

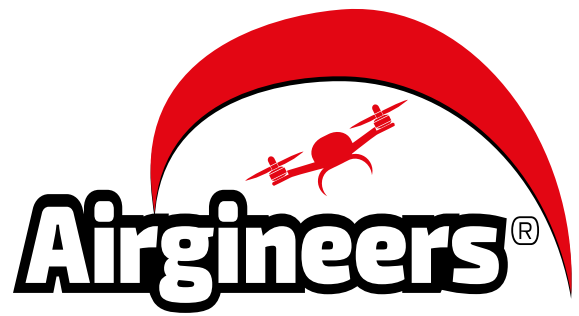
# Electronic Kits & Components

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Full range of Electronic Kits & Components available at:

**[www.rapidonline.com](http://www.rapidonline.com)**

Airineers is a STEAM challenge for secondary school aged students who will need to design, build and learn to fly their own radio-controlled quadcopter, also known as a drone.



## DESIGN 1

### Design using free CAD software

Autodesk are the biggest name in CAD software and have products that are used in engineering, product design, architecture, film, game design and VR. Airineers have worked closely with Autodesk to develop resources for the Fusion 360 and TinkerCAD software to help students learn how to design a drone from scratch, and the best part is that for schools and students, this software is completely free.



Foamboard and 3D printing

### Fusion 360

Fusion 360 is professional-grade software that combines computer-aided design, manufacture and engineering (CAD, CAM and CAE) into a single software package. Whilst the software is installed and run locally, Fusion 360 allows users to harness the massive power of Autodesk's cloud computing to speed up rendering and processing of more complex designs.

### TinkerCAD

TinkerCAD is a free, easy-to-use browser-based app for 3D design, electronics and coding with a shallow learning curve. Because it is browser-based, there is no software to install and students can access it almost anywhere.

Visit [www.airineers.co.uk](http://www.airineers.co.uk) to learn how to access the software.



Vacuum forming and 3D printing



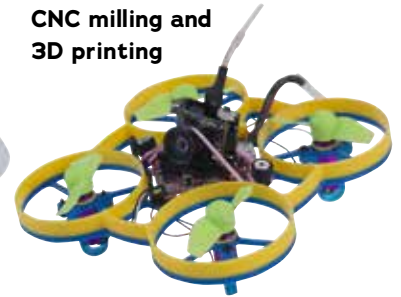
### Design Examples

Airineers Micro Drones can be manufactured using all manner of techniques and materials, each with different advantages. Here are just a few examples.

#### 3D printing



#### CNC milling and 3D printing



Please note these images show a camera module which is not part of the standard Airineers Micro Drone design.

## BUILD 2

### Soldering



### 3D Printing



### Vacuum forming



### Tutorials and safety

Video tutorials for every aspect of Airineers Micro Drones can be found at

[www.airineers.co.uk](http://www.airineers.co.uk)

If you are new to CAD, learn how to use Fusion 360 or TinkerCAD to design your drone frame. Our tutorials also show you how to assemble a Micro Drone, use BetaFlight to configure your flight controller and help you understand the principles behind how a drone flies.

You'll also find a wealth of information regarding the safe use of different types of drones, including Micro Drones

Airineers was created to provide a cutting-edge design and manufacture project that would allow students to learn CAD skills and apply them to manufacturing techniques such as 3D printing, laser cutting and vacuum forming as well as hand-made prototypes.



Micro Drones are just about the easiest way to learn how to make and fly a radio controlled quadcopter. Teams will need to design and build an efficient and manoeuvrable micro-sized flying machine that will compete in team games, individual challenges and time trials.



**Micro-Drone Starter Kit**  
**£71.60**  
 Order code 70-1201

Includes:  
 • Micro-drone component kit  
 • 5 batteries & charger • Transmitter

**Airgineers Micro-Drone Propellers (packs of 4)**

**£1.68**

Red Order code 70-1172  
 Blue Order code 70-1190  
 Green Order code 70-1191

**Airgineers Micro-Drone FlySky Compatible Flight Controller**

**£22.25**  
 Order code 70-1173

**Airgineers Micro-Drone Component Kit**

**£34.78**  
 Order code 70-1200

Includes:  
 • Flight controller • 4 motors  
 • 5 batteries and charger • Propellers

**Micro-Drone Batteries (set of 5) and charger**

**£15.74**  
 Order code 70-1176

**Airgineers FS-i6S Transmitter with FS-A8S Receiver**

**£44.95**  
 Order code 70-1158

**Micro-Drone Squadron Set**

**£275.00**  
 Order code 70-1202

Includes:  
 • 4x Micro-drone kits  
 • 4x Transmitter  
 • 15x Batteries & chargers

**Airgineers Micro-Drone Motors 59,000RPM**

CW MOTOR **£2.79** Order code 70-1175  
 CCW MOTOR **£2.79** Order code 70-1192

**Airgineers Micro-Drone Upgrade Motors 67,000RPM**

CW MOTOR **£3.45** Order code 70-1194  
 CCW MOTOR **£3.45** Order code 70-1193

**Reely LiPo Battery Safety Bag**

**REELY**

**£11.76**  
 Order code 70-1178

**Airgineers E010 RC Quadcopter Spares Part Frame**

**£2.10**  
 Order code 70-1080



Now's the time to fly your drone, either for fun or in team or individual challenges, and increase your skills at pitch, yaw and roll.





# PROJECT IDEAS

VISIT [WWW.RAPIDONLINE.COM/STEAM-LAB/PROJECTS](http://WWW.RAPIDONLINE.COM/STEAM-LAB/PROJECTS) TO VIEW A HUGE RANGE OF PROJECTS. HERE IS A GLIMPSE OF WHAT THERE IS ON OFFER ...

**HOW TO BUILD**  
An Audio Amplifier



**CREATE YOUR OWN**  
Mini-Light



**MAKE YOUR OWN**  
555 Timer



**CREATE YOUR OWN**  
Moisture Tester



**HOW TO BUILD**  
A Logic Alarm



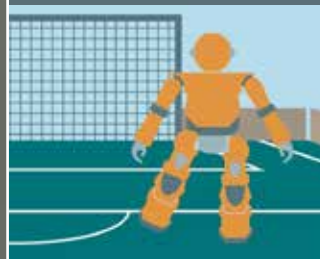
**REACTION GAME**  
micro:bit Project



**STEP COUNTER**  
micro:bit Project



**SPORTS ROBOT**  
Arduino Project

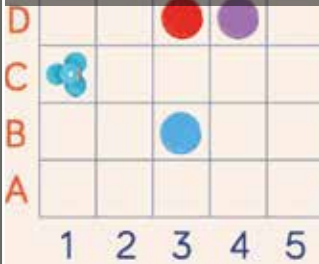


**BUILD A SIMPLE TRACKING ROBOT**  
With Orangepi



**POLLEN LOVE WITH BEES!**  
Ozobot Project

**WONDER LEAGUE**  
Mini Missions

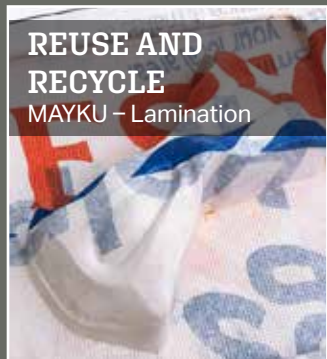


**SORTING WASTE**  
Codey Rocky Project



**CRAFT & CODE**  
Interactive Stories

**REUSE AND RECYCLE**  
MAYKU - Lamination





## Electronic Project Kits



### SC -110 Junior Plus - Over 100 Electronic Projects

Snap Circuits Junior Plus allows for hours of educational fun whilst learning about electronics!

All components are mounted on plastic modules and snap together with ease. The electrical components provide students of ages 8+ with hands-on experience of designing and building models of working electrical circuits.

- Snap-together parts require no tools and ensure correct connections
- Includes 30 parts and instructions for over 100 projects
- Requires 2x AA batteries (not included)
- Clear and concise illustrated manual included and available online



Type	Order code	1+
Junior plus	42-0026	22.36

570884



### SC-100r Junior Education Training Programme - 100 Experiments

Snap Circuits® uses building pieces with snaps to assemble different electronic circuits on a simple 'rows-and-columns' base grid that functions like the printed circuit board found in most electronic products.



Each component is easily identifiable by a different colour and functional purpose. The Model SC-100R is an exploration of the electronic components included with the SC-100 Snap Circuits®. Ideal for use in home-schooling, middle schools, and high schools where students will grasp the basic principles of electronics.

- Custom storage case
- For ages 8 and up
- Requires 2x AA batteries (not included)

**Topics covered:**

- Basic components & circuits
- Series and Parallel circuits
- Short circuits
- Motors & electricity
- LEDs
- Resistance
- Capacitors
- Integrated Circuits of Snap Circuits

Type	Order code	1+
Training programme	42-0027	31.95

570885



### SC-3DI 3D Illumination - Build Over 150 Projects

Snap Circuits® 3D Illumination uses building blocks with snaps to build the different electrical and electronic circuits in the projects. Each block has a function: there are switch blocks, light blocks, battery blocks, different length wire blocks, etc. The blocks are different colours and have different numbers on them so that you can easily identify them.



Build over 150 projects or combine with other sets to build even more unique structures.

- Exciting light effects
- 3-colour light tunnel, mirrors & reflecting circuits
- Magnet & magnetic switch
- Projector with 6 images
- Includes vertical stabilizer, base grid stabilizer & base grid support
- Requires 3x AA batteries (not included)

Type	Order code	1+
3D illumination	42-0028	41.95

570886



### SC-500r Pro Training Programme

The Snap Circuits Model SC-500R is an in-depth exploration of the electronic components included with the SC-500 Snap Circuits Pro. It is ideal for use in home-schooling, middle schools, and high schools, where students can grasp the basic principles of electronics.



The Extreme Student Guide for SC-500R includes 138 pages of educational curriculum. Written with the help of educators, the Student Guide is essential in covering most topics related to the electricity and electronics being taught in middle schools and above. It includes real-world applications and problem-solving quizzes.

The Teacher Guide is meant to prepare educators for the proper introduction of Snap Circuits® and guide them through each chapter with quizzes for students to test their knowledge.

- Contains over 75 snap-together parts
- Builds over 500 exciting projects
- Storage case
- Requires 4x AA batteries (not included)
- Teacher Guide (# 753290) is included
- Extreme Student Guide (#753307) for all 500+ projects, contains 138 pages of educational curriculum
- Suitable for ages 8 and up

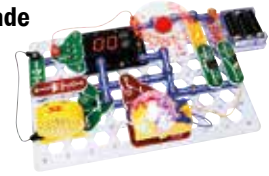
Type	Order code	1+
Training programme	42-0029	85.95

570887



### SCA-200 Arcade

Snap Circuits® Arcade is an exciting introduction to problem-solving, following directions, and the satisfaction of a job well done.



It's fun like an Arcade while supporting a vigorous STEM curriculum.

Snap Circuits® uses building pieces with snaps to assemble different electronic circuits on a simple 'rows and columns' base grid that functions like the printed circuit board found in most electronic products. Each component is easily identifiable by a different colour and functional purpose. Learn the basics of electricity, engineering, and circuitry with full colour, curriculum rich, easy-to-follow instructions.

**Features:**

- 30 snap-together modules to make more than 200 projects
- Enjoy completing projects using a programmable Word Fan, Dual LED Display, and a pre-programmed Micro-Controller
- Clear and concise illustrated manual includes explanations for the different Snap Modules and concepts needed to build Arcade projects
- Suitable for age 8 and up
- Requires 3x AA batteries (not included)

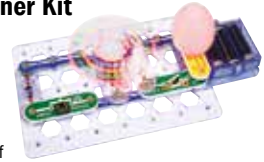
Type	Order code	1+
Arcade	42-0031	39.20

570888



### SCB-20 Beginner Kit

Begin your Snap Circuits® experience with a wonderful introduction to problem solving, following directions, and the satisfaction of a job well done.



**Features:**

- Build over 20 projects with the 14 parts included
- Extra safety features for younger engineers, age 5 and up
- Easy-to-follow colour manual with diagrams like no other Snap Circuits® kit
- Requires 3x AA batteries (not included)

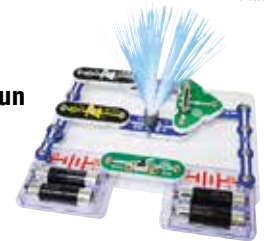
Type	Order code	1+
Beginner kit	42-0032	15.19

570889



### SCP-11 LED Fun

Create your own colourful light show using LEDs with this fun Snap Circuits kit!



- Make over 10 different electronic projects!
- Requires 4x AA batteries (not included)
- For age 8 and up

Type	Order code	1+
LED fun	42-0033	11.84

570890

## STEAM resources

Don't forget to visit our STEAM Lab online – [www.rapidonline.com/steam-lab](http://www.rapidonline.com/steam-lab)



### SCP-12 FM Radio

The Snap Circuits FM radio kit allows you to build a radio that really works!

- You can make 4 projects!
- Requires 3x AA batteries (not included)
- Suitable for age 8 and up



Type	Order code	1+
FM radio	42-0034	12.75

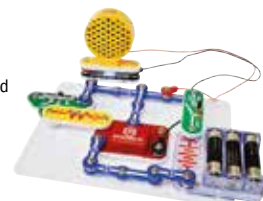
570891



### SCP-14 Strobe Light and Sound

The Snap Circuits Strobe Light & Sound kit makes an adjustable-speed strobe light with sound effects.

- Makes 14 projects!
- Requires 3x AA batteries (not included)
- Suitable for age 8 and up



Type	Order code	1+
Strobe light & sound	42-0035	14.75

570892



### SCROV10 RC Snap Rover

Have fun building your own RC Snap Rover® using colourful Snap Circuits® parts that simply snap together.

This innovative kit offers a fun, hands-on education in electronics, allowing kids to create rovers and other fun devices by snapping together working circuitry. Guide your Snap Rover® with the easy-to-use remote control.

- Over 40 other experiments
- Over 50 parts
- Wireless Remote Control included
- Run up to three Rovers at once
- No Soldering required
- Multi-function, wireless remote control
- Easy to build using easy to follow directions
- Requires 1x PP3, 9V battery and 6x AA batteries (not included)
- Suitable for age 8 and up



Type	Order code	1+
RC snap rover	42-0036	46.95

570893

## STEAM resources

Visit our STEAM lab for project ideas

[www.rapidonline.com/steam-lab](http://www.rapidonline.com/steam-lab)

## Curriculum Based Projects

# CREATE YOUR OWN MINI-LIGHT



Watch our step-by-step video  
[youtube.com/rapideducationtv](http://youtube.com/rapideducationtv)



Lesson plans and teacher notes available online!



## Mini-light Project Kits



LED key ring light kits designed as an introduction for **Key Stage 2 & 3** students to design and make in electronics. Project notes are available as a free PDF download, at [www.rapidonline.com](http://www.rapidonline.com) and are designed to be photocopied for class and teacher use.

Notes include suggested lesson plans and mapping to the National Curriculum, an introduction to circuits and symbols, batteries, LEDs and pricing and costing exercises and a series of homework assignments to support work in class.

- Students start by investigating the need for security and the problems of using locks in the dark
- They can then complete the design process of a mini-light, which can be attached to a key ring
- With careful organisation it should be possible to manufacture the design without specialist workshop facilities
- The component kits include batteries and LEDs, plastazote foam core and high impact polystyrene outer layers
- Available in four styles:
- Standard Mini-light is a keyring torch kit using a red LED
- Super-bright Mini-light is an updated version using a modern white LED
- Rainbow Mini-light has a random colour-changing LED

- Ultraviolet Mini-light has a UV LED and can be used for revealing security coding on banknotes, etc.
- Suitable for **Key Stages 1, 2 & 3** (ages 5 to 14)
- Kits are supplied in **packs of 5**

Type	Order code	1+
Red	70-0015	2.61
White	70-0012	4.05
Rainbow	70-0013	4.44
Ultraviolet	70-0014	4.96

032968



## Mini-light Project Classpacks

This simple but interesting project has been designed by Rapid's technical team for **Key Stages 1, 2 & 3** students. It will help them to make a fully working mini-light from the parts supplied in this great kit. All the notes for making this kit are available as a free download from: [www.rapidonline.com](http://www.rapidonline.com). The classpack is supplied in a handy storage tray with lid, containing sufficient components for 20 mini-lights.

- Batteries and LEDs
- Plastazote foam core
- High impact polystyrene outer layers
- Available in four styles:
- Standard Mini-light is a keyring torch kit using a red LED
- Super-bright Mini-light is an updated version using a modern white LED
- Rainbow Mini-light has a random colour-changing LED
- Ultraviolet Mini-light has a UV LED and can be used for revealing security coding on banknotes, etc.
- Suitable for **Key Stages 1, 2 & 3** (ages 5 to 14)
- Supplied in **classpacks of 20**
- Also available in an assorted classpack of 20, containing 5 of each type

Type	Order code	1+
Standard classpack	13-0138	13.73
White classpack	13-0155	17.54
Rainbow classpack	13-0156	19.01
Assorted classpack	13-0158	16.57

070997



# CREATE YOUR OWN MOISTURE TESTER

**Rapid**

## Moisture Tester Project

Kits of components to build a functional **Moisture Tester** that can be used to tell if pot plants require water.



The kits contain all the electronic components required, except the PCBs, which are available separately. This provides the option to buy ready-made PCBs or for students to make their own.

The moisture tester project has been designed as an introduction for **Key Stage 2 & 3** students to the use of resistors and transistors in circuits.

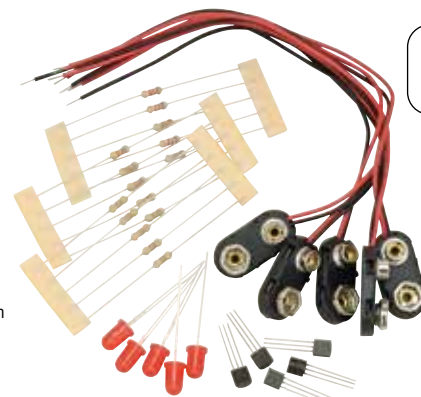
Teachers notes are available to download from [www.rapidonline.com/pdf/70-0030e.pdf](http://www.rapidonline.com/pdf/70-0030e.pdf).

- Students start by investigating the care of house plants and the problems associated with incorrect moisture content of soil
- Downloadable information and activity sheets then guide the students through a series of exercises to build background knowledge in the use of resistors and transistors in circuits
- For manufacture, the project allows the teacher to select from two alternative methods of circuit construction, either self adhesive copper tape onto card or on a printed circuit board (available separately) see order code **34-0635**
- Upon completion of manufacture students are then guided through an evaluation of their work
- They also have the option of producing a 3D model using high density polystyrene foam illustrating how they might develop a final product if the design were manufactured commercially
- Project notes are available for free download and are designed to be photocopied for class use
- They include both detailed student and teacher notes, which contain suggested lesson plans, mapping to the National Curriculum and a series of structured homework assignments to support the work in class

The component kits are supplied in multiples of 5 and include:

- All components including LEDs, battery clip, resistors and transistors
- The project can be produced using PCB available or self adhesive copper tape (see PCB products section)
- Suitable for **Key Stages 2 & 3** (ages 7 to 14)

Each kit requires 1x PP3 battery (not included).



Type	Order code	1+
Class set of 5 kits	<b>70-0030</b>	1.45
PCB packs of 5	<b>70-0040</b>	5.01



Lesson plans and teacher notes available online!



## Moisture Tester Project Classpack

A classpack of 20 kits of components to build a functional **Moisture Tester** that can tell if pot plants require water. The classpack contains all the electronic components required, including ready-made PCBs, in a Grattell's Tray with lid. It offers a substantial saving compared to parts bought separately.



Students will love this Moisture Tester Project, which is linked to the National Curriculum, as it is simple to assemble and is ideal as an introduction to electronics.

- Dimensions of the box: 43cm x 31cm x 7cm
- Great school resource
- Each kit requires 1x PP3 battery (not included)
- Suitable for **Key Stages 2 & 3** (ages 7 to 14)
- Supplied as a **pack**

Classpack contains:

4 x Moisture tester kit (pack 5)	<b>70-0030</b>
4 x Moisture tester kit PCBs (pack 5)	<b>70-0040</b>
1 x Shallow Tray	<b>14-0430</b>
1 x Tray lid	<b>14-0436</b>

Type	Order code	1+
Moisture tester classpack	<b>13-0102</b>	20.60

065931

# MAKE YOUR OWN 555 TIMER



**Rapid**

## 555 Timer Project Kits

The timer project has been designed as an introduction to the use of the NE555 monostable and resistor-capacitor timing circuits.

- Students start by investigating the need for an accurate timer and are then led through the complete design process
- Upon completion of manufacture, students evaluate their work and start to look into commercial product development
- The information and activity sheets guide the students through a series of exercises, including the use of Crocodile Clips software, to build up knowledge in the use of the NE555 monostable within circuits
- Project notes are available and are designed to be photocopied for class use
- They include both detailed student and teacher notes, which contain suggested lesson plans, mapping to the National Curriculum and a series of structured homework assignments to support the work in class
- The component kits are supplied in multiples of five and include: NE555 and IC holder, resistors and capacitors, buzzers and LEDs, switches and potentiometer and battery clips
- Pre-drilled PCBs are available separately in **packs of 5**, order code **70-0060**
- Suitable for **Key Stage 3** (ages 11 to 14)

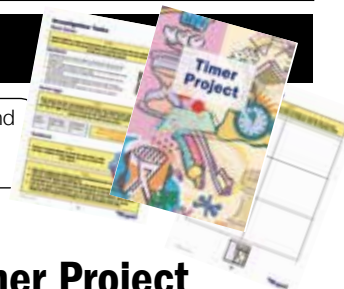
Each kit requires 1x PP3 battery (not included).



Type	Order code	1+
Class set of 5 kits	<b>70-0050</b>	8.93
PCB pack of 5	<b>70-0060</b>	3.60

034263

Lesson plans and teacher notes available online!



## 555 Timer Project Classpack

Your chance to buy a classpack of 20 Timer Project kits offering a substantial saving. Linked to the National Curriculum and supplied in a handy storage tray, complete with lid.



- Great school resource
- Suitable for **Key Stage 3** (ages 11 to 14)
- Supplied as a **pack of 20 kits**

Each kit requires 1x PP3 battery (not included). Each student will also require: 4 x M3 6mm pan head slotted screws (available as Rapid part **33-1500**), 4 x M3 12mm pan head slotted screws (**33-1510**), 4 x M3 spacer 4mm (**33-3632**) and 4 x 18mm threaded spacers (**33-3535**).

Classpack contains:

4x Timer project kit (pack 5)	<b>70-0050</b>	1x Shallow tray	<b>14-0430</b>
4x Timer project kit PCBs (pack 5)	<b>70-0060</b>	1x Tray lid	<b>14-0436</b>

Type	Order code	1+
Timer Classpack	<b>13-0104</b>	36.21

065932

## HOW TO BUILD A LOGIC ALARM

**Rapid**

### Logic Alarm Project Kit Set of 5

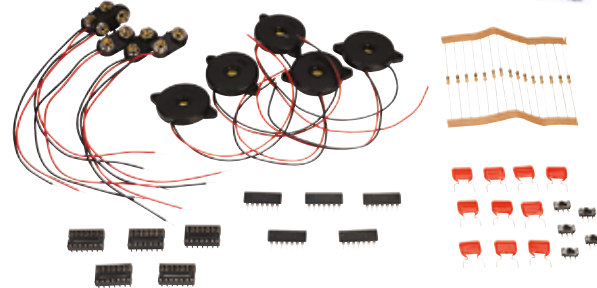
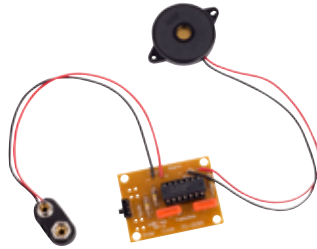


Lesson plans and  
teacher notes  
available online!



This project is designed to cover key topics in electronic based exam courses at GCSE level.

- Each unit of work will offer students an opportunity to build a fundamental circuit and incorporate this with their own design
- The student notes are also supported with a set of teaching notes outlining the areas of the syllabus covered, suggested lesson plans and mapping to the National Curriculum
- Care has been taken to ensure that this project provides schools with a cost-effective, flexible method of offering a practical class based assignment
- The Logic Alarm project is an ideal way to introduce students to logic circuit theory and design
- The notes guide students through the fundamentals of logic, the use of truth tables, common logic gates and the design of combination circuits
- The notes also look at the difference between TTL and CMOS based ICs and their use in project work
- Detailed worksheets can be used in conjunction with Crocodile Clips and PCB Wizard software with a range of homework based assignments
- All circuit design is developed from a systems approach
- **Project notes** are designed to be photocopied for class and teacher use
- The notes contain exercises that cover, in detail, core elements found in examination syllabuses



The component kits are supplied in **multiples of five** and include:

- ICs and switches
- Resistors and capacitors
- Piezo sounders and battery clips
- Pre-drilled PCBs are available separately in **packs of 5**, order code **70-0085**
- Suitable for **Key Stages 3 & 4** (ages 11 to 16)

Requires 1x PP3 battery per kit (not included).

Type	Order code	1+
Class set of 5 kits	<b>70-0075</b>	6.24
PCB packs of 5	<b>70-0085</b>	3.75

034265

## HOW TO BUILD AN AUDIO AMPLIFIER

**Rapid**

### Audio Amplifier Project Kits



Lesson plans and  
teacher notes  
available online!



- The students have a number of design situations to select a starting point from, and they are provided with research topics and background material to help build understanding for their chosen design brief
- The student notes provide material for students to explore how a range of simple amplifier circuits work
- They also include guidance on the design and construction of speakers
- To support students during the construction of the circuit, detailed instructions have been included on how to assemble the amplifier, and how to integrate the circuit into student designs
- In addition, care has been taken, through extensive evaluation of the teaching material and PCB designs in schools, to ensure that the circuits are easy and robust enough for student manufacture
- The project notes have been designed for photocopying for class use

#### Each kit contains the following:

- TBA820M audio amplifier and IC socket
- Resistors, capacitors, and LED
- Switch and connecting jack socket
- Connecting cable
- Speaker and speaker cable
- Battery clip
- Available in **packs of 5 kits, 70-0180**, (no PCBs) or **classpacks of 20 packs** (including PCBs)
- Classpack of 20, **13-0106**, is supplied in a 43 x 31 x 7cm Grattells tray
- Classpack of 20, **13-0105**, has an enclosed battery box and is supplied without the Grattells tray

Each kit requires 1x PP3 battery (not included).

Pre-drilled PCBs are available separately in packs of 5, order code **70-0190** (Included in Classpacks of 20, **13-0105** & **13-0106**).

Type	Order code	1+
5 kits no PCBs	<b>70-0180</b>	9.32
20 kits + PCBs in tray	<b>13-0106</b>	51.95
20 kits + PCBs no tray	<b>13-0105</b>	49.95
Circuit boards (Pack 5)	<b>70-0190</b>	5.89



Aimed at **Key Stage 3**, the audio amplifier project provides teachers with a stimulating and inexpensive project through which to study the subject of amplification.

This schools projects package contains a comprehensive selection of components for schools working on audio related projects linked to the National Curriculum. The classpacks of 20 projects include PCBs and offers a worthwhile saving over parts bought separately which is ideal for schools working to tight budgets.

Teaching resources are available for free download at [www.rapidonline.com](http://www.rapidonline.com)

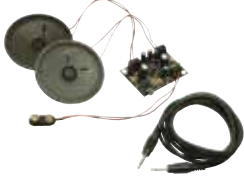
- Students have the opportunity to build a small amplifier, which can be incorporated into a variety of product designs, e.g., as an amplifier for a personal CD/MP3 player so that they can share their music with their friends



**RK Education**

**Stereo Audio Amplifier Kit**

This project kit is a stereo version of our popular Audio Amplifier Project, **70-0180**. Once assembled, the amplifier can be connected to MP3 players, laptops or any other device with a 3.5mm headphone jack socket.



The kit contains all components, speakers, printed circuit board and connecting cable. It is available in packs of 5 kits or as a class pack of 20 kits.

- Stereo version of the popular Audio Amplifier Project, **70-0180**
- Can be connected to MP3 players, laptops or any other device with a 3.5mm headphone jack socket
- Kit contains all components, speakers, printed circuit board and connecting cable
- Available in **packs of 5** kits or as a class **pack of 20** kits

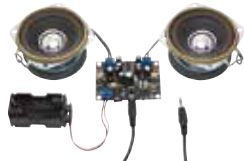
Each kit requires a 9V, PP3 battery (not included).

Type	Order code	1+
Pack of 5	<b>70-0198</b>	20.32
Class pack of 20	<b>70-0199</b>	75.68
Empty PCB only	<b>70-0197</b>	0.984

**Rapid**

**2.5W + 2.5W Stereo Audio Amplifier Kit**

This stereo audio amplifier kit gives you more power and more volume than our standard kits. Each channel can deliver up to 2.5W per channel for a louder, crisper sound. The kit is available with speakers or without if you would prefer to add your own.



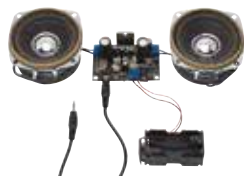
- Kit includes PCB and all components to make one stereo amplifier
- 2.5W power per channel
- Connecting cable supplied
- Available with or without speakers
- Requires 4x AA batteries (not included)
- Empty printed circuit board also available separately

Type	Order code	1+	20+
2.5W - No Speakers	<b>70-0186</b>	6.65	5.14
2.5W - With Speakers	<b>70-0187</b>	10.97	
PCB Only	<b>70-0194</b>	2.09	

**Rapid**

**10W + 10W Stereo Amplifier Kit**

Our most powerful audio amplifier kit has 10W per channel, meaning it can drive much larger speakers to give a loud, clear sound. The kit is available with speakers or without if you would prefer to add your own.



- Kit includes PCB and all components to make one stereo amplifier
- 10W power per channel
- Connecting cable supplied
- Available with or without speakers
- Requires 4x AA batteries (not included)
- Empty printed circuit board also available separately

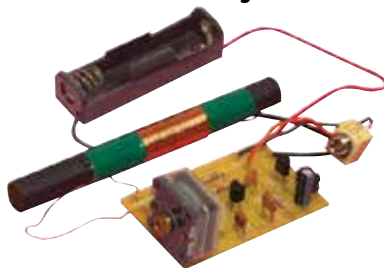
Note: Colour of individual components may vary from those shown.

Type	Order code	1+
10W - No Speakers	<b>70-0188</b>	7.56
10W - With Speakers	<b>70-0189</b>	11.93
PCB Only	<b>70-0195</b>	2.09

**HOW TO BUILD AN AM RADIO**

**Rapid**

**AM Radio Project**



Lesson plans and teacher notes available online!



- Schools have the choice to either purchase a PCB or manufacture their own from the mask provided in the notes
- Suitable for **Key Stages 3 & 4** (ages 11 to 16)
- Pre-drilled PCBs are **supplied separately in packs of 5**, order code **70-0120**

Type	Order code	1+
AM radio project	<b>70-0110</b>	19.95
PCB packs of 5	<b>70-0120</b>	3.28

This project offers students a cost-effective way to build an AM tuner that is easy to incorporate into a variety of design situations. The Printed Circuit Board (PCB) can be either purchased ready made, or students can manufacture their own from the mask provided in the notes. Project notes are available for free download at [www.rapidonline.com](http://www.rapidonline.com) and can be photocopied for class use.

- Based on the TA-7642, an updated version of the popular MK484 IC
- Needs only a few external components to build a high quality AM radio
- They contain both detailed teacher and student sections, providing research information, and structured tasks
- The notes explain in detail how radio signals are transmitted and received
- They also look at how the design of radios has been influenced by style and technology of the day, from the first radios of the 1900's, through the introduction of the transistor, right up to today's digital radios
- Students are offered a variety of starting design briefs and guidance on how to develop their ideas
- Detailed diagrams and instructions support the radio circuit construction, and the notes provide suggestions for possible case designs and methods of manufacture
- The teacher section of the notes includes suggested lesson plans and mapping to the National Curriculum and a range of homework assignments

The component kits are supplied in multiples of five and include:

- TA-7642 and transistors
- Ferrite rods and wire
- Tuning capacitors and switches
- Battery holders and jack sockets
- Resistors and capacitors
- Screws, nuts and washers

**Rapid**

**AM Radio Project Classpack**

This excellent projects package contains a wide range of components for schools working on radio type projects. Linked to the National Curriculum, this classpack of 20 projects offers a substantial saving on parts bought separately which is ideal for schools working to tight budgets. The kit is supplied in a strong box with lid.



- Dimensions of the box: 43cm x 31cm x 7cm
- Great school resource
- Suitable for **Key Stages 3 & 4** (ages 11 to 16)
- Supplied as a pack

Each kit requires 1x AA battery (not included).

Classpack contains:			
4 x Radio project kit (pack 5)	<b>70-0110</b>	1 x Shallow tray	<b>14-0430</b>
4 x Radio project kit PCBs (pack 5)	<b>70-0120</b>	1 x Tray lid	<b>14-0436</b>

Type	Order code	1+
Radio project pack	<b>13-0100</b>	81.95



**Rapid**

**Flashing LED Christmas Tree Project Kit**

A kit of parts for a simple to build festive project. Supplied with comprehensive instructions. Ideal as a one lesson end of term project.



- Size of finished tree: height 105mm, width (max.) 65mm
- Available **individually** and as a money-saving **classpack of 30** kits supplied in a Gratinels tray
- Suitable for **Key Stage 3** (ages 11 to 14)
- Requires soldering

Each kit requires 1x PP3 battery (not included).

Type	Order code	1+
Christmas tree kit	<b>70-1000</b>	3.64
Classpack of 30	<b>70-1005</b>	53.00



## Rapid

## Uncased 16GB USB Memory Stick Module

Fully-functional uncased memory sticks, ideal for allowing students to design and make their own case.

The finished product is a **practical item that students can keep** for transporting homework and other data. The rear section of the PCB from the front of the rectangular hole does not have any components on it so can be used for fixing part of the case. Case designs should not protrude any further than the front of the circuit board so that the USB connector is not obscured. The maximum thickness of the PCB and components is 5mm.

The memory stick is an **ideal basis for a 3D Printing Project** to design and make a suitable case. The cases are relatively small, use only a small amount of filament and are reasonably quick to print. Some 3D printers allow several cases to be printed at once.

- 16GB memory capacity
- USB connection
- On-board LED indicator
- Overall dimensions 14 x 5 x 60mm
- Ideal 3D printer project

Type	Order code	1+
Uncased 16GB stick	19-9996	4.45

559407



## Rapid

## POV Wand Project



Build this PIC based kit which uses the persistence of vision (POV) of the human eye to create the illusion of a message being written in mid-air. Instruction details are available for free download at [www.rapidonline.com](http://www.rapidonline.com) and are designed to be photocopied for class use.

- Programmable – create your own messages up to 6 characters long
- 57 pre-defined characters
- Complete set of components including printed circuit board
- Ideal demonstration of PIC controlled electronics and construction
- Component count 25
- Also available as a money-saving **classpack of 20 kits** packed in a Grattells tray
- Empty PCBs are also available separately
- Suitable for **Key Stages 2, 3 & 4** (ages 7 to 16)

Requires 2x AAA batteries (not included).

Type	Order code	1+
POV wand project	70-2555	6.29
Classpack of 20	70-2557	96.73
	<b>MOQ 2</b>	
Type	Order code	2+
PCB only	70-2556	0.641

073215

## Free Delivery\*

on all orders over £30 (excl. VAT)  
(UK mainland only)

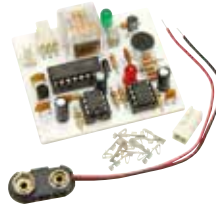
\* See Terms & Conditions for full details - [www.rapidonline.com/terms](http://www.rapidonline.com/terms)

## Rapid

## Clap Switch Project

Build a switch circuit that responds to sharp sounds like clapping your hands, etc.

- Kit contains all components including circuit board
- 3A changeover relay output
- Circuit counts two claps before operating to avoid false triggers
- Operates from 6 to 20V
- Component count 36
- Circuit board dimensions: 55 x 50mm
- Also available as a money-saving **classpack of 20 kits** packed in a Grattells tray
- Suitable for **Key Stages 2, 3 & 4** (ages 7 to 16)



Type	Order code	1+
Clap switch project	70-2570	4.50
	<b>MOQ 2</b>	
Type	Order code	2+
PCB only	70-2571	0.658
Type	Order code	1+
Classpack of 20	70-2602	72.44

073214

## Rapid

## Light Sensor Kit Pack of 10

A pack of components to build 10 light sensors, ideal for class projects with students working in small groups.

The general-purpose light-sensing circuit uses a miniature light dependent resistor (LDR) to detect changes in the level of light and switches the LED on or off accordingly. The sensitivity of the circuit can be set by adjusting a potentiometer.

- Pack contains:
- 10x PCB
- 10x BC548 transistor
- 10x mini-LDR
- 10x 1kΩ resistor
- 10x 100Ω resistor
- 10x 470Ω resistor
- 10x standard LED
- 10x 47kΩ potentiometer
- 10x battery connector
- Designed for use with a 3 to 9V supply
- Supplied as a **pack of 10 kits**

Type	Order code	1+
Light sensor kit (10)	06-1581	9.94

553704

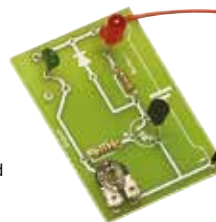


## Rapid

## Temperature Sensor Kit Pack of 10

A pack of components to build 10 temperature sensors, ideal for class projects with students working in small groups.

This general-purpose temperature-sensing circuit uses a thermistor to detect changes in temperature and switches the LED on or off accordingly. The sensitivity of the circuit can be set by adjusting a potentiometer.



## Pack contains:

- 10x PCB
- 10x BC548 transistor
- 10x thermistor (1kΩ)
- 10x 1kΩ resistor
- 10x 3.3kΩ resistor
- 10x 470Ω resistor
- 10x standard LED
- 10x 10kΩ potentiometer
- 10x battery connector
- Designed for use with a 3 to 9V supply
- Supplied as a **pack of 10 kits**

Type	Order code	1+
Temp. sensor kit (10)	06-1582	9.94

553705

## Rapid

## Humidity Sensor Kit Pack of 10

A pack of components to build 10 humidity sensors, ideal for class projects with students working in small groups.

This general-purpose circuit detects changes in humidity and switches the LED on or off accordingly. The sensitivity of the circuit can be set by adjusting a potentiometer.

- Pack contains:
- 10x PCB
- 10x BC548 transistor
- 10x humidity sensor
- 10x 1kΩ resistor
- 10x 100Ω resistor
- 10x 470Ω resistor
- 10x standard LED
- 10x 5kΩ potentiometer
- 10x battery connector
- Designed for use with a 6 to 9V supply
- Supplied as a **pack of 10 kits**

Type	Order code	1+
Humidity kit (10)	06-1583	14.75

553706



## Rapid

## Energy Transfer Demonstration Unit

This unit demonstrates a range of different energy transfers; for example, how energy is transferred electrically from a hand-turned dynamo to a motor. The unit is supplied complete with a booklet that discusses some of the key teaching and learning issues that surround the energy concept, and provides a series of activities that illustrate how the unit can be used to develop simple and coherent ways of talking about energy.

- Demonstrates a range of different energy transfers
- Unit houses a dynamo, electric fan, solar cell, capacitor and buzzer
- Supplied with booklet containing key teaching and learning topics
- Provides a series of activities

Type	Order code	1+
Energy transfer unit	06-1584	109.38

553707



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delivery service

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**555 Astable/Monostable Project Kit**

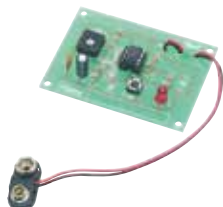
The 555 Astable/Monostable PCB project has been designed specifically to support and integrate with teaching schemes for Key Stages 3 & 4. Instruction details are available for free download at [www.rapidonline.com](http://www.rapidonline.com) and are designed to be photocopied for class use.

- The kit is a timing circuit, which can be used to switch devices or circuits on and off
- Knowledge, skills and understanding can be developed in: component recognition and purpose; PCB circuit assembly and soldering; system and circuit principles; signal tracing and fault finding; product design
- The kit can be used for both class teaching or for individual project work
- All components, including the PCBs, are provided
- The kit includes: resistors and capacitors, NE555 timer, switches and preset resistors, LEDs, wire PCB and PP3 battery clip
- Empty PCBs are also available in **packs of 5**
- **Kit contains components for 5 circuits**
- Suitable for **Key Stages 3 & 4** (ages 11 to 16)

Each kit requires 1x PP3 battery (not included).

Type	Order code	1+
555 project kit	<b>70-0225</b>	9.44
Empty PCBs (5)	<b>70-0230</b>	5.72

070866



**LDR PCB Project Kit**

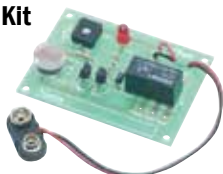
The LDR PCB project has been designed specifically to support and integrate with teaching schemes for Key Stages 3 & 4. Instruction details are available for free download from [www.rapidonline.com](http://www.rapidonline.com) and can be photocopied for class use.

- The kit is a light sensing circuit, which can be used to switch output devices or circuits on and off
- Knowledge, skills and understanding can be developed in: component recognition and purpose, PCB circuit assembly and soldering, system and circuit principles, signal tracing, fault finding and product design
- The kit can be used for both class teaching or for individual project work
- All components, including the PCBs, are provided
- The kit includes: resistors and diodes, transistors and preset resistors, LEDs and relays, LDR PCB and PP3 battery clip
- PCB size 66 x 48 x 1.7mm
- Empty PCBs are also available in packs of 5
- **Kit contains components for 5 circuits**
- Suitable for **Key Stages 3 & 4** (ages 11 to 16)

Each kit requires 1x PP3 battery (not included).

Type	Order code	1+
LDR PCB project kit	<b>70-0245</b>	23.91
Empty PCBs (5)	<b>70-0250</b>	4.16

070867



**Thermistor Temperature Sensor Project Kit**

The thermistor temperature sensor project has been designed specifically to support and integrate with teaching schemes for **Key Stages 3 & 4**.



Instruction details are available for free download at [www.rapidonline.com](http://www.rapidonline.com) and can be photocopied for class use.

- The kit is a heat sensing circuit, which can be set to recognise various temperatures through the use of a variable resistance
- Knowledge, skills and understanding can be developed in: component recognition and purpose; PCB circuit assembly and soldering; system and circuit principles; signal tracing and fault finding; product design
- The kit can be used for both class teaching or for individual project work
- All components, including the PCBs are provided
- The kit includes: resistors, amplifier IC sockets, diodes, thermistors, preset resistors, transistors, LEDs, thermistor PCB and PP3 battery clip
- Empty PCBs are available separately in **packs of 5**
- **Kit contains components for 5 circuits**
- Suitable for **Key Stages 3 & 4** (ages 11 to 16)

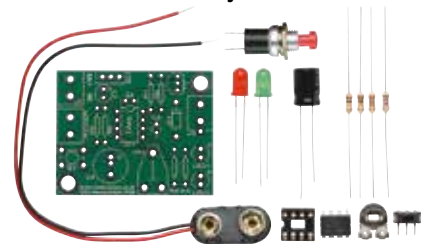
Each kit requires 1x PP3 battery (not included).

Type	Order code	1+
Temperature project kit	<b>70-0315</b>	13.78
Empty PCBs (5)	<b>70-0240</b>	7.14

070901

**RK Education**

**555 Monostable Projects**



This project has been designed to introduce the important concept of timing circuits to students using the 555 monostable circuit. The circuit is very important as it features heavily in KS4 curriculums.

It has been designed to have more than one possible outcome and therefore more than one application. It allows for good differentiation and includes a transistor drive circuit.

- Time can be varied with the variable resistor
- Can be used with various trigger inputs
- Battery-powered
- PCB has space for a transistor drive circuit to allow higher powered outputs to be added
- Clear silkscreen text has been used to make construction simpler
- Professional double-sided PCB pre-drilled with silkscreen and solder-resist
- Empty PCBs are available separately, order code **70-9034**
- Suitable for **Key Stages 2, 3 & 4** (ages 7 to 16)

Type	Order code	1+
Economy	<b>70-6012</b>	2.47
Deluxe with buzzer	<b>70-6013</b>	2.73
PCB only	<b>70-9034</b>	0.929

062439

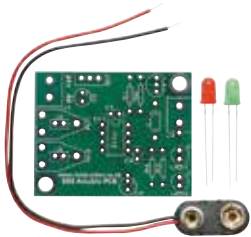
**RK Education**

**555 Timer Astable Projects**

This range of projects has been designed to introduce the important concept of astable timers and pulse-width modulation using a 555 timer astable circuit.

Three versions are available - Economy, 70-6017; With drive circuit, 70-6018 and Deluxe, 70-6019.

The three kits all use the same PCB, but have a different



set of components. Please see Technical Details for more information.

This circuit is very important as it features heavily in KS4 curriculums. The range of projects has been designed to have more than one possible outcome and therefore more than one application.

- Frequency can be varied by adjusting the two variable resistors
- Battery-powered
- Clear silkscreen text has been used to make construction simpler
- Professional double-sided PCB pre-drilled with silkscreen and solder-resist
- Empty PCBs are available separately, order code **70-9036**
- Suitable for **Key Stages 2, 3 & 4** (ages 11 to 16)

Project notes are available to download from [www.rapidonline.com/rk-education](http://www.rapidonline.com/rk-education).

Type	Order code	1+
Economy	<b>70-6017</b>	2.67
With drive circuit	<b>70-6018</b>	3.12
Deluxe	<b>70-6019</b>	3.68
PCB only	<b>70-9036</b>	1.46

062444

**RK Education**

**Transistor Switch Projects**

This project introduces the transistor switch and is an excellent first electronics/systems and control project for students.

The project is also excellent for GCSE students as it has been designed with KS4 curriculums in mind. It is a very versatile project and can be used as a moisture sensor, temperature sensor and light sensor. The project has been designed to allow differentiation and has space for up to 5 outputs and a range of inputs including variable resistors.

- A number of different solutions are possible
- Can be used with an LDR, thermistor or moisture sensor
- Battery-powered
- PCB has space for up to five outputs
- Clear silkscreen text has been used to make construction simpler
- Professional double-sided PCB pre-drilled with silkscreen and solder-resist
- A training system, **70-6046**, is available to help aid teaching and learning with this project and to help students to arrive at their final solution
- 2 versions available for maximum flexibility
- Available with or without temperature sensor
- Empty PCBs are available separately, order code **70-9040**
- Suitable for **Key Stages 2, 3 & 4** (ages 7 to 16)

Project notes are available to download from [www.rapidonline.com/rk-education](http://www.rapidonline.com/rk-education).

Price each		
Type	Order code	1+
Economy	<b>70-6024</b>	2.00
With temperature sensor	<b>70-6025</b>	1.98
MOQ 2		
Type	Order code	2+
PCB only	<b>70-9040</b>	0.644

062451

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## RK Education

## Transistor Astable Project

This project introduces astable circuits and also other important concepts including how resistance and capacitance affect timing circuits and the use of a transistor as a switch.

There are a number of possible outcomes for the circuit including electronic decorations, a police car/fire engine or advertising.

- Frequency of the astable circuit can be varied
- Different outputs can be used
- Battery-powered
- The PCB has space for up to five outputs on either side
- Professional double-sided PCB with silkscreen and solder-resist
- Empty PCBs are available separately, order code **70-9042**
- Suitable for **Key Stages 2, 3 & 4** (ages 7 to 16)

Price each			
Type	Order code	1+	
Economy	<b>70-6028</b>	1.89	
MOQ 2			
Type	Order code	2+	
PCB only	<b>70-9042</b>	0.788	

## RK Education

## RKL298 H-Bridge Motor Drive IC Project PCB Kit

A kit of parts to build this versatile PCB that has been designed specifically for the L298 H-Bridge motor drive chip. The kit is ideal for DC motor control and robotic projects.

Further details, schematics and constructional notes can be downloaded from [www.rapidonline.com](http://www.rapidonline.com).

- Uses an L298 stepper motor control/driver
- L298 has output current of 2A continuous per channel in DC operation
- Ideal for DC motor control and robotic projects
- Great for use with PIC, PICAXE, Genie, ATME1 and Arduino
- Designed for use in DC motor control and robotic projects
- Maximum output current 2A per channel
- Terminal blocks used for easy interfacing
- Mounting holes for PCB mounts
- Includes smoothing capacitors
- High quality, black, double-sided PCB
- Empty PCB is also available separately
- Suitable for Key Stages 4 & A Level (ages 14 to 18)

Type	Order code	1+	
L298 H-bridge kit	<b>70-9111</b>	6.54	
Empty PCB only	<b>70-9069</b>	0.982	

## RK Education

## Servo Controller Project PCB Kit

A kit of parts to make a servo controller PCB that has been specially designed to be fully compatible with Atmel®, Arduino®, Genie®, PIC® and PICAXE®.

- PCB controls upto 8 servos
- Each servo has an LED indicator
- Servos are controlled via headers
- Designed for use with Atmel, Arduino, PIC, Genie and PICAXE
- High quality, double-sided PCB
- Empty PCB is also available separately

Type	Order code	1+	
Servo controller kit	<b>70-9112</b>	2.63	
Empty PCB only	<b>70-9070</b>	1.36	

## RK Education

## 4 Siren Sound and Flashing Lights Generator Kit Based on UM3561 IC

A kit of parts to build a 4 siren sound and flashing lights generator ideal for building into models.

- Uses a UM3561 Sound IC
- High quality speaker
- 4 different emergency siren sounds, selected using a jumper
- Perfect for emergency vehicles
- Sound can be adjusted with a potentiometer
- PCB has space for up to 8 LEDs (available separately)
- LEDs flash
- LEDs can be turned off
- Frequency of flashing can be varied
- Ideal for using RC vehicles, cars, trucks, lorries etc
- Available as a kit or as a blank PCB
- Professional double sided PCB

For components list and instructions visit [www.rapidonline.com](http://www.rapidonline.com).

Type	Order code	1+	
4 siren & lights kit	<b>70-9116</b>	8.40	
Empty PCB only	<b>70-9076</b>	3.00	

## Rapid

## Nightlight Kit Project

The nightlight project is a safe, battery powered, bedside light that automatically switches on when the room lights are switched off. After a time delay of about 5 minutes the light automatically switches off to conserve battery power.

- Light source is a high efficiency, high brightness white LED
- Suitable for illuminating different coloured translucent acrylic, coloured inkjet film or 'fun and fancy' acrylic paints
- An excellent platform for creative product design
- Featured in Electronics Education published by the IEE
- Can be used to explore timing circuits using different component values
- Very popular and engaging project
- Suitable for **Key Stages 2, 3 & 4** (ages 7 to 16)
- Component kits are **supplied in packs of 5 kits** including printed circuit boards

Each kit requires 4x AAA alkaline batteries (not included).

Type	Order code	1+	
Nightlight project	<b>70-2600</b>	11.19	

## Rapid

## Badge Module with Flashing LEDs



Add eye-catching flashing LEDs to your badge designs with this ready-built, battery-powered electronic module.

- Two 3mm red LEDs flash alternately
- On/Off button on circuit board
- Size only 7mm thick x 25mm diameter
- Takes 2x L736 alkaline button cell (supplied)
- Holes can be easily made in most badges for the LEDs
- Complete with badge pin, double-sided adhesive foam pad for fixing to badge and plastic back cover
- Supplied in **packs of 30**

For neat LED holders please see order code **55-0160**.

Type	Order code	1+	
Badge flash modules (30)	<b>70-0721</b>	27.93	

AREXX  
AREXX Engineering

## CP-01K Classical Piano Kit

This kit enables you to build a miniature classical piano to create your own melodies. The piano is able to play a chromatic scale. Alternatively it is pre-programmed with 15 registered melodies for your enjoyment.

- Suitable for **Key Stage 4** (ages 14 to 16)

Requires 3x AAA batteries (not included).

Type	Order code	1+	
Piano kit	<b>13-1440</b>	25.10	

## RK Education

## SCR/Thyristor Projects

This project introduces latching circuits and also other important concepts including different ways of triggering and resetting circuits. There are a number of possible outcomes for the circuit including electronic alarms, an electronic money box, a target game and a steady-hand game.

- Different trigger inputs can be used
- Different resets can be used
- Space for up to 3 outputs
- Battery-powered
- Clear silkscreen text has been used to make construction simpler
- Professional double-sided PCB pre-drilled with silkscreen and solder-resist
- Available in 2 versions: economy and complete
- Both versions are supplied with empty PCB, 1x PP3 battery clip, 1x 2N5060G SCR or equivalent, 1x 5mm red LED, 1x 270 ohm resistor, 1x 1k resistor, 1x 10k resistor (all 0.25W), 1x SPDT slide switch
- Complete version has additional push-to-make switch and 6V PCB mounting buzzer
- Empty PCBs are available separately, order code **70-9048**
- Suitable for **Key Stages 2, 3 & 4** (ages 7 to 16)

Project notes are available to download from [www.rapidonline.com/rk-education](http://www.rapidonline.com/rk-education)

Price each			
Type	Order code	1+	
Economy	<b>70-6031</b>	1.98	
Complete	<b>70-6032</b>	2.42	
MOQ 2			
Type	Order code	2+	
PCB only	<b>70-9048</b>	0.785	

## Pricing

Pricing correct at time of going to press.

For up-to-date pricing visit  
[www.rapidonline.com](http://www.rapidonline.com)



## Sound, Music & Light Modules



### Coin Operated Sound and Music Modules

These modules enable students to enhance a simple container based assignment with a music or sound element.

- The modules are easy to incorporate into a container and can be triggered by a wide variety of coins
- Modules employ a 27mm diameter piezo speaker and 2 replaceable L736 button cells (supplied). For replacement cells, see [www.rapidonline.com](http://www.rapidonline.com)
- Module dimensions: behind flange 39 x 15 x 31mm, flange dimensions 45 x 21 x 2.2mm, coin slot 30 x 3mm

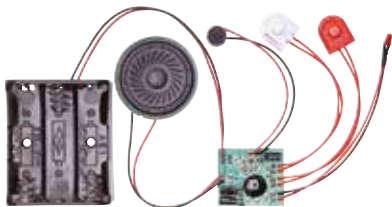


**Note:** Please use coins smaller than the new £1 coin.

Type	Order code	1+
Bird call sound	<b>13-0626</b>	2.07
It's a small world	<b>13-0627</b>	1.35



### 20 Second Sound Recorder Module



A sound recording module providing up to 20 seconds of playback time for speech, music or sound effects.

- Allows students to include a record and playback element into projects
- 40mm mylar speaker
- Separate microphone, record and play buttons
- A single press of the play button starts playback
- The record push-button is held down during recording
- Separate battery holder
- Non-volatile memory allows the batteries to be changed without losing the recorded message
- PCB dimensions: 31 x 27mm

Requires 3x AA batteries (not included).

Type	Order code	1+	5+	10+	25+
20s Sound recorder	<b>13-0665</b>	12.23	11.44	10.92	10.09



### Sound Module for Recording/ Playback

A compact sound recording module allowing you to make a 10-second recording of your own sounds or personalised messages for use in soft toys and textile projects.



- 40mm diameter mylar speaker for sound quality
- 10 seconds worth of recording time
- Recording is made by setting the slide switch to the recording position, depressing the top of the module and speaking into the microphone at the back of the unit
- An LED lights during the recording period
- With the slide switch set to play, depressing the top of the module plays your message back

- New recording can be made by sliding the switch back to record
- Battery compartment cover for easy battery changing
- Dimensions: 26 x 45mm diameter

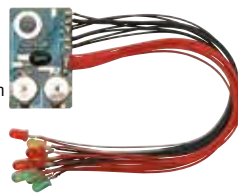
Powered by three L1154 button cells (supplied).

Type	Order code	1+	10+
10s Record/play	<b>13-0678</b>	10.31	8.42



### 10 Flashing LED Module

A flashing LED module, with built-in timer, producing a multi-coloured running light effect similar to that seen in disco light shows. By arranging the LEDs around the PCB, a large display can be created with minimal effort. The module is activated by a push button switch mounted on the PCB, and runs for approximately 10 to 15 seconds before automatically switching off.



- Ideal for eye-catching displays, notices, etc.
- Each module consists of an assortment of ten red, green and yellow 5mm LEDs which flash in pairs in sequence
- The module is powered by two, replaceable L1131 button cells. For replacement cells, see [www.rapidonline.com](http://www.rapidonline.com)
- PCB dimensions: 47 x 29mm
- LED lead length: approx. 280mm

Type	Order code	1+	5+	10+	25+
10 LED Flash module	<b>13-0652</b>	5.06	4.67	4.46	4.29

## Conductive Paint



### Electric Paint



Bare Conductive Electric Paint is conductive which means that electricity from the battery can pass through it just like a wire. When you draw a circuit with a Bare Electric Paint Pen, the components and battery are joined together by the paint and make a complete loop, or circuit.

Bare Electric Paint is non-toxic, solvent-free and dries at room temperature.

- Draw a circuit on almost any surface: Paper, plastic, cardboard, fabric, wood, and more!
- Connect batteries, LEDs and other components
- Try it with microcontrollers like Arduino
- Can be used with conductive thread and e-textiles
- Great for attaching components and for PCB repair
- Can be used as a Cold Solder and Wire Paint
- Non-toxic and solvent free
- Dries at room temperature
- Available in **10ml pens, 50ml jars and 11 tins**
- **Click here** for further information, image gallery, data sheets and downloads.

Type	Order code	1+
10ml Pen	<b>70-0873</b>	9.00
50ml Jar	<b>70-0874</b>	19.14
11Tin	<b>70-0885</b>	242.34



### Touch Board

The Bare Conductive Touch Board is a printed circuit board module that can make your projects interactive, responsive, smart or just fun. Change the world around you by using the Touch Board to turn almost anything into a sensor.



Connect anything conductive to one of the 12 electrodes and trigger a sound via the onboard MP3 player, play a MIDI note or do anything else that you might do with an Arduino or Arduino-compatible device.

The Touch Board has been designed to be an easy-to-use platform for a huge range of projects, whether it is painting a lightswitch on your wall, making a paper piano or creating a customised interactive surface.

- Touch sensing
- Distance sensing
- No programming required for basic operation
- Arduino compatible and works with popular shields
- Ideal for use with Bare Conductive paint or any other conductive material
- MP3 Player / MIDI device
- MicroSD card socket
- Standard 3.5mm audio jack for headphones and speakers
- Lithium Polymer (LiPo) battery recharges via USB
- HID capable - turn the Touch Board into a keyboard or mouse
- Board size: 84 x 62 x 10mm

See [www.rapidonline.com/Bare-Conductive/TouchBoard](http://www.rapidonline.com/Bare-Conductive/TouchBoard) for further information, image gallery, data sheets and downloads and [www.rapidonline.com/Bare-Conductive/projects](http://www.rapidonline.com/Bare-Conductive/projects) to see our **Bare Conductive Ideas Page**.

Type	Order code	1+
Touch board	<b>70-0105</b>	35.84

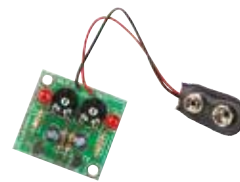
## Velleman Kits



### Flashing LED Module Kit

A simple multivibrator circuit driving two LEDs.

- Suitable for many applications including model construction and education
- Adjustable flashing speed with two potentiometers
- Power consumption approx. 8mA
- Dimensions: 30 x 35 x 15mm
- Kit contains all components required including printed circuit board and construction instructions
- **Velleman MK102**



Requires 1x PP3 battery (not included).

**Please note:** This is a self-assembly kit and requires soldering.

Type	Order code	1+
Flashing LED kit	<b>70-4138</b>	3.92

## Quick Quote

Quick quote service available online  
Either click on a product and ask for a quick quote or visit  
[www.rapidonline.com/quotation](http://www.rapidonline.com/quotation)  
for more details



## Dual Super Bright Flashing LED Lights Kit

A module with two superbright red LEDs giving a powerful warning indication.

- Ideal for emergency and warning signs, eye-catchers, etc.
- High visibility 'alarm-active' - simulation, etc.
- 'Auto turn-on at dark' - mode with adjustable sensitivity
- On/Off switch
- Can be operated from 12V supply
- Dimensions: 55 x 32 x 40mm
- Kit contains all components required including printed circuit board and construction instructions
- **Velleman MK148**

Requires 1x PP3 battery (not included).

**Please note:** This is a self-assembly kit and requires soldering.

Type	Order code	1+
Dual LED flasher	<b>70-4164</b>	5.23

074858



## Running LED Light Kit

This kit will produce a running light effect.

- 8 LEDs
- Different running light effects are selectable (Prog push button)
- Adjustable effect speed with potentiometer
- Includes stand-by push button power switch (Off push button)
- Suitable for beginners
- Dimensions 95(L) x 40(W)mm
- **Velleman MK107**

Requires a 9V battery (not included).

**Please note:** This is a self-assembly kit and requires soldering.

Type	Order code	1+
Running LED light kit	<b>70-4101</b>	5.39

073834



## Red LEDs

A pack of 5mm light emitting diodes, ideal for use in electronics projects.

- Available in **packs of 50**

Set size	Colour	Order code	1+
50	Red	<b>70-4224</b>	5.76

518037



## Mini-6-LED Chaser Kit

If you've ever wanted to recreate the light sequences from the Star Trek Enterprise or from the 1980s TV show Knight Rider, the Velleman Mini-6-LED Chaser Kit is just what you need.

The kit provides LED sequences which scan from side to side or go in one direction and is a great attention-grabber. Suitable for use on cars or in shop



windows, at exhibitions.. or anywhere where you want to get the point across.

- 6 high-intensity 3mm red LEDs
- Fixed scan speed 0.5 sec
- Dimensions 55 x 25 x 10mm
- Power supply 4-15Vdc (20mA at 12Vdc)
- Manufacturer's part **MK173**

**Please note:** This is a self-assembly kit and requires soldering.

Type	Order code	1+
Chaser Kit	<b>70-4416</b>	6.60

518134



## Infrared Light Beam Kit



This kit will produce an IR light beam that can be used to monitor a doorway, a pathway, an area etc. for the arrival or presence of a person or object.

- When the light beam is interrupted the kit makes an audible noise (85dB)
- Uses an IR transmitter emitter to project a beam of infrared light to an IR receiver detector
- Ideal for home security
- On/Off switch provided
- Basic soldering techniques required for circuit board assembly
- Suitable for beginners with little or no previous knowledge of electronics
- Not recommended for outdoor use
- **Velleman MK120**

Transmitter and receiver both require a 9V PP3 battery (not included).

**Please note:** This is a self-assembly kit and requires soldering.

Technical specification	
Audible signal	85db
Visible signal	LED alert
Range	1 to 4m (3.3ft to 13ft)
IR transmitter	5.5 x 4cm
IR receiver	10 x 5 cm
Transmitter emitter	9V DC, 50mA max.
Receiver detector	9V DC, 20mA max.
9V battery holder and power adaptor jack included.	

Type	Order code	1+
IR Light barrier	<b>70-4028</b>	7.96

073843



## Minikits Starter Sets



These starter sets from Velleman give you everything you need to start enjoying electronic projects. Each set contains a number of kits for you to enjoy making. Choose from the Minikits Starter Set, with 6 different projects, or the Seasonal Minikit Pack which gives you 5 different kits, each with a festive theme.

**Please note:** This is a self-assembly kit and requires soldering.

Type	Order code	1+
Starter set	<b>70-4464</b>	29.05
Seasonal pack	<b>70-4466</b>	21.99

518133



## Traffic Light Kit

A miniature four way traffic light as seen at many junctions.

- Realistic operation with adjustable delay
- 12 LEDs
- Great for model railroads, exhibitions or as a toy
- Low power consumption 15mA
- Suitable for beginners
- Dimensions 115(H) x 50(W) x 35(D)mm
- **Velleman MK131**

Requires a 9V PP3 battery (not included).

**Please note:** This is a self-assembly kit and requires soldering.

Type	Order code	1+
Traffic light	<b>70-4040</b>	7.91

073849



## Classic TV Game with Analog Bats

A modern adaptation of the classic 'tele tennis' TV game: - build the kit then play the game. Each player has his own bat with rotary potentiometer for ultra-fast bat



movement. The game has 5 single-player levels, 5 two-player levels, 3 ball angles, smash function and game play sound.

- 5 single-player levels
- 5 two-player levels
- 3 ball angles
- Smash function (press the button the moment the ball hits the bat)
- Only the server can score points
- Audio output
- Composite video out
- PAL or NTSC selection
- Brightness control
- Consumption only 7mA
- Auto power-down
- **Velleman type MK191**

Takes 2x AA batteries, not included.

**Please note:** This is a self-assembly kit and requires soldering.

Type	Order code	1+
TV Tennis Game	<b>70-4147</b>	15.93

526298



## MK112 and MK159 Memory Brain Game Electronics Kits

The Velleman Brain Game Kit will provide hours of fun with just 4 LEDs and 4 push buttons.

It is available **either with or without a case.**

- Aim of the game is to repeat a pattern, which is generated at random
- Pattern is played both visually and audible or visually only (selectable)
- Features 4 difficulty levels, which can be selected at start-up
- Replay speed gradually increases during the game, to make it even more challenging
- Low power consumption
- Microprocessor controlled
- Auto power off
- Basic soldering techniques required for circuit board assembly
- Suitable for beginners with little or no previous knowledge of electronics
- Dimensions 65(L) x 50(W)





• Available with or without case

Requires 3x AAA batteries (not included).

Please note: This is a self-assembly kit and requires soldering.

Type	Order code	1+
Without enclosure	70-4018	9.16
With enclosure	70-4402	17.22

073838



### Expandable Quiz Kit

This quiz table will allow up to four players to compete against one another.

- LED indicates first button pushed
- Quizmaster reset button
- Two units can be daisy chained for eight player fun
- Add your own remote pushbutton and indication
- Suitable for beginners
- On/Off switch
- Dimensions 110(L) x 78(W) x 28(D)mm
- **Velleman MK133**



Requires a 9V PP3 battery (not included).

Please note: This is a self-assembly kit and requires soldering.

Type	Order code	1+
Quiz table	70-4042	7.88

073830



### Wheel of Fortune Kit

This wheel of fortune acts just like the game, just push the button and the 10 LEDs start showing a spinning action. They gradually slow down until the winning one remains lit.

- Push the button to start spinning action
- 10 LEDs red, yellow and green
- Spinning action gradually decreases
- Auto power-off
- Low power consumption
- Suitable for the intermediate, some previous knowledge of electronics required
- Good soldering techniques for medium dense boards recommended
- Dimensions 33(L) x 0.64(D)mm
- **Velleman MK152**



Requires 9V PP3 battery (not included).

Please note: This is a self-assembly kit and requires soldering.

Type	Order code	1+
Wheel of fortune kit	70-4058	6.47

073838



### Roulette Kit

This roulette kit is just like the real thing, and will be a sure winner with you, your friends and relatives.

- With a push of a button, the LEDs lights flash in a spinning sequence and stop randomly
- Enjoy hours of fun with this game of chance
- 37 LEDs are arranged in a circle
- Winner tune played for each colour
- Pushbutton operation
- Microprocessor technology
- Auto power off
- Low power consumption
- Some previous knowledge of electronics required
- Good soldering techniques for medium dense boards
- Suitable for intermediates
- Diameter 90mm
- **Velleman MK119**



Requires 3x AA batteries (not included).

Please note: This is a self-assembly kit and requires soldering.

Type	Order code	1+
Roulette kit	70-4026	14.25

073842



### Electronic Dice Kit

Board games provide an excellent source of pleasant and healthy entertainment, and this dice kit will provide the players with even more fun.

- Fully independent electronic dice
- Result displayed on this electronic dice module
- Cheating is out of the question
- Displays are switched off automatically saving battery power
- Some soldering experience recommended
- Suitable for beginners
- Dimensions 60(L) x 45(W)mm
- **Velleman MK109**



Requires a 9V PP3 battery (not included).

Please note: This is a self-assembly kit and requires soldering.

Type	Order code	1+
Electronic dice	70-4014	5.74

073836



### Electronic Dice Kit

Novel dice that you don't have to throw or press any buttons. Just shake.

- Acts just like regular dice
- Lights roll out slowly and flash the last combination or winning number
- Buy two and simulate a pair of real dice
- Auto power-off
- Suitable for beginners
- Dimensions 36(L) x 36(W) x 32(D)mm
- **Velleman MK150**



Requires 1x 3V Lithium button cell type CR2025 or CR2032 (not included).

Please note: This is a self-assembly kit and requires soldering.

Type	Order code	1+
Shaking dice kit	70-4056	9.53

073837



### Animated LED Smiley

You can make light of every occasion with the Animated LED Smiley Kit from Velleman. The smiley face goes through a sequence of eight different faces, from sad to happy and a few in between. You can use this kit as a novelty gift or just build it for the fun of it.



- Great attention grabber
- Choose between static or animated expressions
- On/off expression selection button
- Auto power off
- Power consumption 15mA
- Dimensions 75 x 75 x 32mm
- Power supply 3 x AAA batteries
- Manufacturer's part MK175

Please note: This is a self-assembly kit and requires soldering.

Type	Order code	1+
LED Smiley	70-4420	9.90

518136



### Running Microbug Kit

This attractive bright coloured bug-shaped miniature robot is always hungry for light, and will constantly run towards it in a bug-like behaviour.



- A really great gift for the budding robotics enthusiast
- Features two open chassis sub-miniature motors
- Adjustable light sensitivity to work in almost any light condition
- LED eyes to indicate driving direction
- Bug stops in total darkness
- Suitable for beginners
- Dimensions 100(L) x 60(W)mm
- **Velleman MK127**

Requires 2x 1.5V AAA batteries (not included).

Please note: This is a self-assembly kit and requires soldering.

Type	Order code	1+
Running microbug kit	70-4034	7.98

073846



### Rolling Message Kit

Create your own moving message with up to 16 self definable characters, the options are many and varied.



- Adjustable scrolling speed
- Press 'SET' to change a particular character
- Press the up or down-key to select a character and end with the '>' sign
- Display standby function press 'Stby' (press RUN to restart)
- 35 LED graphic display
- Requires an 9-12V DC power supply or car battery
- 20mA maximum
- Suitable for beginners
- Dimensions 46/89(L) x 67(W)mm
- **Velleman MK124**

Back-up battery 9V PP3 (not included).

Please note: This is a self-assembly kit and requires soldering.

Type	Order code	1+
Rolling message	70-4032	12.97

073845



### Sound to Light Unit Kit

This kit has four high-intensity LEDs that light up and react simultaneously on every sound.



- For different funny and practical applications
- Sound indicator
- Simple sound-to-light unit for music
- Can be used to indicate the telephone, door bell for the hearing impaired
- Adjustable sensitivity with potentiometer
- Built-in microphone
- Some soldering experience recommended
- Suitable for beginners
- Dimensions 55(L) x 55(W) x 35(D)mm
- **Velleman MK103**

Requires 1x 9V battery (not included).

Please note: This is a self-assembly kit and requires soldering.

Type	Order code	1+
Sound-to-light unit	70-4004	5.38

073831

## SEASONAL KITS



## Electronic Christmas Tree

Have yourself a cosy little Christmas with this Electronic Christmas Tree from Velleman.

- 16 blinking LEDs
- Very low power consumption: max. 4mA
- Dimensions 60 x 100 x 25mm
- Power supply 9V battery PP3 (not supplied)
- Manufacturer's part **MK100**

**Please note:** This is a self-assembly kit and requires soldering.

Type	Order code	1+
Electronic Xmas Tree	<b>70-4382</b>	5.60

518121



## 3D Christmas Tree Electronics Kit



Make sure everyone knows that you're in the Christmas spirit with the Velleman 3D Christmas Tree Kit. Customise your tree with a choice of red, green and yellow LEDs.

- 16 flashing red LEDs
- Extra green and yellow LEDs provided
- Can be hung on and fed through wires
- Low power consumption
- Dimensions 80 x 88 x 102mm
- Power supply 9-12Vdc or 9V battery/8mA (not supplied)
- Manufacturer's part **MK130**

**Please note:** This is a self-assembly kit and requires soldering.

Type	Order code	1+
3D Christmas Tree	<b>70-4386</b>	9.06

519180



## LED Animated Bell Kit

An animated illuminated bell display with 83 LEDs.

- Power supply 9 to 12VDC adaptor or 9V PP3 battery
- No need to remove battery when using external supply
- 12V operation possible for use in cars, lorries, trucks, etc.
- On/Off switch included
- Kit contains all components required including printed circuit board and construction instructions
- **Velleman MK122**

Requires 1x PP3 battery (not included).

**Please note:** This is a self-assembly kit and requires soldering.

Type	Order code	1+
Animated bell kit	<b>70-4148</b>	8.83

074560



## Riding Santa Kit

This animated Riding Santa will make a delightful addition to any seasonal decoration or Christmas display.

- 126 multi-coloured LED lights
- Suitable for use in cars, lorries etc.
- No need to remove battery when using external supply
- On/Off switch included
- Some soldering experience recommended
- Suitable for beginners
- Dimensions: 145(L) x 80(W)mm
- **Velleman MK116**

Powered by either a 9 to 12V DC supply or 9V alkaline battery (not included).

**Please note:** This is a self-assembly kit and requires soldering.

Type	Order code	1+
Riding Santa	<b>70-4000</b>	14.59

073829



## Flashing LED Stars

You can be the star of the local Christmas scene with these Flashing LED Star kits from Velleman. Ideal for lighting up the festive season, these stars are available in 2 colours – red and yellow.

- 35 LEDs included
- Safe battery operation
- Flashing or static operation
- Can be used on desktop or hanging from the ceiling
- Multiple kits enhance the effect
- In-car (12V) operation possible
- Current consumption 40mA (static mode)
- Flash duty cycle 1:2
- Dimensions 90 x 90mm
- Power supply 9Vdc battery

**Please note:** This is a self-assembly kit and requires soldering.

Colour	Order code	1+
Red	<b>70-4410</b>	7.65
Yellow	<b>70-4412</b>	8.07

518132



## LED Halloween Pumpkin Kit

A brightly coloured halloween pumpkin kit with 25 LEDs.

- Random flash effect simulates flickering candle
- One extra high intensity yellow LED illuminates the pumpkin On/Off switch
- Dimensions: 100 x 80 x 33mm
- Kit contains all components required including printed circuit board and construction instructions
- Suitable for **Key Stages 2 & 3** (ages 7 to 14)

Requires 1x PP3 battery (not included).

**Please note:** This is a self-assembly kit and requires soldering.

Type	Order code	1+
LED pumpkin kit	<b>70-4162</b>	6.99

074567



## Electronic Clock Kit

Digital clock with red seven-segment displays in an attractive case.

- Automatic time base selection (internal or net-frequency controlled 50/60Hz)
- Internal time base with fine-tuning adjustment
- Selectable 12 or 24 hour display
- Equipped with optional backup battery facility in case of power failure
- Dimensions: 92 x 45 x 101mm
- Kit contains all components required including printed circuit board and construction instructions
- **Velleman MK151**

Requires a 9V, 500mA AC/DC mains adaptor or 3x AA batteries (not included).

**Please note:** This is a self-assembly kit and requires soldering.

Type	Order code	1+
LED clock kit	<b>70-4166</b>	15.45

074569



## Countdown Timer Kit

A very useful kitchen timer that will alert you with timings from 1 minute to 1 hour.

- Single button and straight forward operation
- Clear 16 LED readout
- Audible and visible alarm
- Discrete pre-alarm
- Auto power-off
- Attractive designer enclosure
- Suitable for beginners
- Dimensions 76.5(L) x 75(W) x 32(D)mm
- **Velleman MK128**

Requires 3x AAA 1.5V DC batteries (not included).

**Please note:** This is a self-assembly kit and requires soldering.

Technical specification

Timer settings	1-10 minutes in one minute steps 10-30 minutes in five minute steps 30-60 minutes in 15 minute steps
Basic accuracy	Better than 5%
Power supply	3xAAA 1.5V batteries (not included)
Power consumption	10mA typical

Type	Order code	1+
Kitchen timer kit	<b>70-4036</b>	11.21

073847



## USB PC Scope and 2-channel Generator

The feature-packed Velleman USB PC Scope and 2-Channel Generator is a complete USB-powered lab in a box. The software offers a 2-channel oscilloscope, spectrum analyser, transient recorder, function generator and bode plotter. With the generator, you can create your own waveforms using the integrated signal wave editor. For automated measurements, it is possible to generate wave sequences, using file or computer input.

- Manufacturer's part **PCSGU250**

Type	Order code	1+
USB PC Scope	<b>70-4468</b>	137.89

518154







### USB PC Scope and Signal Generator

The pocket-sized Velleman USB PC Oscilloscope and Signal Generator contains a whole world of measuring tools in one small box. It includes a powerful 2-channel oscilloscope and a handy bode plot function. There is no need for a power supply as the unit is powered over USB.



- Includes function generator, oscilloscope, transient recorder, bode plotter, spectrum analyser, manual, USB PC scope+generator unit and USB cable
- Dimensions: 100 x 100 x 35mm
- Minimum system requirements - IBM compatible PC, Windows™ XP, Vista, 7 \* , SVGA display card (min.1024 x 768), mouse, USB port 1.1 or 2.0
- Manufacturer's part **PCSU 200**

Type	Order code	1+
PC Scope + Generator	<b>70-4470</b>	112.09

518155



### Educational PC Oscilloscope Kit

Oscilloscopes needn't be expensive and complicated!

Build your own oscilloscope and use your PC to display your measurements. This small and easy to build kit has all the features of a full blown oscilloscope and comes complete with detailed instructions and test leads.



- Self-assembly kit
- Dimensions 94 x 94mm
- Velleman type **EDU09**

Type	Order code	1+
PC based scope	<b>57-4590</b>	29.95

545233



### USB Controlled DMX Interface Kit

The Velleman USB-Controlled DMX Interface Kit enables you to control DMX lighting fixtures using a PC and USB interface. Test software and DMX Light Player software is included, and a Dynamic Link Library (DLL) is provided to write your own software. The device includes a stand-alone test function that outputs all 512 channels at a time, with adjustable levels.



- Kit includes enclosure and USB cable
- Connected and powered through USB
- 512 DMX channels with 256 levels each
- 3 pin XLR-DMX output connector
- Windows 98SE or higher compatible
- 9V battery (not supplied) needed for stand alone test mode
- Solid state - fuse protection on DMX output
- Dimensions 106 x 101 x 45mm
- Power supply 5V DC via USB
- Manufacturer's part **K8062**

**Please note:** This is a self-assembly kit and requires soldering.

Type	Order code	1+
USB DMX Interface	<b>70-4318</b>	40.50

518103



### Multifunction Relay Switch

This kit has a total of 14 different functions including timers, switching, flashing, interval and random switching.



- Two pre-programmed delays
- Learning mode for delays of 2 seconds up to 12 days
- Pushbutton control
- EEPROM for delay time storage in case of power failure
- On-board transient filter for the relay contacts
- Suitable for control of incandescent lighting, halogen lighting, fluorescent lighting, fans, valves, buzzers
- Maximum load 2.5A (550W/220V; 275W/110V)
- Suitable for intermediate with knowledge with previous electronics knowledge and good soldering techniques
- Dimensions 87(L) x 39(W) x 26(D)mm
- Velleman **K8015**

Requires a 12V DC battery or 9 to 12V AC power supply (not included).

**Please note:** This is a self-assembly kit and requires soldering.

Type	Order code	1+
Multi-function relay	<b>70-4066</b>	13.64

073865



### USB Experiment Interface Board

The Velleman USB Experiment Interface board has 5 digital input channels and 8 digital output channels, plus two analogue inputs and two analogue outputs with 8 bit resolution. The number of inputs/outputs can be further expanded by connecting up to 4 more cards to the PC's USB connectors. All communication routines are contained in a Dynamic Link Library (DLL). You may write custom Windows (XP, Vista, Windows7) applications in Delphi, Visual Basic, C++ Builder or any other 32-bit Windows application development tool that supports calls to a DLL. Available either as a kit for you to make yourself or as a pre-assembled module.



- Source code examples for Visual Basic, Visual C++, Visual C#, Excel, Delphi and Borland C++ builder available
- 5 digital inputs (on board test buttons provided)
- 2 analogue inputs with attenuation and amplification option
- 8 digital open collector output switches
- 2 analogue outputs
- Up to 4 cards can be connected to PC
- General conversion time: 2ms per command
- Uses Microsoft human interface device (HID) driver, no external driver required.
- Power supply through USB: approx. 70mA
- Dimensions 145 x 89 x 20mm
- Manufacturer's part **K8055N**

Type	Order code	1+
Kit	<b>70-4314</b>	23.90
Pre-assembled module	<b>70-4476</b>	39.10

518101



### Solderless Experimental Electronics Starter Kit

Take your first steps into the world of electronics with the Velleman EDU01 Solderless Experimental Starter Kit. If you ever needed proof that electronics can be fun, this is it, as the EDU01 allows you to build your own circuits in a fun, safe and educational way.



The kit contains a breadboard and all the components needed to get started, so you can finish assembling your first circuit in just a few minutes.

- Projects include: LED with push button
- Transistor as current amplifier
- Astable multivibrator
- Simple burglar alarm with LED indication and sound
- Light detector
- Polarity tester
- Start-Stop circuit
- Timer circuit
- Light switch
- Water alarm
- No soldering required
- High-quality breadboard with 456 contact terminals
- Extended manual
- Dimensions: 80mm x 60mm

Requires 9V battery (not included)

Type	Order code	1+
Solderless Experiment	<b>70-4204</b>	10.12

518049



### Oscilloscope Tutor Board

The Velleman EDU06 Oscilloscope Tutor Board will show you how to get the most out of your digital oscilloscope. The board generates a number of signals, which you can use to become familiar with AC, DC and frequency measurements, sine and square waves, power supply ripple, full and half wave rectifiers and oscillators. The kit will also help you learn the meaning of terms such as V/div, Time/div, trigger level and auto-setup. Most of the experiments involved can be done using any digital storage scope. Some experiments can be performed with an analogue scope.



- Assembled and tested
- No soldering required
- Dimensions: 116 x 74 x 24mm
- Power supply 9-12V AC/100mA min

Type	Order code	1+
Tutor board	<b>70-4210</b>	17.73

518052



### USB Interface Card

The Velleman USB Experiment Interface Board has 5 digital input channels and 8 digital output channels, plus two analogue inputs and two analogue outputs with 8 bit resolution. The number of inputs/outputs can be further expanded by connecting up to 4 more cards to the PC's USB connectors. All communication routines are contained in a Dynamic Link Library (DLL). You may write custom Windows (XP, Vista, Windows7) applications in Delphi, Visual Basic, C++ Builder or any other 32-bit Windows application development tool that supports calls to a DLL. Also available as a kit for you to make yourself.



- Source code examples for Visual Basic, Visual C++, Visual C#, Excel, Delphi and Borland C++ builder available
- 5 digital inputs (on board test buttons provided)
- 2 analogue inputs with attenuation and amplification option
- 8 digital open collector output switches
- 2 analogue outputs
- Up to 4 cards can be connected to PC
- General conversion time: 2ms per command
- Uses Microsoft human interface device (HID) driver, no external driver required.
- Power supply through USB: approx. 70mA
- Dimensions 145 x 89 x 20mm
- Manufacturer's part **VM110N**

Type	Order code	1+
Interface card	<b>70-4476</b>	39.10

518158

## MitchElectronics®

Electronics for Hobbyists and Education

## 555 Astable Kit

A kit of parts to make an astable circuit using a 555 timer IC.

The circuit is known as an 'astable' circuit because it is not stable in any state (either on or off). This makes it ideal for applications like flashing a warning light by continually switching it on and off.

The 555 timer is arguably the most famous integrated circuit ever invented. Created by Hans Camenzind in 1971 for Signetics (now NXP), the 555 timer is still widely used and in production. These devices are so common that over 1 billion are made each year.

- Frequency range: approx. 0.5Hz to 100Hz
- Component count: 10
- Includes high quality printed circuit board (PCB)
- Downloadable Electronics Construction Manual includes sections on how to solder and how to identify and mount all types of components on to the printed circuit board
- Downloadable instructions include information specific to this kit including circuit diagrams, schematic diagrams and explanations, 'how it works' circuit descriptions as well as component identification and constructional notes
- Requires 1x PP3, 9V battery, not included

Supplied as a kit of parts for assembly. Soldering is required.

Type	Order code	1+
555 astable kit	70-0051	3.34

568027



## MitchElectronics®

Electronics for Hobbyists and Education

## AC-DC 5V Regulator Kit

Many circuits require a voltage supply that is constant and unchanging, e.g. radios, calculators, computers, monitors, phones and even cars.

Batteries are a good source of constant voltage but since they are usually limited by size, weight and power capacity, the mains electricity supply is often used. But the mains electricity supply is constantly changing as it is AC (alternating current), which is not suitable for DC (direct current) circuits.

Therefore, an AC-DC converter is required to convert the alternating current into direct current! This kit will not only do this, but will also regulate the DC output so that it is a smooth, constant 5V which can be used to power many projects and circuits.

- Component count: 15
- Includes high quality printed circuit board (PCB)
- Downloadable Electronics Construction Manual includes sections on how to solder and how to identify and mount all types of components on to the printed circuit board
- Downloadable instructions include information specific to this kit including circuit diagrams, schematic diagrams and explanations, 'how it works' circuit descriptions as well as component identification and constructional notes
- Requires an AC input from a suitable mains transformer with a maximum output voltage of 16V AC, not included
- Do not connect directly to the mains supply

Supplied as a kit of parts for assembly. Soldering is required.

Type	Order code	1+
5V regulator kit	70-0053	3.34

568029



## MitchElectronics®

Electronics for Hobbyists and Education

## 555 Monostable Kit

A kit of parts to make a monostable circuit using a 555 timer IC.

The circuit is known as a 'monostable' circuit because it is only stable in one state, the Off state. While the 555 is in the On state it will only be a matter of time (depending on the resistance of the potentiometer and the size of C1), before the system is reset back into the off state. This makes it ideal for controlling applications like security lights that switch off after a certain length of time.

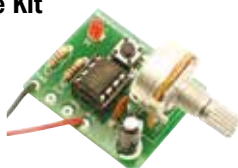
The 555 timer is arguably the most famous integrated circuit ever invented. Created by Hans Camenzind in 1971 for Signetics (now NXP), the 555 timer is still widely used and in production. These devices are so common that over 1 billion are made each year.

- Component count: 12
- Includes high quality printed circuit board (PCB)
- Downloadable Electronics Construction Manual includes sections on how to solder and how to identify and mount all types of components on to the printed circuit board
- Downloadable instructions include information specific to this kit including circuit diagrams, schematic diagrams and explanations, 'how it works' circuit descriptions as well as component identification and constructional notes
- Requires 1x PP3, 9V battery, not included

Supplied as a kit of parts for assembly. Soldering is required.

Type	Order code	1+
555 monostable kit	70-0052	3.34

568028



## MitchElectronics®

Electronics for Hobbyists and Education

## Transistor Flasher Kit

A kit of parts to make a circuit that continuously flashes 2 LEDs alternately.

In electronics it is often required to have a circuit that creates a continuous series of pulses (like the second hand on a clock which ticks every second). Examples of where this is useful include: digital clocks (to track time) and computers - the CPU needs to be triggered by pulses. Most digital systems usually require a central 'clock' that synchronises all the various parts.

A circuit which produces a pulse every so often is called an oscillator. Once powered, an oscillator's output will turn on and then turn off. Once this cycle has been completed it repeats itself indefinitely as long as there is power.

But how is an oscillator made? How do you get some components to keep on pulsing? With this kit you will be creating an circuit that uses two transistors and a few other components to create an oscillator that generates a few pulses every second so that it flashes LEDs (that is why it is called a flasher).

- Component count: 12
- Includes high quality printed circuit board (PCB)
- Downloadable Electronics Construction Manual includes sections on how to solder and how to identify and mount all types of components on to the printed circuit board
- Downloadable instructions include information specific to this kit including circuit diagrams, schematic diagrams and explanations, 'how it works' circuit descriptions as well as component identification and constructional notes
- Requires 1x PP3, 9V battery, not included

Supplied as a kit of parts for assembly. Soldering is required.

Type	Order code	1+
Flasher kit	70-0054	2.50

568030



## MitchElectronics®

Electronics for Hobbyists and Education

## Simple Function Generator Kit

A kit of parts for you to build into a simple function generator.

In just about every electronic circuit there will be a signal that changes with time, and in many circuits this signal may be continuous. For example, the electricity from the mains supply has a sinusoidal shape (like an ocean wave). Another example would be the clock for a computer which has a square shape.

Imagine a scenario where a digital circuit has been created and requires a clock from an external source. One could be built especially for the task, however the clock source would most likely have a fixed frequency. Even if one was designed to have a variable frequency (which takes time), the device would only output a square wave.

This is where the humble function generator steps in! Not only does the SFG (Simple Function Generator), have both a square and triangle output but the frequency is also adjustable. The square and triangle wave are generated by the same source and thus are always in the same phase which means that the two waveforms follow each other constantly (useful if both waves are being used).

But how does this circuit work? What active devices are used to create the oscillations and how is the frequency adjusted? Let's find out .....

- Component count: 18
- Includes high quality printed circuit board (PCB)
- Downloadable Electronics Construction Manual includes sections on how to solder and how to identify and mount all types of components on to the printed circuit board
- Downloadable instructions include information specific to this kit including circuit diagrams, schematic diagrams and explanations, 'how it works' circuit descriptions as well as component identification and constructional notes
- Requires a 5V power supply, not included

Supplied as a kit of parts for assembly. Soldering is required.

Type	Order code	1+
Simple generator kit	70-0056	3.76

568031



## MitchElectronics®

Electronics for Hobbyists and Education

## PWM Generator Kit

A kit of parts to build a Pulse Width Modulation (PWM) generator.

PWM signals are those that have variable duty-cycles and are found in many thousands of circuits. Just a few examples of how PWM signals can be used include Digital-To-Analogue conversion, high efficiency power controllers, servo control, timing and much more.

This kit will allow you to build a simple PWM generator that runs on voltages between 3 and 28V and has two potentiometers for adjusting both the frequency of the PWM wave and the duty-cycle between 0% and 100%.

- Component count: 18
- Includes high quality printed circuit board (PCB)
- Downloadable Electronics Construction Manual includes sections on how to solder and how to identify and mount all types of components on to the printed circuit board
- Downloadable instructions include information specific to this kit including circuit diagrams, schematic diagrams and explanations, 'how it works' circuit descriptions as well as component identification and constructional notes
- Requires a 3 to 28V power supply, not included

Supplied as a kit of parts for assembly. Soldering is required.

Type	Order code	1+
PWM generator kit	70-0058	4.18

568032



Can't find what you need?

Get in touch  
education@rapidonline.com



**MitchElectronics®**

Electronics for Hobbyists and Education

**Logic Probe Kit**

A kit of parts to build a test probe that will indicate the logic levels in your circuits.

Circuits are often tested with multi-meters and oscilloscopes, but this is not always the best method. For example, not everyone has access to an oscilloscope and multi-meters are no good for fast-changing signals. Another reason is ease of use: testing a circuit with an oscilloscope can be tricky as you need to probe the contact and then turn away to look at the display. All it takes is for the probe to slip slightly and then the oscilloscope will be showing the signal trace for a completely different connection.

This is where the logic probe saves the day! Instead of having numbers to show voltages, or a display to show signals over time, the logic probe has just three LEDs for outputs. These outputs can show On, Off, Floating, and Oscillating! So long as the probe has a common ground to the circuit under test (which can be done easily by either using the same power supply or connecting the probe's GND-REF to the circuit's ground), the probe will display one of the four listed conditions above when connected to a point in the circuit. But how does this probe work? Get this kit and find out!

- Component count: 17
- Includes high quality printed circuit board (PCB)
- Downloadable Electronics Construction Manual includes sections on how to solder and how to identify and mount all types of components on to the printed circuit board
- Downloadable instructions include information specific to this kit including circuit diagrams, schematic diagrams and explanations, 'how it works' circuit descriptions as well as component identification and constructional notes
- No battery required - uses the same power supply as the circuit being tested

Supplied as a kit of parts for assembly. Soldering is required.

Type	Order code	1+
Logic probe kit	70-0059	4.18

**MitchElectronics®**

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**Discrete Op-Amp Kit**

A kit of parts to make an Operational Amplifier (op-amp) using individual (discrete) components.

Operational Amplifiers are key components used in electronics and are found in many (if not most) circuits today! Op-amps can be used for amplifying voltages, comparing voltages, producing waveforms and even for converting analogue signals into digital numbers.

But how does an op-amp work? What components make up an op-amp? With this kit you will build your own simple op-amp and learn about its inner workings, as well as its many possible basic configurations including unity buffer, amplifier and comparator!

- Component count: 23
- Includes high quality printed circuit board (PCB)
- Downloadable Electronics Construction Manual includes sections on how to solder and how to identify and mount all types of components on to the printed circuit board
- Downloadable instructions include information specific to this kit including circuit diagrams, schematic diagrams and explanations, 'how it works' circuit descriptions as well as component identification and constructional notes
- Requires 1x PP3, 9V battery, not included

Supplied as a kit of parts for assembly. Soldering is required.

Type	Order code	1+
Discrete op-amp kit	70-0103	3.34

**MitchElectronics®**

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**Simple Power Supply Kit**

A kit of parts for you to build a simple multi-output power supply.

While PP3 and AA batteries can be used to power some kits directly, not every kit can handle these unregulated voltages. For example, any kit with an active buzzer requires a 5V source and some other kits (such as the M602 Door Bell) can only handle up to 4V! Providing these voltages can be cumbersome and any project that requires more than a single 5V source may prove challenging.

This is where the Simple Power Supply comes in! This kit is directly powered from a 9V battery and provides many different outputs including: 9V Out, -9V (approx), 5V Out, and 3.3V Out. The kit generates the 3.3V output with the use of the AMS1117 which is a Surface Mount Device (SMD). However, this is arguably one of the easiest SMD parts to solder and can provide great soldering practice for surface mount devices!

- Component count: 42
- Includes high quality printed circuit board (PCB)
- Downloadable Electronics Construction Manual includes sections on how to solder and how to identify and mount all types of components on to the printed circuit board
- Downloadable instructions include information specific to this kit including circuit diagrams, schematic diagrams and explanations, 'how it works' circuit descriptions as well as component identification and constructional notes
- Requires 1x PP3, 9V battery, not included

Supplied as a kit of parts for assembly. Soldering is required.

Type	Order code	1+
Simple PSU kit	70-0104	4.74

**MitchElectronics®**

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**M602 Door Bell Kit**

A kit of parts for you to build a 'ding-dong' door bell.

While creating circuits from discrete parts and carefully planning out glue logic can be fun for some makers, it can be a pain for others. This kit allows you to create a fully working door bell based around the M602 which perfectly demonstrates how some scenarios can justify a specialised IC.

- Component count: 18
- Includes high quality printed circuit board (PCB)
- Downloadable Electronics Construction Manual includes sections on how to solder and how to identify and mount all types of components on to the printed circuit board
- Downloadable instructions include information specific to this kit including circuit diagrams, schematic diagrams and explanations, 'how it works' circuit descriptions as well as component identification and constructional notes
- This circuit requires a power supply between 3 and 4V to operate correctly, so 2x AA batteries, not included, could be used. Alternatively, the Simple Power Supply kit, not included, could be used as it has a 3.3V output

Supplied as a kit of parts for assembly. Soldering is required.

Type	Order code	1+
Door bell kit	70-0106	4.18

**MitchElectronics®**

Electronics for Hobbyists and Education

**4017 Audible Beacon Kit**

A kit of parts for you to build an audible locator beacon.

The 4017 is a 5-stage Johnson counter that has 10 outputs which turn on one after another. The IC is a commonly used 4000 series part and can be used in many scenarios including finite state machines, simple counters, and even time division.

With this kit you can build a 4017-based beacon that can be used for locating fallen radio-controlled drones or planes, or just for soldering practice!

- Component count: 25
- Includes high quality printed circuit board (PCB)
- Downloadable Electronics Construction Manual includes sections on how to solder and how to identify and mount all types of components on to the printed circuit board
- Downloadable instructions include information specific to this kit including circuit diagrams, schematic diagrams and explanations, 'how it works' circuit descriptions as well as component identification and constructional notes
- Requires a 5V power supply, not included

Supplied as a kit of parts for assembly. Soldering is required.

Type	Order code	1+
Audible beacon kit	70-0107	4.18

**MitchElectronics®**

Electronics for Hobbyists and Education

**4017 Light Chaser Kit**

A kit of parts for you to build into a 10-LED light-chaser.

The 4017 is a 5-stage Johnson counter that has 10 outputs which turn on one after another. This IC is a commonly used 4000 series part and can be used in many scenarios including finite state machines, simple counters and even time division.

With this kit you will build a 4017 based variable light chaser that is great for creating futuristic sci-fi looking displays and lighting effects.

- Component count: 24
- Includes high quality printed circuit board (PCB)
- Downloadable Electronics Construction Manual includes sections on how to solder and how to identify and mount all types of components on to the printed circuit board
- Downloadable instructions include information specific to this kit including circuit diagrams, schematic diagrams and explanations, 'how it works' circuit descriptions as well as component identification and constructional notes
- Requires 1x PP3, 9V battery, not included

Supplied as a kit of parts for assembly. Soldering is required.

Type	Order code	1+
4017 light chaser kit	70-0108	4.18

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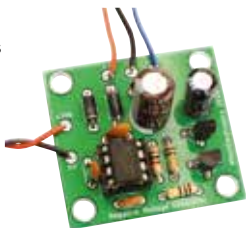
## MitchElectronics®

Electronics for Hobbyists and Education

## Negative Voltage Generator Kit

A kit of parts for you to build a negative voltage generator. Many projects require a negative voltage source such as those heavily based around op-amps and generating a negative voltage can be difficult.

With this kit you will learn how to build a simple negative voltage generator that can be useful in scenarios where a negative voltage is needed from a single rail supply such as a battery or solar panel! This kit is also great for solder practice and teaches how capacitive coupling can be exploited in electronic circuits.



- Component count: 21
- Includes high quality printed circuit board (PCB)
- Downloadable Electronics Construction Manual includes sections on how to solder and how to identify and mount all types of components on to the printed circuit board
- Downloadable instructions include information specific to this kit including circuit diagrams, schematic diagrams and explanations, 'how it works' circuit descriptions as well as component identification and constructional notes
- Requires 1x PP3, 9V battery, not included

Supplied as a kit of parts for assembly. Soldering is required.

Type	Order code	1+
-ve generator kit	70-0109	3.34

568039

## MitchElectronics®

Electronics for Hobbyists and Education

## 5V Source Kit

A kit of parts for you to make a regulated 5V power source.

Many circuits require a 5V supply that is smoothed and reliable. The reason for this is that some components are not able to handle other voltages, for example, the buzzer found in many MitchElectronics kits. The buzzers are rated for 5V operation only. If a different voltage is used, the buzzer may either fail to work properly, or be permanently damaged! Creating a 5V source can be done with the use of a 7805 regulator, but bread-boarding a 5V source can be cumbersome, as breadboards are often large in size and inconvenient.

The 5V source kit, however, is compact and convenient, and produces a stable and regulated 5V source from a standard 9V, PP3 battery.

- Component count: 11
- Includes high quality printed circuit board (PCB)
- Downloadable Electronics Construction Manual includes sections on how to solder and how to identify and mount all types of components on to the printed circuit board
- Downloadable instructions include information specific to this kit including circuit diagrams, schematic diagrams and explanations, 'how it works' circuit descriptions as well as component identification and constructional notes
- Requires 1x PP3, 9V battery, not included

Supplied as a kit of parts for assembly. Soldering is required.

Type	Order code	1+
5V source kit	70-0114	3.34

568040

## MitchElectronics®

Electronics for Hobbyists and Education

## Sound Activated Alarm Kit

A kit of parts for you to make a sound-activated intruder alarm.

When it comes to valuables we all know that security is critical. Whether it be a pesky co-worker pinching your cookies, or a more devious pet finding their way into the pantry, this



sound-activated alarm kit can inform you when someone or something is trying to rob you if they make any noise.

The sound-activated alarm is made up of four different stages; input stage from the microphone, a comparator stage, a latch stage and an oscillator stage that produces an audible warning.

- Component count: 29
- Includes high quality printed circuit board (PCB)
- Downloadable Electronics Construction Manual includes sections on how to solder and how to identify and mount all types of components on to the printed circuit board
- Downloadable instructions include information specific to this kit including circuit diagrams, schematic diagrams and explanations, 'how it works' circuit descriptions as well as component identification and constructional notes
- Requires a 5V power source, not included

Supplied as a kit of parts for assembly. Soldering is required.

Type	Order code	1+
Sound alarm kit	70-0116	4.18

568041

## MitchElectronics®

Electronics for Hobbyists and Education

## Electronic Dice Kit

A kit of parts for you to make an electronic dice.

If you find yourself inside on a rainy day without dice to play

your favourite board games, then look no further because the MitchElectronics Electronic Dice kit is just for you!

The circuit consists of 3 main sub-circuits: a 555 monostable circuit, a 555 astable circuit and a 4017 counter circuit. The finished kit simulates an electronic dice with a simple cool-down system so you can watch the numbers roll.

Press and hold the switch to start the dice rolling, then let go when you're feeling lucky for that number which gets you past those expensive hotels or past that snake!

- Component count: 40
- Includes high quality printed circuit board (PCB)
- Downloadable Electronics Construction Manual includes sections on how to solder and how to identify and mount all types of components on to the printed circuit board
- Downloadable instructions include information specific to this kit including circuit diagrams, schematic diagrams and explanations, 'how it works' circuit descriptions as well as component identification and constructional notes
- Requires 1x PP3, 9V battery, not included

Supplied as a kit of parts for assembly. Soldering is required.

Type	Order code	1+
Electronic dice kit	70-0118	4.18

568043

## MitchElectronics®

Electronics for Hobbyists and Education

## Reaction Game Kit

Want to test your reaction speed? Build this reaction tester kit that uses glue logic to display the result on a dual 7 segment display!

While it would be very easy to design a single-chip solution with the use of a microcontroller, this kit demonstrates how glue logic can be used to create complex systems with discrete parts - and no processors!

- Component count: 61
- Includes high quality printed circuit board (PCB)
- Downloadable Electronics Construction Manual includes sections on how to solder and how to identify and mount all types of components on to the printed circuit board
- Downloadable instructions include information specific to this kit including circuit diagrams, schematic diagrams and explanations, 'how it works' circuit descriptions as well as component identification and constructional notes
- Requires 1x PP3, 9V battery, not included

Supplied as a kit of parts for assembly. Soldering is required.

Type	Order code	1+
Reaction tester	70-0119	7.53

568044

## Clock Movements

## TruMotion

## Quartz Crystal Movement and Numerals

These quartz crystal controlled clock movements and numerals are ideal for replacing defective units or for creating your own personalised clock projects.

They allow you to make any number of different clocks from CDs, papier mache, even paper plates, the only limits are your imagination. Use paper crafting techniques to design and build clocks that will suit any room and express your creativity.

- Quartz crystal controlled clock movements ideal for replacing defective units or for creative clock projects
- Black self-adhesive Arabic Numerals, 20mm high

Type	Order code	1+	5+	25+	100+
Clock movement	85-1430	1.91	1.56	1.43	1.31
Numeral set - black	85-1421	1.26	1.12	1.02	0.942

074959

## Rapid

## Wooden Clock Face Blanks

Have fun with these handy wooden clock face blanks.

- Great for painting and decorating with your own design
- Suitable for use with TruMotion clock movement **85-1430** and numerals **85-1421** (see above)
- Choose from square or round shape
- Size: 170 x 170mm (square), 170mm diameter (round)
- Made from 6mm thick MDF
- 8mm central hole
- Supplied in **packs of 10**

Type	Order code	1+
Square clock blanks	06-0782	6.81
Round clock blanks	06-0783	5.06

070598

## Rapid

## Clock Group Kit



This kit enables pupils to create and design their own working clocks.

- Kit contains 10x wooden clock blanks, 10x clock mechanisms, 10x numeral sets and 100 sheets of A4 white card
- Clock blanks 170 x 170mm
- Suitable for all ages
- **Supplied as a pack**

Type	Order code	1+
Clock group kit	13-0152	25.00

070756



**Component Kits**



**Electricity Class Pack**

A cost-saving classpack containing a selection of commonly used electrical accessories.



- Cost saving over buying parts separately
- Popular parts can be topped up
- Packed in a Grattells storage tray with lid
- Please see individual product descriptions for full details
- Supplied as a **pack**

Kit contains:

Order code	Qty	Description	Order code	Qty	Description
41-0125	10	3.5V bulbs	75-0180	5	Toggle switch
18-0125	5	2x AA battery holders	76-0100	5	Slide switch
41-0070	5	Bulb holders	78-0115	5	Push on/off switch
37-0140	5	Motors	78-0112	5	Push to make switch
18-0105	5	Battery snaps	35-3610	5	Buzzer
17-0350	1	Crocodile leads (Pk of 10)	14-0430	1	Grattells tray
01-0102	5	Wire	14-0436	1	Lid for tray

Type	Order code	1+
Electricity classpack	70-1012	40.51



**Education Wire Starter Pack**

A substantial kit containing a wide array of wire related consumables.



- Ideal for the classroom
- Contains wire cutters and strippers, wire, batteries and battery clips
- Offers a massive saving over separately purchased items
- Moulded box included
- Dimensions of the box: 43cm x 31cm x 7cm
- Great resource for all ages
- Supplied as a **pack**

Kit contains:

5x Wire stripper	86-0350	50x PP3 battery clip	18-0105
5x Economy side cutter	85-0205	1x Shallow tray	14-0430
10x Equipment wire (pack)	01-0108	1x Tray lid	14-0436
15x PP3 zinc chloride battery	18-1448		

Type	Order code	1+
Wire starter pack	13-0112	40.54



**Education Components Spares Kit**

A comprehensive range of essential electronic consumables offering a huge saving over individually purchased items.



- The kit is ideal for the classroom and contains LEDs, resistors, capacitors, etc.
- All the pieces are neatly packed into a well laid out stackable storage box with lid
- Dimensions of the box: 43cm x 31cm x 7cm

- Great school resource
- Total number of components = 1945
- Supplied as a **pack**

Kit contains:

Quantity/Description	Order code
1x 5mm red LED (pack 100)	55-1796
1x 5mm green LED (pack 100)	55-1792
1x 5mm yellow LED (pack 100)	55-1794
1x Carbon film resistor kit (pack 1000)	13-0260
1x Electrolytic capacitor kit (pack 93)	13-0220
1x Polyester capacitor kit (pack 100)	13-0215
30x Stripboard 25 x 64mm	34-0500
2x Single sided pins (pack 100)	34-0610
2x Equipment wire (pack 11)	01-0108
100x BC548B Transistor	81-0466
50x LM741 Op-amp	82-0458
50x NE555 Timer	82-0336
1x Shallow Tray	14-0430
1x Tray lid	14-0436
1x Insert (3 long compartments)	14-0438

Type	Order code	1+
Education spares kit	13-0108	65.24



**Education LED Pack**

A considerable range of LEDs and LED related products are neatly packaged in this classroom kit.



- All the pieces come in re-sealable polythene bags
- Offers a significant saving over separately bought items
- Storage box with compartment tray and lid
- Dimensions of the box: 43cm x 31cm x 7cm
- Suitable for all ages
- Total number of components = 680
- Supplied as a **pack**

Kit contains:

Quantity/Description	Order code
1x 5mm red LED (pack 100)	55-1790
1x 5mm green LED (pack 100)	55-1792
1x 5mm yellow LED (pack 100)	55-1794
25x Flashing 5mm red LED	55-0140
25x Flashing 5mm green LED	55-0142
25x Flashing 5mm yellow LED	55-0144
1x 3mm red LED (pack 100)	55-1770
1x 3mm green LED (pack 100)	55-1772
1x 3mm yellow LED (pack 100)	55-1774
1x LED tester	55-0000
1x Miniature LDR	58-0134
1x Shallow tray	14-0430
1x Tray lid	14-0436
1x Insert 8 compartment	14-0443

Type	Order code	1+
Education LED pack	13-0122	46.64



**Radial Electrolytic Capacitor Kit 93-Piece**



This 93-piece capacitor kit contains a range of micro-miniature radial leaded electrolytic capacitors. The capacitors have a high capacitance per unit volume and are ideal for applications where high density packaging and low profile capacitors are required.

- Each value individually packed
- A total of 12 different values

- 7mm height
- Tolerance  $\pm 20\%$
- Temperature Range  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$

Kit contains:

Number	Value	Voltage
15x	100uF	16V
5x	220uF	16V
5x	470uF	16V
3x	1000uF	16V
2x	2220uF	16V
15x	10uF	25V
5x	22uF	25V
10x	47uF	25V
3x	1000uF	25V
10x	1uF	63V
10x	2.2uF	63V
10x	4.7uF	63V

Type	Order code	1+	5+
Electrolytic capacitor kit	13-0220	8.20	7.11

**Wire & Cable**



**1/0.6mm Single Core Equipment Wire on 100m Reels**



This wire has a solid core and is ideal for plate wiring (running wires across a chassis with all wires straight or at right angles to one another). This wire remains in formed shape without cable ties.

- 1/0.6mm copper conductor
- Overall diameter 1.2mm
- Rating 1kV rms 1.8A at 70°C
- weight of reel approx 400g
- Supplied on reels of 100m

Type	Order code	1+	10+
Black	01-0300	7.98	7.01
Blue	01-0305	7.98	7.01
Brown	01-0310	7.98	7.01
Green	01-0315	7.98	7.01
Grey	01-0320	7.98	7.01
Orange	01-0325	7.98	7.01
Pink	01-0330	7.98	7.01
Red	01-0335	7.98	7.01
Violet	01-0340	7.98	7.01
White	01-0345	7.98	7.01
Yellow	01-0350	7.98	7.01
1 Each of above (11 reels)	01-0380	78.47	70.33



# UNISTRAND cable

## Tinned Copper Wire

A reel of tinned copper wire.

- Supplied on reels of 500g



### Technical specification

Please Note: These figures are the carrying currents. The fusing currents will be higher.

Size	SWG	Carrying current	Order code
2.0mm	14	100A	05-0295
1.6mm	16	65A	05-0300
1.25mm	18	45A	05-0305
0.90mm	20	32A	05-0310
0.71mm	22	24A	05-0315
0.56mm	24	18A	05-0320
0.45mm	26	13A	05-0325
0.375mm	28	10A	05-0330
0.315mm	30	9A	05-0335
0.28mm	32	7.5A	05-0340
0.25mm	34	6.6A	05-0350
0.15mm	38	3A	05-0360

SWG	Length (m)	Order code	1+	10+
14	17	05-0295	15.96	
16	27	05-0300	17.63	14.01
18	48	05-0305	17.63	14.01
20	66	05-0310	17.63	14.01
22	140	05-0315	17.63	14.01
24	230	05-0320	16.99	
26	340	05-0325	16.99	
28	490	05-0330	16.99	
30	780	05-0335	16.99	
32	914	05-0340	17.28	

### MOQ 10+

SWG	Length (m)	Order code	10+
34	1285	05-0350	8.10

### Price each

SWG	Length (m)	Order code	1+
38	3182	05-0360	19.04

# UNISTRAND cable

## Copper/Nickel Alloy Wire

A range of copper/nickel alloy wire (also known as Constantan)

- Suitable for winding resistance coils
- Wire not insulated
- Supplied in lengths of 228m approx.
- Supplied on reels of 125g



Type	Order code	1+	10+
16SWG	05-0400	19.13	15.18
20SWG	05-0405	18.44	
28SWG	05-0407	15.72	
30SWG	05-0410	15.12	
32SWG	05-0415	18.44	
34SWG	05-0420	18.44	
36SWG	05-0425	15.12	

# UNISTRAND cable

## Enamelled Copper Wire

A wide range of enamelled copper wire for winding transformers and coils, etc.

- Supplied on reels of 500g



Warning: This product contains modified polyurethane.

### Technical specification

Gauge	Approx. length	Diameter	Ohms/m	Order Code
36SWG	1850m	0.200mm	0.544Ω	05-0200
35SWG	1450m	0.212mm	0.484Ω	05-0205
34SWG	1250m	0.236mm	0.391Ω	05-0207
33SWG	1120m	0.250mm	0.348Ω	05-0210
30SWG	720m	0.315mm	0.219Ω	05-0215
27SWG	450m	0.400mm	0.136Ω	05-0220
25SWG	290m	0.500mm	0.087Ω	05-0225
24SWG	230m	0.560mm	0.069Ω	05-0230
22SWG	140m	0.710mm	0.043Ω	05-0235
20SWG	100m	0.900mm	0.0268Ω	05-0240
18SWG	45m	1.250mm	0.0139Ω	05-0245
16SWG	28m	1.600mm	0.0085Ω	05-0250

Type	Approx. length (m)	Order code	1+	10+
35/36	1850	05-0200	16.66	13.25
34/35	1450	05-0205	16.05	
34	1250	05-0207	16.05	
33	1120	05-0210	16.05	
30	720	05-0215	16.66	13.25
27	450	05-0220	16.66	13.25
25	290	05-0225	16.05	
24	230	05-0230	16.66	13.25
22	140	05-0235	16.05	
20	100	05-0240	16.05	
18	45	05-0245	15.39	
16	28	05-0250	15.39	

# UNISTRAND cable

## Nichrome Wire

This nichrome wire is ideal for use in applications requiring a heating element and can be used for ignition in applications such as fireworks and pyrotechnics.

- Suitable for producing heating elements
- Weight of reels 125g
- Please see technical specification for reel lengths



### Technical specification

Type	Reel length	Order code
125g Reel 14SWG Nichrome Wire	4.5m	05-0490
125g Reel 16SWG Nichrome Wire	7.0m	05-0495
125g Reel 18SWG Nichrome Wire	11.5m	05-0500
125g Reel 20SWG Nichrome Wire	22.0m	05-0505
125g Reel 22SWG Nichrome Wire	35.0m	05-0510
125g Reel 24SWG Nichrome Wire	57.0m	05-0515
125g Reel 26SWG Nichrome Wire	88.0m	05-0520
125g Reel 28SWG Nichrome Wire	127.0m	05-0525
125g Reel 30SWG Nichrome Wire	180.0m	05-0530
125g Reel 32SWG Nichrome Wire	228.0m	05-0535

SWG	dia. (mm)	Order code	1+
14	2.01	05-0490	20.75
16	1.62	05-0495	20.75
18	1.22	05-0500	20.03
20	0.91	05-0505	20.03
22	0.71	05-0510	20.03
24	0.56	05-0515	20.03
26	0.46	05-0520	20.03
28	0.38	05-0525	20.03
30	0.32	05-0530	20.03
32	0.27	05-0535	20.03

# UNISTRAND cable

## 3-Core Silicone Cable - Reels of 50m

3-core Mains cable with a silicone rubber insulation.

- Silicone rubber sheathed to compound E12
- Intended for applications where the cable can be in contact with high temperatures such as soldering irons etc.
- Available in 0.5mm<sup>2</sup> and 1.0mm<sup>2</sup> sizes
- Conforms to BS6141 and BS6500
- Supplied in white
- Supplied on reels of 50m



Type	Order code	1+
0.5mm <sup>2</sup> Silicone	01-3005	69.80
1.0mm <sup>2</sup> Silicone	01-3007	80.67

# UNISTRAND cable

## 3-core Mains Equipment Cable

Mains electric cable with round profile.

- Flexible PVC sheath
- Suitable for connection of electrical equipment and most light electrical applications
- BS6500, VDE BSI approved
- Supplied on reels of 100m



### Technical specification

300V/500V H05W-F3 13A	CSA	Strands	Current	Overall Dia	Colour	Reel size	Order code
1.25mm <sup>2</sup>	3x 40/0.2mm	13.0A max	7.8mm	Black	100m	01-0282	
1.25mm <sup>2</sup>	3x 40/0.2mm	13.0A max	7.8mm	White	100m	01-0284	

Type	Colour	Order code	1+	5+
100m 13A	Black	01-0282	121.37	113.18
100m 13A	White	01-0284	86.05	80.09



## 3583 Coloured Ribbon Cable

This range of top quality multi-coloured ribbon cable from Alpha Wire is available with a variety of ways.



Rapid can offer access to the complete Alpha Wire catalogue - so even if we do not stock the product or line you need, we can order and despatch it for you. All lines are available on short lead times.

Find out more by visiting [www.rapidonline.com/alphawire](http://www.rapidonline.com/alphawire).

- Ideal for conserving space.
- Suitable for computer chassis to connect a PC board to CD-ROMs and hard drives etc.
- Supplied on reels of 30.5m

### Technical specification

Operating Temperature	-20°C to 105°C
Voltage Rating	300V
Color	Brown, red, orange, yellow, green, blue, violet, grey, white, black, repeats beyond 10 conductors
Description	Stranded tinned copper on 1.27mm centres
Conductor	Thermally bonded PVC with clear PVC covering
Insulation	45.9pF/m at 1MHz
Capacitance	4.6 ns/m (0.18 ns) rise time pulse at 1MHz
Propagation Delay	10 <sup>9</sup> Ω, Nom
Impedance	Near end 3.2%
Crosstalk	Far end 11.5%
(3.05m @ 1ns)	PC board to PC board interconnects where space is a premium, where a high degree of flexibility is required.
Applications	Ground-signal
Transmission Characteristics	UL AWM Style 2651
Approvals	

Alpha part No	No. of conductors	Nominal Width (mm)	Nominal span (mm)
3583/9	9	11.43	10.16
3583/10	10	12.7	11.43
3583/14	14	17.78	16.51
3583/15	15	19.05	17.78
3583/16	16	20.32	19.05
3583/20	20	25.4	24.13
3583/40	40	50.8	49.53
3583/50	50	63.5	62.23

Type	Order code	1+	5+	10+
9-way	01-1460	64.27	60.25	
10-way	01-1461	70.81	66.96	
14-way	01-5455	72.00		
15-way	01-1463	98.30	91.83	86.68
16-way	01-1464	104.90	98.73	93.44
20-way	01-1465	131.15	123.52	
40-way	01-1471	207.69		
50-way	01-1472	202.95		

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cable

## Cable Management

### UNI STRAND cable

#### Canister Packed Cable Ties

Assorted cable ties in a variety of colours and sizes conveniently packed in a plastic canister.

- Manufactured from Nylon 6.6
- Flame retardant to **UL94V2**
- Four different packs available



#### Technical specification

Order Code	Type	Length	Qty	Colour
<b>04-0430</b>	Canister 1	100mm	1000	100x various mixed colours
<b>04-0432</b>	Canister 2	100mm	200	100x natural, 25x red, 25x yellow, 25x blue, 25x black
<b>04-0434</b>	Canister 3	140mm	200	100x natural, 100x black
		180mm	100	50x natural, 50x black
<b>04-0436</b>	Canister 4	180mm	200	100x natural, 25x red, 25x blue, 25x yellow, 25x green
		200mm	100	50x natural, 25x red, 25x blue
		100mm	300	100x red 100x blue, 100x green
		200mm	100	100x natural

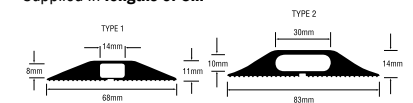
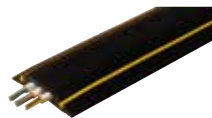
Type	Order code	1+
Canister 1 1000	<b>04-0430</b>	9.21
Canister 2 500	<b>04-0432</b>	8.96
Canister 3 300	<b>04-0434</b>	4.52
Canister 4 300	<b>04-0436</b>	5.39



### High Visibility Cable Protectors

A range of high visibility cable protectors manufactured from a special compound.

- Elastomer rubber is flexible, rugged and hard wearing
- Eye catching warning stripe along each side of the profile
- Enhances safety at work by preventing accidents caused by loose cables
- Ideal solution for trailing cables
- Low lying profile geometry with a unique 'snap open' feature for fast and simple installation
- Housing suitable for one or more cables
- Easily re-laid as required
- Produced from a flame retardant compound to **BS476 Part 7 Class 3** and European equivalent **DIN 4102 Part 1 and Class B1**
- Tested for non-conductivity to BS903-C5 500V, and UV stabilised for extended life
- Available in **68 and 83mm widths**
- Supplied in **lengths of 3m**



#### Technical specification

Type	HAZ/1	HAZ/2
Colour	Black	Black
Stripe colour	Yellow	Yellow
Width	68mm	83mm
Height	15mm	16mm
Cable channel width	14mm	30mm
Cable channel height	8mm	8mm
Order code	<b>04-0800</b>	<b>04-0802</b>

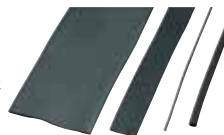
Type	Order code	1+	3+
HAZ/2 Black/yellow 3m	<b>04-0802</b>	41.43	38.32

### UNI STRAND cable

#### 2:1 Heat Shrinkable Sleeving 25m Reels

Available in a wide range of sizes.

- Excellent flame retardant properties
- Excellent flexibility and insulation
- Thermally stabilised flame retardant polyolefin
- 2:1 shrink ratio
- Temperature range -55°C to +125°C
- Shrinking temperature starts at +70°C and totally shrunk at 115°C
- Available in black (for other colours see order code **03-0351**)
- Sizes quoted before shrinking
- Supplied on **reels of 25m**
- **UL224 approved**



#### Technical specification

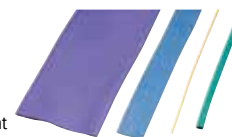
Order code	Nominal pre-shrunk dia.	Order code	Nominal pre-shrunk dia.
<b>03-0340</b>	1.6mm Black	<b>03-0346</b>	12.7mm Black
<b>03-0341</b>	2.4mm Black	<b>03-0347</b>	19.1mm Black
<b>03-0342</b>	3.2mm Black	<b>03-0348</b>	25.4mm Black
<b>03-0343</b>	4.8mm Black	<b>03-0349</b>	40mm Black
<b>03-0344</b>	6.3mm Black	<b>03-0350</b>	50.8mm Black
<b>03-0345</b>	9.5mm Black		

Type	Order code	1+	5+	10+
1.6mm Black	<b>03-0340</b>	6.80	5.90	5.25
2.4mm Black	<b>03-0341</b>	6.67	5.50	4.90
3.2mm Black	<b>03-0342</b>	9.35	8.14	7.22
4.8mm Black	<b>03-0343</b>	9.96	8.63	7.66
6.3mm Black	<b>03-0344</b>	11.62	10.10	8.95
9.5mm Black	<b>03-0345</b>	14.45	12.52	11.04
12.7mm Black	<b>03-0346</b>	16.31	14.10	12.52
19.1mm Black	<b>03-0347</b>	23.93	20.77	18.45
25.4mm Black	<b>03-0348</b>	28.90	25.08	22.30
40mm Black	<b>03-0349</b>	55.10	50.11	48.29
50.8mm Black	<b>03-0350</b>	53.08	48.27	46.46

### UNI STRAND cable

#### 2:1 Heat Shrinkable Sleeving on 25m Reels

Flame retardant heat shrinkable sleeving with 2:1 shrink ratio. Available in a wide range of colours and sizes.



- Excellent flame retardant properties
- Excellent flexibility and insulation
- Thermally stabilised flame retardant polyolefin
- 2:1 shrink ratio
- Temperature range -55°C to +125°C
- Shrinking temperature starts at +70°C and totally shrunk at 115°C
- Available in red, yellow, green, clear, blue, grey, purple and white
- Supplied on **reels of 25m**

Type	Order code	1+	5+	10+
<b>Red</b>				
1.6mm Red	<b>03-0351</b>	8.32	7.22	
2.4mm Red	<b>03-0352</b>	8.51	7.38	6.57
3.2mm Red	<b>03-0353</b>	9.20	7.98	
6.3mm Red	<b>03-0355</b>	11.41	9.91	
9.5mm Red	<b>03-0356</b>	1.73		
12.7mm Red	<b>03-0357</b>	16.03	13.85	
19.1mm Red	<b>03-0358</b>	23.49	20.40	
<b>Yellow</b>				
2.4mm Yellow	<b>03-0363</b>	8.51	7.38	
3.2mm Yellow	<b>03-0364</b>	9.20	7.98	
4.8mm Yellow	<b>03-0365</b>	9.76	8.48	
6.3mm Yellow	<b>03-0366</b>	11.41	9.91	
9.5mm Yellow	<b>03-0367</b>	11.63	10.09	
12.7mm Yellow	<b>03-0368</b>	13.14	11.36	

Type	Order code	1+	5+	10+
<b>Green</b>				
4.8mm Green	<b>03-0376</b>	8.00	6.95	
<b>Clear</b>				
1.6mm Clear	<b>03-0384</b>	6.67	5.78	
3.2mm Clear	<b>03-0386</b>	9.20	7.98	
4.8mm Clear	<b>03-0387</b>	9.76	8.48	
6.3mm Clear	<b>03-0388</b>	11.41	9.91	
9.5mm Clear	<b>03-0389</b>	14.18	12.30	10.95
12.7mm Clear	<b>03-0390</b>	16.03	13.85	
19.1mm Clear	<b>03-0391</b>	23.49	20.40	
25.4mm Clear	<b>03-0392</b>	28.36	24.64	
38.1mm Clear	<b>03-0393</b>	76.30	65.38	
50.8mm Clear	<b>03-0394</b>	73.36	62.89	

Type	Order code	1+	5+	10+
<b>Blue</b>				
3.2mm Blue	<b>03-0397</b>	9.20	7.98	
4.8mm Blue	<b>03-0398</b>	9.76	8.48	
6.3mm Blue	<b>03-0399</b>	9.36	8.13	
19.1mm Blue	<b>03-0452</b>	23.49	20.40	
25.4mm Blue	<b>03-0453</b>	28.36	24.64	
12.7mm Grey	<b>03-0462</b>	16.03	13.85	

Type	Order code	1+	5+	10+
<b>Purple</b>				
4.8mm Purple	<b>03-0470</b>	1.50		
<b>White</b>				
2.4mm White	<b>03-0479</b>	8.51	7.38	
3.2mm White	<b>03-0480</b>	9.20	7.98	
4.8mm White	<b>03-0481</b>	9.76	8.48	
6.3mm White	<b>03-0482</b>	11.41	9.91	
9.5mm White	<b>03-0483</b>	14.18	12.30	

Type	Order code	1+
25.4mm White	<b>03-0486</b>	10.19

### UNI STRAND cable

#### Black Weather Resistant Cable Ties

These black cable ties are ideally suited for any outdoor application.

- Weather-resistant ties have Carbonate A
- Offers UV resistance
- Fastens wires, cables and hose
- One-piece construction for consistent performance and reliability
- High strength and low thread force
- For outdoor use
- Supplied in **packs of 100**
- 100mm cable ties also available in **packs of 1000**, order code **04-0725**



#### Technical specification

Normal service temperature range:	-40°C to +85°C
Flammability rating	UL 94V-2
Heat stabilised nylon	Service temperature 135°C
Specification	Made to comply with mil-spec drawing no. MS-3367 Tensile strength meets or exceeds the MIL-S-23190E standard

Order code	Dimensions (L x W)
<b>04-0636</b>	100 x 2.5mm
<b>04-0637</b>	150 x 3.6mm
<b>04-0638</b>	200 x 4.6mm
<b>04-0639</b>	292 x 3.6mm
<b>04-0640</b>	368 x 4.8mm
<b>04-0725</b>	100 x 2.5mm

Length	Pack size	Order code	1+	10+	50+
100mm	100	<b>04-0636</b>	0.669	0.577	0.502
150mm	100	<b>04-0637</b>	1.77	1.56	1.41
200mm	100	<b>04-0638</b>	2.75	2.19	1.90
292mm	100	<b>04-0639</b>	4.17	3.77	3.66
368mm	100	<b>04-0640</b>	5.51	5.09	4.56
100mm	1000	<b>04-0725</b>	5.29	4.75	4.31

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# Shrinktek

## Heat Shrink Sleeving

A highly flexible, polyolefin tubing supplied on small boxed reels for convenient storage and ease of use.



- Shrink ratio 2:1
- Operating temperature +105°C
- Shrink temperature +100°C
- Resistant to fuel and oils
- Suitable for a wide range of uses including military and professional electronics, and industrial electronics manufacturing
- Applications include insulation, marking, strain relieving, building of wire bundles, colour coding and identification and mechanical protection
- Dielectric strength 20kV/mm
- Flame retardant to **UL224**
- Sizes quoted before shrinking
- Available in black, clear, red, yellow, blue, white, green and brown

Please note: The un-shrunk size may vary, but it does not affect the shrunk size.

Technical specification

Bore size (mm)	Shrunk (mm)	Bore size (mm)	Shrunk (mm)
1.2	0.6	6.4	3.2
1.6	0.8	9.5	4.75
2.4	1.2	12.7	6.35
3.2	1.6	19	9.5
4.8	2.4	25.4	12.7

Type	Size	Order code	1+	5+
1.2mm Black	12m reel	03-0240	7.62	6.73
1.6mm Black	12m reel	03-0250	7.62	6.73
2.4mm Black	11m reel	03-0260	7.62	6.73
3.2mm Black	11m reel	03-0270	7.62	6.73
4.8mm Black	10m reel	03-0280	7.26	6.42
6.4mm Black	9m reel	03-0290	7.62	6.73
9.5mm Black	8m reel	03-0301	7.26	6.42
12.7mm Black	7m reel	03-0241	7.62	
19.0mm Black	5m reel	03-0251	7.62	6.73
25.4mm Black	3.5m reel	03-0261	7.26	6.42
1.2mm Clear	12m reel	03-0271	5.95	
1.6mm Clear	12m reel	03-0281	3.41	
2.4mm Clear	11m reel	03-0291	7.26	
3.2mm Clear	11m reel	03-0302	5.95	
6.4mm Clear	9m reel	03-0252	7.62	6.73
9.5mm Clear	8m reel	03-0262	4.65	
12.7mm Clear	7m reel	03-0272	4.65	
19.0mm Clear	5m reel	03-0282	7.62	
25.4mm Clear	3.5m reel	03-0292	5.95	
1.2mm Red	12m reel	03-0303	7.26	
1.6mm Red	12m reel	03-0243	7.62	
2.4mm Red	11m reel	03-0253	7.26	6.42
3.2mm Red	11m reel	03-0263	7.62	
4.8mm Red	10m reel	03-0273	7.26	
6.4mm Red	9m reel	03-0283	6.91	6.11
9.5mm Red	5m reel	03-0244	6.91	
2.4mm Yellow	11m reel	03-0284	7.26	
3.2mm Yellow	11m reel	03-0294	4.65	
4.8mm Yellow	10m reel	03-0306	5.26	4.65
6.4mm Yellow	9m reel	03-0245	5.26	4.65
9.5mm Yellow	8m reel	03-0255	5.02	4.65
12.7mm Yellow	7m reel	03-0265	5.27	4.65
1.2mm Blue	12m reel	03-0295	5.26	4.65
2.4mm Blue	11m reel	03-0246	4.65	4.30
3.2mm Blue	11m reel	03-0256	5.67	
4.8mm Blue	10m reel	03-0266	5.26	4.65
9.5mm Blue	8m reel	03-0286	5.26	4.65
12.7mm Blue	7m reel	03-0296	6.91	
25.5mm Blue	3.5m reel	03-0247	5.26	4.65
1.2mm White	12m reel	03-0257	5.26	4.65
4.8mm White	10m reel	03-0297	4.65	
12.7mm White	7m reel	03-0258	5.26	4.65
19.0mm White	5m reel	03-0268	6.91	
1.2mm Green	12m reel	03-0288	5.03	4.66
1.6mm Green	12m reel	03-0298	4.65	
2.4mm Green	11m reel	03-0311	5.25	4.65
3.2mm Green	11m reel	03-0249	6.64	5.86

9.5mm Green	8m reel	03-0279	5.02	4.65
12.7mm Green	7m reel	03-0289	5.26	4.65
25.4mm Green	3.5m reel	03-0312	5.67	
3.2mm Brown	11m reel	03-0317	7.26	
6.4mm Brown	9m reel	03-0319	7.26	6.41
9.5mm Brown	7m reel	03-0321	6.91	6.11
12.7mm Brown	6m reel	03-0322	6.12	5.73

## UNISTRAND cable

### 3:1 Heat Shrink Sleeving, 25m Reels

This heat shrink sleeving has excellent flame retardant properties, flexibility and insulation.



- Thermally stabilised flame retardant polyolefin material
- 3:1 shrink ratio
- Temperature range -55°C to +125°C
- Shrinking temperature starts at +70°C and totally shrunk at +115°C
- Sizes quoted before shrinking
- Supplied on reels of 25m
- **UL224** approved

Type	Order code	1+	5+
1.5mm Black	03-0489	8.86	8.17
3mm Black	03-0490	13.28	12.22
6mm Black	03-0491	22.09	20.09
9mm Black	03-0492	42.06	38.24
12mm Black	03-0493	48.18	43.71
18mm Black	03-0494	58.61	53.28
24mm Black	03-0495	69.18	62.90
6mm Red	03-0702	22.60	20.56

# Shrinktek

## 3:1 Heat Shrinkable Sleeving

A range of general purpose, black, flexible polyolefin heat shrink tubing.



- Shrink ratio of 3:1 when heated above +125°C
- Operating temperature -75°C to +135°C
- Suitable for a wide range of uses including military and professional electronics, and industrial electronics manufacturing
- Applications include insulation, marking, strain relieving, building of wire bundles, colour coding, identification and mechanical protection
- Dielectric strength 25kV/mm
- All sizes quoted before shrinking
- Supplied in lengths of **1.2m**

Technical specification

Order code	Mfrs Part No.	Bore size	Shrunk dia.
03-1100	SP3X 1.5 BLK	1.5mm	0.5mm
03-1105	SP3X 3 BLK	3.0mm	1.0mm
03-1110	SP3X 6 BLK	6.0mm	2.0mm
03-1115	SP3X 9 BLK	9.0mm	3.0mm
03-1120	SP3X 12 BLK	12.0mm	4.0mm
03-1125	SP3X 18 BLK	18.0mm	6.0mm
03-1130	SP3X 24 BLK	24.0mm	8.0mm

Bore size	Shrunk dia.	Order code	1+	25+	100+
1.5mm	0.5mm	03-1100	0.989	0.809	
3.0mm	1.0mm	03-1105	0.967	0.83	1.18
6.0mm	2.0mm	03-1110	1.68	1.38	1.18
9.0mm	3.0mm	03-1115	1.89	1.62	
12.0mm	4.0mm	03-1120	2.23	1.81	1.51
18.0mm	6.0mm	03-1125	3.38	2.61	
24.0mm	8.0mm	03-1130	4.43	3.38	

**Rapid**  
... where price meets quality

# Extension Cables

**brennenstuhl®**

## Energy Cube

A double sided, height adjustable, hanging extension reel.

- 6x 240V socket outlets (3 each side)
- Galvanised steel hanging chain (3m)
- Housing made from break resistant plastic
- Rated 13A
- Supplied with cable length of 5m



Type	Order code	1+
Energy cube	23-0220	31.50



## Low Temperature 10m Extension Reel

A 10m mains cassette cable reel fitted with four UK mains sockets and a UK plug fused at 13A.

- Super flexible cable
- Thermal cut out and reset button
- Tough fused 13A plug to **BS1363/A**
- 10A maximum load
- 240V AC
- Four outlet sockets
- Suitable for use down to -20°C
- Smooth winding action
- Easy grip recess and handle for effortless winding
- Complies to all relevant British Standards
- Guaranteed for 25 years against materials and workmanship
- Manufactured to **BSEN61242**
- **CE** approved



Technical specification

Fully wound	720W
Fully un-wound	2400W

Type	Order code	1+
Extension reel	23-0233	18.18

**brennenstuhl®**

## 13A Mains Extension Reels

A range of compact, handy extension cable reels ideal for home, office and DIY.

- 5 or 15m cable lengths
- Three 13A, 240V sockets with self-closing covers
- Maximum overall current rating 13A
- Safety cut-out
- Colour: blue
- Housing made of break-resistant plastic
- Practical carrying handle
- Twin feet for excellent stability
- Easy to unwind and rewind
- Compact, handy cable reel for home, office and DIY
- **Brennenstuhl Vario Line series**



Cable length	Order code	1+
5m	23-0215	13.57
15m	23-0217	22.66

brennenstuhl®

**Automatic Cable Reel, 9+2m/ 16+2m**

This range of **Brennenstuhl Wall and Ceiling Mountable Cable Reels**, are ideal for **Garage and Workshop use**. They feature an easy to use automatic cable rewind function. This makes sure that the durable rubber-neoprene cable is safely stored inside the plastic outer casing, reducing the risk of damage to the cable and preventing the cable becoming a potential trip hazard.

The automatic cable reel is suitable for use in dry interior rooms.

- Automatic cable reel
- Convenient automatic rewind
- Ideal for fitting on walls and ceilings
- Slewable up to 180°
- Robust plastic housing
- Safety cut-out
- Childproof socket
- Cable quality: Rubber-Neoprene
- Body colour: **Yellow**
- Cable colour: **Black**
- Available in **240** and **110V power options**
- Available with cable length of **16+2m** and **9+2m**

Type	Order code	1+
Cable reel 16+2m 110V	<b>23-1343</b>	80.78
Cable reel 16+2m 240V	<b>23-1344</b>	67.91
Cable reel 9+2m 240V	<b>23-1345</b>	46.05

539862

SEALEY

**CRM10 Retractable Cable Reel System 10m, 2x 230V Sockets**

Hard wearing, composite cased, retracting electric cable reel operated by simple pull and release action. Features integral manual thermal trip switch to prevent overload. Double socket outlet with individual LED power indicators and rocker on/off switches.

This socket is wall-mountable.

- Hard wearing, composite cased, retracting electric cable reel operated by simple pull and release action.
- Features integral manual thermal trip switch to prevent overload.
- Double socket outlet with individual LED power indicators and rocker on/off switches.
- Model No. CRM10

Technical specification

Model No:	CRM10
Voltage:	230V
Cable Length:	10mtr
Cable Section:	3 x 1.5mm <sup>2</sup> s
Thermal Trip:	Yes
Capacity Wound:	1000W
Capacity Unwound:	2750W

Type	Order code	1+
Cable reel system	<b>89-1635</b>	60.56

302047

brennenstuhl®

**4-Way Extension Sockets with Neon Indicator, White 2m/5m**

These **White 4-Way Extension Sockets with Neon Indicator 2m/5m 05VV-F3G1.25 GB** from **Brennenstuhl** feature a neon indicator and have been manufactured with highly impact-resistant special plastic in

an attractive design, making it ideal for the home, DIY and office. Equipped with an extra long 5m cable and mounting facilities for wall installation.

- Stylish white design
- Neon indicator
- 27cm housing length
- 2m or 5m cable lengths

Cable length	Order code	1+
2m	<b>23-0644</b>	5.10
5m	<b>23-0645</b>	6.28

533039

brennenstuhl®

**Premium Line Technics Extension Sockets**

These black/grey extension sockets from Brennenstuhl are manufactured from break-resistant plastic, making them ideal for the home, office and school.

Equipped with an illuminated 2-pole switch with protection cover, widely spaced sockets and mounting facilities for wall installation.

- Stylish black/grey design
- Child-proof sockets
- Excess cable can also be wound around housing
- 3m cable length
- 13A nominal current

Sockets	Cable length	Order code	1+
12	3m	<b>23-0661</b>	22.92

533047

mercury®

**2-Way Trailing Extension Lead**

A high quality extension lead.

- 240V AC 13A
- Fitted with 3m of cable
- All sockets are shuttered with the main body of the socket sealed for extra safety
- **BS1363/A** and **CE** approved

Type	Order code	1+	5+
3m Extension lead	<b>23-0509</b>	7.22	6.61

072001

**USB Connectors**

CABLE POWER

**Micro USB to USB Cables**

These USB 2.0 cables from Cable Power are ideal for connecting a range of devices which have a Micro USB connection. They are available in a choice of black or beige colour in 1.8m lengths and in black in 3m lengths.

- Ideal as a charger for a mobile phone with Micro USB charging dock
- USB A to Micros USB cable
- USB 2.0 specification



Cable length	Colour	Order code	1+
1.8m	Black	<b>19-9314</b>	2.27
1.8m	Beige	<b>19-9316</b>	3.47
3m	Black	<b>19-9315</b>	4.62

530506

TruConnect®

**USB2 Cable Assemblies**

A range of USB 2.0 leads and cables for connecting peripheral devices such as printers to PCs.

- Data transfer rate of 480Mb/s
- Backwards compatible with USB 1.1 devices
- Cables with LEDs can be used to check connections
- On-the-go (OTG) cables can connect two devices without needing to go via a PC
- Available in different lengths and with male or female connectors



Type	Length	Colour	Order code	1+	10+	50+
<b>A male to B male</b>						
AM to BM	2m	Beige	<b>19-8660</b>	3.71	3.31	2.43
AM to BM	3m	Beige	<b>19-8662</b>	3.93	3.37	1.64
AM to BM	3m	Black	<b>19-8663</b>	1.63	1.38	1.27
AM to BM	5m	Grey	<b>19-8664</b>	5.50	4.72	3.08
AM to BM	5m	Black	<b>19-8665</b>	5.42	4.67	
<b>A male to A female</b>						
AM to AF	0.5m	Black	<b>45-4007</b>	0.913	0.689	0.626
AM to AF	2m	Beige	<b>45-4006</b>	2.91	2.58	1.53
AM to AF	3m	Beige	<b>45-4008</b>	3.69	3.28	
AM to AF	5m	Beige	<b>45-4010</b>	4.57	3.93	2.58
<b>A male to B male mini</b>						
AM to Mini BM	2m	Black	<b>45-4021</b>	3.78	3.57	2.15
AM to Mini BM	2m	Beige	<b>45-4012</b>	3.47	3.10	1.90
<b>A male to A male</b>						
AM to AM	2m	Beige	<b>45-4016</b>	3.37	2.97	1.80
AM to AM	2m	Black	<b>45-4017</b>	2.06	1.83	1.10
AM to AM	3m	Beige	<b>45-4018</b>	5.46	4.87	
AM to AM	5m	Beige	<b>45-4020</b>	6.25	5.41	

072434

TruConnect®

**USB 2.0 Type A to Micro B Cable - 1m**

A USB 2.0 type A to micro B data cable for connecting devices such as mobile phones and digital cameras equipped with a micro USB port. Suitable for use with BBC Micro:bit

- Length 1m
- Colour: black

Type	Order code	1+
USB A to micro B, 1m	<b>45-4009</b>	1.05

563834

av:link®

**USB 2.0 Cables**

Standard USB 2.0 plug to plug leads, suitable for connection of printers, hubs, audio devices, etc., to a PC.

- Black coloured cable
- Cable diameter 4.3mm
- Cable type 4x0.15mm CCA + 32x0.10 CCA Braid, Cotton Reinforced
- Available in A to A and A to B options
- Length 1.5m

Type	Order code	1+
USB cable A-A 1.5m	<b>35-4758</b>	1.29
USB cable A-B 1.5m	<b>35-4757</b>	1.38

400281





**USB A Type Male Solder Kit**

This self assemble USB kit will enable you to customise and construct your own USB leads to the length required.

- Housing materials: PBT+30% G.F(UL 94 V-0)
- Contact materials: copper alloy
- Shell materials: steel



Technical specification

Contact current rating: 1.5A max. per pin  
 Voltage rating: 30V (DC)  
 Contact resistance: 30mΩ max.  
 Dielectric withstanding voltage: 500V AC(rms) for 1 minute  
 Insulation resistance: 100MΩ min.  
 Operating temperature: 0°C to +50°C

MQ5 - In Multiples of 5				
Type	Order code	5+	10+	100+
USB A-type solder kit	<b>24-0351</b>	0.291	0.197	0.129

**Audio Connectors**



**Miniature 3.5mm Jack Plugs**

Miniature 3.5mm insulate mono or stereo jack plugs with strong plastic barrel and integral cable protector.

- Strong plastic barrels
- Integral cable protector sleeve
- Solder termination



MQ5 - In Multiples of 5				
Type	Order code	5+	100+	500+
3.5mm mono plug	<b>20-0105</b>	0.416	0.332	0.305
3.5mm stereo plug	<b>20-0125</b>	0.416	0.332	0.305



**PCB Jack Sockets (Stereo & Mono)**

Switched PCB mounting 3.5mm jack sockets in either stereo or mono.

- Stereo and mono versions available
- Chrome plated trim
- Both circuits switched
- Also suitable for GENIE and PICAXE download circuits



MQ10 - In Multiples of 10				
Type	Order code	10+	100+	500+
3.5mm Stereo PCB socket	<b>20-0137</b>	0.196	0.127	0.119
3.5mm Mono PCB socket	<b>20-0138</b>	0.181	0.122	0.105

**Selected brands**

**3.5mm Stereo Jack Plug to 3.5mm Stereo Jack Plug Leads**



3.5mm stereo plug to plug leads with screened audio cable. Ideal for connecting MP3, laptop or personal CD players to speakers or Hi-Fi.

- Nickel plated connectors
- Quality materials
- Moulded strain relief
- Available in lengths of 1.2, 3 and 6m

Technical specification

Order code Mfrs Part No. Type  
**35-4475** 112.038UK 3.5mm stereo to 3.5mm stereo 3m  
**35-4476** 112.040UK 3.5mm stereo to 3.5mm stereo 6m

Length	Order code	1+
3m	<b>35-4475</b>	1.80
6m	<b>35-4476</b>	1.30



Common jack leads.

- Employing moulded construction



Technical specification

3.5mm stereo plug to 3.35mm stereo socket 3m **20-0030**  
 3.5mm stereo plug to 3.5mm stereo plug 1.2m **20-0040**  
 3.5mm Stereo plug to bare wires 1.5m **20-0041**

Type	Order code	1+	10+	50+	100+
3.5 Stereo plug/skt	<b>20-0030</b>	1.83	1.46	1.04	0.936
3.5 Stereo plug/plug	<b>20-0040</b>	1.46	1.20	0.982	0.816
3.5 Stereo/bare wire	<b>20-0041</b>	1.21	1.02	0.811	0.665

**Power Connectors**



**DC Power Sockets**

These DC power sockets are supplied with 2.1 or 2.5mm central pins.

- Panel mounting
- Supplied with washer and hexagonal fixing nut
- Contact rating 1A 16V DC
- Switched



Type	Order code	1+	100+	500+
2.1mm Panel power socket	<b>20-1094</b>	1.02	0.799	0.708
2.5mm Panel power socket	<b>20-1096</b>	1.02	0.799	



**DC Power Socket for Panel Cut-out 12.6mm**

High quality chassis mounting DC socket.

- Flush mounting with single hole fixing
- Supplied with hexagonal fixing nut
- Integral break switch on outer contact
- Suitable for panel thickness up to 4.5mm
- Panel cut-out 12.6mm
- Overall dimensions: bezel diameter 14mm, length 15.7mm



MQ5 - In Multiples of 5				
Type	Order code	5+	100+	500+
2.1mm Power socket	<b>20-0980</b>	0.863	0.668	0.622
2.5mm Power socket	<b>20-0985</b>	0.927	0.712	



**Moulded DC Power Extension Leads**

Extension leads for use with DC power applications.

- DC plug to DC socket
- Polarity marked figure-of-8 cable
- Pin length 10mm
- Max. current 3A
- 140Ω per Km
- 14/0.12 bare copper
- Supplied in lengths of 5m



Type	Order code	1+	10+	50+
2.1mm DC Extension	<b>20-1080</b>	3.01	2.04	1.81
2.5mm DC Extension	<b>20-1082</b>	3.01	2.04	1.81



**Chassis Mounting Single Hole Fixing DC Power Socket**

High quality chassis mounting DC sockets for 2.1 and 2.5mm power plugs.



- Flush mounting with single hole fixing
- Supplied with hexagonal fixing nut
- Integral break switch on outer contact
- Suitable for panel thickness up to 8mm
- Panel cut-out 12.6mm
- Rating: 1A 12V
- Overall dimensions: bezel diameter 14.8mm, length 18mm

Technical specification

Contact: Tin plated brass  
 Rating: 1A 12V  
 Nut: Nickel plated brass  
 Cover: PCB  
 Pin: Nickel plated brass  
 Spring: Tin plated phosphor bronze  
 Housing: PBT

MQ5 - In Multiples of 5				
Type	Order code	5+	100+	500+
2.1mm Chassis Single hole	<b>20-0988</b>	0.562	0.364	0.315
2.5mm Chassis Single Hole	<b>20-0989</b>	0.562	0.364	0.315



**13A Mains Plugs**

Tough 13A white or black mains plugs.

- Fitted with 3A or 13A fuse
- Manufactured to BS1363/A
- Suitable for industrial, commercial or educational environments



Type	Order code	1+	20+	100+
3A White	<b>23-0305</b>	2.55	2.17	2.03
3A Black	<b>23-0310</b>	1.91	1.61	1.52
13A White	<b>23-0315</b>	1.91	1.61	
13A Black	<b>23-0325</b>	2.81	2.38	2.23



**13A Transparent Clear Fast Fit Plug**

Transparent 250V 13A mains plugs.

- Fitted with 13A fuse
- Plugs can be readily safety checked without dismantling
- Suitable for industrial, commercial or education environments
- BS1363/A approved



Type	Order code	1+	20+	100+
Clear	<b>23-0342</b>	1.89	1.84	1.78



**13A Plug to Dual IEC Cordsets**

A mains power cord comprising of a moulded 13A plug, fused at 13A, terminating in two moulded IEC straight sockets.

- Ideal for PCs and monitors
- BS1363/A, VDE and KEMA approved
- Supplied in lengths of 2m



Type	Order code	1+	25+	100+
Dual IEC lead	<b>23-6455</b>	3.66	3.24	3.06

## IC Sockets

## DIL IC Sockets



A range of high quality, dual-in-line narrow sockets with black thermoplastic bodies and tin-plated copper alloy contacts. The sockets may be mounted end to end to achieve longer continuous runs. Sockets have chamfered side walls to assist insertion. One end is indented for easy identification of the polarisation.

**Please note: All these products are supplied in tubes. For the actual number in a tube see the technical specification and price panel**

- Ideal for production and replacement use
- PCB hole required: 0.6mm
- Overall height above PCB: 4.8mm
- **UL94V-0** approved
- Available in 7.62mm (0.3in) pitch with **6, 8, 14, 16, 20, 24 and 28-pin options**
- Available in 15.24mm (0.6in) **28, 32 and 40-pin options**
- For tube sizes please see technical specification and price panel

Technical specification	
Material	Thermoplastic alloy
Contacts	Copper
Storage temperature	-20°C to +70°C
Operating temperature	0°C to +85°C
Contact resistance	20mΩ
Insulation resistance	1000MΩ
Dielectric withstanding	500V AC one minute

Description	Dimensions	Order code
Without central support	7362(L) x 5.08(W) x 10.16(H)	<b>22-0106</b>
Without central support	10.16(L) x 7.62(W) x 10.16(H)	<b>22-0107</b>
Without central support	17.78(L) x 15.24(W) x 10.16(H)	<b>22-0108</b>
Without central support	20.32(L) x 17.78(W) x 10.16(H)	<b>22-0109</b>
Without central support	22.86(L) x 20.32(W) x 10.16(H)	<b>22-0110</b>
Without central support	25.40(L) x 22.86(W) x 10.16(H)	<b>22-0111</b>
With central support	25.40(L) x 22.86(W) x 10.16(H)	<b>22-0112</b>
Without central support	30.48(L) x 27.94(W) x 17.78(H)	<b>22-0113</b>
With central support	35.56(L) x 33.02(W) x 10.16(H)	<b>22-0114</b>
Without central support	35.56(L) x 32.02(W) x 17.78(H)	<b>22-0115</b>
Without central support	40.64(L) x 38.10(W) x 17.78(H)	<b>22-0116</b>
Without central support	50.80(L) x 48.26(W) x 17.78(H)	<b>22-0117</b>

Tube qty	Pins	Pitch	Order code	1+	10+	25+	100+
80	6 narrow	7.62mm	<b>22-0106</b>	2.51	1.37	1.27	
60	8 narrow	7.62mm	<b>22-0107</b>	2.07	1.23	1.09	0.984
34	14 narrow	7.62mm	<b>22-0108</b>	1.79	1.03	0.898	0.821
30	16 narrow	7.62mm	<b>22-0109</b>	1.96	1.16	1.03	0.898
26	18 narrow	7.62mm	<b>22-0110</b>	1.85	1.10	0.965	0.854
24	20 narrow	7.62mm	<b>22-0111</b>	1.98	1.19	1.04	0.964
20	24 narrow	7.62mm	<b>22-0112</b>	1.96	1.12	0.992	
20	24	15.24mm	<b>22-0113</b>	1.94	1.16	1.03	0.909
17	28 narrow	7.62mm	<b>22-0114</b>	1.97	1.18	1.04	0.93
17	28	15.24mm	<b>22-0115</b>	1.97	1.18	1.04	0.93
15	32	15.24mm	<b>22-0116</b>	1.91	1.09	0.962	
12	40	15.24mm	<b>22-0117</b>	1.94	1.12	0.951	0.887

## DIL (Dual In Line) Turned Pin Sockets



A range of good quality DIL sockets with closed pins that accept round pin headers. The range includes both 7.62mm (0.3in) and 15.24mm (0.6in) pitch options. The pins been machine turned and the main body has been manufactured from Polybutylene terephthalate (PBT) with glass fibre.

- Closed pin design
- Contacts: Copper alloy
- Moulded in PBT with glass-filled flame retardant polyester

- Please see technical specification for more details
- Approved to **UL 94 V-0**

Technical specification	
<b>Electrical characteristics</b>	
Contact resistance:	20 milliohms max.
Dielectric withstanding voltage:	500V AC(rms) for 1 minute.
Insulation resistance:	1000 megaohms min.
<b>Environment characteristics</b>	
Operating temperature:	0°C - +85°C
Storage temperature:	-20°C - +70°C
Order code	
8-pin 0.3in turned pin socket (tube 60)	<b>22-1757</b>
14-pin 0.3in turned pin socket (tube 34)	<b>22-1758</b>
16-pin 0.3in turned pin socket (tube 30)	<b>22-1759</b>
18-pin 0.3in turned pin socket (tube 26)	<b>22-1760</b>
20-pin 0.3in turned pin socket (tube 24)	<b>22-1761</b>
24-pin 0.3in turned pin socket (tube 20)	<b>22-1762</b>
28-pin 0.3in turned pin socket (tube 17)	<b>22-1763</b>
24-pin 0.6in turned pin socket (tube 20)	<b>22-1764</b>
28-pin 0.6in turned pin socket (tube 17)	<b>22-1765</b>
32-pin 0.6in turned pin socket (tube 15)	<b>22-1766</b>
40-pin 0.6in turned pin socket (tube 12)	<b>22-1767</b>

Type	Order code	1+	10+	25+	100+
8-pin 0.3in tube of 60	<b>22-1757</b>	8.23	6.67	5.95	
14-pin 0.3in tube of 34	<b>22-1758</b>	8.23	6.67	5.95	
16-pin 0.3in tube of 30	<b>22-1759</b>	8.23	6.67	5.95	
18-pin 0.3in tube of 26	<b>22-1760</b>	8.23	6.67	5.95	
20-pin 0.3in tube of 24	<b>22-1761</b>	8.23	6.67	5.95	
24-pin 0.3in tube of 20	<b>22-1762</b>	8.23	6.67	5.95	
28-pin 0.3in tube of 17	<b>22-1763</b>	8.23	6.67	5.95	
24-pin 0.6in tube of 20	<b>22-1764</b>	8.23	6.67	5.95	
28-pin 0.6in tube of 17	<b>22-1765</b>	8.23	6.67	5.95	
32-pin 0.6in tube of 15	<b>22-1766</b>	8.23	6.67	5.95	
40-pin 0.6in tube of 12	<b>22-1767</b>	8.23	6.67	5.95	5.37

## Low Profile Turned Pin DIL Sockets

Low profile high-quality machined contact DIL sockets. Each socket is fitted with gold-plated copper alloy contacts in a thermoplastic housing.



- Moulded in black glass-filled flame retardant polyester
- Height above PCB 4.3mm

Technical specification	
Insulator material	Glass filled polyester Rated UL94V-0
Contact material	inner: 4 finger gold plated beryllium copper outer: Tin plated brass
Current rating	1A
Contact resistance	10mΩ max.
Insulation resistance	1 x 109Ω min.
Dielectric strength	1000V
Operating temperature	-55°C to +125°C

MQQ 5 - In Multiples of 5					
Type	Pitch	Order code	5+	50+	250+
8-pin	0.3in	<b>22-1720</b>	0.274	0.19	0.164
14-pin	0.3in	<b>22-1721</b>	0.656	0.48	0.384
16-pin	0.3in	<b>22-1722</b>	0.742	0.516	0.452
18-pin	0.3in	<b>22-1723</b>	0.852	0.603	0.48
20-pin	0.3in	<b>22-1724</b>	0.626	0.462	0.39
24-pin	0.3in	<b>22-1725</b>	0.742	0.544	
28-pin	0.3in	<b>22-1726</b>	0.869	0.673	0.534
24-pin	0.6in	<b>22-1727</b>	0.754	0.565	
28-pin	0.6in	<b>22-1728</b>	0.852	0.665	0.529
32-pin	0.6in	<b>22-1729</b>	0.999	0.70	0.627
40-pin	0.6in	<b>22-1730</b>	1.28	0.977	0.763

## Wirewrap Turned Pin DIL Sockets

Professional quality turned pin wirewrap sockets with 13mm tin plated brass terminations to allow three wraps per pin.



- Four finger gold plated (0.25 micron) inner contacts
- Technical specification as for low profile type **22-1720**
- Moulded in black glass-filled flame retardant polyester
- Height above PCB 4.9mm
- **Preci-dip type 123-87-3xx-41001** where xx is no of pins

Type	Pitch	Order code	5+	50+	250+
8-pin	0.3in	<b>22-1715</b>	0.655	0.556	0.493
14-pin	0.3in	<b>22-1716</b>	0.88	0.753	
16-pin	0.3in	<b>22-1717</b>	1.21	1.09	
18-pin	0.3in	<b>22-1718</b>	1.46	1.20	1.09
28-pin	0.6in	<b>22-1719</b>	2.01	1.82	

## 2.54mm Pitch Single Row Long Pin Female Headers

These TruConnect

**Long Pin Headers**

with 2.54mm pitch

have gold-plated

brass contacts for PCB

connection. They are

available with either 6, 8 or 10 pins in a single row.

The longer pins means these headers can be used

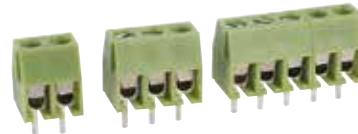
with more than one PCB at the same time.

- Pin length 10.9mm
- Terminal height 8.5mm
- Straight terminals
- Current rating 3A max.
- Contact resistance  $\leq 20\text{m}\Omega$
- Operating temperature -55 to +105°C

MQQ 5 - In Multiples of 5					
Type	Order code	5+	50+	100+	250+
6-way	<b>19-0272</b>	0.399	0.338	0.313	0.282
8-way	<b>19-0273</b>	0.592	0.506	0.459	0.434
10-way	<b>19-0274</b>	0.678	0.59	0.538	

## Terminal Blocks

## 10A 3.5mm Terminal Blocks



If you mount terminal blocks on PCBs we can rapidly help you with our fine selection of terminal blocks. Rapid is pleased to offer you these 2, 3 and 5-way 3.5mm pitch vertical moulded types that are UL94V-0 approved.

Current carrying capacity of these pluggable terminal blocks is 10A per pole. They feature a tin-plated pin header and a Phosphor bronze wire guard. The terminals are housed in moulded green flame proof polyamide PA66.

- 3.5mm pitch
- Slotted screws
- Rated voltage 130V
- Rated current 10A
- Moulded housing in green flame retardant PA66
- Screws zinc plated steel
- Pin header tin plated brass
- Wire guard Phosphor bronze

Technical specification	
Rated voltage	130V
Rated current	10A
Pitch	3.5mm
Screws	M2 slotted, zinc plated steel
Rated current at 130V	10A
Temperature rating	-40°C to +105°C
Housing	Moulded in green flame retardant PA66/UL94V-0
Wire guard	Phosphor bronze
Pin header	Tin plated brass
Strip length	5 - 6mm
Wire range	1.0mm <sup>2</sup>
UL94V-0 and CSA approved	

MQQ 5 - In Multiples of 5					
Type	Order code	5+	100+	500+	1000+
2-way terminal block	<b>21-3000</b>	0.194	0.125	0.109	0.09
3-way terminal block	<b>21-3001</b>	0.274	0.187	0.159	0.13
MQQ 5 - In Multiples of 5					
Type	Order code	5+	10+	25+	
5-way terminal block	<b>21-3098</b>	0.192	0.172	0.154	





### 16A Interlocking Terminal Blocks

These 5mm pitch PCB terminal blocks from TruConnect interlock to give any number of connections.



- Current rating 16A
- Maximum voltage 300V
- Housing PBT (30% glass filled)
- Screw M2.6, steel, zinc plated
- 1.5mm<sup>2</sup> wire size

MQQ 5 - In Multiples of 5						
Type	Length	Order code	5+	10+	50+	100+
2-way	10mm	<b>21-0461</b>	0.177	0.145	0.106	0.096
3-way	15mm	<b>21-0463</b>	0.22	0.186	0.15	0.126
4-way	20mm	<b>21-0465</b>	0.249	0.175	0.155	
6-way	15mm	<b>21-0467</b>	0.416	0.298	0.262	



### 16A Interlocking Terminal Blocks

Quality interlocking PCB terminal blocks on a standard 5mm pitch.



- 5mm pitch
- 16A rating
- Fitted with wire protectors
- Height of 10mm
- Low profile package
- Metway 650tds series

MQQ 5 - In Multiples of 5						
Type	Length	Order code	5+	10+	50+	100+
2-way	Black	<b>21-0440</b>	0.139	0.104	0.064	0.061
3-way	Black	<b>21-0442</b>	0.194	0.126	0.096	0.077
5-way	Black	<b>21-0445</b>	0.318	0.246	0.154	0.144

MQQ 5 - In Multiples of 5						
Type	Order code	5+	10+	50+	100+	
2-way	<b>21-0112</b>	0.198	0.156	0.14	0.126	
3-way	<b>21-0114</b>	0.303	0.24	0.22	0.198	
4-way	<b>21-0116</b>	0.366	0.272	0.245	0.225	
Type	Order code	5+	10+	50+		
6-way	<b>21-0118</b>	0.538	0.437	0.38		
12-way	<b>21-0120</b>	0.98	0.794	0.70		



### 16A Interlocking Terminal Blocks

High quality, low-cost PCB terminal blocks offering wide versatility in a low profile package.



- 16A rating
- Stainless steel wire protectors fitted
- Height 10mm
- 5mm pitch
- Camden CTB5200 series

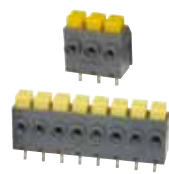
MQQ 5 - In Multiples of 5						
Type	Order code	5+	10+	50+	100+	
2-way	<b>21-0112</b>	0.198	0.156	0.14	0.126	
3-way	<b>21-0114</b>	0.303	0.24	0.22	0.198	
4-way	<b>21-0116</b>	0.366	0.272	0.245	0.225	
Type	Order code	5+	10+	50+		
6-way	<b>21-0118</b>	0.538	0.437	0.38		
12-way	<b>21-0120</b>	0.98	0.794	0.70		

MQQ 5 - In Multiples of 5						
Type	Length	Order code	5+	10+	50+	100+
2-way	10mm	<b>21-0461</b>	0.177	0.145	0.106	0.096
3-way	15mm	<b>21-0463</b>	0.22	0.186	0.15	0.126
4-way	20mm	<b>21-0465</b>	0.249	0.175	0.155	
6-way	15mm	<b>21-0467</b>	0.416	0.298	0.262	



### Metway Screwless Terminal Blocks

These screwless pushbutton terminal blocks from Metway offer customers many benefits.



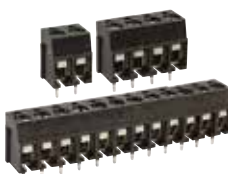
- Speed, on average, screwless connections can be made in half the time
- Cuts installation costs in half
- No need for twisting and turning screws
- Easier on the installer's hands and arms
- Never have a problem with loose connections from loose screws again
- Provide a vibration proof connection
- Spring clamp conforms to the wire with constant tension, making it maintenance-free
- 5mm pitch
- Side entry

MQQ 5 - In Multiples of 5						
Type	Order code	5+	25+	50+	100+	
2-pole	<b>21-2626</b>	0.366	0.282	0.252	0.235	
3-pole	<b>21-2627</b>	0.614	0.492	0.436	0.407	



### Interlocking Terminal Blocks 16A

16A terminal blocks which interlock to provide any number of connections.



- 5mm pitch
- Cable wire protector

MQQ 10 - In Multiples of 10						
Type	Order code	10+	100+	500+		
2-way 16A	<b>21-1810</b>	0.13	0.103	0.085		
3-way 16A	<b>21-1812</b>	0.181	0.133	0.122		
4-way 16A	<b>21-1814</b>	0.274	0.206	0.179		
6-way 16A	<b>21-1816</b>	0.379	0.278	0.246		
12-way 16A	<b>21-1818</b>	0.626	0.479	0.416		



### 3A 12-Way Terminal Blocks

Commercial quality polythene moulding terminal blocks.



- Current rating 3A
- 12-way which may be readily subdivided
- Max. temperature +60°C
- Dimensions 92.5 x 15.5 x 12mm

MQQ 5 - In Multiples of 5						
Current rating	Dimensions	Order code	5+	10+	100+	
3A	92.5x15.5x12	<b>21-0100</b>	1.32	0.952	0.792	063854



### Easy Break Terminal Strips

These easy break terminal strips from CamdenBoss make life simpler for installers to create the exact number of poles required without having to use cutting tools when connecting copper conductors.



- Easily snapped into the required number of poles
- No remaining burrs
- No tools needed to cut to length
- Save time and money
- Supplied in strips of 12-poles
- Three sizes available encompassing insert sizes of 3, 3.5 and 4.4 diameter
- Available in black Polyamide 6,6 **UL94 V2**
- Standard insert is nickel-plated brass with zinc-plated steel screws
- Screws are supplied in open position
- Continuous working temperature range is -30°C to +110°C

Rapid is an official distributor of CamdenBoss products. The products listed here are those that Rapid hold in stock - but we have access to many more, including the company's complete range of terminal blocks.

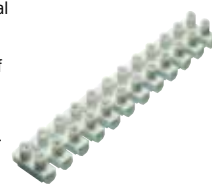
Technical specification				
Length	Width	Inset size	Mfrs. part no.	Order code
19.5mm	17.5mm	3mm	CTSOS431	<b>21-1697</b>
118.1mm	19mm	3.5mm	CTSOS433	<b>21-1698</b>
142.2mm	20.8mm	4.4mm	CTSOS434	<b>21-1699</b>

MQQ 5 - In Multiples of 5				
Type	Order code	5+	25+	
Inset size 3mm	<b>21-1697</b>	1.05	0.851	
Inset size 3.5mm	<b>21-1698</b>	1.13	0.906	
Inset size 4.4mm	<b>21-1699</b>	1.14	1.08	



### 12-Pole Kwik Snap Terminal Blocks

This range of 12-pole terminal blocks features Kwik Snap technology, enabling pole separation without the use of tools. This method of block separation means that the pole dividers are still strong enough to support screws for terminal block assembly.



The connectors are available in 24, 32, 57 and 76A ratings and are manufactured from white UL 94V-2 grade polypropylene.

- Kwik Snap technology for easy and clean break - no tools required
- Pole dividers support screws for assembly
- Formed, zinc plated steel insert
- VDE approved and rated to **T85-110**
- Complies with **IEC/EN60998-1, 60998-2-1**
- Manufactured from **UL 94V-2** grade materials

Technical specification							
Voltage (V)	Current (A)	Wiring capacity max. (mm <sup>2</sup> )	Pitch (mm)	H (mm)	W (mm)	L (mm)	Order code
450	24	4	8	12.2	93.5	17.8	<b>21-4269</b>
450	32	6	10	14	116.5	20	<b>21-4270</b>
450	57	10	12	16.3	139.3	23.4	<b>21-4271</b>
750	76	16	14.5	20.9	169.5	27.7	<b>21-4272</b>

MQQ 5 - In Multiples of 5					
Current (A)	Wire size max. (mm <sup>2</sup> )	Order code	5+	25+	100+
24	4	<b>21-4269</b>	1.48	1.00	0.731
32	6	<b>21-4270</b>	1.60	1.10	0.801
57	10	<b>21-4271</b>	2.19	1.47	1.12
76	16	<b>21-4272</b>	2.43	2.20	

## Test Leads & Probes



### 2mm Uninsulated Socket

Nickel plated 2mm chassis mounting socket.

- Mounting hole 4.2mm
- Contact surface: nickel-plated
- Rated 10A



MOQ 5 - In Multiples of 5

Type	Order code	5+	100+
2mm Socket	17-1043	0.471	0.341

067715



### 4mm Stackable Plugs

These 4mm plugs have a 4mm socket in the rear providing an in-line stacking facility.

- The lead wire is clamped in position by a screw
- Nickel plated brass insert with stainless steel plug spring
- 30A rating
- Spare screws are available



MOQ 2

Type	Order code	2+	100+	500+
Black stackable plug	17-0400	0.82	0.593	0.521
Blue stackable plug	17-0405	0.82	0.593	0.521
Green stackable plug	17-0410	0.82	0.593	0.521
Red stackable plug	17-0420	0.82	0.593	0.521
White stackable plug	17-0425	0.82	0.593	0.521
Yellow stackable plug	17-0430	0.82	0.593	0.521

Price each

Type	Order code	1+	5+	10+
Spare screws (Pack of 25)	17-0398	1.31	1.03	0.939

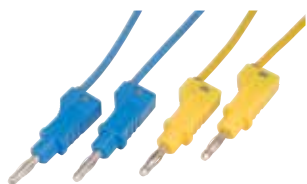
063855



### 4mm Stackable Test Leads

Professional quality 4mm stackable test leads using 0.75mm<sup>2</sup> PVC cable terminated at each end with a stackable 4mm plug.

- Available in a variety of lead lengths and colours



Technical specification

Maximum current	12A
Working voltage	30V AC/60V DC max.
Contact resistance	30mΩ
Contacts	Nickel plated brass/bronze
Cable employed	0.75mm <sup>2</sup> PVC
Temperature range	-20°C to +80°C

Length	Order code	1+	25+
<b>Red</b>			
25cm	17-2280	3.00	2.78
50cm	17-2282	3.23	3.02
100cm	17-2284	3.34	3.11
<b>Black</b>			
25cm	17-2286	2.91	2.68
50cm	17-2288	3.23	3.02
100cm	17-2290	3.34	3.11
<b>Blue</b>			
25cm	17-2291	3.00	2.78
50cm	17-2292	3.23	3.02
100cm	17-2294	3.34	3.11

Length	Order code	1+	25+	100+
<b>Green</b>				
25cm	17-2295	2.86	2.67	
100cm	17-2298	3.34	3.11	
<b>White</b>				
25cm	17-2303	2.46	2.33	
50cm	17-2304	3.23	3.02	
100cm	17-2305	3.34	3.11	
50cm	17-2300	3.10	2.93	2.68
100cm	17-2302	3.34	3.11	

016625



### 4mm Sockets

These 4mm panel mounting sockets have tin plated brass inserts designed to accept a wide range of 4mm plugs.

- Sockets have double flat to assist positive location in panel
- Supplied with panel mounting hardware
- Rated 10A 125V AC
- Solder termination
- SCI R1-22 series



MOQ 5					
Type	Order code	5+	20+	100+	500+
Black 4mm socket	17-1920	0.422	0.329	0.29	0.251
Blue 4mm socket	17-1925	0.396	0.341	0.29	0.251
Green 4mm socket	17-1930	0.356	0.27	0.237	
Red 4mm socket	17-1935	0.396	0.341	0.29	0.251
White 4mm socket	17-1940	0.396	0.341	0.29	0.251
Yellow 4mm socket	17-1945	0.356	0.27	0.237	

063893



### CL1500 Series 4mm Terminals

High quality moulded terminals in acetal.

- All metal parts bright nickel plated
- Rated at 10A
- Will accept our low-cost or standard 4mm plugs
- Height above panel 24-32mm
- 14mm diameter
- Maximum panel thickness 12.7mm
- Thread size 4BA clearance
- Cliff CL1500 series



Type	Order code	1+	25+	100+
Red 4mm terminal	17-0230	1.05	0.937	0.803
Green 4mm terminal	17-0235	1.08	0.895	0.782
Blue 4mm terminal	17-0240	1.11	0.921	0.808
Black 4mm terminal	17-0245	1.05	0.937	0.803
White 4mm terminal	17-0255	1.08	0.895	0.782
Yellow 4mm terminal	17-0260	1.08	0.895	0.782

063805



### Low Cost 4mm Plugs

Economically priced 4mm plugs.

- Can be used in conjunction with our 4mm terminals
- Solder connection
- Available in red, black and white



MOQ 5 - In Multiples of 5				
Type	Order code	5+	100+	500+
4mm Red plug	17-0130	0.431	0.378	0.355
4mm Black plug	17-0135	0.443	0.378	0.355
4mm White plug	17-0137	0.431	0.355	

063883



### 4mm Binding Posts

These shrouded 4mm binding posts are ideal for panel mounting.

They require a cut-out of 8.2mm and are terminated by means of twin nut fastening.

Ideal for audio speaker connectors and other applications where robust high power connections are required. They have a 4mm end hole suitable for a wide variety of leads and probes terminals and a strong threaded insert for added reliability and to ensure a secure fixing.

- Body: Brass
- Spring: Nickel plated
- Insulation: ABS
- Mounting hole 8.2mm
- Contact: Twin nut fastening
- Length: 44mm
- Voltage: 30V AC - 60VDC
- Maximum current rating: 19A
- Available in **black, green and red**



MOQ 5 - In Multiples of 5				
Type	Order code	5+	25+	100+
Black	17-2696	0.552	0.444	0.369
Green	17-2697	0.454	0.39	0.351
Red	17-2698	0.477	0.41	0.37

083001



### 4mm Stackable Plugs to Miniature Shrouded Crocodile Clips 50cm

A choice of red or black test leads that feature one end with a 4mm stackable banana plug and the other end with a miniature shrouded crocodile clip. Length of bale between the connectors is 50cm, making this lead suitable for a wide range of test and prototyping applications.

- Available in red or black
- 50cm PVC Lead with 0.75mm<sup>2</sup> wire
- 4mm banana plug to miniature shrouded croc clip
- Max. rating 15A 30V AC/60V DC



Type	Order code	1+	25+	100+
Red 50cm test lead	17-3279	1.23	0.845	0.733
Black 50cm test lead	17-3280	1.23	0.845	0.733

500241



### Crocodile Lead Pack

A pack of 460mm long crocodile clip leads.

Available in either a **pack of 10** leads in 5 colours, or a **pack of 20** leads in red and black.

- Terminated at each end with a vinyl covered crocodile clip
- Ideal for use as test clips



Type	Order code	1+	10+
Assorted pack 10	17-0350	3.03	2.37
Red/black pack 20	17-0345	5.50	4.59

083888

**Rapid**  
...where price meets quality





### BNC Male/4mm Terminal Adaptor

A useful adaptor comprising a BNC plug terminated to twin 4mm terminals in red and black with 4mm sockets.

- Signal is connected to red terminal
- 19mm centres



Type	Order code	1+	25+
BNC/4mm Adaptor	<b>16-0295</b>	5.61	4.39

063653



### Ready Assembled BNC Test Leads



A range of ready assembled test leads employing bright nickel plated connectors complete with moulded-on strain reliefs, using RG-58 cable.

- Black PVC shield
- 50Ω impedance
- See [www.rapidonline.com](http://www.rapidonline.com) for a range of ready assembled Network Cables employing Thin Ethernet cable

Technical specification

Type	Cable length	Order code
BNC plug to stackable 4mm plugs	1.2m	<b>16-0300</b>
BNC plug to crocodile clips	1.2m	<b>16-0315</b>
BNC plug to BNC plug	1.2m	<b>16-0330</b>
BNC plug to BNC plug	2.0m	<b>16-0340</b>

Type	Order code	1+	10+	50+
BNC 4mm Plugs	<b>16-0300</b>	8.20	6.47	5.85
BNC Croc Clips	<b>16-0315</b>	5.41	4.22	3.77
BNC-BNC 1.2m	<b>16-0330</b>	4.64	3.45	3.03
BNC-BNC 2m	<b>16-0340</b>	5.78	4.29	3.79

063654

## LEDs

### Kingbright

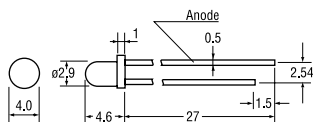
#### Super Bright LED 3mm

The Kingbright Super Bright LEDs employ the latest technology to produce LEDs that are highly visible and therefore suitable for a wide variety of applications.

Available with diffused, water clear, or transparent lenses in a variety of colours and luminous intensities, the Super Bright LEDs rugged design adds to their long life reliability. Meanwhile, these high intensity components have been manufactured using only the best materials - the color devices are made with GaN on Sapphire Light Emitting Diode.

Overall, these unique Super Bright LEDs, along with low power consumption, offer excellent value and are a clear market leader in their field - to find out more about the full range of Kingbright products please visit Rapid's Kingbright page.

- Cathode identified by short leg
- Particularly suitable for signalling applications and as an alternative to filament lamps
- Kingbright L-7104 series (Formerly L-934 series)
- Low power consumption
- Long life - solid state reliability
- 3.2mm length



Order code	Colour	Wavelength (nm)	Lum. int. (mcd) @ I <sub>f</sub> (20mA)	I <sub>f</sub> max. (mA)	V <sub>f</sub> typ. (V)	V <sub>f</sub> max. (V)	View angle	Mfrs. prt. no.
<b>Water clear lens</b>								
<b>55-9214</b>	Super bright red	640	4500	30	2.1	2.5	34°	L-7104SRC-J4
<b>55-0090</b>	Super red	640	800	30	1.85	2.5	34°	L-7104SRC-E
<b>56-0535</b>	Red	640	600	30	1.85	2.5	34°	L-7104SRC-D
<b>56-0530</b>	Super red	640	400	30	1.85	2.5	34°	L-7104SRC-C
<b>55-0104</b>	Hyper orange	630	3500	30	2.2	2.8	34°	L-7104SEC-H
<b>72-8942</b>	Red	630	1300	30	1.9	2.5	34°	L-7104SURC-E
<b>72-8940</b>	Red	628	1300	50	2	2.2	50°	L-7104SURC
<b>56-0570</b>	Red	625	60 (@10mA)	30	2	2.5	34°	L-7104EC
<b>72-8972</b>	Orange	601	1300	30	2	2.5	34°	L-7104SEC
<b>55-0080</b>	Super yellow	589	900	30	2.3	2.8	34°	L-7104SYC-H
<b>72-8974</b>	Yellow	588	700	30	2	2.5	34°	L-7104SYC
<b>56-0580</b>	Yellow	588	20	30	2.1	2.5	34°	L-7104YC
<b>55-1670</b>	Mega green	568	700	30	2.1	2.5	34°	L-7104MGC
<b>72-8970</b>	Green	568	150	25	2.2	2.5	34°	L-7104SGC
<b>56-0575</b>	Green	568	60 (@10mA)	25	2.2	2.5	34°	L-7104GC
<b>55-1478</b>	Blue	470	1500	30	3.5	4	25°	L-7104QBC-D
<b>55-1476</b>	Blue	470	1000	30	3.2	4	20°	L-7104PBC-A
<b>55-1630</b>	White	0.31/0.31*	1200	30	3.2	4	34°	L-7104PWC-A
<b>Diffused lens</b>								
<b>56-0500</b>	Red	660	100	30	1.85	2.5	60°	L-7104SRD-C
<b>72-8978</b>	Red	640	350	30	1.85	2.5	40°	L-7104SRD-F
<b>56-0505</b>	Red	640	150	30	1.85	2.5	40°	L-7104SRD-D
<b>55-0008</b>	SB yellow	588	250	30	2	2.5	40°	L-7104SRD
<b>55-0174</b>	Super green	568	40	25	2.2	2.5	40°	L-7104SGD
<b>55-1462</b>	Blue	470	700	30	3.2	4	30°	L-7104PBD
<b>Transparent lens</b>								
<b>55-1468</b>	Blue	470	800	30	3.2	4	20°	L-7104PBT-A

#### MQQ 5 - In Multiples of 5

Colour	Wlngth/Lumint	Order code	5+	100+	1000+	5000+
<b>Water clear lens</b>						
SB Red	640/4500	<b>55-9214</b>	0.364	0.30	0.226	
Super red	640/800	<b>55-0090</b>	0.10	0.08	0.07	0.06
Red	640/600	<b>56-0535</b>	0.172	0.113	0.086	
Red	640/400	<b>56-0530</b>	0.079	0.065	0.048	0.041
Hyper orange	630/3500	<b>55-0104</b>	0.225	0.204	0.169	
Hyper red	630/1300	<b>72-8942</b>	0.14	0.12	0.112	
Red	625/60	<b>56-0570</b>	0.066	0.045	0.036	
Orange	601/1300	<b>72-8972</b>	0.167	0.111	0.086	
Super yellow	589/900	<b>55-0080</b>	0.399	0.362	0.30	
Yellow	588/700	<b>72-8974</b>	0.144	0.12	0.104	
Yellow	588/20	<b>56-0580</b>	0.104	0.07	0.041	
Mega green	568/700	<b>55-1670</b>	0.376	0.344	0.308	
Green	568/150	<b>72-8970</b>	0.087	0.077	0.053	0.05
Green	568/60	<b>56-0575</b>	0.078	0.055	0.036	
Blue	470/1500	<b>55-1478</b>	0.354	0.221	0.138	
Blue	470/1000	<b>55-1476</b>	0.162	0.147	0.125	0.11
White	0.31 0.31/1200	<b>55-1630</b>	0.507	0.466	0.396	
<b>Diffused lens</b>						
Red	660/100	<b>56-0500</b>	0.115	0.08	0.065	
Red	640/350	<b>72-8978</b>	0.132	0.075	0.058	0.048
Red	640/150	<b>56-0505</b>	0.115	0.083	0.063	0.048
SB yellow	588/250	<b>55-0008</b>	0.115	0.089	0.072	
Super green	568/40	<b>55-0106</b>	0.10	0.061	0.046	
Blue	470/700	<b>55-1462</b>	0.323	0.246	0.19	
<b>Transparent lens</b>						
Blue	470/800	<b>55-1468</b>	0.30	0.228	0.176	

080113



### Rainbow Colour Cycling 3mm LED

Innovative, eye catching rainbow 3mm LEDs that contain an inbuilt IC that causes the LED to cycle through the red, green and blue elements, individually and then in combination. Colour cycles every 33 seconds.

- Water clear or diffused lens types
- Ideal for use in warning devices, indication panels, alarm systems, mood lighting, toys



Technical specification

Colour	Lens type	V <sub>f</sub> typ. (V)	V <sub>f</sub> max. (V)	Blinking cycle (s)	Lum. int. (mcd) @ I <sub>f</sub> =20mA	View angle	Wavelength (nm)
Red	Water clear	4.5	5	33	5000	30°	624
Green	Water clear	4.5	5	33	5000	30°	525
Blue	Water clear	4.5	5	33	3000	30°	470
Red	Diffused	4.5	5	33	2500	30°	624
Green	Diffused	4.5	5	33	2500	30°	525
Blue	Diffused	4.5	5	33	1500	30°	470

#### MQQ 5 - In Multiples of 5

Type	Lens type	Order code	5+	100+	500+
Rainbow LED	Clear	<b>55-1905</b>	1.03	0.747	0.492
Rainbow LED	Diffused	<b>55-1907</b>	0.817	0.594	0.391

082702

**No minimum order value  
UK mainland only**

**Kingbright**

**Flashing 3mm LED**

A range of 3mm LEDs housed in a diffused package with an in-built IC to produce a continuous flash at a frequency of 3Hz.

- Supply voltage 9 to 12V
- No series resistor is required
- **Kingbright L-36BD** series



Technical specification

Colour	I <sub>f</sub> max.	V <sub>f</sub> typ.	V <sub>f</sub> max.	V <sub>r</sub> max.	Lum. int (mcd) @ I <sub>f</sub> (9V)	View angle	Wavelength
HE Red	38-56mA	9-12	13V	0.5V	32	60°	625
Super Red	38-56mA	9-12	13V	0.5V	300	60°	660
Green	38-56mA	9-12	13V	0.5V	32	60°	565
Yellow	38-56mA	9-12	13V	0.5V	20	60°	590

**MQQ 5 - In Multiples of 5**

Type	Order code	5+	25+	50+	100+
3mm HE red LED	<b>56-0760</b>	0.387	0.306	0.267	
Type	Order code	5+	25+	100+	500+
3mm Super red LED	<b>56-0765</b>	0.558	0.45	0.444	0.426
3mm Green LED	<b>56-0755</b>	0.33	0.252	0.243	0.225
3mm Yellow LED	<b>56-0805</b>	0.415	0.395	0.392	0.374

029350

**Truopto**

**3mm White LEDs High Luminous Intensity**

A range of white 3mm LEDs available in various luminous intensities and viewing angles.



Featuring high luminous intensities and long lifetime operation, these LEDs are suitable for a wide range of applications including: electronic sign and signals, small area illumination, back lighting and other lighting.

- 3mm Round standard directivity
- High luminous intensity
- Long lifetime operation
- Superior weather resistance
- UV Resistant epoxy
- Water clear lens

Technical specification

Type	Chromaticity coordinates	Lum. int. (mcd) @ I <sub>f</sub> (20mA)	I <sub>f</sub> max. (mA)	V <sub>f</sub> typ. (V)	V <sub>r</sub> max. (V)	View angle	Order code
3mm White	0.31/0.33	1120	30	3.1	3.6	60°	<b>55-1541</b>
3mm White	0.31/0.33	4200	30	3.1	3.6	60°	<b>55-1545</b>
3mm White	0.31/0.33	10,000	30	3.1	3.6	30°	<b>55-1549</b>

**MQQ 5 - In Multiples of 5**

Type	Lum.Int. (mcd)	Order code	5+	25+	100+	500+
3mm White LED	1120	<b>55-1541</b>	0.698	0.495	0.335	0.165
3mm White LED	4200	<b>55-1545</b>	0.772	0.577	0.412	0.253
3mm White LED	10,000	<b>55-1549</b>	0.735	0.55	0.391	0.242

036855

**Truopto**

**Miniature 3mm LEDs**

A range of industry standard 3mm round LEDs housed in a diffused coloured package.

- Viewing angle 60°
- Supplied in **packs of 100 or 1000**



Technical specification

Colour	Wavelength (nm)	Lum. int. (mcd) @ I <sub>f</sub> (20mA)	I <sub>f</sub> max. (mA)	V <sub>f</sub> typ. (V)	V <sub>r</sub> max. (V)	Order code
Red	690	10	50	2	2.4	<b>55-1770</b>
Bright red	643	100	30	1.7	2.6	<b>55-1776/55-1778</b>
Yellow	590	50	50	2	2.4	<b>55-1774/55-1782</b>
Green	572	28	20	2.2	2.5	<b>55-1772/55-1780</b>
Blue	470	80	30	3.3	3.8	<b>55-1762</b>
White	x: 0.31, y: 0.30*	120	30	3.3	3.8	<b>55-1766</b>

\* Chromaticity coordinates

**Price per pack of 100**

Colour	Order code	1+	10+	25+
Red	<b>55-1770</b>	10.61	7.90	7.00
Bright red	<b>55-1776</b>	9.25	6.86	6.05
Yellow	<b>55-1774</b>	11.79	8.92	
Green	<b>55-1772</b>	12.29	8.92	7.86
Blue	<b>55-1762</b>	19.46	15.12	
White	<b>55-1766</b>	19.46	15.12	

**Price per pack of 1000**

Red	<b>55-1778</b>	59.76	48.50
Bright red	<b>55-1784</b>	63.27	51.82
Yellow	<b>55-1782</b>	85.01	66.66
Green	<b>55-1780</b>	85.01	66.66

064821

**Truopto**

**Standard 3mm Water Clear LEDs**

A range of high power, industry standard 3mm LEDs in various colours. These LEDs are particularly suitable for automotive dashboard lighting and general backlighting purposes.



- Water clear lens
- Viewing angle 30°
- Superior weather-resistance
- Made from UV resistant epoxy
- Suitable for PCB or panel mounting applications

Technical specification

Colour	Wavelength (nm)	Lum. int. (mcd) @ I <sub>f</sub> (20mA)	I <sub>f</sub> max. (mA)	V <sub>f</sub> typ. (V)	V <sub>r</sub> max. (V)	Order code
Red	625	3000	50	2	2.4	<b>55-0066</b>
Yellow	590	3000	50	2	2.4	<b>55-0068</b>
Green	525	8400	30	3.3	3.8	<b>55-0070</b>
Blue	470	4200	30	3.3	3.8	<b>55-0072</b>
White	x: 0.31, y: 0.30*	7000	30	3.3	3.8	<b>55-0076</b>
Warm white	x: 0.45, y: 0.41*	5800	30	3.3	3.8	<b>55-0074</b>
Pink	x: 0.40, y: 0.21*	2180	30	3.3	3.8	<b>55-0078</b>

\* Chromaticity coordinates

**MQQ 5 - In Multiples of 5**

Colour	Order code	5+	100+	1000+	5000+
Red	<b>55-0066</b>	0.15	0.127	0.065	0.046
Yellow	<b>55-0068</b>	0.15	0.127	0.065	
Green	<b>55-0070</b>	0.404	0.247	0.18	
Blue	<b>55-0072</b>	0.335	0.20	0.148	
White	<b>55-0076</b>	0.562	0.375	0.291	
Warm white	<b>55-0074</b>	0.666	0.427	0.317	
Pink	<b>55-0078</b>	0.347	0.271	0.189	

082277

**Nichia**

**Super Bright Blue LEDs Nichia NSPB Series**

The tremendous luminous intensity of these superbright LEDs from Nichia's top-quality NSPB Series opens new application opportunities for analysis equipment in chemistry, medicine and photographic technology.



**MQQ 5**

Size	Intensity	Order code	5+	100+	500+	1000+
5mm	5600mcd	<b>50-0712</b>	0.547	0.464	0.415	0.353
5mm	11000mcd	<b>50-0711</b>	0.569	0.481	0.43	

51984

**Truopto**

**Rainbow Colour Cycling 5mm LED**

Innovative, eye catching colour change LEDs. The 5mm LED contains an inbuilt IC that causes the LED to cycle through the red, green and blue elements, individually and then in combination. Colour cycles in 33s.



- Water clear or diffused lens types
- Ideal for use in warning devices, indication panels, alarm systems, mood lighting, toys

Technical specification

Colour	Red	Green	Blue	Colour	Red	Green	Blue
<b>55-1904</b>				<b>55-1906</b>			
Wavelength (nm)	625	525	470	Wavelength (nm)	625	525	470
Lum. int. (mcd) @ I <sub>f</sub> =20mA	3000	8400	2500	Lum. int. (mcd) @ I <sub>f</sub> =20mA	600	1000	500
Blinking cycle V <sub>f</sub> typ. (V)	33s	4.5		Blinking cycle V <sub>f</sub> typ. (V)	33s	4.5	
V <sub>r</sub> max. (V)	5			V <sub>r</sub> max. (V)	5		
Lens type	Water clear			Lens type	White diffused		
View angle	30°			View angle	30°		

**MQQ 5 - In Multiples of 5**

Type	Lens type	Order code	5+	100+	500+	1000+
Rainbow LED	Clear	<b>55-1904</b>	0.992	0.713	0.478	
Rainbow LED	Diffused	<b>55-1906</b>	0.992	0.713	0.478	0.409

075160

**Pricing**

Pricing correct at time of going to press.  
For up-to-date pricing visit [www.rapidonline.com](http://www.rapidonline.com)





### 5mm White LEDs

LEDs that are available in high luminous intensities of up to 30,000mcd at 20mA and provide white LED technology at the cost of lower technology indicators. Suitable for a wide range of illumination and indication applications where high luminous intensity is required, such as: small area illumination, back lighting and general purpose indication.



- Housed in an industry standard 5mm water clear package
- Viewing angle 15°
- Superior weather resistance
- UV resistant epoxy
- Suitable alternative for filament lamps

Technical specification

Chromaticity coordinates @ I <sub>f</sub> (20mA)	Lum. int. (mcd) typ. @ I <sub>f</sub> (20mA)	Lum. int. (mcd) max. @ I <sub>f</sub> (20mA)	I <sub>f</sub> max. (mA)	V <sub>f</sub> typ. (V)	V <sub>f</sub> max. (V)	Order code
x = 0.31, y = 0.32	6000	8000	30	3.4	4	<b>55-1820</b>
x = 0.27, y = 0.28	10000	12000	30	3.4	4	<b>55-1886</b>
x = 0.31, y = 0.30	30000	36000	30	3.3	3.8	<b>55-2216</b>

MQQ 5 - In Multiples of 5

Type	Order code	5+	100+	500+	1000+
LED 6000mcd	<b>55-1820</b>	0.943	0.676	0.492	
LED 10,000mcd	<b>55-1886</b>	0.632	0.397	0.32	0.283
LED 30,000mcd	<b>55-2216</b>	1.09	0.887	0.713	

064866



### High Intensity LEDs

A range of high intensity LEDs in a 5mm package that features a blade cathode which acts as a heat sink to dissipate heat at high current levels.



- High luminous intensity for use in a wide range of indication and illumination applications requiring a high output
- Manufactured using the latest technologies for long life, energy efficiency and high reliability
- Suitable for PCB and panel mounting applications
- Water clear lens

Technical specification

Colour	Wavelength (nm)	Lum. int. (mcd) @ I <sub>f</sub> (30mA)	I <sub>f</sub> max. (mA)	V <sub>f</sub> typ. (V)	V <sub>f</sub> max. (V)	V <sub>f</sub> max. (V)	View angle
White	0.30/0.31 *	30000	50	3.6	4.2	5	15°
Warm white	0.5/0.43 *	28000	50	3.4	4	5	15°
Red	625	20000	50	2.2	2.6	5	15°
Orange	605	20000	50	2.2	2.6	5	15°
Yellow	590	20000	50	2.2	2.6	5	15°
Green	525	30000	50	3.3	3.6	5	15°
Cyan	505	30000	50	3.6	4.2	5	15°
Blue	470	12000	50	3.6	4.2	5	15°

\* Chromaticity coordinates

MQQ 5 - In Multiples of 5

Type	Colour	Order code	5+	100+	500+	1000+
5mm LED	White	<b>55-2484</b>	0.747	0.544	0.454	0.387
5mm LED	Warm white	<b>55-2600</b>	0.925	0.542	0.476	
5mm LED	Red	<b>55-2476</b>	0.349	0.283	0.252	0.194
5mm LED	Orange	<b>55-2486</b>	0.437	0.282	0.253	0.20
5mm LED	Yellow	<b>55-2478</b>	0.359	0.291	0.259	0.20
5mm LED	Green	<b>55-2480</b>	0.497	0.33	0.291	0.271
5mm LED	Cyan	<b>55-2488</b>	0.496	0.33	0.282	
5mm LED	Blue	<b>55-2482</b>	0.497	0.33	0.291	0.271

073421



### Standard 5mm LED

A range of industry standard 5mm diameter LEDs housed in a coloured diffused lens package.



- Suitable for PCB or panel mounting applications
- Viewing angle 60°
- Cathode is shorter lead
- Supplied in packs of 100 or 1000

Technical specification

Colour	Wavelength (nm)	Lum. int. (mcd) @ I <sub>f</sub> (20mA)	I <sub>f</sub> max. (mA)	V <sub>f</sub> typ. (V)	V <sub>f</sub> max. (V)	Order code
Red	700	10	15	2.2	2.8	<b>55-1790/55-1798</b>
Bright red	643	100	30	1.7	2.6	<b>55-1796/55-1804</b>
Yellow	590	20	50	2	2.4	<b>55-1794/55-1802</b>
Green	570	30	30	2.1	2.8	<b>55-1792/55-1800</b>
Blue	470	68	30	3.3	3.8	<b>55-1754/55-1756</b>
White	x: 0.31, y: 0.30*	100	30	3.3	3.8	<b>55-1758/55-1760</b>

\* Chromaticity coordinates

Price per pack of 100				
Type	Order code	1+	10+	25+
Red	<b>55-1790</b>	7.06	6.34	5.71
Bright red	<b>55-1796</b>	9.25	7.13	
Yellow	<b>55-1794</b>	12.29	9.29	
Green	<b>55-1792</b>	11.93	9.02	8.18
Blue	<b>55-1754</b>	19.41	15.22	
White	<b>55-1758</b>	19.88	15.61	

Price per pack of 1000				
Type	Order code	1+	5+	
Red	<b>55-1798</b>	74.04	55.47	
Bright red	<b>55-1804</b>	72.31	59.22	
Yellow	<b>55-1802</b>	83.02	66.66	
Green	<b>55-1800</b>	76.72	62.84	
Blue	<b>55-1756</b>	103.84	83.24	

061374



### 5mm White LEDs High Luminosity

These 5mm high intensity white LEDs are available in a choice of luminous intensities and are suitable for a wide range of applications such as: electronic signs and signals, small area illumination, and back lighting.



- High luminosity
- 5mm Round standard directivity
- Long operational lifetime
- Superior weather resistance
- UV Resistant epoxy
- Housed in a water clear package

Technical specification

Order code	Chromaticity coordinates	Lum. int. (mcd) @ I <sub>f</sub> (20mA)	I <sub>f</sub> max. (mA)	V <sub>f</sub> typ. (V)	V <sub>f</sub> max. (V)	Power (mW)	View angle
55-1543	0.31/0.33	5800	30	2.9	3.1	108	60°
55-1547	0.31/0.33	1560	30	2.9	3.1	108	60°

MQQ 5 - In Multiples of 5

Type	Order code	5+	25+	100+	500+
5mm White LED 5800mcd	<b>55-1543</b>	0.772	0.577	0.412	0.253
5mm White LED 1560mcd	<b>55-1547</b>	0.771	0.577	0.412	0.253

036651



### 5mm High Brightness 15° LEDs

A range of 5mm high intensity LEDs that are suitable for a wide variety of illumination and indication applications such as: small area illumination, back lighting, general purpose indication.



- Housed in an industry standard 5mm water clear package
- Available in several colours including pink and violet
- Viewing angle 15°
- Superior weather resistance
- UV resistant epoxy
- Suitable alternative for filament lamps

Technical specification

Colour	Wavelength (nm)	Lum. int. (mcd) @ I <sub>f</sub> (20mA)	I <sub>f</sub> max. (mA)	V <sub>f</sub> typ. (V)	V <sub>f</sub> max. (V)
Red	625	14,400	50	2.2	2.6
Red	624	35,000	50	2.1	2.4
Orange	605	4200	50	2	2.4
Yellow	590	5800	30	2	2.4
Green	525	18,000	30	3.3	3.8
Blue	470	1200	25	3.6	4.2
Violet	405	68 (radiant intensity (mW/sr))	30	3.4	4
Pink	0.40/0.20 *	5000	30	3.4	4

\* Chromaticity coordinates

MQQ 5 - In Multiples of 5

Type	Colour	Order code	5+	100+	500+	1000+
5mm LED (14cd)	Red	<b>55-1806</b>	0.235	0.194	0.144	0.109
5mm LED (35cd)	Red	<b>55-1807</b>	0.335	0.253	0.185	
5mm LED	Orange	<b>55-1808</b>	0.207	0.148	0.126	0.084
5mm LED	Yellow	<b>55-1814</b>	0.207	0.148	0.126	
5mm LED	Green	<b>55-1816</b>	0.497	0.40	0.306	
5mm LED	Blue	<b>55-1810</b>	0.735	0.613	0.538	
5mm LED	Violet	<b>55-1818</b>	0.41	0.329	0.235	
5mm LED	Pink	<b>55-1822</b>	0.335	0.271	0.22	

081462



We bring STEAM to life

## Kingbright

## Ultrabright LED 5mm

The Kingbright Ultrabright LED employs the latest technology to produce lamps that are highly visible and therefore suitable for a wide variety of applications. Available with diffused, water clear, or transparent lenses in a variety of colours and luminous intensities, the Ultrabright LEDs rugged design adds to their long life reliability. Meanwhile, these high intensity components have been manufactured with only the best materials - the colour devices are made with Gallium Arsenide Phosphide.

Overall, these unique Ultrabright LEDs, along with low power consumption, offer excellent value and are a clear leader in their field - to find out more about the full range of Kingbright products please visit Rapid's Kingbright page.

- Cathode identified by flat on body
- Suitable for signalling applications and as an alternative to filament lamps
- General purpose leads
- Reliable and rugged
- Long life - solid state reliability
- Available on tape and reel
- RoHS compliant

Technical specification										
Order code	Colour	Wavelength (nm)	Lum. int. (mcd) @ I <sub>f</sub> (10mA)	I <sub>f</sub> max. (mA)	V <sub>f</sub> typ. (V)	V <sub>f</sub> max. (V)	V <sub>f</sub> max. (V)	View angle	Mfrs. pt. no.	
<b>Diffused lens</b>										
55-0132	SB Red	640	150	30	1.85	2.5	5	30°	L-7113SRD-C	
55-0136	SB Red	640	250	30	1.85	2.5	5	30°	L-7113SRD-D	
72-8984	SB Red	640	400	30	1.85	2.5	5	30°	L-7113SRD-E	
72-8989	SB Red	640	1800	30	2.1	2.5	5	30°	L-7113SRD-J4	
55-1520	SB Yellow	588	400	30	2	2.5	5	30°	L-7113SYD	
55-1495	Blue	470	400	30	3.65	4.2	5	20°	L-7113PBD	
55-1480	Blue	466	60	30	3.8	4.5	5	20°	L-7113MBD	
<b>Transparent lens</b>										
55-1525	SB Yellow	588	2000	30	2	2.5	5	20°	L-7113SYT	
55-1482	Blue	466	200	30	3.8	4.5	5	16°	L-7113MBDL	
55-1485	Blue	430	70	30	3.8	4.5	5	16°	L-7113MBT	
<b>Water clear lens</b>										
72-8990	SB Red	660	1000	30	1.85	2.5	5	20°	L-1513SRC-C	
72-8995	SB Red	640	11,000	30	2.1	2.5	5	20°	L-1513SRC-J4	
55-0130	SB Red	640	900	30	1.85	2.5	5	20°	L-7113SRC-C	
55-0131	SB Red	640	1400	30	1.85	2.5	5	20°	L-7113SRC-DV	
55-0133	SB Red	640	1700	30	1.85	2.5	5	20°	L-7113SRC-DW	
55-9212	SB Red	640	5000	30	2.1	2.5	5	20°	L-7113SRC-J4	
72-8946	Hyper Red	640	3000	40	2.45	2.6	5	50°	L-1633SURC-E	
72-8948	Hyper Red	640	4000	40	2.45	2.6	5	12°	L-2523SURC-H	
55-1664	Red-orange	630	10000	30	2.4	2.8	5	20°	L-7113SEC-H	
55-1530	SB Yellow	588	2000	30	2	2.5	5	20°	L-7113SYC	
55-0135	SB Green	568	200	25	2.2	2.5	5	20°	L-7113SGC	
55-1668	Green	525	3000	30	3.5	4.5	5	20°	L-7113VGC-E	
55-1490	Blue	470	1000	30	3.65	4.2	5	16°	L-7113PBC	
55-1662	Blue	470	2200	30	3.5	4	5	15°	L-7113QBC-D	
55-1602	White	0.40/0.43*	200	30	3.8	4.5	5	20°	L-7113MWC	
55-1640	White	0.34/0.35*	3200	30	3.5	4	5	20°	L-7114QWC-D	

\* Chromaticity coordinates



## TruOpto

## 5mm Flashing LEDs

A range of high brightness 5mm LEDs in a water clear package. Each LED contains an IC that produces a continuous blink at a frequency of 1.5Hz (1.8Hz for 55-1210).

- Superior weather resistance
- Suitable for warning devices, alarms, indicators, etc.

Technical specification							
Colour	Wavelength (nm)	Lum. int. (mcd) @ I <sub>f</sub> (20mA)	I <sub>op</sub> max. (mA)	I <sub>th</sub> typ. (mA)	V <sub>op</sub> typ. (V)	V <sub>op</sub> max. (V)	View angle
Red	625	1560	40mA	10	5.0	6.0	30°
Yellow	590	1560	40mA	10	5.0	6.0	30°
Green	525	4200	40mA	10	5.0	6.0	30°
Blue	470	3000	40mA	10	5.0	6.0	30°
Pink	0.45/0.17 *	2500	10µA	-	3.3	5.0	30°
White	0.27/0.28 *	3000	40µA	10	5.0	6.0	30°

\* Chromaticity coordinates

## MQQ 5 - In Multiples of 5

Type	Colour	Order code	5+	100+	500+	1000+
Flashing LED	Red	55-1892	0.409	0.194	0.184	
Flashing LED	Yellow	55-1894	0.421	0.20	0.189	
Flashing LED	Green	55-1896	0.41	0.20	0.189	
Flashing LED	Blue	55-1898	0.41	0.20	0.189	0.171
Flashing LED	Pink	55-1210	0.677	0.487	0.327	
Flashing LED	White	55-1891	0.907	0.644	0.427	

076184

## Kingbright

## LED Low Current 5mm

Kingbright are a worldwide leading manufacturer of LEDs, offering a low current 5mm LED housed in diffused coloured packages.



These well designed components have been manufactured to last and are incredibly reliable, while using only the best materials, including source color devices made with Gallium Arsenide Phosphide.

The unique Kingbright LEDs have also been made RoHS compliant, while boasting low power consumption, in the process offering excellent value in the market place - to find out more about the full range of Kingbright products please visit Rapid's Kingbright page.

- Luminous intensity remains consistent down to 2mA
- Suited to portable equipment and are fully CMOS/MOS compatible
- General purpose leads
- Reliable and rugged
- Long life - solid state reliability
- Available on tape and reel

Technical specification							
Colour	I <sub>f</sub> max.	V <sub>f</sub> typ.	V <sub>f</sub> max.	V <sub>f</sub> max.	Lum. int. (mcd) @ I <sub>f</sub> (2mA)	View angle	Wavelength
Red	30mA	1.7V	2.0V	5V	5	60°	625
Super red	30mA	1.65V	1.95V	5V	20	60°	660
Yellow	30mA	1.8V	2.1V	5V	3.2	60°	590
Green	25mA	1.9V	2.2V	5V	3.2	60°	565
Super green	25mA	2.2V	2.5V	5V	15	30°	568

## MQQ 20 - In Multiples of 5

Type	Order code	20+	100+	1000+
5mm Red	56-0430	0.095	0.071	0.055
5mm Super red	56-0445	0.144	0.089	0.073
5mm Yellow	56-0440	0.078	0.054	0.046
5mm Green	56-0435	0.104	0.072	0.055
Super Green	56-0425	0.127	0.096	0.082

## Price per reel of 1000

Type	Order code	1+
5mm Red	56-0433	42.96

029336

## Kingbright

## Flashing LED 5mm 14V

Kingbright are a worldwide leading manufacturer of LEDs, offering a superb range of flashing 5mm LEDs in a diffused package that have a built-in IC which produces continuous flashing at between 1.5 and 3.0Hz.



These well designed components from the L-56 Series have an operation voltage from 3.5V to 14V, and have been manufactured using only the best materials, including source color devices are made with Gallium Arsenide Phosphide.

MQQ 5 - In Multiples of 5						
Colour	Mfrs. pt. no.	Order code	5+	100+	1000+	5000+
<b>Diffused lens</b>						
SB red	L-7113SRD-C	55-0132	0.167	0.107	0.083	0.073
SB red	L-7113SRD-D	55-0136	0.123	0.082	0.063	0.054
SB red	L-7113SRD-E	72-8984	0.119	0.092	0.079	

MQQ 10 - In Multiples of 10						
Colour	Mfrs. pt. no.	Order code	10+	100+	1000+	5000+
SB Red	L-7113SRD-J4	72-8989	0.331	0.28	0.191	0.166

MQQ 5 - In Multiples of 5						
Colour	Mfrs. pt. no.	Order code	5+	100+	1000+	5000+
SB yellow	L-7113SYD	55-1520	0.357	0.271	0.193	
Blue	L-7113PBD	55-1495	0.573	0.492	0.41	
Blue	L-7113MBD	55-1480	0.457	0.382	0.336	

Transparent lens						
Colour	Mfrs. pt. no.	Order code	5+	100+	1000+	5000+
SB yellow	L-7113SYT	55-1525	0.293	0.238	0.176	
Blue	L-7113MBDL	55-1482	0.599	0.519	0.427	
Blue	L-7113MBT	55-1485	0.409	0.341	0.291	

Water clear lens						
Colour	Mfrs. pt. no.	Order code	5+	100+	1000+	5000+
SB red	L-1513SRC-C	72-8990	0.182	0.135	0.111	
SB Red	L-1513SRC-J4	72-8995	0.205	0.177	0.157	
SB red	L-7113SRC-C	55-0130	0.144	0.083	0.053	0.041
SB red	L-7113SRC-DV	55-0131	0.167	0.083	0.068	
SB red	L-7113SRC-DW	55-0133	0.167	0.083	0.068	
SB Red	L-7113SRC-J4	55-9212	0.364	0.31	0.252	
Hyp red	L-2523SURC-E	72-8948	0.28	0.213	0.161	
Red-omg	L-7113SEC-H	55-1664	0.342			
SB yellow	L-7113SYC	55-1530	0.323	0.246	0.175	0.149
SB green	L-7113SGC	55-0135	0.16	0.098	0.086	
Green	L-7113VGC-E	55-1668	0.50	0.391	0.348	
Blue	L-7113PBC	55-1490	0.364	0.30	0.231	
Blue	L-7113QBC-D	55-1662	0.481	0.283	0.215	

## MQQ 20000

Colour	Mfrs. pt. no.	Order code	20000+
White	L-7113MWC	55-1602	0.344

076184



These unique Kingbright LEDs do not require a series resistor, and offer excellent value in the market place - to find out more about the full range of Kingbright products please visit Rapid's Kingbright page.

- Supply voltage 3.5 to 14V
- Ideal for use in warning devices, alarms, etc
- Kingbright L-56 series
- With built-in blinking IC
- RoHS compliant

Technical specification						
Colour	I <sub>t</sub> typ. (mA)	V <sub>f</sub> max. (V)	V <sub>f</sub> max. (V)	Lum. int. (mcd) @ I <sub>t</sub>	View angle	Wavelength
Red	22	14	0.5	5	60°	660
HE Red	22	14	0.5	40	60°	625
Green	22	14	0.5	20	60°	568
Yellow	22	14	0.5	20	60°	588

MQQ 5 - In Multiples of 5					
Type	Order code	5+	100+	500+	1000+
5mm Red	<b>55-0140</b>	0.572	0.472	0.344	0.338
5mm HE red	<b>55-0138</b>	0.642	0.50	0.416	0.401
5mm Green	<b>55-0142</b>	0.558	0.47	0.419	0.377
5mm Yellow	<b>55-0144</b>	0.607	0.385	0.343	0.308



### 5mm LED Warm White 1120mcd

An LED that has a warm white colour and a 5mm standard directivity design. Its very high luminosity and long lifetime operation makes it ideal for use in electronic signs and signals, small area illumination and back lighting.

- Luminosity 1120mcd
- Superior weather resistance
- UV Resistant epoxy
- Water clear lens
- Viewing angle 60°

Technical specification						
Colour	Chromaticity coordinates	Lum. int. (mcd) @ I <sub>t</sub> (20mA)	I <sub>t</sub> max. (mA)	V <sub>f</sub> typ. (V)	V <sub>f</sub> max. (V)	P <sub>s</sub> max. (W)
Warm white	x=0.45,y=0.41	1120	30	3.1	3.6	108

MQQ 5 - In Multiples of 5					
Type	Order code	5+	100+	500+	1000+
5mm Warm white LED	<b>55-3000</b>	0.229	0.178	0.139	0.131



### AC 5mm LEDs High Brightness

5mm LEDs from TruOpto that are designed to work with an AC power supply. These LEDs, available in various colours, use 80%+ less energy than their incandescent counterparts. These LED lamps also have water clear lenses and standard directivity along with a 15° viewing angle.

With features such as high luminous intensity and low energy consumption there are many applications suitable for these 5mm LEDs, such as: AV equipment, lighting, indicator panels, games and toys, etc. The red and yellow LEDs have a 26mm leg length and the green, blue and white LEDs have a shorter 13.5mm leg length.

**Caution:** These LEDs are not to be used with a rectifier.

- AC LED
- 5mm Round standard directivity
- Water clear lens
- High luminous intensity
- Long lifetime operation
- Superior weather-resistance
- UV Resistant Epoxy
- Temperature range -30°C to +85°C

Technical specification							
Colour	Wavelength (nm)	Lum. int. (mcd) @ I <sub>t</sub> (20mA)	I <sub>t</sub> max. (mA)	V <sub>f</sub> typ. (V)	V <sub>f</sub> max. (V)	P <sub>s</sub> max. (mW)	View angle
Red	625	5800	30	2.1	2.6	78	15°
Yellow	590	5800	30	2.1	2.6	78	15°
Green	525	22,000	30	3.1	3.6	108	15°
Blue	470	5800	30	3.1	3.6	108	15°
White	0.27/0.28 *	10,000	30	3.1	3.6	108	15°

MQQ 5 - In Multiples of 5					
Type	Leg length (mm)	Order code	5+	100+	1000+
5mm Red LED	26	<b>56-2311</b>	0.341	0.261	0.198
5mm Yellow LED	26	<b>56-2316</b>	0.341	0.261	0.198
5mm Green LED	13.5	<b>56-2309</b>	0.584	0.483	0.412
5mm Blue LED	13.5	<b>56-2307</b>	0.585	0.483	0.412
5mm White LED	13.5	<b>56-2314</b>	0.584	0.483	0.412



...where price meets quality

## Kingbright

### LED Standard 5mm

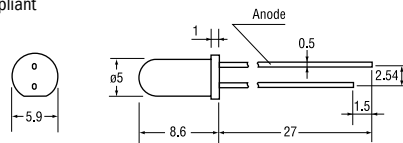
Kingbright are a worldwide leading manufacturer of LED, offering a superb range of high efficiency 5mm LEDs that are suitable for PCB and panel mounting applications.



These well designed components from the Kingbright L-7113 series are available with diffused, transparent or water clear lenses in a variety of colours, while the source color devices are made with Gallium Arsenide Phosphide.

These unique Kingbright LEDs are also RoHS compliant, while boasting low power consumption, making them excellent value on the market place - to find out more about the full range of Kingbright products please visit Rapid's Kingbright page.

- All devices are intensity and colour matched
- Cathode identified by flat on body
- General purpose leads
- Reliable and rugged
- Long life - solid state reliability
- Available on tape and reel
- RoHS compliant



Technical specification								
Colour	Wavelength (nm)	Lum. int. (mcd) @ I <sub>t</sub> (10mA)	I <sub>t</sub> max. (mA)	V <sub>f</sub> typ. (V)	V <sub>f</sub> max. (V)	V <sub>f</sub> max. (V)	View angle	Mfrs. pt. no.
<b>Diffused lens</b>								
Bright red	660	5	25	2.25	2.5	5	30°	L-7113HD
HE red	625	45	30	2	2.5	5	30°	L-7113ID
Amber	625	25	30	2	2.5	5	30°	L-7113ED
Pure orange	610	30	25	2.05	2.5	5	30°	L-7113ND
Yellow	588	20	30	2.1	2.5	5	30°	L-7113YD
Green	565	20	25	2.2	2.5	5	30°	L-7113GD
Pure green	555	5	25	2.25	2.5	5	30°	L-7113PGD
White	0.31, 0.31 *	1000 **	30	3.2	4	5	30°	L-7113PWW-A
<b>Transparent lens</b>								
Red	625	80	30	2	2.5	5	20°	L-7113IT
Yellow	588	40	30	2.1	2.5	5	20°	L-7113YT
Green	568	60	25	2.2	2.5	5	20°	L-7113GT
<b>Water clear lens</b>								
Red	625	80	30	2	2.5	5	20°	L-7113EC
Yellow	588	40	30	2.1	2.5	5	20°	L-7113YC
Green	568	60	25	2.2	2.5	5	20°	L-7113GC
Mega green	568	1000	30	2.1	2.5	5	20°	L-7113MGC

MQQ 10 - In Multiples of 5						
Colour	Mfrs. pt. no.	Order code	10+	100+	1000+	5000+
<b>Diffused lens</b>						
Bright red	L-7113HD	<b>55-0117</b>	0.115	0.079	0.054	0.049
HE Red	L-7113ID	<b>55-0155</b>	0.096	0.067	0.054	
Amber	L-7113ED	<b>55-0127</b>	0.095	0.067	0.051	0.039
Pure orange	L-7113ND	<b>55-0124</b>	0.157	0.089	0.071	0.068
Yellow	L-7113YD	<b>55-0125</b>	0.081	0.058	0.055	
Green	L-7113GD	<b>55-0120</b>	0.131	0.086	0.057	
Pure green	L-7113PGD	<b>55-0122</b>	0.065	0.051	0.048	0.043
<b>Transparent lens</b>						
Red	L-7113IT	<b>56-0250</b>	0.115	0.082	0.066	0.057
Yellow	L-7113YT	<b>56-0260</b>	0.243	0.177	0.133	0.12
Green	L-7113GT	<b>56-0255</b>	0.115	0.077	0.054	0.052
<b>Water clear lens</b>						
Red	L-7113EC	<b>56-0200</b>	0.072	0.063	0.045	
Yellow	L-7113YC	<b>56-0210</b>	0.063	0.054	0.036	
Green	L-7113GC	<b>56-0205</b>	0.07	0.063	0.045	

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### 5mm Oval High Power LEDs

These 5mm high power, oval LEDs from **TruOpto** feature a directivity pattern that is ideally suited to applications such as: traffic signals and portable light sources, signage and channel lettering, decorating and entertainment lighting, architectural lighting, small area illumination and back lighting.

- High power suitable for many applications
- 5.1 x 4.3mm lens
- Superior weather resistance
- UV Resistant epoxy



#### Technical specification

Colour	Wavelength (nm)	Lum. int. (mcd) @ I <sub>f</sub> (20mA)	I <sub>f</sub> max. (mA)	V <sub>f</sub> typ. (V)	V <sub>f</sub> max. (V)	P <sub>o</sub> max. (mW)	View angle
Red	624	2180	50	2.0	2.4	130	100°/40°
Yellow	590	2180	50	2.0	2.4	130	100°/40°
Green	525	2180	30	3.3	3.8	120	100°/40°
Blue	470	1560	30	3.3	3.8	120	100°/40°
White	0.27/0.28 *	2180	30	3.1	3.6	108	100°/40°
White	0.27/0.28 *	4200	30	3.1	3.6	108	100°/40°

\* Chromaticity coordinates

#### MOQ 5 - In Multiples of 5

Colour	Lens	Order code	5+	100+	500+	1000+
Red	Diffused	<b>55-2190</b>	0.359	0.26	0.22	
Yellow	Diffused	<b>55-2191</b>	0.359	0.26	0.22	
Green	Diffused	<b>55-2192</b>	0.36	0.261	0.221	0.169
Blue	Diffused	<b>55-2193</b>	0.359	0.26	0.22	
White	Diffused	<b>55-2194</b>	0.56	0.427	0.358	
White	Water clear	<b>55-2195</b>	0.383	0.281	0.222	

082709

### Kingbright

#### 5mm RGB LED High Brightness

A high brightness RGB LED in a 5mm through-hole package. The LED has low power consumption, a 50° viewing angle and a water clear lens.



- T1 3/4 (5mm) full colour LED lamp
- Uniform light output
- Long life-solid state reliability

#### Technical specification

Colour	Wavelength (nm)	Lum. int. (mcd) @ I <sub>f</sub> (20mA)	I <sub>f</sub> max. (mA)	V <sub>f</sub> typ. (V)	V <sub>f</sub> max. (V)	P <sub>o</sub> (mW)	View angle	Material
Red	630	1300	30	1.9	2.5	75	50°	InGaAlP
Green	525	3600	30	3.2	4	120	50°	InGaN
Blue	465	900	30	3.2	4	120	50°	InGaN

Type	Order code	1+	25+	100+	500+
5mm Full colour LED	<b>72-9661</b>	1.07	1.01	0.833	0.70

548984



#### 5mm RGB Colour Changing LEDs 60s Cycle 30° 4.5V

These full colour RGB LEDs are 5mm round standard directivity lamps that have a 60s colour changing cycle. Ideal for applications such as toys, games, audio equipment, decorative lighting, etc.



- Available with a white diffused or water clear lens
- High luminosity
- Superior weather resistance

#### Technical specification

Order code	Colour component	Wavelength (nm)	Lum. int. (mcd) @ I <sub>f</sub> (20mA)	Lens
<b>55-9206</b>	Red	625	4000	White diffused
	Green	525	7000	
	Blue	470	2180	
<b>55-9207</b>	Red	625	8400	Water clear
	Green	525	14,400	
	Blue	470	4000	

Oscillator frequency (s)	V <sub>f</sub> typ. (V)	V <sub>f</sub> max. (V)	View angle
60	4.5	5.0	30°

Type	Order code	1+	100+	500+
LED Diffused	<b>55-9206</b>	0.499	0.412	0.37
LED Water clear	<b>55-9207</b>	0.499	0.412	0.37

560386



### Full Colour 5mm LED 60°

Versatile full-colour RGB LEDs from **TruOpto** that are suitable for a very wide range of applications. These LED lamps can be used in products such as toys, electronic games, AV equipment, indicator panels, decorative lighting. These solid state LED lights also feature high luminous intensity and a common anode configuration. These LEDs can produce red, green, blue and white light, making them a versatile addition to any project.



- Full colour LED
- Available in water clear or diffused lens types
- Common anode type
- 5mm Round standard directivity
- Excellent weather resistance
- Wide 60° viewing angle

#### Technical specification

72-9643	Colour	Wavelength (nm)	Lum. int. (mcd) @ I <sub>f</sub> (20mA)	I <sub>f</sub> max. (mA)	V <sub>f</sub> typ. (V)	V <sub>f</sub> max. (V)	P <sub>o</sub> max. (mW)
Water clear	Red	625	1560	50	2.1	2.6	130
	Green	525	2180	30	3.1	3.6	108
	Blue	470	1120	30	3.1	3.6	108

#### 72-9647

Lens	Colour	Wavelength (nm)	Lum. int. (mcd) @ I <sub>f</sub> (20mA)	I <sub>f</sub> max. (mA)	V <sub>f</sub> typ. (V)	V <sub>f</sub> max. (V)	P <sub>o</sub> max. (mW)
Diffused	Red	625	750	50	2.1	2.6	130
	Green	525	1000	30	3.1	3.6	108
	Blue	470	500	30	3.1	3.6	108

#### MOQ 5 - In Multiples of 5

Type	Order code	5+	25+	100+
LED Water clear lens	<b>72-9643</b>	1.28	1.04	0.888
LED Diffused lens	<b>72-9647</b>	1.28	1.04	0.888

500653



### High Brightness Tri-colour 5mm LED

Tri-colour LEDs that feature high luminous output. Available in red and green or red and blue these LEDs also provide a third colour when the two primary colours are combined.



- Red and blue available with water clear or white diffused lens
- 5mm Standard directivity
- Superior weather-resistance
- Common cathode type
- Suitable for many applications including toys, games and audio

#### Technical specification

56-0350 Water clear lens	Colour	Wave length (nm)	Lum. int. (mcd) @ I <sub>f</sub> =20mA	I <sub>f</sub> max. (mA)	V <sub>f</sub> typ. (V)	V <sub>f</sub> max. (V)	View angle
Red	625	5800	30mA	2.0	2.4	30°	
	Pure green	525	8400	30mA	3.4	4.0	30°

#### 56-0352 Water clear lens

Colour	Wave length (nm)	Lum. int. (mcd) @ I <sub>f</sub> =20mA	I <sub>f</sub> max. (mA)	V <sub>f</sub> typ. (V)	V <sub>f</sub> max. (V)	View angle
Red	625	5800	30	2.0	2.4	30
Blue	470	4200	30	3.4	4.0	30

#### 56-0353 White diffused lens

Colour	Wave length (nm)	Lum. int. (mcd) @ I <sub>f</sub> =20mA	I <sub>f</sub> max. (mA)	V <sub>f</sub> typ. (V)	V <sub>f</sub> max. (V)	View angle
Red	625	4200	30	2.1	2.6	30
Blue	470	3000	30	3.1	3.6	30

#### MOQ 5 - In Multiples of 5

Colour	Lens	Order code	5+	100+	250+	1000+
Red/green	Water clear	<b>56-0350</b>	0.56	0.469	0.427	0.375
Red/blue	Water clear	<b>56-0352</b>	0.56	0.468	0.427	0.375
Red/blue	White diff.	<b>56-0353</b>	0.526	0.459	0.419	0.375

075158

### Kingbright

#### L-53 Series 5mm LEDs

A range of 5mm LEDs from the Kingbright L-53 Series, available in different colours with a choice of diffused, water clear and transparent lenses. Rugged construction offers long working life with solid state reliability.



- Low power consumption
- Popular T-1 3/4 diameter package
- General purpose leads
- RoHS compliant



Technical specification

Order code	Colour	Wavelength (nm)	Lum. int. @ I <sub>f</sub> (20mA) (mcd)	I <sub>f</sub> (mA)	V <sub>f</sub> typ. (V)	V <sub>f</sub> max. (V)	P <sub>D</sub> (mW)	Viewing angle	Mftrs. part no.
55-0858	Orange	625	60	30	2	2.5	75	30°	L-53ED
55-0864	High Efficiency Red	625	50	30	2	2.5	75	30°	L-53ID
55-0872	Yellow	588	25	30	2.1	2.5	75	60°	L-53YD
55-0868	Green	568	30	25	2.2	2.5	62.5	30°	L-53GD
55-0860	High Efficiency Red	625	200	30	2	2.5	75	20°	L-53EC
55-0870	Yellow	588	80	30	2.1	2.5	75	20°	L-53YC
55-0866	Blue	466	150	30	3.8	4.5	135	16°	L-53MBC
55-0862	High Efficiency Red	625	180	30	2	2.5	75	20°	L-53IT
55-0874	Yellow	588	80	30	2.1	2.5	75	20°	L-53YT

MOQ 10 - In Multiples of 5

Colour	Mftrs part	Order code	10+	100+	1000+
<b>Diffused</b>					
Orange	L-53ED	55-0858	0.08	0.057	0.054
HE Red	L-53ID	55-0864	0.136	0.115	0.093
Yellow	L-53YD	55-0872	0.137	0.10	0.093
Green	L-53GD	55-0868	0.142	0.111	0.096
<b>Water Clear</b>					
HE Red	L-53EC	55-0860	0.077	0.059	0.055
Yellow	L-53YC	55-0870	0.083	0.063	0.058
Blue	L-53MBC	55-0866	0.644	0.479	0.428
<b>Transparent</b>					
HE Red	L-53IT	55-0862	0.072	0.059	0.051
Yellow	L-53YT	55-0874	0.072	0.059	0.051

519065

Kingbright

LED 5mm 5V and 12V

The Kingbright 5mm LEDs are a superb, high quality range of components incorporating an inbuilt series resistor enabling the LED to be directly connected to 5V or 12V supply lines. Tough, reliable and built to last, these high intensity components have been manufactured with only the best materials - the color devices are made with Gallium Arsenide Phosphide. Overall, these unique 3mm LEDs, along with low power consumption, offer excellent value and are a clear leader in their field - to find out more about the full range of Kingbright products please visit Rapid's Kingbright page.

- High intensity
- Colour matched and housed in diffused coloured packages
- Cathode identified by shorter lead
- Low power consumption
- Long life - solid state reliability
- General purpose leads
- **Kingbright L-7113 series**

Technical specification

Colour	I <sub>f</sub> max.	V <sub>f</sub> max.	V <sub>e</sub> max.	P <sub>tot</sub> max.	Lum. int. (mcd) @ I <sub>f</sub> (10mA)	View angle	Wavelength
5V HE Red	17.5mA	6V	5V	85mW	30	30°	625nm
5V Green	17.5mA	6V	5V	85mW	20	30°	568nm
5V Yellow	17.5mA	6V	5V	85mW	20	30°	588nm
12V HE Red	11.5mA	14V	5V	120mW	30	30°	625nm
12V Green	11.5mA	14V	5V	120mW	20	30°	568nm
12V Yellow	11.5mA	14V	5V	120mW	20	30°	588nm

MOQ 5 - In Multiples of 5

Type	Order code	5+	50+	100+	1000+
5mm 5V HE red	56-1500	0.185	0.158	0.133	0.109
5mm 5V Green	56-1505	0.191	0.158	0.141	0.105
5mm 5V Yellow	56-1510	0.14	0.125	0.115	0.102
5mm 12V HE red	56-1550	0.152	0.137	0.117	0.103
5mm 12V Green	56-1555	0.145	0.132	0.112	0.095

MOQ 1000

Type	Order code	1000+
5mm 12V Yellow	56-1560	0.171

060113

Kingbright

5mm Cool White LED Low Current

A cool white LED that features low power consumption.

- High luminous intensity
- Low power consumption
- General purpose leads
- Reliable and rugged
- Long life - solid state reliability
- **Kingbright L-9294VR41C-CTS-C1**

Technical specification

Colour	Lum. int. (mcd) @ I <sub>f</sub> (20mA)	I <sub>f</sub> max. (mA)	V <sub>f</sub> typ. (V)	V <sub>f</sub> max. (V)	P <sub>t</sub> max. (mW)	View angle	Mftrs. pt. no.
6000 temperature (°K)	2300	30	3.3	4.0	120	130°	L-9294VR41C-CTS-C1

MOQ 5 - In Multiples of 5

Type	Order code	5+	100+	1000+
LED L-9294VR41C-CTS-C1	56-0418	0.266	0.225	0.175

200113



5mm Ultraviolet LED

A high power ultraviolet 5mm LED. The features of this LED make it particularly suitable for use in applications such as: backlighting, security and detection applications, and automotive dashboard lighting.

- Water clear lens
- General purpose leads on a 2.54mm (0.1in) pitch
- Superior weather-resistance
- Made from UV resistant epoxy



Technical specification

Wavelength (nm)	UV power @ 20mA typ. (mW)	I <sub>f</sub> max. (mA)	V <sub>f</sub> typ. (V)	V <sub>f</sub> max. (V)	View angle
395	30	30	3.5	3.8	20°

MOQ 5 - In Multiples of 5

Type	Order code	5+	100+	500+	1000+
5mm UV LED	55-1835	1.14	0.968	0.85	0.634

082278



5mm LEDs Water Clear

These 5mm LEDs have an ultra high luminous efficacy and water clear lenses. Available in a choice of colours, these LEDs are suitable for a wide range of applications such as indicator lights, traffic signal light, marker lights, commercial outdoor advertising, energy saving lamp, backlighting, LED displays, electronic and optical indicators, etc.



- Low energy consumption
- High reliability
- Low current requirement
- Fast switching
- No UV/IR radiation
- Easy installation
- Versatile mounting on PC boards

Technical specification

Order code	Colour	Wavelength (nm)	Lum. int. (mcd) @20mA	I <sub>f</sub> (mA)	V <sub>f</sub> typ. (V)	V <sub>f</sub> max. (V)	View angle
54-8486	Red	623	5000	30	1.9	2.6	30°
54-8487	Yellow	590	1500	30	2.1	2.6	45°
54-8488	Green	522	10,000	30	3.4	3.6	30°
54-8489	Blue	465	2000	30	2.7	3.6	45°

MOQ 5 - In Multiples of 5

Type	Order code	5+	100+	500+
Red 5mm LED	54-8486	0.208	0.154	0.14

MOQ 10 - In Multiples of 5

Type	Order code	10+	100+	500+
Yellow 5mm LED	54-8487	0.15	0.127	0.115

MOQ 5 - In Multiples of 5

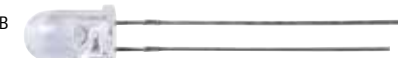
Type	Order code	5+	100+	500+
Green 5mm LED	54-8488	0.212	0.157	0.13
Blue 5mm LED	54-8489	0.208	0.15	0.13

550407

Kingbright

5mm T-1 3/4 Super Bright LEDs

A range of low power consumption 5mm LEDs that are suitable for PCB and panel mounting applications.



- Low power consumption
- Popular T-1 3/4 diameter package
- General purpose leads
- Reliable and rugged
- Long life - solid state reliability
- All devices are intensity and colour matched
- Cathode identified by flat on body
- **Kingbright L-53 series**

Technical specification

Colour	Wavelength (nm)	Lum. int. (mcd) @ I <sub>f</sub> (20mA)	I <sub>f</sub> max. (mA)	V <sub>f</sub> typ. (V)	V <sub>f</sub> max. (V)	P <sub>t</sub> max. (mW)	View angle	Mftrs. pt. no.
Super bright red	640	1400	30	1.85	2.5	100	30°	L-53SRC-DV
Super bright green	568	200	25	2.2	2.5	105	30°	L-53SGC

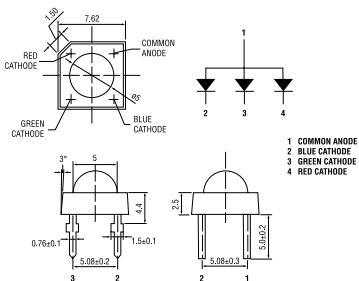
MOQ 10 - In Multiples of 5

Type	Order code	10+	100+	1000+
Red L-53SRC-DV	55-1700	0.14	0.119	0.07
Green L-53SGC	55-1678	0.13	0.105	0.098

200111



### Piranha RGB LED



A high luminosity LED that can produce a full range of colours and tones by varying the current to each of the red, green and blue dies. Comes in a compact package ideal for use in the manufacture of toys, games, audio equipment and in general indication.

- Common anode
- Superior weather-resistance
- Water clear 5mm lens
- 7.62mm Square package

Technical specification				
Component	Red	Green	Blue	
DC Forward current max. (mA)	50	30	30	
Pulse forward current max. (mA)	100	50	50	
Forward voltage max. (V)	2.4	3.6	3.6	
Dominant wavelength typ. (nm) (I <sub>f</sub> =20mA)	625	525	470	
Luminous intensity typ. (mcd) (I <sub>f</sub> =20mA)	3000	4200	2180	
Reverse current max. (µA)	10			
Reverse voltage max. (V)	5			
Power dissipation max. (mW)	150			
Half-power angle	100°			
Lead soldering temperature	260°C/3s			
Operating temperature range	-30°C to +85°C			
Storage temperature range	-30°C to +100°C			

Type	Order code	1+	25+	100+	500+
RGB LED	<b>72-8998</b>	1.44	1.08	0.913	0.749



### Ultrabright 8mm LEDs

A range of high brightness LEDs housed in 8mm water clear packages.



- These devices are particularly suited to warning devices, alarms, indication, etc.
- Red LEDs have GaAlAs dice, white LED has InGaN dice
- **Kingbright L-793/794** series

Technical specification									
Order code	Colour	Wavelength (nm)	Lum. int. (mcd) @ I <sub>f</sub> (20mA)	I <sub>f</sub> max. (mA)	V <sub>f</sub> typ. (V)	V <sub>f</sub> max. (V)	View angle	Mttrs. pt. no.	
<b>55-0435</b>	Red	660	1600	30	1.85	2.5	40°	L-793SRC-D	
<b>55-0440</b>	Red	660	2000	30	1.85	2.5	40°	L-793SRC-D	
<b>55-1888</b>	White	0.31/0.31*	1500	30	3.2	4	20°	L-794PWC-A	

MQ5 - In Multiples of 5				
Type	Order code	5+	100+	1000+
8mm 1600mcd Red	<b>55-0435</b>	0.167	0.115	0.082
8mm 2000mcd Red	<b>55-0440</b>	0.218	0.163	0.103
8mm 1500mcd White	<b>55-1888</b>	0.573	0.534	0.437



### High Intensity 8mm LEDs

High efficiency 8mm LED in a diffused package.



- Particularly suited to warning devices, alarms, etc
- **Kingbright L-793** series

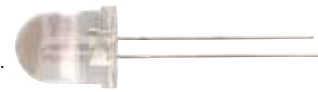
Technical specification							
Colour	I <sub>f</sub> max.	V <sub>f</sub> typ.	V <sub>f</sub> max.	V <sub>f</sub> max.	Lum. int. (mcd) If (20mA)	View angle	Wavelength
Red	30mA	2.5V	2.5V	5V	150	50°	625
Green	25mA	2.5V	2.5V	5V	70	50°	565
Yellow	30mA	2.5V	2.5V	5V	70	50°	590

MQ5 - In Multiples of 5				
Type	Order code	5+	100+	1000+
8mm High intensity red	<b>55-0400</b>	0.191	0.138	0.126
8mm High intensity green	<b>55-0405</b>	0.191	0.163	0.142
8mm High intensity yellow	<b>55-0410</b>	0.191	0.162	0.14



### Rainbow Colour Cycling 10mm LED

Innovative, eye catching colour change 10mm LED. Contains an inbuilt IC that causes the LED to cycle through the red, green and blue elements, individually and then in combination. Colours complete a cycle every 33 seconds. Ideal for use in audio systems, warning devices, indication panels, alarm systems, mood lighting, toys and games.



- Water clear lens
- High luminosity
- Superior weather resistance

Technical specification					
Colour	V <sub>f</sub> typ. (V)	V <sub>f</sub> max. (V)	Lum. int. (mcd) @ I <sub>f</sub> =20mA	Wavelength (nm)	View angle
Red	4.5	5	5800	625	30°
Green	4.5	5	5800	525	30°
Blue	4.5	5	4200	470	30°

MQ5 - In Multiples of 5				
Type	Order code	5+	100+	500+
LED 10mm rainbow clear	<b>55-0780</b>	1.15	1.02	0.644



### Ultrabright 10mm LED

A range of high brightness LEDs housed in 10mm water clear packages.



- These devices are particularly suited to warning devices, alarms, indication, etc.
- Red LEDs have GaAlAs dice, white LED has InGaN dice
- **Kingbright L-813/814** series

Technical specification									
Order code	I <sub>f</sub> max.	V <sub>f</sub> typ.	V <sub>f</sub> max.	V <sub>f</sub> max.	V <sub>f</sub> max.	Lum. int. (mcd)	Viewing angle	Wavelength	Chromaticity
<b>55-0360</b>	30mA	1.85V	2.5V	5V	5V	1600	20°	660nm	
<b>55-1890</b>	30mA	3.65V	4.2V	5V	5V	600	15°		x = 0.33 y = 0.34

MQ5 - In Multiples of 5				
Type	Order code	5+	100+	1000+
10mm 1600 mcd Red	<b>55-0360</b>	0.15	0.10	0.06



### Premium 10mm White LED Through-Hole

A through-hole LED with a 10mm lens and pure white colour. A high luminous output and long life make this large LED suitable for portable lighting, interior and exterior automotive lighting, illuminated advertising, and general lighting.



- T-3 10mm Standard directivity
- Water clear lens
- Superior weather resistance
- UV Resistant epoxy
- Operating temperature -30°C to +85°C

Technical specification									
Colour	Chromaticity coordinates	Colour temp. (°K)	Luminous flux (lm)	I <sub>f</sub> max. (mA)	V <sub>f</sub> typ. (V)	V <sub>f</sub> max. (V)	P <sub>d</sub> (mW)	1/2 Power angle	
Pure white	x = 0.31, y = 0.34	6500	32	90	3.2	3.6	324	30°	

MQ5 - In Multiples of 5				
Type	Order code	5+	100+	500+
10mm Pure white LED	<b>55-2879</b>	0.405	0.334	0.305



### 10mm White Diffused LED 10,000mcd 3.1V 30°

This **10mm White Diffused LED 10,000mcd 3.1V 30°** from TruOpto is a high luminous LED which is ideal for electronic signs and signals, small area illuminations and back lighting. Equipped with a host of excellent features such as the superior weather resistance, long lifetime operation and UV resistant epoxy.



- White diffused type
- High luminous intensity
- 10mm round standard directivity

MQ5 - In Multiples of 5				
Type	Order code	5+	100+	500+
White diffused LED	<b>55-2885</b>	0.194	0.168	0.148

**Kingbright**

**High Intensity LEDs 10mm**

Kingbright are a worldwide leading manufacturer of LEDs, offering a superb range of high intensity 10mm diameter LEDs housed in a diffused package.



These well designed components from the Kingbright L-813 Series are particularly suited to warning devices and alarms, and have been manufactured using only the best materials, such as the source color devices that are made with Gallium Arsenide Phosphide.

These unique Kingbright LEDs also boast low power consumption, making them excellent value on the market place - to find out more about the full range of Kingbright products please visit Rapid's Kingbright page.

- 10mm diameter big lamp
- Low power consumption
- Reliable and rugged
- Long life - solid state reliability

Technical specification

	I <sub>f</sub> max.	V <sub>f</sub> typ.	V <sub>f</sub> max.	V <sub>r</sub> max.	Lum. int. (mod) If (20mA)	View angle	Wavelength
Red	30mA	2.0V	2.5V	5V	150	50°	625
Green	25mA	2.2V	2.5V	5V	70	50°	565
Yellow	30mA	2.1V	2.5V	5V	70	50°	590
Amber	30mA	2V	2.5V	5V	150	50°	625

**MOQ 5 - In Multiples of 5**

Type	Order code	5+	100+	1000+
10mm High intensity red	<b>55-0300</b>	0.194	0.153	0.142
10mm High intensity green	<b>55-0305</b>	0.195	0.144	0.134
10mm High intensity yellow	<b>55-0310</b>	0.19	0.138	0.124

**MOQ 20000**

Type	Order code	20000+
10mm High intensity amber	<b>55-0315</b>	0.24

064876



**Addressable RGB LED Strips**

A range of LED strips containing data addressable full colour RGB LEDs. Using an SBC or development board with a suitable LED driver it is possible to build a simple and scalable light project that can achieve stunning effects, such as chasing, scanning and running water effects. There are two versions with either 30 LEDs per metre or 60 LEDs per metre. Each version comes in either 1m or 5m strips.



When choosing an SBC or development board it should be noted that the input data line has very specific timing requirements. The LED strip requires the use of a real-time microcontroller such as an AVR, Arduino, or PIC type device. Linux based single board computers such as the Raspberry Pi will not work without additional RTC hardware.

Each of the LEDs contains an integrated WS2812B constant current driver that can achieve 256 levels of brightness and up to 16.7m colours. The LEDs require an external power supply, with each LED using 60mA if the red, green and blue components are all on maximum brightness.

As a way to quickly get up and running, Adafruit have a very handy library that can be used (Adafruit call them NeoPixels, but they share the same WS2812B driver ICs).

- Control each colour separately
- High brightness
- Suitable for a wide range of commercial and artistic applications
- Terminated by 200mm of AWG22 cables
- Adhesive strip backing
- 5V Data signal required, to use 3.3V a logic level shifter is required

**Note:** It is recommended that a large capacitor (1000µF, 6.3V or higher) is added across the + and - terminals. Also place a 300 to 500Ω resistor between the data output pin and the input to the strip.

Technical specification

Order code	Length	LEDs per metre	Voltage	Current	Working temperature	Viewing angle
<b>60-8810</b>	1m	30	5V DC	1.8A/m	-40°C to +60°C	≥120°
<b>60-8811</b>	1m	60	5V DC	3.6A/m	-40°C to +60°C	≥120°
<b>60-8812</b>	5m	30	5V DC	1.8A/m	-40°C to +60°C	≥120°
<b>60-8813</b>	5m	60	5V DC	3.6A/m	-40°C to +60°C	≥120°

LEDs per metre	Length	Order code	1+
30	1m	<b>60-8810</b>	14.33
60	1m	<b>60-8811</b>	21.12
30	5m	<b>60-8812</b>	63.48
60	5m	<b>60-8813</b>	76.32

560551



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Miniaturised receivers for infra-red remote control systems.



- PIN diode and pre-amplifier are assembled on lead frame, the epoxy package is designed as IR filter
- Demodulated output signal can directly be decoded by a microprocessor
- Highly reliable
- No external parts, inner shield
- Highly sensitive
- Long transmission range
- High immunity against ambient light, power noise and electromagnetic interference
- Low power consumption
- TTL and CMOS compatibility

Technical specification

Supply voltage (max.)	6V	Storage temperature	-25°C to +85°C
Supply voltage (recommended)	2.4V to 5.5V	Power dissipation	50mW
Supply current (max.)	5mA	Soldering temperature	+260°C
Output voltage	6V	High output pulse width (typical)	600µs
Output current	5mA	Low output pulse width (typical)	600µs
Carrier frequency	38kHz	Receiving distance (typical)	33m
Operating temperature	-25°C to +85°C		

**MOQ 5 - In Multiples of 5**

Type	Order code	5+	25+	100+
Photo module 2.4-5.5V	<b>55-0902</b>	0.907	0.751	0.644

071292

**LDRs**



**Miniature Light Dependent Resistor**

A compact low cost cadmium sulphide light dependent resistor (LDR) housed in a small package.

- 5mm diameter
- Clear epoxy finish
- Resistance reduces as the light falling on the device increases
- Note: This product contains cadmium sulphide, the use of which is restricted by the RoHS directive



Technical specification

Dark resistance	1MΩ	Max. voltage	150V peak AC or DC
Resistance @ 10 Lux	10-20kΩ	Power dissipation	100mW
Resistance @ 100 Lux	2-4kΩ	Lead pitch	3mm
Peak spectral response	540nm	Operating temperature	-30°C to +70°C

**MOQ 5 - In Multiples of 5**

Type	Order code	5+	25+	100+	1000+
Miniature LDR	<b>58-0134</b>	0.669	0.528	0.40	0.346

034796

**Silonex**

**Silonex Light Dependent Resistor NORPS12**

Cadmium sulphide light dependent resistor (LDR).

- Housed in a robust plastic package with clear end window
- Resistance reduces as the light falling on the LDR increases
- **Silonex type NORPS12**
- Note: This product contains cadmium sulphide, the use of which is restricted by the RoHS directive



Technical specification

Dark resistance	1MΩ	Power dissipation	250mW max.
Resistance @ 1ftc	5.4kΩ min, 12.6kΩ max.	Operating temperature	-60°C to +75°C
Peak spectral response	550nm	Dimensions	14.35mm dia. x 7.0mm high
Max. voltage	250V peak AC or DC		9.53mm pitch pins

Type	Order code	1+	25+	100+	500+
NORPS12	<b>58-0132</b>	1.56	1.33	1.20	1.01

034793





## Miniature Light Dependent Resistor - Lead Free Terminals

A compact cadmium sulphide light dependent resistor (LDR) housed in a compact 5mm diameter package.

- Radial leads with 3.4mm pitch
- Lead free terminals
- Note: This product contains cadmium sulphide, the use of which is restricted by the RoHS directive



### Technical specification

Light resistance at 10 Lux	50-100KΩ	Peak spectral response	540nm
Dark resistance (10 sec. after shut off 10 Lux)	20MΩ	Power dissipation	100mW
Gamma value at 10-100 Lux	0.8 ± 1	Maximum voltage	150V

### MOQ 5 - In Multiples of 5

Type	Order code	5+	25+	100+	500+
LDR (lead free)	<b>58-0128</b>	0.955	0.832	0.795	0.607

029399



## 12mm Light Dependent Resistor Non-RoHS

A CdS (Cadmium Sulphide) light dependent resistor (LDR) that is housed in a small package. Typical applications for this device include: camera automatic photometry, photoelectric control, annunciator, light control switch, industrial control, and electronic toys.

- Resistance reduces as the light falling on the device increases
- Small volume
- Clear epoxy finish
- Fast response
- High sensitivity
- Very reliable
- Note: This product contains cadmium sulphide, use of which is restricted by the RoHS directive



### Technical specification

Peak spectral response (nm)	560	Light resistance @ 10 Lux (kΩ)	1	Dark resistance (10-100 Lux) (MΩ)	1	Gamma (10-100 Lux)	0.6
Voltage max. (V)	250	5 - 10	1	10 - 20	2	0.6	
Power dissipation max. (mW)	200	20 - 30	3	30 - 50	5	0.7	
Response time (ms)	30	50 - 100	8			0.8	
Operating temperature	-30°C to +70°C						
Dimensions (mm)	12.1 x 10.3 x 2.1 high						
	8.55 pitch pins						

### MOQ 5 - In Multiples of 5

Type	Order code	5+	100+	500+
LDR Non-RoHS	<b>58-0135</b>	1.50	1.35	1.26

082713

## Lasers



## Red Laser Modules Aluminium Housing Battery Powered

A range of low cost, fixed focus laser modules that are battery powered and provide a constant illumination from a compact aluminium body. The modules are available in a choice of beam types (line, dot or cross) and all modules have an acrylic lens that helps to produce a sharp beam without the need for rotating polygonal mirrors or motors. The compact size and battery power makes these modules suitable for applications where space and accessibility are an issue.



- Wavelength 650nm
- Diode laser technology
- Acrylic lens
- Divergence 1mrad
- Long lifetime >3000h
- Dimensions ø15 x 68mm
- Operating temperature -20°C to +40°C

Powered by 2x LR44 alkaline button cells (included).

### Technical specification

Order code	57-5881	57-5882	57-5884	57-5885
Wavelength (nm)	650	650	650	650
Optical power (mW)	5	5	5	5
Voltage (V)	2.8 to 4.5	3 to 4.5	3 to 4.5	2.7 to 4.5
Current (mA)	20	20	20	20
Laser class	1	1	2	1
Beam shape	Line	Line	Dot	Cross
Line thickness	<1mm @0.25m	<1.2mm @1m	<4.6mm @5m	<1.2mm @1m
Laser dot size	-	-	-	-
Focus point (mm)	250	1000	5000	1000
Fan angle	90°	90°	45°	45°
ø Beam	-	-	2.5mm	-
Operating distance (m)	0.25	1	10	1

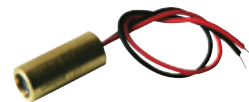
Type	Operating distance	Order code	1+
Line 90°	0.25m	<b>57-5881</b>	19.30
Line 90°	1m	<b>57-5882</b>	19.50
Class 2 dot	10m	<b>57-5884</b>	15.57
Cross 45°	1m	<b>57-5885</b>	24.18

545518



## Red Laser Modules Brass Housing

A range of high quality laser modules that project a red beam in one of three types - line, spot or cross. The modules use a special acrylic lens that produces a sharp beam without the use of rotating polygonal mirrors or motors. The lens and electronics are built-in to a robust brass housing and can be operated under dusty and harsh industrial environments. Operation is possible without series resistors or control electronics, the module simply being connected to a power supply. Suitable applications include laser levels, laser marking systems, robotics, and laser entertainment areas.



- Diode laser technology
- Acrylic lens
- Divergence 1mrad
- Long lifetime >3000h
- Cable length 100mm
- Dimensions ø9 x 20mm
- Operating temperature -20°C to +40°C

### Technical specification

Order code	57-5862	57-5863	57-5864	57-5865	57-5867	57-5869	57-5868
Wavelength (nm)	650	650	650	635	650	650	650
Optical power (mW)	5	3.5	3.5	3.5	0.3	3.5	1
Voltage (V)	3-12	3-12	3-12	3-6	3-12	3-12	3-12
Current (mA)	20	15	20	40	15	20	25
Laser class	1	1	1	1	1	1	2
Beam shape	Line	Line	Line	Line	Dot	Cross	Dot
Line thickness	<1mm @1m	<1.2mm @1m	<1.2mm @1m	<1.2mm @1m	<4.5mm @5m	<1.2mm @1m	<3.4mm @5m
Laser dot size	-	-	-	-	-	-	-
Focus point (mm)	250	1000	1000	1000	5000	1000	5000
Fan angle	90	90	60	60	-	45	-
ø Beam	-	-	-	-	3	-	3
Operating distance (m)	0.25	1	1	2	10	1	10

Type	Operating distance	Order code	1+
Line 90°	0.25m	<b>57-5862</b>	14.83
Line 90°	1m	<b>57-5863</b>	14.15
Line 60°	1m	<b>57-5864</b>	14.21
Line 60°	2m	<b>57-5865</b>	18.68
Dot Class 1 0.3W	10m	<b>57-5867</b>	11.53
Cross 45°	1m	<b>57-5869</b>	15.09
Dot Class 2	10m	<b>57-5868</b>	6.93

545514

## LED Displays

### Kingbright

## LED Display 14.2mm

Kingbright are a worldwide leading manufacturer of LEDs, offering a range of 14.2mm (0.56in high) seven segment displays available in red, high efficiency red, super red or green.



These well designed components have been categorised for luminous intensity, and use only the best materials with the source colour devices made of Gallium Phosphide on Light Emitting Diode. On top of that, the connectors along top and bottom simplify wiring in multi-digit applications.

The unique Kingbright LED Display is also economical to use, in the process making it excellent value on the market place - to find out more about the full range of Kingbright products please visit Rapid's Kingbrightpage.

- Low current operation
- White segments and grey display surface to maximise on/off contrast
- Attractive character appearance
- Easy mounting on PC Boards or sockets
- I.C. Compatible
- 14mm (0.56 inch) digit height

### Technical specification

Per segment	I <sub>f</sub> max.	V <sub>f</sub> typ.	V <sub>f</sub> max.	V <sub>r</sub> max.	Lum. int. (mcd) @ I <sub>f</sub> (10mA)	Wavelength
Red	25mA	2.0V	2.5V	5V	1.4	700
HE red	30mA	2.0V	2.5V	5V	5.6	625
Super red	30mA	1.85V	2.5V	5V	21	660
SB red	30mA	1.65V	2.5V	5V	6	640
Green	25mA	2.2V	2.5V	5V	5.6	565

MQQ 5 - In Multiples of 5						
Type	Mtts. suffix	Order code	5+	25+	100+	500+
<b>Common anode</b>						
CA Red	11HWA	57-0120	0.725	0.703	0.577	0.511
HE red	11EWA	57-0122	1.10	0.99	0.796	0.625
Super red	11SRWA	57-0124	0.779	0.728	0.656	0.51
Green	11GWA	57-0170	1.12	1.04	0.824	
<b>Common cathode</b>						
Red	11HWA	57-0125	1.34	1.19	1.02	
HE red	11EWA	57-0127	1.08	0.96	0.76	0.623
Super red	11SRWA	57-0129	1.17	1.05	0.83	0.69
Green	11GWA	57-0172	1.10	1.00	0.79	0.604
SB Red 1-digit	11LSRWA	57-1448	0.897	0.803	0.642	

029374



### 14.2mm Single Digit Displays

A range of seven segment LED displays that are 14.2mm (0.56in high) and available in red, high output red, yellow, yellow green, pure green, blue and white.

- Available in common anode or common cathode configurations
- Right hand decimal point
- Long lifetime operation
- IC Compatible
- Low power dissipation



Technical specification

Colour	Wavelength (nm)	Lum. int. (mcd) @ I <sub>f</sub> =20mA	I <sub>f</sub> max. (mA)	V <sub>f</sub> typ. (V)	V <sub>f</sub> max. (V)	P <sub>D</sub> (mW)	Order code Common anode	Order code Common cathode
Red	630	20	20	2.1	2.5	44	57-0126	57-0121
High output red	625	100	20	2.1	2.5	44	57-0128	57-0123
Yellow	590	60	20	2.1	2.5	44	57-0136	57-0133
Pure green	525	200	20	3.3	4.0	66		57-0131
Blue	470	50	20	3.3	4.0	66	57-0138	57-0137
White	0.30/0.34 *	65	20	3.3	4.0	44	57-0143	57-0141

\* Chromaticity coordinates

MQQ 5 - In Multiples of 5						
Colour	Order code	5+	25+	100+	500+	
<b>Common anode</b>						
Red (20mcd)	57-0126	0.696	0.564	0.402		
Red (100mcd)	57-0128	0.569	0.461	0.327	0.272	
Yellow	57-0136	0.569	0.461	0.327		
Blue	57-0138	1.31	1.12	0.962		
White	57-0143	1.12	0.939	0.826		
<b>Common cathode</b>						
Red (20mcd)	57-0121	0.97	0.838	0.726		
Red (100mcd)	57-0123	0.704	0.56	0.398		
Yellow	57-0133	0.569	0.461	0.392	0.334	
Pure green	57-0131	0.987	0.838	0.741		
Blue	57-0137	0.987	0.838	0.74		
White	57-0141	1.32	1.09	0.966		

200089

### Kingbright

#### 25.4mm LED Display

A range of 25.4mm (1in high) seven segment displays available in red, high efficiency red, super red and green.

- Available with a choice of pinouts
- Right hand decimal point
- All displays are categorised for luminous intensity with white segment and grey display surface to maximise on/off contrast
- Each segment contains two LED chips, decimal point has one
- **Kingbright SA/SC10** series



Technical specification

Pinout configuration	Colour	Wavelength (nm)	Lum. int. (mcd) @ I <sub>f</sub> (10mA)	I <sub>f</sub> max. (mA)	V <sub>f</sub> typ. (V)	V <sub>f</sub> max. (V)	Order code
<b>Common anode</b>							
SA10-21	SB red	640	60	30	3.7	5	57-0204
SA10-11	HE red	625	16	30	4	5	57-0212
SA10-21	HE red	625	16	30	4	5	57-0202
SA10-21	Green	568	24	25	4.4	5	57-0186
<b>Common cathode</b>							
SC10-21	Red	660	2,925	25	4.5	5	57-0205
SC10-11	SB red	640	60	30	3.7	5	57-0218
SC10-21	SB red	640	60	30	3.7	5	57-0222
SC10-21	HE red	625	16	30	4	5	57-0207
SC10-21	Green	568	24	25	4.4	5	57-0188

Colour	Pinout	Order code	1+	25+	100+	500+
<b>Common anode</b>						
SB red	SA10-21	57-0204	2.72	2.07	1.63	
<b>Common cathode</b>						
Red	SC10-21	57-0205	1.06	0.902		
SB red	SC10-11	57-0218	1.65	1.38	1.02	
SB red	SC10-21	57-0222	2.07	1.72	1.59	1.39
HE red	SC10-21	57-0207	0.741			
Green	SC10-21	57-0188	1.60	1.47	1.39	

064939

### Kingbright

#### 38.1mm (1.5in) LED Display

38.1mm (1.5in high) seven segment displays available in high efficiency red or bi-colour red/green.

- Right hand decimal point
- Connections run along the top and bottom of the display simplifying wiring in multidigit applications
- All displays are categorised for luminous intensity with white diffused segments on a grey background
- Red version has common cathode configuration
- Bi-colour version has independent common anode pins for red and green segments
- **Kingbright types SC15-11EWA** (red) and **SBA23-11EGWA** (red/green)



Technical specification

Order code	57-0495	57-0498
Colour	HE Red	HE Red/green
Wavelength (nm)	625	625/568
Luminous intensity (mcd)	21	18
I <sub>f</sub> (mA)	30	30/25
V <sub>f</sub> typ. (V)	2.0	2.0/2.2
V <sub>f</sub> max. (V)	2.5	2.5/2.5
P <sub>D</sub> (mW)	105	105/105

Type	Order code	1+	25+	100+
CC HE red	57-0495	1.69	1.51	1.37
CA HE red/green	57-0498	4.98	3.69	2.65

029385

### Kingbright

#### 45mm (1.8in) LED Display

A range of 45mm (1.8in high) seven segment displays available in high efficiency red or super red employing advanced GaAlAs technology to produce a very high output display.

- Right hand decimal point
- Connections running along the top and bottom of the display simplifying wiring in multi-digit applications
- All displays are categorised for luminous intensity
- White diffused segments on a grey background
- **Kingbright S18** series



Technical specification

Per segment	I <sub>f</sub> max.	V <sub>f</sub> typ.	V <sub>f</sub> max.	V <sub>f</sub> max.	Lum. int. (mcd) @ I <sub>f</sub> (10mA)	Wavelength
HE red	30mA	6.0V	7.5V	15V	21	625
Super red	30mA	5.6V	7.5V	15V	31	660

Type	Order code	1+	25+	100+
CC HE red	57-0525	3.15	3.10	2.56
CA Super red	57-0530	4.88	3.51	2.63

029386

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## Power LEDs

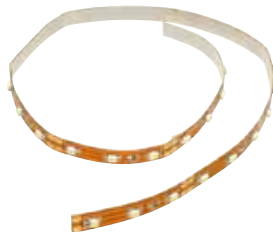


## Flexible LED Strips 30-way

A range of separable LED strips on a flexible printed circuit board. The whole strip contains 30 LEDs and associated circuitry, and the strips are available in a spectrum of colours. Each strip can be separated in to 10 x 3 LEDs pieces and are adhesive backed.

The versatility and operating performance of these LEDs make them ideally suited to a wide range of applications including: channel letter signs, indirect accent decor light, large area back lighting, under counter lighting, building contour delineation, substitution for neon lighting and signage.

- Simple to use, just connect to suitable voltage
- Self-adhesive backing can be fixed almost anywhere
- High intensity output with low power consumption
- Energy saving
- Excellent beam control
- Long life
- Each LED has 120° viewing angle for even light distribution



## Technical specification

Colour	Wavelength (nm)	Lum. int. (per LED) (mcd)	Order code
White	0.30/0.33 *	750	<b>56-0480</b>
Warm white	0.44/0.41 *	600	<b>56-0478</b>

\* Chromaticity coordinates

Input voltage range	12V to 14V DC
Input current range	200mA to 300mA
Power dissipation max.	4.2W
View angle	120°
Operating temperature	-30°C to +50°C
Estimated life	20,000 hours
Dimensions (mm)	500 x 8

Colour	Order code	1+	10+	25+
White	<b>56-0480</b>	15.96	14.36	12.25
Warm white	<b>56-0478</b>	11.86	10.71	10.66

081568



## Flexible LED Strips 24-way

A range of separable LED strips on a flexible printed circuit board. The whole strip contains 24 LEDs and associated circuitry, and the strips are available in white or warm white colours. Each strip can be separated in to 8 x 3 LEDs pieces and are adhesive backed.

The versatility and operating performance of these LEDs make them ideally suited to a wide range of applications including: channel letter signs, indirect accent decor light, large area back lighting, under counter lighting, building contour delineation, substitution for neon lighting and signage.

- Simple to use, just connect to suitable voltage
- Self-adhesive backing can be fixed almost anywhere
- High intensity output with low power consumption
- Energy saving
- Excellent beam control
- Long life
- Each LED has 120° viewing angle for even light distribution



## Technical specification

Colour	Chromaticity coordinates	Lum. int. (per LED) (mcd)	Order code
White	0.30/0.33	750	<b>56-0452</b>
Warm white	0.44/0.41	600	<b>56-0450</b>

Input voltage range	12V to 14V DC
Input current range	166mA to 250mA
Power dissipation max.	3W
View angle	120°
Operating temperature	-30°C to +50°C
Estimated life	30,000 hours
Dimensions (mm)	480 x 8

Colour	Order code	1+	10+	25+
White	<b>56-0452</b>	13.82	12.29	10.24
Warm white	<b>56-0450</b>	13.82	12.29	10.24

081567



## 5m LED Strips

These 5m LED strips are high brightness lighting systems that are available in a selection of colours, including RGB, and with a choice of LED quantity. The low voltage and power consumption together with the high level light output make these LED strips suitable for a wide range of illuminative and indicative lighting applications.

- Each 5m length is terminated by 2.1mm DC jack socket
- Extremely low cost
- Can be cut to length
- Viewing angle 120°
- Available in 300 LEDs per 5m or 600 LEDs per 5m



## Technical specification

Order code	Colour	Length (m)	LED quantity	LED type	Colour temp.	Output (lm/m)	Voltage (V DC)	Current (A/m)	Power max. (W/m)
<b>56-1012</b>	Natural white	5m	300	3528	4000K	330	12	0.4	4.8
<b>56-1014</b>	White	5m	300	3528	5500K	390	12	0.4	4.8
<b>56-1016</b>	Warm white	5m	300	3528	3000K	320	12	0.4	4.8
<b>56-1018</b>	Red	5m	300	3528	-	90	12	0.4	4.8
<b>56-1022</b>	Blue	5m	300	3528	-	80	12	0.4	4.8
<b>56-1028</b>	White	5m	600	3528	5500K	780	12	0.8	9.6
<b>56-1030</b>	Warm white	5m	600	3528	3000K	660	12	0.8	9.6
<b>56-1032</b>	Red	5m	600	3528	-	170	12	0.8	9.6

Colour	No. of LEDs	Order code	1+
Natural white	300	<b>56-1012</b>	21.15
White	300	<b>56-1014</b>	21.15
Warm white	300	<b>56-1016</b>	21.15
Red	300	<b>56-1018</b>	19.94
Blue	300	<b>56-1022</b>	24.32
White	600	<b>56-1028</b>	31.24
Warm white	600	<b>56-1030</b>	29.76

526155



## 12V LED Strip Power Supplies

These 12V power supplies from TT Electronics are ideal for use with the range of LED strips available from Rapid. The various power supply units can tackle anything from 1 to 20 metres of LED tape.

- Variety of fixing options available

Type	Order code	1+
60W	<b>56-2434</b>	20.81
90W	<b>56-2436</b>	27.16

519228



## 1W High Luminosity Power LED Stars

These power star LEDs are high luminosity modules that are mounted on a PCB substrate. Being more energy efficient than incandescent and most halogen lamps and available in a range of colours, including white and warm white, these LEDs are ideal for a wide range of applications including: electronic signs and signals, small area illumination, back lighting and other lighting, bollards, security and garden uses, traffic signalling and beacons.

- High luminous flux
- Super energy efficiency
- Long operational life
- Superior ESD protection
- Superior UV resistance



## Technical specification

Colour	Wavelength (nm)	Lum. flux typ. (lm)	I <sub>f</sub> max. (mA)	V <sub>f</sub> typ. (V)	V <sub>f</sub> max. (V)	View angle
Red	625	50	400	2.5	3.0	120°
Pure green	525	75	400	3.3	4.0	120°
Blue	470	15	400	3.3	4.0	120°
White	0.31/0.33 *	100	400	3.3	4.0	120°
Warm white	0.45/0.41 *	90	400	3.3	4.0	120°

\* Chromaticity coordinates

Colour	Order code	1+	25+	100+	250+
Red	<b>55-2243</b>	2.91	2.67	2.35	2.10
Blue	<b>55-2247</b>	2.91	2.67	2.35	
White	<b>55-2239</b>	2.83	2.59	2.28	2.03
Warm white	<b>55-2241</b>	2.91	2.67	2.35	2.10

200093



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### 3W High Luminosity Power LED Stars

These power star LEDs are high luminosity modules that are mounted on a PCB substrate. Being more energy efficient than incandescent and most halogen lamps and available in a range of colours, including white and warm white, these LEDs are ideal for a wide range of applications including: electronic signs and signals, small area illumination, back lighting and other lighting, bollards, security and garden uses, traffic signalling and beacons.



- High luminous flux
- Super energy efficiency
- Long operational life
- Superior ESD protection
- Superior UV resistance

**Technical specification**

Colour	Wavelength (nm)	Lum. flux typ. (lm)	I <sub>f</sub> max. (mA)	V <sub>f</sub> typ. (V)	V <sub>f</sub> max. (V)	View angle
Red	625	80	800	2.5	3.0	120°
Pure green	525	130	800	3.3	4.0	120°
Blue	470	30	800	3.3	4.0	120°
White	0.31/0.33 *	200	800	3.3	4.0	120°
Warm white	0.45/0.41 *	180	800	3.3	4.0	120°

\* Chromaticity coordinates

Colour	Order code	1+	25+	100+	250+
Red	<b>55-2455</b>	3.68	3.28	3.06	
Green	<b>55-2457</b>	3.68	3.28	3.06	
Blue	<b>55-2253</b>	3.56	3.19	2.96	2.82
White	<b>55-2249</b>	3.56	3.19	2.96	2.82
Warm white	<b>55-2251</b>	3.49	3.17	2.88	2.76



### 1W High Luminous Flux Power LEDs

A range of 1W LEDs that feature high luminous flux with super energy efficient operation.



Suitable applications for these LEDs include: reading lights, portable lighting, security/bollard/ garden, traffic signalling and beacons, signage, etc.

- Silicon lenses
- High luminous flux
- Super energy efficiency
- Long lifetime operation
- Superior ESD protection
- Superior UV resistance
- Beam angle 120°

**Technical specification**

Colour	Wavelength (nm)	Luminous flux (lm) @ I <sub>f</sub> =350mA	I <sub>f</sub> max. (mA)	V <sub>f</sub> typ. (V)	V <sub>f</sub> max. (V)	P <sub>o</sub> (mW)	Order Code
Red (silicon lens)	625	50	400	2.5	3.0	1200	<b>55-1867</b>
Green	525	80	400	3.3	4.0	1600	<b>55-1869</b>
Blue	470	15	400	3.3	4.0	1600	<b>55-1871</b>
White	0.31/0.33 *	80	400	3.3	4.0	1600	<b>55-1873</b>
Warm white	0.45/0.41 *	90	400	3.3	4.0	1600	<b>55-1865</b>

\* Chromaticity coordinates

Type	Order code	1+	25+	100+	250+
High flux red	<b>55-1867</b>	2.44	2.10	1.86	
White 80lm	<b>55-1873</b>	2.08	1.81	1.48	
Warm white 90lm	<b>55-1865</b>	2.44	2.10	1.86	1.69



### 3W 3-LED Round Module

These round type LED modules consist of three power LEDs arranged on an aluminium substrate to produce a module that is ideal for a wide range of applications such as: small space lighting and mechanical equipment lights.



Also available are high efficiency lenses suitable for use with both LED modules. The lenses are available with either a diffused, transparent or crystal diffused surface treatment.

- Super bright
- Green light source
- Fast response
- Long lifetime
- Easy installation
- Large viewing angle
- Superior ESD protection
- Superior UV resistance

**Note:** For longer periods of use it is recommended that thermal management (e.g. heatsink) is employed.

**Technical specification**

Order code	Colour	Chromaticity coordinates	Luminous flux (lm)	I <sub>f</sub> max. (mA)	V <sub>f</sub> typ. (V)	V <sub>f</sub> max. (V)	P <sub>o</sub> max. (W)	View angle
<b>55-2413</b>	White	0.31/0.33	300	400	10	12	4.8	120°
<b>55-2415</b>	Warm white	0.45/0.41	270	400	10	12	4.8	120°

Operating temperature: -10°C to +40°C  
 PCB ø: 31.5mm  
 Weight: 5g

Type	Colour	Order code	1+	5+	10+	15+
3W LED Module	White	<b>55-2413</b>	7.37	5.71	5.00	
3W LED Mod.	Warm white	<b>55-2415</b>	7.37	5.71	5.00	4.72
Diffused LED Lens		<b>55-2421</b>	0.732	0.672	0.609	0.564
Transparent LED Lens		<b>55-2422</b>	0.243			

## LED Accessories

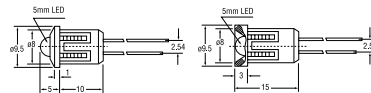


### LED Bezel 5mm

Attractive push fit panel clips for 5mm LEDs in black nylon offering professional appearance at low cost.



- Available in either recessed or prominent position styles
- Mounting hole is 8mm
- **Kingbright types RTF 5010** (prominent) and **RTF 5020** (recessed)



MQQ 5 - In Multiples of 5					
Type	Order code	5+	100+	1000+	5000+
5mm Prominent clip	<b>55-0260</b>	0.322	0.262	0.214	0.202
5mm Recessed clip	<b>55-0265</b>	0.276	0.187	0.155	



### Solderless LED Holders

Novel LED connectors, with 200mm pre-stripped and tinned leads.



The connectors simply clip to the rear of a panel-mounted LED and are retained in position by a patented clamping device.

- Suitable for use with all LEDs with leads on a 2.54mm pitch
- Significantly reduces panel assembly time
- Dimensions 14.5 x 2.6mm
- Moulded in Toray
- **UL 94V-0** rating

MQQ 5 - In Multiples of 5					
Cable size	Order code	5+	25+	100+	1000+
26 AWG	<b>55-0167</b>	0.698	0.578	0.513	0.48

MQQ 5					
Type	Order code	10+	100+	1000+	5000+
22 AWG	<b>55-9290</b>	0.691	0.588	0.508	0.485



### Rapid Assembly LED Clip

A panel mounting single part LED clip available in a 5mm style employing a novel design enabling the user to mount the LED assembly from front or rear.



- Panel cut-out 8mm
- Maximum panel thickness 1.2mm
- Manufactured in black samporene

MQQ 10 - In Multiples of 5					
Type	Order code	10+	100+	1000+	5000+
5mm Rapid assembly clip	<b>55-0295</b>	0.151	0.133	0.112	0.071

## Pricing

Pricing correct at time of going to press. For up-to-date pricing visit [www.rapidonline.com](http://www.rapidonline.com)













### CR25 0.25W Carbon Film Resistors Packs of 100



Miniature high stability 0.25W carbon film resistors for industrial and consumer electronic equipment. A zero-Ohm resistor is also available which is a useful alternative to jumper or wire links on PCBs.

- 5% tolerance
- 0.25W rated
- Supplied in **packs of 100**

**Technical specification**

Power rating	0.25W
Resistance range	0Ω - 10MΩ
Tolerance	±5%
Temperature coefficient	±400 ppm/°C
Operating voltage max.	300V
Temperature range	-25°C to +70°C
Dimensions	body 6.5 x 2.3mm leads 30 x 0.6mm

**Price per pack of 100**

Value (Ω)	Order code	1+
<b>0R-82R</b>		
1R	62-0303	0.83
1R2	62-0304	0.83
1R5	62-0305	0.83
1R8	62-0306	0.83
2R2	62-0307	0.83
2R7	62-0308	0.83
3R3	62-0309	0.83
3R9	62-0310	0.83
4R7	62-0320	0.83
5R6	62-0313	0.83
6R8	62-0324	0.83
8R2	62-0316	0.83
10R	62-0326	0.83
12R	62-0319	0.83
15R	62-0328	0.83
18R	62-0322	0.83
22R	62-0330	0.83
27R	62-0332	0.83
33R	62-0334	0.83
39R	62-0336	0.83
47R	62-0338	0.83
56R	62-0340	0.83
68R	62-0342	0.83
75R	62-0295	0.83
82R	62-0344	0.83
<b>100R-820R</b>		
100R	62-0346	0.83
120R	62-0348	0.83
150R	62-0350	0.83
180R	62-0352	0.83
220R	62-0354	0.83
270R	62-0356	0.83
330R	62-0358	0.83
390R	62-0360	0.83
470R	62-0362	0.83
560R	62-0364	0.83
680R	62-0366	0.83
820R	62-0368	0.83
<b>1K-8K2</b>		
1K	62-0370	0.83
1K2	62-0372	0.83
1K5	62-0374	0.83
1K8	62-0376	0.83
2K2	62-0378	0.83
2K7	62-0380	0.83
3K3	62-0382	0.83
3K9	62-0384	0.83
4K7	62-0386	0.83
5K6	62-0388	0.83
6K8	62-0390	0.83
8K2	62-0392	0.83
<b>10K-82K</b>		
10K	62-0394	0.83
12K	62-0396	0.83
15K	62-0398	0.83

18K	62-0400	0.83
22K	62-0402	0.83
27K	62-0404	0.83
33K	62-0406	0.83
39K	62-0408	0.83
47K	62-0410	0.83
56K	62-0412	0.83
68K	62-0414	0.83
82K	62-0416	0.83
<b>100K-820K</b>		
100K	62-0418	0.83
120K	62-0420	0.83
150K	62-0422	0.83
180K	62-0424	0.83
220K	62-0426	0.83
270K	62-0428	0.83
330K	62-0430	0.83
390K	62-0432	0.83
470K	62-0434	0.83
560K	62-0436	0.83
680K	62-0438	0.83
820K	62-0440	0.83
<b>1M-10M</b>		
1M	62-0442	0.83
1M2	62-0444	0.83
1M5	62-0446	0.83
1M8	62-0448	0.83
2M2	62-0450	0.83
2M7	62-0452	0.83
3M3	62-0454	0.83
3M9	62-0456	0.83
4M7	62-0458	0.83
5M6	62-0460	0.83
6M8	62-0462	0.83
10M	62-0466	0.83



### CR50 0.5W Carbon Film Resistors Box of 1000



Miniature high stability 0.5W carbon film resistors for industrial and consumer electronic equipment.

- 5% tolerance
- 0.5W rated
- Supplied in **boxes of 1000**

**Technical specification**

Power rating @ 70°C	0.5W
Resistance range	4.7Ω to 8.2MΩ
Tolerance	±5%
Temperature coefficient	10Ω below ±200ppm/°C 56KΩ below ±300ppm/°C 68K-470KΩ -500ppm/°C 560K-1MΩ -700ppm/°C 1M2Ω up -1000ppm/°C
Operating voltage max.	350V
Temperature range	-25°C to +70°C
Dimensions	body 8.8 x 2.8mm leads 27 x 0.6mm

**Price each**

Value (Ω)	Order code	1+	5+
4R7	62-0513	6.10	5.16
5R6	62-0501	8.22	
10R	62-0521	8.22	
<b>Value (Ω)</b>			
15R	62-0525	7.21	6.01
22R	62-0527	8.22	6.85
33R	62-0529	6.21	
47R	62-0531	8.22	
82R	62-0519	6.01	5.01
100R	62-0537	8.22	6.85
120R	62-0533	8.22	
180R	62-0543	8.22	
220R	62-0545	8.22	6.85
270R	62-0547	8.22	6.85
330R	62-0549	8.22	
390R	62-0539	8.22	
470R	62-0551	8.22	
560R	62-0553	7.97	
680R	62-0555	8.22	

820R	62-0557	6.01	5.01
1K	62-0559	8.22	6.85
1K2	62-0561	8.22	

**MOQ 10**

Value (Ω)	Order code	10+
1K5	62-0563	5.16

**Price each**

Value (Ω)	Order code	1+	10+
1K8	62-0565	6.96	5.79
2K2	62-0567	8.22	6.85
2K7	62-0569	3.38	
3K3	62-0571	3.95	
3K9	62-0573	3.60	
4K7	62-0575	8.22	
5K6	62-0577	7.84	
6K8	62-0579	8.22	
8K2	62-0581	4.18	
10K	62-0583	8.22	

**MOQ 10**

Value (Ω)	Order code	10+
12K	62-0585	3.83

**Price each**

Value (Ω)	Order code	1+	10+
15K	62-0587	3.34	3.34
18K	62-0589	5.49	
22K	62-0591	8.22	
27K	62-0593	3.96	
33K	62-0595	8.22	
39K	62-0597	3.07	
47K	62-0599	8.22	
56K	62-0601	7.84	
68K	62-0603	8.22	6.85
100K	62-0607	8.22	
120K	62-0609	3.07	
150K	62-0611	8.22	
220K	62-0615	3.34	
330K	62-0619	8.75	7.27

**MOQ 10**

Value (Ω)	Order code	10+
390K	62-0621	5.16

**Price each**

Value (Ω)	Order code	1+	10+
430K	62-0492	6.33	5.27
470K	62-0623	2.93	
<b>Value (Ω)</b>			
560K	62-0625	5.07	

**Price each**

Value (Ω)	Order code	1+	10+
680K	62-0627	6.96	5.78
820K	62-0629	3.66	
1M	62-0631	8.22	

**MOQ 10**

Value (Ω)	Order code	10+
1M2	62-0633	6.37

**Price each**

Value (Ω)	Order code	1+
4M7	62-0647	3.07



### CR25 Carbon Film Resistor Kit



CR25 TruOhm CR25 series carbon film resistor kit containing 1000 pieces supplied in 8 packs containing 0.25W 5% Carbon Film Resistors.

These range from 4.7R to 10M, equalling a total of 63 different values throughout the resistor range provided.





## Potentiometers



ALPHA

### 16mm Commercial Potentiometers 20% Metal Case PCB Mounting

A range of  $\phi 16\text{mm}$  carbon track single potentiometers suitable for PCB mounting in commercial applications. Offered in a range of popular values with 20% tolerance.



- Choice of Linear or Log taper
- Metal case
- Supplied with serrated 6mm diameter shaft
- Bush mount

#### Technical specification

Dimensions	17 x 16.5mm
Pitch	5mm
Tolerance	20%
Power rating	0.125W linear, 0.06W log.
Maximum voltage	150V
Electrical rotation	300° $\pm 5^\circ$
Rotation torque	20-200gm/cm
Temperature range	-25°C to +70°C

Value ( $\Omega$ )	Taper	Order code	1+	50+	250+
470R	Lin	65-0700	0.907	0.68	0.567
1K	Lin	65-0705	0.907	0.68	0.567
4K7	Lin	65-0710	0.907	0.68	0.567
10K	Lin	65-0715	0.907	0.68	0.567
22K	Lin	65-0720	0.907	0.68	0.567
47K	Lin	65-0725	0.907	0.68	0.567
100K	Lin	65-0730	0.907	0.68	0.567
220K	Lin	65-0735	0.907	0.68	0.567
470K	Lin	65-0740	0.907	0.68	0.567
1M	Lin	65-0745	0.907	0.68	0.567
4K7	Log	65-0810	0.907	0.68	0.567
10K	Log	65-0811	0.907	0.68	0.567
22K	Log	65-0820	0.907	0.68	0.567
47K	Log	65-0812	0.907	0.68	0.567
100K	Log	65-0830	0.907	0.68	0.567
470K	Log	65-0813	0.907	0.68	0.567
1M	Log	65-0845	0.907	0.68	0.567

#### Technical specification

Dimensions	$\phi 24\text{mm}$
Tolerance	20%
Power rating	0.5W linear, 0.25W log.
Maximum voltage	125V AC
Electrical rotation	300° $\pm 5^\circ$
Rotation torque	20 to 200gm/cm
Temperature range	-25°C to +70°C

Value	Taper	Order code	1+	50+	250+
470 $\Omega$	Lin	65-0500	0.839	0.669	0.60
1K	Lin	65-0505	0.839	0.669	0.60
4K7	Lin	65-0510	0.839	0.669	0.60
10K	Lin	65-0515	0.839	0.669	0.60
22K	Lin	65-0520	0.839	0.669	0.60
4K7	Lin	65-0525	0.839	0.669	0.60
100K	Lin	65-0530	0.839	0.669	0.60
220K	Lin	65-0535	0.839	0.669	0.60
470K	Lin	65-0540	0.839	0.669	0.60
1M	Lin	65-0545	0.884	0.702	0.634
2M2	Lin	65-0550	0.884	0.702	0.634
2M2	Lin	65-3019	0.83	0.66	0.60

Value	Taper	Order code	1+	50+	100+
1K	Log	65-2661	0.816	0.658	0.594
4K7	Log	65-2662	0.816	0.658	0.594

Value	Taper	Order code	1+	50+	250+
10K	Log	65-0615	0.839	0.669	0.60
22K	Log	65-0651	0.839	0.669	0.60
47K	Log	65-0625	0.839	0.669	0.60
100K	Log	65-0630	0.839	0.669	0.60
220K	Log	65-0652	0.839	0.669	0.60
470K	Log	65-0635	0.839	0.669	0.60
1M	Log	65-0645	0.884	0.702	0.634
2M2	Log	65-0650	0.884	0.702	0.634

065224



### Wirewound Potentiometers

Wirewound potentiometers in various values. The encased pots have a nominal width of 24 mm.



- Solder tag terminals
- Angle of rotation (electrical) 280° ( $\pm 5^\circ$ )
- Metal axle diameter 6mm
- Electrical load capacity 4W
- Nominal resistances 10 $\Omega$  to 25k $\Omega$
- Resistance tolerance  $\pm 10\%$
- Linearity  $\pm 2\%$
- Continuous voltage 500V
- Electrical adjustment range 280° ( $\pm 5^\circ$ )
- Case diameter 24mm
- Spindle length 42mm
- Spindle diameter 6mm
- Thread size M10 x 0.75
- Test voltage 1kV/AC

Value	Order code	1+	25+	50+
10R	50-3980	8.59	8.01	
25R	50-3981	6.25	5.95	
50R	50-2303	4.84	4.35	
100R	50-3982	6.84	6.35	5.59
250R	50-3983	6.69	6.23	
500R	50-3984	6.34	5.99	
1K	50-3985	7.75	6.50	
5K	50-3986	5.74	4.55	
25K	50-3988	5.10	4.90	

519692



### Carbon Preset Potentiometers

Miniature single turn carbon track preset potentiometers.

- Horizontal mounting
- Linear law
- 30% tolerance
- 0.1W rated



#### Technical specification

Dimensions	8.2 x 11.2 x 2.6mm
Pitch	5 x 10mm
Tolerance	$\pm 30\%$
End resistance	>20 $\Omega$
Power rating	0.1W
Maximum operating voltage	100V AC, 20V DC
Electrical rotation	250 $\pm 5^\circ$
Rotational torque	30-60 gf/cm

MQ0 5 - In Multiples of 5					
Value ( $\Omega$ 0mega)	Order code	5+	100+	500+	1000+
100R	67-0400	0.122	0.097	0.066	
220R	67-0402	0.122	0.097	0.066	
470R	67-0404	0.122	0.097	0.066	
1K	67-0406	0.122	0.097	0.066	
2K2	67-0408	0.155	0.12	0.095	
4K7	67-0410	0.122	0.097	0.066	0.059
10K	67-0412	0.122	0.097	0.066	0.059
22K	67-0414	0.122	0.097	0.066	
47K	67-0416	0.155	0.12	0.095	0.076
100K	67-0418	0.122	0.097	0.066	0.059
200K	67-0420	0.122	0.097	0.066	
500K	67-0422	0.122	0.097	0.066	0.059
1M	67-0424	0.122	0.097	0.066	0.059

060285



### 3/8in Single Turn Finger Adjustable Cermet Potentiometer

A range of fully enclosed single turn potentiometers that feature a finger adjustment knob with adjustment slot. Suitable for a wide range of applications.



- Single turn adjustment
- 10% tolerance
- 0.1 x 0.2in pitch spacing
- UL 94V-0 flammability

#### Technical specification

Withstand voltage	600V AC
Insulation resistance	$\geq 1G\Omega$
Effective travel	300°
Power rating	0.5W
Temperature range	-55°C to +125°C
Temperature coefficient	$\pm 100\text{ppm}/^\circ\text{C}$
Starting torque	$\leq 35\text{mNm}$

Type	Order code	1+	25+	100+	500+
<b>3386FT series</b>					
500R	68-0238	0.742	0.621	0.552	
1K	68-0239	0.742	0.621	0.552	0.498
2K	68-0240	0.742	0.621	0.552	
5K	68-0241	0.742	0.621	0.552	0.498
10K	68-0242	0.599	0.496	0.441	0.401
20K	68-0243	0.724	0.606	0.539	0.488
50K	68-0244	0.742	0.621	0.552	
100K	68-0245	0.742	0.621	0.552	
1M	68-0248	0.742	0.621	0.552	

081422

## Lead-free Solder

See page 178

19SWG 12g tube only

# £3.08

Order code 85-1165

22SWG 100g from only

# £6.37

Order code 85-1166

22SWG 500g from only

# £30.65

Order code 85-1168

18SWG 100g from only

# £6.29

Order code 85-1162

18SWG 500g from only

# £30.51

Order code 85-1164



Discretes



Selected brands

Low Power NPN Transistors

Low power, small signal, general purpose and RF, NPN transistors.

- Low power NPN transistors



Technical specification

Table with columns: Device, Mfr., Case style, Vce max (V), Vc max (V), Vb max (V), Ic max (mA), Pdc max (mW), hie min @Ic (mA), fT MHz. Includes various transistor models like 2N2222A, BC107, BC108, etc.

MOQ 5 - In Multiples of 5

Table with columns: Type, Order code, 5+, 25+, 100+, 500+. Lists part numbers like 2N2222A, BC107, BC108, etc. with their respective order codes and quantities.

MOQ 20 - In Multiples of 10

Table with columns: Type, Order code, 20+, 60+, 100+, 500+. Lists various transistor models with their order codes and quantity options.



Selected brands

Medium Power NPN Transistors

Medium power, NPN transistors.



Technical specification

Table with columns: Device, Mfr., Case style, Vce max (V), Vc max (V), Vb max (V), Ic max (A), Pdc max (W), hie min @Ic (mA), fT (MHz). Includes models like BFY52, ZTX689B, BC639, etc.

Price each

Table with columns: Type, Order code, 1+, 25+, 100+, 500+. Lists BFY52 with prices for different quantities.

MOQ 5 - In Multiples of 5

Table with columns: Type, Order code, 5+, 25+, 100+, 500+. Lists ZTX689B and BFY51 with prices.

MOQ 2000

Table with columns: Type, Order code, 2000+. Lists BFY50 with price.

MOQ 5 - In Multiples of 5

Table with columns: Type, Order code, 5+, 25+, 100+, 500+. Lists ZTX450, ZTX451, BFY85, ZTX651, BC639 with prices.



Selected brands

Darlington NPN Transistors

NPN Darlington transistors.



Technical specification

Table with columns: Order code, Device, Mfr., Case style, Vce, Vc, Vb, Ic, Pdc, hie, F. Lists models like 81-0143, 81-0004, 81-0106, etc.

MOQ 5 - In Multiples of 5

Table with columns: Type, Order code, 5+, 25+, 100+, 500+. Lists various Darlington transistor models with their order codes and prices.



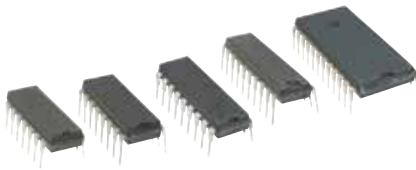
## Integrated Circuits



## Selected brands

## 4000 Series CMOS Logic Family

4000 Series CMOS logic devices with a DC supply voltage rating of up to 20V. The family has a large number of functions including analogue switches, monostable multivibrators, level converters, counters, timers, display drivers, and phase-locked loops (PLLs).



- Through hole packages
- CMOS technology for low power consumption
- Wide operating voltage range
- Applications include instrumentation, control and communications

## Technical specification

Device	Function	Package	Mftr.	Order code
4001B	Quad 2 input Nor gate	DIL-14	TI	83-0316
4007UBE	Two CMOS pairs plus inverter	DIL-14	TI	51-6311
4011B	Quad 2-input NAND gate	DIL-14	TI	83-0328
4012BE	Dual 4 input NAND gates	DIL-14	TI	51-6314
4013BE	Dual D type flip flop	DIL-14	TI	83-0332
4014B	8-bit shift register	DIL-16	TI	83-0334
4015BE	Dual 4 stage shift reg. (serial in/parallel out)	DIL-16	TI	83-0337
4017B	Decade counter/divider	DIL-16	TI	83-0340
4023B	Triple 3-input NOR gate	DIL-14	TI	83-0353
4024B	7 stage binary counter	DIL-14	TI	83-0354
4025B	Triple 3-input NOR gate	DIL-14	ST	83-0356
4026B	Decade ctr w dec 7 seg output	DIL-16	TI	83-0359
4027BE	Dual JK master/slave flip flops	DIL-16	TI	51-6312
4028B	BCD-to-decimal decoder	DIL-16	NXP	83-0363
4030B	Quad XOR gate	DIL-14	ST	83-0366
4035BE	4 stage shift register (parallel in/parallel out)	DIL-16	TI	51-6318
4041UB	Quad true/complement buffer	DIL-14	TI	83-0800
4042B	Quad clocked D-type latches	DIL-16	ST	83-0370
4044BE	Quad NAND SR latches	DIL-16	TI	51-6014
4046B	Micropower PLL	DIL-16	ST	83-0376
4047B	Monostable/astable	DIL-14	TI	83-0378
4049UB	Hex inverters/buffers	DIL-16	TI	83-0380
4051B	Analogue MUX/DEMUX	DIL-16	TI	83-0384
4053B	Analogue MUX/DEMUX	DIL-16	TI	83-0388
4056B	7-segment display driver	DIL-16	TI	83-0812
4060B	14 stage ripple carry binary ctr	DIL-16	TI	83-0390
4070B	Quad 2-input XOR gate	DIL-14	TI	83-0400
4081B	Quad 2-input AND gate	DIL-14	TI	83-0414
4093B	Quad 2-input NAND Schmitt	DIL-14	TI	83-0420
4094B	8 stage shift-store bus register	DIL-16	TI	83-0422
40106B	Hex Schmitt trigger	DIL-14	TI	83-0482
4508B	Dual 4-bit latch	DIL-24	TI	83-0848
4510B	BCD up/down counter	DIL-16	TI	83-0442
4511B	BCD to 7 segment dec/driver	DIL-16	TI	83-0436
4516B	Binary up/down counter	DIL-16	TI	83-0445
4536BE	Programmable 24bit timer	DIL-16	TI	51-6323
4538B	Dual monostable multivibrator	DIL-17	TI	83-0466
4541B	Programmable timer	DIL-14	TI	83-0468

## MQQ 5 - In Multiples of 5

Type	Order code	5+	25+	100+	500+
4001B	83-0316	0.353	0.261	0.198	
4011B	83-0328	0.336	0.30	0.261	
4013BE	83-0332	0.363	0.265	0.22	
4014B	83-0334	0.418	0.34	0.249	
4017B	83-0340	0.401	0.349	0.231	0.208
4023B	83-0353	0.394	0.348	0.237	
4024B (TI)	83-0354	0.354	0.302	0.242	
4025B	83-0356	0.333	0.236	0.197	
4026B	83-0359	0.326	0.244	0.208	
4027BE	51-6312	0.304	0.265	0.243	
4030B	83-0366	0.372	0.271	0.226	
4042B	83-0370	0.676	0.512	0.399	
4044BE	51-6014	0.415	0.327	0.297	
4046B	83-0376	0.42	0.335	0.222	
4049UB (TI)	83-0380	0.31	0.251	0.23	
4051B	83-0384	0.494	0.364	0.217	
4053B (TI)	83-0388	0.396	0.31	0.226	0.202
4056B	83-0812	0.41	0.299	0.283	
4060B (TI)	83-0390	0.287	0.224	0.177	
4070B	83-0400	0.356	0.238	0.179	
4081B	83-0414	0.473	0.343	0.245	0.18
4093B	83-0420	0.343	0.261	0.189	0.186
4094B	83-0422	0.372	0.256	0.202	0.156
40106B (TI)	83-0482	0.451	0.361	0.218	0.205
4510B	83-0442	0.417	0.33	0.226	
4511B	83-0436	0.442	0.246	0.192	
4516B (TI)	83-0445	0.407	0.322	0.222	
4538B	83-0466	0.719	0.522	0.419	

077018

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## ST Stepper Motor Control/Driver

The L293D is a monolithic integrated, high voltage, high current, 4-channel driver.

- L293E is a quad push-pull driver capable of delivering output currents up to 1A per channel
- L297 generates four phase drive signals for two phase bipolar and four phase unipolar stepper motors in microcomputer controlled applications



## Technical specification

Device	Function	Package	Order code
L293D	Accepts DTL/TTL logic levels, will drive inductive loads, DC and stepper motors, switching power transistors.	DIL-16	82-0192
L293E	TTL compatible control, inhibit input on each pair of drivers, external connections for sensing resistors.	DIL-20	82-0194
L297	Motor can be driven in half-step, normal and wave drive modes, on-chip PWM chopper circuits permit switch-mode control of the current in the windings. Requires only clock, direction and mode input signals.	DIL-20	82-0198

Type	Order code	1+	10+	25+	100+
L293D	82-0192	3.58	2.45	2.13	1.63
L293E	82-0194	2.88	2.28	2.13	
L297	82-0198	6.91	5.75	5.49	

034419

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## Relays & Solenoids



### Miniature Relays DPDT

A range of industry standard vertical PCB or socket mounted relays.

- The **Finder 40.52** series incorporate 8mm isolation gap between coil and contacts as required by **VDE0700**
- Housed in a dustproof **IP40** tinted case (AC versions have an orange tint)
- Widely approved including **VDE, BEAB, UL, CSA, SEV, NF-USE, SETI, IMQ, SEMKO** and **DEMKO**
- **Finder 40.52** series



#### Technical specification

Dimensions	29 x 12.4 x 25mm
Contact rating	8A at 240V AC/30V DC
Contact arrangement	Double pole changeover
Contact material	Silver nickel
Operate/release time	10ms/7ms
Coil operating range	70-150%
Coil consumption	500mW*/650mW/1.2VA**
Temperature range	-20°C to +70°C

Coil	Resistance	Order code	1+	25+	100+	250+
6V DC	55Ω	<b>60-1110</b>	5.40	4.54	4.16	
12V DC	300Ω	<b>60-1115</b>	3.78	3.24	2.93	
24V DC	1200Ω	<b>60-1140</b>	3.56	2.54	2.42	2.35
48V DC	3500Ω	<b>60-1145</b>	5.17	4.16	3.60	
60V DC	5500Ω	<b>49-4248</b>	3.41	3.03	2.73	
12V AC	80Ω	<b>49-4250</b>	6.71	5.90	5.24	
24V AC	320Ω	<b>60-1170</b>	4.71	3.71	3.49	
120V AC	9000Ω	<b>49-4251</b>	8.29	7.53	6.92	
240V AC	31500Ω	<b>60-1180</b>	8.11	7.06	6.74	6.53

029524



### Miniature PCB Power Relay SPDT

Power relay with a very low power consumption, 360mW coil for PCB mounting.

- Offered in two switching capacities with either 10A or 15A contacts
- Sealed construction suitable for flow soldering
- **UL approved**



#### Technical specification

##### Contact ratings

Series	RW	RWH
Rated current	10A	15A
Voltage max.	240V AC 110V DC	240V AC 110V DC
Power max.	1500VA 240W	1800VA 360W
Minimum switching load	10mA 5V DC	15mA 5V DC
Contact material	Ag alloy	AgSnO <sub>2</sub>
Contact form	SPDT	SPDT

##### Coil specification

Series	Voltage nom. (V DC)	Current nom. (mA)	Coil resistance (Ω)	Power (W)	Pull-in voltage (V DC)	Drop-out voltage (V DC)	Voltage max. (V DC)	Order code
RW	6	60	100	0.36	75% max.	5% min.	130%	<b>60-4660</b>
RW	12	30	400	0.36	75% max.	5% min.	130%	<b>60-4662</b>
RW	24	15	1600	0.36	75% max.	5% min.	130%	<b>60-4664</b>
RWH	5	73	70	0.36	75% max.	5% min.	130%	<b>60-4661</b>
RWH	6	60	100	0.36	75% max.	5% min.	130%	<b>60-4666</b>
RWH	12	30	400	0.36	75% max.	5% min.	130%	<b>60-4668</b>
RWH	24	15	1600	0.36	75% max.	5% min.	130%	<b>60-4670</b>

##### Performance

Contact resistance	100mΩ max.
Dielectric strength (coil and contact)	1000V AC
Surge resistance	3000V
Insulation resistance	100MΩ min.
Temperature range	-30°C to +55°C
Mechanical life	10 <sup>6</sup>
Electrical life	10 <sup>6</sup>
Dimensions	19 x 15.4 x 15.5mm
Weight	11g

#### MOQ 5 - In Multiples of 5

Coil	Resistance	Order code	5+	25+	100+	250+
<b>RW Series 10A contacts</b>						
6V DC	100Ω	<b>60-4660</b>	0.903	0.85	0.784	
12V DC	400Ω	<b>60-4662</b>	0.723	0.678	0.644	0.622
24V DC	1600Ω	<b>60-4664</b>	0.817	0.766	0.716	
<b>RWH Series 15A contacts</b>						
5V DC	70Ω	<b>60-4661</b>	0.798	0.748	0.697	0.613
6V DC	100Ω	<b>60-4666</b>	0.886	0.812	0.746	
12V DC	400Ω	<b>60-4668</b>	0.721	0.65	0.609	0.553
24V DC	1600Ω	<b>60-4670</b>	0.703	0.654	0.621	0.60

035148



### Subminiature Relay DPCO 1A - GS

A range of compact, lightweight double pole changeover relays to give high density PCB mounting.

- Coil consumption is 360mW
- 92/8 gold silver alloy on silver palladium contacts allows low level switching (1V DC 1mA)
- Casing is epoxy resin sealed for washing
- **BT47** style relays
- **GS-D** series



#### Technical specification

Dimensions	20.3 x 10.1 x 15.6mm
Contact rating	1A 24V DC/120V AC
Max. switching power	30W
Contact arrangement	Double pole changeover
Contact material	Ag Alloy
Operate/release time	6ms/4ms max.
Pull in voltage	75% max.
Drop out voltage	10% min.
Life expectancy	10 <sup>7</sup> operations
	Electrical 10 <sup>6</sup> operations

Coil	Resistance	Order code	1+	25+	100+	240+
5V DC	70Ω	<b>60-4690</b>	1.10	0.934	0.866	
12V DC	400Ω	<b>60-4692</b>	1.10	0.988	0.921	0.866
24V DC	1600Ω	<b>60-4694</b>	1.39	1.16	0.957	

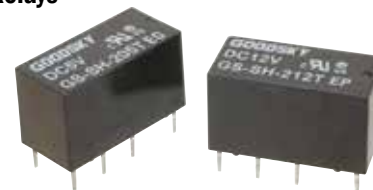
035156



### Subminiature DPDT 2A Relays

A compact lightweight relay for high density PCB mounting.

- Low coil power consumption
- Available in 5V, 12V and 24V versions
- Fully sealed construction
- Applications include telecommunications and audio equipment
- **UL approved**



#### Technical specification

	<b>GS-SH-205T</b>	<b>GS-SH-212T</b>	<b>GS-SH-224T</b>
Nominal voltage	5V DC	12V DC	24V DC
Max. allowable voltage	150%	150%	150%
Coil resistance	125Ω ±10%	720Ω ±10%	2880Ω ±10%
Contact arrangement	DPDT	DPDT	DPDT
Contact material	Ag alloy	Ag alloy	Ag alloy
Operate time	8ms max.	8ms max.	8ms max.
Release time	4ms max.	4ms max.	4ms max.
Nominal current	40mA	16.7mA	8.3mA
Coil operating range	150% max.	150% max.	150% max.
Temperature range	-30°C to +80°C	-30°C to +80°C	-30°C to +80°C
Mechanical life	10 <sup>7</sup> operations at no load condition	10 <sup>7</sup> operations at no load condition	10 <sup>7</sup> operations at no load condition
Electrical life	10 <sup>6</sup> operations at rated resistive load	10 <sup>6</sup> operations at rated resistive load	10 <sup>6</sup> operations at rated resistive load
Dimensions	21 x 12 x 10mm	21 x 12 x 10mm	21 x 12 x 10mm

Mfrs. pt. no.	Coil	Order code	1+	25+	100+	250+
GS-SH-205T	5V DC	<b>60-4754</b>	1.81	1.45	1.25	1.11
GS-SH-212T	12V DC	<b>60-4756</b>	1.41	1.26	1.08	0.978
GS-SH-224T	24V DC	<b>60-4758</b>	1.70	1.37	1.26	1.17

071347





### Cylindrical Linear Solenoids

A comprehensive range of cylindrically-bodied solenoids. There is a choice of push or pull linear actuators and the further choice of diameter and voltage means that there is a solenoid to suit any of the many applications that these devices are designed for.



- Closed design
- Higher efficiency than bar magnets
- Can be used in harsh environments
- Installation via screw caps
- Push type includes return spring
- Fixings M3

Technical specification

Order code	50-6034	50-6036	50-6035	50-6037	50-6040
Type	Pull	Pull	Push	Push	Push
Nominal voltage	6V DC	12V DC	6V DC	12V DC	24V DC
Stroke	4mm	4mm	4mm	4mm	4mm
Start/end force	0.4N/2N	0.4N/2N	0.4N/2N	0.4N/2N	0.4N/2N
Nominal power	4W	4W	4W	4W	4W
Dimensions ø x L	13 x 33mm	13 x 33mm	13 x 33mm	13 x 33mm	13 x 33mm
Limit temperature	130°C	130°C	130°C	130°C	130°C

Order code	50-6052	50-6054	50-6051
Type	Pull	Pull	Push
Nominal voltage	12V DC	24V DC	12V DC
Stroke	9 to 16mm	9 to 16mm	9 to 16mm
Start/end force	0.5N/6N	0.5N/6N	0.5N/6N
Nominal power	5.5W	5.5W	5.5W
Dimensions ø x L	16 x 42	16 x 42	16 x 42
Limit temperature	130°C	130°C	130°C

Order code	50-6039	50-6046	50-6041	50-6045	50-6047	50-6042
Type	Pull	Pull	Pull	Push	Push	Push
Nominal voltage	6V DC	12V DC	24V DC	6V DC	12V DC	24V DC
Stroke	10mm	10mm	10mm	10mm	10mm	10mm
Start/end force	0.6N/11N	0.6N/11N	0.6N/11N	0.6N/11N	0.6N/11N	0.6N/11N
Nominal power	7W	7W	7W	7W	7W	7W
Dimensions ø x L	20 x 49	20 x 49	20 x 49	20 x 49	20 x 49	20 x 49
Limit temperature	130°C	130°C	130°C	130°C	130°C	130°C

Order code	50-6048	50-6050	50-6043	50-6049	50-6033	50-6044
Type	Pull	Pull	Pull	Push	Push	Push
Nominal voltage	6V DC	12V DC	24V DC	6V DC	12V DC	24V DC
Stroke	18mm	18mm	18mm	18mm	18mm	18mm
Start/end force	0.78N/22N	0.78N/22N	0.78N/22N	0.78N/22N	0.78N/22N	0.78N/22N
Nominal power	10W	10W	10W	10W	10W	10W
Dimensions ø x L	25 x 61	25 x 61	25 x 61	25 x 61	25 x 61	25 x 61
Limit temperature	130°C	130°C	130°C	130°C	130°C	130°C

Voltage (V DC)	Solenoid type	Order code	1+	25+
<b>ø13mm</b>				
6	Pull 4mm	50-6034	8.86	6.95
12	Pull 4mm	50-6036	9.49	8.76
6	Push 4mm	50-6035	9.43	8.65
12	Push 4mm	50-6037	10.98	9.33
24	Push 4mm	50-6040	9.17	8.40
<b>ø16mm</b>				
12	Pull 9 to 16mm	50-6052	10.18	9.34
24	Pull 9 to 16mm	50-6054	8.95	8.22
12	Push 9 to 16mm	50-6051	9.47	8.70
<b>ø20mm</b>				
6	Pull 10mm	50-6039	20.22	18.53
24	Pull 10mm	50-6041	10.27	9.63
12	Push 10mm	50-6047	12.20	11.67
24	Push 10mm	50-6042	11.93	10.93
<b>ø25mm</b>				
6	Pull 18mm	50-6048	13.88	11.65
12	Pull 18mm	50-6050	12.81	11.75
24	Pull 18mm	50-6043	13.96	11.06
6	Push 18mm	50-6049	13.16	12.14
12	Push 18mm	50-6033	15.31	14.03
24	Push 18mm	50-6044	12.01	11.13



### Linear Solenoids Open Frame

This series of open-frame linear solenoids are economical and lightly constructed devices that are suitable for a very wide range of applications.

- Metal bracket
- Includes damping ring
- Open mounting position with closed yoke



Order code	50-6097	50-6090	50-6085	50-6086
Type	Push	Push	Pull	Push
Nominal voltage	12V DC	12V DC	12V DC	12V DC
Stroke	2 to 3mm	15mm	1.5mm	1.5mm
Start/end force	0.1N/0.9N	0.2N/10.22N	0.18N/2N	0.18N/2N
Nominal power	0.8W	4.5W	1.1W	1.1W
Dimensions L x W x H	20 x 10 x 8mm	40 x 29.5 x 24.2mm	22 x 11 x 10mm	22 x 11 x 10mm
Limit temperature	130°C	130°C	130°C	130°C

Order code	50-6096	50-6089	50-6092	50-6093
Type	Push	Push	Push	Pull
Nominal voltage	24V DC	12V DC	24V DC	12V DC
Stroke	18mm	15mm	15mm	18mm
Start/end force	2N/56N	0.2N/10.22N	0.2N/10.22N	2N/56N
Nominal power	8W	4.5W	4.5W	8W
Dimensions L x W x H	64 x 38 x 30mm	40 x 29.5 x 24.2mm	40 x 29.5 x 24.2mm	64 x 38 x 30mm
Limit temperature	130°C	130°C	130°C	130°C

Order code	50-6095	50-6094
Type	Pull	Push
Nominal voltage	24V DC	12V DC
Stroke	18mm	18mm
Start/end force	2N/56N	2N/56N
Nominal power	8W	8W
Dimensions L x W x H	64 x 38 x 30mm	64 x 38 x 30mm
Limit temperature	130°C	130°C

Voltage DC	Solenoid type	Order code	1+	25+	100+
<b>20 x 10 x 8mm</b>					
12	Push	50-6097	2.49	2.29	2.12
<b>22 x 11 x 10mm</b>					
12	Pull	50-6085	5.24	4.79	
12	Push	50-6086	6.47	5.96	
<b>40 x 29.5 x 24.2mm</b>					
12	Pull	50-6089	12.63	11.60	
12	Push	50-6090	10.77	9.16	
24	Push	50-6092	10.98	9.44	
<b>64 x 38 x 30mm</b>					
12	Pull	50-6093	18.43	16.90	
24	Pull	50-6095	21.43	19.95	
12	Push	50-6094	20.38	19.50	
24	Push	50-6096	17.33	15.87	

## Sounders, Buzzers & Speakers



### Electronic Buzzers

A range of compact, low-cost electronic buzzers.



- Available with either flying leads (10cm long) or PCB mounting pins
- 3V, 6V or 12V operating versions
- Resonant frequency is 400Hz
- Black ABS case material

Suitable for education and hobbyist use only.

Technical specification

Operating voltage	2V to 5V type	2V to 5V DC or 4V to 8V DC or 9V to 15V
Rated voltage	4V to 8V type	3V DC
	9V to 15V	6V DC
	2V to 5V type	12V DC
Max rated current	4V to 8V type	25mA @ 3V DC
	9V to 15V	30mA @ 6V DC
	2V to 5V type	30mA @ 12V DC
Min sound pressure level	2V to 5V type	70dB @ 3V DC/20cm
	4V to 8V type	75dB @ 6V DC/20cm
	9V to 15V	80dB @ 12 DC/20cm
Resonant frequency		400Hz ± 100Hz
Operating temperature		-20°C to +60°C
Weight	PCB type with lead	10g
	PCB type with lead	8g
Dimensions		23 x 17 x 15mm with PCB pins on 7.6mm centres
		33.5 x 17 x 15mm with 100mm leads
		fixing centres 27.5mm, 2mm dia fixing hole

Type	Order code	1+	25+	100+
3V Buzzer + lead	35-3592	1.32	1.05	0.942
3V PCB Mount buzzer	35-3594	1.32	1.05	0.942
6V Buzzer + lead	35-3596	1.32	1.05	0.942
6V PCB Mount buzzer	35-3598	1.32	1.05	0.942
12V Buzzer + lead	35-3610	1.39	1.13	1.05
12V PCB Mount buzzer	35-3612	1.26	1.03	



We bring STEAM to life



**Rapid**

**Low Profile Buzzers**

These PCB mounting buzzers have a loud but pleasant 85dB tone and operate from a either 6 or 12V DC supply. They are only 7.5mm high when mounted on the PCB. They will work with supply voltages ranging from 3 to 8V DC or 8 to 15V DC depending which version is required. Supply polarity is marked on the bottom of the top of the housing as an aid to installation. The case is finished in black.



- The base of the device is potted to maximise protection against flux contamination
- Masking label is included over the sound emission hole to permit board cleaning
- Encapsulated in a low profile housing making them particularly suitable for inclusion in miniature electronics instrumentation
- Supplied with PCB pins for direct mounting to PCBs
- Small / low profile design
- Compact rich sound
- Pitch 7.6mm
- Application: cellular phones, pagers, communication equipment, computers, household appliances, security of electronic devices
- Dimensions 11.6 x 11.6 x 7.5mm

Technical specification

Order code	<b>35-0040</b>	<b>35-0041</b>
Rated voltage	6V DC	12V DC
Operating voltage	3 to 8V DC	8 to 15V DC
Current consumption	30mA	30mA
Sound output at 10cm	>85dB	>85dB
Frequency	3100Hz ±500Hz	3100Hz ±500Hz
Housing material	PBT	PBT
Weight	2g	2g
Operating temperature	-20°C to +85°C	-20°C to +85°C
Storage temperature	-20°C to +88°C	-20°C to +88°C
Dimensions	11.6 x 11.6 x 7.5(D)mm	11.6 x 11.6 x 7.5(D)mm

Type	Order code	1+	25+	100+	500+
6V low profile buzzer	<b>35-0040</b>	1.14	0.843	0.727	0.596
12V low profile buzzer	<b>35-0041</b>	1.14	0.843	0.727	0.596

**Rapid**

**Electronic Buzzers with 20cm Flying Leads**

A range of rectangular electronic buzzers offering a high but rich sound.



- Supplied with 20cm flying leads
- 2mm fixing holes in base
- **KPMB-2200L series**
- Available with 6 and 12V operating voltages

Technical specification

Operating voltage	6V DC	Mfrs. code	<b>KPMB-2206L</b>	Order code	<b>35-3601</b>
	12V DC		<b>KPMB-2212L</b>		<b>35-3603</b>
Sound output	75dB				
Rated current max.	20mA				
Response time	<50ms				
Operating temperature	-20°C to +60°C				
Dimensions	34(L) x 16(W) x 15(H)mm				
Weight	10g				

Type	Order code	1+	25+	100+
6V	<b>35-3601</b>	1.38	1.08	1.01
12V	<b>35-3603</b>	1.26	1.01	0.942

**SoniCrest**

**6V and 12V Low Profile Electromagnetic Buzzers**

The **SoniCrest HCM12BX** series of electromagnetic sound generators are low profile buzzer units that have a sealed structure and are washable and compatible with wave soldering.



These low profile sounders are efficient, board mounting devices that are

suitable for a wide applications such as: multi-tone audio signals (e.g. GSM), mobile phones and pagers, PDAs, automotive, domestic appliances, portable equipment, medical devices and computer motherboards.

- Available in 6V or 12V variants
- Supply polarity marked on housing as an aid to installation
- Supplied with PCB pins for direct mounting to PCBs
- Sealing label for wash protection
- **SoniCrest HCM12BX series**

Technical specification

Order code	<b>35-0052</b>	<b>35-0053</b>
Mfrs. pt. no.	<b>HCM1206BX</b>	<b>HCM1212BX</b>
Rated voltage	6V	12V
Operating voltage range	4 to 7V	7 to 15V
Rated current	≤30mA	≤30mA
Sound output @ 10cm	≥83dB	≥83dB
Generated frequency	2.3kHz ±400Hz	2.3kHz ±400Hz
Operating temperature	-20°C to +80°C	-20°C to +80°C
Dimensions	7.5 x ø12mm	7.5 x ø12mm
Weight	1.6g	1.6g

Type	Order code	1+	100+
Low Profile Buzzer 6V	<b>35-0052</b>	0.959	0.636
Low Prof. Buzzer 12V	<b>35-0053</b>	0.959	0.636

**Rapid**

**Miniature Electronic Buzzer**

These electronic buzzers offer a high but rich sound. They are ideal for all applications and can be applied to telephone times, calling devices, time pieces electronic toys, safety equipment.



- Base of the buzzer is potted to maximise protection against flux contamination
- Masking label is included over the sound emission hole to permit board cleaning
- Supplied with PCB pins for direct mounting to PCBs
- Encapsulated in a low profile housing
- Suitable for inclusion in miniature electronics instrumentation
- Small/low profile design
- Available in 5, 12V operating versions
- 7.6mm pitch
- Dimensions 12mm dia x 7.5(H)mm

Technical specification

Order code	<b>35-0049</b>	<b>35-0048</b>
Rated voltage	<b>12V DC</b>	<b>5V DC</b>
Operating voltage max.	3 - 15V DC	3 - 8V DC
Sound output	88dB	85dB
Frequency	2300 ±300Hz	2300 ±300Hz
Response time	50ms	50ms
Housing material	PST	PST
Operating temperature	-20°C to +85°C	-20°C to +85°C
Storage temperature	-20°C to +88°C	-20°C to +88°C
Pitch	7.6mm	
Dimensions	12mm diameter	7.5mm(H)
Weight	2g	2g

Type	Order code	1+	25+	100+	500+
5V Buzzer	<b>35-0048</b>	1.20	0.895	0.768	0.624
12V Buzzer	<b>35-0049</b>	1.31	0.923	0.792	0.643

**Rapid**

**Transistor Oscillator Buzzers**

A 1.5V miniature transistor oscillator buzzer with flying leads.



- Frequency 400Hz
- Sound output 75dB at 30cm
- Height 15.5mm
- Length 33.5mm
- Width 16.5mm
- Lead length 150mm
- Voltage 1.5V

Technical specification

Operating voltage	1.3 to 2V
Current consumption	25mA
Sound output	75dB at 30cm

Type	Order code	1+	25+	100+
1.5V buzzer (leads)	<b>35-0086</b>	1.40	1.09	1.03

**Rapid**

**Round Electronic Buzzers with 20cm Flying Leads**

A range of round electronic buzzers offering a high but rich sound.



- Supplied with 20cm flying leads
- 2mm fixing holes in base
- **KPMB-2600L series**
- Available with 3, 6 and 12V operating voltages

Technical specification

Operating voltage	3V DC	Mfrs. code	<b>KPMB-2603L</b>	Order code	<b>35-3587</b>
	6V DC		<b>KPMB-2606L</b>		<b>35-3588</b>
	12V DC		<b>KPMB-2612L</b>		<b>35-3589</b>
Sound output	80dB				
Rated current max.	40mA				
Response time	<50ms				
Operating temperature	-20°C to +60°C				
Dimensions	25mm diameter x 18mm (height)				
Weight	20g				

Type	Order code	1+	25+	100+	500+
3V DC	<b>35-3587</b>	1.35	1.08	0.98	0.892
6V DC	<b>35-3588</b>	1.35	1.08	0.98	
12V DC	<b>35-3589</b>	1.38	1.16	1.03	

**SoniCrest**

**Miniature Electromagnetic Buzzers - 5V and 12V**

A miniature profile electromagnetic buzzer that is available in 5V or 12V versions. The **SoniCrest HCM12X** series of PCB mounting sounders feature a sealed construction making them suitable for washing and wave soldering manufacturing techniques.



These miniature buzzers have PCB pins for direct board mounting and are suitable for a wide applications such as: GSM, PDAs, cell phones and pagers, automotive, domestic appliances, portable equipment, medical devices and computer motherboards.

- Available in 5V or 12V variants
- Supply polarity marked on housing as an aid to installation
- Supplied with PCB pins for direct mounting to PCBs
- Sealing label for wash protection
- **SoniCrest HCM12X series**

Technical specification

Order code	<b>35-0055</b>	<b>35-0056</b>
Mfrs. pt. no.	<b>HCM1205X</b>	<b>HCM1212X</b>
Rated voltage	5V	12V
Operating voltage range	3 to 7V	8 to 15V
Rated current	≤30mA	≤30mA
Sound output @ 10cm	≥85dB	≥85dB
Generated frequency	2.3kHz ±400Hz	2.3kHz ±400Hz
Operating temperature	-40°C to +85°C	-40°C to +85°C
Dimensions	9.5 x ø12mm	9.5 x ø12mm
Weight	2g	2g

Type	Order code	1+	100+	1000+
Miniature Buzzer 5V	<b>35-0055</b>	1.02	0.688	
Miniature Buzzer 12V	<b>35-0056</b>	0.959	0.636	0.547



All the Tools you need ...

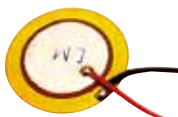
www.rapidonline.com

## Rapid

### Uncased Piezo Transducer

An uncased miniature piezo transducer offering an ultra low profile.

- Ideal for use with speech and music modules as fitted to greetings cards and toys
- Connection is by means of 95mm flying leads



#### Technical specification

Overall diameter	20mm
Ceramic plate diameter	15mm
Overall thickness	0.42mm excluding leads
Brass plate thickness	0.21mm
Resonant frequency	6.8 ±0.7kHz
Resonant resistance	LE 300Ω
Capacitance	15,000pF ±30%

#### MQQ 5 - In Multiples of 5

Type	Order code	5+	50+	300+
Uncased piezo transducer	<b>35-0200</b>	0.555	0.408	0.366

035847



### 90dB Piezo Sound Generator 5V

SoniCrest have produced a sound generator that operates using the piezoelectric effect. Producing a loud 90dB of sound, this 5V buzzer is suitable for use in alarms, sirens, audio alerts, telephone ringers, industrial/household appliances, control modules, high end toys, medical instruments, etc.

- Unsealed structure and non-washable
- With PCB pins for direct board mounting
- **SoniCrest HPA17F** type



#### Technical specification

Rated voltage	5V
Operating voltage range	1 to 30V
Rated current	≤2mA
Sound output @ 10cm	≥90dB
Rated frequency	4kHz
Capacitance	15nF
Operating temperature	-40°C to +85°C
Dimensions	6.8 x ø17mm
Weight	1.5g

Type	Order code	1+	100+	1000+
Piezo Sound Gen 5V	<b>35-0054</b>	0.697	0.458	0.403

500353

## Rapid

### 8Ω Speaker Sound Generator

A low-cost, low power sound generator has been designed for use in toy and other applications. This very compact sound module is ideal for PCB fitting and produces a sound of up to 83dB.

- Good quality
- Suitable for soldering directly to a circuit board
- Dimensions: 30mm (dia) x 11mm (depth)



#### Technical specification

Rated power	0.15W
Input power max.	0.3W
Frequency range	700 - 5000Hz
Rated frequency	1200 ±200Hz
Rated impedance	8Ω
Sound pressure level	83dB
Housing material	ABS/black
Operating temperature	-20°C - +60°C
Weight	12g

Type	Order code	1+	25+	100+
Speaker sound generator	<b>35-0043</b>	1.38	1.07	0.976

083005

## Order online

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 24 hours a day



### 5V Electro-Magnetic Sound Generator

A 5V electro-magnetic sound generator encapsulated in a low profile housing making it particularly suitable for inclusion in miniature electronics instrumentation.

- Electro magnetic sound generator
- 5V voltage rating
- 45mA current
- 85dB at 10cm sound output
- 2400Hz frequency
- 12mm diameter
- 1.2g weight
- Noryl housing
- Sealed base
- Positive terminal marked
- PCB pins
- Requires external drive circuit



#### Technical specification

Rated Voltage	Operating Voltage	Rated Current	Coil Resistance	Sound Output	Rated Frequency	Dia.	Operating Temperature
5V	4-8V	≤60mA	45 ±4mA	≥85dB	2400Hz	12mm	-40°C to +85°C

#### MQQ 5 - In Multiples of 5

Type	Order code	5+	25+	100+
5V	<b>35-3611</b>	0.689	0.593	0.495

073358



### Megaphones with Sirens



Compact and lightweight megaphones available in 25W or 30W power outputs. The feature sets of these compact and durable loudhailers make them ideal for a variety of outdoor uses in schools, work, construction sites, etc.

The megaphones all feature a good quality built-in microphone, comfortable pistol grip handle, rotary volume control and carrying strap. In addition, the 25W and 30W versions also include a hand-held microphone that gives the option of a different operating style.

- Comfortable strong strap included
- Built-in switchable siren function
- Pistol grip handle with push-to-talk trigger switch
- Anti-feedback hand-held microphone
- Rotary volume control
- Robust ABS construction

#### Technical specification

Order code	<b>35-4642</b>	<b>35-4643</b>
Power max.	25W	30W
Power supply	12V DC (8x C batteries)	12V DC (8x D Alkaline batteries)
Range	700m - 1km	600m
Dimensions	335 x ø230mm	340 x ø230mm
Weight	1.65kg	2kg

Type	Order code	1+
25W Siren megaphone	<b>35-4642</b>	47.64
30W Siren megaphone	<b>35-4643</b>	28.76

500292



### Miniature Speakers 80

These KEPO Miniature Speakers 80 are a compact round size, suitable for signal output in machines and other equipment where space is at a premium. Typical applications include voice and signal output in machines and other equipment both indoors and outdoors.

- Available from 330-1280Hz



#### Technical specification

Order code	<b>51-7383</b>	<b>51-7384</b>	<b>51-7386</b>
Basket diameter	36mm	50mm	50mm
Height	4.9mm	17mm	8.3mm
Nominal load	0.5W	0.25W	0.5W
Resonant frequency	500Hz	450Hz	330Hz

Order code	<b>51-7389</b>	<b>51-7391</b>	<b>51-7395</b>
Basket diameter	15mm	20 x 14mm	28mm
Height	3.4mm	3.6mm	5mm
Nominal load	0.5W	0.5W	0.7W
Resonant frequency	850Hz	950Hz	650Hz

Input power	Height	Order code	1+	25+	100+
<b>330Hz</b>					
0.5W/Max.1W	8.3mm	<b>51-7386</b>	2.49	1.98	
<b>450Hz</b>					
0.8W/Max.1.5W	17mm	<b>51-7384</b>	1.90	1.73	1.60
<b>500Hz</b>					
0.5W/Max.1W	4.9mm	<b>51-7383</b>	3.36	3.06	
<b>650Hz</b>					
0.5W/Max.1W	5mm	<b>51-7395</b>	2.58	2.34	
<b>850Hz</b>					
0.5W/Max.0.7W	3.4mm	<b>51-7389</b>	1.79	1.63	
<b>950Hz</b>					
0.5W/Max.1W	3.6mm	<b>51-7391</b>	1.63	1.47	

526112

## Primetone

### Primetone Miniature Loudspeakers

An economical miniature speaker for use in small portable equipment.

- Fitted with paper cone and ferrite magnets
- Solder connection tags
- Both types 66mm diameter 21mm deep
- Handling capacity 300mW
- **Primetone types 6608F (35-0130) and 6664F (35-0135)**



Type	Order code	1+	25+	100+
8Ω Mini speaker	<b>35-0130</b>	1.21	1.11	0.913
64Ω Mini speaker	<b>35-0135</b>	1.25	1.15	0.941

080207

## Rapid

### 75mm 10W Full Range Speaker

A quality and good sounding full range loudspeaker.

- Suitable for all applications
- Foam edged paper cone with chrome HF dome



#### Technical specification

Impedance	8Ω
Power rating	10W
Frequency response	120Hz - 16kHz
Resonant frequency	120Hz
Sensitivity 1W, 1m	88dB
Magnet weight	150g
Overall weight	415g
Dimensions	78 (dia.) x 45mm

Type	Order code	1+	6+	12+
75mm Full range speaker	<b>35-1400</b>	6.31	5.46	4.64

028631

## Rapid

### 50mm Ultra Slim Paper-coned Speakers

These miniature ultra slim loudspeakers are just 17mm thick.

- Paper cones
- Suitable for a wide range of applications
- 50mm diameter
- Wide frequency response enables the speakers to be used for speech, music or high frequency alarm output



- Solder tag termination
- Fitted with flange to assist mounting
- Available in **8Ω** and **64Ω** options

Type	Order code	1+	25+	100+	500+
8Ω speakers	<b>35-0128</b>	1.08	0.869	0.74	0.673
64Ω speakers	<b>35-0129</b>	1.33	1.05	0.903	0.822

**VISATON**

**5cm Mini Speaker with Plastic Diaphragm**

A high quality 5cm round speaker particularly well suited to outdoor applications and where ambient conditions are generally unfavourable.



- Magnetically shielded
- Plastic diaphragm and metal basket
- Full-range driver with good efficiency
- Broad frequency response and good voice reproduction
- Extremely small size due to a neodymium magnet system
- Typical applications include electronic devices and outdoor systems
- **CE** approved

Technical specification

Rated power	2W
Maximum power	3W
Nominal impedance	8Ω
Frequency response	-10dB 180-17000Hz
Mean sound pressure level	86dB
Resonance frequency fs	300Hz
Voice coil diameter	10mm
Cutout diameter	46mm
Net weight	48g
Protective system	IP65

Type	Order code	1+	10+	25+	50+
8Ω	<b>35-2902</b>	2.33	2.05	2.00	1.93

**VISATON**

**2015 FR 7 Round Full Range Speaker 4Ω**

A compact size round miniature speaker from Visaton. Includes a balanced frequency response from 130Hz, high efficiency and very good high range response, making it suitable for machines and other equipment where space is at a premium. Typical applications include control speakers for electronic devices, narrow network column speakers, model construction and electronic musical instruments.



- Moisturised cone
- Metal basket
- Cutout: ø 61mm
- **Manufacturer's part 2015**

Technical specification

Rated/max. power	5W/10W
Impedance	4Ω
Frequency response	130-20000Hz
Mean sound press.	86dB (1W/1m)
Resonance	220Hz
Voice coil	ø 14mm
Winding height	2.5mm

Type	Order code	1+	10+	25+
Round Speaker	<b>35-0567</b>	5.23	4.80	4.53

**Primetone Ultrathin Subminiature Speakers**

A subminiature speaker measuring 40mm in diameter.



- Overall depth of just 9.5mm
- Paper cone and alnico magnet
- Solder connection tags
- 0.1W and 0.25W versions available

Technical specification

Dimensions	40(W) x 9.5(D)mm
Impedance	8Ω
Frequency range	450Hz - 5kHz
Magnet weight	1.5g
Primetone series	LP400

Type	Order code	1+	25+	100+
0.1W 40mm Speaker	<b>35-0120</b>	1.77	1.43	
0.25W 40mm Speaker	<b>35-0122</b>	1.77	1.43	1.20

**VISATON**

**10cm Full Range Speakers**

A high quality 10cm full range speaker with good bass reproduction.



- Galvanised lacquered basket
- Balanced frequency response
- High efficiency
- Suitable as a built-in speaker for music reproduction
- Typical applications include 100V network column speakers, ceiling mounted speakers in transport, built-in car Hi-Fi and electronic music instruments
- Available in **4** and **8Ω** versions
- **CE** approved

Technical specification

Rated power	20W
Maximum power	30W
Nominal impedance	4 and 8Ω
Frequency response	-10 dB 80-20000Hz
Mean sound pressure level	86dB
Resonance frequency fs	95Hz
Voice coil diameter	20mm
Cutout diameter	46mm
Net weight	410g
Protective system	IP65

Type	Order code	1+	10+
4Ω	<b>35-2908</b>	15.23	
8Ω	<b>35-2909</b>	14.29	13.80

**VISATON**

**FRs 8 High Power Fullrange Speakers**

These Visaton 8cm (3.3 inch) Hi-Fi fullrange speakers are suitable for surround, as effect channel speakers and mini subwoofer/satellite systems. Due to the small size they are very suitable for control speakers for electronic devices.



Ideal for use as ceiling-mounted speakers in railway carriages and busses, mini Hi-Fi systems and model construction.

- Small size
- Protective grille 1138 available (order code **35-2959**)

Technical specification

Mfrs. Part No.	FRS 8; 8Ω	FRS 8; 4Ω
Order code	35-2936	35-2937
Rated/maximum power	50W	30W
Impedance	8Ω	4Ω
Frequency response (-0dB)	100 to 20000Hz	100 to 20000Hz
Mean sound pressure level	82dB (1W/1m)	82dB (1W/1m)
Excursion limit xmech	±2.5mm	±2.5mm
Resonance frequency	115Hz/120Hz	115Hz/120Hz
Height of front pole-plate	4mm	4mm
Voice coil diameter	20mm	20mm
Height of winding	4.5mm	4.5mm
Depth	44mm	40mm
Cutout diameter	73mm	73mm
Net weight	280g	280g

Type	Order code	1+	10+
FRS 8; 8 Ohm	<b>35-2936</b>	11.23	10.04
FRS 8; 4 Ohm	<b>35-2937</b>	8.92	8.29

**Rapid**

**50mm Ultra Slim Mylar Cone Speakers**

These miniature ultra slim loudspeakers are just 11mm in thickness.



- Mylar cones
- Suitable for a wide range of applications
- 50mm diameter
- Wide frequency response enables the speakers to be used for speech, music or high frequency alarm output
- Solder tag termination
- Fitted with flange to assist mounting
- Available in **8Ω** and **64Ω** options

Type	Order code	1+	25+	100+	500+
8Ω Speakers	<b>35-0126</b>	1.45	1.24	1.07	
64Ω Speakers	<b>35-0127</b>	1.45	1.24	1.07	1.01

**VISATON**

**1138 Speaker Grille**

A protective grille that has been manufactured from metal and given a matt black finish. The grille has a decoration ring made of black plastic.



Suitable for Visaton speakers: FR 8 4Ω; FR 8 8Ω; FR 8 4Ω; FRS 8 8Ω; F 8 SC 4Ω; F 8 SC 8

- Grille for FRS 8, FR 8 F 8 SC
- Colour: Matt black
- External diameter: 95mm
- External length / Height: 6mm
- External width: 82mm
- Material: Metal
- Surface finish: Matt

Type	Order code	1+	10+
Grille for FRS8, FR 8	<b>35-2959</b>	4.93	4.32

**Rapid**

**Miniature PCB Piezo Transducer**

This piezo transducer is able to generate a range of audible tones and frequencies when energised by a 12V peak square wave. Provided it is mounted rigidly in the prescribed manner, outputs of up to 80dB can be achieved.



- Requires drive circuit
- PCB mounting
- Ideal for toys, clocks and watches, calculators and electronic games, using the transducer in place of a speaker
- Suitable for use in professional, commercial and industrial applications.
- Durable in domestic appliances
- Dimensions: 17(dia) x 8mm (depth)

Note: Not suitable for speech and music.

Technical specification

Rated voltage	12V peak to peak
Allowable voltage max.	30V peak to peak
Current consumption	4mA at 4.0kHz
Sound output	80dB
Frequency	4.0 4± 0.5kHz
Housing material	ABS / black
Weight	1g
Operating temperature	-20°C to +60°C
Storage temperature	-30°C to +70°C

Type	Order code	5+	25+	100+	500+
PCB Piezo transducer	<b>35-0044</b>	0.755	0.479	0.395	0.326

**Free Delivery\***  
on all orders over £30 (excl. VAT) – (UK mainland only)

\* See Terms & Conditions for full details



## Rapid

## Piezo Transducer 1mA, 80dB

A piezo audio transducer that is epoxy sealed at base and suitable for PCB mounting.

- Wave solderable and washable
- Low power consumption
- Available in **black**



## Technical specification

Rated voltage	5V AC
Operating voltage	1 - 20V AC pk-pk
Rated current at rated voltage	1mA
Capacitance	13000 ±30%pF
Sound output at rated voltage	>80dB
Resonant frequency at rated voltage	4000 ±500Hz
Operating temperature	-20°C to +70°C
Storage temperature	-30°C to +80°C
Housing material	Noryl
Weight	1g

Type	Order code	1+	25+	100+
Piezo transducer	<b>35-0282</b>	1.12	0.954	0.842

073100

## Rapid

## Piezo Element 27mm 4.2kHz with Leads

A 27mm diameter piezo element that comes with 200mm flying leads.

- Low power consumption
- Reliable and lightweight
- Just 0.52mm thick



## Technical specification

Rated voltage (max.)	30V pk-pk
Capacitance	20000pF ±30%
Resonant frequency	4.2kHz ±500Hz
Operating temperature	-20°C to +60°C
Storage temperature	-20°C to +70°C
Overall diameter	27mm
Overall thickness	0.52mm
Wire type	AWG28 UL1095
Lead length	200mm

## MQ5 - In Multiples of 5

Type	Order code	5+	100+
Piezo element	<b>35-0288</b>	0.521	0.437

200129

## Rapid

## Piezo Transducer

A piezo audio transducer that is epoxy sealed at base and suitable for PCB mounting.

- Wave solderable and washable.
- Available in two voltage ratings 6 and 12V.
- Low power consumption.
- Available in black
- Please note: This transducer requires a drive circuit.



## Technical specification

Rated voltage	9V DC
Operating voltage	1 - 30V DC
Rated current at rated voltage	3mA
Capacitance	17000 ±30%pF
Sound output at rated voltage	>85dB
Resonant frequency at rated voltage	4000 ±500Hz
Operating temperature	-20°C to +60°C
Storage temperature	-30°C to +70°C
Housing material	Noryl
Weight	3g

Type	Order code	1+	25+	100+
Piezo transducer	<b>35-0286</b>	1.35	1.17	1.03

073102

## Rapid

## Miniature Piezo Transducer with Flying Leads



This piezo transducer is able to generate a range of audible tones and frequencies when energised by a 12V peak square wave. Provided it is mounted rigidly in the prescribed manner, outputs of up to 80dB can be achieved.

- Flying leads
- Requires drive circuit
- PCB mounting
- Ideal for toys, clocks and watches, calculators and electronic games, using the transducer in place of a speaker
- Suitable for use in professional, commercial and industrial applications.
- Durable in domestic appliances
- Available in 12.5, 23 and 30mm diameter options

Note: Not suitable for speech and music.

## Technical specification

Order code	35-0045	35-0046	35-0047
Rated voltage	12V peak to peak	12V peak to peak	12V peak to peak
Allowable voltage max.	25V peak to peak	30V peak to peak	30V peak to peak
Current consumption	2mA at 4.0KHz	3mA at 4.0KHz	8mA at 4.0KHz
Sound output	75dB	80dB	80dB
Frequency	4.0 ± 0.5KHz	4.0 ± 0.5KHz	3.6 ± 0.5KHz
Housing material	ABS / black	ABS / black	ABS / black
Weight	1.3g	1g	3g
Operating temperature	-20°C to +60°C	-20°C to +60°C	-20°C to +60°C
Storage temperature	-30°C to +70°C	-30°C to +70°C	-30°C to +70°C

## MQ5 - In Multiples of 5

Type	Order code	5+	25+	100+	500+
15mm transducer	<b>35-0045</b>	0.925	0.628	0.513	
20mm transducer	<b>35-0046</b>	0.925	0.628	0.513	0.431
29.5mm transducer	<b>35-0047</b>	0.925	0.628	0.513	0.431

083007

## Switches

## SCI PARTS

## R13-510A Low Profile Push Button Switches

A range of low profile push switches that snap-fit into a 12.7mm panel cut-out.

- Large 9mm actuator button available in red or black in momentary action push to make



## Technical specification

Contact rating	1.5A 250V AC 3A 125V AC
Contact resistance	50mΩ max
Insulation resistance	>100MΩ

## MQ5 - In Multiples of 5

Type	Colour	Order code	5+	25+	100+	500+
Push to make	Red	<b>78-1520</b>	0.501	0.456	0.421	0.388
Push to make	Black	<b>78-1522</b>	0.488	0.454	0.41	0.378

03072

## STEAM resources

Don't forget to visit our STEAM Lab online

[www.rapidonline.com/steam-lab](http://www.rapidonline.com/steam-lab)

## SCI PARTS

## Low Profile Push-Button Switches with Chrome Bezels

A range of low profile push switches supplied with large 9mm actuator buttons.

- Available in momentary action push to make, push to break or changeover options
- Smart chrome bezel
- Supplied with button in red or black
- **SCI R13-502** series



## Technical specification

Contact rating	3A 125V AC 1.5A 250V AC
Contact resistance	50m max.
Insulation resistance	10 x 10 <sup>10</sup> min.
Body dimensions	push to make 20mm x 14.0mm dia. push to break 22.3mm x 14.0mm dia. SPCO 21mm x 14.0mm dia.
Panel cut-out	12.7mm

Type	Colour	Order code	1+	25+	100+	500+
Push to make	Red	<b>78-1550</b>	1.00	0.877	0.821	0.744
Push to break	Black	<b>78-1570</b>	1.03	0.87	0.781	
SP Changeover	Red	<b>78-1590</b>	1.08	0.963	0.887	
SP Changeover	Black	<b>78-1591</b>	1.11	0.988	0.877	

030255

## Rapid

## Miniature Push-button Switches



A range of low-cost, miniature push to make and push to break switches that are available in various button colours.

- Ideal for school projects and prototyping
- Non-locking
- Rated 125V AC 250mA
- Panel cut-out 7mm
- Dimensions 28mm long, ø10.5mm

Note: These switches are not recommended for industrial applications.

MQ10 - In Multiples of 10					
Colour	Order code	10+	100+	500+	
<b>Push to make</b>					
Black	<b>78-0118</b>	0.246	0.21	0.193	
Red	<b>78-0100</b>	0.239	0.203	0.187	
Blue	<b>78-0119</b>	0.246	0.21	0.193	
Green	<b>78-0120</b>	0.246	0.21	0.193	
White	<b>78-0121</b>	0.246	0.21	0.193	
Yellow	<b>78-0122</b>	0.246	0.21	0.193	
<b>Push to break</b>					
Black	<b>78-0105</b>	0.246	0.21	0.193	
Red	<b>78-0123</b>	0.246	0.21	0.193	

071607

**Rapid**

**Miniature Push Switches**

Miniature low cost push-to-make switches with an all-plastic body and chrome locking nut, offered in a variety of button colours.



- Non-locking action
- Rated 250mA 60V AC
- Panel cut-out 7mm
- Overall dimensions 28mm long, 10.5mm diameter

These switches are not recommended for industrial applications.

MQQ 5 - In Multiples of 5				
Type	Order code	5+	25+	100+ 500+
Red push switch	<b>78-0030</b>	0.461	0.383	0.324
Black push switch	<b>78-0035</b>	0.461	0.383	0.324

MQQ 2000		
Type	Order code	2000+
Yellow push switch	<b>78-0045</b>	0.263

MQQ 5 - In Multiples of 5			
Type	Order code	5+	100+
White push switch	<b>78-0055</b>	0.531	0.359

**SCI PARTS**

**Miniature Latching Push Switch Small Button**

Low-cost, panel mounting, latching 2P SPST push switches that have small buttons.



- Available with red or black button
- Fits into 7mm panel cut-out, max. thickness 4mm
- Silver plated brass solder terminals
- Nylon frame to **UL 94V-2**

Technical specification

Rating	250V AC 1.5A/125V AC 3A
Contact resistance	50mΩ max.
Insulation resistance	100MΩ min.
Dielectric strength	1500V AC 1 minute

Type	Colour	Order code	1+	25+	100+	500+
Latching switch	Red	<b>78-0233</b>	0.857	0.785	0.671	
Latching switch	Black	<b>78-0234</b>	0.869	0.728	0.68	0.622

**SCI PARTS**

**Miniature Latching Push Switch Large Button**

Low-cost, panel mounting, latching 2P SPST push switch that has a large button.



- Available with red button
- Fits into 7mm panel cut-out, max. thickness 4mm
- Silver plated brass solder terminals
- Nylon frame to **UL 94V-2**

Technical specification

Rating	250V AC 1.5A/125V AC 3A
Contact resistance	50mΩ max.
Insulation resistance	100MΩ min.
Dielectric strength	1500V AC 1 minute

Type	Colour	Order code	1+	25+	100+	500+
Latching switch	Red	<b>78-0235</b>	0.824	0.729	0.671	0.614

**SCI PARTS**

**Miniature SPST Momentary Push-Button Switches**

These low cost push to make switches come with an all-plastic body and chrome locking nut.



- Non-locking momentary action
- Available with red or black button
- 5.2mm (M5) dia. panel cut-out
- Dimensions 19(L) x 8mm diameter
- Silver plated brass terminals
- **UL 94V-2** approved

Technical specification

Voltage rating	0.5A 125V AC
Contact resistance	50mΩ max.
Insulation resistance	500V DC, 100MΩ min.
Dielectric strength	1000V AC, 1 minute
Circuit	SPST momentary push to make
Mount hole	5.2mm
Panel thickness	4mm max.

MQQ 5 - In Multiples of 5				
Type	Order code	5+	25+	100+ 500+
Red push switch	<b>78-0186</b>	0.386	0.336	0.311
Black push switch	<b>78-0187</b>	0.487	0.407	0.373 0.311

**SCI PARTS**

**Latching Push Button Switches**

Low-cost, panel mounting, latching 2P SPST push switches which have domed buttons.



- Available with red or black button
- Fits into 12.2mm panel cut-out, max. thickness 4mm
- ABS actuators with phenolic base
- **UL 94HB** approval

Technical specification

Rating	250V AC 1.5A/125V AC 3A
Contact resistance	50mΩ max.
Insulation resistance	100MΩ min.
Dielectric strength	1000V AC 1 minute

MQQ 5 - In Multiples of 5					
Type	Colour	Order code	5+	25+	100+ 500+
Latching switch	Red	<b>78-0237</b>	0.705	0.576	0.482
Latching switch	Black	<b>78-0238</b>	0.655	0.592	0.523 0.467

**SCI PARTS**

**SPST Momentary Push Switches**

Low-cost push to make switches.



- Non-locking momentary action
- Available with red or black button
- Snap-fit into a 14.8mm dia. panel cut-out
- Dimensions 19.5(L) x 18mm diameter
- Easy to install into panel
- Silver plated brass terminals
- **UL flame 94V-2** approved

Technical specification

Voltage rating	3A 125V AC/1.5A 250V AC
Contact resistance	50mΩ max.
Insulation resistance	500V DC, 100MΩ min.
Dielectric strength	1500V AC, 1 minute
Mount hole	15mm
Panel thickness	0.5 to 2mm

Type	Colour	Order code	1+	25+	100+
Momentary	Red	<b>78-0184</b>	1.08	0.944	0.85
Momentary	Black	<b>78-0185</b>	1.05	0.92	0.828

**SCI PARTS**

**SPST Locking Panel Mounting Push Switch**

A low cost push to make switch with all-plastic body and locking nut.



- Panel mounting
- Latching action
- Available with black actuating button
- 15mm dia. panel cut-out
- Easy to install into panel
- Silver plated brass terminals
- Dimensions 23.5(L) x 18(W)mm
- **UL flame 94HB** approved

**Rapid**  
... where price meets quality

Technical specification

Voltage rating	3A 125V AC/1.5A 250V AC
Contact resistance	50mΩ max.
Insulation resistance	500V DC, 100MΩ min.
Dielectric strength	1500V AC, 1 minute
Circuit	2P SPST latching push to make
Mount hole	15mm
Panel thickness	7mm max.

Type	Order code	1+	25+	100+
Black push switch	<b>78-0189</b>	1.76	1.47	1.25

**SCI PARTS**

**R13-23 Series Square Push Switches - 1A**

A range of attractive large push switches with actuator button in red or black.



- SPST contacts
- Available with momentary push-to-make or latching action
- Body dimensions 34 x 15 x 15mm
- Panel cut-out 12mm
- Contacts rated 1A, 250V AC

MQQ 5				
Type	Order code	5+	25+	100+ 500+
SPST red momentary	<b>78-0110</b>	0.555	0.488	0.444
SPST black momentary	<b>78-0112</b>	0.53	0.472	0.415
SPST red latching	<b>78-0115</b>	0.601	0.556	0.498 0.442
SPST black latching	<b>78-0117</b>	0.60	0.555	0.478

**Rapid**

**Miniature Vertical Slide Switch**

A low-cost SPDT miniature slide switch for PCB mounting.



- Rating 0.5A 50V DC
- Silver plated solder terminals
- Pitch 4mm
- 19mm Long, 5.6mm Wide, 5mm High
- Long lifespan

MQQ 5 - In Multiples of 5					
Type	Order code	5+	100+	500+	1000+
Slide switch	<b>76-0310</b>	0.126	0.101	0.088	0.08

**ALPHA**

**Miniature PCB Slide Switches**

Miniature SPDT PCB mounting slide switches available in vertical or right angle options.



- Suited to many signal switching applications
- Both switches incorporate PCB supports to improve rigidity
- Non shorting contacts rated at 0.3A 125V AC
- Pitch 3mm

MQQ 5 - In Multiples of 5				
Type	Order code	5+	100+	250+
Vertical SPDT slide	<b>76-0265</b>	0.402	0.297	0.226

**Rapid**

**Miniature Slide Switches 6V**

Miniature slide switches available with different size actuators.



- Choice of actuator size 2mm or 4.4mm
- Rating 0.3A 6V DC
- SPDT circuit
- Pitch 2.5mm

MQQ 10				
Type	Order code	10+	30+	100+ 500+
Slide switch 6V	<b>78-3760</b>	0.34	0.307	0.265 0.206

MQQ 5				
Type	Order code	5+	25+	100+ 500+
Slide switch 6V 4.4mm act.	<b>78-3762</b>	0.34	0.307	0.265 0.206



### Standard Slide Switches

Standard slide switches with solder tag connections and break before make DPDT contacts.

- Also available in centre off
- Suited to a wide range of miniature electronic equipment
- Contacts rated at 0.3A, 125V AC
- Fixing centres 28mm



MOQ 5 - In Multiples of 5

Type	Order code	5+	100+	500+	1000+
DPDT Std. slide	<b>76-0105</b>	0.356	0.287	0.239	
DPDT Centre off slide	<b>76-0110</b>	0.334	0.251	0.209	0.197

030267



### 1260 Ultraminiature Slide Switch

A miniature slide switch with SPDT contacts.

- Body measures just 9.0 x 3.5 x 3.5mm
- Ideally suited to a wide range of low voltage applications
- Right angle actuator button making it ideal for edge of board applications
- Pins are on a 2.50mm pitch making the switch suitable as an alternative to jumpers etc.
- Contacts rated 0.3A at 6V



MOQ 5 - In Multiples of 5

Type	Order code	5+	25+	100+	500+
Ultramin slide switch	<b>76-0303</b>	0.311	0.267	0.233	0.211

060329



### Ultraminiature PCB Mounting Slide Switches 2A

A range of vertical and right angle mounting slide switches with PCB pins on a 2.54mm pitch.

- Silver plated contacts close with a positive action
- Sealed terminals are flux immune



#### Technical specification

Dimensions	SPDT	14 x 7.8 x 7.7mm
	DPDT	14 x 12.8 x 7.7mm
Contact rating		2A 250V AC
Minimum load		100mA 10V
Initial contact resistance		10mΩ max.
Electrical life		2 x 10 <sup>4</sup> operations
Temperature range		-40°C to +85°C

Type	Order code	1+	25+	100+	500+
SPDT Vertical	<b>76-0200</b>	0.824	0.722	0.641	0.553
DPDT Vertical	<b>76-0220</b>	1.08	0.948	0.842	0.756
SPDT Right angle	<b>76-0205</b>	1.32	1.08	0.93	
DPDT Right angle	<b>76-0215</b>	1.33	1.14	0.988	0.87

030268



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### Miniature Toggle Switches

A range of low cost panel mounting miniature toggle switches.

- Provides exceptional value
- Available in single pole and double pole options including momentary biased options
- All switches are fully approved to UL and CSA
- **SCI TA102/TA202 series**

For biased switches (On) indicates momentary action.

#### Technical specification

Contact rating	6A, 125V, 3A 250V AC
Initial contact resistance	<20mΩ
Insulation resistance	>100MΩ at 500V DC
Contact material	Copper alloy with silver inlay silver plated
Body material	Flame retardant alkyd
Electrical life	>1 x 10 <sup>4</sup> cycles at full load (min.)
Operating temperature	-20°C to +65°C



MOQ 5 - In Multiples of 5

Type	Order code	5+	25+	100+	
SPST	<b>75-0125</b>	0.904	0.797	0.744	
SPDT	On-Off	<b>75-0130</b>	0.851	0.778	0.706
SPDT	Centre-Off	<b>75-0135</b>	0.85	0.732	0.656
SPDT	On-Off-(On)	<b>75-0152</b>	0.959	0.887	0.793

#### Price each

Type	Order code	1+	25+	100+	
SPDT	(On)-Off-(On)	<b>75-0157</b>	1.10	0.979	0.872
DPDT	On-On	<b>75-0140</b>	1.08	0.983	0.907
DPDT	Centre-Off	<b>75-0145</b>	1.11	0.993	0.917

030254



### Miniature Toggle Switches

A range of panel mounting latching and momentary toggle switches.

- Choose from a variety of contact configurations
- Solder lug terminations
- Silver plated copper alloy contacts
- Stainless steel housing
- **Salecom T80-T series**

For biased switches (On) indicates momentary action.

#### Technical specification

Contact rating	5A 125V AC/28V DC
Electrical life	50,000 make-and-break cycles at full load
Contact resistance	10mΩ max.
Insulation resistance	1000MΩ min.
Dielectric strength	1500V rms
Operating temperature	-30° to +85°C



MOQ 5 - In Multiples of 5

Contacts	Function	Order code	5+	25+	100+	500+
SPST	On-Off	<b>75-0082</b>	0.905	0.837	0.791	0.768
SPDT	On-None-On	<b>75-0083</b>	0.843	0.754	0.678	0.655
SPDT	On-Off-On	<b>75-0084</b>	0.834	0.77	0.713	

#### Price each

Contacts	Function	Order code	1+	25+	100+	500+
SPDT	On-Off-(On)	<b>75-0085</b>	1.22	1.06	0.877	
SPDT	(On)-Off-(On)	<b>75-0086</b>	1.36	1.34	1.01	0.941

MOQ 5 - In Multiples of 5

Contacts	Function	Order code	5+	25+	100+
DPDT	On-Off-On	<b>75-0087</b>	0.985	0.919	0.862

#### Price each

Contacts	Function	Order code	1+	25+	100+
DPDT	On-Off-On	<b>75-0088</b>	1.17	1.02	0.922
DPDT	On-Off-(On)	<b>75-0089</b>	1.22	1.11	0.988
DPDT	(On)-Off-(On)	<b>75-0090</b>	1.43	1.30	1.20

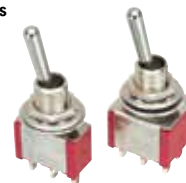
075284



### Miniature Toggle Switches

These miniature toggle switches from Taiway are available in single pole.

- Contact rating - 5A 125VAC, 2A 250VAC
- 50,000 make and break cycles at full load
- Solder lug terminations
- Epoxy terminal seal
- Silver plated contacts



#### Technical specification

Contact resistance	10mΩ max @ 2-4VDC
Insulation resistance	1,000 MΩ min
Dielectric strength	1,500V RMS @ sea level
Operating temperature	-30°C to +85°C
Materials	
Case	Diallylphthalate UL94V-0
Toggle handle	Brass, chrome plated
Bushing	Brass, nickel plated
Housing	Stainless steel

Contacts	Function	Order code	1+	25+	100+
SPDT		<b>75-0211</b>	1.73	1.43	1.24
SPDT	Centre-Off	<b>75-0212</b>	1.78	1.66	1.44

072635



### Standard Toggle Switches

Low-cost standard size toggle switches.

- Complete with On/Off plate
- Rated at 250V 1.5A
- Panel cut-out 12mm
- These switches are not recommended for industrial applications



MOQ 5 - In Multiples of 5

Type	Body dim.	Order code	5+	10+	100+
SPST	25 x 14 x 14	<b>75-0180</b>	0.877	0.813	0.686

#### Price each

Type	Body dim	Order code	1+	10+	100+
DPDT	28 x 18 x 14	<b>75-0185</b>	0.907	0.839	0.794

030255



### Toggle Switches, On-On 250V AC 3A

The chrome-plated toggle has a red removable insulating sleeve. Toggle length 13mm.

- Nickel-plated lever
- 3A; 250V AC



#### Technical specification

<b>50-0957</b>		(L x W x H) 12.5 x 7 x 9.5mm
Dimensions		Maintained-Maintained
Functions		1
Number of pins		1-pole On/On
Toggle length		13mm
Specification		SPDT, On-On
Switch position		3A
Switching current		3A/250V
Switching power		250V AC
Switching voltage		KNX 1
Type		
<b>50-0958</b>		(L x W x H) 12 x 11 x 9.5mm
Dimensions		Maintained-Maintained
Functions		2
Number of pins		13mm
Toggle length		2-pole On/On
Specification		DPDT, On-On
Switch position		3A
Switching current		3A/250V
Switching power		250V AC
Switching voltage		KNX 2
Type		

MOQ 5 - In Multiples of 5

Switch type	Order code	5+	10+	15+	50+
SPDT, 1 pole	<b>50-0957</b>	0.649	0.61	0.578	0.513
DPST, 2 pole	<b>50-0958</b>	0.699	0.655	0.611	0.562

519922



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**Sub-miniature Toggle Switches**

A range of low-cost panel mounting sub-miniature toggle switches.

- Excellent value
- Ideal for use where space is at a premium
- **SCI MTE Series**



Technical specification

Contact rating 3A, 125V, 1.5A 250V AC  
Contact resistance max. 20mΩ  
Insulation resistance min. 100MΩ @ 500V DC  
Dielectric strength 1000V AC 1 min  
Operating temperature -20°C to +85°C

Type	Order code	1+	25+	100+	500+
2P SPST On-Off	75-0095	0.962	0.79	0.648	0.593
3P SPDT On-On	75-0096	0.946	0.777	0.637	0.583
6P DPDT On-On	75-0097	1.07	0.915	0.748	0.686



**Microminiature Microswitches**

A range of micro-miniature microswitches, measuring only 12.7mm in length.

- 1A, 250V AC switching ability in a truly miniature package
- PCB solder terminals
- Single pole changeover contacts
- Available in button and lever operation styles



Technical specification

Dimensions 12.7 x 5.8 x 6.5mm  
Pitch 6.5mm  
Contact material Silver alloy  
Contact rating 2A 30V DC, 1A 250V AC  
Mechanical life >30 x 10<sup>4</sup>  
Electrical life >30 x 14<sup>4</sup>

Operating force 150g  
Release force min. 20g  
Pretravel max. 0.5mm  
Overtravel min. 0.25mm  
Movement diff. max. 0.12mm  
Actuator length -

Button Lever  
80g 80g  
5g 5g

**MOQ 5 - In Multiples of 5**

Type	Order code	5+	25+	100+	500+
Microminiature button	78-0730	0.716	0.609	0.574	
Microminiature lever	78-0735	0.61	0.529	0.515	0.482



**Lever Operated Microswitches**

A range of value for money superminiature microswitches that are suitable for a wide variety of applications.

- Straight, right angle left or right angle right mounting
- Choice of 0.1A 30V DC or 3A 125V AC rating
- Solder terminals
- Minimum 1,000,000 operations for extended life



Technical specification

Contact rating 78-0870 0.1A 30V DC  
78-0877 3A 125V AC  
78-0878 3A 125V AC

Contact resistance (max) 100mΩ  
Insulation resistance (min) 100MΩ

**MOQ 5 - In Multiples of 5**

Rating	Actuator	Order code	5+	25+	100+	500+
0.1A 30V DC	Lever	78-0870	0.414	0.343	0.291	0.27

Price each

Rating	Actuator	Order code	1+
3A 125V AC	Lever RA left	78-0877	0.22

**MOQ 5 - In Multiples of 5**

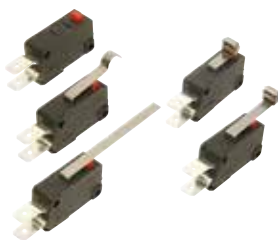
Rating	Actuator	Order code	5+	25+	100+
3A 125V AC	Lever RA right	78-0878	0.546	0.467	0.417



**V3 Microswitches**

A range of high quality standard size microswitches.

- Switching capacity 15A at 250V AC
- Connection may be made by a 6.35mm (¼in.) connector or by soldering
- Can be connected as normally open or normally closed
- Compact and precise operation
- Variety of actuator types
- Phenolic resin push buttons
- Stainless steel levers



Technical specification

Contacts rating 250V 15A AC resistive load  
Service life Mechanical >1,000,000 operations  
Electrical >100,000 operations @ rated load  
Dimensions (HxWxD) 15.9 x 27.8 x 10.34mm ±0.4mm  
Weight approx. 7g

Actuator	Button	Long lever	Short roller	Medium roller	Simulated roller
Pretravel (mm)	1.2	7.6	1.5	3.3	2.5
Differential (mm)	0.15-0.4	2.2	0.5	1.2	1.2
Operating force (g)	300	100	300	150	150
Release force (g)	80	14	85	28	28
Order code	78-0700	78-0702	78-0715	78-0710	78-0703

**MOQ 5 - In Multiples of 5**

Type	Order code	5+	25+	100+
Button	78-0700	0.842	0.733	0.666

Price each

Type	Order code	1+	25+	100+	500+
Long lever	78-0702	1.25	1.15	0.964	0.903
Short roller	78-0715	1.32	1.03	0.923	0.846
Medium roller	78-0710	1.12	0.961	0.874	
Simulated roller	78-0703	0.944	0.818	0.797	



**Paddle Lever Microswitch**

A high quality V3 type microswitch from CamdenBoss with a wide, long paddle lever.

- Ideal for quick alignment in security and safety applications such as tamper switches in alarm panels and bell boxes
- Dimensions of lever: 9 x 54mm (62mm from tip of lever to adjacent fixing hole)
- Camden part no. **CSM30531D**
- **CUL** approved



Rapid is an official distributor of CamdenBoss products. The products listed here are those that Rapid hold in stock - but we have access to many more, including the company's complete range of terminal blocks.

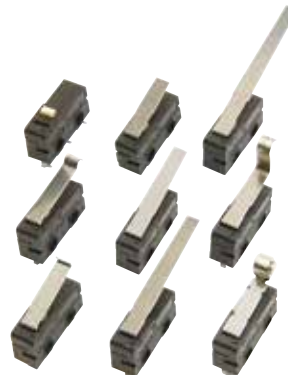
Technical specification

Contacts Silver plated  
Rating 3A 250V AC  
Mechanical life >10<sup>6</sup> operations  
Temperature range -20°C to +70°C

Type	Order code	1+	25+	100+	500+
Paddle level microswitch	78-0720	0.913	0.778	0.722	0.654



**Subminiature V4 Microswitches**



A range of subminiature microswitches.

- Switching capacity of 3A at 250V AC
- Available with solder terminal or PCB terminal connections
- Can be connected as normally open or normally closed
- All switch types are free from overtravel restrictions and permit easy setting
- Wide variety of actuator types
- Phenolic resin push buttons
- Stainless steel levers
- **UL** approved

Technical specification

Contact rating 250V 3A AC resistive load  
Service life Mechanical >10,000,000 operations  
Electrical >100,000 operations rated load  
Dimensions 10.2(H) x 19.8(W) x 6.4(D)mm ±0.4mm  
Weight approx. 2.2g

Actuator	Pretravel (mm)	Differential (mm)	Operating force (g)	Release force (g)
Button	0.5	0.1	150	25
14.5mm Lever	-	0.8	50	6
30.5mm Lever	-	1	30	5
37.5mm Lever	-	1	30	5
Simulated roller	-	0.8	50	6
Edge lever	-	0.8	50	6
Formed lever	-	0.8	50	6
Roller	-	0.8	50	6

**MOQ 5 - In Multiples of 5**

Type	Order code	5+	25+	100+
14.5mm Lever	78-2467	0.649	0.562	0.511

Price each

Type	Order code	1+	25+	100+
22.6mm Lever	78-2468	0.959	0.792	0.691
30.5mm Lever	78-2469	0.937	0.772	0.676

**MOQ 5 - In Multiples of 5**

Type	Order code	5+	25+	100+
37.5mm Lever	78-2470	0.717	0.616	0.555
Simulated roller	78-2471	0.702	0.60	0.541

Price each

Type	Order code	1+	25+	100+	500+
Roller	78-2474	0.972	0.818	0.728	0.655

**MOQ 5 - In Multiples of 5**

Type	Order code	5+	25+	100+
Roller	78-2483	0.671	0.588	0.532

**STEAM Resources**

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### Subminiature V4 Microswitches

Type V4 miniature microswitches with SPDT switching and a long life coil spring mechanism.

- Available in five standard actuator forms
- PCB pins or solder terminals
- **Camden CSM series**
- **CUL approved**



Rapid is an official distributor of CamdenBoss products. The products listed here are those that Rapid hold in stock – but we have access to many more, including the company's complete range of terminal blocks. Click here to make an enquiry about ordering CamdenBoss terminal blocks, connectors and enclosures.

Technical specification

Contact rating	5A 250V AC				
Mechanical life	3 x 10 <sup>6</sup> operations				
Temperature range	-20°C to +70°C				
	Type 00	Type 01	Type 02	Type 05	Type 08
Operating force	150	42	27	42	15
Release force	75	12	5	10	10
Pre-travel max.(mm)	0.6	2.6	5.4	2.6	7.5
Movement differential (mm)	0.1	0.6	0.9	0.6	1.7
Over-travel min.(mm)	0.5	1	1.6	1	5

**MOQ 2**

Type	Order code	2+	25+	100+	250+
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**Solder terminal**

00A Button	<b>78-2400</b>	0.631	0.495	0.441	0.403
01A 14.5mm Lever	<b>78-2402</b>	0.713	0.643	0.536	0.467
Type	Order code	2+	26+	100+	
02A 22.6mm Lever	<b>78-2404</b>	0.614	0.476	0.432	
Type	Order code	2+	25+	100+	250+
05A 14.5mm	<b>78-2407</b>	0.67	0.552	0.483	
08A 43mm Lever	<b>78-2408</b>	0.657	0.603	0.562	0.509

**MOQ 100 - In Multiples of 5**

Type	Order code	100+	250+
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**PCB termination**

00C Button	<b>78-2410</b>	0.397	0.39
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**MOQ 2**

Type	Order code	2+	25+	100+	250+
01C 14.5mm lever	<b>78-2412</b>	0.683	0.523	0.47	0.441
02C 22.6mm Lever	<b>78-2414</b>	0.715	0.559	0.501	
05C 14.5mm Roller lever	<b>78-2416</b>	0.595	0.548	0.512	
08C 43mm Lever	<b>78-2418</b>	0.631	0.551	0.507	

030201



### SPST Miniature "Visible On" Rocker Switches

A range of single pole rocker switches with red, green or blue marking on the rocker which is clearly visible when the switch is in the 'on' position.

- 4.8 x 0.8mm connections
- Panel cut-out 19.2 x 13mm
- A waterproof cover for the switch is also available see this section
- Fully approved to **UL, CSA, VDE, NDE, SEMKO, DEMKO, NEMKO** and **FIMKO**



Technical specification

Contact rating	6A 250V 10A 125V
Initial contact resistance	<50mΩ
Insulation resistance	>100MΩ @ 500V DC
Termination	4.8 x 0.8mm fast-on
Operating temperature	-20°C to +65°C

**MOQ 5 - In Multiples of 5**

Type	Order code	5+	25+	100+	500+
SPST Red rocker	<b>75-0730</b>	0.613	0.568	0.499	0.454
SPST Green rocker	<b>75-0732</b>	0.679	0.581	0.485	
SPST Blue rocker	<b>75-0734</b>	0.679	0.581	0.485	0.431

034224



### DPST Miniature Rocker Switch with Legend

A miniature double pole rocker switch offering a high switch capacity within a small case.

- On position is clearly marked by legend printed on rocker face
- Black bezel with matt black concave rocker
- 4.8 x 0.8mm crimp connections
- **ENEC and FIMKO approved**



Technical specification

Dimensions	21.2 x 15 x 14.5mm
Panel cut-out	19.2 x 13.2mm
Contact rating	4A 250V AC 8A 125V AC
Initial contact resistance	<50mΩ
Insulation resistance	>100M at 500V DC
Mechanical life	>10 <sup>6</sup> cycles
Electrical life	>10 <sup>4</sup> cycles
Operating temperature	-20°C to +65°C

Type	Order code	1+	25+	100+	500+
DPST Miniature rocker	<b>75-0270</b>	1.13	0.932	0.831	0.688



### Rocker Switches, SPST 250V AC

These compact 'snap-in' panel mount rocker switches comply with EN61058.1 (VDE 630 part 1).

- Nickel-plated lever
- 3A; 250V AC



Technical specification

Order code	Switch position	Legend	Housing colour	Rocker colour
<b>50-1028</b>	SPST on-off	None	Black	Black
<b>50-1032</b>	SPDT on-off-on	None	Black	Black
<b>50-1033</b>	SPST on-off	O/I	Black	Black

**MOQ 5 - In Multiples of 5**

Switch type	Rocker colour	Order code	5+	10+	50+	100+
SPST On-Off	Black	<b>50-1028</b>	0.779	0.725	0.683	0.655

**Price each**

Switch type	Rocker colour	Order code	1+	10+	50+
SPDT On-Off-On	Black	<b>50-1032</b>	1.47	1.36	1.30

**MOQ 5 - In Multiples of 5**

Switch type	Rocker colour	Order code	5+	10+	50+	100+
SPST On-Off	Black	<b>50-1033</b>	0.799	0.727	0.688	0.675

519933



### DPDT Rocker Switch

A low cost nylon rocker switch.

- Non-latching concave sprung rocker
- Snap-in mounting
- 28mm x 25mm panel cut-out
- Silver plated brass terminals
- Dimensions 31.5(L) x 29(W) x 35(H)mm
- **UL flame 94V-2 approved**



Technical specification

Voltage rating	16A 125V AC/10A 250V AC
Contact resistance	50mΩ max.
Insulation resistance	500V DC, 100MΩ min.
Dielectric strength	1500V AC, 1 minute
Circuit	6PDT On/Off / On
Operating temperature	-20°C to +85°C
Mount hole	28mm x 25mm
Panel thickness	5mm

Type	Order code	1+	25+	100+
Rocker switch	<b>75-0061</b>	1.71	1.43	1.22

071452



### SPST Panel Mounting Rocker Switch R13-136A

A single pole rocker switch with locking nut.

- On position is clearly marked by a legend printed onto the concave rocker face
- Silver plated brass terminals
- Phenolic base
- Panel mounting
- Dimension 23(L) x 23(W) x 24(D)mm
- Available in black
- **UL flame 94V-2 approved**



Technical specification

Voltage rating	10A 125V AC/6A 250V AC
Contact resistance	50mΩ max.
Insulation resistance	500V DC, 100MΩ min.
Dielectric strength	1500V AC, 1 minute
Circuit	SPST
Mount hole	18.2mm
Panel thickness	6mm

**MOQ 5 - In Multiples of 5**

Type	Order code	5+	25+	100+
Rocker switch	<b>75-0060</b>	0.778	0.676	0.572

071456



### SPST Snap-in Rocker Switch

A low cost nylon rocker switch.

- 15.2mm dia. panel cut-out
- Silver plated brass terminals
- Snap-in mounting
- Available in black
- Dimensions 25mm(L) x 19mm diameter
- **UL flame 94V-2 approved**



Technical specification

Voltage rating	10A 125V AC / 6A 250V AC
Contact resistance	50mΩ max.
Insulation resistance	500V DC, 100MΩ min.
Dielectric strength	1500V AC, 1 minute
Circuit	SPST
Mount hole	15.2mm
Panel thickness	3mm

**MOQ 5 - In Multiples of 5**

Type	Order code	5+	25+	100+	500+
Black rocker switch	<b>75-0057</b>	0.635	0.552	0.515	0.473

071456



### SPST Miniature Rocker Switch

A miniature single pole rocker switch with black concave rocker.

- Has a red marking which is clearly visible when switch is in the 'on' position
- Switch snap fits into a 20mm panel cut-out
- 4.8 x 0.8mm fast-on connections
- **UL, CSA and VDE approved**
- **SCI type R13-112A2**



Technical specification

Contact rating	6A 250V AC 10A 125V AC
Initial contact resistance	<50mΩ
Insulation resistance	100MΩ at 500V DC
Termination	4.8 x 0.8mm fast-on
Operating temperature	-20°C to +65°C

Type	Order code	1+	25+	100+	500+
SPST Miniature rocker	<b>75-0480</b>	0.877	0.71	0.60	0.555

031451



We bring STEAM to life



### SPST On Off Switch Circular Rocker

A miniature single pole rocker switch in a white gloss finish.

- Snap-in mounting, easy to install switch into panel
- Panel cut-out - 20.2mm
- Maximum panel thickness 3mm
- 4.8 x 4.8mm terminals
- A waterproof cover for the switch is also available - see order code **78-0228** [www.rapidonline.com](http://www.rapidonline.com)
- Nylon frame to **UL 94V-2**



**Technical specification**

Contact rating	16A 125V AC 10A 250V AC
Initial contact resistance	50mΩ max.
Insulation resistance	100MΩ min. 500V DC
Dielectric strength	1500V AC 1 minute

**MOQ 5 - In Multiples of 5**

Type	Order code	5+	25+	100+	500+
White rocker switch	<b>75-0063</b>	0.589	0.545	0.488	0.444



### Miniature 6 x 6mm Tactile Switches

A range of high quality SPST miniature 6 x 6mm tactile switches.

- PCB horizontal mount
- Flat, extended and projected plunger lengths
- Positive click action
- **Diptronics DTS-6** series



**Technical specification**

Diptronics part No.	Length x width x height	Order code
61N	6 x 6 x 4.3mm	<b>78-0620</b>
62N	6 x 6 x 5mm	<b>78-0621</b>
63	6 x 6 x 7mm	<b>78-0622</b>
644N	6 x 6 x 7.3mm sq 2.4	<b>78-0623</b>
65N	6 x 6 x 9.5mm	<b>78-0625</b>
66N	6 x 6 x 13mm	<b>78-0626</b>
Pitch	6.5 x 4.5mm	
Contact rating	50mA 12V DC	
Initial contact resistance	100mΩ	

**MOQ 10**

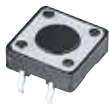
Type	Order code	10+	100+	500+	1000+
61N 4.3 high	<b>78-0620</b>	0.146	0.125	0.102	0.079
62N 5mm high	<b>78-0621</b>	0.146	0.125	0.102	0.079
63 7mm high	<b>78-0622</b>	0.146	0.125	0.102	0.079
644N 7.3mm high sq 2.4	<b>78-0623</b>	0.146	0.122	0.095	0.082
65N 9.5mm high	<b>78-0625</b>	0.229	0.145	0.118	0.091
66N 13mm high	<b>78-0626</b>	0.175	0.12	0.086	0.076



### Miniature 12 x 12mm Tactile Switches

12 x 12mm PCB mounted tactile switches.

- Positive switch action
- Round button
- Single pole normally open contacts
- **Diptronic DTS** series



**Technical specification**

Dimensions	12 x 12 x 4mm
Pitch	12.5 x 5mm
Contact rating	50mA 12V DC
Initial contact resistance	<250mΩ max.
Insulation resistance	>100MΩ min. at 100V DC
Dielectric strength	250V AC for 1 minute
Travel	0.3mm
Operating life	>100,000 ops
Operating temperature range	-20°C to +70°C
PCB footprint	12.5 x 5.0mm

**MOQ 10**

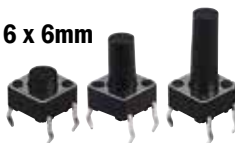
Type	L	Order code	10+	100+	500+	1000+
Round	4.3	<b>78-0630</b>	0.275	0.209	0.175	0.131



### Tactile Switches 6 x 6mm

A range of miniature through hole tactile switches.

- 6 x 6mm
- Positive switch action
- Normally open single pole contacts
- Available in various heights
- Four terminal mounting for additional stability



**Technical specification**

Dimensions	6 x 6 x 3.5mm
Pitch	6.5 x 4.5mm
Contact rating	500mA 12V DC
Contact resistance	≤30mΩ max
Travel	0.25mm
Insulation resistance	≥100MΩ min at 500V dc
Dielectric strength	250V AC for 1 minute
Operating temperature	-30°C to +70°C

**MOQ 10 - In Multiples of 5**

Type	Height	Order code	10+	100+	500+	1000+
Switch 6x6mm	4.3mm	<b>78-3800</b>	0.136	0.101	0.065	0.051
Switch 6x6mm	3.5mm	<b>78-3802</b>	0.136	0.101	0.065	0.051
Switch 6x6mm	7.0mm	<b>78-3804</b>	0.136	0.101	0.065	0.051
Switch 6x6mm	9.5mm	<b>78-3808</b>	0.136	0.101	0.065	0.051
Switch 6x6mm	13.0mm	<b>78-3810</b>	0.172	0.101	0.065	



### Miniature Key Operated Switches

A single pole make/break brass bodied key operated switch with chrome plated bezel.

- Common key operated switch
- Single pole contact
- Off-on operation
- 1A contact current
- 250V AC contact voltage
- 2 position
- PCB pin terminals
- 15mm wide, 26.5mm high
- Initial contact resistance <100mΩ
- Electrical life >15,000 operations
- Round profile for additional security
- Key may be removed in either the on or off position
- Supplied with two keys



**Technical specification**

Dimensions	15 x 26.5mm
Contact rating	1A 250V AC
Initial contact resistance	<100mΩ
Insulation resistance	>500MΩ
Electrical life	>15 x 10 <sup>3</sup> operations
Operating temperature	-20°C to +65°C

Type	Order code	1+	25+	100+	500+
SPST Common key switch	<b>79-0295</b>	3.31	2.85	2.46	2.22



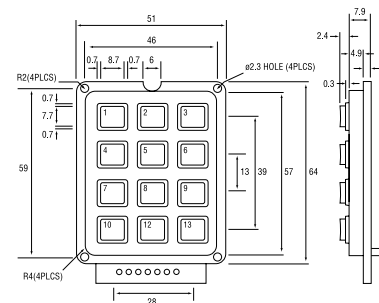
### Matrixed 3 x 4 Data Entry Keypad

A low-profile numeric data entry keypad, with black bezel and white keys. The keypad has conductive rubber contacts and positive action keys requiring only a low operating force.



It is connected via solder pads on the lower edge of the keypad PCB and can be secured via four mounting holes. Suitable for use on a wide range of hand-held and other small equipment.

- Data entry keypad
- 24V DC contact voltage
- 20mA contact current
- 200Ω contact resistance
- 3 x 4 layout
- -20 to +60°C operating temperature
- 1,000,000 ops operating life
- 100gf operating force
- 51mm long, 64mm wide, 7.8mm high



AK-304

**Technical specification**

Contact rating	20mA @ 24V DC			
Contact resistance	200Ω max.			
Mechanical life	1,000,000 cycles per key			
Actuating force	100gf ±30gf			
Key stroke	3 x 4			
	1.4 mm ±0.4mm			
	1.5mm ±0.5mm			
Operating temperature	-20°C to +60°C			
Storage temperature	-40°C to +65°C			
Order code	Key layout	Bezel colour	Key colour	Legend colour
78-0305	3 x 4	Black	White	Black

Type	Order code	1+	25+	100+
3 x 4 Black/white keys	<b>78-0305</b>	4.21	3.09	2.49

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Reed Switches

A comprehensive range of rhodium contact miniature reed switches.

- Available in a variety of styles and contact ratings
- See 60-0560 for suitable magnets



Technical specification

Case code	A	B	C	D	Case code	A	B	C	D
1	36	10	2	0.4	4	54	14.2	2.3	0.6
1A	46	15	2.54	0.6	6	55	18.5	2.6	0.7
2	55	14	2.3	0.5	8	79	52	5.4	2.5
3	52	14	2.6	0.5	9	29	52	5.4	2.5

A = Overall length  
B = Glass length  
C = Diameter  
D = Lead diameter

Type	Contacts	Case code	Contact rating (VA) max.	Switching current (A) max.	Switching voltage (V) AC max.	Pull in range (AT)	Order code
Micro.	SPST	1	1	0.1	24	15-20	60-0520
Submin.	SPST	2	10	0.5	100	20-25	60-0522
Submin.	SPDT	3	3	0.2	30	20-25	60-0524
Miniature	SPST	1A	10	0.5	140	14-23	60-0515
Miniature	SPST	6	40	2	440	20-25	60-0528
Compact	SPST	9	120	3	1500	75-95	60-0532

Type	Order code	1+	25+	100+	500+
Micro SPST	60-0520	1.10	0.992	0.912	0.748
Submin. SPST	60-0522	0.674	0.549	0.50	0.443
Submin. SPDT	60-0524	3.03	2.10	1.81	

Type	Order code	1+	25+	100+	500+
Miniature SPST	60-0515	0.465	0.424	0.388	
Miniature SPST	60-0528	1.25	1.13	0.942	
Compact SPST	60-0532	2.26	1.92	1.65	



M1219 Neodymium Disc Magnets

A range of disc magnets manufactured from Neodymium Iron Boron which is up to 5 times more powerful than Alnico.



- All magnets are nickel plated to reduce the onset of corrosion when used under normal circumstances
- Ideally suited to proximity switch triggering or biasing where space is at a premium

Technical specification

Part no.	Distance at which magnets measure 1000 Gauss	Dimensions	Surface flux (Gauss)
M1219-1	0.5mm	3 x 1mm	1500
M1219-2	0.95mm	3 x 2mm	2500
M1219-3	1.6mm	4 x 3mm	3200
M1219-4	2.0mm	6 x 2mm	2500
M1219-5	3.8mm	10 x 5mm	3500
M1219-6	3.0mm	6 x 5mm	3500
M1219-8	3.0mm	6 x 4mm	3900
M1219-10		22 x 2mm	800

Operating temperature 120°C max.  
NB: M1219-4 has north seeking identified with a dimple

Type	Order code	1+	25+	100+	250+
M1219-1	78-1064	0.756	0.67	0.614	0.555
M1219-2	78-1066	0.83	0.56	0.499	
M1219-3	78-1068	1.31	1.11	0.861	
M1219-4	78-1070	0.992	0.758	0.66	0.568
M1219-5	78-1072	1.77	1.44	1.19	1.08
M1219-6	78-3783	0.894	0.70	0.626	
M1219-8	78-3784	1.07	0.761	0.664	
M1219-10	78-3786	1.36	1.09	0.988	



Non-mercury Tilt Switch

A gas filled hermetically sealed tilt switch employing non toxic materials in a miniature completely mercury free sealed metal package.



- Normally open contacts which will close when tilted more than 10° from the horizontal
- Suited to a wide range of applications including toys, games, automotive and water treatment equipment
- Formerly Assemtech type CW1300-1

Technical specification

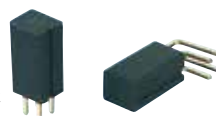
Contact arrangement	Single pole normally open
Contact rating	3VA max.
Switching current	0.25A max.
Switching voltage	60V AC or DC max.
Contact resistance	30Ω max.at 15° tilt
Temperature range	-40°C to +150°C

Type	Order code	1+	25+	100+
Non-mercury tilt switch	78-0760	1.35	1.32	1.30



Low Cost Non-mercury Tilt Switches

Low cost PCB mounting non-mercury tilt switches fitted with gold contacts.

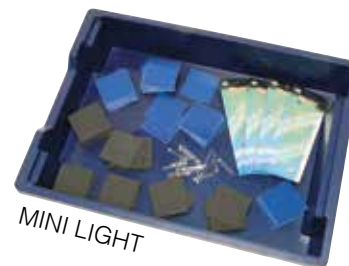


- Available with straight or right angle pins for direct mounting to a PCB
- Ideal low cost solution in alarm systems and general angle sensing
- Supplied in Polyamide 6,6 case with UL 94V-0 rating
- Formerly Assemtech types M1230-1 (vertical) and M1230-2 (horizontal)

Technical specification

Contact rating	25mA at 24V DC
Contact resistance	10 Ω
Differential angle	10°
Operating temperature	-25°C to +70°C

Type	Order code	1+	25+	100+	500+
Vertical tilt switch	78-1058	0.522	0.432	0.386	
Horizontal tilt switch	78-1056	1.26	1.06	0.952	0.85



MINI LIGHT



MOISTURE TESTER



555 TIMER



AUDIO AMPLIFIER



AM RADIO

Curriculum Based Project Classpacks

Start on page 92



Non-Mercury Tilt Switches

A range of economical, non-mercury tilt switches, which operate when tilted approximately 10° from the horizontal.

- Contact is made by gold-plated ball-bearings which roll onto the contact
- Two styles are available:
- 78-0752 has a single gold-plated pin, with a lead attached to the case
- 78-0754 has two nickel-plated leads



Technical specification

Switch rating	24V DC 6mA
Life	100,000 cycles min.
Contact resistance	0.5Ω max. @ 45° tilt
Differential angle	10° max.
Operating temperature	-25°C to +85°C