

## PIC Microcontrollers

Order code	Manufacturer code	Description
73-3262	n/a	PIC12F629-I/P (RC)
73-3264	n/a	PIC12F629-I/SN (RC)
73-3284	n/a	PIC12F675-I/P (RC)
73-3286	n/a	PIC12F675-I/SN MICROCONTROLLER (RC)

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The enclosed information is believed to be correct, Information may change 'without notice' due to product improvement. Users should ensure that the product is suitable for their use. E. & O. E.	Revision A 12/12/2006



For full datasheet please visit:

www.microchip.com

# PIC12F629/675

## 8-Pin FLASH-Based 8-Bit CMOS Microcontroller

### High Performance RISC CPU:

- Only 35 instructions to learn
  - All single cycle instructions except branches
- Operating speed:
  - DC - 20 MHz oscillator/clock input
  - DC - 200 ns instruction cycle
- Interrupt capability
- 8-level deep hardware stack
- Direct, Indirect, and Relative Addressing modes

### Special Microcontroller Features:

- Internal and external oscillator options
  - Precision Internal 4 MHz oscillator factory calibrated to  $\pm 1\%$
  - External Oscillator support for crystals and resonators
  - 5  $\mu$ s wake-up from SLEEP, 3.0V, typical
- Power saving SLEEP mode
- Wide operating voltage range - 2.0V to 5.5V
- Industrial and Extended temperature range
- Low power Power-on Reset (POR)
- Power-up Timer (PWRT) and Oscillator Start-up Timer (OST)
- Brown-out Detect (BOD)
- Watchdog Timer (WDT) with independent oscillator for reliable operation
- Multiplexed  $\overline{\text{MCLR}}$ /Input-pin
- Interrupt-on-pin change
- Individual programmable weak pull-ups
- Programmable code protection
- High Endurance FLASH/EEPROM Cell
  - 100,000 write FLASH endurance
  - 1,000,000 write EEPROM endurance
  - FLASH/Data EEPROM Retention: > 40 years

### Low Power Features:

- Standby Current:
  - 1 nA @ 2.0V, typical
- Operating Current:
  - 8.5  $\mu$ A @ 32 kHz, 2.0V, typical
  - 100  $\mu$ A @ 1 MHz, 2.0V, typical
- Watchdog Timer Current
  - 300 nA @ 2.0V, typical
- Timer1 oscillator current:
  - 4  $\mu$ A @ 32 kHz, 2.0V, typical

### Peripheral Features:

- 6 I/O pins with individual direction control
- High current sink/source for direct LED drive
- Analog comparator module with:
  - One analog comparator
  - Programmable on-chip comparator voltage reference (CVREF) module
  - Programmable input multiplexing from device inputs
  - Comparator output is externally accessible
- Analog-to-Digital Converter module (PIC12F675):
  - 10-bit resolution
  - Programmable 4-channel input
  - Voltage reference input
- Timer0: 8-bit timer/counter with 8-bit programmable prescaler
- Enhanced Timer1:
  - 16-bit timer/counter with prescaler
  - External Gate Input mode
  - Option to use OSC1 and OSC2 in LP mode as Timer1 oscillator, if INTOSC mode selected
- In-Circuit Serial Programming™ (ICSP™) via two pins

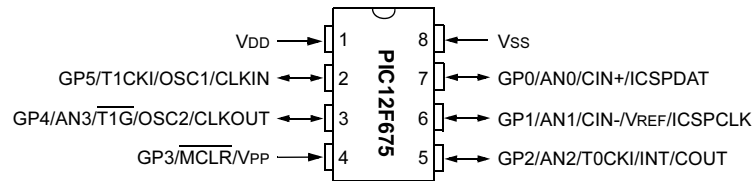
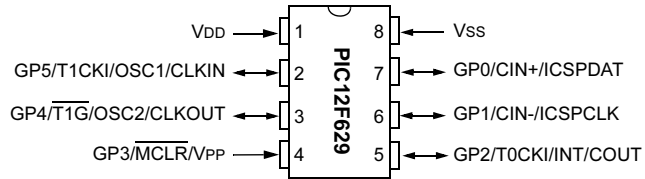
Device	Program Memory	Data Memory		I/O	10-bit A/D (ch)	Comparators	Timers 8/16-bit
	FLASH (words)	SRAM (bytes)	EEPROM (bytes)				
PIC12F629	1024	64	128	6	–	1	1/1
PIC12F675	1024	64	128	6	4	1	1/1

\* 8-bit, 8-pin devices protected by Microchip's Low Pin Count Patent: U.S. Patent No. 5,847,450. Additional U.S. and foreign patents and applications may be issued or pending.

# PIC12F629/675

## Pin Diagrams

### 8-pin PDIP, SOIC, DFN-S



# PIC12F629/675

**TABLE 1-1: PIC12F629/675 PINOUT DESCRIPTION**

Name	Function	Input Type	Output Type	Description
GP0/AN0/CIN+/ICSPDAT	GP0	TTL	CMOS	Bi-directional I/O w/ programmable pull-up and interrupt-on-change
	AN0	AN		A/D Channel 0 input
	CIN+	AN		Comparator input
	ICSPDAT	TTL	CMOS	Serial programming I/O
GP1/AN1/CIN-/VREF/ICSPCLK	GP1	TTL	CMOS	Bi-directional I/O w/ programmable pull-up and interrupt-on-change
	AN1	AN		A/D Channel 1 input
	CIN-	AN		Comparator input
	VREF	AN		External voltage reference
ICSPCLK	ST		Serial programming clock	
GP2/AN2/T0CKI/INT/COU $\bar{T}$	GP2	ST	CMOS	Bi-directional I/O w/ programmable pull-up and interrupt-on-change
	AN2	AN		A/D Channel 2 input
	T0CKI	ST		TMR0 clock input
	INT	ST		External interrupt
COU $\bar{T}$		CMOS	Comparator output	
GP3/MCLR/VPP	GP3	TTL		Input port w/ interrupt-on-change
	MCLR	ST		Master Clear
	VPP	HV		Programming voltage
GP4/AN3/T1G/OSC2/CLKOUT	GP4	TTL	CMOS	Bi-directional I/O w/ programmable pull-up and interrupt-on-change
	AN3	AN		A/D Channel 3 input
	T1G	ST		TMR1 gate
	OSC2		XTAL	Crystal/resonator
CLKOUT		CMOS	Fosc/4 output	
GP5/T1CKI/OSC1/CLKIN	GP5	TTL	CMOS	Bi-directional I/O w/ programmable pull-up and interrupt-on-change
	T1CKI	ST		TMR1 clock
	OSC1	XTAL		Crystal/resonator
	CLKIN	ST		External clock input/RC oscillator connection
VSS	VSS	Power		Ground reference
VDD	VDD	Power		Positive supply

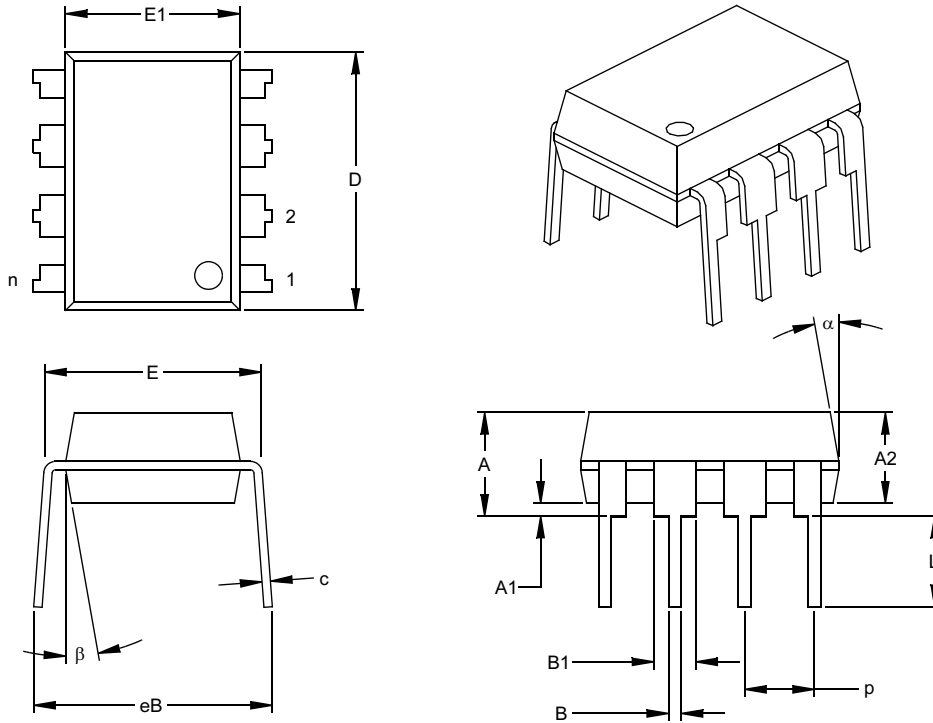
Legend: Shade = PIC12F675 only  
TTL = TTL input buffer, ST = Schmitt Trigger input buffer

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## 14.2 Package Details

The following sections give the technical details of the packages.

### 8-Lead Plastic Dual In-line (P) – 300 mil (PDIP)



Units		INCHES*			MILLIMETERS		
Dimension Limits		MIN	NOM	MAX	MIN	NOM	MAX
Number of Pins	n		8			8	
Pitch	p		.100			2.54	
Top to Seating Plane	A	.140	.155	.170	3.56	3.94	4.32
Molded Package Thickness	A2	.115	.130	.145	2.92	3.30	3.68
Base to Seating Plane	A1	.015			0.38		
Shoulder to Shoulder Width	E	.300	.313	.325	7.62	7.94	8.26
Molded Package Width	E1	.240	.250	.260	6.10	6.35	6.60
Overall Length	D	.360	.373	.385	9.14	9.46	9.78
Tip to Seating Plane	L	.125	.130	.135	3.18	3.30	3.43
Lead Thickness	c	.008	.012	.015	0.20	0.29	0.38
Upper Lead Width	B1	.045	.058	.070	1.14	1.46	1.78
Lower Lead Width	B	.014	.018	.022	0.36	0.46	0.56
Overall Row Spacing	§ eB	.310	.370	.430	7.87	9.40	10.92
Mold Draft Angle Top	α	5	10	15	5	10	15
Mold Draft Angle Bottom	β	5	10	15	5	10	15

\* Controlling Parameter

§ Significant Characteristic

Notes:

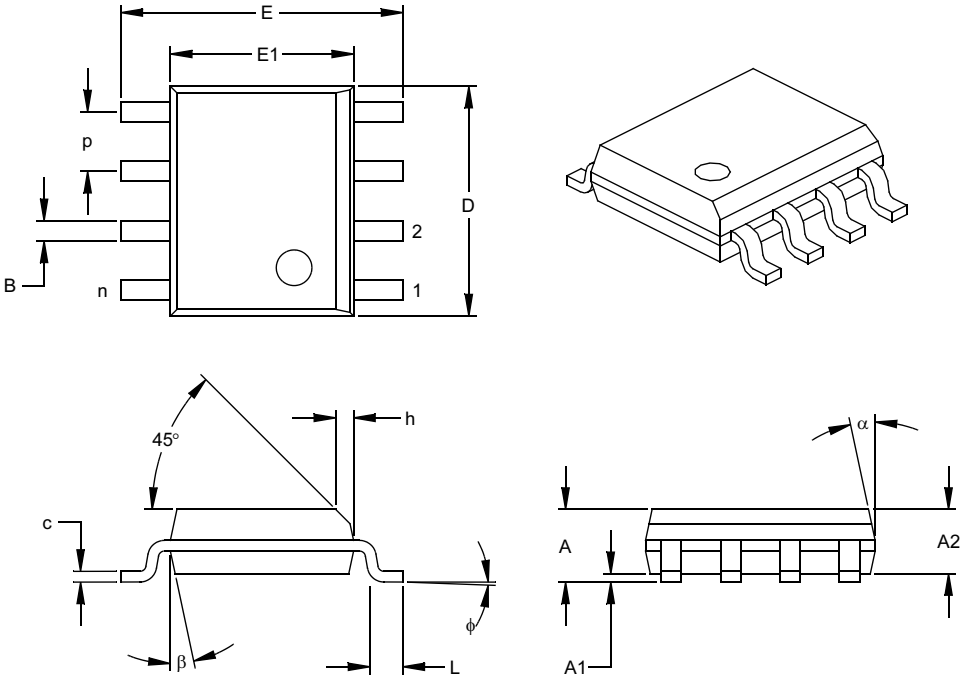
Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" (0.254mm) per side.

JEDEC Equivalent: MS-001

Drawing No. C04-018

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## 8-Lead Plastic Small Outline (SN) – Narrow, 150 mil (SOIC)



Units		INCHES*			MILLIMETERS		
Dimension	Limits	MIN	NOM	MAX	MIN	NOM	MAX
Number of Pins	n		8			8	
Pitch	p		.050			1.27	
Overall Height	A	.053	.061	.069	1.35	1.55	1.75
Molded Package Thickness	A2	.052	.056	.061	1.32	1.42	1.55
Standoff §	A1	.004	.007	.010	0.10	0.18	0.25
Overall Width	E	.228	.237	.244	5.79	6.02	6.20
Molded Package Width	E1	.146	.154	.157	3.71	3.91	3.99
Overall Length	D	.189	.193	.197	4.80	4.90	5.00
Chamfer Distance	h	.010	.015	.020	0.25	0.38	0.51
Foot Length	L	.019	.025	.030	0.48	0.62	0.76
Foot Angle	φ	0	4	8	0	4	8
Lead Thickness	c	.008	.009	.010	0.20	0.23	0.25
Lead Width	B	.013	.017	.020	0.33	0.42	0.51
Mold Draft Angle Top	α	0	12	15	0	12	15
Mold Draft Angle Bottom	β	0	12	15	0	12	15

\* Controlling Parameter  
 § Significant Characteristic

Notes:  
 Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" (0.254mm) per side.  
 JEDEC Equivalent: MS-012  
 Drawing No. C04-057