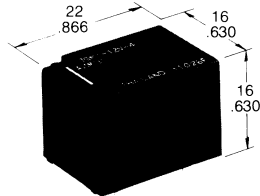


## PCB power relays

Order code	Manufacturer code	Description
60-4295	JSM1-12-5	AUTO.RELAY SPCO 15A - 12V COIL (RC)

PCB power relays	Page 1 of 5
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 20/02/2007

**NAIS****Automotive Ultra-Miniature  
Power Relay****JSM-RELAYS**

mm inch

- Low pick-up voltage for high ambient use
- Sealed construction
- Ultra-miniature size with universal footprint
- Usable at high temperature: 85°C 185°F

**SPECIFICATIONS****Contact**

	Standard	High capacity
Arrangement	1 Form A, 1 Form C	
Contact material	Silver alloy	
Initial contact resistance, max.* (By voltage drop 6 V DC 1 A)	200 mΩ	100 mΩ
Initial voltage drop	Max. 0.2 V (at 10 A 12 V DC)	
Rating		
Nominal switching capacity	10 A 16 V DC (resistive) 5 A 16 V DC, Inrush 25 A (motor load)	15 A 16 V DC (resistive) 10 A 16 V DC, Inrush 50 A (motor load)
Max. switching power	160 W	240 W
Max. switching voltage	16 V DC	16 V DC
Max. switching current	10 A	15 A
Expected life (min. ope.) Mechanical (at 180 cpm)	10 <sup>7</sup>	
Electrical	Resistive	10 <sup>5</sup> N.O.: 10 <sup>5</sup> N.C.: 5×10 <sup>4</sup>
	Motor load	N.O.: 10 <sup>5</sup> N.C.: 10 <sup>5</sup>

\*Measured after operating 5 times at the rated load

**Coil**

Nominal operating power	640 mW
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**Contact rating**

Load	Standard type			High capacity type		
	Form A	Form C		Form A	Form C	
		N.O.	N.C.		N.O.	N.C.
Max. carry current	10 A	10 A	10 A	15 A	15 A	15 A
Max. make current	25 A	25 A	10 A	50 A	50 A	15 A
Max. break current	10 A	10 A	10 A	15 A	15 A	15 A

**Characteristics**

Max. operating speed (at rated load)		15 cps.
Operate time* <sup>1</sup> (at nominal voltage)		Approx. 10 msec.
Release time* <sup>1</sup> (at nominal voltage)		Approx. 10 msec.
Initial insulation resistance		Min. 100 MΩ (at 500 V DC)
Initial breakdown voltage Between open contacts Between contacts and coil		750 Vrms for 1 min. 1,000 Vrms for 1 min.
Ambient temperature		-40°C to +85°C -40°F to +185°F (Not freezing and condensing at low temperature)
Shock resistance	Functional* <sup>2</sup>	Min. 98 m/s <sup>2</sup> (10 G)
	Destructive* <sup>3</sup>	Min. 980 m/s <sup>2</sup> (100 G)
Vibration resistance	Functional* <sup>2</sup>	Approx. 98 m/s <sup>2</sup> (10 G), 10 to 100 Hz at double amplitude of 1.6 mm
	Destructive* <sup>3</sup>	Approx. 117.6 m/s <sup>2</sup> (12 G), 10 to 500 Hz at double amplitude of 2 mm
Unit weight		Approx. 12 g .423 oz

\*<sup>1</sup> Excluding contact bounce time\*<sup>2</sup> Tolerated by relay during service without causing the closed to open for more than the specified time.\*<sup>3</sup> Withstood by the relay during shipping, installation or use, without it suffering damage, and without causing a change in its operating characteristics.**TYPICAL APPLICATIONS**

- Automotive:  
Power-window, car antenna, door lock, intermittent wiper, interior lighting, power seat, power sunroof, car stereo power antenna, etc.

**ORDERING INFORMATION**Ex. JSM 1a F — 12V — 4

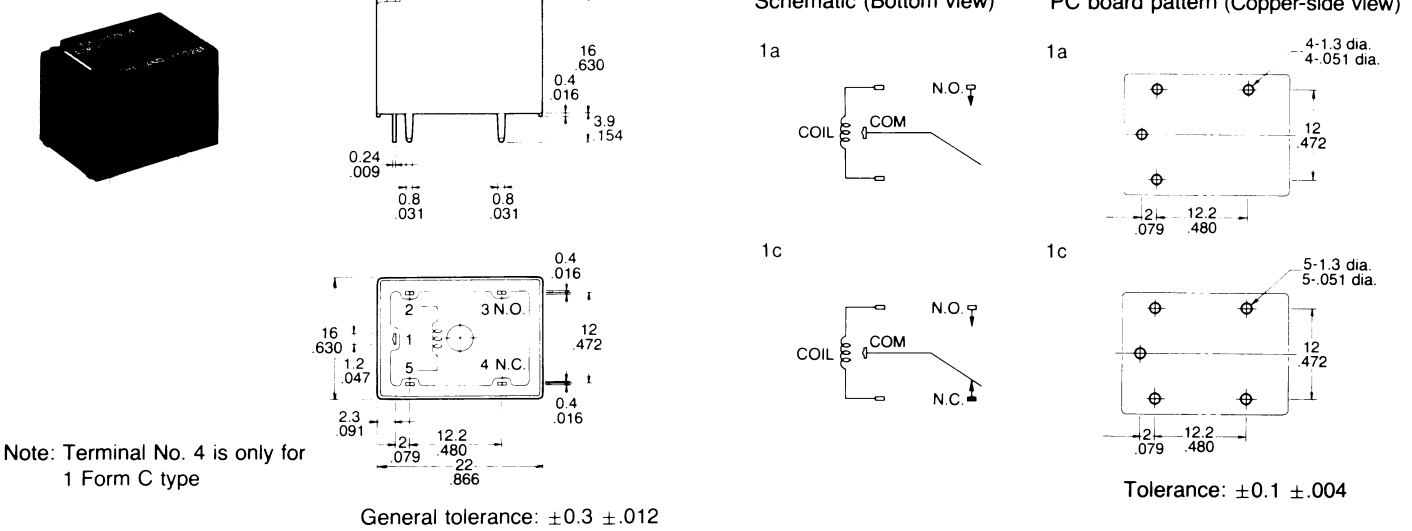
Contact arrangement	Protective construction	Coil voltage (DC)	Contact material
1a: 1 Form A 1: 1 Form C	Nil: Sealed construction F: Flux-resistant type	9, 12 V	4: Standard type (10 A) 5: High capacity type (15 A)

Note: Standard packing: Carton: 100 pcs. Case: 500 pcs.

TYPES AND COIL DATA (at 20°C 68°F)

Contact arrangement	Coil voltage, V DC	Standard type (10 A)		High capacity type (15A)		Nominal voltage, V DC	Pick-up voltage, V DC (max.)	Drop-out voltage, V DC (min.)	Coil resistance, Ω (±10%)	Nominal operating current, mA (±10%)	Nominal operating power, mW	Max. allowable voltage, V DC (at 80°C 176°F)
		Sealed type	Flux-resistant type	Sealed type	Flux-resistant type							
1 Form A	9	JSM1a-9V-4	JSM1aF-9V-4	JSM1a-9V-5	JSM1aF-9V-5	9	4.7	0.7	126	71.4	640	12
	12	JSM1a-12V-4	JSM1aF-12V-4	JSM1a-12V-5	JSM1aF-12V-5	12	6.3	0.9	225	53.3	640	16
1 Form C	9	JSM1-9V-4	JSM1F-9V-4	JSM1-9V-5	JSM1F-9V-5	9	4.7	0.7	126	71.4	640	12
	12	JSM1-12V-4	JSM1F-12V-4	JSM1-12V-5	JSM1F-12V-5	12	6.3	0.9	225	53.3	640	16

DIMENSIONS



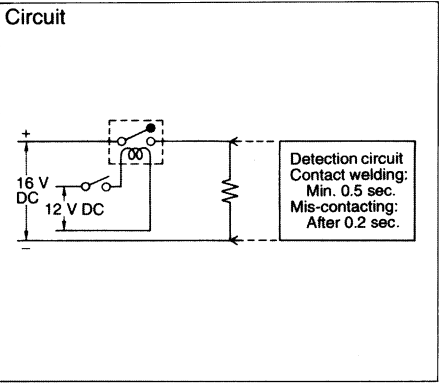
DATA

1-(1) Electrical life test (Resistive)

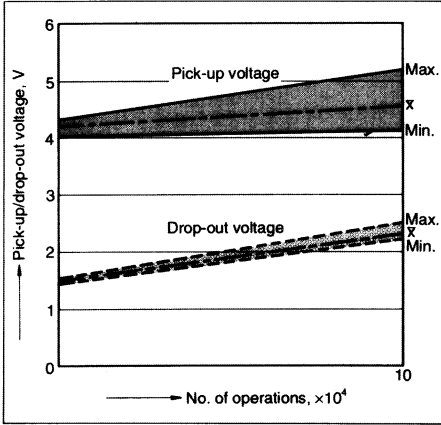
Tested sample: JSM1-12V-4, 3 pcs.

Condition: 10 A 16 V DC resistive load, 20 cpm

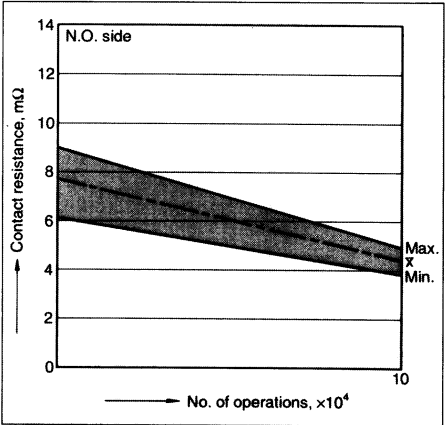
Ambient temperature: 25°C 77°F



Change of pick-up and drop-out voltage



Change of contact resistance



1-(2) Electrical life test (Power window motor load)

Tested sample: JSM1-12V-4, 4 pcs.

Load: DC 14 V

(1) Max. 14.8 A (Inrush) Max. 14.2 A (Break)

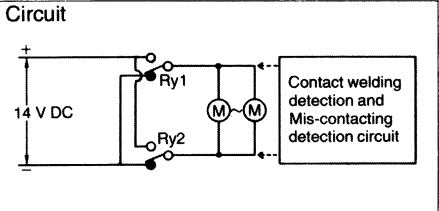
(2) Max. 20.3 A (Inrush) Max. 20.0 A (Break)

(3) Max. 16.2 A (Inrush) Max. 11.6 A (Break)

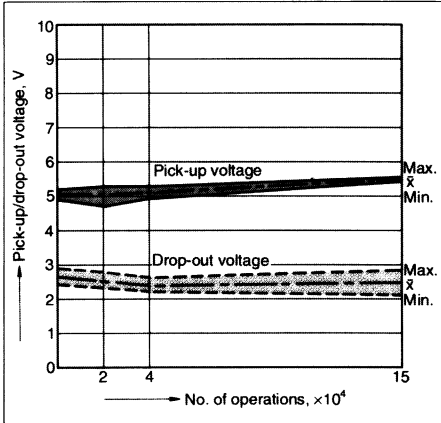
Switching frequency: 3 cycle/min. (ON:OFF = 1:9 sec.)

Ambient temperature: (1) 85°C 185°F; (2) -40°C -40°F; (3) 35°C 95°F

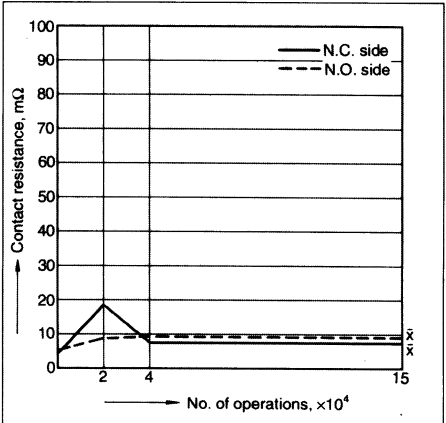
Tested cycle: (1)  $2 \times 10^4$  cycle → (2)  $2 \times 10^4$  cycle → (3)  $11 \times 10^4$  cycle (Total  $15 \times 10^4$  cycles)



Change of pick-up and drop-out voltage



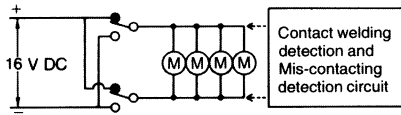
Change of contact resistance



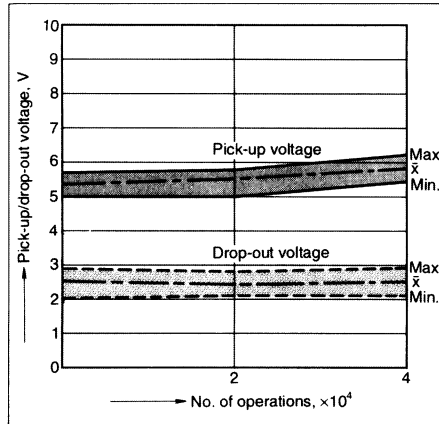
## 1-(3) Electrical life test (Door lock motor load)

Tested sample: JSM1-12V-4, 10 pcs.  
 Load: DC 16 V Max. 17.7 A, Min. 15.2 A  
 Switching frequency: 6 cycles/min.  
 (ON:OFF = 0.5:0.5 sec.)  
 Ambient temperature: 30°C 86°F  
 Tested cycle:  $4 \times 10^4$  cycles

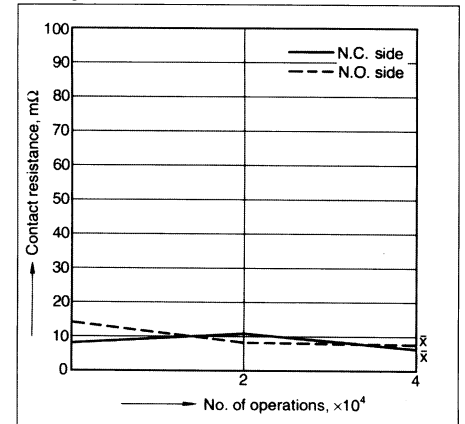
Circuit



Change of pick-up and drop-out voltage



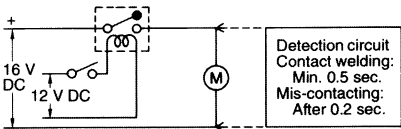
Change of contact resistance



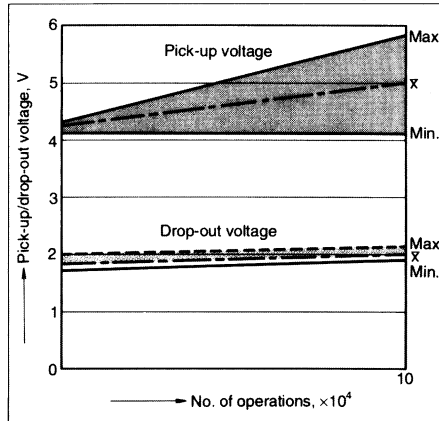
## 1-(4) Electrical life test

Tested sample: JSM1-12V-4, 3 pcs.  
 Load: 16 V DC 25 A/5 A motor load  
 Switching frequency: 6 cycles  
 (ON:OFF = 1:9 sec.)  
 Ambient temperature: 27°C 81°F

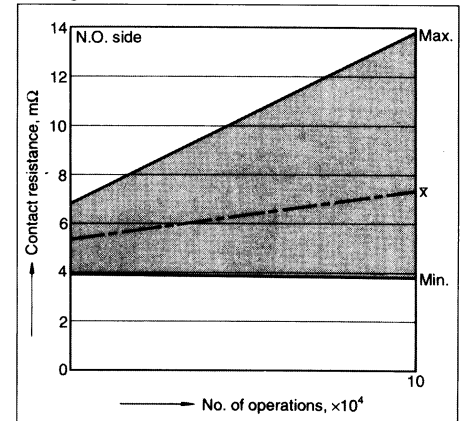
Circuit



Change of pick-up and drop-out voltage



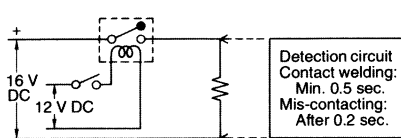
Change of contact resistance



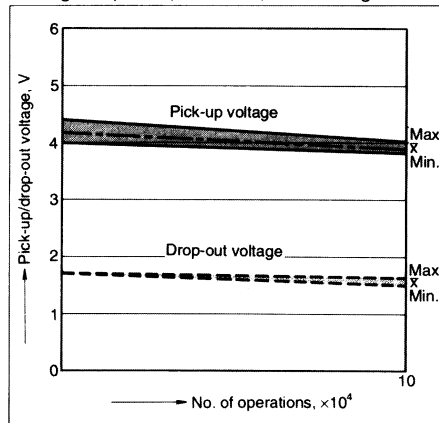
## 1-(5) Electrical life test

Tested sample: JSM1-12V-5, 4 pcs.  
 Load: 16 V DC 15 A (resistive)  
 Switching frequency: 20 cpm  
 Ambient temperature: 25°C 77°F

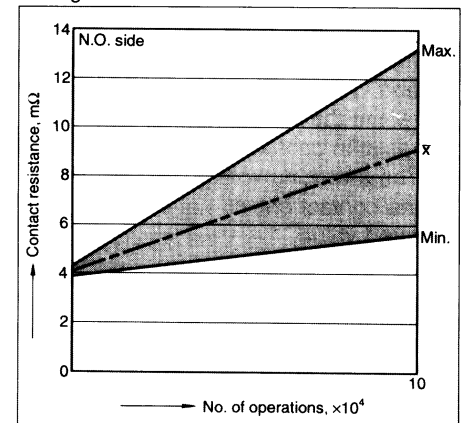
Circuit



Change of pick-up and drop-out voltage



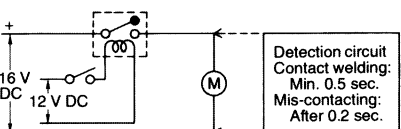
Change of contact resistance



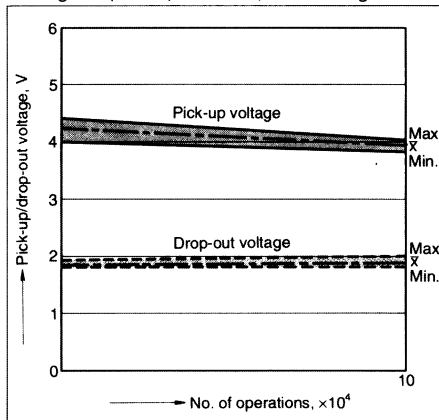
## 1-(6) Electrical life test

Tested sample: JSM1-12V-5, 3 pcs.  
 Load: 16 V DC, 50 A/10 A motor load  
 Switching frequency: 6 cycles  
 (ON:OFF = 1:9 sec.)  
 Ambient temperature: 27°C 81°F

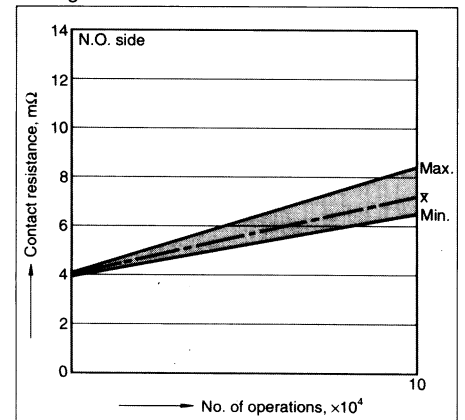
Circuit



Change of pick-up and drop-out voltage

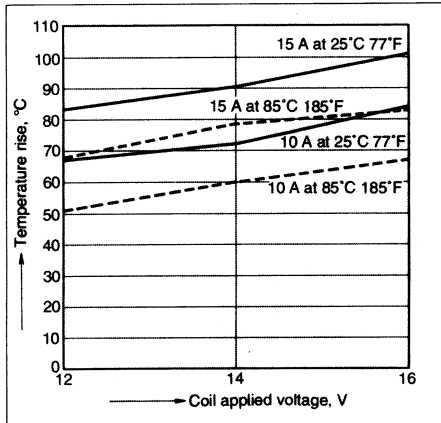


Change of contact resistance



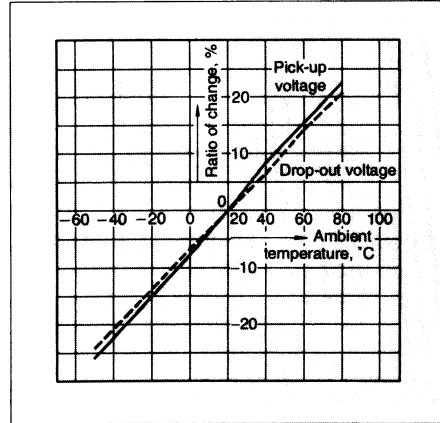
## 2. Temperature rise

Tested sample: JSM1-12V-4 & -5, 5 pcs.  
Measured portion: Inside the coil



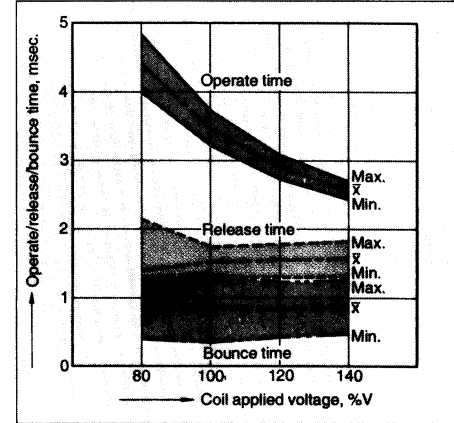
## 3. Ambient temperature characteristics

Tested sample: JSM1-12V-4 & -5, 6 pcs.

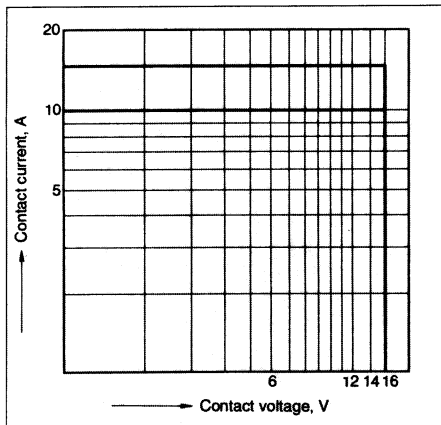


## 4. Operate/release/bounce time

Sample: JSM1a-12V-5, 25 pcs.



## 5. Maximum switching power



## NOTES

1. Avoid using in the location where there is organic gas such as  $\text{SO}_2$  gas and  $\text{H}_2\text{S}$  gas. Note that switching contact in the silicon atmosphere may result in contact failure.
2. The switching voltage and current to the contact should not exceed the rated value.
3. The rated contact capacity and life are typical values. Since contact conditions and life vary depending on kinds of loads and other conditions, please examine them in actual conditions.
4. Relays should be used only within the rated ambient temperature.