

mm inch

### FEATURES

- 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 type	High capacity type			
Arrangement	1 Form A, 1 Form C				
Contact material	Silver alloy				
Initial contact resistance, max.* (By voltage drop 6 V DC 1 A)	200 mOhm	100mOhm			
Initial voltage drop	Max. 0.2 V (at 10 A 12 V DC)				
Rating	Nominal switching capacity	10 A 16 V DC (resistive)	15 A 16 V DC (resistive)		
	Max. switching power	160 W			
	Max. switching voltage	16 V DC			
	Max. switching current	10 A	15 A (10 A max. at 85°C)		
Expected life (min. op.)	Mechanical life (at 180 cpm)	10 <sup>7</sup>			
	Electrical	Resistive	10 <sup>5</sup>	N.O.: 10 <sup>5</sup> N.C.: 5x10 <sup>4</sup>	
* Measured after operating 5 times at the rated load					
Coil					
Nominal operating power	640 mW				
Contact rating					
Load	Standard type		High capacity type		
	Form A	Form C	Form A	Form C	
	N.O.	N.C.	Form A	N.O.	N.C.
Max. carry current	15 A	15 A	15 A	15 A	15 A
Max. make current	25 A	25 A	10 A	50 A	15 A
Max. break current	10 A	10 A	10 A	15 A	15 A

Characteristics		
Max. operating speed (at rated load)		15 cps.
Initial insulation resistance* <sup>1</sup>		Min. 100 MOhm (at 500 V DC)
Initial breakdown voltage* <sup>2</sup>	Between open contacts	750 Vrms for 1 min.
	Between contacts and coil	1,500 Vrms for 1 min.
Operate time* <sup>3</sup> (at nominal voltage)		Approx. 10 ms
Release time (without diode)* <sup>3</sup> (at nominal voltage)		Approx. 10 ms
Shock resistance	Functional* <sup>4</sup>	Min. 98 m/s <sup>2</sup> {10 G}
	Destructive* <sup>5</sup>	Min. 980 m/s <sup>2</sup> {100 G}
Vibration resistance	Functional* <sup>6</sup>	Approx. 98 m/s <sup>2</sup> {10 G}, 10 to 55 Hz at double amplitude of 1.6 mm
	Destructive	Approx. 117.6 m/s <sup>2</sup> {12 G}, 10 to 55 Hz at double amplitude of 2 mm
Conditions for operation, transport and storage* <sup>7</sup> (Not freezing and condensing at low temperature)	Ambient temp.	-40°C to +85°C -40°F to +185°F
	Humidity	5 to 85% R.H.
Unit weight		Approx. 12 g .423 oz

### Remarks

- \* Specifications will vary with foreign standards certification ratings.
- \*<sup>1</sup> Measurement at same location as "Initial breakdown voltage" section
- \*<sup>2</sup> Detection current: 10mA
- \*<sup>3</sup> Excluding contact bounce time
- \*<sup>4</sup> Half-wave pulse of sine wave: 11ms; detection time: 10µs
- \*<sup>5</sup> Half-wave pulse of sine wave: 6ms
- \*<sup>6</sup> Detection time: 10µs
- \*<sup>7</sup> Refer to 5. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT (Page 61)

### 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)

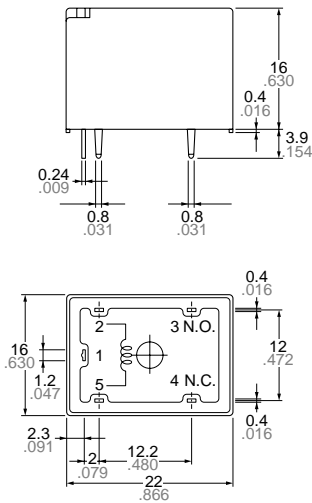
Note: Standard packing: Carton: 100 pcs. Case: 500 pcs.

**TYPES AND COIL DATA (at 20°C 68°F)**

Contact arrangement	Coil voltage, V DC	Standard type (10 A)		High capacity type (15 A)		Nominal voltage, V DC	Pick-up voltage, V DC (max.)	Drop-out voltage, V DC (min.)	Coil resistance Ohm (±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**

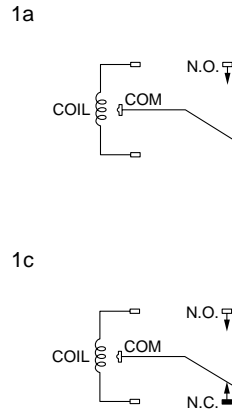
mm inch



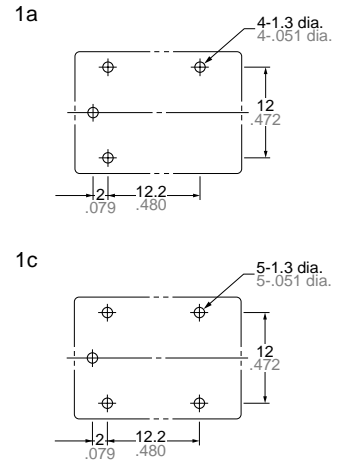
Note: Terminal No. 4 is only for 1 Form C type

General tolerance: ±0.3 ±.012

Schematic (Bottom view)



PC board pattern (Copper-side view)



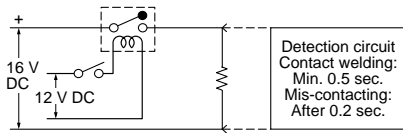
Tolerance: ±0.1 ±.004

**REFERENCE DATA**

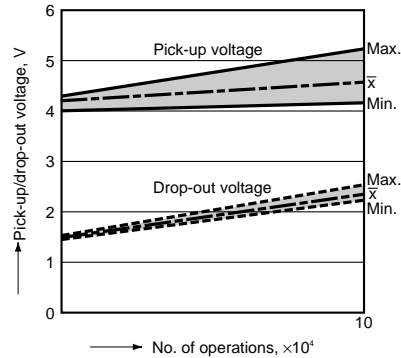
1-(1) Electrical life test (Resistive)

Tested sample: JSM-12V-4, 3 pcs.  
Condition: 10 A 16 V DC resistive load, 20 cpm  
Ambient temperature: 25°C 77°F

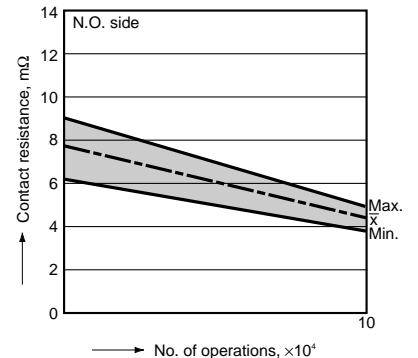
Circuit



Change of pick-up and drop-out voltage



Change of contact resistance

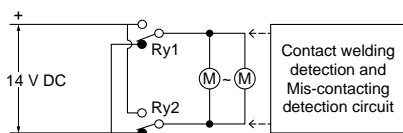


1-(2) Electrical life test

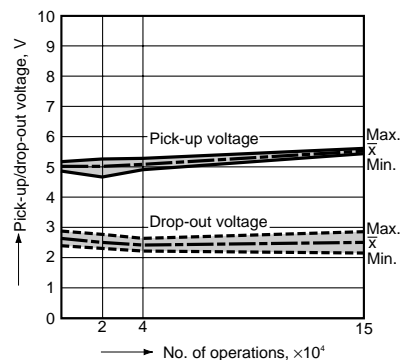
(Power window motor load)

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 s)  
Ambient temperature: (1) 85°C 185°F;  
(2) -40°C -40°F; (3) 35°C 95°F  
Tested cycle: (1) 2 × 10<sup>4</sup> cycle → (2) 2 × 10<sup>4</sup> cycle → (3) 11 × 10<sup>4</sup> cycle (Total 15 × 10<sup>4</sup> cycles)

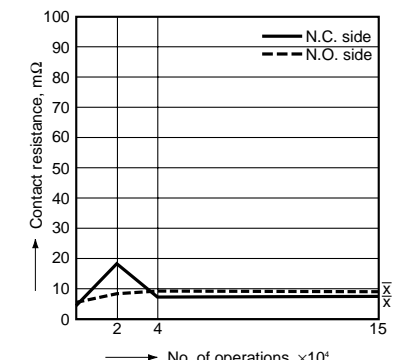
Circuit



Change of pick-up and drop-out voltage



Change of contact resistance

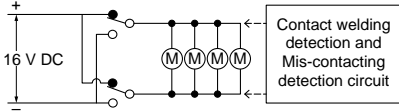


# JS-M

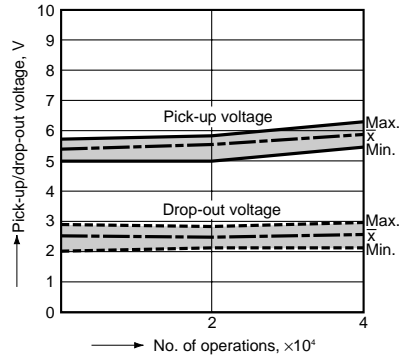
## 1-(3) Electrical life test (Door lock motor load)

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 s)  
 Ambient temperature: 30°C 86°F  
 Tested cycle: 4 x 10<sup>4</sup> cycles

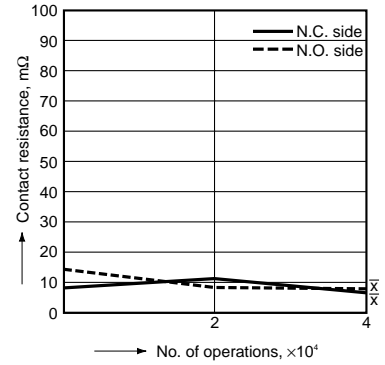
### Circuit



### Change of pick-up and drop-out voltage



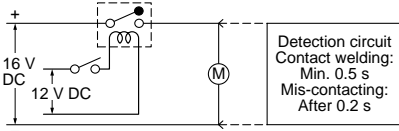
### Change of contact resistance



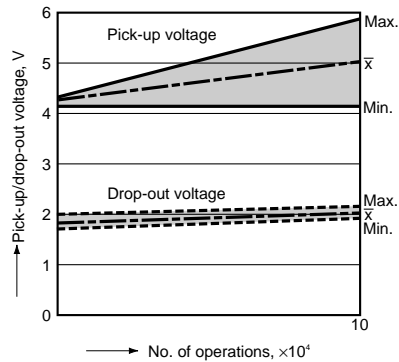
## 1-(4) Electrical life test

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 s)  
 Ambient temperature: 27°C 81°F

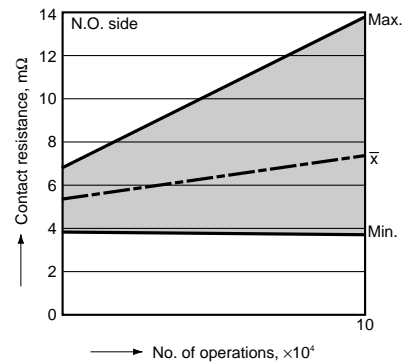
### Circuit



### Change of pick-up and drop-out voltage



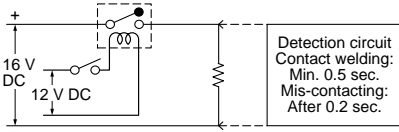
### Change of contact resistance



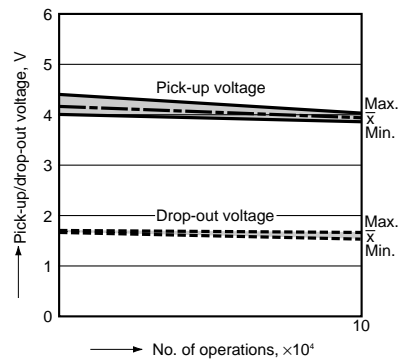
## 1-(5) Electrical life test

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

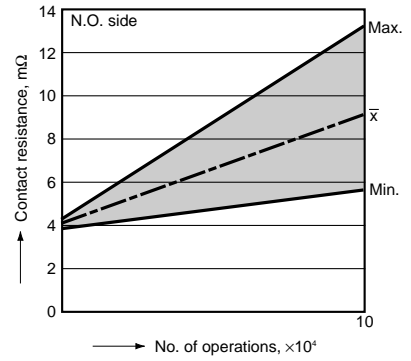
### Circuit



### Change of pick-up and drop-out voltage



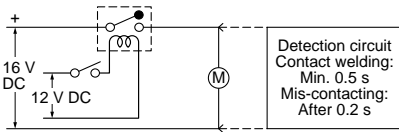
### Change of contact resistance



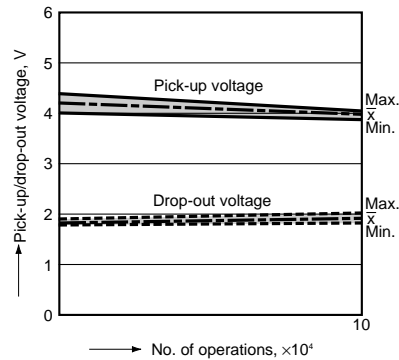
## 1-(6) Electrical life test

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 s)  
 Ambient temperature: 27°C 81°F

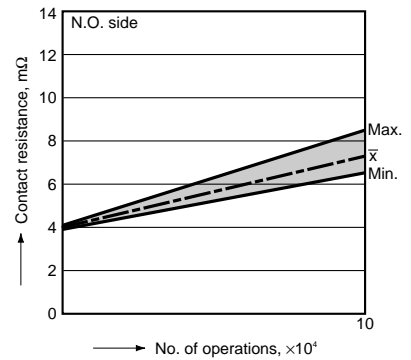
### Circuit



### Change of pick-up and drop-out voltage



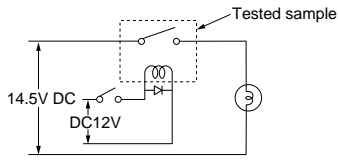
### Change of contact resistance



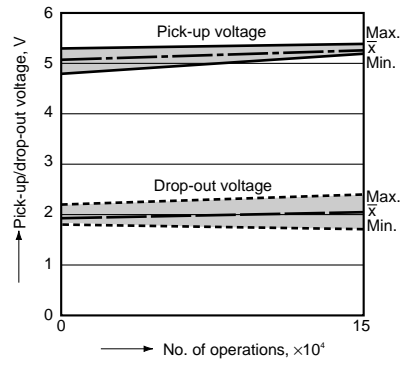
1-(7) Electrical life test (Lamp load)

Tested sample: JSM1a-12V-5, 4 pcs.  
 Load: 9.6A Steady, Inrush 55.2A,  
 14.5V DC (Lamp load)  
 Operating frequency: ON 1s, OFF 2s

Circuit



Contact welding: 0 time  
 Miscontact: 0 time



2. Temperature rise

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

