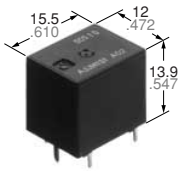
Panasonic
ideas for life

COMPACT SIZE AUTOMOTIVE RELAY

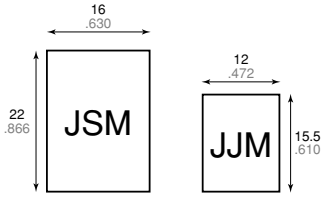
JJ-M RELAYS



mm inch

FEATURES

• Compact (half-size).
The base area is approximately half the size of conventional (JS-M) relays. The controller unit can be made more compact.
Base area has been reduced by one half



• Perfect for automobile electrical systems.
Over 2 × 10^5 openings possible with a 14 V DC motor load, an inrush current of 25 A, and steady state current of 5 A. (N.O. side)

• Standard terminal pitch employed
The terminal array used is identical to that used in small automotive relays.

• Plastic sealed type.
Plastically sealed for automatic cleaning.

• Line-up of 1 Form A and 1 Form C.

TYPICAL APPLICATIONS

- Power windows
- Auto door lock
- Electrically powered sun roof
- Electrically powered mirror
- Cornerring lamp, etc.

Compliance with RoHS Directive

SPECIFICATIONS

Contact

Arrangement			1 Form A	1 Form C
Contact material			Ag alloy (Cadmium free)	
Initial contact resistance (Initial) (By voltage drop 6V DC 1A)			Typ. 5 mΩ	
Rating (resistive load)	Nominal switching capacity		20 A 14 V DC	20 A 14 V DC (N.O.) 10 A 14 V DC (N.C.)
	Min. switching capacity#1		1 A 12 V DC	
	Max. carrying current		N.O.: 35 A (12V, at 20°C 68°F for 2 minutes) 25 A (12V, at 20°C 68°F for 1 hour) 30 A (12V, at 85°C 185°F for 2 minutes) 20 A (12V, at 85°C 185°F for 1 hour)	
Expected life (min. operations)	Mechanical (at 120cpm)		10^7	
	Electrical (at rated load)	Resistive	10^5 *1	10^5 (N.O.)*2 10^5 (N.C.)*3
		Motor load	2×10^5 *4 5×10^4 *5	2×10^5 (N.O.)*6 5×10^4 (N.O.)*7 2×10^5 (N.C.)*8

Coil

Nominal operating power	640 mW

#1 This value can change due to the switching frequency, environmental conditions, and desired reliability level, therefore it is recommended to check this with the actual load.

Remarks

*1 at 20 A 14 V DC, at 20 cpm, operating frequency: 1s ON, 9s OFF
*2 at 20 A 14 V DC, operating frequency: 1s ON, 9s OFF
*3 at 10 A 14 V DC, at 20 cpm, operating frequency: 1s ON, 9s OFF
*4 at 5 A (steady), 25 A (inrush) 14 V DC
*5 at 20 A 14 V DC (Motor lock), operating frequency: 0.5 s ON, 9.5 s OFF
*6 at 5A (steady), 25 A (inrush) 14 V DC

Characteristics

Max. operating speed (at rated load)		6 cpm
Initial insulation resistance*9		Min. 100 MΩ (at 500 V DC)
Initial breakdown voltage*10	Between open contacts	500 Vrms for 1min.
	Between contact and coil	500 Vrms for 1min.
Operate time*11 (at nominal voltage)		Max. 10 ms (at 20°C 68°F)
Release time (without diode)*11 (at nominal voltage) (Initial)		Max. 10 ms (at 20°C 68°F)
Shock resistance	Functional*12	Min. 100 m/s² {10 G}
	Destructive*13	Min. 1,000 m/s² {100 G}
Vibration resistance	Functional*14	10 Hz to 100 Hz, Min. 44.1 m/s² {4.5 G}
	Destructive	10 Hz to 500 Hz, Min. 44.1 m/s² {4.5 G}
Conditions in case of operation, transport and storage*15 (Not freezing and condensing at low temperature)	Ambient temp.	–40°C to +85°C –40°F to +185°F
	Humidity	5% R.H. to 85% R.H.
Mass		Approx. 5 g .176 oz

*7 at 20 A 14 V DC (Motor lock)
*8 at peak 20 A 14 V DC (Braking current) operating frequency: 0.5 s ON, 9.5 s OFF
*9 Measurement at same location as "Initial break down voltage" section.
*10 Detection current: 10mA
*11 Excluding contact bounce time.
*12 Half-wave pulse of sine wave: 11 ms; detection time: 10 μs
*13 Half-wave pulse of sine wave: 6 ms
*14 Detection time: 10 μs
*15 Refer to Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT
Please inquire if you will be using the relay in a high temperature atmosphere (110°C 230°F).

ORDERING INFORMATION

Ex. JJM □ – □

Contact arrangement	Coil voltage(DC)
1a: 1 Form A 1: 1 Form C	12 V

(Note) Standard packing: Carton: 50 pcs.; Case: 1,000 pcs.

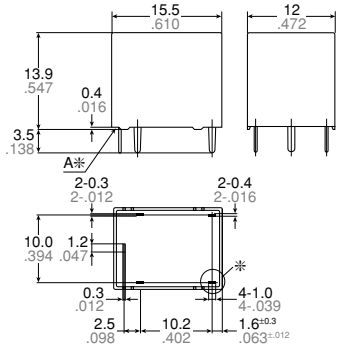
TYPES AND COIL DATA (at 20°C 68°F)

Contact arrangement	Part No.	Nominal voltage, V DC	Pick-up voltage, V DC (Initial)	Drop-out voltage, V DC (Initial)	Coil resistance Ω	Nominal operating current mA	Nominal operating power mW	Usable voltage range, V DC
1 Form A	JJM1a-12 V	12	Max. 7.2	Min. 1.0	225±10%	53.3±10%	640	10 to 16
1 Form C	JJM1-12 V	12	Max. 7.2	Min. 1.0	225±10%	53.3±10%	640	10 to 16

* Other pick-up voltage types are also available. Please contact us for details.

DIMENSIONS

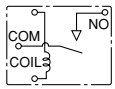
mm inch



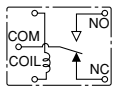
Note: *Marked terminal is only for 1Form C type

Schematic (Bottom view)

1a

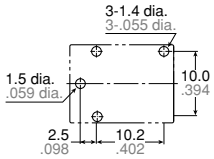


1c

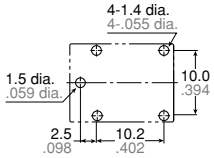


PC board pattern (Bottom view)

1a



1c



* Dimensions (thickness and width) of terminal specified in this catalog is measured before pre-soldering.
Intervals between terminals is measured at A surface level.

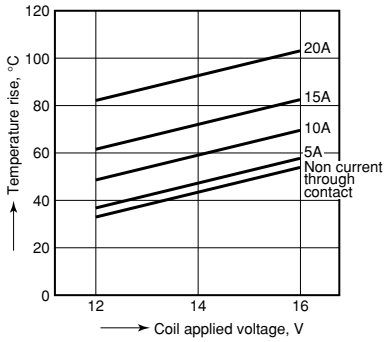
Tolerance: ±0.1 ±.004

Dimension:	General tolerance
Max. 1mm .039 inch:	±0.1 ±.004
1 to 3mm .039 to .118 inch:	±0.2 ±.008
Min. 3mm .118 inch:	±0.3 ±.012

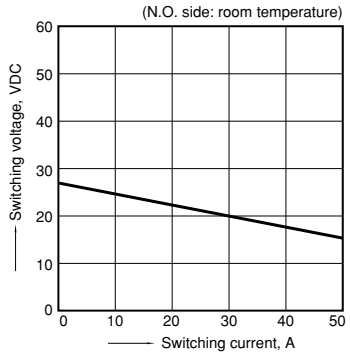
REFERENCE DATA

1. Coil temperature rise

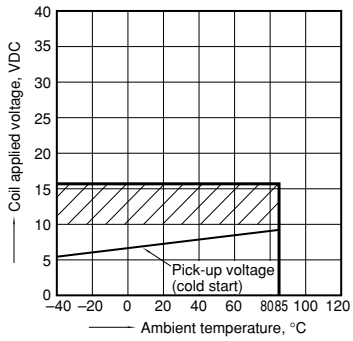
Sample: JJM1-12V, 6pcs
Point measured: Inside the coil
Contact current: Now current through contact, 5A, 10A, 15A, 20A
Resistance method, ambient temperature 85°C 185°F



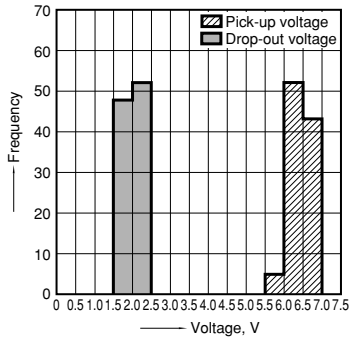
2. Max. switching capability (Resistive load)



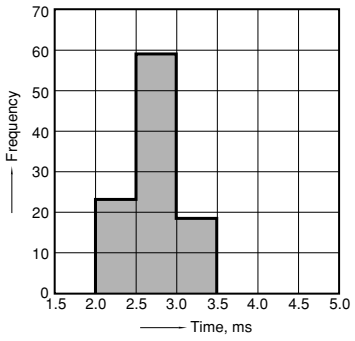
3. Ambient temperature and operating voltage range



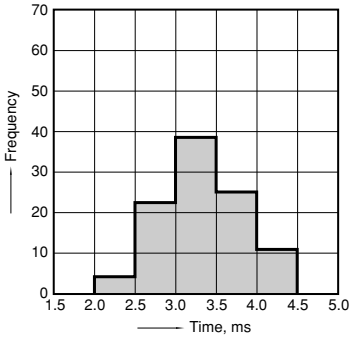
4. Distribution of pick-up and drop-out voltage
Sample: JJM1-12V, 100pcs



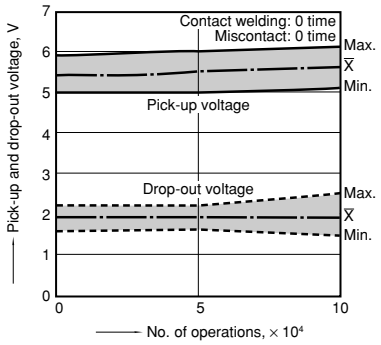
5. Distribution of operate time
Sample: JJM1-12V, 100pcs



6. Distribution of release time
Sample: JJM1-12V, 100pcs
* With diode

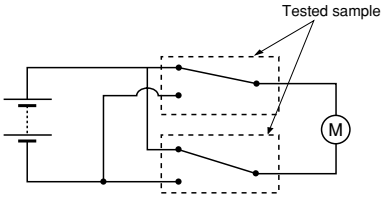


7-(1). Electrical life test (at rated load)
Sample: JJM1-12V
Quantity: n = 6 (NC = 3, NO = 3)
Load: Resisitive load (NC side: 10A 14 V DC, NO side: 20 A 14 V DC); Operating frequency: ON 1s, OFF 9s
Ambient temperature: Room temperature

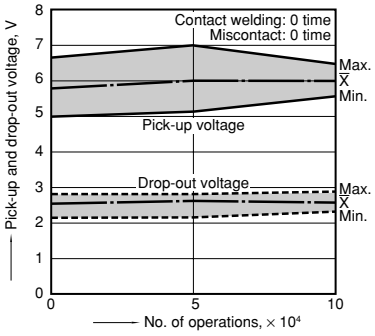


7-(2). Electrical life test (Motor free)
Sample: JJM1-12V, 6pcs.
Load: 5A, Inrush 25A, Brake current 18A 14V DC,
Power window motor load (Free condition).
Operating frequency: (ON : OFF = 0.5s : 9.5s)
Ambient temperature: Room temperature

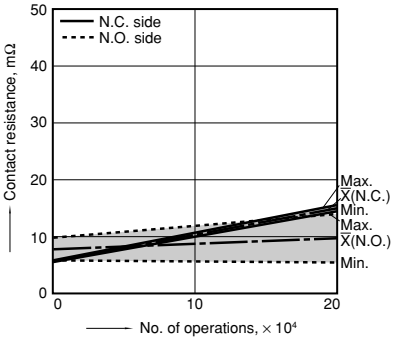
Circuit :



Change of pick-up and drop-out voltage

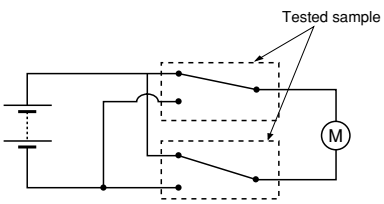


Change of contact resistance

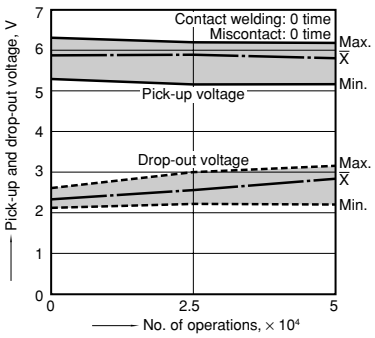


7-(3). Electrical life test (Motor lock)
Sample: JJM1-12V, 6pcs.
Load: 20A, 14VDC,
Power window motor actual load (lock condition).
Operating frequency: (ON : OFF = 1s : 5s)
Ambient temperature: Room temperature

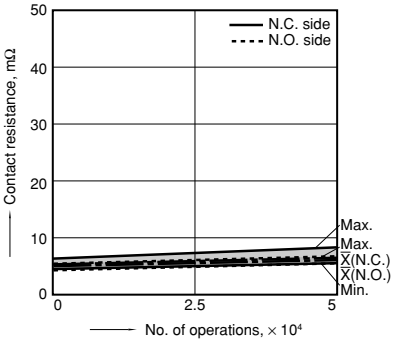
Circuit :



Change of pick-up and drop-out voltage

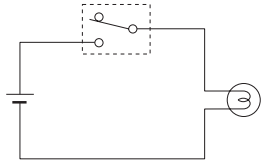


Change of contact resistance

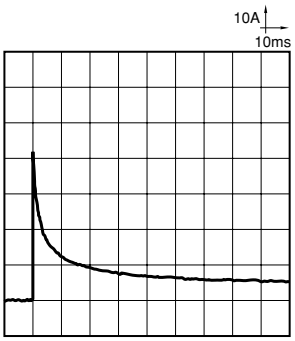


7-(4). Electrical life test (Lamp load)
Sample: JJM1-12V, 6pcs.
Load: 27W+21W, min. 4A (steady), Lamp actual load
Operating frequency: ON 2s, OFF 13s
Ambient temperature: Room temperature

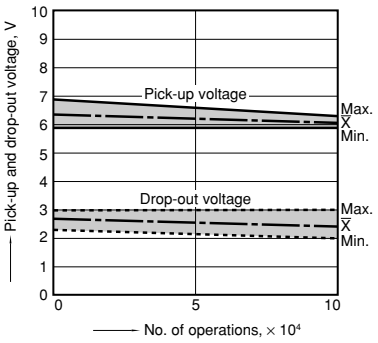
Circuit :



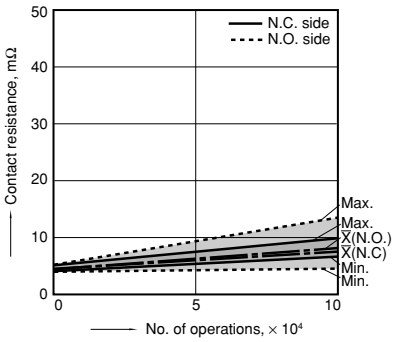
Inrush current: 42A, Steady current: 4.4A



Change of pick-up and drop-out voltage



Change of contact resistance



For Cautions for Use, see Relay Technical Information .