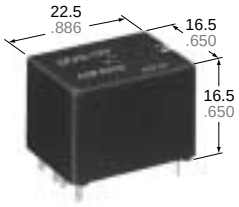
NAiS

NEW DUAL POWER AUTOMOTIVE RELAY

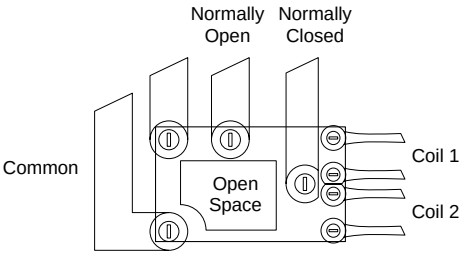
CF-RELAYS



mm inch

FEATURES

- **7 Amp Steady/30 Amp Inrush current capability**
- **Simple footprint enables ease of PC board layout**



SPECIFICATIONS

Contact

Arrangement			1 Form C×2 (H bridge)
Contact material			Silver alloy
Initial contact resistance, max. (By voltage drop 6 V DC 1 A)			50 mΩ
Contact voltage drop, max.			0.2 V (at 20 A switching)
Rating	Nominal switching capacity		N.O.: 20A 14 V DC N.C.: 10A 14 V DC
	Max. switching power		140 W
	Max. switching voltage		16 V DC
	Max. make current		10 A (Continuous), 30 A (within 1 min.; coil applied voltage: 12 V, at 20°C)
	Max. carrying current		30 A (2 minutes), 20A (1 hour) (coil applied voltage: 12 V, at 20°C)
Expected life (min. ope.)	Mechanical (at 180 cpm)		10^6
	Electrical	resistive load	Min.10^5
		7 A 14 V DC, Inrush 30 A (Motor load)	2×10^5
		20 A 14 V DC (Motor lock)	Min.5×10^4

Coil

Nominal operating power	640 mW

Characteristics

Max. operating speed (at rated load)		6 cpm
Initial insulation resistance*1		Min. 100 mΩ (at 500 V DC)
Initial breakdown voltage*2	Between open contacts	1,000 Vrms for 1 min.
	Between contacts and coil	1,000 Vrms for 1 min.
Operate time*3 (at nominal voltage)		Max. 10 ms
Release time (without diode)*3 (at nominal voltage)		Max. 10 ms
Shock resistance	Functional*4	Min. 100 m/s² {10 G}
	Destructive*5	Min. 1,000 m/s² {100 G}
Vibration resistance	Functional*6	Approx. 44.1 m/s2 {4.5 G}, 10 to 100 Hz
	Destructive	Approx. 44.1 m/s² {4.5 G}, 10 to 500 Hz
Conditions for operation, transport and storage*7 (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	Standard type	Approx. 15 g .529 oz

Remarks

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

TYPICAL APPLICATIONS

• Automotive: Power-window, power sunroof, etc.

ORDERING INFORMATION

Ex. CF [2] – [12 V]

Contact arrangement	Coil voltage(DC)
1 Form C × 2	12 V

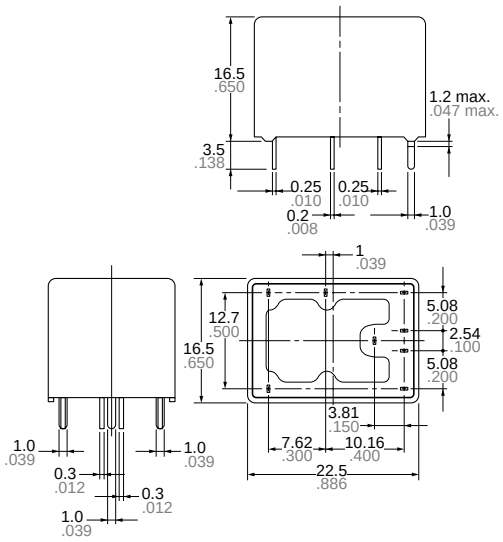
Standard packing: Carton: 35pcs.; Case: 700pcs.

TYPES AND COIL DATA (at 20°C 68°F)

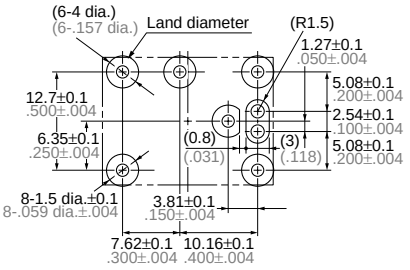
Part No.	Nominal voltage, V DC	Pick-up voltage, V DC (max.)	Drop-out voltage, V DC (min.)	Coil resistance, Ω (±10%)	Nominal operating current, mA (±10%)	Nominal operating Power, mW	Usable voltage range, VDC
CF2-12V	12	7.2	1.0	225	53.3	640	10 to 16

DIMENSIONS

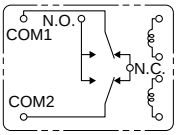
mm inch



Recommended PC board pattern



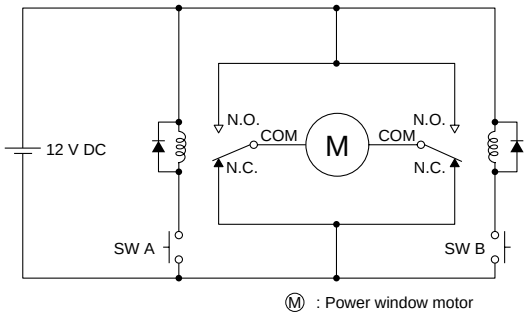
Schematic



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

EXAMPLE OF CIRCUITS

Forward/reverse control circuits of DC motor for power window

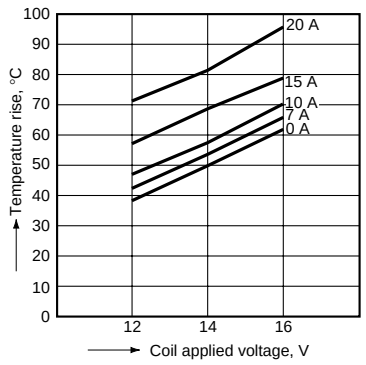


Ⓜ : Power window motor

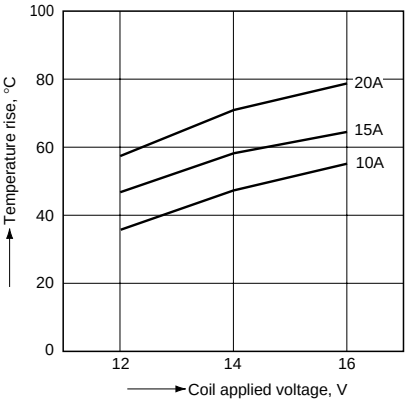
SW A	SW B	Motor
OFF	OFF	Stop
ON	OFF	Forward
OFF	ON	Reverse

REFERENCE DATA

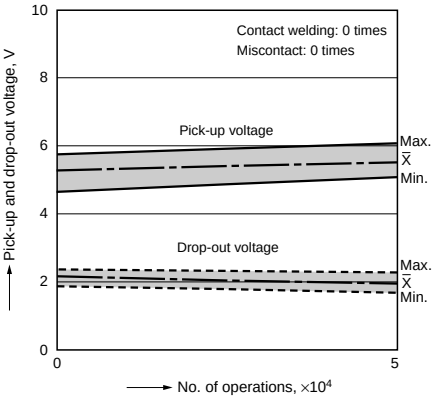
1-(1). Coil temperature rise (at 23°C 73°F)
Tested sample: CF2-12V, 6pcs.
Contact carrying current: 0A, 7A, 10A, 15A, 20A



1-(2). Coil temperature rise (at 85°C 185°F)
Tested sample: CF2-12V, 6pcs.
Contact carrying current: 10A, 15A, 20A



2-(1). Electrical life test (Motor lock)
Tested sample: CF2-12V, 3pcs.
Load: 20A 14V DC
Operating frequency: ON 1s, OFF 5s



2-(2). Electrical life test (Motor free)
Tested sample: CF2-12V, 3pcs.
Load: 7A steady, Inrush 30A, 14V DC
Operating frequency: ON 1s, OFF 5s