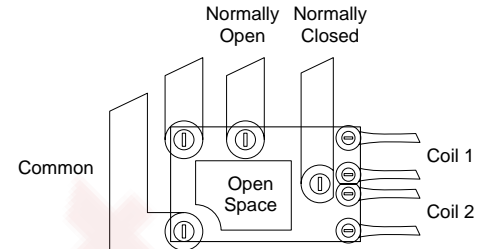


mm inch

FEATURES

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



SPECIFICATIONS

Contact

Arrangement	1 Form Cx2 (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)	
Expect ed 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
-------------------------	--------

Remarks

- * Specifications will vary with foreign standards certification ratings.
- *1 Measurement at same location as "Initial breakdown voltage" section
- *2 Detection current: 10mA
- *3 Excluding contact bounce time
- *4 Half-wave pulse of sine wave: 11ms; detection time: 10μs

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/s ² {10 G}
	Destructive*5	Min. 1,000 m/s ² {100 G}
Vibration resistance	Functional*6	Approx. 44.1 m/s ² {4.5 G}, 10 to 100 Hz
	Destructive	Approx. 44.1 m/s ² {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

*5 Half-wave pulse of sine wave: 6ms

*6 Detection time: 10μs

*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 -

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

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

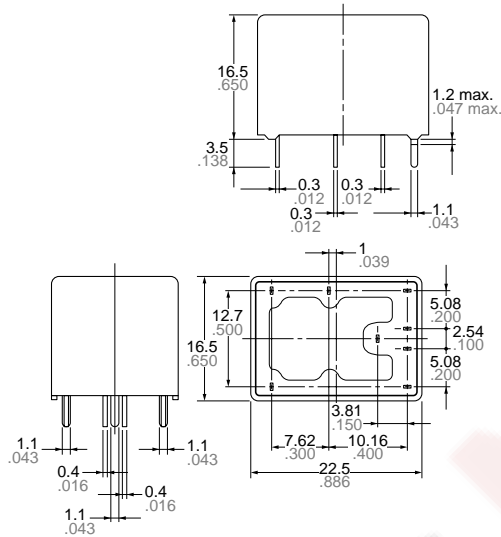
CF

TYPES AND COIL DATA (at 20°C 68°F)

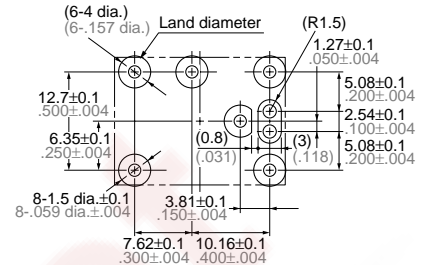
Part No.	Nominal voltage, V DC	Pick-up voltage, V DC (max.)	Drop-out voltage, V DC (min.)	Coil resistance, Ω (±10%)	Nominal operating current, mA (±10%)	Nominal operating Power, mW	Usable voltage range, VDC
CF2-12V	12	7.2	1.0	225	53.3	640	10 to 16

DIMENSIONS

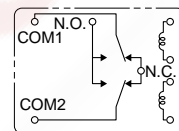
mm inch



Recommended PC board pattern



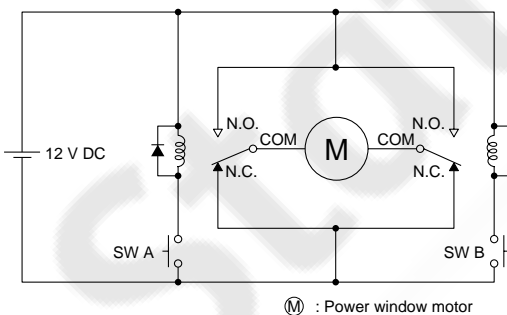
Schematic



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



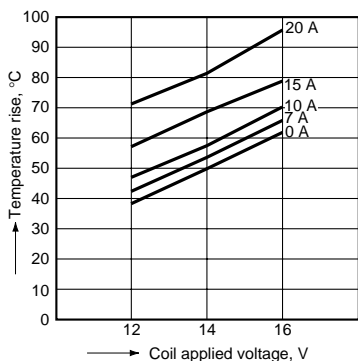
SW A	SW B	Motor
OFF	OFF	Stop
ON	OFF	Forward
OFF	ON	Reverse

REFERENCE DATA

1-(1). Coil temperature rise (at 23°C 73°F)

Tested sample: CF2-12V, 6pcs.

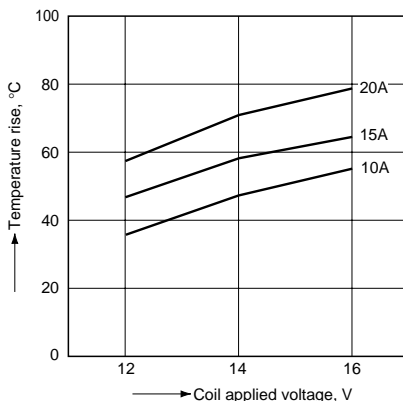
Contact carrying current: 0A, 7A, 10A, 15A, 20A



1-(2). Coil temperature rise (at 85°C 185°F)

Tested sample: CF2-12V, 6pcs.

Contact carrying current: 10A, 15A, 20A

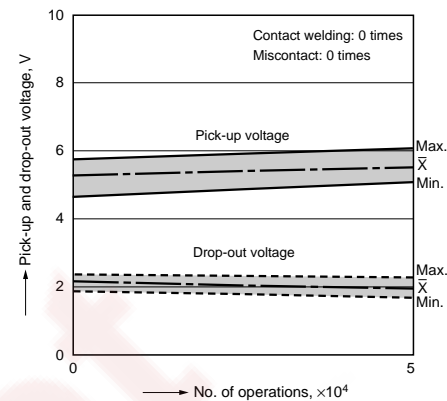


2-(1). Electrical life test (Motor lock)

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

