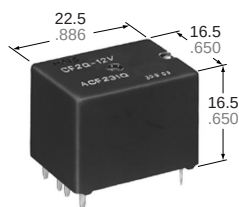


NAIS

NEW DUAL POWER AUTOMOTIVE RELAY

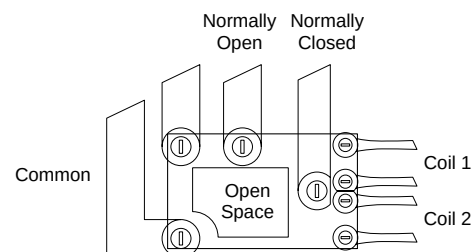
CF-RELAYS



mm inch

FEATURES

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



SPECIFICATIONS

Contact

Arrangement			1 Form 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
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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, trans- port 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 2 - 12 V

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

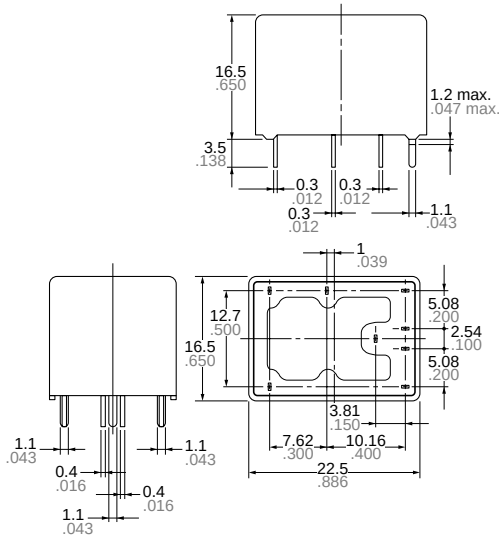
Standard packing: Carton: 35pcs.; Case: 700pcs.

TYPES AND COIL DATA (at 20°C 68°F)

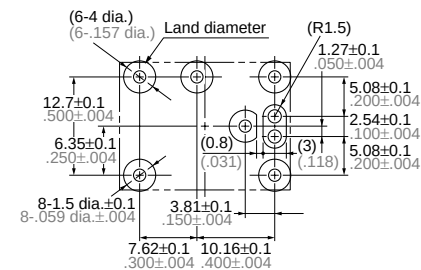
Part No.	Nominal voltage, V DC	Pick-up voltage, V DC (max.)	Drop-out voltage, V DC (min.)	Coil resistance, Ω (±10%)	Nominal operating current, mA (±10%)	Nominal operating Power, mW	Usable voltage range, VDC
CF2-12V	12	7.2	1.0	225	53.3	640	10 to 16

DIMENSIONS

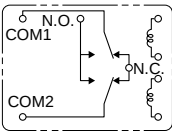
mm inch



Recommended PC board pattern



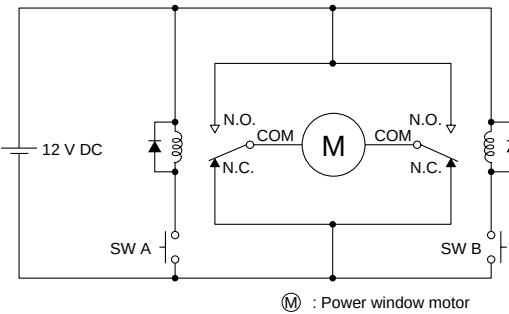
Schematic



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



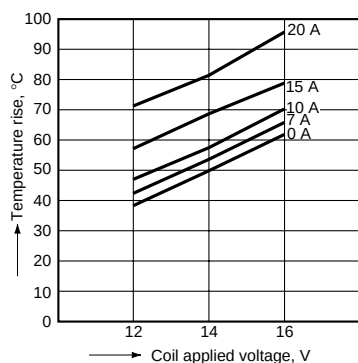
SW A	SW B	Motor
OFF	OFF	Stop
ON	OFF	Forward
OFF	ON	Reverse

REFERENCE DATA

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

Tested sample: CF2-12V, 6pcs.

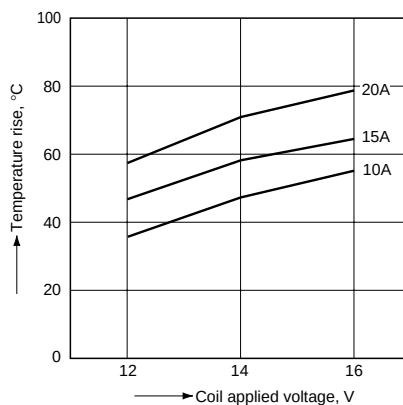
Contact carrying current: 0A, 7A, 10A, 15A, 20A



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

Tested sample: CF2-12V, 6pcs.

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

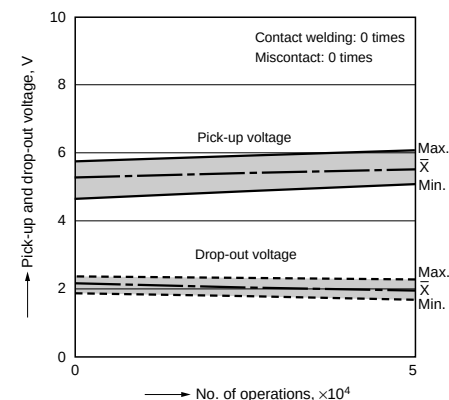


2-(1). Electrical life test (Motor lock)

Tested sample: CF2-12V, 3pcs.

Load: 20A 14V DC

Operating frequency: ON 1s, OFF 5s

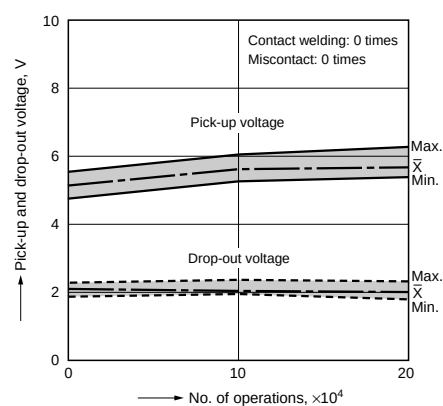
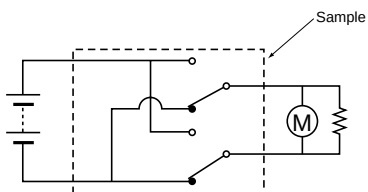


2-(2). Electrical life test (Motor free)

Tested sample: CF2-12V, 3pcs.

Load: 7A steady, Inrush 30A, 14V DC

Operating frequency: ON 1s, OFF 5s



For Cautions for use, see Relay Technical Information (Page 48 to 76).