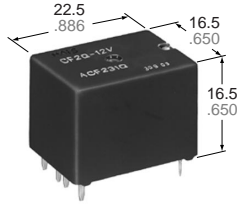


NAIS

NEW DUAL POWER AUTOMOTIVE RELAY

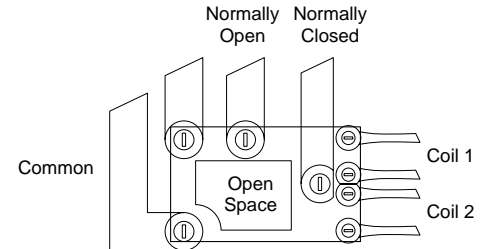
CF-RELAYS



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 |
|-------------------------|--------|

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 |

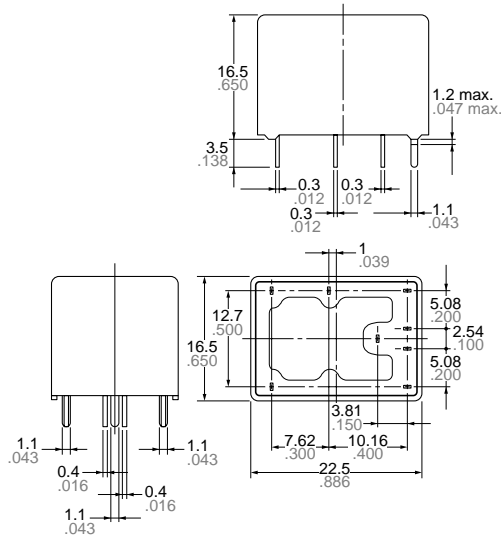
Standard packing: Carton: 35pcs.; Case: 700pcs.

TYPES AND COIL DATA (at 20°C 68°F)

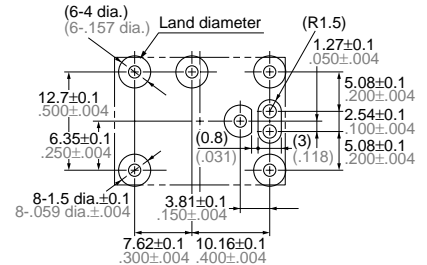
| Part No. | Nominal voltage, V DC | Pick-up voltage, V DC (max.) | Drop-out voltage, V DC (min.) | Coil resistance, Ω (±10%) | Nominal operating current, mA (±10%) | Nominal operating Power, mW | Usable voltage range, VDC |
|----------|-----------------------|------------------------------|-------------------------------|---------------------------|------------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

DIMENSIONS

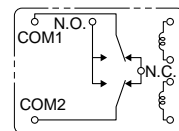
mm inch



Recommended PC board pattern



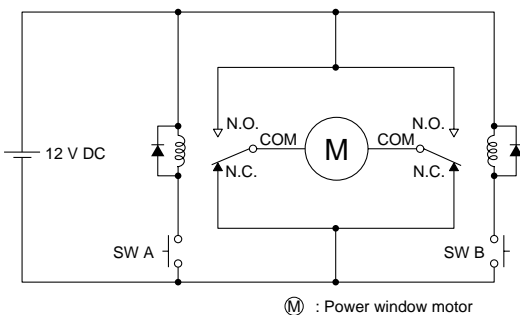
Schematic



| 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



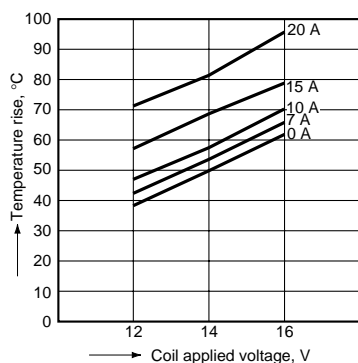
| SW A | SW B | Motor |
|------|------|---------|
| OFF | OFF | Stop |
| ON | OFF | Forward |
| OFF | ON | Reverse |

REFERENCE DATA

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

Tested sample: CF2-12V, 6pcs.

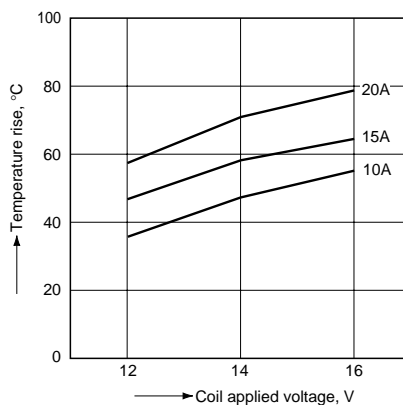
Contact carrying current: 0A, 7A, 10A, 15A, 20A



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

Tested sample: CF2-12V, 6pcs.

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

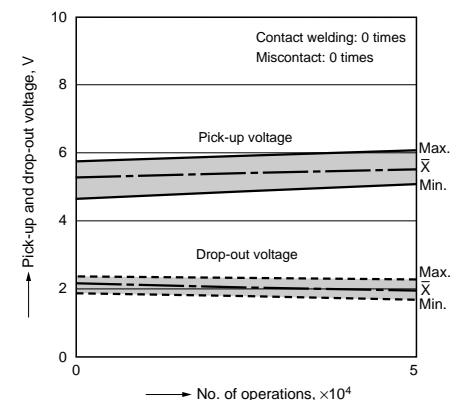


2-(1). Electrical life test (Motor lock)

Tested sample: CF2-12V, 3pcs.

Load: 20A 14V DC

Operating frequency: ON 1s, OFF 5s

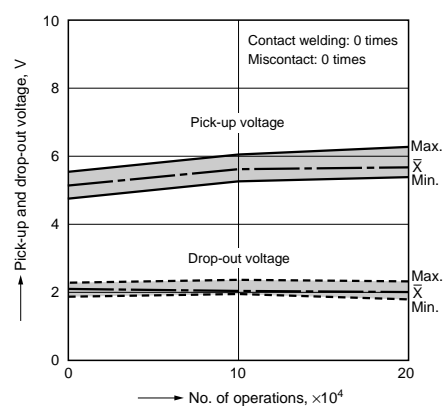
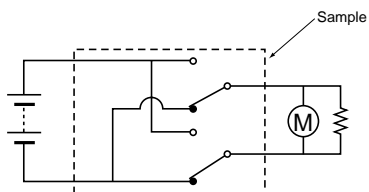


2-(2). Electrical life test (Motor free)

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).