



# TO-5 CASE RELAY SPDT

Series  
1MA1

## Product Description

A series of ultra miniature hermetically sealed relays constructed in a transistor style case, providing superior performance and established reliability characteristics. Available in a variety of sensitivities contact configurations and hybrid improvements, to provide a most versatile element to the circuit designer.

The following construction features ensure the highest reliability in extreme environments:

- All welded relay construction
- Cleaning and sealing techniques ensures maximum internal cleanliness
- Low level to 1 ampere switching
- 1 form C, SPDT contacts, special metal alloy with gold plating
- Frame design and force / mass ratio provides exceptional shock and vibration immunity

Low intercontact capacitance and contact circuit losses, provides also a reliable switching functions in demanding RF applications, combined with small size and low coil power dissipation (see figure 1).

## Series Type

- 1MA1 1 form C, SPDT

## Environmental and Physical Specifications

|                               |  |
|-------------------------------|--|
| <b>Temperature (Ambient)</b>  | - 65°C to + 125°C                            |
| <b>Shock</b>                  | 75 g, 6 ms., half sine wave                  |
| <b>Vibration (sinusoidal)</b> | 30 g, 10 to 2000 Hz, 1,5 amplitude peak      |
| <b>Bump</b>                   | 40 g, 6 ms.                                  |
| <b>Sealing</b>                | All welded, Hermetic                         |
| <b>Weight</b>                 | 0,11 oz. (3,00 grams) max.                   |
| <b>Finish</b>                 | Bright tin lead plated terminations and case |



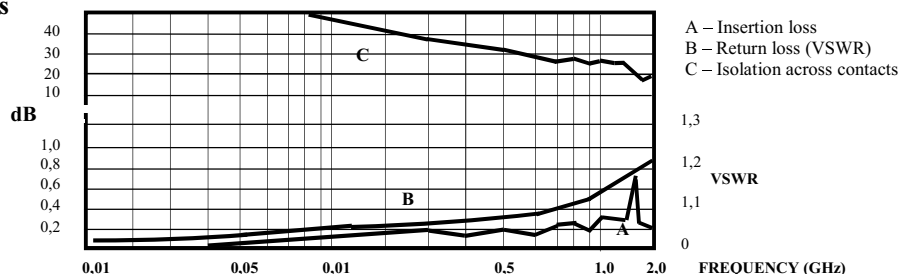
## Electrical Characteristics (over the Temperature range. Unless otherwise noted)

|  |   |                          |                    |
|--|---|--------------------------|--------------------|
| <b>Coil Data</b>                       | See Typical Characteristics chart                                 |                          |                    |
| <b>Contact Rating</b>                  | <b>Type Load</b>  | <b>Contact Load</b>      | <b>Cycles min.</b> |
| (Note: All ratings with grounded case) | Low Level   | 10 mA / 30 mV            | 1.000.000          |
|  | Resistive   | 1 A / 28 Vdc             | 100.000            |
|  | Resistive overload  | 2 A / 28 Vdc             | 100                |
|  | Inductive   | 100 mA / 28 Vdc (320 mH) | 100.000            |
| <b>Contact Resistance</b>              | 0,1 Ω max. initial, 0,3 Ω max. after life                         |                          |                    |
| <b>Operate Time</b>                    | 2,5 ms. max.  |                          |                    |
| <b>Release Time</b>                    | 2,0 ms. max.  |                          |                    |
| <b>Contact Bounce</b>                  | 2,0 ms. max.  |                          |                    |
| <b>Dielectric Strength</b>             | 500 Vrms min., 60 Hz, all points at sea level                     |                          |                    |
| <b>Insulation Resistance</b>           | 10.000 MΩ min. all points at 500 Vdc                              |                          |                    |
| <b>Intercontact Capacitance</b>        | 0,7 pF typical  |                          |                    |
| <b>Sensitivity</b>                     | 100 mW at pick-up, 400 mW at nominal rated coil voltage, at 25 °C |                          |                    |

Figure 1 - Radio Frequency Curves

Note:

Radio frequency curves are typical characteristics based on factory knowledge. Tests to ensure compliance on RF performance, are not performed.





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## Typical Characteristics

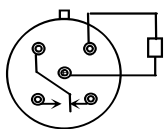
| Coil Variant Code | Coil Voltage Vdc |      | Coil resistance $\Omega$<br>$\pm 10\%$ at 25 °C | Operated Voltage V dc Max. at |       | Release Voltage Vdc |       |                 |        |
|-------------------|------------------|------|---|-------------------------------|-------|---------------------|-------|-----------------|--------|
|                   | Rated            | Max. |   | 25°C                          |       | Non-release at      |       | Must-release at |        |
|                   |                  |      |   | 25°C                          | 125°C | 25°C                | 125°C | 25°C            | - 65°C |
| 01                | 5,0              | 6,0  | 63  | 2,8                           | 3,7   | 1,7                 | 2,4   | 0,23            | 0,15   |
| 02                | 6,0              | 8,0  | 125   | 3,5                           | 4,5   | 2,0                 | 2,8   | 0,28            | 0,18   |
| 03                | 9,0              | 12,0 | 280   | 5,3                           | 6,8   | 3,0                 | 4,2   | 0,54            | 0,35   |
| 04                | 12,0             | 16,0 | 500   | 7,0                           | 9,0   | 4,0                 | 5,6   | 0,63            | 0,40   |
| 05                | 18,0             | 24,0 | 1130  | 10,5                          | 13,5  | 6,0                 | 8,4   | 0,91            | 0,58   |
| 06                | 26,5             | 32,0 | 2000  | 14,2                          | 18,0  | 8,0                 | 10,4  | 1,37            | 0,89   |

## Terminal Variants

| 01 | 02 | 03 |
|----|----|----|
|    |    |    |

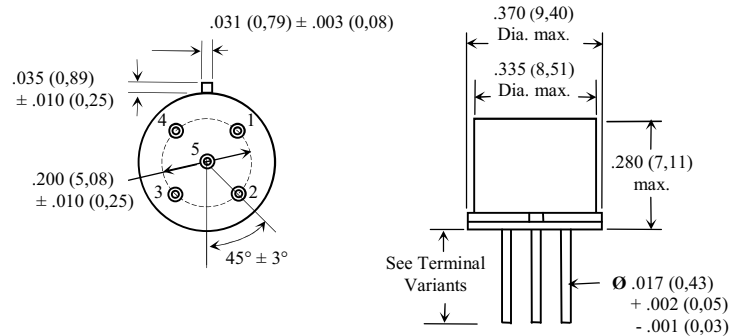
Note: Dimensions are shown in inches (millimetres)

## Schematic Diagram



Note:  
- Schematics are viewed from terminals

## Outline Dimensions



Note:  
-Dimensions are shown in inches (millimetres)

## How to Order

CECC 16101 - 005 - 06 - 02

CECC Specification No.

Terminal and Mounting Variant

Type Code (CECC registration No.)

Coil Variant Code