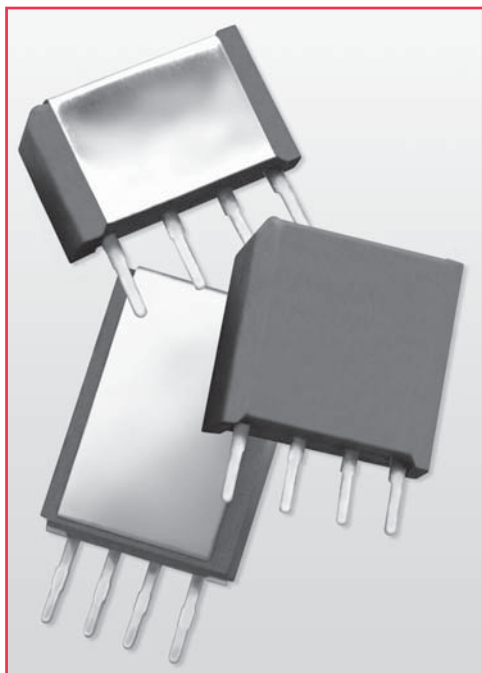


# 9011, 9012 & 9117 Miniature SIP Relays



## Miniature Molded SIP Reed Relays

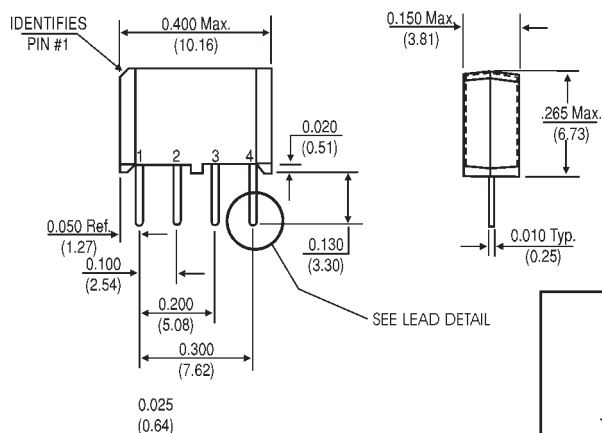
The 9012 package dimensions are 47% smaller than standard 9000 SIPs, yet the relay retains the 10W switch ratings of its larger counterparts. The 9011 package dimensions are 65% smaller than the standard 9000 SIPs and incorporates Coto's 7mm switch rated at 3W. The 9117 goes one step further, reducing package size by 65% from standard 9000 SIPs. This is the smallest SIP footprint with a 3W rating. These miniature SIP relays are ideal for use in ATE applications and other high reliability test, measurement and telecommunications applications where high board density and long life are key requirements.

## Series Features

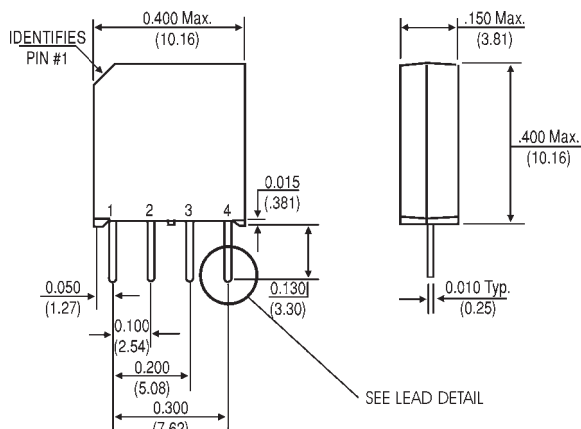
- ◆ 9012 is a 10W SIP relay (.400" x .150" x .400")
- ◆ 9011 is a 3W SIP relay (.400" x .150" x .265")
- ◆ 9117 is the smallest 3W SIP relay (.270" x .150" x .385")
- ◆ Magnetic shielding reduces interaction
- ◆ Optional coil suppression diode protects coil drive circuits
- ◆ UL File # E67117 (9117 UL Pending)
- ◆ High insulation resistance  $10^{12} \Omega$  minimum.
- ◆ High speed switching
- ◆ Molded thermoset body on integral lead frame design
- ◆ High reliability, hermetically sealed contacts for long life

## Model 9011

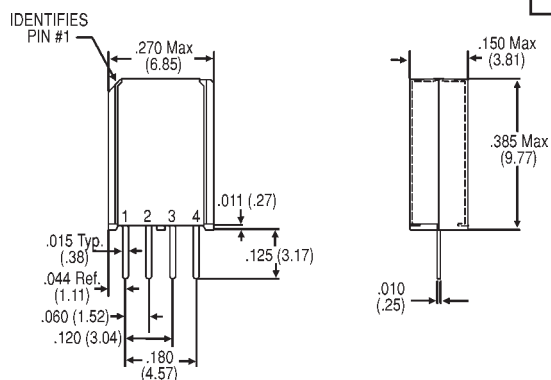
Dimensions in Inches (Millimeters)



## Model 9012



## Model 9117



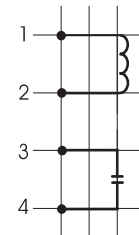
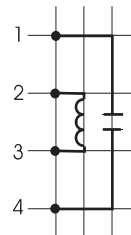
## Ordering Information

| Part Number                  | 90XX-XX-1X  |
|------------------------------|---|
| Model Number                 | 9011 9012 9117                                      |
| Coil Voltage                 | 05 = 5 volts<br>12 = 12 volts (N/A on 9117)         |
| Magnetic Shield              | 1 = Mag Shield (External 9011, 9117; Internal 9012) |
| General Options <sup>2</sup> | 0 = No Diode<br>1 = Diode                           |

# 9011, 9012 & 9117 Miniature SIP Relays

| Model Number                               |   |                        | 9011 <sup>2,4</sup><br>(3 Watt)<br>4 Pin SIP | 9012 <sup>2,4</sup><br>(10 Watt)<br>4 Pin SIP | 9117 <sup>2,4</sup><br>(3 Watt)<br>Narrow Fit |
|--|---|------------------------|--|---|---|
| Parameters                                 | Test Conditions                                 | Units                  |  |   |   |
| <b>COIL SPECS.</b>                         |   |                        |  |   |   |
| Nom. Coil Voltage                          |   | VDC                    | 5 12   | 5 12  | 5   |
| Max. Coil Voltage                          |   | VDC                    | 6.5 15.0                                     | 6.5 15.0                                      | 6.0   |
| Coil Resistance                            | +/- 10%, 25° C                                  | $\Omega$               | 500 750                                      | 500 750                                       | 400   |
| Operate Voltage                            | Must Operate by                                 | VDC - Max.             | 3.75 9.0                                     | 3.75 9.0                                      | 3.75  |
| Release Voltage                            | Must Release by                                 | VDC - Min.             | 0.4 1.0                                      | 0.4 1.0                                       | 0.5   |
| <b>CONTACT RATINGS</b>                     |   |                        |  |   |   |
| Switching Voltage                          | Max DC/Peak AC Resist.                          | Volts                  | 100  | 200   | 100   |
| Switching Current                          | Max DC/Peak AC Resist.                          | Amps                   | 0.250  | 0.5   | 0.25  |
| Carry Current                              | Max DC/Peak AC Resist.                          | Amps                   | 0.5  | 1.5   | 0.5   |
| Contact Rating                             | Max DC/Peak AC Resist.                          | Watts                  | 3  | 10  | 3   |
| Life Expectancy-Typical <sup>1</sup>       | Signal Level 1.0V, 10mA                         | x 10 <sup>6</sup> Ops. | 250  | 1000  | 250   |
| Static Contact Resistance (max. init.)     | 50mV, 10mA                                      | $\Omega$               | 0.150  | 0.120   | 0.120   |
| Dynamic Contact Resistance (max. init.)    | 0.5V, 50mA<br>at 100 Hz, 1.5 msec               | $\Omega$               | 0.200  | 0.200   | 0.200   |
| <b>RELAY SPECIFICATIONS</b>                |   |                        |  |   |   |
| Insulation Resistance (minimum)            | Between all Isolated Pins at 100V, 25°C, 40% RH | $\Omega$               | 10 <sup>12</sup>                             | 10 <sup>12</sup>                              | 10 <sup>12</sup>                              |
| Capacitance - Typical Across Open Contacts |   | pF                     | 0.7  | 0.7   | 0.14  |
| Open Contact to Coil                       |   | pF                     | 1.4  | 1.4   | N/A   |
| Dielectric Strength (minimum)              | Between Contacts                                | VDC/peak AC            | 200  | 300   | 150   |
|  | Contacts to Coil                                | VDC/peak AC            | 1500   | 1500  | 1500  |
| Operate Time - including bounce - Typical  | At Nominal Coil Voltage, 30 Hz Square Wave      | msec.                  | 0.35   | 0.35  | 0.2   |
| Release Time - Typical                     | Zener-Diode Suppression <sup>3</sup>            | msec.                  | 0.1  | 0.1   | 0.1   |

Top View:  
Grid = .1"x.1" (2.54mm x 2.54mm)



## Notes:

<sup>1</sup>Consult factory for life expectancy at other switching loads. Resistance >0.5 $\Omega$  defines end of life or failure to open.

<sup>2</sup>Optional diode is connected to pin #2 (+) and pin #3(-) for 9011 & 9012; pin #1(+) and pin #2(-) for 9117. Correct coil polarity must be observed.

<sup>3</sup>Consists of 20V Zener-diode and 1N1002 diode in series, connected in parallel with coil.

<sup>4</sup>9011 & 9117 external mag shield. 9012 internal mag shield.

## Environmental Ratings:

Storage Temp: -35°C to +100°C; Operating Temp: -20°C to +85°C  
Solder Temp: 270°C max; 10 sec. max

The operate and release voltage and the coil resistance are specified at 25°C. These values vary by approximately 0.4%/°C as the ambient temperature varies.

Vibration: 20 G's to 2000 Hz; Shock: 50 G's