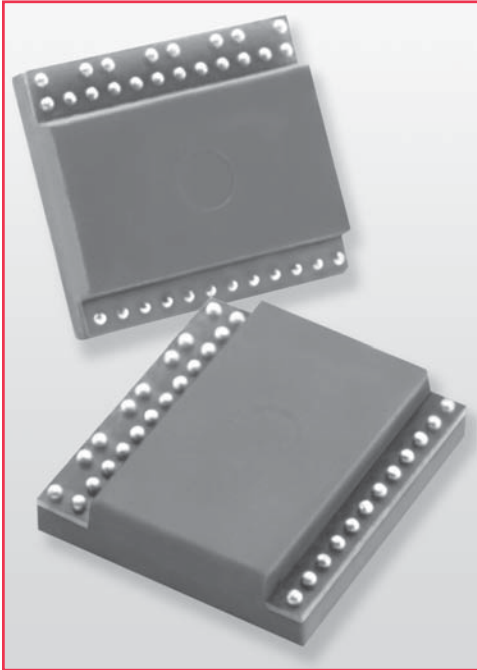


# B40 4-Channel RF Relays



## Ball Grid Array 4-Channel Relays

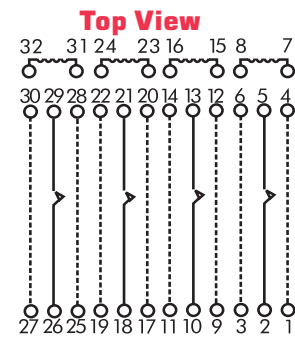
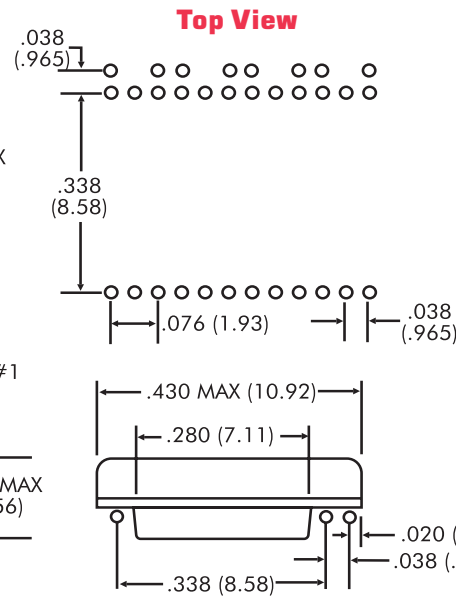
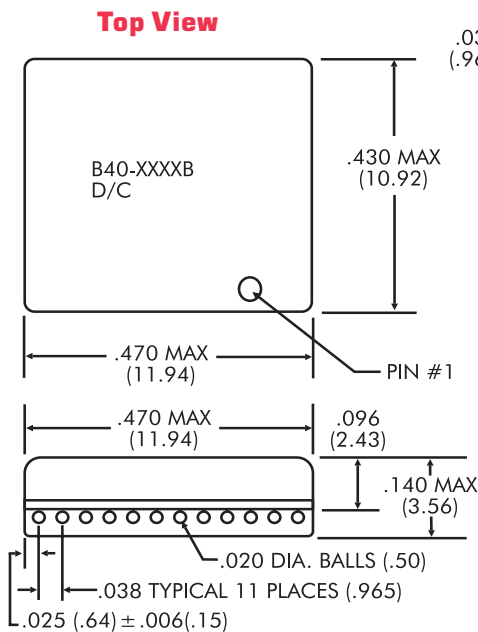
The B40 is four independent form A channels in one quad package. Coto's Ball Grid Array (BGA) construction offers a breakthrough in reed relay performance. This patented technology<sup>1</sup> allows for shorter RF paths in a controlled 50 Ω environment to minimize signal attenuation. The designer is now able to switch or pass signals with wider bandwidth and faster rise time than alternative technologies. This is particularly important in Mixed Signal IC testers. This four-in-one BGA packaging allows relays to be integrated easily on boards designed for surface mount processing.

### Series Features

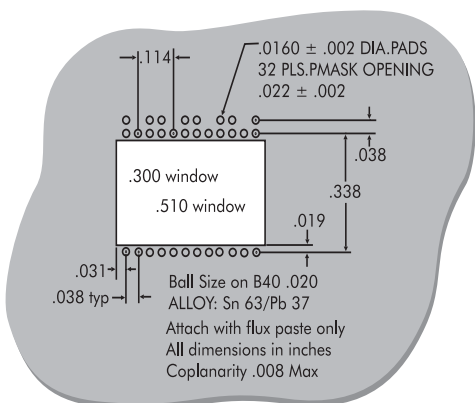
- ◆ BGA Surface Mount
- ◆ Ability to pass GHz signals
- ◆ Rise time < 40 pSec
- ◆ ~50 Ω Characteristic Impedance
- ◆ Low Capacitance
- ◆ Patented Design<sup>1</sup>

### Applications

- ◆ IC Testers
- ◆ In-Line Relay Testers
- ◆ Memory Testers
- ◆ Mixed Signal Testers
- ◆ High Bandpass Applications



Dimensions in Inches  
(Millimeters)



### Ordering Information

|                      |                            |
|----------------------|----------------------------|
| Part Number          | <b>B40-000X</b>            |
| Model Number         | B40                        |
| Nominal Coil Voltage | 0002 = 3.3V<br>0003 = 5.0V |

### Notes:

<sup>1</sup> Protected by one or more of the following  
US Patents: 6025768, 6052045, 6294971,  
6683518, RE38381 and other foreign patents.

# B40 4-Channel RF Relays

| Test Parameters                      | Conditions <sup>1,2</sup>   | B40              |                  |       | Units                 |
|--------------------------------------|---|------------------|------------------|-------|-----------------------|
|                                      |   | Min              | Typ              | Max   |                       |
| Coil Resistance                      | 3.3V Coil   | 49.5             | 55.0             | 60.5  | Ω                     |
| Nominal Voltage                      |   |                  | 3.3              | 4.0   | Volts DC              |
| Must Operate Voltage                 |   |                  |                  | 2.4   | Volts DC              |
| Must Release Voltage                 |   | 0.4              |                  |       | Volts DC              |
| Coil Resistance                      | 5V Coil   | 144.0            | 160.0            | 176.0 | Ω                     |
| Nominal Voltage                      |   |                  | 5.0              | 6.0   | Volts DC              |
| Must Operate Voltage                 |   |                  |                  | 3.8   | Volts DC              |
| Must Release Voltage                 |   | 0.4              |                  |       | Volts DC              |
| Switching Voltage                    | Max DC/Peak AC  |                  |                  | 125   | Volts                 |
| Switching Current                    |   |                  |                  | 0.25  | Amps                  |
| Carry Current (Continuous)           | Switch and Shield   |                  |                  | 0.5   | Amps                  |
| Contact Rating (Resistive Load)      |   | Resistive Load   |                  |       | 3.0                   |
| Life Expectancy                      | Signal Switching <sup>3</sup>                                       |                  | 1000             |       | x 10 <sup>6</sup> Ops |
|                                      | Resistive Load <sup>3</sup>   |                  | 1                |       | x 10 <sup>6</sup> Ops |
|                                      | Other Load Conditions <sup>3</sup>                                  | Consult Factory  |                  |       |                       |
| Static Contact Resistance (initial)  | 0.05VDC / 10mA  |                  |                  | 0.125 | Ω                     |
| Dynamic Contact Resistance (initial) | 0.5V / 50mA 100 Hz, 1.5 mSec  |                  |                  | 0.150 | Ω                     |
| Insulation Res                       | All Isolated Pins   | 10 <sup>10</sup> | 10 <sup>12</sup> |       | Ω                     |
| Capacitance                          | Across Contacts   |                  | 0.2              |       | pF                    |
| Capacitance                          | Open Contact to Coil  |                  | 0.3              |       | pF                    |
| Capacitance                          | Closed Contact to Coil  |                  | 0.5              |       | pF                    |
| Dielectric Strength                  | Across Contacts   |                  | 150              |       | V (DC/Pk AC)          |
|                                      | Contact to Coil   | 100 μA           | 1000             |       | V (DC/Pk AC)          |
|                                      | Contact To Shield   | 100 μA           | 1000             |       | V (DC/Pk AC)          |
|                                      | Between Contacts of Adjacent Channels                               | 100 μA           | 1000             |       | V (DC/Pk AC)          |
| Operate Time (including bounce)      | Nominal Voltage coil drive @ 30 Hz, square wave                     |                  | 100              | 200   | μSec                  |
| Release Time (Si diode damped)       |   |                  | 30               | 50    | μSec                  |
| RF Insertion Loss <sup>4</sup>       | -3 dB roll-off frequency  | 11.0             |                  |       | GHz                   |
| RF Inter-Channel Isolation           | Signal isolation between adjacent closed channels, 1GHz test signal | 40.0             |                  |       | dB                    |
| Signal Rise Time (10% - 90%)         |   |                  |                  | 40    | pSec                  |
| Magnetic Interaction <sup>5</sup>    | Between adjacent channels   |                  |                  | 16    | %                     |

## NOTES:

<sup>1</sup>All parameters specified per EIA/NARM standards for dry reed relays, # RS-421 and RS-436, if a suitable parametric standard exists.

<sup>2</sup>Unless otherwise noted, all parameters are specified at 25°C and 40% RH.

<sup>3</sup>Life expectancies based on characteristic life (63.2% failure) calculated from the 2-parameter Weibull distribution. Contact resistance >2.0Ω defines end of life.

<sup>4</sup>Frequency at which the difference between output and input signal amplitude exceeds -3dB.

<sup>5</sup>Maximum increase in operate voltage for any channel when all channel coils are driven at nominal coil voltage and with the same drive polarity.

## ENVIRONMENTAL RATINGS:

Storage Temperature: -35°C to +100°C.

Operating Temperature: -20°C to +85°C.

Vibration: sinusoidal vibration with an amplitude of 10G over a 10Hz to 2000Hz frequency range shall neither cause a closed channel activated at the nominal coil voltage to open, nor an open channel to close. Max Soldering Temperature: 438°F(226°C) max for 1 minute dwell time. Temperature measured at a relay ball termination.

Moisture sensitive component. Handle as J-STD-020B level 5a.