

B41 4-CHANNEL RF REED RELAYS



B41 Series Ball Grid Array 4-Channel Relays

The B41 contains four independent form A channels in one planar quad package. Coto's Ball Grid Array (BGA) construction offers a breakthrough in reed relay performance. This patented technology¹ 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.

B41 Series Features

- ▶ Planar BGA Surface Mount
- ▶ Ability to switch GHz signals
- ▶ Rise time < 45 μSec
- ▶ ~50Ω Characteristic Impedance
- ▶ Low Capacitance
- ▶ Patented Design¹
- ▶ RoHS compliant solder (optional)*

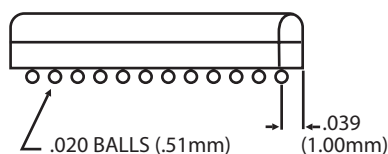
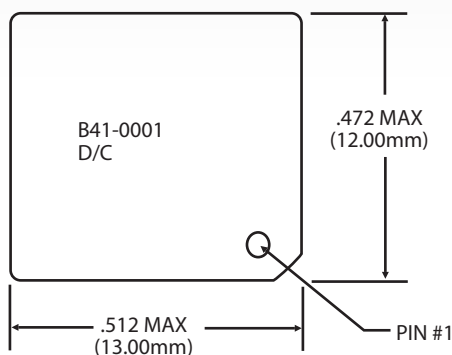
APPLICATIONS

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

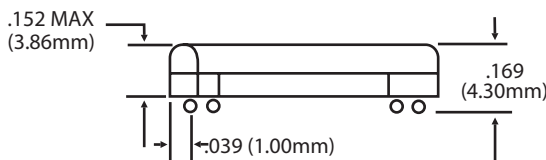
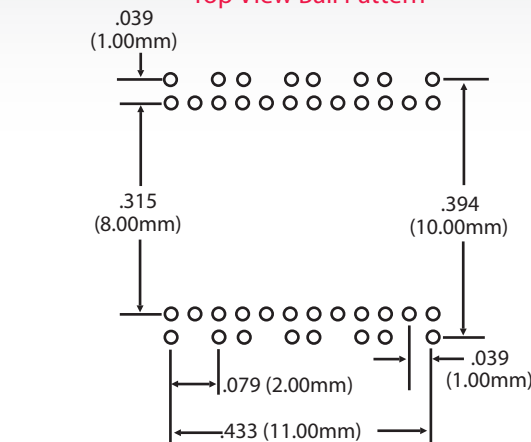
DIMENSIONS

in Inches (Millimeters), Metric Dimensions Govern

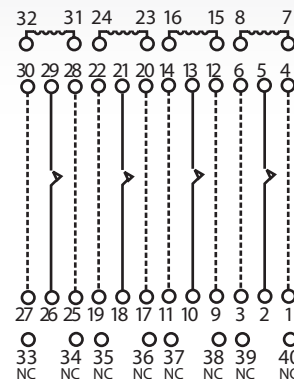
Top View



Top View Ball Pattern



Top View Schematic



General Dimensional Tolerance:
± .006 (0.15)

* Dimensions shown are before soldering.

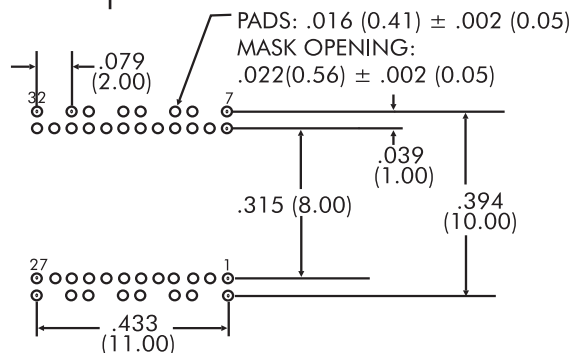
NOTE

- ▶ For RF Graph Performance, see "RF Graphs" section of the *Reed Relay Technical & Application Information*

Ordering Information

| Part Number | B41-00XX | |
|--------------|-----------------------|-----------------|
| Model Number | | Nominal Voltage |
| B41 | | 2 = 3.3V |
| | Solder Alloy | 1 = 5.0V |
| | 1 = SAC Alloy (RoHS)* | |
| | 0 = SnPb Eutectic | |

B41 Receiver Board Pad Layout



Ball Size on B41 .020 (0.51)
ALLOY: Sn 63/Pb 37
Attach with flux paste only
Coplanarity Max: .008 (0.20)

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

| MODEL NUMBER | | | B41 | | |
|---|---|-----------------|------------------|------------------|-------|
| Parameters | Test Conditions ^{1,2} | Units | Min | Typ | Max |
| Coil Resistance | 3.3V Coil | Ω | 49.5 | 55.0 | 60.5 |
| Nominal Voltage | 3.3V Coil | Volts DC | | 3.3 | 4.0 |
| Must Operate Voltage | 3.3V Coil | Volts DC | | | 2.4 |
| Must Release Voltage | 3.3V Coil | Volts DC | 0.4 | | |
| Coil Resistance | 5V Coil | Ω | 144.0 | 160.0 | 176.0 |
| Nominal Voltage | 5V Coil | Volts DC | | 5.0 | 6.0 |
| Must Operate Voltage | 5V Coil | Volts DC | | | 3.8 |
| Must Release Voltage | 5V Coil | Volts DC | 0.4 | | |
| Switching Voltage | Max DC/Peak AC Resist. | Volts | | | 125 |
| Switching Current | | Amps | | | 0.25 |
| Carry Current (Continuous) | Switch & Shield | Amps | | | 0.5 |
| Contact Rating (Resistive Load) | Resistive Load | Watts | | | 3.0 |
| Life Expectancy | Signal Switching ³ | 1VDC/10mA | | 1000 | |
| | Resistive Load ³ | 12VDC/10mA | | 1 | |
| | Other Load Conditions ³ | Consult Factory | | | |
| Static Contact Resistance (initial) | 0.05VDC/10mA | Ω | | | 0.125 |
| Dynamic Contact Resistance (initial) | .5V/10mA 100Hz, 1.5mSec | Ω | | | 0.150 |
| Insulation Resistance - All Isolated Pins | 100VDC | Ω | 10 ¹⁰ | 10 ¹² | |
| Capacitance - Across Contacts | Shield | pF | | 0.2 | |
| Capacitance - Open Contact to Coil | Shield | pF | | 0.3 | |
| Capacitance - Closed Contact to Coil | Shield | pF | | 0.5 | |
| Dielectric Strength - Across Contacts | 100μA | V (DC/Pk AC) | | 150 | |
| Dielectric Strength - Contact to Coil | 100μA | V (DC/Pk AC) | | 1000 | |
| Dielectric Strength - Contact to Shield | 100μA | V (DC/Pk AC) | | 1000 | |
| Dielectric Strength - Between Contacts of Adjacent Channels | 100μA | V (DC/Pk AC) | | 1000 | |
| Operate Time (including bounce) | At Nominal Coil Voltage, 30 Hz Square Wave | μsec. | | 100 | 200 |
| Release Time (Si diode damped) | | | | 30 | 50 |
| RF Insertion Loss ⁴ | -3 dB roll-off frequency | GHz | 8.0 | | |
| RF Inter-Channel Isolation | Signal isolation between adjacent closed channels, 1GHz test signal | dB | 40.0 | | |
| Signal Rise Time (10%-90%) | | pSec | | | 45 |
| Magnetic Interaction ⁵ | Between adjacent channels | % | | | 16 |

Notes:

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

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

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

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

⁵ 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 Temp: -35°C to +100°C; *Operating Temp:* -20°C to +85°C.

Moisture Sensitivity Level: Handle as J-STD-020B Level 5A.

Consult the Coto Technology website (www.cotorelay.com) for recommended reflow profile for SnPb Eutectic and SAC Alloys.

Vibration Exposure: Sinusoidal vibration with an amplitude of 10g over a 10Hz to 2000Hz frequency range shall not cause damage to relay.

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