



**TELEDYNE  
RELAYS**

A Teledyne Technologies Company

**SURFACE MOUNT  
HIGH REPEATABILITY**

**8 GHz**

**TO-5 RELAYS**

**SIGNAL INTEGRITY TO 12 Gbps**

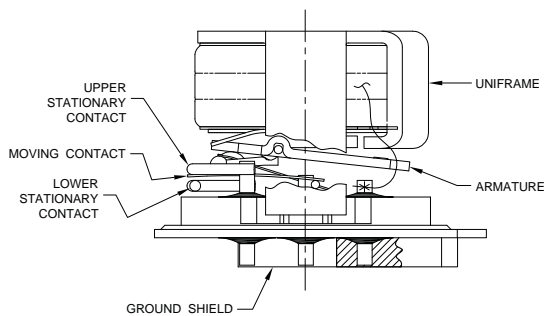
**SPDT**



**SERIES  
GRF311**

SERIES DESIGNATION	RELAY TYPE
GRF311	Repeatable, RF TO-5 relay

#### INTERNAL CONSTRUCTION



#### PERFORMANCE FEATURES

The GRF311 offers monotonic insertion loss to 8 GHz. This improvement in RF insertion loss over the frequency range makes these relays highly suitable for use in attenuator and other RF circuits. The GRF311 features:

- High repeatability.
- Broader bandwidth.
- Metal enclosure for EMI shielding.
- High isolation between control and signal paths.
- Highly resistant to ESD.

#### CONSTRUCTION FEATURES

The following unique construction features and manufacturing techniques provide excellent resistance to environmental extremes and overall high reliability.

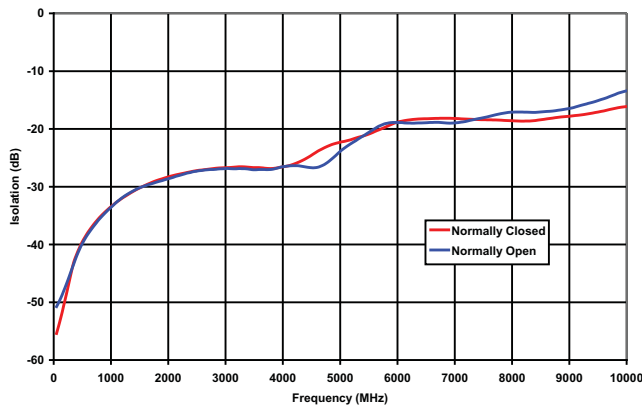
- Uni-frame motor design provides high magnetic efficiency and mechanical rigidity.
- Minimum mass components and welded construction provide maximum resistance to shock and vibration.
- Advanced cleaning techniques provide maximum assurance of internal cleanliness.
- Gold-plated precious metal alloy contacts ensure reliable switching.
- Hermetically sealed.
- Solderable leads.

#### ENVIRONMENTAL AND PHYSICAL SPECIFICATIONS

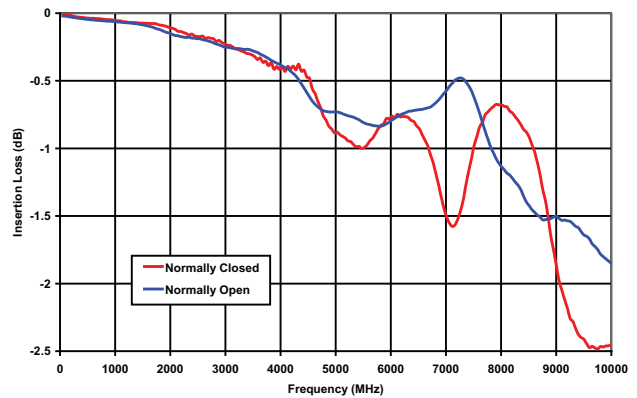
Temperature (Ambient)	Storage	-65°C to +125°C
	Operating	-55°C to +85°C
Vibration (General Note 1)		10 g's to 500 Hz
Shock (General Note 1)		30 g's, 6ms half sine
Enclosure		Hermetically sealed
Weight		0.09 oz. (2.55g) max.

SERIES GRF311  
TYPICAL RF CHARACTERISTICS (See RF Notes)

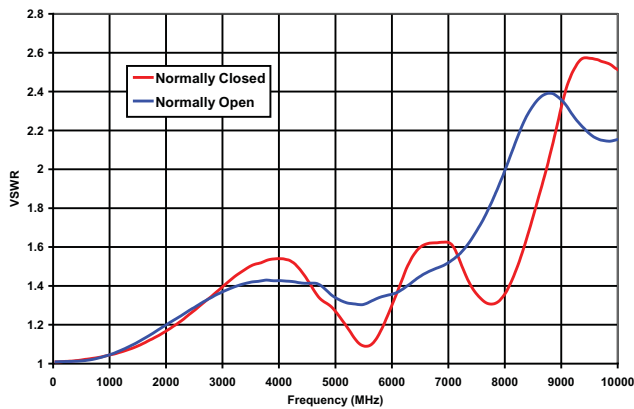
GRF311 Isolation Across Contacts (RF Note 3)



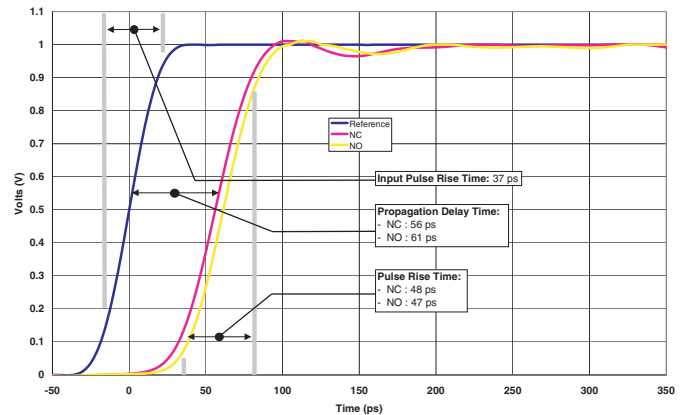
GRF311 Insertion Loss (RF Note 4)



GRF311 VSWR (RF Note 4)



Pulse Response Characteristic



RF NOTES

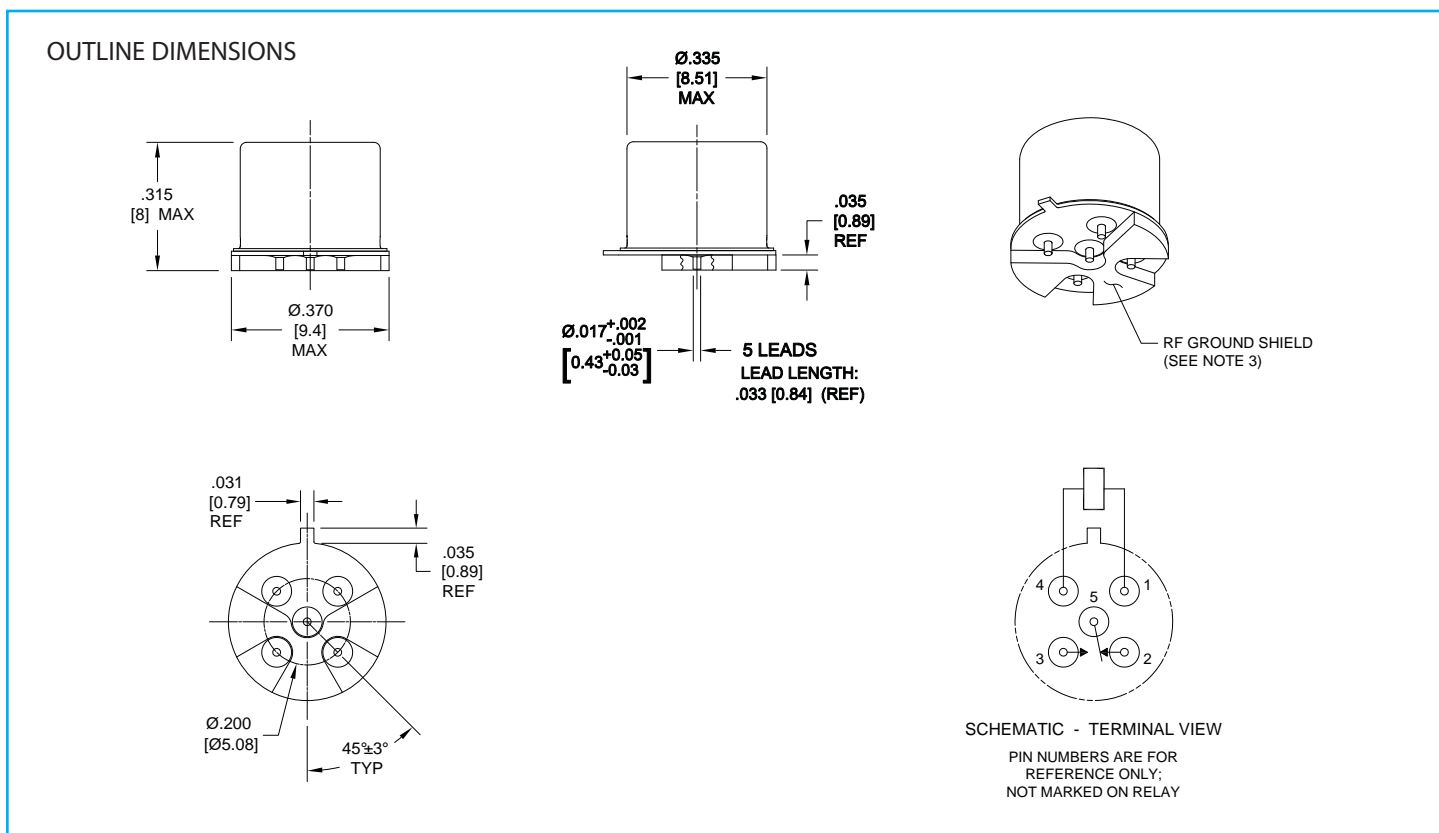
1. Test conditions:
  - a. Fixture: .031" copper clad, reinforced PTFE, RT/duroid® 6002 with SMA connectors. (RT/duroid® is a registered trademark of Rogers Corporation.)
  - b. RF ground shield is soldered to PCB RF ground plane.
  - c. Room ambient temperature.
  - d. Terminals not tested were terminated with 50-ohm load.
  - e. Contact signal level: -10 dBm.
  - f. No. of test samples: 2.
2. Data presented herein represents typical characteristics and is not intended for use as specification limits.
3. Data is the average from readings taken on all open contacts.
4. Data is the average from readings taken on all closed contacts.
5. Test fixture effect de-embedded from frequency and time response data.

SERIES GRF311  
 GENERAL ELECTRICAL SPECIFICATIONS (@ 25 °C unless otherwise noted)

Contact Arrangement	1 Form C (SPDT)
Rated Duty	Continuous
Contact Resistance	0.15 Ω max. initial (measured 1/8" from the header)
Contact Load Rating	Resistive: 1Amp/28Vdc Low level: 10 to 50 μA, 10 to 50 mV
Contact Life Ratings	10,000,000 cycles (typical) at low level
Coil Operating Power	350 mW typical @ nominal rated voltage
Operate Time	4.0 mS max.
Release Time	3.0 mS max.
Intercontact Capacitance	0.4 pF typical
Insulation Resistance	1,000 MΩ min. between mutually isolated terminals
Dielectric Strength	350 Vrms (60 Hz) @ atmospheric pressure

DETAILED ELECTRICAL SPECIFICATIONS (@25°C)

BASE PART NUMBERS	GRF311-5	GRF311-12	GRF311-26
Coil Voltage, Nominal (Vdc)	5.0	12.0	26.5
Coil Resistance (Ohms ±20%)	63	500	2000
Pick-up Voltage (Vdc max.)	3.6	9.0	18.0



GENERAL NOTES

1. Relays will exhibit no contact chatter in excess of 10 μsec or transfer in excess of 1 μsec.
2. Relays may be subjected to 260 °C peak solder reflow temperature, 1 minute, 3 passes.
3. Butt-lead ends are coplanar within .003" (0.08 mm).
4. Application notes available for PCB mounting information.