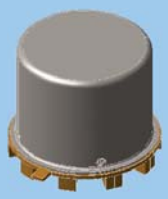
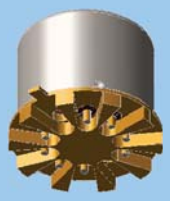
TELEDYNE RELAYS
Everywhereyoulook™

Series GRF312/GRF332

SMT DPDT Non-Latching Electromechanical Relay
Signal Integrity up to 20Gbps



HIGH REPEATABILITY, DC-8 GHz/20Gbps TO-5 RELAYS, DPDT



SERIES	RELAY TYPE
GRF312	Repeatable, Surface-Mount RF relay
GRF332	Low Power Operating Coil, Surface-Mount RF relay

DESCRIPTION

The ultra miniature GRF312 is designed to improve upon the GRF300/GRF303 relay's high frequency performance. The GRF312/GRF332 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 sensitive GRF332 relay has a high resistance coil, thus requiring extremely low operating power (200 mW typical).

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

CONSTRUCTION FEATURES

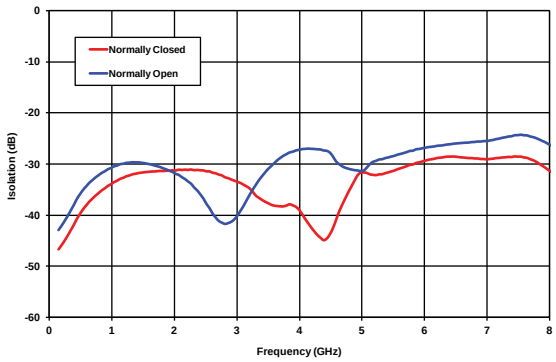
The following unique construction features and manufacturing techniques provide excellent resistance to environmental extremes and overall high reliability.

- 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.

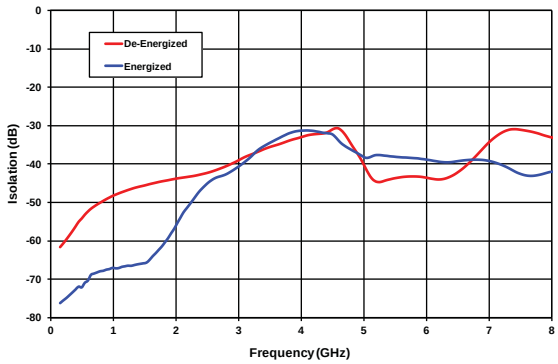
ENVIRONMENTAL AND PHYSICAL SPECIFICATIONS		
Temperature (Ambient)	**Storage**	–65°C to +125°C
	Operating	–55°C to +85°C
Vibration (General Note I)		10 g's to 500 Hz
Shock (General Note I)		30 g's, 6ms half sine
Enclosure		Hermetically sealed
Weight		0.09 oz. (2.55g) max.

SERIES GRF312/GRF332
TYPICAL RF CHARACTERISTICS (See RF Notes)

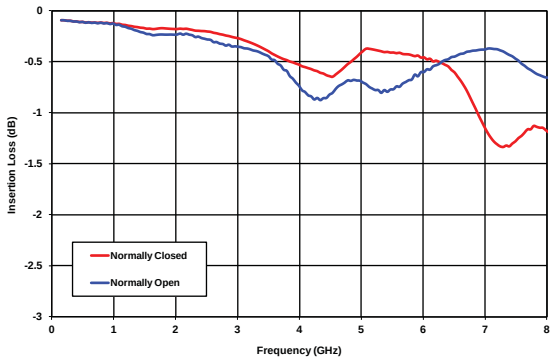
Isolation Across Contacts (RF Note 4)



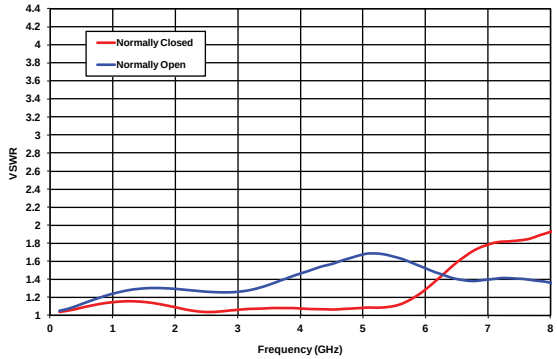
Isolation Pole to Pole (RF Note 5)



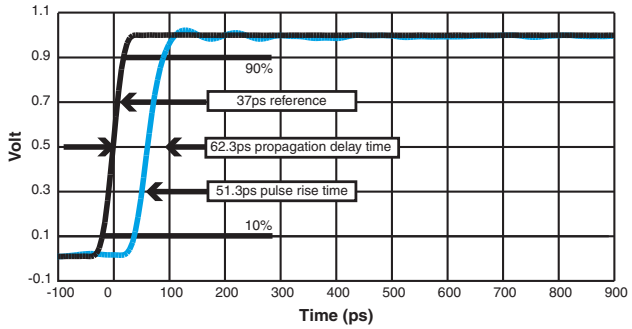
Insertion Loss (RF Note 6)



VSWR (RF Note 6)



GRF312/GRF332 Time Response (RF Note 6)



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.* Room ambient temperature.
   - *c.* Terminals not tested were terminated with 50-ohm load.
   - *d.* Contact signal level: –10 dBm.
   - *e.* No. of test samples: 4.
2. Data presented herein represents typical characteristics and is not intended for use as specification limits.
3. Data is per pole, except for pole-to-pole data.
4. Data is the average from readings taken on all open contacts.
5. Data is the average from readings taken on poles with coil energized and de-energized.
6. Data is the average from readings taken on all closed contacts.
7. Test fixture effect de-embedded from frequency and time response data.

SERIES GRF312/GRF332
GENERAL ELECTRICAL SPECIFICATIONS (@25°C)

Contact Arrangement	2 Form C (DPDT)
Rated Duty	Continuous
Contact Resistance	0.15 Ω max.
Contact Load Rating	Resistive: 1Amp/28Vdc Low level: 10 to 50 µA @ 10 to 50 mV
Contact Life Ratings	1,000,000 cycles (typical) at low level contact load
Coil Operating Power	GRF312: 450 mW typical at nominal rated voltage GRF332: 200 mW typical at nominal rated voltage
Operate Time	GRF312: 4.0 mS max. GRF332: 6.0 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 (GRF312)	GRF312-5	GRF312-12
Coil Voltage, Nominal (Vdc)	5.0	12.0
Coil Resistance (Ohms ±20%)	50	390
Pick-up Voltage (Vdc max.)	3.6	9.0

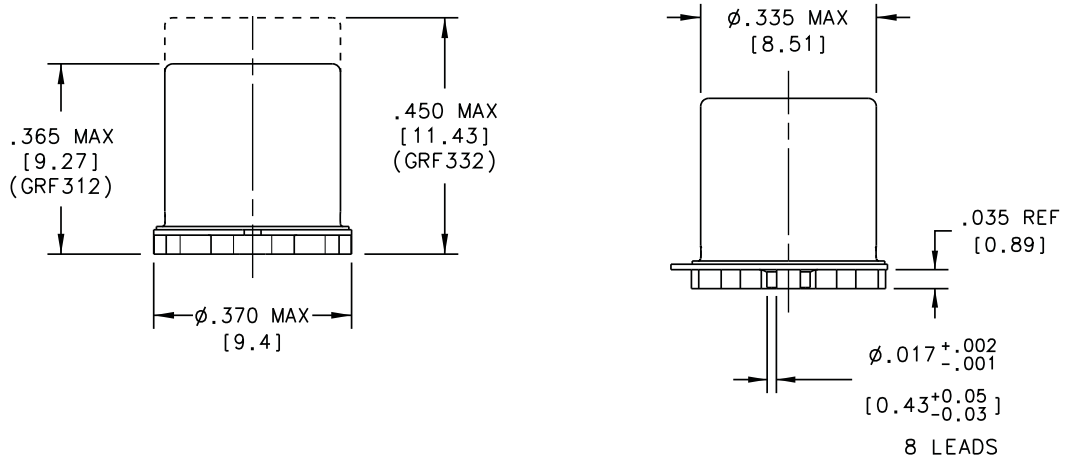
BASE PART NUMBERS (GRF332)	GRF332-5	GRF332-12
Coil Voltage, Nominal (Vdc)	5.0	12.0
Coil Resistance (Ohms ±20%)	100	850
Pick-up Voltage (Vdc max.)	3.6	9.0

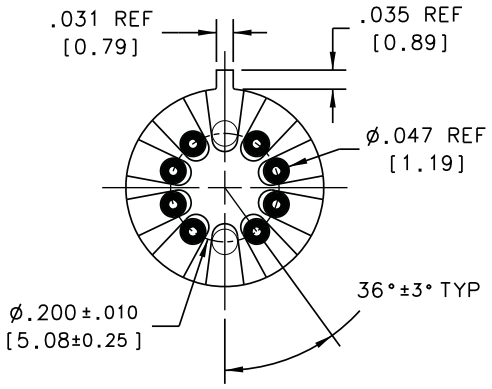
Teledyne Part Numbering System for GRF312/GRF332

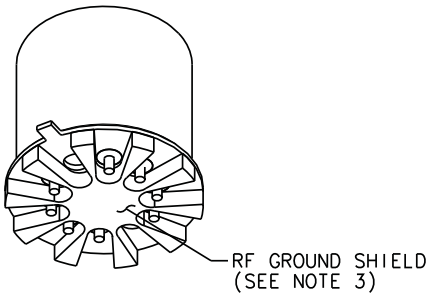
GRF312 - 5

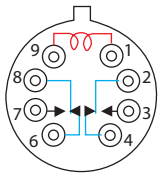
Relay Series — Nominal Coil Voltage

SERIES GRF312/GRF332
OUTLINE DIMENSIONS









SCHEMATIC DIAGRAM

TERMINAL VIEW PIN NUMBERS AE FOR REFERENCE ONLY NOT MARKED ON RELAYS

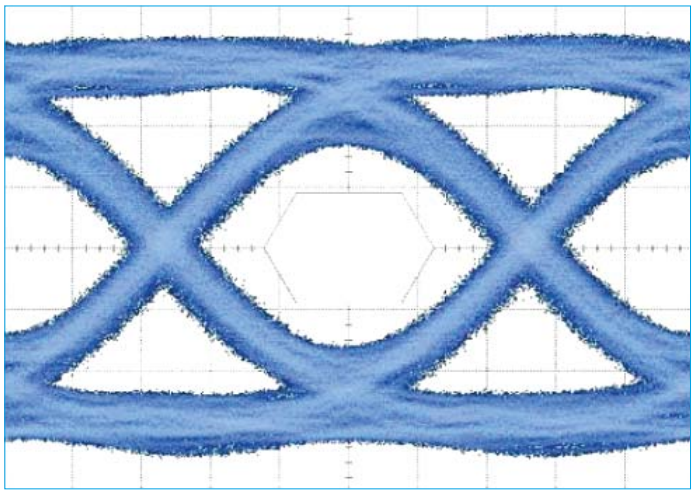
NOTES:

1. **DIMENSIONS ARE IN INCHES, METRIC EQUIVALENTS SHOWN IN [ ].**
2. **POSTITIONS 5 AND 10 ARE FOR UNINSULATED CASE GROUND OPTIONS.**
3. **NO PROTRUSION BELOW BOTTOM OF HEADER WHEN GROUND PINS ARE INSTALLED**
4. **TO ORDER THE CASE GROUND OPTION, AFTER THE SERIES DESIGNATOR, ADD "Y" TO THE PART NUMBER FOR POSITION 5 OR "Z" TO THE PART NUMBER FOR POSITION 10.**

GENERAL NOTES

I. Relays will exhibit no contact chatter in excess of 10 µsec or transfer in excess of 1 µsec.
II. For reference only. Coil resistance not directly measureable at relay terminals due to internal series diode.

SERIES GRF312/GRF332
TYPICAL Single-Ended Signal Integrity Characteristics @ 20 Gbps



Bit Rate	Eye Height	Eye Width	$Jitter_{P-P}$
20 Gbps	182 mV	40.6 ps	11.56 ps