



**TELEDYNE
RELAYS**

A Teledyne Technologies Company

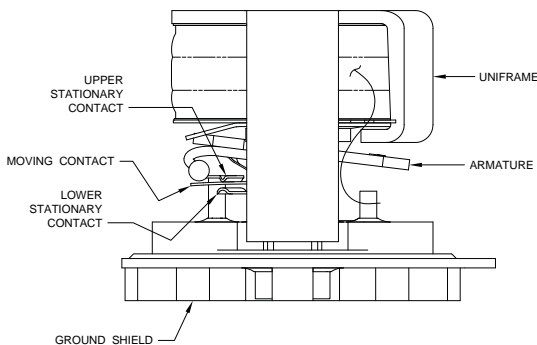


**SURFACE MOUNT
HIGH REPEATABILITY
8 GHz
TO-5 Relays
SIGNAL INTEGRITY TO 12 Gbps
DPDT**

**SERIES
GRF312**

SERIES DESIGNATION	RELAY TYPE
GRF312	Repeatable, RF TO-5 relay

INTERNAL CONSTRUCTION



PERFORMANCE FEATURES

The ultraminiature GRF312 relay is designed to improve upon the GRF300/GRF303 relay's high frequency performance. The GRF312 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 GRF312 features:

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

CONSTRUCTION FEATURES

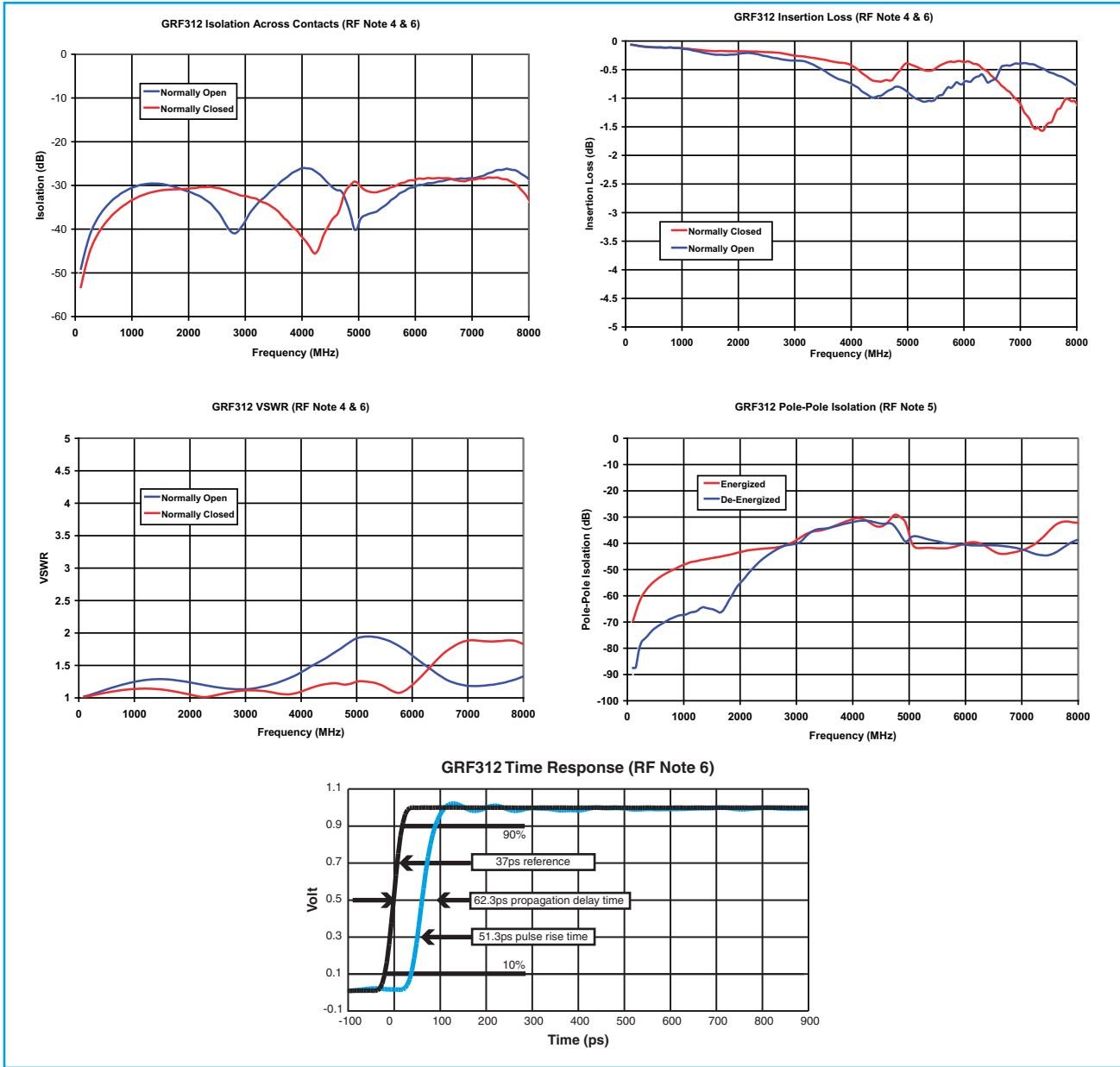
The following unique construction features and manufacturing techniques provide excellent resistance to environmental extremes and overall high reliability.

- 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 GRF312
TYPICAL RF CHARACTERISTICS (See RF Notes)



RF NOTES

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

SERIES GRF312
 GENERAL ELECTRICAL SPECIFICATIONS (@25°C unless otherwise noted) (Notes 2 & 3)

Contact Arrangement	2 Form C (DPDT)
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	450 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	GRF312-5	GRF312-12	GRF312-18	GRF312-26
Coil Voltage, Nominal (Vdc)	5.0	12.0	18.0	26.5
Coil Resistance (Ohms ±20%)	50	390	880	1560
Pick-up Voltage (Vdc max.)	3.6	9.0	12.3	16.5

OUTLINE DIMENSIONS

NOTES

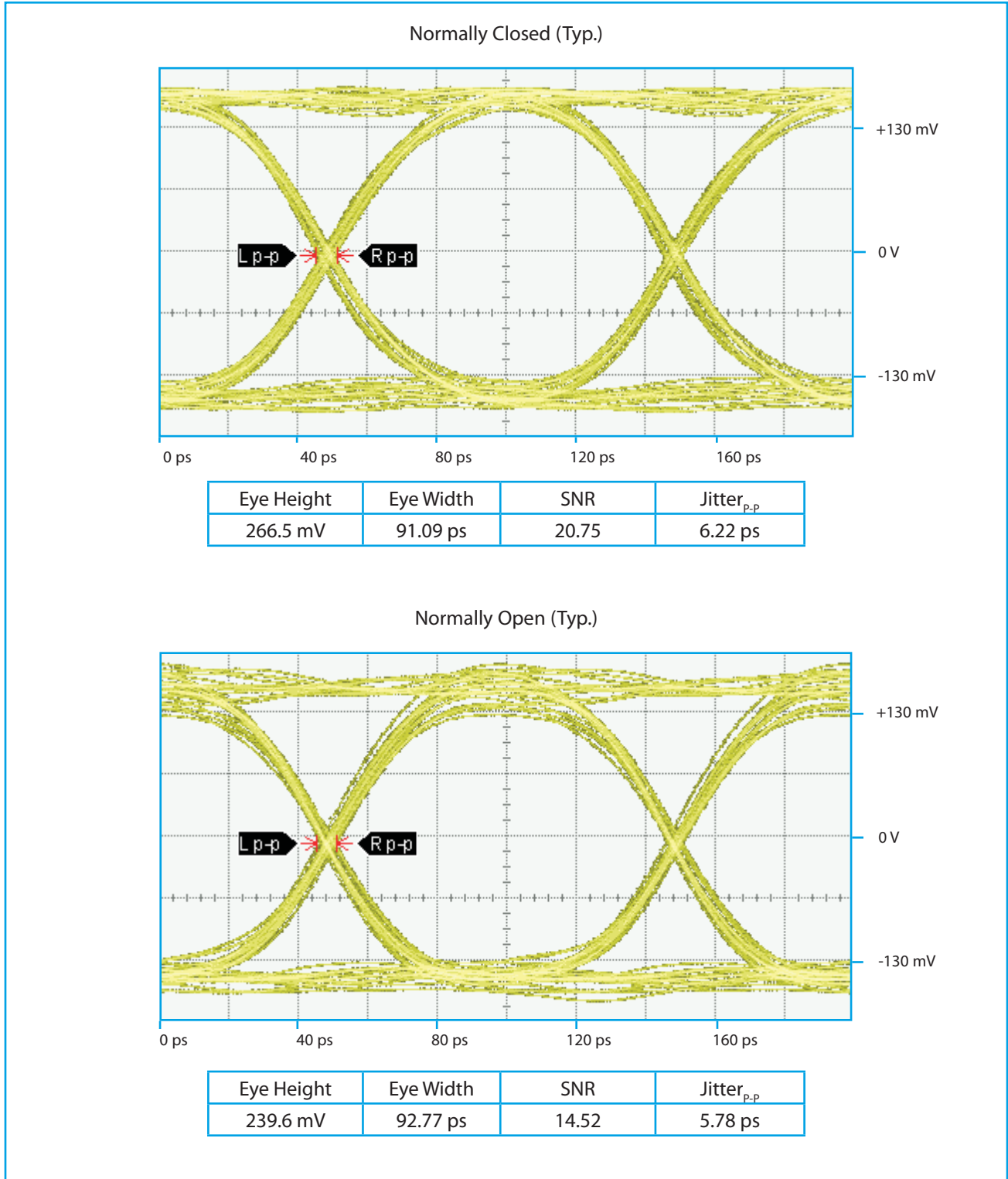
1. Dimensions are in inches. Metric equivalents shown in parentheses.
2. Header dimensions, terminal numbering and schematic are as viewed from the terminals.
3. Positions 5 and 10 are for uninsulated case ground options.
4. To order the case ground option, after the series designator, add "Y" to the part number for position 5 or "Z" to the part number for position 10.
Example: GRF312Y-5

SCHEMATIC - TERMINAL VIEW
 PIN NUMBERS ARE FOR REFERENCE ONLY; NOT MARKED ON RELAY

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" (0.08mm).
4. Application notes available for PCB mounting information.

SERIES GRF312
TYPICAL SIGNAL INTEGRITY CHARACTERISTICS



PATTERN GENERATOR SETTINGS

- 10 Gbps Random Pulse Pattern Generator
- $2^{31} - 1$ PRBS signal
- PRBS output of 300 mV_{p,p} (nominal)
- RF PCB effect (negligible) not removed from measurement
- Data shown is typical of both poles