



**TELEDYNE  
RELAYS**

A Teledyne Technologies Company

**SURFACE MOUNT  
HIGH REPEATABILITY**



**8 GHz**

**TO-5 RELAYS**

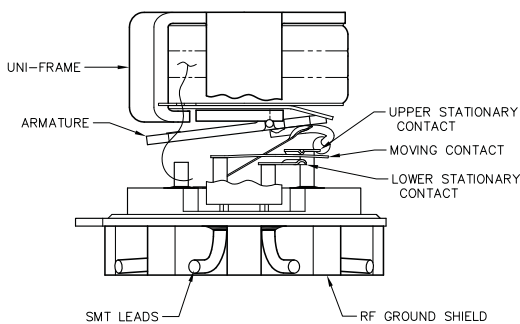
**SIGNAL INTEGRITY TO 12 Gbps**

**DPDT**

**SERIES  
SGRF312**

SERIES DESIGNATION	RELAY TYPE
SGRF312	Repeatable, RF TO-5 relay

#### INTERNAL CONSTRUCTION



#### PERFORMANCE FEATURES

The ultraminiature SGRF312 relays are designed to improve upon the GRF312 relay's high frequency performance. The SGRF312 relays feature a unique ground shield that isolates and shields each lead to ensure excellent contact-to-contact resistance and pole-to-pole isolation. The SGRF312 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 SGRF312 features:

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

#### CONSTRUCTION FEATURES

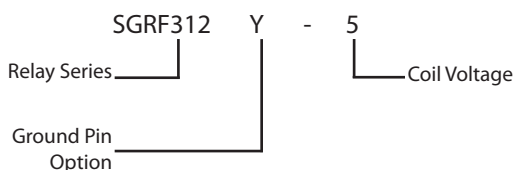
The following unique construction features and manufacturing techniques provide excellent resistance to environmental extremes and overall high reliability.

- 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.

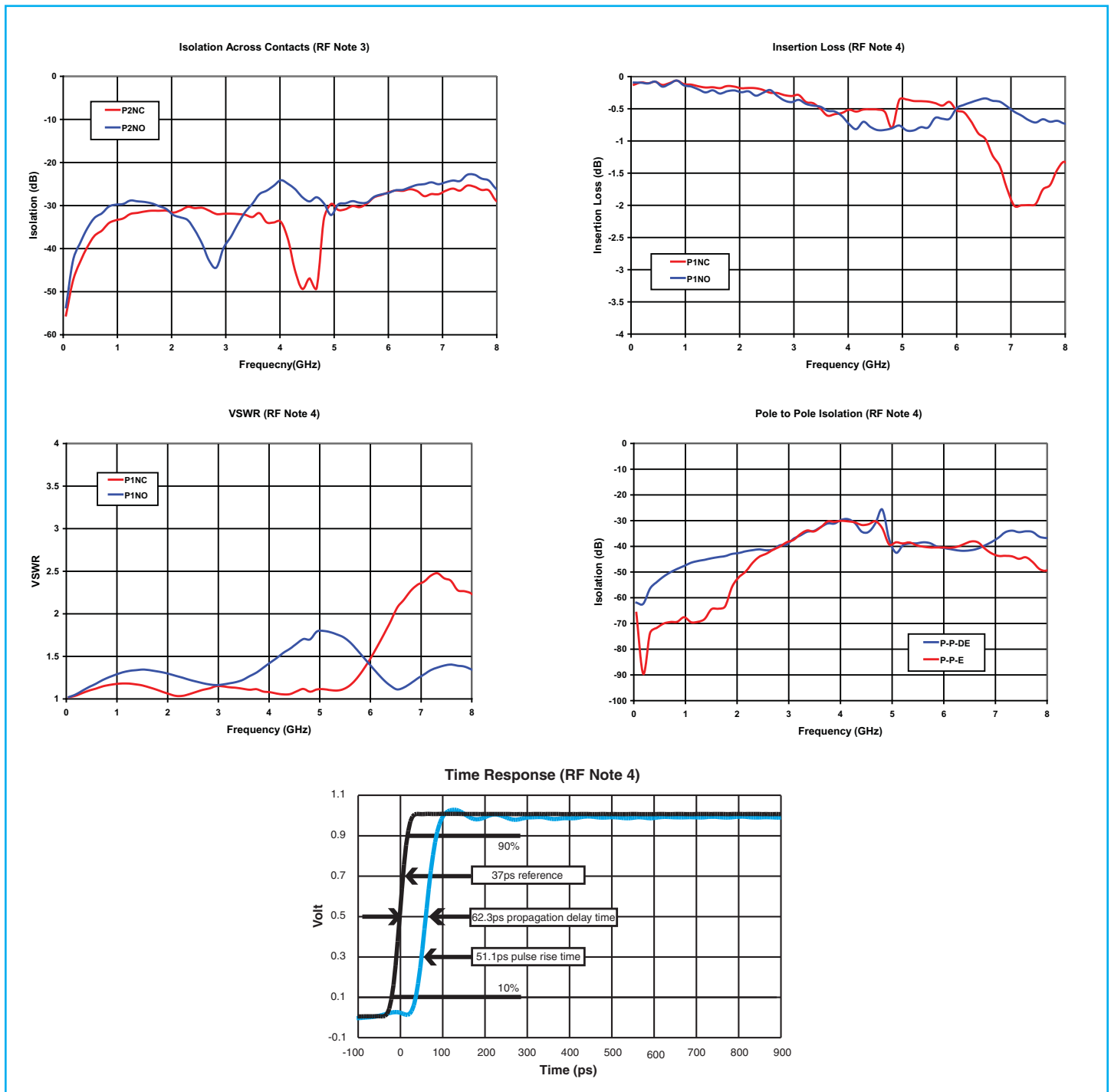
#### ENVIRONMENTAL AND PHYSICAL SPECIFICATIONS

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.

#### PART NUMBERING SYSTEM FOR SGRF RELAYS



SERIES SGRF312  
TYPICAL RF CHARACTERISTICS (See RF Notes)



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 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 between 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 SGRF312  
 GENERAL ELECTRICAL SPECIFICATIONS (@ 25 °C unless otherwise noted)

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	SGRF312-5	SGRF312-12
Coil Voltage, Nominal (Vdc)	5.0	12.0
Coil Resistance (Ohms ±20%)	50	390
Pick-up Voltage (Vdc max.)	3.6	9.0

**OUTLINE DIMENSIONS**

The technical drawings include:

- Top View:** Shows a cylindrical component with a height of .390 MAX [9.91] and a diameter of  $\phi$ .370 MAX [9.4].
- Side View:** Shows a diameter of  $\phi$ .335 MAX [8.51] and a lead height of .063 REF [1.6].
- Terminal View:** Shows 8 leads with a diameter of  $\phi$ .017 ± .002 [-0.001] and a length of 0.43 ± 0.025 [10.43 ± 0.025].
- RF Shield View:** Shows a circular shield with a diameter of  $\phi$ .200 ± .010 [5.08 ± 0.254]. It features 4x .378 ± .030 [-0.020] [9.60 ± 0.51] and 36 ± 3 TYP contacts. Reference dimensions include .031 REF [0.79] and .035 REF [0.89].
- Schematic-Terminal View:** Shows the internal terminal connections with pin numbers 1 through 10.
- RF Ground Shield:** Shows the shield assembly with a note: "RF GROUND SHIELD (SEE NOTE 2)".
- BEFORE LASER WELD:** Shows the shield assembly before the laser welding process.

**NOTES**

1. Dimensions are in inches. Metric equivalents in millimeters are shown in [ ].
2. For best RF performance, solder bottom of RF ground shield to PCB RF ground plane.
3. Positions 5 (Y) and 10 (Z) are for uninsulated case ground pin options.

**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.