

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

SERIES	RELAY TYPE
SGRF312	Repeatable, Surface-Mount RF (DC-8GHz) Relay with Ground Shield and J-Leads

**DESCRIPTION**

The ultra miniature SGRF312 is designed to improve upon the SGRF300 relay's high frequency performance. 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.

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

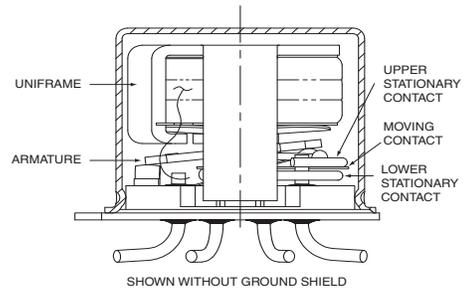
**CONSTRUCTION FEATURES**

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

**INTERNAL CONSTRUCTION**



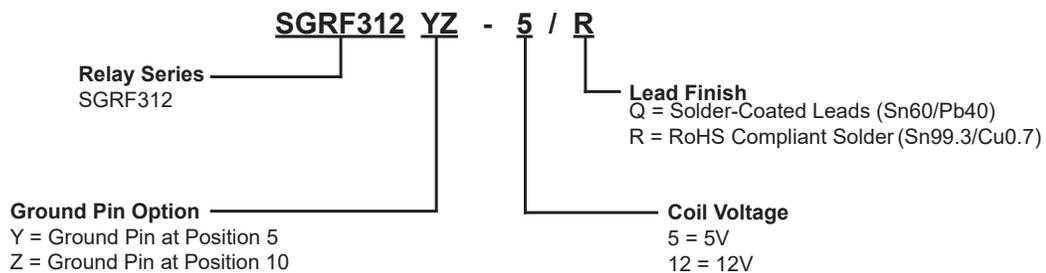
**GENERAL ELECTRICAL SPECIFICATIONS (-55°C to +85°C unless otherwise noted)(Notes 2 & 3)**

<b>Contact Arrangement</b>	2 Form C (DPDT)
<b>Rated Duty</b>	Continuous
<b>Contact Resistance</b>	0.15 Ω max.
<b>Contact Load Rating</b>	Resistive: 1A / 28Vdc Low level: 10 to 50 μA @ 10 to 50 mV
<b>Contact Life Ratings</b>	1,000,000 cycles (typical) at low level contact load
<b>Coil Operating Power</b>	450 mW typical at nominal rated voltage
<b>Operate Time</b>	4.0 ms max.
<b>Release Time</b>	3.0 ms max.
<b>Intercontact Capacitance</b>	0.4 pf typical
<b>Insulation Resistance</b>	1,000 MΩ min. between mutually isolated terminals
<b>Dielectric Strength</b>	350 V <sub>rms</sub> (60 Hz) @ atmospheric pressure

**DETAILED ELECTRICAL SPECIFICATIONS (-55°C to +85°C unless otherwise noted)(Note 3)**

<b>BASE PART NUMBERS (SGRF312)</b>	<b>SGRF312-5</b>	<b>SGRF312-12</b>
<b>Coil Voltage, Nominal (Vdc)</b>	5.0	12.0
<b>Coil Resistance (Ohms ±20%)</b>	50	390
<b>Pick-up Voltage (Vdc max.)</b>	3.6	9.0

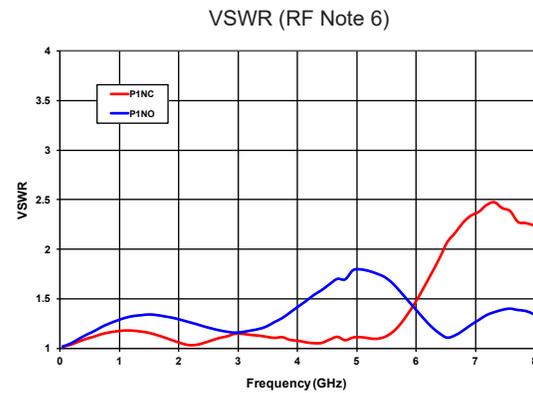
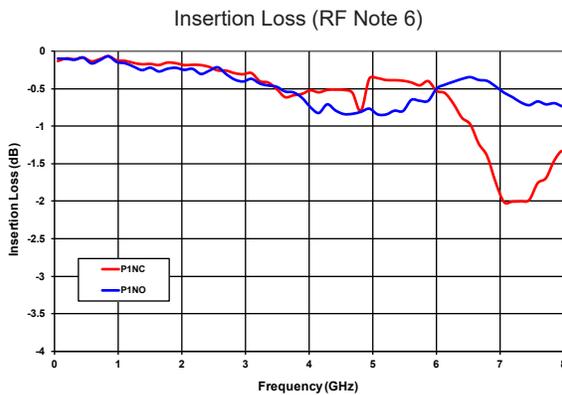
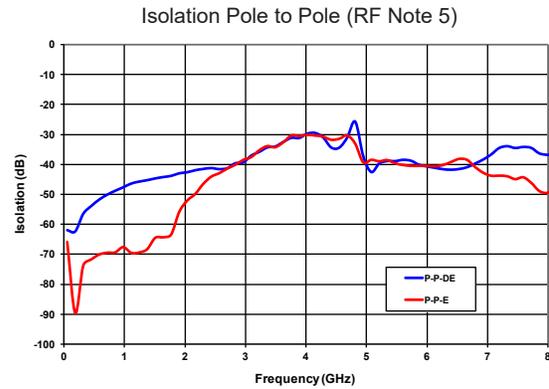
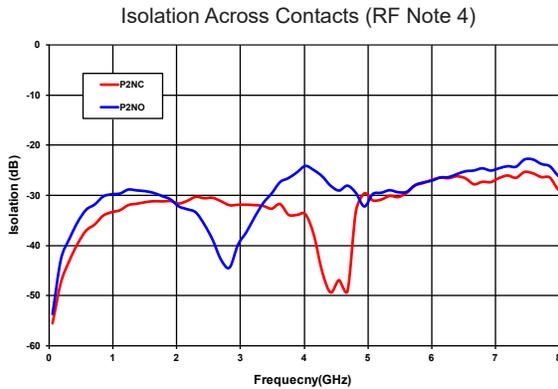
**Part Numbering System (Notes 4 & 5)**



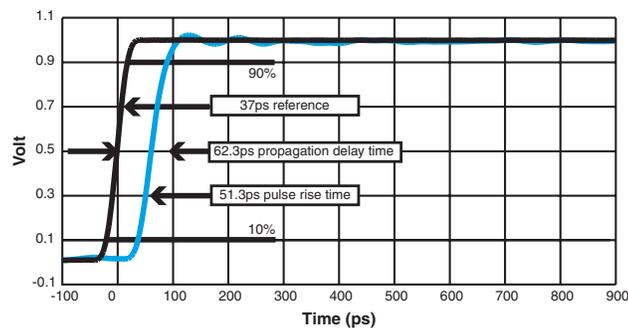
**NOTES**

1. Relays will exhibit no contact chatter in excess of 10 μs or transfer in excess of 1 μs.
2. "Typical" characteristics are based on available data and are best estimates. No on-going verification tests are performed.
3. Unless otherwise specified, parameters are initial values.
4. The slash and characters appearing after the slash are not marked on the relay.
5. Unless otherwise specified, relays will be supplied with solder-coated leads.
6. Using an operate voltage less than the specified minimum may result in unreliable operation.
7. Relay temperature during soldering shall not exceed 250°C, and reflow temperature shall not exceed 250°C, 3 passes, 1 minute each.

**TYPICAL RF CHARACTERISTICS (See RF Notes)**



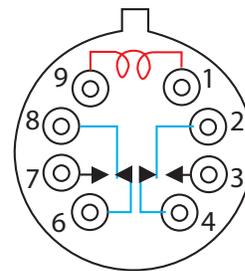
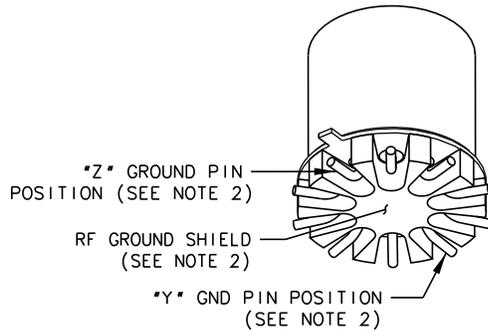
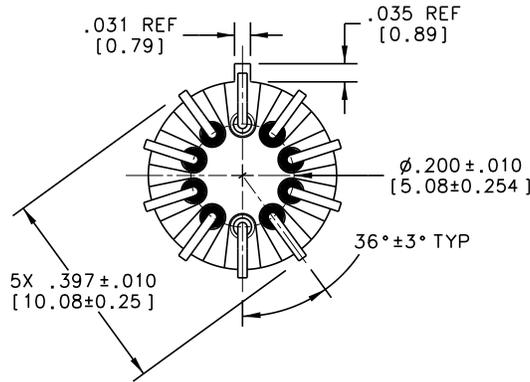
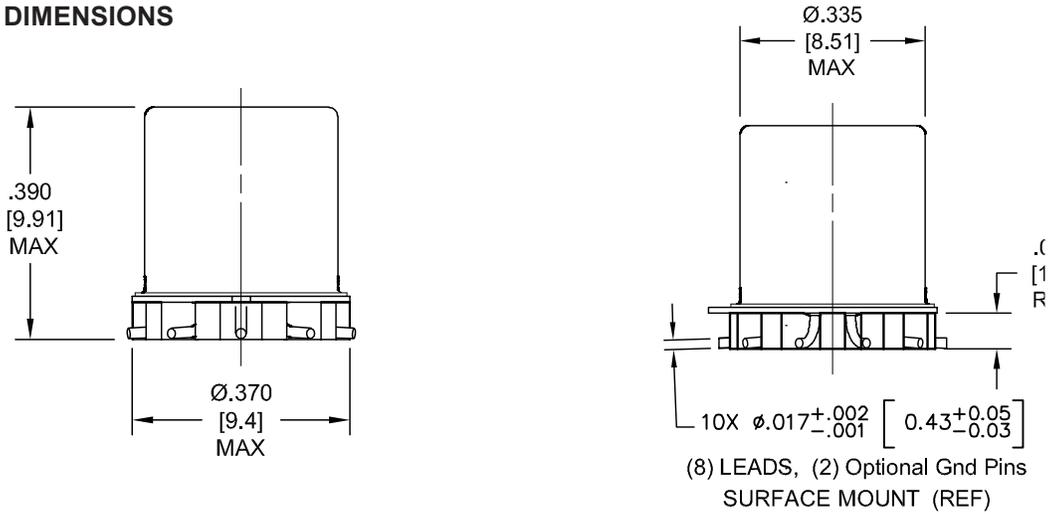
**SGRF312 Time Response (RF Note 6)**



**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.

**OUTLINE DIMENSIONS**

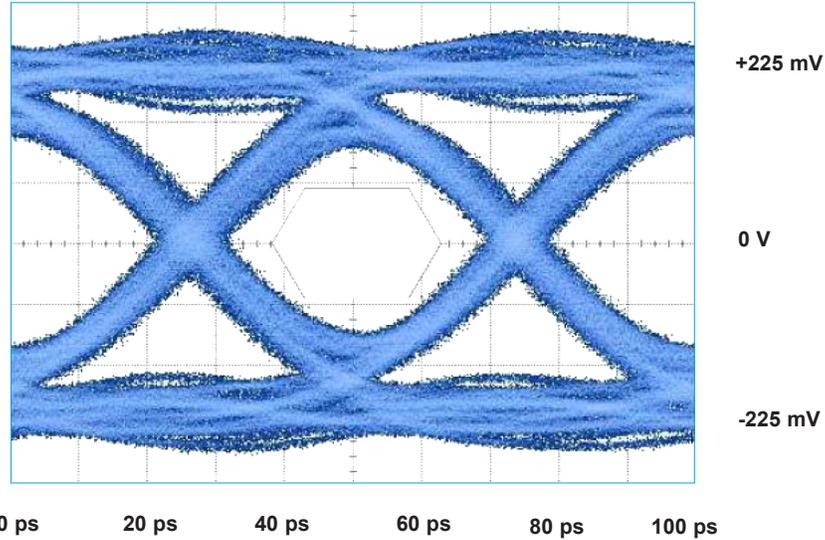


**SCHEMATIC DIAGRAM**  
 TERMINAL VIEW PIN NUMBERS  
 ARE FOR REFERENCE ONLY NOT  
 MARKED ON RELAYS

**NOTES**

1. Dimensions are in inches, metric equivalents shown in ( mm).
2. Positions 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, add "Y" to the part number for position 5 or "Z" to the part number for position 10.

**TYPICAL Single-Ended Signal Integrity Characteristics @ 20 Gbps**



Bit Rate	Eye Height	Eye Width	Jitter <sub>P,P</sub>
20 Gbps	144 mV	33.3 ps	12.67 ps