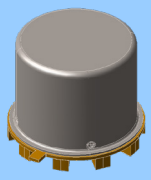
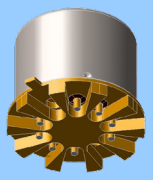


SURFACE MOUNT HIGH REPEATABILITY, BROADBAND TO-5 RELAYS DPDT DC-4 GHz



SERIES	RELAY TYPE
GRF700	Repeatable, RF relay
GRF703	Sensitive, repeatable, RF relay

DESCRIPTION

The ultraminiature GRF700 and GRF703 relays are designed to provide a practical surface-mount solution with improved RF signal repeatability over the frequency range. GRF700 and GRF703 relays feature a unique ground shield that isolates and shields each lead to ensure excellent contact-to-contact and pole-to-pole isolation. This ground shield provides a ground interface that results in improved high-frequency performance as well as parametric repeatability. The GRF700 and GRF703 extend performance advantages over similar RF devices that simply offer formed leads for surface mounting. These relays are engineered for use in RF attenuator, RF switch matrices, ATE and other applications that require dependable high frequency signal fidelity and performance.

The GRF700 and GRF703 feature:

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

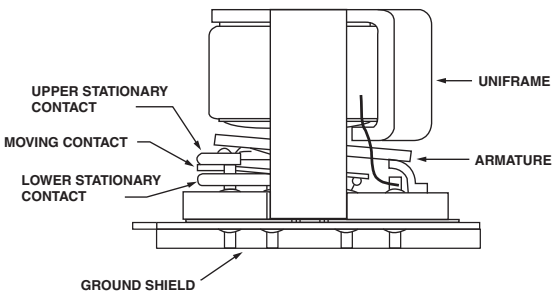
The following unique construction features and manufacturing techniques provide excellent robustness to environmental extremes and overall high reliability:

- Uniframe 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)		–65°C to +125°C
Vibration (Note 1)		10 g's to 500 Hz
Shock (Note 1)		30 g's, 6ms half sine
Enclosure		Hermetically sealed
Weight	**GRF300**	0.09 oz. (2.55g) max.
	GRF303	0.16 oz. (4.5g) max.

INTERNAL CONSTRUCTION



GENERAL ELECTRICAL SPECIFICATIONS (@25°C)

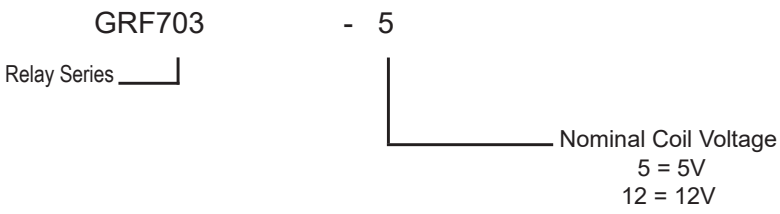
Contact Arrangement	2 Form C (DPDT)
Rated Duty	Continuous
Contact Resistance	0.15 Ω max.
Contact Load Rating	Resistive: 1Amp/28Vdc Low level: 10 to 50 µA @ 10 to 50 mV
Contact Life Ratings	5,000,000 cycles (typical) at low level
Coil Operating Power	GRF700-5: 500 mW @ nominal coil
	GRF703-5: 250 mW @ nominal coil
Operate Time	GRF700: 4.0 mS max. GRF703: 6.0 mS max.
Release Time	GRF700: 3.0 mS max.
	GRF703: 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 (GRF700)	GRF700-5	GRF700-12
Coil Voltage, Nominal (Vdc)	5.0	12.0
Coil Resistance (Ohms ±20%)	50	390

BASE PART NUMBERS (GRF703)	GRF703-5	GRF703-12
Coil Voltage, Nominal (Vdc)	5.0	12.0
Coil Resistance (Ohms ±20%)	100	850

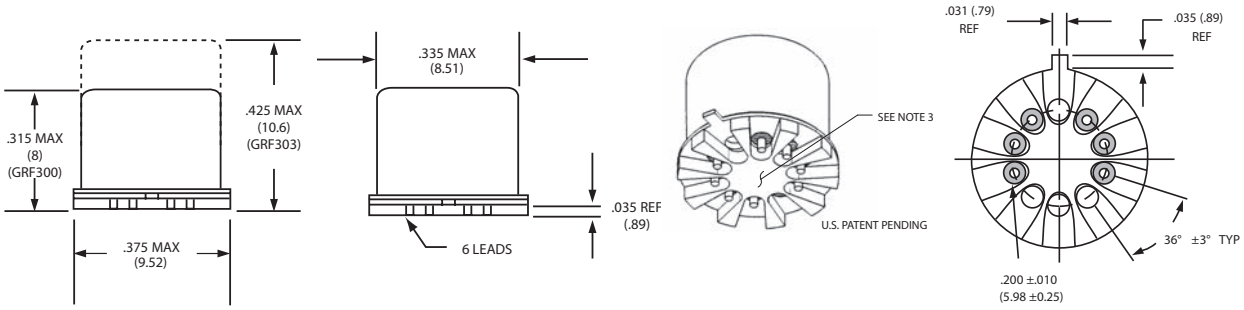
Part Numbering System (Note 3)



NOTES

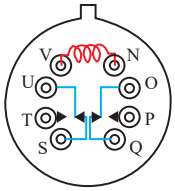
1. Relays will exhibit no contact chatter in excess of 10 µsec or transfer in excess of 1 µsec.
2. For reference only. Coil resistance not directly measureable at relay terminals due to internal series diode.
3. Relays will be supplied with either gold-plated leads.

OUTLINE DIMENSIONS



(Viewed From Terminals)

SCHEMATIC DIAGRAMS



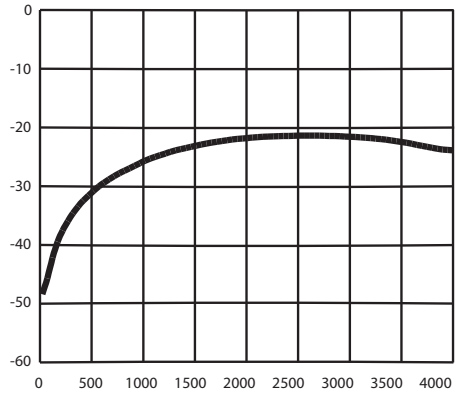
GRF700/GRF703

NOTES:

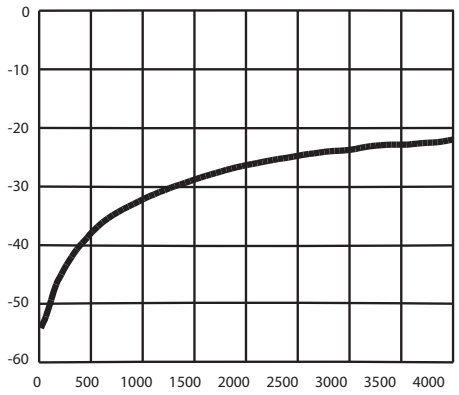
1. **DIMENSIONS ARE IN INCHES, METRIC EQUIVALENTS SHOWN IN [ ].**
2. **POSTITIONS 5 AND 10 ARE FOR UNINSULATED CASE GROUND OPTIONS.**
3. **NO PROTRUSION BELOW BOTTOM OF HEADER WHEN GROUND PINS ARE INSTALLED**
4. **TO ORDER THE CASE GROUND OPTION, AFTER THE SERIES DESIGNATOR, ADD "Y" TO THE PART NUMBER FOR POSITION 5 OR "Z" TO THE PART NUMBER FOR POSITION 10.**
5. **UNLESS OTHERWISE SPECIFIED, TOLERANCES ON DIMENSIONS ARE ± .010 INCH (0.025 MM)**

TYPICAL RF CHARACTERISTICS (See RF Notes)

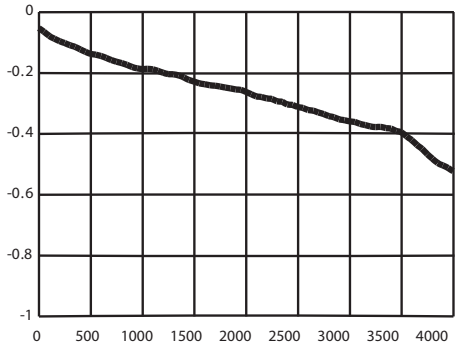
Isolation Across Contacts (RF Note 4)



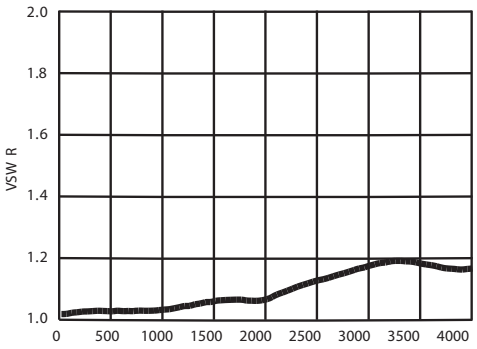
Isolation Pole to Pole (RF Note 5)



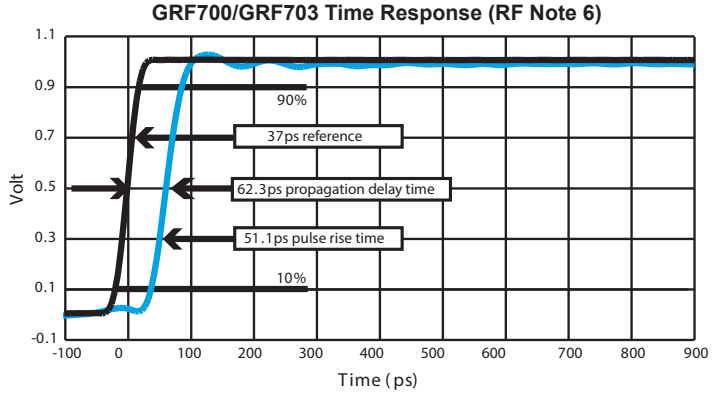
Insertion Loss (RF Note 6)



VSWR (RF Note 6)



GRF700/GRF703 Time Response (RF Note 6)

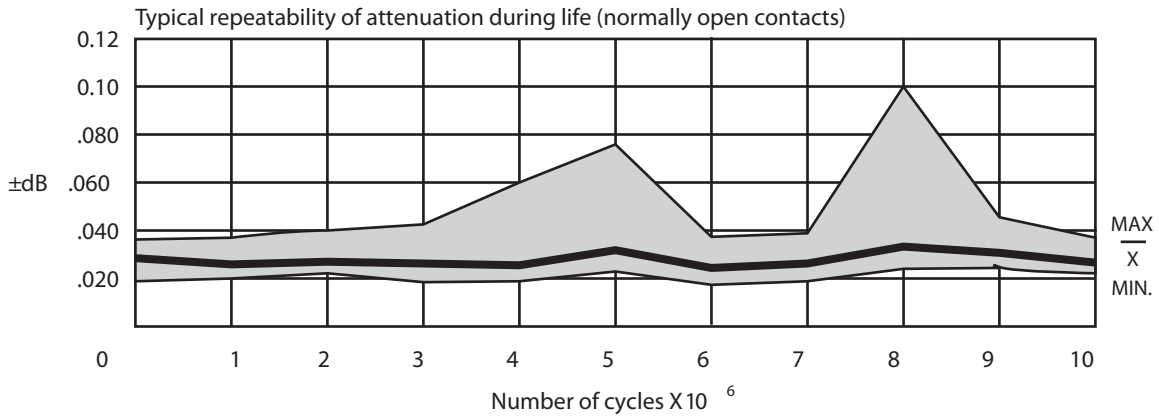


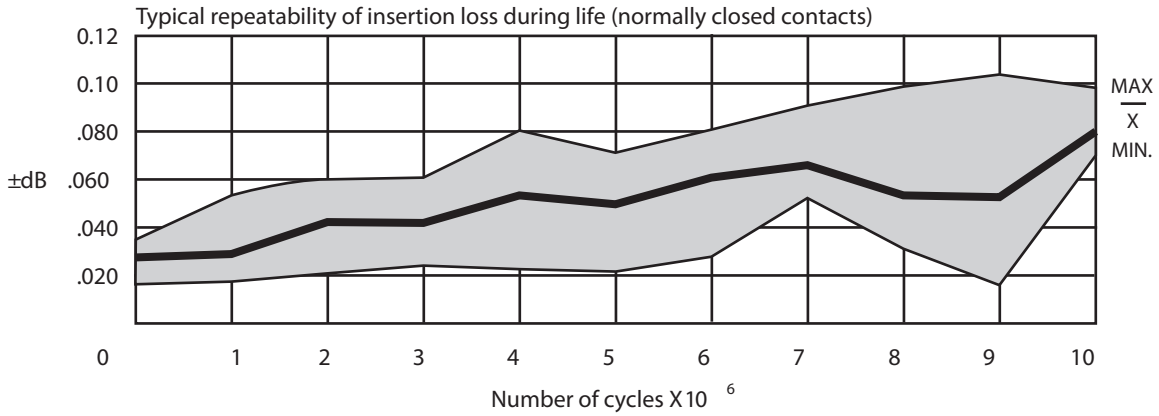
RF NOTES

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.

TYPICAL RF REPEATABILITY PERFORMANCE (See RF Notes 1, 2, and 3)

1 Million Cycle Repeatability **±0.1 dB from DC to 3GHz**





RF NOTES
1. One million cycle repeatability data is based upon 396 observations with an average repeatability ±0.033 dB and a range of ±0.093 dB.
2. Repeatability of attenuation values were obtained from tests conducted in a 20 dB attenuator network with a 0 dBm input signal.
3. Relay operates at frequencies higher than 3 GHz with reduced RF performance characteristics.
4. Curves were developed from tests performed on a 0.031" copper clad, reinforced PTFE circuit board at 20°C (ref). The unutilized contacts were terminated in 50 ohms; characteristic impedance of measuring equipment is 50 ohms. The relays were mounted flush to the circuit board ground plane without the relay header soldered to the ground plane.