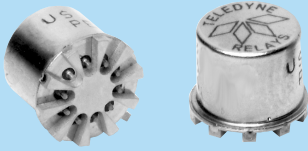




A Unit of Teledyne Electronics and Communications

SURFACE MOUNT, MAGNETIC-LATCHING BROADBAND RF RELAYS DPDT

SERIES GRF342



DESCRIPTION

The Series GRF342 relay is a hermetically sealed, ultraminiature RF relay designed from inception for surface mount applications. This magnetic-latching relay features extremely low internal circuit losses for exceptional time and frequency domain response characteristics through and beyond the UHF spectrum and into the S band. The GRF342 features 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 an RF ground interface that results in improved high-frequency performance as well as parametric repeatability. The GRF342 extends performance advantages over similar RF devices that simply offer formed leads for surface mounting.

The GRF342 is robust to shock, vibration and temperature extremes for use in space applications and other demanding environments. It is engineered for use in RF attenuators, RF

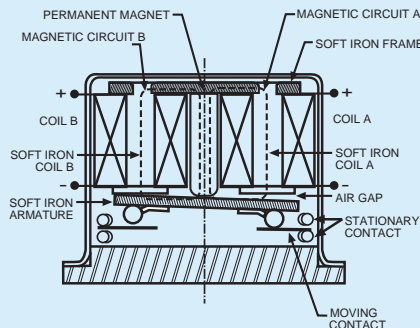
switch matrices, automated test equipment, spacecraft and other applications that require dependable high-frequency signal fidelity and performance. Its low profile makes the GRF342 ideal for applications where extreme packaging density and/or close PC board spacing are required.

Unique features and manufacturing techniques include:

- Positive mounting means to RF ground plane.
- Unique uniframe design provides high magnetic efficiency and mechanical rigidity.
- High force/mass ratios for resistance to shock and vibration.
- Advanced cleaning techniques provide maximum assurance of internal cleanliness.
- Gold-plated precious metal alloy contacts ensure reliable dc and RF signal switching, as well as low and stable insertion loss.
- Robust to high temperature solder reflow environments.

PRINCIPLE OF OPERATION

Energizing Coil B produces a magnetic field opposing the magnetic field of the permanent magnet in Circuit B. As the net holding force decreases, the attractive force in the air gap of Circuit A, which also results from the magnetic field of the permanent magnet, becomes great enough to break the armature free of Core B, and snap it into a closed position against Core A. The armature remains in this position upon removal of power from Coil B, but will snap back into position B upon energizing Coil A. Since operation depends upon cancellation of a magnetic field, it is necessary to apply the correct polarity to the relay coils as indicated on the relay schematic.

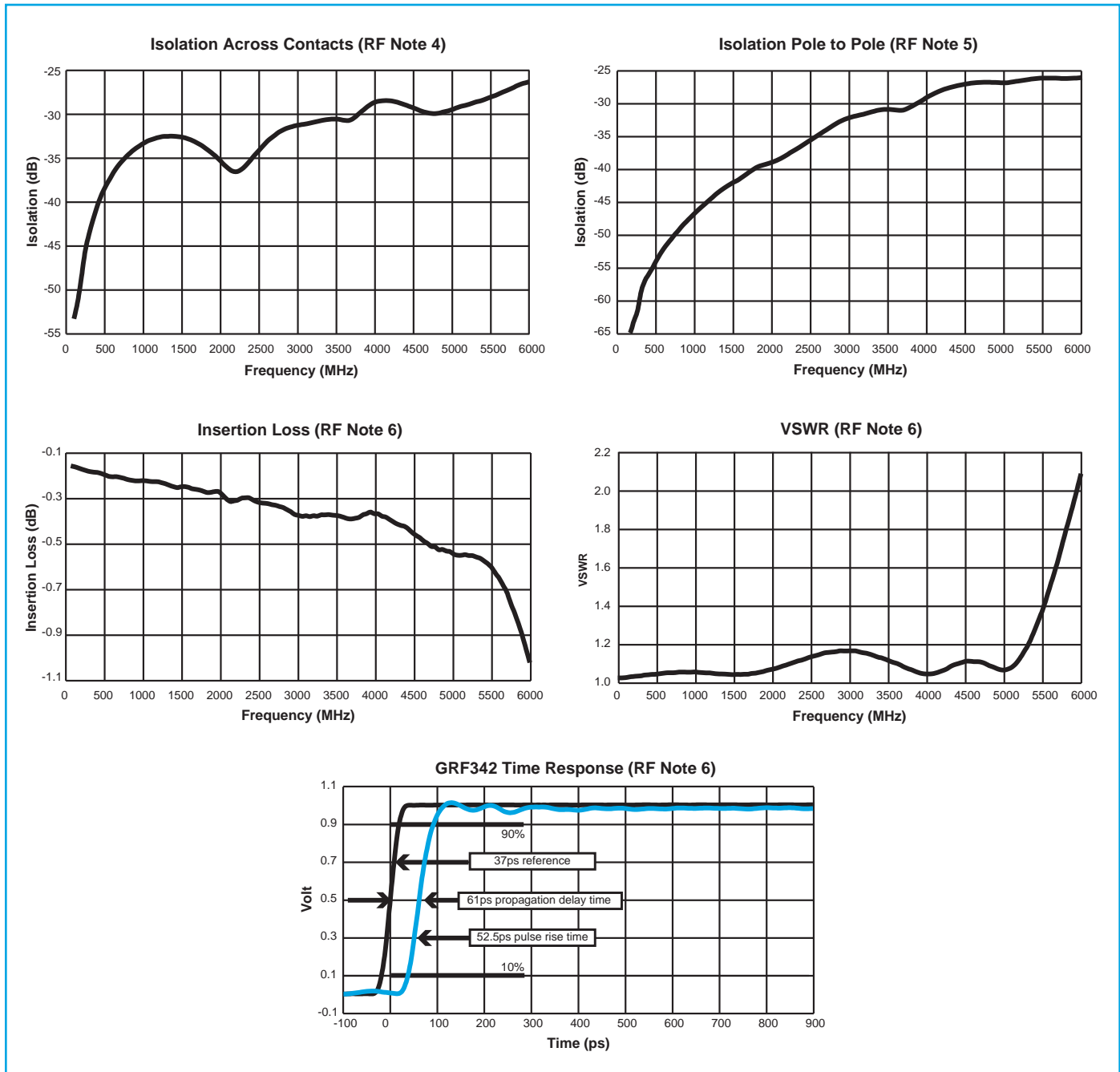


When latching relays are installed in equipment, the latch and reset coils should not be pulsed simultaneously. Coils should not be pulsed with less than rated coil voltage and the pulse width should be a minimum of three times the specified operate time of the relay. If these conditions are not followed, it is possible for the relay to be in the magnetic neutral position.

ENVIRONMENTAL AND PHYSICAL SPECIFICATIONS

Temperature (Ambient)	-55°C to +85°C
Vibration	10 g's to 1000 Hz (Note 1)
Shock	30 g's for 6 msec (Note 1) half-sine
Enclosure	Hermetically sealed
Weight	0.1 oz. (2.9g) max.

SERIES GRF342
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 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 GRF342
GENERAL ELECTRICAL SPECIFICATIONS (@25°C) (General Note 2)

Contact Arrangement	2 Form C (DPDT)
Rated Duty	Continuous
Contact Resistance	0.15 ohm initial
Contact Load Ratings (DC)	Resistive: 1 Amp/28Vdc Low Level: 10 to 50 µA/10 to 50mV
Contact Life Ratings	10,000,000 cycles (typical) at low level 100,000 cycles min. at all other loads specified above
Coil Operating Power	GRF342-5: 410mW typical at nominal rated voltage GRF342-12: 288mW typical at nominal rated voltage
Operate Time	2.0 ms max at nominal rated coil voltage
Minimum Operate Pulse	6.0 ms @ rated voltage
Intercontact Capacitance	0.4 pf typical
Insulation Resistance	1,000 megohms min. between mutually isolated terminals
Dielectric Strength	Atmospheric pressure: 350 Vrms/60Hz

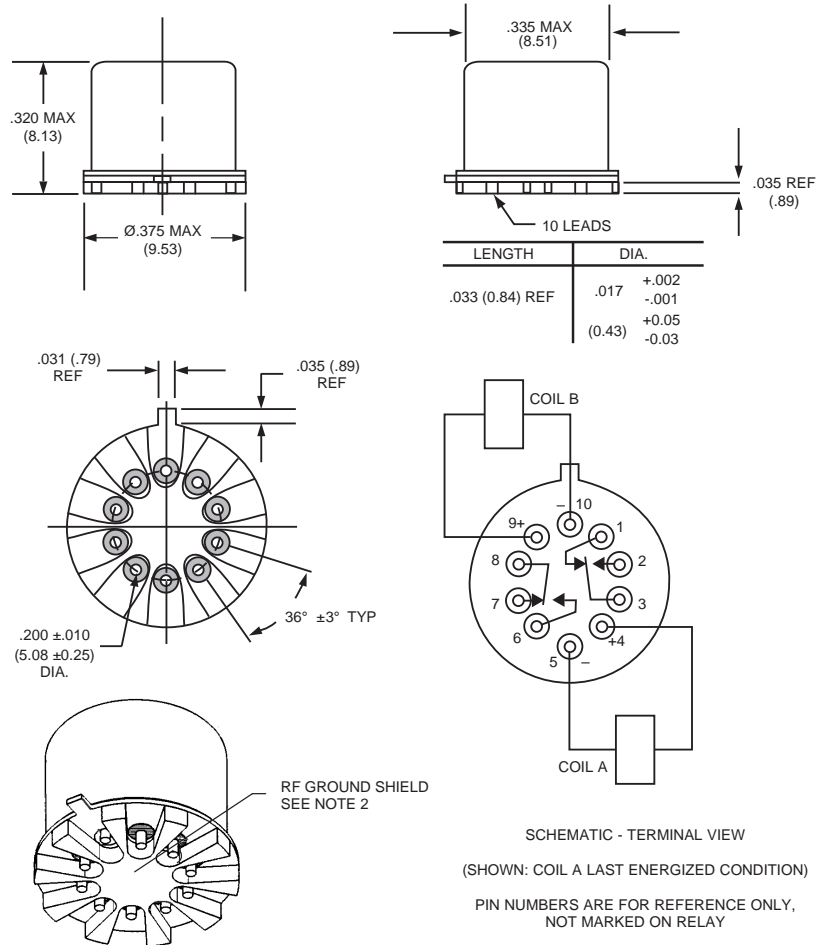
DETAILED ELECTRICAL SPECIFICATIONS (@25°C) (General Note 2)

BASE PART NUMBERS		GRF342-5	GRF342-12
Coil Voltage, Nominal (Vdc)	Nom.	5.0	12.0
	Max.	6.0	16.0
Coil Resistance (Ohms ±20% @25°C) (Note 4)		61	500
Set & Reset Voltage (Vdc, Max.) Pulse Operated		3.5	9.0

GENERAL NOTES

1. Relays will exhibit no contact chatter in excess of 10 µsec or transfer in excess of 1 µsec.
2. Unless otherwise specified, parameters are initial values.
3. For extended contact life ratings, contact factory.
4. Contacts shown in position resulting when Coil A last energized.
5. Relays may be subjected to 260°C, peak solder reflow temperature, 1 minute, 3 passes.
6. Butt-lead ends are coplanar within .003" (0.08).
7. Application notes available for PCB layout and mounting information.

OUTLINE DIMENSIONS



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.