SURFACE MOUNT CENTIGRID® 2.5 GHz RF RELAYS DPDT

SERIES	RELAY TYPE
GRF172	DPDT Surface mount, RF Centigrid® relay
GRF172D	DPDT Surface mount, RF Centigrid® relay with coil transient suppression

DESCRIPTION

The GRF172 surface-mount Centigrid® relay is an ultraminiature, hermetically sealed, armature relay for 2.5 GHz RF applications. Its low profile height (.330") and .100" grid spaced terminals make it an ideal choice where extreme packaging density and/or close PC board spacing are required.

The GRF172 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 a ground interface that results in improved highfrequency performance as well as parametric repeatability. The GRF172 extends performance advantages over similar RF devices that simply offer formed leads for surface mounting.

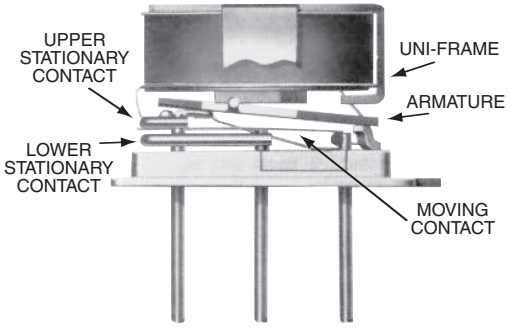
Unique construction features and manufacturing techniques provide overall high reliability and excellent resistance to environmental extremes:

- All welded construction.
- Unique uni-frame design providing 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.
- Precious metal alloy contact material with gold plating assures excellent high current and dry circuit switching capabilities.

Applications include telecommunications, test instruments, mobile communications, attenuators, and automatic test equipment.

ENVIRONMENTAL AND PHYSICAL SPECIFICATIONS	
Temperature (Ambient)	–65°C to +125°C
Vibration (General Note I)	10 g's to 500 Hz
Shock (General Note I)	30 g's, 6ms half sine
Enclosure	Hermetically sealed
Weight	0.15 oz. (4.3g) max.

INTERNAL CONSTRUCTION



SERIES GRF172
GENERAL ELECTRICAL SPECIFICATIONS (@25°C Notes 2 & 5)

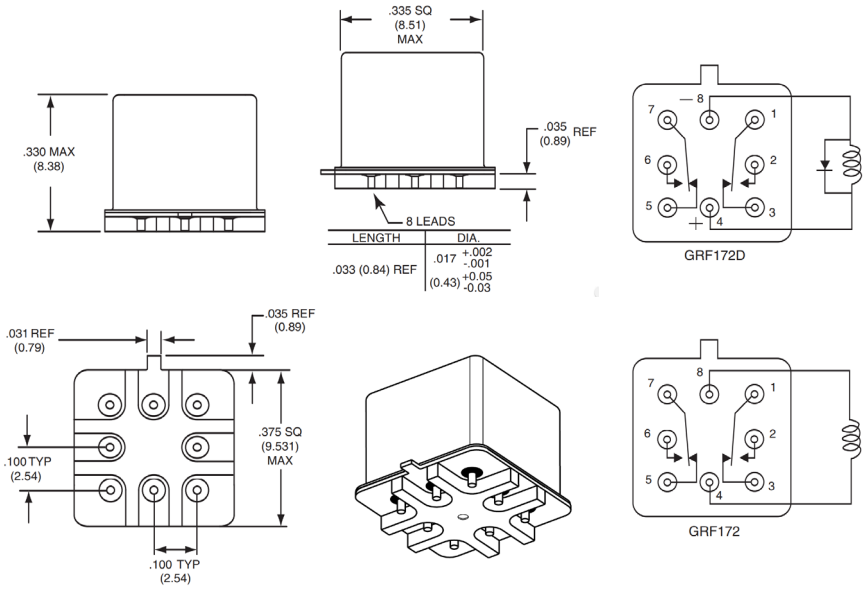
Contact Arrangement	2 Form C (DPDT)	
Rated Duty	Continuous	
Contact Resistance	0.15 Ω max. Before life; 0.3 ohm max. After life at 1A/28Vdc (measured 1/8" from header	
Contact Load Rating	Resistive: 1 A/ 28 Vdc Inductive: 200 mA/ 28 Vdc (320mH) Lamp: 100 mA / 28 Vdc Low level: 10 to 50 µA @ 10 to 50 mV	
Contact Life Ratings	5,000,000 cycles (typical) at low level 500,000 cycles (typical) at 0.5 A / 28 Vdc resistive 100,000 cycles min. at all other loads specified above	
Contact Overload Rating	2 A / 28 Vdc Resistive (100 cycles min.)	
Contact Carry Rating	Contact Factory	
Operate Time	6.0 msec max. at nominal rated coil voltage	
Release Time	GRF172: 3.0 ms max.	GRF172D: 6.0 ms max.
Intercontact Capacitance	0.4 pf typical	
Insulation Resistance	1,000 MΩ min. between mutually isolated terminals	
Dielectric Strength	300 Vrms (60 Hz) @ atmospheric pressure	
Negative Coil Transient (Vdc)	2.0 Vdc Max.	
Diode P.I.V. (Vdc)	60 Vdc Min.	

DETAILED ELECTRICAL SPECIFICATIONS (@25°C)

BASE PART NUMBERS (GRF172, GRF172D)		**GRF172-5 GRF172D-5**	**GRF172-12 GRF172D-12**	**GRF172-26 GRF172D-26**
Coil Voltage, Nominal (Vdc)	**Nom.**	5.0	12.0	26.5
	Max.	5.8	16.0	32.0
Coil Resistance (Ohms ±25%)		64	400	1600
Pick-up Voltage (Vdc, Max.) Pulse Operation		3.8	9.0	18.0
Coil Operating Power at Nominal Voltage (mW)		405	360	440

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. Relays may be subjected to 260°C, peak solder reflow temperature, 1 minute, 3 passes.
4. Butt-lead ends are coplanar within .003" (0.08).
5. "Typical" characteristics are based on available data and are best estimates. No on-going verification tests are performed.
6. Application notes available for PCB layout and mounting information.

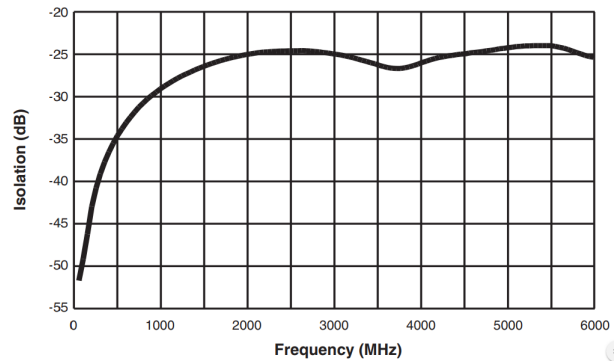
OUTLINE DIMENSIONS



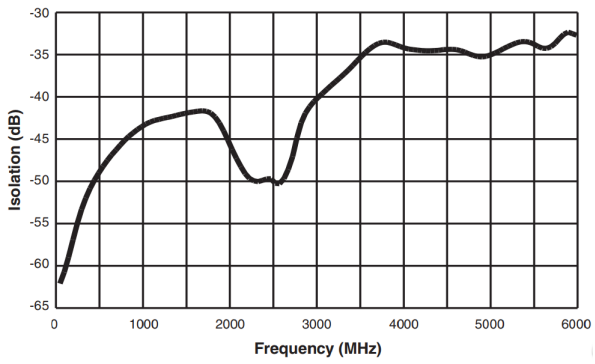
NOTES:
1. DIMENSIONS ARE IN INCHES. METRIC EQUIVALENTS IN MILLIMETERS ARE SHOWN IN ( ).
2. UNLESS OTHERWISE SPECIFIED, TOLERANCES ON DIMENSIONS ARE ±.010 INCH (0.025 mm).
3. FOR OPTIMAL RF PERFORMANCE, SOLDER BOTTOM OF GROUND SHIELD TO PCB RF GROUND PLANE.

SERIES GRF172
TYPICAL RF CHARACTERISTICS (See RF Notes)

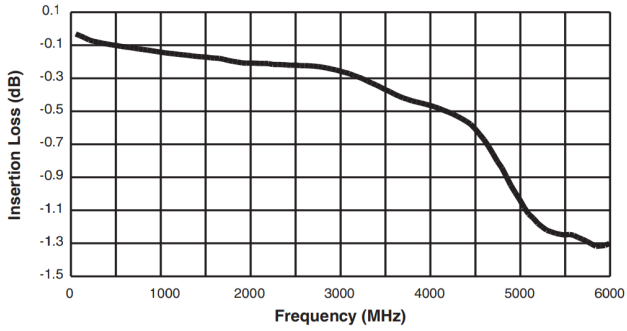
Isolation Across Contacts (RF Note 4)



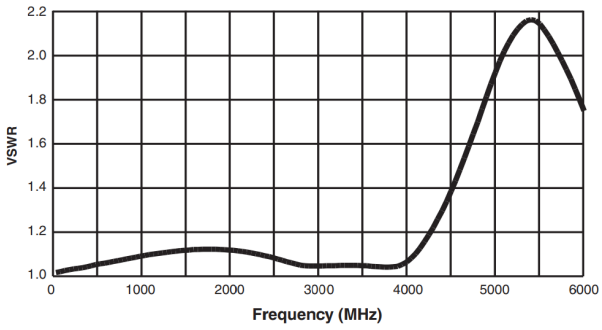
Isolation Pole to Pole (RF Note 5)



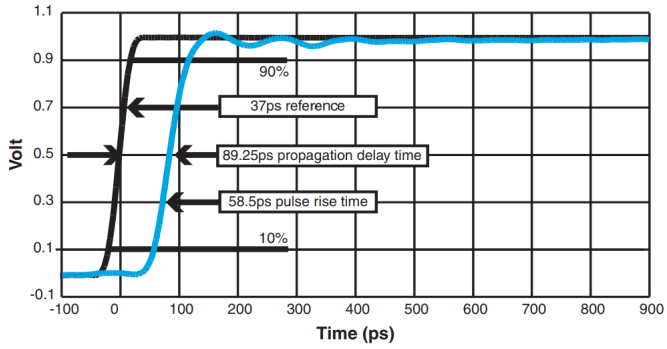
Insertion Loss (RF Note 6)



VSWR (RF Note 6)



GRF172 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. 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: -10dBm**
- **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.

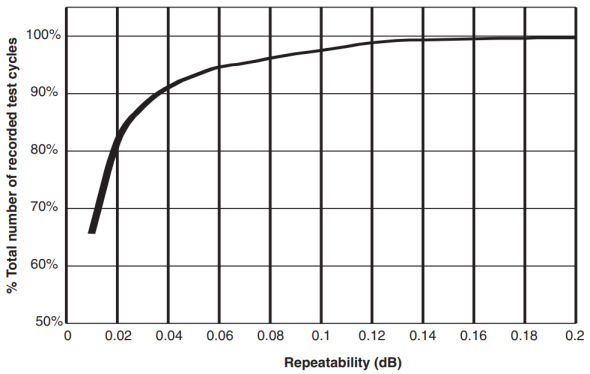
5. Data is the average from readings taken on poles with coil energized and de-energized.

6. Data is the average from readings taken on all closed contacts.

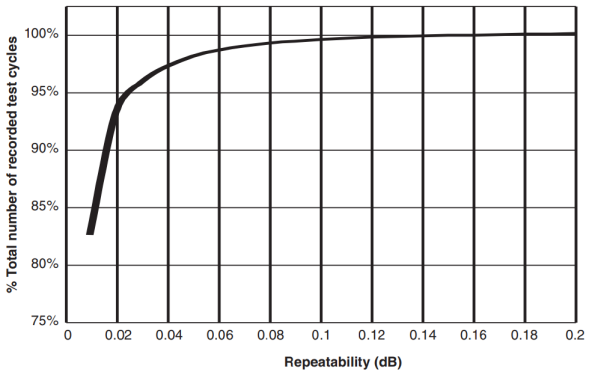
7. Test fixture effect de-embedded from frequency and time response data.

SERIES GRF172
TYPICAL RF INSERTION LOSS REPEATABILITY CHARACTERISTICS
(See RF Insertion Loss Repeatability Notes)

Normally Closed



Normally Open



RF INSERTION LOSS REPEATABILITY 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. Test performed at room abient temperature
   c. Contact signal level: -10dBm
2. Data presented herein represents typical characteristics and is not intended for use as specification limits.
3. Insertion loss repeatability measured over frequency range from 50 MHz to 4 GHz

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Teledyne Relays:

GRF172-5 GRF172D-12 GRF172D-5