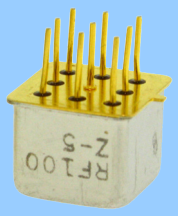
TELEDYNE RELAYS
Everywhereyoulook™

Series RF100/RF103

DPDT Non-Latching
DC-6 GHz, RF Relay

HIGH REPEATABILITY, SMT DPDT, BROADBAND 6 GHz, CENTIGRID® RELAYS



SERIES	RELAY TYPE
RF100	Surface Mount, DPDT, Repeatable, RF Centigrid® relay, DC-6 GHz,
RF103	Sensitive, Surface Mount, DPDT, Repeatable, RF Centigrid® relay

DESCRIPTION

The ultraminiature RF100 and RF103 relays are designed to provide improved RF signal repeatability over the frequency range. These relays are highly suitable for use in attenuator and other RF circuits, the RF100 and RF103
feature:

The RF100 and RF103 feature:

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

CONSTRUCTION FEATURES

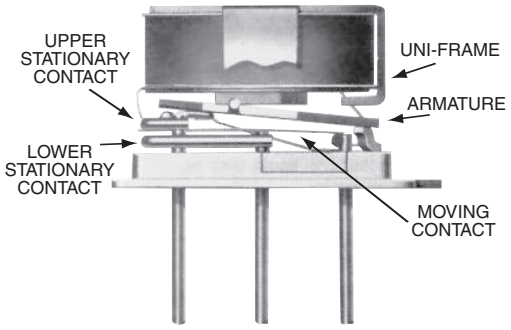
The following unique construction features and manufacturing techniques provide excellent robustness to environmental extremes and overall high reliability:

- 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
- RoHS Compliant

ENVIRONMENTAL AND PHYSICAL SPECIFICATIONS

Temperature (Ambient)	Storage	–55°C to +125°C
	Operating	–55°C to +85°C
Vibration (Note 1)		10 g's, 10 to 500 Hz
Shock (Note 1)		30 g's, 6 ms, half sine
Enclosure		Hermetically sealed
Weight	**RF100**	0.09 oz. (2.55g) max.
	RF103	0.16 oz. (4.5g) max.

INTERNAL CONSTRUCTION



GENERAL ELECTRICAL SPECIFICATIONS (-65 °C to 125 °C unless otherwise noted)(Notes 2 & 3)

Contact Arrangement	DPDT
Rated Duty	Continuous
Contact Resistance	0.100 Ω max. initial (measured 1/8" from the header)
Contact Load Rating	Low level: 10 to 50 µA @ 10 to 50 mV
Contact Life Ratings	10,000,000 cycles (typical) at low level
Coil Operating Power	RF100-5: 500 mW typical @ nominal rated voltage RF100-12: 369 mW typical @ nominal rated voltage RF103-5: 250 mW typical @ nominal rated voltage RF103-12: 180 mW typical @ nominal rated voltage
Operate Time	RF100: 4.0 ms max. RF103: 6.0 ms max.
Release Time	RF100: 3.0 ms max. RF103: 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 (-65 °C to 125 °C unless otherwise noted.) (Note 3)

BASE PART NUMBERS		**RF100-5 RF103-5**	**RF100-12 RF103-12**
Coil Voltage, Nominal (Vdc)		5.0	12.0
Coil Resistance (Ohms ±20%)	**RF100**	50	390
	RF103	100	800
Pick-up Voltage (Vdc max.)		3.6	9.0

Part Numbering System (Notes 4 & 5)

RF100 - 12 / Q

Relay Series
RF100
RF103

Coil Voltage
5 = 5Vdc
12 = 12Vdc

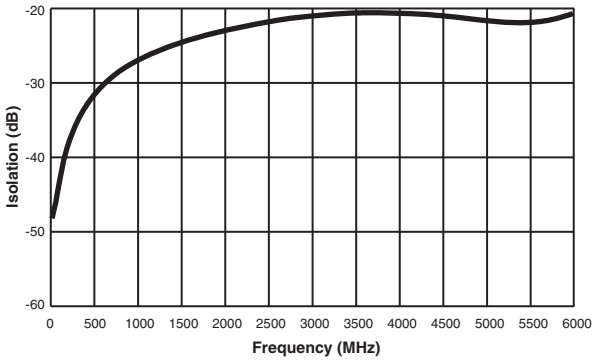
Lead Finish
Q = Solder-Dipped Leads (Sn60/Pb40)
R = RoHS Compliant Solder (Sn99.3/Cu0.7)
No Suffix = Gold-plated Leads

NOTES

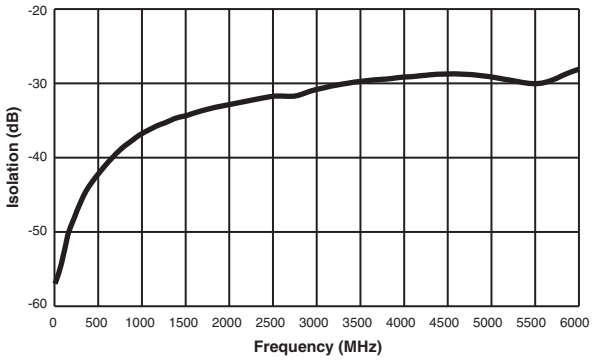
1. Relay contacts will exhibit no chatter in excess of 10 µs or transfer in excess of 1 µs.
2. Characteristics shown as "typical" are based on available data and are best estimates. No ongoing verification tests are performed.
3. Unless otherwise specified, parameters are initial values.
4. Parts ordered with no suffix option will be provided with Gold-Plated leads which have a typical plating thickness of 25-40 µin.
5. The slash and characters appearing after the slash are not marked on the relay.
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)

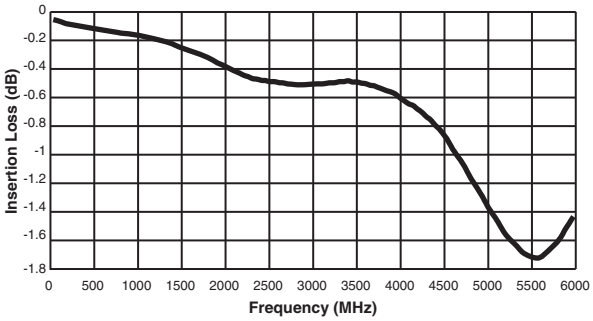
Isolation Across Contacts (RF Note 4)



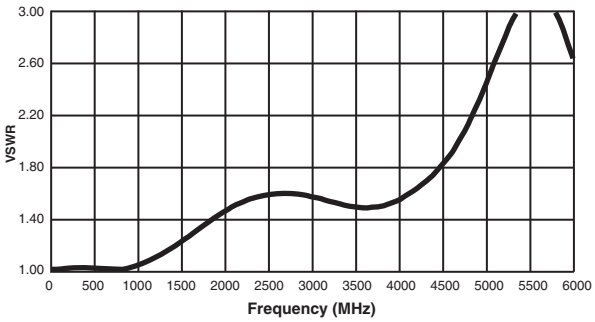
Isolation Pole to Pole (RF Note 5)



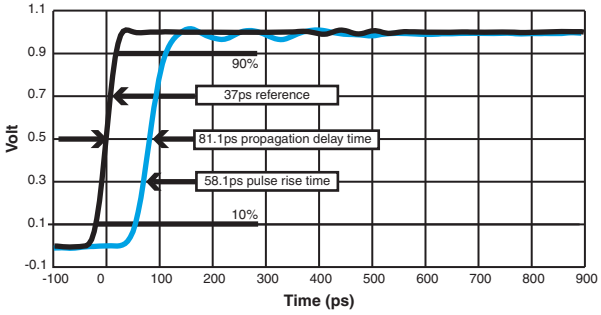
Insertion Loss (RF Note 6)



VSWR (RF Note 6)



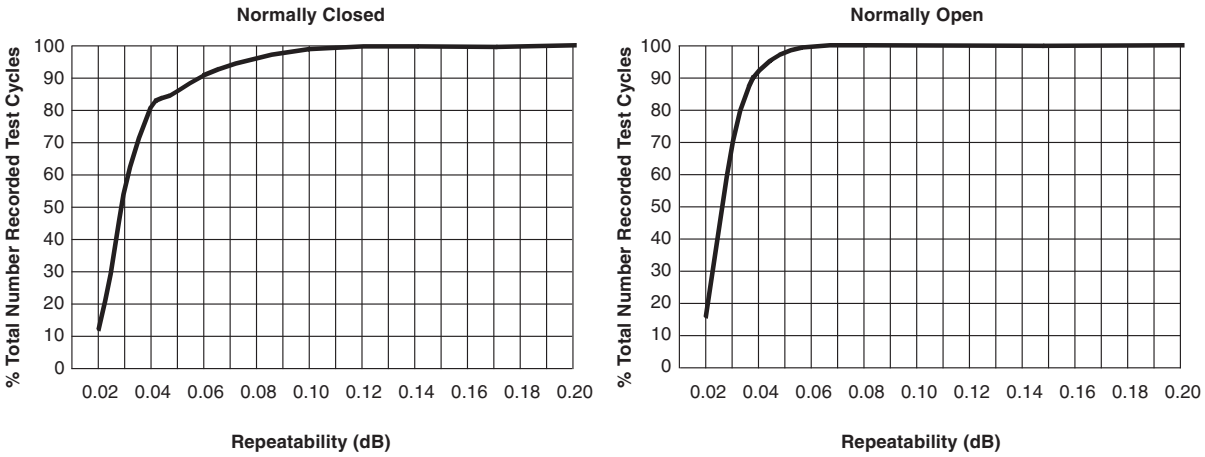
RF100 Time Response (RF Note 6)



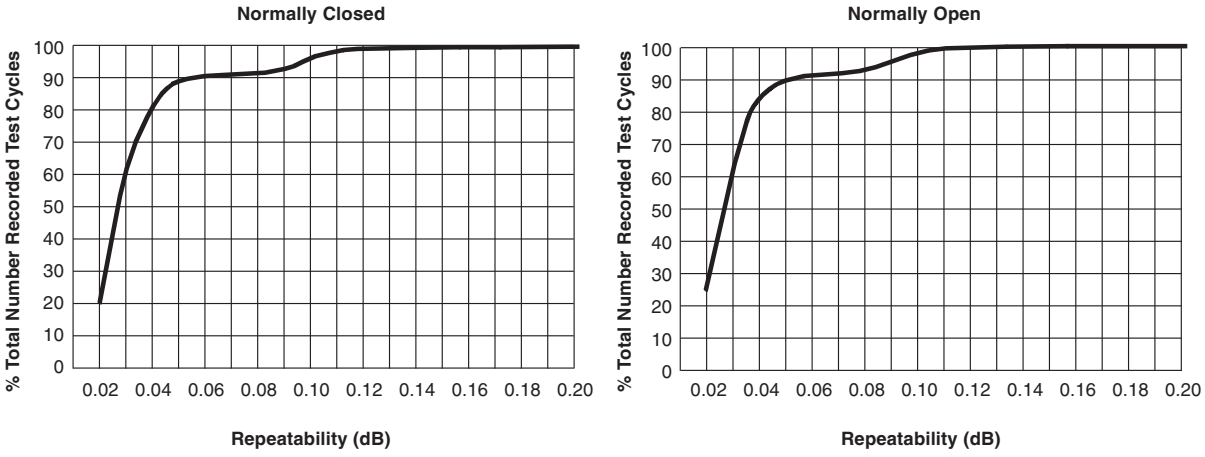
RF NOTES

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: –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.

REPEATABILITY CHARACTERISTIS RF100 RELAYS



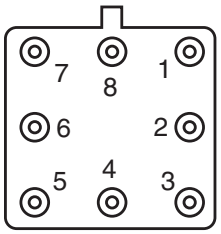
REPEATABILITY CHARACTERISTICS RF103 RELAYS



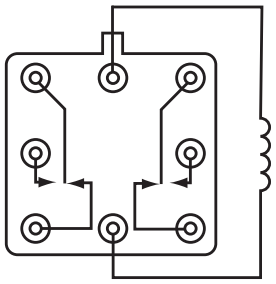
RF INSERTION LOSS REPEATABILITY NOTES

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 ambient temperature.
   c. Contact signal level: –10 dBm.
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.

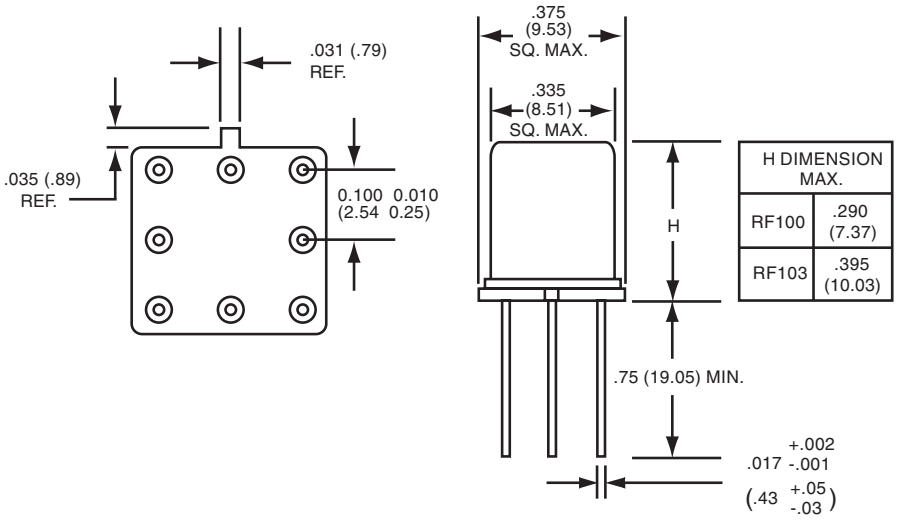
OUTLINE DIMENSIONS



TERMINAL NUMBERING



SCHEMATIC

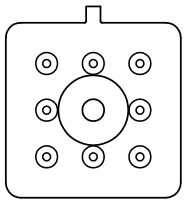
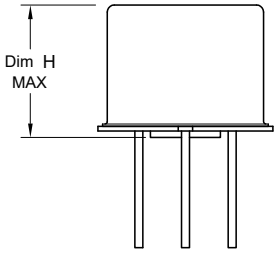


H DIMENSION MAX.	
RF100	.290 (7.37)
RF103	.395 (10.03)

- TERMINAL NUMBERING AND SCHEMATIC ARE AS VIEWED FROM THE TERMINALS.
- DIMENSIONS ARE IN INCHES (MILLIMETERS).
- SCHEMATIC AND EXTERNAL DIMENSIONS SHOWN WITHOUT GROUND PINS.
- TO ORDER THE CASE GROUND OPTION, AFTER THE SERIES DESIGNATOR, ADD “Z” TO THE PART NUMBER FOR CENTER POSITION GROUND PIN.

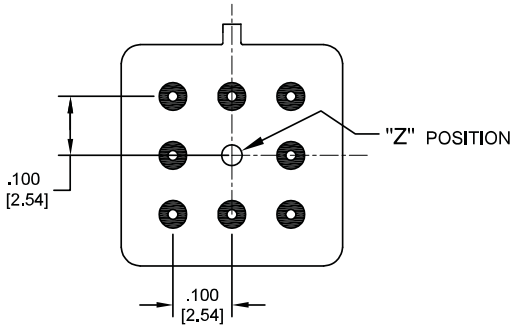
EXAMPLE: RF103Z-12

APPENDIX A : Spacer Pads

Pad designation and bottom view dimensions	Height	For use with the following:	Dim. H Max.
 "M4" Spacer Pad for Centigrid®		RF103	.420 (10.67)

Notes:
1. Spacer pad material: Polyester film.
2. To specify a "M4" spacer pad, refer to the mounting variants portion of the part numbering example in the applicable datasheet.
3. Dimensions are in inches (mm).
4. Unless otherwise specified, tolerance is ± .010" (.25 mm).
5. Add 10 mΩ to the contact resistance shown in the datasheet.
6. Add 0.01 oz. (0.25 g) to the weight of the relay assembly shown in the datasheet.

APPENDIX A : Ground Pin Positions



Centigrid® Relays:
RF100, RF103, ER114, ER134, 172

○ Indicates ground pin position

● Indicates glass insulated lead position

◎ Indicates ground pin or lead position depending on relay type

NOTES
1. Terminal views shown
2. Dimensions are in inches (mm)
3. Tolerances: ± .010 (±.25) unless otherwise specified
4. Ground pin positions are within .015 (0.38) dia. of true position
5. Ground pin head dia., 0.035 (0.89) ref: height 0.010 (0.25) ref.
6. Lead dia. 0.017 (0.43) nom.