

TELEDYNE RELAYS

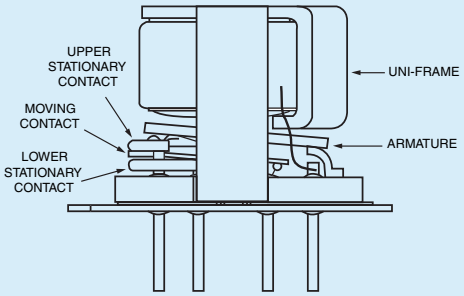
A Unit of Teledyne Electronics and Communications

HIGH REPEATABILITY BROADBAND TO-5 RELAYS DPDT

SERIES RF300 RF303

SERIES DESIGNATION	RELAY TYPE
RF300	Repeatable RF relay
RF303	Sensitive, repeatable RF relay

INTERNAL CONSTRUCTION



PERFORMANCE FEATURES

The ultraminiature RF300 and RF303 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 RF 300 and RF303 feature:

- High repeatability.
- Broader bandwidth.
- Metal enclosure for EMI shielding.
- Ground pin option to improve case grounding.
- 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.

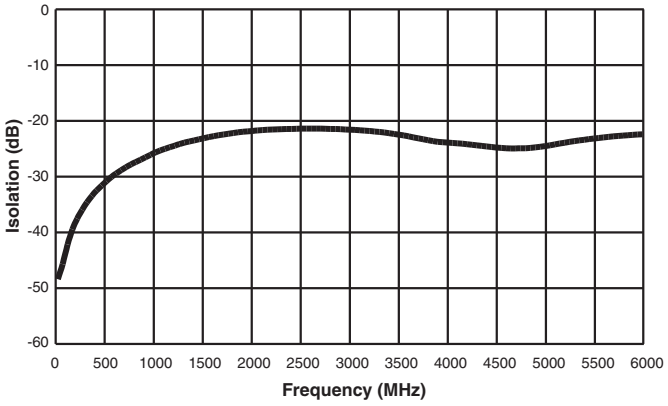
- Uni-frame motor design provides high magnetic efficiency and mechanical rigidity.
- Minimum mass components and welded construction provide maximum resistance to shock and vibration.
- Advanced cleaning techniques provide maximum assurance of internal cleanliness.
- Gold-plated precious metal alloy contacts ensure reliable switching.
- Hermetically sealed.
- Solderable leads.

ENVIRONMENTAL AND PHYSICAL SPECIFICATIONS		
Temperature (Ambient)	**Storage**	–65°C to +125°C
	Operating	–55°C to +85°C
Vibration (General Note 1)		10 g's to 500 Hz
Shock (General Note 1)		30 g's, 6 msec, half-sine
Enclosure		Hermetically sealed
Weight	RF300	0.09 oz. (2.55g) max.
	RF303	0.16 oz. (4.5g) max.

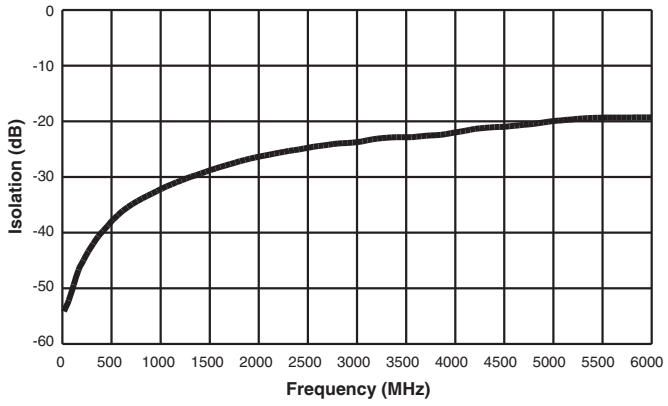
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SERIES RF300 AND RF303
TYPICAL RF CHARACTERISTICS (See RF Notes)

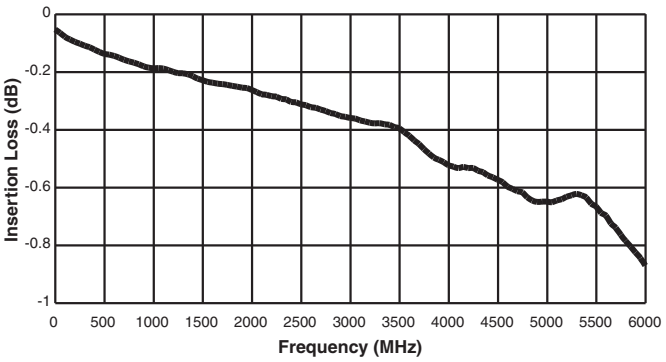
Isolation Across Contacts (RF Note 4)



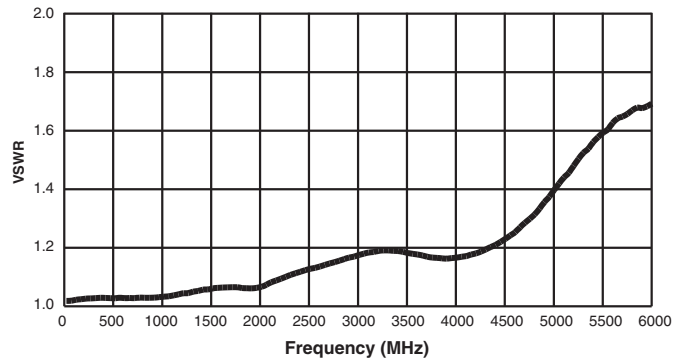
Isolation Pole to Pole (RF Note 5)



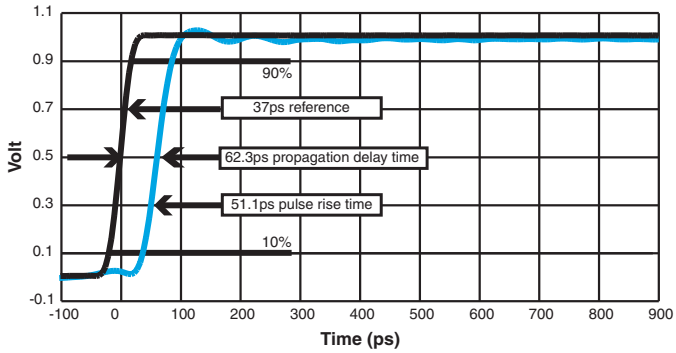
Insertion Loss (RF Note 6)



VSWR (RF Note 6)



RF300 Time Response (RF Note 6)



RF NOTES

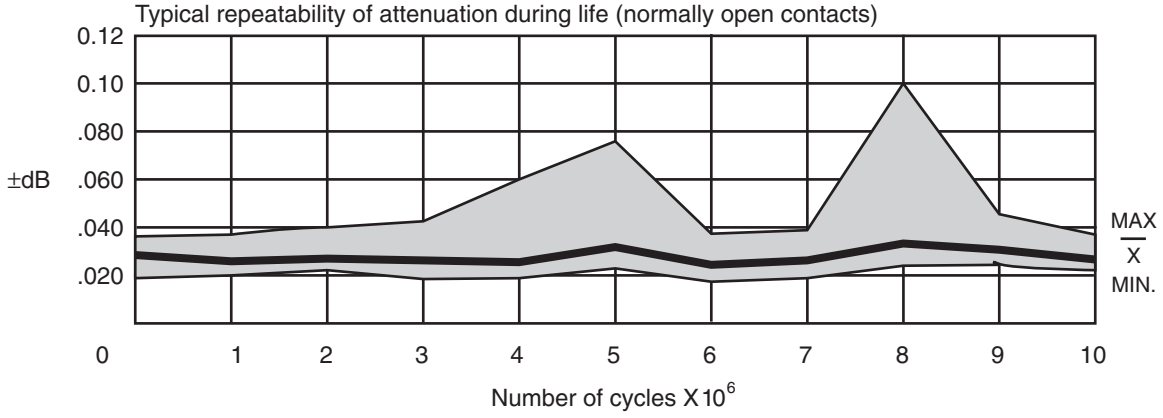
1. Test conditions:
   - *a.* Fixture: .031" copper clad, reinforced PTFE, RT/duroid® 6002 with SMA connectors. (RT/duroid® is a registered trademark of Rogers Corporation.)
   - *b.* Room ambient temperature.
   - *c.* Terminals not tested were terminated with 50-ohm load.
   - *d.* Contact signal level: –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.

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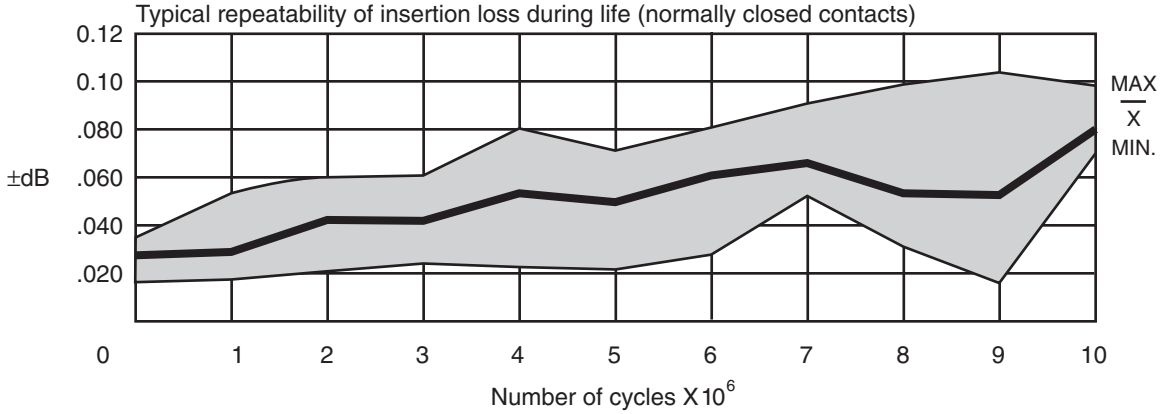
SERIES RF300 AND RF303

RF REPEATABILITY PERFORMANCE (See RF Notes 1, 2 and 3)	
1 million cycle repeatability	±0.1 dB from DC to 3GHz

Typical repeatability of attenuation during life (normally open contacts)



Typical repeatability of insertion loss during life (normally closed contacts)



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.

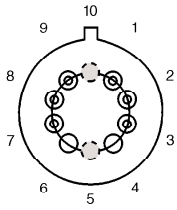
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SERIES RF300 AND RF303
GENERAL ELECTRICAL SPECIFICATIONS (@25°C)

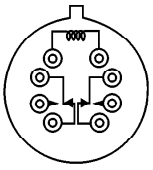
Contact arrangement		2 Form C (DPDT)
Rated duty		Continuous
Contact resistance		0.15 ohm max. initial (measured 1/8" from the header)
Contact load rating		Resistive: 1Amp/28Vdc Low level: 10 to 50 µA, 10 to 50 mV
Contact life rating		10,000,000 cycles typical at low level
Coil operating power		RF300: 450 mW typical @ nominal rated voltage RF303: 200 mW typical @ nominal rated voltage
Operate time	**RF300**	4.0 ms. max.
	RF303	6.0 ms. max.
Release time	**RF300**	3.0 ms. max.
	RF303	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		**RF300-5 RF303-5**	**RF300-12 RF303-12**
Coil voltage, nominal, VDC		5.0	12.0
Coil resistance, ohms ± 20%	**RF300**	50	390
	RF303	100	850
Pick-up voltage max, VDC		3.6	9.0



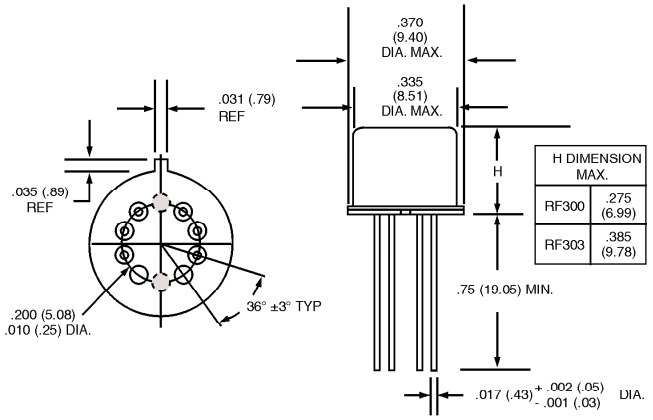
TERMINAL NUMBERING



SCHEMATIC

- HEADER DIMENSIONS, TERMINAL NUMBERING AND SCHEMATIC ARE AS VIEWED FROM THE TERMINALS.
- DIMENSIONS ARE IN INCHES (MILLIMETERS).
- POSITIONS 5 AND 10 ARE FOR UNINSULATED CASE GROUND OPTIONS. SEE APPENDIX.
- NO PROTRUSION BELOW BOTTOM OF HEADER WHEN GROUND PINS ARE INSTALLED.
- 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.

EXAMPLE: RF300Y-COIL VOLTAGE



EXTERNAL DIMENSIONS

GENERAL NOTES

1. Relays will exhibit no contact chatter in excess of 10 µsec or transfer in excess of 1 µsec.

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