

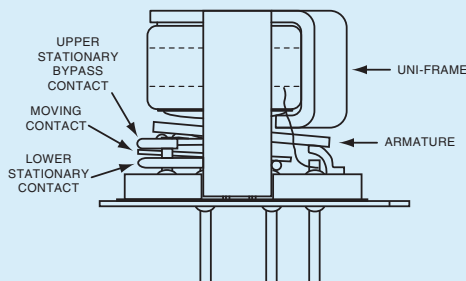
A Unit of Teledyne Electronics and Communications

HIGH REPEATABILITY, NORMALLY CLOSED, BYPASS RF RELAYS

SERIES RF310 RF313

SERIES DESIGNATION	RELAY TYPE
RF310	Repeatable, RF, N.C. bypass relay
RF313	Sensitive, repeatable, RF, N.C. bypass relay

INTERNAL CONSTRUCTION



PERFORMANCE FEATURES

The ultraminiature RF310 and RF313 relays are designed with an internal bypass (through path), when the coil is de-energized, to provide low insertion loss and VSWR through the bypass and simplicity of design for the user. Relays have improved RF insertion loss repeatability over the frequency range from dc to 3 GHz. Highly suitable for use in attenuator, linear amplifier and other RF circuits. The RF310 and RF313 feature:

- N.C. bypass configuration.
- Repeatable insertion loss.
- Broad bandwidth.
- Metal enclosure for EMI shielding.
- Ground pin option to improve case RF grounding.
- High isolation between control and signal paths.
- High resistance to ESD.

CONSTRUCTION FEATURES

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

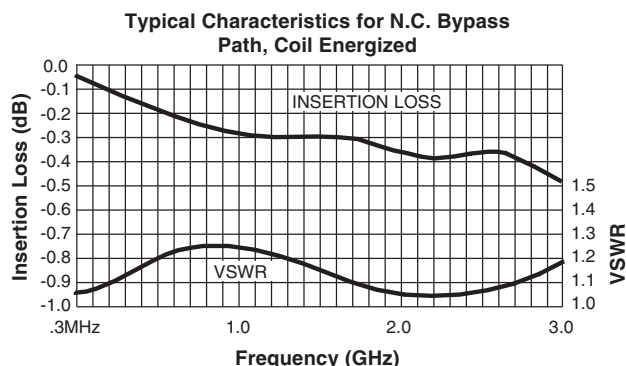
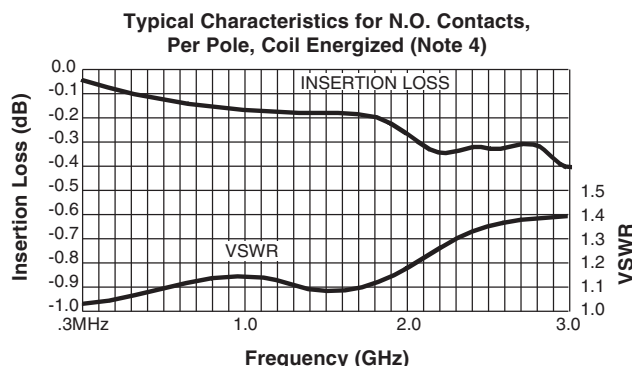
- Uni-frame motor design provides high magnetic efficiency and mechanical rigidity.
- Minimum mass components and welded construction provide maximum resistance to shock and vibration.
- Advanced cleaning techniques provide maximum assurance of internal cleanliness.
- Gold-plated precious metal alloy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

ENVIRONMENTAL AND PHYSICAL SPECIFICATIONS

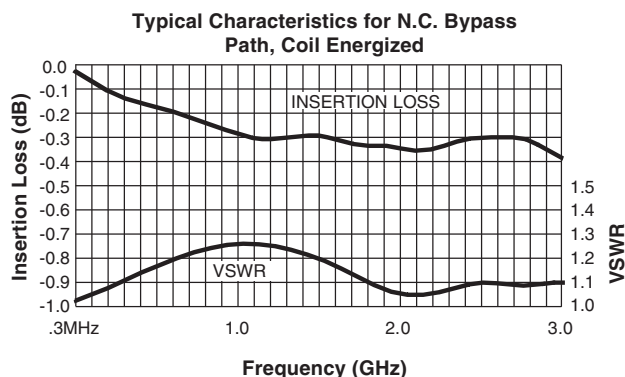
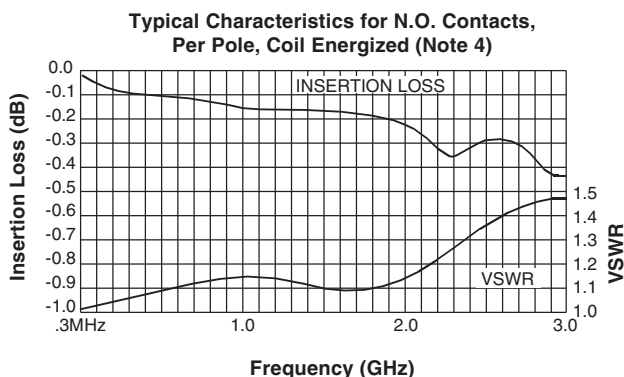
Temperature (Ambient)	Storage	-65°C to +125°C
	Operating	-55°C to +85°C
Vibration (General Note 1)		10 g's to 500 Hz
Shock (General Note 1)		30 g's, 6 msec, half-sine
Enclosure		Hermetically sealed
Weight	RF310	0.09 oz. (2.55g) max.
	RF313	0.16 oz. (4.5g) max.

SERIES RF310 AND RF313
TYPICAL RF CHARACTERISTICS (Notes 1, 2 and 3)

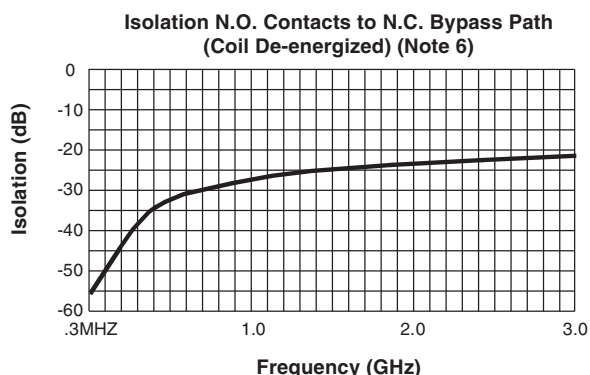
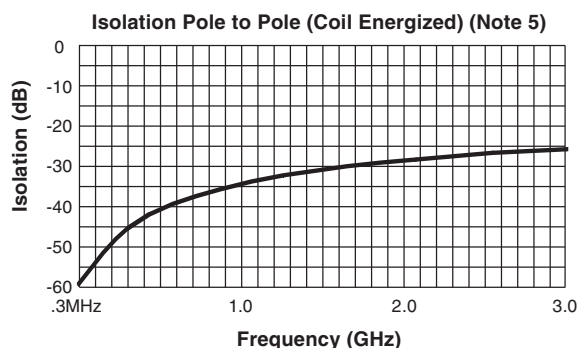
INSERTION LOSS AND VSWR CHARACTERISTICS RF310 RELAYS



INSERTION LOSS AND VSWR CHARACTERISTICS RF313 RELAYS



ISOLATION CHARACTERISTICS RF310 AND RF313 RELAYS



RF NOTES

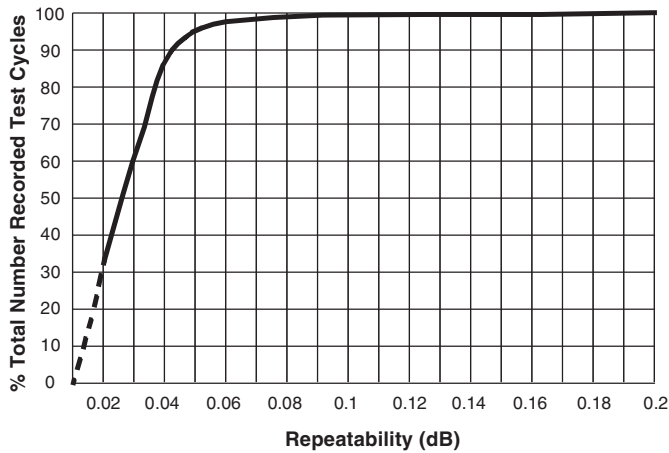
1. Test conditions:
 - a. Fixture: .031" copper clad, reinforced PTFE, RT/duroid® 6002 with SMA connectors. (RT/duroid® is a registered trademark of Rogers Corporation.)
 - b. Relay header is not soldered to ground plane or connected to ground via ground pin.
 - c. Test performed at room ambient temperature.
 - d. Terminals not tested were terminated with 50-ohm load.
 - e. Contact signal level: 0 dBm.
2. Data presented herein represents typical characteristics and is not intended for use as specification limits.
3. Data is per pole.
4. Measurement points are from pins 2 & 3 to pins 7 & 8.
5. Data is the average of both N.O. contacts to the bypass path.
6. Relays operate at frequencies above 3 GHz with reduced RF performance characteristics.

SERIES RF310 AND RF313

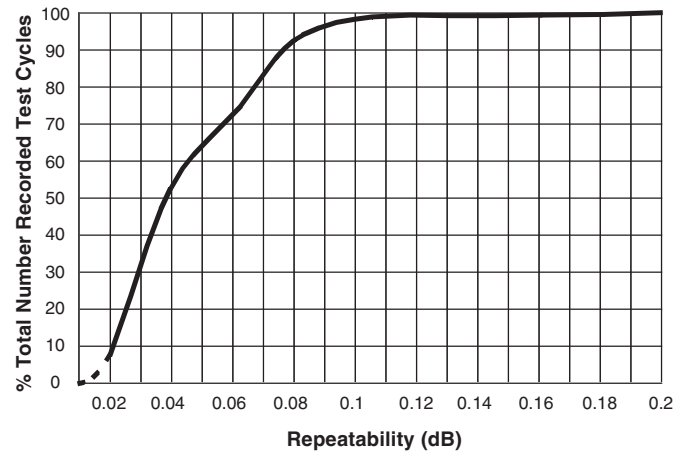
TYPICAL INSERTION LOSS REPEATABILITY CHARACTERISTICS (Notes 1 and 2)

REPEATABILITY CHARACTERISTICS RF310 RELAYS

Typical Repeatability Data, N.O. Contact

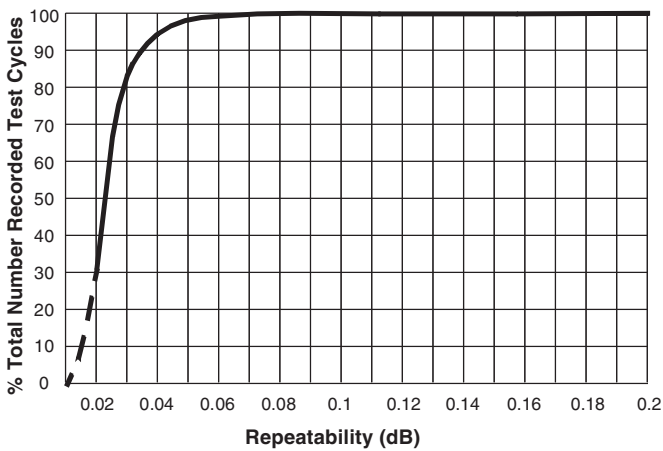


Typical Repeatability Data, Bypass

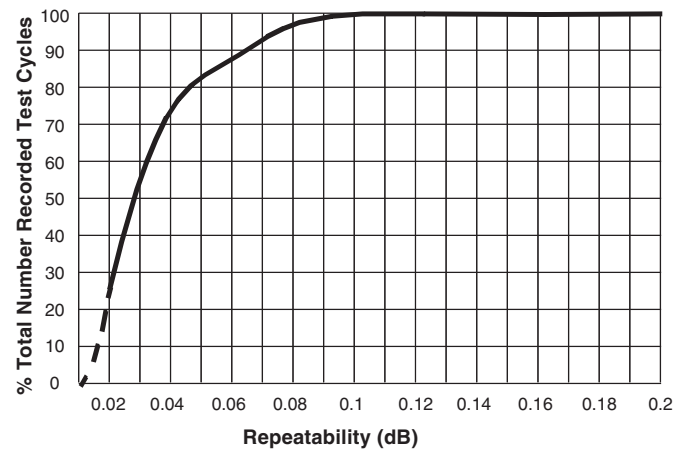


REPEATABILITY CHARACTERISTICS RF313 RELAYS

Typical Repeatability Data, N.O. Contact



Typical Repeatability Data, Bypass



RF INSERTION LOSS REPEATABILITY NOTES

- Test conditions:
 - Fixture: .031" copper clad, reinforced PTFE, RT/duroid® 6002 with SMA connectors. (RT/duroid® is a registered trademark of Rogers Corporation.)
 - Relay header is not soldered to ground plane or connected to ground via ground pin.
 - Test performed at room ambient temperature.
 - Contact signal level: 0 dBm.
- Data presented herein represents typical characteristics and is not intended for use as specification limits.
- N.O. path contacts connected in series externally.
- Insertion loss repeatability measured over frequency range from .3 MHz to 3 GHz.

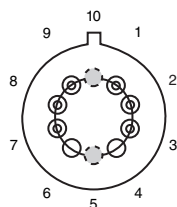
SERIES RF310 AND RF313
GENERAL ELECTRICAL SPECIFICATIONS (@25°C)

Contact arrangement	N.C. side (coil de-energized)	N.O. side (coil energized)
	SPST, Normally Closed Double Break	DPST, Normally Open
Rated duty	Continuous	
Contact resistance (General Note 2)	0.15 ohm max. initial (measured 1/8" from the header)	
Contact load rating	Low level: 10 to 50 μ A, 10 to 50 mV	
Contact life rating	10,000,000 cycles typical at low level	
Coil operating power	RF310: 450 mW typical @ nominal rated voltage RF313: 200 mW typical @ nominal rated voltage	
Operate time	RF310	4.0 ms. max.
	RF313	6.0 ms. max.
Release time	RF310	3.0 ms. max.
	RF313	3.0 ms. max.
Intercontact capacitance	0.4 pF typical	
Insulation resistance	1,000 M Ω min. (between mutually isolated terminals)	
Dielectric strength	350 VRMS / 60 Hz @ atmospheric pressure	

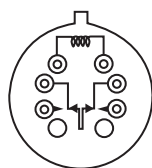
DETAILED ELECTRICAL SPECIFICATIONS (@25°C)

BASE PART NUMBERS		RF310-5 RF313-5	RF310-12 RF313-12
Coil voltage, nominal, VDC		5.0	12.0
Coil resistance, ohms \pm 20%	RF310	50	390
	RF313	100	850
Pick-up voltage max, VDC		3.6	9.0

OUTLINE DIMENSIONS



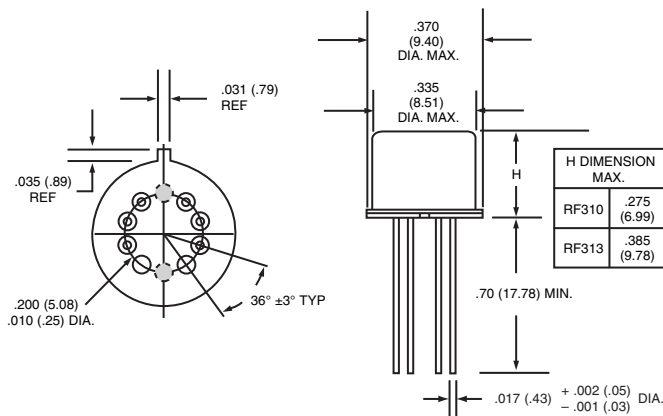
TERMINAL NUMBERING



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: RF310Y-COIL VOLTAGE



EXTERNAL DIMENSIONS

GENERAL NOTES

1. Relays will exhibit no contact chatter in excess of 10 μ sec or transfer in excess of 1 μ sec.
2. Contact resistance value applies to each closed contact as well as the bypass path.