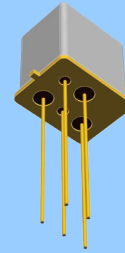


## HIGH REPEATABILITY SPDT, BROADBAND 12 GHz, 20 Gbps NON-LATCHING RF RELAY



SERIES	RELAY TYPE
RF131	RF Non-Latching, SPDT, Through-Hole Relay

### DESCRIPTION

The ultraminiature Series RF131 is built on Teledyne Relays' heritage of miniature RF relays, and is designed to provide a compact electromechanical switching solution with broadband RF performance from DC to 12GHz in a leaded, hand solderable package. The RF131 relay incorporates a precision 50Ω transmission line in the contact system which provides for optimum RF transmission characteristics.

These relays are designed for use in RF attenuators, RF switch matrices, high frequency spread spectrum radios, ATE, and other applications that require dependable high frequency signal fidelity and performance. The low power consumption makes the RF131 suitable for applications where power budget is restricted.

### The RF131 features:

- High Repeatability
- Wide Bandwidth Performance
- Higher Isolation Between Each Signal Path
- Metal Enclosure for EMI Shielding
- High Isolation Between Control and Signal Paths
- High Resistance to ESD

The unique construction features and manufacturing techniques provide excellent robustness for environmental extremes and overall reliability:

- 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
- Hermetic Seal
- 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 1000 Hz	
Shock (Note 1)	30 g's, 6ms half sine	
Spacing Between Adjacent Relays	0.02 in. (Min)	
Enclosure	Hermetically sealed	
Weight	0.13 oz (3.7g)	

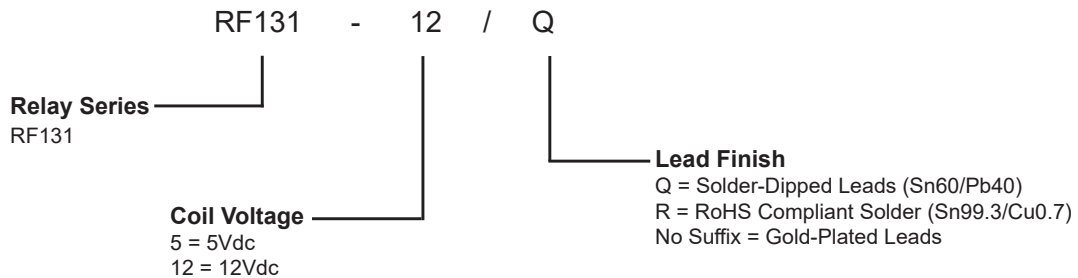
**GENERAL ELECTRICAL SPECIFICATIONS (-55 °C to 85 °C unless otherwise noted.)(Notes 2 & 3.)**

<b>Contact Arrangement</b>	1 Form C (SPDT) with open contact grounded to case
<b>Rated Duty</b>	Continuous
<b>Contact Load Rating</b>	Resistive: .25A @ 28Vdc
<b>Contact Life Rating</b>	2,000,000 cycles typical @ low level
<b>Coil Operating Power</b>	315mW typical @ nominal rated voltage
<b>Switching Time (including bounce)</b>	10 ms. max. (5ms operate time, 2ms release time, 5ms contact bounce time)
<b>Insulation Resistance</b>	1,000MΩ min. between mutually isolated terminals
<b>Dielectric Strength</b>	350 V <sub>rms</sub> (60Hz) @ Atmospheric Pressure
<b>Propagation Delay</b>	54-60 ps (typical)

**DETAILED ELECTRICAL SPECIFICATIONS (-55 °C to 85 °C unless otherwise noted.) (Note 3)**

BASE PART NUMBERS	RF131-5	RF131-12
<b>Coil Voltage, Nominal (Vdc)</b>	5.0	12.0
<b>Coil Resistance (Ohms ±20%, 25°C)</b>	80	460
<b>Pick-up Voltage, Max (Vdc)</b>	4.3	10.4

**Part Numbering System (Notes 4, 5, & 6)**

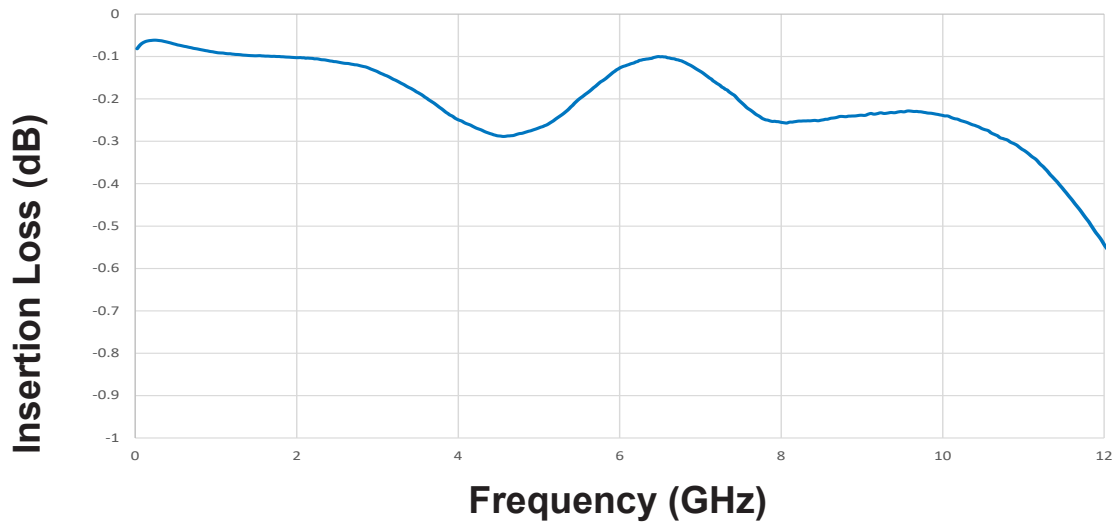


**NOTES**

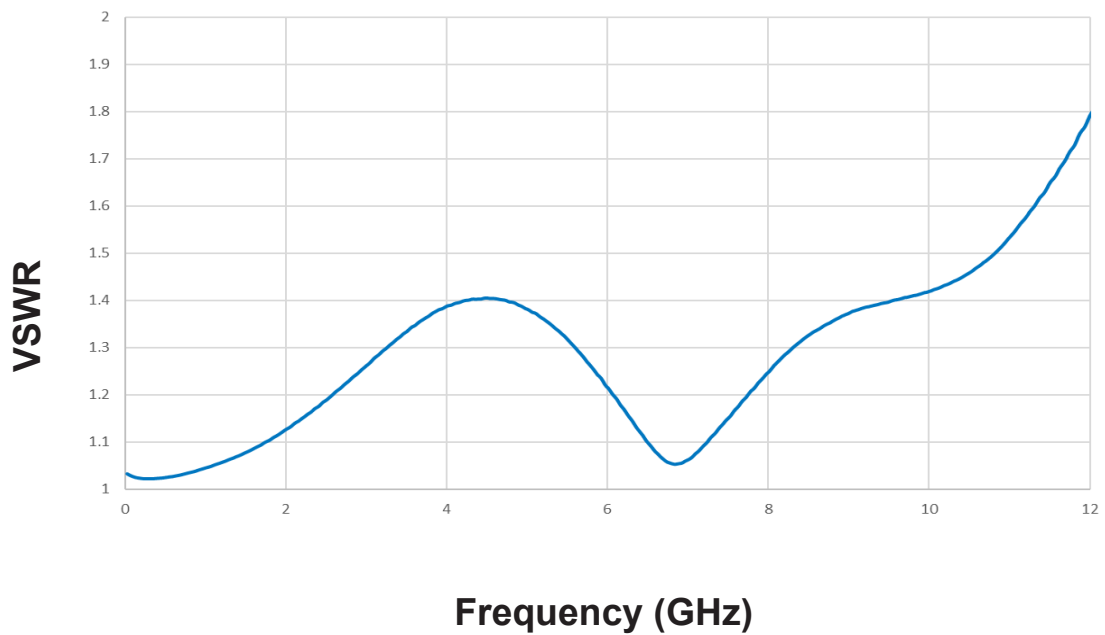
- Relay contacts will exhibit no chatter in excess of 10 μs or transfer in excess of 1 μs.
- Characteristics shown as “typical” are based on available data and are best estimates. No ongoing verification tests are performed.
- Unless otherwise specified, parameters are initial values.
- Parts ordered with no suffix option will be provided with Gold-Plated leads which have a typical plating thickness of 25-40 μin.
- The slash and characters appearing after the slash are not marked on the relay
- Using an operate voltage less than the specified nominal coil voltage may result in unreliable operation.
- Relay temperature during soldering shall not exceed 250°C, and reflow temperature shall not exceed 250°C, 3 passes, 1 minute each.

**RF CHARACTERISTICS (See RF Notes)**

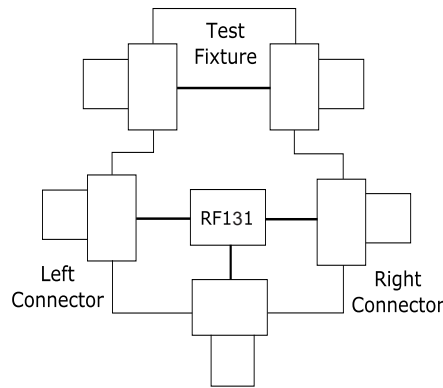
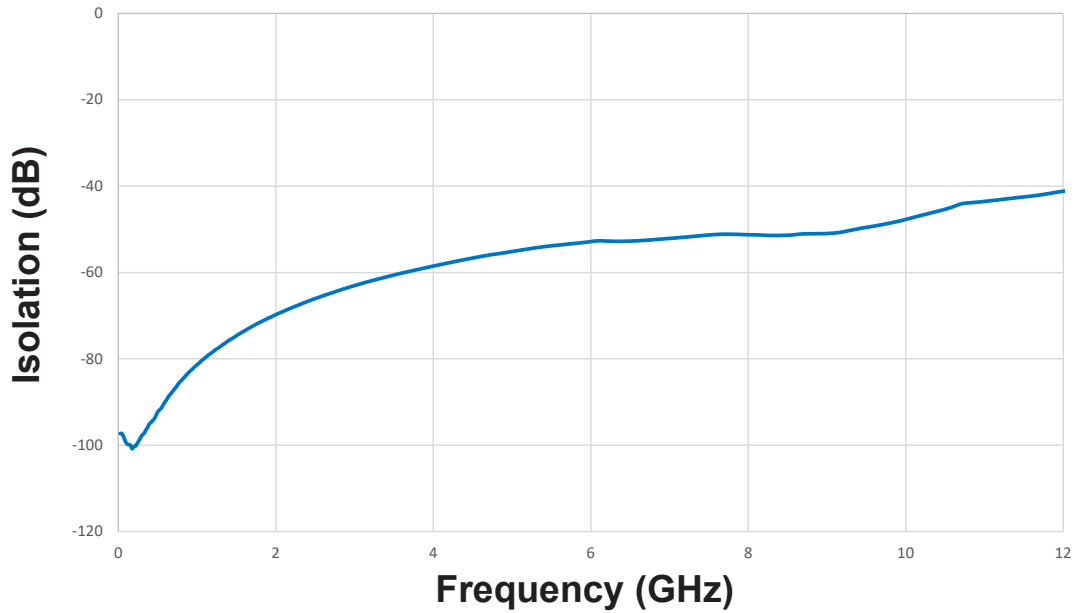
**Insertion Loss**



**VSWR**



## Isolation

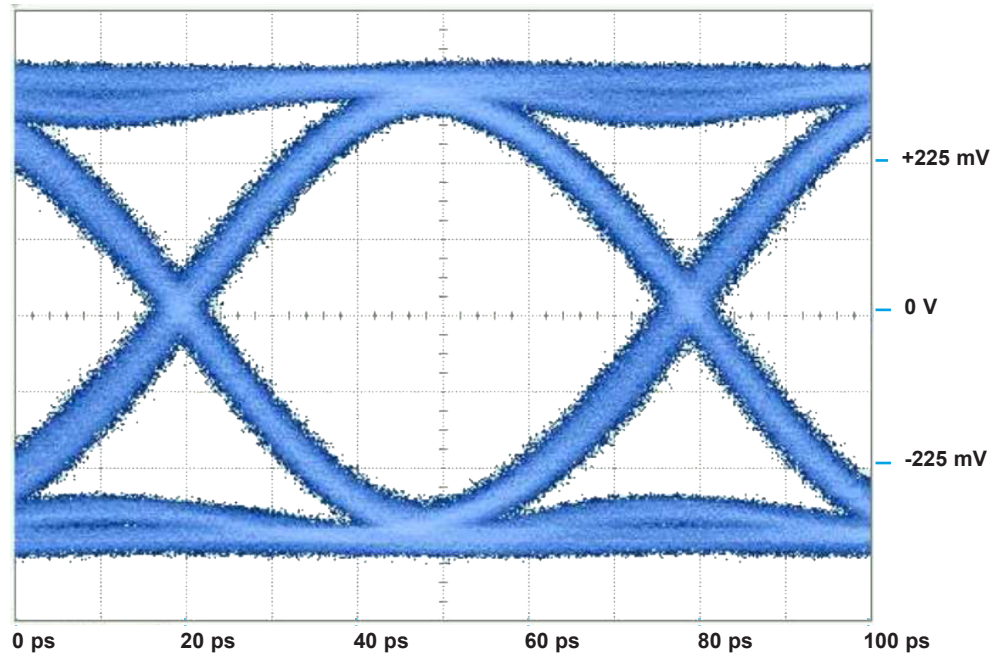


**RF131 Test Evaluation Board**

### RF NOTES

1. Test conditions:
  - a. Fixture: .031" copper clad, gold plated, reinforced Rogers Corporation 4350B High Frequency Laminate with 2.92mm connectors
  - b. Room ambient temperature.
  - c. Contact power level: 0 dBm.
  - d. No. of test samples: 1.
2. Data presented herein represents typical characteristics and is not intended for use as specification limits.
3. Test fixture effect de-embedded from frequency response data.

**SIGNAL INTEGRITY CHARACTERISTICS**

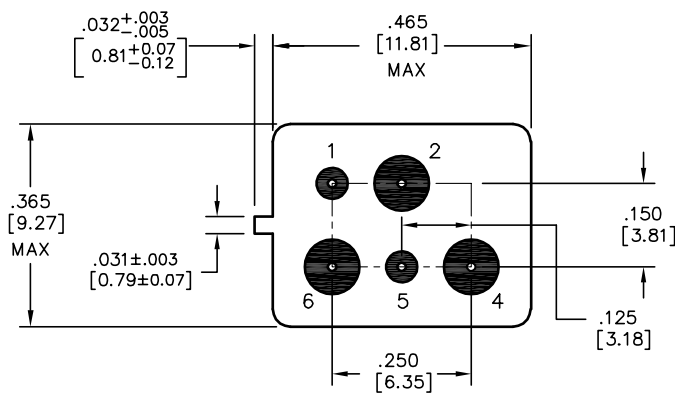
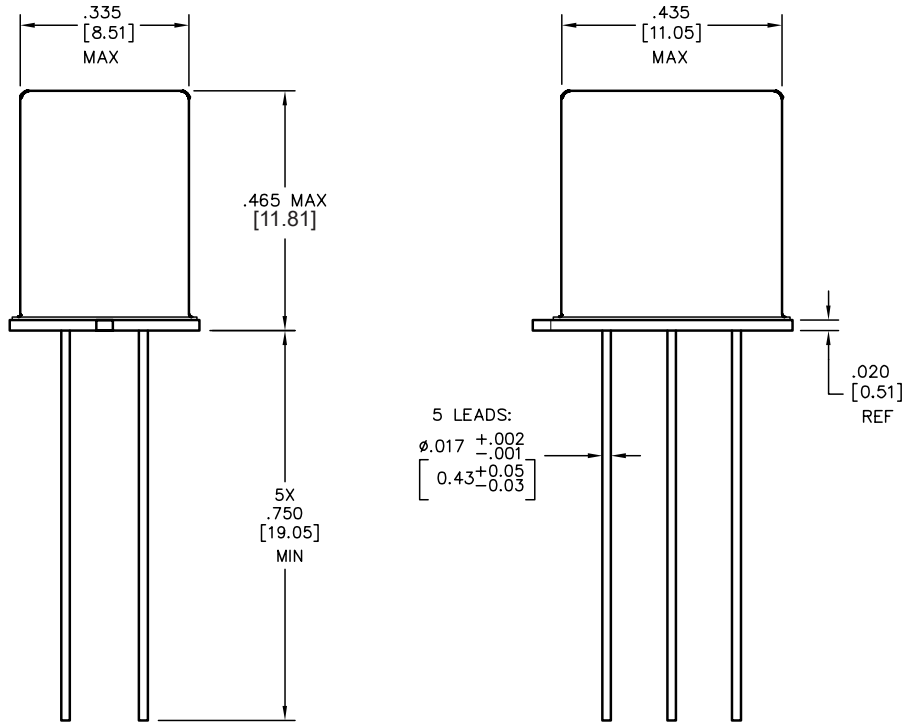


Bit Rate	Eye Height	Eye Width	Jitter <sub>P-P</sub>
20 Gbps	360 mV	40.3 ps	6.93 ps

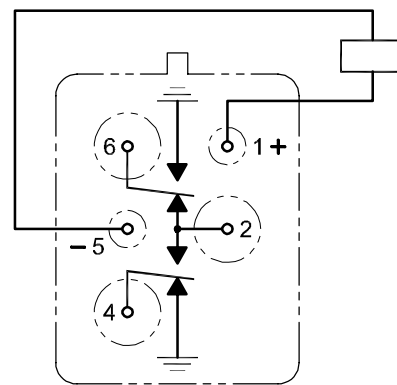
**PATTERN GENERATOR SETTINGS**

- 20 Gbps Random Pulse Pattern Generator
- $2^{31} - 1$  PRBS signal pattern
- PRBS output of 500 mV<sub>P-P</sub> (nominal)
- RF PCB effect (negligible) not removed from measurement
- Data shown is typical of both contacts
- Data based on RF121 which has an identical contact system and waveguide

**OUTLINE DIMENSIONS**



**RF131**  
 Schematic - Terminal View



CONTACTS SHOWN IN POSITION  
 WHEN COIL DE-ENERGIZED