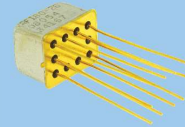


## MAGNETIC-LATCHING BROADBAND RF RELAYS DPDT



SERIES	RELAY TYPE
RF180	DPDT Magnetic-Latching Relay

### DESCRIPTION

The Series RF180 relay is an ultraminiature, hermetically sealed, magnetic-latching relay featuring extremely low intercontact capacitance for exceptional RF performance over the full UHF spectrum. Its low profile height and .100" grid spaced terminals make it ideal for applications where extreme packaging density and/or close PC board spacing are required.

The RF180 design has been optimized for use in RF attenuators, RF switch matrices, and other applications requiring magnetic latching, high isolation, low insertion loss and low VSWR.

Unique construction features and manufacturing techniques provide high reliability and excellent robustness to environmental extremes.

#### The RF180 feature:

- All welded construction.
- Unique uniframe design provides 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.
- Gold-plated precious metal alloy contacts ensure reliable DC switching from dry-circuit to 1/4 amp, as well as low and stable insertion loss in RF applications.

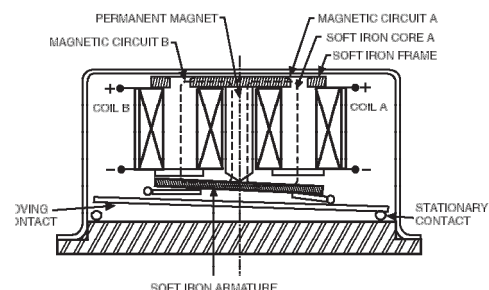
The RF180 relay is ideally suited for applications where power dissipation must be minimized. The relays can be operated with a short-duration coil voltage pulse. After the contacts have transferred, no coil power is required.

The magnetic-latching feature of the RF180 provides a nonvolatile memory capability, since the relays will not reset upon removal of coil power.

### ENVIRONMENTAL AND PHYSICAL SPECIFICATIONS

<b>Temperature</b> (Ambient)	-65°C to +125°C
<b>Vibration</b> (General Note I)	30 g's to 2000 Hz
<b>Shock</b> (General Note I)	75 g's, 6ms half sine
<b>Enclosure</b>	Hermetically sealed
<b>Weight</b>	0.10 oz. (2.9g) max.

### INTERNAL CONSTRUCTION



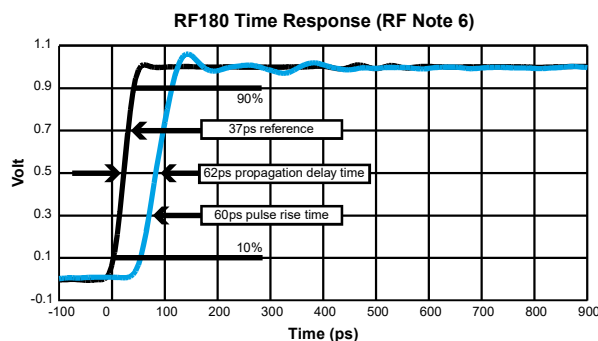
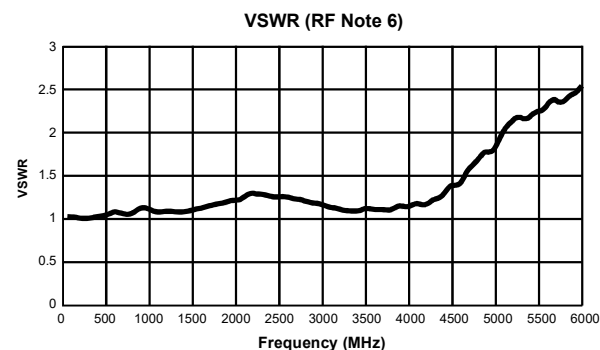
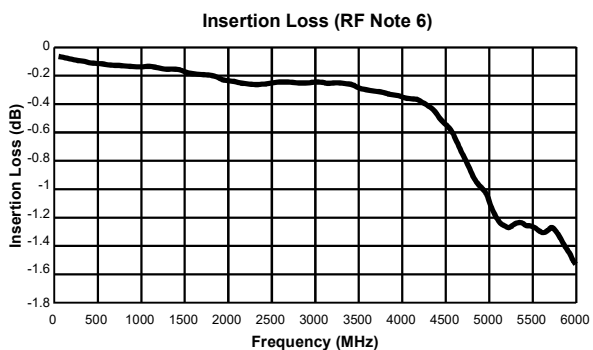
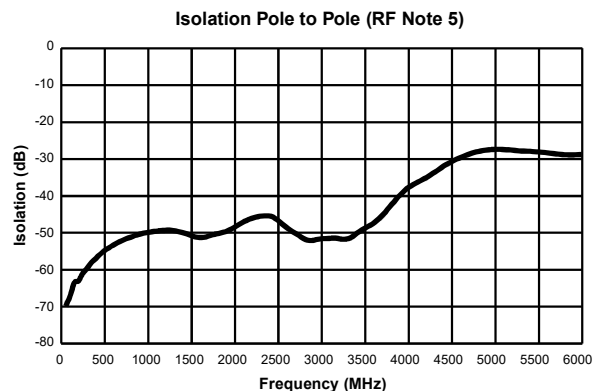
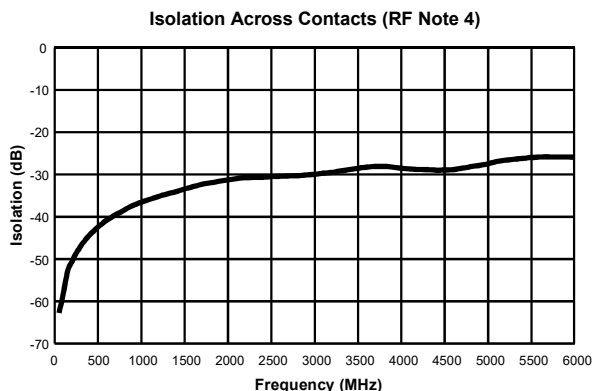
**SERIES RF180**  
**GENERAL ELECTRICAL SPECIFICATIONS (@25°C)**

<b>Contact Arrangement</b>	2 Form C (DPDT)
<b>Rated Duty</b>	Continuous
<b>Contact Resistance</b>	0.15 $\Omega$ max.; 0.25 $\Omega$ max. afterlife at 0.25A / 28 Vdc
<b>Contact Load Rating (DC)</b>	Resistive: 0.25 A / 28 Vdc
<b>Contact Life Ratings</b>	10,000,000 cycles (typical) at low level 1,000,000 cycles (typical) at 0.5 A / 28 Vdc resistive 100,000 cycles min. at all other loads specified above
<b>Contact Overload Rating</b>	2 A / 28 Vdc Resistive (100 cycles min.)
<b>Coil Operating Power (typical)</b>	290 mW (at nominal rated voltage at 25°C)
<b>Contact Carry Rating</b>	Contact Factory
<b>Operate Time</b>	2.0 msec max. at nominal rated coil voltage
<b>Minimum Operative Pulse</b>	6.0 ms width @ rated voltage
<b>Intercontact Capacitance</b>	0.2 pf typical
<b>Insulation Resistance</b>	10,000 M $\Omega$ min. between mutually isolated terminals
<b>Dielectric Strength</b>	350 Vrms (60 Hz) @ atmospheric pressure

**DETAILED ELECTRICAL SPECIFICATIONS (@25°C)**

BASE PART NUMBERS (RF180)		RF180-5	RF180-12	RF180-26
<b>Coil Voltage (Vdc)</b>	<b>Nom.</b>	5.0	12.0	26.5
	<b>Max.</b>	6.0	16.0	32.0
<b>Coil Resistance (Ohms <math>\pm 20\%</math>)</b>		61	500	2,000
<b>Set and Reset Voltage (Vdc)</b>	<b>Max.</b>	3.5	9.0	18.0

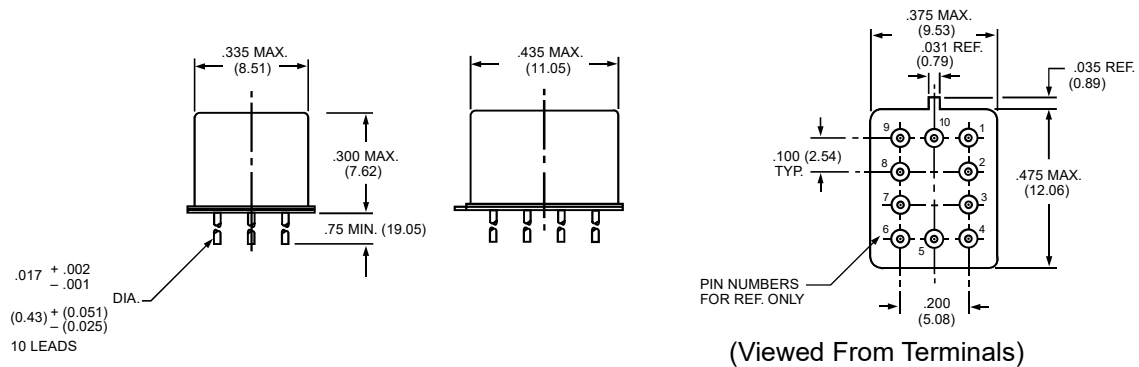
## TYPICAL RF CHARACTERISTICS



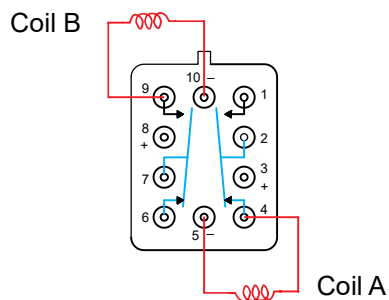
### RF NOTES:

1. DATA REPRESENTS AN AVERAGE BETWEEN THE TYPICAL READING OF PINS 8 AND 6 (CLOSED, COIL A LAST ENERGIZED) AND PINS 8 AND 1 (CLOSED, COIL B LAST ENERGIZED).
2. DATA REPRESENTS AN AVERAGE BETWEEN THE TYPICAL READING OF PINS 8 AND 6 (OPEN, COIL B LAST ENERGIZED) AND PINS 8 AND 1 (OPEN, COIL A LAST ENERGIZED).
3. 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 IN CONTACT WITH, BUT 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: 20 DBM.
4. DATA PRESENTED HEREIN REPRESENTS TYPICAL CHARACTERISTICS AND IS NOT INTENDED FOR USE AS SPECIFICATION LIMITS.

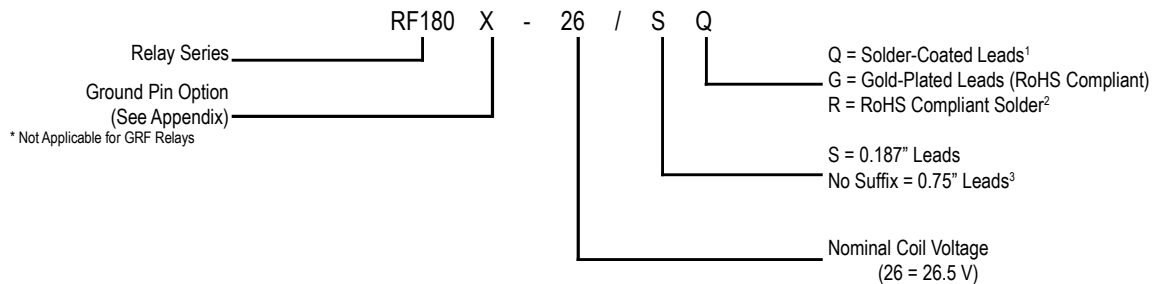
## SERIES RF180 OUTLINE DIMENSIONS



## RF180 SCHEMATIC DIAGRAMS



## Part Numbering System

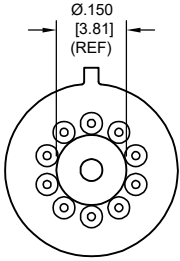
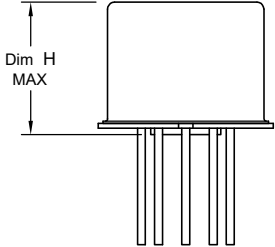
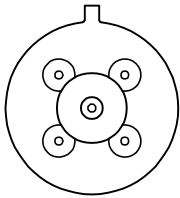
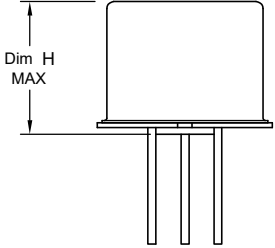
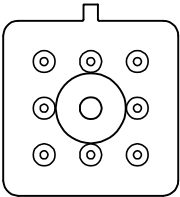
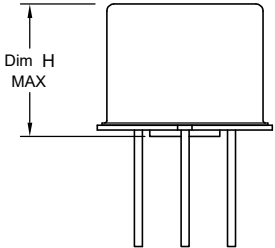
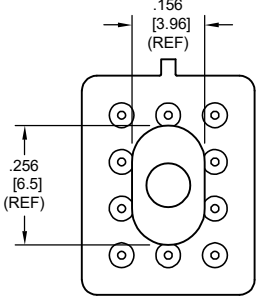
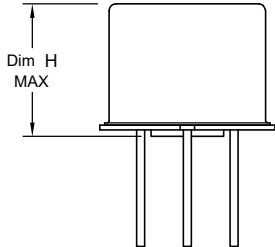


Note: Parts ordered without suffix may be supplied with Solder-Coated or Gold-Plated leads.  
1 Parts ordered with Solder-Coated leads will have (Sn60/Pb40)  
2 Parts ordered with RoHS Solder-Coated leads will have (Sn99.3/Cu0.7)

## NOTES:

1. DIMENSIONS ARE IN INCHES, METRIC EQUIVALENTS SHOWN IN [ ].
2. POSITIONS 5 AND 10 ARE FOR UNINSULATED CASE GROUND OPTIONS.
3. NO PROTRUSION BELOW BOTTOM OF HEADER WHEN GROUND PINS ARE INSTALLED
4. 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.
5. UNLESS OTHERWISE SPECIFIED, TOLERANCES ON DIMENSIONS ARE  $\pm .010$  INCH (0.025 MM)

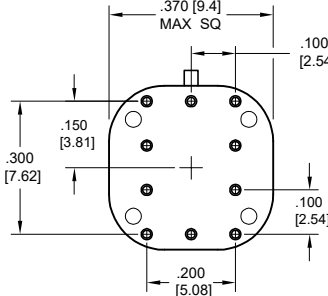
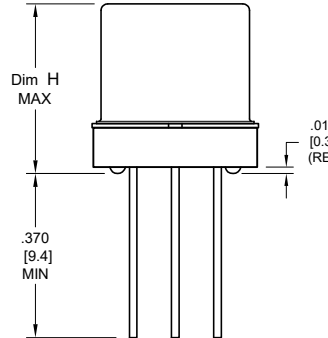
## APPENDIX A : Spacer Pads

Pad designation and bottom view dimensions	Height	For use with the following:	Dim. H Max.
 <p><b>"M4" Spacer Pad for TO-5</b></p>		ER412	.295 (7.49)
		712, RF300, RF, RF700, RF703	.300 (7.62)
		ER422, 722	.305 (7.75)
		ER432	.400 (10.16)
		732, RF303	.410 (10.41)
		RF312	.350 (8.89)
 <p><b>"M4" Spacer Pad for TO-5</b></p>		ER411	.295 (7.49)
		RF311	.300 (7.62)
		RF331	.410 (10.41)
 <p><b>"M4" Spacer Pad for Centigrid®</b></p>		172	.305 (7.75)
		ER114, J114	.300 (7.62)
		ER134, J134	.400 (10.16)
		RF100	.315 (8.00)
		RF103	.420 (10.67)
 <p><b>"M9" Spacer Pad for Centigrid®</b></p>		122C, A152	.320 (8.13)
		ER116C, J116C	.300 (7.62)
		ER136C, J136C	.400 (10.16)
		RF180	.325 (8.25)
		A150	.305 (7.75)

### Notes:

1. Spacer pad material: Polyester film.
2. To specify an "M4" or "M9" 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  $\pm .010$ " (.25 mm).
5. Add 10 m $\Omega$  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.

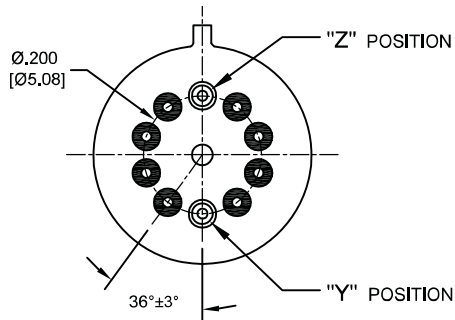
## APPENDIX A : Spreader Pads

Pad designation and bottom view dimensions	Height	For use with the following:	Dim. H Max.
 <p>"M" Spreader Pad <u>5/</u> <u>6/</u></p>		ER411T, ER412, J412	.388 (9.86)
		712	.393 (9.99)
		ER432, J432	.493 (12.52)
		732	.503 (12.78)
		J421, J422, ER422, 722	.398 (10.11)

### Notes:

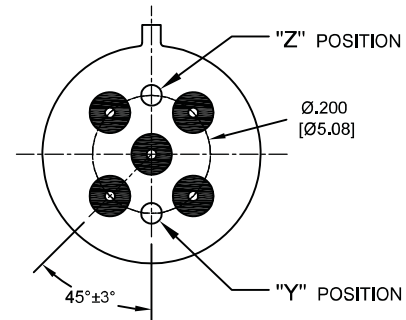
1. Spreader pad material: Diallyl Phthalate.
2. To specify an "M", "M2" or "M3" spreader pad, refer to the mounting variants portion of the part number example in the applicable datasheet.
3. Dimensions are in inches (mm).
4. Unless otherwise specified, tolerance is  $\pm .010$ " (0.25 mm).
- 5/. Add 25 m $\Omega$  to the contact resistance shown in the datasheet.
- 6/. Add .01 oz. (0.25 g) to the weight of the relay assembly shown in the datasheet.
- 7/. Add 50 m $\Omega$  to the contact resistance shown in the datasheet.
- 8/. Add 0.025 oz (0.71 g) to the weight of the relay assembly shown in the datasheet.
- 9/. M3 pad to be used only when the relay has a center pin (e.g. ER411M3-12A, 722XM3-26.)

## APPENDIX A : Ground Pin Positions



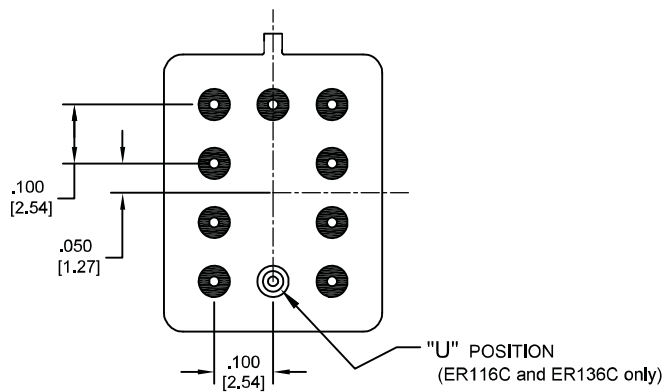
### TO-5 Relays:

ER412, ER412T, ER422, ER432, ER432T, 712, 712TN, 400H, 400K, 400V, RF300, RF303, RF341, RF312, RF332, RF310, RF313, RF320, RF323, SI800, SI803, RF700, RF703



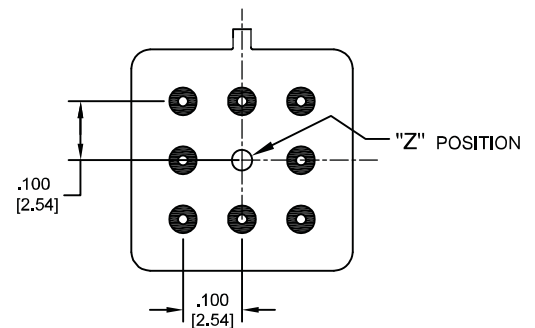
### TO-5 Relays:

ER411, RF311, RF331



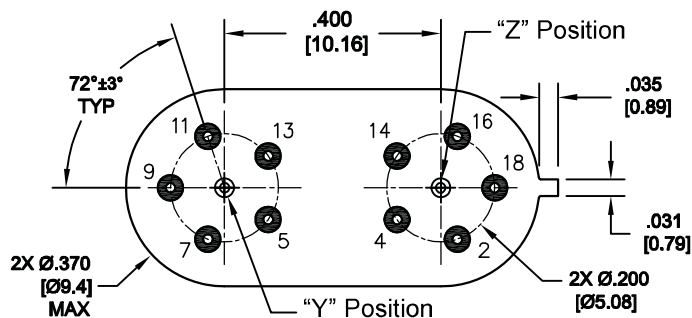
### Centigrid® Relays:

RF180, ER116C, 122C, ER136C



### Centigrid® Relays:

RF100, RF103, ER114, ER134, 172



### Loopback Relays:

LB363

### NOTES

- Indicates ground pin position
- Indicates glass insulated lead position
- ⊙ Indicates ground pin or lead position depending on relay type

1. Terminal views shown
2. Dimensions are in inches (mm)
3. Tolerances:  $\pm .010$  ( $\pm .25$ ) 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.