

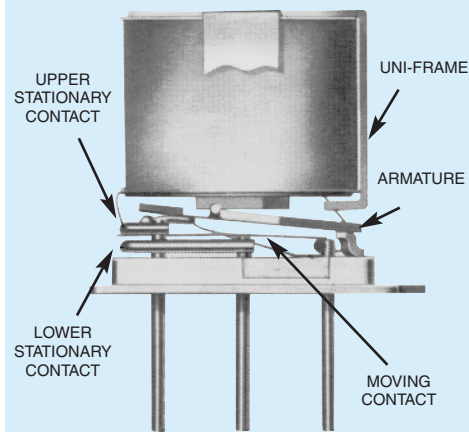
A Unit of Teledyne Electronics and Communications

# CENTIGRID® ESTABLISHED RELIABILITY RELAYS SENSITIVE DPDT

## SERIES 134

| SERIES DESIGNATION | RELAY TYPE  |
|--------------------|---|
| 134                | DPDT basic relay  |
| 134D               | DPDT relay with internal diode for coil transient suppression                                   |
| 134DD              | DPDT relay with internal diodes for coil transient suppression and polarity reversal protection |

### INTERNAL CONSTRUCTION



### DESCRIPTION

The 134 sensitive Centigrid® relay retains the same features as the 114 standard Centigrid® relay with only a minimal increase in profile height (.375 in.). Its .100-inch grid spaced terminals, which preclude the need for spreader pads, and its low profile make the 134 relay ideal for applications where high packaging density is important.

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

- All welded construction.
- Unique uni-frame design providing 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.
- Precious metal alloy contact material with gold plating assures excellent high current and dry circuit switching capabilities.

The Series 134D and 134DD have internal discrete silicon diodes for coil suppression and polarity reversal protection.

The sensitive 134 Centigrid® relay has a high resistance coil, thus requiring extremely low operating power (200 mw typical). The advantages of reduced heat dissipation and power supply demands are a plus.

By virtue of its inherently low intercontact capacitance and contact circuit losses, the 134 relay has proven to be an excellent ultraminiature RF switch for frequency ranges well into the UHF spectrum. A typical RF application for the Centigrid® relay is in handheld radio transceivers, wherein the combined features of good RF performance, small size, low coil power dissipation and high reliability make it a preferred method of Transmit-Receive switching (see Figure 1).

### ENVIRONMENTAL AND PHYSICAL SPECIFICATIONS

|                                      |                              |
|--------------------------------------|------------------------------|
| <b>Temperature</b><br>(Ambient)      | -65°C to +125°C              |
| <b>Vibration</b><br>(General Note 1) | 30 g's to 3000 Hz            |
| <b>Shock</b><br>(General Note 1)     | 75 g's,<br>6 msec, half-sine |
| <b>Acceleration</b>                  | 50 g's                       |
| <b>Enclosure</b>                     | Hermetically sealed          |
| <b>Weight</b>                        | 0.15 oz. (4.3g) max.         |

**SERIES 134**  
**GENERAL ELECTRICAL SPECIFICATIONS (-65°C to +125°C unless otherwise noted) (Notes 2 & 3)**

|   |  |                           |
|---|--|---------------------------|
| <b>Contact Arrangement</b>  | 2 Form C (DPDT)  |                           |
| <b>Rated Duty</b>   | Continuous   |                           |
| <b>Contact Resistance</b>   | 0.1 ohm max. before life; 0.2 ohm max. after life at 1A/28Vdc (measured 1/8" from header)  |                           |
| <b>Contact Load Ratings (DC)</b><br>(See Fig. 2 for other DC resistive voltage/current ratings) | Resistive: 1 Amp/28Vdc<br>Inductive: 200 mA/28Vdc (320 mH)<br>Lamp: 100 mA/28Vdc<br>Low Level: 10 to 50 µA/10 to 50mV                                    |                           |
| <b>Contact Load Ratings (AC)</b>  | Resistive: 250 mA/115Vac, 60 and 400 Hz (Case not grounded)<br>100 mA/115Vac, 60 and 400 Hz (Case grounded)  |                           |
| <b>Contact Life Ratings</b>   | 10,000,000 cycles (typical) at low level<br>1,000,000 cycles (typical) at 0.5A/28Vdc resistive<br>100,000 cycles min. at all other loads specified above |                           |
| <b>Contact Overload Rating</b>  | 2A/28Vdc Resistive (100 cycles min.)   |                           |
| <b>Contact Carry Rating</b>   | Contact factory  |                           |
| <b>Coil Operating Power</b>   | 200 milliwatts typical at nominal rated voltage @ 25°C   |                           |
| <b>Operate Time</b>   | 4.0 msec max. at nominal rated coil voltage  |                           |
| <b>Release Time</b>   | 134 Series: 2.0 msec max. 134D, 134DD Series: 7.5 msec max.  |                           |
| <b>Contact Bounce</b>   | 1.5 msec max.  |                           |
| <b>Intercontact Capacitance</b>   | 0.4 pf typical   |                           |
| <b>Insulation Resistance</b>  | 10,000 megohms min. between mutually isolated terminals  |                           |
| <b>Dielectric Strength</b>  | Atmospheric pressure: 500 Vrms/60Hz  | 70,000 ft.: 125 Vrms/60Hz |
| <b>Negative Coil Transient (Vdc)</b>  | 134D, 134DD  | 1.0 max                   |
| <b>Diode P.I.V. (Vdc)</b>   | 134D, 134DD  | 100 min.                  |

**DETAILED ELECTRICAL SPECIFICATIONS (-65°C to +125°C unless otherwise noted) (Note 3)**

|  | BASE PART NUMBERS<br>(See Note 8 for full P/N example) | ➔    | 134-5             | 134-6             | 134-9             | 134-12              | 134-18              | 134-26              |
|--|--|------|-------------------|-------------------|-------------------|---------------------|---------------------|---------------------|
|  |  |      | 134D-5<br>134DD-5 | 134D-6<br>134DD-6 | 134D-9<br>134DD-9 | 134D-12<br>134DD-12 | 134D-18<br>134DD-18 | 134D-26<br>134DD-26 |
| <b>Coil Voltage (Vdc)</b>                                  | Nom.   |      | 5.0               | 6.0               | 9.0               | 12.0                | 18.0                | 26.5                |
|  | Max.   |      | 7.5               | 10.0              | 15.0              | 20.0                | 30.0                | 40.0                |
| <b>Coil Resistance (Ohms ±10% @25°C)</b>                   | 134, 134D  |      | 100               | 200               | 400               | 800                 | 1600                | 3200                |
|  | 134DD (Note 4)   |      | 64                | 125               | 400               | 800                 | 1600                | 3200                |
| <b>Coil Current (mA<sub>dc</sub> @25°C) (134DD Series)</b> | Min.   |      | 56.8              | 36.3              | 18.1              | 12.5                | 9.6                 | 7.2                 |
|  | Max.   |      | 78.1              | 48.9              | 23.6              | 16.0                | 12.2                | 9.0                 |
| <b>Pick-up Voltage (Vdc, Max.)</b>                         | 134, 134D  |      | 3.5               | 4.5               | 6.8               | 9.0                 | 13.5                | 18.0                |
|  | 134DD  |      | 3.7               | 4.8               | 8.0               | 11.0                | 14.5                | 19.0                |
| <b>Drop-out Voltage (Vdc)</b>                              | 134, 134D  | Min. | 0.12              | 0.18              | 0.35              | 0.41                | 0.59                | 0.89                |
|  |  | Max. | 2.5               | 3.2               | 4.9               | 6.5                 | 10.0                | 13.0                |
|  | 134DD  | Min. | 0.7               | 0.8               | 0.9               | 1.0                 | 1.1                 | 1.3                 |
|  |  | Max. | 2.6               | 3.0               | 4.5               | 5.8                 | 9.0                 | 13.0                |

**PERFORMANCE CURVES**  
**(NOTE 2)**

TYPICAL RF PERFORMANCE

TYPICAL DC CONTACT RATING (RESISTIVE)

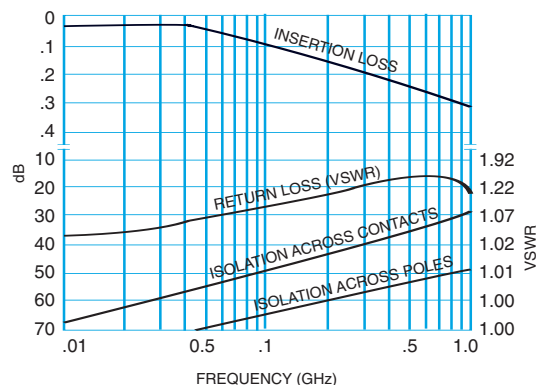


FIGURE 1

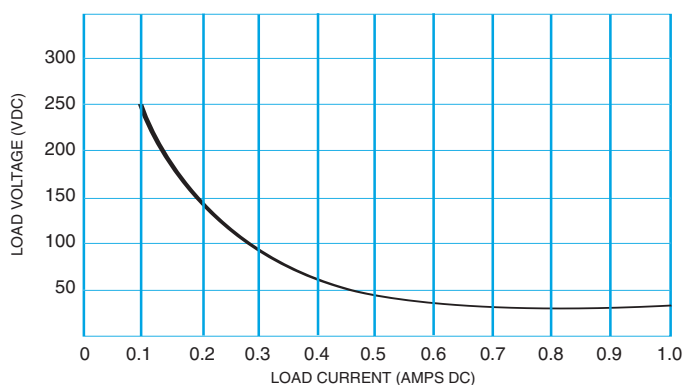
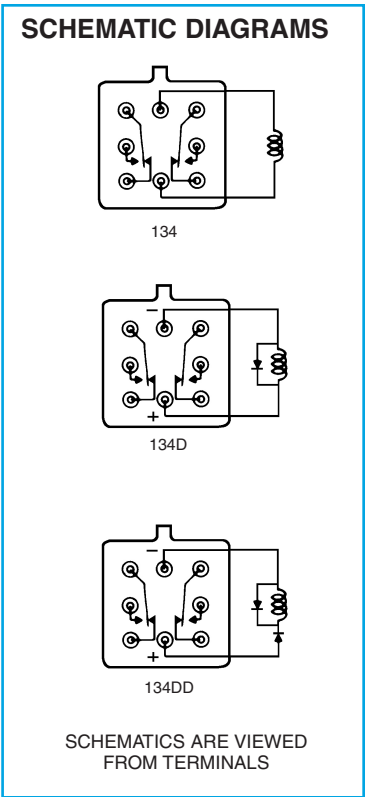
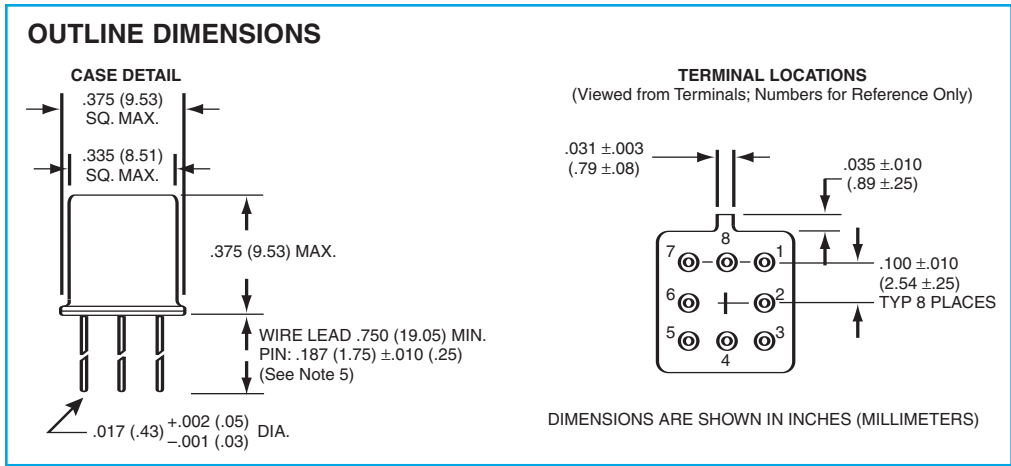


FIGURE 2

# SERIES 134

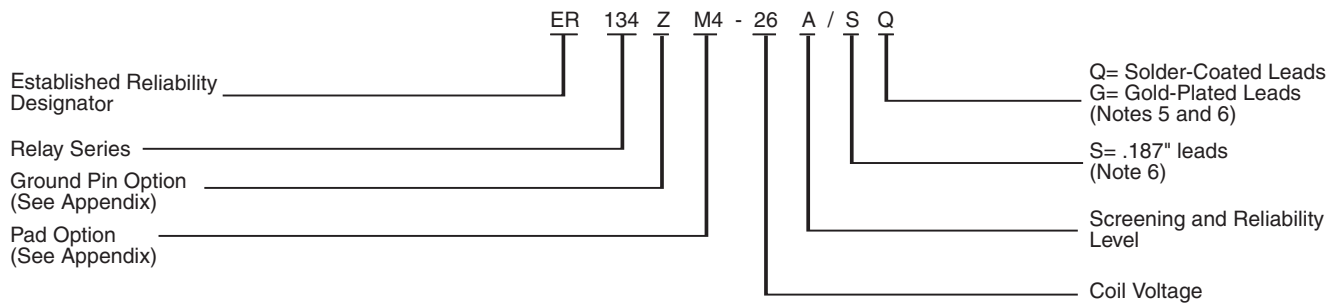


### GENERAL NOTES

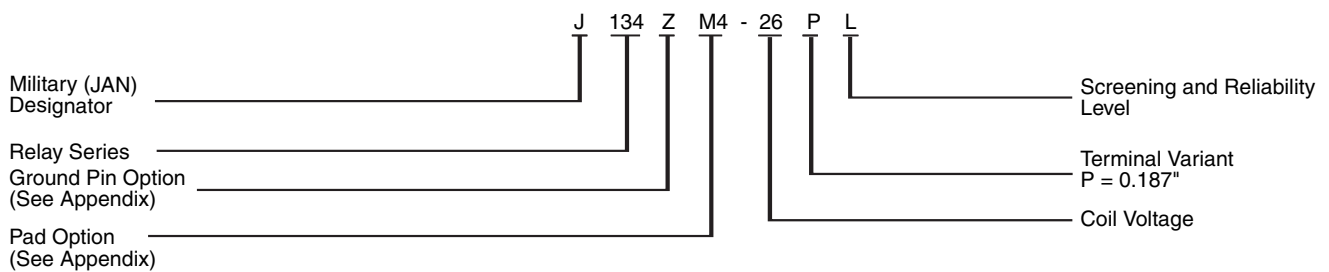
1. Relay contacts will exhibit no chatter in excess of 10 μsec or transfer in excess of 1 μsec.
2. "Typical" characteristics are based on available data and are best estimates. No on-going verification tests are performed.
3. Unless otherwise specified, parameters are initial values.
4. For reference only. Coil resistance not directly measurable at relay terminals due to internal series diode in 134DD only.
5. Unless otherwise specified, relays will be supplied with either gold-plated or solder-coated leads.
6. The slash and characters appearing after the slash are not marked on the relay.
7. Screened HI-REL versions available. Contact factory.
- 8.

ESTABLISHED RELIABILITY

### Teledyne Part Numbering System for T<sup>2</sup>R<sup>®</sup> Established Reliability Relay



### Teledyne Part Numbering System for Military Qualified (JAN) Relays



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6. Ad

Relay Option

# APPENDIX

4. Unless o
5. Add 25r
6. Add .01
7. Add 50r
8. Add .02
9. M3 pad

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Independent

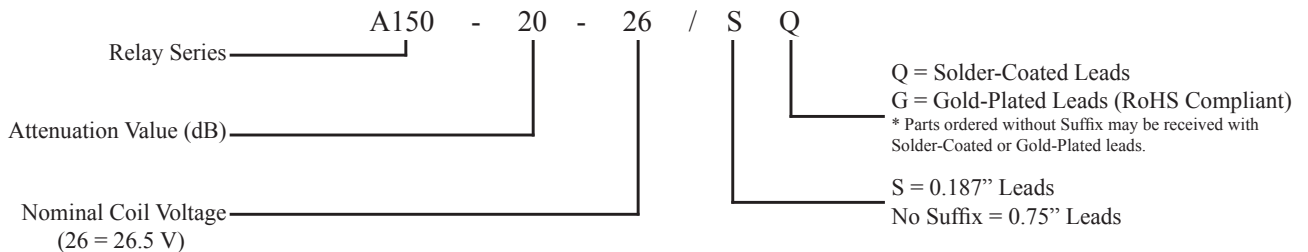
Independent

Independent  
dependent

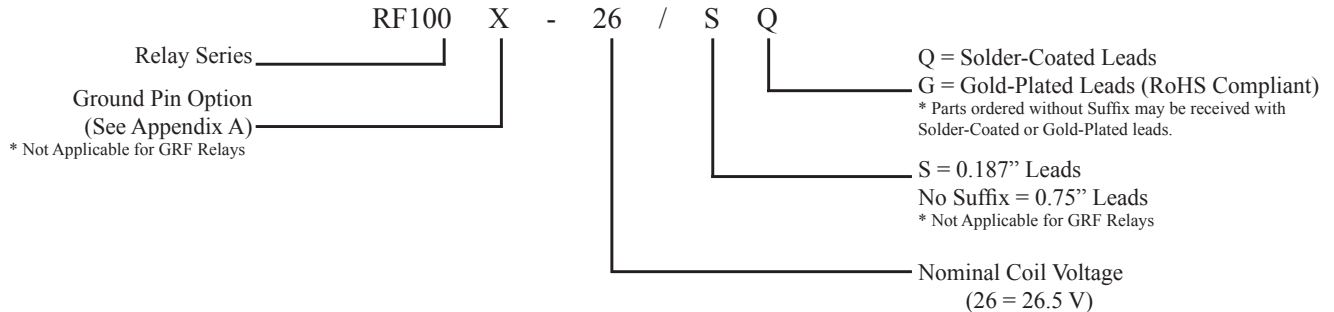
Relay Option

# Teledyne Relays Part Numbering System

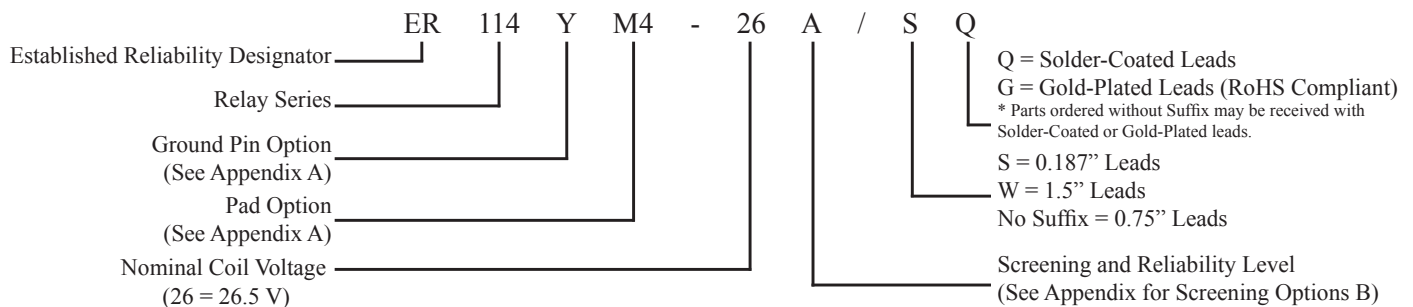
## RF Attenuator Relays



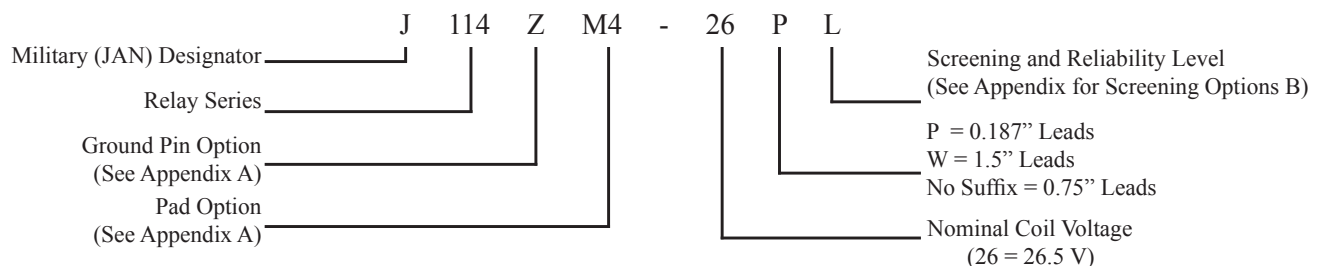
## RF Relays



## T<sup>2</sup>R Established Reliability Relays



## Military Qualified (JAN) Relays



# Appendix B: Teledyne Relays T<sup>2</sup>R Program

| SCREENING LEVELS  |  |  |                              |                              |
|---|--|--|------------------------------|------------------------------|
| INSPECTION  | Applicable To                                    |  |                              |                              |
|   | <i>T<sup>2</sup>R</i> A Level<br>1.5%/10K Cycles | <i>T<sup>2</sup>R</i> B Level<br>.75%/10K Cycles | JAN L Level<br>3%/10K Cycles | JAN M Level<br>1%/10K Cycles |
| <b>Subgroup 1</b>   |  |  |                              |                              |
| Screening, Internal Moisture AQL  | *  | *  | *                            | *                            |
| Vibration (Sinusoidal) AQL  |  |  | *                            |                              |
| Vibration (Sinusoidal) 100%   |  | *  |                              | *                            |
| Screening, Burn-In (Hybrids only)   |  | *  | *                            | *                            |
| Screening, Run-In (Room Temperature)  | *  |  |                              |                              |
| Screening, Run-In (+125°C and -65°C)  |  | *  | *                            | *                            |
| <b>Subgroup 2</b>   |  |  |                              |                              |
| Coil Resistance or Coil Current   | *  | *  | *                            | *                            |
| Insulation Resistance   | *  | *  | *                            | *                            |
| Dielectric Withstanding Voltage   | *  | *  | *                            | *                            |
| Static Contact Resistance   | *  | *  | *                            | *                            |
| Pickup and Dropout or Set and Reset Voltage                                       | *  | *  | *                            | *                            |
| Operate and Release or Set and Reset Time   | *  | *  | *                            | *                            |
| Hold Voltage  |  |  | *                            | *                            |
| Turn-On and Turn-Off Time (Hybrids only)  | *  | *  | *                            | *                            |
| Contact Bounce Time   | *  |  | *                            |                              |
| Contact Stabilization Time  |  | *  |                              | *                            |
| Turn-On Current (T Hybrids only)  | *  | *  | *                            | *                            |
| Turn-On voltage (C Hybrids only)  | *  | *  | *                            | *                            |
| Turn-Off Voltage (Hybrids only)   | *  | *  | *                            | *                            |
| Coil Transient Suppression<br>(D, DD and Hybrids only)                            | *  | *  | *                            | *                            |
| Diode Blocking Integrity (DD only)  | *  | *  | *                            | *                            |
| Zener Voltage (C Hybrid only)   | *  | *  | *                            | *                            |
| Neutral Screen (Latching Relays only)   | *  | *  | *                            | *                            |
| Break Before Make Verification  |  |  | *                            | *                            |
| Contact Simultaneity  |  |  | *                            | *                            |
| <b>Subgroup 3</b>   |  |  |                              |                              |
| Solderability 2 Samples per Daily Solderability<br>Inspection Lot                 | *  | *  | *                            | *                            |
| Leak Test   | *  | *  | *                            | *                            |
| External Visual and Mechanical Inspection 2/Lot for<br>Dimension and Weight Check | *  | *  | *                            | *                            |



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