**Series 114**
DPDT Non-Latching
Established Reliability / Military Relay

**CENTIGRID®**
**ESTABLISHED RELIABILITY**
**MILITARY DPDT**

<table>
<thead>
<tr>
<th>SERIES</th>
<th>RELAY TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>114</td>
<td>DPDT basic relay</td>
</tr>
<tr>
<td>114D</td>
<td>DPDT relay with internal diode for coil transient suppression</td>
</tr>
<tr>
<td>114DD</td>
<td>DPDT relay with internal diodes for coil transient suppression and polarity reversal protection</td>
</tr>
</tbody>
</table>

**DESCRIPTION**

The 114 sensitive Centgrid® relay retains the same features as the 114 standard Centgrid® relay with only a minimal increase in profile height (.275 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:

**The 114 feature:**

- All welded construction.
- Advanced cleaning techniques provide maximum assurance of internal cleanliness.
- Unique uni-frame design providing high magnetic efficiency and mechanical rigidity.
- High force/mass ratios for resistance to shock and vibration.
- Precious metal alloy contact material with gold plating assures excellent high current and dry circuit switching capabilities.

The Series 114D and 114DD have internal discrete silicon diodes for coil suppression and polarity reversal protection.

By virtue of its inherently low intercontact capacitance and contact circuit losses, the 114 relay has proven to be an excellent ultraminiature RF switch for frequency ranges well into the UHF spectrum. A typical RF application for the Centgrid® 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.

**ENVIRONMENTAL AND PHYSICAL SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature (Ambient)</td>
<td>–65°C to +125°C</td>
</tr>
<tr>
<td>Vibration (General Note I)</td>
<td>30 g’s to 3000 Hz</td>
</tr>
<tr>
<td>Shock (General Note I)</td>
<td>75 g’s, 6ms half sine</td>
</tr>
<tr>
<td>Acceleration</td>
<td>50 g’s</td>
</tr>
<tr>
<td>Enclosure</td>
<td>Hermetically sealed</td>
</tr>
<tr>
<td>Weight</td>
<td>0.09 oz. (2.55g) max.</td>
</tr>
</tbody>
</table>

**INTERNAL CONSTRUCTION**

![Internal Construction Diagram]
## SERIES 114
### GENERAL ELECTRICAL SPECIFICATIONS

- **Contact Arrangement**: 2 Form C (DPDT)
- **Rated Duty**: Continuous
- **Contact Resistance**: 0.1 ohm max. before life; 0.2 ohm max. after life at 1A/28Vdc

### Contact Load Rating (DC)
- **Resistive**: 1 A / 28 Vdc
- **Inductive**: 200 mA / 28 Vdc (320mH)
- **Lamp**: 100 mA / 28 Vdc (320mH)
- **Low level**: 10 to 50 μA @ 10 to 50 mV

### Contact Load Rating (AC)
- **Resistive**: 250 mA / 115Vac, 60 and 400 Hz (Case not grounded)
- **100 mA / 115 Vac, 60 and 400 Hz (Case grounded)**

### Contact Life Ratings
- **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**

### Contact Overload Rating
- **2 A / 28 Vdc Resistive (100 cycles min.)**

### Contact Carry Rating
- **Contact Factory Operate Time**: 2.0 msec max. at nominal rated coil voltage
- **Release Time**: 1.5 ms max.

### Intercontact Capacitance
- **0.4 pf typical**

### Insulation Resistance
- **10,000 MΩ min. between mutually isolated terminals**

### Dielectric Strength
- **(Vrms/60)**
- **Atmospheric pressure: 500 Vrms**
- **70,000 ft: 125**

### Negative Coil Transient (Vdc)
- **114D, 114DD**: 1.0 Vdc Max.

### Diode P.I.V. (Vdc)
- **114D, 114DD**: 100 Vdc Min.

## PERFORMANCE CURVES (Note 2)

- **Figures 1 and 2**

## 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. Relays can be supplied with a spacer pad. See appendix.
### 114 Series
**DETAILED ELECTRICAL SPECIFICATIONS**
(-65 °C to 125 °C unless otherwise noted. See note 3.)

<table>
<thead>
<tr>
<th>BASE PART NUMBERS (114, 114D, 114DD)</th>
<th>114-5</th>
<th>114-6</th>
<th>114-9</th>
<th>114-12</th>
<th>114-18</th>
<th>114-26</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>114D-5</td>
<td>114D-6</td>
<td>114D-9</td>
<td>114D-12</td>
<td>114D-18</td>
<td>114D-26</td>
</tr>
<tr>
<td><strong>Coil Voltage</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nom.</td>
<td>5.0</td>
<td>6.0</td>
<td>9.0</td>
<td>12.0</td>
<td>18.0</td>
<td>26.5</td>
</tr>
<tr>
<td>Max.</td>
<td>5.8</td>
<td>8.0</td>
<td>12.0</td>
<td>16.0</td>
<td>24.0</td>
<td>32.0</td>
</tr>
<tr>
<td><strong>Coil Resistance</strong> (Ohms ±10% @25°C)</td>
<td>114, 114D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>50</td>
<td>98</td>
<td>220</td>
<td>390</td>
<td>880</td>
<td>1560</td>
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<td></td>
<td>39</td>
<td>78</td>
<td>220</td>
<td>390</td>
<td>880</td>
<td>1560</td>
</tr>
<tr>
<td><strong>Coil Current (114DD)</strong> (mAdc@25°C)</td>
<td>(Note 5)</td>
<td>Min.</td>
<td>Max.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>93.2</td>
<td>58.3</td>
<td>33.0</td>
<td>25.6</td>
<td>17.5</td>
<td>14.8</td>
</tr>
<tr>
<td></td>
<td>128.2</td>
<td>78.3</td>
<td>42.9</td>
<td>32.8</td>
<td>22.1</td>
<td>18.5</td>
</tr>
<tr>
<td><strong>Pick-up Voltage</strong> (Vdc, Max)</td>
<td>114, 114D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.5</td>
<td>4.5</td>
<td>6.8</td>
<td>9.0</td>
<td>13.5</td>
<td>18.0</td>
</tr>
<tr>
<td></td>
<td>4.0</td>
<td>5.0</td>
<td>7.8</td>
<td>10.0</td>
<td>14.5</td>
<td>19.0</td>
</tr>
<tr>
<td></td>
<td>114DD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min.</td>
<td>0.14</td>
<td>0.18</td>
<td>0.35</td>
<td>0.41</td>
<td>0.59</td>
<td>0.89</td>
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<tr>
<td>Max.</td>
<td>2.3</td>
<td>3.2</td>
<td>4.9</td>
<td>6.5</td>
<td>10.0</td>
<td>13.0</td>
</tr>
<tr>
<td><strong>Drop-out Voltage</strong> (Vdc)</td>
<td>114, 114D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min.</td>
<td>0.6</td>
<td>0.7</td>
<td>0.8</td>
<td>0.9</td>
<td>1.1</td>
<td>1.4</td>
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<tr>
<td>Max.</td>
<td>2.8</td>
<td>3.4</td>
<td>5.3</td>
<td>6.5</td>
<td>10.0</td>
<td>13.0</td>
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<tr>
<td></td>
<td>114DD</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

**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 semiconductor, 114DD 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. Limit Base Emitter current to 15 mAdc.
8. Applicable to all coil voltages. See Base current to turn on.
SERIES 114
OUTLINE DIMENSIONS

CASE DETAIL
.375 (9.53) SQ. MAX.
.335 (8.51) SQ. MAX.
.275 (6.99) MAX.
PIN: .187 (4.75) ±.010 (.25)

WIRE LEAD .750 (19.05) MIN.
.017 (.43)+.002 (.05)
-.001 (.03)
DIAM.

Dimensions: in. (mm)
(Viewed From Terminals)

SCHEMATIC DIAGRAMS

114
114D
114DD

Part Numbering System

Established Reliability Designator
ER 114 Y M4 - 26 A / S O
Relay Series
Ground Pin Option
(See Appendix A)
Pad Option
(See Appendix A)
Nominal Coil Voltage
(26 = 26.5 V)

Q = Solder-Coated Leads
G = Gold-Plated Leads (RoHS Compliant)
R = RoHS Compliant Solder
S = 0.187" Leads
W = 1.5" Leads
No Suffix = 0.75" Leads
Screening and Reliability Level
(See Appendix B for Screening Options)

Military (JAN) Designator
J 114 Z M4 - 26 P L
Relay Series
Ground Pin Option
(See Appendix A)
Pad Option
(See Appendix A)
Nominal Coil Voltage
(26 = 26.5 V)

Screening and Reliability Level
(See Appendix B for Screening Options)
P = 0.187" Leads
W = 1.5" Leads
No Suffix = 0.75" Leads

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114/082018/Q3
# APPENDIX: Spacer Pads

<table>
<thead>
<tr>
<th>Pad designation and bottom view dimensions</th>
<th>Height</th>
<th>For use with the following:</th>
<th>Dim. H Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>“M4” Pad for TO-5</td>
<td><img src="image1.png" alt="Image" /></td>
<td>ER412, ER412D, ER412DD, 712, 712D, 712TN, RF300, RF310, RF320, RF700, RF703</td>
<td>.295 (7.49)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ER420, ER420D, ER420DD, 421, ER421D, ER421DD, ER422, ER422D, ER422DD, 722, 722D, RF341</td>
<td>.305 (7.75)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ER431T, ER432T, ER432, ER432D, ER432DD, 732, 732D, 732TN, RF303, RF313, RF323</td>
<td>.400 (10.16)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RF312, RF332, SI800, SI803</td>
<td>.350 (8.89)</td>
</tr>
<tr>
<td>“M4” Pad for TO-5</td>
<td><img src="image2.png" alt="Image" /></td>
<td>ER411, ER411D, ER411DD, ER411T, ER431, ER431D, ER431DD</td>
<td>.295 (7.49)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RF311</td>
<td>.300 (7.62)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RF331</td>
<td>.410 (10.41)</td>
</tr>
<tr>
<td>“M4” Pad for Centigrid®</td>
<td><img src="image3.png" alt="Image" /></td>
<td>172, 172D, ER114, ER114D, ER114DD, J114, J114D, J114DD</td>
<td>.305 (7.75)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ER134, ER134D, ER134DD, J134, J134D, J134DD</td>
<td>.400 (10.16)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RF100</td>
<td>.315 (8.00)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RF103</td>
<td>.420 (10.67)</td>
</tr>
<tr>
<td>“M9” Pad for Centigrid®</td>
<td><img src="image4.png" alt="Image" /></td>
<td>122C, A152, ER116C, J116C, ER136C, J136C</td>
<td>.320 (8.13)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RF180</td>
<td>.325 (8.25)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A150</td>
<td>.305 (7.75)</td>
</tr>
</tbody>
</table>

**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 ± .010” (.25 mm).
5. Add 10 mΩ 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: Spreader Pads

<table>
<thead>
<tr>
<th>Pad designation and bottom view dimensions</th>
<th>Height</th>
<th>For use with the following:</th>
<th>Dim. H Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="M Pad" /></td>
<td><img src="image" alt="M Height" /></td>
<td>ER411T, J411T, ER412, ER412D ER412DD, J412, J412D, J412DD ER412T, J412T 712, 712D, 712TN</td>
<td>.388 (9.86)</td>
</tr>
<tr>
<td><img src="image" alt="M2 Pad" /></td>
<td><img src="image" alt="M2 Height" /></td>
<td>ER411T ER412, ER412D, ER412DD J412, J412D, J412DD 712, 712D</td>
<td>.414 (11.20)</td>
</tr>
<tr>
<td><img src="image" alt="M3 Pad" /></td>
<td><img src="image" alt="M3 Height" /></td>
<td>ER411, ER411D, ER411DD, ER411TX ER412X, ER412DX, ER412DDX ER412TX 712X, 712DX, 712TNX</td>
<td>.388 (9.86)</td>
</tr>
</tbody>
</table>

### 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 ± .010” (0.25 mm).
5. Add 25 mΩ 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 mΩ 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: Ground Pin Positions

Centigrid® Relays:
RF180, ER116C, 122C, ER136C

TO-5 Relays:
ER411T, ER412, ER412T, ER420, ER421, ER422,
ER431T, ER432, ER432T, 712, 712TN, 400H, 400K,
400V, RF300, RF303, RF341, RF312, RF332, RF310,
RF313, RF320, RF323, SI800, SI803, RF700, RF703

TO-5 Relays:
ER411, ER431, RF311, RF331

Centigrid® Relays:
RF100, RF103, ER114, ER134, 172

Loopback Relays:
LB363

NOTES
1. Terminal views shown
2. Dimensions are in inches (mm)
3. Tolerances: ± .010 (± .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.