Pickering Series 119

High Voltage Micro-SIL
Single-in-Line SIL/SIP Reed Relays
Up to 3kV Stand-off

Features

- **SoftCenter®** construction (see adjacent diagram)
- Highest quality instrumentation grade switches
- Small size
- Internal mu-metal magnetic screen
- One or two switches in a single package
- 1 Form A or 2 Form A (energize to make) or 1 Form B (energize to break) configurations
- 3, 5 and 12 Volt coils are standard, with or without internal diode
- 100% tested for dynamic contact resistance
- Ideal for Cable Testers, Mixed signal testers or other applications where High Voltage capability is required.

The Pickering Series 119 is a new range of very small Single-in-Line Reed Relays intended for voltages very much higher than standard small SIL relays. The vacuumed, sputtered ruthenium reed switches have a superb low level performance also, which makes them an ideal choice where a wide range of signals are involved.

The range is based on the long established Series 109P style of plastic package with an internal mu-metal magnetic screen which allows high packing density and are made using Pickering’s **SoftCenter®** construction.

Six versions are available, all with either 3, 5 or 12 volt operating coils. The 1 Form A, 1.5kV version has a package and pin configuration compatible with the standard 109P type, i.e. 4 pins on 0.15 inches (3.8mm) pitch. The other types have package lengths and pin configurations appropriate for their voltage ratings and the user will need to arrange suitable clearance distances around the parts.

Form A types can be mounted side by side, but a 1cm space should be left between the Form B type and other relays, as the magnetic field from the internal biasing magnet could slightly affect the sensitivity of the relay alongside.

Application Note:

For stand-off voltages at the upper range of the specification; increases in the contact resistance at low signal levels may be observed. This is a characteristic of the switch. For new applications or for further information please contact our Technical department.

Switch Ratings - Dry switches

- **1 Form A (energize to make)**
  - Minimum Stand-off 1.5kV, switching up to 1kV.
  - Minimum Stand-off 2kV, switching up to 1kV.
  - Minimum Stand-off 3kV, switching up to 1kV.

- **1 Form B (energize to break)**
  - Minimum Stand-off 1.5kV, switching up to 1kV.
  - Minimum Stand-off 2kV, switching up to 1kV.

- **2 Form A (energize to make)**
  - Minimum Stand-off 1.5kV, switching up to 1kV.

Typical Pickering **SoftCenter®** Construction
When an internal diode is required, the suffix D is added to the part number as shown in the table.

<table>
<thead>
<tr>
<th>Type</th>
<th>Device</th>
<th>Form</th>
<th>Switch Voltage</th>
<th>Contact Resistance</th>
<th>Life expectancy</th>
<th>Capacitance (typical)</th>
<th>Insulation resistance (minimum)</th>
<th>Coil resistance</th>
<th>Switch to coil</th>
<th>Across switch</th>
<th>Closed switch to coil</th>
<th>Across open switch</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Form A (energize to make) Switch No. 1 (1.5kV)</td>
<td>119-1-A-3/1D</td>
<td>3</td>
<td>120 Ω</td>
<td>0.17 Ω</td>
<td>10^2 Ω</td>
<td>10^2 Ω</td>
<td>2.5 pF</td>
<td>0.17 Ω</td>
<td>10^2 Ω</td>
<td>10^2 Ω</td>
<td>0.17 Ω</td>
<td>10^2 Ω</td>
</tr>
<tr>
<td>1 Form A (energize to make) Switch No. 2 (2kV)</td>
<td>119-2-A-3/1D</td>
<td>3</td>
<td>120 Ω</td>
<td>0.17 Ω</td>
<td>10^2 Ω</td>
<td>10^2 Ω</td>
<td>2.5 pF</td>
<td>0.17 Ω</td>
<td>10^2 Ω</td>
<td>10^2 Ω</td>
<td>0.17 Ω</td>
<td>10^2 Ω</td>
</tr>
<tr>
<td>1 Form A (energize to make) Switch No. 3 (3kV)</td>
<td>119-3-A-3/1D</td>
<td>3</td>
<td>120 Ω</td>
<td>0.17 Ω</td>
<td>10^2 Ω</td>
<td>10^2 Ω</td>
<td>2.5 pF</td>
<td>0.17 Ω</td>
<td>10^2 Ω</td>
<td>10^2 Ω</td>
<td>0.17 Ω</td>
<td>10^2 Ω</td>
</tr>
<tr>
<td>2 Form A (energize to make) Switch No. 1 (1.5kV)</td>
<td>119-2-A-1D</td>
<td>5</td>
<td>100 Ω</td>
<td>0.17 Ω</td>
<td>10^2 Ω</td>
<td>10^2 Ω</td>
<td>2.5 pF</td>
<td>0.17 Ω</td>
<td>10^2 Ω</td>
<td>10^2 Ω</td>
<td>0.17 Ω</td>
<td>10^2 Ω</td>
</tr>
<tr>
<td>1 Form B (energize to break) Switch No. 1 (3kV)</td>
<td>119-1-B-3/1D</td>
<td>3</td>
<td>50 Ω</td>
<td>0.35 Ω</td>
<td>10^2 Ω</td>
<td>10^2 Ω</td>
<td>2.5 pF</td>
<td>0.35 Ω</td>
<td>10^2 Ω</td>
<td>10^2 Ω</td>
<td>0.35 Ω</td>
<td>10^2 Ω</td>
</tr>
</tbody>
</table>

Environmental specification

Standard operating temperature range: -20 to +65 °C.

Note: The upper temperature limit can be extended to +125 °C if the coil drive voltage is increased to accommodate the resistance/temperature coefficient of the copper coil winding. This is approximately 0.4% per °C. This means that at 125 °C the coil drive voltage will need to be increased by approximately 40 x 0.4 =16% to maintain the required magnetic drive level. Please contact sales@pickeringrelay.com for assistance if necessary.

Vibration: Maximum 20 G

Shock: Maximum 50 G

Note: Switching Voltage

This high voltage rating is for RESISTIVE loads only. At these high voltages, even stray capacitance can generate very high current pulses, which can damage the contact plating causing welding of the reed switch. If there is capacitance in circuit, provision should be made to limit the surge, to within the current and power ratings of the relay.

Note: Life expectancy

The life of a reed relay depends upon the switch load and end of life criteria. For example, for an ‘end of life’ contact resistance specification of 1 Ω, switching low loads (10 V at 10 mA resistive) or when ‘cold’ switching, typical life is approx 1 x 10^6 ops. At the maximum load (resistive), typical life is 1 x 10^5 ops. In the event of abusive conditions, e.g. high currents due to capacitive inrushes, this figure reduces considerably. Pickering will be pleased to perform life testing with any particular load condition.

Note: Capacitance across open switch

This is measured with all other component leads connected to the guard terminal of the measuring bridge.

Note: Contact Resistance

As part of our continuous product evaluation program Pickering have identified a characteristic with our Series 119. For stand-off voltages at the upper range of the specification increases in the contact resistance at low signal levels may be observed. This characteristic has always been present and if an application has used these parts and not been affected we do not believe any action needs to be taken.

Help

If you need any technical advice or other help, for example, any special tests that you would like carried out, please do not hesitate to contact our Technical Sales Department. We will always be pleased to discuss Pickering relays with you. email: techsales@pickeringrelay.com

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