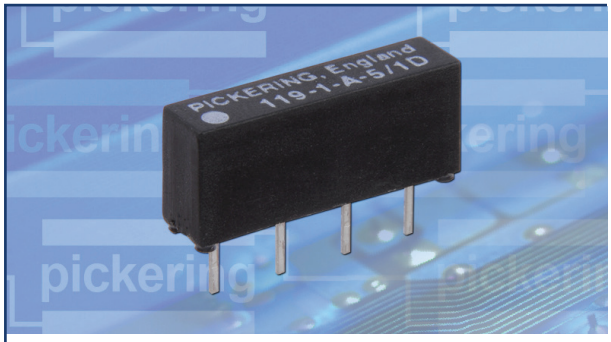
High Voltage Micro-SIL Single-in-Line SIL/SIP Reed Relays

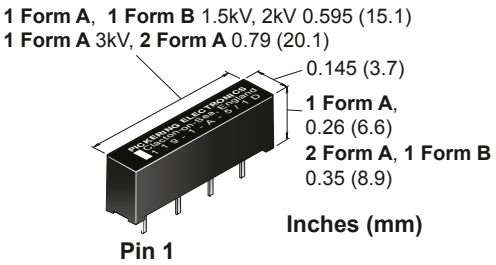
Up to 3kV Stand-off

Products highlighted are available from Rapid Electronics www.rapidonline.com

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.

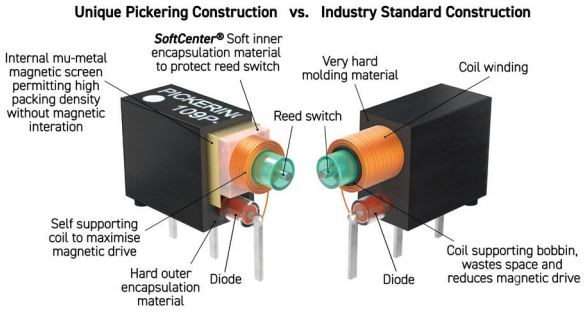
- **1 Form B (energize to break)**

  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



Highlighted parts are available from Rapid Electronics Ltd

Series 119 switch ratings - The contact ratings for each switch type are shown below:

Switch No	Switch form	Power rating	Max. switch current	Max. carry current	Max. switching volts (see Note[1])	Min. stand-off volts	Life expectancy ops typical (see Note[2] below)	Operate time inc bounce (max)	Release time	Special features
1	A or B	10 W	0.7 A	1.25 A	1000	1500	10^8	0.5 ms	0.2 ms	High voltage
2	A or B	10 W	0.7 A	1.25 A	1000	2000	10^8	0.5 ms	0.2 ms	High voltage
3	A	10 W	0.7 A	1.25 A	1000	3000	10^8	0.5 ms	0.2 ms	High voltage

Operating voltages

Coil voltage - nominal	Must operate voltage - maximum at 25°C	Must release voltage - minimum at 25°C
3 V	2.25 V	0.3 V
5 V	3.75 V	0.5 V
12 V	9 V	1.2 V

Coil data and type numbers

Device type	Type Number	Coil (V)	Coil resistance	Max. contact resistance (initial)	Insulation resistance (minimum)		Capacitance (typical) (see Note[3] below)	
					Switch to coil	Across switch	Closed switch to coil	Across open switch
1 Form A (energize to make) Switch No. 1 (1.5kV)	119-1-A-3/1D	3	100 Ω	0.17 Ω	10^{12} Ω	10^{12} Ω	2.5 pF	0.1 pF
	119-1-A-5/1D	5	250 Ω					
	119-1-A-12/1D	12	750 Ω					
1 Form A (energize to make) Switch No. 2 (2kV)	119-1-A-3/2D	3	75 Ω	0.17 Ω	10^{12} Ω	10^{12} Ω	2.5 pF	0.1 pF
	119-1-A-5/2D	5	200 Ω					
	119-1-A-12/2D	12	500 Ω					
1 Form A (energize to make) Switch No. 3 (3kV)	119-1-A-3/3D	3	50 Ω	0.17 Ω	10^{12} Ω	10^{12} Ω	2.0 pF	0.1 pF
	119-1-A-5/3D	5	125 Ω					
	119-1-A-12/3D	12	400 Ω					
2 Form A (energize to make) Switch No. 1 (1.5kV)	119-2-A-3/1D	3	50 Ω	0.17 Ω	10^{12} Ω	10^{12} Ω	2.5 pF	0.1 pF
	119-2-A-5/1D	5	100 Ω					
	119-2-A-12/1D	12	400 Ω					
1 Form B (energize to break) Switch No. 1 (1.5kV)	119-1-B-3/1D	3	50 Ω	0.17 Ω	10^{12} Ω	10^{12} Ω	2.5 pF	0.1 pF
	119-1-B-5/1D	5	100 Ω					
	119-1-B-12/1D	12	400 Ω					
1 Form B (energize to break) Switch No. 2 (2kV)	119-1-B-3/2D	3	50 Ω	0.17 Ω	10^{12} Ω	10^{12} Ω	2.5 pF	0.1 pF
	119-1-B-5/2D	5	100 Ω					
	119-1-B-12/2D	12	400 Ω					

When an internal diode is required, the suffix D is added to the part number as shown in the table.

Environmental specification

Standard operating temperature range: -20 to +85 °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[1] 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[2] 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 10^8 ops. At the maximum load (resistive), typical life is 1 x 10^7 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[3] Capacitance across open switch

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

Note[4] 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.

For new applications or for further information please contact our Technical department.

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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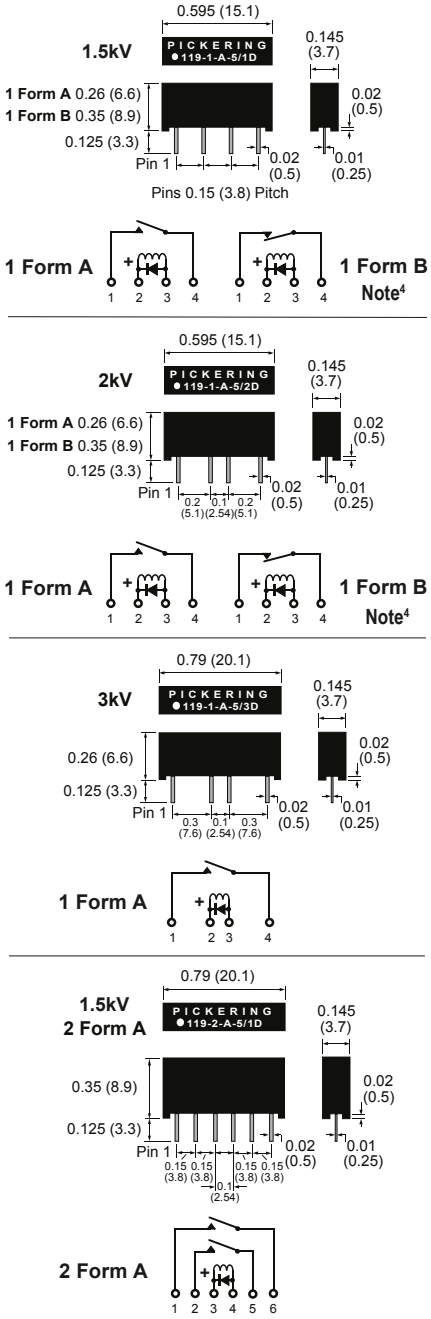
For a full list of agents and representatives visit: **pickeringrelay.com/agents**

ISO9001 Manufacture of Reed Relays FM 29036

Pin Configuration and Dimensional Data

Dimensions in Inches (Millimeters in brackets)



Important: Where the optional internal diode is fitted or for all Form B types, the correct coil polarity must be observed, as shown by the + symbol on the schematics.

Note[4]: A 1cm space should be left between Form B types and other relays, as the magnetic field from the internal biasing magnet could slightly affect the sensitivity of the relay alongside.

3D Models: Interactive models of the complete range of Pickering relay products can be downloaded from the web site.

Order Code

119 - 1 - A - 5 / 1 D

- Series
- Number of reeds
- Switch form
- Coil voltage
- Switch number (See table adjacent)
- Diode if fitted (Omit if not required)

Please ask us for a FREE evaluation sample.