

Single-in-Line SIL/SIP Reed Relays

10 Watts switching - Very high packing density

1 Form A stacks on 0.15 x 0.4 inches pitch

Features

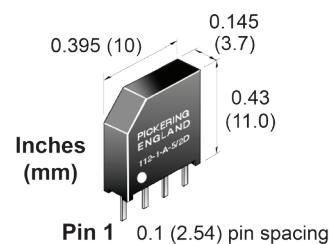
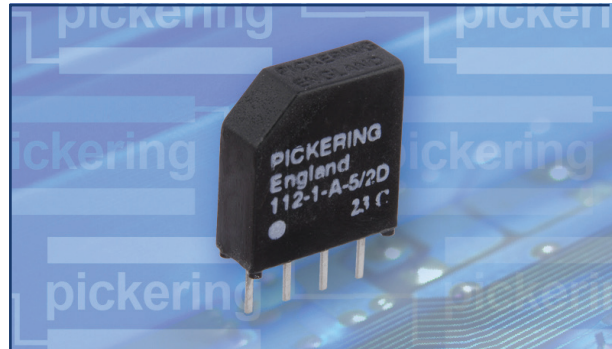
- **SoftCenter®** construction (see adjacent diagram)
- Highest quality instrumentation grade switches
- Ideal for high density card based systems and Automatic Test Equipment
- Plastic package with internal mu-metal magnetic screen
- They take up the minimum of board area, conserving board space
- Insulation resistance greater than $10^{12} \Omega$
- 3, 5 and 12 Volt coils with or without internal diode
- 5 Volt coils of 500 ohms may be driven directly from TTL logic
- 100% tested for dynamic contact resistance for guaranteed performance

The Pickering Series 112 is a range of magnetically screened single-in-line reed relays that require a board area of only 0.15 inches (3.8mm.) by 0.4 inches (10mm.) while retaining the 10 Watts, 0.5 Amps rating associated with larger relays. This small footprint is achieved by mounting the reed switch diagonally within the package.

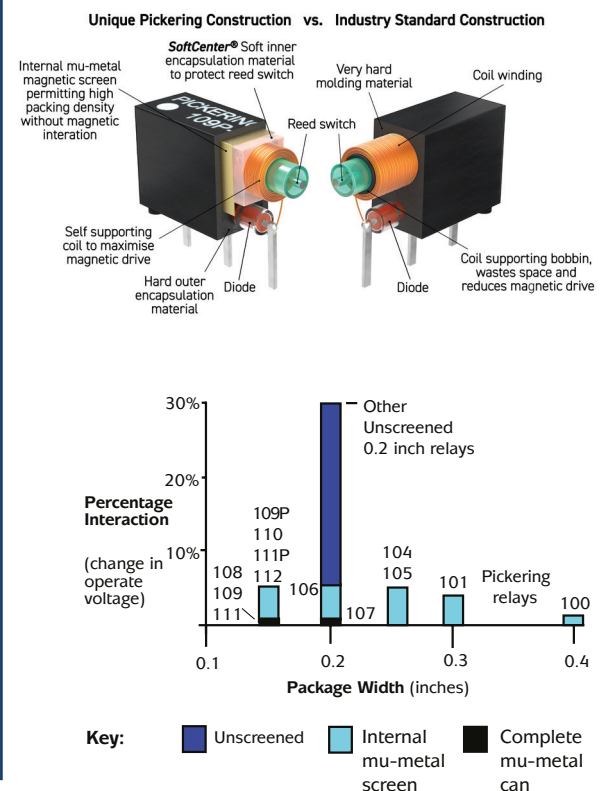
These relays require around one third the board area of the more usual 0.2 x 0.8 inch devices and the height of only 0.43 inches (11mm.) is suitable for high density card based systems such as VME, VXI, Compact PCI, and PXI. The high quality, sputtered ruthenium switch contacts also makes them ideal for Automatic Test Equipment.

The Series 112 is encapsulated in a plastic package using a very high resistivity resin to achieve an insulation resistance greater than 10^{12} ohms. The relay has an internal mumetal screen which totally eliminates the risk of magnetic interaction problems. An unscreened device mounted on this pitch would have an interaction figure of around 40 percent. Relays of this size without magnetic screening would therefore be totally unsuitable for applications where dense packing is required. Pickering Series 112 have a typical interaction figure of 5 percent.

3, 5 and 12 Volt coils are standard, with the option of an internal diode. 5 Volt coils have a resistance of 500 ohms and may be driven directly from TTL logic.



Typical Pickering **SoftCenter®** Construction



Series 112 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	Life expectancy ops typical (see Note ¹ below)	Operate time inc bounce (max)	Release time	Special features
2	A	10 W	0.5 A	0.5 A	200	10 ⁸	0.5 ms	0.2 ms	General purpose

Switch number 2 is suitable for low level or "cold" switching applications. It is also a good general purpose "hot" switch as long as the maximum switching current specification is observed. There is no Switch number 1 available in this range at present.

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 ² below)	
					Switch to coil	Across switch	Closed switch to coil	Across open switch
1 Form A (energize to make) Switch No. 2	112-1-A-3/2D	3	250 Ω	0.12 Ω	10 ¹² Ω	10 ¹² Ω	1.5 pF	0.15 pF
	112-1-A-5/2D	5	500 Ω					
	112-1-A-12/2D	12	750 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 $40 \times 0.4 = 16\%$ to maintain the required magnetic drive level. Please contact sales@pickeringrelay.com for assistance if necessary.

Vibration: Maximum 20 G

Shock: Maximum 50 G

Note¹ 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 2.5×10^8 ops. At the maximum load (resistive), typical life is 1×10^6 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.

Note² Capacitance across open switch

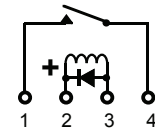
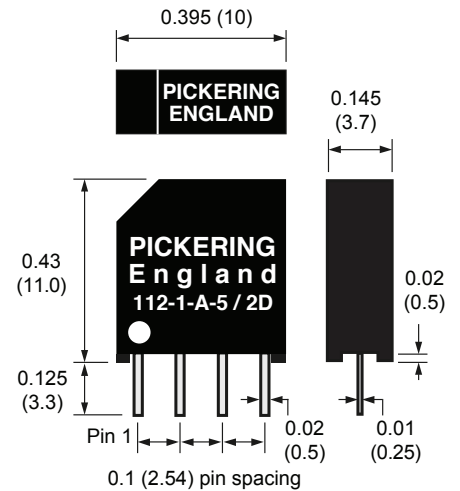
The capacitance across the open switch was measured with other connections guarded.

Internal Mu-metal Magnetic Screen

The Series 112 relays are fitted with an internal mu-metal magnetic screen which permits side-by-side stacking on 0.15 inches pitch.

Pin Configuration and Dimensional Data

Dimensions in Inches (Millimeters in brackets)



Schematic

1 Form A Energize to make

Important: Where the optional internal diode is fitted, the correct coil polarity must be observed, as shown by the + symbol on the schematic.

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

Order Code

112 - 1 - A - 5 / 2 D

Series _____
 Number of reeds _____
 Switch form _____
 Coil voltage _____
 Switch number (Only Type 2 available) _____
 Diode if fitted (Omit if not required) _____

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

Please ask us for a FREE evaluation sample.

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