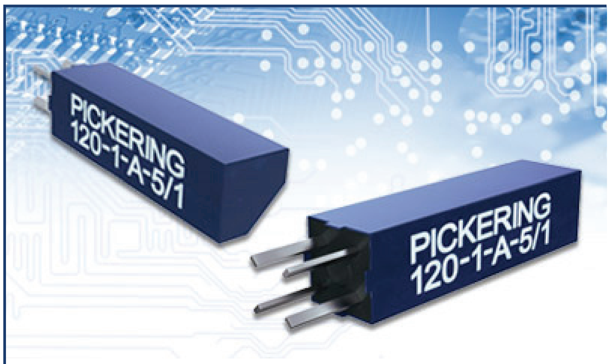
Single Pole *4mm² ™* Reed Relays

Up to 1 Amp switching

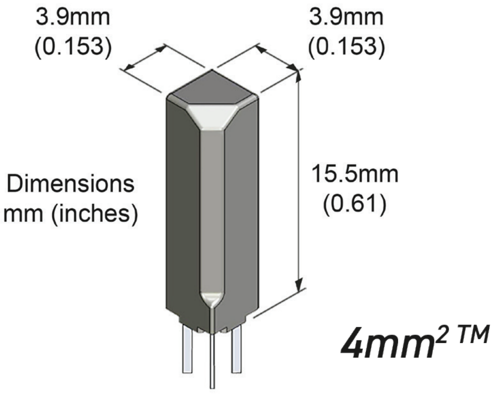
Stacking on 4mm x 4mm pitch

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



Features

- **Highest packing density currently available**
- **3, 5 or 12 Volt coils**
- **Switching up to 1 A, 20 W**
- **1 Form A (SPST) Normally Open (NO) Energize to make**
- **Plastic package with internal mu-metal magnetic screen**
- **Highest quality instrumentation grade switches**
- **Insulation resistance greater than 10^{12} Ω**
- **100% tested for dynamic contact resistance for guaranteed performance**



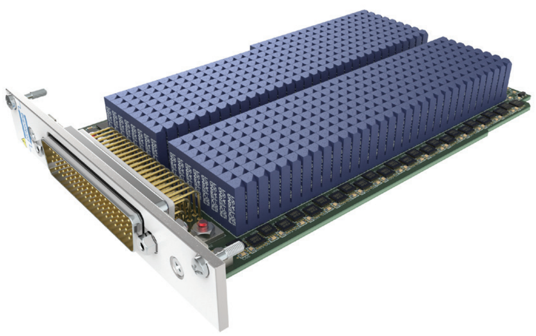
The Series 120 reed relay range takes up the minimum board area making them ideal for very high density applications such as A.T.E. switching matrices or multiplexers. Requiring a board area of only 4mm x 4mm, these relays allow the highest packing density currently available.

Two switch types are available, a general purpose sputtered ruthenium switch rated at 15 Watts, 1 Amp (3 volt version) or 20 Watts, 1 Amp (5 & 12 volt versions) and a low level sputtered ruthenium switch rated at 10 Watts, 0.5 Amps.

These are the same reed switches as used in many other long established Pickering ranges but are orientated vertically within the package, allowing this high density. The small size of the package does not allow an internal diode. Back EMF suppression diodes are included in many relay drivers but if they are not, and depending on your drive methods, these may have to be provided externally.

While socketing relays is not normally recommended due to the risk of affecting contact resistance integrity, it is appreciated that sockets may sometimes be desired for ease of servicing/replacement, in the case of a relay being damaged or reaching the end of its working life.

The device has pins on a 2mm square pitch. There are suitable connectors available from some manufacturers, both SMD and Through Hole, that will allow these relays to be stacked in either a row or in a matrix on a 4mm pitch.



A total of 528 Series 120 relays on Pickering Interfaces ultra-high-density PXI module illustrates the packing density of these extremely small Reed Relays.

Series 120 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
1	A	15 W (3 V Version) 20 W (5 & 12 V)	1.0 A	1.2 A	200	10^9	0.5 ms	0.2 ms	General purpose
2	A	10 W	0.5 A	1.2 A	200	10^9	0.5 ms	0.2 ms	Low level

Switch no.2 is particularly good for switching low currents and/or voltages. It is the ideal switch for A.T.E. systems where cold switching techniques are often used. Where higher power levels are involved, switch no.1 is more suitable.

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	9.0 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[2,3] below)	
					Switch to coil	Across switch	Closed switch to coil	Across open switch
1 Form A (energize to make) General Purpose Switch No. 1	120-1-A-3/1 120-1-A-5/1 120-1-A-12/1	3 5 12	200 Ω 300 Ω 800 Ω	0.12 Ω	10^{12} Ω	10^{12} Ω	2.9 pF	0.25 pF
1 Form A (energize to make) Low Level Switch No. 2	120-1-A-3/2 120-1-A-5/2 120-1-A-12/2	3 5 12	200 Ω 500 Ω 800 Ω	0.12 Ω	10^{12} Ω	10^{12} Ω	2.9 pF	0.25 pF

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] 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 10^9 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[2] Switch to coil capacitance

Due to the asymmetrical internal construction of the relay, the capacitance to the coil from one switch connection is approximately half the capacitance of the other switch connection, pin 1 is lower. In some applications this feature may be used to advantage for example, in a multiplexer where it is desirable to minimize the capacitance of the common connection to maximize bandwidth.

Note[3] Capacitance across open switch

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

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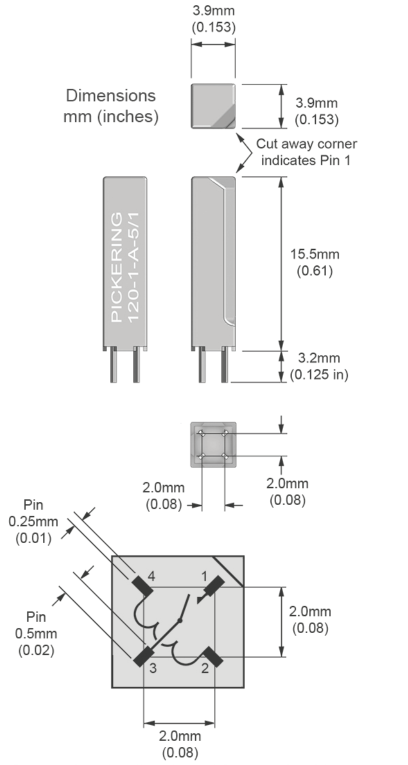
For a full list of agents and representatives visit: **pickeringrelay.com/agents**

ISO9001 Manufacture of Reed Relays FM 29036

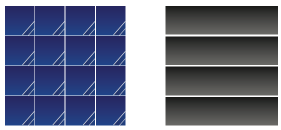
Pin Configuration and Dimensional Data

Dimensions in Millimeters (Inches in brackets)



Connection details -viewed from underside

Example of Packing Density - Actual Size



Pickering Electronics' **Series 120** | Industry standard reed relay of the same electrical specification.

The above full scale graphic illustrates sixteen **new Series 120 Relays** packed into an area of 1.6cm x 1.6cm, in comparison, only four of the industry standard reed relays can be fitted into the same area.

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

Internal Mu-metal Magnetic Screen

The Series 120 relays are fitted with an internal mu-metal magnetic screen which permits side-by-side stacking on a 4mm pitch.

Order Code

120 - 1 - A - 5 / 2

- Series
- Number of reeds
- Switch form
- Coil voltage
- Switch number (1 or 2 See table adjacent)

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.