

## Subminiature Coaxial SIL/SIP Reed Relays for RF and High Speed Digital

### Up to 20 Watts switching

### Features

- **SoftCenter®** construction (see adjacent diagram)
- Highest quality instrumentation grade switches
- Form A (energize to make) or Form B (energize to break) configurations
- Up to 20 Watts switching capability
- Insulation resistance greater than  $10^{12} \Omega$
- 3, 5 and 12 Volt coils with or without internal diode
- 100% tested for dynamic contact resistance for guaranteed performance

The Series 102 is a range of subminiature coaxial reed relays for high frequency applications up to 3 GHz, performance characteristics will be found on reverse of this sheet. Two package types are available, both displaying outstanding RF performance in terms of low insertion loss, good isolation and excellent VSWR characteristics in 50 ohms systems. These relays have good coil drive levels making them ideal for portable applications or where space is at a premium. If an even smaller RF relay is required, look at the Series 109RF or 111 RF.

#### 102M (Mu-metal) Package.

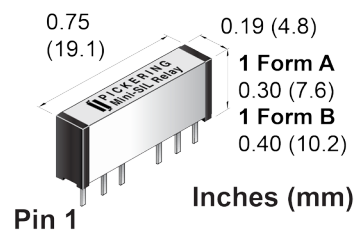
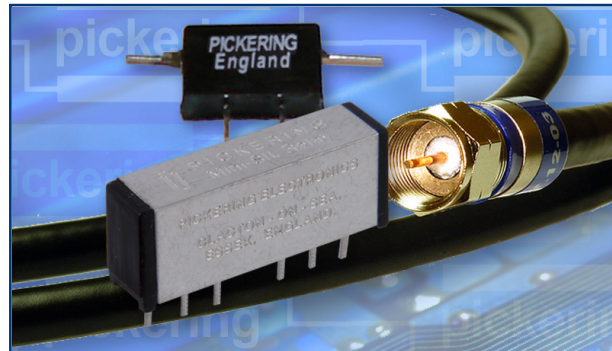
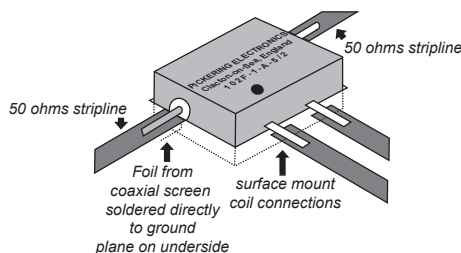
This device, constructed in the popular Single-In-Line format, features a mu-metal case allowing dense packaging without magnetic interaction problems. It has six pins for conventional PCB mounting. With careful printed circuit board layout this configuration will perform well up to 1.5GHz, it is easy to use and will meet most requirements.

#### 102F (Flatpack) package.

The 102F package dispenses with the leadframe connections to the switch and screen. These terminations are instead brought out axially from the ends of the device where they are soldered directly to the stripline. This technique allows very accurate matching to the 50 ohms line and gives an excellent VSWR right up to 3 GHz.

Mounting method:

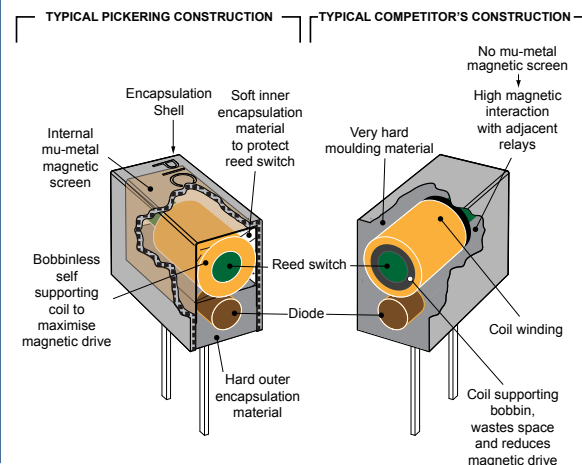
A small rectangular hole is punched into the printed circuit board or notched into the board edge to accommodate the package. The switch leads are then soldered directly to the 50 ohms stripline, the tin plated copper foil from the screen is soldered directly to the ground plane on the reverse side of the P.C.B. The coil connections are soldered directly to their tracks in the same way.



### Switch Ratings

- 1 Form A coaxial (energize to make), 10 watts at 200V - Switch No.1
- 1 Form A coaxial (energize to make), 20 watts at 200V - Switch No.2
- 1 Form B coaxial (energize to break), 10 watts at 200V - Switch No.1
- 1 Form B coaxial (energize to break), 20 watts at 200V - Switch No.2

### Typical Pickering SoftCenter® Construction



**Series 102 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 <sup>1</sup> below)	Operate time inc bounce (max)	Release time
1	A or B	10 W	0.5 A	1.2 A	200	10E8	0.5 ms	0.2 ms
2	A or B	20 W	1 A	1.2 A	200	10E8	0.5 ms	0.2 ms

### 102M (mu-metal) Data and type numbers

Device type	Type Number	Coil (V)	Coil resistance	Max. contact resistance (initial)	Insulation resistance (minimum)		Capacitance (typical) (see Note <sup>2</sup> below)	
					Switch to coil	Across switch	Closed switch to coil	Across open switch
1 Form A (energize to make) General Purpose Switch No. 1 (10 Watts)	102M-1-A-3/1D	3	300 Ω	0.15 Ω	10E12 Ω	10E12 Ω	See Note <sup>3</sup>	0.1 pF
	102M-1-A-5/1D	5	500 Ω					
	102M-1-A-12/1D	12	1000 Ω					
1 Form A (energize to make) Higher Power Dry Reed Switch No. 2 (20 Watts)	102M-1-A-5/2D	5	375 Ω	0.15 Ω	10E12 Ω	10E12 Ω	See Note <sup>3</sup>	0.1 pF
	102M-1-A-12/2D	12	1000 Ω					
1 Form B (energize to break) General Purpose Switch No. 1 (10 Watts)	102M-1-B-5/1D	5	1000 Ω	0.15 Ω	10E12 Ω	10E12 Ω	See Note <sup>3</sup>	0.1 pF
	102M-1-B-12/1D	12	1500 Ω					
1 Form B (energize to break) Higher Power Dry Reed Switch No. 2 (20 Watts)	102M-1-B-5/2D	5	1000 Ω	0.15 Ω	10E12 Ω	10E12 Ω	See Note <sup>3</sup>	0.1 pF
	102M-1-B-12/2D	12	1500 Ω					

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

### 102F (flatpack) Data and type numbers

Device type	Type Number	Coil (V)	Coil resistance	Max. contact resistance (initial)	Insulation resistance (minimum)		Capacitance (typical) (see Note <sup>2</sup> below)	
					Switch to coil	Across switch	Closed switch to coil	Across open switch
1 Form A (energize to make) General Purpose Switch No. 1 (10 Watts)	102F-1-A-3/1D	3	300 Ω	0.10 Ω	10E12 Ω	10E12 Ω	See Note <sup>3</sup>	0.1 pF
	102F-1-A-5/1D	5	500 Ω					
	102F-1-A-12/1D	12	1000 Ω					
1 Form A (energize to make) Higher Power Dry Reed Switch No. 2 (20 Watts)	102F-1-A-5/2D	5	375 Ω	0.10 Ω	10E12 Ω	10E12 Ω	See Note <sup>3</sup>	0.1 pF
	102F-1-A-12/2D	12	1000 Ω					

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

#### Note<sup>1</sup> 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<sup>9</sup> ops. At the maximum load (resistive), typical life is 1 x 10<sup>7</sup> 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.

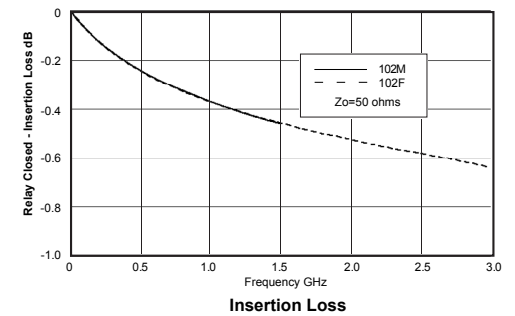
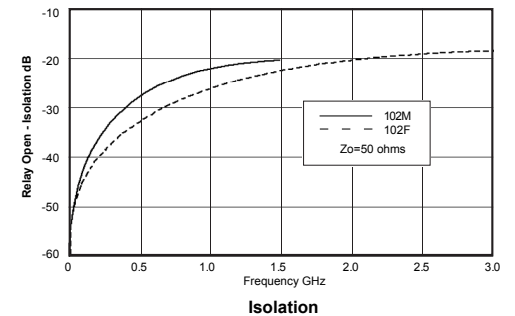
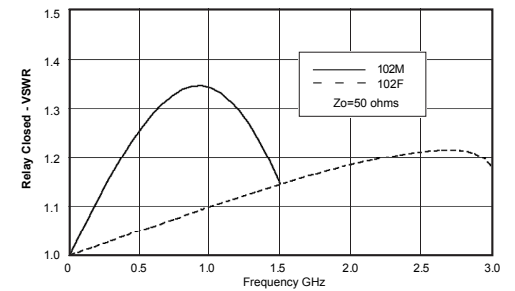
#### Note<sup>2</sup> Capacitance across open switch

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

#### Note<sup>3</sup> Capacitance values

The value will depend upon on the mode of connection/guarding of unused terminals. Please contact technical sales for details.

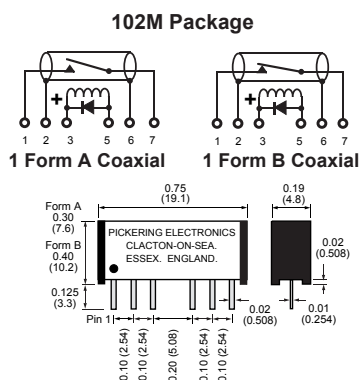
### Typical Performance Characteristics



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

### 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.

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For a full list of agents and representatives visit: [pickeringrelay.com/agents](http://pickeringrelay.com/agents)



ISO9001 Manufacture of Reed Relays FM 29036



### Also available - Low capacitance reed relays

If your high frequency application does not require coaxial relays, Pickering also manufacture devices featuring very low levels of capacitance between the switch and coil, see our Series 103. These are especially useful for such applications as the switching of ranges and attenuators in computer controlled instrumentation. Contact our sales office for further details.

### Order Code

**102 M - 1 - A - 5 / 2 D**

Series \_\_\_\_\_

Package Type (M or F) \_\_\_\_\_

Number of reeds \_\_\_\_\_

Switch form \_\_\_\_\_

Coil voltage \_\_\_\_\_

Switch number (1 or 2 See table adjacent) \_\_\_\_\_

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](mailto:techsales@pickeringrelay.com)

**Please ask us for a FREE evaluation sample.**