



MPS2R10-606
50 MHz to 1 GHz
SPDT Monolithic PIN Switch
RoHS Compliant

GENERAL DESCRIPTION

High power Monolithic Microwave Surface Mount (MMSM) series-shunt pin diode SP2T reflective switch. The technology is a packaged/device integration accomplished at the wafer level. Thermal transfer is optimized by elimination of the traditional package interface. The MPS2R10-606 is completely compatible with pick and place and solder reflow manufacturing techniques.

This series of diodes meets RoHS requirements per EU Directive 2002/95/EC.

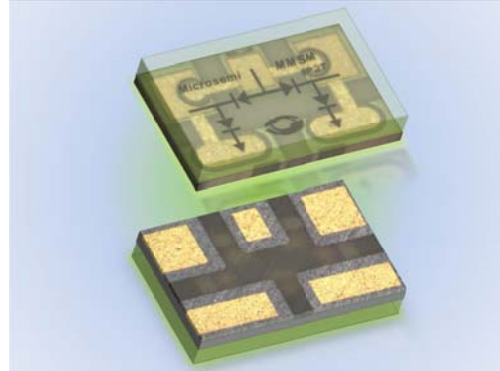
The standard terminal finish is gold unless otherwise specified. Consult the factory if you have special requirements.

ESD HBM Class 1B
Moisture Sensitivity MSL 2

APPLICATIONS

The MPS2R10-606 is optimized for UHF high power and T/R switching applications.

Up to 1 Watt CW power handling with as little as 5 V control.



KEY FEATURES

- Series-shunt pin diode SP2T
- 100W CW power handling
- Low insertion loss
- High isolation
- Surface mount
- 0805 device size
- Stable Low Leakage Passivation with Rugged Glass Body
- RoHS Compliant ¹

¹ These devices are supplied with Gold plated terminations. Consult factory for details.

APPLICATION/BENEFITS

- High power switching
- Surface mountable
- Compact size (80 x 50 mils)

For the most current data, consult MICROSEMI's website: www.MICROSEMI.com
Specifications are subject to change, consult the RFMW Business Unit at (978) 442-5600 for the latest information. Applications information may be found at:

www.microsemi.com/design-support/application-notes#rf-and-pin-diode



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**ABSOLUTE MAXIMUM RATINGS @ 25°C
 (UNLESS OTHERWISE SPECIFIED)**

Rating	Symbol	Value	Unit
Storage Temperature	T_{ST}	-65 to +150	°C
Operating Temperature	T_{OP}	-65 to +125	°C
CW RF Operating Power	P_{CW}	100	W
Forward DC Current	I_F	200	mA
Reverse DC Voltage	V_R	150	V
ESD HBM Class 1B			
Moisture Sensitivity MSL 2			

TYPICAL ELECTRICAL PERFORMANCE (100V Control)

Parameter	Frequency (MHz)	Min	Typ	Max
Maximum CW RF Input Power*	ALL			100 W
Insertion Loss	100		.1 dB	.12 dB
	500		.2 dB	.25 dB
	1000		.5 dB	.6 dB
Return Loss	100	25 dB	28 dB	
	500	13 dB	15 dB	
	1000	7 dB	9 dB	
Isolation	100	55 dB	60dB	
	500	53 dB	55 dB	
	1000	45 dB	47 dB	
Switching Speed			500 ns	

Note: Device is biased per Table I.

TYPICAL ELECTRICAL PERFORMANCE (5V Control)

Parameter	Frequency (MHz)	Min	Typ	Max
Maximum CW RF Input Power*	ALL			1 W
Insertion Loss	100		.05 dB	.10 dB
	500		.25 dB	.30 dB
	1000		.7 dB	.85 dB
Return Loss	100	25 dB	28 dB	
	500	13 dB	15 dB	
	1000	7 dB	9 dB	
Isolation	100	55 dB	60 dB	
	500	50 dB	55 dB	
	1000	43 dB	46 dB	
Switching Speed			500 ns	

*** Maximum Input Power Defined as <1 dB Compression**

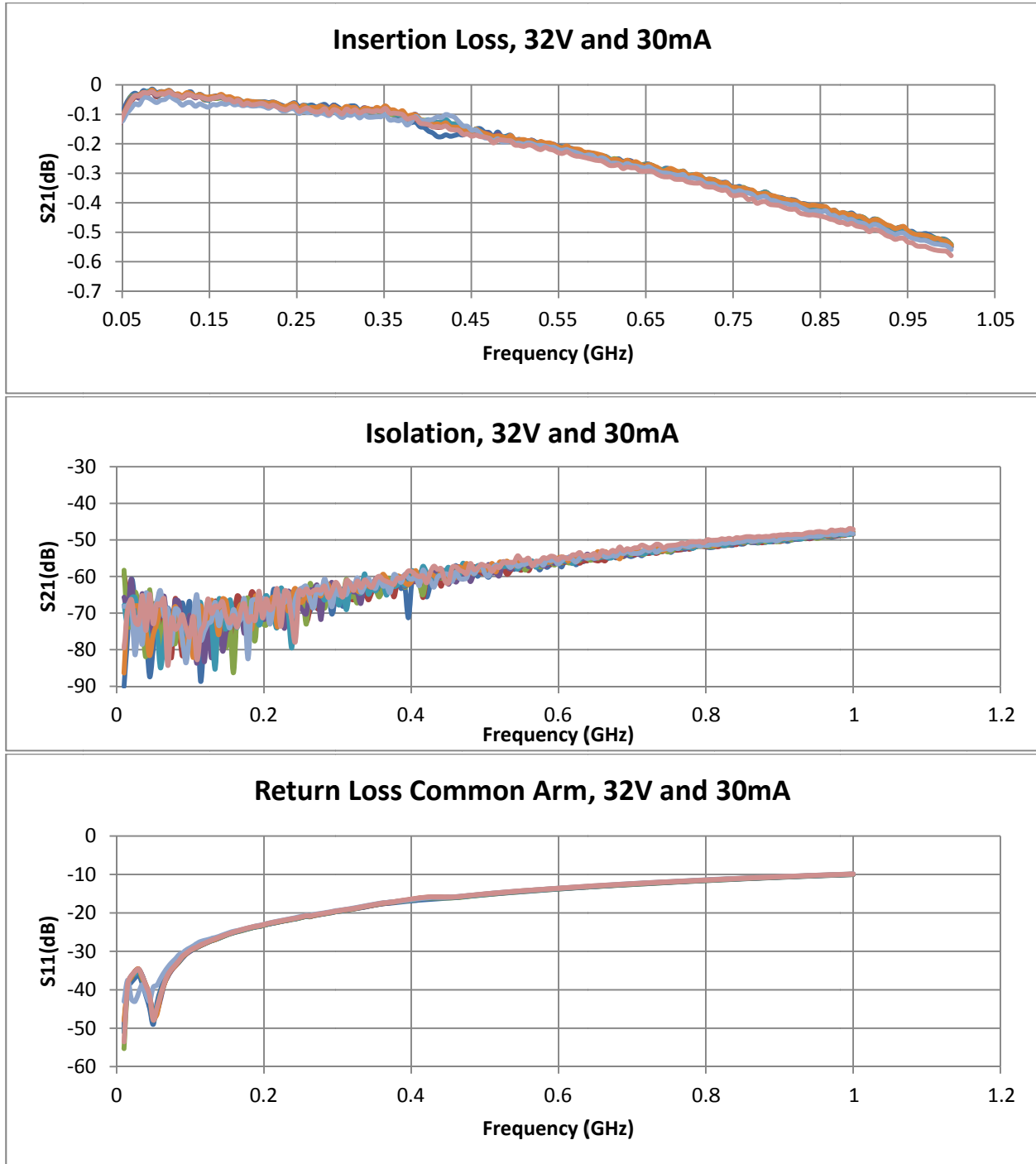
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SMALL SIGNAL SWEPT MEASUREMENTS



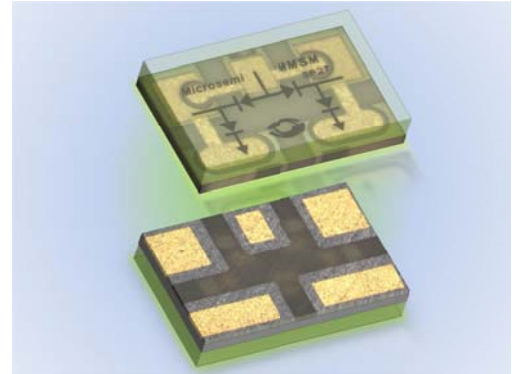
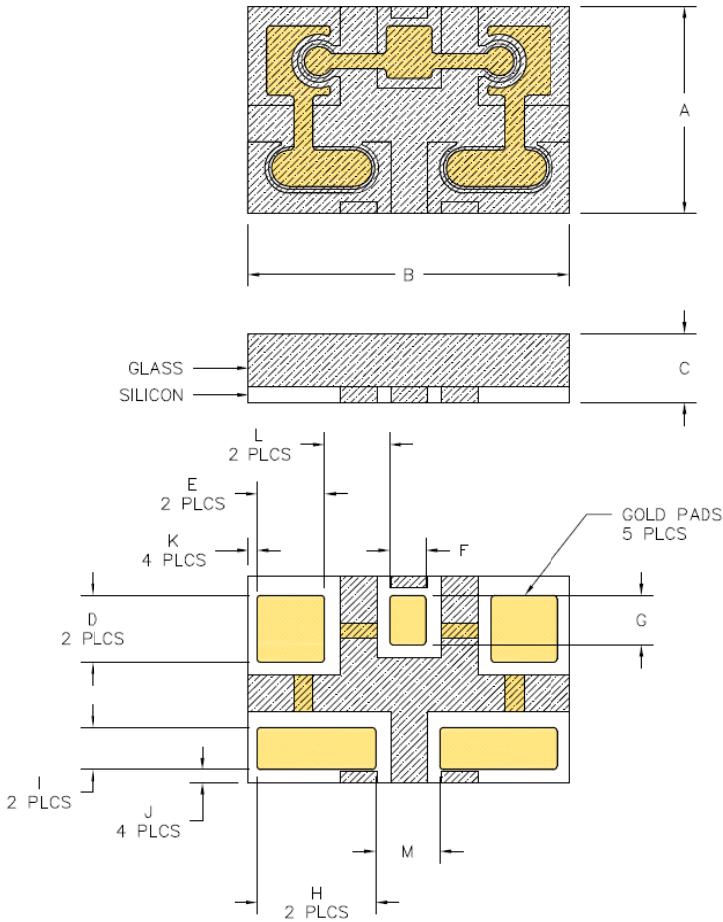
***Bias voltage limited by test equipment.
Characteristics at nominal bias equivalent or better.**

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OUTLINE



DIM	INCHES			MM		
	MIN	TYP	MAX	MIN	TYP	MAX
A	0.048	0.050	0.052	1.219	1.270	1.321
B	0.078	0.080	0.082	1.981	2.032	2.083
C	0.011	0.016	0.021	0.279	0.406	0.533
D	—	0.0175	—	—	0.4445	—
E	—	0.0175	—	—	0.4445	—
F	—	0.0095	—	—	0.2413	—
G	—	0.013	—	—	0.330	—
H	—	0.030	—	—	0.762	—
I	—	0.011	—	—	0.279	—
J	—	0.002	—	—	0.051	—
K	—	0.001	—	—	0.025	—
L	—	0.017	—	—	0.432	—
M	—	0.017	—	—	0.432	—

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Manual Handling & Installation

Solder Assembly

MMSM products are designed to be compatible with modern automatic pick and place equipment and are available in tape and reel format as well as in gel and waffle packs. Because of the nominal size of the units some care must be taken to avoid causing damage during installation. Although storage temperature ratings (non-operating) are compatible and equivalent to ratings for standard plastic encapsulated lead-frame commercial packages (i.e. -55°C to +125°C), temperatures during solder installation can exceed this maximum value. It is critical, therefore, as with any other microelectronic part, to minimize thermal gradients across the device. For example, during manual installation, typical electronic pencil soldering tips can exceed 375°C. When devices are first soldered down to the circuit board on one end only, followed in turn by soldering of the opposite end, the original end provides a path to thermal ground. Unlike a thermal shock test, in which both package ends are simultaneously exposed to the same temperatures, a severe thermal gradient may be created during solder iron manual installation. Specifically, if the original soldered end rests at room temperature, soldering of the second end (@tip temperature = 375°C) may create a temperature gradient across the device of 350°C. Use of a soldering iron tip, therefore, is strongly discouraged. If a tip must be used, the following recommendations will help minimize the risk of damage:

- a) Limit the tip temperature to the lowest possible temperature appropriate to exceed the liquidus point for the solder being used.
- b) Use the smallest tip mass available to reduce the tip thermal mass relative to the device length.
- c) Preheat the circuit board to 100-120°C to further reduce the temperature gradient.

Following these recommendations will help ensure that thermal differentials are minimized to lower levels.

Silver Paste Assembly

Installation of MMSM product using Silver epoxy paste is fairly straight forward. Operators familiar with silver epoxy component assembly can easily adapt his/her technique readily to handle MMSM installation. Epotek H20E or equivalent can be used for installation. It is critical that the paste is within the manufactures guide lines for shelf life and pot life. Epoxy is dispensed and placed (See solder pad outline). The dots should be approximately 10 mils in diameter. Using tweezers or a vacuum pencil, the MMSM is placed on the epoxy dots and lightly pressed into place. Excessive epoxy can cause bridging between the solder pads and short out the device. Not enough epoxy can result in poor electrical or mechanical connection. After installation of the MMSM parts, the assembly is cured using the manufactures recommended time and temperature settings. Improper curing can result in poor mechanical bonds as well as reduced electrical performance. Please refer to MicroNote 716 at www.MICROSEMI.com for additional installation guidance.

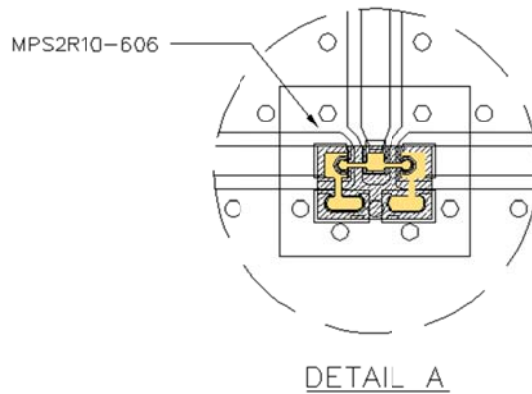
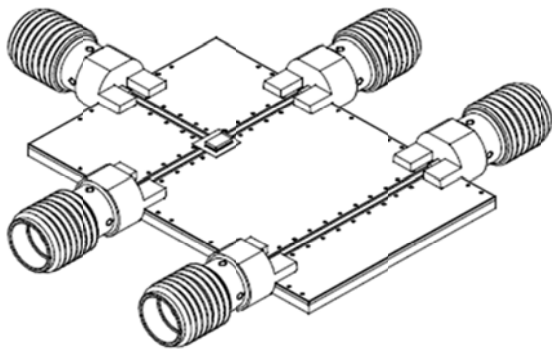
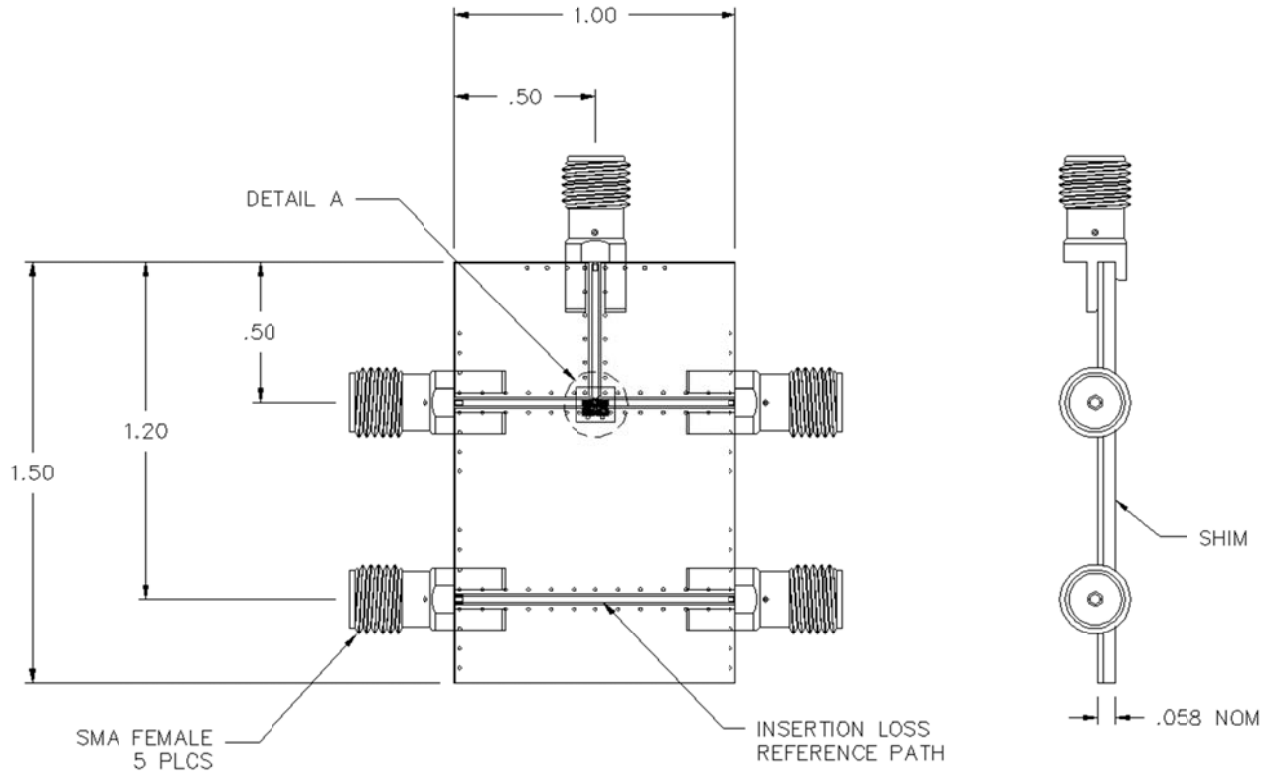
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EVALUATION BOARD ASSEMBLY
MSTF0002



NOTES:

1. Order Microsemi part number MSTF0002
2. Material: .016 Rogers 4003, ½ Oz Copper, cladding both sides starting thickness.
3. Full metal backside.
4. Finish: Enig (Gold Immersion), both sides.
5. Solder mask topside only.
6. Units are in inches.

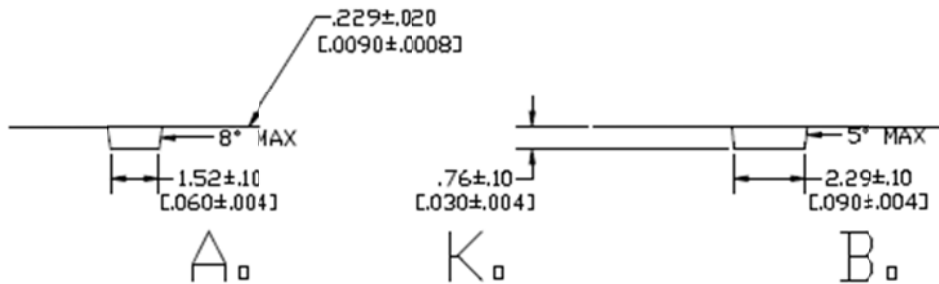
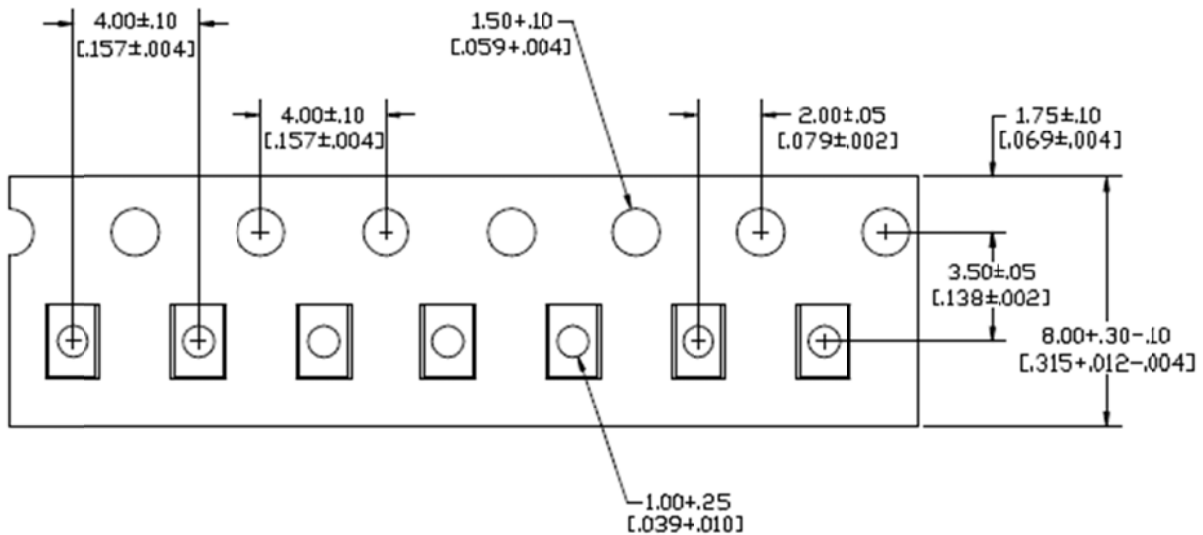
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TAPE AND REEL FORMAT



Revision History

Revision Level / Date	Para. Affected	Description
1 / 9 September 15	-	Initial Release
2 / 4 February 16	-	Reformat

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