MA4P504-1072

MELF PIN Diode
1 - 4000 MHz

Rev. V2

Features

- High Power Handling
- Low Loss / Low Distortion
- Low Thermal Resistance
- Surface Mountable
- Lead-Free MELF Package (1072)
- Halogen-Free “green” Mold Compound
- RoHS* Compliant and 260°C Re-flow Compatible

Description

The MA4P504-1072 is a PIN diode assembled in a surface mount metal electrode leadless faced (MELF) ceramic package. This package is full face bonded to refractory metal plugs on both the anode and cathode. The result is a low loss PIN diode with low thermal resistance due to its symmetrical thermal paths. MELF PIN diodes are designed specifically for high volume tape and reel assembly. Their user friendly design provides for extremely easy automatic pick and place indexing and assembly. All solderable surfaces are tin plated and are compatible with all industry standard reflow and vapor phase solder processes.

The MA4P504 is ideally suited for use in a series or shunt configuration where there is a high incident power present. Typical applications include switches as well as attenuators from HF through UHF frequencies.

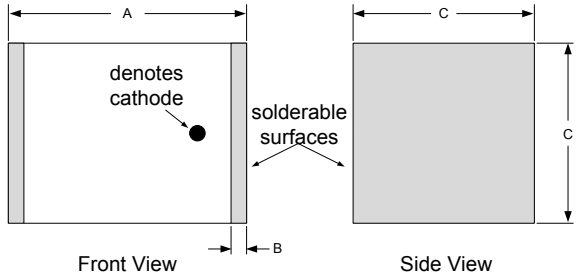
The MA4P504 is manufactured using a unique passivation process which provides for a hard glass encapsulation that protects and hermetically seals the active area of the chip.

Ordering Information[1]

Part Number	Package
MA4P504-1072T	1500 pc. reel

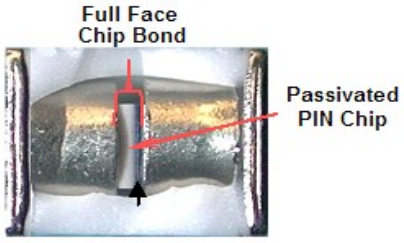
1. Reference Application Note M513 for reel size information.

Package Dimensions ODS 1072

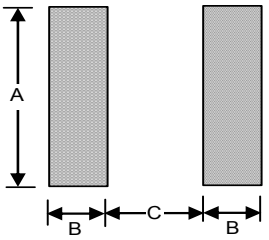


	Inches		Millimeters	
	Min.	Max.	Min.	Max.
A	0.115	0.125	2.921	3.175
B	0.008	0.023	0.203	0.584
C	0.080	0.095	2.032	2.413

Diode Cross Section



Circuit Pad Layout



Dimension	Package Style 1072	
	inches	mm
A	0.093	2.36
B	0.050	1.27
C	0.060	1.52

* Restrictions on Hazardous Substances, European Union Directive 2011/65/EU.

MELF PIN Diode
1 - 4000 MHz

Electrical Specifications: T_A = 25°C

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Forward Voltage	+ 50 mA	V	—	—	1.0
Reverse Leakage Current	-500 V	nA	—	—	| -100 |
Total Capacitance[2]	-100 V @ 1 MHz	pF	—	—	0.50
Package Capacitance	—	pF	—	0.16	—
Input IP3	P_{IN} = +10 dBm, Spacing = 1 MHz @ 1000 MHz	dBm	—	>54	—
Thermal Resistance	Diode attached to infinite Heatsink Diode in air	°CW	—	16 48	20 51
Power Dissipation	Diode attached to infinite Heatsink[3] Diode in air[4]	W	—	—	7.5 2.9
Minority Carrier Lifetime	I_F = +10 mA, I_R = -6 mA	µs	—	1.0	—
Series Resistance	+100 mA, 100 MHz	Ω	—	—	0.60

2. Chip junction capacitance + parasitic package capacitance.
3. De-rate linearly by -50.0 mW/°C to 0 W @ +125°C.
4. De-rate linearly by -19.3 mW/°C to 0 W @ +125°C.

Absolute Maximum Ratings[5,6]

Parameter	Absolute Maximum
Forward Voltage[7]	1.0 V
Reverse Voltage[7]	500 V
Operating Temperature	-65°C to +175°C
Storage Temperature	-65°C to +200°C

5. Exceeding any one or combination of these limits may cause permanent damage to this device.
6. MACOM does not recommend sustained operation near these survivability limits.
7. Values will de-rate linearly over temperature.

Handling Procedures

Please observe the following precautions to avoid damage:

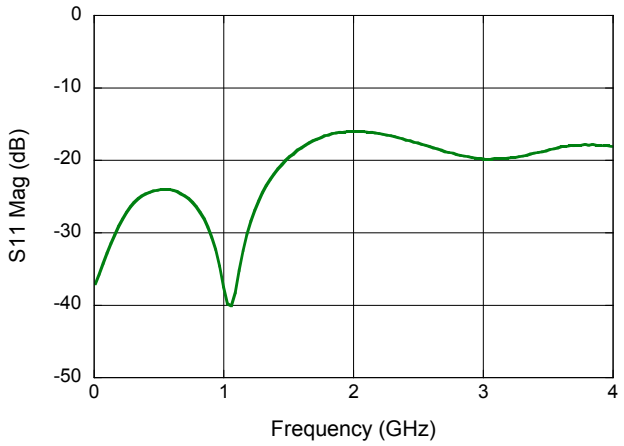
Static Sensitivity

These electronic devices are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these Class 1C devices.

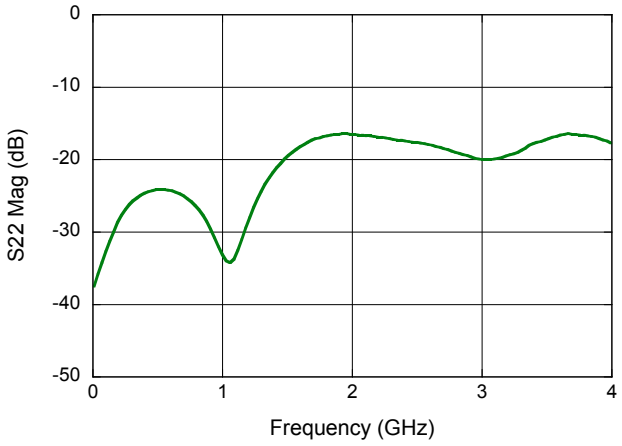
Typical RF Performance Curves (50 – 4000 MHz)

MOUNTED IN A SERIES CONFIGURATION

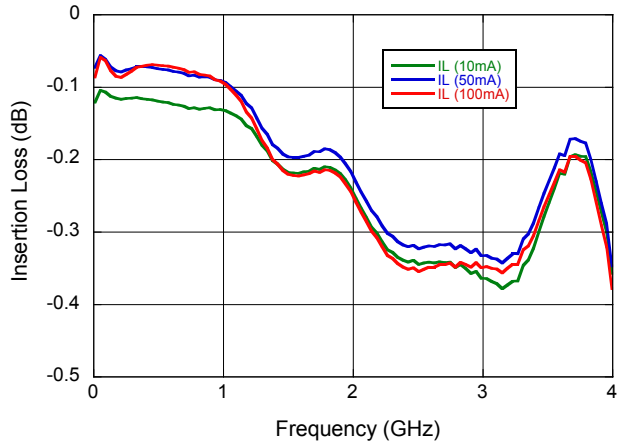
Input Return Loss



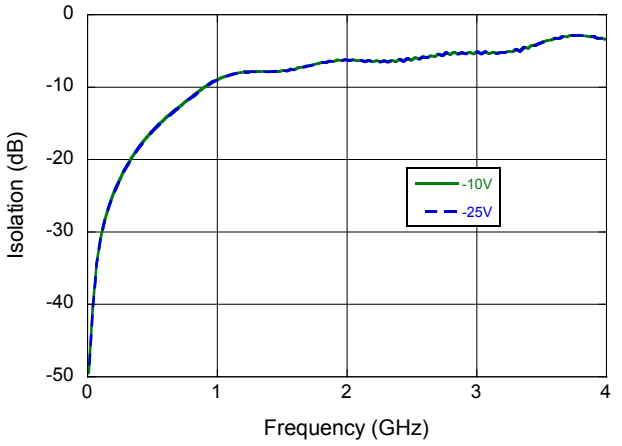
Output Return Loss



Insertion Loss



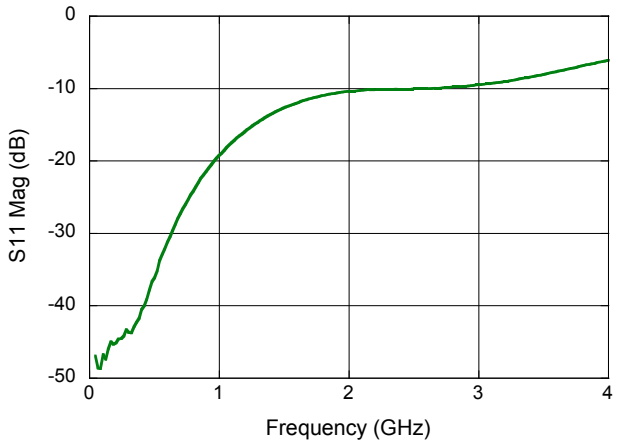
Isolation



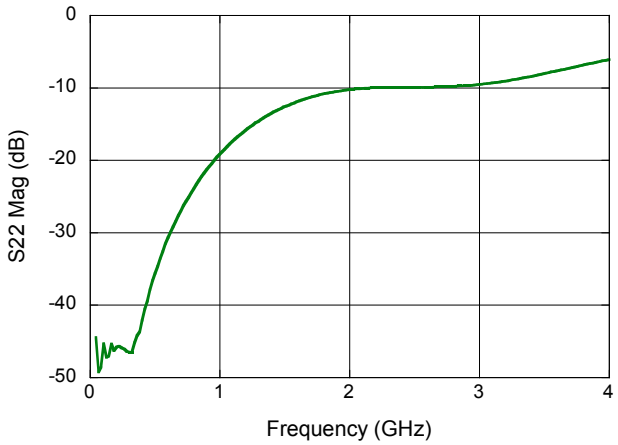
Typical RF Performance Curves (50 – 4000 MHz)

MOUNTED IN A SHUNT CONFIGURATION

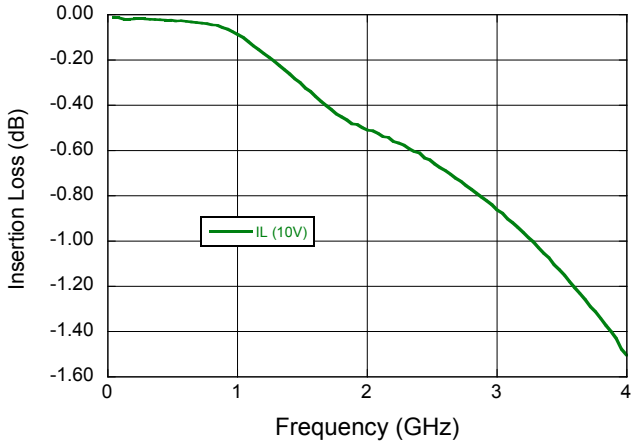
Input Return Loss



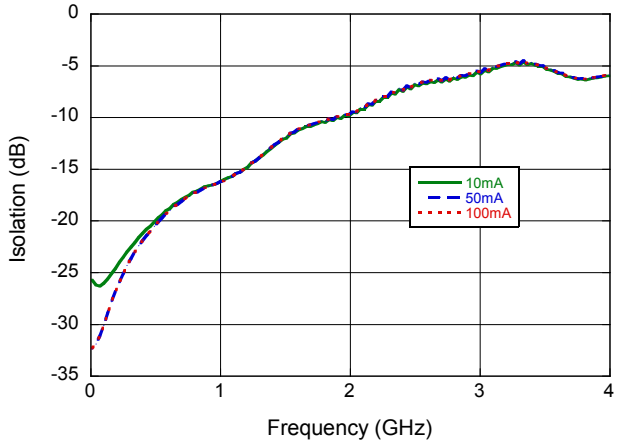
Output Return Loss



Insertion Loss

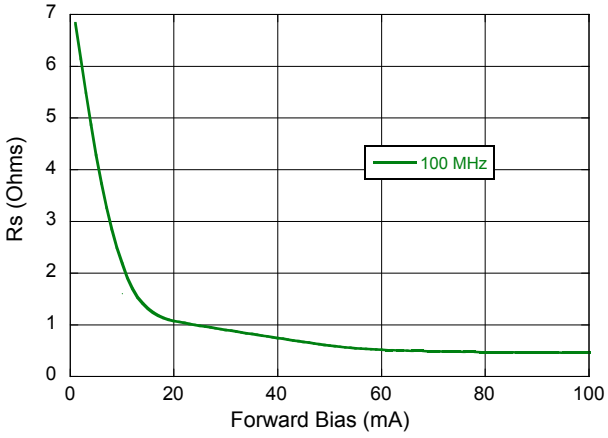


Isolation

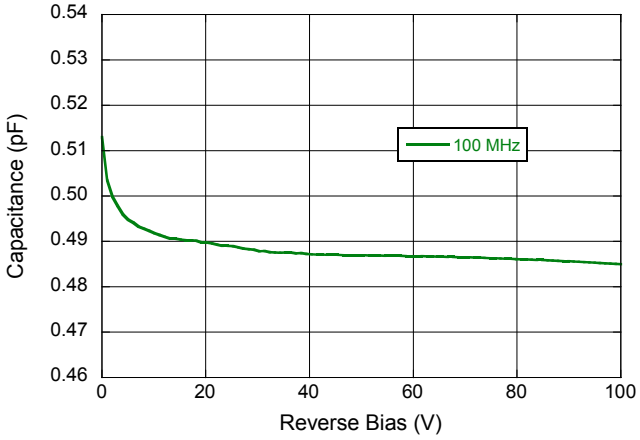


Typical DC Performance Curves

Series Resistance vs. Forward Current



Capacitance vs. Reverse Voltage



Cleanliness and Storage

MELF devices should be handled and stored in a clean environment. The metalized ends of the device are tin plated for greater solderability and any continuous exposure to high humidity (>80%) for extended periods of time may cause the surface to oxidize. Caution should be taken when storing devices for extended intervals.

Mounting Techniques - Solder Attach

Typical wave soldering or reflow techniques may be used to mount MELF packages to circuit boards using Sn63/Pb37 alloy or any RoHS compliant solder. For more information visit the MACOM website and read application note M538.

Note:
Click links below to view datasheets of other MELF packaged PIN diodes and to compare them to the MA4P504-1072.

PACKAGED_PIN_DIODES
and/or
MA4P MELF & HIPAX Series

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

MACOM:
MA4P504-1072T