

Package Style 1072

Features

- ◆ Non-Magnetic Package for MRI Applications
- ◆ Rectangular MELF Ceramic Package
- ◆ Hermetically Sealed
- ◆ RoHS Compliant

Description

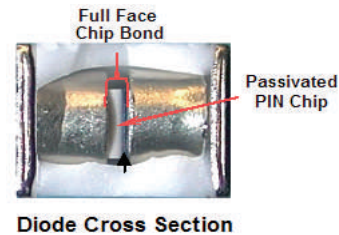
The MADP-011034-10720T is a surface mount PIN diode in a non-magnetic Metal Electrode Leadless Faced (MELF) package. The MADP-011034-10720T is manufactured using M/A-COM Technology Solutions time proven HIPAX technology. The result is a low inductance ceramic package with no ribbons or wires. The package utilizes a unique non-magnetic plating process that provides for a hermetically sealed component that has extremely low electromagnetic permeability. Incorporated in the package is a glass passivated CERMA chip that is full face bonded on the cathode and anode which maximizes the surface contact area to minimize the electrical and thermal resistances. The chip and package have been comprehensively characterized both electrically and mechanically to ensure repeatable and predictable performance.

Application

The MADP-011034-10720T is designed for circuit protection and the tuning of RF coil designs in MRI applications. When connected in an anti-parallel configuration these PIN diodes provide excellent protection from long RF pulses and transient voltage spikes.

Designed for Automated Assembly

This easy to use package design makes automatic pick and place, indexing and assembly, extremely easy. The parallel flat surfaces are well suited for most key jaw or vacuum pick-up techniques. All of the solderable surfaces are tin plated and compatible with industry standard reflow and vapor phase soldering processes.



Absolute Maximum Ratings^{1,2,3} @ 25°C

Parameter	Absolute Maximum
Reverse DC & AC Voltage ^{1,2}	-150 V
D.C. Forward Current ^{1,2}	0.5 A
Peak A.C. Forward Surge Current (8.3 ms Single Half Sine Wave) ^{1,2}	2.5 A
C.W. Power Dissipation ^{1,2,3}	6.0 W
Operating Temperature ^{1,2}	-65°C to +150°C
Storage Temperature ^{1,2}	-65°C to +175°C
Mounting Temperature ^{1,2}	+260°C for 30 s

1. Exceeding these limits may cause permanent damage
2. Values will de-rate over temperature.
3. Infinite Heat Sink, de-rate to 0W @ +175 °C , by -40mW/°C from 25°C to +175 °C

RoHS

The MADP-011034-10720T is fully RoHS compliant meaning that it contains less than the maximum allowable concentration of 0.1% by weight for lead, PBB, PBDE, and 0.01% of cadmium and hexavalent chromium at raw homogeneous materials level. There is less than 100ppm of mercury and no mercury was intentionally added to the component.

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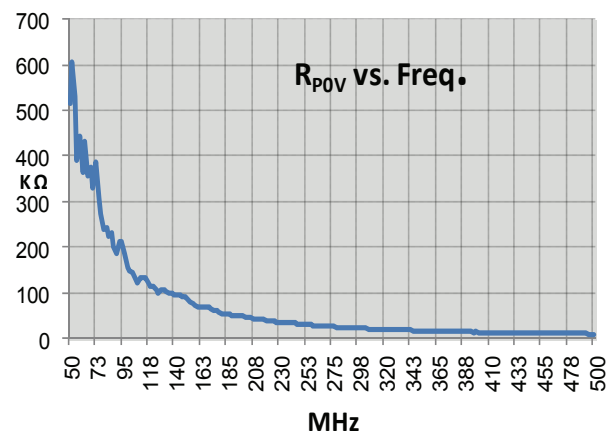
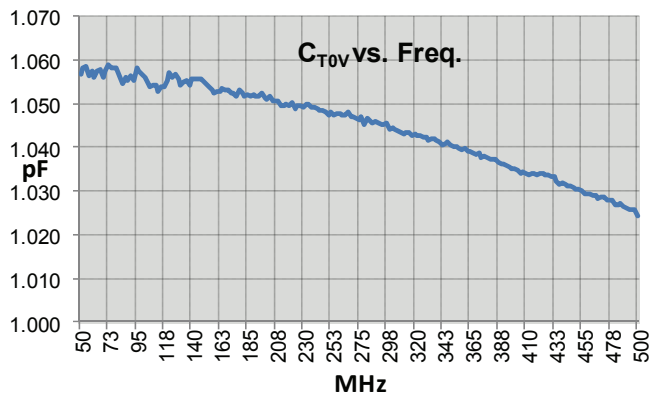
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Electrical Specifications @ T_{AMB} = +25°C

Parameter	Units	Conditions	Min	Typ	Max
-V _B	V	-10μA	-100	-150	
V _F	V	10mA		0.8	0.9
V _F	V	100mA		0.9	1.0
V _F	V	1000mA		1.1	1.3
-I _R	nA	V _r = -20V		-10	-20
-I _R	nA	V _r = -50V		-20	-100
C _T	pF	V _R = 0V / Freq. = 1 MHz		1.0	1.5
R _P	KΩ	V _R = 0V / Freq. = 64 MHz	100	400	
G _p	μS	V _R = 0V / Freq. = 64 MHz		2.5	10
R _S	Ω	I _F = 10mA / Freq. = 100 MHz		0.4	0.5
T _L	nS	I _F = 10mA / I _R = -6mA		300	500
I region Thickness	μm			11	
C.W. Power Dissipation	W	Infinite Heatsink		6.0	6.0
C.W. Thermal Resistance	°C/W			25	30

Typical Performance at Ambient = +25°C



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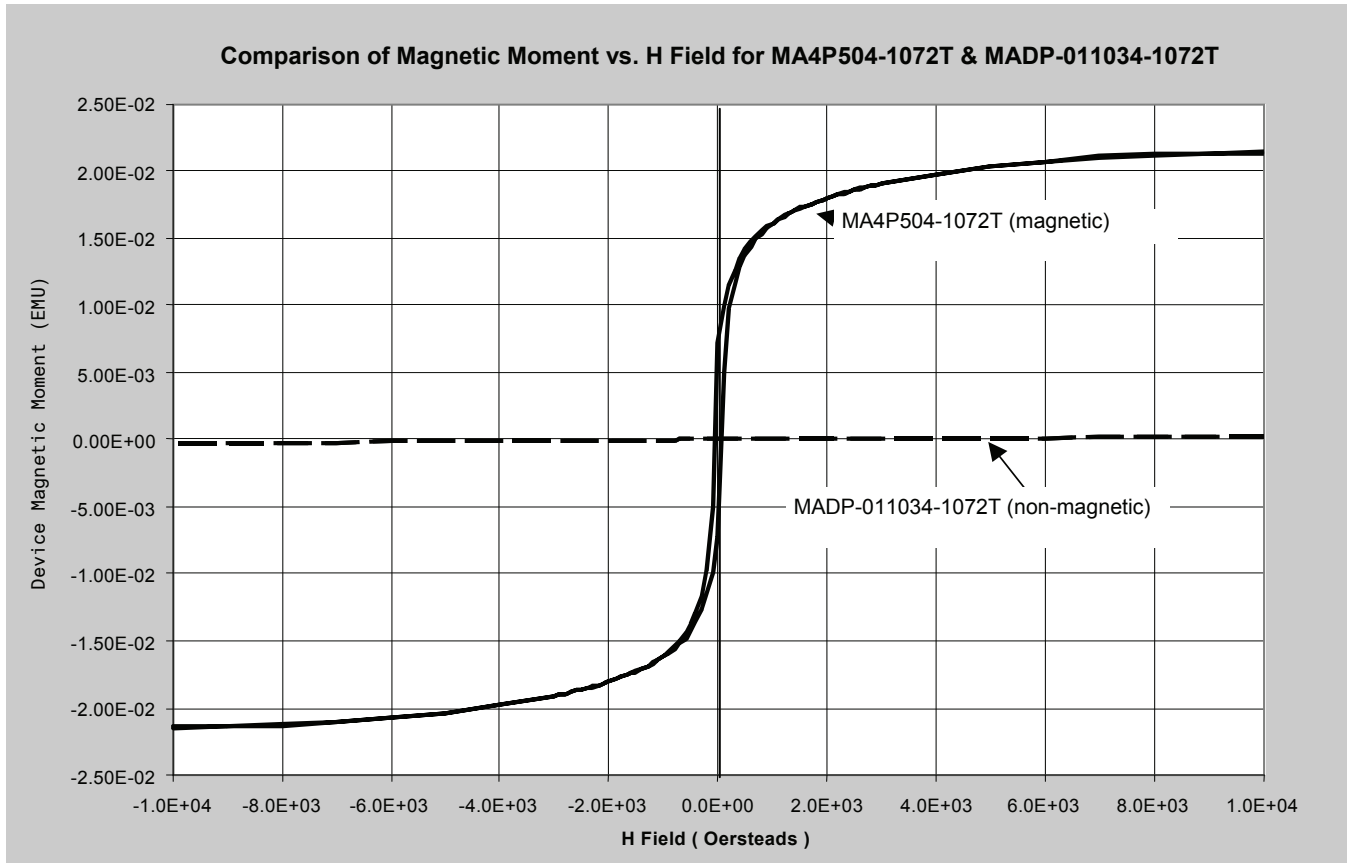
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Typical Non-Magnetic Performance



Magnetic Property	MADP-011034-1072T	MA4P504-1072T
Saturation Moment (EMU) @ H = H _{MAX} Oersteads	2.3 x E-4	2.1 x E-2
Remanance Moment (EMU)@ H = 0 Oersteads	4.2 x E-8	7.1 x E-3
Coercivity (Oersteads)@ EMU = 0 Moment	1	59.2

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Cleanliness and Storage

- ◆ These devices should be handled and stored in a clean environment.
- ◆ Ends of the device are tin plated for greater solderability.
- ◆ Continuous exposure to high humidity (>80%) for extended periods may cause the surface to oxidize. Caution should be taken when storing devices for long periods.

ESD

- ◆ These devices are susceptible to ESD and are rated Class 0, HBM.

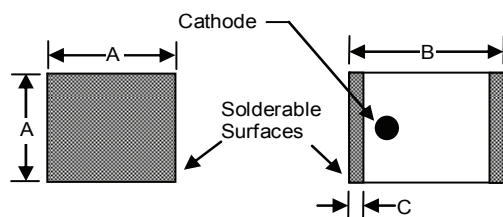
General Handling

- ◆ Device can be handled with tweezers or vacuum pickups and are suitable for use with automatic pick-and-place equipment.

MELF Assembly Recommendations

- ◆ Devices may be soldered using standard 60Sn/40Pb or RoHS compliant solders. MELF devices are plated bright tin, 50 µm minimum thickness, to ensure an optimum connection.

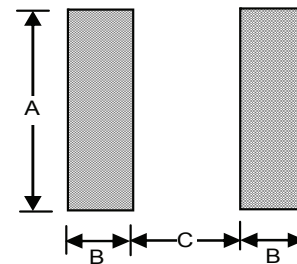
1072 Package Dimensions



Case Style	Size Inches (mm)		
	A (sq) Min./Max.	B Min./Max.	C Min./Max.
1072	0.080/0.095 (2.032/2.413)	0.115/0.135 (2.921/3.429)	0.008/0.030 (.203/.762)

All tolerances are ± .001" (± .025 mm).

Circuit Pad Layout



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

Ordering Information

(Diodes are available in tape and reel in quantities shown below)

Part Number	Quantity (7" Reel)
MADP-011034-10720T	1500

Tape and reel information can be found on the M/A-COM Technology Solutions website at :
<http://www.macom.com/Application%20Notes/pdf/M513.pdf>

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