

Non-Magnetic MELF PIN Diode

Rev. V1

Features

- Non-Magnetic Package Suitable for MRI Applications
- Rectangular MELF SMQ Ceramic Package
- Hermetically Sealed
- RoHS Compliant* and 260°C Reflow Compatible

Description

The MADP-000235-10720T is a surface mountable PIN diode in a non-magnetic **M**etal **E**lectrode **L**eadless **F**aced (MELF) package. MADP-000235-10720T incorporates M/A-COM's time proven HIPAX technology to produce a low inductance ceramic package with no ribbons or wires. The package utilizes M/A-COM's unique non- magnetic plating process that provides for a hermetically sealed package with extremely low permeability. Incorporated in the package is a passivated PIN diode chip that is full face bonded on both the cathode and anode to maximize the surface contact area for lower electrical and thermal resistance. The chip and package have been comprehensively characterized both electrically and mechanically to ensure repeatable and predictable performance.

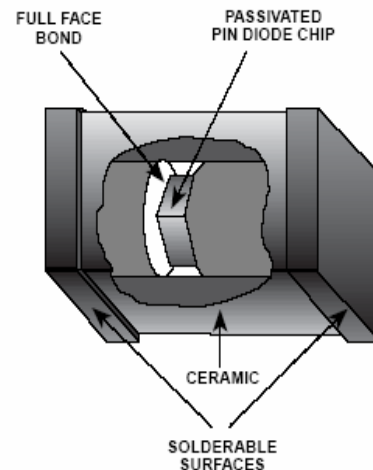
Application

The MADP-000235-10720T is designed for circuit protection and tuning of RF coil designs in MRI applications. When connected in an anti-parallel configuration these PIN diodes provide protection from

Designed for Automated Assembly

This SMQ PIN diode has been designed for high volume tape and reel assembly. The rectangular package design provides for highly efficient automatic pick and place assembly techniques. The parallel flat surfaces are suitable for key jaw or vacuum pickup techniques. All solderable surfaces are tin plated and compatible with most reflow and vapor phase soldering methods.

MELF Internal Construction



Absolute Maximum Ratings^{1,2} @ 25°C

Parameter	Absolute Maximum
Reverse Voltage	-35 V
Forward Current	1.5 A
Operating Temperature	-55°C to +150°C
Storage Temperature	-55°C to +175°C

1. Exceeding these limits may cause permanent damage to the device.
2. Values will re-rate over temperature.

* Restrictions on Hazardous Substances, European Union Directive 2002/95/EC.

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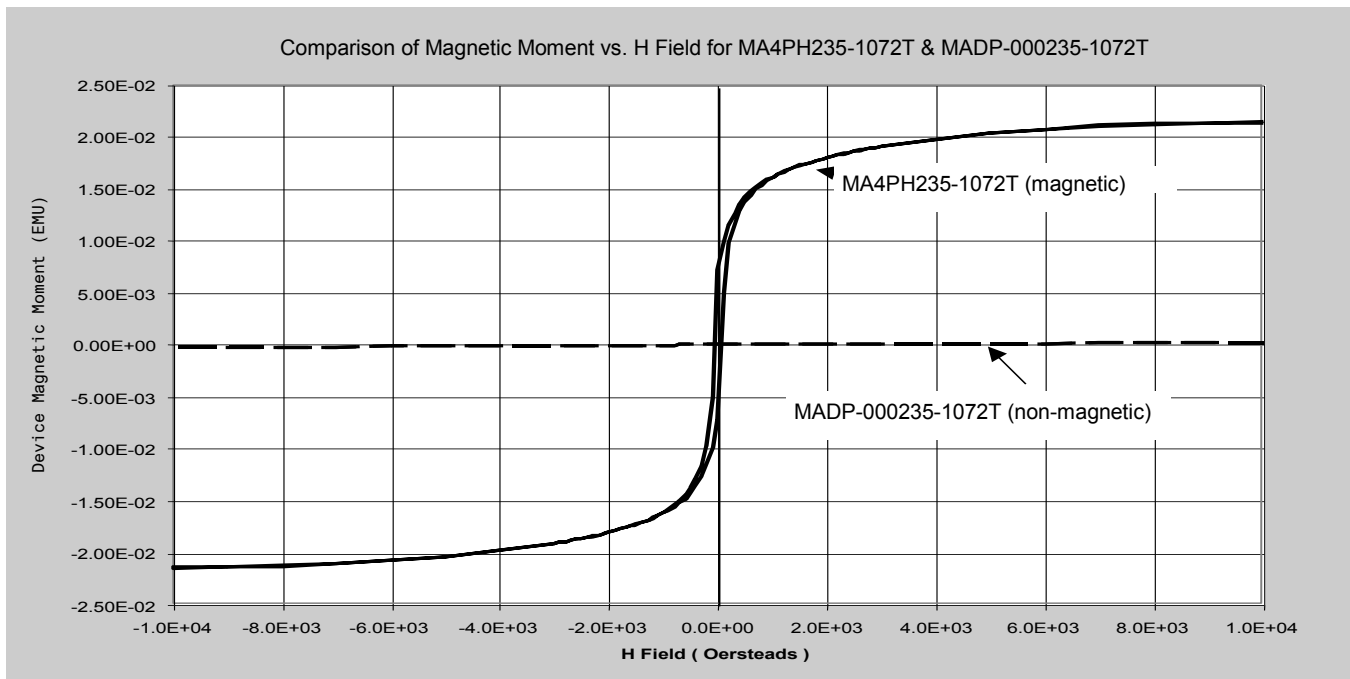
Electrical Specifications @ $T_{AMB} = +25^{\circ}\text{C}$

Part Number	Min. ³ Rev. Volt. $V_R @ 10\mu\text{A}$	Max. ⁴ Capacitance $C_t @ 10\text{V}$	Max. Series Res. $R_s @ 10\text{mA}$ $f = 100\text{MHz}$	Min. Parallel Res. $R_P @ 0\text{V}$ $f = 100\text{MHz}$	Thermal Resistance	Power Dissipation Rating	Nom. Characteristics	
	Volts	pF	Ω	Ω	$^{\circ}\text{C/W}$	Watts	Carrier ⁵ Lifetime μS	I-Region Width Mils
MADP-000235-10720T	35	1.2	0.5	5K	20	7.5	0.3	0.4

Notes:

3. The minimum specified V_R (Reverse Voltage) is sourced and the resultant reverse leakage current, I_r , is measured to be $<10\mu\text{A}$.
 4. Capacitance is specified at 1MHz.
 5. Nominal carrier life time specified with diode biased at $I_F = +10\text{mA}$, $I_{REV} = -6\text{mA}$

Typical Non-Magnetic Performance



Magnetic Property	MADP-000235-1072T	MA4PH235-1072T
Saturation Moment (EMU) @ $H = H_{MAX}$ Oersteds	2.3×10^{-4}	2.1×10^{-2}
Remanance Moment (EMU) @ $H = 0$ Oersteds	4.2×10^{-8}	7.1×10^{-3}
Coercivity (Oersteds) @ 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 2, HBM.

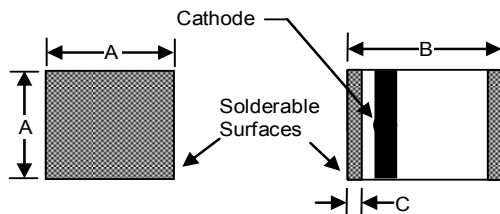
General Handling

- ◆ 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 tin plated 50 μ M thick to ensure an optimum connection.
- ◆ For recommended Sn/Pb and RoHS soldering profiles See Application Note [M538](#) on the M/A-COM website.

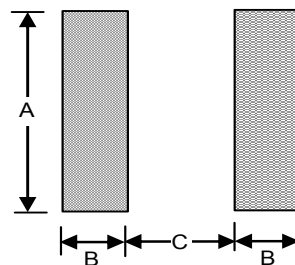
1072 Package Dimensions



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 $\pm .001"$ ($\pm .025$ 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)

Package Style	Quantity 7" Reel
1072T	1500

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

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