

Non Magnetic MELF PIN Diode

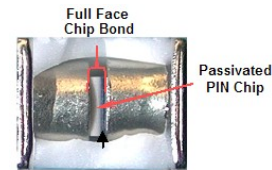
Rev. V2

Features

- ◆ Non– Magnetic MELF Ceramic Package
- ◆ Hermetically Sealed
- ◆ Low R_s for Low Series Loss
- ◆ Low C_j for High Series Isolation
- ◆ High Average Incident Power Handling
- ◆ RoHS Compliant



1072



Diode Cross Section

Description

The MADP-000404-10720T is a non-magnetic surface mount PIN diode in a **Metal Electrode Leadless Faced (MELF)** package. The device incorporates M/A-COM Technology Solutions time proven HIPAX technology to produce a low inductance ceramic package with no ribbons or whisker wires. The diode construction includes a hard glass passivated, CERMACHIP™ that is full face bonded on both the cathode and anode to maximize surface area for the lowest possible electrical and thermal resistance. This device has been comprehensively characterized electrically and mechanically to ensure repeatable and predictable performance.

Applications

The MADP-000404-10720T is well suited for use in low loss, low distortion high power switching circuits in high magnetic field environments from HF through UHF frequencies. The low thermal resistance of this device provides excellent performance at high, incident RF power levels. This device is designed to meet the most rigorous electrical and mechanical requirements of MRI testing environments

Designed for Automated Assembly

MELF PIN diodes are 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. All solderable surfaces are tin plated and compatible with all oven reflow and vapor phase soldering methods.

Absolute Maximum Ratings¹ @ 25°C

Parameter	Absolute Maximum
Operating Temperature	-65 °C to +125°C
Storage Temperature	-65 °C to +150°C
Diode Junction Temperature	+175 °C Continuous
Diode Mounting Temperature	+265°C for 10 seconds
Forward D.C. Current	+ 250 mA
Reverse D.C. Voltage @ -1μA	250V

1. Exceeding these limits may cause permanent damage.

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Electrical Specifications @ +25 °C

Parameter	Symbol	Condition	Unit Value
Forward Voltage (Maximum)	V_F	$I_F = +100 \text{ mA}$	$1.0 V_{DC}$
Voltage Rating (Minimum)	V_R	$I_r = 1 \mu\text{A}$	$250 V_{DC}$
Total Capacitance (Maximum)	C_T	$-50 \text{ V @ } 1 \text{ MHz}$	0.6 pF
Series Resistance (Maximum)	R_S	$+50 \text{ mA @ } 100 \text{ MHz}$	$.7 \text{ Ohms}$
Carrier Lifetime (Nominal)	τ_L	$+6 \text{ mA} / -10 \text{ mA @}$ $(50\% - 90\% \text{ Voltage})$	$1.0 \mu\text{s}$
I-Region Length (Nominal)	μm	-	$30 \mu\text{m}$
Thermal Resistance (Maximum)	θ	-	20°C/W
Reverse Recovery Time (Nominal)	nS	$I_F = +20\text{mA} , I_{REV} = -200\text{mA}.$	100

Environmental Capability

MELF devices are appropriate for use in industrial and military applications and can be screened to meet the environmental requirements of MIL-STD-750, MIL-STD-202 as well as other military standards. The table below lists some of the MIL-STD 750 tests the device is designed to meet.

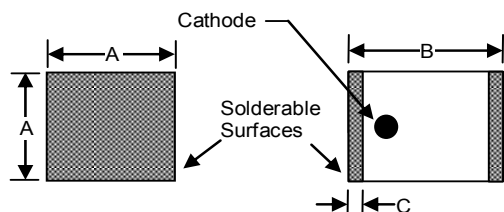
Test	Method	Description
High Temperature Storage	1031	$+150^\circ\text{C}$, for 340 Hours
Temperature Shock	1051	-65°C to $+150^\circ\text{C}$, 20 Cycles
HTRB	1038	80% of rated V_B , $+150^\circ\text{C}$, for 96 Hours
Moisture Resistance	1021	No Initial Conditioning, 85% RH, $+85^\circ\text{C}$
Gross Leak	1071 Cond. E	Dye Penetrant Visual
Vibration Fatigue	2046	20,000G's, 60Hz, x, y, z axis
Solderability	2026	Test Temperature = $+245^\circ\text{C}$

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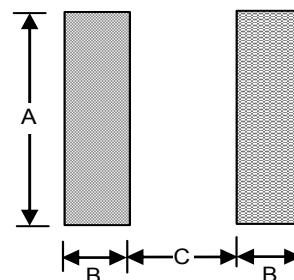
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Mechanical Outline

1072 MELF Surface Mount Package



Circuit Pad Layout for 1072 MELF



Dimension	INCHES		MM	
	MIN.	MAX.	MIN.	MAX.
A	0.080	0.095	2.032	2.413
B	0.115	0.135	2.921	3.429
C	0.008	0.030	0.203	0.762

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

Ordering Information

Part Number	Package	Quantity per Reel
MADP-000404-10720T	Tape and Reel	1500pcs

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