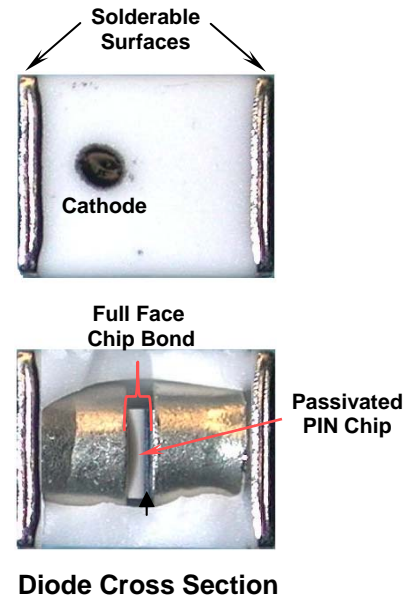


### Features

- ◆ Non-Magnetic Package Suitable for MRI Applications
- ◆ Rectangular MELF SMQ Ceramic Package
- ◆ Low  $R_s$  for Low Series Loss
- ◆ Longer  $\tau_L$  for Low Inter-Modulation Distortion
- ◆ High Average Incident Power Handling
- ◆ RoHS Compliant

### Description and Applications

The MA4P7435NM-1091T is a surface mountable PIN diode in a non-magnetic, Metal Electrode Leadless Faced (MELF) package. The device incorporates M/A-COM Technology's proven HIPAX technology to produce a low inductance ceramic package with no ribbons or whisker wires. The package utilizes M/A-COM Technology's new non-magnetic plating process to provide an extremely low magnetic permeability, hermetically sealed package. Incorporated in the package is a glass passivated PIN chip that is full face bonded on both the cathode and anode to maximize surface area for lower series and thermal resistance. The MA4P7435NM-1091T has been comprehensively characterized both electrically and mechanically to ensure repeatable and predictable performance. The diode is well suited for use in low loss, low distortion, high power switching circuits and is especially designed for use in high magnetic field environments from HF through UHF frequencies. The low thermal resistance of this device also provides excellent performance at high incident RF power levels. This device has been designed to perform well in the most rigorous electrical and mechanical MRI environments.



### Designed for Automated Assembly

These SMQ PIN diodes are designed for high volume tape and reel assembly. The rectangular package design provides for ease of use in most automatic pick and place assembly operations. The parallel flat surfaces are suitable for key jaw or vacuum pickup techniques. All solder able surfaces are tin plated and compatible with reflow and vapor phase soldering methods.

### Absolute Maximum Ratings<sup>1</sup> @ 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
RF C.W. Incident Power	+ 60 dBm C.W.
Forward D.C. Current	+500mA
Reverse D.C. Voltage @ -10µA	-1100V

1. Exceeding these limits may cause permanent damage.

### Electrical Specifications @ T<sub>AMB</sub> = +25°C

Test Parameters	Symbol	Units	Conditions	Min.	Typ.	Max.
Total Capacitance	C <sub>T</sub>	pF	1MHz / 100V	-	-	3.0 <sup>1</sup>
Series Resistance	R <sub>S</sub>	Ω	63.6MHz / 100mA	-	-	0.30 <sup>2,3</sup>
Series Resistance	R <sub>S</sub>	Ω	63.6MHz / 200mA	-	-	0.25 <sup>2,3</sup>
Series Resistance	R <sub>S</sub>	Ω	63.6MHz / 300mA	-	-	0.20 <sup>2,3</sup>
Parallel Resistance	R <sub>p</sub>	Ω	63.6MHz / 0V	4K	-	-
Forward Voltage	V <sub>F</sub>	V	+100mA	-	.9	1.0
Reverse Current	I <sub>R</sub>	nA	-1100	-	-	50
Carrier Lifetime <sup>4</sup>	T <sub>L</sub>	μS	I <sub>F</sub> 10mA / I <sub>R</sub> 6mA	10	14	-
Thermal Resistance	θ	°C/W	-	-	3	5

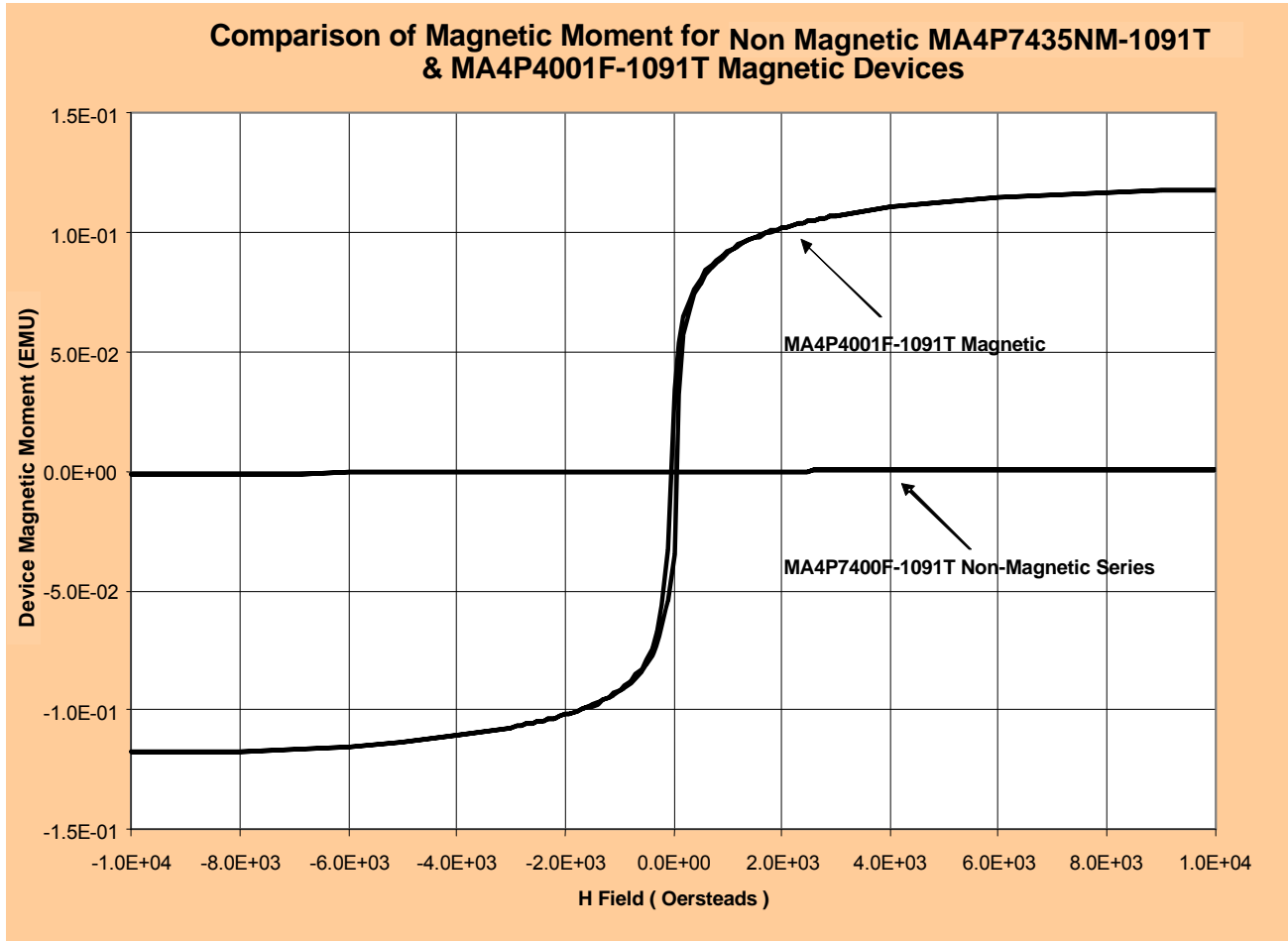
1. Total capacitance is equivalent to the sum of the chip junction capacitance C<sub>j</sub> plus package parasitic capacitance .
2. Series resistance R<sub>S</sub> is the sum of the chip to package contact resistance plus junction resistance R<sub>j</sub>.
3. R<sub>s</sub> is measured on an HP4291A .
4. Measured from 50% of control voltage to 90% of output voltage

### Environmental Capability

MELF devices are applicable for use in commercial and military applications and are designed 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 typical MIL-STD 750 tests the devices are designed to meet .

MIL-STD-750		
Test	Method	Description
High Temperature Storage	1031	+150°C, for 340 Hours
Temperature Shock	1051	-65°C to +125°C, 20 Cycles
HTRB	1038	880V, +150°C, for 96 Hours
Moisture Resistance	1021	No Initial Conditioning, 85% RH, +85°C
Gross Leak	1071 Cond. E	Dye Penetrant Visual
Vibration Fatigue	2046	20,000G's, 60 Hz, x, y, z axis
Solderability	2026	Test Temperature = +245°C

### Typical Non-Magnetic Performance



**Table 1 - Typical Magnetic Properties**

**Non Magnetic MA4P7435NM-1091T  
vs.  
Magnetic MA4P4001F-1091T**

Magnetic Property	MA4P7435NM-1091T Value	MA4P4001-1091T Value
Saturation Moment (EMU) @ H = H <sub>MAX</sub> Oersteds	1.0 x E-3	1.2 x E-1
Remanance Moment (EMU) @ H = 0 Oersteds	1.5 x E-6	3.4 x E-2
Coercivity (Oersteds) @ EMU = 0 Moment	3.0	51.3

3

**ADVANCED:** Data Sheets contain information regarding a product M/A-COM Technology Solutions is considering for development. Performance is based on target specifications, simulated results, and/or prototype measurements. Commitment to develop is not guaranteed.

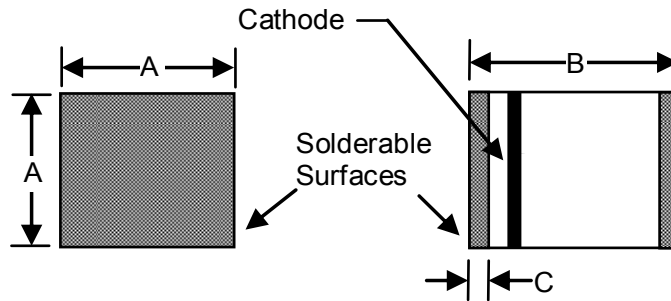
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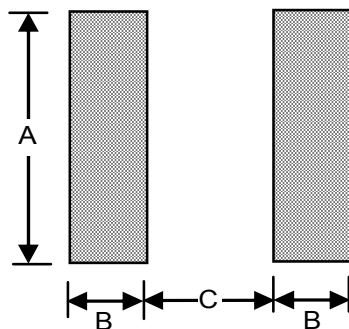
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### Mechanical Outline



Case Style 1091 Dimensions in Inches (mm)		
A Square Min. / Max.	B Min. / Max.	C Min. / Max.
0.138 / 0.155 (3.50 / 3.94)	0.180 / 0.200 (4.57 / 5.08)	0.008 / 0.030 (.203 / .762)

### Circuit Pad Layout



Dimension	Package Style 1091	
	inches	mm
A	0.150	3.81
B	0.050	1.27
C	0.100	2.54

### Ordering Information

Part Number	Package
MA4P7435NM-1091T	Tape and Reel (500pcs/reel)