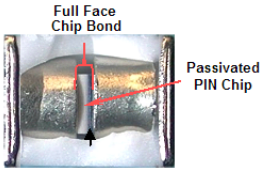
MADP-007417-10720T

SMQ HIPAX PIN Diode

V2

1072



Diode Cross Section

Features

- RoHS Compliant
- Rectangular MELF SMQ Ceramic Package
- Low Rs for Lower Series Loss
- Long τ_L for Low Intermodulation Distortion
- Low Cj for High Series Isolation
- High Average Incident Power Handling Capability

Description and Applications

The MADP-007417-10720T is a surface mountable 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. Incorporated in the package is a fully passivated PIN diode chip that is full face bonded on both the cathode and anode to maximize surface area for low electrical and thermal resistance. The MADP-007417-10720T 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, and high power switching circuits. The low thermal resistance of this device provides excellent high average performance at RF power incident levels up to 200 watts CW. This device is designed to meet the most rigorous electrical and mechanical requirements.

Designed for Automated Assembly

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

Absolute Maximum Ratings[1] @ +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	+53dBm C.W.
Forward D.C. Current	+150mA
Reverse D.C. Voltage @ -10 uA	-1000V

1. Exceeding these limits may cause permanent damage.

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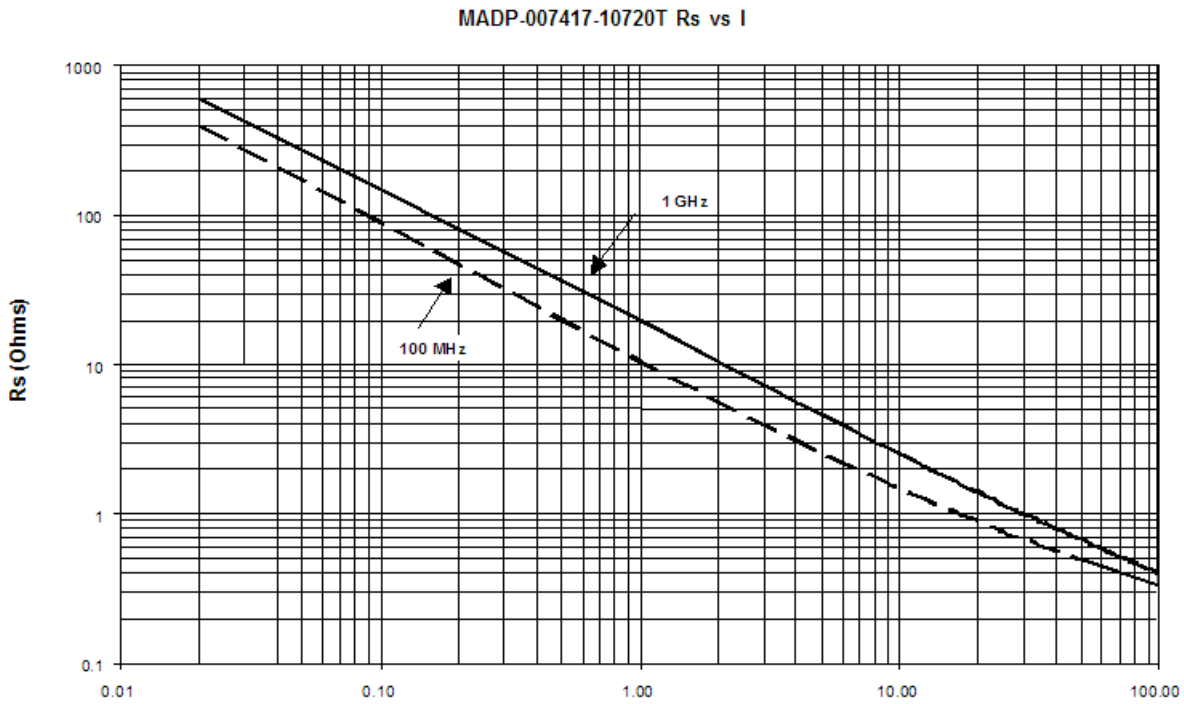
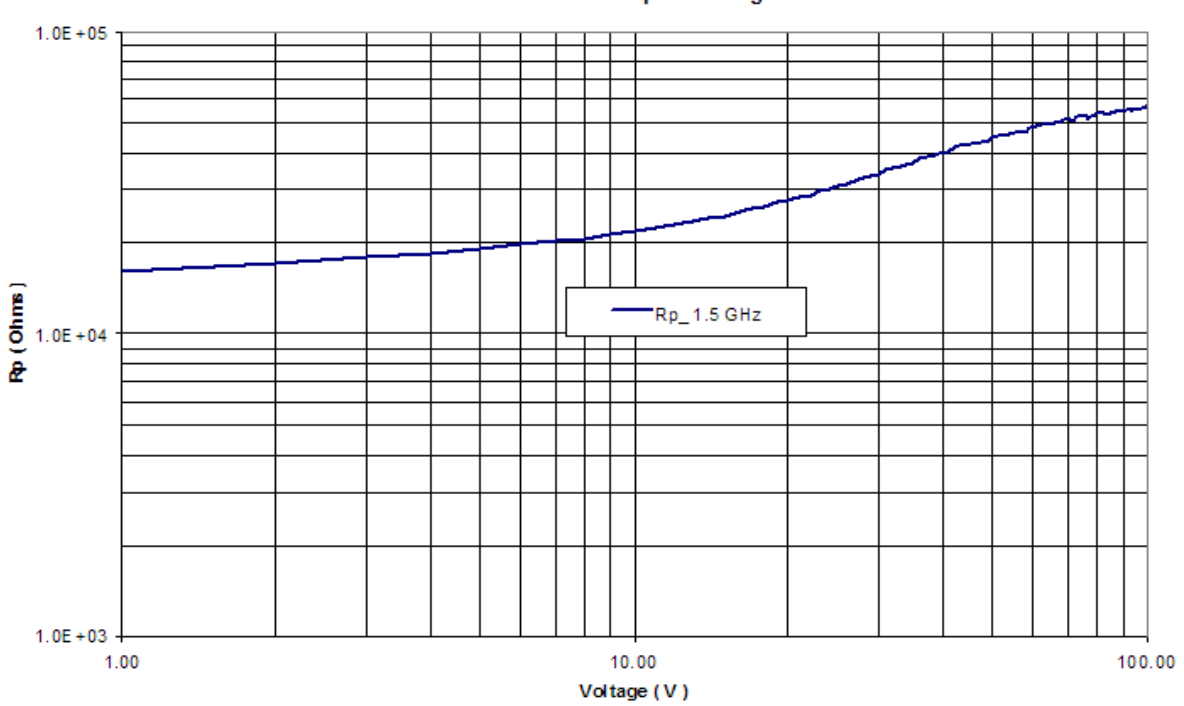
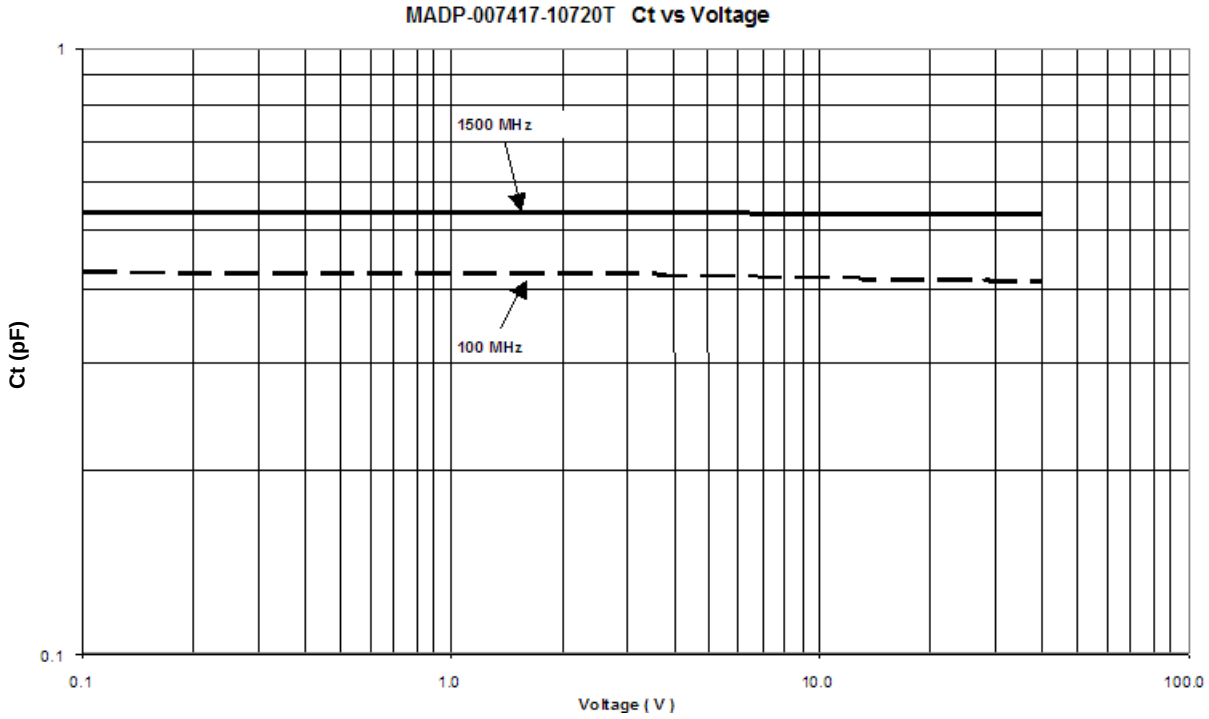
• **India** Tel: +91.80.43537383 • **China** Tel: +86.21.2407.1588
Visit www.macomtech.com for additional data sheets and product information.

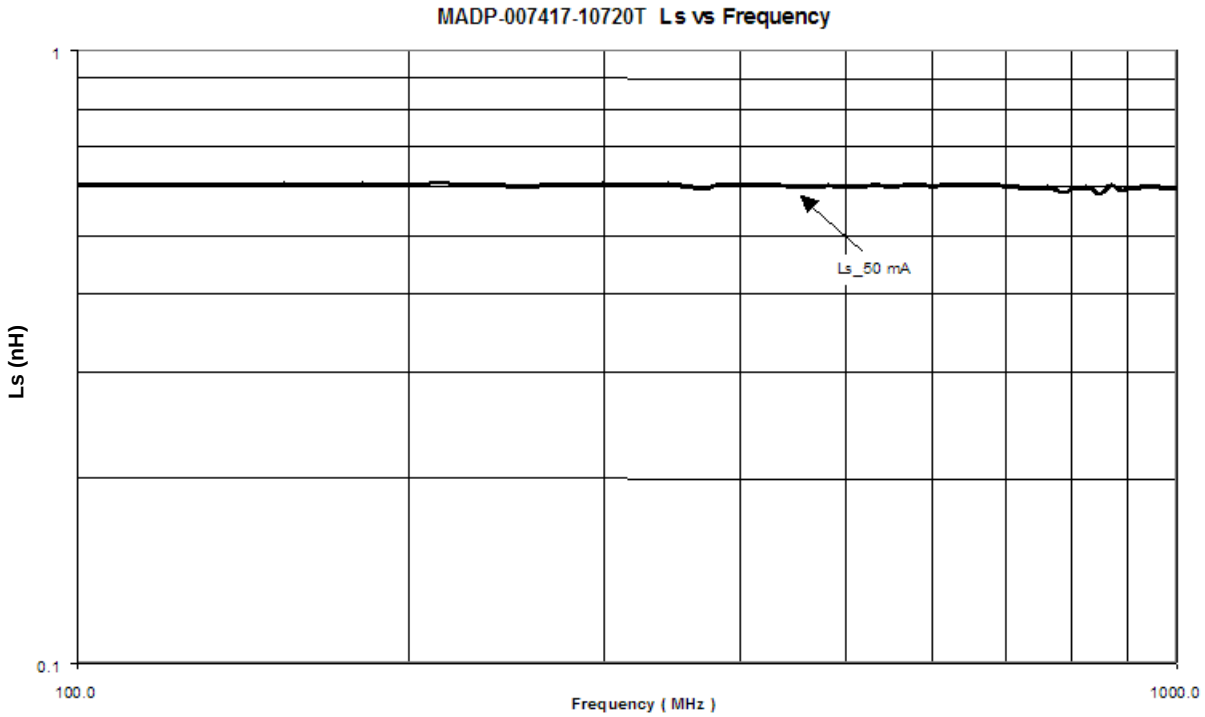
Typical Electrical Performance





Typical Electrical Performance





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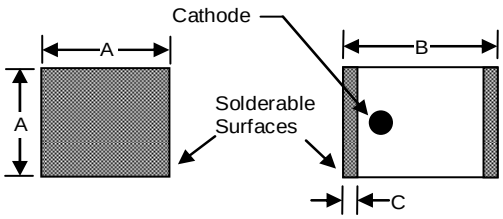
Electrical Specifications @ +25 °C

Parameter	Symbol	Condition	Unit Value
Forward Voltage (Maximum)	V_F	I_F = +100mA	1.0V_{DC}
Voltage Rating (Minimum)	V_R	Ir = -10uA	1000 V_{DC}
Total Capacitance (Maximum)	C_T	-100V @ 100MHz	0.7pF
Series Resistance (Maximum)	R_S	+100mA @ 100MHz	0.8 Ohms
Parallel Resistance (Minimum)	R_P	-10V @ 100MHz	50K Ω
Carrier Lifetime (Nominal)	τ_L	+6mA / -10mA @ (50% - 90% Voltage)	6.5 µs
I-Region Length (Nominal)	µm	-	140 µm
C.W. Thermal Resistance (Maximum)	θ	I_H = 1A, I_L = 10mA, T = 1mS	13°C/W
Power Dissipation in Free Air (Maximum)	W	I_F = +100mA	4W
Power Dissipation with Diode Case at $T_{ambient}$ (Maximum)	P_D	I_F = +100mA	12W

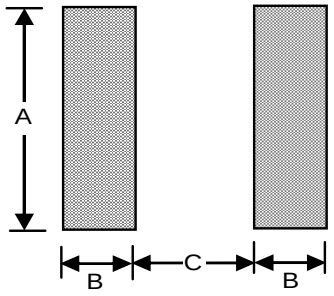
1072 MELF Surface Mount Package



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

Circuit Pad Layout for 1072 MELF

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



Environmental Capability

HIPAX devices are applicable 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.

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	80% of rated V_B, +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	20,000 G's, 60 Hz, x, y, z axis
Solderability	2026	Test Temperature = +245 °C

Ordering Information

Part Number	Package	Quantity
MADP-007417-10720T	Tape and reel	**1500ps**