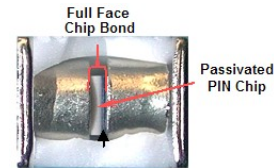


### Features

- RoHS Compliant
- Rectangular MELF SMQ Ceramic Package
- Low  $R_s$  for Lower Series Loss
- Long  $\tau_L$  for Low Intermodulation Distortion
- Low  $C_j$  for High Series Isolation
- High Average Incident Power Handling Capability



1072



Diode Cross Section

### 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

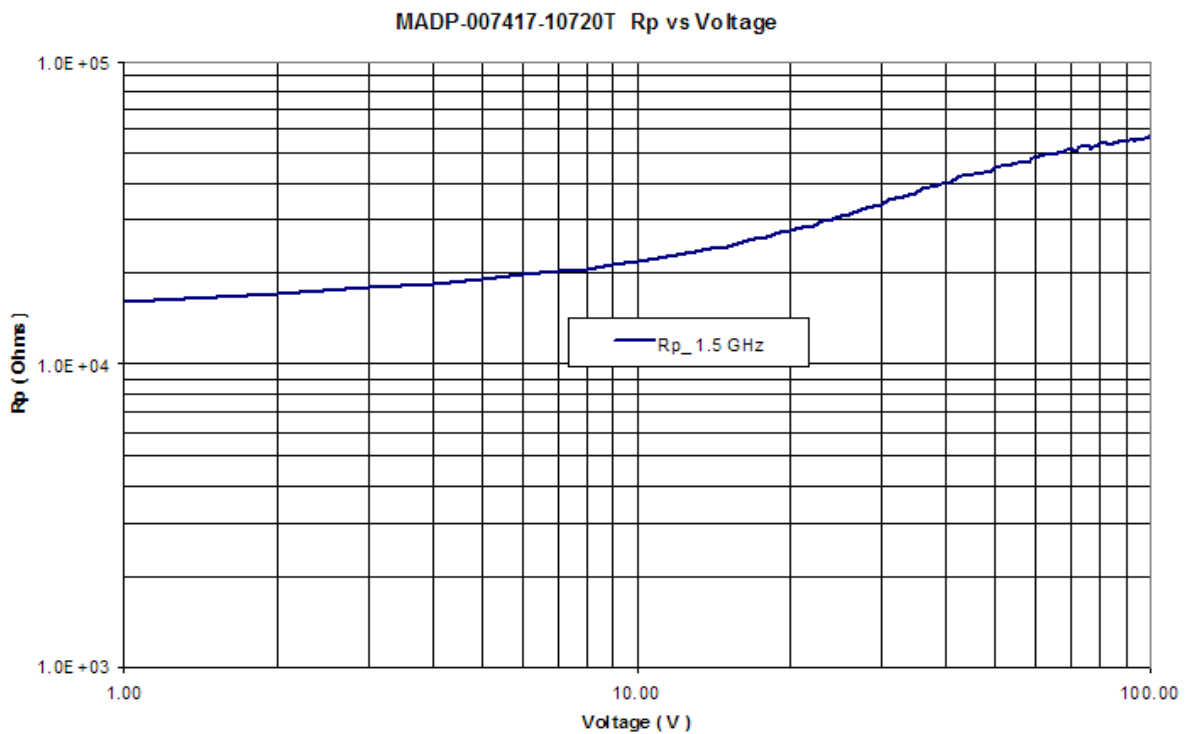
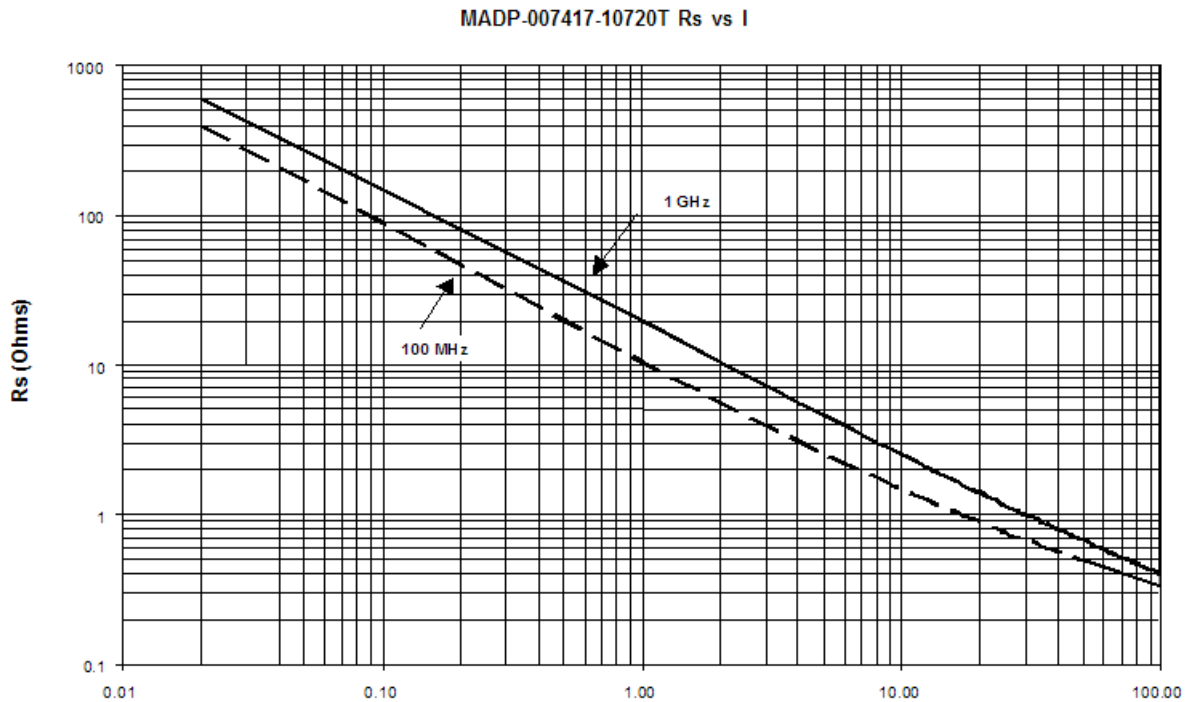
SMQ HIPAX PIN diodes are designed for high volume tape and reel assembly. The rectangular package design provides for a highly efficient means for automatic pick and place assembly. The parallel flat surfaces are suitable for key jaw or vacuum pickup techniques. All solderable surfaces are tin plated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

### Absolute Maximum Ratings<sup>1</sup> @ +25°C

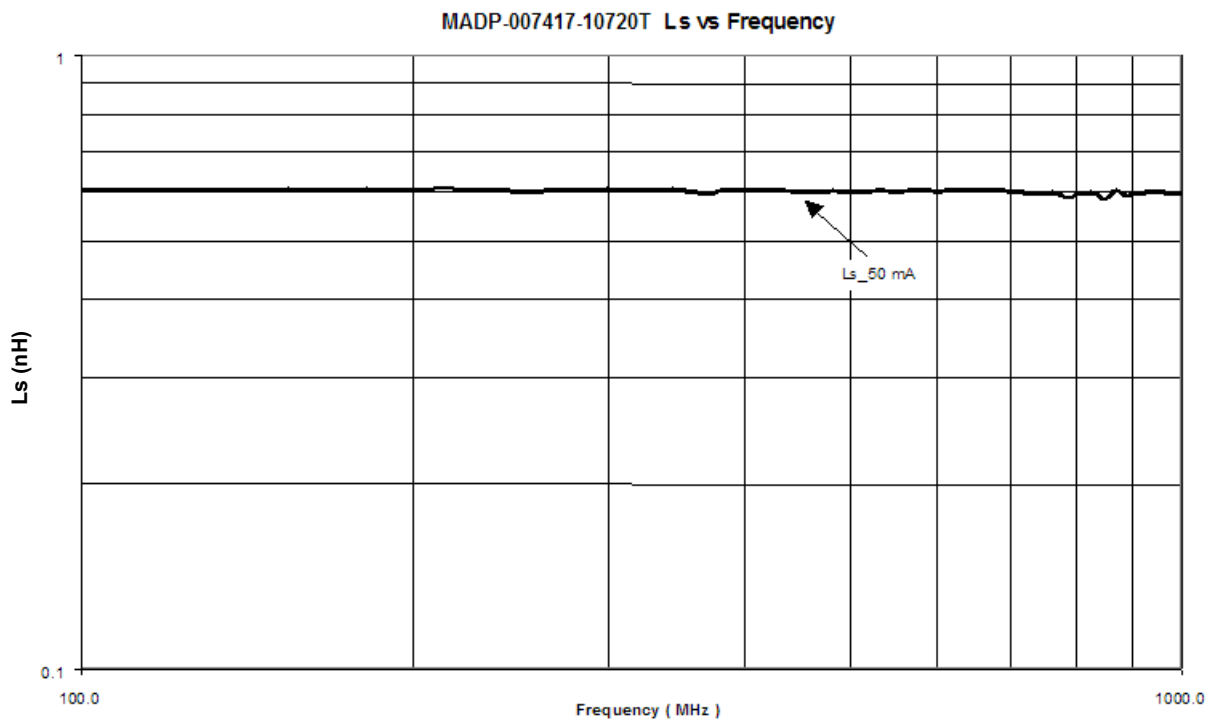
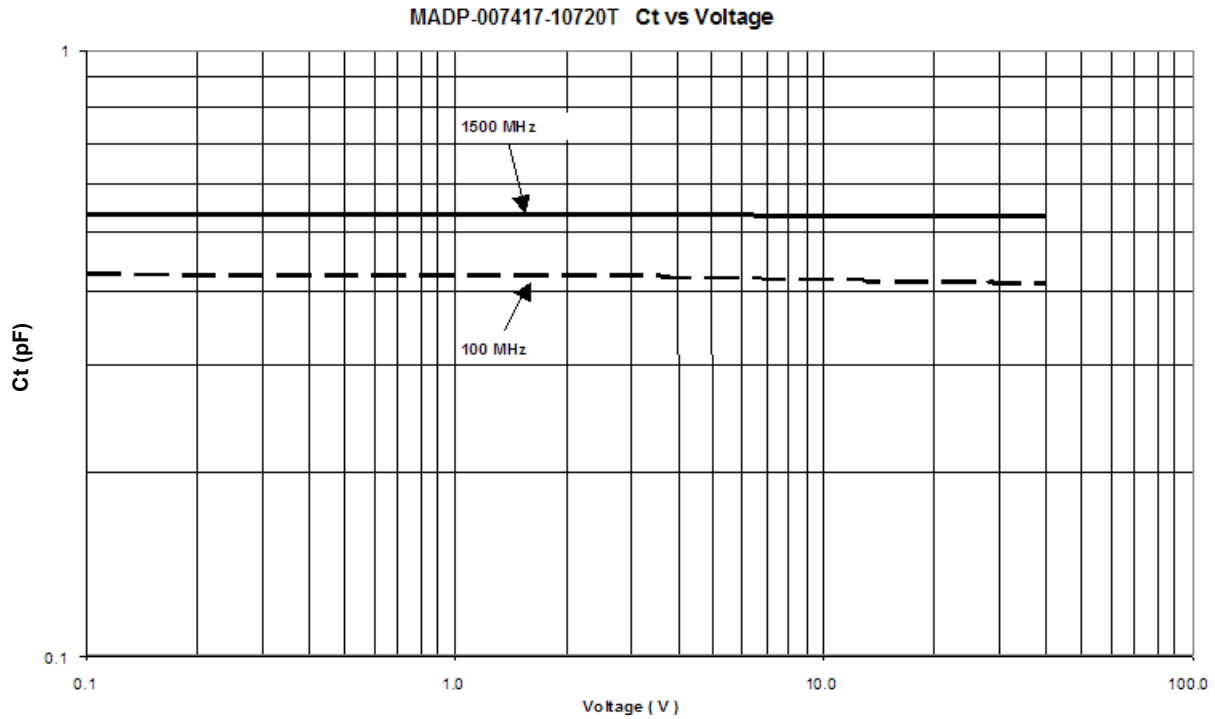
Parameter	Absolute Maximum
Operating Temperature	-65°C to +125°C
Storage Temperature	-65°C to +150°C
Diode Junction Temperature	+175°C Continuous
Diode Mounting Temperature	+265 °C for 10 seconds
RF C.W. Incident Power	+53dBm C.W.
Forward D.C. Current	+150mA
Reverse D.C. Voltage @ -10 uA	-1000V

1. Exceeding these limits may cause permanent damage.

## Typical Electrical Performance



### Typical Electrical Performance



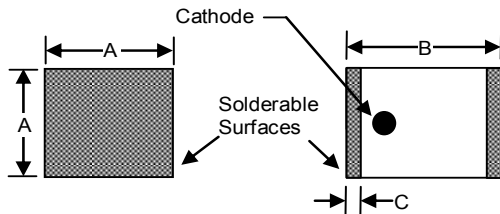
## SMQ HIPAX PIN Diode

Rev. V3

### Electrical Specifications @ +25 °C

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

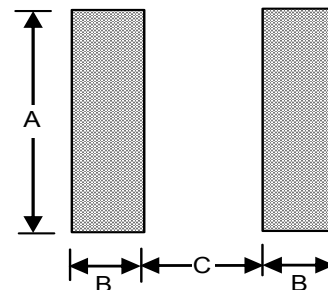
### 1072 MELF Surface Mount Package



### Circuit Pad Layout for 1072 MELF

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

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



## 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

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