

## Features

- Low Series Resistance for Low Series Loss
- Longer Lifetime for Low Inter-Modulation Distortion
- High Average Incident Power Handling
- Rectangular MELF SMQ Ceramic Package
- RoHS\* Compliant

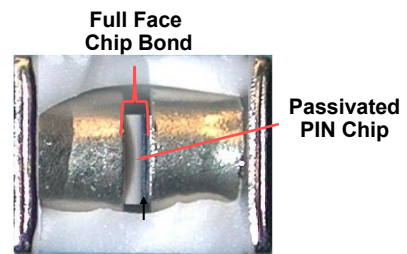
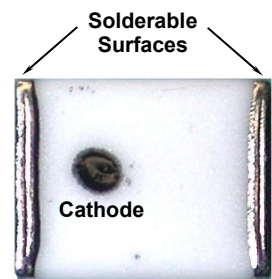
## Applications

- High Power Switching

## Description

The MADP-000638-10910T is a surface mountable PIN diode in a Metal Electrode Leadless Faced (MELF) package. The device incorporates MACOM's proven HIPAX technology to produce a low inductance ceramic package with no ribbons or whisker wires. The package utilizes MACOM's plating process to provide a 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 MADP-000638-10910T 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 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 environments.



Diode Cross Section

## 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.

## Ordering Information

Part Number	Package
MADP-000638-10910T	500 piece Tape and Reel

\* Restrictions on Hazardous Substances, compliant to current RoHS EU directive.

Electrical Specifications:  $T_A = +25^\circ\text{C}$ 

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Total Capacitance <sup>1</sup> ( $C_T$ )	1 MHz, 100 V	pF	—	—	3
Series Resistance <sup>2,3</sup> ( $R_S$ )	100 MHz, 100 mA 200 mA 300 mA	$\Omega$	—	—	0.30 0.25 0.20
Parallel Resistance ( $R_P$ )	100 MHz, 0 V	$\Omega$	4K	—	—
Forward Voltage ( $V_F$ )	100 mA	V	—	0.9	1.0
Reverse Current ( $I_R$ )	-1100 V	nA	—	—	50
Carrier Lifetime <sup>4</sup> ( $T_L$ )	$I_F 10\text{mA}/I_R 6\text{mA}$	$\mu\text{S}$	10	14	—
Thermal Resistance ( $\theta$ )	—	$^\circ\text{C/W}$	—	3	5

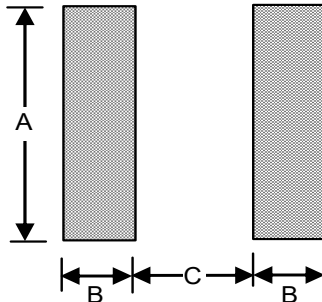
1. Total capacitance is equivalent to the sum of the chip junction capacitance  $C_j$  plus package parasitic capacitance.
2. Series resistance  $R_S$  is the sum of the chip to package contact resistance plus junction resistance  $R_j$ .
3.  $R_S$  is measured on an HP4291A.
4. Measured from 50% of control voltage to 90% of output voltage.

Absolute Maximum Ratings<sup>5,6</sup> @  $25^\circ\text{C}$ 

Parameter	Absolute Maximum
RF C.W. Incident Power	60 dBm C.W.
Forward D.C. Current	+500 mA
Reverse D.C. Voltage @ -10 $\mu\text{A}$	-1100 V
Diode Junction Temperature	+175 $^\circ\text{C}$ Continuous
Operating Temperature	-65 $^\circ\text{C}$ to +125 $^\circ\text{C}$
Storage Temperature	-65 $^\circ\text{C}$ to +150 $^\circ\text{C}$
Diode Mounting Temperature	+265 $^\circ\text{C}$ for 10 seconds

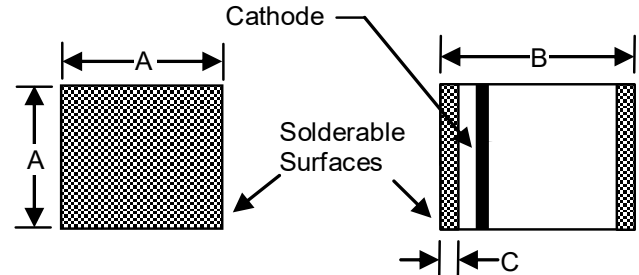
5. Exceeding any one or combination of these limits may cause permanent damage to this device.
6. MACOM does not recommend sustained operation near these survivability limits.

## Circuit Pad Layout



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

## Mechanical Outline



Dimension	Inches Min. / Max	Mm Min. / Max
A (square)	0.138 / 0.155	(3.50/ 3.94)
B	0.180 / 0.200	(4.57/ 5.08)
C	0.008 / 0.030	(.203 / .762)

## 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

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