

Features

- Non-Magnetic Ceramic Surface Mount Package
- Low Series Resistance
- Low Junction Capacitance
- Low Thermal Resistance
- RoHS* Compliant

Description

The MMP70xx-128-1 and MMP70xx-128-4 MELF PIN Diode Series are manufactured using a proprietary diode process which optimizes the anode and cathode bonding area of the diode to the adjacent heat spreading metal posts within the ceramic package. This unique geometry provides lower electrical and thermal resistance within the surface mount package to provide higher average power performance to comparable surface mount diode packages.

With lower thermal resistance ($<20^{\circ}\text{C/W}$), RF C.W. incident power levels of 50 dBm and RF peak incident power levels of 60 dBm are very achievable in higher power UHF cold switching applications. The low series resistance ($<1\ \Omega$), coupled with the longer minority carrier lifetime, ($>8\ \mu\text{s}$), provides better IIP3 distortion values $>70\ \text{dBm}$, for SP2T T_x & R_x Switches.

These devices are hermetically sealed and are constructed with non-magnetic materials to meet the stringent requirements for MRI systems. The devices are RoHS compliant.

The MMP70xx-128-1 and MMP70xx-128-4 MELF PIN Diode Series are designed to be used in High Average Power Switch and Attenuator applications, operating from 1 MHz to 1 GHz at Incident Power levels of 100 W Average Power and 1 KW Peak Power. These devices are durable, reliable, and are capable of meeting all military, commercial, and industrial applications.



Ordering Information

Part Number	Package
MMP70xx-128-1-R	2000 piece reel
MMP70xx-128-4-R	500 piece reel

Environmental Capabilities

The MMP70xx-128-x Series of PIN diodes are capable of meeting the environmental requirements of MIL-STD-750.

Static & Moisture Sensitivity

These electronic devices are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these (HBM) Class 1A devices. The moisture sensitivity level rating for this device is MSL1.

* Restrictions on Hazardous Substances, European Union Directive 2011/65/EU.

Electrical Specifications:

$T_A = +25^\circ\text{C}$, $V_F = 1\text{ V max. @ }100\text{ mA}$, $I_R = 1\ \mu\text{A max. @ }80\% V_B$

Model	Reverse Voltage Breakdown @ 10 μA (V_{BR})	Total Capacitance @ 100 V, 1 MHz (C_T)	Minority Carrier Lifetime $I_F = 10\text{ mA}$, $I_R = 6\text{ mA}$ (T_L)	Series Resistance @ 100 mA, 100 MHz (R_S)	Parallel Resistance @ 0 V, 100 MHz (R_P)	C.W. Thermal Resistance
	V	pF	μs	Ω	k Ω	$^\circ\text{C/W}$
	Min.	Max.	Typ.	Max.	Typ.	Max.
MMP7070-128-4	100	2.2	6.0	0.5	20	20
MMP7071-128-4	100	2.0	8.0	1.0	50	20
MMP7072-128-1	100	0.7	3.0	0.8	200	20
MMP7073-128-1	100	1.0	2.5	0.5	100	20
MMP7074-128-4	200	2.2	6.0	0.5	20	20
MMP7075-128-4	200	2.0	8.0	1.0	50	20
MMP7076-128-1	200	0.7	3.0	0.8	200	20
MMP7077-128-1	200	1.0	2.5	0.5	100	20
MMP7078-128-1	400	1.0	2.5	0.5	100	20
MMP7079-128-4	600	2.2	6.0	0.5	20	20
MMP7080-128-1	600	0.7	3.0	0.8	200	20
MMP7081-128-1	50	1.2	4.0	0.8	20	20
MMP7089-128-1	500	0.5	1.0	0.6	10	30
MMP7090-128-1	500	0.7	2.0	0.5	20	25
MMP7091-128-1	500	1.0	3.0	0.3	50	15

Absolute Maximum Ratings

Parameter	Absolute Maximum
Forward Current	1000 mA
Forward Voltage	1.2 V @ $I_F = 100\text{ mA}$
Power Dissipation	30 W, Infinite heat sink; $T_C = +25^\circ\text{C}$, De-Rate Linearly @ $-200\text{ mW}/^\circ\text{C}$ from 7.5 W @ $+25^\circ\text{C}$ to 0 W @ $T_J = +175^\circ\text{C}$
Junction Temperature	$+175^\circ\text{C}$
Operating Temperature	-65°C to $+125^\circ\text{C}$
Storage Temperature	-65°C to $+150^\circ\text{C}$
Assembly Temperature	$<260^\circ\text{C}$ for 10 seconds

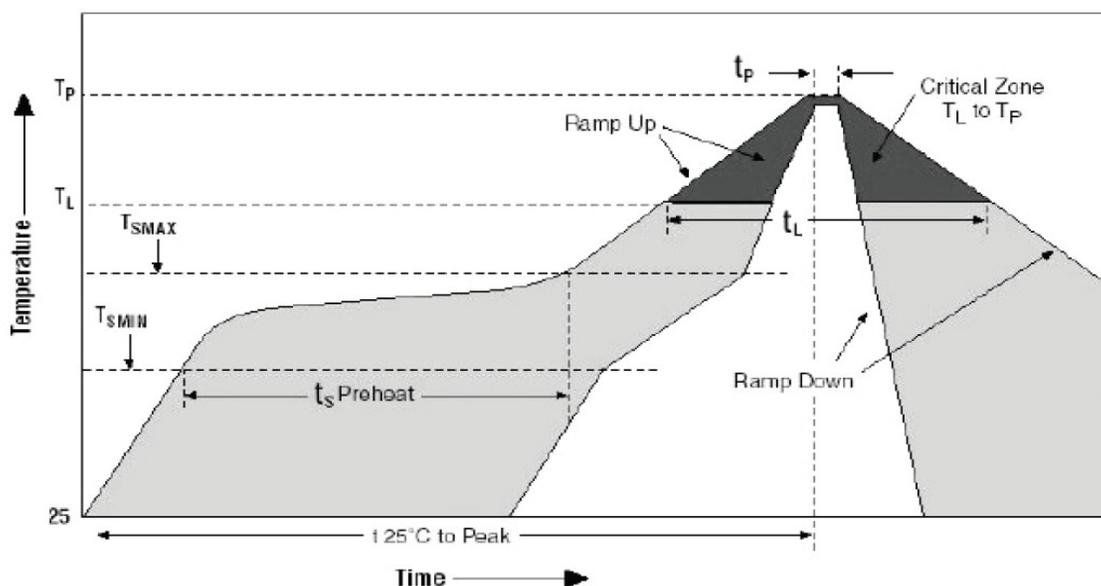
Assembly Instructions

MELF PIN Diodes may be placed onto circuit boards with pick and place manufacturing equipment from tape-reel. The devices are attached to the circuit using conventional solder re-flow or wave soldering procedures with RoHS type or Sn 60 / Pb 40 type solders.

Table 1. Time-Temperature Profile for Sn60/Pb40 or RoHS Type Solders

Profile Feature	SnPb Solder Assembly	Pb-Free Solder Assembly
Average Ramp-Up Rate (T_L to T_P)	3°C /second maximum	3°C /second maximum
Preheat:		
- Temperature Min (T_{SMIN})	100°C	150°C
- Temperature Max (T_{SMAX})	150°C	200°C
- Time (min to max)(t_s)	60-120 s	60-180 s
T_{SMAX} to T_L		
- Ramp-Up Rate		3°C/s maximum
Time Maintained Above:		
- Temperature (T_L)	183°C	217°C
- Time (t_L)	60-150 s	60-150 s
Peak temperature (T_P)	225 +0/-5°C	260 +0/-5°C
Time Within 5°C of Actual Peak Temperature (t_p)	10 – 30 s	20 – 40 s
Ramp-Down Rate	6°C /s maximum	6°C /s maximum
Time 25°C to Peak Temperature	6 minutes maximum	8 minutes maximum

Figure 1. Solder Re-Flow Time-Temperature Profile



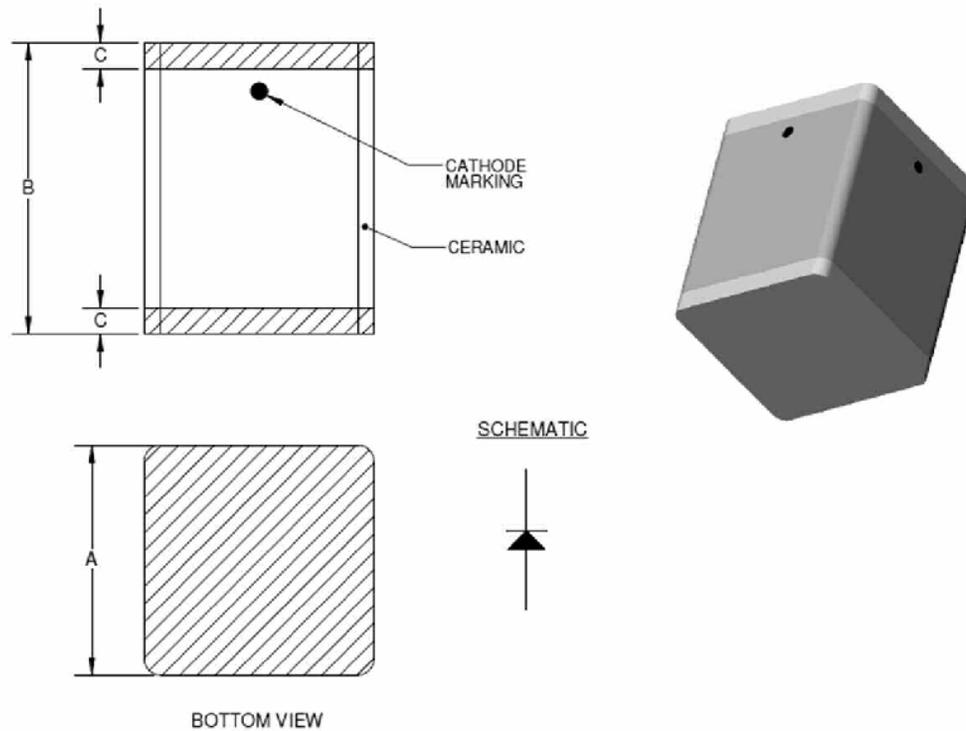
MMP70xx-128-x Series



Silicon PIN Diodes

Rev. V1

Outline Drawing (CS128-1 & CS128-4)



Outline Dimensions

Case	A	B	C
CS128-1	0.088 ±0.007	0.125 ±0.010	0.02
	(2.24 ±0.18)	(3.18 ±0.25)	-0.51
CS128-4	0.143 +0.004 / -0.002	0.181 +0.003 / -0.002	0.016 ±0.008
	(3.63 +0.10 / -0.005)	(4.60 +0.08 / -0.05)	(0.41 ±0.20)

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