

## Step Recovery Diode

Rev. V1

### Features

- Low Transition Time
- High Efficiency
- High Cutoff Frequency
- High Reliability
- RoHS\* Compliant

### Description

The MSD7xx Series of step recovery diodes are designed with epitaxial silicon which provides high output power and efficiency in harmonic generator applications. These diodes are manufactured using a proven diode fabrication process for high reproducibility. A unique silicon dioxide passivation process assures greater stability reliability and low leakage currents at high temperatures.

These diodes are available in various package outlines with capacitance ranges for each of the 4 voltage ratings.

This rugged device is capable of reliable operation in all military, commercial and industrial applications.



Bare Die



Beam Lead Chips



Ceramic Microwave Pill



Ceramic Epoxy SMT



Ceramic Hermetic SMT



Plastic SMT

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

**Voltage Breakdown ( $V_B$ ) = 15 V min. @ 10  $\mu\text{A}$**

**Lifetime ( $T_L$ ) = 8 ns min. and Transition Time ( $T_T$ ) = 60 ps max. @  $I_F$  6 mA /  $I_R$  10 mA**

Model	Junction Capacitance ( $C_J$ ) @ 6 V, 1 MHz	Series Resistance ( $R_S$ ) @ 25 mA	Thermal Resistance ( $\theta_{JC}$ ) Pulsed
	Minimum	Maximum	Maximum
	pF	$\Omega$	$^\circ\text{C/W}$
MSD700	0.2 - 0.4	1.20	125
MSD701	0.4 - 0.6	1.00	100
MSD702	0.6 - 0.8	0.70	100
MSD703	0.8 - 1.0	0.50	75
MSD704	1.0 - 1.4	0.40	75
MSD705	1.4 - 2.0	0.30	60
MSD706	2.0 - 3.0	0.25	60

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

## Step Recovery Diode

Rev. V1

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

**Voltage Breakdown ( $V_B$ ) = 20 V min. @ 10  $\mu\text{A}$**

**Lifetime ( $T_L$ ) = 11 ns min. and Transition Time ( $T_T$ ) = 70 ps max. @  $I_F$  6 mA /  $I_R$  10 mA**

Model	Junction Capacitance ( $C_J$ ) @ 6 V, 1 MHz	Series Resistance ( $R_S$ ) @ 25 mA	Thermal Resistance ( $\theta_{JC}$ ) Pulsed
	Minimum	Maximum	Maximum
	pF	$\Omega$	$^\circ\text{C/W}$
MSD710	0.2 - 0.4	1.00	100
MSD711	0.4 - 0.6	0.70	75
MSD712	0.6 - 0.8	0.60	75
MSD713	0.8 - 1.0	0.50	75
MSD714	1.0 - 1.4	0.40	75
MSD715	1.4 - 2.0	0.30	60
MSD716	2.0 - 3.0	0.25	60

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

**Voltage Breakdown ( $V_B$ ) = 30 V min. @ 10  $\mu\text{A}$**

**Lifetime ( $T_L$ ) = 17 ns min. and Transition Time ( $T_T$ ) = 100 ps max. @  $I_F$  6 mA /  $I_R$  10 mA**

Model	Junction Capacitance ( $C_J$ ) @ 6 V, 1 MHz	Series Resistance ( $R_S$ ) @ 25 mA	Thermal Resistance ( $\theta_{JC}$ ) Pulsed
	Minimum	Maximum	Maximum
	pF	$\Omega$	$^\circ\text{C/W}$
MSD720	0.2 - 0.4	0.80	75
MSD721	0.4 - 0.6	0.60	60
MSD722	0.6 - 0.8	0.50	60
MSD723	0.8 - 1.0	0.40	60
MSD724	1.0 - 1.4	0.30	60
MSD725	1.4 - 2.0	0.25	50
MSD726	2.0 - 3.0	0.20	50

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

**Voltage Breakdown ( $V_B$ ) = 15 V min. @ 10  $\mu\text{A}$**

**Lifetime ( $T_L$ ) = 8 ns min. and Transition Time ( $T_T$ ) = 60 ps max. @  $I_F$  6 mA /  $I_R$  10 mA**

Model	Junction Capacitance ( $C_J$ ) @ 6 V, 1 MHz	Series Resistance ( $R_S$ ) @ 25 mA	Thermal Resistance ( $\theta_{JC}$ ) Pulsed
	Minimum	Maximum	Maximum
	pF	$\Omega$	$^\circ\text{C/W}$
MSD730	0.2 - 0.4	0.80	50
MSD731	0.4 - 0.6	0.60	50
MSD732	0.6 - 0.8	0.50	50
MSD733	0.8 - 1.0	0.40	50
MSD734	1.0 - 1.4	0.30	50
MSD735	1.4 - 2.0	0.25	40
MSD736	2.0 - 3.0	0.20	40

### Absolute Maximum Ratings

Parameter	Absolute Maximum
Junction Temperature	+150 $^\circ\text{C}$
Operating Temperature	-55 $^\circ\text{C}$ to +150 $^\circ\text{C}$
Storage Temperature	-65 $^\circ\text{C}$ to +200 $^\circ\text{C}$

### Environmental Capabilities

The MSD7xx Series of step recovery diodes are capable of meeting the environmental requirements of MIL-STD-750 and MIL-STD-883.

### ESD & Moisture Sensitivity Level Rating

These electronic devices are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD prevention procedures should be followed. The ESD rating for this device is Class 0 (HBM).

### Assembly Instructions

Die attach of the MSD7xx SRD chip diodes may be accomplished with eutectic solders, such as 80 Au / 20 Sn, or conductive epoxy. The leads of the beam lead device may be attached to a hybrid circuit using thermo compression bonding or conductive epoxy.

MACOM Technology Solutions Inc. All rights reserved.

Information in this document is provided in connection with MACOM Technology Solutions Inc ("MACOM") products. These materials are provided by MACOM as a service to its customers and may be used for informational purposes only. Except as provided in MACOM's Terms and Conditions of Sale for such products or in any separate agreement related to this document, MACOM assumes no liability whatsoever. MACOM assumes no responsibility for errors or omissions in these materials. MACOM may make changes to specifications and product descriptions at any time, without notice. MACOM makes no commitment to update the information and shall have no responsibility whatsoever for conflicts or incompatibilities arising from future changes to its specifications and product descriptions. No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document.

THESE MATERIALS ARE PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, RELATING TO SALE AND/OR USE OF MACOM PRODUCTS INCLUDING LIABILITY OR WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, CONSEQUENTIAL OR INCIDENTAL DAMAGES, MERCHANTABILITY, OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT. MACOM FURTHER DOES NOT WARRANT THE ACCURACY OR COMPLETENESS OF THE INFORMATION, TEXT, GRAPHICS OR OTHER ITEMS CONTAINED WITHIN THESE MATERIALS. MACOM SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION, LOST REVENUES OR LOST PROFITS, WHICH MAY RESULT FROM THE USE OF THESE MATERIALS.

MACOM products are not intended for use in medical, lifesaving or life sustaining applications. MACOM customers using or selling MACOM products for use in such applications do so at their own risk and agree to fully indemnify MACOM for any damages resulting from such improper use or sale.