



## FAST RECOVERY, HIGH POWER, MICRO HIGH VOLTAGE RECTIFIERS

### DESCRIPTION

The MC5610 through MC5619 series of fast recovery high voltage silicon rectifiers feature the smallest packages available. They are ideal for high-reliability where a failure cannot be tolerated. These 0.275 to 0.790 amp rated rectifiers for working peak reverse voltages from 1500 to 5000 volts are hermetically sealed with void-less glass construction. Typical applications include transmitters, power supplies, radar equipment and X-ray machines. Surface mount MELF package configurations are also available by adding "US" suffix. Microsemi also offers numerous other rectifier products to meet higher and lower current ratings with various recovery time speed requirements including fast and ultrafast device types in both through-hole and surface mount packages.

**Important:** For the latest information, visit our website <http://www.microsemi.com>.

### FEATURES

- Void-less hermetically sealed glass package.
- Triple-layer passivation.
- Lowest reverse leakage available.
- Absolute high voltage / high temperature stability.
- RoHS compliant versions available.

### APPLICATIONS / BENEFITS

- High voltage standard recovery rectifiers 1500 to 5,000 volts.
- Military and other high-reliability applications.
- Applications include bridges, half-bridges, catch diodes, voltage multipliers, X-ray machines, power supplies, transmitters, and radar equipment.
- High forward surge current capability.
- Extremely robust construction.
- Inherently radiation hard as described in Microsemi [MicroNote 050](#).

### MAXIMUM RATINGS @ T<sub>A</sub> = 25 °C unless otherwise specified

Parameters/Test Conditions	Symbol	Value	Unit	
Junction Temperature	T <sub>J</sub>	-55 to +150	°C	
MC5610 – MC5612		-65 to +150		
MC5613 – MC5616		-65 to +125		
Storage Temperature	T <sub>STG</sub>	-65 to +175	°C	
Thermal Resistance Junction-to-Lead @ 3/8 inch (10 mm) lead length from body	R <sub>θJL</sub>	38	°C/W	
Working Peak Reverse Voltage:	V <sub>RWM</sub>	MC5610 & MC5613	1500	V
		MC5611 & MC5614	2000	
		MC5612 & MC5615	2500	
		MC5616	3000	
		MC5617	4000	
		MC5618	4500	
		MC5619	5000	
Solder Temperature @ 10 s	T <sub>SP</sub>	260	°C	



**S Package**

#### **MSC – Lawrence**

6 Lake Street,  
Lawrence, MA 01841  
Tel: 1-800-446-1158 or  
(978) 620-2600  
Fax: (978) 689-0803

#### **MSC – Ireland**

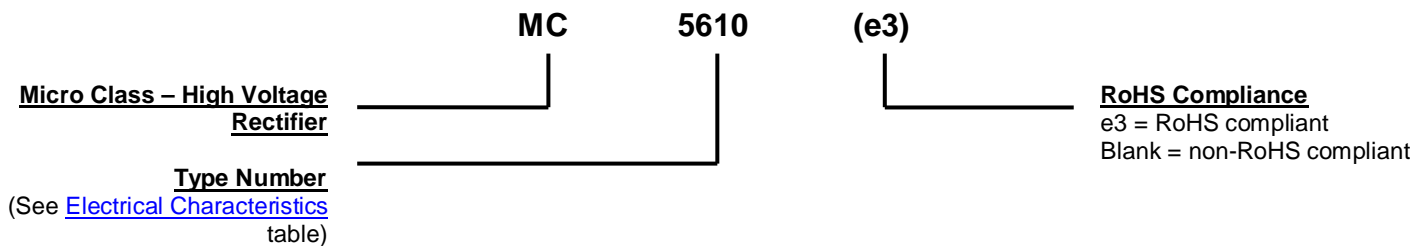
Gort Road Business Park,  
Ennis, Co. Clare, Ireland  
Tel: +353 (0) 65 6840044  
Fax: +353 (0) 65 6822298

#### **Website:**

[www.microsemi.com](http://www.microsemi.com)

**MECHANICAL and PACKAGING**

- CASE: Hermetically sealed void-less hard glass with tungsten slugs.
- TERMINALS: Tin/lead (Sn/Pb) or RoHS compliant matte/tin over copper.
- MARKING: Alphanumeric.
- POLARITY: Cathode indicated by band.
- TAPE & REEL option: Standard per EIA-296. Consult factory for quantities.
- WEIGHT: 400 milligrams (approx).
- See [Package Dimensions](#) on last page.

**PART NOMENCLATURE**

**SYMBOLS & DEFINITIONS**

Symbol	Definition
$I_o$	Average Rectified Forward Current: The output current averaged over a full cycle with a 50 Hz or 60 Hz sine-wave input and a 180 degree conduction angle.
$I_R$	Maximum Leakage Current: The maximum leakage current that will flow at the specified voltage and temperature.
$I_{ZSM}$	Maximum Rated Surge Current: The non-repetitive peak value of rated surge current at a specified wave form.
$V_{(BR)}$	Minimum Breakdown Voltage: The minimum voltage the device will exhibit at a specified current.
$V_F$	Maximum Forward Voltage: The maximum forward voltage the device will exhibit at a specified current.
$V_R$	Reverse Voltage: The reverse voltage dc value, no alternating component.
$V_{RWM}$	Working Peak Reverse Voltage: The maximum peak voltage that can be applied over the operating temperature range.

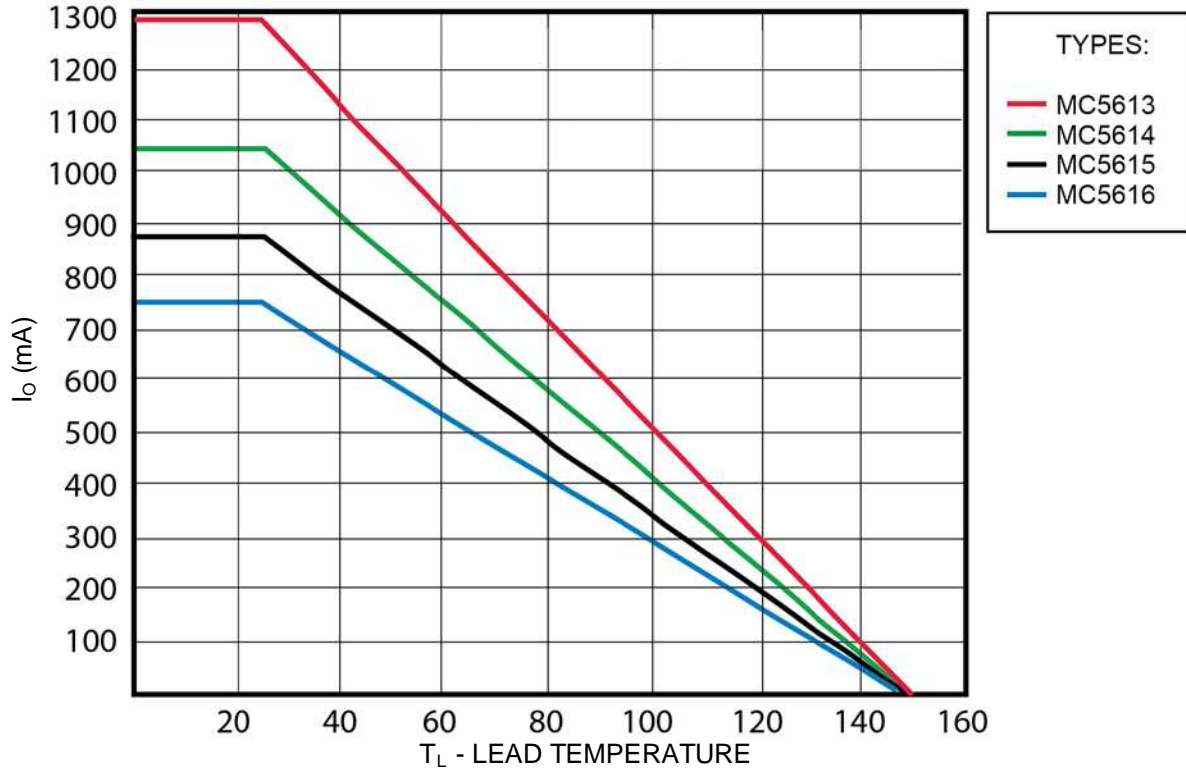
**ELECTRICAL CHARACTERISTICS**

MICROSEMI PART NUMBER	RMS VOLTAGE $V_{R(RMS)}$	AVERAGE RECTIFIED CURRENT $I_o @ T_L =$ (Note 2)		MAXIMUM FORWARD VOLTAGE $V_F @ 100 \text{ mA}$	MAXIMUM REVERSE CURRENT $I_R @ V_{RWM}$	MAXIMUM REVERSE CURRENT $I_R @ V_{RWM}$	MAXIMUM FORWARD SURGE $I_{FS} @ 8.3 \text{ ms}$	MAXIMUM REVERSE RECOVERY TIME $t_{rr}$ (Note 1)
		55 °C	100 °C					
		Volts	mA					
MC5610	1050	790	415	3.0	1.0	25	8	300
MC5611	1400	630	330	4.0	1.0	25	6	300
MC5612	1750	530	280	5.0	1.0	25	5	300
MC5613	1050	975	515	3.0	1.0	20	8	300
MC5614	1400	790	415	4.0	1.0	20	6	300
MC5615	1750	665	350	5.0	1.0	20	5	300
MC5616	2100	570	300	6.0	1.0	20	4	300
MC5617	2800	330	120	8.0	2.5	50	3	300
MC5618	3150	300	110	9.0	2.5	50	2.7	300
MC5619	3500	275	100	10.0	2.5	50	2.5	300

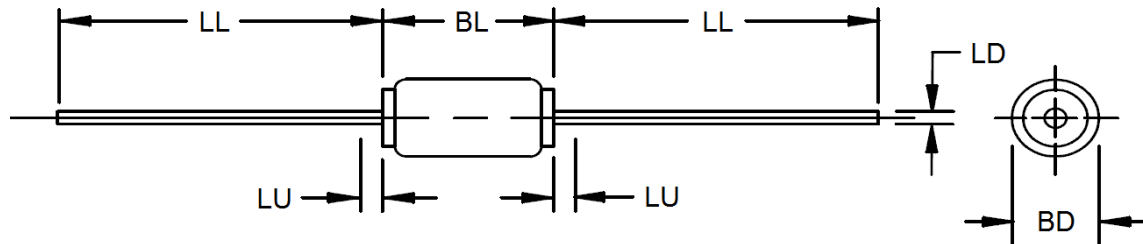
**NOTE 1:**  $I_F = 50 \text{ mA}$ ,  $I_{RM} = 100 \text{ mA}$ ,  $I_{R(REC)} = 25 \text{ mA}$ .

**NOTE 2:** Heat sink 3/8" from body.

GRAPHS



**FIGURE 1**  
Average Rectified Current vs. Lead Temperature  
 Lead Temperature (°C) (L=3/8 inch)

**PACKAGE DIMENSIONS**

**NOTES:**

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. Package contour optional with BD and length BL. Heat slugs, if any, shall be included within this cylinder length but shall not be subject to minimum limit of BD.
4. The specified lead diameters apply in the zone between .050 inch (1.27 mm) from the diode body and the end of the lead.
5. In accordance with ASME Y14.5M, diameters are equivalent to  $\Phi$ x symbology.

Ltr	DIMENSIONS				Notes
	INCH		MILLIMETERS		
	Min	Max	Min	Max	
<b>BD</b>	.065	.110	1.65	2.79	3
<b>BL</b>	.190	.215	4.83	5.46	3
<b>LD</b>	.029	.033	0.74	0.84	
<b>LL</b>	1.00	1.25	25.40	31.75	
<b>LU</b>		.050		1.27	4