RoHS Available

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.



S Package

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_A= 25 °C unless otherwise specified

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

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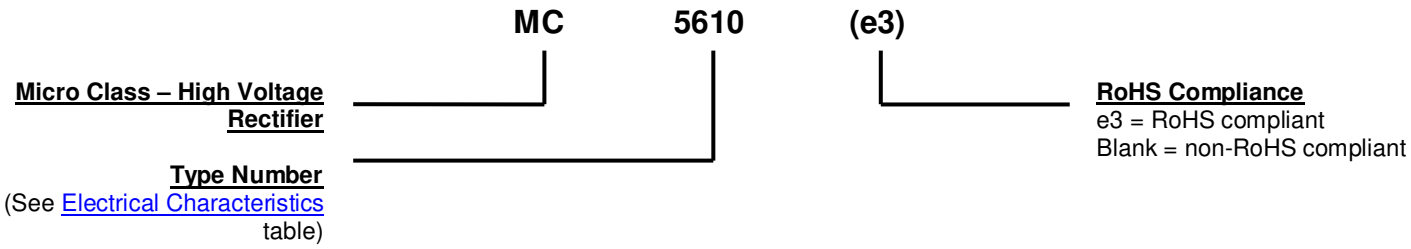
MECHANICAL and PACKAGING

- 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 mA	MAXIMUM REVERSE CURRENT I_R @ V_{RWM}	MAXIMUM REVERSE CURRENT I_R @ V_{RWM}	MAXIMUM FORWARD SURGE I_{FS} @ 8.3 ms	MAXIMUM REVERSE RECOVERY TIME t_{rr} (Note 1)
		55 °C	100 °C		25 °C	100 °C		
	Volts	mA	mA	Volts	µA	µA	Amps	ns
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 mA, I_{RM} = 100 mA, $I_{R(REC)}$ = 25 mA.
NOTE 2: Heat sink 3/8" from body.

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GRAPHS

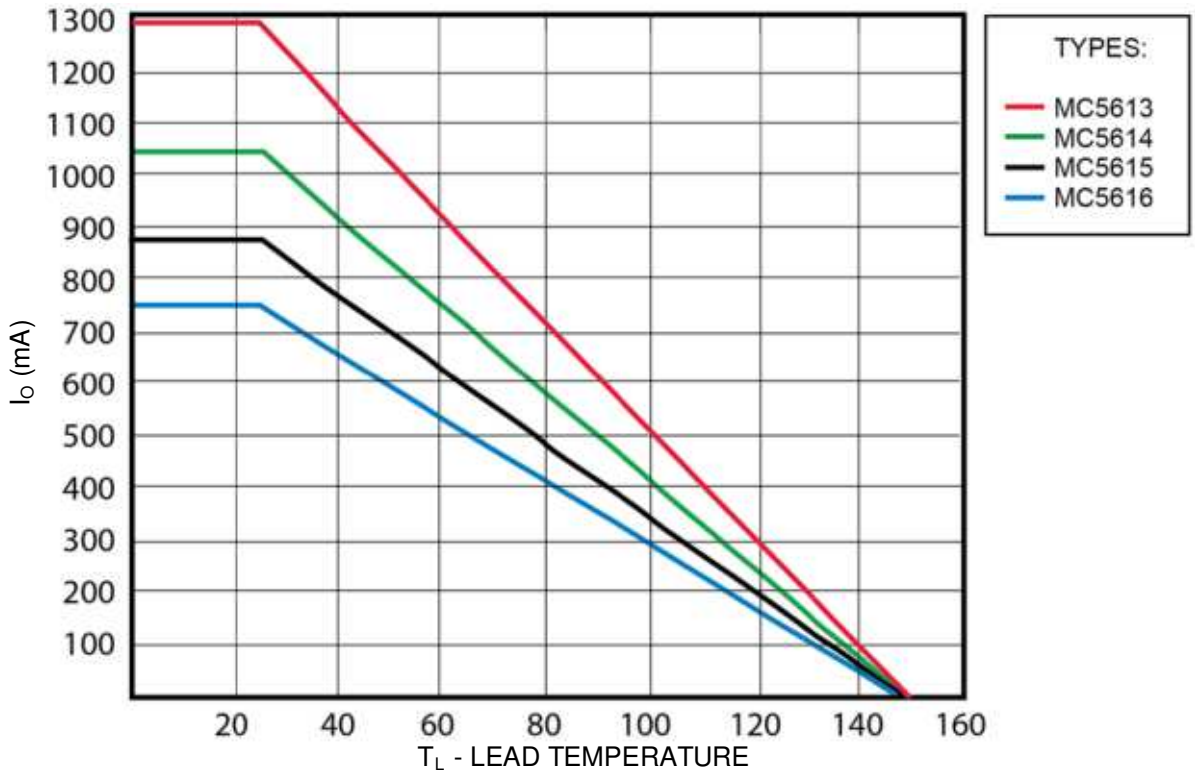

FIGURE 1
Average Rectified Current vs. Lead Temperature
Lead Temperature (°C) (L=3/8 inch)

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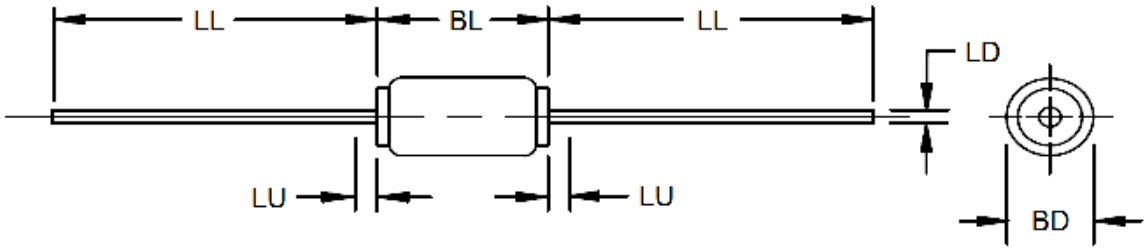
PACKAGE DIMENSIONS



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 Φx symbology.

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

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