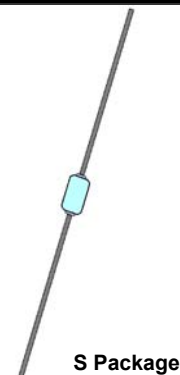


## DESCRIPTION

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 voidless-glass construction using an internal "Category I" metallurgical bond. Typical applications include transmitters, power supplies, radar equipment and X-ray machines. Surface mount MELF package configurations are also available by adding "SM" 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.

## APPEARANCE



**IMPORTANT:** For the most current data, consult MICROSEMI's website: <http://www.microsemi.com>

## FEATURES

- Voidless Hermetically Sealed Glass Package
- Triple-Layer Passivation
- Internal "Category I" Metallurgical bonds
- Lowest Reverse Leakage Available
- Lowest Thermal Resistance Available
- Absolute High Voltage / High Temperature Stability
- Surface mount equivalents also available in a square end-cap MELF configuration with "SM" suffix

## APPLICATIONS / BENEFITS

- High voltage fast recovery rectifiers 1500 to 5000 V
- 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

- Operating Temperature Range:  
MC5610 – MC5612.....-55°C to 150°C  
MC5613 – MC5616.....-65°C to 150°C  
MC5617 – MC5619.....-65°C to 125°C
- Storage Temperature Range: -65°C to 175°C
- Thermal Resistance: 38°C/W junction to lead at 3/8 inch (10 mm) lead length from body
- Average Rectified Forward Current ( $I_O$ ): See Electrical Characteristics for maximum rating at 55°C and 100°C. Also see typical linear derating in Fig 1.
- Forward Surge Current: See Electrical Characteristics for surge at 8.3 ms half-sine wave
- Solder Temperatures: 260°C for 10 s (maximum)

## MECHANICAL AND PACKAGING

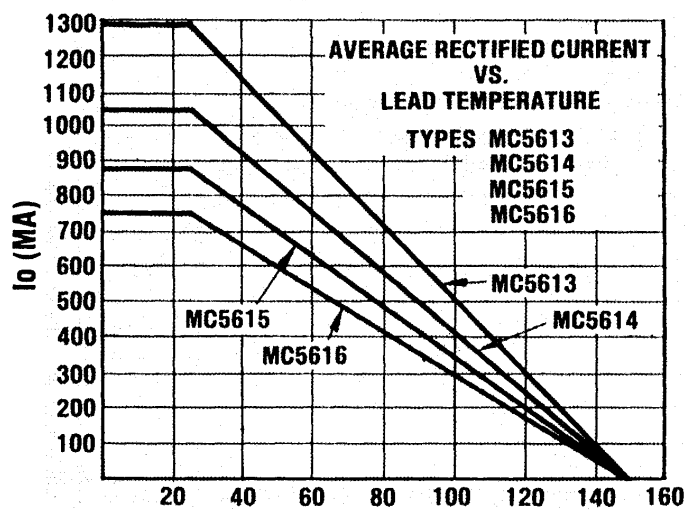
- CASE: Hermetically sealed voidless hard glass with Tungsten slugs
- TERMINATIONS: Axial leads are copper with Tin/Lead (Sn/Pb) finish
- MARKING: Body paint and part number, etc.
- POLARITY: Cathode band
- TAPE & REEL option: Standard per EIA-296
- WEIGHT: 400 mg (approx)
- See package dimensions on last page

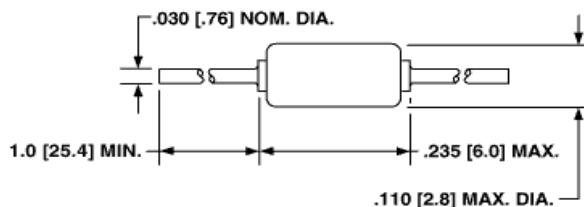
**ELECTRICAL CHARACTERISTICS**

| MICROSEMI<br>PART<br>NUMBER | WORKING<br>PEAK<br>REVERSE<br>VOLTAGE<br>$V_{RWM}$ | RMS<br>VOLTAGE<br>$V_{R(RMS)}$ | AVERAGE<br>RECTIFIED<br>CURRENT<br>@ $T_L =$<br>Note 2 |       | MAXIMUM<br>FORWARD<br>VOLTAGE<br>$V_F @ 100mA$ | MAXIMUM<br>REVERSE<br>CURRENT<br>$I_R @ V_{RWM}$ | MAXIMUM<br>REVERSE<br>CURRENT<br>$I_R @ V_{RWM}$ | MAXIMUM<br>FORWARD<br>SURGE<br>@ 8.3 ms | MAXIMUM<br>REVERSE<br>RECOVERY<br>TIME<br>$t_{rr}$<br>Note 1 |
|-----------------------------|----------------------------------------------------|--------------------------------|--------------------------------------------------------|-------|------------------------------------------------|--------------------------------------------------|--------------------------------------------------|-----------------------------------------|--------------------------------------------------------------|
|                             |                                                    |                                | 55°C                                                   | 100°C |                                                | 25°C                                             | 100°C                                            |                                         |                                                              |
|                             | VOLTS                                              | VOLTS                          | mA                                                     | mA    | VOLTS                                          | $\mu A$                                          | $\mu A$                                          | AMPS                                    | ns                                                           |
| MC5610                      | 1500                                               | 1050                           | 790                                                    | 415   | 3.0                                            | 1.0                                              | 25                                               | 8                                       | 300                                                          |
| MC5611                      | 2000                                               | 1400                           | 630                                                    | 330   | 4.0                                            | 1.0                                              | 25                                               | 6                                       | 300                                                          |
| MC5612                      | 2500                                               | 1750                           | 530                                                    | 280   | 5.0                                            | 1.0                                              | 25                                               | 5                                       | 300                                                          |
| MC5613                      | 1500                                               | 1050                           | 975                                                    | 515   | 3.0                                            | 1.0                                              | 20                                               | 8                                       | 300                                                          |
| MC5614                      | 2000                                               | 1400                           | 790                                                    | 415   | 4.0                                            | 1.0                                              | 20                                               | 6                                       | 300                                                          |
| MC5615                      | 2500                                               | 1750                           | 665                                                    | 350   | 5.0                                            | 1.0                                              | 20                                               | 5                                       | 300                                                          |
| MC5616                      | 3000                                               | 2100                           | 570                                                    | 300   | 6.0                                            | 1.0                                              | 20                                               | 4                                       | 300                                                          |
| MC5617                      | 4000                                               | 2800                           | 330                                                    | 120   | 8.0                                            | 2.5                                              | 50                                               | 3                                       | 300                                                          |
| MC5618                      | 4500                                               | 3150                           | 300                                                    | 110   | 9.0                                            | 2.5                                              | 50                                               | 2.7                                     | 300                                                          |
| MC5619                      | 5000                                               | 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.

**GRAPHS**

 FIGURE 1  
 LEAD TEMPERATURE (°C) (L = 3/8 INCH)

**PACKAGE DIMENSIONS**


NOTE: DIMENSIONS IN INCHES [MM]

NOTE: Lead tolerance is +0.003/-0.004 inches