# 1.0A SURFACE MOUNT SUPER-FAST RECTIFIER

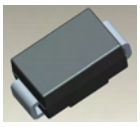
## Features

- Glass Passivated Die Construction
- Super-Fast Recovery Time For High Efficiency
- Surge Overload Rating to 35A Peak
- Ideally Suited for Automated Assembly
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Notes 3 & 4)**

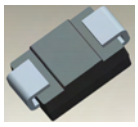
## Mechanical Data

- Case: SMB
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish (Lead Free Plating). Solder Plated Terminal - Solderable per MIL-STD-202, Method 208 e3
- Polarity: Cathode Band or Cathode Notch
- Weight: 0.093 grams (approximate)

SMB



Top View



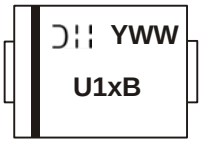
Bottom View

## Ordering Information (Note 5)

| Part Number | Case | Packaging |
|---|---|---|
| MURS140-13-F | SMB | 3000/Tape & Reel |
| MURS160-13-F | SMB | 3000/Tape & Reel |

Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
2. See http://www.diodes.com for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. Product manufactured with Date Code 0924 (week 24, 2009) and newer are built with Green Molding Compound.
5. For packaging details, go to our website at http://www.diodes.com.

## Marking Information




U1xB = Product type marking code
U1GB = MURS140
U1JB = MURS160
= Manufacturers' code marking
YWW = Date code marking
Y = Last digit of year (ex: 2 for 2002)
WW = Week code (01 to 53)

## Maximum Ratings (@$T_A$ = +25°C, unless otherwise specified.)

Single phase, half wave, 60Hz, resistive or inductive load.
For capacitance load, derate current by 20%.

| Characteristic | Symbol | MURS140 | MURS160 | Unit |
|---|---|---|---|---|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage (Note 10) | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 400 | 600 | V |
| RMS Reverse Voltage | $V_{R(RMS)}$ | 283 | 424 | V |
| Average Rectified Output Current @ $T_T$ = +135°C | $I_O$ | 1.0 | | A |
| Non-Repetitive Peak Forward Surge Current<br>8.3ms Single Half Sine-Wave Superimposed on Rated Load | $I_{FSM}$ | 35 | | A |

## Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Typical Thermal Resistance, Junction to Terminal (Note 6) | $R_{\theta JT}$ | 15 | °C/W |
| Operating Temperature Range | $T_J$ | -55 to +150 | °C |
| Storage Temperature Range | $T_{STG}$ | -55 to +175 | °C |

## Electrical Characteristics (@$T_A$ = +25°C, unless otherwise specified.)

| Characteristic | | Symbol | Value | Unit |
|---|---|---|---|---|
| Forward Voltage | @ $I_F$ = 1.0A, $T_J$ = +25°C<br>@ $I_F$ = 1.0A, $T_J$ = +150°C | $V_{FM}$ | 1.25<br>1.05 | V |
| Peak Reverse Current at Rated DC Blocking Voltage (Note 10) | @ $T_A$ = +25°C<br>@ $T_A$ = +150°C | $I_{RM}$ | 5.0<br>150 | μA |
| Reverse Recovery Time (Note 8) | | $t_{rr}$ | 50 | ns |
| Forward Recovery Time (Note 9) | | $t_{fr}$ | 50 | ns |
| Typical Total Capacitance (Note 7) | | $C_T$ | 10 | pF |

Notes:
6. Unit mounted on PC board with 5.0 $mm^2$ (0.013 mm thick) copper pads as heat sink.
7. Measured at 1.0MHz and applied reverse voltage of 4V DC.
8. Measured with $I_F$ = 0.5A, $I_R$ = 1.0A, $I_{rr}$ = 0.25A. See Figure 5.
9. Measured with $I_F$ = 1.0A, di/dt = 100A/μs, Duty Cycle ≤ 2.0%.
10. Short duration pulse test used to minimize self-heating effect.

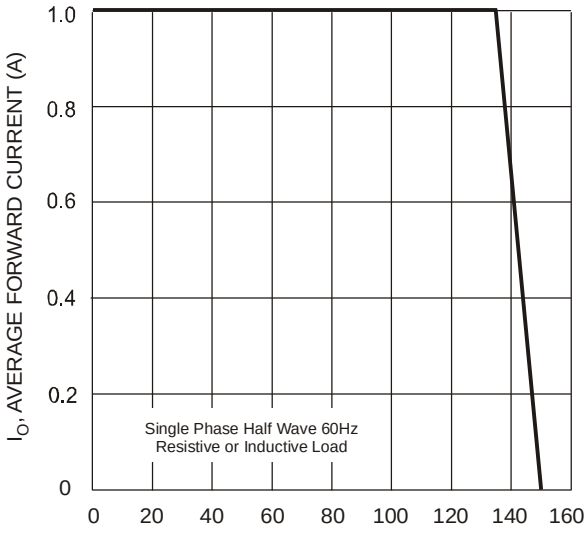



Fig. 1 Forward Current Derating Curve

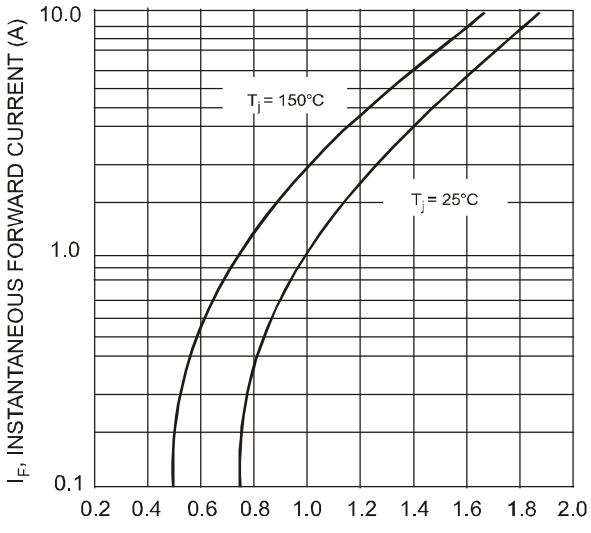



Fig. 2 Typical Forward Characteristics

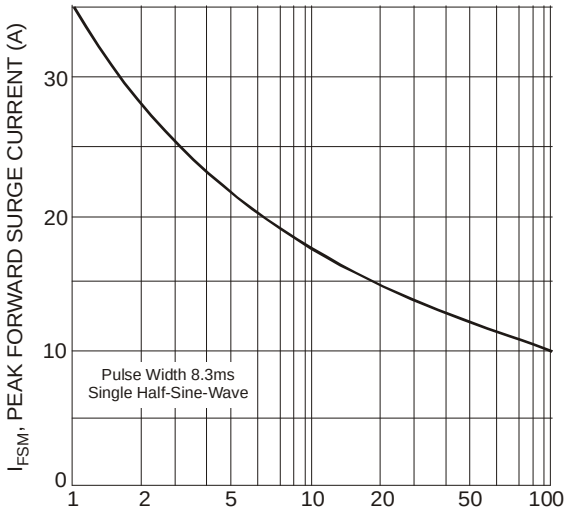



Fig. 3 Surge Current Derating Curve

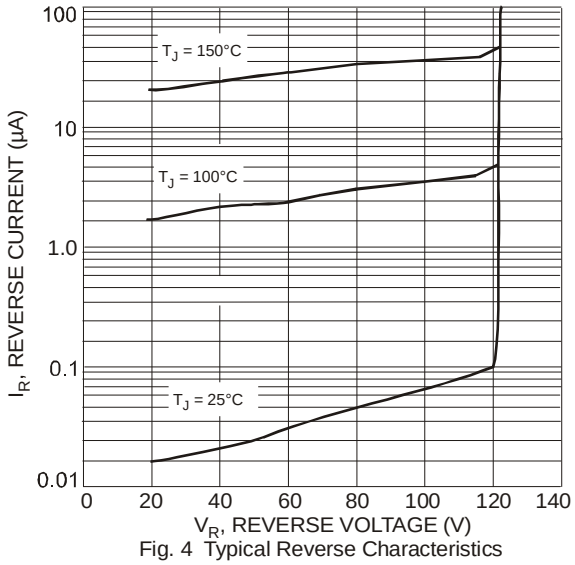
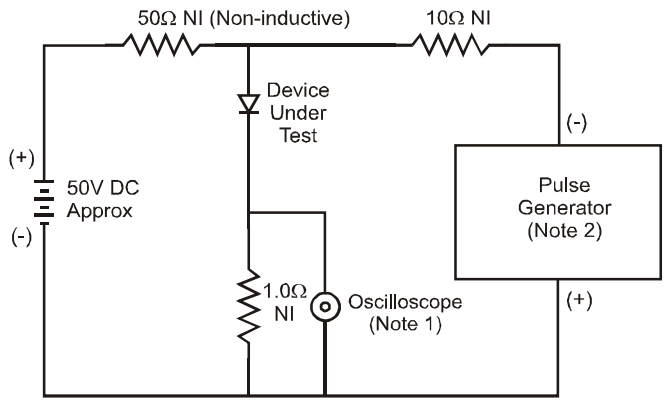



Fig. 4 Typical Reverse Characteristics




Notes:
1. Rise Time = 7.0ns max. Input Impedance = 1.0MΩ, 22pF.
2. Rise Time = 10ns max. Input Impedance = 50Ω.

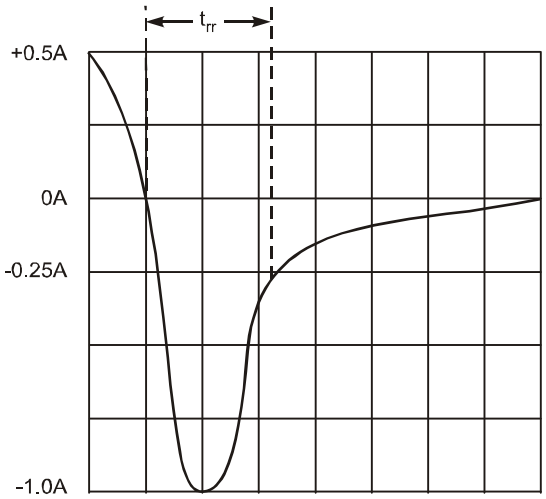
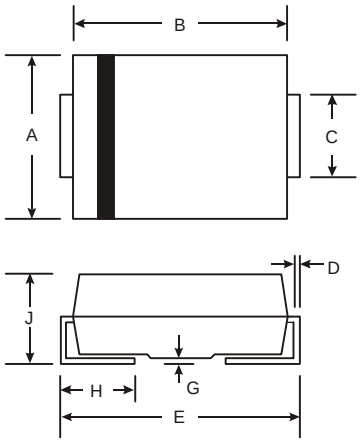



Fig. 5 Reverse Recovery Time Characteristic and Test Circuit

## Package Outline Dimensions

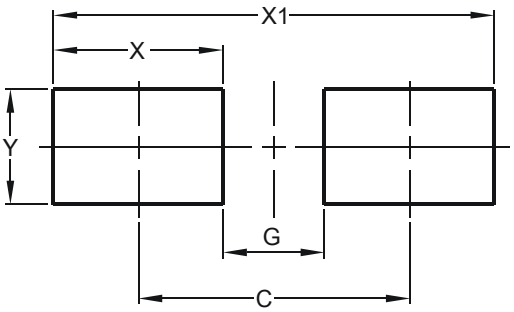
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.




| SMB | | |
|---|---|---|
| **Dim** | **Min** | **Max** |
| **A** | 3.30 | 3.94 |
| **B** | 4.06 | 4.57 |
| **C** | 1.96 | 2.21 |
| **D** | 0.15 | 0.31 |
| **E** | 5.00 | 5.59 |
| **G** | 0.05 | 0.20 |
| **H** | 0.76 | 1.52 |
| **J** | 2.00 | 2.50 |
| **All Dimensions in mm** | | |

## Suggested Pad Layout

Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version.




| Dimensions | Value (in mm) |
|---|---|
| **C** | 4.30 |
| **G** | 1.80 |
| **X** | 2.50 |
| **X1** | 6.80 |
| **Y** | 2.30 |

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