

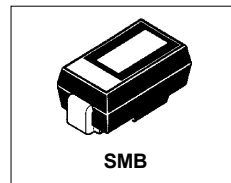


MURS120

## Ultrafast Rectifier

## Features

- Ultrafast Recovery Time
- Low Forward Voltage Drop
- Low Leakage Current
- 175°C Operating Junction Temperature



$$t_{rr} = 25\text{ns}$$

$$I_{F(AV)} = 1\text{Amp}$$

$$V_R = 200\text{V}$$

## Description/Applications

International Rectifier's MUR.. series are the state of the art Ultra fast recovery rectifiers specifically designed with optimized performance of forward voltage drop and ultra fast recovery time.

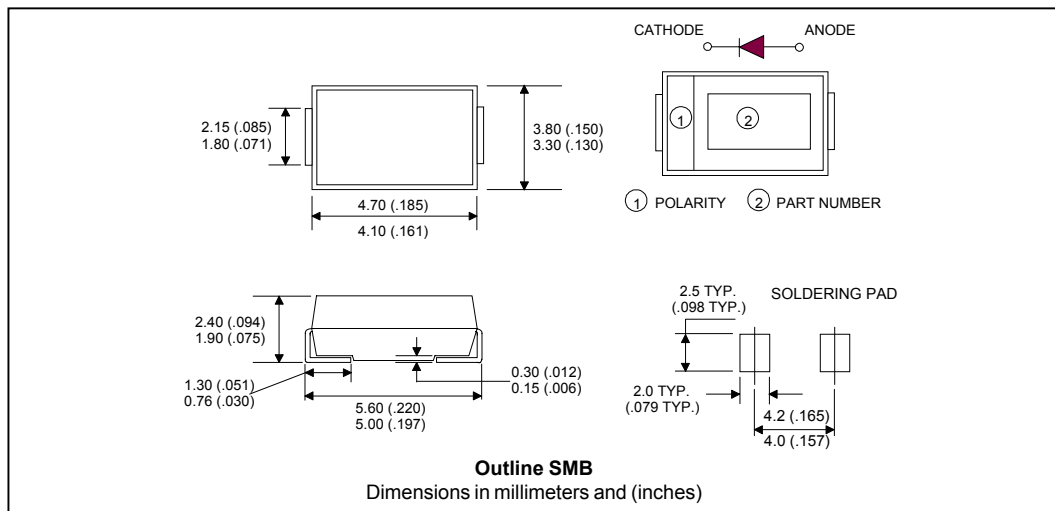
The planar structure and the platinum doped life time control, guarantee the best overall performance, ruggedness and reliability characteristics.

These devices are intended for use in the output rectification stage of SMPS, UPS, DC-DC converters as well as free-wheeling diode in low voltage inverters and chopper motor drives.

Their extremely optimized stored charge and low recovery current minimize the switching losses and reduce over dissipation in the switching element and snubbers.

## Absolute Maximum Ratings

| Parameters                                                               | Max         | Units            |
|--------------------------------------------------------------------------|-------------|------------------|
| $V_{RRM}$ Peak Repetitive Peak Reverse Voltage                           | 200         | V                |
| $I_{F(AV)}$ Average Rectified Forward Current, $T_L = 158^\circ\text{C}$ | 1           | A                |
| $I_{FSM}$ Non Repetitive Peak Surge Current                              | 40          |                  |
| $T_J, T_{STG}$ Operating Junction and Storage Temperatures               | - 65 to 175 | $^\circ\text{C}$ |



**Electrical Characteristics @  $T_J = 25^\circ\text{C}$  (unless otherwise specified)**

| Parameters                                        | Min | Typ  | Max   | Units         | Test Conditions                                    |
|---------------------------------------------------|-----|------|-------|---------------|----------------------------------------------------|
| $V_{BR}, V_r$ Breakdown Voltage, Blocking Voltage | 200 | -    | -     | V             | $I_R = 100\mu\text{A}$                             |
| $V_F$ Forward Voltage                             | -   | 0.83 | 0.875 | V             | $I_F = 1\text{A}$                                  |
|                                                   | -   | 0.65 | 0.71  | V             | $I_F = 1\text{A}, T_J = 150^\circ\text{C}$         |
| $I_R$ Reverse Leakage Current                     | -   | 0.1  | 2     | $\mu\text{A}$ | $V_R = V_R \text{ Rated}$                          |
|                                                   | -   | 11   | 50    | $\mu\text{A}$ | $T_J = 150^\circ\text{C}, V_R = V_R \text{ Rated}$ |
| $C_T$ Junction Capacitance                        | -   | 12   | -     | pF            | $V_R = 200\text{V}$                                |

**Dynamic Recovery Characteristics @  $T_J = 25^\circ\text{C}$  (unless otherwise specified)**

| Parameters                     | Min | Typ | Max | Units | Test Conditions                                                         |
|--------------------------------|-----|-----|-----|-------|-------------------------------------------------------------------------|
| $t_{rr}$ Reverse Recovery Time | -   | -   | 35  | ns    | $I_F = 1.0\text{A}, di_F/dt = 50\text{A}/\mu\text{s}, V_R = 30\text{V}$ |
|                                | -   | -   | 25  |       | $I_F = 0.5\text{A}, I_R = 1.0\text{A}, I_{REC} = 0.25\text{A}$          |

**Thermal - Mechanical Characteristics**

| Parameters                                      | Min  | Typ  | Max | Units                     |
|-------------------------------------------------|------|------|-----|---------------------------|
| $T_J$ Max. Junction Temperature Range           | -    | -    | 175 | $^\circ\text{C}$          |
| $T_{Stg}$ Max. Storage Temperature Range        | - 65 | -    | 175 |                           |
| $R_{thJL}$ Thermal Resistance, Junction to Lead | -    | -    | 21  | $^\circ\text{C}/\text{W}$ |
| $Wt$ Weight                                     | -    | 0.1  | -   | g                         |
|                                                 | -    | 0.07 | -   | (oz)                      |

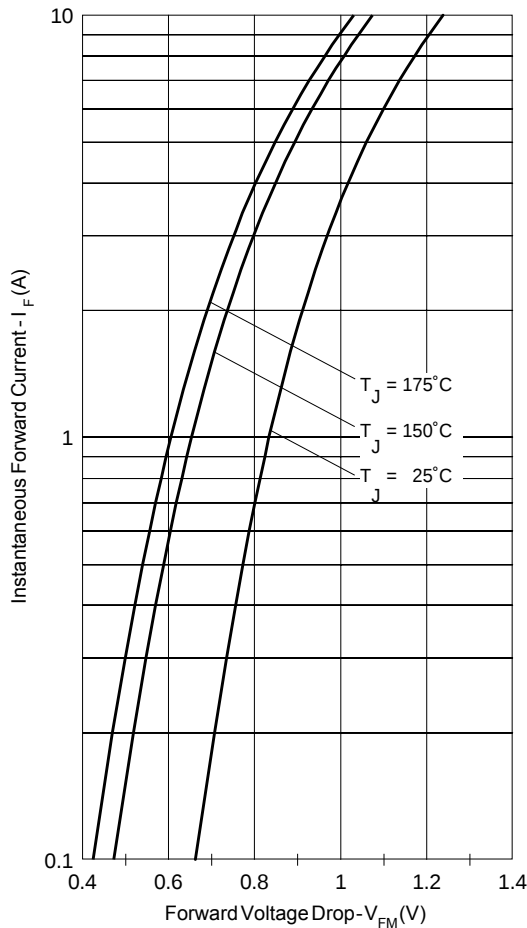


Fig. 1 - Typical Forward Voltage Drop Characteristics

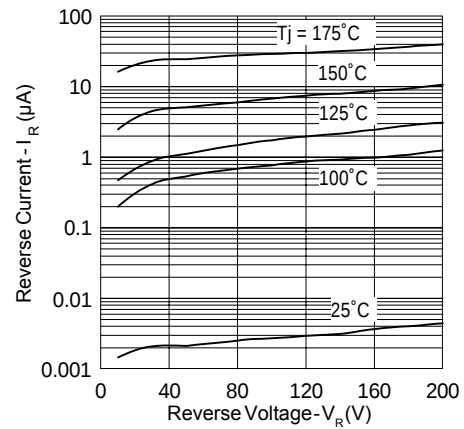


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage

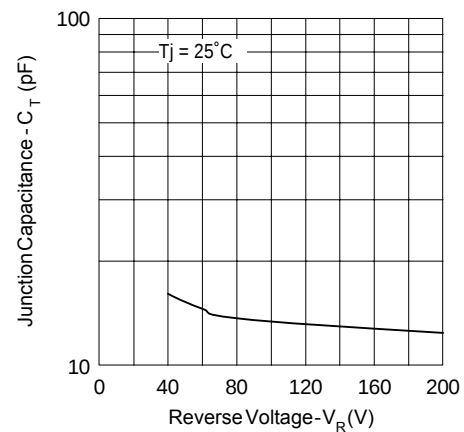


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

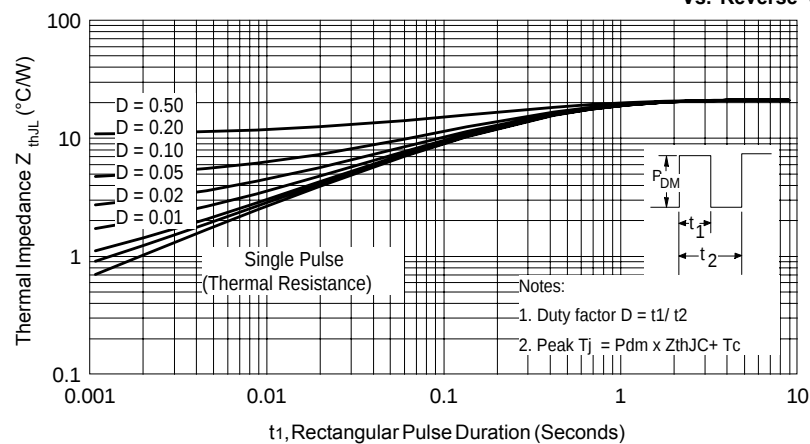
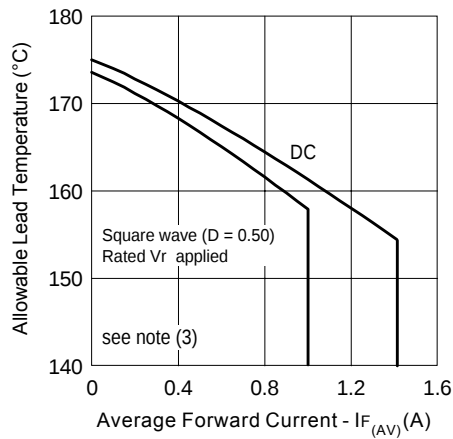
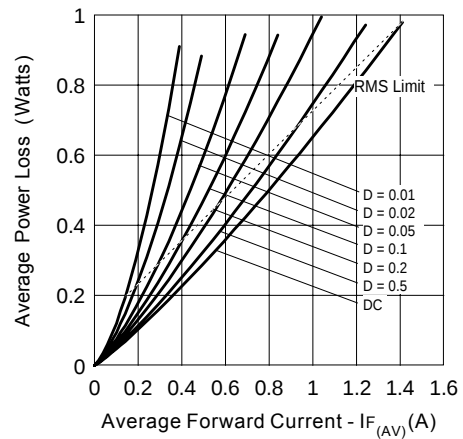


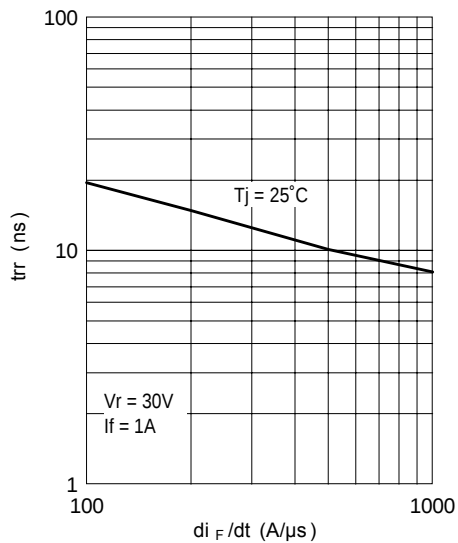
Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics



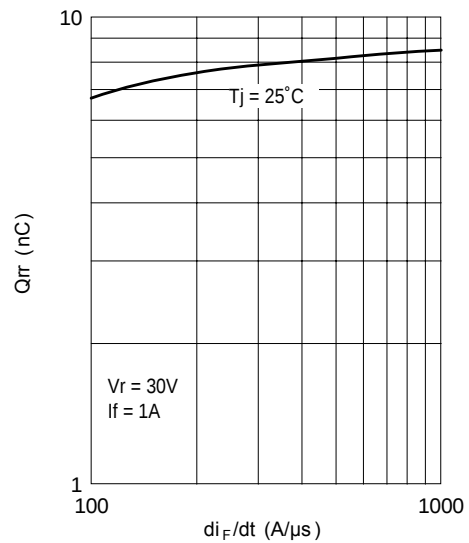
**Fig. 5 - Max. Allowable Lead Temperature Vs. Average Forward Current**



**Fig. 6 - Forward Power Loss Characteristics**



**Fig. 7 - Typical Reverse Recovery vs.  $di_F/dt$**



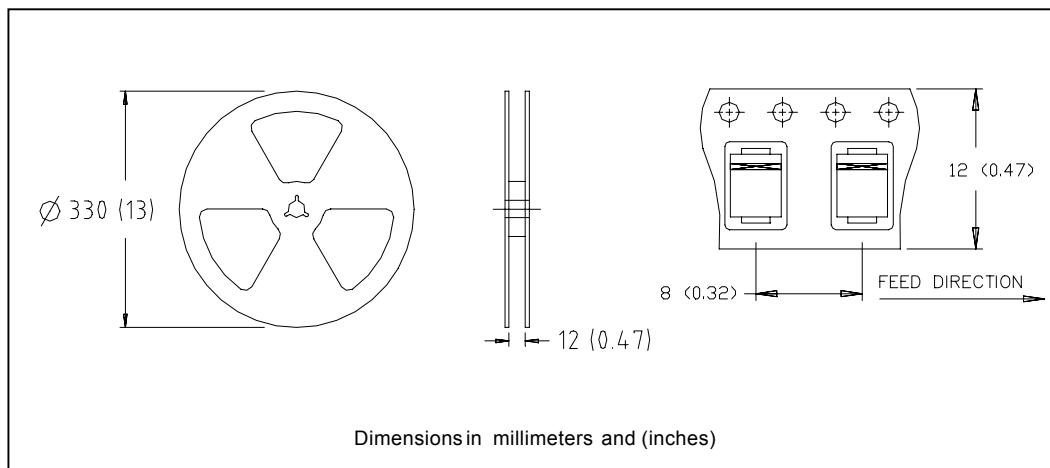
**Fig. 8 - Typical Stored Charge vs.  $di_F/dt$**

(3) Formula used:  $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$ ;

$P_d$  = Forward Power Loss =  $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$  (see Fig. 6);

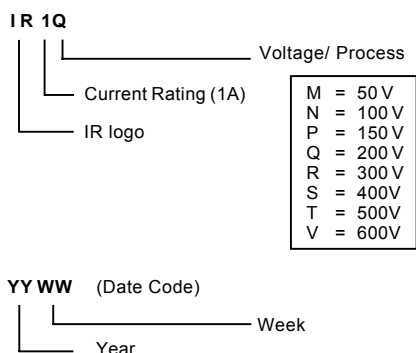
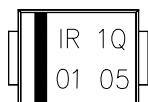
$P_{d_{REV}}$  = Inverse Power Loss =  $V_{R1} \times I_R (1 - D)$ ;  $I_R @ V_{R1}$  = rated  $V_R$

## Tape & Reel Information



## Marking & Identification

Each device has 8 characters, configured 4 digits on two rows, for identification. The first row designates the device as manufactured by International Rectifier as indicated by the letters "IR", and the Part Number (indicates the current rating and voltage/process). The second row indicates the year and the week of manufacturing.



## Ordering Information

### MURS SERIES - TAPE AND REEL

WHEN ORDERING, INDICATE THE PART NUMBER AND THE QUANTITY ( IN MULTIPLES OF 3000 PIECES).

EXAMPLE: MURS120TR - 6000 PIECES

### MURS.. SERIES - BULK QUANTITIES

WHEN ORDERING, INDICATE THE PART NUMBER AND THE QUANTITY (IN MULTIPLES OF 250 PIECES).

EXAMPLE: MURS120 - 500 PIECES

## Ordering Information Table

| Device Code |   |                            |    |
|-------------|---|----------------------------|----|
| MUR         | S | 1                          | 20 |
| 1           | 2 | 3                          | 4  |
| 1           | - | Ultrafast MUR Series       |    |
| 2           | - | Package Style: SMB         |    |
| 3           | - | Current Rating (1 = 1A)    |    |
| 4           | - | Voltage Rating (20 = 200V) |    |

Data and specifications subject to change without notice.  
This product has been designed and qualified for Industrial Level.  
Qualification Standards can be found on IR's Web site.

International  
**IOR** Rectifier

**IR WORLD HEADQUARTERS:** 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105

TAC Fax: (310) 252-7309

Visit us at [www.irf.com](http://www.irf.com) for sales contact information. 07/01