

# International IOR Rectifier

## Ultrafast Rectifier

## MURS120PbF

### Features

- Ultrafast Recovery Time
- Low Forward Voltage Drop
- Low Leakage Current
- 175°C Operating Junction Temperature
- Lead-Free ("PbF" suffix)

$$I_{F(AV)} = 1.0\text{Amp}$$

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

### 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.

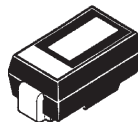
Their extremely optimized stored charge and low recovery current minimize the switching losses and reduce over dissipation in the switching element and snubbers.

### 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 | $^\circ\text{C}$ |

### Case Styles

MURS120PbF



SMB



**Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise specified)**

| Parameters                                                              | Min | Typ  | Max   | Units | Test Conditions                                               |
|-------------------------------------------------------------------------|-----|------|-------|-------|---------------------------------------------------------------|
| V <sub>BR</sub> , V <sub>r</sub> Breakdown Voltage,<br>Blocking Voltage | 200 | -    | -     | V     | I <sub>R</sub> = 100μA                                        |
| V <sub>F</sub> Forward Voltage                                          | -   | 0.83 | 0.875 | V     | I <sub>F</sub> = 1A                                           |
|                                                                         | -   | 0.65 | 0.71  | V     | I <sub>F</sub> = 1A, T <sub>J</sub> = 150°C                   |
| I <sub>R</sub> Reverse Leakage Current                                  | -   | 0.1  | 2     | μA    | V <sub>R</sub> = V <sub>R</sub> Rated                         |
|                                                                         | -   | 11   | 50    | μA    | T <sub>J</sub> = 150°C, V <sub>R</sub> = V <sub>R</sub> Rated |
| C <sub>T</sub> Junction Capacitance                                     | -   | 12   | -     | pF    | V <sub>R</sub> = 200V                                         |

**Dynamic Recovery Characteristics @ T<sub>J</sub> = 25°C (unless otherwise specified)**

| Parameters                            | Min | Typ | Max | Units | Test Conditions                                                           |
|---------------------------------------|-----|-----|-----|-------|---------------------------------------------------------------------------|
| t <sub>rr</sub> Reverse Recovery Time | -   | -   | 35  | ns    | I <sub>F</sub> = 1.0A, di <sub>F</sub> /dt = 50A/μs, V <sub>R</sub> = 30V |
|                                       | -   | -   | 25  |       | I <sub>F</sub> = 0.5A, I <sub>R</sub> = 1.0A, I <sub>REC</sub> = 0.25A    |

**Thermal - Mechanical Characteristics**

| Parameters        |                                      | Min          | Typ  | Max | Units   |
|-------------------|--------------------------------------|--------------|------|-----|---------|
| T <sub>J</sub>    | Max. Junction Temperature Range      | -            | -    | 175 | °C      |
| T <sub>Stg</sub>  | Max. Storage Temperature Range       | - 65         | -    | 175 |         |
| R <sub>thJL</sub> | Thermal Resistance, Junction to Lead | -            | -    | 21  | °C/W    |
| Wt                | Weight                               | -            | 0.1  | -   | g       |
|                   |                                      | -            | 0.07 | -   | (oz)    |
| wt                | Approximate Weight                   | 0.10 (0.003) |      |     | g (oz.) |
| Case Style        |                                      | SMB          |      |     |         |
| Device Marking    |                                      | IRU120       |      |     |         |

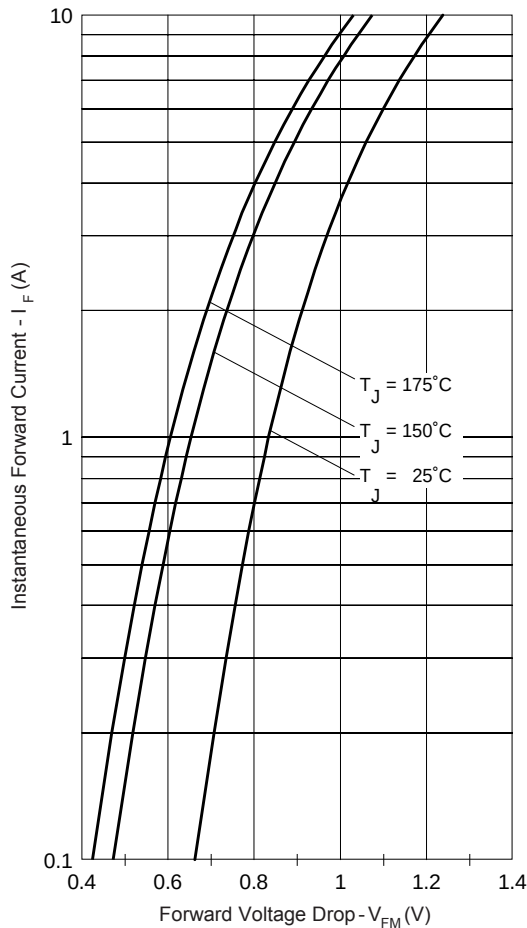


Fig. 1 - Typical Forward Voltage Drop Characteristics

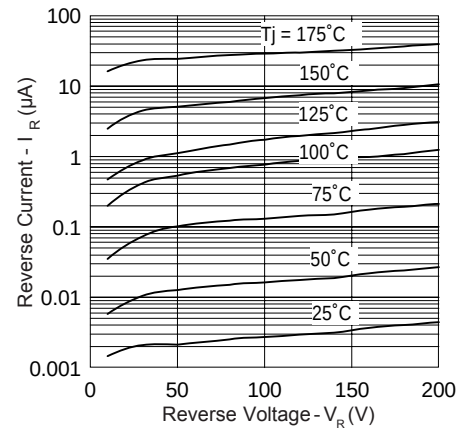


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage

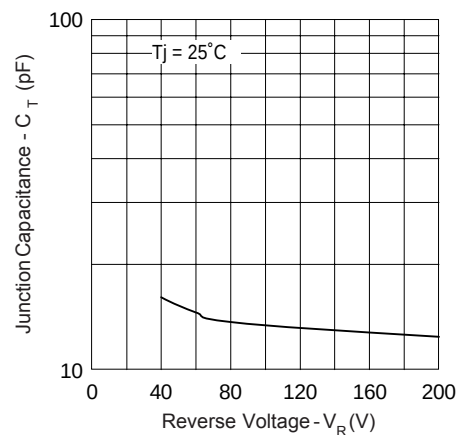


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

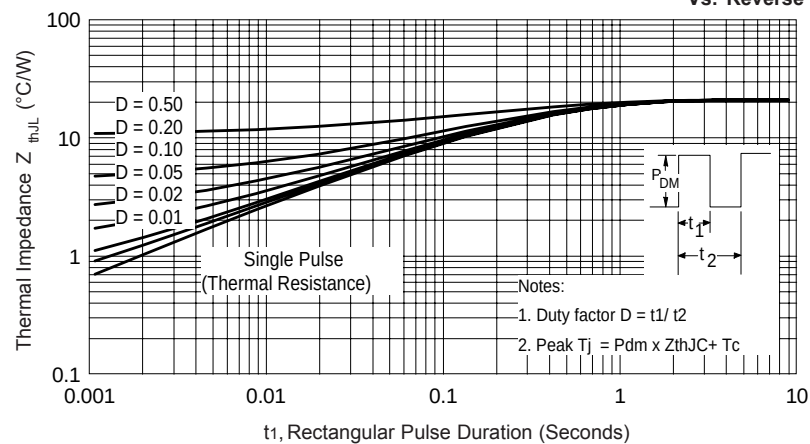
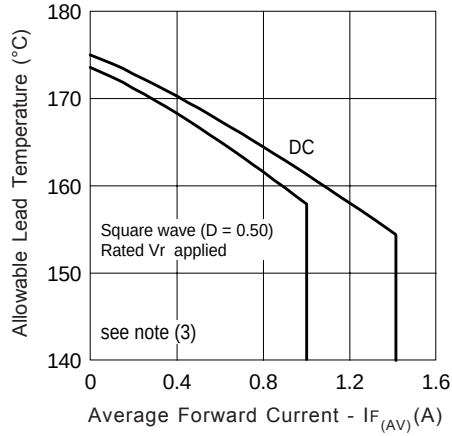
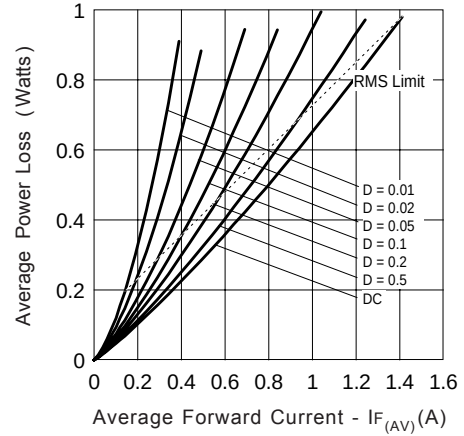


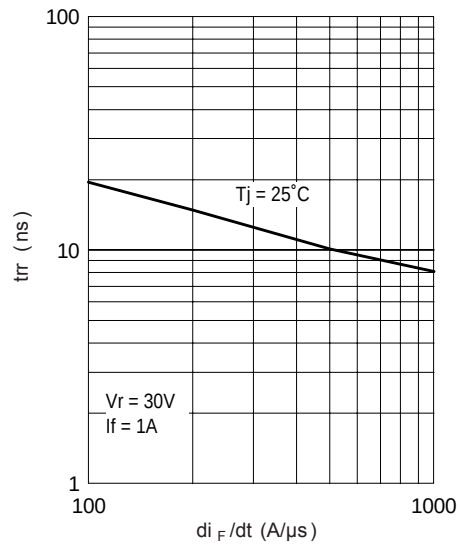
Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics



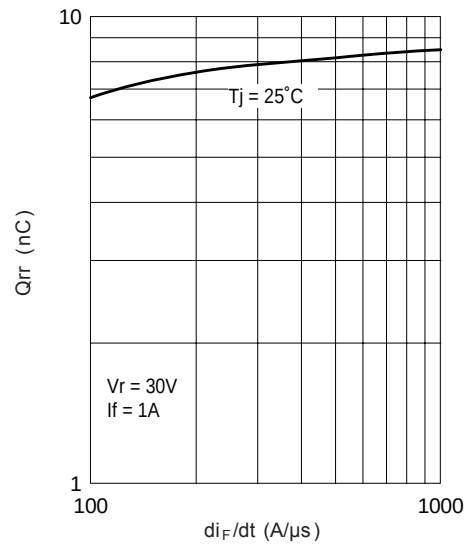
**Fig. 5 - Max. Allowable Lead Temperature Vs. Average Forward Current**



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



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



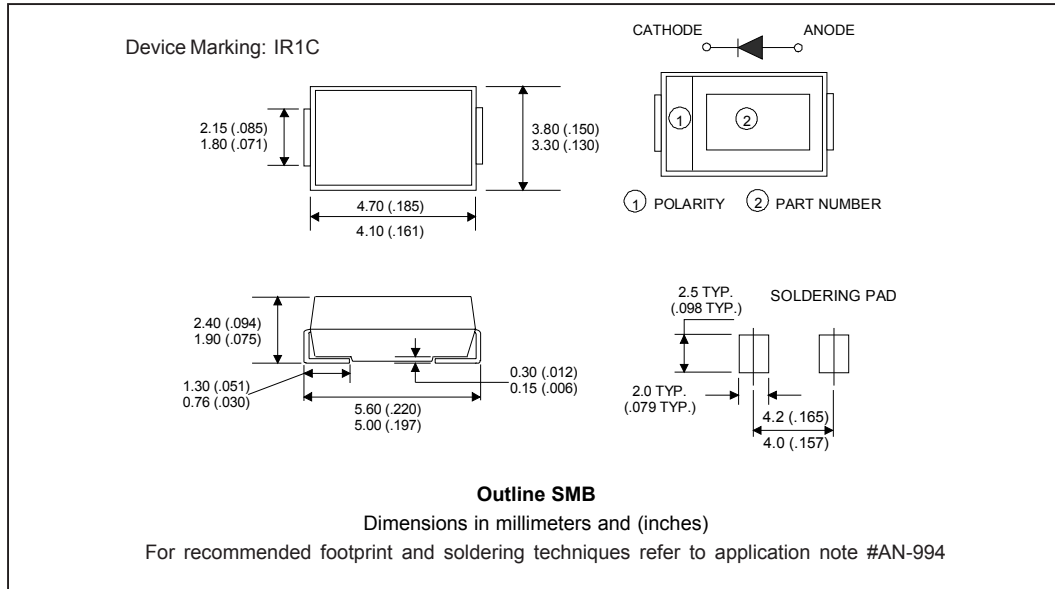
**Fig. 8 - Typical Stored Charge vs.  $di_F / dt$**

(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);

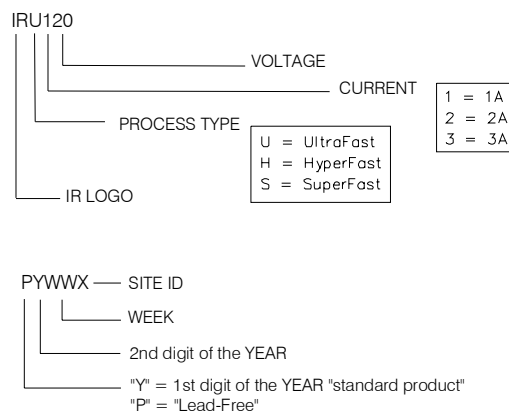
$P_{d_{REV}}$  = Inverse Power Loss =  $V_{R1} \times I_{R1} (1 - D)$ ;  $I_{R1} @ V_{R1}$  = rated  $V_R$

## Outline Table

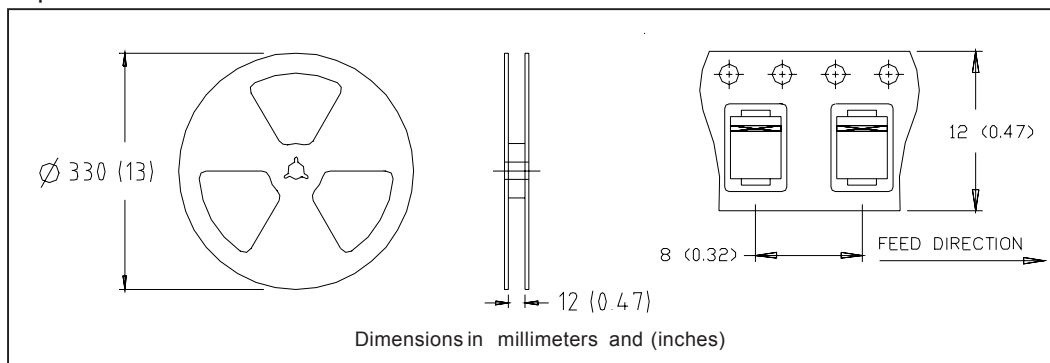


## Marking & Identification

Each device has 2 rows for identification. The first row designates the device as manufactured by International Rectifier, indicated by the letters "IR", and the Part Number (indicates the current, the voltage rating and Schottky Generation). The second row indicates the year, the week of manufacturing and the Site ID.



## Tape &amp; Reel Information



## Ordering Information Table

| Device Code |   |                                  |    |    |     |
|-------------|---|----------------------------------|----|----|-----|
| MUR         | S | 1                                | 20 | TR | PbF |
| 1           | 2 | 3                                | 4  | 5  | 6   |
| 1           | - | Ultrafast MUR Series             |    |    |     |
| 2           | - | Package Style: SMB               |    |    |     |
| 3           | - | Current Rating (1 = 1A)          |    |    |     |
| 4           | - | Voltage Rating (20 = 200V)       |    |    |     |
| 5           | - | • none = Box (1000 pieces)       |    |    |     |
|             |   | • TR = Tape & Reel (3000 pieces) |    |    |     |
| 6           | - | • none = Standard Production     |    |    |     |
|             |   | • PbF = Lead-Free                |    |    |     |

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

International  
**IR** Rectifier

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