



FEATURES

- Ultrafast recovery time
- Low forward voltage drop
- Low leakage current
- 175 °C operating junction temperature
- Designed and qualified for industrial level

DESCRIPTION/APPLICATIONS

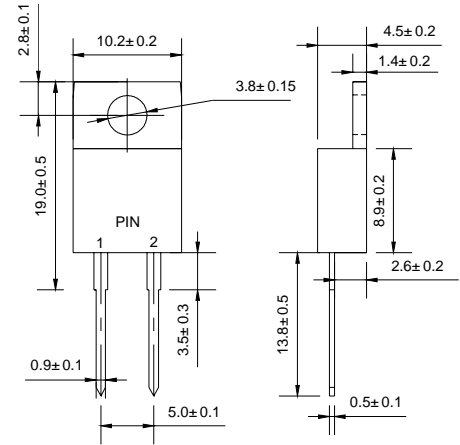
MUR.. series are the state of the art ultrafast recovery rectifiers specifically designed with optimized performance of forward voltage drop and ultrafast recovery time.

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-to-dc converters as well as freewheeling 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.

TO-220AC



Dimensions in millimeters

| ABSOLUTE MAXIMUM RATINGS | | | | |
|---|----------------|--|-------------|-------|
| PARAMETER | SYMBOL | TEST CONDITIONS | MAX. | UNITS |
| Peak repetitive reverse voltage | V_{RRM} | | 200 | V |
| Average rectified forward current | $I_{F(AV)}$ | Total device, rated V_R , $T_C = 150\text{ °C}$ | 15 | A |
| Non-repetitive peak surge current | I_{FSM} | | 200 | |
| Peak repetitive forward current | I_{FM} | Rated V_R , square wave, 20 kHz, $T_C = 150\text{ °C}$ | 30 | |
| Operating junction and storage temperatures | T_J, T_{Stg} | | - 65 to 175 | °C |

| ELECTRICAL SPECIFICATIONS ($T_J = 25\text{ °C}$ unless otherwise specified) | | | | | | |
|--|---------------|---|------|------|--------------|---------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | MIN. | TYP. | MAX. | UNITS |
| Breakdown voltage, blocking voltage | V_{BR}, V_R | $I_R = 100\text{ }\mu\text{A}$ | 200 | - | - | V |
| Forward voltage | V_F | $I_F = 15\text{ A}$ $I_F = 15\text{ A}, T_J = 150\text{ °C}$ | - | - | 1.05 0.85 | |
| Reverse leakage current | I_R | $V_R = V_R$ rated $T_J = 150\text{ °C}, V_R = V_R$ rated | - | - | 10 500 | μA |
| Junction capacitance | C_T | $V_R = 200\text{ V}$ | - | 55 | - | pF |
| Series inductance | L_S | Measured lead to lead 5 mm from package body | - | 8.0 | - | nH |

| DYNAMIC RECOVERY CHARACTERISTICS ($T_J = 25\text{ }^\circ\text{C}$ unless otherwise specified) | | | | | | |
|--|-----------|---|-----------------------------------|------|------|-------|
| PARAMETER | SYMBOL | TEST CONDITIONS | MIN. | TYP. | MAX. | UNITS |
| Reverse recovery time | t_{rr} | $I_F = 1.0\text{ A}$, $di_F/dt = 50\text{ A}/\mu\text{s}$, $V_R = 30\text{ V}$ | - | - | 35 | ns |
| | | $T_J = 25\text{ }^\circ\text{C}$ | - | 22 | - | |
| | | $T_J = 125\text{ }^\circ\text{C}$ | - | 39 | - | |
| Peak recovery current | I_{RRM} | $I_F = 15\text{ A}$ $di_F/dt = 200\text{ A}/\mu\text{s}$ $V_R = 160\text{ V}$ | $T_J = 25\text{ }^\circ\text{C}$ | - | 1.6 | A |
| | | | $T_J = 125\text{ }^\circ\text{C}$ | - | 4.1 | |
| Reverse recovery charge | Q_{rr} | $I_F = 15\text{ A}$ $di_F/dt = 200\text{ A}/\mu\text{s}$ $V_R = 160\text{ V}$ | $T_J = 25\text{ }^\circ\text{C}$ | - | 19 | nC |
| | | | $T_J = 125\text{ }^\circ\text{C}$ | - | 90 | |

| THERMAL - MECHANICAL SPECIFICATIONS | | | | | | |
|--|----------------|--|--------------|------|------------|---------------------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | MIN. | TYP. | MAX. | UNITS |
| Maximum junction and storage temperature range | T_J, T_{Stg} | | - 65 | - | 175 | $^\circ\text{C}$ |
| Thermal resistance, junction to case | R_{thJC} | | - | - | 1.5 | $^\circ\text{C}/\text{W}$ |
| Thermal resistance, junction to ambient | R_{thJA} | | - | - | 50 | |
| Thermal resistance, case to heatsink | R_{thCS} | Mounting surface, flat, smooth and greased | - | 0.5 | - | |
| Weight | | | - | 2.0 | - | g |
| | | | - | 0.07 | - | oz. |
| Mounting torque | | | 6.0 (5.0) | - | 12 (10) | kgf · cm (lbf · in) |
| Marking device | | Case style TO-220AC | MUR1520 | | | |

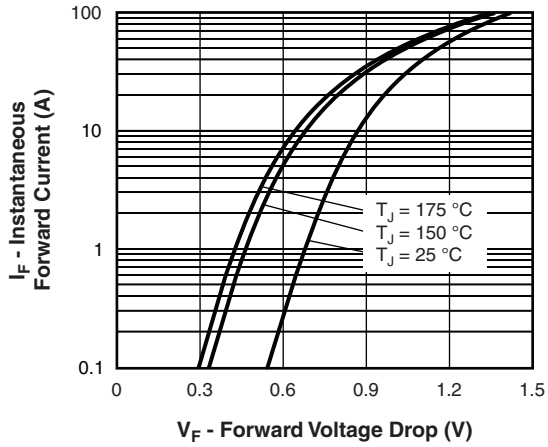


Fig. 1 - Typical Forward Voltage Drop Characteristics

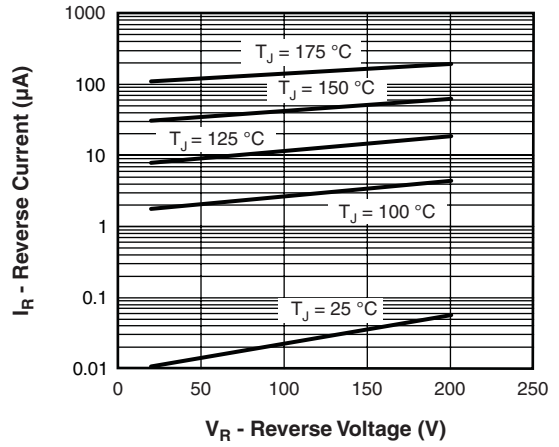


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

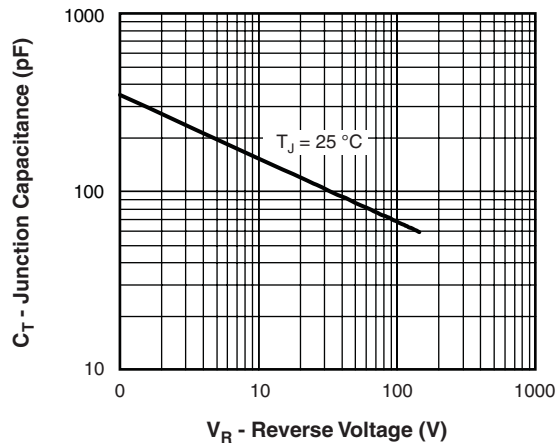


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

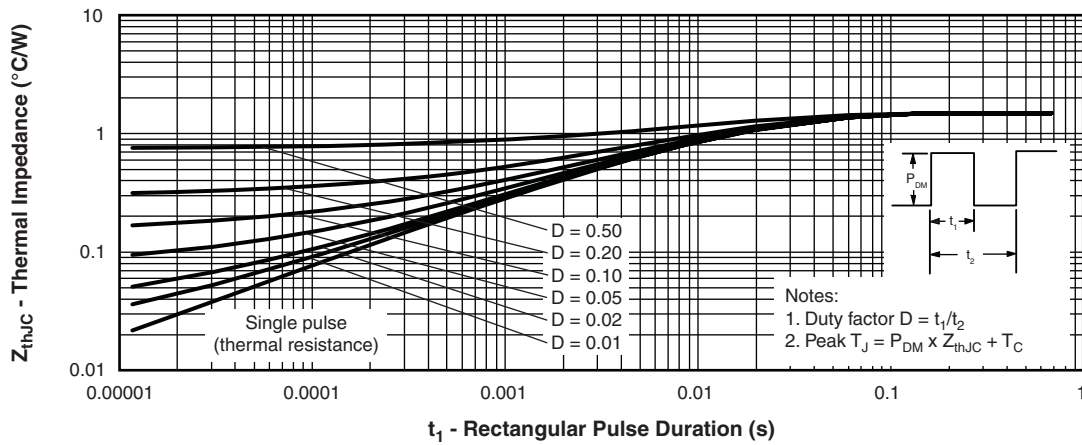


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

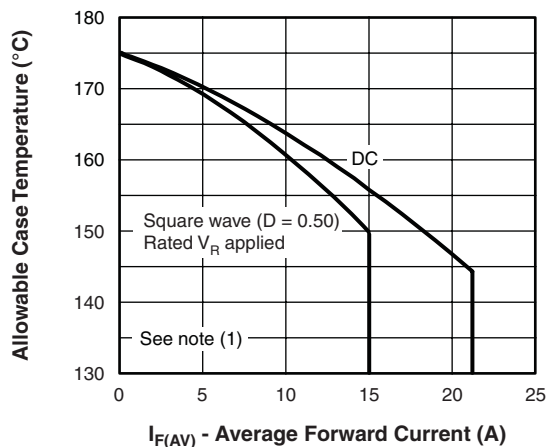


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

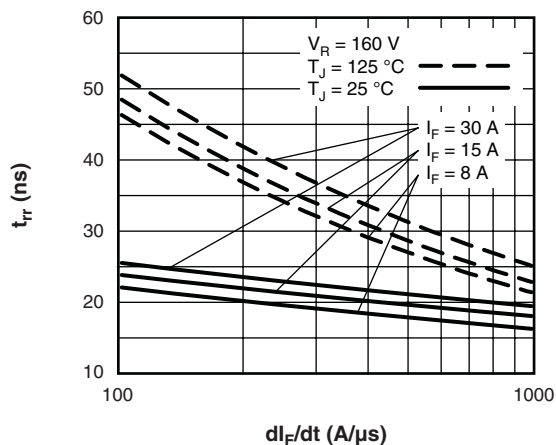


Fig. 7 - Typical Reverse Recovery Time vs. di_F/dt

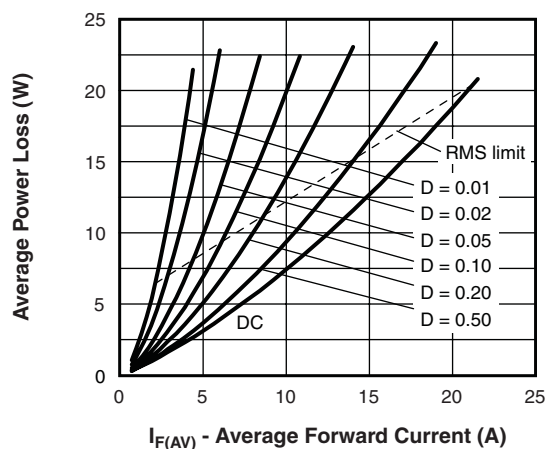


Fig. 6 - Forward Power Loss Characteristics

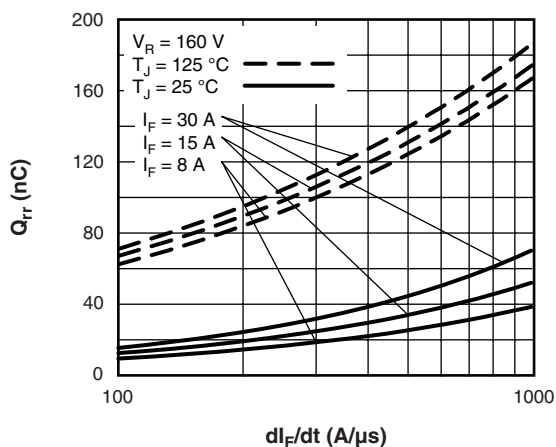


Fig. 8 - Typical Stored Charge vs. di_F/dt

Note

- (1) Formula used: $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$;
 P_d = Forward power loss = $I_{F(AV)} \times V_{FM}$ at $(I_{F(AV)}/D)$ (see fig. 6);
 $P_{d_{REV}}$ = Inverse power loss = $V_{R1} \times I_R (1 - D)$; I_R at V_{R1} = Rated V_R