

**Features:**

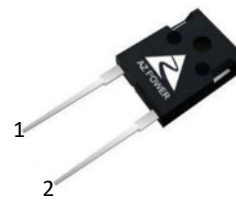
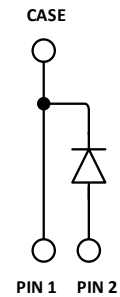
- 650V Schottky Diode
- Zero Reverse Recovery Current
- High Frequency Operation
- Positive Temperature Coefficient
- Temperature independent

## Switching

**Benefits:**

- Unipolar Rectifier
- Minimal switching loss
- Higher Efficiency
- Low cooling requirement

| Symbol                            | Value | Unit |
|-----------------------------------|-------|------|
| $V_{RRM}$                         | 650   | V    |
| $I_F$ ( $T_C=148^\circ\text{C}$ ) | 20    | A    |
| $Q_C$                             | 65    | nC   |

**Outline**

**TO-247-2**
**Circuit**

**Applications:**

- Switch Mode Power Supply
- Booster diodes in PFC, DC/DC
- AC/DC converters

**Maximum Ratings**

| Symbol      | Parameter                                 | Value            | Unit             | Test Conditions   |
|-------------|---|------------------|------------------|---|
| $V_R$       | DC Peak Reverse Voltage                   | 650              | V                | $T_J = 25^\circ\text{C}$  |
| $V_{RRM}$   | Repetitive Peak Reverse Voltage           | 650              | V                | $T_J = 25^\circ\text{C}$  |
| $V_{RSM}$   | Surge Peak Reverse Voltage                | 650              | V                | $T_J = 25^\circ\text{C}$  |
| $I_F$       | Continuous Forward Current                | 58<br>26.5<br>20 | A                | $T_C = 25^\circ\text{C}$<br>$T_C = 135^\circ\text{C}$<br>$T_C = 148^\circ\text{C}$  |
| $I_{FRM}$   | Repetitive Peak Forward Surge Current     | 176<br>160       | A                | $T_C = 25^\circ\text{C}$ , $T_P = 10\text{ms}$ , Half Sine Wave<br>$T_C = 125^\circ\text{C}$ , $T_P = 10\text{ms}$ , Half Sine Wave |
| $I_{FSM}$   | Non-Repetitive Peak Forward Surge Current | 236<br>212       | A                | $T_C = 25^\circ\text{C}$ , $T_P = 10\text{ms}$ , Half Sine Wave<br>$T_C = 125^\circ\text{C}$ , $T_P = 10\text{ms}$ , Half Sine Wave |
| $P_D$       | Power Dissipation                         | 200<br>67        | W                | $T_C = 25^\circ\text{C}$<br>$T_C = 125^\circ\text{C}$   |
| $T_{J,max}$ | Operating Junction Temperature            | 175              | $^\circ\text{C}$ |   |
| $T_{stg}$   | Storage Temperature Range                 | -55 to 175       | $^\circ\text{C}$ |   |

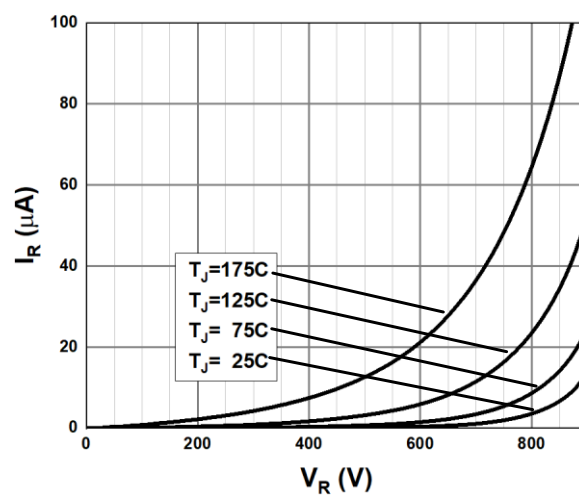
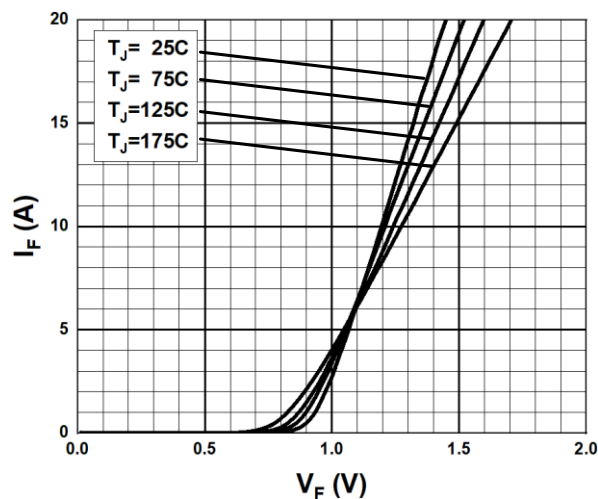
### Thermal characteristics

| Symbol     | Parameter          | Min. | Typ. | Max. | Unit                        |
|------------|--------------------|------|------|------|-----------------------------|
| $R_{thJC}$ | Thermal Resistance |      | 0.75 |      | $^{\circ}\text{C}/\text{W}$ |

### Electrical Characteristics

| Symbol   | Parameter               | Value |                   |            | Unit          | Test Conditions   |
|----------|-------------------------|-------|-------------------|------------|---------------|---|
|          |                         | Min.  | Typ.              | Max.       |               |   |
| $V_{DC}$ | DC Blocking Voltage     | 650   |                   |            | V             | $I_R=500\mu\text{A}$ , $T_J=25^{\circ}\text{C}$   |
| $V_F$    | Forward Voltage         |       | 1.45<br>1.75      | 1.7<br>2.0 | V             | $I_F=20\text{A}$ , $T_J=25^{\circ}\text{C}$<br>$I_F=20\text{A}$ , $T_J=175^{\circ}\text{C}$   |
| $I_R$    | Reverse Current         |       | 2<br>50           | 50<br>300  | $\mu\text{A}$ | $V_R=650\text{V}$ , $T_J=25^{\circ}\text{C}$<br>$V_R=650\text{V}$ , $T_J=175^{\circ}\text{C}$   |
| $Q_C$    | Total Capacitive Charge |       | 65                |            | nC            | $I_F=20\text{A}$ , $di/dt=600\text{A}/\mu\text{s}$<br>$T_J=25^{\circ}\text{C}$ , $V_R=400\text{V}$  |
| C        | Total Capacitance       |       | 796<br>157<br>138 |            | pF            | $V_R=1\text{V}$ , $T_J=25^{\circ}\text{C}$ , $f=1\text{ MHz}$<br>$V_R=200\text{V}$ , $T_J=25^{\circ}\text{C}$ , $f=1\text{ MHz}$<br>$V_R=400\text{V}$ , $T_J=25^{\circ}\text{C}$ , $f=1\text{ MHz}$ |

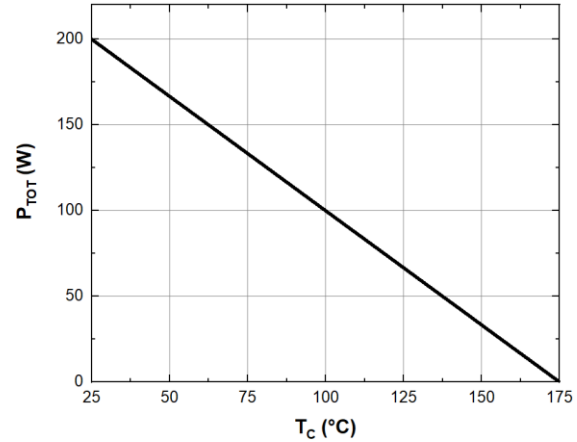
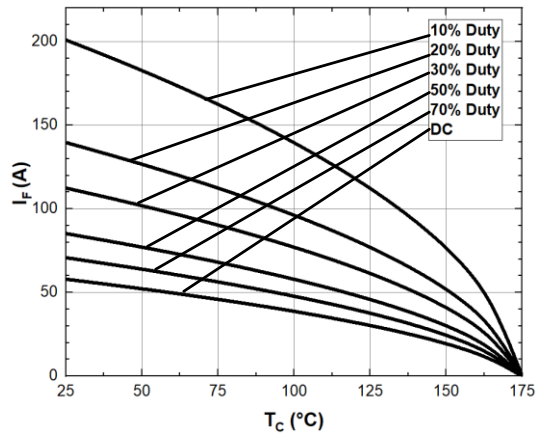
### Typical Performance



**Fig. 1 Forward Characteristics**

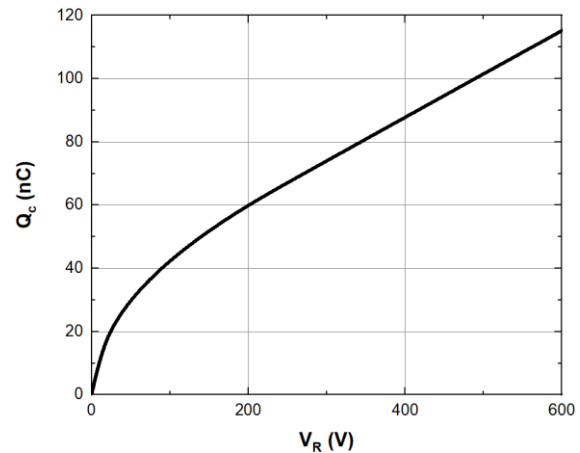
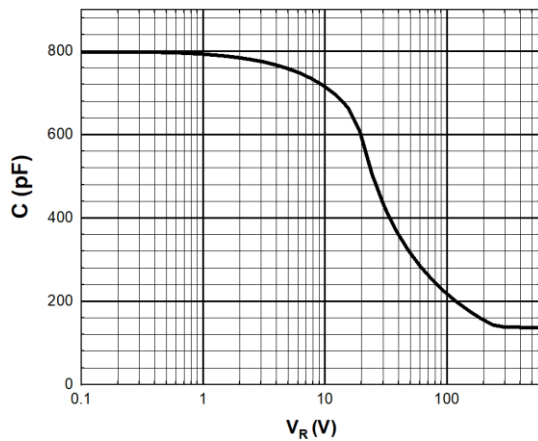
**Fig. 2 Reverse Characteristics**

**Typical Performance**



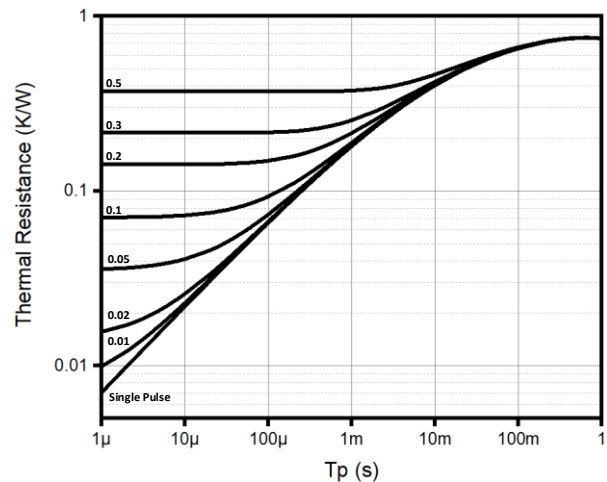
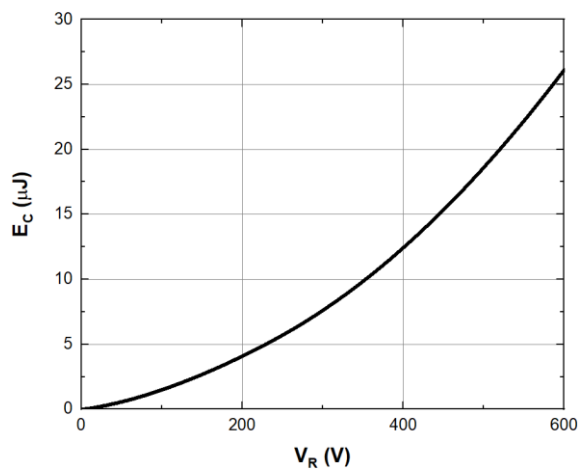
**Fig. 3 Current Derating**

**Fig. 4 Power Derating**



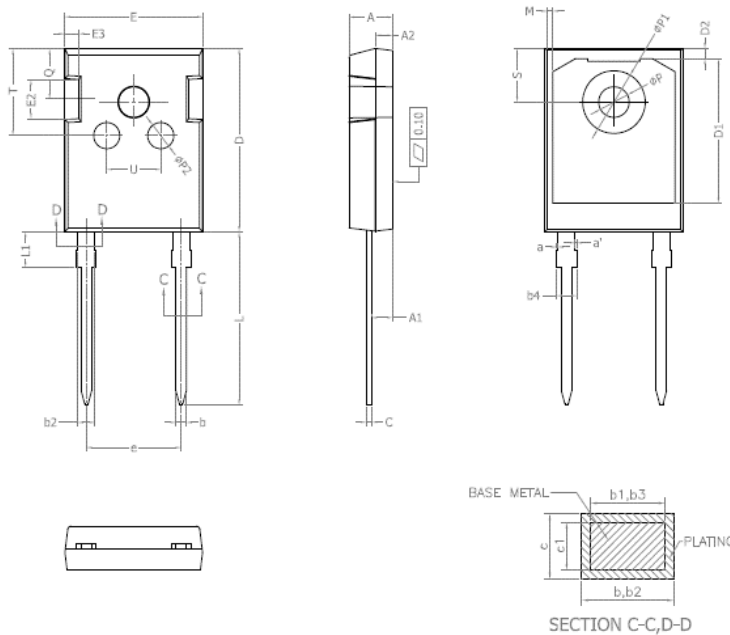
**Fig. 5 Capacitance vs. Reverse Voltage**

**Fig. 6 Recovery Charge vs. Reverse Voltage**



**Fig. 7 Capacitance stored Energy**

**Fig. 8 Thermal Impedance**

**Package TO-247-2 (Unit: mm)**


| COMMON DIMENSIONS<br>(UNITS OF MEASURE =MILLIMETER) |            |       |       |
|---|------------|-------|-------|
| SYMBOL  | MIN        | NOM   | MAX   |
| A   | 4.90       | 5.00  | 5.10  |
| A1  | 2.31       | 2.41  | 2.51  |
| A2  | 1.90       | 2.00  | 2.10  |
| a   | 0          | —     | 0.15  |
| a'  | 0          | —     | 0.15  |
| b   | 1.16       | —     | 1.26  |
| b1  | 1.15       | 1.2   | 1.22  |
| b2  | 1.96       | —     | 2.06  |
| b3  | 1.95       | 2.00  | 2.02  |
| b4  | —          | —     | 2.25  |
| c   | 0.59       | —     | 0.66  |
| c1  | 0.58       | 0.60  | 0.62  |
| D   | 20.90      | 21.00 | 21.10 |
| D1  | 16.25      | 16.55 | 16.85 |
| D2  | 1.05       | 1.17  | 1.35  |
| E   | 15.70      | 15.80 | 15.90 |
| E2  | 4.40       | 4.50  | 4.60  |
| E3  | 2.40       | 2.50  | 2.60  |
| e   | 10.872 BSC |       |       |
| L   | 19.80      | 19.92 | 20.10 |
| L1  | —          | —     | 4.30  |
| M   | 0.35       | —     | 0.95  |
| P   | 3.40       | 3.50  | 3.60  |
| P1  | 7.00       | —     | 7.40  |
| P2  | 2.40       | 2.50  | 2.60  |
| Q   | 5.60       | —     | 6.00  |
| S   | 6.05       | 6.15  | 6.25  |
| T   | 9.80       | —     | 10.20 |
| U   | 6.00       | —     | 6.40  |

This Product has not been designed or tested for use in, and is not intended for use in, applications implanted into the human body nor in applications in which failure of the product could lead to death, personal injury or property damage, including but not limited to equipment used in the operation of nuclear facilities, life-support machines, systems, or air-traffic control systems.

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