

650V Silicon Carbide Schottky Diode

DESCRIPTION :

- Negligible reverse recovery
- High Speed Switching
- Positive temperature Coefficient
- Temperature Independent Switching
- RoHS Compliant

| | |
|-----------|---------------|
| V_{RRM} | 650V |
| I_F | 8A (TC=150°C) |
| Q_C | 23nC |

TYPICAL APPLICATIONS :

- Switch mode power supplies
- Solar inverters
- Data Center
- Uninterruptible power supplies (UPS)



TO-247AC

MAXIMUM RATINGS (at $T_C = 25^\circ\text{C}$, unless otherwise specified)

| Characteristic | Condition | Symbol | Value | Unit |
|---------------------------------------|---|---------------|----------------|----------------------|
| Repetitive Peak Reverse Voltage | | V_{RRM} | 650 | V |
| Continuous Forward Current | $T_C=25^\circ\text{C}$ $T_C=135^\circ\text{C}$ $T_C=150^\circ\text{C}$ | I_F | 21 10 8 | A |
| Non-Repetitive Forward Surge Current | $T_C=25^\circ\text{C}$, $t_P=10\text{ms}$, Half sine pulse $T_C=110^\circ\text{C}$, $t_P=10\text{ms}$, Half sine pulse | I_{FSM} | 74 65 | A |
| Repetitive Peak Forward Surge Current | $T_C=25^\circ\text{C}$, $t_P=10\text{ms}$, Half sine pulse | I_{FRM} | 66 | A |
| i^2t value | $T_C=25^\circ\text{C}$, $t_P=10\text{ms}$ $T_C=110^\circ\text{C}$, $t_P=10\text{ms}$ | $\int i^2 dt$ | 27 21 | A^2S |
| Power dissipation | $T_C=25^\circ\text{C}$ $T_C=110^\circ\text{C}$ $T_C=150^\circ\text{C}$ | P_{tot} | 86 37 14 | W |
| Operation Junction temperature | | T_J | -55~+175 | $^\circ\text{C}$ |
| Storage temperature | | T_{STG} | -55~+175 | $^\circ\text{C}$ |

THERMAL CHARACTERISTICS

| Characteristic | Condition | Symbol | Typical | Unit |
|--|-----------|---------------|---------|-----------------------------|
| Thermal resistance, junction - case | | $R_{th(j-c)}$ | 1.734 | $^{\circ}\text{C}/\text{W}$ |

ELECTRICAL CHARACTERISTICS (at $T_c = 25^{\circ}\text{C}$, unless otherwise specified)

| Characteristic | Symbol | Min. | Typ. | Max. | Unit |
|---|----------|------|----------------------|------|---------------|
| DC Blocking Voltage | V_{DC} | 650 | | | V |
| Forward Voltage IF = 4A IF = 8A, $T_c = 25^{\circ}\text{C}$ IF = 8A, $T_c = 175^{\circ}\text{C}$ | V_F | | 1.18 1.39 1.74 | 1.6 | V |
| Reverse Current VR = 650V, $T_c = 25^{\circ}\text{C}$ VR = 650V, $T_c = 175^{\circ}\text{C}$ | I_R | | 6 12 | 60 | μA |
| Total Capacitive Charge VR = 400V | Q_C | | 23 | | nC |
| Total capacitance VR = 1V, f = 1MHz VR = 200V, f = 1MHz VR = 400V, f = 1MHz | C | | 338 44 43 | | pF |
| Capacitance Stored Energy VR = 400 V | E_C | | 3.8 | | μJ |

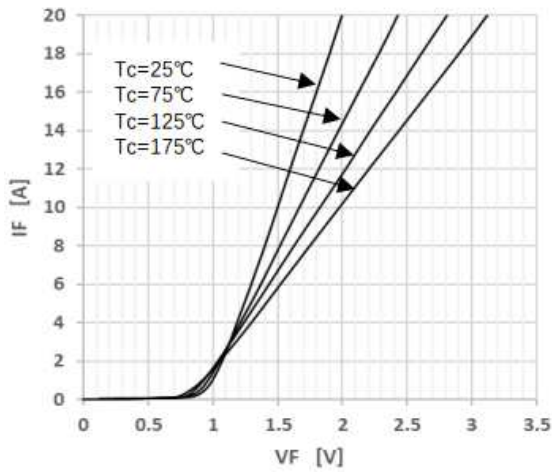


Figure 1. Forward characteristics

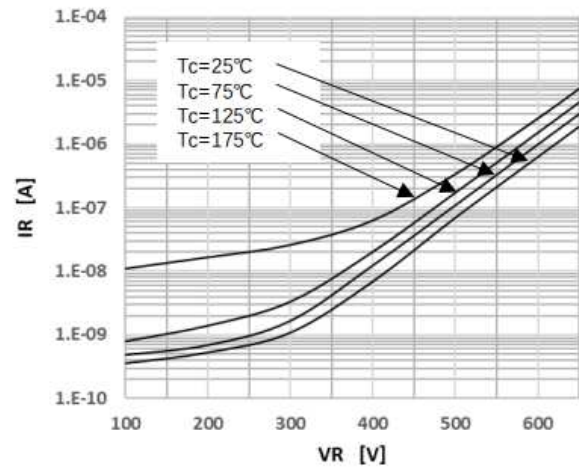


Figure 2. Reverse characteristics

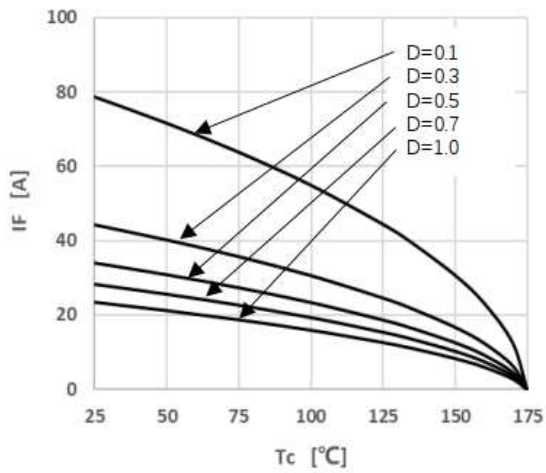


Figure 3. Peak Forward Current Derating

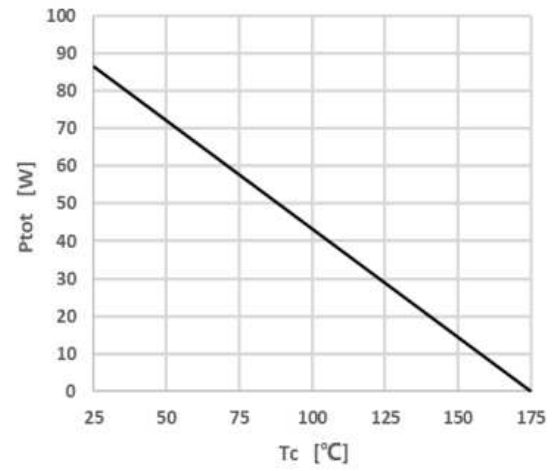


Figure 4. Power Dissipation

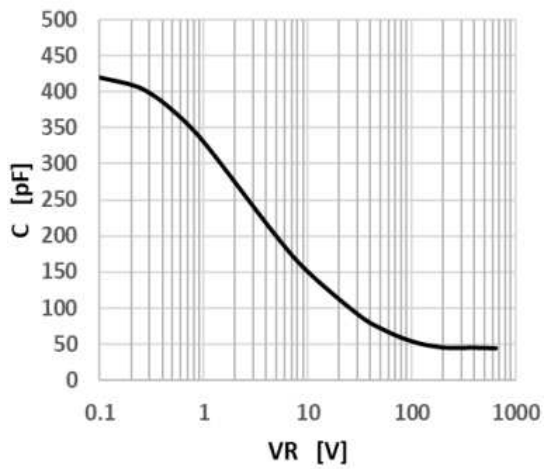


Figure 5. Capacitance vs. Reverse Voltage

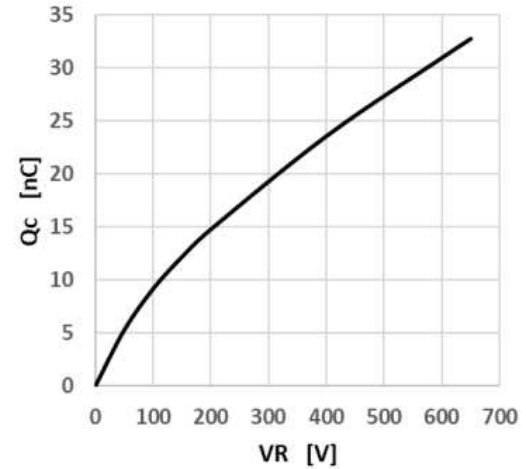


Figure 6. Capacitance Charge vs. Reverse Voltage

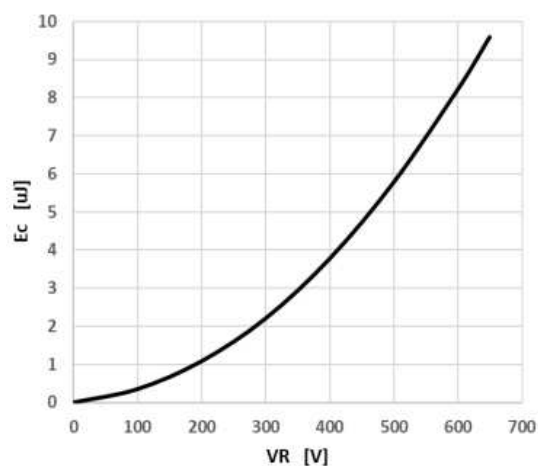


Figure 7. Capacitance Stored Energy

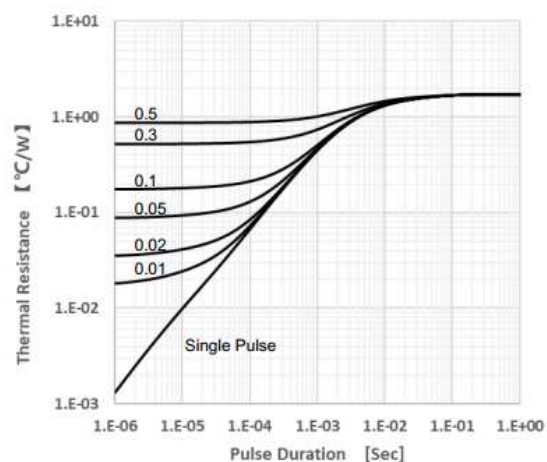
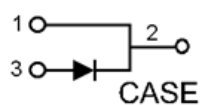
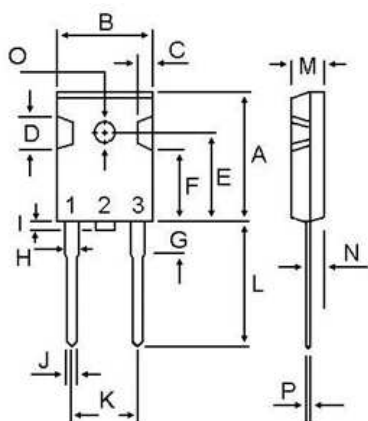


Figure 8. Transient Thermal Impedance

- Circuit diagram



- TO-247AC Package outlines : Dimensions in (mm)



| DIM | MILLIMETERS | |
|-----|-------------|-------|
| | MIN | MAX |
| A | 20.63 | 22.38 |
| B | 15.38 | 16.20 |
| C | 1.90 | 2.70 |
| D | 5.10 | 6.10 |
| E | 14.81 | 15.22 |
| F | 11.72 | 12.84 |
| G | 3.75 | 4.35 |
| H | 1.82 | 2.46 |
| I | --- | 1.25 |
| J | 0.89 | 1.53 |
| K | 10.52 | 11.32 |
| L | 18.50 | 21.50 |
| M | 4.68 | 5.36 |
| N | 2.40 | 2.80 |
| O | 3.25 | 3.65 |
| P | 0.55 | 0.70 |

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