## 650V Silicon Carbide Diode

DESCRIPTION：

·Zero reverse recovery current

·Zero forward recovery voltage

·Temperature independent switching behavior

·Excellent Surge Current Capability

·Positive Temperature Coefficient on VF

·High Frequency Operation

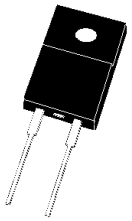
| | |
|---|---|
| $V_{RRM}$ | 650V |
| $I_F$ | 10A (Tc=130℃) |
| $Q_C$ | 30nC |

TYPICAL APPLICATIONS：

·Switch Mode Power Supplies, Power Factor Correction

·Uninterruptible Power Supplies

·Motor drives



ITO-220AC

MAXIMUM RATINGS (at $T_J$ = 25 °C, unless otherwise specified)

| Characteristic | Condition | Symbol | Value | Unit |
|---|---|---|---|---|
| Repetitive Peak Reverse Voltage | | $V_{RRM}$ | 650 | V |
| Average Forward Current | Tc=25℃<br>Tc=130℃ | $I_F$ | 22<br>10 | A |
| Non-Repetitive Forward Surge Current | Tc=25℃; tp = 10ms; Half sine pulse | $I_{FSM}$ | 96 | A |
| $i^2t$ value | Tc=25℃; tp = 10ms; | $\int i^2dt$ | 46 | $A^2S$ |
| Power dissipation | Tc=25℃<br>Tc=110℃ | Ptot | 55<br>24 | W |
| Storage temperature Range | | $T_{STG}$ | -55~+175 | ℃ |
| Operation Junction Range | | Tj | -55~+175 | ℃ |

ELECTRICAL CHARATERISTICS (at $T_J$ = 25 °C, unless otherwise specified)

| Characteristic | Symbol | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| DC Blocking Voltage | $V_{DC}$ | 650 | | | |
| Forward Voltage<br>IF = 10A, $T_J$ =25℃<br>IF = 10A, $T_J$ =135℃<br>IF = 10A, $T_J$ =175℃ | $V_F$ | | <br>1.27<br>1.39<br>1.46 | <br>1.57<br>1.84<br>2.07 | V |
| Reverse Current<br>VR = 650V, $T_J$ =25℃<br>VR = 650V, $T_J$ =175℃ | $I_R$ | | <br>1<br>10 | <br>20<br>200 | uA |
| Total Capacitive Charge<br>VR = 400V | $Q_C$ | | 30 | | nC |
| Diode Capacitance<br>VR = 1V, f =1MHz<br>VR = 400V, f =1MHz<br>VR = 600V, f =1MHz | $C_d$ | | <br>420<br>47<br>46 | | pF |
| Capacitance Stored Energy<br>VR = 400V | $E_C$ | | 3.8 | | uJ |

THERMAL CHARACTERISTICS

| Characteristic | Condition | Symbol | Typical | Unit |
|---|---|---|---|---|
| Thermal resistance, junction to case | with heatsink compound | $R_{th(j-C)}$ | 2.7 | ℃/W |

Typical Performance

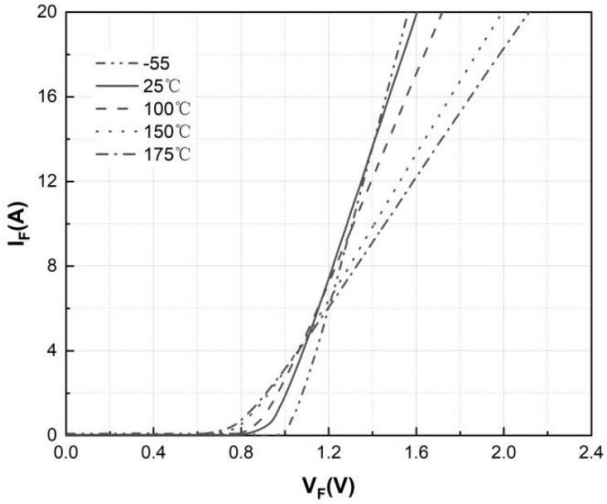



Figure 1. Forward characteristics

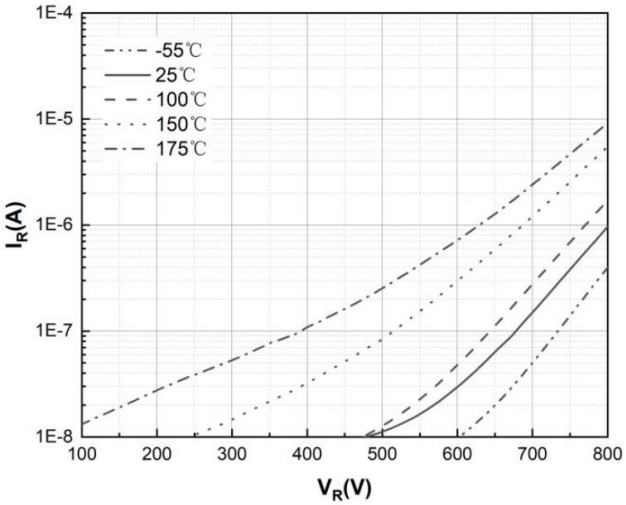



Figure 2. Typical reverse current as function of reverse voltage

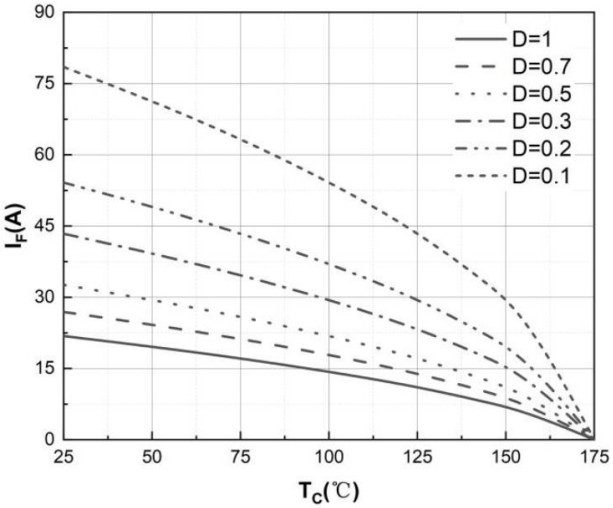



Figure 3. Diode forward current as function of temperature, D=duty cycle

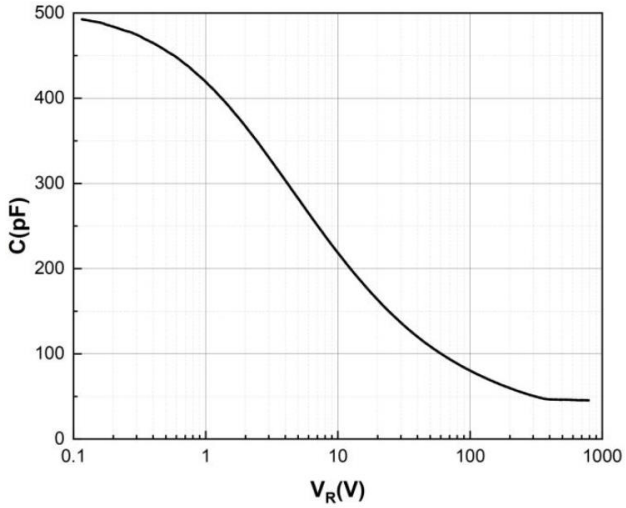



Figure 4. Typical capacitance as function of reverse voltage, C=f(VR); Tj=25°C; f=1 MHz

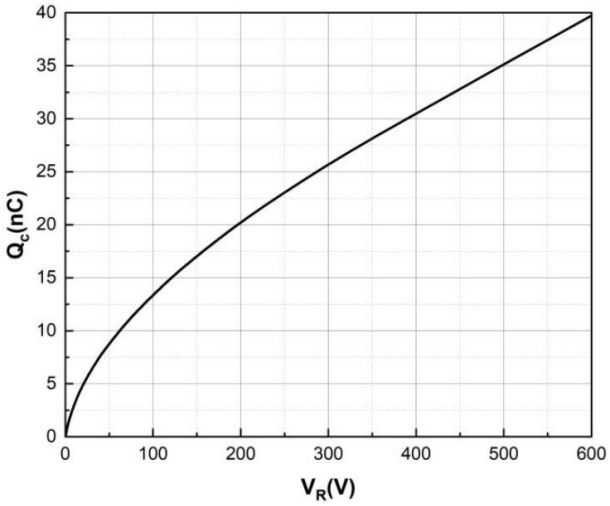



Figure 5. Typical reverse charge as function of reverse voltage

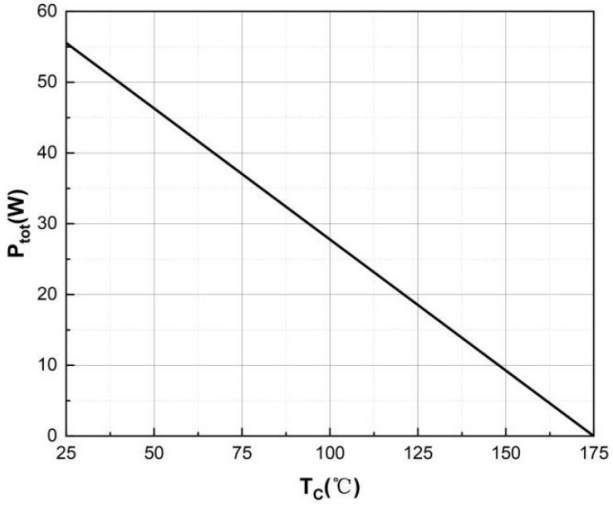



Figure 6. Power dissipation as function of case temperature

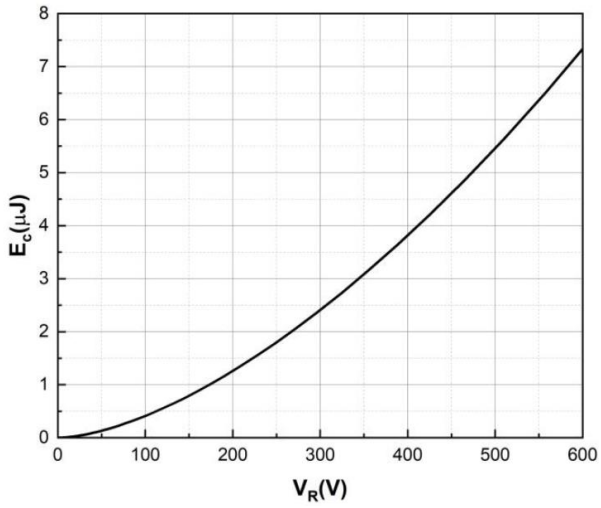



Figure 7. Capacitance Stored Energy

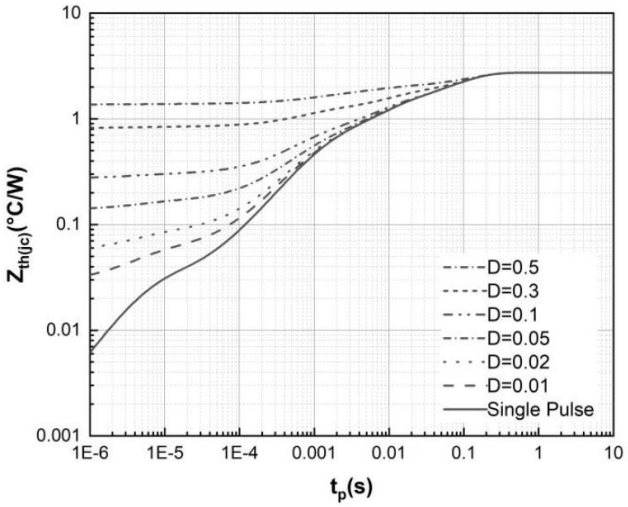
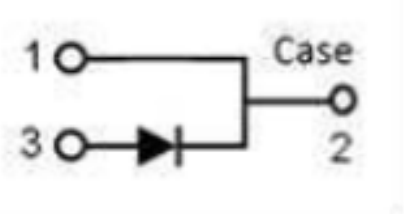
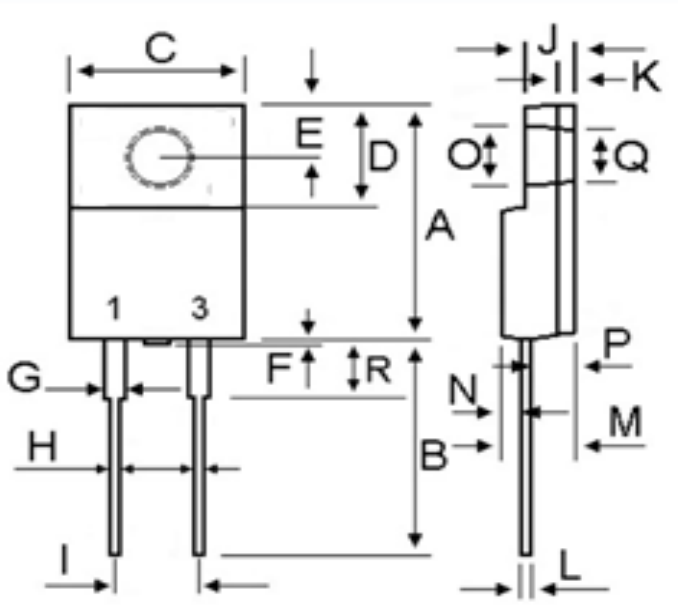



Figure 8. Max. transient thermal impedance, Zth(jc)= f(tp), parameter: D =tp/T

·Circuit diagram



·ITO-220 Package outlines : Dimensions in (mm)




| DIM | MILLIMETERS | |
|---|---|---|
| | MIN | MAX |
| A | 14.80 | 16.10 |
| B | 12.65 | 14.40 |
| C | 9.70 | 10.36 |
| D | 4.60 | 6.80 |
| E | 2.50 | 3.50 |
| F | --- | 2.00 |
| G | 0.90 | 1.45 |
| H | 0.50 | 0.90 |
| I | 4.80 | 5.40 |
| J | 2.34 | 3.30 |
| K | 0.55 | 1.30 |
| L | 0.36 | 0.80 |
| M | 4.20 | 4.90 |
| N | 1.10 | 1.80 |
| O | 2.90 | 3.50 |
| P | 2.30 | 3.15 |
| Q | 2.90 | 3.50 |
| R | 2.80 | 4.85 |

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