

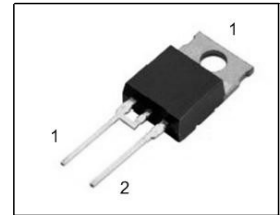
Silicon Carbide Schottky Diode

- Worlds first 600V Schottky diode
- Revolutionary semiconductor material - Silicon Carbide
- Switching behavior benchmark
- No reverse recovery
- No temperature influence on the switching behavior
- No forward recovery

thinQ!™ SiC Schottky Diode
Product Summary

| | | |
|-----------|-----|----|
| V_{RRM} | 600 | V |
| Q_C | 24 | nC |
| I_F | 8 | A |

P-TO220-2-2.



| Type | Package | Ordering Code | Marking | Pin 1 | Pin 2 |
|----------|--------------|---------------|---------|-------|-------|
| SDT08S60 | P-TO220-2-2. | Q67040S4647 | D08S60 | C | A |

Maximum Ratings, at $T_j = 25\text{ °C}$, unless otherwise specified

| Parameter | Symbol | Value | Unit |
|--|----------------|-------------|------------------|
| Continuous forward current, $T_C=100\text{ °C}$ | I_F | 8 | A |
| RMS forward current, $f=50\text{ Hz}$ | I_{FRMS} | 11.3 | |
| Surge non repetitive forward current, sine halfwave $T_C=25\text{ °C}$, $t_p=10\text{ ms}$ | I_{FSM} | 26 | |
| Repetitive peak forward current $T_j=150\text{ °C}$, $T_C=100\text{ °C}$, $D=0.1$ | I_{FRM} | 32 | |
| Non repetitive peak forward current $t_p=10\text{ }\mu\text{s}$, $T_C=25\text{ °C}$ | I_{FMAX} | 80 | |
| i^2t value, $T_C=25\text{ °C}$, $t_p=10\text{ ms}$ | $\int i^2 dt$ | 3.4 | A ² s |
| Repetitive peak reverse voltage | V_{RRM} | 600 | V |
| Surge peak reverse voltage | V_{RSM} | 600 | |
| Power dissipation, $T_C=25\text{ °C}$ | P_{tot} | 65 | W |
| Operating and storage temperature | T_j, T_{stg} | -55... +175 | °C |

Thermal Characteristics

| Parameter | Symbol | Values | | | Unit |
|--|------------|--------|------|------|------|
| | | min. | typ. | max. | |
| Characteristics | | | | | |
| Thermal resistance, junction - case | R_{thJC} | - | - | 2.3 | K/W |
| Thermal resistance, junction - ambient, leaded | R_{thJA} | - | - | 62 | |

Electrical Characteristics, at $T_j = 25^\circ\text{C}$, unless otherwise specified

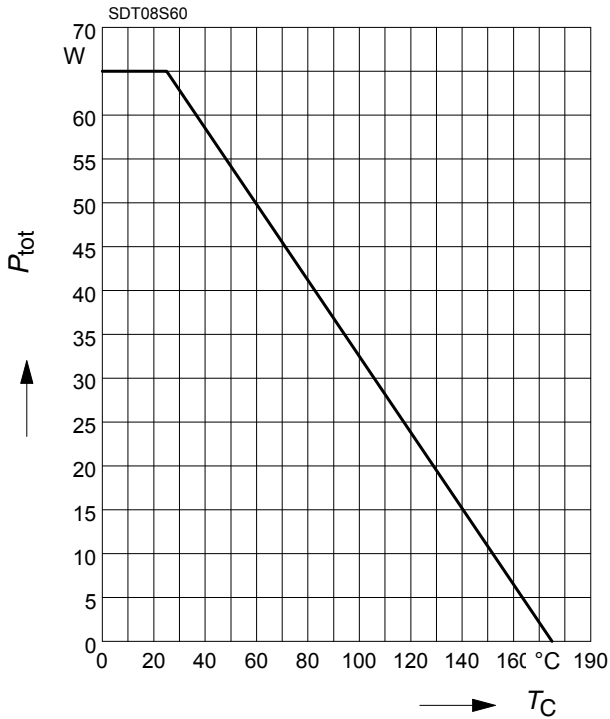
| Parameter | Symbol | Values | | | Unit |
|--|--------|-------------|------------|-------------|------|
| | | min. | typ. | max. | |
| Static Characteristics | | | | | |
| Diode forward voltage $I_F=8\text{A}, T_j=25^\circ\text{C}$ $I_F=8\text{A}, T_j=150^\circ\text{C}$ | V_F | - - - | 1.5 1.7 | 1.7 2.1 | V |
| Reverse current $V_R=600\text{V}, T_j=25^\circ\text{C}$ $V_R=600\text{V}, T_j=150^\circ\text{C}$ | I_R | - - | 28 70 | 300 1500 | |

Electrical Characteristics, at $T_j = 25\text{ }^\circ\text{C}$, unless otherwise specified

| Parameter | Symbol | Values | | | Unit |
|---|----------|--------|-----------------|------|------|
| | | min. | typ. | max. | |
| AC Characteristics | | | | | |
| Total capacitive charge $V_R=400\text{V}$, $I_F=8\text{A}$, $di_F/dt=200\text{A}/\mu\text{s}$, $T_j=150\text{ }^\circ\text{C}$ | Q_C | - | 24 | - | nC |
| Switching time $V_R=400\text{V}$, $I_F=8\text{A}$, $di_F/dt=200\text{A}/\mu\text{s}$, $T_j=150\text{ }^\circ\text{C}$ | t_{rr} | - | n.a | - | ns |
| Total capacitance $V_R=0\text{V}$, $T_C=25\text{ }^\circ\text{C}$, $f=1\text{MHz}$ $V_R=300\text{V}$, $T_C=25\text{ }^\circ\text{C}$, $f=1\text{MHz}$ $V_R=600\text{V}$, $T_C=25\text{ }^\circ\text{C}$, $f=1\text{MHz}$ | C | - | 280 26 18 | - | pF |

1 Power dissipation

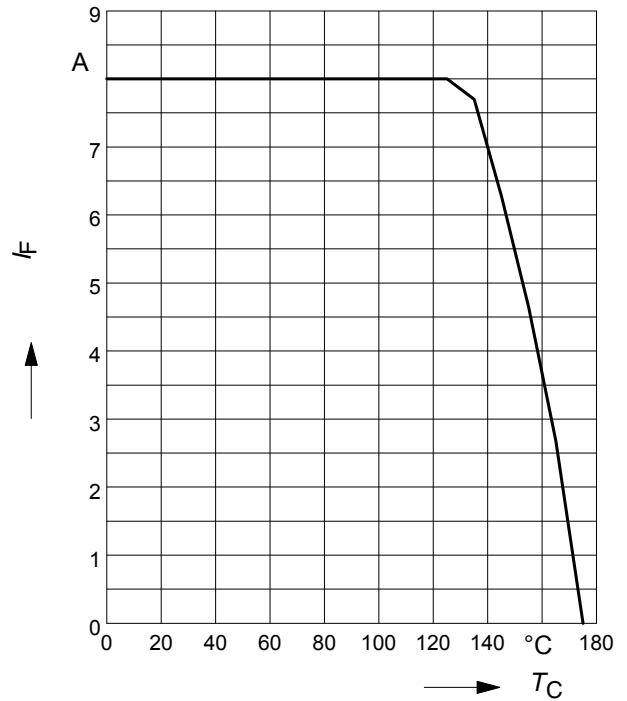
$P_{tot} = f(T_C)$



2 Diode forward current

$I_F = f(T_C)$

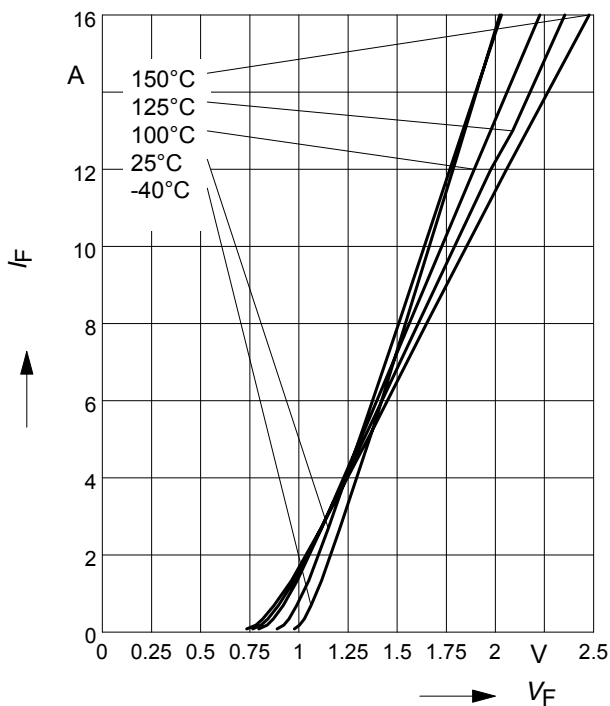
parameter: $T_j \leq 175^\circ\text{C}$



3 Typ. forward characteristic

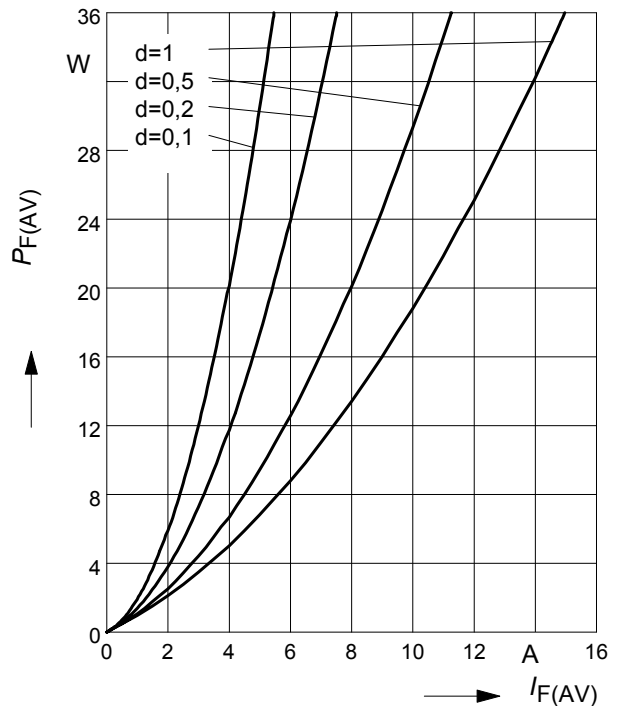
$I_F = f(V_F)$

parameter: $T_j, t_p = 350 \mu\text{s}$



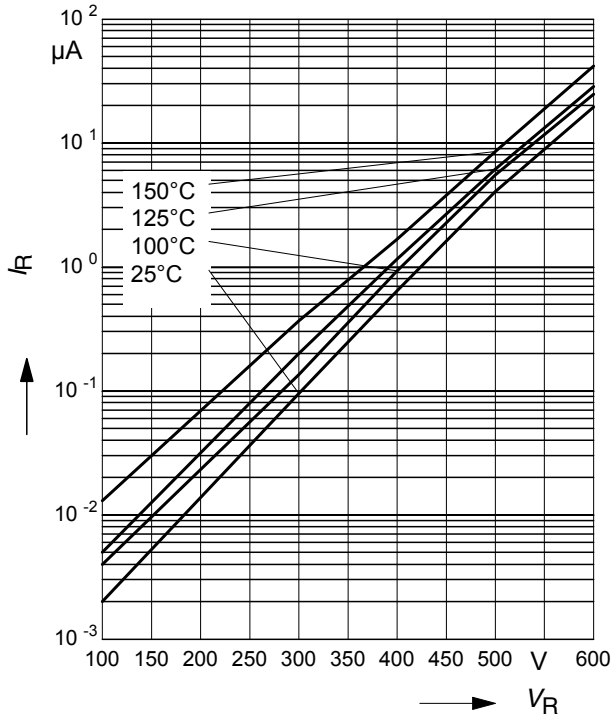
4 Typ. forward power dissipation vs. average forward current

$P_{F(AV)} = f(I_F) \quad T_C = 100^\circ\text{C}, d = t_p/T$



5 Typ. reverse current vs. reverse voltage

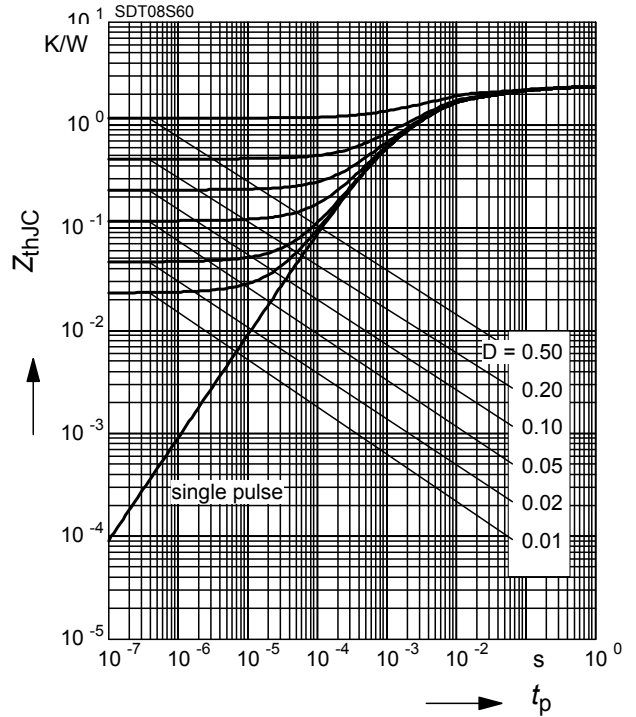
$$I_R = f(V_R)$$



6 Transient thermal impedance

$$Z_{thJC} = f(t_p)$$

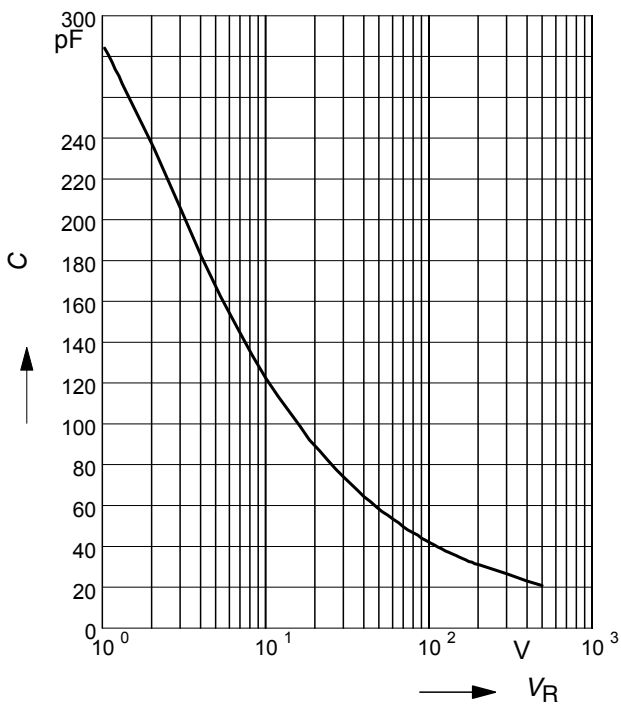
parameter : $D = t_p/T$



7 Typ. capacitance vs. reverse voltage

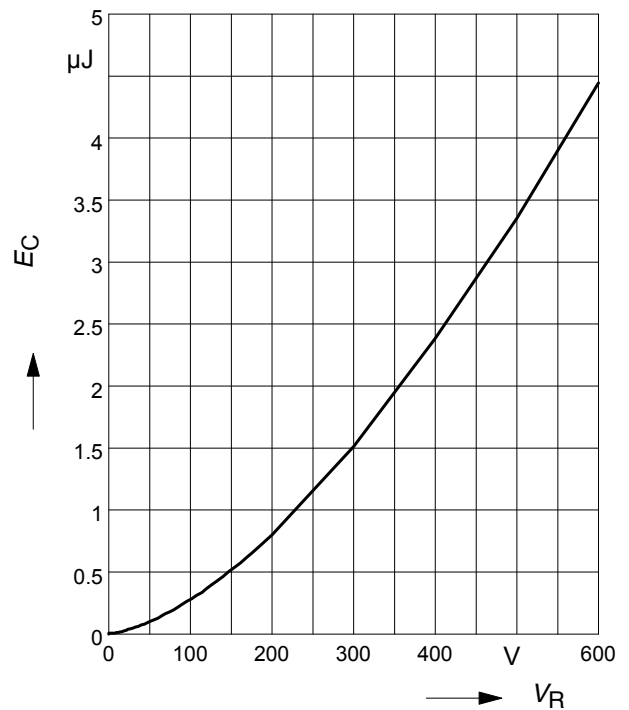
$$C = f(V_R)$$

parameter: $T_C = 25\text{ }^\circ\text{C}$, $f = 1\text{ MHz}$



8 Typ. C stored energy

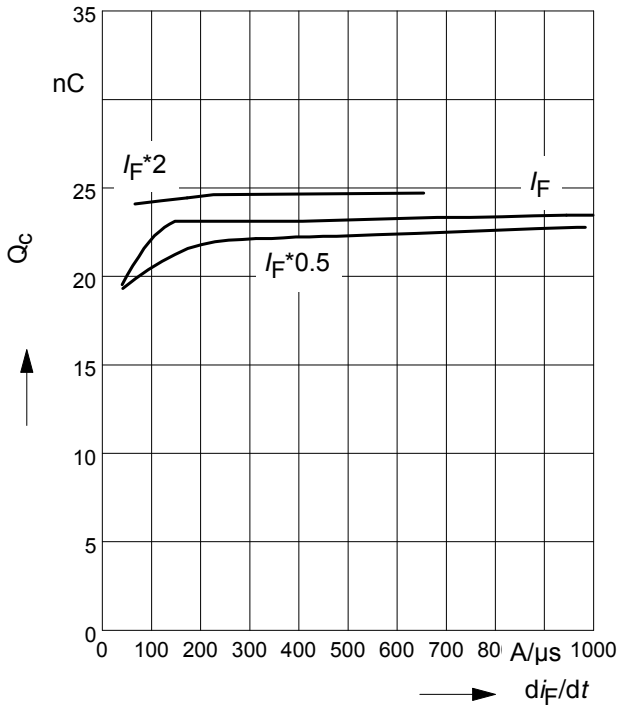
$$E_C = f(V_R)$$

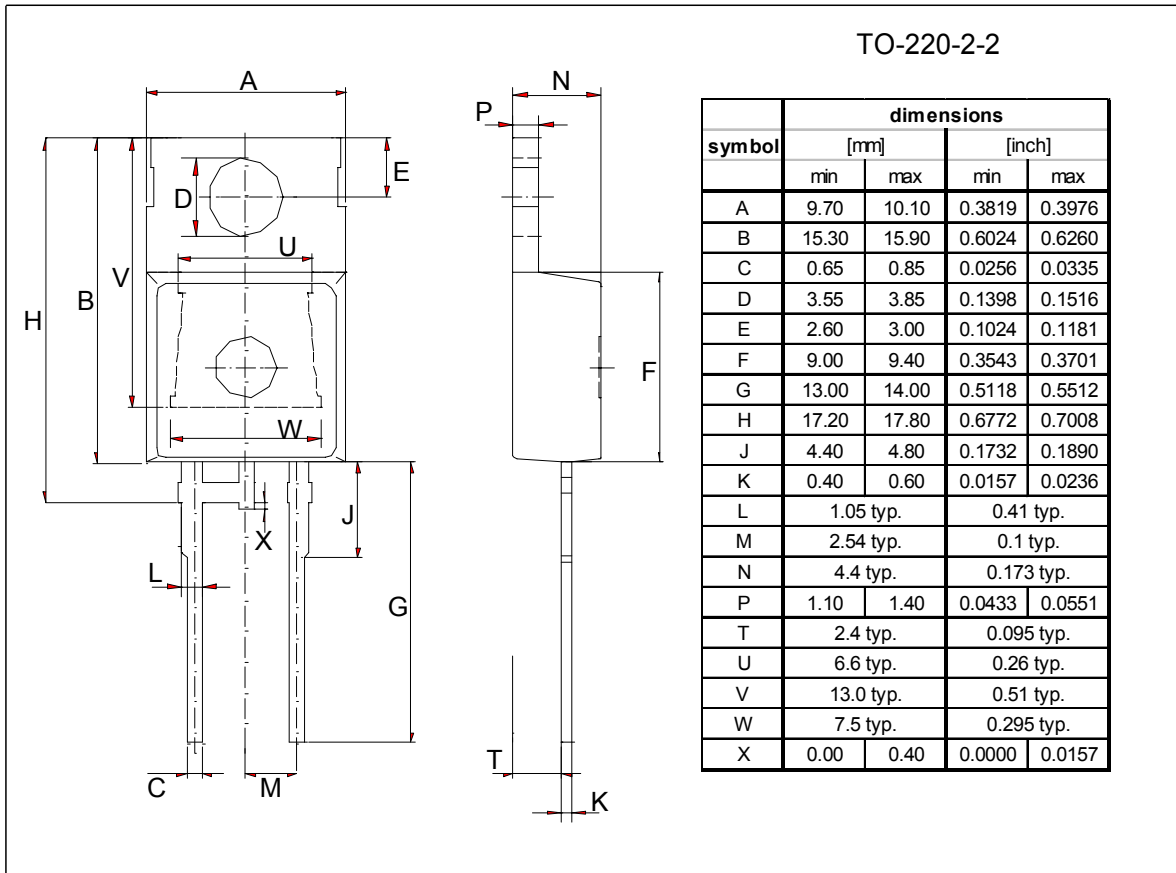


9 Typ. capacitive charge vs. current slope

$$Q_C = f(di_F/dt)$$

parameter: $T_j = 150\text{ }^\circ\text{C}$





Published by
Infineon Technologies AG,
Bereichs Kommunikation
St.-Martin-Strasse 53,
D-81541 München
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