

Silicon Carbide Schottky Diode

Features

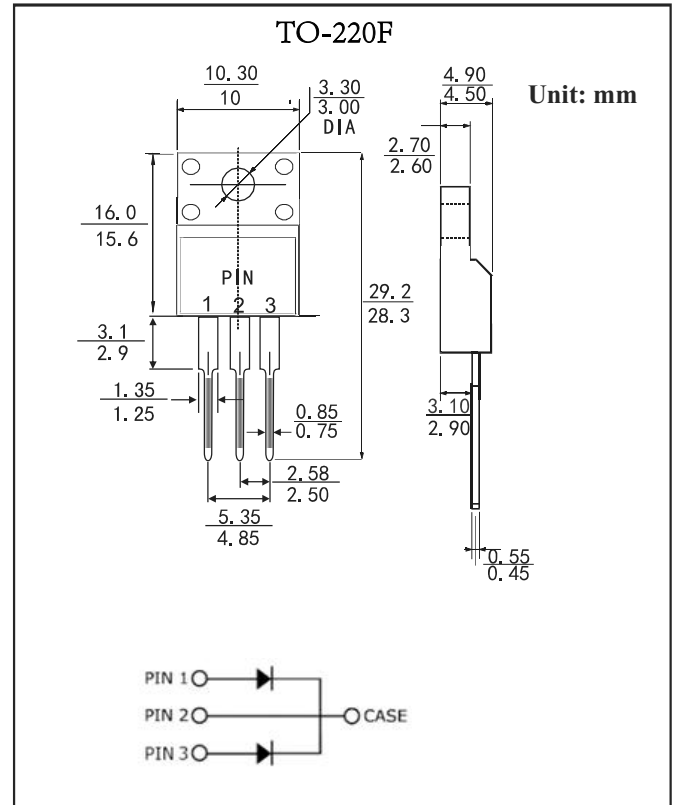
- Low reverse current
- Good surge current capability
- Low capacitive charge
- No reverse recovery current
- Halogen free, RoHs compliant

Benefits

- System efficiency improvement over Si diodes
- Higher switching frequency
- Increased power density
- Essentially no switching losses

Applications

- Switch mode power supplies (SMPS)
- Uninterruptible power supplies
- On Board Charger
- UPS



MAXIMUM RATINGS (Rating 25°C Case temperature unless otherwise)

Symbol	Parameter	Test conditions	Value	Unit
V_{RRM}	Repetitive peak reverse voltage		650	V
V_{RSM}	Non-repetitive peak reverse voltage		650	V
I_F	Continuous forward current	$T_C=25^\circ\text{C}$ $T_C=135^\circ\text{C}$	10*/20** 5*/10**	A
I_{FRM}	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	23* 15*	A
I_{FSM}	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	36* 28*	A
$\int i^2 dt$	i^2t value	$T_C=25^\circ\text{C}$, $t_p=10\text{ms}$, Half Sine Pulse $T_C=110^\circ\text{C}$, $t_p=10\text{ms}$, Half Sine Pulse	6.5* 3.9*	A ² S
P_{tot}	Power dissipation	$T_C=25^\circ\text{C}$ $T_C=110^\circ\text{C}$	30*/60** 13*/26**	W
T_j	Operating junction temperature		-55~175	°C
T_{stg}	Storage temperature		-55~150	°C

Thermal Characteristics

Symbol	Parameter	Value			Unit
		Min.	Typ.	Max.	
$R_{th(jc)}$	Thermal resistance from junction to case		4.90*/9.8**		°C/W

Electrical Characteristics ($T_j=25^{\circ}\text{C}$ unless otherwise specified)
Static Characteristics

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
V_{DC}	DC blocking voltage	$T_j=25^{\circ}\text{C}$	650			V
V_F	Diode forward voltage	$I_F=5\text{A } T_j=25^{\circ}\text{C}$ $I_F=5\text{A } T_j=175^{\circ}\text{C}$		1.4* 1.75*	1.8*	V
I_R	Reverse current	$V_R=650\text{V } T_j=25^{\circ}\text{C}$ $V_R=650\text{V } T_j=175^{\circ}\text{C}$		2* 6*	50* 200*	μA

AC Characteristics ($T_j=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
Q_C	Total capacitive charge	$V_R=400\text{V } T_j=25^{\circ}\text{C}$ $Q_C = \int_0^{V_R} C(V)dV$		10.6*		nC
C	Total capacitance	$V_R=0\text{V } f=1\text{MHz}$ $V_R=200\text{V } f=1\text{MHz}$ $V_R=400\text{V } f=1\text{MHz}$		203* 21* 16*		pF

Typical Performance

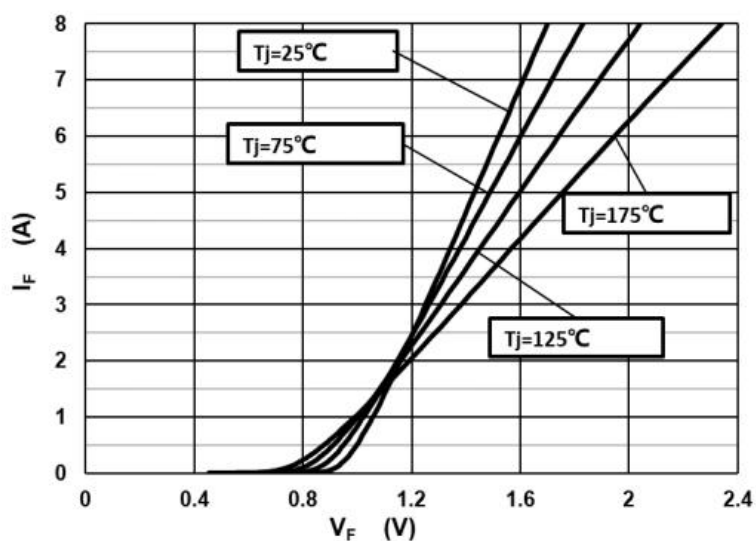


Figure 1. Typical forward characteristics

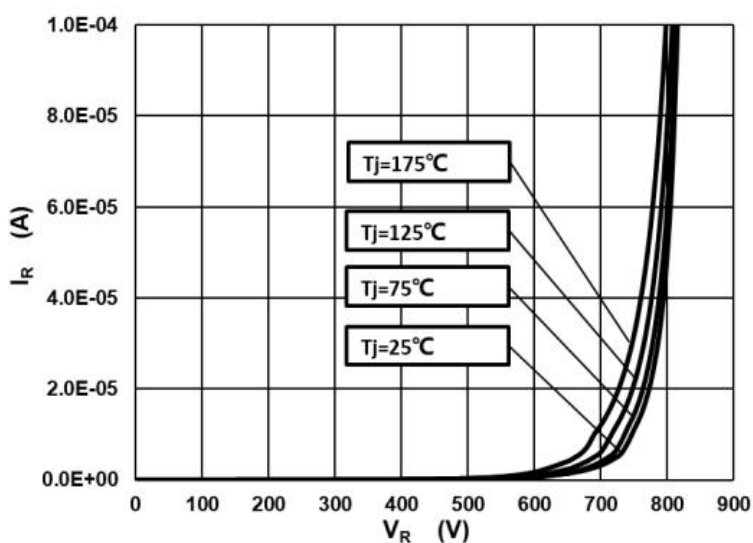


Figure 2. Typical reverse current as function of reverse voltage

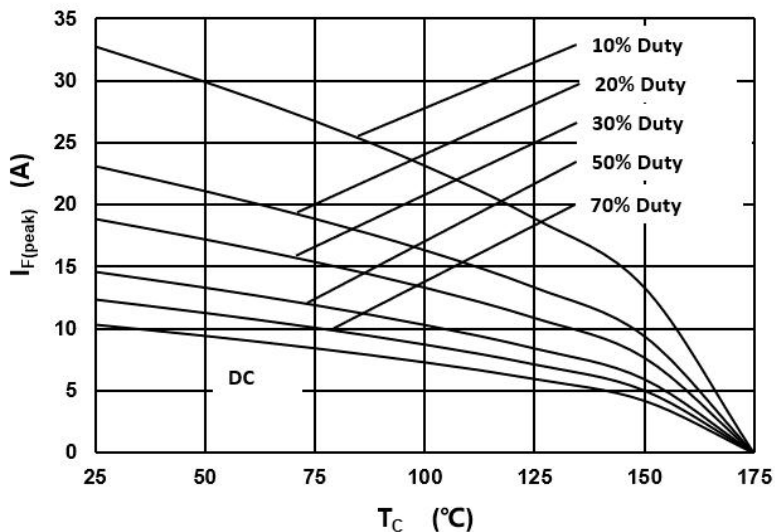


Figure 3. Diode forward current as function of temperature, D=duty cycle

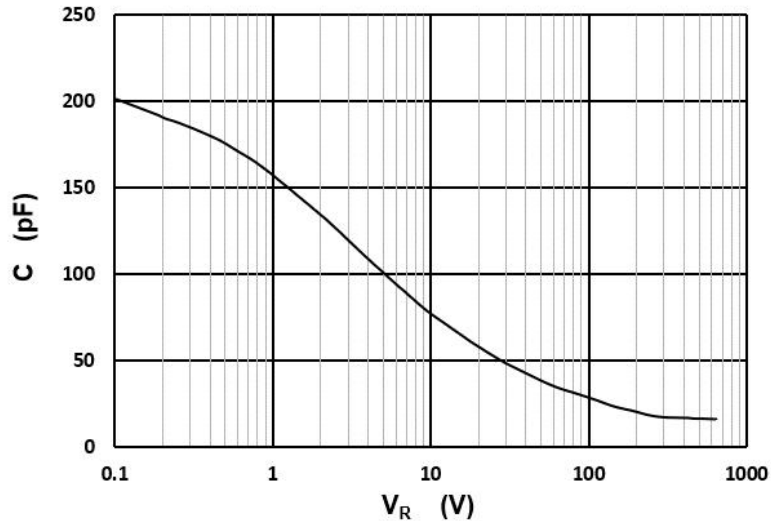


Figure 4. Typical capacitance as function of reverse voltage, $C=f(V_R)$; $T_J=25^\circ\text{C}$

Typical Performance

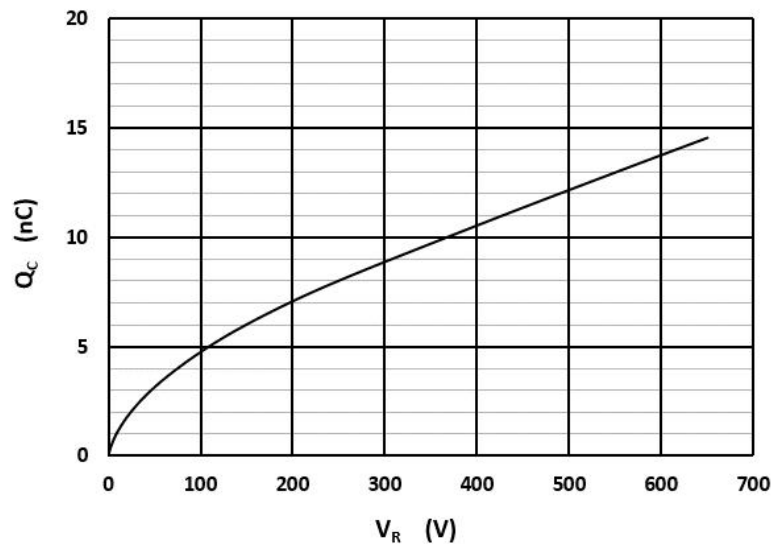


Figure 5. Typical reverse charge as function of reverse voltage

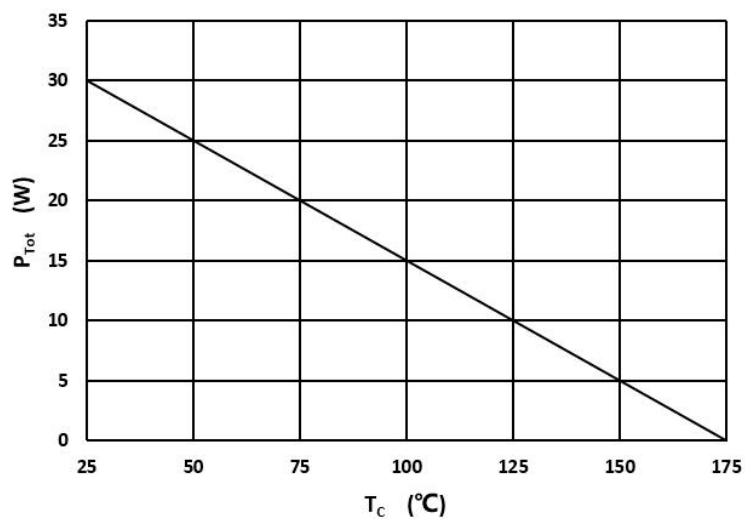


Figure 6. Power dissipation as function of case temperature

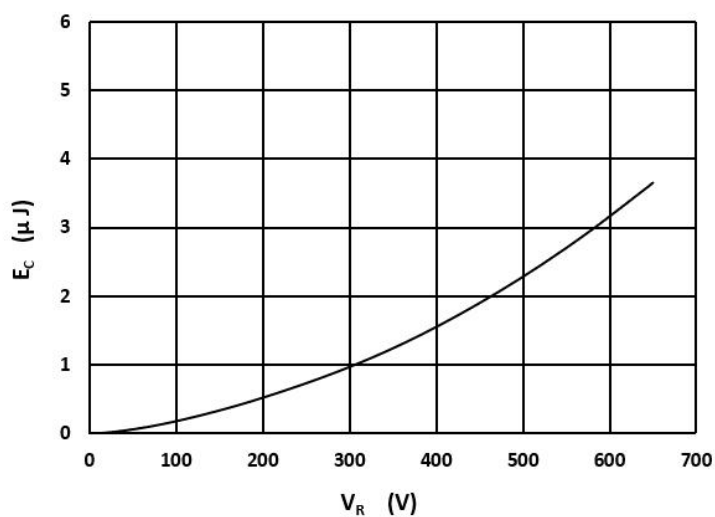


Figure 7. Capacitance stored energy

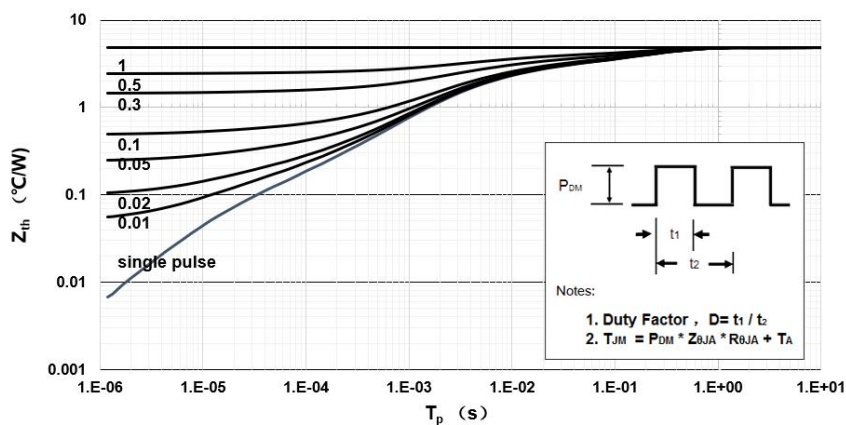


Figure 8. Max. transient thermal impedance