

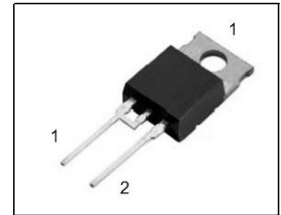
Silicon Carbide Schottky Diode

- 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	4.6	nC
I_F	2	A

P-TO220-2-2.



Type	Package	Ordering Code	Marking	Pin 1	Pin 2
SDT02S60	P-TO220-2-2.	Q67040-S4511	D02S60	C	A

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

Parameter	Symbol	Value	Unit
Continuous forward current, $T_C=100^\circ\text{C}$	I_F	2	A
RMS forward current, $f=50\text{Hz}$	I_{FRMS}	2.8	
Surge non repetitive forward current, sine halfwave $T_C=25^\circ\text{C}$, $t_p=10\text{ms}$	I_{FSM}	4.1	
Repetitive peak forward current $T_j=150^\circ\text{C}$, $T_C=100^\circ\text{C}$, $D=0.1$	I_{FRM}	7.3	
Non repetitive peak forward current $t_p=10\mu\text{s}$, $T_C=25^\circ\text{C}$	I_{FMAX}	17	
i^2t value, $T_C=25^\circ\text{C}$, $t_p=10\text{ms}$	$\int i^2 dt$	0.08	A^2s
Repetitive peak reverse voltage	V_{RRM}	600	V
Surge peak reverse voltage	V_{RSM}	600	
Power dissipation, $T_C=25^\circ\text{C}$	P_{tot}	15	W
Operating and storage temperature	T_j, T_{stg}	-55... +175	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Characteristics					
Thermal resistance, junction - case	R_{thJC}	-	-	10	K/W
Thermal resistance, junction - ambient, leaded	R_{thJA}	-	-	62	

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

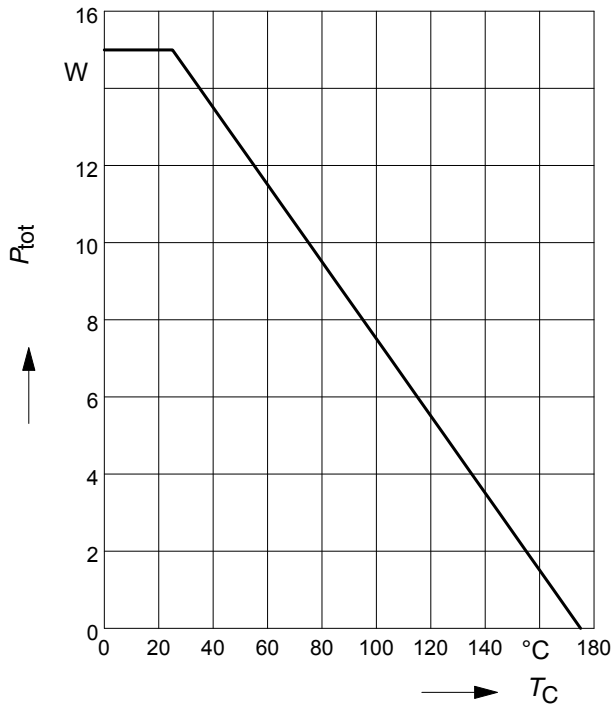
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Static Characteristics					
Diode forward voltage	V_F				V
$I_F=2A, T_j=25^{\circ}C$		-	1.75	2	
$I_F=2A, T_j=150^{\circ}C$		-	2.2	2.6	
Reverse current	I_R				μA
$V_R=600V, T_j=25^{\circ}C$		-	7	100	
$V_R=600V, T_j=150^{\circ}C$		-	30	500	

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics					
Total capacitive charge $V_R=400V, I_F=2A, di_F/dt=200A/\mu s, T_J=150^{\circ}C$	Q_C	-	4.6	-	nC
Switching time $V_R=400V, I_F=2A, di_F/dt=200A/\mu s, T_J=150^{\circ}C$	t_{rr}	-	n.a.	-	ns
Total capacitance $V_R=1V, T_C=25^{\circ}C, f=1MHz$ $V_R=300V, T_C=25^{\circ}C, f=1MHz$ $V_R=600V, T_C=25^{\circ}C, f=1MHz$	C	- - -	50 5.2 5.0	- - -	pF

1 Power dissipation

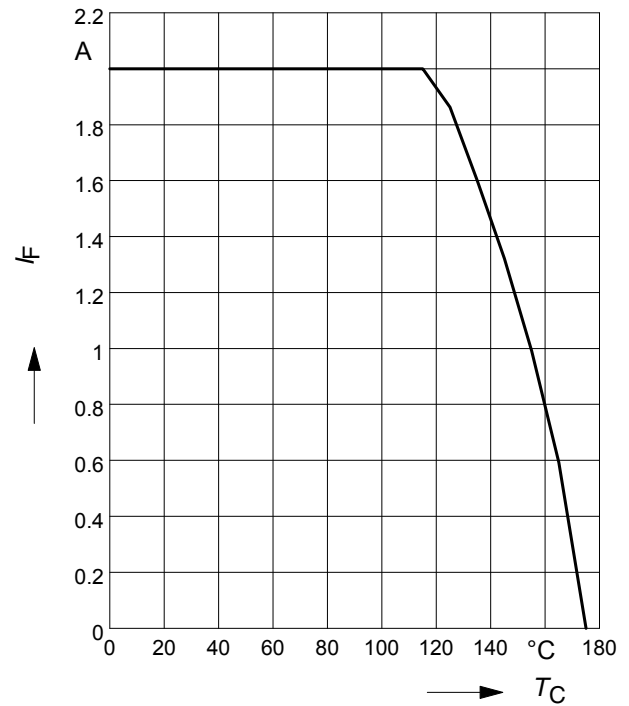
$$P_{\text{tot}} = f(T_C)$$



2 Diode forward current

$$I_F = f(T_C)$$

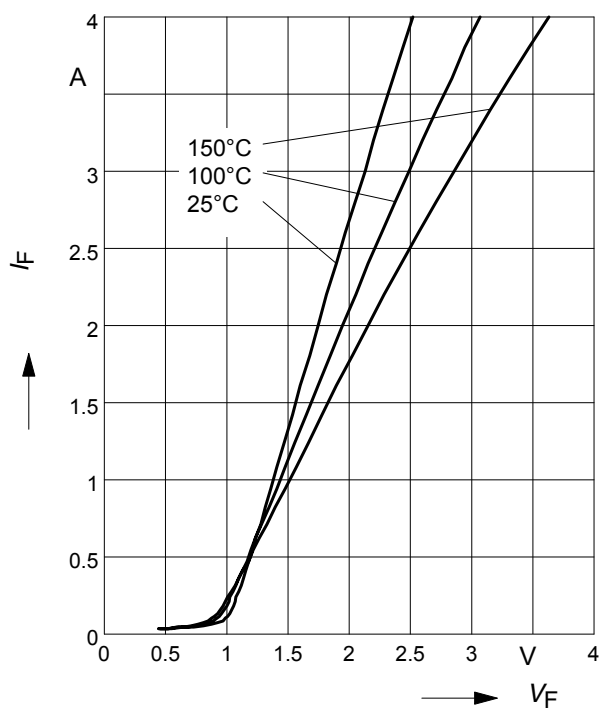
parameter: $T_j \leq 175^\circ\text{C}$



3 Typ. forward characteristic

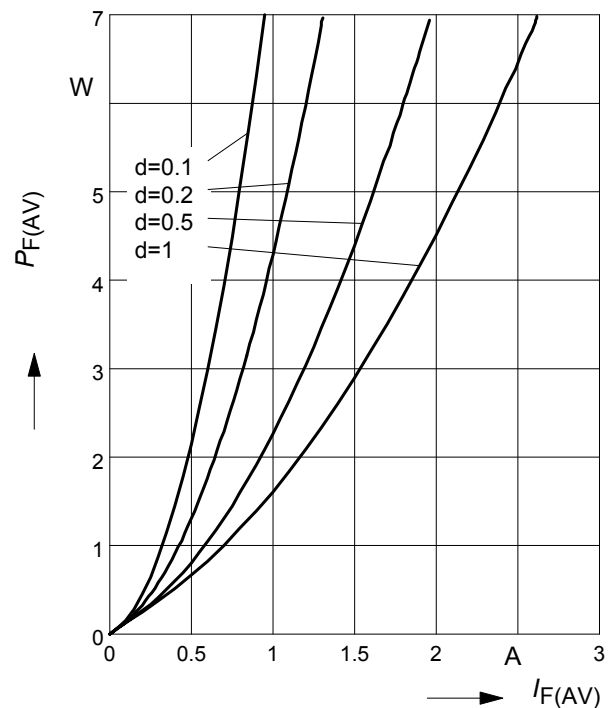
$$I_F = f(V_F)$$

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



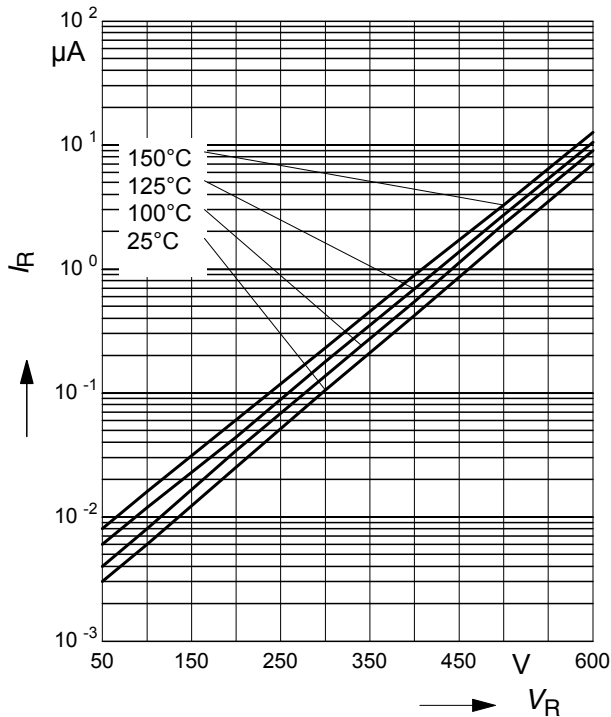
4 Typ. forward power dissipation vs. average forward current

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



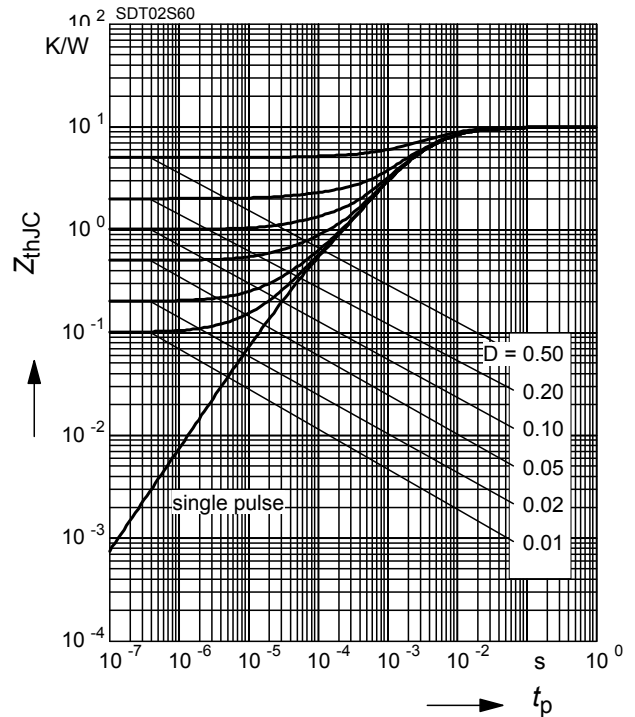
5 Typ. reverse current vs. reverse voltage

$$I_R = f(V_R)$$


6 Transient thermal impedance

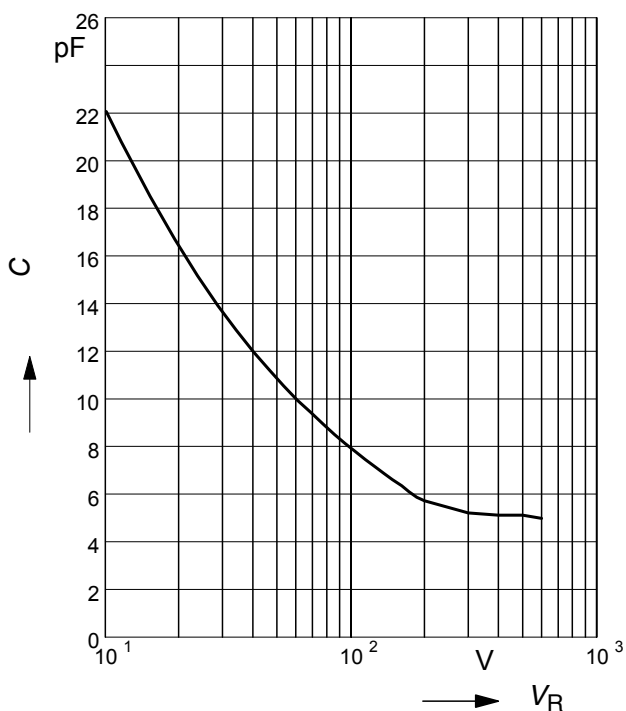
$$Z_{thJC} = f(t_p)$$

$$\text{parameter : } D = t_p / T$$

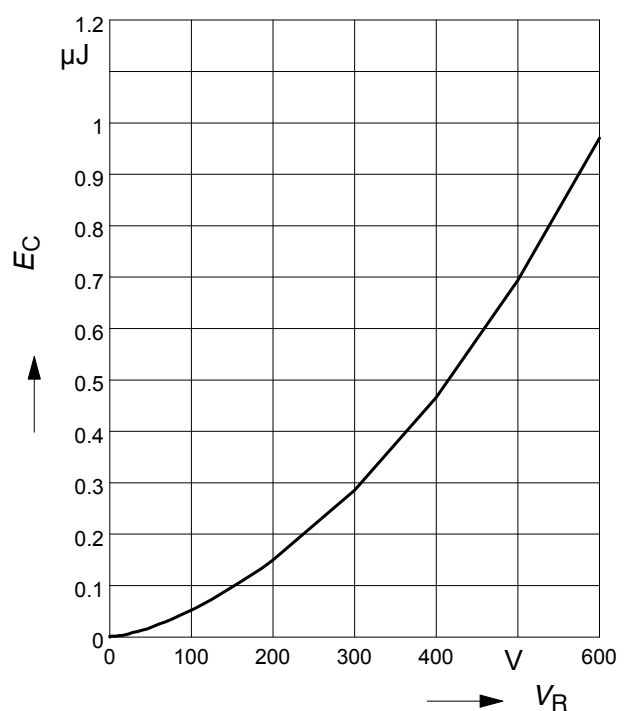

7 Typ. capacitance vs. reverse voltage

$$C = f(V_R)$$

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


8 Typ. C stored energy

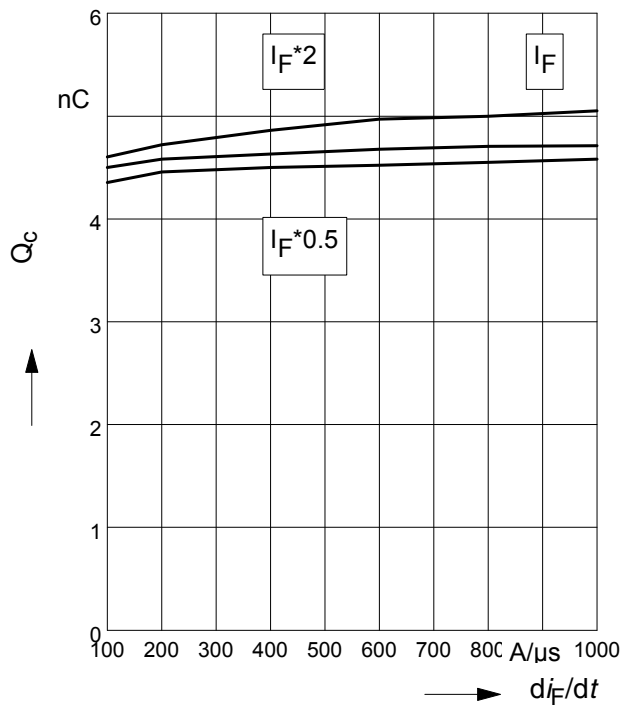
$$E_C = f(V_R)$$

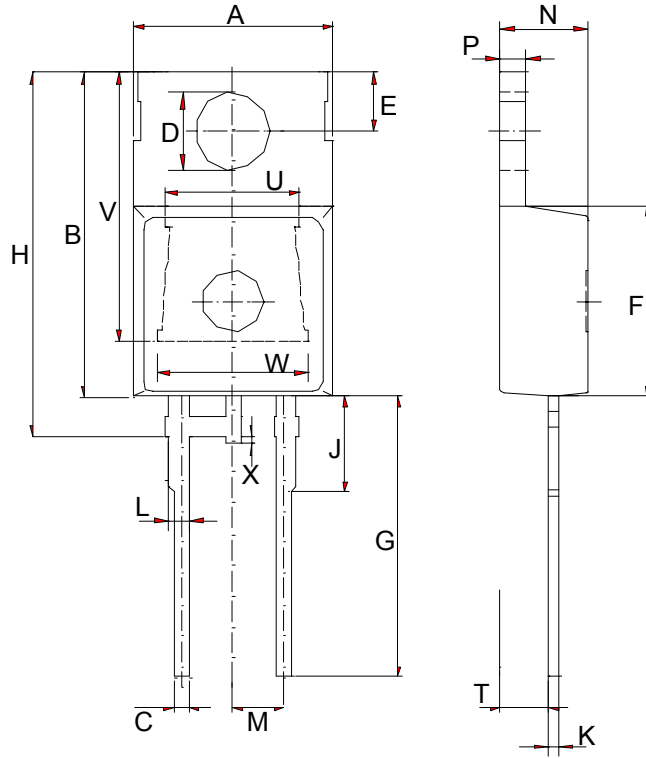


9 Typ. capacitive charge vs. current slope

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

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



TO-220-2-2


symbol	dimensions			
	[mm]		[inch]	
	min	max	min	max
A	9.70	10.10	0.3819	0.3976
B	15.30	15.90	0.6024	0.6260
C	0.65	0.85	0.0256	0.0335
D	3.55	3.85	0.1398	0.1516
E	2.60	3.00	0.1024	0.1181
F	9.00	9.40	0.3543	0.3701
G	13.00	14.00	0.5118	0.5512
H	17.20	17.80	0.6772	0.7008
J	4.40	4.80	0.1732	0.1890
K	0.40	0.60	0.0157	0.0236
L	1.05 typ.		0.41 typ.	
M	2.54 typ.		0.1 typ.	
N	4.4 typ.		0.173 typ.	
P	1.10	1.40	0.0433	0.0551
T	2.4 typ.		0.095 typ.	
U	6.6 typ.		0.26 typ.	
V	13.0 typ.		0.51 typ.	
W	7.5 typ.		0.295 typ.	
X	0.00	0.40	0.0000	0.0157

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