

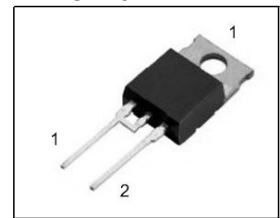
**Silicon Carbide Schottky Diode**

- 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
$Q_C$	14	nC
$I_F$	5	A

P-TO220-2-2.



Type	Package	Ordering Code	Marking	Pin 1	Pin 2
SDT05S60	P-TO220-2-2.	Q67040S4644	D05S60	C	A

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

Parameter	Symbol	Value	Unit
Continuous forward current, $T_C=100\text{ °C}$	$I_F$	5	A
RMS forward current, $f=50\text{ Hz}$	$I_{FRMS}$	7.1	
Surge non repetitive forward current, sine halfwave $T_C=25\text{ °C}$ , $t_p=10\text{ ms}$	$I_{FSM}$	18.5	
Repetitive peak forward current $T_j=150\text{ °C}$ , $T_C=100\text{ °C}$ , $D=0.1$	$I_{FRM}$	21	
Non repetitive peak forward current $t_p=10\text{ }\mu\text{s}$ , $T_C=25\text{ °C}$	$I_{FMAX}$	50	
$i^2t$ value, $T_C=25\text{ °C}$ , $t_p=10\text{ ms}$	$\int i^2 dt$	1.7	A <sup>2</sup> s
Repetitive peak reverse voltage	$V_{RRM}$	600	V
Surge peak reverse voltage	$V_{RSM}$	600	
Power dissipation, $T_C=25\text{ °C}$	$P_{tot}$	43	W
Operating and storage temperature	$T_j, T_{stg}$	-55... +175	°C

**Thermal Characteristics**

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>Characteristics</b>					
Thermal resistance, junction - case	$R_{thJC}$	-	-	3.5	K/W
Thermal resistance, junction - ambient, leaded	$R_{thJA}$	-	-	62	

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

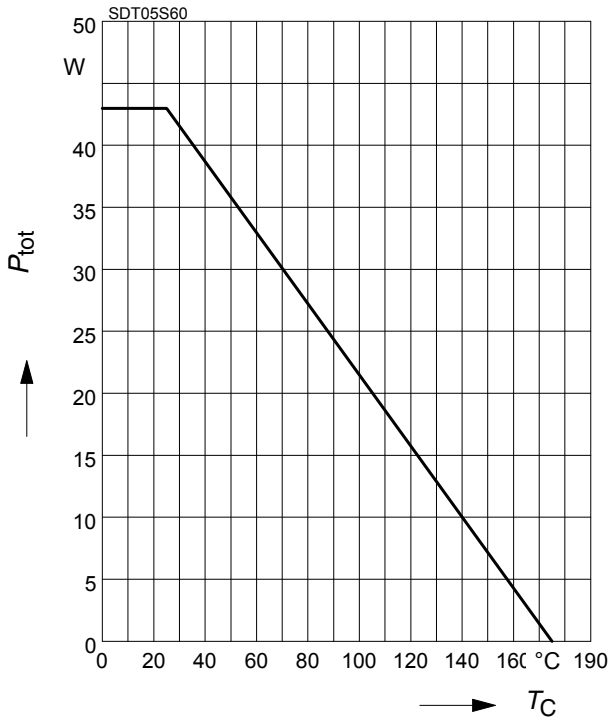
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>Static Characteristics</b>					
Diode forward voltage	$V_F$				V
$I_F=5\text{A}, T_j=25^\circ\text{C}$		-	1.5	1.7	
$I_F=5\text{A}, T_j=150^\circ\text{C}$		-	1.7	2.1	
Reverse current	$I_R$				$\mu\text{A}$
$V_R=600\text{V}, T_j=25^\circ\text{C}$		-	19	200	
$V_R=600\text{V}, T_j=150^\circ\text{C}$		-	45	1000	

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>AC Characteristics</b>					
Total capacitive charge $V_R=400\text{V}$ , $I_F=5\text{A}$ , $di_F/dt=200\text{A}/\mu\text{s}$ , $T_j=150\text{ }^\circ\text{C}$	$Q_C$	-	14	-	nC
Switching time $V_R=400\text{V}$ , $I_F=5\text{A}$ , $di_F/dt=200\text{A}/\mu\text{s}$ , $T_j=150\text{ }^\circ\text{C}$	$t_{rr}$	-	n.a	-	ns
Total capacitance $V_R=1\text{V}$ , $T_C=25\text{ }^\circ\text{C}$ , $f=1\text{MHz}$ $V_R=300\text{V}$ , $T_C=25\text{ }^\circ\text{C}$ , $f=1\text{MHz}$ $V_R=600\text{V}$ , $T_C=25\text{ }^\circ\text{C}$ , $f=1\text{MHz}$	$C$	-	170 16 12	-	pF

**1 Power dissipation**

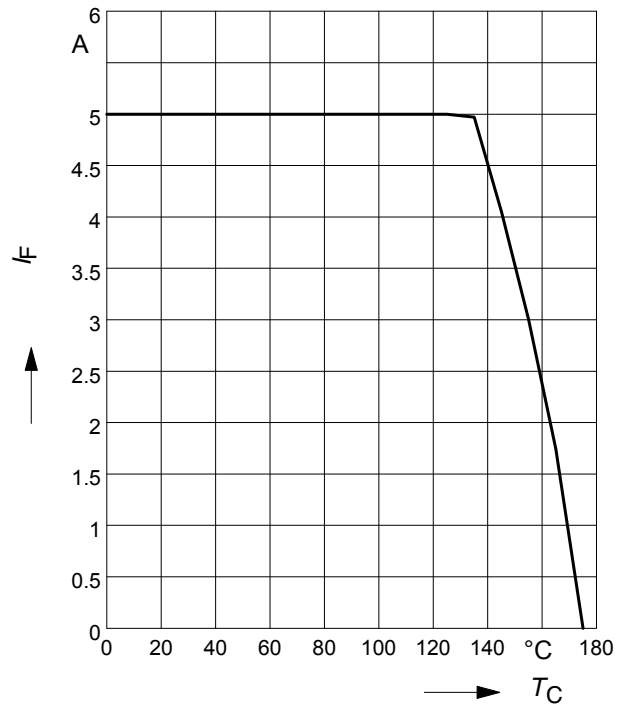
$P_{tot} = f(T_C)$



**2 Diode forward current**

$I_F = f(T_C)$

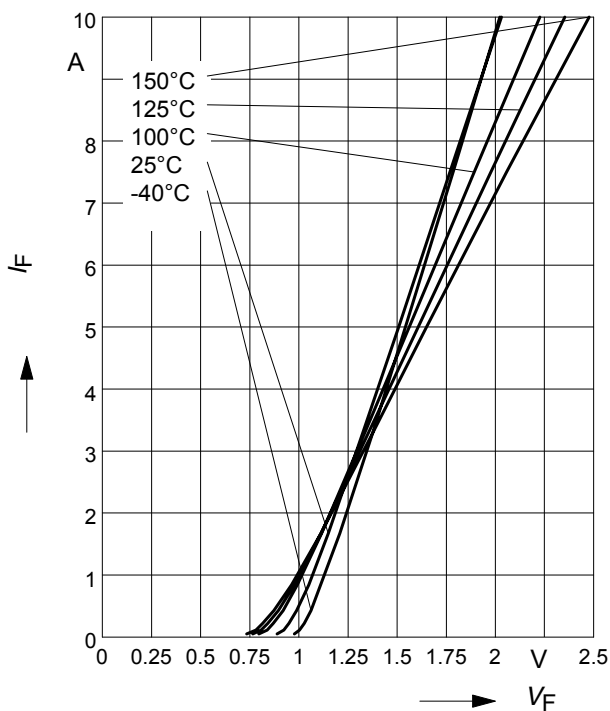
parameter:  $T_j \leq 175^\circ\text{C}$



**3 Typ. forward characteristic**

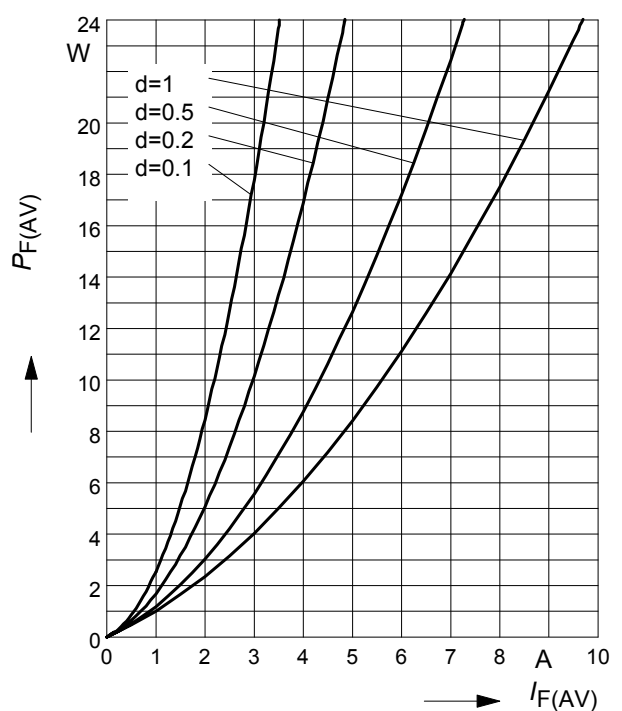
$I_F = f(V_F)$

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



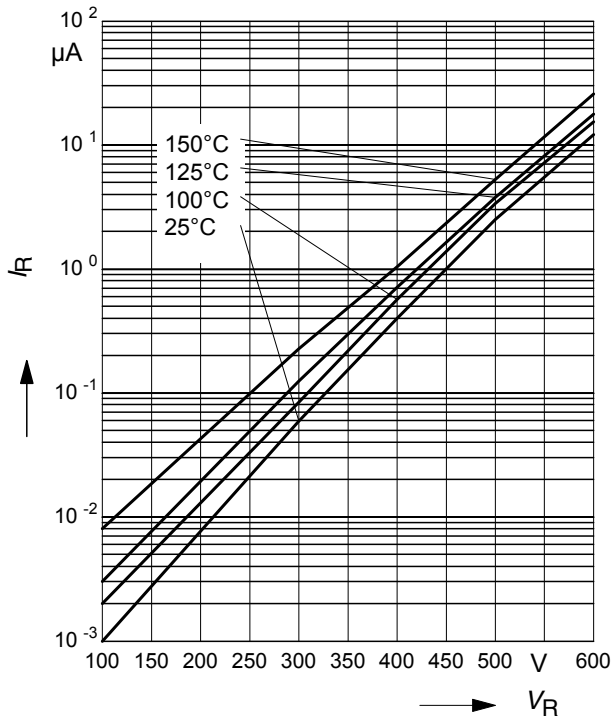
**4 Typ. forward power dissipation vs. average forward current**

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



**5 Typ. reverse current vs. reverse voltage**

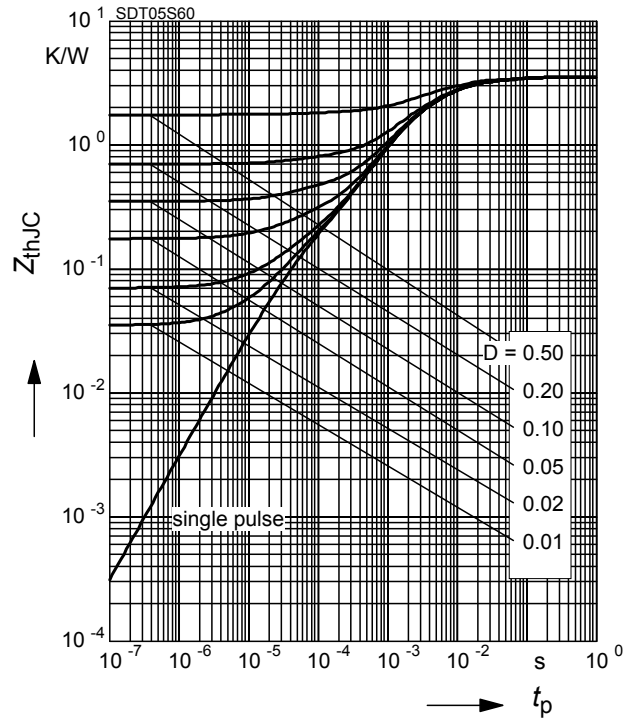
$$I_R = f(V_R)$$



**6 Transient thermal impedance**

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

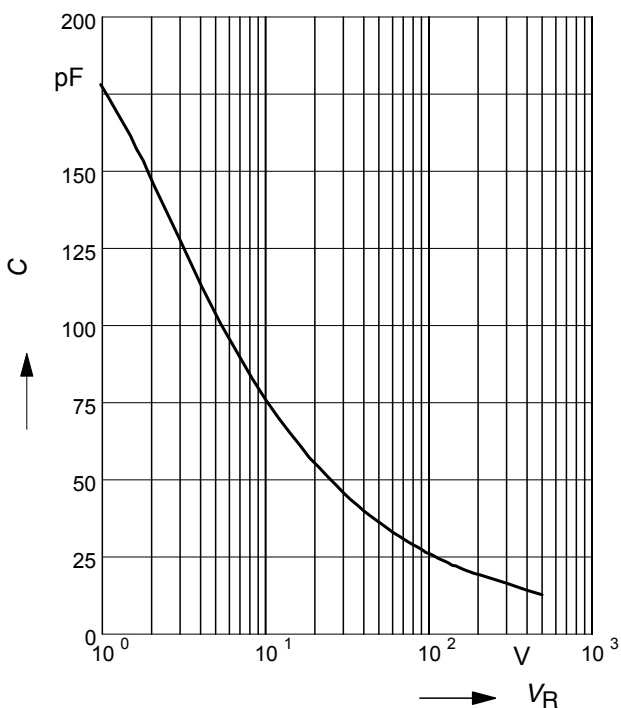
parameter :  $D = t_p/T$



**7 Typ. capacitance vs. reverse voltage**

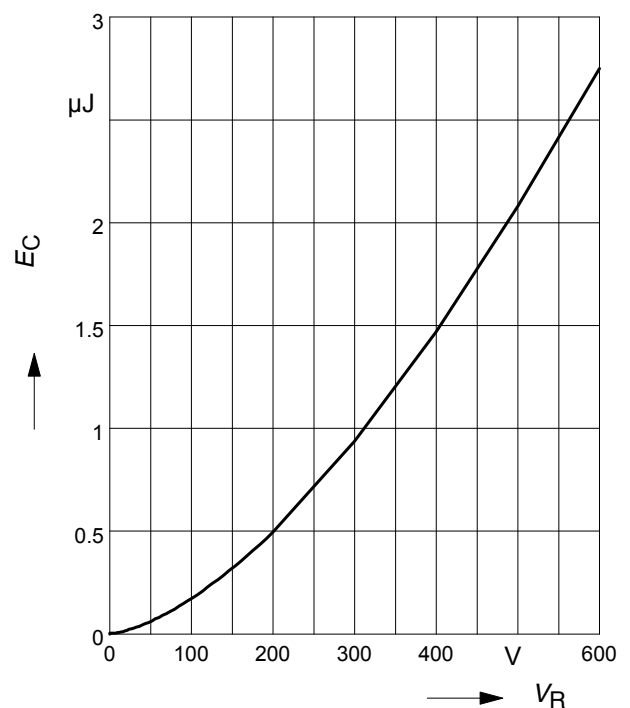
$$C = f(V_R)$$

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



**8 Typ. C stored energy**

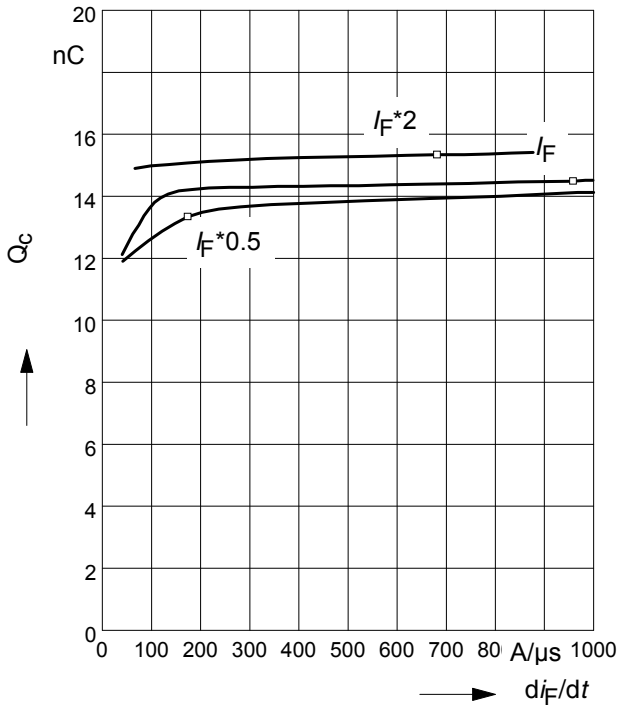
$$E_C = f(V_R)$$

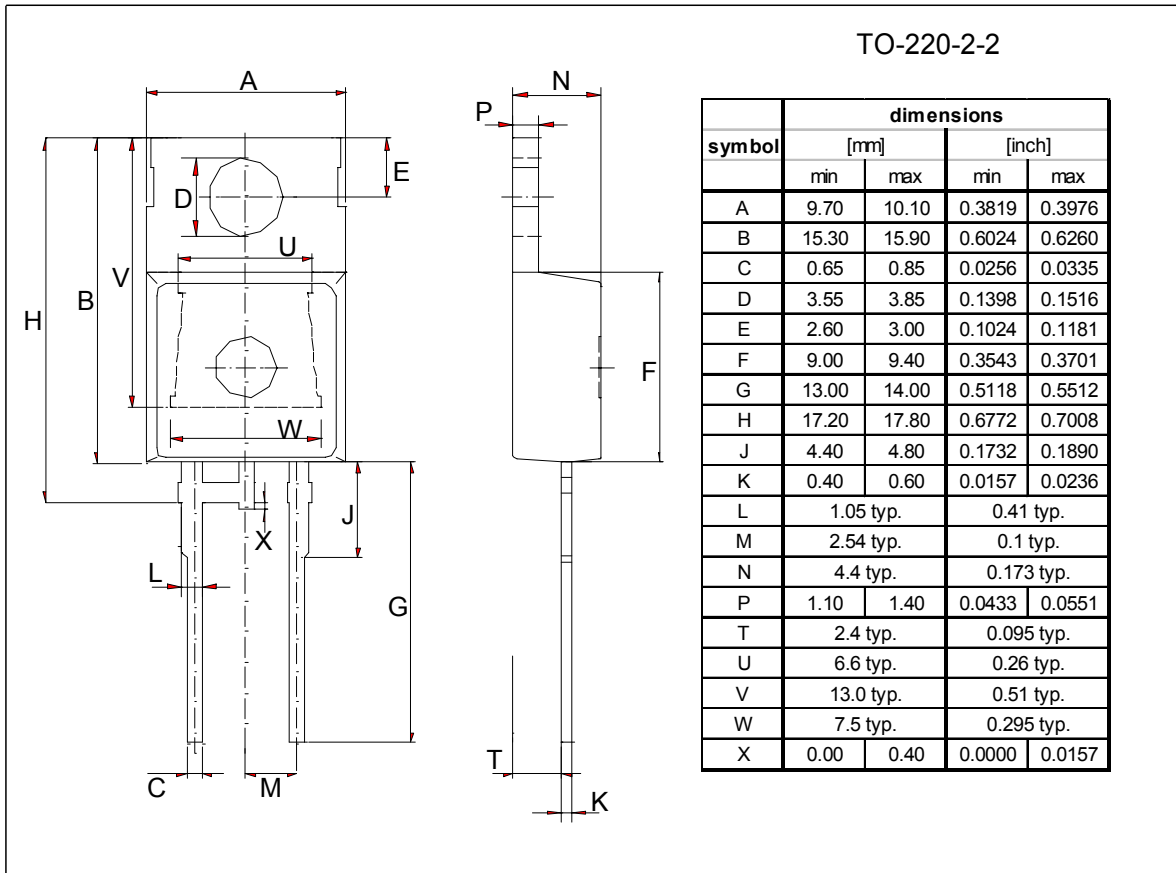


9 Typ. capacitive charge vs. current slope

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

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





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