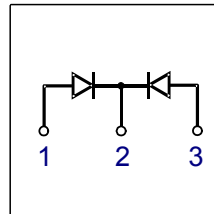
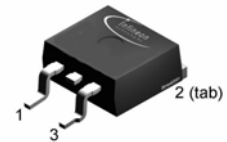


**Silicon Carbide Schottky Diode**

- Revolutionary semiconductor material - Silicon Carbide
- Switching behavior benchmark
- No reverse recovery
- No temperature influence on the switching behavior
- No forward recovery

**thinQ!<sup>TM</sup> SiC Schottky Diode**

**Product Summary**

$V_{RRM}$	300	V
$Q_C$	23	nC
$I_F$	2x10	A

**PG-TO263**


Type	Package	Ordering Code	Marking
SDB20S30	PG-TO263	Q67040-S4374	D20S30

**Maximum Ratings, at  $T_j = 25\text{ }^\circ\text{C}$ , unless otherwise specified (per leg)**

Parameter	Symbol	Value	Unit
Continuous forward current, $T_C=100^\circ\text{C}$	$I_F$	10	A
RMS forward current, $f=50\text{Hz}$	$I_{FRMS}$	14	
Surge non repetitive forward current, sine halfwave $T_C=25^\circ\text{C}$ , $t_p=10\text{ms}$	$I_{FSM}$	36	
Repetitive peak forward current $T_j=150^\circ\text{C}$ , $T_C=100^\circ\text{C}$ , $D=0.1$	$I_{FRM}$	45	
Non repetitive peak forward current $t_p=10\mu\text{s}$ , $T_C=25^\circ\text{C}$	$I_{FMAX}$	100	
$i^2t$ value, $T_C=25^\circ\text{C}$ , $t_p=10\text{ms}$	$\int i^2 dt$	6.5	A <sup>2</sup> s
Repetitive peak reverse voltage	$V_{RRM}$	300	V
Surge peak reverse voltage	$V_{RSM}$	300	
Power dissipation, single diode mode, $T_C=25^\circ\text{C}$	$P_{tot}$	65	W
Operating and storage temperature	$T_j, T_{stg}$	-55... +175	$^\circ\text{C}$

**Thermal Characteristics**

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>Characteristics</b>					
Thermal resistance, junction - case (per leg)	$R_{thJC}$	-	-	2.3	K/W
SMD version, device on PCB:	$R_{thJA}$	-	-	62	
@ min. footprint P-T0263-3-2: @ 6 cm <sup>2</sup> cooling area <sup>1)</sup>		-	35	-	

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>Static Characteristics</b>					
Diode forward voltage	$V_F$	-	1.5	1.7	V
$I_F=10\text{A}$ , $T_j=25\text{ }^\circ\text{C}$		-	1.5	1.9	
Reverse current	$I_R$	-	15	200	$\mu\text{A}$
$V_R=300\text{V}$ , $T_j=25\text{ }^\circ\text{C}$		-	20	1000	

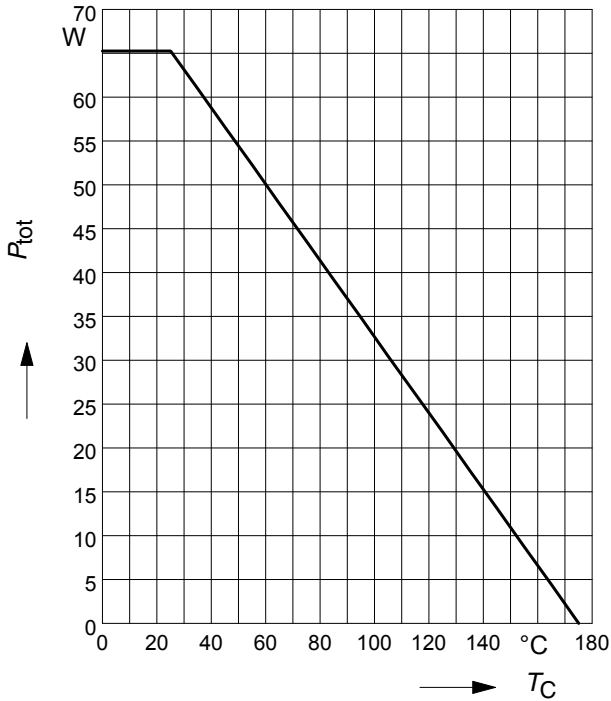
<sup>1</sup>Device on 40mm\*40mm\*1.5mm epoxy PCB FR4 with 6cm<sup>2</sup> (one layer, 70  $\mu\text{m}$  thick) copper area for drain connection. PCB is vertical without blown air.

**Electrical Characteristics, at  $T_j = 25\text{ °C}$ , unless otherwise specified (per leg)**

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>AC Characteristics</b>					
Total capacitive charge <sup>1)</sup> $V_R=200\text{V}$ , $I_F=10\text{A}$ , $di_F/dt=-200\text{A}/\mu\text{s}$ , $T_j=150\text{°C}$	$Q_C$	-	23	-	nC
Switching time <sup>2)</sup> $V_R=200\text{V}$ , $I_F=10\text{A}$ , $di_F/dt=-200\text{A}/\mu\text{s}$ , $T_j=150\text{°C}$	$t_{rr}$	-	n.a.	-	ns
Total capacitance $V_R=0\text{V}$ , $T_C=25\text{°C}$ , $f=1\text{MHz}$ $V_R=150\text{V}$ , $T_C=25\text{°C}$ , $f=1\text{MHz}$ $V_R=300\text{V}$ , $T_C=25\text{°C}$ , $f=1\text{MHz}$	$C$	-	600 55 40	-	pF

**1 Power dissipation (per leg)**

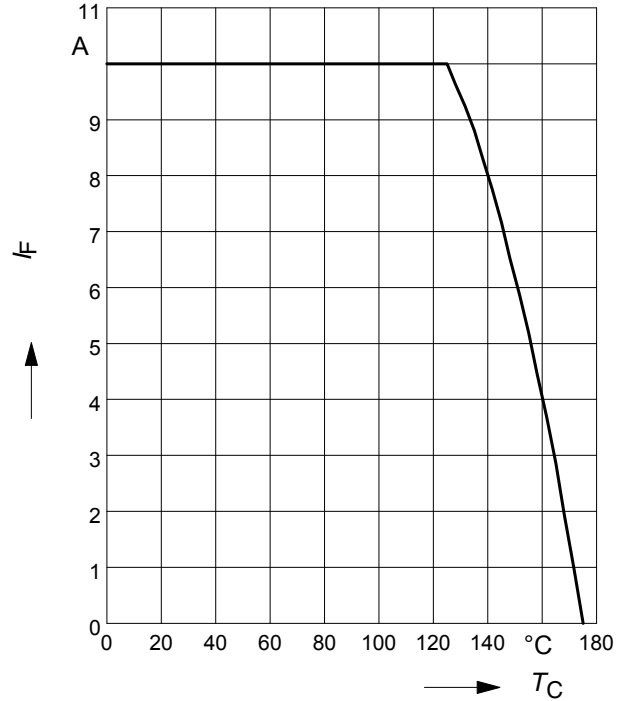
$P_{tot} = f(T_C)$



**2 Diode forward current (per leg)**

$I_F = f(T_C)$

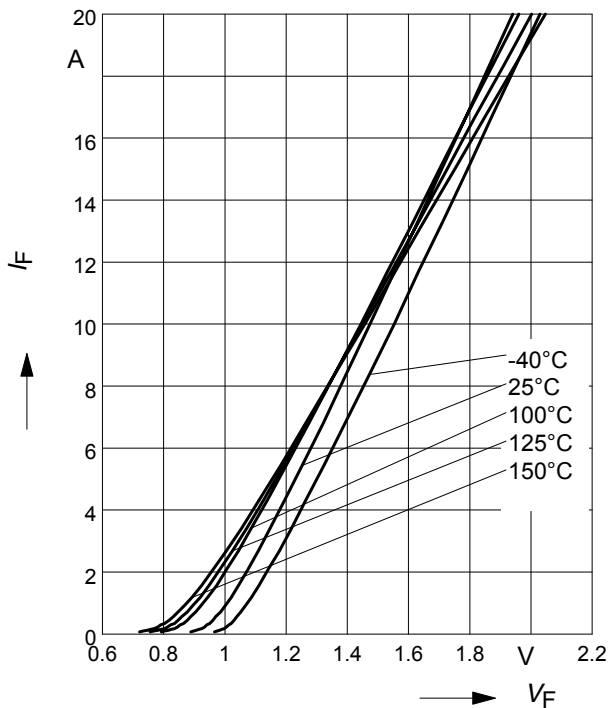
parameter:  $T_j \leq 175^\circ\text{C}$



**3 Typ. forward characteristic (per leg)**

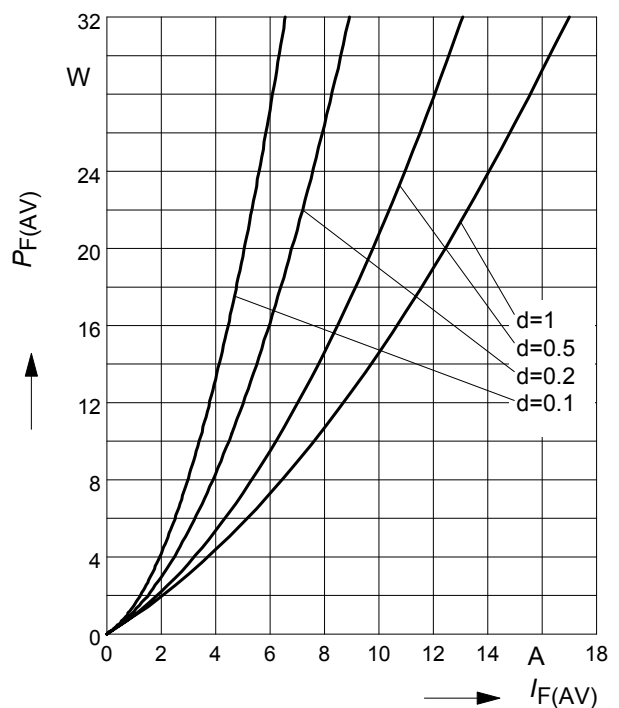
$I_F = f(V_F)$

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

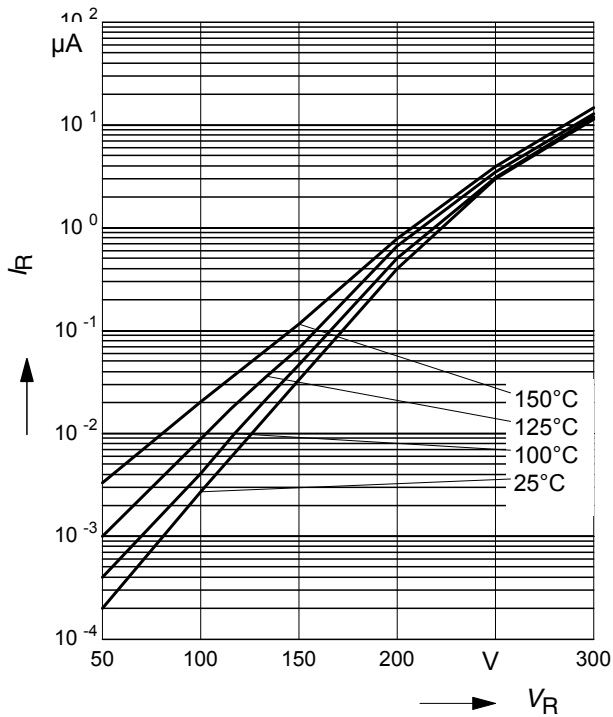


**4 Typ. forward power dissipation vs. average forward current (per leg)**

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



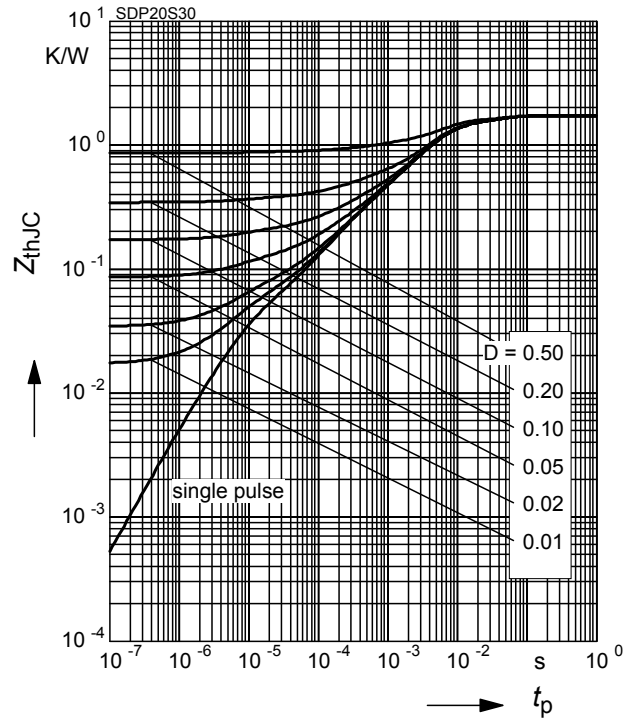
**5 Typ. reverse current vs. reverse voltage**  
(per leg)  $I_R = f(V_R)$



**6 Transient thermal impedance (per leg)**

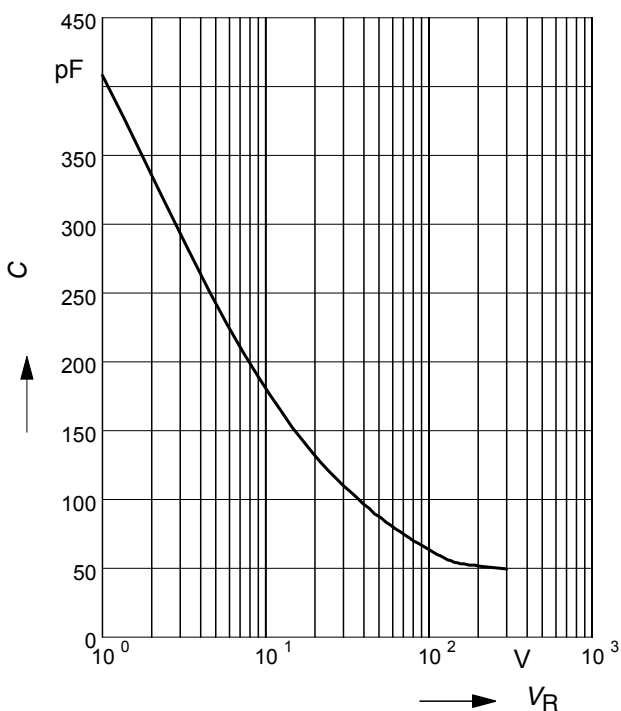
$Z_{thJC} = f(t_p)$

parameter :  $D = t_p/T$



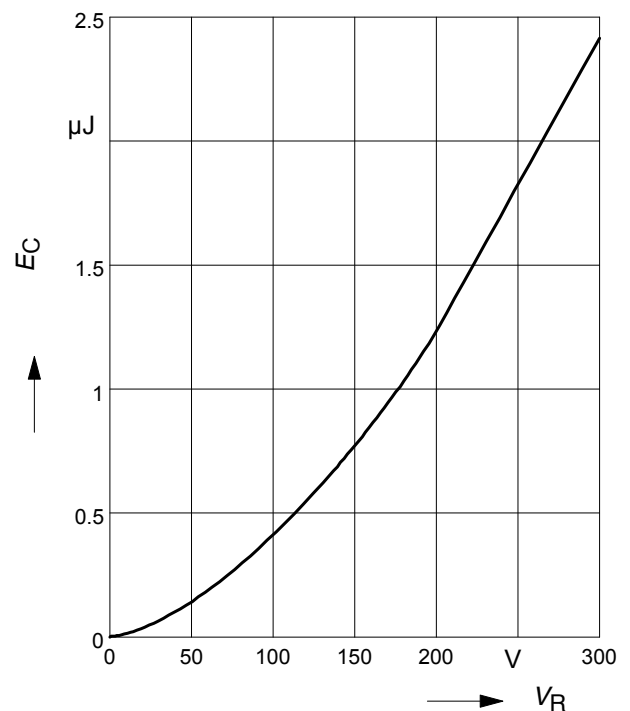
**7 Typ. capacitance vs. reverse voltage**  
(per leg)  $C = f(V_R)$

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



**8 Typ. C stored energy (per leg)**

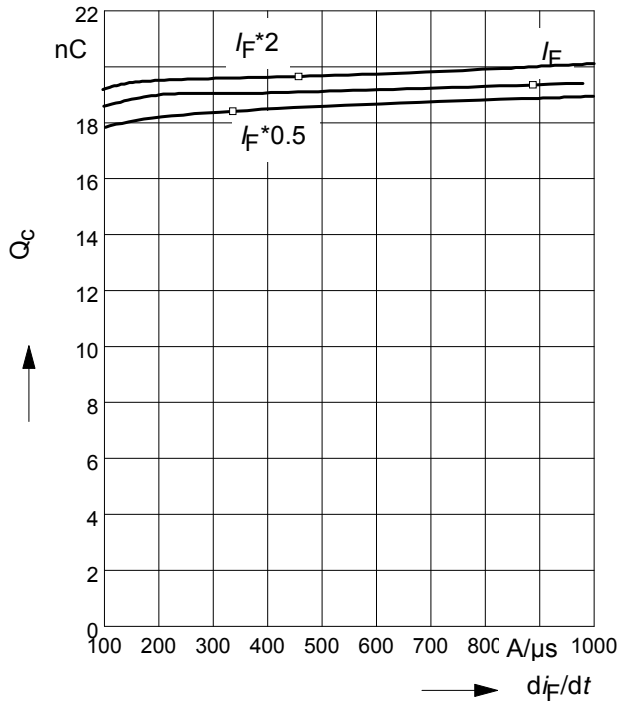
$E_C = f(V_R)$



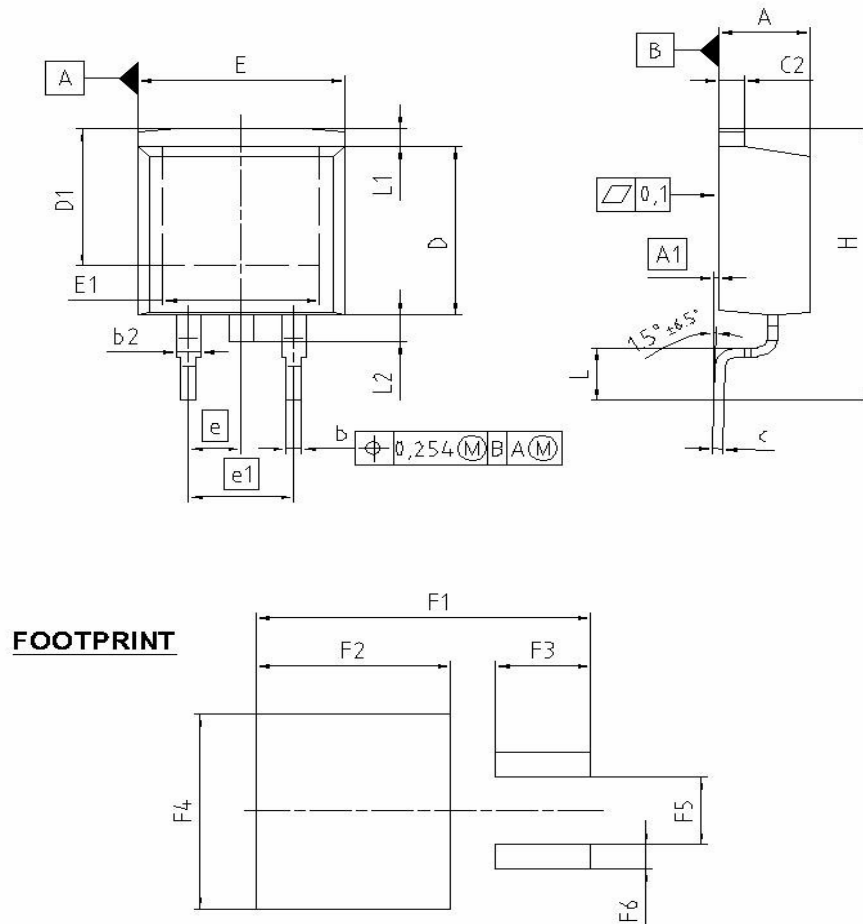
**9 Typ. capacitive charge vs. current slope**

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

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



TO263-3-2 / TO263-3-5 / TO263-3-22



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.300	4.572	0.169	0.180
A1	0.000	0.254	0.000	0.010
b	0.650	0.850	0.026	0.033
b2	0.950	1.321	0.037	0.052
c	0.330	0.650	0.013	0.026
c2	0.170	1.400	0.046	0.055
D	8.509	9.450	0.335	0.372
D1	7.100	-	0.280	-
E	9.800	10.312	0.386	0.406
E1	6.500	-	0.256	-
e	2.540		0.100	
e1	5.080		0.200	
N	2		2	
H	14.605	15.875	0.575	0.625
L	2.200	3.000	0.087	0.118
L1	-	1.600	-	0.063
L2	1.000	1.778	0.039	0.070
F1	16.050	16.250	0.632	0.640
F2	9.300	9.500	0.366	0.374
F3	4.500	4.700	0.177	0.185
F4	10.700	10.900	0.421	0.429
F5	3.630	3.830	0.143	0.151
F6	1.100	1.300	0.043	0.051

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**SCALE**

**EUROPEAN PROJECTION**

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