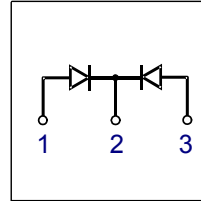


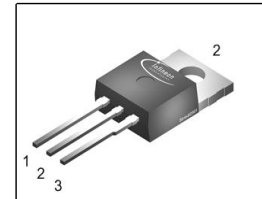
Silicon Carbide Schottky Diode

- Revolutionary semiconductor material - Silicon Carbide
- Switching behavior benchmark
- No reverse recovery
- No temperature influence on the switching behavior
- No forward recovery
- Pb-free lead plating; RoHS compliant
- Qualified according to JEDEC⁰⁾ for target applications

thinQ!TM SiC Schottky Diode

Product Summary

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

P-TO220



Type	Package	Ordering Code	Marking
SDP20S30	P-TO220-3	Q67040-S4419	D20S30

Maximum Ratings, at $T_j = 25^\circ\text{C}$, 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^2s
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.	
Characteristics					
Thermal resistance, junction - case (per leg)	R_{thJC}	-	-	2.3	K/W

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Static Characteristics					
Diode forward voltage $I_F=10\text{A}$, $T_j=25\text{°C}$ $I_F=10\text{A}$, $T_j=150\text{°C}$	V_F	- -	1.5 1.5	1.7 1.9	V
Reverse current $V_R=300\text{V}$, $T_j=25\text{°C}$ $V_R=300\text{V}$, $T_j=150\text{°C}$	I_R	- -	15 20	200 1000	μA

⁰J-STD20 and JESD22

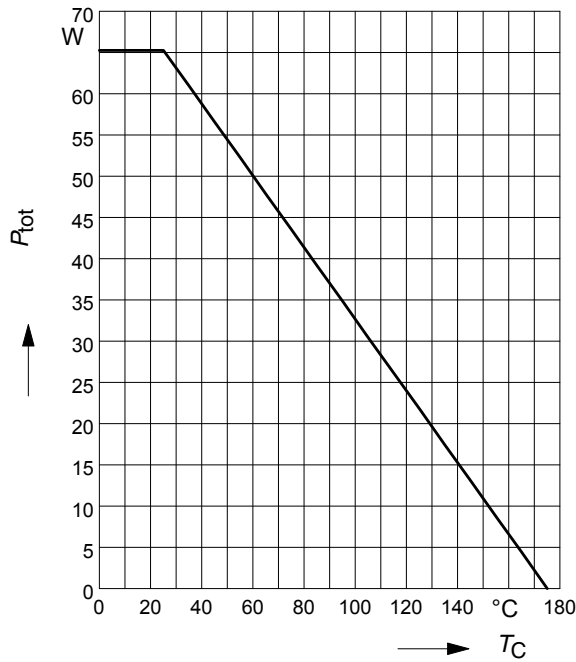
¹Device on 40mm*40mm*1.5mm epoxy PCB FR4 with 6cm² (one layer, 70 μm thick) copper area for drain connection. PCB is vertical without blown air.

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

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

1 Power dissipation (per leg)

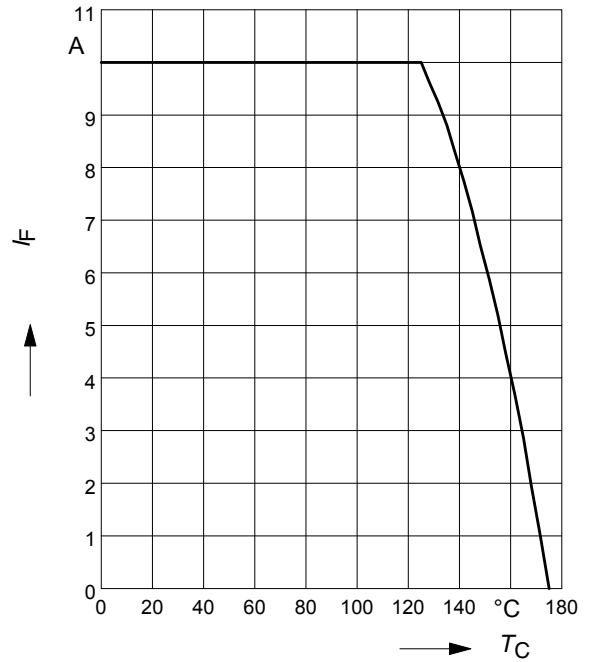
$$P_{tot} = f(T_C)$$



2 Diode forward current (per leg)

$$I_F = f(T_C)$$

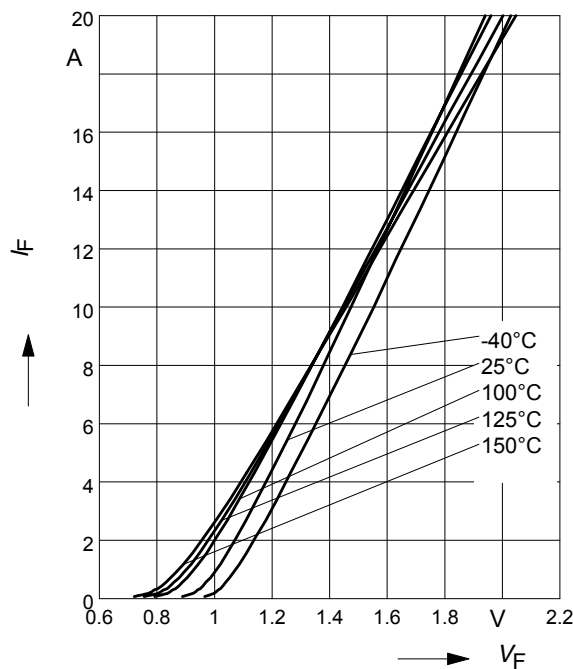
parameter: $T_j \leq 175$ °C



3 Typ. forward characteristic (per leg)

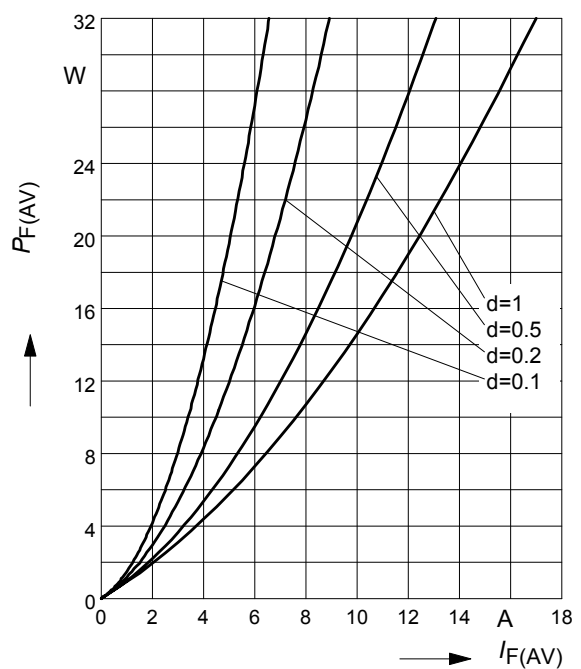
$$I_F = f(V_F)$$

parameter: $T_j, t_p = 350$ μ s

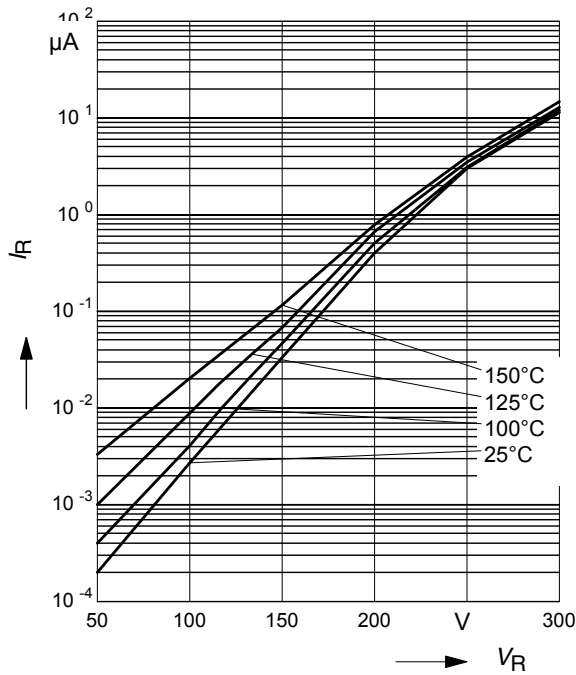


4 Typ. forward power dissipation vs. average forward current (per leg)

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

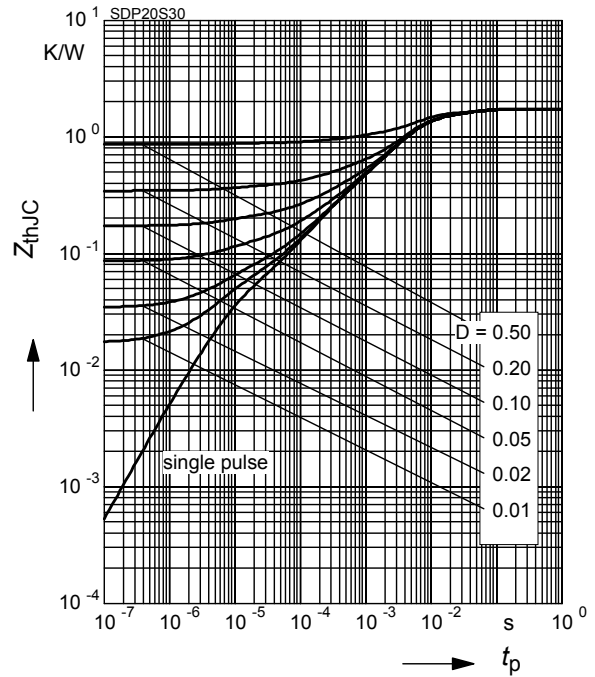


5 Typ. reverse current vs. reverse voltage
(per leg) $I_R = f(V_R)$

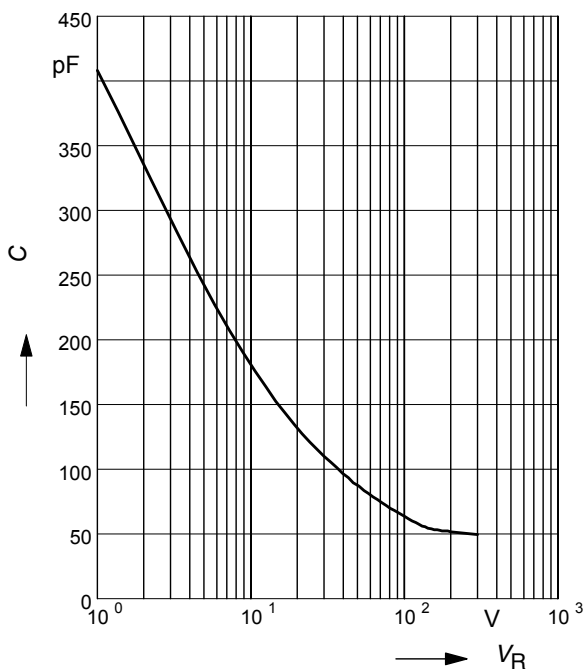


6 Transient thermal impedance (per leg)

$Z_{thJC} = f(t_p)$
parameter : $D = t_p/T$

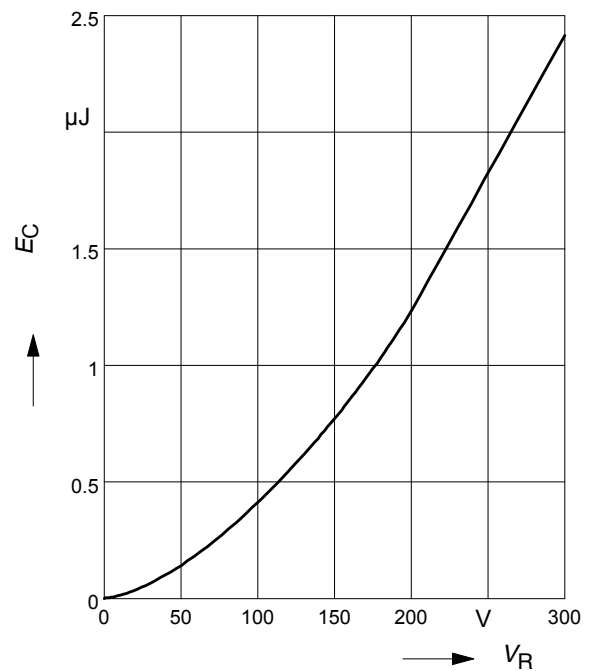


7 Typ. capacitance vs. reverse voltage
(per leg) $C = f(V_R)$
parameter: $T_C = 25^\circ C, f = 1 MHz$



8 Typ. C stored energy (per leg)

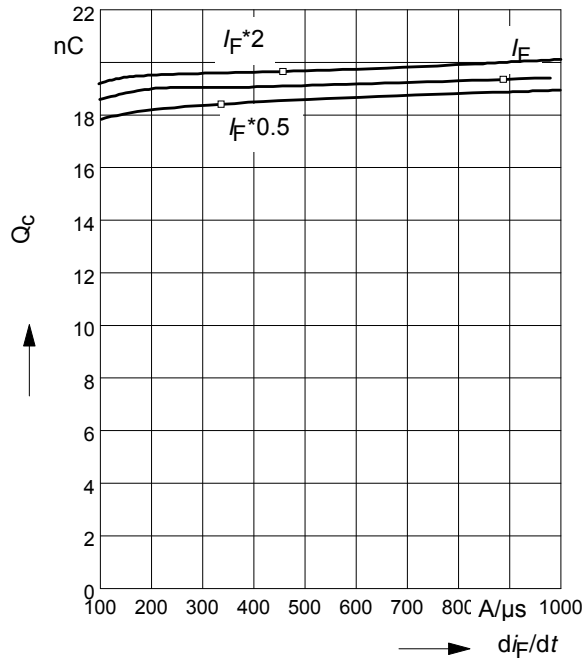
$E_C = f(V_R)$



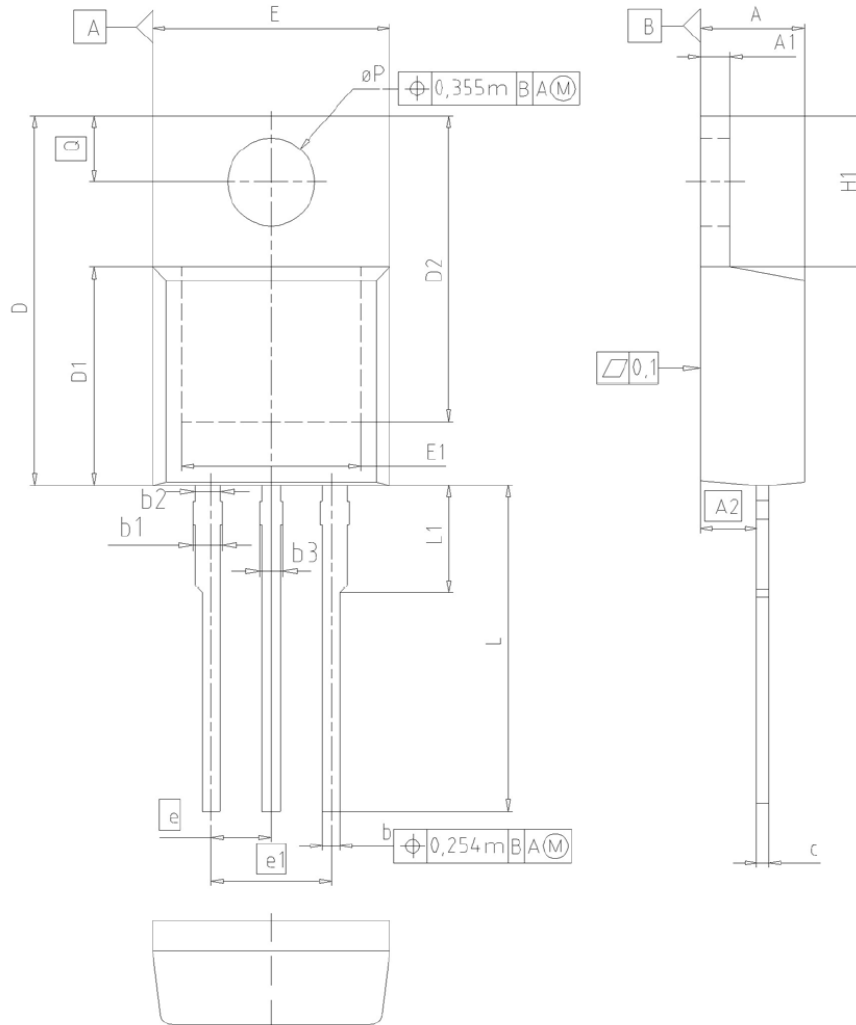
9 Typ. capacitive charge vs. current slope

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

parameter: $T_j = 150\text{ °C}$



P-TO220-3-1, P-TO220-3-21



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.30	4.57	0.169	0.180
A1	1.17	1.40	0.046	0.055
A2	2.15	2.72	0.085	0.107
b	0.65	0.86	0.026	0.034
b1	0.95	1.40	0.037	0.055
b2	0.95	1.15	0.037	0.045
b3	0.65	1.15	0.026	0.045
c	0.33	0.80	0.013	0.024
D	14.81	15.95	0.583	0.628
D1	8.51	9.45	0.335	0.372
D2	12.19	13.10	0.480	0.516
E	9.70	10.36	0.382	0.408
E1	6.50	8.60	0.256	0.339
e	2.54		0.100	
e1	5.08		0.200	
N	3		3	
H1	5.90	6.90	0.232	0.272
L	13.00	14.00	0.512	0.551
L1	-	4.80	-	0.189
ϕP	3.60	3.89	0.142	0.153
Q	2.60	3.00	0.102	0.118

DOCUMENT NO.
Z8B00003318

SCALE

EUROPEAN PROJECTION

ISSUE DATE
23-08-2007

REVISION
05

Published by
Infineon Technologies AG
81726 Munich, Germany
© 2009 Infineon Technologies AG
All Rights Reserved.

Legal Disclaimer

The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics. With respect to any examples or hints given herein, any typical values stated herein and/or any information regarding the application of the device, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind, including without limitation, warranties of non-infringement of intellectual property rights of any third party.

Information

For further information on technology, delivery terms and conditions and prices, please contact the nearest Infineon Technologies Office (www.infineon.com).

Warnings

Due to technical requirements, components may contain dangerous substances. For information on the types in question, please contact the nearest Infineon Technologies Office.

Infineon Technologies components may be used in life-support devices or systems only with the express written approval of Infineon Technologies, if a failure of such components can reasonably be expected to cause the failure of that life-support device or system or to affect the safety or effectiveness of that device or system. Life support devices or systems are intended to be implanted in the human body or to support and/or maintain and sustain and/or protect human life. If they fail, it is reasonable to assume that the health of the user or other persons may be endangered.