2nd Generation thinQ!™ SiC Schottky Diode

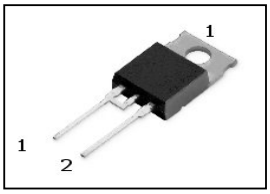
Product Summary

V_{DC}	600	V
Q_c	5	nC
I_F	3	A

Features

- Revolutionary semiconductor material - Silicon Carbide
- No reverse recovery/ no forward recovery
- Temperature independent switching behavior
- High surge current capability
- Qualified according to JEDEC[1)] for target applications
- Breakdown voltage tested at 5mA[2)]
- Optimized for high temperature operation

PG-TO220-2-2



thinQ! 2G Diode designed for fast switching applications like:

- CCM PFC

Type	Package	Marking	Pin 1	Pin 2
IDT03S60C	PG-TO220-2-2	D03S60C	C	A

Maximum ratings,

Parameter	Symbol	Conditions	Value	Unit
Continuous forward current	I_F	T_C<120 °C	3	A
		T_C<70 °C	4.5	
RMS forward current	$I_{F,RMS}$	f=50 Hz	4.2	
Surge non-repetitive forward current, sine halfwave	$I_{F,SM}$	T_C=25 °C, t_p=10 ms	16	
		T_C=150°C, t_p=10 ms	14	
Repetitive peak forward current	$I_{F,RM}$	T_j=150 °C, T_C=100 °C, D=0.1	10.5	
Non-repetitive peak forward current	$I_{F,max}$	T_C=25 °C, t_p=10 µs	115	
i^2t value	$\int i^2dt$	T_C=25 °C, t_p=10 ms	1.2	A^2s
		T_C=150°C, t_p=10 ms	0.96	
Repetitive peak reverse voltage	V_{RRM}	T_j=25 °C	600	V
Diode dv/dt ruggedness	dv/dt	V_R = 0….480V	50	V/ns
Power dissipation	P_{tot}	T_C=25 °C	25	W
Operating and storage temperature	T_j, T_{stg}		-55 ... 175	°C
Mounting torque		M3 and M3.5 screws	60	Mcm

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Thermal characteristics						
Thermal resistance, junction - case	R_{thJC}		-	-	5.9	K/W
Thermal resistance, junction - ambient	R_{thJA}	leaded	-	-	62	
Soldering temperature, wavesoldering only allowed at leads	T_{sold}	1.6mm (0.063 in.) from case for 10s	-	-	260	°C
Electrical characteristics						
Static characteristics						
DC blocking voltage	V_{DC}	I_R=0.05mA, T_j=25°C	600	-	-	V
Diode forward voltage	V_F	I_F=3 A, T_j=25 °C	-	1.7	1.9	
		I_F=3 A, T_j=150 °C	-	2.1	2.6	
		I_F=4.5 A, T_j=25 °C	-	2.1	2.4	
		I_F=4.5 A, T_j=150 °C	-	2.8	3.7	
Reverse current	I_R	V_R=600 V, T_j=25 °C	-	0.32	30	µA
		V_R=600 V, T_j=150 °C	-	1.3	300	
AC characteristics						
Total capacitive charge	Q_c	V_R=400 V,$I_F \leq I_{F,max}$, di_F/dt=200 A/µs, T_j=150 °C	-	5	-	nC
Switching time[3]	t_c		-	-	<10	ns
	C	V_R=1 V, f= MHz	-	90	-	pF
		V_R=300 V, f=1 MHz	-	12	-	
		V_R=600 V, f=1 MHz	-	12	-	

[1] J-STD20 and JESD22

[2] All devices tested under avalanche condition, for a time periode of 5ms, at 5mA.

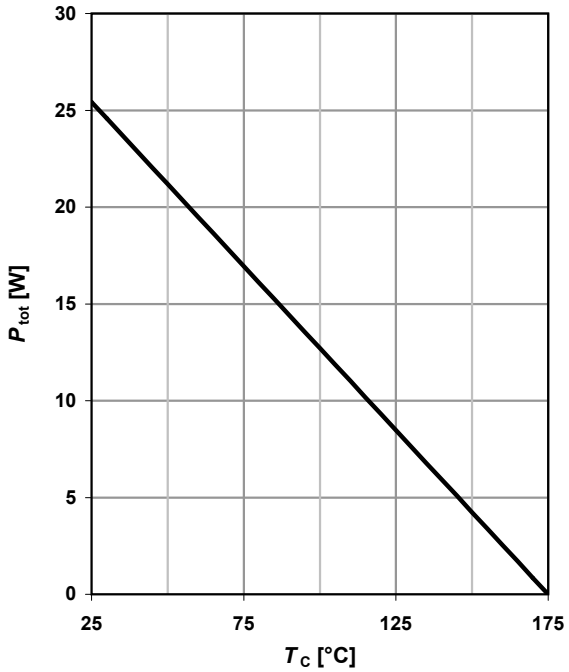
[3] t_c is the time constant for the capacitive displacement current waveform (independent from T_j, I_{LOAD} and di/dt), different from t_{rr}, which is dependent on T_j, I_{LOAD}, di/dt. No reverse recovery time constant t_{rr} due to absence of minority carrier injection.

[4] Only capacitive charge occuring, guaranteed by design.

1 Power dissipation

$P_{tot}=f(T_C)$

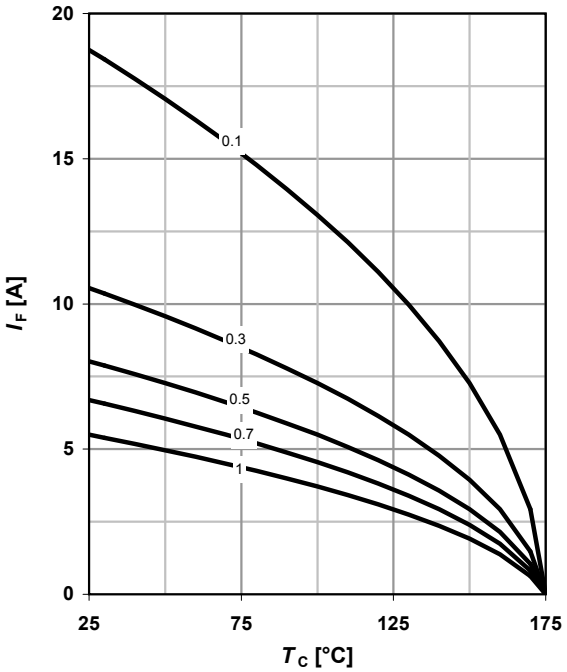
parameter: $R_{thJC(max)}$



2 Diode forward current

$I_F=f(T_C)$; $T_j \leq 175$ °C

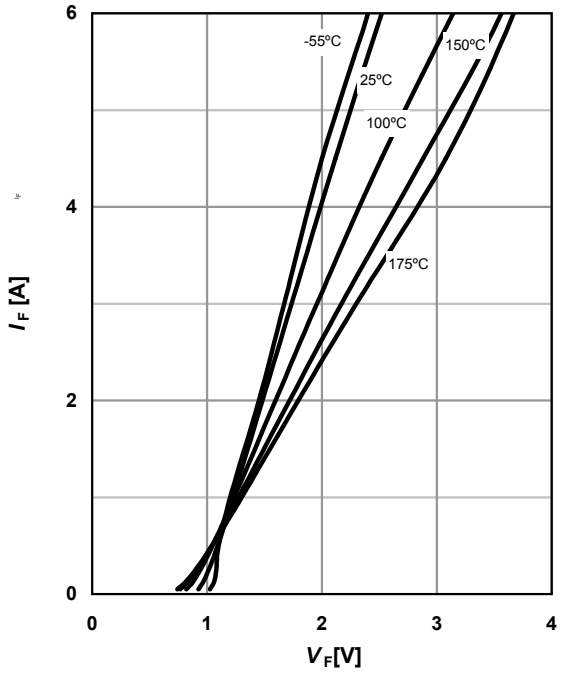
parameter: $D=t_p/T$



3 Typ. forward characteristic

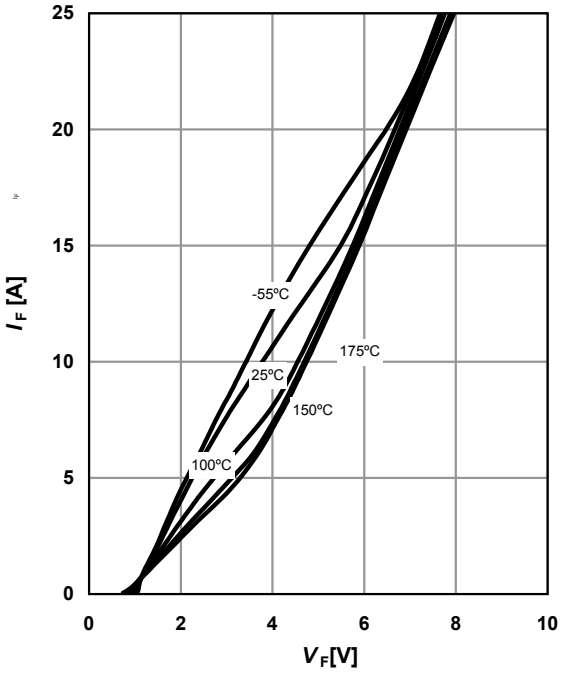
$I_F=f(V_F)$; $t_p=400$ µs

parameter: T_j



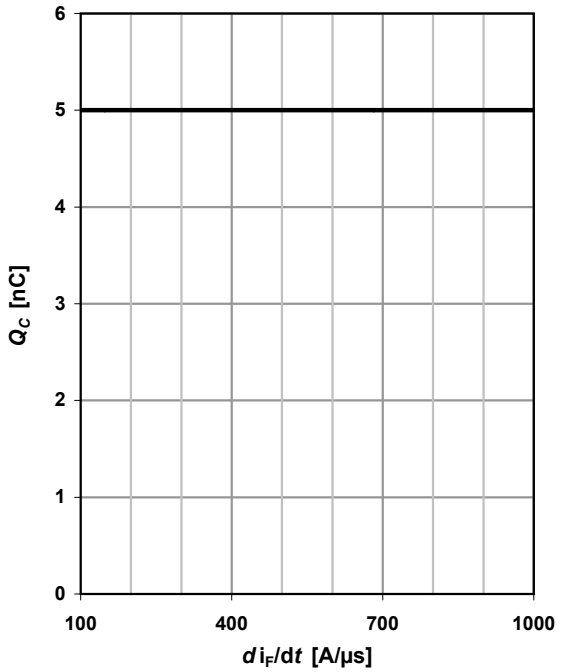
4 Typ. forward characteristic in surge current mode

$I_F=f(V_F)$; $t_p=400$ µs; parameter: T_j



5 Typ. capacitance charge vs. current slope

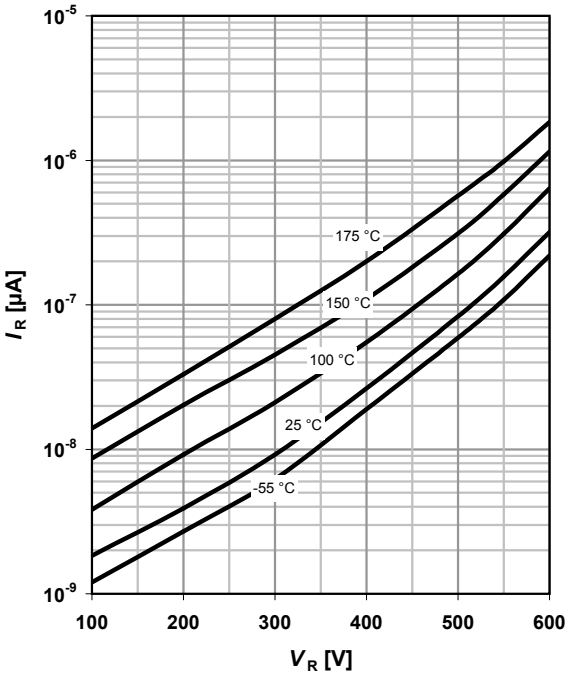
Q_C=f(di_F/dt)[4]; T_j=150 °C; $I_F \leq I_{F,max}$



6 Typ. reverse current vs. reverse voltage

I_R=f(V_R)

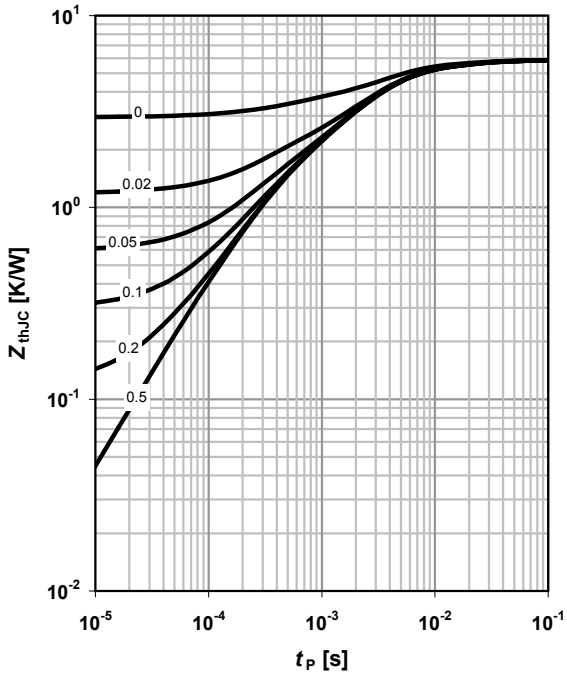
parameter: T_j



7 Transient thermal impedance

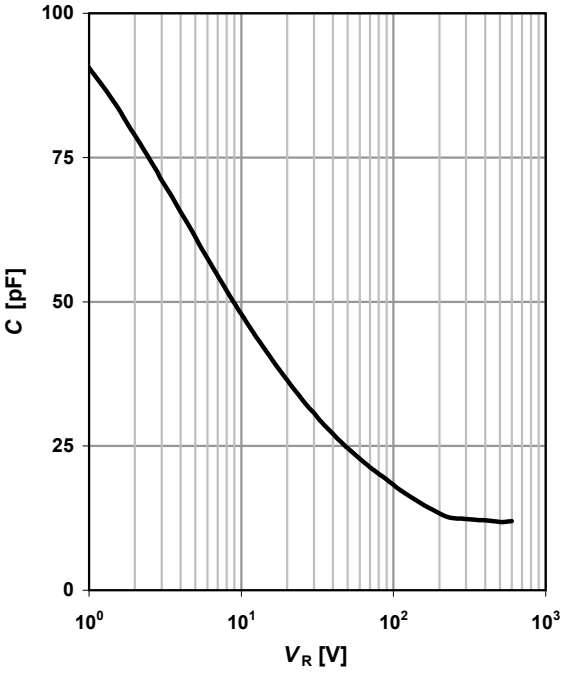
Z_{thJC}=f(t_p)

parameter: $D=t_p/T$



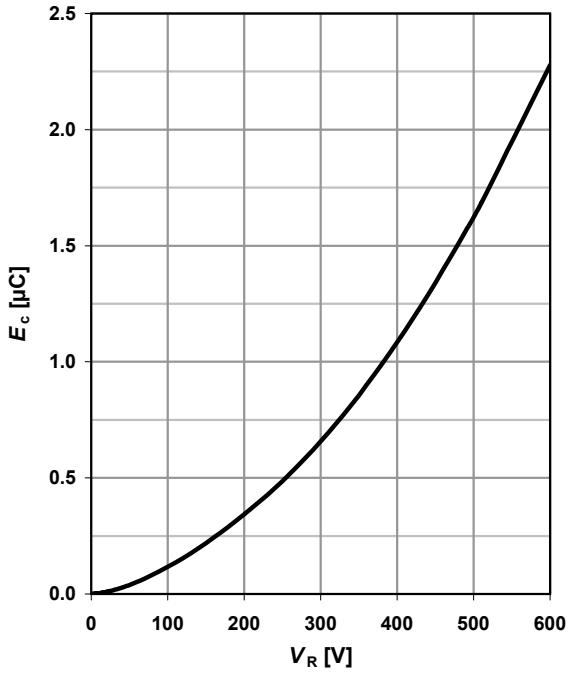
8 Typ. capacitance vs. reverse voltage

C=f(V_R); T_C=25 °C, f=1 MHz

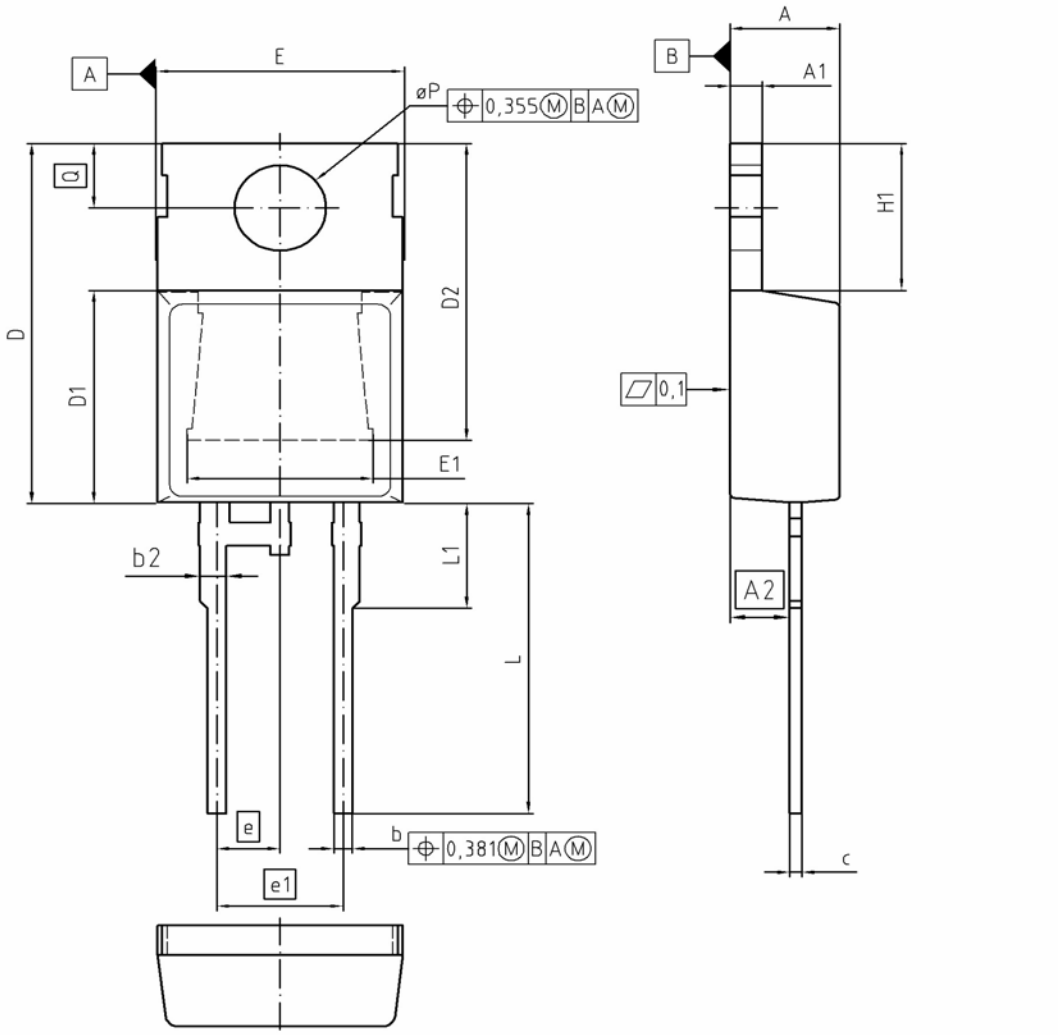


9 Typ. C stored energy

$E_C=f(V_R)$



Package Outline:PG-TO220-2-2



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.191	4.699	0.165	0.185
A1	1.170	1.400	0.046	0.055
A2	2.215	2.718	0.087	0.107
b	0.635	0.889	0.025	0.035
b2	0.950	1.651	0.037	0.065
c	0.330	0.635	0.013	0.025
D	14.808	15.950	0.583	0.628
D1	8.509	9.450	0.335	0.372
D2	12.850	14.245	0.506	0.561
E	9.677	10.363	0.381	0.408
E1	6.500	8.788	0.256	0.346
e	2.540		0.100	
e1	5.080		0.200	
N	2		2	
H1	5.900	6.900	0.232	0.272
L	12.700	14.000	0.500	0.551
L1	3.048	4.800	0.120	0.189
øP	3.550	3.886	0.140	0.153
Q	2.540	3.048	0.100	0.120

DOCUMENT NO.	Z8B00003320
SCALE	0 2.5 0 2.5 5mm
EUROPEAN PROJECTION	
ISSUE DATE	28-02-2007
REVISION	02

Published by
Infineon Technologies AG
81726 München, Germany

Attention please!

The information given in this data sheet shall in no event be regarded as a guarantee of conditions o characteristics (“Beschaffenheitsgarantie”). With respect to any examples or hints given herein, any typica 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 o non-infringement of intellectual property rights of any third party

Information

For further information on technology, delivery terms and conditions and prices please contact your neares 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 your nearest Infineon Technologies Office.
Infineon Technologies Components may only be used in life-support devices or systems with the express written approval of Infineon Technologies, if a failure of such components can reasonably be expected tc 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.