3rd Generation thinQ!™ SiC Schottky Diode

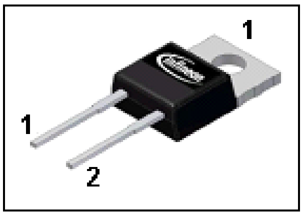
Features

- Revolutionary semiconductor material - Silicon Carbide
- Switching behavior benchmark
- No reverse recovery / No forward recovery
- Temperature independent switching behavior
- High surge current capability
- Pb-free lead plating; RoHS compliant
- Qualified according to JEDEC[1)] for target applications
- Breakdown voltage tested at 20mA[2)]
- Optimized for high temperature operation
- Lowest Figure of Merit Q_C/I_F

Product Summary

V_{DC}	600	V
Q_C	12	nC
I_F; T_C< 130 °C	8	A

PG-TO220-2



thinQ! 3G Diode designed for fast switching applications like:

- SMPS e.g.; CCM PFC
- Motor Drives; Solar Applications; UPS

Type	Package	Marking	Pin 1	Pin 2
IDH08SG60C	PG-TO220-2	D08G60C	C	A

Maximum ratings

Parameter	Symbol	Conditions	Value	Unit
Continuous forward current	I_F	T_C<130 °C	8	A
Surge non-repetitive forward current, sine halfwave	$I_{F,SM}$	T_C=25 °C, t_p=10 ms	42	
		T_C=150 °C, t_p=10 ms	36	
Non-repetitive peak forward current	$I_{F,max}$	T_C=25 °C, t_p=10 µs	350	
i^2t value	$\int i^2 dt$	T_C=25 °C, t_p=10 ms	9	A^2s
		T_C=150 °C, t_p=10 ms	6.5	
Repetitive peak reverse voltage	V_{RRM}	T_j=25 °C	600	V
Diode dv/dt ruggedness	dv/dt	V_R= 0….480 V	50	V/ns
Power dissipation	P_{tot}	T_C=25 °C	100	W
Operating and storage temperature	T_j, T_{stg}		-55 ... 175	°C
Soldering temperature, wavesoldering only allowed at leads	T_{sold}	1.6mm (0.063 in.) from case for 10s	260	
Mounting torque		M3 and M3.5 screws	60	Ncm

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	

Thermal characteristics

Parameter	Symbol	Conditions	min.	typ.	max.	Unit
Thermal resistance, junction - case	R_{thJC}		-	-	1.5	K/W
Thermal resistance, junction - ambient	R_{thJA}	Thermal resistance, junction- ambient, leaded	-	-	62	

Electrical characteristics, at T_j=25 °C, unless otherwise specified

Static characteristics

Parameter	Symbol	Conditions	min.	typ.	max.	Unit
DC blocking voltage	V_{DC}	I_R=0.05 mA, T_j=25 °C	600	-	-	V
Diode forward voltage	V_F	I_F=8 A, T_j=25 °C	-	1.8	2.1	
		I_F=8 A, T_j=150 °C	-	2.2	-	
Reverse current	I_R	V_R=600 V, T_j=25 °C	-	0.6	70	µA
		V_R=600 V, T_j=150 °C	-	2.5	700	

AC characteristics

Parameter	Symbol	Conditions	min.	typ.	max.	Unit
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	-	12	-	nC
Switching time[3]	t_c		-	-	<10	ns
Total capacitance	C	V_R=1 V, f=1 MHz	-	240	-	pF
		V_R=300 V, f=1 MHz	-	30	-	
		V_R=600 V, f=1 MHz	-	30	-	

[1] J-STD20 and JESD22

[2] All devices tested under avalanche conditions, for a time periode of 10ms, at 20mA.

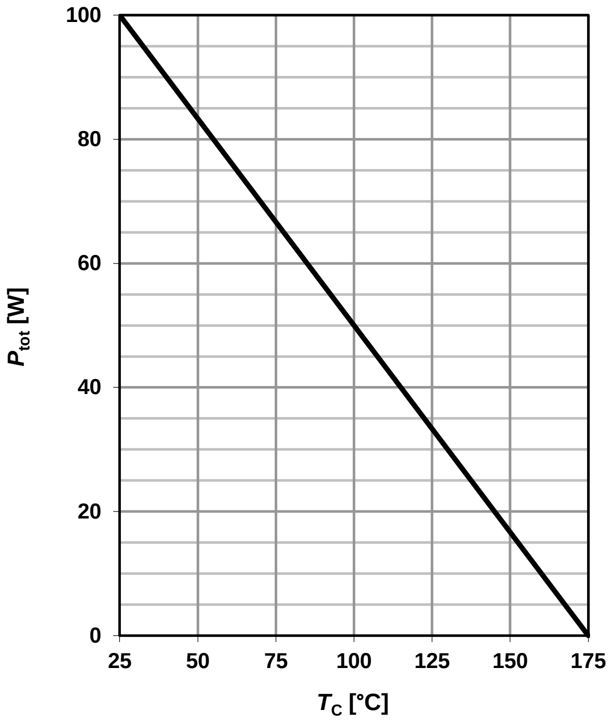
[3] t_c is the time constant for the capacitive displacement current waveform (independent from T_j, I_{LOAD} and di/dt), different from t_{rr} which is dependent on T_j, I_{LOAD} and di/dt. No reverse recovery time constant t_{rr} due to absence of minority carrier injection.

[4] Under worst case Z_{th} conditions.

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

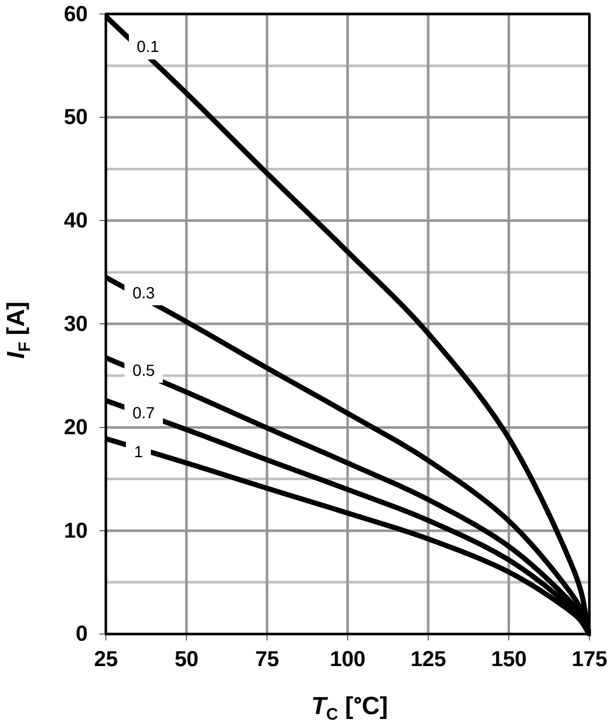
1 Power dissipation

P_{tot}=f(T_C); parameter: $R_{thJC(max)}$



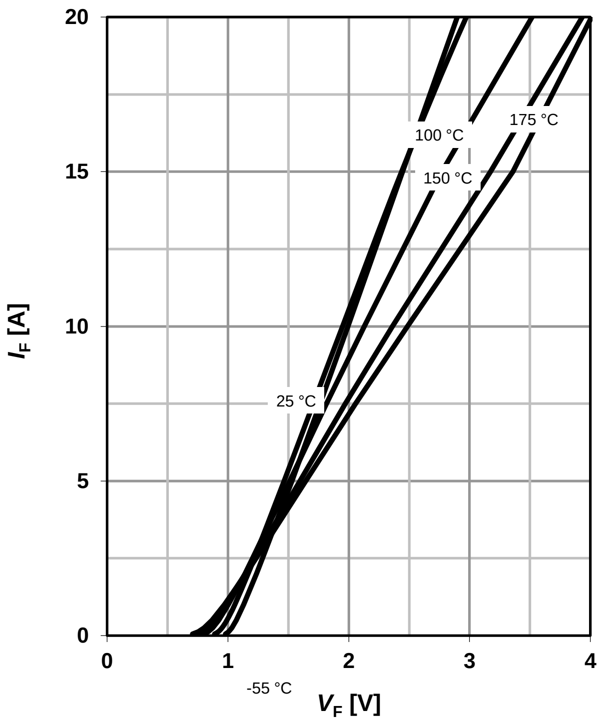
2 Diode forward current

I_F=f(T_C)[4]; T_j≤175 °C; parameter: $D = t_p/T$



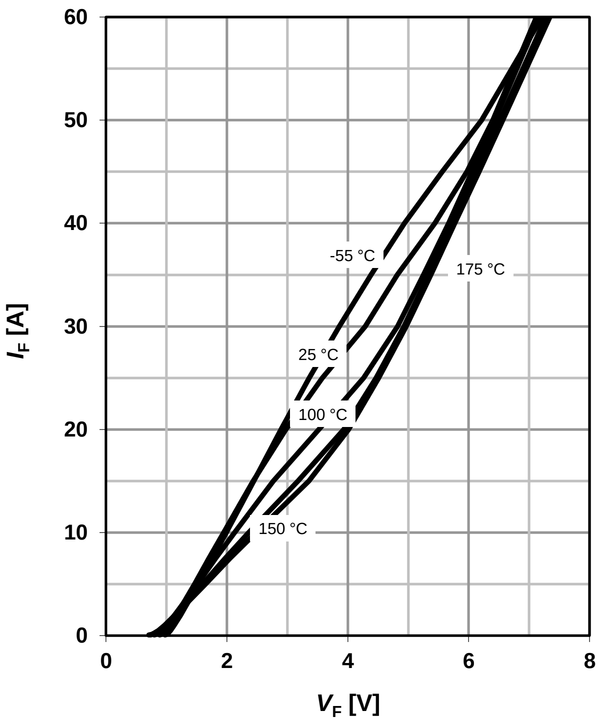
3 Typ. forward characteristic

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



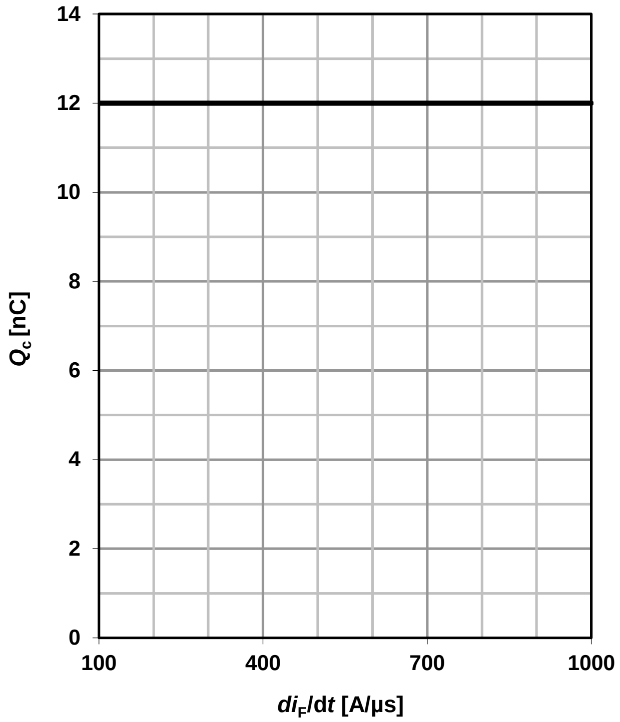
4 Typ. forward characteristic in surge current mode

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



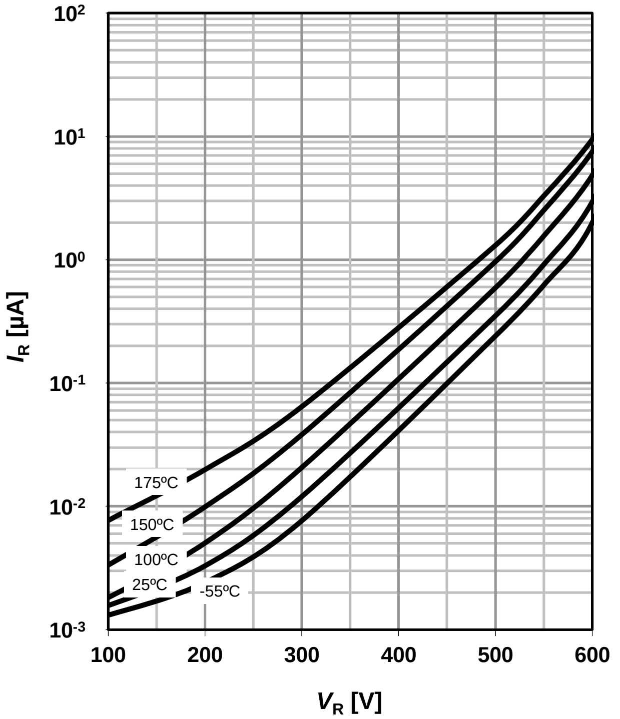
5 Typ. capacitance charge vs. current slope

Q_C=f(di_F/dt)[5]; $I_F \leq I_{F,max}$



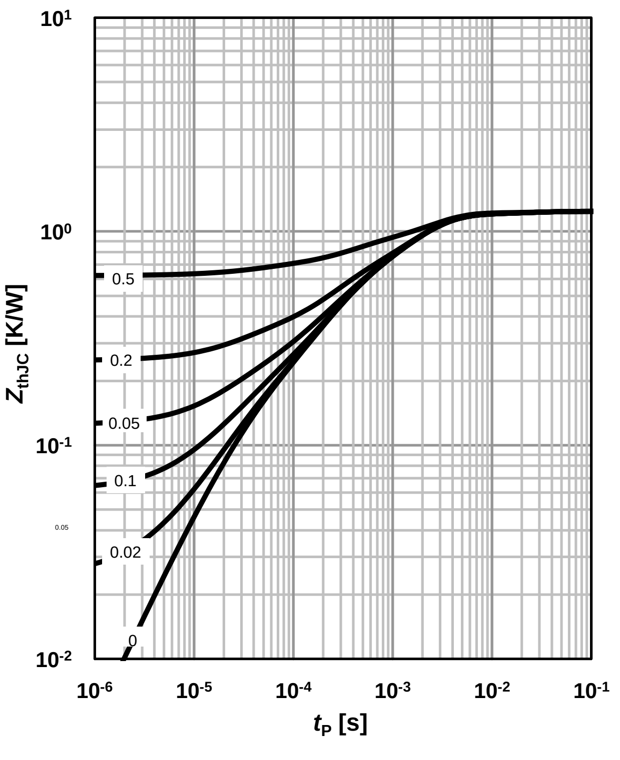
6 Typ. reverse current vs. reverse voltage

I_R=f(V_R); parameter: T_j



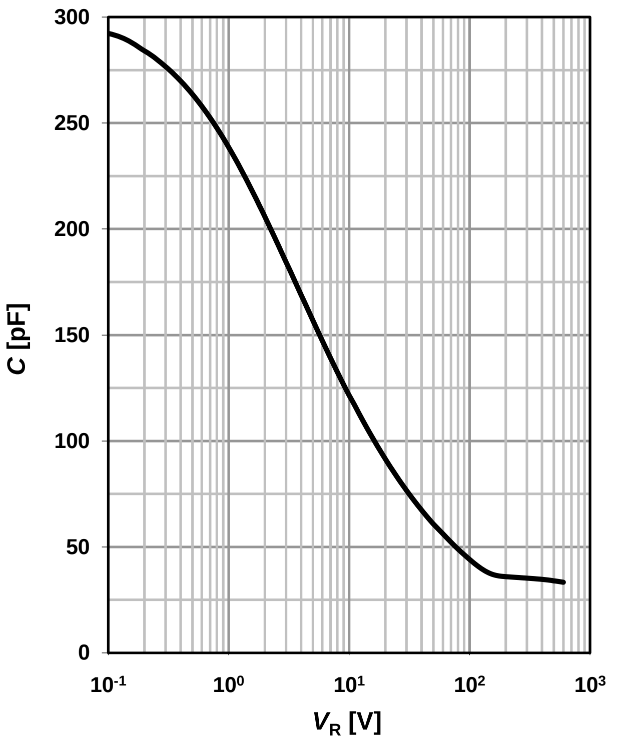
7 Typ. transient thermal impedance

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



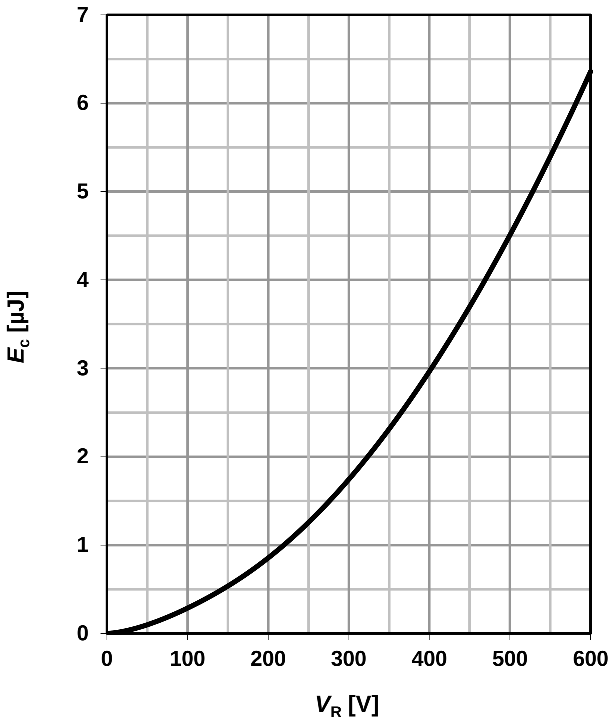
8 Typ. capacitance vs. reverse voltage

C=f(V_R); T_C=25 °C, f=1 MHz

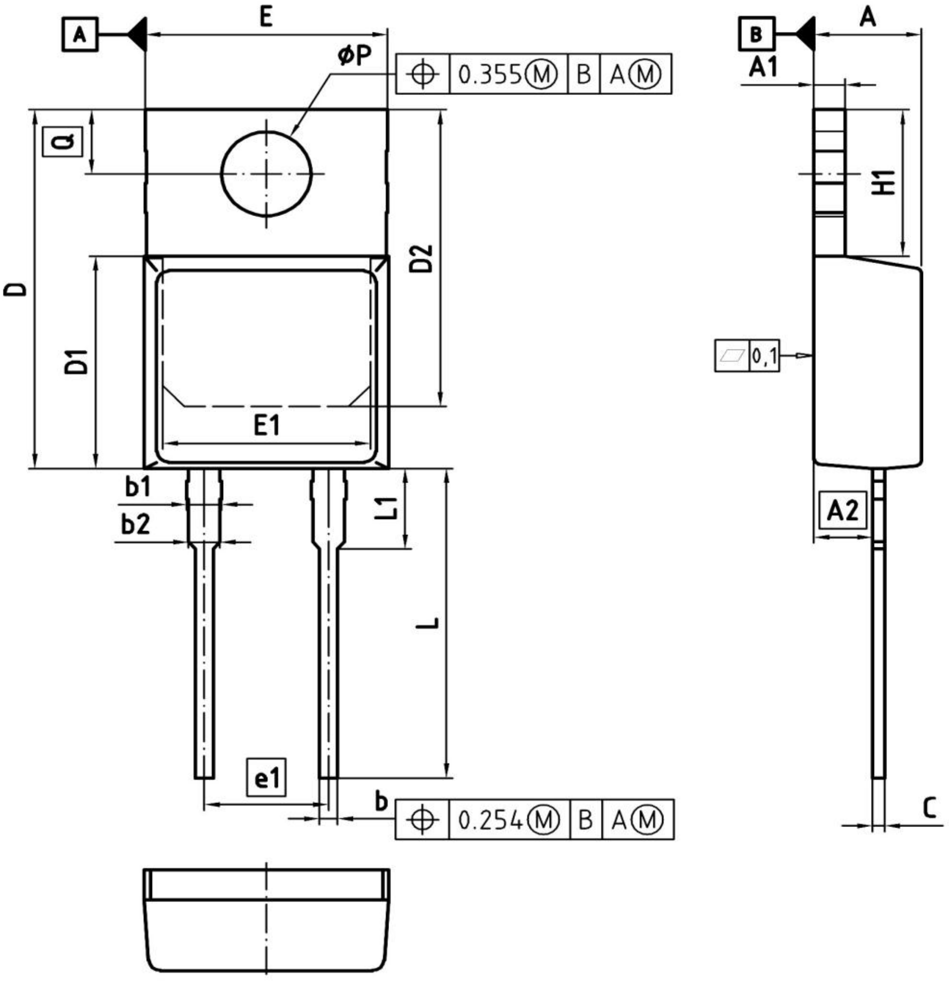


9 Typ. C stored energy

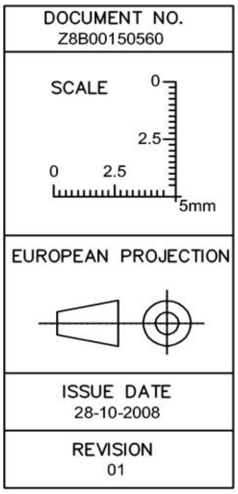
E_C=f(V_R)



PG-TO220-2: Outline



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.30	4.50	0.169	0.177
A1	1.17	1.37	0.046	0.054
A2	2.30	2.50	0.091	0.098
b	0.65	0.85	0.026	0.033
b1	1.19	1.69	0.047	0.066
b2	1.19	1.39	0.047	0.055
c	0.40	0.60	0.016	0.024
D	15.35	15.95	0.604	0.628
D1	9.05	9.45	0.356	0.372
D2	12.30	13.05	0.484	0.514
E	9.80	10.20	0.386	0.402
E1	7.25	8.60	0.285	0.339
e1	5.08		0.200	
N	2		2	
H1	5.90	6.90	0.232	0.272
L	13.00	14.00	0.512	0.551
L1	3.30	3.70	0.130	0.146
øP	3.55	3.70	0.140	0.146
Q	2.60	3.00	0.102	0.118



Dimensions in mm/inches

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