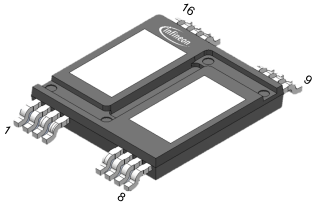
Final datasheet

CoolSiC™ 1200 V Schottky diode G5 : Silicon Carbide Diode with top side cooling and .XT technology

Features



- V_{RRM} = 1200 V
- I_F = 20 A
- No reverse recovery current / no forward recovery
- High surge current capability
- Temperature independent switching behavior
- Low forward voltage
- dv/dt ruggedness
- Pb-free lead plating; RoHS compliant
- .XT interconnection technology for best-in-class thermal performance

Lead-free
Green
Halogen-free
RoHS

Potential applications

- EV Charging
- DIN Rail & Rack Mount (Power Supply)
- Commercial Lighting Fixture

Product validation

- Qualified for industrial applications according to the relevant tests of JEDEC47/20/22

Description

Pin definition:

13-16 & Case 1 – Cathode 1 (C_1)

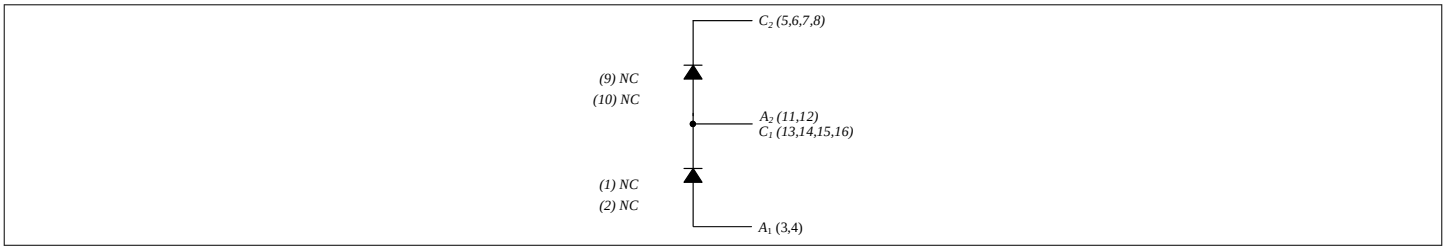
1, 2 – not connected (NC)

3-4 – Anode 1 (A_1)

5-8 & Case 2 – Cathode 2 (C_2)

9, 10 – not connected (NC)

11-12 – Anode 2 (A_2)



Type	Package	Marking
IDSQ20G120C5D	PG-HDSOP-16-U03	D2012C5

Table of contents

1 Package

Table 1 Characteristic values

Parameter	Symbol	Note or test condition	Values			Unit
			Min.	Typ.	Max.	
Storage temperature	T_{stg}		-55		150	°C
Soldering temperature	T_{sold}	Reflow soldering (MSL2 according to JEDEC J-STD-020)			260	°C
Thermal resistance, junction-ambient	$R_{th(j\text{-}a)}$				62	K/W
Diode thermal resistance, junction-case	$R_{th(j\text{-}c)}$			0.32	0.41	K/W
Comparative Tracking Index	*CTI*	IEC 60112 (material group 1 according to IEC 60664-1)	600			V

2 SiC Diode

Table 2 Maximum rated values

Parameter	Symbol	Note or test condition		Values	Unit
Repetitive peak reverse voltage	V_{RRM}	$T_{vj} \geq 25$ °C		1200	V
Continuous forward current for $R_{th(j\text{-}c,max)}$	I_F		$T_c = 25$ °C	72	A
			$T_c = 135$ °C	34	
			$T_c = 159$ °C	20	
Surge repetitive forward current, sine halfwave[1)]	$I_{F,RM}$	$t_p = 10$ ms	$T_c = 25$ °C	80	A
			$T_c = 100$ °C	60	
Surge non-repetitive forward current, sine halfwave	$I_{F,SM}$	$t_p = 10$ ms	$T_c = 25$ °C	139	A
			$T_c = 150$ °C	113	
Non-repetitive peak forward current	$I_{F,max}$	$T_c = 25$ °C, $t_p = 10$ µs		730	A
I^2t- value	$\int I^2t$	$t_p = 10$ ms[2)]	$T_c = 25$ °C	97	A^2s
			$T_c = 150$ °C	64	
Diode dv/dt ruggedness	*dv/dt*	$V_R = 0...960$ V		150	V/ns
Avalanche energy, single pulse	E_{AS}	$I_D = 20$ A, $L = 0.29$ mH		57	mJ
Power dissipation for $R_{th(j\text{-}c,max)}$	P_{tot}		$T_c = 25$ °C	365	W
			$T_c = 100$ °C	182	

1) Not subject to production test. The test was performed with 20k pulses (half-wave rectified sine with 10 ms period).
2) sine halfwave

Table 3 Characteristic values

Parameter	Symbol	Note or test condition		Values			Unit
				Min.	Typ.	Max.	
DC blocking voltage	V_{DC}	I_R = 500 µA		1200			V
Diode forward voltage	V_F	I_F = 20 A	T_{vj} = 25 °C		1.45	1.8	V
			T_{vj} = 125 °C		1.69		
			T_{vj} = 150 °C		1.8		
Reverse current	I_R	V_R = 1200 V	T_{vj} = 25 °C		10	160	µA
			T_{vj} = 150 °C		58		
Total capacitive charge	Q_C	V_R = 800 V, T_{vj} = 25 °C & 150 °C, $Q_C = \int_0^{V_R} C(V)dV$			96		nC
Total capacitance	C	f = 100 kHz	V_R = 1 V		1236		pF
			V_R = 400 V		87		
			V_R = 800 V		70		
Virtual junction temperature	T_{vj}			-55		175	°C

***Note**: For optimum lifetime and reliability, Infineon recommends operating conditions that do not exceed 80% of the maximum ratings stated in this datasheet.*

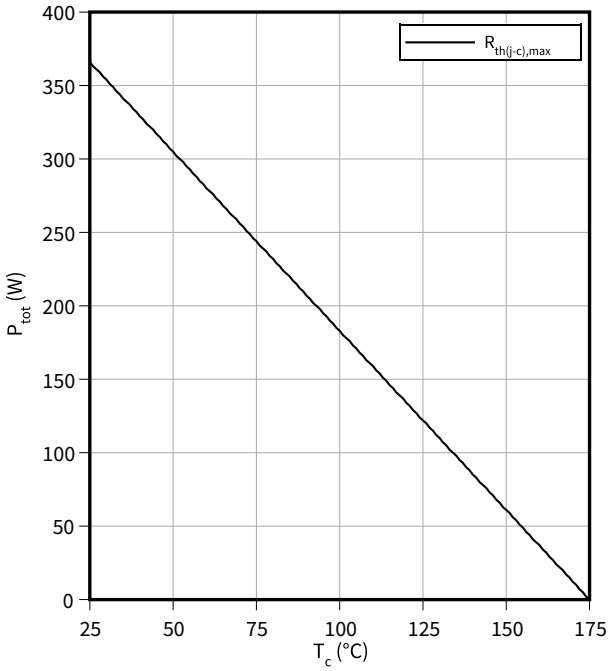
Characteristic at T_{vj} = 25°C, unless otherwise specified.

3 Characteristics diagrams

Power dissipation as function of case temperature

$P_{tot} = f(T_c)$

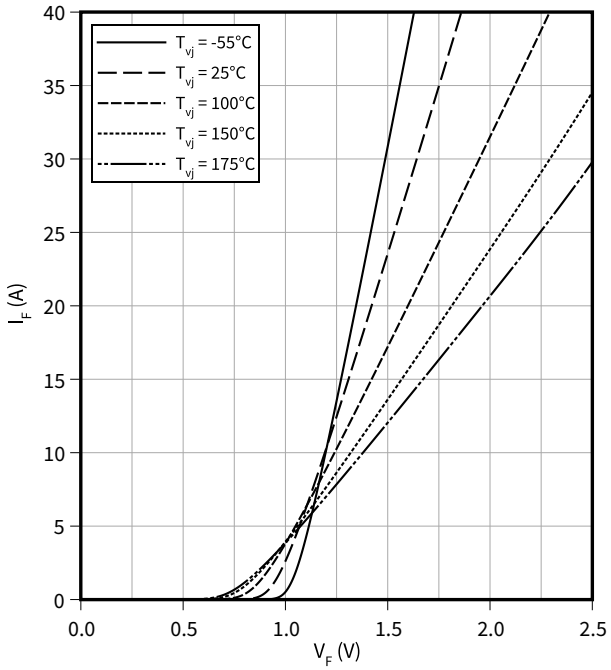
$T_{vj} \leq 175\ °C$



Typical forward characteristics

$I_F = f(V_F)$

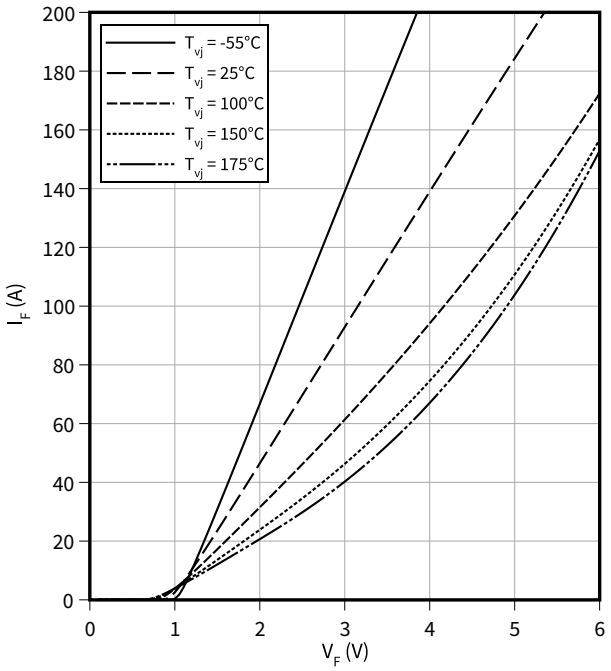
$t_p = 10\ \mu s$



Typical forward characteristics in surge current

$I_F = f(V_F)$

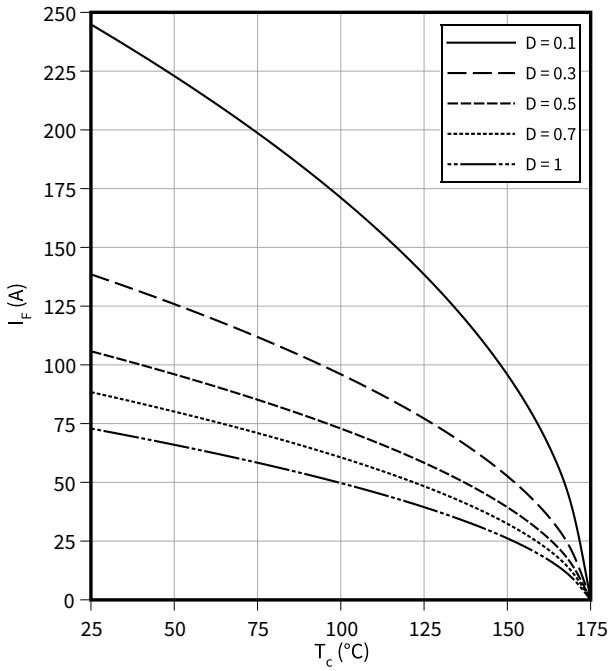
$t_p = 10\ \mu s$



Diode forward current as function of temperature

$I_F = f(T_c)$

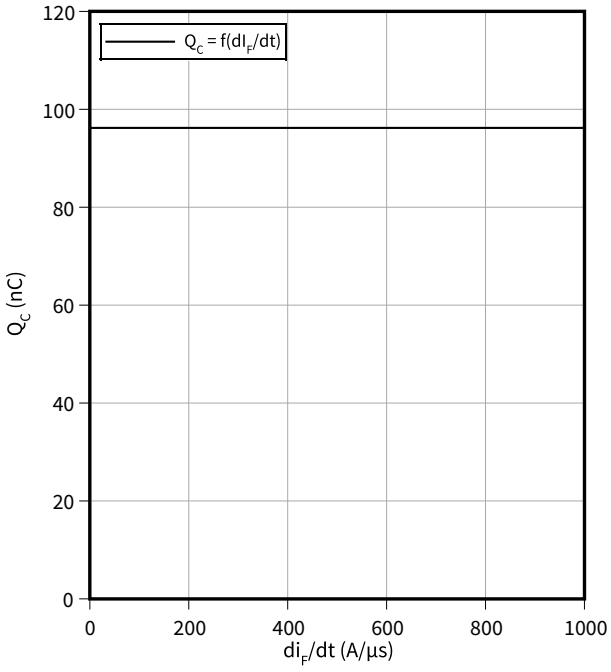
$T_{vj} \leq 175\ °C$



Typical capacitive charge as function of current slope

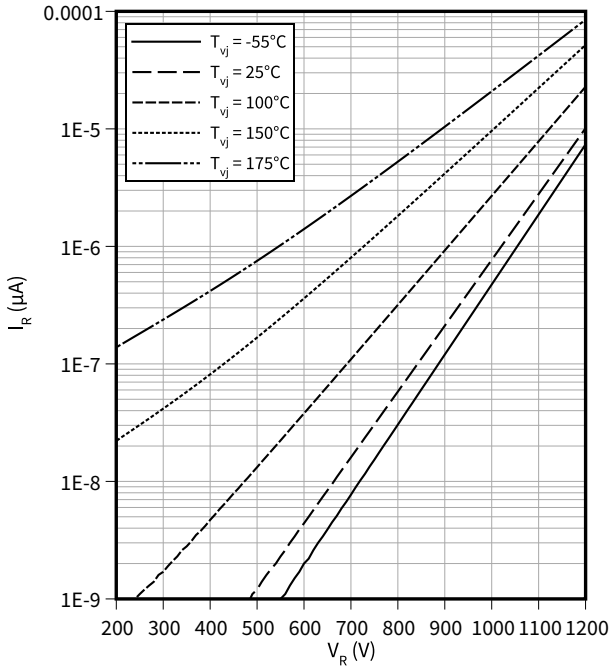
$Q_C = f(di_F/dt)$

T_{vj} = 25 °C, V_R = 800 V



Typical reverse characteristics

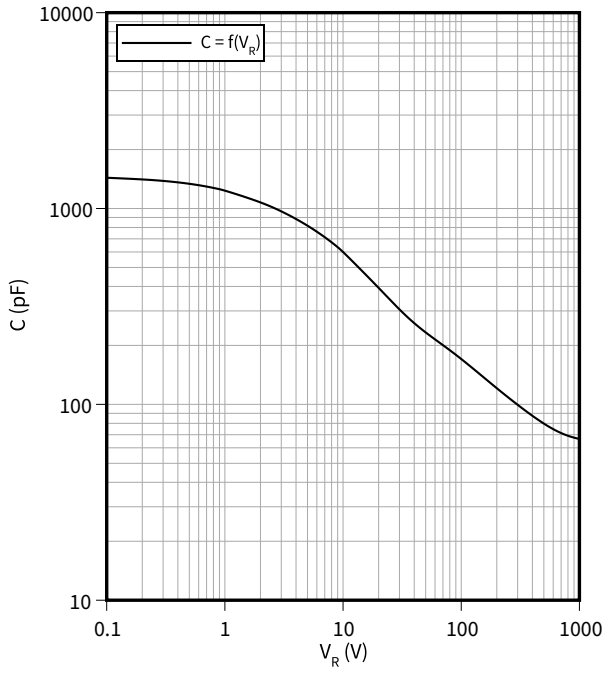
$I_R = f(V_R)$



Typical capacitance as function of reverse voltage

$C = f(V_R)$

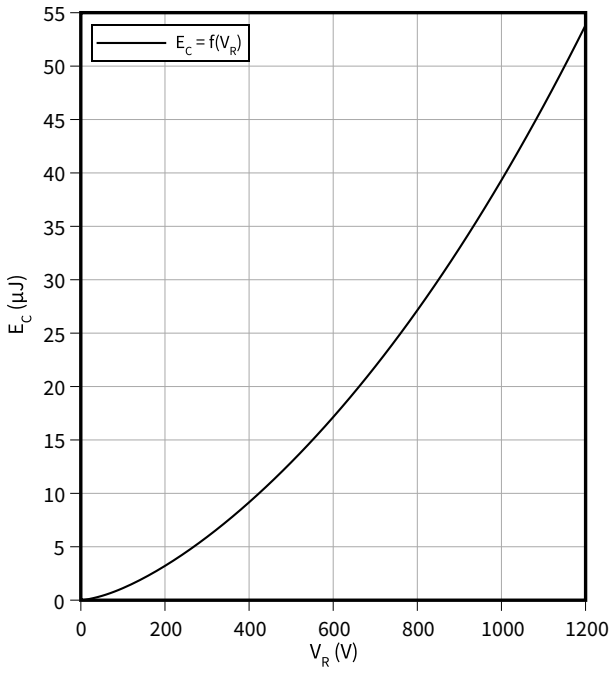
T_{vj} = 25 °C, f = 100 kHz



Typical capacitively stored energy as function of reverse voltage

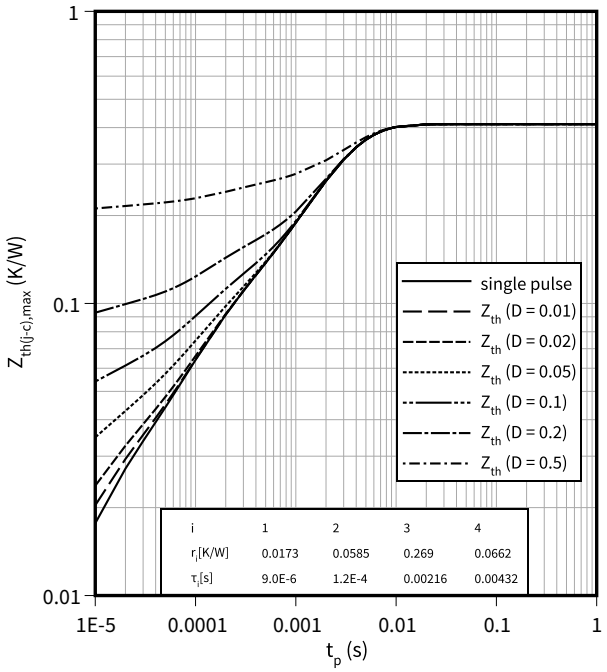
$E_C = f(V_R)$

f = 100 kHz

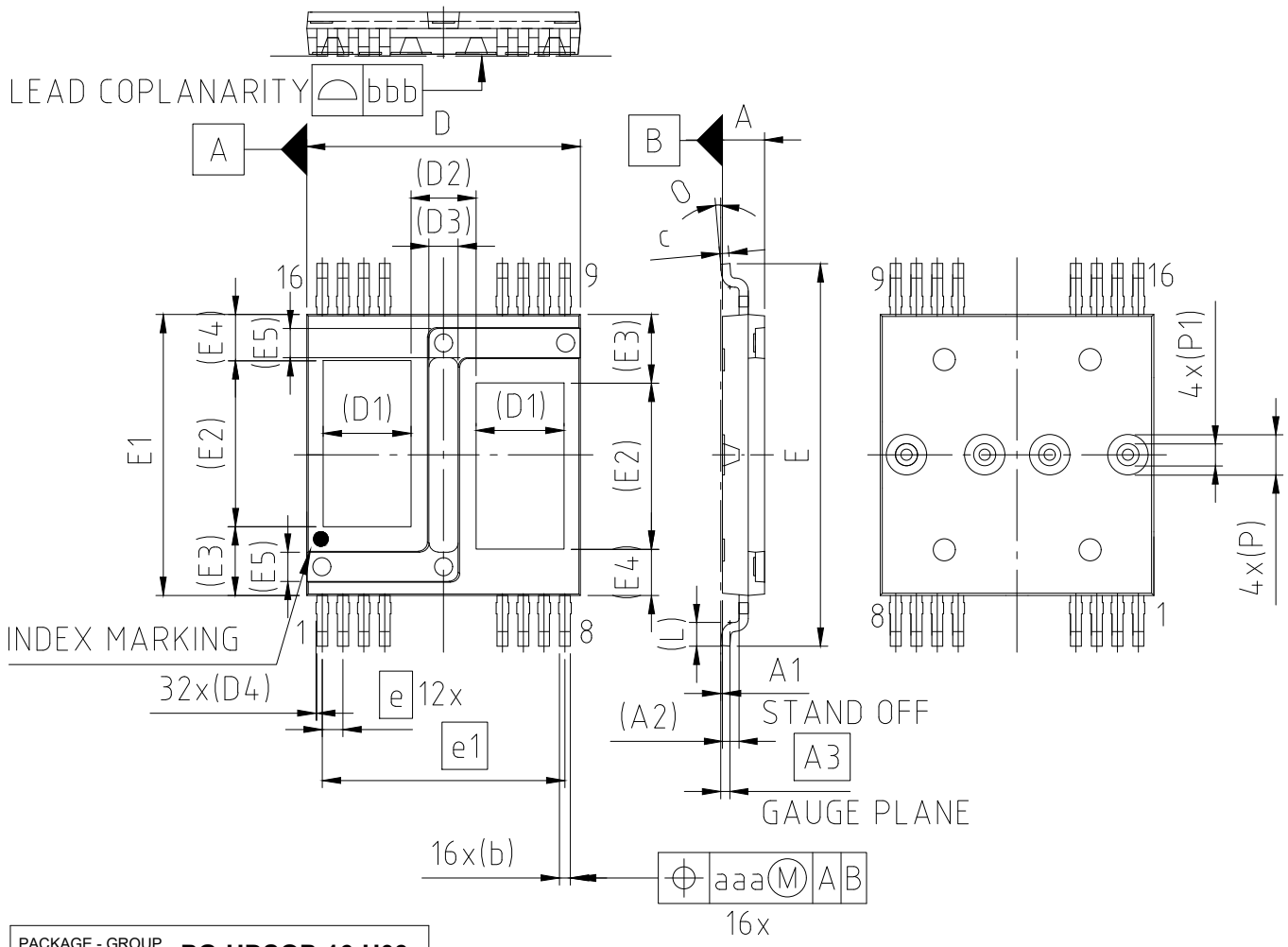


Max. transient thermal impedance

$Z_{th(j-c),max} = f(t_p)$
$D = t_p/T$



4 Package outlines



PACKAGE - GROUP NUMBER:	PG-HDSOP-16-U03	

DIMENSIONS	MILLIMETERS	
	MIN.	MAX.
A	2.25	2.35
A1	0.00	0.15
A2	0.90	
A3	0.50	
b	0.60	
c	0.46	0.58
D	14.90	15.10
D1	4.82	
D2	3.56	
D3	1.60	
D4	0.15	
E	20.81	21.11
E1	15.30	15.50
E2	9.10	
E3	3.76	
E4	2.54	
E5	1.60	

DIMENSIONS	MILLIMETERS	
	MIN.	MAX.
e	1.14	
e1	13.30	
L	1.30	
N	16	
O	0.00°	8°
P	2.20	
P1	1.20	
aaa	0.25	
bbb	0.10	

NOTES:
ALL METAL SURFACES TIN PLATED EXCEPT AREA OF CUT
DIMENSIONS DO NOT INCLUDE MOLD FLASH,
PROTRUSION OR GATE BURRS

Figure 1

Revision history

Document revision	Date of release	Description of changes
0.10	2024-01-24	Target datasheet
0.20	2024-11-14	Updated Avalanche energy, single pulse E_{AS} in Table 2 Editorial changes
0.30	2025-04-03	Preliminary datasheet
1.00	2026-06-25	Final datasheet

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