

Final datasheet
CoolSiC™ 1200 V Schottky diode G5 with .XT interconnection technology

Features

- $V_{RRM} = 1200\text{ V}$ at $T_{vj} = 25^{\circ}\text{C}$
- $I_F = 50\text{ A}$
- 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

Potential applications

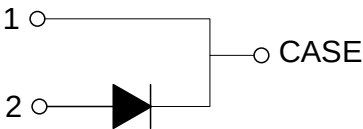
- String inverter
- Online UPS / Industrial UPS
- EV Charging
- Welding

Product validation

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

Description

Pin definition:
Pin 1 & backside – Cathode
Pin 2 – Anode



Type	Package	Marking
IDWD50G120C5	PG-TO247-2-U01	D5012C5



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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}	wave soldering 1.6 mm (0.063 in.) from case for 10 s			260	°C
Mounting torque	M	M3 screw, Maximum of mounting processes: 3			0.6	Nm
Thermal resistance, junction-ambient	$R_{th(j-a)}$				62	K/W
Diode thermal resistance, junction-case	$R_{th(j-c)}$			0.23	0.3	K/W

2 SiC Diode

Table 2 Maximum rated values

Parameter	Symbol	Note or test condition		Values	Unit
Repetitive peak reverse voltage	V_{RRM}	$T_{vj} \geq 25\text{ °C}$		1200	V
Continuous forward current for $R_{th(j-c,max)}$	I_F		$T_c = 25\text{ °C}$	131	A
			$T_c = 135\text{ °C}$	61	
			$T_c = 145\text{ °C}$	50	
Surge repetitive forward current, sine halfwave ¹⁾	$I_{F,RM}$	$t_p = 10\text{ ms}$	$T_c = 25\text{ °C}$	200	A
			$T_c = 100\text{ °C}$	150	
Surge non-repetitive forward current, sine halfwave	$I_{F,SM}$	$t_p = 10\text{ ms}$	$T_c = 25\text{ °C}$	330	A
			$T_c = 150\text{ °C}$	320	
Non-repetitive peak forward current	$I_{F,max}$	$T_c = 25\text{ °C}, t_p = 10\text{ }\mu\text{s}$		1755	A
I^2t value	$\int I^2t$	$t_p = 10\text{ ms}$ ²⁾	$T_c = 25\text{ °C}$	579	A ² s
			$T_c = 150\text{ °C}$	546	
Diode dv/dt ruggedness	dv/dt	$V_R = 0\ldots 960\text{ V}$		150	V/ns
Avalanche energy, single pulse	E_{AS}	$I_D = 35\text{ A}, V_{DD} = 50\text{ V}, L = 0.5\text{ mH}$		302	mJ
Power dissipation for $R_{th(j-c,max)}$	P_{tot}		$T_c = 25\text{ °C}$	500	W
			$T_c = 100\text{ °C}$	250	

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

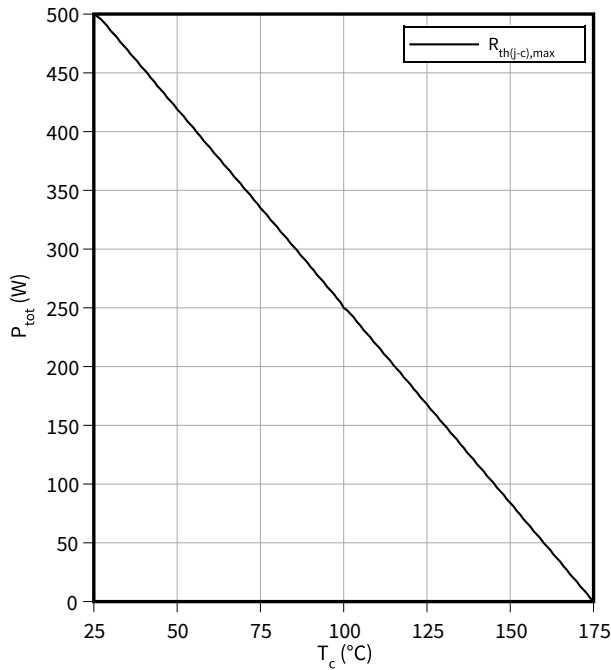
Parameter	Symbol	Note or test condition		Values			Unit
				Min.	Typ.	Max.	
DC blocking voltage	V_{DC}	$I_R = 500 \mu A, T_{vj} = 25^\circ C$		1200			V
Diode forward voltage	V_F	$I_F = 50 A$	$T_{vj} = 25^\circ C$		1.45	1.8	V
			$T_{vj} = 125^\circ C$		1.69		
			$T_{vj} = 150^\circ C$		1.8		
Reverse current	I_R	$V_R = 1200 V$	$T_{vj} = 25^\circ C$		26	400	μA
			$T_{vj} = 150^\circ C$		130		
Total capacitive charge	Q_C	$V_R = 800 V, T_{vj} = 25^\circ C \text{ \& } 150^\circ C,$ $Q_C = \int_0^{V_R} C(V) dV$			223		nC
Total capacitance	C	$f = 100 \text{ kHz}$	$V_R = 1 V$		2890		pF
			$V_R = 400 V$		204		
			$V_R = 800 V$		160		
Operating junction temperature	T_{vj}			-55		175	$^\circ C$

Note: For optimum lifetime and reliability, Infineon recommends operating conditions that do not exceed 80% of the maximum ratings stated in this datasheet.
Electrical Characteristic, at $T_{vj} = 25^\circ C$, unless otherwise specified.

3 Characteristics diagrams

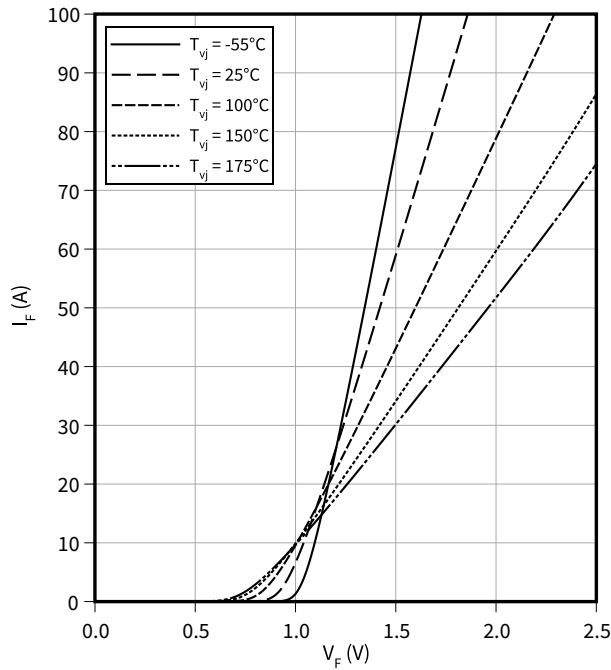
Power dissipation as function of case temperature

$P_{\text{tot}} = f(T_c)$
 $T_{vj} \leq 175\text{ °C}$



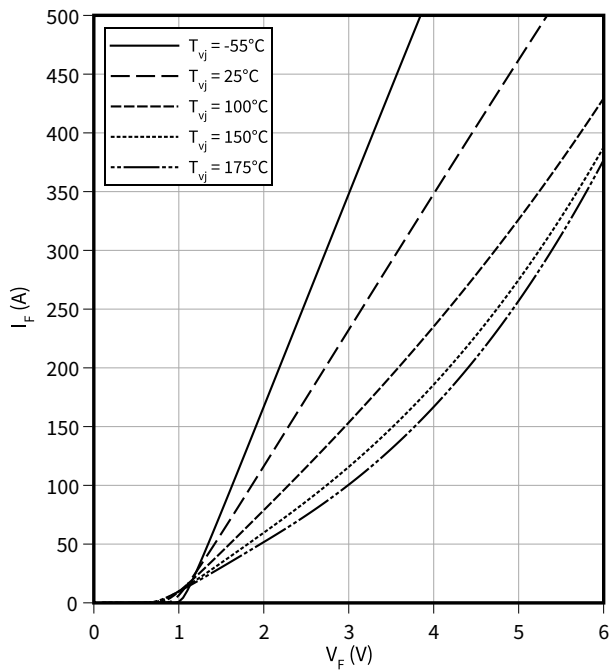
Typical forward characteristics

$I_F = f(V_F)$
 $t_p = 10\text{ }\mu\text{s}$



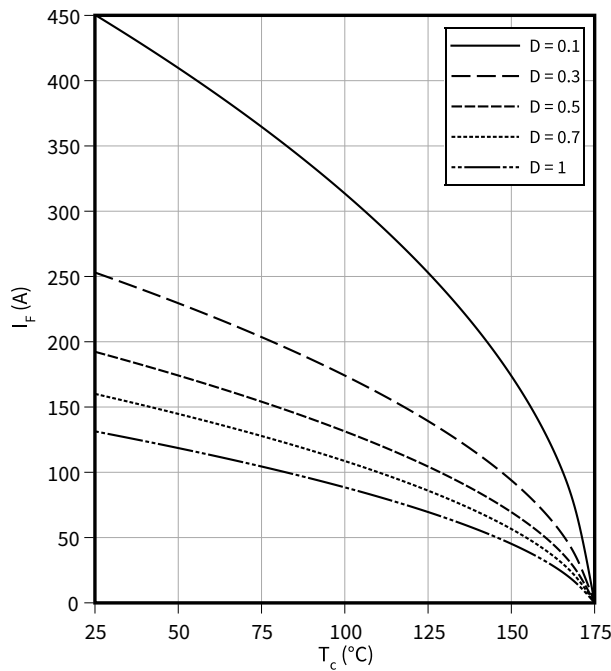
Typical forward characteristics in surge current

$I_F = f(V_F)$
 $t_p = 10\text{ }\mu\text{s}$



Diode forward current as function of temperature

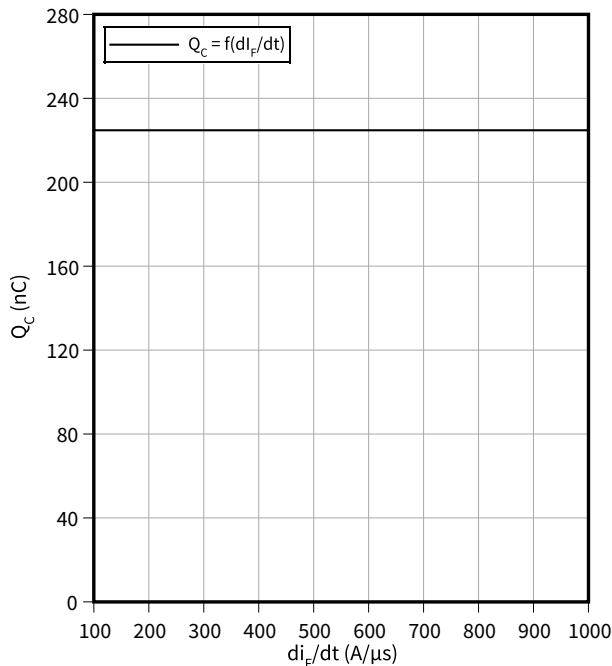
$I_F = f(T_c)$
 $T_{vj} \leq 175\text{ °C}$



3 Characteristics diagrams

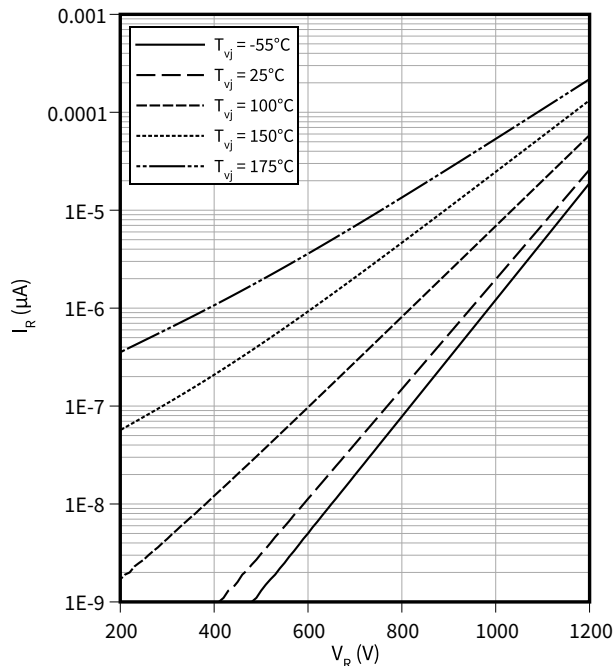
Typical capacitive charge as function of current slope

$Q_C = f(di_F/dt)$
 $T_{vj} = 25\text{ }^{\circ}\text{C}, V_R = 800\text{ V}$



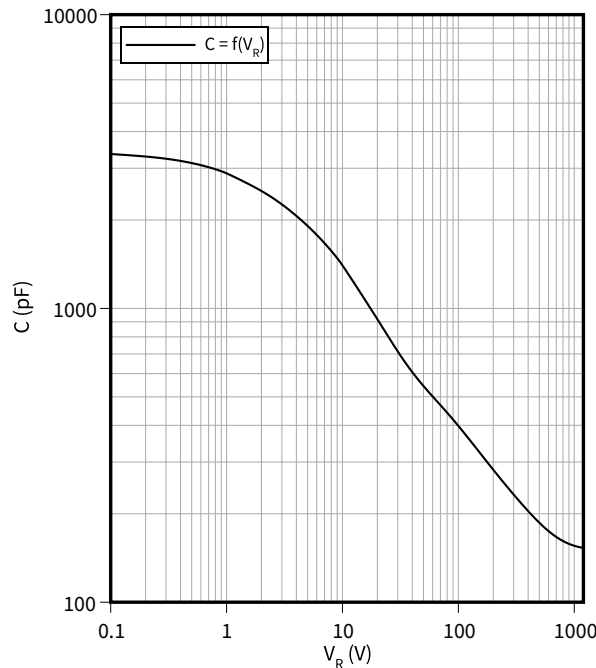
Typical reverse characteristics

$I_R = f(V_R)$



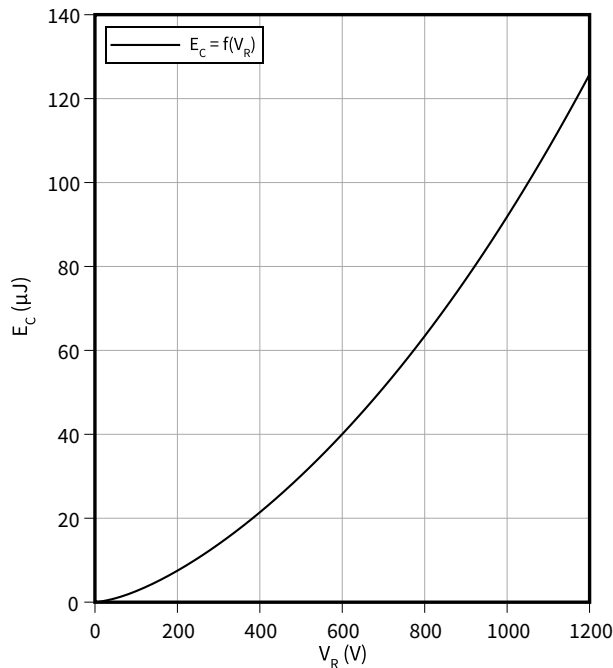
Typical capacitance as function of reverse voltage

$C = f(V_R)$
 $T_{vj} = 25\text{ }^{\circ}\text{C}, f = 100\text{ kHz}$



Typical capacitively stored energy as function of reverse voltage

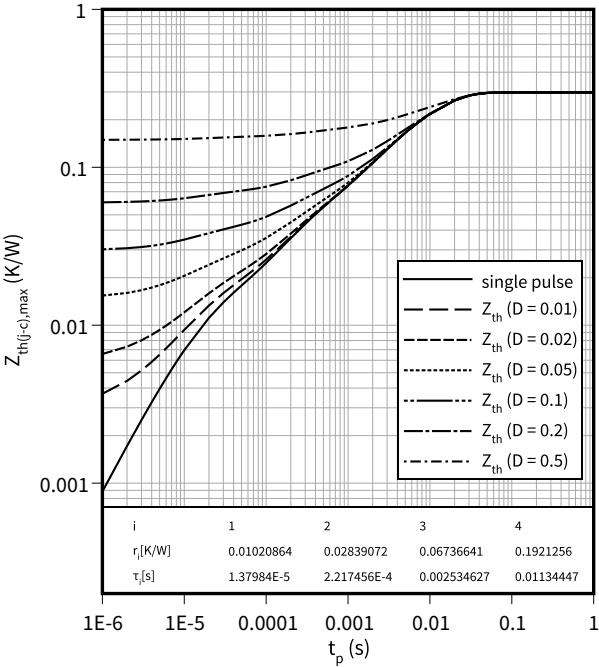
$E_C = f(V_R)$



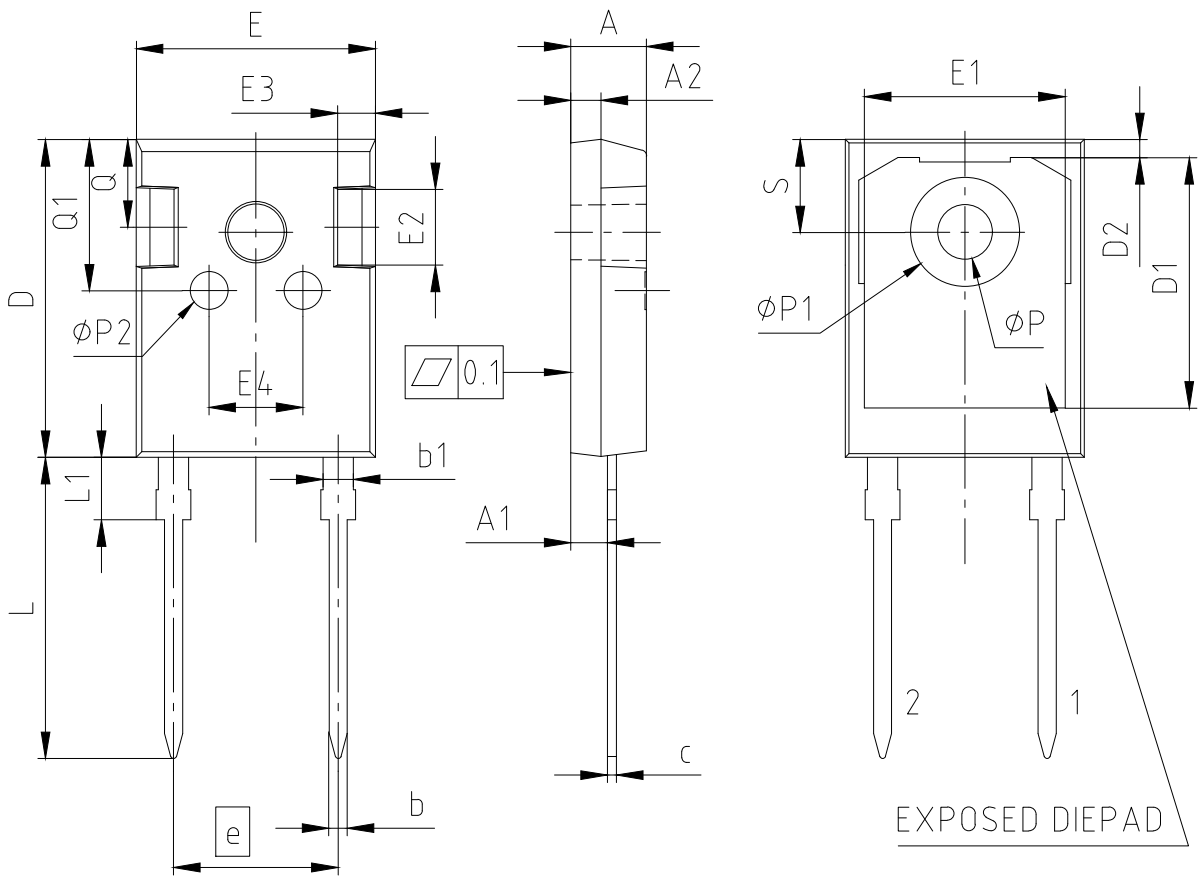
3 Characteristics diagrams

Max. transient thermal impedance

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



4 Package outlines



PACKAGE - GROUP NUMBER:		PG-T0247-2-U01			
DIMENSIONS	MILLIMETERS				
	MIN.	MAX.			
A	4.90	5.10	L	19.80	20.10
A1	2.31	2.51	L1	---	4.30
A2	1.90	2.10	øP	3.50	3.70
b	1.16	1.26	øP1	7.00	7.40
b1	1.96	2.06	øP2	2.40	2.60
c	0.59	0.66	Q	5.60	6.00
D	20.90	21.10	Q1	9.80	10.20
D1	16.25	16.85	S	6.05	6.25
D2	1.05	1.35			
E	15.70	15.90			
E1	13.10	13.50			
E2	4.90	5.10			
E3	2.40	2.60			
E4	6.00	6.40			
e	10.88				
N	2				

ALL DIMENSIONS DO NOT INCLUDE
MOLD FLASH OR PROTRUSIONS.

Figure 1



Revision history

Revision history

Document revision	Date of release	Description of changes
0.10	2023-08-02	Target datasheet
0.20	2024-10-16	Preliminary datasheet
1.00	2024-12-17	Final datasheet

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Edition 2024-12-19

Published by

Infineon Technologies AG
81726 Munich, Germany

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Document reference
IFX-ABH614-003

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