

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

Features

- $V_{RRM} = 1200\text{ V}$
- $I_F = 50\text{ A}$
- 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

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

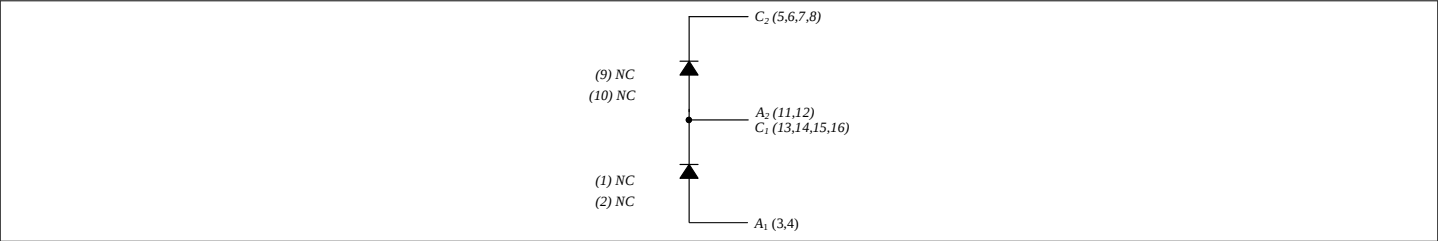
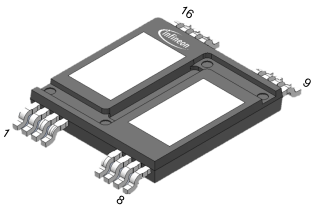
Product validation

- 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
IDSQ50G120C5D	PG-HDSOP-16-U03	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}	Reflow soldering (MSL2 according to JEDEC J-STD-020)			260	°C
Thermal resistance, junction-ambient	$R_{th(j-a)}$				62	K/W
Diode thermal resistance, junction-case	$R_{th(j-c)}$			0.15	0.19	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}	$T_{vj} \geq 25\text{ °C}$		1200	V
Continuous forward current for $R_{th(j-c,max)}$	I_F		$T_c = 25\text{ °C}$	167	A
			$T_c = 135\text{ °C}$	79	
			$T_c = 155\text{ °C}$	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	$I_{F,SM}$	$t_p = 10\text{ ms}$	$T_c = 25\text{ °C}$	288	A
			$T_c = 150\text{ °C}$	248	
Non-repetitive peak forward current	$I_{F,max}$	$T_c = 25\text{ °C}, t_p = 10\text{ }\mu\text{s}$		1700	A
I^2t -value	$\int I^2 t$	$t_p = 10\text{ ms}$ ²⁾	$T_c = 25\text{ °C}$	415	A ² s
			$T_c = 150\text{ °C}$	308	
Diode dv/dt ruggedness	dv/dt	$V_R = 0...960\text{ V}$		150	V/ns
Avalanche energy, single pulse	E_{AS}	$I_D = 50\text{ A}, L = 0.13\text{ mH}$		165	mJ
Power dissipation for $R_{th(j-c,max)}$	P_{tot}		$T_c = 25\text{ °C}$	789	W
			$T_c = 100\text{ °C}$	394	

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**

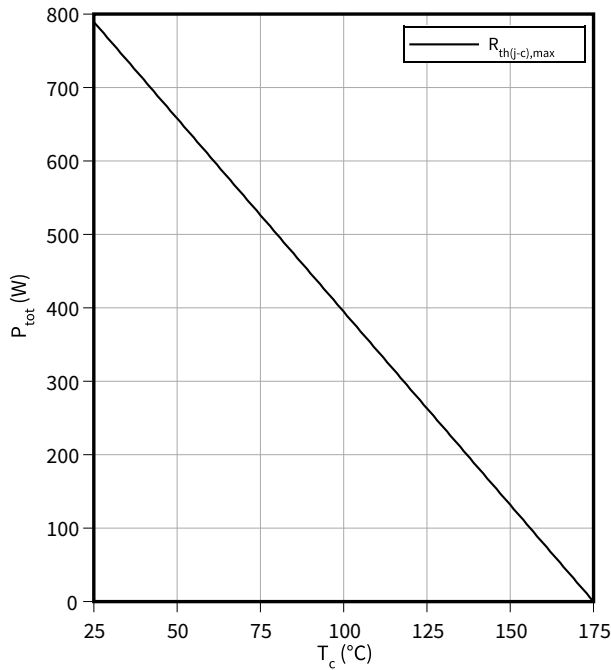
Parameter	Symbol	Note or test condition		Values			Unit
				Min.	Typ.	Max.	
DC blocking voltage	V_{DC}	$I_R = 500 \mu A$		1200			V
Diode forward voltage	V_F	$I_F = 50 A$	$T_{vj} = 25^\circ C$		1.45	1.8	V
			$T_{vj} = 125^\circ C$		1.69		
			$T_{vj} = 150^\circ C$		1.8		
Reverse current	I_R	$V_R = 1200 V$	$T_{vj} = 25^\circ C$		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		
Virtual 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.*
Characteristic at $T_{vj} = 25^\circ C$, unless otherwise specified.

3 Characteristics diagrams

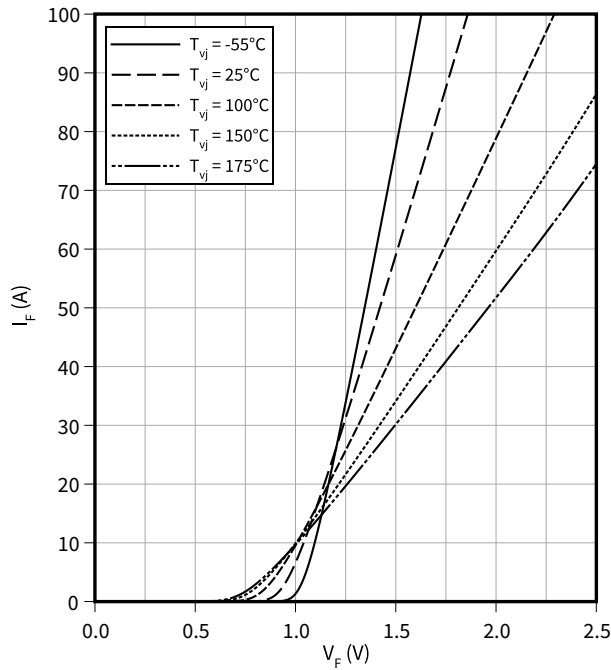
Power dissipation as function of case temperature

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



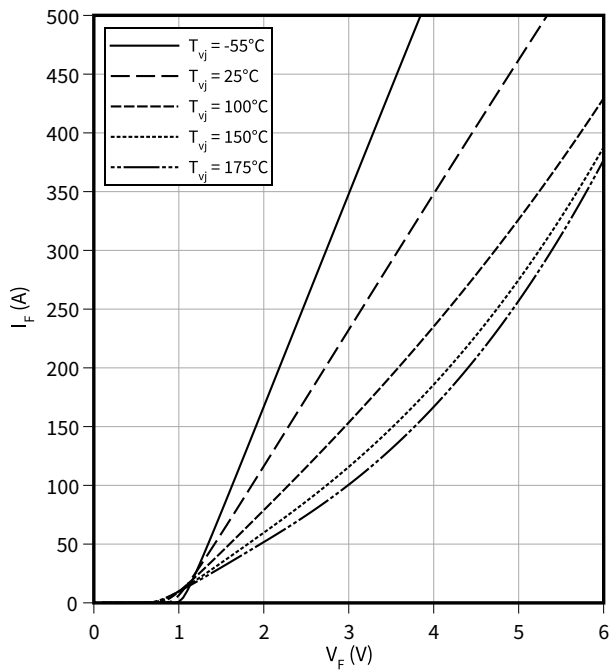
Typical forward characteristics

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



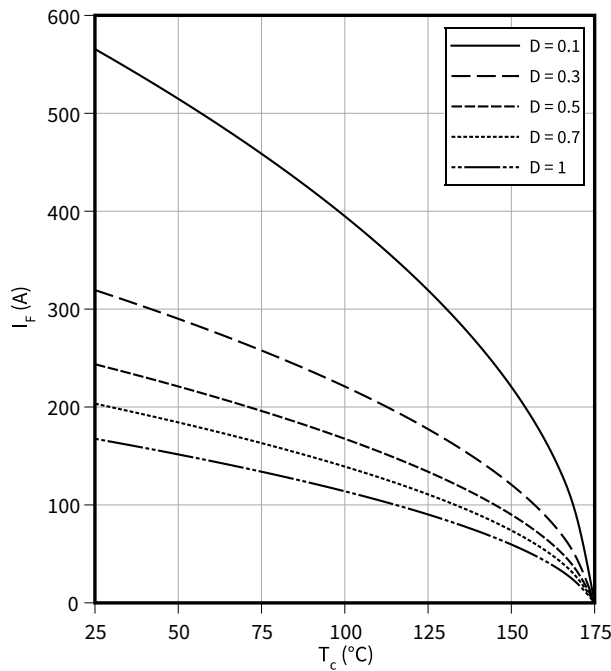
Typical forward characteristics in surge current

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



Diode forward current as function of temperature

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

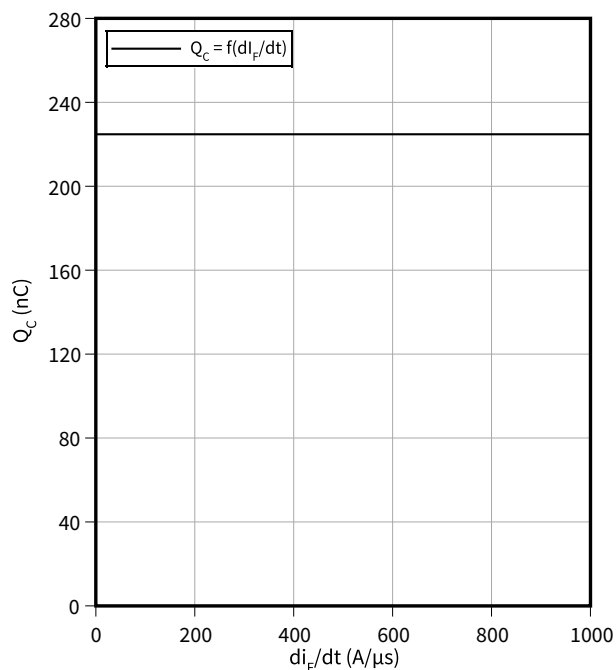


3 Characteristics diagrams

Typical capacitive charge as function of current slope

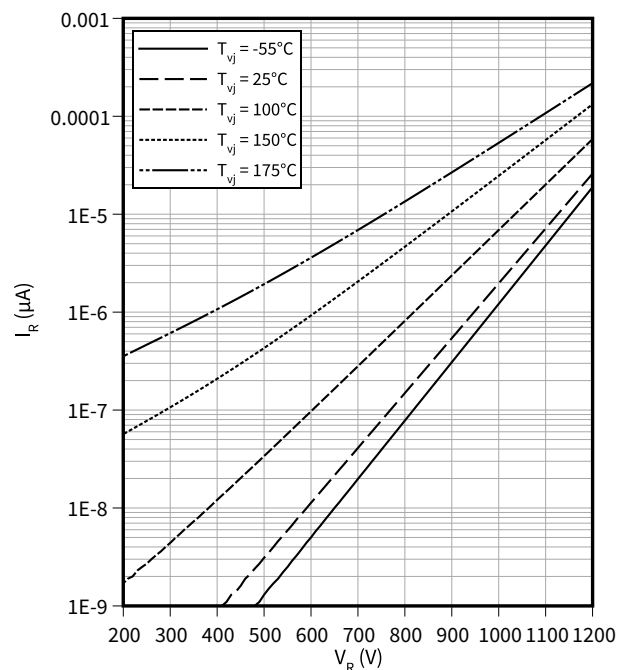
$$Q_C = f(di_F/dt)$$

$T_{vj} = 25^\circ\text{C}$, $V_R = 800\text{ V}$



Typical reverse characteristics

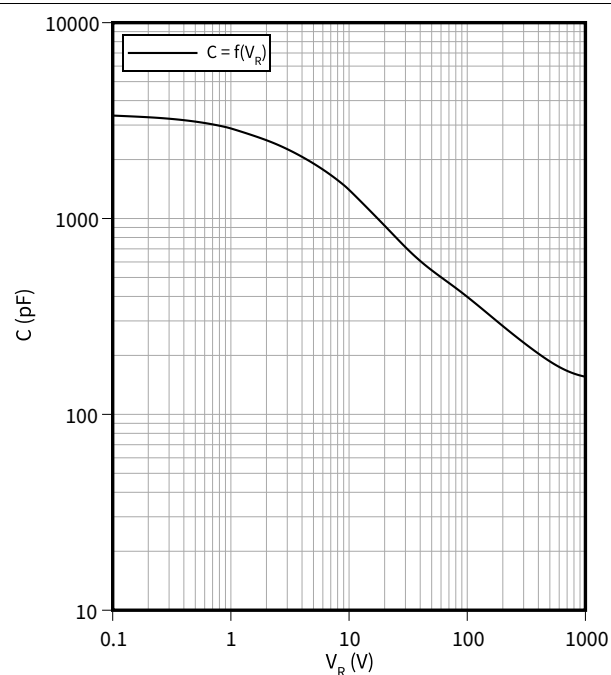
$$I_R = f(V_R)$$



Typical capacitance as function of reverse voltage

$$C = f(V_R)$$

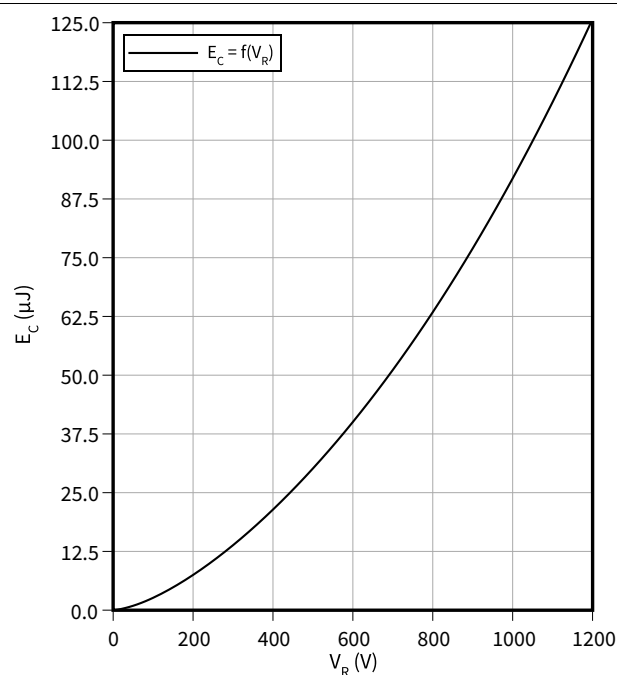
$T_{vj} = 25^\circ\text{C}$, $f = 100\text{ kHz}$



Typical capacitively stored energy as function of reverse voltage

$$E_C = f(V_R)$$

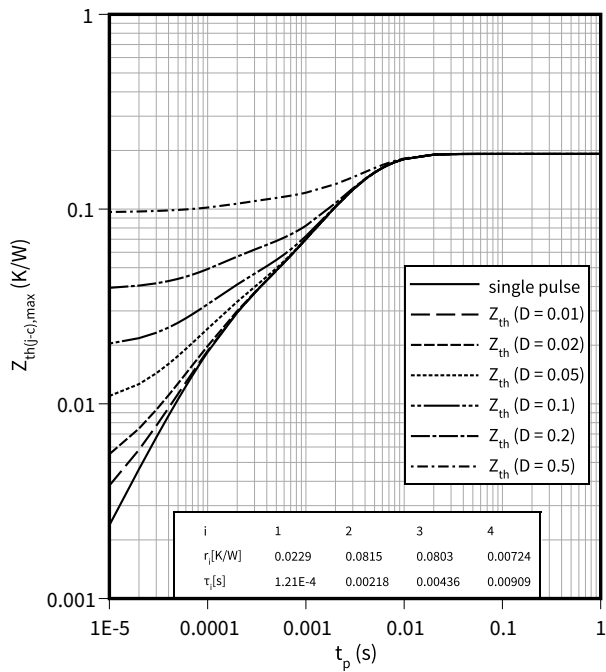
$f = 100\text{ kHz}$



3 Characteristics diagrams

Max. transient thermal impedance

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



4 Package outlines

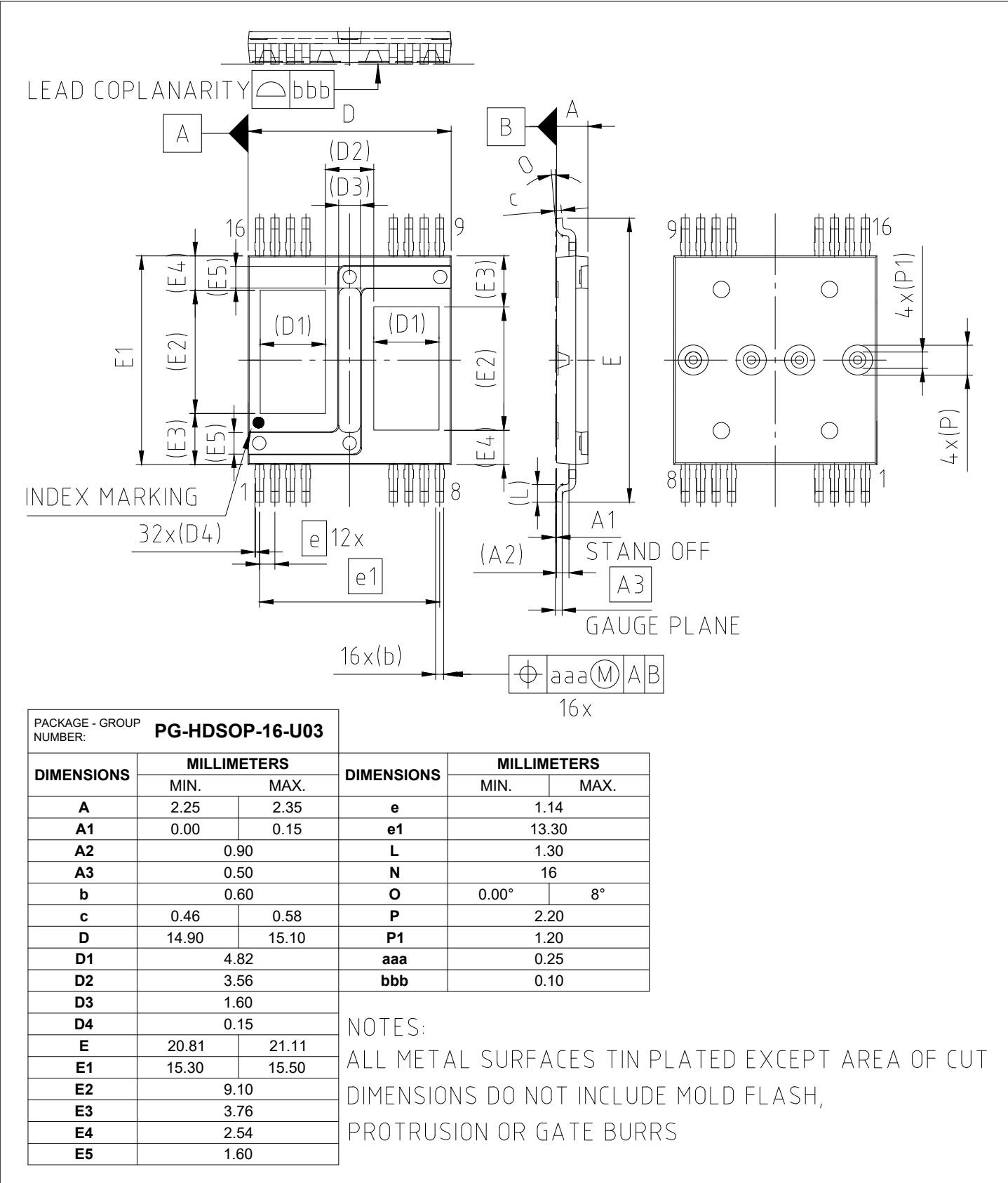


Figure 1



Revision history

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	2025-03-31	Preliminary datasheet
1.00	2026-06-25	Final datasheet

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Edition 2026-06-25

Published by

Infineon Technologies AG

81726 Munich, Germany

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Document reference

IFX-ABI904-004

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