

Final datasheet

CoolSiC™ 1200 V SiC MOSFET G2 and Schottky diode G5 : Boost topology with top side cooling and .XT interconnection technology

Features

- $V_{DS} = 1200 \text{ V}$ at $T_{vj} = 25^\circ\text{C}$
- $I_{DDC} = 61 \text{ A}$ at $T_c = 25^\circ\text{C}$
- $R_{DS(on)} = 25.4 \text{ m}\Omega$ at $V_{GS} = 18 \text{ V}$, $T_{vj} = 25^\circ\text{C}$
- $I_F = 40 \text{ A}$
- Internal layout optimized for fast switching
- Very low switching losses and no reverse recovery current
- High surge current capable Schottky diode
- Short circuit withstand time $2 \mu\text{s}$
- Benchmark gate threshold voltage, $V_{GS(th)} = 4.2 \text{ V}$
- .XT interconnection technology for best-in-class thermal performance
- Suitable Infineon gate drivers can be found under <https://www.infineon.com/gdfinder>

Potential applications

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

Product validation

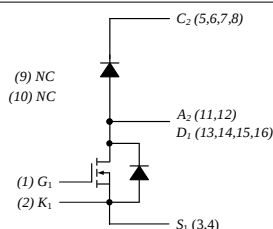
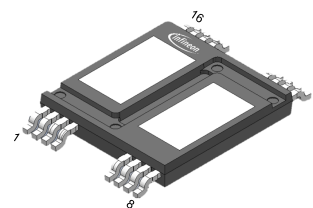
- Qualified for industrial applications according to the relevant tests of JEDEC47/20/22

Description

Pin definition:

- 1 – Gate (G_1)
- 2 – Kelvin sense (K_1)
- 3-4 – Source (S_1)
- 5-8 & Case 2 – Cathode (C_2)
- 9, 10 – not connected (NC)
- 11-12 – Anode (A_2)
- 13-16 & Case 1 – Drain (D_1)

Note: The source and sense pins are not exchangeable, their exchange might lead to malfunction



Type	Package	Marking
IMSQ120R026M2HB	PG-HDSOP-16-U03	12M2B026



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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
MOSFET/body diode thermal resistance, junction-case	$R_{th(j-c)}$			0.28	0.37	K/W
Schottky diode thermal resistance, junction-case	$R_{th(j-c)}$			0.18	0.23	K/W
Comparative Tracking Index	CTI	IEC 60112 (material group 1 according to IEC 60664-1)	600			V

2 MOSFET

Table 2 Maximum rated values

Parameter	Symbol	Note or test condition		Values	Unit
Drain-source voltage	V_{DSS}	$T_{vj} \geq 25\text{ °C}$		1200	V
Continuous DC drain current for $R_{th(j-c,max)}$, limited by $T_{vj(max)}$	I_{DDC}	$V_{GS} = 18\text{ V}$	$T_c = 25\text{ °C}$	81	A
			$T_c = 100\text{ °C}$	57	
Peak drain current, t_p limited by $T_{vj(max)}$ ¹⁾	I_{DM}	$V_{GS} = 18\text{ V}$		285	A
Gate-source voltage, max. transient voltage	V_{GS}	$t_p \leq 0.5\text{ }\mu\text{s}$, $D < 0.01$		-10/25	V
Gate-source voltage, max. static voltage ²⁾	V_{GS}			-7/23	V
Avalanche energy, single pulse	E_{AS}	$I_D = 27.3\text{ A}$, $V_{DD} = 50\text{ V}$, $L = 0.9\text{ mH}$, $T_{vj(start)} = 25\text{ °C}$		343	mJ
Avalanche energy, repetitive	E_{AR}	$I_D = 27.3\text{ A}$, $V_{DD} = 50\text{ V}$, $L = 4.7\text{ }\mu\text{H}$, $T_{vj(start)} = 25\text{ °C}$		1.69	mJ
Short-circuit withstand time	t_{SC}	$V_{DD} \leq 800\text{ V}$, $V_{DS,peak} < 1200\text{ V}$, $V_{GS(on)} = 15\text{ V}$, $T_{vj(start)} = 25\text{ °C}$		2	μs
Power dissipation, limited by $T_{vj(max)}$	P_{tot}	$T_c = 25\text{ °C}$		410	W
		$T_c = 100\text{ °C}$		200	

1) Verified by design.

2) The maximum gate-source voltage in the application design should be in accordance to IPC-9592B.

Table 3 Recommended values

Parameter	Symbol	Note or test condition	Values	Unit
Recommended turn-on gate voltage	$V_{GS(on)}$		15...18	V
Recommended turn-off gate voltage	$V_{GS(off)}$		-5...0	V

Table 4 Characteristic values

Parameter	Symbol	Note or test condition	Values			Unit
			Min.	Typ.	Max.	
Drain-source on-state resistance	$R_{DS(on)}$	$I_D = 27.3 \text{ A}$		$T_{vj} = 25 \text{ °C}, V_{GS(on)} = 18 \text{ V}$	25.4	mΩ
				$T_{vj} = 25 \text{ °C}, V_{GS(on)} = 15 \text{ V}$	31.72	
				$T_{vj} = 150 \text{ °C}, V_{GS(on)} = 18 \text{ V}$	51.8	
				$T_{vj} = 175 \text{ °C}, V_{GS(on)} = 18 \text{ V}$	60.1	
Gate-source threshold voltage	$V_{GS(th)}$	$I_D = 8.6 \text{ mA}, V_{DS} = V_{GS}$ (tested after 1 ms pulse at $V_{GS} = 20 \text{ V}$)		$T_{vj} = 25 \text{ °C}$	3.5	V
				$T_{vj} = 175 \text{ °C}$	4.2	
Zero gate-voltage drain current	I_{DSS}	$V_{DS} = 1200 \text{ V}, V_{GS} = 0 \text{ V}$		$T_{vj} = 25 \text{ °C}$		μA
				$T_{vj} = 175 \text{ °C}$	20	
Gate leakage current	I_{GSS}	$V_{DS} = 0 \text{ V}$		$V_{GS} = -10 \text{ V}$		nA
				$V_{GS} = 23 \text{ V}$	-120	
Forward transconductance	g_{fs}	$I_D = 27.3 \text{ A}, V_{DS} = 20 \text{ V}$		18		S
Internal gate resistance	$R_{G,int}$	$f = 1 \text{ MHz}, V_{AC} = 25 \text{ mV}$		5.5		Ω
Input capacitance	C_{iss}	$V_{DS} = 800 \text{ V}, V_{GS} = 0 \text{ V}, f = 100 \text{ kHz}, V_{AC} = 25 \text{ mV}$		1990		pF
Output capacitance	C_{oss}	$V_{DS} = 800 \text{ V}, V_{GS} = 0 \text{ V}, f = 100 \text{ kHz}, V_{AC} = 25 \text{ mV}$		85		pF
Reverse transfer capacitance	C_{rss}	$V_{DS} = 800 \text{ V}, V_{GS} = 0 \text{ V}, f = 100 \text{ kHz}, V_{AC} = 25 \text{ mV}$		7		pF
C_{oss} stored energy	E_{oss}	Calculated based on $C_{oss} = f(V_{DD})$		36		μJ
Output charge	Q_{oss}	Calculated based on $C_{oss} = f(V_{DD})$		132.6		nC
Effective output capacitance, energy related	$C_{o(er)}$	$V_{DS} = 0...800 \text{ V}, V_{GS} = 0 \text{ V},$ Calculated based on E_{oss}		112.5		pF
Effective output capacitance, time related	$C_{o(tr)}$	$I_D = \text{constant}, V_{DS} = 0...800 \text{ V}, V_{GS} = 0 \text{ V},$ Calculated based on Q_{oss}		165.8		pF
Total gate charge	Q_G	$V_{DD} = 800 \text{ V}, I_D = 27.3 \text{ A}, V_{GS} = 0/18 \text{ V}, \text{turn-on pulse}$		54		nC

(table continues...)

Table 4 (continued) Characteristic values

Parameter	Symbol	Note or test condition	Values			Unit
			Min.	Typ.	Max.	
Plateau gate charge	$Q_{GS(pl)}$	$V_{DD} = 800 \text{ V}$, $I_D = 27.3 \text{ A}$, $V_{GS} = 0/18 \text{ V}$, turn-on pulse		12		nC
Gate-drain charge	Q_{GD}	$V_{DD} = 800 \text{ V}$, $I_D = 27.3 \text{ A}$, $V_{GS} = 0/18 \text{ V}$, turn-on pulse		13		nC
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 800 \text{ V}$, $I_D = 27.3 \text{ A}$, $V_{GS} = 0/18 \text{ V}$, $R_{G,ext} = 2.3 \Omega$, $L_\sigma = 9 \text{ nH}$, diode: package integrated SiC Schottky diode	$T_{vj} = 25 \text{ }^\circ\text{C}$	10.5		ns
			$T_{vj} = 175 \text{ }^\circ\text{C}$	8		
Rise time	t_r	$V_{DD} = 800 \text{ V}$, $I_D = 27.3 \text{ A}$, $V_{GS} = 0/18 \text{ V}$, $R_{G,ext} = 2.3 \Omega$, $L_\sigma = 9 \text{ nH}$, diode: package integrated SiC Schottky diode	$T_{vj} = 25 \text{ }^\circ\text{C}$	6.8		ns
			$T_{vj} = 175 \text{ }^\circ\text{C}$	6.1		
Turn-off delay time	$t_{d(off)}$	$V_{DD} = 800 \text{ V}$, $I_D = 27.3 \text{ A}$, $V_{GS} = 0/18 \text{ V}$, $R_{G,ext} = 2.3 \Omega$, $L_\sigma = 9 \text{ nH}$, diode: package integrated SiC Schottky diode	$T_{vj} = 25 \text{ }^\circ\text{C}$	21.1		ns
			$T_{vj} = 175 \text{ }^\circ\text{C}$	24.7		
Fall time	t_f	$V_{DD} = 800 \text{ V}$, $I_D = 27.3 \text{ A}$, $V_{GS} = 0/18 \text{ V}$, $R_{G,ext} = 2.3 \Omega$, $L_\sigma = 9 \text{ nH}$, diode: package integrated SiC Schottky diode	$T_{vj} = 25 \text{ }^\circ\text{C}$	9.1		ns
			$T_{vj} = 175 \text{ }^\circ\text{C}$	10.7		
Turn-on energy	E_{on}	$V_{DD} = 800 \text{ V}$, $I_D = 27.3 \text{ A}$, $V_{GS} = 0/18 \text{ V}$, $R_{G,ext} = 2.3 \Omega$, $L_\sigma = 9 \text{ nH}$, diode: package integrated SiC Schottky diode	$T_{vj} = 25 \text{ }^\circ\text{C}$	254		μJ
			$T_{vj} = 175 \text{ }^\circ\text{C}$	239		
Turn-off energy	E_{off}	$V_{DD} = 800 \text{ V}$, $I_D = 27.3 \text{ A}$, $V_{GS} = 0/18 \text{ V}$, $R_{G,ext} = 2.3 \Omega$, $L_\sigma = 9 \text{ nH}$, diode: package integrated SiC Schottky diode	$T_{vj} = 25 \text{ }^\circ\text{C}$	81		μJ
			$T_{vj} = 175 \text{ }^\circ\text{C}$	102		

(table continues...)

Table 4 (continued) Characteristic values

Parameter	Symbol	Note or test condition	Values			Unit
			Min.	Typ.	Max.	
Total switching energy	E_{tot}	$V_{\text{DD}} = 800 \text{ V}$, $I_{\text{D}} = 27.3 \text{ A}$, $V_{\text{GS}} = 0/18 \text{ V}$, $R_{\text{G,ext}} = 2.3 \Omega$, $L_{\sigma} = 9 \text{ nH}$, diode: package integrated SiC Schottky diode	$T_{\text{vj}} = 25 \text{ }^{\circ}\text{C}$	335		μJ
			$T_{\text{vj}} = 175 \text{ }^{\circ}\text{C}$	341		
Turn-on energy at -5 V	E_{on}	$V_{\text{DD}} = 800 \text{ V}$, $I_{\text{D}} = 27.3 \text{ A}$, $V_{\text{GS}} = -5/18 \text{ V}$, $R_{\text{G,ext}} = 2.3 \Omega$, $L_{\sigma} = 9 \text{ nH}$, diode: package integrated SiC Schottky diode	$T_{\text{vj}} = 25 \text{ }^{\circ}\text{C}$	254		μJ
			$T_{\text{vj}} = 175 \text{ }^{\circ}\text{C}$	239		
Turn-off energy at -5 V	E_{off}	$V_{\text{DD}} = 800 \text{ V}$, $I_{\text{D}} = 27.3 \text{ A}$, $V_{\text{GS}} = -5/18 \text{ V}$, $R_{\text{G,ext}} = 2.3 \Omega$, $L_{\sigma} = 9 \text{ nH}$, diode: package integrated SiC Schottky diode	$T_{\text{vj}} = 25 \text{ }^{\circ}\text{C}$	41		μJ
			$T_{\text{vj}} = 175 \text{ }^{\circ}\text{C}$	46		
Total switching energy at -5 V	E_{tot}	$V_{\text{DD}} = 800 \text{ V}$, $I_{\text{D}} = 27.3 \text{ A}$, $V_{\text{GS}} = -5/18 \text{ V}$, $R_{\text{G,ext}} = 2.3 \Omega$, $L_{\sigma} = 9 \text{ nH}$, diode: package integrated SiC Schottky diode	$T_{\text{vj}} = 25 \text{ }^{\circ}\text{C}$	468		μJ
			$T_{\text{vj}} = 175 \text{ }^{\circ}\text{C}$	470		
Virtual junction temperature	T_{vj}		-55		175	$^{\circ}\text{C}$

Note: The chip technology was characterized up to 200 kV/ μs . The measured dV/dt was limited by measurement test setup and package.

3 Body diode (MOSFET)

Table 5 Maximum rated values

Parameter	Symbol	Note or test condition		Values	Unit
Drain-source voltage	V_{DSS}	$T_{\text{vj}} \geq 25 \text{ }^{\circ}\text{C}$		1200	V
Continuous reverse drain current for $R_{\text{th(j-c,max)}}$, limited by $T_{\text{vj(max)}}$	I_{SDC}	$V_{\text{GS}} = 0 \text{ V}$	$T_{\text{c}} = 25 \text{ }^{\circ}\text{C}$	70	A
			$T_{\text{c}} = 100 \text{ }^{\circ}\text{C}$	40.4	
Peak reverse drain current, t_{p} limited by $T_{\text{vj(max)}}$	I_{SM}	$V_{\text{GS}} = 0 \text{ V}$		174	A

Table 6 Characteristic values

Parameter	Symbol	Note or test condition	Values			Unit
			Min.	Typ.	Max.	
Drain-source reverse voltage	V_{SD}	$I_{SD} = 27 \text{ A}$, $V_{GS} = 0 \text{ V}$		$T_{vj} = 25 \text{ °C}$	4.2	5.5
				$T_{vj} = 100 \text{ °C}$	4.1	
				$T_{vj} = 175 \text{ °C}$	4	
Virtual junction temperature	T_{vj}		-55		175	°C

4 SiC Diode

Table 7 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		$T_c = 25 \text{ °C}$	136	A
			$T_c = 135 \text{ °C}$	64	
			$T_c = 157 \text{ °C}$	40	
Surge repetitive forward current, sine halfwave	$I_{F,RM}$	$t_p = 10 \text{ ms}$	$T_c = 25 \text{ °C}$	160	A
			$T_c = 100 \text{ °C}$	120	
Surge non-repetitive forward current, sine halfwave	$I_{F,SM}$	$t_p = 10 \text{ ms}$	$T_c = 25 \text{ °C}$	239	A
			$T_c = 150 \text{ °C}$	195	
Non-repetitive peak forward current	$I_{F,max}$	$t_p = 10 \text{ } \mu\text{s}$		1250	A
I^2t -value	$\int I^2 t$	$t_p = 10 \text{ ms}$	$T_c = 25 \text{ °C}$	286	A^2s
			$T_c = 150 \text{ °C}$	190	
Diode dv/dt ruggedness	dv/dt	$V_R = 0 \dots 960 \text{ V}$		150	V/ns
Avalanche energy, single pulse	E_{AS}	$I_D = 40 \text{ A}$, $L = 0.2 \text{ mH}$		165	mJ
Power dissipation for $R_{th(j-c,max)}$	P_{tot}		$T_c = 25 \text{ °C}$	652	W
			$T_c = 100 \text{ °C}$	326	

Table 8 Characteristic values

Parameter	Symbol	Note or test condition	Values			Unit
			Min.	Typ.	Max.	
DC blocking voltage	V_{DC}	$I_R = 500 \text{ } \mu\text{A}$	1200			V

(table continues...)

Table 8 (continued) Characteristic values

Parameter	Symbol	Note or test condition		Values			Unit
				Min.	Typ.	Max.	
Diode forward voltage	V_F	$I_F = 40 \text{ A}$	$T_{vj} = 25 \text{ °C}$		1.45	1.8	V
			$T_{vj} = 125 \text{ °C}$		1.69		
			$T_{vj} = 150 \text{ °C}$		1.8		
Reverse current	I_R	$V_R = 1200 \text{ V}$	$T_{vj} = 25 \text{ °C}$		20	320	μA
			$T_{vj} = 150 \text{ °C}$		105		
Total capacitive charge	Q_C	$V_R = 800 \text{ V}$, $T_{vj} = 25 \text{ °C}$ & 150 °C , $Q_C = \int_0^{V_R} C(V) dV$			182		nC
Total capacitance	C	$f = 100 \text{ kHz}$	$V_R = 1 \text{ V}$		2350		pF
			$V_R = 400 \text{ V}$		166		
			$V_R = 800 \text{ V}$		131		
Virtual junction temperature	T_{vj}			-55		175	$^{\circ}\text{C}$

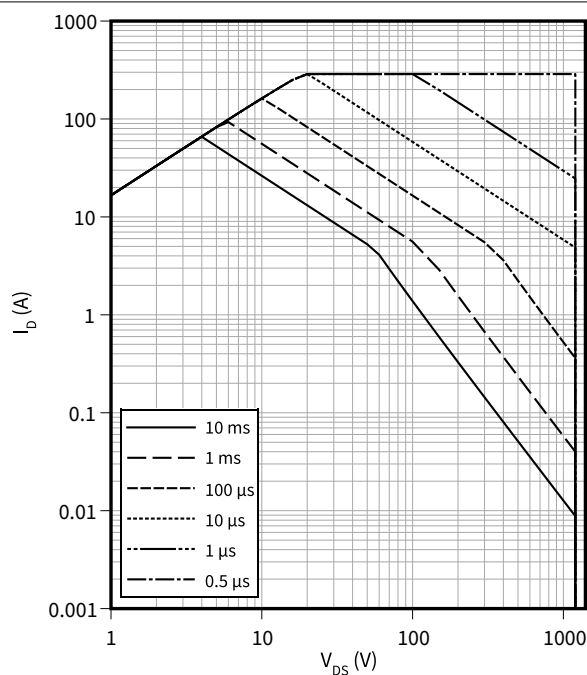
Note: Characteristics at $T_{vj} = 25^{\circ}\text{C}$, unless otherwise specified.

5 Characteristics diagrams

Safe operating area (SOA)

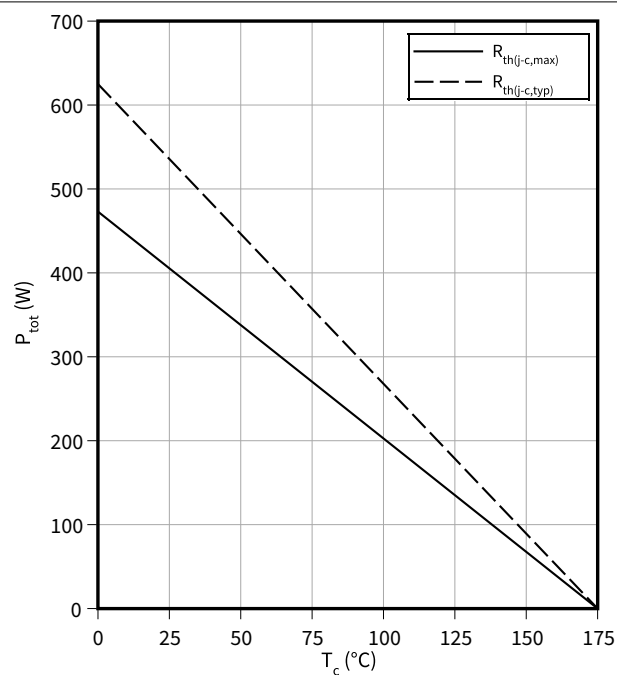
$$I_D = f(V_{DS})$$

$$T_c = 25^\circ\text{C}, T_{vj} \leq 175^\circ\text{C}$$



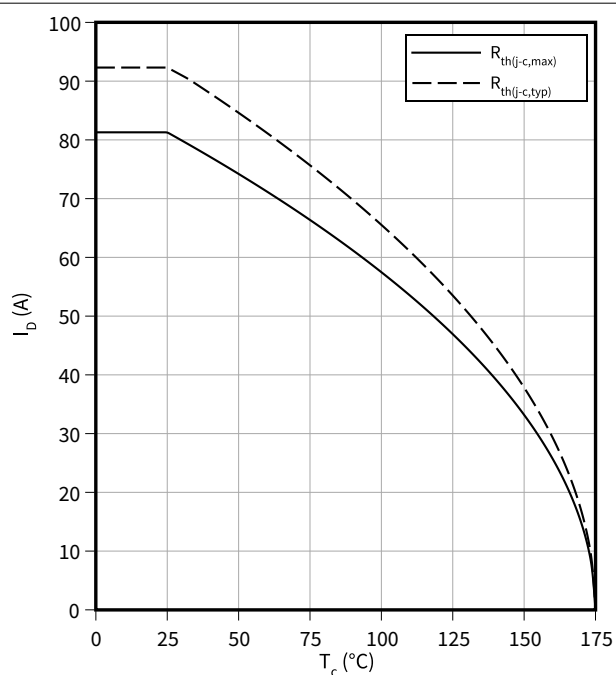
Power dissipation of MOSFET/body diode as a function of case temperature

$$P_{tot} = f(T_c)$$



Maximum DC drain to source current as a function of case temperature limited by bond wire

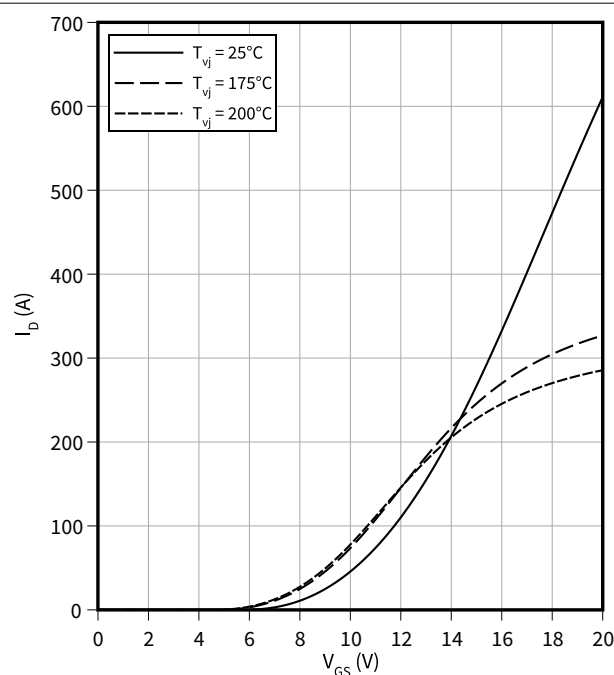
$$I_D = f(T_c)$$



Typical transfer characteristic

$$I_D = f(V_{GS})$$

$$V_{DS} = 20\text{ V}, t_p = 20\text{ μs}$$

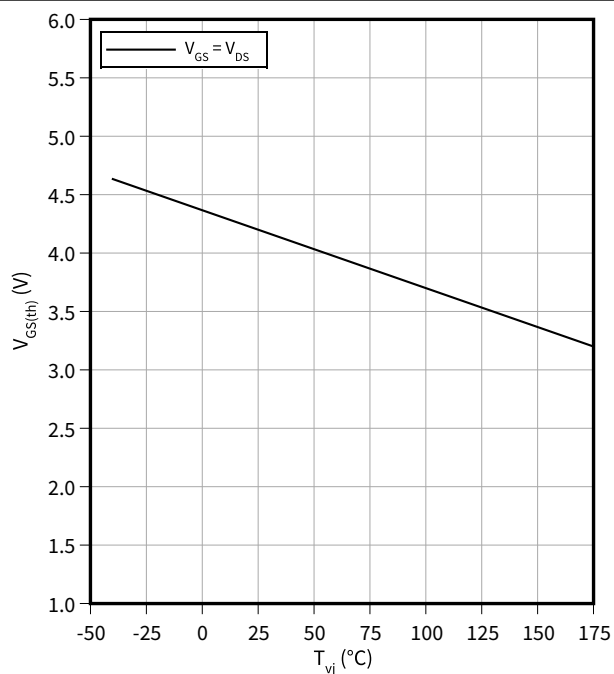


5 Characteristics diagrams

Typical gate-source threshold voltage as a function of junction temperature

$$V_{GS(th)} = f(T_{vj})$$

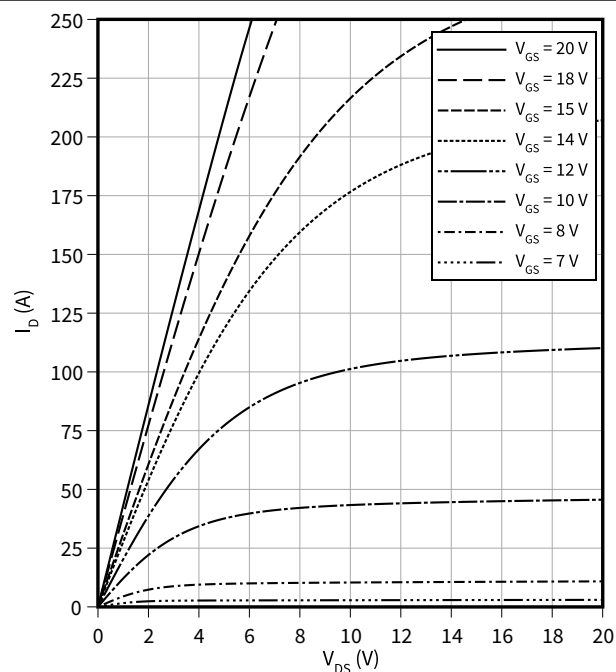
$$I_D = 8.6 \text{ mA}$$



Typical output characteristic, V_{GS} as a parameter

$$I_D = f(V_{DS})$$

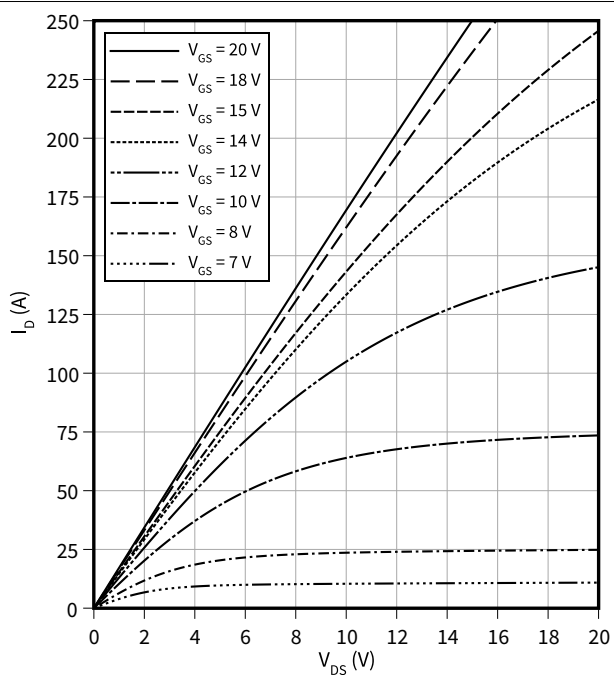
$$T_{vj} = 25 \text{ °C}, t_p = 20 \text{ } \mu\text{s}$$



Typical output characteristic, V_{GS} as a parameter

$$I_D = f(V_{DS})$$

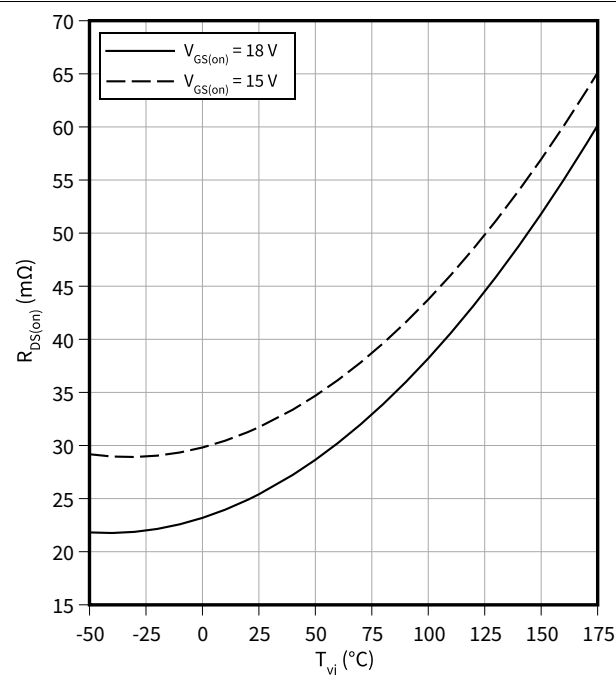
$$T_{vj} = 175 \text{ °C}, t_p = 20 \text{ } \mu\text{s}$$



Typical on-state resistance as a function of junction temperature

$$R_{DS(on)} = f(T_{vj})$$

$$I_D = 27.3 \text{ A}$$

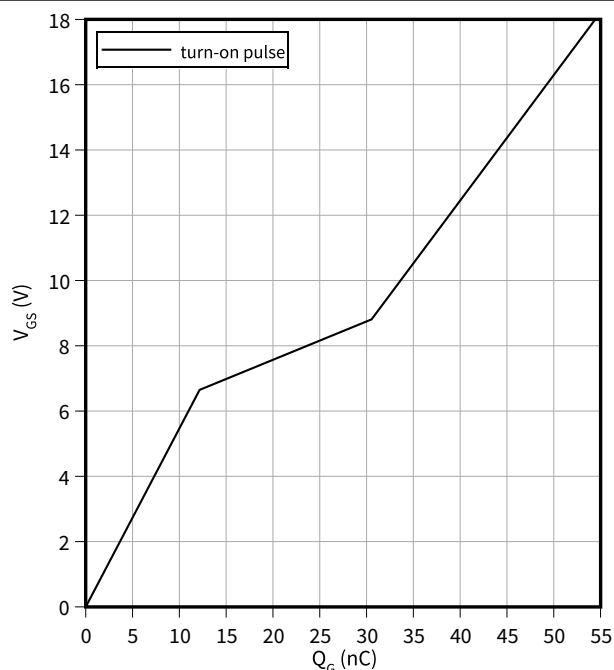


5 Characteristics diagrams

Typical gate charge

$$V_{GS} = f(Q_G)$$

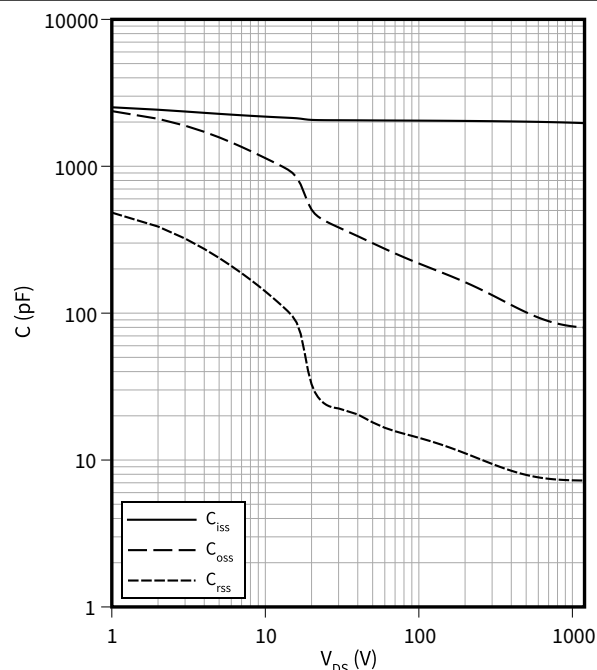
$$I_D = 27.3 \text{ A}, V_{DS} = 800 \text{ V}$$



Typical capacitance as a function of drain-source voltage

$$C = f(V_{DS})$$

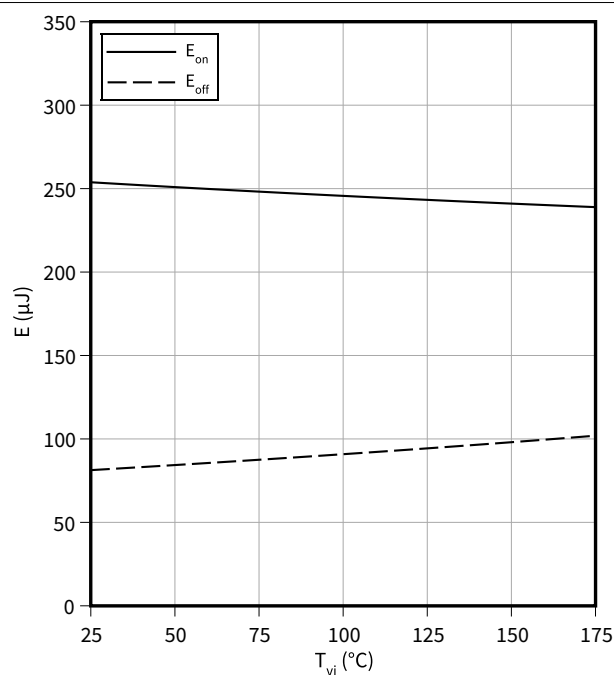
$$f = 100 \text{ kHz}, V_{GS} = 0 \text{ V}$$



Typical switching energy as a function of junction temperature, test circuit in Fig. F, 2nd device package integrated Schottky diode: $V_{GS} = 0 \text{ V}$

$$E = f(T_{vj})$$

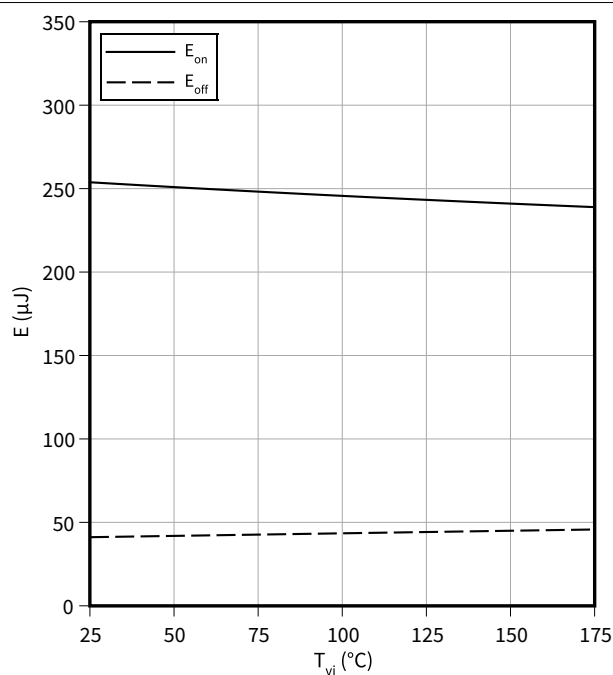
$$V_{GS} = 0/18 \text{ V}, I_D = 27.3 \text{ A}, R_{G,ext} = 2.3 \Omega, V_{DD} = 800 \text{ V}$$



Typical switching energy as a function of junction temperature, test circuit in Fig. F, 2nd device package integrated Schottky diode: $V_{GS} = -5 \text{ V}$

$$E = f(T_{vj})$$

$$V_{GS} = -5/18 \text{ V}, I_D = 27.3 \text{ A}, R_{G,ext} = 2.3 \Omega, V_{DD} = 800 \text{ V}$$

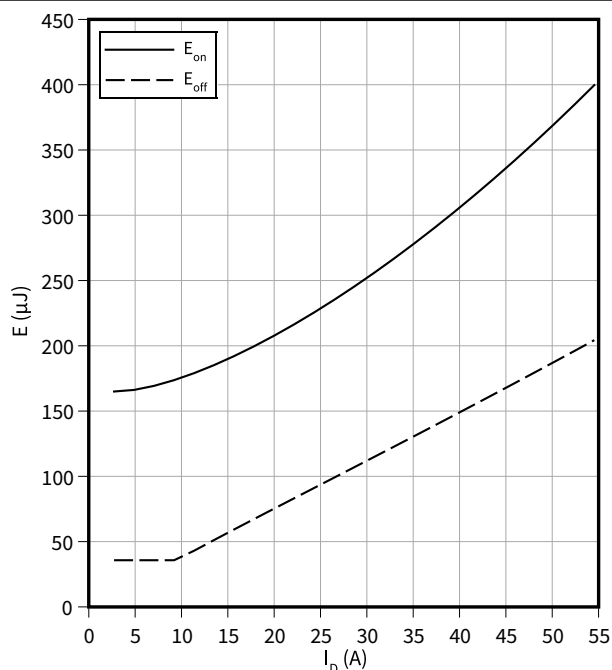


5 Characteristics diagrams

Typical switching energy as a function of drain current, test circuit in Fig. F, 2nd device package integrated Schottky diode: $V_{GS} = 0\text{ V}$

$$E = f(I_D)$$

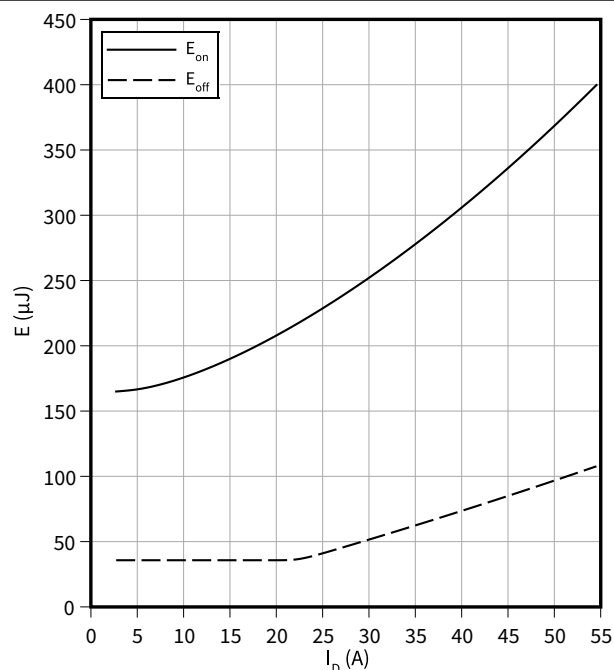
$V_{GS} = 0/18\text{ V}$, $T_{vj} = 175\text{ °C}$, $R_{G,ext} = 2.3\text{ }\Omega$, $V_{DD} = 800\text{ V}$



Typical switching energy as a function of drain current, test circuit in Fig. F, 2nd device package integrated Schottky diode: $V_{GS} = -5\text{ V}$

$$E = f(I_D)$$

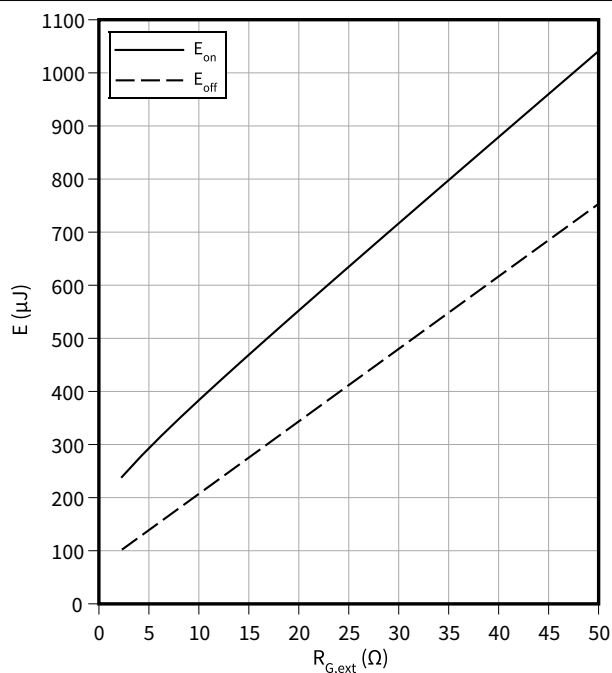
$V_{GS} = -5/18\text{ V}$, $T_{vj} = 175\text{ °C}$, $R_{G,ext} = 2.3\text{ }\Omega$, $V_{DD} = 800\text{ V}$



Typical switching energy as a function of gate resistance, test circuit in Fig. F, 2nd device package integrated Schottky diode: $V_{GS} = 0\text{ V}$

$$E = f(R_{G,ext})$$

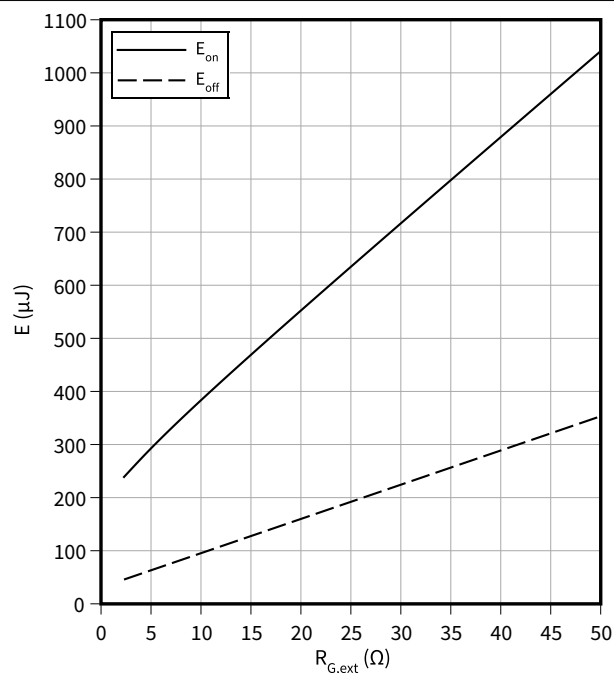
$V_{GS} = 0/18\text{ V}$, $I_D = 27.3\text{ A}$, $T_{vj} = 175\text{ °C}$, $V_{DD} = 800\text{ V}$



Typical switching energy as a function of gate resistance, test circuit in Fig. F, 2nd device package integrated Schottky diode: $V_{GS} = -5\text{ V}$

$$E = f(R_{G,ext})$$

$V_{GS} = -5/18\text{ V}$, $I_D = 27.3\text{ A}$, $T_{vj} = 175\text{ °C}$, $V_{DD} = 800\text{ V}$

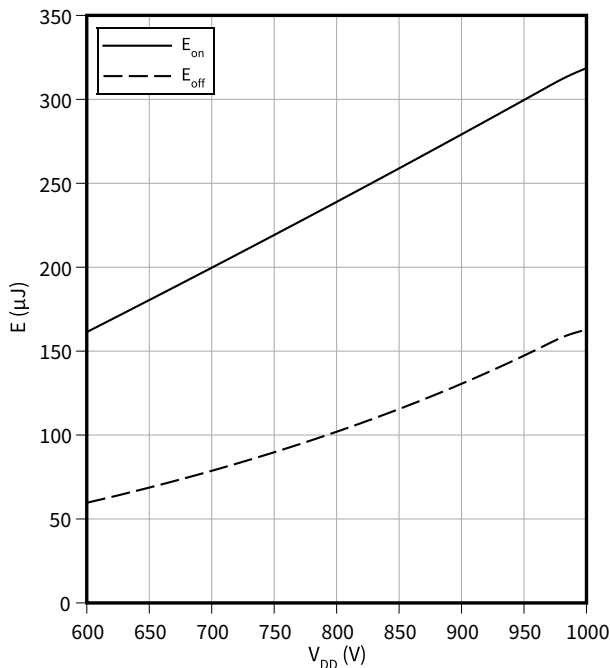


5 Characteristics diagrams

Typical switching energy as a function of DC link voltage, test circuit in Fig. F, 2nd device package integrated Schottky diode: $V_{GS} = 0\text{ V}$

$E = f(V_{DD})$

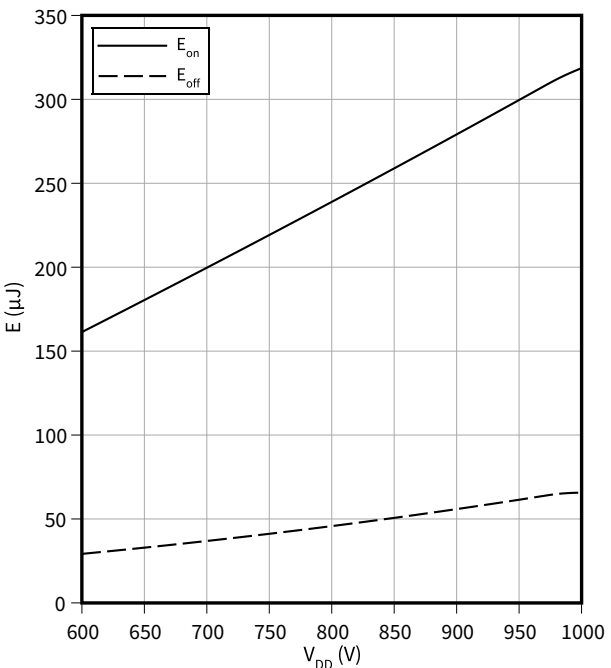
$V_{GS} = 0/18\text{ V}$, $I_D = 27.3\text{ A}$, $T_{vj} = 175\text{ °C}$, $R_{G,ext} = 2.3\text{ }\Omega$



Typical switching energy as a function of DC link voltage, test circuit in Fig. F, 2nd device package integrated Schottky diode: $V_{GS} = -5\text{ V}$

$E = f(V_{DD})$

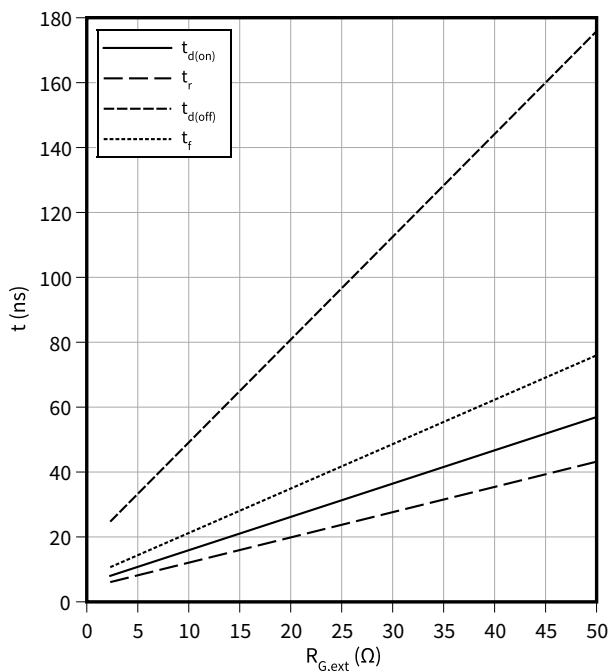
$V_{GS} = -5/18\text{ V}$, $I_D = 27.3\text{ A}$, $T_{vj} = 175\text{ °C}$, $R_{G,ext} = 2.3\text{ }\Omega$



Typical switching times as a function of gate resistance, test circuit in Fig. F, 2nd device package integrated Schottky diode: $V_{GS} = 0\text{ V}$

$t = f(R_{G,ext})$

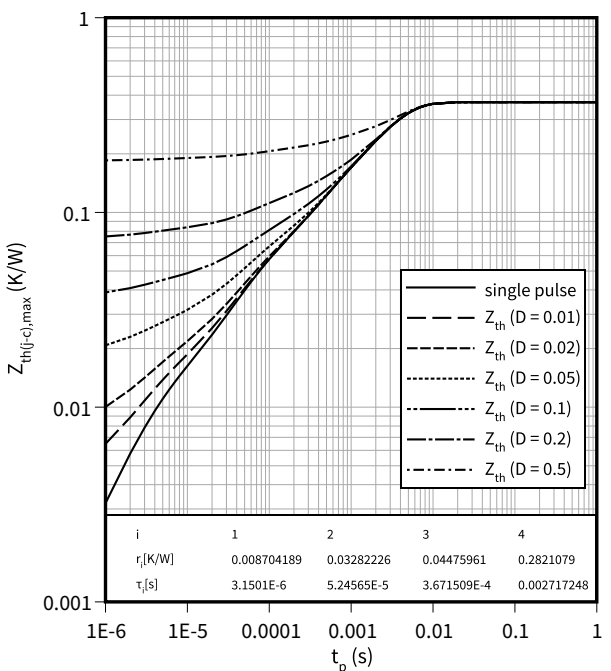
$V_{GS} = 0/18\text{ V}$, $I_D = 27.3\text{ A}$, $T_{vj} = 175\text{ °C}$, $V_{DD} = 800\text{ V}$



Max. transient thermal impedance (MOSFET/diode)

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

$D = t_p/T$

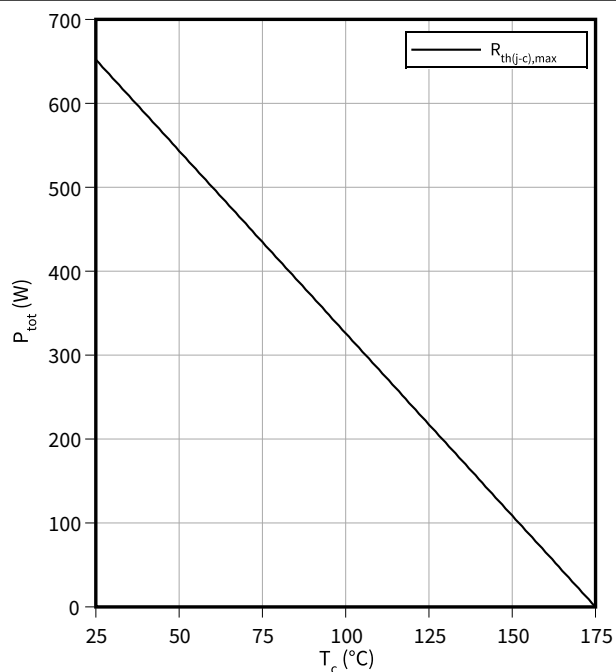


5 Characteristics diagrams

SiC Schottky diode: Power dissipation as function of case temperature

$$P_{\text{tot}} = f(T_c)$$

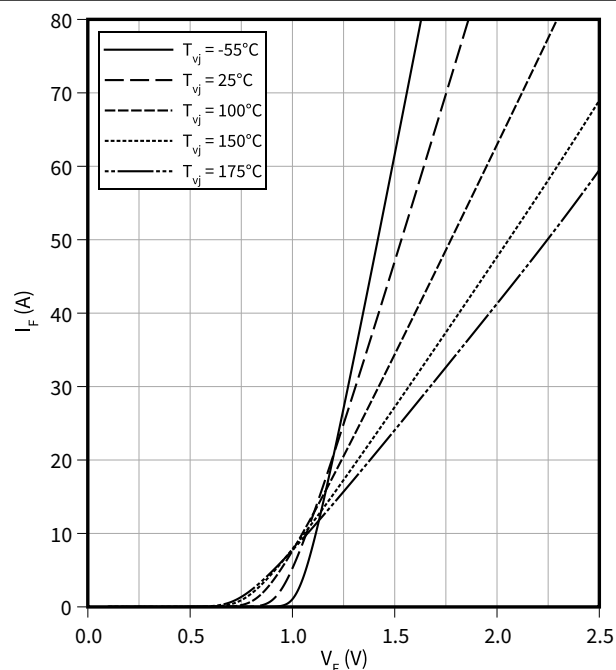
$$T_{vj} \leq 175^\circ\text{C}$$



SiC Schottky diode: Typical forward characteristics

$$I_F = f(V_F)$$

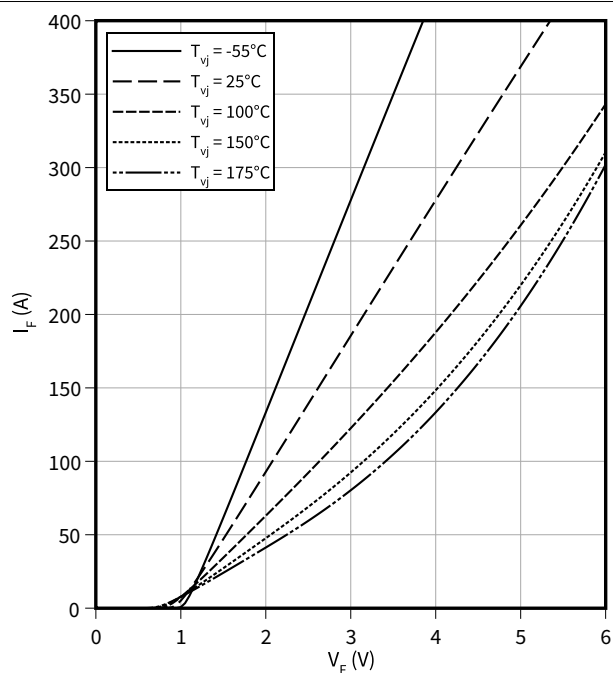
$$t_p = 10 \mu\text{s}$$



SiC Schottky diode: Typical forward characteristics in surge current

$$I_F = f(V_F)$$

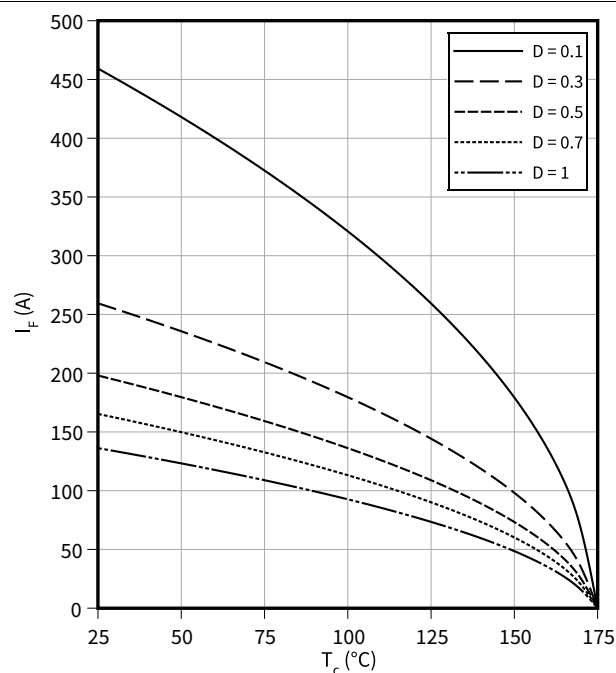
$$t_p = 10 \mu\text{s}$$



SiC Schottky diode: Forward current as function of temperature

$$I_F = f(T_c)$$

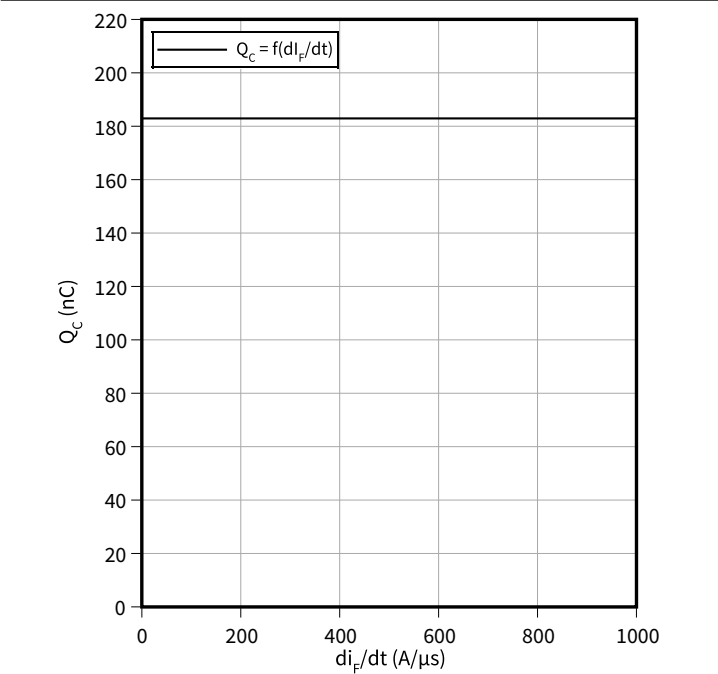
$$T_{vj} \leq 175^\circ\text{C}$$



5 Characteristics diagrams

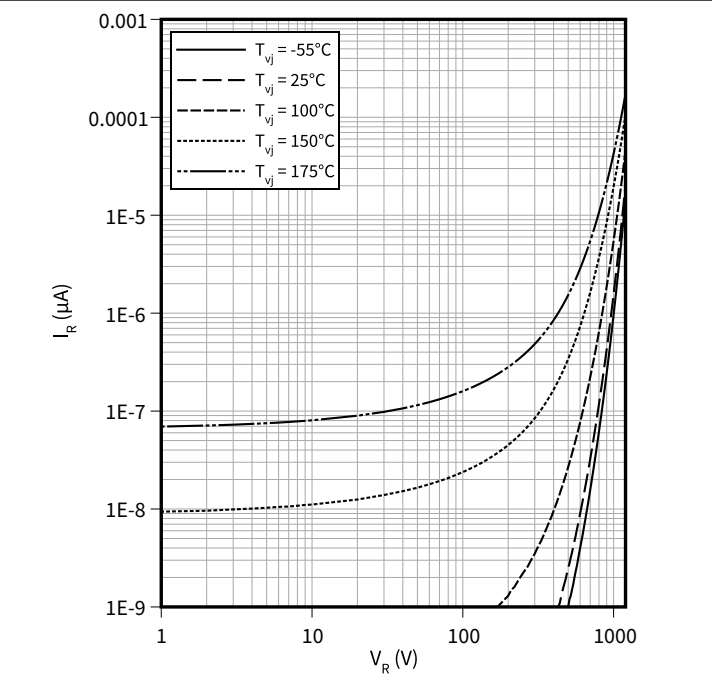
SiC Schottky diode: Typical capacitive charge as function of current slope

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



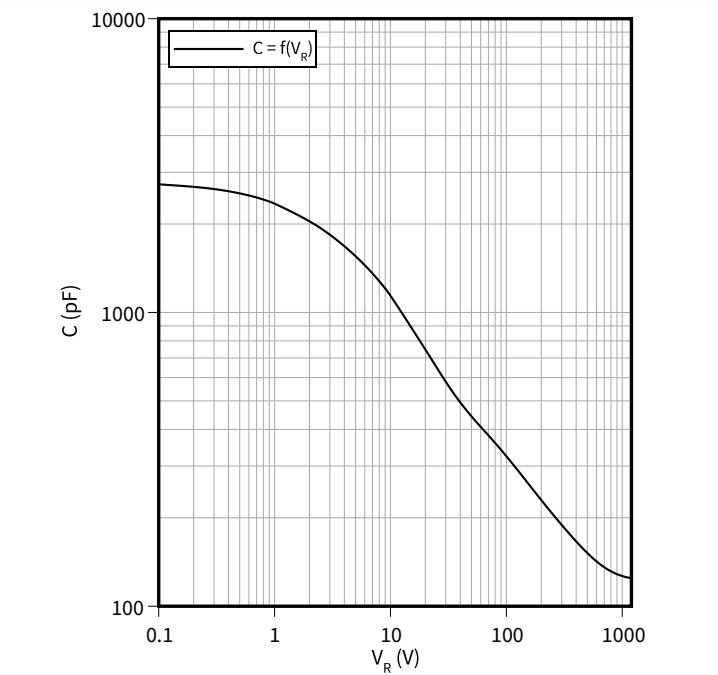
SiC Schottky diode: Typical reverse characteristics

$I_R = f(V_R)$



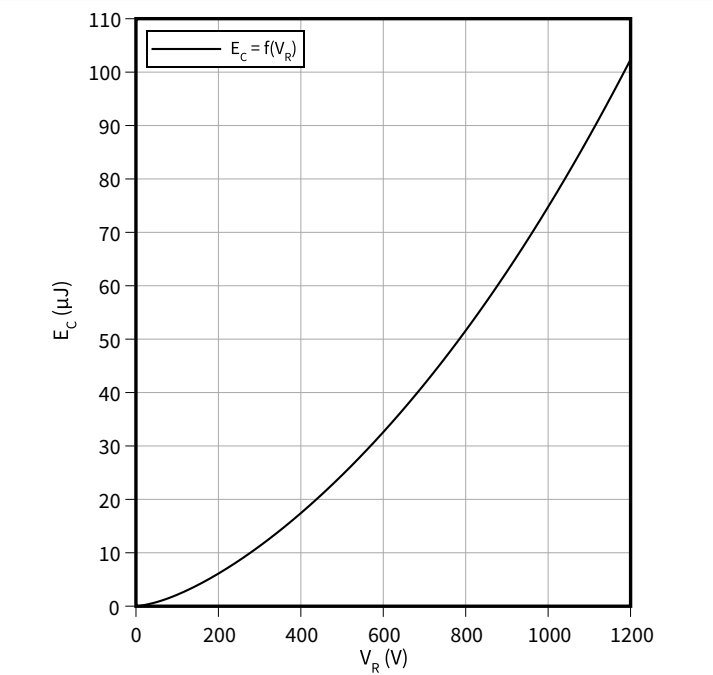
SiC Schottky diode: Typical capacitance as function of reverse voltage

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



SiC Schottky diode: Typical capacitively stored energy as function of reverse voltage

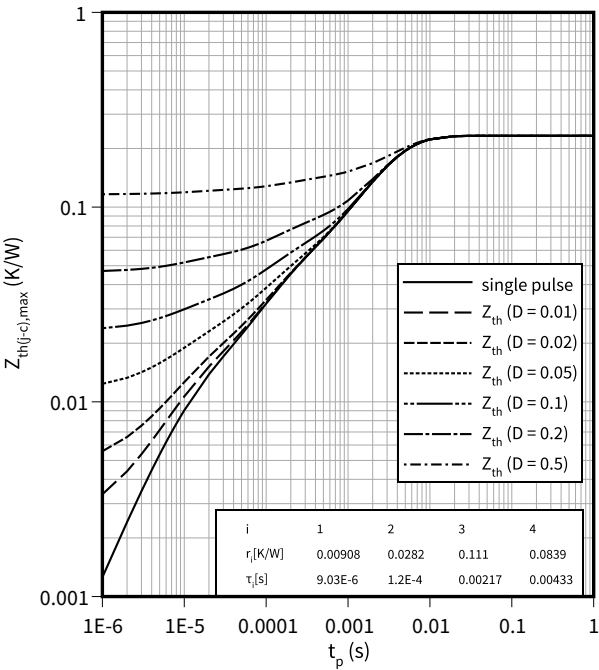
$E_C = f(V_R)$
 $f = 100\text{ kHz}$



5 Characteristics diagrams

SiC Schottky diode: Max. transient thermal impedance

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



7 Testing conditions

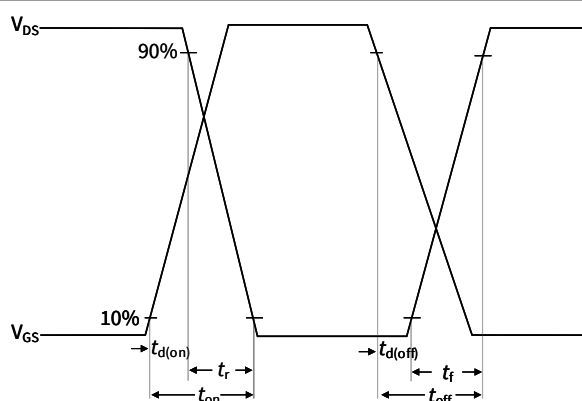


Figure A. Definition of switching times

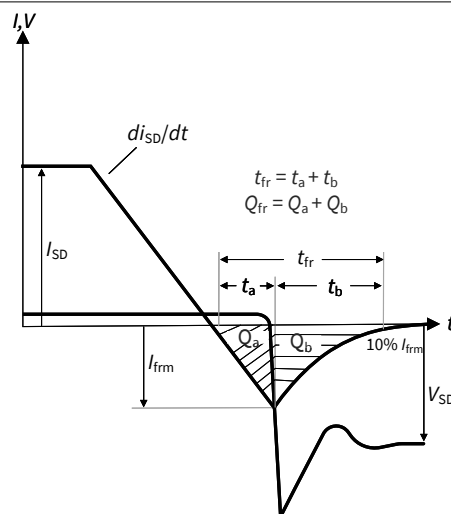


Figure B. Definition of body diode switching characteristics

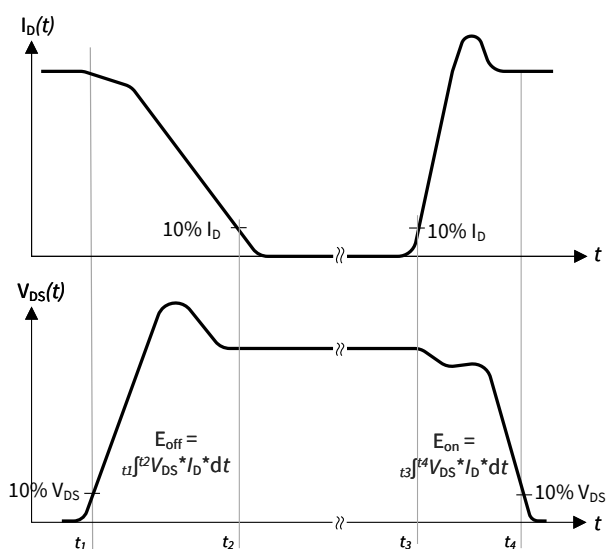


Figure C. Definition of switching losses

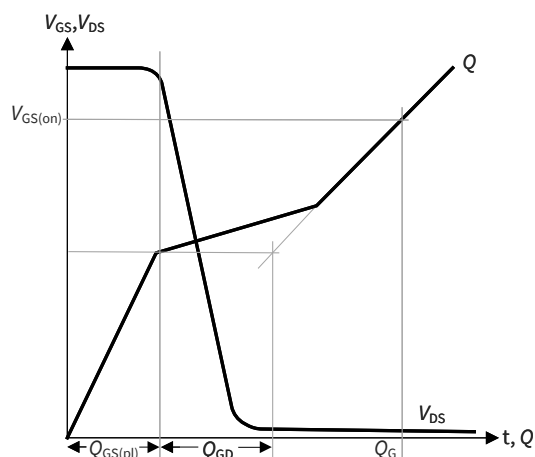


Figure D. Definition of Q_{GD}

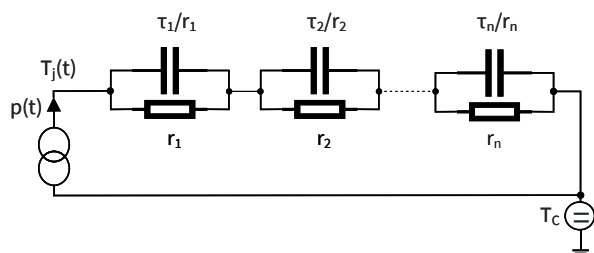


Figure E. Thermal equivalent circuit

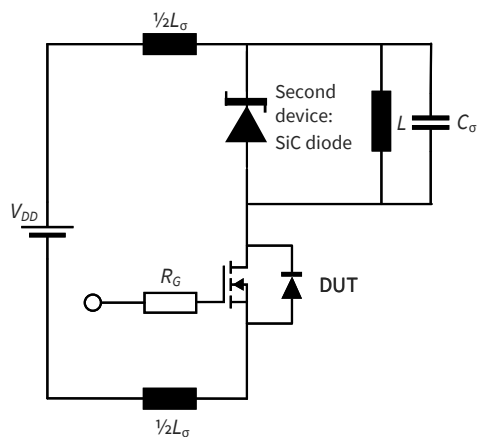


Figure F. Dynamic test circuit for MOSFET
Parasitic inductance L_{σ} ,
Parasitic capacitor C_{σ} ,



Revision history

Document revision	Date of release	Description of changes
0.10	2024-01-24	Target datasheet
0.20	2024-11-25	Updated Avalanche energy, single pulse E_{AS} in Table 5 Editorial changes
1.00	2026-06-25	Final datasheet

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