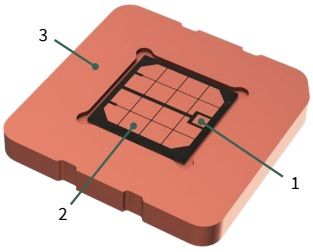
Final datasheet
ENDOPACK™ Cell 1200V CoolSiC™ Gen2p Automotive MOSFET

Features



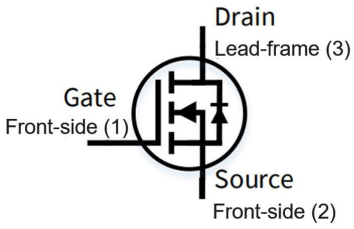
- V_{DSS} = 1200 V at T_{vj} = -40...200°C
- I_{DDC} = 147 A at T_C = 100°C
- $R_{DS(on)}$ = 10.3 mΩ at V_{GS} = 18 V, T_{vj} = 25°C
- New performance-optimized chip technology (Gen2p) with improved R_{DSon}* A FOM
- Supports scalable system designs by enabling the integration of multiple products in a single PCB
- Provides maximum design flexibility and enables up to 3x faster design cycles through a standardized PCB design process and proven PCB manufacturing infrastructure
- Enables ultra-low loop inductance for faster and cleaner switching
- Overload operation up to T_{vj} = 200°C for 100 h
- Best-in-class switching energy for lower switching losses
- A combination of low C_{rss}/C_{iss} ratio and high $V_{GS(th)}$ to avoid parasitic turn-on
- .XT die attach technology for best-in-class thermal performance
- MSL3 up to 260°C peak reflow
- 100% short-circuit and avalanche tested

Halogen-free
Green
Lead-free
RoHS
AEC Qualified

Potential applications
- Traction inverter
- Exciter circuits

Product validation
- Qualified for automotive applications. Product Validation according to AEC-Q101

Description
1 - Gate
2 - Source
3 - Drain



Type	Package	Marking
AIMCE120R010M2P1A	MG-LH2LA-3-4	Not applicable

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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}	Original packing, <90%RH, for <36 months	5		40	°C
MOSFET/body diode thermal resistance, junction-case[1) 2)]	$R_{th(j-c)}$	from junction to ENDOPACK™ Cell backside		0.133	0.173	K/W

1) case refers to the backside of ENDOPACK Cell
2) Not subject to production test - verified by design/characterization.

2 MOSFET

Table 2 Maximum rated values

Parameter	Symbol	Note or test condition		Values	Unit
Drain-source voltage[1)]	V_{DSS}	T_{vj} = -40...200 °C		1200	V
Continuous DC drain current for $R_{th(j-c,max)}$, limited by $T_{vj(max)}$[2)]	I_{DDC}	V_{GS} = 18 V	T_c = 25 °C	208	A
			T_c = 100 °C	147	
Peak drain current, t_p limited by $T_{vj(max)}$[2)]	I_{DM}	V_{GS} = 18 V		441	A
Gate-source voltage, max. transient voltage	V_{GS}	$t_p \leq 0.5$ µs, $D < 0.01$		-15/23	V
Gate-source voltage, max. static voltage	V_{GS}			-10/23	V
Avalanche energy, single pulse	E_{AS}	I_D = 70 A, V_{DD} = 50 V, L = 100 µH		245	mJ
Short-circuit withstand time[3)]	t_{SC}	V_{DD} = 850 V, $V_{DS,peak}$ < 1200 V, $V_{GS(on)}$ = 18 V, $T_{vj(start)}$ = 25 °C, $R_{G(on)}$ = 22 Ω, $R_{G(off)}$ = 7 Ω, L_σ = 25 nH		1.5	µs
Short circuit energy[3)]	E_{SC}	V_{DD} = 850 V, $V_{DS,peak}$ < 1200 V, $V_{GS(on)}$ = 18 V, $T_{vj(start)}$ = 25 °C, $R_{G(on)}$ = 22 Ω, $R_{G(off)}$ = 7 Ω, L_σ = 25 nH		1.2	J
Power dissipation, limited by $T_{vj(max)}$[2)]	P_{tot}		T_c = 25 °C	867	W
			T_c = 100 °C	433	

1) Tested at T_{vj} = 25°C, verified by design/characterization over full temperature range.
2) Not subject to production test - verified by design/characterization.
3) Allowed number of short-circuits (type 1) ≤ 100 pulses, time between pulses > 1 s.

Table 3 Recommended values

Parameter	Symbol	Note or test condition	Values	Unit
Recommended turn-on gate voltage	$V_{GS(on)}$		18	V
Recommended turn-off gate voltage	$V_{GS(off)}$		-5	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 = 100 A	T_{vj} = 25 °C, $V_{GS(on)}$ = 18 V		10.3	13.5	mΩ
			T_{vj} = 100 °C, $V_{GS(on)}$ = 18 V		14.6		
			T_{vj} = 175 °C, $V_{GS(on)}$ = 18 V		20.6	26.9	
			T_{vj} = 200 °C, $V_{GS(on)}$ = 18 V		23.6		
Gate-source threshold voltage[1]	$V_{GS(th)}$	I_D = 18.9 mA, V_{DS} = V_{GS} (tested after 10 ms pulse at V_{GS} = 20 V)	T_{vj} = 25 °C	3.3	4.1	4.7	V
			T_{vj} = 175 °C	2.4	3.3	3.8	
			T_{vj} = 200 °C		3.2		
Zero gate-voltage drain current	I_{DSS}	V_{DS} = 1200 V, V_{GS} = 0 V	T_{vj} = 25 °C		2	90	µA
			T_{vj} = 175 °C		10		
			T_{vj} = 200 °C		17		
Gate leakage current	I_{GSS}	V_{DS} = 0 V	V_{GS} = -10 V			-100	nA
			V_{GS} = 23 V			100	
Forward transconductance	g_{fs}	I_D = 100 A, V_{DS} = 20 V			70		S
Internal gate resistance	$R_{G,int}$	f = 1 MHz, V_{AC} = 25 mV			1.8		Ω
Input capacitance	C_{iss}	V_{DS} = 800 V, V_{GS} = 0 V, f = 100 kHz, V_{AC} = 25 mV			5465		pF
Output capacitance	C_{oss}	V_{DS} = 800 V, V_{GS} = 0 V, f = 100 kHz, V_{AC} = 25 mV			204		pF
Reverse transfer capacitance	C_{rss}	V_{DS} = 800 V, V_{GS} = 0 V, f = 100 kHz, V_{AC} = 25 mV			17		pF
C_{oss} stored energy[2]	E_{oss}	V_{DS} = 800 V, V_{GS} = 0 V, f = 100 kHz, V_{AC} = 25 mV			86		µJ
Output charge[2]	Q_{oss}	Calculated based on C_{oss} = f(V_{DD})			345		nC
Effective output capacitance, energy related[3]	$C_{o(er)}$	V_{DS} = 0...800 V, V_{GS} = 0 V, Calculated based on E_{oss}			269		pF
Effective output capacitance, time related[4]	$C_{o(tr)}$	V_{DS} = 0...800 V, V_{GS} = 0 V, Calculated based on Q_{oss}			431		pF

(table continues...)

Table 4 (continued) Characteristic values

Parameter	Symbol	Note or test condition		Values			Unit
				Min.	Typ.	Max.	
Total gate charge	Q_G	V_{DD} = 800 V, I_D = 100 A, V_{GS} = -5/18 V, turn-on pulse			205		nC
Plateau gate charge	$Q_{GS(pl)}$	V_{DD} = 800 V, I_D = 100 A, V_{GS} = -5/18 V, turn-on pulse			71		nC
Gate-drain charge	Q_{GD}	V_{DD} = 800 V, I_D = 100 A, V_{GS} = -5/18 V, turn-on pulse			35		nC
Turn-on delay time	$t_{d(on)}$	V_{DD} = 800 V, I_D = 100 A, V_{GS} = -5/18 V, $R_{GS(on)}$ = 10.3 Ω, $R_{GS(off)}$ = 10.3 Ω, L_σ = 15 nH, diode: body diode at V_{GS} = -5 V	T_{vj} = 25 °C		30		ns
			T_{vj} = 175 °C		25		
Rise time	t_r	V_{DD} = 800 V, I_D = 100 A, V_{GS} = -5/18 V, $R_{GS(on)}$ = 10.3 Ω, $R_{GS(off)}$ = 10.3 Ω, L_σ = 15 nH, diode: body diode at V_{GS} = -5 V	T_{vj} = 25 °C		35		ns
			T_{vj} = 175 °C		33		
Turn-off delay time	$t_{d(off)}$	V_{DD} = 800 V, I_D = 100 A, V_{GS} = -5/18 V, $R_{GS(on)}$ = 10.3 Ω, $R_{GS(off)}$ = 10.3 Ω, L_σ = 15 nH, diode: body diode at V_{GS} = -5 V	T_{vj} = 25 °C		76		ns
			T_{vj} = 175 °C		83		
Fall time	t_f	V_{DD} = 800 V, I_D = 100 A, V_{GS} = -5/18 V, $R_{GS(on)}$ = 10.3 Ω, $R_{GS(off)}$ = 10.3 Ω, L_σ = 15 nH, diode: body diode at V_{GS} = -5 V	T_{vj} = 25 °C		22		ns
			T_{vj} = 175 °C		23		
Turn-on energy	E_{on}	V_{DD} = 800 V, I_D = 100 A, V_{GS} = -5/18 V, $R_{GS(on)}$ = 10.3 Ω, $R_{GS(off)}$ = 10.3 Ω, L_σ = 15 nH, diode: body diode at V_{GS} = -5 V	T_{vj} = 25 °C		1859		µJ
			T_{vj} = 175 °C		2500		
Turn-off energy	E_{off}	V_{DD} = 800 V, I_D = 100 A, V_{GS} = -5/18 V, $R_{GS(on)}$ = 10.3 Ω, $R_{GS(off)}$ = 10.3 Ω, L_σ = 15 nH, diode: body diode at V_{GS} = -5 V	T_{vj} = 25 °C		1312		µJ
			T_{vj} = 175 °C		1421		

(table continues...)

Table 4 (continued) Characteristic values

Parameter	Symbol	Note or test condition		Values			Unit
				Min.	Typ.	Max.	
Total switching energy	E_{tot}	V_{DD} = 800 V, I_D = 100 A, V_{GS} = -5/18 V, $R_{GS(on)}$ = 10.3 Ω, $R_{GS(off)}$ = 10.3 Ω, L_σ = 15 nH, diode: body diode at V_{GS} = -5 V	T_{vj} = 25 °C		3171		µJ
			T_{vj} = 175 °C		3921		
Virtual junction temperature	T_{vj}			-40		175	°C
Virtual junction temperature	$T_{vj(over)}$	overload, cumulative max 100h				200	°C

1) Values not specified over lifetime according to AEC-Q101, only for zero hour.
2) Calculation based on C_{oss}
3) $C_{o(er)}$ is a fixed capacitance that gives the same stored energy as C_{oss} while V_{DS} is rising from 0 to 800V.
4) $C_{o(tr)}$ is a fixed capacitance that gives the same charging time as C_{oss} while V_{DS} is rising from 0 to 800V.

***Note**: Characteristics at T_{vj} = 25°C, unless otherwise specified.*

3 Body diode (MOSFET)

Table 5 Maximum rated values

Parameter	Symbol	Note or test condition		Values	Unit
Drain-source voltage[1]	V_{DSS}	T_{vj} = -40...200 °C		1200	V
Continuous reverse drain current for $R_{th(j\text{-}c,max)}$, limited by $T_{vj(max)}$[2]	I_{SDC}	V_{GS} = -5 V	T_c = 25 °C	170	A
			T_c = 100 °C	104	
Peak reverse drain current, t_p limited by $T_{vj(max)}$[2]	I_{SM}	V_{GS} = -5 V	V_{GS} = -5 V	170	A
			V_{GS} = -5 V, t_p < 1.5 µs, T_{vj} ≤ 175 °C	189	
			-5 ≤ V_{GS} ≤ 0 V, T_{vj} ≤ 175°C; t_p ≤ 0.3 ms for accumulated conduction time < 5 s or t_p ≤ 1 ms for accumulated conduction time < 2.5 s	587	

1) Tested at T_{vj} = 25°C, verified by design/characterization over full temperature range.
2) Not subject to production test - verified by design/characterization.

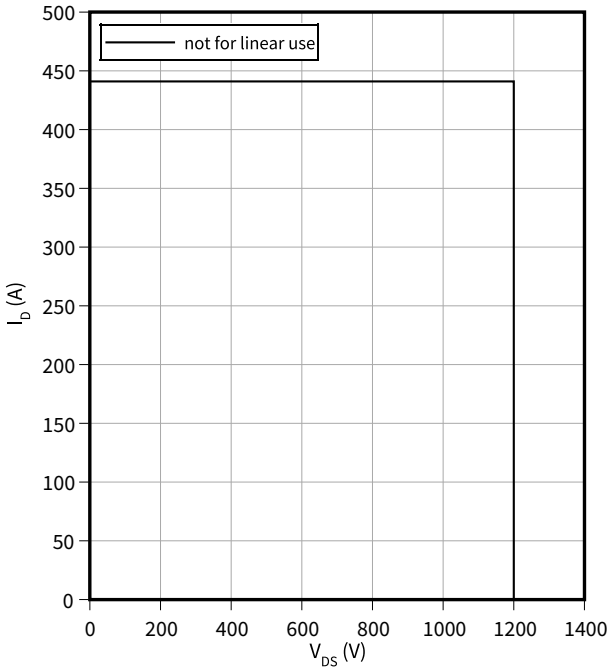
Table 6 Characteristic values

Parameter	Symbol	Note or test condition		Values			Unit
				Min.	Typ.	Max.	
Drain-source reverse voltage	V_{SD}	I_{SD} = 100 A, V_{GS} = -5 V	T_{vj} = 25 °C	3.7	5	6.7	V
			T_{vj} = 100 °C		4.7		
			T_{vj} = 175 °C	3.1	4.5	6.1	
			T_{vj} = 200 °C		4.4		
MOSFET forward recovery charge	Q_{fr}	V_{DD} = 800 V, I_{SD} = 100 A, V_{GS} = -5 V, $-di_{SD}/dt$ = 4000 A/µs	T_{vj} = 25 °C		410		nC
			T_{vj} = 175 °C		2242		
MOSFET peak forward recovery current	I_{frm}	V_{DD} = 800 V, I_{SD} = 100 A, V_{GS} = -5 V, $-di_{SD}/dt$ = 4000 A/µs	T_{vj} = 25 °C		38		A
			T_{vj} = 175 °C		60		
MOSFET forward recovery energy	E_{fr}	V_{DD} = 800 V, I_{SD} = 100 A, V_{GS} = -5 V, $-di_{SD}/dt$ = 4000 A/µs	T_{vj} = 25 °C		55		µJ
			T_{vj} = 175 °C		615		
Virtual junction temperature	T_{vj}			-40		175	°C
Virtual junction temperature	$T_{vj(over)}$	overload, cumulative max. 100 h				200	°C

4 Characteristics diagrams

Reverse bias safe operating area (RBSOA)

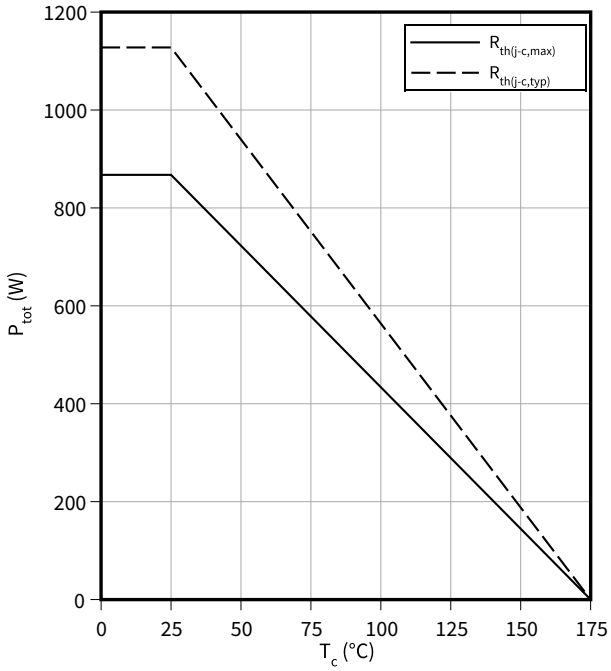
$I_D = f(V_{DS})$



Power dissipation as a function of case temperature

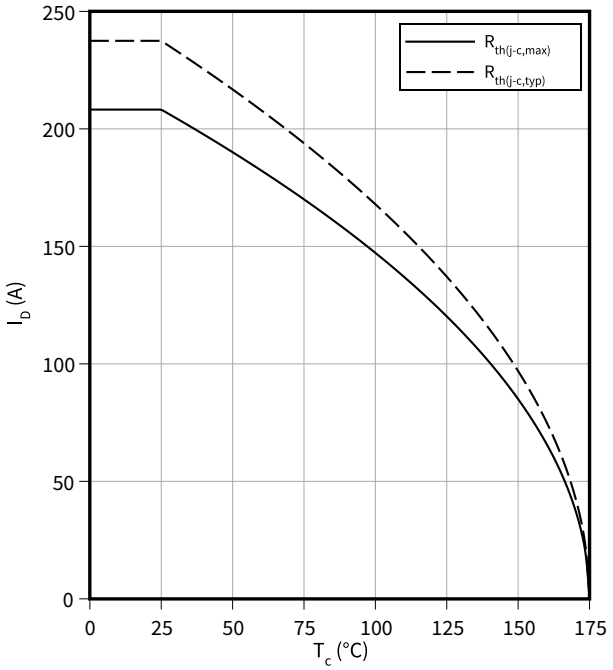
$P_{tot} = f(T_c)$

$T_{vj} \leq 175\ °C$



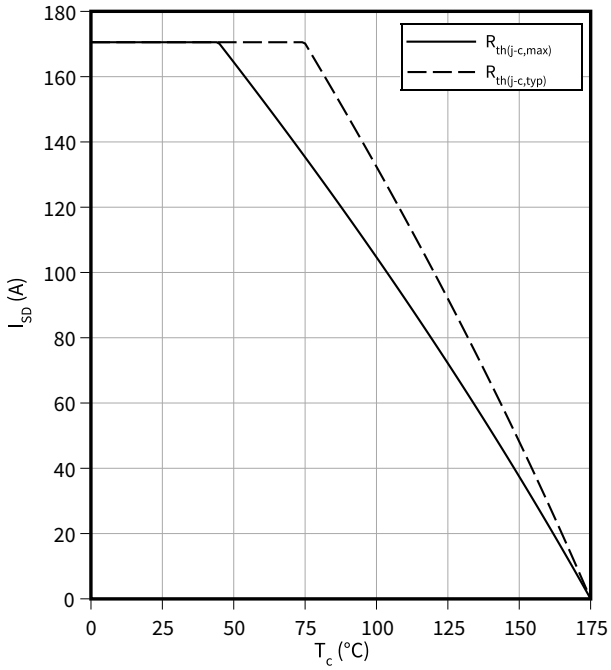
Maximum DC drain to source current as a function of case temperature

$I_D = f(T_c)$



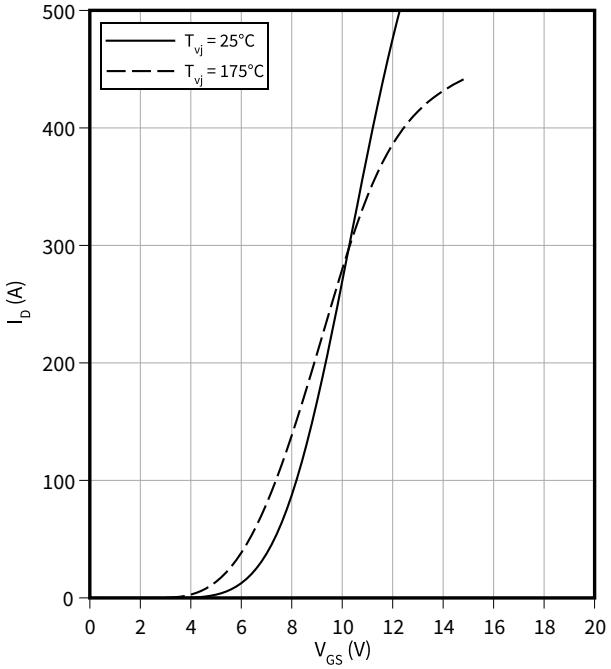
Maximum source to drain current as a function of case temperature

$I_{SD} = f(T_c)$



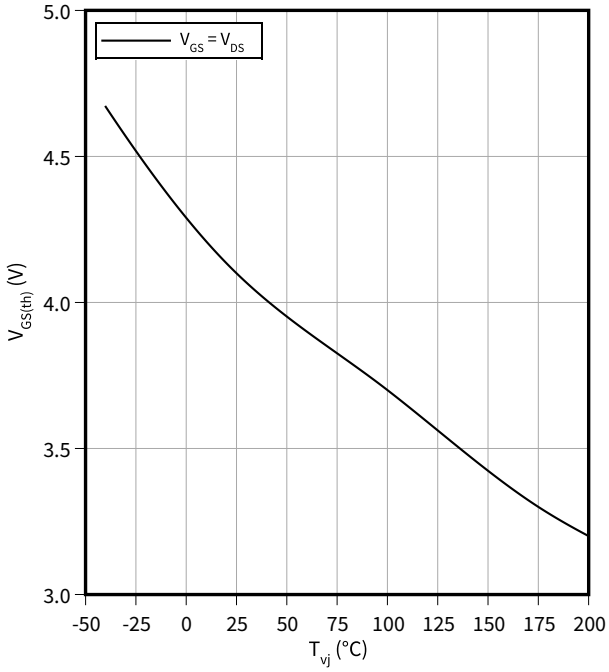
Typical transfer characteristic

$I_D = f(V_{GS})$
$V_{DS} = 20$ V



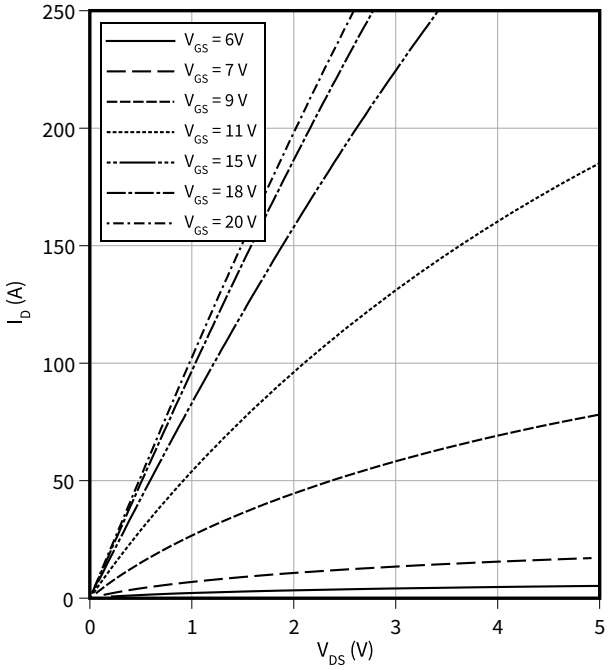
Typical gate-source threshold voltage as a function of junction temperature

$V_{GS(th)} = f(T_{vj})$
$I_D = 18.9$ mA



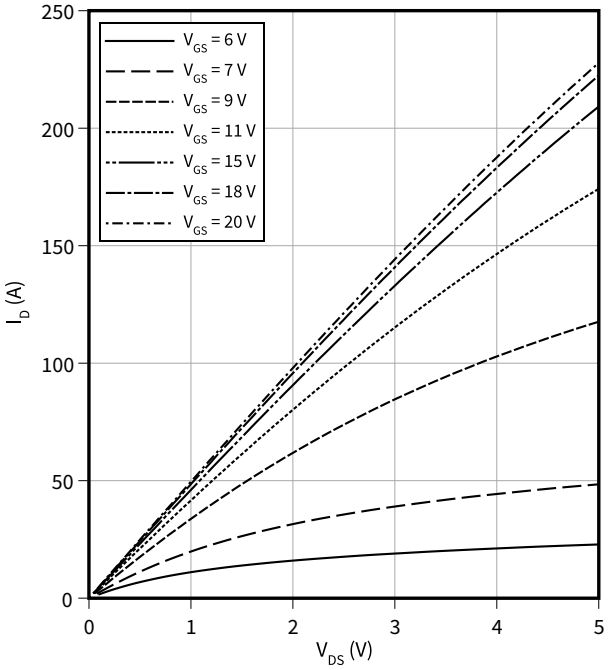
Typical output characteristic, V_{GS} as a parameter

$I_D = f(V_{DS})$
$T_{vj} = 25$ °C



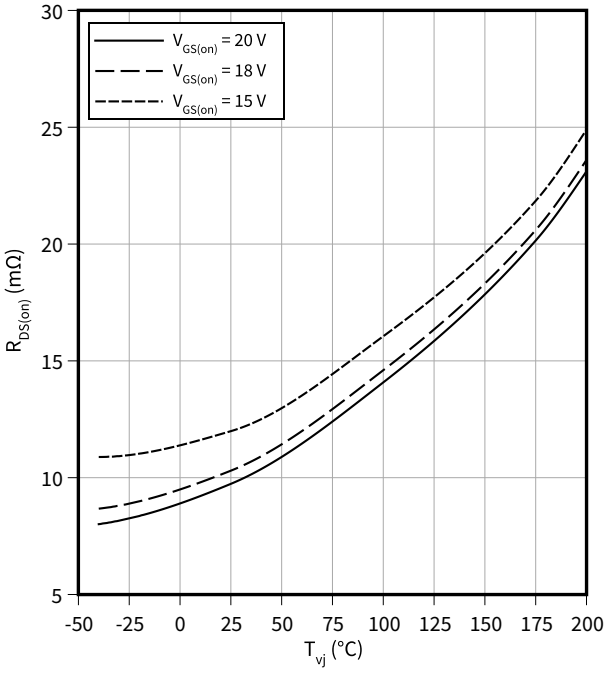
Typical output characteristic, V_{GS} as a parameter

$I_D = f(V_{DS})$
$T_{vj} = 175$ °C



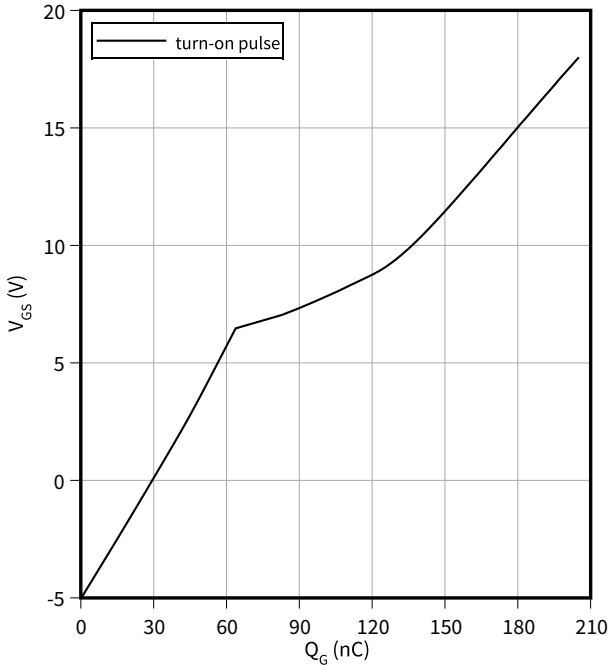
Typical on-state resistance as a function of junction temperature

$R_{DS(on)} = f(T_{vj})$
$I_D = 100$ A



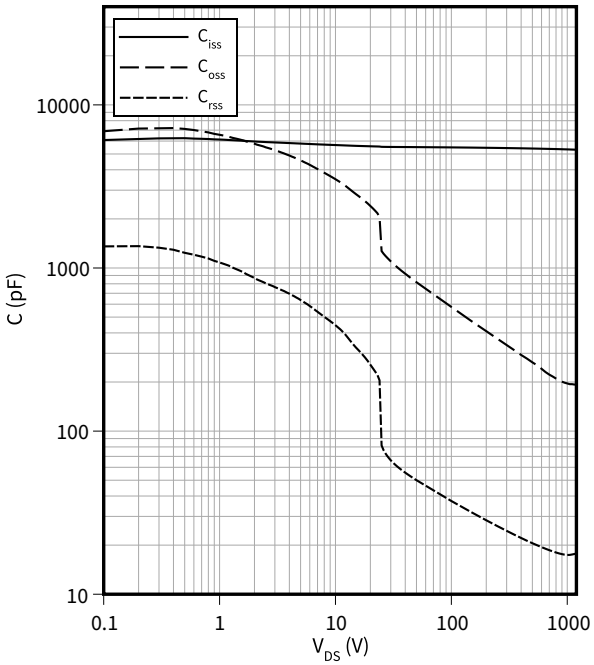
Typical gate charge

$V_{GS} = f(Q_G)$
$I_D = 100$ A, $V_{DS} = 800$ V



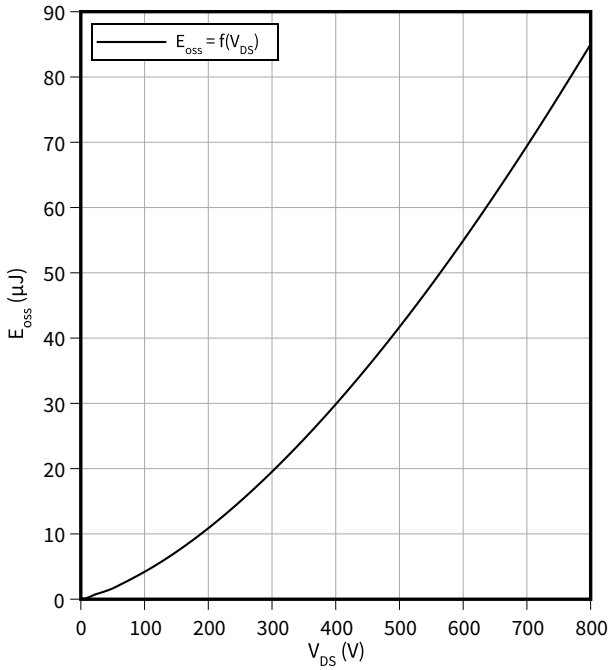
Typical capacitance as a function of drain-source voltage

$C = f(V_{DS})$
$f = 100$ kHz, $V_{GS} = 0$ V



Typical C_{oss} stored energy

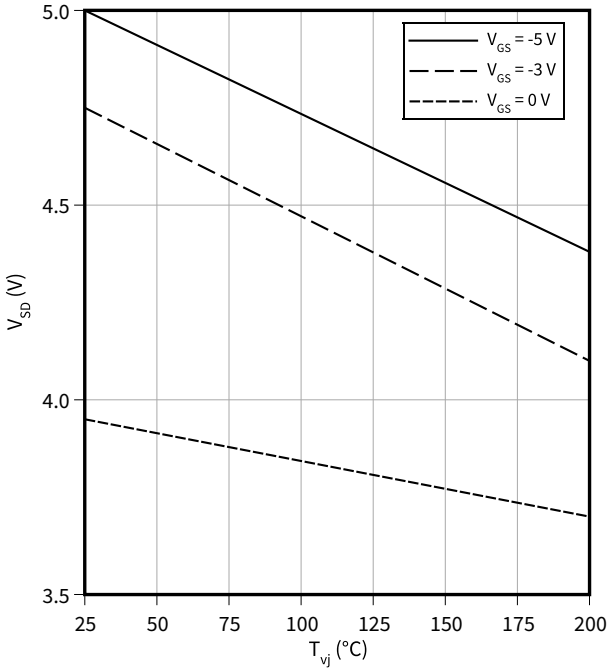
$E_{oss} = f(V_{DS})$
$f = 100$ kHz, $V_{GS} = 0$ V



Typical reverse drain voltage as a function of junction temperature

$V_{SD} = f(T_{vj})$

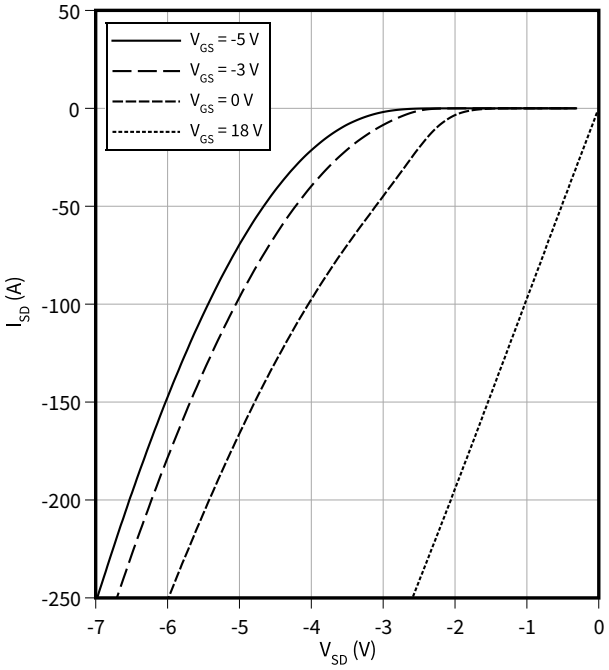
I_{SD} = 100 A



Typical reverse drain current as a function of reverse drain voltage, V_{GS} as a parameter

$I_{SD} = f(V_{SD})$

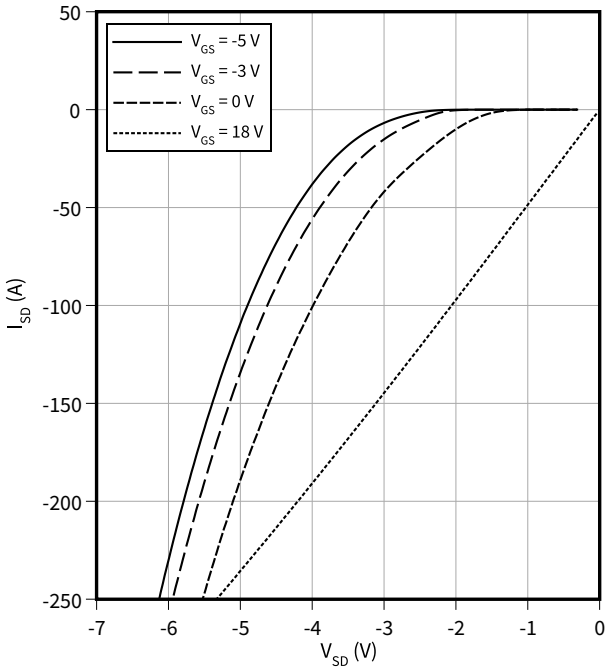
T_{vj} = 25 °C



Typical reverse drain current as a function of reverse drain voltage, V_{GS} as a parameter

$I_{SD} = f(V_{SD})$

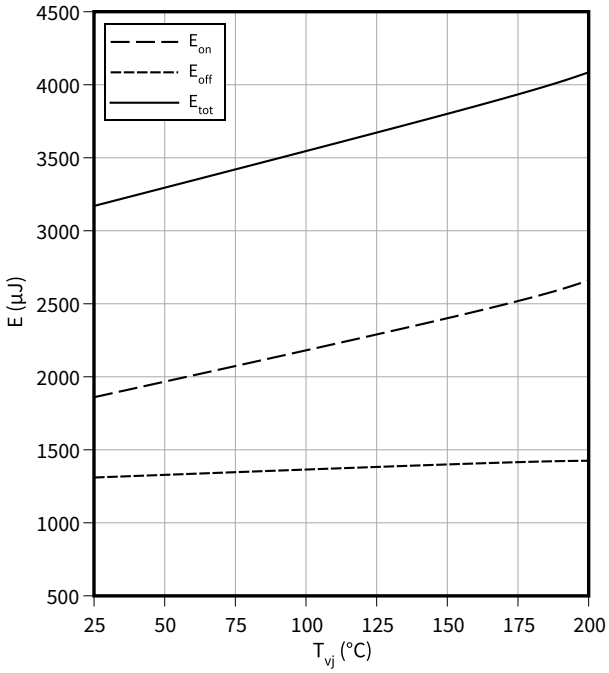
T_{vj} = 175 °C



Typical switching energy as a function of junction temperature, test circuit in Fig. F, 2nd device own body diode: V_{GS} = -5 V

$E = f(T_{vj})$

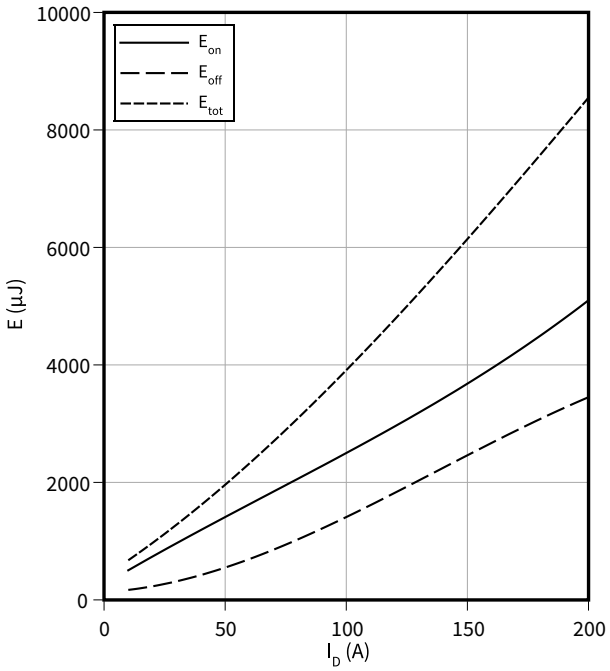
V_{GS} = -5/18 V, I_D = 100 A, $R_{G,ext}$ = 10.3 Ω, V_{DD} = 800 V



Typical switching energy as a function of drain current, test circuit in Fig. F, 2nd device own body diode: V_{GS} = -5 V

$E = f(I_D)$

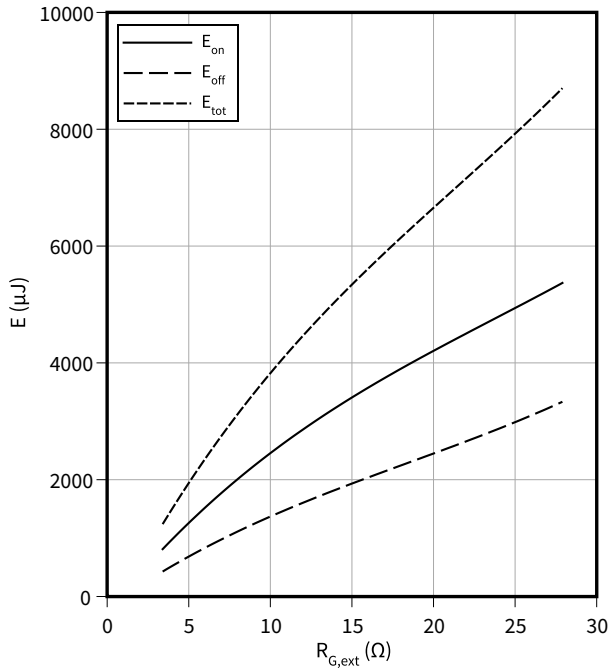
V_{GS} = -5/18 V, T_{vj} = 175 °C, $R_{G,ext}$ = 10.3 Ω, V_{DD} = 800 V



Typical switching energy as a function of gate resistance, test circuit in Fig. F, 2nd device own body diode: V_{GS} = -5 V

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

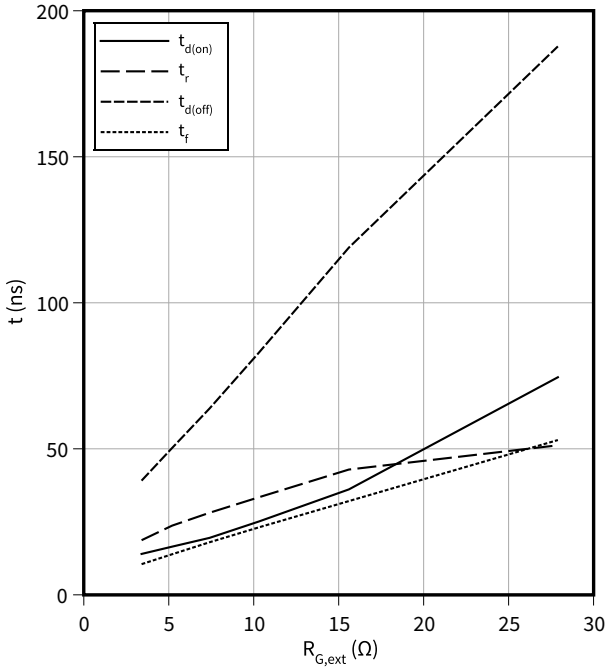
V_{GS} = -5/18 V, I_D = 100 A, T_{vj} = 175 °C, V_{DD} = 800 V



Typical switching times as a function of gate resistance, test circuit in Fig. F, 2nd device own body diode: V_{GS} = -5 V

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

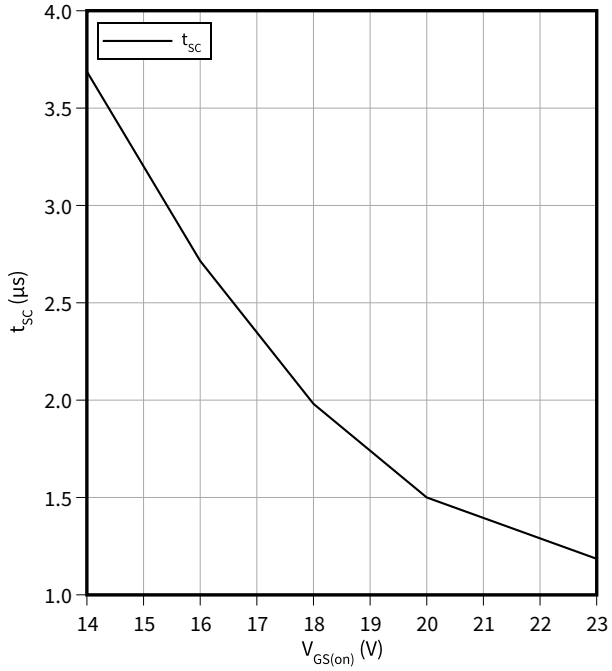
I_D = 100 A, T_{vj} = 175 °C, V_{DD} = 800 V, V_{GS} = -5/18 V



Typical short-circuit withstand time

$t_{SC} = f(V_{GS(on)})$

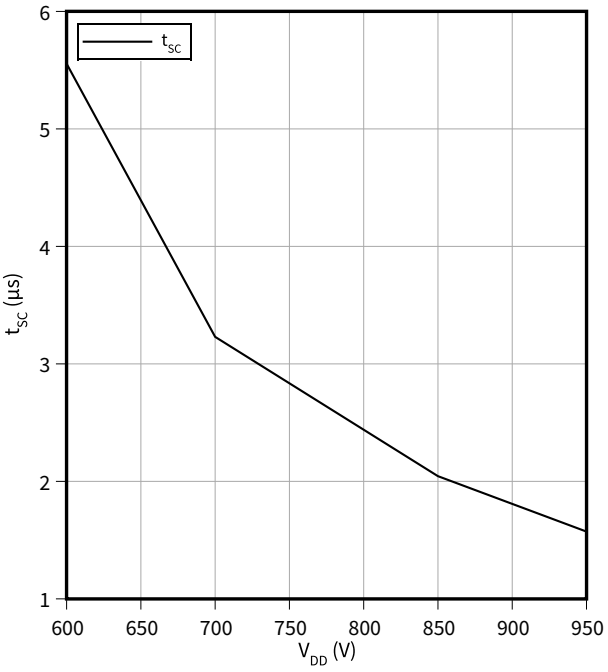
V_{DD} = 850 V, $T_{vj(start)} \leq$ 175 °C



Typical short-circuit withstand time

$t_{SC} = f(V_{DD})$

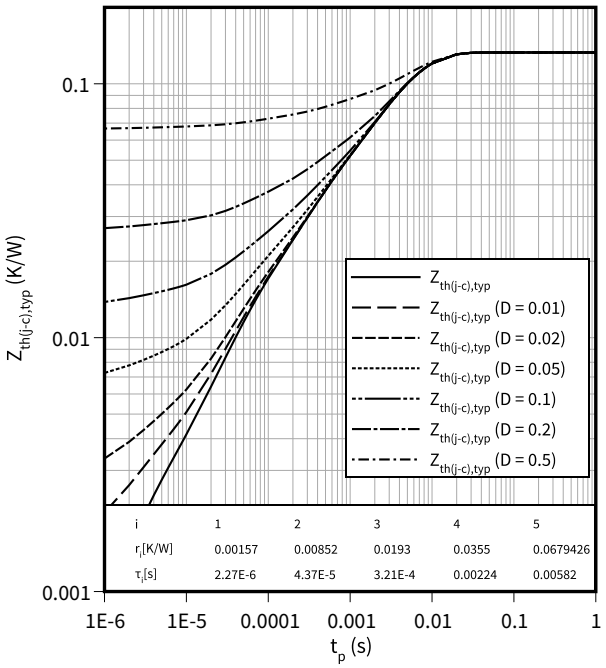
$T_{vj(start)} \leq 175\ °C$



Typ. transient thermal impedance (MOSFET/diode)

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

$D = t_p/T$



5 Package outlines

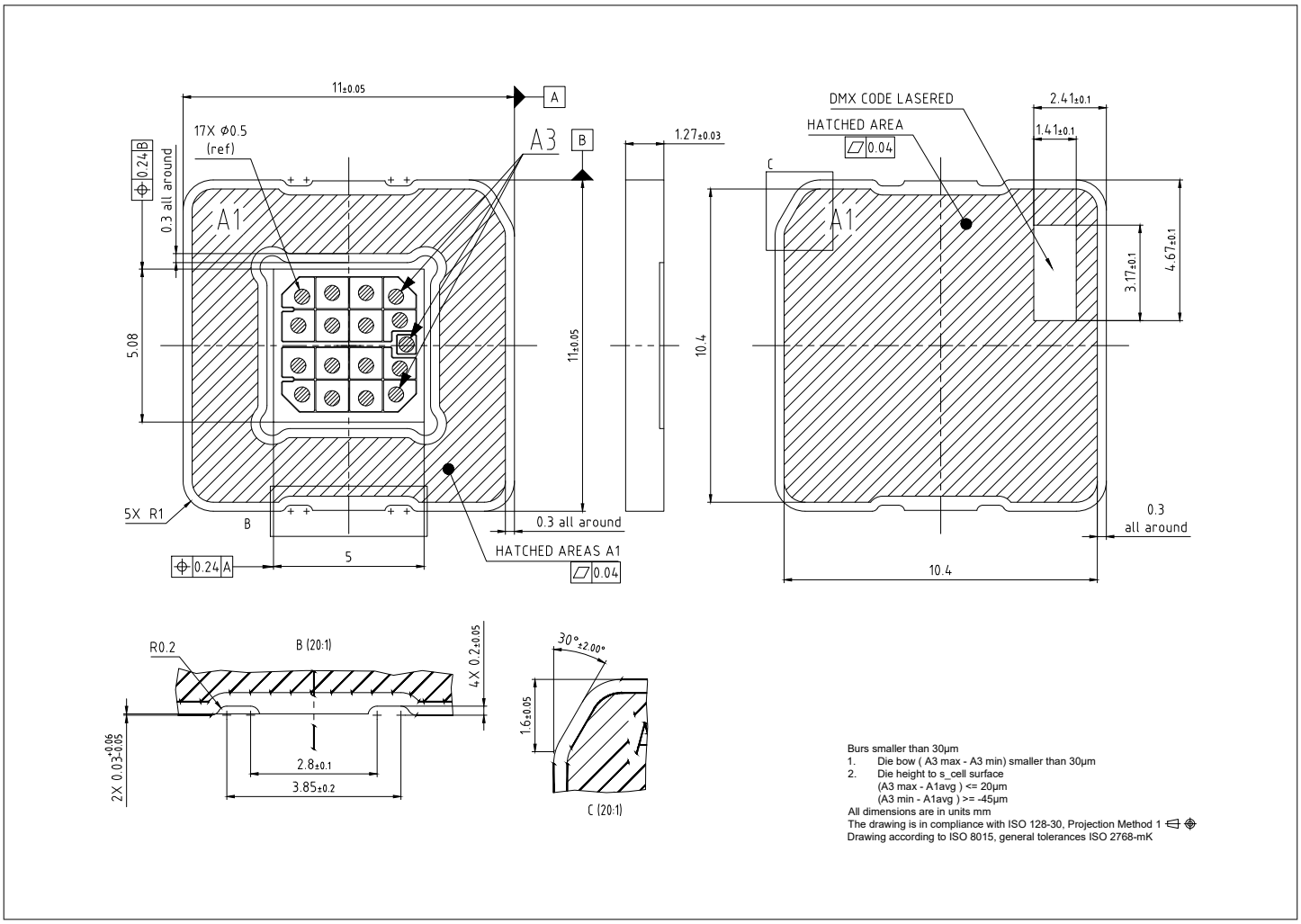


Figure 1

6 Chip drawing

Passivation front side	Imide
Pad metal	Cu

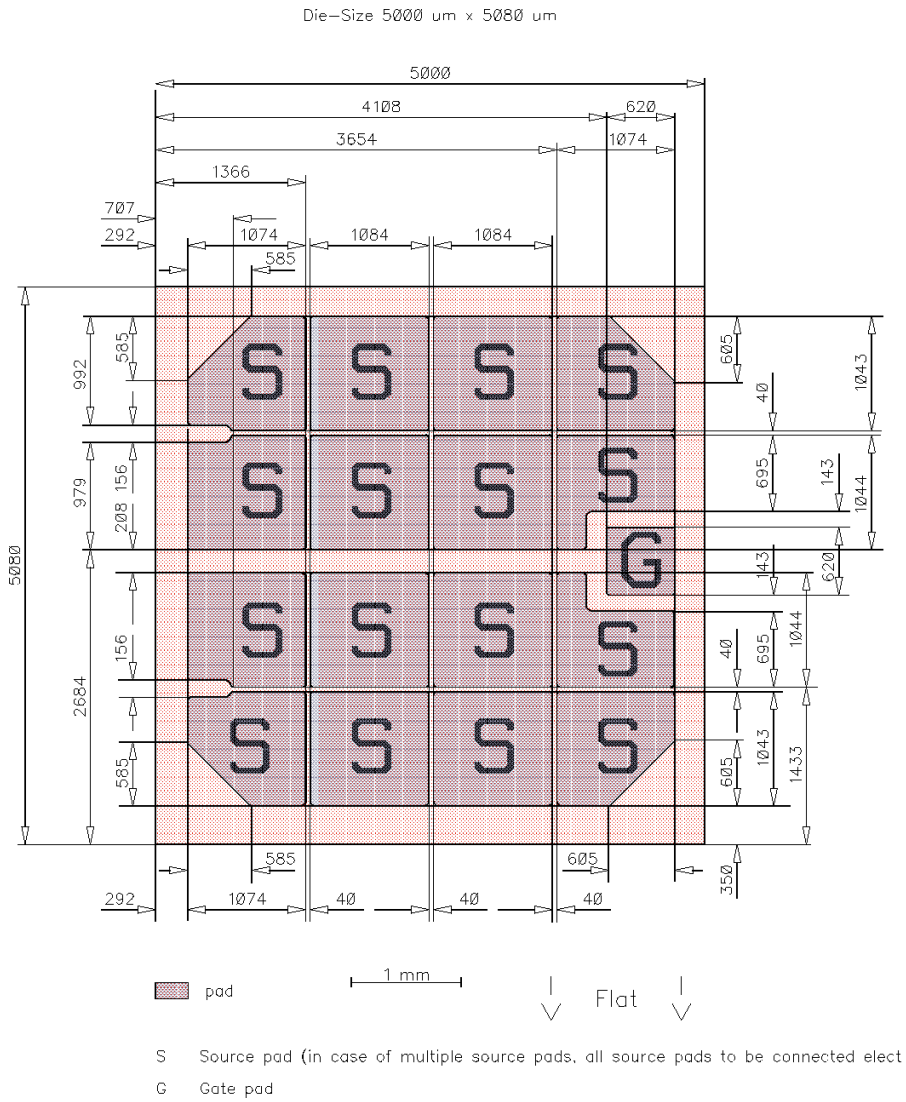


Figure 2

7 Testing conditions

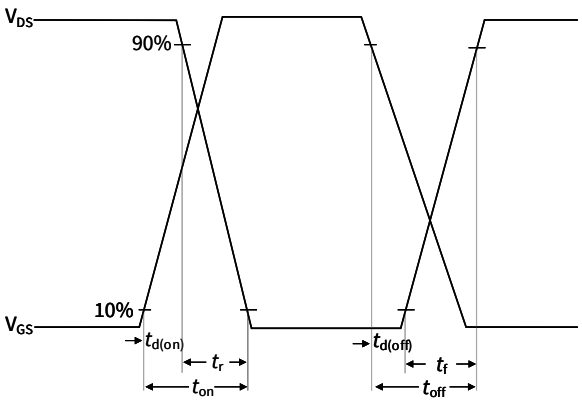


Figure A. **Definition of switching times**

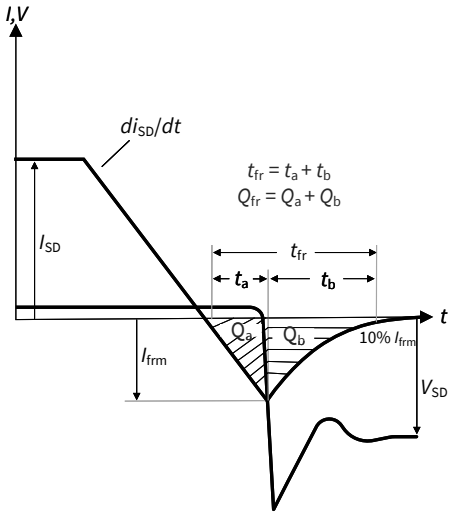


Figure B. **Definition of body diode switching characteristics**

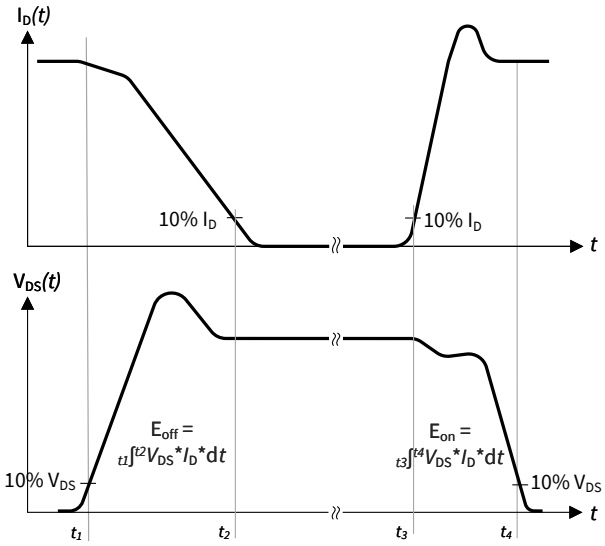


Figure C. **Definition of switching losses**

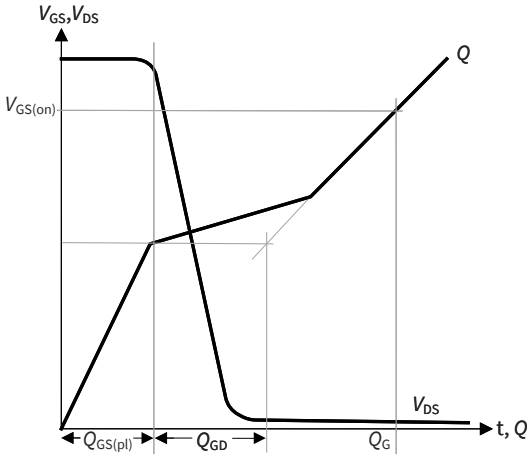


Figure D. **Definition of QGD**

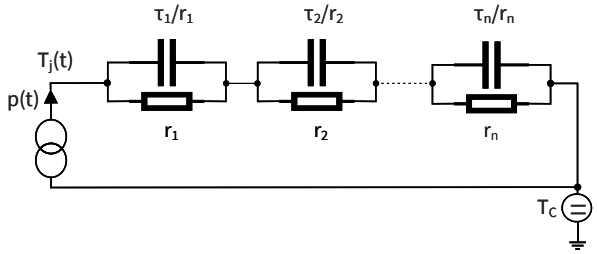


Figure E. **Thermal equivalent circuit**

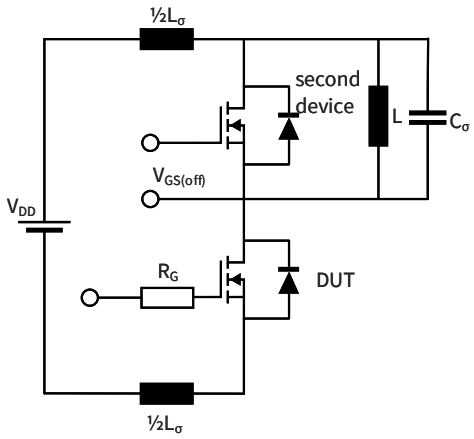


Figure F. **Dynamic test circuit**
Parasitic inductance L_σ,
Parasitic capacitor C_σ,

Figure 3

Revision history

Document revision	Date of release	Description of changes
0.10	2026-07-17	Target datasheet
0.20	2026-09-07	Preliminary datasheet
1.00	2026-09-11	Final datasheet

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