

Final datasheet

EasyPACK™ module with CoolSiC™ Trench MOSFET and PressFIT / NTC

Features

- Electrical features
 - $V_{DS} = 1200\text{ V}$
 - $I_{DN} = 50\text{ A}$ / $I_{DRM} = 100\text{ A}$
 - Low inductive design
 - Low switching losses
 - High current density
 - Suitable Infineon gate drivers can be found under <https://www.infineon.com/gdfinder>
- Mechanical features
 - PressFIT contact technology
 - Integrated NTC temperature sensor
 - Rugged mounting due to integrated mounting clamps
 - Package with CTI > 600
 - High current pin



Typical appearance

Potential applications

- High-frequency switching application
- DC/DC converter
- DC charger for EV

Product validation

- Qualified for industrial applications according to the relevant tests of IEC 60747, 60749 and 60068

Description

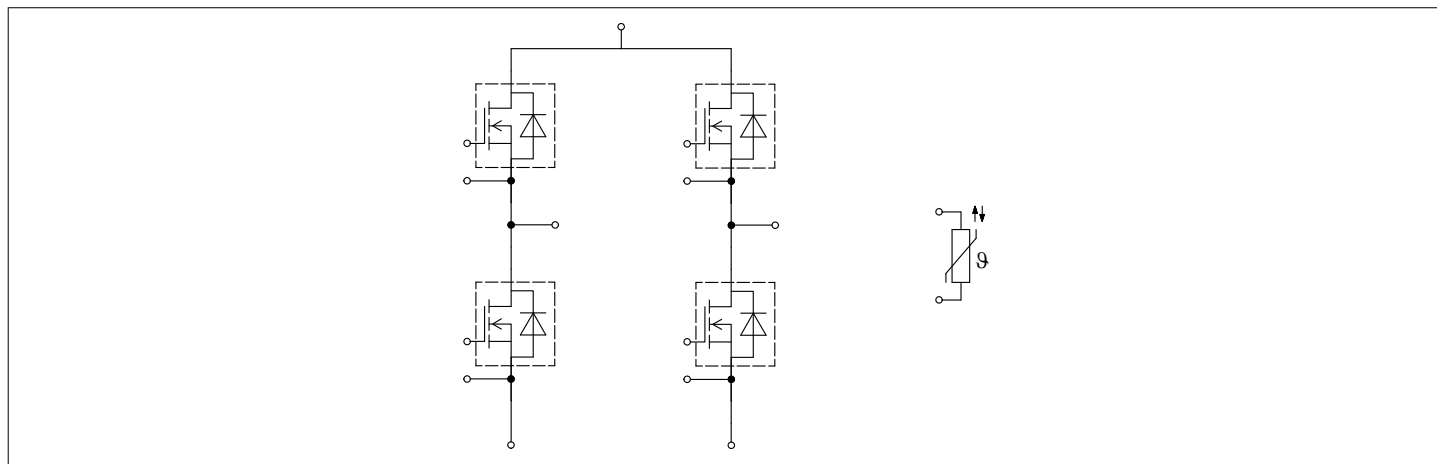


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1 Package

Table 1 Insulation coordination

Parameter	Symbol	Note or test condition	Values	Unit
Isolation test voltage	V_{ISOL}	RMS, $f = 50 \text{ Hz}$, $t = 60 \text{ s}$	4.0	kV
Isolation test voltage NTC	$V_{ISOL(NTC)}$	RMS, $f = 50 \text{ Hz}$, $t = 60 \text{ s}$	3.0	kV
Internal isolation		basic insulation (class 1, IEC 61140)	Al_2O_3	
Comparative tracking index	CTI		> 600	
Relative thermal index (electrical)	RTI	frame	180	°C
		lid	150	

Table 2 Characteristic values

Parameter	Symbol	Note or test condition	Values			Unit
			Min.	Typ.	Max.	
Stray inductance module	L_{SCE}			14		nH
Module lead resistance, terminals - chip	$R_{CC'+EE'}$	$T_H = 25 \text{ °C}$, per switch		2.6		mΩ
Storage temperature	T_{stg}		-40		150	°C
Mounting force per clamp	F		20		50	N
Weight	G			24		g

Note: The current up to 50A per pin is limited by the interaction of the pins with the PCB design and cooling conditions.

2 MOSFET, T1-T4

Table 3 Maximum rated values

Parameter	Symbol	Note or test condition		Values	Unit
Drain-source voltage	V_{DSS}		$T_{vj} = 25 \text{ °C}$	1200	V
Implemented drain current	I_{DN}			50	A
Continuous DC drain current	I_{DDC}	$T_{vj} = 175 \text{ °C}$, $V_{GS} = 18 \text{ V}$	$T_H = 25 \text{ °C}$	60	A
Repetitive peak drain current	I_{DRM}	verified by design, t_p limited by T_{vjmax}		100	A
Gate-source voltage, max. transient voltage	V_{GS}	$D < 0.01$		-10/25	V
Gate-source voltage, max. static voltage	V_{GS}			-7/20	V

Table 4 Recommended values

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

Table 5 Characteristic values

Parameter	Symbol	Note or test condition		Values			Unit
				Min.	Typ.	Max.	
Drain-source on-resistance	$R_{DS(on)}$	$I_D = 50\text{ A}$	$V_{GS} = 15\text{ V}, T_{vj} = 25\text{ °C}$		15		mΩ
			$V_{GS} = 18\text{ V}, T_{vj} = 25\text{ °C}$		12.5	19.3	
			$V_{GS}=18\text{ V}, T_{vj}=125\text{ °C}$		19.4		
			$V_{GS}=18\text{ V}, T_{vj}=175\text{ °C}$		25.2		
Gate threshold voltage	$V_{GS(th)}$	$I_D = 22\text{ mA}, V_{DS} = V_{GS}, T_{vj} = 25\text{ °C},$ (tested after 1ms pulse at $V_{GS} = +20\text{ V}$)		3.45	4.3	5.15	V
Total gate charge	Q_G	$V_{DD}=800\text{ V}, V_{GS} = -3/18\text{ V}, T_{vj} = 25\text{ °C}$			0.158		μC
Internal gate resistor	R_{Gint}	$T_{vj}=25\text{ °C}$			5.2		Ω
Input capacitance	C_{ISS}	$f = 100\text{ kHz}, V_{DS}=800\text{ V}, V_{GS}=0\text{ V}$	$T_{vj}=25\text{ °C}$		4.8		nF
Output capacitance	C_{OSS}	$f = 100\text{ kHz}, V_{DS}=800\text{ V}, V_{GS}=0\text{ V}$	$T_{vj}=25\text{ °C}$		0.196		nF
Reverse transfer capacitance	C_{rss}	$f = 100\text{ kHz}, V_{DS}=800\text{ V}, V_{GS}=0\text{ V}$	$T_{vj}=25\text{ °C}$		0.013		nF
C_{OSS} stored energy	E_{OSS}	$V_{DS}=800\text{ V}, V_{GS} = -3/18\text{ V}, T_{vj} = 25\text{ °C}$			80.4		μJ
Drain-source leakage current	I_{DSS}	$V_{DS} = 1200\text{ V}, V_{GS} = -3\text{ V}$	$T_{vj} = 25\text{ °C}$		0.2	208	μA
Gate-source leakage current	I_{GSS}	$V_{DS} = 0\text{ V}, T_{vj} = 25\text{ °C}$	$V_{GS}=20\text{ V}$			400	nA
Turn-on delay time (inductive load)	$t_{d on}$	$I_D = 50\text{ A}, R_{Gon} = 4.7\text{ Ω}, V_{DD} = 800\text{ V}, V_{GS} = -3/18\text{ V}, t_{dead} = 1000\text{ ns}, 0.1\text{ }V_{GS}$ to $0.1\text{ }I_D$	$T_{vj} = 25\text{ °C}$		24		ns
			$T_{vj} = 125\text{ °C}$		24		
			$T_{vj} = 175\text{ °C}$		24		
Rise time (inductive load)	t_r	$I_D = 50\text{ A}, R_{Gon} = 4.7\text{ Ω}, V_{DD} = 800\text{ V}, V_{GS} = -3/18\text{ V}, t_{dead} = 1000\text{ ns}, 0.1\text{ }I_D$ to $0.9\text{ }I_D$	$T_{vj} = 25\text{ °C}$		12		ns
			$T_{vj} = 125\text{ °C}$		11		
			$T_{vj} = 175\text{ °C}$		11		

(table continues...)

Table 5 (continued) **Characteristic values**

Parameter	Symbol	Note or test condition	Values			Unit
			Min.	Typ.	Max.	
Turn-off delay time (inductive load)	$t_{d\ off}$	$I_D = 50\ A$, $R_{Goff} = 0.22\ \Omega$, $V_{DD} = 800\ V$, $V_{GS} = -3/18\ V$, $0.9\ I_{D\ } to\ 0.9\ I_D$	$T_{vj} = 25\ ^\circ C$	39		ns
			$T_{vj} = 125\ ^\circ C$	46		
			$T_{vj} = 175\ ^\circ C$	48		
Fall time (inductive load)	t_f	$I_D = 50\ A$, $R_{Goff} = 0.22\ \Omega$, $V_{DD} = 800\ V$, $V_{GS} = -3/18\ V$, $0.9\ I_D\ to\ 0.1\ I_D$	$T_{vj} = 25\ ^\circ C$	14		ns
			$T_{vj} = 125\ ^\circ C$	16		
			$T_{vj} = 175\ ^\circ C$	16		
Turn-on energy loss per pulse	E_{on}	$I_D = 50\ A$, $V_{DD} = 800\ V$, $L_\sigma = 15\ nH$, $V_{GS} = -3/18\ V$, $R_{Gon} = 4.7\ \Omega$, $di/dt = 5.17\ kA/\mu s$ ($T_{vj} = 175\ ^\circ C$), $t_{dead} = 1000\ ns$	$T_{vj} = 25\ ^\circ C$	0.95		mJ
			$T_{vj} = 125\ ^\circ C$	1.14		
			$T_{vj} = 175\ ^\circ C$	1.31		
Turn-on energy loss per pulse, optimized	$E_{on,o}$	$I_D = 50\ A$, $V_{DD} = 800\ V$, $L_\sigma = 15\ nH$, $V_{GS} = -3/15\ V$, $R_{Gon,o} = 0.22\ \Omega$, $di/dt = 9.15\ kA/\mu s$ ($T_{vj} = 175\ ^\circ C$), $t_{dead} = 100\ ns$	$T_{vj} = 25\ ^\circ C$	0.52		mJ
			$T_{vj} = 125\ ^\circ C$	0.52		
			$T_{vj} = 175\ ^\circ C$	0.57		
Turn-off energy loss per pulse	E_{off}	$I_D = 50\ A$, $V_{DD} = 800\ V$, $L_\sigma = 15\ nH$, $V_{GS} = -3/18\ V$, $R_{Goff} = 0.22\ \Omega$, $dv/dt = 41.8\ kV/\mu s$ ($T_{vj} = 175\ ^\circ C$)	$T_{vj} = 25\ ^\circ C$	0.27		mJ
			$T_{vj} = 125\ ^\circ C$	0.31		
			$T_{vj} = 175\ ^\circ C$	0.34		
Thermal resistance, junction to heat sink	R_{thJH}	per MOSFET, $\lambda_{grease} = 5\ W/(m\cdot K)$		0.994		K/W
Temperature under switching conditions	$T_{vj\ op}$		-40		175	$^\circ C$
Temperature under overload switching conditions	$T_{vj\ over}$	Overload, cumulative max. 100 h			200	$^\circ C$

Note: The selection of positive and negative gate-source voltages impacts losses and the long-term behavior of the MOSFET and body diode. The design guidelines described in Application Notes AN 2018-09 and AN 2025-02 must be considered to ensure sound operation of the device over the planned lifetime.

3 Body diode (MOSFET, T1-T4)

Table 6 **Maximum rated values**

Parameter	Symbol	Note or test condition	Values	Unit
DC body diode forward current	I_{SD}	$T_{vj} = 175\ ^\circ C$, $V_{GS} = -3\ V$, $T_H = 25\ ^\circ C$	30	A
Pulsed body diode current	$I_{SD\ pulse}$		100	A

Table 7 Characteristic values

Parameter	Symbol	Note or test condition	Values			Unit
			Min.	Typ.	Max.	
Forward voltage	V_{SD}	$I_{SD} = 50 \text{ A}$, $V_{GS} = -3 \text{ V}$	$T_{vj} = 25 \text{ °C}$	4.35	5.35	V
			$T_{vj} = 125 \text{ °C}$	4.05		
			$T_{vj} = 175 \text{ °C}$	3.9		
Peak reverse recovery current	I_{rrm}	$I_{SD} = 50 \text{ A}$, $di_s/dt = 5.17 \text{ kA}/\mu\text{s}$, $V_{DD} = 800 \text{ V}$, $V_{GS} = -3 \text{ V}$, $t_{dead} = 1000 \text{ ns}$	$T_{vj} = 25 \text{ °C}$	43.1		A
			$T_{vj} = 125 \text{ °C}$	58.7		
			$T_{vj} = 175 \text{ °C}$	70.7		
Recovered charge	Q_{rr}	$I_{SD} = 50 \text{ A}$, $di_s/dt = 5.17 \text{ kA}/\mu\text{s}$, $V_{DD} = 800 \text{ V}$, $V_{GS} = -3 \text{ V}$, $t_{dead} = 1000 \text{ ns}$	$T_{vj} = 25 \text{ °C}$	0.45		μC
			$T_{vj} = 125 \text{ °C}$	0.88		
			$T_{vj} = 175 \text{ °C}$	1.21		
Reverse recovery energy	E_{rec}	$I_{SD} = 50 \text{ A}$, $di_s/dt = 5.17 \text{ kA}/\mu\text{s}$ ($T_{vj} = 175 \text{ °C}$), $V_{DD} = 800 \text{ V}$, $V_{GS} = -3 \text{ V}$, $t_{dead} = 1000 \text{ ns}$	$T_{vj} = 25 \text{ °C}$	0.12		mJ
			$T_{vj} = 125 \text{ °C}$	0.34		
			$T_{vj} = 175 \text{ °C}$	0.41		
Reverse recovery energy, optimized	$E_{rec,o}$	$I_{SD} = 50 \text{ A}$, $di_s/dt = 9.15 \text{ kA}/\mu\text{s}$ ($T_{vj} = 175 \text{ °C}$), $V_{DD} = 800 \text{ V}$, $V_{GS} = -3/18 \text{ V}$, $t_{dead} = 100 \text{ ns}$	$T_{vj} = 25 \text{ °C}$	0.19		mJ
			$T_{vj} = 125 \text{ °C}$	0.21		
			$T_{vj} = 175 \text{ °C}$	0.25		

4 NTC-Thermistor

Table 8 Characteristic values

Parameter	Symbol	Note or test condition	Values			Unit
			Min.	Typ.	Max.	
Rated resistance	R_{25}	$T_{NTC} = 25 \text{ °C}$		5		k Ω
Deviation of R_{100}	$\Delta R/R$	$T_{NTC} = 100 \text{ °C}$, $R_{100} = 493 \text{ }\Omega$	-5		5	%
Power dissipation	P_{25}	$T_{NTC} = 25 \text{ °C}$			20	mW
B-value	$B_{25/50}$	$R_2 = R_{25} \exp[B_{25/50}(1/T_2 - 1/(298,15 \text{ K}))]$		3375		K
B-value	$B_{25/80}$	$R_2 = R_{25} \exp[B_{25/80}(1/T_2 - 1/(298,15 \text{ K}))]$		3411		K
B-value	$B_{25/100}$	$R_2 = R_{25} \exp[B_{25/100}(1/T_2 - 1/(298,15 \text{ K}))]$		3433		K

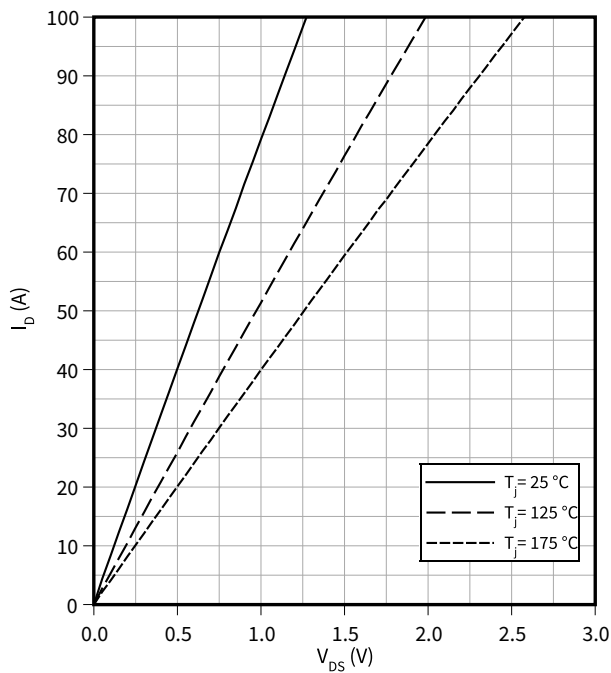
Note: For an analytical description of the NTC characteristics please refer to AN2009-10, chapter 4.

5 Characteristics diagrams

Output characteristic (typical), MOSFET, T1-T4

$I_D = f(V_{DS})$

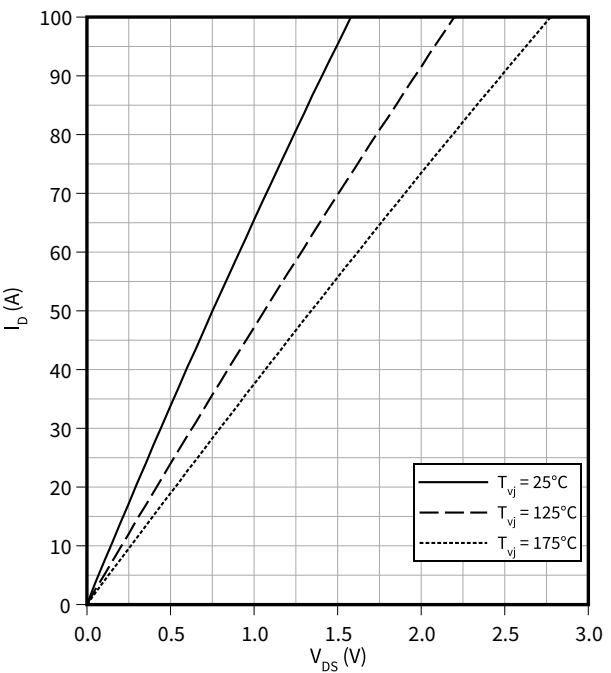
$V_{GS} = 18\text{ V}$



Output characteristic (typical), MOSFET, T1-T4

$I_D = f(V_{DS})$

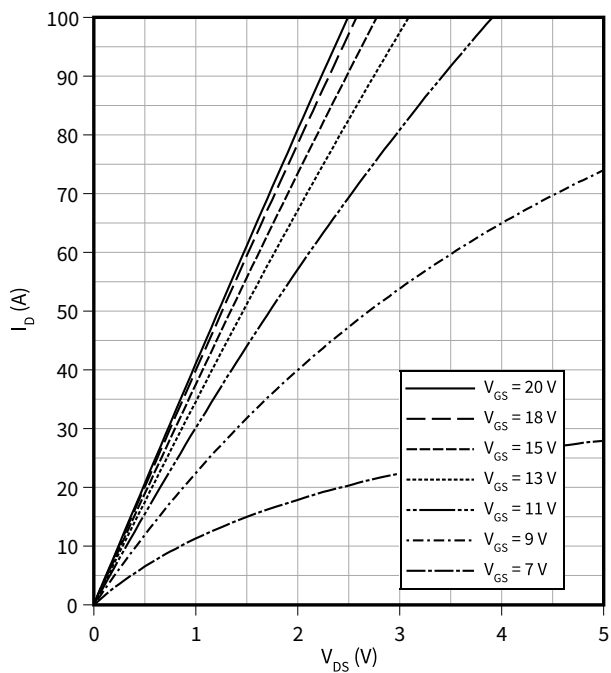
$V_{GS} = 15\text{ V}$



Output characteristic field (typical), MOSFET, T1-T4

$I_D = f(V_{DS})$

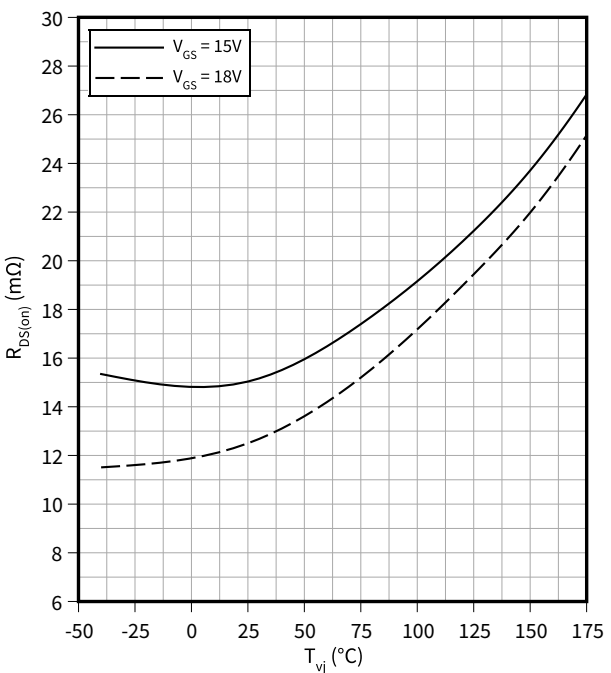
$T_{vj} = 175\text{ °C}$



Drain source on-resistance (typical), MOSFET, T1-T4

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

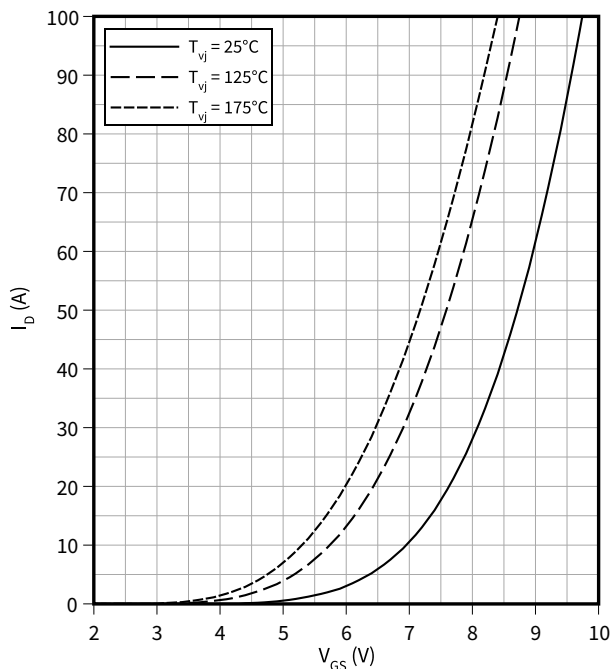
$I_D = 50\text{ A}$



5 Characteristics diagrams

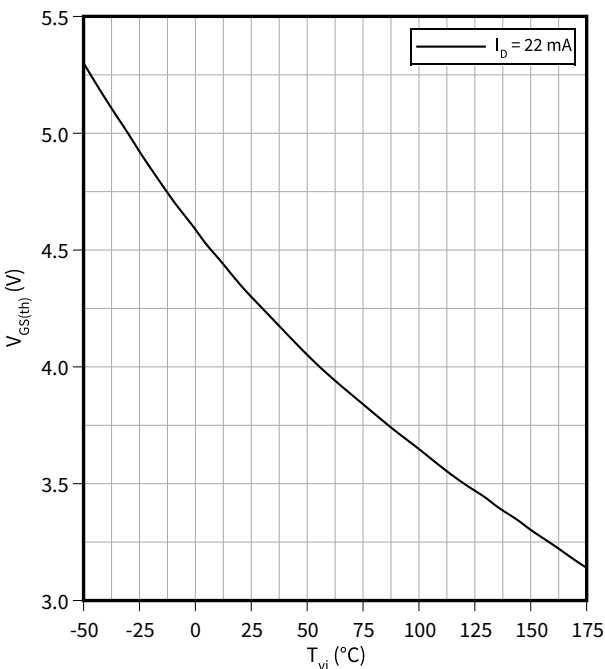
Transfer characteristic (typical), MOSFET, T1-T4

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



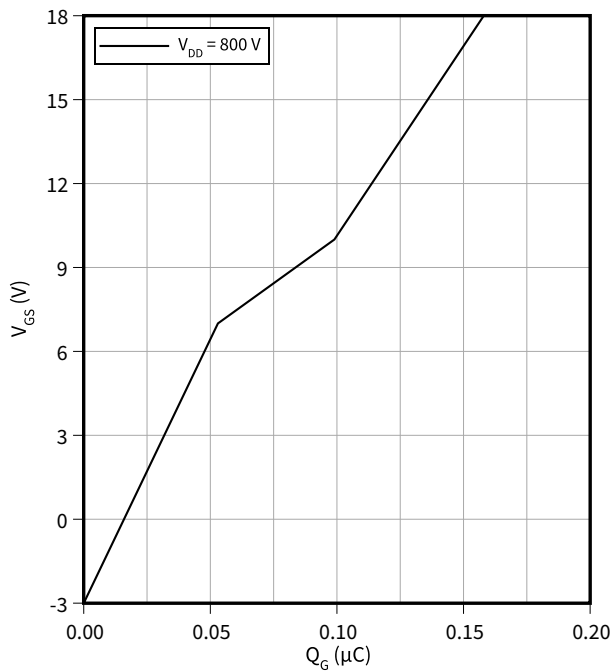
Gate-source threshold voltage (typical), MOSFET, T1-T4

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



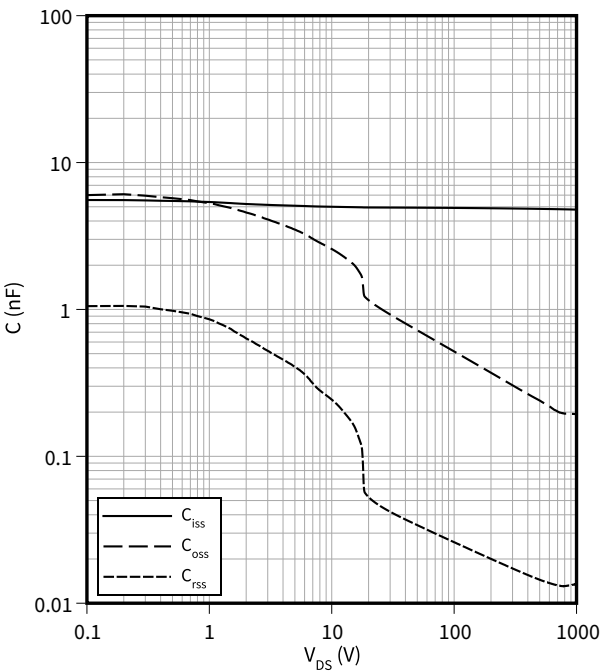
Gate charge characteristic (typical), MOSFET, T1-T4

$V_{GS} = f(Q_G)$
 $I_D = 50\text{ A}$, $T_{vj} = 25^\circ\text{C}$



Capacity characteristic (typical), MOSFET, T1-T4

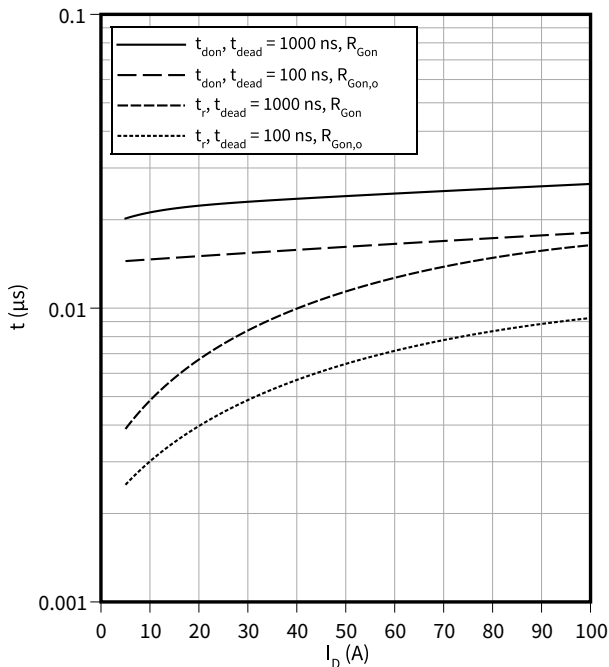
$C = f(V_{DS})$
 $f = 100\text{ kHz}$, $T_{vj} = 25^\circ\text{C}$, $V_{GS} = 0\text{ V}$



5 Characteristics diagrams

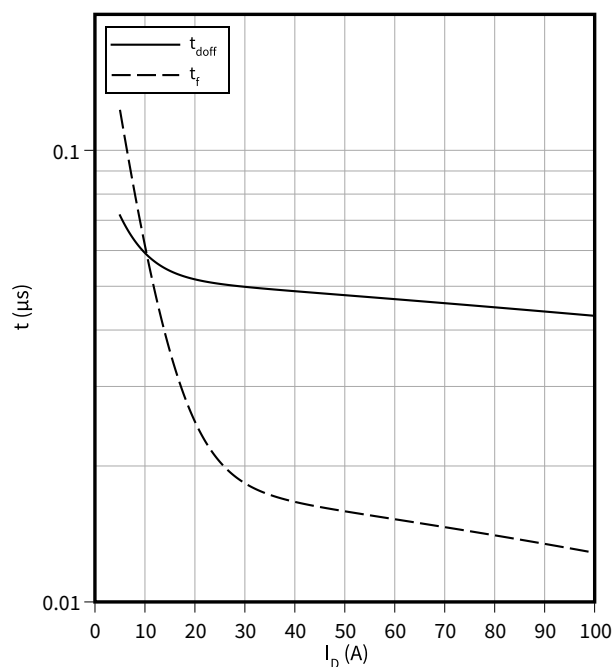
Switching times (typical), MOSFET, T1-T4

$t = f(I_D)$
 $R_{Gon} = 4.7 \Omega$, $V_{DD} = 800 \text{ V}$, $R_{Gon,o} = 0.22 \Omega$, $T_{vj} = 175 \text{ }^\circ\text{C}$,
 $V_{GS} = -3/18 \text{ V}$



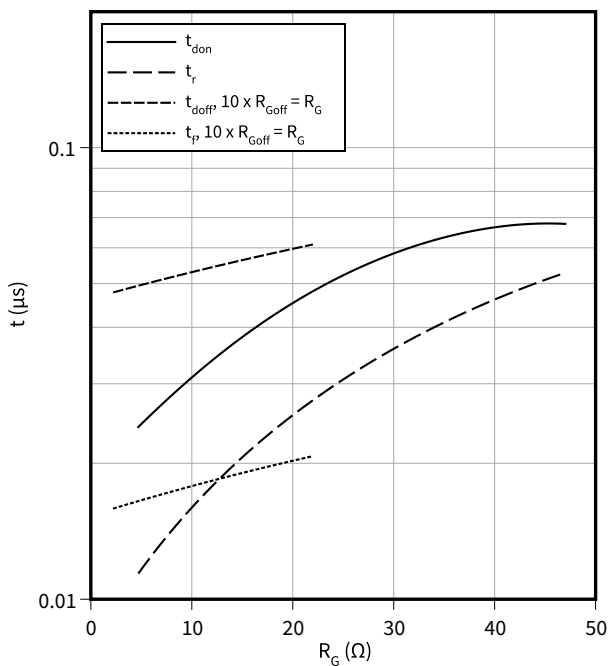
Switching times (typical), MOSFET, T1-T4

$t = f(I_D)$
 $R_{Goff} = 0.22 \Omega$, $V_{DD} = 800 \text{ V}$, $T_{vj} = 175 \text{ }^\circ\text{C}$, $V_{GS} = -3/18 \text{ V}$



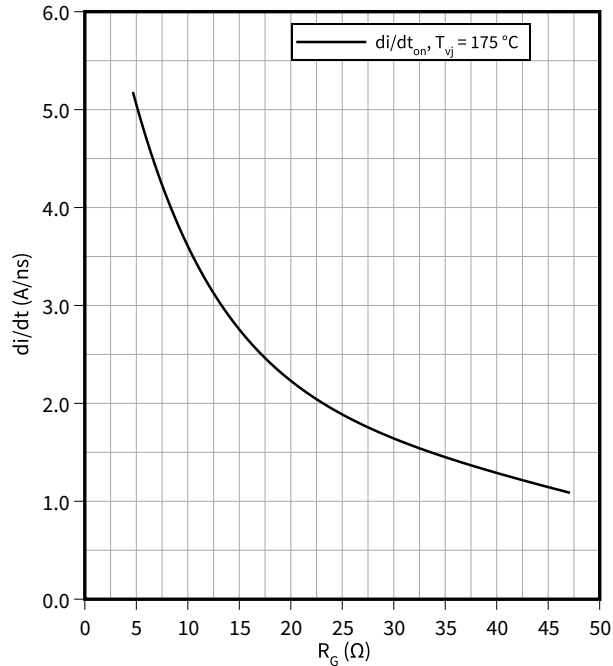
Switching times (typical), MOSFET, T1-T4

$t = f(R_G)$
 $V_{DD} = 800 \text{ V}$, $t_{dead} = 1000 \text{ ns}$, $I_D = 50 \text{ A}$, $T_{vj} = 175 \text{ }^\circ\text{C}$,
 $V_{GS} = -3/18 \text{ V}$



Current slope (typical), MOSFET, T1-T4

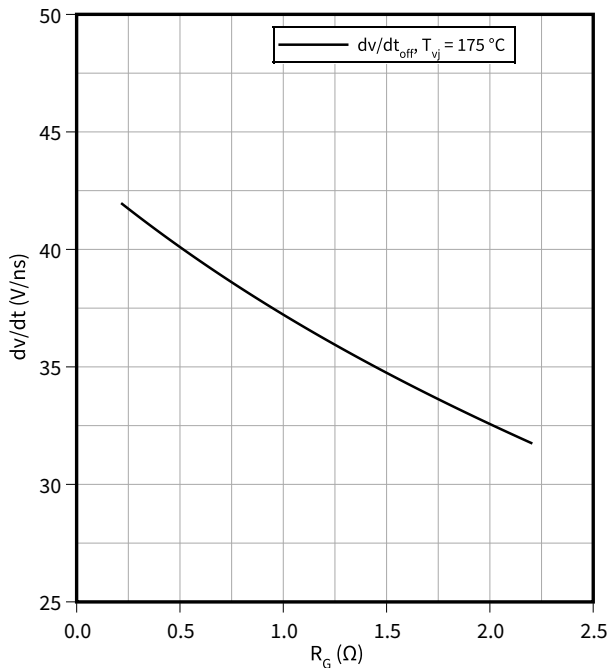
$di/dt = f(R_G)$
 $V_{DD} = 800 \text{ V}$, $t_{dead} = 1000 \text{ ns}$, $I_D = 50 \text{ A}$, $V_{GS} = -3/18 \text{ V}$



5 Characteristics diagrams

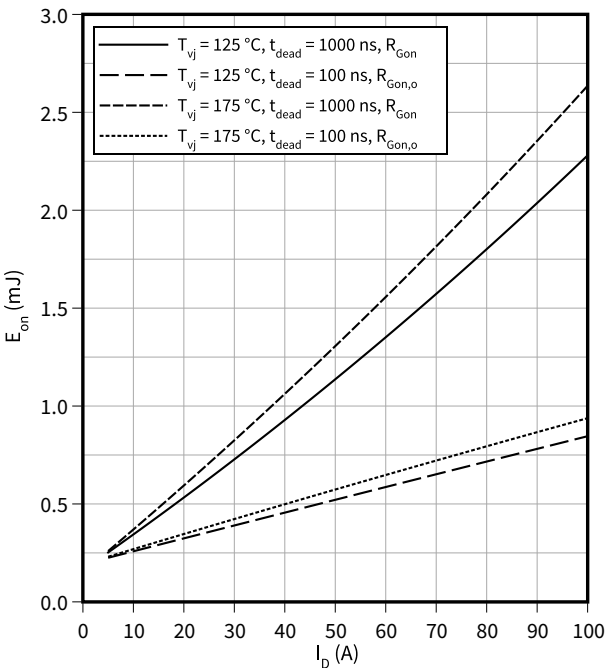
Voltage slope (typical), MOSFET, T1-T4

$dv/dt = f(R_G)$
 $V_{DD} = 800\text{ V}$, $I_D = 50\text{ A}$, $V_{GS} = -3/18\text{ V}$



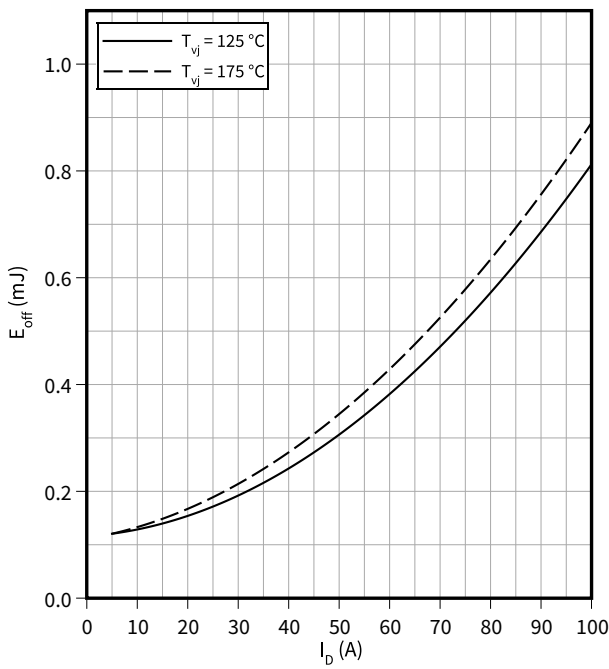
Switching losses (typical), MOSFET, T1-T4

$E_{on} = f(I_D)$
 $R_{Gon} = 4.7\text{ }\Omega$, $V_{DD} = 800\text{ V}$, $R_{Gon,o} = 0.22\text{ }\Omega$, $V_{GS} = -3/18\text{ V}$



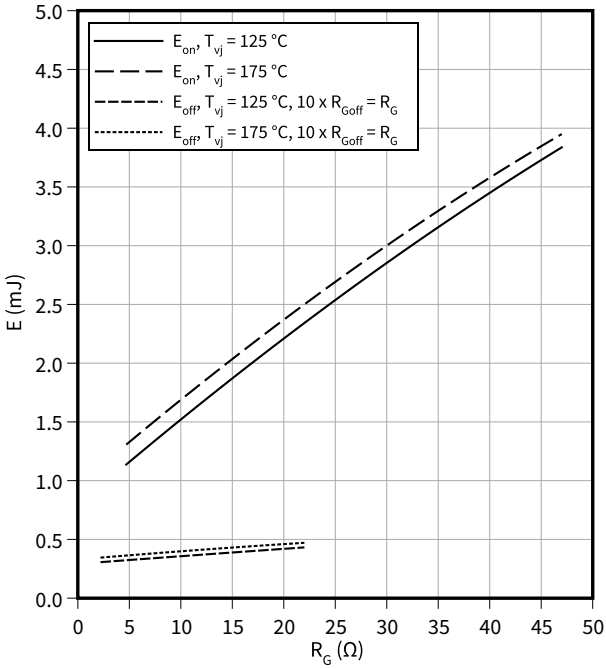
Switching losses (typical), MOSFET, T1-T4

$E_{off} = f(I_D)$
 $R_{Goff} = 0.22\text{ }\Omega$, $V_{DD} = 800\text{ V}$, $V_{GS} = -3/18\text{ V}$



Switching losses (typical), MOSFET, T1-T4

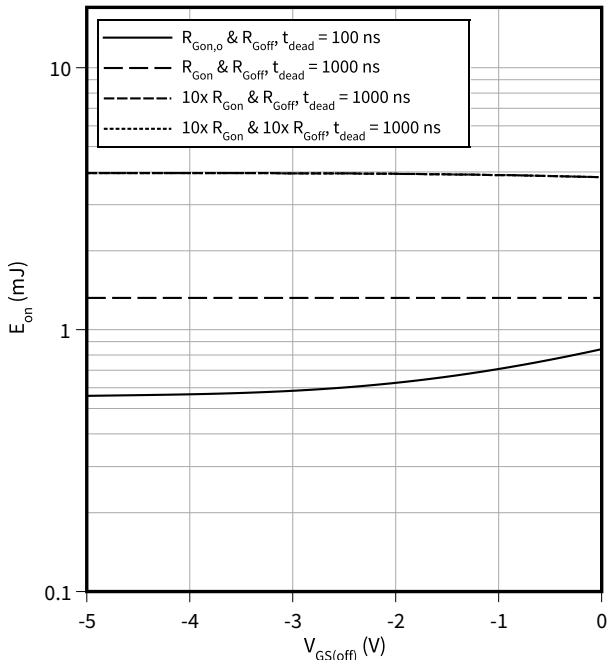
$E = f(R_G)$
 $V_{DD} = 800\text{ V}$, $t_{dead} = 1000\text{ ns}$, $I_D = 50\text{ A}$, $V_{GS} = -3/18\text{ V}$



5 Characteristics diagrams

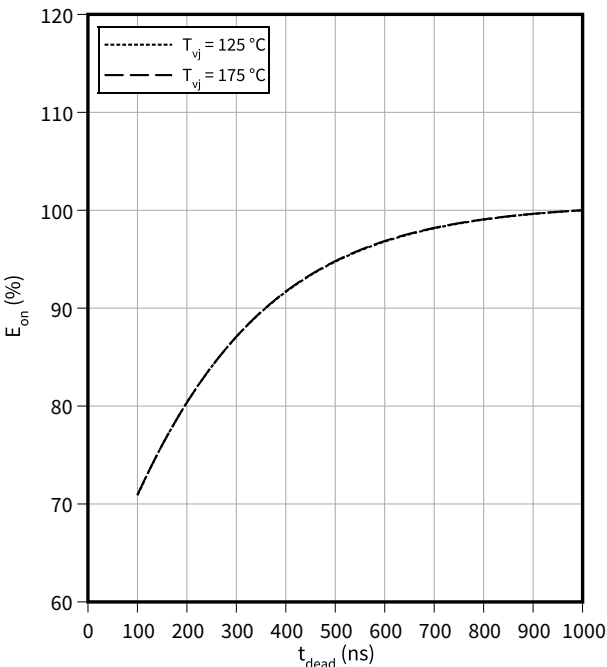
Switching losses (typical), MOSFET, T1-T4

$E_{on} = f(V_{GS(off)})$
 $R_{Goff} = 0.22 \Omega$, $V_{DD} = 800 \text{ V}$, $R_{Gon} = 4.7 \Omega$, $I_D = 50 \text{ A}$,
 $V_{GS(on)} = 18 \text{ V}$, $R_{Gon,o} = 0.22 \Omega$, $T_{vj} = 175 \text{ }^\circ\text{C}$



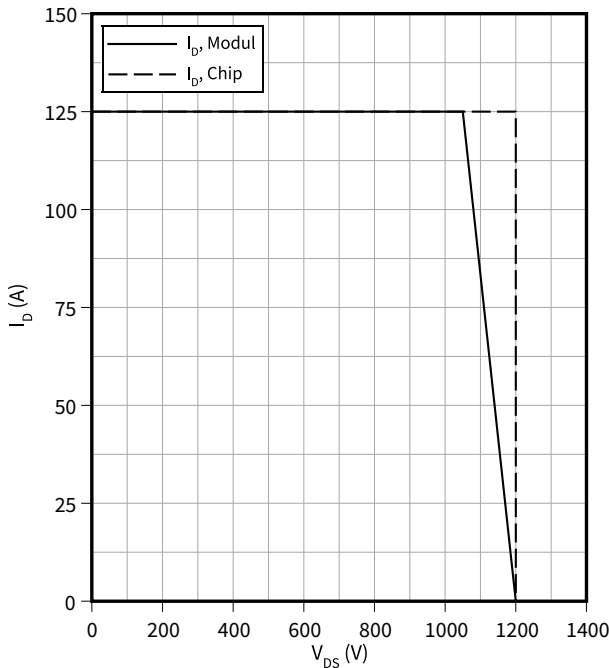
Switching losses (typical), MOSFET, T1-T4

$E_{on} = f(t_{dead})$
 $R_{Gon} = 4.7 \Omega$, $I_D = 50 \text{ A}$, $V_{DD} = 800 \text{ V}$, $V_{GS} = -3/18 \text{ V}$



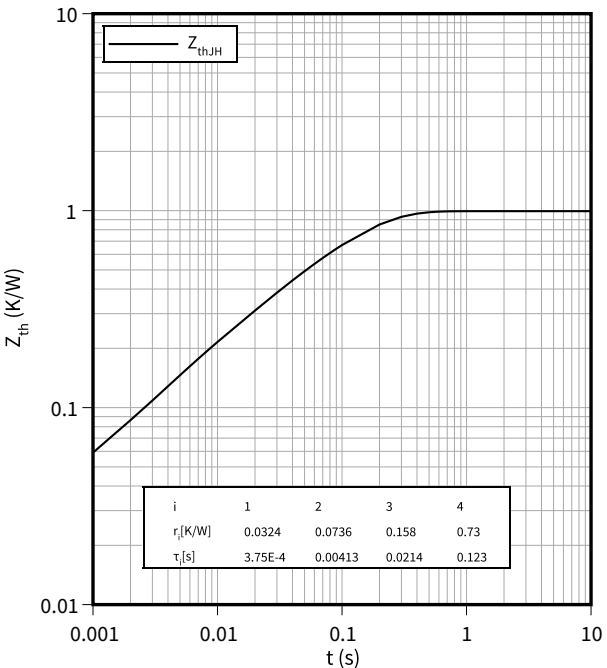
Reverse bias safe operating area (RBSOA), MOSFET, T1-T4

$I_D = f(V_{DS})$
 $R_{Goff} = 0.22 \Omega$, $T_{vj} = 175 \text{ }^\circ\text{C}$, $V_{GS} = -3/18 \text{ V}$



Transient thermal impedance, MOSFET, T1-T4

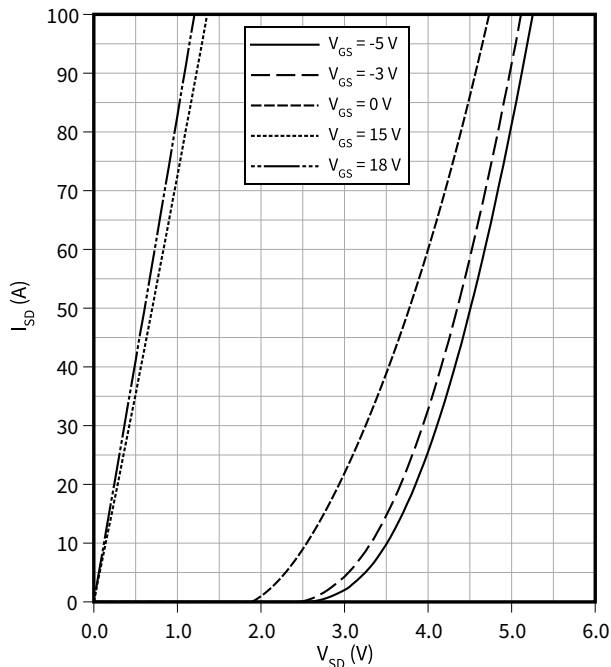
$Z_{th} = f(t)$



5 Characteristics diagrams

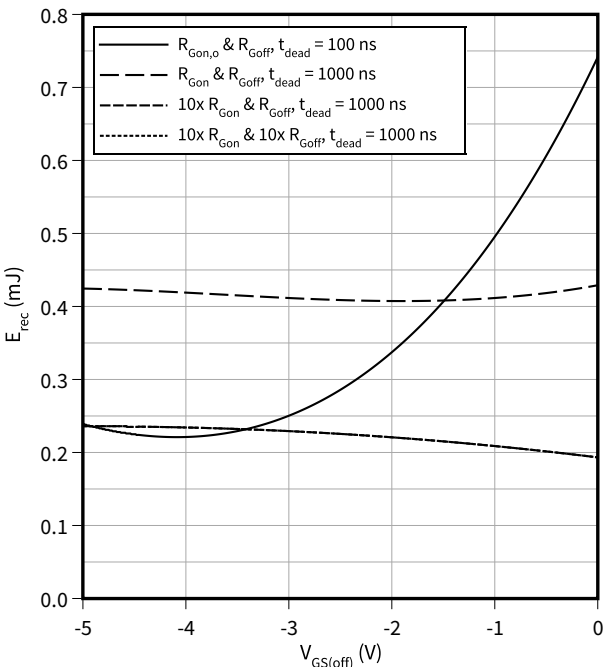
Forward characteristic body diode (typical), MOSFET, T1-T4

$I_{SD} = f(V_{SD})$
 $T_{vj} = 25\text{ °C}$



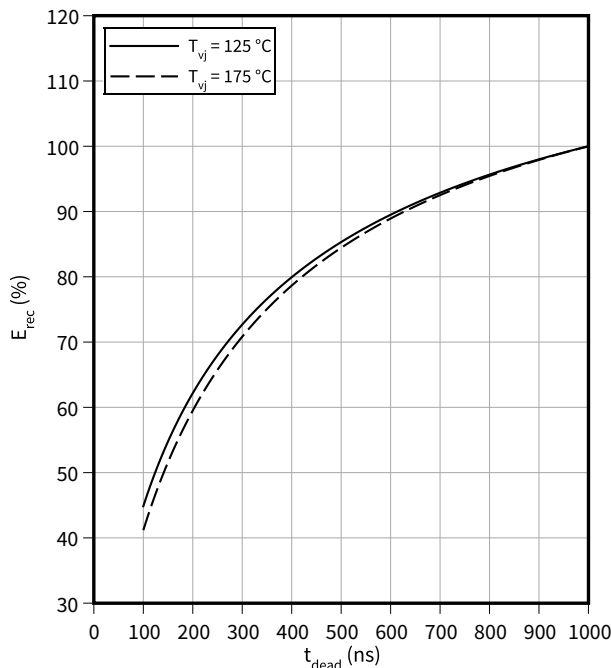
Switching losses body diode (typical), MOSFET, T1-T4

$E_{rec} = f(V_{GS(off)})$
 $R_{Goff} = 0.22\text{ }\Omega$, $R_{Gon} = 4.7\text{ }\Omega$, $V_{GS(on)} = 18\text{ V}$, $I_{SD} = 50\text{ A}$,
 $R_{Gon,o} = 0.22\text{ }\Omega$, $V_{DD} = 800\text{ V}$, $T_{vj} = 175\text{ °C}$



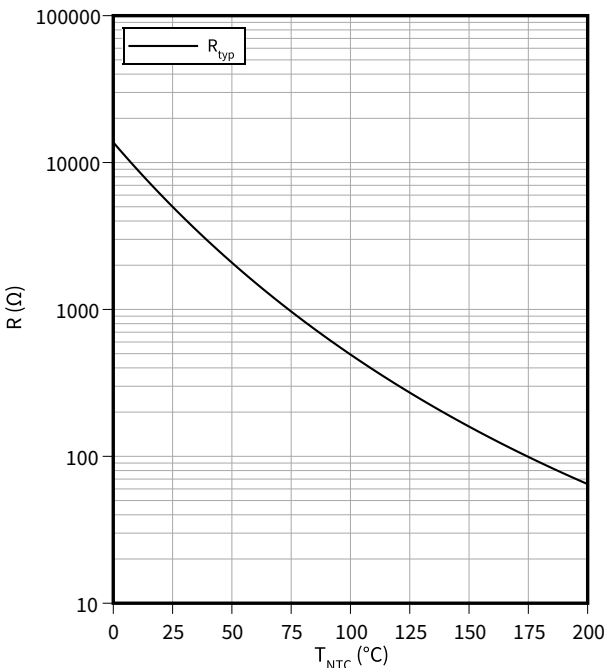
Switching losses body diode (typical), MOSFET, T1-T4

$E_{rec} = f(t_{dead})$
 $R_{Gon} = 4.7\text{ }\Omega$, $I_D = 50\text{ A}$, $V_{DD} = 800\text{ V}$, $V_{GS} = -3/18\text{ V}$



Temperature characteristic (typical), NTC-Thermistor

$R = f(T_{NTC})$



6 Circuit diagram

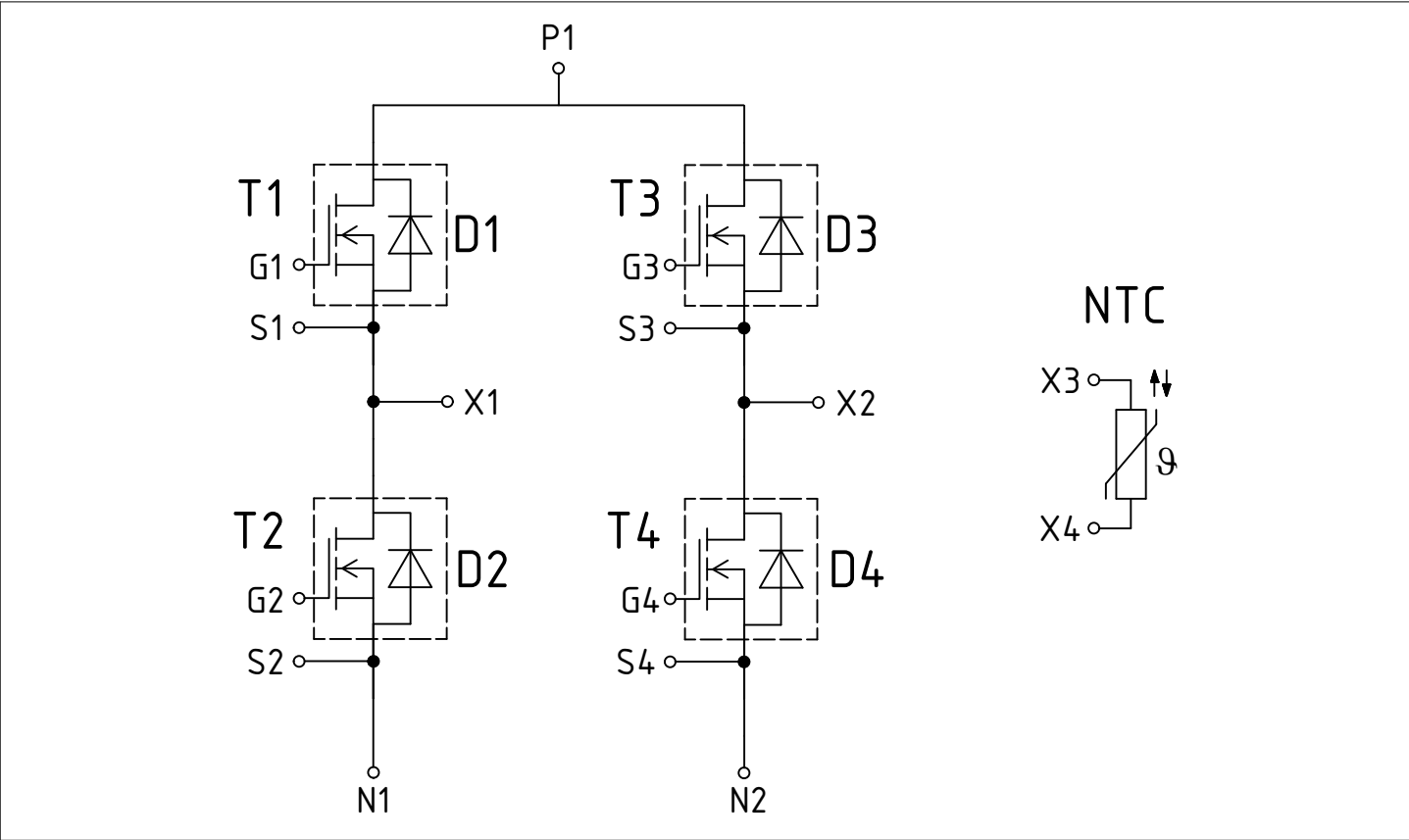


Figure 1

7 Package outlines

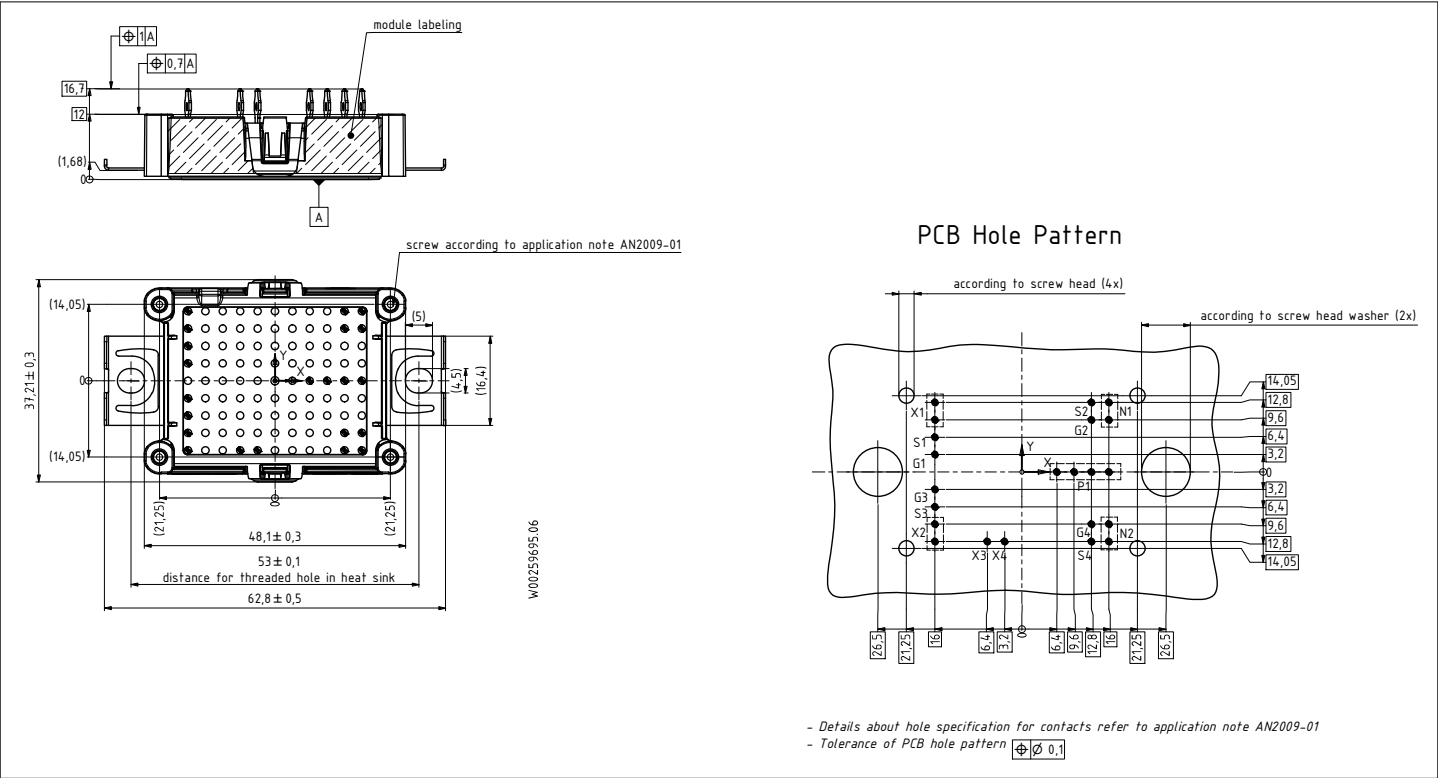


Figure 2

8 Module label code

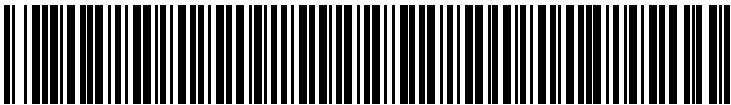
Module label code			
Code format	Data Matrix		Barcode Code128
Encoding	ASCII text		Code Set A
Symbol size	16x16		23 digits
Standard	IEC24720 and IEC16022		IEC8859-1
Code content	<i>Content</i> Module serial number Module material number Production order number Date code (production year) Date code (production week)	<i>Digit</i> 1 - 5 6 - 11 12 - 19 20 - 21 22 - 23	<i>Example</i> 71549 142846 55054991 15 30
Example	  7154914284655054991153071549142846550549911530		

Figure 3



Revision history

Revision history

Document revision	Date of release	Description of changes
0.10	2024-11-12	Initial version
0.20	2025-07-02	Preliminary datasheet
1.00	2026-03-02	Final datasheet

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