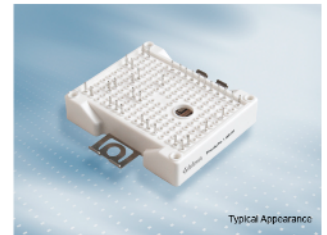


EasyPACK™ module with Trench/Fieldstop IGBT H3 and rapid diode and PressFIT / NTC**Features**

- Electrical features
 - $V_{CES} = 650\text{ V}$
 - $I_{C\text{ nom}} = 100\text{ A} / I_{CRM} = 200\text{ A}$
 - Increased blocking voltage capability up to 650 V
 - Low inductive design
 - Low switching losses
 - Low $V_{CE,sat}$
- Mechanical features
 - Al_2O_3 substrate with low thermal resistance
 - Compact design
 - PressFIT contact technology
 - Rugged mounting due to integrated mounting clamps

**Potential applications**

- Three-level applications
- Motor drives
- Solar applications
- UPS systems

Product validation

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

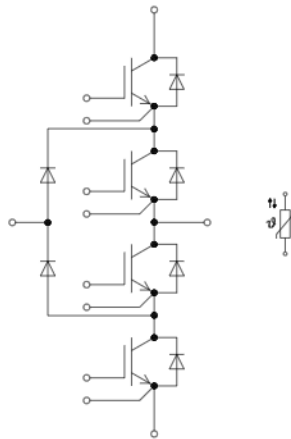
Description

Table of contents

	Description	1
	Features	1
	Potential applications	1
	Product validation	1
	Table of contents	2
1	Package	3
2	IGBT, T1 / T4	3
3	IGBT, T2 / T3	5
4	Diode, D1 / D4	6
5	Diode, D2 / D3	7
6	Diode, D5 / D6	8
7	NTC-Thermistor	9
8	Characteristics diagrams	10
9	Circuit diagram	18
10	Package outlines	19
11	Module label code	20
	Revision history	21
	Disclaimer	22

1 Package

Table 1 Insulation coordination

Parameter	Symbol	Note or test condition	Values	Unit
Isolation test voltage	V_{ISOL}	RMS, $f = 50 \text{ Hz}$, $t = 1 \text{ min}$	3.0	kV
Internal isolation		basic insulation (class 1, IEC 61140)	Al_2O_3	
Creepage distance	d_{Creep}	terminal to heatsink	11.5	mm
Creepage distance	d_{Creep}	terminal to terminal	6.3	mm
Clearance	d_{Clear}	terminal to heatsink	10.0	mm
Clearance	d_{Clear}	terminal to terminal	5.0	mm
Comparative tracking index	CTI		>200	
Relative thermal index (electrical)	RTI	housing	140	°C

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	$R_{CC'+EE'}$	$T_H = 25^\circ\text{C}$, per switch		2.8		mΩ
Storage temperature	T_{stg}		-40		125	°C
Mounting force per clamp	F		40		80	N
Weight	G			39		g

Note: The current under continuous operation is limited to 25A rms per connector pin

2 IGBT, T1 / T4

Table 3 Maximum rated values

Parameter	Symbol	Note or test condition		Values	Unit
Collector-emitter voltage	V_{CES}		$T_{vj} = 25^\circ\text{C}$	650	V
Implemented collector current	I_{CN}			100	A
Continuous DC collector current	I_{CDC}	$T_{vj \text{ max}} = 175^\circ\text{C}$	$T_H = 65^\circ\text{C}$	70	A
Repetitive peak collector current	I_{CRM}	$t_p = 1 \text{ ms}$		200	A
Gate-emitter peak voltage	V_{GES}			±20	V

Table 4 **Characteristic values**

Parameter	Symbol	Note or test condition		Values			Unit
				Min.	Typ.	Max.	
Collector-emitter saturation voltage	$V_{CE\ sat}$	$I_C = 100\ A, V_{GE} = 15\ V$	$T_{vj} = 25\ ^\circ C$		1.68	2.00	V
			$T_{vj} = 125\ ^\circ C$		1.86		
			$T_{vj} = 150\ ^\circ C$		1.89		
Gate threshold voltage	V_{GEth}	$I_C = 1.6\ mA, V_{CE} = V_{GE}, T_{vj} = 25\ ^\circ C$		5.05	5.75	6.45	V
Gate charge	Q_G	$V_{GE} = \pm 15\ V, V_{CE} = 400\ V$			1		μC
Internal gate resistor	R_{Gint}	$T_{vj} = 25\ ^\circ C$			0		Ω
Input capacitance	C_{ies}	$f = 100\ kHz, T_{vj} = 25\ ^\circ C, V_{CE} = 650\ V, V_{GE} = 0\ V$			5.9		nF
Reverse transfer capacitance	C_{res}	$f = 100\ kHz, T_{vj} = 25\ ^\circ C, V_{CE} = 650\ V, V_{GE} = 0\ V$			0.192		nF
Collector-emitter cut-off current	I_{CES}	$V_{CE} = 650\ V, V_{GE} = 0\ V$	$T_{vj} = 25\ ^\circ C$			0.008	mA
Gate-emitter leakage current	I_{GES}	$V_{CE} = 650\ V, V_{GE} = 0\ V, T_{vj} = 25\ ^\circ C$				100	nA
Turn-on delay time (inductive load)	t_{don}	$I_C = 100\ A, V_{CE} = 300\ V, V_{GE} = \pm 15\ V, R_{Gon} = 5.1\ \Omega$	$T_{vj} = 25\ ^\circ C$		0.026		μs
			$T_{vj} = 125\ ^\circ C$		0.027		
			$T_{vj} = 150\ ^\circ C$		0.027		
Rise time (inductive load)	t_r	$I_C = 100\ A, V_{CE} = 300\ V, V_{GE} = \pm 15\ V, R_{Gon} = 5.1\ \Omega$	$T_{vj} = 25\ ^\circ C$		0.028		μs
			$T_{vj} = 125\ ^\circ C$		0.038		
			$T_{vj} = 150\ ^\circ C$		0.040		
Turn-off delay time (inductive load)	t_{doff}	$I_C = 100\ A, V_{CE} = 300\ V, V_{GE} = \pm 15\ V, R_{Goff} = 5.1\ \Omega$	$T_{vj} = 25\ ^\circ C$		0.200		μs
			$T_{vj} = 125\ ^\circ C$		0.220		
			$T_{vj} = 150\ ^\circ C$		0.230		
Fall time (inductive load)	t_f	$I_C = 100\ A, V_{CE} = 300\ V, V_{GE} = \pm 15\ V, R_{Goff} = 5.1\ \Omega$	$T_{vj} = 25\ ^\circ C$		0.044		μs
			$T_{vj} = 125\ ^\circ C$		0.081		
			$T_{vj} = 150\ ^\circ C$		0.091		
Turn-on energy loss per pulse	E_{on}	$I_C = 100\ A, V_{CE} = 300\ V, L_\sigma = 35\ nH, V_{GE} = \pm 15\ V, R_{Gon} = 5.1\ \Omega, di/dt = 3400\ A/\mu s (T_{vj} = 150\ ^\circ C)$	$T_{vj} = 25\ ^\circ C$		2.2		mJ
			$T_{vj} = 125\ ^\circ C$		2.71		
			$T_{vj} = 150\ ^\circ C$		2.75		
Turn-off energy loss per pulse	E_{off}	$I_C = 100\ A, V_{CE} = 300\ V, L_\sigma = 35\ nH, V_{GE} = \pm 15\ V, R_{Goff} = 5.1\ \Omega, dv/dt = 5200\ V/\mu s (T_{vj} = 150\ ^\circ C)$	$T_{vj} = 25\ ^\circ C$		1.44		mJ
			$T_{vj} = 125\ ^\circ C$		2.14		
			$T_{vj} = 150\ ^\circ C$		2.38		
Thermal resistance, junction to heat sink	R_{thJH}	per IGBT			0.782		K/W
Temperature under switching conditions	$T_{vj\ op}$			-40		150	$^\circ C$

3 IGBT, T2 / T3

Table 5 Maximum rated values

Parameter	Symbol	Note or test condition		Values	Unit
Collector-emitter voltage	V_{CES}		$T_{vj} = 25\text{ °C}$	650	V
Implemented collector current	I_{CN}			100	A
Continuous DC collector current	I_{CDC}	$T_{vj\text{ max}} = 175\text{ °C}$	$T_H = 65\text{ °C}$	70	A
Repetitive peak collector current	I_{CRM}	$t_P = 1\text{ ms}$		200	A
Gate-emitter peak voltage	V_{GES}			± 20	V

Table 6 Characteristic values

Parameter	Symbol	Note or test condition		Values			Unit
				Min.	Typ.	Max.	
Collector-emitter saturation voltage	$V_{CE\text{ sat}}$	$I_C = 100\text{ A}, V_{GE} = 15\text{ V}$	$T_{vj} = 25\text{ °C}$		1.45	1.90	V
			$T_{vj} = 125\text{ °C}$		1.61		
			$T_{vj} = 150\text{ °C}$		1.68		
Gate threshold voltage	V_{GEth}	$I_C = 1.6\text{ mA}, V_{CE} = 20\text{ V}, T_{vj} = 25\text{ °C}$		5.05	5.75	6.45	V
Gate charge	Q_G	$V_{GE} = \pm 15\text{ V}, V_{CE} = 400\text{ V}$			1		μC
Internal gate resistor	R_{Gint}	$T_{vj} = 25\text{ °C}$			0		Ω
Input capacitance	C_{ies}	$f = 100\text{ kHz}, T_{vj} = 25\text{ °C}, V_{CE} = 650\text{ V}, V_{GE} = 0\text{ V}$			6.2		nF
Reverse transfer capacitance	C_{res}	$f = 100\text{ kHz}, T_{vj} = 25\text{ °C}, V_{CE} = 650\text{ V}, V_{GE} = 0\text{ V}$			0.19		nF
Collector-emitter cut-off current	I_{CES}	$V_{CE} = 650\text{ V}, V_{GE} = 0\text{ V}$	$T_{vj} = 25\text{ °C}$			0.032	mA
Gate-emitter leakage current	I_{GES}	$V_{CE} = 650\text{ V}, V_{GE} = 0\text{ V}, T_{vj} = 25\text{ °C}$				100	nA
Turn-on delay time (inductive load)	t_{don}	$I_C = 100\text{ A}, V_{CE} = 300\text{ V}, V_{GE} = \pm 15\text{ V}, R_{Gon} = 1.5\text{ }\Omega$	$T_{vj} = 25\text{ °C}$		0.014		μs
			$T_{vj} = 125\text{ °C}$		0.015		
			$T_{vj} = 150\text{ °C}$		0.015		
Rise time (inductive load)	t_r	$I_C = 100\text{ A}, V_{CE} = 300\text{ V}, V_{GE} = \pm 15\text{ V}, R_{Gon} = 1.5\text{ }\Omega$	$T_{vj} = 25\text{ °C}$		0.014		μs
			$T_{vj} = 125\text{ °C}$		0.021		
			$T_{vj} = 150\text{ °C}$		0.022		
Turn-off delay time (inductive load)	t_{doff}	$I_C = 100\text{ A}, V_{CE} = 300\text{ V}, V_{GE} = \pm 15\text{ V}, R_{Goff} = 1.5\text{ }\Omega$	$T_{vj} = 25\text{ °C}$		0.168		μs
			$T_{vj} = 125\text{ °C}$		0.194		
			$T_{vj} = 150\text{ °C}$		0.201		
Fall time (inductive load)	t_f	$I_C = 100\text{ A}, V_{CE} = 300\text{ V}, V_{GE} = \pm 15\text{ V}, R_{Goff} = 1.5\text{ }\Omega$	$T_{vj} = 25\text{ °C}$		0.107		μs
			$T_{vj} = 125\text{ °C}$		0.156		
			$T_{vj} = 150\text{ °C}$		0.172		

(table continues...)

Table 6 (continued) Characteristic values

Parameter	Symbol	Note or test condition	Values			Unit
			Min.	Typ.	Max.	
Turn-on energy loss per pulse	E_{on}	$I_C = 100\text{ A}$, $V_{CE} = 300\text{ V}$, $L_\sigma = 35\text{ nH}$, $V_{GE} = \pm 15\text{ V}$, $R_{Gon} = 1.5\ \Omega$, $di/dt = 3900\text{ A}/\mu\text{s}$ ($T_{vj} = 150\text{ }^\circ\text{C}$)	$T_{vj} = 25\text{ }^\circ\text{C}$	0.261		mJ
			$T_{vj} = 125\text{ }^\circ\text{C}$	0.469		
			$T_{vj} = 150\text{ }^\circ\text{C}$	0.538		
Turn-off energy loss per pulse	E_{off}	$I_C = 100\text{ A}$, $V_{CE} = 300\text{ V}$, $L_\sigma = 35\text{ nH}$, $V_{GE} = \pm 15\text{ V}$, $R_{Goff} = 1.5\ \Omega$, $dv/dt = 3600\text{ V}/\mu\text{s}$ ($T_{vj} = 150\text{ }^\circ\text{C}$)	$T_{vj} = 25\text{ }^\circ\text{C}$	2.45		mJ
			$T_{vj} = 125\text{ }^\circ\text{C}$	3.31		
			$T_{vj} = 150\text{ }^\circ\text{C}$	3.53		
Thermal resistance, junction to heat sink	R_{thJH}	per IGBT		0.782		K/W
Temperature under switching conditions	$T_{vj\text{ op}}$		-40		150	$^\circ\text{C}$

4 Diode, D1 / D4

Table 7 Maximum rated values

Parameter	Symbol	Note or test condition		Values	Unit
Repetitive peak reverse voltage	V_{RRM}		$T_{vj} = 25\text{ }^{\circ}\text{C}$	650	V
Continuous DC forward current	I_F			100	A
Repetitive peak forward current	I_{FRM}	$t_P = 1\text{ ms}$		200	A
I^2t - value	I^2t	$V_R = 0\text{ V}$, $t_P = 10\text{ ms}$	$T_{vj} = 125\text{ }^{\circ}\text{C}$	1750	A^2s
			$T_{vj} = 150\text{ }^{\circ}\text{C}$	1650	

Table 8 Characteristic values

Parameter	Symbol	Note or test condition	Values			Unit
			Min.	Typ.	Max.	
Forward voltage	V_F	$I_F = 100\text{ A}$, $V_{GE} = 0\text{ V}$	$T_{vj} = 25\text{ }^\circ\text{C}$	1.55	1.95	V
			$T_{vj} = 125\text{ }^\circ\text{C}$	1.50		
			$T_{vj} = 150\text{ }^\circ\text{C}$	1.45		
Peak reverse recovery current	I_{RM}	$I_F = 100\text{ A}$, $V_R = 300\text{ V}$, $V_{GE} = -15\text{ V}$, $-di_F/dt = 3900\text{ A}/\mu\text{s}$ ($T_{vj} = 150\text{ }^\circ\text{C}$)	$T_{vj} = 25\text{ }^\circ\text{C}$	87.9		A
			$T_{vj} = 125\text{ }^\circ\text{C}$	102		
			$T_{vj} = 150\text{ }^\circ\text{C}$	104		

(table continues...)

Table 8 (continued) Characteristic values

Parameter	Symbol	Note or test condition	Values			Unit
			Min.	Typ.	Max.	
Recovered charge	Q_r	$I_F = 100\text{ A}$, $V_R = 300\text{ V}$, $V_{GE} = -15\text{ V}$, $-di_F/dt = 3900\text{ A}/\mu\text{s}$ ($T_{vj} = 150\text{ °C}$)	$T_{vj} = 25\text{ °C}$	3.77		μC
			$T_{vj} = 125\text{ °C}$	7.07		
			$T_{vj} = 150\text{ °C}$	8.26		
Reverse recovery energy	E_{rec}	$I_F = 100\text{ A}$, $V_R = 300\text{ V}$, $V_{GE} = -15\text{ V}$, $-di_F/dt = 3900\text{ A}/\mu\text{s}$ ($T_{vj} = 150\text{ °C}$)	$T_{vj} = 25\text{ °C}$	0.835		mJ
			$T_{vj} = 125\text{ °C}$	1.52		
			$T_{vj} = 150\text{ °C}$	1.73		
Thermal resistance, junction to heat sink	R_{thJH}	per diode		0.975		K/W
Temperature under switching conditions	$T_{vj\text{ op}}$		-40		150	$^{\circ}\text{C}$

5 Diode, D2 / D3

Table 9 Maximum rated values

Parameter	Symbol	Note or test condition		Values	Unit
Repetitive peak reverse voltage	V_{RRM}		$T_{vj} = 25\text{ }^{\circ}\text{C}$	650	V
Continuous DC forward current	I_F			100	A
Repetitive peak forward current	I_{FRM}	$t_p = 1\text{ ms}$		200	A
I^2t - value	I^2t	$V_R = 0\text{ V}$, $t_p = 10\text{ ms}$	$T_{vj} = 125\text{ }^{\circ}\text{C}$	1750	A^2s
			$T_{vj} = 150\text{ }^{\circ}\text{C}$	1650	

Table 10 Characteristic values

Parameter	Symbol	Note or test condition	Values			Unit
			Min.	Typ.	Max.	
Forward voltage	V_F	$I_F = 100\text{ A}$, $V_{GE} = 0\text{ V}$	$T_{vj} = 25\text{ °C}$	1.55	1.95	V
			$T_{vj} = 125\text{ °C}$	1.50		
			$T_{vj} = 150\text{ °C}$	1.45		
Peak reverse recovery current	I_{RM}	$I_F = 100\text{ A}$, $V_R = 300\text{ V}$, $V_{GE} = -15\text{ V}$, $-di_F/dt = 3900\text{ A}/\mu\text{s}$ ($T_{vj} = 150\text{ °C}$)	$T_{vj} = 25\text{ °C}$	87.9		A
			$T_{vj} = 125\text{ °C}$	102		
			$T_{vj} = 150\text{ °C}$	104		

(table continues...)

Table 10 (continued) Characteristic values

Parameter	Symbol	Note or test condition	Values			Unit
			Min.	Typ.	Max.	
Recovered charge	Q_r	$I_F = 100\text{ A}$, $V_R = 300\text{ V}$, $V_{GE} = -15\text{ V}$, $-di_F/dt = 3900\text{ A}/\mu\text{s}$ ($T_{vj} = 150\text{ °C}$)	$T_{vj} = 25\text{ °C}$	3.77		μC
			$T_{vj} = 125\text{ °C}$	7.07		
			$T_{vj} = 150\text{ °C}$	8.26		
Reverse recovery energy	E_{rec}	$I_F = 100\text{ A}$, $V_R = 300\text{ V}$, $V_{GE} = -15\text{ V}$, $-di_F/dt = 3900\text{ A}/\mu\text{s}$ ($T_{vj} = 150\text{ °C}$)	$T_{vj} = 25\text{ °C}$	0.835		mJ
			$T_{vj} = 125\text{ °C}$	1.52		
			$T_{vj} = 150\text{ °C}$	1.73		
Thermal resistance, junction to heat sink	R_{thJH}	per diode		0.975		K/W
Temperature under switching conditions	$T_{vj\text{ op}}$		-40		150	$^{\circ}\text{C}$

6 Diode, D5 / D6

Table 11 Maximum rated values

Parameter	Symbol	Note or test condition		Values	Unit
Repetitive peak reverse voltage	V_{RRM}		$T_{vj} = 25\text{ }^{\circ}\text{C}$	650	V
Continuous DC forward current	I_F			100	A
Repetitive peak forward current	I_{FRM}	$t_p = 1\text{ ms}$		200	A
I^2t - value	I^2t	$V_R = 0\text{ V}$, $t_p = 10\text{ ms}$	$T_{vj} = 125\text{ }^{\circ}\text{C}$	1670	A^2s
			$T_{vj} = 150\text{ }^{\circ}\text{C}$	1540	

Table 12 Characteristic values

Parameter	Symbol	Note or test condition	Values			Unit
			Min.	Typ.	Max.	
Forward voltage	V_F	$I_F = 100\text{ A}$, $V_{GE} = 0\text{ V}$	$T_{vj} = 25\text{ °C}$	1.65	2.15	V
			$T_{vj} = 125\text{ °C}$	1.55		
			$T_{vj} = 150\text{ °C}$	1.50		
Peak reverse recovery current	I_{RM}	$I_F = 100\text{ A}$, $V_R = 300\text{ V}$, $V_{GE} = -15\text{ V}$, $-di_F/dt = 3400\text{ A}/\mu\text{s}$ ($T_{vj} = 150\text{ °C}$)	$T_{vj} = 25\text{ °C}$	63.8		A
			$T_{vj} = 125\text{ °C}$	81.4		
			$T_{vj} = 150\text{ °C}$	85.3		

(table continues...)

Table 12 (continued) Characteristic values

Parameter	Symbol	Note or test condition	Values			Unit
			Min.	Typ.	Max.	
Recovered charge	Q_r	$I_F = 100 \text{ A}$, $V_R = 300 \text{ V}$, $V_{GE} = -15 \text{ V}$, $-di_F/dt = 3400 \text{ A}/\mu\text{s}$ ($T_{vj} = 150 \text{ }^\circ\text{C}$)	$T_{vj} = 25 \text{ }^\circ\text{C}$	3.68		μC
			$T_{vj} = 125 \text{ }^\circ\text{C}$	5.42		
			$T_{vj} = 150 \text{ }^\circ\text{C}$	6.06		
Reverse recovery energy	E_{rec}	$I_F = 100 \text{ A}$, $V_R = 300 \text{ V}$, $V_{GE} = -15 \text{ V}$, $-di_F/dt = 3400 \text{ A}/\mu\text{s}$ ($T_{vj} = 150 \text{ }^\circ\text{C}$)	$T_{vj} = 25 \text{ }^\circ\text{C}$	0.512		mJ
			$T_{vj} = 125 \text{ }^\circ\text{C}$	0.994		
			$T_{vj} = 150 \text{ }^\circ\text{C}$	1.16		
Thermal resistance, junction to heat sink	R_{thJH}	per diode		1.01		K/W
Temperature under switching conditions	$T_{vj \text{ op}}$		-40		150	$^\circ\text{C}$

7 NTC-Thermistor

Table 13 Characteristic values

Parameter	Symbol	Note or test condition	Values			Unit
			Min.	Typ.	Max.	
Rated resistance	R_{25}	$T_{NTC} = 25 \text{ }^\circ\text{C}$		5		k Ω
Deviation of R_{100}	$\Delta R/R$	$T_{NTC} = 100 \text{ }^\circ\text{C}$, $R_{100} = 493 \text{ } \Omega$	-5		5	%
Power dissipation	P_{25}	$T_{NTC} = 25 \text{ }^\circ\text{C}$			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

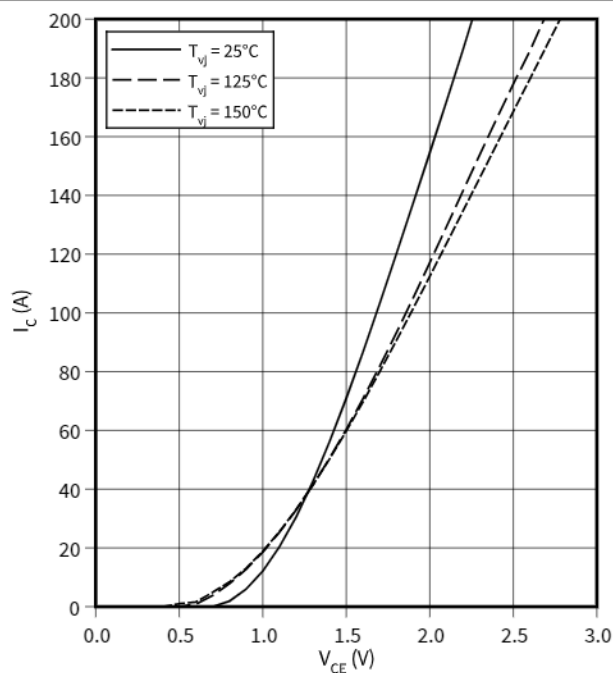
Note: Specification according to the valid application note.

8 Characteristics diagrams

Output characteristic (typical), IGBT, T1 / T4

$$I_C = f(V_{CE})$$

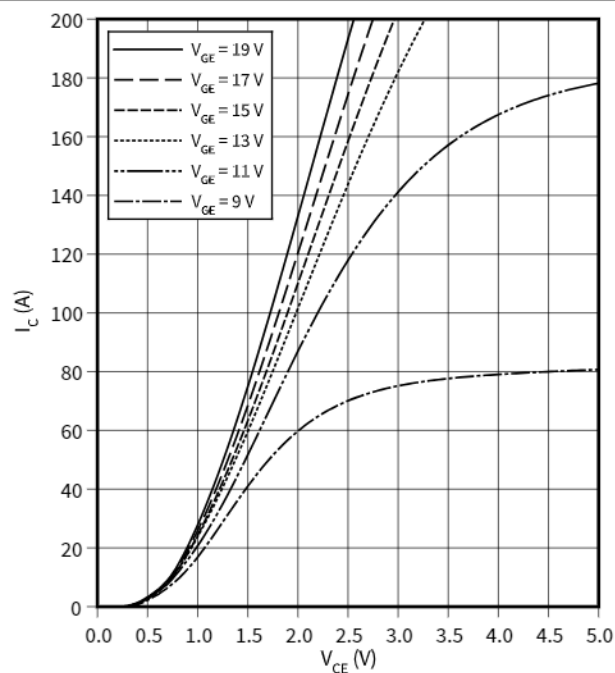
$$V_{GE} = 15 \text{ V}$$



Output characteristic field (typical), IGBT, T1 / T4

$$I_C = f(V_{CE})$$

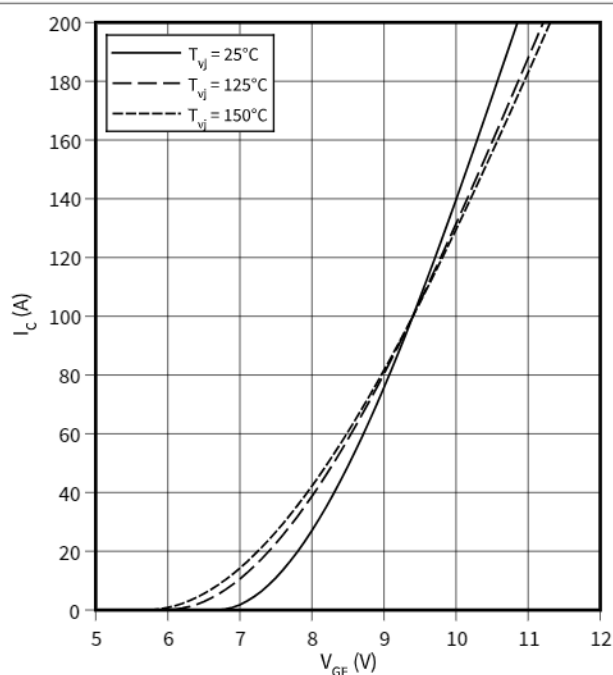
$$T_{vj} = 150 \text{ °C}$$



Transfer characteristic (typical), IGBT, T1 / T4

$$I_C = f(V_{GE})$$

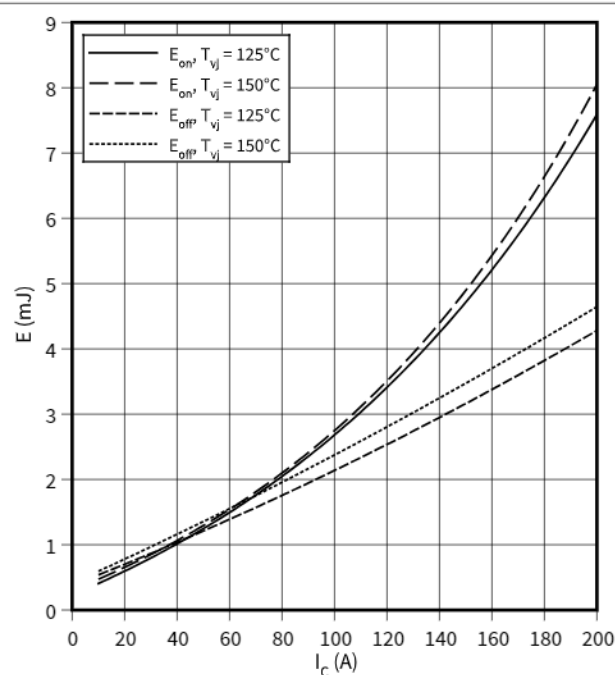
$$V_{CE} = 20 \text{ V}$$



Switching losses (typical), IGBT, T1 / T4

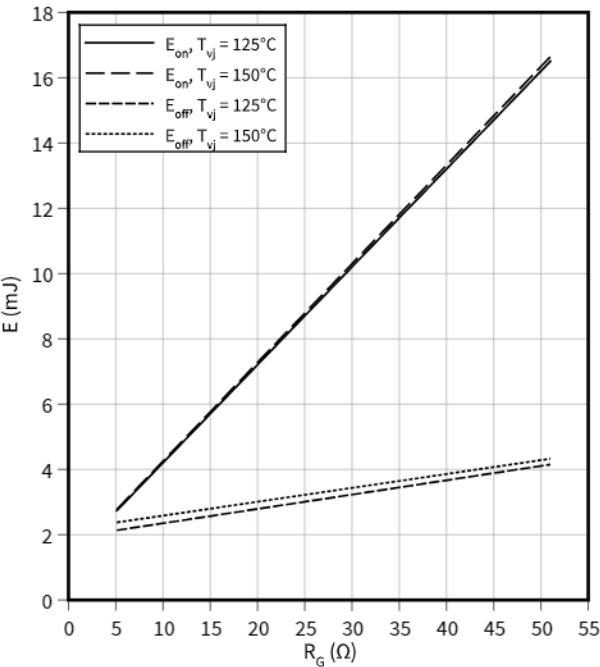
$$E = f(I_C)$$

$$R_{Goff} = 5.1 \text{ } \Omega, R_{Gon} = 5.1 \text{ } \Omega, V_{CE} = 300 \text{ V}, V_{GE} = \pm 15 \text{ V}$$



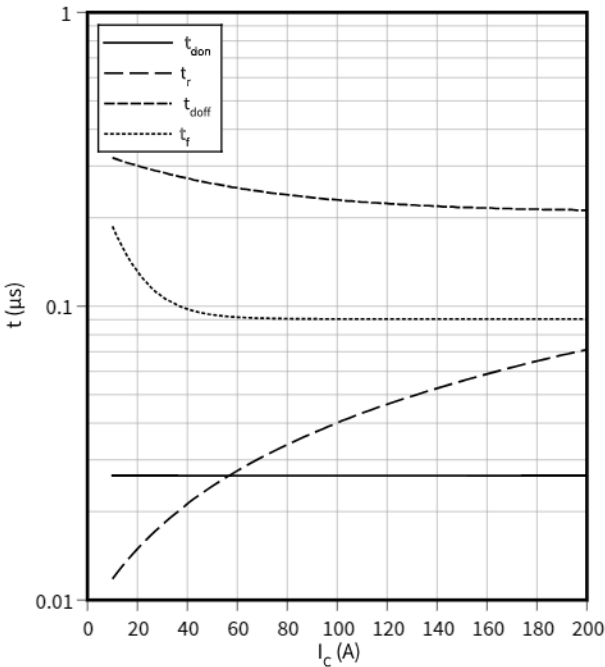
Switching losses (typical), IGBT, T1 / T4

$E = f(R_G)$
 $I_C = 100\text{ A}$, $V_{CE} = 300\text{ V}$, $V_{GE} = \pm 15\text{ V}$



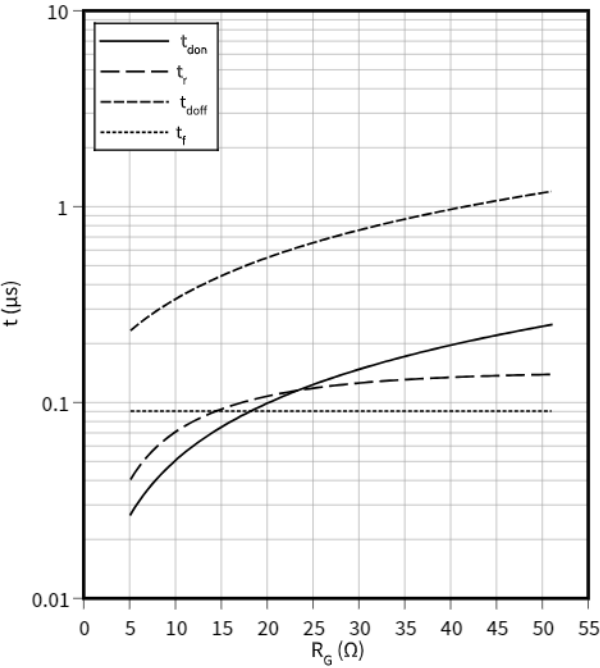
Switching times (typical), IGBT, T1 / T4

$t = f(I_C)$
 $R_{Goff} = 5.1\text{ }\Omega$, $R_{Gon} = 5.1\text{ }\Omega$, $V_{CE} = 300\text{ V}$, $V_{GE} = \pm 15\text{ V}$, $T_{vj} = 150\text{ }^\circ\text{C}$



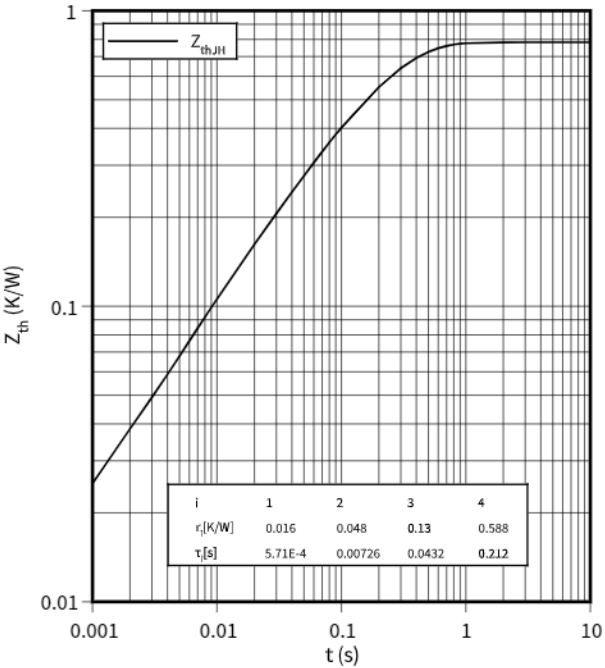
Switching times (typical), IGBT, T1 / T4

$t = f(R_G)$
 $I_C = 100\text{ A}$, $V_{CE} = 300\text{ V}$, $V_{GE} = \pm 15\text{ V}$, $T_{vj} = 150\text{ }^\circ\text{C}$



Transient thermal impedance , IGBT, T1 / T4

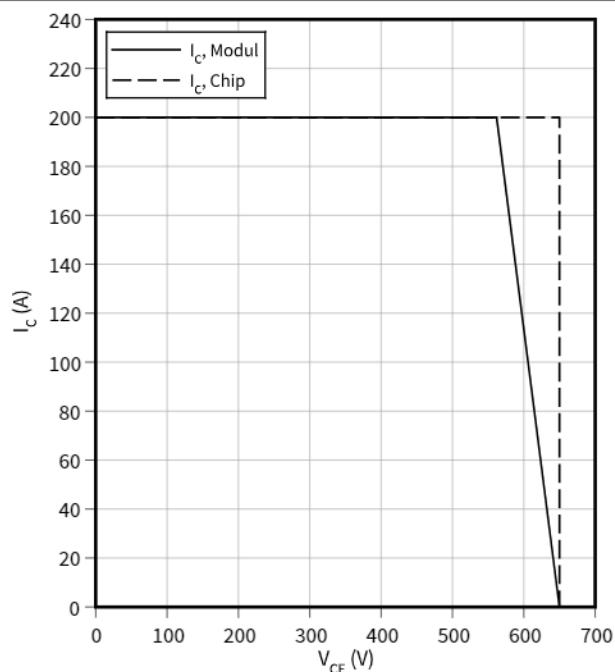
$Z_{th} = f(t)$



Reverse bias safe operating area (RBSOA), IGBT, T1 / T4

$$I_C = f(V_{CE})$$

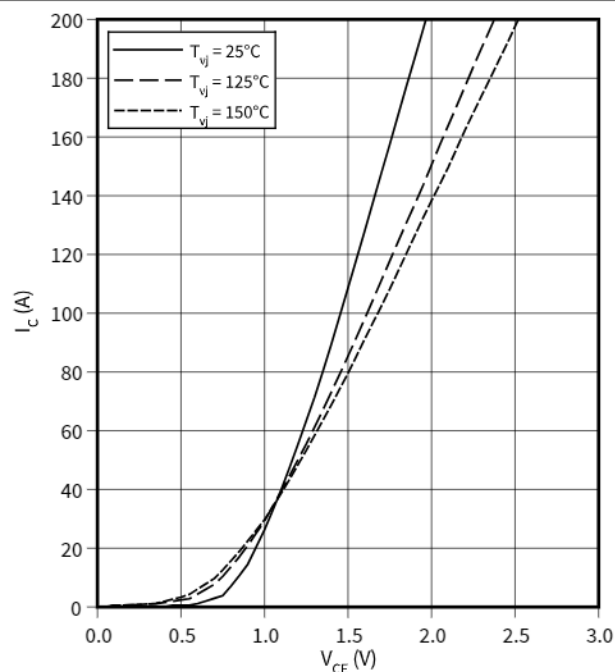
$R_{Goff} = 5.1 \Omega$, $V_{GE} = \pm 15 \text{ V}$, $T_{vj} = 150^\circ \text{C}$



Output characteristic (typical), IGBT, T2 / T3

$$I_C = f(V_{CE})$$

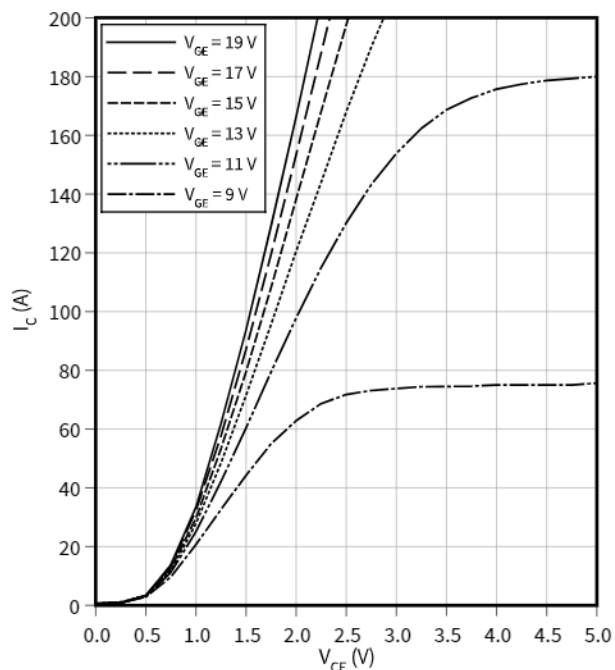
$V_{GE} = 15 \text{ V}$



Output characteristic field (typical), IGBT, T2 / T3

$$I_C = f(V_{CE})$$

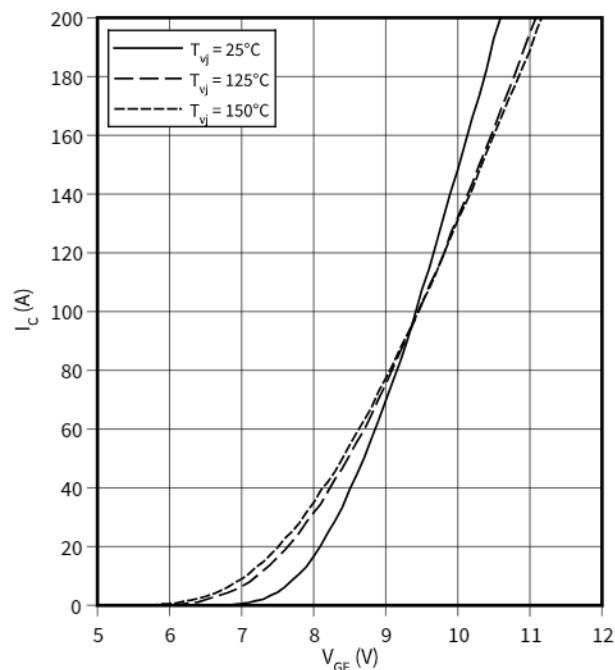
$T_{vj} = 150^\circ \text{C}$



Transfer characteristic (typical), IGBT, T2 / T3

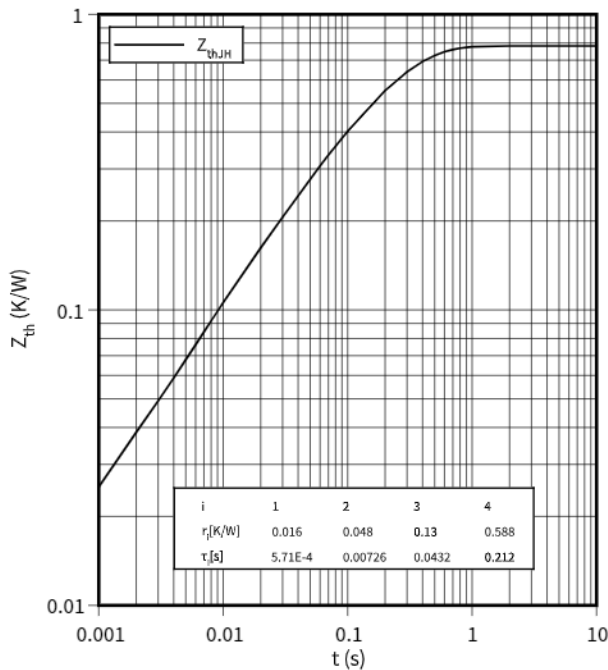
$$I_C = f(V_{GE})$$

$V_{CE} = 20 \text{ V}$



Transient thermal impedance , IGBT, T2 / T3

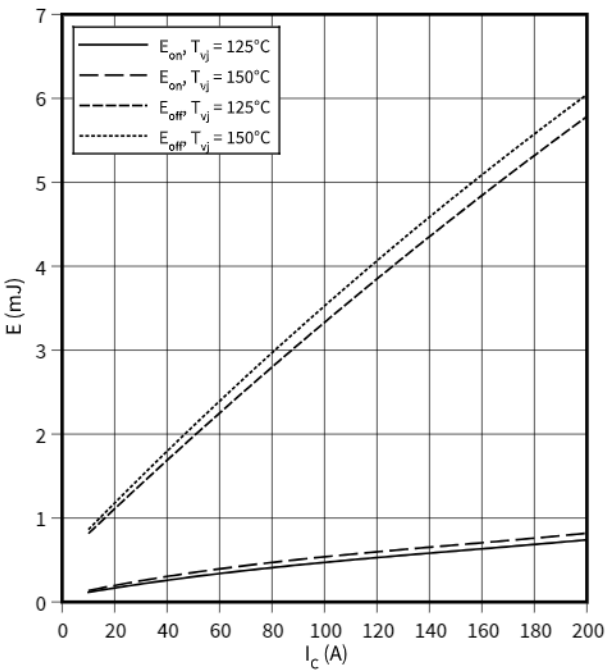
$Z_{th} = f(t)$



Switching losses (typical), IGBT, T2 / T3

$E = f(I_C)$

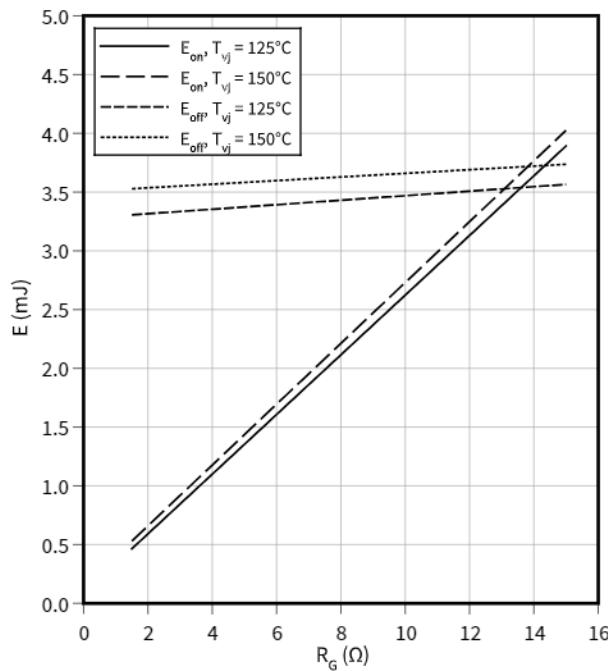
$R_{Goff} = 1.5 \Omega, R_{Gon} = 1.5 \Omega, V_{GE} = \pm 15 V, V_{CE} = 300 V$



Switching losses (typical), IGBT, T2 / T3

$E = f(R_G)$

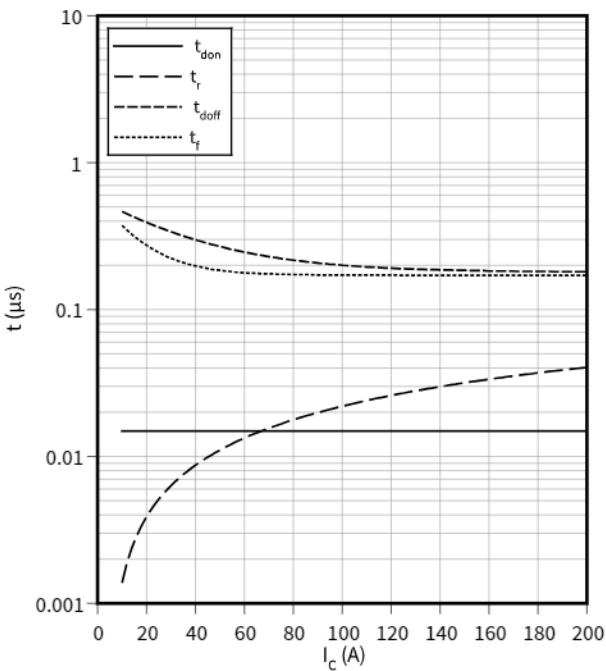
$V_{GE} = \pm 15 V, I_C = 100 A, V_{CE} = 300 V$



Switching times (typical), IGBT, T2 / T3

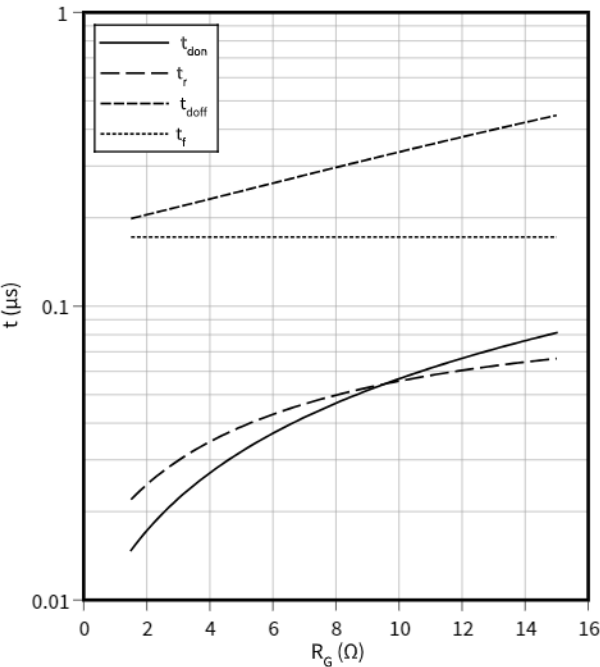
$t = f(I_C)$

$R_{Goff} = 1.5 \Omega, R_{Gon} = 1.5 \Omega, V_{GE} = \pm 15 V, V_{CE} = 300 V, T_{vj} = 150 ^\circ C$



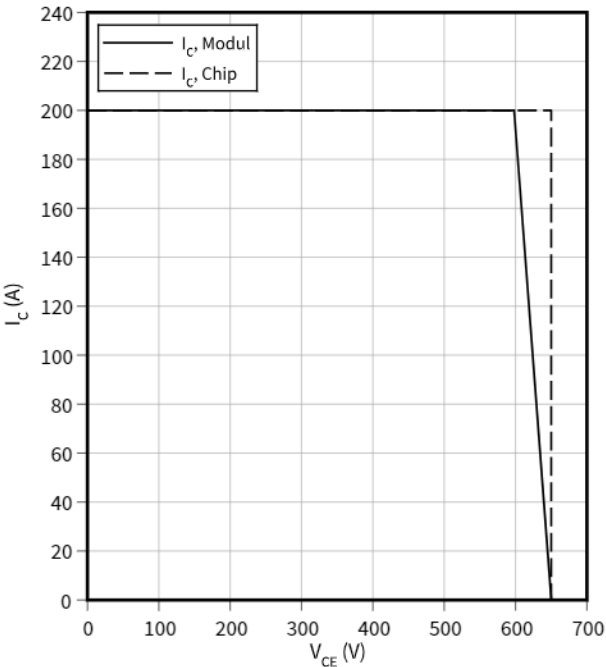
Switching times (typical), IGBT, T2 / T3

$t = f(R_G)$
 $V_{GE} = \pm 15\text{ V}$, $I_C = 100\text{ A}$, $V_{CE} = 300\text{ V}$, $T_{vj} = 150\text{ }^\circ\text{C}$



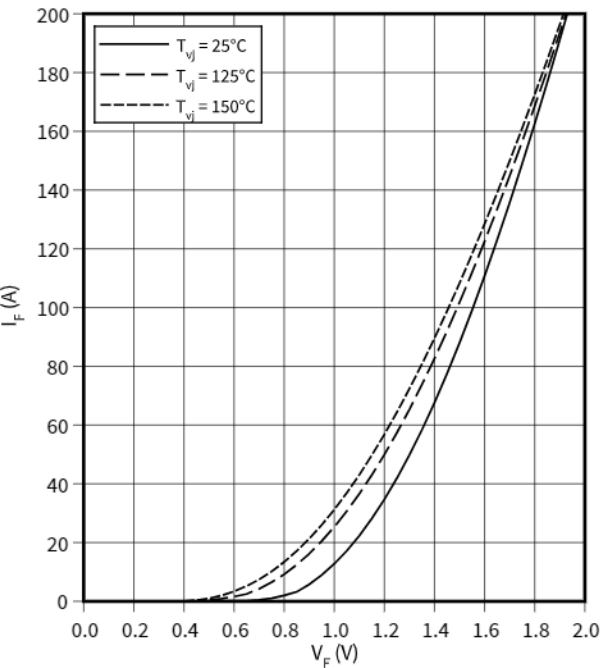
Reverse bias safe operating area (RBSOA), IGBT, T2 / T3

$I_C = f(V_{CE})$
 $R_{Goff} = 1.5\text{ }\Omega$, $V_{GE} = \pm 15\text{ V}$, $T_{vj} = 150\text{ }^\circ\text{C}$



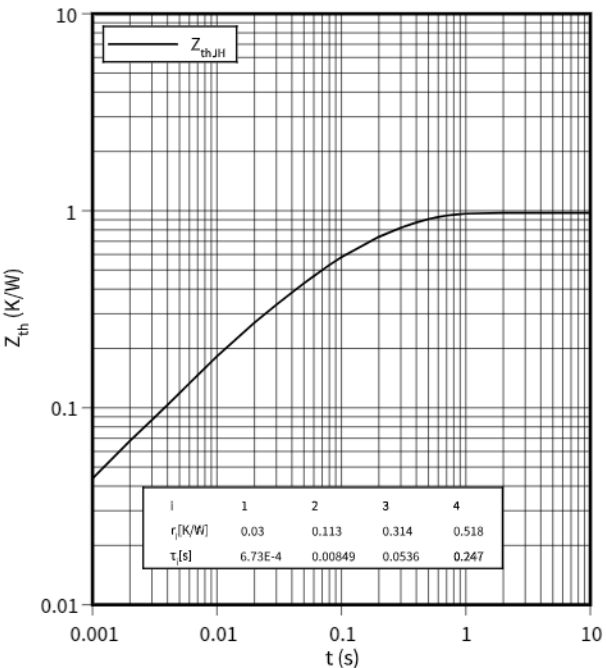
Forward characteristic (typical), Diode, D1 / D4

$I_F = f(V_F)$



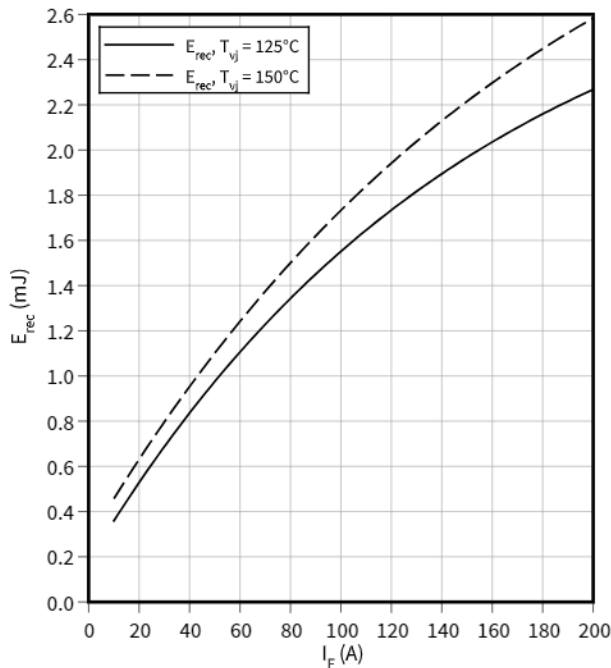
Transient thermal impedance, Diode, D1 / D4

$Z_{th} = f(t)$



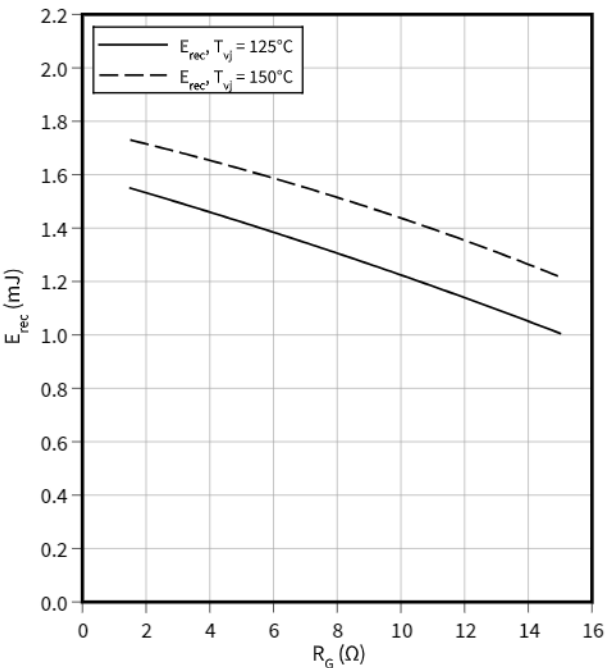
Switching losses (typical), Diode, D1 / D4

$E_{rec} = f(I_F)$
 $R_{Gon} = 1.5 \Omega, V_R = 300 V$



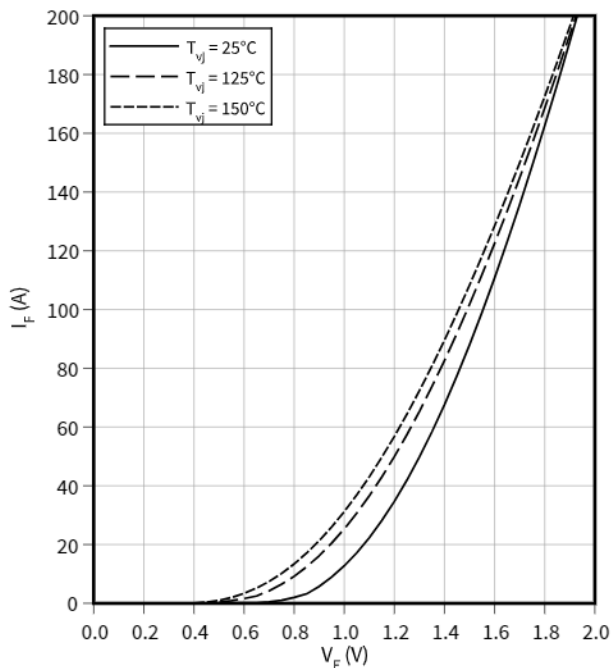
Switching losses (typical), Diode, D1 / D4

$E_{rec} = f(R_G)$
 $I_F = 100 A, V_R = 300 V$



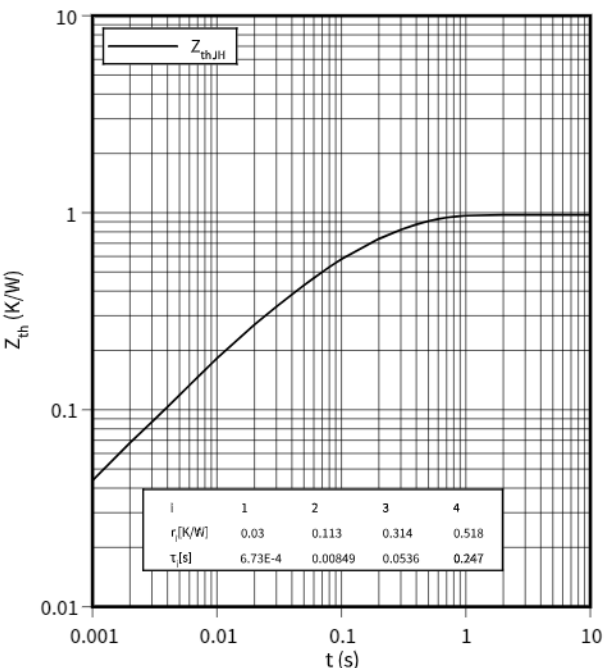
Forward characteristic (typical), Diode, D2 / D3

$I_F = f(V_F)$



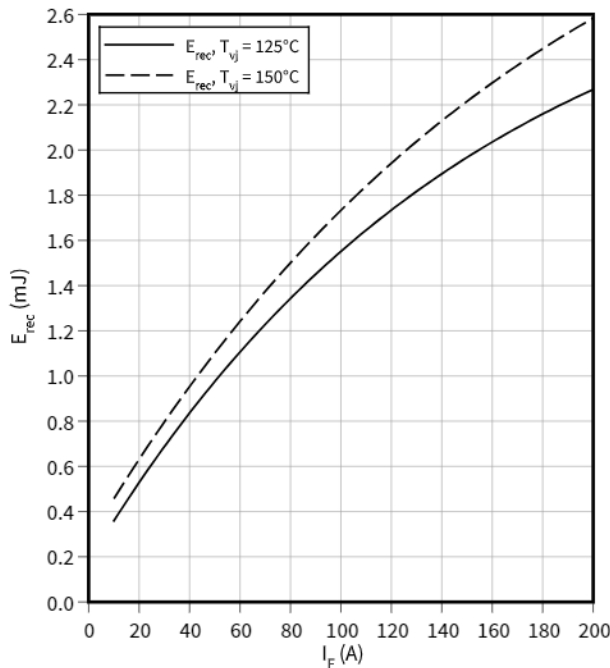
Transient thermal impedance, Diode, D2 / D3

$Z_{th} = f(t)$



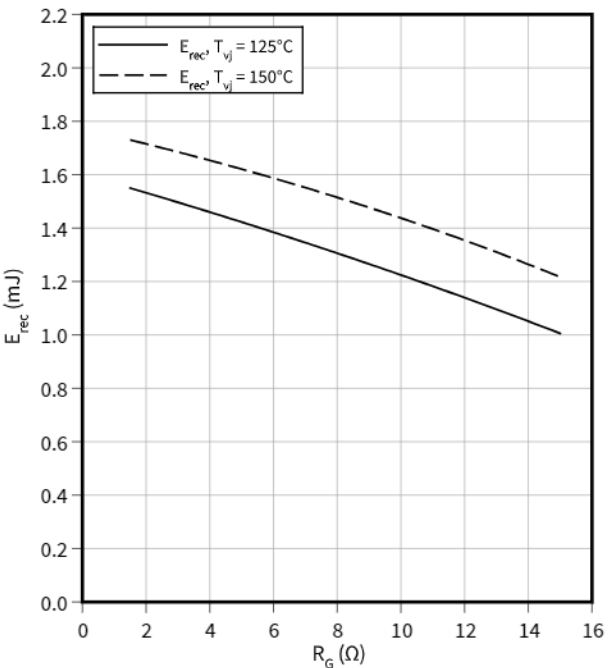
Switching losses (typical), Diode, D2 / D3

$E_{rec} = f(I_F)$
 $R_{Gon} = 1.5 \Omega, V_R = 300 V$



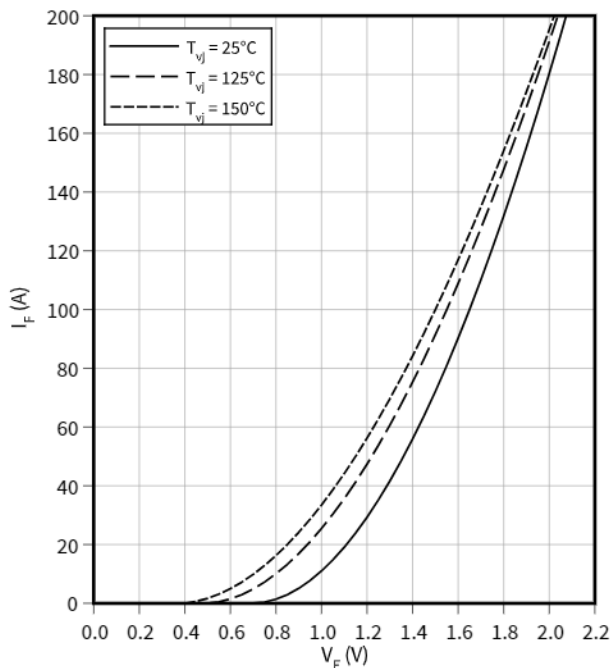
Switching losses (typical), Diode, D2 / D3

$E_{rec} = f(R_G)$
 $I_F = 100 A, V_R = 300 V$



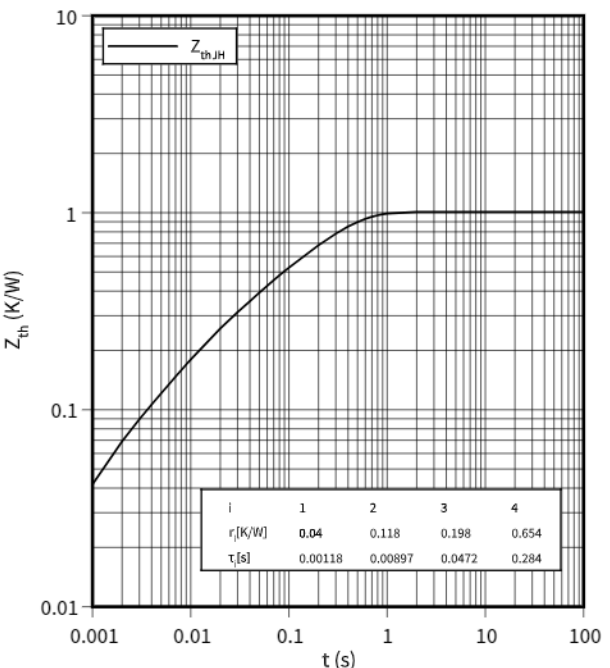
Forward characteristic (typical), Diode, D5 / D6

$I_F = f(V_F)$



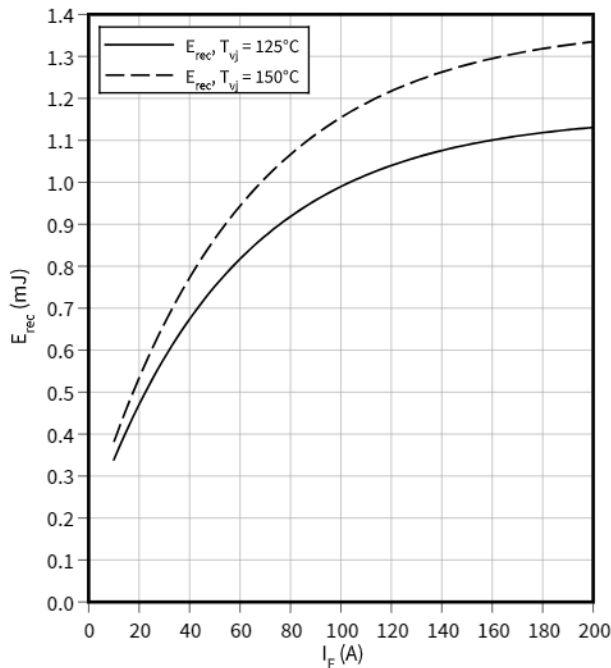
Transient thermal impedance, Diode, D5 / D6

$Z_{th} = f(t)$



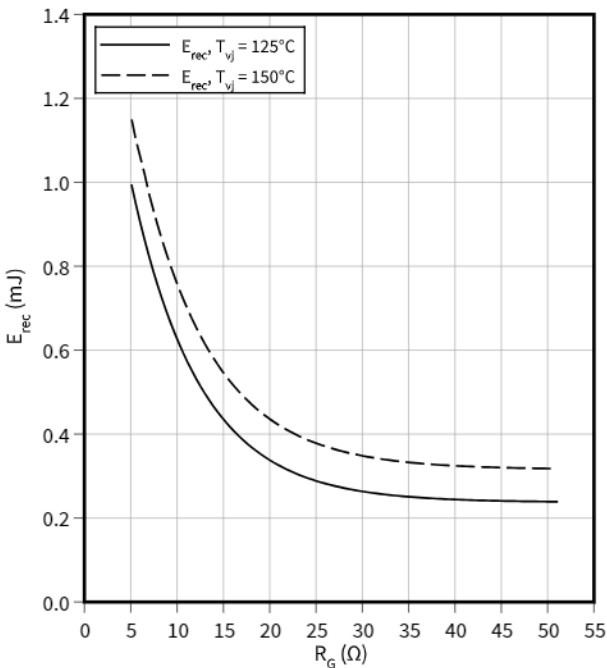
Switching losses (typical), Diode, D5 / D6

$E_{rec} = f(I_F)$
 $R_{Gon} = 5.1 \Omega, V_R = 300 V$



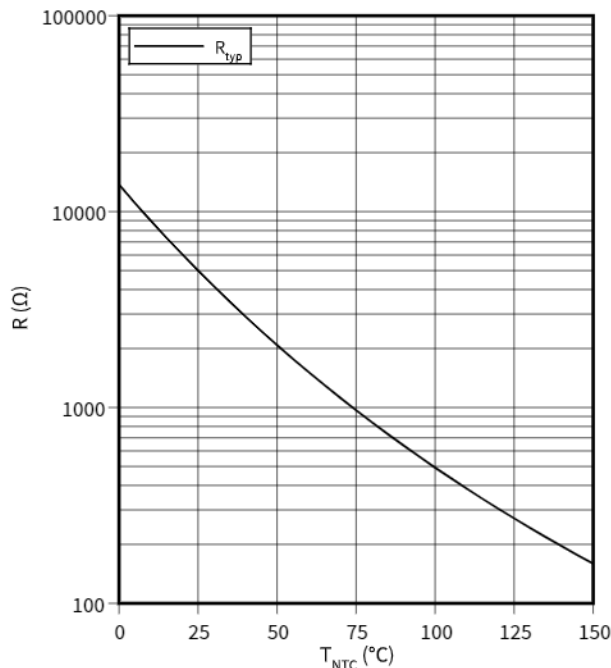
Switching losses (typical), Diode, D5 / D6

$E_{rec} = f(R_G)$
 $I_F = 100 A, V_R = 300 V$



Temperature characteristic (typical), NTC-Thermistor

$R = f(T_{NTC})$



9 **Circuit diagram**

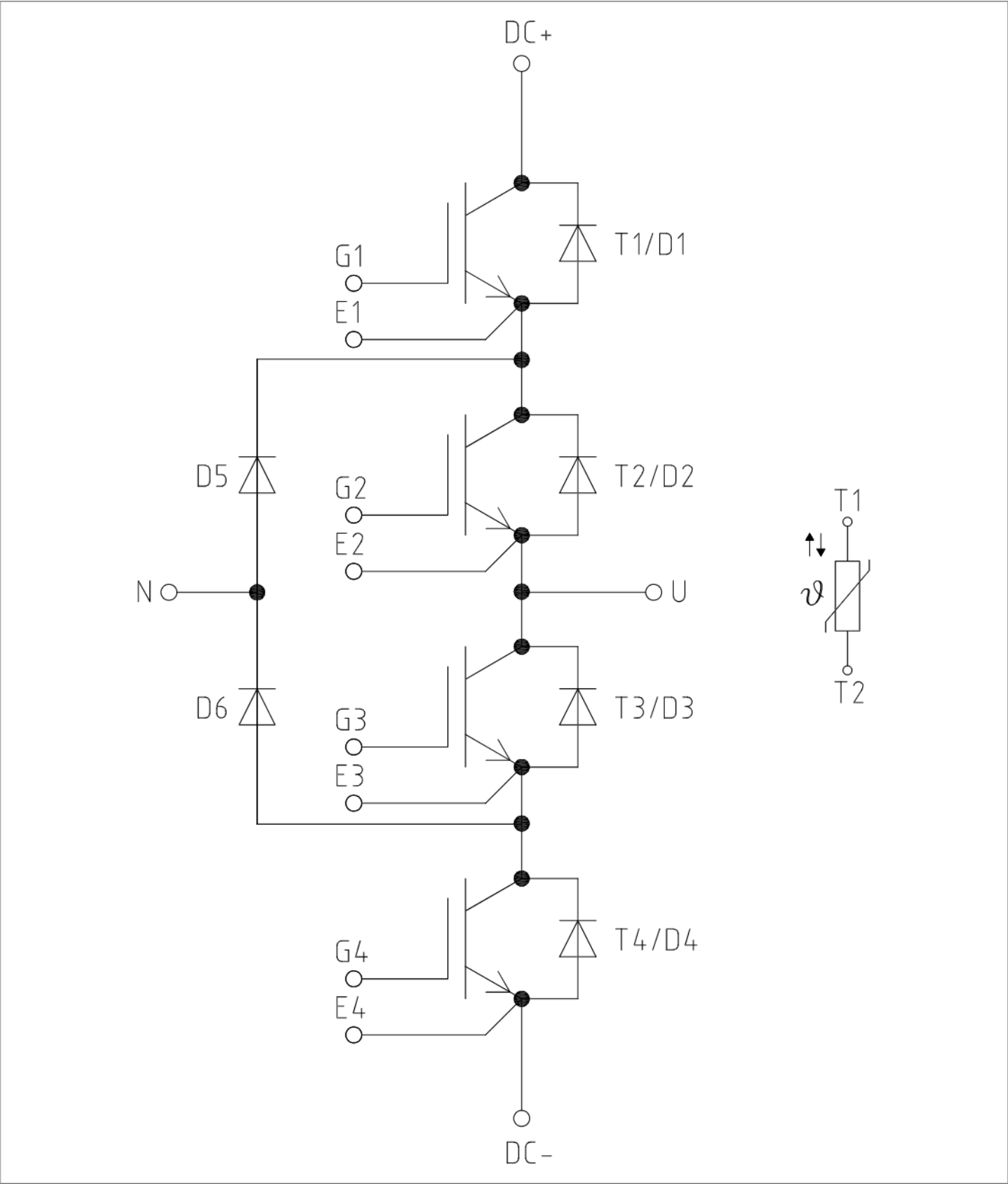


Figure 1

10 Package outlines

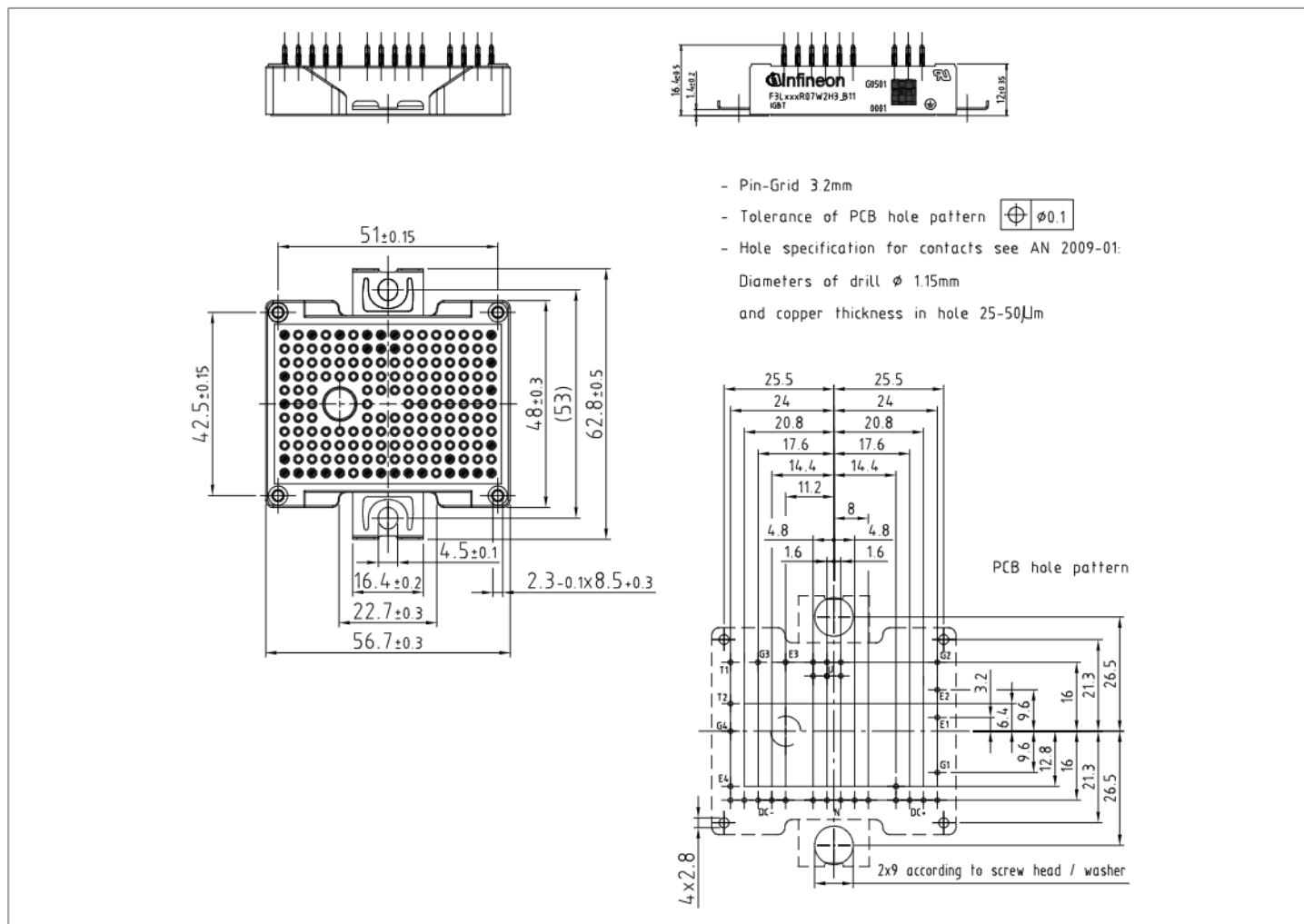


Figure 2

11 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>	<i>Digit</i>	<i>Example</i>
	Module serial number	1 – 5	71549
	Module material number	6 - 11	142846
	Production order number	12 - 19	55054991
	Date code (production year)	20 – 21	15
	Date code (production week)	22 – 23	30
Example			
			
71549142846550549911530		71549142846550549911530	

Figure 3

Revision history

Document revision	Date of release	Description of changes
0.10	2021-09-09	Target datasheet
1.00	2021-12-09	Final datasheet

Trademarks

All referenced product or service names and trademarks are the property of their respective owners.

Edition 2021-12-09

Published by

Infineon Technologies AG
81726 Munich, Germany

© 2021 Infineon Technologies AG
All Rights Reserved.

Do you have a question about any aspect of this document?

Email: erratum@infineon.com

Document reference
IFX-ABA972-002

IMPORTANT NOTICE

The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics ("Beschaffenhheitsgarantie").

With respect to any examples, hints or any typical values stated herein and/or any information regarding the application of the product, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind, including without limitation warranties of non-infringement of intellectual property rights of any third party.

In addition, any information given in this document is subject to customer's compliance with its obligations stated in this document and any applicable legal requirements, norms and standards concerning customer's products and any use of the product of Infineon Technologies in customer's applications.

The data contained in this document is exclusively intended for technically trained staff. It is the responsibility of customer's technical departments to evaluate the suitability of the product for the intended application and the completeness of the product information given in this document with respect to such application.

WARNINGS

Due to technical requirements products may contain dangerous substances. For information on the types in question please contact your nearest Infineon Technologies office.

Except as otherwise explicitly approved by Infineon Technologies in a written document signed by authorized representatives of Infineon Technologies, Infineon Technologies' products may not be used in any applications where a failure of the product or any consequences of the use thereof can reasonably be expected to result in personal injury.