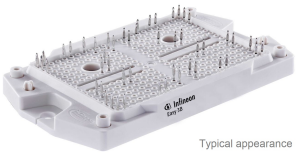
EasyPACK™ module with TRENCHSTOP™ IGBT H3 and emitter controlled 7 diode and PressFIT / NTC

Features


Typical appearance

- Electrical features
  - V_{CES} = 1200 V
  - $I_{C\ nom}$ = 225 A / I_{CRM} = 450 A
  - Low switching losses
  - High-speed IGBT H3
- Mechanical features
  - Compact design
  - PressFIT contact technology
  - Integrated NTC temperature sensor
  - High power density

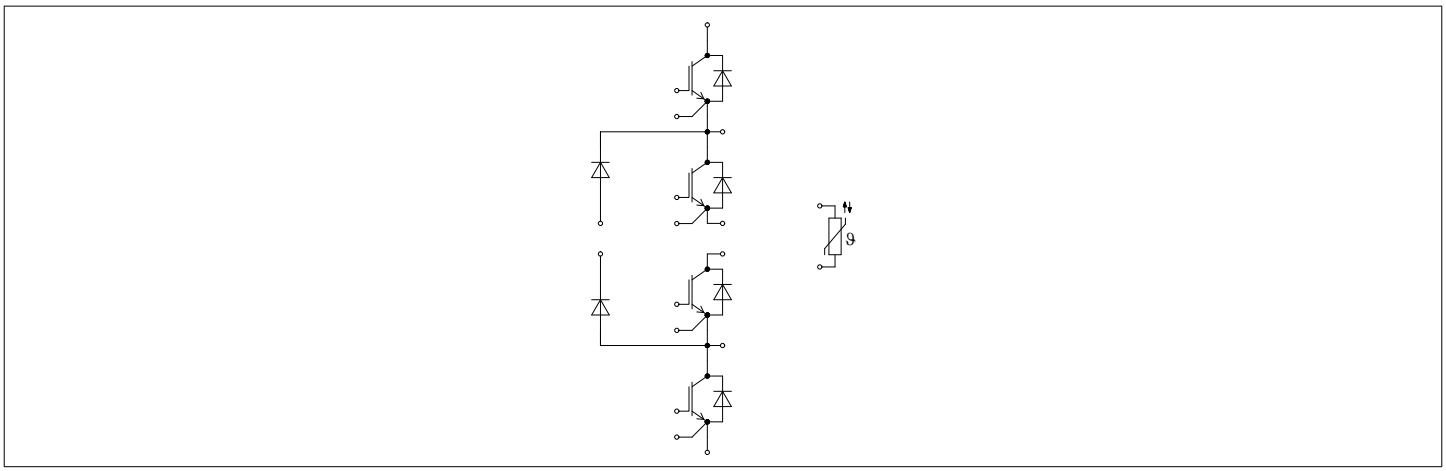
Potential applications

- Energy storage systems
- Solar applications
- Three-level applications

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 Hz, *t* = 1 min	3.2	kV
Internal isolation		basic insulation (class 1, IEC 61140)	Al_2O_3	
Comparative tracking index	*CTI*		> 400	
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}			21		nH
Module lead resistance, terminals - chip	$R_{AA'+CC'}$	T_H = 25 °C, per switch		2.3		mΩ
Module lead resistance, terminals - chip	$R_{CC'+EE'}$	T_H = 25 °C, per switch		1.7		mΩ
Storage temperature	T_{stg}		-40		125	°C
Mounting torque for module mounting	*M*	- Mounting according to valid application note; M5, Screw	1.3		1.5	Nm
Weight	*G*			78		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 °C	1200	V
Implemented collector current	I_{CN}			225	A
Continuous DC collector current	I_{CDC}	$T_{vj\,max}$ = 175 °C	T_H = 65 °C	175	A
Repetitive peak collector current	I_{CRM}	t_p limited by $T_{vj\,op}$		450	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 = 225 A, V_{GE} = 15 V	T_{vj} = 25 °C		2.07	2.55	V
			T_{vj} = 125 °C		2.50		
			T_{vj} = 150 °C		2.60		
Gate threshold voltage	V_{GEth}	I_C = 7.8 mA, V_{CE} = V_{GE}, T_{vj} = 25 °C		5.25	5.80	6.35	V
Gate charge	Q_G	V_{GE} = ±15 V			1.73		µC
Internal gate resistor	R_{Gint}	T_{vj} = 25 °C			3.3		Ω
Input capacitance	C_{ies}	f = 100 kHz, T_{vj} = 25 °C, V_{CE} = 25 V, V_{GE} = 0 V			13.1		nF
Reverse transfer capacitance	C_{res}	f = 100 kHz, T_{vj} = 25 °C, V_{CE} = 25 V, V_{GE} = 0 V			0.72		nF
Collector-emitter cut-off current	I_{CES}	V_{CE} = 1200 V, V_{GE} = 0 V	T_{vj} = 25 °C			1	mA
Gate-emitter leakage current	I_{GES}	V_{CE} = 0 V, V_{GE} = 20 V, T_{vj} = 25 °C				100	nA
Turn-on delay time (inductive load)	t_{don}	I_C = 225 A, V_{CC} = 600 V, V_{GE} = ±15 V, R_{Gon} = 0.47 Ω	T_{vj} = 25 °C		0.107		µs
			T_{vj} = 125 °C		0.115		
			T_{vj} = 150 °C		0.118		
Rise time (inductive load)	t_r	I_C = 225 A, V_{CC} = 600 V, V_{GE} = ±15 V, R_{Gon} = 0.47 Ω	T_{vj} = 25 °C		0.030		µs
			T_{vj} = 125 °C		0.035		
			T_{vj} = 150 °C		0.037		
Turn-off delay time (inductive load)	t_{doff}	I_C = 225 A, V_{CC} = 600 V, V_{GE} = ±15 V, R_{Goff} = 0.47 Ω	T_{vj} = 25 °C		0.300		µs
			T_{vj} = 125 °C		0.329		
			T_{vj} = 150 °C		0.346		
Fall time (inductive load)	t_f	I_C = 225 A, V_{CC} = 600 V, V_{GE} = ±15 V, R_{Goff} = 0.47 Ω	T_{vj} = 25 °C		0.040		µs
			T_{vj} = 125 °C		0.129		
			T_{vj} = 150 °C		0.148		
Turn-on energy loss per pulse	E_{on}	I_C = 225 A, V_{CC} = 600 V, L_σ = 35 nH, V_{GE} = ±15 V, R_{Gon} = 0.47 Ω, di/dt = 6100 A/µs (T_{vj} = 150 °C)	T_{vj} = 25 °C		11.8		mJ
			T_{vj} = 125 °C		20.7		
			T_{vj} = 150 °C		23.4		
Turn-off energy loss per pulse	E_{off}	I_C = 225 A, V_{CC} = 600 V, L_σ = 35 nH, V_{GE} = ±15 V, R_{Goff} = 0.47 Ω, dv/dt = 4500 V/µs (T_{vj} = 150 °C)	T_{vj} = 25 °C		8.67		mJ
			T_{vj} = 125 °C		15.9		
			T_{vj} = 150 °C		17.8		
SC data	I_{SC}	V_{GE} ≤ 15 V, V_{CC} = 800 V, V_{CEmax}=V_{CES}-L_{sCE}*di/dt	t_P ≤ 10 µs, T_{vj}=150 °C		900		A

(table continues...)

Table 4 (continued) Characteristic values

Parameter	Symbol	Note or test condition	Values			Unit
			Min.	Typ.	Max.	
Thermal resistance, junction to heat sink	R_{thJH}	per IGBT, λ_{grease} = 3.3 W/(m·K)		0.218		K/W
Temperature under switching conditions	$T_{vj\,op}$		-40		150	°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 °C	1200	V
Implemented collector current	I_{CN}			225	A
Continuous DC collector current	I_{CDC}	$T_{vj\,max}$ = 175 °C	T_H = 65 °C	180	A
Repetitive peak collector current	I_{CRM}	t_p limited by $T_{vj\,op}$		450	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	$V_{CE\,sat}$	I_C = 225 A, V_{GE} = 15 V	T_{vj} = 25 °C		2.07	2.55	V
			T_{vj} = 125 °C		2.50		
			T_{vj} = 150 °C		2.60		
Gate threshold voltage	V_{GEth}	I_C = 7.8 mA, V_{CE} = V_{GE}, T_{vj} = 25 °C		5.25	5.80	6.35	V
Gate charge	Q_G	V_{GE} = ±15 V			1.73		µC
Internal gate resistor	R_{Gint}	T_{vj} = 25 °C			3.3		Ω
Input capacitance	C_{ies}	f = 100 kHz, T_{vj} = 25 °C, V_{CE} = 25 V, V_{GE} = 0 V			13.1		nF
Reverse transfer capacitance	C_{res}	f = 100 kHz, T_{vj} = 25 °C, V_{CE} = 25 V, V_{GE} = 0 V			0.72		nF
Collector-emitter cut-off current	I_{CES}	V_{CE} = 1200 V, V_{GE} = 0 V	T_{vj} = 25 °C			1	mA
Gate-emitter leakage current	I_{GES}	V_{CE} = 0 V, V_{GE} = 20 V, T_{vj} = 25 °C				100	nA

(table continues...)

Table 6 (continued) Characteristic values

Parameter	Symbol	Note or test condition		Values			Unit
				Min.	Typ.	Max.	
Turn-on delay time (inductive load)	t_{don}	I_C = 225 A, V_{CC} = 600 V, V_{GE} = ±15 V, R_{Gon} = 0.47 Ω	T_{vj} = 25 °C		0.107		µs
			T_{vj} = 125 °C		0.117		
			T_{vj} = 150 °C		0.122		
Rise time (inductive load)	t_r	I_C = 225 A, V_{CC} = 600 V, V_{GE} = ±15 V, R_{Gon} = 0.47 Ω	T_{vj} = 25 °C		0.039		µs
			T_{vj} = 125 °C		0.048		
			T_{vj} = 150 °C		0.050		
Turn-off delay time (inductive load)	t_{doff}	I_C = 225 A, V_{CC} = 600 V, V_{GE} = ±15 V, R_{Goff} = 0.47 Ω	T_{vj} = 25 °C		0.290		µs
			T_{vj} = 125 °C		0.340		
			T_{vj} = 150 °C		0.360		
Fall time (inductive load)	t_f	I_C = 225 A, V_{CC} = 600 V, V_{GE} = ±15 V, R_{Goff} = 0.47 Ω	T_{vj} = 25 °C		0.041		µs
			T_{vj} = 125 °C		0.114		
			T_{vj} = 150 °C		0.139		
Turn-on energy loss per pulse	E_{on}	I_C = 225 A, V_{CC} = 600 V, L_σ = 35 nH, V_{GE} = ±15 V, R_{Gon} = 0.47 Ω, di/dt = 4600 A/µs (T_{vj} = 150 °C)	T_{vj} = 25 °C		8.1		mJ
			T_{vj} = 125 °C		14.3		
			T_{vj} = 150 °C		16.4		
Turn-off energy loss per pulse	E_{off}	I_C = 225 A, V_{CC} = 600 V, L_σ = 35 nH, V_{GE} = ±15 V, R_{Goff} = 0.47 Ω, dv/dt = 4200 V/µs (T_{vj} = 150 °C)	T_{vj} = 25 °C		9.25		mJ
			T_{vj} = 125 °C		17.5		
			T_{vj} = 150 °C		19.6		
SC data	I_{SC}	V_{GE} ≤ 15 V, V_{CC} = 800 V, V_{CEmax}=V_{CES}-L_{sCE}*di/dt	t_P ≤ 10 µs, T_{vj}=150 °C		900		A
Thermal resistance, junction to heat sink	R_{thJH}	per IGBT, λ_{grease} = 3.3 W/(m·K)			0.212		K/W
Temperature under switching conditions	$T_{vj\,op}$			-40		150	°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 °C	1200	V
Continuous DC forward current	I_F			300	A
Repetitive peak forward current	I_{FRM}	t_P = 1 ms		600	A

(table continues...)

Table 7 (continued) Maximum rated values

Parameter	Symbol	Note or test condition		Values	Unit
I^2t - value	I^2t	t_P = 10 ms, V_R = 0 V	T_{vj} = 125 °C	10900	A^2s
			T_{vj} = 150 °C	6280	

Table 8 Characteristic values

Parameter	Symbol	Note or test condition		Values			Unit
				Min.	Typ.	Max.	
Forward voltage	V_F	I_F = 300 A, V_{GE} = 0 V	T_{vj} = 25 °C		1.72	2.10	V
			T_{vj} = 125 °C		1.59		
			T_{vj} = 150 °C		1.56		
Peak reverse recovery current	I_{RM}	V_{CC} = 600 V, I_F = 300 A, V_{GE} = -15 V, -di$_F$/dt = 4800 A/µs (T_{vj} = 150 °C)	T_{vj} = 25 °C		229		A
			T_{vj} = 125 °C		263		
			T_{vj} = 150 °C		272		
Recovered charge	Q_r	V_{CC} = 600 V, I_F = 300 A, V_{GE} = -15 V, -di$_F$/dt = 4800 A/µs (T_{vj} = 150 °C)	T_{vj} = 25 °C		20.5		µC
			T_{vj} = 125 °C		38.4		
			T_{vj} = 150 °C		44.5		
Reverse recovery energy	E_{rec}	V_{CC} = 600 V, I_F = 300 A, V_{GE} = -15 V, -di$_F$/dt = 4800 A/µs (T_{vj} = 150 °C)	T_{vj} = 25 °C		7.88		mJ
			T_{vj} = 125 °C		14.2		
			T_{vj} = 150 °C		16.2		
Thermal resistance, junction to heat sink	R_{thJH}	per diode, λ_{grease} = 3.3 W/(m·K)			0.354		K/W
Temperature under switching conditions	$T_{vj\,op}$			-40		150	°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 °C	1200	V
Continuous DC forward current	I_F			200	A
Repetitive peak forward current	I_{FRM}	t_P = 1 ms		400	A
I^2t - value	I^2t	t_P = 10 ms, V_R = 0 V	T_{vj} = 125 °C	3320	A^2s
			T_{vj} = 150 °C	2110	

Table 10 Characteristic values

Parameter	Symbol	Note or test condition		Values			Unit
				Min.	Typ.	Max.	
Forward voltage	V_F	I_F = 200 A, V_{GE} = 0 V	T_{vj} = 25 °C		1.72	2.10	V
			T_{vj} = 125 °C		1.59		
			T_{vj} = 150 °C		1.56		
Peak reverse recovery current	I_{RM}	V_{CC} = 600 V, I_F = 200 A, V_{GE} = -15 V, -di$_F$/dt = 4300 A/µs (T_{vj} = 150 °C)	T_{vj} = 25 °C		195		A
			T_{vj} = 125 °C		238		
			T_{vj} = 150 °C		248		
Recovered charge	Q_r	V_{CC} = 600 V, I_F = 200 A, V_{GE} = -15 V, -di$_F$/dt = 4300 A/µs (T_{vj} = 150 °C)	T_{vj} = 25 °C		14.1		µC
			T_{vj} = 125 °C		27.4		
			T_{vj} = 150 °C		31.3		
Reverse recovery energy	E_{rec}	V_{CC} = 600 V, I_F = 200 A, V_{GE} = -15 V, -di$_F$/dt = 4300 A/µs (T_{vj} = 150 °C)	T_{vj} = 25 °C		5.72		mJ
			T_{vj} = 125 °C		11.1		
			T_{vj} = 150 °C		12.5		
Thermal resistance, junction to heat sink	R_{thJH}	per diode, λ_{grease} = 3.3 W/(m·K)			0.415		K/W
Temperature under switching conditions	$T_{vj\,op}$			-40		150	°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 °C	1200	V
Continuous DC forward current	I_F			300	A
Repetitive peak forward current	I_{FRM}	t_P = 1 ms		600	A
I^2t - value	I^2t	t_P = 10 ms, V_R = 0 V	T_{vj} = 125 °C	10900	A^2s
			T_{vj} = 150 °C	6280	

Table 12 Characteristic values

Parameter	Symbol	Note or test condition		Values			Unit
				Min.	Typ.	Max.	
Forward voltage	V_F	I_F = 300 A, V_{GE} = 0 V	T_{vj} = 25 °C		1.72	2.10	V
			T_{vj} = 125 °C		1.59		
			T_{vj} = 150 °C		1.56		
Peak reverse recovery current	I_{RM}	V_{CC} = 600 V, I_F = 300 A, V_{GE} = -15 V, -di$_F$/dt = 6200 A/µs (T_{vj} = 150 °C)	T_{vj} = 25 °C		244		A
			T_{vj} = 125 °C		263		
			T_{vj} = 150 °C		272		
Recovered charge	Q_r	V_{CC} = 600 V, I_F = 300 A, V_{GE} = -15 V, -di$_F$/dt = 6200 A/µs (T_{vj} = 150 °C)	T_{vj} = 25 °C		20.4		µC
			T_{vj} = 125 °C		38.4		
			T_{vj} = 150 °C		44.5		
Reverse recovery energy	E_{rec}	V_{CC} = 600 V, I_F = 300 A, V_{GE} = -15 V, -di$_F$/dt = 6200 A/µs (T_{vj} = 150 °C)	T_{vj} = 25 °C		6.87		mJ
			T_{vj} = 125 °C		13		
			T_{vj} = 150 °C		14.8		
Thermal resistance, junction to heat sink	R_{thJH}	per diode, λ_{grease} = 3.3 W/(m·K)			0.399		K/W
Temperature under switching conditions	$T_{vj\,op}$			-40		150	°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 °C		5		kΩ
Deviation of R_{100}	$\Delta R/R$	T_{NTC} = 100 °C, R_{100} = 493 Ω	-5		5	%
Power dissipation	P_{25}	T_{NTC} = 25 °C			20	mW
B-value	$B_{25/50}$	$R_2 = R_{25} \exp[B_{25/50}(1/T_2-1/(298{,}15\ K))]$		3375		K
B-value	$B_{25/80}$	$R_2 = R_{25} \exp[B_{25/80}(1/T_2-1/(298{,}15\ K))]$		3411		K
B-value	$B_{25/100}$	$R_2 = R_{25} \exp[B_{25/100}(1/T_2-1/(298{,}15\ K))]$		3433		K

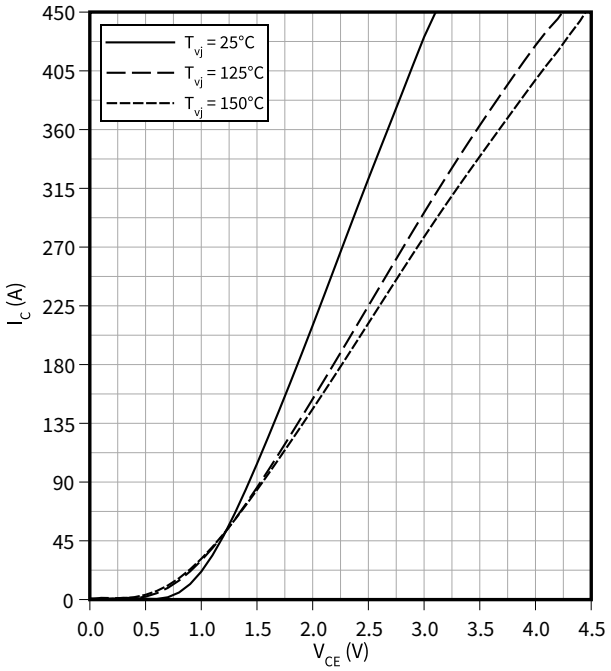
Note: Specification according to the valid application note.

8 Characteristics diagrams

Output characteristic (typical), IGBT, T1 / T4

$I_C = f(V_{CE})$

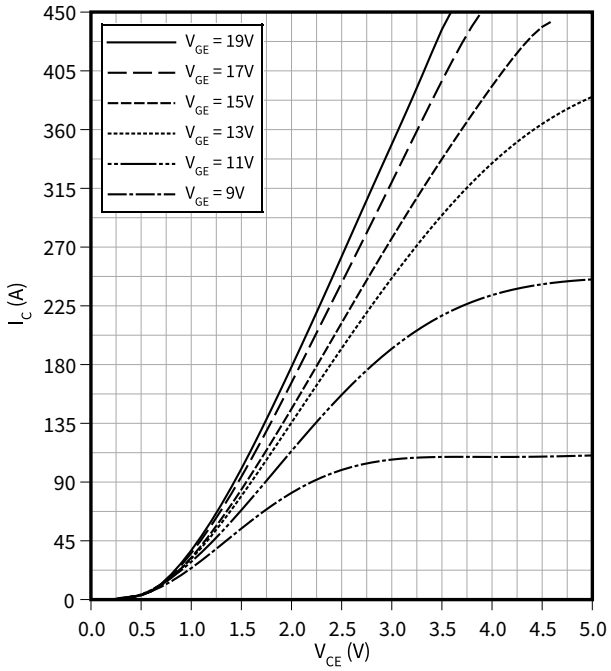
$V_{GE} = 15$ V



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

$I_C = f(V_{CE})$

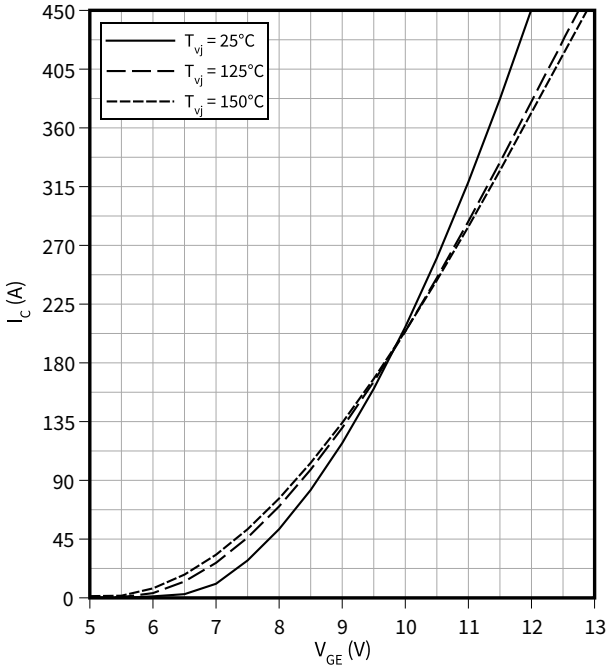
$T_{vj} = 150$ °C



Transfer characteristic (typical), IGBT, T1 / T4

$I_C = f(V_{GE})$

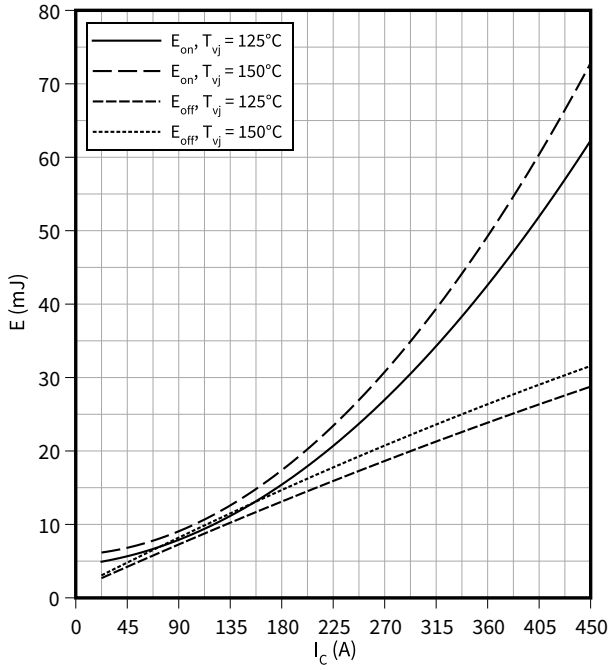
$V_{CE} = 20$ V



Switching losses (typical), IGBT, T1 / T4

$E = f(I_C)$

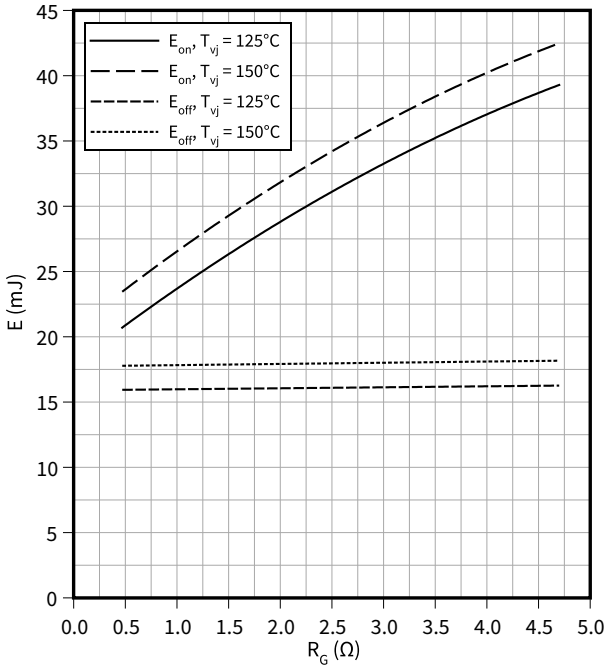
$R_{Goff} = 0.47\ \Omega$, $R_{Gon} = 0.47\ \Omega$, $V_{GE} = \pm 15$ V, $V_{CC} = 600$ V



Switching losses (typical), IGBT, T1 / T4

$E = f(R_G)$

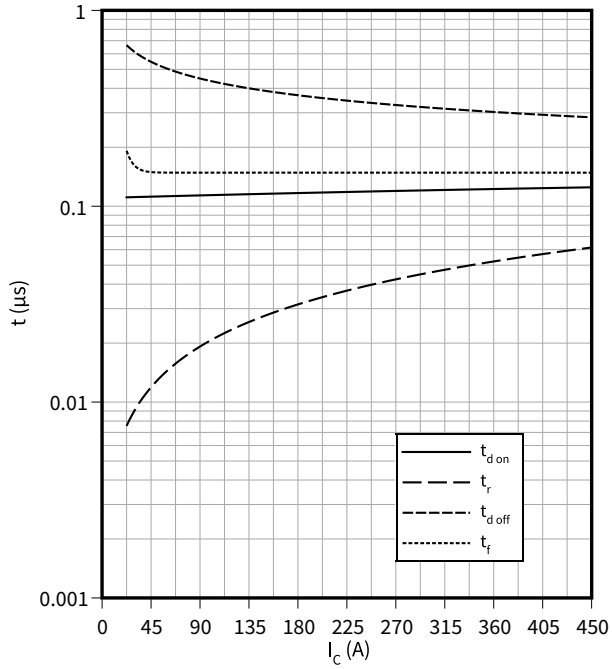
V_{GE} = ±15 V, I_C = 225 A, V_{CC} = 600 V



Switching times (typical), IGBT, T1 / T4

$t = f(I_C)$

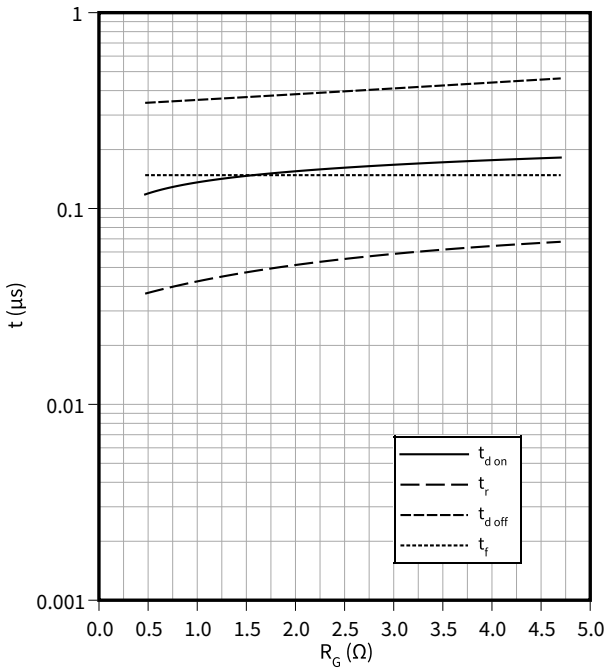
R_{Goff} = 0.47 Ω, R_{Gon} = 0.47 Ω, V_{GE} = ±15 V, V_{CC} = 600 V, T_{vj} = 150 °C



Switching times (typical), IGBT, T1 / T4

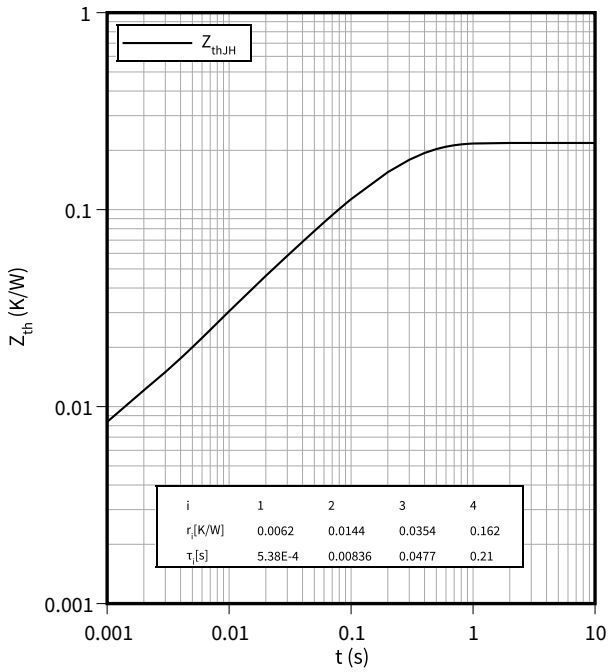
$t = f(R_G)$

V_{GE} = ±15 V, I_C = 225 A, V_{CC} = 600 V, T_{vj} = 150 °C



Transient thermal impedance , IGBT, T1 / T4

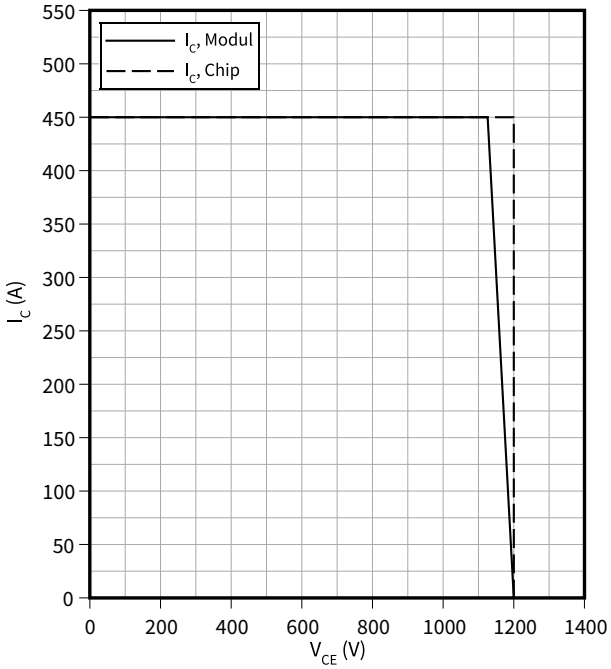
$Z_{th} = f(t)$



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

$I_C = f(V_{CE})$

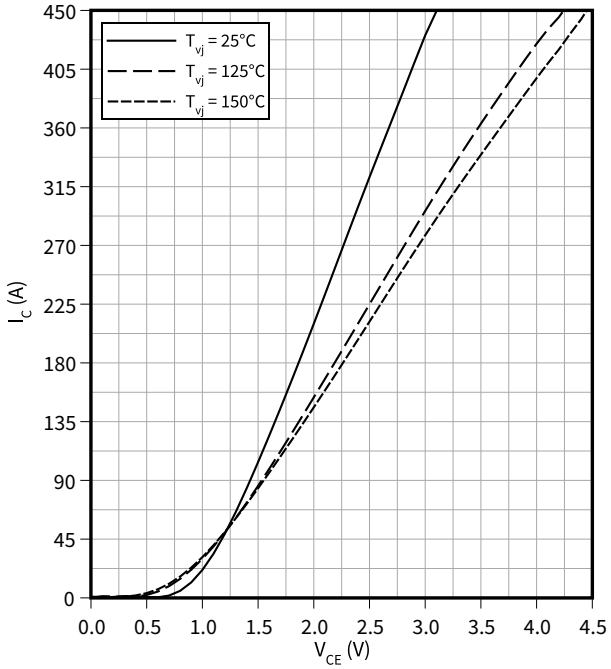
$R_{Goff} = 0.47\ \Omega$, $V_{GE} = \pm 15$ V, $T_{vj} = 150$ °C



Output characteristic (typical), IGBT, T2 / T3

$I_C = f(V_{CE})$

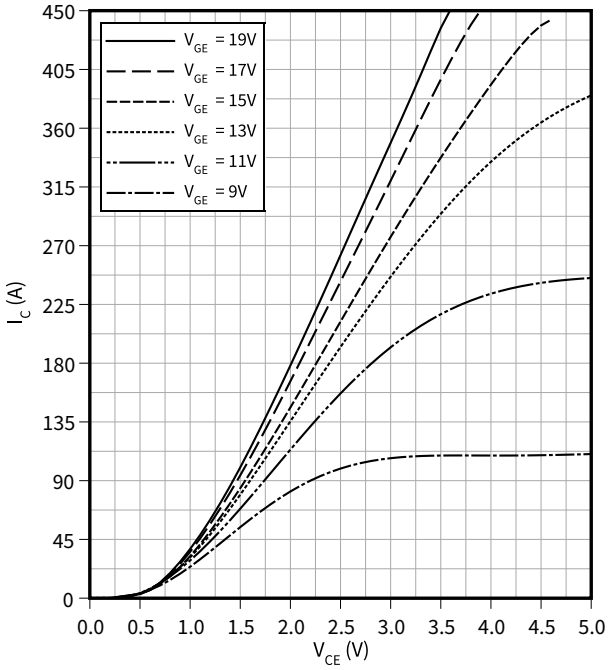
$V_{GE} = 15$ V



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

$I_C = f(V_{CE})$

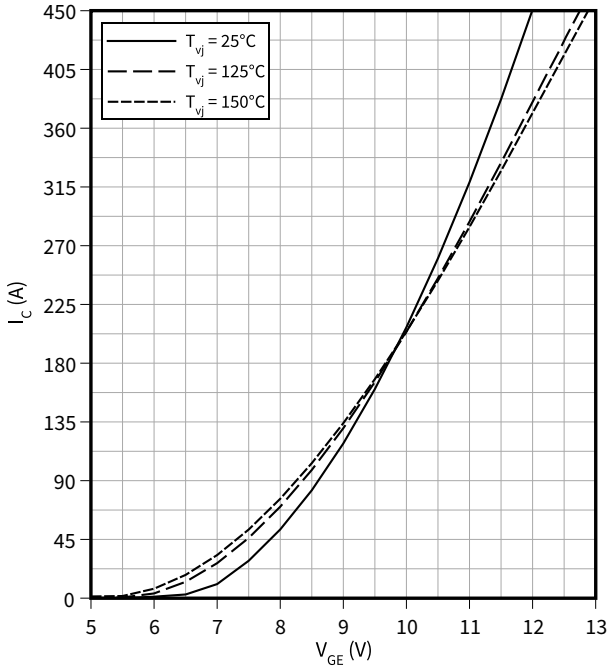
$T_{vj} = 150$ °C



Transfer characteristic (typical), IGBT, T2 / T3

$I_C = f(V_{GE})$

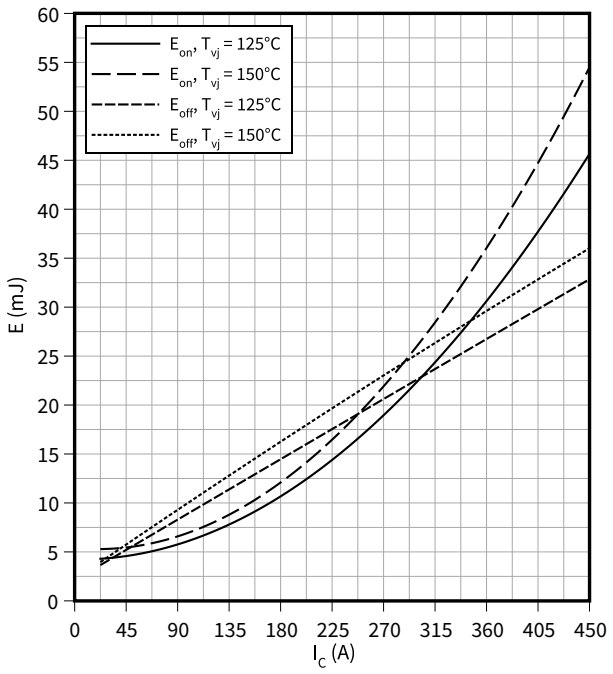
$V_{CE} = 20$ V



Switching losses (typical), IGBT, T2 / T3

$E = f(I_C)$

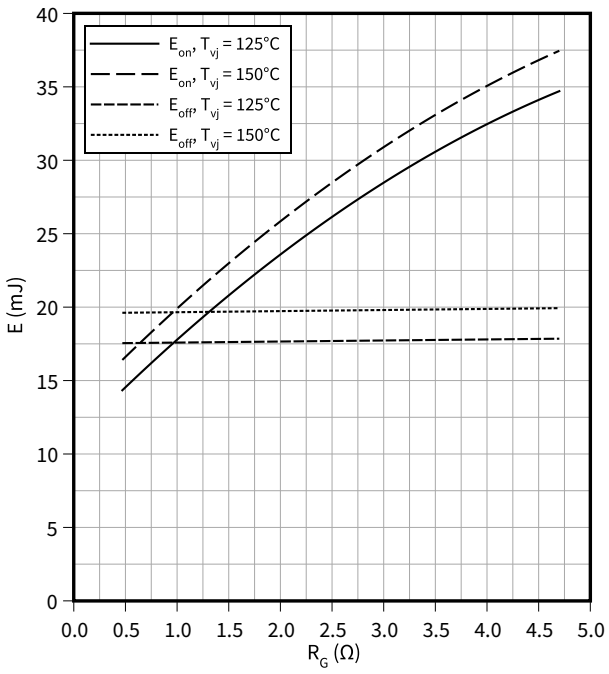
$R_{Goff} = 0.47\ \Omega$, $R_{Gon} = 0.47\ \Omega$, $V_{GE} = \pm 15$ V, $V_{CC} = 600$ V



Switching losses (typical), IGBT, T2 / T3

$E = f(R_G)$

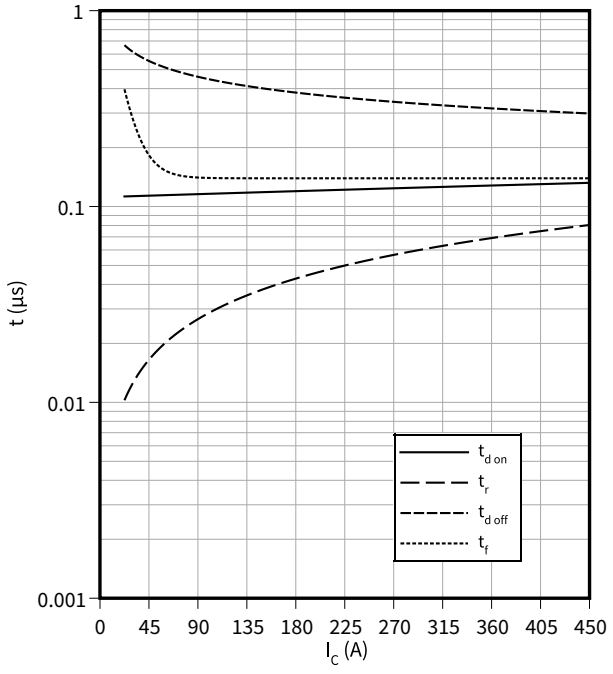
$I_C = 225$ A, $V_{CC} = 600$ V, $V_{GE} = -15 / 15$ V



Switching times (typical), IGBT, T2 / T3

$t = f(I_C)$

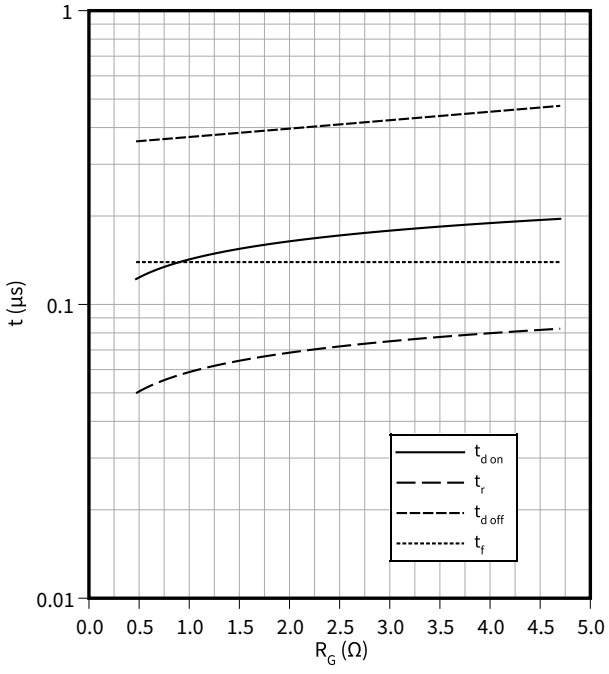
$R_{Goff} = 0.47\ \Omega$, $R_{Gon} = 0.47\ \Omega$, $V_{GE} = \pm 15$ V, $V_{CC} = 600$ V, $T_{vj} = 150$ °C



Switching times (typical), IGBT, T2 / T3

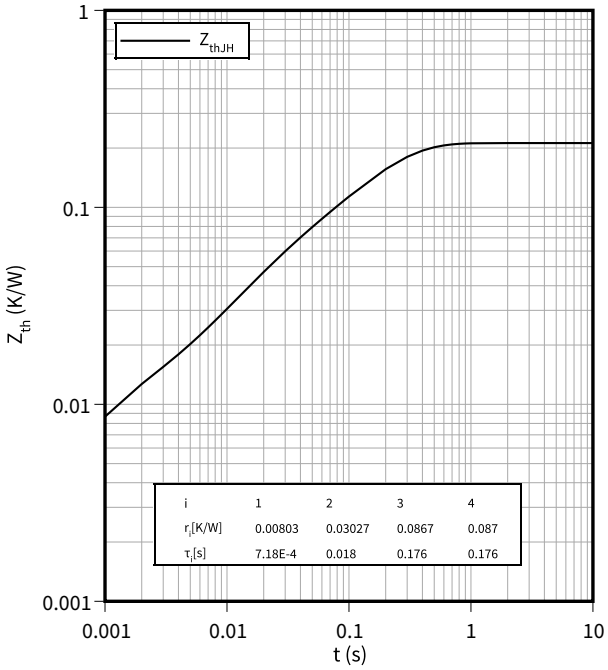
$t = f(R_G)$

$V_{GE} = \pm 15$ V, $I_C = 225$ A, $V_{CC} = 600$ V, $T_{vj} = 150$ °C



Transient thermal impedance , IGBT, T2 / T3

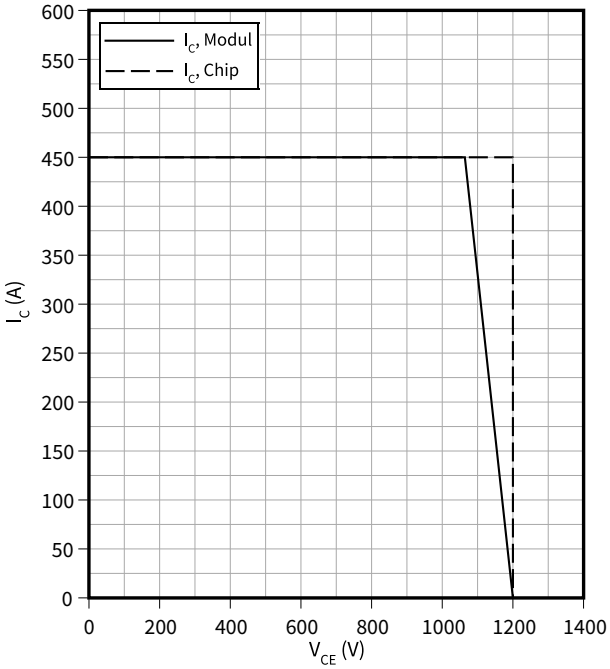
$Z_{th} = f(t)$



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

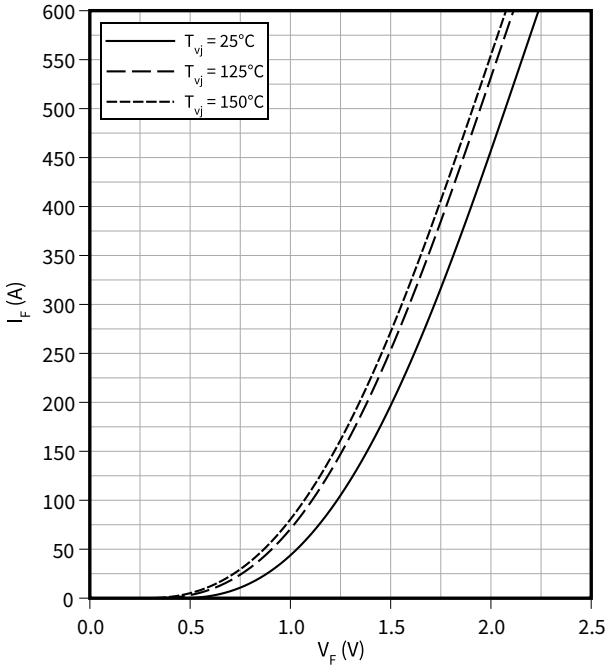
$I_C = f(V_{CE})$

$R_{Goff} = 0.47\ \Omega$, $V_{GE} = \pm 15$ V, $T_{vj} = 150$ °C



Forward characteristic (typical), Diode, D1 / D4

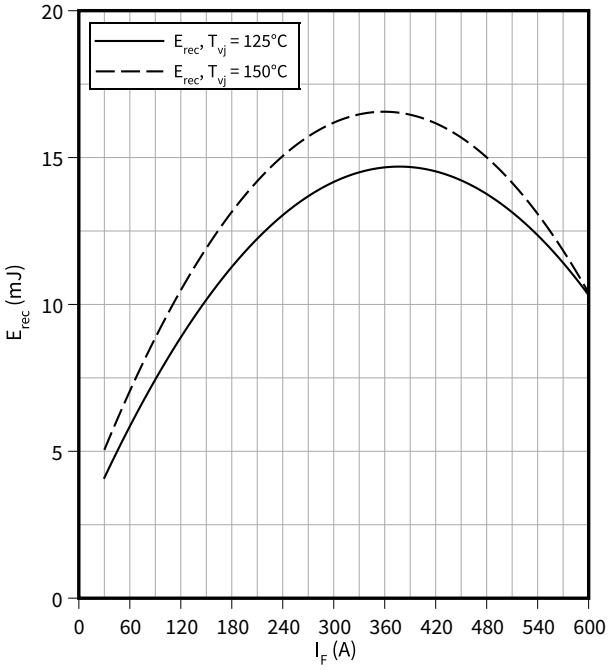
$I_F = f(V_F)$



Switching losses (typical), Diode, D1 / D4

$E_{rec} = f(I_F)$

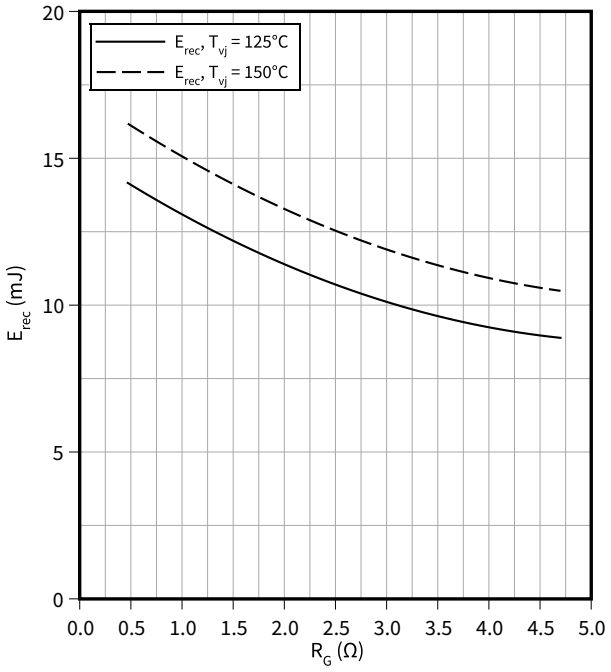
$R_G = 0.47\ \Omega$, $V_{CC} = 600$ V



Switching losses (typical), Diode, D1 / D4

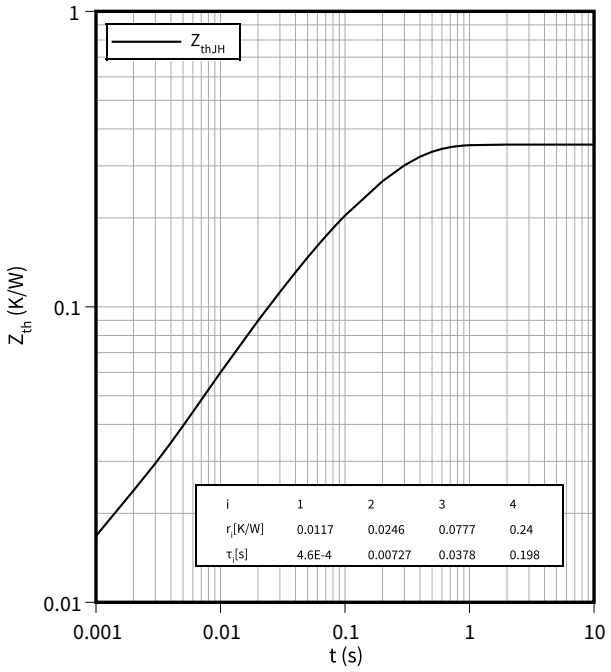
$E_{rec} = f(R_G)$

$I_F = 300\ A$, $V_{CC} = 600\ V$



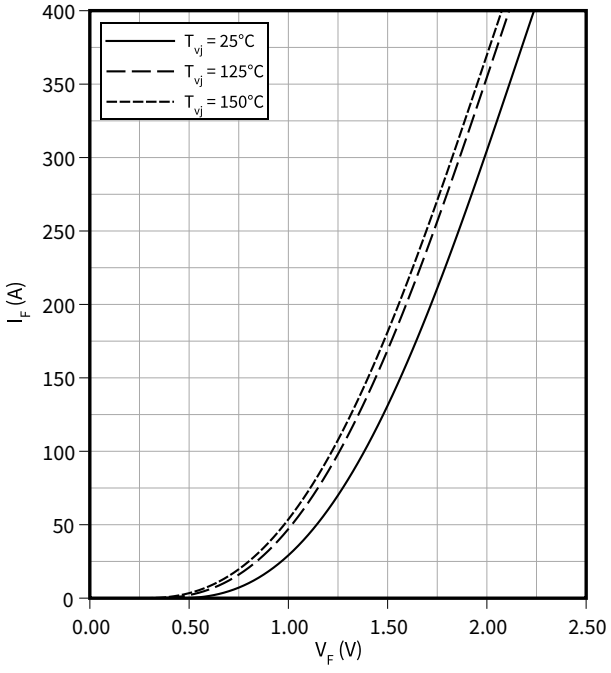
Transient thermal impedance, Diode, D1 / D4

$Z_{th} = f(t)$



Forward characteristic (typical), Diode, D2 / D3

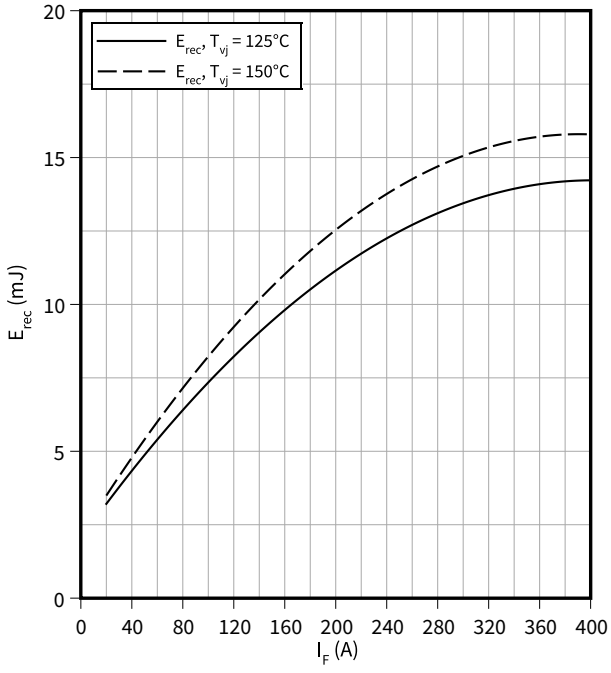
$I_F = f(V_F)$



Switching losses (typical), Diode, D2 / D3

$E_{rec} = f(I_F)$

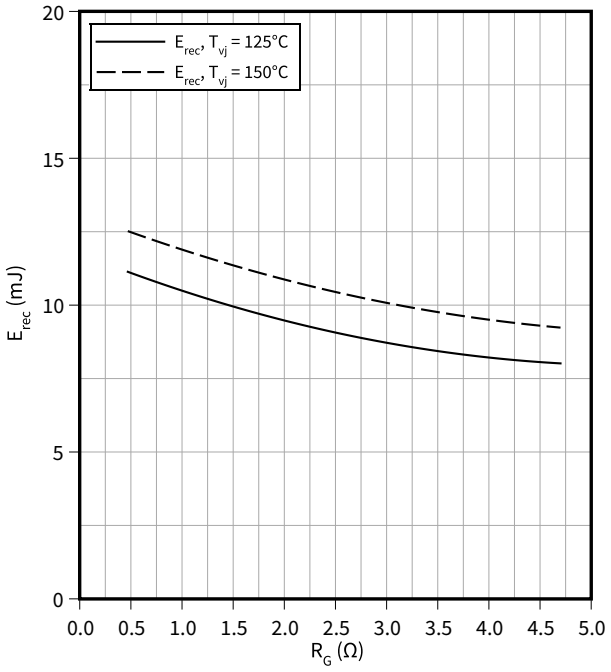
$R_{Gon} = 0.47\ \Omega$, $V_{CC} = 600\ V$



Switching losses (typical), Diode, D2 / D3

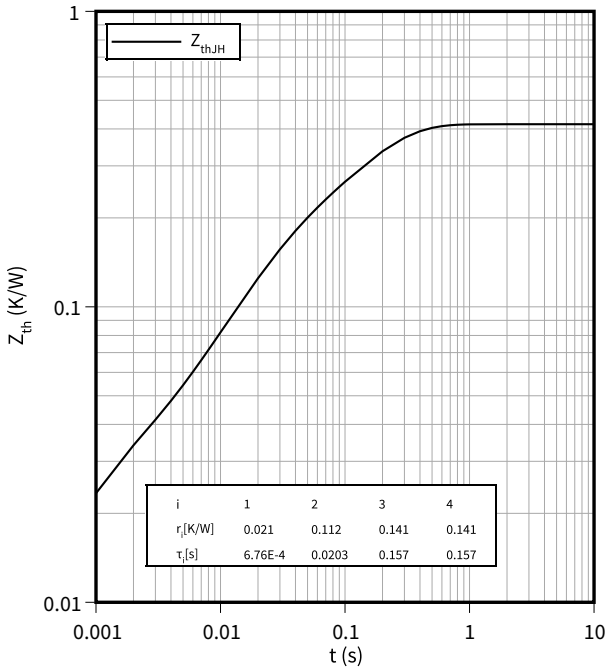
$E_{rec} = f(R_G)$

$I_F = 200\ A, V_{CC} = 600\ V$



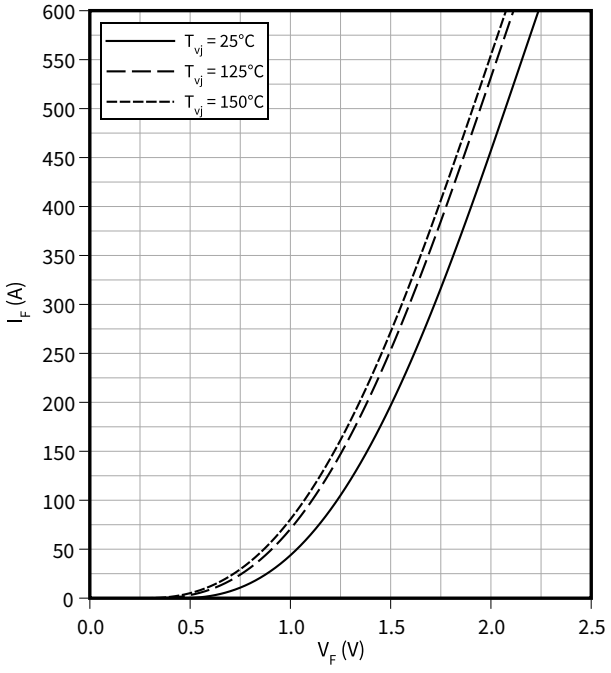
Transient thermal impedance, Diode, D2 / D3

$Z_{th} = f(t)$



Forward characteristic (typical), Diode, D5 / D6

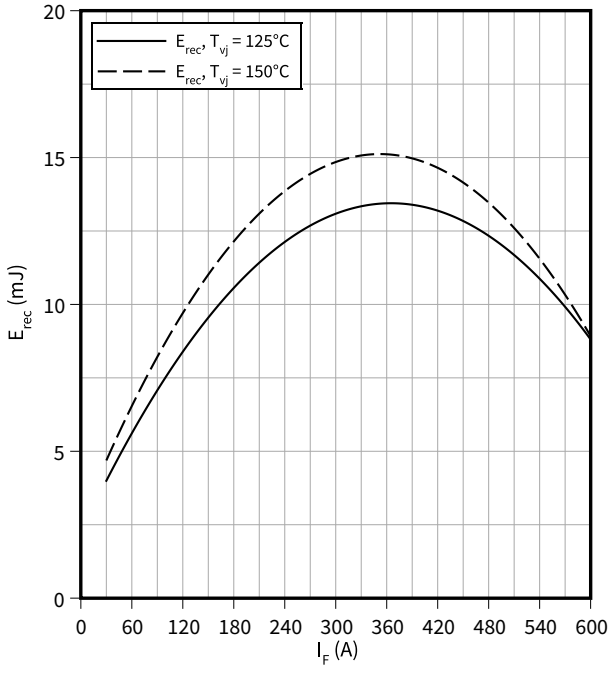
$I_F = f(V_F)$



Switching losses (typical), Diode, D5 / D6

$E_{rec} = f(I_F)$

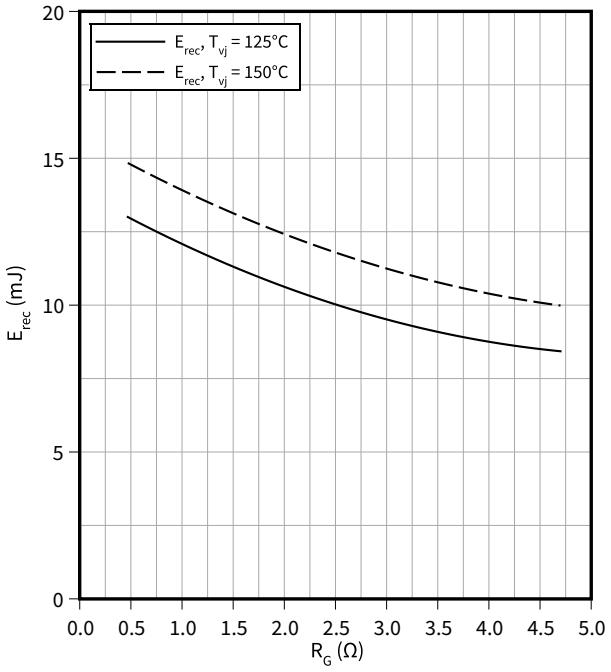
$R_G = 0.47\ \Omega, V_{CC} = 600\ V$



Switching losses (typical), Diode, D5 / D6

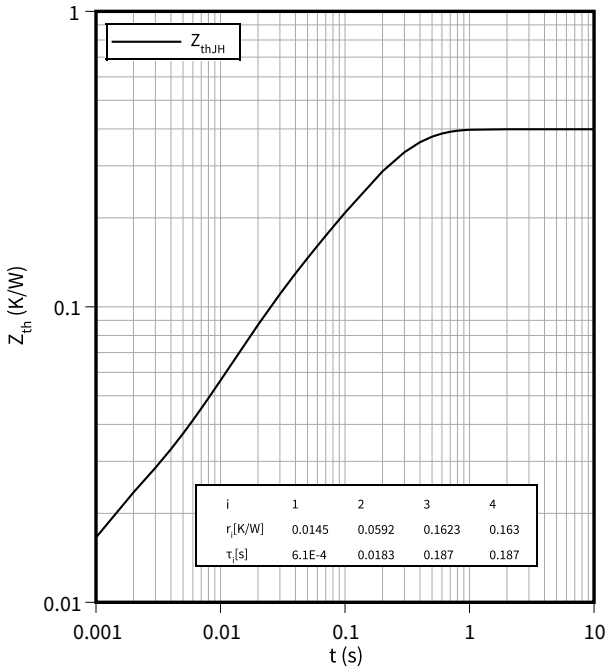
$E_{rec} = f(R_G)$

$I_F = 300\ A,\ V_{CC} = 600\ V$



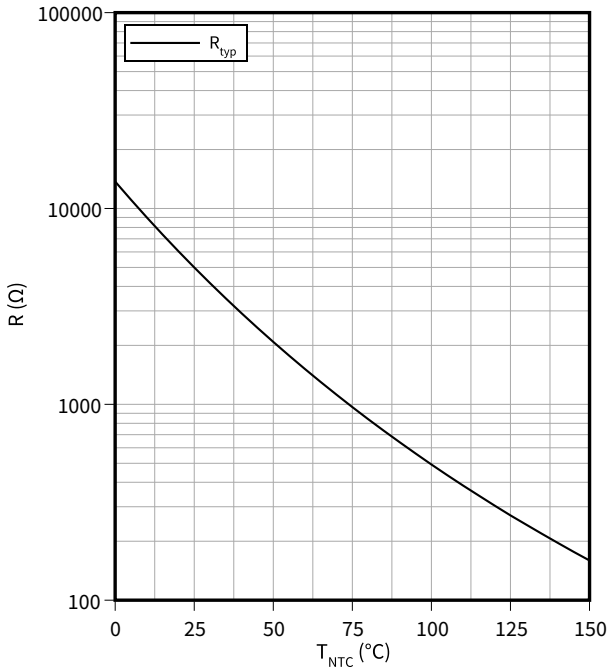
Transient thermal impedance, Diode, D5 / D6

$Z_{th} = f(t)$



Temperature characteristic (typical), NTC-Thermistor

$R = f(T_{NTC})$



9 Circuit diagram

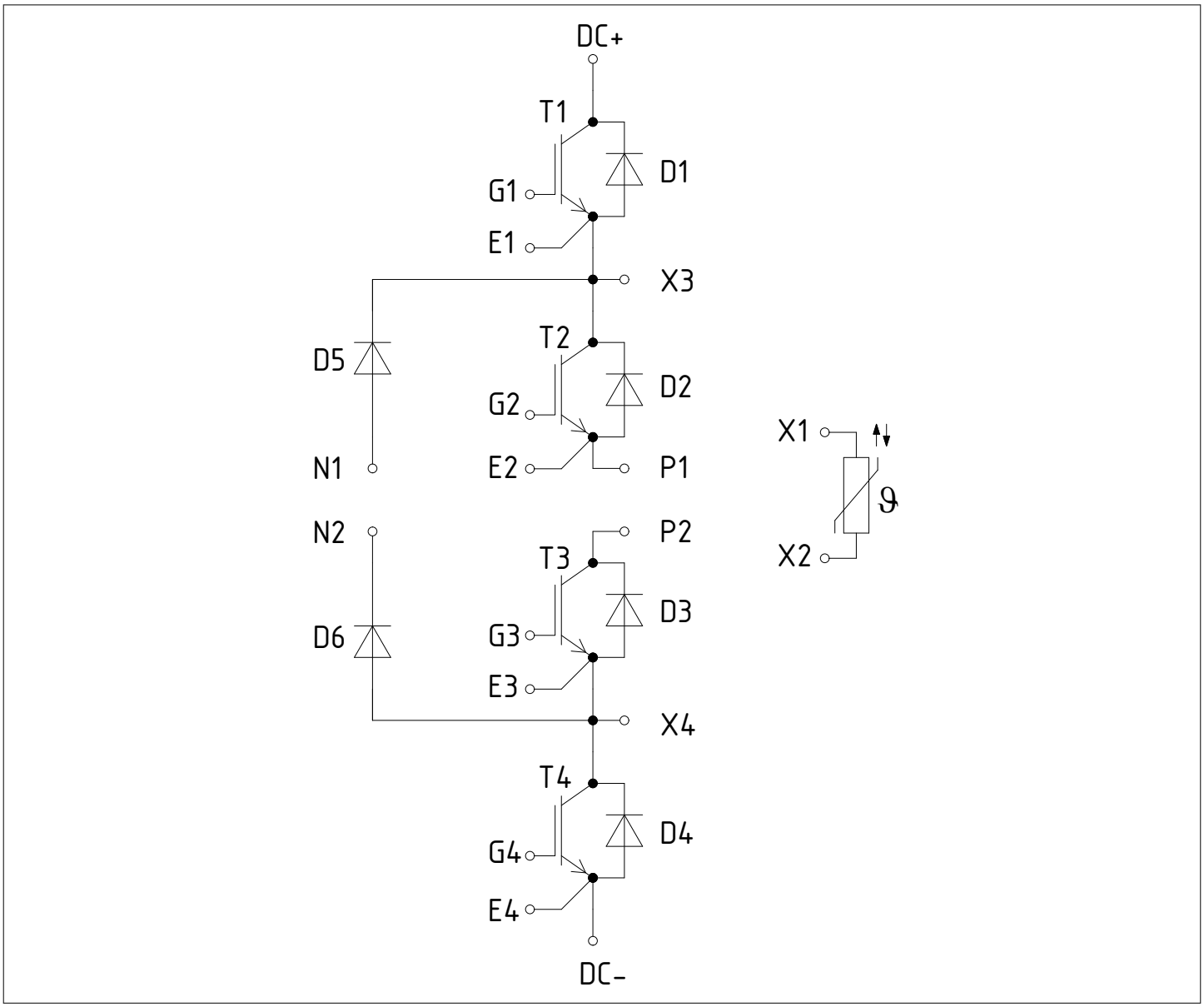


Figure 1

10 Package outlines

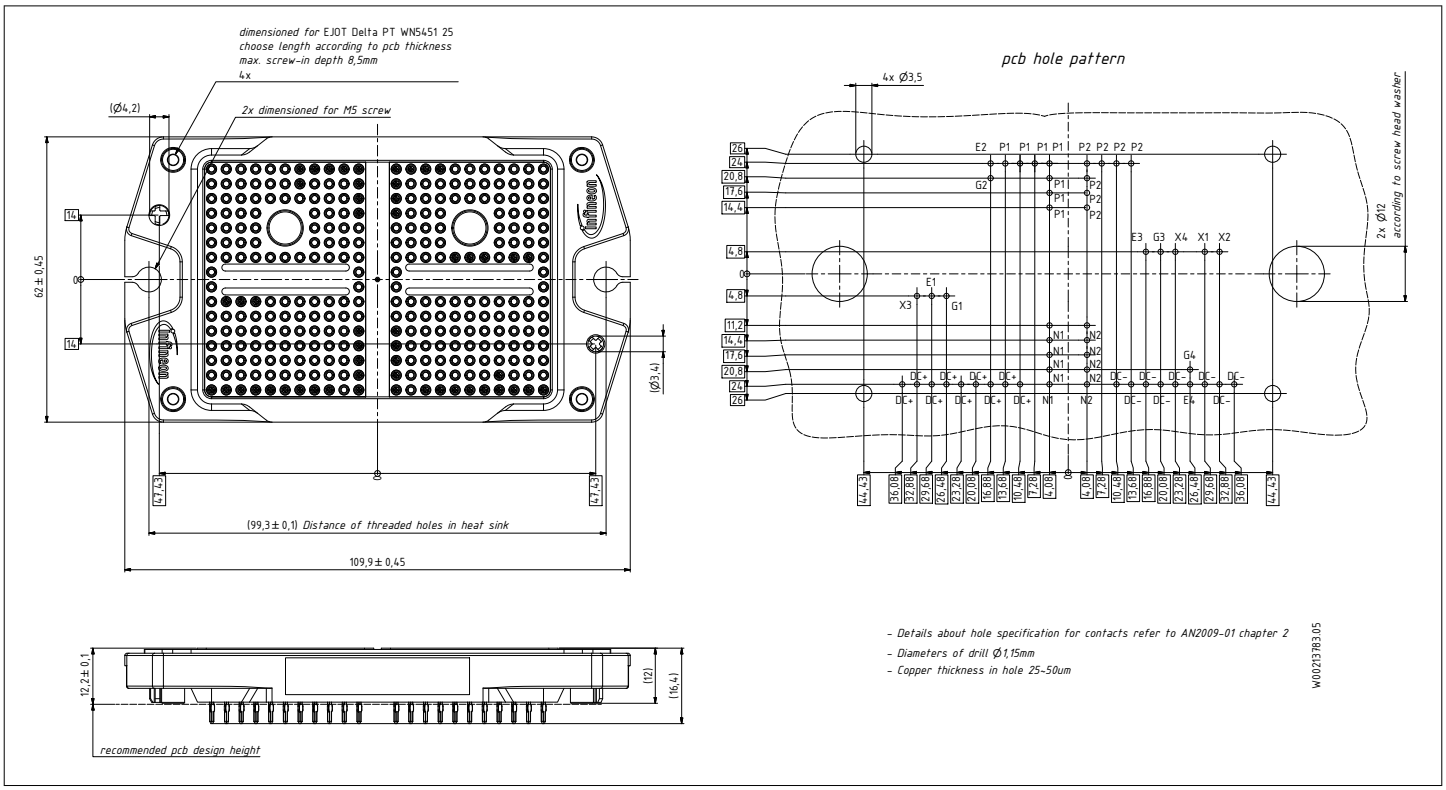


Figure 2

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	*Content* Module serial number Module material number Production order number Date code (production year) Date code (production week)	*Digit* 1 – 5 6 - 11 12 - 19 20 – 21 22 – 23	*Example* 71549 142846 55054991 15 30
Example	715491428465505499115 30		715491428465505499115 30

Figure 3

Revision history

Document version	Date of release	Description of changes
0.10	2022-09-16	Initial version
1.00	2023-02-13	Final datasheet

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