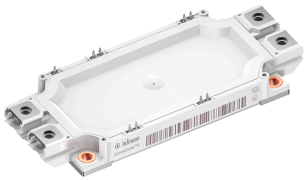
Final datasheet

EconoDUAL™3 module with Trench/Fieldstop IGBT4 and emitter controlled HE diode and PressFIT / pre-applied thermal interface material



Features

- Electrical features
  - V_{CES} = 1200 V
  - $I_{C\ nom}$ = 450 A / I_{CRM} = 900 A
  - Low $V_{CE,sat}$
  - $T_{vj,op}$ = 150°C
  - Suitable Infineon gate drivers can be found under https://www.infineon.com/gdfinder
- Mechanical features
  - PressFIT contact technology
  - Standard housing
  - Pre-applied thermal interface material

Potential applications

- Motor drives
- Servo drives
- UPS systems
- Wind turbines

Product validation

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

Description

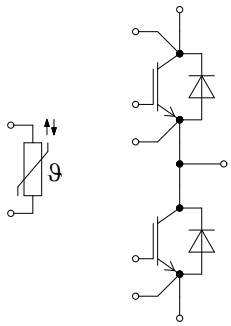


Table of contents

Description . . . 1
Features . . . 1
Potential applications . . . 1
Product validation . . . 1
Table of contents . . . 2
1 Package . . . 3
2 IGBT, Inverter . . . 4
3 Diode, Inverter . . . 5
4 NTC-Thermistor . . . 6
5 Characteristics diagrams . . . 7
6 Circuit diagram . . . 10
7 Package outlines . . . 11
8 Module label code . . . 12
Revision history . . . 13
Disclaimer . . . 14

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	2.5	kV
Isolation test voltage NTC	$V_{ISOL(NTC)}$	RMS, f = 50 Hz, *t* = 1 min	2.5	kV
Material of module baseplate			Cu	
Internal isolation		basic insulation (class 1, IEC 61140)	Al_2O_3	
Creepage distance	$d_{Creep\ nom}$	terminal to baseplate, nom.	> 15	mm
Creepage distance	$d_{Creep\ min}$	terminal to baseplate, min.	14.7	mm
Creepage distance	$d_{Creep\ nom}$	terminal to terminal, nom.	> 19.3	mm
Creepage distance	$d_{Creep\ min}$	terminal to terminal, min.	19.3	mm
Clearance	$d_{Clear\ nom}$	terminal to baseplate, nom.	> 12.5	mm
Clearance	$d_{Clear\ min}$	terminal to baseplate, min.	12.5	mm
Clearance	$d_{Clear\ nom}$	terminal to terminal, nom.	> 10	mm
Clearance	$d_{Clear\ min}$	terminal to terminal, min.	9.6	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}				20		nH
Module lead resistance, terminals - chip	$R_{CC'+EE'}$	T_H = 25 °C, per switch			1.1		mΩ
Storage temperature	T_{stg}			-40		125	°C
Maximum baseplate operation temperature	T_{BPmax}					125	°C
Mounting torque for module mounting	*M*	- Mounting according to valid application note	M5, Screw	3		6	Nm
Terminal connection torque	*M*	- Mounting according to valid application note	M6, Screw	3		6	Nm
Weight	*G*				345		g

***Note**: Storage and shipment of modules with TIM => see AN2012-07*

2 IGBT, Inverter

Table 3 Maximum rated values

Parameter	Symbol	Note or test condition		Values	Unit
Collector-emitter voltage	V_{CES}		T_{vj} = 25 °C	1200	V
Continuous DC collector current	I_{CDC}	$T_{vj\,max}$ = 175 °C	T_H = 55 °C	450	A
Repetitive peak collector current	I_{CRM}	t_p limited by $T_{vj\,op}$		900	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 = 450 A, V_{GE} = 15 V	T_{vj} = 25 °C		1.75	2.10	V
			T_{vj} = 125 °C		2.00		
			T_{vj} = 150 °C		2.05		
Gate threshold voltage	V_{GEth}	I_C = 17.1 mA, V_{CE} = V_{GE}, T_{vj} = 25 °C		5.20	5.80	6.40	V
Gate charge	Q_G	V_{GE} = ±15 V, T_{vj} = 25 °C			3.3		µC
Internal gate resistor	R_{Gint}	T_{vj} = 25 °C			1.7		Ω
Input capacitance	C_{ies}	f = 1000 kHz, T_{vj} = 25 °C, V_{CE} = 25 V, V_{GE} = 0 V			28		nF
Reverse transfer capacitance	C_{res}	f = 1000 kHz, T_{vj} = 25 °C, V_{CE} = 25 V, V_{GE} = 0 V			1.55		nF
Collector-emitter cut-off current	I_{CES}	V_{CE} = 1200 V, V_{GE} = 0 V	T_{vj} = 25 °C			3	mA
Gate-emitter leakage current	I_{GES}	V_{CE} = 0 V, V_{GE} = 20 V, T_{vj} = 25 °C				400	nA
Turn-on delay time (inductive load)	t_{don}	I_C = 450 A, V_{CC} = 600 V, V_{GE} = ±15 V, R_{Gon} = 1.3 Ω	T_{vj} = 25 °C		0.190		µs
			T_{vj} = 125 °C		0.220		
			T_{vj} = 150 °C		0.220		
Rise time (inductive load)	t_r	I_C = 450 A, V_{CC} = 600 V, V_{GE} = ±15 V, R_{Gon} = 1.3 Ω	T_{vj} = 25 °C		0.060		µs
			T_{vj} = 125 °C		0.070		
			T_{vj} = 150 °C		0.070		
Turn-off delay time (inductive load)	t_{doff}	I_C = 450 A, V_{CC} = 600 V, V_{GE} = ±15 V, R_{Goff} = 1.3 Ω	T_{vj} = 25 °C		0.490		µs
			T_{vj} = 125 °C		0.580		
			T_{vj} = 150 °C		0.620		

(table continues...)

Table 4 (continued) Characteristic values

Parameter	Symbol	Note or test condition		Values			Unit
				Min.	Typ.	Max.	
Fall time (inductive load)	t_f	I_C = 450 A, V_{CC} = 600 V, V_{GE} = ±15 V, R_{Goff} = 1.3 Ω	T_{vj} = 25 °C		0.080		µs
			T_{vj} = 125 °C		0.110		
			T_{vj} = 150 °C		0.120		
Turn-on energy loss per pulse	E_{on}	I_C = 450 A, V_{CC} = 600 V, L_σ = 35 nH, V_{GE} = ±15 V, R_{Gon} = 1.3 Ω, di/dt = 7000 A/µs (T_{vj} = 150 °C)	T_{vj} = 25 °C		15		mJ
			T_{vj} = 125 °C		26		
			T_{vj} = 150 °C		28.5		
Turn-off energy loss per pulse	E_{off}	I_C = 450 A, V_{CC} = 600 V, L_σ = 35 nH, V_{GE} = ±15 V, R_{Goff} = 1.3 Ω, dv/dt = 3100 V/µs (T_{vj} = 150 °C)	T_{vj} = 25 °C		38		mJ
			T_{vj} = 125 °C		55.5		
			T_{vj} = 150 °C		61.5		
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		1800		A
Thermal resistance, junction to heat sink	R_{thJH}	per IGBT, Valid with IFX pre-applied Thermal Interface Material				0.104	K/W
Temperature under switching conditions	$T_{vj\,op}$			-40		150	°C

3 Diode, Inverter

Table 5 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			450	A
Repetitive peak forward current	I_{FRM}	t_P = 1 ms		900	A
I^2t - value	I^2t	t_P = 10 ms, V_R = 0 V	T_{vj} = 125 °C	35000	A^2s
			T_{vj} = 150 °C	28500	

Table 6 Characteristic values

Parameter	Symbol	Note or test condition		Values			Unit
				Min.	Typ.	Max.	
Forward voltage	V_F	I_F = 450 A, V_{GE} = 0 V	T_{vj} = 25 °C		1.65	2.10	V
			T_{vj} = 125 °C		1.65		
			T_{vj} = 150 °C		1.65		

(table continues...)

Table 6 (continued) Characteristic values

Parameter	Symbol	Note or test condition		Values			Unit
				Min.	Typ.	Max.	
Peak reverse recovery current	I_{RM}	V_{CC} = 600 V, I_F = 450 A, V_{GE} = -15 V, -di$_F$/dt = 7000 A/µs (T_{vj} = 150 °C)	T_{vj} = 25 °C		450		A
			T_{vj} = 125 °C		550		
			T_{vj} = 150 °C		575		
Recovered charge	Q_r	V_{CC} = 600 V, I_F = 450 A, V_{GE} = -15 V, -di$_F$/dt = 7000 A/µs (T_{vj} = 150 °C)	T_{vj} = 25 °C		48		µC
			T_{vj} = 125 °C		92		
			T_{vj} = 150 °C		105		
Reverse recovery energy	E_{rec}	V_{CC} = 600 V, I_F = 450 A, V_{GE} = -15 V, -di$_F$/dt = 7000 A/µs (T_{vj} = 150 °C)	T_{vj} = 25 °C		26.5		mJ
			T_{vj} = 125 °C		48.5		
			T_{vj} = 150 °C		55		
Thermal resistance, junction to heat sink	R_{thJH}	per diode, Valid with IFX pre-applied Thermal Interface Material				0.149	K/W
Temperature under switching conditions	$T_{vj\,op}$			-40		150	°C

4 NTC-Thermistor

Table 7 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

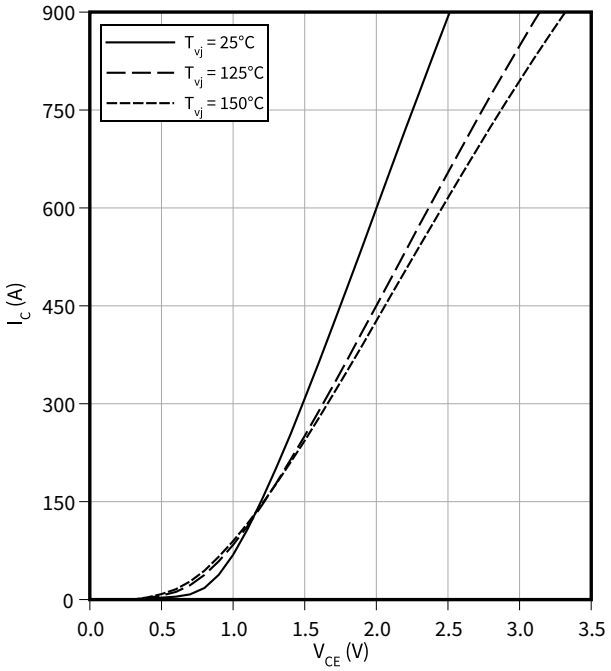
***Note**: For an analytical description of the NTC characteristics please refer to AN2009-10, chapter 4*

5 Characteristics diagrams

Output characteristic (typical), IGBT, Inverter

$I_C = f(V_{CE})$

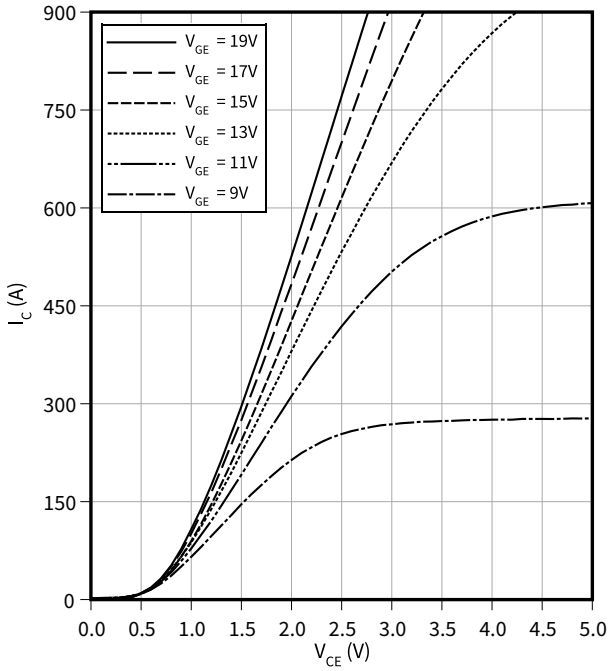
$V_{GE} = 15$ V



Output characteristic field (typical), IGBT, Inverter

$I_C = f(V_{CE})$

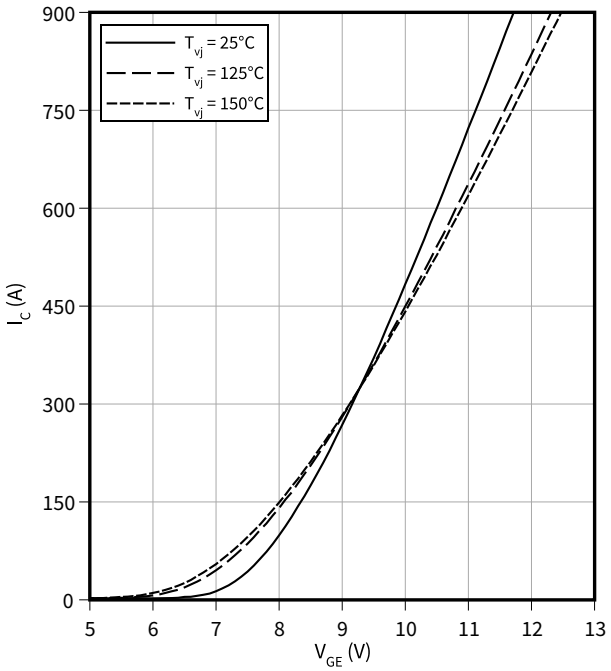
$T_{vj} = 150$ °C



Transfer characteristic (typical), IGBT, Inverter

$I_C = f(V_{GE})$

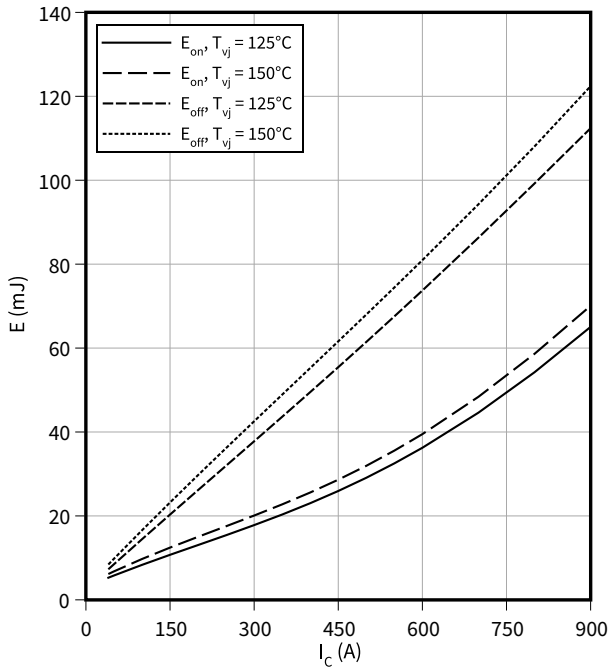
$V_{CE} = 20$ V



Switching losses (typical), IGBT, Inverter

$E = f(I_C)$

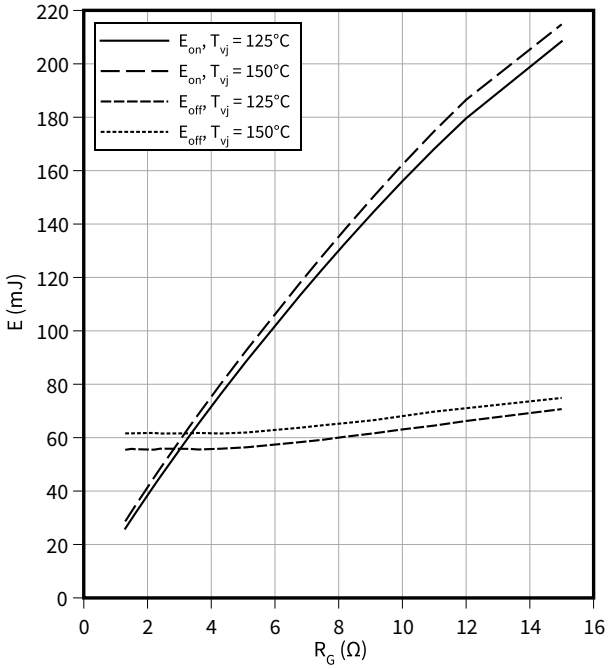
$R_{Goff} = 1.3\ \Omega$, $R_{Gon} = 1.3\ \Omega$, $V_{GE} = \pm 15$ V, $V_{CC} = 600$ V



Switching losses (typical), IGBT, Inverter

$E = f(R_G)$

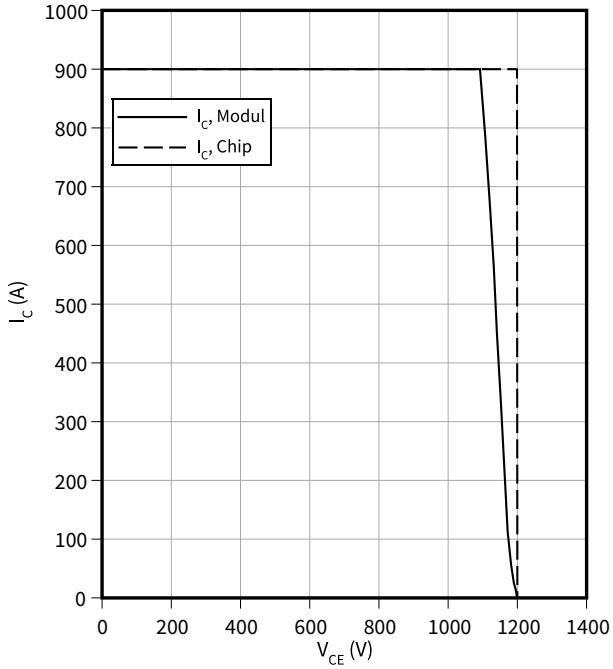
$V_{GE} = \pm 15$ V, $I_C = 450$ A, $V_{CC} = 600$ V



Reverse bias safe operating area (RBSOA), IGBT, Inverter

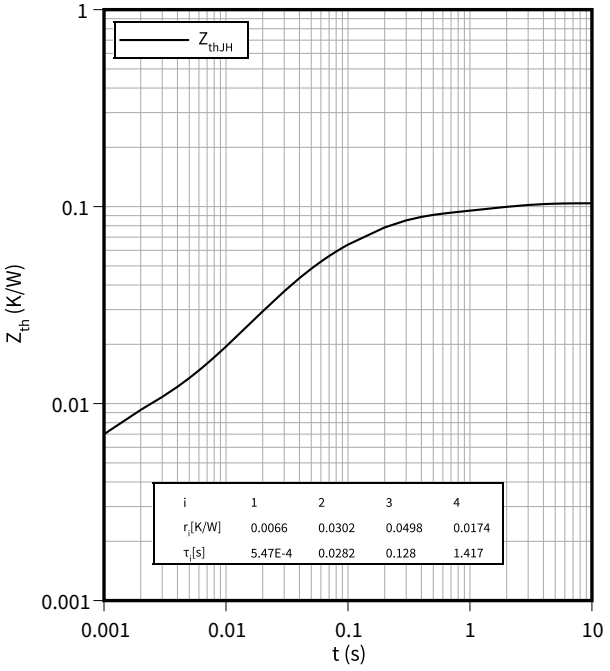
$I_C = f(V_{CE})$

$R_{Goff} = 1.3\ \Omega$, $V_{GE} = \pm 15$ V, $T_{vj} = 150$ °C



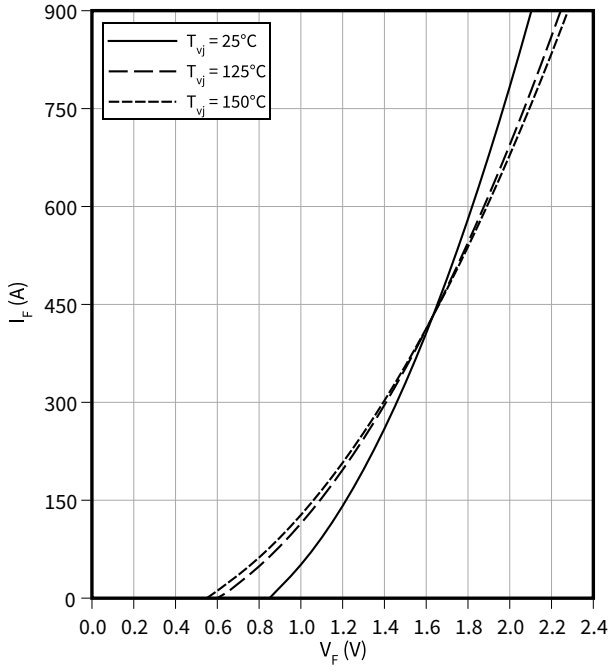
Transient thermal impedance, IGBT, Inverter

$Z_{th} = f(t)$



Forward characteristic (typical), Diode, Inverter

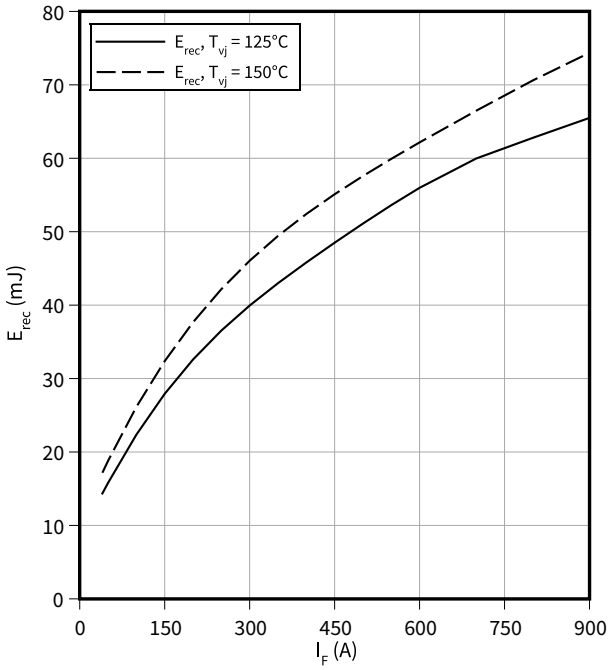
$I_F = f(V_F)$



Switching losses (typical), Diode, Inverter

$E_{rec} = f(I_F)$

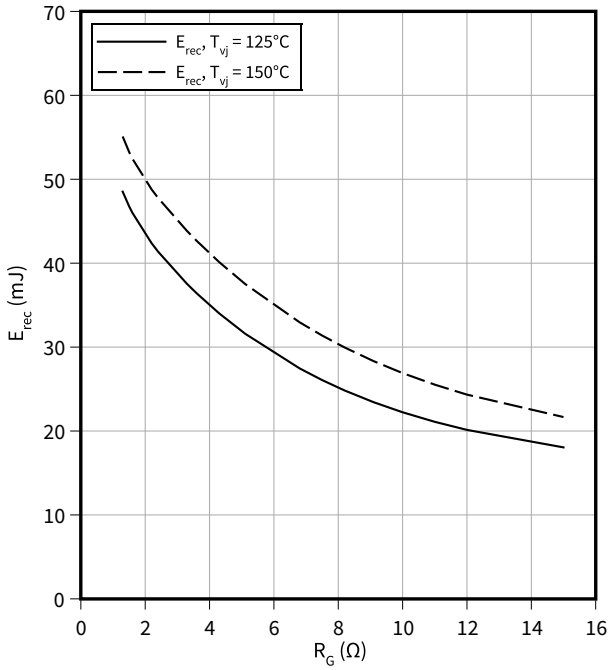
$R_G = 1.3\ \Omega$, $V_{CC} = 600\ V$



Switching losses (typical), Diode, Inverter

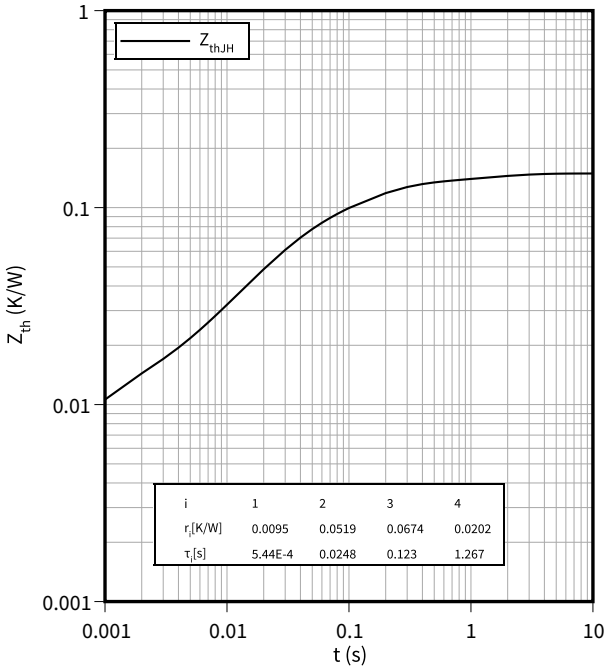
$E_{rec} = f(R_G)$

$I_F = 450\ A$, $V_{CC} = 600\ V$



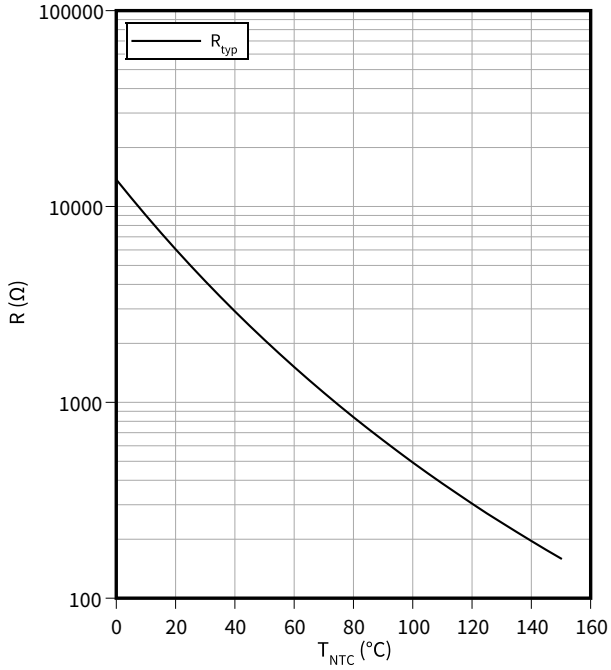
Transient thermal impedance, Diode, Inverter

$Z_{th} = f(t)$



Temperature characteristic (typical), NTC-Thermistor

$R = f(T_{NTC})$



6 Circuit diagram

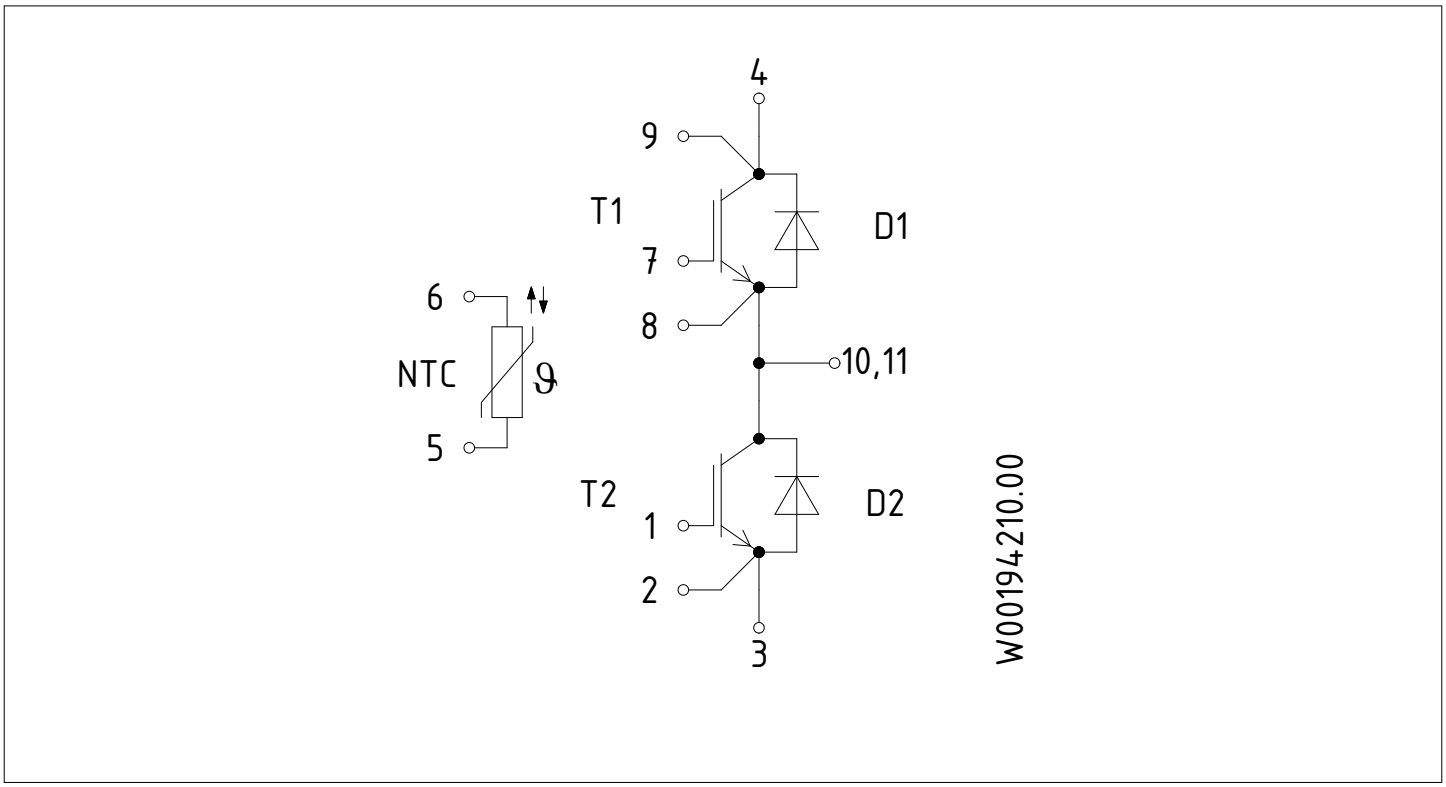


Figure 1

7 Package outlines

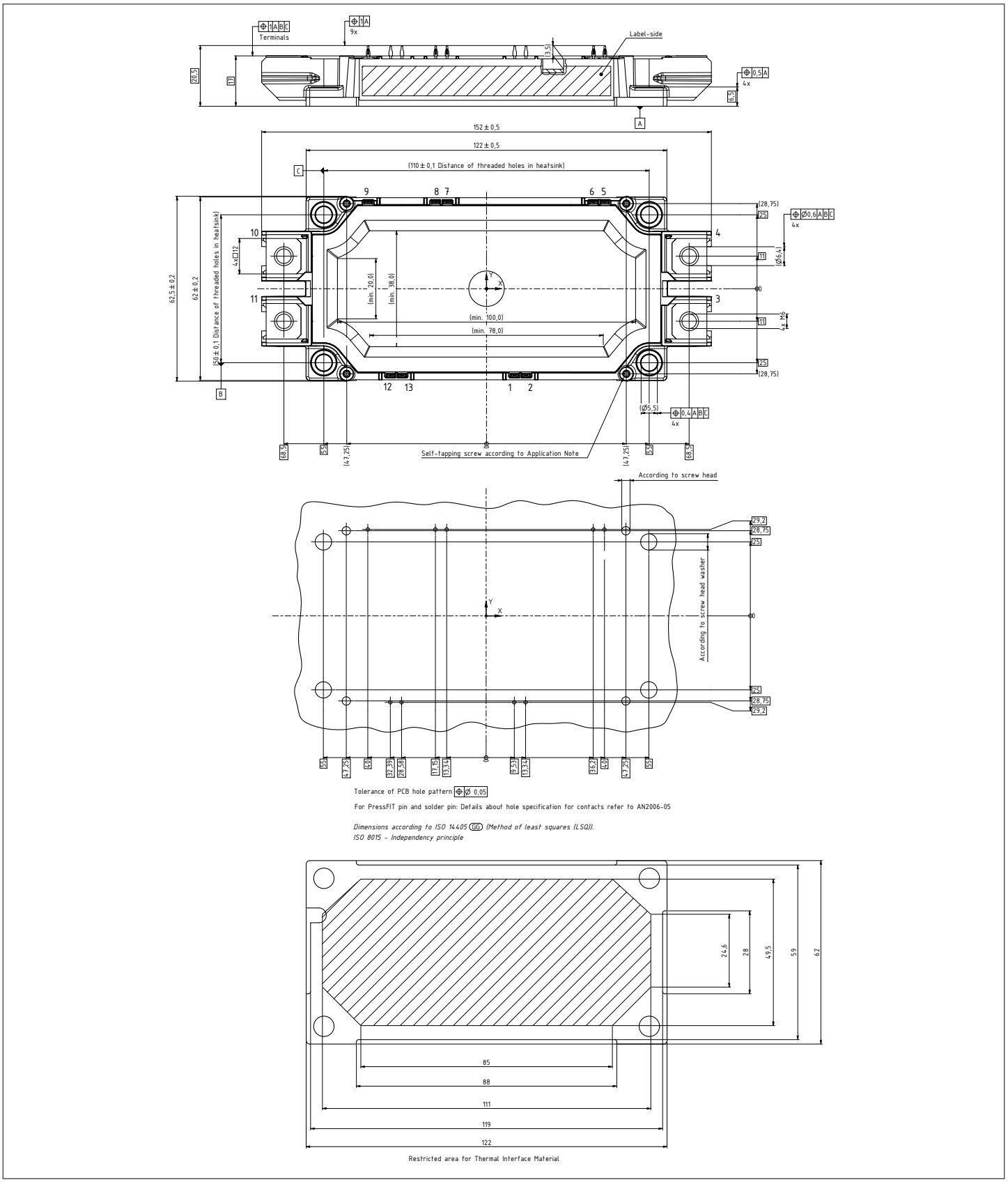


Figure 2

8 Module label code

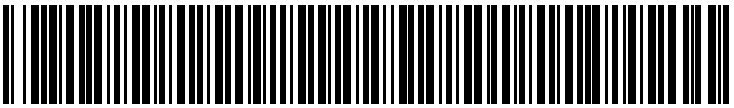
Module label code			
Code format	Data Matrix		Barcode Code128
Encoding	ASCII text		Code Set A
Symbol size	16x16		23 digits
Standard	IEC24720 and IEC16022		IEC8859-1
Code content	*Content* Module serial number Module material number Production order number Date code (production year) Date code (production week)	*Digit* 1 – 5 6 - 11 12 - 19 20 – 21 22 – 23	*Example* 71549 142846 55054991 15 30
Example	 71549142846550549911530	 71549142846550549911530	

Figure 3

Revision history

Document revision	Date of release	Description of changes
V1.0	2014-12-12	Target datasheet
V3.0	2017-04-03	Final datasheet
n/a	2020-09-01	Datasheet migrated to a new system with a new layout and new revision number schema: target or preliminary datasheet = 0.xy; final datasheet = 1.xy
1.10	2024-03-12	Final datasheet
1.20	2025-07-09	Final datasheet

Trademarks

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

Edition 2025-07-09

Published by

Infineon Technologies AG

81726 Munich, Germany

© 2025 Infineon Technologies AG

All Rights Reserved.

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

Email: erratum@infineon.com

Document reference
IFX-AAX538-004

Important notice

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

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.

ENTEGRECİ

Bu belge www.entegreci.com üzerinden sunulmaktadır.

Elektronik komponent tedarikinde Entegreci

Entegreci, Eskişehir merkezli, Türkiye geneline satış yapan bir elektronik komponent mağazasıdır. Entegreler (IC), mikrodenetleyiciler, transistörler, diyotlar, pasif elemanlar, konnektörler, modüller ve geliştirme kartları tek adetten seri üretim adetlerine kadar satılır. Ürün sayfalarında güncel stok durumunu, fiyatı ve datasheet bağlantısını bulabilirsiniz.

Parça koduyla arama

Üretici parça numarasını yazın; stok ve fiyatı hemen görün.

www.entegreci.com

Ürün kategorileri

Entegreden kapasitöre tüm elektronik komponent kategorileri.

Kategorilere göz atın

Üreticiler

Aradığınız üreticinin ürünlerini tek sayfada inceleyin.

Üreticileri görün

Toplu alım ve teklif

Listede olmayan ya da yüksek adetli parçalar için teklif isteyin.

Teklif isteyin

www.entegreci.com | **destek@entegreci.com** | **0850 305 90 34**

Entegreci is an online electronic components store based in Türkiye. Search by manufacturer part number to see stock, prices and datasheets for integrated circuits, microcontrollers, transistors, passive components and connectors, or request a quote for parts that are not listed.

Bu sayfa Entegreci tarafından eklenmiştir. Belgenin önceki sayfaları asıl yayıncısına aittir ve içeriği değiştirilmemiştir; en güncel sürüm için belgenin yayıncısına başvurun.