

EconoPIM™3 module with TRENCHSTOP™ IGBT7 and emitter controlled 7 diode and NTC

Features

- Electrical features
 - $V_{CES} = 1200\text{ V}$
 - $I_{C\text{ nom}} = 150\text{ A} / I_{CRM} = 300\text{ A}$
 - TRENCHSTOP™ IGBT7
 - Overload operation up to 175°C
 - Low $V_{CE,sat}$
- Mechanical features
 - Integrated NTC temperature sensor
 - PressFIT contact technology
 - Copper base plate
 - Al_2O_3 substrate with low thermal resistance



Typical appearance

Potential applications

- Auxiliary inverters
- Motor drives
- Servo drives

Product validation

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

Description

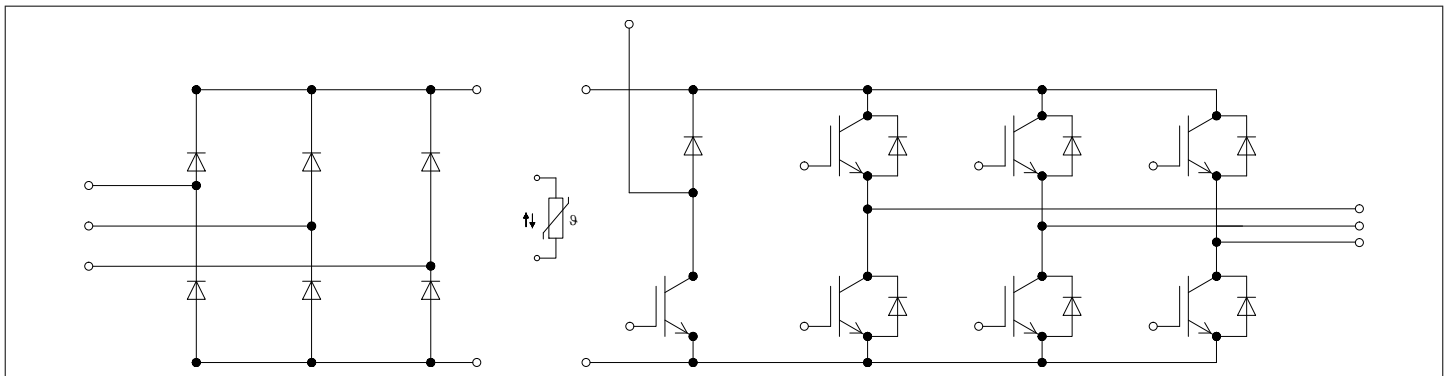


Table of contents

	Description	1
	Features	1
	Potential applications	1
	Product validation	1
	Table of contents	2
1	Package	3
2	IGBT, Inverter	3
3	Diode, Inverter	5
4	Diode, Rectifier	6
5	IGBT, Brake-Chopper	7
6	Diode, Brake-Chopper	9
7	NTC-Thermistor	10
8	Characteristics diagrams	11
9	Circuit diagram	17
10	Package outlines	18
11	Module label code	19
	Revision history	20
	Disclaimer	21

1 Package

Table 1 Insulation coordination

Parameter	Symbol	Note or test condition	Values	Unit
Isolation test voltage	V_{ISOL}	RMS, $f = 50 \text{ Hz}$, $t = 1 \text{ min}$	2.5	kV
Material of module baseplate			Cu	
Internal isolation		basic insulation (class 1, IEC 61140)	Al_2O_3	
Creepage distance	d_{Creep}	terminal to heatsink	10.0	mm
Clearance	d_{Clear}	terminal to heatsink	7.5	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}			25		nH
Module lead resistance, terminals - chip	$R_{AA'+CC'}$	$T_C = 25^\circ\text{C}$, per switch		1.1		mΩ
Module lead resistance, terminals - chip	$R_{CC'+EE'}$	$T_C = 25^\circ\text{C}$, per switch		1.6		mΩ
Storage temperature	T_{stg}		-40		125	°C
Mounting torque for module mounting	M	- Mounting according to valid application note	3		6	Nm
Weight	G			300		g

Note: The current under continuous operation is limited to 50 A rms per connector pin

2 IGBT, Inverter

Table 3 Maximum rated values

Parameter	Symbol	Note or test condition	Values	Unit
Collector-emitter voltage	V_{CES}	$T_{vj} = 25^\circ\text{C}$	1200	V
Continuous DC collector current	I_{CDC}	$T_{vj \max} = 175^\circ\text{C}$ $T_C = 80^\circ\text{C}$	150	A
Repetitive peak collector current	I_{CRM}	t_p limited by $T_{vj \text{ op}}$	300	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	$V_{CE\ sat}$	$I_C = 150\ A, V_{GE} = 15\ V$	$T_{vj} = 25\ ^\circ C$		1.55	1.80	V
			$T_{vj} = 125\ ^\circ C$		1.69		
			$T_{vj} = 175\ ^\circ C$		1.77		
Gate threshold voltage	V_{GETh}	$I_C = 3.5\ mA, V_{CE} = V_{GE}, T_{vj} = 25\ ^\circ C$		5.15	5.80	6.45	V
Gate charge	Q_G	$V_{GE} = \pm 15\ V, V_{CE} = 600\ V$			2.5		μC
Internal gate resistor	R_{Gint}	$T_{vj} = 25\ ^\circ C$			1		Ω
Input capacitance	C_{ies}	$f = 100\ kHz, T_{vj} = 25\ ^\circ C, V_{CE} = 25\ V, V_{GE} = 0\ V$			30.1		nF
Reverse transfer capacitance	C_{res}	$f = 100\ kHz, T_{vj} = 25\ ^\circ C, V_{CE} = 25\ V, V_{GE} = 0\ V$			0.105		nF
Collector-emitter cut-off current	I_{CES}	$V_{CE} = 1200\ V, V_{GE} = 0\ V$	$T_{vj} = 25\ ^\circ C$			0.012	mA
Gate-emitter leakage current	I_{GES}	$V_{CE} = 0\ V, V_{GE} = 20\ V, T_{vj} = 25\ ^\circ C$				100	nA
Turn-on delay time (inductive load)	t_{don}	$I_C = 150\ A, V_{CE} = 600\ V, V_{GE} = \pm 15\ V, R_{Gon} = 3.3\ \Omega$	$T_{vj} = 25\ ^\circ C$		0.172		μs
			$T_{vj} = 125\ ^\circ C$		0.183		
			$T_{vj} = 175\ ^\circ C$		0.189		
Rise time (inductive load)	t_r	$I_C = 150\ A, V_{CE} = 600\ V, V_{GE} = \pm 15\ V, R_{Gon} = 3.3\ \Omega$	$T_{vj} = 25\ ^\circ C$		0.072		μs
			$T_{vj} = 125\ ^\circ C$		0.077		
			$T_{vj} = 175\ ^\circ C$		0.080		
Turn-off delay time (inductive load)	t_{doff}	$I_C = 150\ A, V_{CE} = 600\ V, V_{GE} = \pm 15\ V, R_{Goff} = 3.3\ \Omega$	$T_{vj} = 25\ ^\circ C$		0.331		μs
			$T_{vj} = 125\ ^\circ C$		0.414		
			$T_{vj} = 175\ ^\circ C$		0.433		
Fall time (inductive load)	t_f	$I_C = 150\ A, V_{CE} = 600\ V, V_{GE} = \pm 15\ V, R_{Goff} = 3.3\ \Omega$	$T_{vj} = 25\ ^\circ C$		0.103		μs
			$T_{vj} = 125\ ^\circ C$		0.198		
			$T_{vj} = 175\ ^\circ C$		0.262		
Turn-on energy loss per pulse	E_{on}	$I_C = 150\ A, V_{CE} = 600\ V, L_\sigma = 35\ nH, V_{GE} = \pm 15\ V, R_{Gon} = 3.3\ \Omega, di/dt = 1700\ A/\mu s (T_{vj} = 175\ ^\circ C)$	$T_{vj} = 25\ ^\circ C$		16.6		mJ
			$T_{vj} = 125\ ^\circ C$		24.9		
			$T_{vj} = 175\ ^\circ C$		29.6		
Turn-off energy loss per pulse	E_{off}	$I_C = 150\ A, V_{CE} = 600\ V, L_\sigma = 35\ nH, V_{GE} = \pm 15\ V, R_{Goff} = 3.3\ \Omega, dv/dt = 3200\ V/\mu s (T_{vj} = 175\ ^\circ C)$	$T_{vj} = 25\ ^\circ C$		10.4		mJ
			$T_{vj} = 125\ ^\circ C$		15.9		
			$T_{vj} = 175\ ^\circ C$		19.9		

(table continues...)

Table 4 (continued) Characteristic values

Parameter	Symbol	Note or test condition	Values			Unit
			Min.	Typ.	Max.	
SC data	I_{SC}	$V_{GE} \leq 15 \text{ V}, V_{CC} = 800 \text{ V}, V_{CEmax} = V_{CES} - L_{sCE} \cdot di/dt$		520		A
				490		
Thermal resistance, junction to case	R_{thJC}	per IGBT			0.290	K/W
Thermal resistance, case to heat sink	R_{thCH}	per IGBT, $\lambda_{grease} = 1 \text{ W/(m}^2\text{K)}$		0.0680		K/W
Temperature under switching conditions	$T_{vj op}$		-40		175	°C

Note: $T_{vj op} > 150^\circ\text{C}$ is allowed for operation at overload conditions. For detailed specifications, please refer to AN 2018-14.

3 Diode, Inverter

Table 5 Maximum rated values

Parameter	Symbol	Note or test condition	Values	Unit
Repetitive peak reverse voltage	V_{RRM}	$T_{vj} = 25^\circ\text{C}$	1200	V
Continuous DC forward current	I_F		150	A
Repetitive peak forward current	I_{FRM}	$t_P = 1 \text{ ms}$	300	A
I^2t - value	I^2t	$t_P = 10 \text{ ms}, V_R = 0 \text{ V}$	$T_{vj} = 125^\circ\text{C}$	A^2s
			$T_{vj} = 175^\circ\text{C}$	

Table 6 Characteristic values

Parameter	Symbol	Note or test condition	Values			Unit
			Min.	Typ.	Max.	
Forward voltage	V_F	$I_F = 150 \text{ A}, V_{GE} = 0 \text{ V}$	$T_{vj} = 25^\circ\text{C}$	1.72	2.10	V
			$T_{vj} = 125^\circ\text{C}$	1.59		
			$T_{vj} = 175^\circ\text{C}$	1.52		
Peak reverse recovery current	I_{RM}	$V_R = 600 \text{ V}, I_F = 150 \text{ A}, V_{GE} = -15 \text{ V}, -di_F/dt = 1700 \text{ A}/\mu\text{s} (T_{vj} = 175^\circ\text{C})$	$T_{vj} = 25^\circ\text{C}$	65.3		A
			$T_{vj} = 125^\circ\text{C}$	91.8		
			$T_{vj} = 175^\circ\text{C}$	107		

(table continues...)

Table 6 (continued) Characteristic values

Parameter	Symbol	Note or test condition	Values			Unit
			Min.	Typ.	Max.	
Recovered charge	Q_r	$V_R = 600 \text{ V}$, $I_F = 150 \text{ A}$, $V_{GE} = -15 \text{ V}$, $-di_F/dt = 1700 \text{ A}/\mu\text{s}$ ($T_{vj} = 175 \text{ }^\circ\text{C}$)	$T_{vj} = 25 \text{ }^\circ\text{C}$	10.3		μC
			$T_{vj} = 125 \text{ }^\circ\text{C}$	21.7		
			$T_{vj} = 175 \text{ }^\circ\text{C}$	28.6		
Reverse recovery energy	E_{rec}	$V_R = 600 \text{ V}$, $I_F = 150 \text{ A}$, $V_{GE} = -15 \text{ V}$, $-di_F/dt = 1700 \text{ A}/\mu\text{s}$ ($T_{vj} = 175 \text{ }^\circ\text{C}$)	$T_{vj} = 25 \text{ }^\circ\text{C}$	3.27		mJ
			$T_{vj} = 125 \text{ }^\circ\text{C}$	7.32		
			$T_{vj} = 175 \text{ }^\circ\text{C}$	9.88		
Thermal resistance, junction to case	R_{thJC}	per diode			0.463	K/W
Thermal resistance, case to heat sink	R_{thCH}	per diode, $\lambda_{grease} = 1 \text{ W}/(\text{m}^*\text{K})$		0.0698		K/W
Temperature under switching conditions	$T_{vj op}$		-40		175	$^\circ\text{C}$

Note: $T_{vj op} > 150^\circ\text{C}$ is allowed for operation at overload conditions. For detailed specifications, please refer to AN 2018-14.

4 Diode, Rectifier

Table 7 Maximum rated values

Parameter	Symbol	Note or test condition	Values	Unit
Repetitive peak reverse voltage	V_{RRM}	$T_{vj} = 25 \text{ }^\circ\text{C}$	1600	V
Maximum RMS forward current per chip	I_{FRMSM}	$T_C = 100 \text{ }^\circ\text{C}$	150	A
Maximum RMS current at rectifier output	I_{RMSM}	$T_C = 100 \text{ }^\circ\text{C}$	150	A
Surge forward current	I_{FSM}	$t_P = 10 \text{ ms}$	$T_{vj} = 25 \text{ }^\circ\text{C}$	A
			$T_{vj} = 150 \text{ }^\circ\text{C}$	
I^2t - value	I^2t	$t_P = 10 \text{ ms}$	$T_{vj} = 25 \text{ }^\circ\text{C}$	A^2s
			$T_{vj} = 150 \text{ }^\circ\text{C}$	

Table 8 Characteristic values

Parameter	Symbol	Note or test condition	Values			Unit
			Min.	Typ.	Max.	
Forward voltage	V_F	$I_F = 150 \text{ A}$	$T_{vj} = 150 \text{ }^\circ\text{C}$	0.97		V
Reverse current	I_r	$T_{vj} = 150 \text{ }^\circ\text{C}$, $V_R = 1600 \text{ V}$		1		mA

(table continues...)

Table 8 (continued) Characteristic values

Parameter	Symbol	Note or test condition	Values			Unit
			Min.	Typ.	Max.	
Thermal resistance, junction to case	R_{thJC}	per diode			0.333	K/W
Thermal resistance, case to heat sink	R_{thCH}	per diode, $\lambda_{grease} = 1 \text{ W/(m}^2\text{K)}$		0.0670		K/W
Temperature under switching conditions	$T_{vj, op}$		-40		150	°C

5 IGBT, Brake-Chopper

Table 9 Maximum rated values

Parameter	Symbol	Note or test condition		Values	Unit
Collector-emitter voltage	V_{CES}		$T_{vj} = 25 \text{ °C}$	1200	V
Continuous DC collector current	I_{CDC}	$T_{vj max} = 175 \text{ °C}$	$T_C = 90 \text{ °C}$	100	A
Repetitive peak collector current	I_{CRM}	t_p limited by $T_{vj op}$		200	A
Gate-emitter peak voltage	V_{GES}			±20	V

Table 10 Characteristic values

Parameter	Symbol	Note or test condition		Values			Unit
				Min.	Typ.	Max.	
Collector-emitter saturation voltage	$V_{CE sat}$	$I_C = 100 \text{ A}$, $V_{GE} = 15 \text{ V}$	$T_{vj} = 25 \text{ °C}$		1.50	1.80	V
			$T_{vj} = 125 \text{ °C}$		1.64		
			$T_{vj} = 175 \text{ °C}$		1.72		
Gate threshold voltage	V_{GEth}	$I_C = 2.5 \text{ mA}$, $V_{CE} = V_{GE}$, $T_{vj} = 25 \text{ °C}$		5.15	5.80	6.45	V
Gate charge	Q_G	$V_{GE} = \pm 15 \text{ V}$, $V_{CE} = 600 \text{ V}$			1.8		μC
Internal gate resistor	R_{Gint}	$T_{vj} = 25 \text{ °C}$			1.5		Ω
Input capacitance	C_{ies}	$f = 100 \text{ kHz}$, $T_{vj} = 25 \text{ °C}$, $V_{CE} = 25 \text{ V}$, $V_{GE} = 0 \text{ V}$			21.7		nF
Reverse transfer capacitance	C_{res}	$f = 100 \text{ kHz}$, $T_{vj} = 25 \text{ °C}$, $V_{CE} = 25 \text{ V}$, $V_{GE} = 0 \text{ V}$			0.076		nF
Collector-emitter cut-off current	I_{CES}	$V_{CE} = 1200 \text{ V}$, $V_{GE} = 0 \text{ V}$	$T_{vj} = 25 \text{ °C}$			0.01	mA
Gate-emitter leakage current	I_{GES}	$V_{CE} = 0 \text{ V}$, $V_{GE} = 20 \text{ V}$, $T_{vj} = 25 \text{ °C}$				100	nA

(table continues...)

Table 10 (continued) **Characteristic values**

Parameter	Symbol	Note or test condition	Values			Unit
			Min.	Typ.	Max.	
Turn-on delay time (inductive load)	t_{don}	$I_C = 100\text{ A}$, $V_{CE} = 600\text{ V}$, $V_{GE} = \pm 15\text{ V}$, $R_{Gon} = 4.3\ \Omega$	$T_{vj} = 25\text{ °C}$	0.169		μs
			$T_{vj} = 125\text{ °C}$	0.180		
			$T_{vj} = 175\text{ °C}$	0.187		
Rise time (inductive load)	t_r	$I_C = 100\text{ A}$, $V_{CE} = 600\text{ V}$, $V_{GE} = \pm 15\text{ V}$, $R_{Gon} = 4.3\ \Omega$	$T_{vj} = 25\text{ °C}$	0.063		μs
			$T_{vj} = 125\text{ °C}$	0.067		
			$T_{vj} = 175\text{ °C}$	0.070		
Turn-off delay time (inductive load)	t_{doff}	$I_C = 100\text{ A}$, $V_{CE} = 600\text{ V}$, $V_{GE} = \pm 15\text{ V}$, $R_{Goff} = 4.3\ \Omega$	$T_{vj} = 25\text{ °C}$	0.310		μs
			$T_{vj} = 125\text{ °C}$	0.390		
			$T_{vj} = 175\text{ °C}$	0.410		
Fall time (inductive load)	t_f	$I_C = 100\text{ A}$, $V_{CE} = 600\text{ V}$, $V_{GE} = \pm 15\text{ V}$, $R_{Goff} = 4.3\ \Omega$	$T_{vj} = 25\text{ °C}$	0.110		μs
			$T_{vj} = 125\text{ °C}$	0.190		
			$T_{vj} = 175\text{ °C}$	0.250		
Turn-on energy loss per pulse	E_{on}	$I_C = 100\text{ A}$, $V_{CE} = 600\text{ V}$, $L_\sigma = 35\text{ nH}$, $V_{GE} = \pm 15\text{ V}$, $R_{Gon} = 4.3\ \Omega$, $di/dt =$ $1100\text{ A}/\mu\text{s}$ ($T_{vj} = 175\text{ °C}$)	$T_{vj} = 25\text{ °C}$	7.12		mJ
			$T_{vj} = 125\text{ °C}$	11.7		
			$T_{vj} = 175\text{ °C}$	14.5		
Turn-off energy loss per pulse	E_{off}	$I_C = 100\text{ A}$, $V_{CE} = 600\text{ V}$, $L_\sigma = 35\text{ nH}$, $V_{GE} = \pm 15\text{ V}$, $R_{Goff} = 4.3\ \Omega$, $dv/dt =$ $2800\text{ V}/\mu\text{s}$ ($T_{vj} = 175\text{ °C}$)	$T_{vj} = 25\text{ °C}$	6.93		mJ
			$T_{vj} = 125\text{ °C}$	10.6		
			$T_{vj} = 175\text{ °C}$	13.3		
SC data	I_{SC}	$V_{GE} \leq 15\text{ V}$, $V_{CC} = 800\text{ V}$, $V_{CEmax} = V_{CES} - L_{sCE} \cdot di/dt$	$t_p \leq 8\ \mu\text{s}$, $T_{vj} = 150\text{ °C}$	370		A
			$t_p \leq 7\ \mu\text{s}$, $T_{vj} = 175\text{ °C}$	350		
Thermal resistance, junction to case	R_{thJC}	per IGBT			0.373	K/W
Thermal resistance, case to heat sink	R_{thCH}	per IGBT, $\lambda_{grease} = 1\text{ W}/(\text{m} \cdot \text{K})$		0.0680		K/W
Temperature under switching conditions	$T_{vj\text{ op}}$		-40		175	°C

Note: $T_{vj\text{ op}} > 150\text{ °C}$ is allowed for operation at overload conditions. For detailed specifications, please refer to AN 2018-14.

6 Diode, Brake-Chopper

Table 11 Maximum rated values

Parameter	Symbol	Note or test condition		Values	Unit
Repetitive peak reverse voltage	V_{RRM}		$T_{vj} = 25\text{ °C}$	1200	V
Continuous DC forward current	I_F			50	A
Repetitive peak forward current	I_{FRM}	$t_P = 1\text{ ms}$		100	A
I^2t - value	I^2t	$t_P = 10\text{ ms}, V_R = 0\text{ V}$	$T_{vj} = 125\text{ °C}$	220	A^2s
			$T_{vj} = 175\text{ °C}$	200	

Table 12 Characteristic values

Parameter	Symbol	Note or test condition	Values			Unit
			Min.	Typ.	Max.	
Forward voltage	V_F	$I_F = 50\text{ A}, V_{GE} = 0\text{ V}$	$T_{vj} = 25\text{ °C}$	1.72	2.10	V
			$T_{vj} = 125\text{ °C}$	1.59		
			$T_{vj} = 175\text{ °C}$	1.52		
Peak reverse recovery current	I_{RM}	$V_R = 600\text{ V}, I_F = 50\text{ A}, V_{GE} = -15\text{ V}, -di_F/dt = 550\text{ A}/\mu s (T_{vj} = 175\text{ °C})$	$T_{vj} = 25\text{ °C}$	37.3		A
			$T_{vj} = 125\text{ °C}$	44.3		
			$T_{vj} = 175\text{ °C}$	49.6		
Recovered charge	Q_r	$V_R = 600\text{ V}, I_F = 50\text{ A}, V_{GE} = -15\text{ V}, -di_F/dt = 550\text{ A}/\mu s (T_{vj} = 175\text{ °C})$	$T_{vj} = 25\text{ °C}$	3.86		μC
			$T_{vj} = 125\text{ °C}$	7.05		
			$T_{vj} = 175\text{ °C}$	10.1		
Reverse recovery energy	E_{rec}	$V_R = 600\text{ V}, I_F = 50\text{ A}, V_{GE} = -15\text{ V}, -di_F/dt = 550\text{ A}/\mu s (T_{vj} = 175\text{ °C})$	$T_{vj} = 25\text{ °C}$	1.13		mJ
			$T_{vj} = 125\text{ °C}$	2.34		
			$T_{vj} = 175\text{ °C}$	3.23		
Thermal resistance, junction to case	R_{thJC}	per diode			0.909	K/W
Thermal resistance, case to heat sink	R_{thCH}	per diode, $\lambda_{grease} = 1\text{ W}/(m^{\circ}K)$		0.109		K/W
Temperature under switching conditions	$T_{vj\text{ op}}$		-40		175	$^{\circ}C$

Note: $T_{vj\text{ op}} > 150^{\circ}C$ is allowed for operation at overload conditions. For detailed specifications, please refer to AN 2018-14.

7 NTC-Thermistor

Table 13 Characteristic values

Parameter	Symbol	Note or test condition	Values			Unit
			Min.	Typ.	Max.	
Rated resistance	R_{25}	$T_{NTC} = 25\text{ °C}$		5		kΩ
Deviation of R_{100}	$\Delta R/R$	$T_{NTC} = 100\text{ °C}, R_{100} = 493\text{ Ω}$	-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

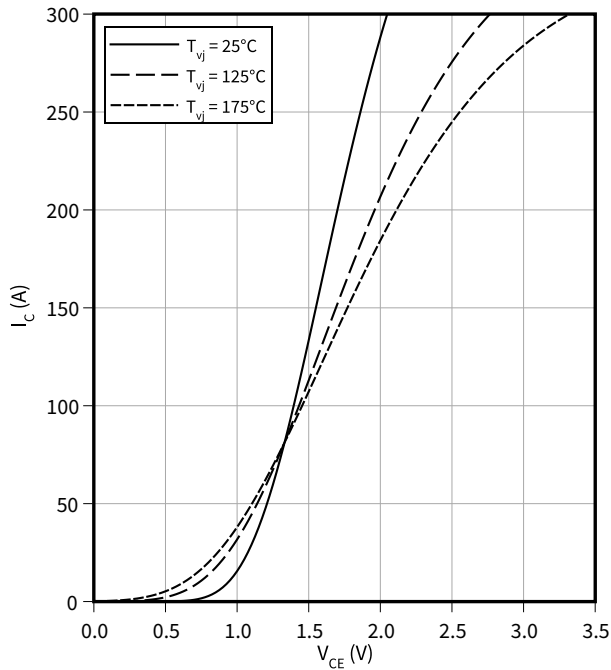
Note: Specification according to the valid application note.

8 Characteristics diagrams

Output characteristic (typical), IGBT, Inverter

$I_C = f(V_{CE})$

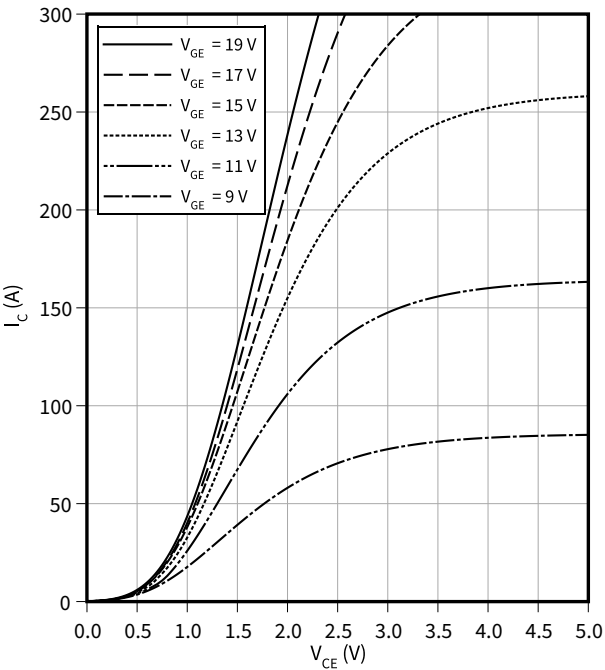
$V_{GE} = 15 \text{ V}$



Output characteristic field (typical), IGBT, Inverter

$I_C = f(V_{CE})$

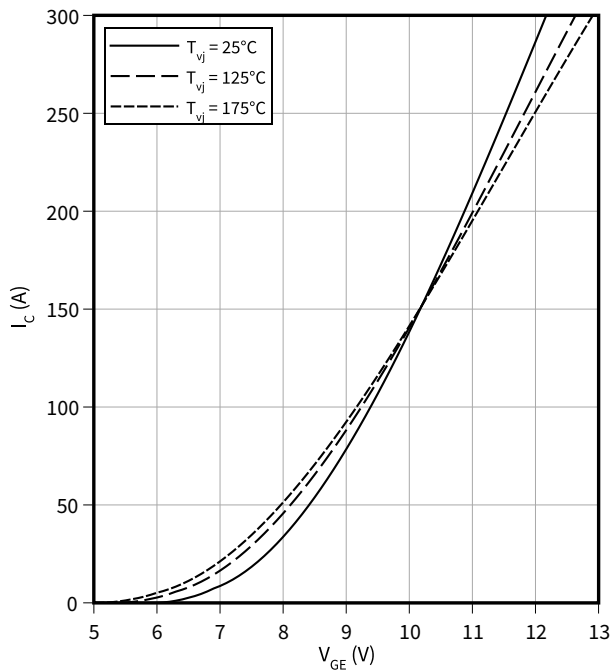
$T_{vj} = 175^\circ\text{C}$



Transfer characteristic (typical), IGBT, Inverter

$I_C = f(V_{GE})$

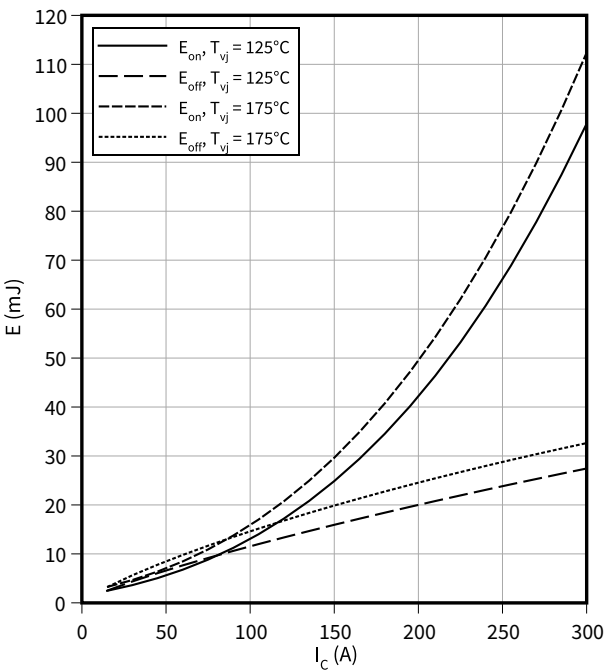
$V_{CE} = 20 \text{ V}$



Switching losses (typical), IGBT, Inverter

$E = f(I_C)$

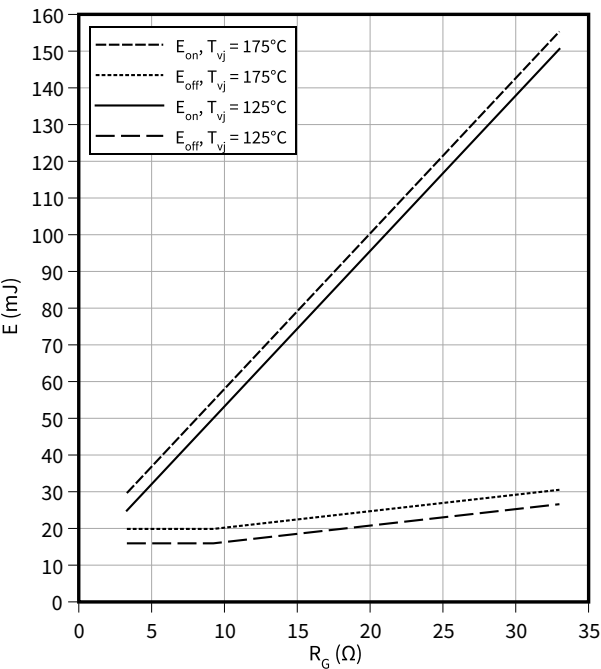
$R_{Goff} = 3.3 \Omega$, $R_{Gon} = 3.3 \Omega$, $V_{GE} = \pm 15 \text{ V}$, $V_{CE} = 600 \text{ V}$



8 Characteristics diagrams

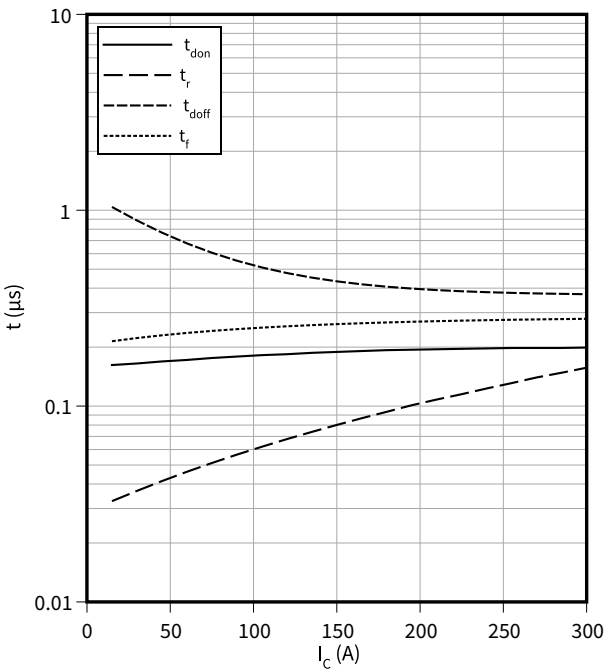
Switching losses (typical), IGBT, Inverter

$E = f(R_G)$
 $V_{GE} = \pm 15\text{ V}$, $I_C = 150\text{ A}$, $V_{CE} = 600\text{ V}$



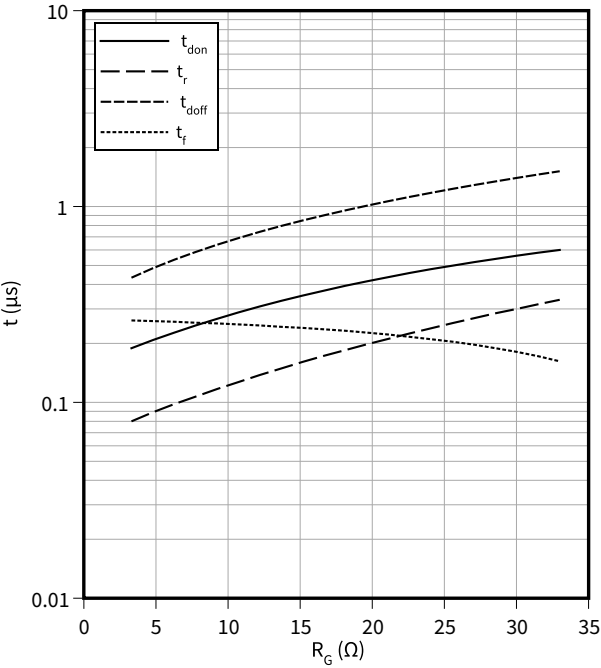
Switching times (typical), IGBT, Inverter

$t = f(I_C)$
 $R_{Goff} = 3.3\ \Omega$, $R_{Gon} = 3.3\ \Omega$, $V_{GE} = \pm 15\text{ V}$, $V_{CE} = 600\text{ V}$, $T_{vj} = 175\text{ °C}$



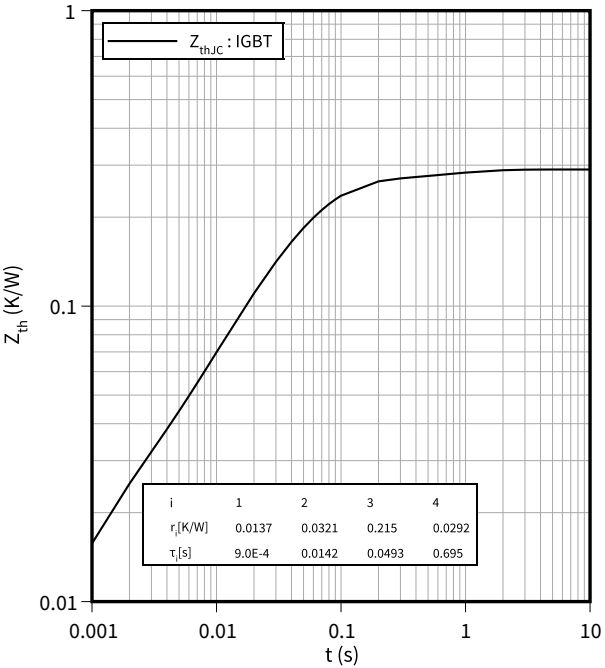
Switching times (typical), IGBT, Inverter

$t = f(R_G)$
 $V_{GE} = \pm 15\text{ V}$, $I_C = 150\text{ A}$, $V_{CE} = 600\text{ V}$, $T_{vj} = 175\text{ °C}$



Transient thermal impedance , IGBT, Inverter

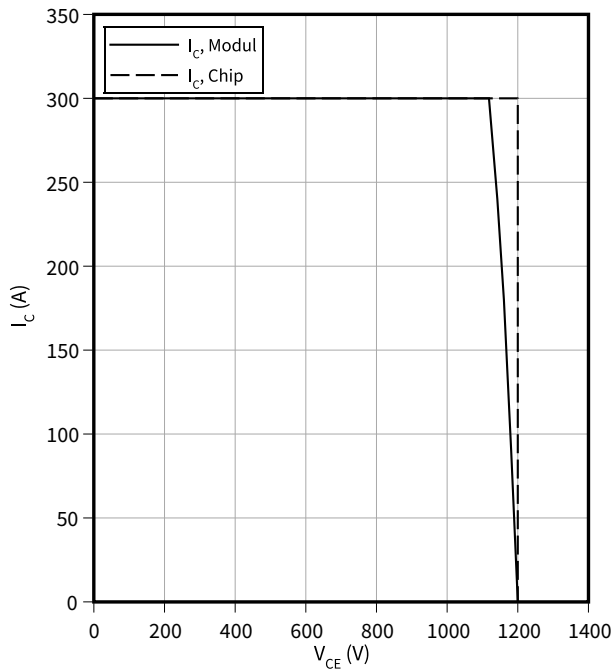
$Z_{th} = f(t)$



8 Characteristics diagrams

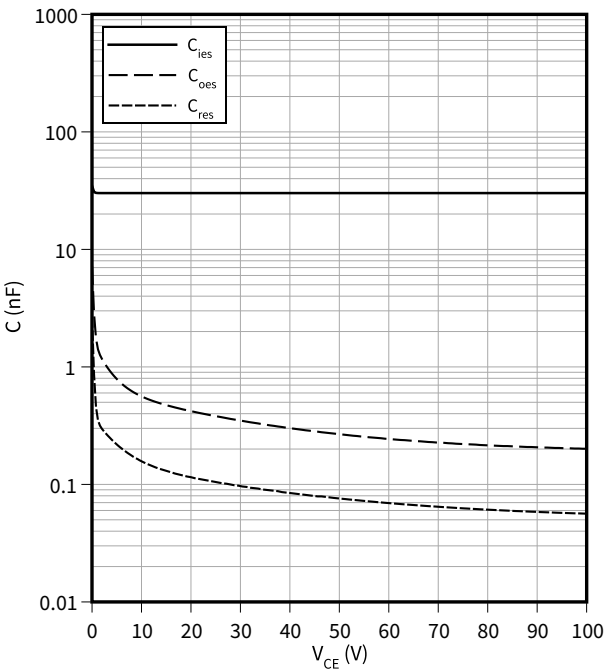
Reverse bias safe operating area (RBSOA), IGBT, Inverter

$I_C = f(V_{CE})$
 $R_{Goff} = 3.3 \Omega$, $V_{GE} = 15 \text{ V}$, $T_{vj} = 175 \text{ }^\circ\text{C}$



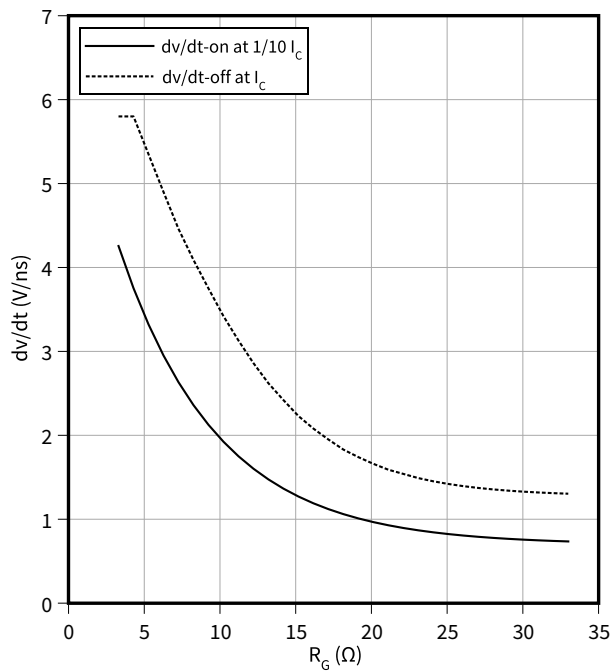
Capacity characteristic (typical), IGBT, Inverter

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



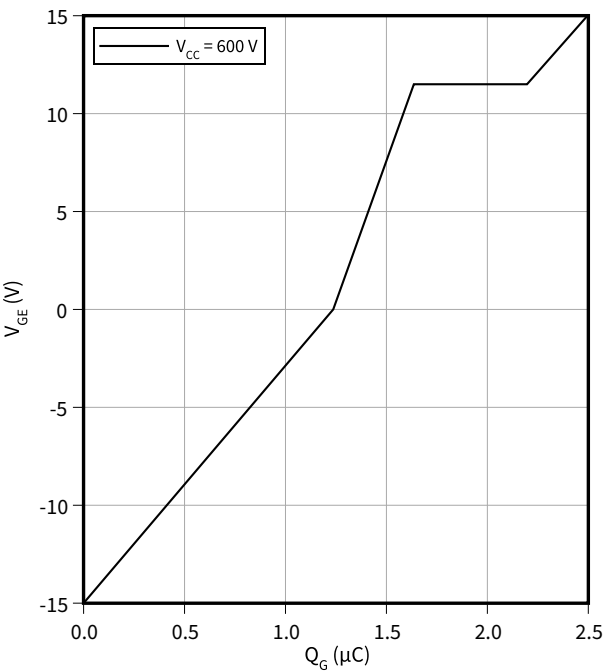
Voltage slope (typical), IGBT, Inverter

$dv/dt = f(R_G)$
 $I_C = 150 \text{ A}$, $V_{CE} = 600 \text{ V}$, $V_{GE} = \pm 15 \text{ V}$, $T_{vj} = 25 \text{ }^\circ\text{C}$



Gate charge characteristic (typical), IGBT, Inverter

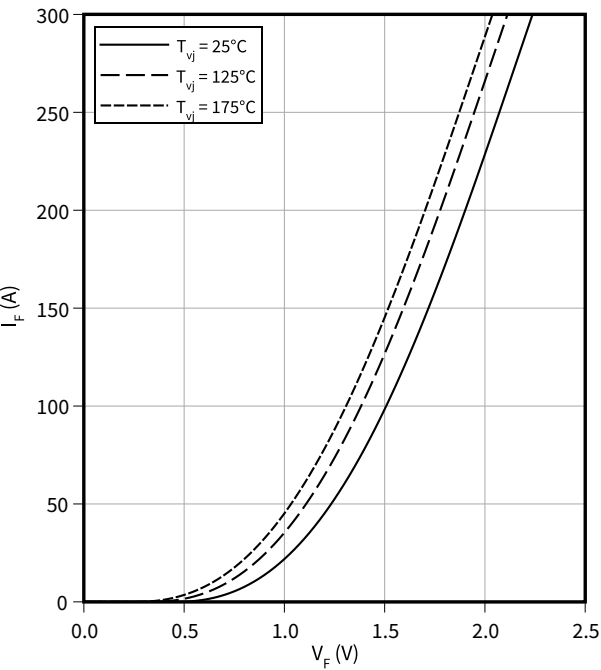
$V_{GE} = f(Q_G)$
 $I_C = 150 \text{ A}$, $T_{vj} = 25 \text{ }^\circ\text{C}$



8 Characteristics diagrams

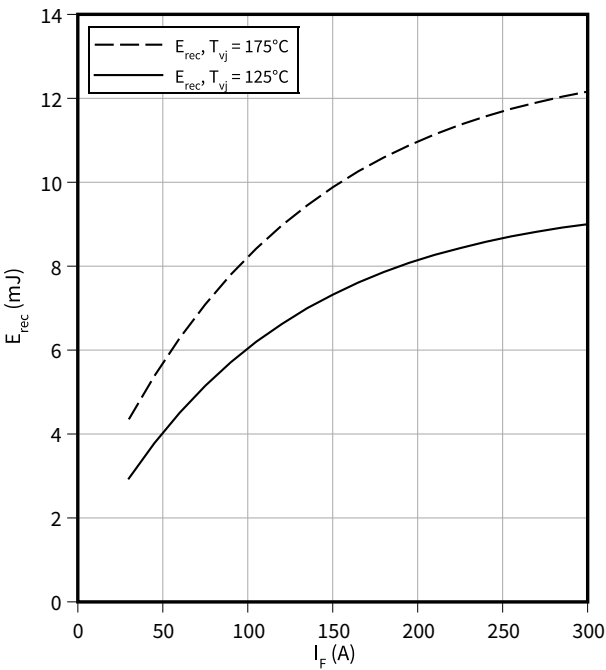
Forward characteristic (typical), Diode, Inverter

$I_F = f(V_F)$



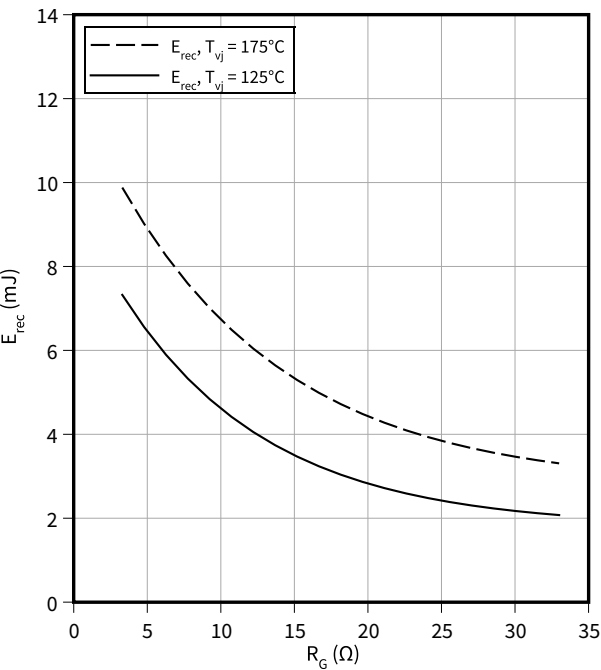
Switching losses (typical), Diode, Inverter

$E_{rec} = f(I_F)$
 $R_{Gon} = 3.3\ \Omega, V_{CE} = 600\ \text{V}$



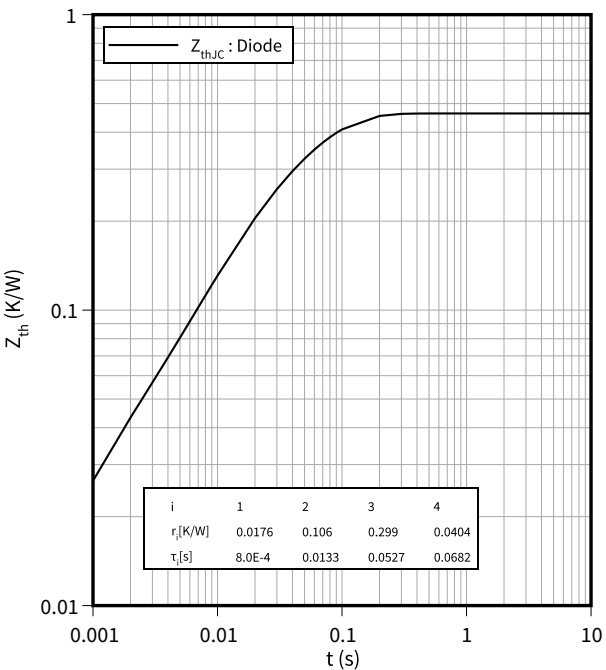
Switching losses (typical), Diode, Inverter

$E_{rec} = f(R_G)$
 $V_{CE} = 600\ \text{V}, I_F = 150\ \text{A}$



Transient thermal impedance, Diode, Inverter

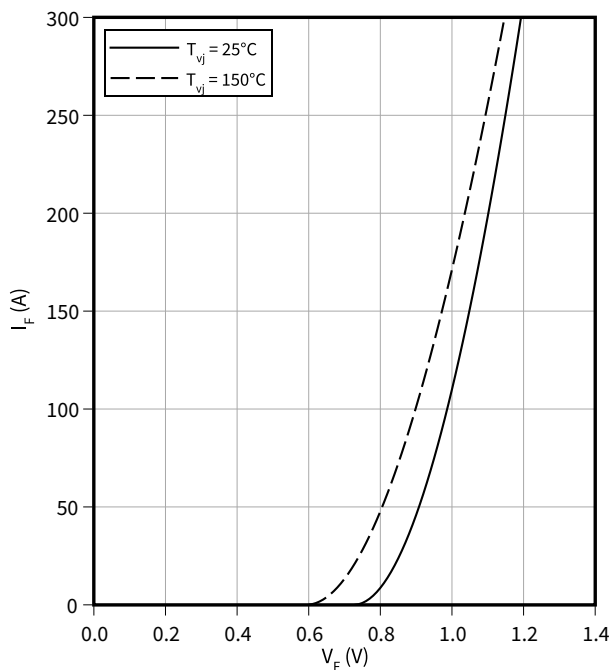
$Z_{th} = f(t)$



8 Characteristics diagrams

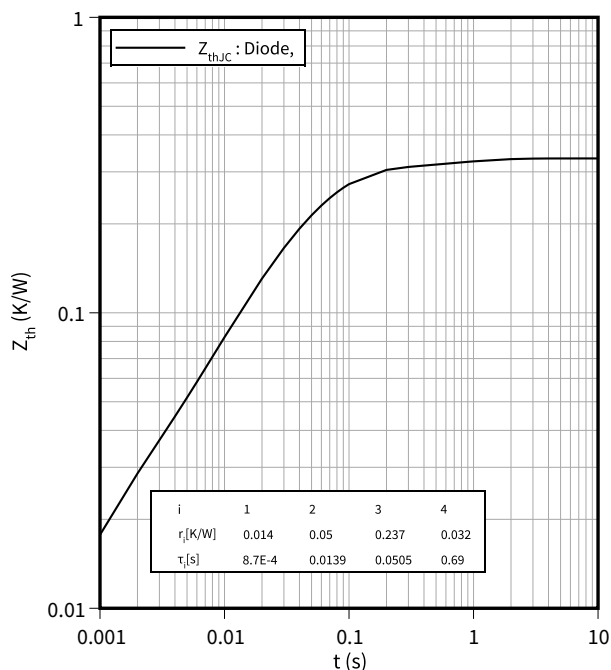
Forward characteristic (typical), Diode, Rectifier

$I_F = f(V_F)$



Transient thermal impedance, Diode, Rectifier

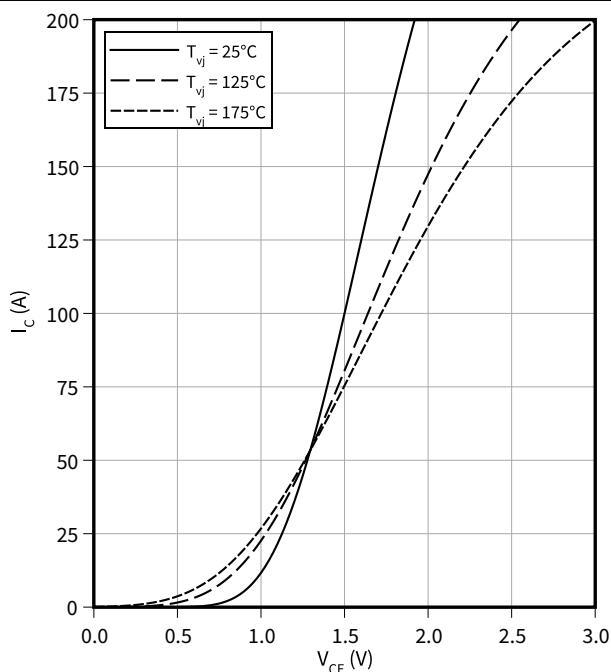
$Z_{th} = f(t)$



Output characteristic (typical), IGBT, Brake-Chopper

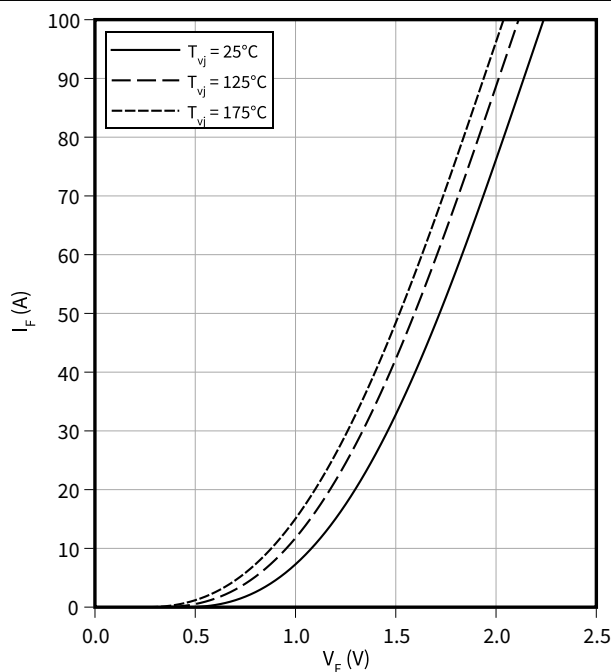
$I_C = f(V_{CE})$

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



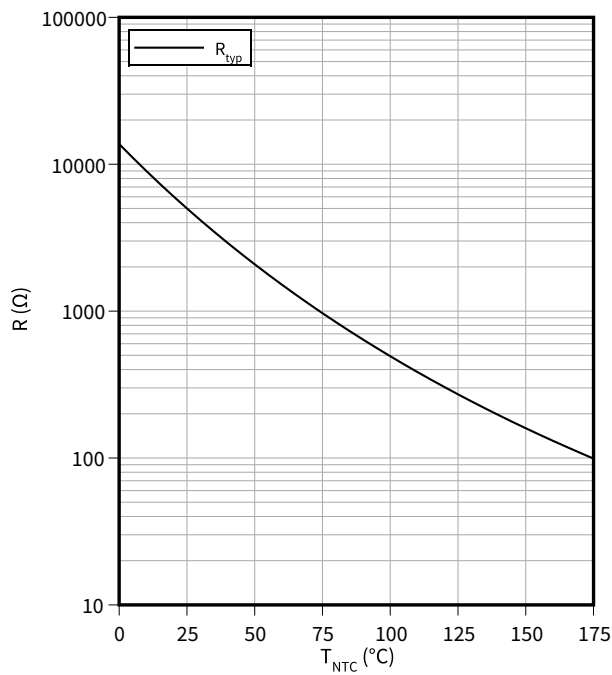
Forward characteristic (typical), Diode, Brake-Chopper

$I_F = f(V_F)$



Temperature characteristic (typical), NTC-Thermistor

$R = f(T_{NTC})$



9 **Circuit diagram**

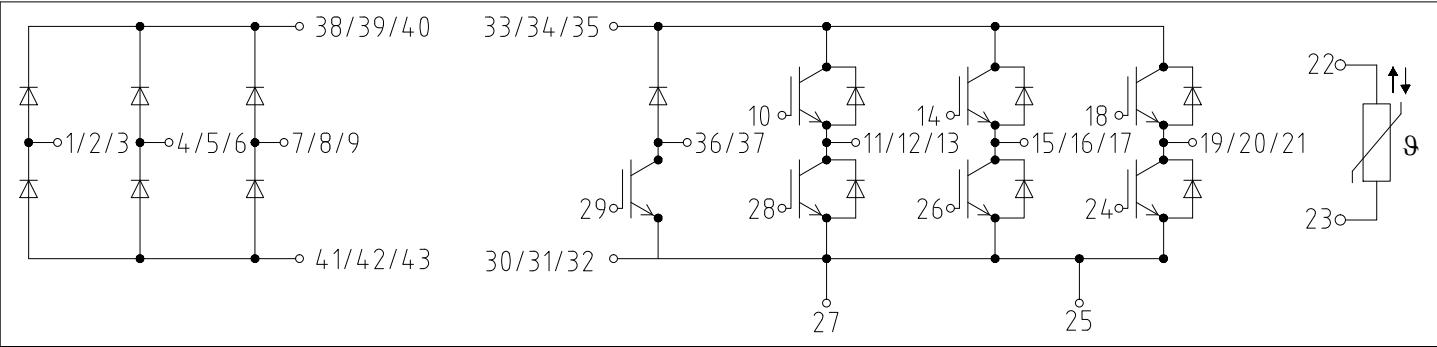
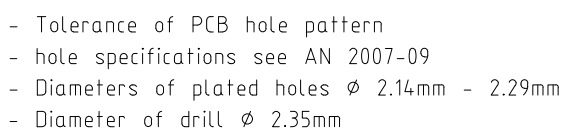


Figure 1



Revision 1.00
2022-03-28

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	2021-08-23	Initial version
1.00	2022-03-28	Final datasheet

Trademarks

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

Edition 2022-03-28

Published by

Infineon Technologies AG
81726 Munich, Germany

© 2022 Infineon Technologies AG
All Rights Reserved.

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

Email: erratum@infineon.com

Document reference
IFX-ABB764-002

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.