

Final datasheet

EconoPIM™3 module with Trench/Fieldstop IGBT4 and emitter controlled 3 diode and NTC

Features

- Electrical features
 - $V_{CES} = 650\text{ V}$
 - $I_{C\text{ nom}} = 150\text{ A} / I_{CRM} = 300\text{ A}$
 - Increased blocking voltage capability up to 650 V
 - High short-circuit capability
 - $T_{vj,op} = 150^{\circ}\text{C}$
 - Trench IGBT 4
 - $V_{CE,sat}$ with positive temperature coefficient
- Mechanical features
 - Integrated NTC temperature sensor
 - Copper base plate
 - Solder contact technology
 - Standard housing



Typical appearance

Potential applications

- Motor drives

Product validation

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

Description

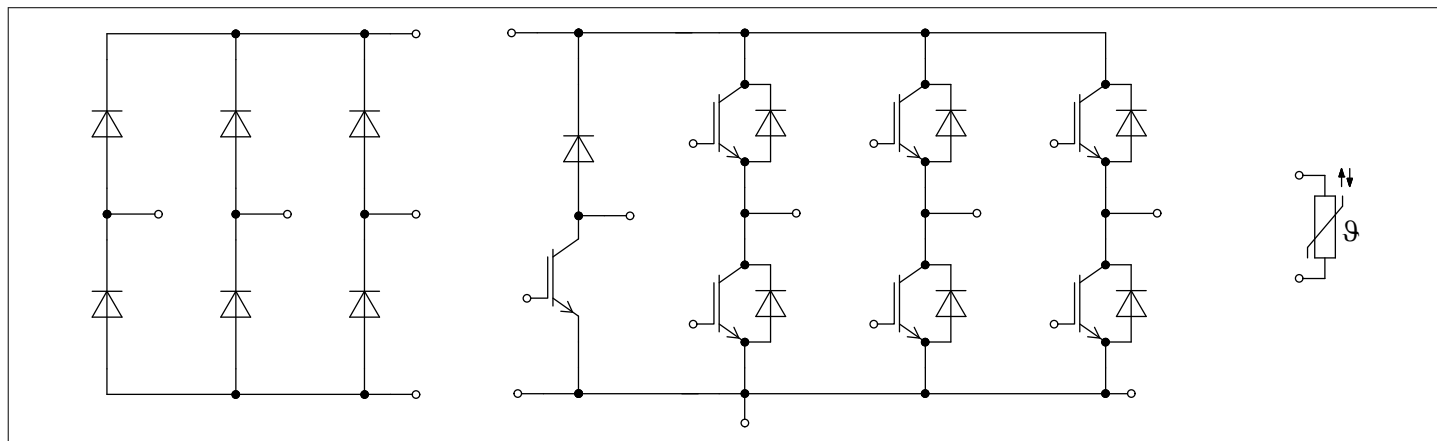


Table of contents

	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	8
7	NTC-Thermistor	9
8	Characteristics diagrams	10
9	Circuit diagram	14
10	Package outlines	15
11	Module label code	16
	Revision history	17
	Disclaimer	18

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	

Table 2 Characteristic values

Parameter	Symbol	Note or test condition	Values			Unit
			Min.	Typ.	Max.	
Thermal resistance, case to heat sink	R_{thCH}	$\lambda_{grease} = 1 \text{ W/(m}\cdot\text{K)}$		0.009		K/W
Stray inductance module	L_{sCE}			40		nH
Module lead resistance, terminals - chip	$R_{AA'+CC'}$	$T_C = 25 \text{ }^\circ\text{C}$, per switch		2		mΩ
Module lead resistance, terminals - chip	$R_{CC'+EE'}$	$T_C = 25 \text{ }^\circ\text{C}$, per switch		4		mΩ
Storage temperature	T_{stg}		-40		125	$^\circ\text{C}$
Mounting torque for module mounting	M	- Mounting according to valid application note	M5, Screw	3	6	Nm
Weight	G			300		g

Note: for operation with $V_{ge} = 0V/+15V$ we recommend a $R_{gon, min}$ of 24 ohms and a $R_{goff, min}$ of 24 ohms (see AN 2006-01)

2 IGBT, Inverter

Table 3 Maximum rated values

Parameter	Symbol	Note or test condition	Values	Unit
Collector-emitter voltage	V_{CES}	$T_{vj} = 25 \text{ }^\circ\text{C}$	650	V
Continuous DC collector current	I_{CDC}	$T_{vj max} = 175 \text{ }^\circ\text{C}$ $T_C = 55 \text{ }^\circ\text{C}$	150	A
Repetitive peak collector current	I_{CRM}	t_p limited by $T_{vj op}$	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	1.95	V
			$T_{vj} = 125\ ^\circ C$		1.70		
			$T_{vj} = 150\ ^\circ C$		1.75		
Gate threshold voltage	V_{GETh}	$I_C = 2.4\ mA, V_{CE} = V_{GE}, T_{vj} = 25\ ^\circ C$		5	5.80	6.5	V
Gate charge	Q_G	$V_{GE} = \pm 15\ V$			1.5		μC
Internal gate resistor	R_{Gint}	$T_{vj} = 25\ ^\circ C$			2		Ω
Input capacitance	C_{ies}	$f = 1000\ kHz, T_{vj} = 25\ ^\circ C, V_{CE} = 25\ V, V_{GE} = 0\ V$			9.3		nF
Reverse transfer capacitance	C_{res}	$f = 1000\ kHz, T_{vj} = 25\ ^\circ C, V_{CE} = 25\ V, V_{GE} = 0\ V$			0.285		nF
Collector-emitter cut-off current	I_{CES}	$V_{CE} = 650\ V, V_{GE} = 0\ V$	$T_{vj} = 25\ ^\circ C$			1	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}	$I_C = 150\ A, V_{CC} = 300\ V, V_{GE} = \pm 15\ V, R_{Gon} = 3.3\ \Omega$	$T_{vj} = 25\ ^\circ C$		0.120		μs
			$T_{vj} = 125\ ^\circ C$		0.140		
			$T_{vj} = 150\ ^\circ C$		0.140		
Rise time (inductive load)	t_r	$I_C = 150\ A, V_{CC} = 300\ V, V_{GE} = \pm 15\ V, R_{Gon} = 3.3\ \Omega$	$T_{vj} = 25\ ^\circ C$		0.030		μs
			$T_{vj} = 125\ ^\circ C$		0.040		
			$T_{vj} = 150\ ^\circ C$		0.040		
Turn-off delay time (inductive load)	t_{doff}	$I_C = 150\ A, V_{CC} = 300\ V, V_{GE} = \pm 15\ V, R_{Goff} = 3.3\ \Omega$	$T_{vj} = 25\ ^\circ C$		0.340		μs
			$T_{vj} = 125\ ^\circ C$		0.370		
			$T_{vj} = 150\ ^\circ C$		0.380		
Fall time (inductive load)	t_f	$I_C = 150\ A, V_{CC} = 300\ V, V_{GE} = \pm 15\ V, R_{Goff} = 3.3\ \Omega$	$T_{vj} = 25\ ^\circ C$		0.060		μs
			$T_{vj} = 125\ ^\circ C$		0.070		
			$T_{vj} = 150\ ^\circ C$		0.070		
Turn-on energy loss per pulse	E_{on}	$I_C = 150\ A, V_{CC} = 300\ V, L_\sigma = 30\ nH, V_{GE} = \pm 15\ V, R_{Gon} = 3.3\ \Omega, di/dt = 5400\ A/\mu s (T_{vj} = 150\ ^\circ C)$	$T_{vj} = 25\ ^\circ C$		0.94		mJ
			$T_{vj} = 125\ ^\circ C$		1.5		
			$T_{vj} = 150\ ^\circ C$		1.65		
Turn-off energy loss per pulse	E_{off}	$I_C = 150\ A, V_{CC} = 300\ V, L_\sigma = 30\ nH, V_{GE} = \pm 15\ V, R_{Goff} = 3.3\ \Omega, dv/dt = 3800\ V/\mu s (T_{vj} = 150\ ^\circ C)$	$T_{vj} = 25\ ^\circ C$		5.75		mJ
			$T_{vj} = 125\ ^\circ C$		7.4		
			$T_{vj} = 150\ ^\circ C$		7.85		

(table continues...)

Table 4 (continued) Characteristic values

Parameter	Symbol	Note or test condition	Values			Unit
			Min.	Typ.	Max.	
SC data	I_{SC}	$V_{GE} \leq 15 \text{ V}, V_{CC} = 360 \text{ V}, V_{CEmax} = V_{CES} - L_{sCE} \cdot di/dt$		720		A
				570		
Thermal resistance, junction to case	R_{thJC}	per IGBT			0.350	K/W
Thermal resistance, case to heat sink	R_{thCH}	per IGBT, $\lambda_{grease} = 1 \text{ W/(m} \cdot \text{K)}$		0.140		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}	$T_{vj} = 25 \text{ °C}$	650	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	$t_p = 10 \text{ ms}, V_R = 0 \text{ V}$	2050	A^2s
			1950	

Table 6 Characteristic values

Parameter	Symbol	Note or test condition	Values			Unit
			Min.	Typ.	Max.	
Forward voltage	V_F	$I_F = 150 \text{ A}, V_{GE} = 0 \text{ V}$		1.55	1.95	V
				1.50		
				1.45		
Peak reverse recovery current	I_{RM}	$V_{CC} = 300 \text{ V}, I_F = 150 \text{ A}, V_{GE} = -15 \text{ V}, -di_F/dt = 5400 \text{ A}/\mu\text{s} (T_{vj} = 150 \text{ °C})$	$T_{vj} = 25 \text{ °C}$	150		A
			$T_{vj} = 125 \text{ °C}$	180		
			$T_{vj} = 150 \text{ °C}$	185		
Recovered charge	Q_r	$V_{CC} = 300 \text{ V}, I_F = 150 \text{ A}, V_{GE} = -15 \text{ V}, -di_F/dt = 5400 \text{ A}/\mu\text{s} (T_{vj} = 150 \text{ °C})$	$T_{vj} = 25 \text{ °C}$	7		μC
			$T_{vj} = 125 \text{ °C}$	13		
			$T_{vj} = 150 \text{ °C}$	15		

(table continues...)

Table 6 (continued) Characteristic values

Parameter	Symbol	Note or test condition		Values			Unit
				Min.	Typ.	Max.	
Reverse recovery energy	E_{rec}	$V_{CC} = 300\text{ V}$, $I_F = 150\text{ A}$, $V_{GE} = -15\text{ V}$, $-di_F/dt = 5400\text{ A}/\mu\text{s}$ ($T_{vj} = 150\text{ °C}$)	$T_{vj} = 25\text{ °C}$		1.95		mJ
			$T_{vj} = 125\text{ °C}$		3.5		
			$T_{vj} = 150\text{ °C}$		3.95		
Thermal resistance, junction to case	R_{thJC}	per diode				0.600	K/W
Thermal resistance, case to heat sink	R_{thCH}	per diode, $\lambda_{grease} = 1\text{ W}/(\text{m}\cdot\text{K})$			0.245		K/W
Temperature under switching conditions	$T_{vj\text{ op}}$			-40		150	°C

4 Diode, Rectifier

Table 7 Maximum rated values

Parameter	Symbol	Note or test condition		Values	Unit
Repetitive peak reverse voltage	V_{RRM}		$T_{vj} = 25\text{ °C}$	1600	V
Maximum RMS forward current per chip	I_{FRMSM}	$T_C = 80\text{ °C}$		150	A
Maximum RMS current at rectifier output	I_{RMSM}	$T_C = 80\text{ °C}$		150	A
Surge forward current	I_{FSM}	$t_P = 10\text{ ms}$	$T_{vj} = 25\text{ °C}$	1150	A
			$T_{vj} = 150\text{ °C}$	880	
I^2t - value	I^2t	$t_P = 10\text{ ms}$	$T_{vj} = 25\text{ °C}$	6600	A ² s
			$T_{vj} = 150\text{ °C}$	3850	

Table 8 Characteristic values

Parameter	Symbol	Note or test condition		Values			Unit
				Min.	Typ.	Max.	
Forward voltage	V_F	$I_F = 150\text{ A}$	$T_{vj} = 150\text{ °C}$		1.10		V
Reverse current	I_r	$T_{vj} = 150\text{ °C}$, $V_R = 1600\text{ V}$			1		mA
Thermal resistance, junction to case	R_{thJC}	per diode				0.400	K/W
Thermal resistance, case to heat sink	R_{thCH}	per diode, $\lambda_{grease} = 1\text{ W}/(\text{m}\cdot\text{K})$			0.165		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}		$T_{vj} = 25\text{ °C}$	650	V
Continuous DC collector current	I_{CDC}	$T_{vj\text{ max}} = 175\text{ °C}$	$T_C = 70\text{ °C}$	100	A
Repetitive peak collector current	I_{CRM}	t_p limited by $T_{vj\text{ op}}$		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	$V_{CE\text{ sat}}$	$I_C = 100\text{ A}$, $V_{GE} = 15\text{ V}$	$T_{vj} = 25\text{ °C}$		1.55	1.95	V
			$T_{vj} = 125\text{ °C}$		1.70		
			$T_{vj} = 150\text{ °C}$		1.75		
Gate threshold voltage	V_{GETh}	$I_C = 1.6\text{ mA}$, $V_{CE} = V_{GE}$, $T_{vj} = 25\text{ °C}$		5	5.80	6.5	V
Gate charge	Q_G	$V_{GE} = \pm 15\text{ V}$			1		μC
Internal gate resistor	R_{Gint}	$T_{vj} = 25\text{ °C}$			2		Ω
Input capacitance	C_{ies}	$f = 1000\text{ kHz}$, $T_{vj} = 25\text{ °C}$, $V_{CE} = 25\text{ V}$, $V_{GE} = 0\text{ V}$			6.2		nF
Reverse transfer capacitance	C_{res}	$f = 1000\text{ kHz}$, $T_{vj} = 25\text{ °C}$, $V_{CE} = 25\text{ V}$, $V_{GE} = 0\text{ V}$			0.19		nF
Collector-emitter cut-off current	I_{CES}	$V_{CE} = 650\text{ V}$, $V_{GE} = 0\text{ V}$	$T_{vj} = 25\text{ °C}$			1	mA
Gate-emitter leakage current	I_{GES}	$V_{CE} = 0\text{ V}$, $V_{GE} = 20\text{ V}$, $T_{vj} = 25\text{ °C}$				100	nA
Turn-on delay time (inductive load)	t_{don}	$I_C = 100\text{ A}$, $V_{CC} = 300\text{ V}$, $V_{GE} = \pm 15\text{ V}$, $R_{Gon} = 3.3\text{ }\Omega$	$T_{vj} = 25\text{ °C}$		0.070		μs
			$T_{vj} = 125\text{ °C}$		0.080		
			$T_{vj} = 150\text{ °C}$		0.080		
Rise time (inductive load)	t_r	$I_C = 100\text{ A}$, $V_{CC} = 300\text{ V}$, $V_{GE} = \pm 15\text{ V}$, $R_{Gon} = 3.3\text{ }\Omega$	$T_{vj} = 25\text{ °C}$		0.020		μs
			$T_{vj} = 125\text{ °C}$		0.020		
			$T_{vj} = 150\text{ °C}$		0.020		
Turn-off delay time (inductive load)	t_{doff}	$I_C = 100\text{ A}$, $V_{CC} = 300\text{ V}$, $V_{GE} = \pm 15\text{ V}$, $R_{Goff} = 3.3\text{ }\Omega$	$T_{vj} = 25\text{ °C}$		0.260		μs
			$T_{vj} = 125\text{ °C}$		0.290		
			$T_{vj} = 150\text{ °C}$		0.300		

(table continues...)

Table 10 (continued) Characteristic values

Parameter	Symbol	Note or test condition	Values			Unit
			Min.	Typ.	Max.	
Fall time (inductive load)	t_f	$I_C = 100 \text{ A}$, $V_{CC} = 300 \text{ V}$, $V_{GE} = \pm 15 \text{ V}$, $R_{Goff} = 3.3 \Omega$	$T_{vj} = 25 \text{ }^\circ\text{C}$	0.070		μs
			$T_{vj} = 125 \text{ }^\circ\text{C}$	0.070		
			$T_{vj} = 150 \text{ }^\circ\text{C}$	0.070		
Turn-on energy loss per pulse	E_{on}	$I_C = 100 \text{ A}$, $V_{CC} = 300 \text{ V}$, $L_\sigma = 30 \text{ nH}$, $V_{GE} = \pm 15 \text{ V}$, $R_{Gon} = 3.3 \Omega$, $di/dt = 5100 \text{ A}/\mu\text{s}$ ($T_{vj} = 150 \text{ }^\circ\text{C}$)	$T_{vj} = 25 \text{ }^\circ\text{C}$	0.33		mJ
			$T_{vj} = 125 \text{ }^\circ\text{C}$	0.77		
			$T_{vj} = 150 \text{ }^\circ\text{C}$	0.88		
Turn-off energy loss per pulse	E_{off}	$I_C = 100 \text{ A}$, $V_{CC} = 300 \text{ V}$, $L_\sigma = 30 \text{ nH}$, $V_{GE} = \pm 15 \text{ V}$, $R_{Goff} = 3.3 \Omega$, $dv/dt = 4000 \text{ V}/\mu\text{s}$ ($T_{vj} = 150 \text{ }^\circ\text{C}$)	$T_{vj} = 25 \text{ }^\circ\text{C}$	3.5		mJ
			$T_{vj} = 125 \text{ }^\circ\text{C}$	4.7		
			$T_{vj} = 150 \text{ }^\circ\text{C}$	4.9		
SC data	I_{SC}	$V_{GE} \leq 15 \text{ V}$, $V_{CC} = 360 \text{ V}$, $V_{CEmax} = V_{CES} - L_{sCE} \cdot di/dt$	$t_p \leq 10 \mu\text{s}$, $T_{vj} = 25 \text{ }^\circ\text{C}$	480		A
			$t_p \leq 10 \mu\text{s}$, $T_{vj} = 150 \text{ }^\circ\text{C}$	380		
Thermal resistance, junction to case	R_{thJC}	per IGBT			0.450	K/W
Thermal resistance, case to heat sink	R_{thCH}	per IGBT, $\lambda_{grease} = 1 \text{ W}/(\text{m} \cdot \text{K})$		0.185		K/W
Temperature under switching conditions	$T_{vj op}$		-40		150	$^\circ\text{C}$

6 Diode, Brake-Chopper

Table 11 Maximum rated values

Parameter	Symbol	Note or test condition	Values	Unit
Repetitive peak reverse voltage	V_{RRM}	$T_{vj} = 25 \text{ }^\circ\text{C}$	650	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	$t_p = 10 \text{ ms}$, $V_R = 0 \text{ V}$	$T_{vj} = 125 \text{ }^\circ\text{C}$	A^2s
			$T_{vj} = 150 \text{ }^\circ\text{C}$	

Table 12 Characteristic values

Parameter	Symbol	Note or test condition	Values			Unit
			Min.	Typ.	Max.	
Forward voltage	V_F	$I_F = 50 \text{ A}$, $V_{GE} = 0 \text{ V}$	$T_{vj} = 25 \text{ °C}$	1.55	1.95	V
			$T_{vj} = 125 \text{ °C}$	1.50		
			$T_{vj} = 150 \text{ °C}$	1.45		
Peak reverse recovery current	I_{RM}	$V_{CC} = 300 \text{ V}$, $I_F = 50 \text{ A}$, $-di_F/dt = 2800 \text{ A}/\mu\text{s}$ ($T_{vj} = 150 \text{ °C}$)	$T_{vj} = 25 \text{ °C}$	69		A
			$T_{vj} = 125 \text{ °C}$	76		
			$T_{vj} = 150 \text{ °C}$	80		
Recovered charge	Q_r	$V_{CC} = 300 \text{ V}$, $I_F = 50 \text{ A}$, $-di_F/dt = 2800 \text{ A}/\mu\text{s}$ ($T_{vj} = 150 \text{ °C}$)	$T_{vj} = 25 \text{ °C}$	1.9		μC
			$T_{vj} = 125 \text{ °C}$	3.4		
			$T_{vj} = 150 \text{ °C}$	3.95		
Reverse recovery energy	E_{rec}	$V_{CC} = 300 \text{ V}$, $I_F = 50 \text{ A}$, $-di_F/dt = 2800 \text{ A}/\mu\text{s}$ ($T_{vj} = 150 \text{ °C}$)	$T_{vj} = 25 \text{ °C}$	0.6		mJ
			$T_{vj} = 125 \text{ °C}$	0.95		
			$T_{vj} = 150 \text{ °C}$	1.1		
Thermal resistance, junction to case	R_{thJC}	per diode			1.20	K/W
Thermal resistance, case to heat sink	R_{thCH}	per diode, $\lambda_{grease} = 1 \text{ W}/(\text{m}\cdot\text{K})$		0.490		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}	$T_{NTC} = 25 \text{ °C}$		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

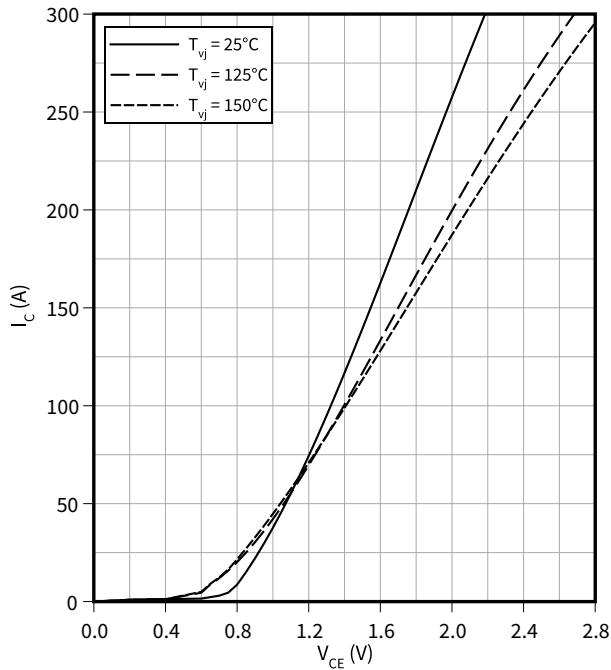
Note: Specification according to the valid application note.

8 Characteristics diagrams

Output characteristic (typical), IGBT, Inverter

$I_C = f(V_{CE})$

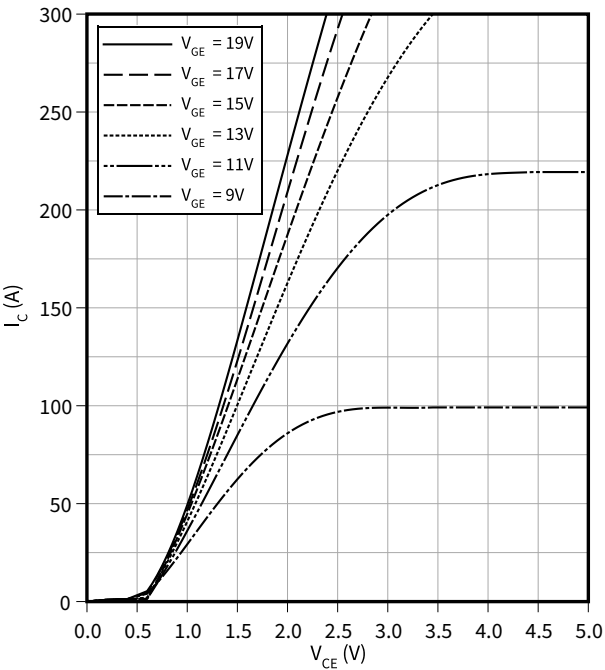
$V_{GE} = 15\text{ V}$



Output characteristic field (typical), IGBT, Inverter

$I_C = f(V_{CE})$

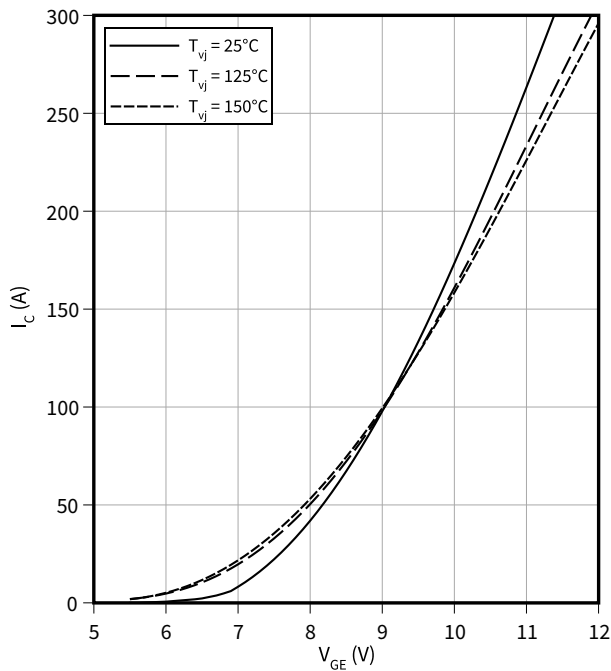
$T_{vj} = 150\text{ °C}$



Transfer characteristic (typical), IGBT, Inverter

$I_C = f(V_{GE})$

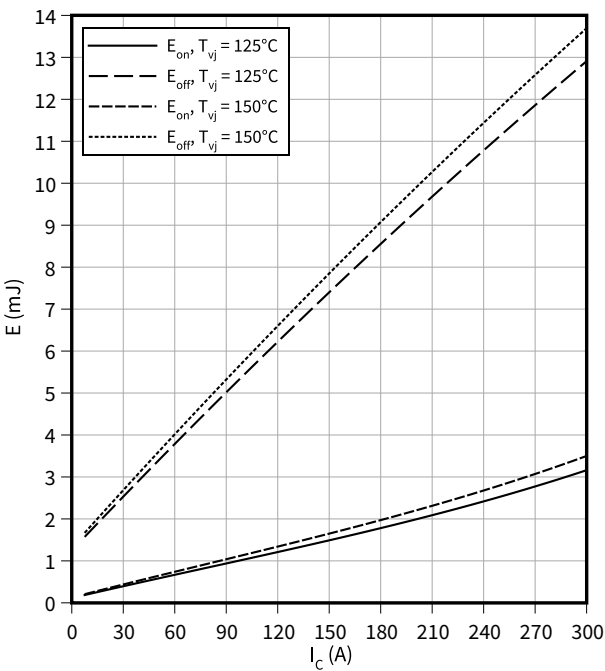
$V_{CE} = 20\text{ V}$



Switching losses (typical), IGBT, Inverter

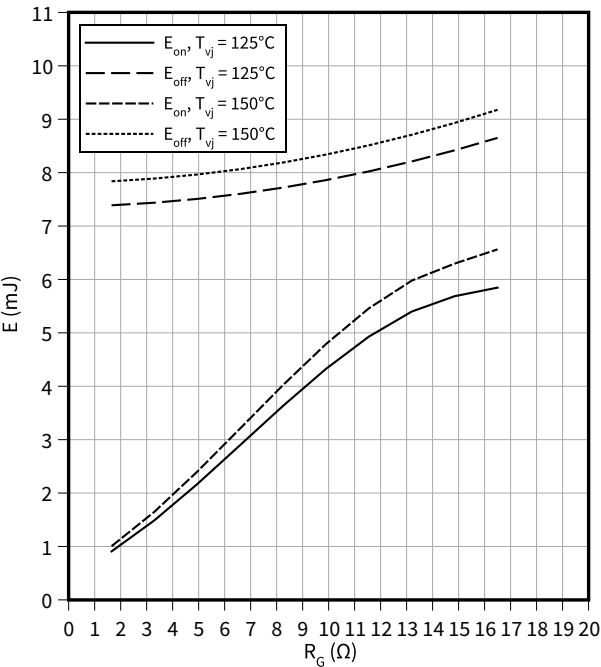
$E = f(I_C)$

$R_{Goff} = 3.3\text{ }\Omega$, $R_{Gon} = 3.3\text{ }\Omega$, $V_{GE} = \pm 15\text{ V}$, $V_{CC} = 300\text{ V}$



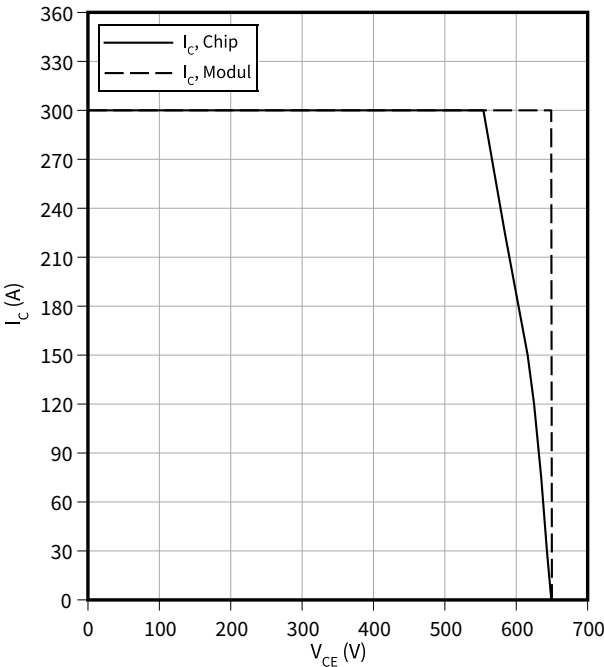
Switching losses (typical), IGBT, Inverter

$E = f(R_G)$
 $V_{GE} = \pm 15\text{ V}$, $I_C = 150\text{ A}$, $V_{CC} = 300\text{ V}$



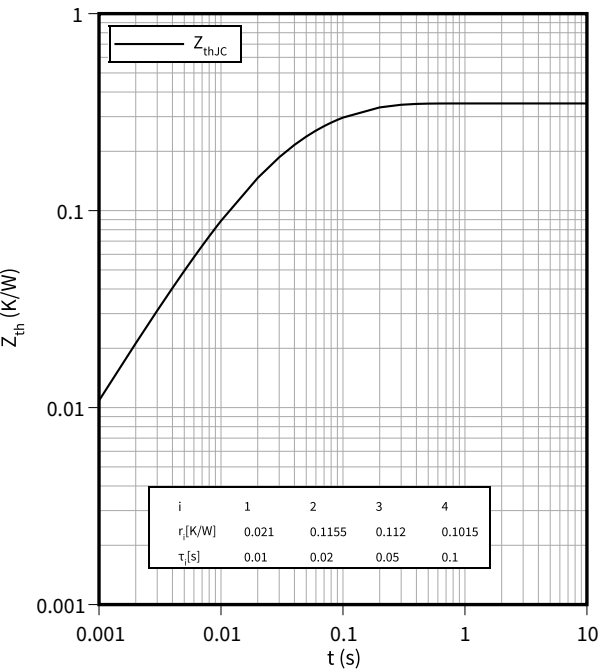
Reverse bias safe operating area (RBSOA), IGBT, Inverter

$I_C = f(V_{CE})$
 $R_{Goff} = 3.3\ \Omega$, $V_{GE} = \pm 15\text{ V}$, $T_{vj} = 150^\circ\text{C}$



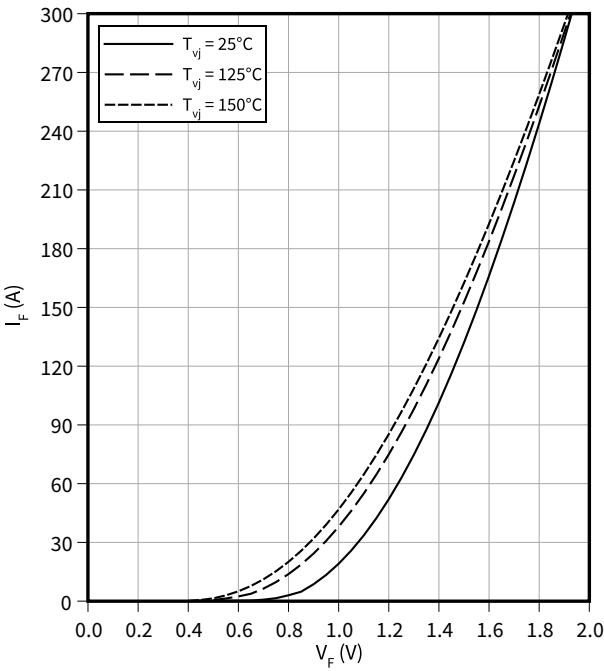
Transient thermal impedance, IGBT, Inverter

$Z_{th} = f(t)$



Forward characteristic (typical), Diode, Inverter

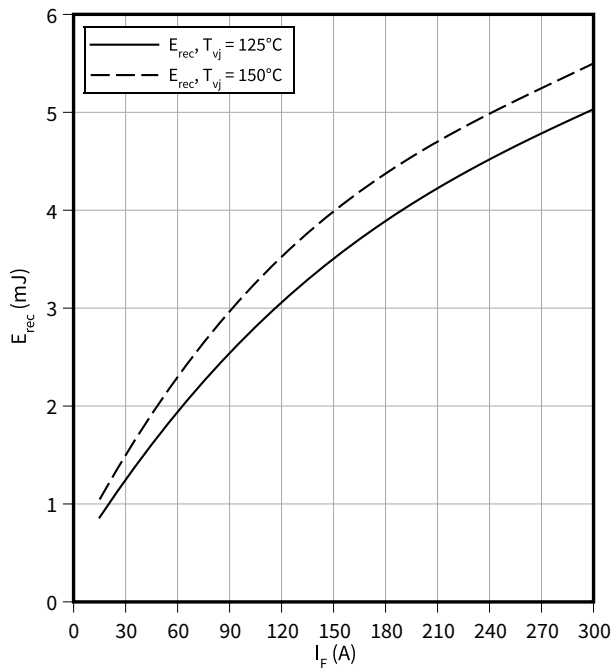
$I_F = f(V_F)$



8 Characteristics diagrams

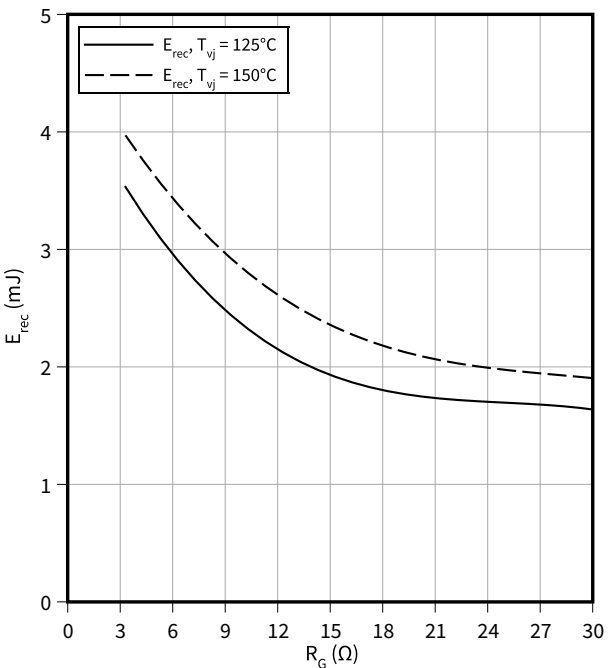
Switching losses (typical), Diode, Inverter

$E_{rec} = f(I_F)$
 $R_{Gon} = R_{Gon}(IGBT) , V_{CC} = 300\text{ V}$



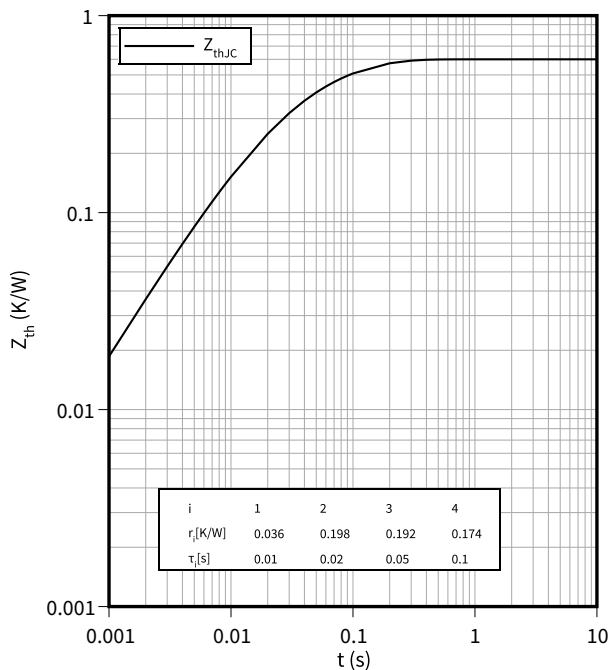
Switching losses (typical), Diode, Inverter

$E_{rec} = f(R_G)$
 $I_F = 150\text{ A}, V_{CC} = 300\text{ V}$



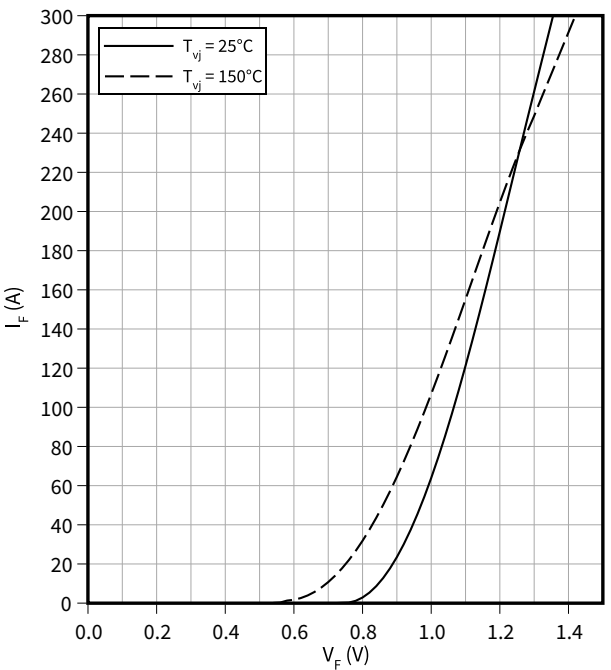
Transient thermal impedance, Diode, Inverter

$Z_{th} = f(t)$



Forward characteristic (typical), Diode, Rectifier

$I_F = f(V_F)$

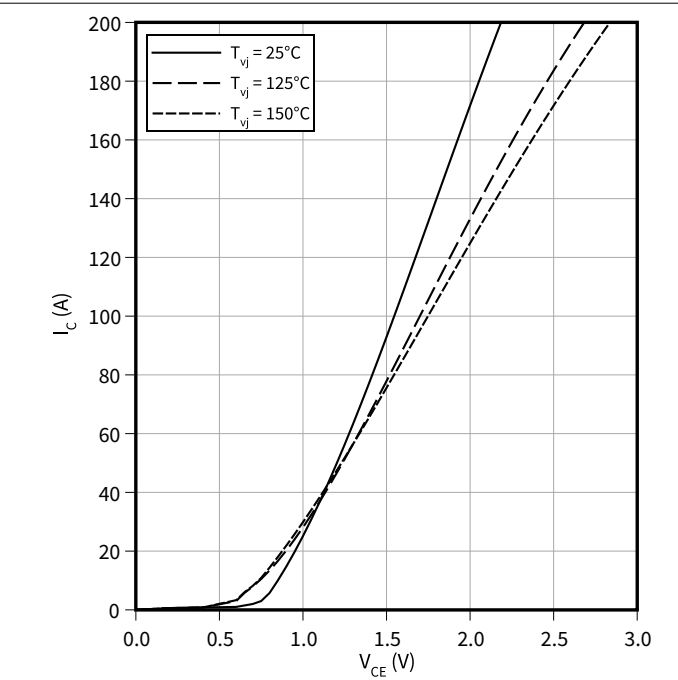


8 Characteristics diagrams

Output characteristic (typical), IGBT, Brake-Chopper

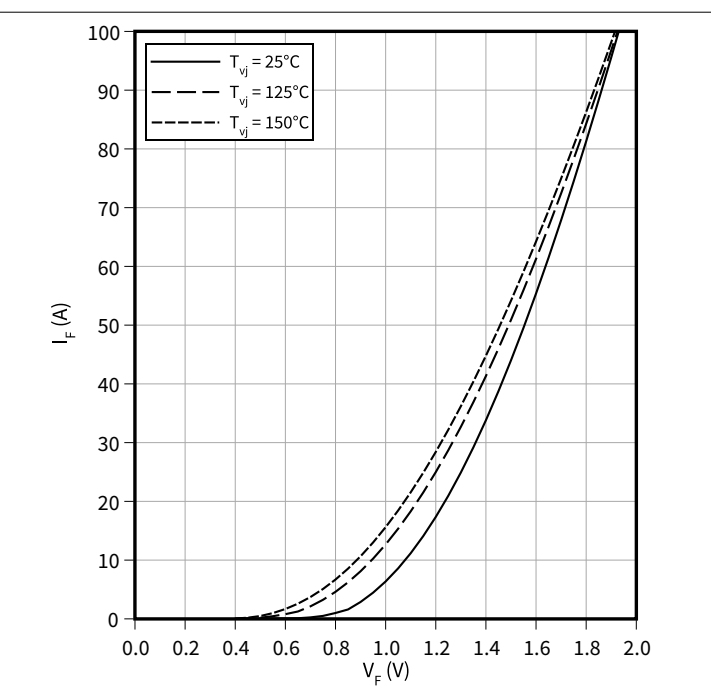
$I_C = f(V_{CE})$

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



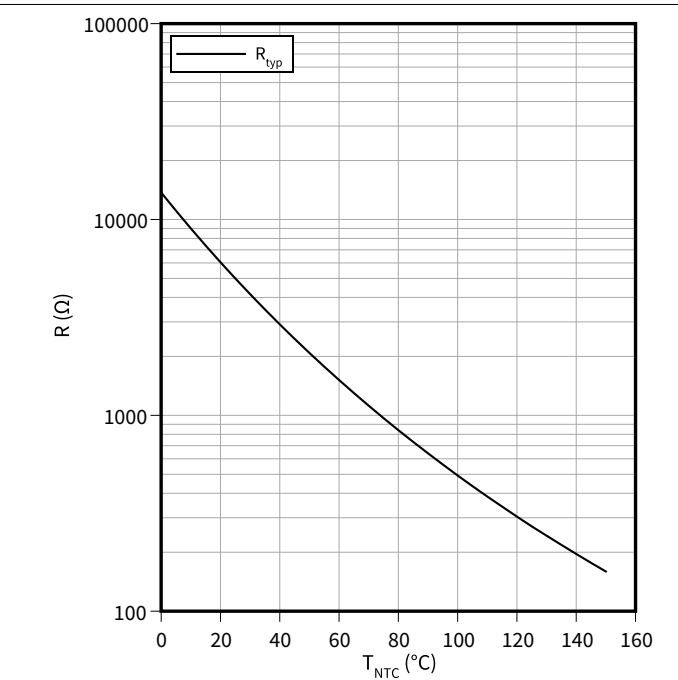
Forward characteristic (typical), Diode, Brake-Chopper

$I_F = f(V_F)$



Temperature characteristic (typical), NTC-Thermistor

$R = f(T_{NTC})$



9 Circuit diagram

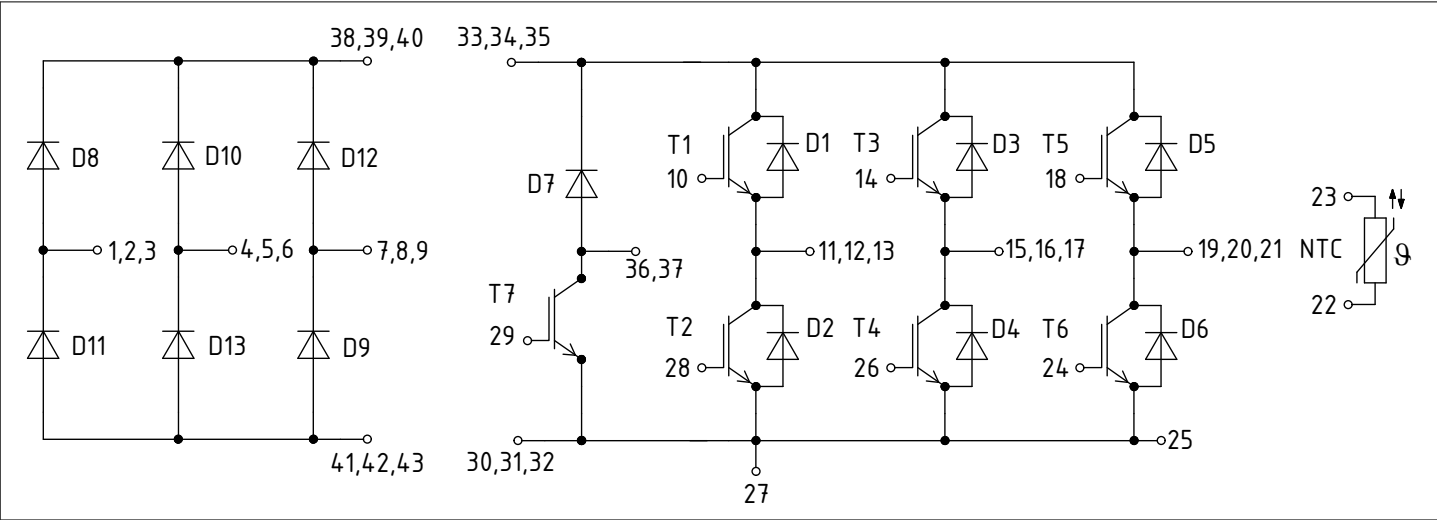


Figure 1

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
V2.0	2011-06-17	Preliminary 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
1.00	2023-11-24	Final datasheet

Trademarks

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

Edition 2023-11-24

Published by

Infineon Technologies AG
81726 Munich, Germany

© 2023 Infineon Technologies AG
All Rights Reserved.

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

Email: erratum@infineon.com

Document reference
IFX-AAW905-002

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.