

**Vorläufige Daten
preliminary data**

IGBT-Wechselrichter / IGBT-inverter

Höchstzulässige Werte / maximum rated values

Kollektor-Emitter-Sperrspannung collector-emitter voltage ¹	$T_{vj} = 25^{\circ}\text{C}1$	V_{CES1}	12001	V
Kollektor-Dauergleichstrom ¹ DC-collector current ¹	$T_C = 80^{\circ}\text{C}, T_{vj} = 150^{\circ}\text{C}1$	$I_{C\text{ nom}1}$	1 8001	A
Periodischer Kollektor Spitzenstrom ¹ repetitive peak collector current ¹	$t_p = 1\text{ ms}, T_C = 80^{\circ}\text{C}1$	I_{CRM1}	16001	A
Gesamt-Verlustleistung ¹ total power dissipation ¹	$T_C = 25^{\circ}\text{C}, T_{vj} = 150^{\circ}\text{C}1$	P_{tot1}	1 35501	W
Gate-Emitter-Spitzenspannung ¹ gate-emitter peak voltage ¹	1	V_{GES1}	1 +/-201	V

Charakteristische Werte / characteristic values

			min.1	typ.1	max.	
Kollektor-Emitter Sättigungsspannung collector-emitter saturation voltage	$I_C = 800\text{ A}, V_{GE} = 15\text{ V}1$ $I_C = 800\text{ A}, V_{GE} = 15\text{ V}1$	$T_{vj} = 25^{\circ}\text{C}1$ $T_{vj} = 125^{\circ}\text{C}$	$V_{CE\text{ sat}}$	1 1,701 2,00	2,151	V1 V
Gate-Schwellenspannung ¹ gate threshold voltage ¹	$I_C = 32,0\text{ mA}, V_{CE} = V_{GE}, T_{vj} = 25^{\circ}\text{C}1$		V_{GEth1}	5,01	5,81	6,51 V
Gateladung ¹ gate charge ¹	$V_{GE} = -15\text{ V} \dots +15\text{ V}1$		Q_{G1}	1	7,401	1 μC
Interner Gatewiderstand ¹ internal gate resistor ¹	$T_{vj} = 25^{\circ}\text{C}1$		R_{Gint1}	1	0,941	Ω
Eingangskapazität ¹ input capacitance ¹	$f = 1\text{ MHz}, T_{vj} = 25^{\circ}\text{C}, V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}1$		C_{ies1}	1	56,01	1 nF
Rückwirkungskapazität ¹ reverse transfer capacitance ¹	$f = 1\text{ MHz}, T_{vj} = 25^{\circ}\text{C}, V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}1$		C_{res1}	1	2,301	1 nF
Kollektor-Emitter Reststrom collector-emitter cut-off current ¹	$V_{CE} = 1200\text{ V}, V_{GE} = 0\text{ V}, T_{vj} = 25^{\circ}\text{C}1$		I_{CES1}		1	5,01 mA
Gate-Emitter Reststrom ¹ gate-emitter leakage current ¹	$V_{CE} = 0\text{ V}, V_{GE} = 20\text{ V}, T_{vj} = 25^{\circ}\text{C}1$		I_{GES1}		1	4001 nA
Einschaltverzögerungszeit (ind. Last) ¹ turn-on delay time (inductive load)	$I_C = 800\text{ A}, V_{CE} = 600\text{ V}1$ $V_{GE} = \pm 15\text{ V}1$ $R_{Gon} = 3,6\ \Omega$	$T_{vj} = 25^{\circ}\text{C}1$ $T_{vj} = 125^{\circ}\text{C}$	$t_{d\text{ on}1}$		0,241 0,25	$\mu\text{s}1$ μs
Anstiegszeit (induktive Last) ¹ rise time (inductive load)	$I_C = 800\text{ A}, V_{CE} = 600\text{ V}1$ $V_{GE} = \pm 15\text{ V}1$ $R_{Gon} = 3,6\ \Omega$	$T_{vj} = 25^{\circ}\text{C}1$ $T_{vj} = 125^{\circ}\text{C}$	t_r1		0,18 0,19	μs μs
Abschaltverzögerungszeit (ind. Last) ¹ turn-off delay time (inductive load)	$I_C = 800\text{ A}, V_{CE} = 600\text{ V}1$ $V_{GE} = \pm 15\text{ V}1$ $R_{Goff} = 0,91\ \Omega$	$T_{vj} = 25^{\circ}\text{C}1$ $T_{vj} = 125^{\circ}\text{C}$	$t_{d\text{ off}1}$		0,79 0,80	μs μs
Fallzeit (induktive Last) ¹ fall time (inductive load)	$I_C = 800\text{ A}, V_{CE} = 600\text{ V}1$ $V_{GE} = \pm 15\text{ V}1$ $R_{Goff} = 0,91\ \Omega$	$T_{vj} = 25^{\circ}\text{C}1$ $T_{vj} = 125^{\circ}\text{C}$	t_f		0,121 0,20	$\mu\text{s}1$ μs
Einschaltverlustenergie pro Puls ¹ turn-on energy loss per pulse	$I_C = 800\text{ A}, V_{CE} = 600\text{ V}1$ $V_{GE} = \pm 15\text{ V}, L_s = 85\text{ nH}1$ $R_{Gon} = 3,6\ \Omega$	$T_{vj} = 25^{\circ}\text{C}1$ $T_{vj} = 125^{\circ}\text{C}$	E_{on1}		85,0	mJ1 mJ
Abschaltverlustenergie pro Puls ¹ turn-off energy loss per pulse	$I_C = 800\text{ A}, V_{CE} = 600\text{ V}1$ $V_{GE} = \pm 15\text{ V}, L_s = 85\text{ nH}1$ $R_{Goff} = 0,91\ \Omega$	$T_{vj} = 25^{\circ}\text{C}1$ $T_{vj} = 125^{\circ}\text{C}$	E_{off1}		125	mJ1 mJ
Kurzschlußverhalten ¹ SC data	$t_p \leq 10\ \mu\text{s}, V_{GE} \leq 15\text{ V}1$ $T_{vj} = 125^{\circ}\text{C}, V_{CC} = 900\text{ V}, V_{CEmax} = V_{CES} - L_s \cdot di/dt$		I_{sc1}		32001	A
Innerer Wärmewiderstand ¹ thermal resistance, junction to case	pro IGBT1 per IGBT1		R_{thJC1}		1	0,0351 K/W

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Diode-Wechselrichter / diode-inverter

Höchstzulässige Werte / maximum rated values

Periodische Spitzensperrspannung1 repetitive peak reverse voltage1	$T_{vj} = 25^{\circ}\text{C}1$	V_{RRM1}	12001	V
Dauergleichstrom1 DC forward current1	1	I_{F1}	1 8001	A
Periodischer Spitzenstrom1 repetitive peak forward current1	$t_p = 1 \text{ ms}1$	I_{FRM1}	16001	A
Grenzlastintegral1 I^2t - value1	$V_R = 0 \text{ V}, t_p = 10 \text{ ms}, T_{vj} = 125^{\circ}\text{C}1$	I^2t1	75000 1	A ² s

Charakteristische Werte / characteristic values

			min.	typ.	max.	
Durchlassspannung1 forward voltage	$I_F = 800 \text{ A}, V_{GE} = 0 \text{ V}1$ $I_F = 800 \text{ A}, V_{GE} = 0 \text{ V}1$	$T_{vj} = 25^{\circ}\text{C}1$ $T_{vj} = 125^{\circ}\text{C}$	V_F	2,20 1,90	2,75	V V
Rückstromspitze1 peak reverse recovery current	$I_F = 800 \text{ A}, -di_F/dt = 3800 \text{ A}/\mu\text{s}1$ $V_R = 600 \text{ V}1$ $V_{GE} = -15 \text{ V}$	$T_{vj} = 25^{\circ}\text{C}1$ $T_{vj} = 125^{\circ}\text{C}$	I_{RM1}	3001 450		A1 A
Sperrverzögerungsladung1 recovered charge	$I_F = 800 \text{ A}, -di_F/dt = 3800 \text{ A}/\mu\text{s}1$ $V_R = 600 \text{ V}1$ $V_{GE} = -15 \text{ V}$	$T_{vj} = 25^{\circ}\text{C}1$ $T_{vj} = 125^{\circ}\text{C}$	Q_{r1}	35,0 95,01		μC $\mu\text{C}1$
Abschaltenergie pro Puls1 reverse recovery energy	$I_F = 800 \text{ A}, -di_F/dt = 3800 \text{ A}/\mu\text{s}1$ $V_R = 600 \text{ V}1$ $V_{GE} = -15 \text{ V}$	$T_{vj} = 25^{\circ}\text{C}1$ $T_{vj} = 125^{\circ}\text{C}$	E_{rec1}	13,01 38,0		mJ1 mJ
Innerer Wärmewiderstand1 thermal resistance, junction to case	pro Diode1 per diode		R_{thJC}		0,06	KW

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Technische Information / technical information

IGBT-Module
IGBT-modules

FZ800R12KE3

power electronics in motion
eupec

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Modul / module

Isolations-Prüfspannung ¹ insulation test voltage ¹	RMS, f = 50 Hz, t = 1 min. ¹	V _{ISO1}	1	2,51	1	kV
Material Modulgrundplatte ¹ material of module baseplate ¹		1	1	Cu1		
Material für innere Isolation ¹ material for internal insulation ¹		1	1	Al ₂ O ₃ 1		
Kriechstrecke creepage distance	Kontakt - Kühlkörper / terminal to heatsink ¹ Kontakt - Kontakt / terminal to terminal ¹			20,01 1	1	mm
Luftstrecke ¹ clearance distance	Kontakt - Kühlkörper / terminal to heatsink ¹ Kontakt - Kontakt / terminal to terminal			11,01		mm
Vergleichszahl der Kriechwegbildung ¹ comparative tracking index ¹	1	CTI1	1	> 4251		
			min.1	typ.1	max.	
Übergangs-Wärmewiderstand ¹ thermal resistance, case to heatsink	pro Modul / per module ¹ $\lambda_{\text{Paste}} = 1 \text{ W}/(\text{m}\cdot\text{K}) / \lambda_{\text{grease}} = 1 \text{ W}/(\text{m}\cdot\text{K})$ ¹	R _{thCH1}	1	0,01		K/W
Modulinduktivität ¹ stray inductance module ¹	1	L _{sCE1}		161	1	nH
Modulleitungswiderstand, ¹ Anschlüsse - Chip ¹ module lead resistance, ¹ terminals - chip	T _C = 25°C, pro Schalter / per switch ¹	R _{CC+EE1}	1	0,501	1	mΩ
Höchstzulässige Sperrschichttemperatur ¹ maximum junction temperature ¹	Wechselrichter / inverter ¹	T _{vj max1}			1501	°C
Temperatur im Schaltbetrieb ¹ temperature under switching conditions ¹	Wechselrichter / inverter ¹	T _{vj op1}	-401		1251	°C
Lagertemperatur ¹ storage temperature ¹	1	T _{stg1}	-401		1251	°C
Anzugsdrehmoment f. mech. Befestigung ¹ mounting torque ¹	Schraube / screw M61	M1	3,001	-1	6,001	Nm
Anzugsdrehmoment f. elektr. Anschlüsse ¹ terminal connection torque	Schraube / screw M41 Schraube / screw M6	M1	1,1 2,5	-1 -	2,01 5,0	Nm ¹ Nm
Gewicht ¹ weight ¹		G1	1	3401		g

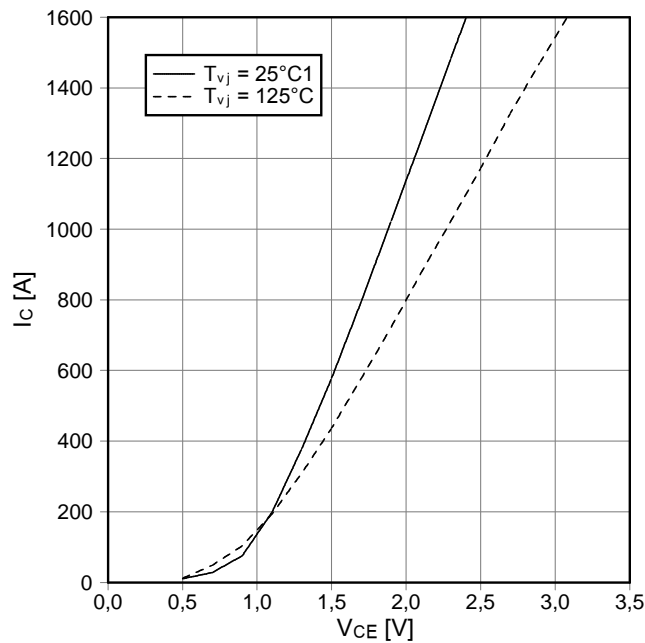
Mit dieser technischen Information werden Halbleiterbauelemente spezifiziert, jedoch keine Eigenschaften zugesichert. Sie gilt in Verbindung mit den zugehörigen technischen Erläuterungen.

This technical information specifies semiconductor devices but guarantees no characteristics. It is valid with the appropriate technical explanations.

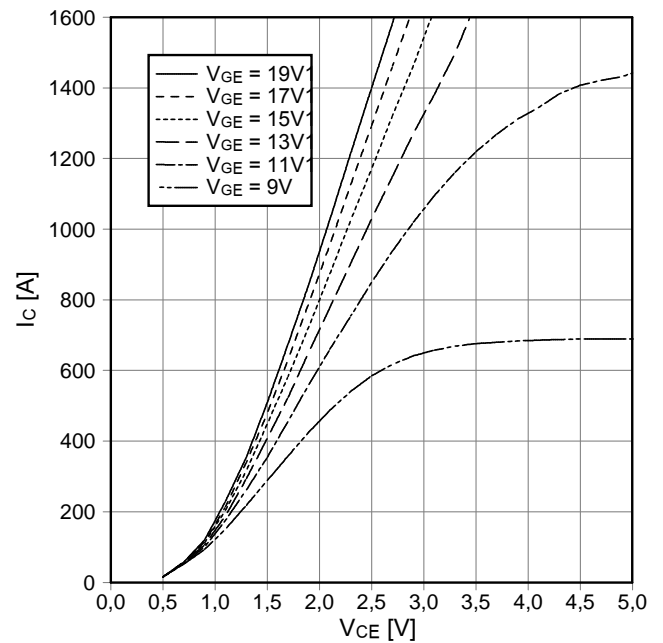
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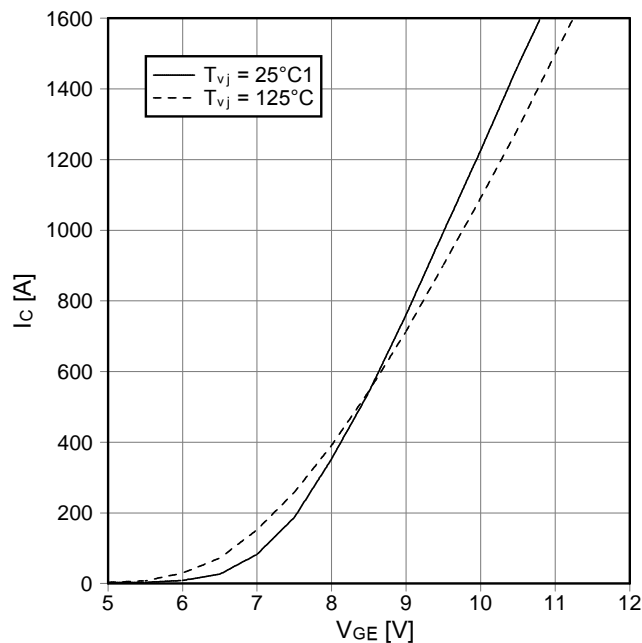
Ausgangskennlinie IGBT-1 echselr. (typisch)
output characteristic IGBT-inverter (typical)
 $I_c = f(V_{CE})^1$
 $V_{GE} = 15\text{ V}$



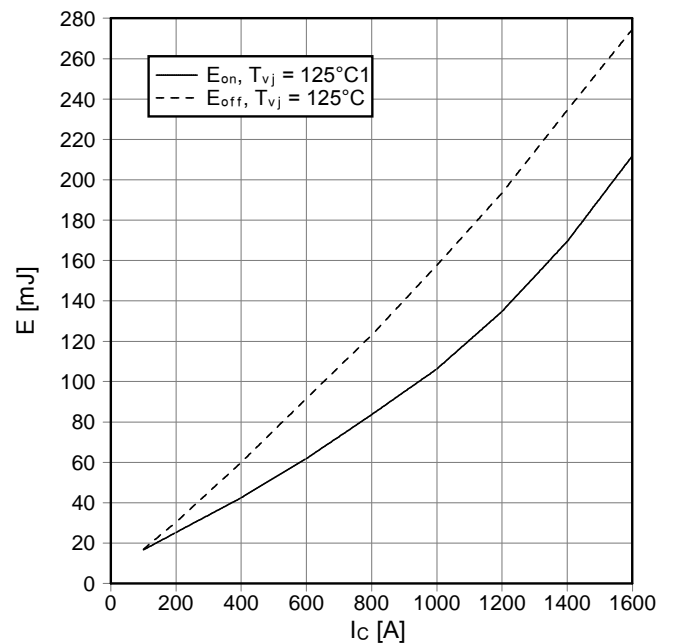
Ausgangskennlinienfeld IGBT-Wechselr. (typisch)1
output characteristic IGBT-inverter (typical)
 $I_c = f(V_{CE})^1$
 $T_{vj} = 125^\circ\text{C}$



Übertragungscharakteristik IGBT-Wechselr. (typisch)
transfer characteristic IGBT-inverter (typical)
 $I_c = f(V_{GE})^1$
 $V_{CE} = 20\text{ V}$



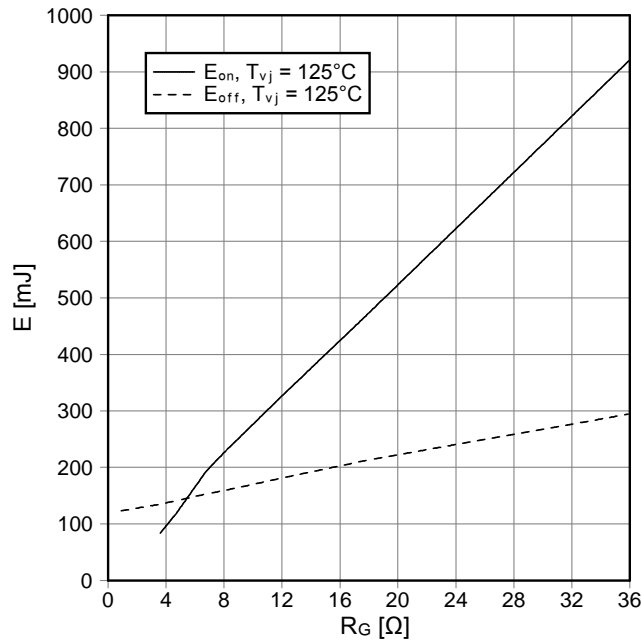
Schaltverluste IGBT-1 echselr. (typisch)
switching losses IGBT-inverter (typical)
 $E_{on} = f(I_c)$, $E_{off} = f(I_c)$
 $V_{GE} = \pm 15\text{ V}$, $R_{Gon} = 3,6\ \Omega$, $R_{Goff} = 0,91\ \Omega$, $V_{CE} = 600\text{ V}$



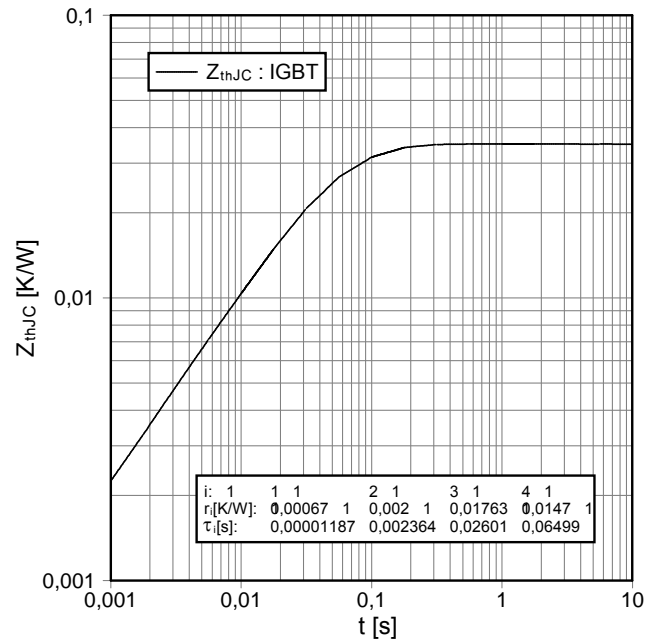
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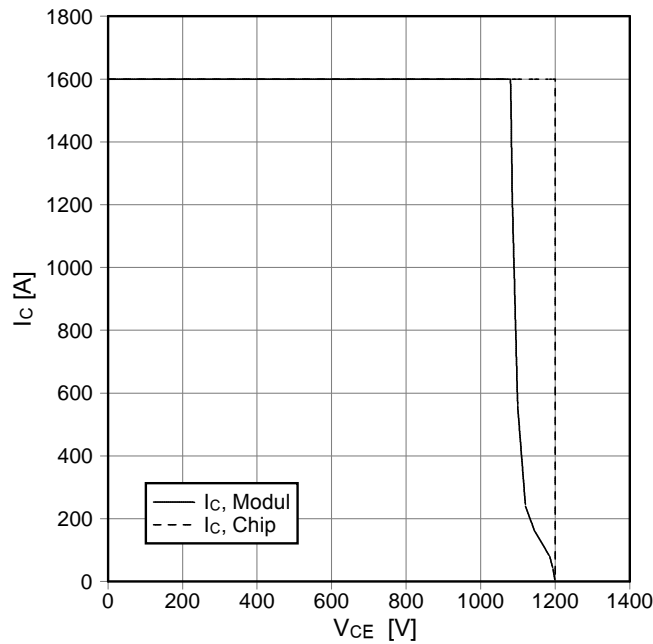
Schaltverluste IGBT-Wechsler. (typisch)1
switching losses IGBT-inverter (typical)1
 $E_{on} = f(R_G)$, $E_{off} = f(R_G)$ 1
 $V_{GE} = \pm 15\text{ V}$, $I_C = 800\text{ A}$, $V_{CE} = 600\text{ V}$



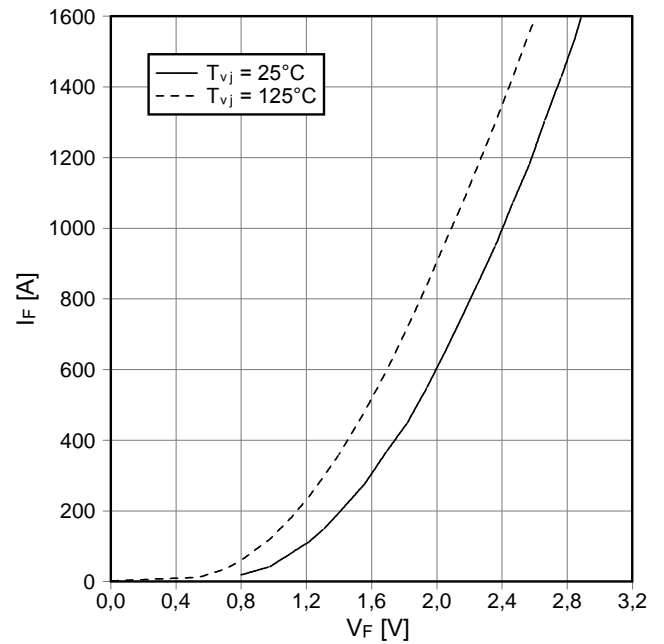
Transienter Wärmewiderstand IGBT-Wechsler.1
transient thermal impedance IGBT-inverter1
 $Z_{thJC} = f(t)$



Sicherer Rückwärts-Arbeitsbereich IGBT-1 j. (RBSOA)
reverse bias safe operating area IGBT-inv. (RBSOA)1
 $I_C = f(V_{CE})$
 $V_{GE} = \pm 15\text{ V}$, $R_{Goff} = 0,91\ \Omega$, $T_{vj} = 125^\circ\text{C}$



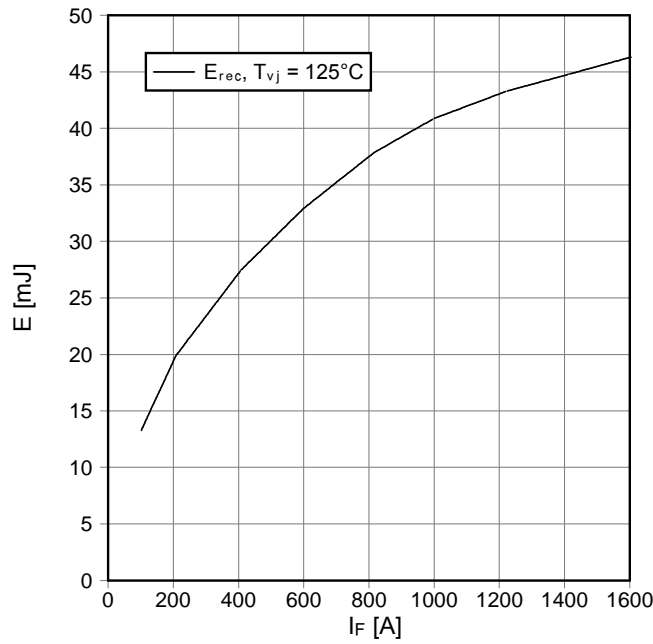
Durchlaßkennlinie der Diode-1 j. (typisch)
forward characteristic of diode-inverter (typical)1
 $I_F = f(V_F)$



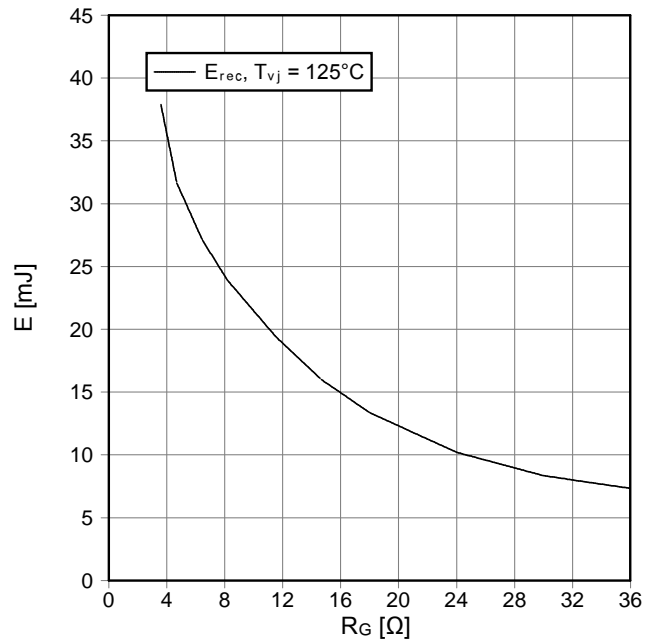
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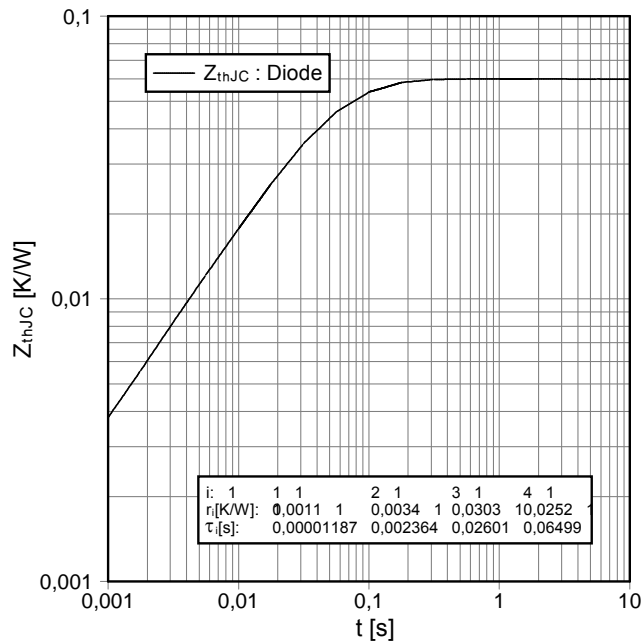
Schaltverluste Diode-Wechselr. (typisch)¹
switching losses diode-inverter (typical)¹
 $E_{rec} = f(I_F)^1$
 $R_{Gon} = 3,6 \Omega$, $V_{CE} = 600 V$



Schaltverluste Diode-Wechselr. (typisch)¹
switching losses diode-inverter (typical)¹
 $E_{rec} = f(R_G)^1$
 $I_F = 800 A$, $V_{CE} = 600 V$



Wärmeleitfähigkeit 1 Wärmewiderstand Diode-1 echselr.
transient thermal impedance diode-inverter1
 $Z_{thJC} = f(t)$

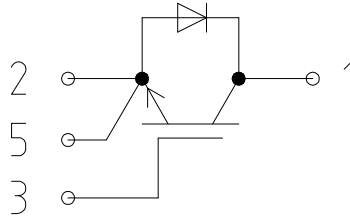


i:	1	1	2	1	3	1	4	1
ri[K/W]:	0,0011	1	0,0034	1	0,0303	10,0252		
τi[s]:	0,00001187		0,002364		0,02601	0,06499		

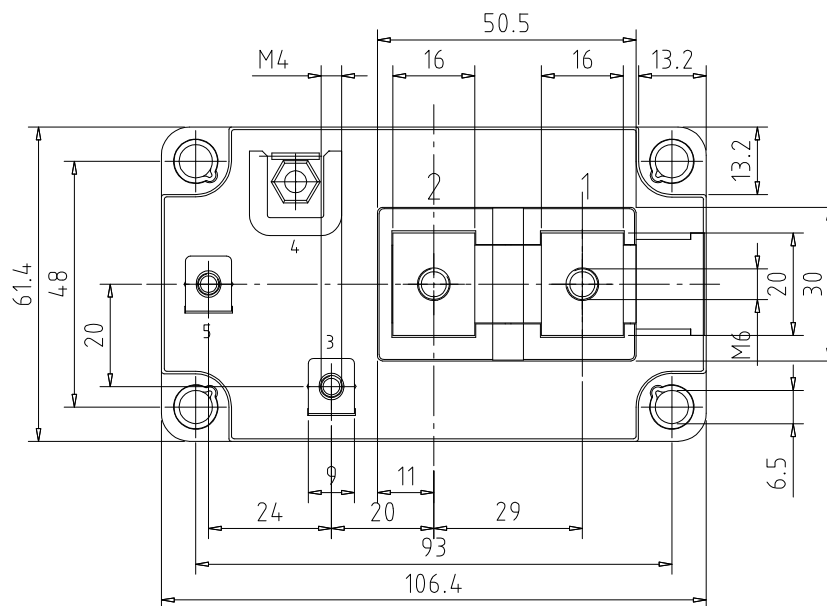
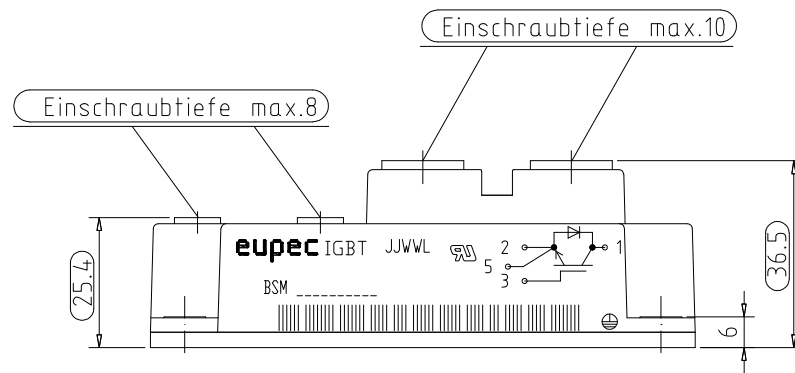
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Schaltplan / circuit diagram



Gehäuseabmessungen / package outlines



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