

**Vorläufige Daten  
preliminary data**

**IGBT-Wechselrichter / IGBT-inverter**

**Höchstzulässige Werte / maximum rated values**

Kollektor-Emitter-Sperrspannung collector-emitter voltage	$T_{vj} = 25^{\circ}\text{C}$	$V_{CES}$	1200	V
Kollektor-Dauergleichstrom DC-collector current	$T_C = 80^{\circ}\text{C}$ $T_C = 25^{\circ}\text{C}$	$I_{C\text{ nom}}$ $I_C$	15 25	A A
Periodischer Kollektor Spitzenstrom repetitive peak collector current	$t_p = 1\text{ ms}, T_C = 80^{\circ}\text{C}$	$I_{CRM}$	30	A
Gesamt-Verlustleistung total power dissipation	$T_C = 25^{\circ}\text{C}$	$P_{tot}$	105	W
Gate-Emitter-Spitzenspannung gate-emitter peak voltage		$V_{GES}$	+/-20	V

**Charakteristische Werte / characteristic values**

			min.	typ.	max.	
Kollektor-Emitter Sättigungsspannung collector-emitter saturation voltage	$I_C = 15\text{ A}, V_{GE} = 15\text{ V}, T_{vj} = 25^{\circ}\text{C}$ $I_C = 15\text{ A}, V_{GE} = 15\text{ V}, T_{vj} = 125^{\circ}\text{C}$	$V_{CE\text{ sat}}$		1,70 1,90	2,15	V V
Gate-Schwellenspannung gate threshold voltage	$I_C = 0,50\text{ mA}, V_{CE} = V_{GE}, T_{vj} = 25^{\circ}\text{C}$	$V_{GEth}$	5,0	5,8	6,5	V
Gateladung gate charge	$V_{GE} = -15\text{ V} \dots +15\text{ V}$	$Q_G$		0,15		$\mu\text{C}$
Interner Gatewiderstand internal gate resistor	$T_{vj} = 25^{\circ}\text{C}$	$R_{Gint}$		0,0		$\Omega$
Eingangskapazität input capacitance	$f = 1\text{ MHz}, T_{vj} = 25^{\circ}\text{C}, V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}$	$C_{ies}$		1,10		nF
Rückwirkungskapazität reverse transfer capacitance	$f = 1\text{ MHz}, T_{vj} = 25^{\circ}\text{C}, V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}$	$C_{res}$		0,04		nF
Kollektor-Emitter Reststrom collector-emitter cut-off current	$V_{CE} = 1200\text{ V}, V_{GE} = 0\text{ V}, T_{vj} = 25^{\circ}\text{C}$	$I_{CES}$			5,0	mA
Gate-Emitter Reststrom gate-emitter leakage current	$V_{CE} = 0\text{ V}, V_{GE} = 20\text{ V}, T_{vj} = 25^{\circ}\text{C}$	$I_{GES}$			400	nA
Einschaltverzögerungszeit (ind. Last) turn-on delay time (inductive load)	$I_C = 15\text{ A}, V_{CE} = 600\text{ V}$ $V_{GE} = \pm 15\text{ V}, R_{Gon} = 75\ \Omega, T_{vj} = 25^{\circ}\text{C}$ $V_{GE} = \pm 15\text{ V}, R_{Gon} = 75\ \Omega, T_{vj} = 125^{\circ}\text{C}$	$t_{d\text{ on}}$		0,09 0,09		$\mu\text{s}$ $\mu\text{s}$
Anstiegszeit (induktive Last) rise time (inductive load)	$I_C = 15\text{ A}, V_{CE} = 600\text{ V}$ $V_{GE} = \pm 15\text{ V}, R_{Gon} = 75\ \Omega, T_{vj} = 25^{\circ}\text{C}$ $V_{GE} = \pm 15\text{ V}, R_{Gon} = 75\ \Omega, T_{vj} = 125^{\circ}\text{C}$	$t_r$		0,03 0,05		$\mu\text{s}$ $\mu\text{s}$
Abschaltverzögerungszeit (ind. Last) turn-off delay time (inductive load)	$I_C = 15\text{ A}, V_{CE} = 600\text{ V}$ $V_{GE} = \pm 15\text{ V}, R_{Goff} = 75\ \Omega, T_{vj} = 25^{\circ}\text{C}$ $V_{GE} = \pm 15\text{ V}, R_{Goff} = 75\ \Omega, T_{vj} = 125^{\circ}\text{C}$	$t_{d\text{ off}}$		0,42 0,52		$\mu\text{s}$ $\mu\text{s}$
Fallzeit (induktive Last) fall time (inductive load)	$I_C = 15\text{ A}, V_{CE} = 600\text{ V}$ $V_{GE} = \pm 15\text{ V}, R_{Goff} = 75\ \Omega, T_{vj} = 25^{\circ}\text{C}$ $V_{GE} = \pm 15\text{ V}, R_{Goff} = 75\ \Omega, T_{vj} = 125^{\circ}\text{C}$	$t_f$		0,07 0,09		$\mu\text{s}$ $\mu\text{s}$
Einschaltverlustenergie pro Puls turn-on energy loss per pulse	$I_C = 15\text{ A}, V_{CE} = 600\text{ V}, L_s = 45\text{ nH}$ $V_{GE} = \pm 15\text{ V}, R_{Gon} = 75\ \Omega, T_{vj} = 25^{\circ}\text{C}$ $V_{GE} = \pm 15\text{ V}, R_{Gon} = 75\ \Omega, T_{vj} = 125^{\circ}\text{C}$	$E_{on}$		1,50 2,10		mJ mJ
Abschaltverlustenergie pro Puls turn-off energy loss per pulse	$I_C = 15\text{ A}, V_{CE} = 600\text{ V}, L_s = 45\text{ nH}$ $V_{GE} = \pm 15\text{ V}, R_{Goff} = 75\ \Omega, T_{vj} = 25^{\circ}\text{C}$ $V_{GE} = \pm 15\text{ V}, R_{Goff} = 75\ \Omega, T_{vj} = 125^{\circ}\text{C}$	$E_{off}$		1,10 1,30		mJ mJ
Kurzschlußverhalten SC data	$t_p \leq 10\ \mu\text{s}, V_{GE} \leq 15\text{ V}$ $T_{vj} \leq 125^{\circ}\text{C}, V_{CC} = 900\text{ V}, V_{CEmax} = V_{CES} - L_{sCE} \cdot di/dt$	$I_{SC}$		60		A
Innerer Wärmewiderstand thermal resistance, junction to case	pro IGBT per IGBT	$R_{thJC}$			1,20	K/W

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**Vorläufige Daten  
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**Diode-Wechselrichter / diode-inverter**

**Höchstzulässige Werte / maximum rated values**

Periodische Spitzensperrspannung repetitive peak reverse voltage	$T_{vj} = 25^{\circ}\text{C}$	$V_{RRM}$	1200	V
Dauergleichstrom DC forward current		$I_F$	15	A
Periodischer Spitzenstrom repetitive peak forward current	$t_p = 1 \text{ ms}$	$I_{FRM}$	30	A
Grenzlastintegral $I^2t$ - value	$V_R = 0 \text{ V}, t_p = 10 \text{ ms}, T_{vj} = 125^{\circ}\text{C}$	$I^2t$	60,0	A <sup>2</sup> s

**Charakteristische Werte / characteristic values**

			min.	typ.	max.	
Durchlassspannung forward voltage	$I_F = 15 \text{ A}, V_{GE} = 0 \text{ V}, T_{vj} = 25^{\circ}\text{C}$ $I_F = 15 \text{ A}, V_{GE} = 0 \text{ V}, T_{vj} = 125^{\circ}\text{C}$	$V_F$		1,65 1,65	2,15	V V
Rückstromspitze peak reverse recovery current	$I_F = 15 \text{ A}, -di_F/dt = 400 \text{ A}/\mu\text{s}$ $V_R = 600 \text{ V}, V_{GE} = -15 \text{ V}, T_{vj} = 25^{\circ}\text{C}$ $V_R = 600 \text{ V}, V_{GE} = -15 \text{ V}, T_{vj} = 125^{\circ}\text{C}$	$I_{RM}$		16,0 15,0		A A
Sperrverzögerungsladung recovered charge	$I_F = 15 \text{ A}, -di_F/dt = 400 \text{ A}/\mu\text{s}$ $V_R = 600 \text{ V}, V_{GE} = -15 \text{ V}, T_{vj} = 25^{\circ}\text{C}$ $V_R = 600 \text{ V}, V_{GE} = -15 \text{ V}, T_{vj} = 125^{\circ}\text{C}$	$Q_r$		1,80 3,00		$\mu\text{C}$ $\mu\text{C}$
Abschaltenergie pro Puls reverse recovery energy	$I_F = 15 \text{ A}, -di_F/dt = 400 \text{ A}/\mu\text{s}$ $V_R = 600 \text{ V}, V_{GE} = -15 \text{ V}, T_{vj} = 25^{\circ}\text{C}$ $V_R = 600 \text{ V}, V_{GE} = -15 \text{ V}, T_{vj} = 125^{\circ}\text{C}$	$E_{rec}$		0,55 1,10		mJ mJ
Innerer Wärmewiderstand thermal resistance, junction to case	pro Diode per diode	$R_{thJC}$			1,50	K/W

**Diode-Gleichrichter / diode-rectifier**

**Höchstzulässige Werte / maximum rated values**

Periodische Rückw. Spitzensperrspannung repetitive peak reverse voltage	$T_{vj} = 25^{\circ}\text{C}$	$V_{RRM}$	1600	V
Durchlassstrom Grenzeffektivwert pro Dio. forward current RMS maximum per diode	$T_C = 80^{\circ}\text{C}$	$I_{FRMSM}$	50	A
Gleichrichter Ausgang Grenzeffektivstrom maximum RMS current at Rectifier output	$T_C = 80^{\circ}\text{C}$	$I_{RMSM}$	60	A
Stoßstrom Grenzwert surge forward current	$t_p = 10 \text{ ms}, T_{vj} = 25^{\circ}\text{C}$ $t_p = 10 \text{ ms}, T_{vj} = 150^{\circ}\text{C}$	$I_{FSM}$	315 260	A A
Grenzlastintegral $I^2t$ - value	$t_p = 10 \text{ ms}, T_{vj} = 25^{\circ}\text{C}$ $t_p = 10 \text{ ms}, T_{vj} = 150^{\circ}\text{C}$	$I^2t$	495 340	A <sup>2</sup> s A <sup>2</sup> s

**Charakteristische Werte / characteristic values**

			min.	typ.	max.	
Durchlassspannung forward voltage	$T_{vj} = 150^{\circ}\text{C}, I_F = 15 \text{ A}$	$V_F$		0,90		V
Sperrstrom reverse current	$T_{vj} = 150^{\circ}\text{C}, V_R = 1600 \text{ V}$	$I_R$		2,00		mA
Innerer Wärmewiderstand thermal resistance, junction to case	pro Diode per diode	$R_{thJC}$			1,00	K/W

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**IGBT-Brems-Chopper / IGBT-brake-chopper  
Höchstzulässige Werte / maximum rated values**

Kollektor-Emitter-Sperrspannung collector-emitter voltage	$T_{vj} = 80^{\circ}\text{C}$	$V_{CES}$	1200	V
Kollektor-Dauergleichstrom DC-collector current	$T_c = 80^{\circ}\text{C}$ $T_c = 25^{\circ}\text{C}$	$I_{Cnom}$ $I_C$	10 18	A A
Periodischer Kollektor Spitzenstrom repetitive peak collector current	$t_p = 1 \text{ ms}, T_c = 80^{\circ}\text{C}$	$I_{CRM}$	20	A
Gesamt-Verlustleistung total power dissipation	$T_c = 25^{\circ}\text{C}$	$P_{tot}$	83,5	W
Gate-Emitter-Spitzenspannung gate-emitter peak voltage		$V_{GES}$	+/-20	V

**Charakteristische Werte / characteristic values**

			min.	typ.	max.	
Kollektor-Emitter Sättigungsspannung collector-emitter saturation voltage	$I_C = 10 \text{ A}, V_{GE} = 15 \text{ V}, T_{vj} = 25^{\circ}\text{C}$ $I_C = 10 \text{ A}, V_{GE} = 15 \text{ V}, T_{vj} = 125^{\circ}\text{C}$	$V_{CE sat}$		1,85 2,15	2,45	V V
Gate-Schwellenspannung gate threshold voltage	$I_C = 0,30 \text{ mA}, V_{CE} = V_{GE}, T_{vj} = 25^{\circ}\text{C}$	$V_{GEth}$	5,0	5,8	6,5	V
Gateladung gate charge	$V_{GE} = -15 \text{ V} \dots +15 \text{ V}$	$Q_G$		0,10		$\mu\text{C}$
Interner Gatewiderstand internal gate resistor		$R_{Gint}$		0,00		$\Omega$
Eingangskapazität input capacitance	$f = 1 \text{ MHz}, T_{vj} = 25^{\circ}\text{C}$ $V_{CE} = 25 \text{ V}, V_{GE} = 0 \text{ V}$	$C_{ies}$		0,60		nF
Rückwirkungskapazität reverse transfer capacitance	$f = 1 \text{ MHz}, T_{vj} = 25^{\circ}\text{C}$ $V_{CE} = 25 \text{ V}, V_{GE} = 0 \text{ V}$	$C_{res}$		0,026		nF
Kollektor-Emitter Reststrom collector-emitter cut-off current	$V_{CE} = 1200 \text{ V}, V_{GE} = 0 \text{ V}, T_{vj} = 25^{\circ}\text{C}$	$I_{CES}$			5,0	mA
Gate-Emitter Reststrom gate-emitter leakage current	$V_{CE} = 0 \text{ V}, V_{GE} = 20 \text{ V}, T_{vj} = 25^{\circ}\text{C}$	$I_{GES}$			400	nA
Einschaltverzögerungszeit (ind. Last) turn-on delay time (inductive load)	$I_C = 10 \text{ A}, V_{CE} = 600 \text{ V}$ $V_{GE} = \pm 15 \text{ V}, R_{Gon} = 100 \Omega, T_{vj} = 25^{\circ}\text{C}$ $V_{GE} = \pm 15 \text{ V}, R_{Gon} = 100 \Omega, T_{vj} = 125^{\circ}\text{C}$	$t_{d on}$		0,09 0,09		$\mu\text{s}$ $\mu\text{s}$
Anstiegszeit (induktive Last) rise time (inductive load)	$I_C = 10 \text{ A}, V_{CE} = 600 \text{ V}$ $V_{GE} = \pm 15 \text{ V}, R_{Gon} = 100 \Omega, T_{vj} = 25^{\circ}\text{C}$ $V_{GE} = \pm 15 \text{ V}, R_{Gon} = 100 \Omega, T_{vj} = 125^{\circ}\text{C}$	$t_r$		0,03 0,05		$\mu\text{s}$ $\mu\text{s}$
Abschaltverzögerungszeit (ind. Last) turn-off delay time (inductive load)	$I_C = 10 \text{ A}, V_{CE} = 600 \text{ V}$ $V_{GE} = \pm 15 \text{ V}, R_{Goff} = 100 \Omega, T_{vj} = 25^{\circ}\text{C}$ $V_{GE} = \pm 15 \text{ V}, R_{Goff} = 100 \Omega, T_{vj} = 125^{\circ}\text{C}$	$t_{d off}$		0,42 0,52		$\mu\text{s}$ $\mu\text{s}$
Fallzeit (induktive Last) fall time (inductive load)	$I_C = 10 \text{ A}, V_{CE} = 600 \text{ V}$ $V_{GE} = \pm 15 \text{ V}, R_{Goff} = 100 \Omega, T_{vj} = 25^{\circ}\text{C}$ $V_{GE} = \pm 15 \text{ V}, R_{Goff} = 100 \Omega, T_{vj} = 125^{\circ}\text{C}$	$t_f$		0,07 0,09		$\mu\text{s}$ $\mu\text{s}$
Einschaltverlustenergie pro Puls turn-on energy loss per pulse	$I_C = 10 \text{ A}, V_{CE} = 600 \text{ V}$ $V_{GE} = \pm 15 \text{ V}, R_{Gon} = 100 \Omega, T_{vj} = 25^{\circ}\text{C}$ $V_{GE} = \pm 15 \text{ V}, R_{Gon} = 100 \Omega, T_{vj} = 125^{\circ}\text{C}$	$E_{on}$		1,00 1,40		mJ mJ
Abschaltverlustenergie pro Puls turn-off energy loss per pulse	$I_C = 10 \text{ A}, V_{CE} = 600 \text{ V}$ $V_{GE} = \pm 15 \text{ V}, R_{Goff} = 100 \Omega, T_{vj} = 25^{\circ}\text{C}$ $V_{GE} = \pm 15 \text{ V}, R_{Goff} = 100 \Omega, T_{vj} = 125^{\circ}\text{C}$	$E_{off}$		0,90 1,00		mJ mJ
Kurzschlußverhalten SC data	$t_p \leq 10 \mu\text{sec}, V_{GE} \leq 15 \text{ V}$ $T_{vj} \leq 125^{\circ}\text{C}, V_{CC} = 900 \text{ V}, V_{CEmax} = V_{CES} - L_{sCE} \cdot di/dt$	$I_{SC}$		40		A
Innerer Wärmewiderstand thermal resistance, junction to case	pro IGBT per IGBT	$R_{thJC}$			1,50	K/W

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**Diode-Brems-Chopper / Diode-brake-chopper  
Höchstzulässige Werte / maximum rated values**

Periodische Spitzensperrspannung repetitive peak reverse voltage	$T_{vj} = 80^{\circ}\text{C}$	$V_{RRM}$	1200	V
Dauergleichstrom DC forward current		$I_F$	10	A
Periodischer Spitzenstrom repetitive peak forw. current	$t_p = 1 \text{ ms}$	$I_{FRM}$	20	A
Grenzlastintegral $I^2t$ - value	$V_R = 0 \text{ V}, t_p = 10 \text{ ms}, T_{vj} = 125^{\circ}\text{C}$	$I^2t$	20,0	A <sup>2</sup> s

**Charakteristische Werte / characteristic values**

			min.	typ.	max.	
Durchlaßspannung forward voltage	$I_F = 10 \text{ A}, V_{GE} = 0 \text{ V}, T_{vj} = 25^{\circ}\text{C}$ $I_F = 10 \text{ A}, V_{GE} = 0 \text{ V}, T_{vj} = 125^{\circ}\text{C}$	$V_F$		1,80 1,85	2,25	V V
Rückstromspitze peak reverse recovery current	$I_F = 10 \text{ A}, -di_F/dt = 400 \text{ A}/\mu\text{s}$ $V_R = 600 \text{ V}, V_{GE} = -15 \text{ V}, T_{vj} = 25^{\circ}\text{C}$ $V_R = 600 \text{ V}, V_{GE} = -15 \text{ V}, T_{vj} = 125^{\circ}\text{C}$	$I_{RM}$		14,0 15,0		A A
Sperrverzögerungsladung recovered charge	$I_F = 10 \text{ A}, -di_F/dt = 400 \text{ A}/\mu\text{s}$ $V_R = 600 \text{ V}, V_{GE} = -15 \text{ V}, T_{vj} = 25^{\circ}\text{C}$ $V_R = 600 \text{ V}, V_{GE} = -15 \text{ V}, T_{vj} = 125^{\circ}\text{C}$	$Q_r$		1,00 1,80		$\mu\text{C}$ $\mu\text{C}$
Abschaltenergie pro Puls reverse recovery energy	$I_F = 10 \text{ A}, -di_F/dt = 400 \text{ A}/\mu\text{s}$ $V_R = 600 \text{ V}, V_{GE} = -15 \text{ V}, T_{vj} = 25^{\circ}\text{C}$ $V_R = 600 \text{ V}, V_{GE} = -15 \text{ V}, T_{vj} = 125^{\circ}\text{C}$	$E_{rec}$		0,26 0,56		mJ mJ
Innerer Wärmewiderstand thermal resistance, junction to case	pro Diode per diode	$R_{thJC}$			2,30	K/W

**NTC-Widerstand / NTC-thermistor**

**Charakteristische Werte / characteristic values**

			min.	typ.	max.	
Nennwiderstand rated resistance	$T_C = 25^{\circ}\text{C}$	$R_{25}$		5,00		k $\Omega$
Abweichung von $R_{100}$ deviation of $R_{100}$	$T_C = 100^{\circ}\text{C}, R_{100} = 493 \Omega$	$\Delta R/R$	-5		5	%
Verlustleistung power dissipation	$T_C = 25^{\circ}\text{C}$	$P_{25}$			20,0	mW
B-Wert B-value	$R_2 = R_{25} \exp [B_{25}/50(1/T_2 - 1/(298,15 \text{ K}))]$	$B_{25}/50$		3375		K

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# Technische Information / technical information

IGBT-Module  
IGBT-modules

## FP15R12KT3

power electronics in motion  
**eupec**

### Vorläufige Daten preliminary data

#### Modul / module

Isolations-Prüfspannung insulation test voltage	RMS, f = 50 Hz, t = 1 min	V <sub>ISOL</sub>	2,5		kV
Material Modulgrundplatte material of module baseplate			Cu		
Material für innere Isolation material for internal insulation			Al <sub>2</sub> O <sub>3</sub>		
Kriechstrecke creepage distance	Kontakt - Kühlkörper / terminal to heatsink Kontakt - Kontakt / terminal to terminal		10,0		mm
Luftstrecke clearance distance	Kontakt - Kühlkörper / terminal to heatsink Kontakt - Kontakt / terminal to terminal		7,50		mm
Vergleichszahl der Kriechwegbildung comparative tracking index		CTI	> 225		
			min.	typ.	max.
Übergangs-Wärmewiderstand thermal resistance, case to heatsink	pro Modul / per module $\lambda_{\text{Paste}} = 1 \text{ W}/(\text{m}\cdot\text{K}) / \lambda_{\text{grease}} = 1 \text{ W}/(\text{m}\cdot\text{K})$	R <sub>thCH</sub>		0,02	K/W
Modulinduktivität stray inductance module		L <sub>sCE</sub>		60	nH
Modulleitungswiderstand, Anschlüsse - Chip module lead resistance, terminals - chip	T <sub>C</sub> = 25°C, pro Schalter / per switch	R <sub>CC'+EE'</sub> R <sub>AA'+CC'</sub>		4,00 3,00	mΩ
Höchstzulässige Sperrschichttemperatur maximum junction temperature		T <sub>vj max</sub>			150 °C
Temperatur im Schaltbetrieb temperature under switching conditions		T <sub>vj op</sub>	-40		125 °C
Lagertemperatur storage temperature		T <sub>stg</sub>	-40		125 °C
Anzugsdrehmoment f. mech. Befestigung mounting torque	Schraube / screw M5	M	3,00	-	6,00 Nm
Gewicht weight		G		180	g

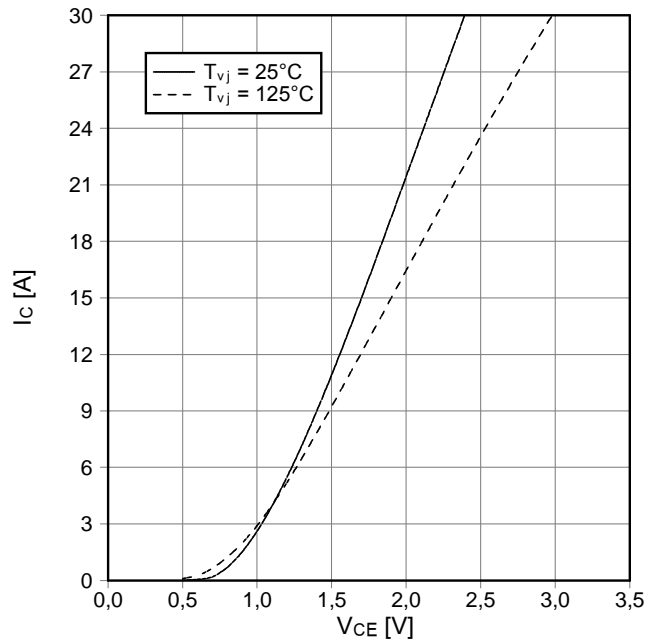
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**This technical information specifies semiconductor devices but guarantees no characteristics. It is valid with the appropriate technical explanations.**

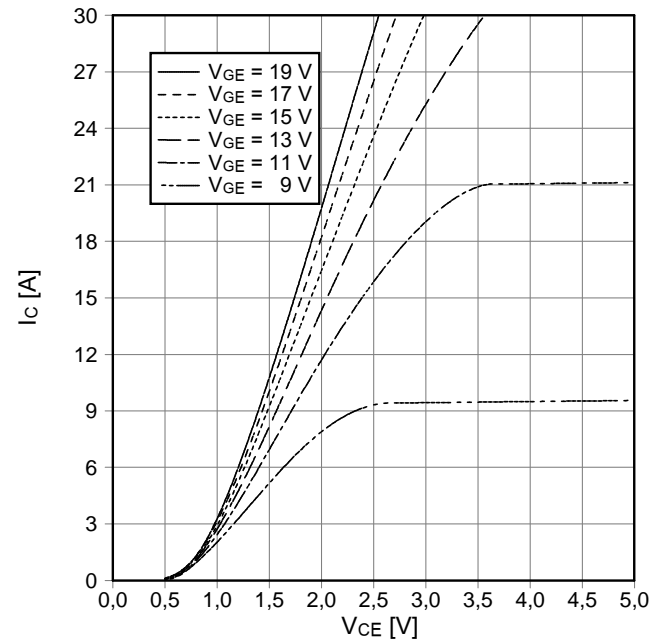
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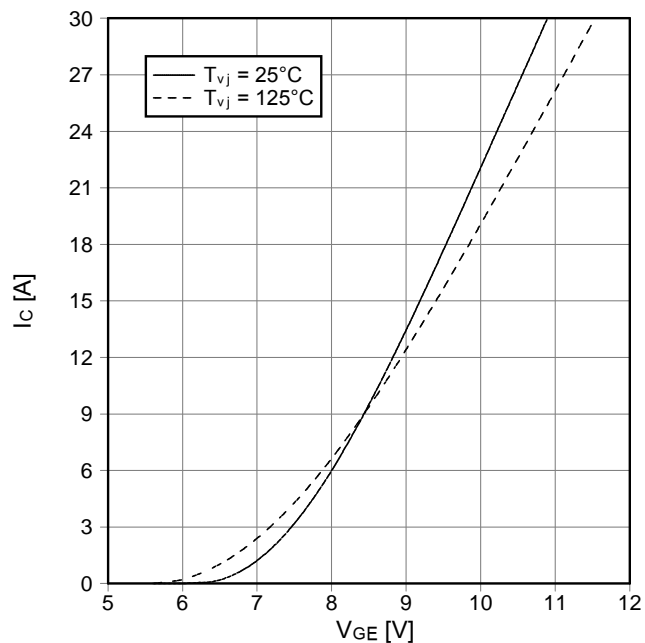
**Ausgangskennlinie IGBT-Wechselr. (typisch)**  
output characteristic IGBT-inverter (typical)  
 $I_c = f(V_{CE})$   
 $V_{GE} = 15\text{ V}$



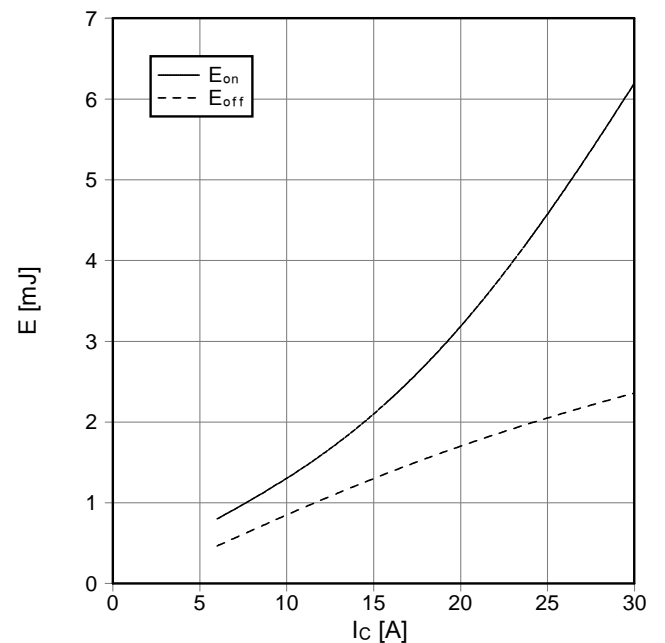
**Ausgangskennlinienfeld IGBT-Wechselr. (typisch)**  
output characteristic IGBT-inverter (typical)  
 $I_c = f(V_{CE})$   
 $T_{vj} = 125^\circ\text{C}$



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



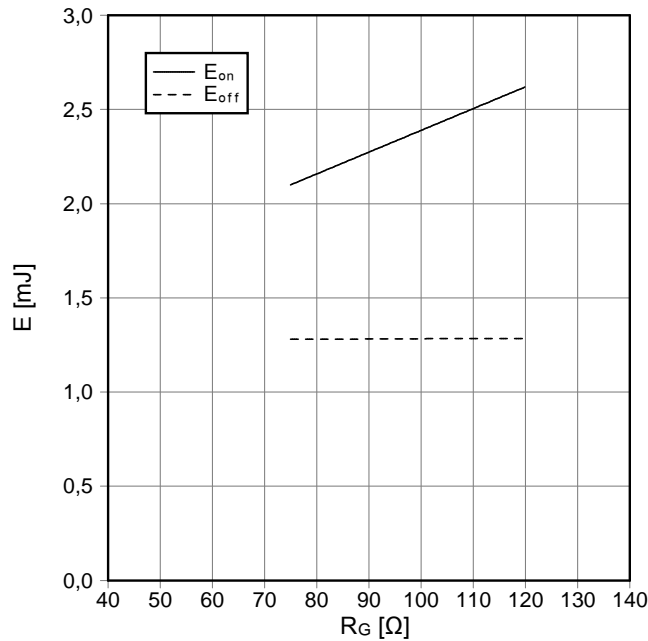
**Schaltverluste IGBT-Wechselr. (typisch)**  
switching losses IGBT-inverter (typical)  
 $E_{on} = f(I_c)$ ,  $E_{off} = f(I_c)$   
 $V_{GE} = \pm 15\text{ V}$ ,  $R_{Gon} = 75\ \Omega$ ,  $R_{Goff} = 75\ \Omega$ ,  $V_{CE} = 600\text{ V}$ ,  
 $T_{vj} = 125^\circ\text{C}$



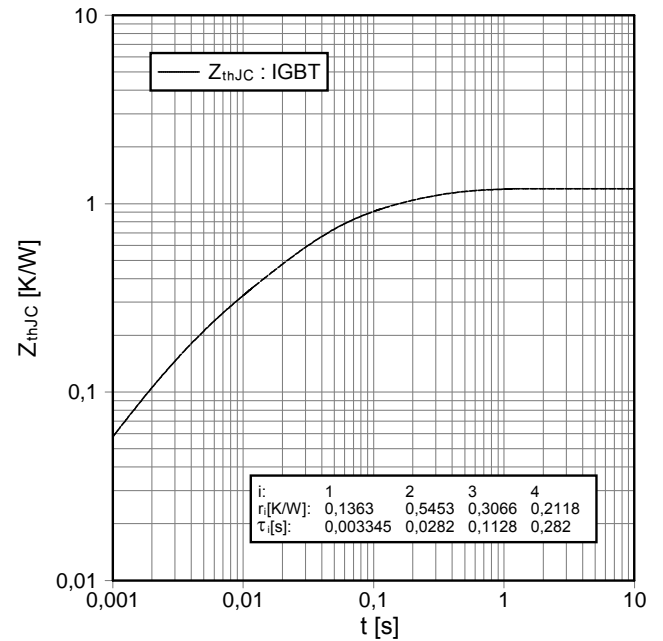
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**preliminary data**

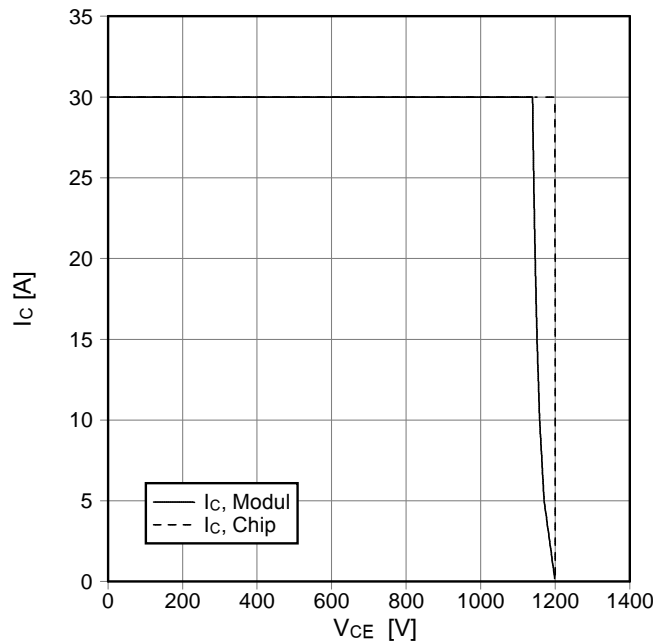
**Schaltverluste IGBT-Wechselr. (typisch)**  
**switching losses IGBT-inverter (typical)**  
 $E_{on} = f(R_G), E_{off} = f(R_G)$   
 $V_{GE} = \pm 15\text{ V}, I_C = 15\text{ A}, V_{CE} = 600\text{ V}, T_{vj} = 125^\circ\text{C}$



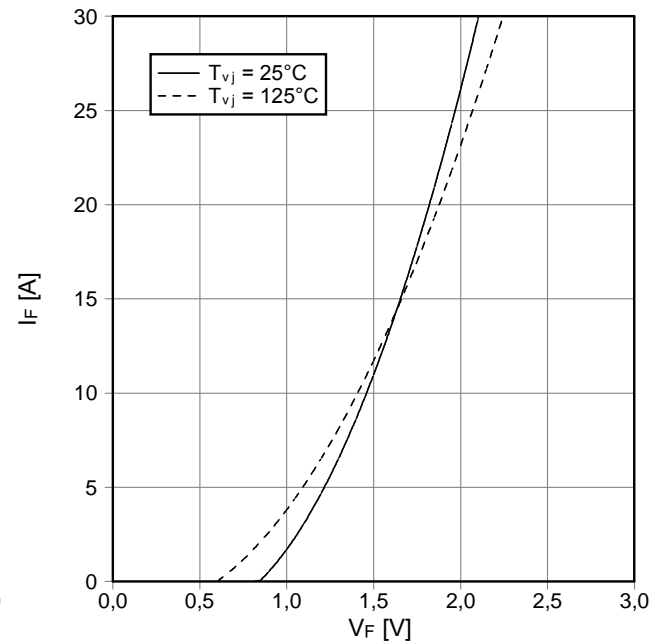
**Transienter Wärmewiderstand IGBT-Wechselr.**  
**transient thermal impedance IGBT-inverter**  
 $Z_{thJC} = f(t)$



**Sicherer Rückwärts-Arbeitsbereich IGBT-Wr. (RBSOA)**  
**reverse bias safe operating area IGBT-inv. (RBSOA)**  
 $I_C = f(V_{CE})$   
 $V_{GE} = \pm 15\text{ V}, R_{Goff} = 75\ \Omega, T_{vj} = 125^\circ\text{C}$



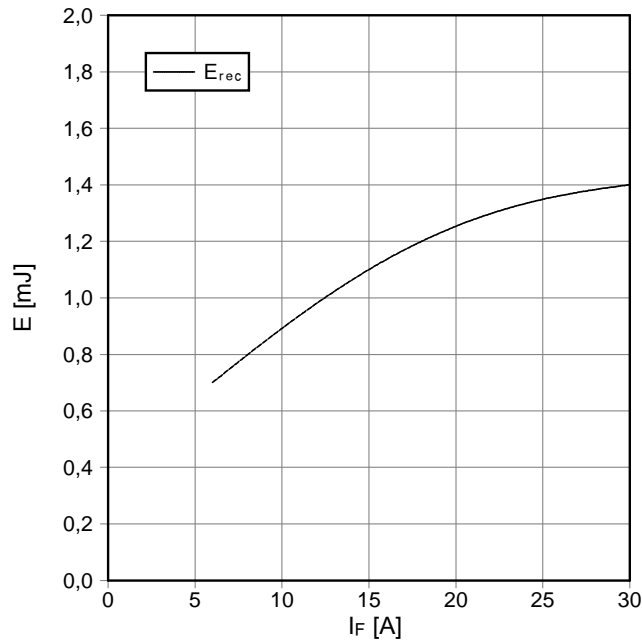
**Durchlaßkennlinie der Diode-Wechselr. (typisch)**  
**forward characteristic of diode-inverter (typical)**  
 $I_F = f(V_F)$



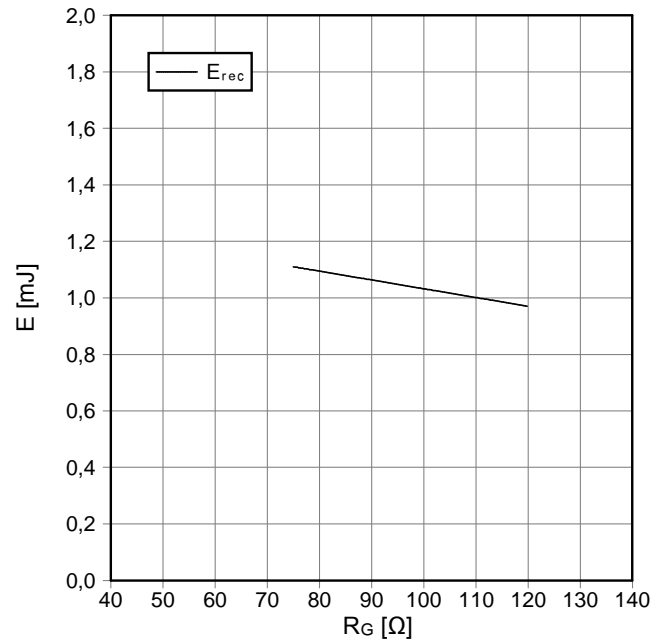
prepared by: Andreas Schulz	date of publication: 2003-12-2
approved by: Robert Severin	revision: 2.1

**Vorläufige Daten**  
**preliminary data**

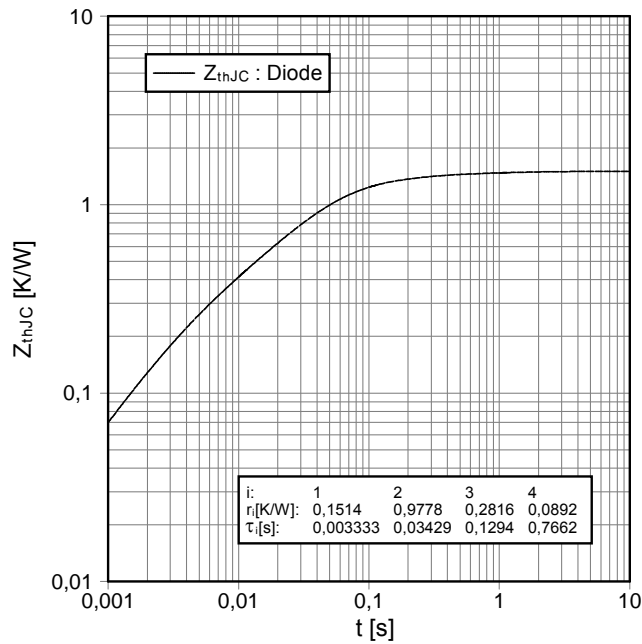
Schaltverluste Diode-Wechselr. (typisch)  
switching losses diode-inverter (typical)  
 $E_{rec} = f(I_F)$   
 $R_{Gon} = 75 \Omega$ ,  $V_{CE} = 600 V$ ,  $T_{vj} = 125^\circ C$



Schaltverluste Diode-Wechselr. (typisch)  
switching losses diode-inverter (typical)  
 $E_{rec} = f(R_G)$   
 $I_F = 15 A$ ,  $V_{CE} = 600 V$ ,  $T_{vj} = 125^\circ C$

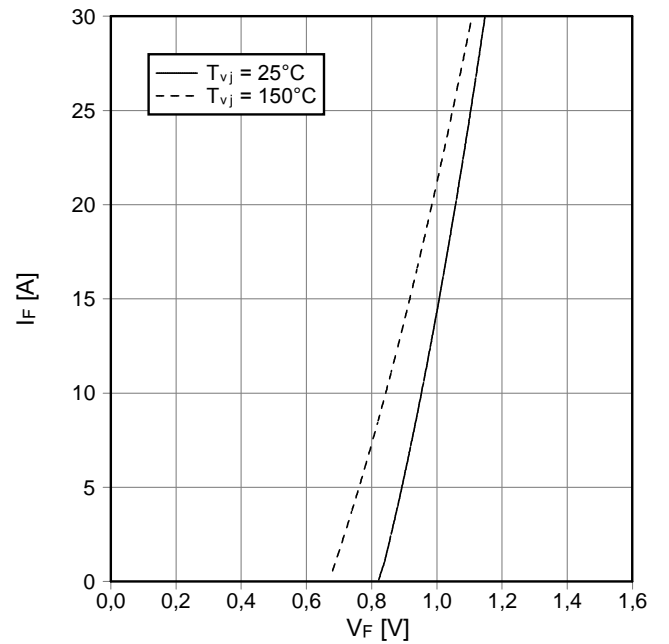


Transienter Wärmewiderstand Diode-Wechselr.  
transient thermal impedance diode-inverter  
 $Z_{thJC} = f(t)$



i:	1	2	3	4
r <sub>i</sub> [K/W]:	0,1514	0,9778	0,2816	0,0892
τ <sub>i</sub> [s]:	0,003333	0,03429	0,1294	0,7662

Durchlaßkennlinie der Diode-Gleichrichter (typisch)  
forward characteristic of diode-rectifier (typical)  
 $I_F = f(V_F)$

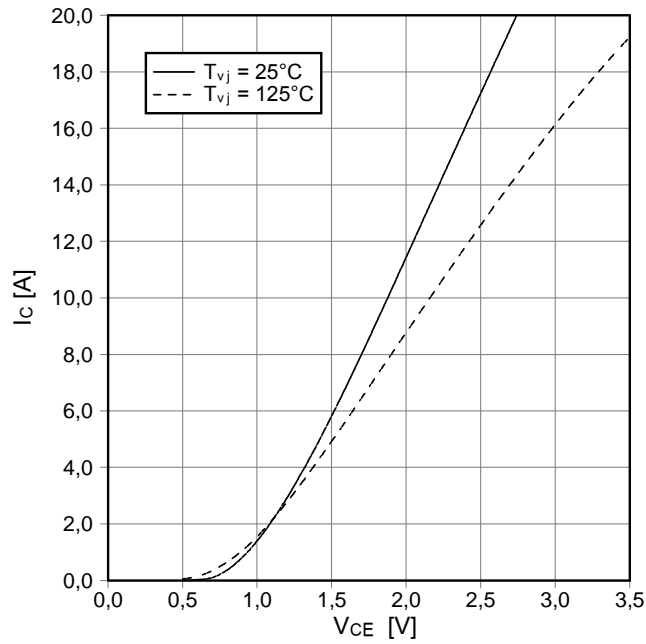


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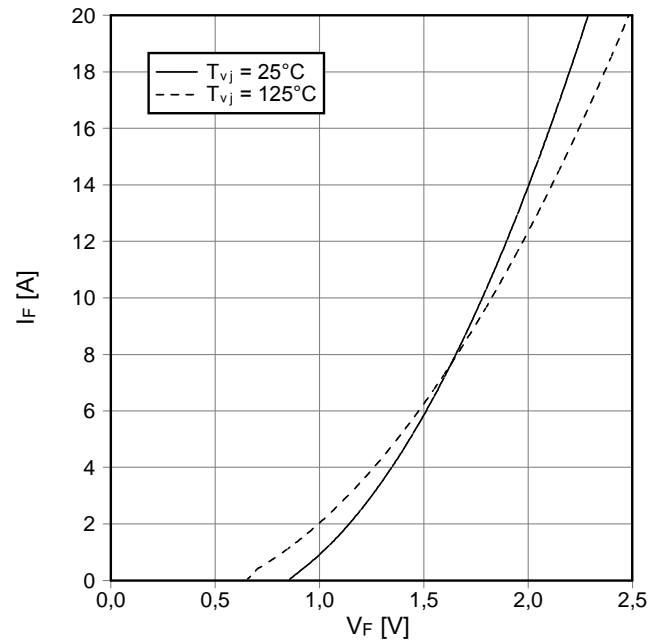


**Vorläufige Daten**  
**preliminary data**

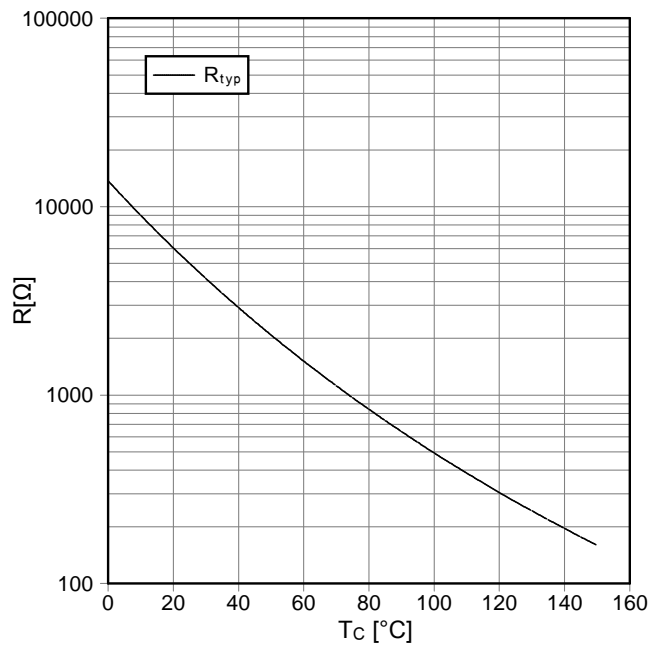
**Ausgangskennlinie IGBT-Brems-Chopper (typisch)**  
**output characteristic IGBT-brake-chopper (typical)**  
 $I_C = f(V_{CE})$   
 $V_{GE} = 15\text{ V}$



**Durchlaßkennlinie der Diode-Brems-Chopper (typisch)**  
**forward characteristic of diode-brake-chopper (typical)**  
 $I_F = f(V_F)$



**NTC-Temperaturkennlinie (typisch)**  
**NTC-temperature characteristic (typical)**  
 $R = f(T)$



prepared by: Andreas Schulz	date of publication: 2003-12-2
approved by: Robert Severin	revision: 2.1



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