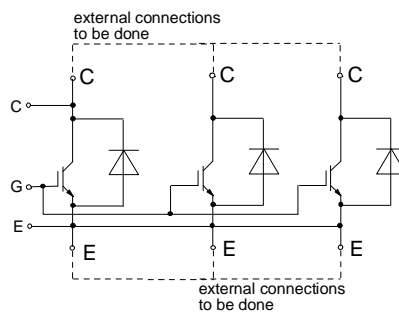
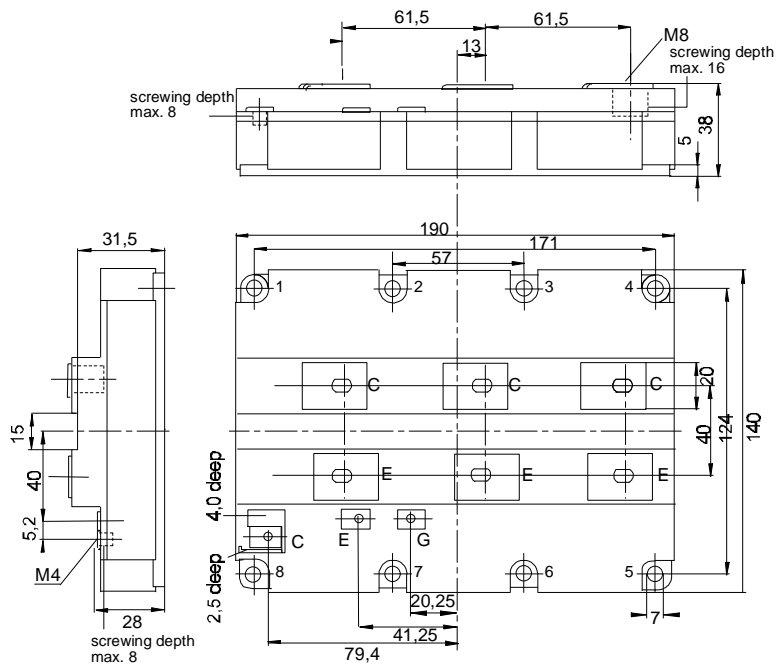




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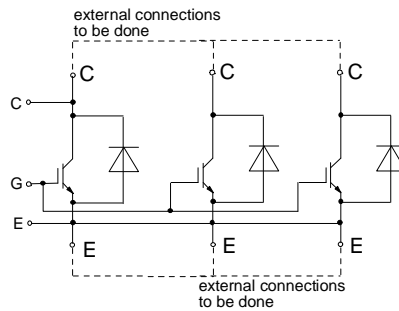
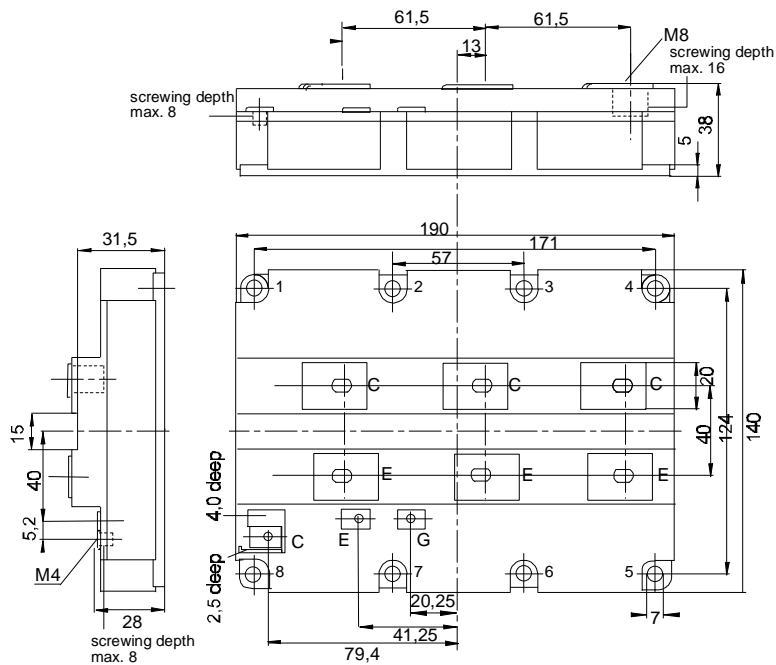




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vorläufige Daten
preliminary data

Höchstzulässige Werte / Maximum rated values Elektrische Eigenschaften / Electrical properties

Kollektor-Emitter-Sperrspannung	collector-emitter voltage	$T_C = 80^\circ\text{C}$	V_{CES}	1700 V
Kollektor-Dauergleichstrom	DC-collector current	$T_C = 25^\circ\text{C}$	$I_{C,nom.}$	1800 A
Periodischer Kollektor Spitzenstrom	repetitive peak collector current	$t_p = 1 \text{ ms}, T_C = 80^\circ\text{C}$	I_C	3600 A
Gesamt-Verlustleistung	total power dissipation	$T_C = 25^\circ\text{C}, \text{ Transistor}$	I_{CRM}	3600 A
Gate-Emitter-Spitzenspannung	gate-emitter peak voltage		P_{tot}	13,9 kW
Dauergleichstrom	DC forward current		V_{GES}	$\pm 20 \text{ V}$
Periodischer Spitzenstrom	repetitive peak forw. current	$t_p = 1 \text{ ms}$	I_F	1800 A
Grenzlastintegral der Diode	I^2t - value, Diode	$V_R = 0\text{V}, t_p = 10\text{ms}, T_{vj} = 125^\circ\text{C}$	I_{FRM}	3600 A
Isolations-Prüfspannung	insulation test voltage	RMS, $f = 50 \text{ Hz}, t = 1 \text{ min.}$	I^2t	980 kA^2s
			V_{ISOL}	4 kV

Charakteristische Werte / Characteristic values: Transistor

			min.	typ.	max.
Kollektor-Emitter Sättigungsspannung	collector-emitter saturation voltage	$I_C = 1800\text{A}, V_{GE} = 15\text{V}, T_{vj} = 25^\circ\text{C}$ $I_C = 1800\text{A}, V_{GE} = 15\text{V}, T_{vj} = 125^\circ\text{C}$	$V_{CE\text{ sat}}$	- 2,7	3,3 V
Gate-Schwellenspannung	gate threshold voltage	$I_C = 120\text{mA}, V_{CE} = V_{GE}, T_{vj} = 25^\circ\text{C}$	$V_{GE(th)}$	4,5	5,5 6,5 V
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}	- 118	- nF
Kollektor-Emitter Reststrom	collector-emitter cut-off current	$V_{CE} = 1700\text{V}, V_{GE} = 0\text{V}, T_{vj} = 25^\circ\text{C}$ $V_{CE} = 1700\text{V}, V_{GE} = 0\text{V}, T_{vj} = 125^\circ\text{C}$	I_{CES}	- 0,4	4 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 (induktive Last)	turn-on delay time (inductive load)	$I_C = 1800\text{A}, V_{CE} = 900\text{V}$ $V_{GE} = \pm 15\text{V}, R_G = 0,8\Omega, T_{vj} = 25^\circ\text{C}$ $V_{GE} = \pm 15\text{V}, R_G = 0,8\Omega, T_{vj} = 125^\circ\text{C}$	$t_{d,on}$	- 0,36	- μs
Anstiegszeit (induktive Last)	rise time (inductive load)	$I_C = 1800\text{A}, V_{CE} = 900\text{V}$ $V_{GE} = \pm 15\text{V}, R_G = 0,8\Omega, T_{vj} = 25^\circ\text{C}$ $V_{GE} = \pm 15\text{V}, R_G = 0,8\Omega, T_{vj} = 125^\circ\text{C}$	t_r	- 0,37	- μs
Abschaltverzögerungszeit (ind. Last)	turn off delay time (inductive load)	$I_C = 1800\text{A}, V_{CE} = 900\text{V}$ $V_{GE} = \pm 15\text{V}, R_G = 0,8\Omega, T_{vj} = 25^\circ\text{C}$ $V_{GE} = \pm 15\text{V}, R_G = 0,8\Omega, T_{vj} = 125^\circ\text{C}$	$t_{d,off}$	- 0,95	- μs
Fallzeit (induktive Last)	fall time (inductive load)	$I_C = 1800\text{A}, V_{CE} = 900\text{V}$ $V_{GE} = \pm 15\text{V}, R_G = 0,8\Omega, T_{vj} = 25^\circ\text{C}$ $V_{GE} = \pm 15\text{V}, R_G = 0,8\Omega, T_{vj} = 125^\circ\text{C}$	t_f	- 1,05	- μs
Einschaltverlustenergie pro Puls	turn-on energy loss per pulse	$I_C = 1800\text{A}, V_{CE} = 900\text{V}, V_{GE} = 15\text{V}$ $R_G = 0,8\Omega, T_{vj} = 125^\circ\text{C}, L_S = 60\text{nH}$	E_{on}	- 500	- mWs
Abschaltverlustenergie pro Puls	turn-off energy loss per pulse	$I_C = 1800\text{A}, V_{CE} = 900\text{V}, V_{GE} = 15\text{V}$ $R_G = 0,8\Omega, T_{vj} = 125^\circ\text{C}, L_S = 60\text{nH}$	E_{off}	- 720	- mWs
Kurzschlußverhalten	SC Data	$t_p \leq 10\mu\text{sec}, V_{GE} \leq 15\text{V}, R_G = 0,8\Omega$ $T_{vj} \leq 125^\circ\text{C}, V_{CC} = 1000\text{V}$ $V_{CEmax} = V_{CES} - L_{sCE} \times di/dt$	I_{SC}	- 7200	- A
Modulinduktivität	stray inductance module		L_{sCE}	- 12	- nH

Charakteristische Werte / Characteristic values: Diode

Durchlaßspannung	forward voltage	$I_F = 1800\text{A}, V_{GE} = 0\text{V}, T_{vj} = 25^\circ\text{C}$ $I_F = 1800\text{A}, V_{GE} = 0\text{V}, T_{vj} = 125^\circ\text{C}$	V_F	- 2,2	2,6 V
Rückstromspitze	peak reverse recovery current	$I_F = 1800\text{A}, -di_F/dt = 10000\text{A}/\mu\text{sec}$ $V_R = 900\text{V}, V_{GE} = -10\text{V}, T_{vj} = 25^\circ\text{C}$ $V_R = 900\text{V}, V_{GE} = -10\text{V}, T_{vj} = 125^\circ\text{C}$	I_{RM}	- 1050	- A
Sperrverzögerungsladung	recovered charge	$I_F = 1800\text{A}, -di_F/dt = 10000\text{A}/\mu\text{sec}$ $V_R = 900\text{V}, V_{GE} = -10\text{V}, T_{vj} = 25^\circ\text{C}$ $V_R = 900\text{V}, V_{GE} = -10\text{V}, T_{vj} = 125^\circ\text{C}$	Q_r	- 240	- μAs
Abschaltenergie pro Puls	reverse recovery energy	$I_F = 1800\text{A}, -di_F/dt = 10000\text{A}/\mu\text{sec}$ $V_R = 900\text{V}, V_{GE} = -10\text{V}, T_{vj} = 25^\circ\text{C}$ $V_R = 900\text{V}, V_{GE} = -10\text{V}, T_{vj} = 125^\circ\text{C}$	E_{rec}	- 520	- μAs
				- 135	- mWs
				- 270	- mWs

Thermische Eigenschaften / Thermal properties

Innerer Wärmewiderstand	thermal resistance, junction to case	Transistor / transistor, DC	R_{thJC}	- -	0,009 K/W
Übergangs-Wärmewiderstand	thermal resistance, case to heatsink	Diode / diode, DC pro Module / per Module	R_{thCK}	- -	0,017 K/W
Höchstzul. Sperrschichttemperatur	max. junction temperature	$d_{paste} \leq 100\mu\text{m} / d_{grease} \leq 100\mu\text{m}$	T_{vj}	- -	150 $^\circ\text{C}$
Betriebstemperatur	operating temperature		T_{op}	-40	125 $^\circ\text{C}$
Lagertemperatur	storage temperature		T_{stg}	-40	125 $^\circ\text{C}$

Mechanische Eigenschaften / Mechanical properties

Innere Isolation	internal insulation				AIN
Kriechstrecke	creepage distance				32 mm
Luftstrecke	clearance				20 mm
CTI	comperative tracking index				275
Anzugsdrehmoment f. mech. Befestigung	mounting torque		M1		5 Nm
Anzugsdrehmoment f. elektr. Anschlüsse	terminal connection torque	terminals M4	M2		2 Nm
		terminals M8			8...10 Nm
Gewicht	weight		G		2250 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 promises no characteristics. It is valid in combination with the belonging technical notes.

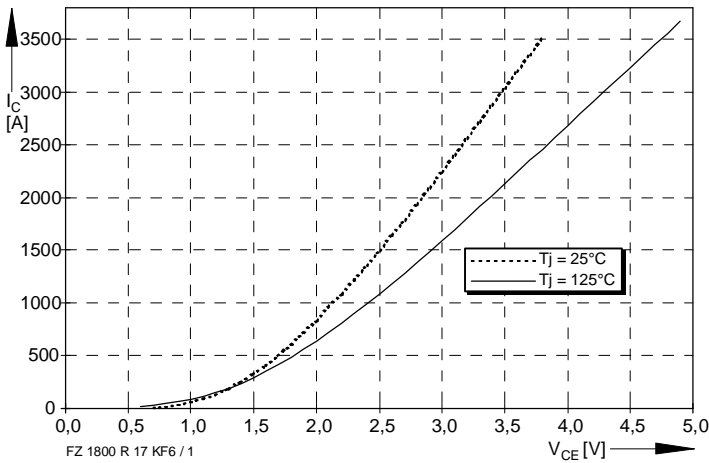


Bild / Fig. 1
Ausgangskennlinie (typisch) /
Output characteristic (typical)
 $I_C = f(V_{CE})$
 $V_{GE} = 15V$

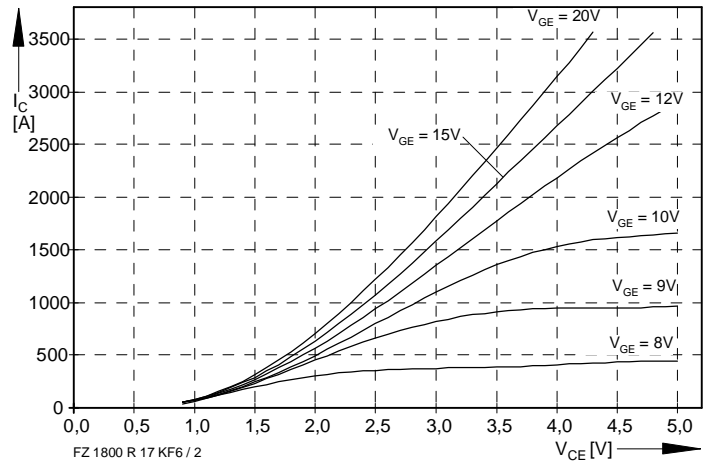


Bild / Fig. 2
Ausgangskennlinienfeld (typisch) /
Output characteristic (typical)
 $I_C = f(V_{CE})$
 $T_{vj} = 125^\circ C$

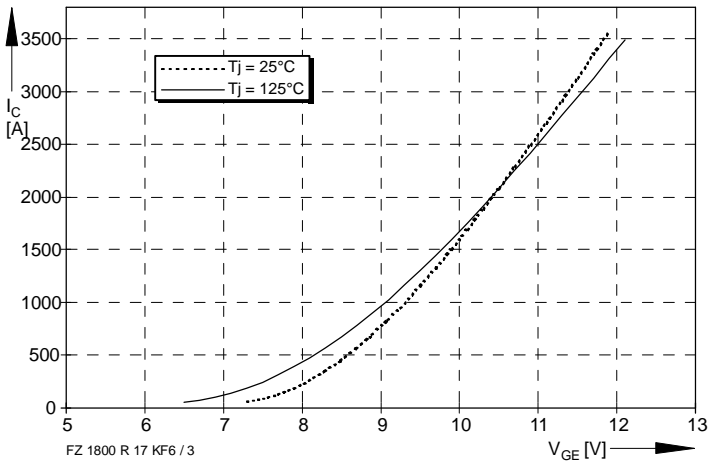


Bild / Fig. 3
Übertragungscharakteristic (typisch) /
Transfer characteristic (typical)
 $I_C = f(V_{GE})$
 $V_{CE} = 20V$

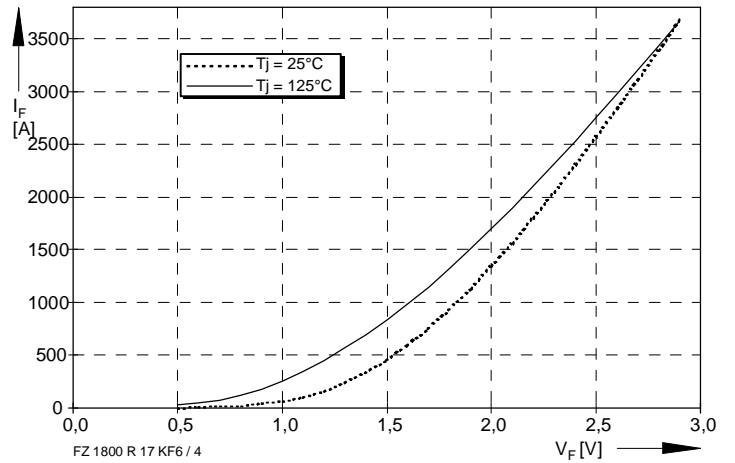


Bild / Fig. 4
Durchlaßkennlinie der Inversdiode (typisch) /
Forward characteristic of inverse diode (typical)
 $I_F = f(V_F)$

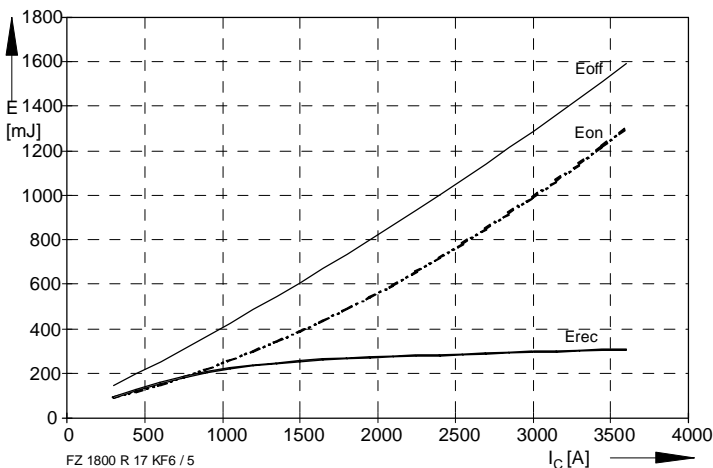


Bild / Fig. 5
Schaltverluste (typisch) /
Switching losses (typical)
 $E_{on} = f(I_C)$, $E_{off} = f(I_C)$, $E_{rec} = f(I_C)$
 $R_{gon} = R_{goff} = 0,8\Omega$, $V_{CE} = 900V$, $T_j = 125^\circ C$

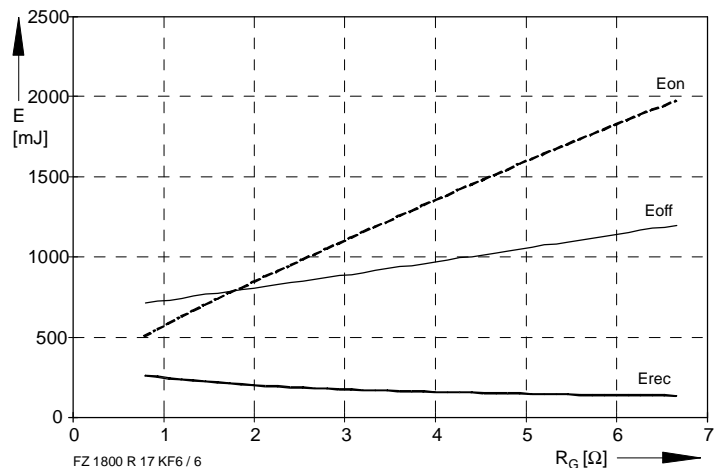
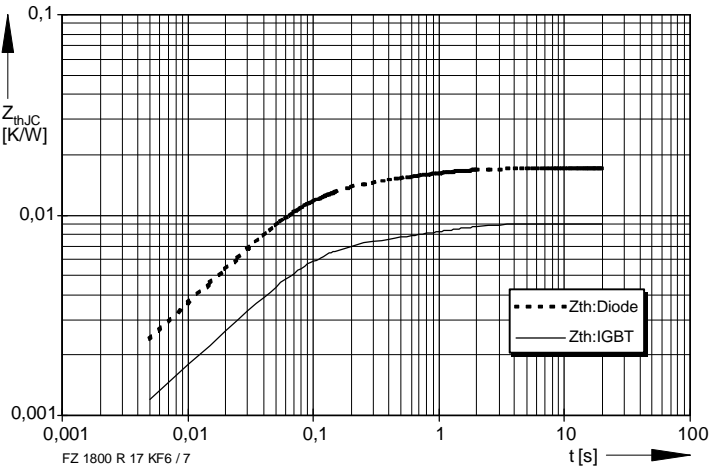


Bild / Fig. 6
Schaltverluste (typisch) /
Switching losses (typical)
 $E_{on} = f(R_G)$, $E_{off} = f(R_G)$, $E_{rec} = f(R_G)$
 $I_C = 1800A$, $V_{CE} = 900V$, $T_j = 125^\circ C$

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i	1	2	3	4
r_f [K/kW] : IGBT	0,865	4,26	1,8	2,08
τ_f [sec] : IGBT	0,003	0,05	0,1	0,95
r_f [K/kW] : Diode	1,67	9,11	3,11	3,11
τ_f [sec] : Diode	0,003	0,045	0,45	0,75

Bild / Fig. 7
 Transienter Wärmewiderstand /
 Transient thermal impedance
 $Z_{thJC} = f(t)$

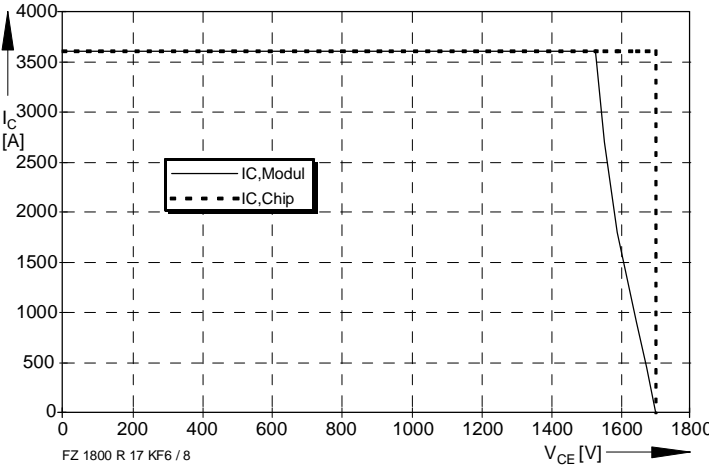


Bild / Fig. 8
 Sicherer Arbeitsbereich (RBSOA) /
 Reverse bias safe operation area (RBSOA)
 $R_g = 0,8\Omega, T_{vj} = 125^\circ C$