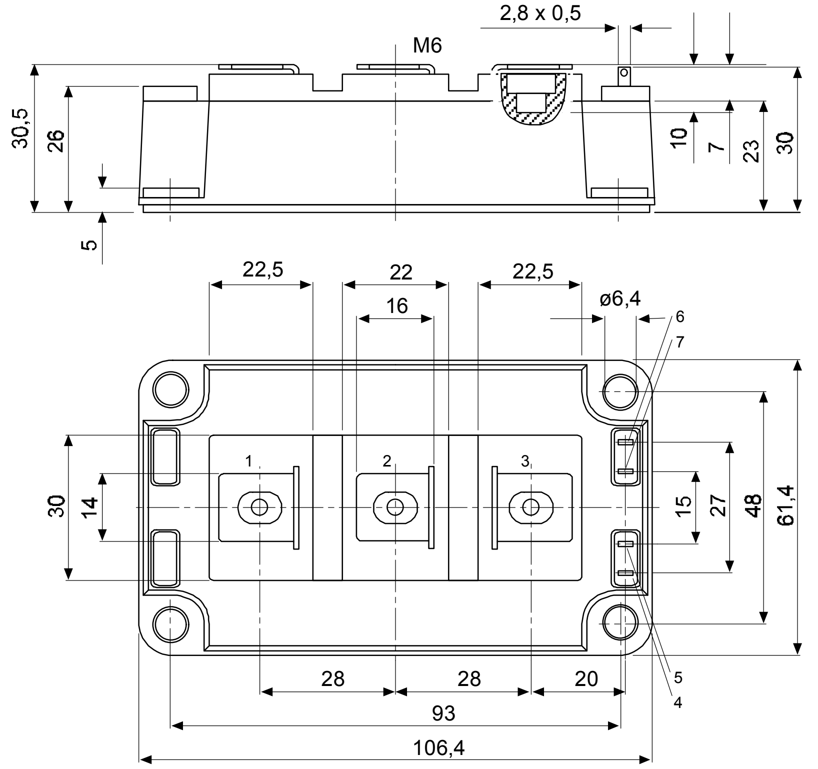
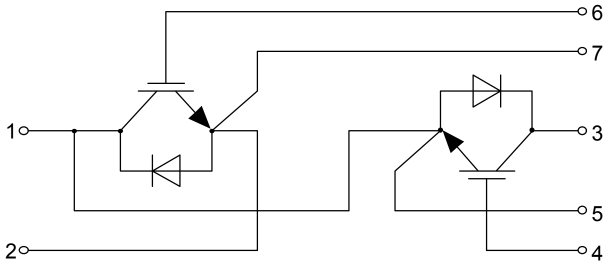
European Power-
Semiconductor and
Electronics Company

Marketing Information
BSM 100 GB 170 DL





23.04.1998

BSM 100 GB 170 DL

vorläufige Daten
preliminary data

Höchstzulässige Werte / Maximum rated values

Elektrische Eigenschaften / Electrical properties

Kollektor-Emitter-Sperrspannung	collector-emitter voltage		V_{CES}	1700	V
Kollektor-Dauergleichstrom	DC-collector current	T_C = 80°C	$I_{C,nom.}$	100	A
		T_C = 25°C	I_C	200	A
Periodischer Kollektor Spitzenstrom	repetitive peak collector current	t_p = 1 ms, T_C = 80°C	I_{CRM}	200	A
Gesamt-Verlustleistung	total power dissipation	T_C = 25°C, Transistor	P_{tot}	960	W
Gate-Emitter-Spitzenspannung	gate-emitter peak voltage		V_{GES}	± 20	V
Dauergleichstrom	DC forward current		I_F	100	A
Periodischer Spitzenstrom	repetitive peak forw. current	t_p = 1 ms	I_{FRM}	200	A
Grenzlastintegral der Diode	I^2t - value, Diode	V_R = 0V, t_p = 10ms, T_{vj} = 125°C	I^2t	4500	A^2s
Isolations-Prüfspannung	insulation test voltage	RMS, f = 50 Hz, t = 1 min.	V_{ISOL}	3,4	kV

Charakteristische Werte / Characteristic values: Transistor

				min.	typ.	max.	
Kollektor-Emitter Sättigungsspannung	collector-emitter saturation voltage	I_C = 100A, V_{GE} = 15V, T_{vj} = 25°C	$v_{CE\,sat}$	-	2,7	3,3	V
		I_C = 100A, V_{GE} = 15V, T_{vj} = 125°C		-	3,2	-	V
Gate-Schwellenspannung	gate threshold voltage	I_C = 5mA, V_{CE} = V_{GE}, T_{vj} = 25°C	$v_{GE(th)}$	4,5	5,5	6,5	V
Eingangskapazität	input capacitance	f = 1MHz,T_{vj} = 25°C,V_{CE} = 25V, V_{GE} = 0V	C_{ies}	-	7	-	nF
Kollektor-Emitter Reststrom	collector-emitter cut-off current	V_{CE} = 1700V, V_{GE} = 0V, T_{vj} = 25°C	I_{CES}	-	0,05	0,2	mA
		V_{CE} = 1700V, V_{GE} = 0V, T_{vj} = 125°C		-	3	-	mA
Gate-Emitter Reststrom	gate-emitter leakage current	V_{CE} = 0V, V_{GE} = 20V, T_{vj} = 25°C	I_{GES}	-	-	200	nA
Einschaltverzögerungszeit (induktive Last)	turn-on delay time (inductive load)	I_C = 100A, V_{CE} = 900V	$t_{d,on}$				
		V_{GE} = ±15V, R_G = 15Ω, T_{vj} = 25°C		-	0,1	-	µs
		V_{GE} = ±15V, R_G = 15Ω, T_{vj} = 125°C		-	0,1	-	µs
Anstiegszeit (induktive Last)	rise time (inductive load)	I_C = 100A, V_{CE} = 900V	t_r				
		V_{GE} = ±15V, R_G = 15Ω, T_{vj} = 25°C		-	0,1	-	µs
		V_{GE} = ±15V, R_G = 15Ω, T_{vj} = 125°C		-	0,1	-	µs
Abschaltverzögerungszeit (ind. Last)	turn off delay time (inductive load)	I_C = 100A, V_{CE} = 900V	$t_{d,off}$				
		V_{GE} = ±15V, R_G = 15Ω, T_{vj} = 25°C		-	0,8	-	µs
		V_{GE} = ±15V, R_G = 15Ω, T_{vj} = 125°C		-	0,9	-	µs
Fallzeit (induktive Last)	fall time (inductive load)	I_C = 100A, V_{CE} = 900V	t_f				
		V_{GE} = ±15V, R_G = 15Ω, T_{vj} = 25°C		-	0,03	-	µs
		V_{GE} = ±15V, R_G = 15Ω, T_{vj} = 125°C		-	0,03	-	µs
Einschaltverlustenergie pro Puls	turn-on energy loss per pulse	I_C = 100A, V_{CE} = 900V, V_{GE} = 15V	E_{on}				
		R_G = 15Ω, T_{vj} = 125°C, L_S = 60nH		-	50	-	mWs
Abschaltverlustenergie pro Puls	turn-off energy loss per pulse	I_C = 100A, V_{CE} = 900V, V_{GE} = 15V	E_{off}				
		R_G = 15Ω, T_{vj} = 125°C, L_S = 60nH		-	30	-	mWs
Kurzschlußverhalten	SC Data	$t_P \leq$ 10µsec, $V_{GE} \leq$ 15V, R_G = 15Ω	I_{SC}				
		$T_{Vj} \leq$125°C, V_{CC}=1000V		-	400	-	A
		V_{CEmax}=V_{CES} -L_{sCE} x dI/dt					
Modulinduktivität	stray inductance module		L_{sCE}	-	30	-	nH

Charakteristische Werte / Characteristic values: Diode

Durchlaßspannung	forward voltage	I_F = 100A, V_{GE} = 0V, T_{vj} = 25°C	V_F	-	2,2	2,6	V
		I_F = 100A, V_{GE} = 0V, T_{vj} = 125°C		-	2	-	V
Rückstromspitze	peak reverse recovery current	I_F = 100A, - di_F/dt = 1500A/µsec	I_{RM}				
		V_R = 900V, V_{GE} = -10V, T_{vj} = 25°C		-	65	-	A
		V_R = 900V, V_{GE} = -10V, T_{vj} = 125°C		-	95	-	A
Sperrverzögerungsladung	recovered charge	I_F = 100A, - di_F/dt = 1500A/µsec	Q_r				
		V_R = 900V, V_{GE} = -10V, T_{vj} = 25°C		-	11	-	µAs
		V_R = 900V, V_{GE} = -10V, T_{vj} = 125°C		-	24	-	µAs
Abschaltenergie pro Puls	reverse recovery energy	I_F = 100A, - di_F/dt = 1500A/µsec	E_{rec}				
		V_R = 900V, V_{GE} = -10V, T_{vj} = 25°C		-	4,5	-	mWs
		V_R = 900V, V_{GE} = -10V, T_{vj} = 125°C		-	8,5	-	mWs

Thermische Eigenschaften / Thermal properties

Innerer Wärmewiderstand	thermal resistance, junction to case	Transistor / transistor, DC	R_{thJC}	-	-	0,13	K/W
		Diode / diode, DC		-	-	0,28	K/W
Übergangs-Wärmewiderstand	thermal resistance, case to heatsink	pro Module / per Module	R_{thCK}				
		$d_{Paste} \leq$ 50µm / $d_{grease} \leq$ 50µm		-	-	0,012	K/W
Höchstzul. Sperrschichttemperatur	max. junction temperature		T_{vj}	-	-	150	°C
Betriebstemperatur	operating temperature		T_{op}	-40	-	125	°C
Lagertemperatur	storage temperature		T_{stg}	-40	-	125	°C

Mechanische Eigenschaften / Mechanical properties

Innere Isolation	internal insulation			Al_2O_3	
Kriechstrecke	creepage distance			20	mm
Luftstrecke	clearance			11	mm
CTI	comperative tracking index				
Anzugsdrehmoment f. mech. Befestigung	mounting torque		max.	5	Nm
Anzugsdrehmoment f. elektr. Anschlüsse	terminal connection torque	terminals M6	max.	5	Nm
Gewicht	weight		G	420	g

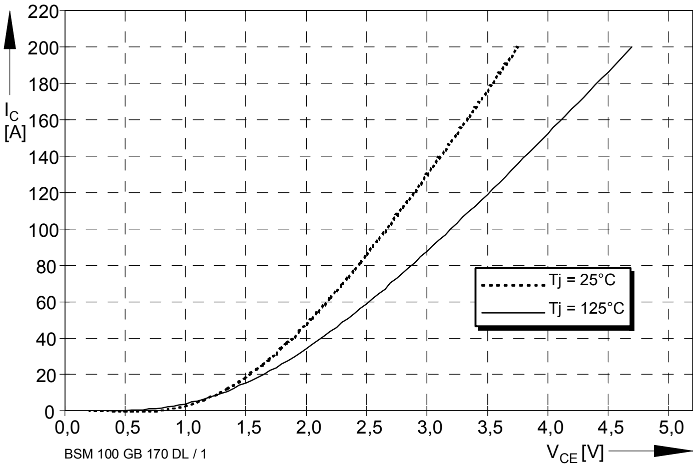


Bild / Fig. 1
Ausgangskennlinie (typisch) /
Output characteristic (typical)
$I_C = f(V_{CE})$
$V_{GE} = 15V$

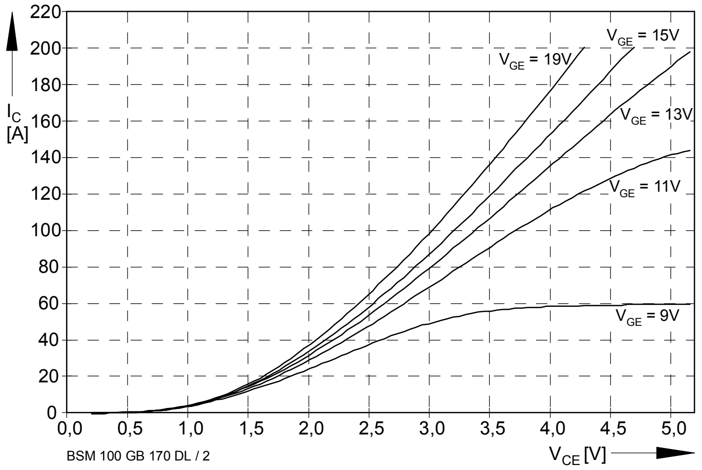


Bild / Fig. 2
Ausgangskennlinienfeld (typisch) /
Output characteristic (typical)
$I_C = f(V_{CE})$
$T_{vj} = 125°C$

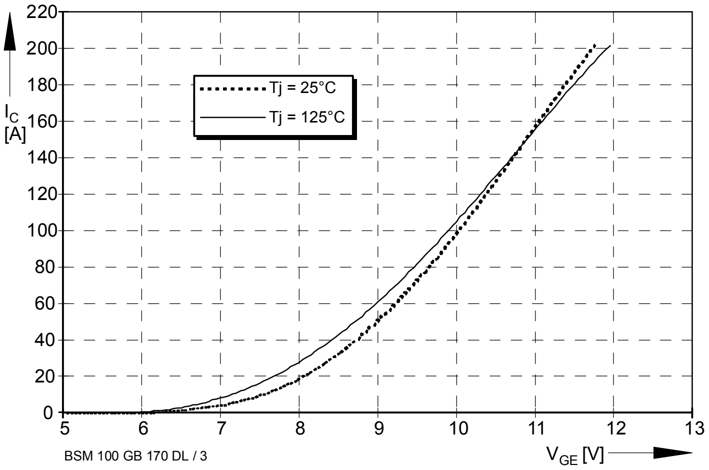


Bild / Fig. 3
Übertragungscharakteristic (typisch) /
Transfer characteristic (typical)
$I_C = f(V_{GE})$
$V_{CE} = 20V$

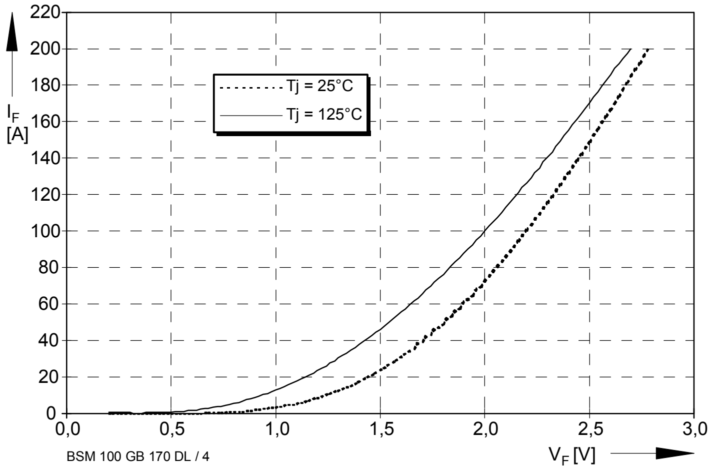


Bild / Fig. 4
Durchlaßkennlinie der Inversdiode (typisch) /
Forward characteristic of inverse diode (typical)
$I_F = f(V_F)$

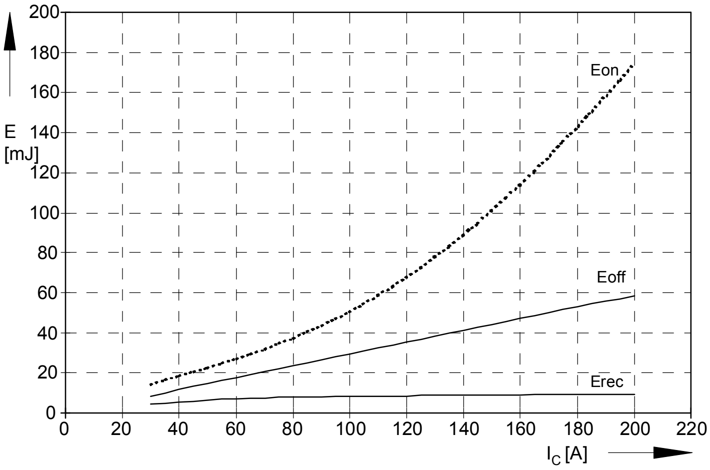


Bild / Fig. 5
Schaltverluste (typisch) /
Switching losses (typical)
$E_{on} = f(I_C)$, $E_{off} = f(I_C)$, $E_{rec} = f(I_C)$
$R_{gon} = R_{goff} = 15\Omega$, $V_{CE} = 900V$, $T_j = 125°C$

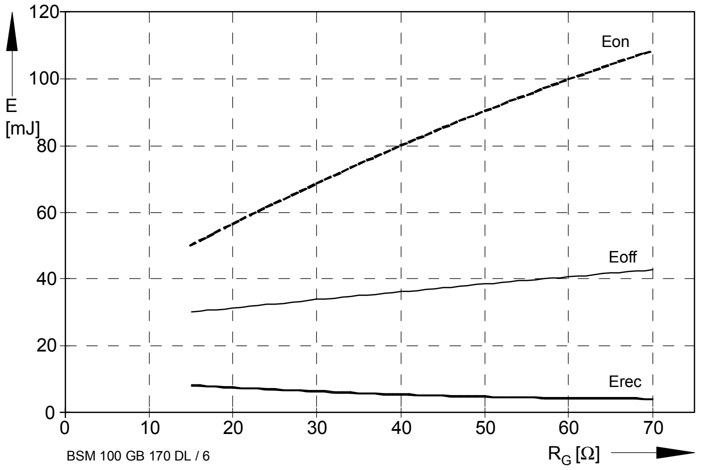


Bild / Fig. 6
Schaltverluste (typisch) /
Switching losses (typical)
$E_{on} = f(R_G)$, $E_{off} = f(R_G)$, $E_{rec} = f(R_G)$
$I_C = 100A$, $V_{CE} = 900V$, $T_j = 125°C$

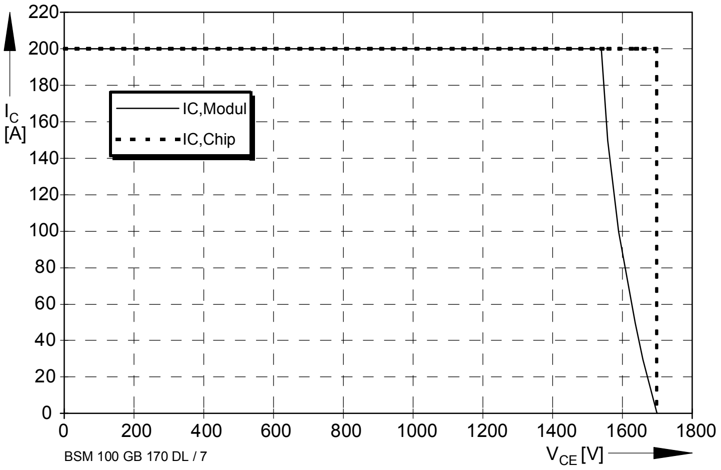


Bild / Fig. 7
Sicherer Arbeitsbereich (RBSOA) /
Reverse bias safe operation area (RBSOA)
$R_g = 15\Omega$, $T_{vj} = 125°C$