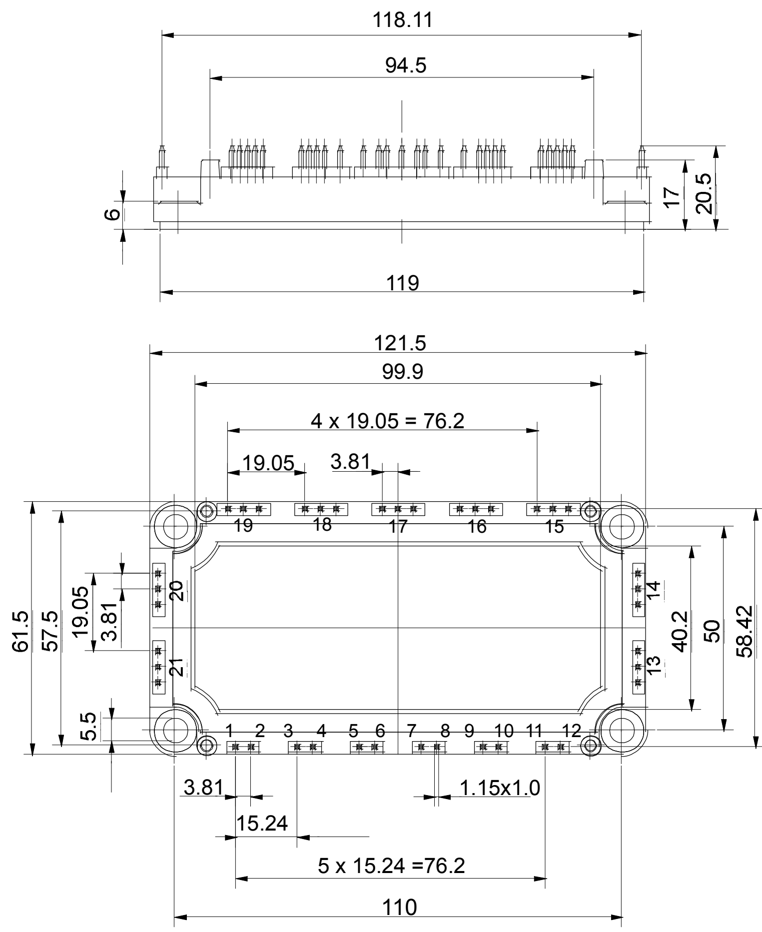
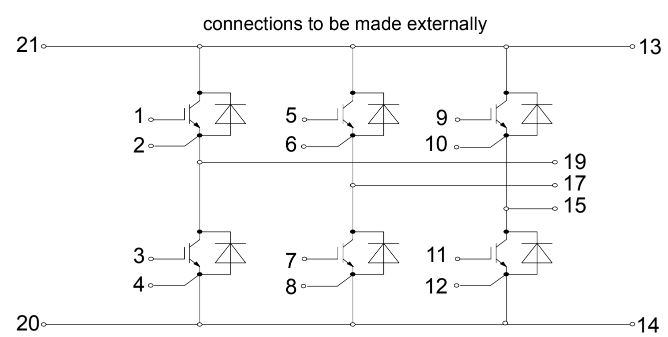
European Power-
Semiconductor and
Electronics Company

Marketing Information
BSM 75 GD 170 DL





01.07.1998

BSM 75 GD 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	$I_{C,nom.}$	75	A
		T_C = 25°C	I_C	150	A
Periodischer Kollektor Spitzenstrom	repetitive peak collector current	t_p = 1 ms, T_C = 80°C	I_{CRM}	150	A
Gesamt-Verlustleistung	total power dissipation	T_C = 25°C, Transistor	P_{tot}	625	W
Gate-Emitter-Spitzenspannung	gate-emitter peak voltage		V_{GES}	± 20	V
Dauergleichstrom	DC forward current		I_F	75	A
Periodischer Spitzenstrom	repetitive peak forw. current	t_p = 1 ms	I_{FRM}	150	A
Grenzlastintegral der Diode	I^2t - value, Diode	V_R = 0V, t_p = 10ms, T_{Vj} = 125°C	I^2t	1800	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 = 75A, V_{GE} = 15V, T_{vj} = 25°C	$v_{CE\ sat}$	-	2,7	3,3	V
		I_C = 75A, V_{GE} = 15V, T_{vj} = 125°C		-	3,2	-	V
Gate-Schwellenspannung	gate threshold voltage	I_C = 3,5mA, 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}	-	5	-	nF
Kollektor-Emitter Reststrom	collector-emitter cut-off current	V_{CE} = 1700V, V_{GE} = 0V, T_{vj} = 25°C	I_{CES}	-	0,03	0,15	mA
		V_{CE} = 1700V, V_{GE} = 0V, T_{vj} = 125°C		-	2	-	mA
Gate-Emitter Reststrom	gate-emitter leakage current	V_{CE} = 0V, V_{GE} = 20V, T_{vj} = 25°C	I_{GES}	-	-	100	nA
Einschaltverzögerungszeit (induktive Last)	turn-on delay time (inductive load)	I_C = 75A, V_{CE} = 900V	$t_{d,on}$				
		V_{GE} = ±15V, R_G = 20Ω, T_{vj} = 25°C		-	0,1	-	µs
		V_{GE} = ±15V, R_G = 20Ω, T_{vj} = 125°C		-	0,1	-	µs
Anstiegszeit (induktive Last)	rise time (inductive load)	I_C = 75A, V_{CE} = 900V	t_r				
		V_{GE} = ±15V, R_G = 20Ω, T_{vj} = 25°C		-	0,1	-	µs
		V_{GE} = ±15V, R_G = 20Ω, T_{vj} = 125°C		-	0,1	-	µs
Abschaltverzögerungszeit (ind. Last)	turn off delay time (inductive load)	I_C = 75A, V_{CE} = 900V	$t_{d,off}$				
		V_{GE} = ±15V, R_G = 20Ω, T_{vj} = 25°C		-	0,8	-	µs
		V_{GE} = ±15V, R_G = 20Ω, T_{vj} = 125°C		-	0,9	-	µs
Fallzeit (induktive Last)	fall time (inductive load)	I_C = 75A, V_{CE} = 900V	t_f				
		V_{GE} = ±15V, R_G = 20Ω, T_{vj} = 25°C		-	0,03	-	µs
		V_{GE} = ±15V, R_G = 20Ω, T_{vj} = 125°C		-	0,03	-	µs
Einschaltverlustenergie pro Puls	turn-on energy loss per pulse	I_C = 75A, V_{CE} = 900V, V_{GE} = 15V	E_{on}				
		R_G = 20Ω, T_{vj} = 125°C, L_S = 60nH		-	37	-	mWs
Abschaltverlustenergie pro Puls	turn-off energy loss per pulse	I_C = 75A, V_{CE} = 900V, V_{GE} = 15V	E_{off}				
		R_G = 20Ω, T_{vj} = 125°C, L_S = 60nH		-	22	-	mWs
Kurzschlußverhalten	SC Data	t_P ≤ 10µsec, V_{GE} ≤ 15V, R_G = 20Ω	I_{SC}				
		T_{Vj}≤125°C, V_{CC}=1000V		-	300	-	A
		V_{CEmax}=V_{CES} -L_{sCE} x dI/dt					
Modulinduktivität	stray inductance module		L_{sCE}	-	25	-	nH

Charakteristische Werte / Characteristic values: Diode

				min.	typ.	max.	
Durchlaßspannung	forward voltage	I_F = 75A, V_{GE} = 0V, T_{vj} = 25°C	V_F	-	2,2	2,6	V
		I_F = 75A, V_{GE} = 0V, T_{vj} = 125°C		-	2	-	V
Rückstromspitze	peak reverse recovery current	I_F = 75A, - di_F/dt = 1100A/µsec	I_{RM}				
		V_R = 900V, V_{GE} = -10V, T_{vj} = 25°C		-	55	-	A
		V_R = 900V, V_{GE} = -10V, T_{vj} = 125°C		-	85	-	A
Sperrverzögerungsladung	recovered charge	I_F = 75A, - di_F/dt = 1100A/µsec	Q_r				
		V_R = 900V, V_{GE} = -10V, T_{vj} = 25°C		-	9	-	µAs
		V_R = 900V, V_{GE} = -10V, T_{vj} = 125°C		-	19	-	µAs
Abschaltenergie pro Puls	reverse recovery energy	I_F = 75A, - di_F/dt = 1100A/µsec	E_{rec}				
		V_R = 900V, V_{GE} = -10V, T_{vj} = 25°C		-	3,5	-	mWs
		V_R = 900V, V_{GE} = -10V, T_{vj} = 125°C		-	6,5	-	mWs

Thermische Eigenschaften / Thermal properties

				min.	typ.	max.	
Innerer Wärmewiderstand	thermal resistance, junction to case	Transistor / transistor, DC	R_{thJC}	-	-	0,2	K/W
		Diode / diode, DC		-	-	0,47	K/W
Übergangs-Wärmewiderstand	thermal resistance, case to heatsink	pro Module / per Module	R_{thCK}				
		d_{Paste} ≤ 50µm / d_{grease} ≤ 50µm		-	-	0,011	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		16	mm
Luftstrecke	clearance		11	mm
CTI	comperative tracking index		225	
Anzugsdrehmoment f. mech. Befestigung	mounting torque	max.	5	Nm
Gewicht	weight	G	300	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.

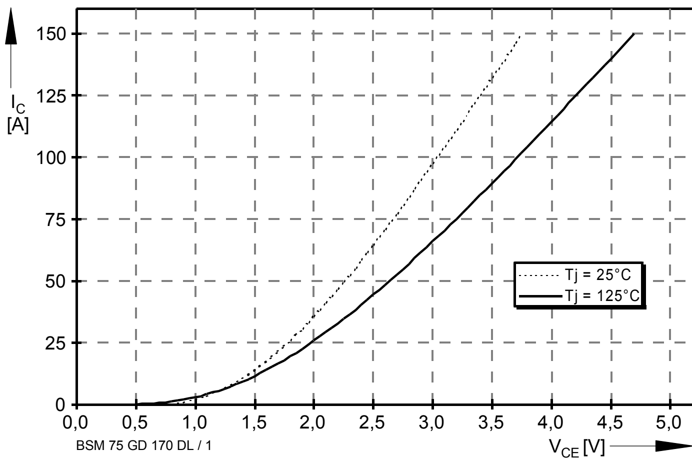


Bild / Fig. 1
Ausgangskennlinie (typisch) /
Output characteristic (typical)
$I_C = f(V_{CE})$
$V_{GE} = 15V$

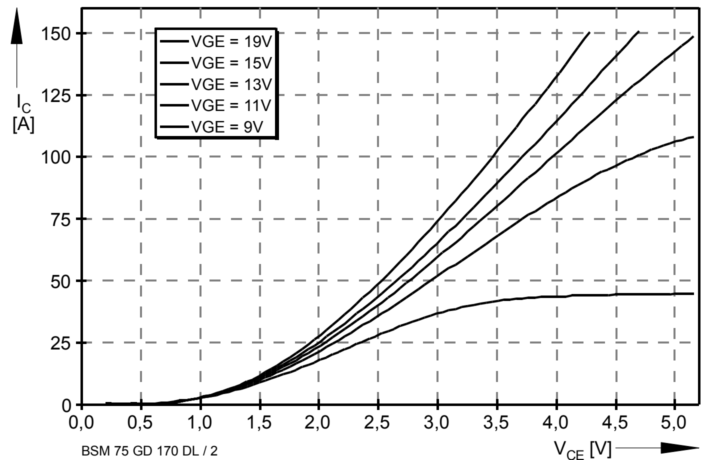


Bild / Fig. 2
Ausgangskennlinienfeld (typisch) /
Output characteristic (typical)
$I_C = f(V_{CE})$
$T_{vj} = 125°C$

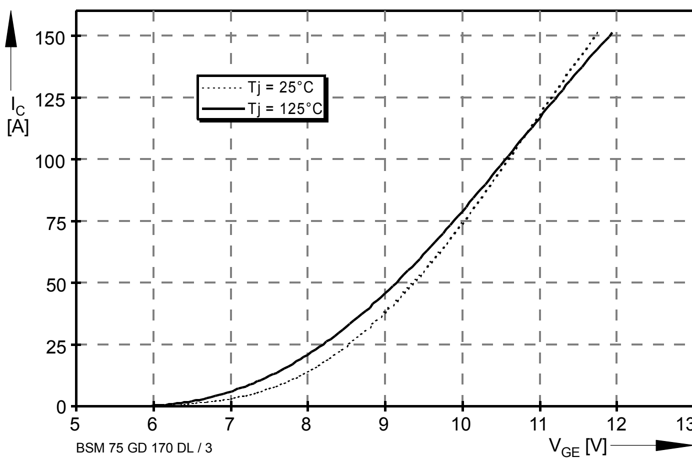


Bild / Fig. 3
Übertragungscharakteristic (typisch) /
Transfer characteristic (typical)
$I_C = f(V_{GE})$
$V_{CE} = 20V$

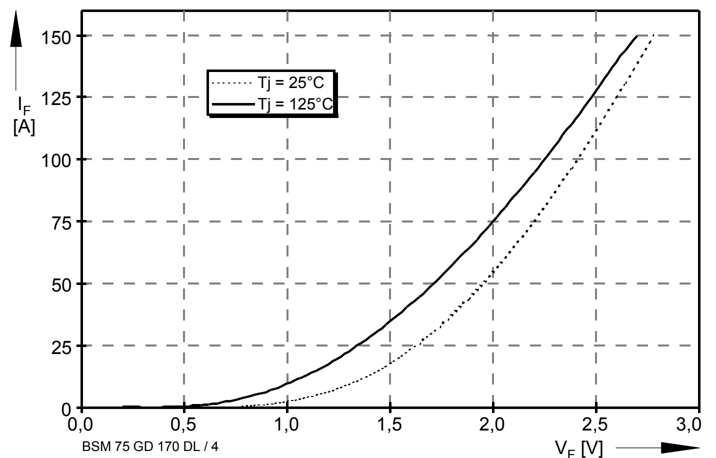


Bild / Fig. 4
Durchlaßkennlinie der Inversdiode (typisch) /
Forward characteristic of inverse diode (typical)
$I_F = f(V_F)$

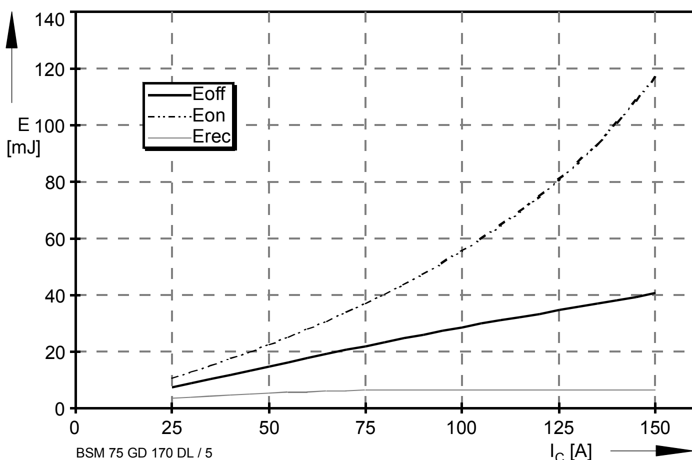


Bild / Fig. 5
Schaltverluste (typisch) /
Switching losses (typical)
$E_{on} = f(I_C)$, $E_{off} = f(I_C)$, $E_{rec} = f(I_C)$
$R_{gon} = R_{goff} = 20\Omega$, $V_{CE} = 900V$, $T_j = 125°C$

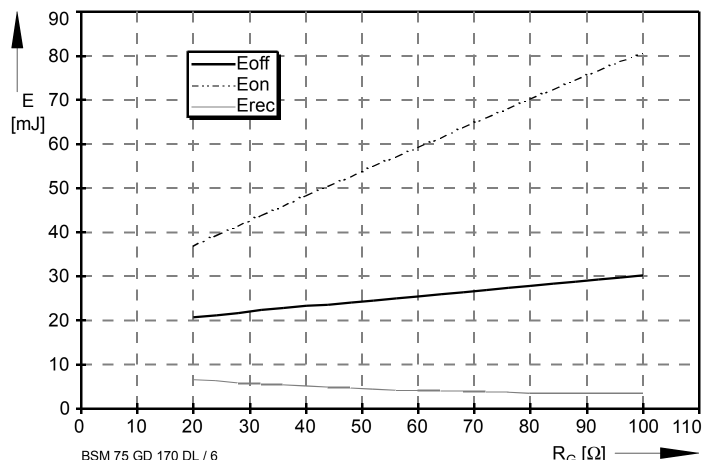


Bild / Fig. 6
Schaltverluste (typisch) /
Switching losses (typical)
$E_{on} = f(R_G)$, $E_{off} = f(R_G)$, $E_{rec} = f(R_G)$
$I_C = 75A$, $V_{CE} = 900V$, $T_j = 125°C$

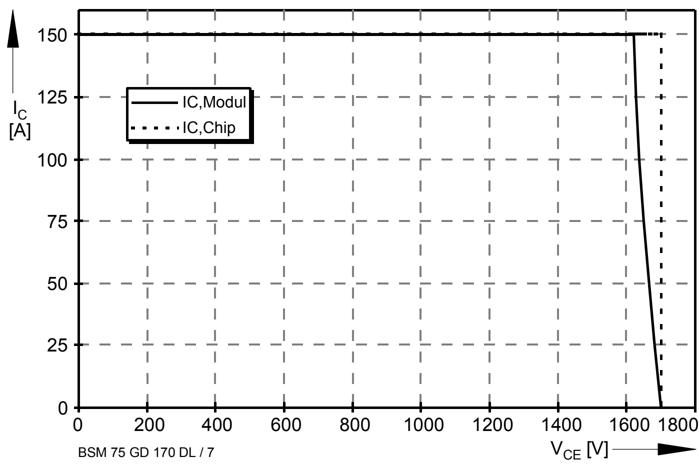


Bild / Fig. 7
Sicherer Arbeitsbereich (RBSOA) /
Reverse bias safe operation area (RBSOA)
R_g = 20Ω, T_{vj} = 125°C