

The technical drawing consists of three parts: a top elevation view, a front elevation view, and a wiring diagram.

Top Elevation View: Shows the module's footprint with overall dimensions of 118.11 mm by 119 mm. The central area contains 12 channels, each 19.05 mm wide, with a total width of 94.5 mm. The module has a 6 mm thick base and a 17 mm high top section.

Front Elevation View: Shows the module's height of 58.42 mm. The top section is 121.5 mm wide, and the bottom section is 110 mm wide. The module has a 5.5 mm thick base and a 19.05 mm high top section. The central area contains 12 channels, each 19.05 mm wide, with a total width of 99.9 mm. The module has a 3.81 mm wide base and a 15.24 mm wide top section. The module has a 1.15x1.0 mm wide base and a 1.15x1.0 mm wide top section.

Wiring Diagram: Shows the internal wiring of the 12 channels. The channels are numbered 1 through 12. The diagram shows the connections between the channels and the external terminals 13, 14, 15, 17, 19, 20, and 21. The connections are as follows:

- Channel 1: Terminal 1 to 21, Terminal 2 to 20.
- Channel 2: Terminal 3 to 21, Terminal 4 to 20.
- Channel 3: Terminal 5 to 21, Terminal 6 to 20.
- Channel 4: Terminal 7 to 21, Terminal 8 to 20.
- Channel 5: Terminal 9 to 21, Terminal 10 to 20.
- Channel 6: Terminal 11 to 21, Terminal 12 to 20.
- Channel 7: Terminal 13 to 21, Terminal 14 to 20.
- Channel 8: Terminal 15 to 21, Terminal 16 to 20.
- Channel 9: Terminal 17 to 21, Terminal 18 to 20.
- Channel 10: Terminal 19 to 21, Terminal 20 to 20.
- Channel 11: Terminal 21 to 21, Terminal 22 to 20.
- Channel 12: Terminal 23 to 21, Terminal 24 to 20.

connections to be made externally

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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	$T_C = 25^{\circ}\text{C}$	$I_{C,nom.}$	50 A
			I_C	100 A
Periodischer Kollektor Spitzenstrom	repetitive peak collector current	$t_p = 1\text{ ms}$, $T_C = 80^{\circ}\text{C}$	I_{CRM}	100 A
Gesamt-Verlustleistung	total power dissipation	$T_C = 25^{\circ}\text{C}$, Transistor	P_{tot}	480 W
Gate-Emitter-Spitzenspannung	gate-emitter peak voltage		V_{GES}	$\pm 20\text{ V}$
Dauergleichstrom	DC forward current		I_F	50 A
Periodischer Spitzenstrom	repetitive peak forw. current	$t_p = 1\text{ ms}$	I_{FRM}	100 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^2t	1100 A ² s
Isolations-Prüfspannung	insulation test voltage	RMS, $f = 50\text{ Hz}$, $t = 1\text{ min.}$	V_{ISOL}	3,4 kV

Charakteristische Werte / Characteristic values: Transistor

Kollektor-Emitter Sättigungsspannung	collector-emitter saturation voltage	$I_C = 50A, V_{GE} = 15V, T_{vj} = 25^{\circ}C$	$V_{CE\ sat}$	-	2,7	3,3 V
		$I_C = 50A, V_{GE} = 15V, T_{vj} = 125^{\circ}C$		-	3,2	- V
Gate-Schwellenspannung	gate threshold voltage	$I_C = 2,5mA, V_{CE} = V_{GE}, T_{vj} = 25^{\circ}C$	$V_{GE(th)}$	4,5	5,5	6,5 V
Eingangskapazität	input capacitance	$f = 1MHz, T_{vj} = 25^{\circ}C, V_{CE} = 25V, V_{GE} = 0V$	C_{ies}	-	3,5	- nF
Kollektor-Emitter Reststrom	collector-emitter cut-off current	$V_{CE} = 1700V, V_{GE} = 0V, T_{vj} = 25^{\circ}C$	I_{CES}	-	0,02	0,1 mA
		$V_{CE} = 1700V, V_{GE} = 0V, T_{vj} = 125^{\circ}C$		-	1,5	- mA
Gate-Emitter Reststrom	gate-emitter leakage current	$V_{CE} = 0V, V_{GE} = 20V, T_{vj} = 25^{\circ}C$	I_{GES}	-	-	100 nA
Einschaltverzögerungszeit (induktive Last)	turn-on delay time (inductive load)	$I_C = 50A, V_{CE} = 900V$	$t_{d,on}$			
		$V_{GE} = \pm 15V, R_G = 30\Omega, T_{vj} = 25^{\circ}C$		-	0,1	- μs
		$V_{GE} = \pm 15V, R_G = 30\Omega, T_{vj} = 125^{\circ}C$		-	0,1	- μs
Anstiegszeit (induktive Last)	rise time (inductive load)	$I_C = 50A, V_{CE} = 900V$	t_r			
		$V_{GE} = \pm 15V, R_G = 30\Omega, T_{vj} = 25^{\circ}C$		-	0,1	- μs
		$V_{GE} = \pm 15V, R_G = 30\Omega, T_{vj} = 125^{\circ}C$		-	0,1	- μs
Abschaltverzögerungszeit (ind. Last)	turn off delay time (inductive load)	$I_C = 50A, V_{CE} = 900V$	$t_{d,off}$			
		$V_{GE} = \pm 15V, R_G = 30\Omega, T_{vj} = 25^{\circ}C$		-	0,8	- μs
		$V_{GE} = \pm 15V, R_G = 30\Omega, T_{vj} = 125^{\circ}C$		-	0,9	- μs
Fallzeit (induktive Last)	fall time (inductive load)	$I_C = 50A, V_{CE} = 900V$	t_f			
		$V_{GE} = \pm 15V, R_G = 30\Omega, T_{vj} = 25^{\circ}C$		-	0,03	- μs
		$V_{GE} = \pm 15V, R_G = 30\Omega, T_{vj} = 125^{\circ}C$		-	0,03	- μs
Einschaltverlustenergie pro Puls	turn-on energy loss per pulse	$I_C = 50A, V_{CE} = 900V, V_{GE} = 15V$	E_{on}			
		$R_G = 30\Omega, T_{vj} = 125^{\circ}C, L_S = 60nH$		-	26	- mWs
Abschaltverlustenergie pro Puls	turn-off energy loss per pulse	$I_C = 50A, V_{CE} = 900V, V_{GE} = 15V$	E_{off}			
		$R_G = 30\Omega, T_{vj} = 125^{\circ}C, L_S = 60nH$		-	14,5	- mWs
Kurzschlußverhalten	SC Data	$t_P \leq 10\mu sec, V_{GE} \leq 15V, R_G = 30\Omega$	I_{SC}			
		$T_{vj} \leq 125^{\circ}C, V_{CC} = 1000V$		-	200	- A
		$V_{CEmax} = V_{CES} - L_{sCE} \times di/dt$				
Modulinduktivität	stray inductance module		L_{sCE}	-	25	- nH

Charakteristische Werte / Characteristic values: Diode

Durchlaßspannung	forward voltage	$I_F = 50\text{A}$, $V_{GE} = 0\text{V}$, $T_{vj} = 25^{\circ}\text{C}$	V_F	-	2,2	2,6 V
		$I_F = 50\text{A}$, $V_{GE} = 0\text{V}$, $T_{vj} = 125^{\circ}\text{C}$		-	2	- V
Rückstromspitze	peak reverse recovery current	$I_F = 50\text{A}$, - $di_F/dt = 750\text{A}/\mu\text{sec}$	I_{RM}			
		$V_R = 900\text{V}$, $V_{GE} = -10\text{V}$, $T_{vj} = 25^{\circ}\text{C}$		-	36	- A
		$V_R = 900\text{V}$, $V_{GE} = -10\text{V}$, $T_{vj} = 125^{\circ}\text{C}$		-	56	- A
Sperrverzögerungsladung	recovered charge	$I_F = 50\text{A}$, - $di_F/dt = 750\text{A}/\mu\text{sec}$	Q_r			
		$V_R = 900\text{V}$, $V_{GE} = -10\text{V}$, $T_{vj} = 25^{\circ}\text{C}$		-	6	- μAs
		$V_R = 900\text{V}$, $V_{GE} = -10\text{V}$, $T_{vj} = 125^{\circ}\text{C}$		-	12	- μAs
Abschaltenergie pro Puls	reverse recovery energy	$I_F = 50\text{A}$, - $di_F/dt = 750\text{A}/\mu\text{sec}$	E_{rec}			
		$V_R = 900\text{V}$, $V_{GE} = -10\text{V}$, $T_{vj} = 25^{\circ}\text{C}$		-	2	- mWs
		$V_R = 900\text{V}$, $V_{GE} = -10\text{V}$, $T_{vj} = 125^{\circ}\text{C}$		-	4	- mWs

Thermische Eigenschaften / Thermal properties

Innerer Wärmewiderstand	thermal resistance, junction to case	Transistor / transistor, DC	R_{thJC}	-	-	0,26 K/W
		Diode / diode, DC		-	-	0,56 K/W
Übergangs-Wärmewiderstand	thermal resistance, case to heatsink	pro Module / per Module	R_{thCK}			
		$d_{Paste} \leq 50\mu\text{m}$ / $d_{grease} \leq 50\mu\text{m}$		-	-	0,011 K/W
Höchstzul. Sperrschichttemperatur	max. junction temperature		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				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.

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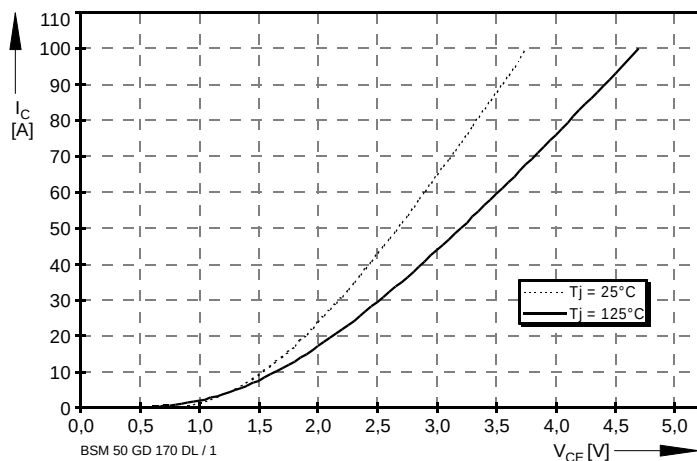


Bild / Fig. 1
Ausgangskennlinie (typisch) /
Output characteristic (typical)
 $I_C = f(V_{CE})$
 $V_{GE} = 15V$

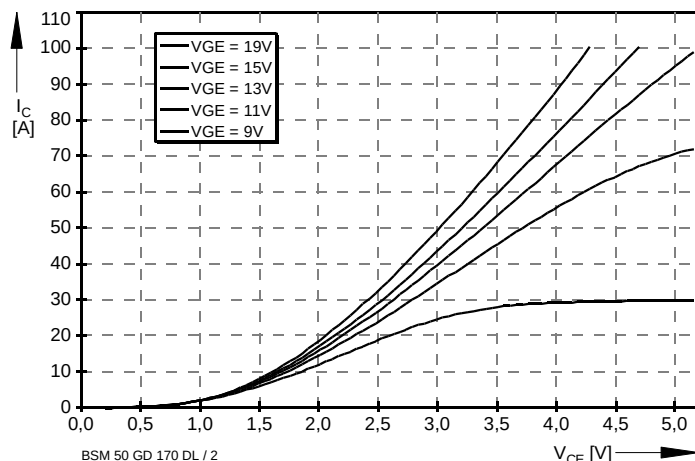


Bild / Fig. 2
Ausgangskennlinienfeld (typisch) /
Output characteristic (typical)
 $I_C = f(V_{CE})$
 $T_{vj} = 125^\circ C$

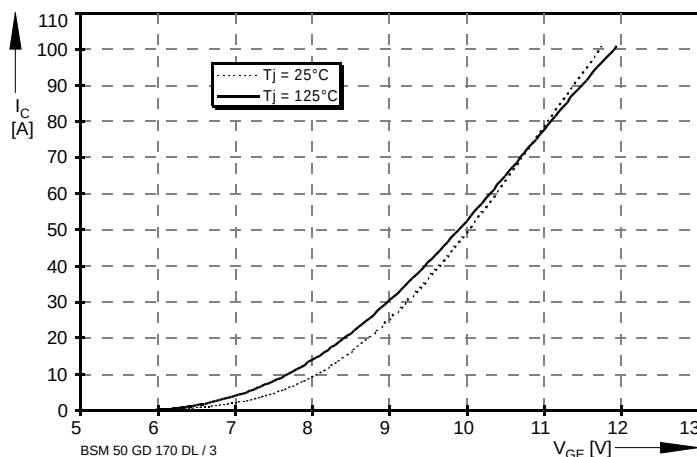


Bild / Fig. 3
Übertragungscharakteristic (typisch) /
Transfer characteristic (typical)
 $I_C = f(V_{GE})$
 $V_{CE} = 20V$

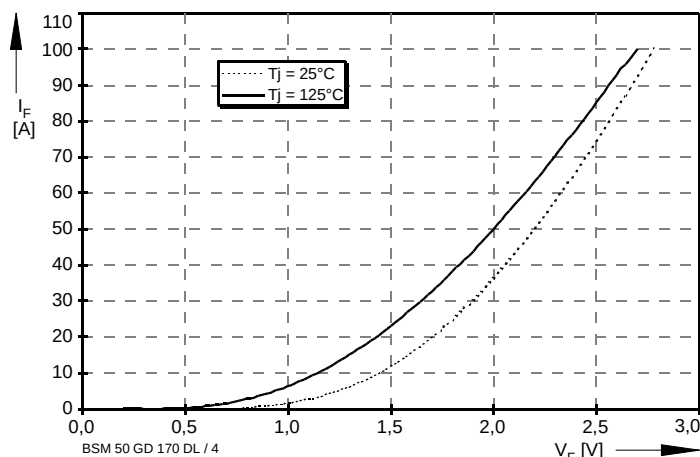


Bild / Fig. 4
Durchlaßkennlinie der Inversdiode (typisch) /
Forward characteristic of inverse diode (typical)
 $I_F = f(V_F)$

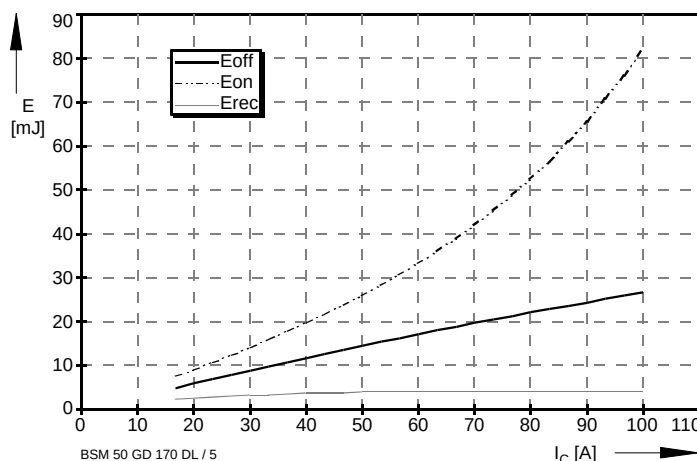


Bild / Fig. 5
Schaltverluste (typisch) /
Switching losses (typical)
 $E_{on} = f(I_C)$, $E_{off} = f(I_C)$, $E_{rec} = f(I_C)$
 $R_{gon} = R_{goff} = 30\Omega$, $V_{CE} = 900V$, $T_J = 125^\circ C$

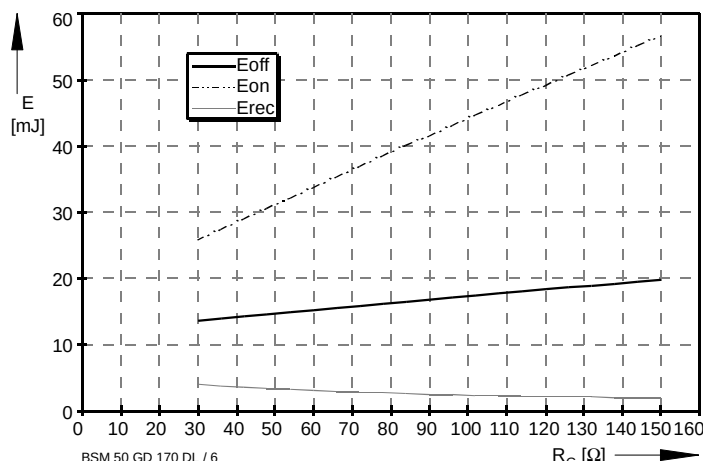


Bild / Fig. 6
Schaltverluste (typisch) /
Switching losses (typical)
 $E_{on} = f(R_G)$, $E_{off} = f(R_G)$, $E_{rec} = f(R_G)$
 $I_C = 50A$, $V_{CE} = 900V$, $T_J = 125^\circ C$

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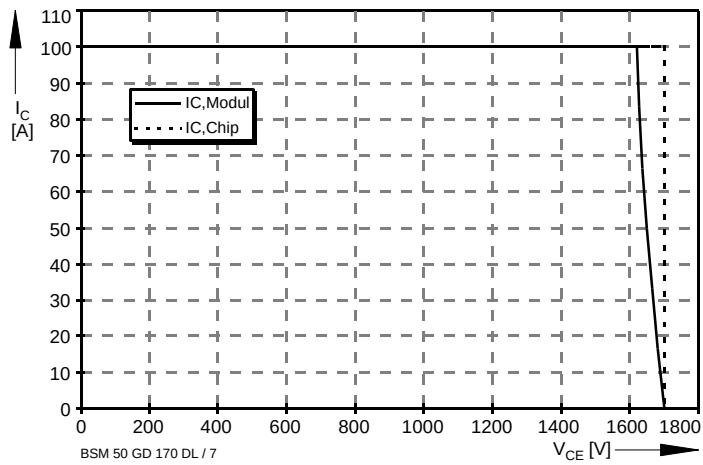


Bild / Fig. 7

Sicherer Arbeitsbereich (RBSOA) /

Reverse bias safe operation area (RBSOA)

$R_g = 30\Omega$, $T_{vj} = 125^\circ\text{C}$