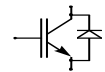


# Technische Information / Technical Information

IGBT-Module  
IGBT-Modules

## BSM 75 GD 60 DLC

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### Höchstzulässige Werte / Maximum rated values

#### Elektrische Eigenschaften / Electrical properties

Kollektor-Emitter-Sperrspannung collector-emitter voltage		$V_{CES}$	600	V
Kollektor-Dauergleichstrom DC-collector current	$T_C = 70^\circ\text{C}$	$I_{C,nom.}$	75	A
	$T_C = 25^\circ\text{C}$	$I_C$	95	A
Periodischer Kollektor Spitzenstrom repetitive peak collector current	$t_p = 1\text{ ms}, T_C = 70^\circ\text{C}$	$I_{CRM}$	150	A
Gesamt-Verlustleistung total power dissipation	$T_C = 25^\circ\text{C}, \text{ Transistor}$	$P_{tot}$	330	W
Gate-Emitter-Spitzenspannung gate-emitter peak voltage		$V_{GES}$	+/- 20V	V
Dauergleichstrom DC forward current		$I_F$	75	A
Periodischer Spitzenstrom repetitive peak forw. current	$t_p = 1\text{ ms}$	$I_{FRM}$	150	A
Grenzlastintegral der Diode $I^2t$ - value, Diode	$V_R = 0\text{V}, t_p = 10\text{ms}, T_{vj} = 125^\circ\text{C}$	$I^2t$	1.200	$\text{A}^2\text{s}$
Isolations-Prüfspannung insulation test voltage	RMS, $f = 50\text{ Hz}, t = 1\text{ min.}$	$V_{ISOL}$	2,5	kV

### Charakteristische Werte / Characteristic values

#### Transistor / Transistor

			min.	typ.	max.	
Kollektor-Emitter Sättigungsspannung collector-emitter saturation voltage	$I_C = 75\text{A}, V_{GE} = 15\text{V}, T_{vj} = 25^\circ\text{C}$	$V_{CE\text{ sat}}$	-	1,95	2,45	V
	$I_C = 75\text{A}, V_{GE} = 15\text{V}, T_{vj} = 125^\circ\text{C}$		-	2,20	-	V
Gate-Schwellenspannung gate threshold voltage	$I_C = 1,5\text{ mA}, V_{CE} = V_{GE}, T_{vj} = 25^\circ\text{C}$	$V_{GE(th)}$	4,5	5,5	6,5	V
Eingangskapazität input capacitance	$f = 1\text{MHz}, T_{vj} = 25^\circ\text{C}, V_{CE} = 25\text{V}, V_{GE} = 0\text{V}$	$C_{ies}$	-	3,3	-	nF
Rückwirkungskapazität reverse transfer capacitance	$f = 1\text{MHz}, T_{vj} = 25^\circ\text{C}, V_{CE} = 25\text{V}, V_{GE} = 0\text{V}$	$C_{res}$	-	0,3	-	nF
Kollektor-Emitter Reststrom collector-emitter cut-off current	$V_{CE} = 600\text{V}, V_{GE} = 0\text{V}, T_{vj} = 25^\circ\text{C}$	$I_{CES}$	-	1	500	$\mu\text{A}$
	$V_{CE} = 600\text{V}, V_{GE} = 0\text{V}, T_{vj} = 125^\circ\text{C}$		-	1	-	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

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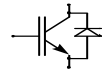
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### Charakteristische Werte / Characteristic values

#### Transistor / Transistor

			min.	typ.	max.	
Einschaltverzögerungszeit (ind. Last) turn on delay time (inductive load)	$I_C = 75 \text{ A}, V_{CC} = 300\text{V}$	$t_{d,on}$	-	63	-	ns
	$V_{GE} = \pm 15\text{V}, R_G = 3,0 \Omega, T_{vj} = 25^\circ\text{C}$ $V_{GE} = \pm 15\text{V}, R_G = 3,0 \Omega, T_{vj} = 125^\circ\text{C}$		-	65	-	ns
Anstiegszeit (induktive Last) rise time (inductive load)	$I_C = 75 \text{ A}, V_{CC} = 300\text{V}$	$t_r$	-	22	-	ns
	$V_{GE} = \pm 15\text{V}, R_G = 3,0 \Omega, T_{vj} = 25^\circ\text{C}$ $V_{GE} = \pm 15\text{V}, R_G = 3,0 \Omega, T_{vj} = 125^\circ\text{C}$		-	25	-	ns
Abschaltverzögerungszeit (ind. Last) turn off delay time (inductive load)	$I_C = 75 \text{ A}, V_{CC} = 300\text{V}$	$t_{d,off}$	-	155	-	ns
	$V_{GE} = \pm 15\text{V}, R_G = 3,0 \Omega, T_{vj} = 25^\circ\text{C}$ $V_{GE} = \pm 15\text{V}, R_G = 3,0 \Omega, T_{vj} = 125^\circ\text{C}$		-	170	-	ns
Fallzeit (induktive Last) fall time (inductive load)	$I_C = 75 \text{ A}, V_{CC} = 300\text{V}$	$t_f$	-	20	-	ns
	$V_{GE} = \pm 15\text{V}, R_G = 3,0 \Omega, T_{vj} = 25^\circ\text{C}$ $V_{GE} = \pm 15\text{V}, R_G = 3,0 \Omega, T_{vj} = 125^\circ\text{C}$		-	35	-	ns
Einschaltverlustenergie pro Puls turn-on energy loss per pulse	$I_C = 75 \text{ A}, V_{CC} = 300\text{V}, V_{GE} = 15\text{V}$ $R_G = 3,0 \Omega, T_{vj} = 125^\circ\text{C}, L_\sigma = 15 \text{ nH}$	$E_{on}$	-	0,7	-	mJ
Abschaltverlustenergie pro Puls turn-off energy loss per pulse	$I_C = 75 \text{ A}, V_{CC} = 300\text{V}, V_{GE} = 15\text{V}$ $R_G = 3,0 \Omega, T_{vj} = 125^\circ\text{C}, L_\sigma = 15 \text{ nH}$	$E_{off}$	-	2,4	-	mJ
Kurzschlußverhalten SC Data	$t_p \leq 10 \mu\text{sec}, V_{GE} \leq 15\text{V}$ $T_{vj} \leq 125^\circ\text{C}, V_{CC} = 360\text{V}, V_{CEmax} = V_{CES} - L_{\sigma CE} \cdot di/dt$	$I_{SC}$	-	340	-	A
Modulinduktivität stray inductance module		$L_{\sigma CE}$	-	55	-	nH
Modul-Leitungswiderstand, Anschlüsse - Chip lead resistance, terminals - chip	$T_c = 25^\circ\text{C}$	$R_{CC+EE}$	-	4,4	-	mΩ

### Charakteristische Werte / Characteristic values

#### Diode / Diode

			min.	typ.	max.	
Durchlaßspannung forward voltage	$I_F = 75 \text{ A}, V_{GE} = 0\text{V}, T_{vj} = 25^\circ\text{C}$	$V_F$	-	1,25	1,6	V
	$I_F = 75 \text{ A}, V_{GE} = 0\text{V}, T_{vj} = 125^\circ\text{C}$		-	1,20	-	V
Rückstromspitze peak reverse recovery current	$I_F = 75 \text{ A}, -di_F/dt = 3000 \text{ A}/\mu\text{sec}$	$I_{RM}$	-	95	-	A
	$V_R = 300\text{V}, V_{GE} = -10\text{V}, T_{vj} = 25^\circ\text{C}$ $V_R = 300\text{V}, V_{GE} = -10\text{V}, T_{vj} = 125^\circ\text{C}$		-	115	-	A
Sperrverzögerungsladung recovered charge	$I_F = 75 \text{ A}, -di_F/dt = 3000 \text{ A}/\mu\text{sec}$	$Q_r$	-	5,1	-	μC
	$V_R = 300\text{V}, V_{GE} = -10\text{V}, T_{vj} = 25^\circ\text{C}$ $V_R = 300\text{V}, V_{GE} = -10\text{V}, T_{vj} = 125^\circ\text{C}$		-	7,9	-	μC
Abschaltenergie pro Puls reverse recovery energy	$I_F = 75 \text{ A}, -di_F/dt = 3000 \text{ A}/\mu\text{sec}$	$E_{rec}$	-	-	-	mJ
	$V_R = 300\text{V}, V_{GE} = -10\text{V}, T_{vj} = 25^\circ\text{C}$ $V_R = 300\text{V}, V_{GE} = -10\text{V}, T_{vj} = 125^\circ\text{C}$		-	2,3	-	mJ