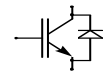


Technische Information / Technical Information

IGBT-Module
IGBT-Modules

BSM 50 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	$T_C=80^\circ\text{C}$	$I_{C,nom.}$	50	A
	$T_C=25^\circ\text{C}$	I_C	70	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}	250	W
Gate-Emitter-Spitzenspannung gate-emitter peak voltage		V_{GES}	+/- 20V	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	760	A^2s
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	$I_C=50\text{A}, V_{GE}=15\text{V}, T_{vj}=25^\circ\text{C}$	$V_{CE\text{ sat}}$	-	1,95	2,45	V
	$I_C=50\text{A}, V_{GE}=15\text{V}, T_{vj}=125^\circ\text{C}$		-	2,20	-	V
Gate-Schwellenspannung gate threshold voltage	$I_C=1\text{mA}, V_{CE}=V_{GE}, T_{vj}=25^\circ\text{C}$	$V_{GE(th)}$	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}	-	2,2	-	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}	-	0,2	-	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	μA
	$V_{CE}=600\text{V}, V_{GE}=0\text{V}, T_{vj}=125^\circ\text{C}$		-	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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Charakteristische Werte / Characteristic values

Transistor / Transistor

			min.	typ.	max.	
Einschaltverzögerungszeit (ind. Last) turn on delay time (inductive load)	$I_C = 50A, V_{CC} = 300V$	$t_{d,on}$	-	40	-	ns
	$V_{GE} = \pm 15V, R_G = 2,7\Omega, T_{vj} = 25^\circ C$					
	$V_{GE} = \pm 15V, R_G = 2,7\Omega, T_{vj} = 125^\circ C$					
Anstiegszeit (induktive Last) rise time (inductive load)	$I_C = 50A, V_{CC} = 300V$	t_r	-	9	-	ns
	$V_{GE} = \pm 15V, R_G = 2,7\Omega, T_{vj} = 25^\circ C$					
	$V_{GE} = \pm 15V, R_G = 2,7\Omega, T_{vj} = 125^\circ C$					
Abschaltverzögerungszeit (ind. Last) turn off delay time (inductive load)	$I_C = 50A, V_{CC} = 300V$	$t_{d,off}$	-	120	-	ns
	$V_{GE} = \pm 15V, R_G = 2,7\Omega, T_{vj} = 25^\circ C$					
	$V_{GE} = \pm 15V, R_G = 2,7\Omega, T_{vj} = 125^\circ C$					
Fallzeit (induktive Last) fall time (inductive load)	$I_C = 50A, V_{CC} = 300V$	t_f	-	12	-	ns
	$V_{GE} = \pm 15V, R_G = 2,7\Omega, T_{vj} = 25^\circ C$					
	$V_{GE} = \pm 15V, R_G = 2,7\Omega, T_{vj} = 125^\circ C$					
Einschaltverlustenergie pro Puls turn-on energy loss per pulse	$I_C = 50A, V_{CC} = 300V, V_{GE} = 15V$ $R_G = 2,7\Omega, T_{vj} = 125^\circ C, L_\sigma = 15nH$	E_{on}	-	0,5	-	mJ
Abschaltverlustenergie pro Puls turn-off energy loss per pulse	$I_C = 50A, V_{CC} = 300V, V_{GE} = 15V$ $R_G = 2,7\Omega, T_{vj} = 125^\circ C, L_\sigma = 15nH$	E_{off}	-	1,0	-	mJ
Kurzschlußverhalten SC Data	$t_p \leq 10\mu sec, V_{GE} \leq 15V$ $T_{vj} \leq 125^\circ C, V_{CC} = 360V, V_{CEmax} = V_{CES} - L_{\sigma CE} \cdot di/dt$	I_{SC}	-	225	-	A
Modulinduktivität stray inductance module		$L_{\sigma CE}$	-	60	-	nH
Modul-Leitungswiderstand, Anschlüsse - Chip lead resistance, terminals - chip	$T_{CC} = 25^\circ C$	R_{CC+EE}	-	8,0	-	mΩ

Charakteristische Werte / Characteristic values

Diode / Diode

			min.	typ.	max.	
Durchlaßspannung forward voltage	$I_F = 50A, V_{GE} = 0V, T_{vj} = 25^\circ C$	V_F	-	1,25	1,6	V
	$I_F = 50A, V_{GE} = 0V, T_{vj} = 125^\circ C$					
Rückstromspitze peak reverse recovery current	$I_F = 50A, -di_F/dt = 2900A/\mu sec$	I_{RM}	-	88	-	A
	$V_R = 300V, V_{GE} = -10V, T_{vj} = 25^\circ C$					
	$V_R = 300V, V_{GE} = -10V, T_{vj} = 125^\circ C$					
Sperrverzögerungsladung recovered charge	$I_F = 50A, -di_F/dt = 2900A/\mu sec$	Q_r	-	3,4	-	μC
	$V_R = 300V, V_{GE} = -10V, T_{vj} = 25^\circ C$					
	$V_R = 300V, V_{GE} = -10V, T_{vj} = 125^\circ C$					
Abschaltenergie pro Puls reverse recovery energy	$I_F = 50A, -di_F/dt = 2900A/\mu sec$	E_{rec}	-	-	-	mJ
	$V_R = 300V, V_{GE} = -10V, T_{vj} = 25^\circ C$					
	$V_R = 300V, V_{GE} = -10V, T_{vj} = 125^\circ C$					