

IGBT-Brems-Chopper / IGBT-brake-chopper

Höchstzulässige Werte / maximum rated values

Kollektor-Emitter-Sperrspannung collector-emitter voltage	$T_{vj} = 25^{\circ}\text{C}$	V_{CES}	600	V
Kollektor-Dauergleichstrom DC-collector current	$T_C = 75^{\circ}\text{C}, T_{vj} = 150^{\circ}\text{C}$ $T_C = 25^{\circ}\text{C}, T_{vj} = 150^{\circ}\text{C}$	I_{Cnom} I_C	15 20	A A
Periodischer Kollektor Spitzenstrom repetitive peak collector current	$t_p = 1 \text{ ms}$	I_{CRM}	30	A
Gesamt-Verlustleistung total power dissipation	$T_C = 25^{\circ}\text{C}, T_{vj} = 150^{\circ}\text{C}$	P_{tot}	78,0	W
Gate-Emitter-Spitzenspannung gate-emitter peak voltage		V_{GES}	+/-20	V

Charakteristische Werte / characteristic values

			min.	typ.	max.		
Kollektor-Emitter Sättigungsspannung collector-emitter saturation voltage	$I_C = 15 \text{ A}, V_{GE} = 15 \text{ V}$ $I_C = 15 \text{ A}, V_{GE} = 15 \text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	$V_{CE sat}$	1,95 2,20	2,55	V V	
Gate-Schwellenspannung gate threshold voltage	$I_C = 0,40 \text{ mA}, V_{CE} = V_{GE}, T_{vj} = 25^{\circ}\text{C}$		V_{Geth}	4,5	5,5	6,5	V
Gateladung gate charge	$V_{GE} = -15 \text{ V} \dots +15 \text{ V}$		Q_G	0,08			μC
Interner Gatewiderstand internal gate resistor	$T_{vj} = 25^{\circ}\text{C}$		R_{Gint}	0,00			Ω
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}	0,65			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}	0,06			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}		1,0		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
Einschaltverzögerungszeit (ind. Last) turn-on delay time (inductive load)	$I_C = 15 \text{ A}, V_{CE} = 300 \text{ V}$ $V_{GE} = \pm 15 \text{ V}$ $R_{Gon} = 68 \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	$t_{d on}$	0,035 0,035			μs μs
Anstiegszeit (induktive Last) rise time (inductive load)	$I_C = 15 \text{ A}, V_{CE} = 300 \text{ V}$ $V_{GE} = \pm 15 \text{ V}$ $R_{Gon} = 68 \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	t_r	0,03 0,035			μs μs
Abschaltverzögerungszeit (ind. Last) turn-off delay time (inductive load)	$I_C = 15 \text{ A}, V_{CE} = 300 \text{ V}$ $V_{GE} = \pm 15 \text{ V}$ $R_{Goff} = 68 \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	$t_{d off}$	0,23 0,23			μs μs
Fallzeit (induktive Last) fall time (inductive load)	$I_C = 15 \text{ A}, V_{CE} = 300 \text{ V}$ $V_{GE} = \pm 15 \text{ V}$ $R_{Goff} = 68 \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	t_f	0,02 0,03			μs μs
Einschaltverlustenergie pro Puls turn-on energy loss per pulse	$I_C = 15 \text{ A}, V_{CE} = 300 \text{ V}$ $V_{GE} = \pm 15 \text{ V}$ $R_{Gon} = 68 \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	E_{on}	0,55			mJ mJ
Abschaltverlustenergie pro Puls turn-off energy loss per pulse	$I_C = 15 \text{ A}, V_{CE} = 300 \text{ V}$ $V_{GE} = \pm 15 \text{ V}$ $R_{Goff} = 68 \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	E_{off}	0,40			mJ mJ
Kurzschlussverhalten SC data	$V_{GE} \leq 15 \text{ V}, V_{CC} = 360 \text{ V}$ $V_{CEmax} = V_{CES} - L_{sCE} \cdot di/dt$	$t_p \leq 10 \mu\text{s}, T_{vj} = 125^{\circ}\text{C}$	I_{SC}	65			A
Innerer Wärmewiderstand thermal resistance, junction to case	pro IGBT per IGBT		R_{thJC}	1,45	1,60		K/W K/W
Übergangs-Wärmewiderstand thermal resistance, case to heatsink	pro IGBT / per IGBT $\lambda_{Paste} = 1 \text{ W}/(\text{m}\cdot\text{K}) / \lambda_{grease} = 1 \text{ W}/(\text{m}\cdot\text{K})$		R_{thCH}	0,60			K/W

prepared by: Daniel Kreuzer	date of publication: 2007-12-14
approved by: Marc Buschkühle	revision: 3.2

Diode-Brems-Chopper / Diode-brake-chopper

Höchstzulässige Werte / maximum rated values

Periodische Spitzenspannung repetitive peak reverse voltage	$T_{vj} = 25^{\circ}\text{C}$	V_{RRM}	600	V
Dauergleichstrom DC forward current		I_F	15	A
Periodischer Spitzenstrom repetitive peak forw. current	$t_p = 1\text{ ms}$	I_{FRM}	30	A
Grenzlastintegral I^2t - value	$V_R = 0\text{ V}, t_p = 10\text{ ms}, T_{vj} = 125^{\circ}\text{C}$	I^2t	25,0	A ² s

Charakteristische Werte / characteristic values

			min.	typ.	max.	
Durchlassspannung forward voltage	$I_F = 15\text{ A}, V_{GE} = 0\text{ V}$ $I_F = 15\text{ A}, V_{GE} = 0\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	V_F	2,15 2,25	2,60	V V
Rückstromspitze peak reverse recovery current	$I_F = 15\text{ A}, -di_F/dt = 600\text{ A}/\mu\text{s}$ ($T_{vj}=125^{\circ}\text{C}$) $V_R = 300\text{ V}$ $V_{GE} = -15\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	I_{RM}	12,0 13,0		A A
Sperrverzögerungsladung recovered charge	$I_F = 15\text{ A}, -di_F/dt = 600\text{ A}/\mu\text{s}$ ($T_{vj}=125^{\circ}\text{C}$) $V_R = 300\text{ V}$ $V_{GE} = -15\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	Q_r	0,40 0,80		μC μC
Abschaltenergie pro Puls reverse recovery energy	$I_F = 15\text{ A}, -di_F/dt = 600\text{ A}/\mu\text{s}$ ($T_{vj}=125^{\circ}\text{C}$) $V_R = 300\text{ V}$ $V_{GE} = -15\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	E_{rec}	0,06 0,14		mJ mJ
Innere Wärmewiderstand thermal resistance, junction to case	pro Diode per diode		R_{thJC}	3,50	3,95	K/W
Übergangs-Wärmewiderstand thermal resistance, case to heatsink	pro Diode / per diode $\lambda_{paste} = 1\text{ W}/(\text{m}\cdot\text{K})$ / $\lambda_{grease} = 1\text{ W}/(\text{m}\cdot\text{K})$		R_{thCH}	1,10		K/W

NTC-Widerstand / NTC-thermistor

Charakteristische Werte / characteristic values

			min.	typ.	max.	
Nennwiderstand rated resistance	$T_C = 25^{\circ}\text{C}$		R_{25}	5,00		k Ω
Abweichung von R_{100} deviation of R_{100}	$T_C = 100^{\circ}\text{C}, R_{100} = 493\ \Omega$		$\Delta R/R$	-5	5	%
Verlustleistung power dissipation	$T_C = 25^{\circ}\text{C}$		P_{25}		20,0	mW
B-Wert B-value	$R_2 = R_{25} \exp [B_{25/50}(1/T_2 - 1/(298,15\text{ K}))]$		$B_{25/50}$	3375		K
B-Wert B-value	$R_2 = R_{25} \exp [B_{25/80}(1/T_2 - 1/(298,15\text{ K}))]$		$B_{25/80}$	3411		K
B-Wert B-value	$R_2 = R_{25} \exp [B_{25/100}(1/T_2 - 1/(298,15\text{ K}))]$		$B_{25/100}$	3433		K

Angaben gemäß gültiger Application Note.
Specification according to the valid application note.

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approved by: Marc Buschkühle	revision: 3.2