

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	$T_C = 80^{\circ}\text{C}, T_{vj} = 150^{\circ}\text{C}$ $T_C = 25^{\circ}\text{C}, T_{vj} = 150^{\circ}\text{C}$	$I_{Cnom}$ $I_C$	10 15	A A
Periodischer Kollektor Spitzenstrom repetitive peak collector current	$t_p = 1 \text{ ms}$	$I_{CRM}$	20	A
Gesamt-Verlustleistung total power dissipation	$T_C = 25^{\circ}\text{C}, T_{vj} = 150^{\circ}\text{C}$	$P_{tot}$	69,5	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	$I_C = 10 \text{ A}, V_{GE} = 15 \text{ V}$ $I_C = 10 \text{ A}, V_{GE} = 15 \text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	$V_{CE \text{ sat}}$	1,95 2,20	2,55	V V	
Gate-Schwellenspannung gate threshold voltage	$I_C = 0,35 \text{ mA}, V_{CE} = V_{GE}, T_{vj} = 25^{\circ}\text{C}$		$V_{GEth}$	4,5	5,5	6,5	V
Gateladung gate charge	$V_{GE} = -15 \text{ V} \dots +15 \text{ V}$		$Q_G$	0,06			$\mu\text{C}$
Interner Gatewiderstand internal gate resistor	$T_{vj} = 25^{\circ}\text{C}$		$R_{Gint}$	0,00			$\Omega$
Eingangskapazität input capacitance	$f = 1 \text{ MHz}, T_{vj} = 25^{\circ}\text{C}, V_{CE} = 25 \text{ V}, V_{GE} = 0 \text{ V}$		$C_{ies}$	0,44			nF
Rückwirkungskapazität reverse transfer capacitance	$f = 1 \text{ MHz}, T_{vj} = 25^{\circ}\text{C}, V_{CE} = 25 \text{ V}, V_{GE} = 0 \text{ V}$		$C_{res}$	0,04			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)	$I_C = 10 \text{ A}, V_{CE} = 300 \text{ V}$ $V_{GE} = \pm 15 \text{ V}$ $R_{Gon} = 82 \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	$t_{d \text{ on}}$	0,03 0,03			$\mu\text{s}$ $\mu\text{s}$
Anstiegszeit (induktive Last) rise time (inductive load)	$I_C = 10 \text{ A}, V_{CE} = 300 \text{ V}$ $V_{GE} = \pm 15 \text{ V}$ $R_{Gon} = 82 \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	$t_r$	0,025 0,03			$\mu\text{s}$ $\mu\text{s}$
Abschaltverzögerungszeit (ind. Last) turn-off delay time (inductive load)	$I_C = 10 \text{ A}, V_{CE} = 300 \text{ V}$ $V_{GE} = \pm 15 \text{ V}$ $R_{Goff} = 82 \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	$t_{d \text{ off}}$	0,23 0,23			$\mu\text{s}$ $\mu\text{s}$
Fallzeit (induktive Last) fall time (inductive load)	$I_C = 10 \text{ A}, V_{CE} = 300 \text{ V}$ $V_{GE} = \pm 15 \text{ V}$ $R_{Goff} = 82 \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	$t_f$	0,02 0,03			$\mu\text{s}$ $\mu\text{s}$
Einschaltverlustenergie pro Puls turn-on energy loss per pulse	$I_C = 10 \text{ A}, V_{CE} = 300 \text{ V}$ $V_{GE} = \pm 15 \text{ V}$ $R_{Gon} = 82 \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	$E_{on}$	0,36			mJ mJ
Abschaltverlustenergie pro Puls turn-off energy loss per pulse	$I_C = 10 \text{ A}, V_{CE} = 300 \text{ V}$ $V_{GE} = \pm 15 \text{ V}$ $R_{Goff} = 82 \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	$E_{off}$	0,44			mJ mJ
Kurzschlussverhalten SC data	$V_{GE} \leq 15 \text{ V}, V_{CC} = 360 \text{ V}$ $V_{CEmax} = V_{CES} - L_{sCE} \cdot di/dt$	$t_p \leq 10 \mu\text{s}, T_{vj} = 125^{\circ}\text{C}$	$I_{SC}$	45			A
Innerer Wärmewiderstand thermal resistance, junction to case	pro IGBT per IGBT		$R_{thJC}$	1,60	1,80		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

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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		$I_F$	10	A
Periodischer Spitzenstrom repetitive peak forw. current	$t_p = 1\text{ ms}$	$I_{FRM}$	20	A
Grenzlastintegral $I^2t$ - value	$V_R = 0\text{ V}, t_p = 10\text{ ms}, T_{vj} = 125^{\circ}\text{C}$	$I^2t$	12,0	$\text{A}^2\text{s}$

Charakteristische Werte / characteristic values

			min.	typ.	max.	
Durchlassspannung forward voltage	$I_F = 10\text{ A}, V_{GE} = 0\text{ V}$ $I_F = 10\text{ A}, V_{GE} = 0\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	$V_F$	1,85 1,90	2,25	V V
Rückstromspitze peak reverse recovery current	$I_F = 10\text{ A}, -di_F/dt = 600\text{ A}/\mu\text{s}$ ( $T_{vj}=125^{\circ}\text{C}$ ) $V_R = 300\text{ V}$ $V_{GE} = -15\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	$I_{RM}$	11,0 12,0		A A
Sperrverzögerungsladung recovered charge	$I_F = 10\text{ A}, -di_F/dt = 600\text{ A}/\mu\text{s}$ ( $T_{vj}=125^{\circ}\text{C}$ ) $V_R = 300\text{ V}$ $V_{GE} = -15\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	$Q_r$	0,40 0,80		$\mu\text{C}$ $\mu\text{C}$
Abschaltenergie pro Puls reverse recovery energy	$I_F = 10\text{ A}, -di_F/dt = 600\text{ A}/\mu\text{s}$ ( $T_{vj}=125^{\circ}\text{C}$ ) $V_R = 300\text{ V}$ $V_{GE} = -15\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	$E_{rec}$	0,05 0,12		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 $\Omega$
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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