

IGBT-Wechselrichter / IGBT-inverter

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	$T_C = 80^{\circ}\text{C}, T_{vj} = 150^{\circ}\text{C}$ $T_C = 25^{\circ}\text{C}, T_{vj} = 150^{\circ}\text{C}$	$I_{C\ nom}$ I_C	10 16	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	$I_C = 10\ \text{A}, V_{GE} = 15\ \text{V}$ $I_C = 10\ \text{A}, V_{GE} = 15\ \text{V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	$V_{CE\ sat}$	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			μC
Interner Gatewiderstand internal gate resistor	$T_{vj} = 25^{\circ}\text{C}$		R_{Gint}	0,0			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}	0,44			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)	$I_C = 10\ \text{A}, V_{CE} = 300\ \text{V}$ $V_{GE} = \pm 15\ \text{V}$ $R_{Gon} = 82\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	$t_{d\ on}$	0,03 0,03			μs μs
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			μs μs
Abschaltverzögerungszeit (ind. Last) turn-off delay time (inductive load)	$I_C = 10\ \text{A}, V_{CE} = 300\ \text{V}$ $V_{GE} = \pm 15\ \text{V}$ $R_{Goff} = 82\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	$t_{d\ off}$	0,23 0,23			μs μs
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			μs μs
Einschaltverlustenergie pro Puls turn-on energy loss per pulse	$I_C = 10\ \text{A}, V_{CE} = 300\ \text{V}$ $V_{GE} = \pm 15\ \text{V}, L_s = 80\ \text{nH}$ $R_{Gon} = 82\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	E_{on}	0,36			mJ mJ
Abschaltverlustenergie pro Puls turn-off energy loss per pulse	$I_C = 10\ \text{A}, V_{CE} = 300\ \text{V}$ $V_{GE} = \pm 15\ \text{V}, L_s = 80\ \text{nH}$ $R_{Goff} = 82\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	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 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-Wechselrichter / diode-inverter

Höchstzulässige Werte / maximum rated values

Periodische Spitzensperrspannung 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 forward 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	A ² 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	$I_F = 10\text{ A}, -di_F/dt = 600\text{ A}/\mu\text{s}$ $V_R = 300\text{ V}$ $V_{GE} = -15\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	I_{RM}	11,0 12,0		A A
Sperrverzögerungsladung recovered charge	$I_F = 10\text{ A}, -di_F/dt = 600\text{ A}/\mu\text{s}$ $V_R = 300\text{ V}$ $V_{GE} = -15\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	Q_r	0,40 0,80		μC μC
Abschaltenergie pro Puls reverse recovery energy	$I_F = 10\text{ A}, -di_F/dt = 600\text{ A}/\mu\text{s}$ $V_R = 300\text{ V}$ $V_{GE} = -15\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	E_{rec}	0,05 0,12		mJ mJ
Innerer 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

Diode-Gleichrichter / diode-rectifier

Höchstzulässige Werte / maximum rated values

Periodische Rückw. Spitzensperrspannung repetitive peak reverse voltage	$T_{vj} = 25^{\circ}\text{C}$	V_{RRM}	800	V
Durchlassstrom Grenzeffektivwert pro Dio. forward current RMS maximum per diode	$T_C = 80^{\circ}\text{C}$	I_{FRMSM}	23	A
Gleichrichter Ausgang Grenzeffektivstrom maximum RMS current at Rectifier output	$T_C = 80^{\circ}\text{C}$	I_{RMSM}	25	A
Stoßstrom Grenzwert surge forward current	$t_p = 10\text{ ms}, T_{vj} = 25^{\circ}\text{C}$ $t_p = 10\text{ ms}, T_{vj} = 150^{\circ}\text{C}$	I_{FSM}	195 160	A A
Grenzlastintegral I^2t - value	$t_p = 10\text{ ms}, T_{vj} = 25^{\circ}\text{C}$ $t_p = 10\text{ ms}, T_{vj} = 150^{\circ}\text{C}$	I^2t	195 125	A ² s A ² s

Charakteristische Werte / characteristic values

			min.	typ.	max.	
Durchlassspannung forward voltage	$T_{vj} = 150^{\circ}\text{C}, I_F = 10\text{ A}$		V_F	0,90		V
Schleusenspannung threshold voltage	$T_{vj} = 150^{\circ}\text{C}$		V_{TO}	0,67		V
Ersatzwiderstand slope resistance	$T_{vj} = 150^{\circ}\text{C}$		r_T	21,0		m Ω
Sperrstrom reverse current	$T_{vj} = 150^{\circ}\text{C}, V_R = 800\text{ V}$		I_R	0,10		mA
Innerer Wärmewiderstand thermal resistance, junction to case	pro Diode per diode		R_{thJC}	1,75	1,95	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}	0,60		K/W

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