

Vorläufige Daten
preliminary data

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	$T_C = 80^{\circ}\text{C}$ $T_C = 25^{\circ}\text{C}$	$I_{C\ nom}$ I_C	10 16	A A
Periodischer Kollektor Spitzenstrom repetitive peak collector current	$t_P = 1\ \text{ms}, T_C = 80^{\circ}\text{C}$	I_{CRM}	20	A
Gesamt-Verlustleistung total power dissipation	$T_C = 25^{\circ}\text{C}$	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	$I_C = 10\ \text{A}, V_{GE} = 15\ \text{V}, T_{vj} = 25^{\circ}\text{C}$ $I_C = 10\ \text{A}, V_{GE} = 15\ \text{V}, T_{vj} = 125^{\circ}\text{C}$	$V_{CE\ sat}$		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		0,05		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}		0,45		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}			5,0	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)	$I_C = 10\ \text{A}, V_{CE} = 300\ \text{V}$ $V_{GE} = \pm 15\ \text{V}, R_{Gon} = 27\ \Omega, T_{vj} = 25^{\circ}\text{C}$ $V_{GE} = \pm 15\ \text{V}, R_{Gon} = 27\ \Omega, T_{vj} = 125^{\circ}\text{C}$	$t_{d\ on}$		0,012 0,012		μs μs
Anstiegszeit (induktive Last) rise time (inductive load)	$I_C = 10\ \text{A}, V_{CE} = 300\ \text{V}$ $V_{GE} = \pm 15\ \text{V}, R_{Gon} = 27\ \Omega, T_{vj} = 25^{\circ}\text{C}$ $V_{GE} = \pm 15\ \text{V}, R_{Gon} = 27\ \Omega, T_{vj} = 125^{\circ}\text{C}$	t_r		0,012 0,013		μs μs
Abschaltverzögerungszeit (ind. Last) turn-off delay time (inductive load)	$I_C = 10\ \text{A}, V_{CE} = 300\ \text{V}$ $V_{GE} = \pm 15\ \text{V}, R_{Goff} = 27\ \Omega, T_{vj} = 25^{\circ}\text{C}$ $V_{GE} = \pm 15\ \text{V}, R_{Goff} = 27\ \Omega, T_{vj} = 125^{\circ}\text{C}$	$t_{d\ off}$		0,085 0,105		μs μs
Fallzeit (induktive Last) fall time (inductive load)	$I_C = 10\ \text{A}, V_{CE} = 300\ \text{V}$ $V_{GE} = \pm 15\ \text{V}, R_{Goff} = 27\ \Omega, T_{vj} = 25^{\circ}\text{C}$ $V_{GE} = \pm 15\ \text{V}, R_{Goff} = 27\ \Omega, T_{vj} = 125^{\circ}\text{C}$	t_f		0,017 0,03		μs μs
Einschaltverlustenergie pro Puls turn-on energy loss per pulse	$I_C = 10\ \text{A}, V_{CE} = 300\ \text{V}, L_S = 60\ \text{nH}$ $V_{GE} = \pm 15\ \text{V}, R_{Gon} = 27\ \Omega, T_{vj} = 25^{\circ}\text{C}$ $V_{GE} = \pm 15\ \text{V}, R_{Gon} = 27\ \Omega, T_{vj} = 125^{\circ}\text{C}$	E_{on}		0,18 0,25		mJ mJ
Abschaltverlustenergie pro Puls turn-off energy loss per pulse	$I_C = 10\ \text{A}, V_{CE} = 300\ \text{V}, L_S = 60\ \text{nH}$ $V_{GE} = \pm 15\ \text{V}, R_{Goff} = 27\ \Omega, T_{vj} = 25^{\circ}\text{C}$ $V_{GE} = \pm 15\ \text{V}, R_{Goff} = 27\ \Omega, T_{vj} = 125^{\circ}\text{C}$	E_{off}		0,18 0,27		mJ mJ
Kurzschlußverhalten SC data	$t_P \leq 10\ \mu\text{s}, V_{GE} \leq 15\ \text{V}$ $T_{vj} \leq 125^{\circ}\text{C}, V_{CC} = 360\ \text{V}, V_{CEmax} = V_{CES} - L_{sCE} \cdot di/dt$	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}		0,80		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^2s

Charakteristische Werte/characteristic values

			min.	typ.	max.	
Durchlassspannung forward voltage	$I_F = 10\text{ A}, V_{GE} = 0\text{ V}, T_{vj} = 25^{\circ}\text{C}$ $I_F = 10\text{ A}, V_{GE} = 0\text{ V}, T_{vj} = 125^{\circ}\text{C}$	V_F		1,85 1,90	2,25	V V
Rückstromspitze peak reverse recovery current	$I_F = 10\text{ A}, -di_F/dt = 1000\text{ A}/\mu\text{s}$ $V_R = 300\text{ V}, V_{GE} = -15\text{ V}, T_{vj} = 25^{\circ}\text{C}$ $V_R = 300\text{ V}, V_{GE} = -15\text{ V}, T_{vj} = 125^{\circ}\text{C}$	I_{RM}		16,0 17,0		A A
Sperrverzögerungsladung recovered charge	$I_F = 10\text{ A}, -di_F/dt = 1000\text{ A}/\mu\text{s}$ $V_R = 300\text{ V}, V_{GE} = -15\text{ V}, T_{vj} = 25^{\circ}\text{C}$ $V_R = 300\text{ V}, V_{GE} = -15\text{ V}, T_{vj} = 125^{\circ}\text{C}$	Q_r		0,50 0,85		μC μC
Abschaltenergie pro Puls reverse recovery energy	$I_F = 10\text{ A}, -di_F/dt = 1000\text{ A}/\mu\text{s}$ $V_R = 300\text{ V}, V_{GE} = -15\text{ V}, T_{vj} = 25^{\circ}\text{C}$ $V_R = 300\text{ V}, V_{GE} = -15\text{ V}, T_{vj} = 125^{\circ}\text{C}$	E_{rec}		0,10 0,18		mJ mJ
Innerer Wärmewiderstand thermal resistance, junction to case	pro Diode per diode	R_{thJC}		3,60	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}		1,35		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

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