

62mm C-Serien Modul mit schnellem IGBT2 für hochfrequentes Schalten
62mm C-series module with the fast IGBT2 for high-frequency switching

IGBT-Wechselrichter / IGBT-inverter

Höchstzulässige Werte / maximum rated values

Kollektor-Emitter-Sperrspannung collector-emitter voltage	$T_{vj} = 25^{\circ}\text{C}$	V_{CES}	1200	V
Kollektor-Dauergleichstrom DC-collector current	$T_C = 60^{\circ}\text{C}, T_{vj} = 150^{\circ}\text{C}$ $T_C = 25^{\circ}\text{C}, T_{vj} = 150^{\circ}\text{C}$	$I_{C\ nom}$ I_C	300 370	A A
Periodischer Kollektor Spitzenstrom repetitive peak collector current	$t_p = 1\ \text{ms}$	I_{CRM}	600	A
Gesamt-Verlustleistung total power dissipation	$T_C = 25^{\circ}\text{C}, T_{vj} = 150^{\circ}\text{C}$	P_{tot}	1950	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	$I_C = 300\ \text{A}, V_{GE} = 15\ \text{V}$ $I_C = 300\ \text{A}, V_{GE} = 15\ \text{V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	$V_{CE\ sat}$	3,20 3,85	3,75	V V	
Gate-Schwellenspannung gate threshold voltage	$I_C = 12,0\ \text{mA}, V_{CE} = V_{GE}, T_{vj} = 25^{\circ}\text{C}$		V_{GEth}	4,5	5,5	6,5	V
Gateladung gate charge	$V_{GE} = -15\ \text{V} \dots +15\ \text{V}$		Q_G	3,20			μC
Interner Gatewiderstand internal gate resistor	$T_{vj} = 25^{\circ}\text{C}$		R_{Gint}	1,0			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}	20,0			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}	1,40			nF
Kollektor-Emitter Reststrom collector-emitter cut-off current	$V_{CE} = 1200\ \text{V}, V_{GE} = 0\ \text{V}, T_{vj} = 25^{\circ}\text{C}$		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)	$I_C = 300\ \text{A}, V_{CE} = 600\ \text{V}$ $V_{GE} = \pm 15\ \text{V}$ $R_{Gon} = 3,0\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	$t_{d\ on}$	0,10 0,11			μs μs
Anstiegszeit (induktive Last) rise time (inductive load)	$I_C = 300\ \text{A}, V_{CE} = 600\ \text{V}$ $V_{GE} = \pm 15\ \text{V}$ $R_{Gon} = 3,0\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	t_r	0,06 0,07			μs μs
Abschaltverzögerungszeit (ind. Last) turn-off delay time (inductive load)	$I_C = 300\ \text{A}, V_{CE} = 600\ \text{V}$ $V_{GE} = \pm 15\ \text{V}$ $R_{Goff} = 3,0\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	$t_{d\ off}$	0,53 0,55			μs μs
Fallzeit (induktive Last) fall time (inductive load)	$I_C = 300\ \text{A}, V_{CE} = 600\ \text{V}$ $V_{GE} = \pm 15\ \text{V}$ $R_{Goff} = 3,0\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	t_f	0,03 0,04			μs μs
Einschaltverlustenergie pro Puls turn-on energy loss per pulse	$I_C = 300\ \text{A}, V_{CE} = 600\ \text{V}$ $V_{GE} = \pm 15\ \text{V}, L_s = 60\ \text{nH}$ $R_{Gon} = 3,0\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	E_{on}	25,0			mJ mJ
Abschaltverlustenergie pro Puls turn-off energy loss per pulse	$I_C = 300\ \text{A}, V_{CE} = 600\ \text{V}$ $V_{GE} = \pm 15\ \text{V}, L_s = 60\ \text{nH}$ $R_{Goff} = 3,0\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	E_{off}	15,0			mJ mJ
Kurzschlußverhalten SC data	$t_p \leq 10\ \mu\text{s}, V_{GE} \leq 15\ \text{V}$ $T_{vj} = 125^{\circ}\text{C}, V_{CC} = 900\ \text{V}, V_{CEmax} = V_{CES} - L_s \cdot di/dt$		I_{SC}	2000			A
Innerer Wärmewiderstand thermal resistance, junction to case	pro IGBT per IGBT		R_{thJC}			0,064	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}	0,03			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}	1200	V
Dauergleichstrom DC forward current		I_F	300	A
Periodischer Spitzenstrom repetitive peak forward current	$t_p = 1\text{ ms}$	I_{FRM}	600	A
Grenzlastintegral I^2t - value	$V_R = 0\text{ V}, t_p = 10\text{ ms}, T_{vj} = 125^{\circ}\text{C}$	I^2t	18000	A ² s

Charakteristische Werte / characteristic values

			min.	typ.	max.	
Durchlassspannung forward voltage	$I_F = 300\text{ A}, V_{GE} = 0\text{ V}$ $I_F = 300\text{ A}, V_{GE} = 0\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	V_F	2,00 1,70	2,55	V V
Rückstromspitze peak reverse recovery current	$I_F = 300\text{ A}, -di_F/dt = 4500\text{ A}/\mu\text{s}$ $V_R = 600\text{ V}$ $V_{GE} = -15\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	I_{RM}	230 300		A A
Sperrverzögerungsladung recovered charge	$I_F = 300\text{ A}, -di_F/dt = 4500\text{ A}/\mu\text{s}$ $V_R = 600\text{ V}$ $V_{GE} = -15\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	Q_r	18,0 42,0		μC μC
Abschaltenergie pro Puls reverse recovery energy	$I_F = 300\text{ A}, -di_F/dt = 4500\text{ A}/\mu\text{s}$ $V_R = 600\text{ V}$ $V_{GE} = -15\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	E_{rec}	7,00 15,0		mJ mJ
Innerer Wärmewiderstand thermal resistance, junction to case	pro Diode per diode		R_{thJC}		0,10	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}	0,06		K/W

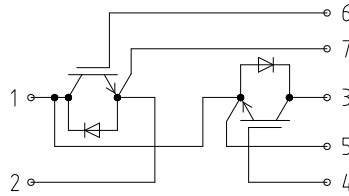
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Modul / module

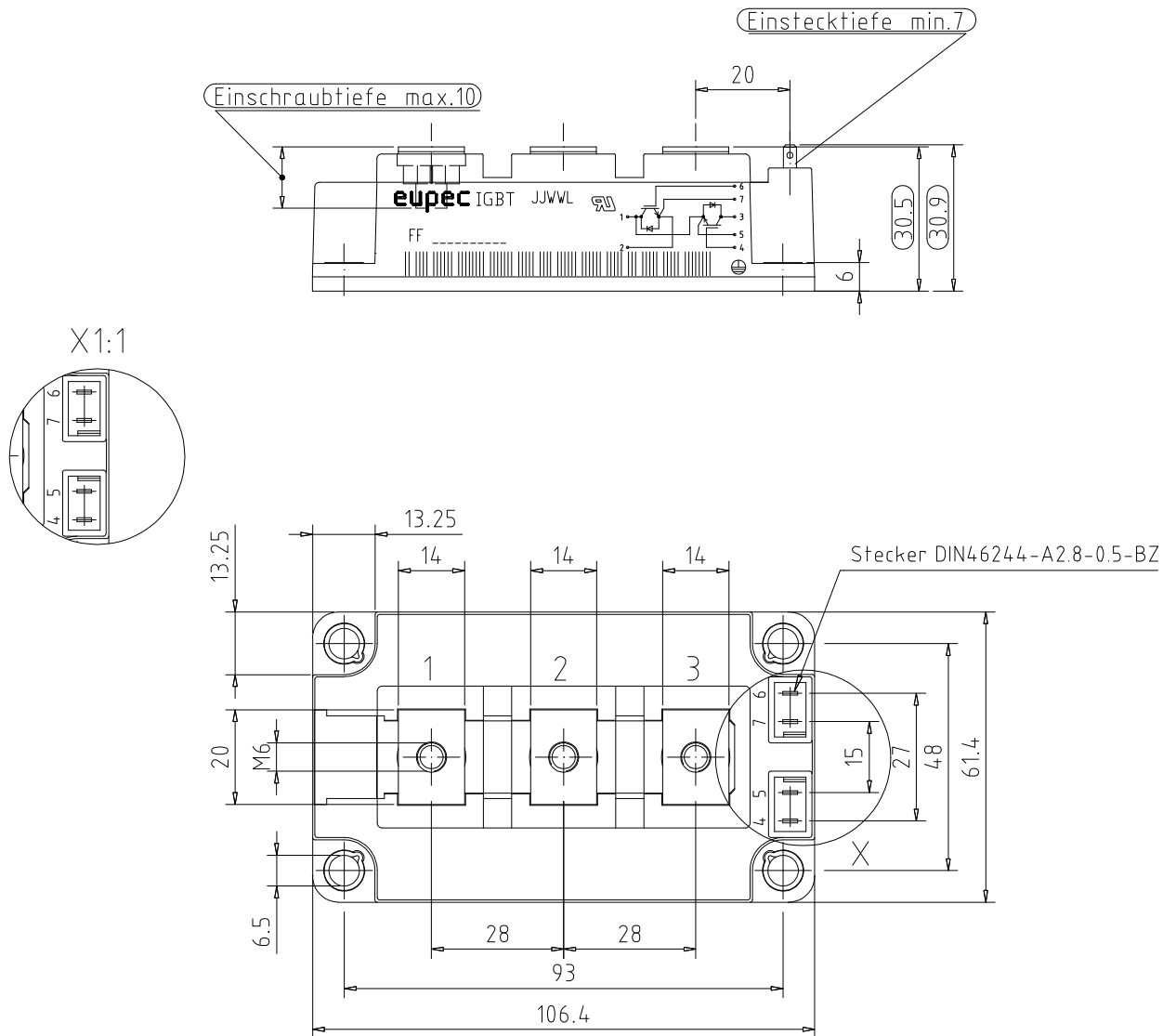
Isolations-Prüfspannung insulation test voltage	RMS, f = 50 Hz, t = 1 min	V _{ISO}	2,5			kV
Material für innere Isolation material for internal insulation			Al ₂ O ₃			
Kriechstrecke creepage distance	Kontakt - Kühlkörper / terminal to heatsink Kontakt - Kontakt / terminal to terminal		20,0			mm
Luftstrecke clearance distance	Kontakt - Kühlkörper / terminal to heatsink Kontakt - Kontakt / terminal to terminal		11,0			mm
Vergleichszahl der Kriechwegbildung comparative tracking index		CTI	> 425			
			min.	typ.	max.	
Übergangs-Wärmewiderstand thermal resistance, case to heatsink	pro Modul / per module $\lambda_{\text{Paste}} = 1 \text{ W/(m}\cdot\text{K)} / \lambda_{\text{grease}} = 1 \text{ W/(m}\cdot\text{K)}$	R _{thCH}		0,01		K/W
Modulinduktivität stray inductance module		L _{sCE}		20		nH
Modulleitungswiderstand, Anschlüsse - Chip module lead resistance, terminals - chip	T _C = 25°C, pro Schalter / per switch	R _{CC'+EE'}		0,70		mΩ
Höchstzulässige Sperrschichttemperatur maximum junction temperature	Wechselrichter, Brems-Chopper / Inverter, Brake-Chopper	T _{vj max}			150	°C
Temperatur im Schaltbetrieb temperature under switching conditions	Wechselrichter, Brems-Chopper / Inverter, Brake-Chopper	T _{vj op}	-40		125	°C
Lagertemperatur storage temperature		T _{stg}	-40		125	°C
Anzugsdrehmoment f. mech. Befestigung mounting torque	Schraube / screw M6	M	3,00	-	6,00	Nm
Anzugsdrehmoment f. elektr. Anschlüsse terminal connection torque	Schraube / screw M6	M	2,5	-	5,0	Nm
Gewicht weight		G		340		g

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Schaltplan / circuit diagram



Gehäuseabmessungen / package outlines



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