

**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	$T_C = 80^{\circ}\text{C}$ $T_C = 25^{\circ}\text{C}$	$I_{C\ nom}$ $I_C$	600 900	A A
Periodischer Kollektor Spitzenstrom repetitive peak collector current	$t_p = 1\ \text{ms}, T_C = 80^{\circ}\text{C}$	$I_{CRM}$	1200	A
Gesamt-Verlustleistung total power dissipation	$T_C = 25^{\circ}\text{C}$	$P_{tot}$	2800	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	$I_C = 600\ \text{A}, V_{GE} = 15\ \text{V}, T_{vj} = 25^{\circ}\text{C}$ $I_C = 600\ \text{A}, V_{GE} = 15\ \text{V}, T_{vj} = 125^{\circ}\text{C}$	$V_{CE\ sat}$		1,70 2,00	2,15	V V
Gate-Schwellenspannung gate threshold voltage	$I_C = 24,0\ \text{mA}, V_{CE} = V_{GE}, T_{vj} = 25^{\circ}\text{C}$	$V_{GEth}$	5,0	5,8	6,5	V
Gateladung gate charge	$V_{GE} = -15\ \text{V} \dots +15\ \text{V}$	$Q_G$		5,60		$\mu\text{C}$
Interner Gatewiderstand internal gate resistor	$T_{vj} = 25^{\circ}\text{C}$	$R_{Gint}$		1,3		$\Omega$
Eingangskapazität input capacitance	$f = 1\ \text{MHz}, T_{vj} = 25^{\circ}\text{C}, V_{CE} = 25\ \text{V}, V_{GE} = 0\ \text{V}$	$C_{ies}$		42,0		nF
Rückwirkungskapazität reverse transfer capacitance	$f = 1\ \text{MHz}, T_{vj} = 25^{\circ}\text{C}, V_{CE} = 25\ \text{V}, V_{GE} = 0\ \text{V}$	$C_{res}$		1,70		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)	$I_C = 600\ \text{A}, V_{CE} = 600\ \text{V}$ $V_{GE} = \pm 15\ \text{V}, R_{Gon} = 1,2\ \Omega, T_{vj} = 25^{\circ}\text{C}$ $V_{GE} = \pm 15\ \text{V}, R_{Gon} = 1,2\ \Omega, T_{vj} = 125^{\circ}\text{C}$	$t_{d\ on}$		0,25 0,30		$\mu\text{s}$ $\mu\text{s}$
Anstiegszeit (induktive Last) rise time (inductive load)	$I_C = 600\ \text{A}, V_{CE} = 600\ \text{V}$ $V_{GE} = \pm 15\ \text{V}, R_{Gon} = 1,2\ \Omega, T_{vj} = 25^{\circ}\text{C}$ $V_{GE} = \pm 15\ \text{V}, R_{Gon} = 1,2\ \Omega, T_{vj} = 125^{\circ}\text{C}$	$t_r$		0,09 0,10		$\mu\text{s}$ $\mu\text{s}$
Abschaltverzögerungszeit (ind. Last) turn-off delay time (inductive load)	$I_C = 600\ \text{A}, V_{CE} = 600\ \text{V}$ $V_{GE} = \pm 15\ \text{V}, R_{Goff} = 1,2\ \Omega, T_{vj} = 25^{\circ}\text{C}$ $V_{GE} = \pm 15\ \text{V}, R_{Goff} = 1,2\ \Omega, T_{vj} = 125^{\circ}\text{C}$	$t_{d\ off}$		0,55 0,65		$\mu\text{s}$ $\mu\text{s}$
Fallzeit (induktive Last) fall time (inductive load)	$I_C = 600\ \text{A}, V_{CE} = 600\ \text{V}$ $V_{GE} = \pm 15\ \text{V}, R_{Goff} = 1,2\ \Omega, T_{vj} = 25^{\circ}\text{C}$ $V_{GE} = \pm 15\ \text{V}, R_{Goff} = 1,2\ \Omega, T_{vj} = 125^{\circ}\text{C}$	$t_f$		0,13 0,18		$\mu\text{s}$ $\mu\text{s}$
Einschaltverlustenergie pro Puls turn-on energy loss per pulse	$I_C = 600\ \text{A}, V_{CE} = 600\ \text{V}, L_S = 85\ \text{nH}$ $V_{GE} = \pm 15\ \text{V}, R_{Gon} = 1,2\ \Omega, T_{vj} = 25^{\circ}\text{C}$ $V_{GE} = \pm 15\ \text{V}, R_{Gon} = 1,2\ \Omega, T_{vj} = 125^{\circ}\text{C}$	$E_{on}$		50,0		mJ mJ
Abschaltverlustenergie pro Puls turn-off energy loss per pulse	$I_C = 600\ \text{A}, V_{CE} = 600\ \text{V}, L_S = 85\ \text{nH}$ $V_{GE} = \pm 15\ \text{V}, R_{Goff} = 1,2\ \Omega, T_{vj} = 25^{\circ}\text{C}$ $V_{GE} = \pm 15\ \text{V}, R_{Goff} = 1,2\ \Omega, T_{vj} = 125^{\circ}\text{C}$	$E_{off}$		88,0		mJ mJ
Kurzschlußverhalten SC data	$t_p \leq 10\ \mu\text{s}, V_{GE} \leq 15\ \text{V}$ $T_{vj} \leq 125^{\circ}\text{C}, V_{CC} = 900\ \text{V}, V_{CEmax} = V_{CES} - L_{sCE} \cdot di/dt$	$I_{SC}$		2400		A
Innerer Wärmewiderstand thermal resistance, junction to case	pro IGBT per IGBT	$R_{thJC}$			0,045	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		$I_F$	600	A
Periodischer Spitzenstrom repetitive peak forward current	$t_p = 1\text{ ms}$	$I_{FRM}$	1200	A
Grenzlastintegral $I^2t$ - value	$V_R = 0\text{ V}, t_p = 10\text{ ms}, T_{vj} = 125^{\circ}\text{C}$	$I^2t$	72000	A <sup>2</sup> s

**Charakteristische Werte / characteristic values**

			min.	typ.	max.	
Durchlassspannung forward voltage	$I_F = 600\text{ A}, V_{GE} = 0\text{ V}, T_{vj} = 25^{\circ}\text{C}$ $I_F = 600\text{ A}, V_{GE} = 0\text{ V}, T_{vj} = 125^{\circ}\text{C}$	$V_F$		1,65 1,65	2,15	V V
Rückstromspitze peak reverse recovery current	$I_F = 600\text{ A}, -di_F/dt = 7000\text{ A}/\mu\text{s}$ $V_R = 600\text{ V}, V_{GE} = -15\text{ V}, T_{vj} = 25^{\circ}\text{C}$ $V_R = 600\text{ V}, V_{GE} = -15\text{ V}, T_{vj} = 125^{\circ}\text{C}$	$I_{RM}$		420 540		A A
Sperrverzögerungsladung recovered charge	$I_F = 600\text{ A}, -di_F/dt = 7000\text{ A}/\mu\text{s}$ $V_R = 600\text{ V}, V_{GE} = -15\text{ V}, T_{vj} = 25^{\circ}\text{C}$ $V_R = 600\text{ V}, V_{GE} = -15\text{ V}, T_{vj} = 125^{\circ}\text{C}$	$Q_r$		60,0 115		$\mu\text{C}$ $\mu\text{C}$
Abschaltenergie pro Puls reverse recovery energy	$I_F = 600\text{ A}, -di_F/dt = 7000\text{ A}/\mu\text{s}$ $V_R = 600\text{ V}, V_{GE} = -15\text{ V}, T_{vj} = 25^{\circ}\text{C}$ $V_R = 600\text{ V}, V_{GE} = -15\text{ V}, T_{vj} = 125^{\circ}\text{C}$	$E_{rec}$		28,0 52,0		mJ mJ
Innerer Wärmewiderstand thermal resistance, junction to case	pro Diode per diode	$R_{thJC}$			0,08	K/W

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**Modul / module**

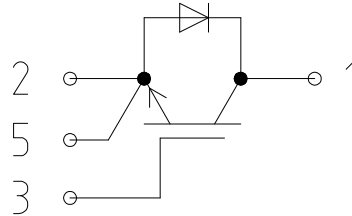
Isolations-Prüfspannung insulation test voltage	RMS, f = 50 Hz, t = 1 min.	V <sub>ISO</sub>	2,5		kV
Material Modulgrundplatte material of module baseplate			Cu		
Material für innere Isolation material for internal insulation			Al <sub>2</sub> O <sub>3</sub>		
Kriechstrecke creepage distance	Kontakt - 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 $\lambda_{\text{Paste}} = 1 \text{ W}/(\text{m}\cdot\text{K}) / \lambda_{\text{grease}} = 1 \text{ W}/(\text{m}\cdot\text{K})$	R <sub>thCH</sub>		0,01	K/W
Modulinduktivität stray inductance module		L <sub>sCE</sub>		16	nH
Modulleitungswiderstand, Anschlüsse - Chip module lead resistance, terminals - chip	T <sub>C</sub> = 25°C, pro Schalter / per switch	R <sub>CC'+EE'</sub>		0,50	mΩ
Höchstzulässige Sperrschichttemperatur maximum junction temperature		T <sub>vj max</sub>			150 °C
Temperatur im Schaltbetrieb temperature under switching conditions		T <sub>vj op</sub>	-40		125 °C
Lagertemperatur storage temperature		T <sub>stg</sub>	-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 M4 Schraube / screw M6	M	1,1 2,5	- -	2,0 5,0 Nm
Gewicht weight		G		340	g

**Mit dieser technischen Information werden Halbleiterbauelemente spezifiziert, jedoch keine Eigenschaften zugesichert. Sie gilt in Verbindung mit den zugehörigen technischen Erläuterungen.**

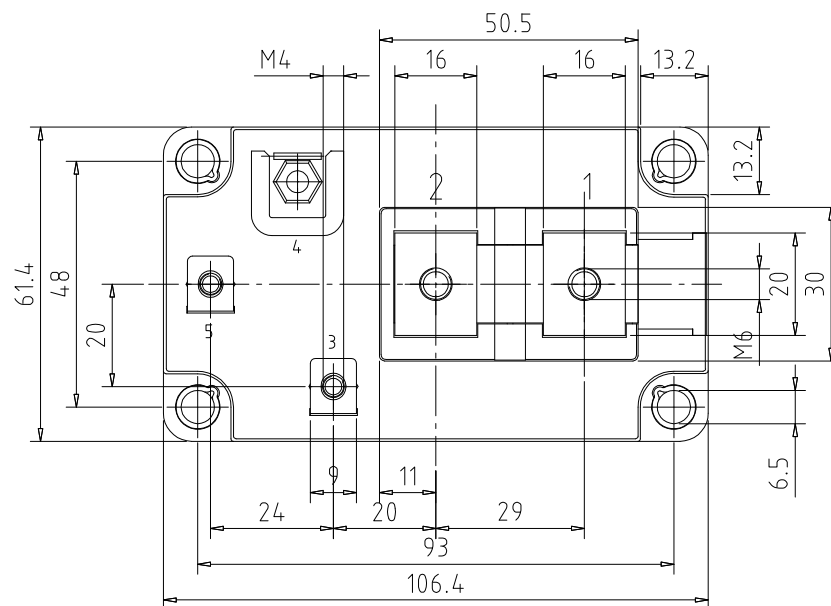
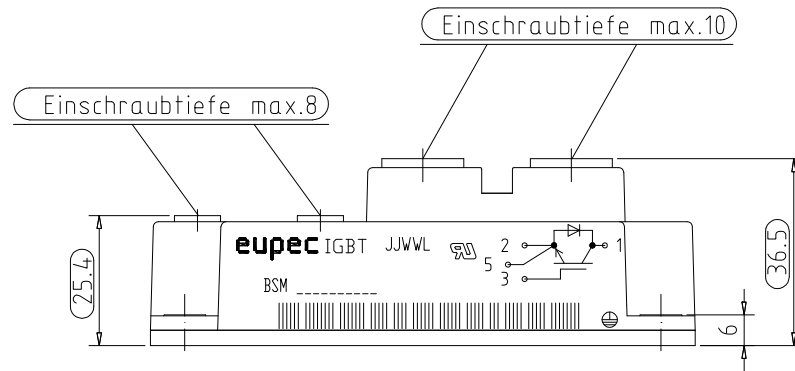
**This technical information specifies semiconductor devices but guarantees no characteristics. It is valid with the appropriate technical explanations.**

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## Schaltplan / circuit diagram



## Gehäuseabmessungen / package outlines



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