

Technische Information / Technical Information

IGBT-Module
IGBT-Modules

DD 400 S 33 K2

eupec



Datenblatt datasheet

Höchstzulässige Werte / Maximum rated values

Elektrische Eigenschaften / Electrical properties

Periodische Spitzensperrspannung repetitive peak reverse voltage	$T_J = 25^\circ\text{C}$ $T_J = -25^\circ\text{C}$	V_R	3300 3300	V
Dauergleichstrom DC forward current		I_F	400	A
Periodischer Spitzenstrom repetitive peak forw. current	$t_p = 1 \text{ ms}$	I_{FRM}	800	A
Grenzlastintegral der Diode I^2t - value, Diode	$V_R = 0V$, $t_p = 10\text{ms}$, $T_{vj} = 125^\circ\text{C}$	I^2t	55.600	A^2s
Spitzenverlustleistung der Diode maximum power dissipation diode	$T_J = 125^\circ\text{C}$	P_{RQM}	400	kW
Isolations-Prüfspannung insulation test voltage	RMS, $f = 50 \text{ Hz}$, $t = 1 \text{ min.}$	V_{ISOL}	6.000	V
Teilentladungs-Aussetzspannung partial discharge extinction voltage	RMS, $f = 50 \text{ Hz}$, $Q_{PD} \leq 10 \text{ pC}$ (acc. to IEC 1287)	V_{ISOL}	2.600	V

Charakteristische Werte / Characteristic values

Diode / Diode

			min.	typ.	max.	
Durchlaßspannung forward voltage	$I_F = 400 \text{ A}$, $V_{GE} = 0V$, $T_{vj} = 25^\circ\text{C}$ $I_F = 400 \text{ A}$, $V_{GE} = 0V$, $T_{vj} = 125^\circ\text{C}$	V_F	-	2,80 2,80	3,50 3,50	V V
Sperrstrom reverse current	$V_{CE} = 3300V$, $T_{vj} = 25^\circ\text{C}$ $V_{CE} = 3300V$, $T_{vj} = 125^\circ\text{C}$	I_R	-	0,005 2	0,8 10	mA mA
Rückstromspitze peak reverse recovery current	$I_F = 400 \text{ A}$, $-di_F/dt = 1200 \text{ A}/\mu\text{sec}$ $V_R = 1800V$, $V_{GE} = -10V$, $T_{vj} = 25^\circ\text{C}$ $V_R = 1800V$, $V_{GE} = -10V$, $T_{vj} = 125^\circ\text{C}$	I_{RM}	-	330 350	- -	A A
Sperrverzögerungsladung recovered charge	$I_F = 400 \text{ A}$, $-di_F/dt = 1200 \text{ A}/\mu\text{sec}$ $V_R = 1800V$, $V_{GE} = -10V$, $T_{vj} = 25^\circ\text{C}$ $V_R = 1800V$, $V_{GE} = -10V$, $T_{vj} = 125^\circ\text{C}$	Q_r	-	235 440	- -	μAs μAs
Abschaltenergie pro Puls reverse recovery energy	$I_F = 400 \text{ A}$, $-di_F/dt = 1200 \text{ A}/\mu\text{sec}$ $V_R = 1800V$, $V_{GE} = -10V$, $T_{vj} = 25^\circ\text{C}$ $V_R = 1800V$, $V_{GE} = -10V$, $T_{vj} = 125^\circ\text{C}$	E_{rec}	-	245 500	- -	mWs mWs
Modulinduktivität stray inductance module	pro Diode / per diode	L_{sCE}	-	25	-	nH
Modul-Leitungswiderstand, Anschlüsse - Chip lead resistance, terminals - chip	$T = 25^\circ\text{C}$, pro Diode / per diode	R_{CC+EE}	-	0,39	-	m Ω

prepared by: Jürgen Göttert

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Thermische Eigenschaften / Thermal properties

			min.	typ.	max.	
Innerer Wärmewiderstand thermal resistance, junction to case	pro Diode / per diode	R_{thJC}	-	-	0,0510	K/W
	pro Modul / per module		-	-	0,0255	K/W
Übergangs-Wärmewiderstand thermal resistance, case to heatsink	pro Modul / per module $\lambda_{paste} = 1 \text{ W/m}^2\text{K} / \lambda_{grease} = 1 \text{ W/m}^2\text{K}$	R_{thCK}	-	0,006	-	K/W
Höchstzulässige Sperrschichttemperatur maximum junction temperature		T_{vj}	-	-	150	°C
Betriebstemperatur operation temperature		T_{op}	-40	-	125	°C
Lagertemperatur storage temperature		T_{stg}	-40	-	125	°C

Mechanische Eigenschaften / Mechanical properties

Gehäuse, siehe Anlage case, see appendix				
Material Modulgrundplatte material of module baseplate			AlSiC	
Innere Isolation internal insulation			AlN	
Kriechstrecke creepage distance			32,2	mm
Luftstrecke clearance			19,1	mm
CTI comperative tracking index			> 400	
Anzugsdrehmoment f. mech. Befestigung mounting torque		M1	5	Nm
Anzugsdrehmoment f. elektr. Anschlüsse terminal connection torque	terminals M4	M2	2	Nm
	terminals M8		8 .. 10	Nm
Gewicht weight		G	1000	g

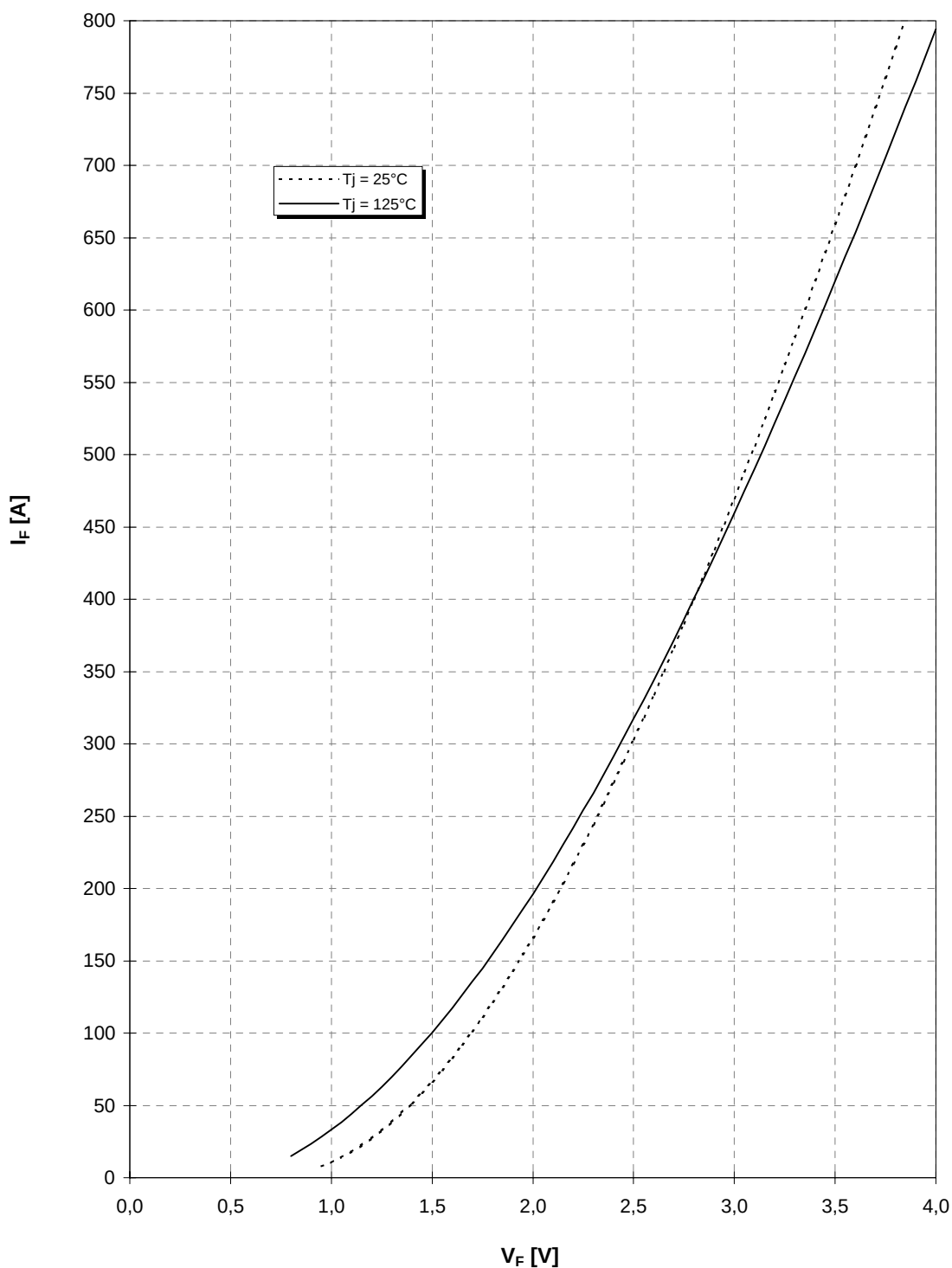
Mit dieser technischen Information werden Halbleiterbauelemente spezifiziert, jedoch keine Eigenschaften zugesichert. Sie gilt in Verbindung mit den zugehörigen Technischen Erläuterungen.

This technical information specifies semiconductor devices but promises no characteristics. It is valid in combination with the belonging technical notes.



Durchlaßkennlinie der Inversdiode (typisch)
Forward characteristic of inverse diode (typical)

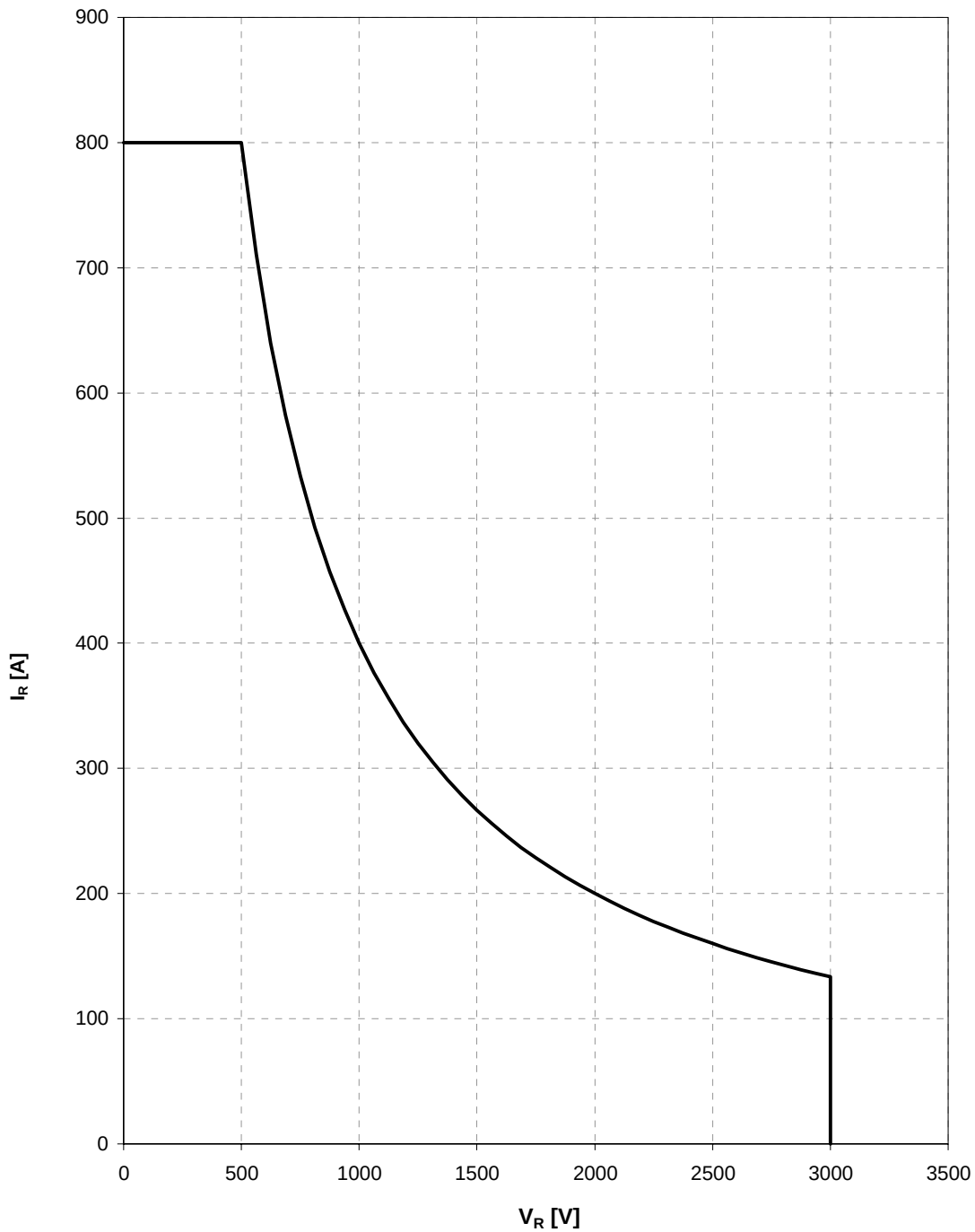
$$I_F = f(V_F)$$





Sicherer Arbeitsbereich Diode (SOA)
safe operation area Diode (SOA)

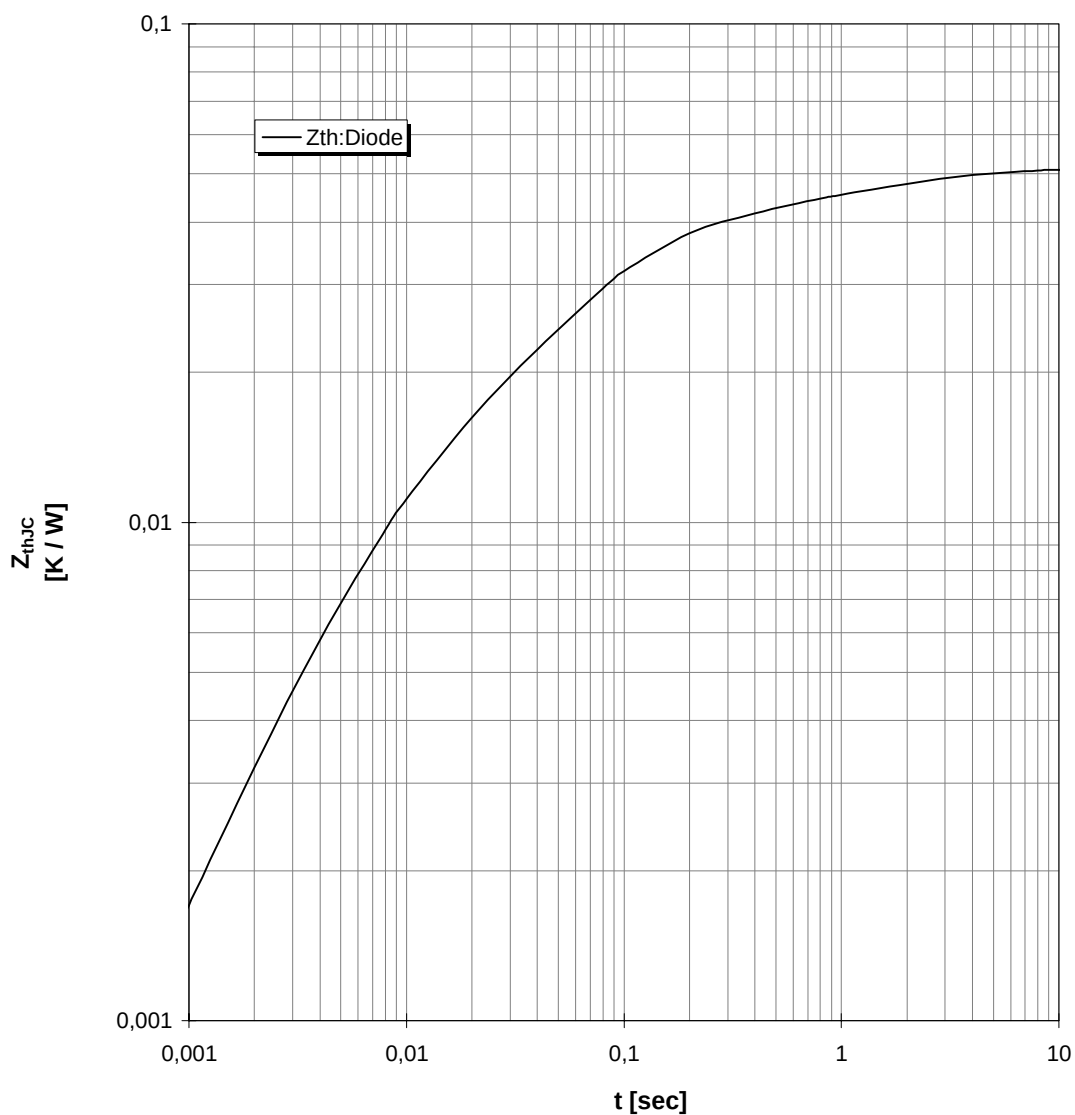
$T_{vj} = 125^{\circ}\text{C}$





Transienter Wärmewiderstand
Transient thermal impedance

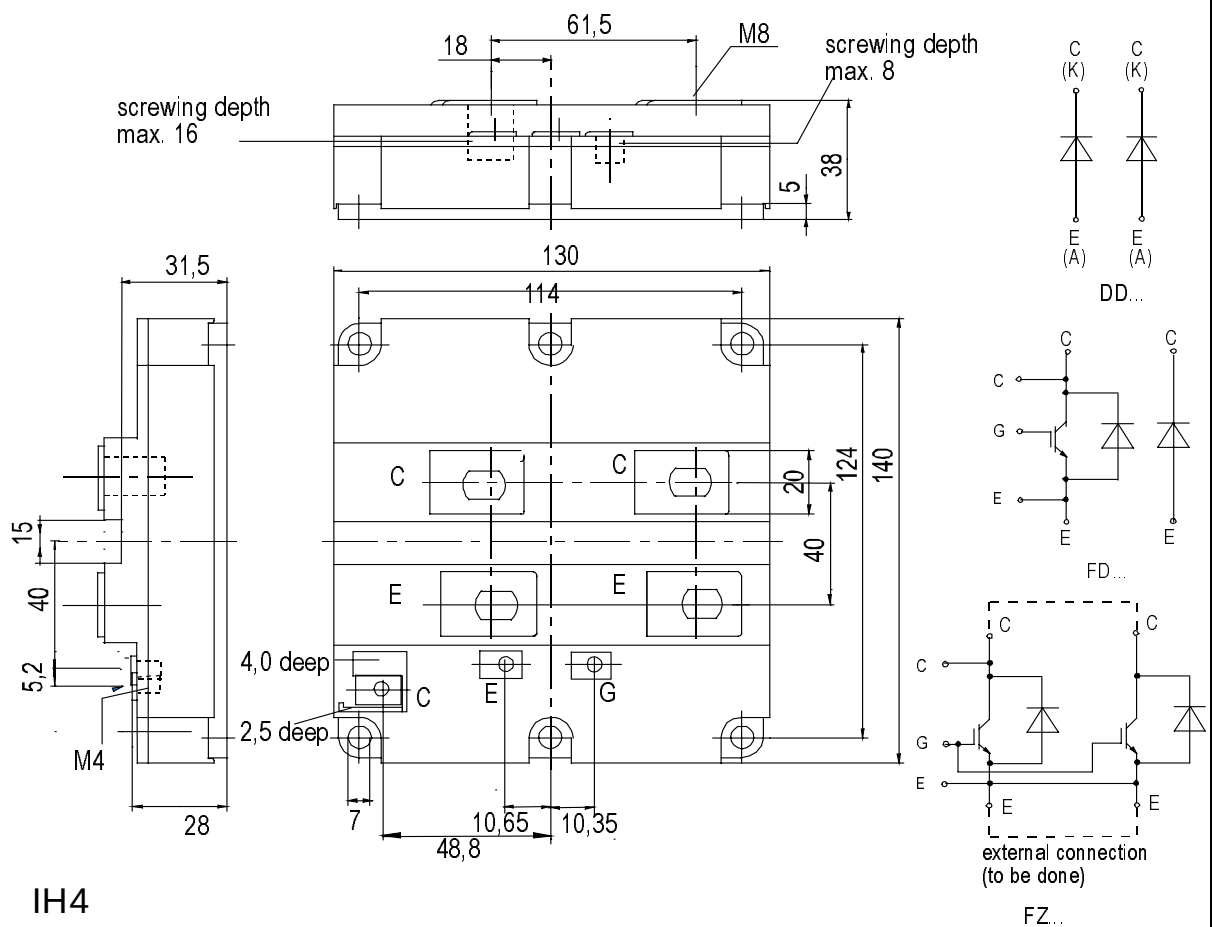
$$Z_{thJC} = f(t)$$



i	1	2	3	4
r_i [K/kW] : Diode	9,34	25,47	7,57	8,63
τ_i [sec] : Diode	0,0068	0,0642	0,3209	2,0212



Gehäusemaße / Schaltbild
Package outline / Circuit diagram



IH4

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