

Elektrische Eigenschaften / Electrical properties

Höchstzulässige Werte / Maximum rated values

Gleichrichterdiode / Rectifierdiode				
Periodische Spitzensperrspannung repetitive peak reverse voltage	$T_{vj} = -40^{\circ}\text{C} \dots T_{vj\text{max}}$	V_{RRM}	1600	V
Durchlaßstrom-Grenzeffektivwert (pro Element) RMS forward current (per chip)		I_{FRMSM}	80	A
Ausgangsstrom output current	$T_C = 100^{\circ}\text{C}$	I_d	134	A
Stoßstrom-Grenzwert surge forward current	$T_{vj} = 25^{\circ}\text{C}, t_p = 10\text{ms}$	I_{FSM}	650	A
	$T_{vj} = T_{vj\text{max}}, t_p = 10\text{ms}$		550	A
Grenzlastintegral I^2t -value	$T_{vj} = 25^{\circ}\text{C}, t_p = 10\text{ms}$	I^2t	2100	A^2s
	$T_{vj} = T_{vj\text{max}}, t_p = 10\text{ms}$		1500	A^2s
IGBT				
Kollektor-Emitter-Sperrspannung collector-emitter voltage		V_{CES}	1200	V
Kollektor-Dauergleichstrom DC-collector current	$T_C = 80^{\circ}\text{C}$	I_C	70	A
Periodischer Kollektor-Spitzenstrom repetitive peak collector current	$t_p = 1\text{ms}, T_C = 80^{\circ}\text{C}$	I_{CRM}	150	A
Gesamt-Verlustleistung total power dissipation	$T_C = 25^{\circ}\text{C}$	P_{tot}	500	W
Gate-Emitter Spitzenspannung gate-emitter peak voltage		V_{GE}	± 20	V
Schnelle Diode / Fast diode				
Periodische Spitzensperrspannung repetitive peak reverse voltage		V_{RRM}	1200	V
Dauergleichstrom DC forward current	$T_C = 80^{\circ}\text{C}$	I_F	35	A
Periodischer Spitzenstrom repetitive peak forward current	$t_p = 1\text{ms}$	I_{FRM}	70	A
Modul				
Isolations-Prüfspannung insulation test voltage	RMS, $f = 50\text{Hz}, t = 1\text{min}$ NTC connected to baseplate	V_{ISOL}	2,5	kV

Charakteristische Werte / Characteristic values

Gleichrichterdiode / Rectifierdiode			min.	typ.	max.	
Durchlaßspannung forward voltage	$T_{vj} = T_{vj\text{max}}, i_F = 100\text{A}$	V_F			1,35	V
Schleusenspannung threshold voltage	$T_{vj} = T_{vj\text{max}}$	$V_{(TO)}$			0,75	V
Ersatzwiderstand forward slope resistance	$T_{vj} = T_{vj\text{max}}$	r_T			6,3	$\text{m}\Omega$
Sperrstrom reverse current	$T_{vj} = T_{vj\text{max}}, V_R = V_{RRM}$	i_R			5	mA
Modul Leitungswiderstand, Anschlüsse-Chip lead resistance, terminals-chip	$T_C = 25^{\circ}\text{C}$	$R_{AA'+KK'}$			1	$\text{m}\Omega$

prepared by: Ralf Jörke	date of publication: 13.12.2000
approved by: Lothar Kleber	revision: 1

Elektrische Eigenschaften / Electrical properties

Charakteristische Werte / Characteristic values

IGBT			min.	typ.	max.	
Kollektor-Emitter Sättigungsspannung collector-emitter saturation voltage	$T_{vj} = 25^{\circ}\text{C}, i_C = 70\text{A}, v_{GE} = 15\text{V}$ $T_{vj} = 125^{\circ}\text{C}, i_C = 70\text{A}, v_{GE} = 15\text{V}$	$V_{CE\text{ sat}}$		2,05 2,40	2,75	V
Gate-Emitter-Schwellspannung gate-emitter threshold voltage	$T_{vj} = 25^{\circ}\text{C}, i_C = 3\text{mA}, v_{GE} = v_{CE}$	$V_{GE(TO)}$	4,5	5,5	6,5	V
Eingangskapazität input capacitance	$T_{vj} = 25^{\circ}\text{C}, f_0 = 1\text{MHz},$ $v_{CE} = 25\text{V}, v_{GE} = 0\text{V}$	C_{ies}		5,1		nF
Kollektor-Emitter Reststrom collector-emitter cut-off current	$T_{vj} = 25^{\circ}\text{C}, v_{CE} = 1200\text{V}, v_{GE} = 0\text{V}$ $T_{vj} = 125^{\circ}\text{C}, v_{CE} = 1200\text{V}, v_{GE} = 0\text{V}$	i_{CES}		10 500	500	μA
Gate-Emitter Reststrom gate leakage current	$T_{vj} = 25^{\circ}\text{C}, v_{CE} = 0\text{V}, v_{GE} = 20\text{V}$	i_{GES}			400	nA
Emitter-Gate Reststrom gate-leakage current	$T_{vj} = 25^{\circ}\text{C}, v_{CE} = 0\text{V}, v_{EG} = 20\text{V}$	i_{EGS}			400	nA
Schnelle Diode / Fast diode						
Durchlaßspannung forward voltage	$T_{vj} = 25^{\circ}\text{C}, i_F = 35\text{A}$ $T_{vj} = 125^{\circ}\text{C}, i_F = 35\text{A}$	V_F		1,85 1,75	2,40	V
Sperrverzögerungsladung recovered charge	$i_{FM} = 35\text{A}, -di/dt = 900\text{A}/\mu\text{s}, v_R = 600\text{V}$ $T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	Q_r		3,6 7,6		μAs μAs

Thermische Eigenschaften / Thermal properties

Innerer Wärmewiderstand thermal resistance, junction to case	Gleichrichter / Rectifier, $\Theta = 120^{\circ}\text{rect}$ Transistor / Transistor, DC Schnelle Diode / Fast diode, DC	R_{thJC}	max. 0,70 max. 0,25 max. 0,80	$^{\circ}\text{C/W}$ $^{\circ}\text{C/W}$ $^{\circ}\text{C/W}$
Übergangs-Wärmewiderstand thermal resistance, case to heatsink	Gleichrichter / Rectifier Transistor / Transistor Schnelle Diode / Fast diode	R_{thCK}	max. 0,25 max. 0,16 max. 0,24	$^{\circ}\text{C/W}$ $^{\circ}\text{C/W}$ $^{\circ}\text{C/W}$
Höchstzulässige Sperrschichttemperatur max. junction temperature		$T_{vj\text{ max}}$	150	$^{\circ}\text{C}$
Betriebstemperatur operating temperature		$T_{c\text{ op}}$	- 40...+150	$^{\circ}\text{C}$
Lagertemperatur storage temperature		T_{stg}	- 40...+150	$^{\circ}\text{C}$

Mechanische Eigenschaften / Mechanical properties

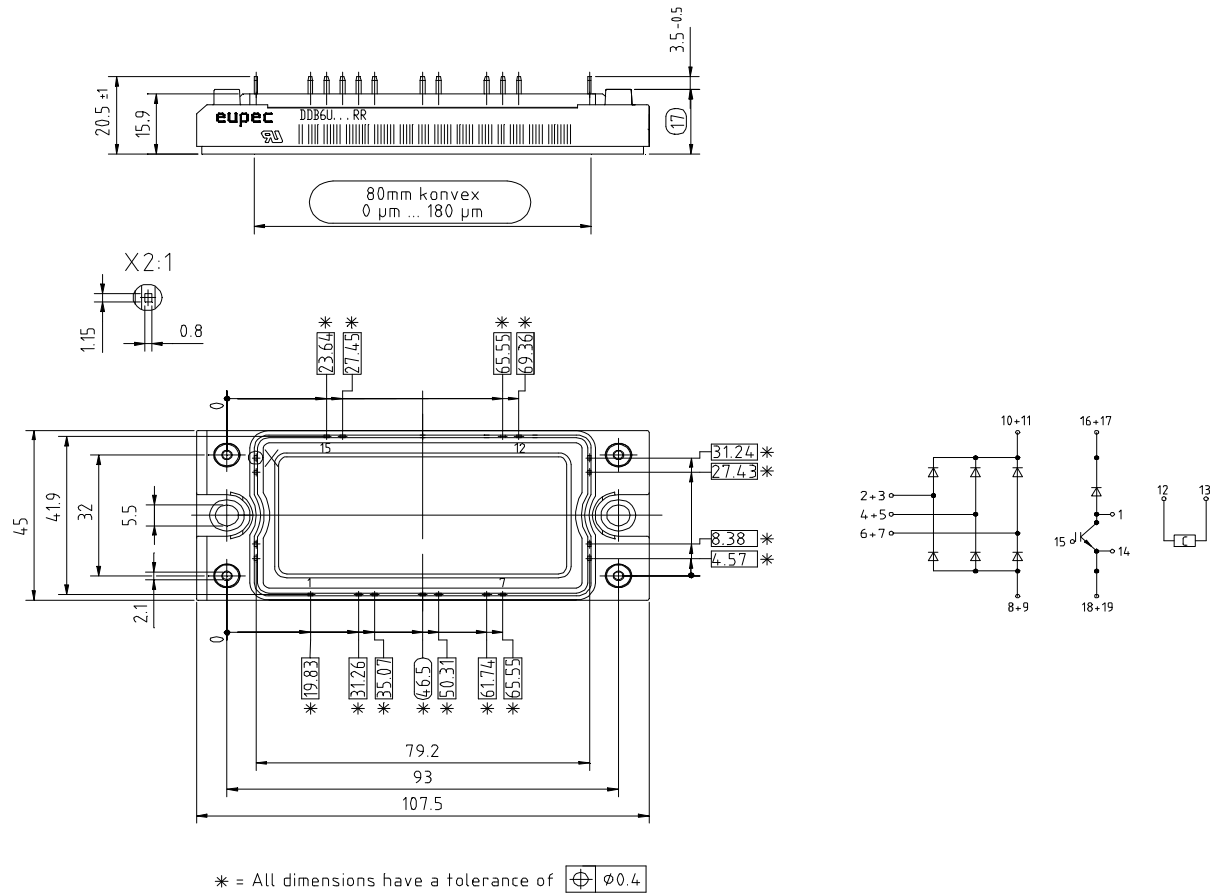
Gehäuse, siehe Anlage case, see appendix			Seite 4 page 4	
Innere Isolation internal insulation			Al ₂ O ₃	
CTI comperative tracking index			225	V
Anzugsdrehmoment für mechanische Befestigung mounting torque	Toleranz / tolerance ±15%	M1	4	Nm
Gewicht weight		G	typ. 185	g
Kriechstrecke creepage distance			12,5	mm
Schwingfestigkeit vibration resistance	f = 50Hz		50	m/s ²

Temperatursensor / Temperature sensor

Nennwiderstand rated resistance	T _C = 25°C R ₁₀₀ = 493Ω ± 5%	R ₂₅	5	kW
Verlustleistung power dissipation	T _C = 25°C	P ₂₅	max. 20	mW
B-Wert B-value	R ₂ = R ₁ exp [B(1/T ₁ - 1/T ₂)]	B _{25/50}	3375	K

Kühlkörper / heatsinks :

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.

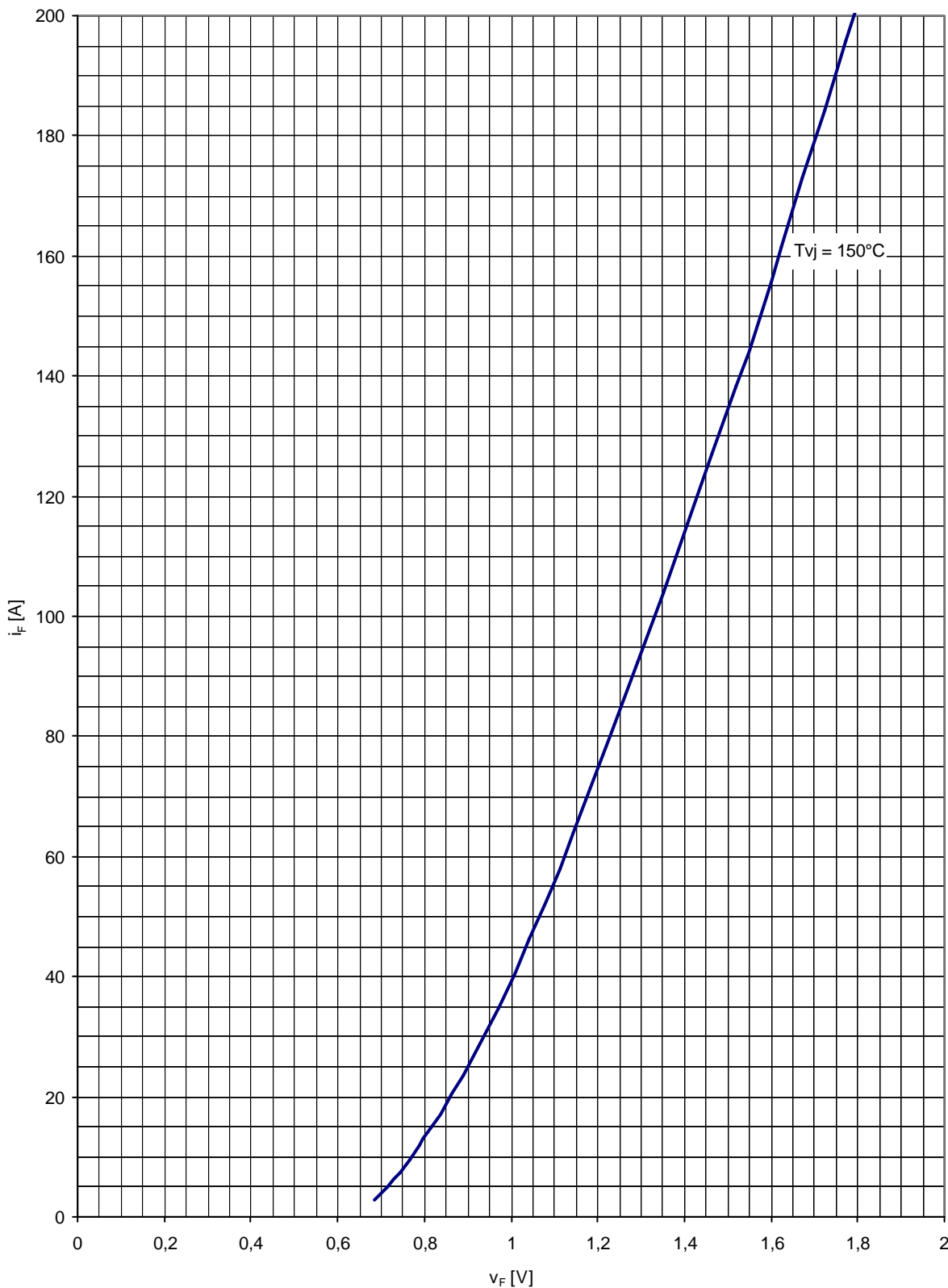


Analytische Elemente des transienten Wärmewiderstandes Z_{thJC} für DC, Netz-Diode

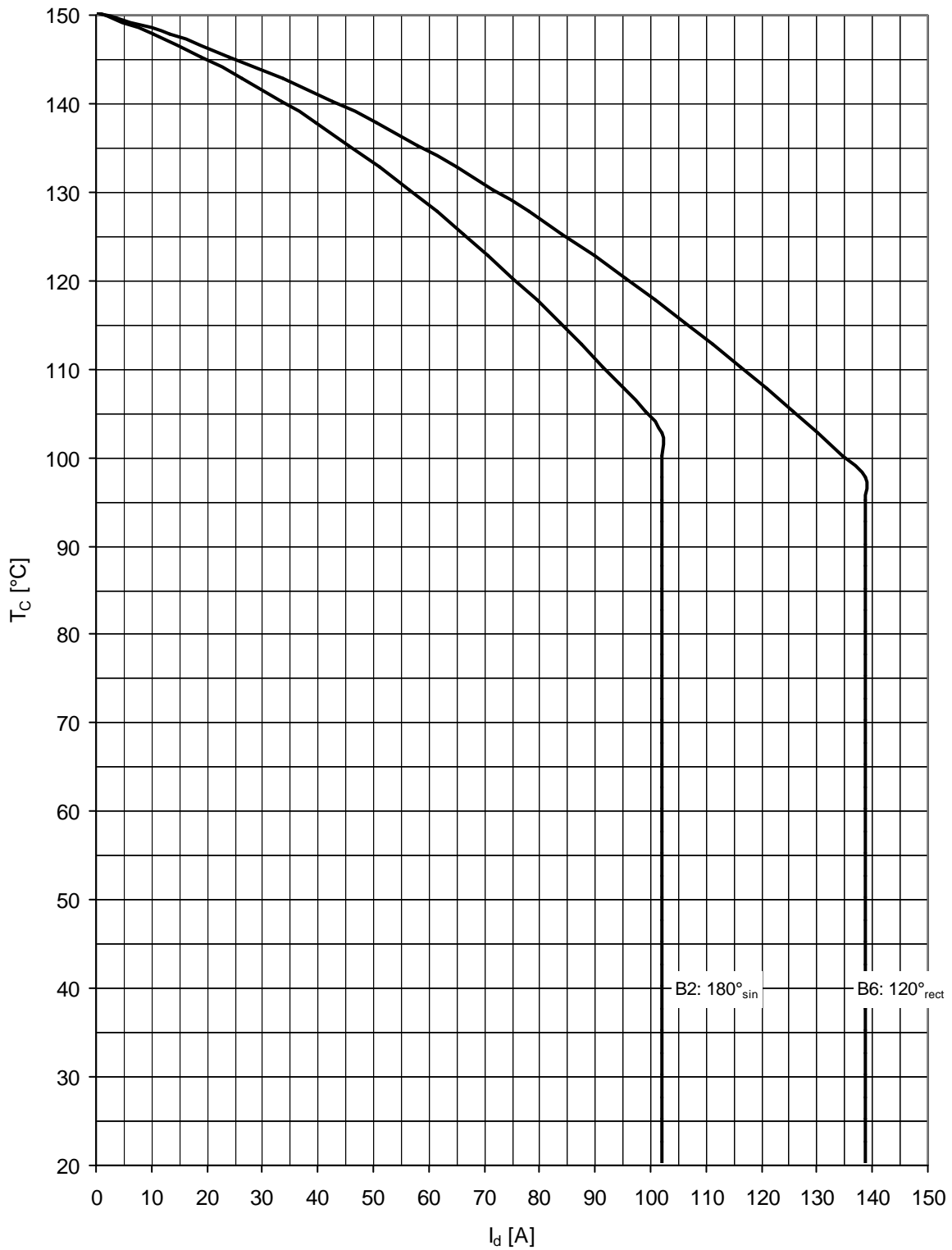
Analytical elements of transient thermal impedance Z_{thJC} for DC, rectifier diode

Pos. n	1	2	3	4	5	6	7
$R_{thn} [^{\circ}C/W]$	0,2633	0,1967	0,0322	0,0200			
$\tau_n [s]$	0,0300	0,0190	0,0140	0,0003			

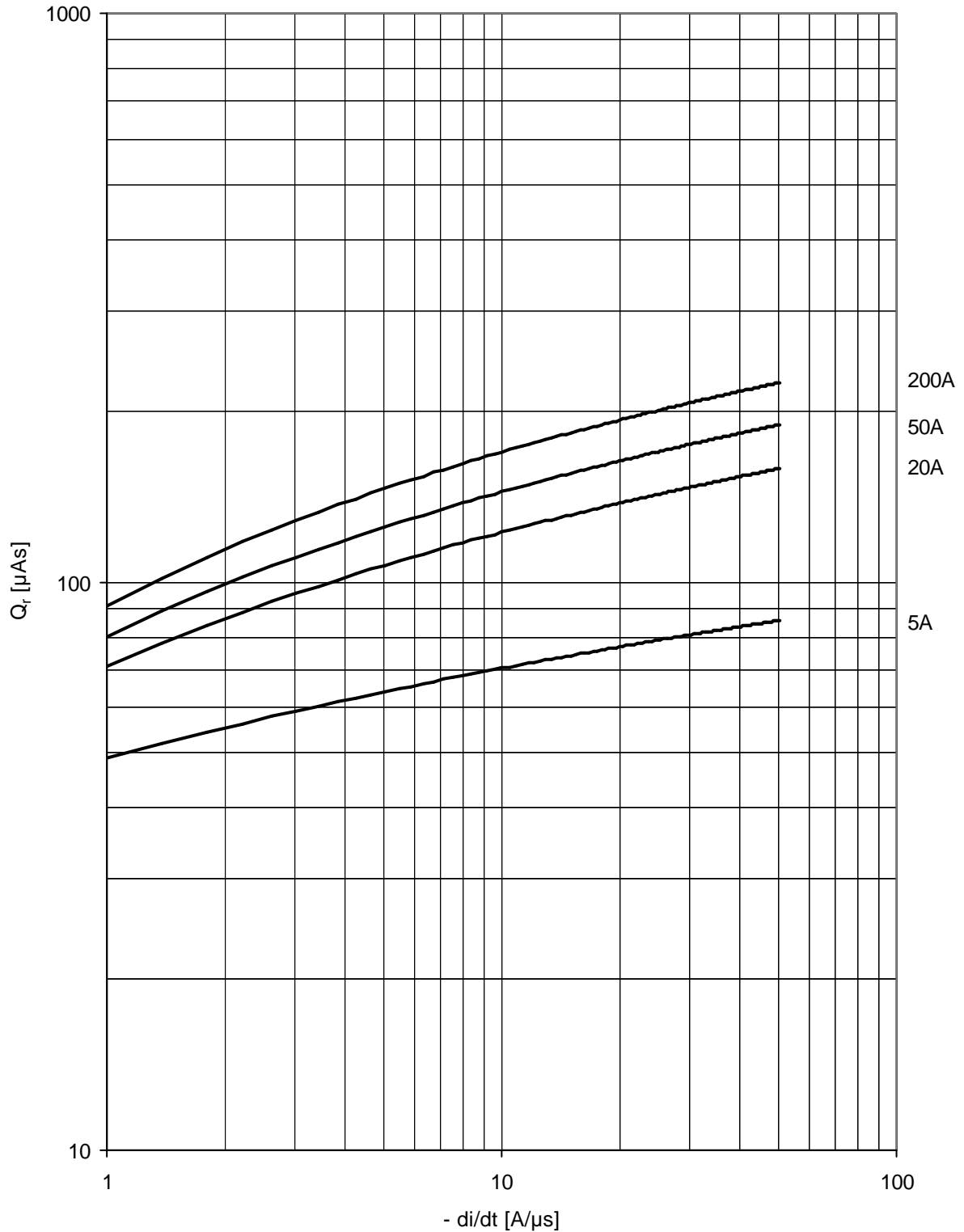
Analytische Funktion:
$$Z_{thJC} = \sum_{n=1}^{n_{max}} R_{thn} \left(1 - e^{-\frac{t}{\tau_n}} \right)$$



Grenzdurchlaßkennlinie / Limiting on-state characteristic $i_F = f(v_F)$



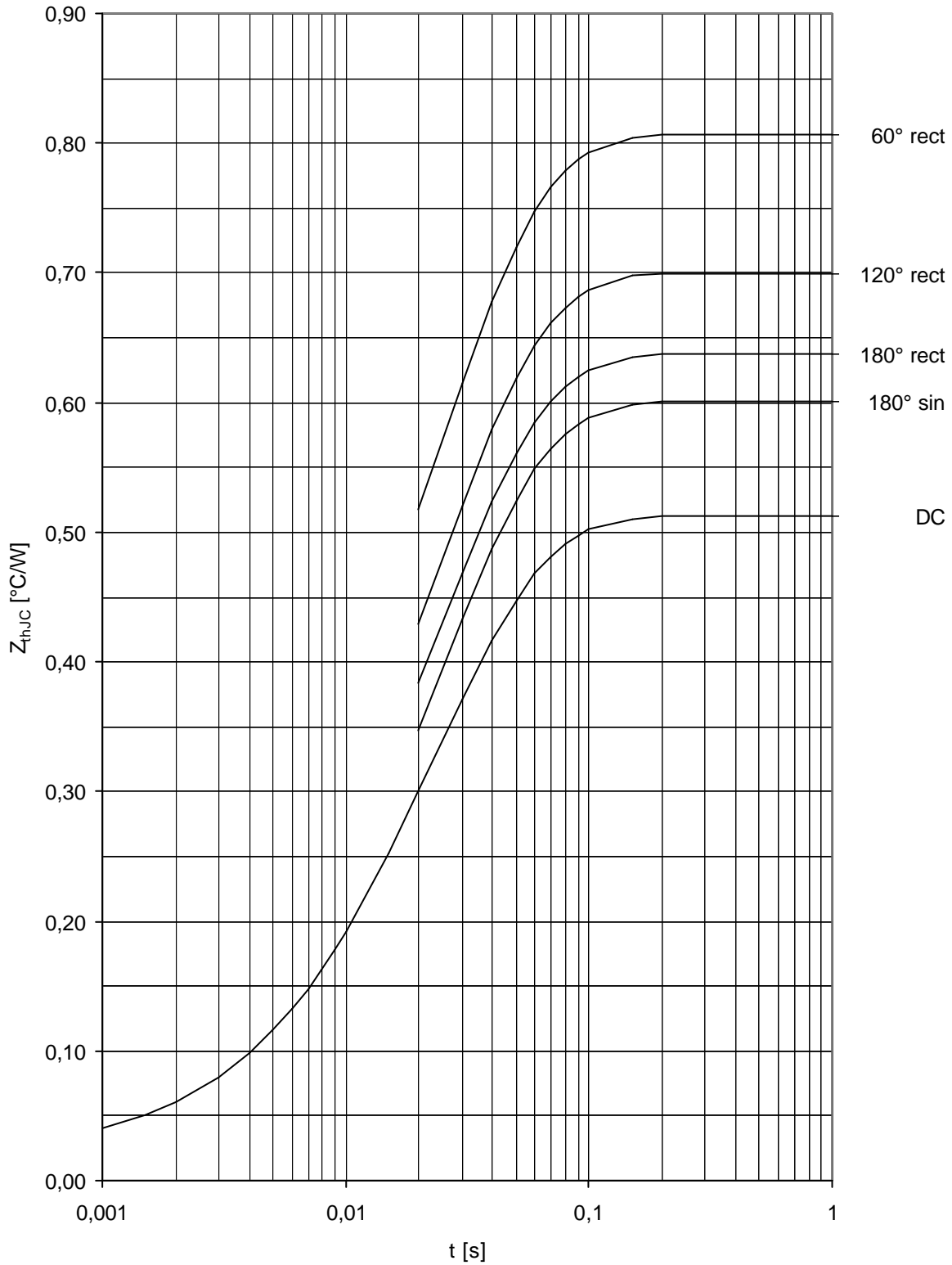
Höchstzulässige Gehäusetemperatur / Maximum allowable case temperatur $T_c = f(I_d)$
 Parameter: Stromrichterschaltung / converter circuit



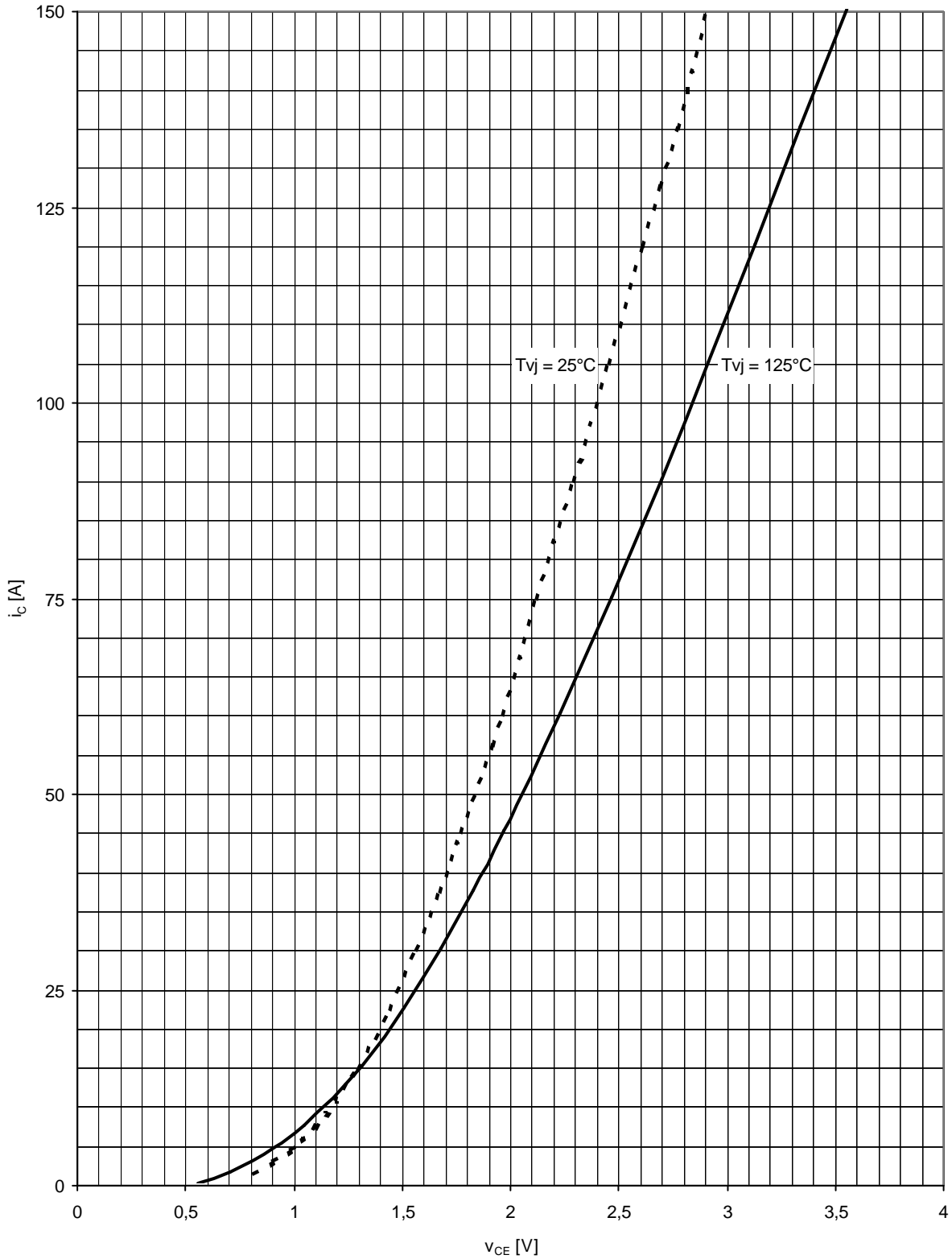
Sperrverzögerungsladung / Recovered charge $Q_r = f(-di/dt)$

$T_{vi} = T_{vi\max}$; $V_R = 0,5V_{RRM}$; $V_{RM} = 0,8V_{RRM}$

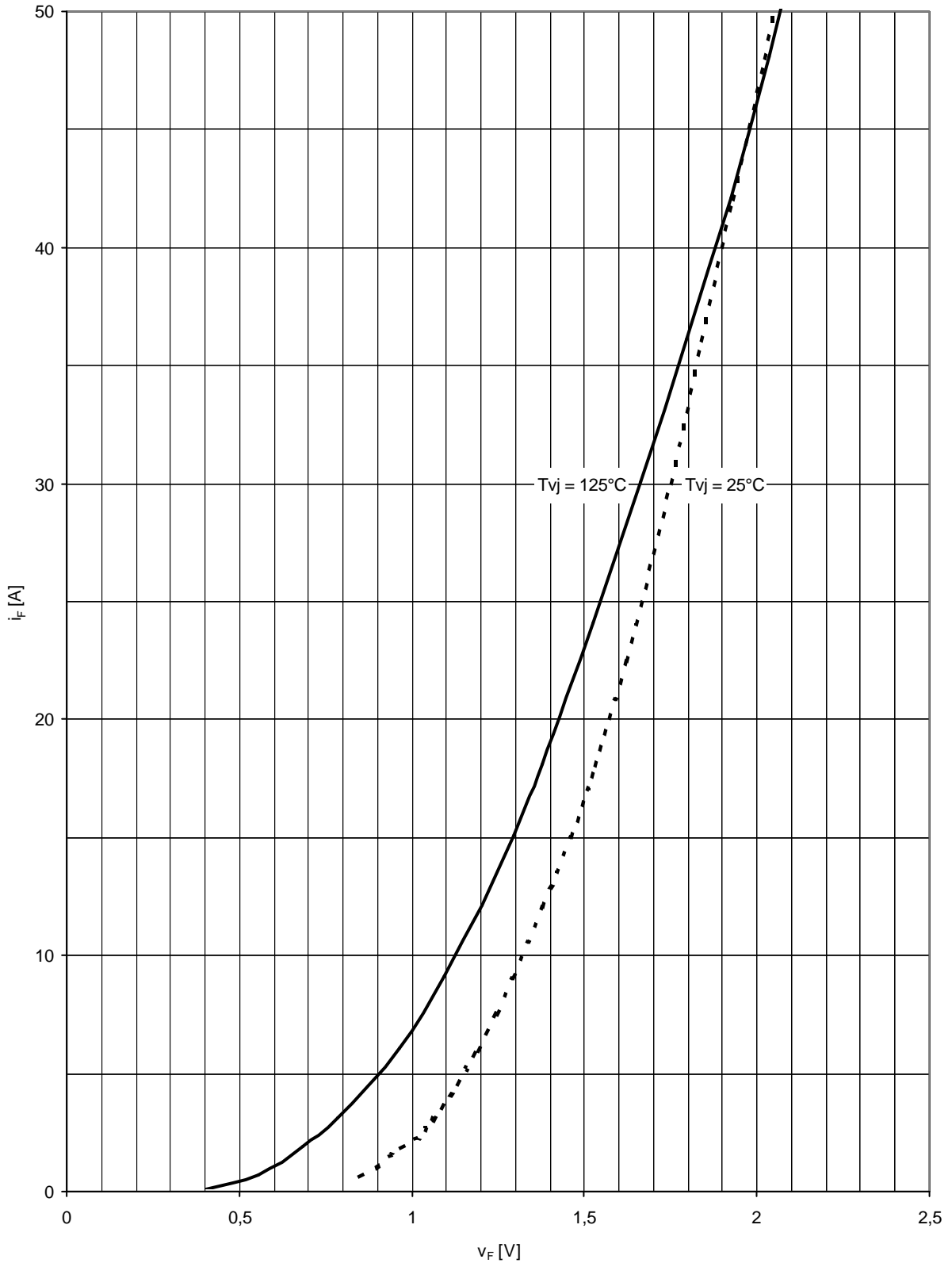
Parameter: Durchlaßstrom / On-state current i_{FM}



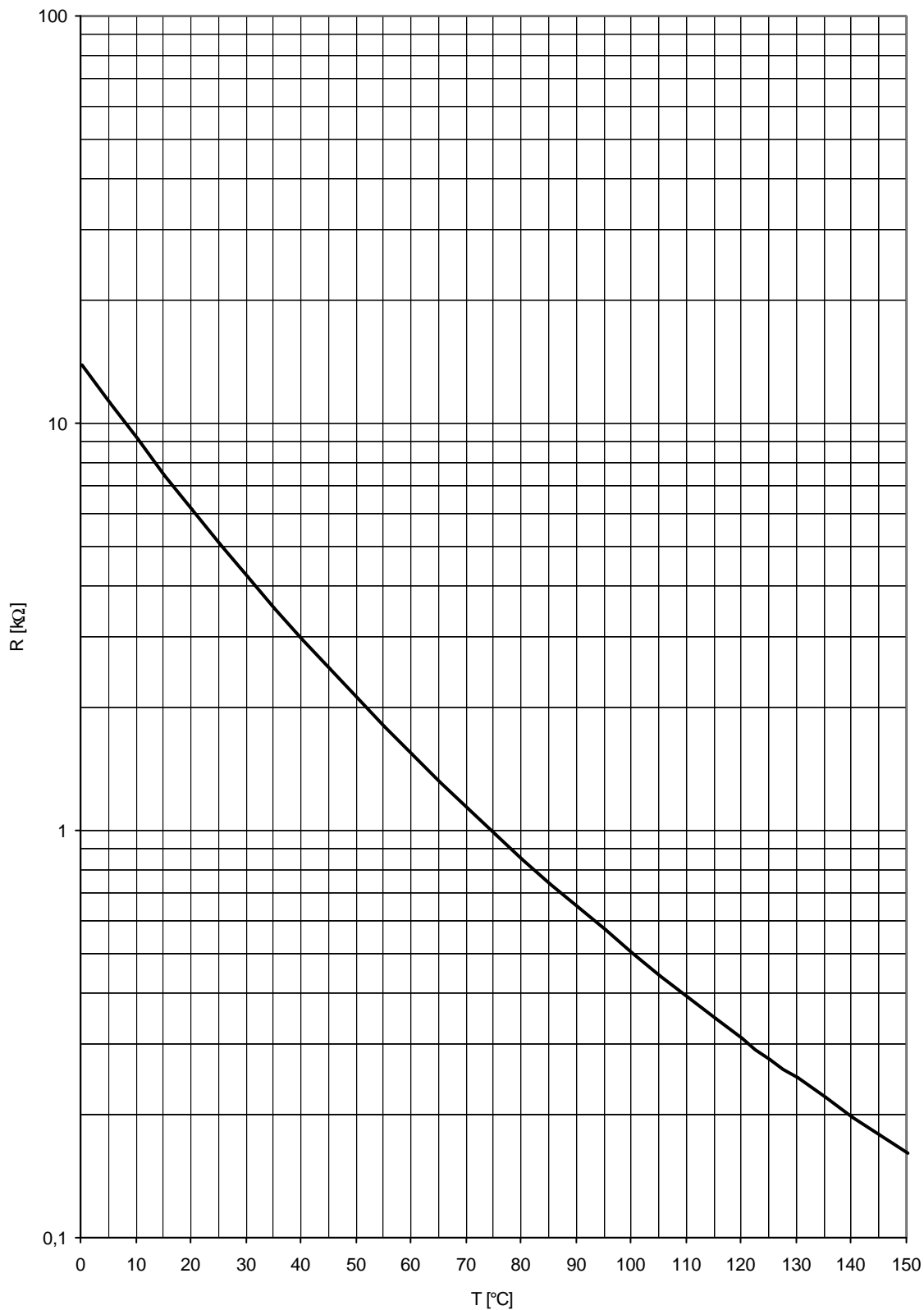
Transienter innerer Wärmewiderstand Gleichrichter / Transient thermal impedance converter $Z_{thJC} = f(t)$
Parameter: Stromflußwinkel / Current conduction angle Q



Ausgangskennlinienfeld Brems-Chopper-IGBT (typisch) / Output characteristic brake-chopper-IGBT (typical)
 $v_{GE} = 15\text{V}$, $i_c = f(v_{CE})$



Durchlaßkennlinie der Brems-Chopper-Diode (typisch) / On-state characteristic of brake-chopper-FWD (typical)
 $i_F = f(v_F)$



NTC-Temperaturkennlinie (typisch) / NTC-temperature characteristic (typical) $R = f(T)$

Terms & Conditions of Usage

Attention

The present product data is exclusively subscribed to technically experienced staff. This Data Sheet is describing the specification of the products for which a warranty is granted exclusively pursuant the terms and conditions of the supply agreement. There will be no guarantee of any kind for the product and its specifications. Changes to the Data Sheet are reserved.

You and your technical departments will have to evaluate the suitability of the product for the intended application and the completeness of the product data with respect to such application. Should you require product information in excess of the data given in the Data Sheet, please contact your local Sales Office via "www.eupec.com / sales & contact".

Warning

Due to technical requirements the products may contain dangerous substances. For information on the types in question please contact your local Sales Office via "www.eupec.com / sales & contact".