Technische Information / Technical Information

eupec

Netz-Thyristor
Phase Control Thyristor

T 508 N 12 ...18

N

Elektrische Eigenschften / Electrical properties

Höchstzulässige Werte / Maximum rated values

Periodische Vorwärts- und Rückwärts-Spitzensperrspannung repetitive peak forward off-state and reverse voltages	T_{vj} = - 40°C...$T_{vj\,max}$	V_{DRM} , V_{RRM}	1200 1600	1400 1800	V V 1)
Vorwärts-Stoßspitzensperrspannung non-repetitive peak foward off-state voltage	T_{vj} = - 40°C...$T_{vj\,max}$	V_{DSM}	1200 1600	1400 1800	V V
Rückwärts-Stoßspitzensperrspannung non-repetitive peak reverse voltage	T_{vj} = + 25°C...$T_{vj\,max}$	V_{RSM}	1300 1700	1500 1900	V V
Durchlaßstrom-Grenzeffektivwert RMSM on-state current		I_{TRSMSM}		800	A
Dauergrenzstrom average on-state current	T_C = 85 °C	I_{TAVM}		508	A
Stoßstrom-Grenzwert surge current	T_{vj} = 25°C, t_p = 10 ms T_{vj} = $T_{vj\,max}$, t_p = 10 ms	I_{TSM}		8000 6900	A A
Grenzlastintegral I²t-value	T_{vj} = 25°C, t_p = 10ms T_{vj} = $T_{vj\,max}$, t_p = 10ms	I²t		320 238	A²s *10³ A²s *10³
Kritische Stromsteilheit critical rate of rise of on-state current	DIN IEC 747-6 f=50 Hz, v_L = 10V, i_{GM} = 1 A di_G/dt = 1 A/µs	$(di_T/dt)_{cr}$		120	A/µs
Kritische Spannungssteilheit critical rate of rise of off-state voltage	T_{vj} = $T_{vj\,max}$, v_D = 0,67 V_{DRM} 5.Kennbuchstabe / 5th letter F	$(dv_D/dt)_{cr}$		1000	V/µs

Charakteristische Werte / Characteristic values

Durchlaßspannung on-state voltage	T_{vj} = $T_{vj\,max}$, i_T = 1600 A	v_T	max.	1,92	V
Schleusenspannung threshold voltage	T_{vj} = $T_{vj\,max}$	$V_{T(TO)}$		0,8	V
Ersatzwiderstand slope resistance	T_{vj} = $T_{vj\,max}$	r_T		0,6	mΩ
Durchlaßkennlinie on-state voltage $v_T = A + B \times i_T + C \times \ln(i_T + 1) + D \times \sqrt{i_T}$	T_{vj} = $T_{vj\,max}$	A= 0,93854 B= 3,384E-04 C=-5,551E-02 D= 2,001E-02			
Zündstrom gate trigger current	T_{vj} = 25°C, v_D = 6 V	I_{GT}	max.	200	mA
Zündspannung gate trigger voltage	T_{vj} = 25°C, v_D = 6V	V_{GT}	max.	2	V
Nicht zündener Steuerstrom gate non-trigger current	T_{vj} = $T_{vj\,max}$, v_D = 6 V T_{vj} = $T_{vj\,max}$,v_D = 0,5 V_{DRM}	I_{GD}	max. max.	10 5	mA mA
Nicht zündene Steuerspannung gate non-trigger voltage	T_{vj} = $T_{vj\,max}$,v_D = 0,5 V_{DRM}	V_{GD}	max.	0,2	mV
Haltestrom holding current	T_{vj} = 25°C, v_D = 6 V, R_A = 5 Ω	I_H	max.	300	mA
Einraststrom latching current	T_{vj} = 25°C, v_D = 6 V, $R_{GK>}$= 10 Ω i_{GM} = 1 A, di_G/dt = 1 A/µs t_g = 20 µs	I_L	max.	1200	mA
Vorwärts- und Rückwärts-Sperrstrom forward off-state and reverse currents	T_{vj} = $T_{vj\,max}$ v_D = V_{DRM}, vR = V_{RRM}	i_D, i_R	max.	50	mA
Zündverzug gate controlled delay time	DIN IEC 747-6 T_{vj} = 25°C i_{GM} = 1 A, di_G/dt = 1 A/µs	t_{gd}	max.	4	µs

1) 1800 V auf Anfrage / 1800 V on demand

Elektrische Eigenschften / Electrical properties

Charakteristische Werte / Characteristic values

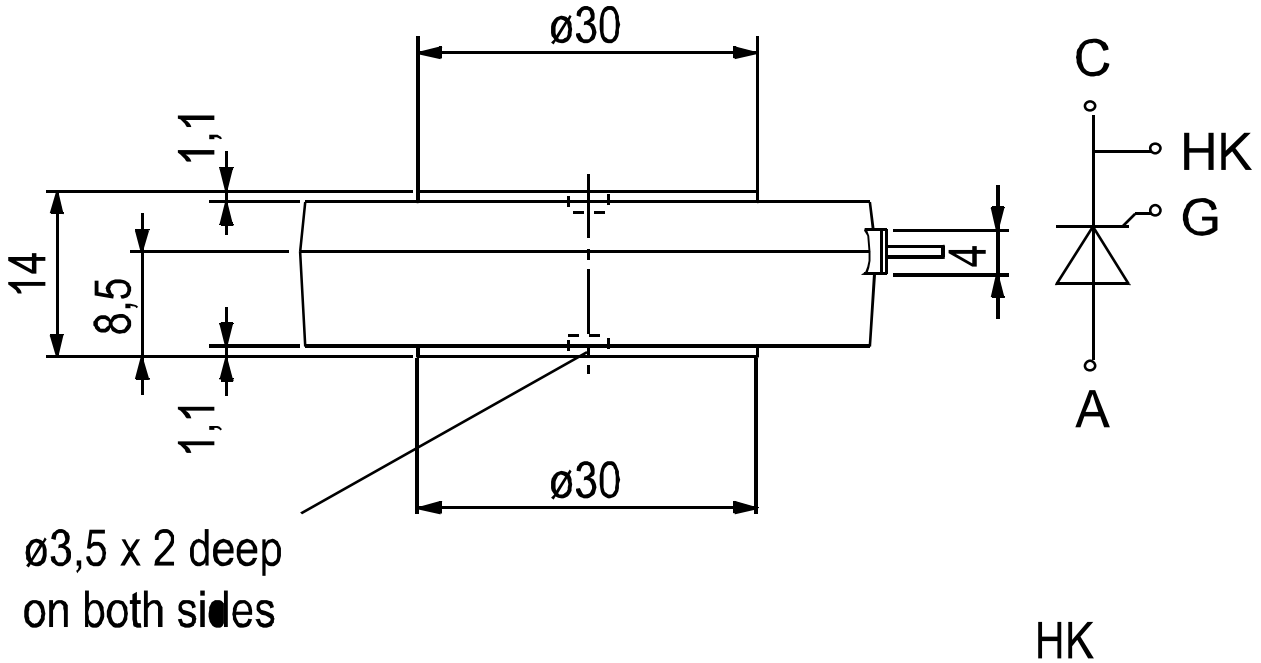
Freiwerdezeit circuit commutatet turn-off time	$T_{vj} = T_{vj\,max}$, $i_{TM}=I_{TAVM}$ v_{RM} =100V, v_{DM} = 0,67 V_{DRM} dv_D/dt = 20 V/µs, $-di_T/dt$ = 10 A/µs 4. Kennbuchstabe / 4th letter O	t_q	typ.	250	µs

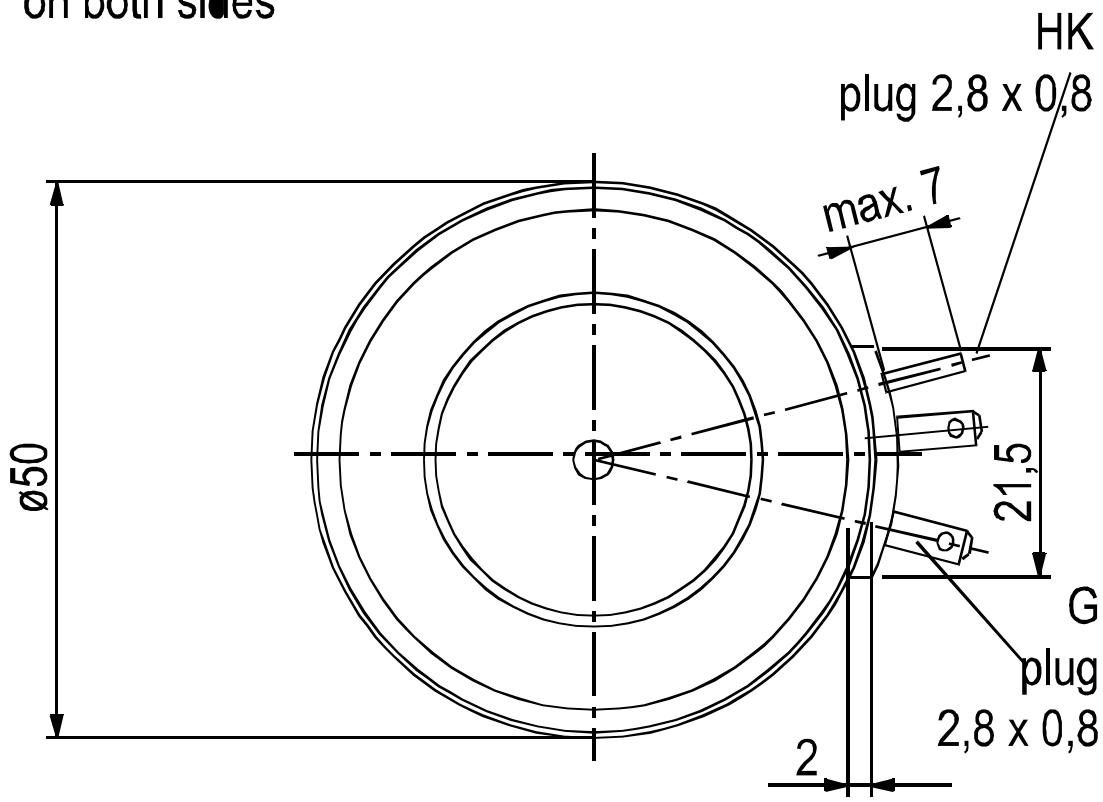
Thermische Eigenschaften / Thermal properties

Innerer Wärmewiderstand thermal resitance, junction to case	Kühlfläche / cooling surface beidseitig / two-sided, ? =180°sin beidseitig / two-sided, DC Anode / anode, ? =180°sin Anode / anode, DC Kathode / cathode, ? =180°sin Kathode / cathode, DC	R_{thJC}	 max. max. max. max. max. max.	 0,0530 0,0500 0,0880 0,0850 0,1230 0,1200	 °C/W °C/W °C/W °C/W °C/W °C/W
Übergangs- Wärmewiderstand thermal resitance, case to heatsink	Kühlfläche / cooling surface beidseitig / two-sided einseitig / single-sided	R_{thCK}	 max. max.	 0,0075 0,0150	 °C/W °C/W
Höchstzulässige Sperrschichttemperatur max. junction temperature		$T_{vj\,max}$		125	°C
Betriebstemperatur operating temperature		$T_{c\,op}$		-40...125	°C
Lagertemperatur storage temperature		T_{stg}		-40...140	°C

Mechanische Eigenschaften / Mechanical properties

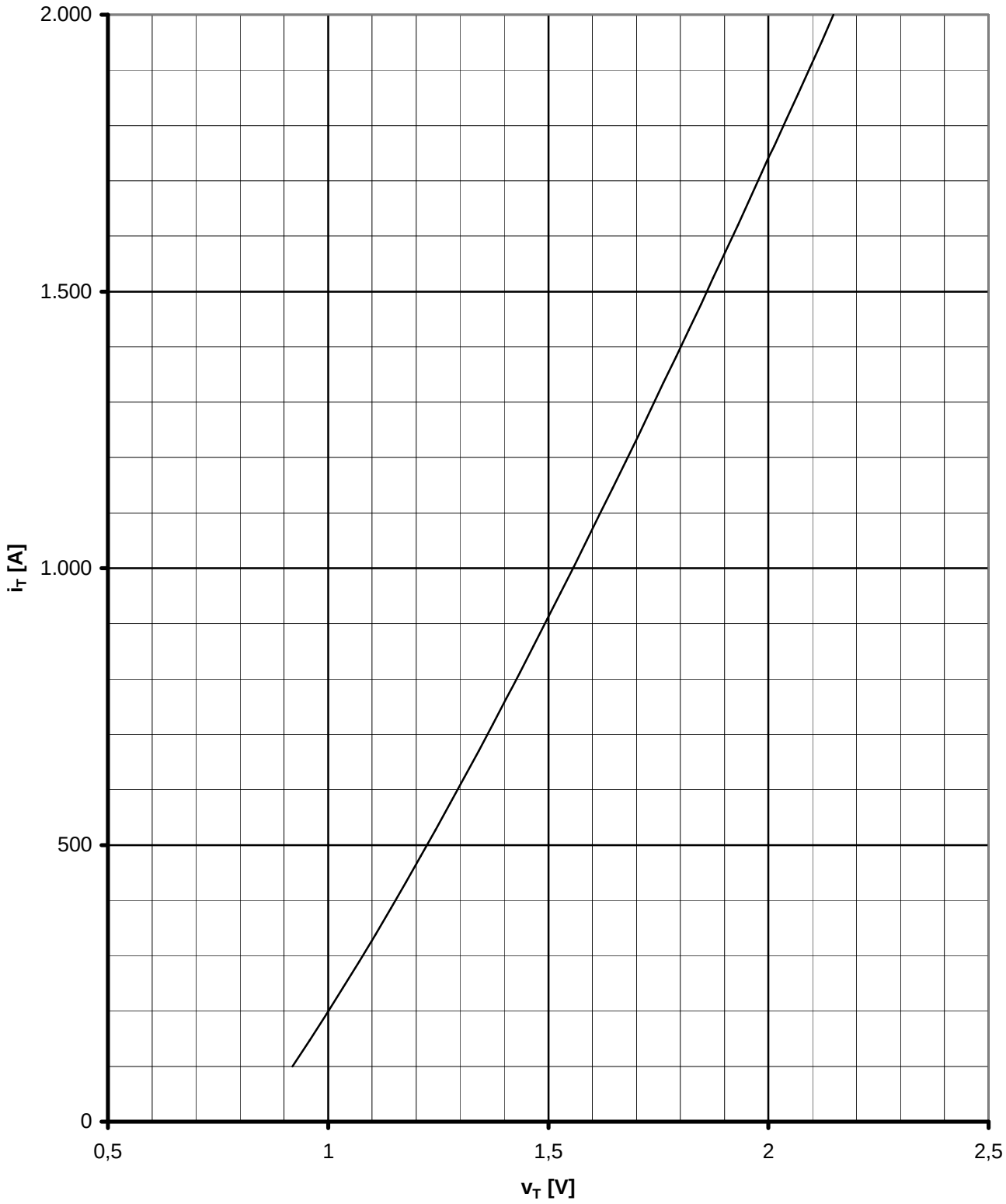
Gehäuse, siehe Anlage case, see appendix				Seite 3 page 3	
Si-Element mit Druckkontakt Si-pellet with pressure contact					
Anpreßkraft clamping force		F		5 ...10	kN
Gewicht weight		G	typ.	100	g
Kriechstrecke creepage distance				17	mm
Feuchteklasse humidity classification	DIN 40040			C	
Schwingfestigkeit vibration resistance	f = 50Hz			50	m/s²


ø30
1,1
14
8,5
1,1
4
ø30
C
HK
G
A
ø3,5 x 2 deep
on both sides

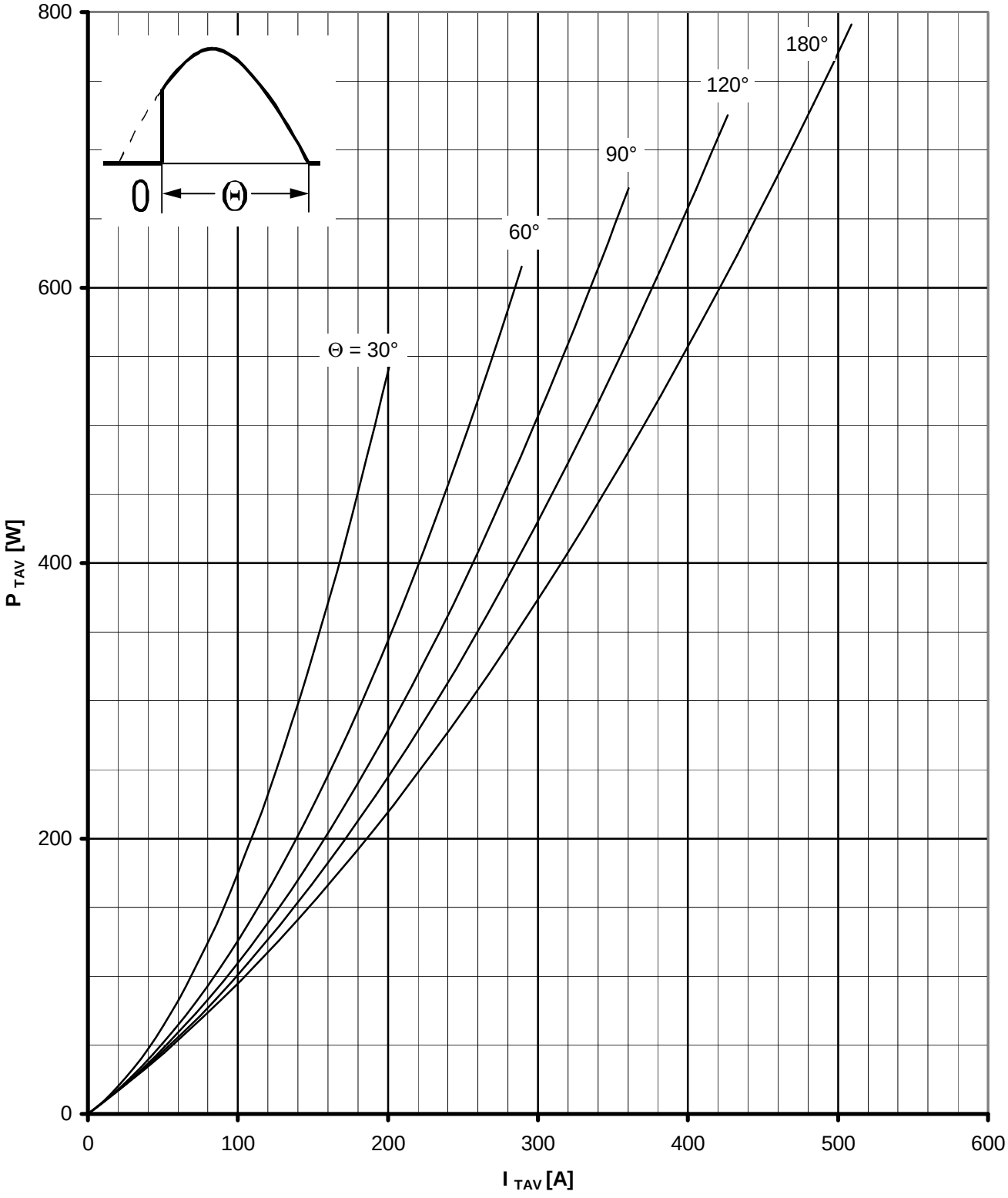

HK
plug 2,8 x 0,8
max. 7
ø50
21,5
G
plug
2,8 x 0,8
2

Kühlung cooling	Analytische Elemente des transienten Wärmewiderstandes Z_{thJC} für DC Analytical ementes of transient thermal impedanceZ_{thJC} for DC							
	Pos.n	1	2	3	4	5	6	7
beidseitig	R_{thn} [°C/W]	0,010500	0,002830	0,016700	0,018800	0,001160		
two-sided	τ_n [s]	0,001130	0,025500	0,051100	0,429000	2,490000		
anodenseitig	R_{thn} [°C/W]	0,009400	0,009740	0,018200	0,016100	0,031600		
anode-sided	τ_n [s]	0,000984	0,016700	0,204000	0,821000	5,000000		
kathodenseitig	R_{thn} [°C/W]	0,009280	0,014500	0,008680	0,040100	0,047500		
cathode-sided	τ_n [s]	0,000939	0,028500	0,156000	1,120000	9,100000		

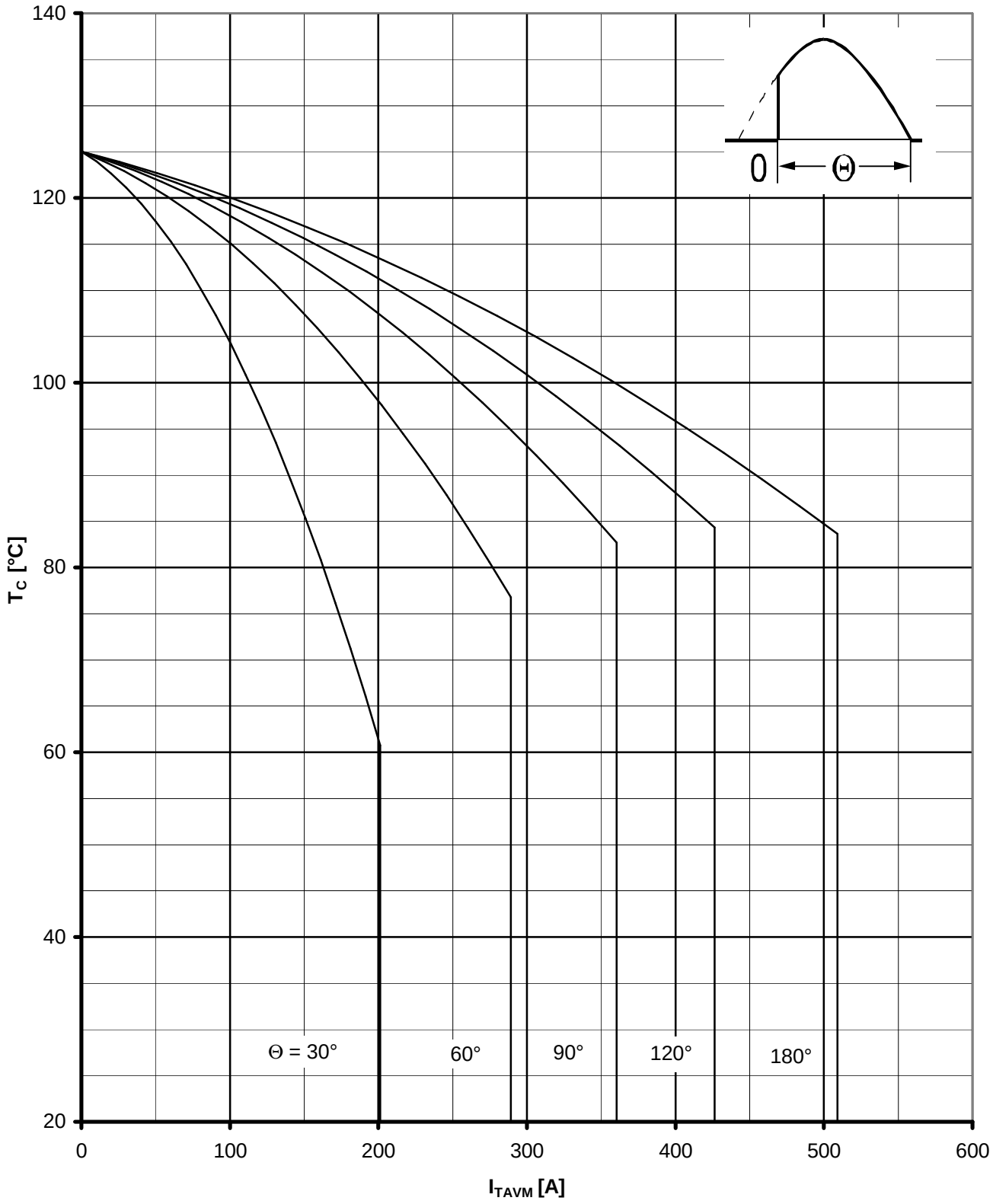
Analytische Funktion / analytical function : $Z_{thJC} = \sum_{n=1}^{n_{max}} R_{thn} (1 - EXP (- t / \tau_n))$



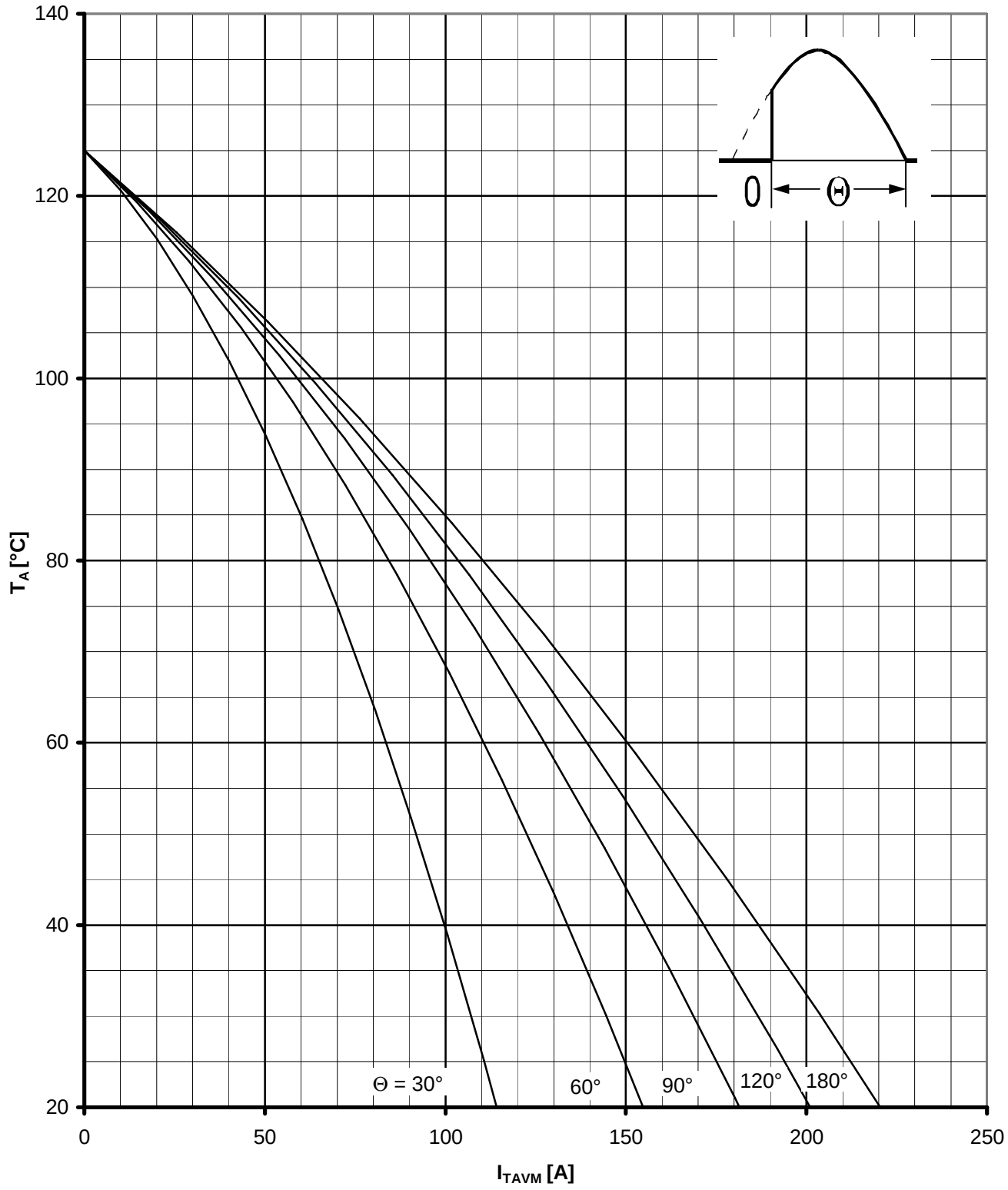
Grenzdurchlaßkennlinie / Limiting 0n-state characteristics $i_T = f(v_T)$
$T_{vj} = T_{vj}$ max



Durchlaßverlustleistung / On-state power loss $P_{TAV} = f(I_{TAV})$
Parameter: Stromflußwinkel Θ / current conduction angle Θ



Höchstzulässige Gehäusetemperatur / Maximum allowable case temperature $T_C = f(I_{TAVM})$
Beidseitige Kühlung / Two-sided cooling
Parameter: Stromflußwinkel Θ / current conduction angle Θ

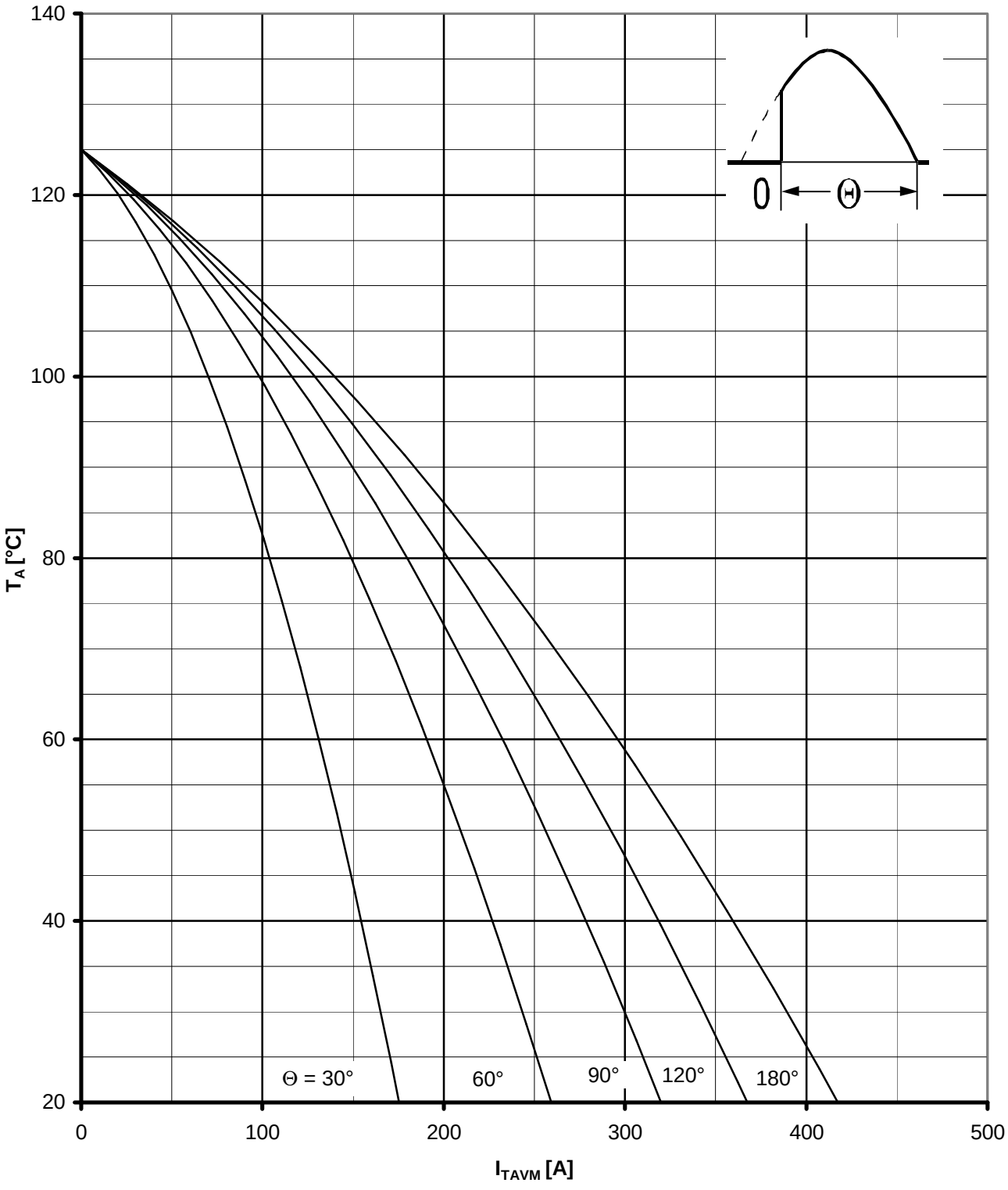


Höchstzulässige Kühlmitteltemperatur / Max. allowable cooling medium temperature $T_A = f(I_{TAVM})$

Luftselbstkühlung / Natural air-cooling

Kühlkörper/Heatsink. K0.36S

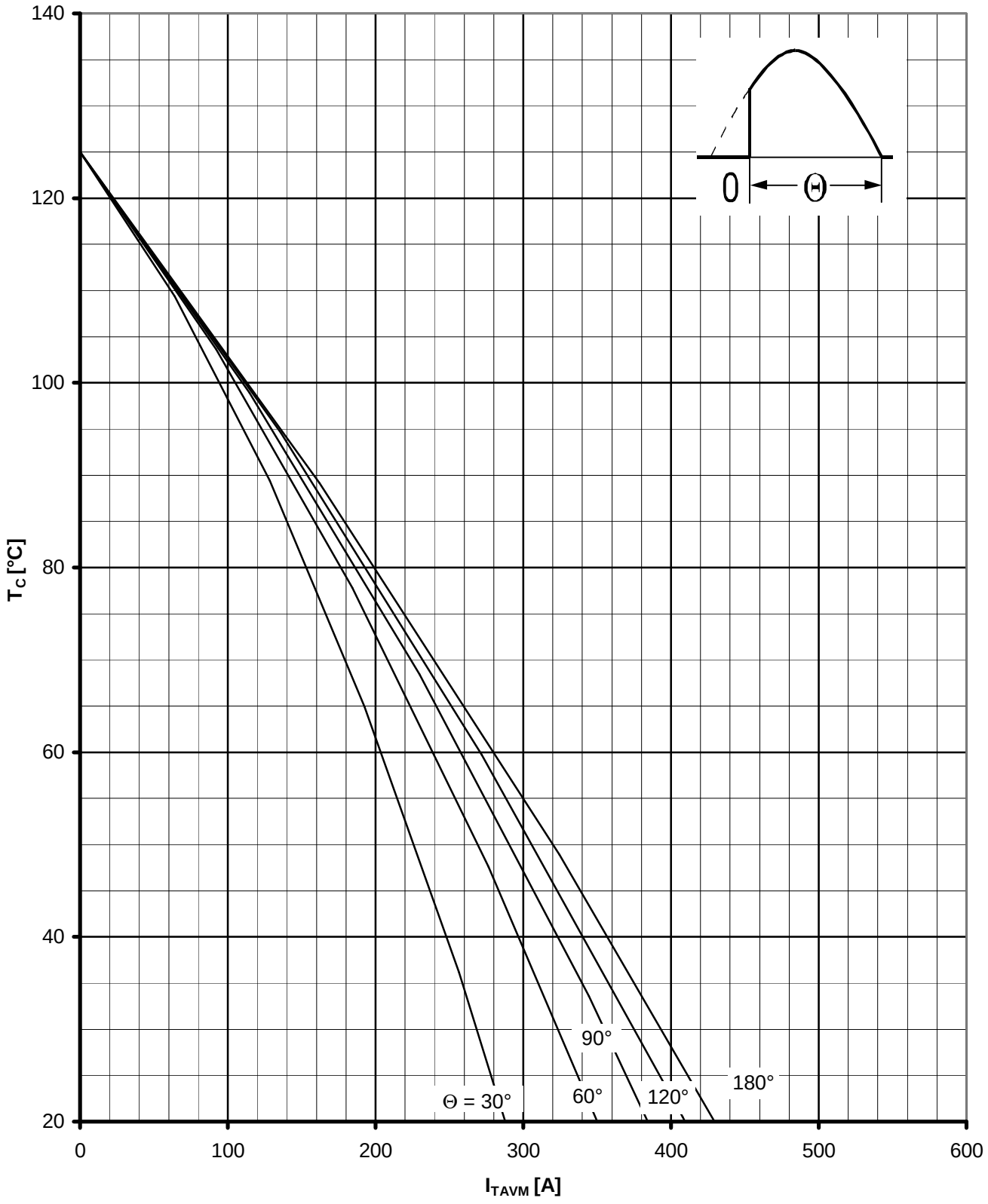
Parameter: Stromflußwinkel Θ / current conduction angle Θ



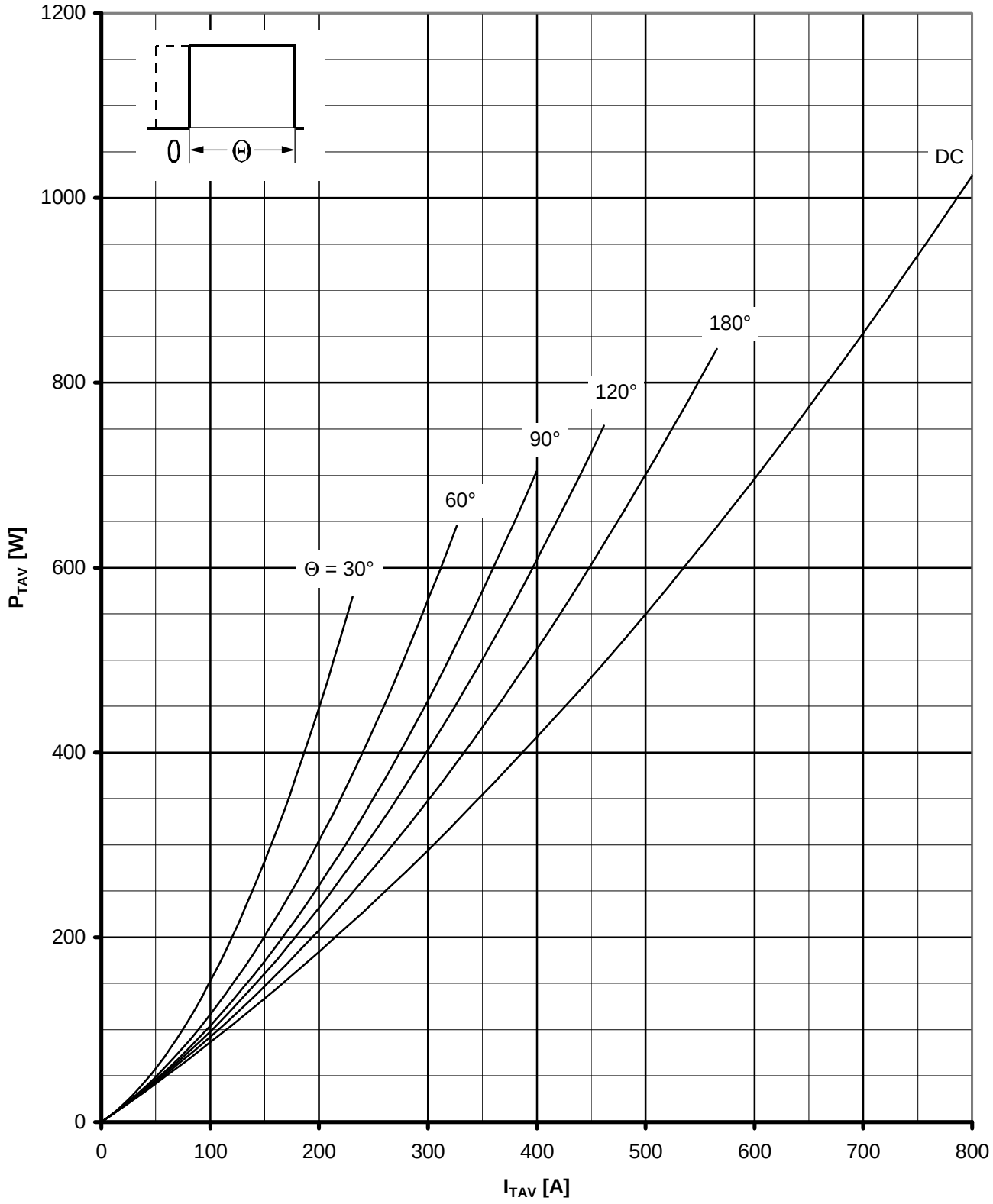
Höchstzulässige Kühlmitteltemperatur / Max. allowable cooling medium temperature $T_A = f(I_{TAVM})$

Verstärkte Luftkühlung / Forced air-cooling
Kühlkörper/Heatsink. K0.05F, V_L = 50 l/s

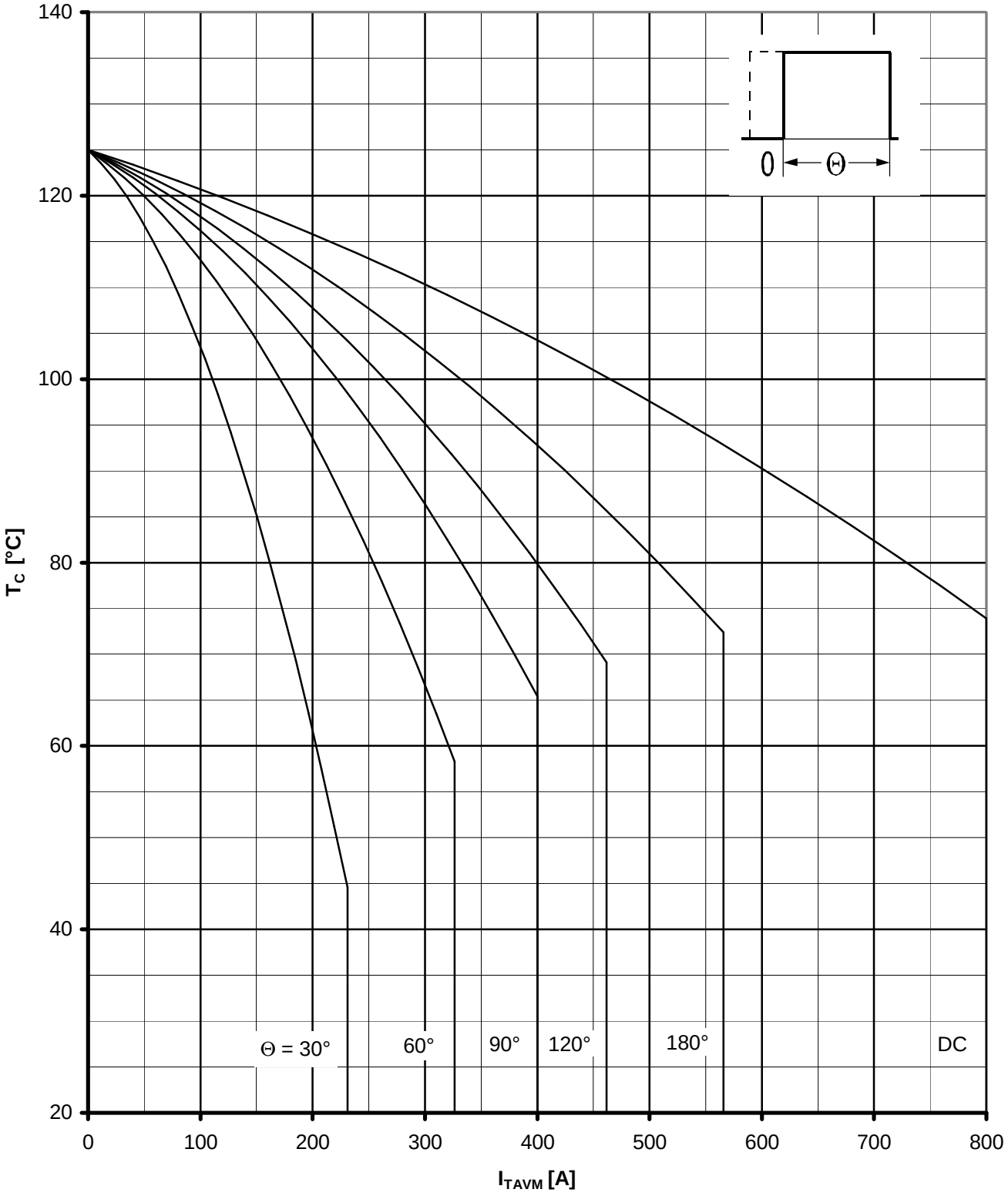
Parameter: Stromflußwinkel Θ / current conduction angle Θ



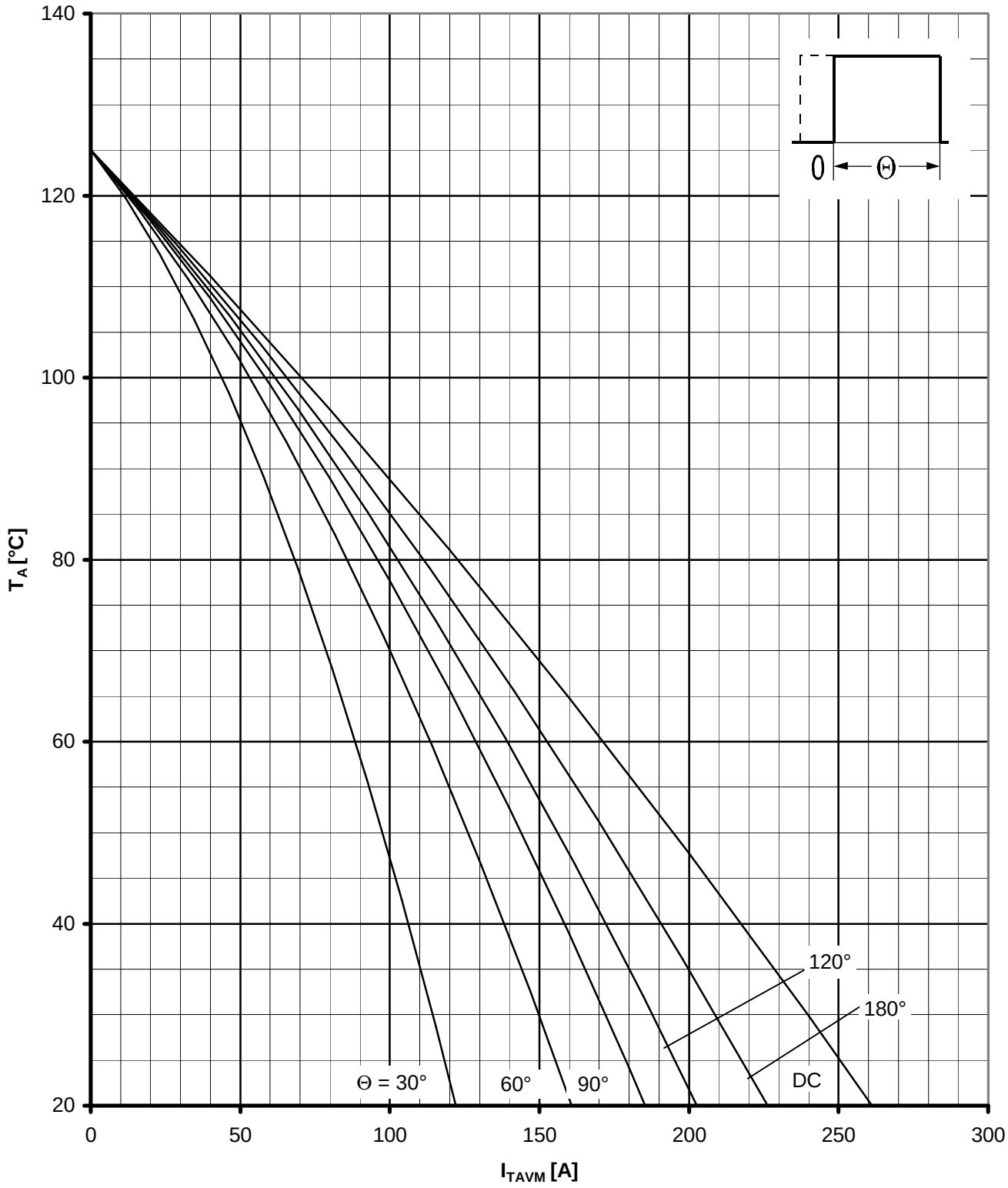
Höchstzulässige Gehäusetemperatur / Maximum allowable case temperature $T_C = f(I_{TAVM})$
Anodenseitige Kühlung / anode sided cooling
Parameter: Stromflußwinkel Θ / current conduction angle Θ



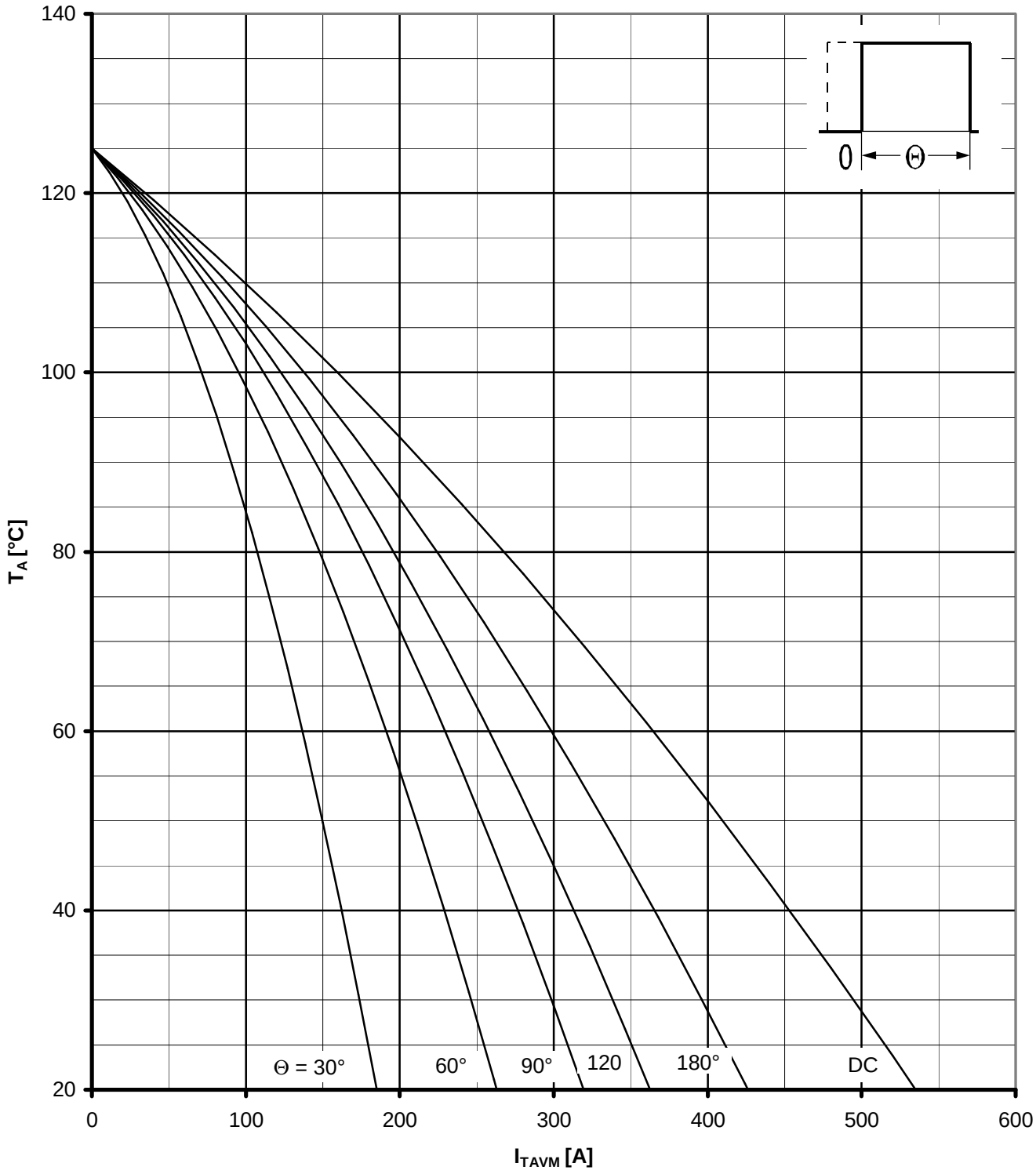
Durchlaßverlustleistung / On-state power loss $P_{TAV} = f(I_{TAV})$
Parameter: Stromflußwinkel Θ / current conduction angle Θ



Höchstzulässige Gehäusetemperatur / Maximum allowable case temperature $T_C = f(I_{TAVM})$
Beidseitige Kühlung / Two-sided cooling
Parameter: Stromflußwinkel Θ / current conduction angle Θ



Höchstzulässige Kühlmitteltemperatur / Max. allowable cooling medium temperature $T_A = f(I_{TAVM})$
Luftselbstkühlung / Natural air-cooling
Kühlkörper/Heatsink. K 0.36 S
Parameter: Stromflußwinkel Θ / current conduction angle Θ

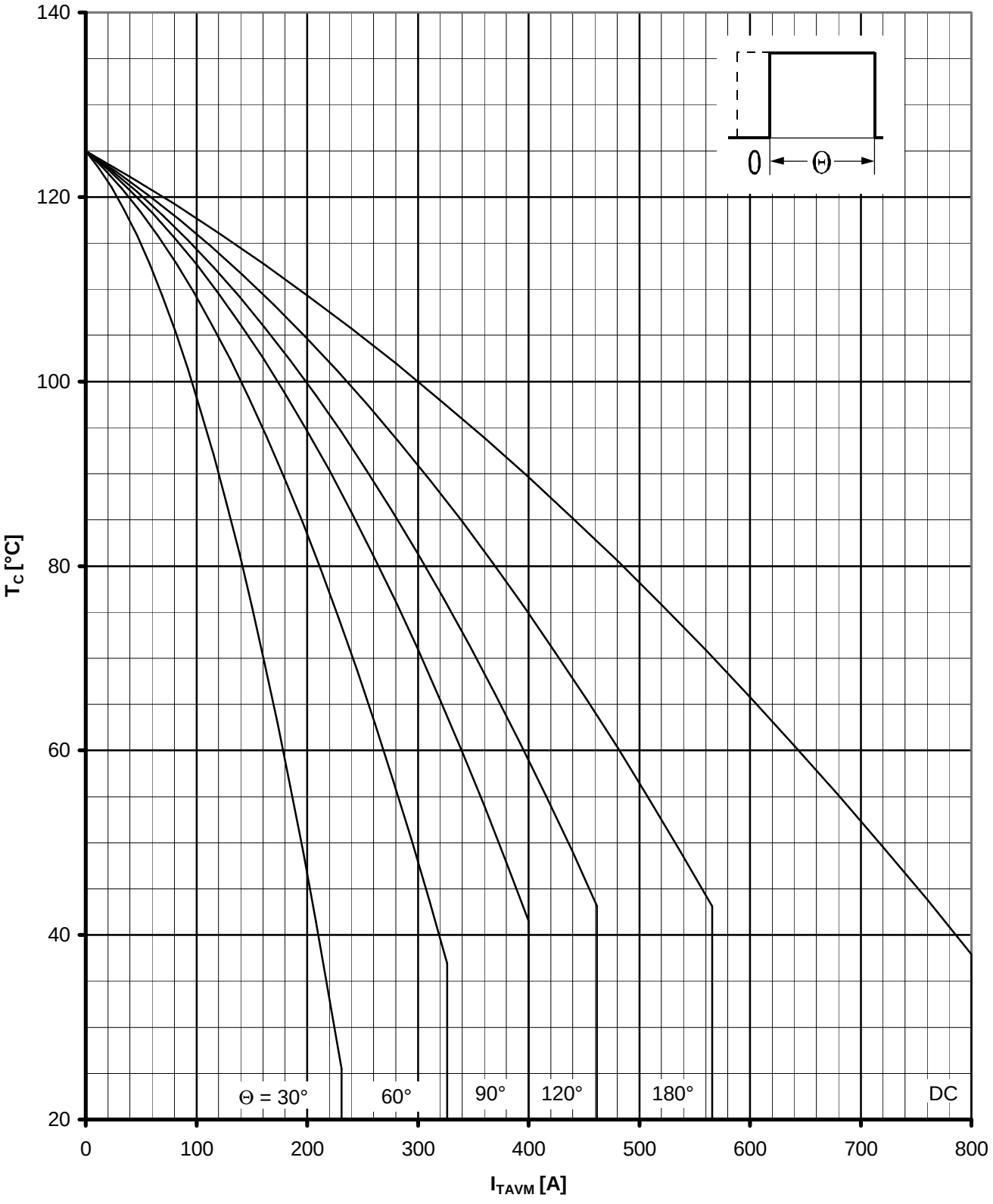


Höchstzulässige Kühlmitteltemperatur / Max. allowable cooling medium temperature $T_A = f(I_{TAVM})$

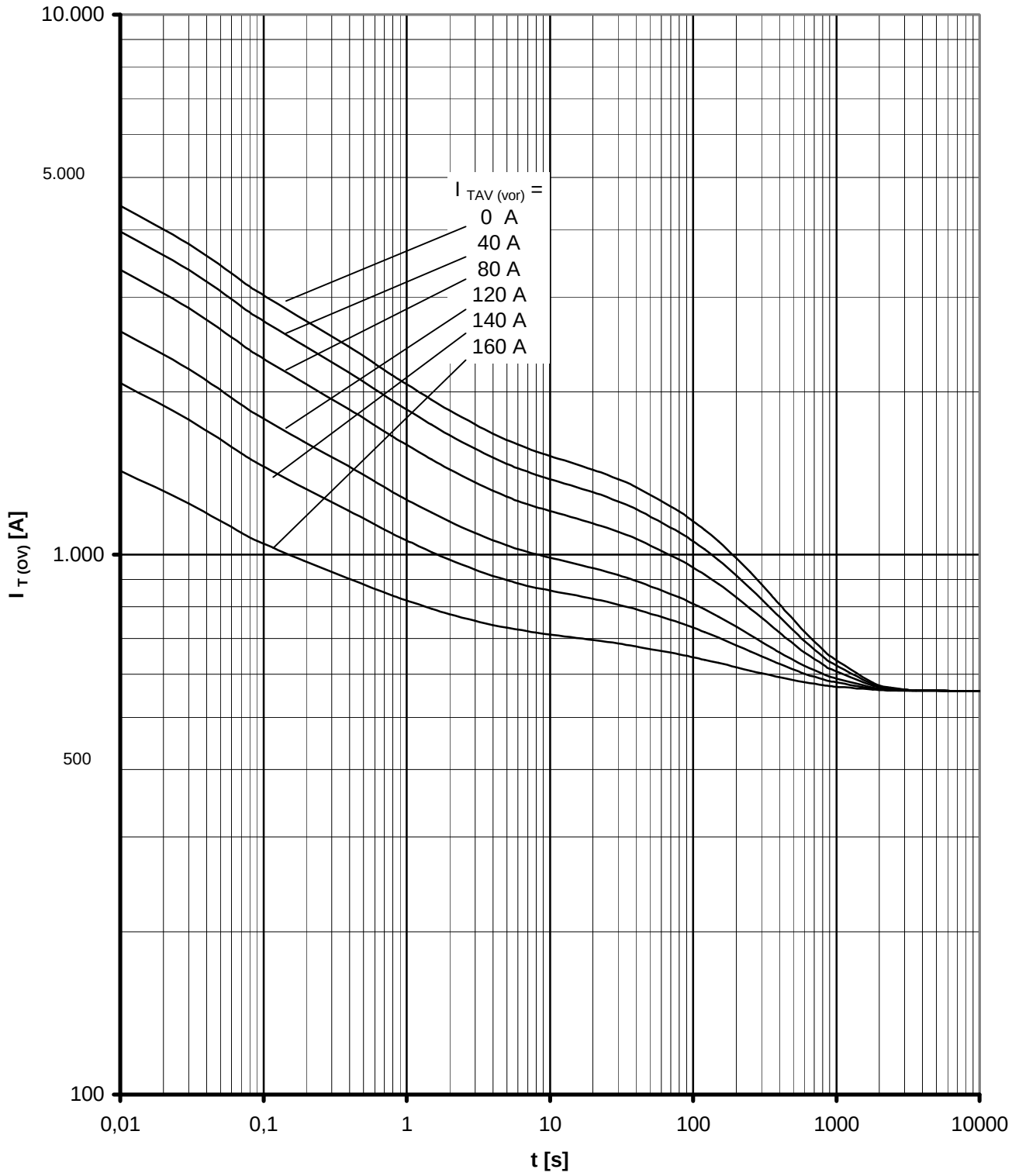
Verstärkte Luftkühlung / Forced air-cooling

Kühlkörper/Heatsink. K0.05F, V_L = 50 l/s

Parameter: Stromflußwinkel Θ / current conduction angle Θ

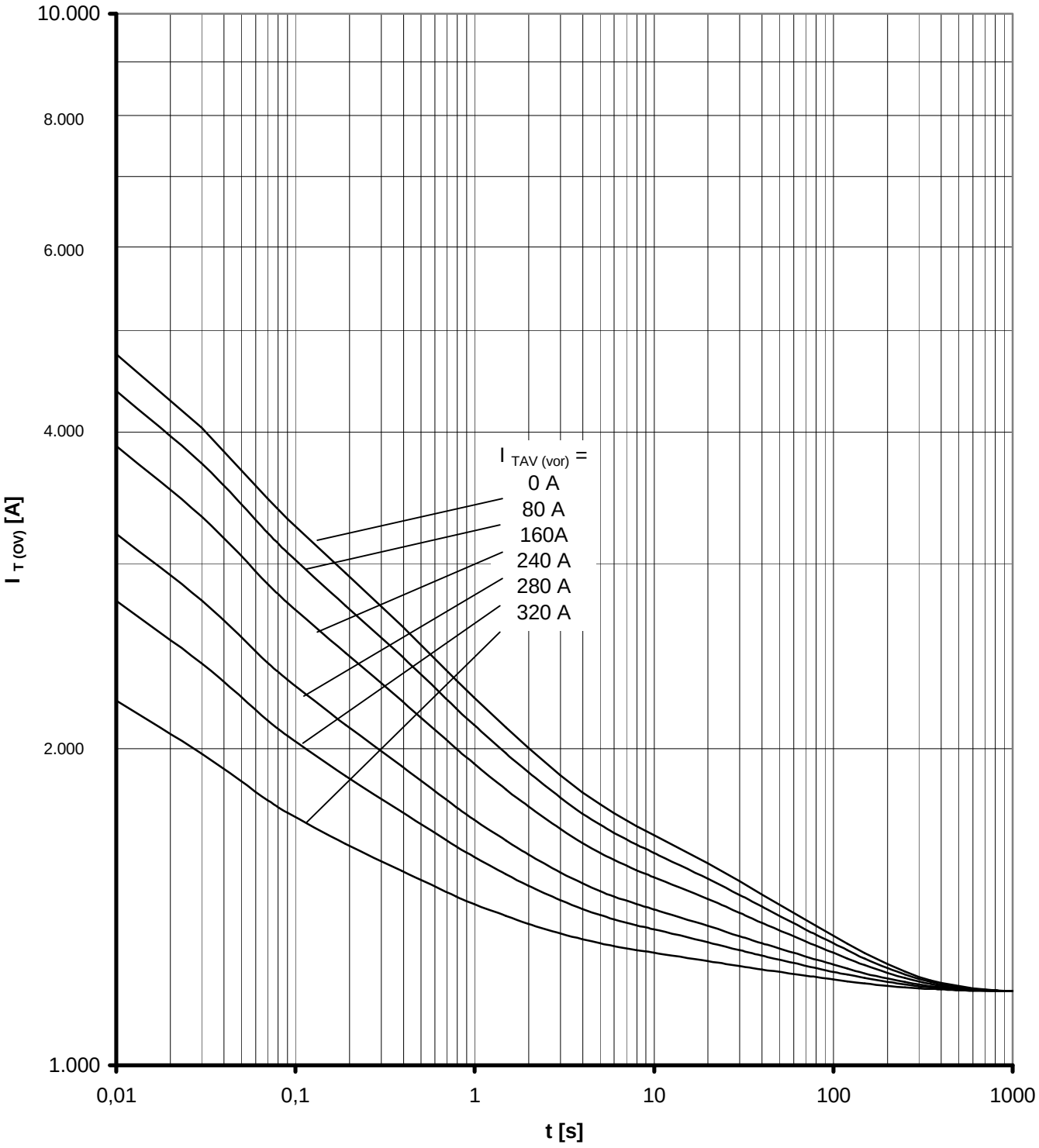


Höchstzulässige Gehäusetemperatur / Maximum allowable case temperature $T_C = f(I_{TAVM})$
Anodenseitige Kühlung / anode sided cooling
Parameter: Stromflußwinkel Θ / current conduction angle Θ



Überstrom / Overload on-state current $I_{T(OV)} = f(t)$

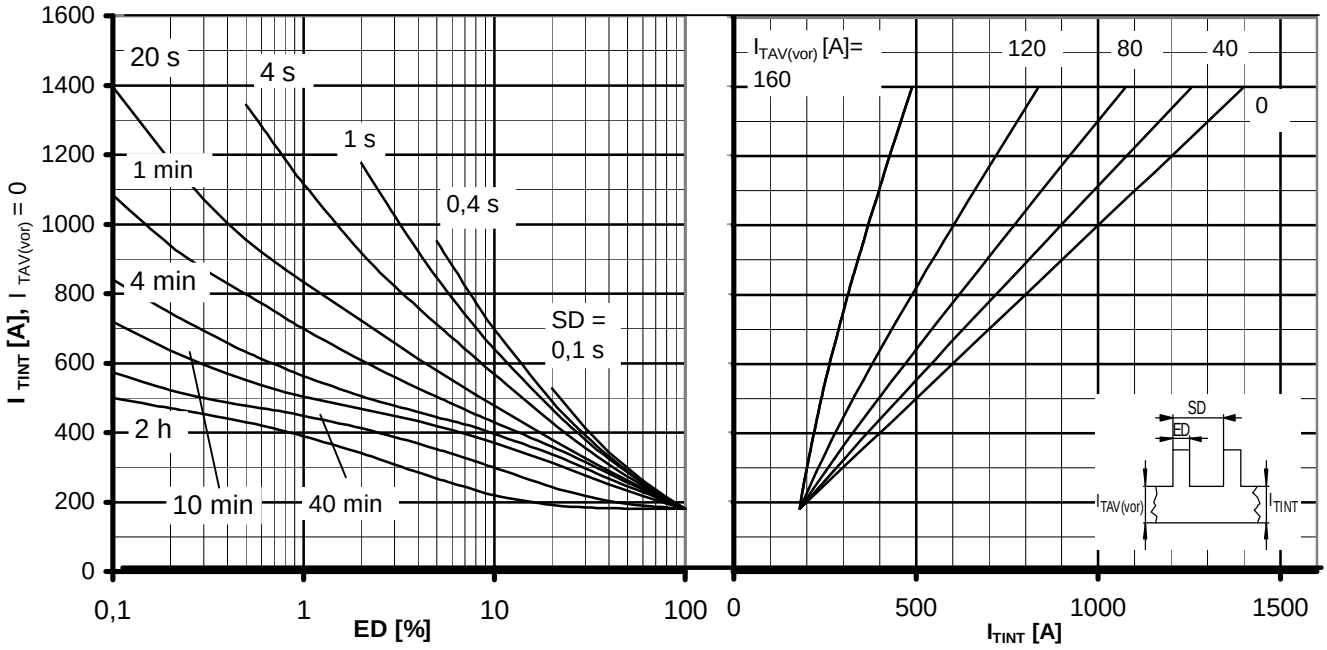
Beidseitige Luftselbstkühlung / Two-sided natural cooling K 0.36 S
T_A = 45°C
Parameter: Vorlaststrom / pre-load current $I_{TAV(vor)}$



Überstrom / Overload on-state current $I_{T(OV)} = f(t)$

Beidseitige verstärkte Kühlung / forced two-sided cooling K0.12F
$T_A = 35°C$, $V_L = 50$ l/s

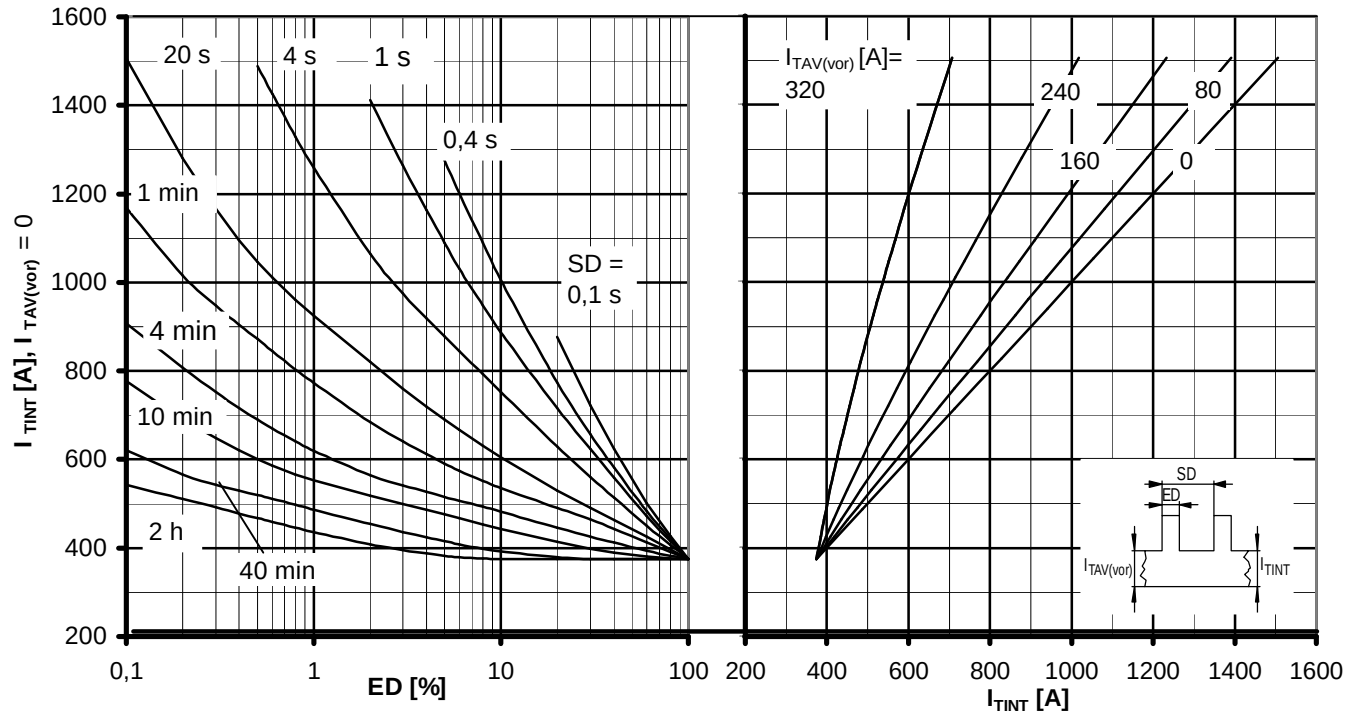
Parameter: Vorlaststrom / pre-load current $I_{TAV(vor)}$



Höchstzul. Durchlaßstrom bei Ausetzbetrieb / Max. allowable on-state current during intermittent operation $I_{TINT} = f(ED)$

Beidseitig Luftselbstkühlung / two-sided natural cooling K 0.36S
T_A = 45 °C

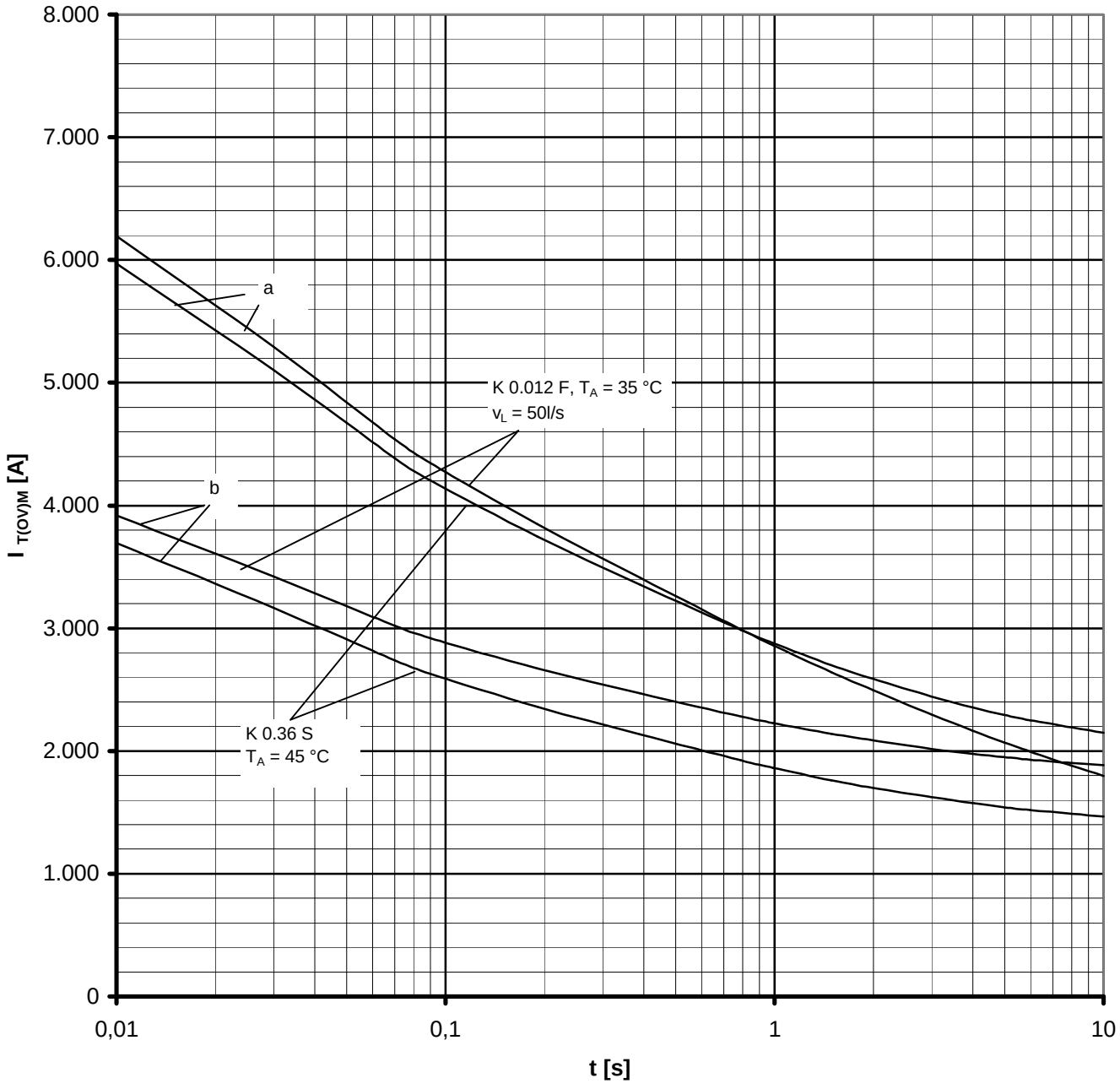
Parameter: Vorlaststrom / pre-load current $I_{TAV(vor)}$, Spieldauer / cycle duration SD



Höchstzul. Durchlaßstrom bei Ausetzbetrieb / Max. allowable on-state current during intermittent operation $I_{TINT} = f(ED)$

Beidseitig verstärkte Kühlung / forced two-sided cooling K 0.12F
T_A = 35 °C, V_L = 50 l/s

Parameter: Vorlaststrom / pre-load current $I_{TAV(vor)}$, Spieldauer / cycle duration SD



Grenzstrom / Max. overload on-state current $I_{T(OV)M} = f(t)$, $v_{RM} = 0{,}8\ V_{RRM}$

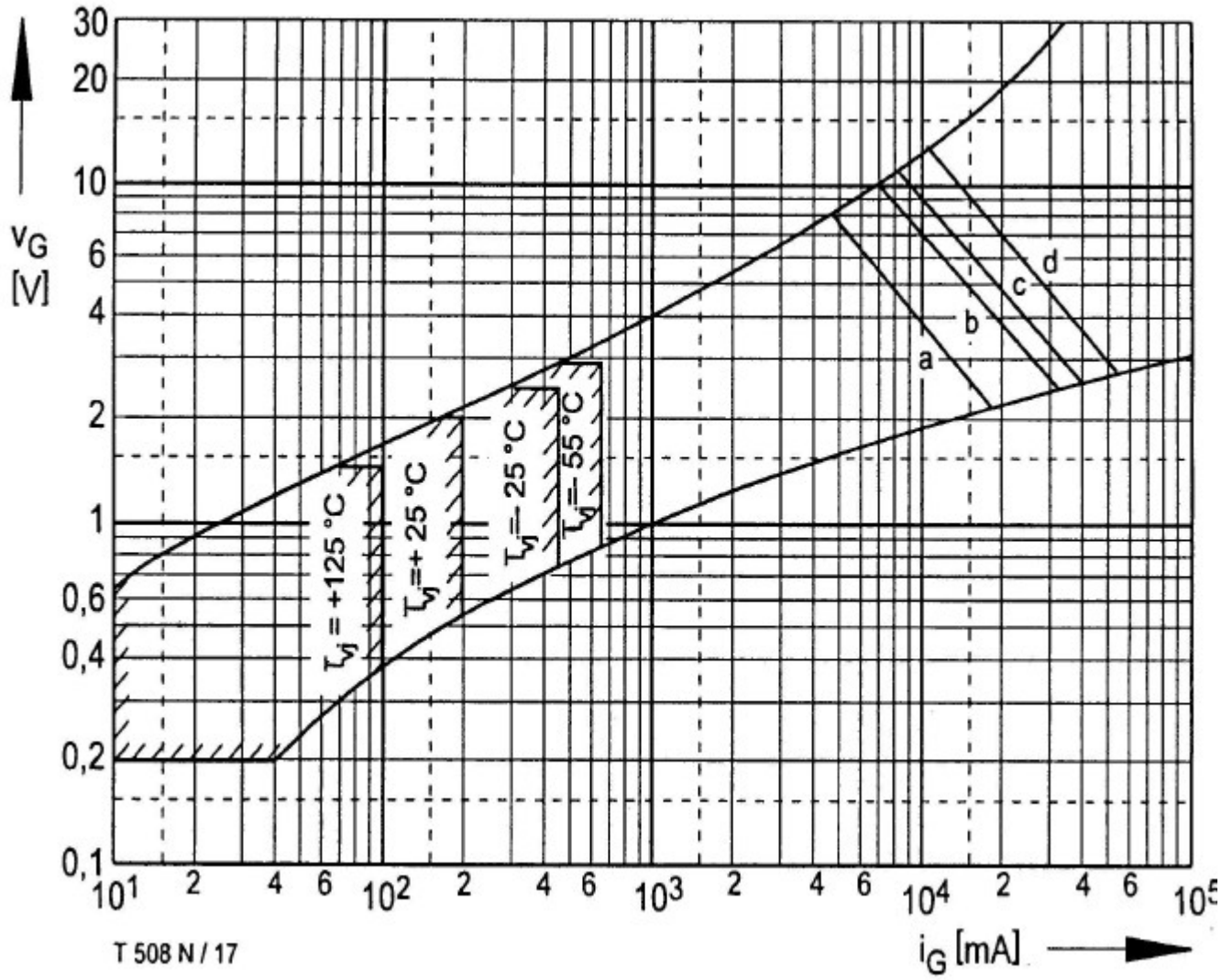
Beidseitige Kühlung / Two-sided cooling

Kühlkörper / Heatsink: K0.36S, K 0.05F

Belastung aus / Surge current occurs:

a - Leerlauf / No-load conditions

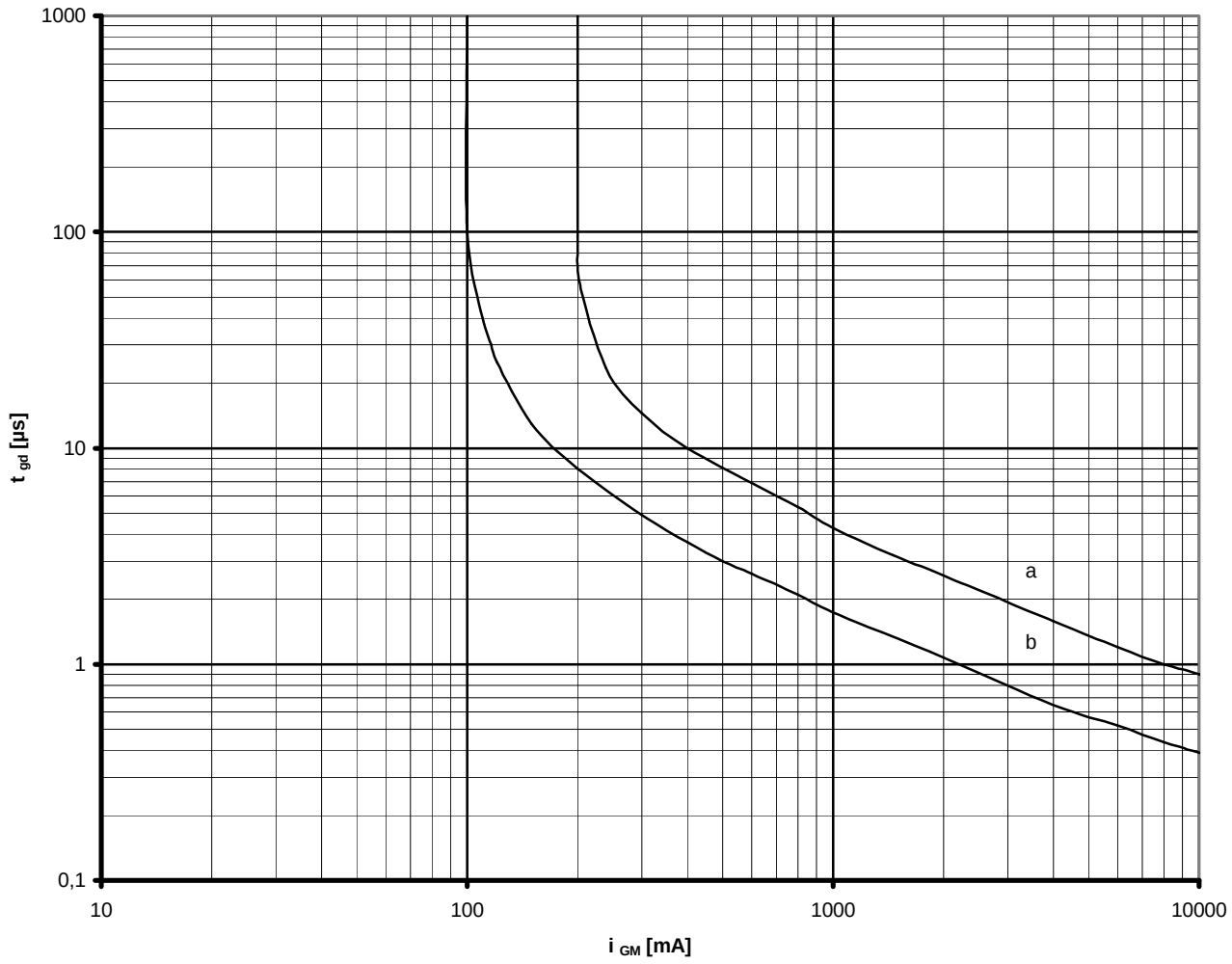
b - Betrieb mit Dauergrenzstrom / During operation at max. average on-state current I_{TAVM}



Steuercharakteristik $v_G = f(i_G)$ mit Zündbereichen für V_D = 6 V
Gate characteristic $v_G = f(i_G)$ with triggering area for V_D = 6 V

Höchstzulässige Spitzensteuerverlustleistung / Maximum rated peak gate power disspation $P_{GM} = f(t_g)$:

a - 40 W/10ms b - 80 W/1ms c - 100 W/0,5ms d - 150 W/0,1ms

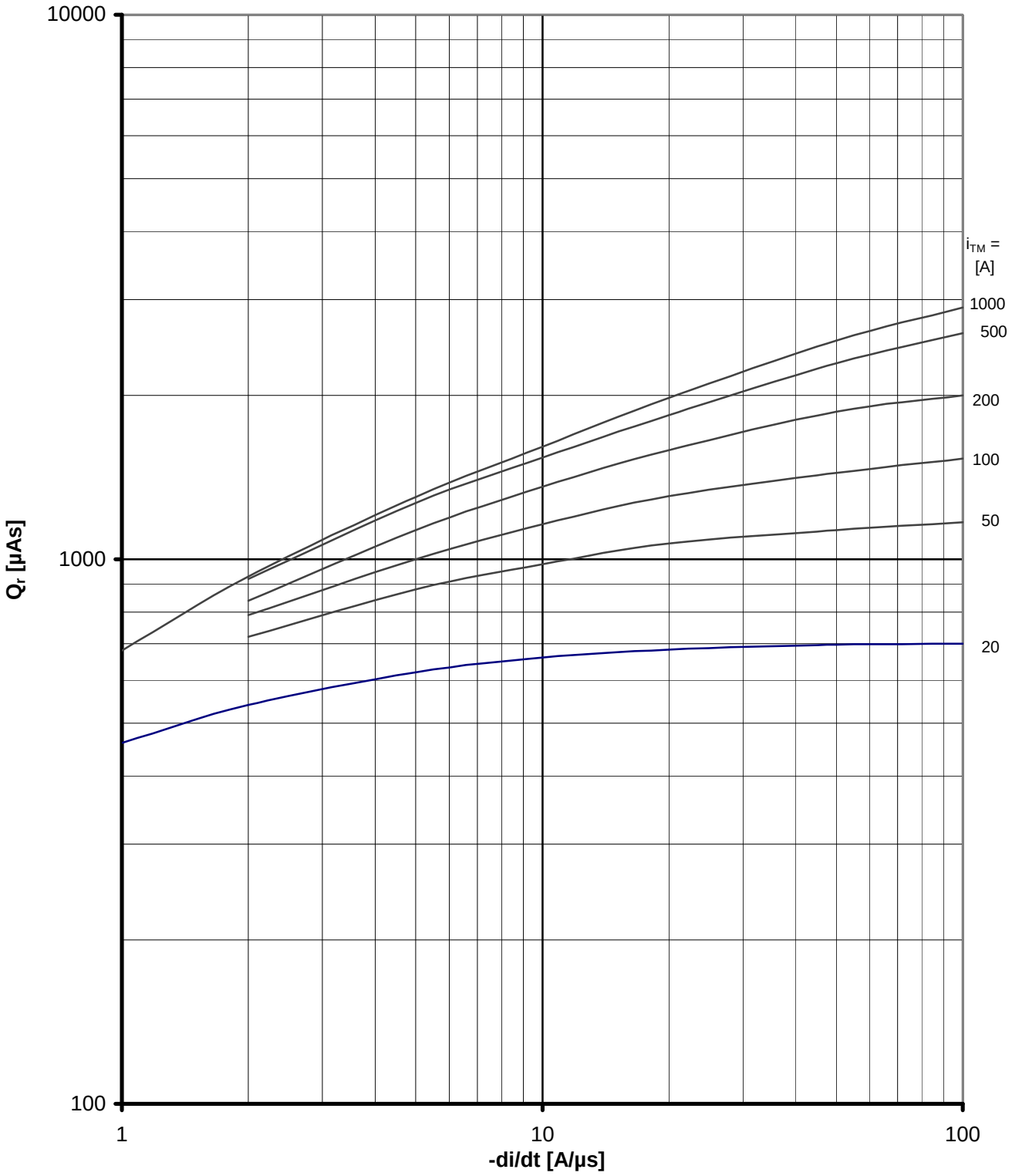


Zündverzug / Gate controlled delay time $t_{gd} = f(i_{GM})$

T_{vj} = 25°C, $di_G/dt = i_{GM}/1\mu s$

a - maximaler Verlauf / limiting characteristic

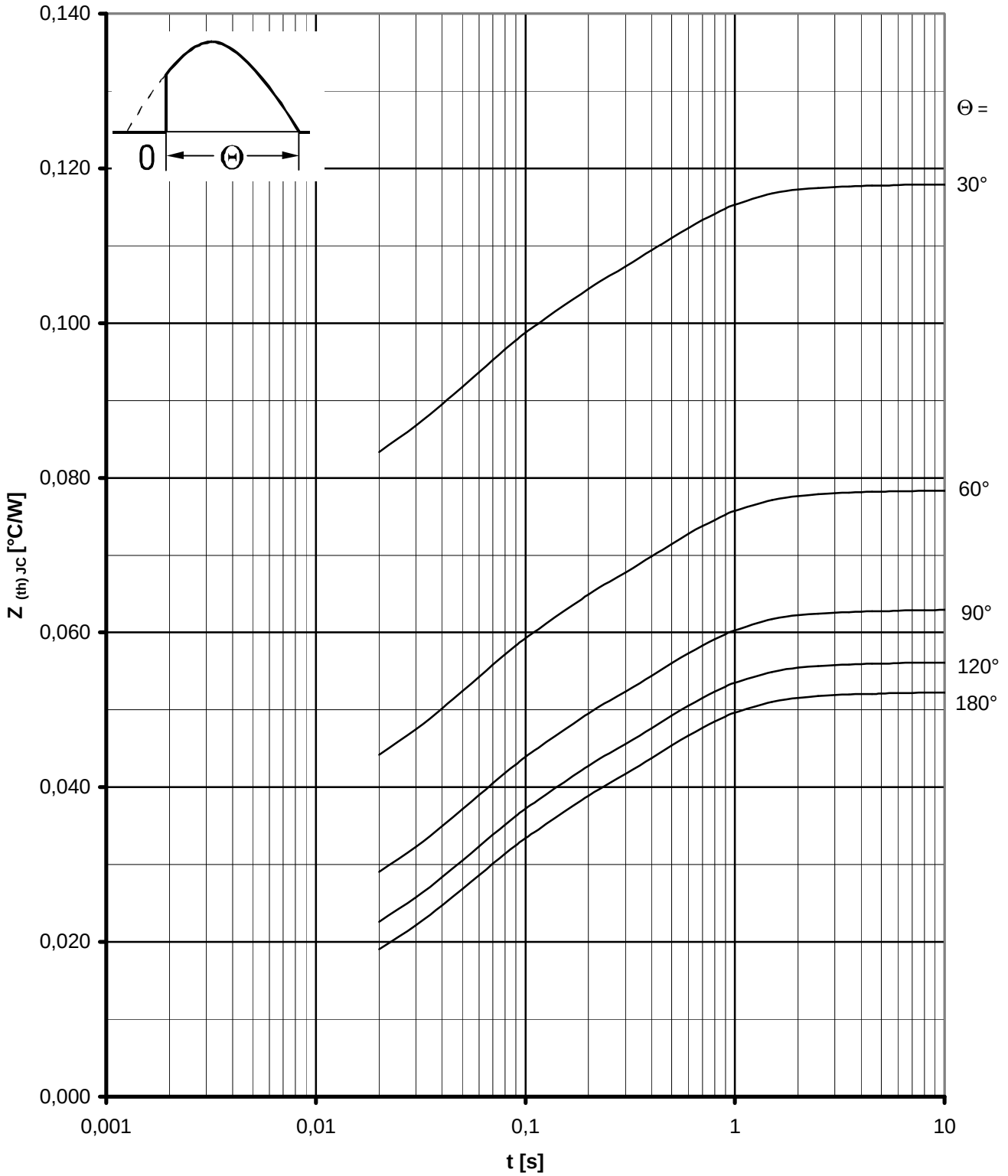
b - typischer Verlauf / typical characteristic



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

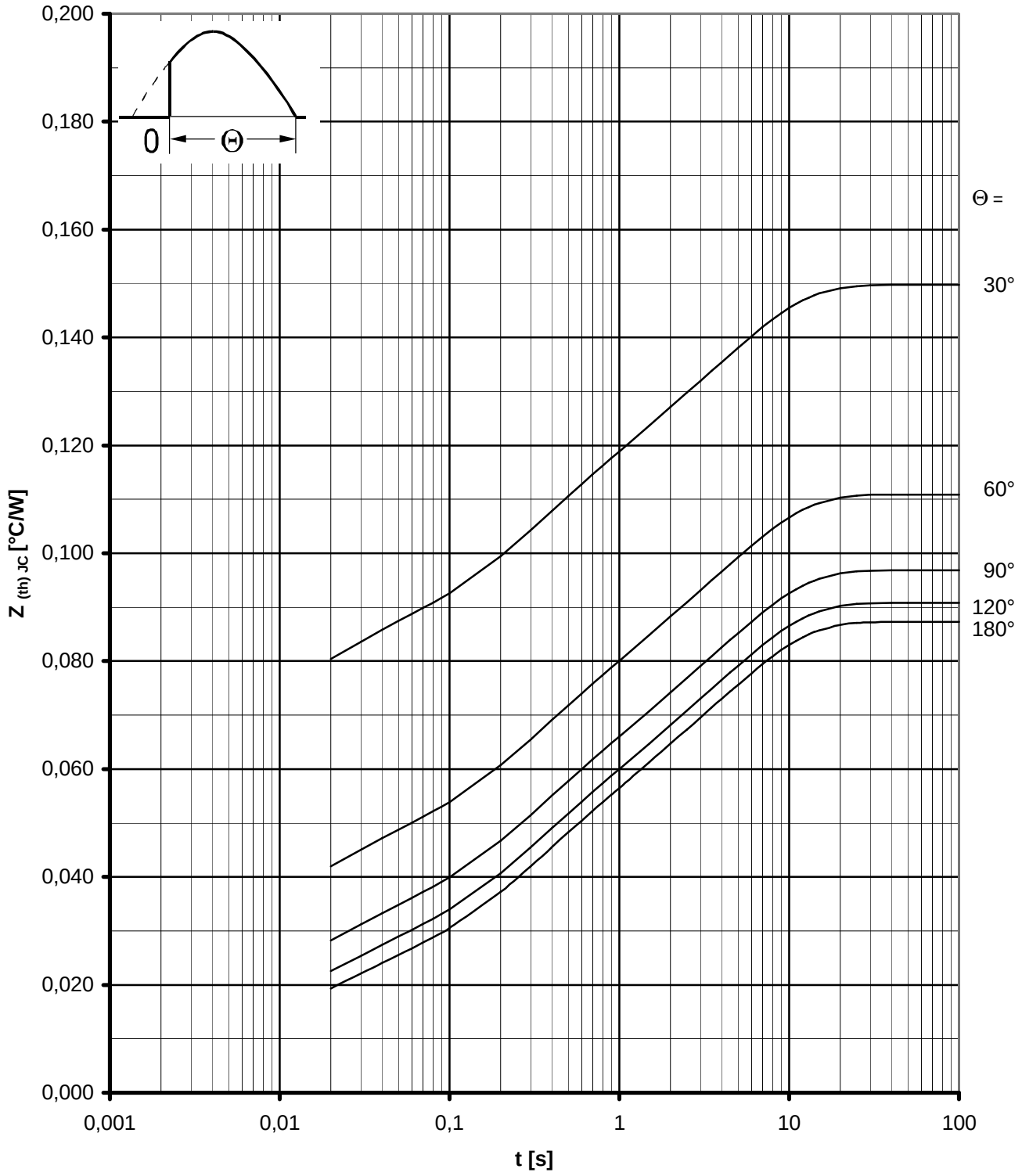
$T_{vj} = T_{vj}$ max, $v_R = 0{,}5\ V_{RRM}$, $v_{RM} = 0{,}8\ V_{RRM}$

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

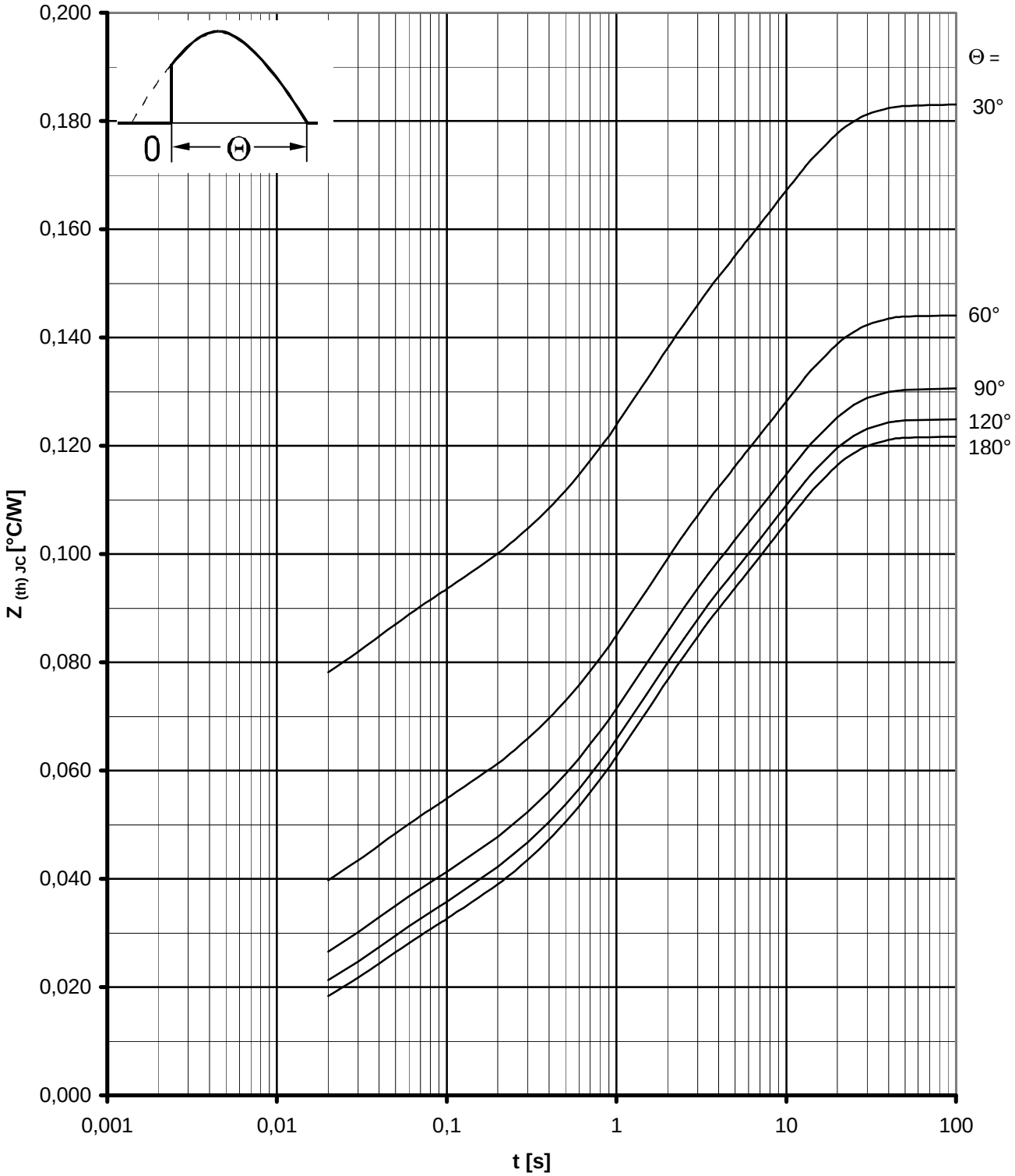


Transienter innerer Wärmewiderstand / Transient thermal impedance $Z_{(th)JC} = f(t)$

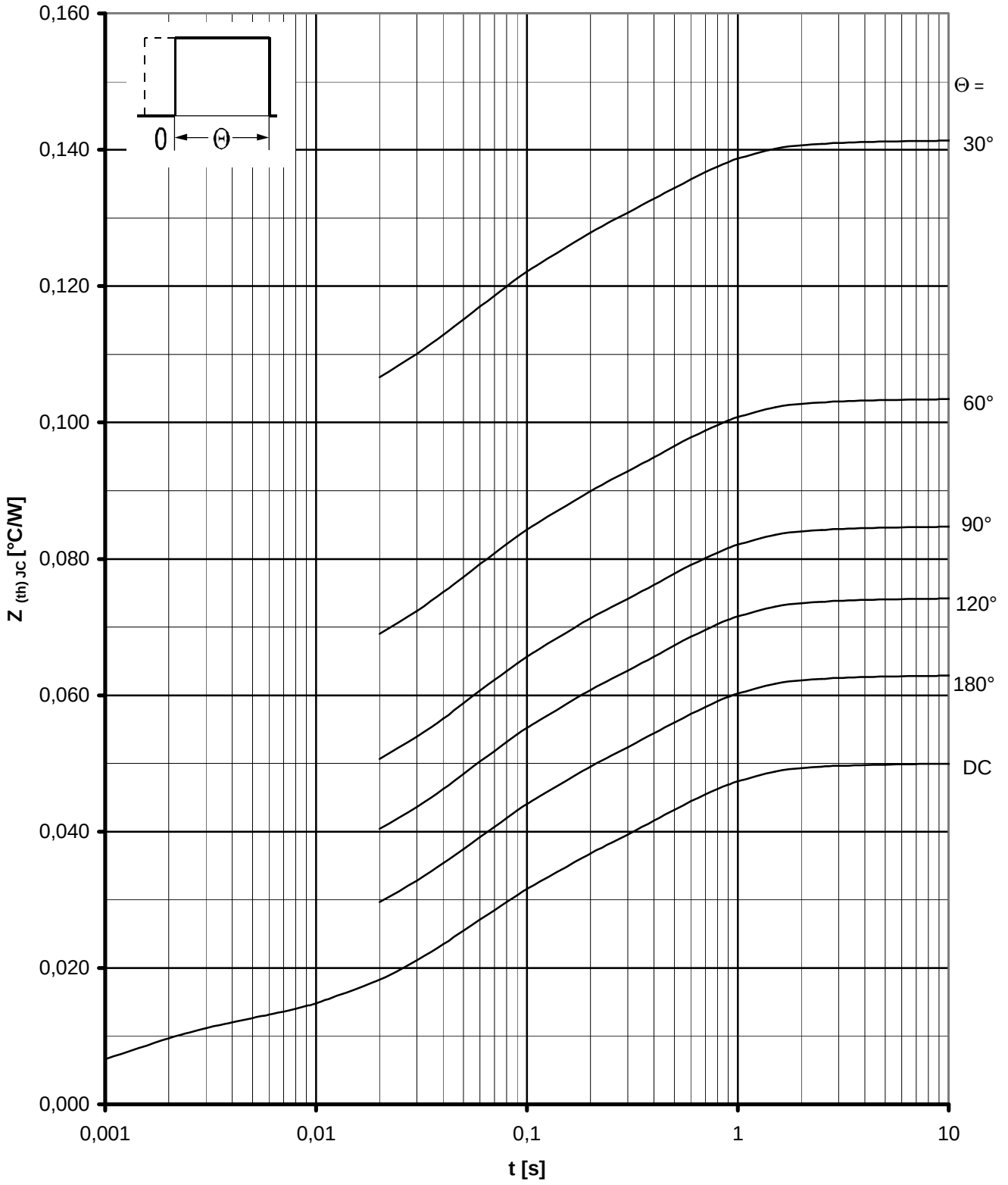
Beidseitige Kühlung /Ttwo-sided cooling
Parameter: Stromflußwinkel Θ / current conduction angle Θ



Transienter innerer Wärmewiderstand / Transient thermal impedance $Z_{(th)JC} = f(t)$
Anodenseitige Kühlung / Anode-sided sided cooling
Parameter: Stromflußwinkel Θ / current conduction angle Θ

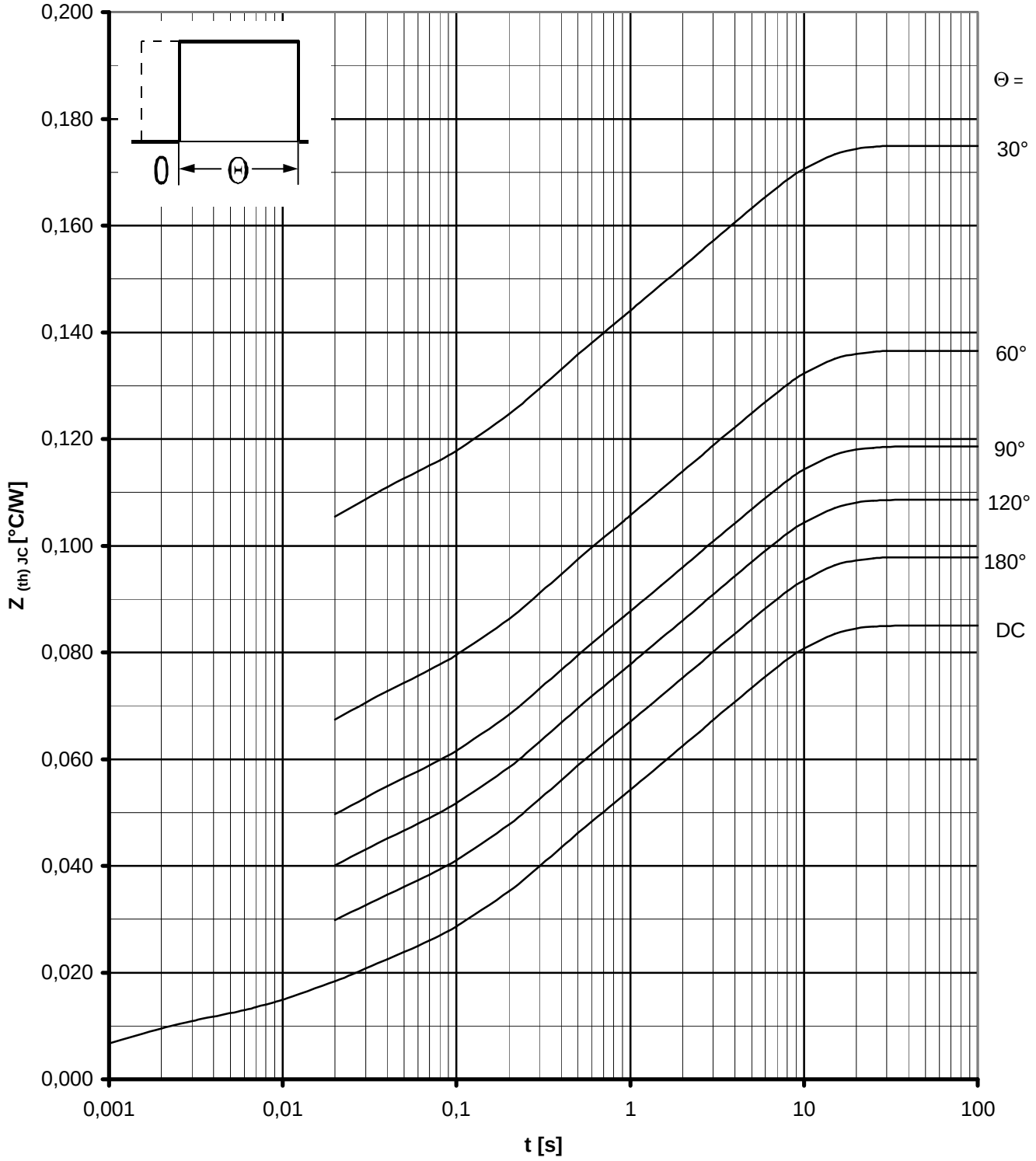


Transienter innerer Wärmewiderstand / Transient thermal impedance $Z_{(th)JC} = f(t)$
Kathodenseitige Kühlung / Cathde-sided cooling
Parameter: Stromflußwinkel Θ / current conduction angle Θ

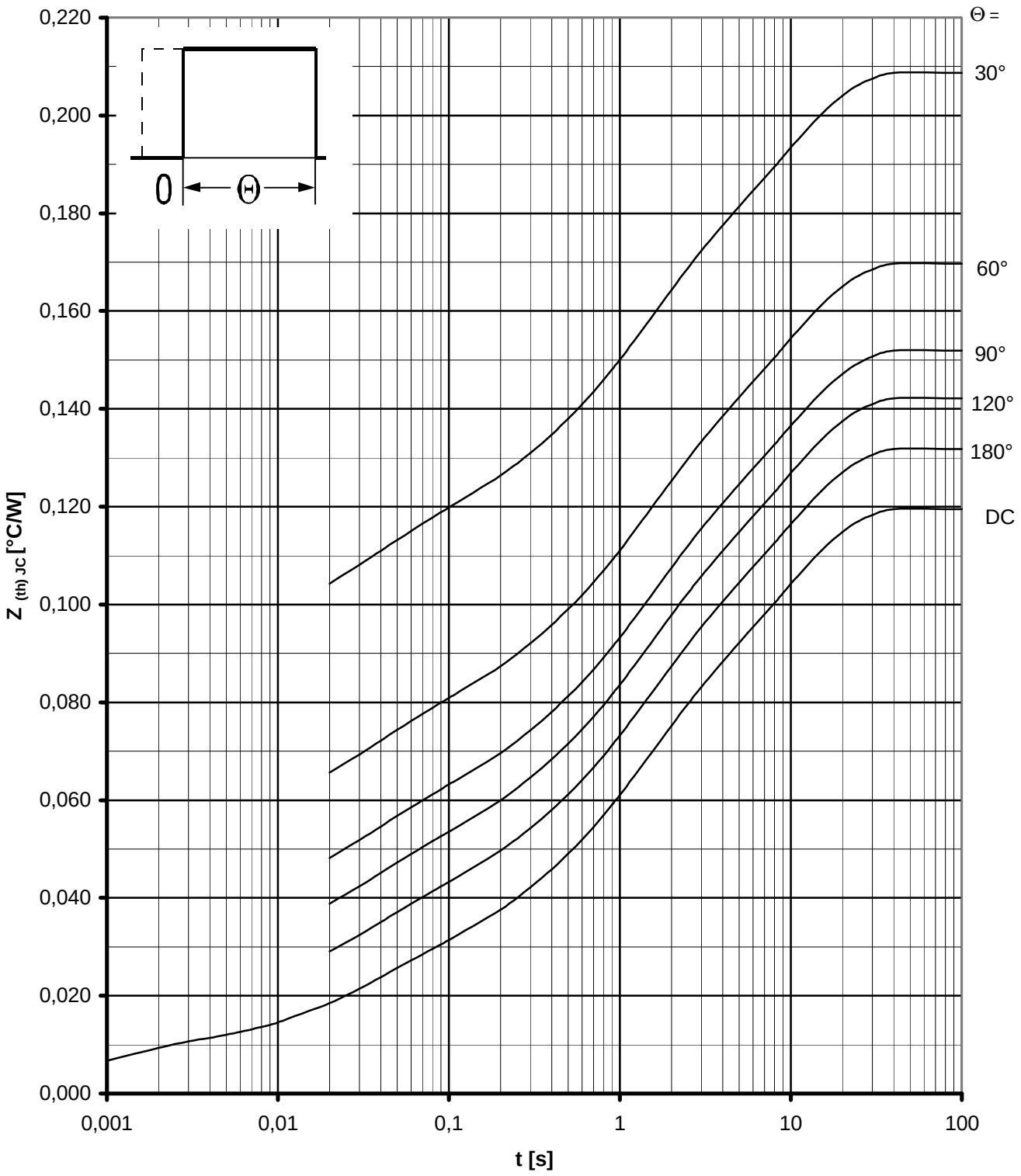


Transienter innerer Wärmewiderstand / Transient thermal impedance $Z_{(th)JC} = f(t)$

Beidseitige Kühlung /Ttwo-sided cooling
Parameter: Stromflußwinkel Θ / current conduction angle Θ



Transienter innerer Wärmewiderstand / Transient thermal impedance $Z_{(th)JC} = f(t)$
Anodenseitige Kühlung / Anode-sided cooling
Parameter: Stromflußwinkel Θ / current conduction angle Θ



Transienter innerer Wärmewiderstand / Transient thermal impedance $Z_{(th)JC} = f(t)$

Kathodenseitige Kühlung / Cathode-sided cooling
Parameter: Stromflußwinkel Θ / current conduction angle Θ

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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".