

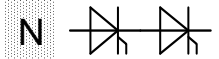
Elektrische Eigenschaften / Electrical properties

Höchstzulässige Werte / Maximum rated values

Periodische Vorwärts- und Rückwärts-Spitzensperrspannung repetitive peak forward off-state and reverse voltages	$T_{vj} = -40^{\circ}\text{C} \dots T_{vj\text{ max}}$	$V_{\text{DRM}}, V_{\text{RRM}}$	1200, 1400 1600	V V
Vorwärts-Stoßspitzensperrspannung non-repetitive peak forward off-state voltage	$T_{vj} = -40^{\circ}\text{C} \dots T_{vj\text{ max}}$	V_{DSM}	1200, 1400 1600	V V
Rückwärts-Stoßspitzensperrspannung non-repetitive peak reverse voltage	$T_{vj} = +25^{\circ}\text{C} \dots T_{vj\text{ max}}$	V_{RSM}	1300, 1500 1700	V V
Durchlaßstrom-Grenzeffektivwert RMS on-state current		I_{TRMSM}	520	A
Dauergrenzstrom average on-state current	$T_C = 85^{\circ}\text{C}$	I_{TAVM}	330	A
Stoßstrom-Grenzwert surge current	$T_{vj} = 25^{\circ}\text{C}, t_p = 10\text{ms}$ $T_{vj} = T_{vj\text{ max}}, t_p = 10\text{ms}$	I_{TSM}	9100 8000	A A
Grenzlastintegral I^2t -value	$T_{vj} = 25^{\circ}\text{C}, t_p = 10\text{ms}$ $T_{vj} = T_{vj\text{ max}}, t_p = 10\text{ms}$	I^2t	414000 320000	A^2s A^2s
Kritische Stromsteilheit critical rate of rise of on-state current	DIN IEC 747-6 $f = 50\text{Hz}, i_{\text{GM}} = 1\text{A}, di_{\text{G}}/dt = 1\text{A}/\mu\text{s}$	$(di_{\text{T}}/dt)_{\text{cr}}$	250	$\text{A}/\mu\text{s}$
Kritische Spannungssteilheit critical rate of rise of off-state voltage	$T_{vj} = T_{vj\text{ max}}, v_{\text{D}} = 0,67 V_{\text{DRM}}$ 6. Kennbuchstabe / 6th letter F	$(dv_{\text{D}}/dt)_{\text{cr}}$	1000	$\text{V}/\mu\text{s}$

Charakteristische Werte / Characteristic values

Durchlaßspannung on-state voltage	$T_{vj} = T_{vj\text{ max}}, i_{\text{T}} = 800\text{A}$	V_{T}	max. 1,44	V
Schleusenspannung threshold voltage	$T_{vj} = T_{vj\text{ max}}$	$V_{(\text{TO})}$	0,8	V
Ersatzwiderstand slope resistance	$T_{vj} = T_{vj\text{ max}}$	r_{T}	0,6	$\text{m}\Omega$
Zündstrom gate trigger current	$T_{vj} = 25^{\circ}\text{C}, v_{\text{D}} = 6\text{V}$	I_{GT}	max. 200	mA
Zündspannung gate trigger voltage	$T_{vj} = 25^{\circ}\text{C}, v_{\text{D}} = 6\text{V}$	V_{GT}	max. 2,0	V
Nicht zündender Steuerstrom gate non-trigger current	$T_{vj} = T_{vj\text{ max}}, v_{\text{D}} = 6\text{V}$ $T_{vj} = T_{vj\text{ max}}, v_{\text{D}} = 0,5 V_{\text{DRM}}$	I_{GD}	max. 10 max. 5	mA mA
Nicht zündende Steuerspannung gate non-trigger voltage	$T_{vj} = T_{vj\text{ max}}, v_{\text{D}} = 0,5 V_{\text{DRM}}$	V_{GD}	max. 0,2	V
Haltestrom holding current	$T_{vj} = 25^{\circ}\text{C}, v_{\text{D}} = 6\text{V}, R_{\text{A}} = 5\Omega$	I_{H}	max. 300	mA
Einraststrom latching current	$T_{vj} = 25^{\circ}\text{C}, v_{\text{D}} = 6\text{V}, R_{\text{GK}} \geq 10\Omega$ $i_{\text{GM}} = 1\text{A}, di_{\text{G}}/dt = 1\text{A}/\mu\text{s}, t_{\text{G}} = 20\mu\text{s}$	I_{L}	max. 1200	mA
Vorwärts- und Rückwärts-Sperrstrom forward off-state and reverse currents	$T_{vj} = T_{vj\text{ max}}$ $v_{\text{D}} = V_{\text{DRM}}, v_{\text{R}} = V_{\text{RRM}}$	$i_{\text{D}}, i_{\text{R}}$	max. 70	mA
Zündverzug gate controlled delay time	DIN IEC 747-6 $T_{vj} = 25^{\circ}\text{C}, i_{\text{GM}} = 1\text{A}, di_{\text{G}}/dt = 1\text{A}/\mu\text{s}$	t_{gd}	max. 3,0	μs
Freiwerdezeit circuit commutated turn-off time	$T_{vj} = T_{vj\text{ max}}, i_{\text{TM}} = 350\text{A}$ $V_{\text{RM}} = 100\text{V}, V_{\text{DM}} = 0,67 V_{\text{DRM}}$ $dv_{\text{D}}/dt = 20\text{V}/\mu\text{s}, -di_{\text{T}}/dt = 10\text{A}/\mu\text{s}$ 5. Kennbuchstabe / 5th letter O	t_{q}	typ. 250	μs
Isolations-Prüfspannung insulation test voltage	RMS, $f = 50\text{Hz}, t = 1\text{min}$ RMS, $f = 50\text{Hz}, t = 1\text{sec}$	V_{ISOL}	3,0 3,6	kV kV



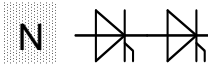
Thermische Eigenschaften / Thermal properties:

Innerer Wärmewiderstand thermal resistance, junction to case	pro Modul / per module, $\Theta = 180^\circ\text{sin}$	R_{thJC}	max. 0,059	$^\circ\text{C/W}$
	pro Zweig / per arm, $\Theta = 180^\circ\text{sin}$		max. 0,117	$^\circ\text{C/W}$
	pro Modul / per module, DC		max. 0,056	$^\circ\text{C/W}$
	pro Zweig / per arm, DC		max. 0,111	$^\circ\text{C/W}$
Übergangs-Wärmewiderstand thermal resistance, case to heatsink	pro Modul / per module	R_{thCK}	max. 0,020	$^\circ\text{C/W}$
	pro Zweig / per arm		max. 0,040	$^\circ\text{C/W}$
Höchstzulässige Sperrschichttemperatur max. junction temperature		$T_{\text{vj max}}$	135	$^\circ\text{C}$
Betriebstemperatur operating temperature		$T_{\text{c op}}$	- 40...+135	$^\circ\text{C}$
Lagertemperatur storage temperature		T_{stg}	- 40...+140	$^\circ\text{C}$

Mechanische Eigenschaften / Mechanical properties:

Gehäuse, siehe Anlage case, see appendix			Seite 3 page 3	
Si-Elemente mit Druckkontakt, Amplifying-Gate Si-pellets with pressure contact, amplifying-gate				
Innere Isolation internal insulation			AlN	
Anzugsdrehmoment für mechanische Befestigung mounting torque	Toleranz / tolerance $\pm 15\%$	M1	6	Nm
Anzugsdrehmoment für elektrische Anschlüsse terminal connection torque	Toleranz / tolerance +5% / -10%	M2	12	Nm
Gewicht weight		G	typ. 800	g
Kriechstrecke creepage distance			17	mm
Schwingfestigkeit vibration resistance	f = 50Hz		50	m/s^2

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.

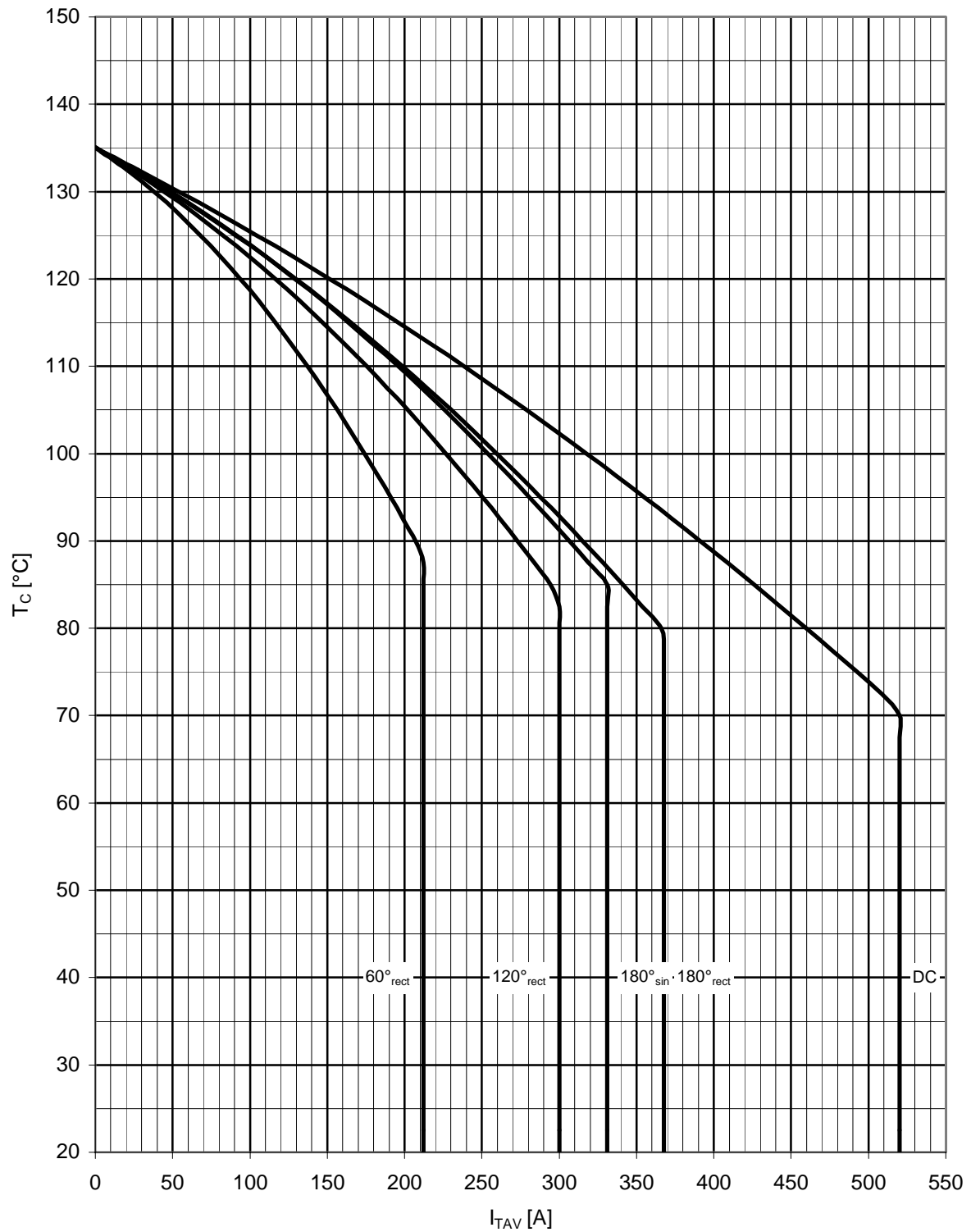
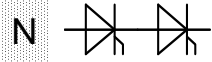


Analytische Elemente des transienten Wärmewiderstandes Z_{thJC} für DC

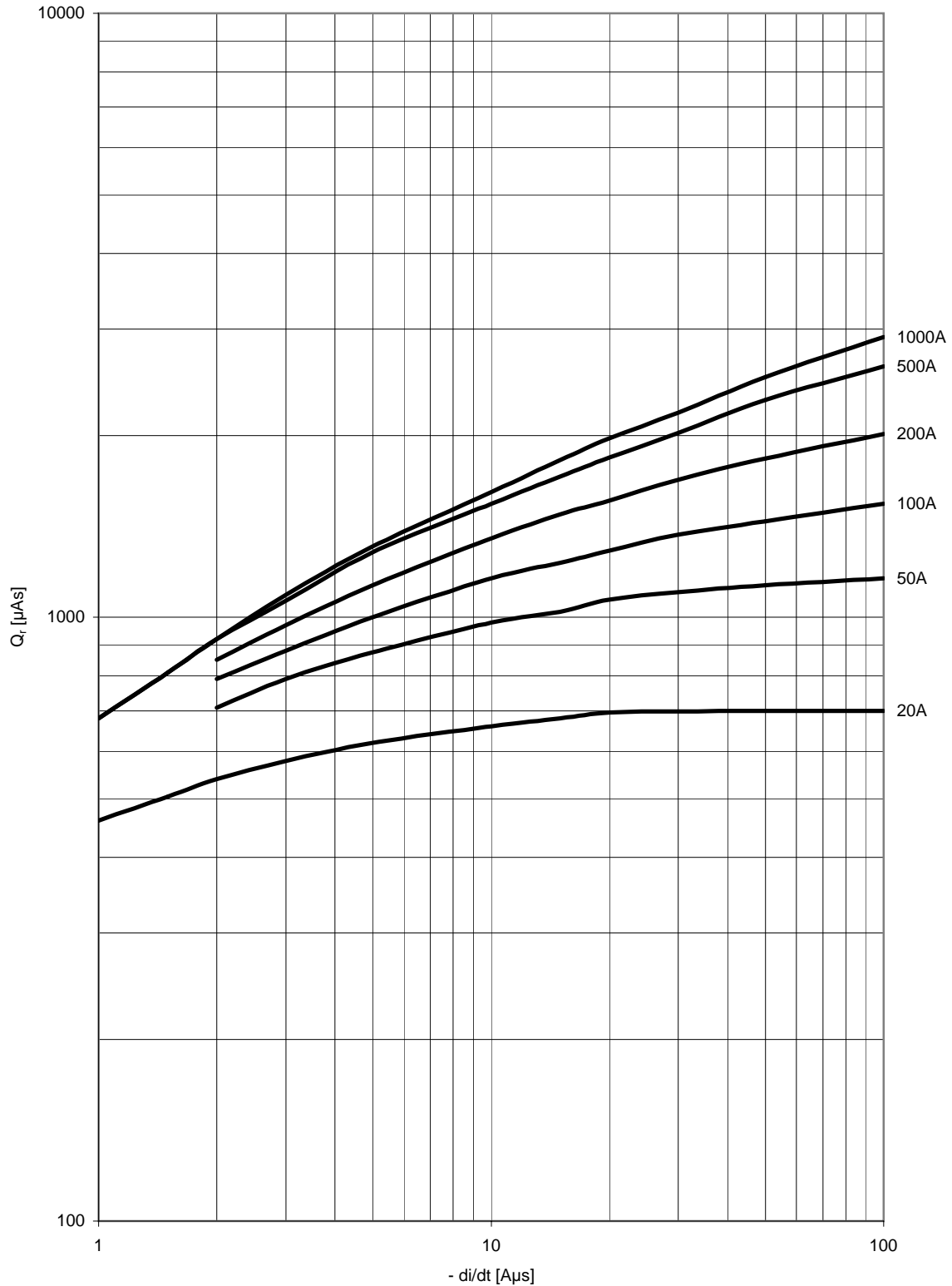
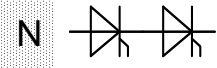
Analytical elements of transient thermal impedance Z_{thJC} for DC

Pos. n	1	2	3	4	5	6	7
$R_{thn} [^{\circ}C / W]$	0,0031	0,0097	0,0259	0,0359	0,0366		
$\tau_n [s]$	0,0009	0,0080	0,1100	0,6100	3,0600		

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



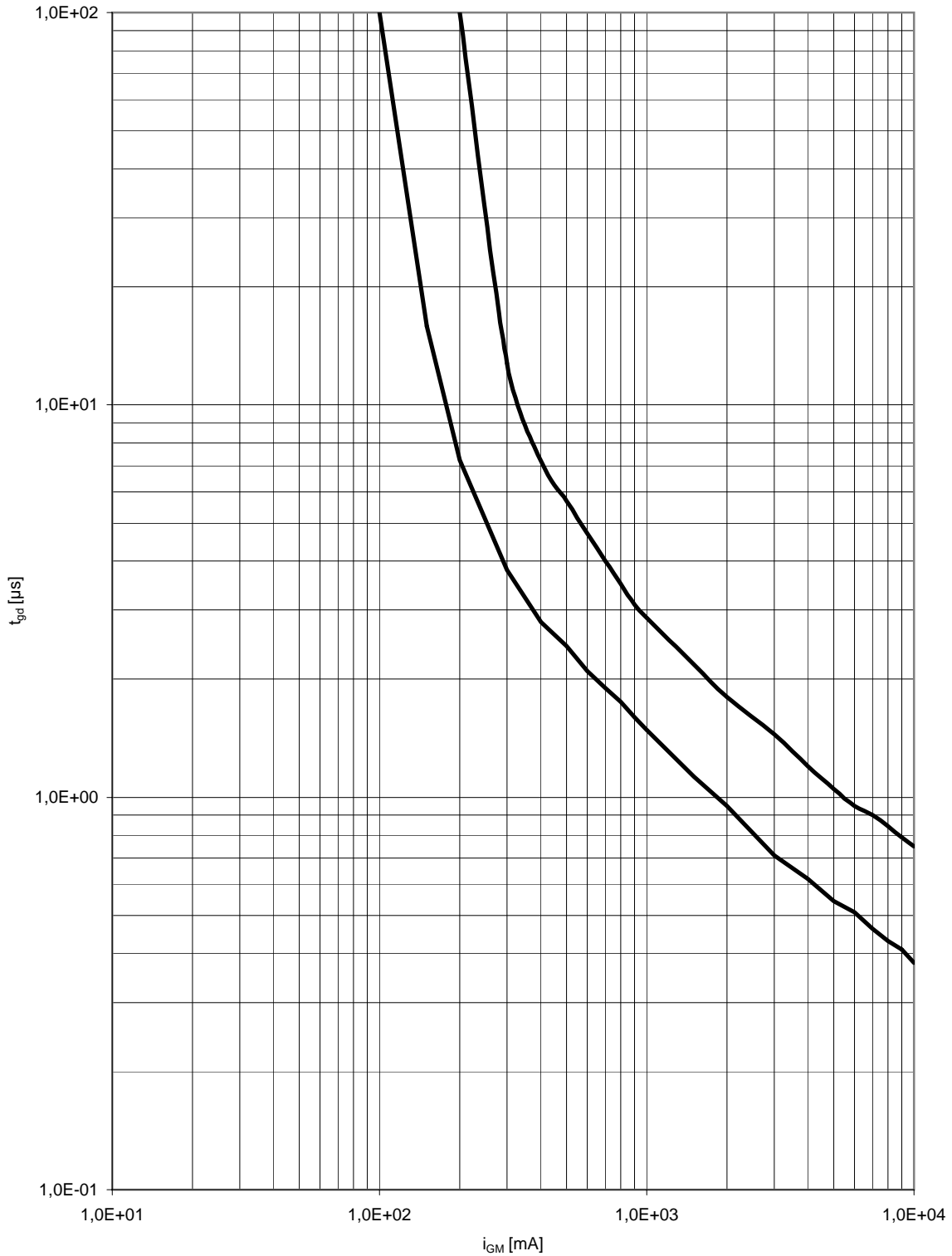
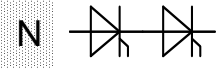
Höchstzulässige Gehäusetemperatur / Maximum allowable case temperature $\bar{T}_C = f(I_{TAVM})$
 Strombelastbarkeit je Zweig / current load per arm
 Parameter: Stromflußwinkel / current conduction angle θ



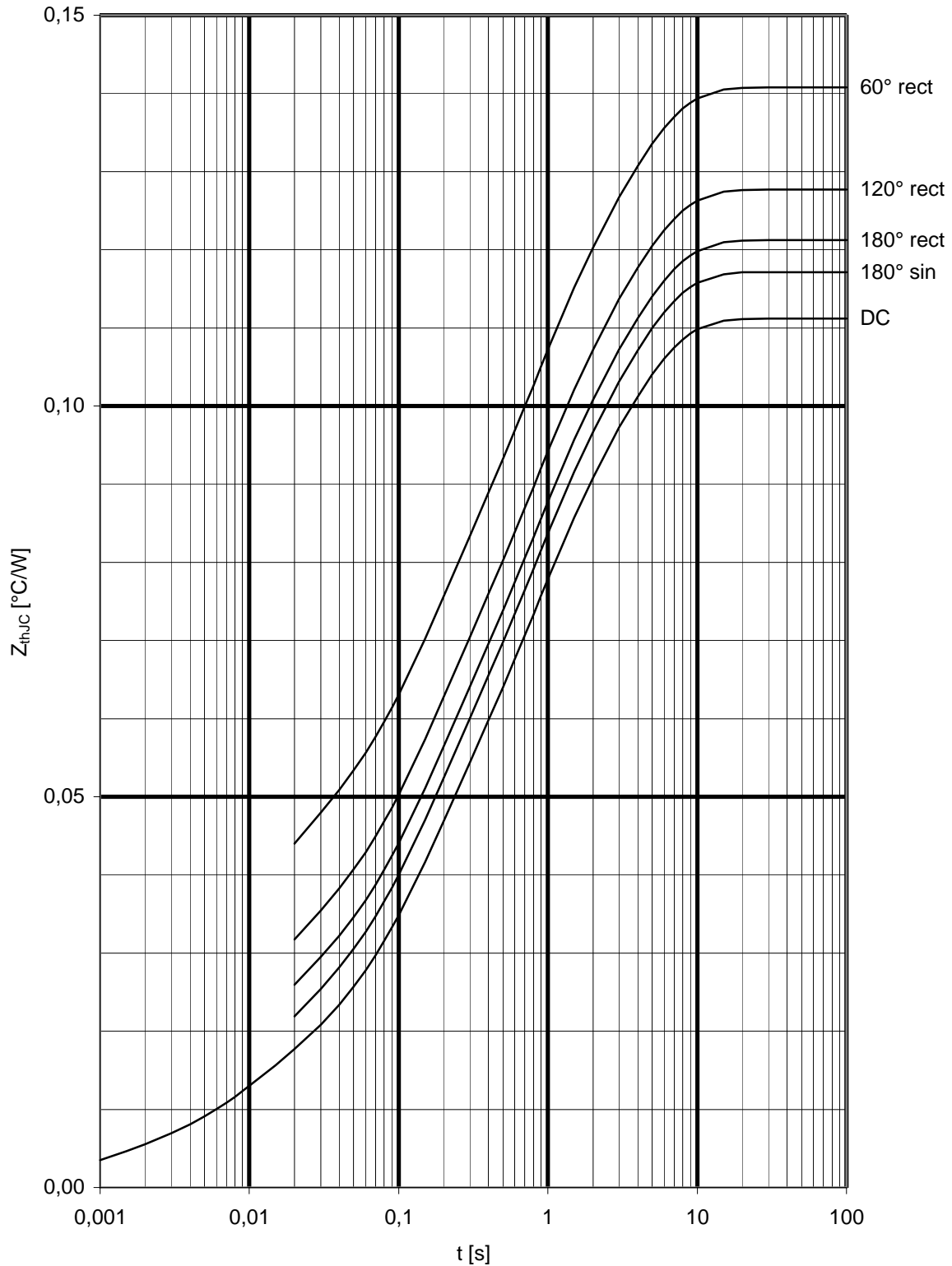
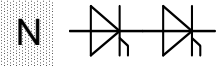
Sperrverzögerungsladung / Recovered charge $Q_r = f(-di/dt)$

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

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



Zündverzögerung / Gate controlled delay time $t_{gd} = f(i_{GM})$
 $T_{vj} = 25^\circ\text{C}; di_G/dt = i_{GM}/1\mu\text{s}$
 a - maximaler Verlauf / limiting characteristic
 b - typischer Verlauf / typical characteristic



Transienter innerer Wärmewiderstand je Zweig / Transient thermal impedance per arm $\hat{z}_{thJC} = f(t)$
Parameter: Stromflußwinkel / current conduction angle θ