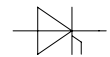


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Features:

Volle Sperrfähigkeit bei 125° mit 50 Hz

Full blocking capability at 125°C with 50 Hz

Hohe Stoßströme und niedriger Wärme-widererstände durch NTV-Verbindung zwischen Silizium und Mo-Trägerscheibe.

High surge currents and low thermal resistance by using low temperature-connection NTV between silicon wafer and molybdenum.

Elektroaktive Passivierung durch a - C:H

Electroactive passivation by a - C:H

Elektrische Eigenschaften / Electrical properties

Höchstzulässige Werte / Maximum rated values

Periodische Vorwärts- und Rückwärts-Spitzensperrspannung repetitive peak forward off-state and reverse voltage	f = 50 Hz	V _{DRM} , V _{RRM}	t _{vj min} = -40°C 3000 3200 3400 3500 3600	t _{vj min} = 0°C 3100 3300 3500 3600 3700	V V V V V
Durchlaßstrom-Grenzeffektivwert RMS forward current		I _{TRMSM}		4350	A
Dauergrenzstrom mean forward current	t _C = 85°C, f = 50Hz t _C = 60°C, f = 50Hz	I _{TAVM}		2050 2750	A A
Stoßstrom-Grenzwert surge forward current	t _{vj} = 25°C, t _p = 10ms t _{vj} = t _{vj max} , t _p = 10ms	I _{TSM}		42,5 38,5	kA kA
Grenzlastintegral I ² t-value	t _{vj} = 25°C, t _p = 10ms t _{vj} = t _{vj max} , t _p = 10ms	I ² t		9,0 · 10 ⁶ 7,4 · 10 ⁶	A ² s A ² s
Kritische Stromsteilheit critical rate of rise of on-state current	DIN IEC 747-6 f = 50Hz, v _D = 0,67 V _{DRM} , i _{GM} = 3A, di _C /dt = 6A/µs	(di/dt) _{cr}		300	A/µs
Kritische Spannungssteilheit critical rate of rise of off-state current	t _{vj} = t _{vj max} , v _D = 0,67 V _{DRM} 5. Kennbuchstabe / 5 th letter F	(dv/dt) _{cr}		1000	V/µs

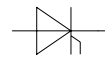
Technische Information / Technical Information

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Elektrische Eigenschaften / Electrical properties

Charakteristische Werte / Characteristic values

Durchlaßspannung on-state voltage	$t_{vj} = t_{vj \max}, i_T = 2kA$	v_T	typ. 1,35	max. 1,5	V
Schleusenspannung / threshold voltage Ersatzwiderstand / slope resistance	$t_{vj} = t_{vj \max}$	$V_{(TO)}$ r_T	typ. 0,9 0,225	max. 1 0,25	V mΩ
Durchlaßrechenkennlinie on - state characteristics for calculation $V_T = A + B \cdot i_T + C \cdot \ln(i_T + 1) + D \cdot \sqrt{i_T}$ 400 A ≤ i_T ≤ 6000 A	$t_{vj} = t_{vj \max}$	A B C D	typ. - 0,0978 0,000187 0,15 - 0,00173	max. - 0,0981 0,000153 0,143 0,00466	
Zündstrom gate trigger current	$t_{vj} = 25^\circ C, v_D = 6V$	I_{GT}		350	mA
Zündspannung gate trigger voltage	$t_{vj} = 25^\circ C, v_D = 6V$	V_{GT}		2,5	V
Nicht zündender Steuerstrom gate non-trigger current	$t_{vj} = t_{vj \max}, v_D = 6V$ $t_{vj} = t_{vj \max}, v_D = 0,5 \cdot V_{DRM}$	I_{GD}		20 10	mA mA
nicht zündende Steuerspannung gate non-trigger voltage	$t_{vj} = t_{vj \max}, v_D = 0,5 V_{DRM}$	V_{GD}		0,4	V
Haltestrom holding current	$t_{vj} = 25^\circ C, v_D = 12V, R_A = 4,7\Omega$	I_H		350	mA
Einraststrom latching current	$t_{vj} = 25^\circ C, v_D = 12V, R_{GK} \geq 10\Omega$ $i_{GM} = 3A, di_G/dt = 6 A/\mu s, t_g = 20\mu s$	I_L		3	A
Vorwärts- und Rückwärts-Sperrstrom forward off-state and reverse currents	$t_{vj} = t_{vj \max}$ $v_D = V_{DRM}, v_R = V_{RRM}$	i_D, i_R		300	mA
Zündverzugszeit gate controlled delay time	DIN IEC 747-6 $t_{vj} = 25^\circ C,$ $i_{GM} = 3A, di_G/dt = 6A/\mu s$	t_{gd}		1,5	μs
Freiwerdezeit circuit commutated turn-off time	$t_{vj} = t_{vj \max}, i_{TM} = I_{TAVM}$ $v_{RM} = 100V, v_{DM} = 0,67 V_{DRM}$ $dv_D/dt = 20V/\mu s, -di_T/dt = 10A/\mu s$ 4. Kennbuchstabe / 4 th letter O	t_q	typ.	300	μs
Sperrverzögerungsladung recovered charge	$t_{vj} = t_{vj \max}$ $I_{TM} = 2000A, di/dt = 10A/\mu s$ $V_R = 0,5 V_{RRM}, V_{RM} = 0,8 V_{RRM}$	Q_f		8,5	mAs
Rückstromspitze peak reverse recovery current	$t_{vj} = t_{vj \max}$ $I_{TM} = 2000A, di/dt = 10 A/\mu s$ $V_R = 0,5 \cdot V_{RRM}, V_{RM} = 0,8 \cdot V_{RRM}$	I_{RM}		270	A

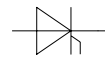
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Thermische Eigenschaften / Thermal properties

Innerer Wärmewiderstand thermal resistance, junction to case	beidseitig / two-sided, $\Theta = 180^\circ \sin$ beidseitig / two-sided, DC Anode / anode DC Kathode / cathode DC	R_{thJC}	0,0087 0,0080 0,0150 0,0170	$^\circ\text{C/W}$ $^\circ\text{C/W}$ $^\circ\text{C/W}$ $^\circ\text{C/W}$
Übergangs-Wärmewiderstand thermal resistance, case to heatsink	beidseitig / two-sided einseitig / single-sided	R_{thCH}	0,0025 0,0050	$^\circ\text{C/W}$ $^\circ\text{C/W}$
Höchstzulässige Sperrschichttemperatur max. junction temperature		$t_{vj \max}$	125	$^\circ\text{C}$
Betriebstemperatur operating temperature		$t_{c \text{ op}}$	-40...+125	$^\circ\text{C}$
Lagertemperatur storage temperature		t_{stg}	-40...+150	$^\circ\text{C}$

Mechanische Eigenschaften / Mechanical properties

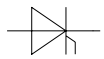
Gehäuse, siehe Anlage case, see appendix			Seite 4 / 5	
Si - Element mit Druckkontakt, Amplifying gate Si - pellet with pressure contact, amplifying gate	Silizium Tablette silicon wafer		76TN36	
Anpreßkraft clampig force		F	36...52	kN
Gewicht weight	T2001N T2009N	G	typ. 1700 typ. 1200	g g
Kriechstrecke surface creepage distance	T2001N T2009N		33 25	mm mm
Feuchteklasse humidity classification	DIN 40040		C	
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.

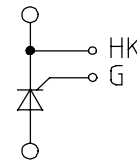
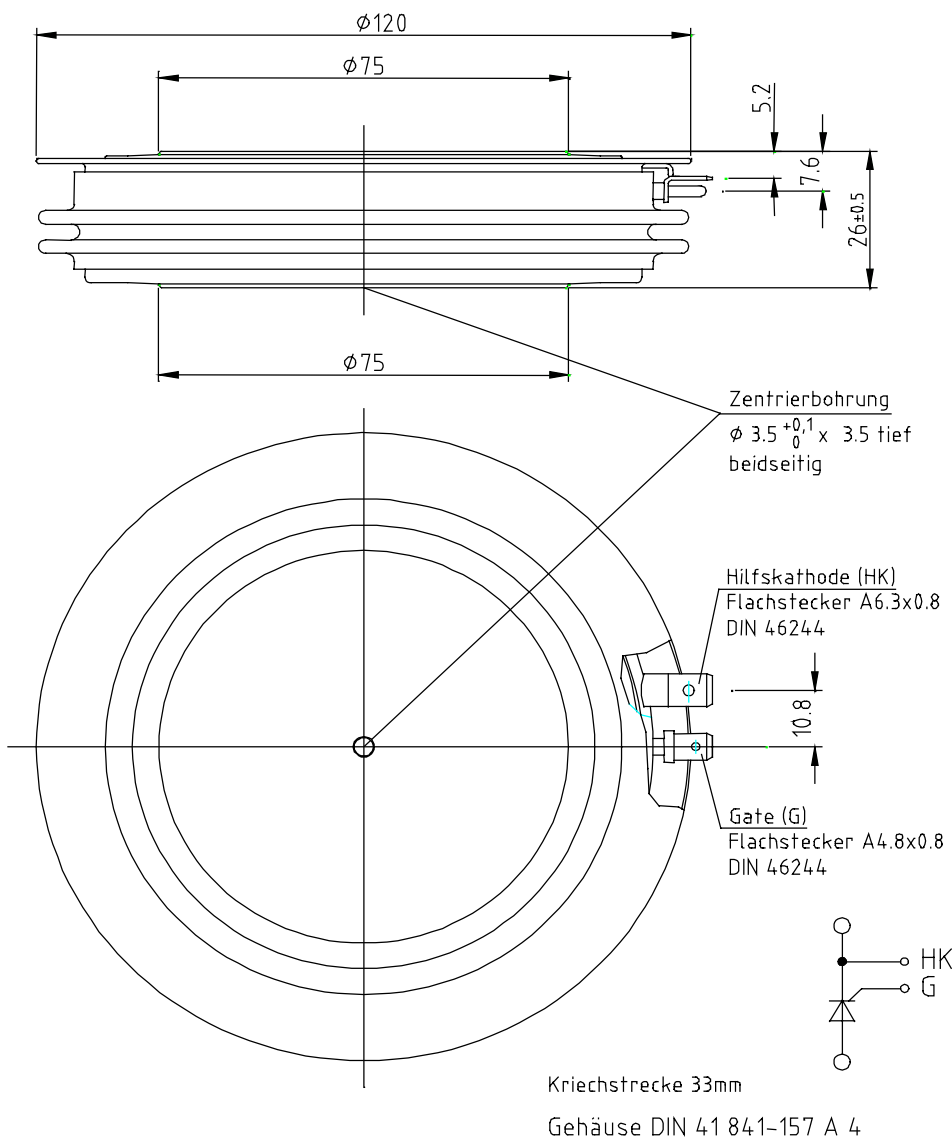
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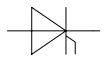
Maßbild / Outline T2001N



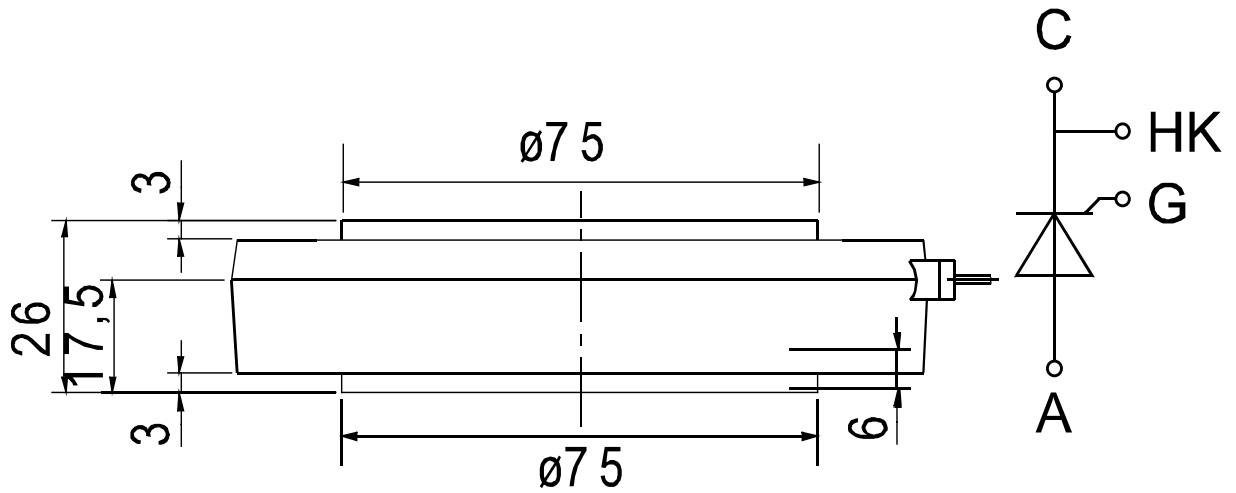
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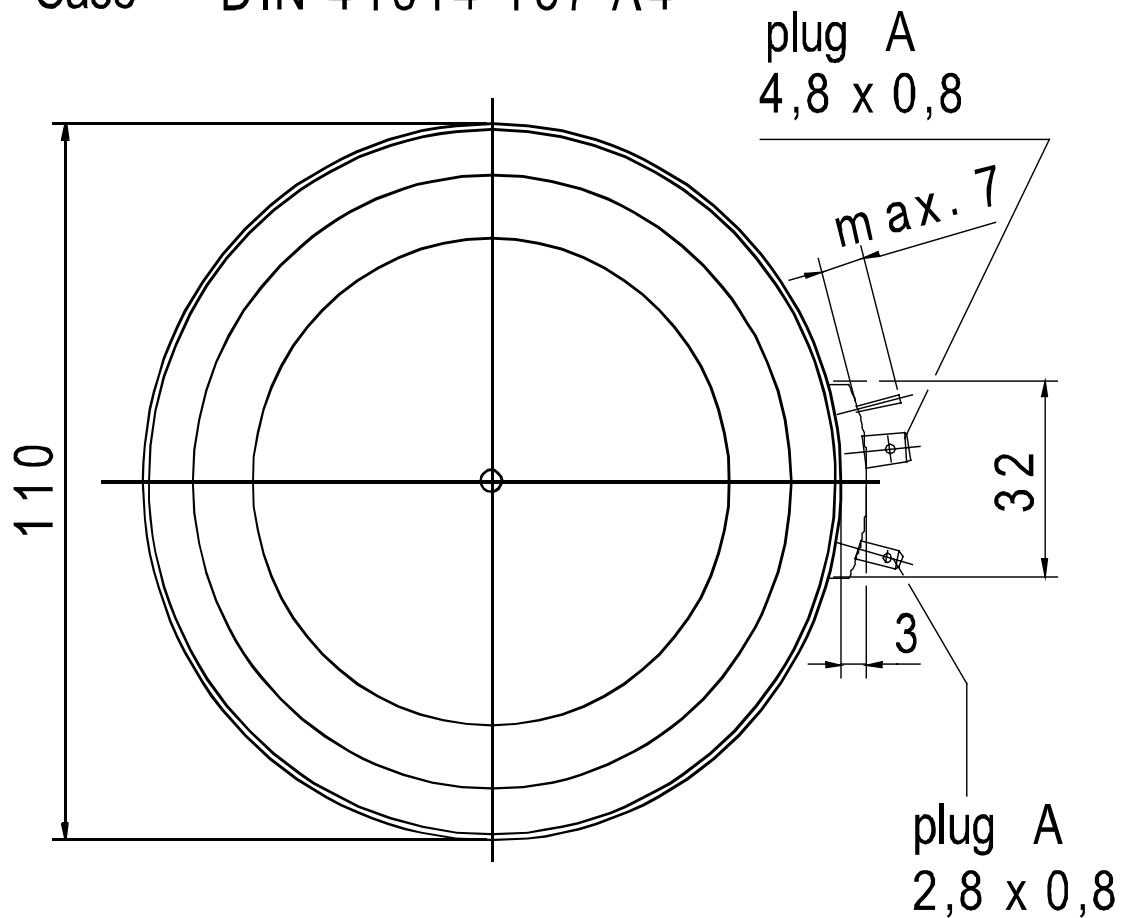
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Maßbild / Outline T2009N



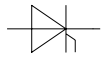
Case DIN 41814-157 A4



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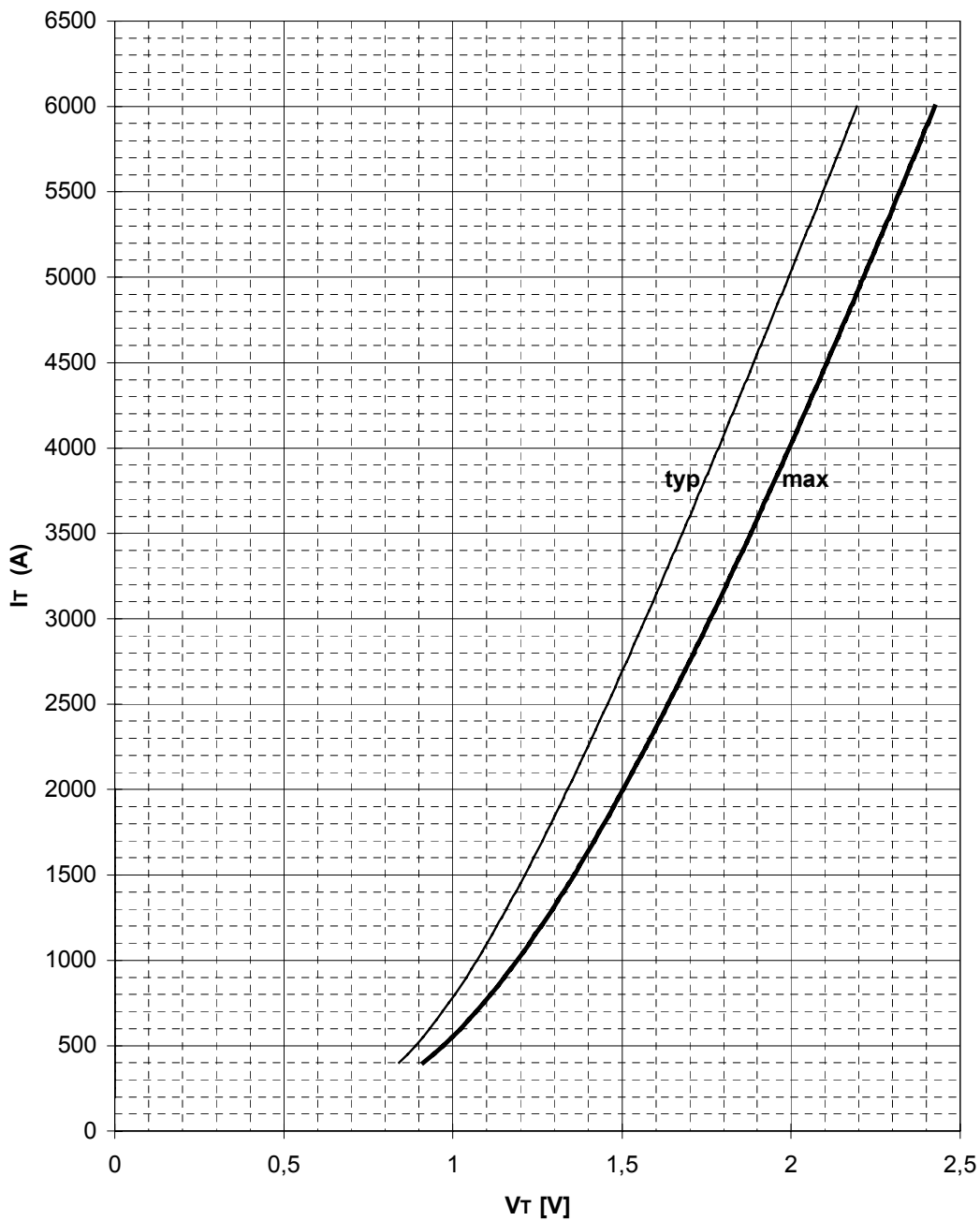
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Durchlaßkennlinien $i_T = f(v_T)$
Limiting and typical on-state characteristic

— $t_{vj} = 125^\circ\text{C}$



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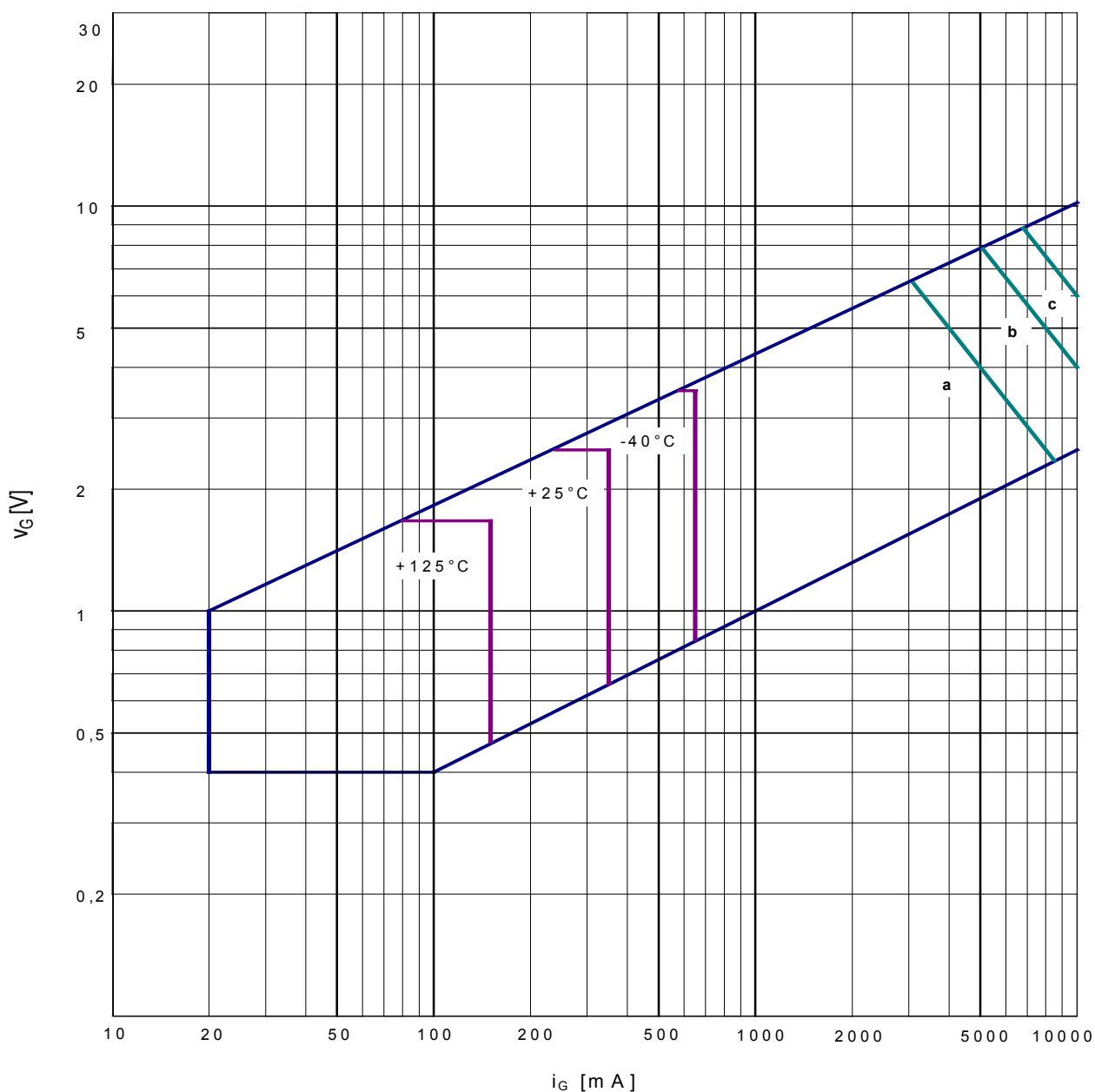
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Steuerkreischarakteristik mit Zündbereichen
Gate characteristic with triggering areas
 $v_G = f(i_G), V_D = 6V$

Parameter		a	b	C
Steuerimpulsdauer / trigger pulse duration	t_G (ms)	10	1	0,5
Höchstzulässige Spitzensteuerverlustleistung Max. rated peak power dissipation	P_{GM} (W)	20	40	60



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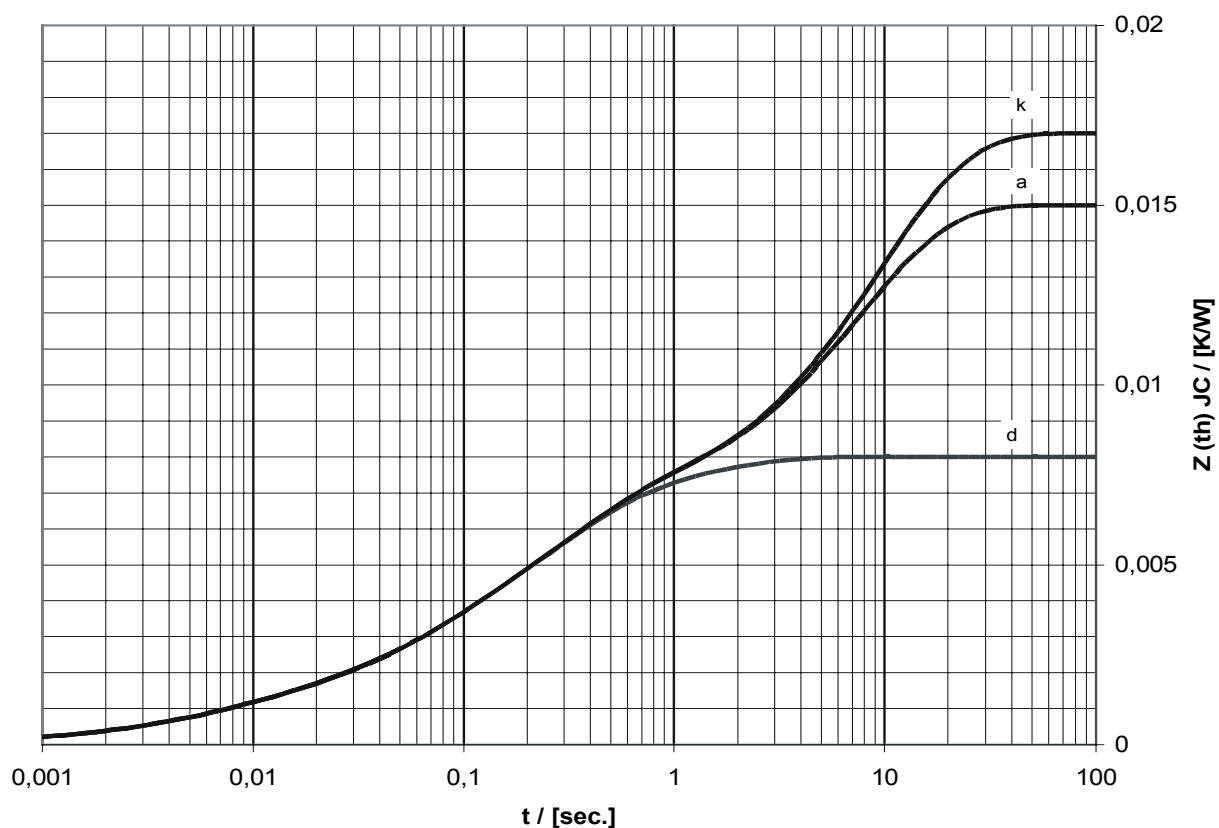


Transienterr innerer Wärmewiderstand
Transient thermal impedance $Z_{th\ JC} = f(t)$

	doppelseitige Kühlung		anodenseitige Kühlung		kathodenseitige Kühlung	
	r [K/W]	[s]	r [K/W]	[s]	r [K/W]	[s]
1	0,00137	1,25	0,00837	7,63	0,01037	9,46
2	0,004	0,27	0,004	0,27	0,004	0,27
3	0,0017	0,056	0,0017	0,056	0,0017	0,056
4	0,0008	0,0068	0,0008	0,0068	0,0008	0,0068
5	0,00013	0,0017	0,00013	0,0017	0,00013	0,0017
	0,008	-	0,015	-	0,017	-

Doppelseitige Kühlung / double sided cooling:	add. R_{th} [K/W]
180°-Rechteckstrom / 180° rectangular current:	0,00085
120°-Rechteckstrom / 120° rectangular current:	0,00135
60°-Rechteckstrom / 60° rectangular current:	0,00210
30°-Rechteckstrom / 30° rectangular current:	0,00270
180°-Sinusstrom / 180° sine current:	0,0007

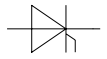
$$Z_{thJC} = \sum_{n=1}^{n_{max}} R_{thn} \cdot (1 - e^{-t/\tau_n})$$



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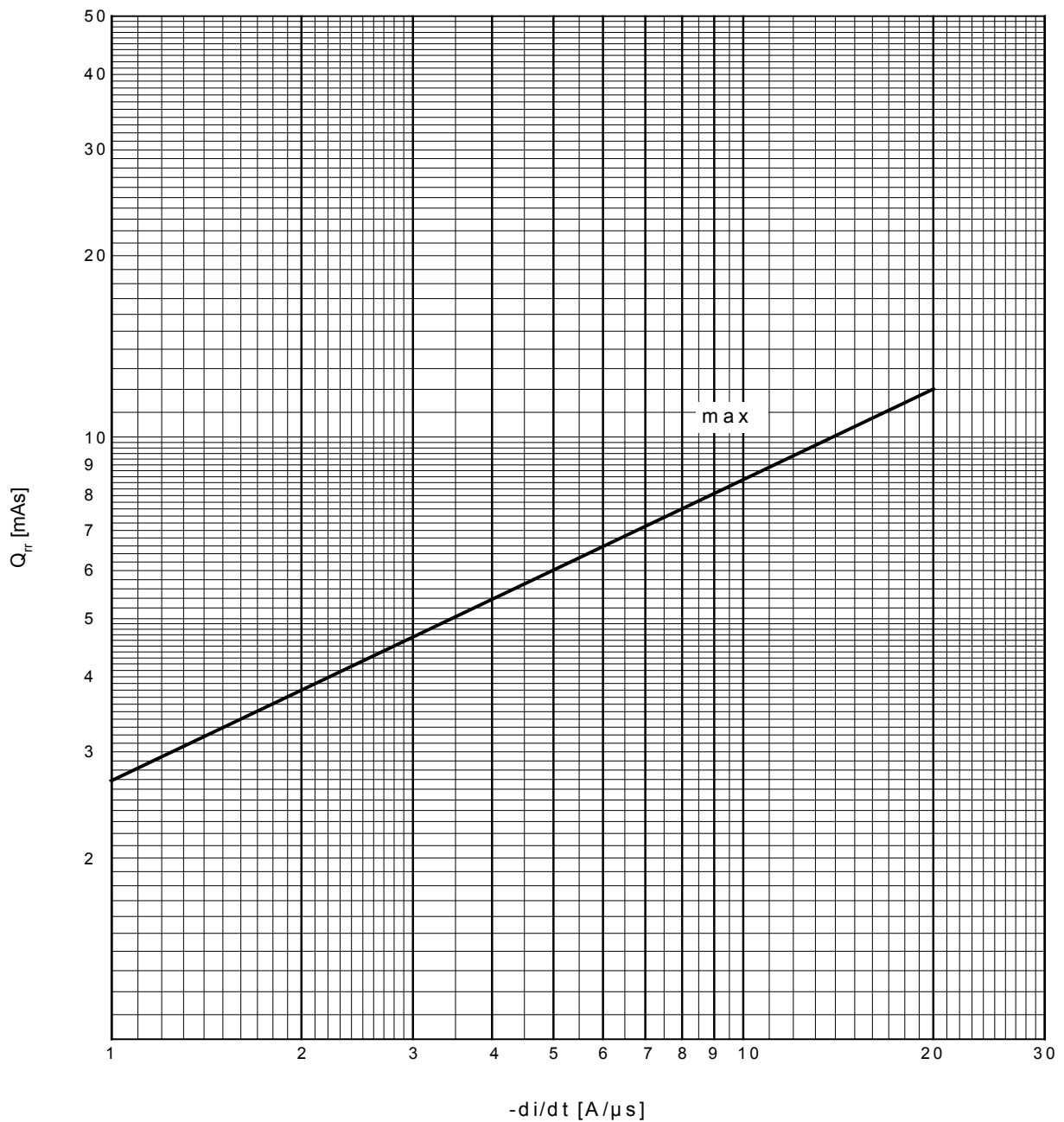
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Sperrverzögerungsladung / recoverd charge

$$Q_{rr} = f (di/dt)$$

$t_{vj} = 125^{\circ}C, I_{TM} = 2000A, v_R = 0,5 \cdot V_{RRM}, v_R = 0,8 \cdot V_{RRM}$



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Rückstromspitze / reverse recovery current
(typische Abhängigkeit / typical dependence)

$$I_{RM} = f (di/dt)$$

$t_{vj} = 125^{\circ}C, I_{TM} = 2000A, V_R = 0,5 \cdot V_{RRM}, V_R = 0,8 \cdot V_{RRM}$

