



Netz-Gleichrichterdiode
Rectifier Diode

D 3041N

Zieldaten

Elektrische Eigenschaften / Electrical properties
Höchstzulässige Werte / Maximum rated values

Periodische Rückwärts-Spitzensperrspannung repetitive peak reverse voltages	$T_d = -40^{\circ}\text{C} \dots T_{d,max}$	V_{RRM}	5800 6500	6000 6800	V V
Periodische Rückwärts-Spitzensperrspannung repetitive peak reverse voltages	$T_d = 0^{\circ}\text{C} \dots T_{d,max}$	V_{RRM}	6000 6700	6200 7000	V V
Durchlaßstrom-Grenzeffektivwert maximum RMS on-state current		I_{RMS}		6440	A
Dauergrenzstrom average on-state current	$T_C = 100^{\circ}\text{C}$ $T_C = 60^{\circ}\text{C}$	I_{RMS}		3030 4100	A A
Stoßstrom-Grenzwert surge current	$T_d = 25^{\circ}\text{C}, t_p = 10\text{ ms}$ $T_d = T_{d,max}, t_p = 10\text{ ms}$	I_{FSM}		57000 53000	A A
Grenzlastintegral PI-value	$T_d = 25^{\circ}\text{C}, t_p = 10\text{ ms}$ $T_d = T_{d,max}, t_p = 10\text{ ms}$	PI		16240 14040	$10^3\text{ A}^2\text{s}$ $10^3\text{ A}^2\text{s}$
Spitzensperrverlustleistung Surge reverse power dissipation	$T_d = 25^{\circ}\text{C}, t_p = 20\text{ }\mu\text{s}$ $T_d = T_{d,max}, t_p = 20\text{ }\mu\text{s}$	P_{RSM}			10^3 W 10^3 W

Charakteristische Werte / Characteristic values

Durchlaßspannung on-state voltage	$T_d = T_{d,max}, I_F = 4000\text{ A}$	V_F	typ. 1,58 max. 1,7	V V
Schleusenspannung threshold voltage	$T_d = T_{d,max}$	$V_{(TO)}$	typ. 0,78 max. 0,84	V V
Ersatzwiderstand slope resistance	$T_d = T_{d,max}$	r_T	typ. 0,20 max. 0,22	mΩ mΩ
Durchlaßkennlinie on-state characteristic	$T_d = T_{d,max}$ $1500\text{ A} \leq I_F \leq 4000\text{ A}$ $v_F = A + B \cdot I_T + C \cdot \ln(I_T + 1) + D \cdot \sqrt{I_T}$	typ. max.	A 0,4075395 B 0,00008787 C 0,0173038 D 0,010806 A 0,442073 B 9,7148E-5 C 0,0187525 D 0,0113256	
Rückwärts-Sperrstrom reverse current	$T_d = T_{d,max}, V_R = V_{RRM}$	I_R	max. 100	mA

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Datenblatt / Data sheet

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Elektrische Eigenschaften / Electrical properties
Charakteristische Werte / Characteristic values

Sperrverzögerungsladung recovered charge	$V_R = 1000V, T_{vj} = T_{vjmax}$ $C = 1\mu F, R = 22\Omega$ $I_{RM} = 1000A, -di_T/dt = 10 A/\mu s$	Q_r	max.	11	mAs
Rückstromspitze peak reverse recovery current	$V_R = 1000V, T_{vj} = T_{vjmax}$ $C = 1\mu F, R = 22\Omega$ $I_{RM} = 1000A, -di_T/dt = 10 A/\mu s$	I_{RM}	max.	300	A

Sperrverzögerungsladung recovered charge	$V_R = 100V, T_{vj} = T_{vjmax}$ $C = 1\mu F, R = 22\Omega$ $I_{RM} = 1000A, -di_T/dt = 10 A/\mu s$	Q_r	typ.	9	mAs
Rückstromspitze peak reverse recovery current	$V_R = 100V, T_{vj} = T_{vjmax}$ $C = 1\mu F, R = 22\Omega$ $I_{RM} = 1000A, -di_T/dt = 10 A/\mu s$	I_{RM}	typ.	240	A

Thermische Eigenschaften / Thermal properties

Innerer Wärmewiderstand thermal resistance, junction to case	<u>Kühlfläche / cooling surface</u> beidseitig / two-sided, $\theta = 180^\circ$ sin beidseitig / two-sided, DC Anode / anode, DC Kathode / cathode, DC	R_{thJC}	max.	0,00827	$^\circ C/W$
			max.	0,0075	$^\circ C/W$
			max.	0,0133	$^\circ C/W$
			max.	0,0172	$^\circ C/W$
Übergangs-Wärmewiderstand thermal resistance, case to heatsink	<u>Kühlfläche / cooling surface</u> beidseitig / two-sided einseitig / single-sided	R_{thCH}	max.	0,0025	$^\circ C/W$
			max.	0,005	$^\circ C/W$
Höchstzulässige Sperrschichttemperatur maximum junction temperature		T_{vjmax}		160	$^\circ C$
Betriebstemperatur operating temperature		$T_{c op}$		-40...+160	$^\circ C$
Lagertemperatur storage temperature		T_{stg}		-40...+160	$^\circ C$

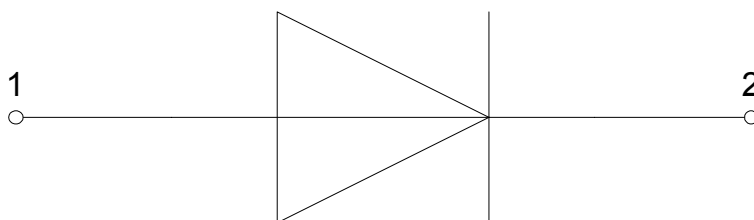
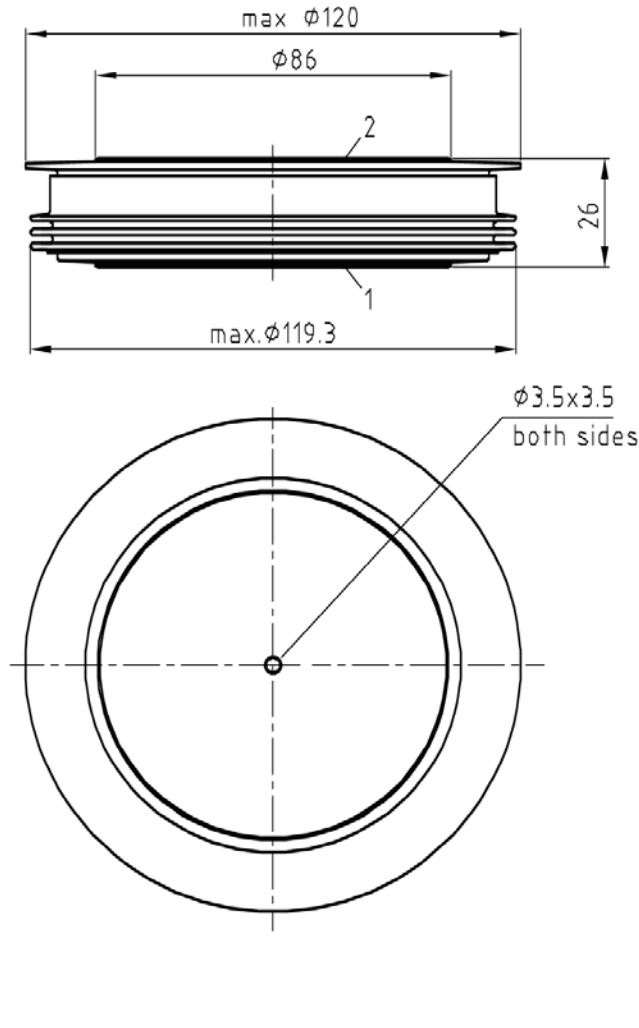
Mechanische Eigenschaften / Mechanical properties

Gehäuse, siehe Anlage case, see annex				Seite 3 page 3	
Si-Element mit Druckkontakt Si-pellet with pressure contact				76DNE68	
Anpresskraft clamping force		F		36...53	kN
Gewicht weight		G	typ.	1200	g
Kriechstrecke creepage distance				33	mm
Schwingfestigkeit vibration resistance	$f = 50 \text{ Hz}$			50	m/s^2

Mit diesem Datenblatt werden Halbleiterbauelemente spezifiziert, jedoch keine Eigenschaften zugesichert. Sie gilt in Verbindung mit den zugehörigen technischen Erläuterungen.

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

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1: Anode/Anode

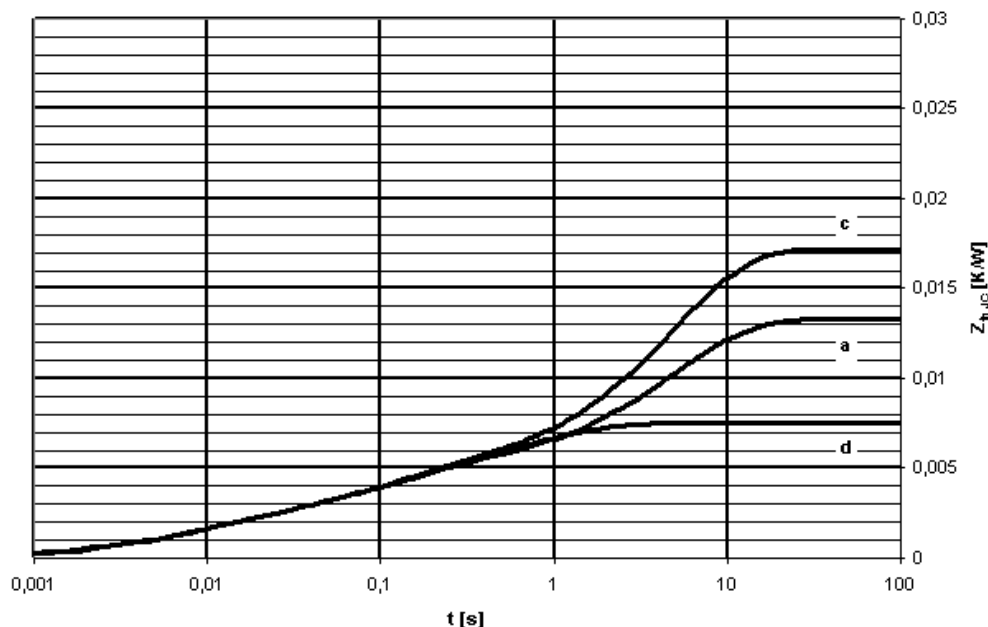
2: Kathode/Cathode

Analytische Elemente des transienten Wärmewiderstandes Z_{thJC}
Analytical elements of transient thermal impedance Z_{thJC}

	Pos. n	1	2	3	4	5	6	7
beidseitig two-sided	R_{thn} [$^{\circ}C/W$]	0,00295	0,002	0,00154	0,00098	0,00003		
	τ_n [s]	0,78008	0,13092	0,02165	0,00514	0,00104		
anodenseitig anode-sided	R_{thn} [$^{\circ}C/W$]	0,00804	0,00081	0,00239	0,0016	0,00046		
	τ_n [s]	5,11029	0,35916	0,09623	0,01197	0,00332		
kathodenseitig cathode-sided	R_{thn} [$^{\circ}C/W$]	0,0121	0,0004	0,00244	0,00155	0,00071		
	τ_n [s]	4,97289	0,48885	0,12071	0,01530	0,00427		

Analytische Funktion / Analytical function:

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

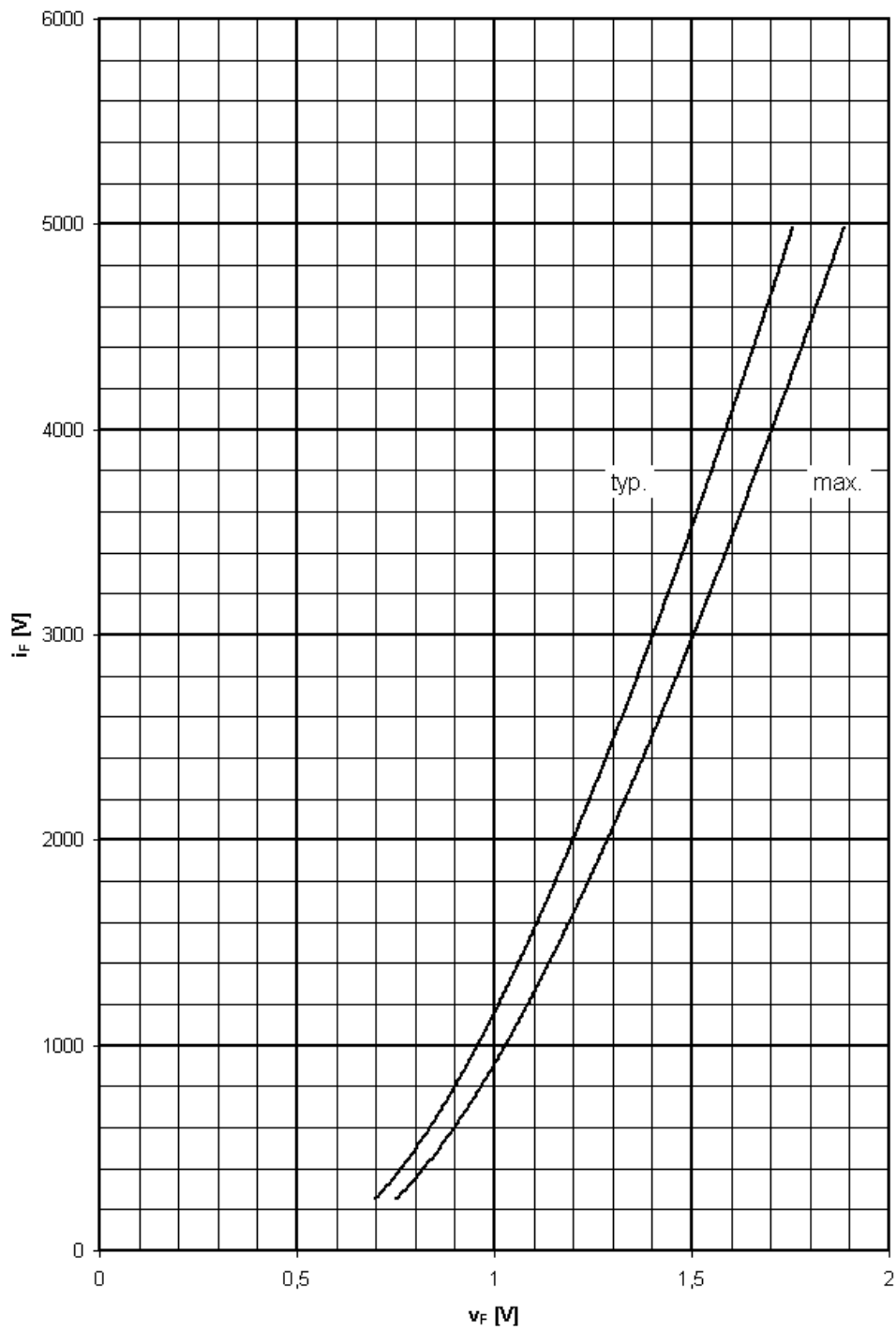


Transienter innerer Wärmewiderstand für DC/ Transient thermal impedance $Z_{thJC} = f(t)$ for DC

Beidseitige Kühlung / Two-sided cooling

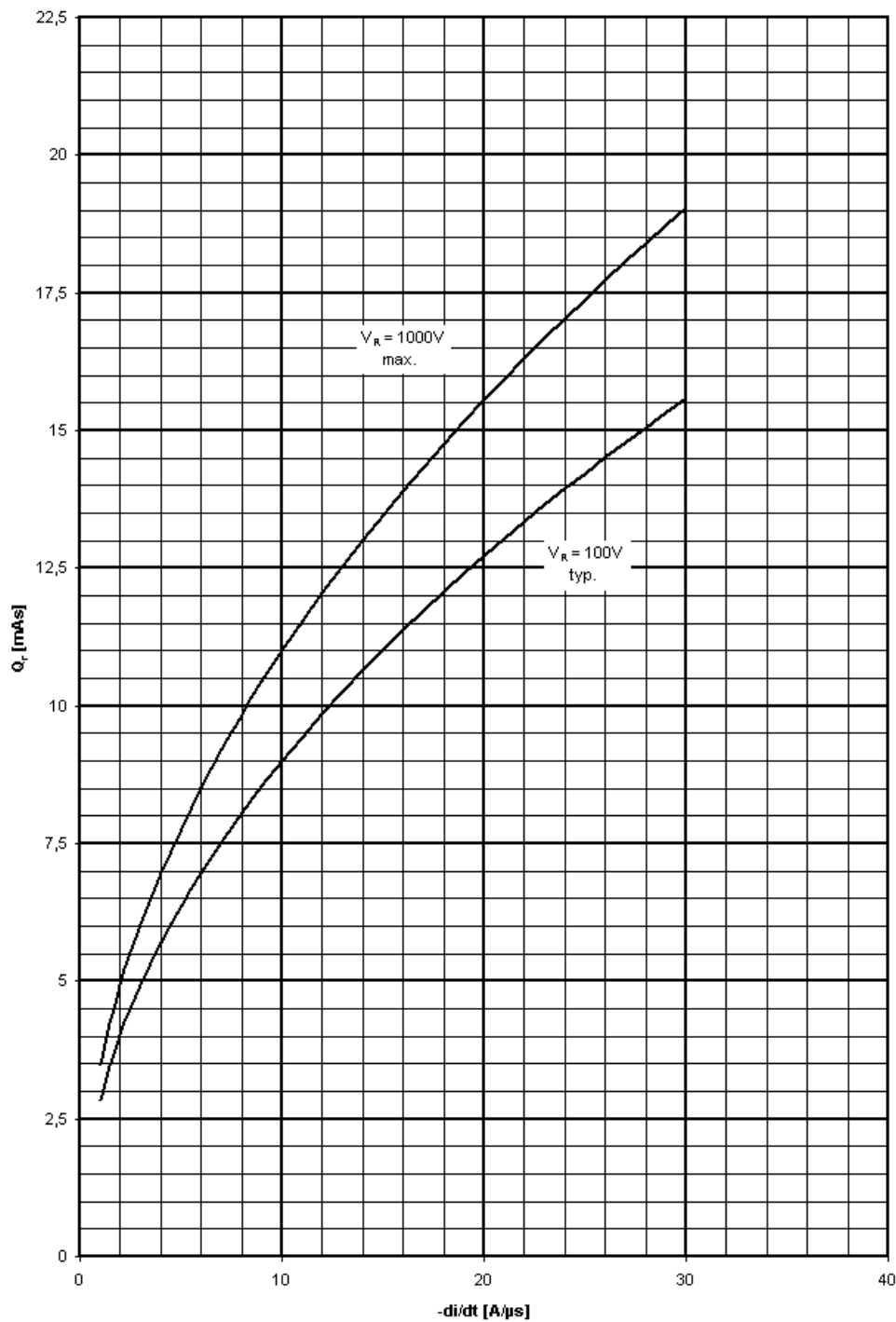
Anodenseitige Kühlung / Anode-sided cooling

Kathodenseitige Kühlung / Cathode-sided cooling



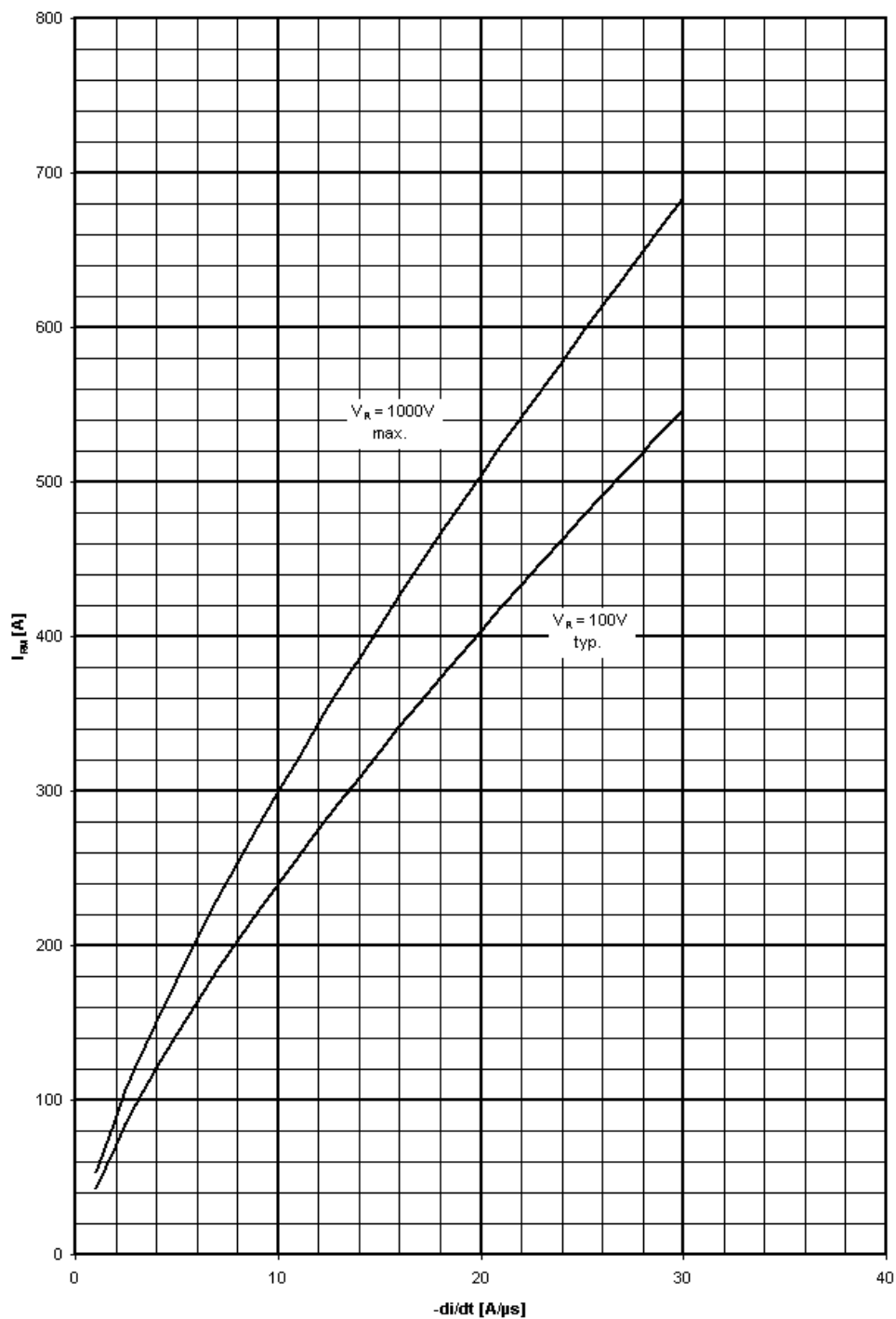
Grenzdurchlaßkennlinie / Limiting on-state characteristic $i_F = f(v_F)$

$$T_{vj} = T_{vj \max}$$



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

$$T_{vj} = T_{vjmax}, C = 1\mu F, R = 22\Omega$$



Rückstromspitze / Peak reverse recovery current $I_{RM} = f(-di/dt)$

$T_{vj} = T_{vjmax}$, $C = 1\mu F$, $R = 22\Omega$

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