



Elektrische Eigenschaften / Electrical properties

Höchstzulässige Werte / Maximum rated values

Periodische Spitzensperrspannung repetitive peak reverse voltage	$T_{vj} = -40^{\circ}\text{C} \dots T_{vj \text{ max}}$ $f = 50\text{Hz}$	V_{RRM}	$T_{vj \text{ min}} = -40^{\circ}\text{C}$ 5800 6000 6500 6800	$0^{\circ}\text{C} \dots T_{vj \text{ max}}$ 6000 6200 6700 7000	V V V V
Durchlaßstrom-Grenzeffektivwert RMS forward current		I_{FRMSM}		6030	A
Dauergrenzstrom mean forward current	$T_C = 100^{\circ}\text{C}, f = 50\text{Hz}$ $T_C = 60^{\circ}\text{C}, f = 50\text{Hz}$	I_{FAVM}		2820 3840	A A
Stoßstrom-Grenzwert surge forward current	$T_{vj} = 25^{\circ}\text{C}, t_p = 10\text{ms}$ $T_{vj} = T_{vj \text{ max}}, t_p = 10\text{ms}$	I_{FSM}		57 53	kA kA
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		$16,24 \cdot 10^6$ $14,04 \cdot 10^6$	A^2s A^2s

Charakteristische Werte / Characteristic values

Durchlaßspannung forward voltage	$T_{vj} = T_{vj \text{ max}}, i_F = 4000\text{A}$	V_F	typ. 1,58	max. 1,7	V
Schleusenspannung threshold voltage	$T_{vj} = T_{vj \text{ max}}$ $i_F = 4000\text{A}$	$V_{(TO)}$	typ. 0,783	max. 0,84	V
Ersatzwiderstand forward slope resistance	$T_{vj} = T_{vj \text{ max}}$	r_T	typ. 0,201	max. 0,216	mΩ
Durchlaßrechenkennlinie 1500 A $\leq i_F \leq$ 4000 A On-state characteristics for calculation $V_F = A + B \cdot i_F + C \cdot \ln(i_F + 1) + D \cdot \sqrt{i_F}$	$T_{vj} = T_{vj \text{ max}}$	A B C D	typ. 0,4075395 8,7875E-05 0,01730387 0,01080604	max. 0,442073 9,7148E-05 0,0187525 0,0113256	
Sperrstrom reverse current	$T_{vj} = T_{vj \text{ max}}, V_R = V_{RRM}$	I_R		100	mA
Sperrverzögerungsladung recovered charge	$T_{vj} = T_{vj \text{ max}}$ $I_{TM} = 1 \text{ kA}, -di/dt = 10 \text{ A}/\mu\text{s}$ $V_R = 1000\text{V}, V_{RM} = 1600\text{V}$ $C = 1\mu\text{F}, R = 22\Omega$	Q_r		11	mAs
Rückstromspitze peak reverse recovery current	$T_{vj} = T_{vj \text{ max}}$ $I_{TM} = 1 \text{ kA}, -di/dt = 10 \text{ A}/\mu\text{s}$ $V_R = 1000\text{V}, V_{RM} = 1600\text{V}$ $C = 1\mu\text{F}, R = 22\Omega$	I_{RM}		300	A



Thermische Eigenschaften / Thermal properties

Innerer Wärmewiderstand thermal resistance, junction to case	beidseitig / two-sided, DC Anode / anode, DC Kathode / cathode, DC	R_{thJC}	max max max	0,0085 0,0149 0,0196	°C/W °C/W °C/W
Übergangs-Wärmewiderstand thermal resistance, case to heatsink	Kühlfläche / cooling surface beidseitig / two-sided einseitig / single sided	R_{thCK}	max max	0,0025 0,005	°C/W °C/W
Höchstzulässige Sperrschichttemperatur max. junction temperature		$t_{vj \max}$		160	°C
Betriebstemperatur operating temperature		$t_{c \text{ op}}$		-40...+160	°C
Lagertemperatur storage temperature		t_{stg}		-40...+160	°C

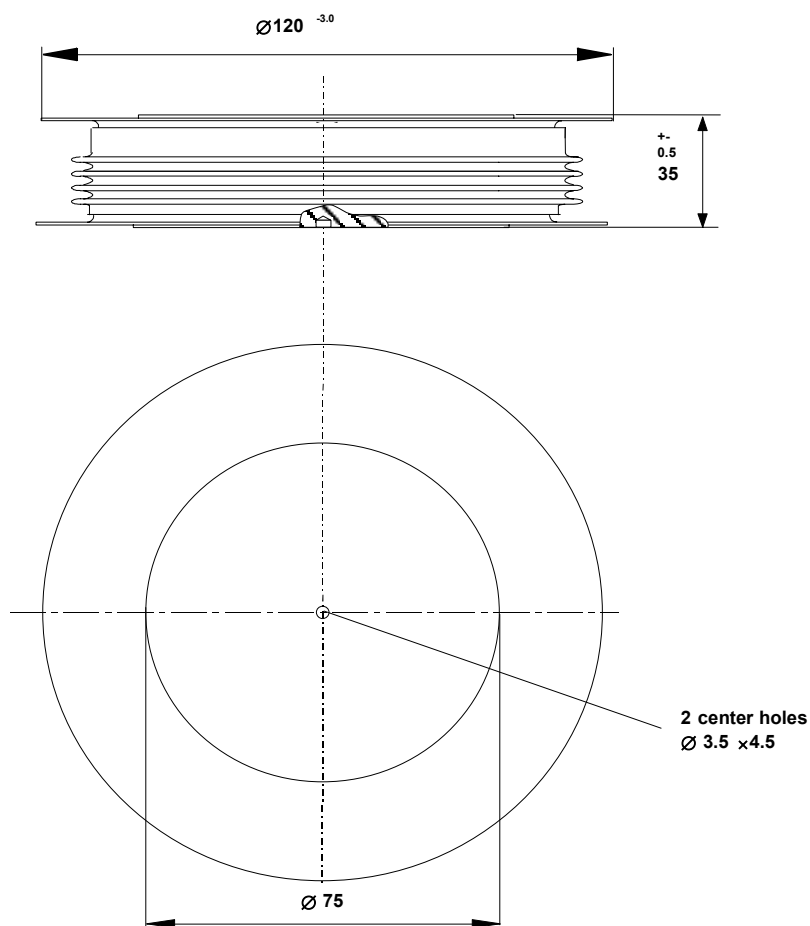
Mechanische Eigenschaften / Mechanical properties

Gehäuse, siehe Anlage case, see appendix				Seite 3	
Si - Element mit Druckkontakt Si - pellet with pressure contact				76DN68	
Anpreßkraft clamping force		F		36...52	kN
Gewicht weight		G	typ	1700	g
Kriechstrecke creepage distance				40	mm
Luftstrecke air distance				30	mm
Feuchtklasse 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.



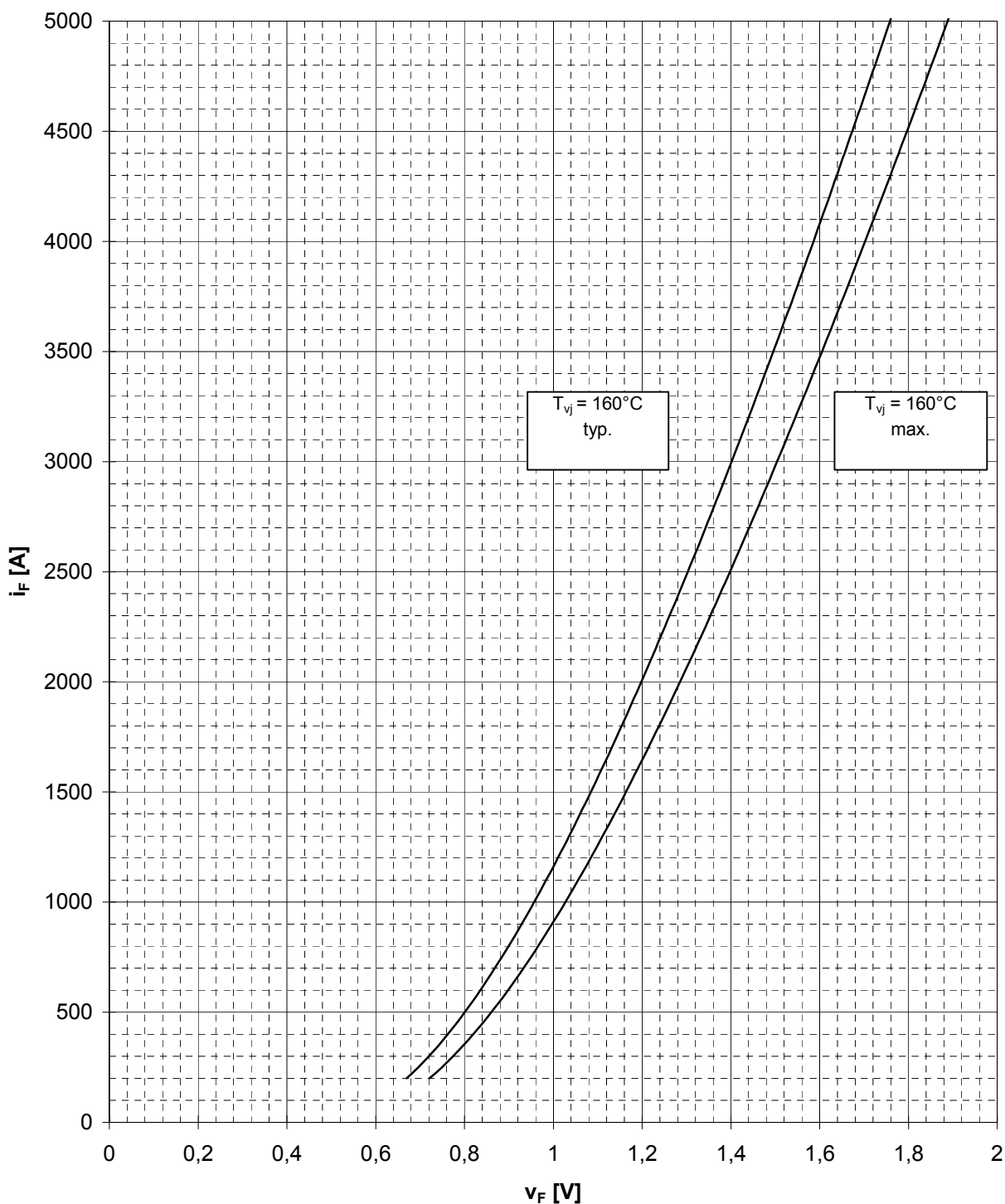
Maßbild /Outline





Durchlaßkennlinie / On-State Characteristics $i_F = f(v_F)$

Limiting and typical on-state characteristic



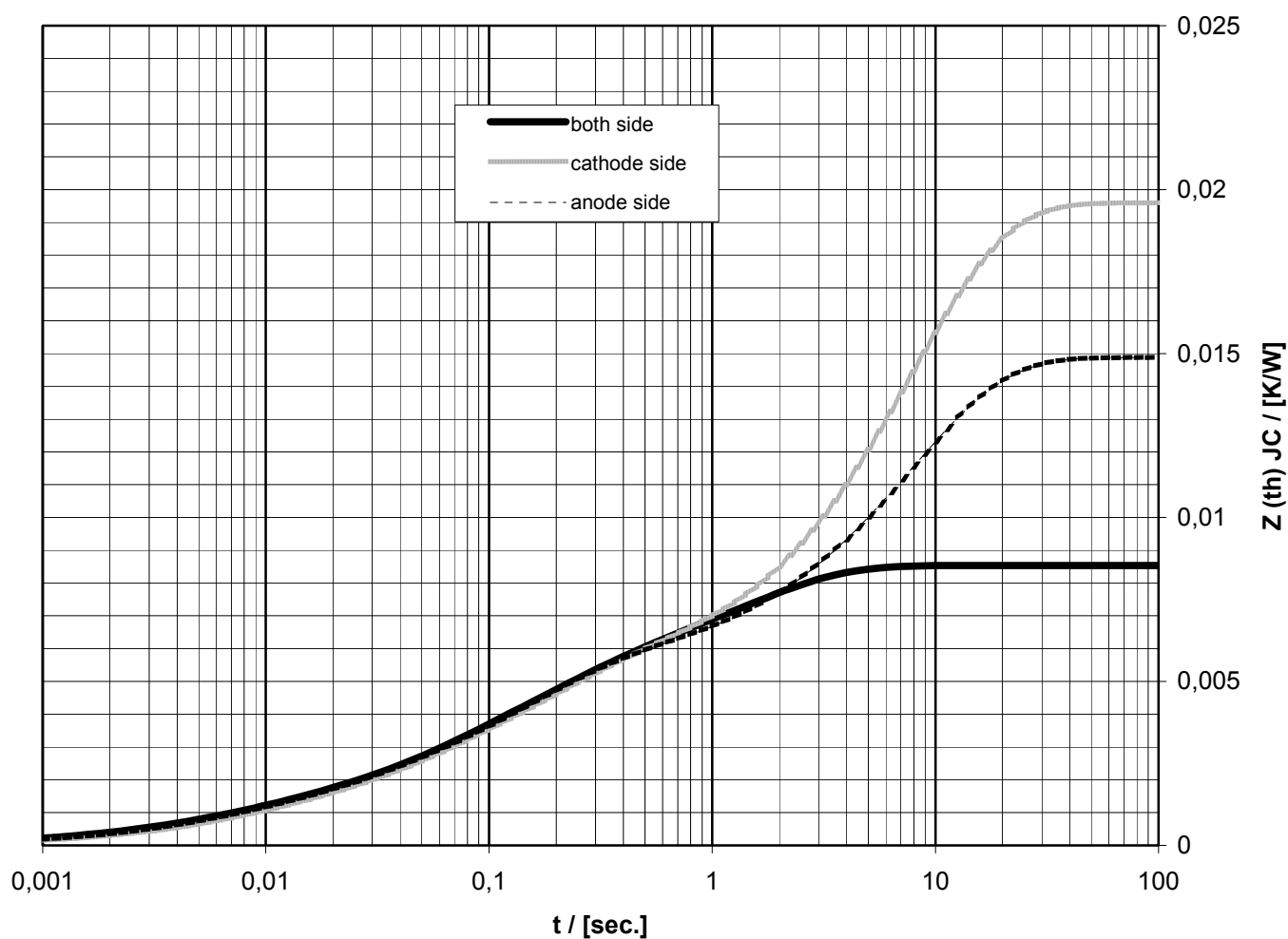


Transienter innerer Wärmewiderstand Transient thermal impedance $Z_{(th) JC} = f(t)$

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

	Double side cooled		Cathode side cooled		Anode side cooled	
	r [K/W]	[s]	r [K/W]	[s]	r [K/W]	[s]
1	0,00321	1,47207	0,01438	7,72917	0,00926	7,78435
2	0,00279	0,18563	-0,00013	1,20471	0,00025	0,66320
3	0,00159	0,04885	0,00324	0,18047	0,00371	0,14870
4	0,00076	0,00706	0,00136	0,04084	0,00101	0,02443
5	0,00018	0,00202	0,00074	0,00658	0,00065	0,00484
Σ	0,0085	-	0,0196	-	0,0149	-

$Z_{th} = f(t)$
without heat sink

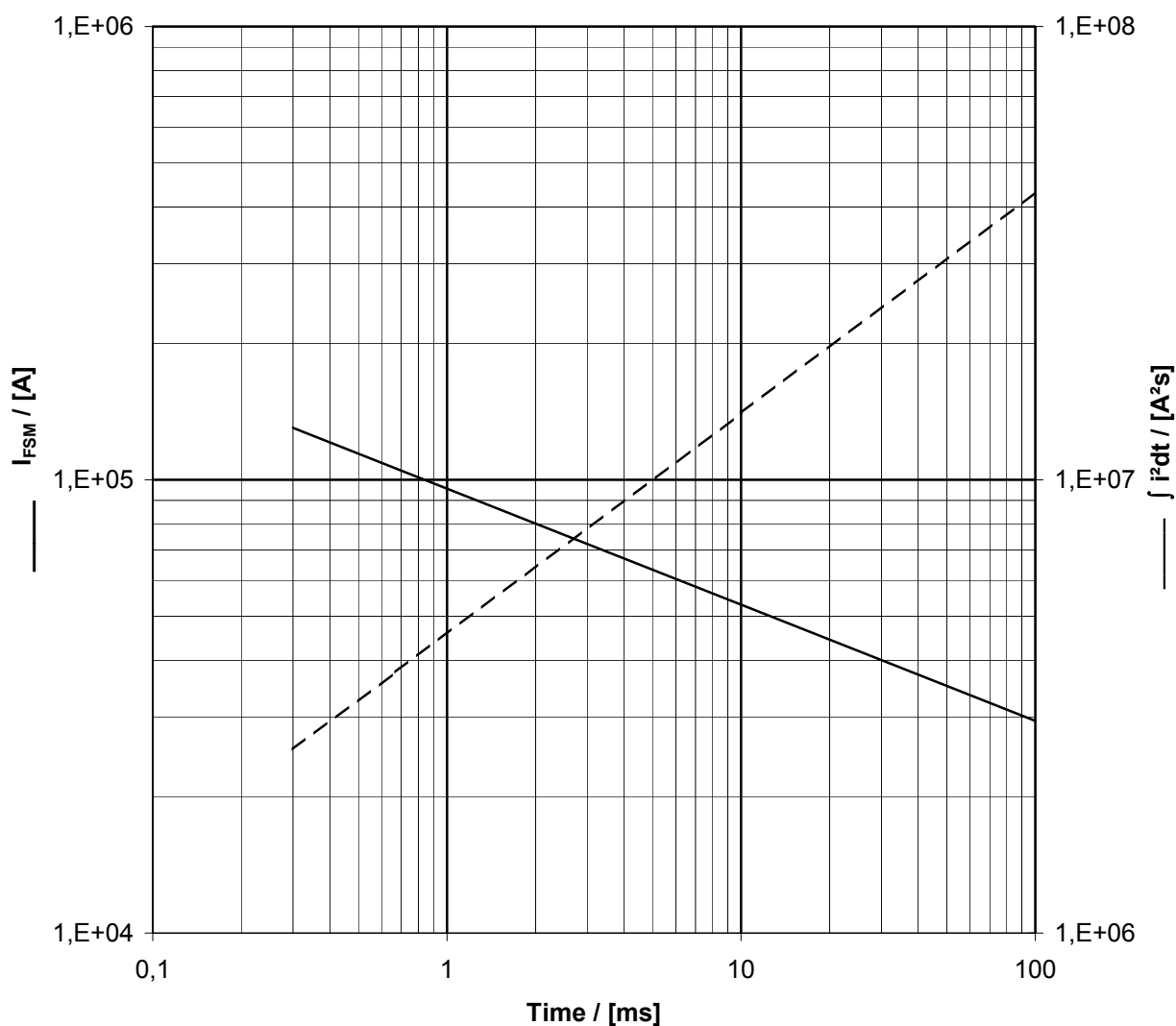




Stoßstrom / Grenzlastintegral Charakteristik Surge Current / I^2t value Characteristics

$$I_{FSM} = f(t_p) / \int i^2 dt = f(t_p)$$

Sine half-wave, $T_{vj}=160^\circ\text{C}$, $v_R=0$

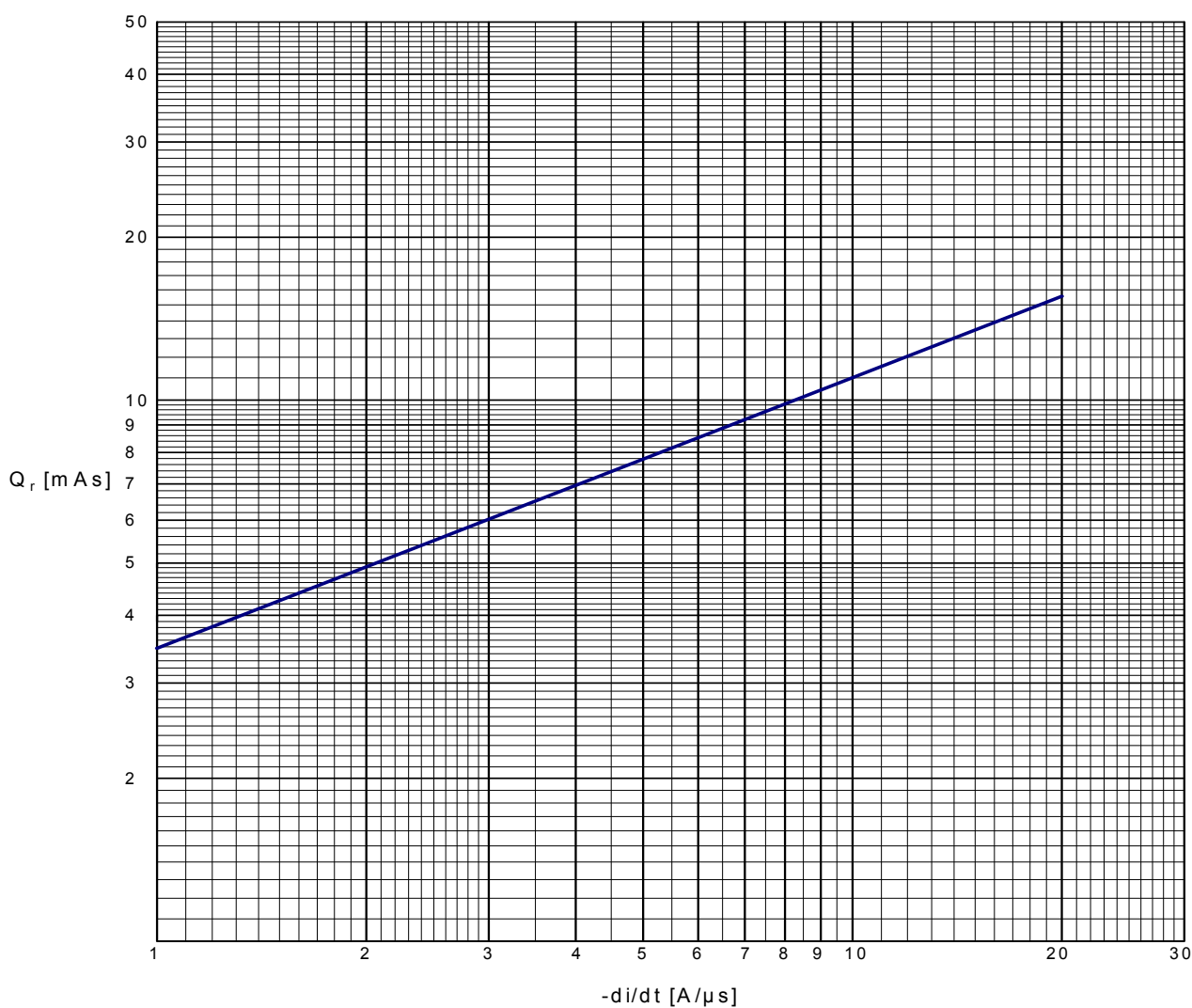




Sperrverzögerungsladung / recovered charge

$$Q_r = f (- di/dt)$$

$T_{vj} = 160^{\circ}\text{C}$, $I_{TM} = 1000\text{A}$, $v_R = 1000\text{V}$, $v_{RM} = 1600\text{V}$, $C = 1\mu\text{F}$, $R = 22\Omega$



**Rückstromspitze / reverse recovery current**

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

$T_{vj} = 160^{\circ}\text{C}$, $I_{TM} = 1000\text{A}$, $v_R = 1000\text{V}$, $v_{RM} = 1600\text{V}$, $C = 1\mu\text{F}$, $R = 22\Omega$

