

### Elektrische Eigenschaften / Electrical properties

#### Höchstzulässige Werte / Maximum rated values

Periodische Spitzensperrspannung repetitive peak reverse voltage	$t_{vj} = -40^{\circ}\text{C} \dots t_{vj \text{ max}}$ $f = 50\text{Hz}$	$V_{RRM}$	1600 1800 2000 2200	V V V V
Durchlaßstrom-Grenzeffektivwert RMS forward current		$I_{FRMSM}$	10350	A
Dauergrenzstrom mean forward current	$t_C = 100^{\circ}\text{C}, f = 50\text{Hz}$ $t_C = 60^{\circ}\text{C}, f = 50\text{Hz}$	$I_{FAVM}$	4650 6600	A A
Stoßstrom-Grenzwert surge forward current	$t_{vj} = 25^{\circ}\text{C}, t_p = 10\text{ms}$ $t_{vj} = t_{vj \text{ max}}, t_p = 10\text{ms}$	$I_{FSM}$	88 73,5	kA kA
Grenzlastintegral $I^2t$ -value	$t_{vj} = 25^{\circ}\text{C}, t_p = 10\text{ms}$ $t_{vj} = t_{vj \text{ max}}, t_p = 10\text{ms}$	$I^2t$	$38,7 \cdot 10^6$ $27,0 \cdot 10^6$	$\text{A}^2\text{s}$ $\text{A}^2\text{s}$

#### Charakteristische Werte / Characteristic values

Durchlaßspannung forward voltage	$t_{vj} = t_{vj \text{ max}}, i_F = 4000\text{A}$	$V_F$	max 1,0	V
Schleusenspannung threshold voltage	$t_{vj} = t_{vj \text{ max}}$	$V_{(TO)}$	typ 0,62 max 0,7	V
Ersatzwiderstand forward slope resistance	$t_{vj} = t_{vj \text{ max}}$	$r_T$	typ 0,069 max 0,075	m?
Durchlaßrechenkennlinie On-state characteristics for calculation $V_F = A \cdot B \cdot i_F + C \ln(i_F + D) + D \sqrt{i_F}$	$t_{vj} = t_{vj \text{ max}}$	A B C D	typ. 0,480 -0,0000204 -0,00859 0,0090	
Durchlaßrechenkennlinie On-state characteristics for calculation $V_F = A \cdot B \cdot i_F + C \ln(i_F + D) + D \sqrt{i_F}$	$t_{vj} = t_{vj \text{ max}}$	A B C D	max. 0,600 -0,0000249 -0,0219 0,0108	
Sperrstrom reverse current	$t_{vj} = t_{vj \text{ max}}, V_R = V_{RRM}$	$i_R$	200	mA
Sperrverzögerungsladung recovered charge	$t_{vj} = t_{vj \text{ max}}$ $I_{FM} = 1500\text{A}, -di/dt = 5 \text{ A}/\mu\text{s}$ $V_R = 0,5 V_{RRM}, C = 4,7\mu\text{F}, R = 8,2\Omega$	$Q_r$	max 1,75	mAs

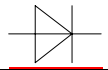


### Thermische Eigenschaften / Thermal properties

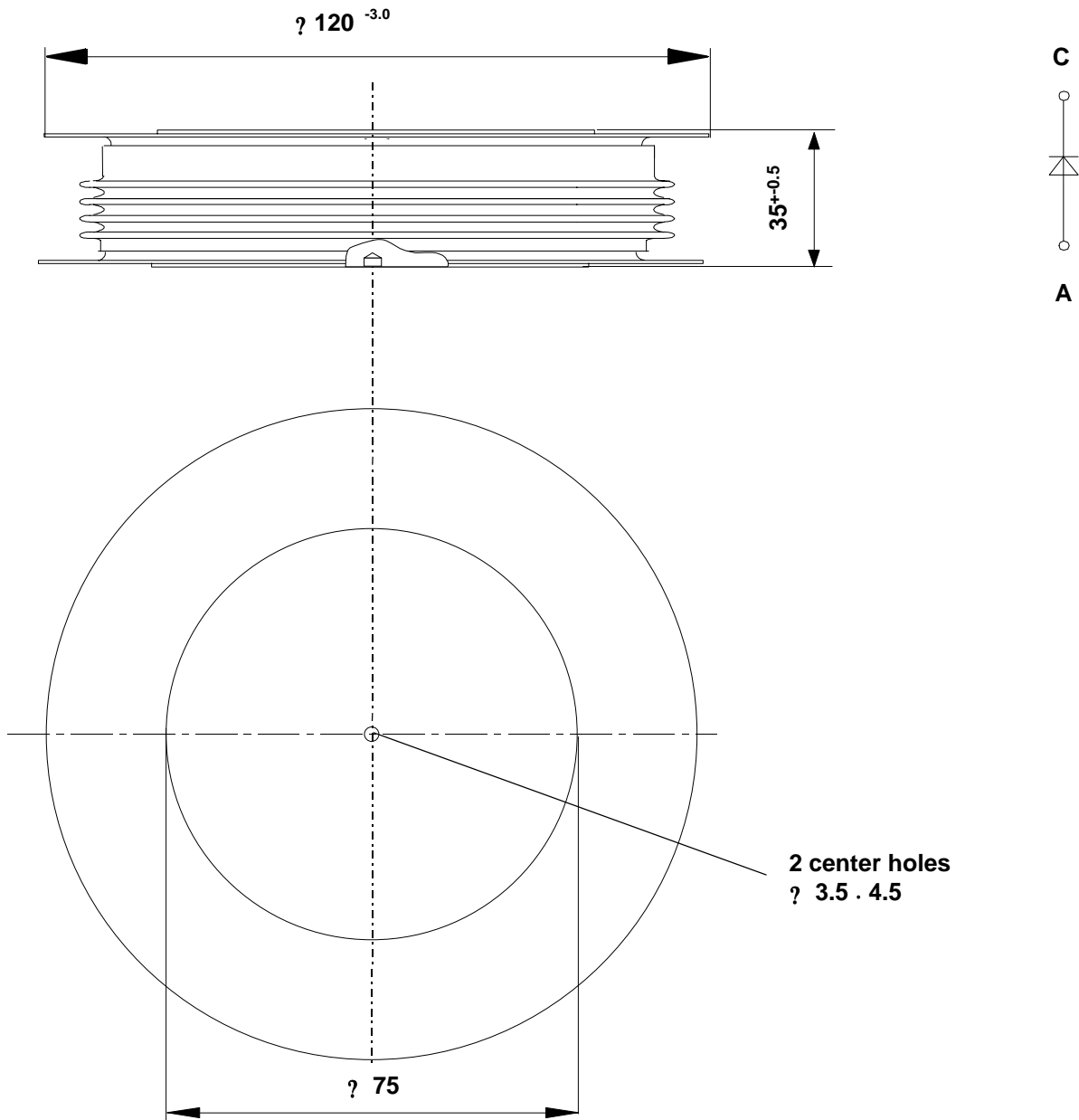
Innerer Wärmewiderstand thermal resistance, junction to case	beidseitig / two-sided, DC Anode / anode, DC Kathode / cathode, DC	$R_{thJC}$	max 0,0085 max 0,016 max 0,018	°C/W °C/W °C/W
Übergangs-Wärmewiderstand thermal resistance, case to heatsink	Kühlfläche / cooling surface beidseitig / two-sided einseitig / single sided	$R_{thCK}$	max 0,0025 max 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

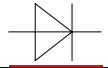
### Mechanische Eigenschaften / Mechanical properties

Gehäuse, siehe Anlage case, see appendix			Seite 3	
Si - Element mit Druckkontakt Si - pellet with pressure contact			75DN22	
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 <sup>2</sup>



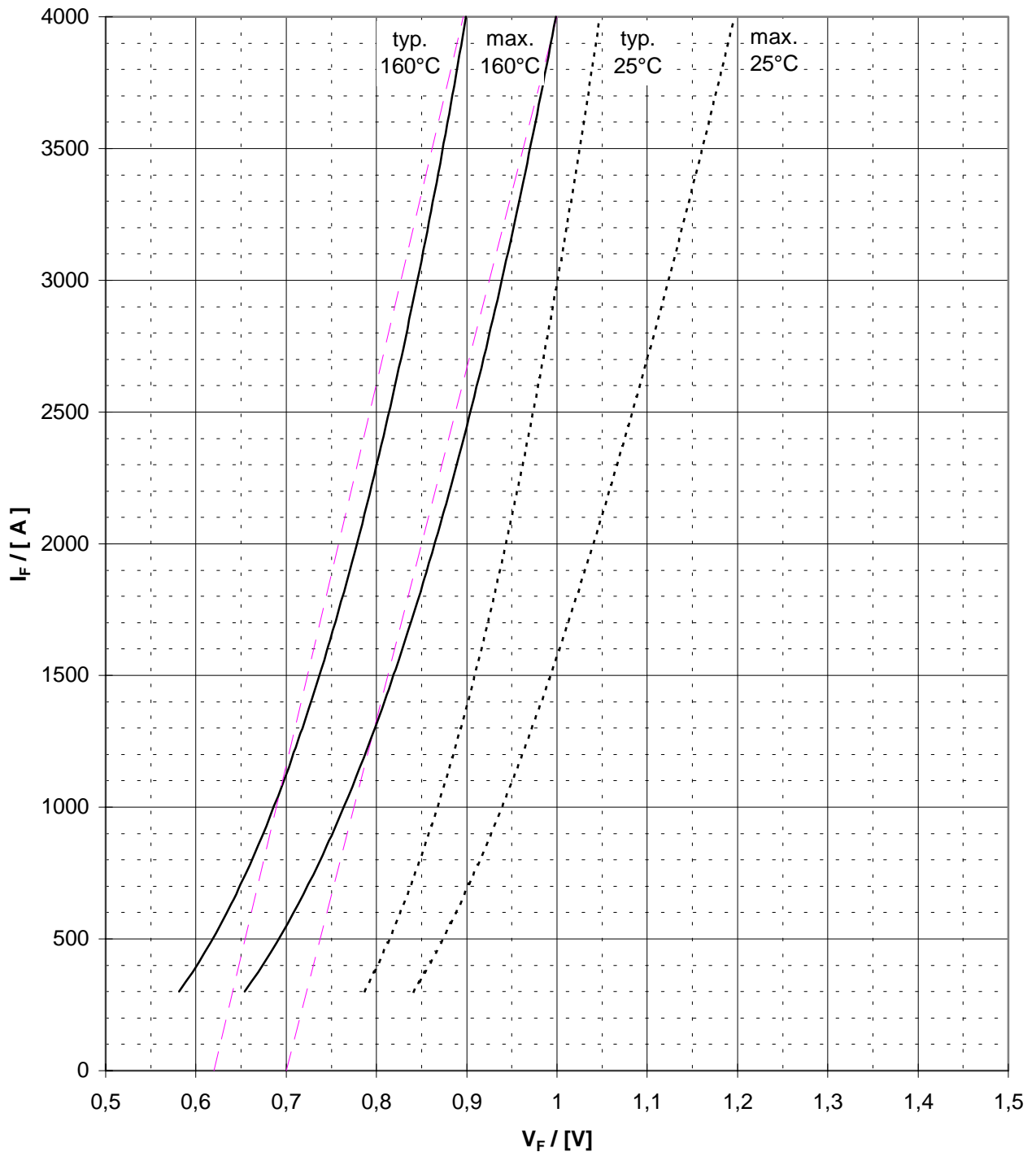
Outline Drawing

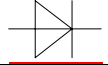




**On-State Characteristics (  $v_F$  )**  
typical and limiting on state characteristic

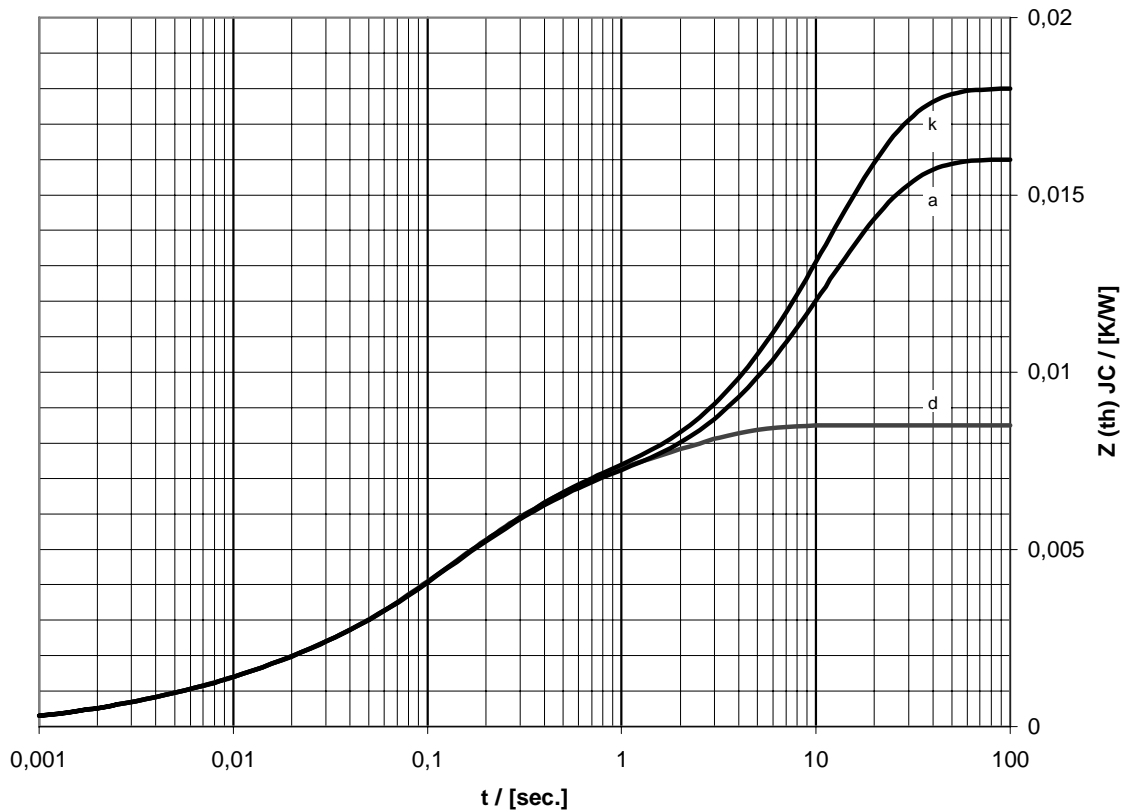
—  $t_{vj} = 160^\circ\text{C}$   
....  $t_{vj} = 25^\circ\text{C}$

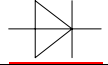




Transient thermal Impedance for constant-current

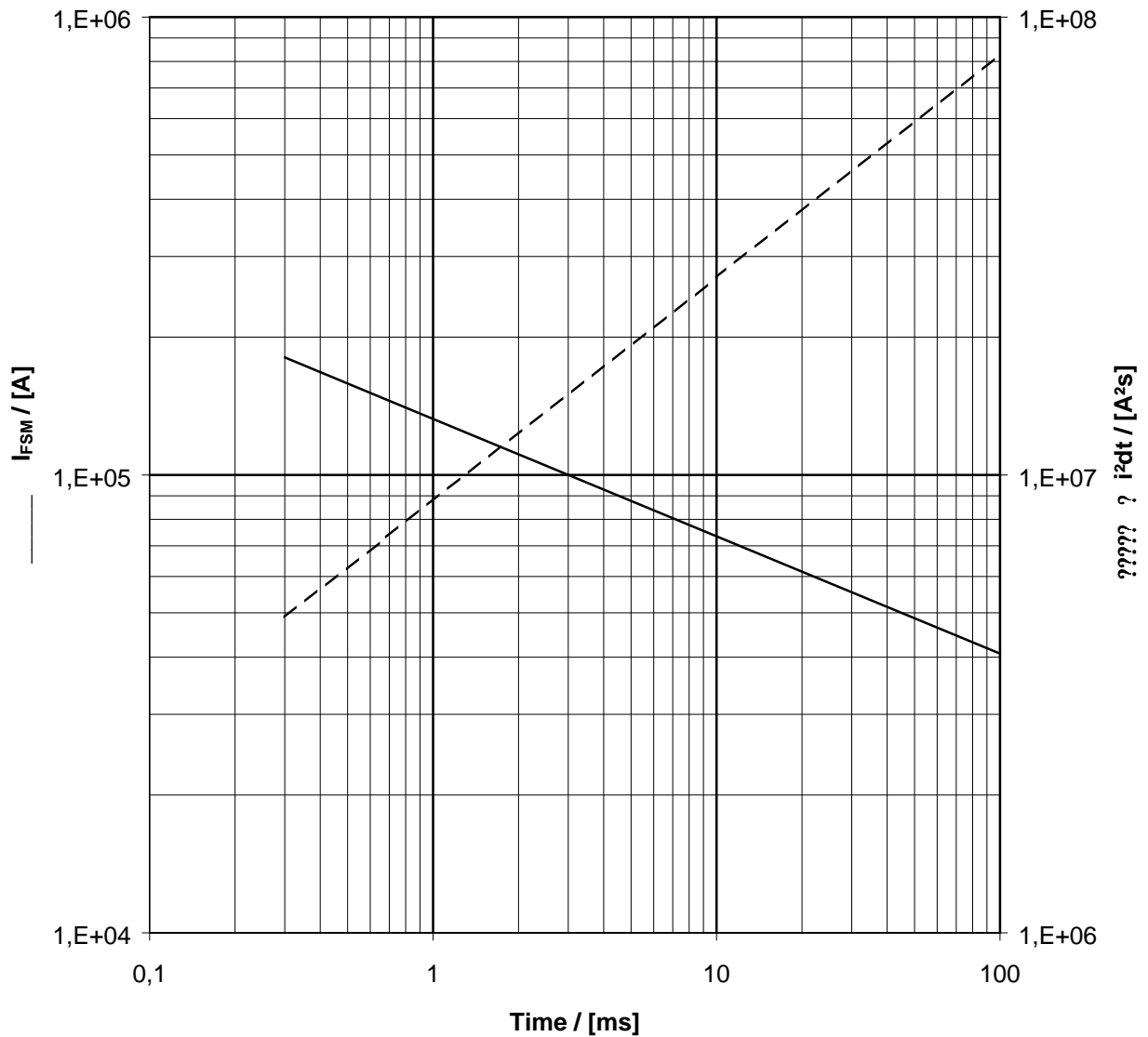
	Double side cooled		Anode side cooled		Cathode side cooled	
	r [K/W]	[s]	r [K/W]	[s]	r [K/W]	[s]
1	0,002	1,84	0,0095	11,5	0,0115	11,7
2	0,003	0,24	0,003	0,24	0,003	0,24
3	0,0022	0,071	0,0022	0,071	0,0022	0,071
4	0,0009	0,0097	0,0009	0,0097	0,0009	0,0097
5	0,0004	0,0018	0,0004	0,0018	0,0004	0,0018
?	0,085	-	0,016	-	0,018	-

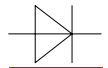




**Surge Current Characteristics  $I_{FSM} = f(t_p)$**   
 $I^2t$  value       $i^2 dt = f(t_p)$

Sine half-wave,  $t_{vj} = 160^\circ C$ ,  $V_R = 0$





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

$t_{vj} = 160^\circ \text{C}$ ,  $I_{FM} = 1500 \text{ A}$ ,  $v_R = 0,5 V_{RRM}$   
 $C = 4,7 \mu\text{F}$ ,  $R = 8,2 \Omega$

