

Elektrische Eigenschaften

Electrical properties

Höchstzulässige Werte

Maximum rated values

Periodische Vorwärts- und Rückwärts-Sperrspannung	repetitive peak forward off-state and reverse voltages	$t_{vj} = -40^{\circ}\text{C} \dots t_{vj\text{max}}$	$V_{\text{DRM}}, V_{\text{RRM}}$ 2200, 2400 V 2500, 2600* V
Vorwärts-Stoßsperrspannung	non repetitive peak forward off-state voltage	$t_{vj} = -40^{\circ}\text{C} \dots t_{vj\text{max}}$	$V_{\text{DSM}} = V_{\text{DRM}}$
Rückwärts-Stoßsperrspannung	non repetitive peak reverse voltage	$t_{vj} = +25^{\circ}\text{C} \dots t_{vj\text{max}}$	$V_{\text{RSM}} = V_{\text{RRM}} + 100$ V
Durchlaßstrom-Grenzeffektivwert	RMS on-state current	$t_c = 65^{\circ}\text{C}$	I_{TRMSM} 2000 A
Dauergrenzstrom	average on-state current	$t_c = 49^{\circ}\text{C}$	I_{TAVM} 820 A 1275 A
Stoßstrom-Grenzwert	surge current	$t_{vj} = 25^{\circ}\text{C}, t_p = 10$ ms	I_{TSM} 18 kA
Grenzlastintegral	I^2t -value	$t_{vj} = t_{vj\text{max}}, t_p = 10$ ms	16,5 kA
Kritische Stromsteilheit	critical rate of rise of on-state current	$t_{vj} = 25^{\circ}\text{C}, t_p = 10$ ms	I^2t 1620 kA ² s
Kritische Spannungssteilheit	critical rate of rise of off-state voltage	$t_{vj} = t_{vj\text{max}}, t_p = 10$ ms	1360 kA ² s
		$V_D \leq 67\% V_{\text{DRM}}, f = 50$ Hz	$(di/dt)_{\text{cr}}$ 200 Alps
		$i_{\text{GM}} = 1,5$ A, $di_G/dt = 2$ A/ μs	1) 2)
		$t_{vj} = t_{vj\text{max}}, V_D = 67\% V_{\text{DRM}}$	$(dv/dt)_{\text{cr}}$ N: 1000 50 V/ μs

Charakteristische Werte

Characteristic values

Durchlaßspannung	on-state voltage	$t_{vj} = t_{vj\text{max}}, I_T = 3600$ A	V_T max. 3,17 V
Schleusenspannung	threshold voltage	$t_{vj} = t_{vj\text{max}}$	$V_{T(\text{TO})}$ 1,35 V
Ersatzwiderstand	slope resistance	$t_{vj} = t_{vj\text{max}}$	r_T 0,45 m Ω
Zündstrom	gate trigger current	$t_{vj} = 25^{\circ}\text{C}, V_D = 6$ V	I_{GT} max. 300 mA
Zündspannung	gate trigger voltage	$t_{vj} = 25^{\circ}\text{C}, V_D = 6$ V	V_{GT} max. 2 V
Nicht zündender Steuerstrom	gate non-trigger current	$t_{vj} = t_{vj\text{max}}, V_D = 6$ V	I_{GD} max. 40 mA
Nicht zündende Steuerspannung	gate non-trigger voltage	$t_{vj} = t_{vj\text{max}}, V_D = 0,5 V_{\text{DRM}}$	V_{GD} max. 0,3 V
Haltestrom	holding current	$t_{vj} = 25^{\circ}\text{C}, V_D = 6$ V, $R_A = 5$ Ω	I_H max. 400 mA
Einraststrom	latching current	$t_{vj} = 25^{\circ}\text{C}, V_D = 6$ V, $R_{\text{GK}} \geq 10$ Ω	I_L max. 2 A
		$i_{\text{GM}} = 1$ A, $di_G/dt = 1$ A/ μs , $t_g = 20$ ps	
Vorwärts- u. Rückwärts-Sperrstrom	forward off-state and reverse currents	$t_{vj} = t_{vj\text{max}}, V_D = V_{\text{DRM}}, V_R = V_{\text{RRM}}$	i_D, i_R max. 200 mA
Zündverzögerung	gate controlled delay time	$t_{vj} = 25^{\circ}\text{C}, i_{\text{GM}} = 1$ A, $di_G/dt = 1$ A/ μs	t_{gd} max. 2,3 μs
Freierzeit	circuit commutated turn-off time	siehe Techn. Erl./see Techn. Inf.	t_q 1: max. 120 μs

Thermische Eigenschaften

Thermal properties

Innere Wärmewiderstand für beidseitige Kühlung	thermal resistance, junction to case for two-sided cooling	$\Theta = 180^{\circ}$ el, sin DC	R_{thJC} max. 0,0215 $^{\circ}\text{C}/\text{W}$ max. 0,0200 $^{\circ}\text{C}/\text{W}$
Übergangswärmewiderstand	thermal resistance, case to heatsink	beidseitig/two-sided einseitig/one-sided	R_{thCK} max. 0,005 $^{\circ}\text{C}/\text{W}$ max. 0,010 $^{\circ}\text{C}/\text{W}$
Höchstzul. Sperrschichttemperatur	max. junction temperature		$t_{vj\text{max}}$ 125 $^{\circ}\text{C}$
Betriebstemperatur	Operating temperature		$t_{\text{c op}}$ -40 ... + 125 $^{\circ}\text{C}$
Lagertemperatur	storage temperature		t_{stg} -40 ... + 150 $^{\circ}\text{C}$

Mechanische Eigenschaften

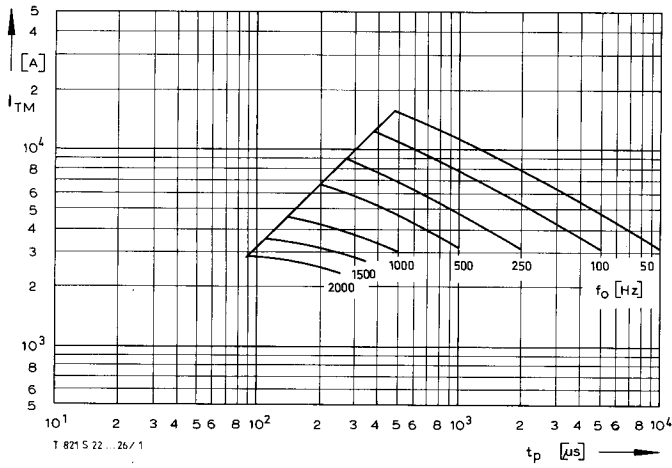
Mechanical properties

Si-Element mit Druckkontakt	Si-pellet with pressure contact		F 13,5...24 kN
Anpreßkraft	Clamping force		G typ. 550 g
Gewicht	weight		25 mm
Kriechstrecke	Creepage distance		C
Feuchteklasse	humidity classification	DIN 40040	50 m/s ²
Schwingfestigkeit	Vibration resistance	f = 50 Hz	Seite/page 155
Maßbild	outline	DIN 41814-151A4	

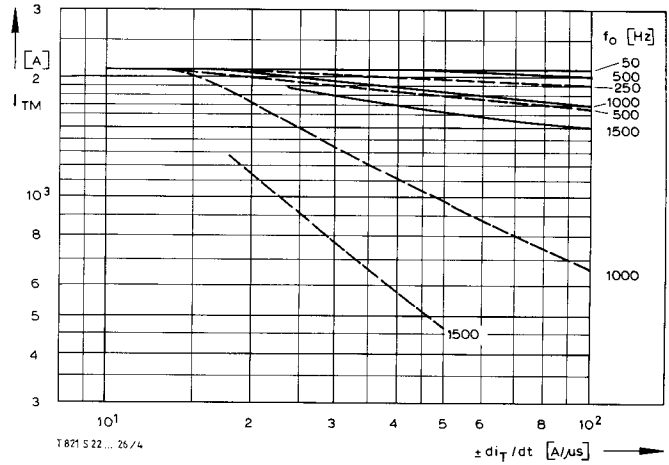
• Für größere Stückzahlen bitte Liefertermin erfragen/Delivery for larger quantities on request

1) Werte nach DIN IEC 747-6 (ohne vorausgehende Kommutierung)/Values to DIN IEC 747-6 (without prior commutation)

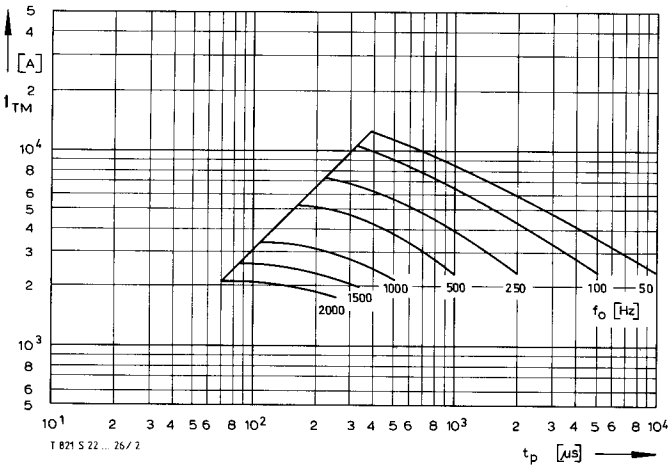
2) Unmittelbar nach der Freierzeit, vgl. Meßbedingungen für t_q /Immediately after circuit commutated turn-off time, see Parameters t_q



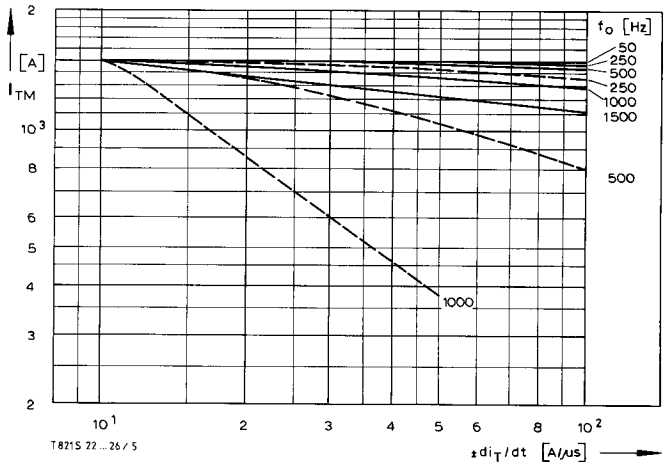
Bild/Fig. 1 $t_c = 60^\circ\text{C}$



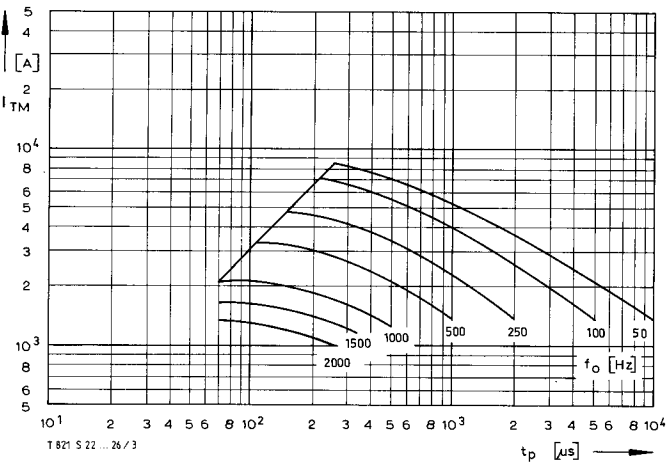
Bild/Fig. 4 $t_c = 60^\circ\text{C}$



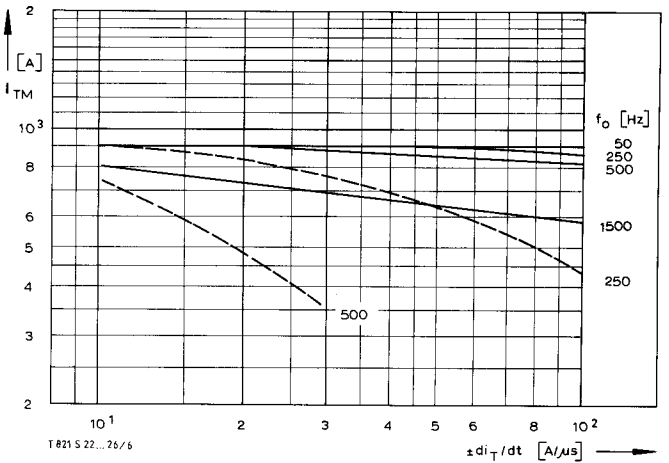
Bild/Fig. 2 $t_c = 80^\circ\text{C}$



Bild/Fig. 5 $t_c = 80^\circ\text{C}$



Bild/Fig. 3 $t_c = 100^\circ\text{C}$



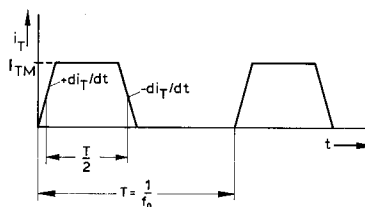
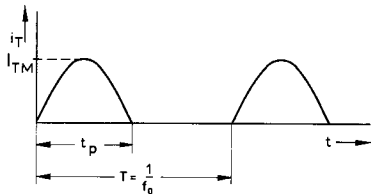
Bild/Fig. 6 $t_c = 100^\circ\text{C}$

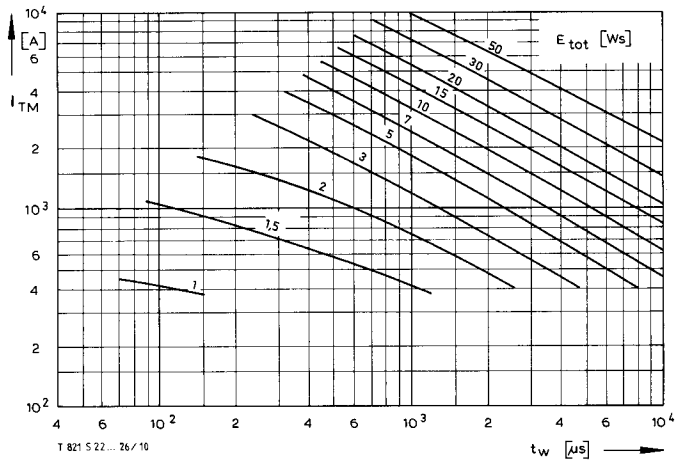
Bild/Fig. 1, 2, 3
Steuer-generator/pulse generator:
 $i_G = 1,5 \text{ A}$, $di_G/dt = 2 \text{ A}/\mu\text{s}$

RC-Glied/RC-network:
 $R \leq 15 \Omega$
 $C \leq 1 \mu\text{F}$

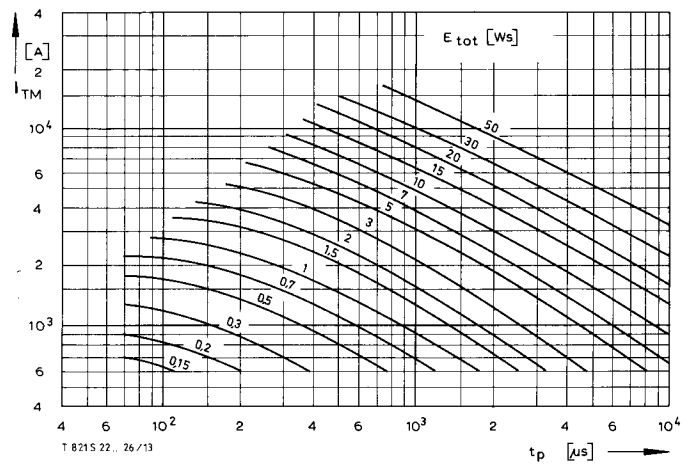
Bild/Fig. 4, 5, 6
Steuer-generator/pulse generator:
 $i_G = 1,5 \text{ A}$, $di_G/dt = 2 \text{ A}/\mu\text{s}$

RC-Glied/RC-network:
 $R \geq 15 \Omega$
 $C \leq 1 \mu\text{F}$
 $dv_p/dt \leq 800 \text{ V}/\mu\text{s}$
 $V_{RM} \leq 0,87 V_{RSM}$

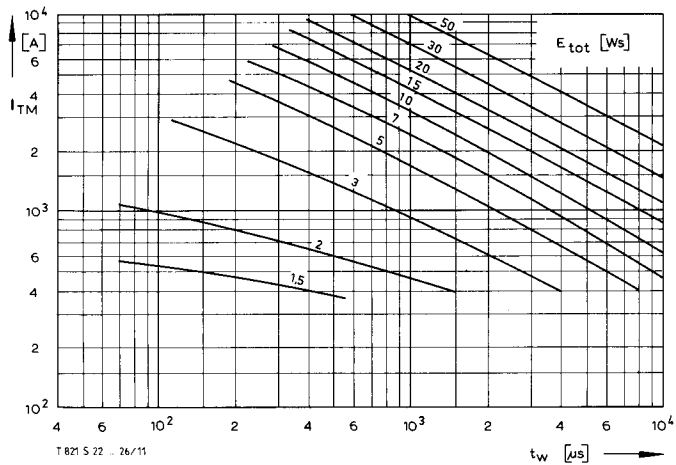




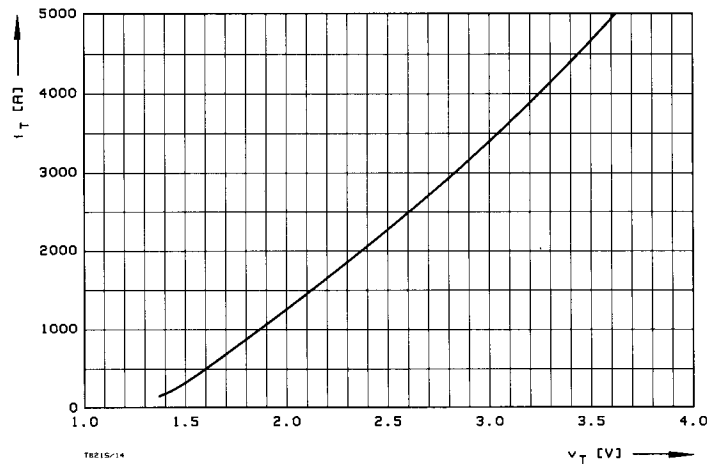
Bild/Fig. 10 $-di_T/dt = 25 \text{ A}/\mu\text{s}$



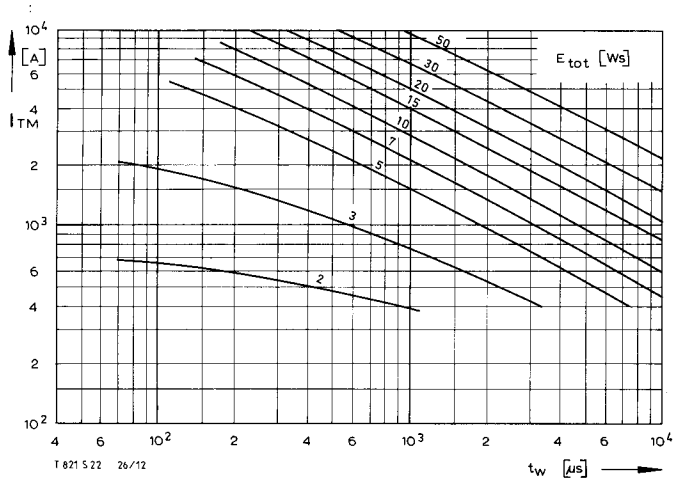
Bild/Fig. 13



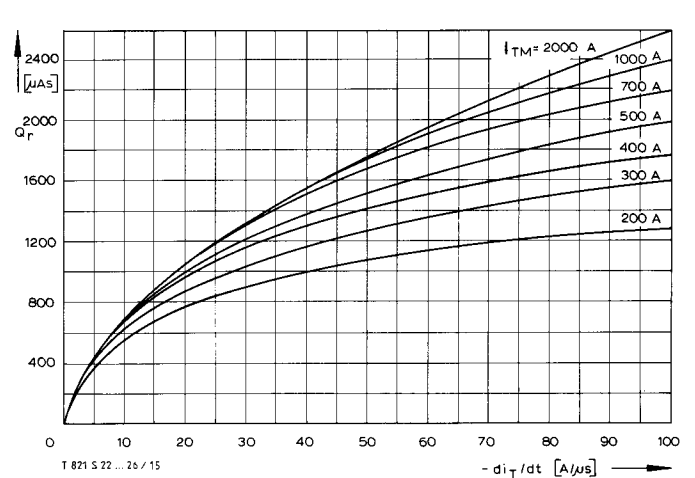
Bild/Fig. 11 $-di_T/dt = 50 \text{ A}/\mu\text{s}$



Bild/Fig. 14



Bild/Fig. 12 $-di_T/dt = 100 \text{ A}/\mu\text{s}$



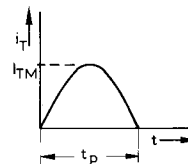
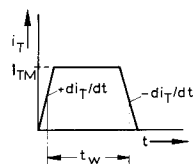
Bild/Fig. 15

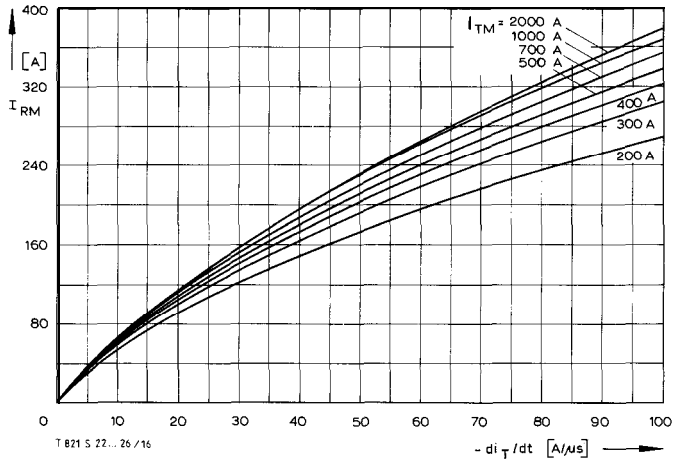
Bild/Fig. 10, 11, 12
Steuergenerator/pulse generator:
 $i_G = 1,5 \text{ A}$, $di_G/dt = 2 \text{ A}/\mu\text{s}$

RC-Glied/RC-network:
 $R \geq 15 \Omega$, $C \leq 1 \mu\text{F}$
 $v_{DM} \leq 0,67 V_{DRM}$
 $dv_T/dt \leq 800 \text{ V}/\mu\text{s}$
 $v_{RM} \leq 0,67 V_{RRM}$

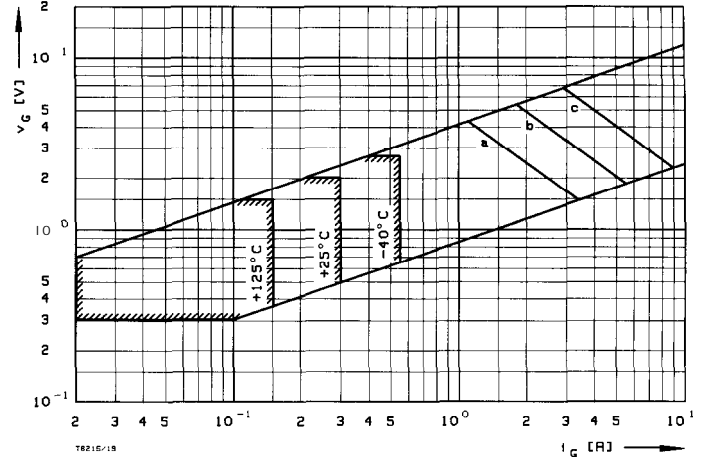
zu Bild/to Fig. 13
Steuergenerator/pulse generator:
 $i_G = 1,5 \text{ A}$, $di_G/dt = 2 \text{ A}/\mu\text{s}$
 $v_{DM} \leq 0,67 V_{DRM}$
 $v_{RM} \leq 50 \text{ V}$

RC-Glied/RC-network:
 $R \geq 15 \Omega$
 $C \leq 1 \mu\text{F}$



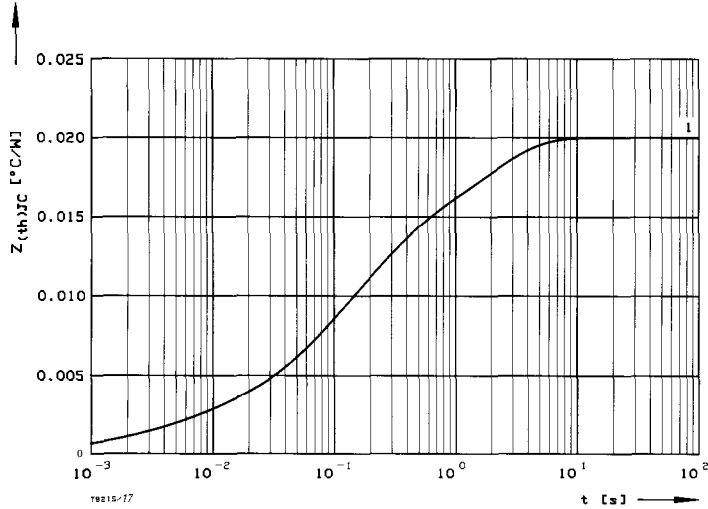


BildFig. 16
 Rückstromspitze $I_{RM} = f(-di/dt)$, $t_{vj} = t_{vj(max)}$, $V_R = 0,5 V_{RRM}$, $V_{RM} = 0,8 V_{RRM}$
 Peak reverse recovery current $I_{RM} = f(-di/dt)$, $t_{vj} = t_{vj(max)}$, $V_R = 0,5 V_{RRM}$, $V_{RM} = 0,8 V_{RRM}$
 Parameter: Durchlaßstrom/On-state current I_{TM}



BildFig. 19
 Steuercharakteristik mit Zündbereichen/Gate Characteristic with triggering areas
 $v_G = f(I_G)$, $V_D = 6 V$

Parameter:	a	b	c
Steuerimpulsdauer/Trigger pulse duration t_g [ms]	10	1	0,5
Höchstzulässige Spitzensteuerverlustleistung/Max. rated peak gate power dissipation P_{GM} [W]	10	20	40



BildFig. 17
 Transienter innerer Wärmewiderstand $Z_{thJC} = f(t)$, DC
 Transient thermal impedance $Z_{thJC} = f(t)$, DC
 1 Beidseitige Kühlung/two-sided cooling

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

Kühlung cooling	Pos. n	1	2	3	4	5	6	7
beidseitig two-sided	R_{thn} [°C/W]	0,0064	0,0072	0,0043	0,00164	0,00046		
	τ_n [s]	1,9	0,225	0,058	0,0054	0,0011		
anodenseitig anode-sided	R_{thn} [°C/W]							
	τ_n [s]							
kathodenseitig cathode-sided	R_{thn} [°C/W]							
	τ_n [s]							

Analytische Funktion/analytical function:

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