Elektrische Eigenschaften **Electrical properties**

Höchstzulässige Werte — Maximum rated values

Periodische Vorwärts- und Rückwärts-Spitzensperrspannung	repetitive peak forward off-state and reverse voltages	t_{vj} = -40°C $t_{vj\,max}$	V_{DRM}, V_{RRM}		800, 1000		V
					1100, 1200		v
					1300, 1400*		v
Vorwärts-Stoßspitzen-sperrspannung	non repetitive peak forward off-state voltage	t_{vj} = −40°C ... $t_{vj\,max}$	V_{DSM} = V_{DRM}				
Rückwärts-Stoßspitzen-sperrspannung	non repetitive peak reverse voltage	t_{vj} = + 25°C $t_{vj\,max}$	V_{RSM} = V_{RRM}		+ 100		v
Durchlaßstrom-Grenzeffektivwert	RMS on-state current		I_{TRMSM}		200		A
Dauergrenzstrom	average on-state current	tc = 85°C	I_{TAVM}		80		A
		t_C = 52°C			127		A
Stoßstrom-Grenzwert	surge current	t_{vj} = 25°C, t_p = 10 ms	I_{TSM}		2800		A
		t_{vj} = $t_{vj\,max}$, t_p = 10 ms			2450		A
Grenzlastintegral	I^2t-value	t_{vj} = 25°C, t_p = 10 ms	I^2t		39200		A^2s
		t_{vj} = $t_{vj\,max}$, t_p = 10 ms			30000		A^2s
Kritische Stromsteilheit	critical rate of rise of on-state current	$v_D \leq$ 67% v_{DRM}, f = 50 Hz	$(di/dt)_{cr}$		160		A/µs
		i_{GM} = 0,6 A, di_G/dt = 0,6 A/µs			[1]	[2]	
Kritische Spannungssteilheit	critical rate of rise of off-state voltage	t_{vj} = $t_{vj\,max}$, v_D = 67% V_{DRM}	$(dv/dt)_{cr}$	B:	50	50	V/µs
				c*:	500	500	V/µs
				L:	500	50	V/µs
				M*:	1000	500	V/µs

Charakteristische Werte — Characteristic values

Durchlaßspannung	on-state voltage	t_{vj} = $t_{vj\,max}$, i_T = 400 A	v_T	max.	2,4	V
Schleusenspannung	threshold voltage	t_{vj} = $t_{vj\,max}$	$V_{T(TO)}$		1,3	v
Ersatzwiderstand	slope resistance	t_{vj} = $t_{vj\,max}$	r_T		2,4	mΩ
Zündstrom	gate trigger current	t_{vj} = 25°C, v_D = 12 v	I_{GT}	max.	150	mA
Zündspannung	gate trigger voltage	t_{vj} = 25°C, v_D = 12 V	V_{GT}	max.	2	v
Nicht zündender Steuerstrom	gate non-trigger current	t_{vj} = $t_{vj\,max}$, v_D = 12 v	I_{GD}	max.	10	mA
Nicht zündende Steuerspannung	gate non-trigger voltage	t_{vj} = $t_{vj\,max}$, v_D = 0,5 V_{DRM}	V_{GD}	max.	0,25	V
Haltestrom	holding current	t_{vj} = 25°C, v_D = 12 V, R_A = 10 Ω	I_H	max.	250	mA
Einraststrom	latching current	t_{vj} = 25°C, v_D = 12 V, $R_{GK} \geq$ 10 Ω	I_L	max.	1	A
		i_{GM} = 0,6 A, di_G/dt = 0,6 A/µs, t_g = 20 µs				
Vorwärts- u. 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	max.	30	mA
Zündverzug	gate controlled delay time	t_{vj} = 25°C, i_{GM} = 0,6 A, di_G/dt = 0,6 A/µs	t_{gd}	max.	1,4	µs
Freiwerdezeit	circuit commutated turn-off time	siehe Techn. Erl./see Techn. Inf.	t_q s:	max.	18	µs
			E:	max.	20	µs
			F:	max.	25	µs

Thermische Eigenschaften **Thermal properties**

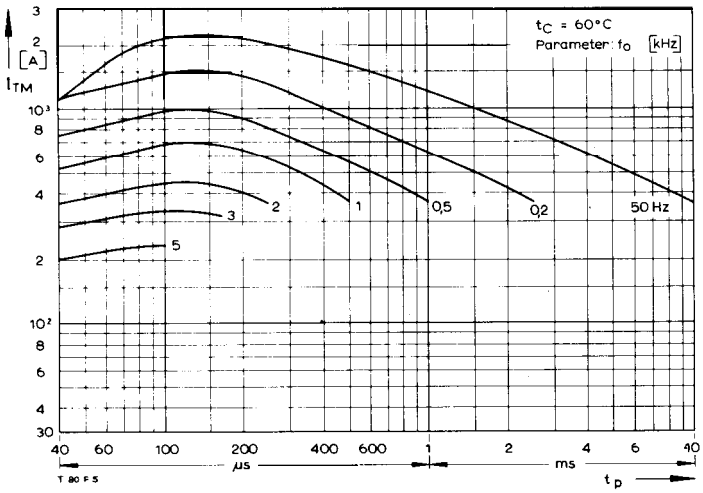
Innerer Wärmewiderstand	**thermal resistance, junction to case**					
		Θ = 180° el, sin	R_{thJC}	max.	0,28	°C/W
		DC		max.	0,261	°C/W
Höchstzul. Sperrschichttemperatur	max. junction temperature		$t_{vj\,max}$		125	°C
Betriebstemperatur	Operating temperature		$t_{c\,op}$		−40 ... + 125	°C
Lagertemperatur	storage temperature		t_{stg}		−40 ... + 150	°C

Mechanische Eigenschaffen — Mechanical properties

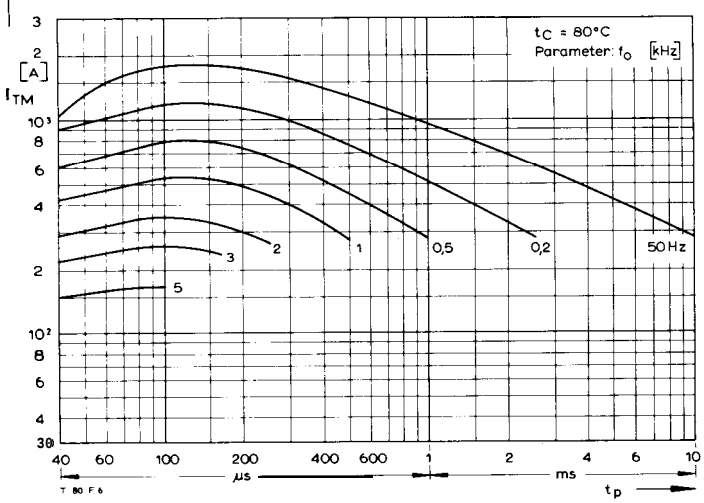
Si-Element mit Druckkontakt	Si-pellet with pressure contact				
Anzugsdrehmoment	tightening torque		M		20 Nm
Gewicht	weight		G	typ.	150 g
Kriechstrecke	Creepage distance				8 mm
Feuchteklasse	humidity classification	DIN 40040			C
Schwingfestigkeit	Vibration resistance	f = 50 Hz			50 m/s^2
Maßbild B	outline B	DIN 41892-204B3			Seite/page 154

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

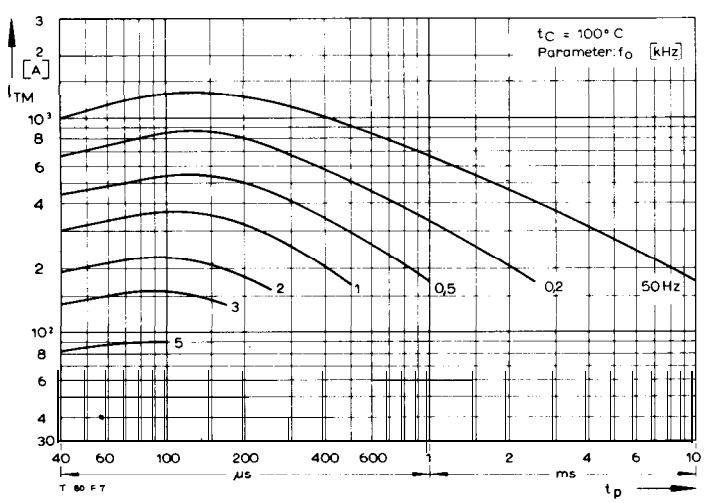
1) Werte nach DIN IEC 747-6 (ohne vorausgehende Kommutierung)/Values to DIN IEC 747-6 (without prior commutation)
2) Unmittelbar nach der Freiwerdezeit, vgl. Meßbedingungen für t_q/Immediately after circuit commutated turn-off time, see Parameters t_q



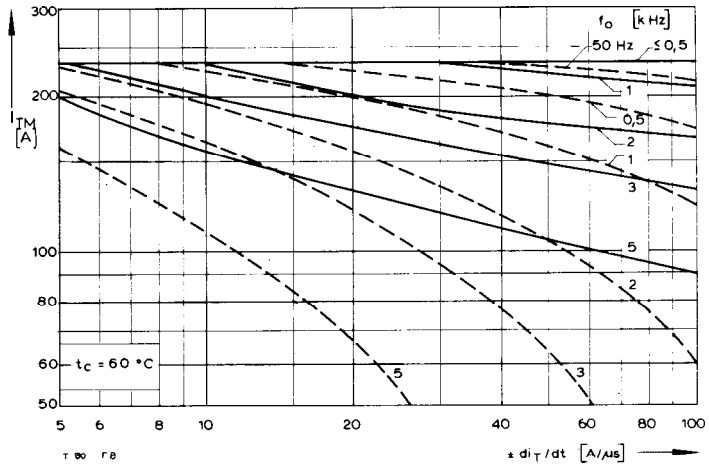
Bild/Fig. 1



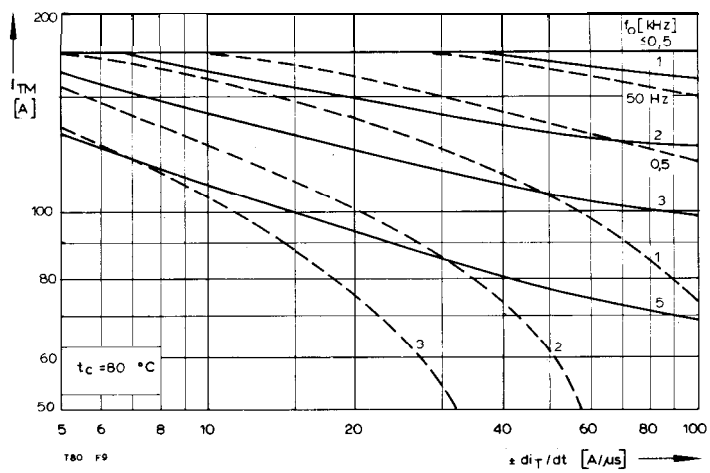
Bild/Fig. 2



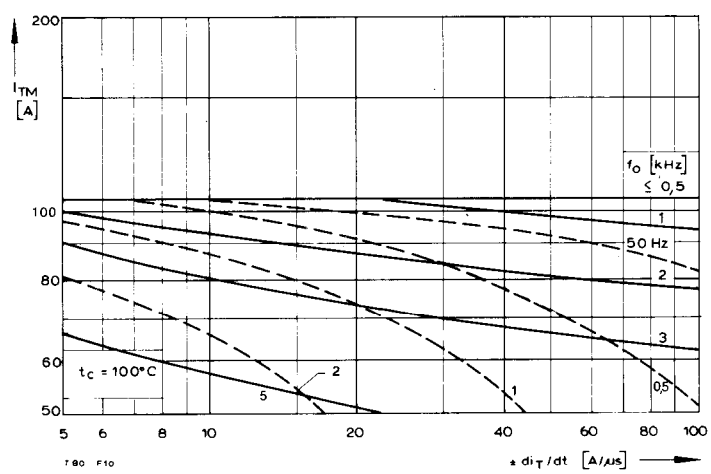
Bild/Fig. 3



Bild/Fig. 4



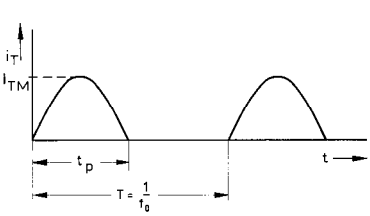
Bild/Fig. 5



Bild/Fig. 6

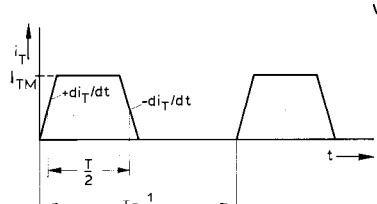
Bild/Fig. 1, 2, 3
Steuergenerator/pulse generator:
i_G = 0,6 A, di_G/dt = 0,6 Alps

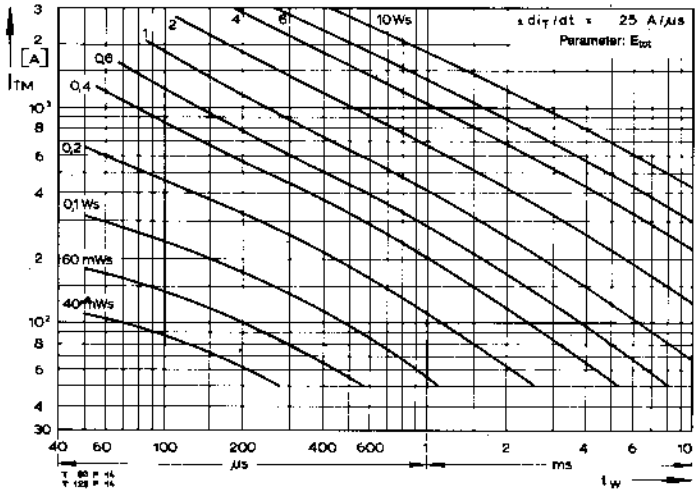
RC-Glied/RC-network:
R [Ω] ≥ 0,02 v_{DM} [V]
C ≤ 0,15 µF
v_{DM} ≤ 0,67 V_{DRM}



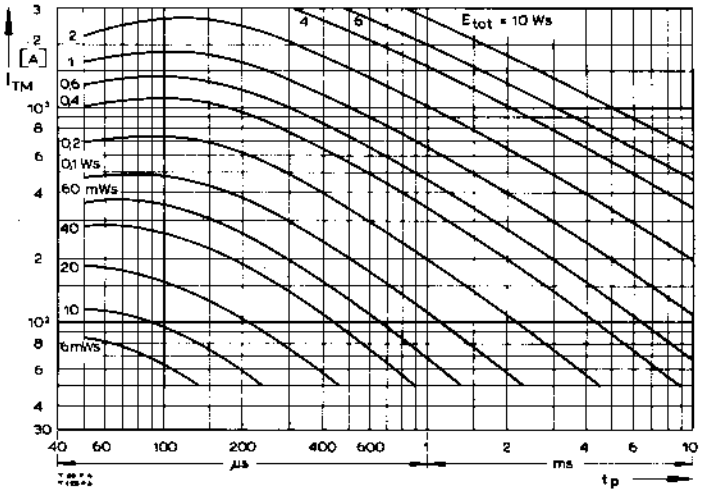
Bild/Fig. 4, 5, 6
Steuergenerator/pulse generator:
i_G = 0,6 A, di_G/dt = 0,6 A/µs

RC-Glied/RC-network:
R [Ω] ≥ 0,02 v_{DM} [V]
C ≤ 0,22 µF
v_{DM} ≤ 0,67 V_{DRM}
dv_R/dt ≤ 600 V/µs
v_{RM} ≤ 0,67 V_{RRM}

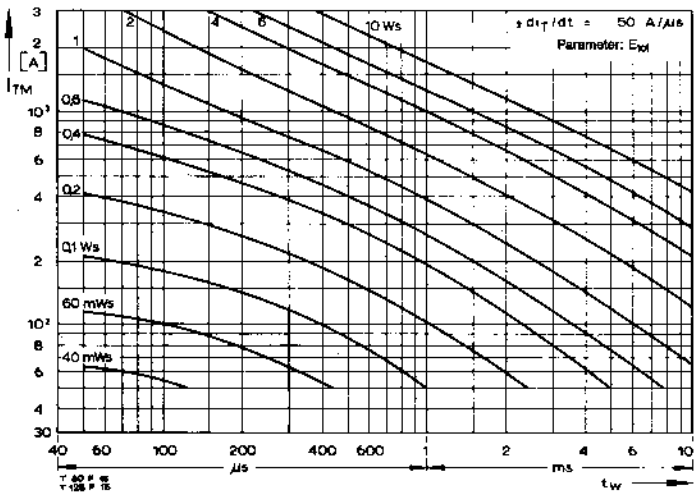




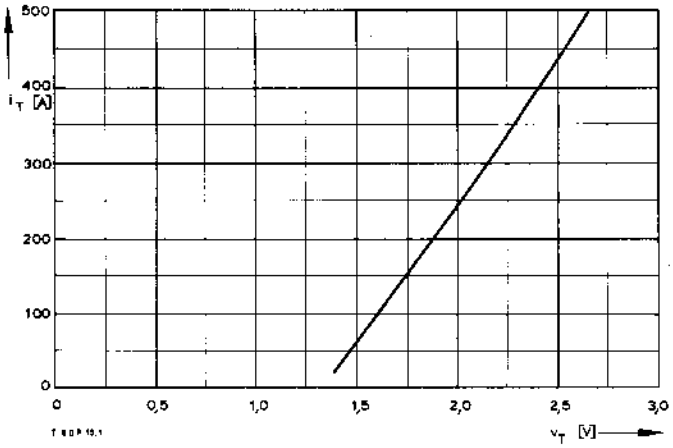
Bild/Fig. 10



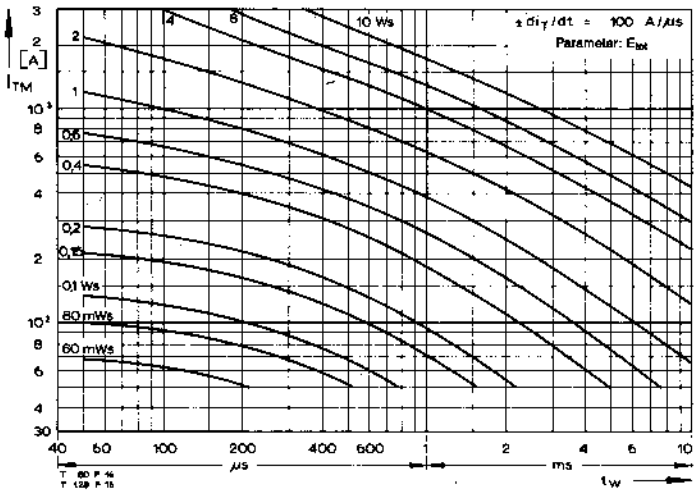
Bild/Fig. 13



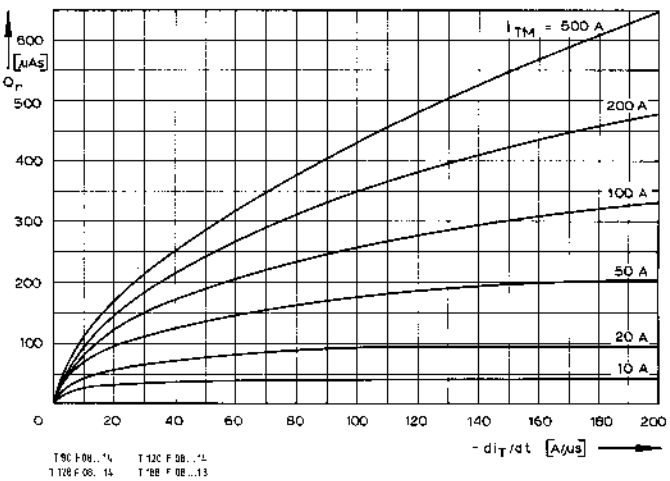
Bild/Fig. 11



Bild/Fig. 14



Bild/Fig. 12



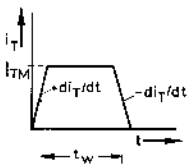
Bild/Fig. 15

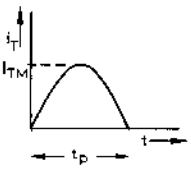
Bild/Fig. 10, 11, 12
Steuergenerator/pulse generator:
i_G = 0,6 A, di_G/dt = 0,6 A/µs

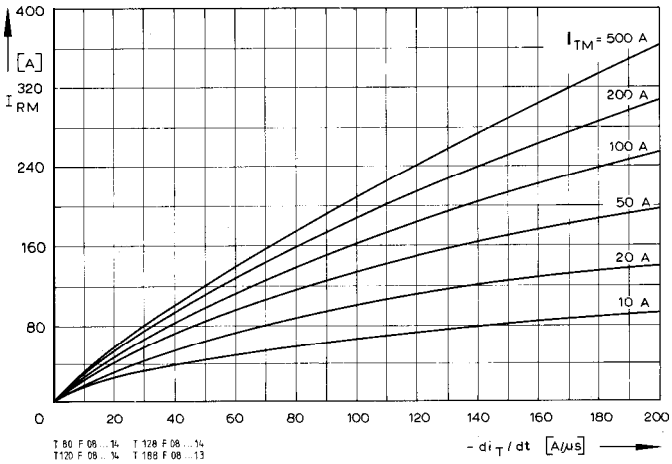
RC-Glied/RC-network:
R [Ω] ≥ 0,02 v_{DM} [V]
C ≤ 0,22 µF
v_{DM} ≤ 0,67 V_{DRM}
dv_D/dt ≤ 500 V/µs
v_{RM} ≤ 0,67 V_{RRM}

(zu Bild/to Fig. 13)
Steuergenerator/pulse generator:
i_G = 0,6 A, di_G/dt = 0,6 A/µs

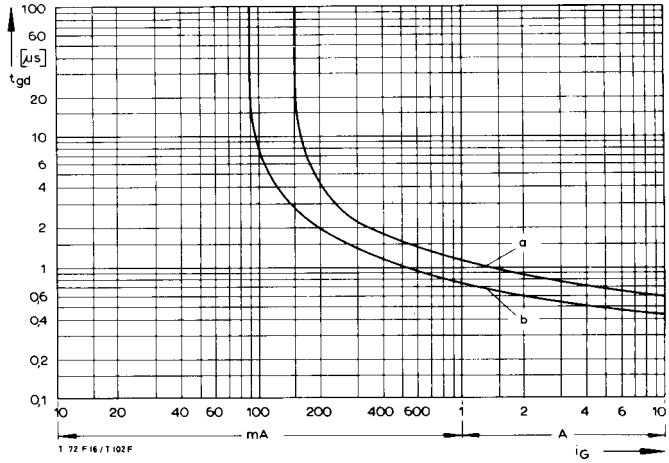
RC-Glied/RC-network:
R [Ω] ≥ 0,02 v_{DM} [V]
C ≤ 0,15 µF



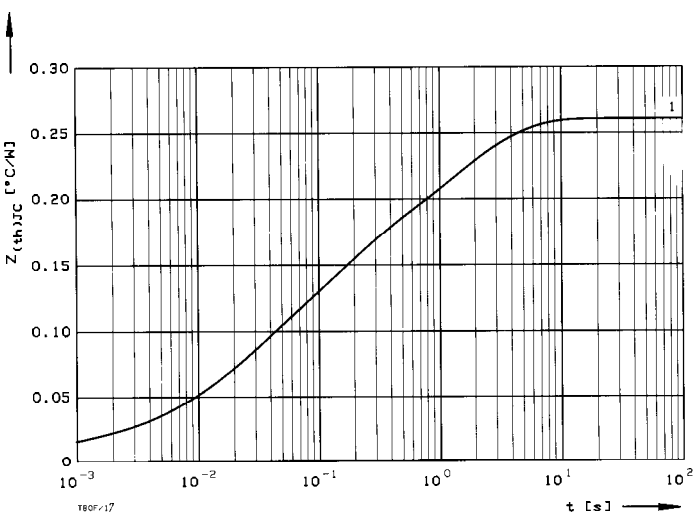




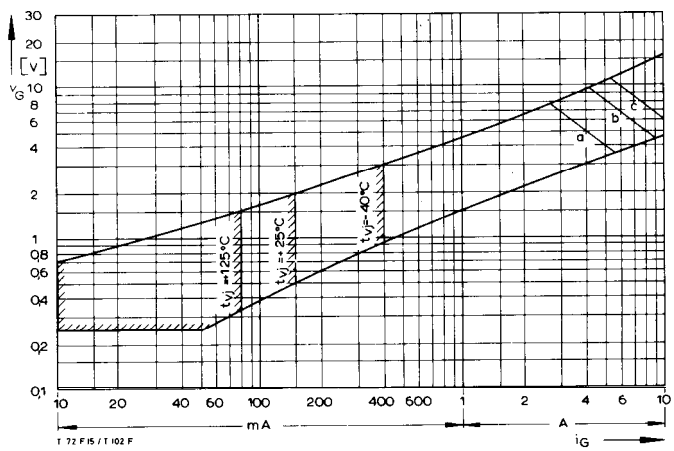
Bild/Fig. 16
Rückstromspitze $I_{RM} = f(-di/dt)$, $t_{vj} = t_{vj\,(max)}$, $v_R = 0{,}5\ V_{RRM}$, $v_{RM} = 0{,}8\ V_{RRM}$
Peak reverse recovery current $I_{RM} = f(-di/dt)$, $t_{vj} = t_{vj\,(max)}$, $v_R = 0.5\ V_{RRM}$, $v_{RM} = 0.8\ V_{RRM}$
Parameter: Durchlaßstrom/On-state current I_{TM}



Bild/Fig. 18
Zündverzug/Gate controlled delay time $t_{gd} = f(i_{GM})$, $t_{vj} = 25°C$, $di_G/dt = i_{GM}/1\mu s$
a – Maximaler Verlauf/Limiting Characteristic
b – Typischer Verlauf/Typical Characteristic



BildlFlg. 17
Transienter innerer Wärmewiderstand $Z_{(th)JC} = f(t)$, DC
Transient thermal impedance $Z_{(th)JC} = f(t)$, DC



Bild/Fig. 19
Steuercharakteristik mit ZündbereichenlGate Characteristic with triggering areas
$v_G = f(i_G)$, V_D = 12 V

Parameter:		a	b	c
Steuerimpulsdauer/Trigger pulse duration t_g	[ms]	10	1	0,5
Höchstzulässige Spitzensteuerverlustleistung/ Max. rated oeak aate oower dissipation P_{GM}	[W]	20	40	60

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

Pos. n	1	2	3	4	5	6	7
R_{thn} [°C/W]	0,012063	0,019762	0,054867	0,069583	0,045603	0,058956	
τ_n [s]	0,000531	0,006426	0,025215	0,133728	0,795190	2,643219	

Analytische Funktion/analytical functlon:

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