

Elektrische Eigenschaften

Electrical properties

Höchstzulässige Werte

Maximum rated values

Periodische Vorwärts- und Rückwärts-Spitzensperrspannung	repetitive peak forward off-state and reverse voltages	$t_{vj} = -40^{\circ}\text{C} \dots t_{vj\text{max}}$	$V_{\text{DRM}}, V_{\text{RRM}}$	200, 400 V 600, 800 V
Vorwärts-Stoßspitzen-Sperrspannung	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-Stoßspitzen-Sperrspannung	non repetitive peak reverse voltage	$t_{vj} = +25^{\circ}\text{C} \dots t_{vj\text{max}}$	$V_{\text{RSM}} = V_{\text{RRM}}$	+50 V
Durchlaßstrom-Grenzeffektivwert	RMS on-state current	$t_c = 65^{\circ}\text{C}$	I_{TRMMSM}	200 A
Dauerrenzstrom	average on-state current	$t_c = 44^{\circ}\text{C}$	I_{TAVM}	72 A 127 A
Stoßstrom-Grenzwert	surge current	$t_{vj} = 25^{\circ}\text{C}, t_p = 10\text{ ms}$ $t_{vj} = t_{vj\text{max}}, t_p = 10\text{ ms}$	I_{TSM}	2400 A 2050 A
Grenzlastintegral	I²t-value	$t_{vj} = 25^{\circ}\text{C}, t_p = 10\text{ ms}$ $t_{vj} = t_{vj\text{max}}, t_p = 10\text{ ms}$	I²t	28800 A ² s 21000 A ² s
Kritische Stromsteilheit	critical rate of rise of on-state current	$V_D \leq 67\% V_{\text{DRM}}, f = 50\text{ Hz}$ $i_{\text{GM}} = 0,6\text{ A}, di_{\text{G}}/dt = 0,6\text{ A}/\mu\text{s}$	(di/dt)_{cr}	200 A/ μs
Kritische Spannungsteilheit	critical rate of rise of off-state voltage	$t_{vj} = t_{vj\text{max}}, V_D = 67\% V_{\text{DRM}}$	(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	$t_{vj} = t_{\text{max}}, i_T = 400\text{ A}$	V_T	max. 2,2 V
Schleusenspannung	threshold voltage	$t_{vj} = t_{vj\text{max}}$	$V_{T(\text{TO})}$	1,25 V
Ersatzwiderstand	slope resistance	$t_{vj} = t_{vj\text{max}}$	r_T	1,8 m Ω
Zündstrom	gate trigger current	$t_{vj} = 25^{\circ}\text{C}, V_D = 6\text{ V}$	I_{GT}	max. 150 mA
Zündspannung	gate trigger voltage	$t_{vj} = 25^{\circ}\text{C}, V_D = 6\text{ V}$	V_{GT}	max. 2 V
Nicht zündender Steuerstrom	gate non-trigger current	$t_{vj} = t_{vj\text{max}}, V_D = 6\text{ V}$	I_{GD}	max. 10 mA
Nicht zündende Steuerspannung	gate non-trigger voltage	$t_{vj} = t_{vj\text{max}}, V_D = 0,5 V_{\text{DRM}}$	V_{GD}	max. 0,25 V
Haltestrom	holding current	$t_{vj} = 25^{\circ}\text{C}, V_D = 6\text{ V}, R_{\text{GK}} = 5\ \Omega$	I_{H}	max. 250 mA
Einraststrom	latching current	$t_{vj} = 25^{\circ}\text{C}, V_D = 6\text{ V}, R_{\text{GK}} \geq 10\ \Omega$ $i_{\text{GM}} = 0,6\text{ A}, di_{\text{G}}/dt = 0,6\text{ A}/\mu\text{s}, t_g = 20\ \mu\text{s}$	I_{L}	max. 750 mA
Vorwärts- u. Rückwärts-Sperrstrom	forward off-state and reverse Currents	$t_{vj} = t_{vj\text{max}}, V_D = V_{\text{DRM}}, V_R = V_{\text{RRM}}$	$i_{\text{D}}, i_{\text{R}}$	max. 30 mA
Zündverzögerung	gate controlled delay time	$t_{vj} = 25^{\circ}\text{C}, i_{\text{GM}} = 0,6\text{ A}, di_{\text{G}}/dt = 0,6\text{ A}/\mu\text{s}$	t_{gd}	max. 1,4 μs
Freiwerdezeit	circuit commutated turn-off time	siehe Techn. Erl./see Techn. Int.	t_{q}	B*: max. 10 ps D: max. 15 μs s: max. 18 μs E: max. 20 μs

Thermische Eigenschaften

Thermal properties

Innerer Wärmewiderstand	thermal resistance, junction to case	$\Theta = 180^{\circ}\text{ el, sin DC}$	R_{thJC}	max. 0,35 $^{\circ}\text{C}/\text{W}$ max. 0,33 $^{\circ}\text{C}/\text{W}$
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

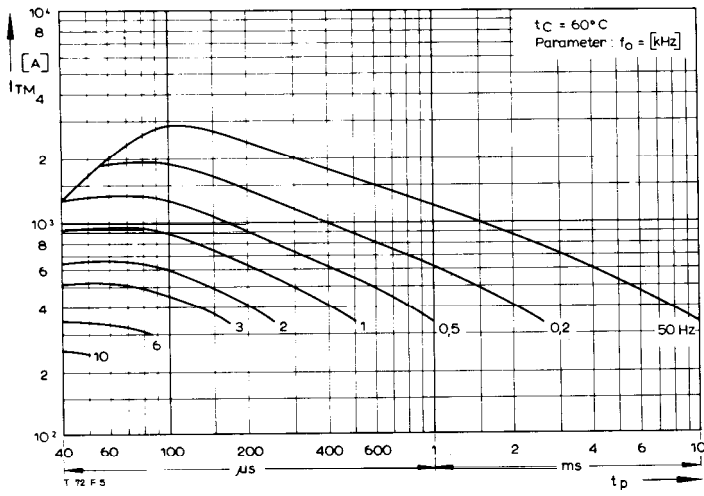
Mechanical properties

Si-Element mit Druckkontakt	Si-pellet with pressure contact		M	20 Nm
Anzugsdrehmoment	tightening torque		G	typ. 150 g
Gewicht	weight			8 mm
Kriechstrecke	Creepage distance			C
Feuchteklasse	humidity classification	DIN 40040		50 m/s ²
Schwingfestigkeit	Vibration resistance	f = 50 Hz		
Maßbild B	outline B	DIN 41692.20483		Seite/page 154

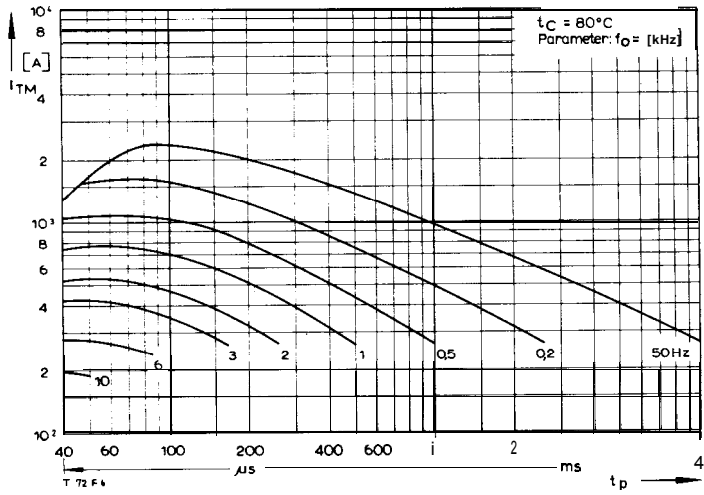
* Für größere Stückzahlen bitte Liefertermin erfragen/Delivery for larger quantities on request

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

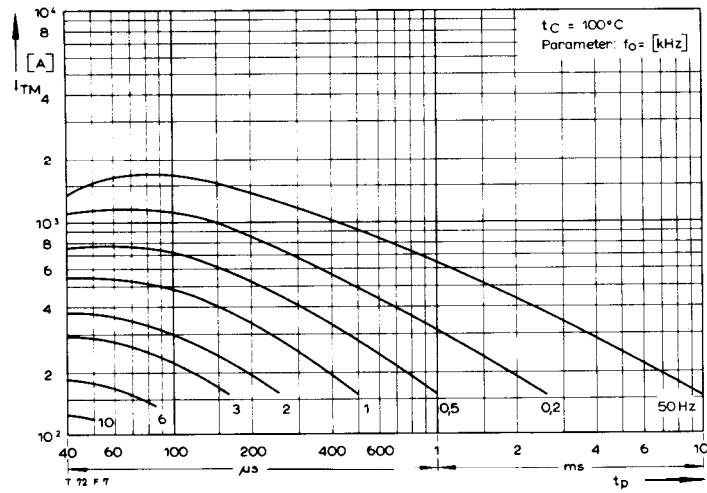
2) Unmittelbar nach der Freiwerdezeit, vgl. Meßbedingungen für t_{q} /Immediately after circuit commutated turn-off time, see Parameters t_{q}



BildFig. 1



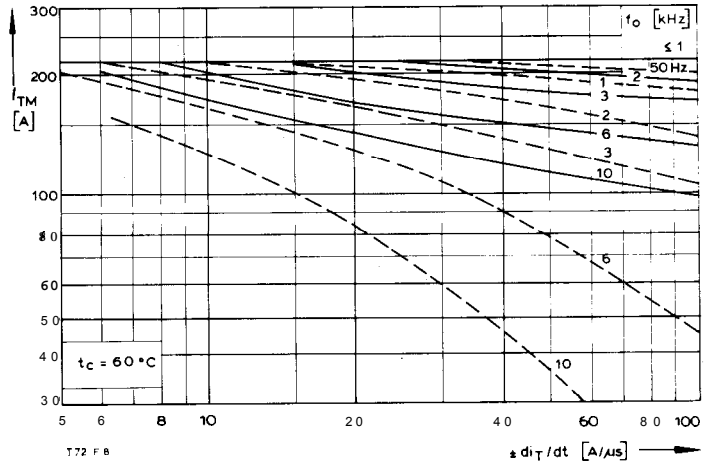
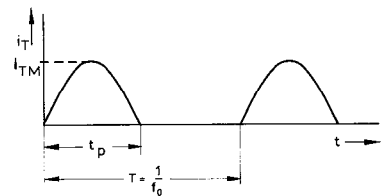
BildFig. 2



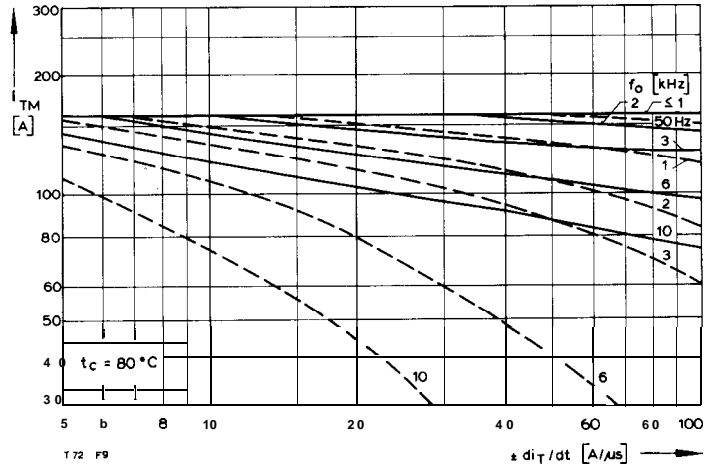
Bild/ Fig. 3

BildFig 1, 2, 3
Steuer-generator/pulse generator:
 $i_G = 0,6 \text{ A}$, $di_G/dt = 0,6 \text{ A}/\mu\text{s}$

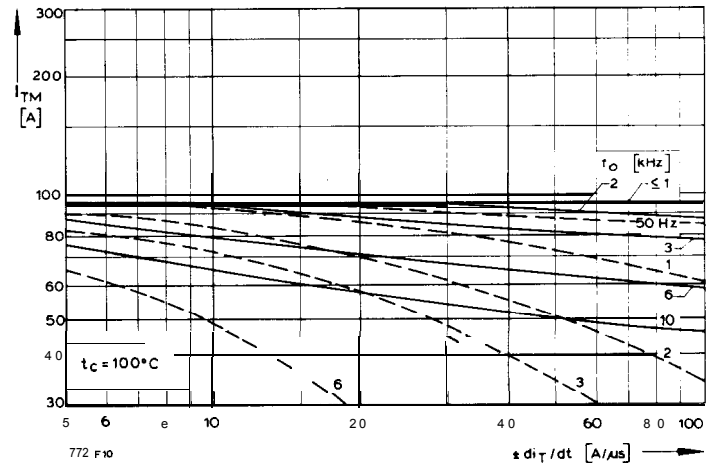
RC-Glied/RC-network:
 $R [\Omega] \geq 0,02 V_{DM} [V]$
 $C \leq 0,15 \mu\text{F}$
 $V_{DM} \leq 0,67 V_{DRM}$



BildFig 4



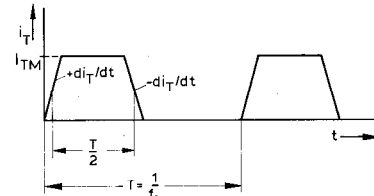
BildFig. 5

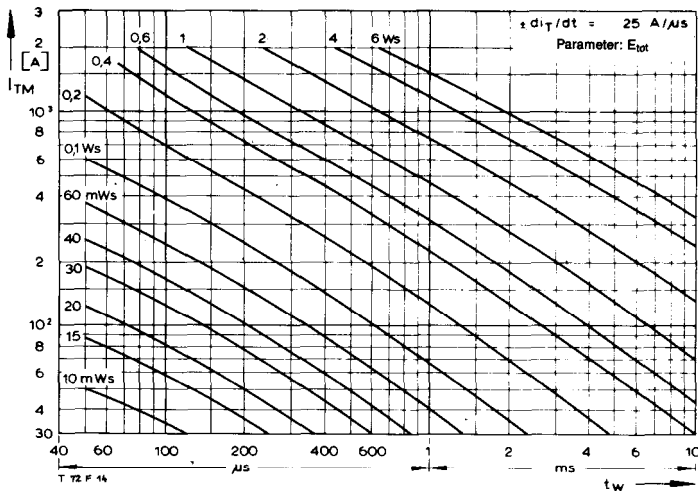


BildFig. 6

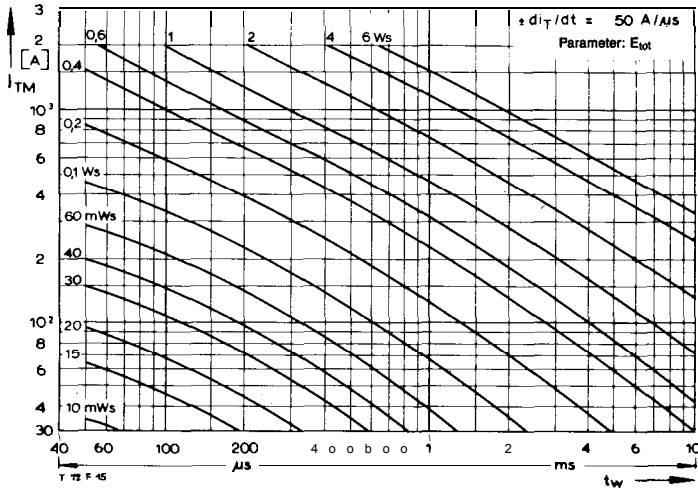
BildFig. 4, 5, 6
Steuer-generator/pulse generator:
 $i_G = 0,6 \text{ A}$, $di_G/dt = 0,6 \text{ A}/\mu\text{s}$

RC-Glied/RC-network:
 $R [\Omega] \geq 0,02 V_{DM} [V]$
 $C \leq 0,22 \mu\text{F}$
 $V_{DM} \leq 0,67 V_{DRM}$
 $dV_H/dt \leq 500 \text{ V}/\mu\text{s}$
 $V_{RM} \leq 0,67 V_{RRM}$

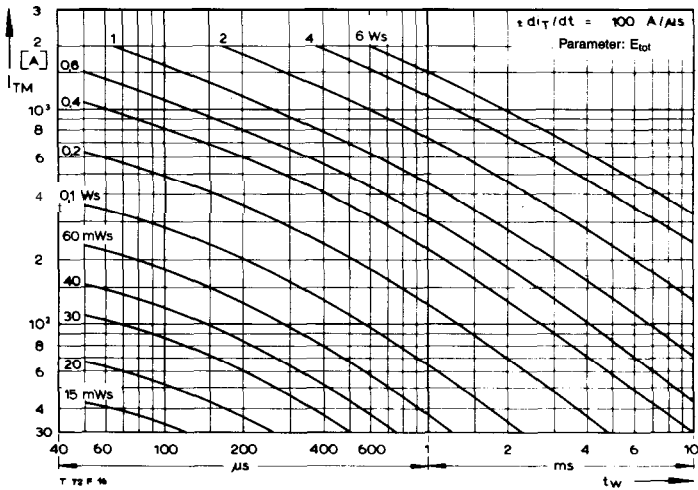




Bild/Fig. 10



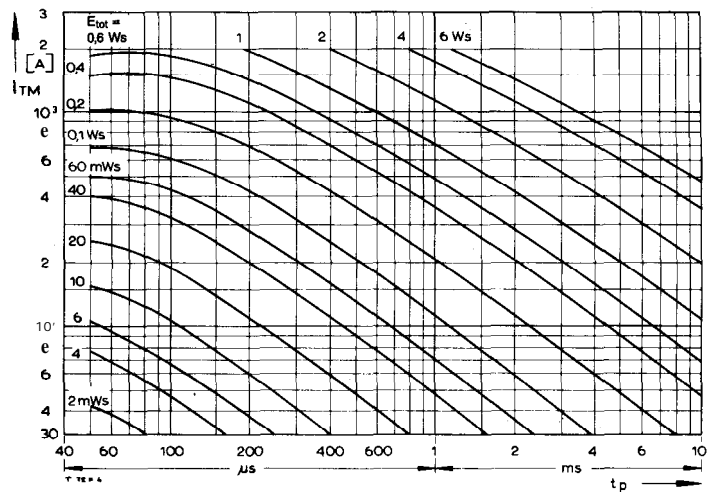
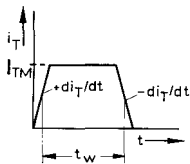
Bild/Fig. 11



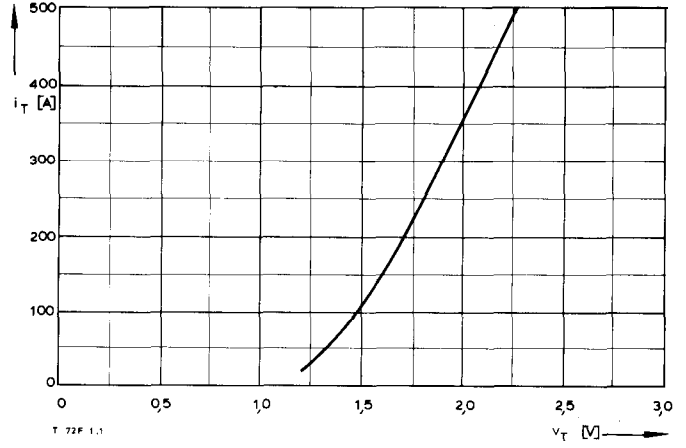
Bild/Fig. 12

Bild/Fig. 10, 11, 12
Steuer-generator/pulse generator:
 $i_G = 0,6 \text{ A}$, $di_G/dt = 0,6 \text{ A}/\mu\text{s}$

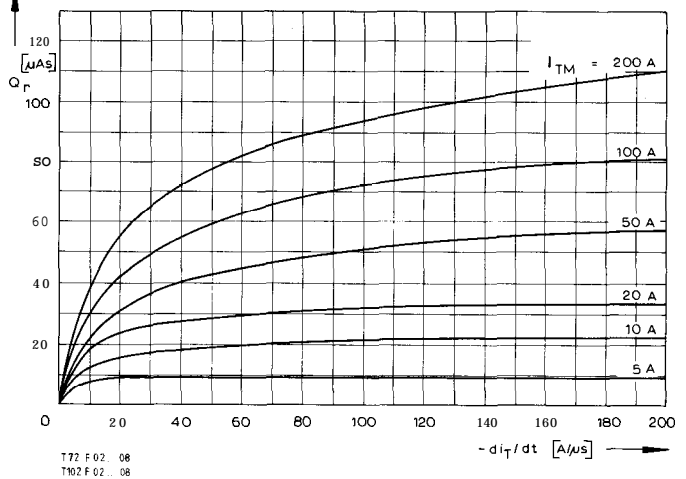
RC-Glied/RC-network:
 $F1 [\Omega] \geq 0,02 v_{DM} [V]$
 $C \leq 0,22 \mu\text{F}$
 $v_{DM} \leq 0,67 v_{DRM}$
 $dv_H/dt \leq 500 \text{ V}/\mu\text{s}$
 $v_{RM} \leq 0,67 v_{RRM}$



Bild/Fig. 13



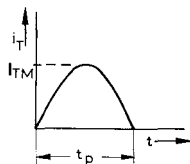
Bild/Fig. 14

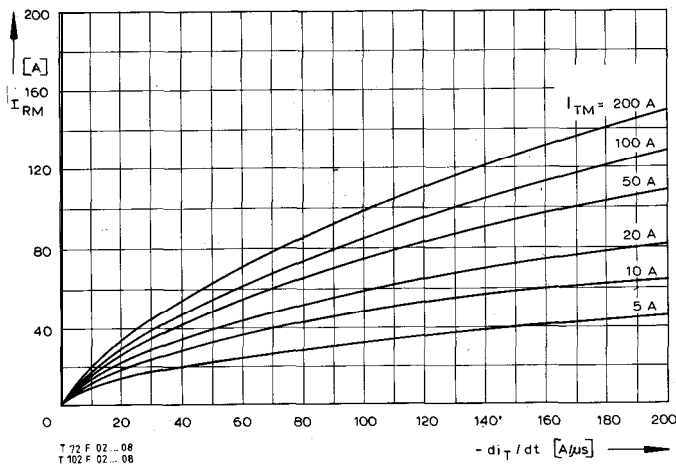


Bild/Fig. 15

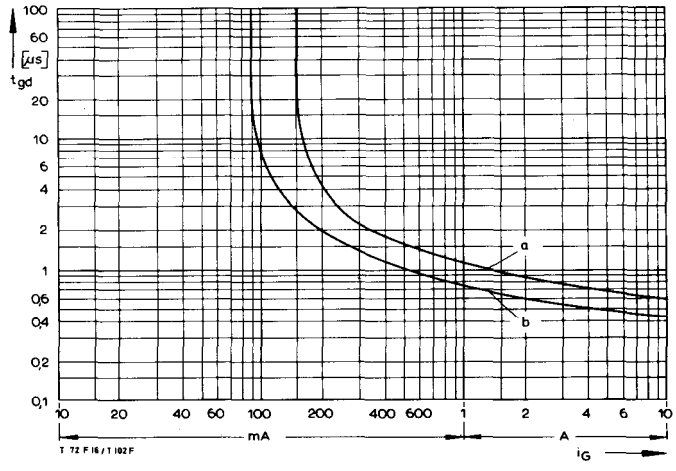
(zu Bild/to Fig. 13)
Steuer-generator/pulse generator:
 $i_G = 0,6 \text{ A}$, $di_G/dt = 0,6 \text{ A}/\mu\text{s}$

RC-Glied/RC-network:
 $R [\Omega] \geq 0,02 v_{DM} [V]$
 $C \leq 0,15 \mu\text{F}$

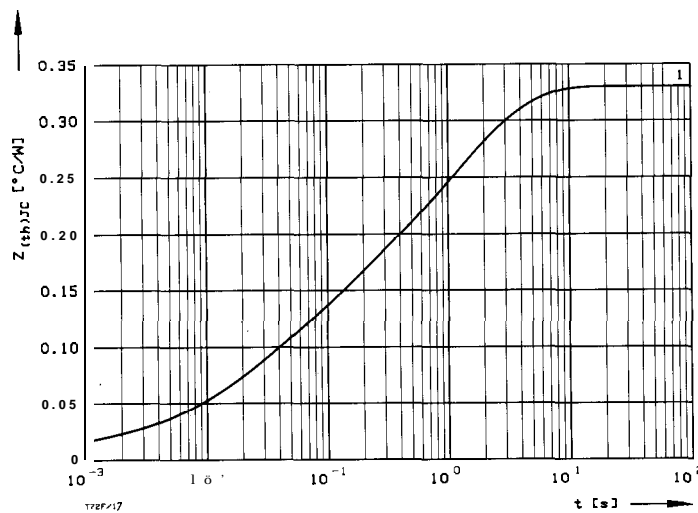




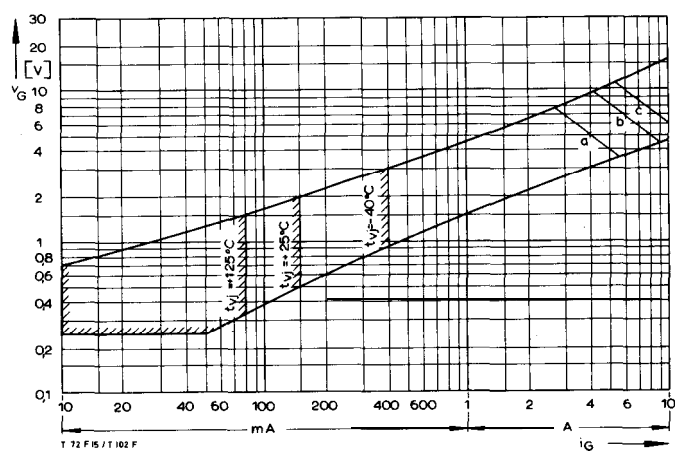
Bild/Fig. 16
 Rückstromspitze $I_{RM} = f(-di/dt)$, $t_{vj} = t_{vj(max)}$, $V_R = 0,5 V_{RRM}$, $V_{RM} = 0,8 V_{RRM}$
 Peak reverse recovery current $I_{RM} = f(-di/dt)$, $t_{vj} = t_{vj(max)}$, $V_R = 0,5 V_{RRM}$, $V_{RM} = 0,8 V_{RRM}$
 Parameter: Durchlaßstrom/On-state current I_{TM}



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



Bild/Fig. 17
 Transienter innerer Wärmewiderstand $Z_{thJC} = f(t)$, DC
 Transient thermal impedance $Z_{thJC} = f(t)$, DC



Bild/Fig. 19
 Steuercharakteristik mit Zündbereichen/Gate Characteristic with triggering areas
 $V_G = f(i_G)$, $V_G = 6 \text{ V}$

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]	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]	0,012	0,02	0,055	0,07	0,085	0,088	
τ_n [s]	0,00053	0,0064	0,025	0,13	0,8	2,6	

Analytische Funktion/analytical function:

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