

Elektrische Eigenschaften

Electrical properties

Höchstzulässige Werte

Maximum rated values

Periodische Vorwärts-Spitzensperrenschnung	repetitive peak forward off-state voltage	$t_{vj} = -40^{\circ}\text{C} \dots t_{vj \max}$	V_{DRM}	600, 800 V 1000, 1100 v 1200, 1300* V
Vorwärts-Stoßspitzenschnung	non repetitive peak forward off-state voltage	$t_{vj} = -40^{\circ}\text{C} \dots t_{vj \max}$	$V_{\text{DSM}} = V_{\text{DRM}}$	
Periodische Rückwärts-Spitzensperrenschnung	repetitive peak reverse voltage	$t_{vj} = -40^{\circ}\text{C} \dots t_{vj \max}$	V_{RRM}	15 v
Periodische Rückwärts-Spitzensperrenschnung nach der Kommutierung	repetitive peak reverse voltage after commutation	$t_{vj} = -40^{\circ}\text{C} \dots t_{vj \max}, t_p = 1 \text{ ps}$	$V_{\text{RRM(C)}}$	50 v
Durchlaßstrom-Grenzeffektivwert	RMS on-state current	$t_c = 05^{\circ}\text{C}$	I_{TRMSM}	900 A
Dauergrenzstrom	average on-state current	$t_c = 56^{\circ}\text{C}$	I_{TAVM}	438 A 573 A
Stoßstrom-Grenzwert	surge current	$t_{vj} = 25^{\circ}\text{C}, t_p = 10 \text{ ms}$	I_{TSM}	6,2 kA
Grenzlastintegral	$\int i^2 dt$ -value	$t_{vj} = t_{vj \max}, t_p = 10 \text{ ms}$ $t_{vj} = 25^{\circ}\text{C}, t_p = 10 \text{ n-s}$ $t_{vj} = t_{vj \max}, t_p = 10 \text{ ms}$	$\int i^2 dt$	5,5 kA 192 kA ² s 151 kA ² s
Kritische Stromsteilheit	critical rate of rise of on-state current	$V_D \leq 67\% V_{\text{DRM}}, f_o = 50 \text{ Hz}$ $V_L = 10 \text{ V}, I_{\text{GM}} = 1,2 \text{ A}, di/dt = 1,2 \text{ A}/\mu\text{s}$	$(di/dt)_{\text{cr}}$	500 A/ μs
Kritische Spannungssteilheit	critical rate of rise of off-state voltage	$t_{vj} = t_{vj \max}, V_D = 67\% V_{\text{DRM}}$ 5. Kennbuchstabe/5th letter C 5. Kennbuchstabe/5th letter F	$(dv/dt)_{\text{cr}}$	500 V/ μs 1000 V/ μs

Charakteristische Werte

Characteristic values

Durchlaßspannung	on-state voltage	$t_{vj} = t_{vj \max}, i_T = 1500 \text{ A}$	V_T	max. 2,1 v
Schleusenspannung	threshold voltage	$t_{vj} = t_{vj \max}$	$V_{T(\text{TO})}$	1,1 v
Ersatzwiderstand	slope resistance	$t_{vj} = t_{vj \max}$	r_T	0,6 m Ω
Zündstrom	gate trigger current	$t_{vj} = 25^{\circ}\text{C}, V_D = 12 \text{ V}$	I_{GT}	max. 300 mA
Zündspannung	gate trigger voltage	$t_{vj} = 25^{\circ}\text{C}, V_D = 12 \text{ V}$	V_{GT}	max. 2,7 V
Nicht zündender Steuerstrom	gate non-trigger current	$t_{vj} = t_{vj \max}, V_D = 12 \text{ V}$	I_{GD}	max. 10 mA
Nicht zündende Steuerspannung	gate non-trigger voltage	$t_{vj} = t_{vj \max}, V_D = 0,5 V_{\text{DRM}}$	V_{GD}	max. 0,25 V
Haltestrom	holding current	$t_{vj} = 25^{\circ}\text{C}, V_D = 12 \text{ V}, R_A = 10 \Omega$	I_H	max. 300 mA
Einraststrom	latching current	$t_{vj} = 25^{\circ}\text{C}, V_D = 12 \text{ V}, R_{\text{GK}} \geq 10 \Omega$ $I_{\text{GM}} = 1,2 \text{ A}, di/dt = 1,2 \text{ A}/\mu\text{s}, t_g = 20 \mu\text{s}$	I_L	max. 1,2 A
Vorwärts- u. Rückwärts-Sperrestrom	forward off-state and reverse Currents	$t_{vj} = t_{vj \max}, V_D = V_{\text{ORM}}, V_R = V_{\text{RRM}}$	i_D	max. 50 mA
Zündverzögerung	gate controlled delay time	$t_{vj} = 25^{\circ}\text{C}, I_{\text{GM}} = 1,2 \text{ A}, di/dt = 1,2 \text{ A}/\mu\text{s}$	i_R	max. 250 mA
Freiwerdezeit	circuit commutated turn-off time	siehe Techn. Erl./see Techn. Inf.	t_{gd}	max. 1,4 μs
			t_q	D: max. 15 μs^1 E: max. 20 μs^1 F: max. 25 μs^1

Thermische Eigenschaften

Thermal properties

Innerer Wärmewiderstand für beidseitige Kühlung	thermal resistance, junction to case for two-sided cooling	$\theta = 180^{\circ} \text{ el, sin}$ DC	R_{thJC}	max. 0,053 $^{\circ}\text{C}/\text{W}$ max. 0,05 $^{\circ}\text{C}/\text{W}$
für anodenseitige Kühlung	for anode-sided cooling	$\theta = 180^{\circ} \text{ el, sin}$ DC	$R_{\text{thJC(A)}}$	max. 0,088 $^{\circ}\text{C}/\text{W}$ max. 0,085 $^{\circ}\text{C}/\text{W}$
für kathodenseitige Kühlung	for cathode-sided cooling	$\theta = 180^{\circ} \text{ el, sin}$ DC	$R_{\text{thJC(K)}}$	max. 0,123 $^{\circ}\text{C}/\text{W}$ max. 0,12 $^{\circ}\text{C}/\text{W}$
Übergangswärmewiderstand	thermal resistance, case to heatsink	beidseitig/two-sided einseitig/one-sided	R_{thCK}	max. 0,01 $^{\circ}\text{C}/\text{W}$ max. 0,02 $^{\circ}\text{C}/\text{W}$
Höchstzul. Sperrschichttemperatur	max. junction temperature		$t_{vj \max}$	125 $^{\circ}\text{C}$
Betriebstemperatur	Operating temperature		$t_{\text{c op}}$	-40 ... + 125 $^{\circ}\text{C}$
Lagertemperatur	storage temperature		t_{stg}	-40 ... + 140 $^{\circ}\text{C}$

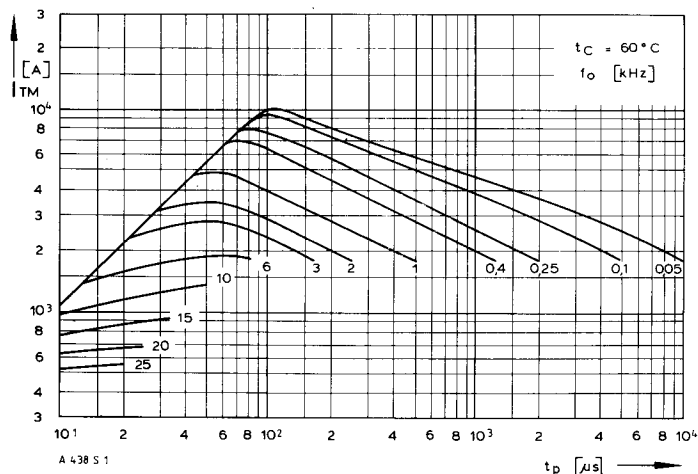
Mechanische Eigenschaften

Mechanical properties

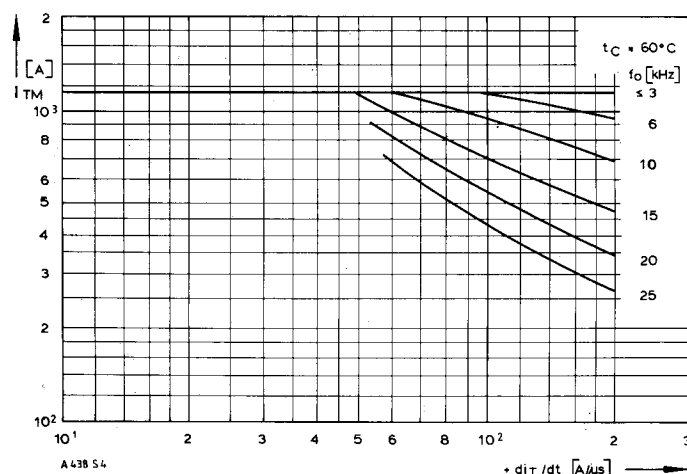
Si-Elemente mit Druckkontakt	Si-pellets with pressure contact		F	4,5...9 kN
Anpreßkraft	Clamping force		G	typ. 100 g
Gewicht	weight			17 mm
Kriechstrecke	Creepage distance			c
Feuchteklasse	humidity classification	DIN 40040		50 m/s ²
Schwingfestigkeit	Vibration resistance	f = 50 Hz		Seite/page 154
Maßbild	outline	DIN 41814-152A4		

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

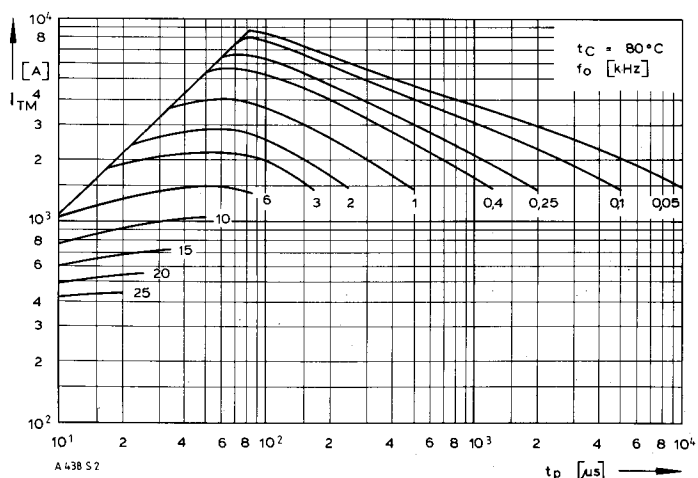
1) mit antiparalleler Diode with inverse paralleled diode



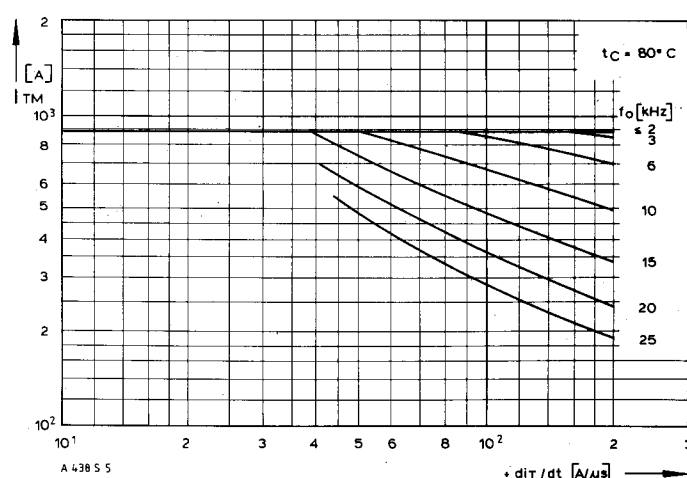
Bild/Fig. 1



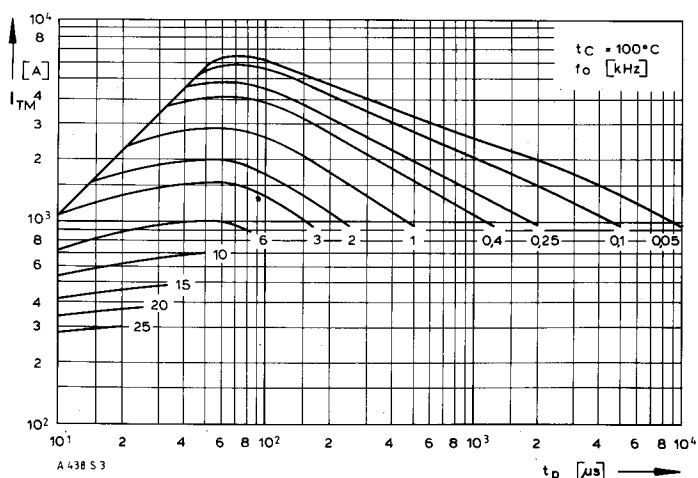
Bild/Fig. 4



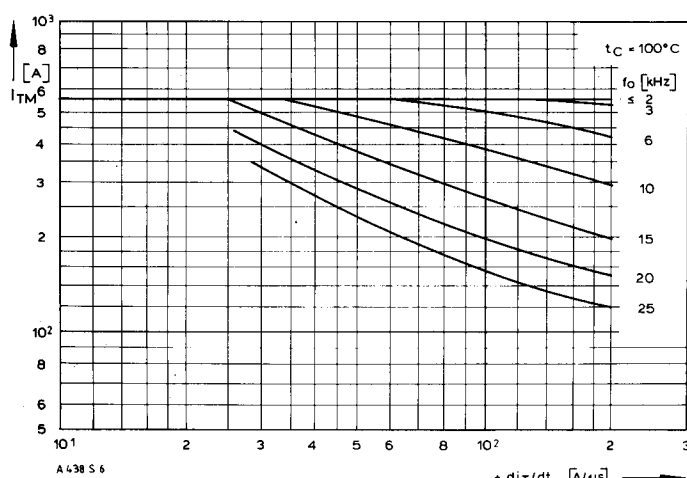
Bild/Fig. 2



Bild/Fig. 5



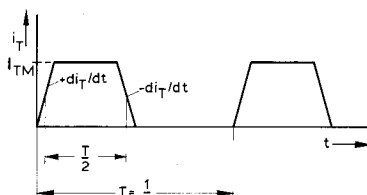
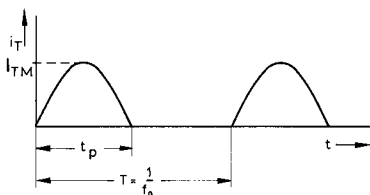
Bild/Fig. 3



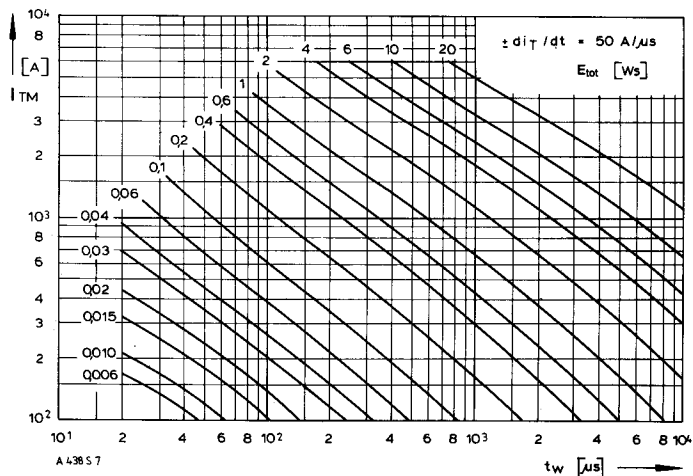
Bild/Fig. 6

Bild/Fig. 1, 2, 3
Steuer-generator/pulse generator:
 $i_G = 2,4 \text{ A}$, $di_G/dt = 2,4 \text{ A/μs}$

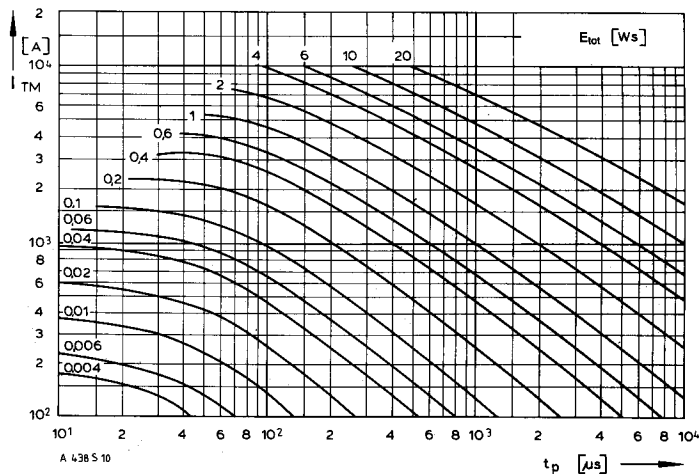
RC-Glied/RC-network:
 $R [\Omega] \geq 0,02 V_{DM} [V]$
 $C \leq 0,22 \mu\text{F}$
 $V_{DM} \leq 0,67 V_{DRM}$



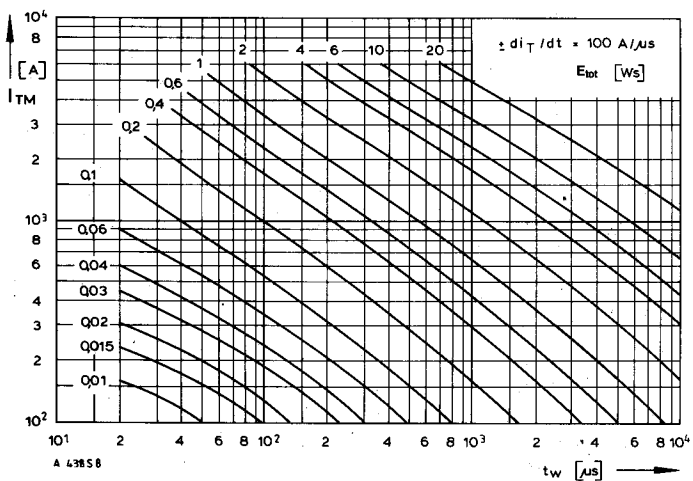
RC-Glied/RC-network:
 $R [\Omega] \geq 0,02 V_{DM} [V]$
 $C \leq 0,33 \mu\text{F}$
 $V_{DM} \leq 0,67 V_{DRM}$



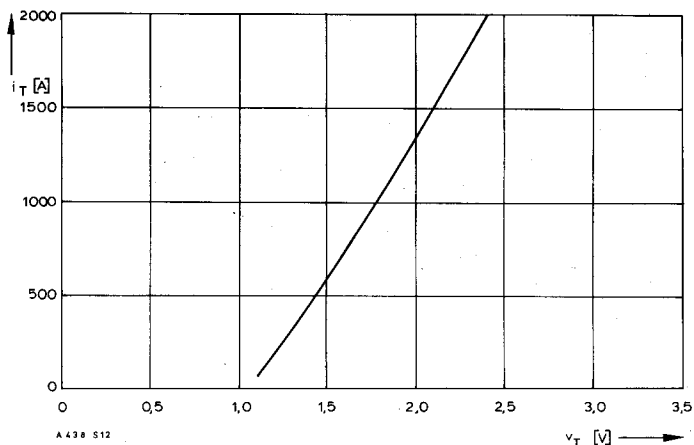
Bild/Fig. 7



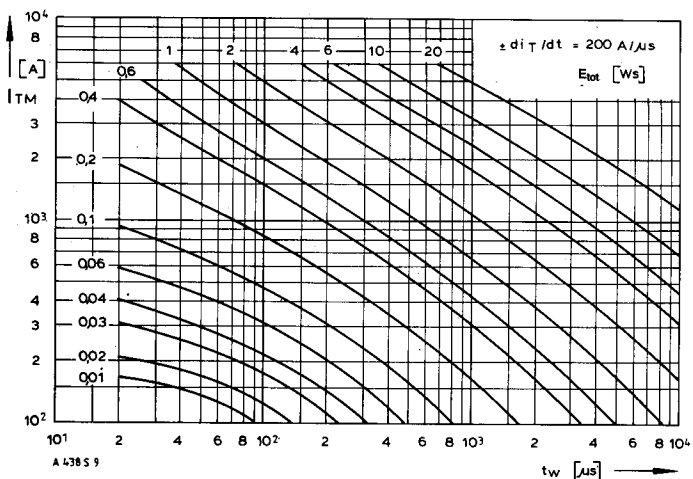
Bild/Fig. 13



Bild/Fig. 8



Bild/Fig. 14



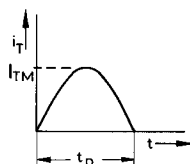
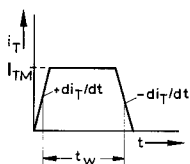
Bild/Fig. 9

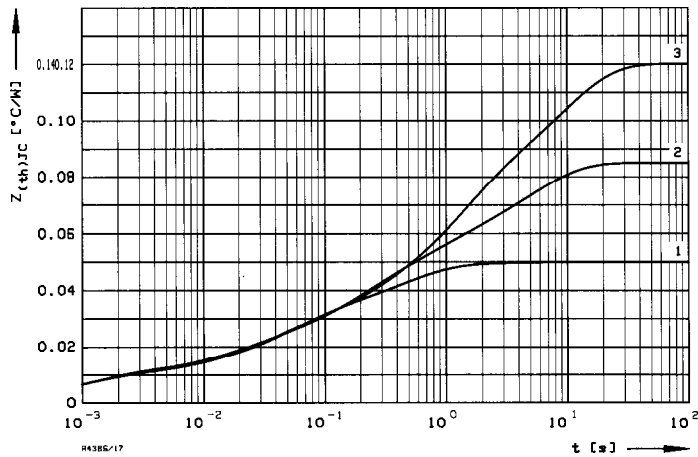
Bild/Fig. 7, 8, 9
Steuergenerator/pulse generator:
 $i_G = 2,4 \text{ A}$, $di_G/dt = 2,4 \text{ A}/\mu\text{s}$

RC-Glied/RC-network:
 $R [\Omega] \geq 0,02 V_{DM} [V]$
 $C \leq 0,33 \mu\text{F}$
 $V_{DM} \leq 0,67 V_{DRM}$

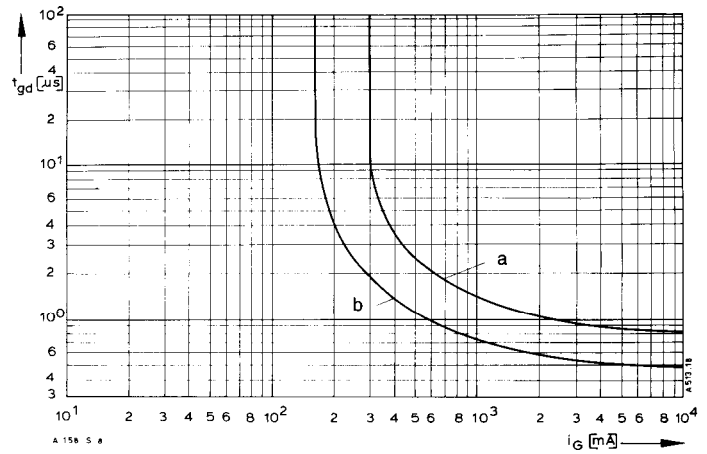
(zu Bild/to Fig. 13)
Steuergenerator/pulse generator:
 $i_G = 2,4 \text{ A}$, $di_G/dt = 2,4 \text{ A}/\mu\text{s}$

RC-Glied/RC-network:
 $R [\Omega] \geq 0,02 V_{DM} [V]$
 $C \leq 0,22 \mu\text{F}$

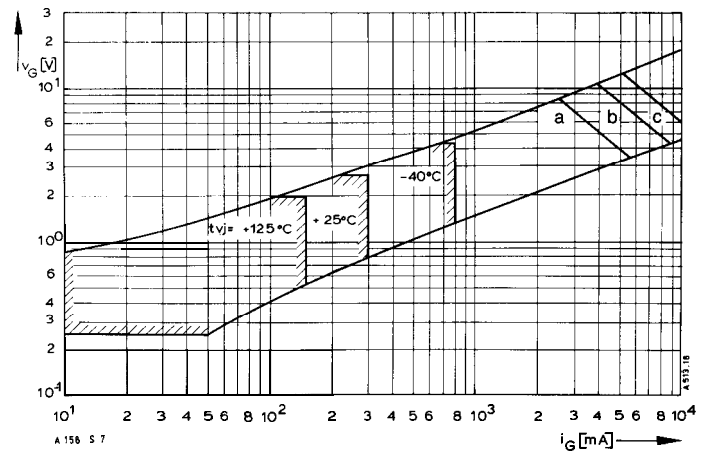




Bild/Fig. 17
 Transienter innerer Wärmewiderstand $Z_{thJC} = f(t)$, DC
 Transient thermal impedance $Z_{thJC} = f(t)$, DC
 1 Beidseitige Kühlung/two-sided cooling
 2 Anodenseitige Kühlung/anode side cooling
 3 Kathodenseitige Kühlung/cathode side cooling



BildFig. 16
 Zündverzugs/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. 19
 Steuercharakteristik mit Zündbereichen/Gate Characteristic with triggering areas
 $V_G = f(i_G)$, $V_D = 12\text{ V}$

Parameter:	a	b	c
Steuerimpulsdauer/Trigger pulse duration t_n [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

Kühlung	Pos. n	1	2	3	4	5	6	7
beidseitig	$R_{thn} [^\circ\text{C/W}]$	0,0105	0,00283	0,0167	0,0188	0,00116		
two-sided	$\tau_n [s]$	0,00113	0,0255	0,0511	0,429	2,49		
anodenseitig	$R_{thn} [^\circ\text{C/W}]$	0,0094	0,00974	0,0182	0,0161	0,0316		
anode-sided	$\tau_n [s]$	0,000984	0,017	0,15	0,6	5,0		
kathodenseitig	$R_{thn} [^\circ\text{C/W}]$	0,00928	0,0145	0,00868	0,0401	0,0475		
cathode-sided	$\tau_n [s]$	0,000939	0,0285	0,156	1,12	9,1		

Analytische Funktion/analytical function:

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