Elektrische Eigenschaften — Electrical properties

Höchstzulässige Werte — Maximum rated values

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

charakteristische Werte — Characteristic values

Durchlaßspannung	on-state voltage	$t_{vj} = t_{vj\,max}$, i_T = 3600 A	v_T	max.	3,17	v
Schleusenspannung	threshold voltage	$t_{vj} = t_{vj\,max}$	$V_{T(TO)}$		1,35	v
Ersatzwiderstand	slope resistance	$t_{vj} = t_{vj\,max}$	r_T		0,45	mΩ
Zündstrom	gate trigger current	t_{vj} = 25°C, v_D = 6 V	I_{GT}	max.	300	mA
Zündspannung	gate trigger voltage	t_{vj} = 25°C, v_D = 6 V	V_{GT}	max.	2	v
Nicht zündender Steuerstrom	gate non-trigger current	$t_{vj} = t_{vj\,max}$, v_D = 6 V	I_{GD}	max.	40	mA
Nicht zündende Steuerspannung	gate non-trigger voltage	$t_{vj} = t_{vj\,max}$, v_D = 0,5 V_{DRM}	V_{GD}	max.	0,3	v
Haltestrom	holding current	t_{vj} = 25°C, v_D = 6 V, R_A = 5 Ω	I_H	max.	400	mA
Einraststrom	latching current	t_{vj} = 25°C, v_D = 6 V, $R_{GK} \geq$ 10 Ω i_{GM} = 1 A, di_G/dt = 1 A/µs, t_g = 20 ps	I_L	max.	2	A
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.	200	mA
Zündverzug	gate controlled delay time	t_{vj} = 25°C, i_{GM} = 1 A, di_G/dt = 1 A/µs	t_{gd}	max.	2,3	µs
Freiwerdezeit	circuit commutated turn-off time	siehe Techn. Erl./see Techn. Inf.	t_q 1:	max.	120	µs

Thermische Eigenschaften — Thermal orooerties

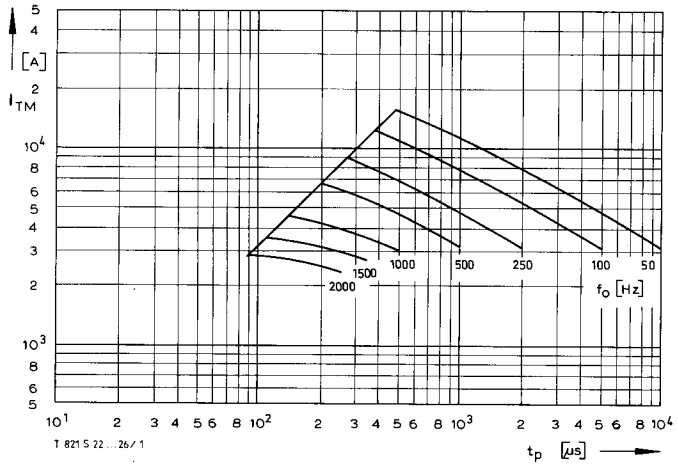
Innerer Wärmewiderstand für beidseitige Kühlung	thermal resistance, junction to case for two-sided cooling	Θ = 180" el, sin	R_{thJC}	max.	0,0215 °C/W
		DC		max.	0,0200 °C/W
Übergangswärmewiderstand	thermal resistance, case to heatsink	beidseitig/two-sided	R_{thCK}	max.	0,005 °C/W
		einseitiglone-sided		max.	0,010 °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 Eigenschaften — Mechanical properties

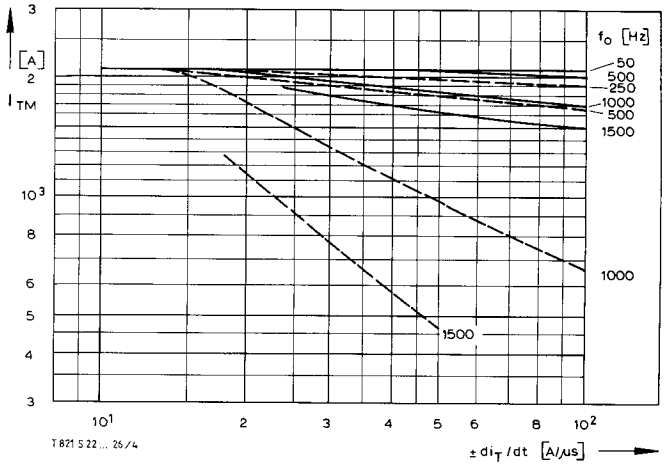
Si-Element mit Druckkontakt	Si-pellet with pressure contact				
Anpreßkraft	Clamping force		F		13,5 ... 24 kN
Gewicht	weight		G	typ.	550 g
Kriechstrecke	Creepage distance				25 mm
Feuchteklasse	humidity classification	DIN 40040			C
Schwingfestigkeit	Vibration resistance	f = 50 Hz			50 m/s²
Maßbild	outline	DIN 41814-151A4			Seite/page 155

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

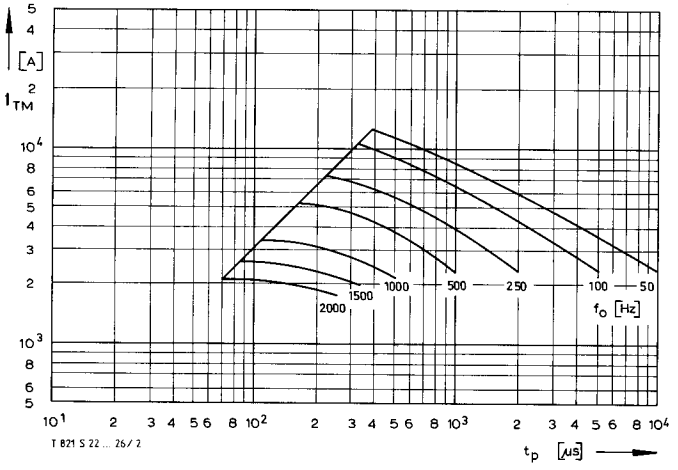
1) Werte nach DIN IEC 747-6 (ohne vorausgehende Kommutierung)/Values to DIN IEC 747-6 (without prior commutation)
2) Unmittelbar nach der Freiwerdezeit, vgl. Meßbedingungen für t_q/Immediately after circuit commutated turn-off time, see Parameters t_q



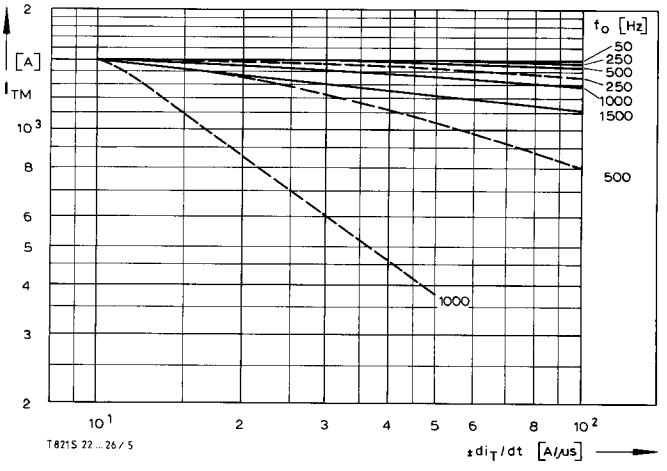
Bild/Fig. 1 t_C = 60°C



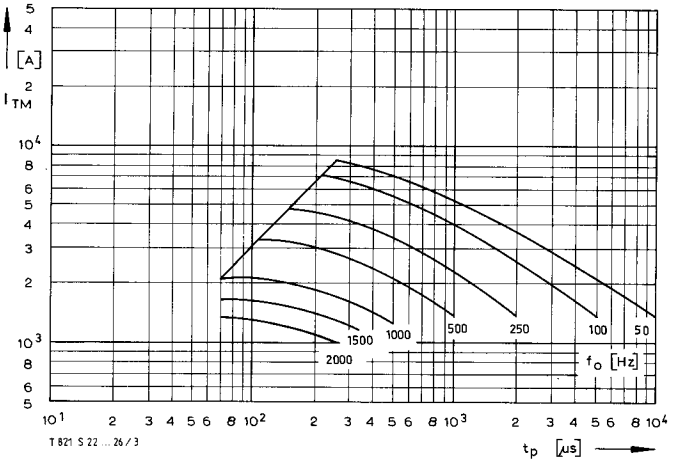
Bild/Fig. 4 t_C = 60°C



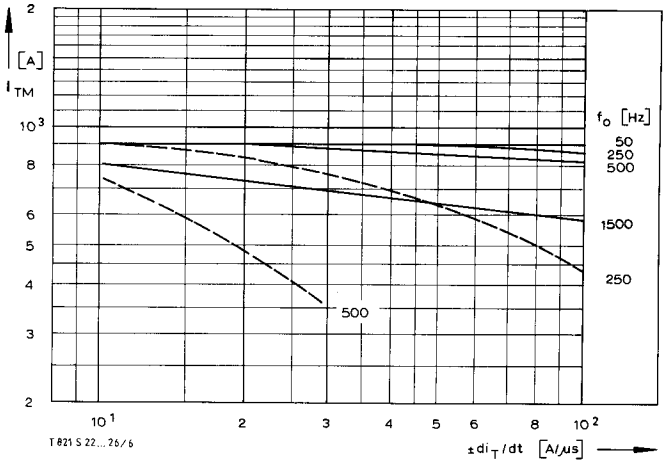
Bild/Fig. 2 t_C = 80°C



Bild/Fig. 5 t_C = 80°C



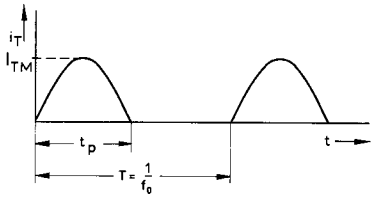
Bild/Fig. 3 t_C = 100°C



Bild/Fig. 6 t_C = 100°C

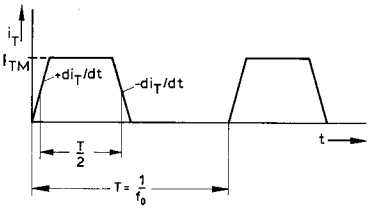
Bild/Fig. 1, 2, 3
Steuergenerator/pulse generator:
i_G = 1,5 A, di_G/dt = 2 A/µs

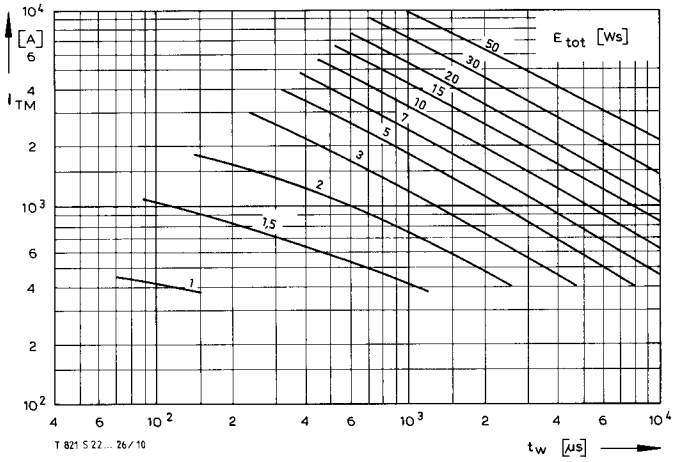
RC-Glied/RC-network:
R ≤ 15 Ω
C ≤ 1 µF



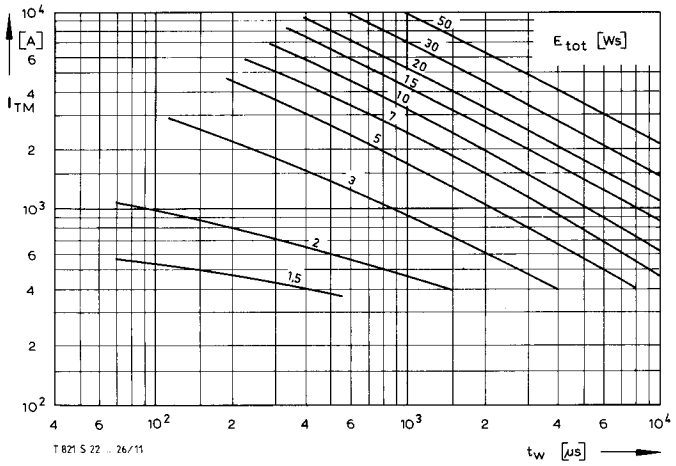
Bild/Fig. 4, 5, 6
Steuergenerator/pulse generator:
i_G = 1,5 A, di_G/dt = 2 A/µs

RC-Glied/RC-network:
R ≥ 15 Ω
C ≤ 1 µF
dv_R/dt ≤ 800 V/µs
v_{RM} ≤ 0,67 V_{RRM}

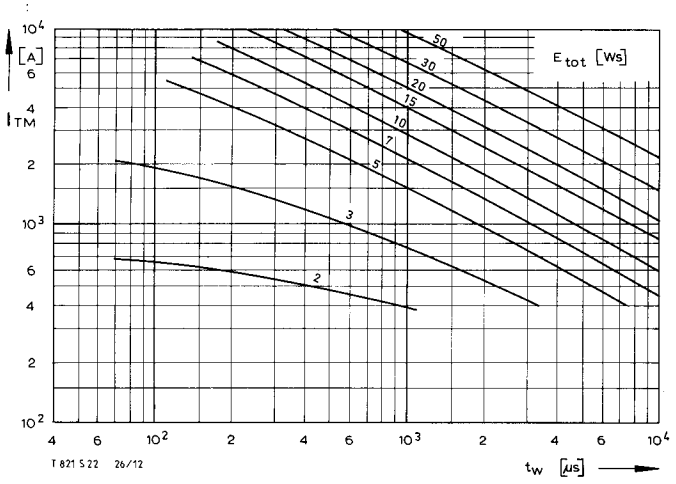




Bild/Fig. 10 $-di_T/dt = 25\ A/\mu s$



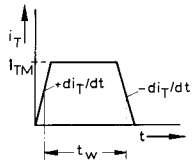
Bild/Fig. 11 $-di_T/dt = 50\ A/\mu s$

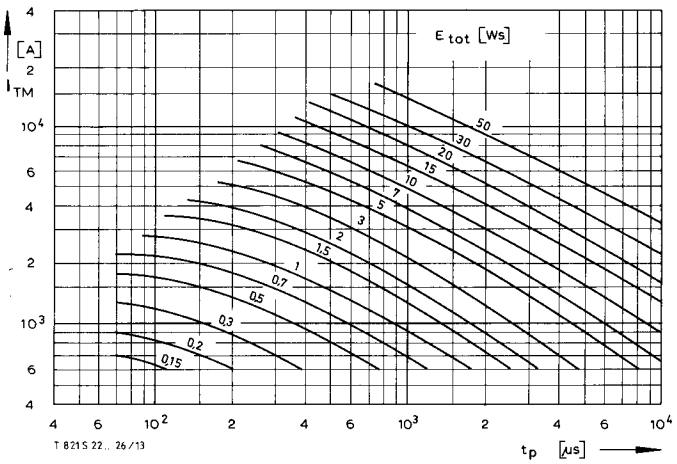


Bild/Fig. 12 $-di_T/dt = 100\ A/\mu s$

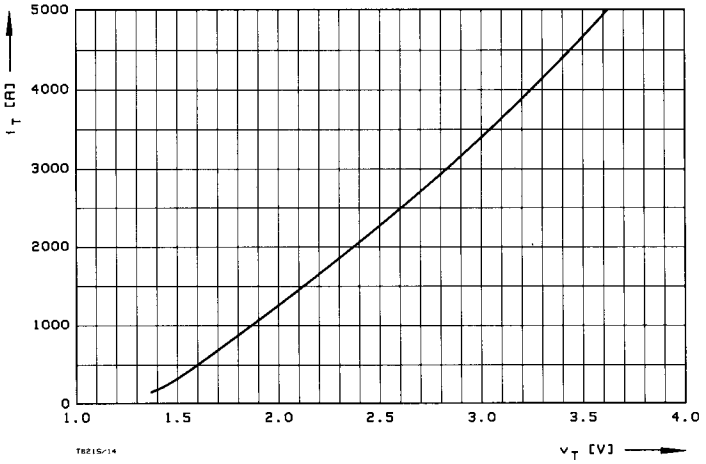
Bild/Fig. 10, 11, 12
Steuergenerator/pulse generator:
$i_G = 1,5\ A$, $di_G/dt = 2\ A/\mu s$

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

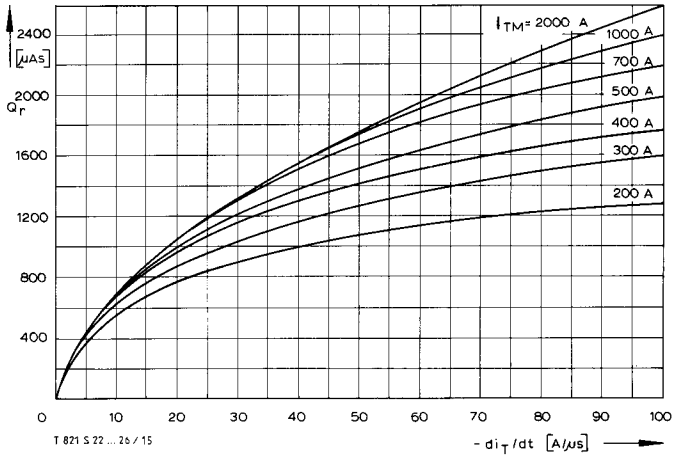




Bild/Fig. 13



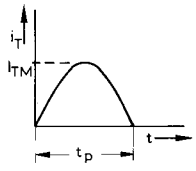
Bild/Fig. 14

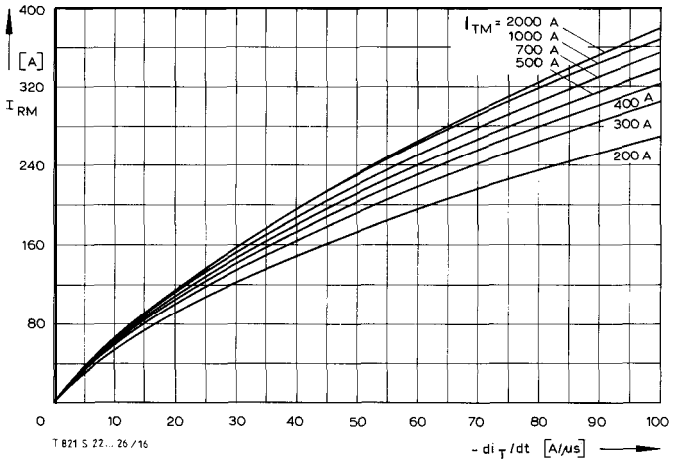


Bild/Fig. 15

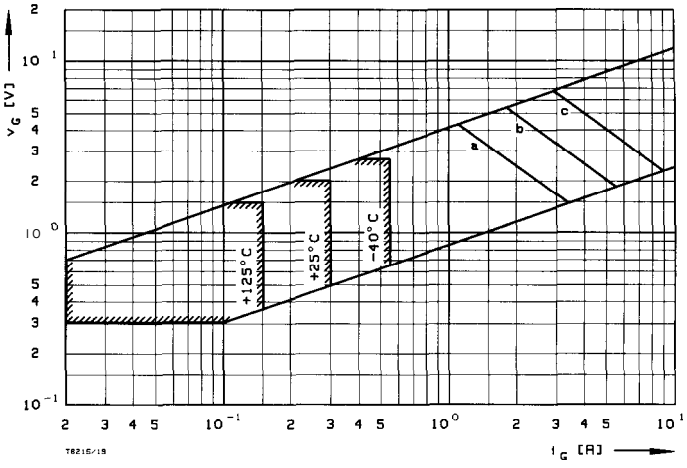
zu Bild/to Fig. 13
Steuergenerator/pulse generator:
$i_G = 1,5\ A$, $di_G/dt = 2\ A/\mu s$
$v_{DM} \leq 0,67\ V_{DRM}$
$v_{RM} \leq 50\ V$

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



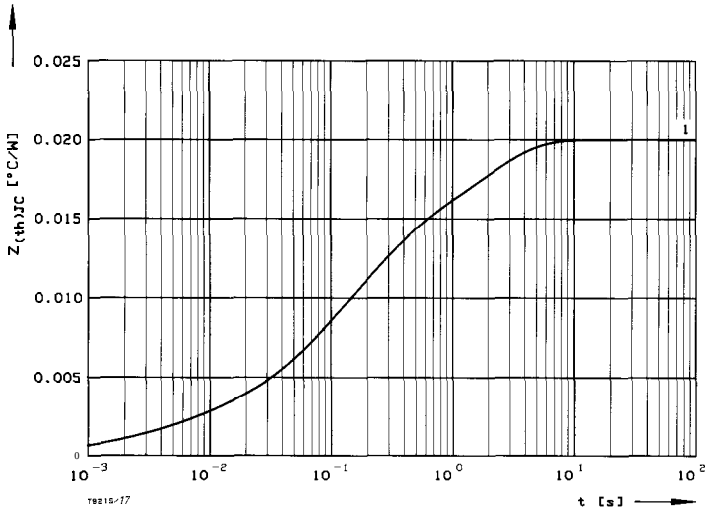


BildlFig. 16
Rückstromspitze $I_{RM} = f(-di/dt), t_{vj} = t_{vj\,(max)}, v_R = 0,5\,V_{RRM}, v_{RM} = 0,8\,V_{RRM}$
Peak reverse recovery current $I_{RM} = f(-di/dt), t_{vj} = t_{vj\,(max)}, v_R = 0.5\ V_{RRM}, v_{RM} = 0.8\ V_{RRM}$
Parameter: Durchla8strom/On-state current I_{TM}



BrldlFig. 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 Spitzensteuerverlustlerstung/ Max. rated peak gate power dissipation P_{GM}	[W]	10	20	40



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

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

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

Analytische Funktion/analytical function:

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