

T 468 S
T 470 S

T-25-19

Typenreihe/Type range 1400 1600 1800 2000*

Elektrische Eigenschaften

Electrical properties

Höchstzulässige Werte

Maximum permissible values

V_{DRM}		1400...2000	V
V_{RRM}		1400...2000	V
I_{TRMSM}		1300	A
I_{TAVM}	$t_c = 85^\circ\text{C}$	470	A
	$t_c = 33^\circ\text{C}$	830	A
I_{TSM}	$t = 10\text{ ms}, t_{vj} = 45^\circ\text{C}$	9,3	kA
	$t = 10\text{ ms}, t_{vj} = t_{vj\text{ max}}$	8,3	kA
$\int i^2 dt$	$t = 10\text{ ms}, t_{vj} = 45^\circ\text{C}$	433	kA ² s
	$t = 10\text{ ms}, t_{vj} = t_{vj\text{ max}}$	345	kA ² s
$(di/dt)_{cr}$	nicht per./non rep.	1000	A/ μs
	per./rep., $i_{TM} = 2,5\text{ kA}$	300	A/ μs
$(dv/dt)_{cr}$	$i_G = 1\text{ A}, di_G/dt = 1\text{ A}/\mu\text{s}$		
	$V_D = 67\% V_{DRM}, t_{vj} = t_{vj\text{ max}}$		
		1) 2)	
	B:	50 50	V/ μs
	C*:	400 400	V/ μs
	L:	400 50	V/ μs
	M*:	1000 400	V/ μs

Charakteristische Werte

Characteristic values

V_T	$t_{vj} = t_{vj\text{ max}}, i_T = 2,5\text{ kA}$	3,35	V
$V_{(TO)}$	$t_{vj} = t_{vj\text{ max}}$	1,3	V
r_T	$t_{vj} = t_{vj\text{ max}}$	0,72	m Ω
V_{GT}	$t_{vj} = 25^\circ\text{C}, V_D = 6\text{ V}, R_A = 5\ \Omega$	2,2	V
I_{GT}	$t_{vj} = 25^\circ\text{C}, V_D = 6\text{ V}, R_A = 5\ \Omega$	250	mA
	$t_{vj} = t_{vj\text{ max}}, V_D = 6\text{ V}, R_A = 5\ \Omega$	10	mA
I_H	$t_{vj} = 25^\circ\text{C}, V_D = 6\text{ V}, R_A = 5\ \Omega$	300	mA
I_L	$t_{vj} = 25^\circ\text{C}, V_D = 6\text{ V}, R_{GK} \geq 10\ \Omega$	1,5	A
	$i_G = 1\text{ A}, di_G/dt = 1\text{ A}/\mu\text{s}, t_g = 20\ \mu\text{s}$		
i_D	$t_{vj} = t_{vj\text{ max}}, V_D = V_{DRM}$	100	mA
i_R	$t_{vj} = t_{vj\text{ max}}, V_R = V_{RRM}$	100	mA
t_{gd}	$i_G = 1\text{ A}, di_G/dt = 1\text{ A}/\mu\text{s}$	1,5	μs
t_q	Prüfbedingungen siehe 3.4.3.2/	40	μs
	test conditions see 3.4.3.2	M: 50	μs
		N: 60	μs
Q_s	$t_{vj} = t_{vj\text{ max}}, i_{TM} = 800\text{ A}, -di_T/dt = 20\text{ A}/\mu\text{s}$	200	μAs
C_{null}	$t_{vj} = 25^\circ\text{C}, f = 10\text{ kHz}$	7	nF

Thermische Eigenschaften

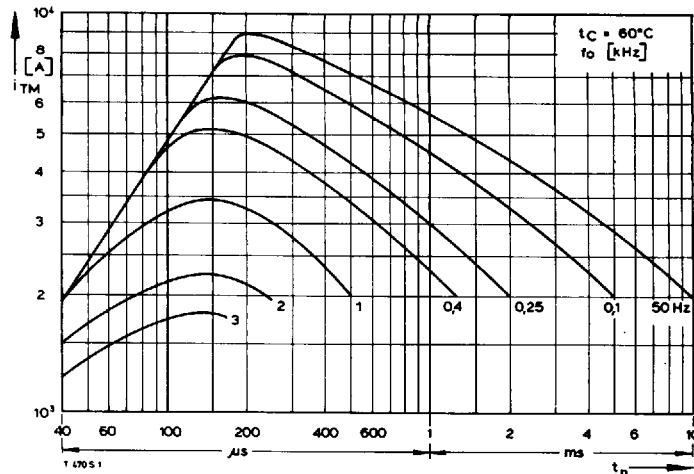
Thermal properties

R_{thJC}	$\theta = 180^\circ\text{el, sinus}$	$\leq 0,04\text{ }^\circ\text{C/W}$
	DC	$\leq 0,038\text{ }^\circ\text{C/W}$
$R_{thJC(A)}$	$\theta = 180^\circ\text{el, sinus}$	$\leq 0,071\text{ }^\circ\text{C/W}$
	DC	$\leq 0,069\text{ }^\circ\text{C/W}$
$R_{thJC(K)}$	$\theta = 180^\circ\text{el, sinus}$	$\leq 0,088\text{ }^\circ\text{C/W}$
	DC	$\leq 0,086\text{ }^\circ\text{C/W}$
R_{thCK}		0,01 $^\circ\text{C/W}$
$t_{vj\text{ max}}$		125 $^\circ\text{C}$
$t_{vj\text{ op}}$		-40 $^\circ\text{C}$...+125 $^\circ\text{C}$
t_{stg}		-40 $^\circ\text{C}$...+150 $^\circ\text{C}$

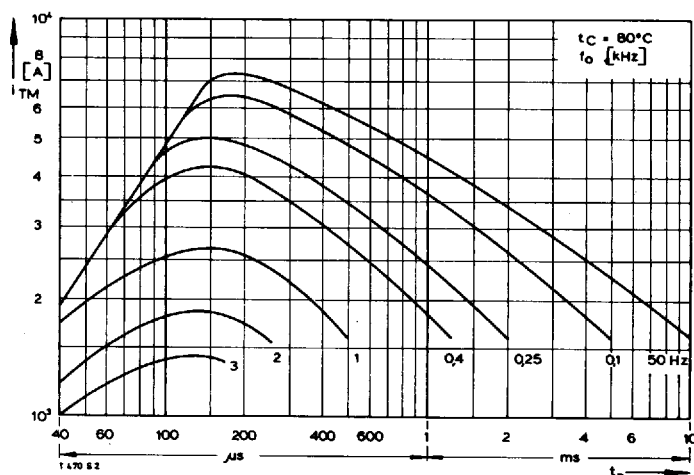
Mechanische Eigenschaften

Mechanical properties

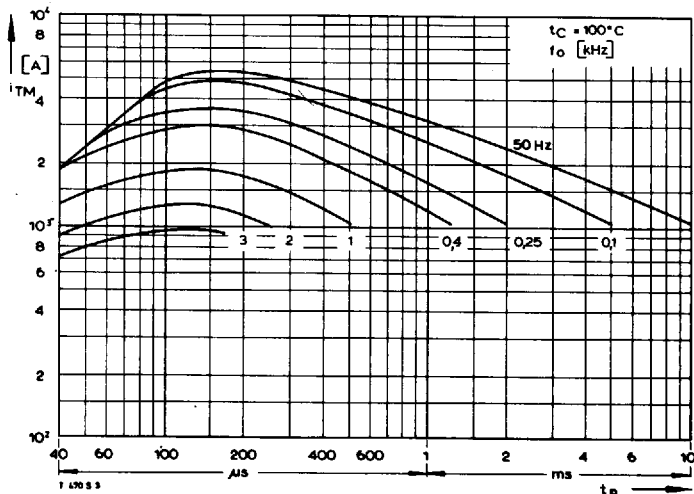
G	T 468 S/T 470 S	160/300 g
M		
F		12...15 kN
	T 468 S/T 470 S	17 mm/25 mm
Case	T 468 S DIN 41814-153 D 4	Seite/page 198
Case	T 470 S DIN 41814-153 C 4	Seite/page 198



Bild/Fig. 1



Bild/Fig. 2



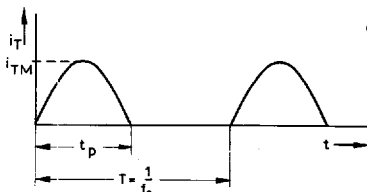
Bild/Fig. 3

Steuergenerator:

$i_G = 1\text{ A}, t_a = 1\ \mu\text{s}$,
RC-Glied: $R [\Omega] \geq 0,02 v_{DM} [V]$,
 $C \leq 0,22\ \mu\text{F}$

pulse generator:

$i_G = 1\text{ A}, t_a = 1\ \mu\text{s}$,
RC network: $R [\Omega] \geq 0,02 v_{DM} [V]$,
 $C \leq 0,22\ \mu\text{F}$



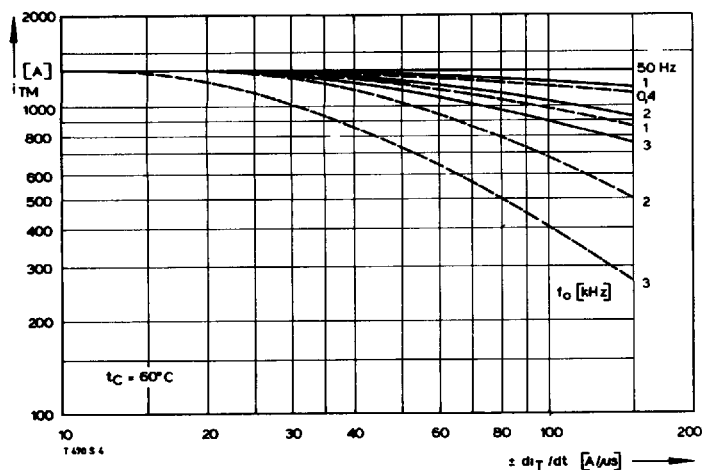
$dv_T/dt \leq 700\text{ V}/\mu\text{s}$

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

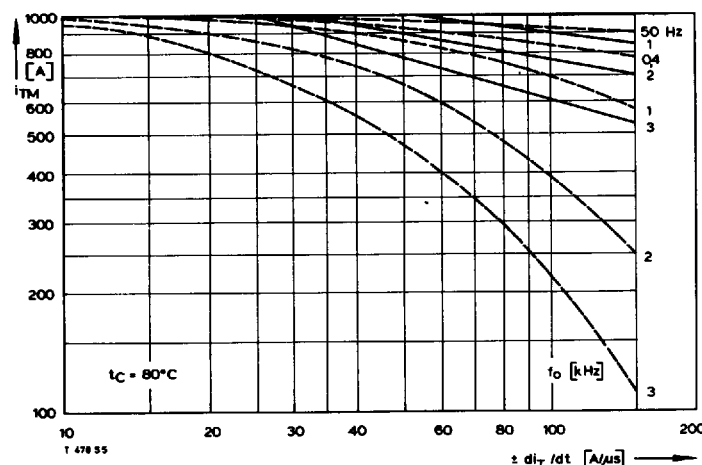
1) Werte nach DIN 41787 (ohne vorausgehende Kommutierung)/
Values to DIN 41787 (without prior commutation)

2) Unmittelbar nach der Freierzeit/Immediately after turn-off time

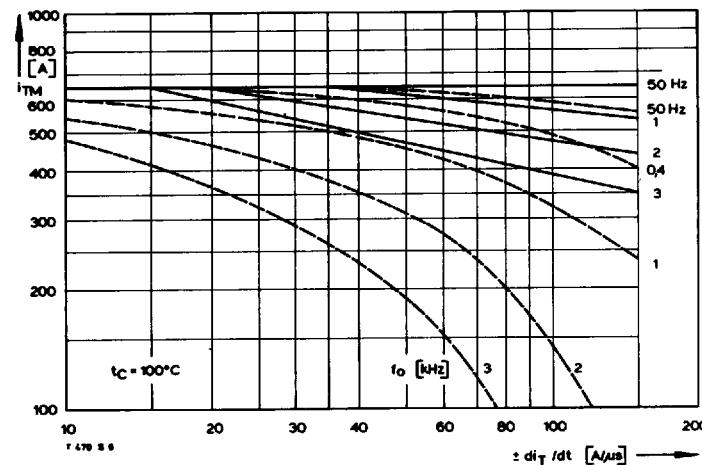
T468 S
T470 S



Bild/Fig. 4



Bild/Fig. 5

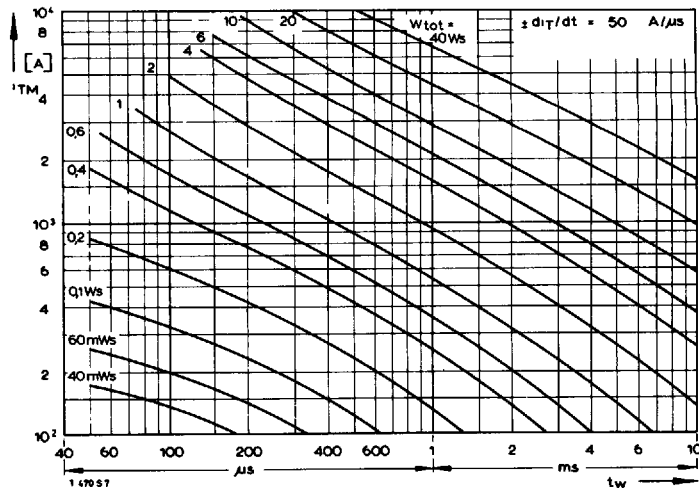
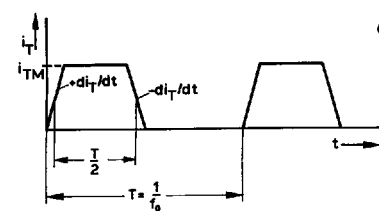


Bild/Fig. 6

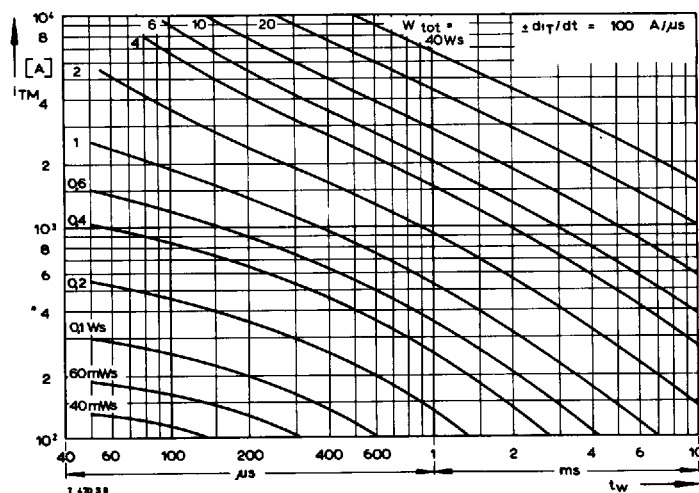
Steuergenerator:
 $i_G = 1 \text{ A}$, $t_a = 1 \mu\text{s}$,
RC-Glied: $R [\Omega] \geq 0,02 v_{DM} [V]$,
 $C \leq 0,33 \mu\text{F}$

pulse generator:
 $i_G = 1 \text{ A}$, $t_a = 1 \mu\text{s}$,
RC network: $R [\Omega] \geq 0,02 v_{DM} [V]$,
 $C \leq 0,33 \mu\text{F}$

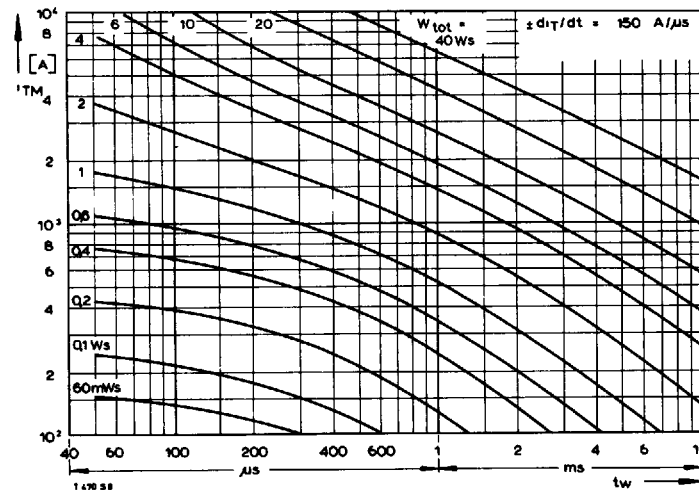
$dv_T/dt \leq 700 \text{ V}/\mu\text{s}$



Bild/Fig. 7



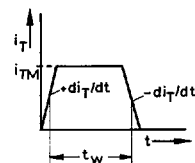
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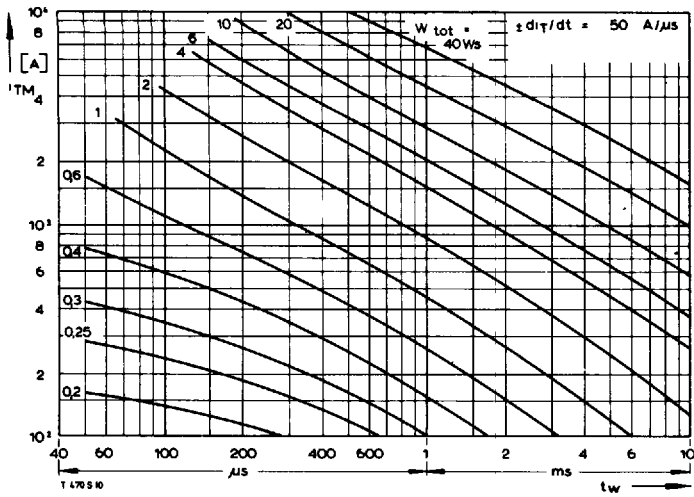


Bild/Fig. 9

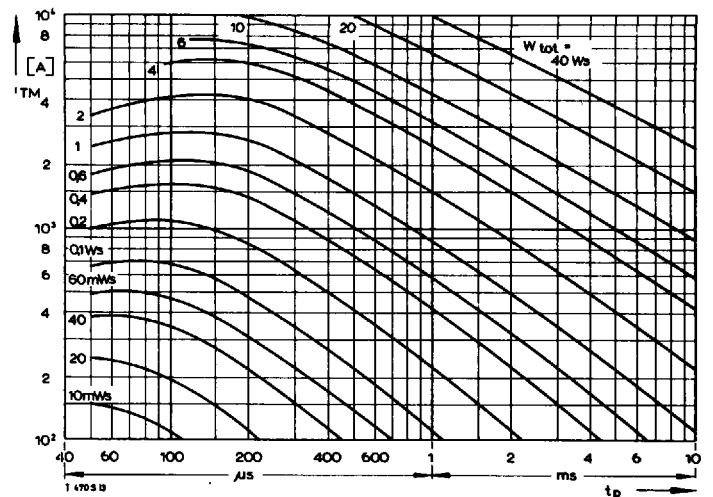
Steuergenerator:
 $i_G = 1 \text{ A}$, $t_a = 1 \mu\text{s}$,
RC-Glied: $R [\Omega] \geq 0,02 v_{DM} [V]$,
 $C \leq 0,33 \mu\text{F}$

pulse generator:
 $i_G = 1 \text{ A}$, $t_a = 1 \mu\text{s}$,
RC network: $R [\Omega] \geq 0,02 v_{DM} [V]$,
 $C \leq 0,33 \mu\text{F}$

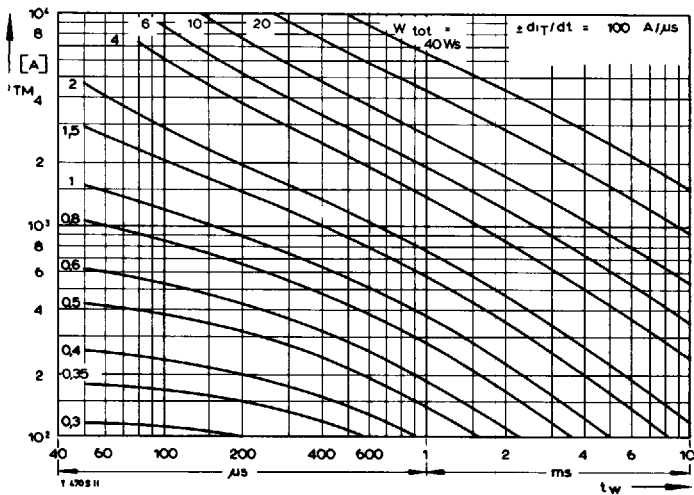




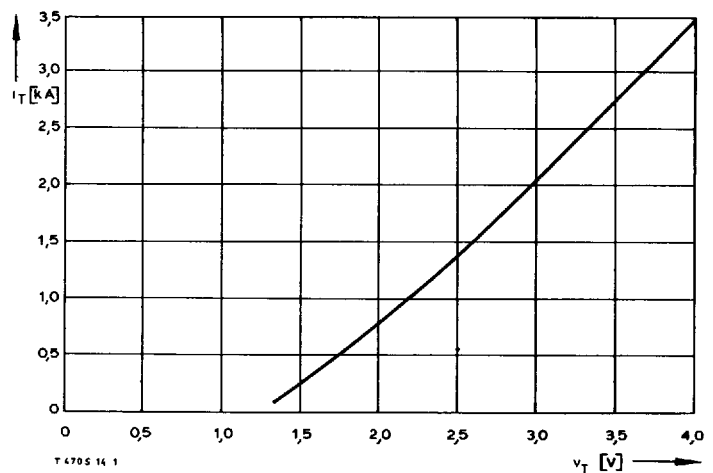
Bild/Fig. 10



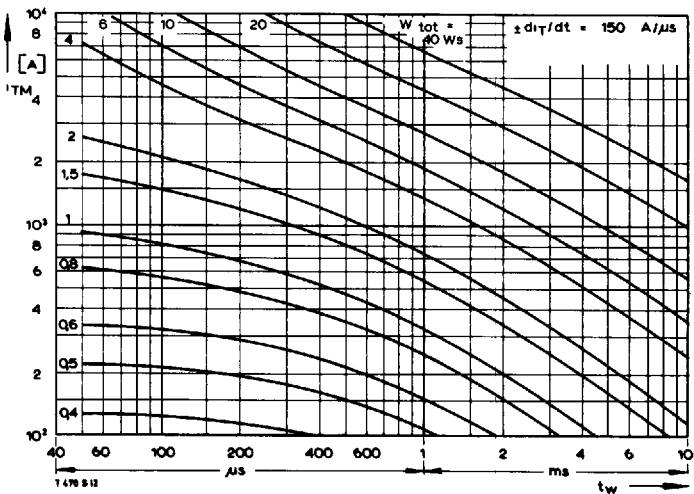
Bild/Fig. 13



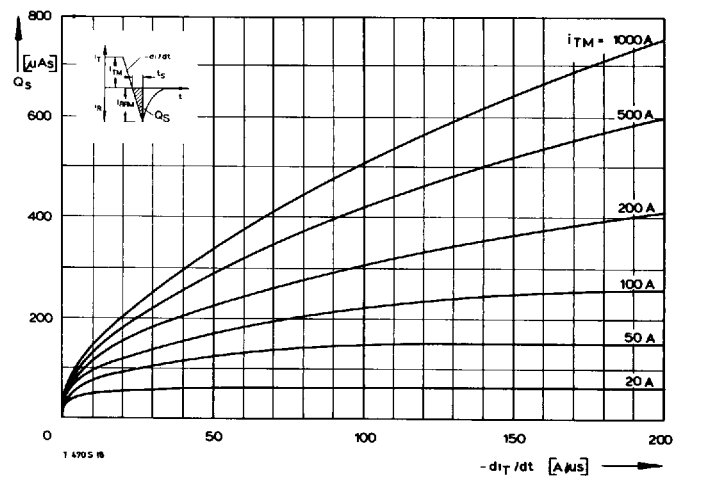
Bild/Fig. 11



Bild/Fig. 14



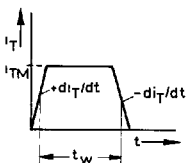
Bild/Fig. 12



Bild/Fig. 15

Steuergenerator:

$i_G = 1 \text{ A}$, $t_a = 1 \mu\text{s}$,
 RC-Glied: $R [\Omega] \geq 0,02 v_{DM} [\text{V}]$,
 $C \leq 0,33 \mu\text{F}$



pulse generator:

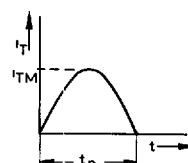
$i_G = 1 \text{ A}$, $t_a = 1 \mu\text{s}$,
 RC network: $R [\Omega] \geq 0,02 v_{DM} [\text{V}]$,
 $C \leq 0,33 \mu\text{F}$

$dv_T/dt \leq 700 \text{ V}/\mu\text{s}$

(zu Bild/to Fig. 13)

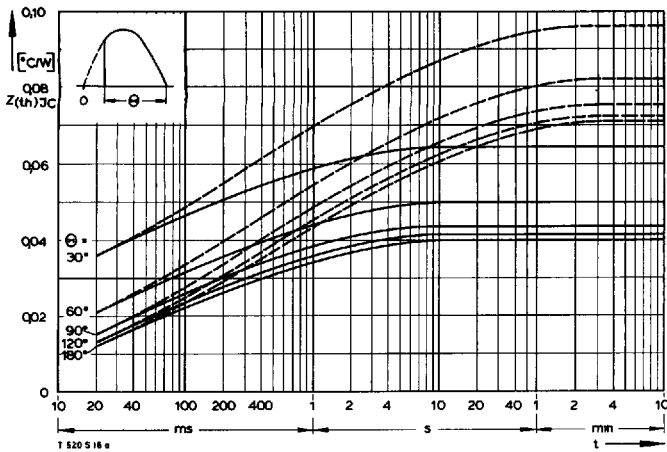
Steuergenerator:

$i_G = 1 \text{ A}$, $t_a = 1 \mu\text{s}$,
 RC-Glied: $R [\Omega] \geq 0,02 v_{DM} [\text{V}]$,
 $C \leq 0,22 \mu\text{F}$

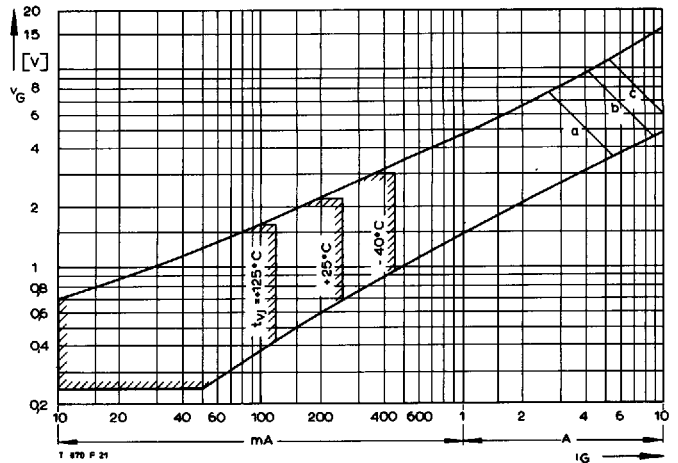


pulse generator:

$i_G = 1 \text{ A}$, $t_a = 1 \mu\text{s}$,
 RC network: $R [\Omega] \geq 0,02 v_{DM} [\text{V}]$,
 $C \leq 0,22 \mu\text{F}$



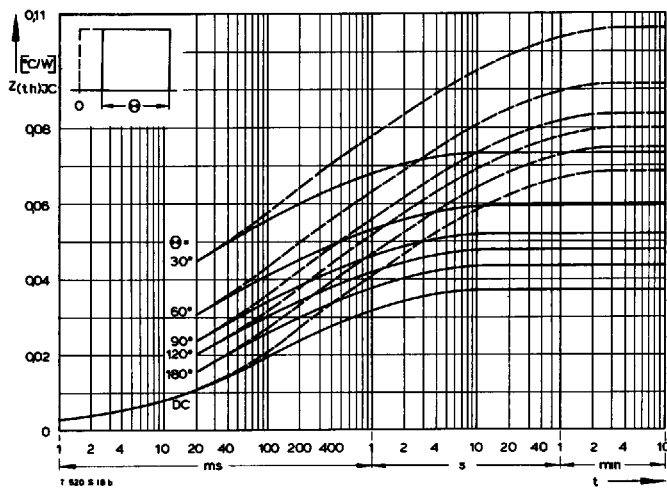
Bild/Fig. 16
 Transienter innerer Wärmewiderstand $Z_{(th)JC}$
 Transient thermal impedance, junction to case, $Z_{(th)JC}$
 ----- anodenseitige Kühlung/anode sided cooling
 ————— beidseitige Kühlung/two-sided cooling



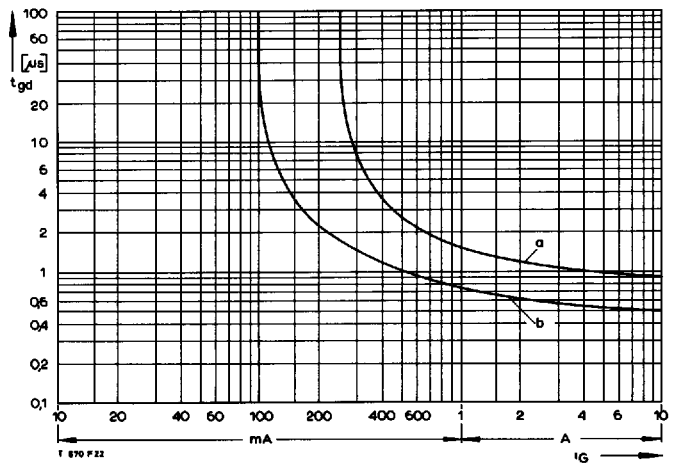
Bild/Fig. 18
 Zündbereich und Spitzensteuerleistung bei $v_D \geq 6$ V.
 Gate characteristic and peak gate power dissipation at $v_D \geq 6$ V.

Parameter:

	a	b	c
Steuerimpulsdauer/Pulse duration t_g [ms]	10	1	0,5
Höchstzulässige Spitzensteuerleistung/Maximum allowable peak gate power [W]	20	40	60



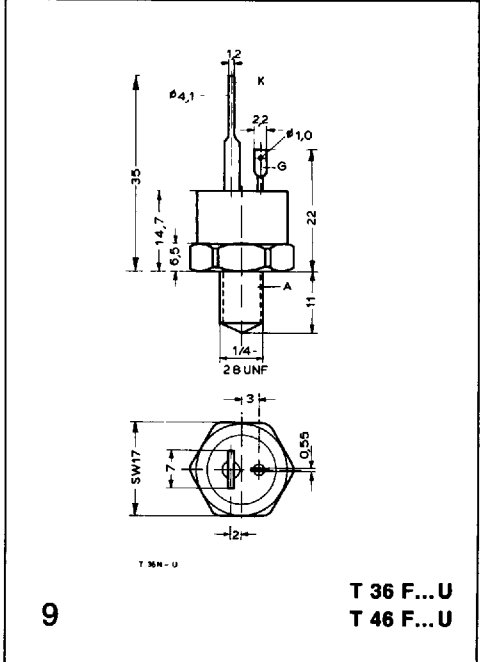
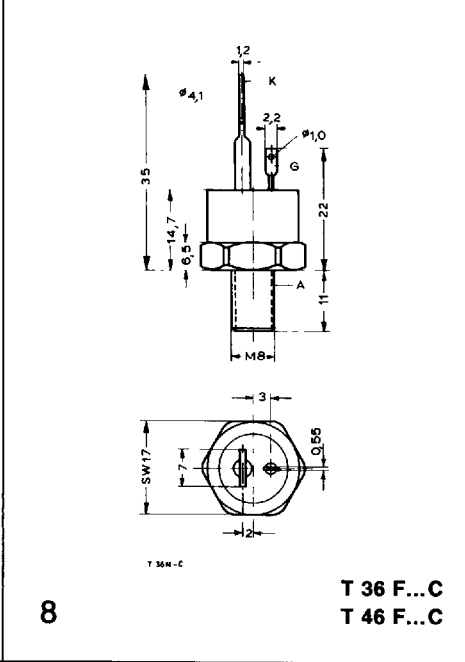
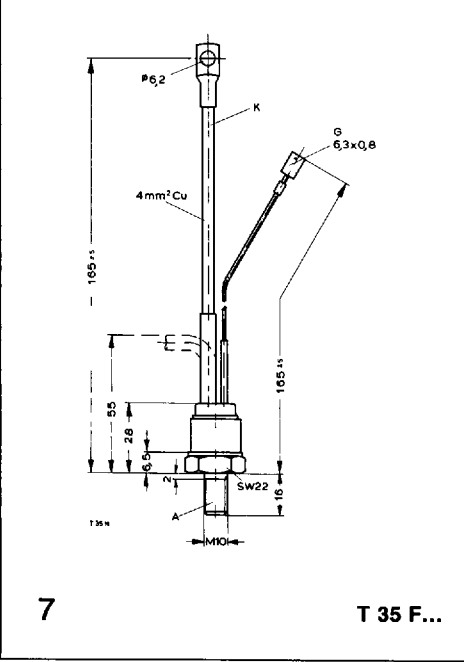
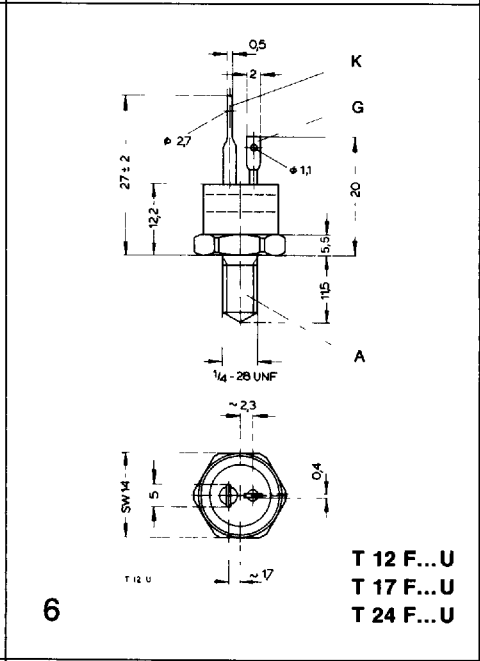
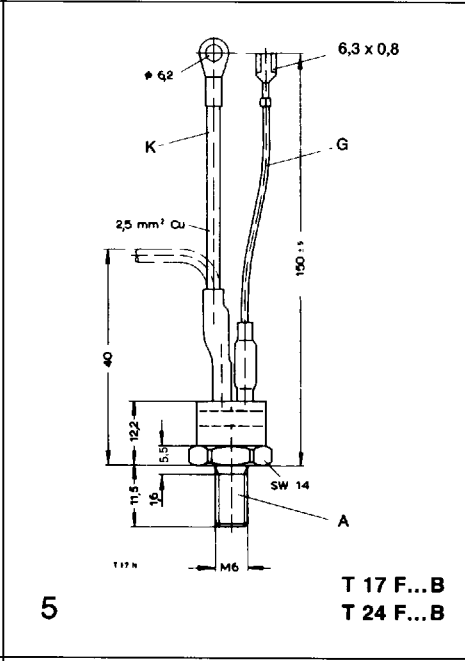
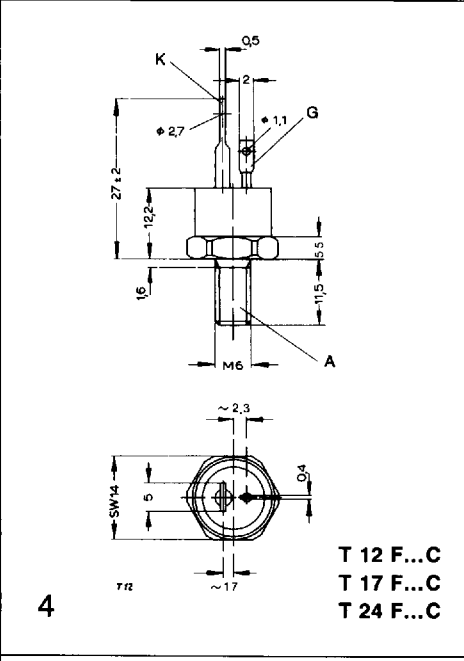
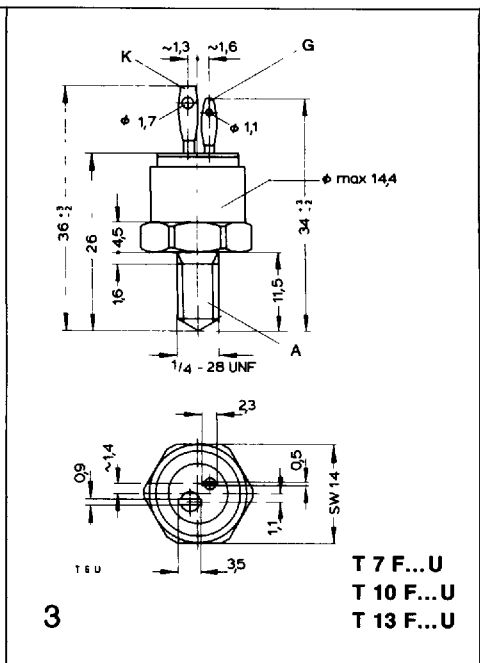
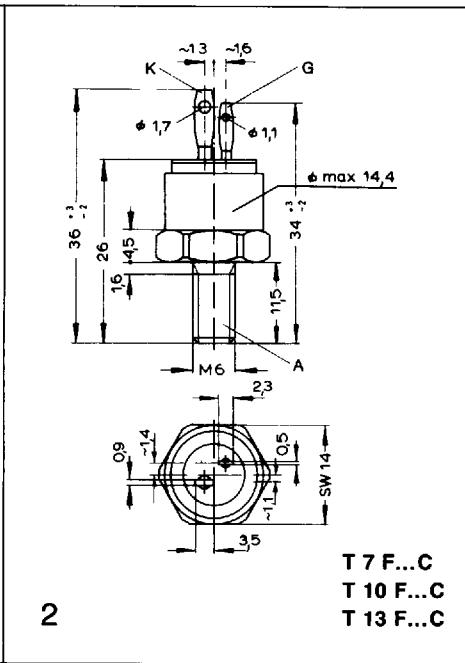
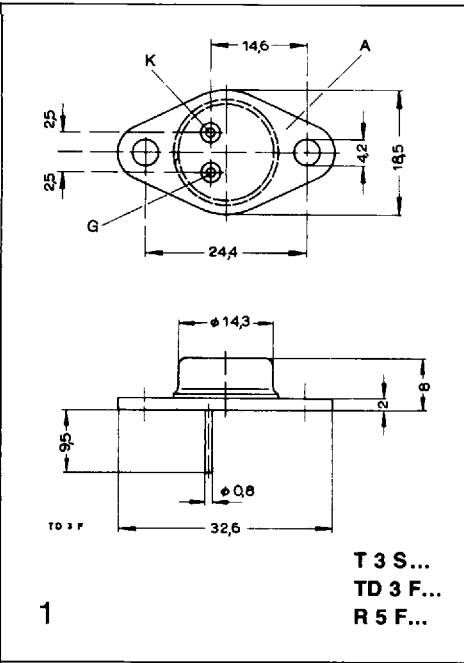
Bild/Fig. 17
 Transienter innerer Wärmewiderstand $Z_{(th)JC}$
 Transient thermal impedance, junction to case, $Z_{(th)JC}$
 ----- anodenseitige Kühlung/anode sided cooling
 ————— beidseitige Kühlung/two-sided cooling



Bild/Fig. 19
 Zündverzögerung t_{gd} nach DIN 41787 bei $t_{vj} = 25^\circ\text{C}$, $t_a = 1 \mu\text{s}$.
 Gate controlled delay time t_{gd} to DIN 41787 at $t_{vj} = 25^\circ\text{C}$, $t_a = 1 \mu\text{s}$.
 a - äußerster Verlauf/limiting characteristic
 b - typischer Verlauf/typical characteristic

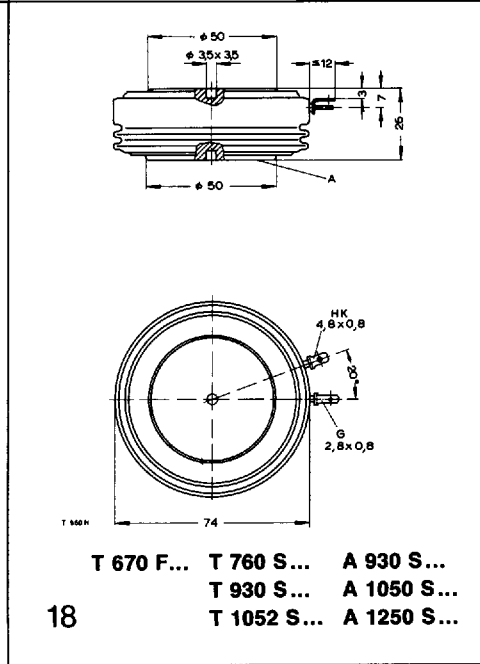
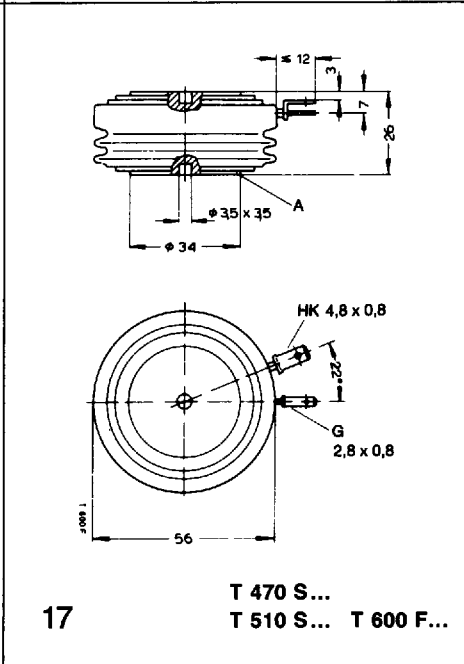
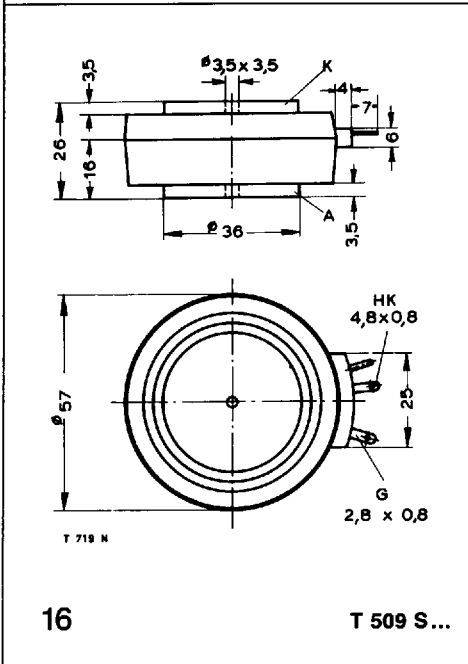
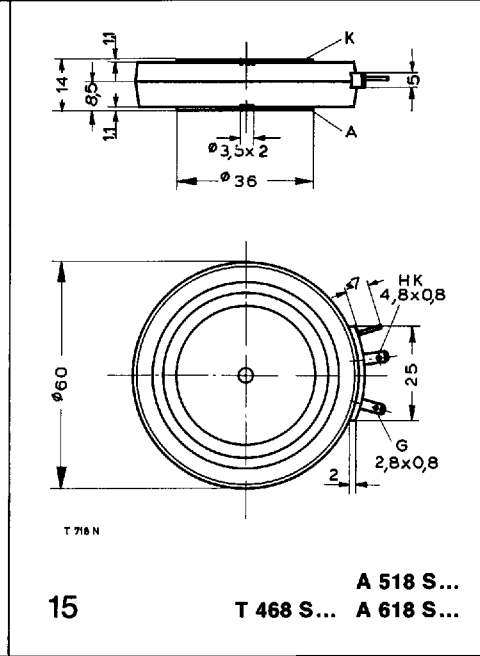
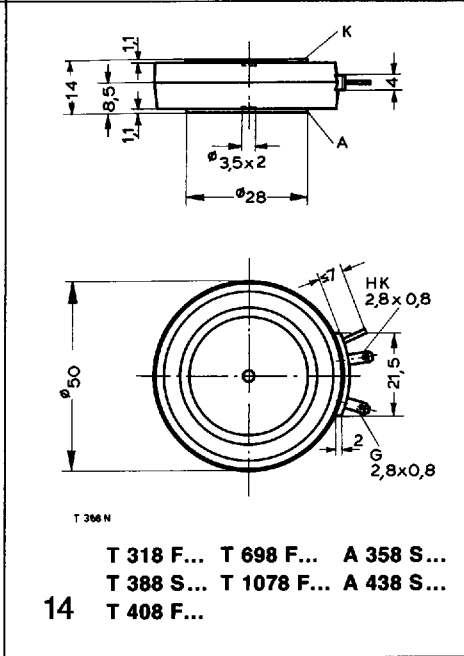
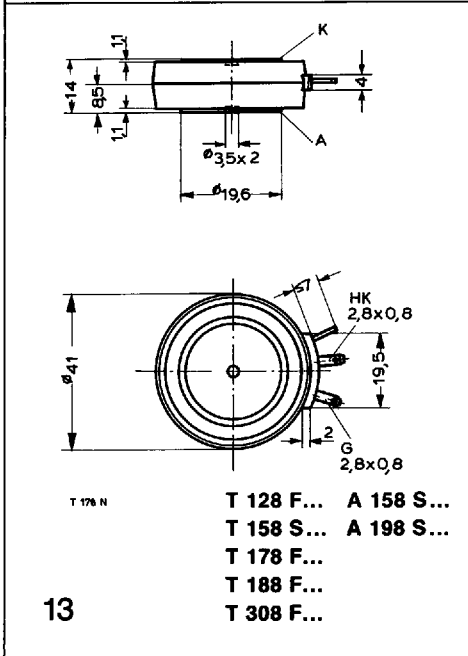
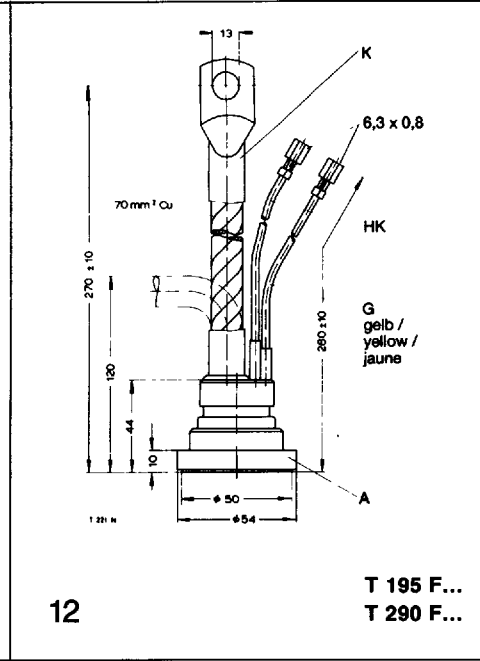
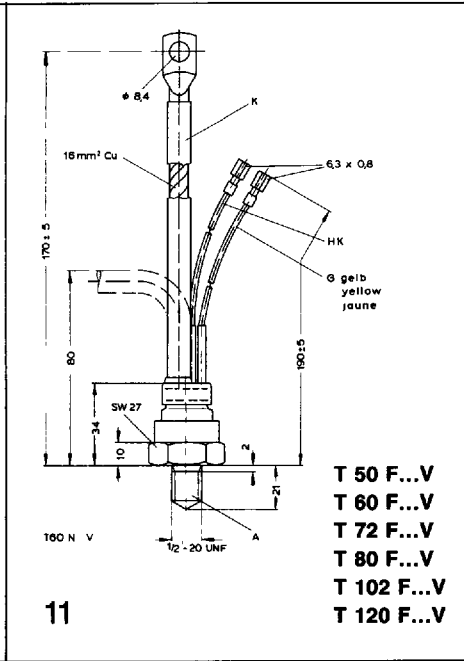
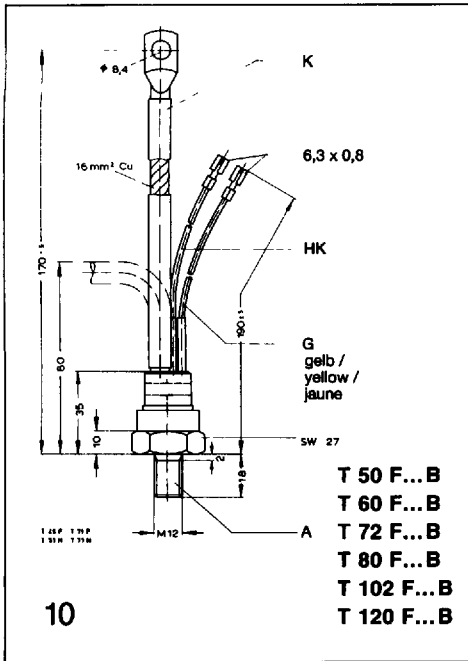
Tabelle 1 – Größen des thermischen Ersatzschaltbildes, Konstantstrom

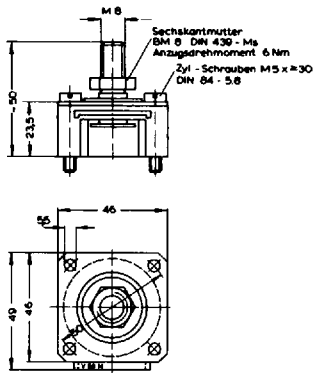
	i	1	2	3	4	5	6	7
Z_{thJC}	R_{th1} [°C/W]	0,003551	0,000737	0,008319	0,007688	0,009637	0,008068	
	τ_1 [s]	0,000999	0,011363	0,023882	0,104824	0,398978	2,394707	
$Z_{thJC(A)}$	R_{th1} [°C/W]	0,003980	0,008684	0,018596	0,014534	0,013170	0,012078	
	τ_1 [s]	0,001153	0,024309	0,165421	1,101806	5,220734	37,643801	
$Z_{thJC(K)}$	R_{th1} [°C/W]	0,003866	0,008225	0,011664	0,015032	0,018689	0,028523	
	τ_1 [s]	0,001130	0,022306	0,140609	0,515255	3,017335	25,452741	



**Maßbilder/Outlines
Thyristoren/Thyristors**

T-91-20

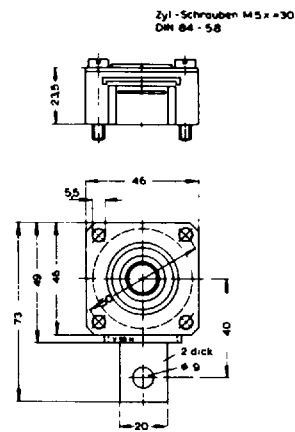




V 50 M

Für Bauelemente/For components
 Ø 41 mm, h = 14 mm

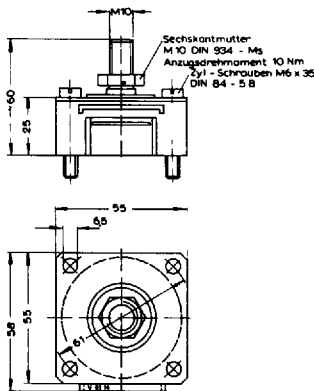
19



V 50 N

Für Bauelemente/For components
 Ø 41 mm, h = 14 mm

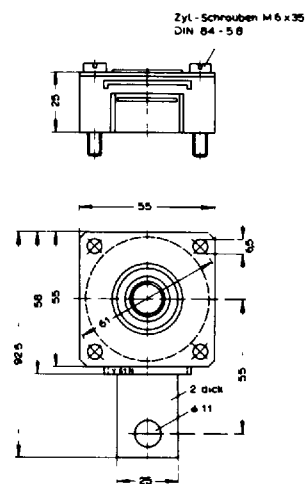
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V 61 M

Für Bauelemente/For components
 Ø 50 mm, h = 14 mm

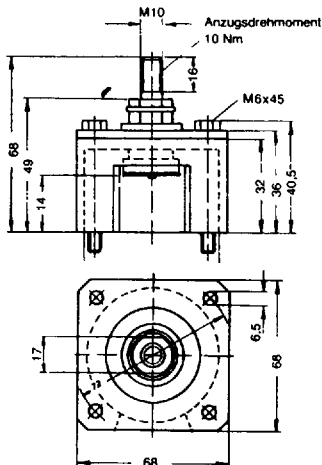
21



V 61 N

Für Bauelemente/For components
 Ø 50 mm, h = 14 mm

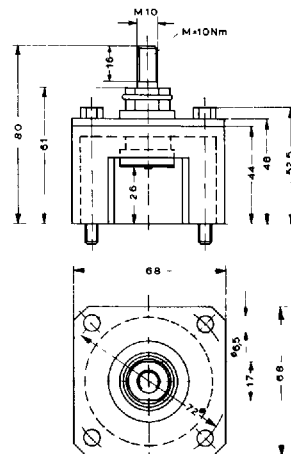
22



V 72 M 14

Für Bauelemente/For components
 Ø 60 mm, h = 14 mm

23



V 72 M 26

Für Bauelemente/For components
 Ø 60 mm, h = 26 mm

24