High power cycling capability
Low on-state and switching losses
Designed for traction and industrial applications

Phase Control Thyristor Chip
Type TG70-1250-44

Maximum allowable mean on-state current[1)]		I_{TAV}	1250 A	
Repetitive peak off-state voltage		V_{DRM}	3800...4400 V	
Repetitive peak reverse voltage		V_{RRM}		
Turn-off time		t_q	630 µs	
V_{DRM}, V_{RRM}, V	3800	4000	4200	4400
Voltage code	38	40	42	44
T_j, °C	–60...+125			

MAXIMUM ALLOWABLE RATINGS

Symbols and parameters		Units	Values	Test conditions	
ON-STATE					
I_{TAV}	Maximum allowable mean on-state current[1)]	A	1250 1838 2260	T_c= 102 °C, Double side cooled T_c= 85 °C, Double side cooled T_c= 70 °C, Double side cooled 180° half-sine wave; 50 Hz	
I_{TRMS}	RMS on-state current[1)]	A	1963	T_c= 102 °C, Double side cooled 180° half-sine wave; 50 Hz	
I_{TSM}	Surge on-state current[1)]	kA	26.0 30.0	T_j=$T_{j\,max}$ T_j=25 °C	180° half-sine wave; t_p=10 ms; single pulse; V_D=V_R=0 V; Gate pulse: I_G=2 A; t_{GP}=50 µs; di_G/dt≥1 A/µs
			27.0 31.0	T_j=$T_{j\,max}$ T_j=25 °C	180° half-sine wave; t_p=8.3 ms; single pulse; V_D=V_R=0 V; Gate pulse: I_G=2 A; t_{GP}=50 µs; di_G/dt≥1 A/µs
I^2t	Safety factor[1)]	$A^2s{\cdot}10^3$	3300 4500	T_j=$T_{j\,max}$ T_j=25 °C	180° half-sine wave; t_p=10 ms; single pulse; V_D=V_R=0 V; Gate pulse: I_G=2 A; t_{GP}=50 µs; di_G/dt≥1 A/µs
			3000 3900	T_j=$T_{j\,max}$ T_j=25 °C	180° half-sine wave; t_p=8.3 ms; single pulse; V_D=V_R=0 V; Gate pulse: I_G=2 A; t_{GP}=50 µs; di_G/dt≥1 A/µs
BLOCKING					
V_{DRM}, V_{RRM}	Repetitive peak off-state and Repetitive peak reverse voltages	V	3800...4400	$T_{j\,min}$< T_j <$T_{j\,max}$; 180° half-sine wave; 50 Hz; Gate open	
V_{DSM}, V_{RSM}	Non-repetitive peak off-state and Non-repetitive peak reverse voltages	V	3900...4500	$T_{j\,min}$< T_j <$T_{j\,max}$; 180° half-sine wave; single pulse; Gate open	
V_D, V_R	Direct off-state and Direct reverse voltages	V	0.6·V_{DRM} 0.6·V_{RRM}	T_j=$T_{j\,max}$; Gate open	

Advance Data

TRIGGERING				
I_{FGM}	Peak forward gate current	A	8	$T_j=T_{j\,max}$
V_{RGM}	Peak reverse gate voltage	V	5	
P_G	Gate power dissipation	W	5	$T_j=T_{j\,max}$ for DC gate current
SWITCHING				
$(di_T/dt)_{crit}$	Critical rate of rise of on-state current non-repetitive (f=1 Hz)	A/µs	630	$T_j=T_{j\,max}$; $V_D=0.67 \cdot V_{DRM}$; $I_{TM}=2\ I_{TAV}$; Gate pulse: $I_G=2$ A; $t_{GP}=50$ µs; $di_G/dt \geq 1$ A/µs
THERMAL				
T_{stg}	Storage temperature	°C	–60...+50	
T_j	Operating junction temperature	°C	–60...+125	
MECHANICAL				
F	Mounting force[1)]	kN	33.0...40.0	
F_{cg}	Force on control gate	N	7.8	

CHARACTERISTICS

Symbols and parameters		Units	Values	Conditions	
ON-STATE					
V_{TM}	Peak on-state voltage[1)], max	V	2.30	$T_j=25$ °C; $I_{TM}=5000$ A	
$V_{T(TO)}$	On-state threshold voltage, max	V	1.05	$T_j=T_{j\,max}$;	
r_T	On-state slope resistance[1)], max	mΩ	0.250	$0.5\ \pi\ I_{TAV} < I_T < 1.5\ \pi\ I_{TAV}$	
I_L	Latching current, max	mA	1500	$T_j=25$ °C; $V_D=12$ V; Gate pulse: $I_G=2$ A; $t_{GP}=50$ µs; $di_G/dt \geq 1$ A/µs	
I_H	Holding current, max	mA	300	$T_j=25$ °C; $V_D=12$ V; Gate open	
BLOCKING					
I_{DRM}, I_{RRM}	Repetitive peak off-state and Repetitive peak reverse currents, max	mA	200	$T_j=T_{j\,max}$; $V_D=V_{DRM}$; $V_R=V_{RRM}$	
$(dv_D/dt)_{crit}$	Critical rate of rise of off-state voltage[2)], min	V/µs	1000	$T_j=T_{j\,max}$; $V_D=0.67 \cdot V_{DRM}$; Gate open	
TRIGGERING					
V_{GT}	Gate trigger direct voltage, max	V	5.00 3.00 2.00	$T_j=T_{j\,min}$ $T_j=25$ °C $T_j=T_{j\,max}$	$V_D=12$ V; $I_D=3$ A; Direct gate current
I_{GT}	Gate trigger direct current, max	mA	500 300 200	$T_j=T_{j\,min}$ $T_j=25$ °C $T_j=T_{j\,max}$	
V_{GD}	Gate non-trigger direct voltage, min	V	0.35	$T_j=T_{j\,max}$; $V_D=0.67 \cdot V_{DRM}$; Direct gate current	
I_{GD}	Gate non-trigger direct current, min	mA	15.00		
SWITCHING					
t_{gd}	Delay time, max	µs	4.00	$T_j=25$ °C; $V_D=0.4 \cdot V_{DRM}$; $I_{TM}=I_{TAV}$; Gate pulse: $I_G=2$ A; $t_{GP}=50$ µs; $di_G/dt \geq 1$ A/µs	
t_q	Turn-off time[3)], max	µs	630	$dv_D/dt=50$ V/µs; $T_j=T_{j\,max}$; $I_{TM}=I_{TAV}$; $di_R/dt=-10$ A/µs; $V_R=100$ V; $V_D=0.67\ V_{DRM}$;	

Advance Data

THERMAL					
R_{thjc}	Thermal resistance, junction to case[1)], max	°C/W	0.0100	Direct current	Double side cooled
R_{thjc-A}			0.0220		Anode side cooled
R_{thjc-K}			0.0180		Cathode side cooled
MECHANICAL					
m	Weight, max	g	168		

PART NUMBERING GUIDE

TG	70	1250	44	A2	C2
1	2	3	4	5	6

1. Phase Control Thyristor Chip with a distributed gate
2. Maximum diameter, mm
3. Mean on-state current, A
4. Voltage code
5. Critical rate of rise of off-state voltage, V/µs
6. Turn-off time (dv_D/dt=50 V/µs)

NOTES

[1)] Depending on the specifications of the housing used. The specified values are relevant when using the Proton-Electrotex T.E3 housing.

[2)] Critical rate of rise of off-state voltage

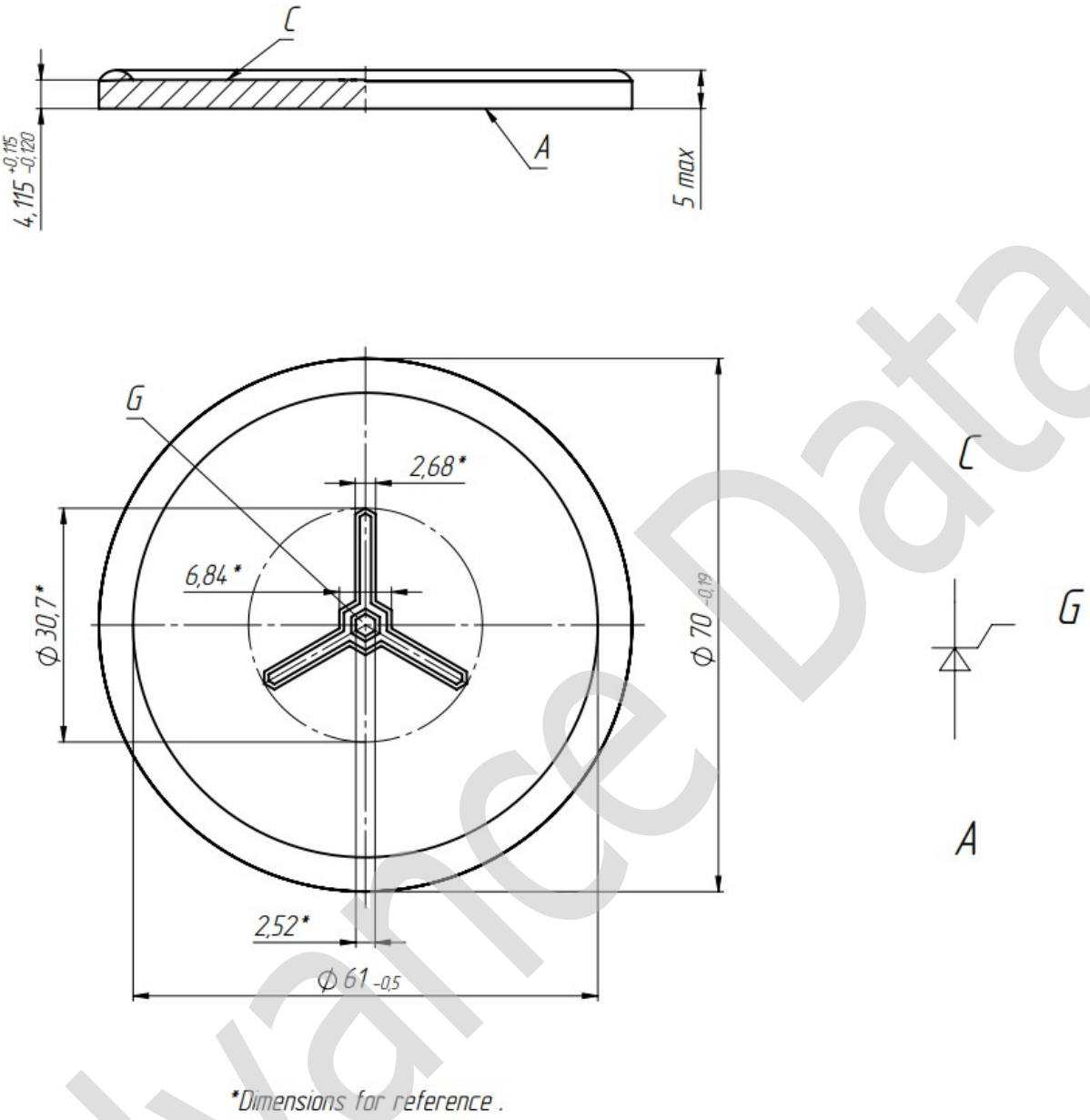
Symbol of Group	A2
$(dv_D/dt)_{crit}$, V/µs	1000

[3)] Turn-off time (dv_D/dt=50 V/µs)

Symbol of Group	C2
t_q, µs	630

Advance Data

OVERALL DIMENSIONS



*Dimensions for reference .

All dimensions in millimeters

Advance Data

The information contained herein is confidential and protected by Copyright.
In the interest of product improvement, Proton-Electrotex reserves the right to change data sheet without notice.