CSG10F2500

Gate Turn-off Thyristor

High-end Power Semiconductor Manufacturer

FEATURES

- Free floating silicon technology
- Low on-state and switching loss
- Ring gate electrode
- Industrial standard housing

KEY PARAMETERS

V_{DRM}	2500 V
I_{TGQM}	1000 A
I_{TSM}	7 kA
V_{T0}	1.66 V
r_T	0.57 mΩ
V_{DClin}	1400 V

VOLTAGE RATINGS

V_{DRM}	Repetitive peak off-state voltage	2500	V	$V_{GR} \geq 2V$	
V_{RRM}	Repetitive peak reverse voltage	15	V		
I_{DRM}	Repetitive peak off-state current	≤ 50	mA	$V_D = V_{DRM}$	$V_{GR} \geq 2V$
I_{RRM}	Repetitive peak reverse current	≤ 100	mA	$V_R = V_{RRM}$	$R_{GK} \geq \infty$
V_{DClink}	Permanent DC voltage for 100 FIT failure rate	1400	V	-40 ≤ T_j ≤ 125 °C. Ambient cosmic radiation at sea level in open air.	

MECHANICAL RATINGS

F_m	Mounting force	min.	10	kN
		max.	15	kN
A	Acceleration: Device unclamped Device clamped		 50 200	 m/s^2 m/s^2
M	Weight		0.8	kg
D_S	Surface creepage distance		≥ 22	mm
D_a	Air strike distance		≥ 13	mm

GTO CHARACTERISTICS

ON-STATE RATINGS

I_{TAVM}	Max. average on-state current	830 A	Half sine wave, T_C = 65 °C	
I_{TRMS}	Max. RMS on-state current	1300 A		
I_{TSM}	Max. peak non-repetitive surge current	12000 A		
I^2t	Limiting load integral	$7.2 \bullet 10^5$ A^2s		
V_T	On-state voltage	2.50 V	I_T = 1000 A	T_j = 125 °C
V_{T0}	Threshold voltage	1.66 V	I_T = 200 - 2500 A	
r_T	Slope resistance	0.57 mΩ		
I_H	Holding current	50 A	T_j = 25 °C	

GATE RATINGS

V_{GT}	Gate trigger voltage	1.5 V	V_D = 24 V	T_j = 25 °C
I_{GT}	Gate trigger current	2.0 A	R_A = 0.1 Ω	
V_{GRM}	Repetitive peak reverse voltage	17 V		
I_{GRM}	Repetitive peak reverse current	50 mA	V_G = V_{GRM}	

TURN ON

di/dt_{crit}	Max. rate of rise of on-state current	300 A/μs	f = 200Hz	I_T = 1 000 A, T_j = 125 °C
		700 A/μs	f = 1Hz	I_{GM} = 30 A, di_G/dt = 20 A/μs
t_d	Delay time	1.5 μs	V_D = 0.5 V_{DRM}	T_j = 125 °C
t_r	Rise time	3.5 μs	I_T = 1000 A	di/dt = 300 A/μs
$t_{on(min)}$	Min. on-time	80 μs	I_{GM} = 30 A	di_G/dt = 20 A/μs
E_{on}	Turn-on energy per pulse	0.75 Ws	C_S = 2 μF	R_S = 5 Ω

TURN OFF

I_{TGQM}	Max controllable turn-off current	1000 A	V_{DM} = V_{DRM}	di_{GQ}/dt = 30 A/μs
			C_S = 2 μF	L_S ≤ 0.3 μH
t_s	Storage time	22.0 μs	V_D = ½ V_{DRM}	V_{DM} = V_{DRM}
t_f	Fall time	2.0 μs	T_j = 125 °C	di_{GQ}/dt = 30 A/μs
$t_{off(min)}$	Min. off-time	80 μs	I_{TGQ} = I_{TGQM}	
E_{off}	Turn-off energy per pulse	3.5 Ws	C_S = 2 μF	R_S = 5 Ω
I_{GQM}	Peak turn-off gate current	700 A	L_S ≤ 0.3 μH	

THERMAL RATINGS

T_j	Storage and operating junction temperature range	-40...125°C	
R_{thJC}	Thermal resistance junction to case	30 K/kW	Anode side cooled
		39 K/kW	Cathode side cooled
		17 K/kW	Double side cooled
R_{thCH}	Thermal resistance case to heat sink	10 K/kW	Single side cooled
		5 K/kW	Double side cooled

Analytical function for transient thermal impedance:

$$Z_{thJC}(t) = \sum_{i=1}^{4} R_i(1 - e^{-t/\tau_i})$$

i	1	2	3	4
R_i (K/kW)	11.7	4.7	0.64	0.0001
τ_i (s)	0.9	0.26	0.002	0.001

PACKAGE DETAILS

All dimensions in mm, unless stated otherwise. DO NOT SCALE.

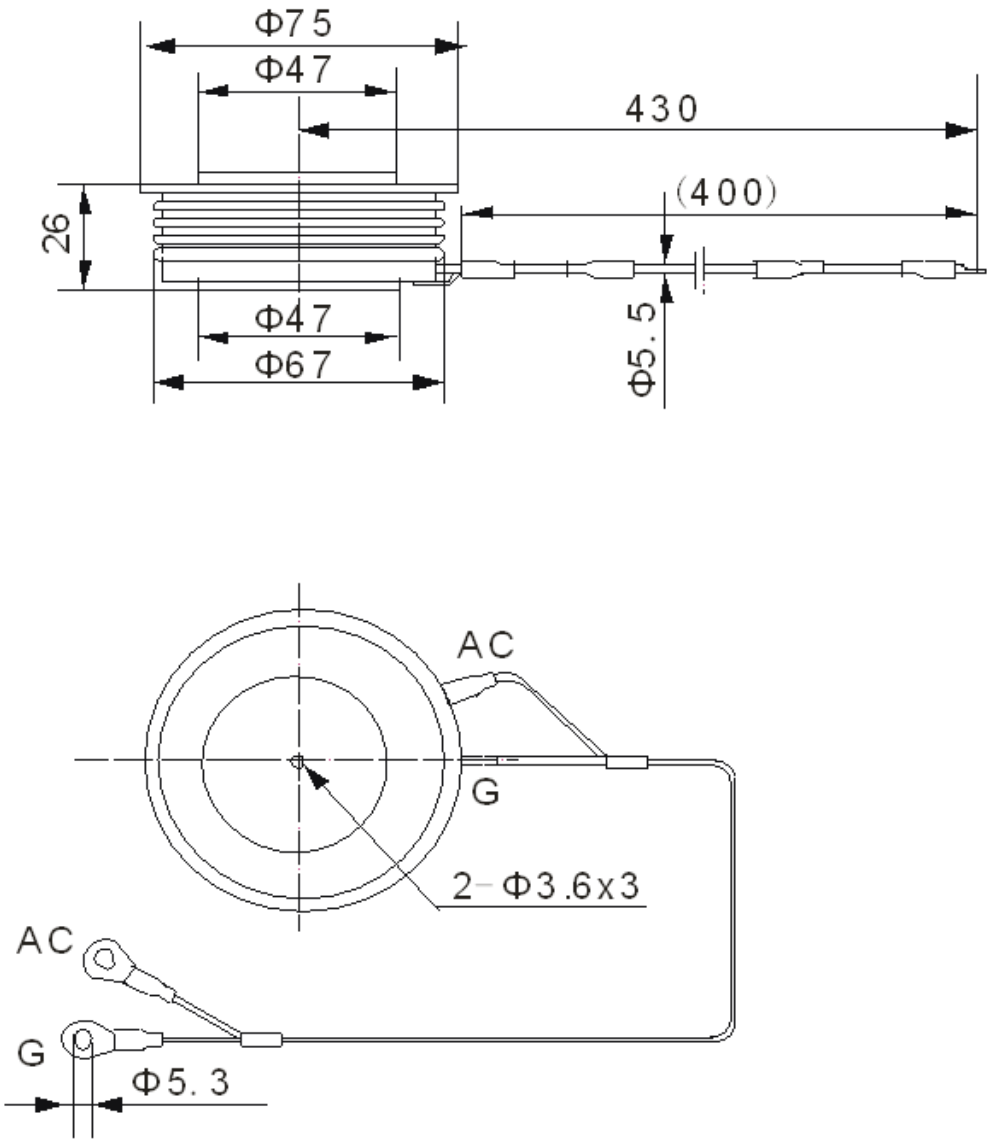

Fig. 1 Outline drawing. All dimensions are in millimeters and represent nominal values unless stated otherwise