



High-end Power Semiconductor Manufacturer

TL193-2000

Light Triggered Thyristor

◆ $V_{\text{DRM}} = \underline{6800-7600 \text{ V}}$ ◆ $V_{\text{RRM}} = \underline{6800-7600 \text{ V}}$ ◆ $I_{\text{T(AV)}} = \underline{1832\text{A}}$ ($T_{\text{C}} = 85 \text{ }^{\circ}\text{C}$) ◆ $I_{\text{T(AV)}} = \underline{2295\text{A}}$ ($T_{\text{C}} = 70 \text{ }^{\circ}\text{C}$) ◆ $I_{\text{TSM}} = \underline{55 \text{ kA}}$ ($T_{\text{j}} = 120 \text{ }^{\circ}\text{C}$) ◆ $P_{\text{LM}} = \underline{40 \text{ mW}}$			
◆ Light triggering ◆ Low on-state and switching losses ◆ Interdigitated amplifying gate			
MAXIMUM RATED VALUES			
Parameters and conditions	Symbol	Values	Units
Repetitive peak off-state voltage	V_{DRM}	6800, 7200, 7600	V
Repetitive peak reverse voltages	V_{RRM}	6800, 7200, 7600	
Repetitive peak off-state current / Repetitive peak reverse current $T_{\text{j}}=120 \text{ }^{\circ}\text{C}$, $V_{\text{D}} / V_{\text{R}} = V_{\text{DRM}} / V_{\text{RRM}}$	$I_{\text{DRM}} / I_{\text{RRM}}$	max.500	mA
Maximum average on-state current $f = 50 \text{ Hz}$, double side cooling $T_{\text{C}}=85^{\circ}\text{C}$ $T_{\text{C}}=70 \text{ }^{\circ}\text{C}$	$I_{\text{T(AV)}}$	1832 2295	A
Surge current, $V_{\text{R}}=0$, $T_{\text{j}} = 120 \text{ }^{\circ}\text{C}$, $t_{\text{p}}=10 \text{ mc}$	I_{TSM}	55	kA
Critical rate of rise of on-state current, $V=0.67V_{\text{DRM}}$, $I_{\text{T}}=5000 \text{ A}$, $P_{\text{LM}}=40 \text{ mW}$, $t_{\text{L}}=10 \text{ }\mu\text{s}$, $t_{\text{rise}}=0.5 \text{ }\mu\text{s}$, $f=50 \text{ Hz}$, $T_{\text{j}}=120 \text{ }^{\circ}\text{C}$	$(di_{\text{T}}/dt)_{\text{crit}}$	300	A/ μs
Critical rate of rise of off-state voltage, $V_{\text{D}} = 0.67V_{\text{DRM}}$, $T_{\text{j}} = 120 \text{ }^{\circ}\text{C}$	$(dV_{\text{D}}/dt)_{\text{crit}}$	2000	V/ μs
Minimum gate trigger light power, $T_{\text{j}} = 25 \text{ }^{\circ}\text{C}$, $V_{\text{D}} = 12 \text{ V}$	P_{LM}	max. 40	mW
Operating temperature	T_{j}	-40... +120	$^{\circ}\text{C}$
Storage temperature	T_{stg}	-40... +50	

ELECTRICAL CHARACTERICTICS			
Maximum peak on-state voltage, $I_T = 7850 \text{ A}$, $T_j = 25 \text{ }^\circ\text{C}$	V_{TM}	max. 2.9	V
On-state threshold voltage, $T_j = 120 \text{ }^\circ\text{C}$, $I_T = 4000 - 12000 \text{ A}$	$V_{(TO)}$	max. 1.27	
On-state slope resistance, $T_j = 120 \text{ }^\circ\text{C}$, $I_T = 4000 - 12000 \text{ A}$	r_T	max. 0.35	mΩ
Gate controlled delay time, $V = 1000 \text{ V}$, $I_T = 2500 \text{ A}$, $P_{LM} = 40 \text{ mV}$, $t_L = 10 \text{ }\mu\text{s}$, $t_{rise} = 0.5 \text{ }\mu\text{s}$, $T_j = 25 \text{ }^\circ\text{C}$	t_d	max. 5.0	μs
Circuit-commutated turn-off time, $I_T = 2500 \text{ A}$, $di_T/dt = -5 \text{ A}/\mu\text{s}$, $V_R \geq 100 \text{ V}$, $V_D = 0.67V_{DRM}$, (dV_D/dt) = $50 \text{ B}/\mu\text{s}$, $T_j = 120 \text{ }^\circ\text{C}$	t_q	typ. 630	
Recovery charge, $di_T/dt = -5 \text{ A}/\mu\text{s}$, $T_j = 120 \text{ }^\circ\text{C}$, $I_T = 2500 \text{ A}$, $V_R \geq 100 \text{ V}$	Q_{rr}	max. 6000	μAs
Holding current, $V_D = 12 \text{ V}$, $T_j = 25 \text{ }^\circ\text{C}$	I_H	300	mA
Latching current, $V_D = 12 \text{ V}$, $T_j = 25 \text{ }^\circ\text{C}$, $P_{LM} = 40 \text{ mW}$, $t_L = 10 \text{ }\mu\text{s}$, $t_{rise} = 0.5 \text{ }\mu\text{s}$	I_L	1000	
THERMAL PARAMETERS			
Thermal resistance junction to case, sin 180°: double side cooled DC: double side cooled	R_{thjc} R_{thjc}	0.0067 0.0064	$^\circ\text{C/W}$
Thermal resistance case to heatsink, double side cooled single side cooled	R_{thch}	0.0015 0.003	
MECHANICAL PARAMETERS			
Weight	w	typ. 3.0	kg
Clamping force	F	70 – 90	kN
Vibration resistance	a	50	m/s ²
Creepage distance	D_s	62	mm
Air strike distance	D_a	25.7	mm

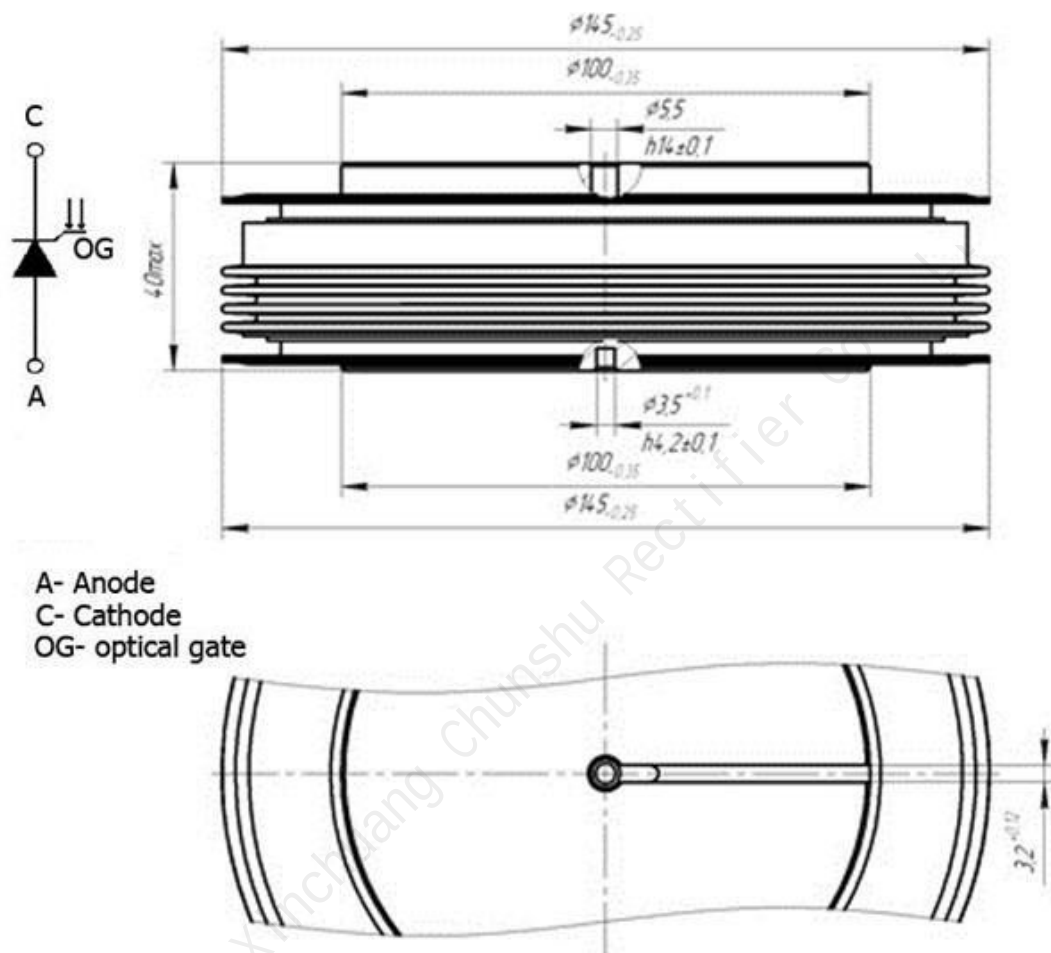


Fig. 1. Device Outline Drawing
(dimensions in mm)