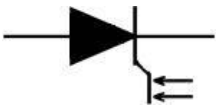
ChunZheng

高端电力电子器件和装置制造商

TL353-630

光控晶闸管

- V_S = **6200- 6600 V**
- V_{RRM} = **6600- 7000 V**
- $I_{T(AV)}$ = **630A** (T_C = 85 °C)
- $I_{T(AV)}$ = **790A** (T_C = 70 °C)
- I_{TSM} = **12 kA** (T_j = 120 °C)
- P_{LM} = **40 mW**



- 光触发
- 低通态和开关损耗
- 叉指型放大门电路
- 集成保护

最大额定数值

参数及测试条件	符号	数值	单位
Protective break over voltage	V_{BO}	6200, 6400, 6600	V
Repetitive peak off-state voltage	V_{DRM}	6000, 6200, 6400	
Repetitive peak reverse voltages	V_{RRM}	6600, 6800, 7000	
Repetitive peak off-state current / Repetitive peak reverse current T_j=120 °C, V_D / V_R = V_{DRM} / V_{RRM}	I_{DRM} / I_{RRM}	max.150	mA
Maximum average on-state current f = 50 Hz, double side cooling T_C=85°C T_C=70 °C	$I_{T(AV)}$	 630 790	A
RMS on-state current, f=50 Hz, T_C=70 °C	I_{TRMS}	1240	
Surge current, V_R=0, T_j = 120 °C, t_p=10 mc	I_{TSM}	12	kA
Safety current, T_j=120 °C, t_p=10 ms	I^2t	720	kA^2s
Critical rate of rise of on-state current, V=0.67V_{DRM} , I_T=1260 A, P_{LM}=40 mW, t_L=10 μs, t_{rise}=0.5 μs, f=50 Hz, T_j=120 °C	(diT/dt)crit	300	A/μs
Critical rate of rise of off-state voltage, V_D = 0.67V_{DRM}, T_j = 120 °C	(dVD/dt)crit	1000, 1600, 2000	V/μs
Minimum gate trigger light power, T_j = 25 °C, V_D = 12 V	P_{LM}	max. 40	mW
Operating temperature	T_j	-40… +120	˚C
Storage temperature	T_{stg}	-40… +50	

电学特性			
Maximum peak on-state voltage, I_T = 1980 A, T_j = 25 °C	V_{TM}	max. 2.63	V
On-state threshold voltage, T_j = 120 °C, I_T = 1000 - 3000 A	$V_{(TO)}$	max. 1.2	
On-state slope resistance, T_j = 120 °C, I_T = 1000 - 3000 A	r_T	max. 1.0	mΩ
Gate controlled delay time, V= 1000 V, I_T = 630 A, P_{LM} = 40 mW, t_L= 10 us, tnse = 0,5 µS, Ti = 25 °C	t_d	max. 5.0	µs
Circuit-commutated turn-off time, I_T= 630 A, di_T/dt = - 5 A/µs, V_R≥100 V, V_D = 0,67V_{DRM}, (dV_D/dt) = 50 V/µs, Tj= 120 °C	t_q	typ. 630	
Recovery charge, di_T/dt = - 5 A/µs, Tj= 120 °C, I_T = 630 A V_R≥100 V	Q_{rr}	max. 3000	µAs
Holding current, V_D =12 V, T_j = 25 °C	I_H	100	mA
Latching current, V_D = 12 V, T_j = 25 °C, P_{LM} = 40 mW, t_L = 10 µs, t_{rise} = 0.5 µs	I_L	1000	
热学特性			
Thermal resistance junction to case, sin 180°: double side cooled DC: double side cooled	R_{thjc} R_{thjc} R_{thjc-A} R_{thjc-K}	0.0200 0.0190 0.0305 0.0500	°C/W
Thermal resistance case to heatsink, double side cooled single side cooled	R_{thch}	0.005 0.010	
力学特性			
Weight	w	typ. 0.65	kg
Clamping force	F	20 – 26	kN
Vibration resistance	a	50	m/s^2
Creepage distance	D_s	25.4	mm

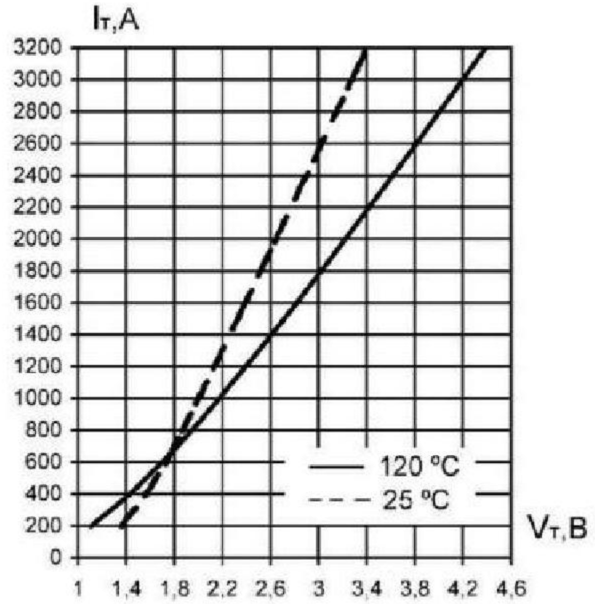


Fig. 1. Limiting on-state characteristic $I_T = f(V_T)$

On-state characteristics model

$$V_T = A + B\cdot I_T + C\cdot \ln(I_T + 1) + D\cdot \sqrt{I_T}$$

valid for I_T = 200÷3200 A

	T_j = 120 ºC	T_j = 25 ºC
A	0.035	0.081
B	0.0008076	0.0007431
C	0.142	0.271
D	0.011	-0.022

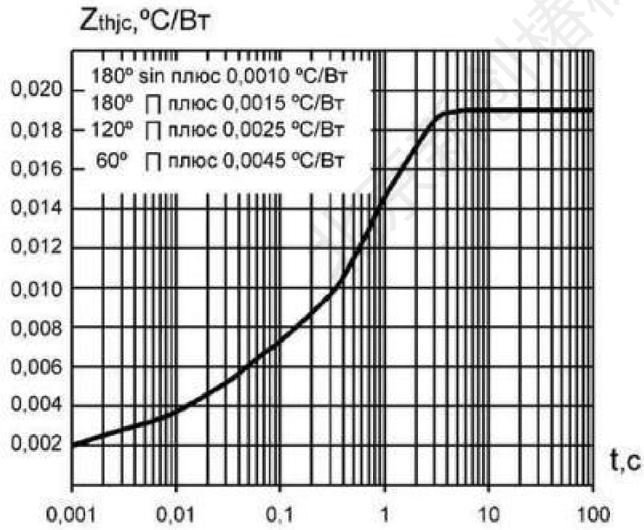


Fig. 2. Transient thermal impedance Z_{thJC} =f(t) for DC

Analytical elements of transient thermal impedance, junction to case

$$Z_{thjc} = \sum_{i=1}^{n} Ri(1 - e^{-t/\tau_i})$$

i	1	2	3	4
Ri,ºC/W	0.0008	0.0016	0.0037	0.0129
τi,c	0.0001	0.0013	0.0298	0.9313

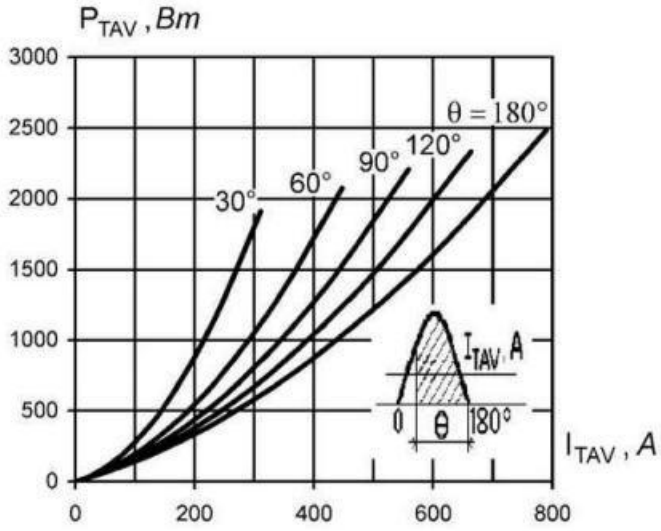


Fig. 3. On-state power loss vs. On-state current (sine)

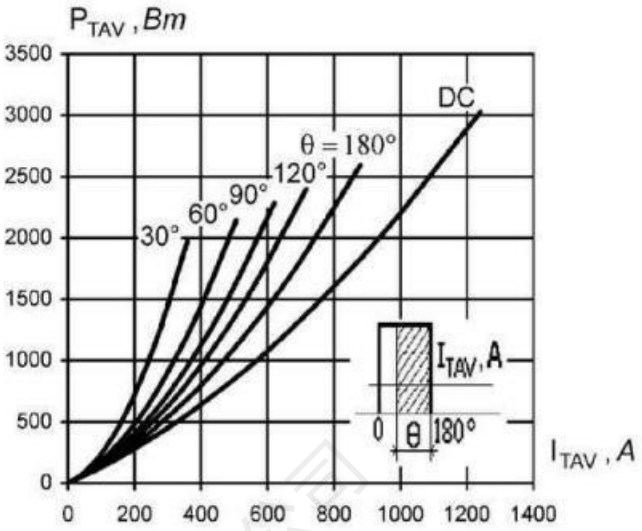


Fig. 4. On-state power loss vs. on-state current (rectangular)

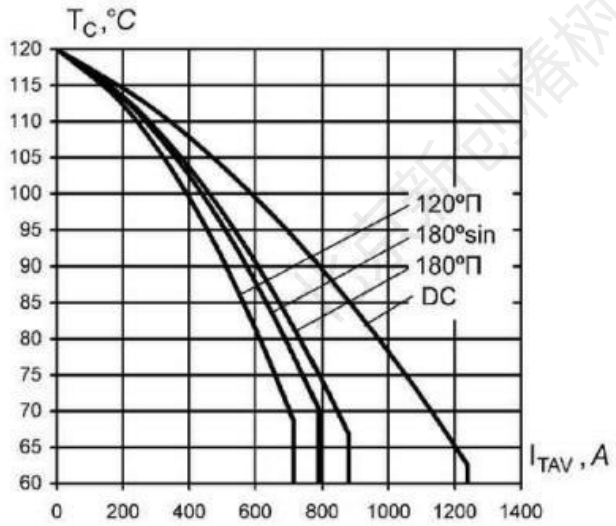


Fig. 5. Maximum allowable case temperature during various angles of conductance and various forms of current

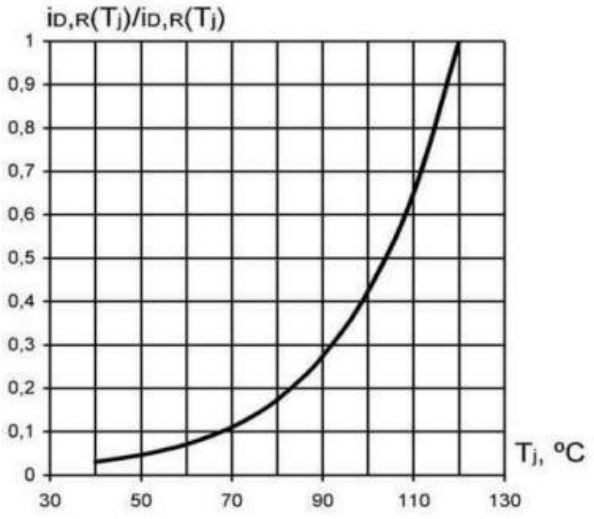


Fig. 6. Repetitive peak off-state current and repetitive peak reverse current vs. junction temperature (U_D=U_{DRM} U_R=U_{RRM})

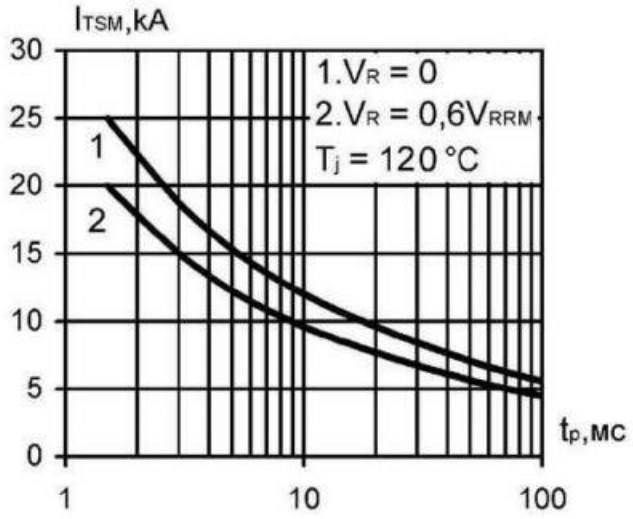


Fig. 7. Surge on-state current vs. pulse length (half-sine)

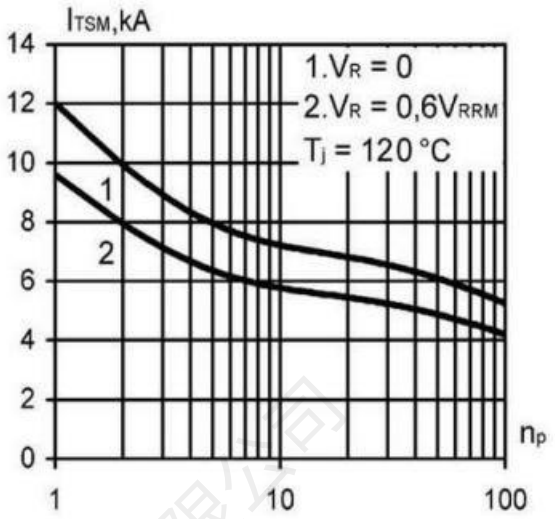


Fig. 8. Surge on-state current vs. number of pulses of sine form (10 ms, 50 Hz)

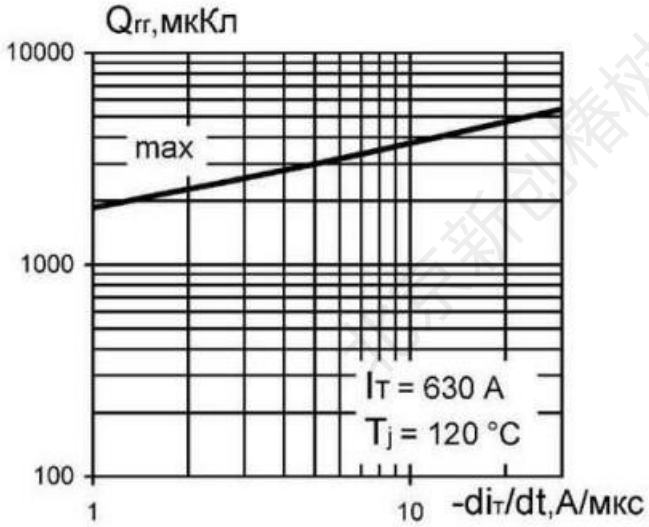


Fig. 9. Recovery charge vs. decay rate of on-state current

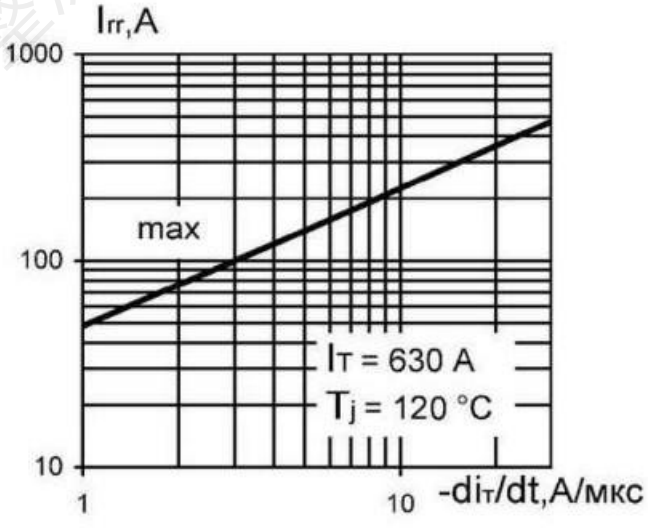
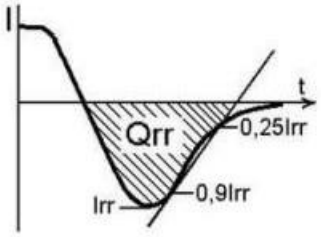


Fig. 10. Peak reverse recovery current vs. decay rate of on-state current



TL353-630--- 外形尺寸

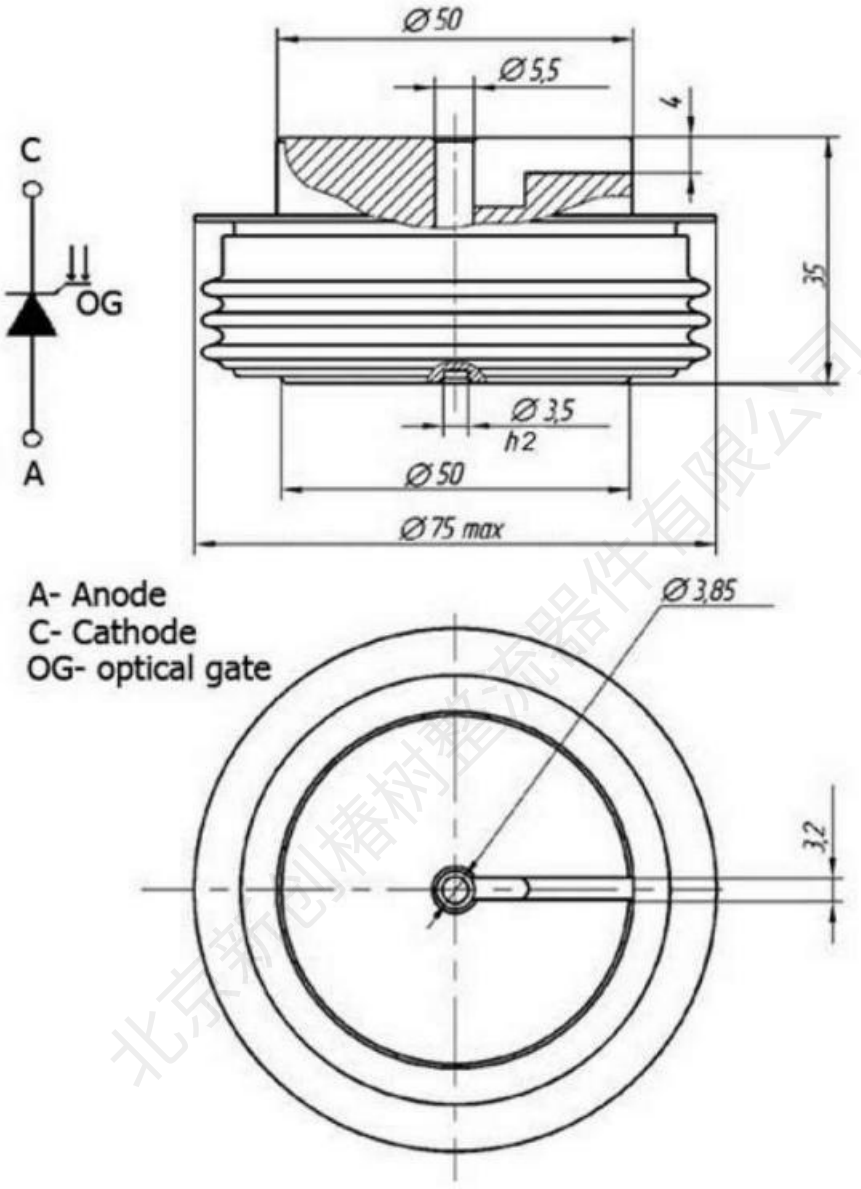


Fig. 11. Device outline drawing
(dimensions in mm)

