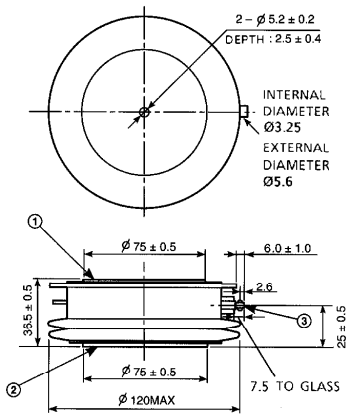
TOSHIBA ALLOY-FREE LIGHT TRIGGER THYRISTOR

SL1500GX24

HIGH POWER CONTROL APPLICATIONS

- Repetitive Peak Off-State Voltage : V_{DRM} } = 4000V
- Repetitive Peak Reverse Voltage : V_{RRM} }
- Average On-State Current : $I_{T(AV)}$ = 1500A
- Light Trigger Power : P_{LT} : 10mW (Max.)
- Turn-Off Time : t_q = 400μs (Max.)
- Critical Rate of Rise of On-State Current : di / dt = 250A / μs
- Critical Rate of Rise of Off-State Voltage : dv / dt = 1500V / μs
- Flat Package

Unit in mm



1. CATHODE
2. ANODE
3. GATE

JEDEC	—
EIAJ	—
TOSHIBA	13-120L1A

Weight : 1700g

MAXIMUM RATINGS

CHARACTERISTIC	SYMBOL	RATING	UNIT
Repetitive Peak Off-State Voltage and Repetitive Peak Reverse Voltage	V_{DRM} V_{RRM}	4000	V
Non-Repetitive Peak Reverse Voltage (Non-Repetitive ≦ 5ms, T_j = 0~125°C)	V_{RSM}	4400	V
R.M.S On-State Current	$I_{T(RMS)}$	2355	A
Average On-State Current	$I_{T(AV)}$	1500	A
Peak One Cycle Surge On-State Current (Non-Repetitive)	I_{TSM}	30000 (50Hz)	A
		33000 (60Hz)	
I^2t Limit Value	I^2t	4500×10^3	A^2s
Critical Rate of Rise of On-State Current (Note)	di / dt	250	A / μs
Junction Temperature	T_j	−40~125	°C
Storage Temperature Range	T_{stg}	−40~125	°C
Mounting Force	—	39.2±3.9	kN

Note : V_D = 2000V, f = 50Hz, T_j = 120°C

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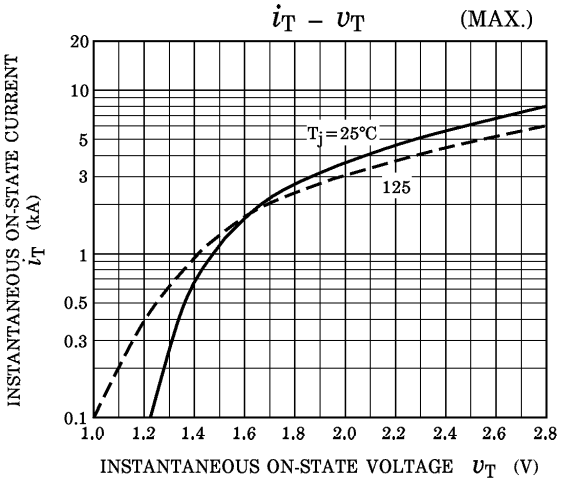
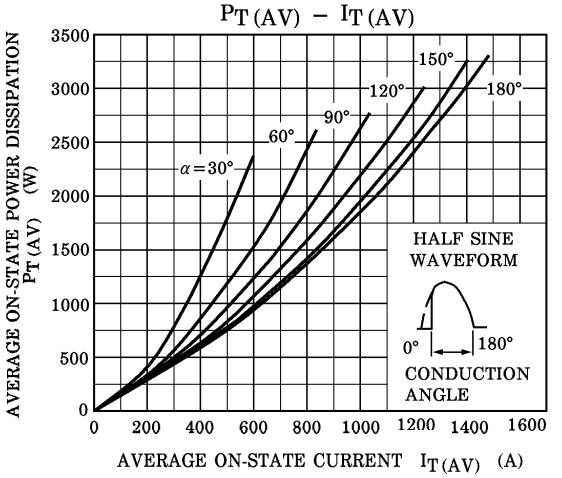
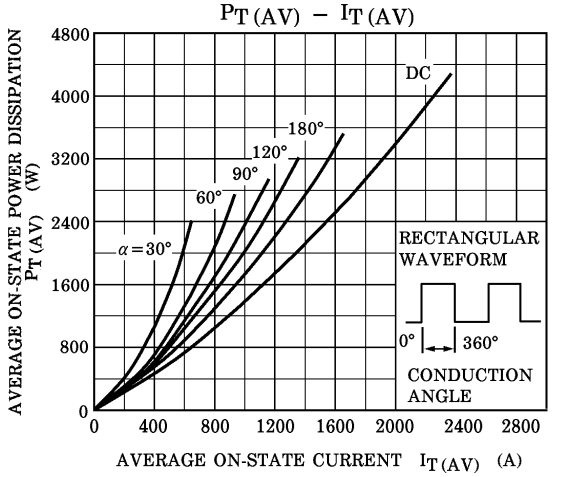
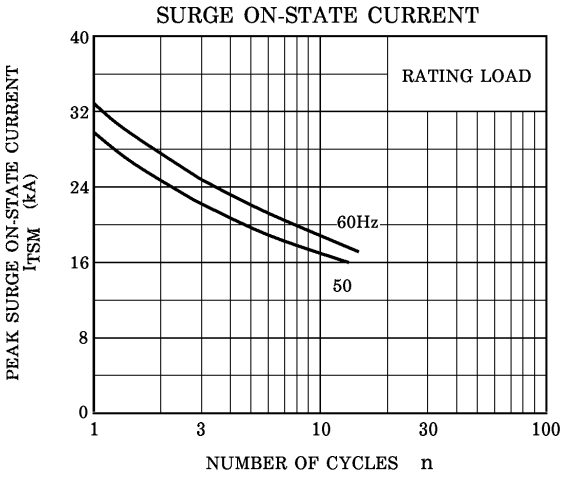
ELECTRICAL CHARACTERISTICS

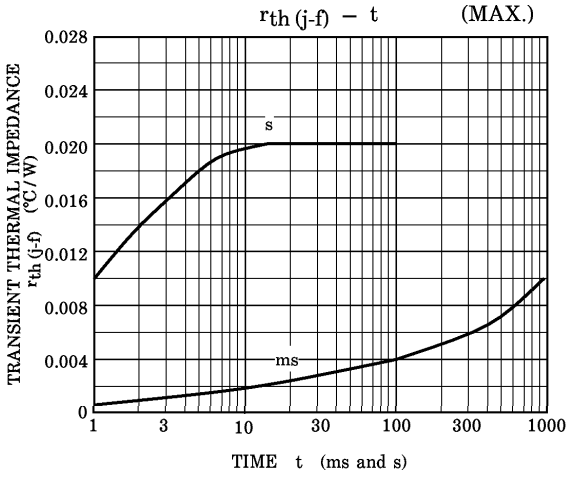
CHARACTERISTIC	SYMBOL	TEST CONDITION		MIN.	MAX.	UNIT
Repetitive Peak Off-State Current and Repetitive Peak Reverse Current	I_{DRM} I_{RRM}	$V_{DRM}=V_{RRM}=4000V$ $T_j=125°C$		—	120	mA
Peak On-State Voltage	V_{TM}	$I_{TM}=5000A$, $T_j=25°C$		—	2.3	V
Light Trigger Power	P_{LT}	$V_D=12V$, $R_L=6\Omega$	$T_j=-40°C$	—	—	mW
			$T_j=25°C$	—	10	
Delay Time	t_d	$V_D=2000V$, $T_j=25°C$ $P_L=20mW$		—	4	μs
Gate Turn-On Time	t_{gt}			—	6	μs
Turn-Off Time	t_q	$I_T=1200A$, $V_R \geqq 200V$ $dv/dt=25V/\mu s$, $T_j=115°C$ $V_{DRM}=2000V$		—	400	μs
Holding Current	I_H	$T_j=25°C$, $R_L=6\Omega$		—	300	mA
Critical Rate of Rise of Off-State Voltage	dv/dt	$V_{DRM}=2000V$, $T_j=125°C$ Gate Open, Exponential Rise		1500	—	$V/\mu s$
Thermal Resistance (Junction to Case)	$R_{th\,(j-f)}$	DC		—	0.02	°C / W


i_T – v_T (MAX.)
INSTANTANEOUS ON-STATE CURRENT i_T (kA)
20
10
5
3
1
0.5
0.3
0.1
T_j = 25°C
125
1.0 1.2 1.4 1.6 1.8 2.0 2.2 2.4 2.6 2.8
INSTANTANEOUS ON-STATE VOLTAGE v_T (V)


$P_{T(AV)}$ – $I_{T(AV)}$
AVERAGE ON-STATE POWER DISSIPATION $P_{T(AV)}$ (W)
3500
3000
2500
2000
1500
1000
500
0
150°
120°
180°
90°
60°
α = 30°
HALF SINE WAVEFORM
0° 180°
CONDUCTION ANGLE
0 200 400 600 800 1000 1200 1400 1600
AVERAGE ON-STATE CURRENT $I_{T(AV)}$ (A)


$P_{T(AV)}$ – $I_{T(AV)}$
AVERAGE ON-STATE POWER DISSIPATION $P_{T(AV)}$ (W)
4800
4000
3200
2400
1600
800
0
DC
180°
120°
90°
60°
α = 30°
RECTANGULAR WAVEFORM
0° 360°
CONDUCTION ANGLE
0 400 800 1200 1600 2000 2400 2800
AVERAGE ON-STATE CURRENT $I_{T(AV)}$ (A)


SURGE ON-STATE CURRENT
PEAK SURGE ON-STATE CURRENT I_{TSM} (kA)
40
32
24
16
8
0
RATING LOAD
60Hz
50
1 3 10 30 100
NUMBER OF CYCLES n


$r_{th\,(j\text{-}f)}$ – t (MAX.)
TRANSIENT THERMAL IMPEDANCE $r_{th\,(j\text{-}f)}$ (°C/W)
0.028
0.024
0.020
0.016
0.012
0.008
0.004
0
s
ms
1 3 10 30 100 300 1000
TIME t (ms and s)