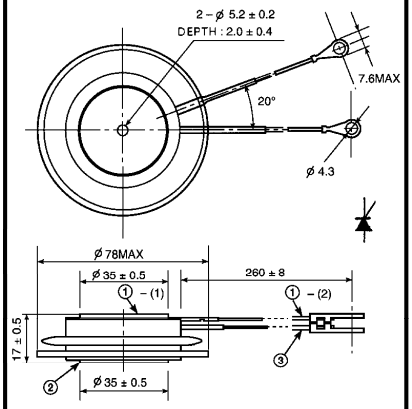
TOSHIBA ALLOY-FREE HIGHT SPEED THYRISTOR

SH400EX33C

HIGH POWER CONTROL APPLICATIONS

Unit in mm

- Repetitive Peak Off-State Voltage : V_{DRM} } = 2500V
- Repetitive Peak Reverse Voltage : V_{RRM} }
- Average On-State Current : $I_{T(AV)}$ = 400A
- Turn-Off Time : t_q = 40 μs (Max.)
- Critical Rate of Rise of On-State Current : di / dt = 200A / μs
- Critical Rate of Rise of Off-State Voltage : dv / dt = 500V / μs
- Weight : 260g
- Flat Package



1-(1) CATHODE
1-(2) CATHODE (BLACK)
2. ANODE
3. GATE (WHITE)

JEDEC	—
EIAJ	—
TOSHIBA	13-78F1A

961001EAA1

MAXIMUM RATINGS

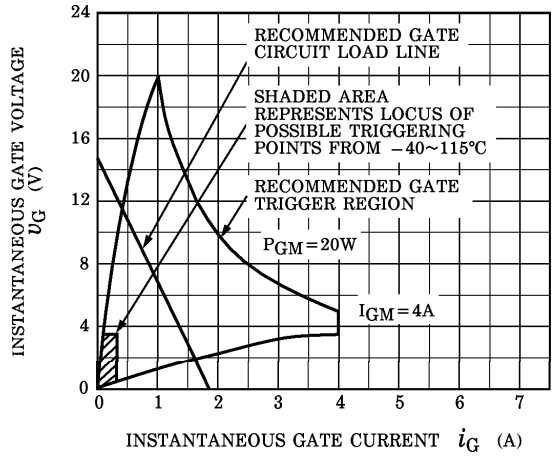
CHARACTERISTIC	SYMBOL	RATING	UNIT
Repetitive Peak Off-State Voltage and Repetitive Peak Reverse Voltage	V_{DRM} V_{RRM}	2500	V
Non-Repetitive Peak Reverse Voltage (Non-Repetitive < 5ms, T_j = 0~115°C)	V_{RSM}	2550	V
R.M.S On-State Current	$I_{T(RMS)}$	628	A
Average On-State Current	$I_{T(AV)}$	400	A
Peak One Cycle Surge On-State Current (Non-Repetitive)	I_{TSM}	8000 (50Hz) 8800 (60Hz)	A
I^2t Limit Value	I^2t	3.2×10^5	A^2s
Critical Rate of Rise of On-State Current (Note)	di / dt	200	A / μs
Peak Gate Power Dissipation	P_{GM}	20	W
Average Gate Power Dissipation	$P_{G(AV)}$	4	W
Peak Forward Gate Current	I_{GM}	4	A
Peak Forward Gate Voltage	V_{FGM}	20	V
Peak Reverse Gate Voltage	V_{RGM}	5	V
Junction Temperature	T_j	−40~115	°C
Storage Temperature Range	T_{stg}	−40~115	°C
Mounting Force	—	14.7±1.5	kN

Note : V_D = 1250V, f = 50Hz, T_j = 110°C, Gate Supply (V_G = 15V, R_G = 8Ω, $t_r \leqq 1\mu s$)

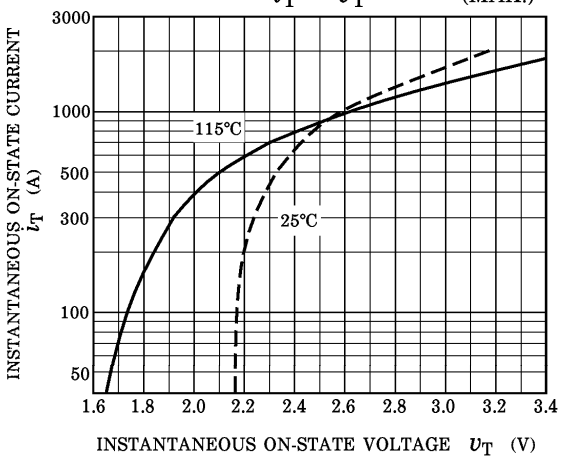
ELECTRICAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	TEST CONDITION		MIN.	MAX.	UNIT
Repetitive Peak Off-State Current and Repetitive Peak Reverse Current	I_{DRM} I_{RRM}	$V_{DRM}=V_{RRM}=2500V$ $T_j=115°C$		—	50	mA
Peak On-State Voltage	V_{TM}	$I_{TM}=1250A$, $T_j=25°C$		—	2.7	V
Gate Trigger Voltage	V_{GT}	$V_D=6V$, $R_L=6\Omega$	$T_j=-40°C$	—	3.5	V
			$T_j=25°C$	—	2.5	
Gate Trigger Current	I_{GT}		$T_j=-40°C$	—	350	mA
			$T_j=25°C$	—	250	
Gate Non-Trigger Voltage	V_{GD}	$V_D=1250V$, $T_j=115°C$		0.3	—	V
Gate Non-Trigger Current	I_{GD}			10	—	mA
Delay Time	t_d	$V_D=1250V$, $T_j=25°C$ Gate Supply ($V_G=15V$, $R_G=8\Omega$, $t_r\leqq1\mu s$)		—	4	μs
Gate Turn-On Time	t_{gt}			—	6	μs
Turn-Off Time	t_q	$I_{TM}=800A$, $V_R\geqq50V$, $dv/dt=20V/\mu s$, $T_j=110°C$ $V_{DRM}=1250V$		—	40	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	$V_{DRM}=1670V$, $T_j=115°C$ Gate Open, Exponential Rise		500	—	V / μs
Thermal Resistance (Junction to Case)	$R_{th\,(j\text{-}f)}$	DC		—	0.04	°C / W

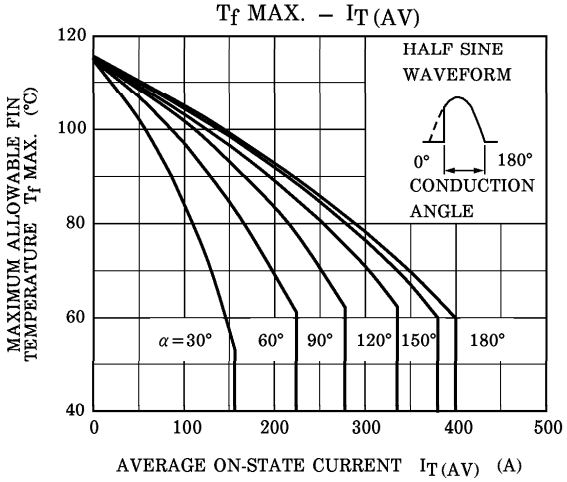
GATE TRIGGER CHARACTERISTIC



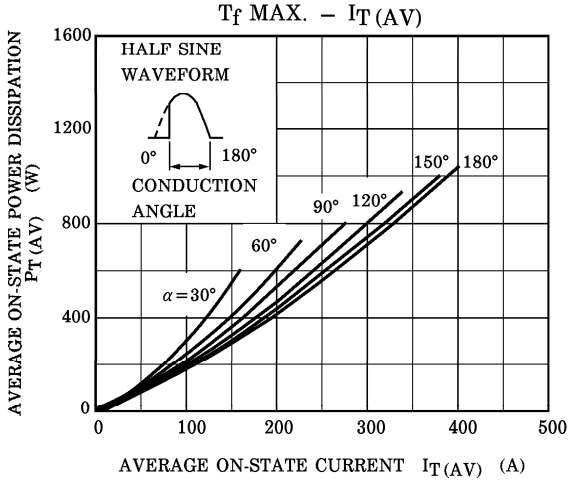
$i_T - v_T$ (MAX.)



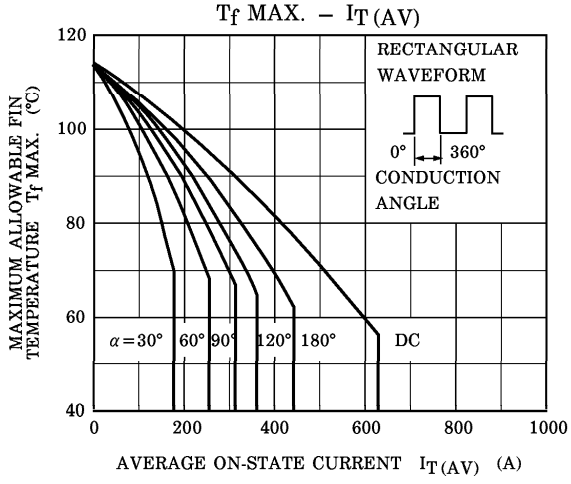
T_f MAX. – $I_{T(AV)}$



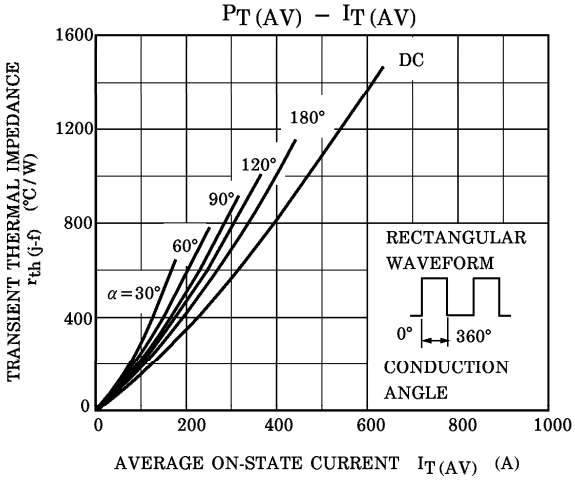
T_f MAX. – $I_{T(AV)}$



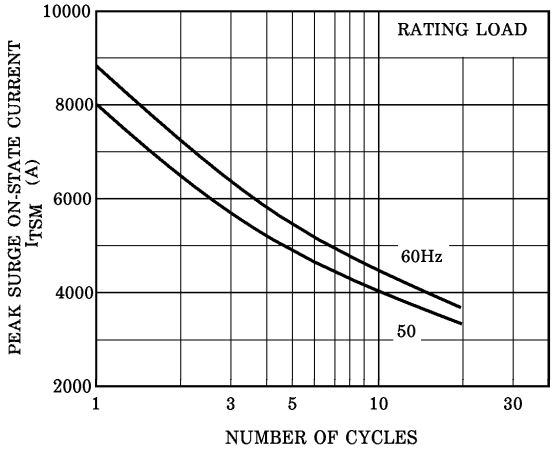
T_f MAX. – $I_{T(AV)}$



$P_{T(AV)}$ – $I_{T(AV)}$



SURGE ON-STATE CURRENT



$r_{th\,(j\text{-}f)}$ – t (MAX.)