

**TOSHIBA**

**SH400R33B**

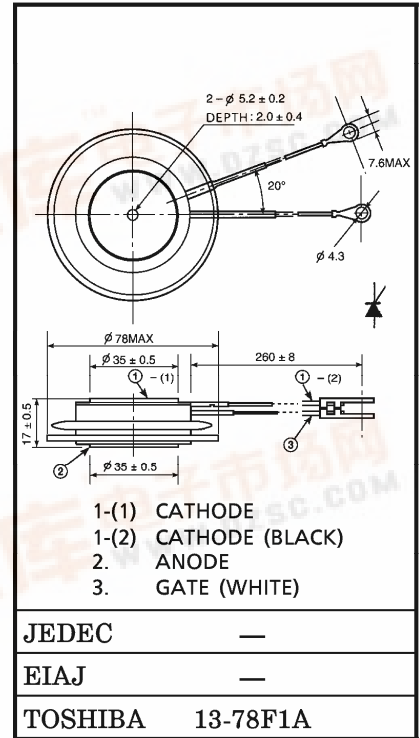
TOSHIBA ALLOY-FREE HIGHT SPEED THYRISTOR

# SH400R33B

HIGH POWER CONTROL APPLICATIONS

- Repetitive Peak Off-State Voltage :  $V_{DRM}$
- Repetitive Peak Reverse Voltage :  $V_{RRM}$
- Average On-State Current :  $I_T(AV) = 400A$
- Turn-Off Time :  $t_q = 25\mu s$  (Max.)
- Critical Rate of Rise of On-State Current :  $di/dt = 200A/\mu s$
- Critical Rate of Rise of Off-State Voltage :  $dv/dt = 500V/\mu s$
- Weight : 260g
- Flat Package

Unit in mm



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## MAXIMUM RATINGS

CHARACTERISTIC	SYMBOL	RATING	UNIT
Repetitive Peak Off-State Voltage and Repetitive Peak Reverse Voltage	V <sub>DRM</sub> V <sub>RPM</sub>	1300	V
Non-Repetitive Peak Reverse Voltage (Non-Repetitive < 5ms, T <sub>j</sub> = 0~125°C)	V <sub>RSM</sub>	1400	V
R.M.S On-State Current	I <sub>T (RMS)</sub>	628	A
Average On-State Current	I <sub>T (AV)</sub>	400	A
Peak One Cycle Surge On-State Current (Non-Repetitive)	I <sub>TSM</sub>	8000 (50Hz) 8800 (60Hz)	V
I <sup>2</sup> t Limit Value	I <sup>2</sup> t	3.2 × 10 <sup>5</sup>	A <sup>2</sup> s
Critical Rate of Rise of On-State Current (Note)	di / dt	200	A / μs
Peak Gate Power Dissipation	P <sub>GM</sub>	20	W
Average Gate Power Dissipation	P <sub>G (AV)</sub>	4	W
Peak Forward Gate Current	I <sub>GM</sub>	4	A
Peak Forward Gate Voltage	V <sub>FGM</sub>	20	V
Peak Reverse Gate Voltage	V <sub>RGM</sub>	5	V
Junction Temperature	T <sub>j</sub>	-40~115	°C
Storage Temperature Range	T <sub>stg</sub>	-40~115	°C
Mounting Force	—	14.7 ± 1.5	kN

Note : V<sub>D</sub> = 650V, f = 50Hz, T<sub>j</sub> = 110°C, Gate Supply (V<sub>G</sub> = 15V, R<sub>G</sub> = 8Ω, t<sub>r</sub> ≤ 1μs)

ELECTRICAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	MAX.	UNIT	
Repetitive Peak Off-State Current and Repetitive Peak Reverse Current	$I_{DRM}$ $I_{RRM}$	$V_{DRM} = V_{RRM} = 1300V$ $T_j = 115^\circ C$	—	50	mA	
Peak On-State Voltage	$V_{TM}$	$I_{TM} = 1250A, T_j = 25^\circ C$	—	2.2	V	
Gate Trigger Voltage	$V_{GT}$	$V_D = 6V, R_L = 6\Omega$	$T_j = -40^\circ C$	—	4.5	V
			$T_j = 25^\circ C$	—	3.5	V
Gate Trigger Current	$I_{GT}$	$V_D = 6V, R_L = 6\Omega$	$T_j = -40^\circ C$	—	400	mA
			$T_j = 25^\circ C$	—	260	mA
Gate Non-Trigger Voltage	$V_{GD}$	$V_D = 650V, T_j = 115^\circ C$	0.2	—	V	
Gate Non-Trigger Current	$I_{GD}$		5	—	mA	
Delay Time	$t_d$	$V_D = 650V, T_j = 25^\circ C$ Gate Supply	—	4	$\mu s$	
Gate Turn-On Time	$t_{gt}$	$(V_G = 15V, R_G = 8\Omega, t_r \leq 1\mu s)$	—	6	$\mu s$	
Turn-Off Time	$t_q$	$I_{TM} = 800A, V_R \geq 50V$ $dv/dt = 20V/\mu s, T_j = 110^\circ C$ $V_{DRM} = 650V$	—	25	$\mu s$	
Holding Current	$I_H$	$T_j = 25^\circ C, R_L = 6\Omega$	—	400	mA	
Critical Rate of Rise of Off-State Voltage	$dv/dt$	$V_{DRM} = 870V, T_j = 115^\circ C$ Gate Open, Exponential Rise	500	—	$V/\mu s$	
Thermal Resistance (Junction to Case)	$R_{th(j-f)}$	DC	—	0.04	$^\circ C/W$	

