

TOSHIBA

SH400EX33C

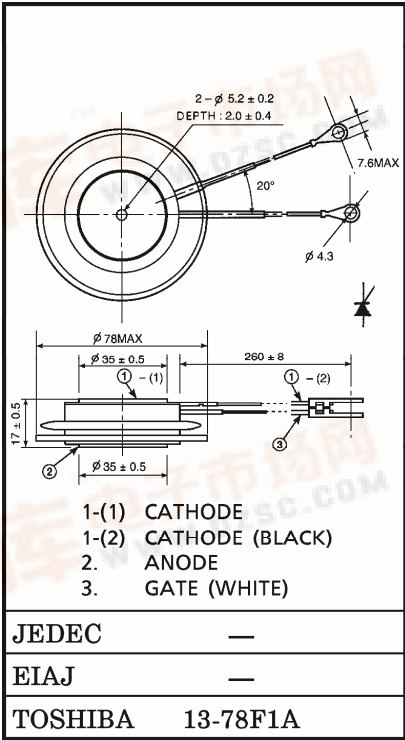
TOSHIBA ALLOY-FREE HIGHT SPEED THYRISTOR

SH400EX33C

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 : $t_q=40\mu s$ (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



961001EAA1

- TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.

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, $T_j = 0 \sim 115^\circ\text{C}$)	V_{RSM}	2550	V
R.M.S On-State Current	$I_{\text{T}} (\text{RMS})$	628	A
Average On-State Current	$I_{\text{T}} (\text{AV})$	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	$\text{A} / \mu\text{s}$
Peak Gate Power Dissipation	P_{GM}	20	W
Average Gate Power Dissipation	$P_{\text{G}} (\text{AV})$	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	$-40 \sim 115$	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	$-40 \sim 115$	$^\circ\text{C}$
Mounting Force	—	14.7 ± 1.5	kN

Note : $V_{\text{D}} = 1250\text{V}$, $f = 50\text{Hz}$, $T_j = 110^\circ\text{C}$, Gate Supply ($V_{\text{G}} = 15\text{V}$, $R_{\text{G}} = 8\Omega$, $t_r \leq 1\mu\text{s}$)

ELECTRICAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	MAX.	UNIT
Repetitive Peak Off-State Current and Repetitive Peak Reverse Current	I_{DRM} I_{RRM}	$V_{DRM}=V_{RRM}=2500V$ $T_j=115^{\circ}C$	—	50	mA
Peak On-State Voltage	V_{TM}	$I_{TM}=1250A$, $T_j=25^{\circ}C$	—	2.7	V
Gate Trigger Voltage	V_{GT}	$V_D=6V$, $R_L=6\Omega$	$T_j=-40^{\circ}C$	—	3.5
			$T_j=25^{\circ}C$	—	2.5
Gate Trigger Current	I_{GT}		$T_j=-40^{\circ}C$	—	350
			$T_j=25^{\circ}C$	—	250
Gate Non-Trigger Voltage	V_{GD}	$V_D=1250V$, $T_j=115^{\circ}C$	0.3	—	V
Gate Non-Trigger Current	I_{GD}		10	—	mA
Delay Time	t_d	$V_D=1250V$, $T_j=25^{\circ}C$ Gate Supply	—	4	μs
Gate Turn-On Time	t_{gt}	$(V_G=15V, R_G=8\Omega, t_r \leq 1\mu s)$	—	6	μs
Turn-Off Time	t_q	$I_{TM}=800A$, $V_R \geq 50V$, $dv/dt=20V/\mu s$, $T_j=110^{\circ}C$ $V_{DRM}=1250V$	—	40	μs
Holding Current	I_H	$T_j=25^{\circ}C$, $R_L=6\Omega$	—	300	mA
Critical Rate of Rise of Off-State Voltage	dv/dt	$V_{DRM}=1670V$, $T_j=115^{\circ}C$ Gate Open, Exponential Rise	500	—	$V/\mu s$
Thermal Resistance (Junction to Case)	$R_{th(j-f)}$	DC	—	0.04	$^{\circ}C/W$

