

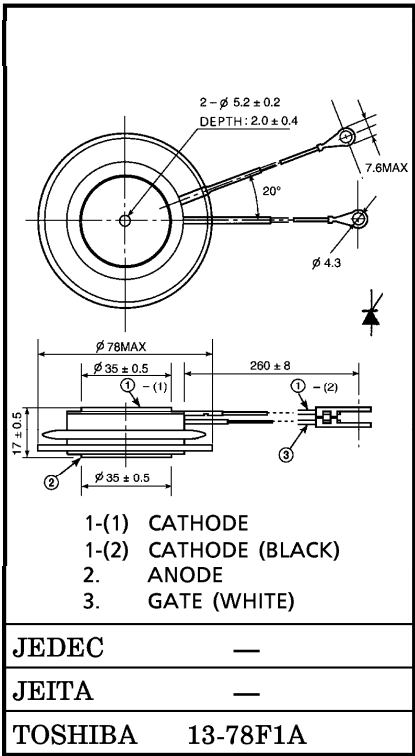
TOSHIBA ALLOY-FREE HIGHT SPEED THYRISTOR

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



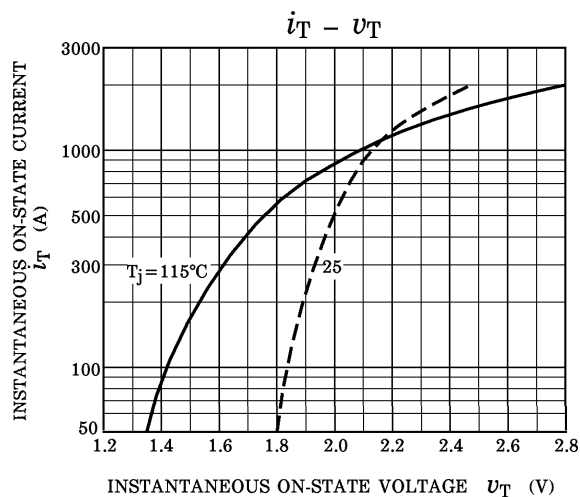
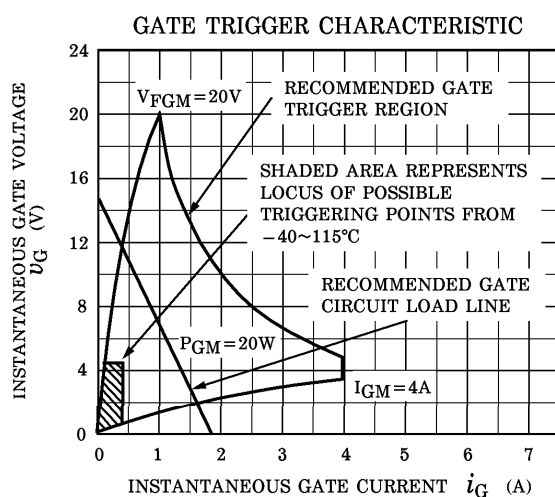
MAXIMUM RATINGS

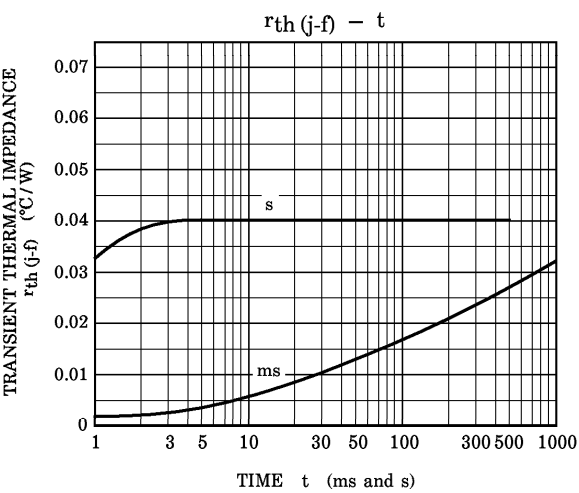
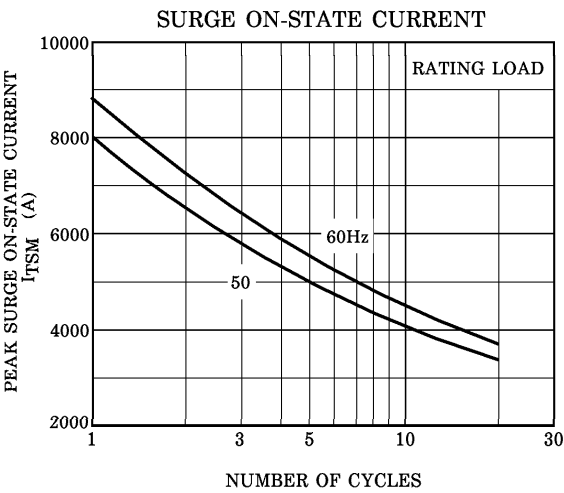
CHARACTERISTIC	SYMBOL	RATING	UNIT
Repetitive Peak Off-State Voltage and Repetitive Peak Reverse Voltage	V _{DRM} V _{RRM}	1300	V
Non-Repetitive Peak Reverse Voltage (Non-Repetitive < 5ms, T _j = 0~125°C)	V _{RSM}	1400	V
R.M.S On-State Current	I _T (RMS)	628	A
Average On-State Current	I _T (AV)	400	A
Peak One Cycle Surge On-State Current (Non-Repetitive)	I _{TSM}	8000 (50Hz) 8800 (60Hz)	V
I ² t Limit Value	I ² t	3.2 × 10 ⁵	A ² s
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 = 650V, f = 50Hz, T_j = 110°C, Gate Supply (V_G = 15V, R_G = 8Ω, t_r ≤ 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
			$T_j = 25^\circ C$	—	3.5
Gate Trigger Current	I_{GT}		$T_j = -40^\circ C$	—	400
			$T_j = 25^\circ C$	—	260
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	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	$I_{TM} = 800A$, $V_R \geq 50V$ $dv/dt = 20V/\mu s$, $T_j = 110^\circ C$ $V_{DRM} = 650V$	—	25	μs
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	$^\circ C/W$





RESTRICTIONS ON PRODUCT USE

000707EAA

- TOSHIBA is continually working to improve the quality and 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 comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such TOSHIBA products 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 TOSHIBA products specifications. Also, please keep in mind the precautions and conditions set forth in the "Handling Guide for Semiconductor Devices," or "TOSHIBA Semiconductor Reliability Handbook" etc..
- The TOSHIBA products listed in this document are intended for usage in general electronics applications (computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.). These TOSHIBA products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury ("Unintended Usage"). Unintended Usage include atomic energy control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, combustion control instruments, medical instruments, all types of safety devices, etc.. Unintended Usage of TOSHIBA products listed in this document shall be made at the customer's own risk.
- 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.