

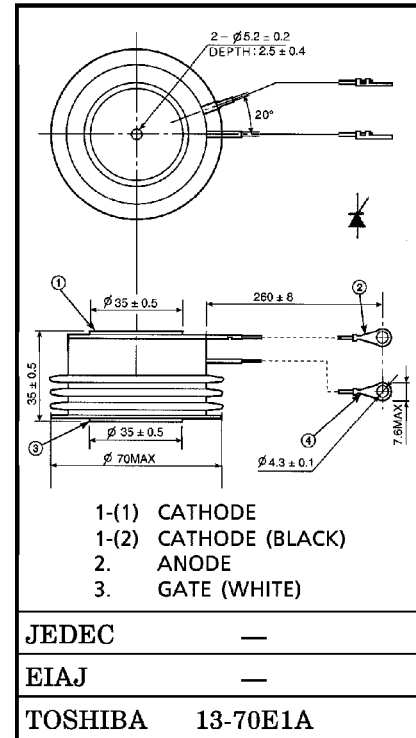
TOSHIBA ALLOY-FREE HIGH SPEED THYRISTOR

**SH400R28B**

HIGH POWER CONTROL APPLICATIONS

- Repetitive Peak Off-State Voltage :  $V_{DRM}$  } = 1300V
- 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 : 480g
- Flat Package

Unit in mm



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## MAXIMUM RATINGS

CHARACTERISTIC	SYMBOL	SYMBOL	RATING	UNIT
Repetitive Peak Off-State Voltage and Repetitive Peak Reverse Voltage	V <sub>DRM</sub> V <sub>RRM</sub>	V <sub>DRM</sub> V <sub>RRM</sub>	1300	V
Non-Repetitive Peak Reverse Voltage (Non-Repetitive < 5ms, T <sub>j</sub> = 0~115°C)	V <sub>RSM</sub>	V <sub>RSM</sub>	1400	V
R.M.S On-State Current	I <sub>T (RMS)</sub>	I <sub>T (RMS)</sub>	630	A
Average On-State Current	I <sub>T (AV)</sub>	I <sub>T (AV)</sub>	400	A
Peak One Cycle Surge On-State Current (Non-Repetitive)	I <sub>TSM</sub>	I <sub>TSM</sub>	7200 (50Hz) 8000 (60Hz)	A
I <sup>2</sup> t Limit Value	I <sup>2</sup> t	I <sup>2</sup> t	200×10 <sup>3</sup>	A <sup>2</sup> s
Critical Rate of Rise of On-State Current (Note)	di / dt	di / dt	200	A / μs
Peak Gate Power Dissipation	P <sub>GM</sub>	P <sub>GM</sub>	20	W
Average Gate Power Dissipation	P <sub>G (AV)</sub>	P <sub>G (AV)</sub>	4	W
Peak Forward Gate Current	I <sub>GM</sub>	I <sub>GM</sub>	4	A
Peak Forward Gate Voltage	V <sub>FGM</sub>	V <sub>FGM</sub>	20	V
Peak Reverse Gate Voltage	V <sub>RGM</sub>	V <sub>RGM</sub>	5	V
Junction Temperature	T <sub>j</sub>	T <sub>j</sub>	-40~115	°C
Storage Temperature Range	T <sub>stg</sub>	T <sub>stg</sub>	-40~115	°C
Mounting Force	—	—	14.7 ± 1.5	kN

Note : V<sub>D</sub> = 1/2 Rated, 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	$I_{DRM}$ $I_{RRM}$	$V_{DRM} = V_{RRM} = \text{Rated}$ $T_j = 115^\circ\text{C}$	—	50	mA
Peak On-State Voltage	$V_{TM}$	$I_{TM} = 1250\text{A}$ , $T_j = 25^\circ\text{C}$	—	2.2	V
Gate Trigger Voltage	$V_{GT}$	$V_D = 6\text{V}$ , $R_L = 6\Omega$	$T_j = -40^\circ\text{C}$	—	4.5
Gate Trigger Current	$I_{GT}$		$T_j = 25^\circ\text{C}$	—	3.5
			$T_j = -40^\circ\text{C}$	—	400
			$T_j = 25^\circ\text{C}$	—	260
Gate Non-Trigger Voltage	$V_{GD}$	$V_D = 1/2 \text{ Rated}$ , $T_j = 115^\circ\text{C}$	0.2	—	V
Gate Non-Trigger Current	$I_{GD}$		5	—	mA
Delay Time	$t_d$	$V_D = 1/2 \text{ Rated}$ , $T_j = 25^\circ\text{C}$ Gate Supply ( $V_G = 15\text{V}$ , $R_G = 8\Omega$ , $t_r \leq 1\mu\text{s}$ )	—	4	$\mu\text{s}$
Gate Turn-On Time	$t_{gt}$		—	6	$\mu\text{s}$
Turn-Off Time	$t_q$	$I_T = 800\text{A}$ , $V_R \geq 50\text{V}$ $dv/dt = 20\text{V}/\mu\text{s}$ , $T_j = 110^\circ\text{C}$ $V_{DRM} = 1/2 \text{ Rated}$	—	25	$\mu\text{s}$
Holding Current	$I_H$	$T_j = 25^\circ\text{C}$ , $R_L = 6\Omega$	—	400	mA
Critical Rate of Rise of Off-State Voltage	$dv/dt$	$V_{DRM} = 1/2 \text{ Rated}$ , $T_j = 115^\circ\text{C}$ Gate Open, Exponential Rise	500	—	$\text{V}/\mu\text{s}$
Thermal Resistance (Junction to Case)	$R_{th(j-f)}$	DC	—	0.05	$^\circ\text{C}/\text{W}$

