

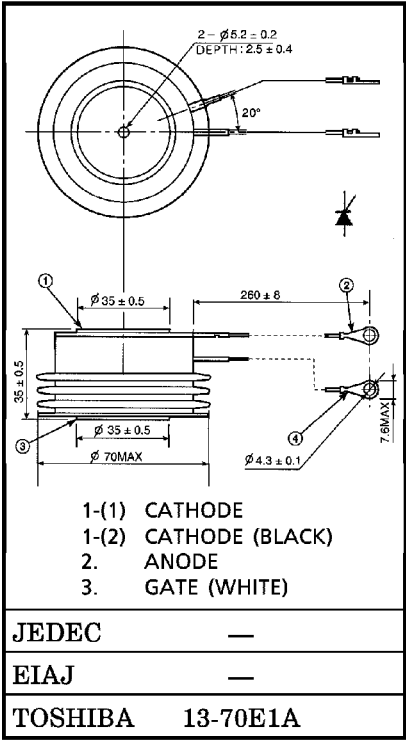
TOSHIBA ALLOY-FREE HIGHT SPEED THYRISTOR

SH400R28B

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 : 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	$V_{\text{DRM}}$ $V_{\text{RRM}}$	$V_{\text{DRM}}$ $V_{\text{RRM}}$	1300	V
Non-Repetitive Peak Reverse Voltage (Non-Repetitive < 5ms, $T_j = 0 \sim 115^\circ\text{C}$ )	$V_{\text{RSM}}$	$V_{\text{RSM}}$	1400	V
R.M.S On-State Current	$I_{\text{T(RMS)}}$	$I_{\text{T(RMS)}}$	630	A
Average On-State Current	$I_{\text{T(AV)}}$	$I_{\text{T(AV)}}$	400	A
Peak One Cycle Surge On-State Current (Non-Repetitive)	$I_{\text{TSM}}$	$I_{\text{TSM}}$	7200 (50Hz) 8000 (60Hz)	A
$I^2t$ Limit Value	$I^2t$	$I^2t$	$200 \times 10^3$	$\text{A}^2\text{s}$
Critical Rate of Rise of On-State Current (Note)	$di / dt$	$di / dt$	200	$\text{A} / \mu\text{s}$
Peak Gate Power Dissipation	$P_{\text{GM}}$	$P_{\text{GM}}$	20	W
Average Gate Power Dissipation	$P_{\text{G(AV)}}$	$P_{\text{G(AV)}}$	4	W
Peak Forward Gate Current	$I_{\text{GM}}$	$I_{\text{GM}}$	4	A
Peak Forward Gate Voltage	$V_{\text{FGM}}$	$V_{\text{FGM}}$	20	V
Peak Reverse Gate Voltage	$V_{\text{RGM}}$	$V_{\text{RGM}}$	5	V
Junction Temperature	$T_j$	$T_j$	$-40 \sim 115$	$^\circ\text{C}$
Storage Temperature Range	$T_{\text{stg}}$	$T_{\text{stg}}$	$-40 \sim 115$	$^\circ\text{C}$
Mounting Force	—	—	$14.7 \pm 1.5$	kN

Note :  $V_D = 1/2$  Rated,  $T_j = 110^\circ\text{C}$ , Gate Supply ( $V_G = 15\text{V}$ ,  $R_G = 8\Omega$ ,  $t_r \leq 1\mu\text{s}$ )

ELECTRICAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	MAX.	UNIT
Repetitive Peak Off-State Current and Repetitive Peak Reverse Current	$I_{\text{DRM}}$ $I_{\text{RRM}}$	$V_{\text{DRM}} = V_{\text{RRM}} = \text{Rated}$ $T_j = 115^\circ\text{C}$	—	50	mA
Peak On-State Voltage	$V_{\text{TM}}$	$I_{\text{TM}} = 1250\text{A}$ , $T_j = 25^\circ\text{C}$	—	2.2	V
Gate Trigger Voltage	$V_{\text{GT}}$	$V_{\text{D}} = 6\text{V}$ , $R_{\text{L}} = 6\Omega$	$T_j = -40^\circ\text{C}$	—	4.5
			$T_j = 25^\circ\text{C}$	—	3.5
Gate Trigger Current	$I_{\text{GT}}$		$T_j = -40^\circ\text{C}$	—	400
			$T_j = 25^\circ\text{C}$	—	260
Gate Non-Trigger Voltage	$V_{\text{GD}}$	$V_{\text{D}} = 1/2 \text{ Rated}$ , $T_j = 115^\circ\text{C}$	0.2	—	V
Gate Non-Trigger Current	$I_{\text{GD}}$		5	—	mA
Delay Time	$t_{\text{d}}$	$V_{\text{D}} = 1/2 \text{ Rated}$ , $T_j = 25^\circ\text{C}$ Gate Supply ( $V_{\text{G}} = 15\text{V}$ , $R_{\text{G}} = 8\Omega$ , $t_{\text{r}} \leq 1\mu\text{s}$ )	—	4	$\mu\text{s}$
Gate Turn-On Time	$t_{\text{gt}}$		—	6	$\mu\text{s}$
Turn-Off Time	$t_{\text{q}}$	$I_{\text{T}} = 800\text{A}$ , $V_{\text{R}} \geq 50\text{V}$ $\text{dv}/\text{dt} = 20\text{V}/\mu\text{s}$ , $T_j = 110^\circ\text{C}$ $V_{\text{DRM}} = 1/2 \text{ Rated}$	—	25	$\mu\text{s}$
Holding Current	$I_{\text{H}}$	$T_j = 25^\circ\text{C}$ , $R_{\text{L}} = 6\Omega$	—	400	mA
Critical Rate of Rise of Off-State Voltage	$\text{dv}/\text{dt}$	$V_{\text{DRM}} = 1/2 \text{ Rated}$ , $T_j = 115^\circ\text{C}$ Gate Open, Exponential Rise	500	—	$\text{V}/\mu\text{s}$
Thermal Resistance (Junction to Case)	$R_{\text{th (j-f)}}$	DC	—	0.05	$^\circ\text{C}/\text{W}$

