

## TOSHIBA ALLOY-FREE REVERSE CONDUCTING THYRISTOR

**SHR400R22**

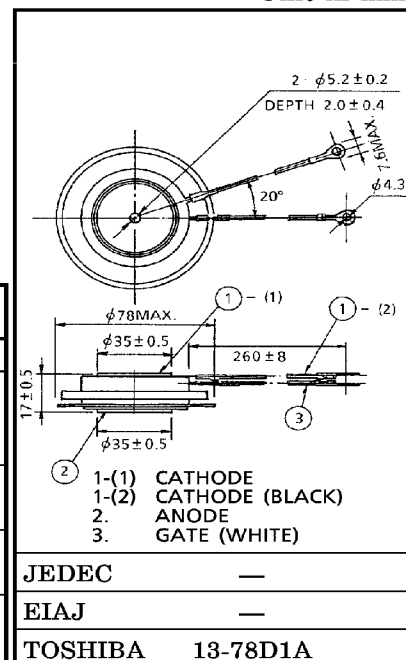
## HIGH POWER CONTROL APPLICATIONS

- Repetitive Peak Off-State Voltage :  $V_{DRM}=1300V$
- R.M.S On-State Current :  $I_T(RMS)=630A$
- Turn-Off Time :  $t_q=40\mu s$  (Max.)
- Flat Package

## MAXIMUM RATINGS

CHARACTERISTIC	SYMBOL	RATING	UNIT
Repetitive Peak Off-State Voltage	$V_{DRM}$	1300	V
Non-Repetitive Peak Off-State Voltage (Non-Repetitive <5ms, $T_j=0\sim115^\circ C$ )	$V_{DSM}$	1300	V
R.M.S On-State Current	$I_T(RMS)$	630	A
R.M.S Reverse Current	$I_R(RMS)$	235	
Average On-State Current	$I_T(AV)$	400	A
Average Reverse Current	$I_R(AV)$	150	
Peak One Cycle Surge On-State Current (Non-Repetitive)	$I_{TSM}$	7200 (50Hz) 8000 (60Hz)	A
Peak One Cycle Surge Reverse Current (Non-Repetitive)	$I_{RSM}$	2500 (50Hz) 2750 (60Hz)	
$I^2t$ Limit Value	$I^2t$	$200 \times 10^3$ (On-Current)	$A^2s$
		$31 \times 10^3$ (Reverse Current)	
Critical Rate of Rise of On-State Current	$di/dt$	100	$A/\mu s$
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	$T_j$	$-40\sim115$	$^\circ C$
Storage Temperature Range	$T_{stg}$	$-40\sim115$	$^\circ C$
Mounting Force	—	1350~1650	kg

Unit in mm



Weight : 260g

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## ELECTRICAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	MAX.	UNIT
Repetitive Peak Off-State Current	$I_{DRM}$	$V_{DRM} = \text{Rated}, T_j = 115^\circ\text{C}$	—	35	mA
Peak On-State Voltage	$V_{TM}$	$I_{TM} = 1250\text{A}, T_j = 25^\circ\text{C}$	—	3.0	V
Peak Reverse Voltage	$V_{RM}$	$I_{RM} = 500\text{A}, T_j = 25^\circ\text{C}$	—	2.5	
Gate Trigger Voltage	$V_{GT}$	$V_D = 6\text{V}, R_L = 6\Omega$	$T_c = -40^\circ\text{C}$	—	4.5
			$T_c = 25^\circ\text{C}$	—	3.0
Gate Trigger Current	$I_{GT}$		$T_c = -40^\circ\text{C}$	—	400
			$T_c = 25^\circ\text{C}$	—	200
Gate Non-Trigger Voltage	$V_{GD}$	$V_D = 1/2 \text{ Rated}, T_j = 115^\circ\text{C}$	0.15	—	V
Gate Non-Trigger Current	$I_{GD}$		1.5	—	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	$t_q$	$I_{TM} = 400\text{A}, I_{RM} = 10\text{A},$ $V_{DRM} = 1/2 \text{ Rated},$ $dv/dt (C) = 200\text{V}/\mu\text{s}, T_j = 115^\circ\text{C}$	—	40	$\mu\text{s}$
Holding Current	$I_H$	$T_j = 25^\circ\text{C}, R_L = 6\Omega$	—	500	mA
Critical Rate of Rise of Commutating OFF-State Voltage	$dv/dt (C)$	$I_{TM} = 2000\text{A}, I_{RM} = 1000\text{A},$ $V_{DRM} = 1/2 \text{ Rated},$ Pulse width $60\mu\text{s}, T_j = 115^\circ\text{C}$	200	—	$\text{V}/\mu\text{s}$
Thermal Resistance (Junction to Case)	$R_{th(j-f)}$	DC	—	0.04	$^\circ\text{C}/\text{W}$
Critical Rate of Rise of Off-State Voltage	$dv/dt$	$V_D = 650\text{V}, T_j = 115^\circ\text{C},$ Gate Open, Exponential Rise	1000	—	$\text{V}/\mu\text{s}$

