

## TOSHIBA ALLOY-FREE REVERSE CONDUCTING THYRISTOR

**SHR400EX25**

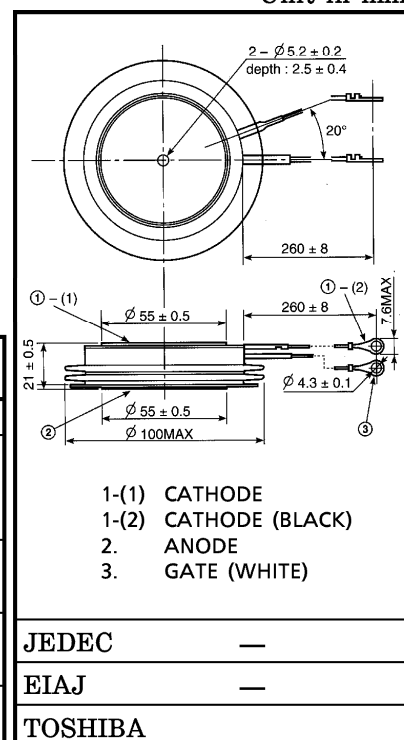
HIGH POWER CONTROL APPLICATIONS

Unit in mm

- Repetitive Peak Off-State Voltage :  $V_{DRM}=2500V$
- 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	$V_{DRM}$	2500	V
Non-Repetitive Peak Off-State Voltage (Non-Repetitive < 5ms, $T_j=0\sim 115^\circ C$ )	$V_{DSM}$	2500	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)	$I_{TSM}$	7000 (50Hz) 7700 (60Hz)	A
Peak One Cycle Surge Reverse Current (Non-Repetitive)	$I_{RSM}$	2500 (50Hz) 2750 (60Hz)	
$I^2t$ Limit Value	$I^2t$	$245 \times 10^3$ (On-Current) $31 \times 10^3$ (Reverse Current)	$A^2s$
Critical Rate of Rise of On-State Current	$di/dt$	200	$A/\mu s$
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	$T_j$	$-40\sim 115$	$^\circ C$
Storage Temperature Range	$T_{stg}$	$-40\sim 115$	$^\circ C$
Mounting Force	—	$19.6 \pm 2$	kN



Weight : 630g (Typ.)

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## ELECTRICAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	TEST CONDITION		MIN.	MAX.	UNIT
Repetitive Peak Off-State Current	I <sub>DRM</sub>	V <sub>DRM</sub> =Rated, T <sub>j</sub> =115°C		—	100	mA
Peak On-State Voltage	V <sub>TM</sub>	I <sub>TM</sub> =1250A, T <sub>j</sub> =25°C		—	3.0	V
Peak Reverse Voltage	V <sub>RM</sub>	I <sub>RM</sub> =500A, T <sub>j</sub> =25°C		—	2.3	
Gate Trigger Voltage	V <sub>GT</sub>	V <sub>D</sub> =12V, R <sub>L</sub> =6Ω	T <sub>j</sub> =−40°C	—	4.0	V
			T <sub>j</sub> =25°C	0.5	3.0	
Gate Trigger Current	I <sub>GT</sub>		T <sub>j</sub> =−40°C	—	500	mA
			T <sub>j</sub> =25°C	15	300	
Gate Non-Trigger Voltage	V <sub>GD</sub>	V <sub>D</sub> =0.5 Rated, T <sub>j</sub> =115°C		0.2	—	V
Gate Non-Trigger Current	I <sub>GD</sub>			5	—	mA
Delay Time	t <sub>d</sub>	V <sub>D</sub> =0.5 Rated, T <sub>j</sub> =25°C, Gate Supply (V <sub>G</sub> =15V, R <sub>G</sub> =8Ω, t <sub>r</sub> ≤1μs) di / dt=200A / μs		—	4	μs
Gate Turn-On Time	t <sub>gt</sub>			—	6	μs
Turn-Off Time	t <sub>q</sub>	I <sub>TM</sub> =400A, I <sub>R</sub> =10A V <sub>DRM</sub> =0.5 Rated dv / dt=350V / μs, T <sub>j</sub> =115°C		—	40	μs
Holding Current	I <sub>H</sub>	T <sub>j</sub> =25°C, R <sub>L</sub> =6Ω		—	1000	mA
Critical Rate of Rise of Commutating OFF-State Voltage	dv / dt (C)	I <sub>TM</sub> =2500A, I <sub>RM</sub> =2500A, V <sub>DRM</sub> =0.5 Rated, Pulse width=100μs, T <sub>j</sub> =115°C		350	—	V / μs
Thermal Resistance (Junction to Case)	R <sub>th (j-f)</sub>	DC		—	0.025	°C / W