

TOSHIBA THYRISTOR SILICON DIFFUSED TYPE

**SF1500GX23**

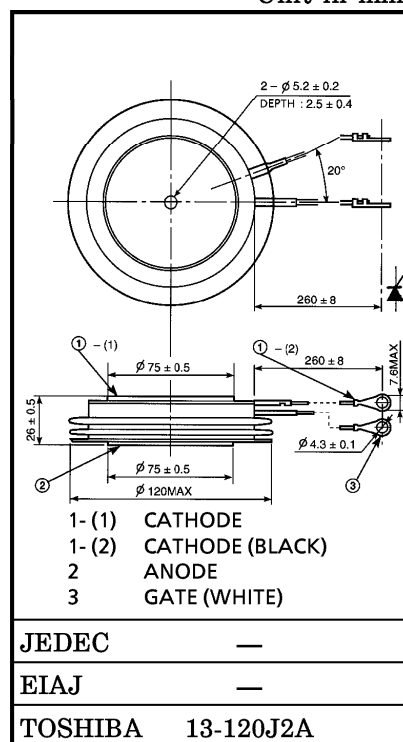
HIGH POWER CONTROL APPLICATIONS

Unit in mm

- Repetitive Peak Off-State Voltage :  $V_{DRM}$  } = 4000V
- Repetitive Peak Reverse Voltage :  $V_{RRM}$  }
- Average On-State Current :  $I_T(AV) = 1500A$
- Turn-Off Time :  $t_q = 400\mu s$  (Max.)
- Critical Rate of Rise of On-State Current :  $di/dt = 250A/\mu s$
- Critical Rate of Rise of Off-State Voltage :  $dv/dt = 1500V/\mu s$
- Flat Package

## MAXIMUM RATINGS

CHARACTERISTIC	SYMBOL	RATING	UNIT
Repetitive Peak Off-State Voltage and Repetitive Peak Reverse Voltage	$V_{DRM}$ $V_{RRM}$	4000	V
Non-Repetitive Peak Reverse Voltage (Non-Repetitive < 5ms, $T_j = 0 \sim 125^\circ C$ )	$V_{RSM}$	4400	V
R.M.S On-State Current	$I_T(RMS)$	2355	A
Average On-State Current	$I_T(AV)$	1500	A
Peak One Cycle Surge On-State Current (Non-Repetitive)	$I_{TSM}$	30000 (50Hz) 33000 (60Hz)	A
$I^2t$ Limit Value	$I^2t$	$4.5 \times 10^6$	$A^2s$
Critical Rate of Rise of On-State Current (Note)	$di/dt$	250	$A/\mu s$
Peak Gate Power Dissipation	$P_{GM}$	30	W
Average Gate Power Dissipation	$P_G(AV)$	4	W
Peak Forward Gate Current	$I_{GM}$	6	A
Peak Forward Gate Voltage	$V_{FGM}$	30	V
Peak Reverse Gate Voltage	$V_{RGM}$	5	V
Junction Temperature	$T_j$	$-40 \sim 125$	$^\circ C$
Storage Temperature Range	$T_{stg}$	$-40 \sim 125$	$^\circ C$
Mounting Force	—	30~45	kN



Weight : 1350g

Note :  $V_D = 2000V$ ,  $f = 50Hz$ ,  $T_j = 125^\circ C$ , Gate Supply ( $V_G = 15V$ ,  $R_G = 8\Omega$ ,  $t_r \leq 1\mu s$ )

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## ELECTRICAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	MAX.	UNIT
Repetitive Peak Off-State Current and Repetitive Peak Reverse Current	$I_{\text{DRM}}$ $I_{\text{RRM}}$	$V_{\text{DRM}} = V_{\text{RRM}} = 4000\text{V}$ , $T_j = 125^\circ\text{C}$	—	120	mA
Peak On-State Voltage	$V_{\text{TM}}$	$I_{\text{TM}} = 5000\text{A}$ , $T_j = 25^\circ\text{C}$	—	2.4	V
Gate Trigger Voltage	$V_{\text{GT}}$	$V_{\text{D}} = 12\text{V}$ , $R_{\text{L}} = 6\Omega$	$T_j = -40^\circ\text{C}$	—	4.5
			$T_j = 25^\circ\text{C}$	—	3.5
Gate Trigger Current	$I_{\text{GT}}$		$T_j = -40^\circ\text{C}$	—	600
			$T_j = 25^\circ\text{C}$	—	400
Gate Non-Trigger Voltage	$V_{\text{GD}}$	$V_{\text{D}} = 2000\text{V}$ , $T_j = 125^\circ\text{C}$	0.2	—	V
Gate Non-Trigger Current	$I_{\text{GD}}$		5	—	mA
Delay Time	$t_{\text{d}}$	$V_{\text{D}} = 2000\text{V}$ , $T_j = 25^\circ\text{C}$ Gate Supply	—	5	$\mu\text{s}$
Gate Turn-On Time	$t_{\text{gt}}$	( $V_{\text{G}} = 15\text{V}$ , $R_{\text{G}} = 8\Omega$ , $t_{\text{r}} \leq 1\mu\text{s}$ )	—	10	$\mu\text{s}$
Turn-Off Time	$t_{\text{q}}$	$I_{\text{T}} = 1200\text{A}$ , $V_{\text{R}} \geq 200\text{V}$ , $dv/dt = 25\text{V}/\mu\text{s}$ , $T_j = 125^\circ\text{C}$ $V_{\text{DRM}} = 2000\text{V}$ , $di/dt = 2\text{A}/\mu\text{s}$	—	400	$\mu\text{s}$
Holding Current	$I_{\text{H}}$	$T_j = 25^\circ\text{C}$ , $R_{\text{L}} = 6\Omega$	—	300	mA
Critical Rate of Rise of Off-State Voltage	$dv/dt$	$V_{\text{DRM}} = 2670\text{V}$ , $T_j = 125^\circ\text{C}$ Gate Open Exponential Rise	1500	—	$\text{V}/\mu\text{s}$
Thermal Resistance	$R_{\text{th(j-f)}}$	Junction to Fin	—	0.0125	$^\circ\text{C}/\text{W}$

