

TOSHIBA THYRISTOR SILICON DIFFUSED TYPE

SF1500GX22

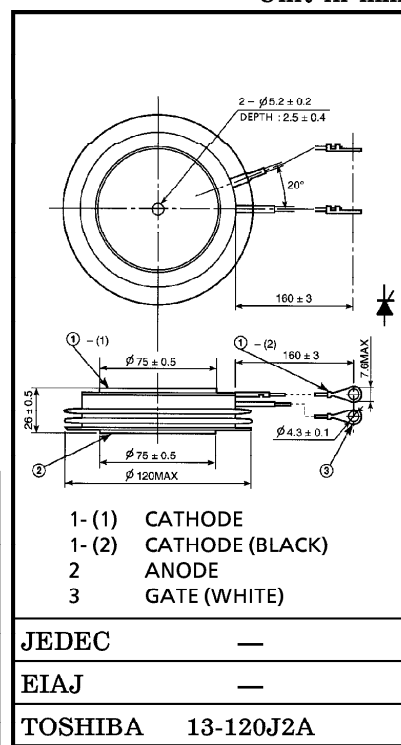
HIGH POWER CONTROL APPLICATIONS

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	4500×10^3	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	—	39.2 ± 3.9	kN



Weight : 1350g

Note : $V_D = 1/2$ Rated, $T_j = 120^\circ C$, Gate Supply ($V_G = 15V$, $R_G = 8\Omega$, $t_r \leq 1\mu s$)

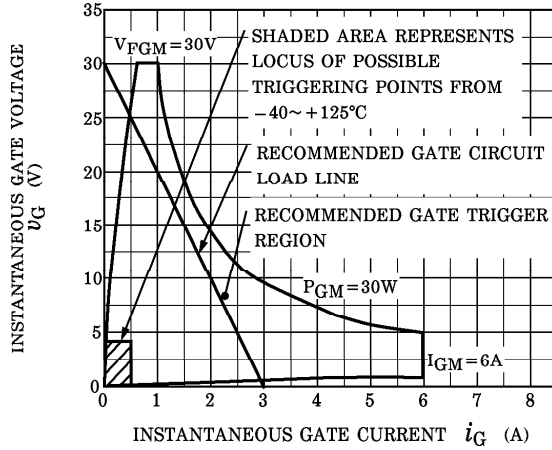
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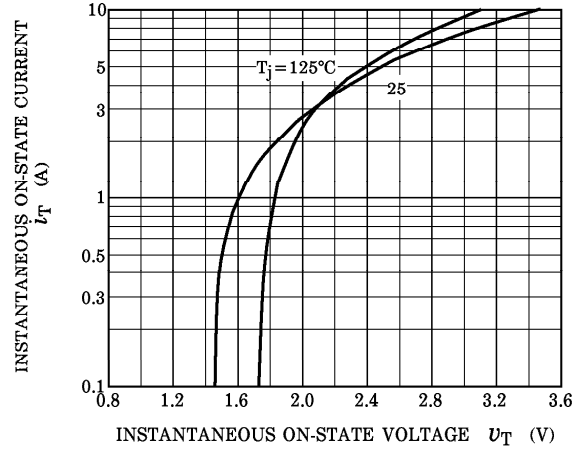
ELECTRICAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	TEST CONDITION		MIN.	MAX.	UNIT
Repetitive Peak Off-State Current and Repetitive Peak Reverse Current	I_{DRM} I_{RRM}	$V_{\text{DRM}}=V_{\text{RRM}}=\text{Rated}$, $T_{\text{j}}=125^{\circ}\text{C}$		—	120	mA
Peak On-State Voltage	V_{TM}	$I_{\text{TM}}=5000\text{A}$, $T_{\text{j}}=25^{\circ}\text{C}$		—	2.4	V
Gate Trigger Voltage	V_{GT}	$V_{\text{D}}=12\text{V}$, $R_{\text{L}}=6\Omega$	$T_{\text{j}}=-40^{\circ}\text{C}$	—	4.5	V
			$T_{\text{j}}=25^{\circ}\text{C}$	—	3.5	
Gate Trigger Current	I_{GT}		$T_{\text{j}}=-40^{\circ}\text{C}$	—	600	mA
			$T_{\text{j}}=25^{\circ}\text{C}$	—	400	
Gate Non-Trigger Voltage	V_{GD}	$V_{\text{D}}=1/2\text{ Rated}$, $T_{\text{j}}=125^{\circ}\text{C}$		0.2	—	V
Gate Non-Trigger Current	I_{GD}			5	—	mA
Delay Time	t_{d}	$V_{\text{D}}=0.5\text{ Rated}$, $T_{\text{j}}=25^{\circ}\text{C}$ Gate Supply ($V_{\text{G}}=15\text{V}$, $R_{\text{G}}=8\Omega$, $t_{\text{r}}\leq 1\mu\text{s}$)		—	5	μs
Gate Turn-On Time	t_{gt}			—	10	μs
Turn-Off Time	t_{q}	$I_{\text{T}}=1200\text{A}$, $V_{\text{R}}\geq 200\text{V}$, $\text{d}v/\text{d}t=25\text{V}/\mu\text{s}$, $T_{\text{j}}=115^{\circ}\text{C}$, $V_{\text{DRM}}=1/2\text{ Rated}$		—	400	μs
Holding Current	I_{H}	$T_{\text{j}}=25^{\circ}\text{C}$, $R_{\text{L}}=6\Omega$		—	300	mA
Critical Rate of Rise of Off-State Voltage	$\text{d}v/\text{d}t$	$V_{\text{DRM}}=1/2\text{ Rated}$, $T_{\text{j}}=125^{\circ}\text{C}$ Gate Open Exponential Rise		1500	—	$\text{V}/\mu\text{s}$
Thermal Resistance	$R_{\text{th (j-f)}}$	Junction to Fin		—	0.0125	$^{\circ}\text{C}/\text{W}$

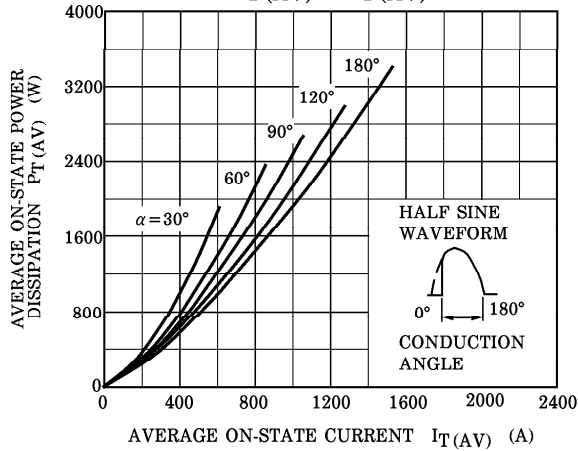
GATE TRIGGER CHARACTERISTIC



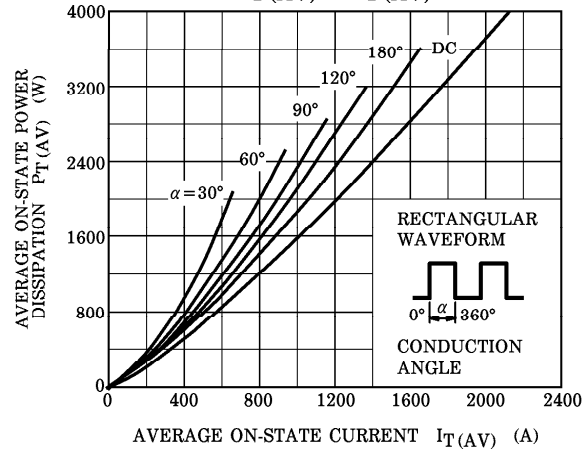
$i_T - v_T$



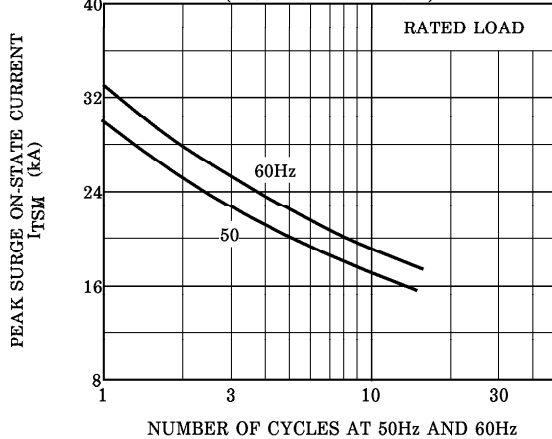
$P_T(\text{AV}) - I_T(\text{AV})$



$P_T(\text{AV}) - I_T(\text{AV})$



SURGE ON-STATE CURRENT (NON-REPETITIVE)



TRANSIENT THERMAL IMPEDANCE (JUNCTION TO FIN)

