

TOSHIBA THYRISTOR SILICON DIFFUSED TYPE

SF1500GX22

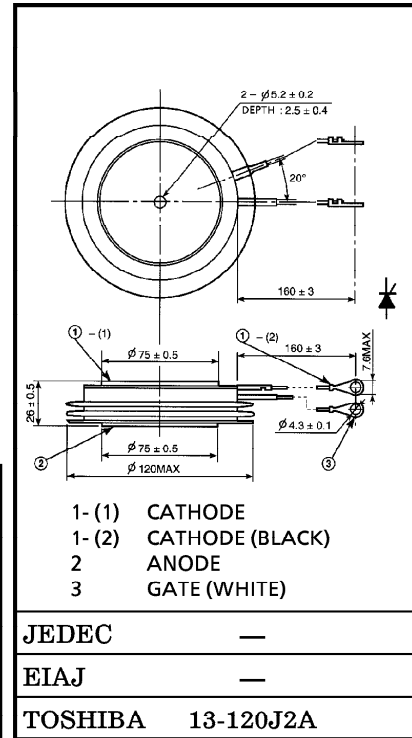
HIGH POWER CONTROL APPLICATIONS

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} | 4000 | V |
| | V_{RRM} | | |
| 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) | A |
| | | 33000 (60Hz) | |
| 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 ($V_G = 15V$, $R_G = 8\Omega$, $t_r \leq 1\mu s$)

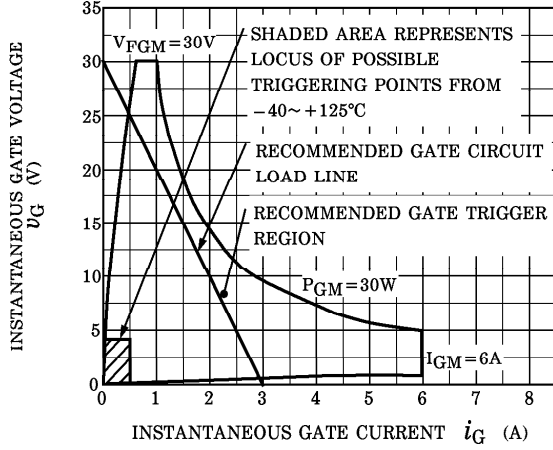
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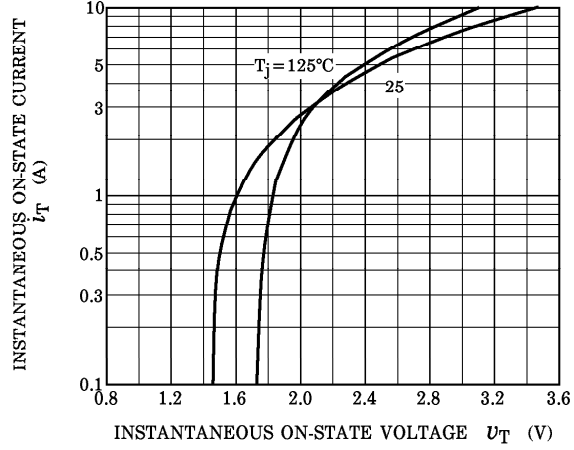
ELECTRICAL CHARACTERISTICS

| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN. | MAX. | UNIT | |
|---|------------------------|--|---------------------------|--------|---------------------------|----|
| Repetitive Peak Off-State Current and Repetitive Peak Reverse Current | I_{DRM} I_{RRM} | $V_{DRM} = V_{RRM} = \text{Rated}$, $T_j = 125^\circ\text{C}$ | — | 120 | mA | |
| Peak On-State Voltage | V_{TM} | $I_{TM} = 5000\text{A}$, $T_j = 25^\circ\text{C}$ | — | 2.4 | V | |
| Gate Trigger Voltage | V_{GT} | $V_D = 12\text{V}$, $R_L = 6\Omega$ | $T_j = -40^\circ\text{C}$ | — | 4.5 | V |
| | | | $T_j = 25^\circ\text{C}$ | — | 3.5 | |
| Gate Trigger Current | I_{GT} | | $T_j = -40^\circ\text{C}$ | — | 600 | mA |
| | | | $T_j = 25^\circ\text{C}$ | — | 400 | |
| Gate Non-Trigger Voltage | V_{GD} | $V_D = 1/2 \text{ Rated}$, $T_j = 125^\circ\text{C}$ | 0.2 | — | V | |
| Gate Non-Trigger Current | I_{GD} | | 5 | — | mA | |
| Delay Time | t_d | $V_D = 0.5 \text{ Rated}$, $T_j = 25^\circ\text{C}$ Gate Supply ($V_G = 15\text{V}$, $R_G = 8\Omega$, $t_r \leq 1\mu\text{s}$) | — | 5 | μs | |
| Gate Turn-On Time | t_{gt} | | — | 10 | μs | |
| Turn-Off Time | t_q | $I_T = 1200\text{A}$, $V_R \geq 200\text{V}$, $dv/dt = 25\text{V}/\mu\text{s}$, $T_j = 115^\circ\text{C}$, $V_{DRM} = 1/2 \text{ Rated}$ | — | 400 | μs | |
| Holding Current | I_H | $T_j = 25^\circ\text{C}$, $R_L = 6\Omega$ | — | 300 | mA | |
| Critical Rate of Rise of Off-State Voltage | dv/dt | $V_{DRM} = 1/2 \text{ Rated}$, $T_j = 125^\circ\text{C}$ Gate Open Exponential Rise | 1500 | — | $\text{V}/\mu\text{s}$ | |
| Thermal Resistance | $R_{th(j-f)}$ | Junction to Fin | — | 0.0125 | $^\circ\text{C}/\text{W}$ | |

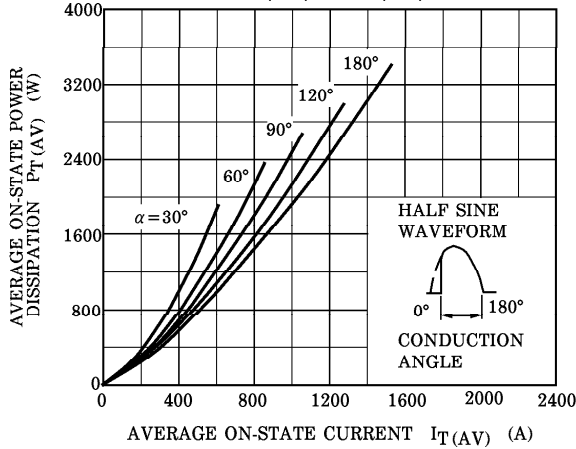
GATE TRIGGER CHARACTERISTIC



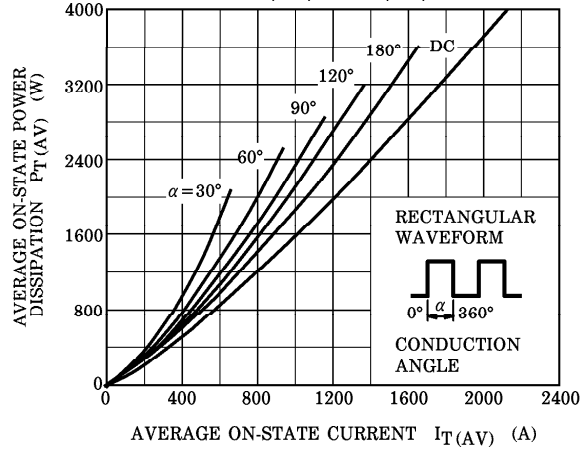
$i_T - v_T$



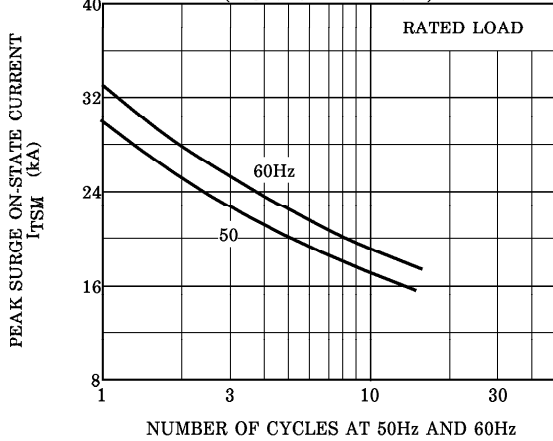
$P_T (AV) - I_T (AV)$



$P_T (AV) - I_T (AV)$



SURGE ON-STATE CURRENT (NON-REPETITIVE)



TRANSIENT THERMAL IMPEDANCE (JUNCTION TO FIN)

