

TOSHIBA GATE TURN-OFF THYRISTOR REVERSE CONDUCTING TYPE

SGR3000GXH26

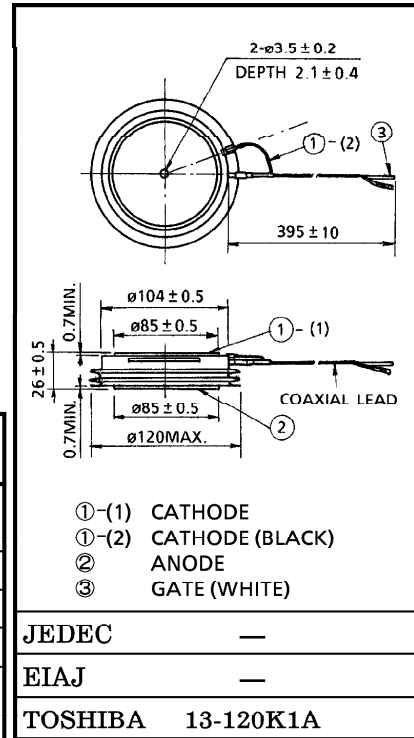
INVERTER APPLICATION

Unit in mm

- Repetitive Peak Off-State Voltage : $V_{DRM}=4500V$ (Note 1)
- R.M.S On-State Current : $I_T(RMS)=1200A$ ($T_f=77^\circ C$)
- R.M.S Reverse Current : $I_R(RMS)=900A$ ($T_f=77^\circ C$)
- Peak Turn-Off Current : $I_{TGQM}=3000A$
- Critical Rate of Rise of On-State Current : $di/dt=600A/\mu s$
- Critical Rate of Rise of Off-State Current : $dv/dt=1000V/\mu s$

MAXIMUM RATINGS

| CHARACTERISTIC | SYMBOL | RATING | UNIT |
|--|--------------|----------------|-------------|
| Repetitive Peak Off-State Voltage (Note 1) | V_{DRM} | 4500 | V |
| Peak Turn-Off Current (Note 2) | I_{TGQM} | 3000 | A |
| R.M.S On-State Current (Note 3) | $I_T(RMS)$ | 1200 | A |
| R.M.S Reverse Current (Note 3) | $I_R(RMS)$ | 900 | A |
| Peak One Cycle Surge On-State Current (non repetitive, 10ms-width half sine waveform) | I_{TSM} | 16000 | A |
| Peak One Cycle Surge Reverse Current (non repetitive, 10ms-width half sine waveform) | I_{RSM} | 14000 | A |
| Critical Rate of Rise of On-State Current (Note 4) | di/dt | 600 | A / μs |
| Peak Forward Gate Current | I_{FGM} | 100 | A |
| Average Forward Gate Power Dissipation | $P_{FG(AV)}$ | 50 | W |
| Average Reverse Gate Power Dissipation | $P_{RG(AV)}$ | 230 | W |
| Peak Reverse Gate Power Dissipation | P_{RGM} | 30 | kW |
| R.M.S Gate Current (Note 5) | $I_G(RMS)$ | 42 | A |
| Peak Reverse Gate Voltage (at Static) | V_{RGM} | 16 | V |
| Operating Junction Temperature Range | T_j | -40~125 | $^\circ C$ |
| Storage Temperature Range | T_{stg} | -40~150 | $^\circ C$ |
| Mounting Force | — | 39.2 ± 4.9 | kN |



Weight : 1700g

Note 1 : $V_{GK} \leq -2V$

Note 2 : $V_{DM}=4000V$, $C_S=3.5\mu F$, $R_S=5\Omega$, $di_{GQ}/dt=50A/\mu s$, $L_S \leq 0.2\mu H$, $V_{DSP} \leq 1030V$

Note 3 : 50Hz Half Sine Waveform at $T_f=77^\circ C$

Note 4 : $V_D=1/2 V_{DRM}$, $I_{TM}=4000A$, $I_{GM} \geq 25A$

Note 5 : Ambient Temperature of coaxial gate-cathode lead= $90^\circ C$

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ELECTRICAL CHARACTERISTICS

| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT | |
|--|--------------------|--|---------------------|------|------|------------|--------------|
| Repetitive Peak Off-State Current | I_{DRM} | $V_{DRM} = \text{RATED}$, $V_{GK} = -2V$, $T_j = 125^\circ C$ | — | — | 150 | mA | |
| Repetitive Peak Reverse Gate Current | I_{RGM} | $V_{RGM} = 18V$, $T_j = 25^\circ C$ | — | — | 250 | mA | |
| Peak On-State Voltage | V_{TM} | $I_{TM} = 3000A$, $T_j = 125^\circ C$ | — | — | 4.0 | V | |
| Peak Reverse Voltage | V_{RM} | $I_{RM} = 3000A$, $T_j = 125^\circ C$ | — | — | 4.0 | V | |
| Gate Trigger Voltage | V_{GT} | $V_D = 24V$, $R_L = 0.1\Omega$ | $T_j = -40^\circ C$ | — | — | 1.5 | V |
| | $T_j = 25^\circ C$ | | — | — | 1.20 | | |
| Gate Trigger Current | I_{GT} | | $T_j = -40^\circ C$ | — | — | 8.0 | A |
| | $T_j = 25^\circ C$ | | — | — | 3.0 | | |
| Turn-On Delay Time | t_d | $V_D = 1/2 V_{DRM}$, $I_{TM} = 4000A$, $di/dt = 600A/\mu s$, $I_{GM} = 25A$, $di_G/dt = 10A/\mu s$, $T_j = 25^\circ C$ | — | — | 3 | μs | |
| Turn-On Time | t_{gt} | | — | — | 10 | | |
| Critical Rate of Rise of Off-State Voltage | dv/dt | $V_{DRM} = 2/3 \text{ RATED}$, $T_j = 125^\circ C$, $V_{GK} = -15V$ | 1000 | — | — | V/ μs | |
| Storage Time | t_s | $V_{DM} = 4000V$, $I_{TGQ} = 3000A$, $V_D = 1/2 V_{DRM}$, $di_{GQ}/dt = 50A/\mu s$, $C_S = 3.5\mu F$, $R_S = 5\Omega$, $T_j = 125^\circ C$, $L_S \leq 0.2\mu H$ | — | — | 27.0 | μs | |
| Gate Turn-Off Time | t_{gq} | | — | — | 30.0 | | |
| Gate Turn-Off Current | I_{GQ} | | — | — | 800 | A | |
| Tail Time | t_{tail} | | ($V_D = 1000V$) | — | — | 115 | μs |
| Commutating Critical Rate of Rise of Off-State Voltage | $dv/dt (c)$ | $I_{RM} = 3500A$, $di_R/dt = 300A/\mu s$, $V_D = 1500V$, $V_{DM} = 3000V$, $C_S = 3.5\mu F$, $V_{GK} = -2V$, $T_j = 125^\circ C$ | 350 | — | — | V/ μs | |
| Reverse Recovery Charge | Q_{rr} | $I_{RM} = 2000A$, $V_D = 500V$, $di_R/dt = 100A/\mu s$, $T_j = 125^\circ C$ (no snubber circuit) | — | — | 2200 | μC | |
| Peak Reverse Recovery Current | I_{rr} | | — | — | 500 | A | |
| Thermal Resistance (Junction to Fin) | $R_{th(j-f)}$ | DC | GTO Side | — | — | 0.016 | $^\circ C/W$ |
| | | | Diode Side | — | — | 0.025 | |

