

# SG1400EX21

GATE TURN-OFF THYRISTOR  
SILICON DIFFUSED TYPE

CHOPPER, INVERTER APPLICATION.

## FEATURES:

- . Repetitive Peak Off-State Voltage :  $V_{DRM}=2500V$
- . Repetitive Peak Reverse Voltage :  $V_{RRM}=500V$
- . R.M.S On-State Current :  $I_T(RMS)=700A$
- . Peak Turn-Off Current :  $I_{TGQM}=1400A$
- . Critical Rate of Rise of On-State Current  
:  $di/dt=250A/\mu s$
- . Critical Rate of Rise of Off-State Voltage  
:  $dv/dt=500V/\mu s$
- . Flat Package

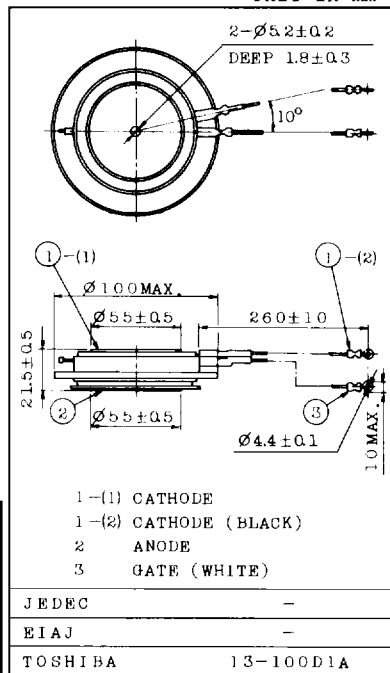
## MAXIMUM RATINGS

| CHARACTERISTIC                                         | SYMBOL     | RATING                     | UNIT       |
|--------------------------------------------------------|------------|----------------------------|------------|
| Repetitive Peak Off-State Voltage                      | $V_{DRM}$  | 2500                       | V          |
| Repetitive Peak Reverse Voltage                        | $V_{RRM}$  | 500                        | V          |
| Peak Turn-Off Current (Note 2)                         | $I_{TGQM}$ | 1400                       | A          |
| R.M.S On-State Current                                 | $I_T(RMS)$ | 700                        | A          |
| Peak One Cycle Surge On-State Current (Non-Repetitive) | $I_{TSM}$  | 14000(50Hz)<br>15400(60Hz) | A          |
| Critical Rate of Rise of On-State Current (Note 1)     | $di/dt$    | 250                        | A/ $\mu s$ |
| Peak Forward Gate Power Dissipation                    | $P_{FGM}$  | 20                         | W          |
| Peak Reverse Gate Power Dissipation                    | $P_{RGM}$  | 10                         | kW         |
| Average Forward Gate Power Dissipation                 | $P_G(AV)$  | 4                          | W          |
| Peak Forward Gate Current                              | $I_{FGM}$  | 20                         | A          |
| Peak Reverse Gate Voltage                              | $V_{RGM}$  | 12                         | V          |
| Storage Temperature Range                              | $T_{stg}$  | -40 ~ 115                  | °C         |
| Operating Junction Temperature Range                   | $T_j$      | -40 ~ 115                  | °C         |
| Mounting Force                                         | -          | 2000±200                   | kg         |

Note 1 :  $V_D=1/2$  Rated, Gate Supply ( $I_G=20A$ ,  $t_r \leq 1\mu s$ ),  $f=50Hz$

Note 2 : Snubber  $C_S=2\mu F$ ,  $R_S=20\Omega$

Unit in mm



Weight : 700g

## ELECTRICAL CHARACTERISTICS

| CHARACTERISTIC                             | SYMBOL        | TEST CONDITION                                                                                                          |                           | MIN. | TYP. | MAX. | UNIT                      |
|--------------------------------------------|---------------|-------------------------------------------------------------------------------------------------------------------------|---------------------------|------|------|------|---------------------------|
| Repetitive Peak Off-State Current          | $I_{DRM}$     | $V_{DRM}, V_{RRM} = \text{Rated}$<br>$R_{GK} = 20\Omega, T_j = 115^\circ\text{C}$                                       |                           | -    | -    | 50   | mA                        |
| Repetitive Peak Reverse Current            | $I_{RRM}$     |                                                                                                                         |                           | -    | -    | 50   | mA                        |
| Peak On-State Voltage                      | $V_{TM}$      | $I_{TM} = 1400\text{A}, T_c = 25^\circ\text{C}$                                                                         |                           | -    | -    | 2.62 | V                         |
| Gate Trigger Voltage                       | $V_{GT}$      | $V_D = 12\text{V}$<br>$R_L = 0.5\Omega$                                                                                 | $T_c = -40^\circ\text{C}$ | -    | 1.5  | -    | V                         |
|                                            |               |                                                                                                                         | $T_c = 25^\circ\text{C}$  | -    | 0.7  | 1.5  |                           |
| Gate Trigger Current                       | $I_{GT}$      |                                                                                                                         | $T_c = -40^\circ\text{C}$ | -    | 5.0  | -    | A                         |
|                                            |               |                                                                                                                         | $T_c = 25^\circ\text{C}$  | -    | 0.5  | 1.0  |                           |
| Gate Non-Trigger Voltage                   | $V_{GD}$      | $V_D = 1/2 \text{ Rated}, T_c = 115^\circ\text{C}$                                                                      |                           | 0.3  | -    | -    | V                         |
| Gate Non-Trigger Current                   | $I_{GD}$      |                                                                                                                         |                           | 10   | -    | -    | mA                        |
| Delay Time                                 | $t_d$         | $V_D = 1/2 \text{ Rated}, T_c = 25^\circ\text{C}$<br>Gate Supply<br>( $I_G = 10\text{A}, t_r \leq 2\mu\text{s}$ )       |                           | -    | -    | 6    | $\mu\text{s}$             |
| Gate Turn-On Time                          | $t_{gt}$      |                                                                                                                         |                           | -    | -    | 12   | $\mu\text{s}$             |
| Critical Rate of Rise of Off-State Voltage | $dv/dt$       | $V_{DRM} = 2/3 \text{ Rated}$<br>$T_j = 115^\circ\text{C}, R_{GK} = 20\Omega$<br>$V_G = -4\text{V}$<br>Exponential Rise |                           | 500  | -    | -    | $\text{V}/\mu\text{s}$    |
| Holding Current                            | $I_H$         | $T_c = 25^\circ\text{C}, R_{GK} = 20\Omega, R_L = 0.5\Omega$                                                            |                           | -    | 10   | -    | A                         |
| Gate Turn-Off Voltage                      | $V_{GQ}$      | $I_T = 1400\text{A}$<br>$V_{DRM} = 2/3 \text{ Rated}$<br>$dv/dt = 200\text{V}/\mu\text{s}, T_c = 110^\circ\text{C}$     |                           | -    | 35   | -    | V                         |
| Gate Turn-Off Current                      | $I_{GQ}$      |                                                                                                                         |                           | -    | 300  | -    | A                         |
| Storage Time                               | $t_s$         | $dI_{RG}/dt = 30\text{A}/\mu\text{s}$<br>$I_T = 1400\text{A}, I_{RG} = 350\text{A}$                                     |                           | -    | -    | 20   | $\mu\text{s}$             |
| Gate Turn-Off Time                         | $t_{gq}$      | $dv/dt = 200\text{V}/\mu\text{s}, T_c = 110^\circ\text{C}$<br>$V_{DRM} = 2/3 \text{ Rated}$                             |                           | -    | -    | 25   | $\mu\text{s}$             |
| Thermal Resistance                         | $R_{th(j-f)}$ | Junction to Fin                                                                                                         |                           | -    | -    | 0.03 | $^\circ\text{C}/\text{W}$ |

