

TOSHIBA BI-DIRECTIONAL TRIODE THYRISTOR SILICON PLANAR TYPE

**SM8G45, SM8J45, SM8G45A, SM8J45A**

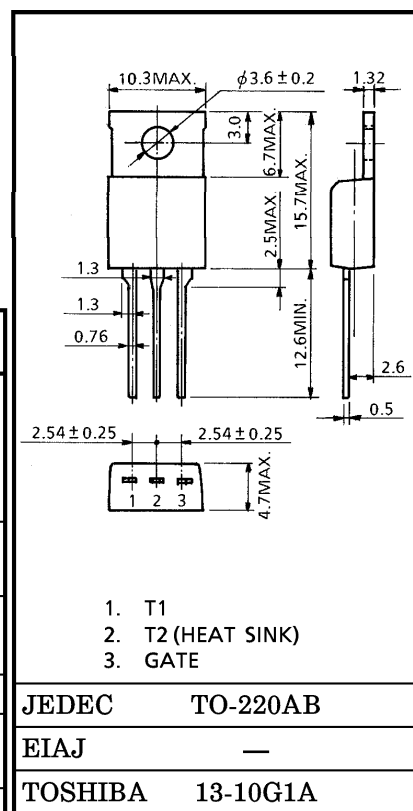
AC POWER CONTROL APPLICATIONS

Unit in mm

- Repetitive Peak Off-State Voltage :  $V_{DRM} = 400, 600V$
- R.M.S On-State Current :  $I_T (RMS) = 8A$
- High Commutating (dv / dt)

## MAXIMUM RATINGS

| CHARACTERISTIC                                                      | SYMBOL      | RATING         | UNIT        |
|---------------------------------------------------------------------|-------------|----------------|-------------|
| Repetitive Peak Off-State Voltage                                   | $V_{DRM}$   | 400            | V           |
|                                                                     |             | 600            |             |
| R.M.S On-State Current<br>(Full Sine Waveform $T_c = 105^\circ C$ ) | $I_T (RMS)$ | 8              | A           |
| Peak One Cycle Surge On-State Current (Non-Repetitive)              | $I_{TSM}$   | 80 (50Hz)      | A           |
|                                                                     |             | 88 (60Hz)      |             |
| $I^2t$ Limit Value                                                  | $I^2t$      | 32             | $A^2s$      |
| Critical Rate of Rise of On-State Current                           | $di / dt$   | 50             | $A / \mu s$ |
| Peak Gate Power Dissipation                                         | $P_{GM}$    | 5              | W           |
| Average Gate Power Dissipation                                      | $P_G (AV)$  | 0.5            | W           |
| Peak Gate Voltage                                                   | $V_{GM}$    | 10             | V           |
| Peak Gate Current                                                   | $I_{GM}$    | 2              | A           |
| Junction Temperature                                                | $T_j$       | $-40 \sim 125$ | $^\circ C$  |
| Storage Temperature Range                                           | $T_{stg}$   | $-40 \sim 125$ | $^\circ C$  |



Weight : 2.0g

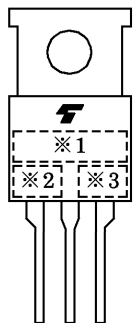
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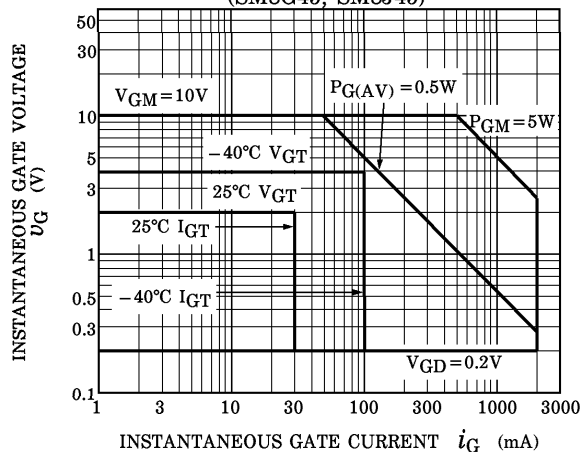
## ELECTRICAL CHARACTERISTICS (Ta = 25°C)

| CHARACTERISTIC                                            |                    |                        | SYMBOL                                                                                   | TEST CONDITION                                 |                  | MIN. | TYP.   | MAX. | UNIT   |
|-----------------------------------------------------------|--------------------|------------------------|------------------------------------------------------------------------------------------|------------------------------------------------|------------------|------|--------|------|--------|
| Repetitive Peak Off-State Current                         |                    |                        | I <sub>DRM</sub>                                                                         | V <sub>DRM</sub> =Rated, T <sub>j</sub> =125°C |                  | —    | —      | 2    | mA     |
| Gate Trigger Voltage                                      | SM8G45<br>SM8J45   | I                      | V <sub>GT</sub>                                                                          | V <sub>D</sub> =12V,<br>R <sub>L</sub> =20Ω    | T2 (+), Gate (+) | —    | —      | 2    | V      |
|                                                           |                    | II                     |                                                                                          |                                                | T2 (+), Gate (—) | —    | —      | 2    |        |
|                                                           |                    | III                    |                                                                                          |                                                | T2 (—), Gate (—) | —    | —      | 2    |        |
|                                                           |                    | IV                     |                                                                                          |                                                | T2 (—), Gate (+) | —    | —      | —    |        |
|                                                           | SM8G45A<br>SM8J45A | I                      |                                                                                          |                                                | T2 (+), Gate (+) | —    | —      | 1.5  |        |
|                                                           |                    | II                     |                                                                                          |                                                | T2 (+), Gate (—) | —    | —      | 1.5  |        |
|                                                           |                    | III                    |                                                                                          |                                                | T2 (—), Gate (—) | —    | —      | 1.5  |        |
|                                                           |                    | IV                     |                                                                                          |                                                | T2 (—), Gate (+) | —    | —      | —    |        |
| Gate Trigger Current                                      | SM8G45<br>SM8J45   | I                      | I <sub>GT</sub>                                                                          | V <sub>D</sub> =12V,<br>R <sub>L</sub> =20Ω    | T2 (+), Gate (+) | —    | —      | 30   | mA     |
|                                                           |                    | II                     |                                                                                          |                                                | T2 (+), Gate (—) | —    | —      | 30   |        |
|                                                           |                    | III                    |                                                                                          |                                                | T2 (—), Gate (—) | —    | —      | 30   |        |
|                                                           |                    | IV                     |                                                                                          |                                                | T2 (—), Gate (+) | —    | —      | —    |        |
|                                                           | SM8G45A<br>SM8J45A | I                      |                                                                                          |                                                | T2 (+), Gate (+) | —    | —      | 20   |        |
|                                                           |                    | II                     |                                                                                          |                                                | T2 (+), Gate (—) | —    | —      | 20   |        |
|                                                           |                    | III                    |                                                                                          |                                                | T2 (—), Gate (—) | —    | —      | 20   |        |
|                                                           |                    | IV                     |                                                                                          |                                                | T2 (—), Gate (+) | —    | —      | —    |        |
| Peak On-State Voltage                                     |                    |                        | V <sub>TM</sub>                                                                          | I <sub>TM</sub> =12A                           |                  | —    | —      | 1.5  | V      |
| Gate Non-Trigger Voltage                                  |                    |                        | V <sub>GD</sub>                                                                          | V <sub>D</sub> =Rated, T <sub>c</sub> =125°C   |                  | 0.2  | —      | —    | V      |
| Holding Current                                           |                    |                        | I <sub>H</sub>                                                                           | V <sub>D</sub> =12V, I <sub>TM</sub> =1A       |                  | —    | —      | 50   | mA     |
| Thermal Resistance                                        |                    |                        | R <sub>th(j-c)</sub>                                                                     | Junction to Case, AC                           |                  | —    | —      | 2.0  | °C / W |
| Critical Rate of Rise of Off-State Voltage at Commutation | SM8G45<br>SM8J45   | (dv / dt) <sub>c</sub> | V <sub>DRM</sub> =400V,<br>(di / dt) <sub>c</sub> = −4.5A / ms,<br>T <sub>j</sub> =125°C | 10                                             | —                | —    | V / μs |      |        |
|                                                           | SM8G45A<br>SM8J45A |                        |                                                                                          | 4                                              | —                | —    |        |      |        |

## MARKING



| NUMBER | SYMBOL                                                                                                                                                                                    |                  | MARK                                                                     |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|--------------------------------------------------------------------------|
| ※1     | TYPE                                                                                                                                                                                      | SM8G45, SM8G45A  | M8G45                                                                    |
|        |                                                                                                                                                                                           | SM8J45, SM8J45A  | M8J45                                                                    |
| ※2     |                                                                                                                                                                                           | SM8G45A, SM8J45A | A                                                                        |
| ※3     | Lot Number<br> Month (Starting from<br>Alphabet A)<br>Year (Last Decimal Digit of<br>the Current Year) |                  | Example<br>8A : January 1998<br>8B : February 1998<br>8L : December 1998 |

GATE TRIGGER CHARACTERISTIC  
(SM8G45, SM8J45)GATE TRIGGER CHARACTERISTIC  
(SM8G45A, SM8J45A)