

# TRIAC(Through Hole / Isolated)

# TMG12CQ60F

(T<sub>j</sub>=150°C)

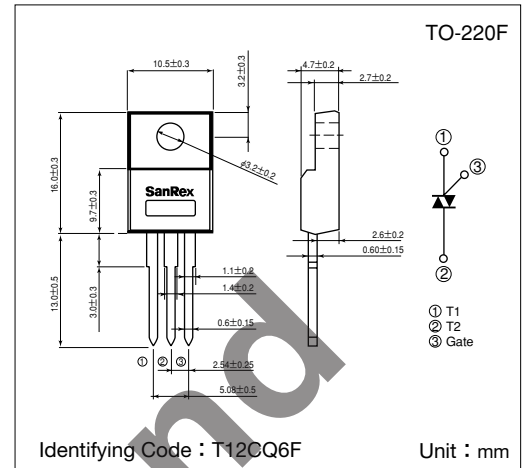
**SanRex** Triac TMG12CQ60F is designed for full wave AC control applications. It can be used as an ON/OFF function or for phase control operation.

### Typical Applications

- Home Appliances : Washing Machines, Vacuum Cleaners, Rice Cookers, Micro Wave Ovens, Hair Dryers, other control applications
- Industrial Use : SMPS, Copier Machines, Motor Controls, Dimmer, SSR, Heater Controls, Vending Machines, other control applications

### Features

- I<sub>T(RMS)</sub>=12A
- High Surge Current
- Low Voltage Drop
- Lead-Free Package



### Maximum Ratings

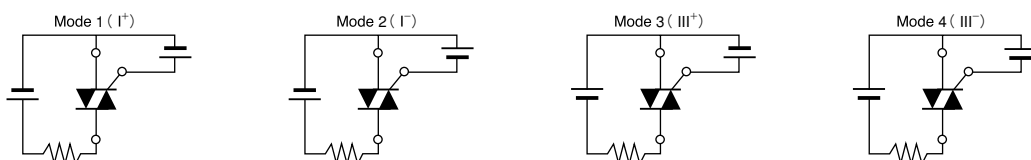
(T<sub>j</sub>=25°C unless otherwise specified)

| Symbol                      | Item                                     | Reference                                       | Ratings  | Unit             |
|-----------------------------|--|---|----------|------------------|
| V <sub>DRM</sub>            | Repetitive Peak Off-State Voltage        |   | 600      | V                |
| I <sub>T(RMS)</sub>         | R.M.S. On-State Current                  | T <sub>c</sub> =103°C                           | 12       | A                |
| I <sub>TSM</sub>            | Surge On-State Current                   | One cycle, 50Hz/60Hz, Peak value non-repetitive | 119/130  | A                |
| I <sup>2</sup> <sub>t</sub> | I <sup>2</sup> <sub>t</sub> (for fusing) |   | 71       | A <sup>2</sup> S |
| P <sub>GM</sub>             | Peak Gate Power Dissipation              |   | 5        | W                |
| P <sub>G(AV)</sub>          | Average Gate Power Dissipation           |   | 0.5      | W                |
| I <sub>GM</sub>             | Peak Gate Current                        |   | 2        | A                |
| V <sub>GM</sub>             | Peak Gate Voltage                        |   | 10       | V                |
| V <sub>ISO</sub>            | Isolation Breakdown Voltage (R.M.S.)     | A.C. 1minute                                    | 1500     | V                |
| T <sub>j</sub>              | Operating Junction Temperature           |   | -40~+150 | °C               |
| T <sub>stg</sub>            | Storage Temperature                      |   | -40~+150 | °C               |
|                             | Mass                                     |   | 2        | g                |

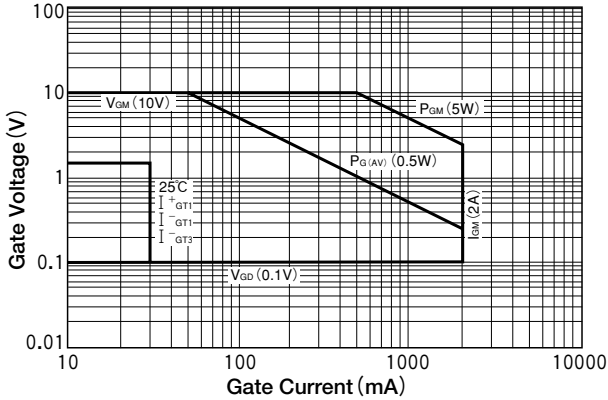
### Electrical Characteristics

| Symbol                        | Item  | Reference  | Ratings |      |      | Unit |
|-------------------------------|---|--|---------|------|------|------|
|                               |   |  | Min.    | Typ. | Max. |      |
| I <sub>DRM</sub>              | Repetitive Peak Off-State Current                         | V <sub>D</sub> =V <sub>DRM</sub> , Single phase, half wave, T <sub>j</sub> =150°C        |         |      | 2    | mA   |
| V <sub>TM</sub>               | Peak On-State Voltage                                     | I <sub>T</sub> =20A, Inst. measurement   |         |      | 1.4  | V    |
| I <sub>GT1</sub> <sup>+</sup> | Gate Trigger Current                                      | V <sub>D</sub> =6V, R <sub>L</sub> =10Ω  | 1       |      | 30   | mA   |
| I <sub>GT1</sub> <sup>-</sup> |   |  | 2       |      | 30   |      |
| I <sub>GT3</sub> <sup>+</sup> |   |  | 3       |      | —    |      |
| I <sub>GT3</sub> <sup>-</sup> |   |  | 4       |      | 30   |      |
| V <sub>GT1</sub> <sup>+</sup> | Gate Trigger Voltage                                      | T <sub>j</sub> =150°C, V <sub>D</sub> =1/2V <sub>DRM</sub>                               | 1       |      | 1.5  | V    |
| V <sub>GT1</sub> <sup>-</sup> |   |  | 2       |      | 1.5  |      |
| V <sub>GT3</sub> <sup>+</sup> |   |  | 3       |      | —    |      |
| V <sub>GT3</sub> <sup>-</sup> |   |  | 4       |      | 1.5  |      |
| V <sub>GD</sub>               | Non-Trigger Gate Voltage                                  | T <sub>j</sub> =150°C, V <sub>D</sub> =1/2V <sub>DRM</sub>                               | 0.1     |      |      | V    |
| (dv/dt) <sub>c</sub>          | Critical Rate of Rise of Off-State Voltage at Commutation | T <sub>j</sub> =150°C, (di/dt) <sub>c</sub> =-6A/ms, V <sub>D</sub> =2/3V <sub>DRM</sub> | 5       |      |      | V/μs |
| I <sub>H</sub>                | Holding Current   |  |         | 20   |      | mA   |
| R <sub>th</sub>               | Thermal Resistance  | Junction to case   |         |      | 3.3  | °C/W |

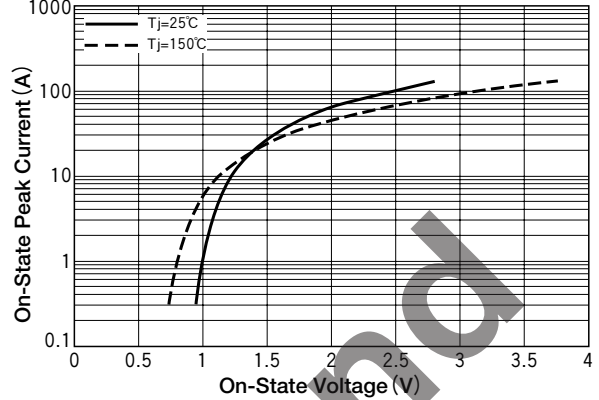
Trigger mode of the triac



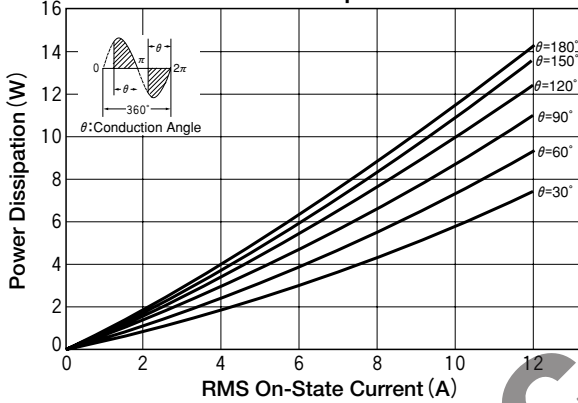
### Gate Characteristics



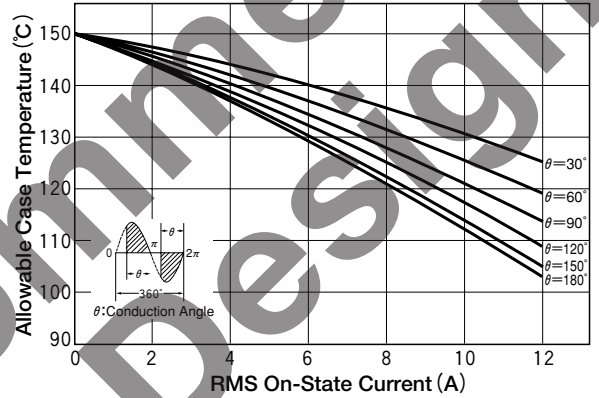
### On-State Characteristics (MAX)



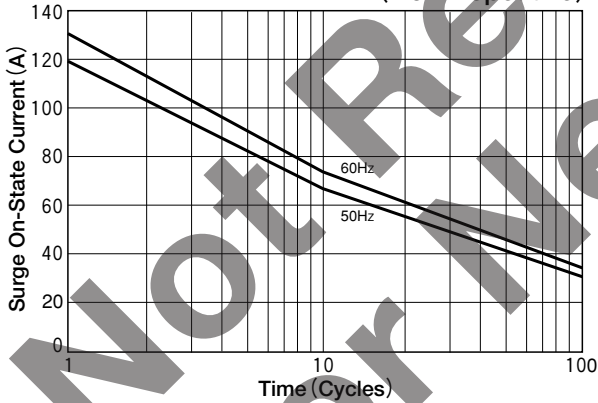
### RMS On-State Current vs Maximum Power Dissipation



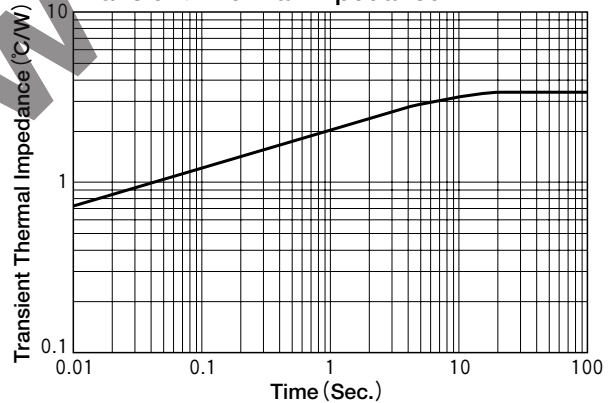
### RMS On-State vs Allowable Case Temperature



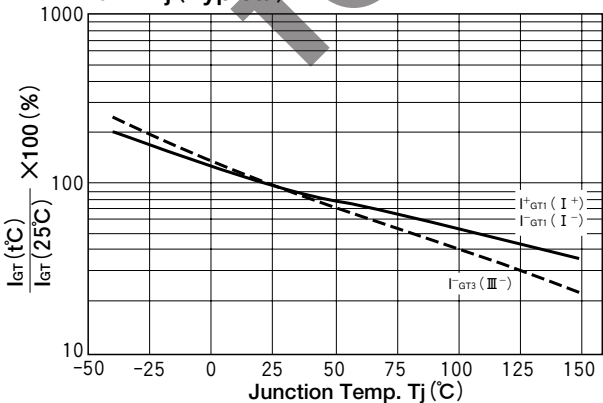
### Surge On-State Current Rating (Non-Repetitive)



### Transient Thermal Impedance



### I<sub>GT</sub> - T<sub>j</sub> (Typical)



### V<sub>GT</sub> - T<sub>j</sub> (Typical)

