

# MITSUBISHI THYRISTOR MODULES

## TM200DZ/CZ/PZ-M,-H,-24,-2H

HIGH POWER GENERAL USE  
INSULATED TYPE

### TM200DZ/CZ/PZ-M,-H,-24,-2H



(DZ Type)

- **IT (AV)** Average on-state current ..... **200A**
- **VRRM** Repetitive peak reverse voltage  
..... **400/800/1200/1600V**
- **VDRM** Repetitive peak off-state voltage  
..... **400/800/1200/1600V**
- **DOUBLE ARMS**
- **Insulated Type**
- **UL Recognized**

Yellow Card No. E80276 (N)

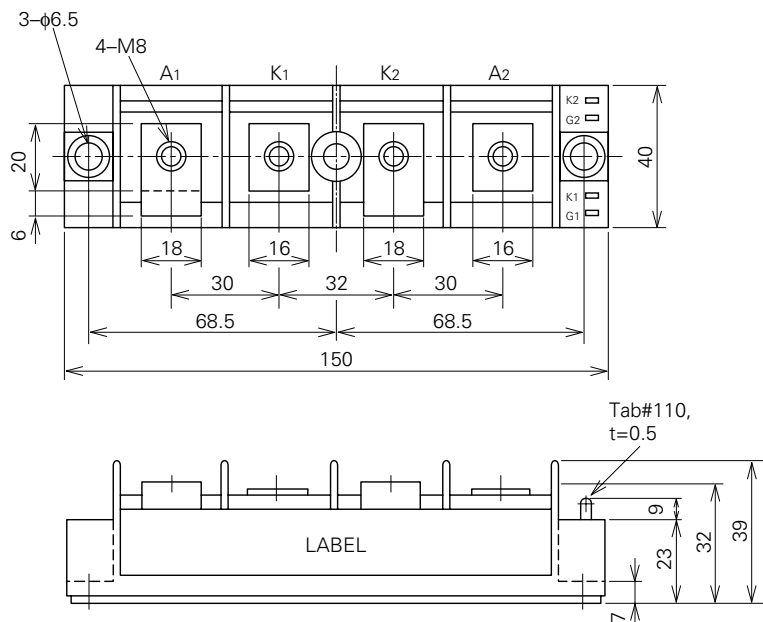
File No. E80271

### APPLICATION

DC motor control, NC equipment, AC motor control, Contactless switches,  
Electric furnace temperature control, Light dimmers

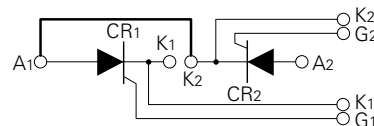
### OUTLINE DRAWING & CIRCUIT DIAGRAM

Dimensions in mm

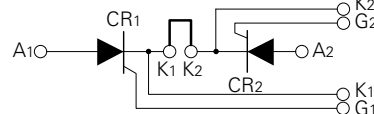


(DZ Type)

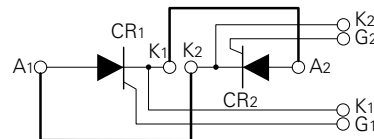
(DZ)



(CZ)



(PZ)



(Bold line is connective bar.)

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## ABSOLUTE MAXIMUM RATINGS

| Symbol  | Parameter                             | Voltage class |     |      |      | Unit |
|---------|---------------------------------------|---------------|-----|------|------|------|
|         |                                       | M             | H   | 24   | 2H   |      |
| VRRM    | Repetitive peak reverse voltage       | 400           | 800 | 1200 | 1600 | V    |
| VRSM    | Non-repetitive peak reverse voltage   | 480           | 960 | 1350 | 1700 | V    |
| VR (DC) | DC reverse voltage                    | 320           | 640 | 960  | 1280 | V    |
| VDRM    | Repetitive peak off-state voltage     | 400           | 800 | 1200 | 1600 | V    |
| VDSM    | Non-repetitive peak off-state voltage | 480           | 960 | 1350 | 1700 | V    |
| VD (DC) | DC off-state voltage                  | 320           | 640 | 960  | 1280 | V    |

| Symbol           | Parameter                                 | Conditions  | Ratings               | Unit             |
|------------------|---|---|-----------------------|------------------|
| IT (RMS)         | RMS on-state current                      |   | 310                   | A                |
| IT (AV)          | Average on-state current                  | Single-phase, half-wave 180° conduction, Tc=64°C                                  | 200                   | A                |
| ITSM             | Surge (non-repetitive) on-state current   | One half cycle at 60Hz, peak value  | 4000                  | A                |
| I <sup>2</sup> t | I <sup>2</sup> t for fusing               | Value for one cycle of surge current  | 6.7 × 10 <sup>4</sup> | A <sup>2</sup> s |
| di/dt            | Critical rate of rise of on-state current | V <sub>D</sub> =1/2V <sub>DRM</sub> , I <sub>G</sub> =1.0A, T <sub>j</sub> =125°C | 100                   | A/μs             |
| PGM              | Peak gate power dissipation               |   | 10                    | W                |
| PG (AV)          | Average gate power dissipation            |   | 3.0                   | W                |
| VFGM             | Peak gate forward voltage                 |   | 10                    | V                |
| VRGM             | Peak gate reverse voltage                 |   | 5.0                   | V                |
| IFGM             | Peak gate forward current                 |   | 4.0                   | A                |
| T <sub>j</sub>   | Junction temperature                      |   | -40~+125              | °C               |
| T <sub>stg</sub> | Storage temperature                       |   | -40~+125              | °C               |
| V <sub>iso</sub> | Isolation voltage                         | Charged part to case  | 2500                  | V                |
| —                | Mounting torque                           | Main terminal screw M8  | 8.83~10.8             | N·m              |
|                  |   |   | 90~110                | kg·cm            |
|                  |   | Mounting screw M6   | 1.96~3.92             | N·m              |
|                  |   |   | 20~40                 | kg·cm            |
| —                | Weight                                    | Typical value   | 300                   | g                |

## ELECTRICAL CHARACTERISTICS

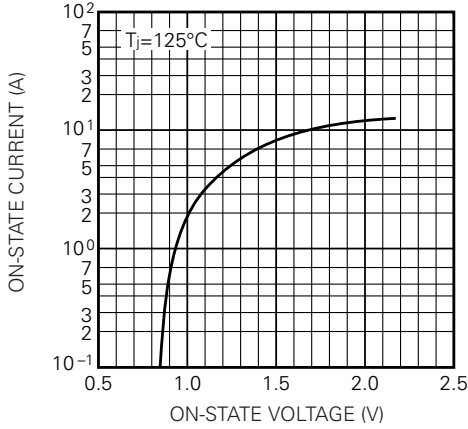
| Symbol                | Parameter                                  | Test conditions   | Limits |      |      | Unit |
|-----------------------|--|---|--------|------|------|------|
|                       |  |   | Min.   | Typ. | Max. |      |
| IRRM                  | Repetitive peak reverse current            | T <sub>j</sub> =125°C, VRRM applied                               | —      | —    | 30   | mA   |
| IDRM                  | Repetitive peak off-state current          | T <sub>j</sub> =125°C, VDRM applied                               | —      | —    | 30   | mA   |
| VTM                   | On-state voltage                           | T <sub>j</sub> =125°C, I <sub>TM</sub> =600A, instantaneous meas. | —      | —    | 1.35 | V    |
| dv/dt                 | Critical rate of rise of off-state voltage | T <sub>j</sub> =125°C, V <sub>D</sub> =2/3V <sub>DRM</sub>        | 500    | —    | —    | V/μs |
| VGT                   | Gate trigger voltage                       | T <sub>j</sub> =25°C, V <sub>D</sub> =6V, R <sub>L</sub> =2Ω      | —      | —    | 3.0  | V    |
| VGD                   | Gate non-trigger voltage                   | T <sub>j</sub> =125°C, V <sub>D</sub> =1/2V <sub>DRM</sub>        | 0.25   | —    | —    | V    |
| IGT                   | Gate trigger current                       | T <sub>j</sub> =25°C, V <sub>D</sub> =6V, R <sub>L</sub> =2Ω      | 15     | —    | 100  | mA   |
| R <sub>th (j-c)</sub> | Thermal resistance                         | Junction to case (per 1/2 module)                                 | —      | —    | 0.2  | °C/W |
| R <sub>th (c-f)</sub> | Contact thermal resistance                 | Case to fin, conductive grease applied (per 1/2 module)           | —      | —    | 0.1  | °C/W |
| —                     | Insulation resistance                      | Measured with a 500V megohmmeter between main terminal and case   | 10     | —    | —    | MΩ   |

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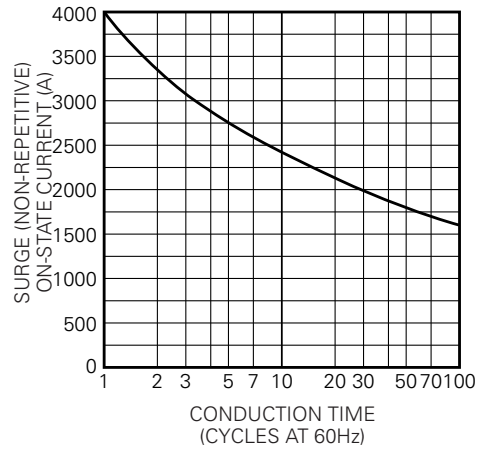
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## PERFORMANCE CURVES

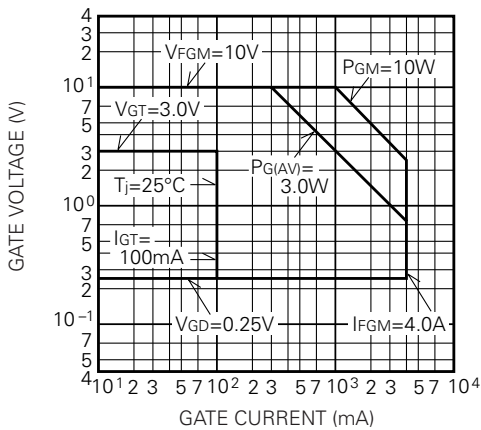
**MAXIMUM ON-STATE CHARACTERISTIC**



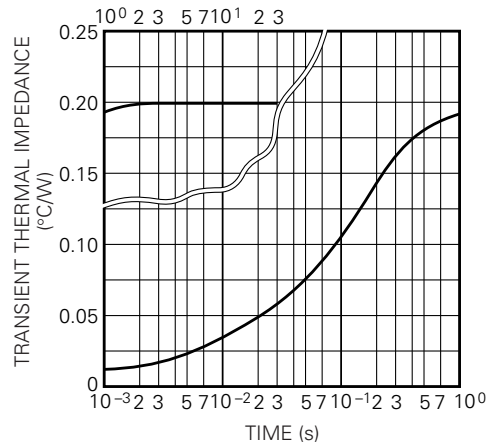
**RATED SURGE (NON-REPETITIVE) ON-STATE CURRENT**



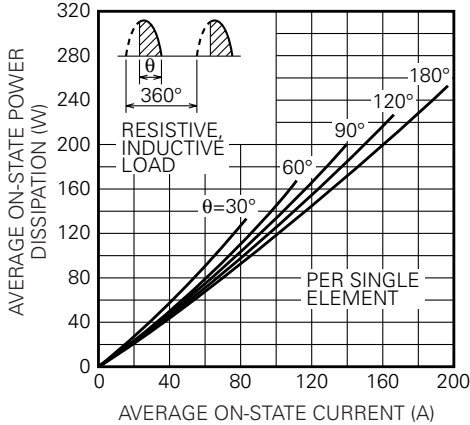
**GATE CHARACTERISTICS**



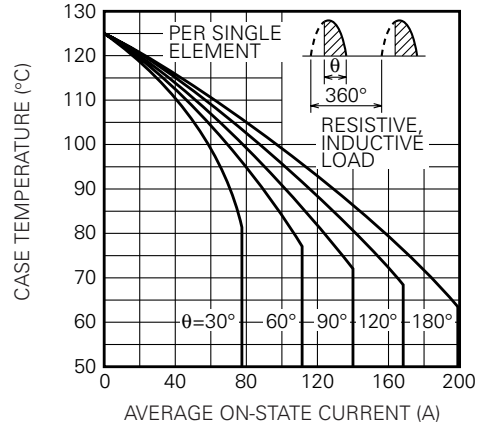
**MAXIMUM TRANSIENT THERMAL IMPEDANCE (JUNCTION TO CASE)**



**MAXIMUM AVERAGE ON-STATE POWER DISSIPATION (SINGLE PHASE HALF WAVE)**



**LIMITING VALUE OF THE AVERAGE ON-STATE CURRENT (SINGLE PHASE HALF WAVE)**



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