

To all our customers

Regarding the change of names mentioned in the document, such as Mitsubishi Electric and Mitsubishi XX, to Renesas Technology Corp.

The semiconductor operations of Hitachi and Mitsubishi Electric were transferred to Renesas Technology Corporation on April 1st 2003. These operations include microcomputer, logic, analog and discrete devices, and memory chips other than DRAMs (flash memory, SRAMs etc.) Accordingly, although Mitsubishi Electric, Mitsubishi Electric Corporation, Mitsubishi Semiconductors, and other Mitsubishi brand names are mentioned in the document, these names have in fact all been changed to Renesas Technology Corp. Thank you for your understanding. Except for our corporate trademark, logo and corporate statement, no changes whatsoever have been made to the contents of the document, and these changes do not constitute any alteration to the contents of the document itself.

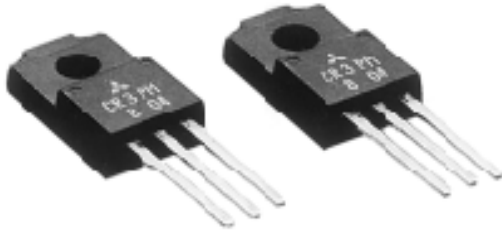
Note : Mitsubishi Electric will continue the business operations of high frequency & optical devices and power devices.

Renesas Technology Corp.
Customer Support Dept.
April 1, 2003

CR3PM

LOW POWER USE
INSULATED TYPE, GLASS PASSIVATION TYPE

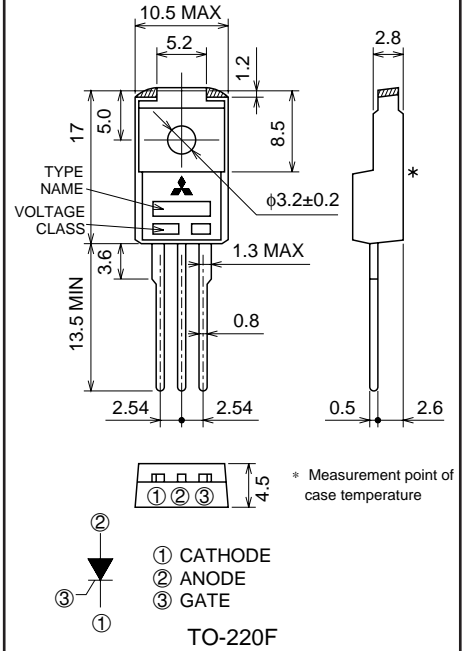
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- I_T (AV) 3A
- V_{DRM} 400V/600V
- I_{GT} 100 μ A
- V_{iso} 1500V
- UL Recognized: File No. E80276

OUTLINE DRAWING

Dimensions
in mm



APPLICATION

TV sets, control of household equipment such as electric blankets, other general purpose control applications

MAXIMUM RATINGS ($T_a=25^\circ\text{C}$, unless otherwise noted)

| Symbol | Parameter | Voltage class | | Unit |
|------------|--------------------------------------|---------------|-----|------|
| | | 8 | 12 | |
| V_{RRM} | Repetitive peak reverse voltage | 400 | 600 | V |
| V_{RSM} | Non-repetitive peak reverse voltage | 500 | 720 | V |
| V_R (DC) | DC reverse voltage | 320 | 480 | V |
| V_{DRM} | Repetitive peak off-state voltage *1 | 400 | 600 | V |
| V_D (DC) | DC off-state voltage *1 | 320 | 480 | V |

| Symbol | Parameter | Conditions | Ratings | Unit |
|-------------|--------------------------------|--|------------|------------------|
| I_T (RMS) | RMS on-state current | | 4.7 | A |
| I_T (AV) | Average on-state current | Commercial frequency, sine half wave, 180° conduction, $T_c=103^\circ\text{C}$ | 3.0 | A |
| I_{TSM} | Surge on-state current | 60Hz sine half wave 1 full cycle, peak value, non-repetitive | 70 | A |
| I^2_t | I^2_t for fusing | Value corresponding to 1 cycle of half wave 60Hz, surge on-state current | 24.5 | A ² s |
| PGM | Peak gate power dissipation | | 0.5 | W |
| PG (AV) | Average gate power dissipation | | 0.1 | W |
| V_{FGM} | Peak gate forward voltage | | 6 | V |
| V_{RGM} | Peak gate reverse voltage | | 6 | V |
| I_{FGM} | Peak gate forward current | | 0.3 | A |
| T_j | Junction temperature | | -40 ~ +125 | $^\circ\text{C}$ |
| T_{stg} | Storage temperature | | -40 ~ +125 | $^\circ\text{C}$ |
| — | Weight | Typical value | 2.0 | g |
| V_{iso} | Isolation voltage | $T_a=25^\circ\text{C}$, AC 1 minute, each terminal to case | 1500 | V |

*1. With gate to cathode resistance $R_{GK}=220\Omega$.

Feb.1999

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ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Test conditions | Limits | | | Unit |
|---------------|-----------------------------------|--|--------|------|-------------------|----------------------|
| | | | Min. | Typ. | Max. | |
| IRRM | Repetitive peak reverse current | $T_j=125^{\circ}\text{C}$, V_{RRM} applied, $R_{GK}=220\Omega$ | — | — | 2.0 | mA |
| IDRM | Repetitive peak off-state current | $T_j=125^{\circ}\text{C}$, V_{DRM} applied, $R_{GK}=220\Omega$ | — | — | 2.0 | mA |
| V_{TM} | On-state voltage | $T_c=25^{\circ}\text{C}$, $I_{TM}=10\text{A}$, instantaneous value | — | — | 1.6 | V |
| V_{GT} | Gate trigger voltage | $T_j=25^{\circ}\text{C}$, $V_D=6\text{V}$, $I_T=0.1\text{A}$ | — | — | 0.8 | V |
| V_{GD} | Gate non-trigger voltage | $T_j=125^{\circ}\text{C}$, $V_D=1/2V_{DRM}$, $R_{GK}=220\Omega$ | 0.1 | — | — | V |
| I_{GT} | Gate trigger current | $T_j=25^{\circ}\text{C}$, $V_D=6\text{V}$, $I_T=0.1\text{A}$ | 1 | — | 100 ^{*3} | μA |
| $R_{th(j-c)}$ | Thermal resistance | Junction to case ^{*2} | — | — | 4.1 | $^{\circ}\text{C/W}$ |

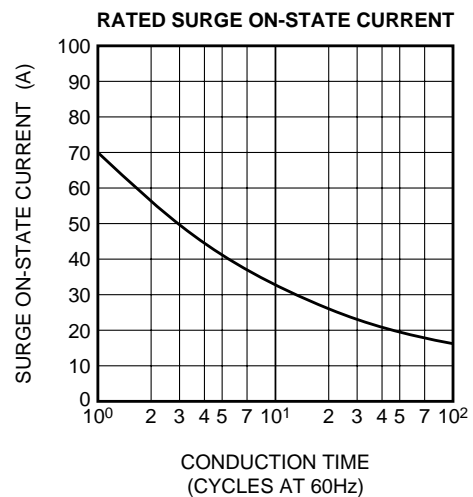
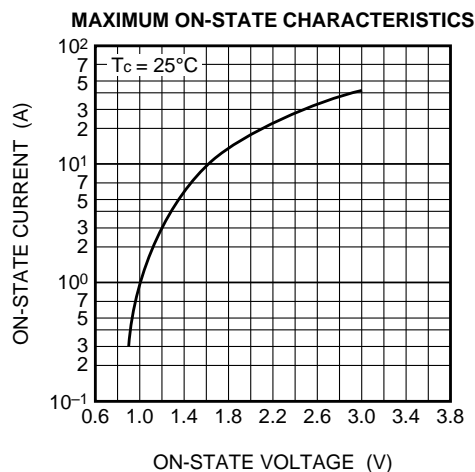
*2. The contact thermal resistance $R_{th(c-f)}$ is 0.5°C/W with greased.

*3. If special values of I_{GT} are required, choose at least two items from those listed in the table below. (Example: AB, BC)

| Item | A | B | C |
|------------------------|--------|---------|----------|
| $I_{GT} (\mu\text{A})$ | 1 ~ 30 | 20 ~ 50 | 40 ~ 100 |

The above values do not include the current flowing through the 220Ω resistance between the gate and cathode.

PERFORMANCE CURVES

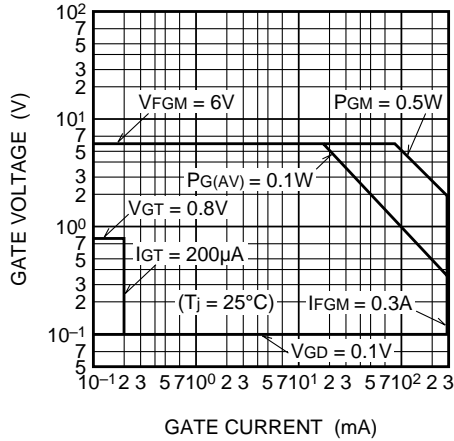


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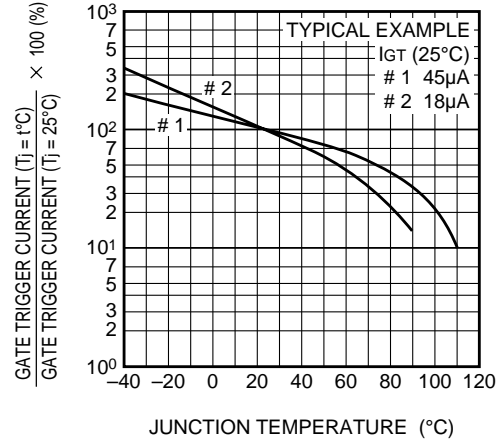
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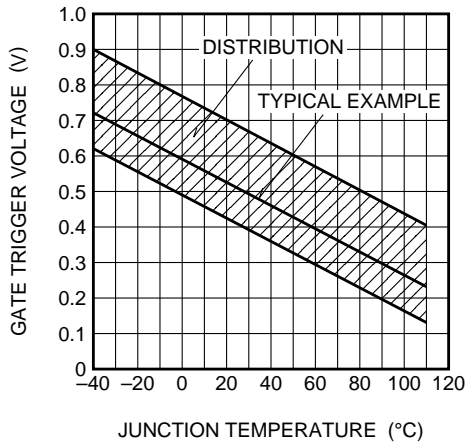
GATE CHARACTERISTICS



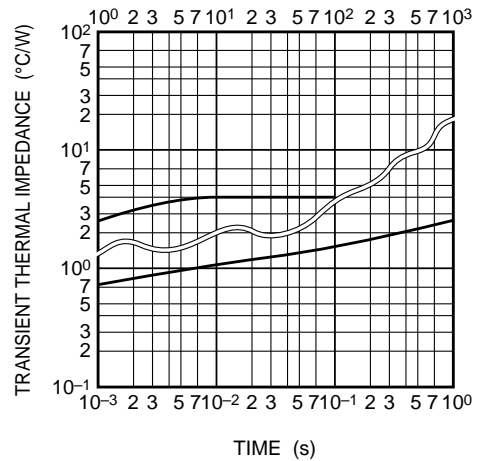
GATE TRIGGER CURRENT VS. JUNCTION TEMPERATURE



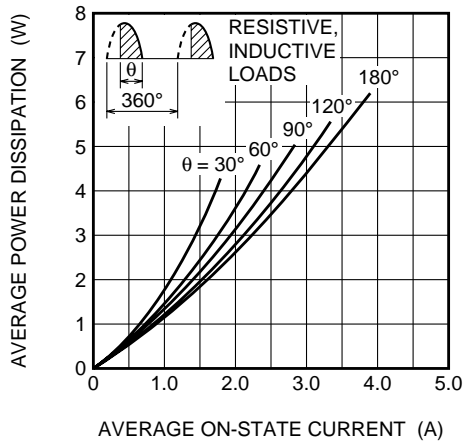
GATE TRIGGER VOLTAGE VS. JUNCTION TEMPERATURE



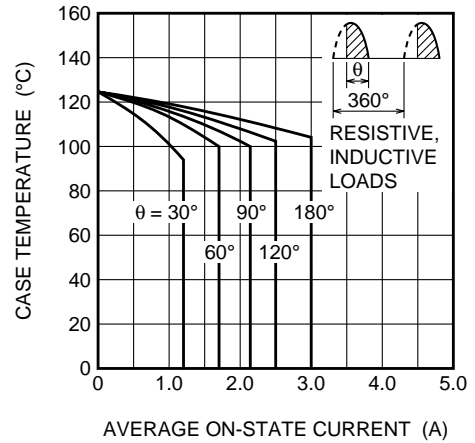
MAXIMUM TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO CASE)



MAXIMUM AVERAGE POWER DISSIPATION (SINGLE-PHASE HALF WAVE)



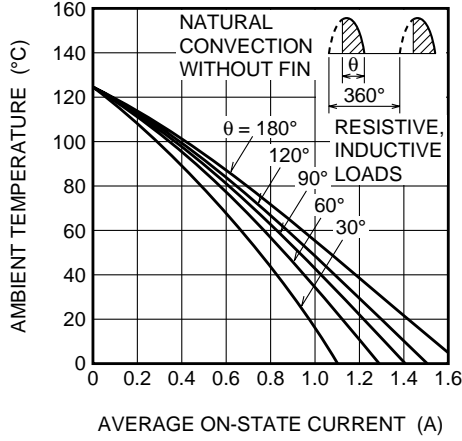
ALLOWABLE CASE TEMPERATURE VS. AVERAGE ON-STATE CURRENT (SINGLE-PHASE HALF WAVE)



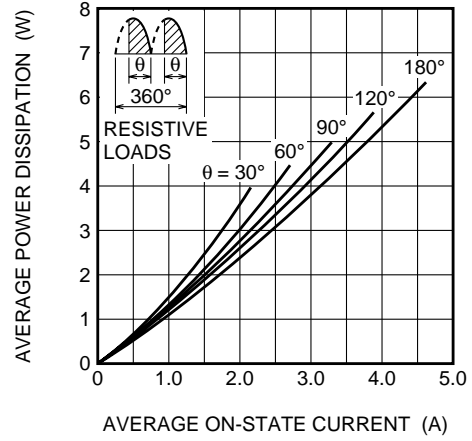
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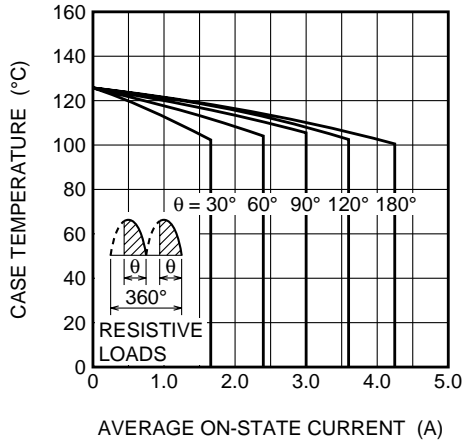
**ALLOWABLE AMBIENT TEMPERATURE VS.
AVERAGE ON-STATE CURRENT
(SINGLE-PHASE HALF WAVE)**



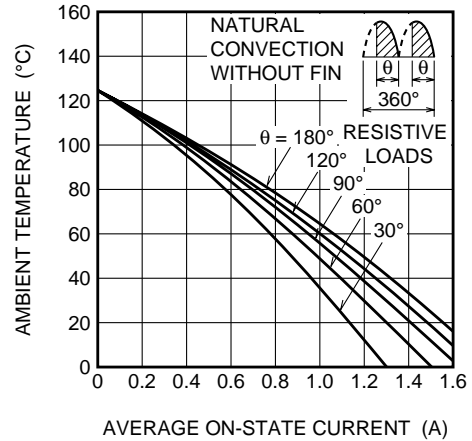
**MAXIMUM AVERAGE POWER DISSIPATION
(SINGLE-PHASE FULL WAVE)**



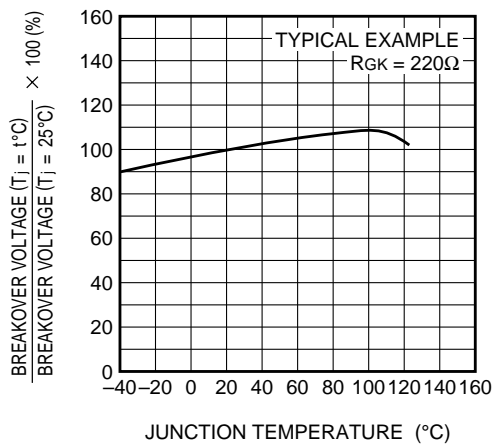
**ALLOWABLE CASE TEMPERATURE VS.
AVERAGE ON-STATE CURRENT
(SINGLE-PHASE FULL WAVE)**



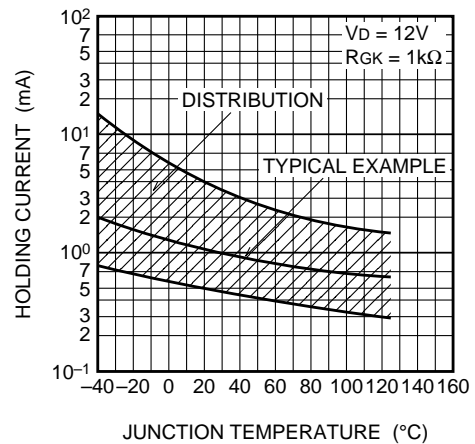
**ALLOWABLE AMBIENT TEMPERATURE VS.
AVERAGE ON-STATE CURRENT
(SINGLE-PHASE FULL WAVE)**



**BREAKOVER VOLTAGE VS.
JUNCTION TEMPERATURE**



**HOLDING CURRENT VS.
JUNCTION TEMPERATURE**



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