

To our customers,

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## Old Company Name in Catalogs and Other Documents

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April 1<sup>st</sup>, 2010  
Renesas Electronics Corporation

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# CR6KM-12A

## Thyristor

Medium Power Use

REJ03G0387-0100

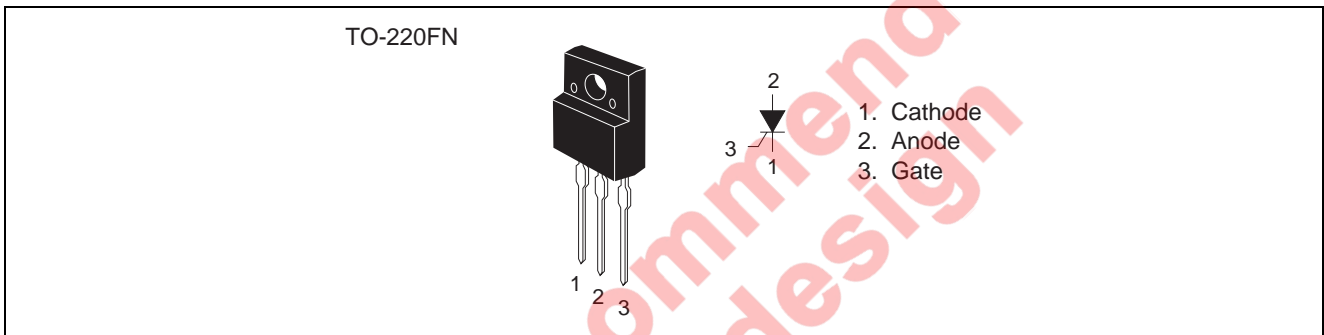
Rev.1.00

Aug.06.2004

### Features

- $I_{T(AV)}$  : 6 A
- $V_{DRM}$  : 600 V
- $I_{GT}$  : 10 mA
- $V_{ISO}$  : 2000 V
- Insulated Type
- Planar Passivation Type
- UL Recognized : Yellow Card No. E223904  
File No. E80271

### Outline



### Applications

Switching mode power supply, regulator for autcycle, motor control, heater control, and other general purpose control applications

### Maximum Ratings

| Parameter                           | Symbol      | Voltage class | Unit |
|-------------------------------------|-------------|---------------|------|
|                                     |             | 12            |      |
| Repetitive peak reverse voltage     | $V_{RRM}$   | 600           | V    |
| Non-repetitive peak reverse voltage | $V_{RSM}$   | 720           | V    |
| DC reverse voltage                  | $V_{R(DC)}$ | 480           | V    |
| Repetitive peak off-state voltage   | $V_{DRM}$   | 600           | V    |
| DC off-state voltage                | $V_{D(DC)}$ | 480           | V    |

| Parameter                      | Symbol       | Ratings      | Unit                 | Conditions   |
|--------------------------------|--------------|--------------|----------------------|--|
| RMS on-state current           | $I_{T(RMS)}$ | 9.4          | A                    |  |
| Average on-state current       | $I_{T(AV)}$  | 6            | A                    | Commercial frequency, sine half wave 180° conduction, $T_c = 85^\circ\text{C}$ |
| Surge on-state current         | $I_{TSM}$    | 90           | A                    | 60Hz sine half wave 1 full cycle, peak value, non-repetitive                   |
| $I^2t$ for fusing              | $I^2t$       | 34           | $\text{A}^2\text{s}$ | Value corresponding to 1 cycle of half wave 60Hz, surge on-state current       |
| Peak gate power dissipation    | $P_{GM}$     | 5            | W                    |  |
| Average gate power dissipation | $P_{G(AV)}$  | 0.5          | W                    |  |
| Peak gate forward voltage      | $V_{FGM}$    | 6            | V                    |  |
| Peak gate reverse voltage      | $V_{RGM}$    | 10           | V                    |  |
| Peak gate forward current      | $I_{FGM}$    | 2            | A                    |  |
| Junction temperature           | $T_j$        | - 40 to +125 | $^\circ\text{C}$     |  |
| Storage temperature            | $T_{stg}$    | - 40 to +125 | $^\circ\text{C}$     |  |
| Mass                           | —            | 2.0          | g                    | Typical value  |
| Isolation voltage              | Viso         | 2000         | V                    | $T_a = 25^\circ\text{C}$ , AC 1 minute, each terminal to case                  |

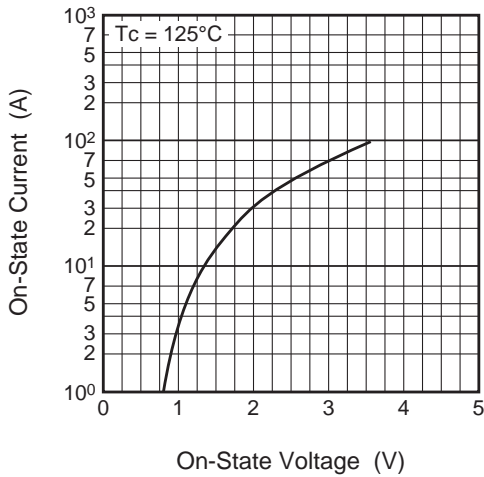
## Electrical Characteristics

| Parameter                         | Symbol        | Minimum Characteristics Value |      |      | Unit               | Test conditions   |
|-----------------------------------|---------------|-------------------------------|------|------|--------------------|---|
|                                   |               | Min.                          | Typ. | Max. |                    |   |
| Repetitive peak reverse current   | $I_{RRM}$     | —                             | —    | 2.0  | mA                 | $T_j = 125^\circ\text{C}$ , $V_{RRM}$ applied                           |
| Repetitive peak off-state current | $I_{DRM}$     | —                             | —    | 2.0  | mA                 | $T_j = 125^\circ\text{C}$ , $V_{DRM}$ applied                           |
| On-state voltage                  | $V_{TM}$      | —                             | —    | 1.7  | V                  | $T_c = 25^\circ\text{C}$ , $I_{TM} = 20\text{ A}$ , instantaneous value |
| Gate trigger voltage              | $V_{GT}$      | —                             | —    | 1.0  | V                  | $T_j = 25^\circ\text{C}$ , $V_D = 6\text{ V}$ , $I_T = 1\text{ A}$      |
| Gate non-trigger voltage          | $V_{GD}$      | 0.2                           | —    | —    | V                  | $T_j = 125^\circ\text{C}$ , $V_D = 1/2 V_{DRM}$                         |
| Gate trigger current              | $I_{GT}$      | —                             | —    | 10   | mA                 | $T_j = 25^\circ\text{C}$ , $V_D = 6\text{ V}$ , $I_T = 1\text{ A}$      |
| Holding current                   | $I_H$         | —                             | 15   | —    | mA                 | $T_j = 25^\circ\text{C}$ , $V_D = 12\text{ V}$                          |
| Thermal resistance                | $R_{th(j-c)}$ | —                             | —    | 4.0  | $^\circ\text{C/W}$ | Junction to case <sup>Note1</sup>                                       |

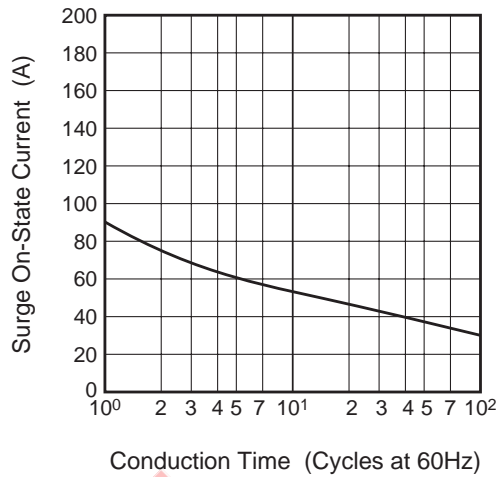
Notes: 1. The contact thermal resistance  $R_{th(c-f)}$  in case of greasing is  $0.5^\circ\text{C/W}$ .

Performance Curves

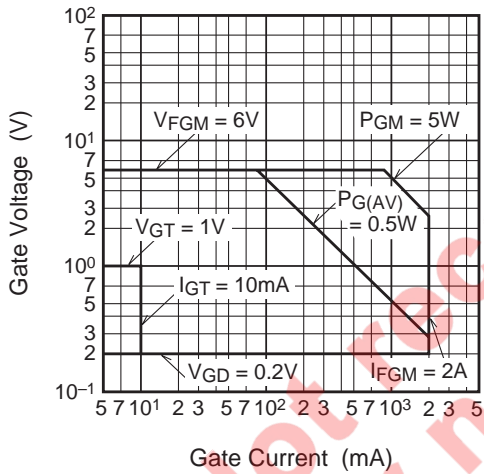
Maximum On-State Characteristics



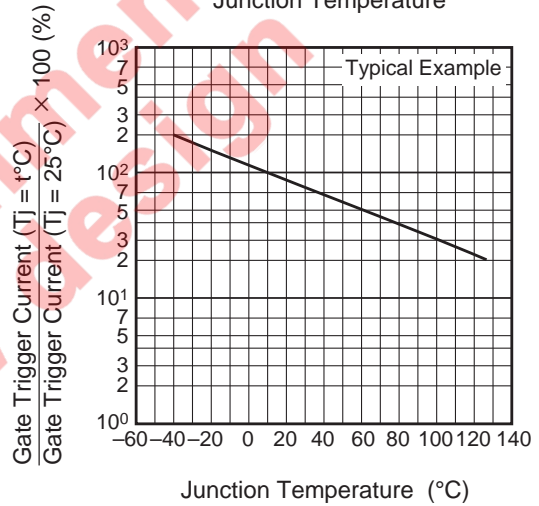
Rated Surge On-State Current



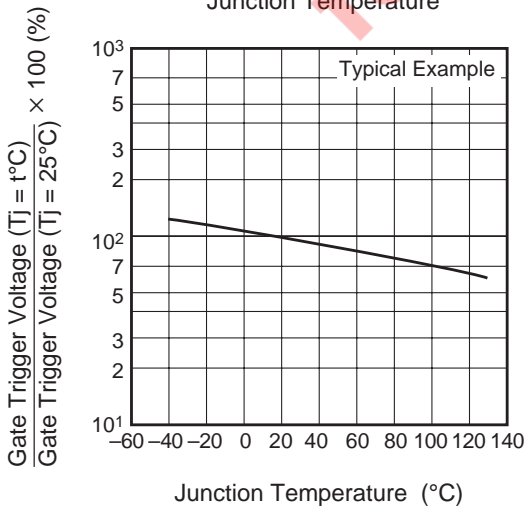
Gate Characteristics



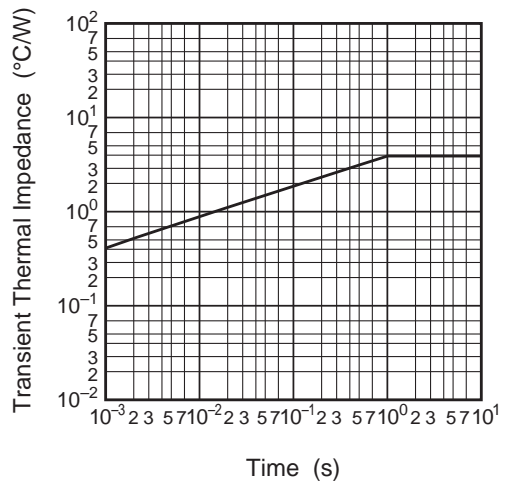
Gate Trigger Current vs. Junction Temperature

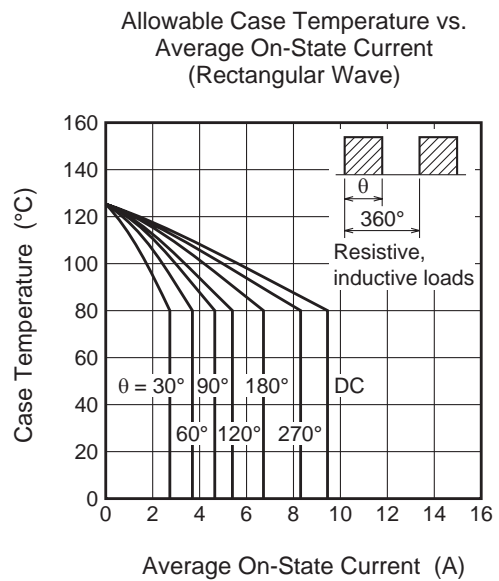
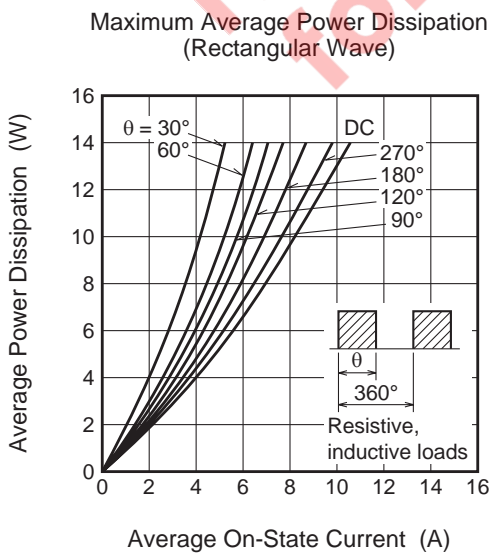
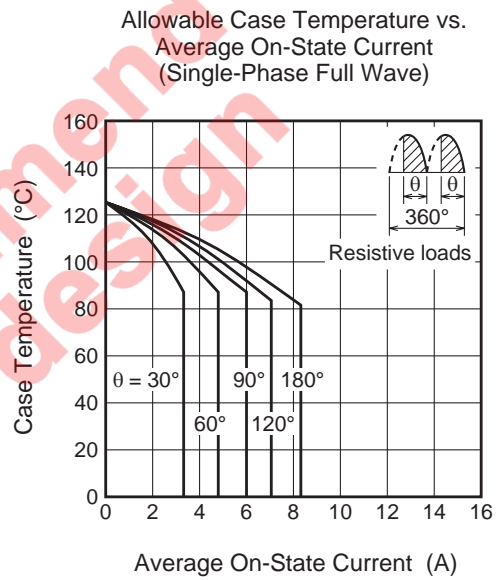
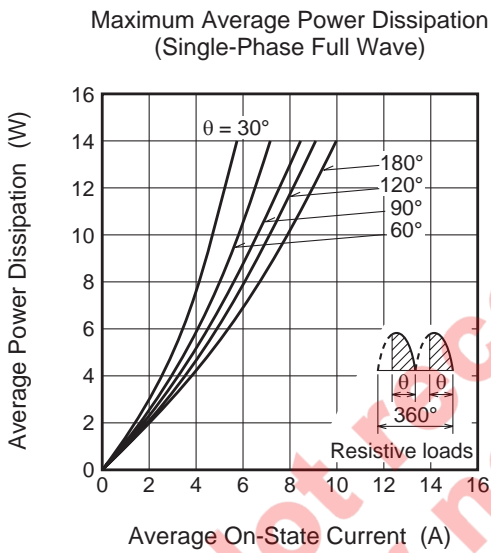
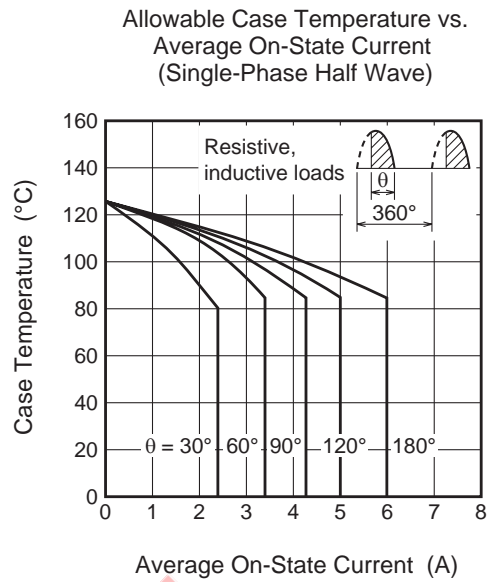
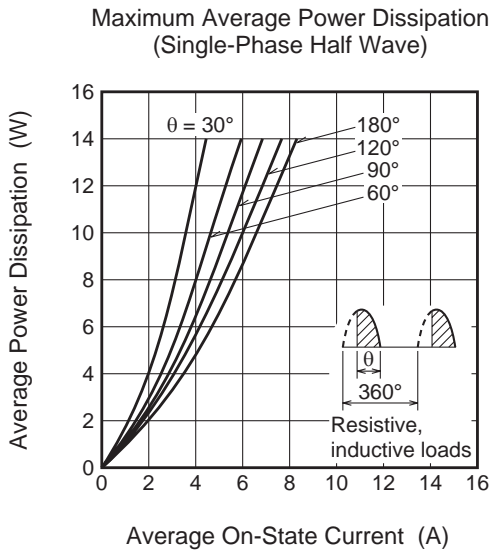


Gate Trigger Voltage vs. Junction Temperature

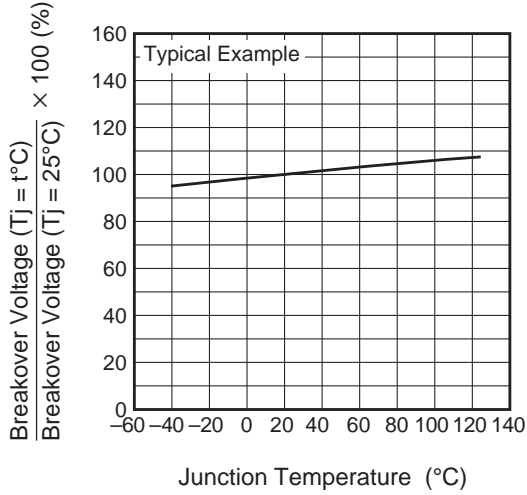


Maximum Transient Thermal Impedance Characteristics (Junction to case)

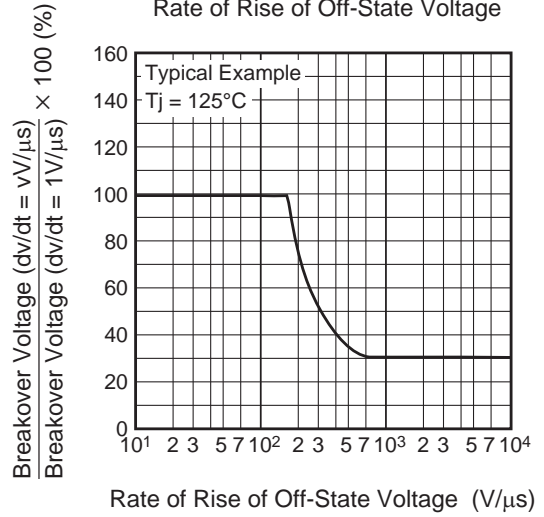




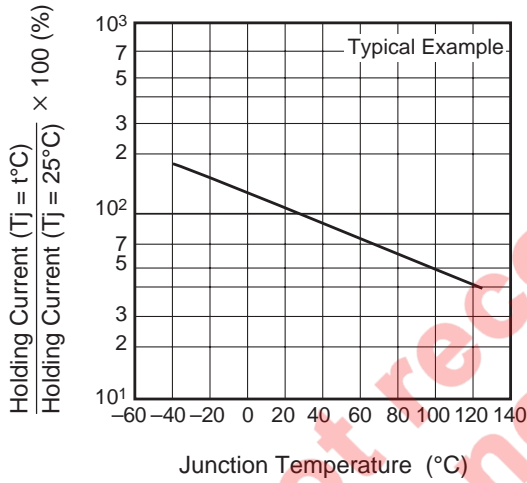
Breakover Voltage vs. Junction Temperature



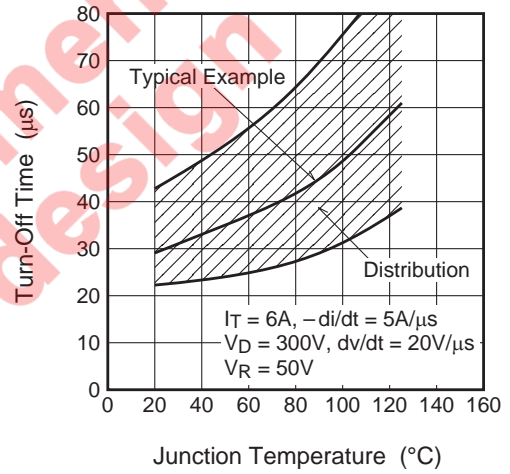
Breakover Voltage vs. Rate of Rise of Off-State Voltage



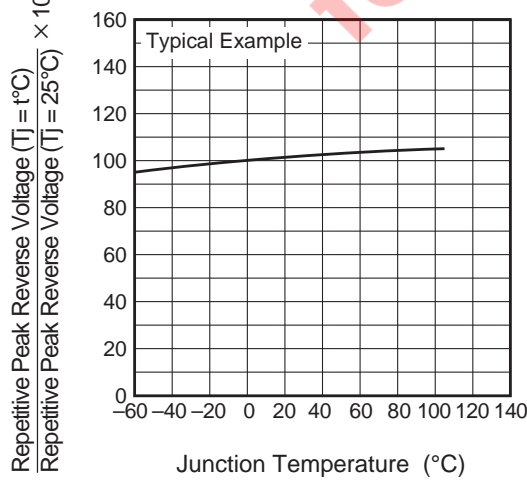
Holding Current vs. Junction Temperature



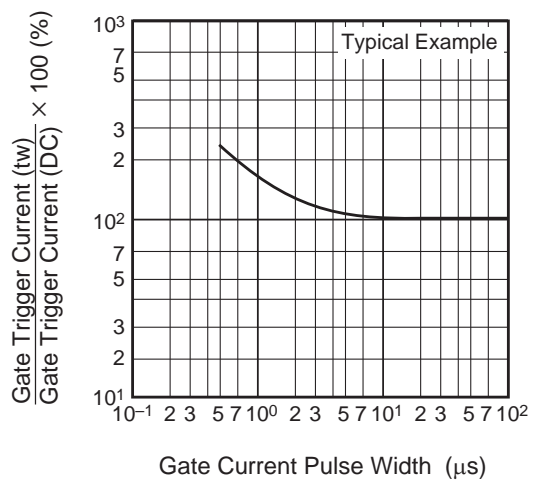
Turn-Off Time vs. Junction Temperature



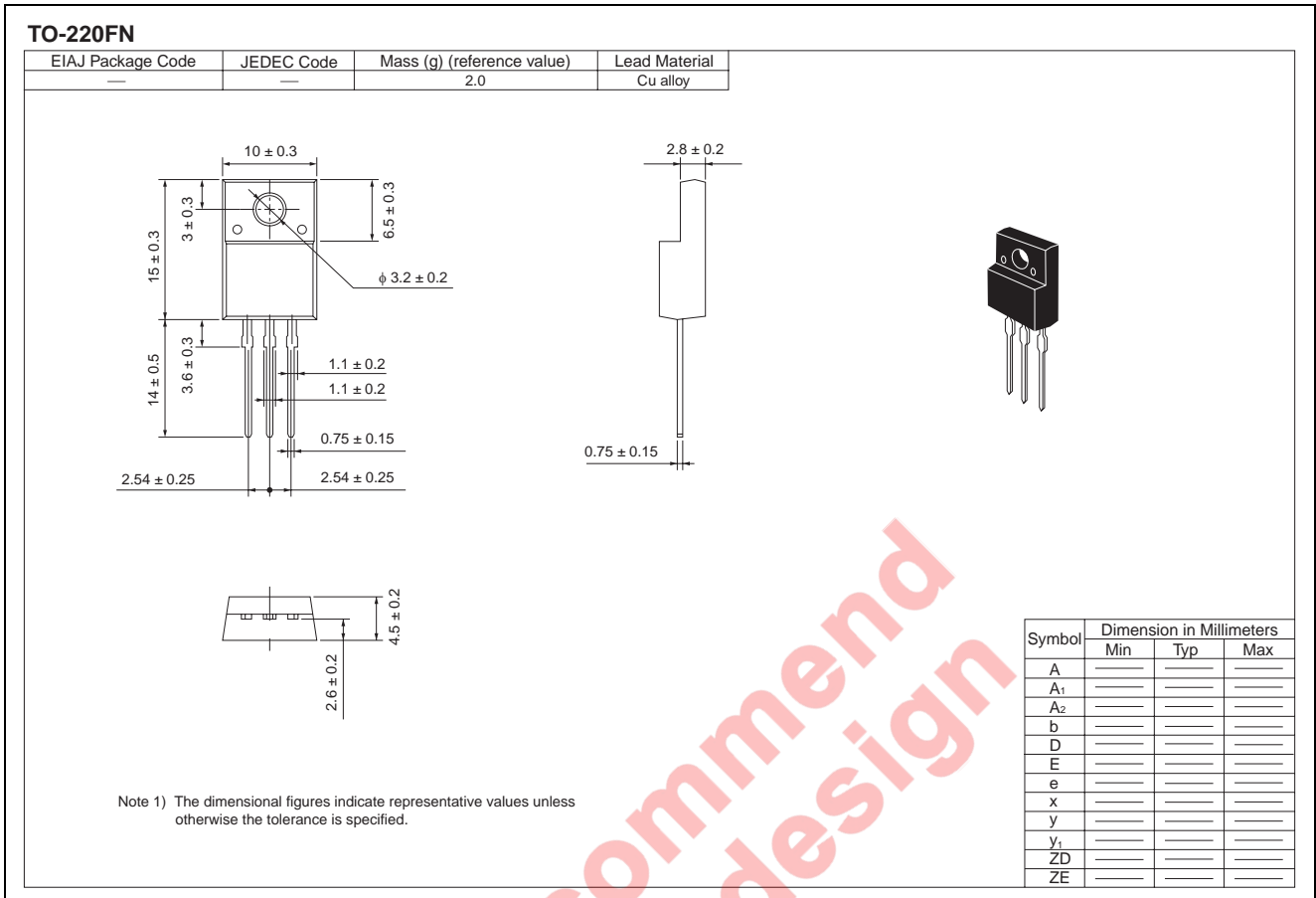
Repetitive Peak Reverse Voltage vs. Junction Temperature



Gate Trigger Current vs. Gate Current Pulse Width



## Package Dimensions



## Order Code

| Lead form     | Standard packing        | Quantity | Standard order code           | Standard order code example |
|---------------|-------------------------|----------|-------------------------------|-----------------------------|
| Straight type | Plastic Magazine (Tube) | 50       | Type name                     | CR6KM-12A                   |
| Lead form     | Plastic Magazine (Tube) | 50       | Type name – Lead forming code | CR6KM-12A-A8                |

Note : Please confirm the specification about the shipping in detail.



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