

## CR3KM-12

### Thyristor

Low Power Use

REJ03G0386-0200

Rev.2.00

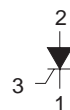
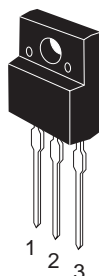
Mar.28.2005

### Features

- $I_{T(AV)}$  : 3 A
- $V_{DRM}$  : 600 V
- $I_{GT}$  : 100  $\mu$ A
- $V_{ISO}$  : 2000 V
- Insulated Type
- Glass Passivation Type
- UL Recognized : Yellow Card No. E223904  
File No. E80271

### Outline

RENESAS Package code: PRSS0003AB-A  
(Package name: TO-220FN)



1. Cathode
2. Anode
3. Gate

### Applications

TV sets, control of household equipment such as electric blanket, 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 <sup>Note1</sup>	$V_{DRM}$	600	V
DC off-state voltage <sup>Note1</sup>	$V_{D(DC)}$	480	V

Parameter	Symbol	Ratings	Unit	Conditions
RMS on-state current	$I_{T(RMS)}$	4.7	A	
Average on-state current	$I_{T(AV)}$	3.0	A	Commercial frequency, sine half wave 180° conduction, $T_c = 103^\circ\text{C}$
Surge on-state current	$I_{TSM}$	70	A	60Hz sine half wave 1 full cycle, peak value, non-repetitive
$I^2t$ for fusing	$I^2t$	24.5	$\text{A}^2\text{s}$	Value corresponding to 1 cycle of half wave 60Hz, surge on-state current
Peak gate power dissipation	$P_{GM}$	0.5	W	
Average gate power dissipation	$P_{G(AV)}$	0.1	W	
Peak gate forward voltage	$V_{FGM}$	6	V	
Peak gate reverse voltage	$V_{RGM}$	6	V	
Peak gate forward current	$I_{FGM}$	0.3	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

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

## Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test conditions
Repetitive peak reverse current	$I_{RRM}$	—	—	2.0	mA	$T_j = 125^\circ\text{C}$ , $V_{RRM}$ applied, $R_{GK} = 220 \Omega$
Repetitive peak off-state current	$I_{DRM}$	—	—	2.0	mA	$T_j = 125^\circ\text{C}$ , $V_{DRM}$ applied, $R_{GK} = 220 \Omega$
On-state voltage	$V_{TM}$	—	—	1.6	V	$T_c = 25^\circ\text{C}$ , $I_{TM} = 10 \text{ A}$ , instantaneous value
Gate trigger voltage	$V_{GT}$	—	—	0.8	V	$T_j = 25^\circ\text{C}$ , $V_D = 6 \text{ V}$ , $I_T = 0.1 \text{ A}$
Gate non-trigger voltage	$V_{GD}$	0.1	—	—	V	$T_j = 125^\circ\text{C}$ , $V_D = 1/2 V_{DRM}$ , $R_{GK} = 220 \Omega$
Gate trigger current	$I_{GT}$	1	—	100 <sup>Note3</sup>	$\mu\text{A}$	$T_j = 25^\circ\text{C}$ , $V_D = 6 \text{ V}$ , $I_T = 0.1 \text{ A}$
Thermal resistance	$R_{th(j-c)}$	—	—	4.1	$^\circ\text{C/W}$	Junction to case <sup>Note2</sup>

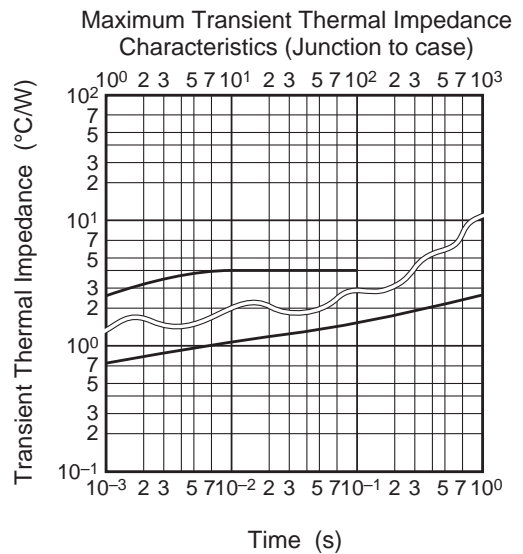
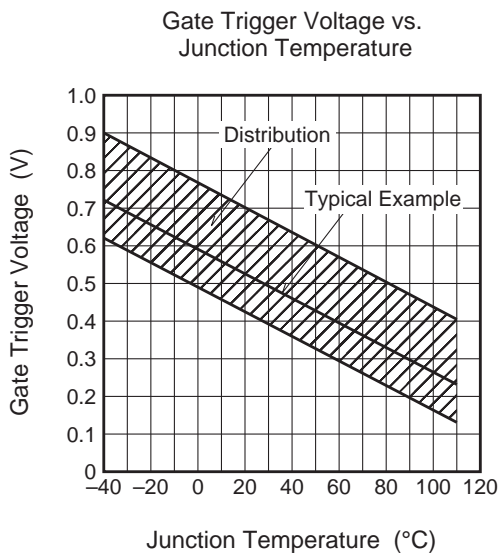
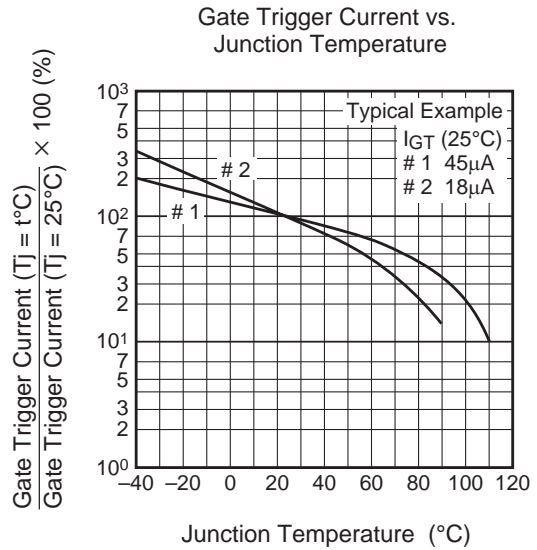
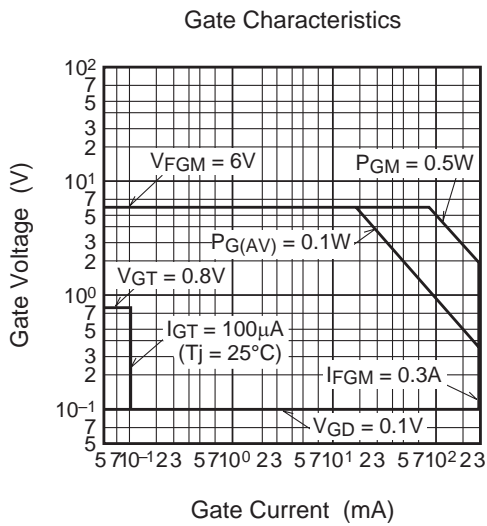
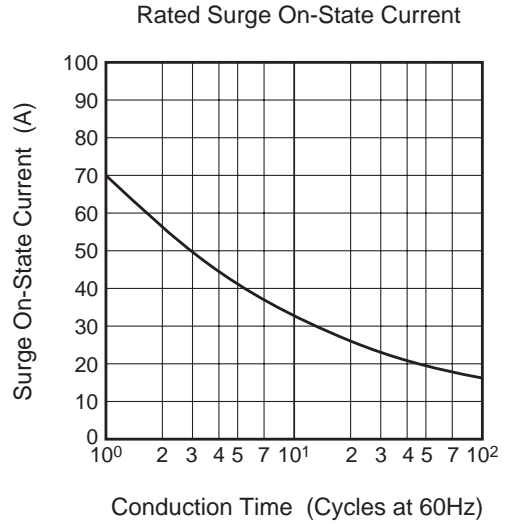
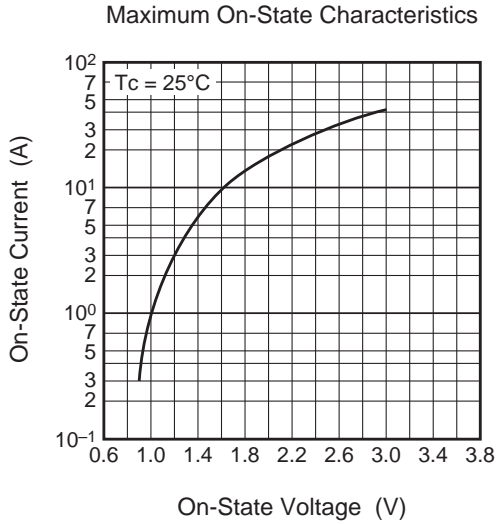
Notes: 2. The contact thermal resistance  $R_{th(c-f)}$  in case of greasing is  $0.5^\circ\text{C/W}$ .

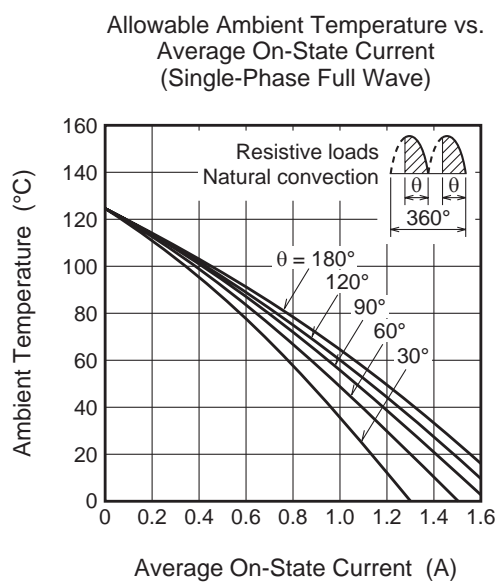
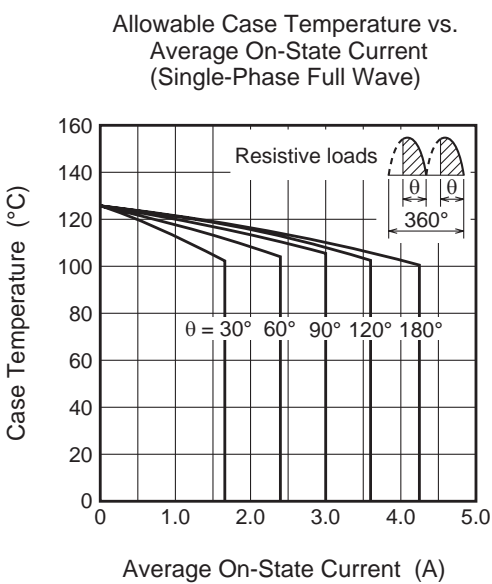
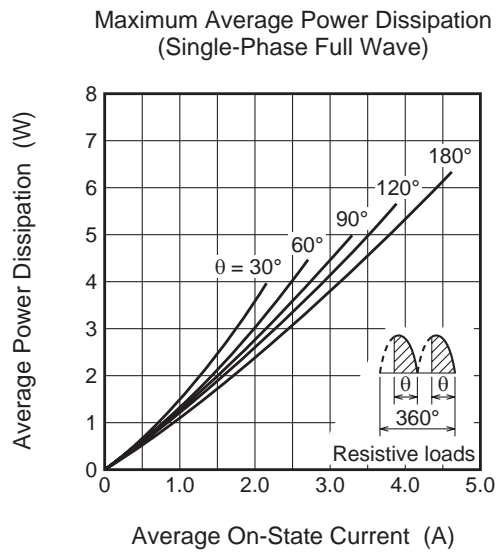
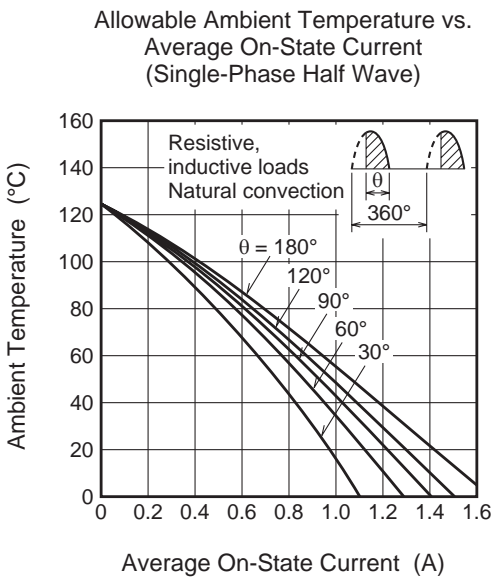
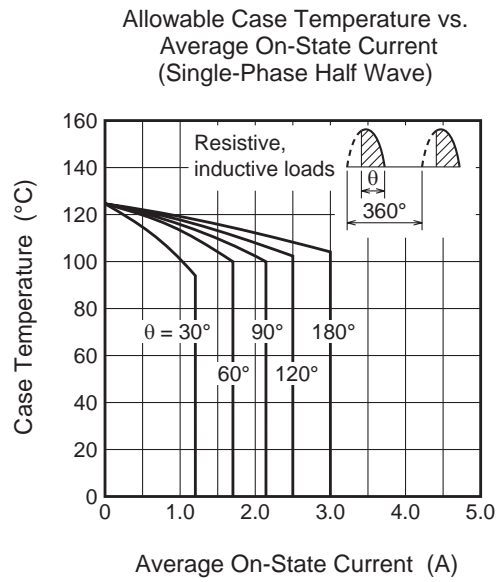
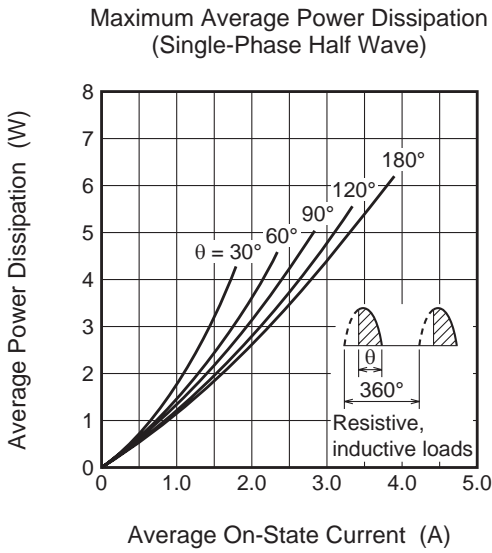
3. If special values of  $I_{GT}$  are required, choose item D or E from those listed in the table below if possible.

Item	B	C	D	E
$I_{GT} (\mu\text{A})$	20 to 50	40 to 100	1 to 50	20 to 100

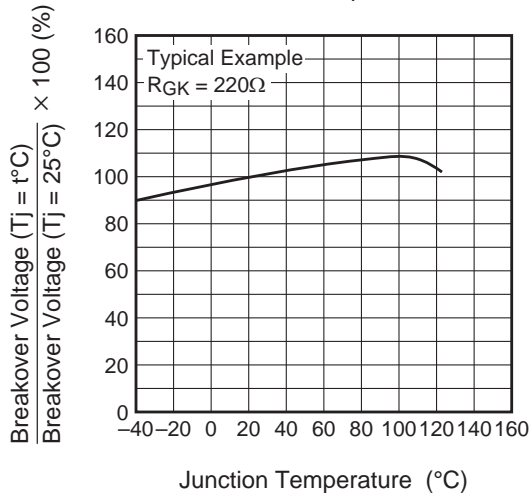
The above values do not include the current flowing through the  $220 \Omega$  resistance between the gate and cathode.

Performance Curves

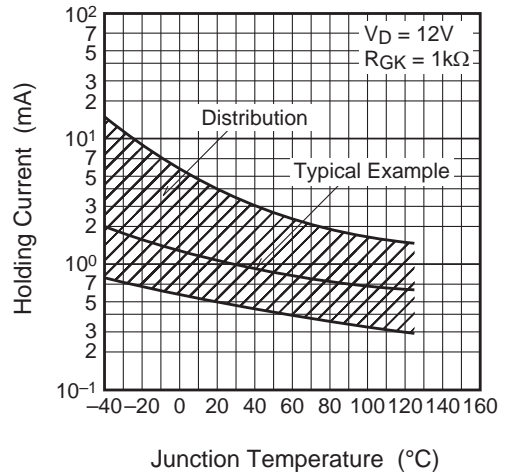




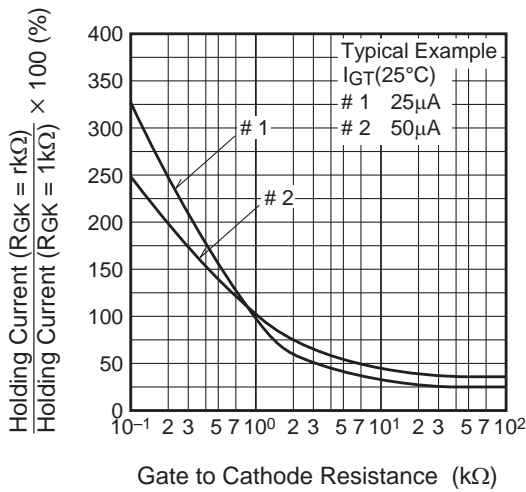
Breakover Voltage vs. Junction Temperature



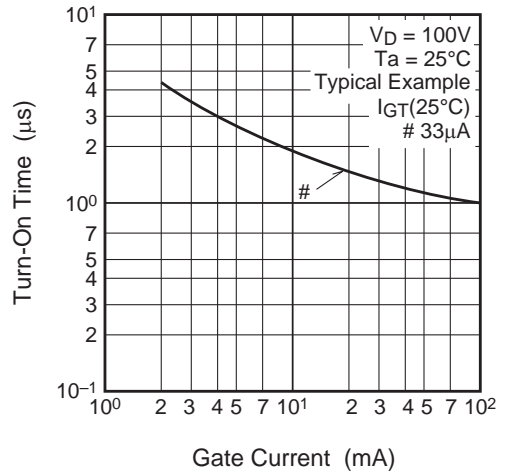
Holding Current vs. Junction Temperature



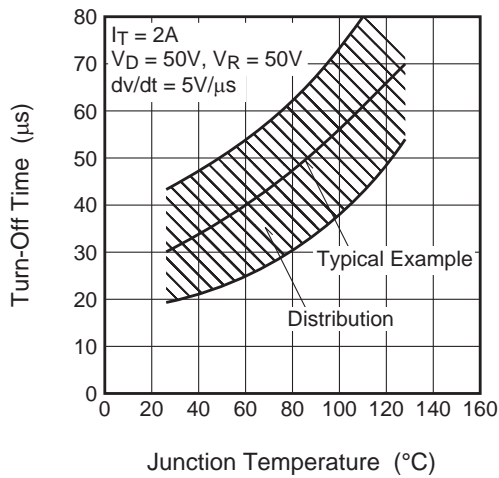
Holding Current vs. Gate to Cathode Resistance



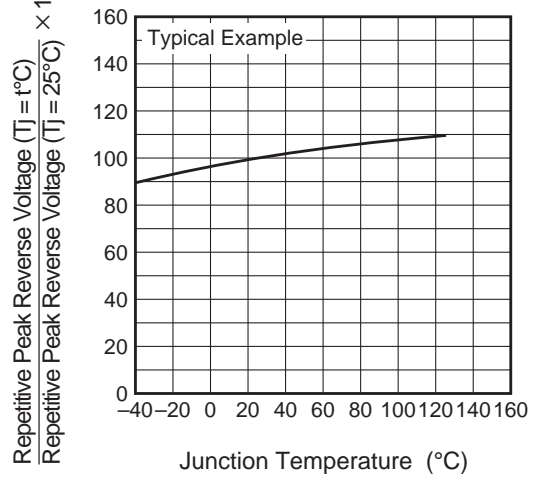
Turn-On Time vs. Gate Current



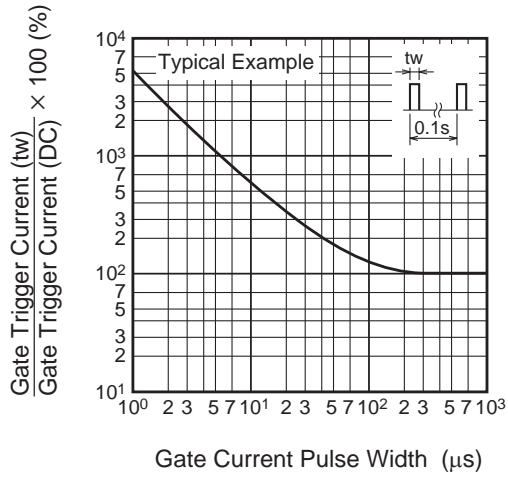
Turn-Off Time vs. Junction Temperature



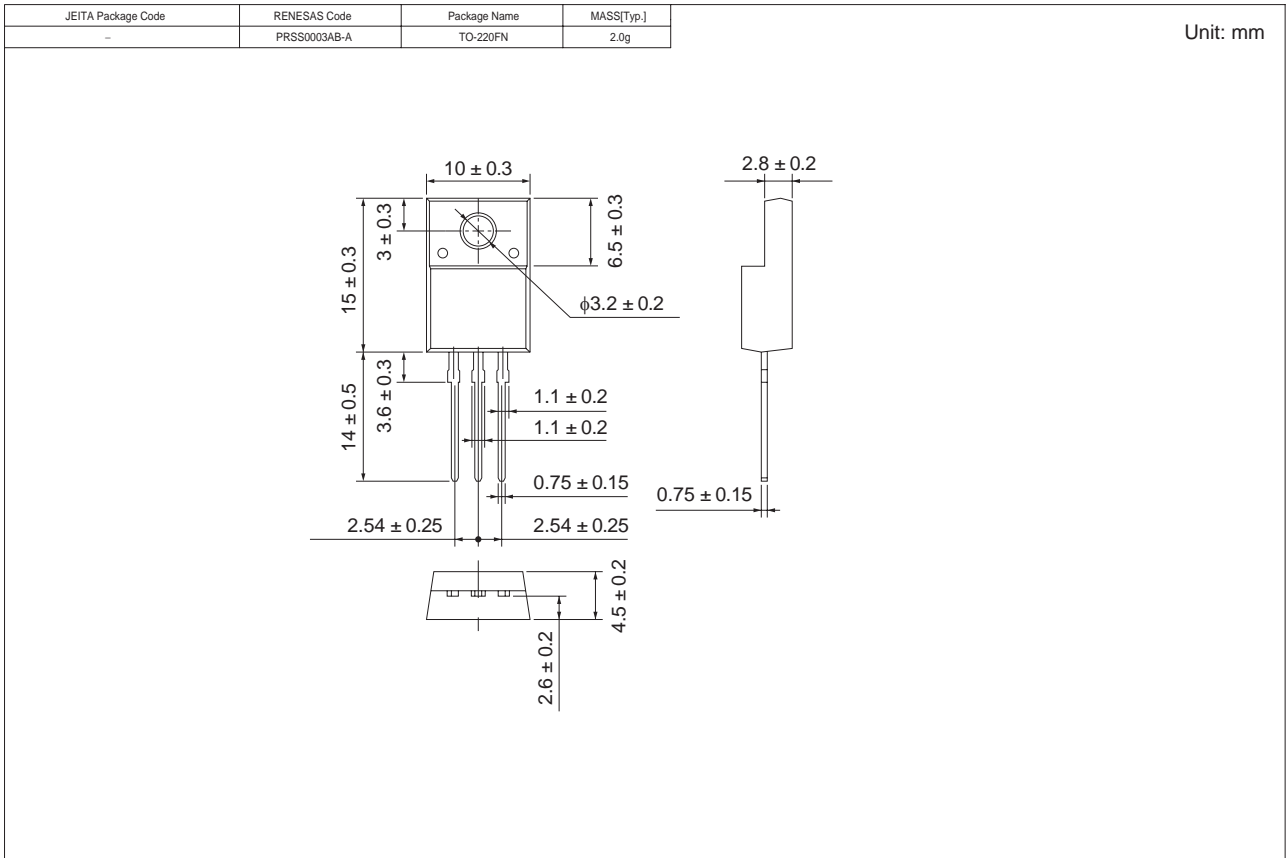
Repetitive Peak Reverse Voltage vs. Junction Temperature



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	Tube	50	Type name	CR3KM-12
Lead form	Tube	50	Type name – Lead forming code	CR3KM-12-A8

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

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