

CR3KM-12

Thyristor

Low Power Use

REJ03G0386-0100

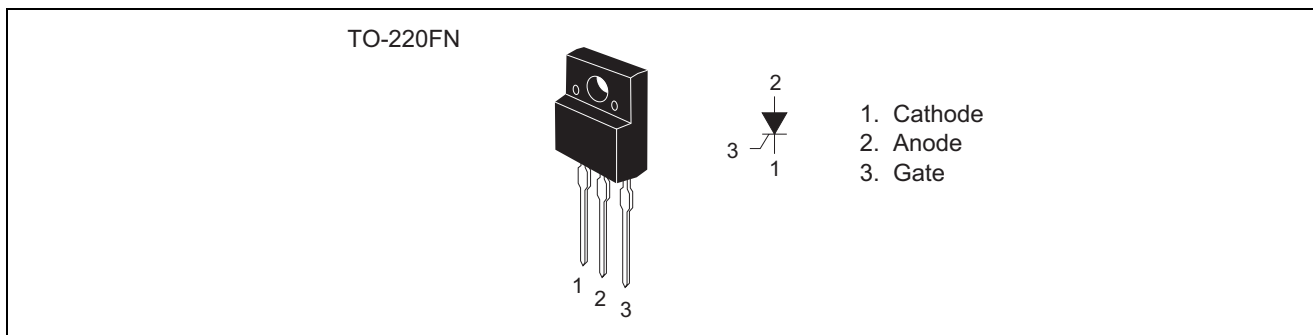
Rev.1.00

Aug.06.2004

Features

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

Outline



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 ^{Note1}	V_{DRM}	600	V
DC off-state voltage ^{Note1}	$V_D (DC)$	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	A^2s	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	V_{iso}	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 ^{Note3}	μA	$T_j = 25^\circ\text{C}$, $V_D = 6 \text{ V}$, $I_T = 0.1 \text{ A}$
Thermal resistance	$R_{th (j-c)}$	—	—	4.1	$^\circ\text{C/W}$	Junction to case ^{Note2}

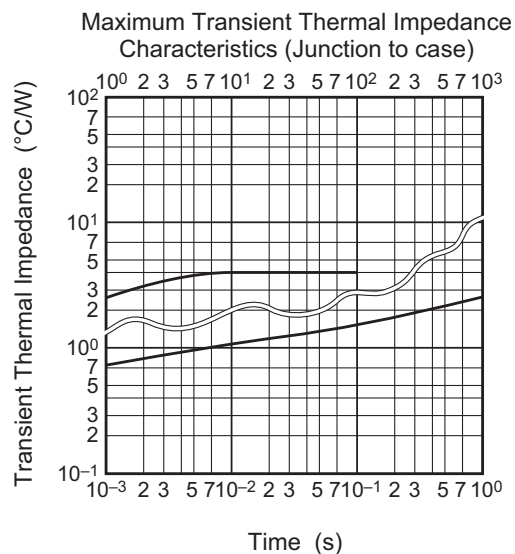
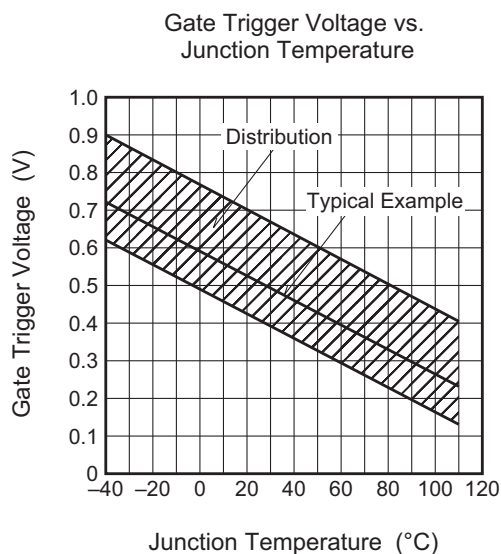
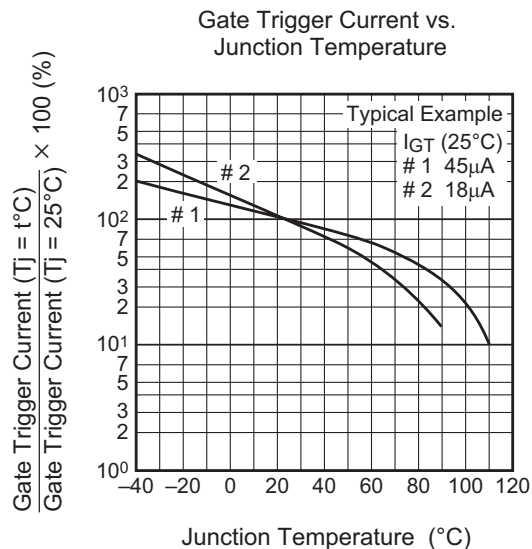
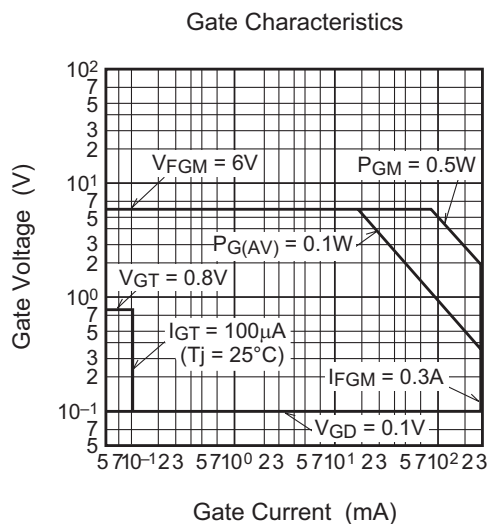
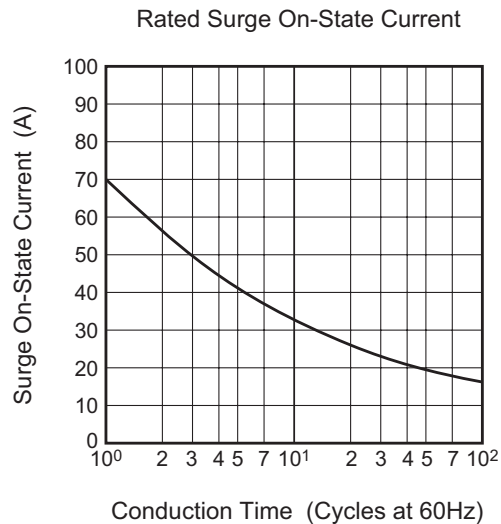
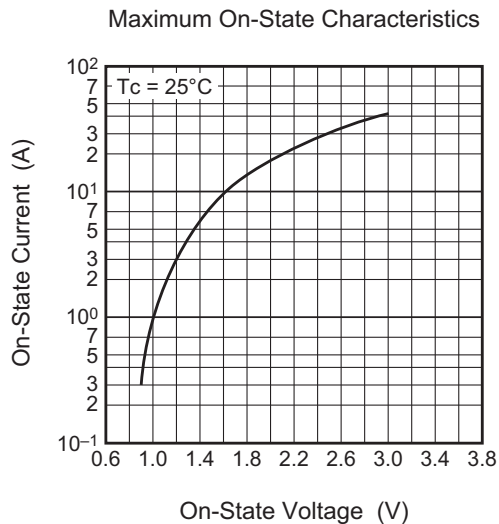
Notes: 2. The contact thermal resistance $R_{th (c-f)}$ in case of greasing is 0.5°C/W .

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

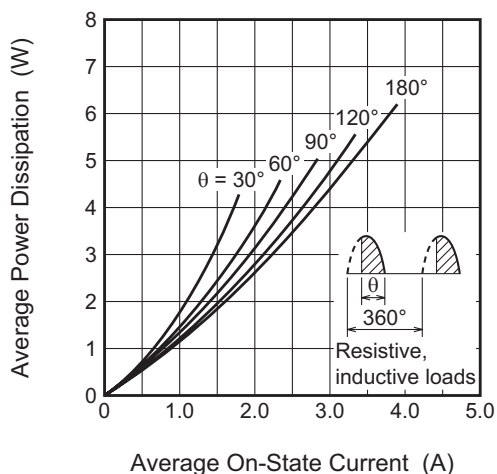
Item	B	C
$I_{GT} (\mu\text{A})$	20 to 50	40 to 100

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

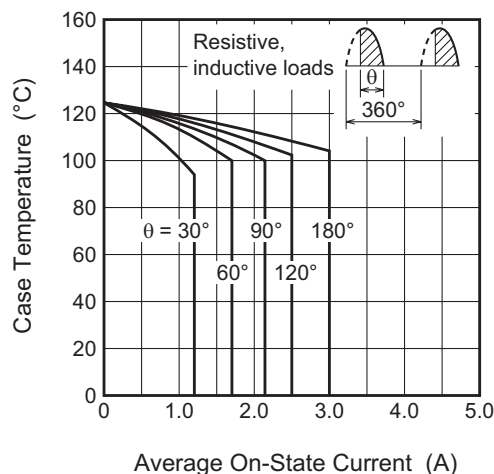
Performance Curves



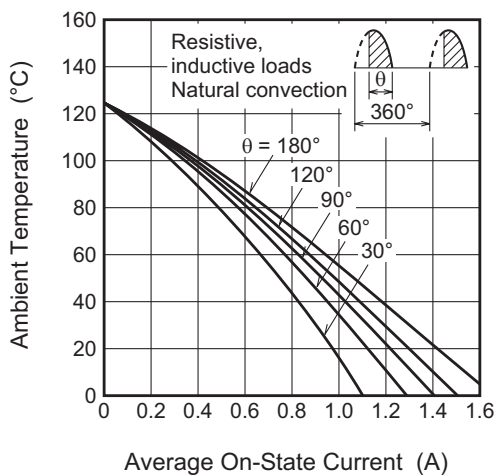
Maximum Average Power Dissipation
(Single-Phase Half Wave)



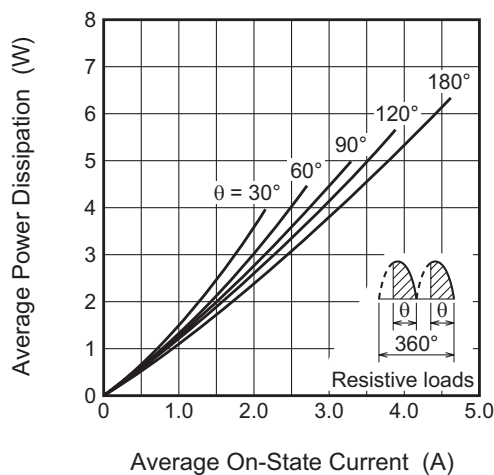
Allowable Case Temperature vs.
Average On-State Current
(Single-Phase Half Wave)



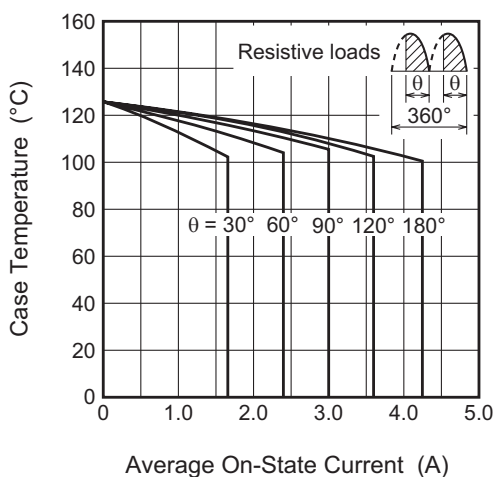
Allowable Ambient Temperature vs.
Average On-State Current
(Single-Phase Half Wave)



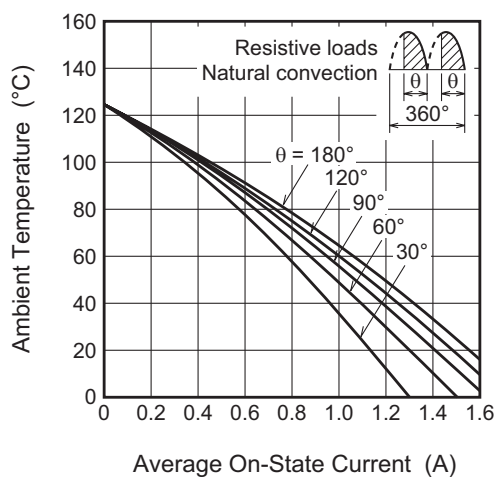
Maximum Average Power Dissipation
(Single-Phase Full Wave)

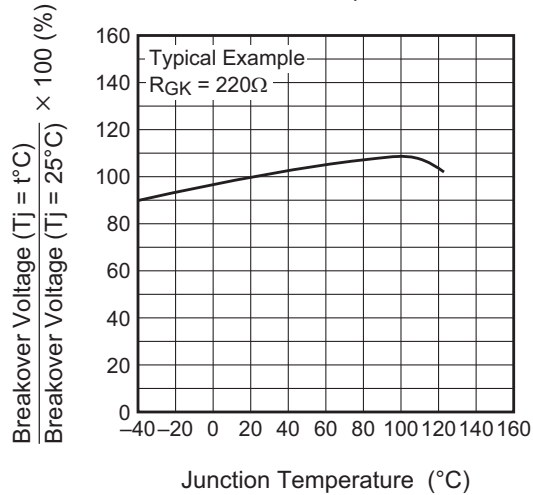
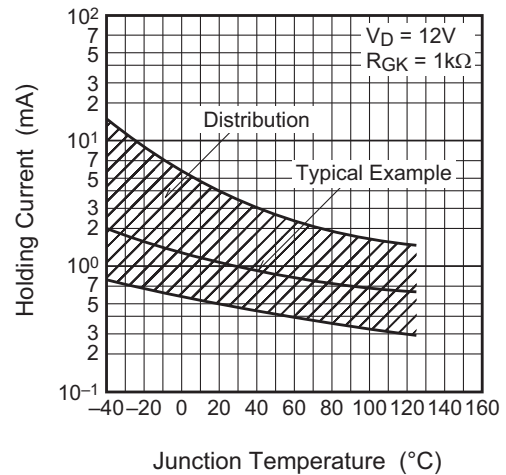
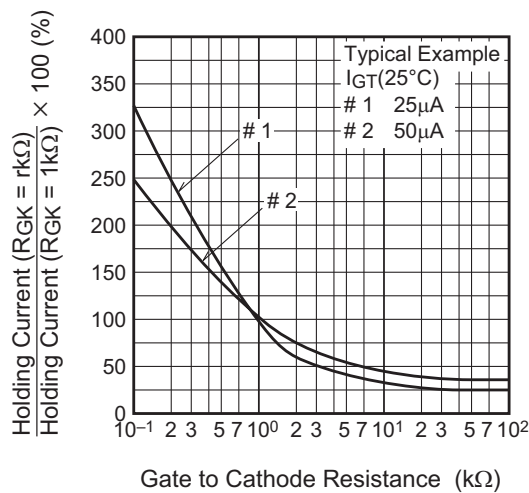
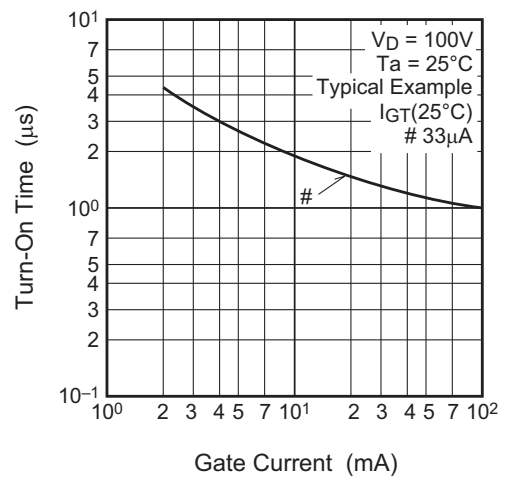
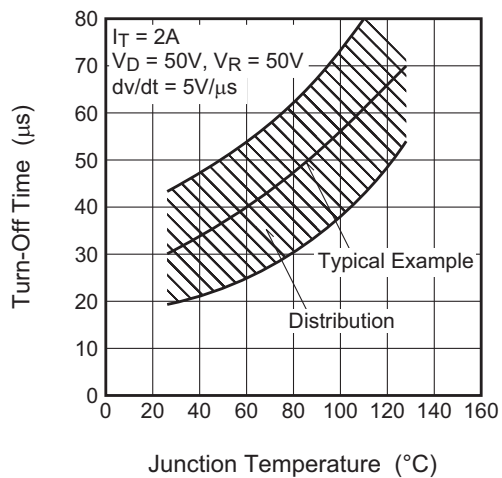
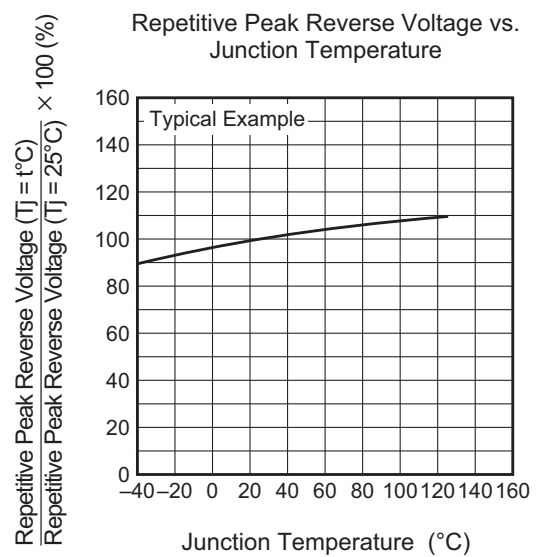


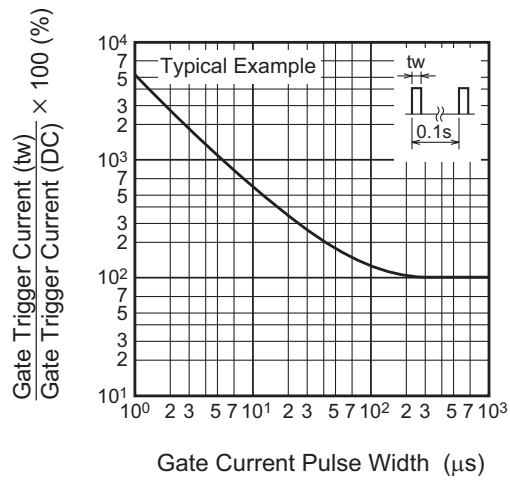
Allowable Case Temperature vs.
Average On-State Current
(Single-Phase Full Wave)



Allowable Ambient Temperature vs.
Average On-State Current
(Single-Phase Full Wave)



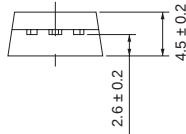
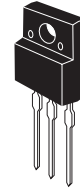
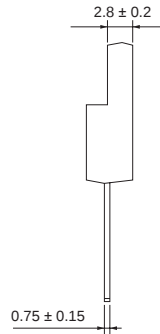
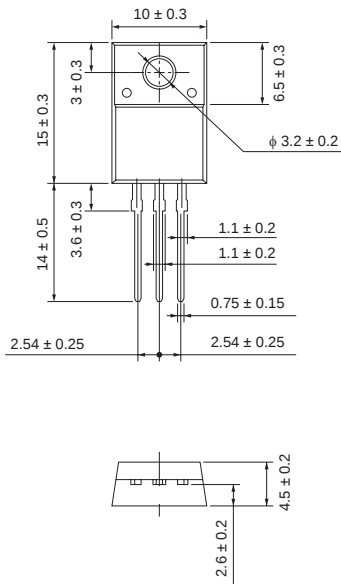
Breakover Voltage vs.
Junction TemperatureHolding Current vs.
Junction TemperatureHolding Current vs.
Gate to Cathode ResistanceTurn-On Time vs.
Gate CurrentTurn-Off Time vs.
Junction TemperatureRepetitive Peak Reverse Voltage vs.
Junction Temperature

Gate Trigger Current vs.
Gate Current Pulse Width

Package Dimensions

TO-220FN

EIAJ Package Code	JEDEC Code	Mass (g) (reference value)	Lead Material
—	—	2.0	Cu alloy



Note 1) The dimensional figures indicate representative values unless otherwise the tolerance is specified.

Symbol	Dimension in Millimeters		
	Min	Typ	Max
A	—	—	—
A ₁	—	—	—
A ₂	—	—	—
b	—	—	—
D	—	—	—
E	—	—	—
e	—	—	—
x	—	—	—
y	—	—	—
y ₁	—	—	—
ZD	—	—	—
ZE	—	—	—

Order Code

Lead form	Standard packing	Quantity	Standard order code	Standard order code example
Straight type	Plastic Magazine (Tube)	50	Type name	CR3KM-12
Lead form	Plastic Magazine (Tube)	50	Type name – Lead forming code	CR3KM-12-A8

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

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