

CR3KM-12

Thyristor

Low Power Use

REJ03G0386-0100

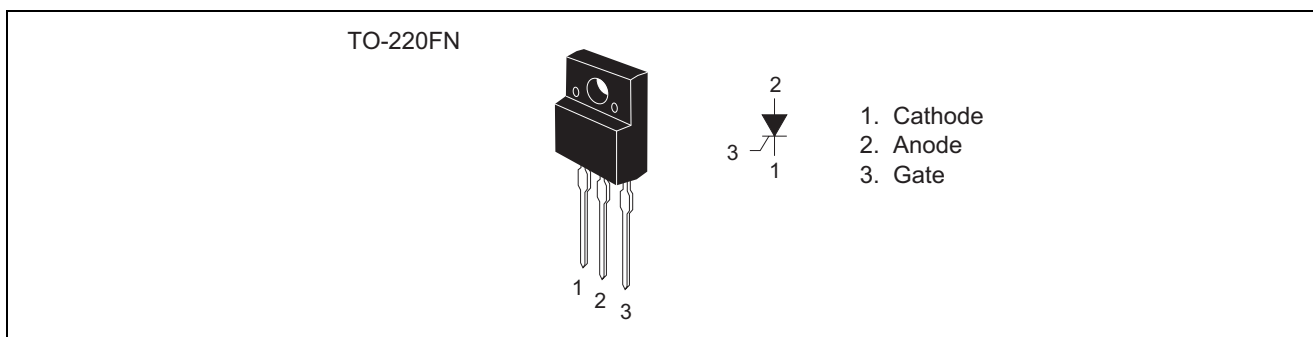
Rev.1.00

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	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 ^{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	$^\circ\text{C}/\text{W}$	Junction to case ^{Note2}

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

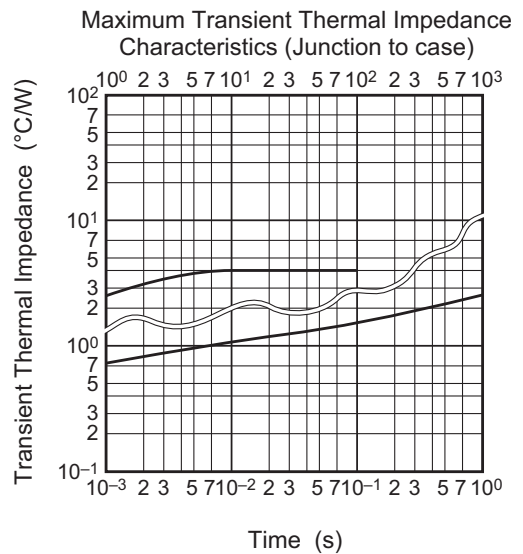
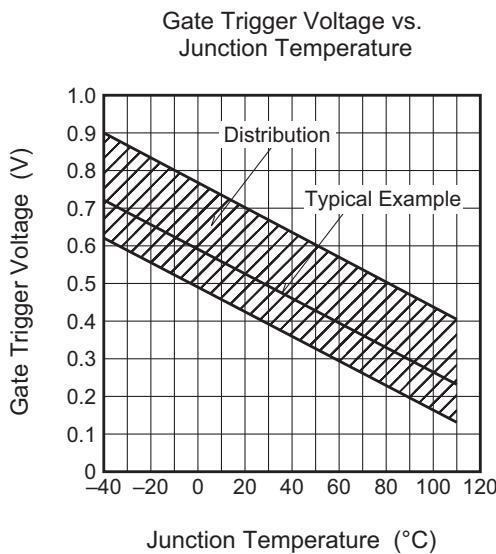
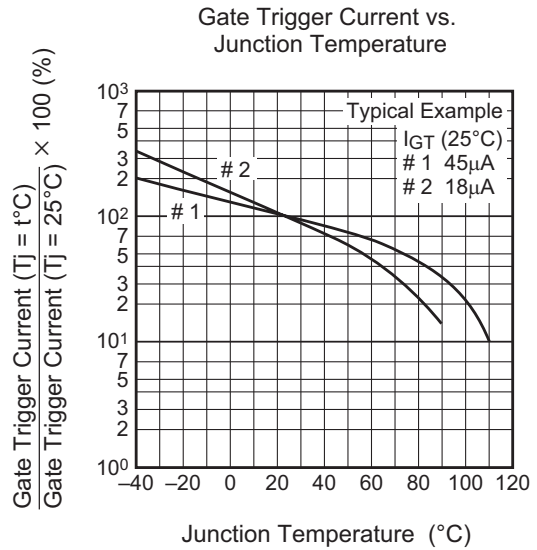
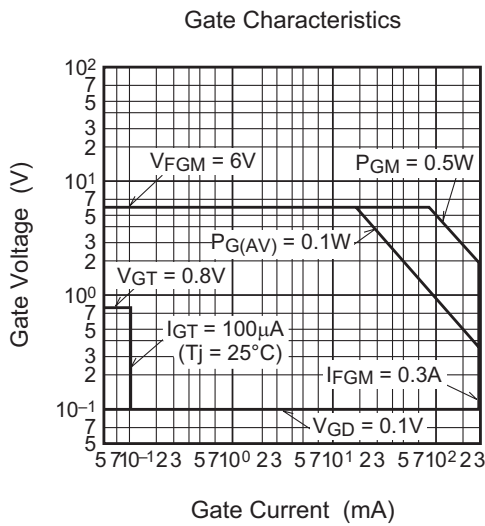
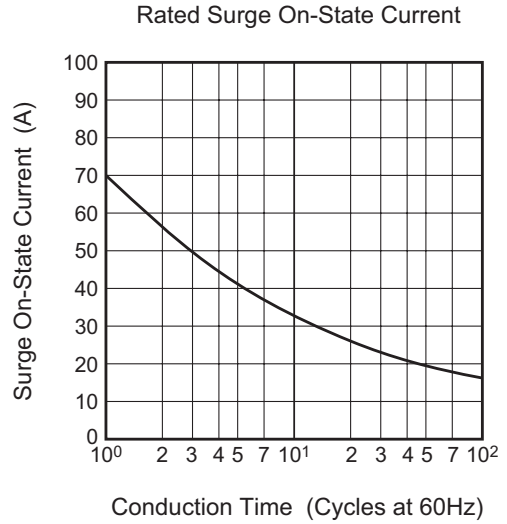
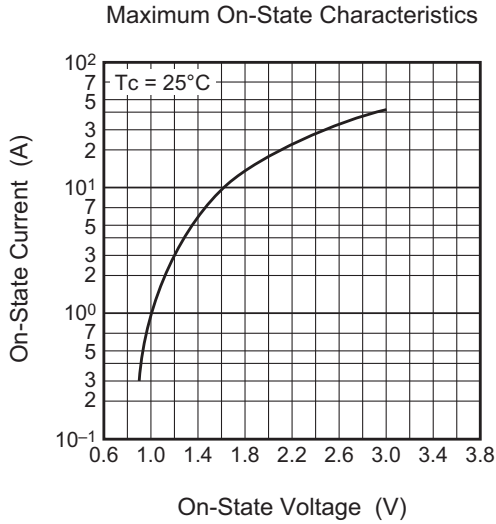
3. If special values of I_{GT} are required, choose at least two items from those listed in the table below.

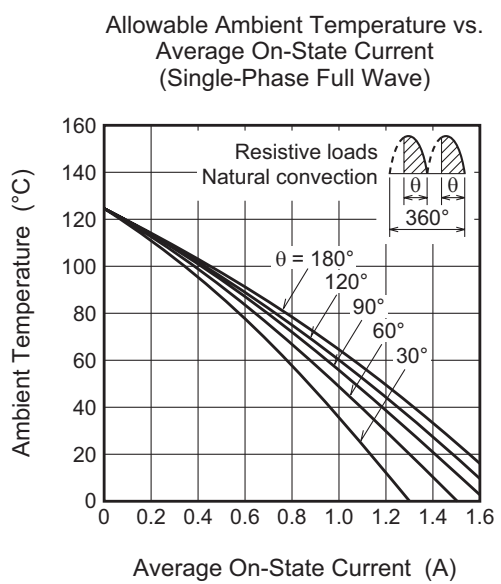
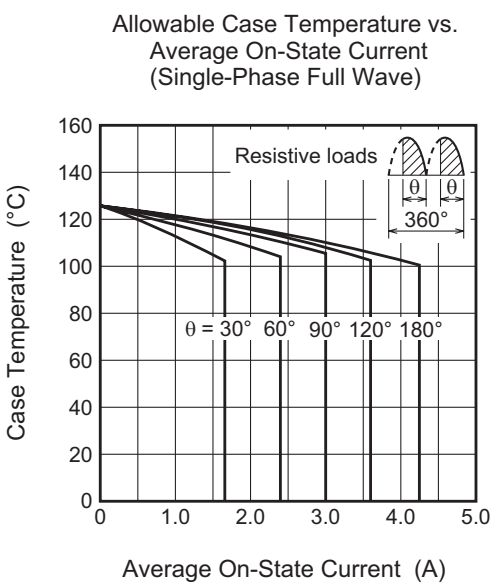
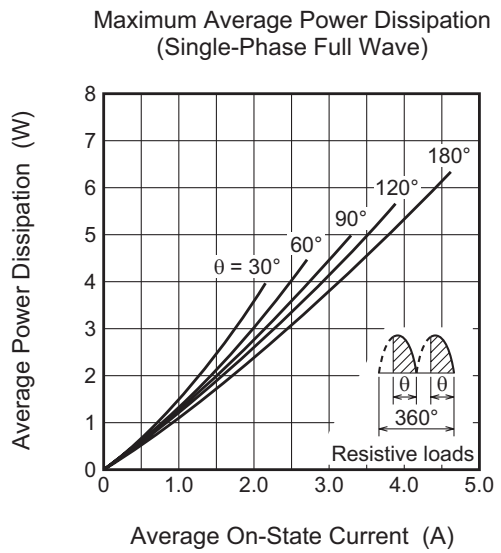
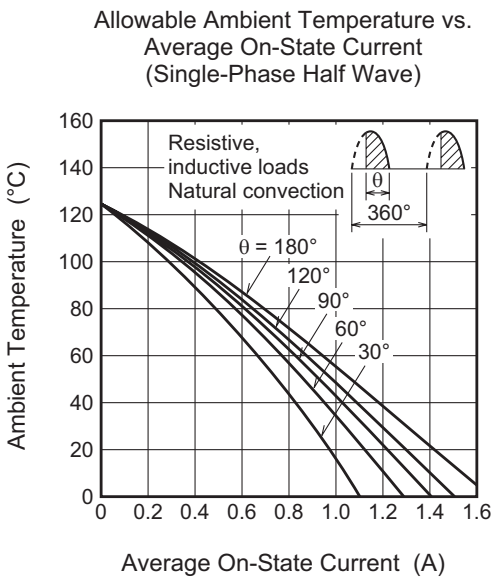
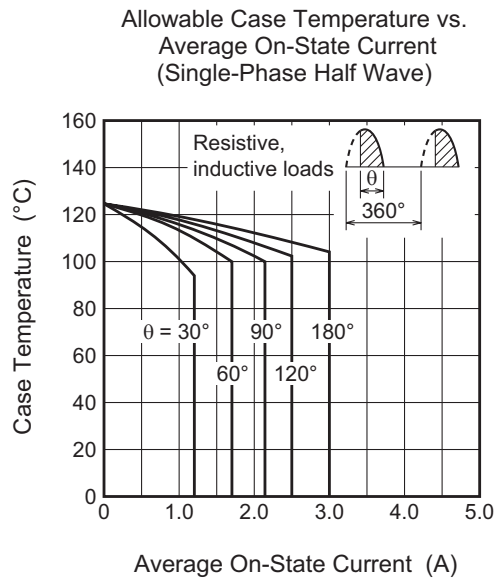
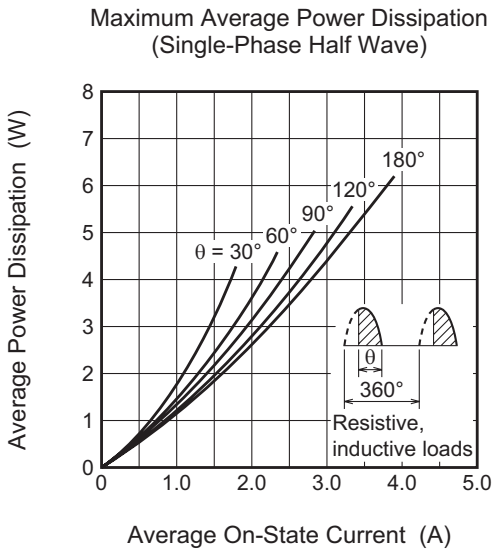
(Example: BC)

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

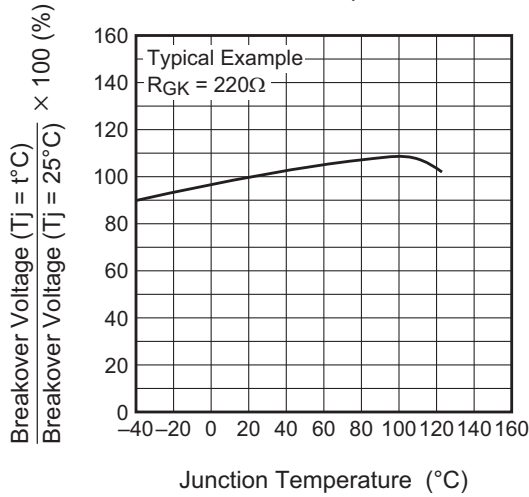
The above values do not include the current flowing through the 220Ω resistance between the gate and cathode.

Performance Curves

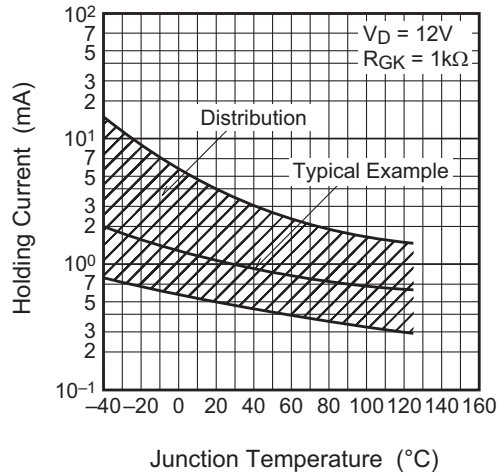




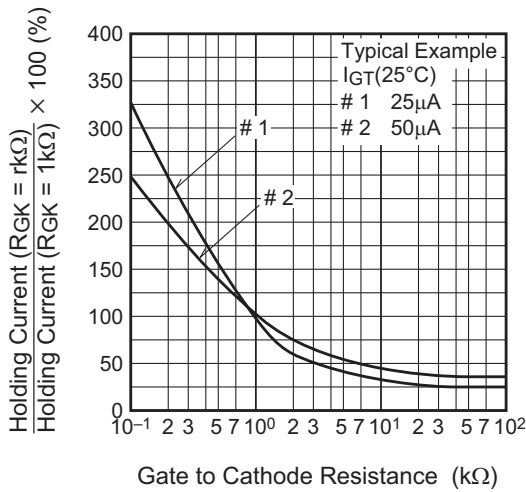
Breakover Voltage vs. Junction Temperature



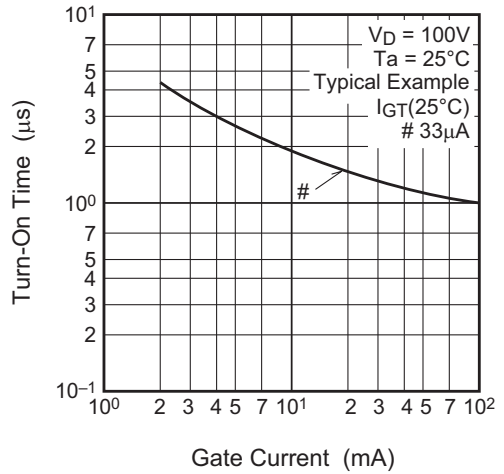
Holding Current vs. Junction Temperature



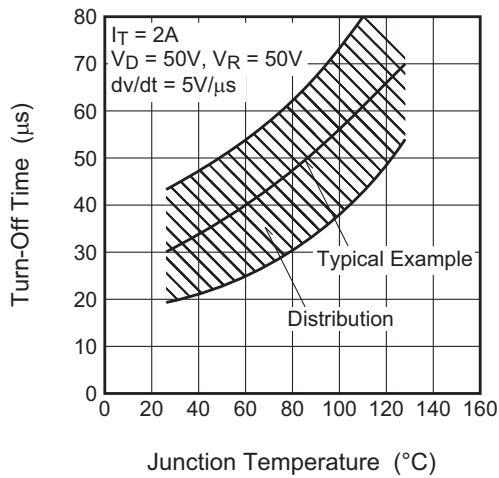
Holding Current vs. Gate to Cathode Resistance



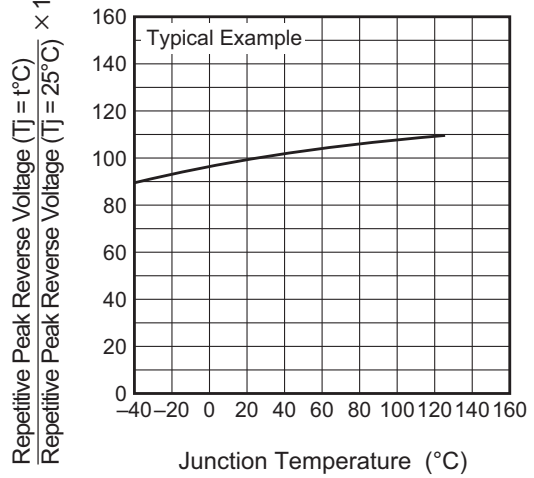
Turn-On Time vs. Gate Current



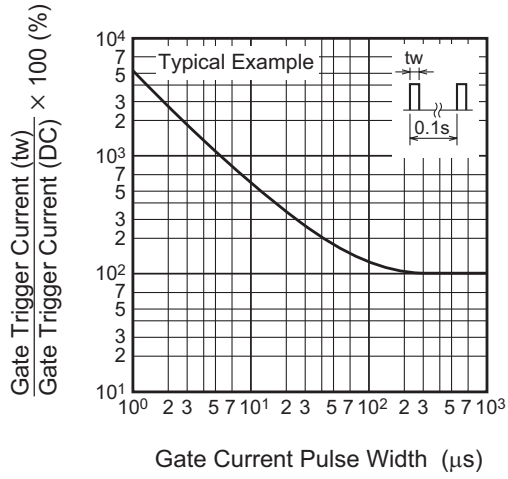
Turn-Off Time vs. Junction Temperature



Repetitive Peak Reverse Voltage vs. Junction Temperature



Gate Trigger Current vs.
Gate Current Pulse Width



Package Dimensions

TO-220FN

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

Technical drawings showing dimensions for the TO-220FN package. Dimensions are in millimeters.

- Top view: Overall width 10 ± 0.3 , distance from top edge to mounting hole center 3 ± 0.3 , distance between mounting holes 6.5 ± 0.3 , hole diameter $\phi 3.2 \pm 0.2$, distance from bottom edge to lead start 14 ± 0.5 , lead spacing 3.6 ± 0.3 , lead width 1.1 ± 0.2 , lead thickness 0.75 ± 0.15 , distance from lead start to lead end 2.54 ± 0.25 .
- Side view: Package height 2.8 ± 0.2 , lead length 0.75 ± 0.15 .
- Lead view: Lead thickness 2.6 ± 0.2 , lead width 4.5 ± 0.2 .

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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