To our customers,

Old Company Name in Catalogs and Other Documents

On April 1st, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

Renesas Electronics website: http://www.renesas.com

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (http://www.renesas.com)

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CR6KM-12A

Thyristor

Medium Power Use

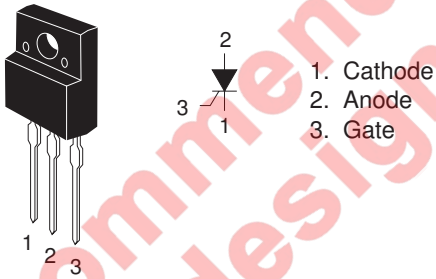
REJ03G0387-0100
Rev.1.00
Aug.06.2004

Features

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

Outline

TO-220FN



1. Cathode
2. Anode
3. Gate

Applications

Switching mode power supply, regulator for autocycle, 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, Tc = 85°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	A^2s	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	Tj	– 40 to +125	°C	
Storage temperature	Tstg	– 40 to +125	°C	
Mass	—	2.0	g	Typical value
Isolation voltage	Viso	2000	V	Ta = 25°C, AC 1 minute, each terminal to case

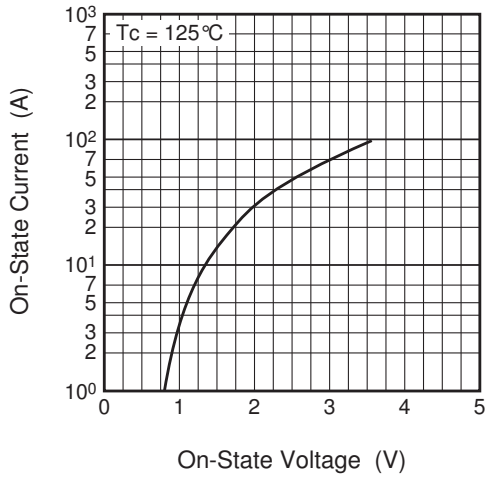
Electrical Characteristics

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

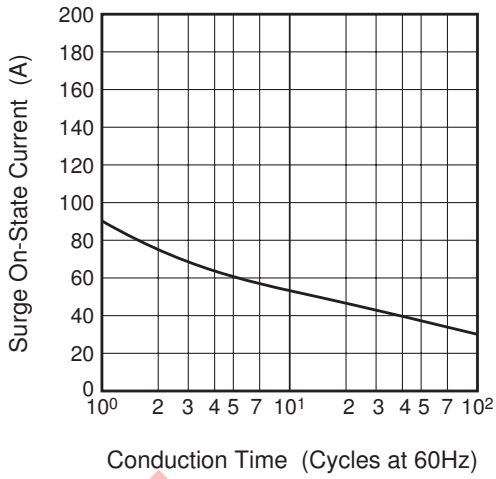
Notes: 1. The contact thermal resistance $R_{th\ (c-f)}$ in case of greasing is 0.5°C/W.

Performance Curves

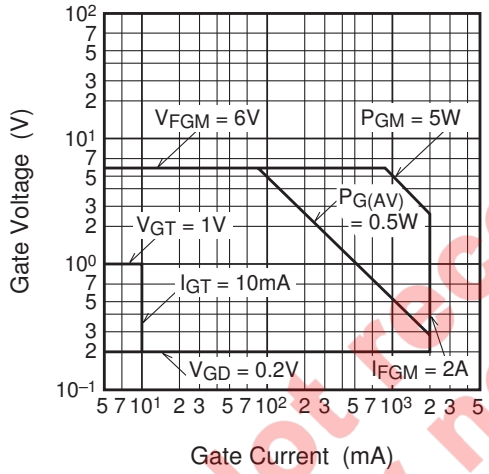
Maximum On-State Characteristics



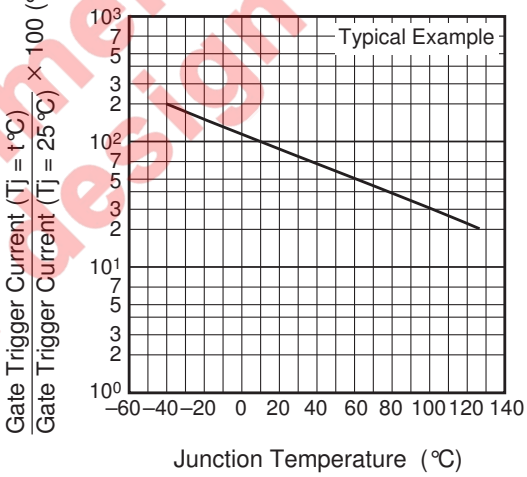
Rated Surge On-State Current



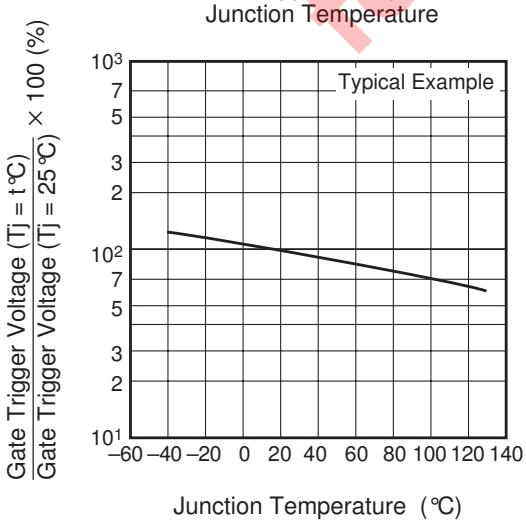
Gate Characteristics



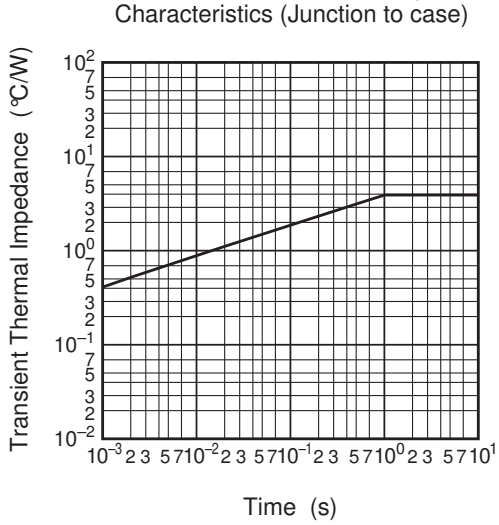
Gate Trigger Current vs. Junction Temperature



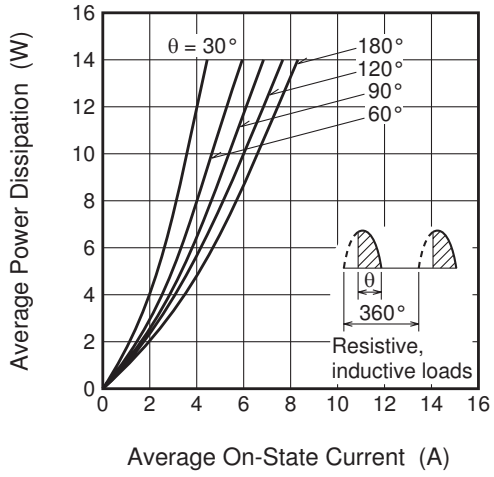
Gate Trigger Voltage vs. Junction Temperature



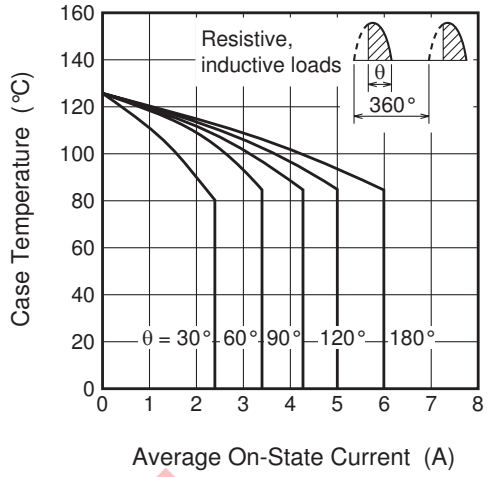
Maximum Transient Thermal Impedance Characteristics (Junction to case)



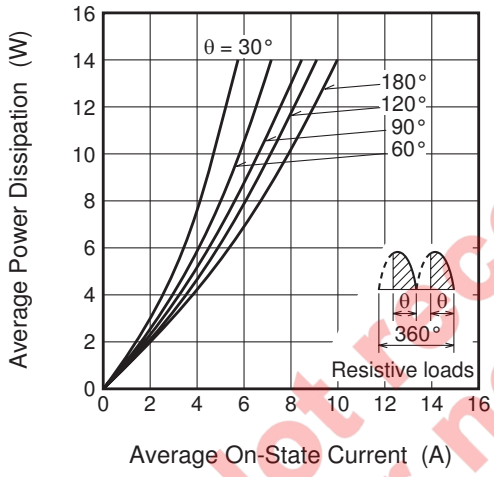
Maximum Average Power Dissipation
(Single-Phase Half Wave)



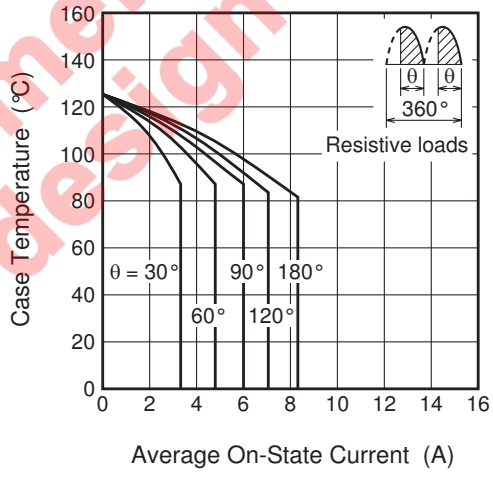
Allowable Case Temperature vs.
Average On-State Current
(Single-Phase Half Wave)



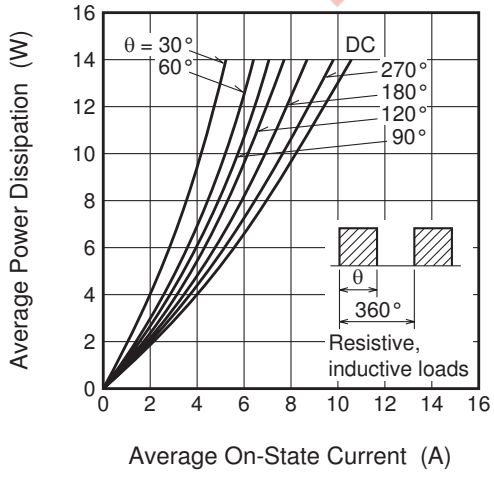
Maximum Average Power Dissipation
(Single-Phase Full Wave)



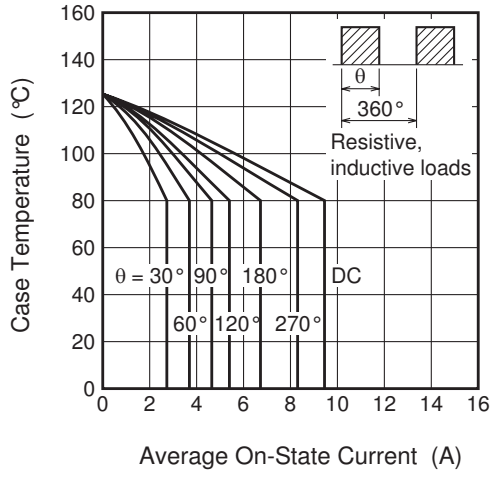
Allowable Case Temperature vs.
Average On-State Current
(Single-Phase Full Wave)



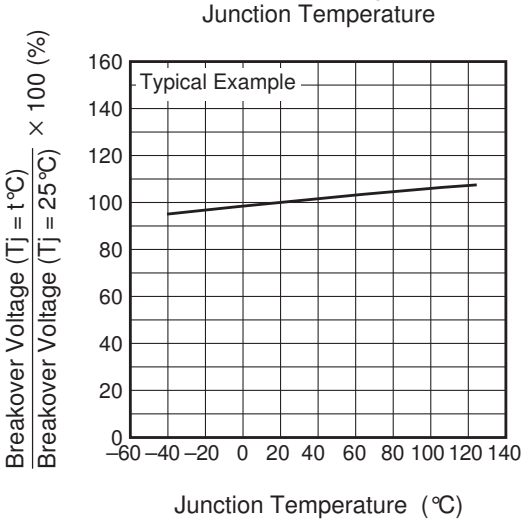
Maximum Average Power Dissipation
(Rectangular Wave)



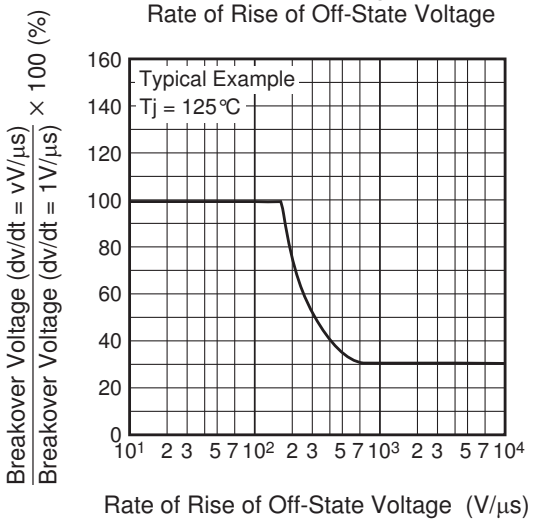
Allowable Case Temperature vs.
Average On-State Current
(Rectangular Wave)



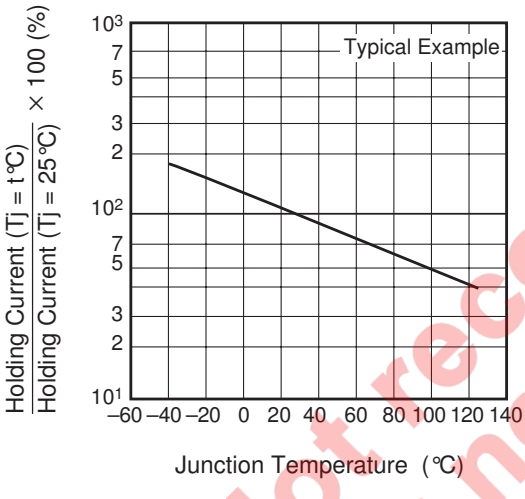
Breakover Voltage vs.
Junction Temperature



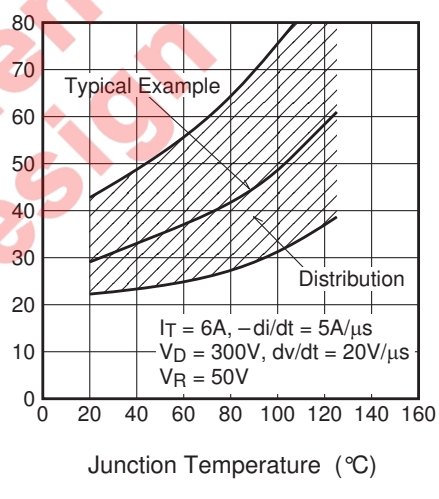
Breakover Voltage vs.
Rate of Rise of Off-State Voltage



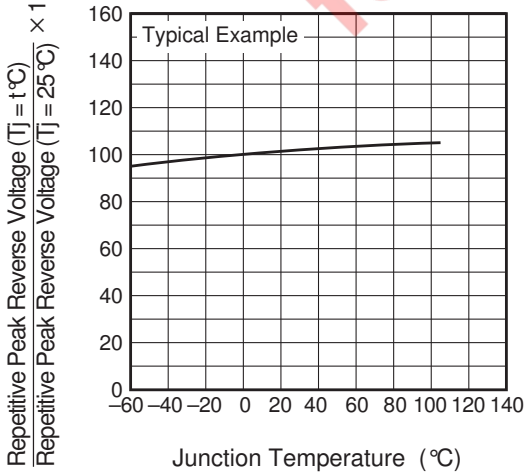
Holding Current vs.
Junction Temperature



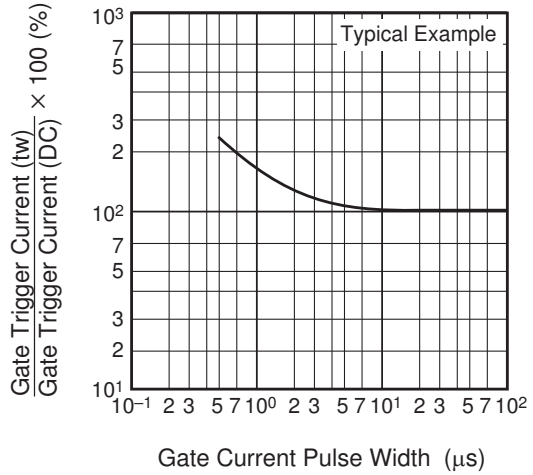
Turn-Off Time vs.
Junction Temperature



Repetitive Peak Reverse Voltage vs.
Junction Temperature



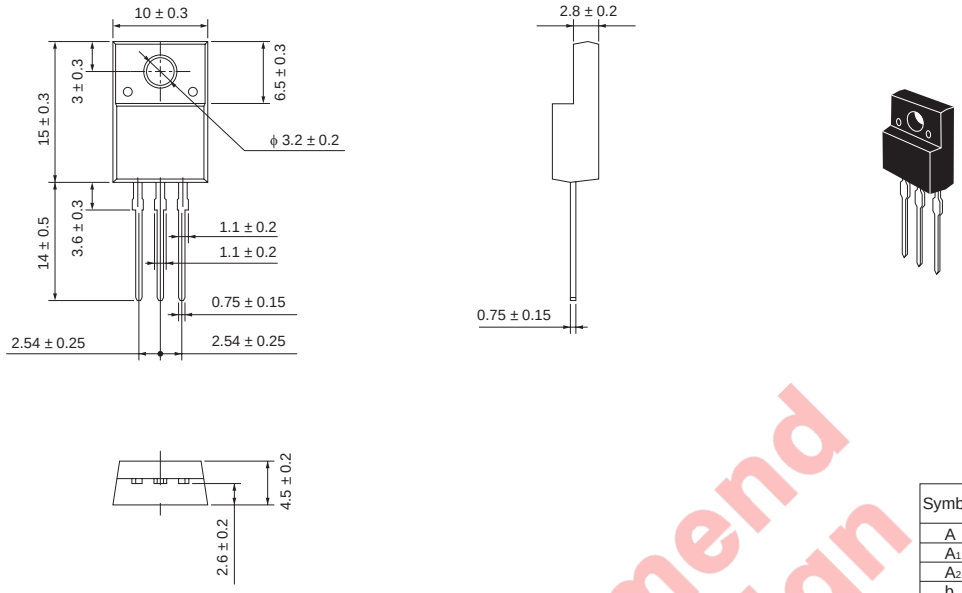
Gate Trigger Current vs.
Gate Current Pulse Width



Package Dimensions

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	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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Colophon .1.0