

To all our customers

Regarding the change of names mentioned in the document, such as Mitsubishi Electric and Mitsubishi XX, to Renesas Technology Corp.

The semiconductor operations of Hitachi and Mitsubishi Electric were transferred to Renesas Technology Corporation on April 1st 2003. These operations include microcomputer, logic, analog and discrete devices, and memory chips other than DRAMs (flash memory, SRAMs etc.) Accordingly, although Mitsubishi Electric, Mitsubishi Electric Corporation, Mitsubishi Semiconductors, and other Mitsubishi brand names are mentioned in the document, these names have in fact all been changed to Renesas Technology Corp. Thank you for your understanding. Except for our corporate trademark, logo and corporate statement, no changes whatsoever have been made to the contents of the document, and these changes do not constitute any alteration to the contents of the document itself.

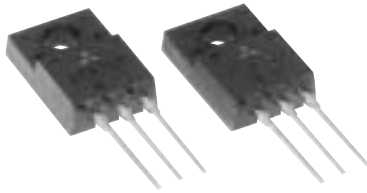
Note : Mitsubishi Electric will continue the business operations of high frequency & optical devices and power devices.

Renesas Technology Corp.
Customer Support Dept.
April 1, 2003

BCR3KM-14

LOW POWER USE
INSULATED TYPE, PLANAR PASSIVATION TYPE

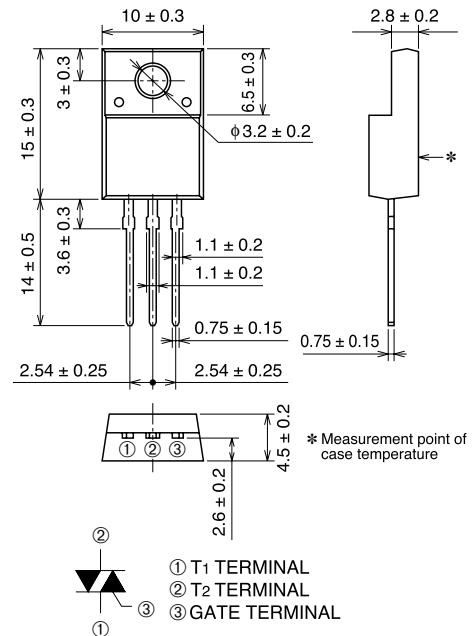
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- I_T (RMS) 3A
- V_{DRM} 700V
- IFGT I , IRGT I , IRGT III 30mA
- V_{iso} 2000V

OUTLINE DRAWING

Dimensions in mm



TO-220FN

APPLICATION

Contactless AC switches, light dimmer, electric blankets, control of household equipment such as electric fan, solenoid drivers, small motor control, other general purpose control applications

MAXIMUM RATINGS

Symbol	Parameter	Voltage class	Unit
		14	
V_{DRM}	Repetitive peak off-state voltage*1	700	V
V_{DSM}	Non-repetitive peak off-state voltage*1	840	V

Symbol	Parameter	Conditions	Ratings	Unit
I_T (RMS)	RMS on-state current	Commercial frequency, sine full wave 360° conduction, $T_c=108^\circ\text{C}$	3	A
I_{TSM}	Surge on-state current	60Hz sine wave 1 full cycle, peak value, non-repetitive	30	A
I^2_t	I^2_t for fusing	Value corresponding to 1 cycle of half wave 60Hz, surge on-state current	3.7	A ² s
P_{GM}	Peak gate power dissipation		3	W
P_G (AV)	Average gate power dissipation		0.3	W
V_{GM}	Peak gate voltage		6	V
I_{GM}	Peak gate current		0.5	A
T_j	Junction temperature		-40 ~ +125	°C
T_{stg}	Storage temperature		-40 ~ +125	°C
—	Weight	Typical value	2.0	g
V_{iso}	Isolation voltage	$T_a=25^\circ\text{C}$, AC 1 minute, T1 · T2 · G terminal to case	2000	V

*1. Gate open.

Mar.2002

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ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
I_{DRM}	Repetitive peak off-state current	$T_j=125^{\circ}\text{C}$, V_{DRM} applied	—	—	2.0	mA
V_{TM}	On-state voltage	$T_c=25^{\circ}\text{C}$, $I_{TM}=4.5\text{A}$, Instantaneous measurement	—	—	1.6	V
$V_{FGT\text{ I}}$	Gate trigger voltage *2	$T_j=25^{\circ}\text{C}$, $V_D=6\text{V}$, $R_L=6\Omega$, $R_G=330\Omega$	—	—	1.5	V
$V_{RGT\text{ I}}$			—	—	1.5	V
$V_{RGT\text{ III}}$			—	—	1.5	V
$I_{FGT\text{ I}}$	Gate trigger current *2	$T_j=25^{\circ}\text{C}$, $V_D=6\text{V}$, $R_L=6\Omega$, $R_G=330\Omega$	—	—	30	mA
$I_{RGT\text{ I}}$			—	—	30	mA
$I_{RGT\text{ III}}$			—	—	30	mA
V_{GD}	Gate non-trigger voltage	$T_j=125^{\circ}\text{C}$, $V_D=1/2V_{DRM}$	0.2	—	—	V
$R_{th(j-c)}$	Thermal resistance	Junction to case *3	—	—	4.0	$^{\circ}\text{C}/\text{W}$
$(dv/dt)_c$	Critical-rate of rise of off-state commutating voltage *4	$T_j=125^{\circ}\text{C}$	5	—	—	$\text{V}/\mu\text{s}$

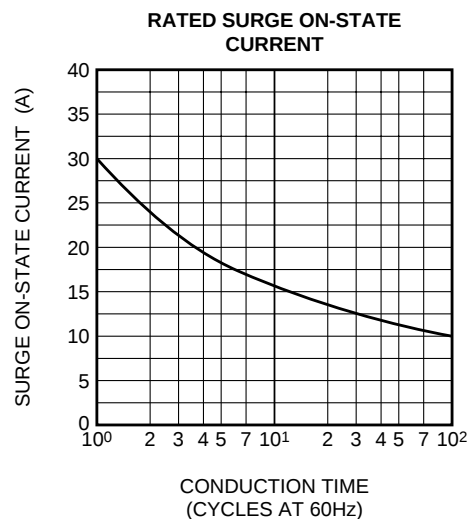
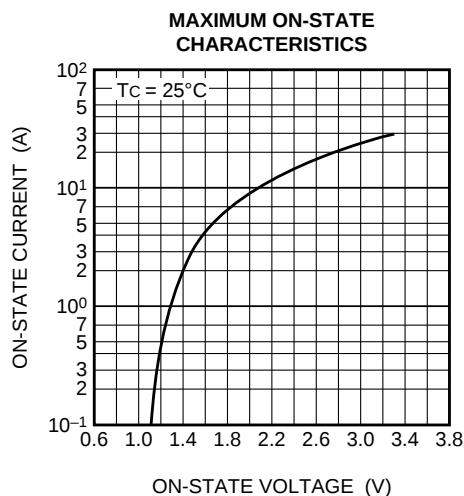
*2. Measurement using the gate trigger characteristics measurement circuit.

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

*4. Test conditions of the critical-rate of rise of off-state commutating voltage is shown in the table below.

Test conditions	Commutating voltage and current waveforms (inductive load)
1. Junction temperature $T_j=125^{\circ}\text{C}$ 2. Rate of decay of on-state commutating current $(di/dt)_c=-1.5\text{A}/\text{ms}$ 3. Peak off-state voltage $V_D=400\text{V}$	

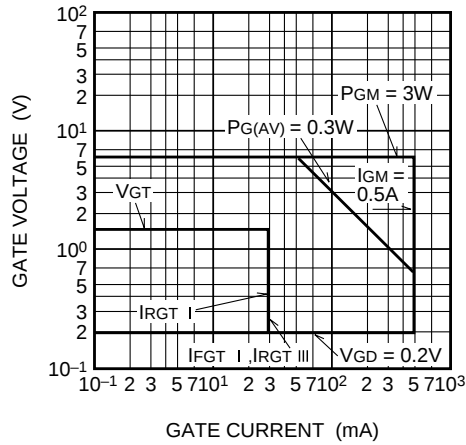
PERFORMANCE CURVES



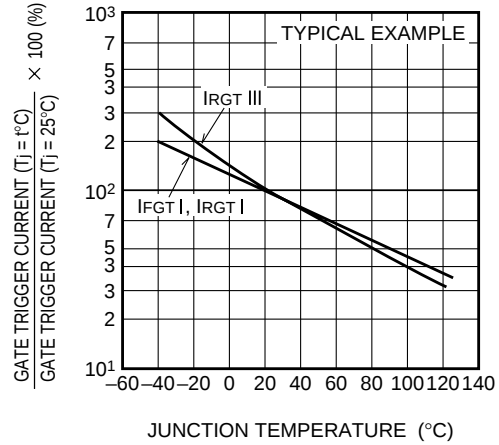
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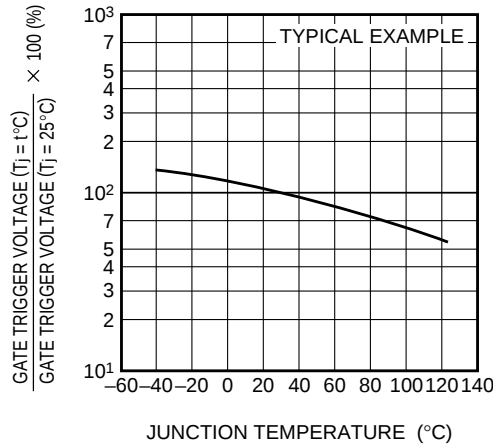
**GATE CHARACTERISTICS
(I, II AND III)**



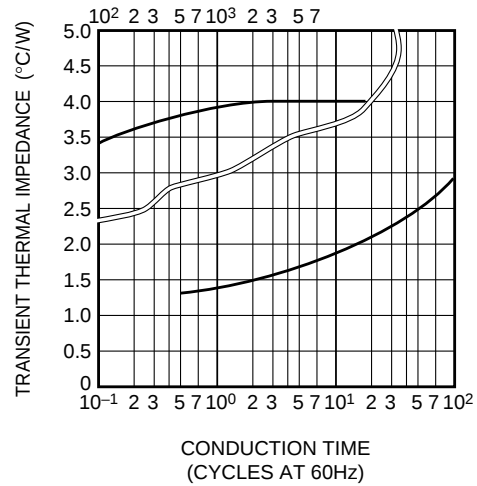
**GATE TRIGGER CURRENT VS.
JUNCTION TEMPERATURE**



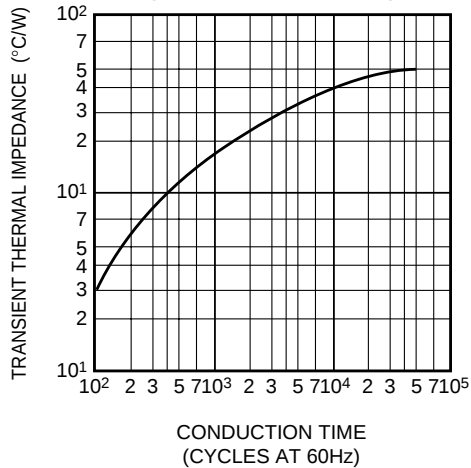
**GATE TRIGGER VOLTAGE VS.
JUNCTION TEMPERATURE**



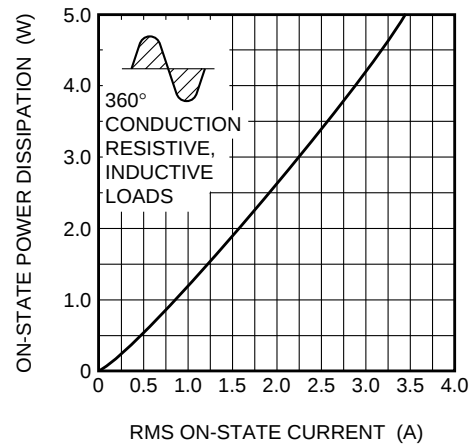
**MAXIMUM TRANSIENT THERMAL
IMPEDANCE CHARACTERISTICS
(JUNCTION TO CASE)**



**MAXIMUM TRANSIENT THERMAL
IMPEDANCE CHARACTERISTICS
(JUNCTION TO AMBIENT)**



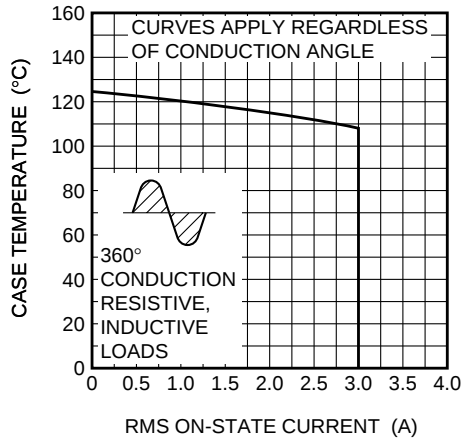
**MAXIMUM ON-STATE POWER
DISSIPATION**



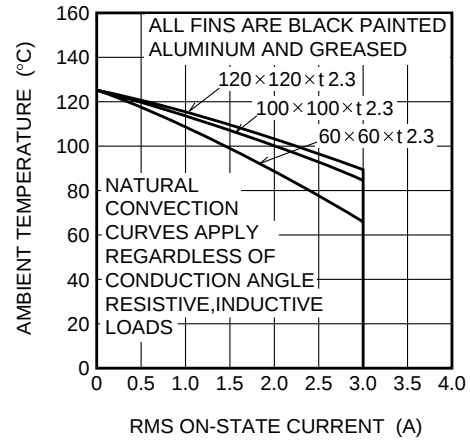
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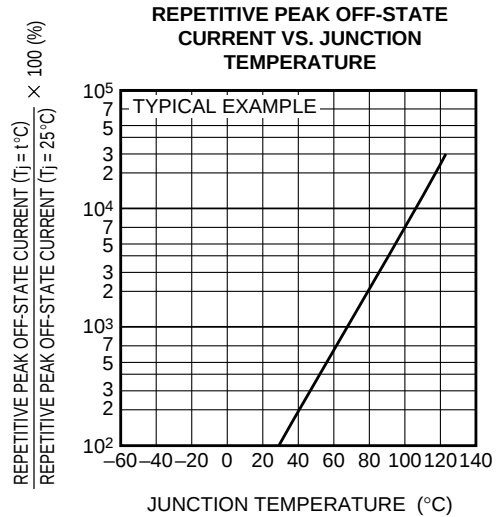
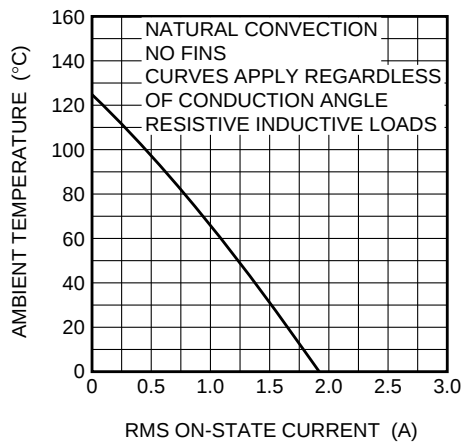
ALLOWABLE CASE TEMPERATURE
VS. RMS ON-STATE CURRENT



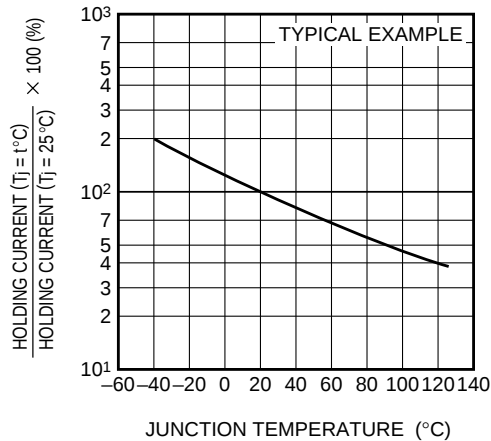
ALLOWABLE AMBIENT TEMPERATURE
VS. RMS ON-STATE CURRENT



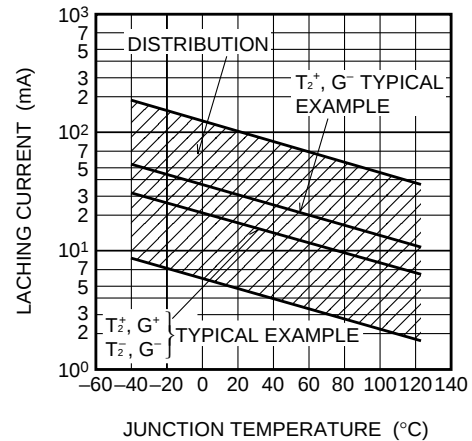
ALLOWABLE AMBIENT TEMPERATURE
VS. RMS ON-STATE CURRENT



HOLDING CURRENT VS.
JUNCTION TEMPERATURE

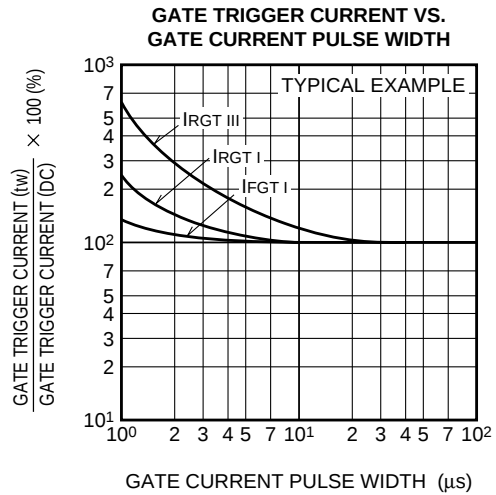
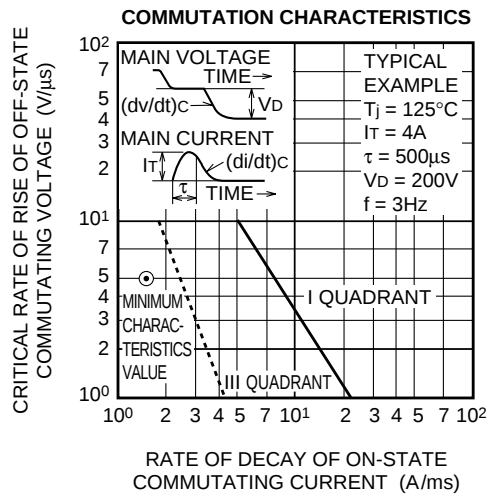
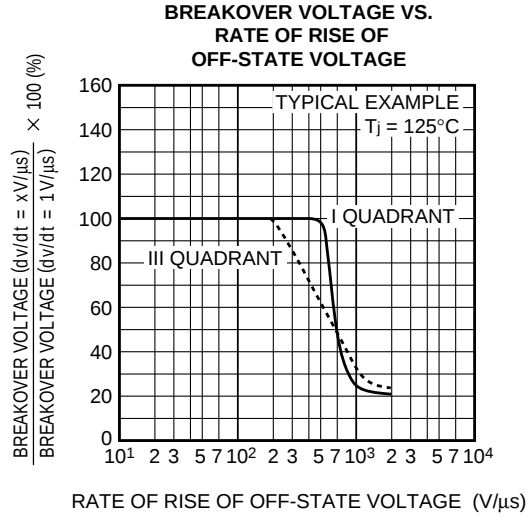
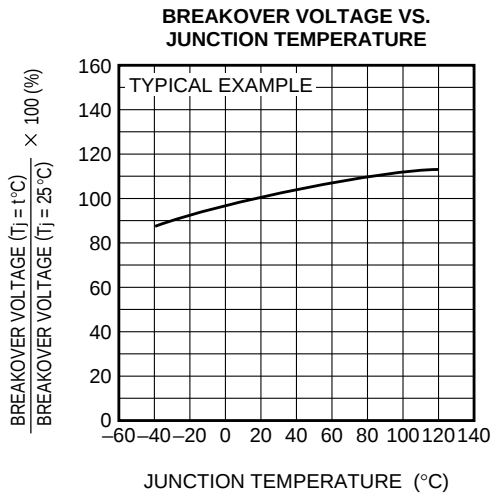


LACHING CURRENT VS.
JUNCTION TEMPERATURE



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LOW POWER USE
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GATE TRIGGER CHARACTERISTICS TEST CIRCUITS

