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)

Send any inquiries to http://www.renesas.com/inquiry.

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(Note 2) "Renesas Electronics product(s)" means any product developed or manufactured by or for Renesas Electronics.

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

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LOW POWER USE

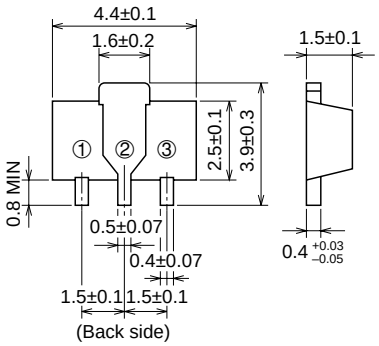
NON-INSULATED TYPE, PLANAR PASSIVATION TYPE

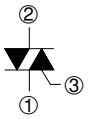
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- **$I_{T\ (RMS)}$ 0.8A**
- **V_{DRM} 600V**
- **$I_{FGT\ I}$, $I_{RGT\ I}$, $I_{RGT\ III}$ 5mA**
- **$I_{FGT\ III}$ 10mA**

OUTLINE DRAWING Dimensions in mm





① T_1 TERMINAL
② T_2 TERMINAL
③ GATE TERMINAL

SOT-89

APPLICATION

Hybrid IC, solid state relay,
control of household equipment such as electric fan · washing machine,
other general purpose control applications

MAXIMUM RATINGS

Symbol	Parameter	Voltage class	Unit
		12 (marked "BF")	
V_{DRM}	Repetitive peak off-state voltage *1	600	V
V_{DSM}	Non-repetitive peak off-state voltage *1	720	V

Symbol	Parameter	Conditions	Ratings	Unit
$I_{T\ (RMS)}$	RMS on-state current	Commercial frequency, sine full wave 360° conduction, T_a=40°C *3	0.8	A
I_{TSM}	Surge on-state current	60Hz sinewave 1 full cycle, peak value, non-repetitive	8	A
I^2t	I^2t for fusing	Value corresponding to 1 cycle of half wave 60Hz, surge on-state current	0.26	A^2s
P_{GM}	Peak gate power dissipation		1	W
$P_{G\ (AV)}$	Average gate power dissipation		0.1	W
V_{GM}	Peak gate voltage		6	V
I_{GM}	Peak gate current		1	A
T_j	Junction temperature		–40 ~ +125	°C
T_{stg}	Storage temperature		–40 ~ +125	°C
—	Weight	Typical value	48	mg

*1. Gate open.

Mar. 2002

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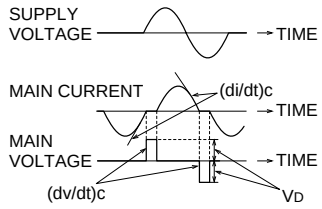
LOW POWER USE

NON-INSULATED TYPE, PLANAR PASSIVATION TYPE

ELECTRICAL CHARACTERISTICS

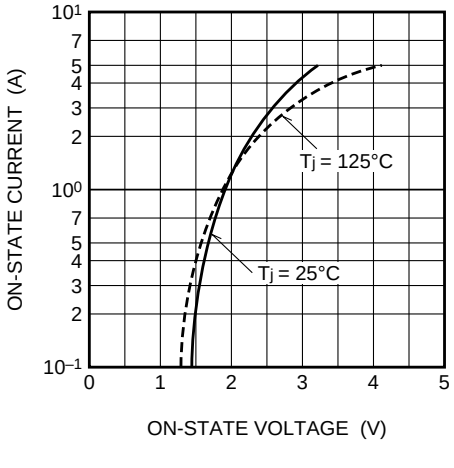
Symbol	Parameter		Test conditions	Limits			Unit
				Min.	Typ.	Max.	
I_{DRM}	Repetitive peak off-state current		T_j=125°C, V_{DRM} applied	—	—	1.0	mA
V_{TM}	On-state voltage		T_C=25°C, I_{TM}=1.2A, Instantaneous measurement	—	—	2.0	V
$V_{FGT\ I}$	Gate trigger voltage *2	I	T_j=25°C, V_D=6V, R_L=6Ω, R_G=330Ω	—	—	2.0	V
$V_{RGT\ I}$		II		—	—	2.0	V
$V_{RGT\ III}$		III		—	—	2.0	V
$V_{FGT\ III}$		IV		—	—	2.0	V
$I_{FGT\ I}$	Gate trigger current *2	I	T_j=25°C, V_D=6V, R_L=6Ω, R_G=330Ω	—	—	5	mA
$I_{RGT\ I}$		II		—	—	5	mA
$I_{RGT\ III}$		III		—	—	5	mA
$I_{FGT\ III}$		IV		—	—	10	mA
V_{GD}	Gate non-trigger voltage		T_j=125°C, V_D=1/2V_{DRM}	0.1	—	—	V
$R_{th\ (j-a)}$	Thermal resistance		Junction to case *3	—	—	65	°C/W
$(dv/dt)_c$	Critical-rate of rise of off-state commutating voltage *4		T_j=125°C	0.5	—	—	V/µs

*2. Measurement using the gate trigger characteristics measurement circuit.
*3. Mounted on 25mm × 25mm × t0.7mm ceramic plate with solder.
*4. Test conditions of the critical-rate of rise of off-state commutating voltage is shown in the table below.

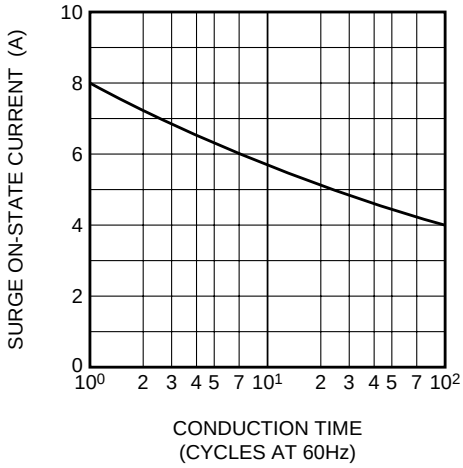
Test conditions	Commutating voltage and current waveforms (inductive load)
1. Junction temperature T_j=125°C 2. Rate of decay of on-state commutating current $(di/dt)_c$=–0.4A/ms 3. Peak off-state voltage V_D=400V	

PERFORMANCE CURVES

MAXIMUM ON-STATE CHARACTERISTICS



RATED SURGE ON-STATE CURRENT



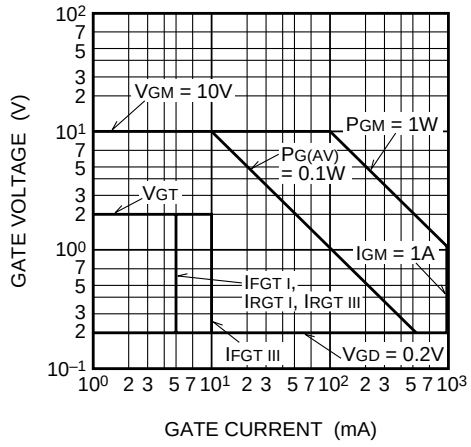
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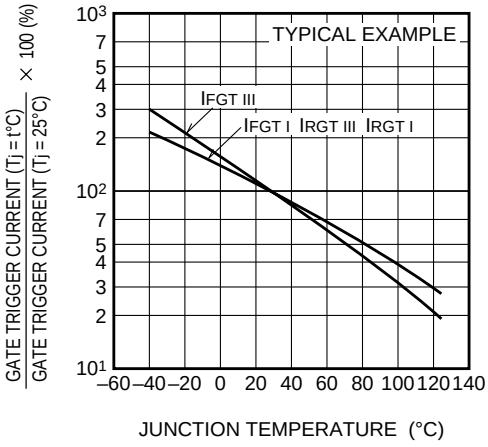
LOW POWER USE

NON-INSULATED TYPE, PLANAR PASSIVATION TYPE

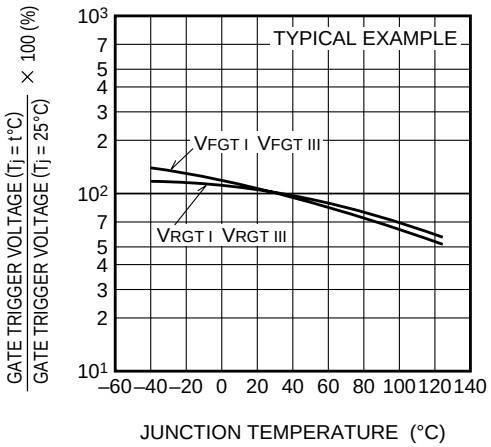
GATE CHARACTERISTICS



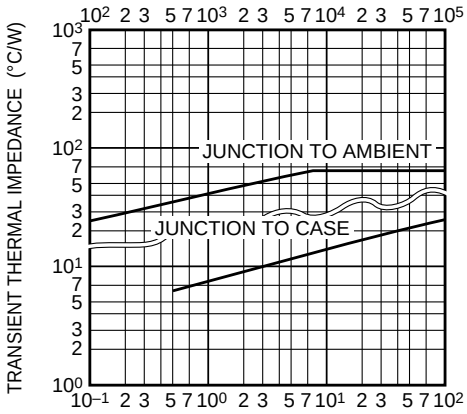
GATE TRIGGER CURRENT VS. JUNCTION TEMPERATURE



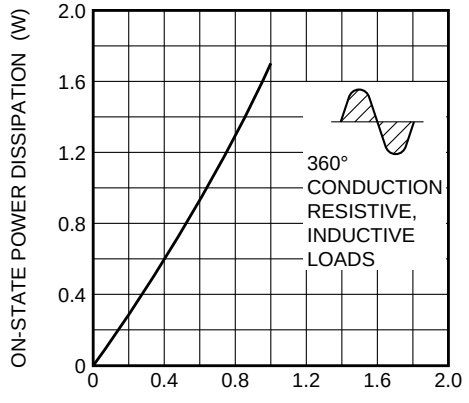
GATE TRIGGER VOLTAGE VS. JUNCTION TEMPERATURE



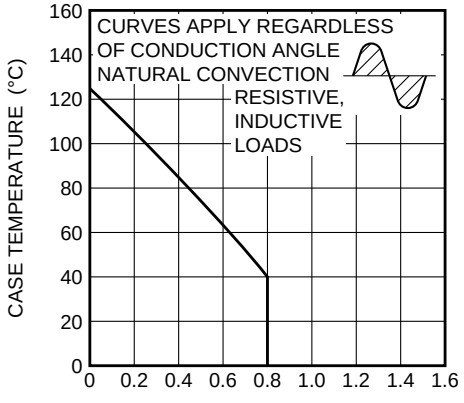
MAXIMUM TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS



MAXIMUM ON-STATE POWER DISSIPATION



ALLOWABLE CASE TEMPERATURE VS. RMS ON-STATE CURRENT



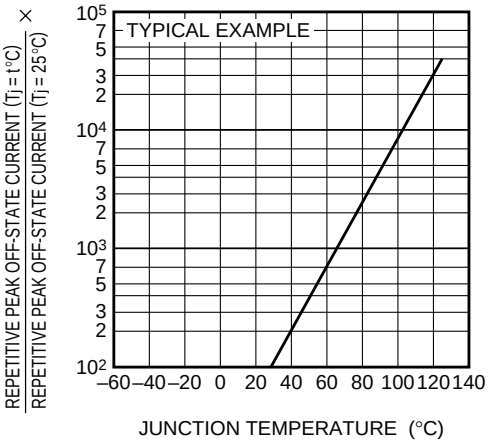
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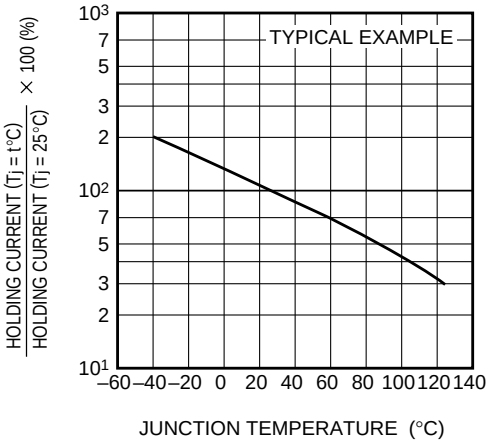
LOW POWER USE

NON-INSULATED TYPE, PLANAR PASSIVATION TYPE

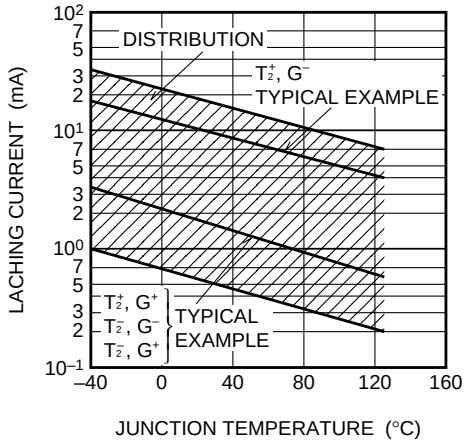
REPETITIVE PEAK OFF-STATE CURRENT VS. JUNCTION TEMPERATURE



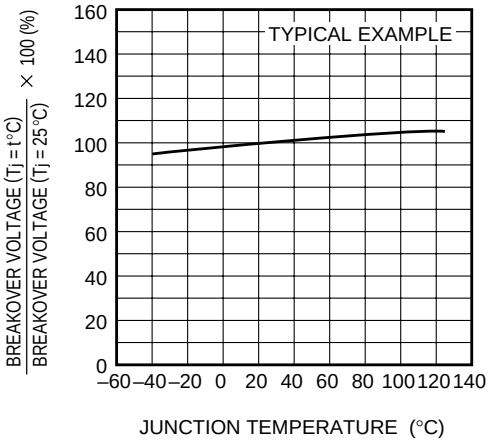
HOLDING CURRENT VS. JUNCTION TEMPERATURE



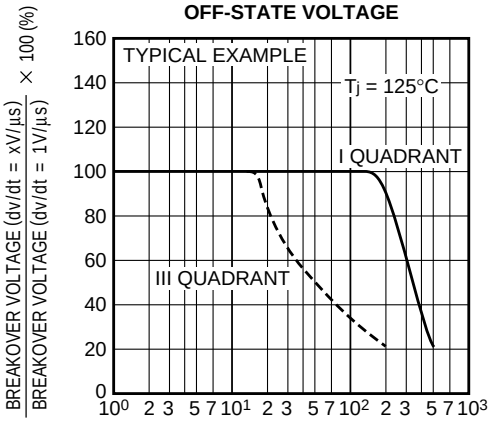
LACHING CURRENT VS. JUNCTION TEMPERATURE



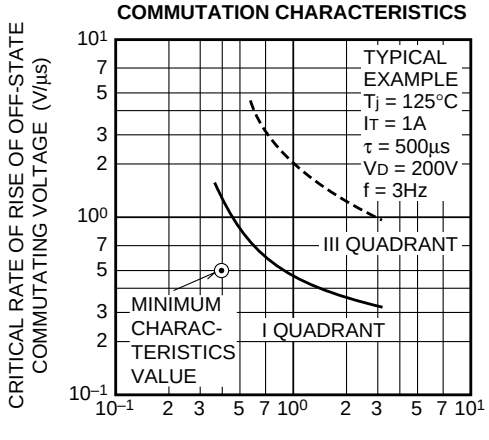
BREAKOVER VOLTAGE VS. JUNCTION TEMPERATURE



BREAKOVER VOLTAGE VS. RATE OF RISE OF OFF-STATE VOLTAGE

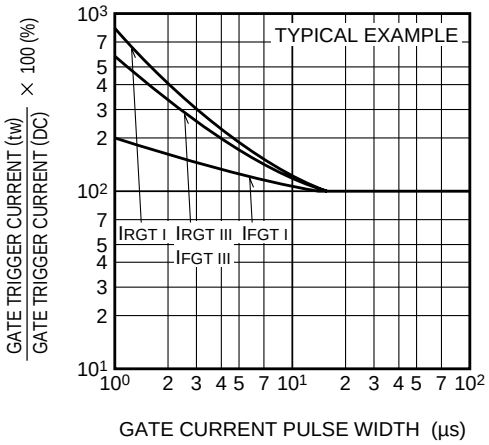


COMMUTATION CHARACTERISTICS

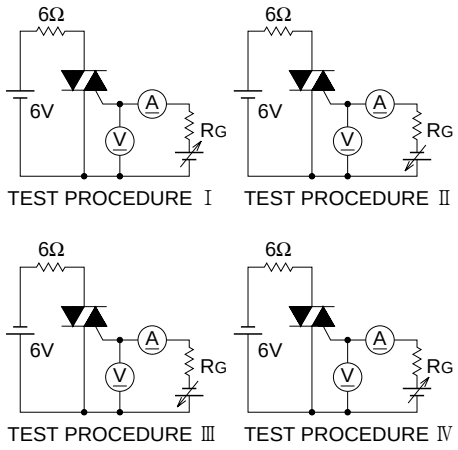


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GATE TRIGGER CURRENT VS. GATE CURRENT PULSE WIDTH



GATE TRIGGER CHARACTERISTICS TEST CIRCUITS



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