

To our customers,

Old Company Name in Catalogs and Other Documents

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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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AC03DSMA, AC03FSMA

3 A RESIN MOLD TYPE TRIAC

<R> DESCRIPTION

The AC03DSMA and AC03FSMA are resin mold type TRIACs with an effective on-state current 3 A ($T_c = 109^\circ\text{C}$), repetitive peak off-state voltage 400 V and 600 V.

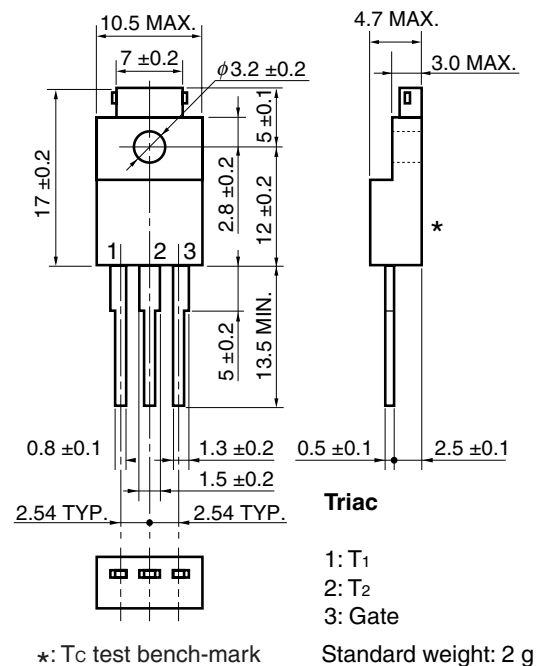
FEATURES

- Can be replaced with TO-220AB package
- High allowable on-current when using a single unit

APPLICATIONS

- Motor speed control
- Heater temperature control
- Lamp light control
- Various solid state switches

<R> PACKAGE DRAWING (Unit: mm)



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MAXIMUM RATINGS

Parameter	Symbol	AC03DSMA	AC03FSMA	Unit	Remarks
Non-repetitive Peak Off-state Voltage	V_{DSM}	500	700	V	–
Repetitive Peak Off-state Voltage	V_{DRM}	400	600	V	–
Effective On-state Current	$I_{T(RMS)}$	3 ($T_C = 109^\circ\text{C}$)		A	Refer to Figure 11 and 12 .
Surge On-state Current	I_{TSM}	30 (50 Hz 1 cycle) 33 (60 Hz 1 cycle)		A	Refer to Figure 2 .
Fusing Current	$\int i^2 dt$	4 ($1 \text{ ms} \leq t \leq 10 \text{ ms}$)		A^2s	–
Critical Rate Rise of On-state Current	di_T/dt	40		$\text{A}/\mu\text{s}$	–
Peak Gate Power Dissipation	P_{GM}	3 ($f \geq 50 \text{ Hz}$, Duty $\leq 10\%$)		W	–
Average Gate Power Dissipation	$P_{G(AV)}$	0.3		W	–
Peak Gate Current	I_{GM}	± 0.5 ($f \geq 50 \text{ Hz}$, Duty $\leq 10\%$)		A	–
Junction Temperature	T_J	–40 to +125		$^\circ\text{C}$	–
Storage Temperature	T_{stg}	–55 to +150		$^\circ\text{C}$	–

ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$)

Parameter		Symbol	Conditions		MIN.	TYP.	MAX.	Unit	Remarks
Repetitive Peak Off-state Current		I _{DRM}	V _{DM} = V _{DRM}	T _J = 25°C	–	–	100	μA	–
				T _J = 125°C	–	–	1	mA	–
On-state Voltage		V _{TM}	I _{TM} = 5 A		–	–	1.8	V	Refer to Figure 1 .
Gate Trigger Current	Mode I	I _{GT}	V _{DM} = 12 V, R _L = 30 Ω	T ₂ +, G+	–	–	12	mA	Refer to Figure 4 .
	II			T ₂ –, G+	–	–	–		
	III			T ₂ –, G–	–	–	12		
	IV			T ₂ +, G–	–	–	12		
Gate Trigger Voltage	Mode I	V _{GT}	V _{DM} = 12 V, R _L = 30 Ω	T ₂ +, G+	–	–	1.5	V	Refer to Figure 4 .
	II			T ₂ –, G+	–	–	–		
	III			T ₂ –, G–	–	–	1.5		
	IV			T ₂ +, G–	–	–	1.5		
Gate Non-trigger Voltage		V _{GD}	T _J = 125°C, V _{DM} = $\frac{1}{2}$ V _{DRM}		0.2	–	–	V	–
Holding Current		I _H	V _{DM} = 24 V, I _{TM} = 5 A		–	10	–	mA	–
Critical Rate Rise of Off-state Voltage		dv/dt	T _J = 125°C, V _{DM} = $\frac{2}{3}$ V _{DRM}		–	100	–	V/μs	–
Commutating Critical Rate Rise of Off-state Voltage		(dv/dt) _c	T _J = 125°C, (di _T /dt) _c = –1.6 A/ms, V _b = 400 V		5	–	–	V/μs	–
Thermal Resistance ^{Note}		R _{th(j-c)}	Junction to case		–	–	4.5	°C/W	Refer to Figure 13 .
		R _{th(j-a)}	Junction to ambient		–	–	65	°C/W	

Note The thermal resistance at 50 Hz and 60 Hz sine wave current, which is shown on the follow expression.

$$R_{th(j-c)} = \frac{T_{J(max)} - T_C}{P_{T(AV)}}$$

$T_{J(max)}$: Maximum junction temperature

T_C : Case temperature

$P_{T(AV)}$: Average on-dissipation

TYPICAL CHARACTERISTICS

Figure 1. i_T vs. v_T CHARACTERISTIC

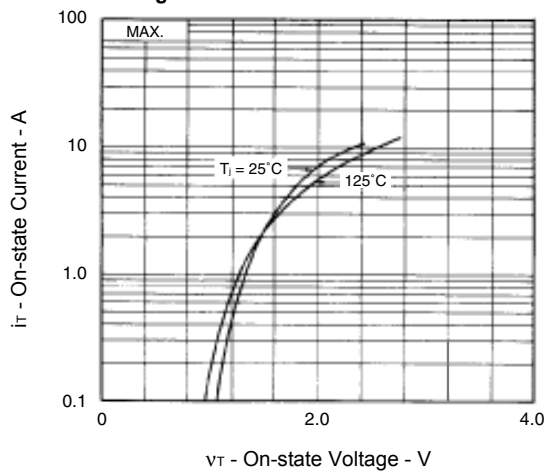


Figure 2. I_{TSM} RATING

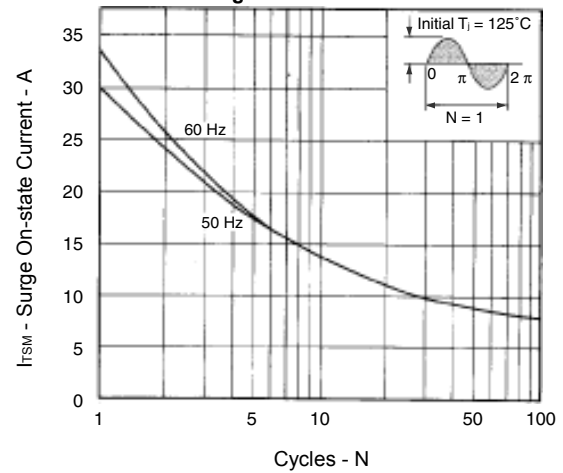


Figure 3. V_G vs. I_G RATING

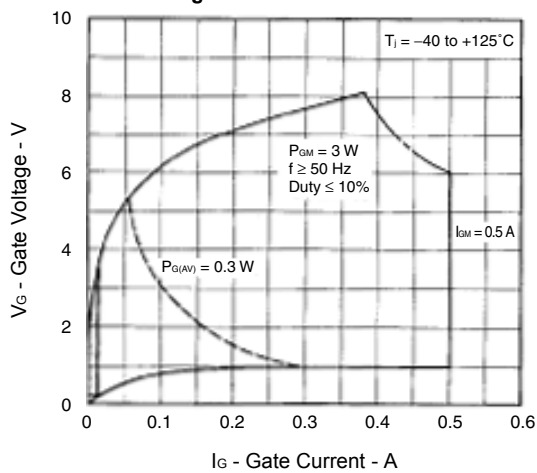


Figure 4. V_{GT} vs. I_{GT} CHARACTERISTIC

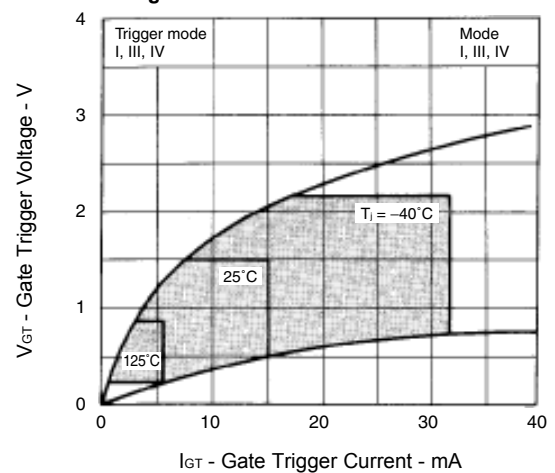


Figure 5. I_{GT} vs. T_A CHARACTERISTIC

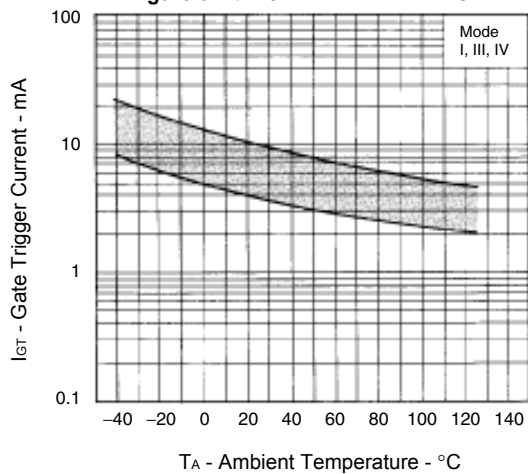


Figure 6. V_{GT} vs. T_A CHARACTERISTIC

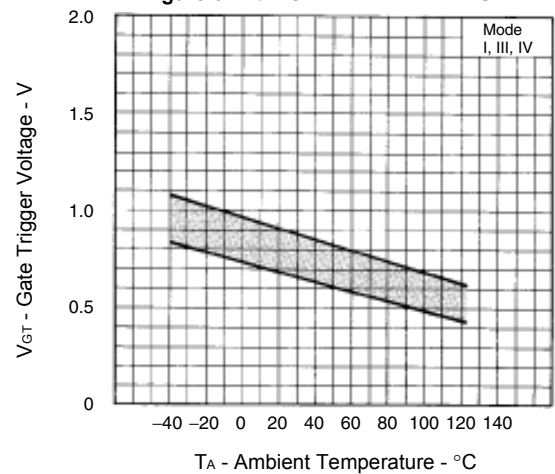


Figure 7. i_{GT} vs. τ CHARACTERISTIC

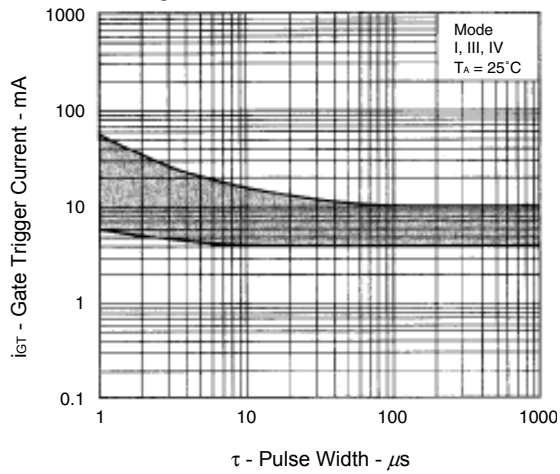


Figure 8. v_{GT} vs. τ CHARACTERISTIC

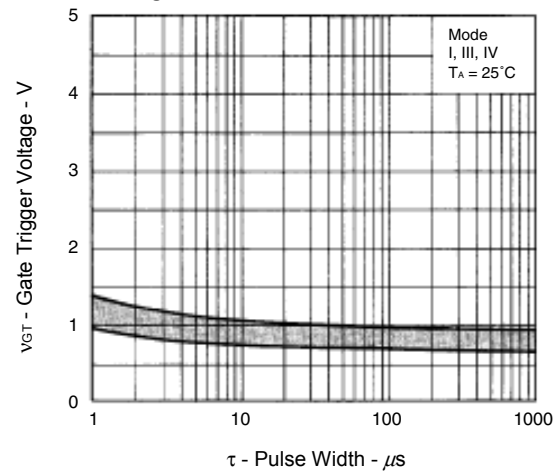


Figure 9. I_H vs. T_A CHARACTERISTIC

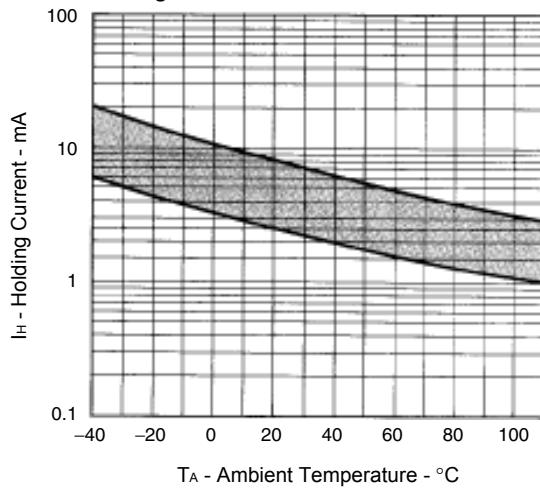


Figure 10. $P_{T(AV)}$ vs. $I_{T(RMS)}$ CHARACTERISTIC

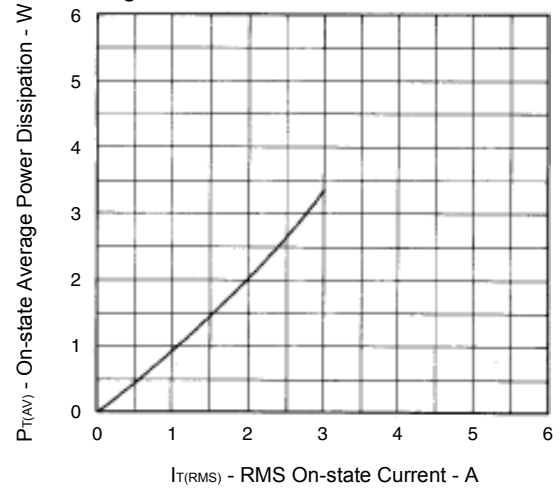


Figure 11. T_C vs. $I_{T(RMS)}$ RATING

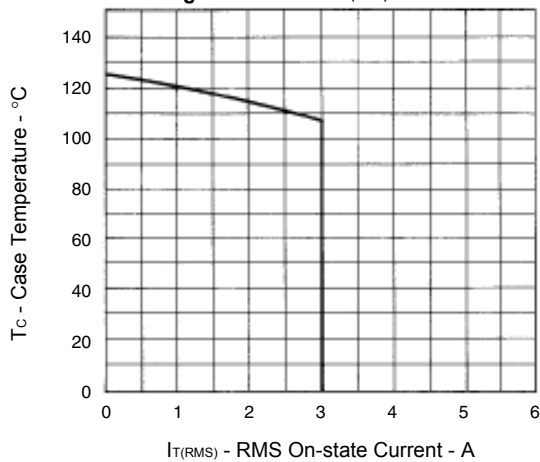


Figure 12. T_A vs. $I_{T(RMS)}$ RATING

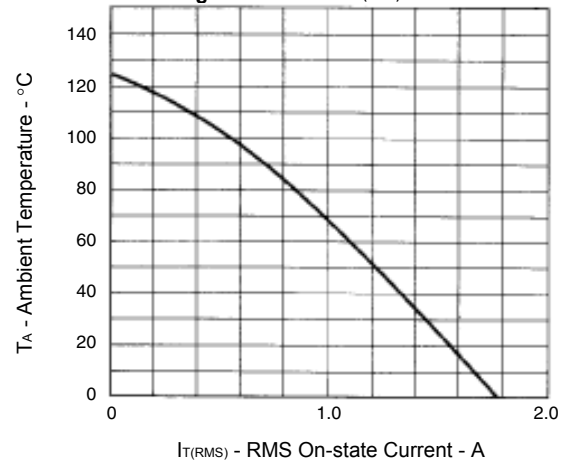
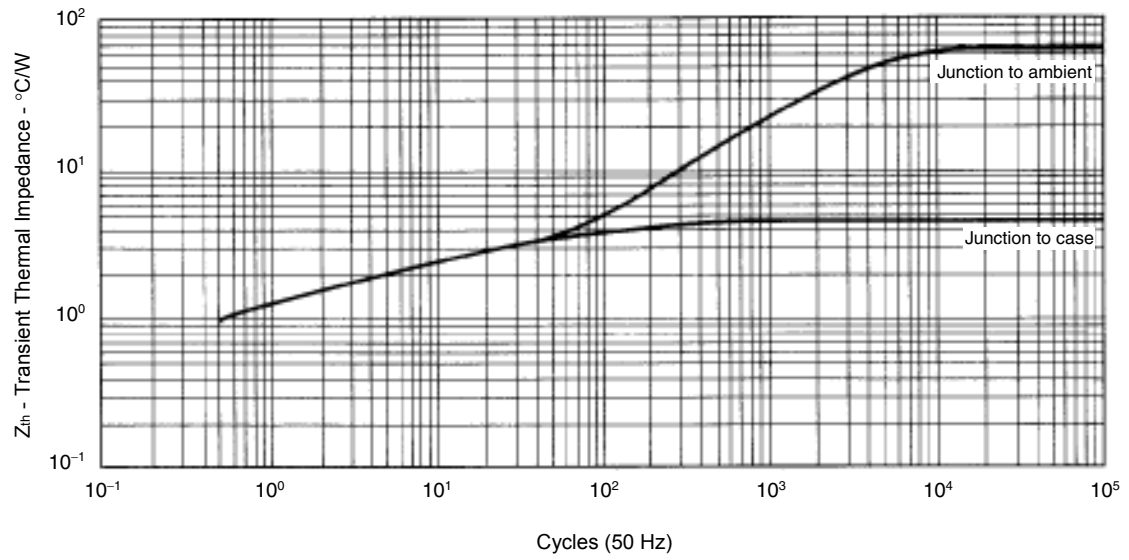


Figure 13. Z_{th} CHARACTERISTIC



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