

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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TRIAC AC05DJM, AC05DJM-Z AC05FJM, AC05FJM-Z

5 A MOLD TRIAC

DESCRIPTION

The AC05 $\overline{\text{F}}$ JM and AC05 $\overline{\text{F}}$ JM-Z are all diffused mold type triac granted RMS On-state current 5 Amps, with rated voltages up to 400, 600 volts.

FEATURES

- Small and Surface Mount Package
- 50 A Surge current
- Mold package

APPLICATIONS

- Motor speed control
- Lamp dimmer, Temperature controllers
- Various solid state switches, etc.

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$)

CHARACTERISTICS	SYMBOL	AC05DJM AC05DJM-Z	AC05FJM AC05FJM-Z	UNIT	NOTE
Repetitive Peak Off Voltage	V_{DRM}	400	600	V	
Non-repetitive Peak Off Voltage	V_{DSM}	500	700	V	
RMS On-State Current	$I_{\text{T(RMS)}}$	5 ($T_c = 104^\circ\text{C}$)		A	See Fig. 11
Peak Surge On-State Current	I_{TSM}	50 (50 Hz, Non-repetitive)		A	See Fig. 2
Fusing Current	$\int i^2 dt$	10 ($1\text{ ms} \leq t \leq 10\text{ ms}$)		A^2s	
Peak Gate Power Dissipation	P_{GM}	3 ($f \geq 50\text{ Hz}$, Duty $\leq 10\%$)		W	
Average Gate Power Dissipation	$P_{\text{G(AV)}}$	0.3		W	
Peak Gate Current	I_{FGM}	± 1.5 ($f \geq 50\text{ Hz}$, Duty $\leq 10\%$)		A	
Junction Temperature	T_j	-40 to $+125$		$^\circ\text{C}$	
Storage Temperature	T_{stg}	-40 to $+150$		$^\circ\text{C}$	

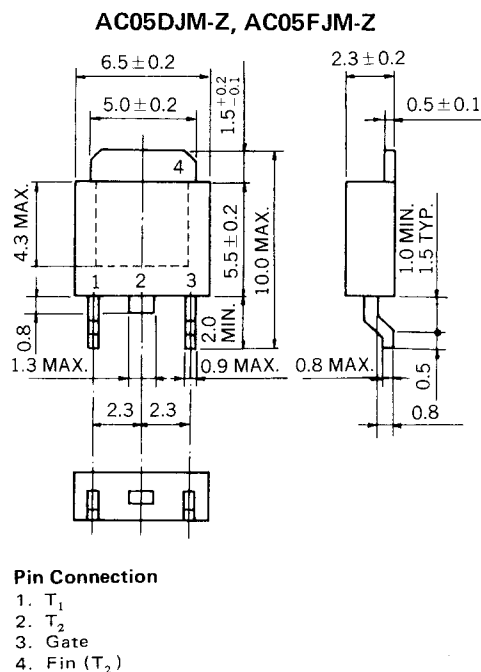
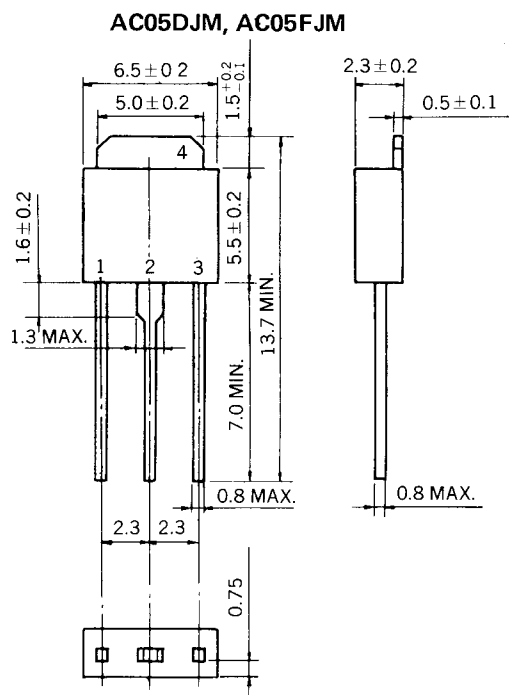
ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)

CHARACTERISTIC		SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT	NOTE
Peak Off-State Current		I _{DRM}	V _{DM} = V _{DRM}		—	—	100	μA	
Peak Off-State Current		I _{DRM}	T _j = 125 °C, V _{DM} = V _{DRM}		—	—	1	mA	
On-State Voltage		V _{TM}	I _{TM} = 5 A		—	—	1.8	V	See Fig. 1
Gate-trigger Current	Trigger Mode I	I _{GT}	V _{DM} = 12 V, R _L = 30 Ω	T ₂ +, G+	—	—	10	mA	See Fig. 4
	II			T ₂ −, G+	—	—	—		
	III			T ₂ −, G−	—	—	10		
	IV			T ₂ +, G−	—	—	10		
Gate-trigger Voltage	Trigger Mode I	V _{GT}	V _{DM} = 12 V, R _L = 30 Ω	T ₂ +, G+	—	—	1.5	V	See Fig. 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 _D = 24 V, I _{TM} = 5 A		—	10	—	mA	
Critical Rate-of Rise of Off-State Voltage		dV/dt	T _j = 125 °C, V _{DM} = $\frac{2}{3}$ V _{DRM}		—	100	—	V/μs	
Commutating dV/dt		(dV/dt) _C	T _j = 125 °C (di _T /dt) _C = −2.7 A/ms V _{DM} = 400 V		5	—	—	V/μs	
Thermal Resistance		R _{th(j-c)}	Junction to Case		—	—	3.0	°C/W	See Fig. 13
Thermal Resistance		R _{th(j-a)}	Junction to Ambient*		—	—	62.5	°C/W	AC05DJM-Z AC05FJM-Z

* Mounted on ceramic substrate of $7.5\text{ cm}^2 \times 0.7\text{ mm}$.

PACKAGE DIMENSIONS

(Unit : mm)



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

Fig. 1 $i_T - v_T$ CHARACTERISTIC

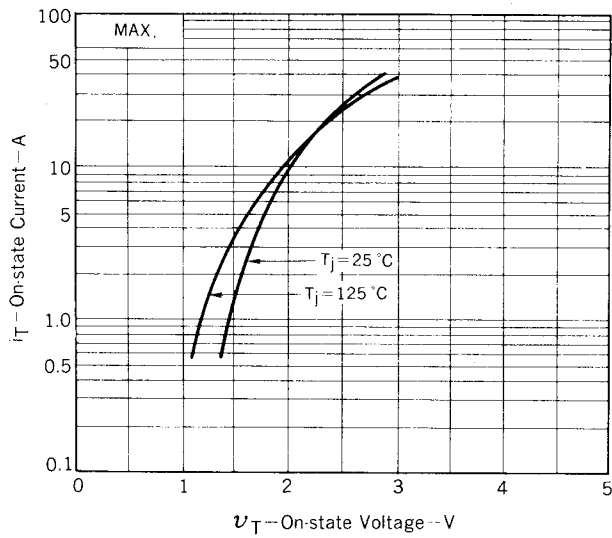


Fig. 2 I_{TSM} RATING

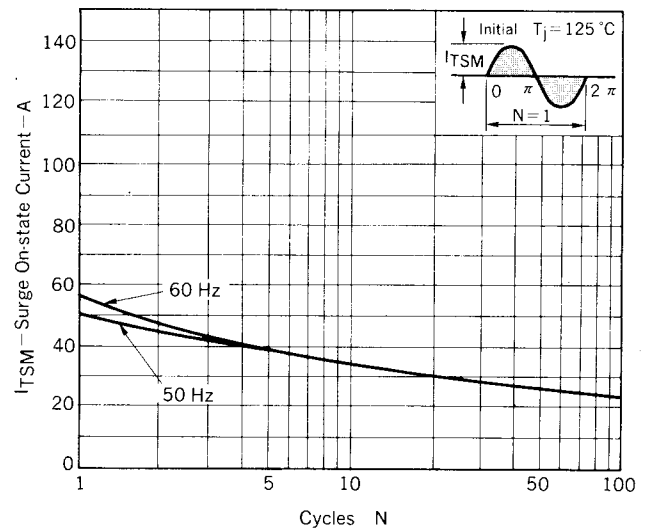


Fig. 3 $V_G - I_G$ RATING

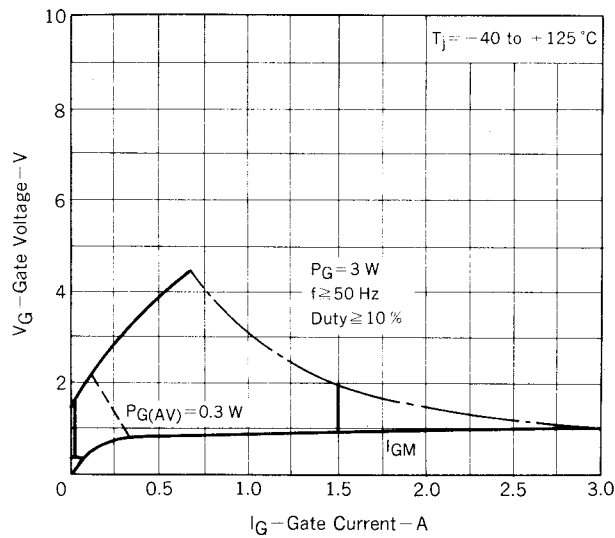


Fig. 4 $V_{GT} - I_{GT}$ TYPICAL CHARACTERISTIC

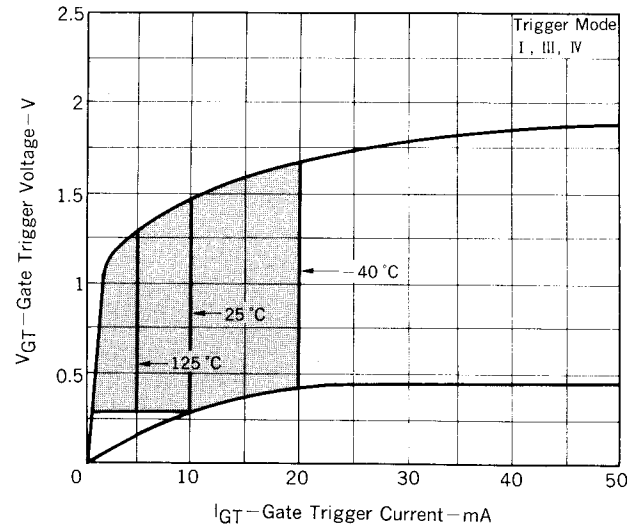


Fig. 5 $I_{GT} - T_A$ TYPICAL DISTRIBUTION

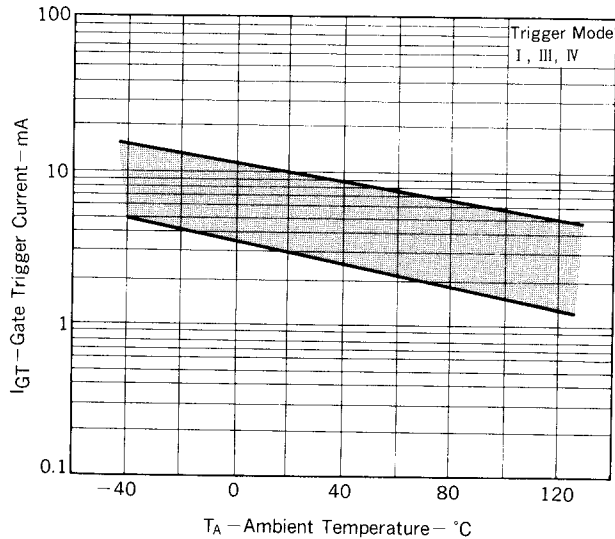


Fig. 6 $V_{GT} - T_A$ TYPICAL DISTRIBUTION

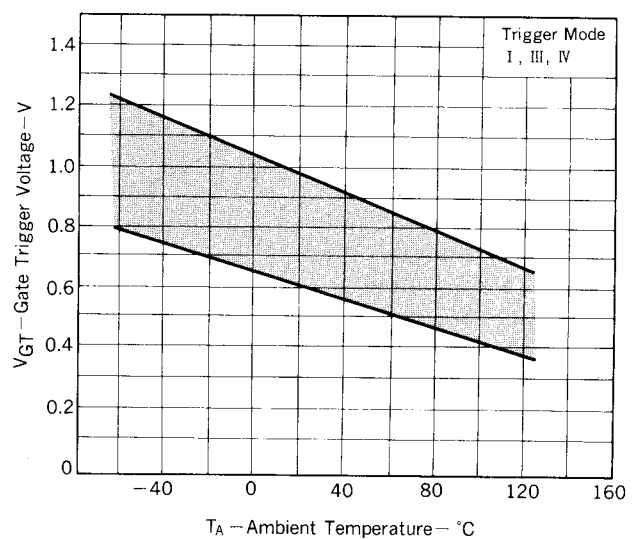


Fig. 7 $i_{GT} - \tau$ TYPICAL DISTRIBUTION

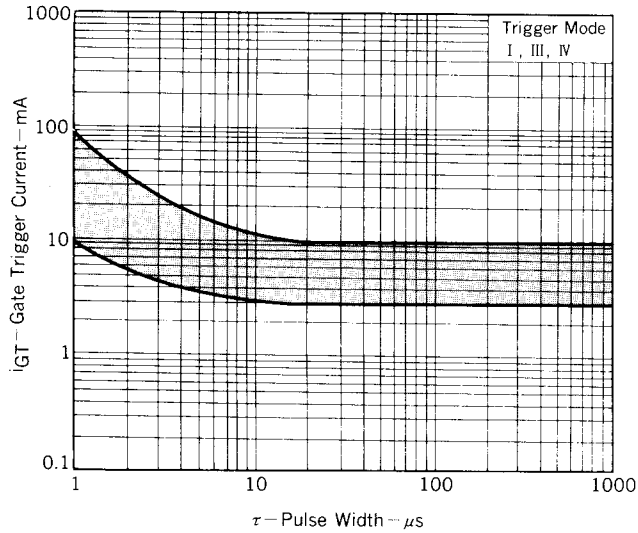


Fig. 8 $v_{GT} - \tau$ TYPICAL DISTRIBUTION

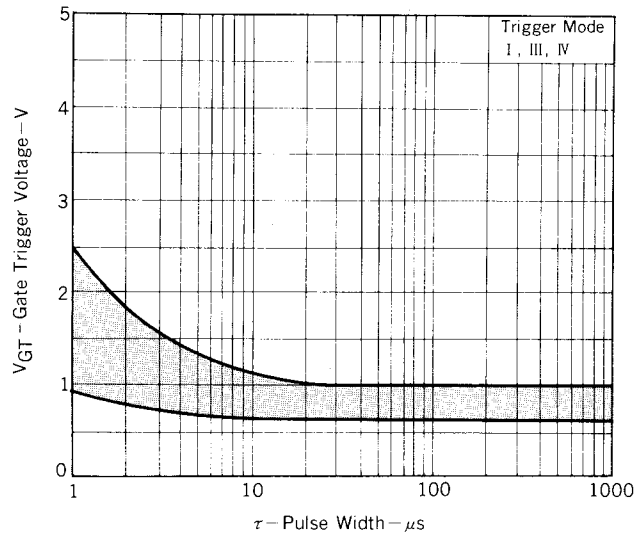


Fig. 9 $I_H - T_A$ TYPICAL DISTRIBUTION

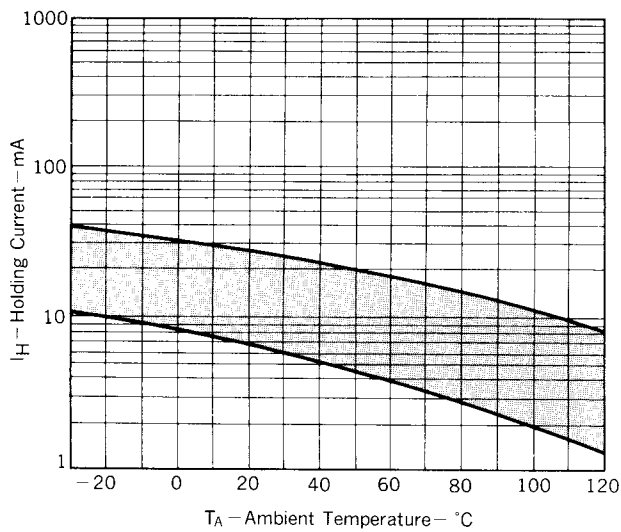


Fig. 10 $P_{T(AV)} - I_{T(RMS)}$ CHARACTERISTIC

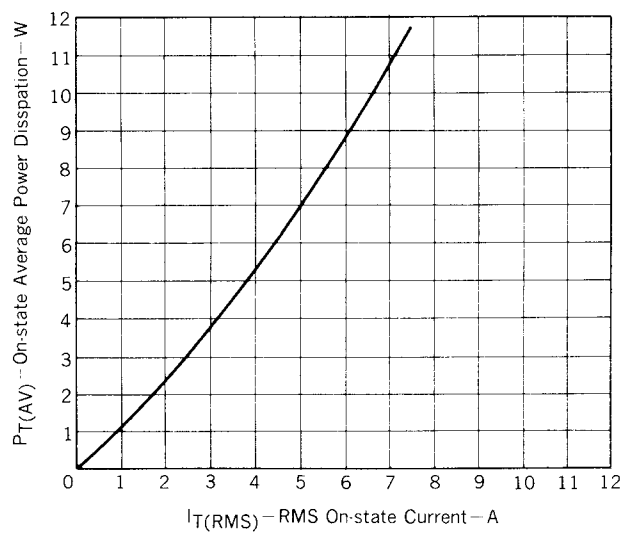


Fig. 11 $T_C - I_{T(RMS)}$ RATING

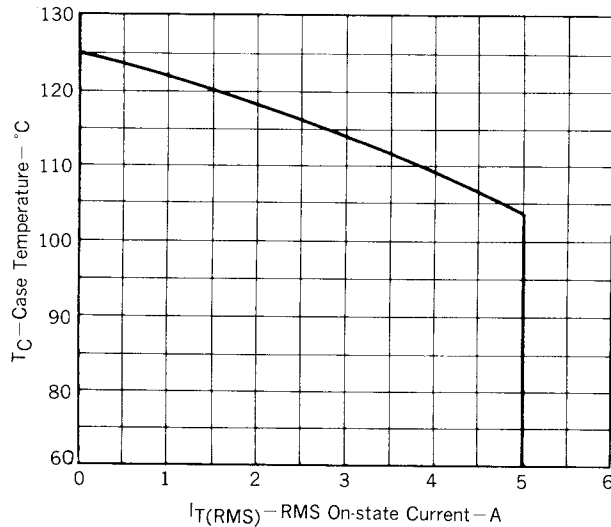


Fig. 12 $T_A - I_{T(RMS)}$ RATING

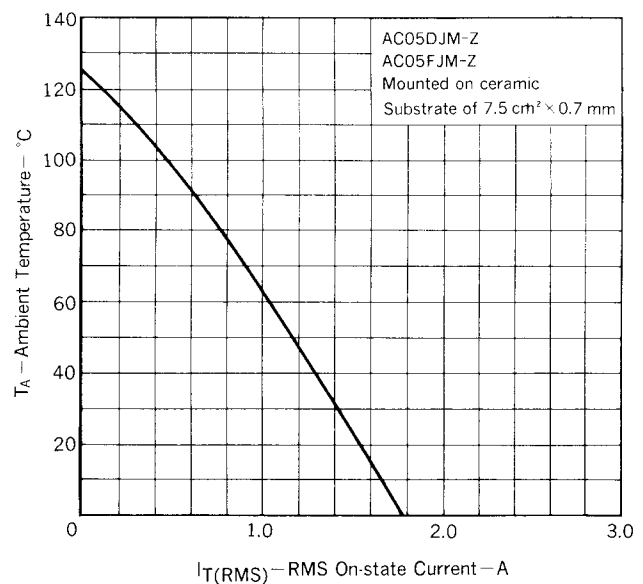
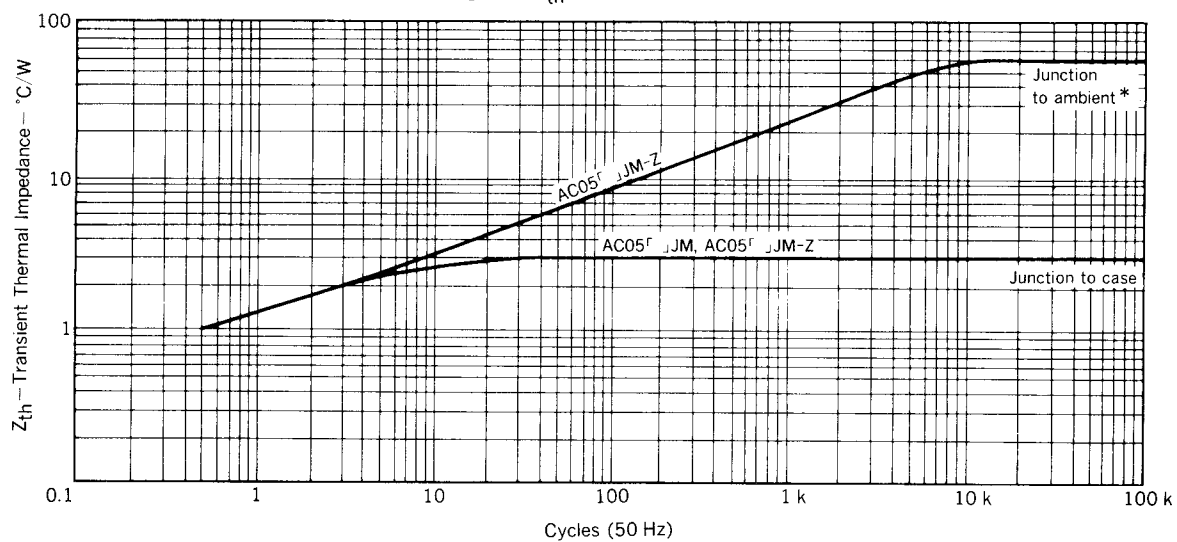


Fig. 13 Z_{th} CHARACTERISTIC



* Mounted on ceramic substrate of $7.5\text{ cm}^2 \times 0.7\text{ mm}$

REFERENCE

APPLICATION NOTE NAME	No.
GUIDE TO QUALITY ASSURANCE FOR SEMICONDUCTOR DEVICES	MEI-1202
SEMICONDUCTOR DEVICE MOUNTING TECHNOLOGY MANUAL	C10535E

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Special: Transportation equipment (automobiles, trains, ships, etc.), traffic control systems, anti-disaster systems, anti-crime systems, safety equipment and medical equipment (not specifically designed for life support)

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