

### 5 A MOLD TRIAC

#### DESCRIPTION

The AC05DJM and AC05DJM-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	$I_T(\text{RMS})$	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 ( $1\text{ ms} \leq t \leq 10\text{ ms}$ )		$\text{A}^2\text{s}$	
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	$I_{FGM}$	$\pm 1.5$ ( $f \geq 50\text{ Hz}$ , Duty $\leq 10\%$ )		A	
Junction Temperature	$T_j$	-40 to +125		$^\circ\text{C}$	
Storage Temperature	$T_{stg}$	-40 to +150		$^\circ\text{C}$	

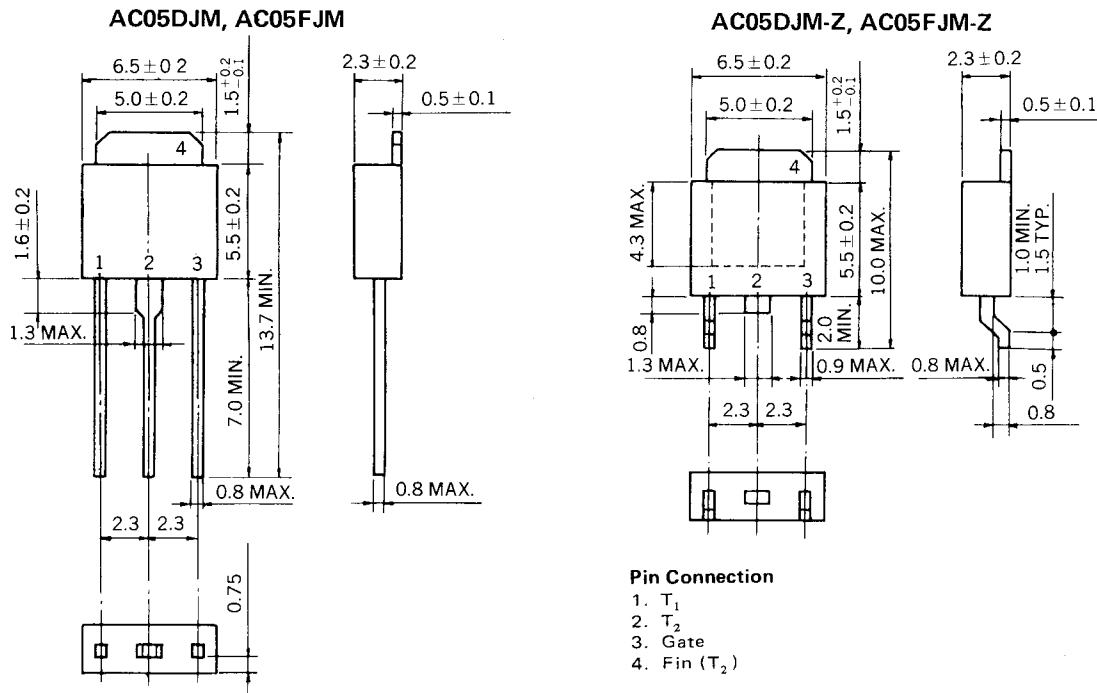
ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25 °C)

CHARACTERISTIC		SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT	NOTE	
Peak Off-State Current		I <sub>DRM</sub>	V <sub>DM</sub> = V <sub>DRM</sub>	—	—	100	μA		
Peak Off-State Current		I <sub>DRM</sub>	T <sub>j</sub> = 125 °C, V <sub>DM</sub> = V <sub>DRM</sub>	—	—	1	mA		
On-State Voltage		V <sub>TM</sub>	I <sub>TM</sub> = 5 A	—	—	1.8	V	See Fig. 1	
Gate-trigger Current	Trigger Mode I	I <sub>GT</sub>	V <sub>DM</sub> = 12 V, R <sub>L</sub> = 30 Ω	T <sub>2+</sub> , G+	—	—	10	mA	See Fig. 4
	II			T <sub>2-</sub> , G+	—	—	—		
	III			T <sub>2-</sub> , G-	—	—	10		
	IV			T <sub>2+</sub> , G-	—	—	10		
Gate-trigger Voltage	Trigger Mode I	V <sub>GT</sub>	V <sub>DM</sub> = 12 V, R <sub>L</sub> = 30 Ω	T <sub>2+</sub> , G+	—	—	1.5	V	See Fig. 4
	II			T <sub>2-</sub> , G+	—	—	—		
	III			T <sub>2-</sub> , G-	—	—	1.5		
	IV			T <sub>2+</sub> , G-	—	—	1.5		
Gate Non-Trigger Voltage		V <sub>GD</sub>	T <sub>j</sub> = 125 °C, V <sub>DM</sub> = $\frac{1}{2}$ V <sub>DRM</sub>	0.2	—	—	V		
Holding Current		I <sub>H</sub>	V <sub>D</sub> = 24 V, I <sub>TM</sub> = 5 A	—	10	—	mA		
Critical Rate-of Rise of Off-State Voltage		dV/dt	T <sub>j</sub> = 125 °C, V <sub>DM</sub> = $\frac{2}{3}$ V <sub>DRM</sub>	—	100	—	V/μs		
Commutating dV/dt		(dV/dt) <sub>C</sub>	T <sub>j</sub> = 125 °C (di <sub>T</sub> /dt) <sub>C</sub> = -2.7 A/ms V <sub>DM</sub> = 400 V	5	—	—	V/μs		
Thermal Resistance		R <sub>th(j-c)</sub>	Junction to Case	—	—	3.0	°C/W	See Fig. 13	
Thermal Resistance		R <sub>th(j-a)</sub>	Junction to Ambient*	—	—	62.5	°C/W	AC05DJM-Z AC05FJM-Z	

\* Mounted on ceramic substrate of 7.5 cm<sup>2</sup> × 0.7 mm.

PACKAGE DIMENSIONS

(Unit : mm)



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

Fig. 1  $i_T - v_T$  CHARACTERISTIC

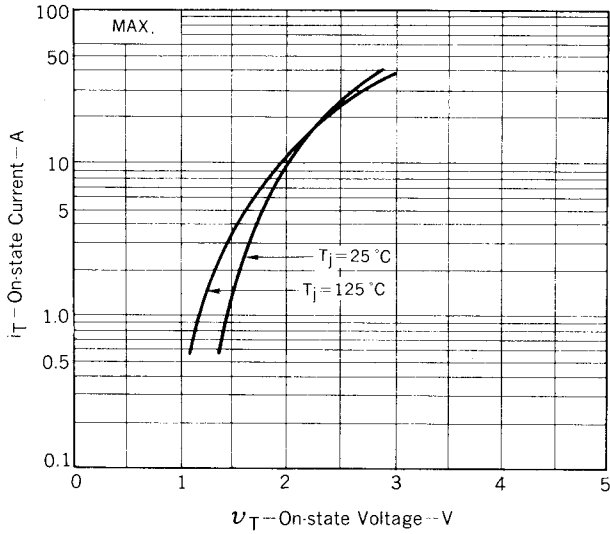


Fig. 2  $I_{TSM}$  RATING

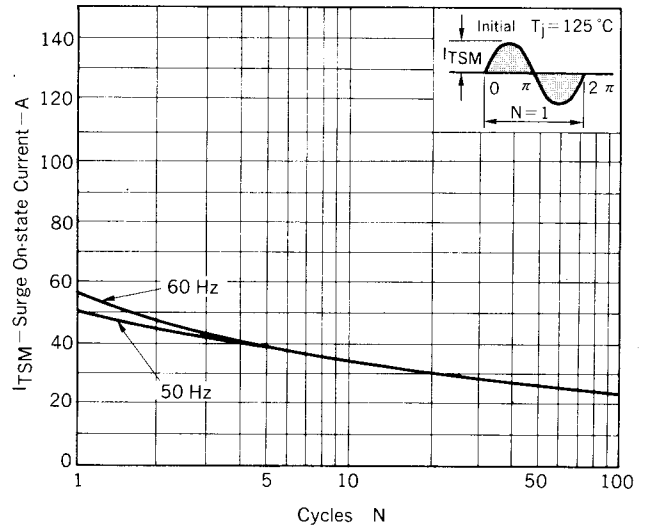


Fig. 3  $V_G - I_G$  RATING

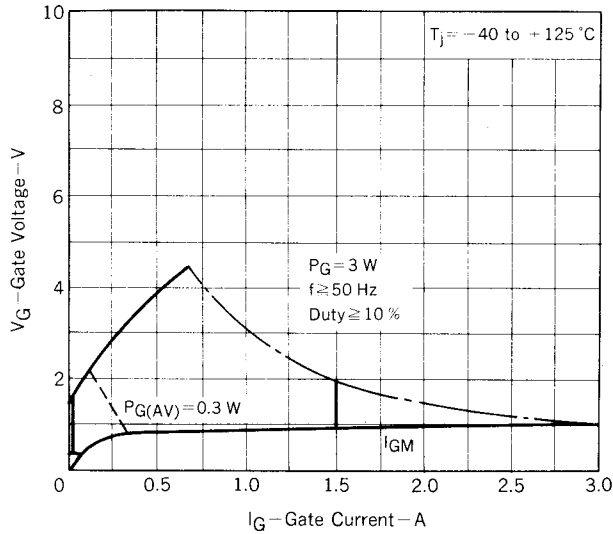


Fig. 4  $V_{GT} - I_{GT}$  TYPICAL CHARACTERISTIC

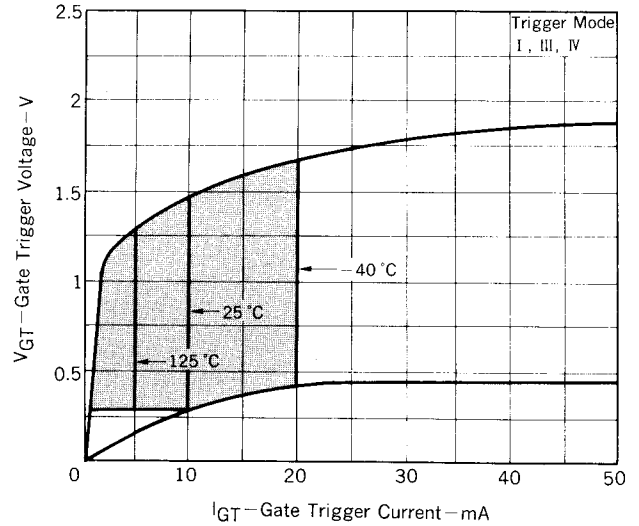


Fig. 5  $I_{GT} - T_A$  TYPICAL DISTRIBUTION

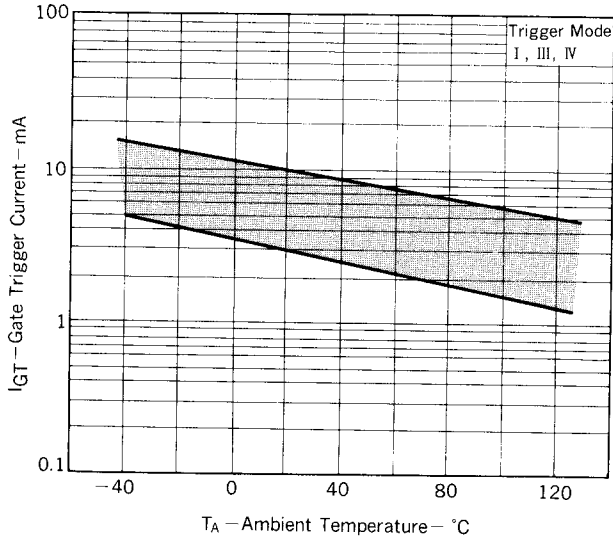


Fig. 6  $V_{GT} - T_A$  TYPICAL DISTRIBUTION

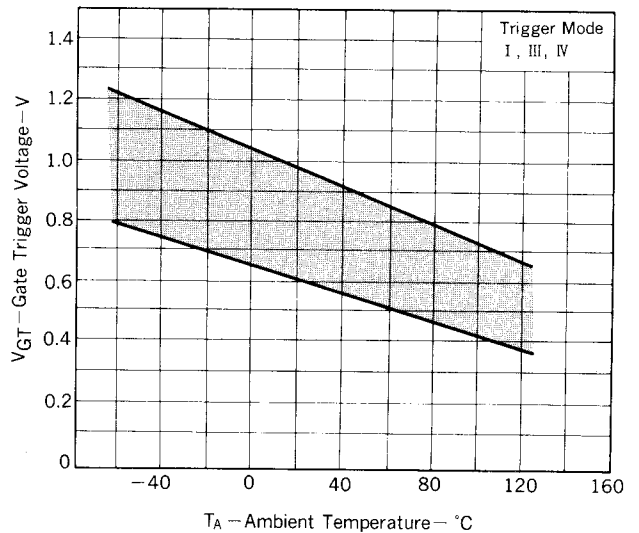


Fig. 7  $i_{GT} - \tau$  TYPICAL DISTRIBUTION

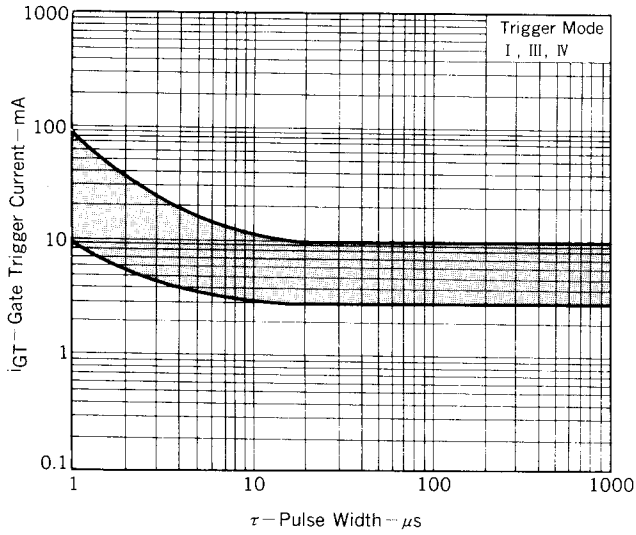


Fig. 8  $v_{GT} - \tau$  TYPICAL DISTRIBUTION

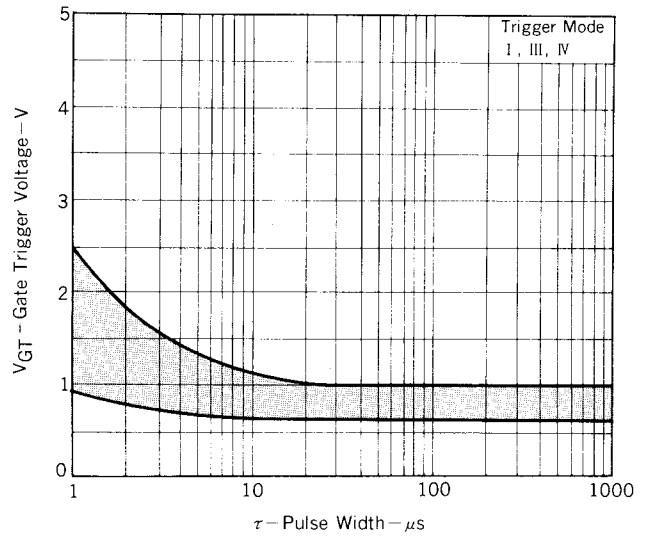


Fig. 9  $I_H - T_A$  TYPICAL DISTRIBUTION

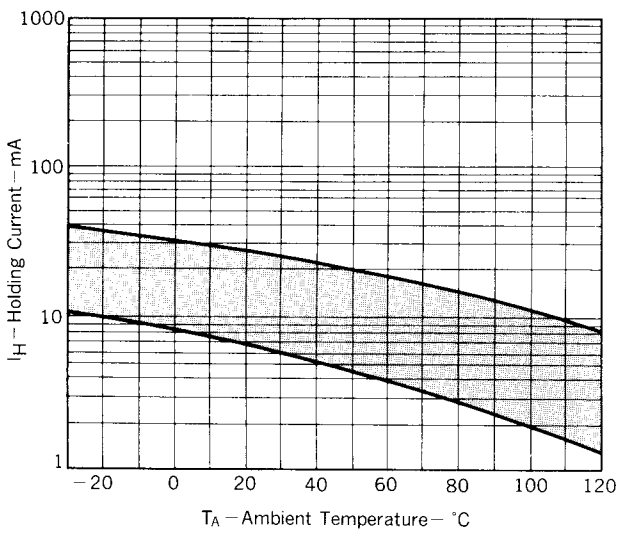


Fig. 10  $P_{T(AV)} - I_{T(RMS)}$  CHARACTERISTIC

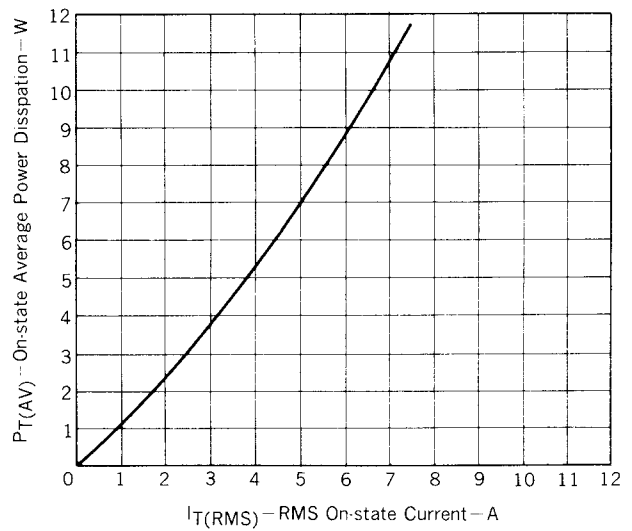


Fig. 11  $T_C - I_{T(RMS)}$  RATING

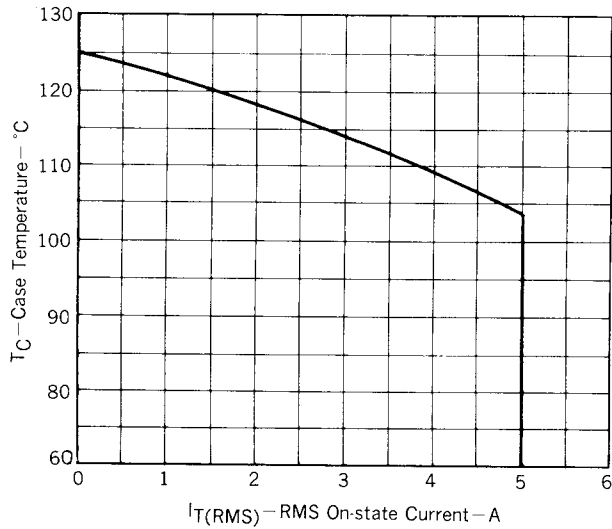


Fig. 12  $T_A - I_{T(RMS)}$  RATING

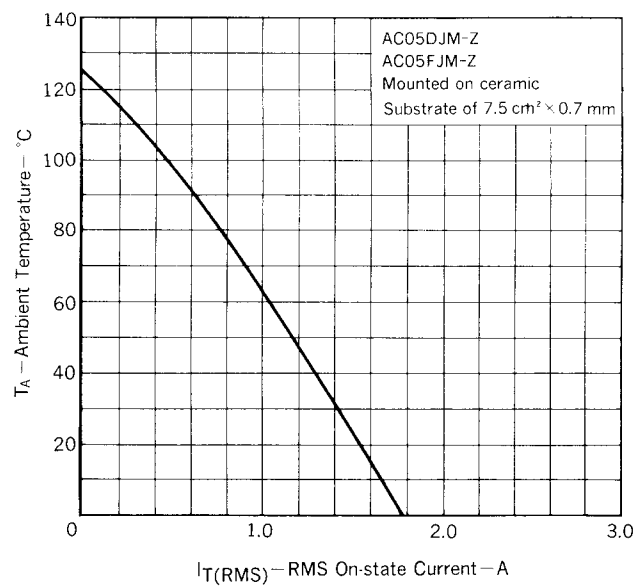
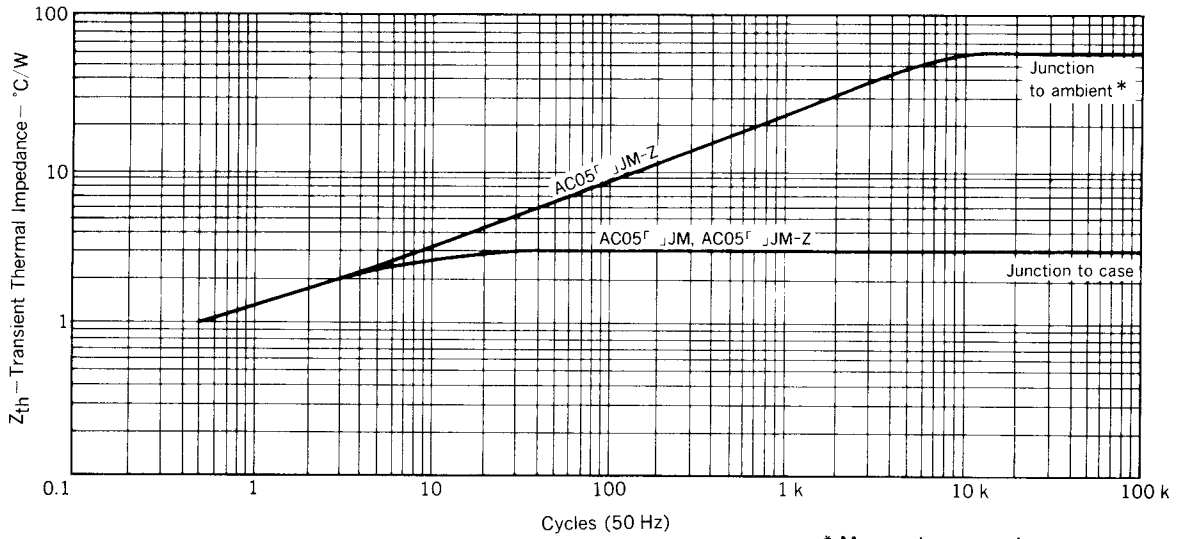


Fig. 13 Z<sub>th</sub> CHARACTERISTIC



\* Mounted on ceramic substrate of 7.5 cm<sup>2</sup> x 0.7 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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Anti-radioactive design is not implemented in this product.