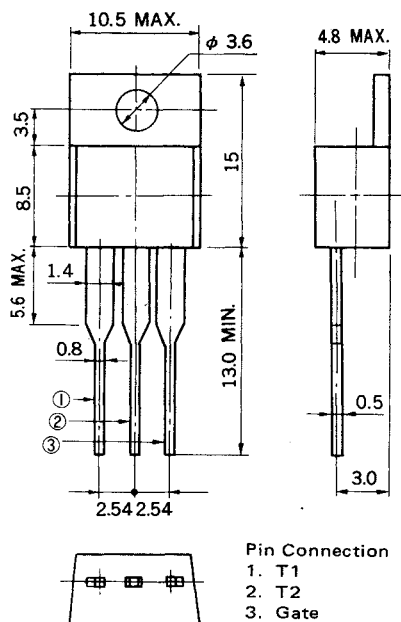


AC05DGM to AC05FGM

5 A MOLD TRIAC

PACKAGE DIMENSIONS (Unit: mm)



The AC05DGM to AC05FGM are all diffused mold type triac granted RMS On-state current 5 Amps, with rated voltages up to 600 volts.

FEATURES

- 50 A Surge current
- TO-220AB mold package
- Low cost

APPLICATIONS

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

MAXIMUM RATINGS

CHARACTERISTIC	SYMBOL	AC05DGM	AC05EGM	AC05FGM	UNIT	NOTE
Repetitive Peak off Voltage	V_{DRM}	400	500	600	V	
Non-repetitive Peak off Voltage	V_{DSM}	500	600	700	V	
RMS On-State Current	I_T (RMS)	5 ($T_c = 107^\circ\text{C}$)			A	See Fig. 11, 12
Peak Surge On-State Current	I_{TSM}	50 (50 Hz, Non-repetitive)			A	See Fig. 2
Fusing Current	$\int i T^2 dt$	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_G (AV)	0.3			W	
Peak Gate Current	I_{FGM}	± 3 ($f \geq 50 \text{ Hz}$, Duty $\leq 10\%$)			A	
Junction Temperature	T_j	-40 to $+125$			$^\circ\text{C}$	
Storage Temperature	T_{stg}	-40 to $+125$			$^\circ\text{C}$	

CHARACTERISRIC		SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT	NOTE
Peak off-State Current		I_{DRM}	$T_j = 125^\circ\text{C}$ $V_{\text{DM}} = V_{\text{DRM}}$	—	—	1	mA	
On-State Voltage		V_{TM}	$I_{\text{TM}} = 5\text{ A}$	—	—	1.8	V	See Fig. 1
Gate Trigger Current	Trigger Mode I	I_{GT}	$V_{\text{DM}} = 12\text{ V}$ $R_L = 30\ \Omega$	—	—	10	mA	See Fig. 4
	II			—	—	—		
	III			—	—	10		
	IV			—	—	10		
Gate Trigger Voltage	Trigger Mode I	V_{GT}	$V_{\text{DM}} = 12\text{ V}$ $R_L = 30\ \Omega$	—	—	1.5	V	See Fig. 4
	II			—	—	2.0		
	III			—	—	1.5		
	IV			—	—	1.5		
Gate Non-Trigger Voltage		V_{GD}	$T_j = 125^\circ\text{C}$, $V_{\text{DM}} = \frac{1}{2}V_{\text{DRM}}$	0.2	—	—	V	
Commutating dv/dt		(dv/dt) C	$T_j = 125^\circ\text{C}$ (di _T /dt) C = -2.7 A/ms $V_D = 400\text{ V}$	5	—	—	V/ μs	
Holding Current		I_{H}	$V_D = 24\text{ V}$, $I_{\text{TM}} = 5\text{ A}$	—	10	—	mA	
Thermal Resistance		$R_{\text{th}} (j-c)$	Junction to Case	—	—	3.0	$^\circ\text{C/W}$	See Fig. 13

Four circuit diagrams illustrating different trigger modes for a thyristor (T₁) and a diode (T₂) in a load circuit (R_L = 30 Ω). The thyristor is triggered by a 12 V DC source (V_{DM}).

- Trigger Mode II:** The thyristor (T₁) is forward-biased (anode to AC source, cathode to load). The diode (T₂) is reverse-biased (anode to load, cathode to AC source). The load resistor (R_L) is in series with the thyristor.
- Trigger Mode I:** The thyristor (T₁) is forward-biased (anode to AC source, cathode to load). The diode (T₂) is reverse-biased (anode to load, cathode to AC source). The load resistor (R_L) is in series with the diode.
- Trigger Mode III:** The thyristor (T₁) is reverse-biased (anode to load, cathode to AC source). The diode (T₂) is forward-biased (anode to AC source, cathode to load). The load resistor (R_L) is in series with the thyristor.
- Trigger Mode IV:** The thyristor (T₁) is reverse-biased (anode to load, cathode to AC source). The diode (T₂) is forward-biased (anode to AC source, cathode to load). The load resistor (R_L) is in series with the diode.

Figure 1 is a graph showing the TSM Surge On-state Current (A) versus Cycles. The y-axis ranges from 0 to 140 A, and the x-axis ranges from 1 to 100 Cycles (logarithmic scale). Two curves are plotted: 60 Hz and 50 Hz. The 60 Hz curve starts at approximately 55 A at 1 cycle and decreases to about 25 A at 100 cycles. The 50 Hz curve starts at approximately 45 A at 1 cycle and decreases to about 20 A at 100 cycles. An inset graph shows a sinusoidal current waveform with peak current I_{TSM} , initial temperature $T_i = 125^\circ\text{C}$, and $N=1$ cycle.

Fig. 3 $V_G - I_G$ RATING

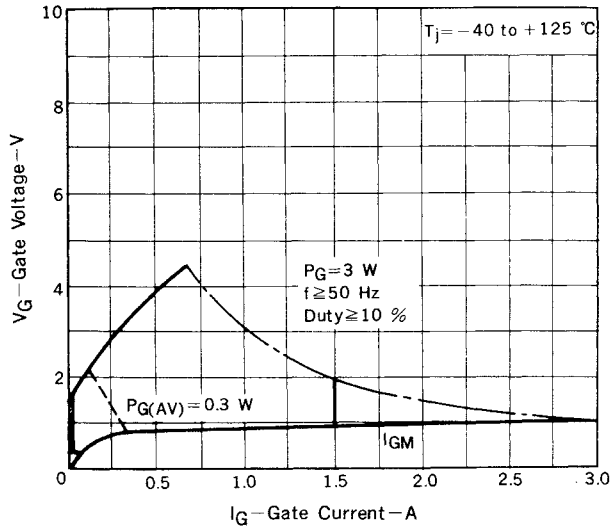


Fig. 4 $V_{GT} - I_{GT}$ CHARACTERISTIC

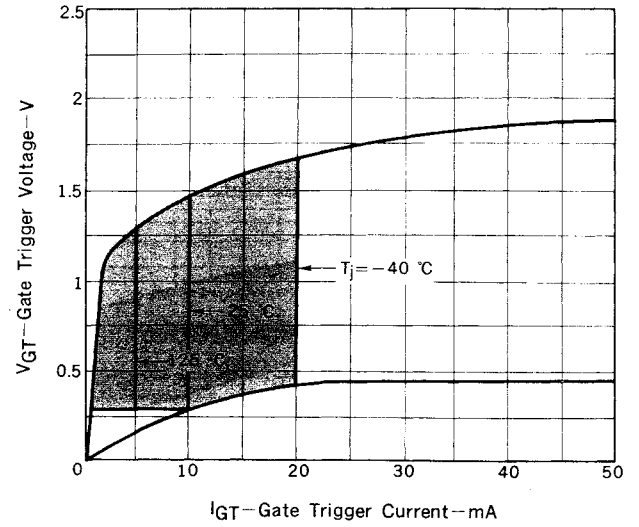


Fig. 5 $I_{GT} - T_a$ TYPICAL DISTRIBUTION

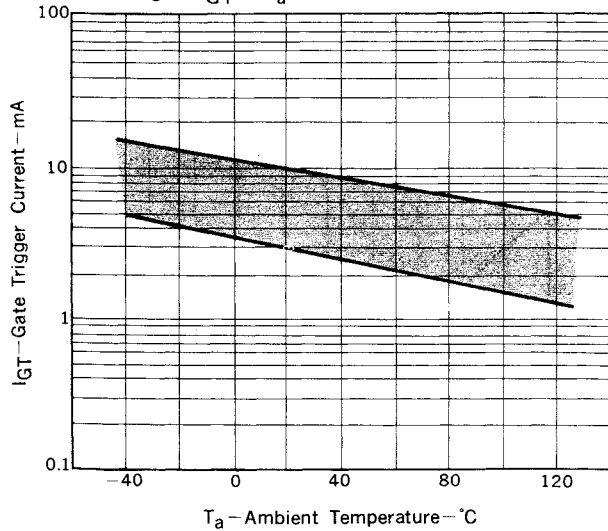


Fig. 6 $V_{GT} - T_a$ TYPICAL DISTRIBUTION

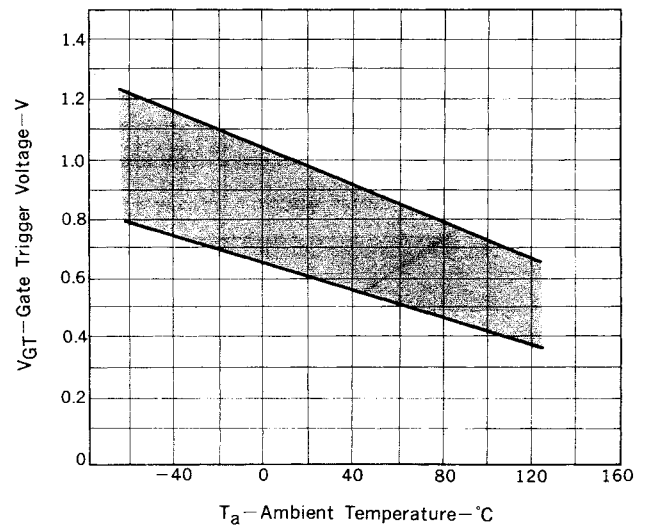


Fig. 7 $i_{GT} - \tau$ TYPICAL DISTRIBUTION

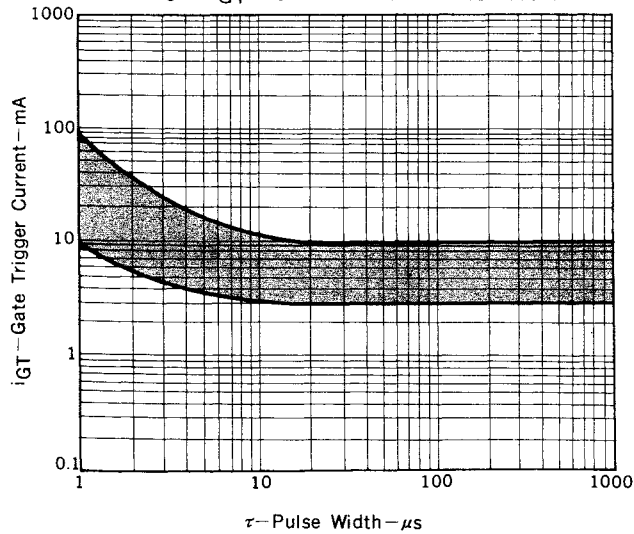


Fig. 8 $v_{GT} - \tau$ TYPICAL DISTRIBUTION

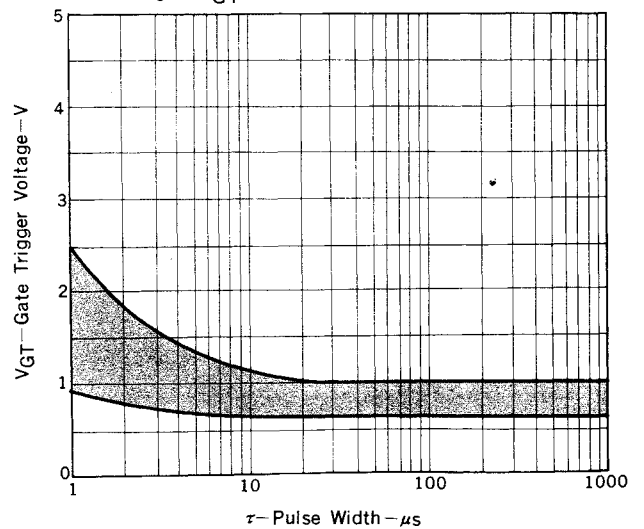


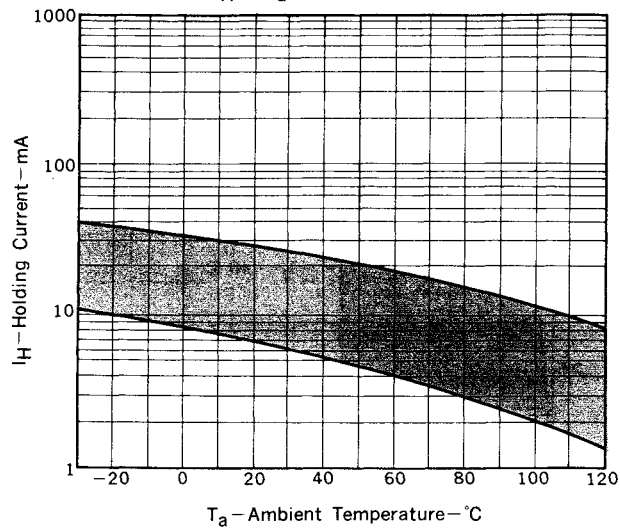
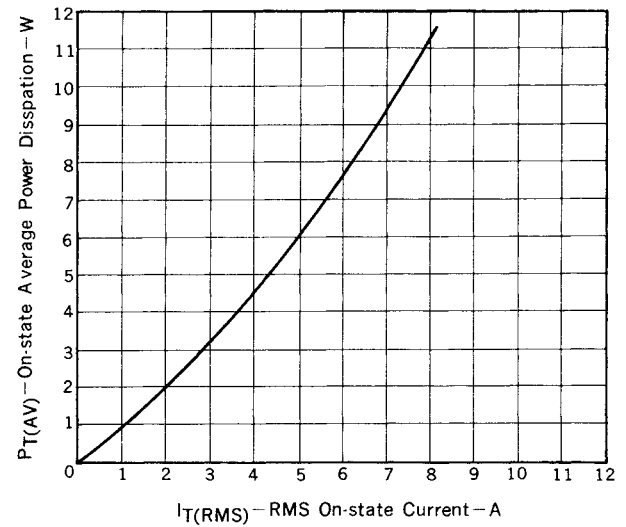
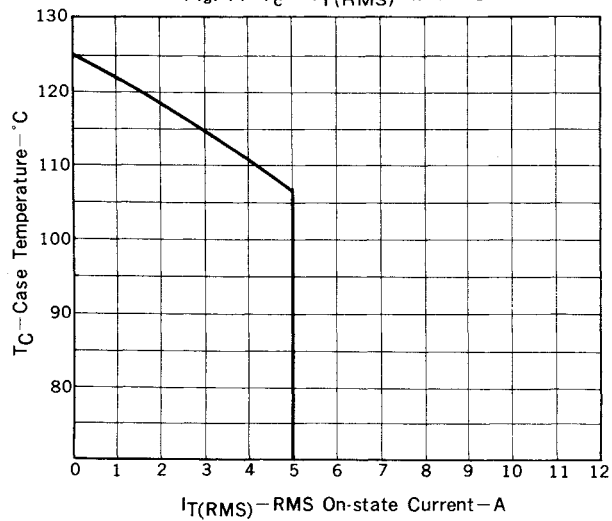
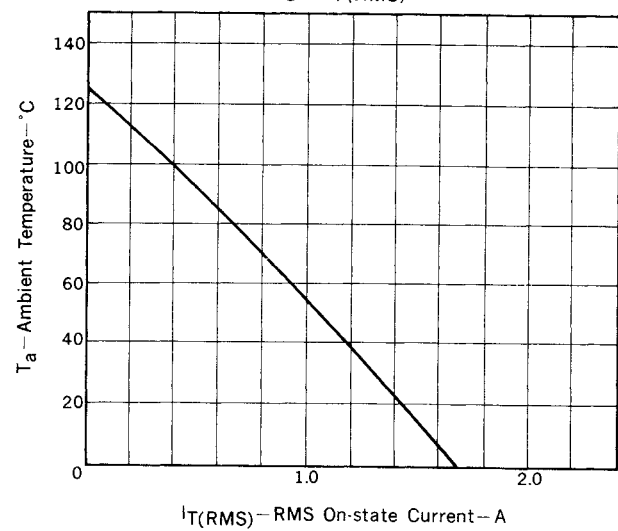
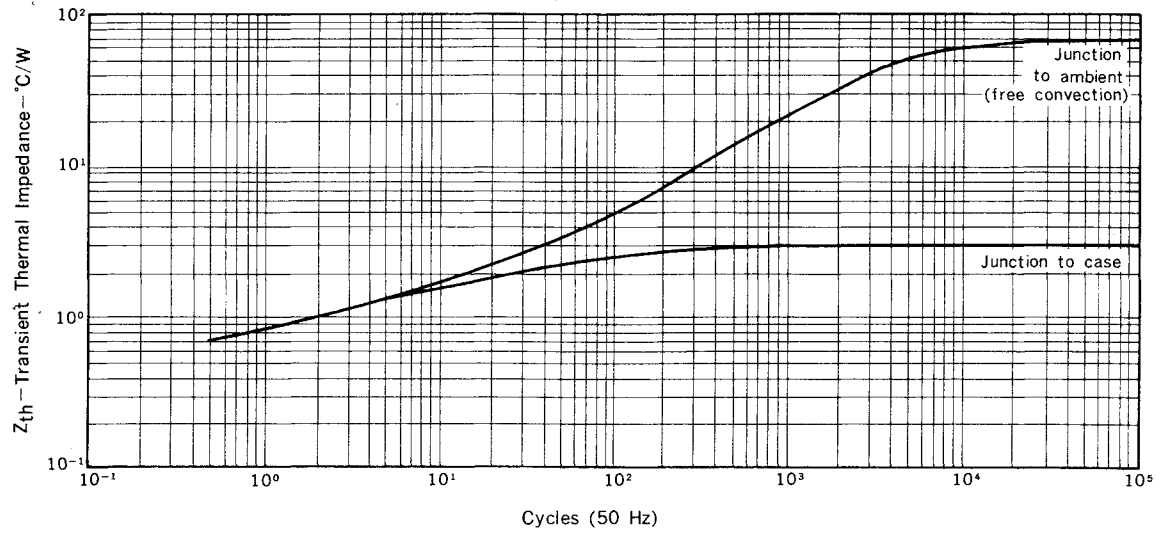
Fig. 9 $I_H - T_a$ TYPICAL DISTRIBUTIONFig. 10 $P_T(AV) - I_T(RMS)$ CHARACTERISTICFig. 11 $T_c - I_T(RMS)$ RATINGFig. 12 $T_a - I_T(RMS)$ RATING

Fig. 13 Z_{th} CHARACTERISTIC



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APR.-25-85M

Printed in Japan