

# THYRISTORS

# AC03DGM, AC03FGM

### 3 A MOLD TRIAC

The AC03EGM and AC03FGM are fully diffused mold TRIACs with an effective on-current of 3 A. The repeat peak off-voltages are 400 V and 600 V.

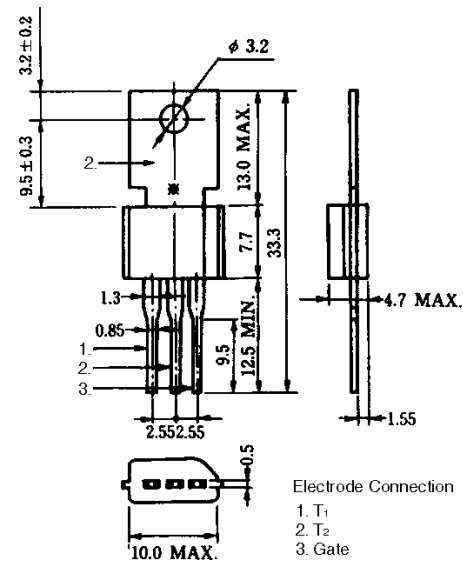
#### FEATURES

- Gate trigger current (mode I, III, and IV) at 12 mA or less is guaranteed.
- This transistor features a small and lightweight package and is easy to handle even on the mounting surface due to its TO-202AA dimensions. Processing of lead wires and heatsink (tablet) using jigs is also possible.
- High degrees-of-freedom applications design is available due to high gate trigger sensitivity and small hold current distribution.
- Employs flame-retardant epoxy resin (UL94V-0).

#### APPLICATIONS

Noncontact switches of motor speed control, heater temperature control, lamp light control

#### PACKAGE DRAWING (UNIT: mm)



\*T<sub>c</sub> test bench-mark

Standard weight: 1.4 g

#### ABSOLUTE MAXIMUM RATINGS (T<sub>a</sub> = 25°C)

Parameter	Symbol	AC03DGM	AC03FGM	Unit	Remarks
Non-repetitive peak off-state voltage	V <sub>DSM</sub>	500	700	V	—
Repetitive peak off-voltage	V <sub>DRM</sub>	400	600	V	—
Effective on-state current	I <sub>T(RMS)</sub>	3 (T <sub>c</sub> = 92°C)		A	Refer to Figures 11 and 12.
Surge on-state current	I <sub>TSM</sub>	30 (50 Hz 1 cycle) 33 (60 Hz 1 cycle)		A	Refer to Figure 2.
Fusing current	fI <sub>T</sub> <sup>2</sup> dt	4.0 (1 ms ≤ t ≤ 10 ms)		A <sup>2</sup> s	—
Critical rate of rise of on-state current	dI <sub>T</sub> /dt	40		A/μs	—
Peak gate power dissipation	P <sub>GM</sub>	3 (f ≥ 50 Hz, Duty ≤ 10 %)		W	—
Average gate power dissipation	P <sub>G(AV)</sub>	0.3		W	—
Peak gate current	I <sub>GM</sub>	±0.5 (f ≥ 50 Hz, Duty ≤ 10 %)		A	—
Junction temperature	T <sub>j</sub>	-40 to +125		°C	—
Storage temperature	T <sub>stg</sub>	-55 to +150		°C	—

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**ELECTRICAL CHARACTERISTICS (T<sub>j</sub> = 25°C, R<sub>GK</sub> = 1 kΩ)**

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit	Remarks	
Repeat peak off-current		I <sub>DRM</sub>	V <sub>DM</sub> = V <sub>DRM</sub>	T <sub>j</sub> = 25°C	-	-	100	μA	-
				T <sub>j</sub> = 125°C	-	-	1	mA	
On-state voltage		V <sub>TM</sub>	I <sub>TM</sub> = 5 A	-	-	1.8	V	Refer to Figure 1.	
Gate trigger current	Mode I	I <sub>GT</sub>	V <sub>DM</sub> = 12 V R <sub>L</sub> = 30 Ω	T <sub>2</sub> +, G+	-	-	12	mA	Refer to Figure 4.
	II			T <sub>2</sub> -, G+	-	-	-		
	III			T <sub>2</sub> -, G-	-	-	12		
	IV			T <sub>2</sub> +, G-	-	-	12		
Gate trigger voltage	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	Refer to Figure 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> = 1/2 V <sub>DRM</sub>	0.2	-	-	V	-	
Hold current		I <sub>H</sub>	V <sub>DM</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> = 2/3 V <sub>DRM</sub>	-	100	-	V/μs	-	
Commutating critical rate of rise of off-state voltage		(dv/dt) <sub>c</sub>	T <sub>j</sub> = 125°C (di <sub>T</sub> /dt) <sub>c</sub> = -1.6 A/ms V <sub>D</sub> = 400 V	5	-	-	V/μs	-	
Thermal resistance*		R <sub>th(j-c)</sub>	Junction-to-case AC	-	-	10	°C/W	Refer to Figure 13.	
		R <sub>th(j-a)</sub>	Junction-to-ambient AC	-	-	75	°C/W		

\* The thermal resistance at 50 Hz and 60 Hz sine wave current, which is shown on the following 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

Figure 1. i<sub>T</sub> vs. v<sub>T</sub> Characteristics

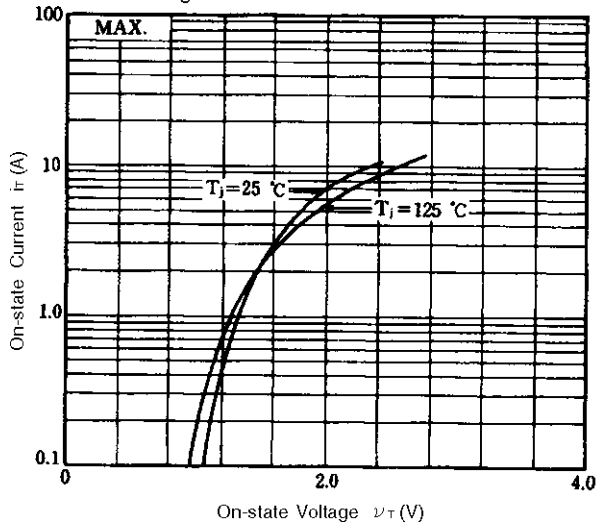


Figure 2. I<sub>TSM</sub> Rating

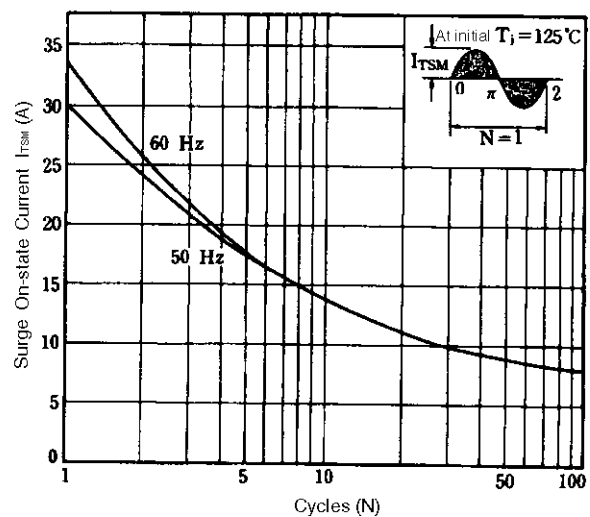


Figure 3. Gate Rating

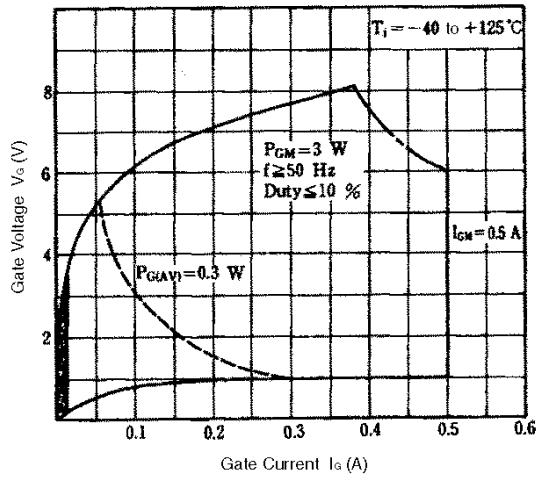


Figure 4. Example of Gate Characteristics

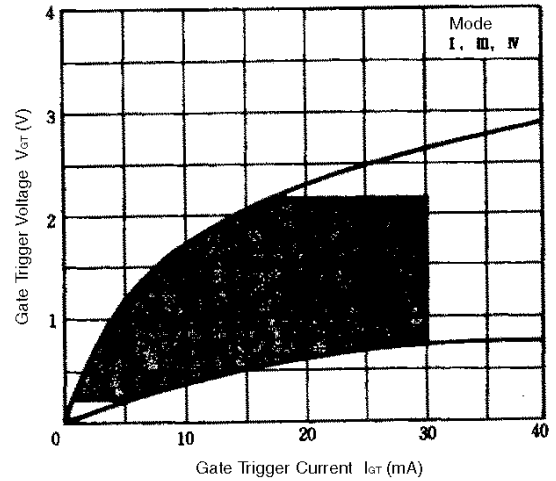


Figure 5.  $I_{GT}$  vs.  $T_A$  Example of Characteristics

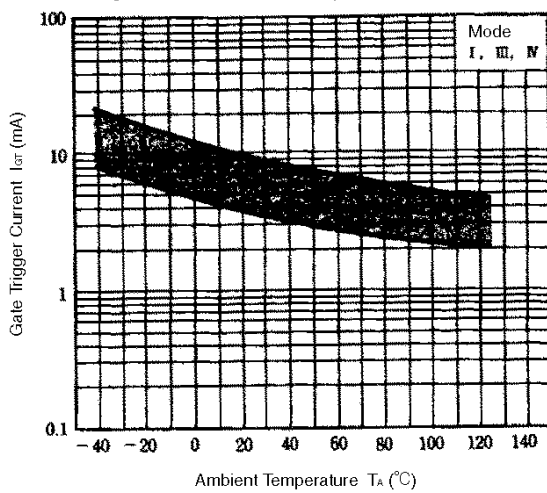


Figure 6.  $V_{GT}$  vs.  $T_A$  Example of Characteristics

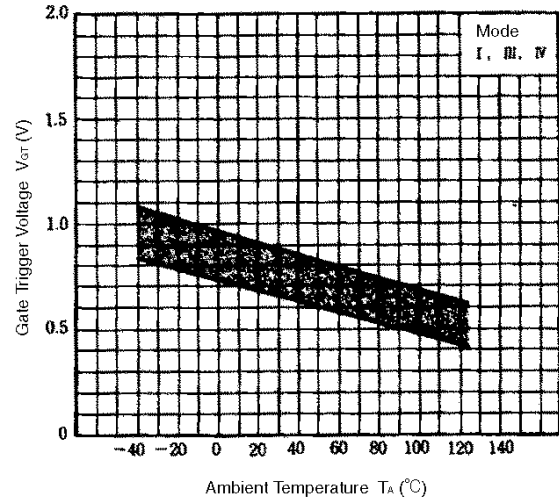


Figure 7.  $I_{GT}$  vs.  $\tau$  Example of Characteristics

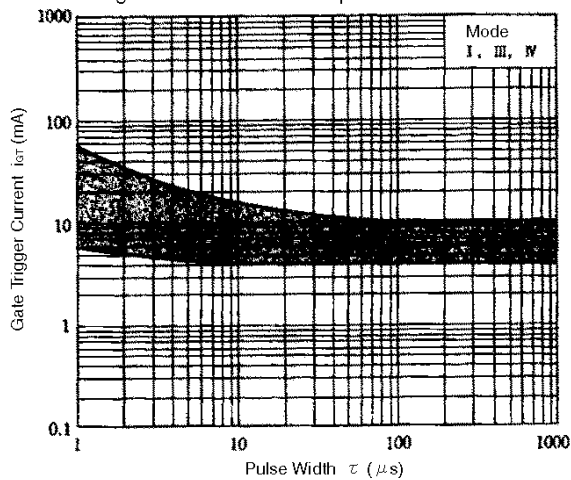


Figure 8.  $V_{GT}$  vs.  $\tau$  Example of Characteristics

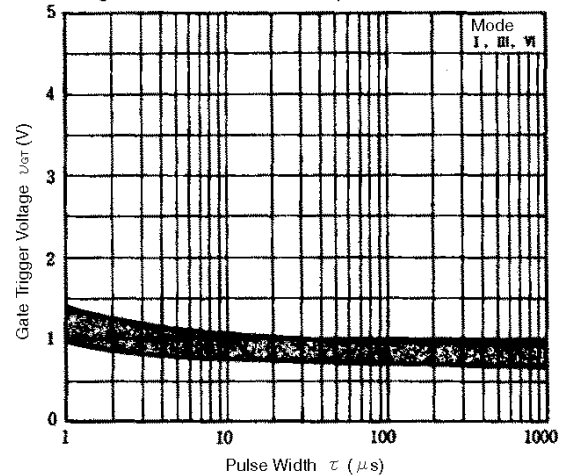


Figure 9.  $I_H$  vs.  $T_A$  Example of Characteristics

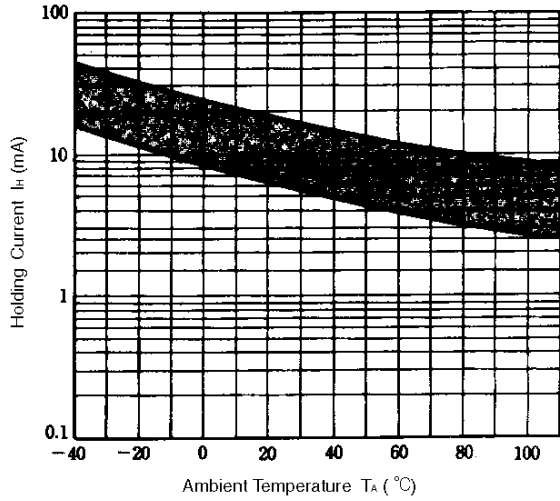


Figure 10.  $P_{T(AV)}$  vs.  $I_{T(RMS)}$  Characteristics

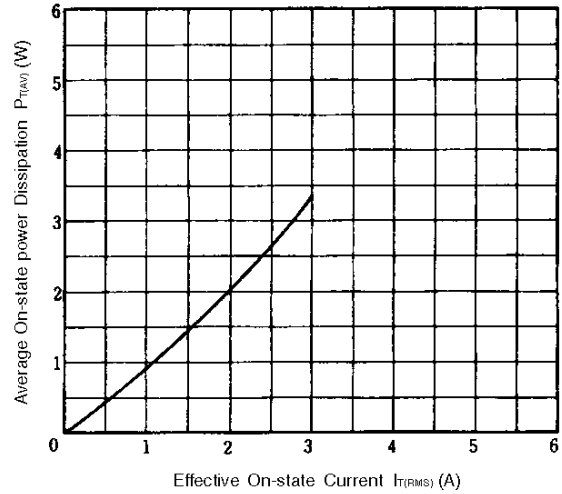


Figure 11.  $T_C$  vs.  $I_{T(AV)}$  Rating

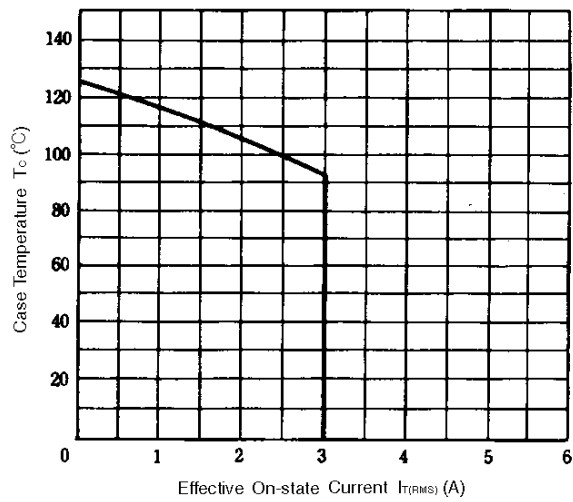


Figure 12.  $T_A$  vs.  $I_{T(RMS)}$  Rating

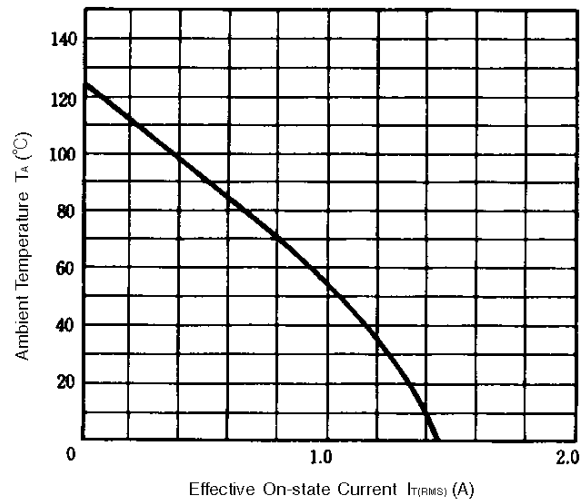
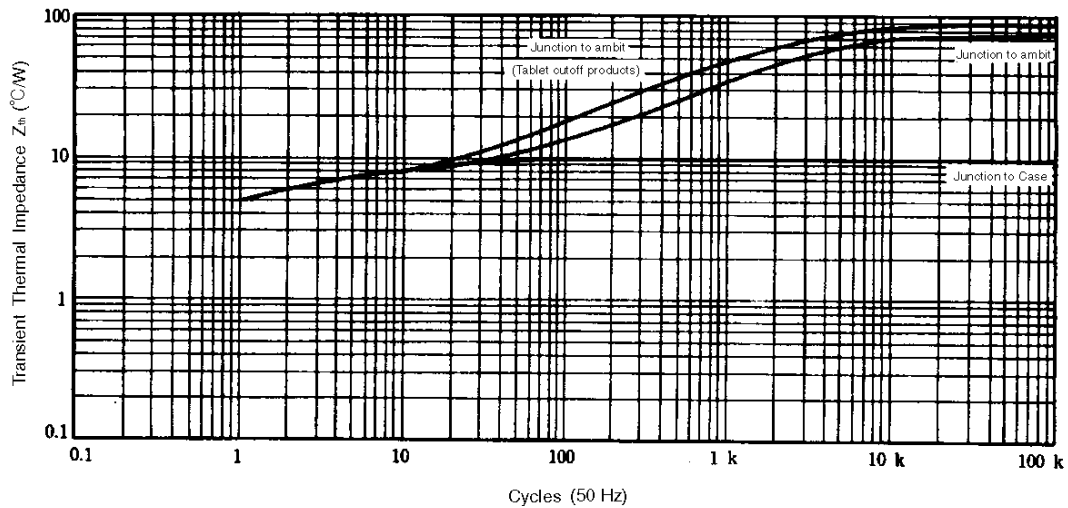


Figure 13.  $Z_{th}$  Characteristics



[MEMO]

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