

# AC08DSM, AC08FSM, AC08DSMA, AC08FSMA

### 8 A RESIN INSULATION TYPE TRIAC

The AS08[ ]SM, AC08[ ]SMA are resin insulation type TRIACs with an effective current of 8 A ( $T_c = 88\text{ }^\circ\text{C}$ ).

These products are covered with resin mold on the entire case and are electrically insulated with electrodes, giving them a considerable advantage over conventional TRIACs when mounting on a heatsink board or performing high-density mounting.

This series features ratings and electrical characteristics equal to NEC's TO-220AB package TRIAC and a high-reliability design.

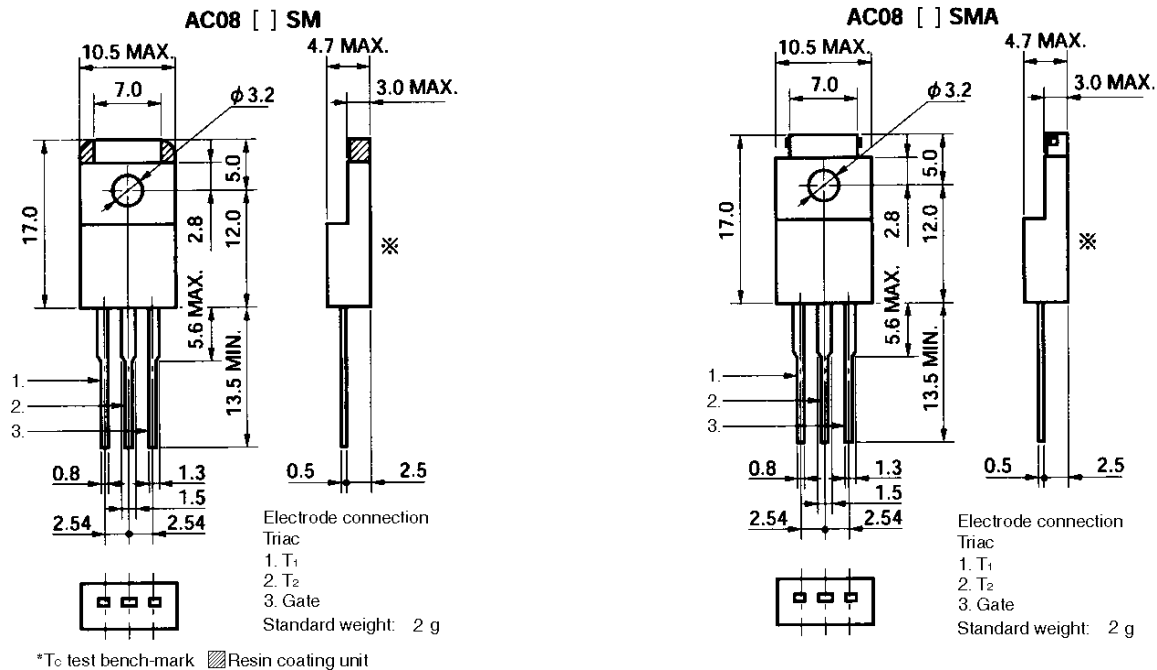
#### FEATURES

- Insulation type triac fully covered with resin on the entire case other than electrode leads
- Insulation voltage and conduction equal to conventional mica and polyester film
- Insulation voltage of 1500 V for 1 minute (1800 V for 1 second) is guaranteed (only AS05[ ]SM type)
- Can be replaced with TO-220AB package.
- High allowable on-current when using a single unit

#### APPLICATIONS

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

#### PACKAGE DRAWING (UNIT: mm)



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**ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)**

Parameter	Symbol	AC08DSM AC08DSMA	AC08FSM AC08FSMA	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>	8 (T <sub>C</sub> = 88°C)		A	Refer to Figures 11 and 12.
Surge on-state current	I <sub>TSM</sub>	80 (50 Hz 1 cycle) 88 (60 Hz 1 cycle)		A	Refer to Figure 2.
Fusing current	f $\int$ i <sup>2</sup> dt	28 (1 ms ≤ t ≤ 10 ms)		A <sup>2</sup> s	–
Critical rate rise of on-state current	di <sub>T</sub> /dt	50		A/μs	–
Peak gate power dissipation	P <sub>GM</sub>	5.0 (f ≥ 50 Hz, Duty ≤ 10 %)		W	–
Average gate power dissipation	P <sub>G(AV)</sub>	0.5		W	–
Peak gate current	I <sub>GM</sub>	±3 (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	–
Insulation voltage	–	1500 (AC 1minute)		V	Only AC08 [ ] SM type

**ELECTRICAL CHARACTERISTICS (Tj = 25°C, RGK = 1 kΩ)**

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit	Remarks	
Repetitive peak off-state 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	–	–	2	mA	
On-state voltage		V <sub>TM</sub>	I <sub>TM</sub> = 10 A	–	–	1.6	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+	–	–	20	mA	Refer to Figure 4.
	II			T <sub>2</sub> –, G+	–	–	–		
	III			T <sub>2</sub> –, G–	–	–	20		
	IV			T <sub>2</sub> +, G–	–	–	20		
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>	0.3	–	–	V	–	
Holding current		I <sub>H</sub>	V <sub>DM</sub> = 24 V, I <sub>TM</sub> = 10 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 dv/dt		(dv/dt) <sub>c</sub>	T <sub>j</sub> = 125°C (di <sub>T</sub> /dt) <sub>c</sub> = –4 A/ms V <sub>D</sub> = 400 V	10	–	–	V/μs	–	
Thermal resistance*		R <sub>th(j-c)</sub>	Junction-to-case AC	–	–	3.7	°C/W	Refer to Figure 13.	

\* The thermal resistance with a 50 Hz or 60 Hz sine wave current, as shown in the following expression:

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

T<sub>j(max)</sub> :Maximum junction temperature

T<sub>C</sub> :Case temperature

P<sub>T(AV)</sub> :Average on-dissipation

Figure 1.  $i_T$  vs.  $v_T$  Characteristics

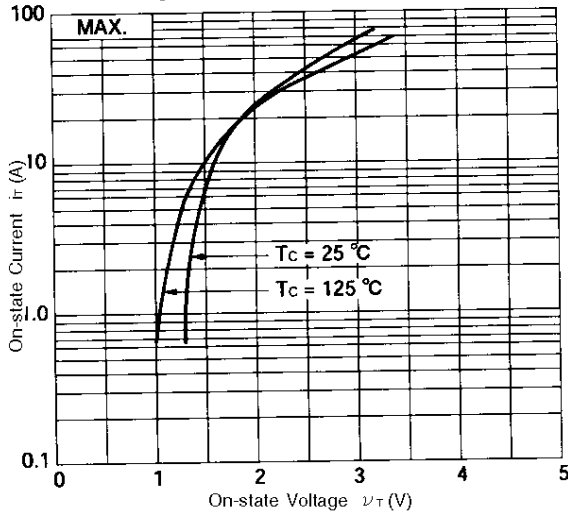


Figure 2.  $I_{TSM}$  Rating

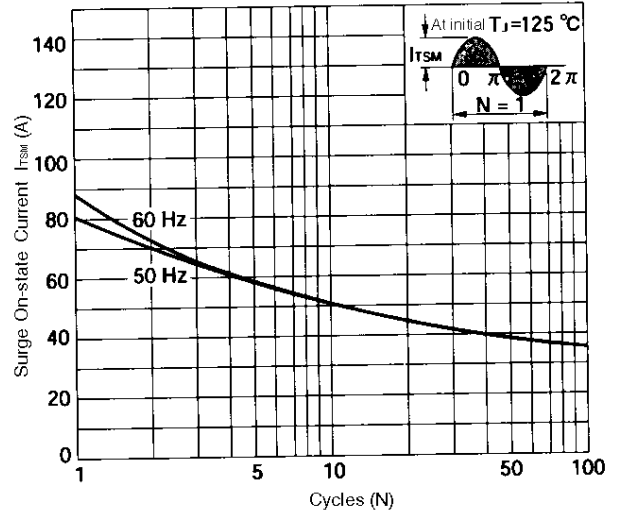


Figure 3. Gate Rating

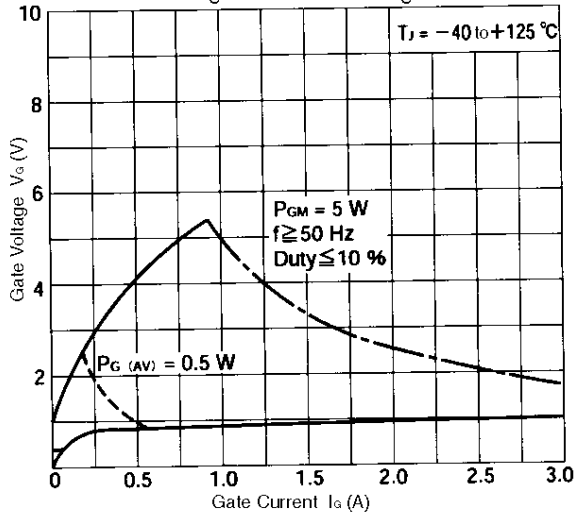


Figure 4. Example of Gate Characteristics

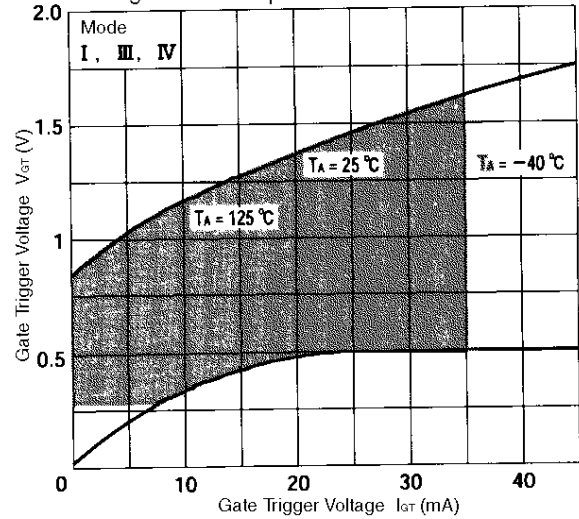


Figure 5.  $I_{GT}$  vs.  $T_A$  Example of Characteristics

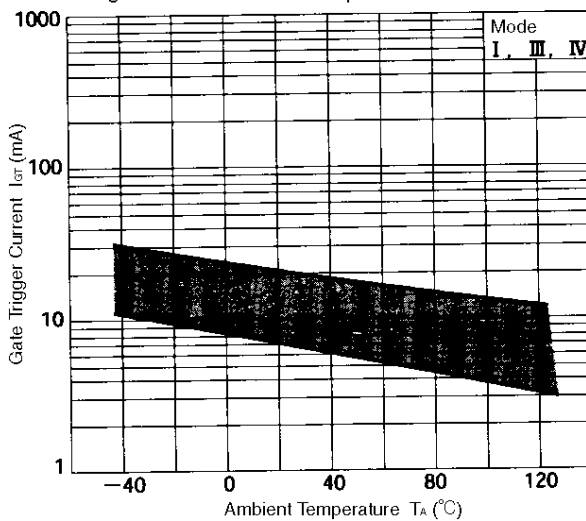
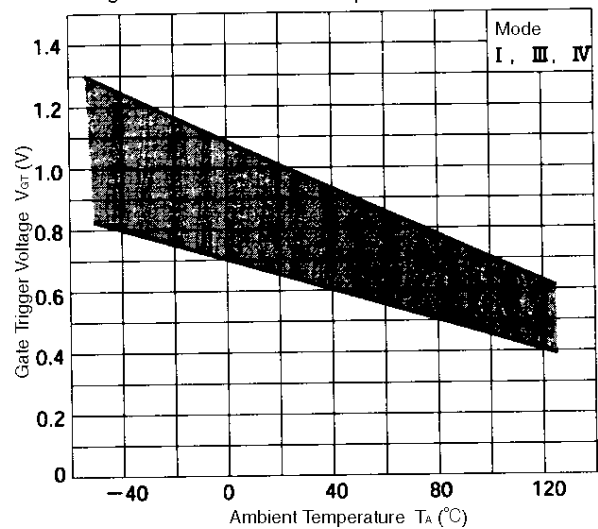


Figure 6.  $V_{GT}$  vs.  $T_A$  Example of Characteristics



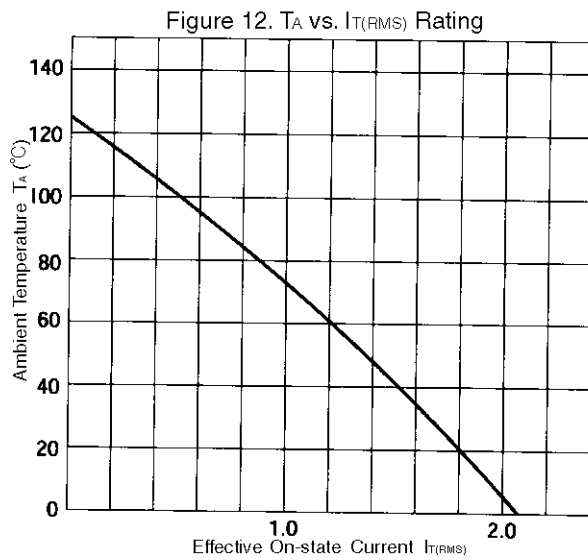
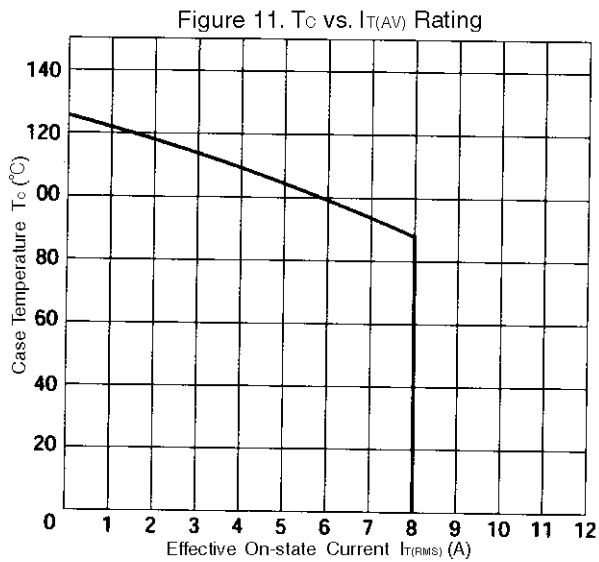
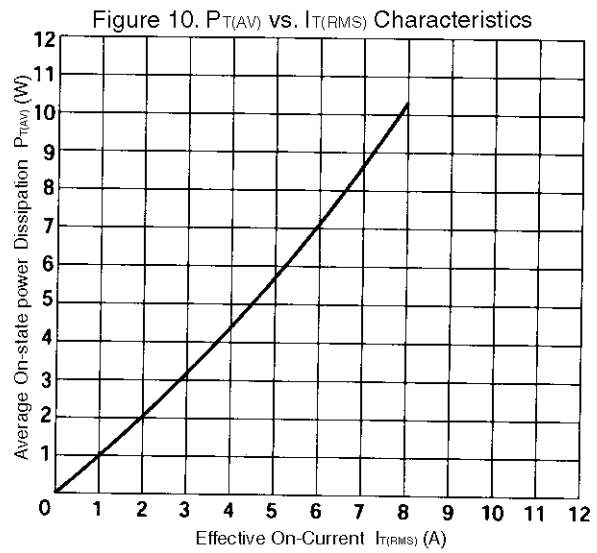
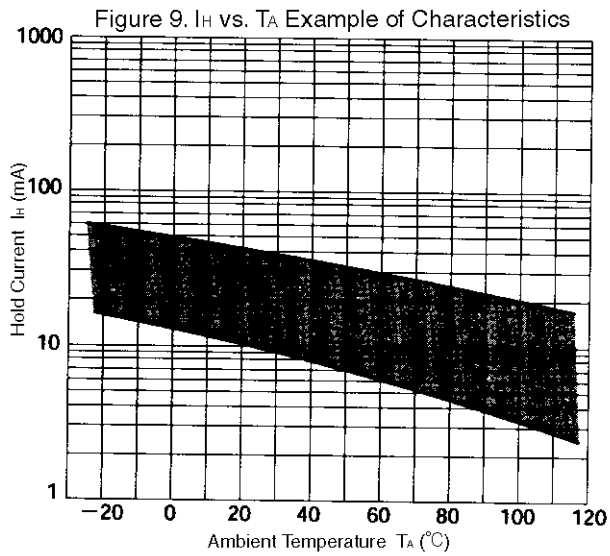
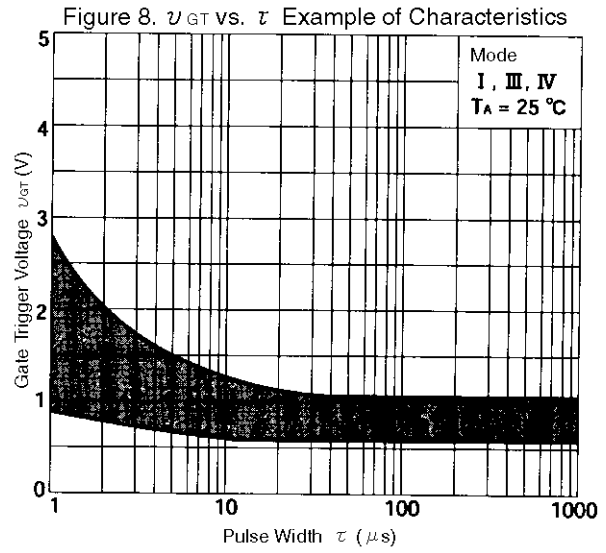
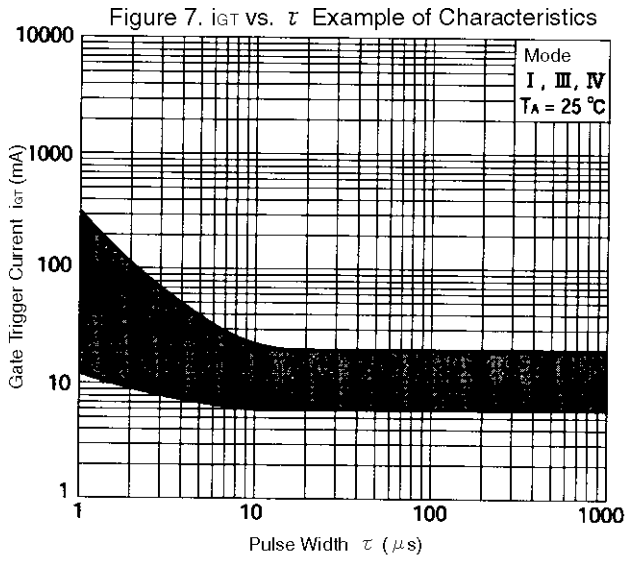
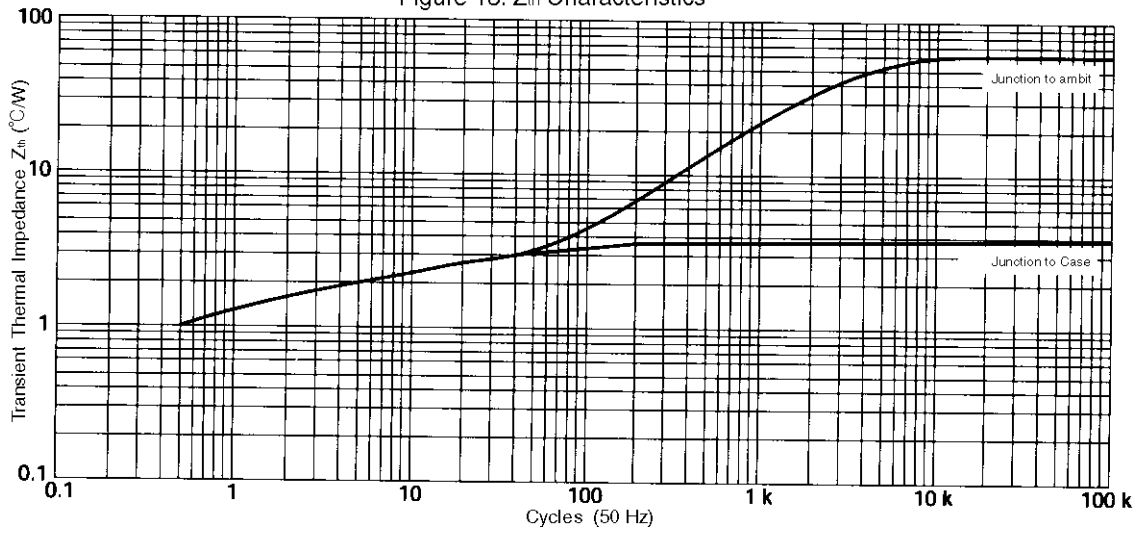


Figure 13.  $Z_{th}$  Characteristics



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