

AC10DSM, AC10FSM, AC10DSMA, AC10FSMA

10 A RESIN INSULATION TYPE TRIAC

The AS10[]SM, AC10[]SMA are resin insulation type TRIACs with an effective current of 10 A ($T_c = 85^\circ\text{C}$).

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

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

Parameter	Symbol	AC10DSM AC10DSMA	AC10FSM AC10FSMA	Unit	Remarks
Non-repetitive peak off-state voltage	V_{DSM}	500	700	V	–
Repetitive peak off-voltage	V_{DRM}	400	600	V	–
Effective on-state current	$I_{T(RMS)}$	10 ($T_c = 85^\circ\text{C}$)		A	Refer to Figures 11 and 12.
Surge on-state current	I_{TSM}	80 (50 Hz 1 cycle) 88 (60 Hz 1 cycle)		A	Refer to Figure 2.
Fusing current	$\int i^2 dt$	28 (1 ms $\leq t \leq$ 10 ms)		A^2s	–
Critical rate-rise of on-state current	di_T/dt	50		$\text{A}/\mu\text{s}$	–
Peak gate power dissipation	P_{GM}	5.0 ($f \geq 50$ Hz, Duty ≤ 10 %)		W	–
Average gate power dissipation	$P_{G(AV)}$	0.5		W	–
Peak gate current	I_{GM}	± 3 ($f \geq 50$ Hz, Duty ≤ 10 %)		A	–
Junction temperature	T_j	–40 to +125		$^\circ\text{C}$	–
Storage temperature	T_{stg}	–55 to +150		$^\circ\text{C}$	–
Insulation voltage	–	1500 (AC 1minute)		V	Only AC10 [] SM type

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

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit	Remarks	
Repeat peak off-state current		I _{DRM}	V _{DM} = V _{DRM}	T _j = 25°C	-	-	100	μA	-
				T _j = 125°C	-	-	2	mA	
On-state voltage		V _{TM}	I _{TM} = 10 A	-	-	1.3	V	Refer to Figure 1.	
Gate trigger current	Mode I	I _{GT}	V _{DM} = 12 V R _L = 30 Ω	T ₂ +, G+	-	-	20	mA	Refer to Figure 4.
	II			T ₂ -, G+	-	-	-		
	III			T ₂ -, G-	-	-	20		
	IV			T ₂ +, G-	-	-	20		
Gate trigger voltage	Mode I	V _{GT}	V _{DM} = 12 V R _L = 30 Ω	T ₂ +, G+	-	-	1.5	V	Refer to Figure 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} = 1/2 V _{DRM}	0.3	-	-	V	-	
Holding current		I _H	V _{DM} = 24 V, I _{TM} = 10 A	-	30	-	mA	-	
Critical rate of rise of off-state voltage		dv/dt	T _j = 125°C, V _{DM} = 2/3 V _{DRM}	-	100	-	V/μs	-	
Commutating dv/dt		(dv/dt) _c	T _j = 125°C (di/dt) _c = -5 A/ms V _D = 400 V	10	-	-	V/μs	-	
Thermal resistance*		R _{th(j-c)}	Junction-to-case AC	-	-	3.5	°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_{j(max)} :Maximum junction temperature
 T_C :Case temperature
 P_{T(AV)} :Average on-dissipation

PACKAGE DRAWING (UNIT: mm)

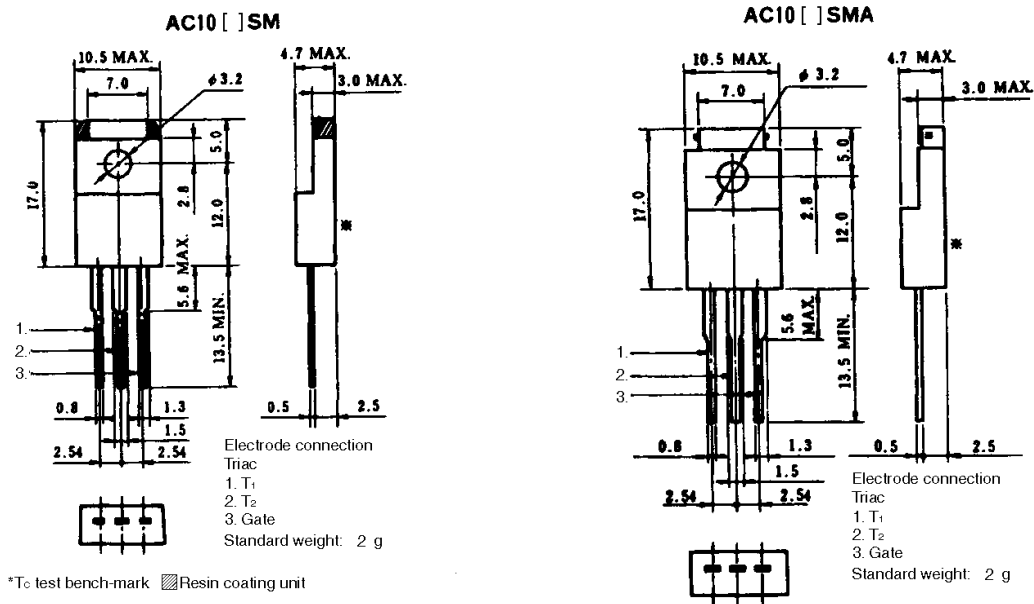


Figure 1. i_T vs. v_T Characteristics

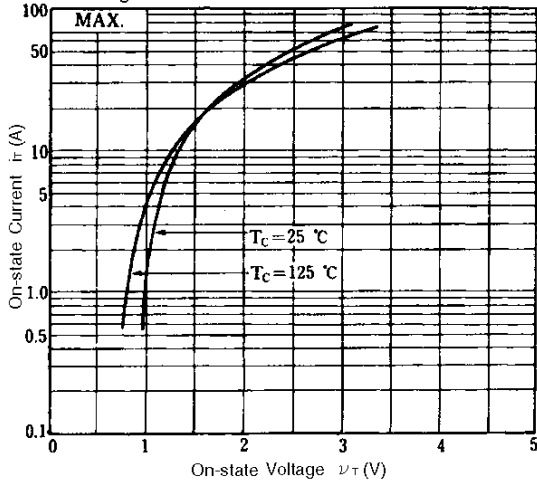


Figure 2. I_{TSM} Rating

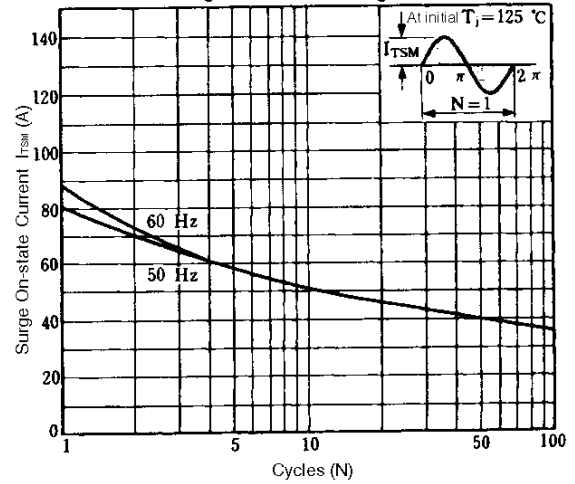


Figure 3. Gate Rating

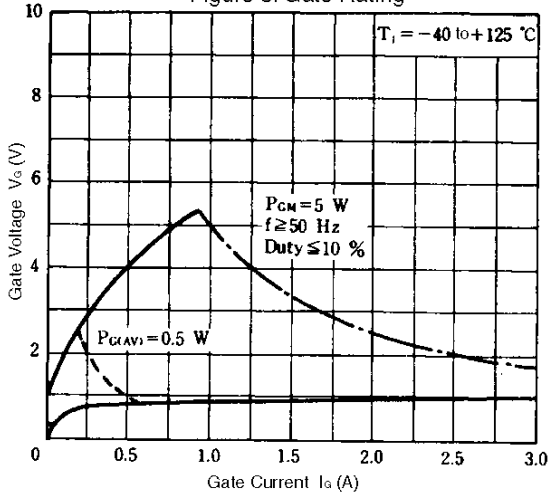


Figure 4. Example of Gate Characteristics

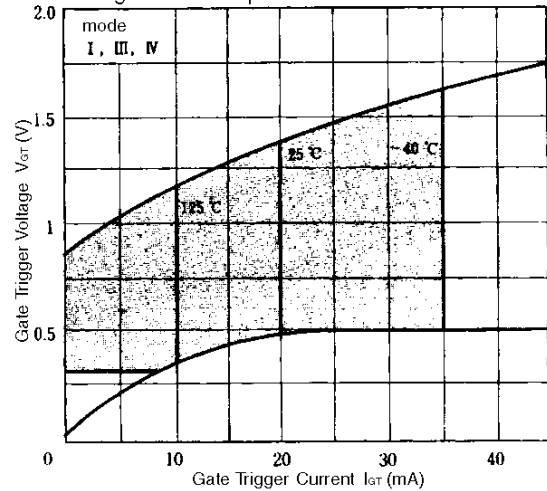


Figure 5. I_{GT} vs. T_A Example of Characteristics

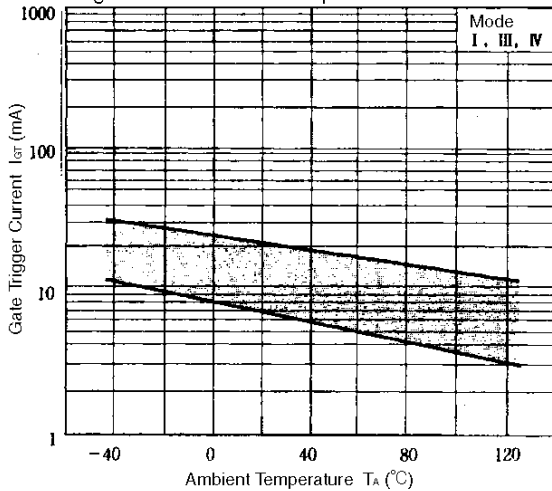


Figure 6. V_{GT} vs. T_A Example of Characteristics

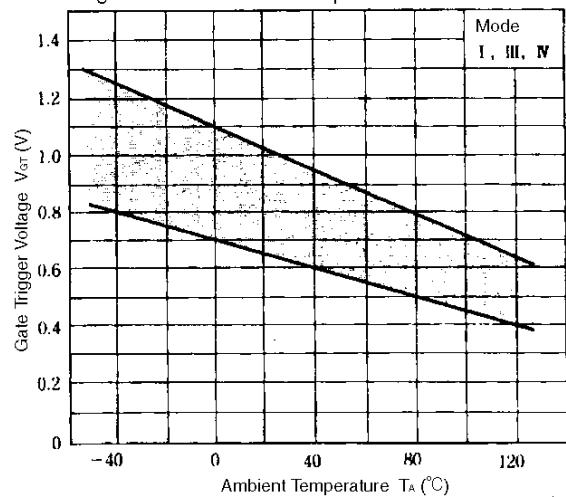


Figure 7. i_{GT} vs. τ Example of Characteristics

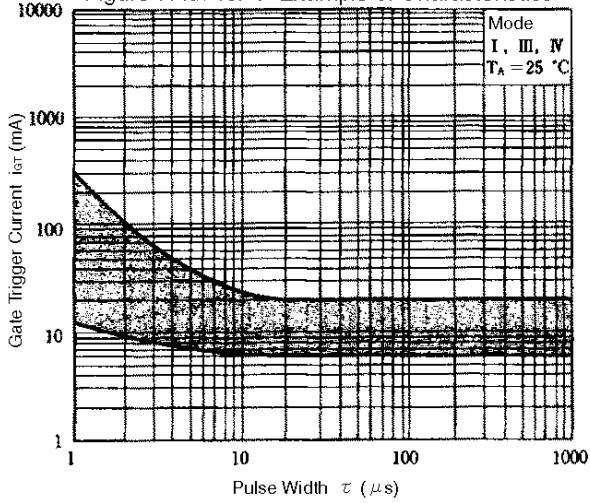


Figure 8. v_{GT} vs. τ Example of Characteristics

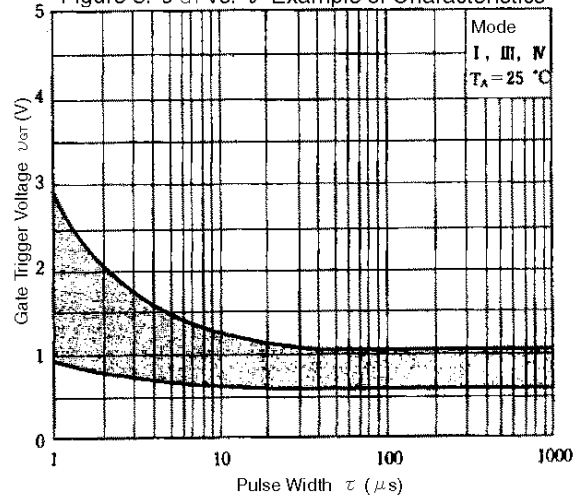


Figure 9. I_H vs. T_A Example of Characteristics

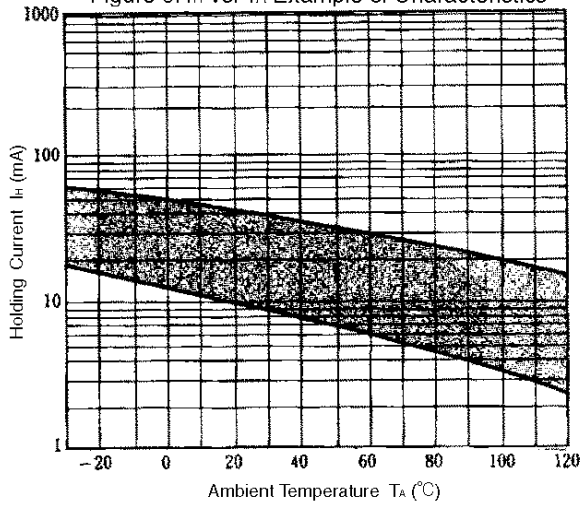


Figure 10. $P_{T(AV)}$ vs. $I_{T(RMS)}$ Characteristics

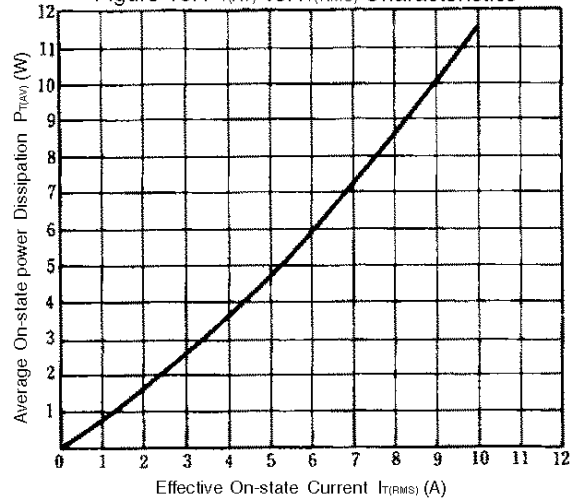


Figure 11. T_C vs. $I_{T(AV)}$ Rating

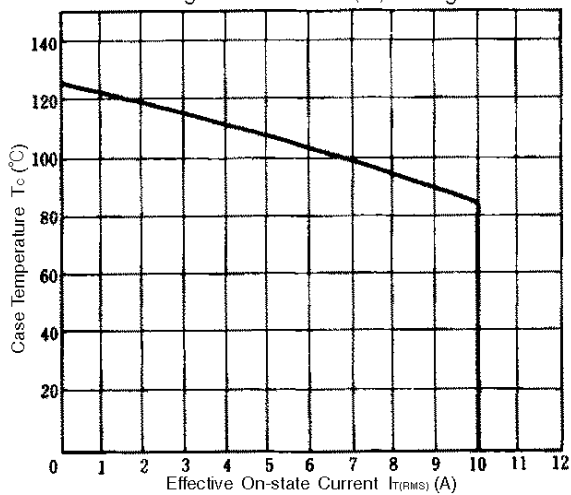


Figure 12. T_A vs. $I_{T(RMS)}$ Rating

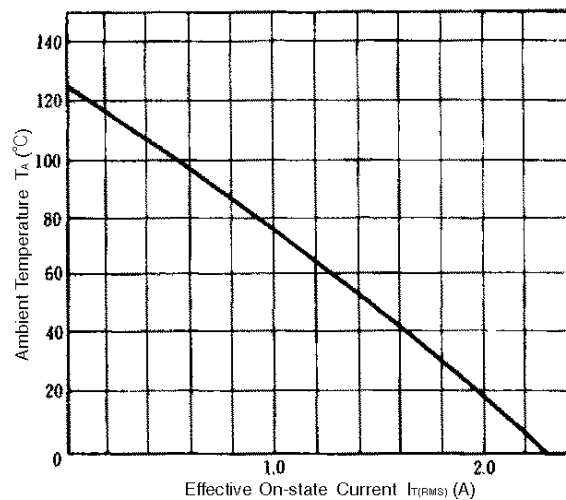
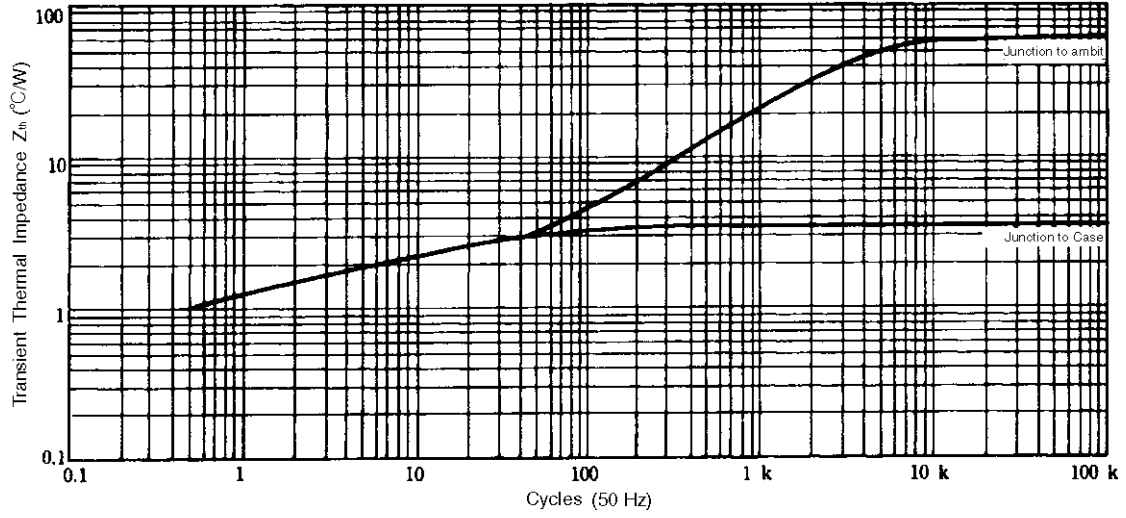


Figure 13. Z_{th} Characteristics



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