

# THYRISTORS AC16DSMA, AC16FSMA

## 16 A MOLD ISOLATED TRIAC

### DESCRIPTION

The AC16DSMA and AC16FSMA are all diffused mold type triac granted RMS on-state current 16 A, with rated voltages up to 600 V.

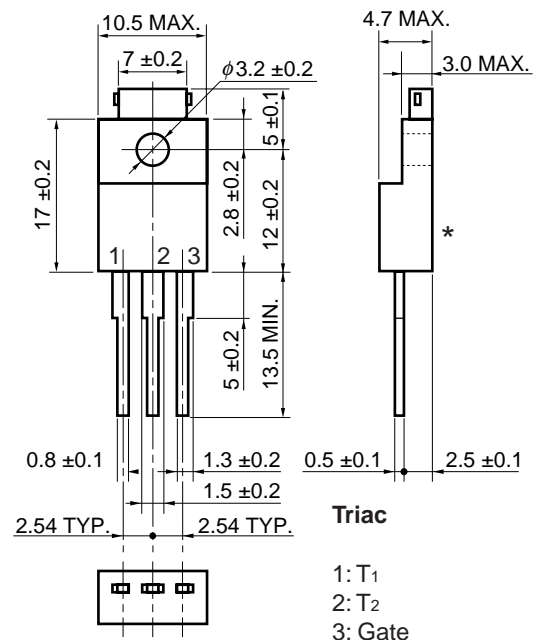
### FEATURES

- Isolated plastic package (modified TO-220AB)
- 150 A surge current

### APPLICATIONS

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

### ★ PACKAGE DRAWING (Unit: mm)



### ★ ABSOLUTE MAXIMUM RATINGS

★: T<sub>c</sub> test bench-mark

Standard weight: 2 g

Parameter	Symbol	AC16DSMA	AC16FSMA	Unit	Remarks
Non-repetitive Peak Off-state Voltage	V <sub>DSM</sub>	500	700	V	—
Repetitive Peak Off-state Voltage	V <sub>DRM</sub>	400	600	V	—
RMS On-state Current	I <sub>T(RMS)</sub>	16 (T <sub>c</sub> = 68°C)		A	Refer to <b>Figure 11</b> .
Surge On-state Current	I <sub>TSM</sub>	150 (50 Hz 1 cycle) 165 (60 Hz 1 cycle)		A	Refer to <b>Figure 2</b> .
Fusing Current	$\int i^2 dt$	100 (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 (f ≥ 50 Hz, Duty ≤ 10%)		W	Refer to <b>Figure 3</b> .
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 ~ +125		°C	—
Storage Temperature	T <sub>stg</sub>	-55 ~ +150		°C	—

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

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> = 25 A	–	–	1.4	V	Refer to <b>Figure 1</b> .	
Gate Trigger Current	Mode I	V <sub>DM</sub> = 12 V, R <sub>L</sub> = 30 Ω	T <sub>2+</sub> , G+	–	–	30	mA	Refer to <b>Figure 4</b> , <b>5</b> and <b>7</b> .
	II		T <sub>2-</sub> , G+	–	–	–		
	III		T <sub>2-</sub> , G–	–	–	30		
	IV		T <sub>2+</sub> , G–	–	–	30		
Gate Trigger Voltage	Mode I	V <sub>DM</sub> = 12 V, R <sub>L</sub> = 30 Ω	T <sub>2+</sub> , G+	–	–	1.5	V	Refer to <b>Figure 4</b> , <b>6</b> and <b>8</b> .
	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>	0.3	–	–	V	–	
Holding Current	I <sub>H</sub>	V <sub>DM</sub> = 24 V, I <sub>TM</sub> = 20 A	–	30	–	mA	Refer to <b>Figure 9</b> .	
Critical Rate 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 Critical Rate Rise of Off-state Voltage	(dv/dt) <sub>c</sub>	T <sub>j</sub> = 125°C, I <sub>TM</sub> = 22 A (di <sub>T</sub> /dt) <sub>c</sub> = –8 A/ms, V <sub>D</sub> = 400 V	10	–	–	V/μs	–	
Thermal Resistance <sup>Note</sup>	R <sub>th(j-c)</sub>	Junction to case AC	–	–	3.3	°C/W	Refer to <b>Figure 13</b> .	
	R <sub>th(j-a)</sub>	Junction to ambient AC	–	–	60	°C/W		

★ **Note** The thermal resistance at 50 Hz and 60 Hz sine wave current, which is shown on the follow expression.

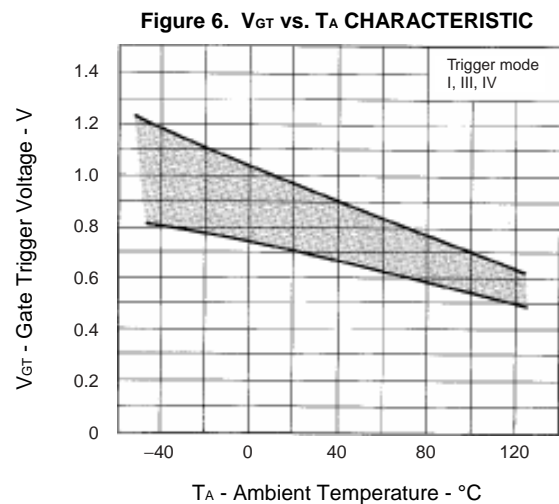
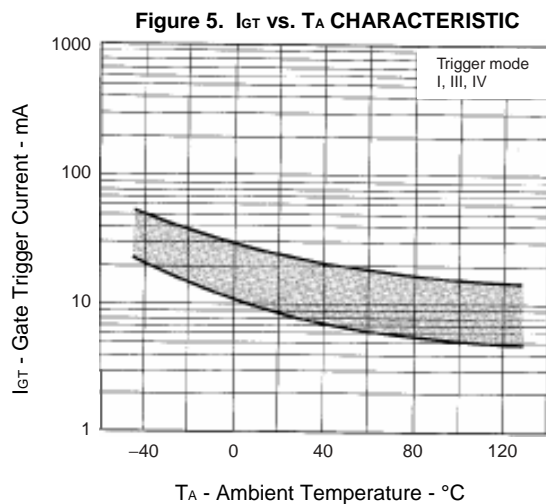
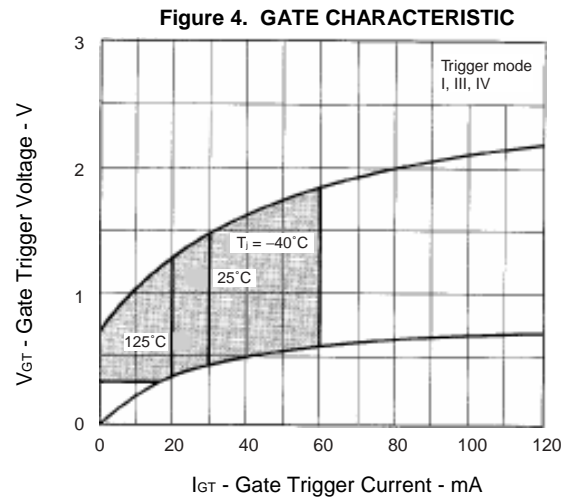
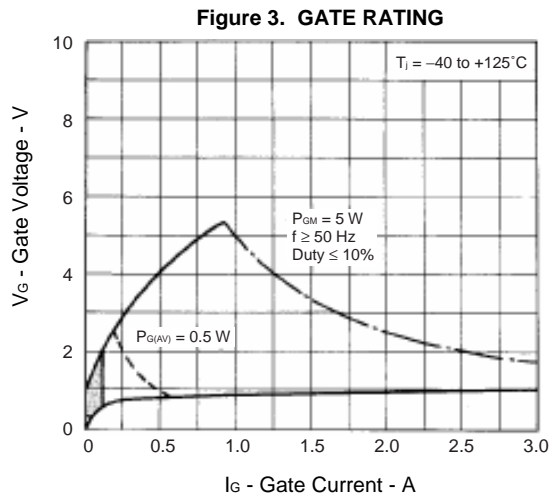
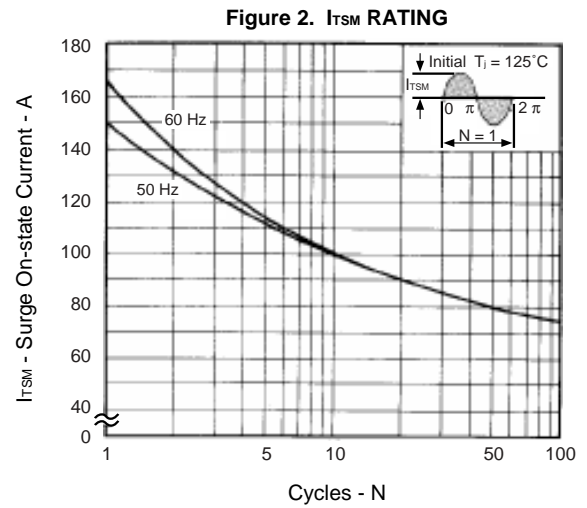
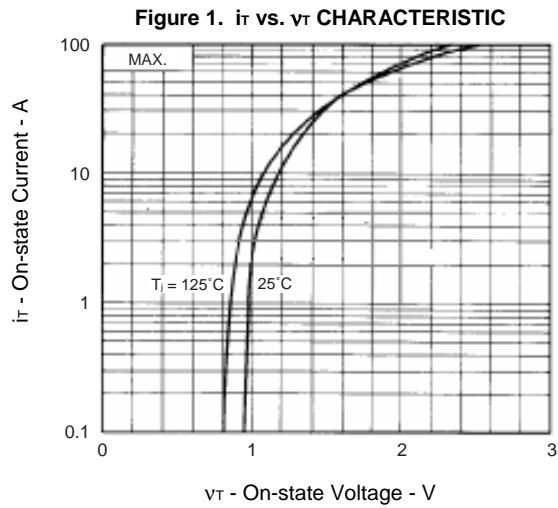
$$R_{th(j-c)} = \frac{T_{j(max)} - T_c}{P_{T(AV)}}$$

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

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

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

TYPICAL CHARACTERISTICS



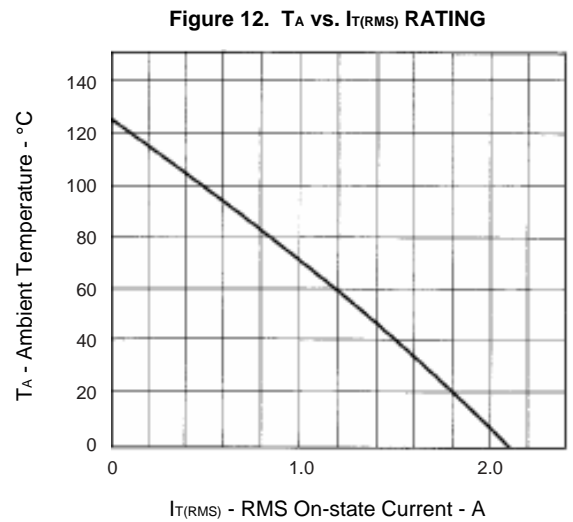
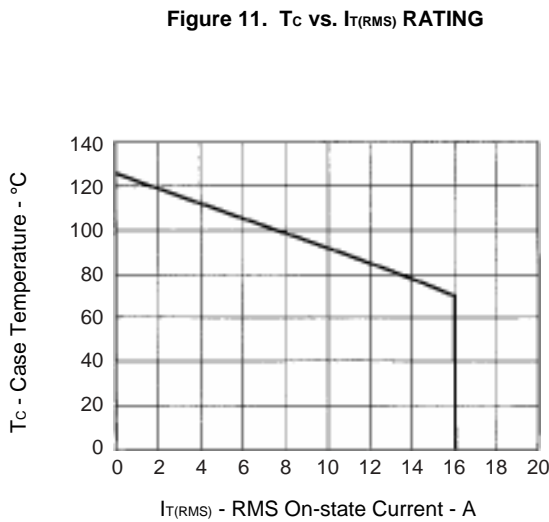
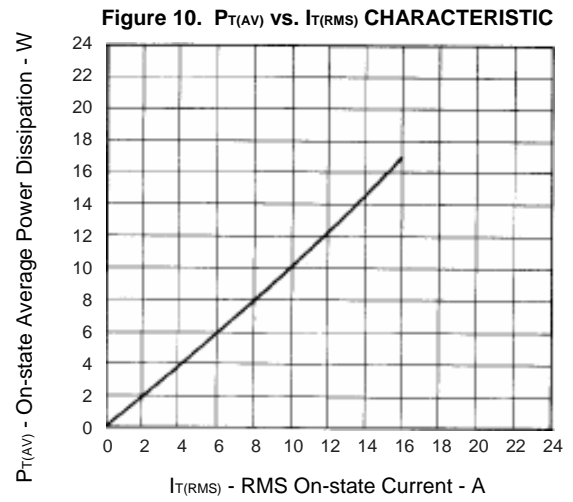
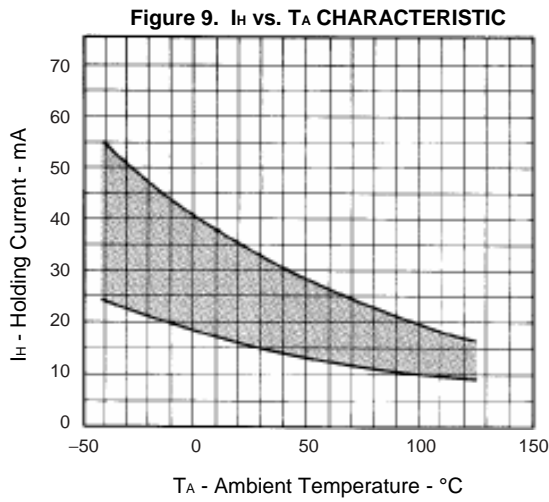
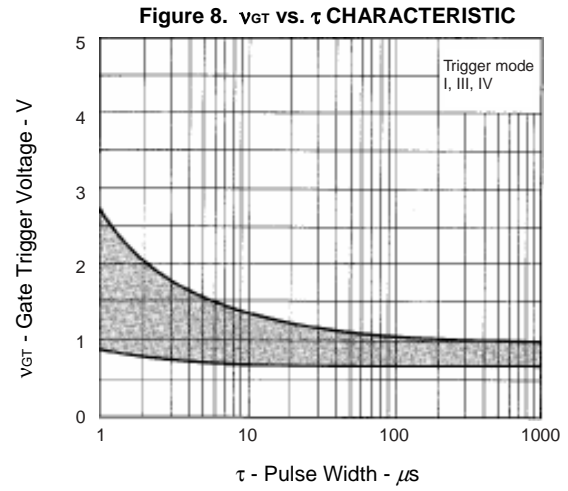
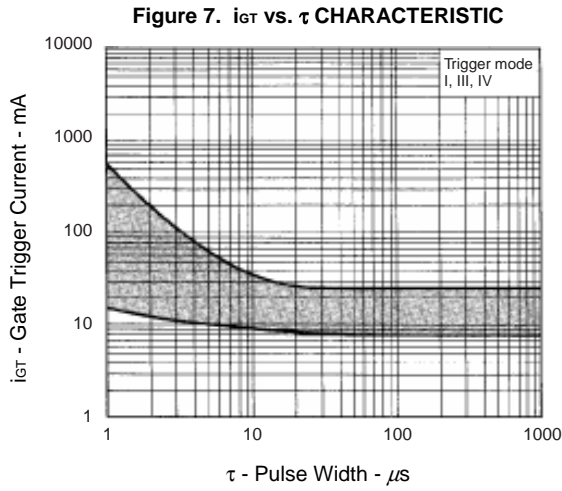
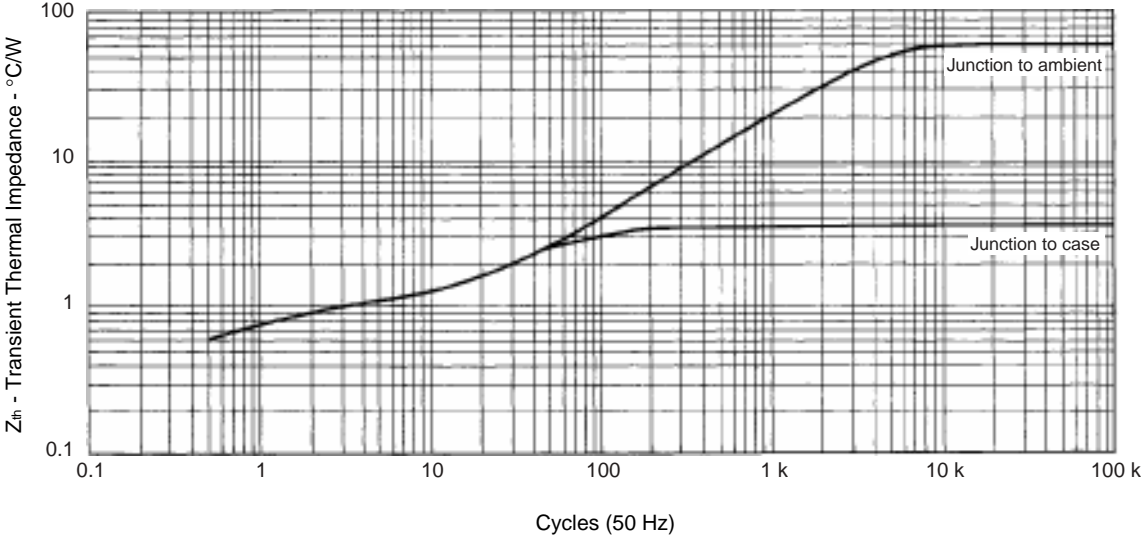


Figure 13. Z<sub>th</sub> CHARACTERISTIC



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