

NEC

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.

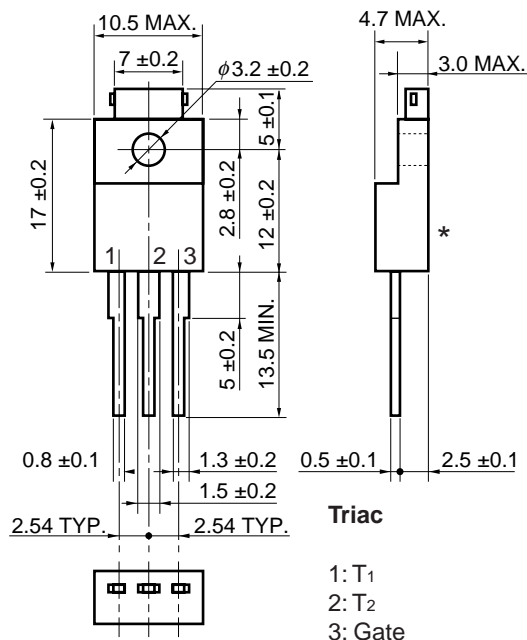
FEATURES

- 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_c test bench-mark

Standard weight: 2 g

Parameter	Symbol	AC16DSMA	AC16FSMA	Unit	Remarks
Non-repetitive Peak Off-state Voltage	V _{DSM}	500	700	V	—
Repetitive Peak Off-state Voltage	V _{DRM}	400	600	V	—
RMS On-state Current	I _{T(RMS)}	16 (T _c = 68°C)		A	Refer to Figure 11.
Surge On-state Current	I _{TSM}	150 (50 Hz 1 cycle) 165 (60 Hz 1 cycle)		A	Refer to Figure 2.
Fusing Current	$\int i_T^2 dt$	100 (1 ms ≤ t ≤ 10 ms)		A ² s	—
Critical Rate Rise of On-state Current	di _T /dt	50		A/μs	—
Peak Gate Power Dissipation	P _{GM}	5 (f ≥ 50 Hz, Duty ≤ 10%)		W	Refer to Figure 3.
Average Gate Power Dissipation	P _{G(AV)}	0.5		W	
Peak Gate Current	I _{GM}	±3 (f ≥ 50 Hz, Duty ≤ 10%)		A	
Junction Temperature	T _j	-40~+125		°C	—
Storage Temperature	T _{stg}	-55~+150		°C	—

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ELECTRICAL CHARACTERISTICS ($T_j = 25^\circ\text{C}$)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit	Remarks	
Repetitive Peak Off-state Current	I_{DRM}	$V_{DM} = V_{DRM}$	$T_j = 25^\circ\text{C}$	–	–	100	μA	–
			$T_j = 125^\circ\text{C}$	–	–	2	mA	–
On-state Voltage	V_{TM}	$I_{TM} = 25\text{ A}$	–	–	1.4	V	Refer to Figure 1 .	
Gate Trigger Current	Mode I	$V_{DM} = 12\text{ V}$, $R_L = 30\ \Omega$	$T_{2+}, G+$	–	–	30	mA	Refer to Figure 4 , 5 and 7 .
	II		$T_{2-}, G+$	–	–	–		
	III		$T_{2-}, G-$	–	–	30		
	IV		$T_{2+}, G-$	–	–	30		
Gate Trigger Voltage	Mode I	$V_{DM} = 12\text{ V}$, $R_L = 30\ \Omega$	$T_{2+}, G+$	–	–	1.5	V	Refer to Figure 4 , 6 and 8 .
	II		$T_{2-}, G+$	–	–	–		
	III		$T_{2-}, G-$	–	–	1.5		
	IV		$T_{2+}, G-$	–	–	1.5		
Gate Non-trigger Voltage	V_{GD}	$T_j = 125^\circ\text{C}$, $V_{DM} = \frac{1}{2} V_{DRM}$	0.3	–	–	V	–	
Holding Current	I_H	$V_{DM} = 24\text{ V}$, $I_{TM} = 20\text{ A}$	–	30	–	mA	Refer to Figure 9 .	
Critical Rate Rise of Off-state Voltage	dv/dt	$T_j = 125^\circ\text{C}$, $V_{DM} = \frac{2}{3} V_{DRM}$	–	100	–	V/ μs	–	
Commutating Critical Rate Rise of Off-state Voltage	$(dv/dt)_c$	$T_j = 125^\circ\text{C}$, $I_{TM} = 22\text{ A}$ $(di_T/dt)_c = -8\text{ A/ms}$, $V_D = 400\text{ V}$	10	–	–	V/ μs	–	
Thermal Resistance ^{Note}	$R_{th(j-c)}$	Junction to case AC	–	–	3.3	$^\circ\text{C/W}$	Refer to Figure 13 .	
	$R_{th(j-a)}$	Junction to ambient AC	–	–	60	$^\circ\text{C/W}$		

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

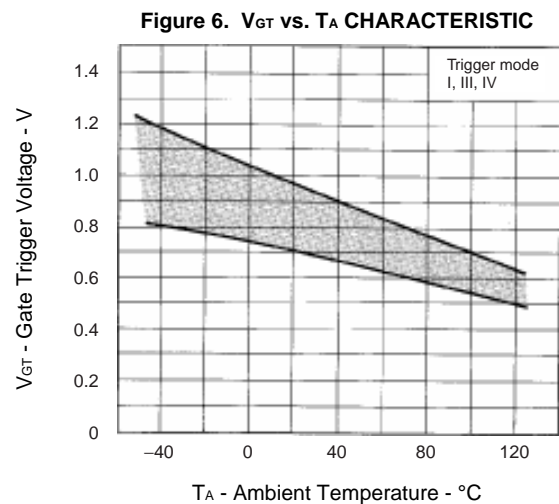
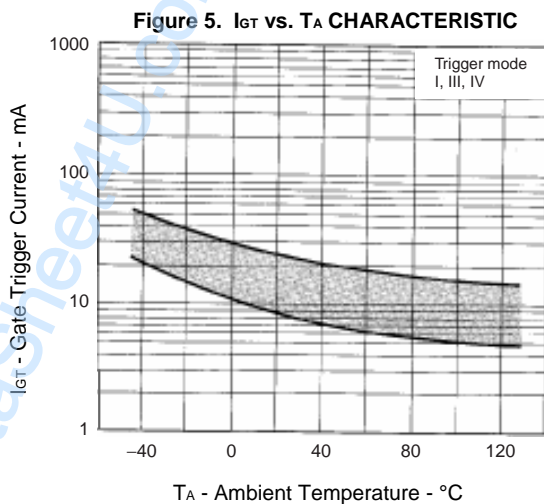
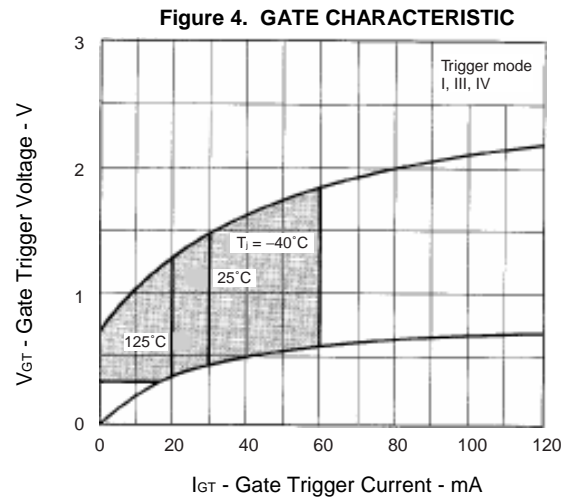
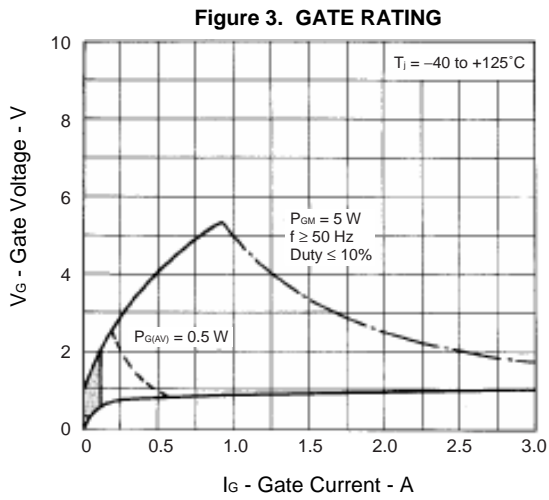
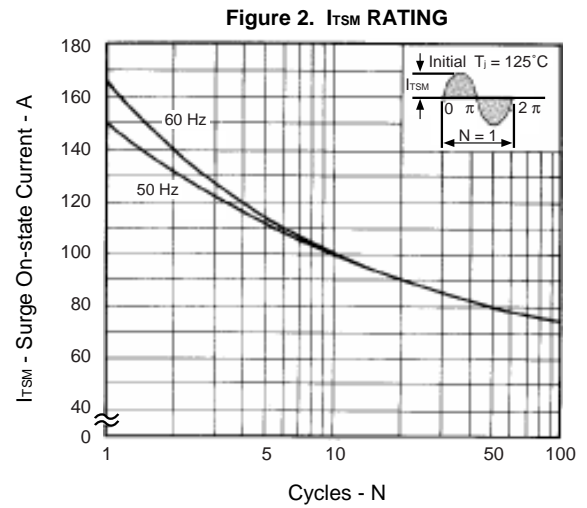
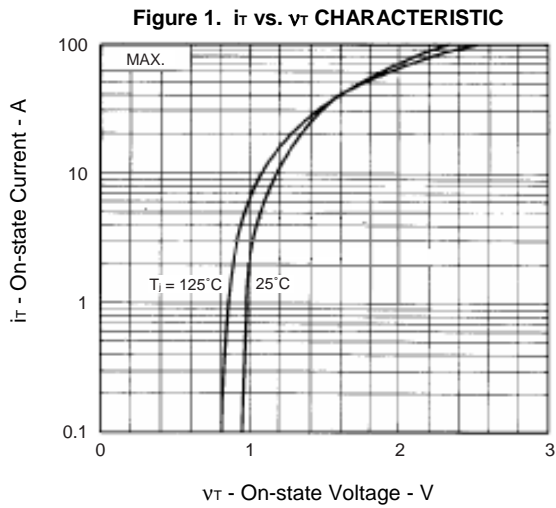
$$R_{th(j-c)} = \frac{T_{j(max)} - T_c}{P_{T(AV)}}$$

$T_{j(max)}$: Maximum junction temperature

T_c : Case temperature

$P_{T(AV)}$: Average on-dissipation

TYPICAL CHARACTERISTICS



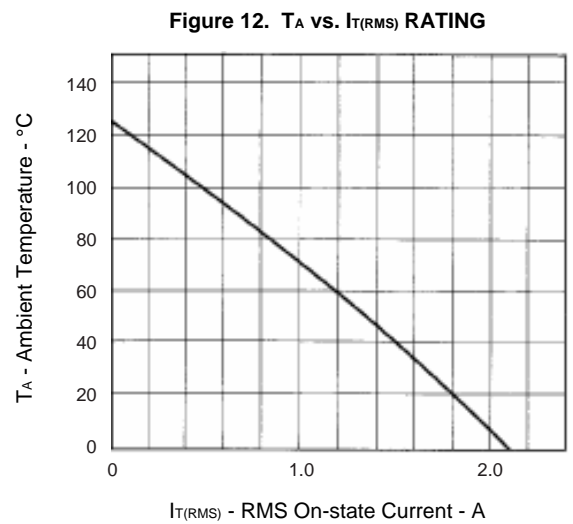
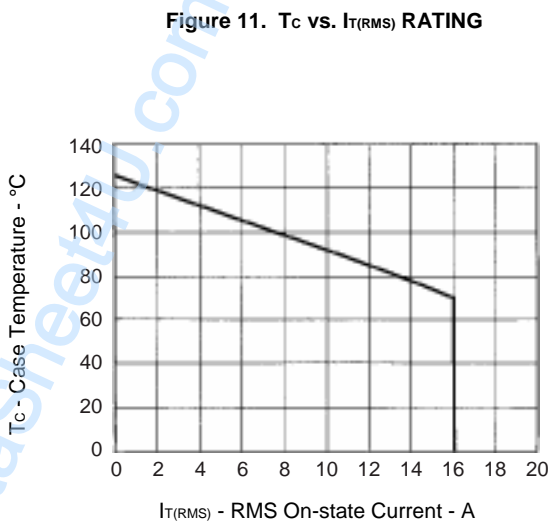
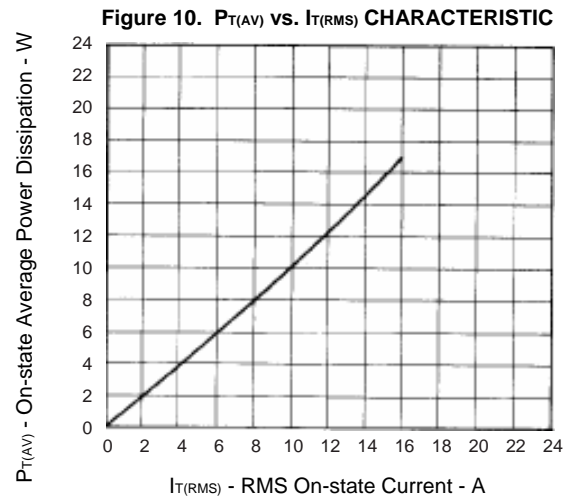
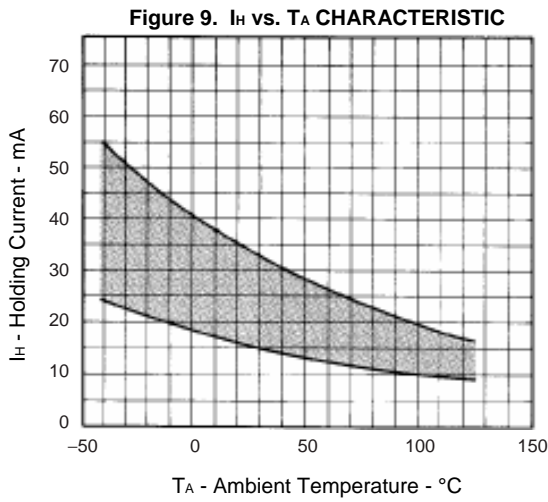
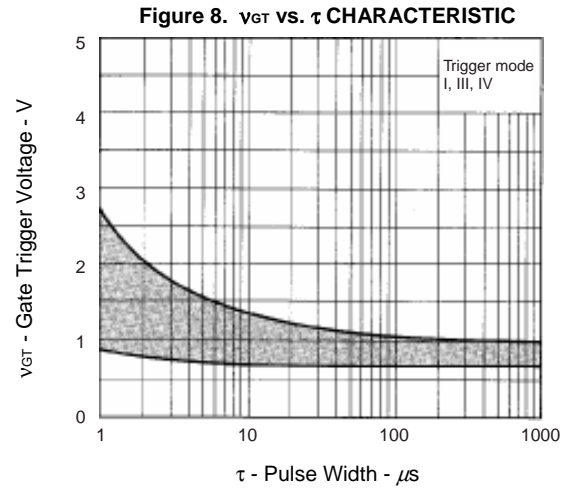
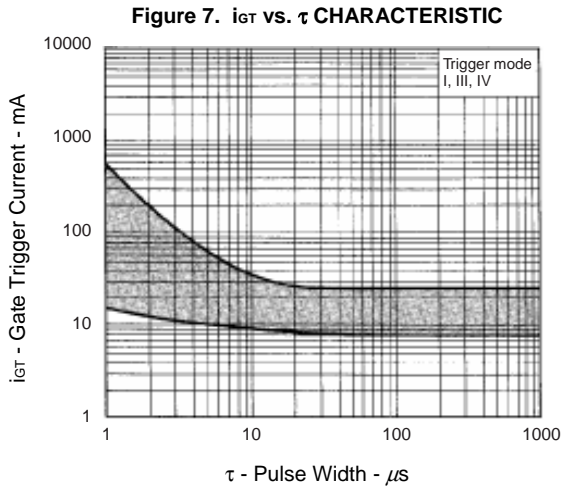
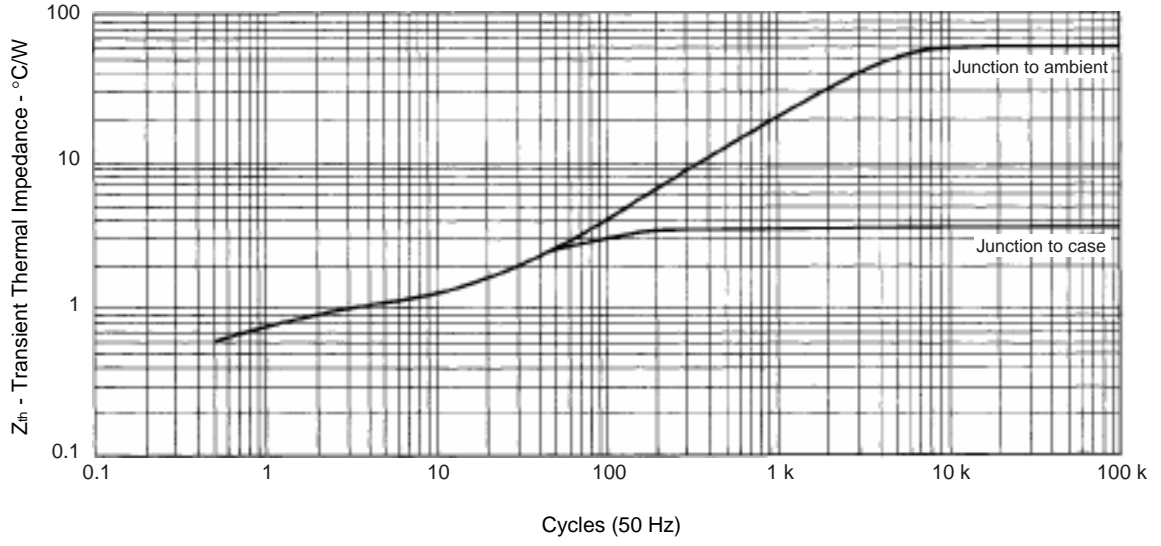


Figure 13. Z_{th} CHARACTERISTIC



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