

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.

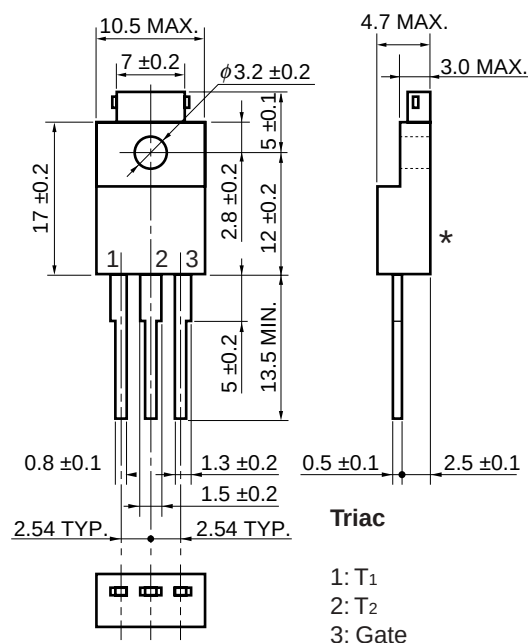
FEATURES

- 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°C)

Parameter		Symbol	Conditions		MIN.	TYP.	MAX.	Unit	Remarks	
Repetitive 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} = 25 A		–	–	1.4	V	Refer to Figure 1 .	
Gate Trigger Current	Mode I	I _{GT}	V _{DM} = 12 V, R _L = 30 Ω	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 _{GT}	V _{DM} = 12 V, R _L = 30 Ω	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°C, V _{DM} = $\frac{1}{2}$ V _{DRM}		0.3	–	–	V	–	
Holding Current		I _H	V _{DM} = 24 V, I _{TM} = 20 A		–	30	–	mA	Refer to Figure 9 .	
Critical Rate Rise of Off-state Voltage		dv/dt	T _J = 125°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°C, I _{TM} = 22 A (di _T /dt) _c = –8 A/ms, V _D = 400 V			10	–	–	V/μs	–
Thermal Resistance ^{Note}		R _{th(j-c)}	Junction to case AC			–	–	3.3	°C/W	Refer to Figure 13 .
		R _{th(j-a)}	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_{j(max)}: Maximum junction temperature

T_c: Case temperature

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

TYPICAL CHARACTERISTICS

Figure 1. i_T vs. v_T CHARACTERISTIC

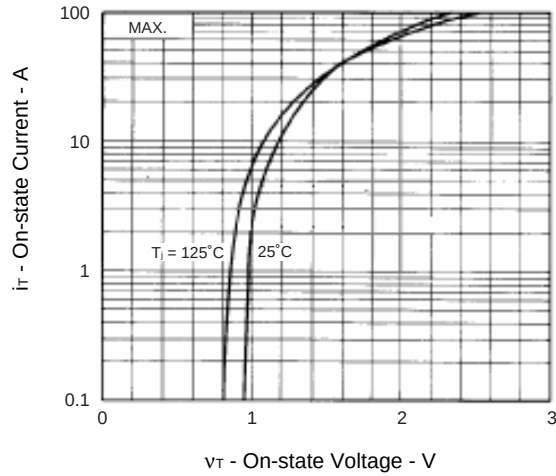


Figure 2. I_{TSM} RATING

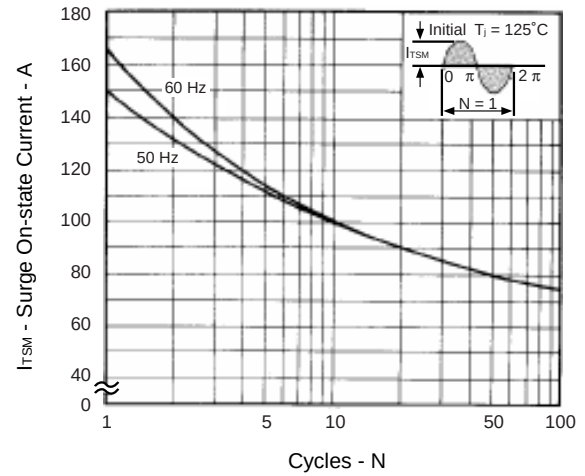


Figure 3. GATE RATING

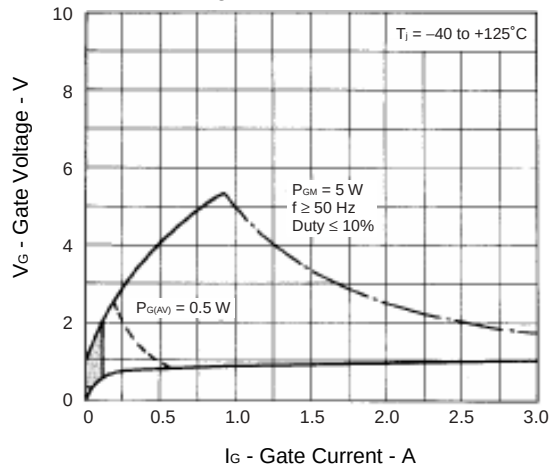


Figure 4. GATE CHARACTERISTIC

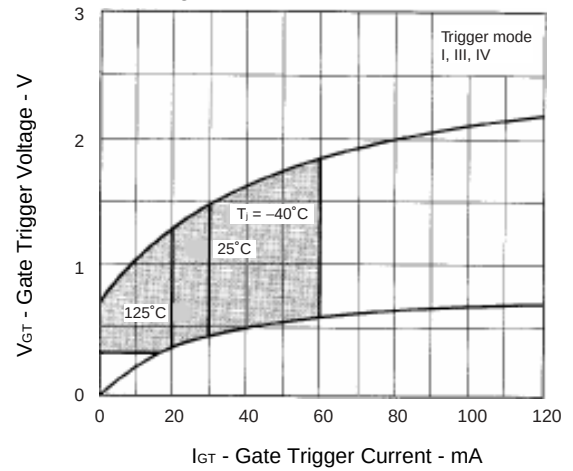


Figure 5. I_{GT} vs. T_A CHARACTERISTIC

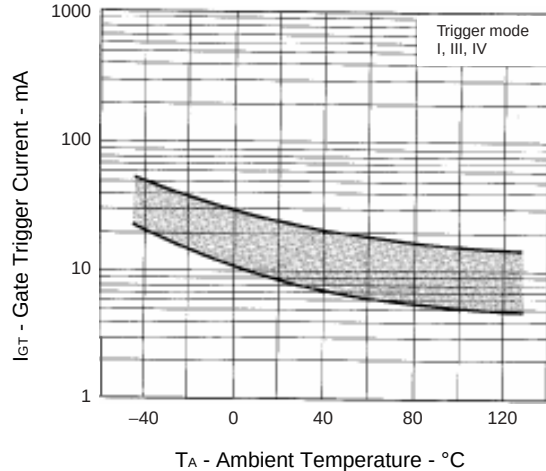


Figure 6. V_{GT} vs. T_A CHARACTERISTIC

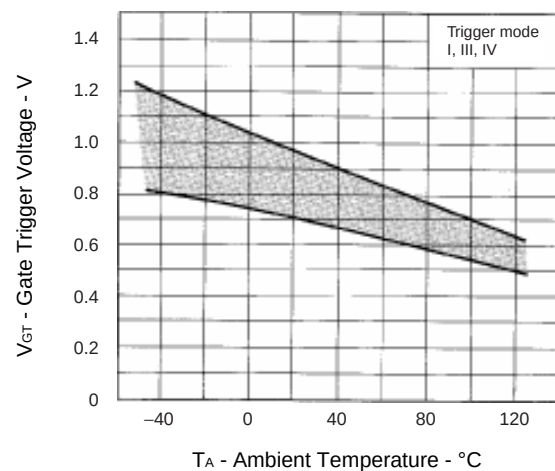


Figure 7. i_{GT} vs. τ CHARACTERISTIC

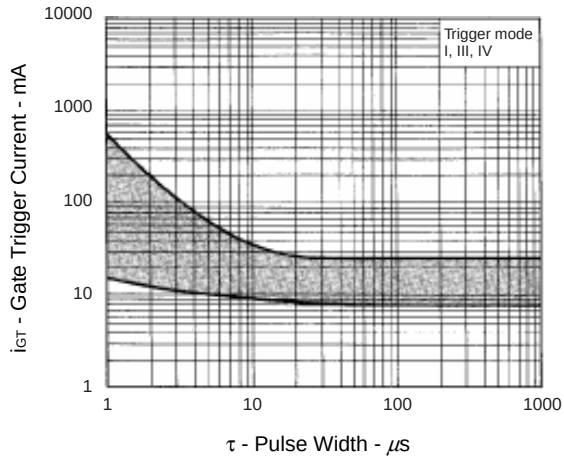


Figure 8. v_{GT} vs. τ CHARACTERISTIC

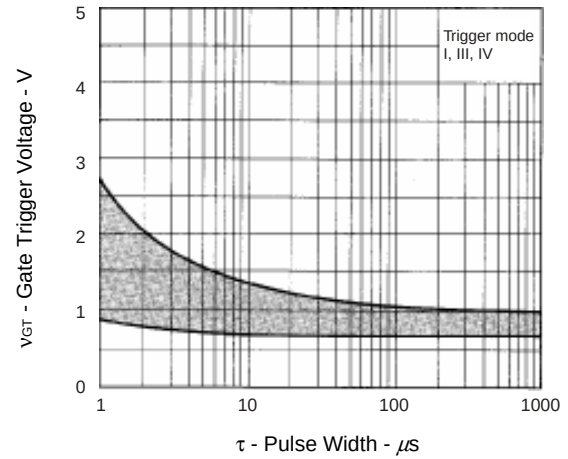


Figure 9. I_H vs. T_A CHARACTERISTIC

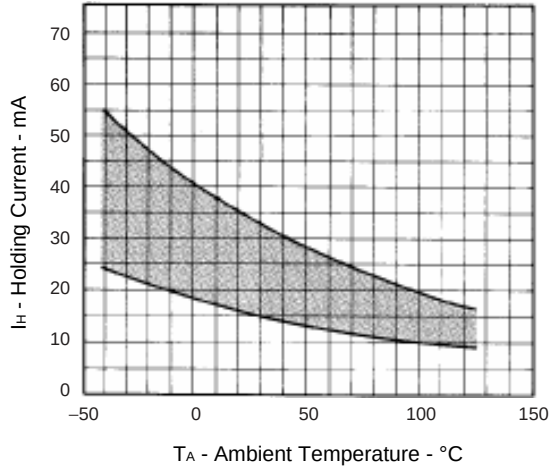


Figure 10. $P_{T(AV)}$ vs. $I_{T(RMS)}$ CHARACTERISTIC

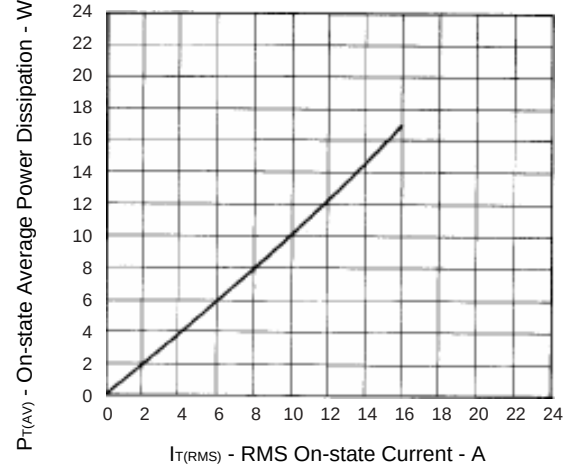


Figure 11. T_C vs. $I_{T(RMS)}$ RATING

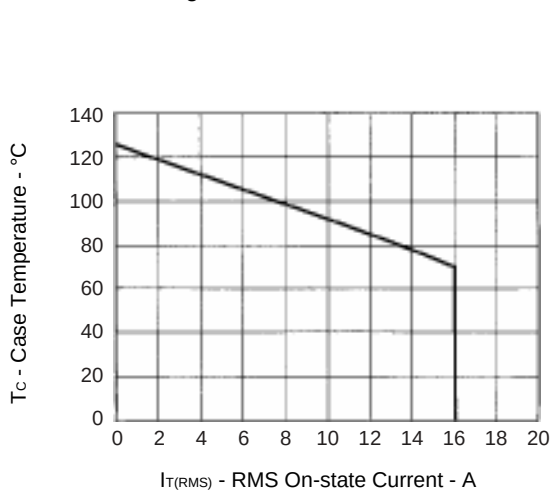


Figure 12. T_A vs. $I_{T(RMS)}$ RATING

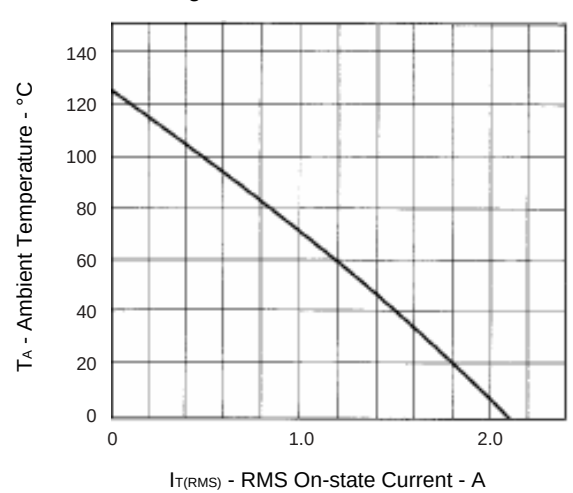
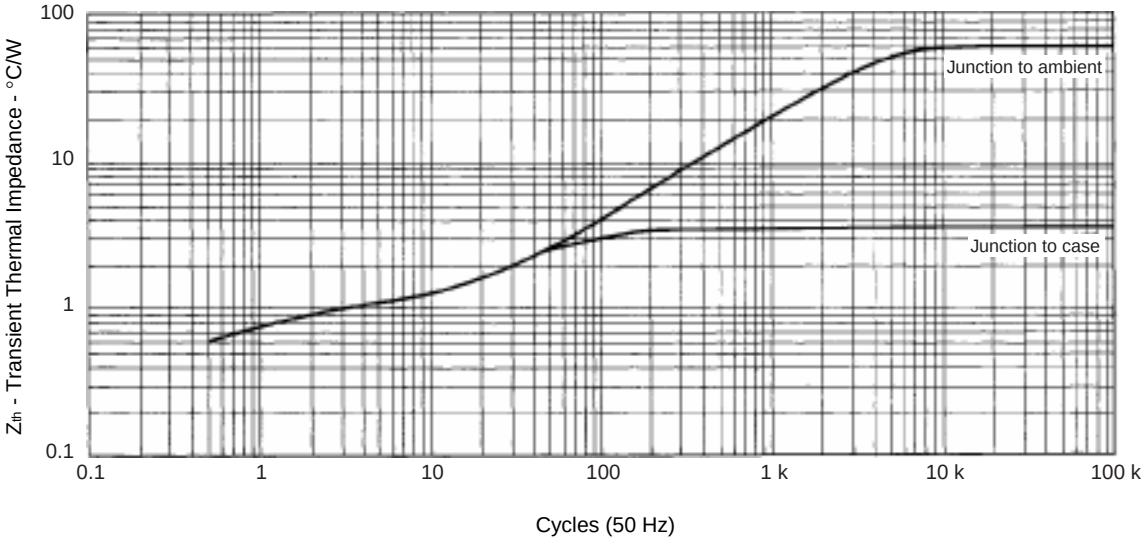


Figure 13. Z_{th} CHARACTERISTIC



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