

## 1 A POWER MINI MOLD TRIAC

## DESCRIPTION

The AC01DJM is all diffused type TRIAC granted RMS On-state Current 1 Amps, with rated voltages up to 400 volts.

This is designed specifically to be driven by low-level logic in any gating mode.

## FEATURES

- The AC01DJM offers sensitive gate specs of 5 and 10 mA, in all for quadrants.
- You can fill the gap between microprocessor controls and the power-output requirements.
- This is housed in the popular SOT-89 package.
- The package features excellent environmental stress and temperature cycling.

## QUALITY GRADE

Standard

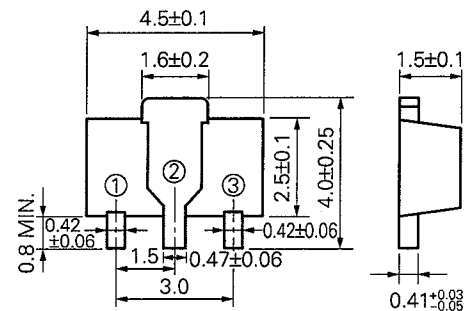
Please refer to "Quality grade on NEC Semiconductor Devices" (Document number IEI-1209) published by NEC Corporation to know the specification of quality grade on the devices and its recommended applications.

## APPLICATIONS

Solid-state relays, microprocessor interfacing, TTL logic and various solid-state switch designs alone or with larger TRIAC.

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

CHARACTERISTIC	SYMBOL	MAXIMUM RATINGS	UNIT	NOTE
Repetitive Peak Off Voltage	$V_{DRM}$	400	V	
Non-repetitive Peak Off Voltage	$V_{DSM}$	500	V	
RMS On-State Current	$I_{T(RMS)}$	1 ( $T_c = 113\text{ }^\circ\text{C}$ )	A	See Fig. 12
Peak Surge On-State Current	$I_{TSM}$	7 (50 Hz), 8 (60 Hz)	A	See Fig. 2
Fusing Current	$\int i^2 dt$	0.2 ( $1\text{ ms} \leq t \leq 10\text{ ms}$ )	$\text{A}^2\text{s}$	
Peak Gate Power Dissipation	$P_{GM}$	1 ( $f \geq 50\text{ Hz}$ , Duty $\leq 10\%$ )	W	
Average Gate Power Dissipation	$P_{G(AV)}$	0.1	W	
Peak Gate Current	$I_{GM}$	$\pm 0.5$ ( $f \geq 50\text{ Hz}$ , Duty $\leq 10\%$ )	A	
Junction Temperature	$T_j$	125	$^\circ\text{C}$	
Storage Temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$	

PACKAGE DIMENSIONS  
(in millimeters)

## Pin Connections

1.  $T_1$  Terminal
2.  $T_2$  Terminal
3. Gate

\* Measure point of Case Temperature

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

CHARACTERISTIC		SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT	NOTE	
Peak Off-State Current		I <sub>DRM</sub>	V <sub>DM</sub> = V <sub>DRM</sub>	T <sub>j</sub> = 25 °C	-	-	10	μA	
				T <sub>j</sub> = 125 °C	-	-	100		
On-State Voltage		V <sub>TM</sub>	I <sub>TM</sub> = 1.2 A	-	-	1.5	V	See Fig. 1	
DC Gate Trigger Current	MODE I	I <sub>GT</sub>	V <sub>DM</sub> = 12 V R <sub>L</sub> = 100 Ω	G; Positive, T <sub>2</sub> ; Positive	-	-	5	mA	See Fig. 5, 7
	II			G; Negative, T <sub>2</sub> ; Positive	-	-	10		
	III			G; Negative, T <sub>2</sub> ; Negative	-	-	5		
	IV			G; Positive, T <sub>2</sub> ; Negative	-	-	5		
DC Gate Trigger Voltage	MODE I	V <sub>GT</sub>	V <sub>DM</sub> = 12 V R <sub>L</sub> = 100 Ω	G; Positive, T <sub>2</sub> ; Positive	-	-	1.0	V	See Fig. 6, 8
	II			G; Negative, T <sub>2</sub> ; Positive	-	-	1.5		
	III			G; Negative, T <sub>2</sub> ; Negative	-	-	1.0		
	IV			G; Positive, T <sub>2</sub> ; Negative	-	-	1.0		
Gate Non-Trigger Voltage		V <sub>GD</sub>	T <sub>j</sub> = 125 °C, V <sub>DM</sub> = 1/2 V <sub>DRM</sub>	0.1	-	-	V		
DC Holding Current		I <sub>H</sub>	V <sub>D</sub> = 24 V, I <sub>TM</sub> = 1 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> Gate Open Circuited Exponential Waveform	-	10	-	V/μs		
Critical Rate of Rise of Commutating Off-State Voltage		(dv/dt) <sub>c</sub>	T <sub>j</sub> = 125 °C, I <sub>TM</sub> = 1.2 A (di <sub>T</sub> /dt) <sub>c</sub> = -0.5 A/ms V <sub>DM</sub> = 400 V	0.5	-	-	V/μs		
Steady State		R <sub>th(j-c)</sub>	Junction to Case	-	-	10	°C/W	See Fig. 13	
Thermal Resistance		R <sub>th(j-a)</sub>	Junction to Ambient	-	-	120	°C/W		

**TYPICAL CHARACTERISTICS (T<sub>a</sub> = 25 °C)**

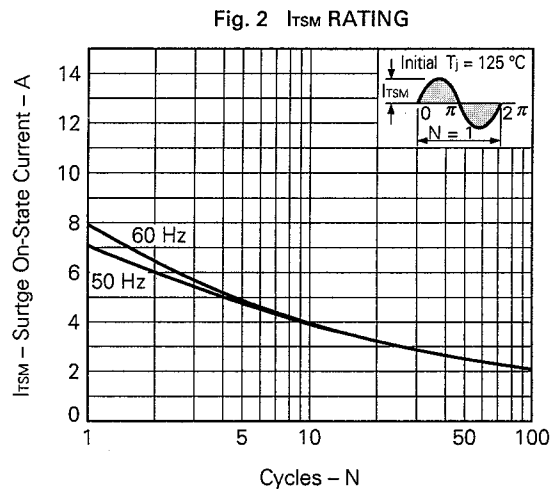
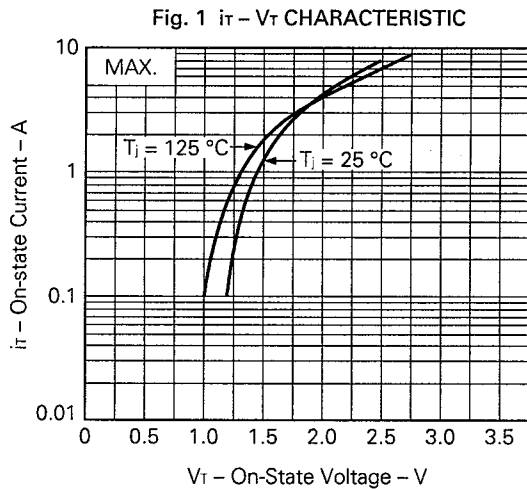


Fig. 3  $V_G - I_G$  RATING

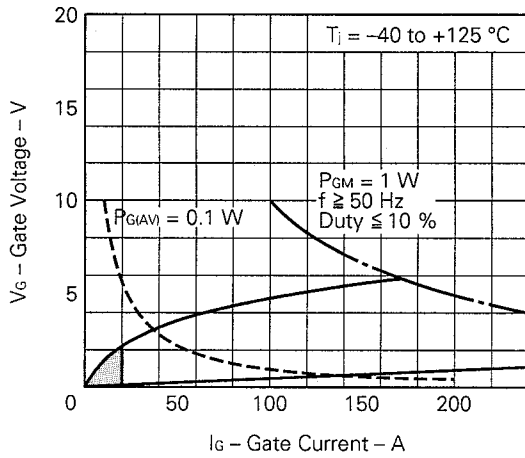


Fig. 4 GATE CHARACTERISTIC

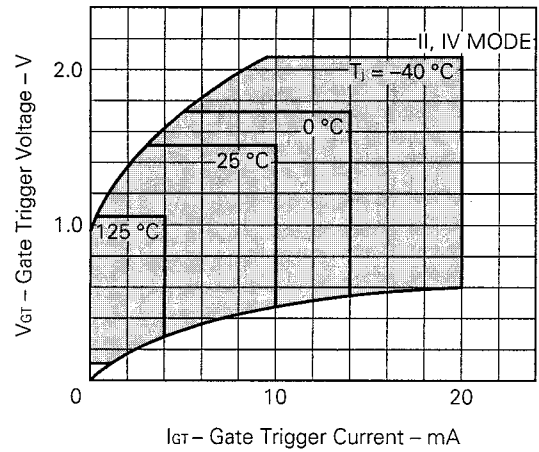


Fig. 5 GATE CHARACTERISTIC

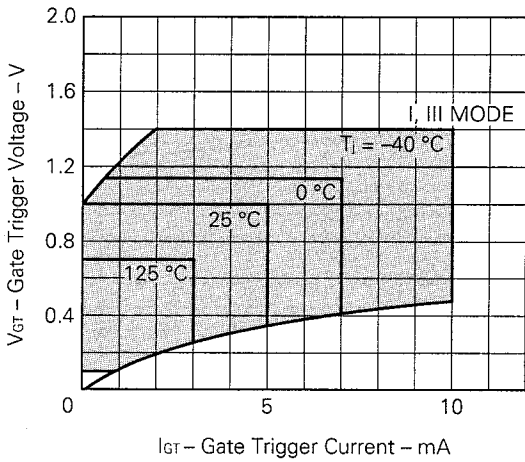


Fig. 6  $I_{GT} - T_a$  TYPICAL DISTRIBUTION

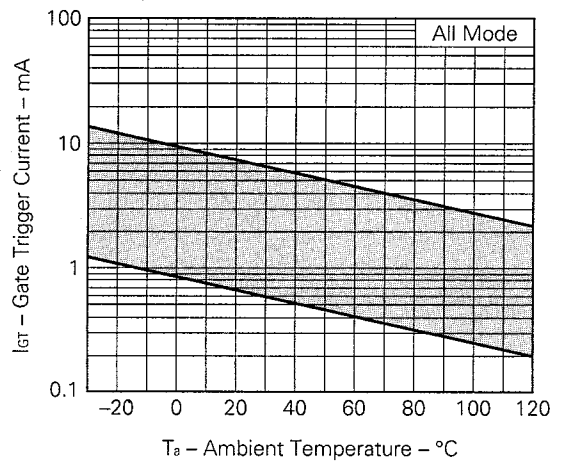


Fig. 7  $V_{GT} - T_a$  TYPICAL DISTRIBUTION

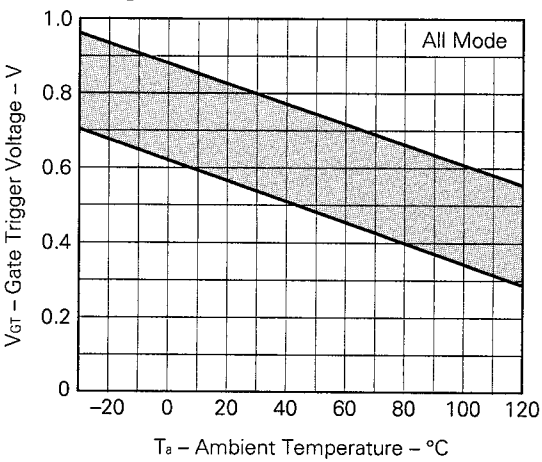


Fig. 8  $i_{GT} - \tau$  TYPICAL DISTRIBUTION

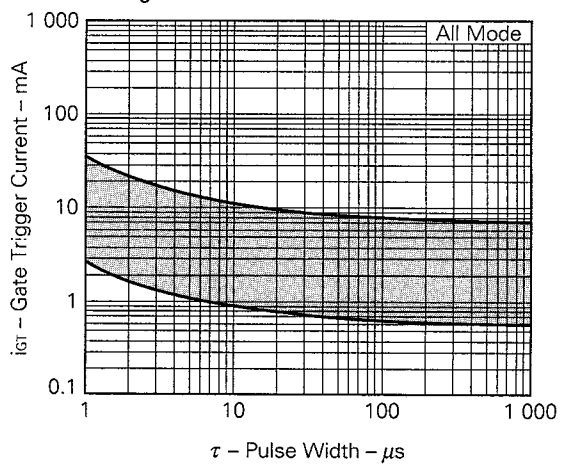


Fig. 9  $v_{GT} - \tau$  TYPICAL DISTRIBUTION

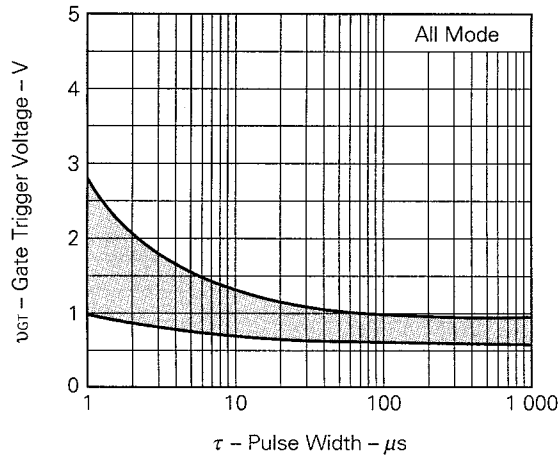


Fig. 10  $I_H - T_a$  TYPICAL DISTRIBUTION

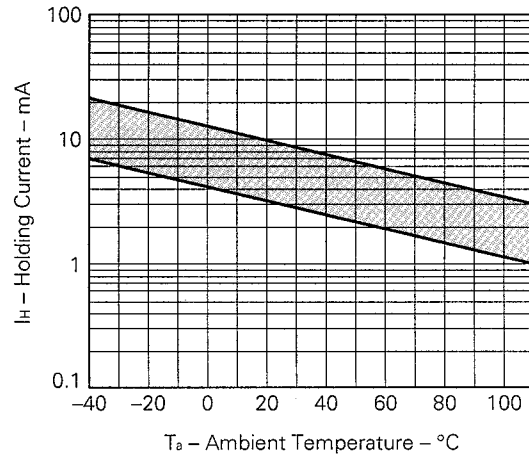


Fig. 11  $P_{T(AV)} - I_{T(RMS)}$  CHARACTERISTIC

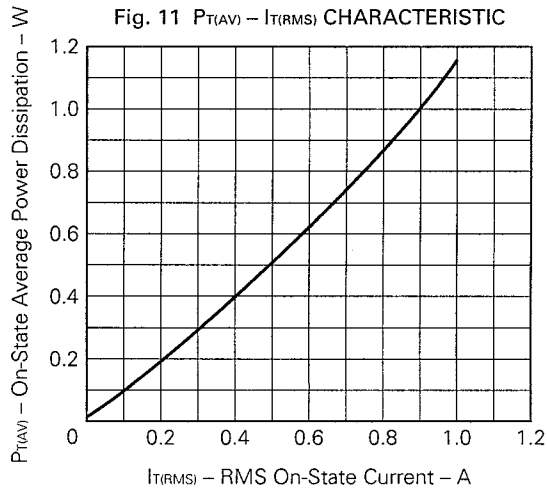


Fig. 12  $T_c - I_{T(RMS)}$  RATING

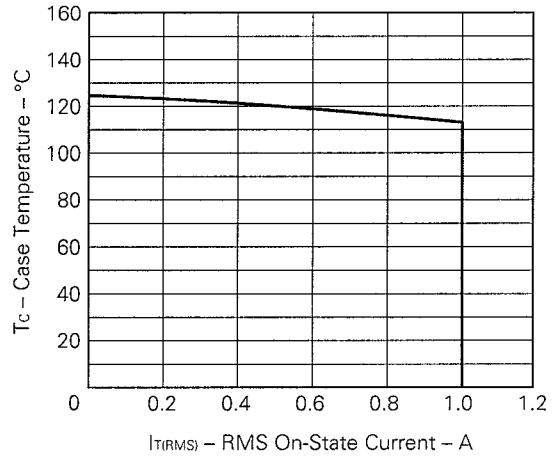


Fig. 13  $T_a - I_{T(RMS)}$  RATING

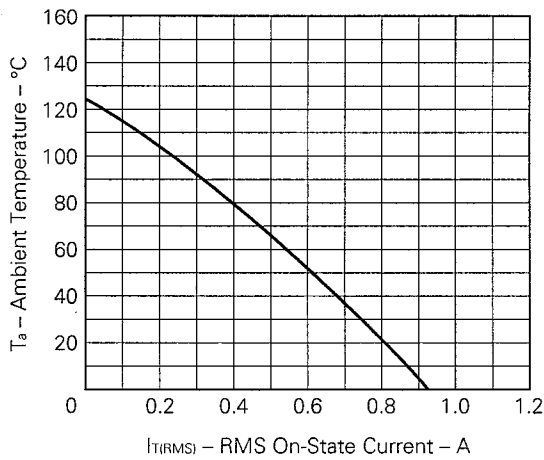
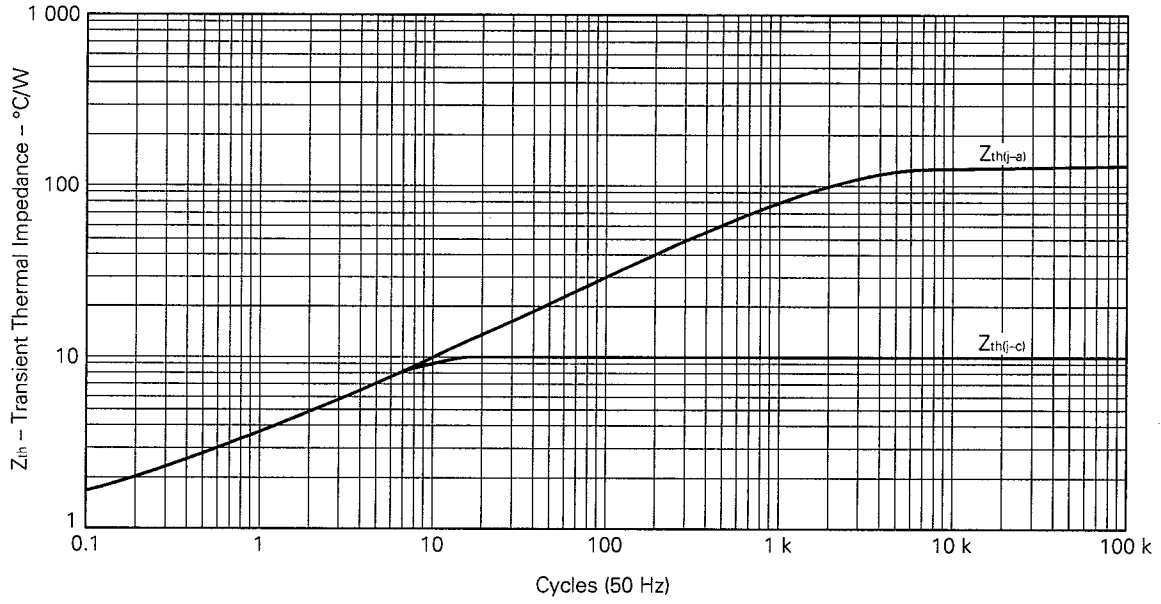


Fig. 14  $Z_{th}$  CHARACTERISTIC



REFERENCE

Document name	Document No.
Quality control guide of semiconductor devices	MEI-1202
Assembly manual of semiconductor devices	IEI-1207

[MEMO]

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