

File Number 1042

T2320, T2322, T2323, T2327 Series

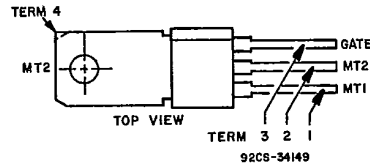
### 2.5-A Sensitive-Gate Silicon Triacs

For AC Power Switching

**Features:**

- 800V, 125 Deg. C  $T_J$  Operating
- High  $dv/dt$  and  $di/dt$  Capability
- Low Switching Losses
- High Pulse Current Capability
- Low Forward and Reverse Leakage
- Sipos Oxide Glass Multilayer Passivation System
- Advanced Unisurface Construction
- Precise Ion Implanted Diffusion Source

**TERMINAL DESIGNATIONS**



**JEDEC TO-202AB**

The RCA-T2320, T2322, T2323 and T2327, series triacs are gate-controlled full-wave silicon ac switches that are designed to switch from an off-state to an on-state for either polarity of applied voltage with positive or negative gate triggering voltages. The gate sensitivity of these triacs permits the use of economical transistorized or integrated cir-

cuit control circuits and enhances their use in low-power phase-control and load-switching applications.

All types in each series utilize the JEDEC-TO-202AB (VER-SATAB) plastic package.

**MAXIMUM RATINGS, Absolute-Maximum Values:**

	3mA Gate	T2320A	T2320B	T2320D	T2320E	T2320M	T2320N	
10 mA Gate	T2322A	T2322B	T2322D	T2322E	T2322M	T2322N		
25 mA Gate	T2323A	T2323B	T2323D	T2323E	T2323M	T2323N		
5 mA Gate	T2327A	T2327B	T2327D	T2327E	T2327M	T2327N		
$V_{DROM}^{\Delta}$ (Gate Open, $T_J = -40$ to $125^{\circ}C$ )	100	200	400	500	600	800		
$I_{T(RMS)}$ ( $T_C = 95^{\circ}C$ )				2.5				A
$I_{T(RMS)}$ ( $T_A = 25^{\circ}C$ )				1				A
$I_{TSM}$ (for 1 full cycle)				25				A
$di/dt$				100				A/ $\mu s$
$I^2t$ [At $T_C$ shown for $I_{T(RMS)}$ ] (Half-sine wave):								
$t = 20$ ms				3.4				A <sup>2</sup> s
$= 2.5$ ms				1.7				A <sup>2</sup> s
$= 0.5$ ms				1				A <sup>2</sup> s
For other time values				See Fig. 5				
$I_{GTM}^{\circ}$ (For 1 $\mu s$ max.)				1				A
$P_{GM}$ (for 1 $\mu s$ max.)				10				W
$P_{G(AV)}$ (Averaging time 10ms max.)				0.1				W
T Storage				-40 to 150				$^{\circ}C$
$T_J$				-40 to 125				$^{\circ}C$
$T_c^{\square}$ :								
During soldering for 10 s maximum at distance $\geq 1/16$ in. (1.58 mm) from seating plane				225				$^{\circ}C$

$\Delta$ For either polarity of main terminal 2 voltage ( $V_{MT2}$ ) with reference to main terminal 1.  
 $\circ$ For either polarity of gate voltage ( $V_G$ ) with reference to main terminal 1.  
 $\square$ For temperature measurement reference point, see *Dimensional Outlines*.

Triacs

**T2320, T2322, T2323, T2327 Series**

**ELECTRICAL CHARACTERISTICS**

At Maximum Ratings Unless Otherwise Specified, and at Indicated Case Temperature ( $T_C$ )

CHARACTERISTIC	LIMITS			UNITS
	For All Types Except as Specified			
	Min.	Typ.	Max.	
$I_{DROM} \blacktriangle$ : Gate open, $T_J = 125^\circ C$ , $V_{DROM} = \text{Max. rated value}$ .....	—	0.2	0.75	mA
$V_{TM} \blacktriangle$ : $i_T = 10 \text{ A (peak)}$ , $T_C = 25^\circ C$ T2322, T2322, T2327 series $i_T = 10 \text{ A (peak)}$ , $T_C = 25^\circ C$ T2323 series	—	1.7	2.2 2.6	V
$I_{HO} \blacktriangle$ : Gate open, Initial principal current = 150 mA (dc), $V_D = 12 \text{ V}$ , $T_C = 25^\circ C$ .....	—	15	30	mA
$dv/dt$ (Commutating) $\blacktriangle$ : $V_D = V_{DROM}$ , $I_{T(RMS)} = 2.5 \text{ A}$ , commutating $di/dt = 1.33 \text{ A/ms}$ , gate unenergized, $T_C = 95^\circ C$ .....	1	4	—	V/ $\mu s$
$dv/dt$ (Off-state) $\blacktriangle$ : $V_D = V_{DROM}$ , exponential voltage rise, gate open, $T_C = 125^\circ C$ .....	10	100	—	
$I_{GT} \blacktriangle \bullet$ : $V_D = 12 \text{ V dc}$ , $R_L = 30 \Omega$ , $T_C = 25^\circ C$ (See Fig. 7)				mA
Mode $V_{MT2}$ $V_G$				
I+ positive positive	—	—	3	
T2320 series	—	—	10	
T2322 series	—	—	25	
T2323 series	—	—	5	
T2327 series	—	—	5	
III- negative negative	—	—	3	
T2320 series	—	—	10	
T2322 series	—	—	25	
T2323 series	—	—	5	
T2327 series	—	—	5	
I- positive negative	—	—	3	
T2320 series	—	—	10	
T2322 series	—	—	40	
T2323 series	—	—	5	
T2327 series	—	—	5	
III+ negative positive	—	—	3	
T2320 series	—	—	10	
T2322 series	—	—	40	
T2323 series	—	—	5	
T2327 series	—	—	5	
$V_{GT} \blacktriangle \bullet$ : $V_D = 12 \text{ V dc}$ , $R_L = 30 \Omega$ , $T_C = 25^\circ C$ $V_D = V_{DROM}$ , $R_L = 125 \Omega$ , $T_C = 125^\circ C$ (See Fig. 8)	— 0.15	1	2.2	V
$t_{gt}$ : $V_D = V_{DROM}$ , $I_G = 60 \text{ mA}$ , $t_r = 0.1 \mu s$ , $i_T = 10 \text{ A (peak)}$ , $T_C = 25^\circ C$ .....	—	1.8	2.5	$\mu s$
$R_{\theta JC}$ $R_{\theta JA}$	—	—	8 80	$^\circ C/W$

$\blacktriangle$  For either polarity of main terminal 2 voltage ( $V_{MT2}$ ) with reference to main terminal 1.  
 $\bullet$  For either polarity of gate voltage ( $V_G$ ) with reference to main terminal 1.

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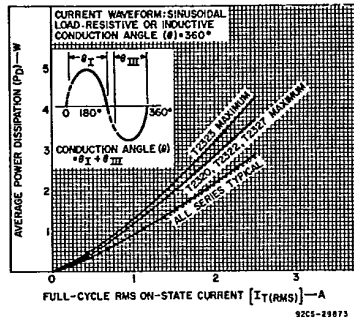


Fig. 1 — Power dissipation as a function of on-state current.

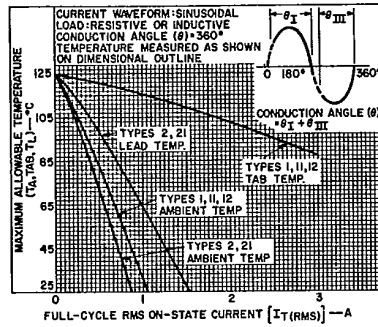


Fig. 2 — Maximum allowable temperature as a function of on-state current for T2320, T2322, and T2327.

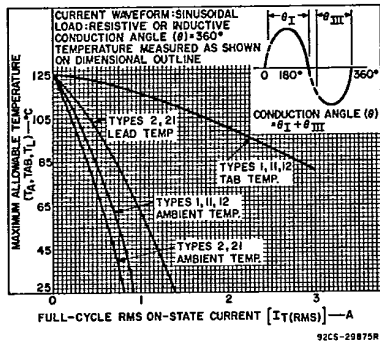


Fig. 3 — Maximum allowable temperature as a function of on-state current for T2323.

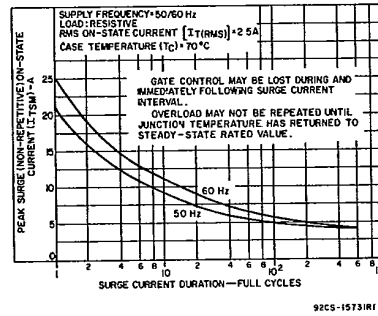


Fig. 4 — Peak surge on-state current as a function of surge-current duration.

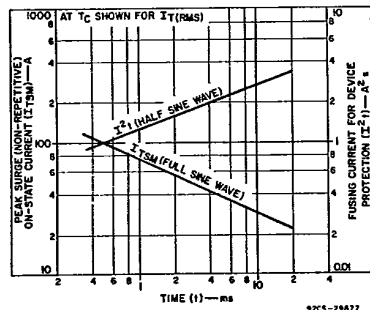


Fig. 5 — Peak surge on-state current and fusing current as a function of time.

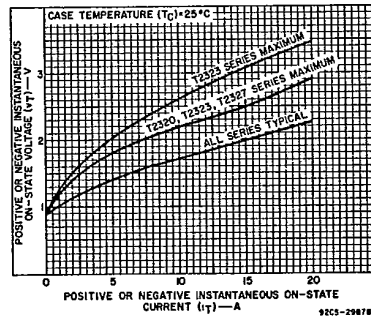


Fig. 6 — On-state current vs. on-state voltage.

Triacs

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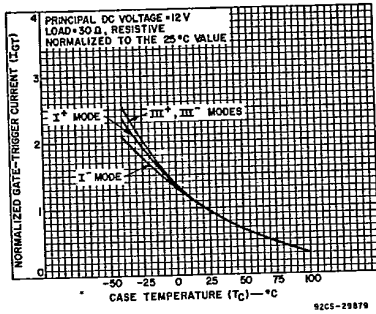


Fig. 7 — Gate-trigger current vs. case temperature.

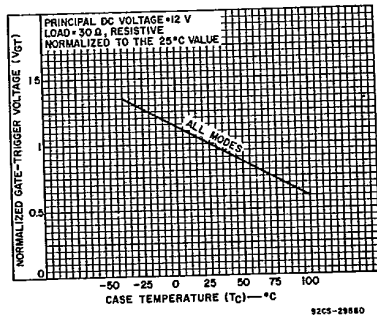


Fig. 8 — Gate-trigger voltage vs. case temperature.

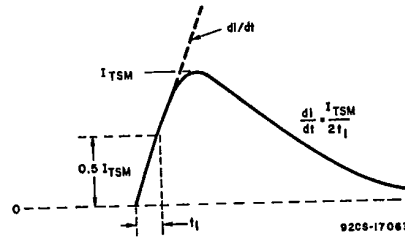
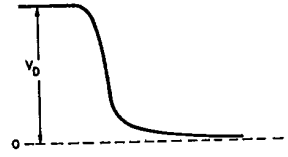


Fig. 9 — Rate-of-change of on-state current with time (defining di/dt).

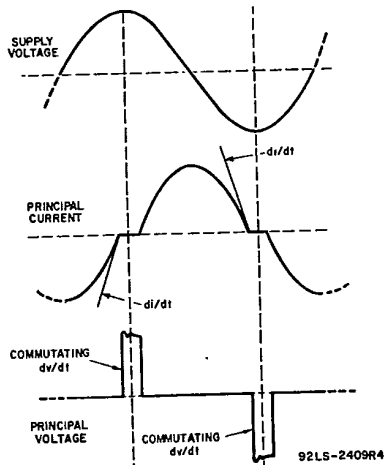


Fig. 10 — Relationship between supply voltage and principal current (inductive load) showing reference points for definition of commutating voltage (dv/dt).

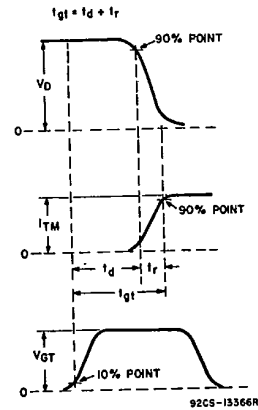


Fig. 11 — Relationship between off-state voltage, on-state current, and gate-trigger voltage showing reference points for definition of turn-on time (t<sub>gt</sub>).

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