File Number **1084**

2N6342A-2N6349A Series

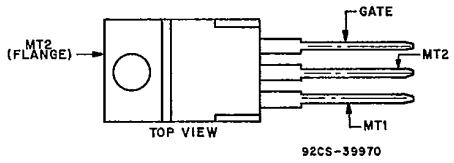
12-A Silicon Triacs

For Power Control and Power-Switching Applications

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-220AB

The 2N6342A–2N6349A series triacs are gate-controlled full-wave silicon switches utilizing a plastic case with three leads to facilitate mounting on printed-circuit boards. They are intended for the control of ac loads in such applications as motor controls, light dimmers, heating controls, and power-switching systems.

These devices 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. They have an on-state current rating of 12 amperes at a T_C of 80°C and repetitive off-state voltage ratings of 200, 400, 600, and 800 volts. The plastic package design provides not only ease of mounting but also low thermal impedance, which allows operation at high case temperatures and permits reduced heat-sink size.

MAXIMUM RATINGS, *Absolute-Maximum Values:*

	2N6342A 2N6346A	2N6343A 2N6347A	2N6344A 2N6348A	2N6345A 2N6349A	
*V_{DROM}● T_J = -40 to 110°C	200	400	600	800	V
$I_{T(RMS)}$ T_C = 80°C, θ 360°	12				A
For other conditions	See Figs. 5				
I_{TSM}					
For one cycle of applied principal voltage					
* 60 Hz (sinusoidal), T_C = 80°C	120				A
50 Hz (sinusoidal), T_C = 80°C	113				A
For more than one cycle of applied principal voltage	See Fig. 6				
di/dt					
$v_D = V_{DROM}$, I_{GT} = 200 mA, t_r = 0.1 μs	100				A/μs
I^2t [At T_C shown for $I_{T(RMS)}$, half-sine wave]:					
t = 10 ms	64				A^2s
= 2.5 ms	40				A^2s
= 0.5 ms	23				A^2s
* = 1 to 8.3 ms	40				A^2s
*I_{GTM}■					
For 1 μs max.	4				A
*P_{GM} (For 1 μs max., $I_{GTM} \leq 4$ A	20				W
*$P_{G(AV)}$	0.5				W
*T_{stg}	-40 to 150				°C
*T_C	-40 to 110				°C
*T_T During soldering for 10 s max.	230				°C

*In accordance with JEDEC registration data format JC-22 RDF-2.
●For either polarity to main terminal 2 voltage (V_{MT2}) with reference to main terminal 1.
■For either polarity to gate voltge (V_G) with reference to main terminal 1.

2N6342A-2N6349A Series

ELECTRICAL CHARACTERISTICS
At Maximum Ratings Unless Otherwise Specified, and at Indicated Temperatures

	CHARACTERISTIC	LIMITS For All Types Except as Specified Min.	Typ.	Max.	UNITS
*	I_{DROM}● T_J = 110°C, V_{DROM} = Max, rated value	—	—	2	mA
*	v_{TM}● i_T = 17A (peak), T_C = 25°C	—	1.3	1.75	V
	I_{HO}● Gate open, Initial principal current = 200 mA				
	v_D = 12V, T_C = 25°C	—	6	40	mA
*	= -40°C	—	—	75	
	dv/dt● (Commutating) $v_D = V_{DROM}$, I_{TM} = 17A, di/dt = 6.5A/ms. T_C = 80°C	—	5	—	V/μs
	dv/dt● (Off-State) $v_D = V_{DROM}$, T_C = 100°C				
	2N6342A, 2N6346A	100	300	—	
	2N6343A, 2N6347A	75	250	—	
	2N6344A, 2N6348A	60	200	—	
	2N6345A, 2N6349A	30	70	—	
	I_{GT}●■ v_D = 12V (dc), R_L = 100 Ω				
	Mode V_{MT2} V_G	—			
	1+ + +	—	6	50	
	T_C = 25°C 111- - -	—	10	50	
	1- + - (2N6346A-49A only)	—	6	75	
	111+ - + (2N6346A-49A only)	—	25	75	mA
*	1+ + +	—	—	100	
*	T_C = -40°C 111- - -	—	—	100	
*	1- + - (2N6346A-49A only)	—	—	125	
*	111+ - + (2N6346A-49A only)	—	—	125	
	V_{GT}●■ v_D = 12V (dc), R_L = 100 Ω				
	Mode V_{MT2} V_G	—			
	1+ + +	—	0.9	2	
	T_C = 25°C 111- - -	—	1.1	2	
	1- + - (2N6346A-48A only)	—	0.9	2.5	
	111+ - + (2N6346A-48A only)	—	1.4	2.5	
*	1+ + +	—	—	2.5	
*	T_C = -40°C 111- - -	—	—	2.5	
*	1- + - (2N6346A-49A only)	—	—	3	V
*	111+ - + (2N6346A-49A only)	—	—	3	
	$v_D = V_{DROM}$, R_L = 10 KΩ				
	1+ + +	0.2	—	—	
	T_J = 110°C 111- - -	0.2	—	—	
	1- + - (2N6346A-49A only)	0.2	—	—	
	111+ 1- + (2N6346A-49A only)	0.2	—	—	
*	t_{gt} $V_D = V_{DROM}$, I_{GT} = 120mA, t_r = 0.1 μs, i_T = 17A (peak), T_C = 25°C	—	1.5	2	μs
*	$R_{\theta JC}$	—	—	2	°C/W

*In accordance with JEDEC registration data format JC-22 RDF2.
●For either polarity of main terminal 2 voltage (V_{MT2}) with reference to main terminal 1.
■For either polarity of gate voltage (V_G) with reference to main terminal 1.

2N6342A-2N6349A Series

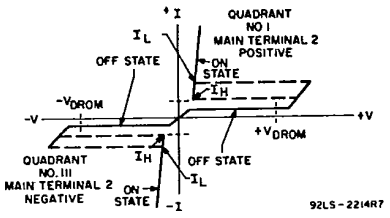


Fig. 1 — Principal voltage-current characteristic.

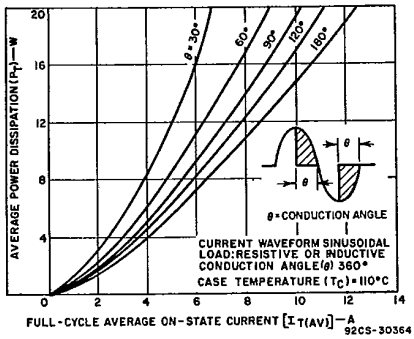


Fig. 2 — Power dissipation as a function of average on-state current.

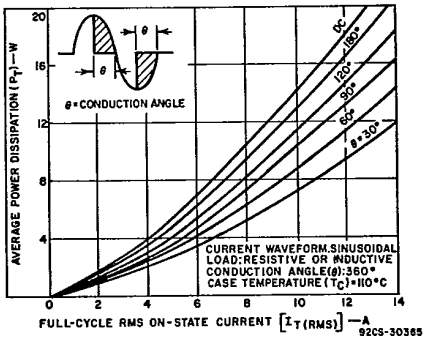


Fig. 3 — Power dissipation as a function of rms on-state current.

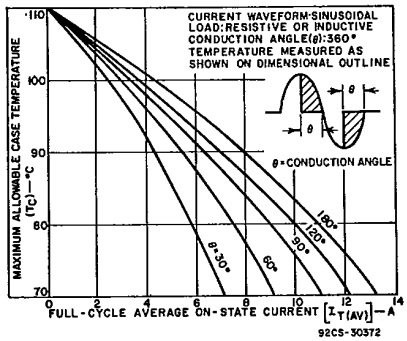


Fig. 4 — Maximum allowable case-temperature as a function of average on-state current.

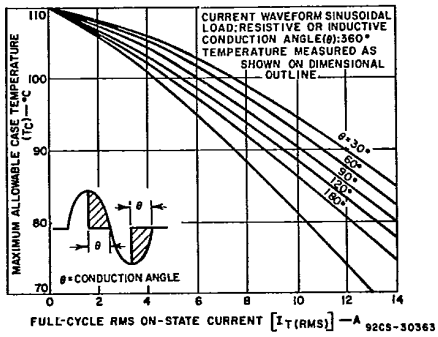


Fig. 5 — Maximum allowable case-temperature as a function of rms on-state current.

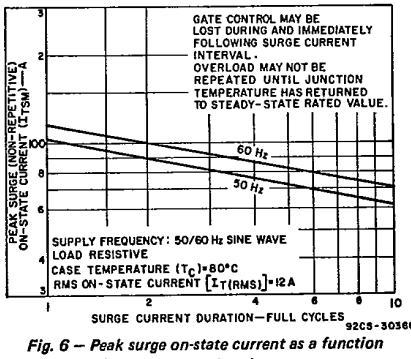


Fig. 6 — Peak surge on-state current as a function of surge current duration.

2N6342A-2N6349A Series

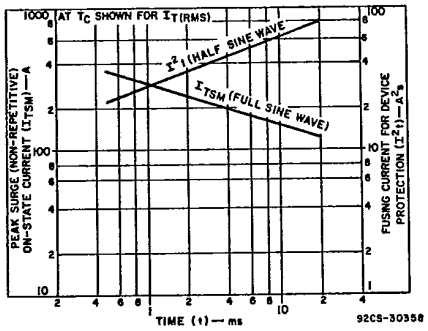


Fig. 7 — Peak surge on-state current and fusing current as a function of time.

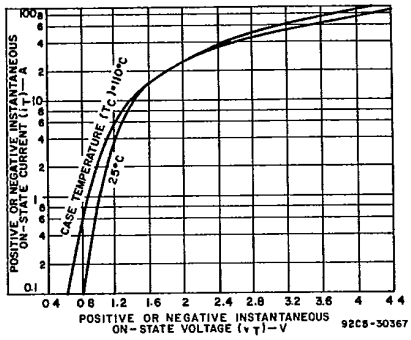


Fig. 8 — On-state current as a function of on-state voltage.

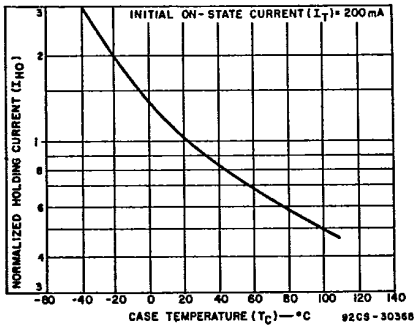


Fig. 9 — Normalized holding current as a function of case temperature.

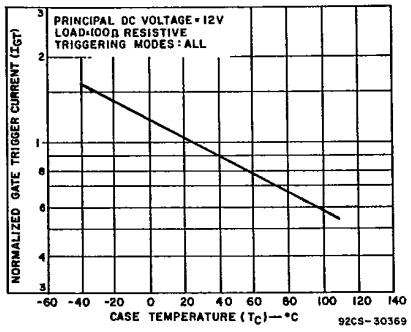


Fig. 10 — Normalized gate trigger current as a function of case temperature.

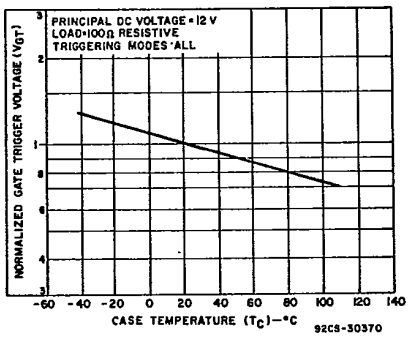


Fig. 11 — Normalized gate trigger voltage as a function of case temperature.

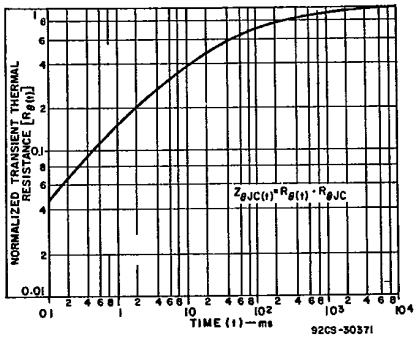


Fig. 12 — Normalized transient thermal resistance as a function of time.

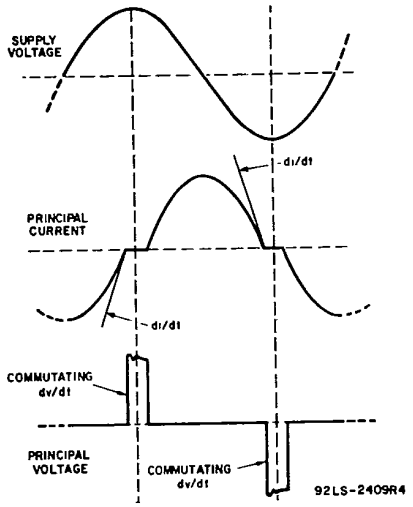


Fig. 13 — Relationship between supply voltage and principal current (inductive load) showing reference points for definition of commutating voltage (dv/dt).

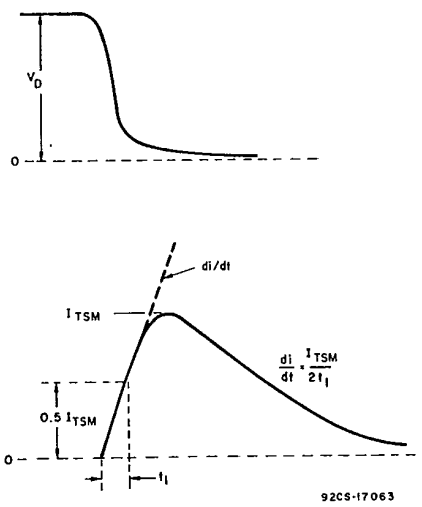


Fig. 14 — Rate-of-change of on-state current with time (defining di/dt).

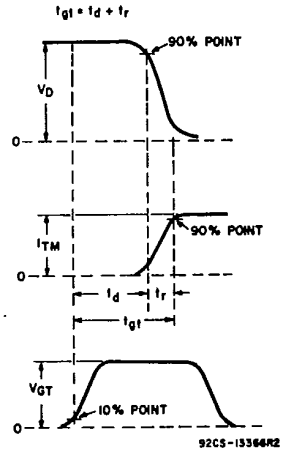


Fig. 15 — Relationship between off-state voltage, on-state current, and gate-trigger voltage showing reference points for definition of turn-on time (t_{gt}).