

T2700 Series

File Number **351**

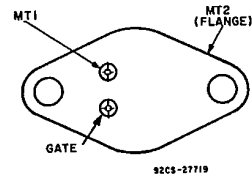
High Voltage, 6-A Silicon Triacs

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-213AA

RCA T2700-series devices are gate controlled full-wave silicon triacs. They are intended for the control of ac loads in applications such as heating controls, motor controls, light dimmers, and power-switching systems.

These triacs are designed to switch from an off-state to an on-state condition for either polarity of applied voltage with

positive or negative triggering voltages to the gate.

The T2700B, D, M, and N are hermetically sealed types having an on-state current rating of 6 amperes at a case temperature of +75°C and repetitive off-state voltage ratings of 200, 400, 600, and 800 volts, respectively.

MAXIMUM RATINGS, Absolute-Maximum Values:

	T2700B	T2700D	T2700M	T2700N	
V_{DRM}	200	400	600	800	V
$I_{T(RMS)}$ ($T_C = 100^\circ\text{C}$)			6		A
I_{TSM} (for 1 full cycle) 60 Hz			100		A
di/dt			100		A/ μs
I^2T (at 1.25 to 10 ms)			50		A ² s
I_{GTM}			4		A
P_{GM} (for 1 μs max.)			16		W
$P_{G(AV)}$ (Averaging time 10ms max.)			0.2		W
T Storage▲			-65 to 150		°C
T_C			-65 to 125		°C
T_J (During soldering): For 10 s max. (terminals and case)			225		°C

*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.

▲For temperature measurement reference point, see *Dimensional Outline*.

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ELECTRICAL CHARACTERISTICS

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

CHARACTERISTIC	SYMBOL	LIMITS			UNITS
		For All Types Unless Otherwise Specified			
		Min.	Typ.	Max.	
Peak Off-State Current: [*] Gate open, T _J = 125°C, V _{DROM} = Max. rated value	I _{DROM}	—	0.1	4	mA
Maximum On-State Voltage: [*] For I _T = 30A (peak), T _C = 25°C	V _{TM}	—	1.8	2.25	V
DC Holding Current: [*] Gate open, Initial principal current = 150 mA (DC), v _D = 12V: T _C = 25°C For other case temperatures	I _{HO}	—	15 See Fig. 5	30	mA
Critical Rate-of-Rise of Commutation Voltage: [*] For V _D = V _{DROM} , I _{T(RMS)} = 6 A, Commutating di/dt = 3.2 A/ms, and gate unenergized At T _C = +100°C	dv/dt	3	10	—	V/μs
Critical Rate of Rise of Off-State Voltage: [*] For V _D = V _{DROM} , exponential voltage rise, and gate open At T _C = 125°C	dv/dt	30	150	—	V/μs
T2500B		20	100	—	
T2500D		15	70	—	
T2500M		10	50	—	
DC Gate-Trigger Current: ^{*†} For v _D = 12 volts (dc), R _L = 30 Ω, T _C = +25°C, and Specified Triggering Mode:	I _{GT}	—	15	25	mA
I ⁺ Mode: V _{MT2} positive, V _G positive		—	20	30	
III ⁻ Mode: V _{MT2} negative, V _G negative		—	25	40	
I ⁻ Mode: V _{MT2} positive, V _G negative		—	25	40	
III ⁺ Mode: V _{MT2} negative, V _G positive		See Figs. 7 & 8			
DC Gate-Trigger Voltage: ^{*†} For v _D = 12 V(DC), R _L = 30 Ω T _C = 25°C	V _{GT}	—	1	2.2	V
For other case temperatures		0.2	—	—	
Gate-Controlled Turn-On Time: (Delay Time + Rise Time) For v _D = V _{DROM} , I _G = 160 mA, t _r = 0.1 μs, I _T = 10 A (peak), T _C = 25°C (See Fig. 15)	t _{GI}	—	2.2	—	μs
Thermal Resistance: Junction-to-Case (Steady-State)	R _{θJA}	—	—	4	°C/W
Junction-to-Case (Transient)		See Fig. 10			

^{*}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.

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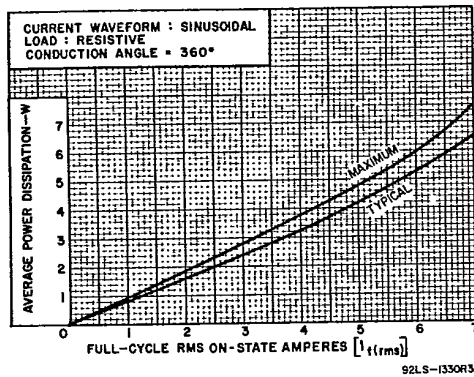


Fig. 1 — Power dissipation vs. on-state current.

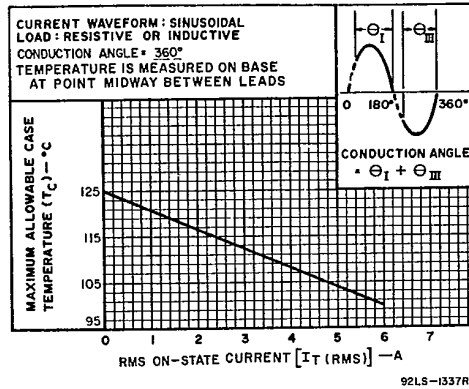


Fig. 2 — Allowable case temperature vs. on-state current.

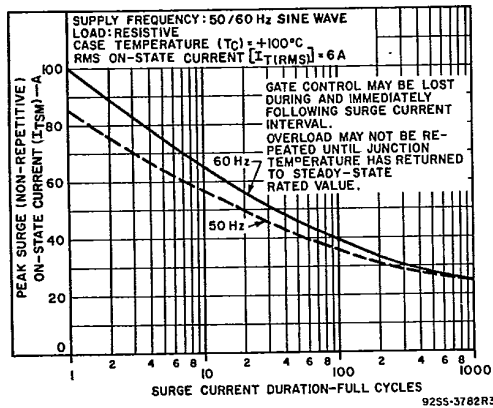


Fig. 3 — Peak surge on-state current vs. surge current duration.

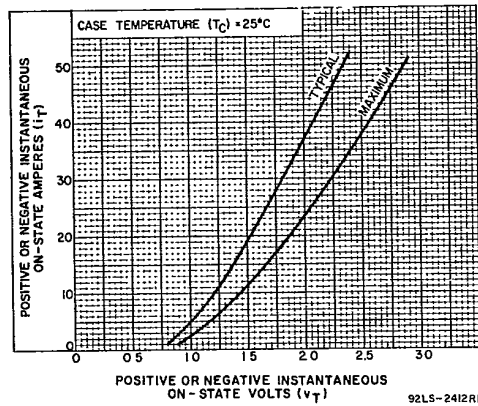


Fig. 4 — On-state current vs. on-state voltage.

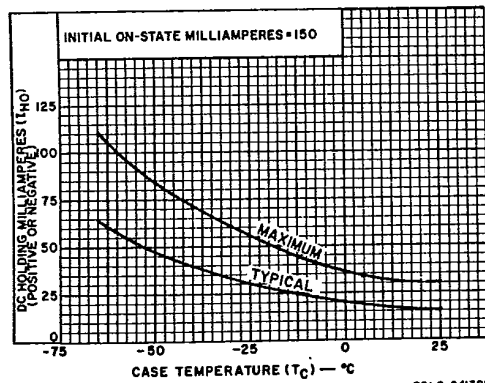


Fig. 5 — DC holding current for either direction of on-state current vs. case temperature.

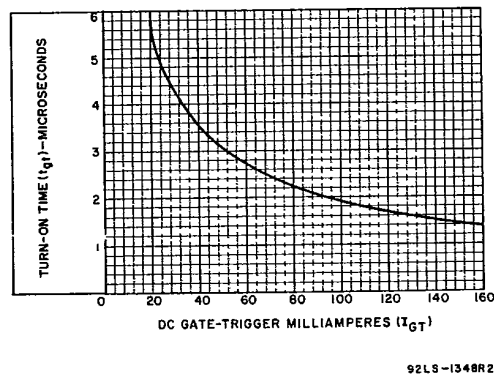


Fig. 6 — Typical turn-on time vs. gate-trigger current.

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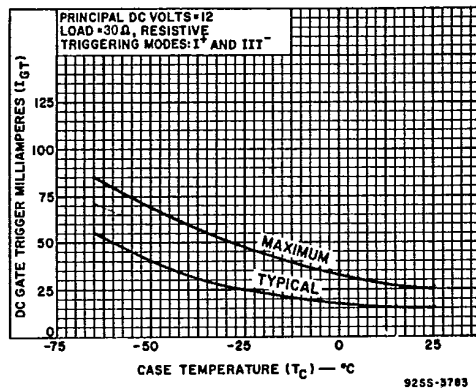


Fig. 7 — DC gate-trigger current (for I⁺ and III⁻ triggering modes) vs. case temperature.

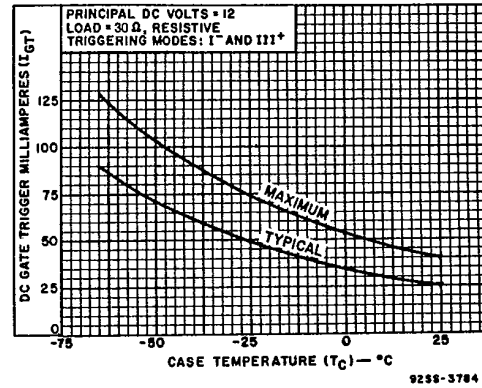


Fig. 8 — DC gate-trigger current (for I⁻ and III⁺ triggering modes) vs. case temperature.

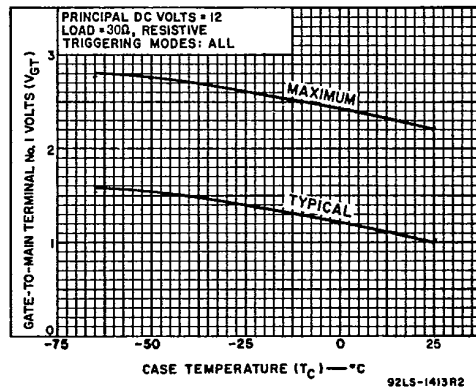


Fig. 9 — DC gate-trigger voltage vs. case temperature.

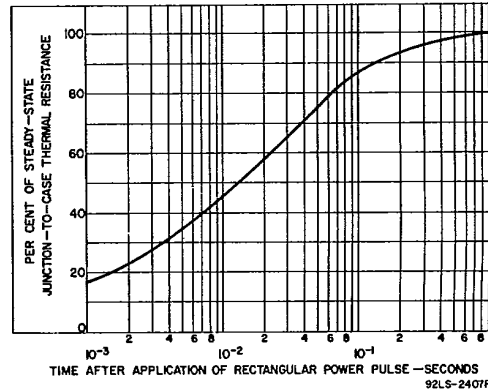


Fig. 10 — Transient thermal resistance (junction-to-case vs. time).

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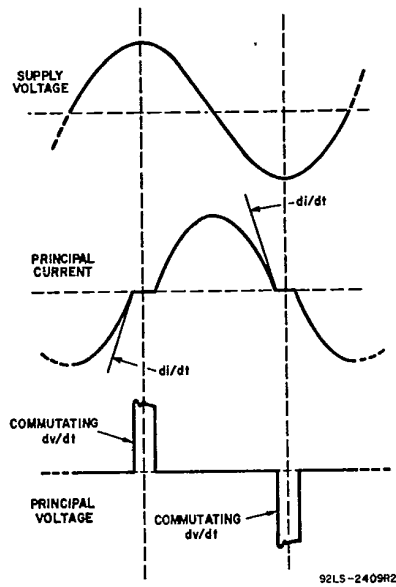


Fig. 11 — Oscilloscope display of commutating dv/dt .

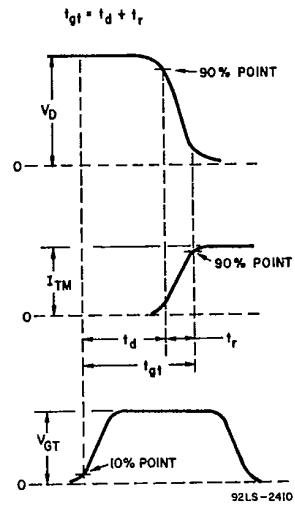


Fig. 12 — Oscilloscope display for measurement of gate-controlled turn-on time (t_{gt}).