S2800 Series

File Number **890**

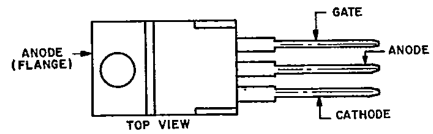
10-A Silicon Controlled Rectifiers

For Power Switching, Power Control

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 S2800 series are high voltage, medium current silicon controlled rectifiers designed for switching AC and DC currents. The types within the series differ in their voltage ratings: the voltage ratings are identified by suffix letters in the type designations.

All types utilize the JEDEC TO-220AB package.

These Thyristors feature an advanced unisurface construction with a multilayer glass passavation system for improved reliability performance at high junction operating temperatures. Their dv/dt, di/dt capability and low switching losses make them suitable for applications such as lighting, power-switching, motor speed control and crow-bars.

MAXIMUM RATINGS, *Absolute-Maximum Values:*

	S2800F	S2800A	S2800B	S2800C	S2800D	S2800E	S2800M	S2800S	S2800N	
V_{DRM}, V_{RRM}	50	100	200	300	400	500	600	700	800	V
$I_{T(RMS)}$ (T_C=100°C, θ = 180°)					10					A
I_{TSM} (for 1 full cycle)					100					A
di/dt					100					A/µs
I^2T (at 8.3 ms)					40					A^2s
P_{GM} (for 10µs max.)					16					W
$P_{G(AV)}$ (Averaging time 10ms max.)					0.5					W
T Storage					-65 to +150					°C
T_J					-65 to +125					°C
T_T (During soldering): For 10 s max. terminals and case)					250					°C

ELECTRICAL CHARACTERISTICS
At Maximum Ratings Unless Otherwise Specified, and at Indicated Case Temperatures (T_C)

CHARACTERISTIC	LIMITS For All Types Except as Specified Min.	Typ.	Max.	UNITS
I_{DROM} or I_{ROM} $V_D = V_{DROM}$ or $V_R = V_{RROM}$, $T_C = +125°C$	—	0.1	2	mA
V_T $i_T = 30$ A, $T_C = +25°C$	—	1.7	2	V
For other values of i_T	←	See Fig. 4	→	
I_{GT} $V_D = 12$ V (DC), $R_L = 30\ \Omega$ $T_C = +25°C$	—	8	15	mA
For other case temperatures	←	See Fig. 5	→	
V_{GT} $V_D = 12$ V (DC), $R_L = 30\ \Omega$ $T_C = +25°C$	—	0.9	1.5	V
For other case temperatures	←	See Fig. 6	→	
I_{HO} $T_C = +25°C$	—	10	20	mA
For other case temperatures	←	See Fig. 7	→	
dv/dt $v_D = V_{DROM}$, Exponential voltage rise $T_C = +125°C$ (See Fig. 11)				V/μs
S2800F	100	—	—	
S2800A	75	—	—	
S2800B	50	—	—	
S2800C	40	—	—	
S2800D	30	—	—	
S2800E	25	—	—	
S2800M	20	—	—	
S2800S	15	—	—	
S2800N	15	—	—	
t_{gt} $V_D = V_{DROM}$, $i_T = 2$ A $I_{GT} = 80$ mA, 0.1 μs rise time $T_C = +25°C$ (See Fig. 9)	—	1.6	2.5	μs
t_q $V_D = V_{DROM}$, $i_T = 2$ A, $t_p = 50$ μs dv/dt = 200 V/μs, di/dt = −10 A/μs I_{GT}= 200 mA at t_{ON}, $T_C = +75°C$ (See Fig. 12)	—	10	35	μs
$R_{\theta JC}$	—	—	2	°C/W
$R_{\theta JA}$	—	—	60	°C/W

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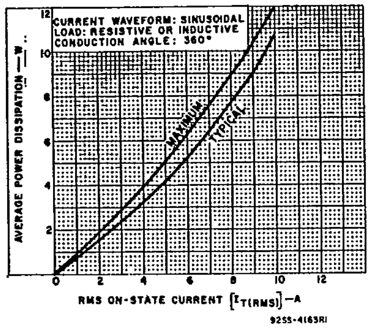

Fig. 1 — Power dissipation vs. on-state current.

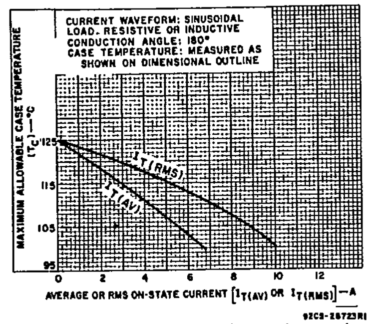

Fig. 2 — Maximum allowable case temperature vs. on-state current.

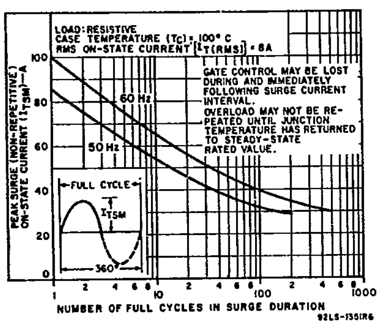

Fig. 3 — Allowable peak surge on-state current vs. surge duration.

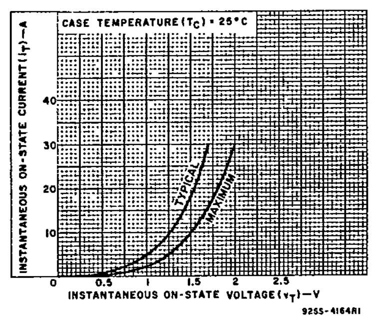

Fig. 4 — Instantaneous on-state current vs. on-state voltage.

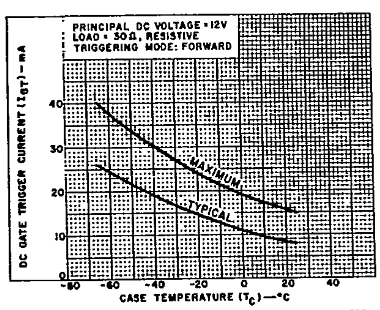

Fig. 5 — DC gate-trigger current vs. case temperature.

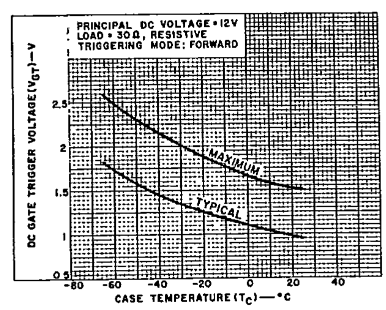

Fig. 6 — DC gate-trigger voltage vs. case temperature.

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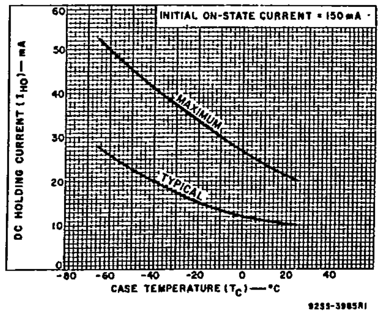

Fig. 7 — Holding current vs. case temperature.

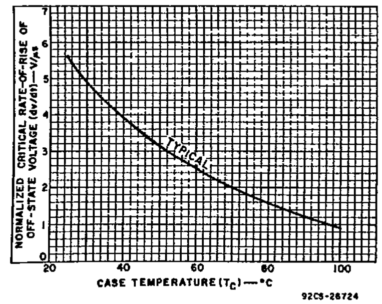

Fig. 8 — Normalized critical rate of rise of off-state voltage vs. case temperature.

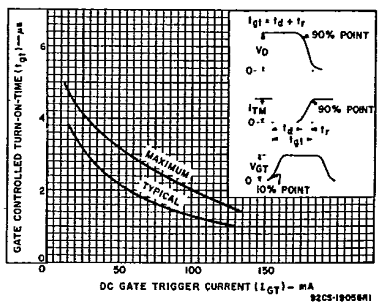

Fig. 9 — Gate-controlled turn-on time vs. gate trigger current.

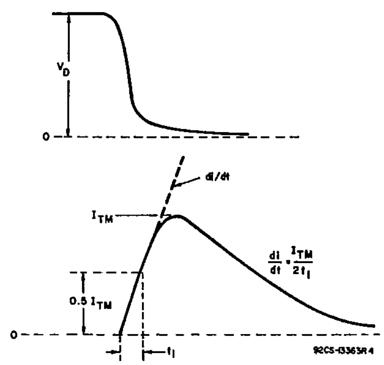

Fig. 10 — Rate of change of on-state current with time (defining di/dt).

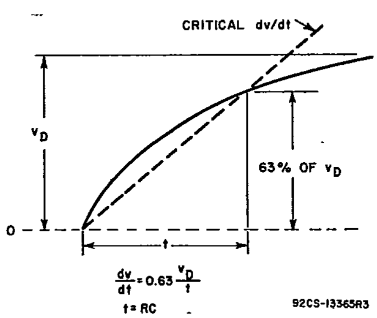

Fig. 11 — Rate of rise of off-state voltage with time (defining critical dv/dt).

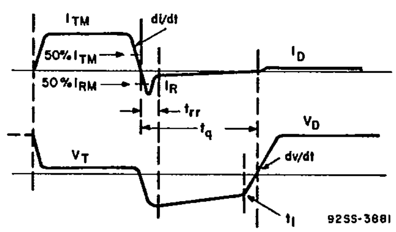

Fig. 12 — Relationship between instantaneous on-state current and voltage, showing reference points for measurement of circuit-commutated turn-off time (t_q).