

3875081 G E SOLID STATE  
Silicon Controlled Rectifiers

01E 17724 D T-25-15

**S2800 Series**

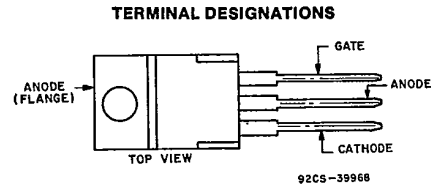
File Number **890**

**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
- Silicon Oxide Glass Multilayer Passivation System
- Advanced Unisurface Construction
- Precise Ion Implanted Diffusion Source



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 passivation 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	
$I_{T(RMS)}$ ( $T_C=100^\circ\text{C}, \theta = 180^\circ$ ) .....										10	A
$I_{TSM}$ (for 1 full cycle) .....										100	A
$di/dt$ .....										100	A/ $\mu\text{s}$
$i^2t$ (at 8.3 ms) .....										40	A <sup>2</sup> s
$P_{GM}$ (for 10 $\mu\text{s}$ max.) .....										16	W
$P_{G(AV)}$ (Averaging time 10ms max.) .....										0.5	W
T Storage .....										-65 to +150	$^\circ\text{C}$
$T_J$ .....										-65 to +125	$^\circ\text{C}$
$T_r$ (During soldering): For 10 s max. terminals and case) .....										250	$^\circ\text{C}$

S2800 Series

**ELECTRICAL CHARACTERISTICS**

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

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

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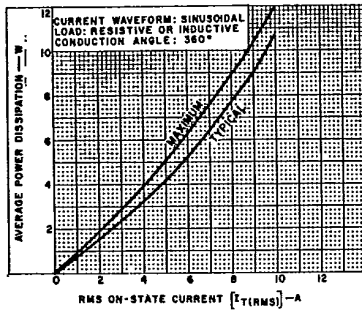


Fig. 1 — Power dissipation vs. on-state current.

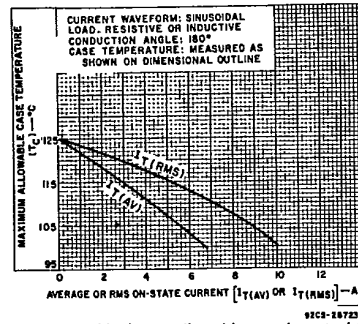


Fig. 2 — Maximum allowable case temperature vs. on-state current.

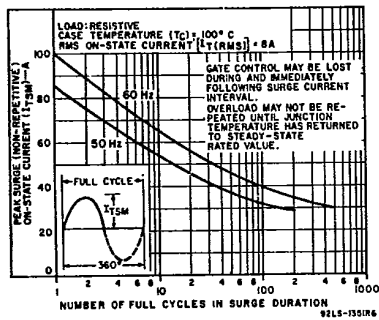


Fig. 3 — Allowable peak surge on-state current vs. surge duration.

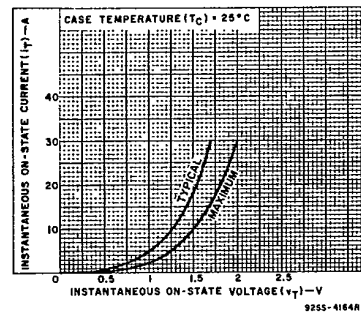


Fig. 4 — Instantaneous on-state current vs. on-state voltage.

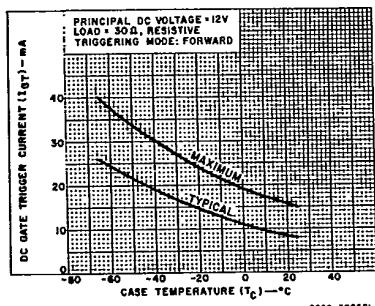


Fig. 5 — DC gate-trigger current vs. case temperature.

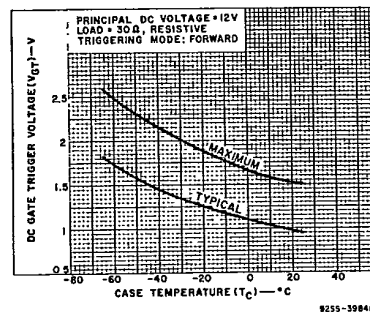


Fig. 6 — DC gate-trigger voltage vs. case temperature.

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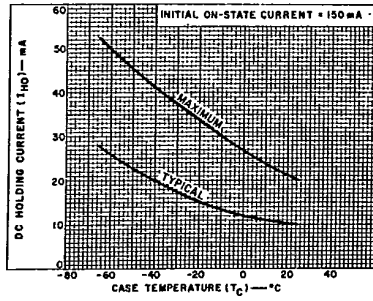


Fig. 7 — Holding current vs. case temperature.

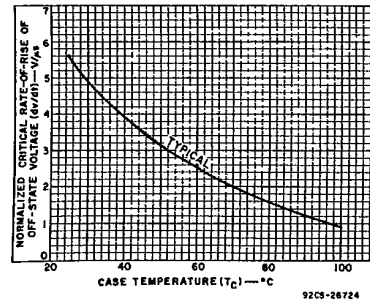


Fig. 8 — Normalized critical rate of rise of off-state voltage vs. case temperature.

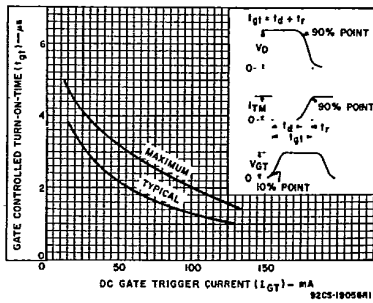


Fig. 9 — Gate-controlled turn-on time vs. gate trigger current.

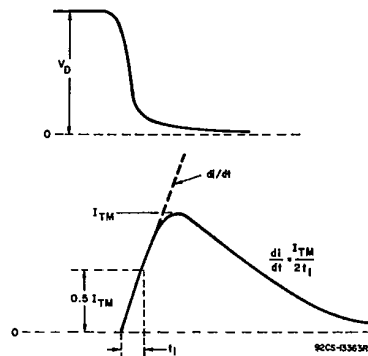


Fig. 10 — Rate of change of on-state current with time (defining di/dt).

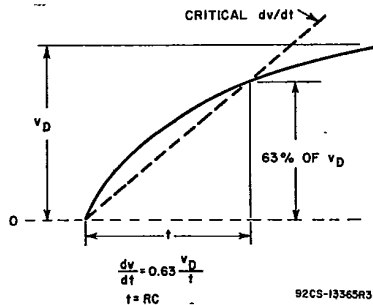


Fig. 11 — Rate of rise of off-state voltage with time (defining critical dv/dt).

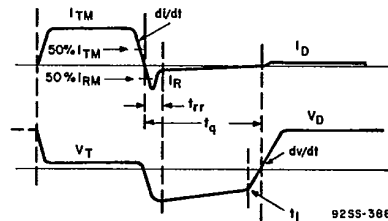


Fig. 12 — Relationship between instantaneous on-state current and voltage, showing reference points for measurement of circuit-commutated turn-off time ( $t_q$ ).