

3875081 G E SOLID STATE  
Silicon Controlled Rectifiers

01E 17724 D T-25-15

## S2800 Series

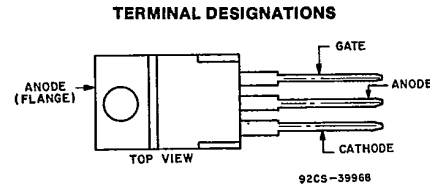
File Number 890

### 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
- Sipsos Oxide Glass Multilayer Passivation System
- Advanced Unisurface Construction
- Precise Ion Implanted Diffusion Source



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 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					$^\circ\text{C}$

3875081 G E SOLID STATE

01E 17725 D T-25-15

Silicon Controlled Rectifiers

## 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 See Fig. 4	2	V
$I_{GT}$ $V_D = 12\text{ V (DC)}$ , $R_L = 30\ \Omega$ $T_C = +25^\circ\text{C}$ .....	—	8 See Fig. 5	15	mA
$V_{GT}$ $V_D = 12\text{ V (DC)}$ , $R_L = 30\ \Omega$ $T_C = +25^\circ\text{C}$ .....	—	0.9 See Fig. 6	1.5	V
$I_{HO}$ $T_C = +25^\circ\text{C}$ .....	—	10 See Fig. 7	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	—	—	
$t_{gt}$ $V_D = V_{DROM}$ , $i_T = 2\text{ A}$ $I_{GT} = 80\text{ mA}$ , $0.1\ \mu\text{s}$ 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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01E 17726 D T-25-15

## S2800 Series

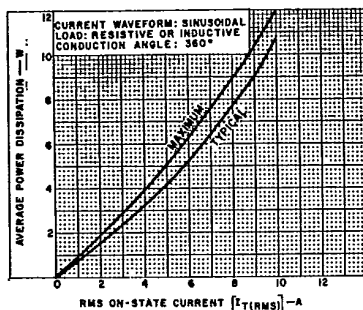


Fig. 1 — Power dissipation vs. on-state current.

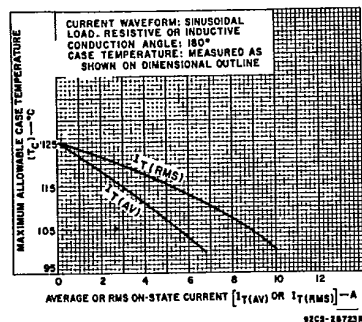


Fig. 2 — Maximum allowable case temperature vs. on-state current.

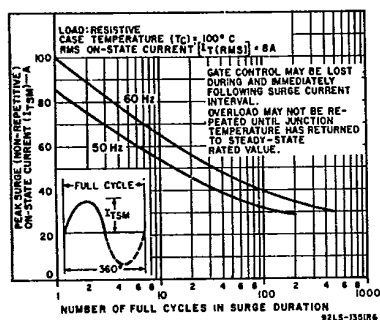


Fig. 3 — Allowable peak surge on-state current vs. surge duration.

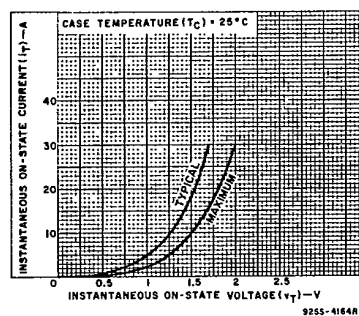


Fig. 4 — Instantaneous on-state current vs. on-state voltage.

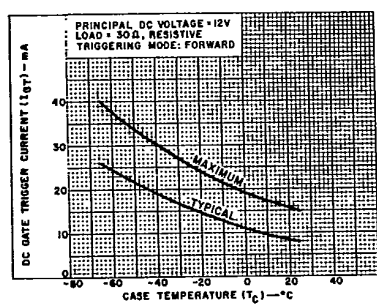


Fig. 5 — DC gate-trigger current vs. case temperature.

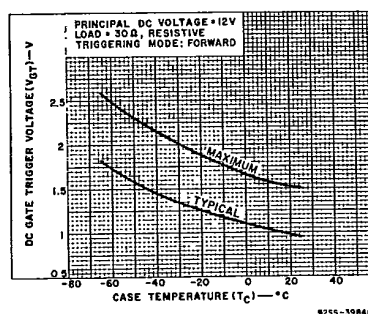


Fig. 6 — DC gate-trigger voltage vs. case temperature.

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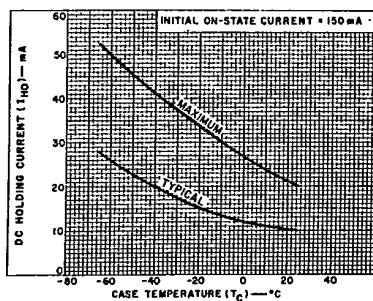


Fig. 7 — Holding current vs. case temperature.

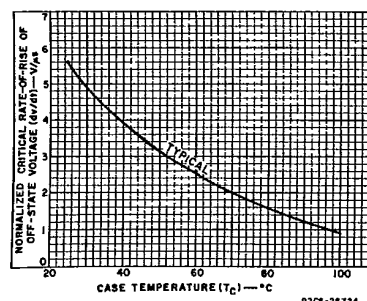


Fig. 8 — Normalized critical rate of rise of off-state voltage vs. case temperature.

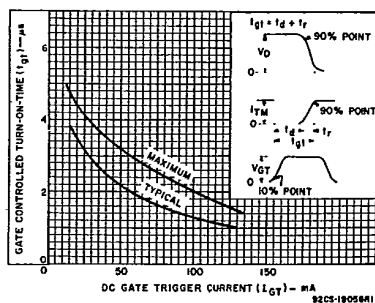


Fig. 9 — Gate-controlled turn-on time vs. gate trigger current.

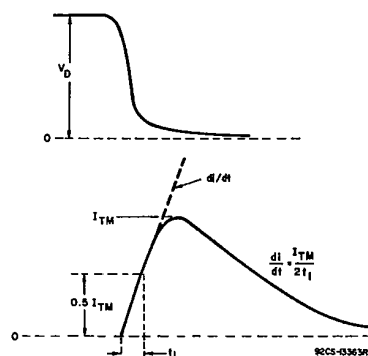


Fig. 10 — Rate of change of on-state current with time (defining di/dt).

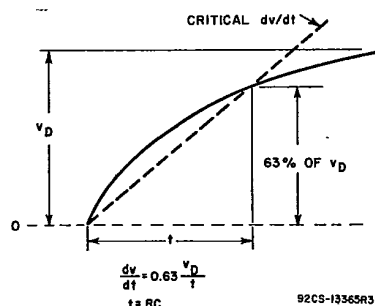
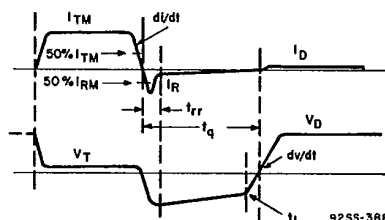


Fig. 11 — Rate of rise of off-state voltage with time (defining critical dv/dt).

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

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