



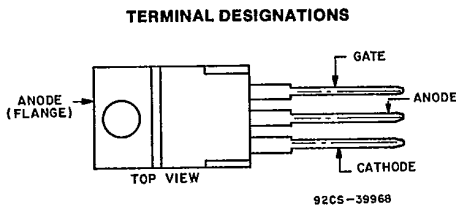
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8-A Silicon Controlled Rectifiers

For Power Switching, Power Control

Features:

- High *dv/dt* capability
- Glass-passivated chip
- Shorted-emitter gate-cathode construction
- Low thermal resistance



JEDEC TO-220AB

The RCA-C122 series types are medium-power silicon controlled rectifiers designed for switching ac and dc currents. These devices can switch from the off-state to the on-state when both the anode and gate voltages are positive. Negative anode voltages make these devices revert to the blocking state regardless of gate-voltage polarity.

The TO-220AB package provides easy package mounting and low thermal resistance, allowing operation at high case temperatures and permitting reduced heat-sink size. These SCR's can be used in lighting and motorspeed controls and power-switching systems.

MAXIMUM RATINGS, Absolute-Maximum Values:

V_{RRM}^{Δ} , V_{DROM}^{Δ}	
$I_{T(RMS)}$ ($T_C = 75^{\circ}C$, $\theta = 180^{\circ}$)	
I_{TSM}	
For one full cycle of applied	
principal voltage 400-Hz	
60-Hz	
50-Hz	
For more than one full cycle of applied	
principal voltage	
di/dt	
$V_D = V_{DROM}$	
$I_{GT} = 80$ mA, $t_r = 0.5$ μ s	
I_{GT}	
$T_J = -65$ to $100^{\circ}C$,	
$t = 1$ to 8.3 ms	
P_{GM}° (for 10 μ s max.)	
$P_{G(AV)}^{\circ}$ (averaging time = 10 ms max.)	
T_{stg}	
T_C	
T_T	
During soldering for 10 s maximum	
(terminal and case)	

	C122F	C122A	C122B	C122C	C122D	C122E	C122M	
	50	100	200	300	400	500	600	V
	8							A
				200				A
				100				A
				85				A
	See Fig. 3							
				100				A/ μ s
				40				A's
				16				W
				0.5				W
				-65 to +150				$^{\circ}C$
				-65 to +100				$^{\circ}C$
				250				$^{\circ}C$

Δ These values do not apply if there is a positive gate signal. Gate must be open or negatively biased.
 •Any values of peak gate current or peak gate voltage which result in equal or lower power are permissible.

C122 Series

ELECTRICAL CHARACTERISTICS

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

CHARACTERISTIC	LIMITS			UNITS
	FOR ALL TYPES Except as Specified			
	Min.	Typ.	Max.	
I_{DOM} or I_{ROM} $V_D = V_{DROM}$ or $V_R = V_{RROM}$, $T_C = +100^\circ\text{C}$	—	0.1	0.5	mA
v_T $i_T = 16 \text{ A}$, $T_C = +25^\circ\text{C}$ For other values of i_T	—	1.45	1.83	V
I_{GT} $V_D = 12 \text{ V (DC)}$, $R_L = 30 \Omega$ $T_C = +25^\circ\text{C}$	—	10	15	mA
V_{GT} $V_D = 12 \text{ V (DC)}$, $R_L = 30 \Omega$ $T_C = +25^\circ\text{C}$	—	1.0	1.5	V
i_{HO} $T_C = +25^\circ\text{C}$	—	20	30	mA
dv/dt $V_D = V_{DROM}$ Exponential voltage rise $T_C = +100^\circ\text{C}$ (See Fig. 12)	10	100	—	V/ μs
t_{gt} $V_D = V_{DROM}$, $i_T = 4.5 \text{ A}$, $i_T = 2 \text{ A}$ $I_{GT} = 80 \text{ mA}$, $0.1 \mu\text{s}$ rise time $T_C = +25^\circ\text{C}$ (See Fig. 10)	—	1.6	2.5	μs
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. 13)	—	10	35	μs
$R_{\theta JC}$	—	—	1.8	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	—	—	75	$^\circ\text{C}/\text{W}$

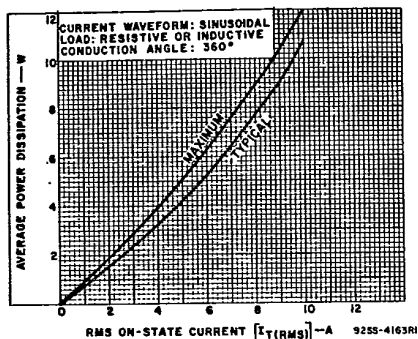


Fig. 1 — Power dissipation vs. on-state current.

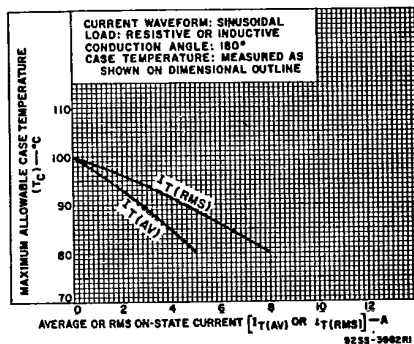


Fig. 2 — Maximum allowable case temperature vs. on-state current.

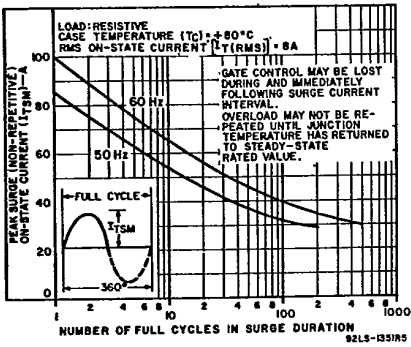


Fig. 3 — Allowable peak surge on-state current vs. surge duration.

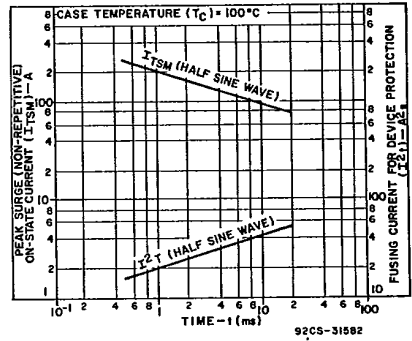


Fig. 4 — Peak surge on-state current and fusing current as a function of time.

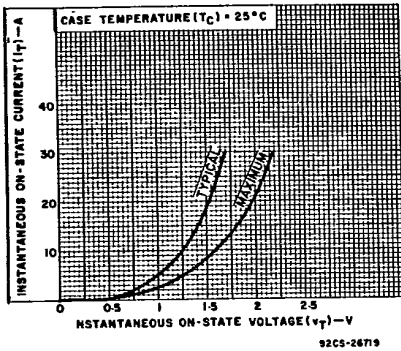


Fig. 5 — Instantaneous on-state current vs. on-state voltage.

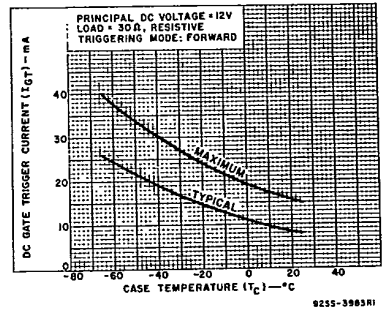


Fig. 6 — DC gate-trigger current vs. case temperature.

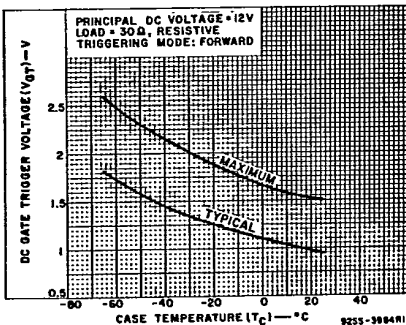


Fig. 7 — DC gate-trigger voltage vs. case temperature.

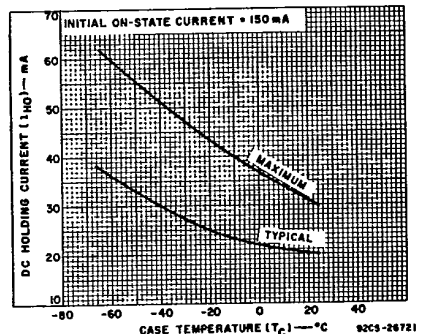


Fig. 8 — Holding current vs. case temperature.

C122 Series

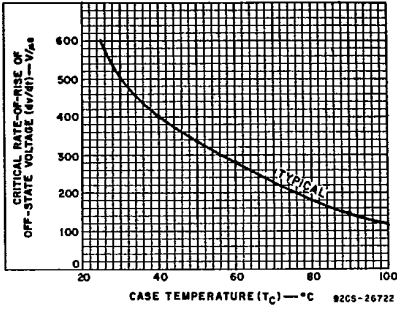


Fig. 9 — Critical rate of rise of off-state voltage vs. case temperature.

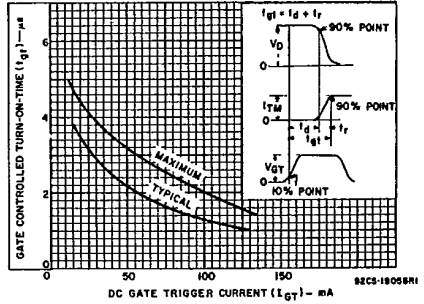


Fig. 10 — Gate-controlled turn-on time vs. gate trigger current.

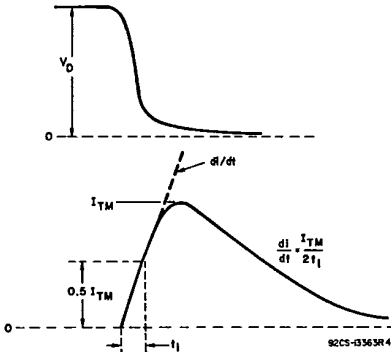


Fig. 11 — Rate of change of on-state current with time (defining di/dt).

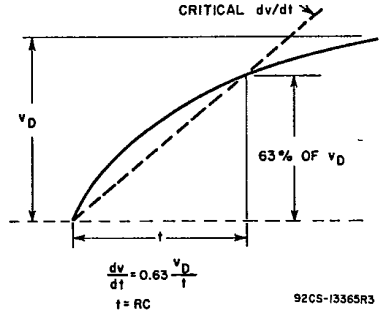


Fig. 12 — Rate of rise of off-state voltage with time (defining critical dv/dt).

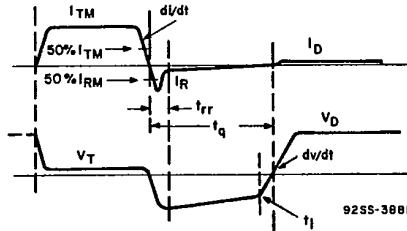


Fig. 13 — Relationship between instantaneous on-state current and voltage, showing reference points for measurement of circuit-commutated turn-off time (t_q).