File Number **1173**

C122 Series

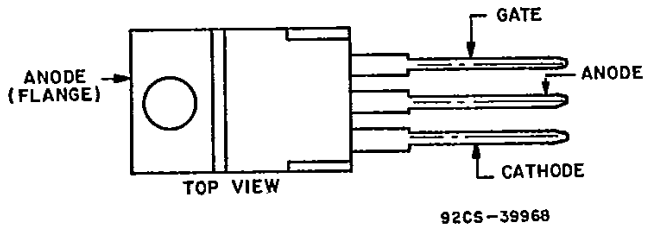
8-A Silicon Controlled Rectifiers

For Power Switching, Power Control

Features:

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

TERMINAL DESIGNATIONS



92CS-39968

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:*

	C122F	C122A	C122B	C122C	C122D	C122E	C122M	
V_{RROM}^{Δ}, V_{DROM}^{Δ}	50	100	200	300	400	500	600	V
$I_{T(RMS)}$ (T_C = 75°C, θ = 180°)				8				A
I_{TSM}								
For one full cycle of applied principal voltage 400-Hz				200				A
60-Hz				100				A
50-Hz				85				A
For more than one full cycle of applied principal voltage				See Fig. 3				
di/dt								
$V_D = V_{DROM}$, I_{GT} = 80 mA, t_r = 0.5 μs				100				A/μs
I^2t								
T_J = -65 to 100°C, t = 1 to 8.3 ms				40				A^2s
P_{GM}• (for 10 μs max.)				16				W
$P_{G(AV)}$• (averaging time = 10 ms max.)				0.5				W
T_{stg}				-65 to +150				°C
T_C				-65 to +100				°C
T_T								
During soldering for 10 s maximum (terminal and case)				250				°C

ΔThese 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.

ELECTRICAL CHARACTERISTICS

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

CHARACTERISTIC	LIMITS FOR ALL TYPES Except as Specified			UNITS
	Min.	Typ.	Max.	
I_{DOM} or I_{ROM} $V_D = V_{DROM}$ or $V_R = V_{RROM}$, T_C = +100°C	–	0.1	0.5	mA
v_T i_T = 16 A, T_C = +25°C	–	1.45	1.83	V
For other values of i_T	← See Fig. 5 →			
I_{GT} V_D = 12 V (DC), R_L = 30 Ω T_C = +25°C	–	10	15	mA
For other case temperatures	← See Fig. 6 →			
V_{GT} V_D = 12 V (DC), R_L = 30 Ω T_C = +25°C	–	1.0	1.5	V
For other case temperatures	← See Fig. 7 →			
i_{HO} T_C = +25°C	–	20	30	mA
For other case temperatures	← See Fig. 8 →			
dv/dt $V_D = V_{DROM}$ Exponential voltage rise T_C = +100°C (See Fig. 12)	10	100	–	V/μs
t_{gt} $V_D = V_{DROM}$, i_T = 4.5 A, i_T = 2 A I_{GT} = 80 mA, 0.1 μs rise time T_C = +25°C (See Fig. 10)	–	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. 13)	–	10	35	μs
$R_{\theta JC}$	–	–	1.8	°C/W
$R_{\theta JA}$	–	–	75	

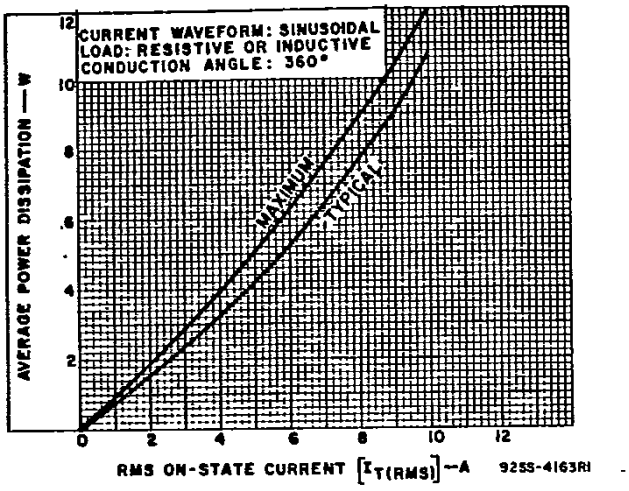


Fig. 1 — Power dissipation vs. on-state current.

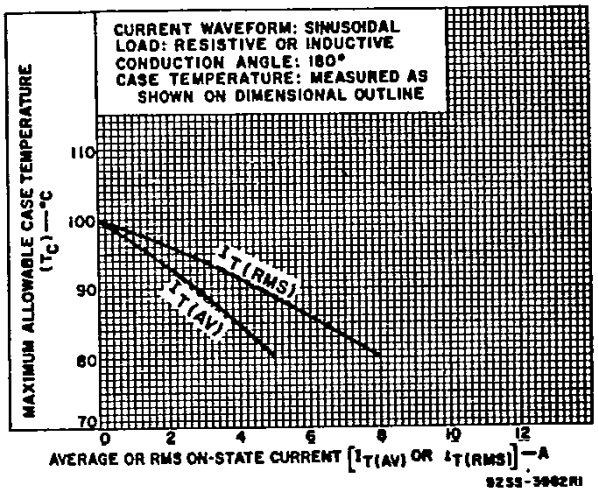


Fig. 2 — Maximum allowable case temperature vs. on-state current.

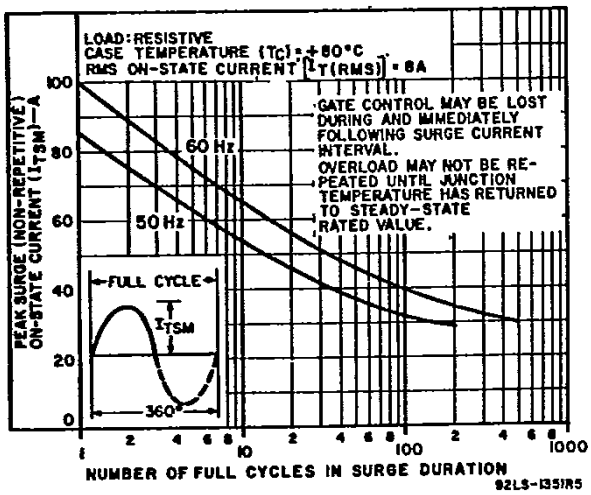


Fig. 3 — Allowable peak surge on-state current vs. surge duration.

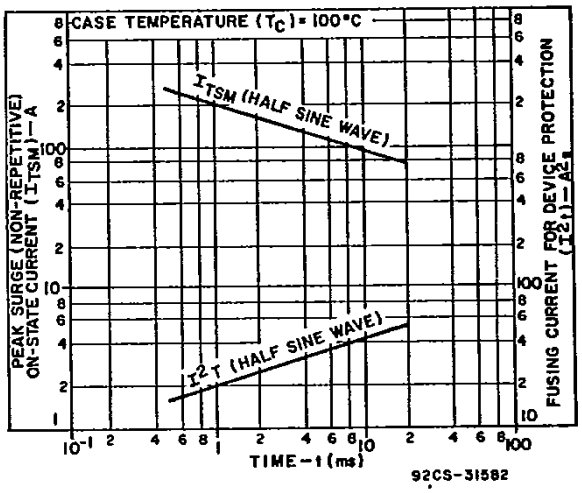


Fig. 4 — Peak surge on-state current and fusing current as a function of time.

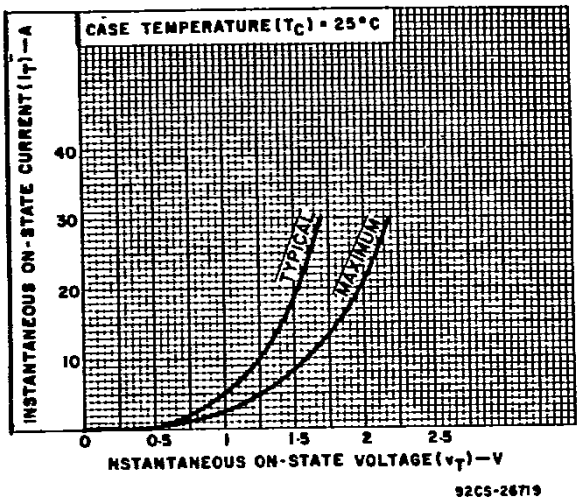


Fig. 5 — Instantaneous on-state current vs. on-state voltage.

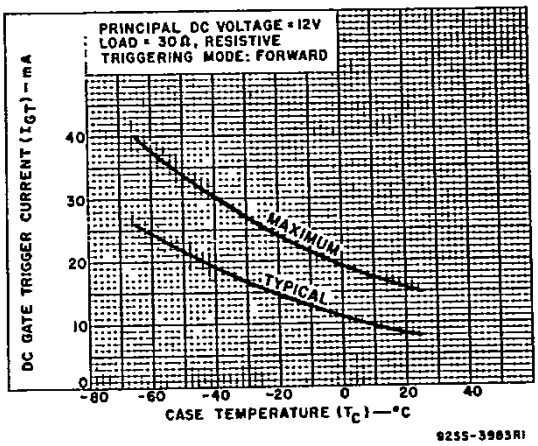


Fig. 6 — DC gate-trigger current vs. case temperature.

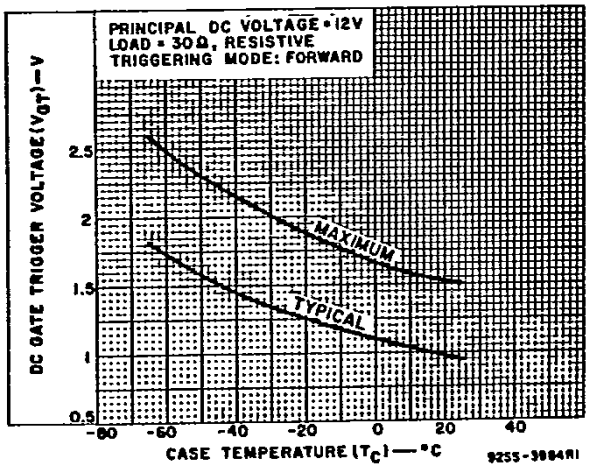


Fig. 7 — DC gate-trigger voltage vs. case temperature.

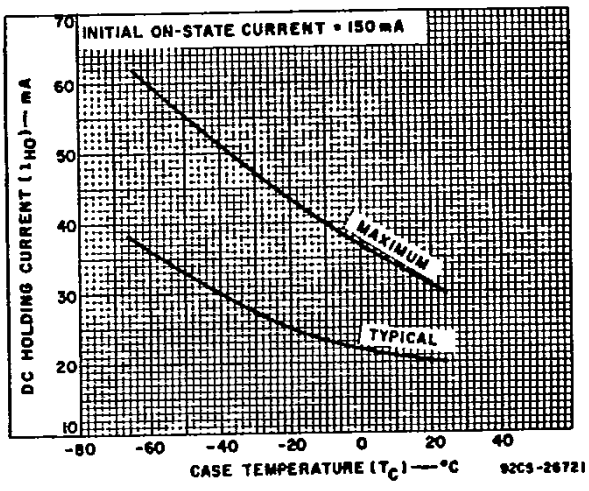


Fig. 8 — Holding current vs. case temperature.

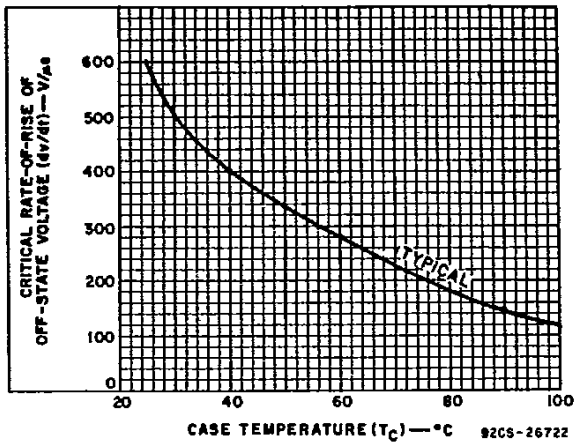


Fig. 9 — Critical rate of rise of off-state voltage vs. case temperature.

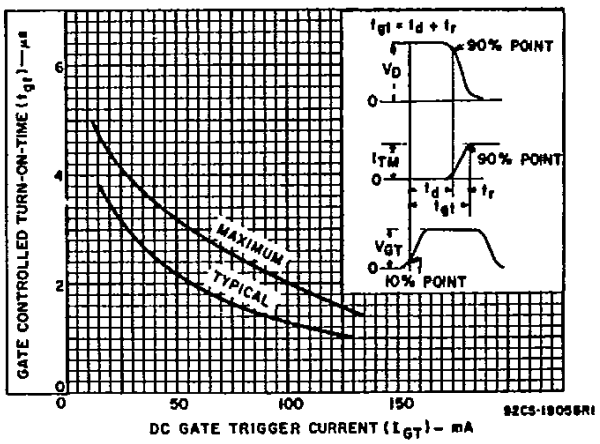


Fig. 10 — Gate-controlled turn-on time vs. gate trigger current.

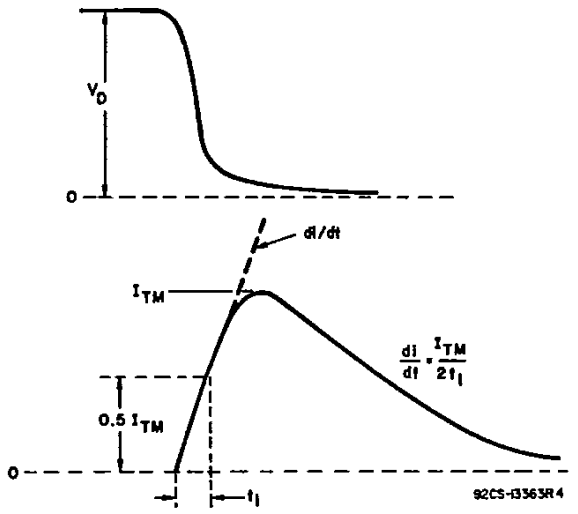


Fig. 11 — Rate of change of on-state current with time (defining di/dt).

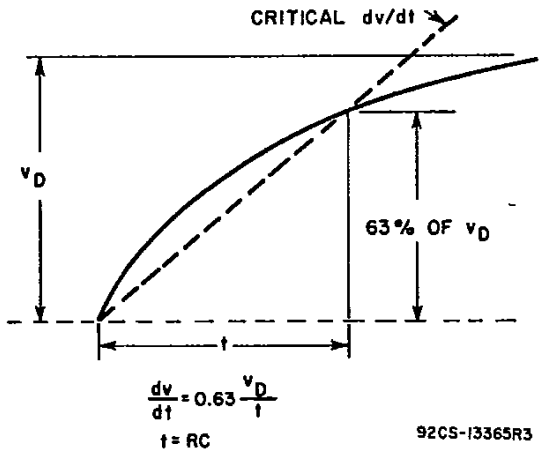


Fig. 12 — Rate of rise of off-state voltage with time (defining critical dv/dt).

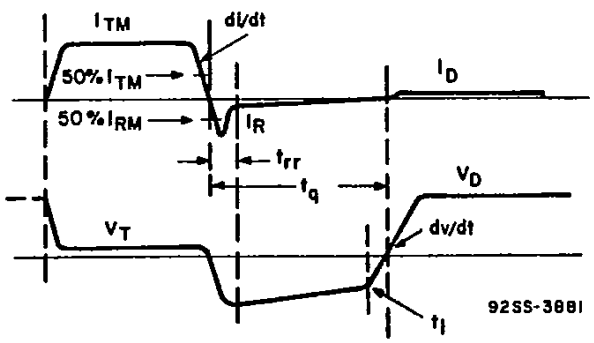


Fig. 13 — Relationship between instantaneous on-state current and voltage, showing reference points for measurement of circuit-commutated turn-off time (t_q).