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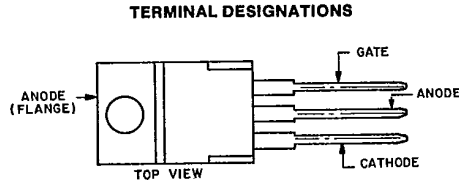
C122 Series

## 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



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	
$V_{RRM}, V_{DRM}$ .....	50	100	200	300	400	500	600	V
$I_{T(RMS)}$ ( $T_C = 75^\circ C, \theta = 180^\circ$ ) .....	8							A
$I_{TSM}$								
For one full cycle of applied principal voltage								A
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							
$di/dt$								
$V_D = V_{DRM}$ $I_{GT} = 80 \text{ mA}, t_r = 0.5 \mu s$ .....	100							A/ $\mu s$
$t^2$								
$T_J = -65 \text{ to } 100^\circ C,$ $t = 1 \text{ to } 8.3 \text{ ms}$ .....	40							A <sup>2</sup> s
$P_{GM}^*$ (for 10 $\mu s$ max.) .....	16							W
$P_{G(AV)}^*$ (averaging time = 10 ms max.) .....	0.5							W
$T_{sig}$ .....	-65 to +150							$^\circ C$
$T_C$ .....	-65 to +100							$^\circ C$
$T_T$								
During soldering for 10 s maximum (terminal and case) .....	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.

Silicon Controlled Rectifiers

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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 $V_R = V_{RROM}$ , $T_C = +100^\circ C$	-	0.1	0.5	mA
$v_T$ $i_T = 16$ A, $T_C = +25^\circ C$ For other values of $i_T$ .....	-	1.45	1.83	V
$I_{GT}$ $V_D = 12$ V (DC), $R_L = 30 \Omega$ $T_C = +25^\circ C$ .....	-	10	15	mA
$V_{GT}$ $V_D = 12$ V (DC), $R_L = 30 \Omega$ $T_C = +25^\circ C$ .....	-	1.0	1.5	V
$i_{HO}$ $T_C = +25^\circ C$ .....	-	20	30	mA
$dv/dt$ $V_D = V_{DROM}$ Exponential voltage rise $T_C = +100^\circ C$ (See Fig. 12)	10	100	-	V/ $\mu s$
$t_{gt}$ $V_D = V_{DROM}$ , $i_T = 4.5$ A, $i_T = 2$ A $I_{GT} = 80$ mA, $0.1 \mu s$ rise time $T_C = +25^\circ C$ (See Fig. 10)	-	1.6	2.5	$\mu s$
$t_g$ $V_D = V_{DROM}$ , $i_T = 2$ A, $t_p = 50 \mu s$ $dv/dt = 200$ V/ $\mu s$ , $di/dt = -10$ A/ $\mu s$ $I_{GT} = 200$ mA at $t_{ON}$ , $T_C = +75^\circ C$ (See Fig. 13)	-	10	35	$\mu s$
$R_{\theta JC}$	-	-	1.8	$^\circ C/W$
$R_{\theta JA}$	-	-	75	$^\circ C/W$

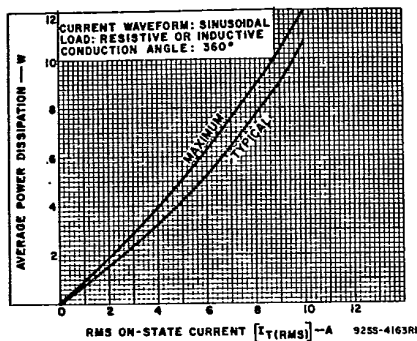


Fig. 1 — Power dissipation vs. on-state current.

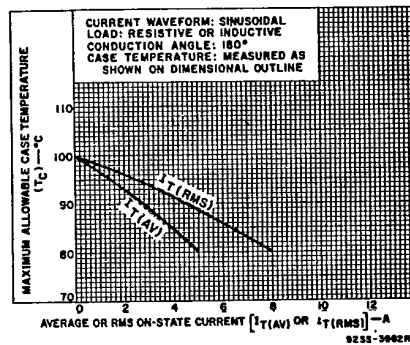


Fig. 2 — Maximum allowable case temperature vs. on-state current.

C122 Series

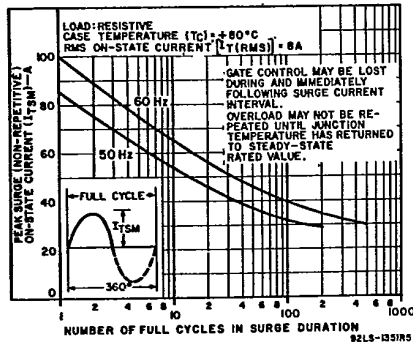


Fig. 3 — Allowable peak surge on-state current vs. surge duration.

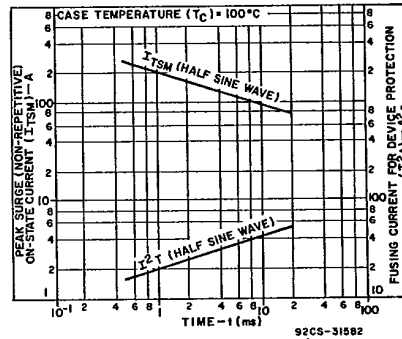


Fig. 4 — Peak surge on-state current and fusing current as a function of time.

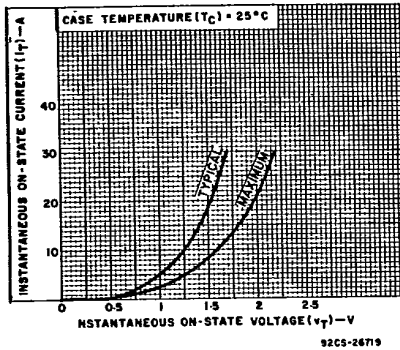


Fig. 5 — Instantaneous on-state current vs. on-state voltage.

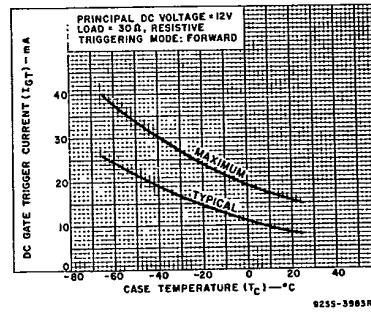


Fig. 6 — DC gate-trigger current vs. case temperature.

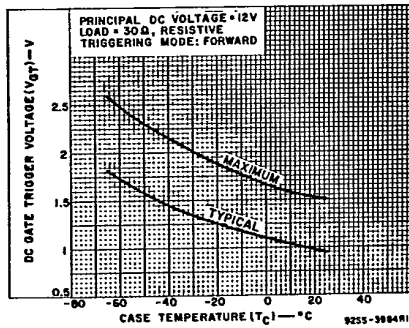


Fig. 7 — DC gate-trigger voltage vs. case temperature.

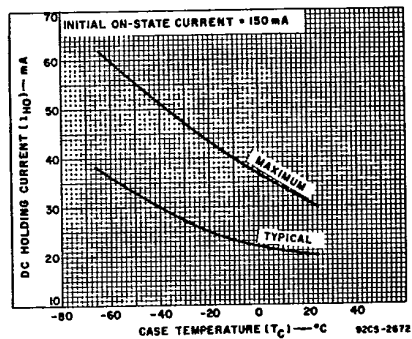


Fig. 8 — Holding current vs. case temperature.

Silicon Controlled Rectifiers

C122 Series

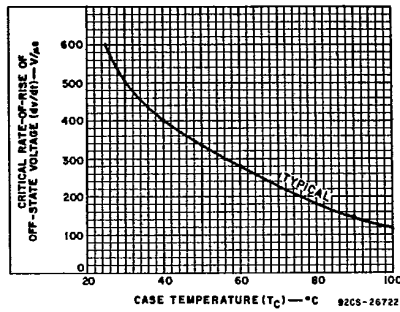


Fig. 9 — Critical rate of rise of off-state voltage vs. case temperature.

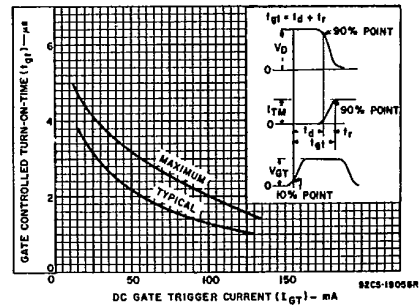


Fig. 10 — Gate-controlled turn-on time vs. gate trigger current.

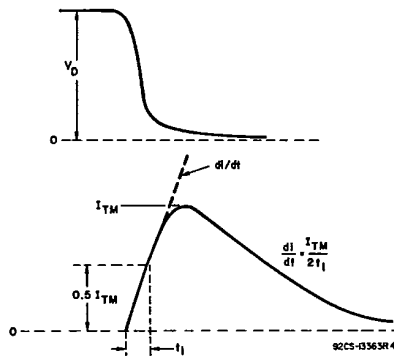


Fig. 11 — Rate of change of on-state current with time (defining  $dI/dt$ ).

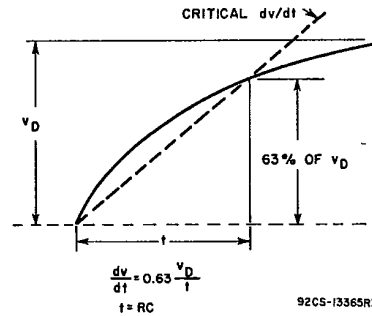


Fig. 12 — Rate of rise of off-state voltage with time (defining critical  $dV/dt$ ).

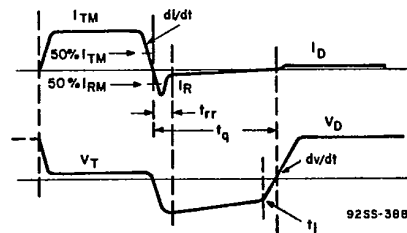


Fig. 13 — Relationship between instantaneous on-state current and voltage, showing reference points for measurement of circuit-commutated turn-off time ( $t_q$ ).