2N681-2N692

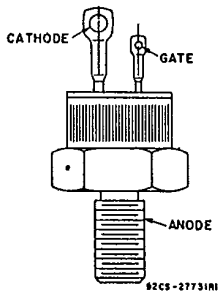
File Number **96**

25-A Silicon Controlled Rectifiers

For Power-Control and Power-Switching Application

Features:
- *High di/dt capability*
- *Low on-state voltage at high current levels*
- *Low thermal resistance*

TERMINAL DESIGNATIONS



JEDEC TO-208AA

The RCA2N681-2N692 are all-diffused silicon controlled rectifiers (reverse-blocking triode thrysistors) 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.
These SCR's employ a hermetic JEDEC TO-208AA package.

MAXIMUM RATINGS, *Absolute-Maximum Values:*

	2N681	2N682	2N683	2N684	2N685	2N686	2N687	2N688	2N689	2N690	2N691	2N692	
V_{RSOM}▲	35	75	150	225	300	350	400	500	600	720	840	960	V
*V_{RROM}▲	25	50	100	150	200	250	300	400	500	600	700	800	V
*V_{DROM}▲	25	50	100	150	200	250	300	400	500	600	700	800	V
$I_{T(RMS)}$ (θ = 180°): T_C = 65° C	25												A
*$I_{T(AV)}$ (θ = 180°): T_C = 65° C	16												A
$I_{(STM)}$: For one full cycle of applied principal voltage													
60Hz♦	150												A
50Hz♦	140												A
For more than one full cycle of applied principal voltage	See Fig. 2												
di/dt: $V_D = V_{DROM}$, I_{GT} = 200 mA, t_r = 0.5 μs	200												A/μs
I^2t [at T_C shown for $I_{T(RMS)}$]: t = 10 ms	100												A^2s
= 1 ms	46												A^2s
*P_{GM}•:	5												W
*$P_{G(AV)}$•	0.5												W
*I_{GM}	2												A
*V_{GM}	10												V
*V_{GRM}	5												V
*T_{stg}■	-65 to 150												°C
*T_C■	-65 to 125												°C
T_T During soldering for 10 s maximum (terminal and case)	225												°C
T_s: Recommended	35												in-lb
	0.4												kgf-m
Maximum (DO NOT EXCEED)	50												in-lb
	0.57												kgf-m

*In accordance with JEDEC registration data
△These values do not apply if there is a positive gate signal. Gate must be open or negatively biased
♦At $I_{T(RMS)}$ = 25 A and T_C = 65°C
•Any product gate current and gate voltage which results in gate power less than the maximum is permitted.
■For temperature measurement reference point, see Dimensional Outline.

2N681-2N692

ELECTRICAL CHARACTERISTICS, *At Maximum Ratings Unless Otherwise Specified and at Indicated Case Temperature (T_C)*

CHARACTERISTIC	LIMITS 2N681-2N690 MIN.	TYP.	MAX.	UNITS
*I_{DROM} or I_{RROM} $V_D = V_{DROM}$ or $V_R = V_{RROM}$, T_C = 125°C:				
2N681, 2N682, 2N683, 2N684	—	—	6.5	mA
2N685	—	—	6	
2N686	—	—	5.5	
2N687	—	—	5	
2N688	—	—	4	
2N689	—	—	3	
2N690	—	—	2.5	
2N691	—	—	2.25	
2N692	—	—	2	
*v_T: i_T = 50 A (peak), T_C = 25°C	—	—	2	V
$v_T(AV)$: $I_T = I_T$ (RMS) = T_C = 65°C	—	—	0.86	V
i_{HO}: T_C = 125°C	—	15	—	mA
I_{GT}: T_C = 125°	—	—	25	mA
V_D = 12 V (dc), R_L = 50Ω, T_C = -65°C	—	—	80*	
V_{GT}: V_D = 12 V (dc), R_L = 50Ω, T_C = -65 to 125°C	—	—	3	V
= 125°	0.25	—	—	
$R_{\theta JC}$	—	—	2	°C/W

*In accordance with JEDEC registration data.

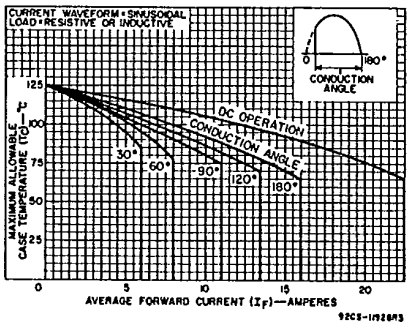


Fig. 1 — Maximum allowable case temperature vs. on-state current for 2N681-2N692.

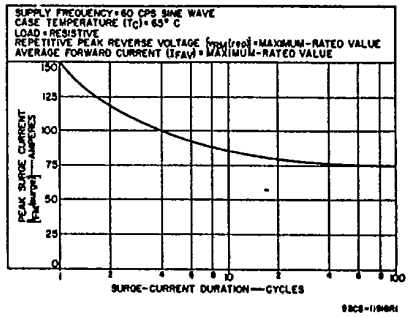


Fig. 2 — Peak surge on-state current vs. surge duration for 2N681-2N692.

2N681-2N692

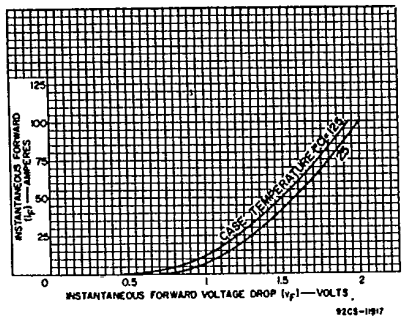


Fig. 3 — Typical on-state current vs. instantaneous on-state voltage for 2N681-2N692.

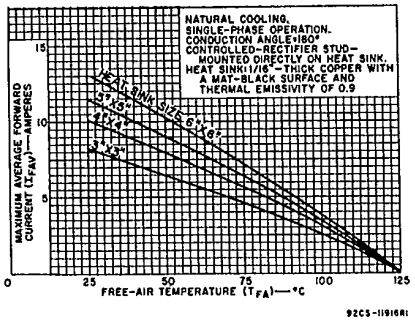


Fig. 4 — Average on-state forward current vs. ambient temperature for 2N681-2N692.