

T-33-01

50-A Complementary High-Current, Medium-Voltage N-P-N and P-N-P Silicon Darlington Power Transistors

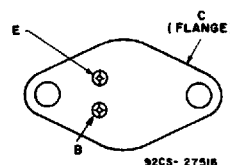
Features:

- 300 W at 25°C case temperature
- 50-A rated collector current
- Hard glass passivation
- Wire-bonded construction

Applications:

- General purpose
- Low-speed switching
- DC motor control

TERMINAL DESIGNATIONS



JEDEC TO-204AE

(141 mil diameter pin isolation)

The RCA9228A, RCA9228B, RCA9228C, RCA9228D and the RCA9229A*, RCA9229B*, RCA9229C*, RCA9229D* are complementary n-p-n and p-n-p silicon Darlington transistors designed for general-purpose amplifier and low-speed switching applications. The high gain of these devices makes it possible for them to be driven directly from integrated circuits.

These devices are supplied in the JEDEC TO-204AE hermetic steel package.

*The RCA9228A, RCA9228B, RCA9228C, RCA9228D and RCA9229A, RCA9229B, RCA9229C, RCA9229D were formerly RCA developmental nos. TA9228 and TA9229, respectively.

MAXIMUM RATINGS, Absolute-Maximum Values:

	RCA9228A RCA9229A*	RCA9228B RCA9229B*	RCA9228C RCA9229C*	RCA9228D RCA9229D*	
V_{CE0}	60	80	100	120	V
$V_{CE0}(SUS)$	60	80	100	120	V
V_{EB0}		5			V
I_C		50			A
I_B		1			A
P_T					
$T_C \leq 25^\circ C$		300			W
$T_C > 25^\circ C$		Derate linearly	2.4		W/°C
T_{stg}, T_J		-65 to +150			°C
T_L					
At distances > 1/8 in. (3.17 mm) from case for 10 s max.		235			°C

* For p-n-p devices, voltage and current values are negative.

ELECTRICAL CHARACTERISTICS, Case Temperature (T_c) = 25°C Unless Otherwise Specified

CHARACTERISTIC	TEST CONDITIONS				LIMITS								UNITS
	VOLTAGE V dc		CURRENT A dc		RCA9228A RCA9229A*		RCA9228B RCA9229B*		RCA9228C RCA9229C*		RCA9228D RCA9229D*		
	V _{CE}	V _{BE}	I _C	I _B	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	
I _{CEO}	50 70 90 110				—	0.5	—	—	—	—	—	—	mA
I _{EBO}		-5			—	5	—	5	—	5	—	5	mA
V _{CEO(SUS)}	a		0.1 ^b		60	—	80	—	100	—	120	—	V
h _{FE}	3 5		25 50		2000 400	—	2000 400	—	2000 400	—	2000 400	—	
V _{BE(sat)}			25 50	0.2 0.3	—	3 4.5	—	3 4.5	—	3 4.5	—	3 4.5	V
V _{CE(sat)}			25 50	0.25 0.5	—	2.5 3.5	—	2.5 3.5	—	2.5 3.5	—	2.5 3.5	V
I _{S,b} t = 0.5 sec.	30				10	—	10	—	10	—	10	—	A
C _{obo} V _{CB} = 10 V RCA9228A,B,C,D RCA9229A,B,C,D					Typ. 300 Typ. 600		Typ. 300 Typ. 600		Typ. 300 Typ. 600		Typ. 300 Typ. 600		pF
h _{re} at f = 1 MHz					Typ. 5		Typ. 5		Typ. 5		Typ. 5		
R _{θJC}					—	0.416	—	0.416	—	0.416	—	0.416	°C/W

• For p-n-p devices, voltage and current values are negative.

a CAUTION: Sustaining voltage $V_{CEO}(SUS)$ MUST NOT be measured on a curve tracer.

b Pulsed: Pulse duration = 300 μ s, duty factor < 2%.

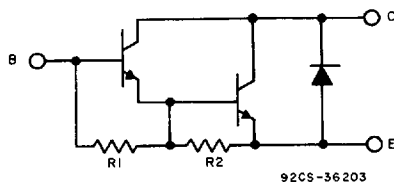


Fig. 1 - Schematic diagram for RCA9228A, RCA9228B, RCA9228C, RCA9228D.

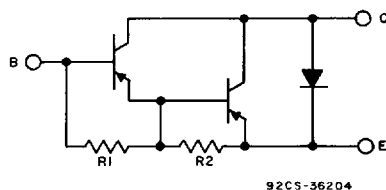
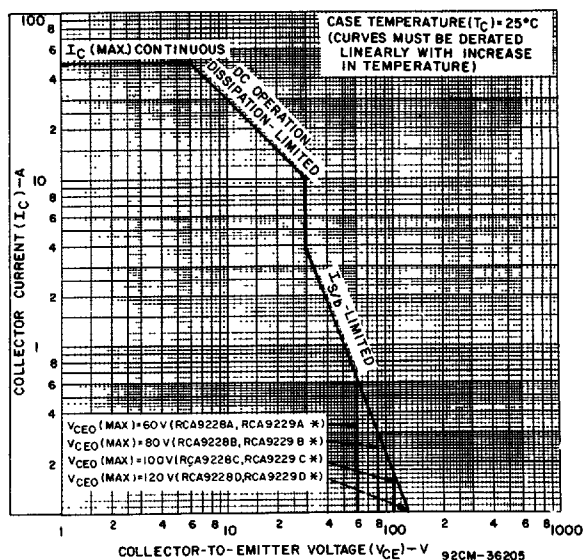


Fig. 2 - Schematic diagram for RCA9229A, RCA9229B, RCA9229C, RCA9229D.



*FOR p-n-p DEVICES, VOLTAGE AND CURRENT VALUES ARE NEGATIVE

Fig. 3 - Maximum operating areas for all types.

RCA9228A, RCA9228B, RCA9228C, RCA9228D
RCA9229A, RCA9229B, RCA9229C, RCA9229D

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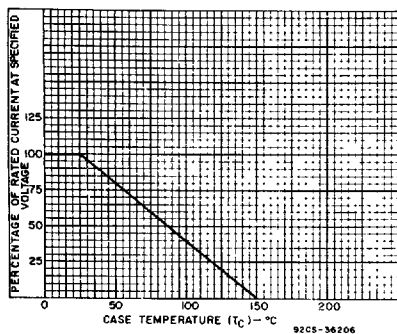


Fig. 4 - Current derating curve for all types.

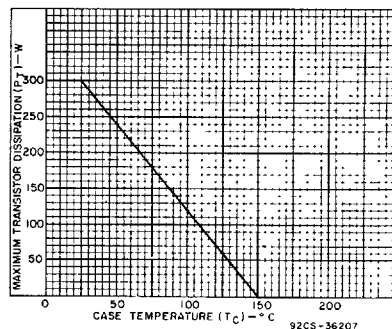


Fig. 5 - Power derating curve for all types.

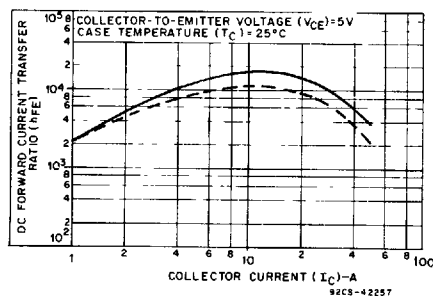


Fig. 6 - Typical dc beta characteristics for all types.

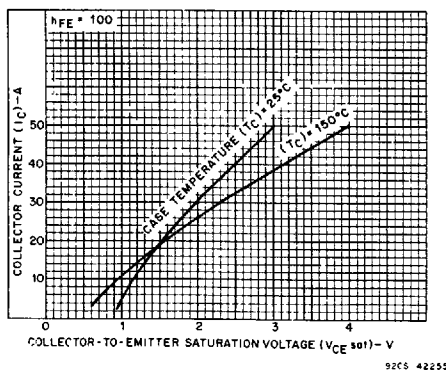


Fig. 7 - Typical collector-to-emitter saturation voltage characteristics for RCA9228A, RCA9228B, RCA9228C and RCA9228D.

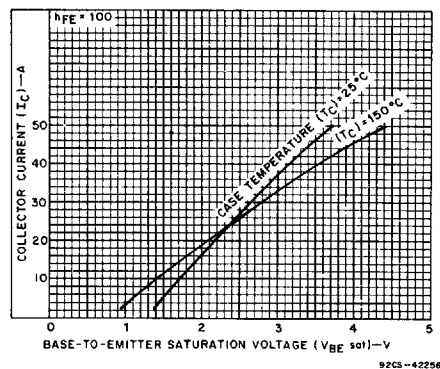


Fig. 8 - Typical base-to-emitter saturation voltage characteristics for RCA9228A, RCA9228B, RCA9228C and RCA9228D.

RCA9228A, RCA9228B, RCA9228C, RCA9228D
RCA9229A, RCA9229B, RCA9229C, RCA9229D

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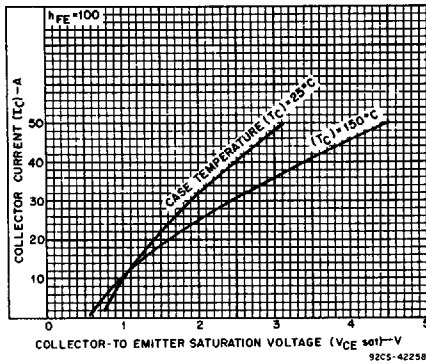


Fig. 9 - Typical collector-to-emitter saturation voltage characteristics for RCA9229A, RCA9229B, RCA9229C and RCA9229D.

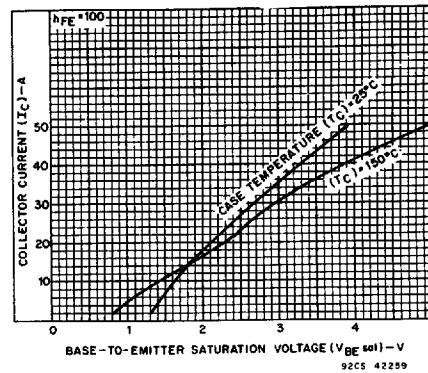


Fig. 10 - Typical base-to-emitter saturation voltage characteristics for RCA9229A, RCA9229B, RCA9229C and RCA9229D.