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

File Number **1448**

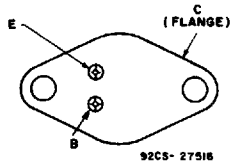
T-33-01

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_{CBO}	60	80	100	120	V
$V_{CEO(sus)}$	60	80	100	120	V
V_{EBO}	5				V
I_C	50				A
I_B	1				A
P_T					
$T_C \leq 25°C$	300				W
$T_C > 25°C$ 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.

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

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

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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				—	0.5	—	—	—	—	—	—	mA
	70				—	—	—	0.5	—	—	—	—	
	90				—	—	—	—	—	0.5	—	—	
	110				—	—	—	—	—	—	—	0.5	
I_{EBO}		-5			—	5	—	5	—	5	—	5	mA
V_{CEO}(sus)	a		0.1[b]		60	—	80	—	100	—	120	—	V
h_{FE}	3		25		2000	—	2000	—	2000	—	2000	—	
	5		50		400	—	400	—	400	—	400	—	
V_{BE}(sat)			25	0.2	—	3	—	3	—	3	—	3	V
			50	0.3	—	4.5	—	4.5	—	4.5	—	4.5	
V_{CE}(sat)			25	0.25	—	2.5	—	2.5	—	2.5	—	2.5	V
			50	0.5	—	3.5	—	3.5	—	3.5	—	3.5	
$I_{s/b}$ 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_{fe} at f = 1 MHz					Typ. 5		Typ. 5		Typ. 5		Typ. 5		
$R\theta_{JC}$					—	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 μs, duty factor < 2%.

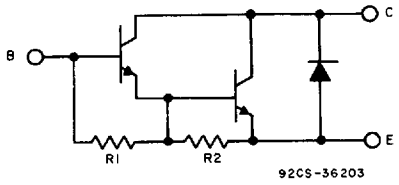


Fig. 1 - Schematic diagram for RCA9228A, RCA9228B, RCA9228C, RCA9228D.

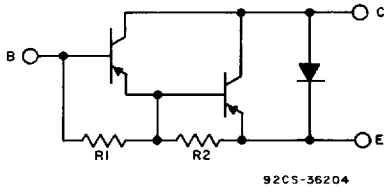
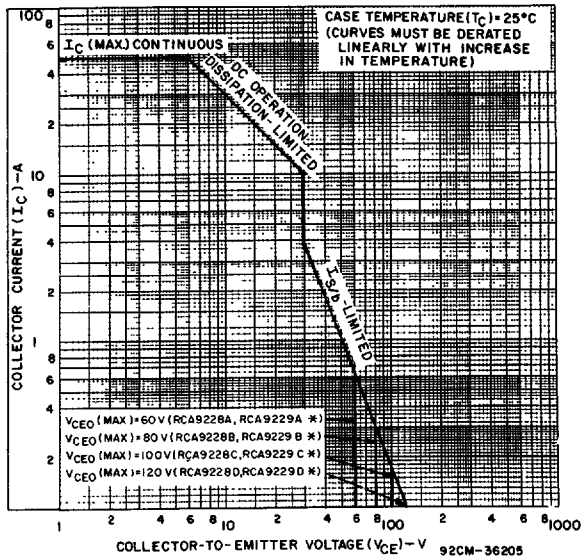


Fig. 2 - Schematic diagram for RCA9229A, RCA9229B, RCA9229C, RCA9229D.



*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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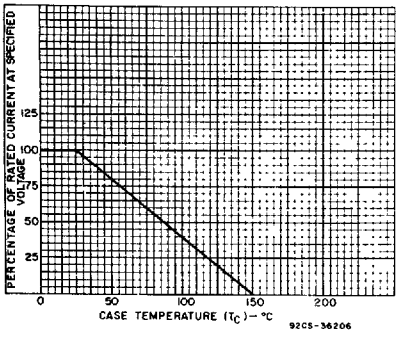

Fig. 4 - Current derating curve for all types.

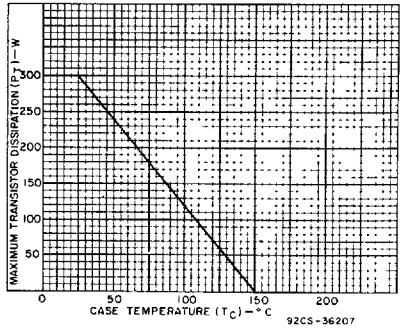

Fig. 5 - Power derating curve for all types.

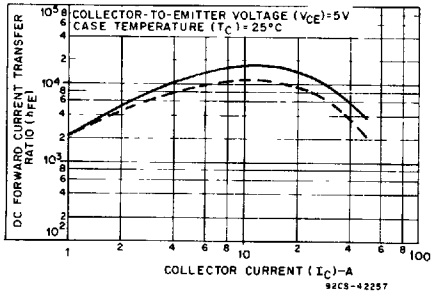

Fig. 6 - Typical dc beta characteristics for all types.

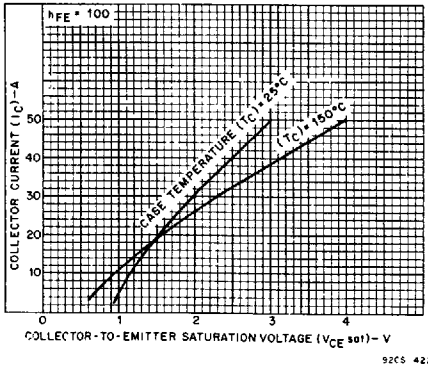

Fig. 7 - Typical collector-to-emitter saturation voltage characteristics for RCA9228A, RCA9228B, RCA9228C and RCA9228D.

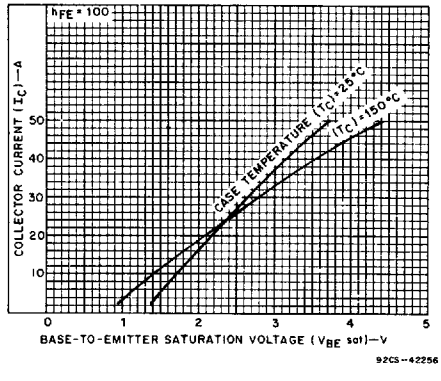

Fig. 8 - Typical base-to-emitter saturation voltage characteristics for RCA9228A, RCA9228B, RCA9228C and RCA9228D.

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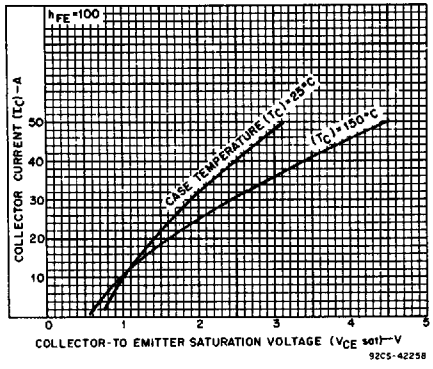

Fig. 9 - Typical collector-to-emitter saturation voltage characteristics for RCA9229A, RCA9229B, RCA9229C and RCA9229D.

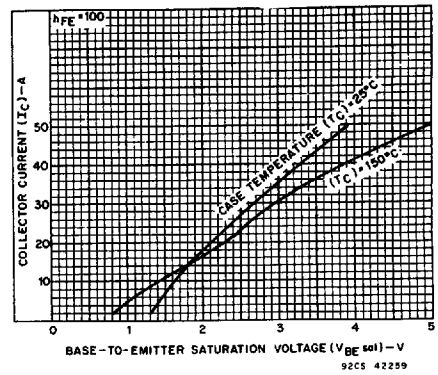

Fig. 10 - Typical base-to-emitter saturation voltage characteristics for RCA9229A, RCA9229B, RCA9229C and RCA9229D.