

RCA1000, RCA1001

File Number 594

8-Ampere Silicon N-P-N Darlington Power Transistors

For Use as Output Devices in General-Purpose
Switching and Amplifier Applications

Features:

- High dc current gain:
 $h_{FE} = 1000$ min. at $I_C = 3$ A
- Monolithic construction

RCA1000 and 1001 are monolithic silicon n-p-n Darlington transistors intended for medium-power applications as output devices. The construction of these units provides good forward-bias second-breakdown capability. Their high gain makes it possible for them to be driven directly from integrated circuits.

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

TERMINAL DESIGNATIONS

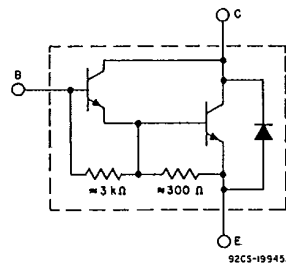
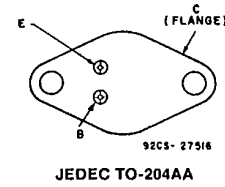


Fig. 1 — Schematic diagram for all types.

MAXIMUM RATINGS, Absolute-Maximum Values:

	RCA-1000	RCA-1001	
COLLECTOR-TO-BASE VOLTAGE:			
With emitter open	V _{CBO} 60	80	V
COLLECTOR-TO-EMITTER VOLTAGE:			
With base open	V _{CEO} 60	80	V
EMITTER-TO-BASE VOLTAGE:			
With collector open	V _{EBO} 5	5	V
COLLECTOR CURRENT:			
Continuous	I _C 8	8	A
Pulsed	15	15	A
BASE CURRENT (Continuous)	I _B 0.1	0.1	A
TRANSISTOR DISSIPATION:			
At case temperatures up to 25°C	P _T 90	90	W
At case temperatures above 25°C, derate linearly at	0.515		W/°C
TEMPERATURE RANGE:			
Storage & Operating (Junction)	-55 to +200		°C
LEAD TEMPERATURE (During Soldering):			
At distance ≥ 1/8 in. (3.17 mm) from case to 10 s max.	235		°C

ELECTRICAL CHARACTERISTICS, At Case Temperature (T_C) = 25°C unless otherwise specified

CHARACTERISTIC	SYMBOL	TEST CONDITIONS				LIMITS				UNITS	
		DC VOLTAGE (V)			DC CURRENT (A)		RCA 1000		RCA 1001		
		V _{CB}	V _{CE}	V _{BE}	I _C	I _B	MIN.	MAX.	MIN.		MAX.
Collector Cutoff Current: With base open	I _{CEO}		30 40			0 0	— —	500 —	— —	— 500	μA
With external base-to-emitter resistance (R _{BE}) = 1 kΩ	I _{CER}	60 80					— —	1 —	— —	— 1	mA
At T _C = 150°C		60 80					— —	5 —	— —	— 5	
Emitter Cutoff Current	I _{EBO}			5	0		—	2	—	2	mA
Collector-to-Emitter Breakdown Voltage	V _{(BR)CEO}				0.1 [‡] 0.1 [‡]	0 0	60 —	— —	— 80	— —	V
DC Forward Current Transfer Ratio	h _{FE}		3 3		3 4		1000 750	— —	1000 750	— —	
Base-to-Emitter Voltage	V _{BE}		3		3 [‡]		—	2.5	—	2.5	V
Collector-to-Emitter Saturation Voltage	V _{CE(sat)}				3 [‡] 8 [‡]	0.012 0.04	— —	2 4	— —	2 4	V
Thermal Resistance (Junction-to-Case)	R _{θJC}						—	1.94	—	1.94	°C/W

[‡] Pulsed: Pulse duration ≤ 300 μs, duty factor ≤ 2%.

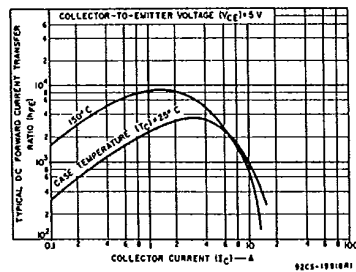


Fig. 2 — Typical dc beta characteristics for both types.

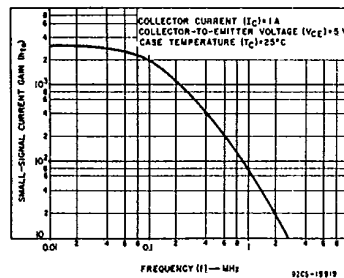


Fig. 3 — Typical small-signal gain for both types.

RCA1000, RCA1001

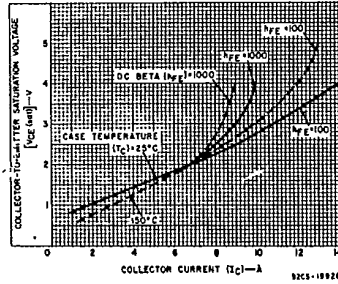


Fig. 4 — Typical saturation characteristics for both types.

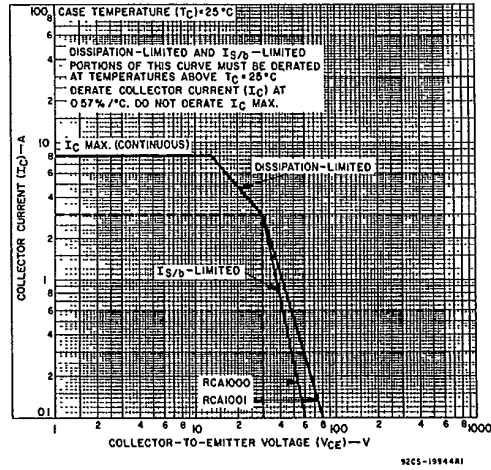


Fig. 5 — DC safe-area-of-operation for both types.