

RCA1000, RCA1001

File Number 594

T-33-29

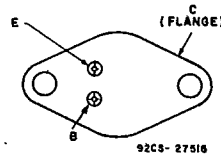
## 8-Ampere Silicon N-P-N Darlington Power Transistors

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

**Features:**

- High dc current gain:  
hFE = 1000 min. at IC = 3 A
- Monolithic construction

**TERMINAL DESIGNATIONS**



JEDEC TO-204AA

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.

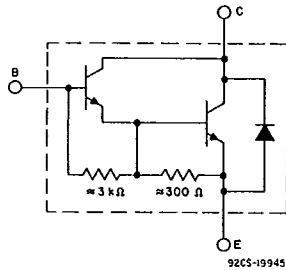


Fig 1 — Schematic diagram for all types.

**MAXIMUM RATINGS, Absolute-Maximum Values:**

		RCA-1000	RCA-1001	
COLLECTOR-TO-BASE VOLTAGE				
With emitter open	V <sub>CB0</sub>	60	80	V
COLLECTOR-TO-EMITTER VOLTAGE:				
With base open	V <sub>CE0</sub>	60	80	V
EMITTER-TO-BASE VOLTAGE				
With collector open	V <sub>EB0</sub>	5	5	V
COLLECTOR CURRENT:				
Continuous	I <sub>C</sub>	8	8	A
Pulsed		15	15	A
BASE CURRENT (Continuous)	I <sub>B</sub>	0.1	0.1	A
TRANSISTOR DISSIPATION	P <sub>T</sub>			
At case temperatures up to 25°C		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

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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 <sub>CB</sub>	V <sub>CE</sub>	V <sub>BE</sub>	I <sub>C</sub>	I <sub>B</sub>	MIN.	MAX.	MIN.	MAX.	
Collector Cutoff Current With base open	I <sub>CEO</sub>		30 40			0 0	- -	500 -	- -	- 500	μA
With external base-to-emitter resistance (R <sub>BE</sub> ) = 1 kΩ	I <sub>CER</sub>	60 80					- -	1 -	- -	- 1	mA
At T <sub>C</sub> = 150°C		60 80					- -	5 -	- -	- 5	
Emitter Cutoff Current	I <sub>EBO</sub>			5		0	-	2	-	2	mA
Collector-to-Emitter Breakdown Voltage	V <sub>(BR)CEO</sub>				0.1 <sup>a</sup> 0.1 <sup>a</sup>	0 0	60 -	- -	- 80	- -	V
DC Forward Current Transfer Ratio	h <sub>FE</sub>		3 3		3 4		1000 750	- -	1000 750	- -	
Base-to-Emitter Voltage	V <sub>BE</sub>		3		3 <sup>a</sup>		-	2.5	-	2.5	V
Collector-to-Emitter Saturation Voltage	V <sub>CE(sat)</sub>				3 <sup>a</sup> 8 <sup>a</sup>	0.012 0.04	-	2 4	-	2 4	V
Thermal Resistance (Junction-to-Case)	R <sub>θJC</sub>						-	1.94	-	1.94	°C/W

<sup>a</sup> Pulsed Pulse duration ≤ 300 μs, duty factor ≤ 2%.

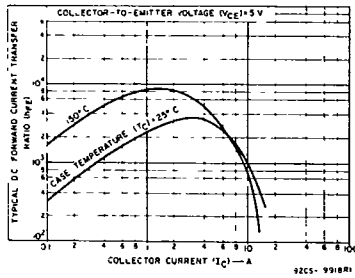


Fig 2 — Typical dc beta characteristics for both types.

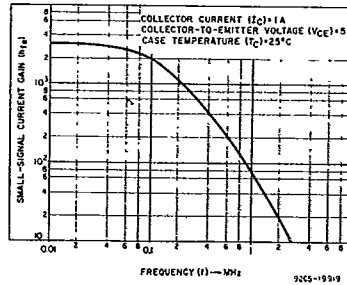


Fig 3 — Typical small-signal gain for both types.

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HARRIS SEMICONDUCTOR SECTOR

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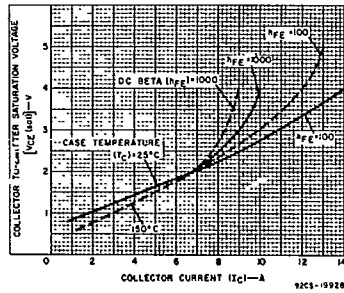


Fig. 4 — Typical saturation characteristics for both types.

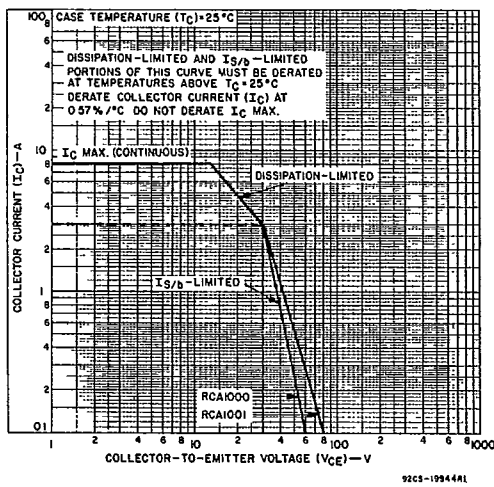


Fig. 5 — DC safe-area-of-operation for both types.