RCA
Solid State
Division

Power Transistors

RCA1000
RCA1001

H-1570 JEDEC TO-3

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 with built-in base-emitter shunt resistors**

RCA-1000 and 1001 are monolithic silicon n-p-n Darlington transistors intended for medium-power applications as output devices. The double epitaxial construction of these units provides good forward and reverse second-breakdown capability. Their high gain makes it possible for them to be driven directly from integrated circuits.

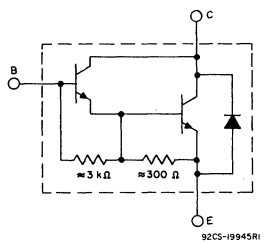

Fig.1—Schematic diagram of RCA-1000 and RCA 1001 Darlington power transistors.

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:	I_C			
Continuous		8	8	A
Pulsed		15	15	A
BASE CURRENT (Continuous)	I_B	0.1	0.1	A
TRANSISTOR DISSIPATION:	P_T			
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

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			0	–	500	–	–	μA
			40			0	–	–	–	500	
With external base-to-emitter resistance (R_{BE}) = 1 kΩ	I_{CER}	60					–	1	–	–	mA
		80					–	–	–	1	
At T_C = 150°C		60					–	5	–	–	
		80					–	–	–	5	
Emitter Cutoff Current	I_{EBO}			5	0		–	2	–	2	mA
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$				0.1[a]	0	60	–	–	–	V
					0.1[a]	0	–	–	80	–	
DC Forward Current Transfer Ratio	h_{FE}		3		3		1000	–	1000	–	
			3		4		750	–	750	–	
Base-to-Emitter Voltage	V_{BE}		3		3[a]		–	2.5	–	2.5	V
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$				3[a]	0.012	–	2	–	2	V
					8[a]	0.04	–	4	–	4	
Thermal Resistance (Junction-to-Case)	$R_{\theta JC}$						–	1.94	–	1.94	°C/W

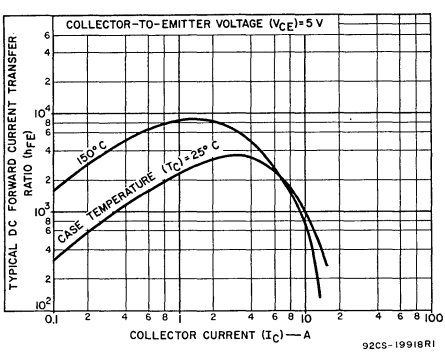

Fig.2—Typical dc beta characteristics for both types.

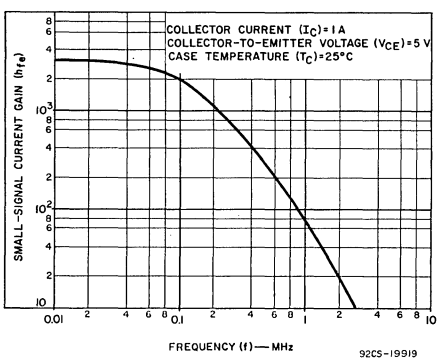

Fig.3—Typical small-signal gain for both types.

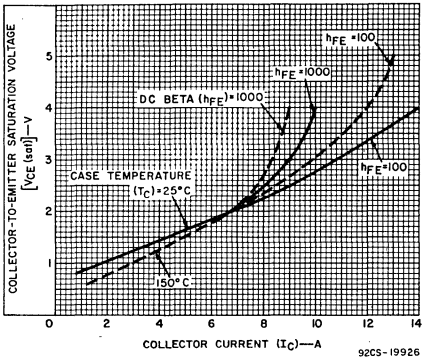

Fig.4—Typical saturation characteristics for both types.

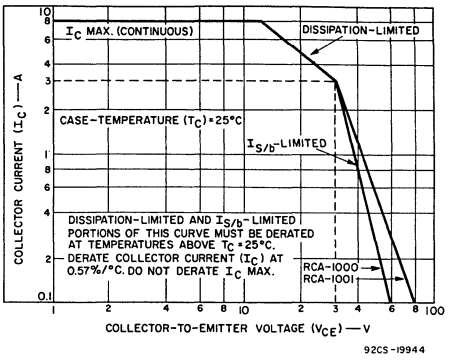

Fig.5—DC safe-area-of-operation for both types.

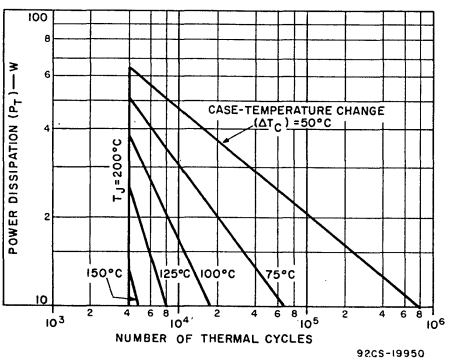

Fig.6—Thermal-cycling rating chart for both types.

TERMINAL CONNECTIONS

Pin 1 — Base
Pin 2 — Emitter
Case — Collector
Mounting Flange — Collector