

High-Voltage Silicon P-N-P Transistor

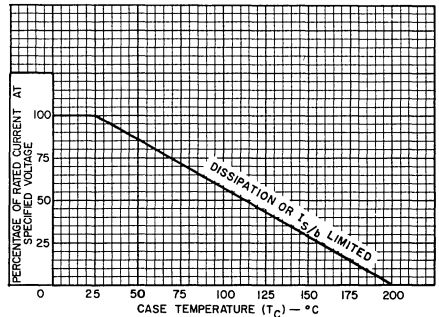
For High-Speed Switching and Linear-Amplifier Applications in Industrial and Commercial Equipment

Features:

- Maximum safe-area-of-operation curves
- High voltage ratings:
 $V_{CEO(sus)} = -250$ V min.

The RCA-RCS881 is an epitaxial silicon p-n-p transistor with high breakdown voltages, high frequency response, and fast switching speeds. It is provided in the JEDEC TO-39 hermetic package.

Typical applications include high-voltage differential and operational amplifiers; high-voltage inverters; and high-voltage, low-current switching and series regulators.



92LS-1469RI

Fig. 1 - Dissipation derating curve.

MAXIMUM RATINGS, Absolute-Maximum Values:

COLLECTOR-TO-BASE VOLTAGE	V_{CBO}	-250	V
COLLECTOR-TO-EMITTER SUSTAINING VOLTAGE:			
With base open	$V_{CEO(sus)}$	-250	V
EMITTER-TO-BASE VOLTAGE	V_{EBO}	-4	V
COLLECTOR CURRENT	I_C	-1	A
BASE CURRENT	I_B	-0.5	A
TRANSISTOR DISSIPATION:	P_T		
At case temperatures up to 25°C		7.5	W
At case temperatures above 25°C		See Figs. 1 and 4	
At ambient temperatures up to 50°C		0.75	W
At ambient temperatures above 50°C	Derate linearly at	5	mW/°C
TEMPERATURE RANGE:			
Storage and Operating (Junction)		-65 to +200	°C
At distance \geq 1/32 in. (0.8 mm) from seating plane for 10 s max.		255	°C

ELECTRICAL CHARACTERISTICS, Case Temperature (T_C) = 25°C

CHARACTERISTIC	SYMBOL	TEST CONDITIONS					LIMITS		UNITS
		VOLTAGE V dc			CURRENT mA dc		RCS881		
		V _{CB}	V _{CE}	V _{BE}	I _C	I _B	Min.	Max.	
Collector-Cutoff Current: With emitter open	I _{CBO}	-175					-	-50	μA
With base open	I _{CEO}		-150			0	-	-50	μA
With base-emitter junction reverse-biased	I _{CEV}		-200	1.5			-	-50	μA
Emitter-Cutoff Current	I _{EBO}			4	0		-	-20	μA
DC Forward-Current Transfer Ratio	h _{FE}		-10		-35 ^b		20	-	
Collector-to-Emitter Sustaining Voltage: With base open	V _{CEO(sus)}				-50	0	-250 ^a	-	V
Base-to-Emitter Saturation Voltage	V _{BE}		-10		-50 ^b		-	-1.5	V
Collector-to-Emitter Saturation Voltage	V _{CE(sat)}				-50 ^b	-5	-	-3	V
Magnitude of Common-Emitter, Small-Signal, Short-Circuit Forward-Current Transfer Ratio: f = 5 MHz	h _{fe}		-10		-10		3	-	
Real Part of Common-Emitter Small-Signal, Short-Circuit Impedance: f = 1 MHz	Re(h _{ie})		-10		-5		-	300	Ω
Common-Base, Short-Circuit, Input Capacitance: f = 1 MHz	C _{ib}				5	0	-	75	pF
Output Capacitance: f = 1 MHz	C _{ob}	-10					-	15	pF
Forward-Bias, Second-Breakdown Collector Current: 0.4-s, non-repetitive pulse	I _{S/b}		-75				-100	-	mA
Thermal Resistance: Junction-to-Case	R _{θJC}						-	23.3	°C/W

^aCAUTION: The sustaining voltage V_{CEO(sus)} MUST NOT be measured on a curve tracer. The sustaining voltage should be measured by means of the test circuit shown in Fig. 2.

^bPulsed: Pulse = 300 μs; duty factor ≤ 2%.

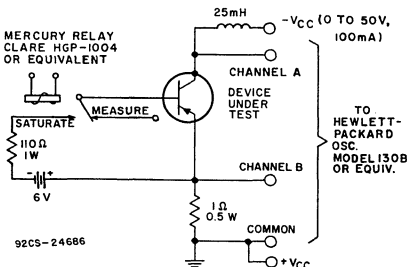
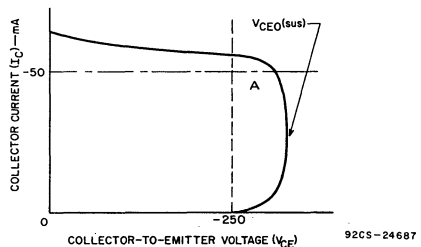
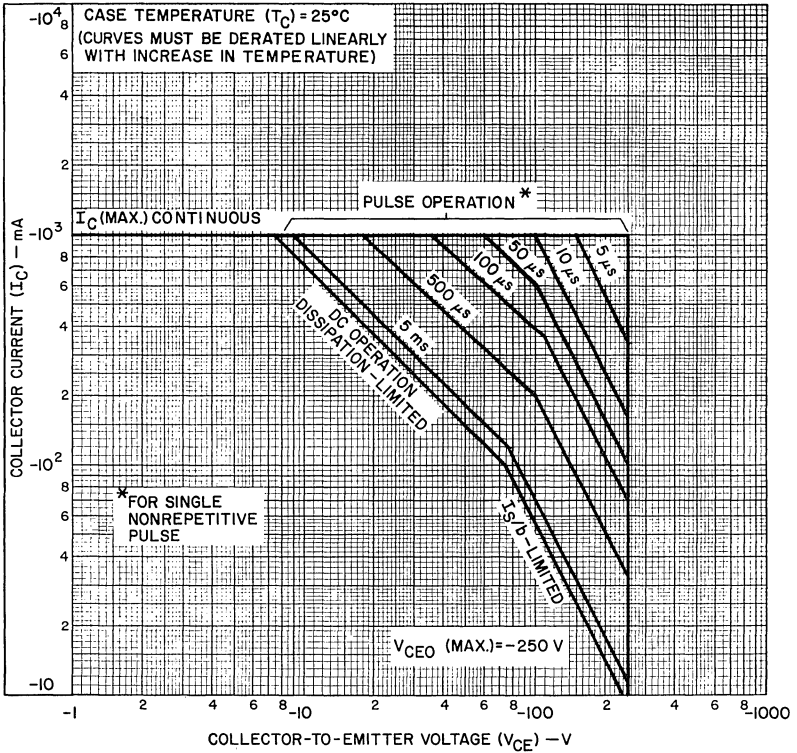


Fig. 2 - Circuit used to measure sustaining voltage V_{CEO(sus)}.



The sustaining voltage V_{CEO(sus)} is acceptable when the trace falls to the right and above point "A"

Fig. 3 - Oscilloscope display for measurement of sustaining voltages (test circuit shown in Fig. 2).



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Fig. 4 - Maximum safe operating areas.

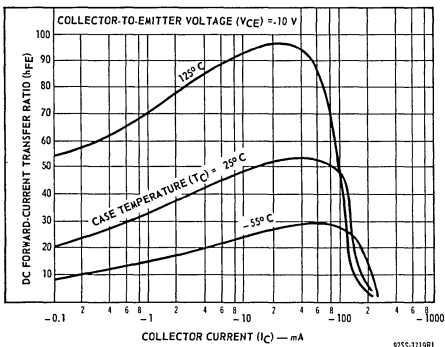


Fig. 5 - Typical dc beta characteristics.

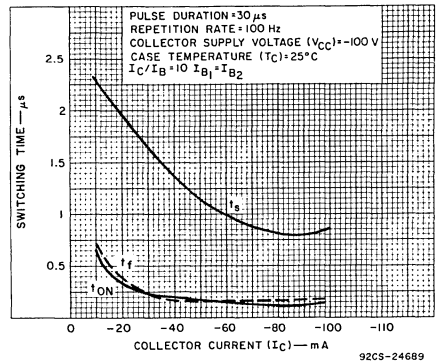


Fig. 6 - Typical saturated switching times.

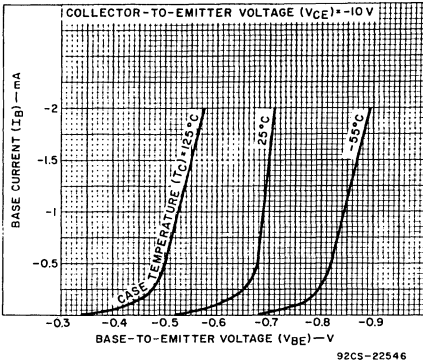


Fig. 7 — Typical input characteristics.

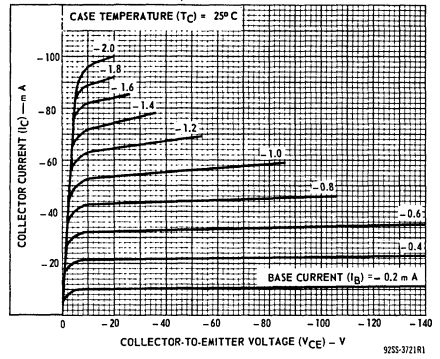


Fig. 8 — Typical output characteristics.

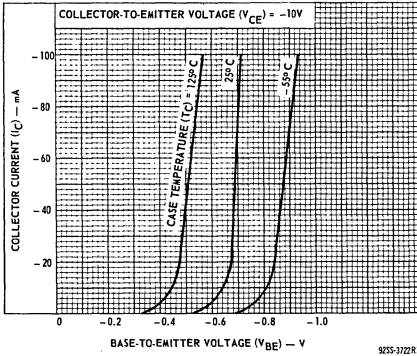


Fig. 9 — Typical transfer characteristics.

TERMINAL CONNECTIONS

- Lead 1 — Emitter
- Lead 2 — Base
- Lead 3 — Collector, Case