

2N2270

File Number 24

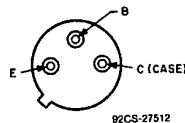
Silicon N-P-N Planar Transistor

General-Purpose Type for Small-Signal,
Medium-Power Applications

Features:

- Minimum gain-bandwidth product = 100 MHz;
useful in applications from dc to 20 MHz
- Operation at high junction temperatures
- Planar construction for low-noise and low-leakage characteristics
- Very low output capacitances

TERMINAL DESIGNATIONS



JEDEC TO-205AD

The RCA-2N2270 is a silicon n-p-n planar transistor intended for a wide variety of small-signal and medium-power applications in military and industrial equipment. It features exceptionally low noise and leakage characteristics, and very low output capacitance.

The 2N2270 is supplied in a TO-205AD package.

MAXIMUM RATINGS, Absolute-Maximum Values:

* COLLECTOR-TO-BASE VOLTAGE.....	V_{CB0}	60	V
* COLLECTOR-TO-EMITTER VOLTAGE:			
With external base-to-emitter resistance (R_{BE}) $\leq 10 \Omega$	V_{CER}	60	V
With base open.....	V_{CEO}	45	V
* EMITTER-TO-BASE VOLTAGE.....	V_{EB0}	7	V
* COLLECTOR CURRENT.....	I_C	1	A
* TRANSISTOR DISSIPATION:	P_T		
At case temperatures up to 25°C.....		5	W
At case temperatures above 25°C.....		See Fig. 1	
At free-air temperatures up to 25°C.....		1	W
At free-air temperatures above 25°C.....		See Fig. 1	
* TEMPERATURE RANGE:			
Storage and operating (Junction).....	T_{stg}, T_J	-65 to +200	°C
* LEAD TEMPERATURE (During soldering):			
At distance $\geq 1/16$ in. (1.58 mm) from seating plane for 10 s max.....	T_L	255	°C

* In accordance with JEDEC registration data format (JS-6 RDF-1).

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

CHARACTERISTIC	TEST CONDITIONS					LIMITS		UNITS
	VOLTAGE V dc			CURRENT mA dc		2N2270		
	V_{CB}	V_{CE}	V_{BE}	I_C	I_B	Min.	Max.	
* I_{CBO} $T_C = 150^\circ\text{C}$	60 60					— —	0.05 50	μA
* I_{EBO}			-5	0		—	0.1	μA
* $V_{(BR)EBO}$ $I_E = 0.1 \text{ mA}$				0		7	—	V
* $V_{(BR)CBO}$				0.1		60	—	V
* $V_{CER(sus)}^a$ $R_{BE} = 10 \Omega$				100 ^b		60	—	V
* $V_{CEO(sus)}^a$				100 ^b	0	45	—	V
* $V_{CE(sat)}$				150 ^b	15		0.9	
* $V_{BE(sat)}$				150	15	—	1.2	V
* h_{FE}		10 10		150 ^b 1		50 30	200 —	
* h_{fe} $f = 1 \text{ kHz}$		10		5		50	275	
* $ h_{fe} $ $f = 20 \text{ MHz}$		10		50		5	—	
* f_T		10		50		100	—	MHz
* NF $f = 1 \text{ kHz}$ $R_G = 1 \text{ K}\Omega$ $BW = 1 \text{ Hz}$		10		0.3		—	10	dB
* $t_{ON} + t_{OFF}$ (See Fig. 8)							30	ns
* C_{ob} $I_E = 0$	10					—	15	pF
* C_{ib}			-0.5	0		—	80	pF
* $R_{\theta JC}$						—	35	$^\circ\text{C/W}$
* $R_{\theta JA}$						—	175	

* In accordance with JEDEC registration data

a CAUTION: The sustaining voltages $V_{CEO(sus)}$ and $V_{CER(sus)}$ MUST NOT be measured on a curve tracer.b Pulsed; pulse duration $\leq 300 \mu\text{s}$, duty factor $\leq 1.8\%$.

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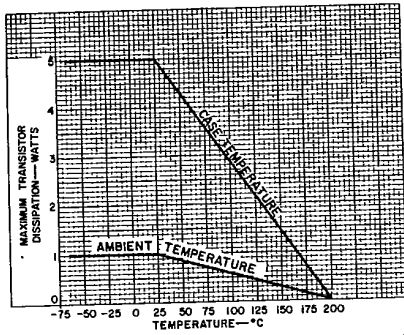


Fig. 1 - Rating Chart.

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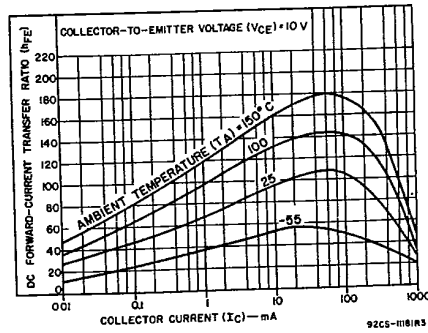


Fig. 2 - Typical dc forward-current transfer ratio characteristics.

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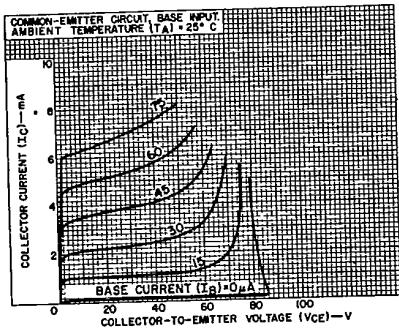


Fig. 3 - Typical collector characteristics.

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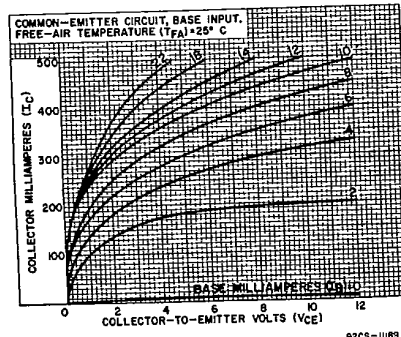


Fig. 4 - Typical collector characteristics.

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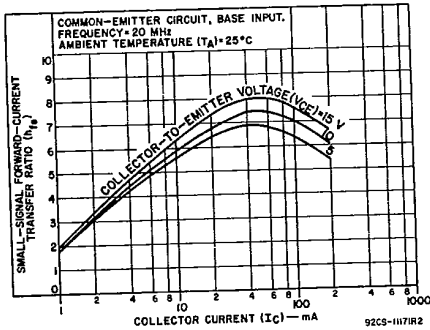


Fig. 5 - Typical small-signal forward-current ratio characteristics.

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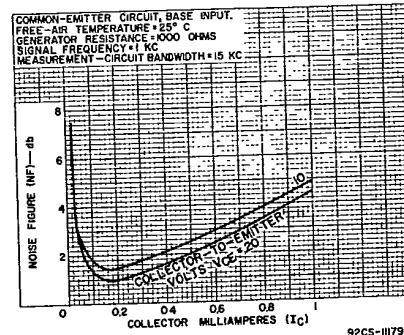


Fig. 6 - Typical af noise-figure characteristics.

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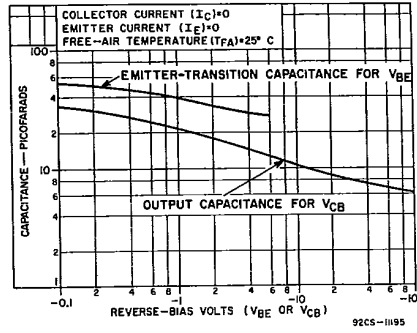


Fig. 7 - Typical emitter-transition-capacitance and output-capacitance characteristics.

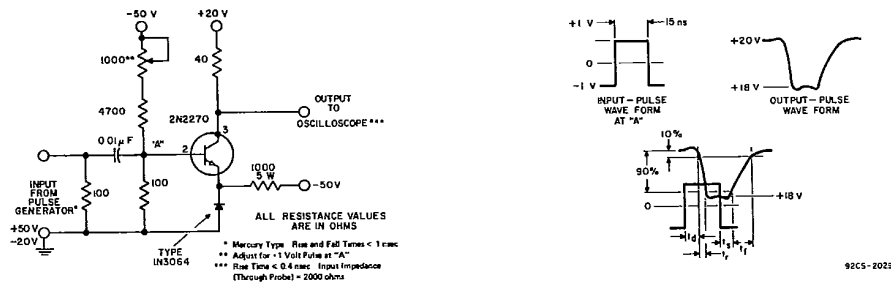


Fig. 8 - Test circuit for measurement of saturated switching time and associated waveforms.