General-Purpose Power Transistors

File Number 141

2N1700

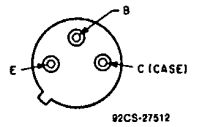
Silicon N-P-N Power-Switching Transistor

For Switching Applications

Features:

- *Operation at high junction temperatures*

TERMINAL DESIGNATIONS



JEDEC TO-205AD

The RCA-2N1700 silicon n-p-n transistor is intended for a wide variety of uses in industrial equipment. They are particularly useful in applications such as inverters, choppers, voltage and current regulators, and relay-actuating circuits.

The 2N1700 is supplied in a JEDEC TO-205AD package.

MAXIMUM RATINGS, *Absolute-Maximum Values:*

	2N1700	
* V_{CBO}	60	V
* V_{CEX}		
V_{BE} = -1.5 V	60	V
* $V_{CEO(SUS)}$	40	V
* V_{EBO}	6	V
* I_C	1	A
* I_B	0.75	A
* P_T		
$T_C \leq 25°C$	5	W
$T_C > 25°C$ ..... Derate linearly	0.029	°C/W
* T_{stg}, T_J	-65 to +200	°C
* T_L		
At distance ≥ 1/16 in. ± 1/32 in. (1.58 mm ± 0.8 mm) from seating plane for 10 s max.	255	°C

*In accordance with JEDEC registration data format.

General-Purpose Power Transistors

2N1700

ELECTRICAL CHARACTERISTICS, *T_C=25° C Unless Otherwise Specified*

CHARACTERISTIC	TEST CONDITIONS				LIMITS		UNITS
	VOLTAGE V dc		CURRENT A dc		2N1700		
	V_{CE}	V_{BE}	I_C	I_B	Min.	Max.	
* I_{CBO}							
V_{CB}=30 V					—	75	μA
V_{CB}=60 V					—	25	
* T_C=150° C, V_{CB}=30 V					—	1	mA
* I_{EBO}		-6	0		—	25	μA
* V_{CEO}(sus)			0.05[a]	0	40[b]	—	V
* V_{CEX}		-1.5	0.0005		60[b]	—	V
* h_{FE}	4		0.1[a]		20	80	
	20		1[a]		6	—	
* V_{BE}	4		0.1		—	2	V
	20		1		—	12.5	
* r_{CE}(sat)			0.1	0.01	—	10	Ω
* V_{CE}(sat)			1[a]	0.5	—	12	V
h_{fe} f=1 MHz	4		5		40	—	
f_{hfb}							
* V_{CB}=6 V				0.005	400	—	kHz
V_{CB}=28 V			0.0005		1.2 (typ.)		MHz
C_{obo} V_{CB}=40 V, f=1 MHz					150 (typ.)		pF
τ_1					10 (typ.)		ms
* $R_{\theta JC}$					—	35	°C/W
* $R_{\theta JA}$					—	200	

*In accordance with JEDEC registration data format.

[a]Pulsed: pulse duration = 300 μs, duty factor ≤ 2%.

[b]CAUTION: The sustaining voltages V_{CEO}(sus) and V_{CEX}(sus) MUST NOT be measured on a curve tracer.

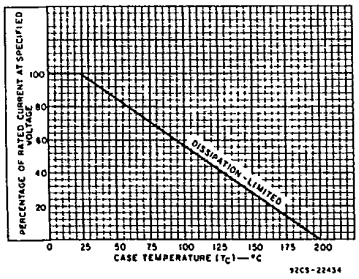


Fig. 1 - Derating curve.

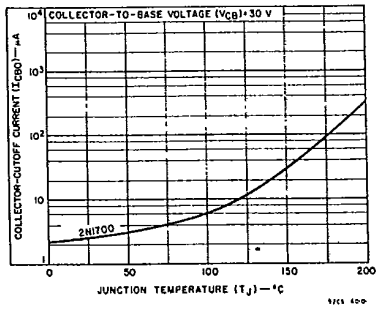


Fig. 2 - Typical collector-cutoff current characteristics.

2N1700

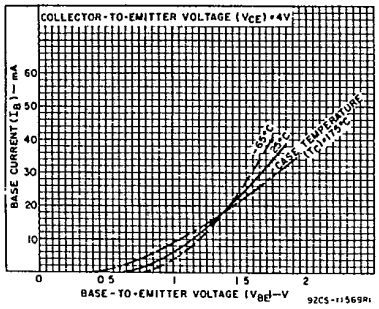


Fig. 3 - Typical input characteristics.

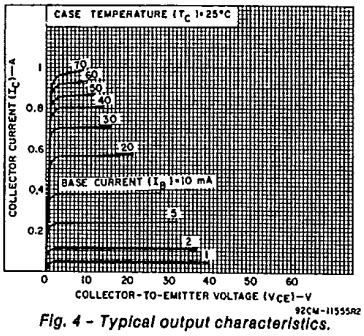


Fig. 4 - Typical output characteristics.

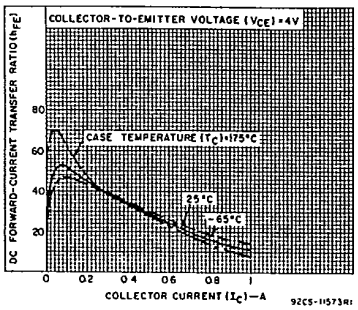
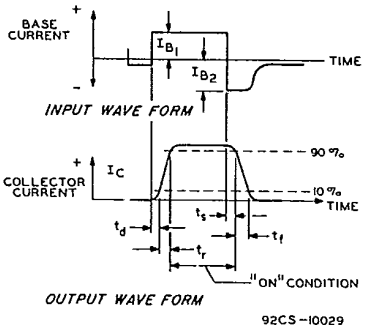
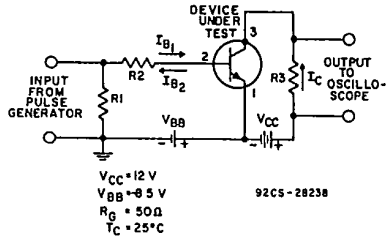


Fig. 5 - Typical dc beta characteristics.





		2N1700	
Test Conditions:			
R_1	1 W	50	Ω
R_2	1 W	700	Ω
R_3	2 W	59	Ω
I_C		200	mA
I_{B1}		20	mA
I_{B2}		-8.5	mA
Switching Times:			
t_d		0.2	μs
t_r		1	μs
t_s		0.6	μs
t_f		1	μs

Fig. 6 - Test circuit and oscilloscope display for measurement of switching times.