Epitaxial-Base, Silicon P-N-P VERSAWATT Transistors

For Power-Amplifier and High-Speed-Switching Applications

Features:

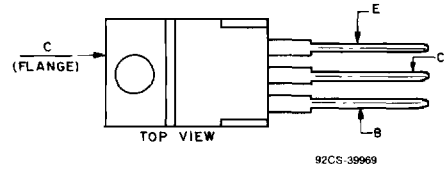
- *30 W at 25°C case temperature*
- *3 A rated collector current*
- *Min. f_T of 3 MH_z at -10 V, -200 mA*
- *Designed for complementary use with TIP29-series n-p-n types**

The RCA-TIP30, TIP30A, TIP30B, and TIP30C are epitaxial-base, silicon p-n-p transistors intended for a wide variety of switching and amplifier applications, such as series and shunt regulators and driver and output stages of high-fidelity amplifiers. These power transistors are designed for complementary use with devices in the TIP29 series. They differ from each other in voltage ratings.

They are supplied in the JEDEC TO-220AB (VERSAWATT) plastic package.

* Technical data for the TIP29-series devices are given in RCA data bulletin File No. 990

TERMINAL DESIGNATIONS



JEDEC TO-220AB

MAXIMUM RATINGS, *Absolute-Maximum Values:*

	TIP30	TIP30A	TIP30B	TIP30C	
V_{CBO}	-40	-60	-80	-100	V
V_{CEO}	-40	-60	-80	-100	V
V_{EBO}	-5	-5	-5	-5	V
I_C	-3	-3	-3	-3	A
I_B	-1	-1	-1	-1	A
P_T:					
At $T_C \leq 25°C$	30	30	30	30	W
At $T_A \leq 25°C$	2	2	2	2	W
At $T_C > 25°C$ ... Derate linearly	0.24				W/°C
T_{stg}, T_J	-65 to 150				°C
T_L (During soldering):					
At distance 1/8 in. (3.17 mm) from case for 10 s max.	235				°C

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

CHARACTERISTIC	TEST COND. VOLTAGE V dc	TEST COND. CURRENT A dc	LIMITS TIP30		TIP30A		TIP30B		TIP30C		Units
	V_{CE}	I_C	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
I_{CEO} I_B=0	−30 −60		– –	−0.3 –	– –	−0.3 –	– –	– −0.3	– –	– −0.3	mA
I_{CES} V_{EB}=0	−40 −60 −80 −100		– – – –	−0.2 – – –	– – – –	– −0.2 – –	– – – –	– – −0.2 –	– – – –	– – – −0.2	mA
I_{EBO} V_{BE}=5V		0	–	−1	–	−1	–	−1	–	−1	mA
$V_{CEO(sus)}$ I_B=0		−0.03[a]	−40[b]	–	−60[b]	–	−80[b]	–	−100[b]	–	V
h_{FE}	−4 −4	−0.2[a] −1[a]	40 15	– 150	40 15	– 150	40 15	– 150	40 15	– 150	
V_{BE}	−4	−1[a]	–	−1.3	–	−1.3	–	−1.3	–	−1.3	V
$V_{CE(sat)}$ I_B= −0.125A		−1[a]	–	−0.7	–	−0.7	–	−0.7	–	−0.7	V
h_{fe} f=1 kHz	−10	−0.2	20	–	20	–	20	–	20	–	
$\|h_{fe}\|$ f=1 MHz	−10	−0.2	3	–	3	–	3	–	3	–	
t_{ON} (t_d+t_r) V_{CC}= −30V R_L=30Ω I_{B1}=−I_{B2} =−0.1A		−1	0.2 (typ.)		0.2 (typ.)		0.2 (typ.)		0.2 (typ.)		μs
t_{OFF} (t_s+t_f) V_{CC}= −30V R_L=30Ω I_{B1}=I_{B2} =−0.1A		−1	1 (typ.)		1 (typ.)		1 (typ.)		1 (typ.)		μs
$R_{\theta JC}$			–	4.17	–	4.17	–	4.17	–	4.17	°C/W
$R_{\theta JA}$			–	62.5	–	62.5	–	62.5	–	62.5	°C/W

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

b *CAUTION:* Sustaining voltage, $V_{CEO(sus)}$, *MUST NOT* be measured on a curve tracer.

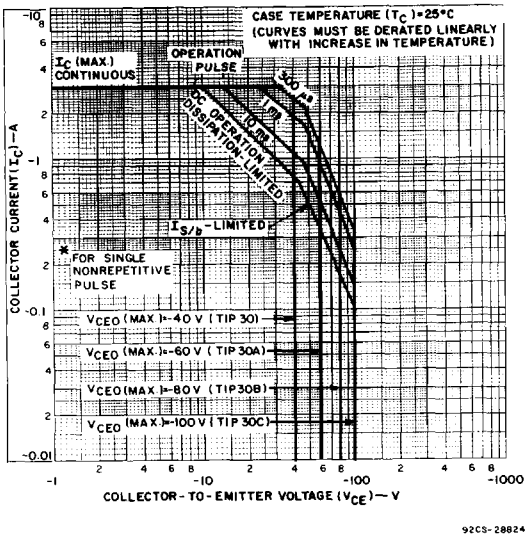


Fig. 1 — Maximum operating areas for all types.

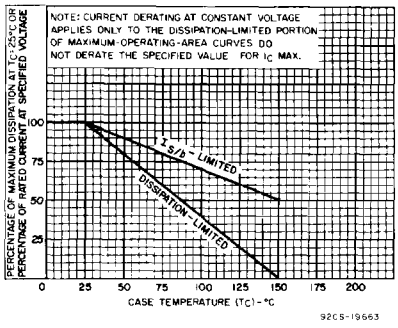


Fig. 2 — Derating curve for all types.

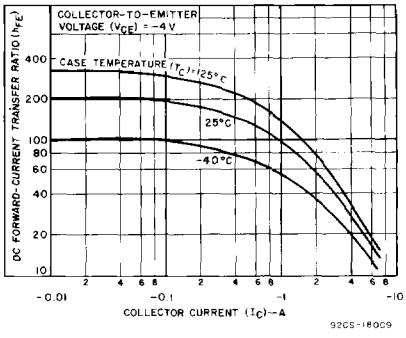


Fig. 3 — Typical dc beta characteristics for TIP30, TIP30A, and TIP30B.

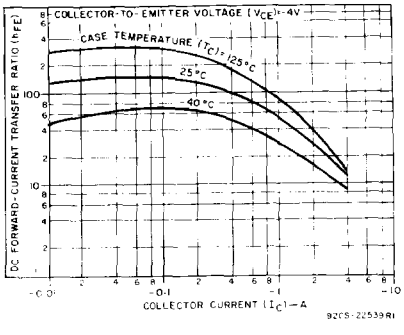


Fig. 4 — Typical dc beta characteristics for TIP30C.

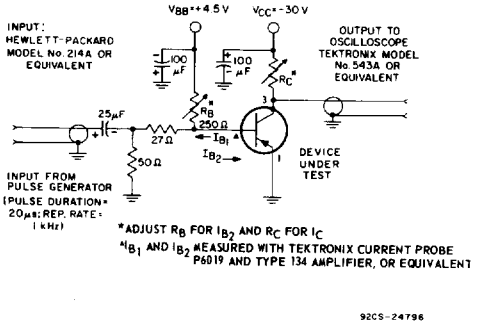


Fig. 5 — Circuit used to measure saturated switching times for all types.

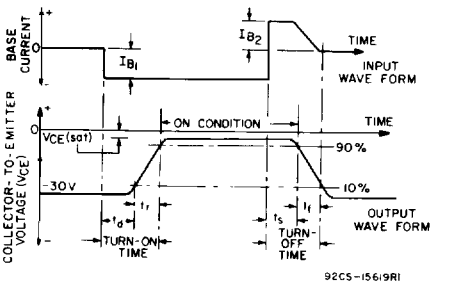


Fig. 6 — Oscilloscope display for measurement of switching times.