

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

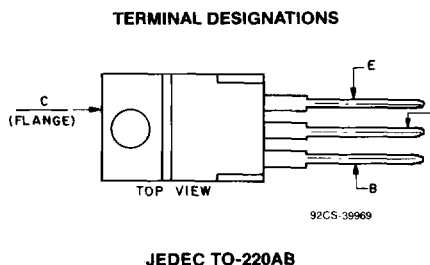
For Power-Amplifier and High-Speed-Switching Applications

Features:

- 65 W at 25°C case temperature
- 7 A rated collector current
- Min. f_T of 3 MHz at 10V, 500 mA
- Designed for complementary use with TIP42-series p-n-p types*

The RCA-TIP41, TIP41A, TIP41B, and TIP41C are epitaxial-base silicon n-p-n 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 TIP42-series. They differ from each other in voltage ratings. They are supplied in the JEDEC TO-220AB (VERSAWATT) plastic package.

* Technical data for the TIP42-series devices are given in RCA data bulletin File No. 996



MAXIMUM RATINGS, Absolute-Maximum Values:

	TIP41	TIP41A	TIP41B	TIP41C	
V_{CE0}	40	60	80	100	V
V_{CEO}	40	60	80	100	V
V_{EBO}	5	5	5	5	V
I_C	7	7	7	7	A
I_{CM}	10	10	10	10	A
I_B	3	3	3	3	A
P_T :					
At $T_C \leq 25^\circ\text{C}$	65	65	65	65	W
At $T_A \leq 25^\circ\text{C}$	2	2	2	2	W
At $T_C > 25^\circ\text{C}$	Derate linearly at			0.52	W/°C
T_{stg}, T_J				-65 to 150	W
T_L (During soldering):					
At distances 1/8 in. (3.17 mm)					
from case for 10 s max.				235	°C

TIP41, TIP41A, TIP41B, TIP41C

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

CHARACTERISTIC	TEST CONDITIONS		LIMITS								Units
	Voltage V dc	Current A dc	TIP41		TIP41A		TIP41B		TIP41C		
	V_{CE}	I_C	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
I_{CEO} $I_B=0$	30		–	0.7	–	0.7	–	–	–	–	mA
	60		–	–	–	–	–	0.7	–	0.7	
I_{CES} $V_{BE}=0$	40		–	0.4	–	–	–	–	–	–	mA
	60		–	–	–	0.4	–	–	–	–	
	80		–	–	–	–	–	0.4	–	–	
	100		–	–	–	–	–	–	–	0.4	
I_{EBO} $V_{BE}=-5$ V		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	0.3 ^a	30	–	30	–	30	–	30	–	
	4	3 ^a	15	150	15	150	15	150	15	150	
V_{BE}	4	6 ^a	–	2.2	–	2.2	–	2.2	–	2.2	V
$V_{CE(sat)}$ $I_B=0.6$ A		6 ^a	–	2	–	2	–	2	–	2	V
h_{fe} f=1 kHz	10	0.5	20	–	20	–	20	–	20	–	
$ h_{fe} $ f=1 MHz	10	0.5	3	–	3	–	3	–	3	–	
t_{ON} ($t_d + t_r$) $V_{CC}=30$ V, $R_L=5$ Ω , $I_{B1}=I_{B2}=0.6$ A		6	0.6 (typ.)		0.6 (typ.)		0.6 (typ.)		0.6 (typ.)		μ s
t_{OFF} ($t_s + t_f$) $V_{CC}=30$ V, $R_L=5$ Ω , $I_{B1}=I_{B2}=0.6$ A		6	1.4 (typ.)		1.4 (typ.)		1.4 (typ.)		1.4 (typ.)		
$R_{\theta JC}$			–	1.92	–	1.92	–	1.92	–	1.92	°C/W
$R_{\theta JA}$			–	62.5	–	62.5	–	62.5	–	62.5	

^a Pulsed, pulse duration = 300 μ s, duty factor \leq 2%.

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

TIP41, TIP41A, TIP41B, TIP41C

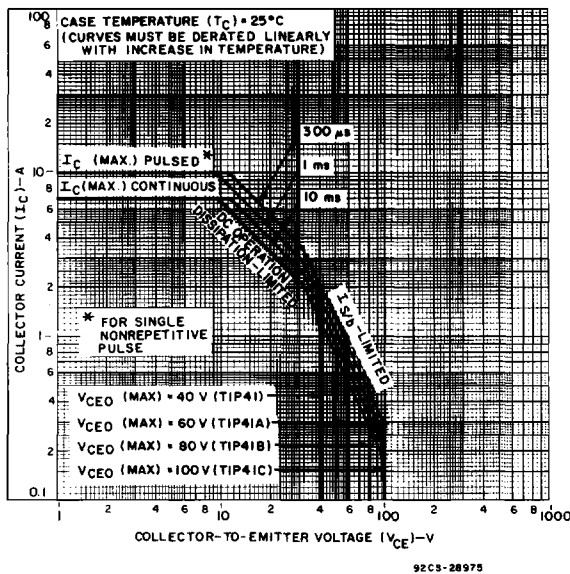


Fig. 1 — Maximum operating areas for all types.

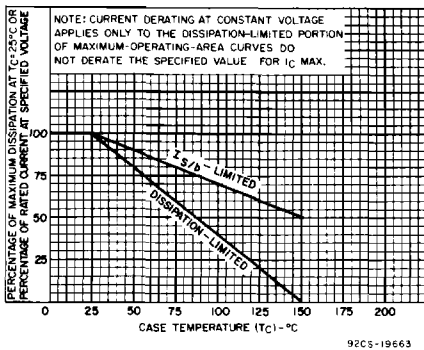


Fig. 2 — Derating curves for all types.

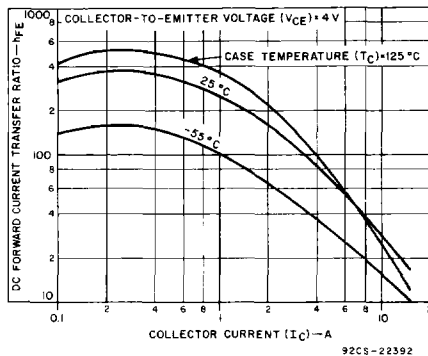


Fig. 3 — Typical dc beta characteristics for all types.

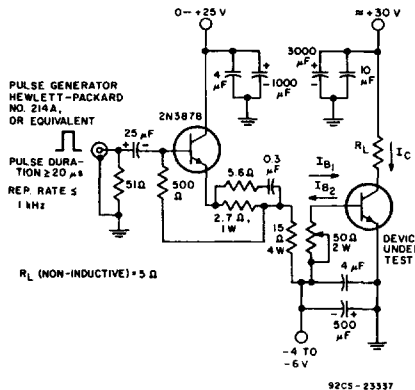


Fig. 4 — Circuit used to measure saturated switching times for all types.

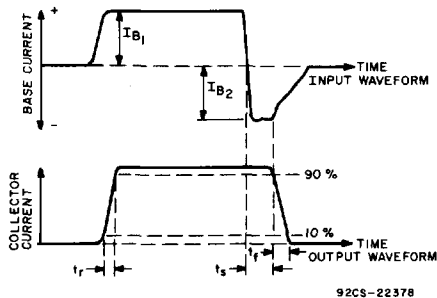


Fig. 5 — Oscilloscope display for measurement of switching times.