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

For Power-Amplifier and High-Speed-Switching Applications

Features:

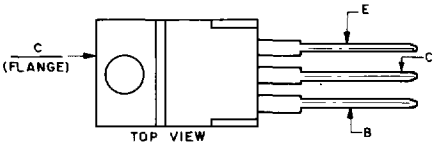
- *40 W at 25°C case temperature*
- *5 A rated collector current*
- *Min. f_T of 3 MHz at -10 V, -500 mA*
- *Designed for complementary use with TIP31-series n-p-n types**

The RCA-TIP32, TIP32A, TIP32B, and TIP32C 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 TIP31 series. They differ from each other in voltage ratings.

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

* Technical data for the TIP31-series devices are given in RCA data bulletin File No. 991

TERMINAL DESIGNATIONS



92CS-39969

JEDEC TO-220AB

MAXIMUM RATINGS, *Absolute-Maximum Values:*

	TIP32	TIP32A	TIP32B	TIP32C	
V_{CBO}	-40	-60	-80	-100	V
V_{CEO}	-40	-60	-80	-100	V
V_{EBO}	-5	-5	-5	-5	V
I_C	-5	-5	-5	-5	A
I_B	-1	-1	-1	-1	A
P_T:					
At $T_C \leq 25°C$	40	40	40	40	W
At $T_A \leq 25°C$	2	2	2	2	W
At $T_C > 25°C$ ... Derate linearly	0.32				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 TIP32		TIP32A		TIP32B		TIP32C		Units
	V_{CE}	I_C	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
I_{CEO} I_B=0	−30		–	−0.3	–	−0.3	–	–	–	–	mA
	−60		–	–	–	–	–	−0.3	–	−0.3	
I_{CES} V_{EB}=0	−40		–	−0.2	–	–	–	–	–	–	mA
	−60		–	–	–	−0.2	–	–	–	–	
	−80		–	–	–	–	–	−0.2	–	–	
	−100		–	–	–	–	–	–	–	−0.2	
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	−1[a]	25	–	25	–	25	–	25	–	
	−4	−3[a]	10	50	10	50	10	50	10	50	
V_{BE}	−4	−3[a]	–	−1.8	–	−1.8	–	−1.8	–	−1.8	V
$V_{CE(sat)}$ I_B= −0.375A		−3[a]	–	−1.2	–	−1.2	–	−1.2	–	−1.2	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}= −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
$R_{\theta JC}$			–	3.125	–	3.125	–	3.125	–	3.125	°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.

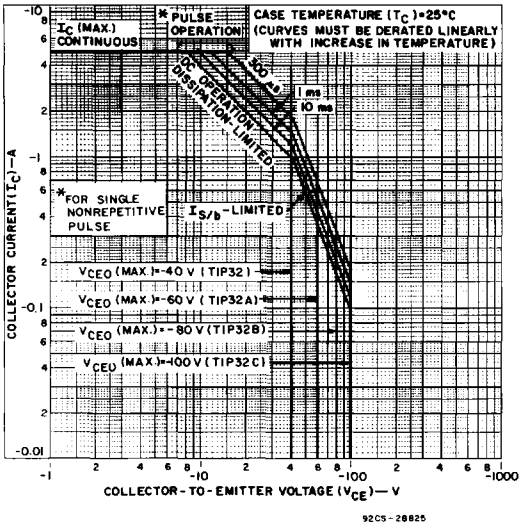


Fig. 1 — Maximum operating areas for all types.

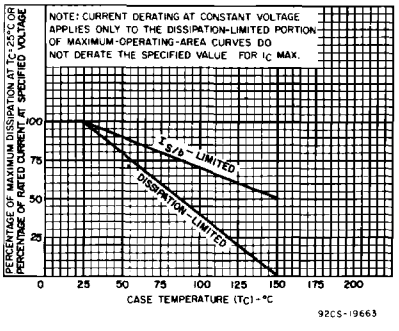


Fig.2 — Derating curve for all types.

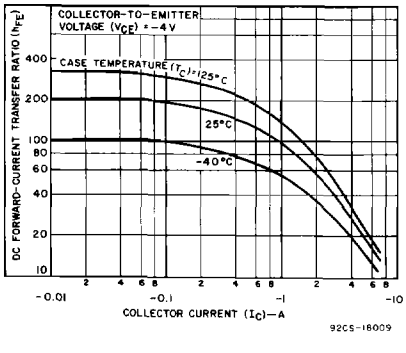


Fig. 3 — Typical dc beta characteristics for TIP32, TIP32A, and TIP32B.

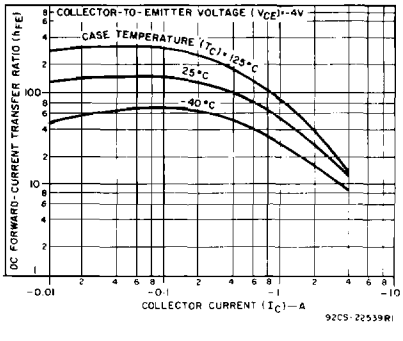


Fig. 4 — Typical dc beta characteristics for TIP32C.

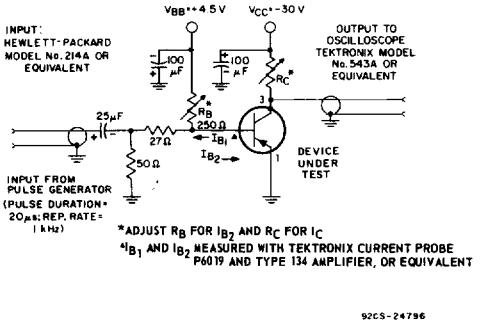


Fig. 5 — Circuit used to measure saturated switching times for all types.

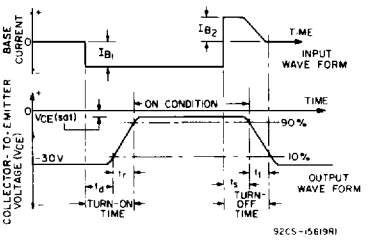


Fig. 6 — Oscilloscope display for measurement of switching times.