

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

For Power-Amplifier and High-Speed-Switching Applications

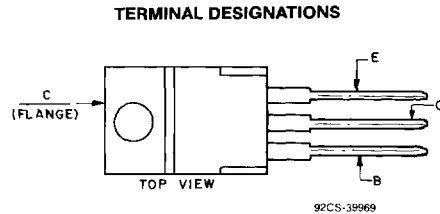
Features:

- 65 W at 25°C case temperature
- 7 A rated collector current
- Min. f_T of 3 MHz at 10 V, 500 mA
- Designed for complementary use with TIP41-series n-p-n types*

The RCA-TIP42, TIP42A, TIP42B, and TIP42C 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 TIP41 series. They differ from each other in voltage ratings.

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

* Technical data for the TIP41-series devices are given in RCA data bulletin File No. 992



JEDEC TO-220AB

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POWER TRANSISTORS

MAXIMUM RATINGS, Absolute-Maximum Values:

	TIP42	TIP42A	TIP42B	TIP42C	
V_{CBO}	-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 _____ °C				
T_L (During soldering):					
At distance 1/8 in. (3.17 mm)					
from case for 10 s max.	_____ 235 _____ °C				

TIP42, TIP42A, TIP42B, TIP42C

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

CHARACTERISTICS	TEST COND.		LIMITS								UNITS	
	VOLTAGE	CURRENT	TIP42		TIP42A		TIP42B		TIP42C			
	V dc	A dc	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.		
I_{CEO} $I_B = 0$	- 30 - 60		-	-0.7	-	-0.7	-	-	-	-	-0.7	mA
I_{CES} $V_{EB} = 0$	- 40 - 60 - 80 -100		-	-0.4	-	-	-	-	-	-	-0.4	mA
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 -4	-0.3 ^a -3 ^a	30 15	150	30 15	150	30 15	150	30 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} ($t_d + t_r$) $V_{CC} = -30 V$ $R_L = 5 \Omega$ $I_{B1} = I_{B2} = -0.6 A$		-6	0.3 (typ.)		0.3 (typ.)		0.3 (typ.)		0.3 (typ.)			μs
t_{OFF} ($t_s + t_f$) $V_{CC} = -30 V$ $R_L = 5 \Omega$ $I_{B1} = I_{B2} = -0.6 A$		-6	0.7 (typ.)		0.7 (typ.)		0.7 (typ.)		0.7 (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 μs , duty factor $\leq 2\%$.

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

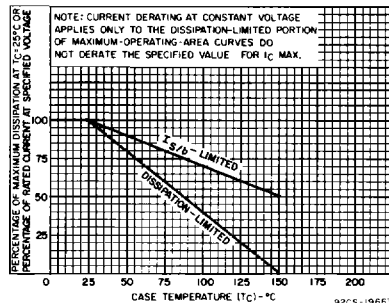


Fig. 1 - Derating curve for all types.

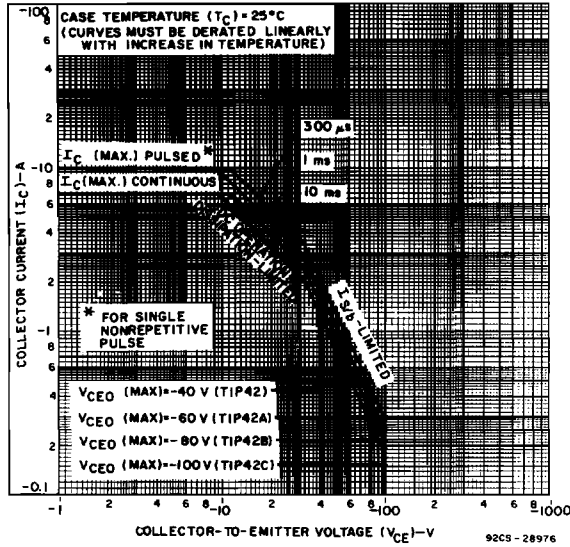


Fig. 2 — Maximum operating areas for all types.

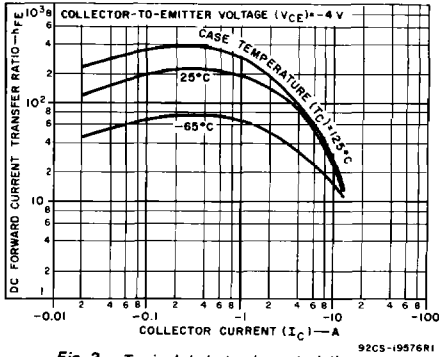


Fig. 3 — Typical dc beta characteristics for TIP42, TIP42A, and TIP42B.

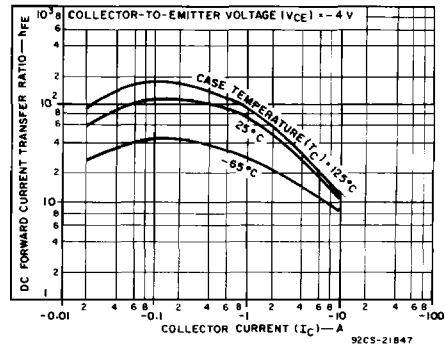
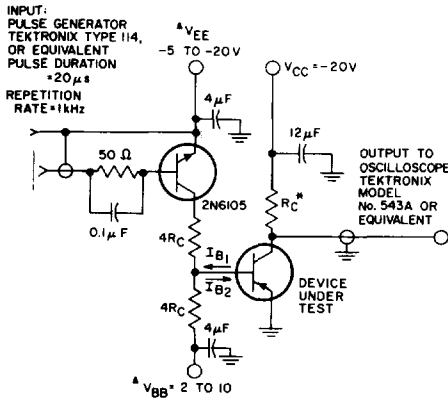


Fig. 4 — Typical dc beta characteristics for TIP42C.



* R_C IS CHOSEN FOR I_C
 V_{EE} AND V_{BB} ARE MEASURED FOR I_{B1} AND I_{B2}
 I_{B1} AND I_{B2} ARE MEASURED WITH TEKTRONIX CURRENT PROBE P-6019 AND TYPE 134 AMPLIFIER, OR EQUIVALENT

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

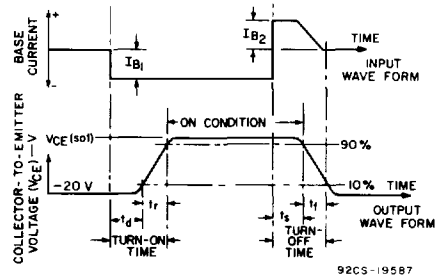


Fig. 6 — Oscilloscope display for measurement of switching times.