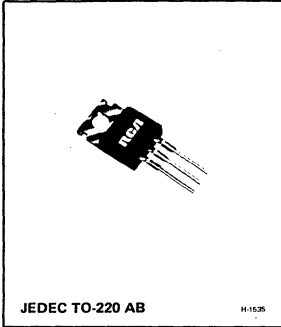




Power Transistors

RCA42 RCA42B
RCA42A RCA42C



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 RCA41, RCA41A, RCA41B, and RCA41C n-p-n types.

RCA42, RCA42A, RCA42B, and RCA42C are epitaxial-base, silicon p-n-p transistors. They are 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 new plastic power transistors are designed for complementary use with devices in the RCA41 series. • They differ from each other in voltage ratings.

• RCA41-series transistors are described in RCA data bulletin File No. 587.

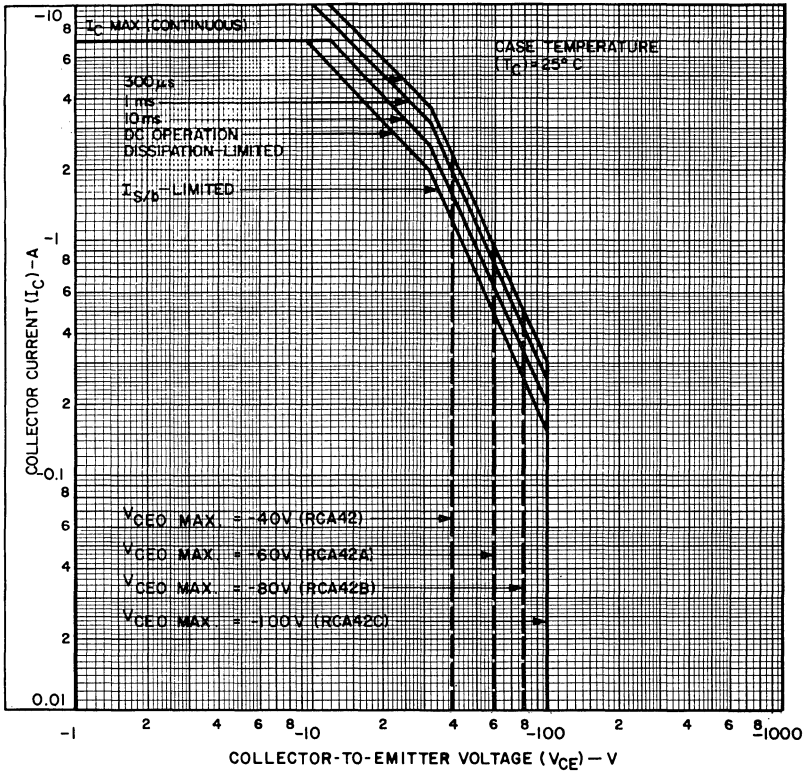
MAXIMUM RATINGS, Absolute-Maximum Values:

		RCA42	RCA42A	RCA42B	RCA42C	
COLLECTOR-TO-BASE VOLTAGE	V_{CBO}	-40	-60	-80	-100	V
COLLECTOR-TO-EMITTER VOLTAGE:						
With base open	V_{CEO}	-40	-60	-80	-100	V
EMITTER-TO-BASE VOLTAGE	V_{EBO}	-5	-5	-5	-5	V
CONTINUOUS COLLECTOR CURRENT	I_C	-7	-7	-7	-7	A
PEAK COLLECTOR CURRENT		-10	-10	-10	-10	A
CONTINUOUS BASE CURRENT	I_B	-3	-3	-3	-3	A
TRANSISTOR DISSIPATION:	P_T					
At case temperatures up to 25°C		65	65	65	65	W
At ambient temperatures up to 25°C		2	2	2	2	W
TEMPERATURE RANGE:						
Storage & Operating (Junction)		←----- -65 to 150 -----→				°C
LEAD TEMPERATURE (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

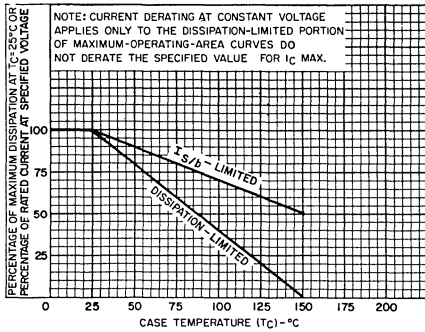
CHARACTERISTIC	SYMBOL	TEST CONDITIONS				LIMITS								UNITS		
		DC VOLTAGE (V)		DC CURRENT (A)		RCA42		RCA42A		RCA42B		RCA42C				
		V _{CE}	V _{BE}	I _C	I _B	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.			
Collector-Cutoff Current: With base open	I _{CEO}	-30 -60			0 0	-	-0.7	-	-0.7	-	-	-	-0.7	-	-0.7	mA
With base-emitter junction short-circuited	I _{CES}	-40 -60 -80 -100	0 0 0 0			-	-0.4	-	-	-	-	-	-	-	-0.4	
Emitter-Cutoff Current	I _{EBO}		5	0		-	-1	-	-1	-	-1	-	-1	-	-1	mA
Collector-to-Emitter Sustaining Voltage: With base open	V _{CEO(sus)}			-0.03 ^a	0	-40	-	-60	-	-80	-	-100	-	-	-	V
DC Forward-Current Transfer Ratio	h _{FE}	-4 -4		-0.3 ^a -3 ^a		30 15	- 150	30 15	- 150	30 15	- 150	30 15	- 150	30 15	- 150	
Base-to-Emitter Voltage	V _{BE}	-4		-6 ^a		-	-2.2	-	-2.2	-	-2.2	-	-2.2	-	-2.2	V
Collector-to-Emitter Saturation Voltage	V _{CE(sat)}			-6 ^a	-0.6	-	-2	-	-2	-	-2	-	-2	-	-2	V
Common-Emitter Small-Signal, Forward-Current Transfer Ratio (f = 1 kHz)	h _{re}	-10		-0.5		20	-	20	-	20	-	20	-	20	-	
Magnitude of Common-Emitter, Small-Signal, Forward-Current Transfer Ratio (f=1 MHz)	h _{fe}	-10		-0.5		3	-	3	-	3	-	3	-	3	-	
Saturated Switching Time: (R _L = 5 Ω) See Figs. 5 and 6																
Turn-on time t _d + t _r	t _{ON}	(V _{CC}) -30		-6	-0.6 ^b	0.3 (typ.)		0.3 (typ.)		0.3 (typ.)		0.3 (typ.)		0.3 (typ.)		μs
Turn-off time t _s + t _f	t _{OFF}	(V _{CC}) -30		-6	-0.6 ^b	0.7 (typ.)		0.7 (typ.)		0.7 (typ.)		0.7 (typ.)		0.7 (typ.)		
Thermal Resistance: Junction-to-Case	R _{θJC}					-	1.92	-	1.92	-	1.92	-	1.92	-	1.92	°C/W
Junction-to-Ambient	R _{θJA}					-	62.5	-	62.5	-	62.5	-	62.5	-	62.5	

^aPulsed: Pulse duration = 300 μs, duty factor ≤ 2%^bI_{B1} = I_{B2} = value shown



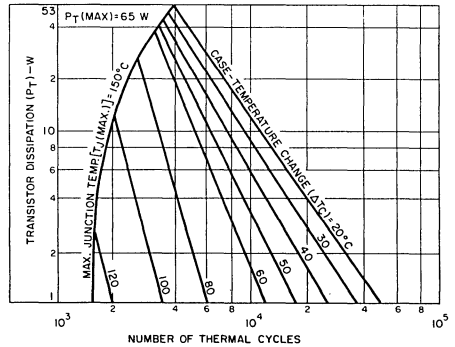
92CS-20140

Fig. 1—Maximum safe operating areas for all types.



92CS-19663

Fig. 2—Derating curves for all types.



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Fig. 3—Thermal-cycling ratings for all types.

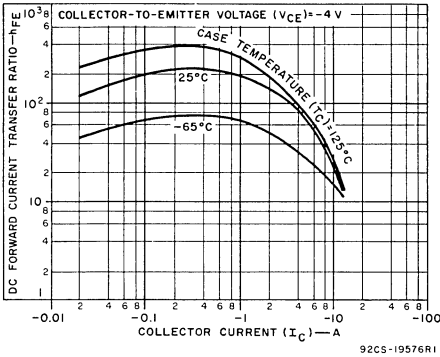


Fig. 4—Typical dc beta characteristics for RCA42, RCA42A, and RCA42B.

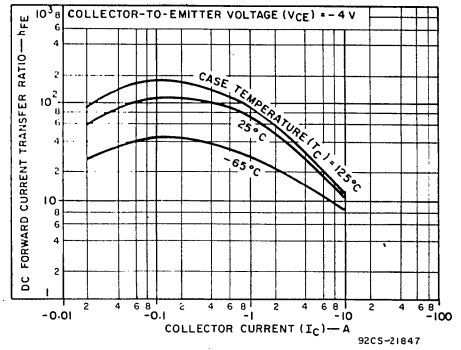
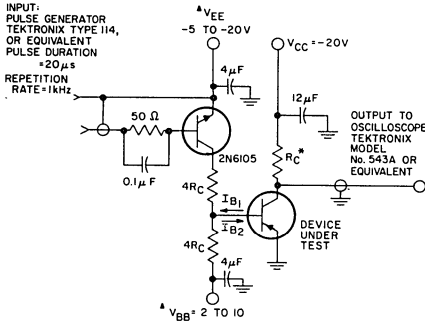


Fig. 5—Typical dc beta characteristics for RCA42C.



* 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 92CS-23338R1

Fig. 6—Circuit used to measure switching times for all types.

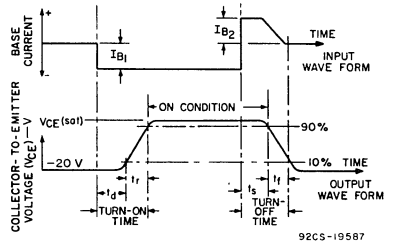


Fig. 7—Phase relationship between input current and output voltage showing reference points for specification of switching times (test circuit shown in Fig. 6).

TERMINAL CONNECTIONS

- Lead No. 1 — Base
- Lead No. 2 — Collector
- Lead No. 3 — Emitter

Mounting Flange, Lead No. 4 — Collector