



Power Transistors

RCA41A/SDH
RCA41B/SDH

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

For Medium-Power Switching and
 Amplifier Applications

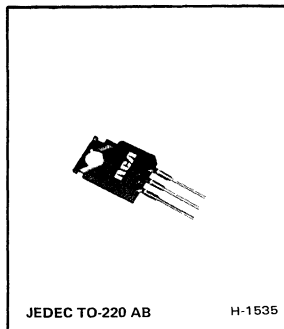
Features:

- 75 W at 25°C case temperature
- Low saturation voltage
- Maximum safe-area-of-operation curves
- Thermal-cycle rating curves

TERMINAL CONNECTIONS

Terminal No. 1 — Base
 Terminal No. 2 — Collector
 Terminal No. 3 — Emitter

Mounting Flange Terminal No. 4 — Collector



RCA41/SDH, RCA41A/SDH, and RCA41B/SDH are single-diffused hometaxial-base, silicon n-p-n transistors. These types are essentially hometaxial-base versions of the RCA41, RCA41A, and RCA41B epitaxial-base types, respectively. 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 differ from each other in voltage ratings.

• RCA-41 series types are described in RCA data bulletin File No. 587.

MAXIMUM RATINGS, Absolute-Maximum Values:

		RCA41/SDH	RCA41A/SDH	RCA41B/SDH	
COLLECTOR-TO-BASE VOLTAGE	V_{CBO}	40	60	80	V
COLLECTOR-TO-EMITTER VOLTAGE:					
With base open	V_{CEO}	40	60	80	V
EMITTER-TO-BASE VOLTAGE	V_{EBO}	5	5	5	V
* CONTINUOUS COLLECTOR CURRENT	I_C	16	10	10	A
* CONTINUOUS BASE CURRENT	I_B	4	4	4	A
* TRANSISTOR DISSIPATION:	P_T				
At case temperatures up to 25°C		75	75	75	W
At ambient temperatures up to 25°C		1.8	1.8	1.8	W
At case temperatures above 25°C		See Fig. 2			
At ambient temperatures above 25°C	Derate linearly ..	0.0144			W/°C
TEMPERATURE RANGE:					
Storage & Operating (Junction)		-65 to 150			°C
TERMINAL TEMPERATURE (During Soldering):					
At distance 1/8 in. (3.17 mm) from case for 10 s max.		235			°C

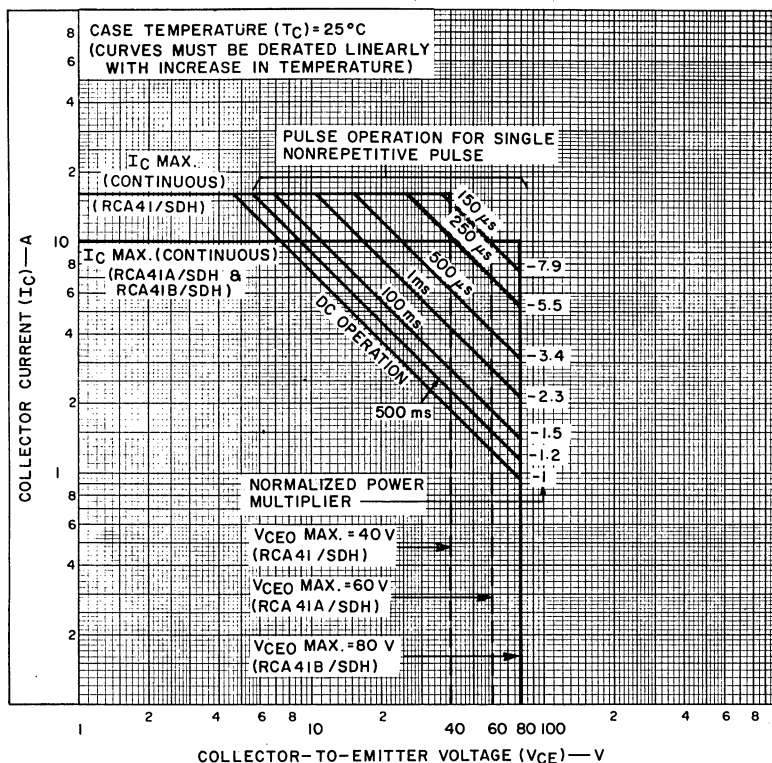
* Differs from RCA41 Series.

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

CHARACTERISTIC	SYMBOL	TEST CONDITIONS					LIMITS						UNITS
		DC VOLTAGE (V)			DC CURRENT (A)		RCA41/SDH		RCA41A/SDH		RCA41B/SDH		
		V _{CE}	V _{EB}	V _{BE}	I _C	I _B	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	
Collector-Cutoff Current: With base open	I _{CEO}	30 60				0 0	— —	0.7 —	— —	0.7 —	— 0.7	mA	
With base-emitter junction short- circuited	I _{CES}	40 60 80		0 0 0		— — —	0.4 — —	— — —	— 0.4 —	— — 0.4			
Emitter-Cutoff Current	I _{EBO}		5		0	—	1	—	1	—	1		mA
Collector-to-Emitter Sustaining Voltage: With base open	V _{CEO(sus)}				0.03 ^a	0	40	—	60	—	80	—	V
* DC Forward-Current Transfer Ratio	h _{FE}	4 4			0.3 ^a 3 ^a		30 15	— —	30 15	— —	30 15	— —	
Base-to-Emitter Voltage	V _{BE}	4			6 ^a		—	2.2	—	2.2	—	2.2	V
Collector-to-Emitter Saturation Voltage	V _{CE(sat)}				6 ^a	0.6	—	2	—	2	—	2	V
Common-Emitter, Small- Signal; Forward-Current Transfer Ratio (f = 1 kHz)	h _{fe}	10			0.5		20	—	20	—	20	—	
* Magnitude of Common- Emitter, Small-Signal, Forward-Current Transfer Ratio (f = 1 MHz)	h _{fe}	10			0.5		0.8	—	0.8	—	0.8	—	
Unclamped Inductive Load Energy ^b (L = 20 mH) (See Fig.5)		(V _{CC}) 10					—	62.5	—	62.5	—	62.5	mJ
* Saturated Switching Time: (R _L = 5Ω) See Figs. 7 and 8 Turn-on time (t _d + t _r)	t _{on}	(V _{CC}) 30			6	0.6 ^c	3.2 (typ.)	10	3.2 (typ.)	10	3.2 (typ.)	10	μs
Turn-off Time (t _s + t _f)	t _{off}	(V _{CC}) 30			6	0.6 ^c	3.7 (typ.)	20	3.7 (typ.)	20	3.7 (typ.)	20	
* Thermal Resistance: Junction-to-Case	R _{θJC}						—	1.67	—	1.67	—	1.67	°C/W
Junction-to-Ambient	R _{θJA}						—	70	—	70	—	70	

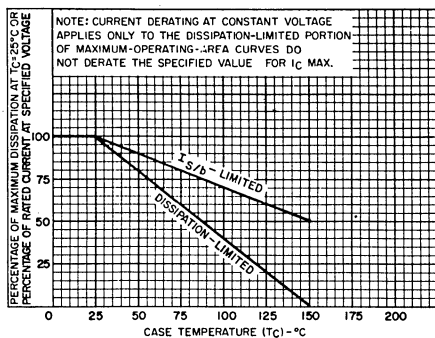
*Differs from RCA41 Series.

^aPulsed: Pulse duration = 300 μs, duty factor ≤ 2%.^bBased upon ability of device to perform in circuit shown in Fig. 5.^cI_{B1} = I_{B2} = value shown.

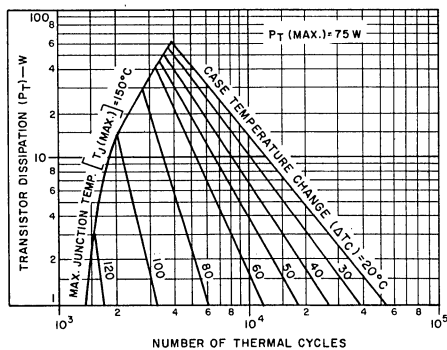


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Fig. 1 — Maximum safe operating areas for all types.



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Fig. 2 — Dissipation and I_S/b derating curves for all types.

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Fig. 3 — Thermal-cycling rating chart for all types.

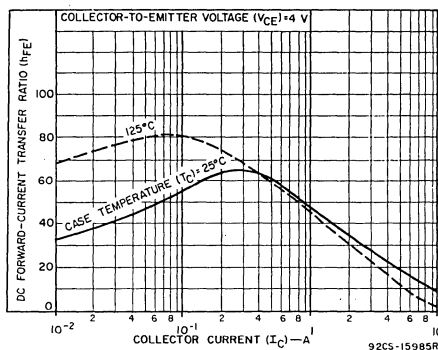


Fig. 4 — Typical dc-beta characteristics for all types.

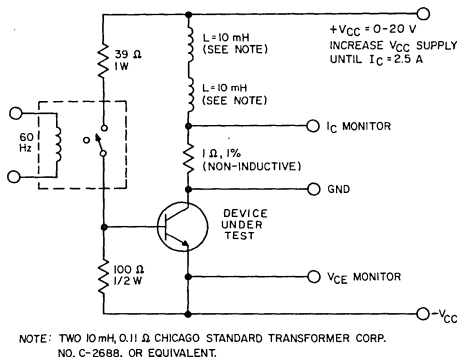


Fig. 5 — Circuit for measuring inductive-load switching for all types.

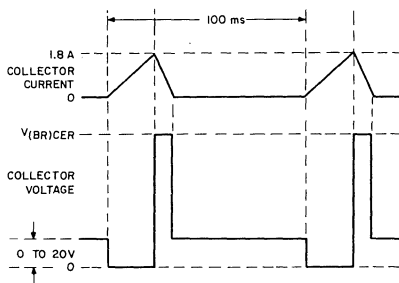


Fig. 6 — Inductive-load switching voltage and curve waveforms (test circuit shown in Fig. 5).

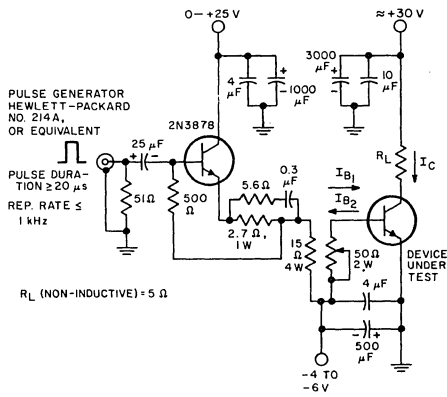


Fig. 7 — Circuit used to measure switching times for all types.

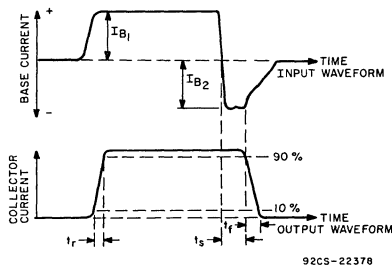


Fig. 8 — Phase relationship between input and output currents showing reference points for specification of switching times (test circuit shown in Fig. 7).