

File Number 618

RCA3054, RCA3055

T-33-11
T-33-13

Silicon N-P-N VERSAWATT Transistors

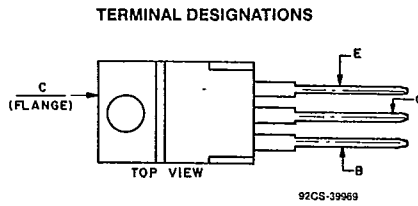
Designed for Medium-Power Linear and Switching Service
in Consumer, Automotive, and Industrial Applications

Features:

- Maximum safe-area-of-operation curves
- Low saturation voltages
- High dissipation ratings

Applications:

- Series and shunt regulators
- High-fidelity amplifiers
- Power-switching circuits



JEDEC TO-220AB

RCA3054 and RCA3055 are silicon n-p-n transistors intended for a wide variety of high-current applications. The construction of these devices renders them highly resistant to second breakdown over a wide range of operating conditions.

The VERSAWATT case has a proven thermal-cycle capability. This capability is assured by real-time quality controls in our manufacturing locations. The RCA3054 and RCA3055 are supplied in the JEDEC TO-220AB straight-lead version of the package. They are also available on special order in a variety of lead-form configurations.

MAXIMUM RATINGS, Absolute-Maximum Values:

		RCA3054	RCA3055	
COLLECTOR-TO-BASE VOLTAGE	VCBO	90	100	V
COLLECTOR-TO-EMITTER SUSTAINING VOLTAGE:				
With external base-to-emitter resistance (R _{BE}) = 100 Ω	V _{CE} (sus)	60	70	V
With base open	V _{CEO} (sus)	55	60	V
With base reverse-biased V _{BE} = -1.5 V	V _{CEV} (sus)	90	90	V
EMITTER-TO-BASE VOLTAGE	VEBO	7	7	V
CONTINUOUS COLLECTOR CURRENT	I _C	4	15	A
CONTINUOUS BASE CURRENT	I _B	2	4	A
TRANSISTOR DISSIPATION:	P _T			
At case temperatures up to 25°C		36	75	W
At case temperatures above 25°C		See Fig.3		
TEMPERATURE RANGE:				
Storage and Operating (Junction)		-65 to +150		°C
PIN TEMPERATURE (During Soldering):				
At distances ≥ 1/32 in. (0.8 mm) from seating plane for 10 s max.		235		°C

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

CHARACTERISTIC	SYMBOL	TEST CONDITIONS					LIMITS				UNITS
		VOLTAGE V dc			CURRENT A dc		RCA3054		RCA3055		
		V _{CE}	V _{EB}	V _{BE}	I _C	I _B	MIN.	MAX.	MIN.	MAX.	
Collector-Cutoff Current, With base open	I _{CEO}	30				0	-	0.5	-	0.7	mA
With base-emitter junction reverse-biased	I _{CEX}	90 100		-1.5 -1.5			-	1 -	-	- 5	
At T _C = 150°C	I _{CEX}	90 100		-1.5 -1.5			-	6 -	-	- 30	
Emitter-Cutoff Current	I _{EBO}		7		0		-	1.0	-	5	mA
Collector-to-Emitter Sustaining Voltage With base open	V _{CEO(sus)}				0.1 ^a 0.2 ^a	0 0	55 -	- -	- 60	- -	V
With external base-to- emitter resistance (R _{BE}) = 100 Ω	V _{CER(sus)}				0.1 ^a 0.2 ^a		60 -	- -	- 70	- -	
With base-emitter junction reverse-biased	V _{CEV(sus)}			-1.5	0.1 ^a		90	-	90	-	
DC Forward-Current Transfer Ratio	h _{FE}	4 4 4 4			3 ^a 10 ^a 0.5 ^a 4 ^a		5 - 25 -	- - 100 -	- - - 20	- - - 70	
Collector-to-Emitter Saturation Voltage	V _{CE(sat)}				0.5 ^a 4 ^a	0.05 ^a 0.4 ^a	- -	1.0 -	- -	- 1.1	V
Base-to-Emitter Voltage	V _{BE}	4 4			0.5 ^a 4 ^a		- -	1.7 -	- -	- 1.8	V
Common-Emitter, Small-Signal, Short-Circuit, Forward Current Transfer Ratio Cutoff Frequency	f _{hfe}	4 4			0.1 1		30 -	- -	- 10	- -	kHz
Magnitude of Common- Emitter, Small-Signal Short Circuit Forward Current Transfer Ratio (f = 0.4 MHz)	h _{fe}	4 4			0.1 1		2 -	- -	- 8	- -	
Common-Emitter, Small-Signal, Short- Circuit Forward Current Transfer Ratio (f = 1 kHz)	h _{fe}	4 4			0.1 1		25 -	- -	- 15	- 120	
Forward-Bias Second Breakdown Collector Current ^b (t ≥ 1 s)	I _{S/b}	55 60					0.65 -	- -	- 1.2	- -	A
Thermal Resistance Junction-to-Case	R _{θJC}						-	3.5	-	1.67	°C/W
Junction-to-Ambient	R _{θJA}						-	70	-	70	

^a Pulsed Pulse duration = 300 μs, duty factor = 1.8%.
^b Pulsed 1-second non-repetitive pulse.

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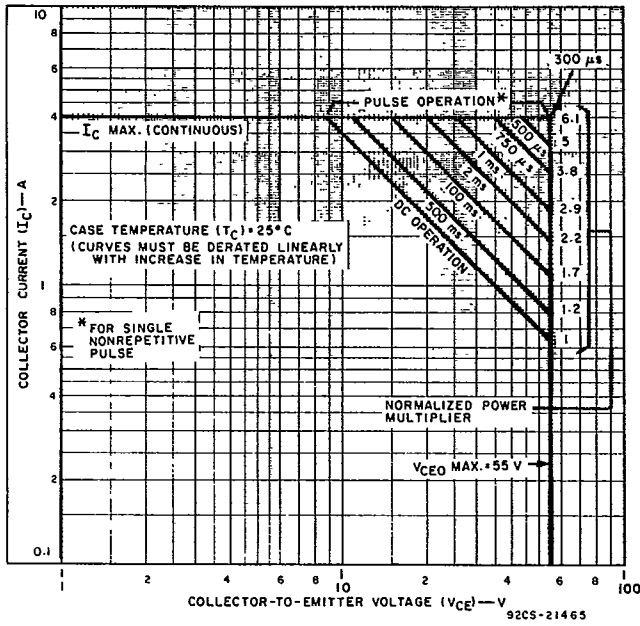


Fig. 1 — Maximum operating areas for RCA3054.

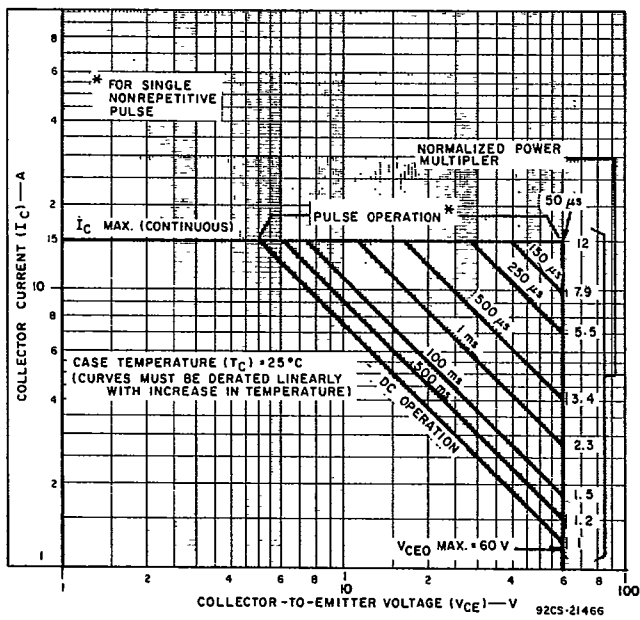


Fig. 2 — Maximum operating areas for RCA3055.



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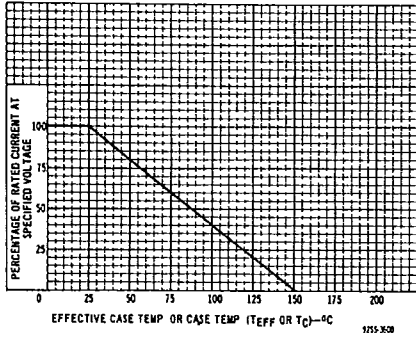


Fig. 3 — Derating curve for both types.

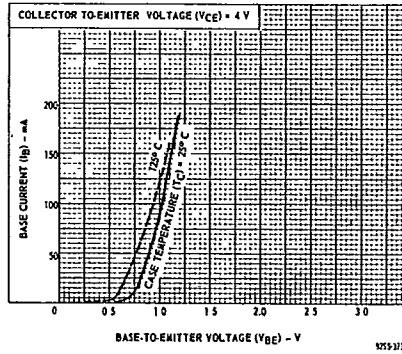


Fig. 4 — Typical input characteristics for RCA3054.

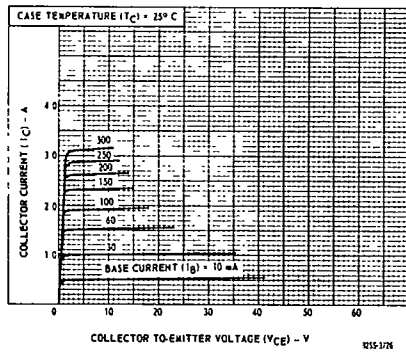


Fig. 5 — Typical output characteristics for RCA3054

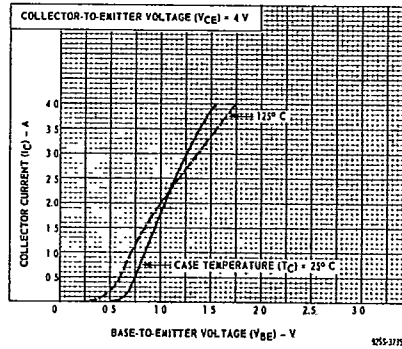


Fig. 6 — Typical transfer characteristics for RCA3054.

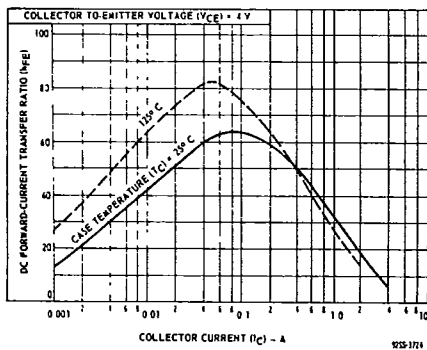


Fig. 7 — Typical dc beta characteristics for RCA3054.

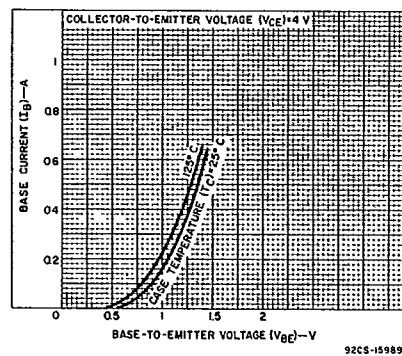


Fig. 8 — Typical input characteristics for RCA3055.

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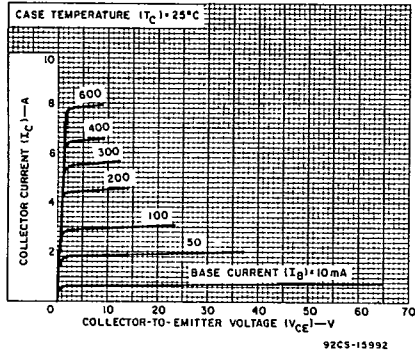


Fig 9 — Typical output characteristics for RCA3055

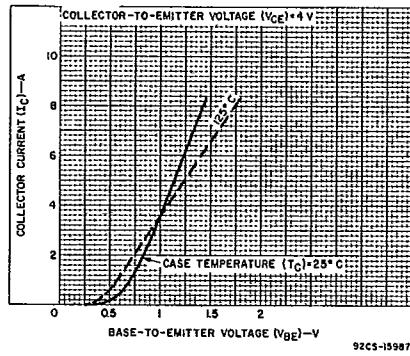


Fig 10 — Typical transfer characteristics for RCA3055.

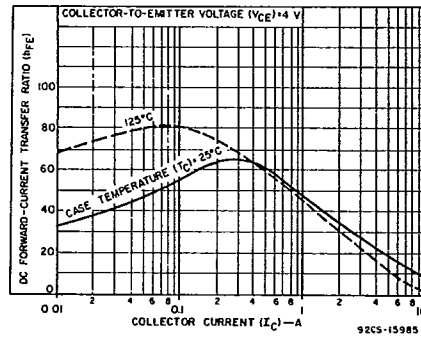


Fig 11 — Typical dc beta characteristics for RCA3055.

