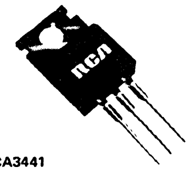
Solid State Division

Power Transistors

RCA3441 RCA6263



RCA3441
RCA6263

JEDEC TO-220AB H-1535R1

Hometaxial-Base 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
- Thermal-cycling rating curves

Applications:

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

RCA3441 and RCA6263 are silicon n-p-n transistors intended for a wide variety of high-current applications. The hometaxial-base 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-cycling capability. This capability is assured by real-time quality controls in our manufacturing locations. The RCA3441 and RCA6263 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. Two popular variations have leads formed to fit TO-66 sockets (specify formed lead No. 6201) or printed-circuit boards (specify formed lead No. 6207). Detailed information on these and other VERSAWATT outlines is contained in "RCA's Lineup of Power Transistors" (PSP-704).

TERMINAL CONNECTIONS
JEDEC TO-220AB

Terminal No. 1 – Base
Terminal No. 2 – Collector
Terminal No. 3 – Emitter
Terminal No. 4 – Collector

MAXIMUM RATINGS, *Absolute-Maximum Values:*

		RCA6263	RCA3441	
COLLECTOR-TO-BASE VOLTAGE	V_{CBO}	140	160	V
COLLECTOR-TO-EMITTER SUSTAINING VOLTAGE:				
With external base-to-emitter resistance (R_{BE}) = 100 Ω	$V_{CER}(sus)$	130	150	V
With base open	$V_{CEO}(sus)$	120	140	V
With base reverse-biased V_{BE} = −1.5 V	$V_{CEV}(sus)$	140	160	V
EMITTER-TO-BASE VOLTAGE	V_{EBO}	7	7	V
CONTINUOUS COLLECTOR CURRENT	I_C	3	3	A
PEAK COLLECTOR CURRENT		4	4	A
CONTINUOUS BASE CURRENT	I_B	2	2	A
TRANSISTOR DISSIPATION:	P_T			
At case temperatures up to 25°C		36	36	W
At case temperatures above 25°C		See Fig. 4		
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

8-73

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

CHARACTERISTIC	SYMBOL	TEST CONDITIONS VOLTAGE V dc V_{CE}	V_{EB}	V_{BE}	CURRENT A dc I_C	I_B	LIMITS RCA6263 MIN.	RCA6263 MAX.	RCA3441 MIN.	RCA3441 MAX.	UNITS
Collector-Cutoff Current: With base open	I_{CEO}	100				0	–	5	–	–	mA
		120				0	–	–	–	5	
With base-emitter junction reverse-biased	I_{CEX}	120		−1.5			–	5	–	–	
		140		−1.5			–	–	–	5	
At T_C = 150°C	I_{CEX}	120		−1.5			–	10	–	–	
		140		−1.5			–	–	–	10	
Emitter-Cutoff Current	I_{EBO}		5		0		–	2	–	2	mA
Collector-to-Emitter Sustaining Voltage: With base open	$V_{CEO}(sus)$				0.1[a]	0	120	–	140	–	V
With external base-to-emitter resistance (R_{BE}) = 100 Ω	$V_{CER}(sus)$				0.1[a]		130	–	150	–	
With base-emitter junction reverse-biased	$V_{CEV}(sus)$			−1.5	0.1[a]		140	–	160	–	
DC Forward-Current Transfer Ratio	h_{FE}	4			0.5[a]		20	150	20	150	
Collector-to-Emitter Saturation Voltage	$V_{CE}(sat)$				0.5[a]	0.05[a]	–	1.2	–	1.2	V
Base-to-Emitter Voltage	V_{BE}	4			0.5[a]		–	2	–	2	V
Gain-Bandwidth Product	f_T	4			0.2		200	–	200	–	kHz
Common-Emitter, Small-Signal, Short-Circuit Forward-Current Transfer Ratio (f = 1 kHz)	h_{fe}	4			0.1		25	–	25	–	
Forward-Bias Second Breakdown Collector Current[b] (t ≥ 1 s)	$I_{S/b}$	120					0.3	–	0.3	–	A
Thermal Resistance: Junction-to-Case	$R_{\theta JC}$						–	3.5	–	3.5	°C/W
Junction-to-Ambient	$R_{\theta JA}$						–	70	–	70	

[a]Pulsed: Pulse duration = 300 μs, duty factor = 1.8%.

[b]Pulsed: 1-second non-repetitive pulse.

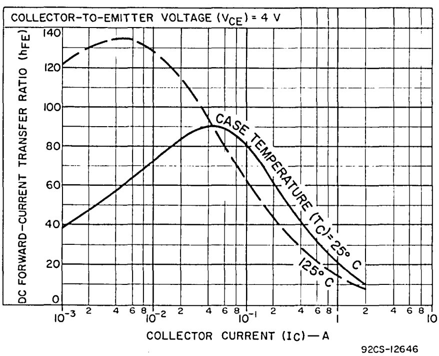


Fig. 1— Typical dc beta characteristics for RCA3441.

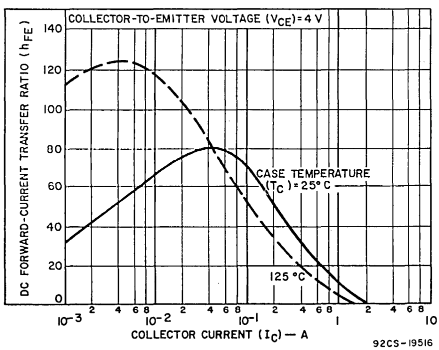


Fig. 2— Typical dc beta characteristics for RCA6263.

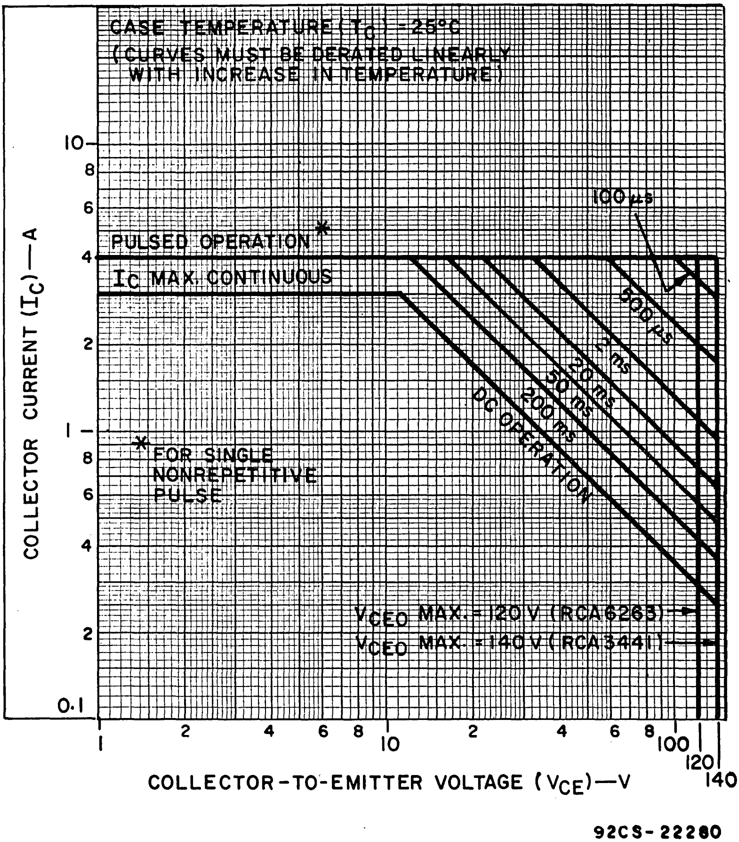


Fig. 3— Maximum operating areas for both types.

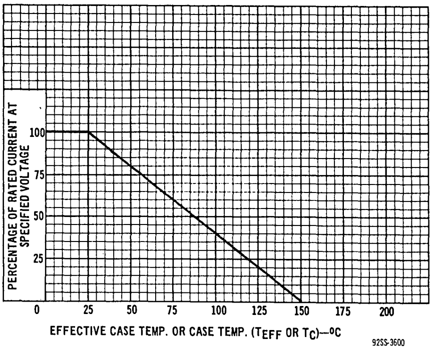


Fig. 4— Current derating curve for both types.

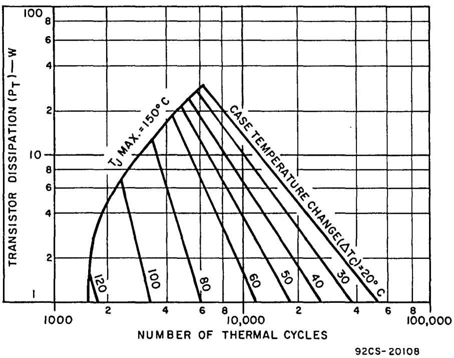


Fig. 5— Thermal-cycling rating chart for both types.

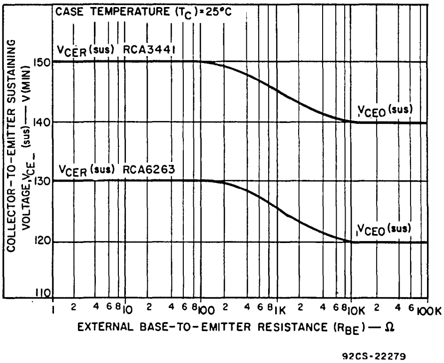


Fig. 6— Sustaining voltage vs. base-to-emitter resistance for both types.

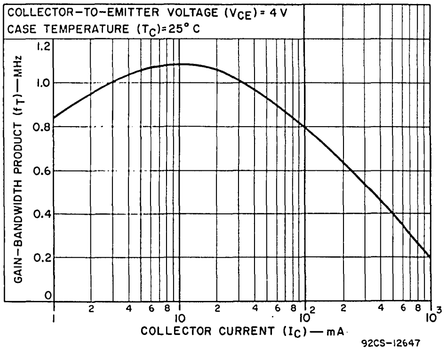


Fig. 7— Typical gain-bandwidth product for both types.

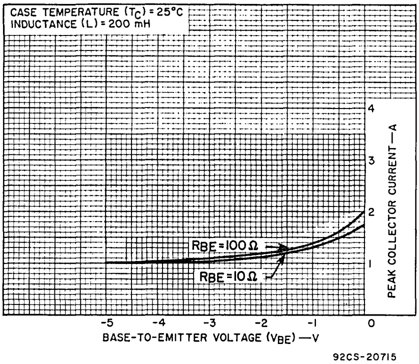


Fig. 8— Minimum reverse-bias second-breakdown characteristics for both types.

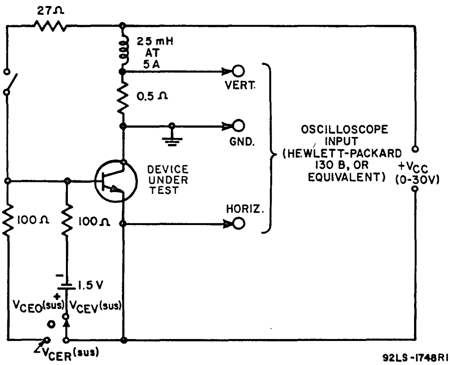
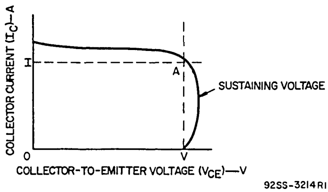


Fig. 9— Circuit used to measure sustaining voltages, V_{CEO}(sus), V_{CER}(sus), and V_{CEV}(sus) for both types.



NOTE:
THE SUSTAINING VOLTAGE V_{CEO}(sus) OR V_{CEV}(sus) IS ACCEPTABLE WHEN THE TRACE FALLS TO THE RIGHT AND ABOVE POINT "A" FOR TYPES 2N4347 AND 2N3442.
(FOR VALUES OF I & V, SEE ELECTRICAL CHARACTERISTICS)

Fig. 10— Oscilloscope display for measurement of sustaining voltages (test circuit shown in Fig. 9).

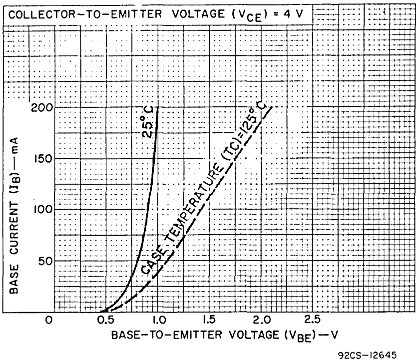


Fig. 11— Typical input characteristics for RCA3441.

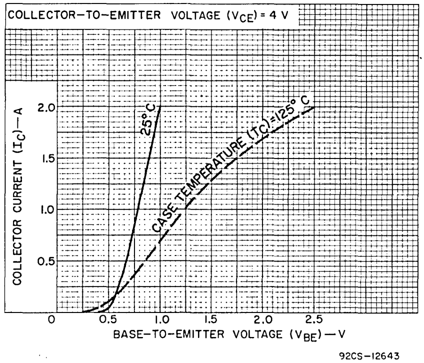


Fig. 12— Typical transfer characteristics for RCA3441.

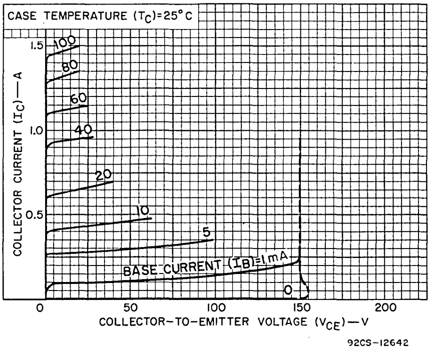


Fig. 13— Typical output characteristics for RCA3441.

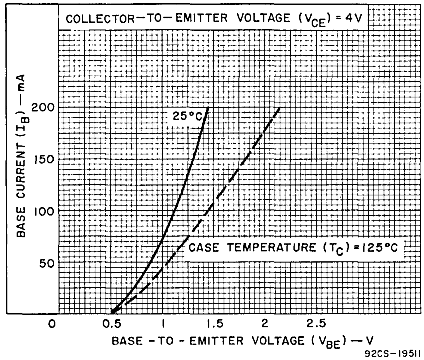


Fig. 14— Typical input characteristics for RCA6263.

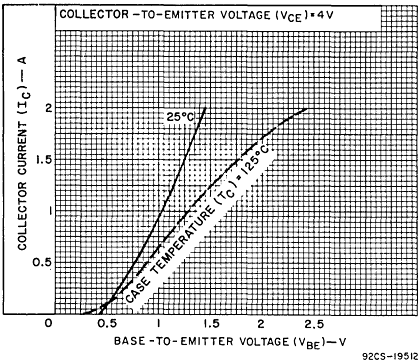


Fig. 15— Typical transfer characteristics for RCA6263.

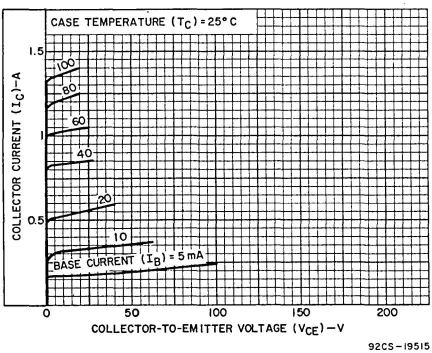


Fig. 16— Typical output characteristics for RCA6263.