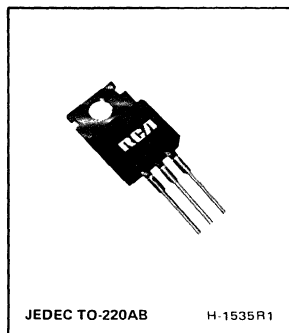




# Power Transistors

**RCA1C03 RCA1C12**  
**RCA1C04 RCA1C13**



## Silicon Transistors for Audio-Frequency Linear-Amplifier Applications

N-P-N and P-N-P Complementary Types

RCA1C03 RCA1C04  
 RCA1C12 RCA1C13

RCA1C03, RCA1C04, RCA1C12, and RCA1C13 are complementary silicon n-p-n and p-n-p transistors especially characterized for audio-amplifier applications. These devices, singly or in pairs in complementary- or quasi-complementary-symmetry circuits, are particularly useful as drivers or pre-drivers. They may also be used in audio power amplifiers, linear modulators, servo amplifiers, and operational amplifiers. The units are supplied in the JEDEC TO-220AB version of the plastic VERSAWATT package.

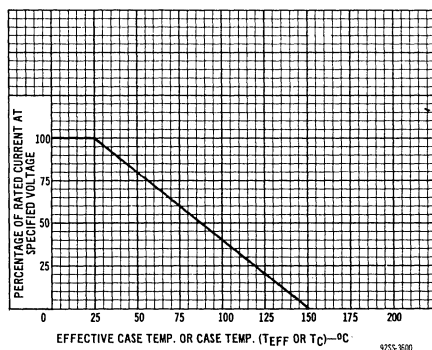


Fig. 1—Derating curve for all types.

### MAXIMUM RATINGS, Absolute-Maximum Values:

	RCA1C03	RCA1C04	RCA1C12	RCA1C13	
COLLECTOR-TO-BASE VOLTAGE .....	120	-120	140	-140	V
COLLECTOR-TO-EMITTER SUSTAINING VOLTAGE:					
With base open .....	100	-100	120	-120	V
With external base-to-emitter resistance ( $R_{BE}$ ) = 100 $\Omega$ ...	120	-120	140	-140	V
EMITTER-TO-BASE VOLTAGE .....	5	-5	5	-5	V
CONTINUOUS COLLECTOR CURRENT .....	4	-4	4	-4	A
CONTINUOUS BASE CURRENT .....	2	-2	2	-2	A
TRANSISTOR DISSIPATION: $P_T$					
At case temperatures up to 25°C .....	40	40	40	40	W
At case temperatures above 25°C .....	See Fig. 1				
TEMPERATURE RANGE:					
Storage and Operating (Junction) .....	-65 to +150				°C
PIN TEMPERATURE (During Soldering):					
At distances $\geq$ 1/32 in. (0.8 mm) from seating plane for 10 s max. ....	230				°C

**Type RCA1C03****Package:** JEDEC TO-220AB**Construction:** Silicon n-p-n, epitaxial**ELECTRICAL CHARACTERISTICS, At Case Temperature ( $T_C$ ) = 25°C Unless Otherwise Specified**

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	LIMITS		UNITS
			MIN.	MAX.	
Collector Cutoff Current: With external base-to-emitter resistance ( $R_{BE}$ )	$I_{CER}$	$V_{CE} = 110 \text{ V}, R_{BE} = 100\Omega$	—	1	mA
Emitter Cutoff Current: With collector open	$I_{EBO}$	$V_{EB} = 5 \text{ V}, I_C = 0$	—	1	mA
Collector-to-Emitter Voltage: With base open	$V_{CEO}$	$I_C = 0.1 \text{ A}, I_B = 0$	100	—	V
Gain Bandwidth Product	$f_T$	$I_C = 0.5 \text{ A}, V_{CE} = 4 \text{ V}$	4	—	MHz
DC Forward-Current Transfer Ratio	$h_{FE}$	$I_C = 1 \text{ A}, V_{CE} = 4 \text{ V}$	50	250	
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 1 \text{ A}, I_B = 0.1 \text{ A}$	—	1	V
Base-to-Emitter Voltage	$V_{BE}$	$I_C = 1 \text{ A}, V_{CE} = 4 \text{ V}$	—	1.5	V
Second-Breakdown Collector Current: With base forward biased	$I_{S/b}$	$V_{CE} = 40 \text{ V}, t = 0.4 \text{ s}$	1	—	A

For characteristics curves and test conditions, refer to published data for prototype 2N6293 (File 542).

**Type RCA1C04****Package:** JEDEC TO-220AB**Construction:** Silicon p-n-p, epitaxial**ELECTRICAL CHARACTERISTICS, At Case Temperature ( $T_C$ ) = 25°C Unless Otherwise Specified**

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	LIMITS		UNITS
			MIN.	MAX.	
Collector Cutoff Current: With external base-to-emitter resistance ( $R_{BE}$ )	$I_{CER}$	$V_{CE} = -110 \text{ V}, R_{BE} = 100\Omega$	—	-1	mA
Emitter Cutoff Current: With collector open	$I_{EBO}$	$V_{EB} = -5 \text{ V}, I_C = 0$	—	-1	mA
Collector-to-Emitter Voltage: With base open	$V_{CEO}$	$I_C = -0.1 \text{ A}, I_B = 0$	-100	—	V
Gain Bandwidth Product	$f_T$	$I_C = -0.5 \text{ A}, V_{CE} = -4 \text{ V}$	10	—	MHz
DC Forward-Current Transfer Ratio	$h_{FE}$	$I_C = -1 \text{ A}, V_{CE} = -4 \text{ V}$	50	250	
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = -1 \text{ A}, I_B = -0.1 \text{ A}$	—	-1	V
Base-to-Emitter Voltage	$V_{BE}$	$I_C = -1 \text{ A}, V_{CE} = -4 \text{ V}$	—	-1.5	V
Second-Breakdown Collector Current: With base forward biased	$I_{S/b}$	$V_{CE} = -40 \text{ V}, t = 0.4 \text{ s}$	-1	—	A

For characteristics curves and test conditions, refer to published data for prototype 2N6476 (File 676).

**TERMINAL CONNECTIONS**

- Lead 1 — Base
- Lead 2 — Collector
- Lead 3 — Emitter
- Lead 4 — Collector

## Type RCA1C12

Package: JEDEC TO-220AB

Construction: Silicon n-p-n, epitaxial

ELECTRICAL CHARACTERISTICS, At Case Temperature ( $T_C$ ) = 25°C Unless Otherwise Specified

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	LIMITS		UNITS
			MIN.	MAX.	
Collector Cutoff Current: With external base-to-emitter resistance ( $R_{BE}$ )	$I_{CER}$	$V_{CE} = 90 \text{ V}, R_{BE} = 100 \Omega$	—	100	$\mu\text{A}$
Emitter Cutoff Current: With collector open	$I_{EBO}$	$V_{EB} = 5 \text{ V}, I_C = 0$	—	1	mA
Collector-to-Emitter Voltage: With base open	$V_{CEO}$	$I_C = 0.1 \text{ A}, I_B = 0$	120	—	V
Collector-to-Emitter Voltage: With external base-to-emitter resistance ( $R_{BE}$ )	$V_{CER}$	$I_C = 0.1 \text{ A}, R_{BE} = 100 \Omega$	140	—	V
Gain Bandwidth Product	$f_T$	$I_C = 0.5 \text{ A}, V_{CE} = 4 \text{ V}$	4	—	MHz
DC Forward-Current Transfer Ratio	$h_{FE}$	$I_C = 1 \text{ A}, V_{CE} = 2 \text{ V}$	40	250	
Base-to-Emitter Voltage	$V_{BE}$	$I_C = 1 \text{ A}, V_{CE} = 2 \text{ V}$	—	1.2	V
Second-Breakdown Collector Current: With base forward biased	$I_{S/b}$	$V_{CE} = 60 \text{ V}, t = 0.4 \text{ s}$	0.66	—	A

For characteristics curves and test conditions, refer to published data for prototype 2N6474 (File 676).

## Type RCA1C13

Package: JEDEC TO-220AB

Construction: Silicon p-n-p, epitaxial

ELECTRICAL CHARACTERISTICS, At Case Temperature ( $T_C$ ) = 25°C Unless Otherwise Specified

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	LIMITS		UNITS
			MIN.	MAX.	
Collector Cutoff Current: With external base-to-emitter resistance ( $R_{BE}$ )	$I_{CER}$	$V_{CE} = -90 \text{ V}, R_{BE} = 100 \Omega$	—	-100	$\mu\text{A}$
Emitter Cutoff Current: With collector open	$I_{EBO}$	$V_{EB} = -5 \text{ V}, I_C = 0$	—	-1	mA
Collector-to-Emitter Voltage: With base open	$V_{CEO}$	$I_C = -0.1 \text{ A}, I_B = 0$	-120	—	V
Collector-to-Emitter Voltage: With external base-to-emitter resistance ( $R_{BE}$ )	$V_{CER}$	$I_C = -0.1 \text{ A}, R_{BE} = 100 \Omega$	-140	—	V
Gain Bandwidth Product	$f_T$	$I_C = -0.5 \text{ A}, V_{CE} = -4 \text{ V}$	10	—	MHz
DC Forward-Current Transfer Ratio	$h_{FE}$	$I_C = -1 \text{ A}, V_{CE} = -2 \text{ V}$	40	250	
Base-to-Emitter Voltage	$V_{BE}$	$I_C = -1 \text{ A}, V_{CE} = -2 \text{ V}$	—	-1.2	V
Second-Breakdown Collector Current: With base forward biased	$I_{S/b}$	$V_{CE} = -60 \text{ V}, t = 0.4 \text{ s}$	-0.66	—	A

For characteristics curves and test conditions, refer to published data for prototype 2N6476 (File 676).