

Silicon NPN Transistor

RCA1C12

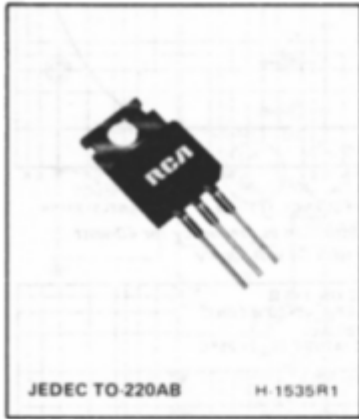
Power Transistor

140V / 4A

DATASHEET

OEM –RCA

Source: RCA Databook 1975



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.

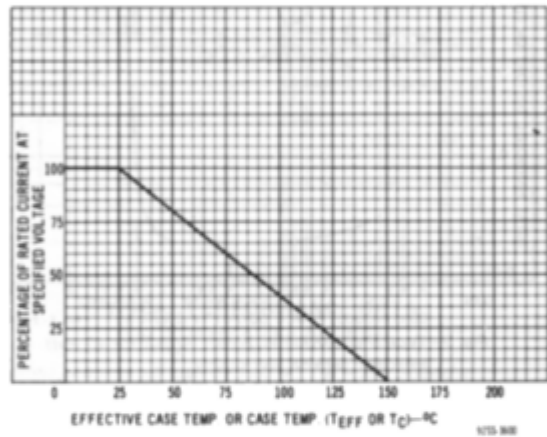


Fig. 1 - Derating curve for all types.

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 Ω ...	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 ≥ 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	μA
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	μA
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).