



ELECTRONIC TUBE REFERENCE

8056

Nuvistor Tubes (all numbers) electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION

CONSTRUCTION

TRIODE

Industrial medium-mu Nuvistor triode intended for low-voltage industrial amplification and control applications.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	5
NOMINAL HEATER	6.3 V / 135 mA	PARALLEL HEATER	— / —
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION1 Triode	
PLATE RESISTANCE	1530 Ω
TRANSCONDUCTANCE	0.0075 S
AMPLIFICATION FACTOR	11.5
MAXIMUM PLATE VOLTAGE	50 V
MAXIMUM PLATE DISSIPATION	0.45 W
MAXIMUM CATHODE CURRENT	15 mA
<i>Published promoted values applied where semantically applicable; additional source-table values retained in TUBE_SECTION_PARAMETER.</i>	

8056 — Low-Voltage Medium-Mu Industrial Nuvistor Triode

Compact metal-shell triode for hybrid electronics, impedance conversion, cathode followers, multivibrators, and low-voltage industrial and military circuits.

Overview

The **8056** is a **medium-mu Nuvistor triode specifically designed for low-voltage power supplies**. RCA describes industrial and military applications, while Siemens highlights hybrid circuits, **impedance-converter stages, cathode followers, and multivibrators**. Unlike many receiving tubes characterized at hundreds of volts, the 8056 has published typical operation at only **12 and 24 V** plate supply.

The low plate resistance, relatively high transconductance, and amplification factor around **12** are central to the manufacturer's intended applications.

Construction, Heater, and Basing

The 8056 uses a **coated, indirectly heated unipotential cathode** inside a compact **MT4 metal-shell Nuvistor** envelope. It has a medium ceramic-wafer **E5-65 Twelvar base, 12AQ basing**, and requires a Nuvistor socket. RCA permits any mounting orientation.

Parameter	Value
Heater voltage	6.3 ± 0.6 V
Heater current	135 mA
Heater power, calculated	0.85 W
Peak heater-to-cathode voltage	±100 V
Maximum overall length	0.800 in
Maximum seated length	0.625 in
Maximum diameter	0.440 in
Approximate mass	1.9-2 g

The RCA underside-view diagram identifies **pin 2 as plate, pin 4 as grid, pin 8 as cathode, and pins 10 and 12 as heater**. The remaining indexed internal-connection pins must not be used as general-purpose circuit terminals.

Low-Voltage Operating Characteristics

RCA provides two representative low-voltage operating conditions:

Characteristic	12 V supply	24 V supply
Plate supply voltage	12 V	24 V
Grid bias	Via 33 kΩ grid resistor	−0.7 V
Plate current	5.5 mA	9.5 mA

Characteristic	12 V supply	24 V supply
Amplification factor	12	12
Plate resistance	Approximately 1.5 k Ω	1.5 k Ω
Transconductance	8 mA/V	8 mA/V

A separate RCA Class A1 characteristic condition uses **24 V supply**, **100 Ω cathode resistor**, and the grid connected to the negative end of that resistor. It gives **8.7 mA plate current**, **7.5 mA/V transconductance**, **1,530 Ω plate resistance**, and **11.5 amplification factor**.

The small-signal relation $\mu \approx g_m \times r_p$ is consistent with the published figures: $0.0075 \text{ S} \times 1,530 \text{ } \Omega \approx 11.5$.

Cathode-Follower and Impedance-Converter Applications

Siemens explicitly recommends the 8056 for **cathode-follower** and **impedance-transformer** stages in hybrid electronics. In a cathode follower, the signal is taken from the cathode circuit and follows the grid's voltage changes, providing a different input-output impedance relationship from a plate-loaded voltage amplifier.

The published low plate resistance and transconductance help explain its suitability for these roles. Siemens also identifies **multivibrator circuits**, where the tube can be used as a switching and timing element. The datasheets do not specify one universal multivibrator circuit or timing range.

Maximum Ratings

Parameter	Published maximum
Plate voltage	50 V in detailed RCA HB3 and Siemens data
Plate dissipation	0.45 W
Cathode current	15 mA
Negative grid voltage	55 V
Peak positive grid voltage	2 V
Grid current	2 mA
Grid-circuit resistance, fixed bias	10 MΩ
Grid-circuit resistance, cathode bias	10 MΩ

The later RCA RC30 condensed table lists **60 V** maximum plate voltage, differing from the detailed RCA HB3 and Siemens **50 V** figure. This is a documented publication difference; the higher value should not be substituted indiscriminately.

The grid-circuit resistance rating is specified for metal-shell temperatures up to **150°C**, with a manufacturer chart for other temperatures.

Interelectrode Capacitances

Measurement	Typical value
Grid to plate	2.1 pF
Grid to cathode, shell, and heater	4.0 pF
Plate to cathode, shell, and heater	1.7 pF
Plate to cathode	0.34 pF
Heater to cathode	1.4 pF

These capacitances influence input loading and feedback in hybrid and high-frequency circuit applications.

Industrial Reliability and Qualification

RCA's extensive technical sheet specifies **1,000 g impact-shock testing**, **2.5 g fatigue vibration for 48 hours at 60 Hz**, variable-frequency vibration tests, low-pressure breakdown testing, heater cycling, and multiple life tests.

The vibration-noise limits include **20 mV RMS at 50-3,000 Hz**, **50 mV peak at 3-6 kHz**, and **500 mV peak at 6-15 kHz**, under the specified test circuit.

The low-pressure breakdown test simulates approximately **100,000 feet altitude** with **250 V RMS** applied between the plate and the other electrodes.

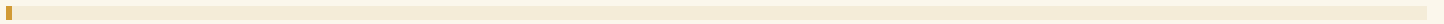
RCA also specifies a minimum **2,000 heater on/off cycles** in its heater-cycling test. Its life qualification includes 20-hour stabilization, 100-hour survival, and 1,000-hour conduction and standby tests. Siemens separately describes a service life exceeding **10,000 hours** under its quality specification.

These tests document industrial qualification and should not be confused with unrestricted operating ratings.

Technical Summary

The **8056** is a **6.3 V / 135 mA low-voltage industrial Nuvistor triode** with approximately **12 amplification factor**, **8 mA/V transconductance**, and **1.5 kΩ plate resistance** at its published low-voltage operating points.

Its documented applications include **hybrid electronic circuits**, **impedance conversion**, **cathode followers**, **multivibrators**, and **low-voltage industrial and military equipment**. Its compact construction, high electrical slope at 12-24 V, and stringent mechanical reliability testing distinguish it from ordinary higher-voltage receiving triodes.





SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1963 Siemens

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1963 SIEMENS

Section 1 · Triode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater voltage	6.3 V	—

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Transconductance	7000 μS	Nominal/Bogey
Amplification factor	11.5	Nominal/Bogey



SOURCE OPERATING CONDITIONS

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1971 RCA HB3 Binder 3 of 7

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1971 RCA HB3 BINDER 3 OF 7

Section 1 · Triode

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Voltage (AC or DC) – published value 1	6.3 V	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Voltage (AC or DC) – published value 2	0.6 V	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Current at heater volts = 6.3 – published value 1	6.3 V	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Current at heater volts = 6.3 – published value 2	0.135 V	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Grid to plate	2.1 pF	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Grid to .cathode, shell, and heater	4 pF	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Plate to cathode, shell, and heater	1.7 pF	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Plate to cathode – published value 1	0 pF	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Plate to cathode – published value 2	34 pF	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Heater to cathode	1.4 pF	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Plate Supply Voltage	24 V	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Plate Resistance (Approx)	1530 ohm	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Transconductance	7500	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Plate Current	8.7 mA	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Grid Voltage (Approx.) for plate $\mu_a = 50$ – published value 1	50 V	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Grid Voltage (Approx.) for plate $\mu_a = 50$ – published value 2	-5 V	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Pin 2 -Plate	2	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Pin 4 -Grid	4	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Pin 10 -Heater	10	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Pin 12 -Heater	12	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Plate Supply Voltage – published value 1	12 V	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Plate Supply Voltage – published value 2	24 V	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Grid Supply Voltage	0.7 V	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Grid Resistor	33000 ohm	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Plate Resistance (Approx) – published value 1	1500 ohm	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Plate Resistance (Approx) – published value 2	1500 ohm	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Transconductance – published value 1	8000	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Transconductance – published value 2	8000	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Plate Current – published value 1	5.5 mA	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Plate Current – published value 2	9.5 mA	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
peratures above 150° C., see accompanying Cr id-Circuit-Resistance Rating	150	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater Current – published value 1	1	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Heater Current – published value 2	0.125	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Heater Current – published value 3	0.145	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Grid to plate – published value 1	2 pF	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Grid to plate – published value 2	1.8 pF	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Grid to plate – published value 3	2.4 pF	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
and heater – published value 1	2 pF	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
and heater – published value 2	3.4 pF	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
and heater – published value 3	4.6 pF	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
and heater – published value 1	2 pF	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
and heater – published value 2	1.4 pF	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
and heater – published value 3	2 pF	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Heater to cathode – published value 1	2	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Heater to cathode – published value 2	1.1	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater to cathode – published value 3	1.7	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Plate to cathode – published value 1	2 pF	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Plate to cathode – published value 2	0.26 pF	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Plate to cathode – published value 3	0.42 pF	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Plate Current (1) – published value 1	1 mA	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Plate Current (1) – published value 2	3 mA	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Plate Current (1) – published value 3	6.7 mA	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Plate Current (1) – published value 4	10.7 mA	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Plate Current (21 – published value 1	21	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Plate Current (21 – published value 2	1	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Plate Current (21 – published value 3	4	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Plate Current (21 – published value 4	50	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Transconductance (1) – published value 1	1	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Transconductance (1) – published value 2	13	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Transconductance (1) – published value 3	6500	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Transconductance (1) – published value 4	8500	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Transconductance (2) – published value 1	2	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Transconductance (2) – published value 2	35	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Transconductance (2) – published value 3	5700	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Reverse Grid Current – published value 1	16	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Reverse Grid Current – published value 2	0.05	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Note 1 – published value 1	1 V	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Note 1 – published value 2	6.3 V	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Note 3 – published value 1	3 V	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Note 3 – published value 2	2 V	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Note 3 – published value 3	100 V	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
antl cathode-Dypass Capacitor = 1000 μ t	1000	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Note LL – published value 1	24 V	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Note LL – published value 2	-10 V	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Note 5 – published value 1	5 V	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Note 5 – published value 2	5.7 V	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Note 6 – published value 1	6 V	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Note 6 – published value 2	-2 V	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Note 7 – published value 1	7 V	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Note 7 – published value 2	100 V	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Note 8 – published value 1	8 V	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Note 8 – published value 2	100 V	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Note 9 – published value 1	9 V	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater negative with respect to cathode	100 V	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
Heater positive with respect to cathode	100 V	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
PLATE VOLTAGE	50 V	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Negative-bias value	55 V	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
GRID CURRENT	2 mA	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
CATHODE CURRENT	15 mA	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
PLATE DISSIPATION – published value 1	0 mA	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
PLATE DISSIPATION – published value 2	45 mA	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
For fixed-bias operation	10 mA	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.
For cathode-bias operation	10 mA	Published datasheet value; multiple numbers on a source row represent separate limits or operating conditions.



SOURCE OPERATING CONDITIONS

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1975 RCA RC30

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1975 RCA RC30

Section 1 · Triode

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid to Plate Capacitance	2.1 pF	—
Heater to Cathode Capacitance	1.4 pF	—

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Typical Plate Supply Voltage	24 V	LowVoltage

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Typical Plate Current	9.5 mA	LowVoltage