

ELECTRONIC TUBE REFERENCE

7587

Nuvistor Tubes (all numbers) electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION

CONSTRUCTION

TETRODE

Industrial sharp-cutoff Nuvistor tetrode for general-purpose industrial amplifier applications, combining compact metal-ceramic construction with stable small-signal amplification.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	9
NOMINAL HEATER	6.3 V / 150 mA	PARALLEL HEATER	— / —
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION1 Tetrode	
PLATE RESISTANCE	200000 Ω
TRANSCONDUCTANCE	0.0106 S
MAXIMUM PLATE VOLTAGE	250 V
MAXIMUM SCREEN VOLTAGE	110 V
MAXIMUM PLATE DISSIPATION	2.2 W
MAXIMUM SCREEN DISSIPATION	0.2 W
MAXIMUM CATHODE CURRENT	20 mA
Nuvistor tetrode.	

7587 — Special-Quality Sharp-Cutoff Nuvistor Tetrode

An industrial all-metal-and-ceramic miniature tetrode for high-transconductance amplification, low-voltage operation, and mechanically demanding electronic equipment.

Overview

The **7587** is a **sharp-cutoff Nuvistor tetrode** for general-purpose **industrial amplifier applications**. RCA identifies it as a sharp-cutoff, high-transconductance Nuvistor, while Lorenz describes a steep-slope universal tetrode suitable for relatively low operating voltages. Philips documents the tube as a **special-quality, shock- and vibration-resistant tetrode**.

Its characteristic design combines a control grid, screen grid, and plate with an indirectly heated coated cathode in a compact metal-ceramic structure. The published operating point uses **125 V plate supply**, **50 V screen supply**, and approximately **10 mA plate current**, with **10.6 mA/V transconductance**.

Construction, Basing, and Heater

The 7587 uses a **metal-shell MT4 envelope with a ceramic cylinder**, a **skirted miniature plate cap**, and an **E5-65 ceramic-wafer Nuvistor base**. The RCA basing designation is **12AS**. The tube requires a Nuvistor socket and may be mounted in any position.

The manufacturer pin diagram identifies **pin 2 as screen grid**, **pin 4 as control grid**, **pin 8 as cathode**, and **pins 10 and 12 as heater**. The **plate is brought to the top cap**. Other base positions include internal connections and a designated do-not-use contact, and must be interpreted according to the indexed manufacturer's basing diagram.

Mechanical/heater parameter	Value
Heater voltage	6.3 ± 0.6 V
Heater current	0.150 A
Calculated heater power	0.945 W
Maximum overall length	1.050 in
Maximum seated length	0.840 in
Maximum diameter	0.440 in
Approximate weight	0.1 oz
Heater-cathode peak voltage	±100 V

The heater may be powered by AC or DC.

Typical Class A1 Amplifier Characteristics

Characteristic	Published value
Plate supply voltage	125 V
Screen-grid supply voltage	50 V
Cathode resistor	68 Ω
Plate current	10 mA
Screen-grid current	2.7 mA
Transconductance	10,600 μmhos (10.6 mA/V)
Plate resistance	Approximately 200 k Ω
Grid voltage at 10 μA plate current	Approximately -4.5 V

The high plate resistance and relatively high transconductance are characteristic of the tube's tetrode operating behavior. RCA provides plate-current and transfer-characteristic curves to illustrate the effect of control-grid bias and screen-grid voltage.

Philips gives production-design ranges of **8.5-11.5 mA plate current**, **1.8-3.6 mA screen current**, and approximately **9-12.2 mA/V transconductance** at the defined test condition.

Industrial Maximum Ratings

Parameter	Maximum
Plate supply voltage	330 V
Plate voltage	250 V
Screen-grid supply voltage	330 V
Screen-grid voltage	110 V
Plate dissipation	2.2 W
Screen-grid input/dissipation	0.2 W
Cathode current	20 mA
Negative control-grid voltage	55 V
Peak positive control-grid voltage	2 V
Control-grid current	2 mA
Fixed-bias grid-circuit resistance	0.5 M Ω

Parameter	Maximum
Cathode-bias grid-circuit resistance	1 MΩ
Metal-shell temperature, stated ratings	150°C

The plate and screen **supply-voltage limits** are distinct from the maximum electrode voltages. The higher 330 V supply figures are not unrestricted continuous plate or screen operating voltages.

Interelectrode Capacitances

Measurement	RCA value
Control grid to plate	≤0.015 pF
Control grid to cathode, screen, shell, and heater	7.0 pF
Plate to cathode, screen, shell, and heater	1.4 pF
Heater to cathode	1.4 pF

Philips lists a slightly different nominal grid-to-plate capacitance of approximately **0.01 pF**. The exceptionally small control-grid-to-plate capacitance is significant for reducing direct input-output feedback in an amplifier.

Reliability and Special-Quality Tests

The RCA industrial sheet specifies extensive sample-lot tests, including **1,000 g impact shock**, **2.5 g fatigue vibration for 48 hours at 60 Hz**, vibration-induced output-noise testing, low-pressure breakdown testing, heater cycling, shorts and continuity testing, and life-performance evaluation.

RCA's variable-frequency vibration test specifies **≤35 mV RMS output over 50-6,000 Hz** and **≤500 mV over 6,000-15,000 Hz** under the stated 1 g test arrangement.

The low-pressure breakdown test applies **240 V RMS** between plate and other electrodes under simulated altitudes up to **100,000 feet**. RCA also specifies a minimum **2,000 heater on/off cycles** in its test procedure.

Production qualification includes early-hour stabilization, 100-hour life testing, and 1,000-hour performance evaluation. These tests describe industrial quality control rather than a single unconditional guaranteed service life.

Manufacturer Documentation

Lorenz, RCA, and Philips consistently describe a **sharp-cutoff, high-transconductance tetrode** with **6.3 V / 150 mA heater**, **125 V plate-supply characteristic point**, and **10.6 mA/V nominal transconductance**. Their documents differ in the depth of industrial reliability and production-tolerance data.

The Philips source is a special-quality sheet originally dated 1962, despite its later archive/catalog label. The RCA detailed industrial documentation provides the fullest mechanical and qualification information.

Technical Summary

The **7587** is a **6.3 V / 150 mA sharp-cutoff industrial Nuistor tetrode** with **12AS basing**, a **top-cap plate connection**, **10.6 mA/V transconductance**, approximately **200 kΩ plate resistance**, and **2.2 W maximum plate dissipation**.

Its high-slope characteristics, very low grid-to-plate capacitance, compact metal-ceramic construction, and extensive shock, vibration, altitude, and endurance testing distinguish it as a specialized industrial amplifier tube.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

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 · Tetrode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater voltage	6.3 V	—
Heater current	150 mA	—
Plate supply voltage	125 V	ClassA
Screen supply voltage	50 V	ClassA
Cathode resistor	68 ohm	ClassA
Plate current	10 mA	ClassA
Screen current	2.7 mA	ClassA
Maximum plate voltage	250 V	—
Maximum screen voltage	330 V	—
Maximum plate dissipation	2.2 W	—

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate resistance	200000 ohm	ClassA
Transconductance	10600 uS	ClassA

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid-to-plate capacitance	0.015 pF	—
Input capacitance	7 pF	—
Output capacitance	1.4 pF	—

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 · Tetrode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate Supply Voltage	330 V	IndustrialService
Screen Supply Voltage	330 V	IndustrialService
Typical Plate Supply Voltage	125 V	ClassA
Typical Screen Supply Voltage	50 V	ClassA
Cathode Resistor	68 ohm	ClassA
Plate Current	10 mA	ClassA
Screen Current	2.7 mA	ClassA

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid No.1 to Plate Capacitance	0.015 pF	Maximum



SOURCE DATA APPENDIX

1999 Philips 0-D

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

1999 PHILIPS 0-D
Section 1 · Tetrode

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater voltage	6.3 V	—
Heater current	150 mA	—
Internal resistance	0.2 MOhm	—

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Mutual conductance	10.6 mA/V	—
elements except anode Cgy	7 PF	PublishedLine: elements except anode Cgy = 6.51 6.0~7.0 PF
ments except grid No	-1.6 pF	PublishedLine: ments except grid No.1 Ca = 1.4 1,2-1,6 pF
Cathode to heater Ckf	-1.7 pF	PublishedLine: Cathode to heater Ckf = 1.4: 1,1-1,7 pF
Anode current Iz	11.5 mA	PublishedLine: Anode current Iz = 10: 8.5~11,5 mA
Grid No	-3.6 mA	PublishedLine: Grid No.2 current Ig, = 2.7 1.8-3.6 mA
M utual conductance S	-12.2 mA	PublishedLine: M¥utual conductance S = 10.6: 9.0-12,2 mA/V!)

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Anode voltage maximum	250 V	—
Anode dissipation maximum	2.2 W	—
Screen voltage maximum	110 V	—
Screen dissipation maximum	0.2 W	—
Cathode current maximum	20 mA	—
Grid No	2 mA	PublishedLine: Grid No.1 current I61 = max. 2 mA
Cathode current Ix max	20 mA	PublishedLine: Cathode current Ix = max. 20 mA