

ELECTRONIC TUBE REFERENCE

6E12N

Nuvistor Tubes (all numbers) electronic tube

CONSOLIDATED TECHNICAL DATA
1 SECTION
CONSTRUCTION
TETRODE

Russian high-frequency tetrode for voltage and power amplification. Its design supports RF signal amplification rather than audio-output or sweep service.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	—
NOMINAL HEATER	6.3 V / 140 mA	PARALLEL HEATER	— / —
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION1 Tetrode	
TRANSCONDUCTANCE	0.0095 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	22 mA
Representative section row from the complete filename-matched Russian datasheet content only; neighboring-tube fragments excluded.	

6E12N / 6Э12H — Metal-Ceramic High-Frequency Amplifier Tetrode

An indirectly heated Soviet miniature tetrode for high-frequency voltage and power amplification, with a related vibration-qualified 6E12NV / 6Э12H-B variant.

Overview

The **6E12N**, written **6Э12Н** in the original Russian reference, is a **high-frequency tetrode** intended for amplification of voltage and power at high frequencies. Its construction uses a compact **metal-ceramic envelope** with rigid electrode connections. The manufacturer reference also covers **6Э12Н-В**, transliterated **6E12NV**, a related version with separately specified vibration, shock, and high-temperature endurance.

The source provides separate numerical characteristics for the standard and -B versions. These should be preserved rather than assuming every specification is identical.

Electrode Structure and Mechanical Construction

The 6E12N contains an anode, a first or control grid, a second or screen grid, and an indirectly heated cathode. The original drawing labels **A** for anode, **C1** for first grid, **C2** for second grid, **K** for cathode, and **II** for heater.

The manufacturer drawing identifies electrode connections in groups: anode at the upper connection; second-grid connections **1, 2, 3**; first-grid connections **4, 5, 6**; cathode connections **7, 8, 9**; and heater connections **10 and 12**. This is the source's illustrated terminal grouping, not a conventional nine-pin miniature receiving-tube basing.

The published mass is approximately **4 g**. The metal-ceramic construction and grouped connections distinguish the tube from ordinary glass-envelope receiver tetrodes.

Heater and Test Conditions

The reference specifies basic measurements at **6.3 V heater voltage**, **120 V anode voltage**, **50 V screen-grid voltage**, and **68 Ω cathode resistance**.

Parameter	6E12N	<u>6E12NV</u>
Heater current	140 ± 15 mA	140 ± 15 mA
Anode current	10 ± 3 mA	9.5 ± 2.5 mA
Screen-grid current	≤3.6 mA	≤3.6 mA
Transconductance	9.5 ± 2.5 mA/V	11 mA/V, +2/−2.5
Anode current at grid-1 voltage −6 V	≤50 μA	≤50 μA

The two versions have similar nominal operating conditions but different transconductance and anode-current tolerance statements. The **6E12NV** sheet additionally specifies a first-grid reverse-current test at **−1.6 V** and **0.5 kΩ** grid resistance, with a limit of **≤0.1 μA**.

High-Frequency Performance and Noise

For the standard **6E12N**, the source specifies an equivalent noise resistance of **$\leq 1 \text{ k}\Omega$ at 30 MHz**. This is a particular RF noise measurement and should not be generalized into a complete broadband noise-figure specification.

The standard tube's vibration-induced noise voltage is specified as **$\leq 40 \text{ mV}$ with a $2 \text{ k}\Omega$ anode load**, at **50 Hz** mechanical vibration and **2.5 g** acceleration.

For the **6E12NV**, the reference gives a more extensive vibration-noise qualification. At **15 g** acceleration, the specified maximum noise voltages vary by frequency and by the proportion of tubes meeting each threshold:

Vibration frequency	80% of tubes	20% of tubes
50 Hz	$\leq 30 \text{ mV}$	$\leq 50 \text{ mV}$
5-2,500 Hz	$\leq 130 \text{ mV}$	$\leq 250 \text{ mV}$
2,500-5,000 Hz	$\leq 250 \text{ mV}$	$\leq 400 \text{ mV}$

These are manufacturer acceptance criteria for vibration-induced output, not normal RF signal amplitudes.

Interelectrode Capacitances

Measurement	6E12N	<u>6E12NV</u>
Input capacitance	$7 \pm 1 \text{ pF}$	$7 \pm 1 \text{ pF}$
Output capacitance	$1.5 \pm 0.4 \text{ pF}$	$1.5 \pm 0.4 \text{ pF}$
Feedthrough capacitance	$\leq 0.017 \text{ pF}$	$\leq 0.015 \text{ pF}$
Cathode-to-heater capacitance	$1.4 \pm 0.4 \text{ pF}$	$1.4 \pm 0.4 \text{ pF}$

The exceptionally small published **feedthrough capacitance** is important to high-frequency tetrode operation because it characterizes unwanted coupling between input and output electrode systems. The distinction between the two versions is small but explicitly documented.

Limiting Operating Conditions

The source gives the following limiting values for the family:

Parameter	Limit
Heater voltage	5.7-7.0 V
Anode voltage	250 V

Parameter	Limit
Anode voltage with tube cut off	330 V
Negative first-grid voltage	55 V
Anode dissipation	2.2 W
Screen-grid dissipation	0.2 W
First-grid dissipation	0.2 W
Cathode current	20 mA
First-grid circuit resistance	1 MΩ
Maximum envelope temperature	250°C

The [6E12NV](#) additionally specifies a **110 V screen-grid limit**, a **330 V screen-grid condition when cut off**, and **100 V cathode-to-heater voltage**. The standard version's table does not separately state these three limits; they should not automatically be copied across without manufacturer confirmation.

The cut-off voltage limits are separate from the normal conducting operating limits.

Service Life and Environmental Qualification

The standard **6E12N** is specified for **at least 5,000 hours** of operation. The [6E12NV](#) has separately stated endurance of **at least 500 hours at 200°C ambient** and **at least 1,000 hours at normal ambient temperature**.

The manufacturer gives a standard-tube multiple-shock acceleration of **35 g**, while the [6E12NV](#) is rated for **150 g repeated shock** and **1,000 g single shock**.

The operating ambient ranges are **−60°C to +125°C** for the standard **6E12N** and **−60°C to +200°C** for the [6E12NV](#). These are substantial distinctions between the versions.

Characteristic Curves

The original Russian reference includes plate-current curves for the [6E12NV](#), showing anode current versus anode voltage at different first-grid biases, with **6.3 V heater** and **50 V screen-grid** conditions. It also includes a transfer curve of anode current versus first-grid voltage at **120 V anode** and **50 V screen**.

These curves illustrate the effect of control-grid bias on anode current and the relatively flat plate-current behavior over part of the conducting range typical of the documented tetrode operation. They complement, rather than replace, the tabulated measurement points.

Technical Summary

The **6E12N / 6Θ12H** is a compact **6.3 V metal-ceramic high-frequency amplifier tetrode**, with approximately **140 mA heater current**, **10 mA typical anode current**, and **9.5 mA/V nominal transconductance** at the published 120 V anode / 50 V screen test point.

Its **low feedthrough capacitance**, RF noise specification, high-temperature construction, and high-frequency voltage and power amplification purpose distinguish it from general-purpose low-frequency receiving tubes. The related [6E12NV](#) / **6Θ12H-B** is separately characterized for vibration, shock, and elevated ambient temperature operation, and should retain its own manufacturer-specific limits.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1981 Russian Tubes Katsnelson and Larionov

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

1981 RUSSIAN TUBES KATSNELSON AND LARIONOV

Section 1 · Tetrode

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater voltage nominal	6.3 V	Published heater operating voltage
Heater current nominal	140 mA	Nominal or midpoint of published heater-current tolerance
Plate current	10 mA	Plate 120 V, screen 50 V
Screen current	3.6 mA	Maximum
Transconductance	9.5 mA/V	Published nominal
Service life	5000 h	Minimum

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Input capacitance	7.5 pF	Published
Output capacitance	1.5 pF	Published nominal
Transfer capacitance	0.017 pF	Maximum

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate voltage limit	250 V	Published
Screen voltage limit	110 V	Published
Plate dissipation	2.2 W	Published

TUBE TINKER

An independent reference for electronic tubes, vacuum tubes, and their source documents.

