

ELECTRONIC TUBE REFERENCE

14H7

Voltage - Pentode Remote Cutoff (single) electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
PENTODE

High-slope variable-mu pentode for RF and IF amplification, combining strong gain with extended-cutoff automatic gain control.

GENERAL CHARACTERISTICS

BASE DESIGNATION	8V	BASE PINS	8
NOMINAL HEATER	12.6 V / 160 mA	PARALLEL HEATER	– / –
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

8V - TERMINAL PINOUT

TERMINAL	SECTION	ELEMENT	STATUS
PIN1 – H	–	H – Heater	CONNECTED
PIN2 – P	A	P – Plate (Anode)	CONNECTED
PIN3 – G2	A	G2 – Screen Grid	CONNECTED
PIN4 – G3	A	G3 – Suppressor Grid	CONNECTED
PIN5 – IS	A	IS – Internal Screen	CONNECTED
PIN6 – G1	A	G1 – Control Grid	CONNECTED
PIN7 – K	A	K – Cathode	CONNECTED
PIN8 – H	–	H – Heater	CONNECTED

SECTION RATINGS

SECTION1 Pentode	
PLATE RESISTANCE	800000 Ω
TRANSCONDUCTANCE	0.004 S
MAXIMUM PLATE VOLTAGE	300 V
MAXIMUM SCREEN VOLTAGE	150 V
MAXIMUM PLATE DISSIPATION	2.5 W
MAXIMUM SCREEN DISSIPATION	0.5 W
<i>Promoted from clearly identified printed ratings/characteristics; additional published operating points and capacitances retained in TUBE_SECTION_PARAMETER.</i>	

14H7 — High-Slope Semi-Remote-Cutoff RF Pentode

The **14H7** is a loctal-base, indirectly heated, semi-remote-cutoff (variable-mu) pentode designed for radio frequency (RF) and intermediate frequency (IF) amplification. It is particularly suited for use in AC-DC operated radio receivers employing series-connected heater strings. The tube features a unipotential cathode, triple-grid construction, and an internal shield.

Construction, Heater, and Pinout

The 14H7 is constructed in a T-9 glass envelope with a locking-in 8-pin (loctal) base. Its physical dimensions include a maximum diameter of 1-3/16 inches, a maximum seated height of 2-3/32 inches, and a maximum overall length of 2-5/8 inches.

Heater Specifications

The heater of the 14H7 is designed for AC or DC operation. The published specifications for the heater vary slightly across different documentation sources:

- **Typical Operating Conditions:** 12.6 V at 0.15 A
- **Alternative Ratings:** 12.6 V at 0.16 A
- **Nominal Ratings:** 14.0 V at 0.16 A

These variations reflect the tube's adaptability to 150 mA series-string heater circuits.

Pin Connections

The 14H7 utilizes the **8V** loctal basing diagram. When viewed from the bottom of the tube, the pin connections are:

Pin	Electrode Connection
1	Heater
2	Plate (Anode)
3	Screen Grid (Grid No. 2)
4	Suppressor Grid (Grid No. 3)
5	Internal Shield / Suppressor
6	Control Grid (Grid No. 1)
7	Cathode
8	Heater

The center of the base features a metal locking key.

Electrical Characteristics and Operating Points

The 14H7 is characterized by high transconductance (high slope) and high plate resistance. Under Class A (or Class A1) amplifier service, typical operating conditions are documented for two distinct voltage levels:

Low-Voltage Operating Point

- **Plate Voltage:** 100 V
- **Screen Voltage:** 100 V
- **Control Grid Voltage:** -1 V (or established via a cathode bias resistor of 180 I in some configurations)
- **Suppressor and Internal Shield Voltage:** 0 V
- **Plate Current:** 7.5 mA to 8.2 mA
- **Screen Current:** 2.6 mA to 3.3 mA
- **Plate Resistance (approximate):** 0.25 MI to 0.35 MI
- **Transconductance:** 3,800 Imhos to 4,000 Imhos
- **Control Grid Voltage for Cutoff (approximate, for $G_m = 35$ Imhos):** -12 V

High-Voltage Operating Point

- **Plate Voltage:** 250 V
- **Screen Voltage:** 150 V
- **Control Grid Voltage:** -2.5 V
- **Suppressor and Internal Shield Voltage:** 0 V
- **Plate Current:** 9.5 mA to 10.0 mA
- **Screen Current:** 3.2 mA to 3.5 mA
- **Plate Resistance (approximate):** 0.8 MI (800,000 I)

- **Transconductance:** 3,800 Imhos to 4,000 Imhos
- **Control Grid Voltage for Cutoff (approximate, for $G_m = 35$ Imhos):** -19 V

The semi-remote-cutoff characteristic is demonstrated by the grid bias required to reduce transconductance to 35 Imhos, which increases from -12 V to -19 V as screen voltage is raised from 100 V to 150 V.

Maximum Ratings

The maximum ratings for the 14H7 are established to ensure reliable operation and prevent thermal or electrical breakdown:

Parameter	Maximum Rating
Maximum Plate Voltage	300 V
Maximum Screen Supply Voltage	300 V
Maximum Screen Voltage	150 V
Minimum External Grid Bias Voltage	0 V
Maximum Plate Dissipation	2.5 W
Maximum Screen Dissipation	0.5 W

Interelectrode Capacitances

The direct interelectrode capacitances of the 14H7 are measured with an external shield connected to the cathode:

- **Input Capacitance (Control Grid to all other electrodes except plate):** 8.0 IIF (pF)
- **Output Capacitance (Plate to all other electrodes except control grid):** 7.0 IIF (pF)
- **Control Grid to Plate Capacitance:** 0.004 IIF to 0.007 IIF maximum

The extremely low grid-to-plate capacitance is critical for preventing self-oscillation in high-gain RF and IF amplifier stages.

Related Designations

The 14H7 is closely related to the [7H7](#) vacuum tube. Manufacturers note that for further technical information, reference should be made to the [7H7](#), indicating that the 14H7 shares identical electrical characteristics and design features with the [7H7](#), with the exception of the heater configuration.

Technical Summary

The **14H7** is a loctal-base, high-slope, semi-remote-cutoff RF pentode designed for RF and IF amplification in AC-DC receivers. It features a unipotential cathode, a triple-grid structure with an internal shield, and a locking 8-pin base. Depending on the application, its heater is rated at **12.6 V / 0.15 A** (or up to **14.0 V / 0.16 A**). The tube delivers a high transconductance of **3,800 to 4,000 Imhos** and a high plate resistance of **0.25 to 0.8 MI** under typical Class A operating conditions. Its very low grid-to-plate capacitance of **0.004 to 0.007 pF** ensures stable operation in high-frequency circuits.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

195X General Electric Essential Characteristics

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

195X GENERAL ELECTRIC ESSENTIAL CHARACTERISTICS

Section 1 · Pentode

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Input capacitance	8 pF	Section1
Output capacitance	7 pF	Section1
Grid-to-plate capacitance	0.004 pF	Section1

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate voltage	250 V	ClassA
Screen voltage	150 V	ClassA
Cathode resistor	180 Ω	ClassA
Plate current	10 mA	ClassA
Screen current	3.2 mA	ClassA
Plate voltage	100 V	ClassA
Screen voltage	100 V	ClassA
Control-grid voltage	-1.5 V	ClassA
Plate current	7.5 mA	ClassA
Screen current	2.6 mA	ClassA

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate resistance	800000 Ω	ClassA
Transconductance	4000 μS	ClassA
Plate resistance	350000 Ω	ClassA
Transconductance	4000 μS	ClassA

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