

ELECTRONIC TUBE REFERENCE

14A5

Power - Beam Single (NOT sweep) (under 10W) electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
BEAMPOWER

Lock-in beam-power amplifier designed for receiver output-stage service, providing a compact power tube for audio-frequency amplification.

GENERAL CHARACTERISTICS

BASE DESIGNATION	6AA	BASE PINS	8
NOMINAL HEATER	12.6 V / 150 mA	PARALLEL HEATER	– / –
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

6AA - TERMINAL PINOUT

TERMINAL	SECTION	ELEMENT	STATUS
PIN1 – Pin 1	–	H – Heater	CONNECTED · verified
PIN2 – Pin 2	A	P – Plate (Anode)	CONNECTED · verified
PIN3 – Pin 3	A	G2 – Screen Grid	CONNECTED · verified
PIN4 – Pin 4	–	–	NC · verified
PIN5 – Pin 5	–	–	NC · verified
PIN6 – Pin 6	A	G1 – Control Grid	CONNECTED · verified
PIN7 – Pin 7	A	BP – Beam-Forming Plate	CONNECTED · verified
PIN7 – Pin 7	A	K – Cathode	CONNECTED · verified

TERMINAL	SECTION	ELEMENT	STATUS
PIN8 – Pin 8	–	H – Heater	CONNECTED • verified

SECTION RATINGS

SECTION1 Beam Power	
PLATE RESISTANCE	70000 Ω
TRANSCONDUCTANCE	0.003 S
MAXIMUM PLATE VOLTAGE	300 V
MAXIMUM SCREEN VOLTAGE	250 V
MAXIMUM PLATE DISSIPATION	7.5 W
<i>Published promoted fields populated semantically; identical repeated sections compressed.</i>	

14A5 – Beam Power Amplifier

An indirectly heated lock-in beam power pentode designed for Class A audio power amplification in radio receivers and electronic equipment.

Overview

The **14A5** is a beam power amplifier (also classified as a beam pentode) featuring a lock-in construction. It is designed with a coated unipotential cathode and a heater rated for 12.6 V operation.

In vacuum tube design, corresponding 7-volt and 14-volt types often share identical electrical characteristics aside from their heater ratings. However, the 14A5 is a notable exception to this rule, possessing a distinct set of operating characteristics and ratings that do not directly mirror a corresponding 7-volt counterpart. The tube is primarily applied as a Class A1 audio power amplifier, capable of delivering moderate power output with low distortion.

Construction, Physical Dimensions, and Base Connection

The 14A5 is constructed using a T-9 glass bulb and an 8-pin lock-in base, which corresponds to the **6AA** basing diagram. The lock-in design provides a secure mechanical connection and integrated shielding properties via the metal base shell and center guide pin. The tube is designed to operate reliably in any mounting position.

Physical Dimensions

- **Maximum Overall Length:** 2-25/32 inches

- **Maximum Seated Height:** 2-1/4 inches
- **Maximum Bulb Diameter:** 1-3/16 inches

Pinout Configuration

When viewed from the bottom of the lock-in base, the pin connections are assigned as follows:

Pin Number	Electrode Connection
Pin 1	Heater (H)
Pin 2	Plate (P)
Pin 3	Grid #2 (Screen Grid, G ₂)
Pin 4	No Connection (NC)
Pin 5	No Connection (NC)
Pin 6	Grid #1 (Control Grid, G ₁)
Pin 7	Cathode (K)
Pin 8	Heater (H)

Heater and Electrical Ratings

The heater of the 14A5 is designed to operate from either an AC or DC supply. The maximum ratings are established under the RMA Standard M8-210 system, though some variation exists in general reference tables regarding absolute limits.

Heater Specifications

- **Heater Voltage:** 12.6 V
- **Heater Current:** 150 mA (0.15 A)
- **Heater Supply:** AC or DC

Maximum Ratings

The absolute and design-maximum limits for the electrodes are defined as follows:

- **Maximum Plate Voltage:** 250 V to 300 V
- **Maximum Grid #2 (Screen) Voltage:** 250 V to 300 V
- **Maximum Heater-Cathode Voltage:** 90 V
- **Maximum Plate Dissipation:** 7.5 W
- **Maximum Grid #2 Dissipation:** 1.5 W
- **Maximum Grid #1 Circuit Resistance (Fixed Bias):** 1.0 MΩ
- **Maximum Grid #1 Circuit Resistance (Self Bias):** 0.5 MΩ

The variation in maximum plate and screen voltages (ranging from 250 V in general tables to 300 V under specific RMA standard interpretations) highlights the importance of operating the tube within conservative design limits to ensure longevity.

Typical Operating Conditions and Characteristics

The 14A5 is optimized for Class A₁ audio amplification. Under typical operating conditions with a 250 V supply on both the plate and screen grid, the tube exhibits the following electrical characteristics:

Parameter	Value
Plate Voltage	250 V
Grid #2 (Screen) Voltage	250 V
Grid #1 (Control Grid) Voltage	-12.5 V
Peak A-F Signal Voltage	12.5 V
Zero-Signal Plate Current	30 mA
Zero-Signal Grid #2 Current	3.5 mA
Maximum-Signal Plate Current	32 mA
Maximum-Signal Grid #2 Current	5.5 mA
Plate Resistance (Approximate)	70,000 Ω
Transconductance	3,000 μ mhos
Load Resistance	7,500 Ω
Power Output	2.8 W
Total Harmonic Distortion (THD)	7%

Operating Analysis

When biased at -12.5 V, the control grid (Grid #1) can accept a peak audio-frequency signal voltage of 12.5 V without driving the grid positive, preventing the onset of grid current. Under zero-signal conditions, the plate draws 30 mA and the screen grid draws 3.5 mA.

When driven to full output by the maximum peak signal, the plate current rises slightly to 32 mA, and the screen grid current increases to 5.5 mA. The plate resistance is approximately 70,000 Ω , which, combined with a transconductance of 3,000 μ mhos, allows the tube to deliver 2.8 W of audio power into a 7,500 Ω load. At this maximum output level, the total harmonic distortion is limited to a moderate 7 percent.

Technical Summary

The **14A5** is an **8-pin lock-in beam power amplifier** featuring a **12.6 V, 150 mA heater** and a **coated unipotential cathode**. It is designed for Class A₁ audio power output service, where it can deliver **2.8 W** of output power into a **7,500 Ω** load with **7% total harmonic distortion** when operated at a plate and screen potential of **250 V**.

Its lock-in construction (basing **6AA**) provides robust mechanical stability and integrated shielding, making it suitable for compact receiver designs. Because the 14A5 is an exception to the typical parameter matching between corresponding 7-volt and 14-volt series, designers must rely strictly on its unique ratings and operating points rather than assuming equivalence with related designations.

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 · Beam Power

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum plate voltage	250 V	Published handbook rating
Maximum screen voltage	250 V	Published handbook rating
Plate voltage	250 V	ClassA
Screen voltage	250 V	ClassA
Control-grid bias	12.5 V	ClassA
Plate current	30 mA	ClassA
Screen current	3.5 mA	ClassA
Load resistance	7500 ohm	ClassA
Power output	2.8 W	ClassA

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate resistance	70000 ohm	Published handbook characteristic
Transconductance	3000 μ S	Published handbook characteristic
Heater voltage	12.6 V	Published heater rating
Heater current	150 mA	Published heater rating

1961 Tung Sol

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

1961 TUNG SOL

Section 1 · Beam Power

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Power Output	2.8 W	ClassA1

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Transconductance	3000 uS	ClassA1

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