

ELECTRONIC TUBE REFERENCE

14F7

Voltage - Dual Triode (similar) electronic tube

CONSOLIDATED TECHNICAL DATA

2 SECTIONS

CONSTRUCTION

TRIODE-TRIODE

Series-heater counterpart of the 7F7 twin high-mu triode, designed for resistance-coupled voltage amplification and phase-inverter service with two similar amplifier sections.

GENERAL CHARACTERISTICS

BASE DESIGNATION	8AC	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

SECTION RATINGS

SECTION1 Triode	
PLATE RESISTANCE	62500 Ω
TRANSCONDUCTANCE	0.0016 S
AMPLIFICATION FACTOR	100
MAXIMUM PLATE VOLTAGE	300 V
MAXIMUM PLATE DISSIPATION	1 W
Representative row for identical repeated sections.	

SECTION2 Triode	
PLATE RESISTANCE	62500 Ω
TRANSCONDUCTANCE	0.0016 S
AMPLIFICATION FACTOR	100
MAXIMUM PLATE VOLTAGE	300 V
MAXIMUM PLATE DISSIPATION	1 W
Second identical physical triode section; added to align rows with SectionCount.	

14F7 — High-Mu Twin Triode Vacuum Tube

An indirectly heated, lock-in double triode designed for voltage amplification, resistance-coupled cascade circuits, and phase inverter service.

Overview

The **14F7** is a twin high-mu triode vacuum tube featuring lock-in construction. It contains two electrically independent triode units within a single T-9 glass envelope. Each triode section has its own cathode, control grid, and plate, allowing them to be operated independently or in cascade. The tube is designed with a common heater rated for **12.6 V** and **150 mA** (0.15 A), suitable for AC or DC operation.

The 14F7 is primarily applied as a voltage amplifier in resistance-coupled cascade amplifiers or as a phase inverter. Its electrical characteristics are identical to the octal-based [6SL7GT](#) and the 6.3 V lock-in [7F7](#) twin triodes.

Construction, Heater, and Base Configuration

The 14F7 utilizes a T-9 glass bulb and an 8-pin lock-in base with a **BAC** (or **8AC**) basing arrangement. The physical dimensions of the tube are compact, with a maximum overall length of **2-25/32 inches**, a maximum seated height of **2-1/4 inches**, and a maximum bulb diameter of **1-3/16 inches**. The tube is designed to operate reliably in any mounting position.

The cathodes are coated unipotential structures. The heater is designed for series or parallel operation on a nominal 12.6 V supply. The pin connections, viewed from the bottom of the lock-in base, are as follows:

Pin	Connection
1	Heater
2	Plate (Triode Unit 2)
3	Grid (Triode Unit 2)
4	Cathode (Triode Unit 2)

Pin	Connection
5	Cathode (Triode Unit 1)
6	Grid (Triode Unit 1)
7	Plate (Triode Unit 1)
8	Heater

Heater Specifications

- **Heater Voltage:** 12.6 V
- **Heater Current:** 150 mA (0.15 A)
- **Calculated Heater Power:** 1.89 W (calculated as $12.6\text{ V} \times 0.15\text{ A}$)
- **Cathode Type:** Coated unipotential

Direct Interelectrode Capacitances

The direct interelectrode capacitances of the 14F7 are measured with an RMA #308 shield connected to the cathode. The capacitance values are identical for both triode units:

Capacitance Parameter	Triode Unit 1	Triode Unit 2
Grid to Plate (G to P)	$1.6\ \mu\text{F}$	$1.6\ \mu\text{F}$
Input: G to ($H + K$)	$2.4\ \mu\text{F}$	$2.4\ \mu\text{F}$
Output: P to ($H + K$)	$2.0\ \mu\text{F}$	$2.0\ \mu\text{F}$
Grid to Grid (G to G) max	$0.2\ \mu\text{F}$	—
Plate to Plate (P to P) max	$1.0\ \mu\text{F}$	—

Electrical Ratings and Operating Conditions

The maximum ratings for the 14F7 are interpreted according to the RMA Standard M8-210. These limits define the safe operating envelope for the tube:

- **Maximum Plate Voltage:** 300 V (noted as 250 V in some general Class A amplifier tables)
- **Maximum Heater-Cathode Voltage:** 90 V
- **Minimum External Grid Bias Voltage:** 0 V
- **Maximum Plate Dissipation Per Unit:** 1 Watt

Typical Class A1 Operating Points

Typical operating conditions and electrical characteristics for each triode unit are specified at two primary plate voltage levels:

Parameter	Operating Point A	Operating Point B
Plate Voltage	100 V	250 V
Grid Voltage	-1 V	-2 V
Plate Current	0.65 mA	2.3 mA
Plate Resistance (r_p)	62,000 Ω	44,000 Ω
Transconductance (g_m)	1,125 μmhos	1,600 μmhos
Amplification Factor (μ)	70	70

The relationship between amplification factor, transconductance, and plate resistance is consistent with the standard triode formula $\mu = g_m \times r_p$. For Operating Point B, this is verified by calculation: $1,600 \times 10^{-6} \text{ S} \times 44,000 \Omega = 70.4 \approx 70$

Characteristic Curves and Interpretation

The electrical behavior of each triode unit is illustrated by its characteristic curves. The plate family curves plot plate current against plate voltage for grid bias values ranging from 0 V to -6.5 V. At a typical plate supply of 250 V, the grid cutoff voltage is approximately -4.5 V, where plate current approaches zero.

Additional transfer curves at a plate voltage of 250 V show how plate current (I_b), plate resistance (r_p), and amplification factor (μ) vary with grid bias:

- As the grid bias becomes more negative (from 0 V to -4.0 V), the plate current falls from approximately 5.0 mA to near zero.
- Concurrently, the plate resistance (r_p) rises sharply, starting below 40,000 Ω at a grid bias of -1 V and exceeding 150,000 Ω as the bias approaches -3.5 V.
- The amplification factor (μ) remains remarkably flat, holding steady near 70 across most of the usable grid bias range, only dropping slightly near the cutoff region.

Related Designations and Comparisons

The 14F7 is closely related to several other vacuum tube types:

- **7F7**: The **7F7** is electrically identical to the 14F7 in its triode characteristics, but it is designed for a 6.3 V, 300 mA heater supply instead of the 14F7's 12.6 V, 150 mA heater.
- **6SL7GT**: The electrical characteristics of each triode unit in the 14F7 are identical to those of the **6SL7GT**.

- **14AF7**: Although sharing the same 12.6 V heater rating and 8AC lock-in base, the **14AF7** is a medium-mu twin triode ($\mu = 16$, plate resistance of 7,600 Ω , and transconductance of 2,100 μmhos at 250 V plate voltage). It is a distinct type and cannot be directly substituted where the high-mu characteristics of the 14F7 are required.

Technical Summary

The **14F7** is a lock-in, high-mu twin triode designed for voltage amplification and phase inverter service. With a 12.6 V, 150 mA heater, it provides two independent high-gain triode units, each featuring an amplification factor of 70, a transconductance of 1,600 μmhos , and a plate resistance of 44,000 Ω under typical 250 V operating conditions. Its robust lock-in construction and stable high-mu characteristics make it a reliable choice for cascade resistance-coupled amplifiers.

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 · Triode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate voltage	250 V	ClassA;EachSection
Control-grid voltage	-2 V	ClassA;EachSection
Plate current	2.3 mA	ClassA;EachSection

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate resistance	44000 Ω	EachSection
Transconductance	1600 μS	EachSection
Amplification factor	70	EachSection

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

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 · Triode

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid To Plate Capacitance	1.6 pF	EachUnit

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1966 Tung Sol Electronic Tubes 2 of 4

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

1966 TUNG SOL ELECTRONIC TUBES 2 OF 4

Section 1 · Triode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
MAX	6.3 V	Published datasheet; published column 1
MAX	300 V	Published datasheet; published column 2
MAXIMUM PLATE VOLTAGE	300 V	Maximum ratings
MINIMUM EXTERNAL GRID BIAS VOLTAGE	0 V	Maximum ratings
MAXIMUM PLATE DISSIPATION PER UNIT	1 W	Maximum ratings
HEATER VOL Tp GE	6.3 V	Typical operating conditions; published column 1
HEATER VOL Tp GE	3 V	Typical operating conditions; published column 2
NEATEf1 CURRENT	3 mA	Typical operating conditions
PLATE VOI TALE	100 V	Typical operating conditions; published column 1
PLATE VOI TALE	25 V	Typical operating conditions; published column 2
PLATE VOI TALE	0 V	Typical operating conditions; published column 3
PLATE CURRENT	0.65 mA	Typical operating conditions; published column 1
PLATE CURRENT	3 mA	Typical operating conditions; published column 2
PLATE RESISTANCE	62 ohm	Typical operating conditions; published column 1
PLATE RESISTANCE	0 ohm	Typical operating conditions; published column 2

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
PLATE RESISTANCE	44 ohm	Typical operating conditions; published column 3
TRANSCONDUCTANCE	1 uS	Typical operating conditions; published column 1
TRANSCONDUCTANCE	125 uS	Typical operating conditions; published column 2
TRANSCONDUCTANCE	16 uS	Typical operating conditions; published column 3
TRANSCONDUCTANCE	0 uS	Typical operating conditions; published column 4
Et =	6.3 V	Typical operating conditions
Eb =	250 V	Typical operating conditions
GRID d1 VOLTS	1 V	Typical operating conditions
Maximum plate voltage	300 V	Published datasheet; promoted section value
Maximum plate dissipation	1 W	Published datasheet; promoted section value

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
GRID.~TO PLATE: (G TO P)	1.6 pF	Interelectrode capacitances; published column 1
GRID TO GRID: (G TO G) MAX	0.2 pF	Interelectrode capacitances
PLATE TO PIA TE: (P TO p) MAX	1 pF	Interelectrode capacitances

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate resistance	44000 ohm	Published datasheet; promoted section value
Transconductance	0.0016 A/V	Published datasheet; promoted section value
Amplification factor	70	Published datasheet; promoted section value

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