

ELECTRONIC TUBE REFERENCE

14J7

Voltage - Triode (with diode, heptode or hexode) electronic tube

CONSOLIDATED TECHNICAL DATA

2 SECTIONS
CONSTRUCTION
HEPTODE-TRIODE

Triode-heptode frequency changer for superheterodyne receivers. A separate triode supplies local oscillation while the high-resistance heptode performs mixing, providing useful isolation between oscillator, RF input, and converted-signal circuits.

GENERAL CHARACTERISTICS

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

SECTION RATINGS

SECTION1 Triode	
No fixed ratings recorded.	
Promoted from clearly identified printed ratings/characteristics; additional published operating points and capacitances retained in TUBE_SECTION_PARAMETER.	
SECTION2 Heptode	
PLATE RESISTANCE	1500000 Ω
MAXIMUM PLATE VOLTAGE	300 V
MAXIMUM SCREEN VOLTAGE	100 V
Promoted from clearly identified printed ratings/characteristics; additional published operating points and capacitances retained in TUBE_SECTION_PARAMETER.	

14J7 — Triode-Heptode Converter

The **14J7** is an indirectly heated triode-heptode converter vacuum tube designed for frequency conversion service. It integrates a triode oscillator section and a heptode mixer section within a single envelope, sharing a common cathode.

Physical and Heater Specifications

The 14J7 is constructed with an indirectly heated cathode. The heater is designed with the following electrical ratings:

- **Heater Voltage:** 12.6 V
- **Heater Current:** 0.15 A
- **Cathode Type:** Heater (Htr)

Physically, the tube is defined by the **9-30** outline drawing and utilizes an **8BL** base connection.

Pinout and Base Configuration

The 14J7 uses an 8-pin base designated as **8BL**. The pin connections, viewed from the bottom of the tube, are assigned as follows:

- **Pin 1:** Heater (H)
- **Pin 2:** Heptode Plate (P_H)
- **Pin 3:** Grids 2 and 4 (G_2, G_4)
- **Pin 4:** Heptode Grid 3 (G_3)
- **Pin 5:** Triode Grid and Heptode Grid 1 (G_T, G_1)
- **Pin 6:** Triode Plate (P_T)
- **Pin 7:** Cathode and Heptode Grid 5 (K, G_5)
- **Pin 8:** Heater (H)

In this configuration, the triode grid is internally connected to the first grid of the heptode section (G_1), which is typical for converter designs where the oscillator signal is injected directly into the mixer.

Maximum Ratings

To ensure safe and reliable operation, the 14J7 must be operated within its maximum design limits:

- **Maximum Plate Voltage:** 300 V
- **Maximum Screen Voltage:** 100 V

Converter Operating Points and Characteristics

Under typical operating conditions as a converter, the heptode and triode sections are biased to achieve efficient frequency conversion. The typical operating parameters are:

- **Plate Voltage:** 250 V
- **Screen Voltage:** 100 V
- **Negative Grid Voltage:** 3.0 V
- **Plate Current:** 1.4 mA
- **Screen Current:** 2.8 mA
- **Plate Resistance (r_p):** Approximately 1,500,000 Ω (1.5 M Ω)
- **Conversion Transconductance (g_c):** 290 μ mhos

Oscillator Section Operating Conditions

The oscillator portion of the converter operates with the following specific parameters:

- **Oscillator Grid Current (I_{g1}):** 0.4 mA
- **Oscillator Grid Resistor (R_{g1}):** 50,000 Ω
- **Triode Oscillator Plate Voltage (E_b):** 250 V (supplied through a 20,000 Ω resistor)
- **Triode Plate Current (I_b):** 5.0 mA

Technical Summary

The 14J7 is a specialized triode-heptode converter tube featuring a 12.6 V, 0.15 A heater and an 8BL base. It is rated for a maximum plate voltage of 300 V and a maximum screen voltage of 100 V. In typical converter service, it provides a conversion transconductance of 290 μ mhos with a heptode plate current of 1.4 mA and an oscillator triode plate current of 5.0 mA.

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
Oscillator plate voltage	250 V	Converter
Oscillator plate series resistance	20000 Ω	Converter
Oscillator plate current	5 mA	Converter
Oscillator-grid current	0.4 mA	Converter
Oscillator-grid resistor	50000 Ω	Converter

195X GENERAL ELECTRIC ESSENTIAL CHARACTERISTICS

Section 2 · Heptode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate voltage	250 V	Converter
Screen voltage	100 V	Converter
Control-grid voltage	-3 V	Converter
Plate current	1.4 mA	Converter
Screen current	2.8 mA	Converter

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate resistance	1500000 Ω	Converter
Conversion transconductance	290 μS	Converter

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and their source documents.

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