

ELECTRONIC TUBE REFERENCE

12AH7GT

Voltage - Dual Triode (similar) electronic tube

CONSOLIDATED TECHNICAL DATA

2 SECTIONS

CONSTRUCTION

TRIODE-TRIODE

Medium-mu dual triode for general voltage-amplifier service, offering relatively low plate resistance and useful current capability in a GT-envelope receiving-tube format.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	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	9600 Ω
TRANSCONDUCTANCE	0.0024 S
AMPLIFICATION FACTOR	16
MAXIMUM PLATE VOLTAGE	300 V
MAXIMUM PLATE DISSIPATION	2.9 W
Published promoted fields populated semantically; identical repeated sections compressed.	

SECTION2 Triode	
PLATE RESISTANCE	9600 Ω
TRANSCONDUCTANCE	0.0024 S
AMPLIFICATION FACTOR	16
MAXIMUM PLATE VOLTAGE	300 V
MAXIMUM PLATE DISSIPATION	2.9 W
Second identical physical triode section; added to align rows with SectionCount.	

12AH7GT — Twin Triode Vacuum Tube

The **12AH7GT** is an indirectly heated, dual-section glass envelope vacuum tube designed for use in converter and audio applications. It contains two independent triode sections within a single T-9 bulb, sharing a common heater but possessing separate cathode, grid, and plate connections. This configuration allows each section to operate independently in diverse electronic circuits.

Physical Characteristics and Pin Configuration

The 12AH7GT is constructed with a T-9 glass bulb and is equipped with an 8-pin octal base, typically made of bakelite. The tube can be operated in any mounting position.

The physical dimensions of the tube are as follows:

- **Maximum Diameter:** 1-5/16 inches
- **Maximum Overall Length:** 3-1/16 to 3-3/16 inches
- **Maximum Seated Height:** 2-1/2 inches

The tube utilizes an 8-pin octal base with the **8BE** basing arrangement. Looking at the bottom view of the base, the pin connections are assigned as follows:

Pin Number	Electrode Connection
1	Grid, Triode Section 1 (G1)
2	Cathode, Triode Section 1 (K1)
3	Plate, Triode Section 1 (P1)
4	Cathode, Triode Section 2 (K2)
5	Grid, Triode Section 2 (<u>G2</u>)
6	Plate, Triode Section 2 (<u>P2</u>)
7	Heater (H)

Pin Number	Electrode Connection
8	Heater (H)

The base features a central locating key situated between Pin 1 and Pin 8 to ensure correct insertion into the socket. There is no top cap connection.

Heater and Maximum Ratings

The 12AH7GT features a unipotential (indirectly heated, coated) cathode system. The heater is designed to operate from either an alternating current (AC) or direct current (DC) supply.

Heater Specifications

- **Heater Voltage:** 12.6 Volts (AC or DC)
- **Heater Current:** 0.150 Ampere
- **Calculated Heater Power:** $12.6\text{ V} \times 0.150\text{ A} = 1.89\text{ Watts}$

Maximum Ratings (Per Triode Section)

The maximum design limits for the 12AH7GT must be interpreted according to the RMA Standard M8-210:

- **Maximum Plate Voltage:** 300 Volts per plate
- **Maximum Plate Dissipation:** 2.5 Watts per plate

Typical Operating Conditions and Electrical Characteristics

Under typical Class A amplifier operating conditions, each independent triode section of the 12AH7GT exhibits the following electrical characteristics:

Parameter	Value
Plate Voltage	250 Volts
Grid Voltage	-9 Volts
Plate Current	12 Milliampères
Plate Resistance	6,600 Ohms
Transconductance	2,400 Micromhos (umhos)
Amplification Factor (u)	16
Plate Current at $E_c = -30\text{ V}$ (Cutoff)	10 Microampères (uA)

Parameter Verification

The fundamental triode relationship relates amplification factor (u), transconductance (gm), and plate resistance (rp) through the formula: $u = gm \cdot rp$

Using the typical operating values as inputs for this calculation: $0.0024 \text{ S} \cdot 6,600 \text{ Ohms} = 15.84$ This calculated value closely aligns with the published nominal amplification factor of 16.

At a grid bias of -30 Volts, the plate current is reduced to a nominal value of 10 microamperes, indicating the near-cutoff region of the triode sections under a 250-volt plate supply.

Direct Interelectrode Capacitances

The direct interelectrode capacitances of the 12AH7GT are measured with a tight-fitting external shield. Due to minor structural variations in the internal layout, the two triode sections exhibit slightly different capacitance values:

Capacitance Parameter	Triode Section 1	Triode Section 2
Grid to Plate (G - P)	2.2 uuF (max)	3.0 uuF (max)
Grid to Cathode (G - K)	3.2 uuF (max)	2.9 uuF (max)
Plate to Cathode (P - K)	3.0 uuF (max)	2.6 uuF (max)

Inter-Section Capacitances

The capacitive coupling between the two independent triode sections is minimal but documented as follows:

- **Plate to Plate (P1 - P2):** 0.4 uuF (max)
- **Grid to Grid (G1 - G2):** 0.06 uuF (max)

These low inter-section capacitances help prevent unwanted crosstalk and parasitic oscillations when the two triodes are used in high-gain cascade configurations or separate circuit stages.

Characteristic Curves and Behavior

The average electrical characteristics of a single triode section of the 12AH7GT are graphically represented by two primary sets of curves:

1. **Average Characteristics (Parameter vs. Plate Current):** These curves illustrate how the dynamic parameters vary as a function of plate current at a nominal heater voltage of 12.6 V and a plate voltage of 250 V.
 - **Plate Resistance (rp):** Decreases rapidly as plate current increases from 0 to approximately 8 mA, after which it flattens out, stabilizing near 6,600 Ohms.
 - **Transconductance (gm):** Increases steadily with plate current, showing a rising curve that begins to level off as plate current exceeds 12 mA.

- **Amplification Factor (μ):** Remains relatively stable across the normal operating range of plate current, showing only a slight decline at very low plate currents.
2. **Average Plate Characteristics (Plate Current vs. Plate Voltage):** This family of curves plots plate current (in milliamperes) against plate voltage (up to 450 V) for discrete grid bias voltages (E_c) ranging from 0 V down to -30 V in 3-volt increments.
- The curves demonstrate typical triode behavior, where more negative grid voltages shift the conduction threshold to higher plate voltages.
 - At $E_c = 0$ V, the tube conducts heavily at low plate voltages, reaching 25 mA of plate current at approximately 210 V.
 - At the typical operating bias of -9 V, the curve passes through the 12 mA plate current coordinate at exactly 250 V.
 - At $E_c = -30$ V, the plate current is nearly cut off, requiring more than 350 V on the plate to initiate significant conduction.

Technical Summary

The **12AH7GT** is a versatile, medium-mu twin triode vacuum tube featuring a 12.6 V, 150 mA heater and an 8-pin octal base. Designed primarily for converter and audio applications, it houses two independent triode sections with separate cathodes. Each section provides an amplification factor of 16, a transconductance of 2,400 micromhos, and a plate resistance of 6,600 Ohms under typical Class A operating conditions (250 V plate, -9 V grid). With a maximum plate voltage rating of 300 V and a plate dissipation limit of 2.5 W per section, the 12AH7GT offers reliable performance in a compact T-9 glass envelope.



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1937 Ken Rad

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

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Section 1 · Triode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate Voltage	250 V	Plate Voltage 250 Volts
Grid Voltage	-9 V	Grid Voltage -9 Volis
Amplification Factor	18 ratio	Amplification Factor 18
Plate Resistance	600 ohm	Plate Resistance €600 Ohms
Plate voltage	250 V	EachTriodeSection
Grid voltage	-3 V	EachTriodeSection
Plate current	12 mA	EachTriodeSection

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