



ELECTRONIC TUBE REFERENCE

12J5WGT

Voltage - Triode (single) electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION

CONSTRUCTION

TRIODE

Rugged 12.6-volt heater triode for voltage-amplifier service in equipment requiring improved mechanical reliability.

GENERAL CHARACTERISTICS

BASE DESIGNATION	60	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

SECTION 1 Triode	
PLATE RESISTANCE	7700 Ω
TRANSCONDUCTANCE	0.0026 S
AMPLIFICATION FACTOR	20
MAXIMUM PLATE VOLTAGE	300 V
Published ratings/characteristics promoted where semantically applicable.	

12J5WGT — Ruggedized Medium-Mu Triode

An indirectly heated, single-section ruggedized triode vacuum tube designed for voltage amplification in radio-frequency and audio-frequency applications.

Overview

The **12J5WGT** is a ruggedized, medium-mu single triode vacuum tube designed primarily for voltage amplifier service. It features an indirectly heated, unipotential cathode and is built to withstand

demanding operating conditions. The tube operates with a nominal heater supply of **12.6 V** at a current of **0.15 A**.

The electrical characteristics of the 12J5WGT are closely aligned with those of the standard **12J5** and **12J5-GT** triodes, offering an amplification factor of **20** and a maximum plate voltage rating of **300 V**. However, the "WGT" designation indicates a ruggedized construction with specific physical dimensions and robust mechanical properties suitable for industrial or military applications where reliability is paramount.

Physical Dimensions and Basing Configuration

The 12J5WGT is housed in a glass envelope with a standard octal base. Its physical dimensions are characterized by a maximum overall height of **3-5/16 inches** and a maximum diameter of **1-5/16 inches**.

The tube is designed to use the **9R** or **6Q** basing arrangement. Under the standard **6Q** octal connection scheme, the pin assignments (viewed from the bottom of the base) are as follows:

- **Pin 1:** Shell / Shield (internal or external metal envelope grounding)
- **Pin 2:** Heater
- **Pin 3:** Plate
- **Pin 5:** Grid
- **Pin 7:** Cathode
- **Pin 8:** Heater
- **Pins 4 and 6:** No connection (omitted from the active electrode structure)

This configuration allows the heater to be operated independently of the cathode, provided that appropriate heater-to-cathode voltage limits are maintained.

Heater Specifications and Interelectrode Capacitances

The 12J5WGT utilizes a robust heater design optimized for series or parallel heater strings operating at a nominal 12.6 V.

Parameter	Value
Heater Voltage	12.6 V
Heater Current	0.15 A
Cathode Type	Indirectly heated, unipotential

Interelectrode capacitances vary slightly depending on the specific envelope construction. For the **12J5-WGT** (and the corresponding **12J5-GT**), the capacitances measured without an external shield are:

- **Input Capacitance (Grid to Cathode & Heater):** 5.0 pF
- **Output Capacitance (Plate to Cathode & Heater):** 5.0 pF
- **Grid-to-Plate Capacitance:** 3.8 pF

In comparison, the standard metal-envelope **12J5** exhibits slightly lower capacitances, with an input capacitance of 3.4 pF, an output capacitance of 3.6 pF, and a grid-to-plate capacitance of 3.4 pF. The higher capacitance values in the WGT variant reflect its ruggedized internal structure and glass envelope configuration.

Electrical Ratings and Class A Operating Points

The 12J5WGT is rated for a maximum plate voltage of **300 V**. Under typical Class A amplifier service, the tube can be operated at two distinct recommended operating points depending on the desired gain, plate dissipation, and signal swing:

Operating Point A (Low Voltage)

- **Plate Voltage:** 90 V
- **Grid Voltage:** 0 V
- **Plate Current:** 10 mA
- **Plate Resistance:** 6,700 Ω
- **Transconductance (Mutual Conductance):** 3,000 μmhos
- **Amplification Factor (μ):** 20

Operating Point B (Standard Voltage)

- **Plate Voltage:** 250 V
- **Grid Voltage:** -8.0 V
- **Plate Current:** 9.0 mA
- **Plate Resistance:** 7,700 Ω
- **Transconductance (Mutual Conductance):** 2,600 μmhos
- **Amplification Factor (μ):** 20

At both operating points, the tube maintains a constant nominal amplification factor of 20. The relationship between transconductance (g_m), plate resistance (r_p), and amplification factor (μ) is mathematically consistent with the standard triode formula ($\mu = g_m \times r_p$). For example, at Operating Point B: $0.0026 \text{ S} \times 7,700 \Omega = 20.02$ This demonstrates the highly predictable and linear behavior of the triode within its recommended operating region.

Technical Summary

The **12J5WGT** is a ruggedized, medium-mu single triode vacuum tube featuring a **12.6 V, 0.15 A** heater, an octal base, and a maximum plate voltage rating of **300 V**. It is designed for reliable voltage amplification in Class A circuits, delivering an amplification factor of **20** with a transconductance of **2,600 to 3,000 μmhos** and a plate resistance ranging from **6,700 to 7,700 Ω** , depending on the operating point. With its robust mechanical construction, standard **9R** or **6Q** basing, and stable electrical characteristics, the 12J5WGT serves as a dependable component in both legacy and specialized electronic systems requiring a high-reliability medium-mu triode.

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

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Input capacitance	3.6 pF	—
Output capacitance	5 pF	—
Grid-to-plate capacitance	3.8 pF	—

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate voltage	90 V	ClassA
Plate current	10 mA	ClassA
Plate voltage	250 V	ClassA
Plate current	9 mA	ClassA

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate resistance	7700 ohm	ClassA;PlateVoltage=250V
Transconductance	2600 uS	ClassA;PlateVoltage=250V

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

195X Raytheon Special Purpose Tubes

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

195X RAYTHEON SPECIAL PURPOSE TUBES

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate voltage	250 V	ClassA
Grid voltage	-8 V	ClassA
Plate current	9 mA	ClassA

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Transconductance	2600 uS	ClassA
Amplification factor	20	ClassA

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