



ELECTRONIC TUBE REFERENCE

CONSOLIDATED TECHNICAL DATA

12AW6

1 SECTION

CONSTRUCTION

PENTODE

Voltage - Pentode Sharp Cutoff (single) electronic tube

Sharp-cutoff pentode with a separately connected suppressor grid for RF, IF, and general amplifier service. The independent suppressor connection permits additional circuit flexibility beyond ordinary fixed-suppressor pentodes.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	7
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 Pentode	
PLATE RESISTANCE	500000 Ω
TRANSCONDUCTANCE	0.0051 S
MAXIMUM PLATE VOLTAGE	300 V
MAXIMUM SCREEN VOLTAGE	150 V
MAXIMUM PLATE DISSIPATION	2 W
MAXIMUM SCREEN DISSIPATION	0.5 W
Sharp-cutoff pentode; triode-connected values retained as parameters.	

12AW6 — Sharp Cut-Off RF Pentode

Overview

The **12AW6** is a miniature, sharp cut-off radio frequency (RF) pentode designed for use in compact, lightweight electronic equipment. It features a high transconductance and low input and output capacitances, making it highly effective as an RF amplifier at frequencies up to approximately 400 megacycles (MHz), as well as a high-frequency intermediate-frequency (IF) amplifier.

The tube is constructed with an indirectly heated unipotential cathode and is housed in a T-5 1/2 glass envelope with a 7-pin miniature button base. Electrically, the 12AW6 is equivalent to the [6AG5](#), sharing identical ratings and characteristics but utilizing a 12.6-volt heater.

Physical Construction and Pinout

The 12AW6 is built in a small T-5 1/2 glass bulb. Its physical dimensions are:

- **Maximum overall length:** 2 1/8 inches
- **Maximum seated height:** 1 7/8 inches
- **Maximum diameter:** 3/4 inch

The tube can be mounted in **any position**. It utilizes a standard 7-pin miniature button base with the following pin assignments, viewed from the bottom of the tube:

Pin Number	Electrode Connection
1	Grid No. 1 (Control Grid, G1)
2	Cathode (K)
3	Heater (H)
4	Heater (H)
5	Plate (P)
6	Grid No. 2 (Screen Grid, G2)
7	Grid No. 3 (Suppressor Grid, G3) and Internal Shield (IS)

The separate suppressor grid connection (Pin 7) allows for direct grounding or flexible circuit configurations, which contributes to the tube's stable high-frequency performance.

Heater and Interelectrode Capacitances

The 12AW6 features a unipotential cathode heated by a 12.6-volt filament. The heater can be operated on either alternating current (AC) or direct current (DC).

Heater Parameter	Value
Heater Voltage	12.6 V
Heater Current	150 mA
Heating Method	Indirect

Direct Interelectrode Capacitances

Measured without an external shield, the direct interelectrode capacitances of the 12AW6 are:

- **Grid to Plate (G1 to P) (Maximum):** 0.025 pF (uuf)
- **Input (G1 to H + K + G2 + G3 & IS):** 6.5 pF (uuf)
- **Output (P to H + K + G2 + G3 & IS):** 1.5 pF (uuf)

These low capacitances, particularly the very small grid-to-plate feedback capacitance, are critical for maintaining stability and preventing oscillation in high-frequency amplifier stages.

Maximum Ratings

The maximum ratings for the 12AW6 are interpreted according to the RMA Standard M8-210. The tube can be operated either in its standard pentode configuration or as a triode (with Grid No. 2 tied to the Plate and Grid No. 3 tied to the Cathode).

Rating Parameter	Triode Connection	Pentode Connection	Unit
Heater Voltage	12.6	12.6	Volts
Maximum Heater-Cathode Voltage	90	90	Volts
Maximum Plate Voltage	300	300	Volts
Maximum Grid No. 2 Voltage	—	150	Volts
Maximum Grid No. 2 Supply Voltage	—	300	Volts
Maximum Negative DC Grid No. 1 Voltage	50	50	Volts
Maximum Positive DC Grid No. 1 Voltage	0	0	Volts
Maximum Plate Dissipation	2.5	2.0	Watts

Rating Parameter	Triode Connection	Pentode Connection	Unit
Maximum Grid No. 2 Dissipation	—	0.5	Watt

Typical Operating Conditions and Characteristics

The 12AW6 can be operated as a Class A1 amplifier in either pentode or triode connection.

Class A1 Pentode Connection

In the pentode configuration, Grid No. 3 is connected directly to the cathode at the socket. Typical operating points at three different plate voltages are:

Parameter	Point 1	Point 2	Point 3	Unit
Heater Voltage	12.6	12.6	12.6	Volts
Heater Current	150	150	150	mA
Plate Voltage	100	125	250	Volts
Grid No. 2 Voltage	100	125	150	Volts
Cathode Bias Resistor	100	100	200	Ohms
Plate Resistance (Approx.)	0.3	0.5	0.8	Megohm
Transconductance	4,750	5,100	5,000	umhos
Plate Current	5.5	7.2	7.0	mA
Grid No. 2 Current	1.6	2.1	2.0	mA
Grid No. 1 Voltage (Approx.) for $I_b = 10 \mu A$	-5	-6	-8	Volts

Class A1 Triode Connection

When connected as a triode (with Grid No. 2 tied to the Plate and Grid No. 3 tied to the Cathode), the typical operating points are:

Parameter	Point 1	Point 2	Unit
Heater Voltage	12.6	12.6	Volts
Heater Current	150	150	mA
Plate Voltage	180	250	Volts
Cathode Bias Resistor	350	825	Ohms
Plate Resistance	7,900	11,000	Ohms
Transconductance	5,700	3,800	umhos
Amplification Factor (u)	45	42	—
Plate Current	7.0	5.5	mA

Characteristic Curves and Behavior

The published performance curves for the 12AW6 illustrate its behavior under both pentode and triode operating conditions.

Pentode Connection Curves

Under pentode operation with a fixed screen grid voltage ($E_{c2} = 150$ V) and the suppressor grid at ground ($E_{c3} = 0$ V), the plate current (I_b) and screen current (I_{c2}) are plotted against plate voltage:

- At a control grid bias (E_{c1}) of 0 V, the plate current rises sharply below 50 volts, leveling off to a nearly flat plateau of approximately 14 mA across the 100 V to 500 V range.
- As the negative grid bias increases (from -0.5 V down to -4.0 V), the plate current plateaus decrease progressively. At $E_{c1} = -4.0$ V, the plate current is reduced to less than 1 mA, demonstrating the sharp cut-off characteristic of the tube.
- The screen grid current (I_{c2}) curves follow a similar trend but at lower magnitudes, with I_{c2} reaching approximately 5.5 mA at $E_{c1} = 0$ V and dropping to near zero as the control grid is biased more negatively.

Triode Connection Curves

In the triode-connected configuration, where Grid No. 2 is tied to the plate, the plate current curves exhibit typical triode behavior:

- The curves rise more gradually with plate voltage compared to the sharp knee of the pentode curves.
- At $E_c = 0$ V, plate current begins to flow immediately as plate voltage rises, reaching 15 mA at approximately 100 V.
- Successive negative grid bias curves (from -1 V down to -14 V) shift the plate current onset to higher plate voltages. For example, at a grid bias of -14 V, plate current only begins to flow as the plate

voltage approaches 450 V.

Technical Summary

The **12AW6** is a high-performance, 7-pin miniature RF pentode featuring a sharp cut-off characteristic and high transconductance. Operating with a 12.6 V, 150 mA heater, it is electrically equivalent to the 6AG5 and is optimized for high-frequency amplification up to 400 MHz. Its design incorporates low interelectrode capacitances and a separate suppressor grid connection to ensure stable operation in compact RF and IF amplifier stages. With maximum ratings of 300 V on the plate and a plate dissipation limit of 2.0 W (pentode) or 2.5 W (triode), the 12AW6 provides a versatile and reliable solution for high-frequency receiving applications.



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 · Pentode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate Voltage	125 V	—
Screen Voltage	125 V	—



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 · Pentode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate voltage	250 V	ClassA;PentodeConnection
Grid #2 voltage	150 V	ClassA;PentodeConnection
Plate current	10 mA	ClassA;PentodeConnection
Grid #2 current	2 mA	ClassA;PentodeConnection
Triode-connected plate voltage	250 V	TriodeConnection
Triode-connected plate current	5.5 mA	TriodeConnection

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate resistance	800000 ohm	ClassA;PentodeConnection
Transconductance	7500 uS	ClassA;PentodeConnection
Triode-connected plate resistance	11000 ohm	TriodeConnection
Triode-connected amplification factor	42	TriodeConnection

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid-to-plate capacitance	0.02 pF	—
Input capacitance	7.5 pF	—
Output capacitance	3 pF	—

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