

ELECTRONIC TUBE REFERENCE

12AT7WA

Voltage - Dual Triode (similar) electronic tube

CONSOLIDATED TECHNICAL DATA

2 SECTIONS

CONSTRUCTION

TRIODE-TRIODE

Military-specification 12AT7/6201-family twin triode for oscillator, RF, and AF amplifier service, designed for demanding aircraft and missile applications with controlled heater characteristics.

GENERAL CHARACTERISTICS

BASE DESIGNATION	9A	BASE PINS	9
NOMINAL HEATER	12.6 V / 150 mA	PARALLEL HEATER	6.3 V / 300 mA
HEATING	Indirect	SERIES OPERATION	Capable
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

9A - TERMINAL PINOUT

TERMINAL	SECTION	ELEMENT	STATUS
PIN1 – 2P	B	P – Plate (Anode)	CONNECTED
PIN2 – 2G1	B	G1 – Control Grid	CONNECTED
PIN3 – 2K	B	K – Cathode	CONNECTED
PIN4 – H	–	H – Heater	CONNECTED
PIN5 – H	–	H – Heater	CONNECTED
PIN6 – 1P	A	P – Plate (Anode)	CONNECTED
PIN7 – 1G1	A	G1 – Control Grid	CONNECTED
PIN8 – 1K	A	K – Cathode	CONNECTED
PIN9 – HCT	–	HCT – Heater Center Tap	CONNECTED

SECTION RATINGS

SECTION1 Triode	
PLATE RESISTANCE	15000 Ω
TRANSCONDUCTANCE	0.004 S
AMPLIFICATION FACTOR	60
MAXIMUM PLATE VOLTAGE	300 V
MAXIMUM PLATE DISSIPATION	2.8 W
MAXIMUM CATHODE CURRENT	20 mA
Published promoted fields populated semantically; identical repeated sections compressed.	

SECTION2 Triode	
PLATE RESISTANCE	15000 Ω
TRANSCONDUCTANCE	0.004 S
AMPLIFICATION FACTOR	60
MAXIMUM PLATE VOLTAGE	300 V
MAXIMUM PLATE DISSIPATION	2.8 W
Second identical physical triode section; added to align rows with SectionCount.	

12AT7WA — Ruggedized High-Mu Twin Triode Premium Tube

An indirectly heated, dual-section premium receiving valve designed for high-reliability applications, including high-frequency oscillators, mixers, grounded-grid RF amplifiers, and pulse amplification in severe mechanical environments.

Overview

The **12AT7WA** (also designated as **12AT7/WA**) is a premium, ruggedized high-mu double triode featuring two electrically independent triode sections within a single miniature glass envelope. Each section is constructed with its own coated unipotential cathode, control grid, and plate. The tube is designed to meet stringent military and critical industrial specifications, offering high mechanical robustness, operational safety, and resistance to severe shock and vibration. It is particularly suited for mobile, aircraft, and missile applications, and is classified under high-reliability quality standards such as the "Sécurité 'Cinq Etoiles'" (Five-Star Safety) designation.

The 12AT7WA is engineered for a wide range of demanding operations, including grounded-grid high-frequency (HF) amplifiers, oscillators, and mixers operating at frequencies up to 300 MHz. Additionally, its high amplification factor and low plate resistance make it highly effective in audio amplification, multivibrators, computer circuits, pulse amplifiers, and low-power servo amplifiers.

Construction, Mechanical Design, and Physical Specifications

The mechanical design of the 12AT7WA incorporates a reinforced internal structure to withstand extreme physical stress. The tube features oxide-coated, indirectly heated unipotential cathodes that are specially controlled for cathode interface resistance.

The physical dimensions and mechanical limits of the device are as follows:

- **Envelope:** T-6 1/2 glass bulb (JEDEC 6-2 or Outline 6-7 configuration).
- **Base:** Small button 9-pin miniature base (9A, 9C12, or Noval, Outline E9-1).
- **Maximum Diameter:** 22.2 mm (7/8 inch).
- **Body Height:** 39.7 ± 2.3 mm.
- **Maximum Overall Height:** 49.2 mm (excluding pins).
- **Maximum Pin Length:** 7.14 mm.
- **Pin Diameter:** 1.02 ± 0.05 mm.
- **Net Weight:** 12 g.
- **Mounting Position:** The tube can be mounted in any position.

Heater and Base Connections

The 12AT7WA is equipped with a center-tapped heater, allowing for either series or parallel filament operation. This flexibility permits integration into both 12.6 V and 6.3 V electrical systems.

Heater Parameter	Series Connection	Parallel Connection
Nominal Voltage (V_f)	12.6 V (AC or DC)	6.3 V (AC or DC)
Nominal Current (I_f)	0.150 A	0.300 A
Voltage Limits (Absolute)	11.4 V to 13.8 V (or 13.9 V max)	5.7 V to 6.9 V
Current Limits (Design)	138 mA to 162 mA	—
Connection Pins	Pins 4 and 5	Pin 9 to Pins 4 & 5 connected together

Calculation of Heater Power: Using the nominal values, the heater power consumption is calculated as:

- Series: $12.6\text{ V} \times 0.150\text{ A} = 1.89\text{ W}$
- Parallel: $6.3\text{ V} \times 0.300\text{ A} = 1.89\text{ W}$

The filament is designed for high durability, capable of supporting a minimum of 5,000 successive switch-on and switch-off cycles under standard conditions.

Pinout Configuration (Bottom View)

The 9A (or 9C12) basing arrangement provides independent connections for the two triode sections, with the heater center tap accessible on Pin 9:

- **Pin 1:** Plate (Anode), Triode Section 2
- **Pin 2:** Grid, Triode Section 2
- **Pin 3:** Cathode, Triode Section 2
- **Pin 4:** Heater
- **Pin 5:** Heater
- **Pin 6:** Plate (Anode), Triode Section 1
- **Pin 7:** Grid, Triode Section 1
- **Pin 8:** Cathode, Triode Section 1
- **Pin 9:** Heater Center-Tap

Interelectrode Capacitances

The direct interelectrode capacitances of each triode section are documented both with and without an external shield. The shield used for measurements is a standard 22.2 mm internal diameter shield (such as shield #316) connected directly to the cathode.

Capacitance Parameter	Without Shield (Normal)	With External Shield
Grid to Plate (Section 1 & 2)	1.5 pF (1.30 to 1.90 pF)	1.5 pF or 1.6 pF
Input (Section 1 & 2)	2.2 pF (2.00 to 3.00 pF)	2.2 pF or 2.5 pF
Output (Section 1)	0.45 pF to 0.5 pF (0.20 to 0.70 pF)	1.2 pF
Output (Section 2)	0.35 pF to 0.4 pF (0.16 to 0.60 pF)	1.5 pF
Plate to Plate (Maximum)	0.33 pF (0.15 to 0.33 pF)	0.25 pF
Heater to Cathode (Section 1 & 2)	2.4 pF to 2.8 pF (2.10 to 3.50 pF)	2.4 pF to 2.8 pF
Grid to Grid (Approximate)	0.005 pF	0.004 pF

These low capacitances, particularly the very small grid-to-grid and plate-to-plate values, minimize unwanted coupling between the two independent triode sections when they are operated in separate high-frequency stages.

Electrical Characteristics and Operating Points

The 12AT7WA is characterized by a high amplification factor ($\mu = 60$) combined with a relatively high transconductance and moderate plate resistance. The typical Class A1 operating characteristics for each

individual triode section are specified under two distinct operating points:

Operating Point 1 (Low Plate Voltage)

- **Plate Voltage (V_a):** 100 V
- **Cathode Bias Resistor (R_k):** 270 Ω
- **Plate Current (I_a):** 3.7 mA
- **Plate Resistance (r_p):** 15,000 Ω
- **Transconductance (g_m):** 4,000 μmhos (4.0 mA/V)
- **Amplification Factor (μ):** 60
- **Grid Voltage (Approximate) for $I_b = 10 \mu\text{A}$:** -5 V

Operating Point 2 (Standard Plate Voltage)

- **Plate Voltage (V_a):** 250 V
- **Cathode Bias Resistor (R_k):** 200 Ω
- **Plate Current (I_a):** 10.0 mA
- **Plate Resistance (r_p):** 10,900 Ω (noted as approximately 5.5 k Ω under specific high-current conditions)
- **Transconductance (g_m):** 5,500 μmhos (5.5 mA/V, up to 10.9 mA/V under specific high-current conditions)
- **Amplification Factor (μ):** 60
- **Grid Voltage (Approximate) for $I_b = 10 \mu\text{A}$:** -12 V

The fundamental triode relationship $\mu \approx g_m \times r_p$ is demonstrated by these parameters. For Operating Point 2: $0.0055 \text{ S} \times 10,900 \Omega \approx 60$ This calculation confirms the consistency of the published nominal parameters.

Maximum Ratings and Environmental Limits

The absolute maximum ratings define the safe operational boundaries for the 12AT7WA. Operating the tube beyond these limits can impair reliability and cause permanent damage.

- **Maximum DC Plate Voltage (V_a):** 330 V
- **Maximum Negative DC Grid Voltage ($-V_g$):** -55 V (or -50 V under certain absolute limit systems)
- **Maximum Positive DC Grid Voltage (V_g):** 0 V
- **Maximum Plate Dissipation (Each Section, P_a):** 2.8 W (or 2.5 W under MIL-E-1 design ratings)
- **Maximum Cathode Current (I_k):** 20 mA
- **Maximum Heater-Cathode Voltage (V_{fk}):** ± 100 V (or peak $V_{fk \text{ cr}} = 100$ V)
- **Maximum Bulb Temperature:** 165 $^{\circ}\text{C}$ to 200 $^{\circ}\text{C}$
- **Maximum Altitude:** 10,000 feet (up to 60,000 feet under specific military design ratings)
- **Maximum Grid Resistance (R_g):**

- Fixed Bias: 0.25 M Ω
- Cathode Bias: 0.5 M Ω

Equipment Design Limits and Special Testing

To ensure long-term reliability in military and industrial equipment, design limits and rigorous test end points are established for the 12AT7WA. These parameters are evaluated initially and after life testing (typically at 500-hour and 1000-hour intervals):

- **Heater Current Limits (at 12.6 V):** Min 138 mA, Max 162 mA (Initial & 500/1000 Hr); production average is maintained between 144 mA and 156 mA.
- **Heater-Cathode Leakage (at $V_{fk} = \pm 100$ Vdc):** Max ± 10 μ Adc (Initial & 500/1000 Hr); production average is ± 2 μ Adc.
- **Grid Current (at $R_g = 0.5$ M Ω):** Max -0.7 μ Adc (Initial & 500/1000 Hr); production average is -0.2 μ Adc.
- **Plate Current Range (at $V_a = 250$ V, $R_k = 200$ Ω):** Min 7.0 mA, Max 14.0 mA; production average is 8.5 to 11.5 mA.
- **Plate Current Difference Between Sections (ΔI_b):** Max 3.2 mA.
- **Cut-off Plate Current (at $V_g = -20$ Vdc, $R_p = 0.1$ M Ω):** Max 100 μ A.
- **Transconductance Range (Initial):** Min 4,500 μ mhos, Max 6,500 μ mhos; production average is 4,880 to 6,120 μ mhos.
- **Transconductance Range (500/1000 Hr):** Min 3,800 μ mhos, Max 6,500 μ mhos.
- **Average Transconductance Change (500 Hr):** Max 20%.
- **Electrode Insulation Resistance:**
 - Grid to all other electrodes (at -100 Vdc): Min 100 M Ω (Initial), Min 50 M Ω (500/1000 Hr).
 - Plate to all other electrodes (at -300 Vdc): Min 100 M Ω (Initial), Min 50 M Ω (500/1000 Hr).

Environmental and Mechanical Testing

The 12AT7WA undergoes extensive mechanical and environmental qualification tests:

- **Shock Resistance:** Designed to withstand a maximum impact acceleration of 600 G to 630 G. Testing includes 20 total impacts (5 in each of 4 positions) using a Navy high-impact shock machine at a 42° hammer angle, or 5 shocks of 450 G applied in 4 directions along 3 perpendicular axes.
- **Vibration Fatigue:** Sinusoidal vibration at 2.5 G acceleration, 25 Hz (or 25 to 60 cps), applied in 3 perpendicular directions for a total of 72 to 96 hours.
- **Variable Frequency Vibration:** Maximum vibrational voltage output of 100 mVac (measured at 10 G acceleration, 50 Hz, with $V_f = 12.6$ V, $V_a = 250$ V, $V_g = -3$ V, and $R_a = 2,000$ Ω).
- **Noise and Microphonics:** Maximum output of 100 mVac under vibration (with $V_f = 12.6$ Vdc, $V_{bb} = 300$ Vdc, $R_p = 10,000$ Ω , and a calibration signal of 100 mVac).
- **Heater Cycling Life Test:** Minimum of 2,000 cycles (1 minute on, 4 minutes off) with the heaters connected in parallel at $V_f = 7.5$ V and a heater-to-cathode voltage of $V_{fk} = 135$ Vdc. The end-point heater-cathode leakage must not exceed 15 to 20 μ Adc.

- **Glass Strain Test:** Involves a 48-hour room temperature hold, water immersion at 97–100 °C for 15 seconds, immediate immersion in water at 5 °C or lower, followed by a 48-hour drying period and physical inspection.
- **Interface Life Test:** Conducted for 500 hours at $V_f = 6.9$ V (parallel) with other electrodes disconnected; the resulting interface resistance must remain below 50 Ω .

Applications and Circuit Configurations

The 12AT7WA is highly versatile, serving as an RF amplifier, oscillator, mixer, multivibrator, and pulse amplifier.

Grounded-Grid RF Amplifier and HF Mixer

The tube is optimized for grounded-grid RF amplification up to 300 MHz. The grounded-grid configuration utilizes the control grid as an electrostatic shield between the input (cathode) and output (plate) circuits, which significantly reduces feedback and allows stable high-frequency gain without neutralization.

Typical 100 MHz Converter Circuit

For converter operation at 100 MHz, one triode section of the 12AT7WA functions as a local oscillator while the second section acts as a mixer. The circuit is configured with the following components:

- **Capacitors:**
 - $C_1 = 100$ pF
 - C_2 : RF Tuning Capacitor
 - $C_3 = 25$ pF
 - $C_4 = 1000$ pF
 - $C_5 = 1$ pF
 - $C_6 = 1000$ pF
 - $C_7 = 50$ pF (Maximum)
 - $C_8 = 1000$ pF
 - $C_9 = 50$ pF (Maximum)
 - $C_{10} = 50$ pF
 - C_{11} : Oscillator Tuning Capacitor
 - $C_{12} = 1000$ pF
 - $C_{13}, C_{14}, C_{15}, C_{16}, C_{17} = 1000$ pF
- **Resistors:**
 - $R_1 = 50,000$ Ω
 - $R_2 = 50,000$ Ω
 - $R_3 = 2,000$ Ω
 - $R_4 = 10,000$ Ω
 - $R_5 = 1,000$ Ω

- $R_6 = 1,000\ \Omega$
- **Anode Supply Voltage (E_b):** 100 V or 250 V.
- **Operating Note:** The local oscillator voltage injected into the mixer section should be adjusted to a level just sufficient to initiate grid current flow in the mixer.

Pulse and Servo Amplifier Service

Due to its low plate resistance and high peak plate current capability, the 12AT7WA is well-suited for pulse and low-power servo amplifier service. Under pulsed conditions, the tube can deliver a minimum peak cathode current (i_k) of 280 mA. This is specified under the following pulse test conditions:

- $V_f = 12.6\text{ V}$
- $E_b = 250\text{ Vdc}$
- $E_c = -30\text{ Vdc}$
- $R_k = 1.0\ \Omega$
- Grid-to-cathode pulse voltage (e_{gk}): +30 V
- Pulse repetition rate (PRR): 1,000 Hz
- Pulse width (t_p): 10 μs
- Rise time (t_r) and fall time (t_f): < 1 μs

Qualitative Analysis of Characteristic Curves

The published characteristic curves for the 12AT7WA describe the behavior of the tube across a wide range of operating conditions:

- **Plate Characteristics (I_b vs. E_b):** In the negative grid region (grid voltage V_g from 0 V down to -6 V or -8 V, with plate voltages up to 350 V or 400 V), the curves display typical triode behavior. The plate current rises smoothly with increasing plate voltage, and the curves shift to the right as the grid is made more negative, showing a progressive and clean cutoff. In the positive grid region (V_g from 0 V up to +6 V or +8 V, with plate voltages up to 500 V), the plate current rises rapidly and then flattens slightly at higher plate voltages. Concurrently, the grid current (I_g , represented by dashed lines) increases at low plate voltages and decreases as the plate voltage rises and more electrons are drawn to the plate.
- **Transfer Characteristics (I_b vs. V_g):** Plotted for plate voltages from 50 V to 300 V in 50 V steps, these curves show plate current up to 15 mA for grid voltages from -10 V to 0 V. The transfer curves demonstrate a sharp and well-defined cutoff behavior near -10 V at higher plate voltages.
- **Parameters vs. Plate Current:** Plotted at a constant plate voltage of $E_b = 250\text{ V}$ (and also at 100 V), these curves illustrate how the dynamic parameters vary with plate current (I_a up to 14 mA or 20 mA):
 - **Transconductance (g_m or S):** Rises sharply from approximately 1,000 μmhos at 1 mA to about 7,000 μmhos (or 14 mA/V under high-current conditions) as plate current increases.
 - **Plate Resistance (r_p or ρ):** Drops rapidly from high values (around 30,000 to 50,000 Ω at very low currents) down to a stable level of approximately 10,000 Ω (or ~5 k Ω at high currents).

- **Amplification Factor (μ or K):** Remains remarkably stable, hovering consistently around 60 across the entire plate current range.

Related Designations and Equivalents

The **12AT7WA** is a premium, ruggedized version of the standard **12AT7** prototype. It shares analogous electrical characteristics with the standard **12AT7** and the European equivalent **ECC81**. However, the 12AT7WA is manufactured with a reinforced mechanical structure and is subjected to rigorous quality controls and environmental testing that are not applied to standard commercial **12AT7** or **ECC81** tubes. Therefore, while the 12AT7WA can directly replace a standard **12AT7** or **ECC81** in any application, standard commercial types should not be substituted for the 12AT7WA in military, aeronautical, or industrial equipment where severe shock, vibration, or high-reliability operation is required.

Technical Summary

The **12AT7WA** is a **9-pin miniature, ruggedized, high-mu twin triode** designed for high-reliability military and industrial applications. It features a center-tapped heater allowing for **12.6 V / 0.150 A** series or **6.3 V / 0.300 A** parallel operation, and two independent triode sections with separate coated unipotential cathodes.

At its standard Class A1 operating point of 250 V on the plate, each section provides an amplification factor of **60**, a transconductance of **5,500 μ mhos**, and a plate resistance of **10,900 Ω** . The tube is rated for a maximum plate voltage of **330 V** and a plate dissipation of **2.8 W** per section.

Engineered to withstand severe environmental conditions, the 12AT7WA is rated for shocks up to **630 G** and long-term vibration fatigue. Its documented applications span from high-frequency RF amplifiers and mixers up to **300 MHz** to pulse amplifiers, multivibrators, and high-gain audio stages. It represents a highly robust, high-performance evolution of the classic **12AT7** double triode.

This technical article is an original synthesis based exclusively on manufacturer specifications and military standards for the 12AT7WA. All numerical values and calculations are derived directly from the documented test parameters.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1938 Raytheon

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

1938 RAYTHEON

Section 1 · Triode

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
aircraft and missile applications. A heater center tap is provided to permit operation at	12.6 volts	aircraft and missile applications. A heater center tap is provided to permit operation at 12.6 volts
or parallel operation at	6.3 volts	or parallel operation at 6.3 volts. PHYSICAL DIMENSIONS
AT -gp=	250 volts	AT -gp=250 volts L

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater Volt Series	13.9 Volt	Heater Volt Series 11.4 12.6 12.6 13.9 v :
Plate Voltage Eb	330 Vdc	Plate Voltage Eb: 250 250 330 Vdc :
Grid Voltage Ecl: =	0 Vdc	Grid Voltage Ecl: =55 0 0 0 Vdc
Fixed Rg/g	0.25 Meg	Fixed Rg/g: . - ... 0.25 Meg.
ance Cathode Rg/g	0.5 Meg	ance Cathode Rg/g: - - .- 0.5 Meg.
Plate Current (	14 mAdc	Plate Current (1) Ib/p: 7 10 14 mAdc :
Cathode Resistance Rk/k	200 ohms	Cathode Resistance Rk/k: .- 200 200 - ohms
Transconductance Sm/p	2 pmhos	Transconductance Sm/p: 4500 .- 5500 6500 pmhos : Pin 1 Plate, Unit #2
Heater Current If	4 mA	Heater Current If: 142 ..- 150 158 mA . Pin 4 Heater
Plate Current (	8 mAdc	Plate Current (1) Alb: 3.2 mAdc : Pin 8 Cathode, Unit #]
is immersed in water at	15 °C	is immersed in water at 97-100°C for 15 seconds and immediately immersed in water at not

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
more than	48 °C	more than 5°C. The sample is then dried at room temperature for 48 hours and inspected
Life Test— (heaters in parallel); E _{hk} =+	135 Vdc	Life Test— (heaters in parallel); E _{hk} =+ 135 Vdc and other elements floating. At the conclusion of this
Intermittent	165 °C	Intermittent 1000 hours. Sample is operated with minimum Envelope Temperature of 165°C.
Life Test— connected. (Interface resistance<	50 ohms	Life Test— connected. (Interface resistance< 50 ohms).
Leakage E _{hk} =	7 Vdc	Leakage E _{hk} =-100 Vdc ' i _{hk} - . - 7] -+ pAdc
R _p =	0.1 Meg	R _p =0.1 Meg;
trodes E (g—all)=	500 Vdc	trodes E (g—all)=100 Vdc 2.5 L6 R 500 - eee ee --- Meg
E (p—all)=	500 Vdc	E (p—all)=-300 Vdc R 500) --- cee] eee e <o+ Meg
R _p =	0.1 Meg	R _p =0.1 Meg
C _k =	1000 pf	C _k =1000 pf
phonics (for re— E _{bb} =	300 Vdc	phonics (for re— E _{bb} =300 Vdc;
Pulse cathode E _f =	280 ma	.. Pulse cathode E _f =12.6V 2.5 Code ik 280 - -l - .- - ma
voltage breakdown voltage=	500 Vac	voltage breakdown voltage=500 Vac Note
E _{hk} =	100 Vdc	E _{hk} =+100 Vdc
points E _{hk} =	20 Vdc	points E _{hk} =+100 Vdc .es “.- I _{hk} cee eus ees wee) 20 e- pAde
E _{hk} =	0 Vdc	E _{hk} =100 Vdc thk coe oen 20 [-0-] pAde
E _{hk} =	15 Vdc	E _{hk} =+100 Vdc - --- i _{hk} cee fen- N T 15 --- pAde
E _{hk} =	-1 Vdc	E _{hk} =-100 Vdc “-- .- thk cee - cee e 15 ---1 pAdc
R _g /g=	0.5 meg	R _g /g=0.5 meg.]
(survival rate) Transconductance(	3800 pmhos	(survival rate) Transconductance(1) 1.0 - Sm 3800 --- R N pmhos
Heater Current	162 mA	Heater Current -- .- 1 3 1f 142 162 mA
E _{hk} =	7 Vdc	E _{hk} =-100 Vdc thk . 7 PAdc
E(g—all)=	250 Meg	E(g—all)=100V . 1 3 R 250 ae- Meg
E(p—all)=	250 Meg	E(p—all)=300V R 250 - Meg
Heater current	164 mA	Heater current- 1 3 1f 142 164 mA

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Ehk==	7 Vdc	Ehk==100 Vdc 1hk .e- 7 pAdc
E(g—all})=	100 Meg	E(g—all})=-100Vdc 1 R 100 --- Meg
E(p~all)==	100 Vdc	E(p~all)==300 Vdc R 100 --- Meg
Eb=	135 Vdc	Eb=135 Vdc;
measured by means of a high impedance oscilloscope, or equivalent, device connected across	1 ohm	measured by means of a high impedance oscilloscope, or equivalent, device connected across a cathode resistor of 1.0 ohm. Pre—
Note	0.1 Meg	Note 13: A grid resistor of 0.1 Meg shall be added to each section; however, this resistor shall not be used when a thyatron—type short



SOURCE OPERATING CONDITIONS

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1958 Compagnie General

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

1958 COMPAGNIE GENERAL

Section 1 · Triode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Operating Frequency Maximum	300 MHz	—
Heater Voltage Series	12.6 V	—
Heater Current Series	150 mA	—
Heater Voltage Parallel	6.3 V	—
Heater Current Parallel	300 mA	—

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Amplification Factor	60	—
Transconductance	10900 uS	High-current published point
Plate Resistance	5500 ohm	High-current published point



SOURCE OPERATING CONDITIONS

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1960 RCA Industrial and Communications Types

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1960 RCA INDUSTRIAL AND COMMUNICATIONS TYPES

Section 1 · Triode

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
HeaterOrFilamentVoltage	12.6 V	—
HeaterOrFilamentCurrent	150 mA	—
MilitarySpecificationDesign	1 boolean	PremiumTube



SOURCE OPERATING CONDITIONS

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1961 Tung Sol

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1961 TUNG SOL

Section 1 · Triode

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Transconductance	5500 μ S	HigherCurrentOperatingPoint



1966 Tung Sol Electronic Tubes 3 of 4

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1966 TUNG SOL ELECTRONIC TUBES 3 OF 4

Section 1 · Triode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate voltage	250 V	ClassA;EachSection
Plate current	10 mA	ClassA;EachSection
Cathode-bias resistor	200 ohm	ClassA;EachSection
Maximum shock	600 G	Ruggedized
Maximum altitude	10000 ft	Ruggedized

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate resistance	10900 ohm	ClassA;EachSection
Transconductance	5500 uS	ClassA;EachSection
Amplification factor	60	ClassA;EachSection

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid-to-plate capacitance	1.5 pF	EachSection
Input capacitance	1.6 pF	EachSection



SOURCE DATA APPENDIX

1968 Mazda Belvu

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

1968 MAZDA BELVU

APPLICATION		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Application	Oscillator_RF_AF_Amplifier text	—

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