

ELECTRONIC TUBE REFERENCE

18GD6A

Voltage - Pentode Sharp Cutoff (single) electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
PENTODE

Controlled-warm-up sharp-cutoff pentode for RF and IF amplification in transformerless series-heater receiver circuits.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	7
NOMINAL HEATER	18 V / 100 mA	PARALLEL HEATER	— / —
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION 1 Pentode	
PLATE RESISTANCE	500000 Ω
TRANSCONDUCTANCE	0.0043 S
MAXIMUM PLATE VOLTAGE	150 V
MAXIMUM SCREEN VOLTAGE	150 V
MAXIMUM PLATE DISSIPATION	2.5 W
MAXIMUM SCREEN DISSIPATION	0.6 W
MAXIMUM CATHODE CURRENT	20 mA
Sharp-cutoff pentode.	

18GD6A — Sharp-Cutoff Pentode

The **18GD6A** is a miniature, sharp-cutoff pentode featuring a coated unipotential cathode and a heater with a controlled warm-up time. It is primarily designed for radio frequency (RF) and intermediate frequency (IF) amplifier applications, as well as autodyne converter service in AC/DC radio receivers and

other electronic equipment. The 18GD6A directly replaces the obsolete [18GD6](#), with which it is identical except for its controlled heater warm-up characteristics.

Mechanical Specifications and Pinout

The 18GD6A is constructed in a T-5 1/2 glass envelope with a small-button miniature 7-pin base (JEDEC designation E7-1). The tube can be operated in any mounting position.

Physical Dimensions

- **Maximum Overall Length:** 2-1/8 inches (2.125 in)
- **Maximum Seated Height:** 1-7/8 inches (1.875 in)
- **Length from Base Seat to Bulb Top (excluding tip):** 1-1/2 $\pm$ 3/32 inches
- **Diameter:** 0.650 to 0.750 inches (maximum 0.750 in)

Pin Connections (JEDEC 7BK Basing, Bottom View)

The 7-pin base configuration provides the following connections:

- **Pin 1:** Grid No. 1 (G1)
- **Pin 2:** Grid No. 3 (G3) / Internal Shield (IS)
- **Pin 3:** Heater (H)
- **Pin 4:** Heater (H)
- **Pin 5:** Plate (P)
- **Pin 6:** Grid No. 2 ([G2](#))
- **Pin 7:** Cathode (K)

Heater and Maximum Ratings

The heater is designed for series string operation in AC/DC equipment and features a controlled warm-up time to ensure reliable operation.

Heater Specifications

- **Heater Voltage (AC or DC):** 18 V
- **Heater Current:** 0.100 A (nominal), with an acceptable range of 94–106 mA ($\pm 6\%$ tolerance)
- **Heater Warm-up Time:** 20 seconds. This is defined as the time required to reach 80% of the rated heater voltage when 4 times the rated voltage is applied in series with a resistor equal to 3 times the nominal heater operating resistance.
- **Maximum Heater-Cathode Voltage:** 100 V (total DC and peak) with the heater either positive or negative with respect to the cathode.

Design-Maximum Ratings (EIA Standard RS-239)

- **Maximum Plate Voltage:** 150 V

- **Maximum Grid No. 2 (Screen-Grid) Supply Voltage:** 150 V
- **Maximum Plate Dissipation:** 2.5 W
- **Maximum Grid No. 2 Dissipation:** 0.6 W (for Grid No. 2 voltages up to 75 V; for voltages between 75 V and 150 V, dissipation limits are subject to specific rating charts)

Electrical Characteristics and Typical Operation

Under typical Class A1 amplifier operating conditions, the 18GD6A exhibits high transconductance and high plate resistance.

Typical Operating Conditions

- **Plate Voltage:** 100 V
- **Grid No. 3 (Suppressor Grid):** Connected to cathode at socket
- **Grid No. 2 Voltage:** 100 V
- **Cathode Bias Resistor:** 150 Ω
- **Plate Current:** 5 mA
- **Grid No. 2 Current:** 2.0 mA
- **Transconductance:** 4300 μmhos
- **Plate Resistance (Approximate):** 0.5 M Ω
- **Grid No. 1 Voltage for Cutoff (approximate, at $I_b = 10 \mu\text{A}$):** -4.7 V

Direct Interelectrode Capacitances

Capacitances are measured either with or without an external shield (JEDEC No. 316) connected to the cathode:

- **Grid No. 1 to Plate (Maximum):** 0.0035 pF
- **Input (G1 to H + K + G2 + G3 + IS):** 6.0 pF
- **Output (P to H + K + G2 + G3 + IS):** 5.0 pF

Qualitative Curve Analysis

The average plate characteristics of the 18GD6A show a sharp knee below 25 V, which is characteristic of sharp-cutoff pentodes. The screen-grid (Grid No. 2) current decreases as the plate voltage increases. Under typical supply conditions ($E_b = 100 \text{ V}$, $E_{c2} = 100 \text{ V}$), the transconductance falls from approximately 5300 μmhos at zero grid bias ($E_{c1} = 0 \text{ V}$) to near zero at approximately -4.5 V. Similarly, the plate current drops from approximately 10.5 mA at zero bias to zero near -4.5 V.

Technical Summary

The **18GD6A** is a miniature sharp-cutoff pentode designed for RF/IF amplification and autodyne converter service in series-string AC/DC receivers. Operating with an 18 V, 100 mA heater with a controlled 20-second warm-up time, it provides a transconductance of 4300 μmhos and a plate resistance of 0.5 M Ω

under typical 100 V operating conditions. Its design-maximum ratings restrict plate and screen supply voltages to 150 V, with a maximum plate dissipation of 2.5 W.



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1950 Sylvania

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

1950 SYLVANIA

Section 1 · Pentode

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate Resistance	500000 ohm	—

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum Plate Voltage	150 V	—
Plate Voltage	100 V	—



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	100 V	—
Heater Warmup Time	20 s	—

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
TransconductancePublished	4300 uS	—

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1966 Tung Sol Electronic Tubes 3 of 4

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

1966 TUNG SOL ELECTRONIC TUBES 3 OF 4

Section 1 · Pentode

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid 1-to-plate capacitance maximum	0.0035 pF	WholeTube
Input capacitance	6 pF	WholeTube
Output capacitance	5 pF	WholeTube
Grid 1 voltage for 10 μ A plate current	-4.7 V	WholeTube

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum plate voltage	150 V	WholeTube
Maximum screen supply voltage	150 V	WholeTube
Maximum plate dissipation	2.5 W	WholeTube
Maximum screen dissipation	0.6 W	WholeTube
Screen voltage	100 V	TypicalOperation
Cathode bias resistor	150 ohm	TypicalOperation
Plate current	5 mA	TypicalOperation
Screen current	2 mA	TypicalOperation
Transconductance	4300 μ S	TypicalOperation
Plate resistance	500000 ohm	TypicalOperation

1971 RCA HB3 Binder 5 of 7

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

1971 RCA HB3 BINDER 5 OF 7
Section 1 · Pentode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater voltage	18 V	—
Heater current	100 mA	—
Heater warm-up time	20 s	ControlledWarmup
Plate supply voltage	100 V	ClassA
Screen supply voltage	100 V	ClassA
Cathode resistor	150 ohm	ClassA
Plate current	5 mA	ClassA
Screen current	2 mA	ClassA
Maximum plate voltage	150 V	RFAmplifier
Maximum screen supply voltage	150 V	RFAmplifier
Screen input at <=75 V	0.6 W	—
Plate dissipation	2.5 W	—
Peak heater-cathode voltage heater negative	100 V	—
Peak heater-cathode voltage heater positive	100 V	—

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate resistance	500000 ohm	ClassA
Transconductance	4300 uS	ClassA
Grid voltage for plate current 10 uA	-4.7 V	—

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid-to-plate capacitance	0.0035 pF	—

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Input capacitance	6 pF	—
Output capacitance	5 pF	—

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