

ELECTRONIC TUBE REFERENCE

10EG7

Power - TV Vertical Output electronic tube

CONSOLIDATED TECHNICAL DATA

2 SECTIONS

CONSTRUCTION

TRIODE-TRIODE

Dissimilar television vertical-deflection dual triode combining an oscillator section with a low-mu, high-transconductance output amplifier rated for 10 W plate dissipation and high pulse voltage.

GENERAL CHARACTERISTICS

BASE DESIGNATION	8BD	BASE PINS	9
NOMINAL HEATER	9.7 V / 600 mA	PARALLEL HEATER	– / –
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Dissimilar

8BD - TERMINAL PINOUT

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

SECTION RATINGS

SECTION1 Triode	
PLATE RESISTANCE	8750 Ω
TRANSCONDUCTANCE	0.002 S
AMPLIFICATION FACTOR	17.5
MAXIMUM PLATE VOLTAGE	330 V
MAXIMUM PLATE DISSIPATION	1.5 W
MAXIMUM CATHODE CURRENT	22 mA
<i>medium-mu</i>	

SECTION2 Triode	
PLATE RESISTANCE	800 Ω
TRANSCONDUCTANCE	0.0075 S
AMPLIFICATION FACTOR	6
MAXIMUM PLATE VOLTAGE	330 V
MAXIMUM PLATE DISSIPATION	10 W
MAXIMUM CATHODE CURRENT	40 mA
<i>low-mu</i>	

10EG7 — Dissimilar Double Triode

The **10EG7** is a glass octal double triode containing two highly dissimilar triode sections in a single envelope. It is specifically designed for use in television receivers employing series heater-string arrangements. Section 1 is designed to operate as a vertical deflection oscillator, while Section 2 is designed to function as a vertical deflection amplifier.

Mechanical Specifications, Base, and Pinout

The 10EG7 is constructed with a T-9 glass bulb and utilizes a short intermediate-shell octal 8-pin base with external barriers, conforming to the JEDEC Group 1, No. B8-58 standard. The tube can be mounted and operated in any position.

Physical Dimensions

- **Maximum Overall Length:** 3.000 inches
- **Maximum Seated Length:** 2.437 inches (2-7/16")
- **Maximum Diameter:** 1.188 inches (1-9/32")

Pin Connections

The tube uses the **8BD** basing arrangement. When viewed from the bottom of the base, the pin assignments are as follows:

Pin	Connection	Description
1	<u>G2</u>	Grid of Unit No. 2 (Amplifier)
2	<u>P2</u>	Plate of Unit No. 2 (Amplifier)
3	K2	Cathode of Unit No. 2 (Amplifier)
4	G1	Grid of Unit No. 1 (Oscillator)
5	P1	Plate of Unit No. 1 (Oscillator)
6	K1	Cathode of Unit No. 1 (Oscillator)
7	H	Heater
8	H	Heater

Section 1 (Oscillator) is connected to pins 4, 5, and 6, while Section 2 (Amplifier) is connected to pins 1, 2, and 3.

Heater Characteristics

The 10EG7 features a series-string heater designed for operation with unipotential cathodes.

Parameter	Value
Nominal Heater Voltage	9.7 V (AC or DC)
Nominal Heater Current	0.60 A (600 mA)
Heater Current Range	560 to 640 mA
Average Heater Warm-up Time	11.0 seconds

The heater warm-up time is defined as the time required for the voltage across the heater to reach 80% of its rated voltage after applying four times the rated heater voltage to a circuit consisting of the tube heater in series with a resistance equal to three times the nominal heater operating resistance.

Heater-Cathode Voltage Ratings (Design-Maximum Values)

- **Heater Negative with Respect to Cathode:** 200 V max (Total DC and Peak)
- **Heater Positive with Respect to Cathode:** 100 V max DC, 200 V max (Total DC and Peak)

Electrical Characteristics and Class A1 Operation

The two triode sections of the 10EG7 are electrically dissimilar, with Section 1 operating as a medium- μ unit and Section 2 operating as a low- μ unit. The typical operating conditions and characteristics under Class A1 amplifier service are detailed below:

Parameter	Section 1 (Oscillator)	Section 2 (Amplifier)
Plate Voltage	250 V	150 V
Grid No. 1 Voltage	-11 V	-17.5 V
Plate Current	5.5 mA	45 mA
Transconductance	2000 μ mhos	7500 μ mhos
Amplification Factor (μ)	17.5	6.0
Plate Resistance (Approx.)	8750 Ω	800 Ω
Grid Voltage for $I_b = 10 \mu$ A (Approx.)	-20 V	—
Grid Voltage for $I_b = 100 \mu$ A (Approx.)	—	-40 V
Plate Current at $E_c = -25$ VDC	—	8 mA
Plate Current at $E_b = 60$ V, $E_c = 0$ V	—	95 mA

Direct Interelectrode Capacitances

These values are measured without an external shield:

Capacitance	Section 1 (Oscillator)	Section 2 (Amplifier)
Grid to Plate	4.4 pF	9.5 pF
Input: g to (h + k)	2.2 pF	7.0 pF
Output: p to (h + k)	0.6 pF	1.6 pF

Design-Maximum Ratings and Television Deflection Service

The ratings of the 10EG7 are interpreted according to the Design-Maximum Rating System. These ratings represent limiting values of operating and environmental conditions that should not be exceeded under the worst probable conditions.

For operation in a 525-line, 30-frame television system, the ratings are specified as follows:

Rating	Section 1 (Oscillator)	Section 2 (Amplifier)
Maximum DC Plate Voltage	330 V	330 V
Maximum Peak Positive Pulse Plate Voltage	—	1500 V
Maximum Peak Negative Pulse Grid Voltage	400 V	250 V
Maximum Plate Dissipation	1.5 W	10 W
Maximum Average Cathode Current	22 mA	50 mA
Maximum Peak Cathode Current	77 mA	175 mA
Maximum Grid Circuit Resistance (Self Bias)	2.2 M Ω	2.2 M Ω

Operating Conditions and Circuit Protection

- **Pulse Duty Cycle:** The peak pulse ratings are applicable where the duration of the voltage pulse does not exceed 15% of one vertical scanning cycle. In a standard 525-line, 30-frame system, 15% of one vertical scanning cycle corresponds to 2.5 milliseconds.
- **Grid Leak Bias Protection:** In stages operating with grid leak bias, an adequate cathode bias resistor or other suitable protective means must be employed to protect the tube from excessive plate dissipation in the absence of excitation.

Related Designations

The dimensional outline of the 10EG7 is identical to that of the [6EM7](#). Additionally, the maximum ratings and characteristics of the 10EG7 are closely related to those of the [6EW7](#), except for the specific heater operating parameters.

Technical Summary

The **10EG7** is a specialized, dissimilar double triode designed for series-string television receiver applications. It combines a medium- μ triode (Section 1, $\mu = 17.5$) for vertical oscillator service and a high-power, low- μ triode (Section 2, $\mu = 6.0$) for vertical deflection amplification. Operating from a 9.7 V, 0.60 A heater with a controlled 11-second warm-up time, the tube is housed in a T-9 glass envelope with an 8-pin octal base. By separating the oscillator and power amplifier functions into distinct, optimized triode units, the 10EG7 provides a compact and efficient solution for television vertical deflection circuits.

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 · Triode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Service	Vertical deflection oscillator	Section1
Heater Warmup Time	11 s	—

1961 TUNG SOL

Section 2 · Triode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Service	Vertical deflection amplifier	Section2

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 · Triode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate voltage	250 V	Section1;VerticalOscillator
Plate current	5.5 mA	Section1;VerticalOscillator
Peak negative grid voltage	400 V	Section1;VerticalOscillator

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater warm-up time	11 s	WholeTube

1966 TUNG SOL ELECTRONIC TUBES 2 OF 4

Section 2 · Triode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate voltage	150 V	Section2;VerticalDeflection
Plate current	45 mA	Section2;VerticalDeflection
Peak positive pulse plate voltage	1500 V	Section2;VerticalDeflection
Peak negative grid voltage	250 V	Section2;VerticalDeflection



SOURCE DATA APPENDIX

SOURCE OPERATING CONDITIONS

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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 · Triode

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate Voltage	250 V	ClassA
Grid Voltage	-11 V	ClassA
Plate Current	5.5 mA	ClassA
Amplification Factor	17.5	—
Plate Resistance	8750 Ω	—
Transconductance	2000 μS	—
Grid-to-Plate Capacitance	4.4 pF	—
Grid-to-Cathode-and-Heater Capacitance	2.2 pF	—
Plate-to-Cathode-and-Heater Capacitance	0.6 pF	—

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Peak Cathode Current	77 mA	ClassA
Average Cathode Current	22 mA	ClassA

1971 RCA HB3 BINDER 5 OF 7

Section 2 · Triode

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate Voltage	150 V	ClassA
Grid Voltage	-17.5 V	ClassA
Plate Current	45 mA	ClassA
Amplification Factor	6	—
Plate Resistance	800 Ω	—
Transconductance	7500 μS	—
Grid-to-Plate Capacitance	9.5 pF	—
Grid-to-Cathode-and-Heater Capacitance	7 pF	—
Plate-to-Cathode-and-Heater Capacitance	1.6 pF	—
Peak Cathode Current	175 mA	ClassA
Average Cathode Current	50 mA	ClassA

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