



ELECTRONIC TUBE REFERENCE

12DZ8

Power - Pentode (NOT beam) electronic tube

CONSOLIDATED TECHNICAL DATA

2 SECTIONS

CONSTRUCTION

PENTODE-TRIODE

Triode-pentode electrically equivalent to related 6DZ8-family versions except for heater rating. Manufacturer documentation defines a combined small-signal triode and pentode device rather than a single-section power pentode.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	9
NOMINAL HEATER	12.6 V / 225 mA	PARALLEL HEATER	— / —
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Common cathode	SECTION CONSTRUCTION	Dissimilar

SECTION RATINGS

SECTION1 Triode	
PLATE RESISTANCE	5500 Ω
TRANSCONDUCTANCE	0.0075 S
AMPLIFICATION FACTOR	40
MAXIMUM PLATE VOLTAGE	150 V
MAXIMUM PLATE DISSIPATION	0.75 W
MAXIMUM CATHODE CURRENT	5 mA
<i>Promoted from published ratings/characteristics tables; additional operating points and capacitances retained in TUBE_SECTION_PARAMETER.</i>	

SECTION2 Pentode	
PLATE RESISTANCE	250000 Ω
TRANSCONDUCTANCE	0.006 S
MAXIMUM PLATE VOLTAGE	150 V
MAXIMUM SCREEN VOLTAGE	135 V
MAXIMUM PLATE DISSIPATION	6.5 W
MAXIMUM SCREEN DISSIPATION	1.5 W
MAXIMUM CATHODE CURRENT	60 mA
<i>Promoted from published ratings/characteristics tables; additional operating points and capacitances retained in TUBE_SECTION_PARAMETER.</i>	

12DZ8 — High-Mu Triode Power Pentode

An indirectly heated, multi-section miniature vacuum tube combining a high-mu triode and a power pentode in a single envelope, designed for two-stage audio frequency amplification.

Overview

The **12DZ8** is a multi-section miniature vacuum tube containing a high-mu triode and a power pentode within a single glass envelope. It is designed specifically for use as a two-stage audio frequency amplifier in applications where the plate supply voltage is obtained directly from a single half-wave rectifier connected to a 120-volt AC power line. The tube features a 9-pin miniature base and is designed to operate with a nominal 12.0 V heater supply.

Construction, Mechanical Specifications, and Pinout

The 12DZ8 is constructed with a T-6 1/2 glass bulb and a miniature 9-pin base. It utilizes a coated unipotential cathode and is designed to operate in any mounting position.

Physical Dimensions

- **Maximum overall length:** 2 5/8 inches
- **Maximum seated height:** 2 3/8 inches
- **Maximum diameter:** 7/8 inch

Pin Connections

The bottom view of the miniature 9-pin base provides the following electrode connections:

Pin	Symbol	Connection
1	G	Triode Grid
2	Ks	Triode Cathode and Internal Shield
3	G1	Pentode Grid No. 1 (Control Grid)
4	H	Heater
5	H	Heater
6	P1	Pentode Plate
7	<u>G2</u>	Pentode Grid No. 2 (Screen Grid)
8	K	Pentode Cathode
9	<u>P2</u>	Triode Plate

The heater is designed for operation on either AC or DC with a nominal voltage of **12.0 Volts** and a nominal current of **0.45 Ampere**.

Electrical Characteristics and Typical Operation

The 12DZ8 contains two independent electrical sections with distinct characteristics optimized for their respective roles in a two-stage audio amplifier.

Triode Section

The triode section is designed as a high-gain voltage amplifier, featuring a high amplification factor. Under typical operating conditions, it exhibits the following characteristics:

- **Plate Voltage:** 120 Volts
- **Grid No. 1 Voltage:** 0 Volts
- **Cathode Bias Resistor:** 1500 Ohms
- **Plate Current:** 0.8 mA
- **Transconductance:** 1400 μ mhos
- **Amplification Factor (μ):** 100
- **Grid Cutoff Voltage** (for a plate current of 20 μ A): -2.5 Volts

Pentode Section

The pentode section is designed as a power output stage capable of delivering audio power to a load. Under typical operating conditions, it exhibits the following characteristics:

- **Plate Voltage:** 145 Volts
- **Grid No. 2 Voltage:** 120 Volts
- **Grid No. 1 Voltage:** 0 Volts
- **Cathode Bias Resistor:** 180 Ohms
- **Plate Current:** 45 mA
- **Grid No. 2 Current:** 6 mA
- **Transconductance:** 7500 μ mhos
- **Load Resistance:** 2500 Ohms
- **Power Output:** 2.0 Watts

Maximum Ratings

The maximum ratings for the 12DZ8 are established under the **Design Center System**. These limits represent the maximum values that should not be exceeded under any normal operating conditions.

Rating	Triode Section	Pentode Section	Units
Heater Voltage	-	12.0	Volts
Maximum Plate Voltage	150	150	Volts
Maximum Plate Dissipation	0.75	6.5	Watts
Maximum Grid No. 2 Voltage	-	135	Volts
Maximum Grid No. 2 Dissipation	-	1.5	Watts
Maximum DC Heater-Cathode Potential	110	110	Volts
Maximum Grid Circuit Resistance	5.0	0.5	Megohms
Maximum Cathode Current	5.0	60.0	mA
Maximum Heater-Cathode Voltage (Heater Negative)	200	200	Volts
Maximum Heater-Cathode Voltage (Heater Positive)	200	200	Volts

Similar Designations and Family Relations

The 12DZ8 belongs to a family of identical triode-pentode tubes that share the same internal structure, electrode geometry, and electrical characteristics, differing only in their heater ratings. Except for these heater specifications, the 12DZ8 is identical to the following tube types:

- **6DZ8**
- **9DZ8**
- **18DZ8**
- **35DZ8**

These related designations represent versions of the same basic design optimized for different heater supply configurations, such as series-string heater circuits in television or radio receivers.

Technical Summary

The **12DZ8** is a miniature 9-pin triode-pentode vacuum tube featuring a **12.0 V, 0.45 A** heater and a coated unipotential cathode. It is designed specifically as a two-stage audio frequency amplifier operating directly from a half-wave rectified 120-volt AC line. The high-mu triode section provides an amplification factor of **100** with a transconductance of **1400 μ mhos**, while the power pentode section delivers **2.0 Watts** of audio power into a **2500 Ohm** load with a transconductance of **7500 μ mhos**. The tube is physically housed in a T-6 1/2 glass bulb and can be operated in any mounting position. Except for its heater ratings, the 12DZ8 is identical to the **6DZ8**, **9DZ8**, **18DZ8**, and **35DZ8** vacuum tubes.

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
Heater voltage	12.6 V	Nominal
Heater current	225 mA	Nominal
Plate voltage	150150 V	Typical operating conditions
Plate current	0.845 mA	Typical operating conditions

1961 TUNG SOL

Section 2 · Pentode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater voltage	12.6 V	Nominal
Heater current	225 mA	Nominal
Plate voltage	150150 V	Typical operating conditions
Plate current	0.845 mA	Typical operating conditions

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 2 · Pentode

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
HEATER VOLTAGE	7.2 V	HEATER VOLTAGE 7.2.0 VOLTS
MAX I'M UM GRID (	2 V	MAX I'M UM GRID (2) VOLTAGE --- 135 VOLTS
NEATER VOLTAGE	12 V	NEATER VOLTAGE 12.0 VOLTS
HEATER CURRENT	450 mA	HEATER CURRENT 0.45 AMP.
PLATE VOLTAGE	12 V	PLATE VOLTAGE 120 - 145 VOLTS
GRID #	2 V	GRID #2 VOLTAGE --- 120 VOLTS
GRID #	1 V	GRID #1 VOLTAGE O O VOLTS
CATHODE RESISTOR	1500 Ω	CATHODE RESISTOR 1500 I.HO OHMS
PLATE CURRENT 0	8 mA	PLATE CURRENT 0.8 45 MA.
GRID #	2 mA	GRID #2 CURRENT --- G MA.
GRID CUTOFF VOLTAGE FOR	2 V	GRID CUTOFF VOLTAGE FOR 2Qu.A —2.5 --- VOLTS

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
MAXIMUM PLATE VOLTAGE	15 V	MAXIMUM PLATE VOLTAGE 150 .LSO VOLTS
MAXIMUM PLATE DISSIPATION	75 mA	MAXIMUM PLATE DISSIPATION .75 (,5 WATTS
MAXIMUM GRID (	2 mA	MAXIMUM GRID (2) DISSIPATION --- 1._5 WATTS
MAXIMUM DC HE ATER- CATHODE POTENTIAL	11 V	MAXIMUM DC HE ATER- CATHODE POTENTIAL 11O 11O VOLTS
MAXIMUM GRID CIRCUIT RESISTANCE	5 mA	MAXIMUM GRID CIRCUIT RESISTANCE 5.O O.5 MEGOHMS
MAXIMUM CATHODE CURRENT	5 mA	MAXIMUM CATHODE CURRENT 5.O 60.0 MA.
LOAD RESISTANCE	2500 Ω	LOAD RESISTANCE --- 2500 OHMS
POWER OUTPUT	2 W	POWER OUTPUT --- 2:O WATTS

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