



ELECTRONIC TUBE REFERENCE

12DV8

Voltage - Pentode or Tetrode (under 100V) electronic tube

CONSOLIDATED TECHNICAL DATA

3 SECTIONS

CONSTRUCTION

DIODE-DIODE-TETRODE

Two-diode space-charge-grid tetrode for low-voltage automobile-radio service, providing useful amplification directly from approximately 12.6 V while integrating detector or control rectification.

GENERAL CHARACTERISTICS

BASE DESIGNATION	9HR	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 Diode*No fixed ratings recorded.**Space-charge grid***SECTION2** Diode*No fixed ratings recorded.**Representative identical-diode row*

SECTION3 Tetrode	
PLATE RESISTANCE	900 Ω
TRANSCONDUCTANCE	0.0085 S
AMPLIFICATION FACTOR	7.6
MAXIMUM PLATE VOLTAGE	16 V
Promoted from published ratings/characteristics tables; additional operating points and capacitances retained in TUBE_SECTION_PARAMETER.	

12DV8 — Duplex-Diode Space-Charge-Grid Tetrode

The **12DV8** is a miniature duplex-diode, space-charge-grid tetrode designed for use in automobile receivers. It serves as a combined detector, automatic volume control (AVC) rectifier, and transistor driver. The tetrode section of the tube is specifically engineered to operate with its plate and space-charge-grid voltages supplied directly from a 12-volt storage battery, making it highly suitable for hybrid vacuum-tube/transistor automotive systems.

Physical Construction and Basing

The 12DV8 is constructed in a miniature T-6 1/2 glass envelope with an E9-1 small button 9-pin base. The tube features a coated unipotential cathode and can be mounted in any position.

Physical Dimensions

- **Maximum Diameter:** 7/8 inch
- **Maximum Overall Length:** 2 5/8 inches
- **Maximum Seated Height:** 2 3/8 inches

Terminal Connections

The 12DV8 uses the **9HR** basing arrangement. The pin connections, viewed from the bottom of the base, are as follows:

Pin	Connection
Pin 1	Diode Number 2 Plate
Pin 2	Tetrode Cathode
Pin 3	Tetrode Grid Number 1 (Space-Charge Grid)
Pin 4	Heater
Pin 5	Heater

Pin	Connection
Pin 6	Tetrode Plate
Pin 7	Tetrode Grid Number 2 (Control Grid)
Pin 8	Diodes Cathode and Shield
Pin 9	Diode Number 1 Plate

The diodes share a cathode connection with an internal shield on Pin 8, which is separate from the tetrode cathode on Pin 2.

Heater Characteristics and Automotive Service

The heater of the 12DV8 is designed for operation from either an alternating current (AC) or direct current (DC) supply.

Heater Parameter	Value
Nominal Heater Voltage	12.6 V
Nominal Heater Current	0.375 A

Automotive Voltage Variations

When operated in automotive service from a nominal 12-volt source, the heater voltage is subject to wide fluctuations. Under no circumstances should the heater voltage fall below 10.0 volts or exceed 15.9 volts. While these extreme variations can be tolerated for short periods, operating at or near these limits impacts the tube's performance and longevity:

- **Low Heater Voltage:** Results in a sacrifice in electrical performance.
- **High Heater Voltage:** Significantly reduces the life expectancy of the tube.

To maximize equipment reliability, improved supply-voltage regulation is highly recommended.

Maximum Ratings

The following limiting values are established under the Design-Maximum System. These ratings represent the limits at which satisfactory tube life can be expected under the worst probable operating conditions, including supply-voltage variations, component tolerances, and environmental changes.

Parameter	Design-Maximum Rating
Maximum Plate Voltage	16 V
Maximum Negative Control-Grid Voltage	16 V

Parameter	Design-Maximum Rating
Maximum Space-Charge-Grid Voltage	16 V
Maximum Heater-Cathode Voltage (Heater Positive)	16 V
Maximum Heater-Cathode Voltage (Heater Negative)	16 V
Maximum Control-Grid Circuit Resistance	10 MΩ
Maximum Diode Current for Continuous Operation (Each Diode)	5.0 mA

Direct Interelectrode Capacitances

The direct interelectrode capacitances of the 12DV8 are measured without an external shield:

Capacitance Parameter	Value
Tetrode Grid Number 2 (Control Grid) to Plate	12 μF
Tetrode Input	9.0 μF
Tetrode Output	1.0 μF
Tetrode Grid Number 2 to Any Diode Plate (Maximum)	0.015 μF
Diode Number 1 Input	1.7 μF
Diode Number 2 Input	1.6 μF
Diode Number 1 Plate to Diode Number 2 Plate (Maximum)	0.10 μF

Typical Operating Conditions and Characteristics

The tetrode section of the 12DV8 is designed to operate at very low voltages, typically matching the 12.6 V heater supply.

Average Characteristics

At a standard operating point, the average characteristics of the tetrode and diode sections are:

- **Plate Voltage:** 12.6 V
- **Space-Charge-Grid Voltage:** 12.6 V
- **Cathode Resistor:** 18 Ω

- **Control-Grid Resistor:** 4.7 M Ω
- **Amplification Factor (Control Grid to Plate):** 7.6
- **Plate Resistance (Approximate):** 900 Ω
- **Transconductance (Control Grid to Plate):** 8,500 μmhos
- **Plate Current:** 9.0 mA
- **Space-Charge-Grid Current:** 53 mA
- **Average Diode Current (Each Diode, with 10 V DC applied):** 3.0 mA

Class A Amplifier Operation

When configured as a Class A amplifier, the 12DV8 operates under the following typical conditions:

Parameter	Value
Plate Voltage	12.6 V
Space-Charge-Grid Voltage	12.6 V
Cathode Resistor	18 Ω
Control-Grid Resistor	4.7 M Ω
AF Signal Source Resistance	300,000 Ω
Peak AF Control-Grid Voltage	1.2 V
Maximum Signal Plate Current	6.8 mA
Space-Charge-Grid Current	54 mA
Load Resistance	1,250 Ω
Total Harmonic Distortion (Approximate)	3%
Power Output	5 mW

The low plate resistance of 900 ohms and high transconductance of 8,500 μmhos allow the tetrode section to efficiently drive a subsequent transistor stage, delivering a power output of 5 milliwatts into a 1,250-ohm load with low distortion.

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 · Diode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater voltage	12.6 V	Nominal
Heater current	225 mA	Nominal
Plate voltage	16 V	Typical operating conditions
Plate current	9 mA	Typical operating conditions

1961 TUNG SOL

Section 2 · Diode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater voltage	12.6 V	Nominal
Heater current	225 mA	Nominal
Plate voltage	16 V	Typical operating conditions
Plate current	9 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 3 · Tetrode

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
TETRODE GRID #	2 mA	TETRODE GRID #2 TO ANY DIODE PLATE (MAX.) 0.015 μ f
DIODE #	1 mA	DIODE #1 PLATE TO DIODE #2 PLATE (MAX.) 0.10 μ f
HEATER VOLTAGE	12.6 V	HEATER VOLTAGE 12.6A VOLTS
HEATER POSITIVE WITH RESPECT TO CATHODE	16 V	HEATER POSITIVE WITH RESPECT TO CATHODE 16 VOLTS
HEATER NEGATIVE WITH RESPECT TO CATHODE	16 V	HEATER NEGATIVE WITH RESPECT TO CATHODE 16 VOLTS
NEATER VOLTAGE BE LESS THAN	10 V	NEATER VOLTAGE BE LESS THAN 10.0 VOLTS OR NORE TN AN 15.9 VOLTS. THESE EXTREME VARIATIONS IM
HEATER CURRENT	370 mA	HEATER CURRENT 0.37Fj AMP.
PLATE VOLTAGE	1.2 V	PLATE VOLTAGE 1.2.6 VOLTS
CONTROL GRID RESISTOR	4.7 M Ω	CONTROL GRID RESISTOR 4.7 MEGOHMS
SPACE- CHARGE- GRID VOLTAGE	12.6 V	SPACE- CHARGE- GRID VOLTAGE 12.6 VOLTS
AMPLIFICATION FACTOR S	7.6 A	AMPLIFICATION FACTOR S 7,6
PLATE RESISTANCE (APPROX.)	9 Ω	PLATE RESISTANCE (APPROX.) 900 OHMS
PLATE CURRENT	9 mA	PLATE CURRENT 9.0 MA.
SPACE- CHARGE-GRID CURRENT	53 mA	SPACE- CHARGE-GRID CURRENT 53 MA•
HEATER CURRENT	375 mA	HEATER CURRENT 0.375 AMP.
PLATE VOLTAGE '	12.6 V	PLATE VOLTAGE '12.6 VOLTS
CONTROL- GRID RESISTOR	4.7 Ω	CONTROL- GRID RESISTOR 4.7 ME GOHMS
SPACE-CHARGE-GRID VOLTAGE	12.6 V	SPACE-CHARGE-GRID VOLTAGE 12.6 voLTs
PEAK AF CONTROL-GRID VOLTAGE Z	2 V	PEAK AF CONTROL-GRID VOLTAGE Z.2 VOLTS
SPACE-CHARGE-GRID CURRENT	54 mA	SPACE-CHARGE-GRID CURRENT 54 MA.

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
MAXIMUM PLATE VOLTAGE	16 V	MAXIMUM PLATE VOLTAGE 16 VOLTS
MAXIMUM NEGATIVE CONTROL- GRID VOLTAGE	16 V	MAXIMUM NEGATIVE CONTROL-GRID VOLTAGE 16 VOLTS

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
MAXIMUM SPACE-CHARGE-GRID VOLTAGE	16 V	MAXIMUM SPACE-CHARGE-GRID VOLTAGE 16 VOLTS
MAXIMUM CONTROL-GRID CIRCUIT RESISTANCE	10 mA	MAXIMUM CONTROL-GRID CIRCUIT RESISTANCE 10 MEGOHMS
MAXIMUM DIODE CURRENT FOR CONTINUOUS OPERATION (EA.DIOD E)	5 mA	MAXIMUM DIODE CURRENT FOR CONTINUOUS OPERATION (EA.DIOD E) 5,0 MA.
AF SIGNAL SOURCE RESISTANCE	300 Ω	AF SIGNAL SOURCE RESISTANCE 300 000 OHMS
MAXIMUM SIGNAL PLATE CURRENT	6 mA	MAXIMUM SIGNAL PLATE CURRENT 6.\$ MA.
LOAD RESISTANCE Z	25 Ω	LOAD RESISTANCE Z 250 OHMS

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