



ELECTRONIC TUBE REFERENCE

12C8

Voltage - Radio Detector Converter electronic tube

CONSOLIDATED TECHNICAL DATA

3 SECTIONS

CONSTRUCTION

DIODE-DIODE-PENTODE

Double-diode pentode combining detector and control-voltage rectification with a separate voltage-amplifier pentode. High plate resistance and low feedback capacitance support stable receiver signal amplification.

GENERAL CHARACTERISTICS

BASE DESIGNATION	8E	BASE PINS	8
NOMINAL HEATER	12.6 V / 150 mA	PARALLEL HEATER	– / –
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Dissimilar

SECTION RATINGS

SECTION1 Pentode

PLATE RESISTANCE	600000 Ω
TRANSCONDUCTANCE	0.001325 S
MAXIMUM PLATE VOLTAGE	300 V
MAXIMUM SCREEN VOLTAGE	125 V
<i>Published ratings/characteristics promoted where semantically applicable.</i>	

SECTION2 Diode*No fixed ratings recorded.**Two diode sections are represented by one repeated-section row.***SECTION3** Diode*No fixed ratings recorded.*

12C8 — Duplex-Diode Semi-Remote-Cutoff Pentode

The **12C8** is a multi-unit vacuum tube of metal construction containing a semi-remote-cutoff pentode and two independent diode plates sharing a common unipotential cathode. This combination of a high-gain radio-frequency pentode and dual detector diodes in a single envelope makes the 12C8 highly suited for simultaneous detection, automatic volume control (AVC) signal generation, and voltage amplification.

Physical Construction and Pin Connections

The 12C8 is housed in an MT-8 metal shell envelope with a small wafer 8-pin octal base. To minimize input capacitance and provide high isolation between the input and output circuits, the control grid (Grid #1) of the pentode section is terminated at a miniature top cap.

The physical dimensions of the device are:

- **Maximum Diameter:** 1 5/16 inches
- **Maximum Overall Length:** 3 1/8 inches
- **Maximum Seated Height:** 2 9/16 inches

The tube utilizes the 8E basing arrangement. Viewed from the bottom of the base, the pin connections are assigned as follows:

Pin	Connection
Pin 1	Metal Shell
Pin 2	Heater
Pin 3	Pentode Plate
Pin 4	Diode Plate #2
Pin 5	Diode Plate #1
Pin 6	Grid #2 (Screen Grid)
Pin 7	Heater
Pin 8	Cathode and Grid #3 (Suppressor Grid)
Top Cap	Grid #1 (Control Grid)

Pin 1 connects directly to the metal shell, allowing the envelope to be grounded for effective electrostatic shielding. Pin 8 internally connects the unipotential cathode to Grid #3 (the suppressor grid), simplifying external circuitry and ensuring proper suppression of secondary emission.

Heater Ratings and Interelectrode Capacitances

The 12C8 features an indirectly heated unipotential cathode designed for operation from either an AC or DC power source. The heater ratings are:

- **Heater Voltage:** 12.6 V
- **Heater Current:** 0.150 A (150 mA)

The interelectrode capacitances of the pentode section, measured with the metal shell connected directly to the cathode, are:

- **Control Grid to Cathode (Input):** 6.0 μF
- **Plate to Cathode (Output):** 9.0 μF
- **Grid to Plate:** 0.005 μF (Maximum)

The extremely low grid-to-plate capacitance of 0.005 μF is a critical design feature of the pentode section, preventing regenerative feedback and ensuring stable operation in high-gain intermediate-frequency (IF) and radio-frequency (RF) amplifier stages.

Electrical Ratings and Operating Conditions

The 12C8 has specific maximum ratings and typical operating parameters established for Class A1 amplifier service and diode detection.

Maximum Ratings

- **Maximum Plate Voltage:** 300 V
- **Maximum Screen (Grid #2) Voltage:** 125 V
- **Maximum Plate Dissipation:** 2.25 W
- **Maximum Screen Dissipation:** 0.35 W
- **Minimum External Grid (#1) Bias Voltage:** 0 V

Diode Characteristics

The two diode plates are designed for detection and AVC service. Under test conditions, each diode plate exhibits:

- **Minimum Diode Current:** 0.8 mA per plate when a 10 V DC potential is applied.

Typical Class A1 Amplifier Operation

When operated as a Class A1 voltage amplifier, the typical operating points and electrical characteristics of the pentode section are:

Parameter	Value
Plate Voltage	250 V

Parameter	Value
Screen Voltage (Grid #2)	125 V
Control Grid Voltage (Grid #1)	-3.0 V
Zero-Signal Plate Current	10 mA
Zero-Signal Screen Current	2.3 mA
Approximate Plate Resistance	0.6 M Ω (600,000 Ω)
Transconductance	1,325 μ mhos
Control Grid Voltage for Cathode Current Cut-off (Approx.)	-21 V

The semi-remote-cutoff characteristic of the pentode is highlighted by the control grid voltage required for cathode current cut-off. At approximately -21 V, the plate current is cut off, allowing the tube to handle large signal swings and respond smoothly to automatic volume control bias voltages without introducing excessive distortion.

Technical Summary

The **12C8** is an octal-based, metal-envelope duplex-diode semi-remote-cutoff pentode. It features a **12.6 V, 0.150 A** heater and combines a high-gain pentode amplifier with two independent diode plates. Under typical Class A1 operating conditions with a plate voltage of **250 V** and screen voltage of **125 V**, the pentode section provides a transconductance of **1,325 μ mhos** and a plate resistance of approximately **0.6 M Ω** , drawing **10 mA** of plate current. Its physical design incorporates a miniature top cap for the control grid and utilizes the metal shell (connected to Pin 1) for shielding, making it an efficient and compact solution for detection, AVC, and amplification in radio receiver designs.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

195X General Electric Essential Characteristics

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

195X GENERAL ELECTRIC ESSENTIAL CHARACTERISTICS

Section 1 · Pentode

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Input capacitance	6 pF	—
Output capacitance	9 pF	—
Grid-to-plate capacitance	0.005 pF	—

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate voltage	250 V	ClassA
Screen voltage	125 V	ClassA
Grid voltage	-3 V	ClassA
Plate current	10 mA	ClassA
Screen current	2.3 mA	ClassA

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
Heater voltage	12.6 V	Nominal
Heater current	150 mA	Nominal
Plate voltage	300 V	Typical operating conditions
Screen voltage	125 V	Typical operating conditions
Plate current	10 mA	Typical operating conditions

1961 TUNG SOL

Section 2 · Diode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater voltage	12.6 V	Nominal
Heater current	150 mA	Nominal
Plate voltage	300 V	Typical operating conditions
Screen voltage	125 V	Typical operating conditions
Plate current	10 mA	Typical operating conditions

1961 TUNG SOL

Section 3 · Diode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater voltage	12.6 V	Nominal
Heater current	150 mA	Nominal
Plate voltage	300 V	Typical operating conditions
Screen voltage	125 V	Typical operating conditions
Plate current	10 mA	Typical operating conditions

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