

Triple-diode high-mu triode combining AM/FM detection with voltage amplification, integrating several receiver detector and first-audio functions within one envelope.

GENERAL CHARACTERISTICS

BASE DESIGNATION	9E	BASE PINS	9
NOMINAL HEATER	18.9 V / 150 mA	PARALLEL HEATER	– / –
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Dissimilar

9E - TERMINAL PINOUT

TERMINAL	SECTION	ELEMENT	STATUS
PIN1 – 1P3	A	P – Plate (Anode)	CONNECTED
PIN2 – 2P	B	P – Plate (Anode)	CONNECTED
PIN3 – IS	A	IS – Internal Screen	CONNECTED
PIN3 – 2K	B	K – Cathode	CONNECTED
PIN4 – H	–	H – Heater	CONNECTED
PIN5 – H	–	H – Heater	CONNECTED
PIN6 – 1P2	A	P – Plate (Anode)	CONNECTED
PIN7 – IS	A	IS – Internal Screen	CONNECTED
PIN7 – 1K	A	K – Cathode	CONNECTED
PIN8 – 1G1	A	G1 – Control Grid	CONNECTED
PIN9 – 1P	A	P – Plate (Anode)	CONNECTED

SECTION RATINGS

SECTION1 Diode	
No fixed ratings recorded.	
Promoted from printed maximum-rating/characteristic columns; additional published values retained in TUBE_SECTION_PARAMETER. The chart identifies repeated detector-diode section(s) but does not publish separate diode electrical ratings on this row.	

SECTION2 Triode	
PLATE RESISTANCE	80000 Ω
TRANSCONDUCTANCE	0.00125 S
AMPLIFICATION FACTOR	100
MAXIMUM PLATE VOLTAGE	250 V
MAXIMUM PLATE DISSIPATION	1 W
Promoted from printed maximum-rating/characteristic columns; additional published values retained in TUBE_SECTION_PARAMETER.	

SECTION3 Rectifier	
MAXIMUM CATHODE CURRENT	6 mA
Physical section restored under current one-row-per-physical-section policy.	

SECTION4 Rectifier	
MAXIMUM CATHODE CURRENT	6 mA
Physical section restored under current one-row-per-physical-section policy.	

19C8 — Triple-Diode High-Mu Triode Vacuum Tube

An indirectly heated, multi-unit miniature receiving tube containing three diodes and a high-mu triode in a single envelope, designed for AM/FM receiver applications.

Overview

The **19C8** is a multi-unit miniature vacuum tube featuring three independent diode plates and a single high-mu triode. Housed in a T-6 1/2 glass envelope with a 9-pin miniature button base, the tube is designed to simplify circuit design in AM/FM receivers by minimizing the need for complex switching.

A key feature of the 19C8's internal construction is its cathode arrangement: Diode #1 is provided with its own independent cathode, while Diode #2, Diode #3, and the high-mu triode share a common cathode. This configuration allows Diode #1 to operate in balanced, low-impedance detector circuits while the remaining elements perform detection, automatic volume control (AVC), or audio amplification functions.

Heater and Cathode Characteristics

The 19C8 utilizes a coated unipotential cathode design. The heater is designed for series-string or parallel operation, requiring a nominal voltage of 18.9 V and drawing a current of 150 mA (0.15 A).

Parameter	Value
Heater Voltage (AC or DC)	18.9 V
Heater Current	150 mA (0.15 A)
Cathode Type	Coated Unipotential
Maximum Peak Heater-Cathode Voltage	200 V

The high heater-to-cathode voltage rating of 200 V peak provides flexibility in series-string heater arrangements common in AC/DC receivers.

Pinout and Physical Specifications

The 19C8 is constructed in a T-6 1/2 glass bulb envelope and utilizes a 9-pin miniature button base designated **9E**. The tube can be mounted and operated in any physical position.

The bottom-view pin connections for the 9E base are assigned as follows:

Pin Number	Electrode Connection
1	Diode Plate #1 (1P)
2	Diode Cathode #1 (1K)
3	Diode Plate #2 (2P)
4	Heater (H)
5	Heater (H)
6	Diode Plate #3 (3P)
7	Common Cathode for Diode #2, Diode #3, and Triode (K)
8	Triode Grid (G)
9	Triode Plate (P)

Electrical Characteristics and Operating Points

The triode section of the 19C8 is a high-mu voltage amplifier. Under typical Class A (or Class A1) operating conditions, the triode unit exhibits the following characteristics:

Parameter	Value
Plate Voltage	100 V
Grid Voltage (Negative)	1.0 V (or -1 V)
Plate Current	0.5 mA to 0.6 mA
Plate Resistance (r_p)	80,000 Ω
Transconductance (g_m)	1,250 μmhos
Amplification Factor (μ)	100

The high amplification factor of 100 makes the triode section highly effective for first-stage audio amplification following the detector stages. The small variation in typical plate current (ranging from 0.5 mA to 0.6 mA under identical voltage conditions) represents typical production tolerances or minor variations in operating point definitions.

Maximum Ratings

The maximum ratings for the 19C8 are established under standard design limits (such as the RMA Standard M8-210) to ensure reliable operation:

- **Maximum Plate Voltage (Triode):** 250 V
- **Maximum Plate Dissipation (Triode):** 1 W
- **Maximum Diode Current (Each Plate, Continuous):** 6 mA
- **Maximum Peak Heater-Cathode Voltage:** 200 V

These ratings represent absolute limits that should not be exceeded under any operating conditions.

Interelectrode Capacitances

The direct interelectrode capacitances of the 19C8, measured approximately without an external shield, are detailed below:

- **Diode #1 to All other electrodes:** 5.2 $\mu\mu\text{F}$ (Measured from 1P to H + 1K + 2K + 2P + 3P + G + P)
- **Diode #2 to All other electrodes:** 4.0 $\mu\mu\text{F}$ (Measured from 2P to H + 1K + 2K + 1P + 3P + G + P)
- **Diode #3 to All other electrodes:** 5.2 $\mu\mu\text{F}$ (Measured from 3P to H + 1K + 2K + 1P + 2P + G + P)
- **Diode #1 Plate to Triode Grid (1P to G) Max:** 0.030 $\mu\mu\text{F}$
- **Diode #2 Plate to Triode Grid (2P to G) Max:** 0.006 $\mu\mu\text{F}$
- **Diode #3 Plate to Triode Grid (3P to G) Max:** 0.030 $\mu\mu\text{F}$

These low plate-to-grid capacitances minimize unwanted signal leakage and crosstalk between the detector and amplifier sections of the tube.

Application Guidelines

The 19C8 is specifically designed for use in AM/FM receivers where space and component count are critical. By combining three diodes and a high-mu triode in a single envelope, the tube reduces the physical space required on the chassis and simplifies the switching circuitry needed when changing bands between AM and FM reception.

The inclusion of an independent cathode for Diode #1 (Pin 2) is particularly advantageous. In FM receiver designs, a balanced low-impedance detector (such as a ratio detector) requires a separate cathode connection to function correctly. Meanwhile, Diode #2 and Diode #3, which share a common cathode with the triode (Pin 7), can be utilized for AM detection, automatic volume control (AVC) rectification, or FM discriminator functions. The high-mu triode then serves as the subsequent voltage amplifier to drive the audio output stage.

Technical Summary

The **19C8** is a versatile, space-saving **triple-diode high-mu triode** miniature vacuum tube. It features a **9-pin miniature button base (9E)**, a **T-6 1/2 glass envelope**, and an **18.9 V, 150 mA heater**. Its unique internal structure provides an independent cathode for one diode and a common cathode for the remaining two diodes and the triode section. With a triode amplification factor of **100** and a maximum plate voltage rating of **250 V**, the 19C8 is highly optimized for detection, AVC, and audio pre-amplification in compact AM/FM receivers.



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 2 · Triode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate voltage	100 V	ClassA
Control-grid voltage	-1 V	ClassA
Plate current	0.5 mA	ClassA

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate resistance	80000 Ω	ClassA
Transconductance	1250 μS	ClassA
Amplification factor	100	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 · Diode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
MaximumDiodeCurrent	6 mA	EachPlate

1961 TUNG SOL

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Service	High-mu triode amplifier	—