



ELECTRONIC TUBE REFERENCE

19MR10

Voltage Pentode - Sharp Cutoff (single) electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION

CONSTRUCTION

PENTODE

Long-life sharp-cutoff pentode developed for voltage amplification in professional wire-communications equipment.

GENERAL CHARACTERISTICS

BASE DESIGNATION	E7-1	BASE PINS	7
NOMINAL HEATER	19 V / 100 mA	PARALLEL HEATER	– / –
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION 1 Pentode	
PLATE RESISTANCE	260000 Ω
TRANSCONDUCTANCE	0.0062 S
MAXIMUM PLATE VOLTAGE	275 V
MAXIMUM SCREEN VOLTAGE	165 V
MAXIMUM PLATE DISSIPATION	2.2 W
MAXIMUM SCREEN DISSIPATION	0.44 W
MAXIMUM CATHODE CURRENT	22 mA

19MR10 — Miniature Sharp-Cutoff Pentode

The **19MR10** (also designated as the **19M-R10**) is a long-life, miniature sharp-cutoff pentode designed primarily for use as a voltage amplifier in wire communication equipment. It is engineered for reliable service in communication systems, though it is specifically not recommended for applications where the heater circuit is subjected to frequent "ON and OFF" switching.

Mechanical Construction and Pin Connections

The 19MR10 is constructed in a compact T5 1/2 glass envelope and utilizes an E7-1 miniature button 7-pin base. The tube is designed to operate reliably in any mounting position, offering flexibility in physical equipment layouts.

The 7-pin base configuration provides direct connections to the internal electrodes, including an internal shield connected to the suppressor grid. The pinout is arranged as follows:

Pin Number	Electrode Connection
Pin 1	Grid No. 1 (G1)
Pin 2	Cathode (K)
Pin 3	Heater (H)
Pin 4	Heater (H)
Pin 5	Plate (P)
Pin 6	Grid No. 2 (<u>G2</u>)
Pin 7	Grid No. 3 (G3), Internal Shield (IS)

Heater and Interelectrode Capacitances

The tube features an indirectly heated cathode. The heater is designed for series or parallel operation within communication systems, requiring a nominal voltage of 19.0 V and drawing a current of 0.1 A.

When operated with an external shield, the direct interelectrode capacitances of the 19MR10 are highly controlled to minimize feedback and maintain stability in high-gain voltage amplifier stages:

- **Grid No. 1 to Plate:** 0.02 pF (Maximum)
- **Input Capacitance:** 7.2 pF
- **Output Capacitance:** 4.1 pF

Maximum Ratings

To ensure the long-life characteristics of the 19MR10, operation must be maintained within the following absolute maximum limits:

- **Plate Voltage:** 275 V
- **Grid No. 2 (Screen Grid) Voltage:** 165 V
- **Plate Dissipation:** 2.2 W
- **Grid No. 2 Dissipation:** 0.44 W
- **Total Cathode Current:** 22 mA
- **Peak Heater-Cathode Voltage (Heater negative with respect to cathode):** 100 V

- **Peak Heater-Cathode Voltage (Heater positive with respect to cathode):** 100 V

Typical Operation and Characteristics

Under typical operating conditions as a Class A voltage amplifier, the 19MR10 exhibits high transconductance and high plate resistance. A representative operating point is detailed below:

- **Plate Voltage:** 120 V
- **Grid No. 3 (Suppressor Grid) Voltage:** 0 V
- **Grid No. 2 (Screen Grid) Voltage:** 120 V
- **Cathode-Bias Resistor:** 180 Ω
- **Plate Current:** 9.5 mA
- **Grid No. 2 Current:** 2.8 mA
- **Transconductance:** 6,200 μmhos
- **Plate Resistance (Approximate):** 260 k Ω

The use of a 180 Ω cathode-bias resistor establishes the appropriate negative grid bias relative to the cathode under these conditions, ensuring stable operation and optimal transconductance for voltage amplification.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1963 Hitachi

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

1963 HITACHI

Section 1 · Pentode

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Interelectrode capacitances published	1	See source table