

ELECTRONIC TUBE REFERENCE

CONSOLIDATED TECHNICAL DATA

19BRP4

1 SECTION
CONSTRUCTION
CATHODERAY

Specialized - Cathode Ray electronic tube

Nineteen-inch direct-view monochrome television picture tube with electrostatic focusing and magnetic deflection; its manufacturer documentation explicitly warns about X-ray shielding above 16 kV. It belongs to the high-voltage picture-tube family designed for bright receiver display.

GENERAL CHARACTERISTICS

BASE DESIGNATION	8HR	BASE PINS	8
NOMINAL HEATER	6.3 V / 600 mA	PARALLEL HEATER	– / –
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION1 Cathode Ray	
MAXIMUM PLATE VOLTAGE	23000 V
MAXIMUM SCREEN VOLTAGE	550 V
MAXIMUM HEATER-CATHODE VOLTAGE	180 V
CRT anode and grid-2 maximum ratings are promoted from the printed ratings block; other CRT-specific focus/drive/deflection values are preserved in parameters.	

19BRP4 — 19-Inch Cathode Ray Tube

Overview

The **19BRP4** is a 19-inch, 114-degree lightweight cathode ray tube (CRT) designed primarily for television display applications. It features a laminated construction with a Pittsburgh facepanel and a short neck length of 4 3/8 inches. The tube utilizes electrostatic focusing and magnetic deflection,

incorporating a metal-backed (aluminized) screen with a straight electron gun that does not require an external ion trap.

Physical Construction and Optical Characteristics

The 19BRP4 is built using a laminated structure that incorporates a Pittsburgh facepanel and an FP149A1 implosion panel, resulting in an approximate weight of 18 lbs. The bulb conforms to the EIA designation C-149 Exp. #5 or its equivalent.

The optical system features an aluminized P4 phosphor screen, which provides a metal-backed reflective layer to maximize light output. The light transmittance at the center of the facepanel is approximately 52%.

The physical dimensions and mechanical specifications include:

- **Deflection Angle:** 114 degrees
- **Neck Length:** 4 3/8 inches
- **Bulb Contact (Ultor):** JEDEC J1-21
- **Base:** JEDEC B7-208
- **Basing Arrangement:** JEDEC 8HR
- **Implosion Panel:** FP149A1
- **Approximate Weight:** 18 lbs

Electrical Connections and Pinout

The 19BRP4 uses the JEDEC B7-208 base with the JEDEC 8HR basing configuration. The electrical connections are assigned as follows:

Pin Number	Electrode Connection
Pin 1	Heater
Pin 2	Grid #1
Pin 3	Grid #2
Pin 4	Grid #4 (Focusing Electrode)
Pin 6	Grid #1
Pin 7	Cathode
Pin 8	Heater
Bulb Contact	Ultor (Anode)

The heater is designed for a nominal voltage of 6.3 V and operates at a current of 600 ± 5% mA. The heater warm-up time is approximately 11 seconds.

Direct Interelectrode Capacitances

The capacitive coupling between the internal electrodes and external coatings is characterized by the following values:

- **Cathode to all other electrodes:** ~5 μf
- **Grid #1 to all other electrodes:** ~6 μf
- **External conductive coating to anode:** 1000 μf (minimum) to 1500 μf (maximum)

Electrical Ratings and Operating Conditions

The 19BRP4 is rated under the design-maximum system. These ratings represent the absolute limits within which the tube must be operated to ensure reliability and performance.

Design-Maximum Ratings

- **Anode Voltage:** 12,000 V (minimum) to 23,000 V (maximum)
- **Grid #4 (Focusing Electrode) Voltage:** -550 V to +1100 V
- **Grid #2 Voltage:** 550 V (maximum)
- **Grid #1 Voltage:**
 - Maximum Negative DC Value: 155 V
 - Maximum Negative Peak Value: 220 V
 - Maximum Positive DC Value: 0 V
 - Maximum Positive Peak Value: 2 V
- **Heater Voltage:** 5.7 V (minimum) to 6.9 V (maximum)
- **Heater-Cathode Voltage:**
 - Heater negative with respect to cathode (during warm-up ≤ 15 seconds): 450 V (maximum)
 - Heater negative with respect to cathode (after warm-up): 200 V (maximum)
 - Heater positive with respect to cathode: 200 V (maximum)
- **Maximum Grid #1 Circuit Resistance:** 1.5 Megohms

Typical Operating Conditions (Grid Drive Service)

Under typical grid drive operating conditions, the tube is configured with the following electrical parameters:

- **Anode Voltage:** 16,000 V DC
- **Grid #4 Voltage (Focusing Electrode):** 0 to +400 V DC
- **Grid #2 Voltage:** 300 V DC
- **Grid #1 Voltage (for visual extinction of focused raster):** +35 to +72 V DC

Safety Considerations

When operating the 19BRP4 at high anode voltages, safety precautions regarding X-ray radiation must be observed. If the tube is operated at anode voltages exceeding 16,000 V, shielding may be necessary to protect users against prolonged exposure to X-ray radiation at close range.

Technical Summary

The **19BRP4** is a 19-inch, 114-degree cathode ray tube featuring a lightweight, laminated construction with a Pittsburgh facepanel and an FP149A1 implosion panel. It utilizes electrostatic focusing via Grid #4 and magnetic deflection, operating with a straight electron gun and an aluminized P4 phosphor screen. The nominal heater rating is 6.3 V at 600 mA with an 11-second warm-up time. Designed for grid drive service, it operates typically at an anode voltage of 16,000 V DC, with Grid #4 focusing voltage adjustable from 0 to +400 V DC, and Grid #2 at 300 V DC. The design-maximum anode voltage limit is 23,000 V, and appropriate X-ray shielding is recommended if operated above 16,000 V.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1956 National Video

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

1956 NATIONAL VIDEO

Section 1 · Cathode Ray

OTHER

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Typical Anode Voltage	16000 V	—
Phosphor	P4	—

CHARACTERISTIC

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater Voltage Nominal	6.3 V	—
Heater Current Nominal	600 mA	—

CAPACITANCE

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Cathode to All Other Electrodes Capacitance	5 pF	Approximate
Grid 1 to All Other Electrodes Capacitance	6 pF	Approximate

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