



ELECTRONIC TUBE REFERENCE

19DLP4

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

Nineteen-inch electrostatically focused, magnetically deflected picture tube with a P4 screen. Intended for high-voltage monochrome television display service, its documentation includes an X-ray shielding warning.

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

SECTION 1 Cathode Ray	
MAXIMUM PLATE VOLTAGE	20000 V
MAXIMUM SCREEN VOLTAGE	60 V
MAXIMUM HEATER-CATHODE VOLTAGE	180 V
<i>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.</i>	

19DLP4 — 19-Inch Cathode Ray Tube

The **19DLP4** is a 19-inch cathode ray tube (CRT) designed for television display applications. It features a 114-degree diagonal deflection angle, electrostatic focusing, and magnetic deflection. The tube utilizes a straight electron gun that does not require an ion trap magnet. It is equipped with an aluminized P4 phosphor screen, providing high brightness and a light transmittance of approximately 49% at the center of the screen.

Mechanical and Optical Characteristics

The 19DLP4 is constructed with a rectangular glass bulb designated as EIA J-149-F1. It has a short neck length of $4 \frac{3}{8} \pm \frac{1}{8}$ inches, contributing to a compact overall length of $11 \frac{5}{8} \pm \frac{1}{4}$ inches. The physical dimensions of the tube are:

- **Greatest Diagonal:** $18 \frac{5}{8} \pm \frac{1}{8}$ inches
- **Greatest Width:** $16 \frac{13}{32} \pm \frac{1}{8}$ inches
- **Greatest Height:** $13 \frac{11}{32} \pm \frac{1}{8}$ inches

The tube features approximate deflection angles of 102° horizontally, 85° vertically, and 114° diagonally. The minimum useful projected screen area is 172 square inches, with the following minimum dimensions:

- **Diagonal:** $17 \frac{9}{16}$ inches
- **Horizontal:** $15 \frac{1}{8}$ inches
- **Vertical:** 12 inches

The screen is coated with an aluminized P4 phosphor, which is optimized for television display service. The light transmittance at the center of the faceplate is approximately 49%.

For safety, a shatter-proof cover is recommended over the tube face to protect against potential implosion and X-ray exposure.

Electrical Connections and Basing

The 19DLP4 uses a small button neo-eightar 7-pin base with a JEDEC B7-208 designation. The electrical pinout is configured according to the JEDEC 8HR basing diagram. The high-voltage anode connection (Ultor) is made via a recessed small cavity cap (JEDEC J1-21) located on the bulb. This Ultor terminal is aligned with pin position #4 within a tolerance of $\pm 30^\circ$.

The pin connections are assigned as follows:

- **Pin 1:** Heater
- **Pin 2:** Grid No. 1
- **Pin 3:** Grid No. 2
- **Pin 4:** Grid No. 4 (Focusing Electrode)
- **Pin 6:** Grid No. 1
- **Pin 7:** Cathode
- **Pin 8:** Heater
- **Cap:** Ultor (comprising Grid No. 3, Grid No. 5, and Collector)
- **External Coating (C):** External conductive coating (must be grounded)

Interelectrode Capacitances

The interelectrode capacitances of the tube are:

- **Cathode to all other electrodes:** approximately 5 pF

- **Grid No. 1 to all other electrodes:** approximately 6 pF
- **External conductive coating to Anode:** 1000 pF minimum, 1500 pF maximum

The external conductive coating must be properly grounded to the receiver chassis to act as a filter capacitor in conjunction with the internal anode coating.

Heater Ratings

The heater is designed for operation under the Design-Maximum System:

- **Nominal Heater Voltage:** 6.3 V
- **Heater Voltage Range:** 5.8 V (minimum) to 6.9 V (maximum)
- **Heater Current:** 600 $\pm$ 30 mA at 6.3 V
- **Heater Warm-up Time:** 11 seconds

Design-Maximum Ratings

The following ratings are established under the Design-Maximum System. Unless otherwise specified, all voltages are positive with respect to Grid No. 1:

- **Anode Voltage:** 10,000 V (minimum) to 20,000 V (maximum)
- **Grid No. 4 (Focusing Electrode) Voltage:** -500 V to +1100 V
- **Grid No. 2 Voltage:** 25 V (minimum) to 60 V (maximum)
- **Cathode Voltage:**
 - **Maximum Negative DC Value:** 0 V
 - **Maximum Negative Peak Value:** 2 V
 - **Maximum Positive DC Value:** 100 V
 - **Maximum Positive Peak Value:** 150 V
- **Heater-Cathode Voltage:**
 - **Heater negative with respect to cathode (during warm-up $\leq$ 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 No. 1 Circuit Resistance:** 1.5 Megohms

Typical Operating Conditions (Cathode Drive Service)

In typical cathode drive service, voltages are specified positive with respect to Grid No. 1:

- **Anode Voltage:** 16,000 V DC
- **Grid No. 4 (Focusing Electrode) Voltage:** 250 V DC (with satisfactory focus obtainable over a range of 0 to +400 V DC)
- **Grid No. 2 Voltage:** 50 V DC
- **Cathode Voltage (for visual extinction of focused raster):** 35 to 55 V DC

Technical Summary

The **19DLP4** is a 19-inch, 114-degree deflection cathode ray tube featuring electrostatic focus and magnetic deflection. It utilizes a straight electron gun, eliminating the need for an external ion trap magnet. Operating with a typical anode voltage of 16,000 V and a 6.3 V, 600 mA heater, the tube provides a bright, high-resolution display on its aluminized P4 phosphor screen. Its compact physical envelope (J-149-F1 bulb, 11 5/8 inches overall length) and standard 8HR basing make it a highly integrated component for television receiver designs. Proper grounding of the external conductive coating and the installation of a protective faceplate cover are required safety and operational practices.



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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