

ELECTRONIC TUBE REFERENCE

CONSOLIDATED TECHNICAL DATA  
**1 SECTION**  
CONSTRUCTION  
**CATHODERAY**

# 19DCP4

Specialized - Cathode Ray electronic tube

Nineteen-inch picture tube with electrostatic focusing, magnetic deflection, and an aluminized P4 screen. Its high-voltage direct-view construction is intended for large-screen monochrome television display service.

## 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                                                                                                                                           | 20000 V |
| MAXIMUM SCREEN VOLTAGE                                                                                                                                          | 200 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. |         |

### 19DCP4 — 19-Inch Banded Picture Tube

The **19DCP4** is a 19-inch, 114-degree banded cathode-ray picture tube designed for television display applications. It features electrostatic focusing and magnetic deflection, utilizing a straight electron gun that does not require an ion trap. The screen is metal-backed (aluminized) with a P4 phosphor, providing approximately 49% center light transmittance. The physical envelope is designated as EIA J-149-F1, which incorporates a shield/rim band and a tension strap for implosion protection.

# Mechanical and Physical Characteristics

The 19DCP4 is a wide-angle picture tube with a diagonal deflection angle of 114°, a horizontal deflection angle of 102°, and a vertical deflection angle of 85°.

## Physical Dimensions

- **Overall Length:** 11 5/8 ± 1/4 inches
- **Neck Length:** 4 3/8 ± 1/8 inches
- **Greatest Diagonal:** 18 7/8 inches maximum
- **Greatest Width:** 16 11/16 inches maximum
- **Greatest Height:** 13 39/64 inches maximum

## Screen and Display Area

The screen features a metal-backed, aluminized P4 phosphor. The minimum useful projected screen dimensions are:

- **Diagonal:** 17 9/16 inches
- **Horizontal:** 15 1/8 inches
- **Vertical:** 12 inches
- **Total Area:** 172 square inches

## Electrical Connections and Basing

The 19DCP4 uses a JEDEC B7-208 base with a JEDEC 8HR basing configuration. The high-voltage anode connection is made via a JEDEC J1-21 bulb contact (recessed small cavity cap), which aligns with pin 4 within a tolerance of ±30°.

## Pinout Configuration

The pin connections for the JEDEC 8HR base are defined as follows:

| Pin   | Connection                      |
|-------|---------------------------------|
| 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                          |

| Pin | Connection                                     |
|-----|------------------------------------------------|
| Cap | Ultor (Grid No. 3, Grid No. 5, Collector)      |
| C   | External Conductive Coating (must be grounded) |

The external conductive coating (C) must be connected to a reliable system ground, as it forms a capacitor with the internal anode.

## Interelectrode Capacitances

- **Cathode to all other electrodes:** ~5 uuf
- **Grid No. 1 to all other electrodes:** ~6 uuf
- **External conductive coating to anode:** 1,000 uuf minimum to 1,500 uuf maximum

## Heater Ratings

The heater is designed for a nominal 6.3 V supply.

- **Nominal Heater Voltage:** 6.3 V
- **Design-Maximum Heater Voltage Range:** 5.7 V to 6.9 V
- **Heater Current:** 600  $\pm$  30 mA
- **Heater Warm-up Time:** 11 seconds

## Design-Maximum Ratings

The following design-maximum ratings represent the absolute limits within which the tube must be operated. All voltages are positive with respect to the cathode unless otherwise specified.

- **Anode Voltage:** 12,000 V minimum to 20,000 V maximum
- **Grid No. 4 (Focusing Electrode) Voltage:** -500 V to +1,000 V
- **Grid No. 2 Voltage:** 200 V minimum to 550 V maximum
- **Grid No. 1 Voltage:**
  - Maximum negative DC voltage: 154 V
  - Maximum negative peak voltage: 220 V
  - Maximum positive DC voltage: 0 V
  - Maximum positive peak voltage: 2 V
- **Heater-Cathode Voltage:**
  - Heater negative with respect to cathode: 450 V maximum during a warm-up period of 15 seconds or less; 200 V maximum after warm-up.
  - Heater positive with respect to cathode: 200 V maximum.

## Typical Operating Conditions (Grid Drive Service)

Under typical grid-drive operating conditions, with all voltages measured positive with respect to the cathode, the operating parameters are:

- **Anode Voltage:** 16,000 V DC
- **Grid No. 4 Voltage:** 0 to +400 V DC (adjusted for satisfactory focus)
- **Grid No. 2 Voltage:** 400 V DC
- **Grid No. 1 Voltage:** -39 V to -94 V DC (for visual extinction of the focused raster)

These operating conditions are specified with an anode current of 100 uA on a 15 1/8" x 12" pattern (such as that generated by an RCA 2F21 Monoscope).

## Maximum Circuit Values

- **Grid No. 1 Circuit Resistance:** 1.5 Megohms maximum

## Technical Summary

The **19DCP4** is an electrostatic-focus, magnetic-deflection 19-inch cathode-ray tube featuring a 114° diagonal deflection angle, a straight electron gun, and an aluminized P4 phosphor screen. Operating with a nominal 6.3 V, 600 mA heater, it provides a 172-square-inch useful screen area. The tube is designed to operate with anode voltages up to 20,000 V and utilizes a JEDEC 8HR base configuration. Proper operation requires grounding the external conductive coating and adhering to the 1.5 Megohm maximum grid-circuit resistance limit.

## 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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