

ELECTRONIC TUBE REFERENCE

# 19EZP4

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION  
CONSTRUCTION  
CATHODERAY

Wide-angle aluminized P4 monochrome television picture tube using electrostatic focusing and magnetic deflection, designed for high-voltage direct-view service with a large approximately 19-inch screen.

## GENERAL CHARACTERISTICS

|                     |                   |                      |               |
|---------------------|-------------------|----------------------|---------------|
| BASE DESIGNATION    | —                 | BASE PINS            | —             |
| NOMINAL HEATER      | 6.3 V / 450 mA    | PARALLEL HEATER      | — / —         |
| HEATING             | Indirect          | SERIES OPERATION     | Not specified |
| CATHODE ARRANGEMENT | Separate cathodes | SECTION CONSTRUCTION | Similar       |

## SECTION RATINGS

|                                              |
|----------------------------------------------|
| SECTION1 Cathode Ray                         |
| No fixed ratings recorded.                   |
| Television CRT electron-gun/display section. |

### 19EZP4 — Direct-View Cathode Ray Tube

The **19EZP4** is a 19-inch rectangular glass-envelope cathode ray tube designed for direct-view television applications. It features a space-saving short-neck design, 114-degree magnetic deflection, and electrostatic focusing. The tube is characterized by its cathode-drive design, low Grid #2 operating voltage, and an integrated filled-rim implosion protection system.

### Mechanical Construction and Optical Features

The 19EZP4 is constructed using a J149F1 rectangular glass bulb with a gray filter glass faceplate. The screen utilizes an aluminized P4 phosphor, which provides a light transmittance of approximately 49% at the center.

To facilitate mounting and enhance safety, the tube incorporates a filled-rim implosion protection system. The metal rim provides four mounting holes, each measuring 1/4 inch in diameter.

## Physical Dimensions and Weight

- **Overall Length:** 11 5/8"  $\pm$  1/4"
- **Neck Length:** 4 3/8"  $\pm$  1/8"
- **Greatest Dimensions (including Metal Rim):**
  - Diagonal: 20 7/16" + 3/32"
  - Width: 16 7/8"  $\pm$  1/16"
  - Height: 13 13/16"  $\pm$  1/16"
- **Minimum Useful Screen Dimensions (Projected):**
  - Diagonal: 17 9/16"
  - Horizontal Axis: 15 1/8"
  - Vertical Axis: 12"
  - Total Area: 172 sq. inches
- **Approximate Weight:** 15 lb. 8 oz.

The tube uses a B6-214 base with a 7FA basing configuration. The high-voltage anode connection is made via a J1-21 bulb contact, which aligns with the pin #7 position within a tolerance of  $\pm$  30°.

## Electrical Connections and Capacitances

The 19EZP4 utilizes the 7FA basing arrangement. The pinout configuration, viewed from the bottom of the base, is detailed below:

| Pin Number   | Element Connection                |
|--------------|-----------------------------------|
| Pin 1        | Cathode (K)                       |
| Pin 2        | Grid #1 (G1)                      |
| Pin 3        | Heater (H)                        |
| Pin 4        | Heater (H)                        |
| Pin 5        | Grid #1 (G1)                      |
| Pin 6        | Grid #4 / Focusing Electrode (G4) |
| Pin 7        | Grid #2 ( <u>G2</u> )             |
| Bulb Contact | Anode (A)                         |

## Direct Interelectrode Capacitances

The electrostatic coupling between the tube elements is characterized by the following approximate values:

- **Cathode to all other electrodes:** 5  $\mu\text{F}$
- **Grid #1 to all other electrodes:** 6  $\mu\text{F}$
- **External conductive coating to Anode (including implosion hardware):** 1,000  $\mu\text{F}$  minimum to 1,500  $\mu\text{F}$  maximum

## Heater and Electrical Ratings

The 19ECP4 is designed with a controlled heater warm-up time for series-string or parallel operation. All voltage ratings, unless otherwise specified, are positive and measured with respect to Grid #1.

### Heater Characteristics

- **Nominal Voltage:** 6.3 V (Design Maximum limits: 5.8 V minimum to 7.0 V maximum)
- **Nominal Current:** 450  $\pm$  5% mA
- **Warm-up Time:** 11 seconds

### Design Maximum Ratings

- **Anode Voltage:** 19,800 Volts maximum; 12,000 Volts minimum
- **Grid #4 (Focusing Electrode) Voltage:** -500 to +1100 Volts maximum
- **Grid #2 Voltage:** 55 Volts maximum; 30 Volts minimum
- **Cathode Voltage:** 100 Volts maximum
- **Maximum Heater-Cathode Voltage:**
  - Heater negative with respect to cathode during warm-up (not to exceed 15 seconds): 410 Volts
  - Heater negative with respect to cathode after warm-up: 180 Volts
  - Heater positive with respect to cathode: 180 Volts

## Typical Operating Conditions

In typical cathode-drive service, the tube operates under the following electrical conditions:

- **Anode Voltage:** 16,000 Volts DC
- **Grid #2 Voltage:** 45 Volts DC
- **Grid #4 (Focusing Electrode) Voltage:** 250 Volts DC (individual tubes focus within a range of 0 to 500 Volts DC under test pattern conditions)
- **Cathode Voltage (for visual extinction of focused raster):** 35 to 50 Volts DC

### Deflection Characteristics

The tube utilizes magnetic deflection with the following approximate deflection angles:

- **Diagonal:** 114°
- **Horizontal:** 103°
- **Vertical:** 86°

## Circuit Limits and Special Characteristics

To ensure stable operation and prevent damage to the electron gun, the external circuitry must adhere to the following limits:

- **Maximum Grid #1 Circuit Resistance:** 1.5 Megohms

## Anode Penetration Current

Under specific test conditions—with 19,800 Volts applied to the Anode, zero voltage applied to the Cathode, Grid #1, and Grid #2, and all other elements held at nominal voltages—the maximum anode penetration current is limited to 150  $\mu$ A.

## SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

# 1964 RMA EIA

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

1964 RMA EIA

## Section 1 · Cathode Ray

| CHARACTERISTICS                               |                    |                  |
|-----------------------------------------------|--------------------|------------------|
| PARAMETER                                     | PUBLISHED VALUE    | CONDITION / NOTE |
| Heater Voltage                                | 6.3 V              | —                |
| Heater Current                                | 450 mA             | —                |
| Heater Warm-up Time                           | 11 s               | —                |
| Focusing Method                               | Electrostatic text | —                |
| Deflection Method                             | Magnetic text      | —                |
| Horizontal Deflection Angle                   | 103 deg            | —                |
| Vertical Deflection Angle                     | 86 deg             | —                |
| Diagonal Deflection Angle                     | 114 deg            | —                |
| Cathode-to-All Capacitance                    | 5 pF               | Approximate      |
| Grid1-to-All Capacitance                      | 6 pF               | Approximate      |
| External Coating-to-Anode Capacitance Minimum | 1000 pF            | —                |
| External Coating-to-Anode Capacitance Maximum | 1500 pF            | —                |
| Phosphor                                      | P4 Aluminized text | —                |
| Fluorescence                                  | White text         | —                |
| Light Transmittance                           | 49 percent         | ScreenCenter     |

| OTHER                             |                 |                  |
|-----------------------------------|-----------------|------------------|
| PARAMETER                         | PUBLISHED VALUE | CONDITION / NOTE |
| Maximum Anode Penetration Current | 150 uA          | —                |

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and their source documents.

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