

ELECTRONIC TUBE REFERENCE

19DZP4

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

Nineteen-inch rectangular direct-view television picture tube with electrostatic focus, 114-degree magnetic deflection, aluminized P4 white screen, cathode-drive design, and no ion trap. The wide-angle geometry supports shallow monochrome receivers.

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.

19DZP4 — Electrostatic-Focus Picture Tube

A 19-inch rectangular glass cathode-ray tube featuring magnetic deflection, an aluminized P4 phosphor screen, and a short-neck, non-ion trap gun designed for cathode drive service.

Overview

The **19DZP4** is a rectangular, glass, aluminized picture tube designed for television display applications. It features a 19-inch diagonal screen, electrostatic focusing, and magnetic deflection. The tube incorporates a short-neck, non-ion trap electron gun designed specifically for cathode drive operation. Its spherical gray faceplate provides approximately 78% light transmittance at the center, which helps maintain high picture contrast under ambient lighting conditions. The tube is also equipped with an

external conductive coating that, in conjunction with the internal anode coating, forms a high-voltage filter capacitor.

Physical and Mechanical Design

The 19DZP4 utilizes a J149A1A glass bulb. The physical dimensions of the tube are compact, featuring a short neck length of $4 \frac{1}{2} \pm \frac{1}{8}$ inches, which contributes to a shallow cabinet depth.

Overall Dimensions

- **Overall Length:** $11 \frac{3}{4} \pm \frac{1}{4}$ inches
- **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

Screen and Display Area

The screen is rectangular with a spherical gray faceplate. The minimum useful projected screen dimensions are:

- **Diagonal:** $17 \frac{9}{16}$ inches
- **Horizontal Axis:** $15 \frac{1}{8}$ inches
- **Vertical Axis:** 12 inches
- **Total Useful Area:** 172 square inches

Deflection Angles (Approximate)

- **Diagonal:** 114 degrees
- **Horizontal:** 102 degrees
- **Vertical:** 87 degrees

Base and Electrical Connections

The tube uses a JETEC No. B7-237 or B7-208 base with an 8HR basing arrangement. The high-voltage anode connection is made via a JETEC No. J1-21 bulb contact located on the long side of the bulb. This anode contact aligns with Pin No. 4 within a tolerance of ± 30 degrees.

The pinout configuration (8HR basing) viewed from the bottom of the base is as follows:

- **Pin 1:** Heater (H)
- **Pin 2:** Grid No. 1 (G1)
- **Pin 3:** Grid No. 2 (G2)
- **Pin 4:** Focus / Grid No. 4 (F)
- **Pin 6:** Grid No. 1 (G1)
- **Pin 7:** Cathode (K)
- **Pin 8:** Heater (H)

- **Bulb Contact:** Anode (A)

Electrical Characteristics and Heater Ratings

The 19DZP4 is designed with a low-power heater and specific interelectrode capacitances to ensure stable operation in television receivers.

Heater Ratings

The heater is designed for a nominal voltage of 6.3 V and has a controlled warm-up time.

- **Heater Voltage:** 6.3 V (with design-maximum limits of 5.7 V minimum to 6.9 V maximum)
- **Heater Current:** 450 ± 23 mA
- **Heater Warm-up Time:** 11 seconds

Direct Interelectrode Capacitances

- **Cathode to all other electrodes:** approximately 0.5 μF
- **Grid No. 1 to all other electrodes:** approximately 0.6 μF
- **External conductive coating to Anode:** 1000 μF minimum to 1500 μF maximum

The external conductive coating, when connected to the chassis, forms a high-voltage filter capacitor with the internal anode coating, which helps smooth the high-voltage anode supply.

Operating Conditions and Ratings

The 19DZP4 is rated under the Design-Maximum System. All voltage values are positive and measured with respect to the cathode unless otherwise specified.

Absolute Design-Maximum Ratings

- **Anode Voltage:** 10,000 V minimum to 18,000 V maximum
- **Grid No. 4 (Focusing Electrode) Voltage:** -500 V to +1000 V
- **Grid No. 2 Voltage:** 100 V minimum to 250 V maximum
- **Grid No. 1 Voltage:**
 - Maximum Negative DC Value: 140 V
 - Maximum Negative Peak Value: 200 V
 - Maximum Positive DC Value: 0 V
 - Maximum Positive Peak Value: 2 V
- **Maximum Heater-Cathode Voltage:**
 - Heater negative with respect to cathode during warm-up (≤ 15 seconds): 410 V
 - Heater negative with respect to cathode after equipment warm-up: 180 V
 - Heater positive with respect to cathode: 180 V

Typical Operating Conditions (Cathode Drive Service)

In typical cathode drive service, the input signal is applied to the cathode, and the operating voltages are established as follows:

- **Anode Voltage:** 13,000 V DC
- **Grid No. 4 Voltage:** -250 V to +150 V DC (adjusted for optimum focus at 150 μ A anode current on a 15 1/8 x 11 15/16 inch pattern)
- **Grid No. 2 Voltage:** 150 V DC
- **Cathode to Grid No. 1 Voltage:** 36 V to 54 V DC (required for visual extinction of the focused raster)

Maximum Circuit Values

To prevent damage to the tube's internal electrodes from transient arcs or discharges, specific circuit resistance limits must be observed:

- **Maximum Grid No. 1 Circuit Resistance:** 1.5 M Ω
- **Minimum Grid No. 2 Circuit Resistance:** 0.1 M Ω
- **Minimum Focusing Electrode Circuit Resistance:** 0.1 M Ω

Note: It is advisable to include protective resistance in the Grid No. 2 and focusing electrode circuits to safeguard the tube.

Technical Summary

The **19DZP4** is an electrostatic-focus, magnetic-deflection glass picture tube featuring a 114-degree diagonal deflection angle, a short neck, and a non-ion trap gun optimized for cathode drive service. Operating with a 6.3 V, 450 mA heater, it provides a 172-square-inch display area on an aluminized P4 phosphor screen. Under typical cathode drive conditions, it operates with an anode voltage of 13,000 V, a Grid No. 2 voltage of 150 V, and a focusing voltage range of -250 V to +150 V. Circuit designs must incorporate protective resistances in the Grid No. 2 and focusing electrode paths to ensure long-term reliability.

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	102 deg	—
Vertical Deflection Angle	87 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	71.8 percent	ScreenCenter

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid2 Voltage	150 V	CathodeDriveDesign

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