

ELECTRONIC TUBE REFERENCE

CONSOLIDATED TECHNICAL DATA

19ENP4

1 SECTION
CONSTRUCTION
CATHODERAY

Specialized - Cathode Ray electronic tube

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.

19ENP4 — 19-Inch Cathode-Ray Tube

The **19ENP4** is a 19-inch, 114-degree deflection cathode-ray tube (CRT) designed primarily for cathode drive television service. It features a straight electron gun that eliminates the need for an ion trap magnet, a unipotential focus lens, electrostatic focusing, and magnetic deflection. The tube is constructed with a banded implosion protection system without cloth.

Mechanical and Optical Characteristics

The 19ENP4 is built using a JEDEC J1-149-F1 glass envelope. It features an aluminized P4 phosphor screen with a light transmittance of approximately 49% at the center, and does not have an antireflection treatment.

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

Minimum Useful Screen (Projected)

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

Mounting and Protection

The tube uses a JEDEC B7-208 base with a maximum wafer diameter of 1 3/4 inches. To prevent lateral strain on the pins, a non-rigid socket mounting is required. The bulb contact is a JEDEC J1-21 ultor terminal, which aligns with Pin 4 ± 30° and is located on the same side of the envelope as Pin 4.

The tube features a banded implosion protection system. The electrical resistance between the external conductive coating and the implosion hardware is specified at a minimum of 50 MΩ.

Electrical Connections and Pinout

The 19ENP4 utilizes the JEDEC 8HR basing configuration. The pin assignments, viewed from the bottom of the base, are 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
Bulb Contact	Anode, Grid No. 3, Grid No. 5 (Ultor)

Heater Ratings and Interelectrode Capacitances

The heater is designed for operation under the following nominal conditions:

- **Heater Voltage (AC or DC):** 6.3 V nominal (5.8 V minimum, 6.9 V maximum)
- **Heater Current:** 450 ± 20 mA at 6.3 V
- **Heater Warm-up Time:** 11 seconds

Interelectrode Capacitances

- **Cathode to all other electrodes:** approximately 5 pF
- **Grid No. 1 to all other electrodes:** approximately 6 pF
- **External conductive coating to anode:** 1,000 pF minimum to 1,500 pF maximum (measured with the implosion protection hardware connected to the external coating)

Absolute Maximum Ratings

The following ratings are established under the Design Maximum System. All voltages are positive and measured with respect to Grid No. 1 unless otherwise specified.

- **Anode Voltage:** 12,000 V minimum, 21,000 V maximum
- **Grid No. 4 (Focusing Electrode) Voltage:** -500 V to +1,000 V maximum
- **Grid No. 2 Voltage:** 25 V minimum, 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 (≤ 15 seconds): 450 V maximum
 - Heater negative with respect to cathode after equipment warm-up: 200 V maximum
 - Heater positive with respect to cathode: 200 V maximum
- **Grid No. 1 Circuit Resistance:** 1.5 MΩ maximum

Typical Operating Conditions

Under typical cathode drive service conditions, voltages are positive and measured with respect to Grid No. 1:

- **Anode Voltage:** 16,000 V DC
- **Grid No. 4 (Focusing Electrode) Voltage:** 250 V DC
- **Grid No. 2 Voltage:** 50 V DC
- **Cathode Voltage (for visual extinction of focused raster):** 32 V to 50 V DC

During testing, individual tubes focus between 0 V and +400 V on Grid No. 4 under test conditions of 100 μ A anode current on a 15 1/8" x 12" pattern.

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	85 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
Grid2 Voltage	50 V	CathodeDriveDesign

TUBE TINKER

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and their source documents.

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