

ELECTRONIC TUBE REFERENCE

19CKP4

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

Nineteen-inch direct-view monochrome television picture tube with electrostatic focusing, 114-degree magnetic deflection, an aluminized screen, external conductive coating, and a non-ion-trap low-grid-2 cathode-drive gun. It belongs to the high-voltage picture-tube family designed for bright receiver display.

GENERAL CHARACTERISTICS

BASE DESIGNATION	8HR	BASE PINS	—
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
No fixed ratings recorded.
CRT specialized anode, grid, optical, and deflection data retained in TUBE_SECTION_PARAMETER.

19CKP4 — Electrostatic-Focus Magnetic-Deflection Picture Tube

The **19CKP4** is a 19-inch glass picture tube designed for use in television receivers. It features electrostatic focusing and magnetic deflection, with a short overall length and a small neck diameter. The tube incorporates a non-ion trap gun designed specifically for low Grid No. 2 voltage operation in cathode-drive circuits. It is equipped with an aluminized screen and an external conductive coating that acts as a filter capacitor when grounded.

Mechanical Specifications and Envelope

The 19CKP4 utilizes a J149-A1 glass bulb with a spherical gray glass faceplate, which provides an approximate light transmittance of 78% at the center.

Physical Dimensions

- **Overall Length:** $11 \frac{3}{4} \pm \frac{1}{4}$ inches
- **Neck Length:** $4 \frac{1}{2} \pm \frac{1}{8}$ 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 Characteristics and Deflection Angles

The minimum useful projected screen dimensions are:

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

The approximate deflection angles are:

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

Electrical Characteristics and Interelectrode Capacitances

The 19CKP4 has a nominal heater voltage of 6.3 V and a heater current of 600 ± 30 mA. The heater warm-up time is approximately 11 seconds.

Direct Interelectrode Capacitances

- **Cathode to all other electrodes:** approximately 5 μf
- **Grid No. 1 to all other electrodes:** approximately 6 μf
- **External conductive coating to Anode:** 1,000 μf minimum / 1,500 μf maximum

Pinout and Basing Diagram

The tube uses the **8HR** basing configuration with a JEDEC No. B7-237 or B7-208 base. The anode connection is made via a JEDEC No. J1-21 bulb contact, which aligns with Pin No. 4 within ± 30 degrees.

The pin connections are as follows:

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

Design-Maximum Ratings

The following design-maximum ratings are specified. All voltages are positive and measured with respect to the cathode unless otherwise noted:

- **Anode Voltage:** 15,000 V minimum / 22,000 V maximum
- **Grid No. 4 (Focusing Electrode) Voltage:** -500 V to +1,000 V maximum
- **Grid No. 2 Voltage:** 40 V minimum / 100 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
- **Heater Voltage:** 5.7 V minimum / 6.9 V maximum
- **Maximum Heater-Cathode Voltage:**
 - Heater negative to cathode (during warm-up $\leq$ 15 seconds): 410 V
 - Heater negative to cathode (after warm-up): 300 V
 - Heater positive to cathode: 180 V

Typical Operating Conditions (Cathode-Drive Service)

Under typical operating conditions in cathode-drive service, the tube is configured with the following parameters:

- **Anode Voltage:** 18,000 V DC
- **Grid No. 4 Voltage (Focusing Electrode):** 250 V DC (individual tubes focus within a range of 0 to 500 V DC)
- **Grid No. 2 Voltage:** 50 V DC
- **Cathode-to-Grid No. 1 Voltage:** 31 to 49 V DC (required for visual extinction of the focused raster)

Maximum Circuit Values

To ensure safe and reliable operation, the following circuit resistance limits must be observed:

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

Note: It is advisable to include protective resistance in the Grid No. 2 and focusing electrode circuits; a common resistor may be utilized for this purpose.

Technical Summary

The **19CKP4** is a 19-inch, 114-degree magnetic-deflection glass picture tube featuring electrostatic focusing and an aluminized screen. Designed specifically for cathode-drive television receivers, it operates with a low Grid No. 2 voltage (typically 50 V) and does not require an ion trap. Its physical design features a short overall length of 11 3/4 inches and a small neck diameter, making it suitable for compact receiver designs. The tube operates with a nominal 6.3 V heater and is rated for anode voltages up to 22,000 V.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1968 General Electric Co

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

1968 GENERAL ELECTRIC CO

Section 1 · Cathode Ray

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum Anode Voltage	22000 V	—
Heater Warmup Time	11 s	—
Minimum Anode Voltage	15000 V	—
Maximum Grid2 Voltage	100 V	—
Minimum Grid2 Voltage	40 V	—
Typical Anode Voltage	18000 V	—
Typical Focus Grid Voltage	250 V	—
Typical Grid2 Voltage	50 V	—
Cathode To Grid1 Voltage	31–49 V	CathodeDriveService

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Horizontal Deflection Angle	102 degree	—
Vertical Deflection Angle	87 degree	—
Diagonal Deflection Angle	114 degree	—

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Cathode To All Other Electrodes Capacitance	5 pF	—
Grid1 To All Other Electrodes Capacitance	6 pF	—
External Coating To Anode Capacitance	1000–1500 pF	—

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