

ELECTRONIC TUBE REFERENCE

19CGP4

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

Nineteen-inch direct-view monochrome television picture tube with electrostatic focusing, magnetic deflection, and an aluminized P4 screen. Manufacturer documentation places it in the high-voltage picture-tube family used for bright, high-contrast receiver display.

GENERAL CHARACTERISTICS

BASE DESIGNATION	12L	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	
MAXIMUM PLATE VOLTAGE	20000 V
Cathode-ray picture-tube section; anode rating and published direct capacitances captured from supplied family sheet.	

19CGP4 — 19-Inch Direct-Viewed Television Picture Tube

The **19CGP4** is a 19-inch, direct-viewed, rectangular glass television picture tube designed for monochrome television receivers. It features electrostatic focusing, magnetic deflection, an aluminized P4 phosphor screen, and a bonded safety shield laminated directly to the faceplate. The tube operates without an ion trap and incorporates an external conductive coating that must be grounded to serve as a high-voltage filter capacitor.

Screen and Faceplate Construction

The 19CGP4 utilizes an aluminized P4 phosphor screen that produces white fluorescence with short-to-medium persistence. The faceplate is constructed with a bonded shield, which consists of a gray filter glass safety plate laminated directly to the face of the tube. This safety plate has a light transmittance of approximately 44% and is treated on its external surface to reduce specular reflection, improving contrast and viewing comfort under ambient lighting conditions.

The tube's deflection system is magnetic, providing a 92° diagonal deflection angle. This corresponds to a horizontal deflection angle of 81° and a vertical deflection angle of 67°.

Mechanical Specifications

The 19CGP4 is built using a J149D glass bulb and an FP159B safety plate. The physical dimensions and mechanical characteristics of the tube are detailed below:

- **Minimum Useful Screen Dimensions:**
 - **Height:** 12-1/16 inches
 - **Width:** 15-1/4 inches
 - **Diagonal:** 17-5/8 inches
 - **Area:** 172 square inches
- **Neck Length:** 5-1/2 ± 3/16 inches
- **Overall Length:** 15-1/2 ± 3/8 inches
- **Weight:** Approximately 20 lbs
- **Bulb Contact:** Recessed Small Cavity Cap (J1-21)
- **Base:** B6-203
- **Basing Designation:** 12L

Heater and Electrical Characteristics

The 19CGP4 is equipped with an indirectly heated cathode. The heater is designed for a nominal 6.3 V supply and features a controlled warm-up time.

Parameter	Value
Heater Voltage	6.3 V
Heater Current	0.60 ± 5% A
Heater Warm-up Time	11 seconds

Interelectrode Capacitances

The approximate capacitances between the internal electrodes and external elements are as follows:

- **Cathode to All Other Electrodes:** 5 µµF

- **Grid No. 1 to All Other Electrodes:** 6 μF
- **External Conductive Coating to Anode:** 1400 μF (minimum) to 1700 μF (maximum)

The external conductive coating must be grounded in the receiver circuit. When grounded, the capacitance between this coating and the internal anode acts as a high-voltage filter capacitor for the anode power supply.

Basing and Pin Connections

The 19CGP4 uses the **12-L** pinout configuration with a B6-203 base. High voltage is applied to the anode via a recessed small cavity cap on the side of the bulb.

Pin Number	Connection
Pin 1	Heater
Pin 2	Grid No. 1 (Control Grid)
Pin 6	Grid No. 4 (Focusing Electrode)
Pin 10	Grid No. 2 (Screen Grid)
Pin 11	Cathode
Pin 12	Heater
Cap	Anode

Operating Conditions and Maximum Ratings

The 19CGP4 is rated under the Design Maximum system. Operating the tube beyond these limits can impair performance and reduce service life. The ratings and typical operating conditions are specified for grid drive service.

Design Maximum Ratings

- **Anode Voltage:** 20,000 V dc (maximum), 11,000 V dc (minimum)
- **Grid No. 4 Voltage (Focusing Electrode):** -550 to +1100 V dc
- **Grid No. 2 Voltage:** 550 V dc (maximum)
- **Grid No. 1 Voltage:**
 - **Negative Bias Value:** 155 V dc (maximum)
 - **Negative Peak Value:** 220 V (maximum)
 - **Positive Bias Value:** 0 V dc (maximum)
 - **Positive Peak Value:** 2 V (maximum)
- **Peak Heater-Cathode Voltage:**
 - **Heater Negative with respect to Cathode (during warm-up, ≤ 15 seconds):** 450 V (maximum)

- **Heater Negative with respect to Cathode (after warm-up):** 200 V (maximum)
- **Heater Positive with respect to Cathode:** 200 V (maximum)

Typical Operating Conditions (Grid Drive Service)

Under typical operating conditions, the electrodes are biased as follows:

- **Anode Voltage:** 16,000 V dc
- **Grid No. 4 Voltage for Focus:** 0 to +400 V dc
- **Grid No. 2 Voltage:** 300 V dc
- **Grid No. 1 Voltage Required for Cutoff:** -35 to -72 V dc (for visual extinction of a focused raster; visual extinction of a stationary focused spot requires approximately 5 V more negative bias)

Circuit Values

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

The maximum limit on the grid No. 1 circuit resistance prevents unstable operation or thermal runaway resulting from grid emission or gas currents within the tube.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1950 Sylvania

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

1950 SYLVANIA

Section 1 · Cathode Ray

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Phosphor	P4	—
Focusing method	Electrostatic	—
Deflection method	Magnetic	—

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater voltage	6.3 V	—
Heater current	600 mA	—