

ELECTRONIC TUBE REFERENCE

19CVP4

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

Nineteen-inch direct-view monochrome television CRT with electrostatic focus, magnetic deflection, and an aluminized P4 white screen. Wide 114-degree-class deflection and high-voltage operation provide a bright large-screen receiver picture; an X-ray warning is published.

GENERAL CHARACTERISTICS

BASE DESIGNATION	8HR	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	
MAXIMUM PLATE VOLTAGE	23000 V
Cathode-ray picture-tube section; anode rating and published direct capacitances captured from supplied family sheet.	

19CVP4 — Rectangular Glass Television Picture Tube

A 19-inch direct-viewed, rectangular glass television picture tube featuring electrostatic focusing, magnetic deflection, and a Bonded Shield safety plate for monochrome television receivers.

Overview

The **19CVP4** is a cathode-ray tube designed for television display applications. It features a rectangular screen with an aluminized P4 phosphor that produces white fluorescence with medium-short persistence.

The tube incorporates a Bonded Shield construction, consisting of a gray filter glass safety plate laminated directly to the face of the tube, which provides approximately 44% light transmittance.

Key design features include electrostatic focusing, magnetic deflection, a low Grid No. 2 operating voltage, and an external conductive coating. The 19CVP4 does not require an ion trap magnet. Its electrical and physical characteristics are optimized for cathode drive service in television receivers.

Mechanical Construction and Physical Dimensions

The 19CVP4 is constructed using a J149C glass bulb and an FP159A safety plate. The mechanical specifications of the tube are as follows:

- **Minimum Useful Screen Dimensions:**
 - Height: 12-1/16 inches
 - Width: 15-1/4 inches
 - Diagonal: 17-5/8 inches
 - Screen Area: 172 square inches
- **Deflection Angles (Approximate):**
 - Diagonal: 114°
 - Horizontal: 102°
 - Vertical: 86°
- **Neck Length:** 4-1/8 ± 1/8 inches
- **Overall Length:** 11-5/8 ± 3/16 inches
- **Weight:** Approximately 18-1/2 pounds
- **Bulb Contact:** Recessed Small Cavity Cap (J1-21)
- **Base:** B7-208

Heater Specifications and Electrical Connections

The 19CVP4 utilizes an indirectly heated cathode. The heater is designed with a controlled warm-up time to facilitate operation in series-string or parallel heater circuits.

Heater Parameter	Value
Nominal Heater Voltage	6.3 V
Nominal Heater Current	0.45 A ± 5% (450 mA)
Heater Warm-up Time	11 seconds

Pinout and Basing (8HR Configuration)

The tube uses an 8HR basing arrangement. The pin connections, viewed from the bottom of the base, are:

- **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
- **Recessed Cap:** Anode

Interelectrode Capacitances

- **Cathode to All Other Electrodes:** 5 pF (approximate)
- **Grid No. 1 to All Other Electrodes:** 6 pF (approximate)
- **External Conductive Coating to Anode:** 1700 pF minimum / 2100 pF maximum

Operating Conditions and Ratings

The 19CVP4 is rated under the Design-Maximum System for Cathode Drive Service. Unless otherwise specified, all voltages are positive with respect to Grid No. 1.

Design-Maximum Ratings

- **Anode Voltage:** 15,000 V dc (minimum) to 23,000 V dc (maximum)
- **Grid No. 4 Voltage (Focusing Electrode):** -400 to +1250 V dc
- **Grid No. 2 Voltage:** 70 V dc
- **Cathode Voltage:**
 - Positive Bias Value: 100 V dc
 - Positive Peak Value: 150 V
 - Negative Bias Value: 0 V
 - Negative Peak Value: 2 V dc
- **Peak Heater-Cathode Voltage:**
 - Heater negative with respect to cathode during warm-up (≤ 15 seconds): 450 V
 - Heater negative with respect to cathode after warm-up: 200 V
 - Heater positive with respect to cathode: 200 V

Typical Operating Conditions

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

- **Anode Voltage:** 16,000 V dc
- **Grid No. 4 Voltage for Focus:** 0 to +400 V dc
- **Grid No. 2 Voltage:** 50 V dc
- **Cathode Voltage for Cutoff:** +32 to +50 V dc (This range is required for visual extinction of a focused raster. Extinction of a stationary focused spot requires approximately 5 V more positive bias on the cathode, corresponding to +37 to +55 V dc.)

Circuit Values

- **Grid No. 1 Circuit Resistance:** 1.5 Megohms maximum
- **External Conductive Coating:** The external conductive coating must be grounded to ensure proper operation and safety.

Technical Summary

The **19CVP4** is a rectangular glass television picture tube featuring a 114° diagonal deflection angle, electrostatic focusing, and magnetic deflection. It is equipped with a Bonded Shield safety plate with 44% light transmittance and an aluminized P4 phosphor screen. Operating under cathode drive service, it requires an anode voltage between 15,000 and 23,000 V dc, with a typical operating point of 16,000 V dc. The 8HR basing configuration provides separate connections for the heater, cathode, Grid No. 1, Grid No. 2, and Grid No. 4, with the anode connection made via a recessed small cavity cap. The external conductive coating must be grounded, and the Grid No. 1 circuit resistance must not exceed 1.5 Megohms.



SOURCE OPERATING CONDITIONS

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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	450 mA	—



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1965 Sylvania Electronic Tubes Vol3

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

1965 SYLVANIA ELECTRONIC TUBES VOL3

Section 1 · Cathode Ray

CHARACTERISTIC

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater Voltage	6.3 V	—
Heater Current	450 mA	—
FocusingMethod	Electrostatic	—
DeflectionMethod	Magnetic	—
Phosphor	Aluminized P4 white	—

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
DeflectionAngles	102H/85V/114D	—
Cathode To All Capacitance	5 pF	—
Grid1 To All Capacitance	6 pF	—
ExternalConductiveCoatingToAnodeCapacitanceMaximum	1500 pF	—
ExternalConductiveCoatingToAnodeCapacitanceMinimum	1000 pF	—

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
AnodeVoltageMaximum	23000 V	—
AnodeVoltageMinimum	15000 V	—
FocusingElectrodeVoltageRangeMaximum	-400 to +1250 V	—
Grid2VoltageMaximum	700 V	—
Grid2VoltageMinimum	350 V	—
Grid1NegativeBiasMagnitudeMaximum	155 V	—
Grid1PositivePeakVoltageMaximum	2 V	—
HeaterCathodeVoltageMaximum	450 V	Warmup<=15s;HeaterNegative
HeaterCathodeVoltageMaximum	200 V	AfterWarmup
HeaterCathodeVoltageMaximum	200 V	HeaterPositive
Anode Voltage	19000 V	—
FocusingElectrodeVoltage	0 to +400 V	—
Grid1VoltageForCutoff	-35 to -72 V	—
Grid1CircuitResistanceMaximum	1.5 Mohm	—