

ELECTRONIC TUBE REFERENCE

19DKP4

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. Its 110-degree-class deflection and high-voltage ratings suit large-screen receiver service, with an X-ray warning.

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

19DKP4 — Television Picture Tube

A 19-inch direct-viewed rectangular glass cathode-ray tube featuring a bonded shield, electrostatic focus, 114-degree magnetic deflection, and an aluminized screen.

Overview

The **19DKP4** is a rectangular glass television picture tube designed for direct-view receiver applications. It features a 19-inch diagonal screen with an aluminized P4 phosphor that produces white fluorescence with medium-short persistence. The tube employs electrostatic focusing and a wide-angle 114-degree magnetic deflection system, allowing for a relatively short overall length.

A key mechanical feature of the 19DKP4 is its bonded shield construction, which laminates a gray filterglass safety plate directly to the face of the tube. This design eliminates the need for a separate cabinet-mounted safety glass. The tube does not require an ion trap and includes an external conductive coating that, when grounded, forms a high-voltage filter capacitor in conjunction with the internal anode coating.

Mechanical and Optical Specifications

The 19DKP4 is built using a J149C glass bulb and a B7-208 base. The physical dimensions and screen characteristics are tightly controlled to ensure compatibility with standard television chassis designs:

- **Overall Length:** 11 9/16 ± 5/16 inches
- **Neck Length:** 4 1/8 ± 1/8 inches
- **Neck Diameter:** 1 1/8 inches (1.125 inches nominal, with tolerances of +0.043 and -0.025 inches)
- **Weight:** Approximately 15 1/2 lbs
- **Deflection Angles (Approximate):**
 - Diagonal: 114°
 - Horizontal: 101°
 - Vertical: 86°
- **Minimum Useful Screen Dimensions:**
 - Height: 12 1/16 inches
 - Width: 15 1/4 inches
 - Diagonal: 17 9/16 to 17 5/8 inches
 - Area: 172 square inches

The faceplate assembly consists of the tube's faceplate and an FP149B2 safety plate, which is 1/8-inch thick and has a light transmittance of 55%. The combined laminated assembly provides an overall light transmittance of approximately 45%, enhancing picture contrast under ambient lighting conditions.

Heater and Basing Configuration

The 19DKP4 uses an indirectly heated, unipotential cathode. The heater is designed with a controlled warm-up time of 11 seconds to facilitate operation in series-string receiver configurations.

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

The tube utilizes the **8HR** basing diagram, which provides connections through a 7-pin base (B7-208) and a separate high-voltage anode contact. The anode connection is made via a recessed small cavity cap (J1-21) located on the bulb cone.

Pin / Cap	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
Cap	Anode (Grid No. 3, Grid No. 5, Screen)

Interelectrode Capacitances

The electrical isolation and capacitive loading of the gun structure are characterized by the following approximate values:

- **Cathode to all other electrodes:** 5 pF
- **Grid No. 1 to all other electrodes:** 6 pF
- **External conductive coating to Anode:** 1000 pF minimum, 1500 pF maximum

The capacitance between the external conductive coating and the internal anode coating serves as a filter capacitor for the high-voltage power supply, helping to stabilize the anode voltage during rapid beam current transitions.

Operating Modes and Design-Maximum Ratings

The 19DKP4 can be operated in either Grid Drive Service (where the video signal is applied to Grid No. 1 and the cathode is held at a reference bias) or Cathode Drive Service (where the video signal is applied to the cathode and Grid No. 1 is held at a reference bias). The design-maximum ratings and typical operating conditions are optimized separately for each mode.

Grid Drive Service

In Grid Drive configuration, the control grid (Grid No. 1) modulates the electron beam.

- **Design-Maximum Ratings:**
 - Anode Voltage: 15,000 V dc (Min) to 23,000 V dc (Max)
 - Grid No. 4 (Focusing Electrode) Voltage: -550 to +1100 V dc
 - Grid No. 2 Voltage: 200 V dc (Min) to 550 V dc (Max)
 - Grid No. 1 Voltage:
 - Negative Bias: 155 V dc

- Negative Peak: 220 V
- Positive Bias: 0 V dc
- Positive Peak: 2 V
- Maximum Grid No. 1 Circuit Resistance: 1.5 Megohms
- **Typical Operating Conditions:**
 - Anode Voltage: 20,000 V dc
 - Grid No. 4 Voltage (for focus): 0 to 400 V dc
 - Grid No. 2 Voltage: 400 V dc
 - Grid No. 1 Voltage for Cutoff: -46 to -94 V dc

Cathode Drive Service

In Cathode Drive configuration, the cathode potential is modulated to control the beam current, which often permits lower drive voltage requirements.

- **Design-Maximum Ratings:**
 - Anode Voltage: 15,000 V dc (Min) to 23,000 V dc (Max)
 - Grid No. 4 (Focusing Electrode) Voltage: -400 to +1250 V dc
 - Grid No. 2 Voltage: 350 V dc (Min) to 700 V dc (Max)
 - Cathode Voltage:
 - Positive Bias: 155 V dc
 - Positive Peak: 220 V
 - Negative Bias: 0 V dc
 - Negative Peak: 2 V
- **Typical Operating Conditions:**
 - Anode Voltage: 20,000 V dc
 - Grid No. 4 Voltage (for focus): 0 to 400 V dc
 - Grid No. 2 Voltage: 400 V dc
 - Cathode Voltage for Cutoff: 42 to 78 V dc

Heater-Cathode Voltage Limits

To prevent insulation breakdown between the heater and the cathode, the potential difference between these elements must not exceed the following design-maximum limits in either operating mode:

- **Heater negative with respect to cathode:**
 - During warm-up (first 15 seconds or less): 450 V peak
 - After warm-up: 200 V peak (or dc)
- **Heater positive with respect to cathode:** 200 V peak (or dc)

Technical Summary

The **19DKP4** is a highly integrated 19-inch television picture tube that combines a space-saving 114-degree magnetic deflection angle with electrostatic focusing. Its bonded safety shield faceplate provides robust protection and high contrast with a 45% light transmittance. Capable of operating at anode potentials up to 23,000 V, the tube supports both grid-drive and cathode-drive configurations, offering flexible design options for television receiver designers.



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	—



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	600 mA	—
FocusingMethod	Electrostatic	—
DeflectionMethod	Magnetic	—
Phosphor	Aluminized P4 white	—

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
DeflectionAngles	110-class magnetic	—
Cathode To All Capacitance	5 pF	—
Grid1 To All Capacitance	6 pF	—
ExternalConductiveCoatingToAnodeCapacitanceMaximum	1500 pF	—
ExternalConductiveCoatingToAnodeCapacitanceMinimum	1000 pF	—
RimbandToExternalCoatingResistanceMinimum	50 Mohm	—

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
AnodeVoltageMaximum	23000 V	—
AnodeVoltageMinimum	15000 V	—
FocusingElectrodeVoltageRangeMaximum	-400 to +1250 V	—
Grid2VoltageMaximum	550 V	—
Grid2VoltageMinimum	200 V	—
Grid1NegativeBiasMagnitudeMaximum	155 V	—
Grid1PositivePeakVoltageMaximum	2 V	—
HeaterCathodeVoltageMaximum	450 V	Warmup<=15s;HeaterNegative
HeaterCathodeVoltageMaximum	200 V	AfterWarmup
HeaterCathodeVoltageMaximum	200 V	HeaterPositive
Anode Voltage	20000 V	—
FocusingElectrodeVoltage	0 to +400 V	—
Grid1VoltageForCutoff	-42 to -78 V	—
Grid1CircuitResistanceMaximum	1.5 Mohm	—

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