

ELECTRONIC TUBE REFERENCE

CONSOLIDATED TECHNICAL DATA

19EKP4

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.

19EKP4 Television Picture Tube

A 19-inch direct-view rectangular glass television picture tube featuring magnetic deflection, electrostatic focusing, and a cathode-drive design.

Overview

The **19EKP4** is a 19-inch direct-view rectangular glass television picture tube. It features a gray filter glass, an aluminized screen, and a cathode-drive design. The tube incorporates a filled rim implosion protection system, where the rim itself provides mounting holes, and does not require an ion trap. It is designed for magnetic deflection and electrostatic focusing, utilizing a low Grid #2 (G2) operating voltage of 45 V.

Mechanical Specifications and Optical Characteristics

Physical Dimensions

- **Overall Length:** 11 5/8 inches $\pm$ 1/4 inch
- **Neck Length:** 4 3/8 inches $\pm$ 1/8 inch
- **Greatest Dimensions (including Metal Rim):**
 - Diagonal: 20 13/16 inches $\pm$ 3/32 inch
 - Width: 17 5/32 inches $\pm$ 1/16 inch
 - Height: 14 3/32 inches $\pm$ 1/16 inch
- **Minimum Useful Screen Dimensions (Projected):**
 - Diagonal: 17 9/16 inches
 - Horizontal Axis: 15 1/8 inches
 - Vertical Axis: 12 inches
 - Total Area: 172 square inches

Envelope and Basing

The tube uses a **J149F1** bulb with a **J1-21** bulb contact and a **B6-214** base. The basing configuration is designated as **7FA**. The J1-21 bulb contact aligns with pin position #7 within a tolerance of $\pm 30^\circ$.

Optical Data

- **Phosphor:** P4 Aluminized
- **Light Transmittance:** Approximately 49% at the center of the screen.

Electrical and Deflection Characteristics

Deflection and Focusing

The 19EKP4 employs magnetic deflection and electrostatic focusing. The approximate deflection angles are:

- **Diagonal:** 114°
- **Horizontal:** 103°
- **Vertical:** 86°

Heater Ratings

The heater is designed for a nominal voltage of 6.3 V with a controlled warm-up time.

- **Heater Voltage:** 6.3 V (Design limits: 5.8 V minimum to 7.0 V maximum)
- **Heater Current:** 450 $\pm$ 5% mA
- **Heater Warm-up Time:** 11 seconds

Direct Interelectrode Capacitances

- **Cathode to all other electrodes:** Approximately 5 μF
- **Grid #1 to all other electrodes:** Approximately 6 μF
- **External conductive coating to anode (including implosion protection hardware):** 1,000 μF minimum to 1,500 μF maximum

Operating Conditions and Design Maximums

All voltages are specified positive with respect to Grid #1, unless otherwise noted.

Design Maximum Ratings

- **Anode Voltage:** 12,000 V minimum to 19,800 V maximum
- **Grid #4 (Focusing Electrode) Voltage:** -500 V to +1100 V
- **Grid #2 Voltage:** 30 V minimum to 55 V maximum
- **Cathode Voltage:** 100 V maximum
- **Heater-Cathode Voltage:**
 - Heater negative with respect to cathode: 410 V maximum during warm-up (≤ 15 seconds), 180 V maximum after warm-up
 - Heater positive with respect to cathode: 180 V maximum

Typical Operating Conditions (Cathode Drive Service)

Under typical cathode drive operation, the operating parameters are:

- **Anode Voltage:** 16,000 V DC
- **Grid #4 (Focusing Electrode) Voltage:** 250 V DC (satisfactory focus is obtained between 0 V and 500 V DC, measured with combined Grid #1 bias and video-signal adjusted for a 150 μA anode current on a 15 1/8 inch by 12 inch pattern)
- **Grid #2 Voltage:** 45 V DC
- **Cathode Voltage (for visual extinction of focused raster):** 35 V to 50 V DC

Special Characteristics and Circuit Limits

- **Anode Penetration Current:** Under test conditions with 19,800 V applied to the anode, and zero voltage applied to the Cathode, Grid #1, and Grid #2 (with other elements at nominal voltages), the anode penetration current is a maximum of 150 μA .
- **Maximum Grid #1 Circuit Resistance:** 1.5 Megohms

Technical Summary

The **19EKP4** is a 19-inch rectangular glass television picture tube designed for cathode-drive service. It features a short-neck design with an overall length of 11 5/8 inches, magnetic deflection with a wide 114° diagonal angle, and low-voltage electrostatic focusing. The tube utilizes a P4 aluminized phosphor screen

with a gray filter glass providing 49% light transmittance, and is protected by a filled rim implosion system. Operating at a typical anode voltage of 16,000 V and a low Grid #2 voltage of 45 V, the 19EKP4 provides a compact, high-performance display solution for television receivers without requiring an external ion trap.

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	103 deg	—
Vertical Deflection Angle	86 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
Maximum Anode Penetration Current	150 uA	—