

ELECTRONIC TUBE REFERENCE

CONSOLIDATED TECHNICAL DATA

19EGP4

1 SECTION
CONSTRUCTION
CATHODERAY

Specialized - Cathode Ray electronic tube

Nineteen-inch television picture tube with low-voltage electrostatic focus, 114-degree magnetic deflection, and an aluminized P4 white screen. Designed for high-voltage monochrome picture display, it includes published X-ray precautions.

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	
MAXIMUM PLATE VOLTAGE	21000 V
MAXIMUM SCREEN VOLTAGE	60 V
Filled-rim low-grid-2 aluminized P4 cathode-drive picture tube.	

19EGP4 — Electrostatic-Focus Magnetic-Deflection Television Picture Tube

The **19EGP4** is a 19-inch cathode ray tube (CRT) designed for television receiver applications. It features a 114-degree magnetic deflection angle, a straight electron gun requiring no ion-trap magnet, and low-voltage electrostatic focusing. The tube incorporates a filled-rim type implosion protection system with integrated hardware, a spherical gray filter glass faceplate, and an aluminized P4 phosphor screen.

Mechanical and Optical Specifications

The 19EGP4 is constructed using a JEDEC J149F (or J149F1) glass bulb envelope. It features a recessed small cavity cap (JEDEC J1-21) for the high-voltage anode connection and a small-button Neoeightar 7-pin base (JEDEC B7-208). The anode cap is aligned with pin position number 4 within a tolerance of ± 30 degrees.

Physical Dimensions

- **Overall Length:** 11.625 ± 0.250 inches
- **Neck Length:** 4.375 ± 0.125 inches
- **Neck Diameter:** Maximum of 1.168 inches at the splice
- **Greatest Shell Dimensions:**
 - Diagonal: 20.875 ± 0.094 inches (or $20 \frac{7}{8} \pm \frac{3}{32}$ inches)
 - Width: 17.125 ± 0.063 inches (or $17 \frac{1}{8} \pm \frac{1}{16}$ inches)
 - Height: 14.078 ± 0.063 inches (or $14 \frac{5}{64} \pm \frac{1}{16}$ inches)
- **Minimum Useful Screen Dimensions (Projected):**
 - Diagonal: 17.562 inches (or $17 \frac{9}{16}$ inches)
 - Horizontal Axis: 15.125 inches (or $15 \frac{1}{8}$ inches)
 - Vertical Axis: 12.000 inches
 - Projected Area: 172 square inches
- **Net Weight:** Approximately 16 to 16.25 pounds

Optical Characteristics

The faceplate is made of gray filter glass with a light transmittance of approximately 48% to 49% at the center. It does not feature an anti-reflection treatment. The screen utilizes an aluminized, sulfide-type P4 phosphor, which provides a white display.

Heater and Basing Configuration

The 19EGP4 is equipped with an indirectly heated cathode. The heater is designed for series or parallel operation in television receivers.

Heater Ratings

- **Nominal Heater Voltage:** 6.3 V
- **Design-Maximum Heater Voltage Range:** 5.7 V or 5.8 V to 6.9 V
- **Heater Current:** 450 mA with a tolerance of $\pm 5\%$ (or ± 20 mA)
- **Heater Warm-up Time:** 11 seconds (average). This warm-up characteristic is defined as the time required for the heater to reach 80% of its rated voltage when four times the rated voltage is applied in series with a resistance equal to three times the rated voltage divided by the rated current.

Basing and Pin Connections

The tube utilizes the JEDEC 8HR basing arrangement. Under this configuration, the pin connections viewed from the bottom of the base are:

Pin Number	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, Collector / Ultor)
External Coating	External Conductive Coating (Grounding Contact)

Grid No. 1 is internally connected to both Pin 2 and Pin 6. The external conductive coating is of the modified-band type, providing a contact area for grounding near the reference line.

Electrical Characteristics and Capacitances

The direct interelectrode capacitances of the 19EGP4 are relatively low, minimizing loading on the driving circuitry:

- **Cathode to all other electrodes:** Approximately 5 pF
- **Grid No. 1 to all other electrodes:** Approximately 6 pF
- **External conductive coating to anode:** 1,000 pF minimum to 1,500 pF maximum (or up to 1,250 pF minimum to 1,750 pF maximum depending on the specific implosion-protection hardware configuration).

The electrical resistance between the external conductive coating and the implosion-protection hardware is specified as a minimum of 5 Megohms or 50 Megohms, depending on the hardware grounding arrangement.

Design-Maximum Ratings

The following limits are established under the Design-Maximum System. All voltages are positive and measured with respect to Grid No. 1 unless otherwise specified.

Electrode Voltages

- **Anode Voltage:** 12,000 V minimum to 21,000 V maximum
- **Grid No. 4 (Focusing Electrode) Voltage:**
 - Maximum Positive Value: +1,000 V, +1,100 V, or +1,250 V
 - Maximum Negative Value: -400 V, -500 V, or -550 V
- **Grid No. 2 Voltage:** 20 V or 25 V minimum to 60 V maximum
- **Cathode Voltage:**
 - Maximum Negative Bias Value: 0 V DC
 - Maximum Negative Peak Value: 2 V
 - Maximum Positive Bias Value: 100 V or 154 V DC
 - Maximum Positive Peak Value: 150 V or 220 V

Heater-Cathode Voltage Limits

- **Heater Negative with Respect to Cathode:**
 - During equipment warm-up period (not to exceed 15 seconds): 450 V maximum
 - After equipment warm-up period: 200 V or 300 V maximum
- **Heater Positive with Respect to Cathode:**
 - Combined AC and DC voltage: 200 V maximum
 - DC component limit: 100 V maximum

Circuit Impedance Limits

- **Maximum Grid No. 1 Circuit Resistance:** 1.5 Megohms
- **Minimum Grid No. 2 and Grid No. 4 Circuit Resistance:** 10,000 Ohms. A protective resistance of at least this value is advised in these electrode circuits to prevent damage from internal arcing.

Typical Operating Conditions (Cathode-Drive Service)

In typical cathode-drive operation, the input signal is applied to the cathode while Grid No. 1 is held at a reference potential (usually ground). All voltages are positive and measured with respect to Grid No. 1.

- **Anode Voltage:** 16,000 V DC. Operating the tube at anode voltages exceeding 16,000 V may generate X-rays, which can require appropriate shielding in the receiver design.
- **Grid No. 4 (Focusing Electrode) Voltage:** Typically 250 V DC. Individual tubes are designed to focus satisfactorily within a range of 0 to +400 V DC (measured with an anode current of 150 μ A on a 12" x 15.125" raster pattern).
- **Grid No. 2 Voltage:** 50 V DC
- **Cathode Voltage for Raster Cutoff:** 32 V to 50 V DC, or 35 V to 55 V DC, for visual extinction of the focused raster.
- **Centering Magnet Field Strength:** An adjustable centering magnet providing a field strength of 0 to 8 Gauss is required to align the raster.



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
Focusing method	Electrostatic	—
Deflection method	Magnetic	—
Heater voltage	6.3 V	—
Heater current	450 mA	—

OTHER

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Anode voltage maximum	23000 V	—

APPLICATION

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Application	Television picture display	—

CROSSREFERENCE

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Co-designation source	23FWP4 / 19EGP4 registration sheet	—



SOURCE OPERATING CONDITIONS

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

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater voltage	6.3 V	—
Heater current	450 mA	—
Maximum anode voltage	21000 V	—
Maximum grid 2 voltage	60 V	—
Maximum positive cathode voltage	154 V	—
Maximum positive peak cathode voltage	220 V	—
Minimum recommended anode voltage	12000 V	—
Maximum focusing electrode voltage	1100 V	Positive limit

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Cathode to all other electrodes capacitance	5 pF	—
Grid 1 to all other electrodes capacitance	6 pF	—



SOURCE DATA APPENDIX

SOURCE OPERATING CONDITIONS

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1971 RCA HB3 Binder 1 of 7

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

1971 RCA HB3 BINDER 1 OF 7

Section 1 · Cathode Ray

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater voltage	6.3 V	—
Heater current	450 mA	—
Heater warm-up time	11 s	—

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum anode/ultor voltage	21000 V	—
Minimum anode/ultor voltage	12000 V	—
Typical anode/ultor voltage	16000 V	PictureTubeService
Maximum grid No.2 voltage	60 V	—
Typical grid No.2 voltage	50 V	PictureTubeService
Focus-voltage range minimum	0 V	OptimumFocus
Focus-voltage range maximum	400 V	OptimumFocus
Visual-extinction voltage range minimum	32 V	FocusedRasterExtinction
Visual-extinction voltage range maximum	50 V	FocusedRasterExtinction
Maximum grid No.1 circuit resistance	1.5 megohm	—
X-ray shielding warning	Present	HighAnodeVoltage
Maximum cathode positive bias voltage	100 V	CathodeDrive
Maximum cathode positive peak voltage	150 V	CathodeDrive
Maximum cathode negative peak voltage	2 V	CathodeDrive
Peak heater-cathode voltage during warm-up	450 V	HeaterNegative;Warmup<=15s
Peak heater-cathode voltage after warm-up	300 V	HeaterNegative
Peak heater-cathode voltage heater positive	200 V	HeaterPositive
Adjustable centering magnet field strength maximum	8 gauss	Approximate

CONSTRUCTION		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Focusing method	LowVoltageElectrostatic	—
Deflection method	Magnetic	—
Phosphor	P4	—
Screen type	Aluminized white	P4

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Deflection angle	114 deg	Approximate

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Cathode to all other electrodes capacitance	5 pF	Approximate
External conductive coating to anode capacitance minimum	1000 pF	Approximate
External conductive coating to anode capacitance maximum	1500 pF	Approximate

TUBE TINKER

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