

ELECTRONIC TUBE REFERENCE

19FEP4B

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

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	
MAXIMUM PLATE VOLTAGE	23500 V
MAXIMUM SCREEN VOLTAGE	60 V
Pan-O-Ply low-grid-2 aluminized P4 cathode-drive picture tube.	

19FEP4B Picture Tube

The **19FEP4B** is a PAN-O-PLY type cathode-ray picture tube designed for television display applications. It features low-voltage electrostatic focusing and a 114-degree magnetic deflection system. The tube utilizes an electron gun design that does not require an ion-trap magnet, incorporating a unipotential focus lens to maintain image clarity.

Physical and Optical Characteristics

The 19FEP4B is constructed with a filterglass faceplate that provides approximately 48% light transmission at its center, enhancing display contrast. The screen is coated with an aluminized P4-sulfide type phosphor.

Mechanically, the tube weighs approximately 15 pounds and has a projected screen area of 172 square inches. Its physical dimensions are characterized by an overall length of 11.625 ± 0.250 inches and a neck length of 4.375 ± 0.125 inches. The envelope includes a regular-band type external conductive coating with a grounding contact located near the reference line, which integrates implosion protection hardware.

Electrical Connections and Pinout

The tube utilizes a Small-Button Neoeightar 7-Pin base (Arrangement 1, JEDEC No. B7-208) along with a Recessed Small Cavity cap (JEDEC No. J1-21) for the high-voltage anode connection. The electrical connections, viewed from the bottom of the base (8HR arrangement), are assigned as follows:

Pin / Cap	Connection
Pin 1	Heater
Pin 2	Grid No. 1
Pin 3	Grid No. 2
Pin 4	Grid No. 4
Pin 6	Grid No. 1
Pin 7	Cathode
Pin 8	Heater
Cap	Anode (Grid No. 3, Grid No. 5, Screen, Collector)
C	External Conductive Coating

Heater Ratings and Interelectrode Capacitances

The 19FEP4B heater is designed for a typical operating voltage of 6.3 V, with a design-maximum range spanning from a minimum of 5.7 V to a maximum of 6.9 V. At the nominal 6.3 V, the heater draws a current of 450 ± 20 mA. The average heater warm-up time is 11 seconds.

The direct interelectrode capacitances of the tube are:

- **Cathode to all other electrodes:** 5 pF
- **Grid No. 1 to all other electrodes:** 6 pF
- **External conductive coating to anode:** 1250 pF minimum to 1750 pF maximum

Design-Maximum Ratings

The following design-maximum limits are established for the 19FEP4B. Unless otherwise noted, all voltages are positive with respect to Grid No. 1:

Parameter	Rating Value
Anode Voltage	12,000 Min to 23,500 Max V
Grid No. 4 Voltage	Positive 1,250 Max V / Negative 400 Max V
Grid No. 2 Voltage	20 Min to 60 Max V
Cathode Voltage (Negative Peak)	2 Max V
Cathode Voltage (Negative Bias)	0 Max V
Cathode Voltage (Positive Bias)	100 Max V
Cathode Voltage (Positive Peak)	150 Max V
Grid No. 1 Circuit Resistance	1.5 Max MΩ

Heater-Cathode Voltage Limits

- **Heater negative to cathode:** 450 V maximum during the first 15 seconds of warm-up; 300 V maximum after warm-up.
- **Heater positive to cathode:** 200 V maximum (combined AC and DC); 100 V maximum for the DC component.

Typical Operating Conditions (Cathode-Drive Service)

Under typical cathode-drive operating conditions, with voltages specified positive with respect to Grid No. 1, the operating parameters are:

- **Anode Voltage:** 16,000 V
- **Grid No. 4 Voltage:** 100 V (with an optimum focus range of -100 V to +300 V at an anode current of 100 μ A)
- **Grid No. 2 Voltage:** 30 V
- **Cathode Voltage (for visual extinction of focused raster):** 22 V to 45 V
- **Centering Magnet Field Strength:** 0 to 8 Gauss

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

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

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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	—
Maximum anode/ultor voltage	23500 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	30 V	PictureTubeService
Focus-voltage range minimum	-100 V	OptimumFocus
Focus-voltage range maximum	300 V	OptimumFocus
Visual-extinction voltage range minimum	22 V	FocusedRasterExtinction
Visual-extinction voltage range maximum	45 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

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
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	—
Focus lens	Unipotential	—
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	1250 pF	Approximate
External conductive coating to anode capacitance maximum	1750 pF	Approximate

TUBE TINKER

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