The 23FRP4 is a 23"-110° cathode ray tube with filled rim and a 4 1/2" neck length. This tube has a 450 milliampere 6.3 volt filament, a straight gun which requires no ion trap and 50 volt C2 for cathode drive design.

**ELECTRICAL DATA**

- **Focusing Method**
  - Electrostatic
- **Deflection Method**
- **Deflection Angles (Approximate)**
  - Diagonal: 110 Degrees
  - Horizontal: 99 Degrees
  - Vertical: 82 Degrees
- **Direct Interelectrode Capacitances**
  - Cathode to all other electrodes (approximate): 5 uuf
  - Grid No. 1 to all other electrodes (approximate): 6 uuf
  - External conductive coating to anode (Note 1): 2,500 max. uuf
    - 1,700 min. uuf
- **Resistance Between External Conductive Coating and Implosion Protection Hardware**
  - 50 min. megohms
- **Heater Current at 6.3 Volts**
  - 450 ± 20 ma
- **Heater Warm-up Time**
  - 11 Seconds

**OPTICAL DATA**

- **Phosphor Number**
  - P4 Aluminized
- **Light transmittance at center (approximate)**
  - 43 Per cent
- **Antireflection Treatment**
  - No

**MECHANICAL DATA**

- **Over-all Length**
  - 14 1/4 ±1/4 Inches
- **Neck Length**
  - 4 1/2 ±1/8 Inches
- **Greatest Dimensions of Tube**
  - Diagonal: 25 31/32 ±3/32 Inches
  - Width: 21 17/64 ±1/16 Inches
  - Height: 17 21/64 ±1/16 Inches
- **Minimum Useful Screen Dimensions (Projected)**
  - Diagonal: 22 5/16 Inches
  - Horizontal Axis: 19 1/4 Inches
  - Vertical Axis: 15 1/8 Inches
  - Area: 282 Sq. Inches
  - Implosion Protection: 6 - Filled Rim

from JEDEC release #4637, March 16, 1964
MECHANICAL DATA (CONT.)

Bulb JEDEC Designation J-187-K1
Bulb Contact JEDEC Designation J1-21
Base JEDEC Designation B7-208
Basing JEDEC Designation 8HR
Bulb Contact Alignment J1-21 contact aligns with Pin Position No. 4 ± 30°

RATINGS (Design Maximum System)

Unless otherwise specified, voltage values are positive and measured with respect to Grid No. 1.

Maximum Anode Voltage 23,000 Volts
Minimum Anode Voltage 12,000 Volts
Maximum Grid No. 4 (Focusing Electrode) Voltage +1,000 to -500 Volts
Maximum Grid No. 2 Voltage 60 Volts
Minimum Grid No. 2 Voltage 25 Volts
Cathode Voltage
  Maximum negative value 0 Volts dc
  Maximum negative peak value 2 Volts
  Maximum positive value 100 Volts dc
  Maximum positive peak value 150 Volts
Maximum Heater Voltage 6.9 Volts
Minimum Heater Voltage 5.8 Volts
Maximum Heater-Cathode Voltage
  Heater negative with respect to cathode
    During warm-up period not to exceed 15 seconds 450 Volts
    After equipment warm-up period 200 Volts
  Heater positive with respect to cathode 200 Volts

TYPICAL OPERATING CONDITIONS

CATHODE DRIVE SERVICE

Unless otherwise specified, all voltage values are positive with respect to Grid No. 1

Anode Voltage 16,000 Volts dc
Grid No. 4 Voltage (Focusing Electrode) 250 Volts dc
  (Notes 3 & 4)
Grid No. 2 Voltage 50 Volts dc
Cathode Voltage (Note 2) 35 to 55 Volts dc

MAXIMUM CIRCUIT VALUES

Maximum Grid No. 1 Circuit Resistance 1.5 Megohms

GRAPHS AND DRAWINGS

Tube Outline with Essential Dimensions and Tolerances
Pin Connections:

<table>
<thead>
<tr>
<th>Pin 1</th>
<th>Heater</th>
<th>Pin 6</th>
<th>Grid No. 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin 2</td>
<td>Grid No. 1</td>
<td>Pin 7</td>
<td>Cathode</td>
</tr>
<tr>
<td>Pin 3</td>
<td>Grid No. 2</td>
<td>Pin 8</td>
<td>Heater</td>
</tr>
<tr>
<td>Pin 4</td>
<td>Grid No. 4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NOTES

1. Measured with implosion protection hardware connected to external coating.

2. Visual extinction of focused raster.

3. With the combined Grid No. 1 bias voltage and video-signal voltage adjusted to give an anode current of 100 microamperes on a 19 1/4" by 15 1/8" pattern from RCA 2F21 monoscope or equivalent.

4. Individual tubes will have satisfactory focus at some value between 0 and +400 volts.

NOTES FOR DIMENSIONAL OUTLINE

1. The plane through the tube axis and Pin No. 4 may vary from the plane through the tube axis and ultor terminal by angular tolerance (measured about the tube axis) of 30°.  Ultor terminal is on same side as Pin No. 4.

2. With tube neck inserted through flared end of reference-line gauge JEDEC No. G-126 and with tube seated in gauge, the reference-line is determined by the intersection of the Plane CC' of the gauge with the glass funnel.

3. Socket for this base should not be rigidly mounted; it should have flexible leads and be allowed to move freely. The design of the socket should be such that the circuit wiring cannot impress lateral strains through the socket contacts on the base pins. Bottom circumference of base wafer will fall within a circle concentric with bulb axis and having a diameter of 3 3/4".

4. External conductive coating must be grounded.

5. To clean this area, wipe only with soft dry lint-less cloth.