

*Toshiba***TOSHIBA ELECTRON TUBE****11EP4****PICTURE TUBE**

Rectangular Glass Type

Low - Voltage Electrostatic focus

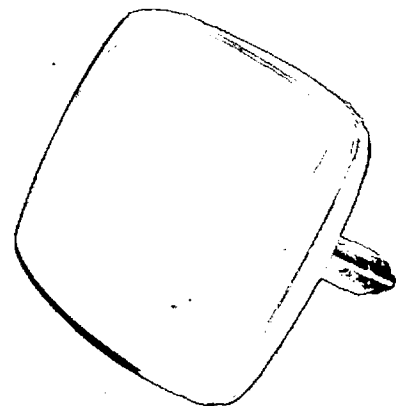
Aluminized Screen

Magnetic Deflection

Toshiba 11EP4 is a 11 inch, directly viewed, rectangular, glass picture tube of the low voltage electrostatic focus and 114° magnetic deflection type.

The 11EP4 employs short neck, no ion trap gun featuring good focus over entire picture area.

11EP4 has a aluminized screen and its maximum overall length is only 215 mm or 8.5 inch thus very suitable for portable T.V. Set.

**GENERAL DATA****Electrical :**

|                                            |                        |            |
|--------------------------------------------|------------------------|------------|
| Heater voltage .....                       | 6.3                    | V          |
| Heater current at 6.3 Volts .....          | 600±30                 | mA         |
| Heater warm up time .....                  | 11                     | second     |
| Direct interelectrode capacitance          |                        |            |
| Grid No. 1 to all other electrodes .....   | 6                      | PF         |
| Cathode to all other electrodes .....      | 5                      | PF         |
| External conductive coating to ultor ..... | { 500 max.<br>300 min. | { PF<br>PF |
| Focusing method .....                      | Electrostatic          |            |
| Deflection method .....                    | Magnetic               |            |

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Deflection angles (approx)

|                    |                                   |     |
|--------------------|-----------------------------------|-----|
| Diagonal .....     | 114                               | deg |
| Horizontal .....   | 102                               | deg |
| Vertical .....     | 85                                | deg |
| Electron gun ..... | Type requiring no ion-trap magnet |     |

**Optical :**

|                                             |               |
|---------------------------------------------|---------------|
| Face plate .....                            | Filter glass  |
| Light transmission at center (approx) ..... | 75%           |
| Phosphor .....                              | P4-Aluminized |
| Fluorescence .....                          | White         |
| Phosphorescence .....                       | White         |
| Persistence .....                           | Medium short  |

**Mechanical :**

Tube dimensions

|                       |         |                     |
|-----------------------|---------|---------------------|
| Overall length .....  | 215±7mm | (8.46±0.28 inches)  |
| Greatest width .....  | 243±3mm | (9.57±0.18 inches)  |
| Greatest height ..... | 198±3mm | (7.80±0.18 inches)  |
| Diagonal .....        | 278±3mm | (10.95±0.18 inches) |
| Neck length .....     | 105±5mm | (4.12±0.12 inches)  |

Screen dimension (minimum)

|                          |                       |                    |
|--------------------------|-----------------------|--------------------|
| Greatest width .....     | 223 min mm            | (8.78 min inches)  |
| Greatest height .....    | 177 min mm            | (6.97 min inches)  |
| Diagonal .....           | 257 min mm            | (10.12 min inches) |
| Projected area .....     | 38000 mm <sup>2</sup> | ( 59 sq. inches)   |
| Weight (approx) .....    | 1.6 kg                | ( 3.5 Lbs)         |
| Operating position ..... | any                   |                    |

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Cap ..... Recessed small cavity (JEDEC No. J1-21)  
 Base ..... Small-Button Neoeightier 7-pin (JEDEC B7-205)  
 Basing designation ..... 8HR

### GRID-DRIVE SERVICE

Unless otherwise specified, voltage values  
are positive with respect to cathode

#### Maximum and Minimum Ratings, Design - Maximum values:

|                                                                  |                           |                |
|------------------------------------------------------------------|---------------------------|----------------|
| Ultor voltage .....                                              | { 14000 max.<br>8000 min. | Volts<br>Volts |
| Grid No. 4 (focusing) voltage;                                   |                           |                |
| Positive value .....                                             | 1100 max.                 | Volts          |
| Negative value .....                                             | 550 max.                  | Volts          |
| Grid No. 2 voltage .....                                         | { 550 max.<br>300 min.    | Volts<br>Volts |
| Grid No. 1 voltage;                                              |                           |                |
| Negative-peak value .....                                        | 220 max.                  | Volts          |
| Negative-bias value .....                                        | 154 min.                  | Volts          |
| Positive-bias value .....                                        | 0 max.                    | Volts          |
| Positive-peak value .....                                        | 2 max.                    | Volts          |
| Heater voltage .....                                             | { 6.9 max.<br>5.7 min.    | Volts<br>Volts |
| Peak heater-cathode voltage;                                     |                           |                |
| Heater negative with respect to cathode                          |                           |                |
| During equipment warm-up period not<br>exceeding 15 second ..... | 450 max.                  | Volts          |
| After equipment warm-up period ....                              | 200 max.                  | Volts          |
| Heater positive with respect to cathode ..                       | 200 max.                  | Volts          |

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## TOSHIBA ELECTRON TUBE

### Equipment Design Ranges;

With any ultor voltage<sup>①</sup> ( $E_{c5}$  k) between 8000 and 14000 volts and Grid - No. 2 voltage ( $E_{c2}$  k) between 200 and 550 volts.

Grid - No. 4 voltage for focus<sup>②</sup> ..... 0 to 400 Volts

Grid - No. 1 voltage ( $E_{c1k}$ ) for visual extinction of focused raster  
..... See Raster - Cutoff - Range Chart  
for Grid - Drive Service

Grid - No. 4 current ..... -25 to +25  $\mu$ A

Grid - No. 2 current ..... -15 to +15  $\mu$ A

Field strength of adjustable centering magnet<sup>③</sup> .. 0 to 8 gauss

### Examples of Use of Design Ranges;

Ultor voltage<sup>①</sup> ..... 10000 Volts

Grid - No. 2 voltage ..... 400 Volts

Grid - No. 4 voltage for focus<sup>②</sup> ..... 0 to 400 Volts

Grid - No. 1 voltage for visual  
extinction of focused raster<sup>④</sup> ..... -36 to -94 Volts

### Maximum Circuit Values:

Grid - No. 1 circuit resistance ..... 1.5 max. megohms

## CATHODE-DRIVE SERVICE

Unless otherwise specified, voltage values are  
positive with respect to grid - No. 1

### Maximum and Minimum Ratings, Design - Maximum values:

|                                     |            |       |
|-------------------------------------|------------|-------|
| Ultor to Grid - No. 1 voltage ..... | 14000 max. | Volts |
|                                     | 8000 min.  | Volts |

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|                                                               |                        |                |
|---------------------------------------------------------------|------------------------|----------------|
| Grid - No. 4 to Grid - No. 1 (focusing) voltage               |                        |                |
| Positive value .....                                          | 1100 max.              | Volts          |
| Negative value .....                                          | 550 max.               | Volts          |
| Grid - No. 2 to Grid No. 1 voltage .....                      | { 700 max.<br>350 min. | Volts<br>Volts |
| Grid - No. 2 to cathode voltage .....                         | 550 max.               | Volts          |
| Cathode to Grid - No. 1 voltage                               |                        |                |
| Positive - peak value .....                                   | 220 max.               | Volts          |
| Positive - bias value .....                                   | 154 max.               | Volts          |
| Negative - bias value .....                                   | 0 max.                 | Volts          |
| Negative - peak value .....                                   | 2 max.                 | Volts          |
| Heater voltage .....                                          | { 6.9 max.<br>5.7 min. | Volts<br>Volts |
| Peak heater - cathode voltage;                                |                        |                |
| Heater negative with respect to cathode                       |                        |                |
| During equipment warm-up period not exceeding 15 second ..... | 450 max.               | Volts          |
| After equipment warm-up period .....                          | 200 max.               | Volts          |
| Heater positive with respect to cathode ....                  | 200 max.               | Volts          |

### Equipment Design Ranges :

With any ultor to Grid - No. 1 voltage<sup>①</sup>( $E_{c_1} g_1$ ) between 8000 and 14000 volts and Grid - No. 2 to Grid - No. 1 voltage ( $E_{c_2} g_1$ ) between 400 and 690 volts

Grid - No. 4 to Grid - No. 1 voltage for focus<sup>②</sup>... 0 to 400 Volts

Cathode to Grid - No. 1 voltage ( $E_{kg_1}$ ) for  
visual extinction of focused raster ..... See Raster - Cutoff - Range  
Chart for Cathode - Drive  
Service

Grid - No. 4 current ..... -25 to +25  $\mu A$

Grid - No. 2 current ..... -15 to +15  $\mu A$

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## TOSHIBA ELECTRON TUBE

Field strength of adjustable  
centering magnet<sup>③</sup> ..... 0 to 8      gaussses

### Examples of Use of Design Ranges :

|                                                                                  |          |       |
|----------------------------------------------------------------------------------|----------|-------|
| Ultor voltage .....                                                              | 10000    | Volts |
| Grid - No. 2 voltage .....                                                       | 400      | Volts |
| Grid - No. 4 Grid - No. 1 voltage for focus <sup>②</sup> ....                    | 0 to 400 | Volts |
| Cathode to Grid - No. 1 voltage for<br>visual extinction of focused raster ..... | 36 to 78 | Volts |

### Maximum Circuit Values :

Grid - No. 1 circuit resistance ..... 1.5 max. megohms

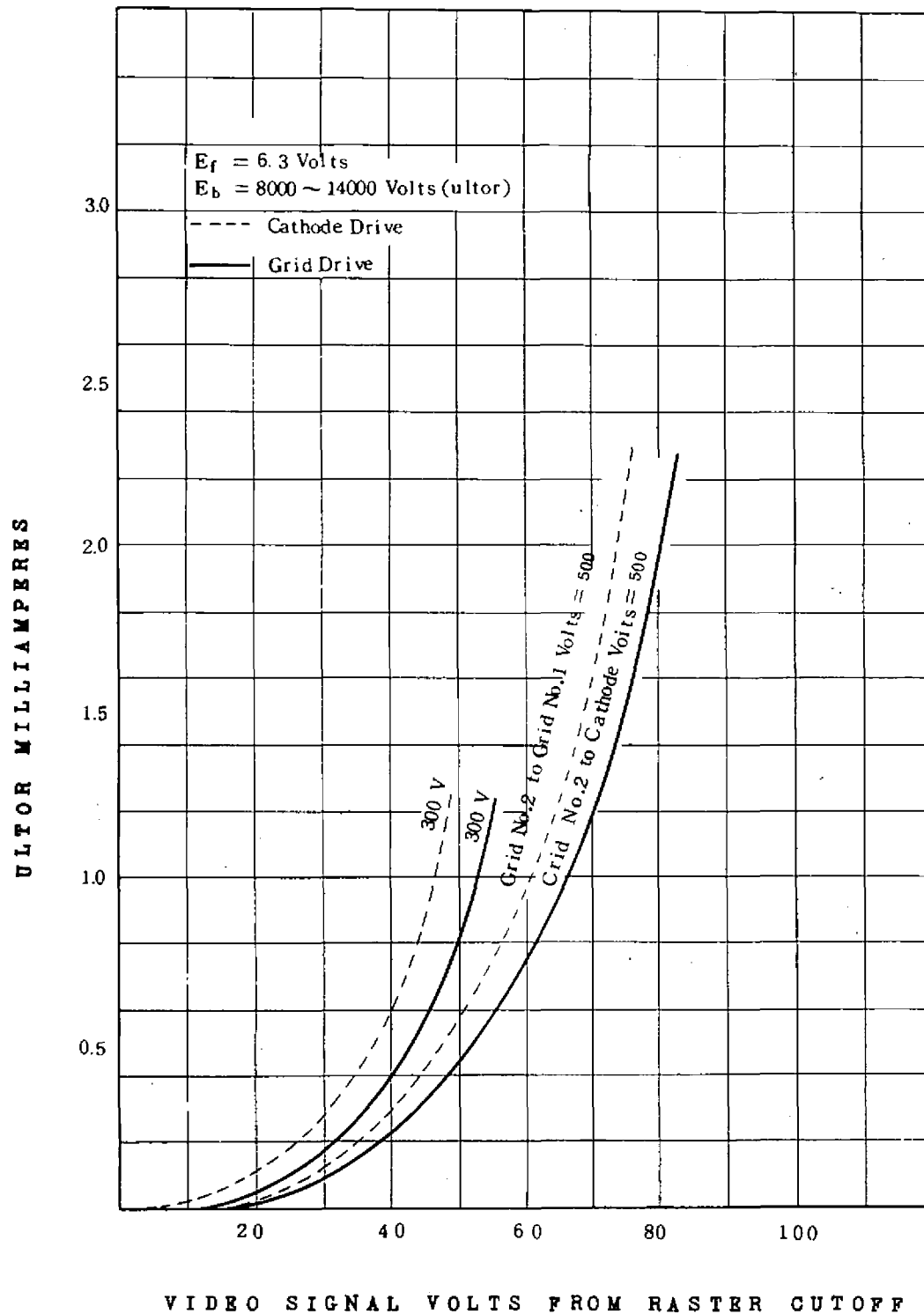
#### Notes:

1. Brilliance and definition decrease with decreasing voltage of ultor to Grid - No. 1 voltage. In general the ultor voltage or ultor to Grid- No. 1 voltage should not be less than 8000 volts.
2. Individual tubes will have satisfactory focus at same value of Grid- No. 4 (or Grid - No. 4 to Grid No. 1) voltage between 0 and 400 volts with the combined bias voltage and video - signal voltage adjusted to produce an ultor current of 100 micro amperes.
3. Distance from Reference line for suitable P. M. centering magnet should not exceed 2-1/8. Excluding extraneous fields, the center of the undeflected focused spot will fall within a circle having a 5/16 inch radius concentric with the center of the tube face. It is to be noted that the earths magnetic field can cause as much as 7/16 inch deflection of the spot from the center of the tube face.

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## TOSHIBA ELECTRON TUBE

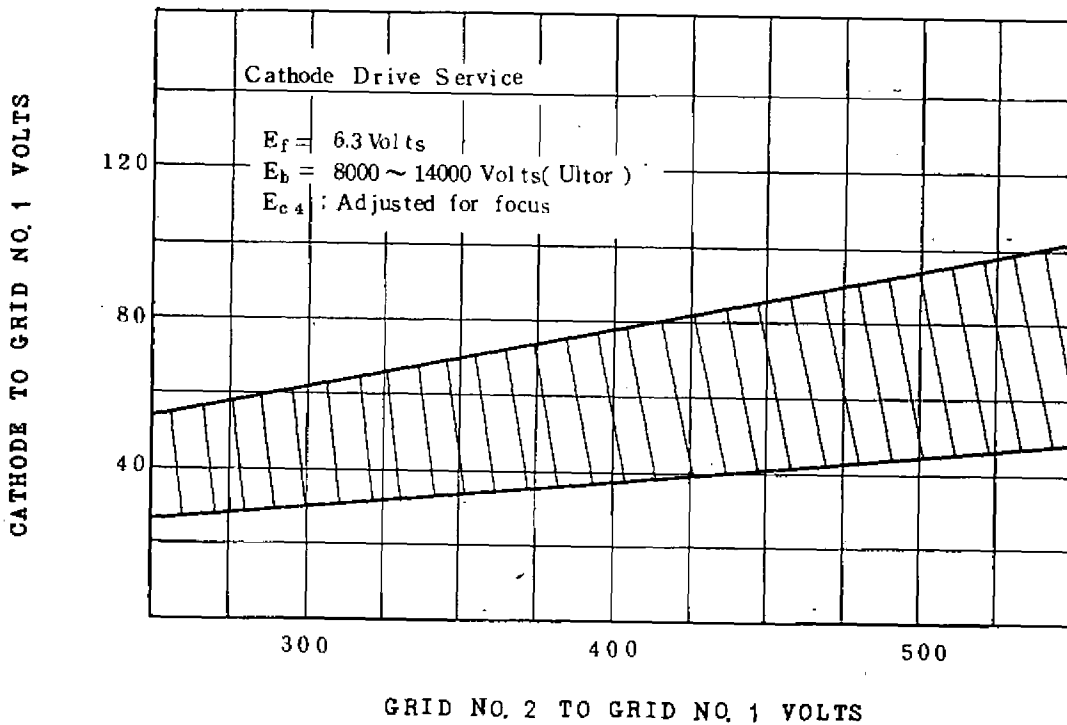
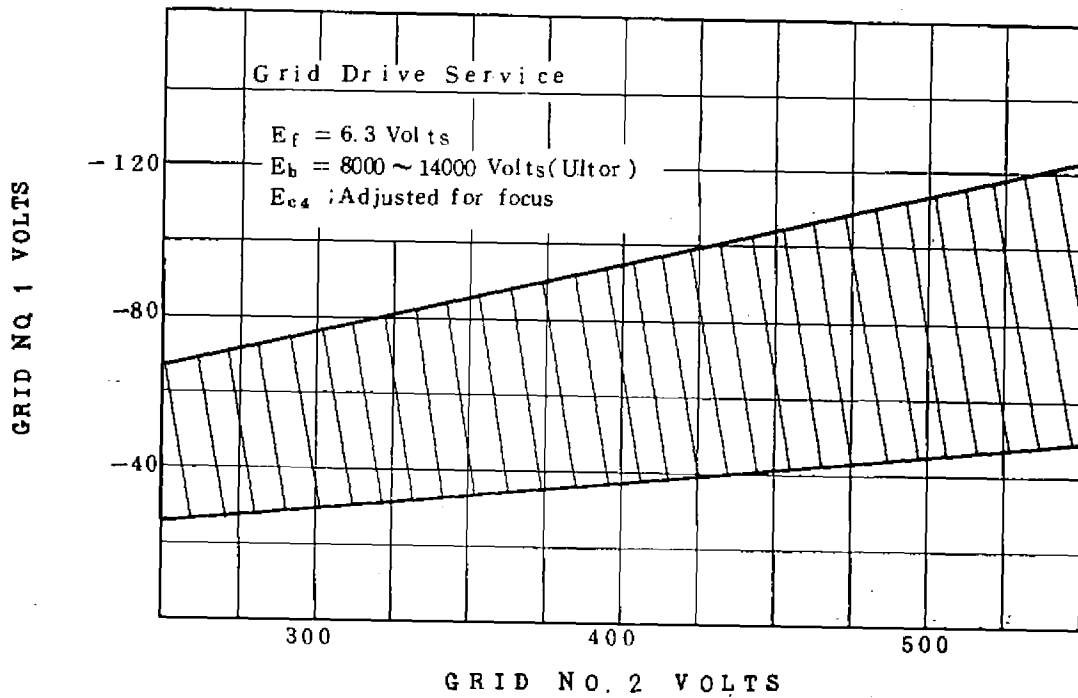
AVERAGE DRIVE CHARACTERISTICS



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## TOSHIBA ELECTRON TUBE

RASTER CUTOFF-RANGE CHARTS

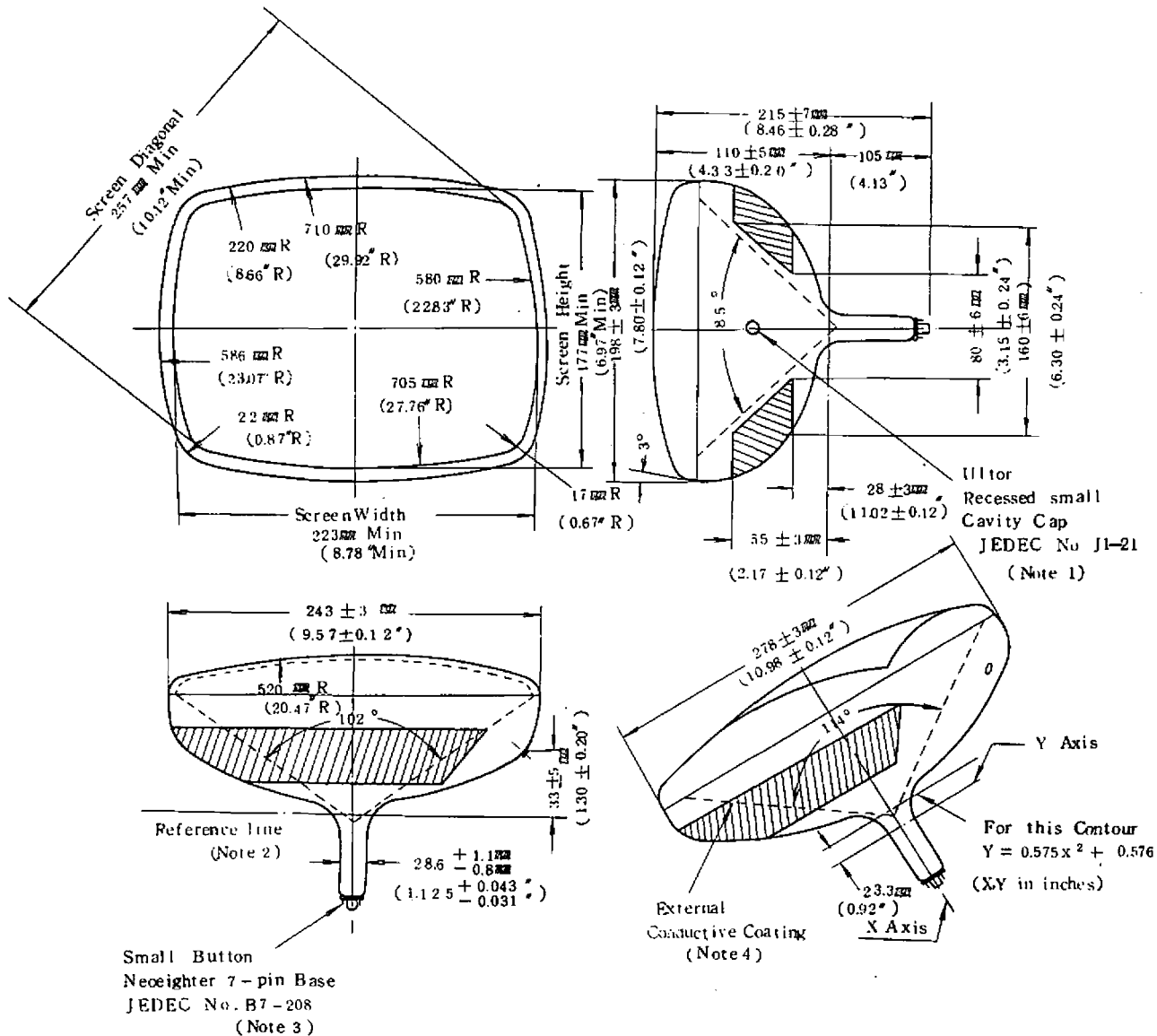


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## TOSHIBA ELECTRON TUBE

### Dimensional Outline

(Dimension in mm & inch)



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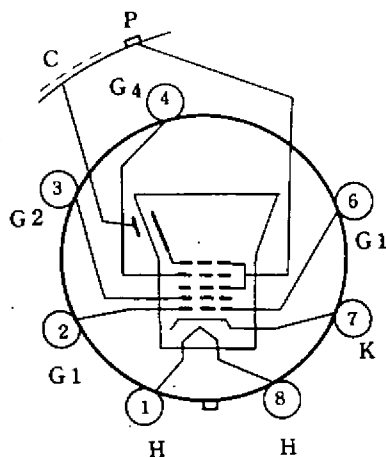
## TOSHIBA ELECTRON TUBE

### NOTES FOR DIMENSIONAL OUTLINE

#### Notes:

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 of  $\pm 30$  degree. Ultor terminal is on the same side as Pin No. 4.
2. With tube neck inserted through flare end of reference-line gauge JEDEC G-126 and with tube seated in gauge, the reference-line is determined by the inter-section 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.
4. External conductive coating must be grounded.

### SOCKET CONNECTION BOTTOM VIEW (8HR)



- 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: Heater  
P : Ultor  
C : External conductive coating

All inquiries as to the data should be addressed to Tokyo Shibaura Electric Co., Ltd.  
Tube and Semiconductor Division, 12, 1-Chome, Yuraku-Cho, Chiyoda-Ku, Hibiya  
Mitsui Building, Tokyo, Japan.