Toshiba E5001 is a 1"-diameter, magnetic-focus and deflection vidicon-type camera tube having cadmium selenide photoconductive target. This tube has extremely high sensitivity, low dark current, high resolution and no burn-in. The electron-gun structure of Toshiba E5001 is the same as that of the 8541.

**FEATURES**
* EXREMELY HIGH SENSITIVITY
* WIDE SPECTRAL RESPONSE OVER THE WHOLE RANGE OF VISIBLE WAVELENGTHS
* HIGH RESOLUTION
* NO BURN-IN
* VERY LOW DARK CURRENT

**GENERAL DATA**

**Electrical:**
- Cathode
  - Heater Voltage: 6.3±10 % V
  - Heater Current: 95 mA
- Direct Interelectrode Capacitance (Note 1)
  - Target to all other electrodes: 4.6 pF
- Spectral Sensitivity: See Fig. 3
- Focusing Method: Magnetic
- Deflecting Method: Magnetic

**Mechanical:**
- Base: Small-Button Ditetar 8-pin (JEDEC No. E3-11)
- Dimensions:
  - Overall Length: 6.25±0.25 inches (159±3 mm)
  - Maximum Diameter: 1.125±0.010 inches (28.6±0.3 mm)
- Maximum useful Size of Rectangular Image (4x3 aspect ratio): 0.62 inches (15.7 mm) (diagonal)

**Orientation:**
Proper orientation is obtained when the horizontal scan is essentially parallel to the plane passing through the tube axis and short index pin.

This information applies to a contemplated laboratory tube design and is subject to change.
No obligations are assumed as to future manufacture unless otherwise arranged.

Apr. 6, 1972

TOKYO SHIBAURA ELECTRIC CO., LTD.
MAXIMUM RATINGS
(Absolute-Maximum Values: For scanned area of 1/2" x 3/8" (12.7x9.5 mm²) )

<table>
<thead>
<tr>
<th>Grid No.4 Voltage</th>
<th>800 Vdc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grid No.3 Voltage</td>
<td>800 Vdc</td>
</tr>
<tr>
<td>Grid No.2 Voltage</td>
<td>400 Vdc</td>
</tr>
<tr>
<td>Grid No.1 Voltage: Negative-bias value</td>
<td>300 Vdc</td>
</tr>
<tr>
<td>Positive-bias value</td>
<td>0 Vdc</td>
</tr>
</tbody>
</table>

Peak Heater to Cathode Voltage
- Heater Negative with respect to Cathode: 125 V
- Heater Positive with respect to Cathode: 10 V

Target Voltage: 50 Vdc
Peak Target Current: 600 nA
Faceplate Illumination (Note 2): 105 lx
Faceplate Temperature: -20°C to 60°C

TYPICAL OPERATION
For scanned area of 1/2" x 3/8" (12.7 x 9.5 mm²)

<table>
<thead>
<tr>
<th>Standard Operation</th>
<th>High Voltage Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faceplate Temperature (Note 3)</td>
<td>25~35°C</td>
</tr>
<tr>
<td>Grid No.4 Voltage (Note 4)</td>
<td>500 Vdc</td>
</tr>
<tr>
<td>Grid No.3 (Beam Focus Electrode) Voltage</td>
<td>300 Vdc</td>
</tr>
<tr>
<td>Grid No.2 Voltage</td>
<td>300 Vdc</td>
</tr>
<tr>
<td>Grid No.1 Voltage for Picture Cutoff (Note 5)</td>
<td>-45~100 Vdc</td>
</tr>
<tr>
<td>Target Voltage (Note 6)</td>
<td>0.95</td>
</tr>
<tr>
<td>Average &quot;Gamma&quot;</td>
<td>0.95</td>
</tr>
<tr>
<td>Lag (Note 7)</td>
<td>20</td>
</tr>
</tbody>
</table>

Minimum peak-to-peak Blanking Voltage
- When applied to Grid No.1: 75 Vp-p
- When applied to Cathode: 20 Vp-p

Field strength at the Center of Focusing Coil | 41 Gauss |
Field Strength of Adjustable Alignment Coll | 0~4 Gauss |
Center Resolution | 750 TV lines |
Corner Resolution | 600 TV lines |

Amplitude Response to a 400 TV Line Square-wave Test Pattern at Center of the Picture (See Fig. 5): 45% |
Highlight Signal Current | 200 nA |
Signal Uniformity | 10% |
Dark Current (Note 3) 1 1 nA
Sensitivity to Tungsten Light Source (Note 8)
Faceplate Illumination 0.5 0.5 lx
Signal Output Current 160 160 nA

Notes:
1. The capacitance, effectively the output impedance of this tube, will increase when the tube is mounted in the deflecting-yoke and focusing-coil assembly. The resistive component of the output impedance is several 100 megohms.

2. The tube can withstand the illumination contained in a focused image of the sun without damage.

3. The dark current of the E5001 is about 1 nA at room temperature. The deterioration of picture quality due to the increase of dark current is not seen until up to 60°C of face-plate temperature. (See Fig. 2)

4. The recommended ratio of grid No. 1 to grid No. 3 voltage is from 1.5 to 1.7. (The ratio is changeable depending on the characteristics of coil assemblies.)

5. With no blanking voltage on grid No. 1.

6. Adjust the target voltage to the optimum voltage where after image with "negative" pictures does not remain when an incident pattern is removed and the target is illuminated uniformly.

7. The ratio of residual current at 50 msec after the cessation of illumination to the initial signal current of 200 nA with the target voltage adjusted by Note 6. (See Fig. 4)

8. The tungsten lamp with the color temperature of 2854 K. (See Fig. 1)
**FIGURE 1. TYPICAL LIGHT TRANSFER CHARACTERISTICS**

- **ILLUMINATION:** Uniform over target area
- **SCANNED AREA OF TARGET:** 1/2" x 3/8" (12.7 x 9.5 mm²)
- **FACEPLATE TEMPERATURE:** 30°C APPROX
- **TARGET VOLTAGE:** adjusted

**2854°K TUNGSTEN ILLUMINATION ON FACEPLATE (1x)**

**FIGURE 2. TYPICAL TEMPERATURE CHARACTERISTICS**

- **SCANNED AREA OF PHOTOCONDUCTIVE LAYER:** 1/2" x 3/8" (12.7 x 9.5 mm²)
- **TARGET VOLTAGE:** adjusted

**FACEPLATE TEMPERATURE (°C)**
FIGURE 3. TYPICAL SPECTRAL RESPONSE CHARACTERISTICS

![Graph showing typical spectral response characteristics.](image)

FIGURE 4. TYPICAL LAG CHARACTERISTICS

![Graph showing typical lag characteristics.](image)

TARGET VOLTAGE: adjusted
SCANNED AREA OF TARGET: 1/2"x3/8"
(12.7x9.5 mm²)

FACEPLATE TEMPERATURE: 30 °C APPROX

<table>
<thead>
<tr>
<th>CURVE</th>
<th>SIGNAL CURRENT (nA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>100</td>
</tr>
<tr>
<td>B</td>
<td>200</td>
</tr>
<tr>
<td>C</td>
<td>400</td>
</tr>
</tbody>
</table>

TIME AFTER ILLUMINATION IS REMOVED (ms)
FIGURE 5. TYPICAL HORIZONTAL SQUARE-WAVE RESPONSE

TARGET VOLTAGE: adjusted
HIGHLIGHT SIGNAL CURRENT: 200nA

(A) Grid No. 3 Voltage 450V
Grid No. 4 Voltage 750V

(B) Grid No. 3 Voltage 300V
Grid No. 4 Voltage 500V

TV LINE NUMBER

UNCOMPENSATED HORIZONTAL PEAK-TO-PEAK SQUARE-WAVE RESPONSE AT CENTER OF PICTURE

TARGET VOLTAGE: adjusted
HIGHLIGHT SIGNAL CURRENT: 200nA

(A) Grid No. 3 Voltage 450V
Grid No. 4 Voltage 750V

(B) Grid No. 3 Voltage 300V
Grid No. 4 Voltage 500V

TV LINE NUMBER
OUTLINE

BASE CONNECTIONS
(BOTTOM VIEW)

PIN 1.......HEATER
PIN 2.......GRID NO.1
PIN 3.......GRID NO. 4
PIN 4.......INTERNAL CONNECTION
DO NOT USE
PIN 5.......GRID NO.2
PIN 6.......GRID NO.3
PIN 7.......CATHODE
PIN 8.......HEATER
SJ .........TARGET

SHORT INDEX PIN: INTERNAL CONNECTION DO NOT USE.