Toshiba 6HK8 is a 9 Pin miniature, medium Mu twin triode, with high transconductance, low noise and low interelectrode capacitance, designed for use as a cascade amplifier in high gain tuners for television receivers. This tube is also useful RF amplifier and frequency converter for FM receivers.

**GENERAL DATA**

Electrical:

*Heater, for unipotential Cathode:*

<table>
<thead>
<tr>
<th>Voltage (AC or DC)</th>
<th>6.3 volts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>400 ma.</td>
</tr>
</tbody>
</table>

*Direct Interelectrode Capacitances (with external shield):*

<table>
<thead>
<tr>
<th>Component</th>
<th>Unit 1</th>
<th>Unit 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grid to plate: (g to p)</td>
<td>1.2</td>
<td>1.2 µµf</td>
</tr>
<tr>
<td>Input: g to (h+k+i+s+es)</td>
<td>3.3</td>
<td>3.3 µµf</td>
</tr>
<tr>
<td>Input: 1K to (h+i+g+i+s+es) grounded grid</td>
<td>5.6</td>
<td>µµf</td>
</tr>
<tr>
<td>Output: P to (h+K+i+s+es)</td>
<td>1.1</td>
<td>1.3 µµf</td>
</tr>
<tr>
<td>Output: 1P to (h+i+g+i+s+es) grounded grid</td>
<td>2.4</td>
<td>µµf</td>
</tr>
<tr>
<td>Plate to Heater: p to h</td>
<td>0.15</td>
<td>0.15 µµf</td>
</tr>
<tr>
<td>Cathode to Heater: K to h</td>
<td>2.5</td>
<td>2.5 µµf</td>
</tr>
<tr>
<td>Plate No. 1 to plate No. 2: 1p to 2p</td>
<td>0.01 µµf max.</td>
<td></td>
</tr>
<tr>
<td>Plate No. 1 to plate No. 2, Grid No. 2: 1p to (2p, 2g)</td>
<td>0.03 µµf max.</td>
<td></td>
</tr>
</tbody>
</table>

(1)

from JEDEC release #2960, Sept. 19, 1960
Mechanical:

Operating Position ................................................................. Any
Maximum Overall Length ......................................................... 2\%\%"
Maximum Seated Length ......................................................... 1\%\%"
Length, Base Seat to Bulb Top (Excluding tip) ........................... 1\%\%" ± \%\%"
Maximum Diameter .................................................................. \%\%"
Bulb ....................................................................................... T6-1/2
Base ....................................................................................... Small-Button Naval 9-Pin (JEDEC No. E9-1)

Maximum Ratings (Design Center Values):

Plate Supply Voltage with Cut Off Bias ...................................... 300 volts
Plate Voltage ........................................................................... 150 volts
Plate Dissipation ..................................................................... 2.0 Watts
Cathode Current ..................................................................... 20 ma
Circuit Values: Grid Circuit Resistance ..................................... 0.5 Megohm
Heater-Cathode Voltage

Heater Negative with Respect to Cathode, DC ............................. 200 volts
Total, DC and Peak ................................................................. 200 volts
Heater Positive with Respect to Cathode, DC ............................. 100 volts
Total, DC and Peak ................................................................. 200 volts

Typical Operating Conditions and Characteristics:

Class A1 Amplifier (Each section)
Plate Voltage ........................................................................... 90 volts
Grid Voltage ........................................................................... -1 volts
Amplification Factor ................................................................. 36
Plate Resistance ..................................................................... 4500 ohms
Transconductance .................................................................. 8000 \mu mhos
Plate Current ......................................................................... 8.5 ma
Grid Voltage, Approximate for Ib=10 \mu a ................................ -5.5 volts

Cascade Amplifier (see typical operating circuit):

Plate Voltage ........................................................................... 180 volts
Grid Voltage ........................................................................... -1 volts

(2)
Transconductance ................................................................. 9500 μmhos
Plate Current ........................................................................... 12 mA
Grid Voltage, Approximate for gm = 50 μmhos ................................ −6 volts

**TYPICAL OPERATING CIRCUIT**

![Typical Operating Circuit Diagram]

**Mixer:**
Plate Voltage ................................................................. 75 100 125 volts
Grid Voltage ................................................................. 0 0 0
Grid Circuit Resistance .................................................. 0.25 0.25 0.25 megohms
Exciting Grid Voltage .................................................... 1.8 2.2 2.6 volts ac
Conversion Transconductance ........................................ 3350 4200 5050 μmhos
Plate Current ................................................................. 4.1 7.0 10.7 mA

**6H4B AVERAGE CHARACTERISTICS FOR EACH UNIT**

![Characteristics Graph]

(3)
SHKB OPERATION CHARACTERISTICS
FOR MIXER

\( E_t = 6.3V \)
\( E_c = 0V(DC-SUPPLY) \)
\( R_g = 250K \)

\( E_a = 150V \)
\( 125V \)
\( 100V \)
\( 75V \)

PLATE CURRENT (I_p) (mA)

OSCILLATION VOLTAGE (E_{osc}) (r.m.s.) (V)

SHKB OPERATION CHARACTERISTICS
FOR MIXER

\( E_t = 6.3V \)
\( E_c = 0V(DC-SUPPLY) \)
\( R_g = 250K \)

CONVERSION CONDUCTANCE (G_c) (μS)

OSCILLATION VOLTAGE (E_{osc}) (r.m.s.) (V)
DIMENSIONAL OUTLINE

*MEASURED FROM BASE SEAT TO BULB TOP LINE AS DETERMINED BY RING GAUGE OF 7/16" I.D.

SOCKET CONNECTIONS
BOTTOM VIEW

PIN 1: UNIT 2 PLATE  PIN 2: UNIT 2 GRID  PIN 3: UNIT 2 CATHODE  GROUNDED CATHODE INPUT SECTION  PIN 6: UNIT 1 PLATE  PIN 7: UNIT 1 GRID  PIN 8: UNIT 1 CATHODE  GROUNDED GRID OUTPUT SECTION  PIN 4: HEATER  PIN 5: HEATER  PIN 9: INTERNAL SHIELD
All inquiries as to the data should be addressed to Tokyo Shibaura Electric Co., Ltd., Lamp and Tube Manufacturing and Sales Division, 72 Harikawacho, Kawasaki, Kanagawa-ken, Japan.