FLAT PANEL TYPE
MULTIANODE PMT ASSEMBLY
H12700 SERIES

52 mm Square, Bialkali Photocathode, 10-stage
8 × 8 Multianode, Small Dead Space, Fast Time Response

FEATURES
- Large Effective Area: 48.5 mm × 48.5 mm
- Packing Density: 87 %
- 8 × 8 Multianode,
  Pixel Size: 6 mm × 6 mm / Anode
- High Quantum Efficiency: 33 % Typ.
- Two Types are Available for HV Input
  H12700A Series: Cable Input Type
  H12700B Series: Pin Input Type

APPLICATIONS
- Academic Research
  (RICH, Gamma Ray Telescope, etc.)
- Nuclear Medicine Equipment
  (PET, Gamma Camera, etc.)
- 2D Radiation Imaging

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**Table 1: Voltage Distribution Ratio and Supply Voltage**

<table>
<thead>
<tr>
<th>Electrodes</th>
<th>K</th>
<th>Dy1</th>
<th>Dy2</th>
<th>Dy3</th>
<th>Dy4</th>
<th>Dy5</th>
<th>Dy6</th>
<th>Dy7</th>
<th>Dy8</th>
<th>Dy9</th>
<th>Dy10</th>
<th>GR</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distribution Ratio</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0.5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Supply Voltage: -1000 V,  K: Cathode,  Dy: Dynode,  GR: Guard Ring  P: Anode

**NOTE:**

- A: BA: Bialkali  B: K: Borosilicate glass, U: UV glass  C: MC: Metal channel
- The light source is a tungsten filament lamp operated at a distribution temperature of 2856 K. Supply voltage is 150 volts between the cathode and the tube under the same condition as Note ①.
- The value is cathode output current when a blue filter (comprising CS 5-58 polished to 1/2 stock thickness) is interposed between the light source and all other electrodes connected together as anode.
- Measured with the same light source as Note ① and with the anode-to-cathode supply voltage and voltage distribution ratio shown in Table 1 below.
- Measured with the same supply voltage and voltage distribution ratio as Note ① after 30 minute storage in darkness.
- Those are test data when a signal from a central channel (P28) of 64 anodes is used, while all photocathode are illuminated by pulsed light source.
- The rise time is the time for the output pulse to rise from 10 % to 90 % of the peak amplitude when the whole photocathode is illuminated by a delta function light pulse.
- The electron transit time is the interval between the arrival of delta function light pulse at the entrance window of the tube and the time when the anode output reaches the peak amplitude. In measurement, the whole photocathode is illuminated.
- Also called transit time jitter. This is the fluctuation in electron transit time between individual pulses in the single photo electron event, and defined as the FWHM of the frequency distribution of electron transit time.

**Figure 3: Anode Uniformity**  
**Figure 4: Anode Cross-talk**  
**Figure 5: Single Photon Counting**

**Table 2: Spectral Response and Peak Wavelength**

<table>
<thead>
<tr>
<th>Type No.</th>
<th>Range</th>
<th>Peak Wavelength</th>
</tr>
</thead>
<tbody>
<tr>
<td>H12700A</td>
<td>300 to 650</td>
<td>380 (nm)</td>
</tr>
<tr>
<td>H12700B</td>
<td>300 to 650</td>
<td>380 (nm)</td>
</tr>
<tr>
<td>H12700A-03</td>
<td>185 to 650</td>
<td>300 (nm)</td>
</tr>
<tr>
<td>H12700B-03</td>
<td>185 to 650</td>
<td>300 (nm)</td>
</tr>
</tbody>
</table>

**Figure 6: Single Photon Counting**

**SUPPLY VOLTAGE: -1000 V**  
**LIGHT SOURCE:** TUNGSTEN LAMP with BLUE FILTER  
**SPOT ILLUMINATION (APERTURE SIZE): 6 mm square on each channel**
Figure 6: Dimensional Outlines and Basing Diagram (Unit: mm)

- HV Cable Input Type (H12700A/H12700A-03)

- Anode Characteristics

<table>
<thead>
<tr>
<th>Luminous Gain</th>
<th>Dark Current per Channel</th>
<th>Dark Current in Total</th>
<th>Time Response</th>
<th>Pulse Linearity per Channel</th>
<th>Uniformity Between Each Anode</th>
<th>Type No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>—</td>
<td>110</td>
<td>1.5 x 10^6</td>
<td>0.1</td>
<td>—</td>
<td>6</td>
<td>50</td>
</tr>
<tr>
<td>—</td>
<td>110</td>
<td>1.5 x 10^6</td>
<td>0.1</td>
<td>—</td>
<td>6</td>
<td>50</td>
</tr>
<tr>
<td>—</td>
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<td>0.1</td>
<td>—</td>
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<td>50</td>
</tr>
<tr>
<td>—</td>
<td>110</td>
<td>1.5 x 10^6</td>
<td>0.1</td>
<td>—</td>
<td>6</td>
<td>50</td>
</tr>
</tbody>
</table>

Figure 7: Internal Circuit (H12700A/H12700A-03)
Figure 8: Dimensional Outlines and Basing Diagram (Unit: mm)

- **HV PIN Input Type (H12700B/H12700B-03)**

![Diagram of Dimensional Outlines and Basing Diagram](image)

**NOTE**
*A: Suitable sockets for the connectors will be attached. For signal output is HSC-200-D86P-X (JC ELECTRONICS CORPORATION). For +HV, GND is SQT-102-01-L-S (SAMTEC).*

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Figure 9: Internal Circuit (H12700B/H12700B-03)

![Internal Circuit Diagram](image)

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