FLAT PANEL TYPE
MULTIANODE PMT ASSEMBLY
H12700 SERIES / H14220 SERIES

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.
- Small dead space
- Fast time response
- Two types for HV input
  - H12700A series / H14220A: Cable input type
  - H12700B series / H14220B: Connector input type
- With tapered divider (-10 type)
- High sensitivity in green region: H14220 series

APPLICATIONS

- Academic research
  - (RICH, Gamma ray telescope, etc.)
- Nuclear medicine equipment
  - (PET, Gamma camera, etc.)
- 2D radiation imaging

Figure 1: Typical spectral response

Figure 2: Typical gain

- Academic research
- Nuclear medicine equipment
- 2D radiation imaging
### Specifications

<table>
<thead>
<tr>
<th>Type No.</th>
<th>Range (nm)</th>
<th>Peak Wavelength (nm)</th>
<th>Electrode Material</th>
<th>Window Material</th>
<th>Dynode Structure / Stages</th>
<th>Supply Voltage between Anode and Cathode (V)</th>
<th>Average Anode Output Current at -1100 V (μA)</th>
<th>Divider Current at -1100 V (μA)</th>
<th>Luminous Sensitivity (CS 5-58)</th>
</tr>
</thead>
<tbody>
<tr>
<td>H12700A</td>
<td>300 to 650</td>
<td>380</td>
<td>BA</td>
<td>BA</td>
<td>K</td>
<td>MC/10</td>
<td>-1100</td>
<td>100</td>
<td>225</td>
</tr>
<tr>
<td>H12700B</td>
<td>300 to 650</td>
<td>380</td>
<td>BA</td>
<td>BA</td>
<td>K</td>
<td>MC/10</td>
<td>-1100</td>
<td>100</td>
<td>225</td>
</tr>
<tr>
<td>H12700A-03</td>
<td>185 to 650</td>
<td>380</td>
<td>BA</td>
<td>BA</td>
<td>U</td>
<td>MC/10</td>
<td>-1100</td>
<td>100</td>
<td>225</td>
</tr>
<tr>
<td>H12700B-03</td>
<td>185 to 650</td>
<td>380</td>
<td>BA</td>
<td>BA</td>
<td>U</td>
<td>MC/10</td>
<td>-1100</td>
<td>100</td>
<td>225</td>
</tr>
<tr>
<td>H12700A-10</td>
<td>300 to 650</td>
<td>380</td>
<td>BA</td>
<td>BA</td>
<td>K</td>
<td>MC/10</td>
<td>-1100</td>
<td>100</td>
<td>225</td>
</tr>
<tr>
<td>H12700B-10</td>
<td>300 to 650</td>
<td>380</td>
<td>BA</td>
<td>BA</td>
<td>K</td>
<td>MC/10</td>
<td>-1100</td>
<td>100</td>
<td>225</td>
</tr>
<tr>
<td>H14220A</td>
<td>300 to 700</td>
<td>420</td>
<td>BA</td>
<td>BA</td>
<td>K</td>
<td>MC/10</td>
<td>-1100</td>
<td>100</td>
<td>225</td>
</tr>
<tr>
<td>H14220B</td>
<td>300 to 700</td>
<td>420</td>
<td>BA</td>
<td>BA</td>
<td>K</td>
<td>MC/10</td>
<td>-1100</td>
<td>100</td>
<td>225</td>
</tr>
</tbody>
</table>

#### 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>Standard divider type</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>1</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>Tapered divider type</td>
<td>2.4</td>
<td>1.2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1.1</td>
<td>3.5</td>
<td>0.5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Supply voltage: -1000 V, K: Cathode, Dy: Dynode, GR: Guard ring, P: Anode

#### Figure 3: Anode uniformity (Example)

Supply Voltage: -1000 V
Light Source: Tungsten Lamp with Blue Filter (DC Light)
Spot Illumination (Aperture Size): 6 mm square on each channel

#### Figure 4: Anode cross-talk (Example)

Supply Voltage: -1000 V
Light Source: Tungsten Lamp with Blue Filter (DC Light)
Fiber Size: 1.0 mm (Kuraray: Clear Fiber NA=0.72)

#### Figure 5: Single photon counting (Example)

Supply Voltage: -1000 V
Measuring Time: 100 s
Signal + Dark Count
Pulse Height / Channel Number (ch)
### Anode characteristics

<table>
<thead>
<tr>
<th>Luminous (A/m)</th>
<th>Gain</th>
<th>Dark current per channel (nA)</th>
<th>Dark current in total (nA)</th>
<th>Time response</th>
<th>Pulse linearity per channel [2% deviation] (mA)</th>
<th>Uniformity between each anode</th>
<th>Type No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>—</td>
<td>140</td>
<td>1.5 × 10⁶</td>
<td>0.1</td>
<td>—</td>
<td>6</td>
<td>50</td>
<td>0.52</td>
</tr>
<tr>
<td>—</td>
<td>140</td>
<td>1.5 × 10⁶</td>
<td>0.1</td>
<td>—</td>
<td>6</td>
<td>50</td>
<td>0.52</td>
</tr>
<tr>
<td>—</td>
<td>140</td>
<td>1.5 × 10⁶</td>
<td>0.1</td>
<td>—</td>
<td>6</td>
<td>50</td>
<td>0.52</td>
</tr>
<tr>
<td>—</td>
<td>60</td>
<td>0.6 × 10⁵</td>
<td>(0.1)</td>
<td>—</td>
<td>(6)</td>
<td>50</td>
<td>0.52</td>
</tr>
<tr>
<td>—</td>
<td>60</td>
<td>0.6 × 10⁵</td>
<td>(0.1)</td>
<td>—</td>
<td>(6)</td>
<td>50</td>
<td>0.52</td>
</tr>
<tr>
<td>—</td>
<td>200</td>
<td>1.5 × 10⁶</td>
<td>0.1</td>
<td>—</td>
<td>12</td>
<td>60</td>
<td>0.52</td>
</tr>
<tr>
<td>—</td>
<td>200</td>
<td>1.5 × 10⁶</td>
<td>0.1</td>
<td>—</td>
<td>12</td>
<td>60</td>
<td>0.52</td>
</tr>
</tbody>
</table>

( ): Measured with the special voltage distribution ratio (Tapered divider) shown in Table 1 bellow.

Figure 6: Dimensional outlines and basing diagram (Unit: mm)

- **HV cable input type (H12700A / H12700A-03 / H12700A-10 / H14220A)**

![Diagram](image)

**TOP VIEW**

**SIDE VIEW**

**CONNECTION FOR SIGNAL CONNECTORS**

- **BOTTOM VIEW**

*NOTE* **A**: Suitable sockets for the connectors will be attached. For -HV, GND is SQT-102-01-L-S (SAMTEC). For **HV**, GND is ISQT-102-01-L-S (ISAMTEC).

**Figure 7: Internal circuit**

- **H12700A / H12700A-03 / H14220A**

![Diagram](image)

- **H12700A-10**

![Diagram](image)
**Figure 8:** Dimensional outlines and basing diagram (Unit: mm)

● HV connector input type (H12700B / H12700B-03 / H12700B-10 / H14220B)

**Figure 9:** Internal circuit

**Figure 10:** Accessories (Unit: mm)  
**Signal cable A13976**

*Sold separately*

**Signal read-out board E14340**  
(for position imaging with center of gravity method)

*The fall time slows down caused by resistor chain of E14340*