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 are available for HV input
  - H12700A series: Cable input type
  - H12700B series: Pin input type
- With tapered divider (-10 type)

APPLICATIONS

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

Figure 1: Typical spectral response

**CATHODE RADIANT SENSITIVITY (mA/W)**

**QUANTUM EFFICIENCY (%)**

**WAVELENGTH (nm)**

Figure 2: Typical gain

**GAIN**

**SUPPLY VOLTAGE (V)**

- Left: H12700A, Right: H12700B

Subject to local technical requirements and regulations, availability of products included in this promotional material may vary. Please consult with our sales office. Information furnished by HAMAMATSU is believed to be reliable. However, no responsibility is assumed for possible inaccuracies or omissions. Specifications are subject to change without notice. No patent rights are granted to any of the circuits described herein. ©2018 Hamamatsu Photonics K.K.
### 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>1</td>
<td>0.5</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</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1.1</td>
</tr>
<tr>
<td>1.1</td>
<td>3.5</td>
<td>0.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

NOTE:
- 1. BA: Bialkali
- 2. K: Borosilicate glass, U: UV glass
- 3. MC: Metal channel
- 4. 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 all other electrodes connected together as anode.
- 5. The value is cathode output current when a blue filter (Corning CS 5-58 polished to 1/2 stock thickness) is interposed between the light source and the tube under the same condition as Note 4.
- 6. Measured with the same light source as Note 5 and with the anode-to-cathode supply voltage and voltage distribution ratio shown in Table 1 below.
- 7. 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.
- 8. Measured with the same supply voltage and voltage distribution ratio as Note 5 after 30 minute storage in darkness.
- 9. 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.
- 10. Also called transit time jitter. This is the fluctuation in electron transit time between individual pulses in the single photoelectron event, and defined as the FWHM of the frequency distribution of electron transit time.

### Table 1: Voltage distribution ratio and supply voltage

<table>
<thead>
<tr>
<th>Type No.</th>
<th>Spectral response</th>
<th>Photocathode material</th>
<th>Window material</th>
<th>Dynode structure / Stages</th>
<th>Supply voltage between anode and cathode</th>
<th>Average anode output current in total</th>
<th>Divider current at -1100 V</th>
<th>Cathode characteristics</th>
<th>Anode to cathode supply voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>H12700A</td>
<td>300 to 650</td>
<td>380</td>
<td>BA</td>
<td>K</td>
<td>MC/10</td>
<td>-1100</td>
<td>100</td>
<td>225</td>
<td>60</td>
</tr>
<tr>
<td>H12700B</td>
<td>300 to 650</td>
<td>380</td>
<td>BA</td>
<td>K</td>
<td>MC/10</td>
<td>-1100</td>
<td>100</td>
<td>225</td>
<td>60</td>
</tr>
<tr>
<td>H12700A-03</td>
<td>185 to 650</td>
<td>380</td>
<td>BA</td>
<td>K</td>
<td>MC/10</td>
<td>-1100</td>
<td>100</td>
<td>225</td>
<td>60</td>
</tr>
<tr>
<td>H12700B-03</td>
<td>185 to 650</td>
<td>380</td>
<td>BA</td>
<td>U</td>
<td>MC/10</td>
<td>-1100</td>
<td>100</td>
<td>225</td>
<td>60</td>
</tr>
<tr>
<td>H12700A-10</td>
<td>300 to 650</td>
<td>380</td>
<td>BA</td>
<td>K</td>
<td>MC/10</td>
<td>-1100</td>
<td>100</td>
<td>225</td>
<td>60</td>
</tr>
<tr>
<td>H12700B-10</td>
<td>300 to 650</td>
<td>380</td>
<td>BA</td>
<td>K</td>
<td>MC/10</td>
<td>-1100</td>
<td>100</td>
<td>225</td>
<td>60</td>
</tr>
</tbody>
</table>

NOTE:
- A: BA: Bialkali
- B: K: Borosilicate glass, U: UV glass
- C: MC: Metal channel
- D: 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 all other electrodes connected together as anode.
- E: The value is cathode output current when a blue filter (Corning CS 5-58 polished to 1/2 stock thickness) is interposed between the light source and the tube under the same condition as Note D.
- F: Measured with the same light source as Note E and with the anode-to-cathode supply voltage and voltage distribution ratio shown in Table 1 below.
- G: 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.
- H: 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.
- I: Also called transit time jitter. This is the fluctuation in electron transit time between individual pulses in the single photoelectron event, and defined as the FWHM of the frequency distribution of electron transit time.

### 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
Light source: Tungsten lamp with blue filter (DC light)
Anode characteristics

<table>
<thead>
<tr>
<th>Luminous Bright (A/lm)</th>
<th>Gain</th>
<th>6 × 6 = 36</th>
<th>R22</th>
<th>P57</th>
<th>P49</th>
<th>P41</th>
<th>P33</th>
<th>P25</th>
<th>P17</th>
</tr>
</thead>
<tbody>
<tr>
<td>— 140 1.5 × 10⁶</td>
<td>0.1</td>
<td>— 6 50</td>
<td>0.52</td>
<td>4.9</td>
<td>0.35</td>
<td>0.8</td>
<td>1: 2</td>
<td>1: 3</td>
<td></td>
</tr>
<tr>
<td>— 140 1.5 × 10⁶</td>
<td>0.1</td>
<td>— 6 50</td>
<td>0.52</td>
<td>4.9</td>
<td>0.35</td>
<td>0.8</td>
<td>1: 2</td>
<td>1: 3</td>
<td></td>
</tr>
<tr>
<td>— 140 1.5 × 10⁶</td>
<td>0.1</td>
<td>— 6 50</td>
<td>0.52</td>
<td>4.9</td>
<td>0.35</td>
<td>0.8</td>
<td>1: 2</td>
<td>1: 3</td>
<td></td>
</tr>
<tr>
<td>— (38) (0.4 × 10⁶)</td>
<td>(0.1)</td>
<td>— (6) (50)</td>
<td>(0.52)</td>
<td>(4.9)</td>
<td>(0.35)</td>
<td>(3)</td>
<td>1: 2</td>
<td>1: 3</td>
<td></td>
</tr>
<tr>
<td>— (38) (0.4 × 10⁶)</td>
<td>(0.1)</td>
<td>— (6) (50)</td>
<td>(0.52)</td>
<td>(4.9)</td>
<td>(0.35)</td>
<td>(3)</td>
<td>1: 2</td>
<td>1: 3</td>
<td></td>
</tr>
</tbody>
</table>

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

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

● HV cable input type (H12700A / H12700A-03 / H12700A-10)

Figure 7: Internal circuit
Figure 8: Dimensional outlines and basing diagram (Unit: mm)

H12700B / H12700B-03 / H12700B-10

Figure 9: Internal circuit

Figure 10: Accessories (Unit: mm) Sold separately

Signal cable A13976

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