MAPMT253  
Multi-Anode MCP-PMT

The AuraTek MAPMT253 is a next generation Multi-Anode Micro-Channel Plate Photo-Multiplier Tube (MCP-PMT). It can be configured as a multi-channel single photon counter or analog photon pulse analyzer. The 4096 individual anodes are arranged in a 64 x 64 pattern with 0.828 mm pitch, resulting in a 53 mm square active area. The overall tube is 59 mm square, enabling efficient tiling of multiple MAPMT253s to cover large areas. Connection of the high density anode output is made using Photek’s proprietary interconnect process based on an Anisotropic Conductive Film (ACF). Customers can request custom readout configurations of the full 4096 anodes via high density connectors, or group the anodes to form unique readout geometries. The timing performance is state-of-the-art, with pulse rise-time of <175 ps and single photon transit time spread of < 40 ps rms per channel. Ask our experts to help you select the best readout electronics for your application.

**KEY ATTRIBUTES**

- True noiseless photon counting
- 430 ps FWHM pulse width
- Transit time spread of < 40 ps rms
- Extremely low dark counts
- Highest anode density of any PMT with 0.828mm pitch and 4096 anodes
- Customer configurable anode readout and interconnect via proprietary ACF technology
- Variety of high QE, low noise photocathodes covering full UV to visible wavelengths
- Immunity to magnetic fields
- Assistance with selection of optimal readout electronics

**APPLICATIONS**

- Ring Imaging Cherenkov (RICH)
- Detection of Internally Reflected Cherenkov (DIRC)
- Sampling Calorimeter Readout
- Wavelength Shifting Fibre Readout
- Scintillating/Cherenkov Fibre Readout
- Beam Monitor
- High Content Screening
- Time Resolved Spectroscopy
- LIDAR
- Standoff Chemical/Biological Detection
- Microplate Readout

**PRODUCT OVERVIEW**

| General Characteristics                  |  
|------------------------------------------|---|
| Window                                   | Fused Silica (Optional Fibre Optic) |
| Active Area                              | 53 x 53 mm |
| Electron Multiplier                      | Dual MCP |
| Anode Format                             | 64 x 64 (Reconfigurable) |
| Anode Pitch                              | 0.828 mm |
| Photocathode                             | Solar Blind, Bi-Alkali, S20, S25 |
SPECIFICATIONS

Single Photon Response

- **Dark Counts per Anode**: < 2 cps
- **Pulse Risetime (10% to 90%)**: < 175 ps
- **Pulse Width**: < 430 ps FWHM
- **Transit Time Spread**: < 40 ps RMS
- **Pulse Height Distribution**: 100% FWHM
- **Linear Total Count Rate**: Up to 10 MHz

Maximum Ratings

- **Overall Voltage**: < 3500 V
- **Operating Temperature**: -50 to +50°C
- **Storage Temperature**: -50 to +50°C

OUTLINE DRAWING

Pulse height distribution using single photon illumination with 60 second integration. Mean gain calibrated to be $1.0 \times 10^6$.

Available photocathodes on fused silica window. Optional fibre optic window will reduce sensitivity and no response below 300 nm.

Interposer boards with ribbon connectors are available in user-defined configurations, including summing of adjacent anodes or reduced area coverage. Examples include:

<table>
<thead>
<tr>
<th>Anode Format</th>
<th>Pitch (mm) X</th>
<th>Pitch (mm) Y</th>
<th>Total Anodes</th>
</tr>
</thead>
<tbody>
<tr>
<td>64 x 64</td>
<td>0.828</td>
<td>0.828</td>
<td>4096</td>
</tr>
<tr>
<td>32 x 32</td>
<td>1.656</td>
<td>1.656</td>
<td>1024</td>
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<td>64 x 8</td>
<td>0.828</td>
<td>6.624</td>
<td>512</td>
</tr>
<tr>
<td>8 x 8</td>
<td>6.624</td>
<td>6.624</td>
<td>64</td>
</tr>
</tbody>
</table>

0.45 □ Contact

0.828 □ Pitch