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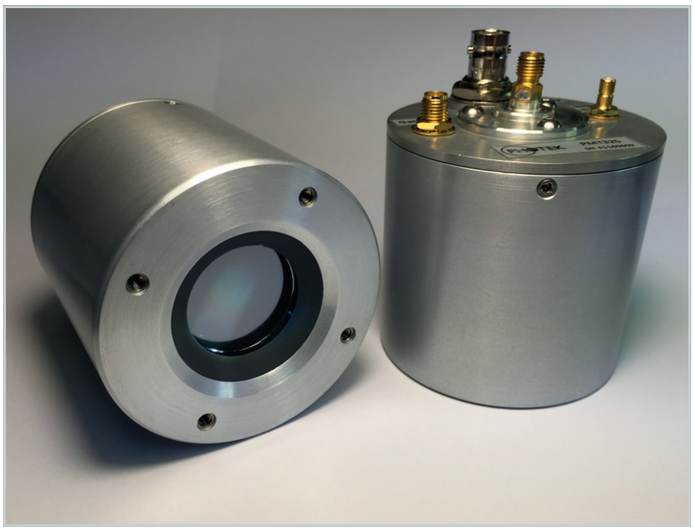
Photomultiplier Tube

Analysis of ultra-fast optical phenomena



Photek's range of photomultiplier tubes (PMTs) provide solutions for analysing ultra fast optical phenomena in a range of applications, including LiDAR, nuclear physics and time correlated photon counting.

Photek manufactures 10, 25, and 40 mm PMTs with a variety of photocathodes having high sensitivity in the UV, visible and NIR spectrum. A number of MCP configurations are available to ensure that Photek's PMTs satisfy all user gain requirements. Photek's PMTs are the fastest in the world with pulse rise times down to 60 ps and pulse FWHM down to 100 ps. For applications where fast gating is required, the Photek photomultipliers can provide gated speeds to 2 ns.

Key Attributes

- 10, 25 and 40 mm areas as standard, other sizes available upon request
- Single, chevron or z-stack MCP options with gain greater than 10^7
- Wide range of photocathodes including UV, solar blind, visible and NIR response
- Rise time to 60 ps (model dependant)
- FWHM to 100 ps (model dependant)
- Single photon jitter below 30 ps
- Multi-photon jitter below 10 ps
- Fast pulse output linear up to 1 A
- Integral 50 ohm output

Applications

- Analysis of fast optical pulses
- Cherenkov light detection
- Fluorescence spectroscopy
- LiDAR
- Particle & Nuclear physics
- Single photon counting fluorescence
- Time correlated photon counting

Available Configurations

MCP	Size	Input	Cathode	Gating
1	18	**F** (fibre)	CsI	**G** (fibre optic)
2	25	**Q** (fused silica)	SB	**NG**
3	40	**M** (MgF_2)	BI	**TCU**
		G (glass)	S20B	
			S20	
			S25	

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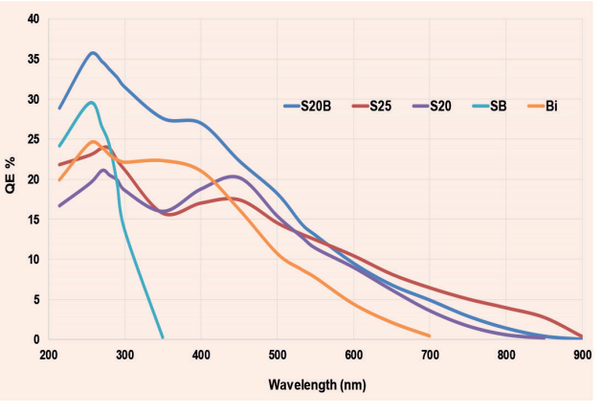
Quantum Efficiency Curves

Photek offers a full range of second generation photocathodes. These include CsI, Solar Blind, Bialkali, Low Noise S20, S20 and S25 which demonstrate the broad spectral response that can be achieved, as seen below:



Note: Detectors with fibre optic input windows will have no response below 300 nm. Specific gating requirements may alter the QE. Please contact the Sales Office to discuss your exact requirements.

Time Response - Pulse Rise Time (ps)

MCPs	Detector Diameter								
	10 mm			25 mm			40 mm		
	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max
1	60	65	70		115		100	150	200
2	75	85	95		190		180	230	280
3		105		300	400	500		320	

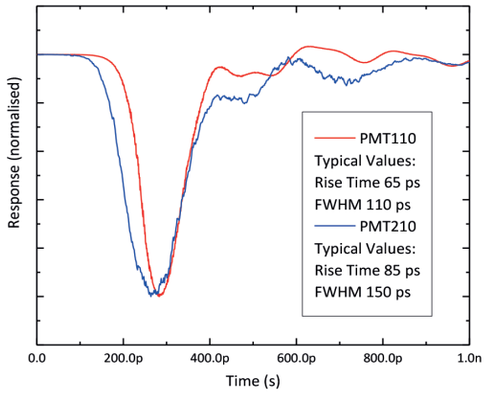
Pulse FWHMs (ps)

MCPs	Detector Diameter								
	10 mm			25 mm			40 mm		
	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max
1	100	110	120		700		300	450	600
2	130	150	170		840		600	850	1100
3		170		800	1000	1200		920	

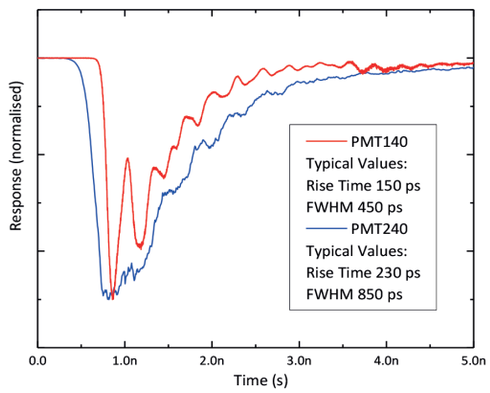
Typical Output Waveform

Graphs below show how the typical output waveform changes with gain and size.

Results for a 10 mm 1 MCP

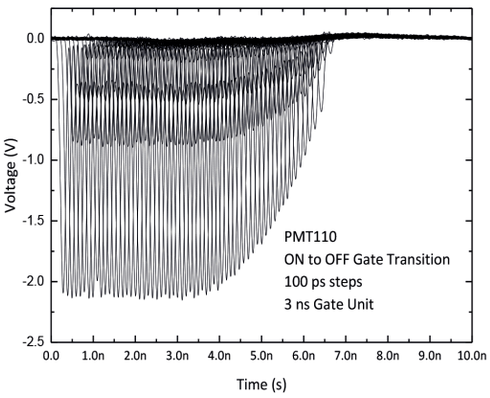


Results for a 40 mm 1 MCP



Gate Transition

The ON-OFF gate transition for a PMT110 can be seen below using a GM300-3N 3 ns, 300 kHz gate unit.



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