

Design and Characterization of a Micro-Strip RF Anode for Large-Area MCP-based Photodetectors

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We describe an inexpensive micro-strip RF anode designed to measure the time and position in large-area MCP-based photo-detectors. The anode has been optimized to match the bandwidth of the intrinsically fast MCPs (risetime $< 1\text{ns}$). The timing, two-dimensional position, and energy of the MCP pulses are extracted by fast waveform digitization at both ends of the anode micro-strips. The anode geometry consists of 30 equidistant, silver microstrips silk-screened on a 20cm-by-20cm, 2.75 mm-thick, Borofloat glass plate. A solid ground plane is referenced on the opposite side of the glass. The anode is measured to have an analog bandwidth of 2 GHz (175 ps risetime), cross-talk coupling between strips of -10dB, and impedance control of the 50-ohm lines of better than 10% over the entire bandwidth. The anode geometry and construction allows for multiple anodes to be connected in series, efficiently increasing the photosensitive area for the same number of electronics channels.

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