

85104 Microchannel Plate Photomultiplier

With Semi-Transparent Gallium-Arsenide Photocathode

- Typical Luminous Sensitivity 1500 $\mu\text{A}/\text{lm}$
- Over 120 mA/Watt at 860 nm Typical
- Broad Spectral Response Range
350 to 920 nm
- 18 mm Diameter Input Window
- 52.5 mm Case Length
- Excellent Photon Counting Properties

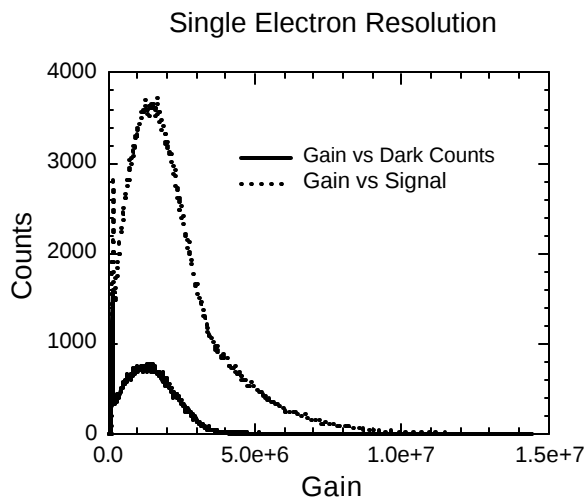
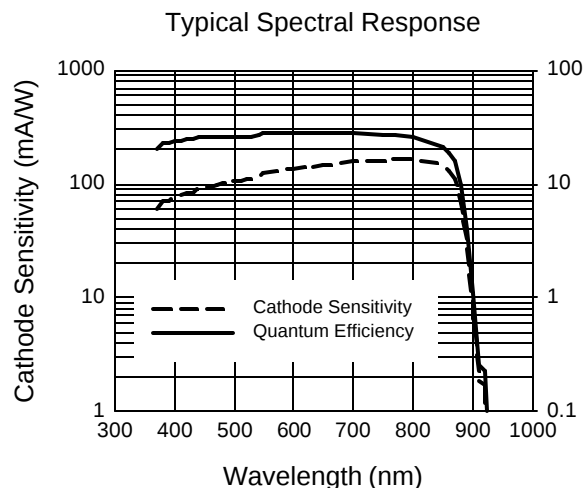
BURLE's 85104 gallium-arsenide photocathode microchannel plate photomultiplier (MCP PMT) has exceptionally high cathode sensitivity that extends well into the near-infrared region of the spectrum. The MCP and anode are in close proximity within the vacuum envelope so that the tube has high immunity to external magnetic fields. It has a short length as well which makes the tube a very compact component to keep detector package size small. Depending on MCP voltage, gains in excess of 4×10^6 are achievable.

For noise reduction, the tube can be operated at reduced temperatures such as in a thermoelectric cooler as is frequently done with conventional PMT's.

The 85104 has very good single electron resolution coupled with low dark counts at reduced temperatures resulting in excellent photon counting properties.

Maximum Ratings

Anode Current:	
Continuous or average	300 nA
DC Supply Voltage:	
Overall Voltage	-3600 V
Temperature	
	-50 °C - +50 °C



GENERAL CHARACTERISTICS

Useful Area = 254 mm²
Multiplier Structure - 2-stage Microchannel Plate
Capacitance, Anode to Ground (case) = 15 pF

Weight = 153 grams
Dimensions - See diagram below.

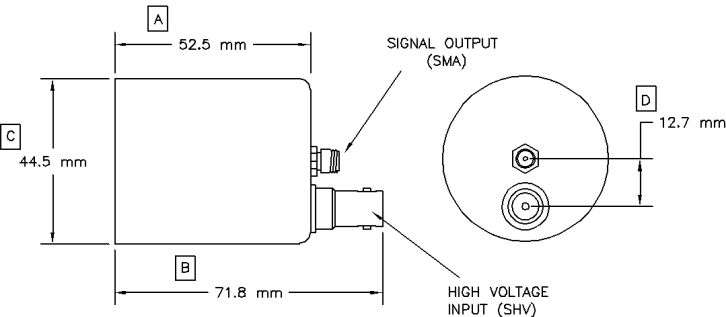
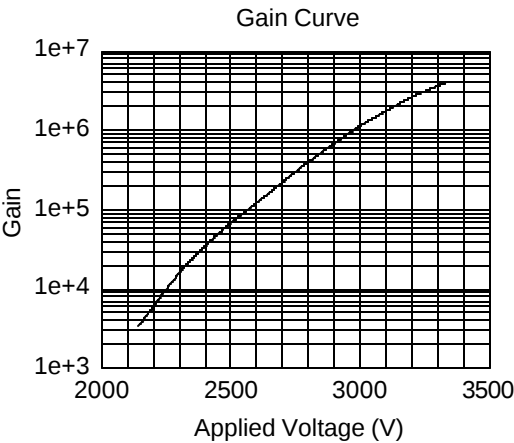
ELECTRICAL CHARACTERISTICS

PARAMETER	Minimum	Typical	Maximum	Units
Cathode Response				
Luminous	1250	1500	-----	µA/lm
Radiant @ 410 nm	55	80	-----	mA/W
Radiant @ 860 nm	80	120	-----	mA/W
Anode Dark Current ¹	-----	-----	10	nA
Dark Count Rate ²	-----	-----	200	CPS
Peak Pulse Current ³	-----	-----	150	mA
Peak-to-Valley	2:1	-----	-----	

- Notes: 1. At a gain of 1 X 10⁶
2. At -30 °C; gain = 5 X 10⁵ to 2 X 10⁶, 1/3 to 3 pe equivalent, Peak-to-Valley ratio 2:1 or better.
3. For narrow pulse widths at a low duty cycle; the average anode current of 300 nA should never be exceeded, therefore, it may be necessary to calculate the average current from the known pulse characteristics.

PRECAUTIONS

1. Do not exceed the maximum high voltage rating under any circumstances. Apply the high voltage gradually rather than instantly switching on the full high voltage. Monitoring the output with a microammeter is a good method to use to indicate excessive anode current. The supply must always be NEGATIVE high voltage. Be sure to apply the correct polarity from the high voltage supply.
2. Do not connect or disconnect the signal or high voltage cable during operation. After turning off the high voltage, allow the voltage to discharge to 0 before disconnecting.
3. Use care to assure that the maximum continuous anode current is never exceeded. This could result in permanent damage to the device. If a current meter is not used, the voltage developed across a known load resistor can be used as an indication of the current, either with an oscilloscope or a voltmeter.



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