GM-MCP3-500

1kHz 10ns 500V Gating Module

The GM-MCP3-500 module is a +12V d.c. powered 500V pulse amplifier for periodic operation of MCP devices by biasing the MCP on and off for specific lengths of time. This unit requires an external +12V/300mA power supply, a +5V TTL input trigger pulse and an external high voltage power supply for the bias input, ±9kV max.

The GM-MCP3 is designed to gate Micro-Channel Plate devices. The output pulse is directly related to the input pulse but will be delayed and there is a small pulse width loss across the GM-MCP3 of between 2 to 5ns.

Operating Characteristics

The gate module is intended to connect directly to the device being gated by a short length of wire. The MCP may be biased to a voltage of ±9kV and the output pulse of the GM-MCP3-500 will be +500V with respect to the bias input and thus turn the detector on.

The gate pulse drive required is 5V TTL into the GM-MCP3 high impedance input. The propagation delay across the GM-MCP3 is approximately 60ns, this is specific to each unit and if precise figures are required the unit must be measured.

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GM-MCP3 Pulse Characteristics

<table>
<thead>
<tr>
<th></th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Pulse</td>
<td>10ns</td>
<td>RC Limited</td>
</tr>
<tr>
<td>Pulse Width Loss</td>
<td>2ns</td>
<td>5ns</td>
</tr>
<tr>
<td>Propagation Delay</td>
<td>50ns</td>
<td>70ns</td>
</tr>
<tr>
<td>O/P Pulse Rise-time</td>
<td>4ns</td>
<td>8ns</td>
</tr>
<tr>
<td>O/P Pulse Fall-time</td>
<td>2ns</td>
<td>6ns</td>
</tr>
<tr>
<td>Off Voltage</td>
<td>0V +Bias Input</td>
<td></td>
</tr>
<tr>
<td>On Voltage</td>
<td>1000V +Bias Input</td>
<td></td>
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</tbody>
</table>

The GM-MCP3-500 has a Positive Bias inhibit circuit which will disable the output pulse if the high voltage bias input exceeds a pre-set level. An LED will illuminate if the trip has activated and disabled the Gate Pulse Output.

To set the trip level, apply the maximum bias voltage then adjust the trimpot until the LED illuminates.

This inhibit only works for positive bias inputs.
Items Supplied
1 x 700-1048 - GM-MCP3-500 Gating Module.
1 x ED558 – SHV to SHV Cable – 65mm.
1 x ED588 – BNC to SMA Trigger Cable – 2m.
1 x B4025 - Universal a.c. to 12Vd.c. Power Supply. *see note
1 x B3000 or B3001 or B3002 - UK/US/EU IEC Power Lead. *see note

*Note: - B4025 and IEC Power Lead are not supplied if the unit is to be used with any mains powered Photek unit. An appropriate power cable will be supplied to connect the GM-MCP3 to the mains powered unit.

Electrical Specifications - Inputs
- **Supply Voltage**: +12V D.C. ±5%
- **Supply Current - Typical** (Operating Frequency = 1kHz): <100mA (300mA Turn On Surge)
- **Input Drive Pulse**: 5V TTL
- **Input Impedance**: High Impedance
- **High Voltage Bias Input maximum**: ±9kV

Electrical Specifications - Outputs
- **Negative O/P Voltage Max.**: 0V (±Bias I/P)
- **Positive O/P Voltage Max.**: +500V (±Bias I/P)
- **Output Pulse Min.**: 10ns FWHM
- **Minimum MCP Load**: 10MΩ
- **Maximum Capacitive Load**: 300pF
- **Jitter (Input to Output)**: <250ps RMS

Mechanical Specifications
- **Length**: 166mm
- **Length (Incl. Connectors)**: 191mm
- **Width**: 81.1mm
- **Height**: 46.1mm
- **Weight**: ~420g

Operating Temperature Range
- **Temperature Minimum**: 0°C
- **Temperature Maximum**: 70°C

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