The G Series is a line of miniature, versatile component level building blocks that provide up to 6kV, positive or negative, in a compact PCB mount package. The isolated output is directly proportional to the input, and is linear from approximately 0.7 volts in. Excellent filtering techniques and a low noise quasi-sinewave oscillator provide clean, reliable DC to HV DC conversion with low ripple and low EMI/RFI. The isolated output allows for user selectable output polarity. A dual output option with center-tap pin which, when grounded provides both positive and negative outputs from one compact, low cost module. The pin pattern on the G Series allows for a direct drop-in replacement for many larger high voltage modules. The GPMT model has been specifically designed for biasing PMT's.

### FEATURES
- Proportional Input/Output
- Compact, PCB Mount Package
- Low Ripple, Low EMI / RFI
- Proven Reliability
- Short Circuit Protection
- Input/Output Isolation
- Low Leakage Current
- Low Input/Output Coupling Capacitance
- No External Components Required
- No Minimum Load Required
- MTBF: >2.29 Million Hours per Bellcore TR-332
- RoHS Compliant

### APPLICATIONS
- Capacitor Charging
- Piezo Devices
- Mass Spectrometry
- Electrostatic Chuck
- Igniter / Spark Module
- Sustaining Ion Pumps
- Piezo Devices
- Vacuum Gauges
- Photomultiplier Tubes
- Lamp Ignition and Drive

### OPTIONS
- Dual output (Center Tap) Models Available (CT Suffix)
- External Mounting Enclosure (AB Suffix)
- Alternate Input/Output Combinations (Consult Factory)
### Electrical Specifications

<table>
<thead>
<tr>
<th>Reversible Model</th>
<th>Output Voltage$^2$</th>
<th>Dual Output (Center Tap) Model$^4$</th>
<th>Output Voltage$^2$</th>
<th>Output Current$^1$</th>
<th>Input Current (No Load)</th>
<th>Input Current (Full Load)</th>
<th>Ripple$^5$</th>
</tr>
</thead>
<tbody>
<tr>
<td>G01</td>
<td>0 to 100V</td>
<td>G01CT</td>
<td>0 to +/- 50V</td>
<td>15mA</td>
<td>&lt;100mA</td>
<td>&lt;250mA</td>
<td>&lt;1.75%</td>
</tr>
<tr>
<td>G02</td>
<td>0 to 200V</td>
<td>G02CT</td>
<td>0 to +/- 100V</td>
<td>7.5mA</td>
<td>&lt;100mA</td>
<td>&lt;250mA</td>
<td>&lt;0.75%</td>
</tr>
<tr>
<td>G03</td>
<td>0 to 300V</td>
<td>G03CT</td>
<td>0 to +/- 150V</td>
<td>5mA</td>
<td>&lt;100mA</td>
<td>&lt;250mA</td>
<td>&lt;0.75%</td>
</tr>
<tr>
<td>G04</td>
<td>0 to 400V</td>
<td>G04CT</td>
<td>0 to +/- 200V</td>
<td>3.75mA</td>
<td>&lt;100mA</td>
<td>&lt;250mA</td>
<td>&lt;0.75%</td>
</tr>
<tr>
<td>G05</td>
<td>0 to 500V</td>
<td>G05CT</td>
<td>0 to +/- 250V</td>
<td>3mA</td>
<td>&lt;100mA</td>
<td>&lt;250mA</td>
<td>&lt;0.1%</td>
</tr>
<tr>
<td>G06</td>
<td>0 to 600V</td>
<td>G06CT</td>
<td>0 to +/- 300V</td>
<td>2.5mA</td>
<td>&lt;100mA</td>
<td>&lt;250mA</td>
<td>&lt;0.1%</td>
</tr>
<tr>
<td>G10</td>
<td>0 to 1kV</td>
<td>G10CT</td>
<td>0 to +/- 500V</td>
<td>1.5mA</td>
<td>&lt;100mA</td>
<td>&lt;250mA</td>
<td>&lt;0.1%</td>
</tr>
<tr>
<td>G12</td>
<td>0 to 1.2kV</td>
<td>G12CT</td>
<td>0 to +/- 600V</td>
<td>1.25mA</td>
<td>&lt;150mA</td>
<td>&lt;275mA</td>
<td>&lt;0.1%</td>
</tr>
<tr>
<td>G15</td>
<td>0 to 1.5kV</td>
<td>G15CT</td>
<td>0 to +/- 750V</td>
<td>1.0mA</td>
<td>&lt;125mA</td>
<td>&lt;275mA</td>
<td>&lt;0.5%</td>
</tr>
<tr>
<td>G20</td>
<td>0 to 2kV</td>
<td>G20CT</td>
<td>0 to +/- 1kV</td>
<td>0.75mA</td>
<td>&lt;165mA</td>
<td>&lt;275mA</td>
<td>&lt;0.5%</td>
</tr>
<tr>
<td>G25</td>
<td>0 to 2.5kV</td>
<td>G25CT</td>
<td>0 to +/- 1.25kV</td>
<td>0.60mA</td>
<td>&lt;125mA</td>
<td>&lt;275mA</td>
<td>&lt;1.0%</td>
</tr>
<tr>
<td>G30</td>
<td>0 to 3kV</td>
<td>G30CT</td>
<td>0 to +/- 1.5kV</td>
<td>0.50mA</td>
<td>&lt;125mA</td>
<td>&lt;300mA</td>
<td>&lt;2.0%</td>
</tr>
<tr>
<td>G40</td>
<td>0 to 4kV</td>
<td>G40CT</td>
<td>0 to +/- 2kV</td>
<td>0.37mA</td>
<td>&lt;125mA</td>
<td>&lt;300mA</td>
<td>&lt;1.0%</td>
</tr>
<tr>
<td>G50</td>
<td>0 to 5kV</td>
<td>G50CT</td>
<td>0 to +/- 2.5kV</td>
<td>0.30mA</td>
<td>&lt;125mA</td>
<td>&lt;300mA</td>
<td>&lt;2.0%</td>
</tr>
<tr>
<td>G60</td>
<td>0 to 6kV</td>
<td>G60CT</td>
<td>0 to +/- 3kV</td>
<td>0.25mA</td>
<td>&lt;125mA</td>
<td>&lt;300mA</td>
<td>&lt;2.0%</td>
</tr>
<tr>
<td>GPMT</td>
<td>0 to 1.25kV</td>
<td>—</td>
<td>—</td>
<td>350uA</td>
<td>&lt;35mA</td>
<td>&lt;75mA</td>
<td>&lt;0.05%</td>
</tr>
<tr>
<td>PARAMETER</td>
<td>VALUE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------------------</td>
<td>------------------------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INPUT VOLTAGE</td>
<td>0 to 12VDC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TURN-ON VOLTAGE</td>
<td>&lt;0.7VDC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ISOLATION</td>
<td>&lt; +/-3.5kV BIAS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INPUT CAPACITANCE</td>
<td>120µF</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RESPONSE TIME</td>
<td>&lt;15ms (G01 thru G60 Models)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt;40ms (GMPT Models)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OUTPUT VOLTAGE TOLERANCE</td>
<td>+/-3% (Full Load, 100% output voltage)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>REGULATION</td>
<td>&lt;10% VARIATION OVER LOAD RANGE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FREQUENCY</td>
<td>125kHz +/- 65kHz</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OPERATING TEMPERATURE*6</td>
<td>-10C to +60°C (CASE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STORAGE TEMPERATURE</td>
<td>-25C to +90°C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**TOP VIEW**

- **0.25 (6.35)**
- **1.000 (25.40)**
- **0.15 (3.81)**
- **1.200 (30.48)**

**RECOMMENDED HOLE & PAD O.D. SIZE:**
- Ø 0.052 (1.32) & Ø 0.082 (2.08) 4 PLACES

**RECOMMENDED PCB LAYOUT**

- **0.15 (3.81)**
- **1.200 (30.48)**
- **0.800 (20.32)**
- **0.35 (8.89)**
- **0.20 (5.08)**
- **0.25 (6.35)**

**DIMENSIONS ARE IN INCHES (METRIC EQUIVALENTS ARE IN PARENTHESES) DIMENSIONAL TOLERANCES: .XX = ±0.02 (0.51), .XXX = ±0.005 (0.127)**

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>WEIGHT</td>
<td>Weight: 1.5 OZ (43 Grams)</td>
</tr>
<tr>
<td>VOLUME</td>
<td>1.4 cubic inches (23 cubic centimeters)</td>
</tr>
<tr>
<td>DIMENSIONS</td>
<td>1.5L (38.1L) x 1.5W (38.1L) x 0.63H (16.0H)</td>
</tr>
<tr>
<td>CASE MATERIAL</td>
<td>Diallyl Phthalate (DAP)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PIN #</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(+) Input</td>
</tr>
<tr>
<td>2</td>
<td>(-) Input</td>
</tr>
<tr>
<td>3</td>
<td>(+) Output</td>
</tr>
<tr>
<td>4</td>
<td>(-) Output</td>
</tr>
</tbody>
</table>
### G SERIES

#### G50 THRU G60 MECHANICAL SPECIFICATIONS

**TOP VIEW**

[Diagram of TOP VIEW showing dimensions and labels]

**RECOMMENDED PCB LAYOUT**

[Diagram of PCB layout showing pin connections and dimensions]

- **RECOMMENDED HOLE & PAD O.D. SIZE:**
  - Ø 0.052 (1.32) & Ø 0.082 (2.08)
  - 4 PLACES

**DIMENSIONS ARE IN INCHES (METRIC EQUIVALENTS ARE IN PARENTHESES)**

**DIMENSIONAL TOLERANCES:** .XX = +0.02 (0.51), .XXX = +0.005 (0.127)

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>WEIGHT</td>
<td>Weight: 1.5 OZ (43 Grams)</td>
</tr>
<tr>
<td>VOLUME</td>
<td>1.4 cubic Inches (23 cubic centimeters)</td>
</tr>
<tr>
<td>DIMENSIONS</td>
<td>1.5L (38.1L) x 1.5W (38.1L) x 0.63H (16.0H)</td>
</tr>
<tr>
<td>CASE MATERIAL</td>
<td>Diallyl Phthalate (DAP)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PIN #</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(+) Input</td>
</tr>
<tr>
<td>2</td>
<td>(-) Input</td>
</tr>
<tr>
<td>3</td>
<td>(+) Output</td>
</tr>
<tr>
<td>4</td>
<td>(-) Output</td>
</tr>
</tbody>
</table>

**WEIGHT**

Weight: 1.5 OZ (43 Grams)

**VOLUME**

1.4 cubic Inches (23 cubic centimeters)

**DIMENSIONS**

1.5L (38.1L) x 1.5W (38.1L) x 0.63H (16.0H)

**CASE MATERIAL**

Diallyl Phthalate (DAP)
G SERIES

G01CT THRU G20CT MECHANICAL SPECIFICATIONS

PARAMETER | VALUE
--- | ---
WEIGHT | Weight: 1.5 OZ (43 Grams)
VOLUME | 1.4 cubic Inches (23 cubic centimeters)
DIMENSIONS | 1.5L (38.1L) x 1.5W (38.1L) x 0.63H (16.0H)
CASE MATERIAL | Diallyl Phthalate (DAP)

PIN/WIRE # | FUNCTION
--- | ---
1 | (+) Input
2 | (-) Input
3 | (+) Output
4 | (-) Output
5 | Dual Output/Center Tap

DIMENSIONS ARE IN INCHES (METRIC EQUIVALENTS ARE IN PARENTHESIS)
DIMENSIONAL TOLERANCES: XX = ±0.02 (0.51), XXX = ±0.005 (0.127)
G25CT THRU G60CT MECHANICAL SPECIFICATIONS

**PARAMETER** | **VALUE** |
--- | --- |
Weight | 1.5 OZ (43 Grams) |
Volume | 1.4 cubic inches (23 cubic centimeters) |
Dimensions | 1.5L (38.1L) x 1.5W (38.1L) x 0.63H (16.0H) |
Case Material | Diallyl Phthalate (DAP) |

**PIN/WIRE #** | **FUNCTION** |
--- | --- |
1 | (+) Input |
2 | (-) Input |
3 | (+) Output |
4 | (-) Output |
5 | Dual Output/Center Tap |

**Top View**

**Recommended PCB Layout**

**Recommended Hole & Pad O.D. Size:**

\( \varnothing 0.052 \text{ (1.32)} & \varnothing 0.082 \text{ (2.08)} \)

5 places

**Dimensions are in inches (metric equivalents are in parenthesis)**

**Dimensional Tolerances:** XX = \( \pm 0.02 \text{ (0.51)} \), XXX = \( \pm 0.005 \text{ (0.127)} \)
The "AB" Series provides low cost EMI/RFI shielding and rugged mounting for XP EMCO High Voltage DC to DC converters. These five-sided aluminum enclosures feature a durable, non-conductive black anodized finish. The enclosures are manufactured at our own sheet metal fabrication facility, which allows for low cost and stock delivery. Add an "AB" suffix to the model number for a factory-installed enclosure (e.g. E10AB). Contact our sales department by phone, fax or email for immediate attention.

### Application Information

On models with outputs of 3kV or higher, special care must be taken to ensure adequate spacing and insulation between the metal can and the high voltage output. Single sided layout, encapsulants or conformal coating may be required.

Case grounding stud must be connected to ground. Case ground is not internally connected to (-) input.

---

**Shield Description**

**Parameter** | **Value**
---|---
Box Size | See Table
Material | 0.03 (0.76mm) Aluminum
Mounting | Two Tabs With Thru-Holes

**Application Information**

**Parameter** | **Value**
---|---
Ground | Black Anodized Aluminum
Dimensions With Tab | 2.4L (60.96) x 1.6W (40.64) x 0.68H (17.27)
Dimensions Without Tab | 1.6L (40.64) x 1.6W (40.64) x 0.68H (17.27)
**Notes:**

1. At maximum rated output voltage.
2. Output voltage is load dependent. Under light or no load conditions, reduce input voltage so maximum rated output voltage is not exceeded.
3. Specifications after 30 minute warm up, full load, at 25°C unless otherwise indicated.
4. For dual output units [CT option], the negative output voltage will be ~20% larger than the positive output voltage with respect to the center tap pin.
5. Ripple Specifications for dual output units applies to the voltage between the positive and negative output terminals.
6. Proper thermal management techniques are required to maintain safe case temperature at maximum power output.
7. The GPTT is only 0.4375W.
8. Models G40, G50 & G60 do not have internal bleeder resistors on the output. Provisions must be made externally to discharge the output capacitors.

XP EMCO reserves the right to make changes on products and literature, including specifications, without notice. XP EMCO standard product models are not recommended for “copy-exact” applications or any other application restricting product changes. “Copy-exact” options are available. Please contact an XP EMCO sales representative for more details.

---

**PART NUMBER SELECTOR:**

Model Number:

**G10CTAB**

Model

Output Voltage (See table)

Center Tap (for dual output option)

Shielding & Mounting Enclosure (Optional)

**EXAMPLE:** **G10CTAB** (G-Model, 10-Output Voltage, CT-Center Tap, AB-Shielding & Mounting Enclosure)