



ULTRAVOLT® M SERIES
MINIATURE, MICRO-SIZED
HIGH VOLTAGE BIASING SUPPLIES





Single-output, micro-sized HV modules

The miniature, micro-sized M series is the ideal solution for applications requiring biasing voltage ranging from 0 to 3000 V and very small current—only 16.4 cc (1.00 in³). Less than 12.7 mm (0.5") high, these modules are ideal for low-profile applications.

Features

- › Seven models from 0 to 600, 1000, 1250, 1500, 2000, 2500, or 3000 V
- › Output power: 0.5, 0.8, or 1 W
- › Tight line/load regulation
- › Arc and continuous short circuit protection
- › Self-restoring output voltage
- › Low cost
- › Miniature and lightweight
- › Voltage monitoring
- › Low ripple (0.01% peak to peak)
- › Optional flying lead for high voltage output

Typical Applications

- › Bias supplies
- › Electrostatic chucks
- › Hand held x-ray fluorescence (XRF)
- › Avalanche photo diodes (APD)
- › Photomultiplier tubes (PMT)
- › Silicon detector (SiD)
- › X-ray flat panel detector (FPD)
- › Ionization chamber detector





| PARAMETER | SPECIFICATIONS | | | | | | UNITS |
|---|---|------|------|-----------------------------|------|------|------------|
| Input Voltage Vin (Pins 1 and 2) | 5 ±0.5 (2 to 3 kV ONLY), 12 ±1, 15 ±1 (600 V to 1.5 kV ONLY), or 24 ±2 | | | | | | VDC |
| Input Voltage | 5 (2 to 3 kV ONLY) | | | 12 | | | V |
| Input Current | No load: 55, full load: 450 | | | No load: 45, full load: 200 | | | mA |
| Polarity | Fixed positive and fixed negative | | | | | | - |
| Output Voltage | 0 to 600 | | | 0 to 1000 | | | VDC |
| Input Voltage | 12 | 15 | 24 | 12 | 15 | 24 | VDC |
| Output Power | 0.5 | 0.8 | 1 | 0.5 | 0.8 | 1 | W |
| Output Current | 0.83 | 1.33 | 1.67 | 0.5 | 0.8 | 1 | mA |
| Output Voltage | 0 to 1250 | | | 0 to 1500 | | | VDC |
| Input Voltage | 12 | 15 | 24 | 12 | 15 | 24 | VDC |
| Output Power | 0.5 | 0.8 | 1 | 0.5 | 0.8 | 1 | W |
| Output Current | 0.4 | 0.64 | 0.8 | 0.33 | 0.53 | 0.67 | mA |
| HV Setting | 10 to 100 K (potentiometer across Vref. and signal ground, wiper to adjust) | | | | | | - |
| Load Voltage Regulation | < 0.01% of full output voltage for no load to full load | | | | | | VDC |
| Line Voltage Regulation | < 0.01% of full output voltage over specified input voltage range | | | | | | VDC |
| Residual Ripple | < 0.01% at full load | | | | | | V pk to pk |
| Temperature Coefficient | 100 ppm/°C for the max output voltage after starting and over temperature range 0 to 50°C | | | | | | - |
| Output Voltage Monitoring (600 to 1500 V) | +1 V/1 kV max or -1 V/-1 kV max according to model polarity output impedance = 200 kΩ ±1% | | | | | | - |
| Output Voltage Monitoring (2 to 3 kV) | 12 to 24 V input only: 0 to +5 V±2% | | | | | | VDC |
| | 5 V inputs: 0 to +2.5 V±2% | | | | | | |
| Reference Voltage | 12 to 24 V input only: 5 V ±1%, TC: 100 ppm/°C, max output current: 1 mA | | | | | | - |
| | 5 V inputs: 2.5 V ±1%, TC: 100 ppm/°C, max output current: 1 mA | | | | | | |
| Operating Temperature | -10 to +65, full load, max Eout, case temp | | | | | | °C |
| Storage Temperature | -40 to +70 | | | | | | °C |
| Safeguards | Arc and short circuit protection | | | | | | - |
| Options | Flying lead for HV output | | | | | | - |
| Enhanced Interface (-EI) Option (2 to 3 kV Only) | Enable/disable (ON/OFF): 0 to +0.5 V enable, +2.4V to V_input disable (default = disable) | | | | | | - |
| | Output current monitor (5 V input only): 0 to +2.5 V ±2% | | | | | | |
| | Output current monitor (12 to 24 V input): 0 to +5.0 V ±2% | | | | | | - |



| PARAMETER | SPECIFICATIONS | | | | | | UNITS |
|---|---|------|------|-----------------------------|-------|-------|------------|
| Input Voltage Vin (Pins 1 and 2) | 5 ±0.5 (2 to 3 kV ONLY), 12 ±1, 15 ±1 (600 V to 1.5 kV ONLY), or 24 ±2 | | | | | | VDC |
| Input Voltage | 15 (600 V to 1.5 kV ONLY) | | | 24 | | | V |
| Input Current | No load: 40, full load: 190 | | | No load: 35, full load: 160 | | | mA |
| Polarity | Fixed positive and fixed negative | | | | | | - |
| Output Voltage | 0 to 2000 | | | 0 to 2500 | | | VDC |
| Input Voltage | 5 | 12 | 24 | 5 | 12 | 24 | VDC |
| Output Power | 0.5 | 0.8 | 1 | 0.5 | 0.8 | 1 | W |
| Output Current | 0.25 | 0.40 | 0.50 | 0.20 | 0.32 | 0.40 | mA |
| Output Voltage | | | | 0 to 3000 | | | VDC |
| Input Voltage | | | | 5 | 12 | 24 | VDC |
| Output Power | | | | 0.5 | 0.8 | 1 | W |
| Output Current | | | | 0.167 | 0.267 | 0.333 | mA |
| HV Setting | 10 to 100 K (potentiometer across Vref. and signal ground, wiper to adjust) | | | | | | - |
| Load Voltage Regulation | < 0.01% of full output voltage for no load to full load | | | | | | VDC |
| Line Voltage Regulation | < 0.01% of full output voltage over specified input voltage range | | | | | | VDC |
| Residual Ripple | < 0.01% at full load | | | | | | V pk to pk |
| Temperature Coefficient | 100 ppm/°C for the max output voltage after starting and over temperature range 0 to 50°C | | | | | | - |
| Output Voltage Monitoring (600 to 1500 V) | +1 V/1 kV max or -1 V/-1 kV max according to model polarity output impedance = 200 kΩ ±1% | | | | | | - |
| Output Voltage Monitoring (2 to 3 kV) | 12 to 24 V input only: 0 to +5 V ±2% | | | | | | VDC |
| | 5 V inputs: 0 to +2.5 V ±2% | | | | | | |
| Reference Voltage | 12 to 24 V input only: 5 V ±1%, TC: 100 ppm/°C, max output current: 1 mA | | | | | | - |
| | 5 V inputs: 2.5 V ±1%, TC: 100 ppm/°C, max output current: 1 mA | | | | | | |
| Operating Temperature | -10 to +65, full load, max Eout, case temp | | | | | | °C |
| Storage Temperature | -40 to +70 | | | | | | °C |
| Safeguards | Arc and short-circuit protection | | | | | | - |
| Options | Flying lead for HV output | | | | | | - |
| Enhanced Interface (-EI) Option (2 to 3 kV Only) | Enable/disable (ON/OFF): 0 to +0.5 V enable, +2.4V to V_input disable (default = disable) | | | | | | - |
| | Output current monitor (5 V input only): 0 to +2.5 V ±2% | | | | | | |
| | Output current monitor (12 to 24 V input): 0 to +5.0 V ±2% | | | | | | - |



PCB MOUNTING (TOP VIEW)

Note: Pins 7 and 8 are available for 2 kV to 3 kV units with enhanced interface option ONLY.
 Drawing views: third angle projections. Measurements are in inches (millimeters).

PHYSICAL SPECIFICATIONS

| | |
|---------------------|--|
| Construction | Steel, tin-plated thickness 0.5 mm (0.02") Insulation: fully potted in an epoxy resin |
| Volume | 16.4 cc (1.00 in ³) |
| Weight | 35 g (1.23 oz) |
| Tolerance | |
| Overall | ±0.76 mm (0.030") |
| Pin to Pin | ±0.38 mm (0.015") |
| Pin to Tab | ±0.51 mm (0.020") |
| Tab to Tab | ±0.25 mm (0.010") |

Notes: 0.47 mm (0.019") round pins, length: 3 mm (0.12"), spacing: 2.54 mm (0.1")
 PCB mounting through 4 mounting tabs, length: 5 mm (0.2"), width: 1.5 mm (0.059"), thickness: 0.5 mm (0.02")
 Optional flying lead for HV output: coaxial cable (RG178), diameter: 2 mm (0.079"), length: 500 mm (19.685")

CONNECTIONS

| Pin | Function |
|-----|--|
| 1 | POSITIVE POWER INPUT |
| 2 | POWER GROUND |
| 3 | SIGNAL GROUND |
| 4 | REMOTE ADJUST INPUT |
| 5 | REFERENCE VOLTAGE |
| 6 | VOLTAGE MONITOR |
| 7 | CURRENT MONITOR (available with -EI option only) |
| 8 | ENABLE (available with -EI option only) |
| 9 | HV OUTPUT |

Note: Mounting tabs must be connected to ground.



ORDERING INFORMATION

| | | |
|-----------------|--|------------|
| Type | 0 to 600 VDC Output | 0.6 M |
| | 0 to 1000 VDC Output | 1 M |
| | 0 to 1250 VDC Output | 1.25 M |
| | 0 to 1500 VDC Output | 1.5 M |
| | 0 to 2000 VDC Output | 2 M |
| | 0 to 2500 VDC Output | 2.5 M |
| | 0 to 3000 VDC Output | 3 M |
| Input | 5 VDC Nominal (2 to 3 kV only) | 5 |
| | 12 VDC Nominal | 12 |
| | 15 VDC Nominal (600 V to 1.5 kV only) | 15 |
| | 24 VDC Nominal | 24 |
| Power | 0.5 W Output | 0.5 |
| | 0.8 W Output | 0.8 |
| | 1 W Output | 1 |
| Case | Tin Steel Case | (Standard) |
| Polarity | Positive Output | -P |
| | Negative Output | -N |
| Option | Shielded Flying Lead for HV Output (600 V to 1.5 kV) | -WS |
| | Flying Lead for HV Output (2 to 3 kV only) | -W |
| | Current Monitor/Enable Pin (2 to 3 kV only) | -EI |



RoHS COMPLIANT Non-RoHS compliant units are available. Please contact the factory for more information.



Popular accessories ordered with this product include the PCB-CONN-M/V.

The M series is not available in all territories. Please contact Advanced Energy for details concerning sales in your area.



For international contact information, visit
advanced-energy.com.