



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





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# 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 in<sup>3</sup>). 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

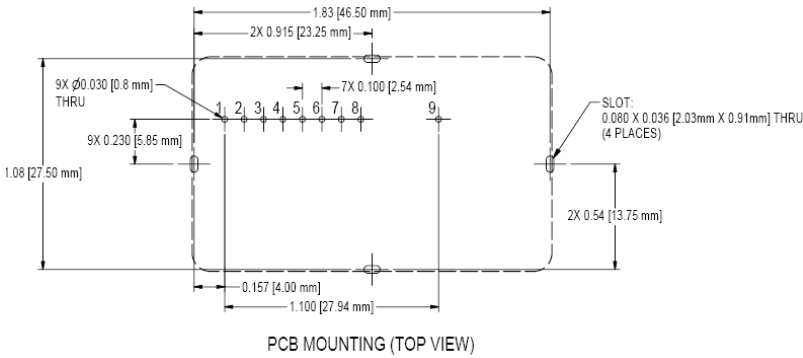




PARAMETER	SPECIFICATIONS						UNITS
<b>Input Voltage Vin (Pins 1 and 2)</b>	5 ±0.5 (2 to 3 kV ONLY), 12 ±1, 15 ±1 (600 V to 1.5 kV ONLY), or 24 ±2						VDC
<b>Input Voltage</b>	5 (2 to 3 kV ONLY)			12			V
<b>Input Current</b>	No load: 55, full load: 450			No load: 45, full load: 200			mA
<b>Polarity</b>	Fixed positive and fixed negative						-
<b>Output Voltage</b>	0 to 600			0 to 1000			VDC
<b>Input Voltage</b>	12	15	24	12	15	24	VDC
<b>Output Power</b>	0.5	0.8	1	0.5	0.8	1	W
<b>Output Current</b>	0.83	1.33	1.67	0.5	0.8	1	mA
<b>Output Voltage</b>	0 to 1250			0 to 1500			VDC
<b>Input Voltage</b>	12	15	24	12	15	24	VDC
<b>Output Power</b>	0.5	0.8	1	0.5	0.8	1	W
<b>Output Current</b>	0.4	0.64	0.8	0.33	0.53	0.67	mA
<b>HV Setting</b>	10 to 100 K (potentiometer across Vref. and signal ground, wiper to adjust)						-
<b>Load Voltage Regulation</b>	< 0.01% of full output voltage for no load to full load						VDC
<b>Line Voltage Regulation</b>	< 0.01% of full output voltage over specified input voltage range						VDC
<b>Residual Ripple</b>	< 0.01% at full load						V pk to pk
<b>Temperature Coefficient</b>	100 ppm/°C for the max output voltage after starting and over temperature range 0 to 50°C						-
<b>Output Voltage Monitoring (600 to 1500 V)</b>	+1 V/1 kV max or -1 V/-1 kV max according to model polarity output impedance = 200 kΩ ±1%						-
<b>Output Voltage Monitoring (2 to 3 kV)</b>	12 to 24 V input only: 0 to +5 V±2%						VDC
	5 V inputs: 0 to +2.5 V±2%						
<b>Reference Voltage</b>	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						
<b>Operating Temperature</b>	-10 to +65, full load, max Eout, case temp						°C
<b>Storage Temperature</b>	-40 to +70						°C
<b>Safeguards</b>	Arc and short circuit protection						-
<b>Options</b>	Flying lead for HV output						-
<b>Enhanced Interface (-EI) Option (2 to 3 kV Only)</b>	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
<b>Input Voltage Vin (Pins 1 and 2)</b>	5 ±0.5 (2 to 3 kV ONLY), 12 ±1, 15 ±1 (600 V to 1.5 kV ONLY), or 24 ±2						VDC
<b>Input Voltage</b>	15 (600 V to 1.5 kV ONLY)			24			V
<b>Input Current</b>	No load: 40, full load: 190			No load: 35, full load: 160			mA
<b>Polarity</b>	Fixed positive and fixed negative						-
<b>Output Voltage</b>	0 to 2000			0 to 2500			VDC
<b>Input Voltage</b>	5	12	24	5	12	24	VDC
<b>Output Power</b>	0.5	0.8	1	0.5	0.8	1	W
<b>Output Current</b>	0.25	0.40	0.50	0.20	0.32	0.40	mA
<b>Output Voltage</b>				0 to 3000			VDC
<b>Input Voltage</b>				5	12	24	VDC
<b>Output Power</b>				0.5	0.8	1	W
<b>Output Current</b>				0.167	0.267	0.333	mA
<b>HV Setting</b>	10 to 100 K (potentiometer across Vref. and signal ground, wiper to adjust)						-
<b>Load Voltage Regulation</b>	< 0.01% of full output voltage for no load to full load						VDC
<b>Line Voltage Regulation</b>	< 0.01% of full output voltage over specified input voltage range						VDC
<b>Residual Ripple</b>	< 0.01% at full load						V pk to pk
<b>Temperature Coefficient</b>	100 ppm/°C for the max output voltage after starting and over temperature range 0 to 50°C						-
<b>Output Voltage Monitoring (600 to 1500 V)</b>	+1 V/1 kV max or -1 V/-1 kV max according to model polarity output impedance = 200 kΩ ±1%						-
<b>Output Voltage Monitoring (2 to 3 kV)</b>	12 to 24 V input only: 0 to +5 V ±2%						VDC
	5 V inputs: 0 to +2.5 V ±2%						
<b>Reference Voltage</b>	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						
<b>Operating Temperature</b>	-10 to +65, full load, max Eout, case temp						°C
<b>Storage Temperature</b>	-40 to +70						°C
<b>Safeguards</b>	Arc and short-circuit protection						-
<b>Options</b>	Flying lead for HV output						-
<b>Enhanced Interface (-EI) Option (2 to 3 kV Only)</b>	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%						-



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

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

<b>Type</b>	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
<b>Input</b>	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
<b>Power</b>	0.5 W Output	0.5
	0.8 W Output	0.8
	1 W Output	1
<b>Case</b>	Tin Steel Case	(Standard)
<b>Polarity</b>	Positive Output	-P
	Negative Output	-N
<b>Option</b>	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](http://advanced-energy.com).