

"M" Series

PCB-mount miniature, microsize, regulated, high voltage DC-DC converter



ULTRAVOLT®
MAKING HIGH VOLTAGE
EASIER!®



Vin : 12Vdc, 15Vdc or 24Vdc
Vout : 0 to 600V, 1000V, 1250V or 1500V
Pout : up to 1W

The miniature, microsize "M" Series is the ideal solution for PMTs that need a bias voltage ranging from 0 to 1500V, with very small current at only 1.28in³ [20.9cc].



- low cost
- tight line/load regulation
- arc and continuous short circuit protection
- miniature and lightweight
- voltage monitoring
- self restoring output voltage
- 5V reference
- low ripple (0.01% p. to p.)
- option : flying wire for HV output

Parameters	Specifications
Input voltage Vin (pins 1 & 2)	12Vdc ± 0.5 Vdc or 15Vdc ± 0.5 Vdc or 24Vdc ± 1 Vdc, according to type
Input current	at no load : 15mA at full load : from 65mA to 100mA
HV output Vout (pin 7 or wire - optional)	programmable nominal voltage, refer to the Selection Guide for voltage ranges
Polarity	fixed positive and fixed negative
HV setting (pins 3,4 & 5)	via external potentiometer, minimum resistance 10k Ω or via external voltage source 0/ 5V $\pm 0.5\%$ at full scale, and input impedance >1M Ω optional: via external voltage source 0/10V $\pm 0.5\%$ at full scale, and input impedance >1M Ω
Max. output current Iout	refer to the Selection Guide
Load voltage regulation	$\pm 0.01\%$ of full output voltage for no load to full load
Line voltage regulation	$\pm 0.01\%$ of full output voltage over specified input voltage range
Residual ripple	between 50mV and 150mV peak-to-peak at full load
Temperature coefficient	100ppm/ $^{\circ}$ C for the maximum output voltage after starting and over temperature range 0 to 50 $^{\circ}$ C
Output HV monitoring (pin 6)	+1V/1kV max. or -1V/-1kV max. according to model polarity output impedance = 200k Ω $\pm 1\%$
Output reference voltage (pin 5)	5V $\pm 0.5\%$, TC:50ppm/ $^{\circ}$ C, max. output current:1mA
Operating temperature	0 $^{\circ}$ C to +50 $^{\circ}$ C
Storage temperature	-20 $^{\circ}$ C to +70 $^{\circ}$ C
Safeguards	arc and short circuit protection
Options	▪ flying wire for HV output instead of pin 7 ▪ suitable for use with an external potentiometer

Typical Applications
<ul style="list-style-type: none"> ▪ Bias Supplies ▪ Avalanche Photo Diodes (APD) ▪ Photomultiplier Tubes (PMT)

Package Configuration	
Case material	tin steel plate thickness 0.5mm
Case dimensions LxHxW	51.0x13.0x31.5mm
Pins	through $\varnothing 0.46$ round pins, length : 3mm, spacing : 2.54mm, option: flying wire for HV output
PCB mounting (raised mounting models only)	through 4 mounting tabs length: 5mm, width : 1,5 mm, thickness : 0,5mm
Weight	35g
Lead (optional)	coaxial cable (RG178), diameter = 2mm, length = 500mm
Insulation	fully potted in an epoxy resin

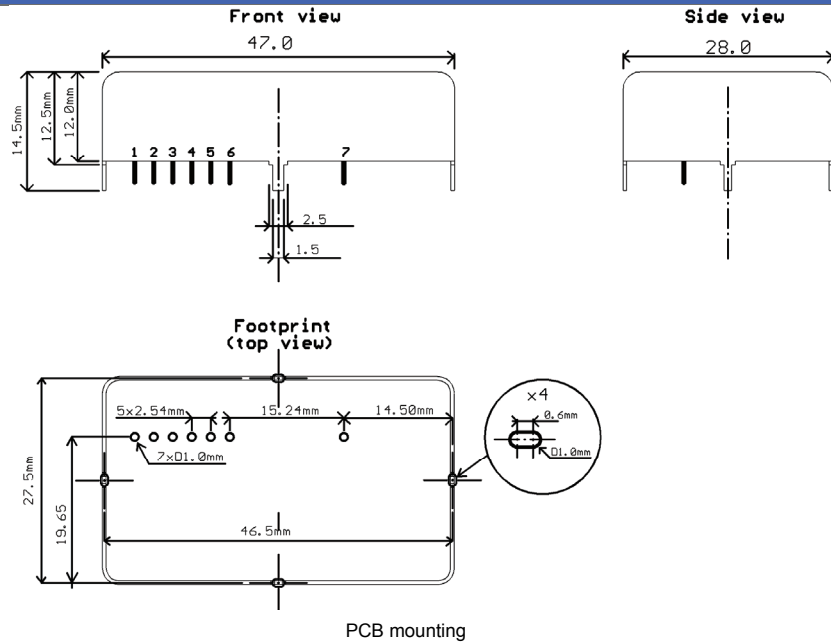
Pin Connections	
Line input :	1. Vin
	2. 0V supply ground
HV setting :	3. 0V signal ground
	4. control input
	5. output reference
HV monitoring :	6. voltage monitoring
HV output :	7. Vout

"M" Series

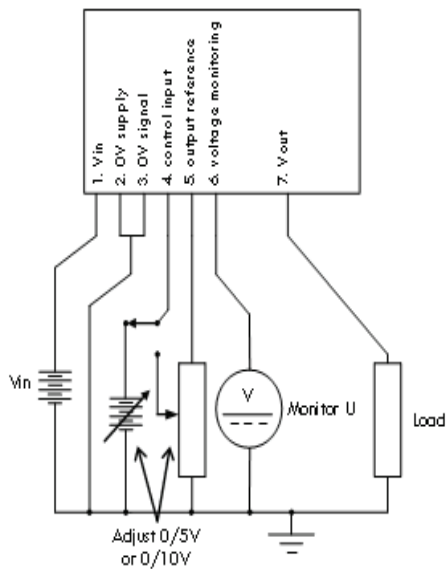
PCB-mount miniature, microsize, regulated, high voltage DC-DC converter



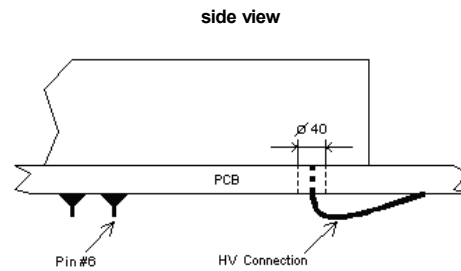
Mechanical Dimension



Functional Diagram



Option : flying wire for HV output



"M" Series Overview*

		Vin (Vdc)		
		12	15	24
Vout (Vdc)	600	(0.2W) 330µA	(0.3W) 500µA	(0.6W) 1mA
	1000	(0.4W) 400µA	(0.6W) 600µA	(1W) 1mA
	1250	(0.5W) 400µA	(0.8W) 640µA	(1W) 800µA
	1500	(0.5W) 330µA	(0.7W) 460µA	(1W) 660µA

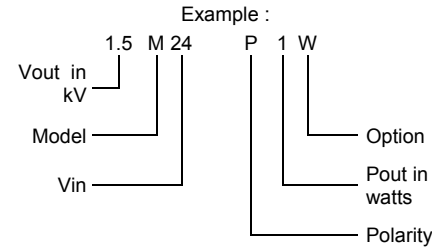
"M" Series

PCB-mount vertical, microsize, regulated, high voltage DC-DC converter



Ordering Information

Model	name of the series	M
Vin	12Vdc nominal	12
	15Vdc nominal	15
	24Vdc nominal	24
Polarity	positive output voltage	-P
	negative output voltage	-N
Vout	HV output voltage	see Ordering Code
Iout	output power	see Ordering Code
Option	flying wire to collect the HV output	-W
	10Vdc control and monitor	-10



+1500V@1W psu under 24Vdc
with the optional flying wire for the HV output

"M" Series Selection Guide

Vout	Iout / Pout	Vin	Polarity	Model
1500V	0.66mA / 1.0W	24V	+	1.5M24-P1
			-	1.5M24-N1
	0.46mA / 0.70W	15V	+	1.5M15-P0.7
			-	1.5M15-N0.7
	0.33mA / 0.50W	12V	+	1.5M12-P0.5
			-	1.5M12-N0.5
1250V	0.8mA / 1.00W	24V	+	1.25M24-P1
			-	1.25M24-N1
	0.64mA / 0.80W	15V	+	1.25M15-P0.8
			-	1.25M15-N0.8
	0.4mA / 0.50W	12V	+	1.25M12-P0.5
			-	1.25M12-N0.5
1000V	1.0mA / 1.00W	24V	+	1M24-P1
			-	1M24-N1
	0.6mA / 0.60W	15V	+	1M15-P0.6
			-	1M12-N0.6
	0.4mA / 0.40W	12V	+	1M12-P0.4
			-	1M12-P0.4
600V	1.0mA / 0.60W	24V	+	0.6M24-P0.6
			-	0.6M24-N0.6
	0.5mA / 0.30W	15V	+	0.6M15-P0.3
			-	0.6M15-N0.3
	0.4mA / 0.24W	12V	+	0.6M12-P0.24
			-	0.6M12-N0.24