

# **UMHV Series**

Ultra-Miniature High Voltage DC to Dc Converter

Ultra-Miniature Case Size (0.5" x 0.5" x 0.5") High Impedance Programming Input (10kΩ) Extremely Low Quiescent Current (5mA typical) No External Components Required PCB Mountable Low Ripple and EMI/RFI High Input/Output Isolation Wide Operating Temp Range (-55°C to +70°C) Available in positive or negative outputs

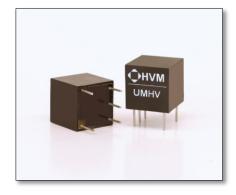


## Mechanical Characteristics

- Size: 0.5" x 0.5" x 0.5"
- Weight: 4.1 grams typical
- **Packaging:** Encapsulated in high performance epoxy
- **Case Material:** Thermoset plastic (Diallyl Phthalate)

## Environmental Characteristics

- **Operating Temp Range:** -55°C to +70°C
- Storage Temp Range: -55°C to +85°C



## **Description**

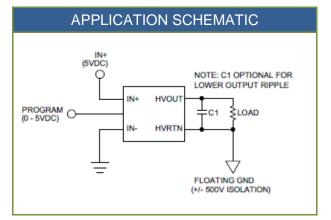
The UMHV Series is a family of ultra-miniature singleoutput DC to DC converters supplying up to 5kV in 0.125 cubic inches ( $0.5'' \times 0.5'' \times 0.5''$ ). These ultra-compact converters are ideal for applications requiring small size and ease of use. A high impedance programming input makes it very easy to use, eliminating the need for a low impedance adjustable power source voltage.

HVM's proprietary resonant converter design minimizes quiescent current and operating noise while delivering maximum performance and reliability. A special feature of this power supply is its extremely low input current, typically 1/10th of that of similar devices on the market, making it ideal for battery powered applications.

The devices operate directly from 5VDC  $\pm$  0.5VDC input. Output voltage is independent of input power voltage and is proportional to the programming voltage (0 to IN+ produces 0 to full scale output) and features excellent linearity. The output power rating is 0.5W and the input to output isolation is  $\pm$  500V. The UMHV Series is very stable over a wide operating temperature range.

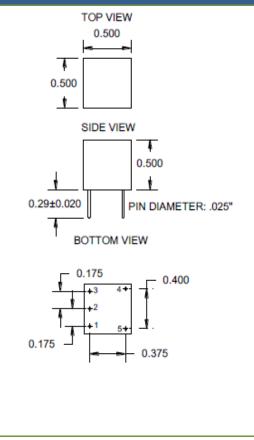
Available with alternate output voltages, consult sales for additional information.





| ELECTRICAL CHARACTERISTICS      |   |  |  |  |
|---------------------------------|---|--|--|--|
| Input Power Voltage<br>(V+):    | 5V or 12V ± 10%   |  |  |  |
| Programming<br>Voltage:         | 0 to 5V IN+ results in 0 to rated output voltage  |  |  |  |
| Programming Input<br>Impedance: | 10kΩ  |  |  |  |
| Output Tolerance at No Load:    | ± 5%  |  |  |  |
| Input-Output<br>Isolation:      | ± 500Vdc  |  |  |  |
| Load Regulation:                | 20% (drop from no load to full load)  |  |  |  |
| Output Ripple:                  | <2% typical at full load; Note:<br>additional external capacitance<br>can be added to reduce ripple |  |  |  |
| Oscillator<br>Frequency:        | 45 kHz – 80 kHz   |  |  |  |
| Efficiency:                     | 55% typical at full load  |  |  |  |

#### MECHANICAL



| PIN# | FUNCTION |  |  |
|------|----------|--|--|
| 1    | Program  |  |  |
| 2    | IN -     |  |  |
| 3    | IN +     |  |  |
| 4    | HVOUT    |  |  |
| 5    | HVRTN    |  |  |



## Model Selection Guide

| Model     | Input Voltage | Output     | MAX Output | Input Current |          |
|-----------|---------------|------------|------------|---------------|----------|
|           |               | Voltage    | Current    | NO Load       | MAX Load |
| UMHV0505  | 5V            | 0 to ±500V | 1mA        | <10mA         | <175mA   |
| UMHV1205  | 12V           | 0 to ±500V | 1mA        | <10mA         | <100mA   |
| UMHV0510  | 5V            | 0 to +1kV  | 500µA      | <10mA         | <175mA   |
| UMHV0510N | 5V            | 0 to -1kV  | 500µA      | <10mA         | <175mA   |
| UMHV1210  | 12V           | 0 to +1kV  | 500µA      | <10mA         | <100mA   |
| UMHV1210N | 12V           | 0 to -1kV  | 500µA      | <10mA         | <100mA   |
| UMHV0520  | 5V            | 0 to +2kV  | 250µA      | <10mA         | <175mA   |
| UMHV0520N | 5V            | 0 to -2kV  | 250µA      | <10mA         | <175mA   |
| UMHV1220  | 12V           | 0 to +2kV  | 250µA      | <10mA         | <100mA   |
| UMHV1220N | 12V           | 0 to -2kV  | 250µA      | <10mA         | <100mA   |
| UMHV0530  | 5V            | 0 to +3kV  | 167µA      | <15mA         | <175mA   |
| UMHV0530N | 5V            | 0 to -3kV  | 167µA      | <15mA         | <175mA   |
| UMHV1230  | 12V           | 0 to +3kV  | 167µA      | <15mA         | <100mA   |
| UMHV1230N | 12V           | 0 to -3kV  | 167µA      | <15mA         | <100mA   |
| UMHV0540  | 5V            | 0 to +4kV  | 125µA      | <15mA         | <175mA   |
| UMHV0540N | 5V            | 0 to -4kV  | 125µA      | <15mA         | <175mA   |
| UMHV1240  | 12V           | 0 to +4kV  | 125µA      | <15mA         | <100mA   |
| UMHV1240N | 12V           | 0 to -4kV  | 125µA      | <15mA         | <100mA   |
| UMHV0550  | 5V            | 0 to +5kV  | 100µA      | <15mA         | <175mA   |
| UMHV0550N | 5V            | 0 to -5kV  | 100µA      | <15mA         | <175mA   |
| UMHV1250  | 12V           | 0 to +5kV  | 100µA      | <15mA         | <100mA   |
| UMHV1250N | 12V           | 0 to -5kV  | 100µA      | <15mA         | <100mA   |