

## 2.4mW

The P Series of micro-power DC to high voltage DC converters feature extremely low ripple (<100µV) and low EMI/RFI due to a unique magnetic free design. Fully regulated and programmable outputs of 0 to 1200 volts or 0 to 2000 volts are available in positive or negative polarity. A precision on-board voltage reference allows for simple configuration for full scale, fixed or variable output. A high impedance voltage programming input allow for easy system integration. Voltage monitoring is provided at a 1000:1 ratio.

Very low power consumption and light weight, with a case height of less than 0.220 inches, make these PCB mount modules ideal for portable, battery powered equipment. Soft-start high voltage ramp-rates are designed in to further protect sensitive detectors to support long-term reliability.

### Features

- Precision Voltage Regulated
- Output Voltages 1.2kV and 2kV
- Ultra-Low Noise, Magnetic Free Design
- Soft-Start for Sensitive Detectors
- Low Ripple, <100µV
- Output Voltage Monitor
- On-board Voltage Reference
- Standard and Extended Operating Temperatures
- Lightweight Shielded Case
- 3 Year Warranty

### Models & Ratings

Model Number	Output Voltage	Output Current
P12N	0 to -1200V	2µA
P12P	0 to +1200V	2µA
P12P-T	0 to +1200V	2µA
P20N	0 to -2000V	1µA
P20P	0 to +2000V	1µA
P20P-T	0 to +2000V	1µA

### DC-HVDC CONVERTER



### Typical Applications



- Portable Toxin Detection
- Electrostatic Applications
- Low Power Biasing
- Piezo Devices
- Battery Powered Equipment

### Dimensions

1.38" x 0.68" x 0.25" (35.1 x 17.3 x 6.40mm)

## Input

12Vin Models					
Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage Range	5		12.0	VDC	Input voltage range is 6V to 12V below -10°C
Input Current, No Load			2.1, 2.6	mA	For 1.2kV, 2kVout, @5V input
Input Current, No Load			3.3, 3.6	mA	For 1.2kV, 2kVout, @5V input
Input Current, Capacitance		1		μF	
Control Voltage, $V_{CTL}$	0		+4.096	VDC	

## Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Programming			100	%	
Output Voltage Tolerance		±1		%	For Max Vout
Standby Current			300	μA	
Minimum Load	No minimum load required				
Ripple and Noise			100	μV	
Temperature Coefficient		250		ppm/°C	With Voltage Reference Output tied to Voltage Control
Stability			100	ppm/hr	
Voltage Monitor Output		1000:1		Ratio	$V_{MON} = V_{HV} / 1000$
Voltage Reference Output		+4.096		VDC	Fixed output voltage
Start Up Time		10,15		sec	For 1.2kV, 2kVout, time to output high voltage after applying input
Response Time		900		msec	Response to Control Voltage, after Start Up Time

## General

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Isolation	N/A – Input ground is connected to output ground				
Construction	Magnet free design, grounded metal case				
Switching Frequency	21.6	24	26.4	kHz	
Mean Time Between Failure	1.6			Mhrs	Per Bellcore TR 332 GB +25°C

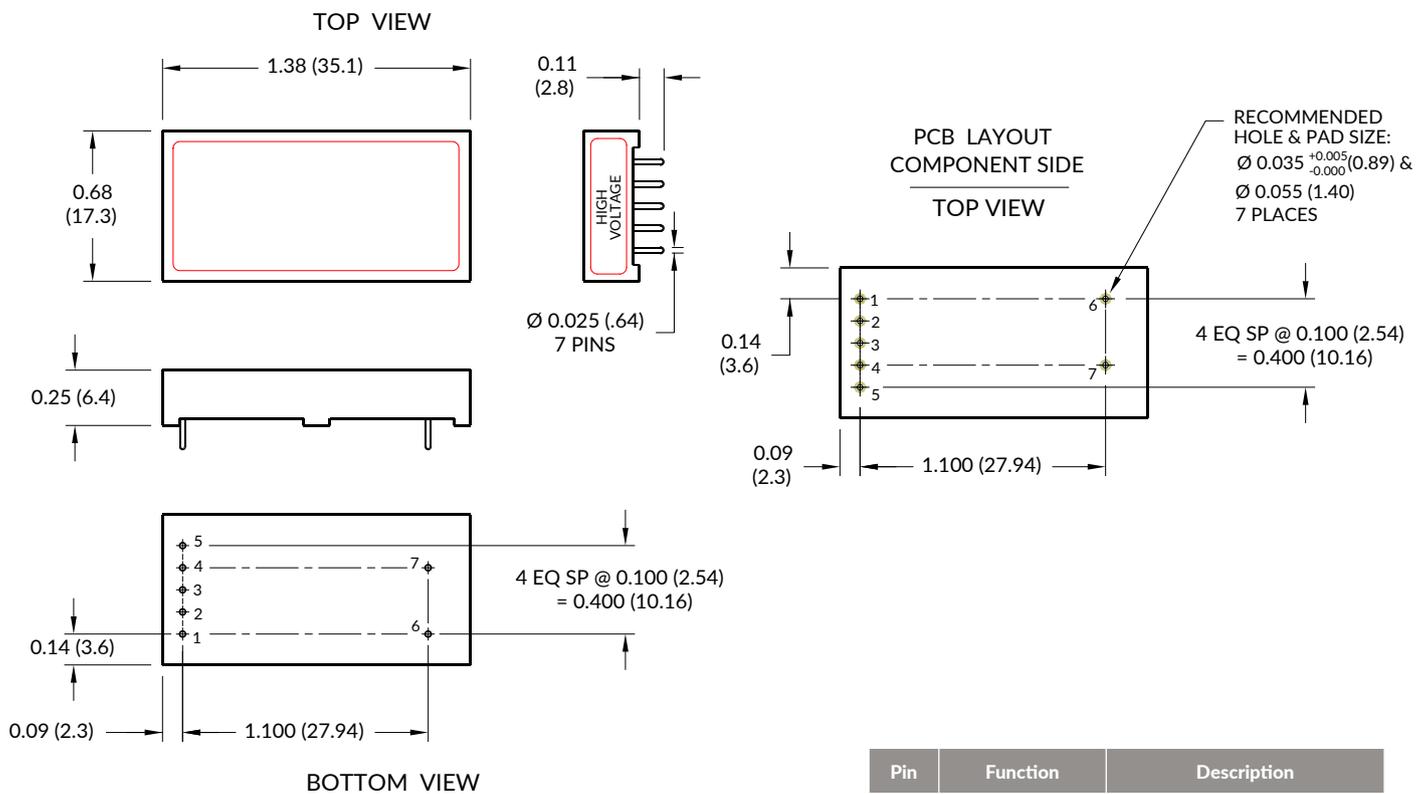
### Notes:

1. Maximum rated output current is available at maximum rated output voltage.

## Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Operating Temperature	-10		+70	°C	Standard operating temperature
Storage Temperature	-40		+85	°C	Extended operating temperature, -T suffix
Cooling	Natural convection				
Humidity	-55		+105	%RH	

## Mechanical Details



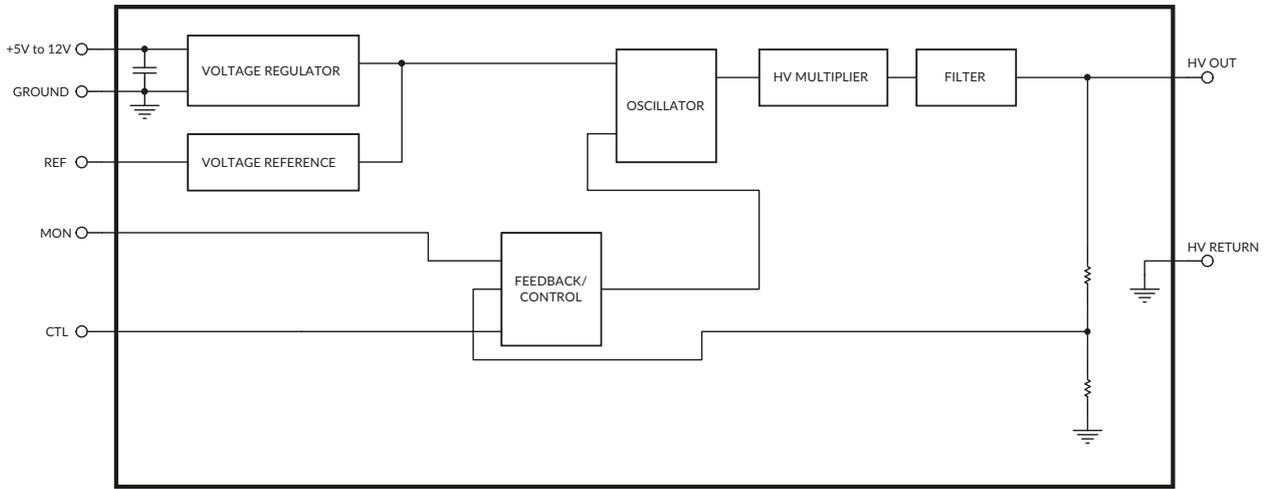
Pin	Function	Description
1	GND	Signal Ground
2	$V_{IN}$	Input Voltage
3	$V_{REF}$	Reference Voltage Output
4	$V_{CTL}$	Control Voltage Input
5	$V_{MON}$	Voltage Monitor Output
6	HV RTN	HV Output Return
7	HV OUT	High Voltage Output

### Notes:

1. All dimensions are in inches (mm)
2. Weight: 0.26oz (7.5g)
3. Tolerance: X.XX±0.02 (0.51)
4. Pin Tolerance: ±0.005 (0.127)

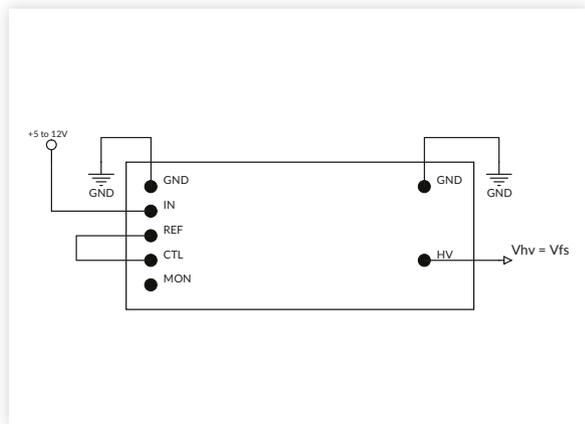
5. All grounds are internally connected to case. Grounded case assists low noise design efforts. Both grounds must be connected to ground for proper operation.
6. Voltage Reference and Voltage Monitor should be left floating when not in use to reduce power consumption.

## Block Diagram

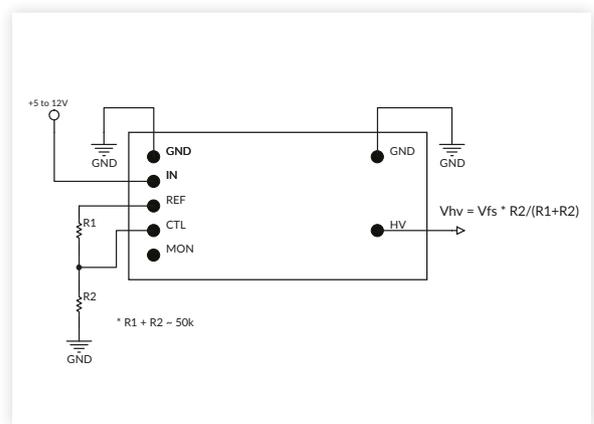


## Connection Diagram

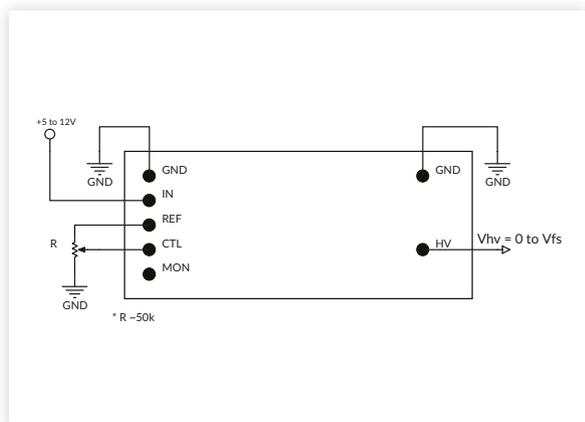
Fixed output (full-scale voltage)



Fixed output (reduced voltage)



Variable output



Voltage-controlled output

