P Series

DC-HVDC Converter

XP Power

2.4 milli-Watt

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

Dimensions:

P Series: 1.38 x 0.68 x 0.25" (35.1 x 17.3 x 6.4mm)

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.

Key Applications:

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

Models & Ratings

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

Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Programming			100	%	
Output Voltage Tolerance		±1			For Max Vout
Standby Current	0		300	uA	
Minimum Load	No minimum load required				
Ripple and Noise			100	uV	
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

Notes

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

Input

12Vin Models					
Characteristic	**Minimum**	**Typical**	**Maximum**	**Units**	**Notes & Conditions**
Input Voltage, Vin	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		uF	
Control Voltage, V_{CTL}	0		+4.096	VDC	

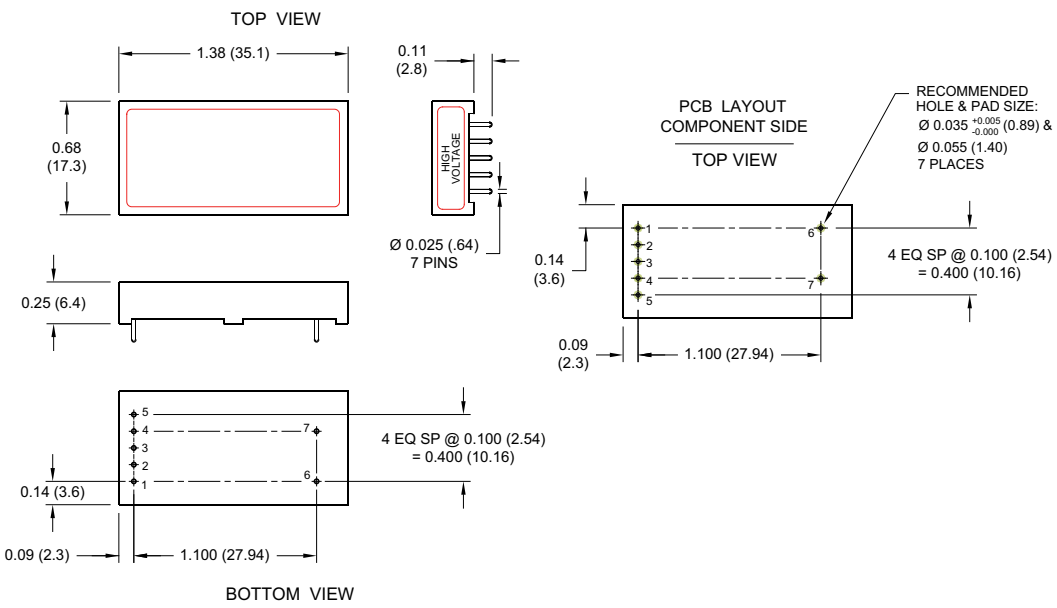
General

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Isolation	N/A – Input ground is connected to output ground				
Construction	Magnetic 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

Environmental

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

Mechanical Details

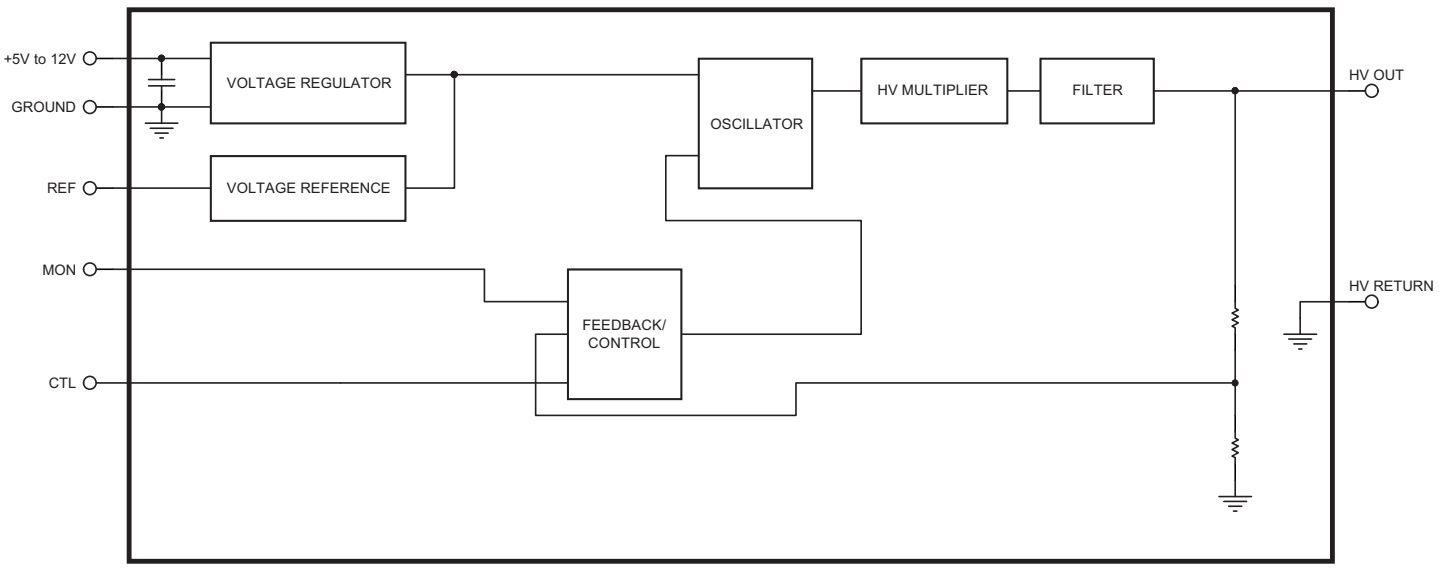


Pin	Function	Description
1	GND	Signal Ground
2	V_{IN}	Input Voltage
3	V_{REF}	Reference Voltage Output
4	V_{CTL}	Control Voltage Input
5	V_{MON}	Voltage Monitor Output
6	HV RTN	HV Output Return
7	HV OUT	High Voltage Output

Notes

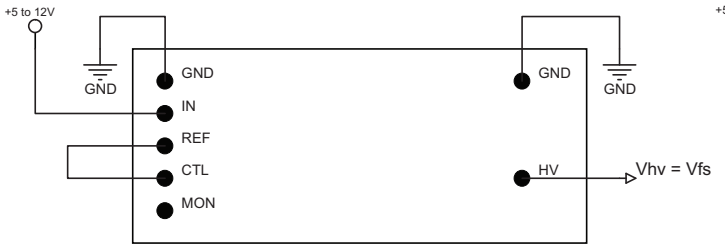
1. All dimensions are in inches (mm)
2. Weight: 0.26oz (7.5g)
3. Tolerance: X.XX±0.02 (0.51)
4. Pin Tolerance: ±0.005 (0.127)
5. All grounds are internally connected to case. Grounded case assists low noise design efforts. Both grounds must be connected to ground for proper operation.
6. Voltage Reference and Voltage Monitor should be left floating when not in use to reduce power consumption.

Block Diagram

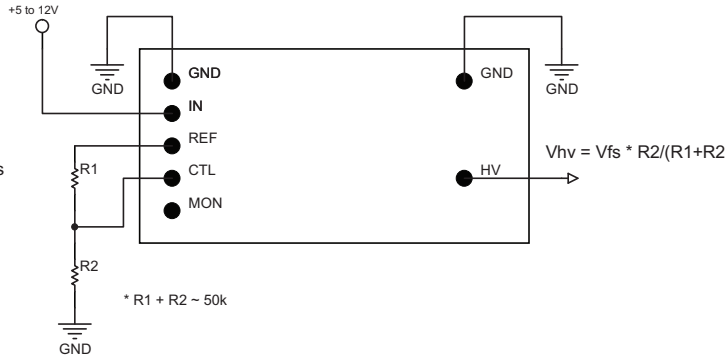


Connection Diagram

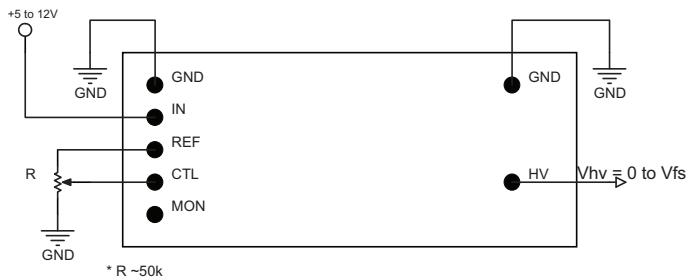
Fixed output (full-scale voltage):



Fixed output (reduced voltage):



Variable output:



Voltage-controlled output: