

## 1W CONVECTION COOLED

The CB Series is line of miniature, well-regulated high voltage power supplies providing clean and reliable high voltage in a shielded, PCB mount package. They are programmed from 0 to 100% via a 0 to +5 volt DAC compatible high impedance programming input voltage. A built-in reference voltage source can be used in lieu of the programming voltage.

Current and voltage monitoring outputs are standard on all models. Safety features include built-in protection against programming overvoltage and thermal shutdown. Temperature drift is less than 50ppm/°C. The units exhibits very low ripple, noise, and EMI/RFI by utilizing a quasi-sinewave oscillator, shielded transformer, excellent filtering techniques, and an isolated steel enclosure featuring a separate grounding pin. A proprietary encapsulation process and high performance formula are used to achieve excellent high voltage and thermal properties. These component level power supplies are ideal for easy integration into compact, sensitive equipment.

### Features

- Precision Voltage Regulated
- Output Voltages up to 10kV
- 0 to 100% Programmable Output
- Voltage & Current Monitors
- On-board Voltage Reference
- Operating Temperature -10°C to +60°C
- Temperature Coefficient <50ppm/°C
- Shielded Case with Isolated Case Ground
- 3 Year Warranty

### Models & Ratings

Model Number	Output Voltage	Output Current <sup>(1)</sup>
CB101	0 to +10kV	100µA
CB101N	0 to -10kV	100µA

### DC-HVDC CONVERTER



### Typical Applications



- Mass Spectrometry
- Electrostatic Chucks
- Capillary Electrophoresis
- Capacitor Charging
- X-ray Detector
- Test Equipment

### Dimensions

3.00 x 1.25 x 0.60" (76.2 x 31.8 x 15.2mm)

## Input

12Vin Models					
Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage, $V_{in}$	11.5	12.0	16.0	VDC	
Input Current, No Load			100	mA	
Input Current, Full Load			225	mA	
Input Capacitance		440		$\mu$ F	
Programming Voltage, $V_{pgm}$	0		+5	VDC	<100 $\mu$ A
$V_{pgm}$ , Overvoltage Protection			+5.25	VDC	

## Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Programming	0		100	%	
Setpoint Accuracy <sup>(4)</sup>		$\pm 1$		%	
Gain Adjust <sup>(5)</sup>		$\pm 1$		%	Potentiometer
Linearity <sup>(6)</sup>			$\pm 1$	%	From 20% to 100% $V_{out}$
Minimum Load	No minimum load required				
Line Regulation			0.1	%	Conditions: 100% $V_{pgm}$ , Full Load
Load Regulation			0.1	%	No Load to Full Load at 100% $V_{pgm}$ , Nominal $V_{in}$
Ripple and Noise			0.1	%	1MHz bandwidth
Temperature Coefficient		50		ppm/ $^{\circ}$ C	
Stability			100	ppm/hr	
Voltage Reference Output		+5			Fixed output voltage +5V $\pm 1\%$ , 2mA
Voltage Monitor Output	0		+5	VDC	0 to 100% Output Voltage, (Error = <0.5% from 20% to 100%)
Current Monitor Output	0		+5		0 to 100% Output Voltage, (Error = <0.5% from 20% to 100%)
Response Time			250	msec	Full Load, 10 to 90%

### Notes:

1. Maximum rated output current is available at maximum rated output voltage.
2. Specifications after 1 hour warm-up, full load, 25 $^{\circ}$ C unless otherwise indicated.
3. Proper thermal management techniques are required to maintain safe case temperature.
4. SET POINT ACCURACY refers to the ability of the unit to accurately deliver the programmed voltage.

5. GAIN ADJUST refers to the ability to alter the gain of the circuit to allow for setpoint accuracy error.
6. LINEARITY refers to how much the transfer function can deviate from a straight line in the absence of any set-point error.

## General

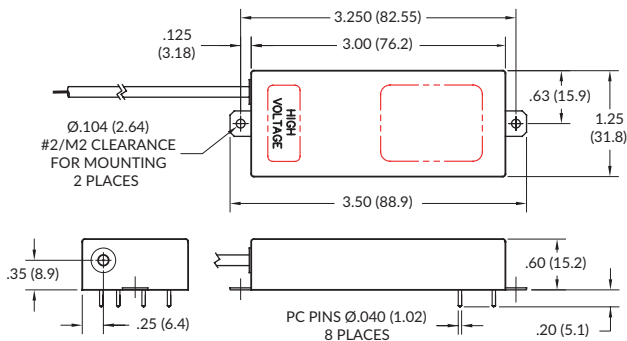
Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Isolation: Input to Output	N/A - Input Ground is connected to Output Ground				
Switching Frequency	100		150	kHz	
Construction	Case materials is zinc plated steel. UL 94 V-0 rated solid vacuum encapsulation				
Mean Time Between Failure	2.6			Mhrs	Per Bellcore TR 332 GB +25°C

## Environmental

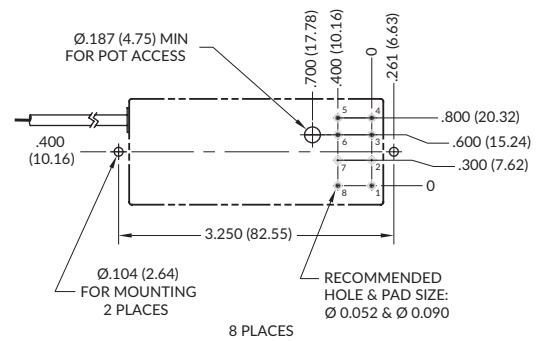
Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Operating Temperature	-10		+60	°C	Case temperature
Storage Temperature	-20		+100	°C	
Cooling	Natural convection				
Humidity			95	%RH	Non-condensing
Thermal Shock Limit			1	°C/10sec	
Thermal Shutdown		+85		°C	

## Mechanical Details

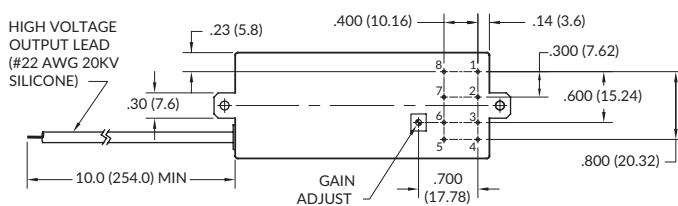
### Top View



### PCB Layout



### Bottom View

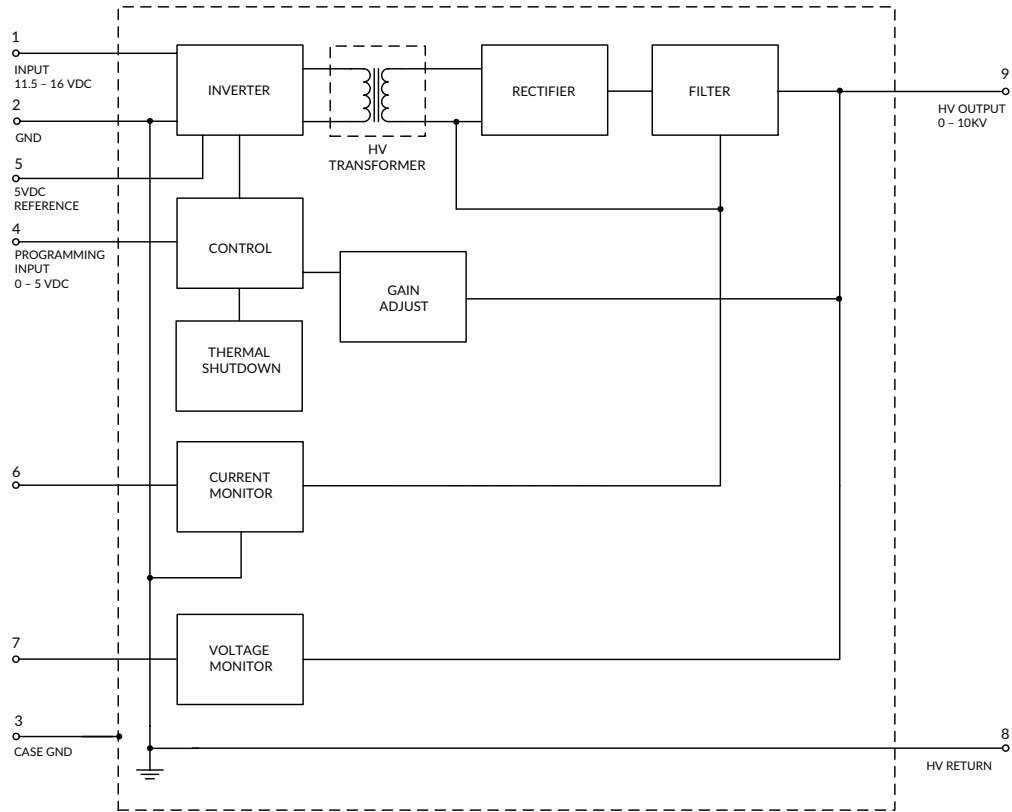


Pin	Function	Description
1	VIN	Input Voltage
2	SGND	Signal Ground
3	CGND	Case Ground <sup>(5)</sup>
4	VPGM	Voltage Programming Input, <100µA
5	VREF	Voltage Reference Output, ±1%, 2mA
6	IMON	Current Monitor Output, scales to 0 to 100% Iout
7	VMON	Voltage Monitor Output, scales to 0 to 100% Vout
8	HV RTN	HV Output Return
WIRE	HV OUT	High Voltage Output

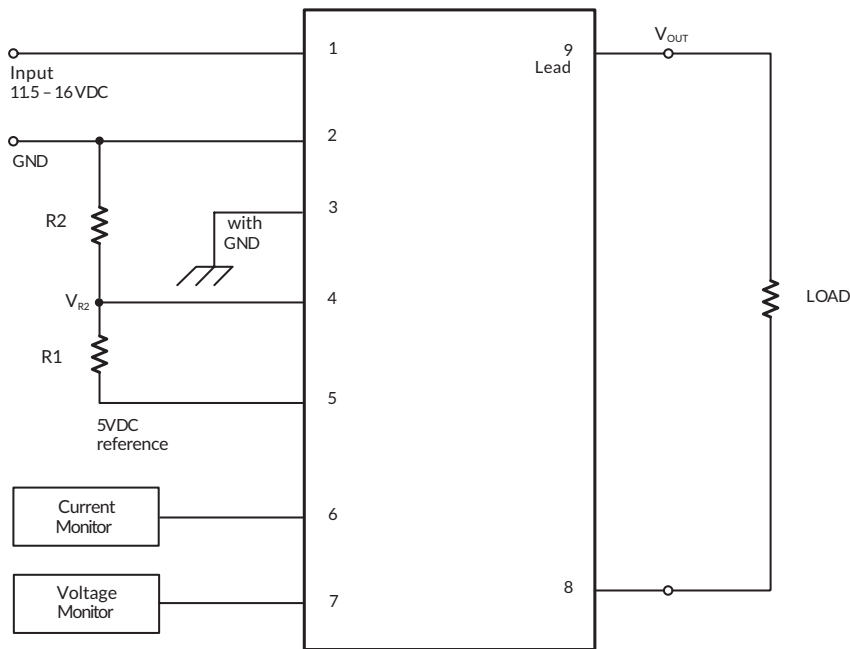
### Notes:

- All dimensions are in inches (mm)
- Weight: 3oz (85g)
- Tolerance: X.XX±0.02 (0.51)
- Pin Tolerance: ±0.005 (0.127)
- All grounds internally connected except case. Case Ground (Pin 3) must be connected to ground, with no more than 50V between case ground (Pin 3) and circuit ground (Pin 2).

## Block Diagram



## Connection Diagram



Operate with 5VDC Reference Voltage  
Variable output

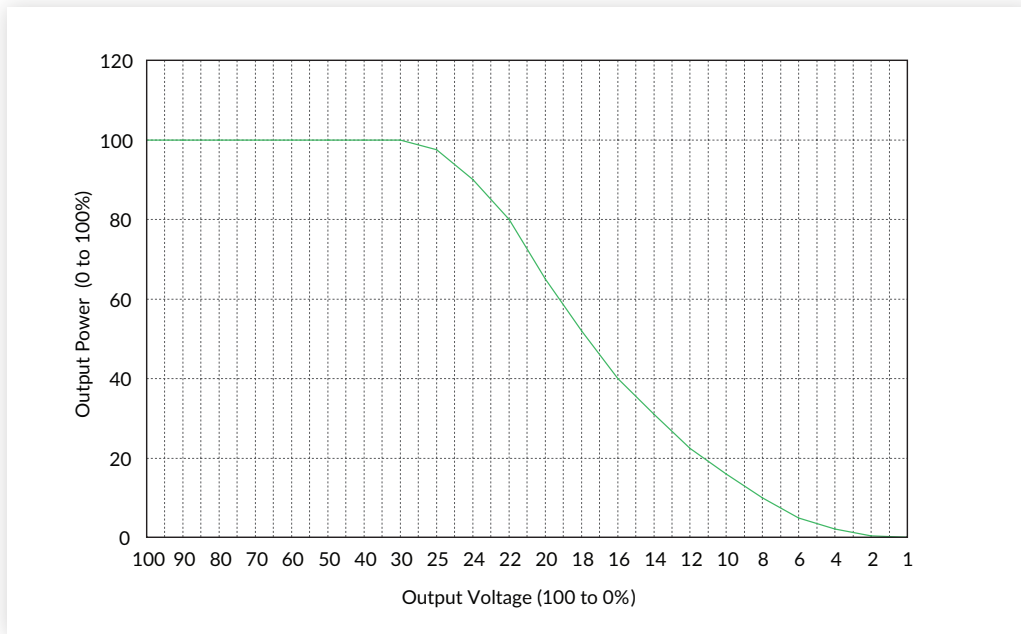
$$V_{R2} = \frac{R1}{R1 + R2} (5)$$

$$V_{OUT} = \frac{R1}{R1 + R3} (10000)$$

R1 can be replaced with a potentiometer

## Application Notes

### Output Voltage vs. Output Power Derating Curve



### Programming Voltage vs Output Voltage

