Advanced Energy®

ULTRAVOLT® FLHV SERIES

BIPOLAR HIGH VOLTAGE POWER SUPPLIES WITH PRECISION FLOATING OUTPUT

Bipolar high voltage power supplies **with precision floating output**

The advanced controls, high stability, and reliability of new UltraVolt® FLHV high voltage power supplies elevate the performance of your entire system and distinguish this series from competitive offerings. These regulated, fully controlled and monitored units provide output that can float on a high voltage bias supply up to 5 kV above or below the input ground reference.

New Features

- High input output isolation supports floating electronics on high voltage
- High output stability (< ±0.5%) from no load to full load
- Accurate monitoring (±2.0%) of the floating bias supply output voltage and current
- Excellent unit-to-unit repeatability
- No pre-loading required; output will not exceed 101% of nominal under normal input conditions
- Reduced input current at no-load (quiescent)/full load (higher efficiency)
- Standard digital-ready, fully featured interface
- Programmable output operation over a range on a fixed input voltage
- Standard enable/disable control pin

Typical Applications

- Electrostatic chucks (ESC)
- Channel electron multipliers (CEM)
- Photo multiplier tubes (PMT)
- HV bias (e-beam, i-beam, energy analyzers)
- Gate supplies
- Pulse generators
- Amplifier rails
- Other floating electronics

Ask us about derivatives and special products built to your requirements.

SPECIFICATIONS[1]

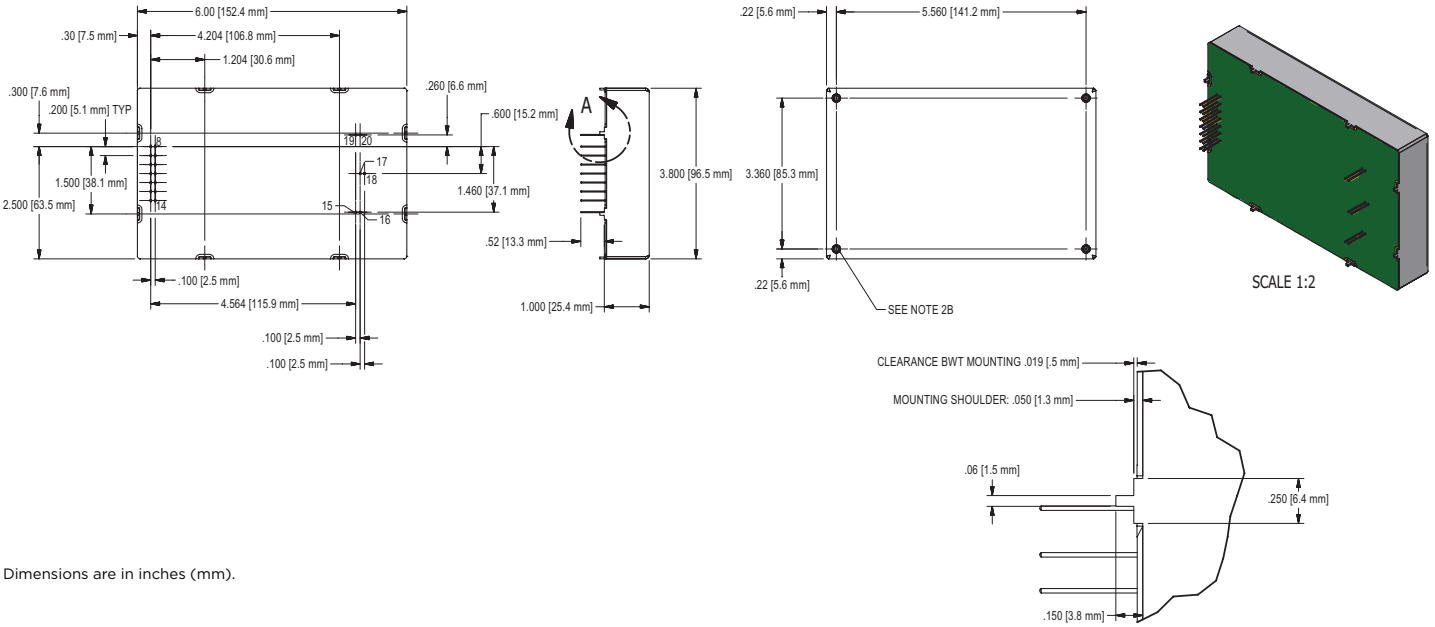
Electrical Input	
Voltage	24 VDC ±5%
Current	Input current disabled < 250 mA
	Input current no-load < 350 mA
	Input current full load < 1 A
Protection	Input reverse polarity protection is an internal diode across the input.
	(Source power to the HVPS should be fused; time delay/slow blow, 2.0 A value)
Electrical Output	
Full Scale	1, 2, 4, and 6 kV, 15 W
Power	0 to 15 W, 100% of rated current down to 0% of output voltage
Voltage Control Range	10 to 100%
Isolation	Input ground to output center tap: ±5 kV indefinitely
	Isolation: 150 MΩ, 600 pF, 200 MΩ on 6 kV models
Load Regulation	≤ 0.1% across the ± output terminals
Voltage Full-Scale Accuracy	< ±1% ("-BP" units across the ± output terminals)
Current Full-Scale Accuracy	<±2%
	Standard linearity: < ±1% + 10 mV over the output range
No-Load Operation	Voltage will not exceed 101% of nominal under normal input conditions
Ripple	< ±0.05% peak to peak, either + or – to CT
	< ±0.05% peak to peak across + to -
Noise	Equal to stated ripple across a DC to 20 Mhz BW
Stability	< ±0.5% for 8 hours after 30 minute warmup
Temperature Coefficient	< ±50 ppm max per °C; optional "-25 ppm" is < ±25 ppm per °C
Environmental[2] and Compliance	
Operational Temperature	-45 to +65°C (-49 to +149°F)*; -25PPM option: +10°C to +45°C (50 to 113°F)
Storage/Temperature	-55 to +105°C (-67 to +221°F)
Humidity	0 to 95%, non-condensing
Compliance	ROHS
Controls and Monitors[3]	
Voltage Control Programming	+1 to +10 VDC = 10 to 100% ±1% full scale of nominal output voltage.
	NOTE: Unit requires a minimum output voltage to operate properly. At Vprogram of 0 V, the output will be at 0 V.
Control Reference	+10 VDC ±0.05%, < ±5 PPM °C, source 1 mA min
Control Enable/Disable	Disable: TTL 0 or grounded
	Enable: TTL 1 or a voltage up to +32 VDC
	No connection: defaults to disable
Eout Monitor	Buffered 0 to +10 VDC = 0 to 100% ±1% full scale accuracy; measures the actual output voltage across the floating + and - HV output terminals
Current Limit Programming	0 to +10 VDC = 0 to 100% ±2% full scale of nominal output current
Iout Monitor	Buffered 0 to +10 VDC = to 0 to 100% ±2% full-scale accuracy
Mode Indicators	The CV/CC mode indicator lines reflect the output regulation status of the module. These open collector lines can sink current from an indicator such as an LED or with a pull up resistor establish a TTL bit for system monitoring.
Additional Features	Safe off requires the HV to be < 42 V after 2 sec, with no additional external capacitance or resistance.

Proven design techniques and power-conversion technologies for high stability, repeatability, and reliability.

[1] All measurements are at the HVPS; nominal inputs and outputs unless otherwise specified.
[2] Proper thermal management techniques are required to maintain safe case temperature at maximum power output.
[3] All controls and monitors are referenced to the input power ground. The "-i10" document further defines this interface.

SPECIFICATIONS[1]	
Physical	
Dimensions (W x H x D)	See dimensional drawings, below.
Weight (approx.)	825.5 g (< 1.82 lb)
Construction	Encapsulated tin-plated steel box
Pins	Gold-plated 0.64 cm^2 (0.025 in^2)
Mounting	8 solder tabs 1.5 mm (0.060") x 2.5 mm (0.100") x 1.2 mm (0.040") thick
	4 0.138-32 UNC-2B X 0.23 full threads min (7 thds)

DIMENSIONAL DRAWINGS



Dimensions are in inches (mm).

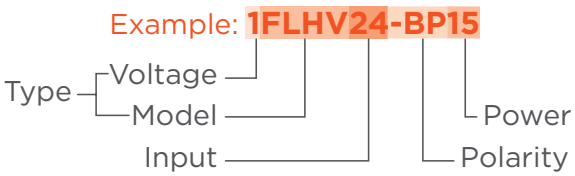
CONNECTIONS

PIN	FUNCTION	PIN	FUNCTION
1	Power Ground	9	Input Power
2	Input Power	10	Buffered -Eout Current Monitor (5 MA max)
3	Buffered +Eout Current Monitor (5 mA max)	11	Current Mode Indicator (Reg or Limit)
4	Enable (ON/OFF)	12	Voltage Mode Indicator
5	Signal Ground	13	Current Programming (Current Limit on BP Units)
6	Voltage Programming	14	Buffered Voltage Monitor (5 mA Max)
7	+10 V REFERENCE (5 mA Max)	15 & 16	-HV Output
8	Power Ground	17 & 18	HV Floating Ground Return (CT on BP Units)
		19 & 20	+HV Output

Note: Designers can externally sum the two current monitors to create a CT current monitor; see tech note.

OPTIONS

ORDERING INFORMATION		
Type	1 kV output	1FLHV
	2 kV output	2FLHV
	4 kV output	4FLHV
	6 kV output	6FLHV
Input	24 VDC	24
Polarity	Bipolar output	-BP
Power	15 W output	-15W
Options	Temperature coefficient	-25PPM



Non-RoHS compliant units are available. Please contact the factory for more information.

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ENG-HV-FLHV-230-A 1.16