



ULTRAVOLT® C SERIES
HIGH VOLTAGE CAP-CHARGING SUPPLIES





DC-to-HVDC
single-output
high voltage cap-
charging modules

The C series of high voltage regulated DC-to-DC converters are designed for fast rise time/charging applications utilizing state-of-the-art power conversion topology. This high power density module is especially suited to high-energy pulsers, amplifiers, and discharge devices with large capacitance, fast repetition rates, or high current loads. Surface-mount technology and encapsulation techniques provide high reliability and low cost.

Features

- › 7 models from 0 to 125 V through 0 to 6 kV
- › 20 or 30 W output power
- › Maximum lout capability down to 0 V
- › Maximum lout during charge/rise time
- › Indefinite output short circuit protection
- › Very fast rise with very low overshoot
- › Output voltage and current monitors
- › > 400,000 h MTBF at 65°C
- › Fixed-frequency, low-stored-energy design
- › UL/cUL recognized component; CE Mark (LVD and RoHS)

Typical Applications

- › Cap-charging
- › Pulsed power
- › Test equipment
- › Mass spectrometry
- › Automated test equipment (ATE)
- › Lasers and electro-optics
- › HV pulse generator bias
- › HV amplifier bias



Note: See Application Note 10 for more charging information.



PARAMETER	CONDITIONS	MODELS						UNITS
Input		All Types						
Voltage Range	Full Power	+23 to 30						VDC
Voltage Range	Derated Power Range	+9 to 32						VDC
Current	Standby/Disable	< 30						mA
Current	No Load, Max Eout	< 90						mA
Current	Max Load, Max Eout	20 W: 950, 30 W: 1425						mA
AC Ripple Current	Nominal Input, Full Load	< 80						mA pk to pk
Output		1/8C		1/4C		1/2C		
Voltage Range	Nominal Input	0 to 125		0 to 250		0 to 500		VDC
Power	Nominal Input, Max Eout	20	30	20	30	20	30	W
Current	Iout, Entire Output Voltage Range	160	240	80	120	40	60	mA
Current Scale Factor	Full Load	2540	4210	1096	2000	1142	1667	mA/V
Voltage Monitor Scaling		100:1 ±2% into 10 MΩ						
Ripple	Full Load, Max Eout, Cload ≥ 0.5 uF	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	V pk to pk
Overshoot	C Load, 0 Eout to Full Eout	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 2.0	V pk
Rise Time	Max Iout, Various C Loads and Eout	Figure A						-
Storage Capacitance	Internal	0.50	0.50	0.15	0.15	0.16	0.16	uF
Line Regulation	Nominal Input, Max Eout, Full Power	< 0.01 %						VDC
Static Load Regulation	No Load to Full Load, Max Eout	< 0.01%						VDC
Stability	30 Min Warmup, Per 8 h, Per Day	< 0.01%/< 0.02%						VDC
Programming And Controls		All Types						
Input Impedance	Nominal Input	+Output models 1.1 MΩ to ground, -output models 1.1 MΩ to +5 vRef.						MΩ
Adjust Resistance	Typical Potentiometer Values	10 to 100 K (potentiometer across vRef. and signal ground, wiper to adjust)						Ω
Adjust Logic	0 to +5 for +Out, +5 to 0 for -Out	+4.64 VDC for +output or +0.36 for -output = nominal Eout						-
Output Voltage and Impedance	T = +25°C	+5.00 VDC ±2%, Zout = 464 Ω ±1%						-
Enable/Disable		0 to +0.5 disable, +2.4 to 32 enable (default = enable)						VDC
Environmental		Standard						
Operating	Full Load, Max Eout, Case Temp.	-40 to +65						°C
Coefficient	Over The Specified Temperature	±50						PPM/°C
Thermal Shock	Mil-Std 810, Method 503-4, Proc. II	-40 to +65						°C
Storage	Non-operating, Case Temp.	-55 to +105						°C
Humidity	All Conditions, Standard Package	0 to 95% non-condensing						-
Altitude	All Conditions, Standard Package	Sea level through vacuum (vacuum may require -P2 option, contact factory for details)						-
Shock	Mil-Std-810, Method 516.5, Proc. IV	20 (standard), 40 (-C option)						Gs
Vibration	Mil-Std-810, Method 514.5, Fig.514.5C-3	10 (standard), 20 (-C option)						Gs

C = uF
V = Volts
I = mA
T = mS

$$T = \frac{C \times V}{I}$$

C = uF
V = kV
I = mA
F = Hz

$$I = C \times V \times F$$

C = uF
V = kV
I = mA
F = Hz

$$F = \frac{I}{C \times V}$$

C = uF
E² = kV
J = Ws

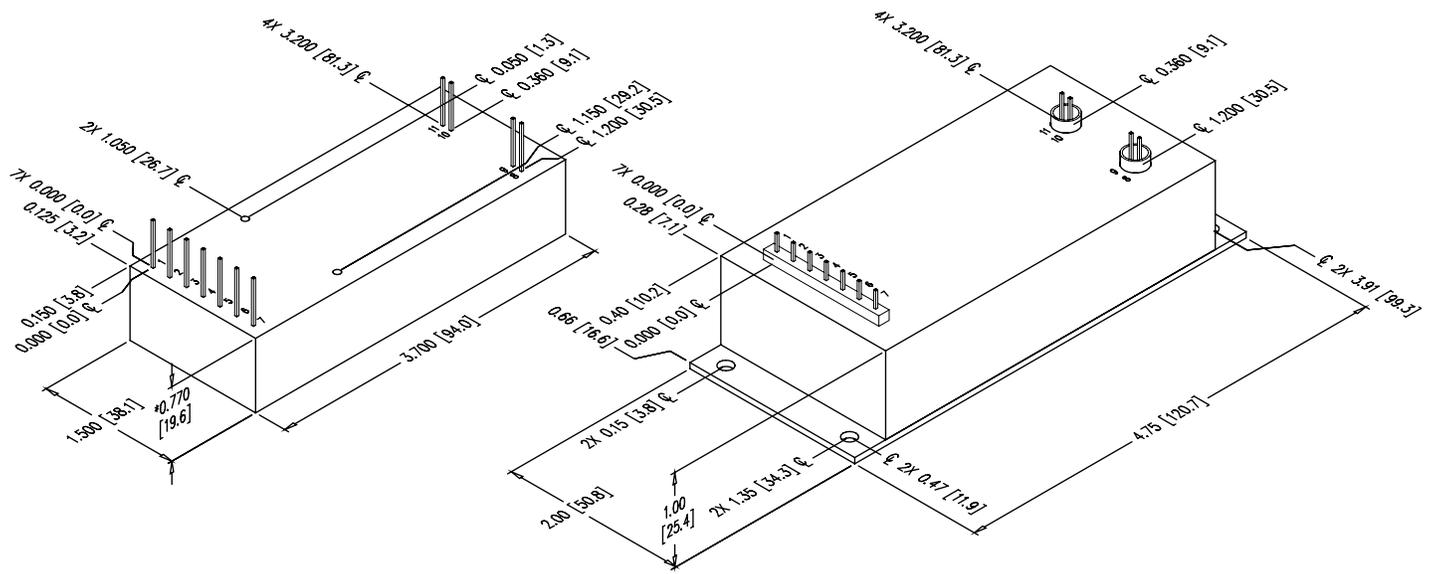
$$J = \frac{C \times E^2}{2}$$

Figure A - Rise time formulas

Note: Capacitance must include HVPS internal capacitance.



PARAMETER									UNITS
Input									
Voltage Range									VDC
Voltage Range									VDC
Current									mA
Current									mA
Current									mA
AC Ripple Current									mA pk to pk
Output	1C		2C		4C		6C		
Voltage Range	0 to 1000		0 to 2000		0 to 4000		0 to 6000		VDC
Power	20	30	20	30	20	30	20	30	W
Current	20	30	10	15	5	7.5	3.3	5	mA
Current Scale Factor	307	476	159	259	94	112	51	86	mA/V
Voltage Monitor Scaling									
Ripple	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	V pk to pk
Overshoot	< 2.0	< 2.0	< 2.0	< 2.0	< 4.0	< 4.0	< 6.0	< 6.0	V pk
Rise Time									-
Storage Capacitance	0.033	0.018	0.009	0.009	0.010	0.010	0.0064	0.0064	uF
Line Regulation									VDC
Static Load Regulation									VDC
Stability									VDC
Programming And Controls									
Input Impedance									MΩ
Adjust Resistance									Ω
Adjust Logic									-
Output Voltage and Impedance									-
Enable/Disable									VDC
Environmental	-25 PPM Option								
Operating	+10 to +45								°C
Coefficient	±25								PPM/°C
Thermal Shock									°C
Storage									°C
Humidity									-
Altitude									-
Shock									Gs
Vibration									Gs



Note: Downloadable drawings (complete with mounting and pin information) and 3D models are available online.

PHYSICAL SPECIFICATIONS	
Construction	Epoxy-filled DAP box certified to ASTM-D-5948 with -C option, aluminum box, chem film per MIL-A-8625 Type II (anodizing)
Volume	70.5 cc (4.30 in ³), with -C option: 131.1 cc (8.00 in ³)
Weight	142 g (5.0 oz), with -C Option: 284 g (10.0 oz)
Tolerance	Overall 1.27 mm (±0.050"), pin to pin 0.38 mm (±0.015"), mounting hole location 0.64 (±0.025") (plastic case) Overall 0.64 mm (±0.025"), pin to pin 0.38 mm (±0.015"), hole to hole location 0.64 mm (±0.025") (metal case)

Notes: 20 and 30 W versions are an additional 157 mm (0.062") in height.
 -M equipped units are an additional 0.76 mm (0.030") for each dimension.
 Contact Advanced Energy for drawings of models equipped with -E or -H options.



CONNECTIONS

Pin	Function
1	INPUT POWER GROUND RETURN
2	POSITIVE POWER INPUT
3	IOUT MONITOR
4	ENABLE/DISABLE
5	SIGNAL GROUND RETURN
6	REMOTE ADJUST INPUT
7	+5 VDC REFERENCE OUTPUT
8	HV GROUND RETURN
9	EOUT MONITOR
10 and 11	HV OUTPUT

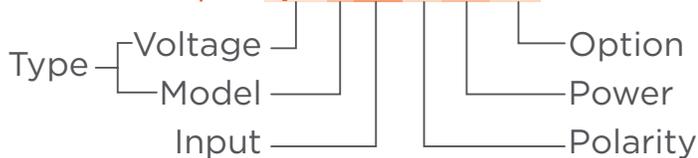
All grounds joined internally. Power supply mounting points isolated from internal grounds by > 100 kΩ, 0.01 uF/50 V (max) on all models except -M, -M-C, -M-E, and -M-H configurations which are 0 Ω.

ORDERING INFORMATION

Type	0 to 125 VDC Main Output	1/8C
	0 to 250 VDC Main Output	1/4C
	0 to 500 VDC Main Output	1/2C
	0 to 1,000 VDC Main Output	1C
	0 to 2000 VDC Main Output	2C
	0 to 4000 VDC Main Output	4C
	0 to 6000 VDC Main Output	6C
Input	24 VDC Nominal (20 and 30 W)	24
Polarity	Positive Output	-P
	Negative Output	-N
Power	W Output	20
	W Output	30
Case	Plastic Case - Diallyl Phthalate	(Standard)
	'Eared' Heatsink Plate (Plastic Case)	-E
	RF-Tight Aluminum Case	-C
Heatsink	0.400" High (Sized-to-Fit Case)	-H
Shield	Six-sided Mu-Metal Shield	-M
Temp. Coefficient	25 PPM Temperature Coefficient	-25 PPM

Contact the factory for boosted current monitor options.

Example: **1/2C24-P20-C**



Popular accessories ordered with this product include CONN-KIT and BR-1 mounting bracket kit.



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



For international contact information, visit
advanced-energy.com.