

### 1 Watt

- +12VDC Input [11.5 to 16V]
- Voltage Regulated
- Output Voltages from 100V to 8000V
- 0 to 100% Programmable Output
- High Reliability 2.6Mhrs MTBF
- <50ppm/°C Temperature Coefficient
- Shielded Case for Low EMI
- Low Ripple - down to 0.002%
- 3 Year Warranty



The C Series is a line of miniature, regulated high voltage power supplies. Each model is programmed from 0 to 100% of rated output via a 0 to +5 volt, DAC-compatible, high-impedance programming input voltage. An externally accessible potentiometer provides adjustable gain trim, allowing for individual calibration of units.

These converters exhibit 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 a custom UL 94 V-0 listed, high-performance formula are used to achieve excellent high voltage and thermal properties. Temperature drift is typically less than 50ppm/°C.

#### Dimensions:

- C01 - C20:** 1.40 x 1.11 x 0.50" (35.6 x 28.2 x 12.7mm)
- C25 - C40:** 1.75 x 1.11 x 0.50" (44.4 x 28.2 x 12.7mm)
- C50 - C60:** 2.10 x 1.11 x 0.50" (53.3 x 28.2 x 12.7mm)
- C80:** 2.50 x 1.25 x 0.60" (76.2 x 31.75 x 15.24mm)

#### Key Applications:

- Photo Multiplier Tube
- Solid State Detectors
- Electrophoresis
- Piezo Devices
- Capacitor Charging
- EO Lenses

#### Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage Range	11.5	13.75	16	VDC	Works with nominal 12V or 15V supply
Input Current, Full Load			250	mA	
Input Current, No Load			100	mA	
Programming Inputs	0		5	VDC	Analog DC Voltage Controls Output 0 to 100%
Input Capacitance		440		µA	Low ESR

#### Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Voltage			8000	VDC	See Models and Ratings Table
Output Current			10	mA	See Models and Ratings Table
Output Programming	0		100	%	Output Voltage programmable via Analog DC Programming Voltage Input
Setpoint Accuracy <sup>(4)</sup>		±1		%	@ Max Vpgm, No Load
Gain Adjust <sup>(5)</sup>		±5		%	Potentiometer, See Signals & Controls
Linearity: Output vs Program <sup>(6)</sup>			±1	%	15 to 100% Output
Minimum Load	No minimum load required				
Start Up Response			250	msec	At Max Vout, Full Load
Line Regulation	0.05		1.0	%	100% Vpgm, Full Load, [Min to Max Input]
Load Regulation	0.07		0.75	%	100% Vpgm, 13.75Vin, [NL to FL]
Ripple and Noise	0.002		0.75	%	1MHz bandwidth, See Models and Ratings Table
Temperature Coefficient		50		ppm/°C	
Stability			100	ppm/hr	After 30 minute warm up

#### Notes

1. Maximum current is available at maximum output voltage.
2. Specifications after 1 hour warm-up, full load, 25°C, unless otherwise noted.
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 set-point 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.

### Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Operating Temperature	-10		+60	°C	Case Temperature
Storage Temperature	-20		+90	°C	
Humidity			95	%RH	Non-condensing
Cooling					Natural convection
Thermal Shock Limit			1	°C/10sec	Natural convection

### Safety Approvals

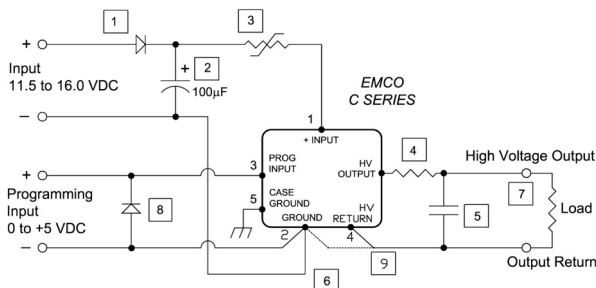
Safety Agency	Safety Standard	Notes & Conditions
UL and TUV	IEC/UL/CSA/EN 62368	
CE	CE Directive, RoHS and LVD	Where applicable
RoHS	RoHS 2 and 3 Directive (2011/65/EU)	Where applicable

### General

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Isolation: Input to Output	N/A – Input ground is connected to output ground				
Construction	Case material is zinc plated steel. Solid vacuum encapsulation, UL 94 V-0 rated.				
Switching Frequency	50		350	kHz	
Mean Time Between Failure	2.6			MHrs	Per Bellcore TR 332

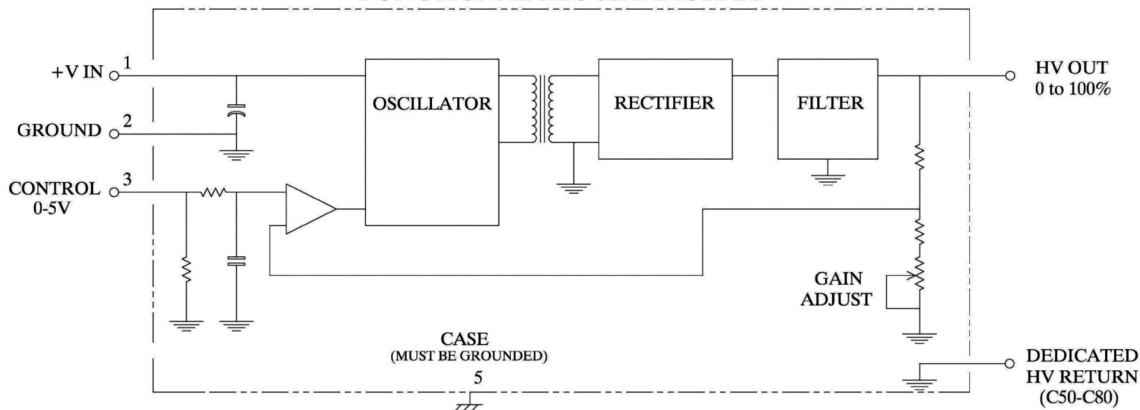
### Application Notes

#### Improved Performance and Protection



- 1 Diode provides reverse polarity protection.
- 2 Capacitor reduces ripple.
- 3 Resettable fuse (Raychem P/N RXE020.025 or 030) provides indefinite short circuit protection. *Selection depends on model used, load characteristics and operating temperature range.*
- 4 Series resistance increases arc protection and reduces ripple (when used with an output capacitor).
- 5 Capacitor reduces ripple.
- 6 IMPORTANT: Keep Input, Programming and Output return paths separate to eliminate ground loop accuracy errors.
- 7 Conformal coating recommended on all exposed high voltage conductors.
- 8 Diode provides protection against negative programming voltage or negative transient spike.
- 9 Output circuit return to HV return (pin 4) on C50 - C80. On C01-C40, output circuit return to ground (pin 2).

#### FUNCTIONAL BLOCK DIAGRAM



### Models & Ratings

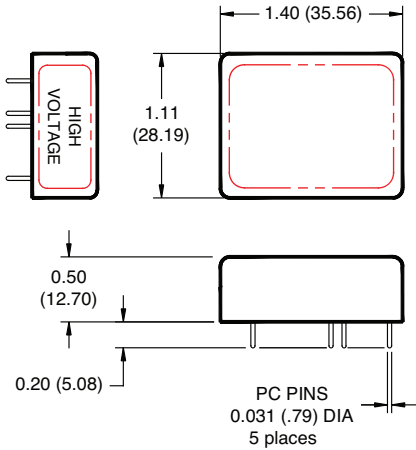
Output Voltage	Output Current <sup>(1)</sup>	Regulation		Ripple	Frequency	Model Number
		Load	Line			
0 to +100V	10mA	<0.1%	<0.1%	<0.75%	200-250kHz	C01
0 to +200V	5mA	<0.1%	<0.1%	<0.05%	250-350kHz	C02
0 to +200V	5mA	<0.1%	<0.1%	<0.05%	250-350kHz	C02R
0 to -200V	5mA	<0.1%	<1.0%	<0.05%	75-150kHz	C02N
0 to +300V	3.3mA	<0.1%	<0.1%	<0.03%	200-300kHz	C03
0 to +300V	3.3mA	<0.1%	<0.1%	<0.03%	200-300kHz	C03R
0 to +500V	2mA	<0.07%	<0.1%	<0.004%	250-350kHz	C05
0 to +500V	2mA	<0.07%	<0.1%	<0.004%	250-350kHz	C05R
0 to -500V	2mA	<0.5%	<0.5%	<0.005%	200-350kHz	C05N
0 to -500V	2mA	<0.5%	<0.5%	<0.005%	200-350kHz	C05NR
0 to +600V	1.67mA	<0.1%	<0.1%	<0.003%	250-300kHz	C06
0 to -600V	1.67mA	<0.75%	<0.75%	<0.003%	125-300kHz	C06N
0 to +1000V	1mA	<0.3%	<0.3%	<0.005%	200-250kHz	C10
0 to +1000V	1mA	<0.3%	<0.3%	<0.005%	200-250kHz	C10R
0 to -1000V	1mA	<0.5%	<0.3%	<0.002%	100-125kHz	C10N
0 to -1000V	1mA	<0.5%	<0.3%	<0.002%	100-125kHz	C10NR
0 to +1250V	1mA	<0.1%	<0.1%	<0.004%	200-250kHz	C12
0 to +1250V	1mA	<0.1%	<0.1%	<0.004%	200-250kHz	C12R
0 to -1250V	1mA	<0.175%	<0.1%	<0.003%	100-125kHz	C12N
0 to -1250V	1mA	<0.175%	<0.1%	<0.003%	100-125kHz	C12NR
0 to +1500V	0.67mA	<0.1%	<0.1%	<0.002%	100-125kHz	C15
0 to -1500V	0.67mA	<0.2%	<0.2%	<0.002%	75-100kHz	C15N
0 to -1500V	0.67mA	<0.2%	<0.2%	<0.002%	75-100kHz	C15NR
0 to +2000V	0.5mA	<0.15%	<0.1%	<0.002%	75-100kHz	C20
0 to -2000V	0.5mA	<0.15%	<0.1%	<0.002%	75-100kHz	C20N
0 to -2000V	0.5mA	<0.15%	<0.1%	<0.002%	75-100kHz	C20NR
0 to +2500V	0.4mA	<0.03%	<0.2%	<0.1%	125-150kHz	C25
0 to -2500V	0.4mA	<0.5%	<0.2%	<0.2%	125-150kHz	C25N
0 to -2500V	0.4mA	<0.5%	<0.2%	<0.2%	125-150kHz	C25NR
0 to +3000V	0.33mA	<0.03%	<0.05%	<0.1%	75-100kHz	C30
0 to +3000V	0.33mA	<0.03%	<0.05%	<0.1%	75-100kHz	C30R
0 to -3000V	0.33mA	<0.03%	<0.075%	<0.2%	75-100kHz	C30N
0 to -3000V	0.33mA	<0.03%	<0.075%	<0.2%	75-100kHz	C30NR
0 to +4000V	0.25mA	<0.25%	<0.2%	<0.1%	50-125kHz	C40
0 to +4000V	0.25mA	<0.25%	<0.2%	<0.1%	50-125kHz	C40R
0 to -4000V	0.25mA	<0.2%	<0.1%	<0.1%	75-150kHz	C40N
0 to -4000V	0.25mA	<0.2%	<0.1%	<0.1%	75-150kHz	C40NR
0 to +5000V	0.2mA	<0.35%	<0.1%	<0.1%	75-150kHz	C50
0 to +5000V	0.2mA	<0.35%	<0.1%	<0.1%	75-150kHz	C50R
0 to -5000V	0.2mA	<0.25%	<0.1%	<0.1%	125-175kHz	C50N
0 to -5000V	0.2mA	<0.25%	<0.1%	<0.1%	125-175kHz	C50NR
0 to +6000V	0.167mA	<0.25%	<0.1%	<0.1%	125-175kHz	C60
0 to +6000V	0.167mA	<0.25%	<0.1%	<0.1%	125-175kHz	C60R
0 to -6000V	0.167mA	<0.25%	<0.15%	<0.1%	125-175kHz	C60N
0 to -6000V	0.167mA	<0.25%	<0.15%	<0.1%	125-175kHz	C60NR
0 to +8000V	0.125mA	<0.75%	<0.15%	<0.2%	100-150kHz	C80
0 to -8000V	0.125mA	<0.75%	<0.25%	<0.2%	100-150kHz	C80N
0 to -8000V	0.125mA	<0.75%	<0.25%	<0.2%	100-150kHz	C80NR

R suffix is used as a RoHS designator for legacy part numbers.

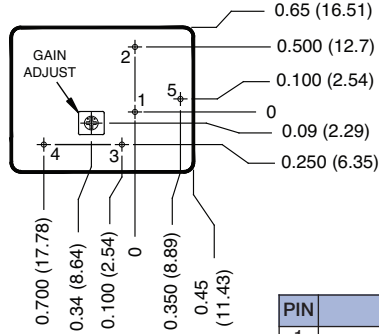
### Mechanical Details

#### C01-C20

##### Top View

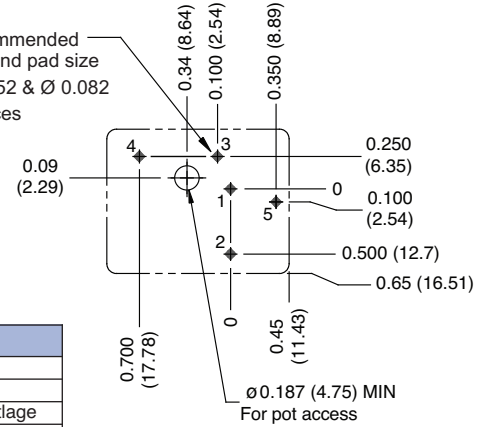


##### Bottom View



##### PCB Layout

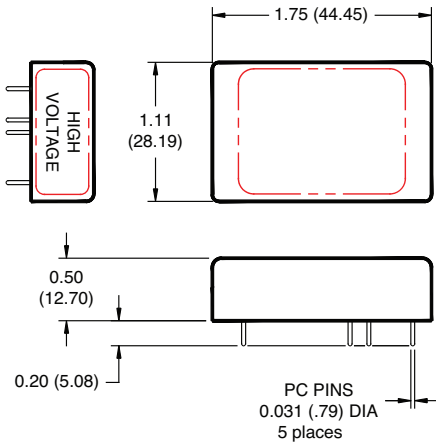
Recommended hole and pad size  
 $\varnothing$  0.052 &  $\varnothing$  0.082  
 5 places



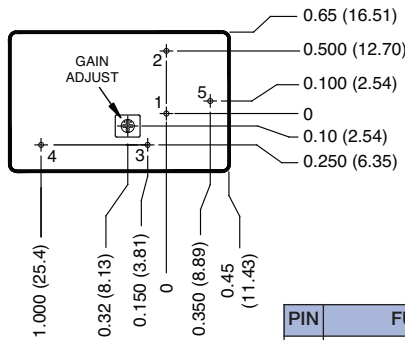
PIN	FUNCTION
1	(+) Input
2	Ground
3	Programming Voltage
4	HV Out
5	Case Ground

#### C25-C40

##### Top View

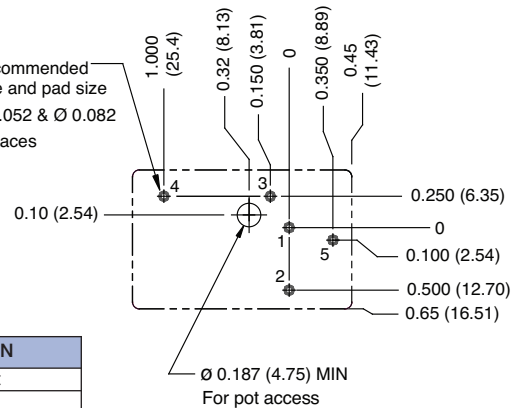


##### Bottom View



##### PCB Layout

Recommended hole and pad size  
 $\varnothing$  0.052 &  $\varnothing$  0.082  
 5 places



PIN	FUNCTION
1	(+) Input
2	Ground
3	Programming Voltage
4	HV Out
5	Case Ground

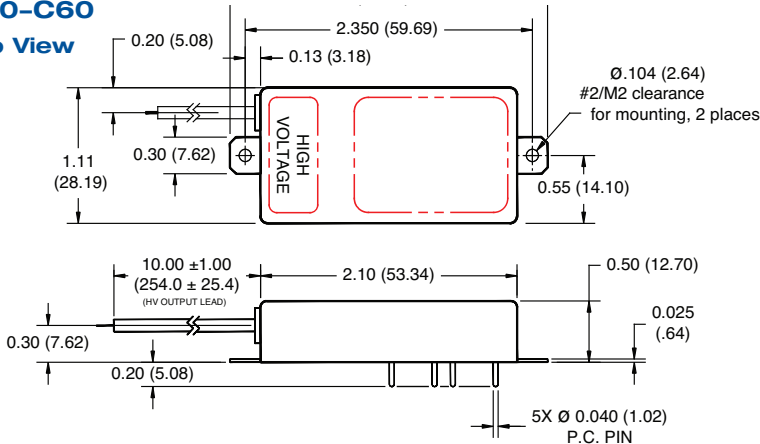
All dimensions are in inches (mm)  
 Tolerance: X.XX  $\pm$ 0.02 (0.51)  
 Pin Tolerance:  $\pm$ 0.005 (0.127)  
 Weight: C01-C20: 1.1oz (31g)  
 C25-C40: 1.3oz (36.8g)

All grounds internally connected except case. Case ground (Pin5) must be connected to ground, with no more than 50V between case ground (Pin 5) and circuit ground (Pin 2).

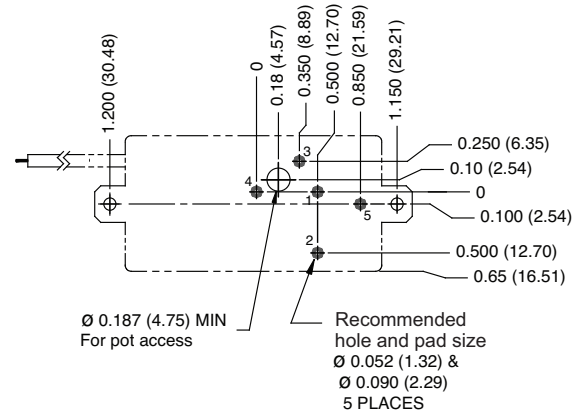
### Mechanical Details

#### C50-C60

##### Top View

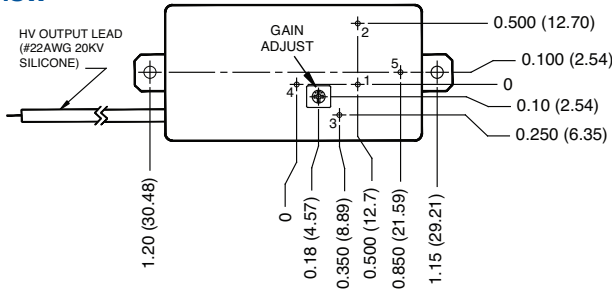


##### PCB Layout



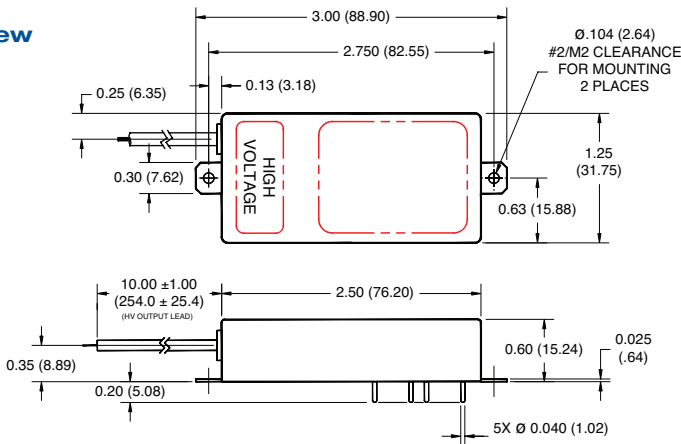
PIN	FUNCTION
1	(+) Input
2	Ground
3	Programming Voltage
4	HV Return
5	Case Ground
LEAD	HV Out

##### Bottom View

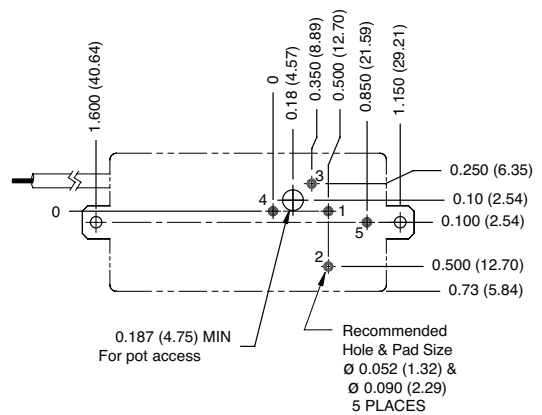


#### C80

##### Top View

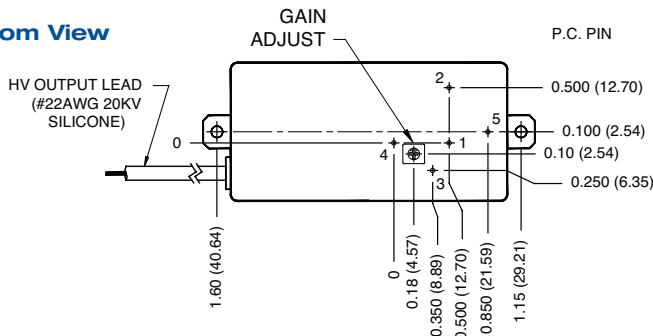


##### PCB Layout



PIN	FUNCTION
1	(+) Input
2	Ground
3	Programming Voltage
4	HV Return
5	Case Ground
LEAD	HV Out

##### Bottom View

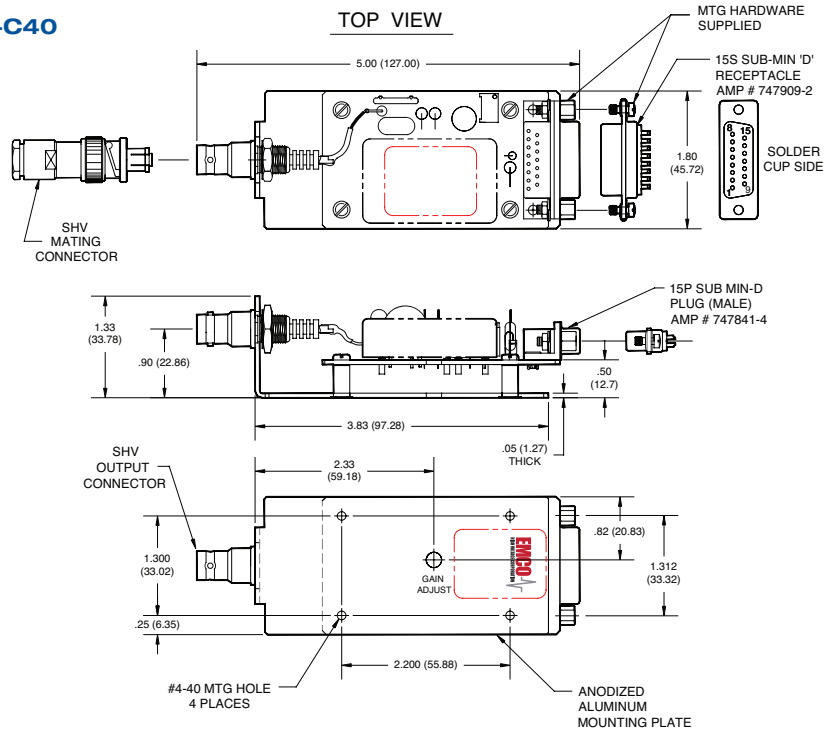


All dimensions are in inches (mm)  
 Tolerance: X.XX ±0.02 (0.51)  
 Pin Tolerance: ±0.005 (0.127)  
 Weight: C50-C60: 1.8oz (51g)  
 C80: 2.0oz (57g)

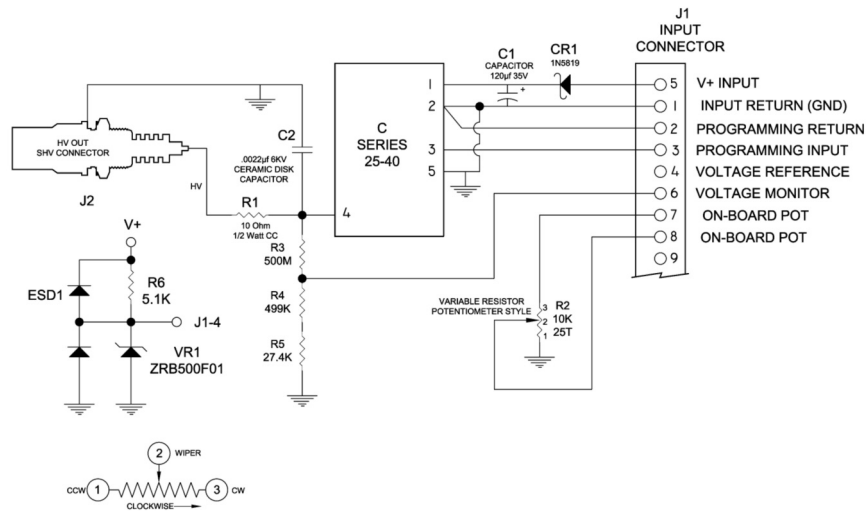
All grounds internally connected except case. Case ground (Pin5) must be connected to ground, with no more than 50V between case ground (Pin 5) and circuit ground (Pin 2).

## Mounting Kit

CM3 fits models C25-C40



## Block Diagram



## Notes

Dimensions are in inches (metric equivalents are in parentheses)

Dimensional tolerances: .xx +/- 0.02 (0.51mm)  
.xxx +/- 0.005 (0.127mm)

## Product Description

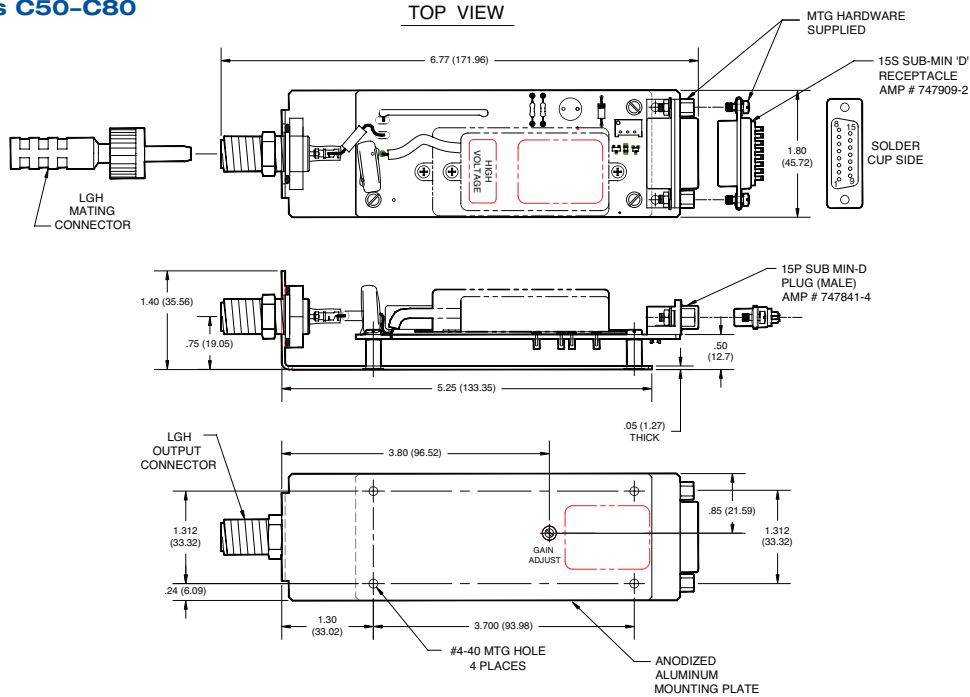
These adapters provide convenient prototyping and evaluation during system development and integration. They allow C Series modules to be mounted to a chassis instead of designed into a PC board. Extra filtering on the input and output improves performance. A schottky diode on the input provides reverse polarity protection. Input connector is via a 15P SUB MIN-D plug (mate supplied) and output is via an SHV style coaxial connector (mate supplied). Please note when ordering a CM3 the C Series is not included and must be ordered separately.

## Programming Instructions

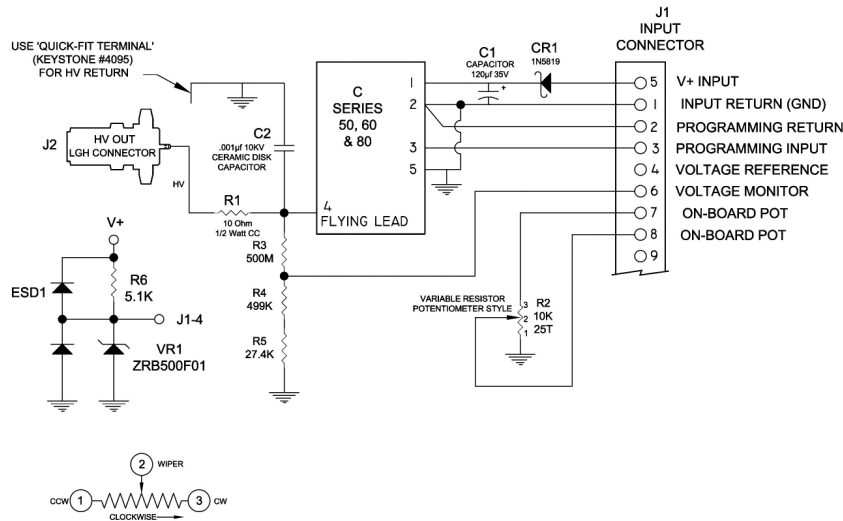
- Onboard Potentiometer: connect pins 7 to 4 and 8 to 3, turn potentiometer to adjust high voltage.
- Or Remote Potentiometer: connect wiper arm to pin 3, other sides to pins 4 and 2.
- Or Remote Analog Signal: apply programming voltage to pin 3, return to pin 2.

## Mounting Kit

CM4 fits models C50-C80



## Block Diagram



## Notes

Dimensions are in inches (metric equivalents are in parentheses)

Dimensional tolerances: .xx +/- 0.02 (0.51mm)  
.xxx +/- 0.005 (0.127mm)

## Product Description

These adapters provide convenient prototyping and evaluation during system development and integration. They allow C Series modules to be mounted to a chassis instead of designed into a PC board. Extra filtering on the input and output improves performance. A schottky diode on the input provides reverse polarity protection. Input connector is via a 15P SUB MIN-D plug (mate supplied) and output is via an SHV style coaxial connector (mate supplied). Please note when ordering a CM3 the C Series is not included and must be ordered separately.

## Programming Instructions

Onboard Potentiometer: connect pins 7 to 4 and 8 to 3, turn potentiometer to adjust high voltage.  
Or Remote Potentiometer: connect wiper arm to pin 3, other sides to pins 4 and 2.  
Or Remote Analog Signal: apply programming voltage to pin 3, return to pin 2.