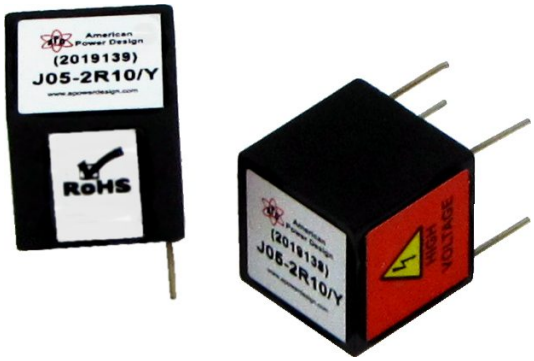
American Power Design, Inc.

"The best high voltage design solution"

RoHS

J05 SERIES 0.5 WATT PROPORTIONAL HV DC/DC CONVERTERS



FEATURES

- Customer Selects Output Voltage
- Ultra Miniature 0.125 Cubic Inches
- Single Outputs to + or - 2000 Vdc
- Dual Outputs to +/- 450 Vdc
- High Reliability
- Industry Standard Pinouts
- Temperature Range (-25 to +70°C)
- 400 kHz Switching Frequency
- Continuous Short Circuit Protection

The J05 Series of miniature DC/DC converters offers a 500 Vdc isolated high voltage output directly proportional to input voltage. They are available in industry standard pinouts and a optional shielded case. These miniature converters are ideal for applications requiring minimal size and weight. All models will tolerate a short circuit indefinitely.

ELECTRICAL SPECIFICATIONS

Voltage Accuracy	+/- 5%
Line Regulation	Proportional
Load Regulation	< 15%
Output Ripple	< 0.1% P-P
Startup Voltage	< 0.7Vdc
Input Filter	Low ESR Capacitor
Efficiency	60% (typ.)
Short Circuit Protection	Continuous
Switching Frequency	300 - 500kHz
Output Isolation	500 Vdc
Input / Output Capacitance	< 30pF

GENERAL SPECIFICATIONS

Temp. Stability	+/-0.05%/°C
Temp. (Operating , Case)	-25 to +70°C
Temp. (Storage)	-50 to +105°C
Humidity	0 to 95% (Non-Condensing)
EMI/RFI	Shielded Version Available *(Suffix /S)*
Derating	None
Cooling	Free-Air Convection

PHYSICAL SPECIFICATIONS

Dimensions	0.5 x 0.5 x 0.5 inches
Weight	0.15 Oz
Encapsulation Material	UL 94V-0 Epoxy
Case Material	Black Phenolic

J05 SERIES 0.5 WATT PROPORTIONAL HV DC/DC CONVERTERS

5V INPUT SINGLE OUTPUTS

REPRESENTATIVE MODEL LISTING							
MODEL NUMBER		INPUT SPECIFICATIONS			OUTPUT SPECIFICATIONS		
Non-RoHs	RoHs	VOLTAGE	NO LOAD	FULL LOAD	VOLTAGE	RIPPLE	CURRENT
J05-5R10	J05-5R10/Y	0V to 5Vdc	<100 mA	<250 mA	0V to 100Vdc	<1% P-P	5 mA
J05-5R15	J05-5R15/Y	0V to 5Vdc	<100 mA	<250 mA	0V to 150Vdc	<0.5% P-P	3.33 mA
J05-5R20	J05-5R20/Y	0V to 5Vdc	<100 mA	<250 mA	0V to 200Vdc	<0.25% P-P	2.5 mA
J05-5R25	J05-5R25/Y	0V to 5Vdc	<100 mA	<250 mA	0V to 250Vdc	<0.25% P-P	2 mA
J05-5R30	J05-5R30/Y	0V to 5Vdc	<100 mA	<250 mA	0V to 300Vdc	<0.25% P-P	1.67 mA
J05-5R35	J05-5R35/Y	0V to 5Vdc	<100 mA	<250 mA	0V to 350Vdc	<0.25% P-P	1.43 mA
J05-5R40	J05-5R40/Y	0V to 5Vdc	<100 mA	<250 mA	0V to 400Vdc	<0.1% P-P	1.25 mA
J05-5R45	J05-5R45/Y	0V to 5Vdc	<100 mA	<250 mA	0V to 450Vdc	<0.15% P-P	1.11 mA
J05-5R50	J05-5R50/Y	0V to 5Vdc	<100 mA	<250 mA	0V to 500Vdc	<0.15% P-P	1 mA
J05-5R60	J05-5R60/Y	0V to 5Vdc	<100 mA	<250 mA	0V to 600Vdc	<0.1% P-P	0.83 mA
J05-5R70	J05-5R70/Y	0V to 5Vdc	<100 mA	<250 mA	0V to 700Vdc	<0.25% P-P	0.72 mA
J05-5R80	J05-5R80/Y	0V to 5Vdc	<100 mA	<250 mA	0V to 800Vdc	<0.3% P-P	0.63 mA
J05-5R90	J05-5R90/Y	0V to 5Vdc	<100 mA	<250 mA	0V to 900Vdc	<0.25% P-P	0.56 mA
J05-5P100	J05-5P100/Y	0V to 5Vdc	<100 mA	<250 mA	0V to +1kVdc	<0.25% P-P	0.5 mA
J05-5N100	J05-5N100/Y	0V to 5Vdc	<100 mA	<250 mA	0V to -1kVdc	<0.25% P-P	0.5 mA
J05-5P120	J05-5P120/Y	0V to 5Vdc	<100 mA	<250 mA	0V to +1.2kVdc	<0.25% P-P	0.42 mA
J05-5N120	J05-5N120/Y	0V to5Vdc	<100 mA	<250 mA	0V to -1.2kVdc	<0.25% P-P	0.42 mA
J05-5P150	J05-5P150/Y	0V to 5Vdc	<100 mA	<250 mA	0V to +1.5kVdc	<0.25% P-P	0.33 mA
J05-5N150	J05-5N150/Y	0V to 5Vdc	<100 mA	<250 mA	0V to -1.5kVdc	<0.25% P-P	0.33 mA
J05-5P200	J05-5P200/Y	0V to 5Vdc	<100 mA	<250 mA	0V to +2kVdc	<0.25% P-P	0.25 mA
J05-5N200	J05-5N200/Y	0V to 5Vdc	<100 mA	<250 mA	0V to -2kVdc	<0.25% P-P	0.25 mA

J05-2N100/S/Y

- Product Family
- Total Output Power
- Input Voltage
  - **5** = 0 to 5Vdc Input
  - **2** = 0 to 12Vdc Input
  - **4** = 0 to 24Vdc Input
- Output Polarity
  - **R** = Reversible (+ or -)
  - **P** = Positive (+ only)
  - **N** = Negative (- only)
  - **D** = Dual (+ and -)
- /S Shield Option
- /Y RoHS Compliance

*Customer Selects Output Voltage**

The J05 Series are designed such that the customer may order any output voltage from 100Vdc to 2kVdc (Single Outputs) or +/- 50Vdc to +/- 450Vdc (Dual Outputs) at no additional charge.

ACTUAL OUTPUT VOLTAGE IS 10X

J05 SERIES 0.5 WATT PROPORTIONAL HV DC/DC CONVERTERS

12V INPUT SINGLE OUTPUTS

REPRESENTATIVE MODEL LISTING							
MODEL NUMBER		INPUT SPECIFICATIONS			OUTPUT SPECIFICATIONS		
Non-RoHs	RoHs	VOLTAGE	NO LOAD	FULL LOAD	VOLTAGE	RIPPLE	CURRENT
J05-2R10	J05-2R10/Y	0V to 12Vdc	<40 mA	<100 mA	0V to 100Vdc	<1% P-P	5 mA
J05-2R15	J05-2R15/Y	0V to 12Vdc	<40 mA	<100 mA	0V to 150Vdc	<0.5% P-P	3.33 mA
J05-2R20	J05-2R20/Y	0V to 12Vdc	<40 mA	<100 mA	0V to 200Vdc	<0.25% P-P	2.5 mA
J05-2R25	J05-2R25/Y	0V to 12Vdc	<40 mA	<100 mA	0V to 250Vdc	<0.25% P-P	2 mA
J05-2R30	J05-2R30/Y	0V to 12Vdc	<40 mA	<100 mA	0V to 300Vdc	<0.25% P-P	1.67 mA
J05-2R35	J05-2R35/Y	0V to 12Vdc	<40 mA	<100 mA	0V to 350Vdc	<0.25% P-P	1.43 mA
J05-2R40	J05-2R40/Y	0V to 12Vdc	<40 mA	<100 mA	0V to 400Vdc	<0.1% P-P	1.25 mA
J05-2R45	J05-2R45/Y	0V to 12Vdc	<40 mA	<100 mA	0V to 450Vdc	<0.15% P-P	1.11 mA
J05-2R50	J05-2R50/Y	0V to 12Vdc	<40 mA	<100 mA	0V to 500Vdc	<0.15% P-P	1 mA
J05-2R60	J05-2R60/Y	0V to 12Vdc	<40 mA	<100 mA	0V to 600Vdc	<0.1% P-P	0.83 mA
J05-2R70	J05-2R70/Y	0V to 12Vdc	<40 mA	<100 mA	0V to 700Vdc	<0.25% P-P	0.72 mA
J05-2R80	J05-2R80/Y	0V to 12Vdc	<40 mA	<100 mA	0V to 800Vdc	<0.3% P-P	0.63 mA
J05-2R90	J05-2R90/Y	0V to 12Vdc	<40 mA	<100 mA	0V to 900Vdc	<0.25% P-P	0.56 mA
J05-2P100	J05-2P100/Y	0V to 12Vdc	<40 mA	<100 mA	0V to +1kVdc	<0.25% P-P	0.5 mA
J05-2N100	J05-2N100/Y	0V to 12Vdc	<40 mA	<100 mA	0V to -1kVdc	<0.25% P-P	0.5 mA
J05-2P120	J05-2P120/Y	0V to 12Vdc	<40 mA	<100 mA	0V to +1.2kVdc	<0.25% P-P	0.42 mA
J05-2N120	J05-2N120/Y	0V to12Vdc	<40 mA	<100 mA	0V to -1.2kVdc	<0.25% P-P	0.42 mA
J05-2P150	J05-2P150/Y	0V to 12Vdc	<40 mA	<100 mA	0V to +1.5kVdc	<0.25% P-P	0.33 mA
J05-2N150	J05-2N150/Y	0V to 12Vdc	<40 mA	<100 mA	0V to -1.5kVdc	<0.25% P-P	0.33 mA
J05-2P200	J05-2P200/Y	0V to 12Vdc	<40 mA	<100 mA	0V to +2kVdc	<0.25% P-P	0.25 mA
J05-2N200	J05-2N200/Y	0V to 12Vdc	<40 mA	<100 mA	0V to -2kVdc	<0.25% P-P	0.25 mA

J05 SERIES 0.5 WATT PROPORTIONAL HV DC/DC CONVERTERS

24V INPUT SINGLE OUTPUTS

REPRESENTATIVE MODEL LISTING							
MODEL NUMBER		INPUT SPECIFICATIONS			OUTPUT SPECIFICATIONS		
Non-RoHs	RoHs	VOLTAGE	NO LOAD	FULL LOAD	VOLTAGE	RIPPLE	CURRENT
J05-4R10	J05-4R10/Y	0V to 24Vdc	<20 mA	<50 mA	0V to 100Vdc	<1% P-P	5 mA
J05-4R15	J05-4R15/Y	0V to 24Vdc	<20 mA	<50 mA	0V to 150Vdc	<0.5% P-P	3.33 mA
J05-4R20	J05-4R20/Y	0V to 24Vdc	<20 mA	<50 mA	0V to 200Vdc	<0.25% P-P	2.5 mA
J05-4R25	J05-4R25/Y	0V to 24Vdc	<20 mA	<50 mA	0V to 250Vdc	<0.25% P-P	2 mA
J05-4R30	J05-4R30/Y	0V to 24Vdc	<20 mA	<50 mA	0V to 300Vdc	<0.25% P-P	1.67 mA
J05-4R35	J05-4R35/Y	0V to 24Vdc	<20 mA	<50 mA	0V to 350Vdc	<0.25% P-P	1.43 mA
J05-4R40	J05-4R40/Y	0V to 24Vdc	<20 mA	<50 mA	0V to 400Vdc	<0.1% P-P	1.25 mA
J05-4R45	J05-4R45/Y	0V to 24Vdc	<20 mA	<50 mA	0V to 450Vdc	<0.15% P-P	1.11 mA
J05-4R50	J05-4R50/Y	0V to 24Vdc	<20 mA	<50 mA	0V to 500Vdc	<0.15% P-P	1 mA
J05-4R60	J05-4R60/Y	0V to 24Vdc	<20 mA	<50 mA	0V to 600Vdc	<0.1% P-P	0.83 mA
J05-4R70	J05-4R70/Y	0V to 24Vdc	<20 mA	<50 mA	0V to 700Vdc	<0.25% P-P	0.72 mA
J05-4R80	J05-4R80/Y	0V to 24Vdc	<20 mA	<50 mA	0V to 800Vdc	<0.3% P-P	0.63 mA
J05-4R90	J05-4R90/Y	0V to 24Vdc	<20 mA	<50 mA	0V to 900Vdc	<0.25% P-P	0.56 mA
J05-4P100	J05-4P100/Y	0V to 24Vdc	<20 mA	<50 mA	0V to +1kVdc	<0.25% P-P	0.5 mA
J05-4N100	J05-4N100/Y	0V to 24Vdc	<20 mA	<50 mA	0V to -1kVdc	<0.25% P-P	0.5 mA
J05-4P120	J05-4P120/Y	0V to 24Vdc	<20 mA	<50 mA	0V to +1.2kVdc	<0.25% P-P	0.42 mA
J05-4N120	J05-4N120/Y	0V to24Vdc	<20 mA	<50 mA	0V to -1.2kVdc	<0.25% P-P	0.42 mA
J05-4P150	J05-4P150/Y	0V to 24Vdc	<20 mA	<50 mA	0V to +1.5kVdc	<0.25% P-P	0.33 mA
J05-4N150	J05-4N150/Y	0V to 24Vdc	<20 mA	<50 mA	0V to -1.5kVdc	<0.25% P-P	0.33 mA
J05-4P200	J05-4P200/Y	0V to 24Vdc	<20 mA	<50 mA	0V to +2kVdc	<0.25% P-P	0.25 mA
J05-4N200	J05-4N200/Y	0V to 24Vdc	<20 mA	<50 mA	0V to -2kVdc	<0.25% P-P	0.25 mA

J05 SERIES 0.5 WATT PROPORTIONAL HV DC/DC CONVERTERS

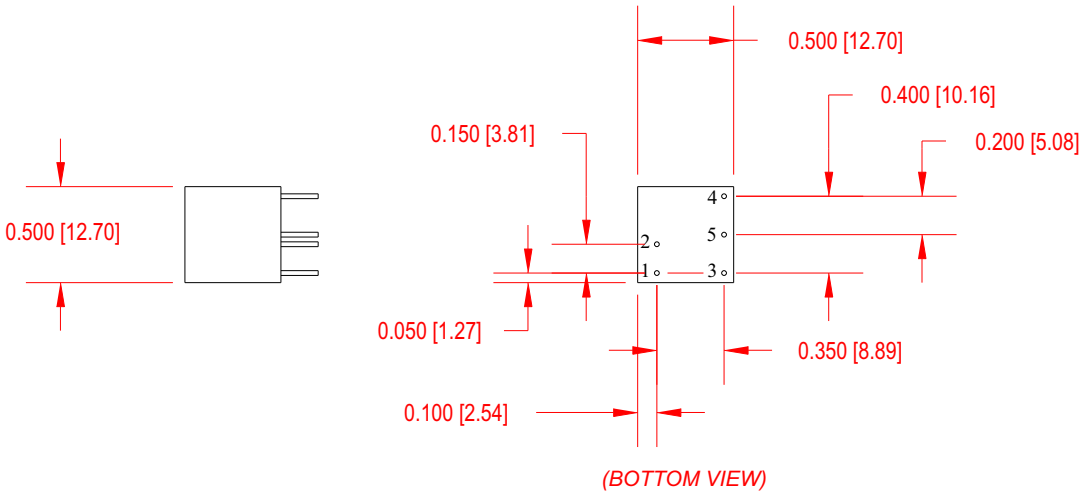
DUAL OUTPUTS

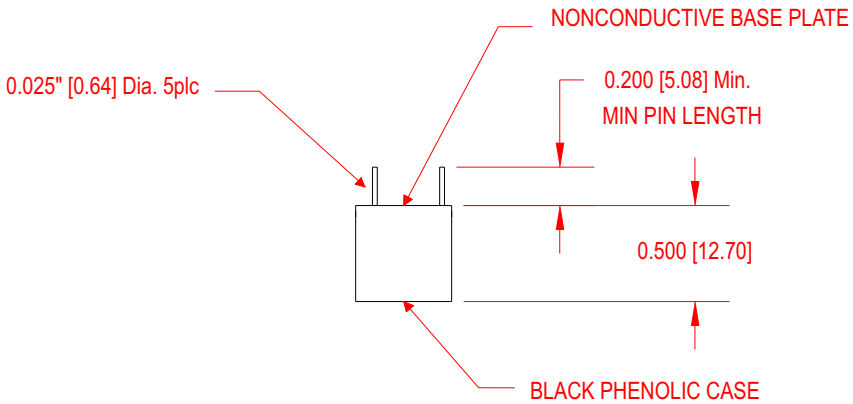
REPRESENTATIVE MODEL LISTING							
MODEL NUMBER		INPUT SPECIFICATIONS			OUTPUT SPECIFICATIONS		
Non-RoHs	RoHs	VOLTAGE	NO LOAD	FULL LOAD	VOLTAGE	RIPPLE	CURRENT
J05-5D5	J05-5D5/Y	0V to 5Vdc	<100 mA	<250 mA	0V to +/-50Vdc	<1% P-P	5 mA
J05-2D5	J05-2D5/Y	0V to 12Vdc	<40 mA	<100 mA	0V to +/-50Vdc	<1% P-P	5 mA
J05-4D5	J05-4D5/Y	0V to 24Vdc	<20 mA	<50 mA	0V to +/-50Vdc	<1% P-P	5 mA
J05-5D10	J05-5D10/Y	0V to 5Vdc	<100 mA	<250 mA	0V to +/-100Vdc	<0.25% P-P	2.5 mA
J05-2D10	J05-2D10/Y	0V to 12Vdc	<40 mA	<100 mA	0V to +/-100Vdc	<0.25% P-P	2.5 mA
J05-4D10	J05-4D10/Y	0V to 24Vdc	<20 mA	<50 mA	0V to +/-100Vdc	<0.25% P-P	2.5 mA
J05-5D15	J05-5D15/Y	0V to 5Vdc	<100 mA	<250 mA	0V to +/-150Vdc	<0.25% P-P	1.67 mA
J05-2D15	J05-2D15/Y	0V to 12Vdc	<40 mA	<100 mA	0V to +/-150Vdc	<0.25% P-P	1.67 mA
J05-4D15	J05-4D15/Y	0V to 24Vdc	<20 mA	<50 mA	0V to +/-150Vdc	<0.25% P-P	1.67 mA
J05-5D20	J05-5D20/Y	0V to 5Vdc	<100 mA	<250 mA	0V to +/-200Vdc	<0.1% P-P	1.25 mA
J05-2D20	J05-2D20/Y	0V to 12Vdc	<40 mA	<100 mA	0V to +/-200Vdc	<0.1% P-P	1.25 mA
J05-4D20	J05-4D20/Y	0V to 24Vdc	<20 mA	<50 mA	0V to +/-200Vdc	<0.1% P-P	1.25 mA
J05-5D25	J05-5D25/Y	0V to 5Vdc	<100 mA	<250 mA	0V to +/-250Vdc	<0.15% P-P	1 mA
J05-2D25	J05-2D25/Y	0V to 12Vdc	<40 mA	<100 mA	0V to +/-250Vdc	<0.15% P-P	1 mA
J05-4D25	J05-4D25/Y	0V to 24Vdc	<20 mA	<50 mA	0V to +/-250Vdc	<0.15% P-P	1 mA
J05-5D30	J05-5D30/Y	0V to 5Vdc	<100 mA	<250 mA	0V to +/-300Vdc	<0.1% P-P	0.83 mA
J05-2D30	J05-2D30/Y	0V to 12Vdc	<40 mA	<100 mA	0V to +/-300Vdc	<0.1% P-P	0.83 mA
J05-4D30	J05-4D30/Y	0V to 24Vdc	<20 mA	<50 mA	0V to +/-300Vdc	<0.1% P-P	0.83 mA
J05-5D35	J05-5D35/Y	0V to 5Vdc	<100 mA	<250 mA	0V to +/-350Vdc	<0.25% P-P	0.72 mA
J05-2D35	J05-2D35/Y	0V to 12Vdc	<40 mA	<100 mA	0V to +/-350Vdc	<0.25% P-P	0.72 mA
J05-4D35	J05-4D35/Y	0V to 24Vdc	<20 mA	<50 mA	0V to +/-350Vdc	<0.25% P-P	0.72 mA
J05-5D40	J05-5D40/Y	0V to 5Vdc	<100 mA	<250 mA	0V to +/-400Vdc	<0.3% P-P	0.63 mA
J05-2D40	J05-2D40/Y	0V to 12Vdc	<40 mA	<100 mA	0V to +/-400Vdc	<0.3% P-P	0.63 mA
J05-4D40	J05-4D40/Y	0V to 24Vdc	<20 mA	<50 mA	0V to +/-400Vdc	<0.3% P-P	0.63 mA
J05-5D45	J05-5D45/Y	0V to 5Vdc	<100 mA	<250 mA	0V to +/-450Vdc	<0.25% P-P	0.56 mA
J05-2D45	J05-2D45/Y	0V to 12Vdc	<40 mA	<100 mA	0V to +/-450Vdc	<0.25% P-P	0.56 mA
J05-4D45	J05-4D45/Y	0V to 24Vdc	<20 mA	<50 mA	0V to +/-450Vdc	<0.25% P-P	0.56 mA

NOTE: *Ripple on dual output units are measured between the positive and negative output pins.*

J05 SERIES 0.5 WATT PROPORTIONAL HV DC/DC CONVERTERS

STANDARD



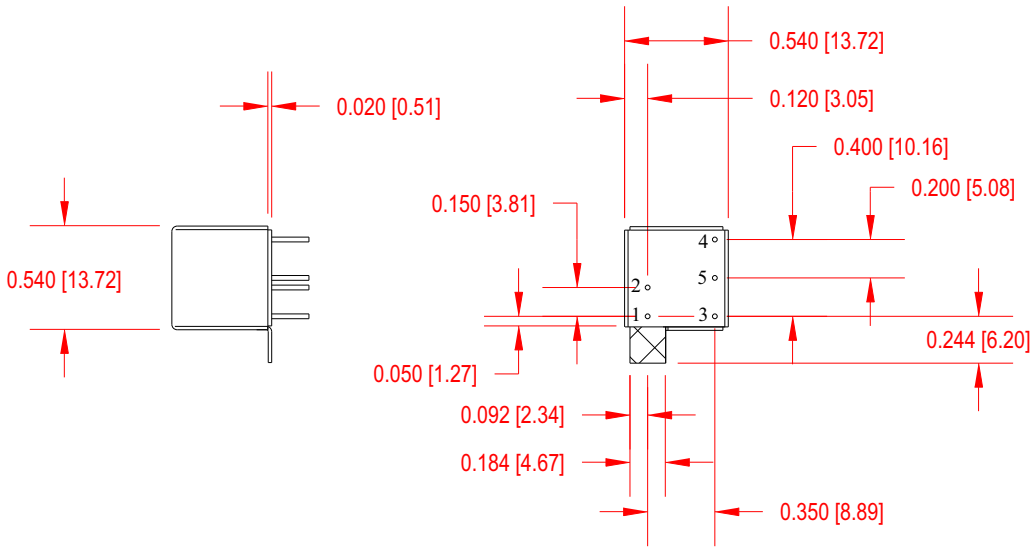


PIN #	100V TO 900V OUTPUTS	DUAL OUTPUTS	POSITIVE 1KV TO 2KV OUTPUTS	NEGATIVE 1KV TO 2KV OUTPUTS
1	- INPUT	- INPUT	- INPUT	- INPUT
2	+ INPUT	+ INPUT	+ INPUT	+ INPUT
3	+ OUTPUT	+ OUTPUT	+ OUTPUT	- OUTPUT
4	- OUTPUT	- OUTPUT	HV RTN	HV RTN
5	NO PIN	COM	NO PIN	NO PIN

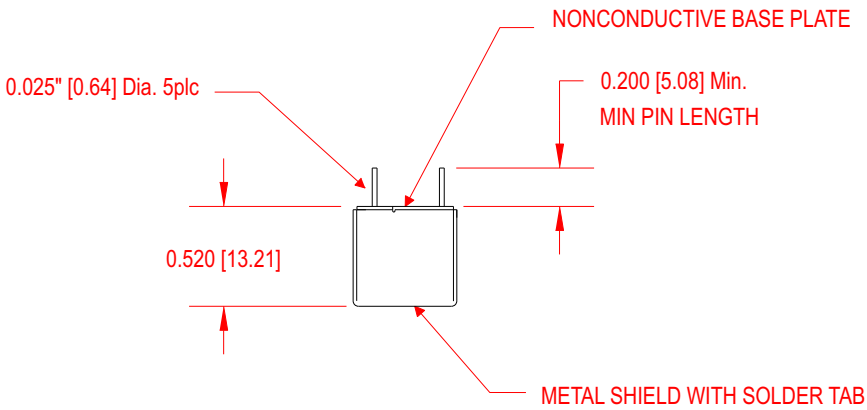
Dimensions are in Inches
[Metric equivalents in brackets]

J05 SERIES 0.5 WATT PROPORTIONAL HV DC/DC CONVERTERS

SHIELD OPTION (/S)



(BOTTOM VIEW)



PIN #	100V TO 900V OUTPUTS	DUAL OUTPUTS	POSITIVE 1KV TO 2KV OUTPUTS	NEGATIVE 1KV TO 2KV OUTPUTS
1	- INPUT	- INPUT	- INPUT	- INPUT
2	+ INPUT	+ INPUT	+ INPUT	+ INPUT
3	+ OUTPUT	+ OUTPUT	+ OUTPUT	- OUTPUT
4	- OUTPUT	- OUTPUT	HV RTN	HV RTN
5	NO PIN	COM	NO PIN	NO PIN

Dimensions are in Inches
[Metric equivalents in brackets]

J05 SERIES 0.5 WATT PROPORTIONAL HV DC/DC CONVERTERS

APPLICATION NOTES

INPUT AND OUTPUT IMPEDANCE

The J05 Series of power converters have been designed to be stable with no external capacitors when used in low inductance input and output circuits. However, in some applications, the inductance associated with the distribution from the power source to the input of the converter can affect the stability of the converter. The addition of a 10 µF electrolytic capacitor with an ESR <1 Ohm across the input helps ensure stability of the converter. In some applications, the user may need to use decoupling capacitance at the load.

SHORT CIRCUIT PROTECTION

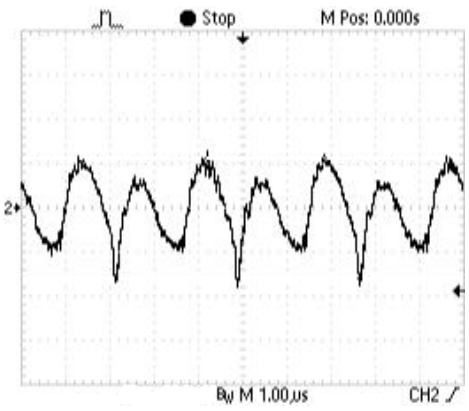
The J05 Series is equipped with short circuit protection. The converter will fold-back the input power whenever a short circuit is applied to its output and automatically recover after the overload condition is removed.

ISOLATION

The output of the J05 Series is galvanically isolated from the input, capacitance is < 30pF and resistance is > 10G Ohm. For dual output units Isolation is from Com output pin (5) and -Input (1).

RIPPLE AND NOISE

Figure below shows a typical output voltage ripple waveform, measured at full rated load current with no additional output filtering. External low ESR capacitors may be added across output to further reduce ripple.



STARTUP TRANSIENT

Figure below shows a typical output voltage during turn-on, measured at no load current with no additional output filtering.

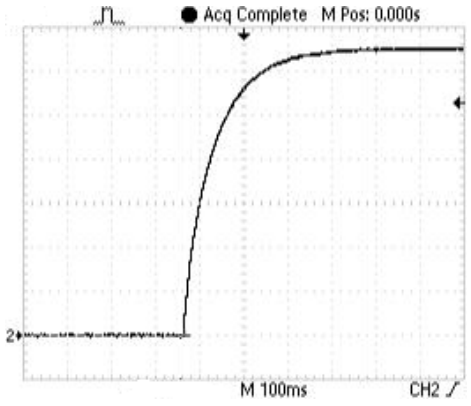
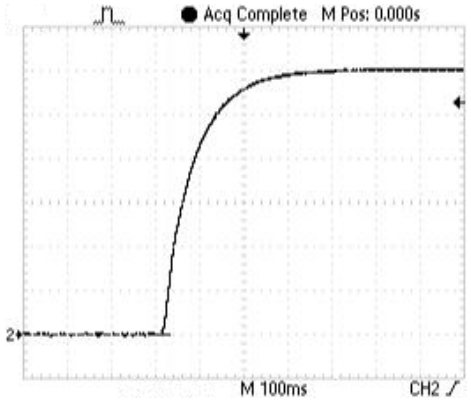


Figure below shows a typical output voltage during turn-on, measured at full rated load current with no additional output filtering.



J05 SERIES 0.5 WATT PROPORTIONAL HV DC/DC CONVERTERS

APPLICATION NOTES

INRUSH CURRENT

The inrush current of the J05 Series has been kept as low as possible. However, a series resistor may be inserted in the input line to limit this current further.

LOAD TRANSIENT

Figure below shows a typical output voltage response, measured during a transition from full rated load current to no load current with no additional output filtering.

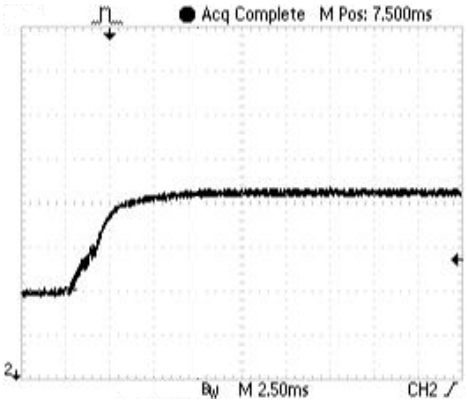
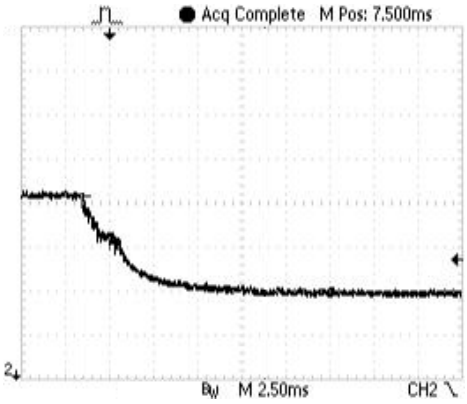


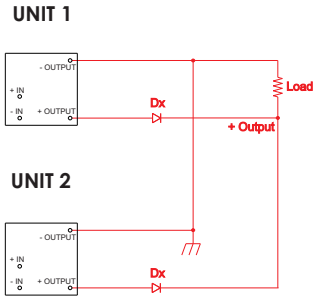
Figure below shows a typical output voltage response, measured during a transition from no load current to full rated load current with no additional output filtering.



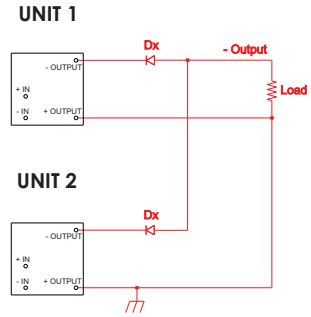
CONNECTION IN PARALLEL

The figures below shows how to connect outputs of several units with equal nominal output voltage in parallel with the use of oring diodes.

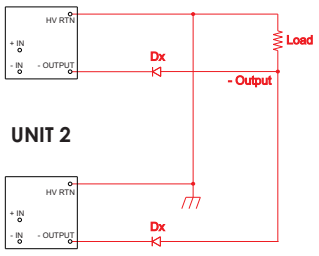
POSITIVE OUTPUT



NEGATIVE OUTPUT (100V TO 900V)



NEGATIVE OUTPUT (1KV TO 2KV)



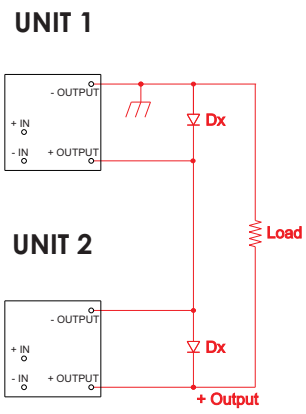
NOTE:
The ratings of Dx should be 1.5 times the maximum current and voltage expected in each branch.

J05 SERIES 0.5 WATT PROPORTIONAL HV DC/DC CONVERTERS

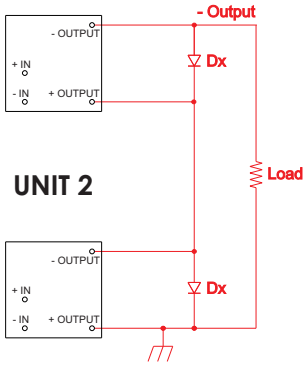
CONNECTION IN SERIES

Figures below shows how to connect multiple outputs in series with the use of shunt diodes, taking into consideration that the highest achieved output voltage should remain below the rated isolation voltage (500V).

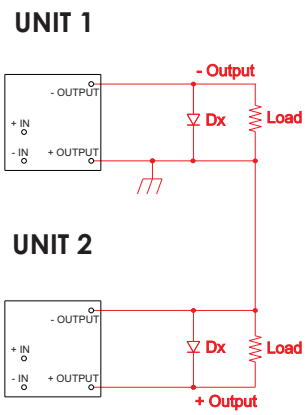
POSITIVE OUTPUT



NEGATIVE OUTPUT



DUAL OUTPUT



NOTE:
The ratings of Dx should be 1.5 times the maximum current and voltage expected in each branch.

J05 SERIES 0.5 WATT PROPORTIONAL HV DC/DC CONVERTERS

APPLICATION NOTES

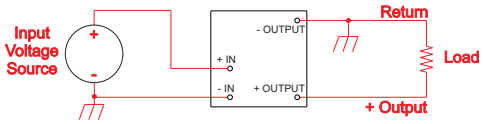
POSITIVE OR NEGATIVE OUTPUTS

Isolated DC-DC voltage converters can provide positive or negative voltages from a single device.

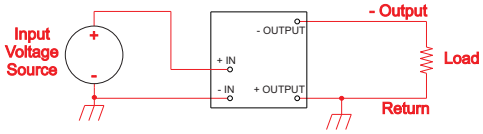
Isolated DC-DC converters may also be used with either a positive or a negative input voltage source, as long as the relative polarity of the input to the device is maintained.

The figures below show the various polarity combinations and how to connect the converter to provide them relative to ground.

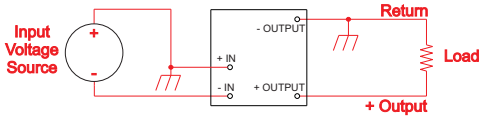
POSITIVE SOURCE WITH A POSITIVE OUTPUT



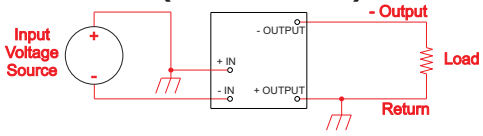
POSITIVE SOURCE WITH A NEGATIVE OUTPUT (100V TO 900V)



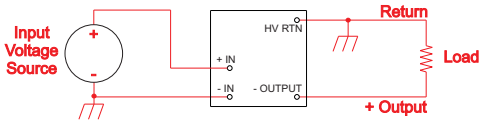
NEGATIVE SOURCE WITH A POSITIVE OUTPUT



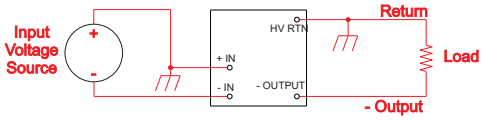
NEGATIVE SOURCE WITH A NEGATIVE OUTPUT (100V TO 900V)



POSITIVE SOURCE WITH A NEGATIVE OUTPUT (-1KV TO -2KV)



NEGATIVE SOURCE WITH A NEGATIVE OUTPUT (-1KV TO -2KV)

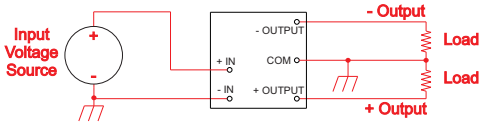


CONNECTIONS FOR DUAL OUTPUTS

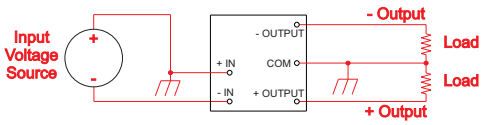
Isolation on a dual output converter is from Com output pin (5) and -Input (2) and therefore ground connection on the output is to Com pin only.

The figures below shows how to power a dual output converter with either a positive or a negative input voltage source.

POSITIVE VOLTAGE SOURCE



NEGATIVE VOLTAGE SOURCE



NOTE:
The (- In) must be kept negative with respect to the (+In) pin. If this polarity is reversed, permanent damage to the converter may occur.

J05 SERIES 0.5 WATT PROPORTIONAL HV DC/DC CONVERTERS

APPLICATION NOTES

CLEANING AGENTS

In order to avoid possible damage, any penetration of cleaning fluids must be prevented, since the power supplies are not hermetically sealed.

NUCLEAR AND MEDICAL APPLICATIONS

American Power Design products are not designed, intended for use in, or authorized for use as critical components in life support systems, equipment used in hazardous environments, or nuclear control systems without the express written consent of American Power Design, Inc.

TECHNICAL REVISIONS

The appearance of products, including safety agency certifications pictured on labels, may change depending on the date manufactured. Specifications are subject to change without notice.

SAFETY REQUIREMENTS

The converters are designed to meet North American and International safety regulatory requirements per UL 60950-1/CSA 22.2 No. 60950-1-07 Second Edition, IEC 60950-1: 2005, and EN 60950-1:2006. Basic Insulation is provided between input and output. To comply with safety agencies requirements, an input line fuse must be used external to the converter. The table below provides the recommended fuse rating for use with this family of products.

Input Voltage Range	Fuse Rating
0 to 5Vdc	1A
0 to12Vdc	0.5A
0 to 24Vdc	0.2A

If one input fuse is used for a group of modules, the maximum fuse rating should not exceed 5A.

WARRANTY

All products manufactured by American Power Design, Inc. (APD) are warranted to be free of defects due to material or workmanship for a period of one year from date of shipment. At our option, APD will repair or replace any non-conforming product.
APD expressly disclaims any liability for consequential or incidental damages resulting from the use or misuse of its products by the purchaser or others.
This warranty is in lieu of all warranties expressed or implied, including the warranties of merchantability. No other warranties, obligations, or liabilities are expressed or implied.
All products being returned for repair require a return material authorization(RMA) assigned by APD prior to return shipment.