

Interfacing with the nHV Series

Nano-Sized High Voltage DC to DC Converter

Introduction

This application note is intended to provide the pin assignments, input requirements, and output characteristics for the **nHV Series** ultra-miniature high voltage power supplies. This document should be used in conjunction with the product specification sheet to form a complete usage manual for the **nHV Series** modules.

The **nHV Series** is a family of nano-sized single-output DC to DC converters supplying up to 1.2kV in 0.058 cubic inches (0.45" x 0.35" x 0.37"). The nominal input voltage is 5Vdc. See product specification sheet for specific models.

Functional Diagram

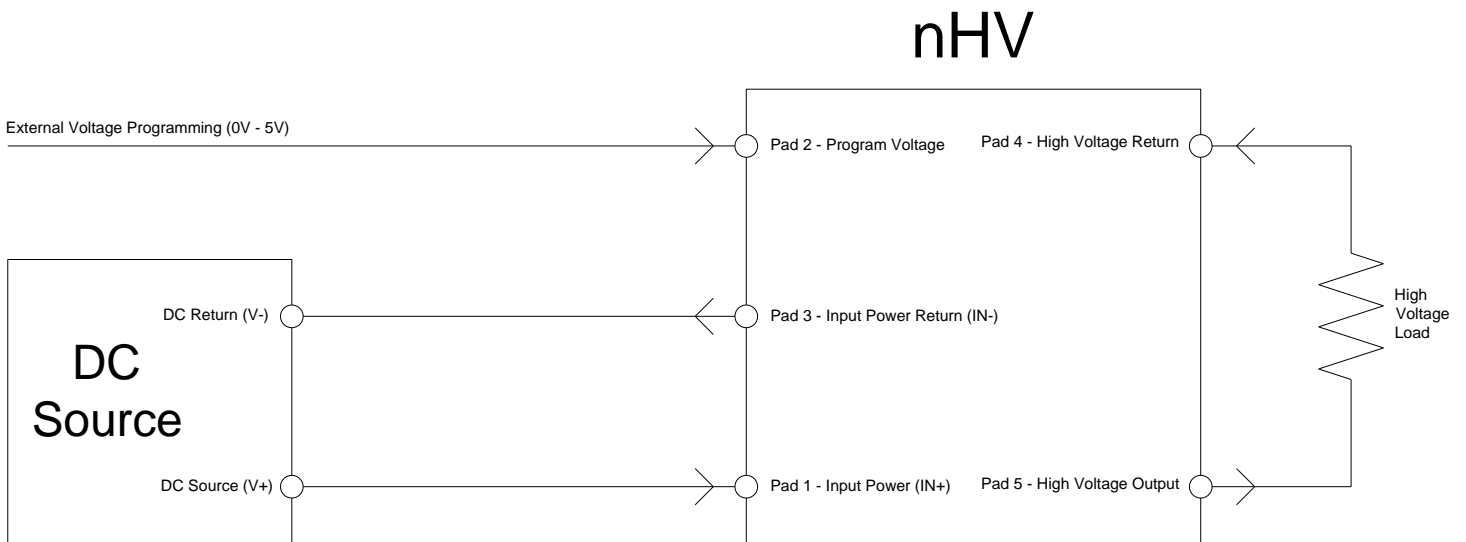


Figure 1. nHV Series Functional Diagram, Positive Polarity Model

Pad Overview

Pad assignments are referenced from Figure 1 above.

Pad 1 – Input Power (IN+):

This pad is the power input for the nHV module supplied by the DC source. This source must be capable of providing the input voltage and maximum input current necessary for operation of the UMHV module. These requirements vary by model and can be found in the Model Selection Guide table of the product specification sheet. Some examples of acceptable DC sources are batteries, AC/DC supplies, and DC/DC supplies.

Pad 2 – Program Voltage:

This pad is used to control the high voltage output of the device by using a low voltage analog signal. An input of 0Vdc to +5Vdc will linearly control the high voltage output from 0 to 100% of the max rated output as described in the product specification sheet for the chosen module. This pad has an input impedance of 100k Ω \pm 2%. The programming voltage signal can be from a wide variety of sources as long as those sources have a common ground return to the nHV module, including operational amplifiers, digital to analog converters, and potentiometers.

Pad 3 – Input Power Return (IN-):

This pad is the return ground path to the input DC source that powers the module. This pad is also used as the return ground path for the program voltage signal.

Pad 4 – High Voltage Return:

This pad provides a return path to the nHV module for the high voltage output from the high voltage load. This return path is internally connected to the Input Power Return, and the High Voltage Output is referenced from this point.

Pad 5 – High Voltage Output:

This pad is the high voltage output of the nHV module. This pad supplies an output power of 100mW at single polarity voltages up to \pm 1.2kV. Refer to product specification sheet for specific model max ratings. The output adjusts linearly in response to the signal from the Program Voltage.



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Design Considerations

PCB Layout:

Always use best practices when designing the system PC board. The nHV series can range up to $\pm 1.2\text{kV}$ depending on model, so proper creepage and clearance spacing must be observed. If possible, PCB routing is recommended on higher voltage modules to isolate the high voltage output from the lower voltage pads. Avoid placing traces under the module, especially critical signal traces. Ground planes and/or power planes are recommended, but take caution to eliminate these layers near the High Voltage Output.

Soldering:

The nHV series of modules is rated for hand soldering only. Unit damage may occur in convection or wave soldering machines. Module should be soldered to PCB using a temperature not to exceed 600°F for no longer than 5 seconds. Inspect all solder connections for conformance to industry standards.

Cleaning:

If contaminants are present on the unit or the connections, it is imperative to be cleaned prior to operation. The nHV series are encased in a Thermoset plastic (Diallyl Phthalate) housing. Be sure any solvents used are compatible with the housing material and solder used.

Customization:

The nHV series can be manufactured with modifications, if necessary. Contact the factory for information on custom voltage outputs, metal shielding, or other requests.

About HVM Technology

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