

NCH6300HV High Voltage DC-DC Power Booster



Official Website www.omnixie.com
www.omnixie.cn

Version 1.0
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Electronics Design Mr. Yan, Zeyuan



Thank you for purchasing an Omnixie® product!

Below you will find information on how to get the most from your power booster. Please read the following information carefully before using this product. If you have any questions regarding these instructions, please contact us for further explanation.

* Features

NCH6300HV high voltage DC-DC power booster is a miniature step-up DC-DC converter with high efficiency and low heat generation, operating from 3.7 to 15V_{DC} input with an output of 100V to 230V_{DC}, adjustable by a precise potentiometer onboard. It is designed mainly for Nixie tubes, VFD tubes and Magic eye etc. The input can be as low as 3.7V, suitable for applications using Lithium battery or USB port as the power supply. The module can be completely shut off by controlling the SHDN pin, for better safety and maximum energy conservation. The pin pitch is 0.1", therefore compatible with standard perforated boards and breadboards. PCB terminals and pin headers are provided.

! WARNING

- ◇ High voltage is present on the board when energized. Please do not touch the circuit board or the components with bare hands when the power is connected.
- ◇ Overload prohibited! Keep the input voltage/output current in the specified range.
- ◇ When used in an enclosed environment, be sure to add proper ventilation for heat dissipation.
- ◇ Indoor use only.

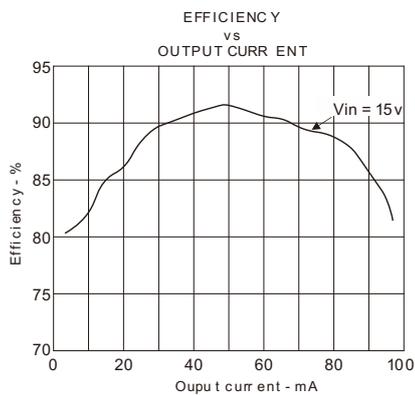
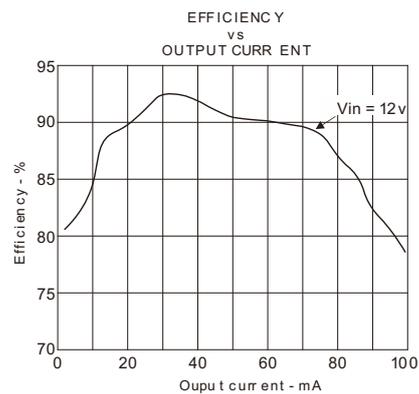
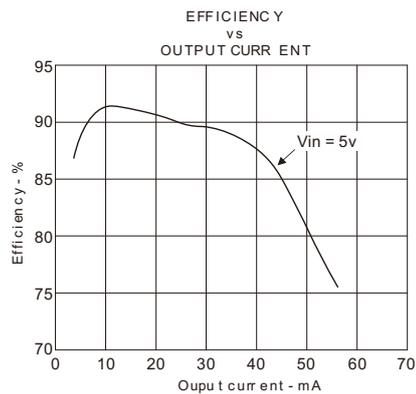
* Technical Specifications

Specification	Symbol	Min	Typ	Max	Units
Input voltage	V_{IN}	3.70	5.00	15.00	Volts
Output voltage ($I_o = 10mA$)	V_{OUT}	100	170	230	Volts
Output current ($V_{IN} = 3.7V$ $V_{OUT} = 170V$)	I_{OUT}	0	30	40	mAmps
Output current ($V_{IN} = 5.0V$ $V_{OUT} = 170V$)		0	40	60	mAmps
Output current ($V_{IN} = 12V$ $V_{OUT} = 170V$)		0	60	100	mAmps
Shutdown current ($V_{IN} = 5V$ $V_{OUT} = 170V$)	I_{OFF}	---	0.01	---	mAmps
Operating Frequency	F_{SYNC}	---	70	---	kHz
Efficiency ($V_{IN} = 3.7-15VDC$, 60%-80% rated load)	Efficiency	---	86	92.5	%

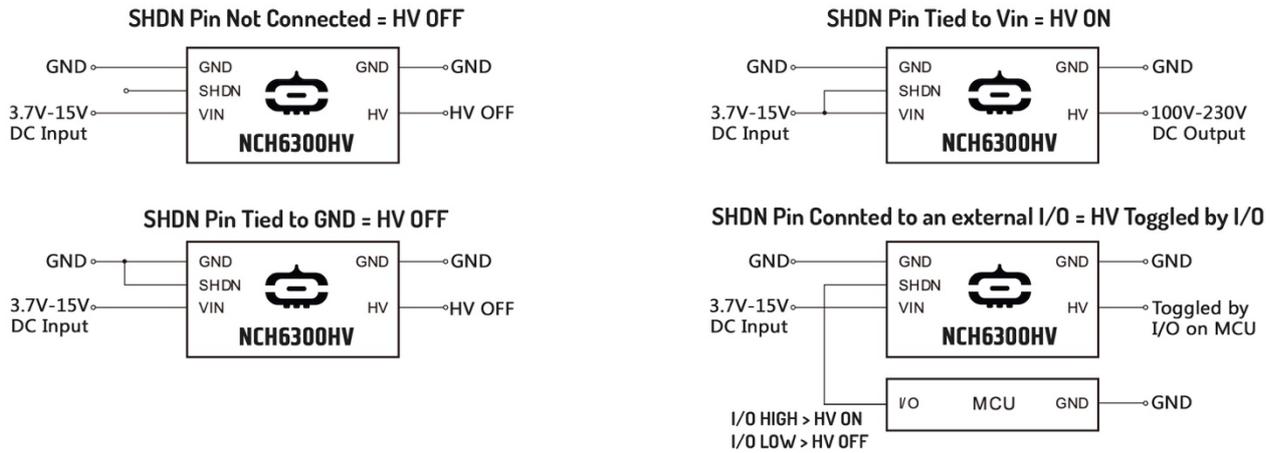
Notes:

1. The SHDN pin MUST be pulled HIGH or V_{IN} to enable the HV output!
2. No reverse polarity protection is provided! Double check your input polarity before power on.

Efficiency Curve (Tested When $V_{OUT} = 170V_{DC}$)



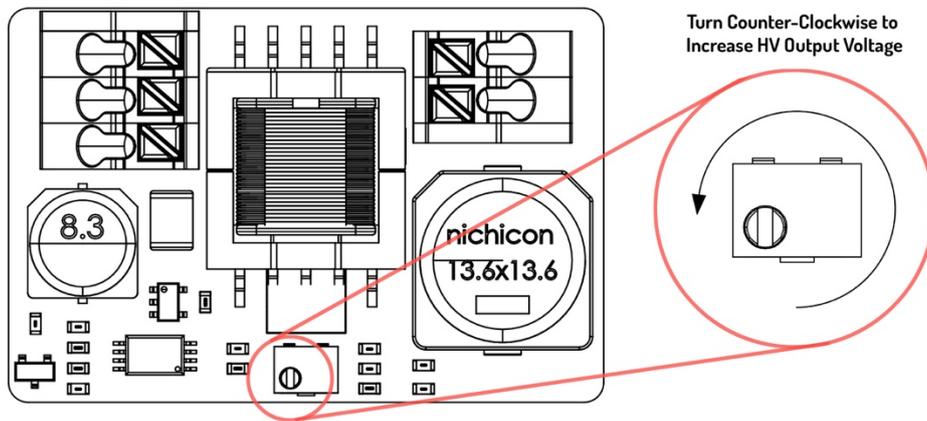
Typical Applications



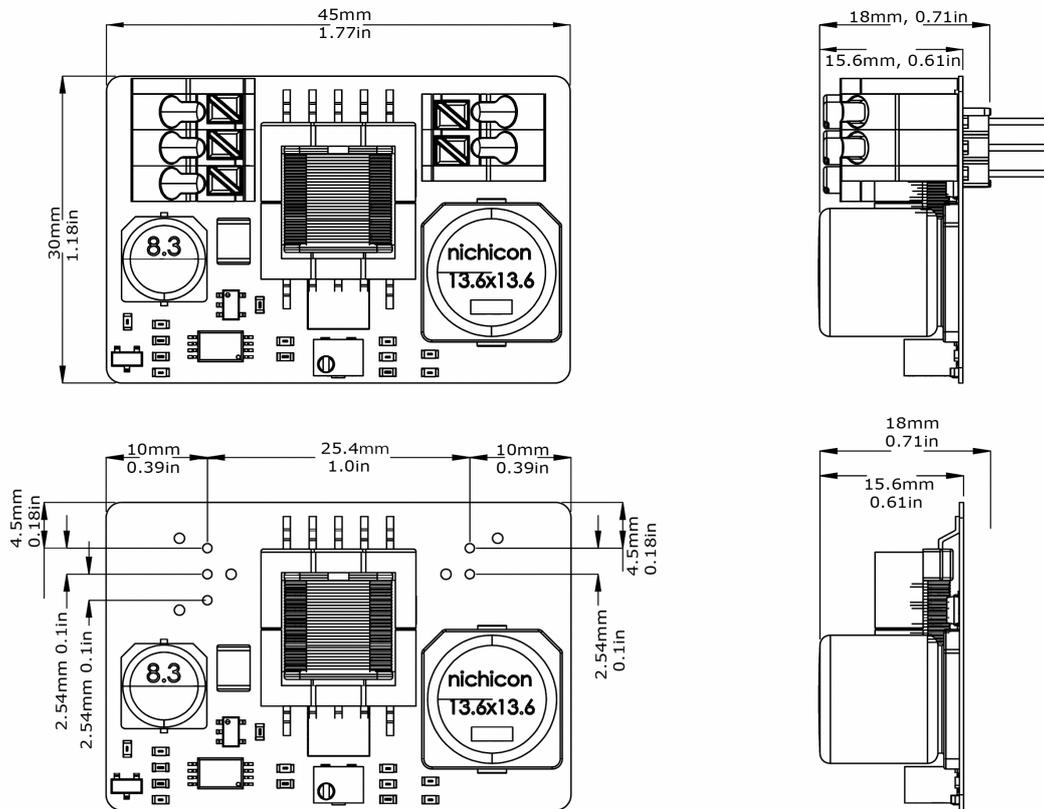
⚠ CAUTION

1. The SHDN behavior is **REVERSED** compared to its precedent, NCH6100HV. If you are to replace NCH6100HV with NCH6300HV, remember to make changes to the SHDN connections accordingly.
2. A capacitor on the input is recommended if the NCH6300HV is far from the power.
3. The module will generate heat, esp. on high output current. Make sure to add ventilation to help heat dissipation.

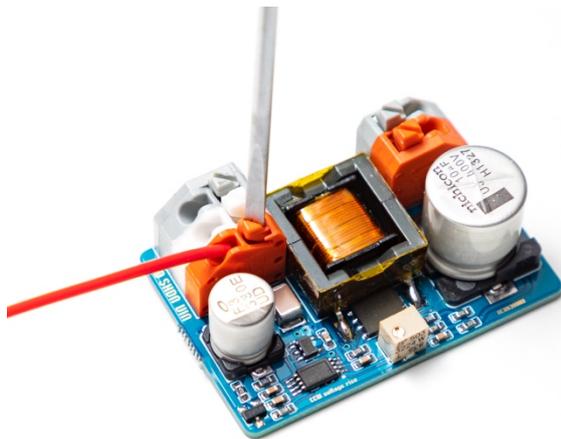
Output High Voltage Adjustment



* Physical Dimensions



* How to Use



Wire Connection

1. Press the PCB terminals with a screwdriver.
2. Insert the stripped wire. (AWG 16-22 recommended)
3. Release the screwdriver.



High Voltage Output Adjustment

Tune the potentiometer with a flat head screwdriver.
(Clockwise: Decrease; Counter-Clockwise: Increase)

* Our Power Booster Product Line Comparison

**6100****6300****8200**

DC INPUT VOLTAGE	10-24V	3.7-15V	2.5-15V
DC OUTPUT VOLTAGE	85-235V	100-230V	170V Fixed
OUTPUT CURRENT ($V_{in}=12V$, $V_{out}=170V$)	35-55mA	70-100mA	30mA
TYPICAL EFFICIENCY	80%	86%-92.5%	86%-89%
Li-Ion Battery Input	NO	YES	YES
OUTPUT ADJUSTABLE	YES	YES	NO
OUTPUT ENABLE PIN	YES (LOW/NC = ENABLE)	YES (HIGH = ENABLE)	NO
CONNECTION METHODS	WIRE TERMINAL; 0.1" PITCH HEADER	WIRE TERMINAL; 0.1" PITCH HEADER	INDIVIDUAL PINS
BREADBOARD COMPATIBLE	YES	YES	YES
MOUNTING HOLES	2	0	0
WIDTH	1.77in/45mm	45mm	0.71in/18mm
HEIGHT	1.46in/37mm	1.18in/30mm	0.67in/17mm
THICKNESS	0.59in/15mm	0.61in/15.6mm	0.24in/6mm
RELEASE DATE	AUG, 2012	NOV, 2020	JUL, 2017
CURRENT STATUS	DISCONTINUED	ACTIVE	ACTIVE
Retail Price	\$30	\$30	\$30

Where to buy: www.Omnixie.com
(No Sales Tax excl. California)

* Troubleshooting

- ◇ No high voltage output
 1. Power off the module. Check V_{IN} and HV_{OUT} are NOT short to ground.
 2. Check the input voltage is on.
 3. Check the input voltage polarity is correct.
 4. Check the SHDN pin is tied to V_{in} or pulled HIGH.
- ◇ HV Output cannot reach expected current
 1. Check all wires are thick enough to minimize the voltage drop over wires. This is VERY CRITICAL, especially when you use Lithium battery as power source.
 2. Enable the module first, before turn on the tubes.
 3. Let it cool down for a minute before retry.
- ◇ High voltage output does not change when tuning the potentiometer
 1. Power off the module and wait for at least 1 minute.
 2. Turn the potentiometer clockwise all the way to the end.
 3. Power on the module.
 4. Slowly turn the potentiometer counter-clockwise while measuring the HV output with a volt meter, until the desired voltage is reached.
- ◇ Overheat of the IC on the module
 1. Power off the module. Check V_{IN} and HV_{OUT} are NOT short to ground.
 2. Power on, and check the output current does not exceed the maximum.
 3. Add a heat sink on the IC, or a cooling fan nearby to help heat dissipation.

* Guarantee

Omnixie® products are warranted to be free from any defect in workmanship or materials and to be function as expected provided used according to the instructions for one (1) year. This warranty does not cover malfunction due to alteration or accident.

* Contact

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