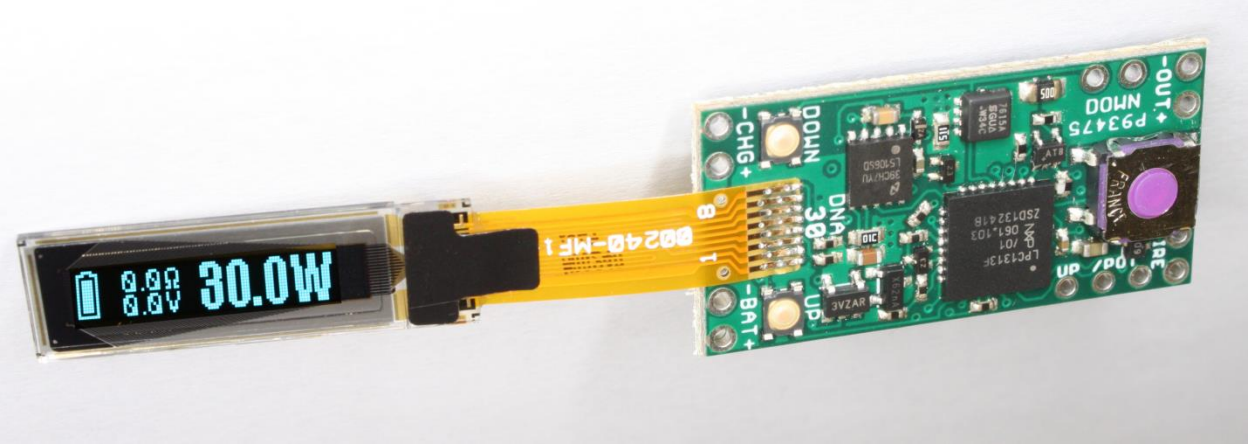
Evolv DNA 30D

30 Watt variable power module with OLED display

Datasheet



The DNA 30D is a power regulated digital switch-mode DC-DC converter for personal vaporizers. It features a small OLED display, analog or digital user controls, onboard buttons and synchronous rectification for maximum battery life and minimal heat generation.

	Minimum	Typical	Max
Output Power	7 Watts		30 Watts
Output Voltage	4 Volts		8.3 Volts
Output Current			10 Amps
Atomizer Resistance	.5 Ohms	1.5 Ohms	3.0 Ohms
Input Voltage	3.2 Volts	3.7 Volts	4.3 Volts
Input Current	1.5 Amps	6.0 Amps	12 Amps
Screen On Current		25mA	
Quiescent Current		1 mA	
Power Down Current		30 uA	
Efficiency		94%	
Weight		6g	
Footprint		.65” x 1.30”	
Thickness		.35”	
Screen size		.69” OLED	

Display

The DNA 30D has a small .69” diagonal blue OLED screen. The screen is attached to the main board by a flexible cable, allowing freedom in the design of your device. Please use caution when handling the screen and design the device so that the cable will be secured or strain relieved in operation. The normal and special operating modes shown on the display are discussed below.

Normal Operation

Watt setting: The power level currently set on the DNA 30D.

Battery indicator: The current state of charge of the battery.

Volts display: The output voltage being supplied to the atomizer.

Ohms display: The resistance of the atomizer attached to the device. This is measured only when the unit is supplying power to the atomizer. At other times, it shows the most recent measurement.

Other modes

Locked mode: Pressing the fire button five times with less than .7 seconds between presses will cause the device to enter Locked mode. In Locked mode, the device will not fire and the output power will not adjust accidentally. While in Locked mode, the screen will be off, except that pressing a button will show “Locked, Click 5X”. To exit Locked mode, press the fire button 5 times.

Stealth mode: While locked, holding the fire and down buttons simultaneously for five seconds will switch to stealth mode. In this mode the display is off. It will still show error and lock messages. To switch back to normal display mode, hold down the fire and down buttons simultaneously for 5 seconds. This setting is stored to internal flash memory, and remains if power is removed.

Right Mode and Left Mode: While locked, holding the fire and up buttons simultaneously for 5 seconds flips the display. This allows for maximum flexibility in designing the mod, as well as accommodating left handed use. This setting is stored to internal flash memory, and remains if power is removed. If using a potentiometer, this option can be set before soldering the potentiometer on during manufacture.

Power Locked mode: Holding down both the up and down buttons for two seconds will place the device in Power Locked mode. In this mode, the mod will operate normally, but you will not be able to change the power setting. This mode prevents accidental power level changes due to the buttons being pressed while in a pocket. To exit Power Locked mode, hold the up and down buttons for two seconds.

Error Messages

The DNA 30 will indicate a variety of error states.

Check Atomizer: The DNA does not detect an atomizer, the atomizer has shorted out, or the atomizer resistance is incorrect for the power setting.

Shorted: The atomizer or wiring are short circuited.

Check Battery: The battery is below 3.1 volts. It probably needs to be charged.

Weak Battery: The battery sags excessively when firing. This typically means the user is not using a high rate battery, or the battery is old and degraded. It can also mean the battery is not making good contact.

Too Hot: The DNA 30D has onboard temperature sensing. It will shut down and display this message if the internal board temperature becomes excessive.

Too low power setting: The DNA 30D puts out a minimum of 4 volts. With low power settings (7 to 8 watts) and low resistance atomizers (below 2 ohms) the DNA will sometimes be unable to provide a low enough power output to be power regulating. If this is the case, the Ohms display will be flashing. The device will still operate.

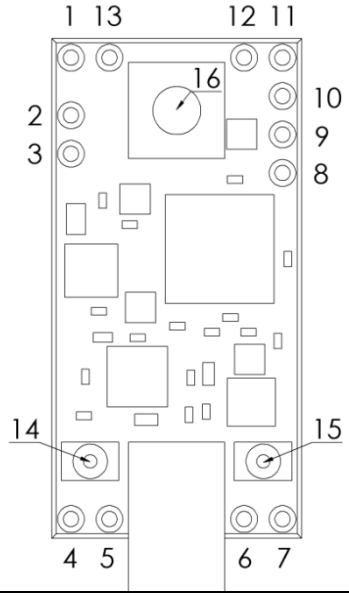
Device resets: If the battery is not able to power the device at the desired setting, or the battery is excessively discharged, the device may go immediately into a low voltage shutdown. If firing the device causes the screen to blank out and then display the welcome screen, you should charge, replace or upgrade your battery. This is especially common at power settings above 20 watts.

Auto power down

The screen will be at full brightness while firing. After 15 seconds with no button presses, the screen will dim. 2 minutes after the last button press, the screen will fade out and the device will go to sleep mode. Pressing any button will turn the device and display back on.

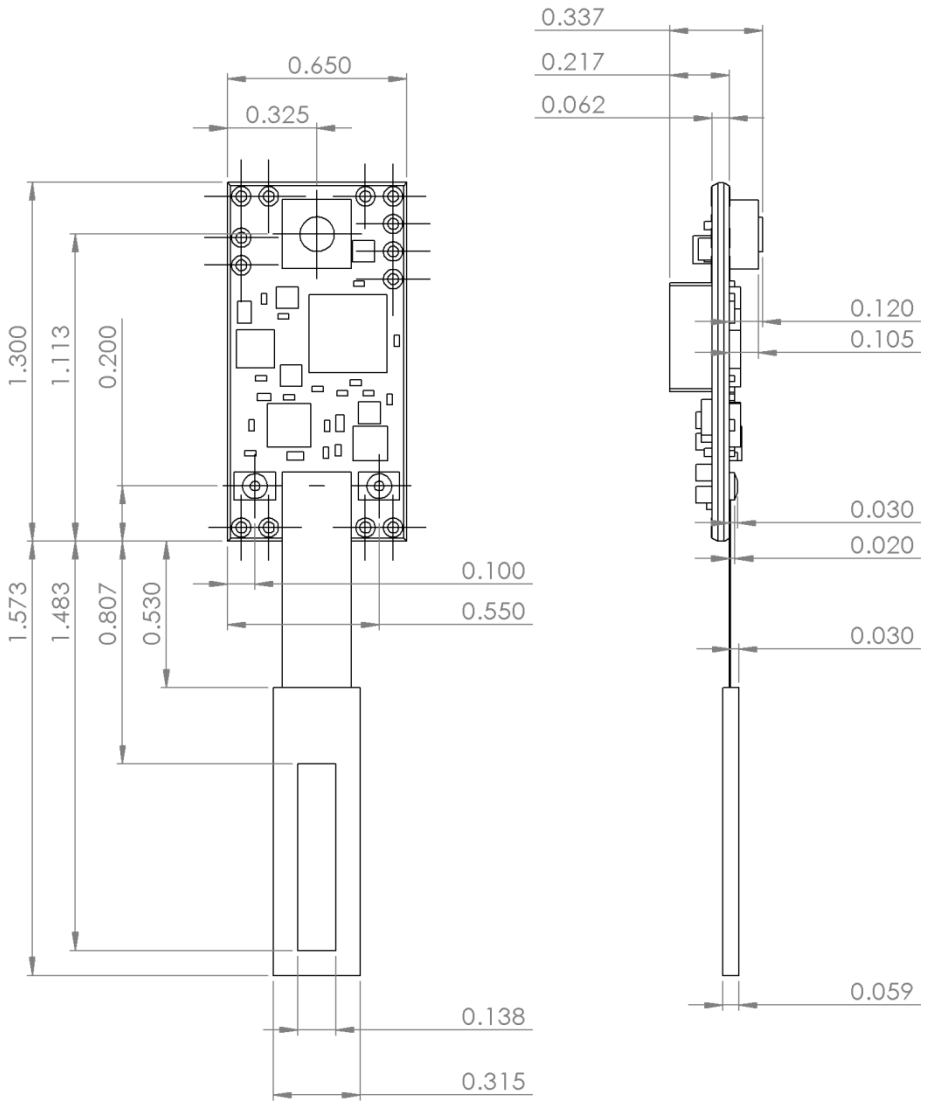
Pinout

The DNA 30D has onboard switches for adjusting the power level and activating the output. Each of these functions also has optional through-hole pads for using remote buttons. The power level can also be set with a potentiometer. The DNA will automatically detect whether the power level is being set with a potentiometer or buttons at startup. There is an input port for a charger. The DNA 30D has been designed to be physically identical to the DNA 20D. This allows for upgrades or multiple products with minimal investment in new tooling.



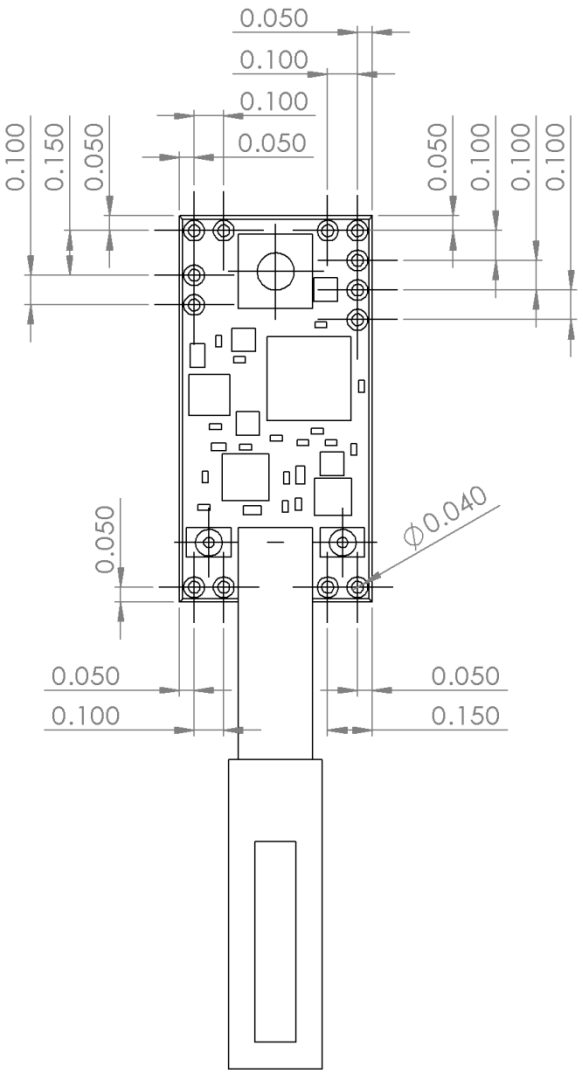
Pin Number	Pin Name	Function
1	Output -	Negative side of the power output. Connect to atomizer
2	Down -	Negative side of the power down switch
3	Down +	Positive side of the power down switch
4	Charger -	Negative side of the charger board connection
5	Charger +	Positive side of the charger board connection
6	Battery -	Negative side of the battery input
7	Battery +	Positive side of the battery input
8	Up - / Pot -	Digital mode: Negative side of the up switch Analog mode: Potentiometer negative terminal
9	Up + / Pot Wiper	Digital mode: Positive side of the up switch Analog mode: Potentiometer center terminal
10	NC / Pot +	Digital mode: Do not connect Analog mode: Potentiometer positive terminal
11	Fire +	Positive side of the fire switch
12	Fire -	Negative side of the fire switch
13	Output +	Positive side of the power output. Connect to atomizer.
14	DOWN	Onboard down button
15	UP	Onboard up button
16	FIRE	Onboard fire button

Mechanical Dimensions



Recommended wire sizes			
	Minimum size	Recommended size	Maximum size
Battery	22 gauge	20 gauge	20 gauge
Output	24 gauge	20 gauge	20 gauge
Charger, if used	26 gauge	24 gauge	20 gauge
Potentiometer, if used	28 gauge	24 gauge	20 gauge
Switches, if used	28 gauge	24 gauge	20 gauge

It is important to use appropriately sized wire when using the DNA. Too small wire will not perform well, and significantly undersized wire can burn out. High temperature insulation is preferred.



The mounting holes for the DNA 30D are .100” pitch and .040” diameter. It can be wired in directly using soldered connections, or socketed with .1” hardware.

External component recommendations

The DNA 30D is a self-contained power regulator which does not require external components for its user interface. However, it does support the use of external interface components if desired.

Switch:

Use a momentary on, normally open type switch or button. A standard pushbutton switch is appropriate. The switch is a logic function – all power switching is handled with transistors inside the DNA module, so the switch does not need to be rated for power. A waterproof or processed sealed switch is recommended.

Up/Down buttons:

The small onboard buttons labeled UP and DOWN allow the user to increase or decrease the power level in .1 Watt increments. The onboard tactile switches are waterproof and rated for 300,000 actuations. However, they are designed to always be used with external actuators, not pressed directly with the fingers. Please make sure the actuator presses down on the button only, and does not rotate or drag the top surface. Alternatively, remote normally open type switches or buttons can be attached to the UP and DOWN mounting holes for customization.

Potentiometer:

As an alternative to the digital interface, an analog potentiometer can be used to dial in the power setting. If connected to the UP/POT pads, the DNA 30D will automatically detect analog mode and use the potentiometer instead of the buttons. Resistances between 1k and 10k ohms are recommended. To reverse the direction of turn for adjustment, reverse the Potentiometer – and Potentiometer + connections. Any type of potentiometer can be made to work – shaft, shaftless, slide, etc.

Battery:

A single cell rechargeable lithium chemistry battery is recommended. Either a lithium ion or a lithium polymer type can be used. Any battery used should be rated for a **MINIMUM** of 12 amps continuous discharge current. High C rated lithium polymer or IMR cylindrical cells are strongly preferred. Make sure that all contacts and connections are capable of handling at least 12 amps.

Charger:

Evolv offers an accessory DNA Charger which is USB powered and provides a 500 milliamp charge current. The use on an onboard charger is optional – a removable battery will also work.