

Evolv DNA 75 Color



75 Watt Variable Power Module with Temperature Protection and USB

The DNA 75C is a power regulated digital switch-mode DC-DC converter for personal vaporizers. It features Evolv's patented Wattage Control, Temperature Protection, Preheat, a full color TFT screen, Reverse Polarity Protection, an onboard programmable multicolor LED, waterproof onboard buttons and a real-time clock. Evolv's EWrite software and Theme Designer software can be used to fully customize all aspects of the interface and monitor the user experience. The DNA 75C runs from a single lithium polymer or lithium ion battery, and features battery monitoring and an integrated 1A charger.

Operating Range

	Minimum	Typical	Max
Output Power	1 Watt		75 Watts
Output Voltage	.2 Volts		9.0 Volts
Output Current, continuous	.5 Amps		30.0 Amps
Atomizer Resistance, temperature sensing wire, cold	See Graph	.15 Ohm	See Graph
Atomizer Resistance, Kanthal wire	See Graph	.25 Ohm	See Graph
Temperature Limit	200°F	450°F	600°F
Input Voltage, unloaded	3.0 Volts	3.7 Volts	4.2 Volts
Input Current		12.0 Amps	30.0 Amps
Screen On Current		50mA	
Quiescent Current		30mA	
Power Down Current		1uA	
Efficiency		85%	

Specifications

Footprint	.71" x 2.60" / 18mm x 66mm
Thickness	.32"
Screen	.9" 80 x 160 pixel Full Color TFT
Weight	15.2g

Absolute Limits

	Minimum	Max
Output Current, instantaneous peak		40.0 Amps
Atomizer Resistance, cold	.02 Ohm	8.0 Ohm
Input Voltage	2.5 Volts	5.0 Volts
Input Current, pulse		32.0 Amps

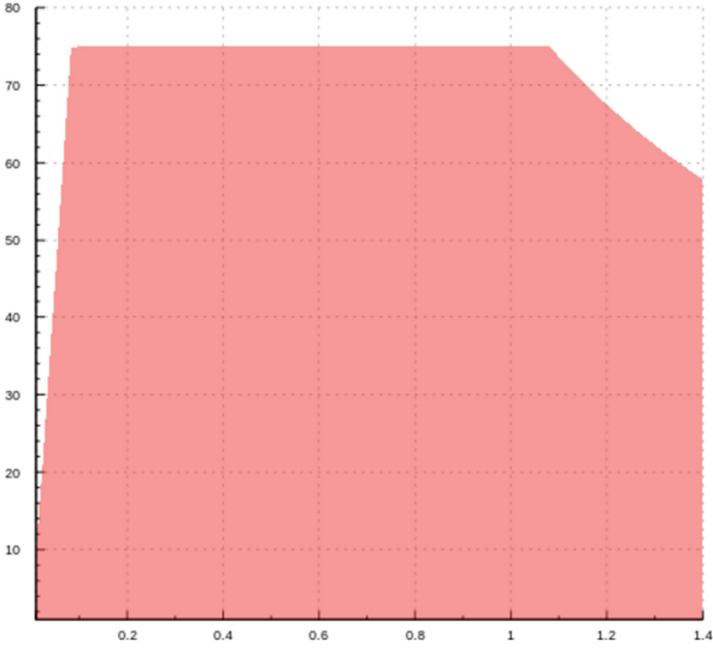
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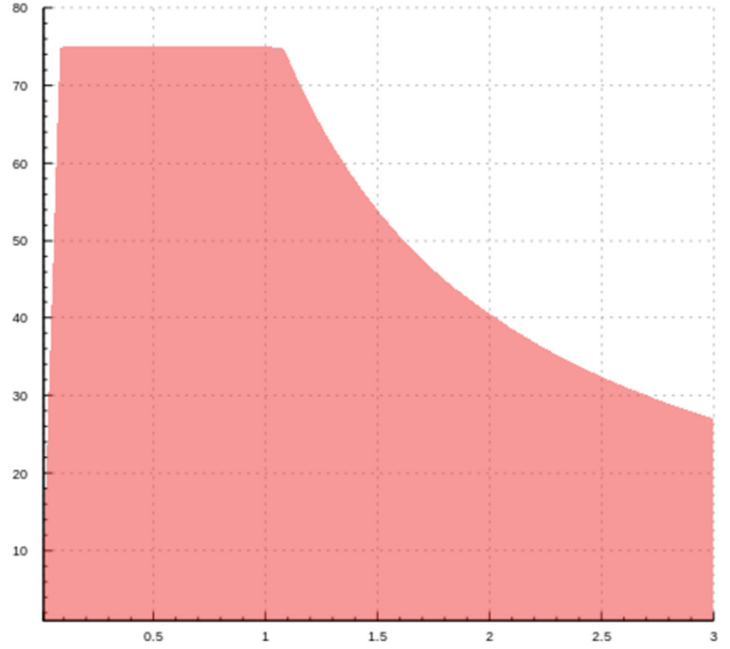
Output Power

The following graphs show the output power range of the DNA 75C as a function of the coil resistance.

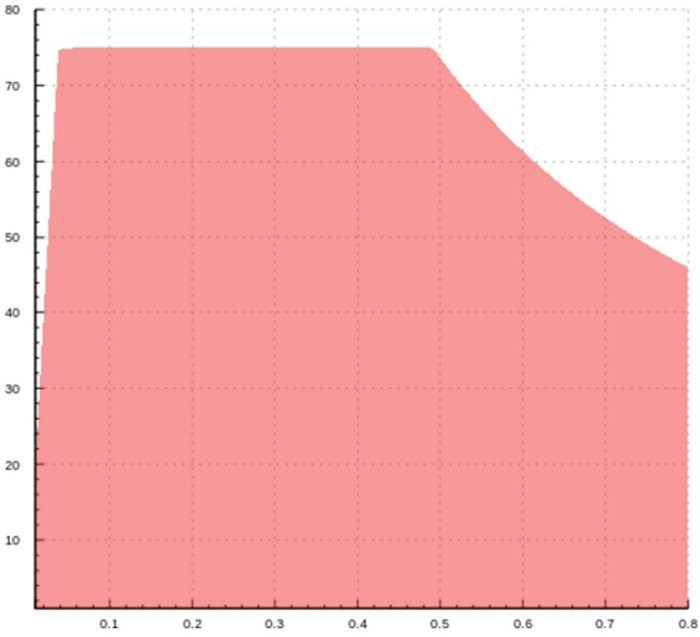
DNA 75C Kanthal Power



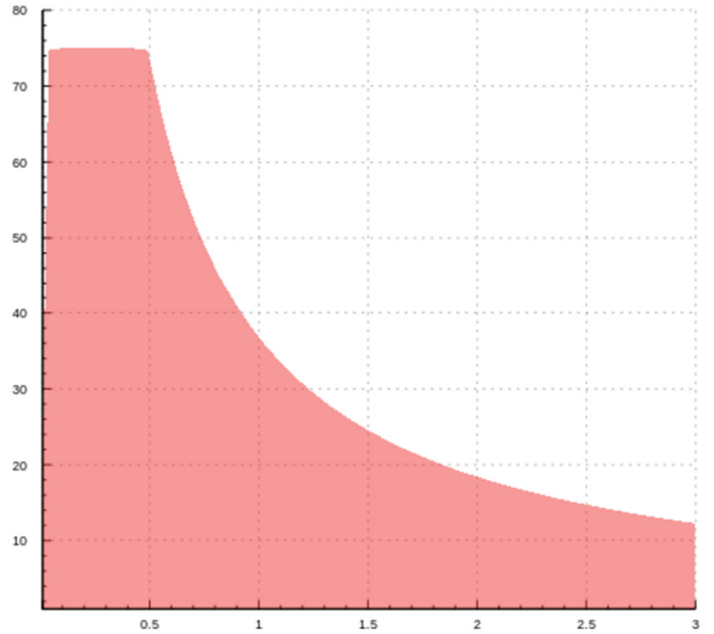
DNA 75C Kanthal Power Extended



DNA 75C Nickel Power



DNA 75C Nickel Power Extended



Display

The DNA 75C has a full color 80 x 160 pixel TFT screen. The screen is attached to the main board by a flexible cable, allowing freedom in the design of your device. The screen's default position is on top of the board, between the fire and adjust buttons. This allows for easy assembly. The screen connects to the board with a ZIF connector, so alternate placement is possible. Please use caution when handling the screen and design the device so that the cable will be secured or strain relieved in operation. The two notches along each side of the PCB are designed to accommodate a screen holder. A 3D model is available to 3D print or injection mold screen holders for the DNA 75C.

Error Messages

The DNA 75C will indicate a variety of error states.

No Atomizer: The DNA does not detect an atomizer.

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

Check Battery: The battery is deeply discharged and needs to be charged, or is damaged. If this happens, the DNA 75C will not fire the atomizer. The Check Battery message will continue to display for a few seconds after attempting to fire the device. User should remove and replace the battery.

Shorted: The atomizer or wiring are short circuited.

Ohms Too Low: The resistance of the atomizer coil is too low for the current wattage setting. If this happens, the DNA 75C will continue to fire, but will not be able to provide the desired wattage. The Ohms Too Low message will continue to display for a few seconds after the end of puff.

Ohms Too High: The resistance of the atomizer coil is too high for the current wattage setting. If this happens, the DNA 75C will continue to fire, but will not be able to provide the desired wattage. The Ohms Too High message will continue to display for a few seconds after the end of puff.

Temperature Protected: The heating coil reached the maximum allowed temperature during the puff. If this happens, the DNA 75C will continue to fire, but will not be able to provide the desired wattage.

Weak Battery: The battery needs to be charged, or a higher amp rated battery needs to be used. If this happens, the DNA 75C will continue to fire the atomizer, but will not be able to provide the desired wattage. The Weak Battery message will continue to display for a few seconds after the end of the puff.

Return To Researcher: The DNA has reached a limit configured by a researcher.

Too Hot: The DNA 75C has onboard temperature sensing. It will shut down and display this message if the internal board temperature becomes excessive.

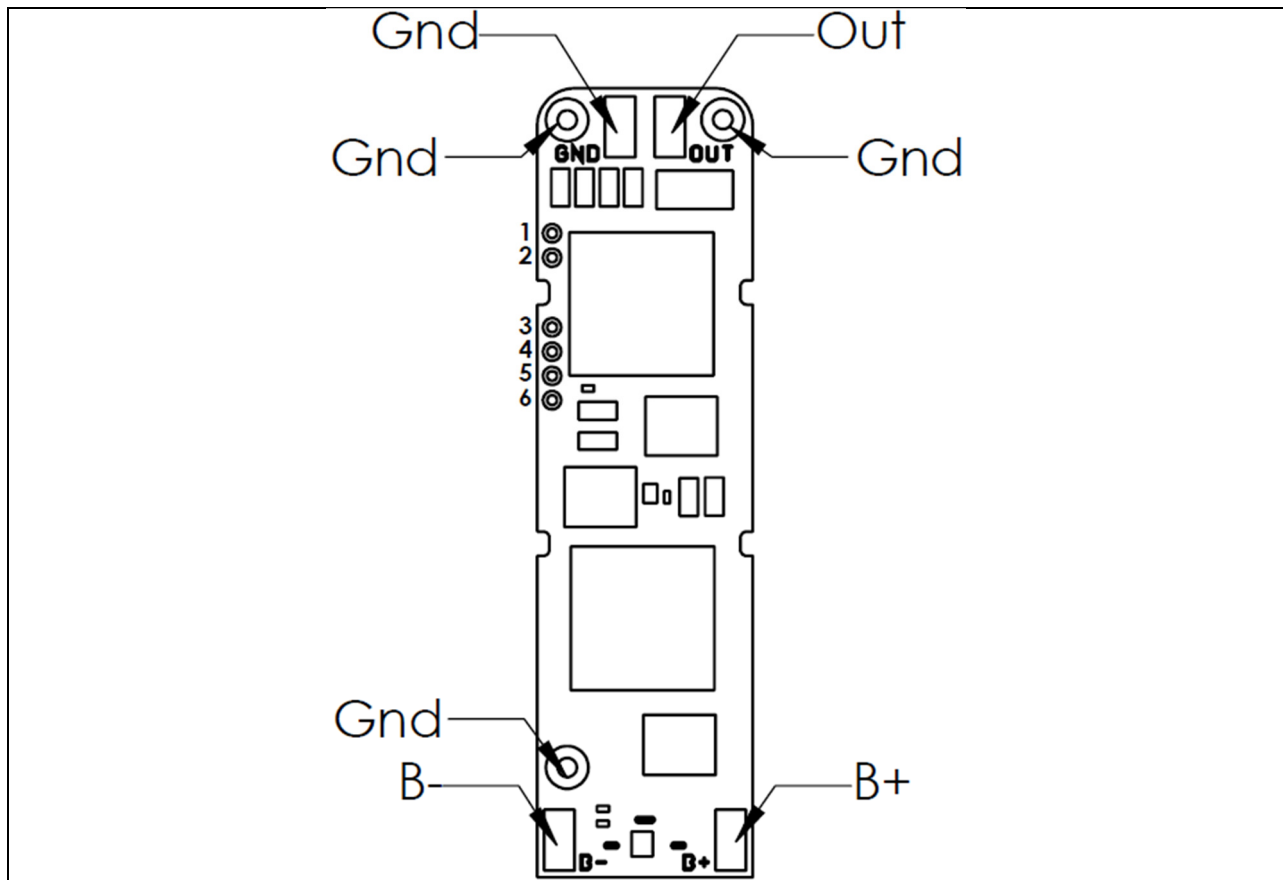
Charger

The DNA 75C has a built in 1A USB charger. It automatically detects the type of USB power supply it is connected to, so it can be plugged into standard PC USB ports or higher power chargers.

Battery monitoring

The DNA 75C contains a full battery management system that continuously monitors the state and health of the battery both under load and while idle.

Pinout (bottom side shown)



Pin Number	Pin Name	Function
Out	Out	Power output.
1	Fire-	Negative side of the fire button.
2	Fire+	Positive side of the fire button.
3	Up+	Positive side of the up button.
4	Select+	Positive side of the select button.
5	Down+	Positive side of the down button.
6	Logic-	Logic ground. Negative side of the up, select, and down buttons.
Gnd	Gnd	Power output. Gnd is the ground return for the atomizer. It is connected internally to B-. There are three ground lugs and one ground pad.
B+	B+	Positive battery terminal.
B-	B-	Negative battery terminal. Internally connected to Gnd.

Wiring

The atomizer is connected to the Out pad. If the DNA 75C is not being grounded through the mounting screws, the Gnd pad should connect to the negative side of the connector. The battery is connected to the B+ and B- terminals. 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. The output wires should be silicone or Teflon insulated only, and at least 14 gauge. The input wire carries less current, and can be as small as 20 gauge wire if silicone or Teflon insulated.

Recommended wire sizes			
	Minimum size	Recommended size	Maximum size
Battery, silicone insulated	20 gauge	18 gauge	16 gauge
Battery, PVC insulated	18 gauge	16 gauge	14 gauge
Output, silicone insulated	16 gauge	14 gauge	12 gauge
Switches, if used	28 gauge	24 gauge	22 gauge

Reverse Polarity Protection

The DNA 75C includes built in Reverse Polarity Protection to protect the user, board, device, and battery in the event that a battery is inserted backwards.

External component recommendations

The DNA 75C is a self-contained power regulator which does not require external buttons for its user interface. However, it does support the use of external buttons if desired.

Fire button:

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. Please use caution, as the positive side of the fire button connects directly to positive battery voltage.

Up/Select/Down buttons:

The small onboard buttons allow the user to navigate the interface and modify device settings. Alternatively, remote normally open type switches or buttons can be attached to the UP, SELECT and DOWN mounting holes for customization.

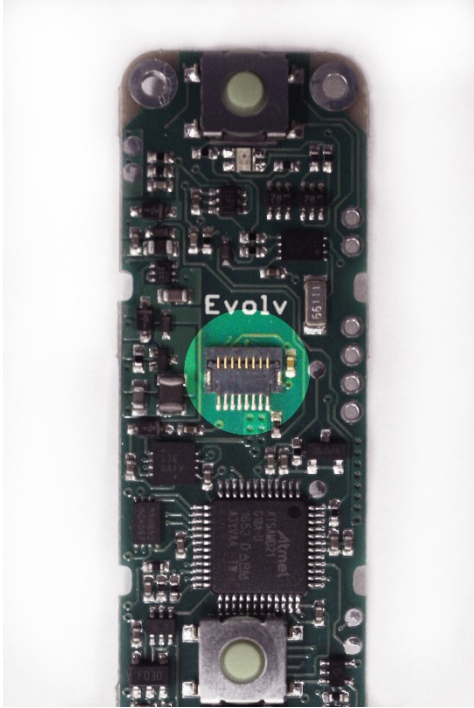
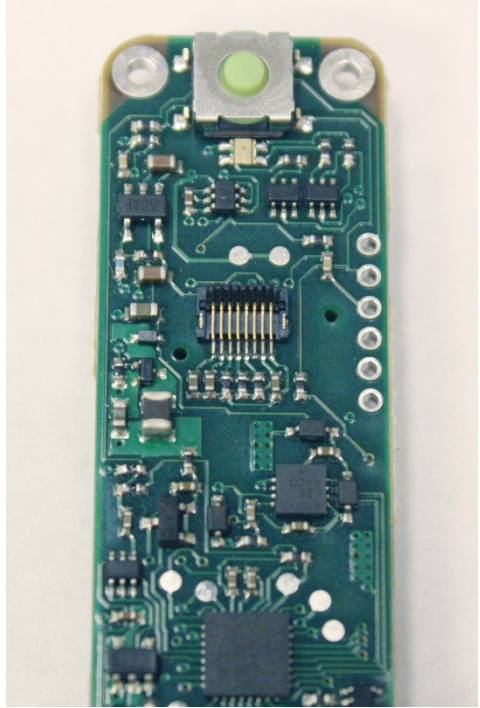
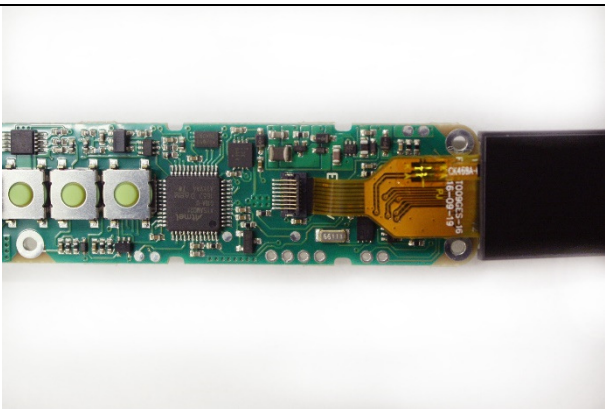
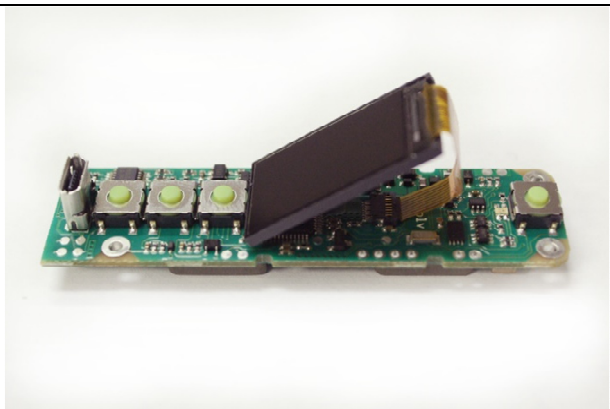
Battery:

The DNA 75C runs from a single lithium polymer type battery pack or round lithium ion 18650 type battery. The DNA 75C can use multiple cells in a parallel type wiring configuration as long as the maximum input voltage is 4.2 Volts.

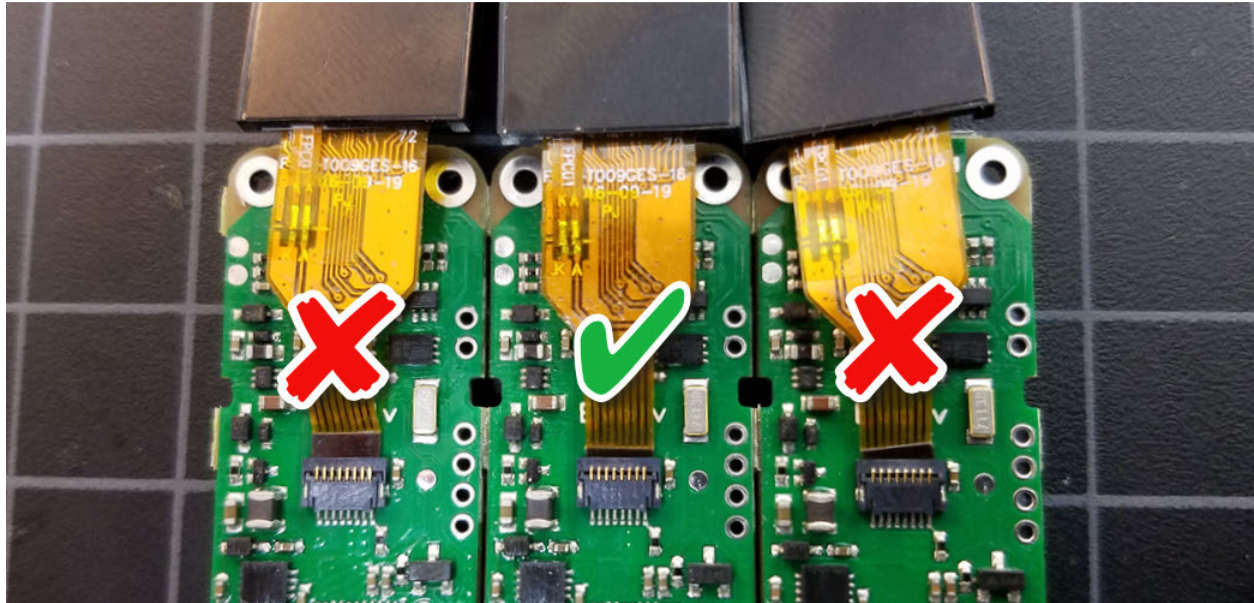
Assembly

Installing the Screen

The TFT screen connects to the DNA 75C using an 8 pin ZIF socket and a flexible cable to allow for design flexibility. The cable can be bent or folded (once) but care should be taken to not apply tension or strain to the area where the cable attaches to the screen itself. Once the screen is mounted the cable should be tucked up under the screen and not out towards the fire button. Positioning the cable near the fire button can allow the mods fire button to contact the cable when pressed which will cause eventual screen failure. Only insert or remove the screen before the board is powered on.

 A photograph of the DNA 75C PCB. A green ZIF connector is circled in the center of the board. The word "Evolv" is printed on the PCB above the connector.	 A photograph of the DNA 75C PCB. The locking tab on the ZIF connector is lifted vertically.
<p>Step 1: Locate the ZIF connector on the DNA 75C PCB.</p>	<p>Step 2: Carefully and gently lift the locking tab on the rear of the connector to vertical.</p>
 A photograph showing the flexible cable being inserted into the ZIF socket on the DNA 75C PCB. The cable is black and the socket is green.	 A photograph showing the TFT screen attached to the ZIF connector on the DNA 75C PCB. The screen is black and the connector is green.
<p>Step 3: Fully insert the flexible cable into the front of the socket with the contact side towards the PCB.</p>	<p>Step 4: Close the locking tab and press until the connector gently clicks. Remove the clear screen protector by pulling on the colored tab.</p>

Screen issues can occur if the screen is inserted incorrectly. If you are experiencing a white screen or intermittent display issues confirm the screen is correctly seated in the ZIF socket as shown below.



Mounting

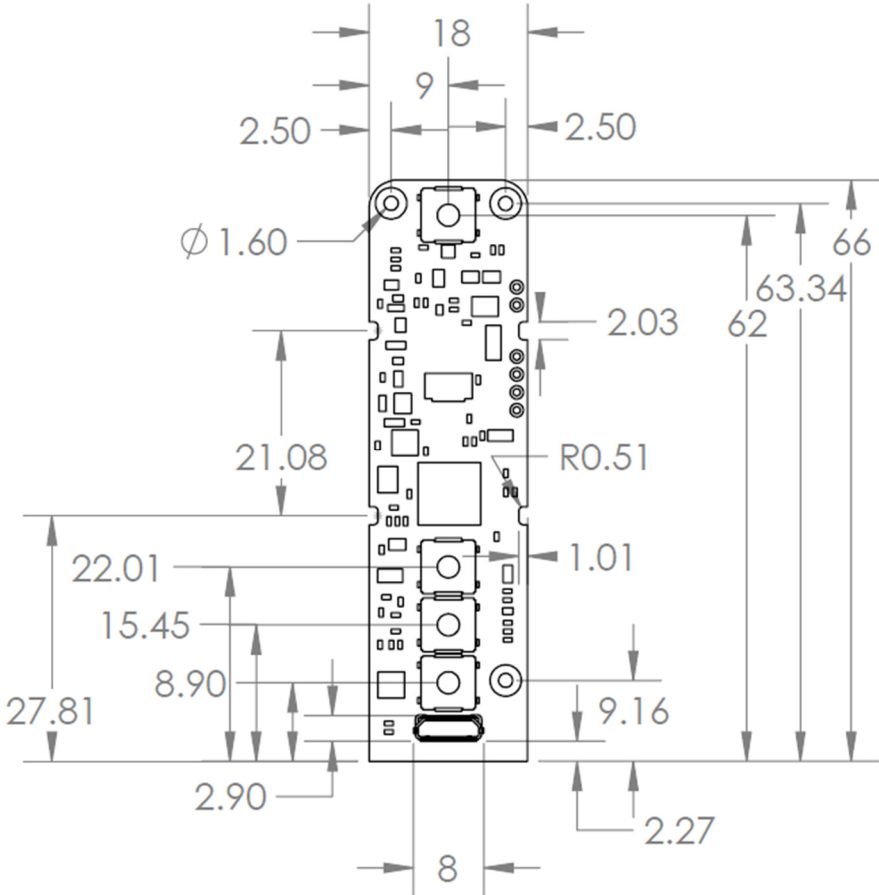
The DNA 75C has onboard switches for adjusting the power level, navigating the interface and activating the output. Each of these functions also has optional through-hole pads for using remote buttons.

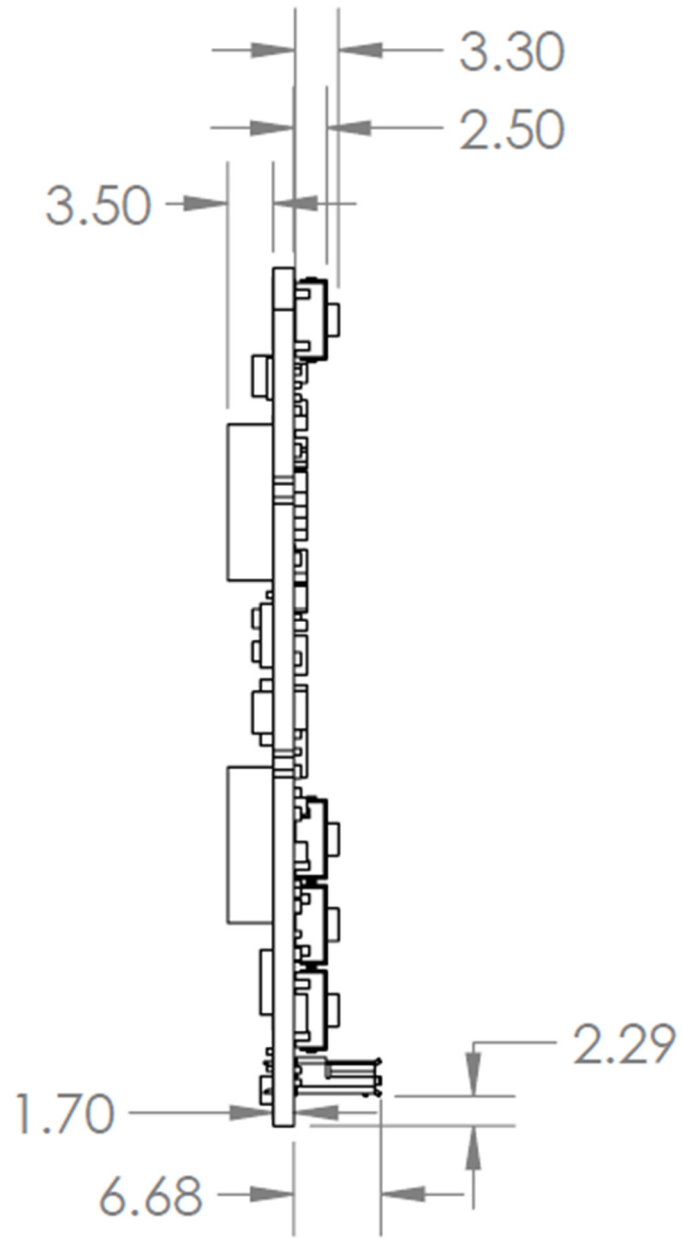
The DNA 75C has three mounting holes on the PCB. These holes are designed for #0 screws. There is an extended mounting pad of .125" diameter around each. These holes are electrically connected to each other and to ground. With careful design, the mounting pads can be used to ground the chassis to the DNA 75C, and pass the output current through chassis to the connector. However, if using this method, ensure that the PCB remains in good contact with the board at all times. Split lock washers and a RoHS chromate conversion coating on the chassis are recommended.

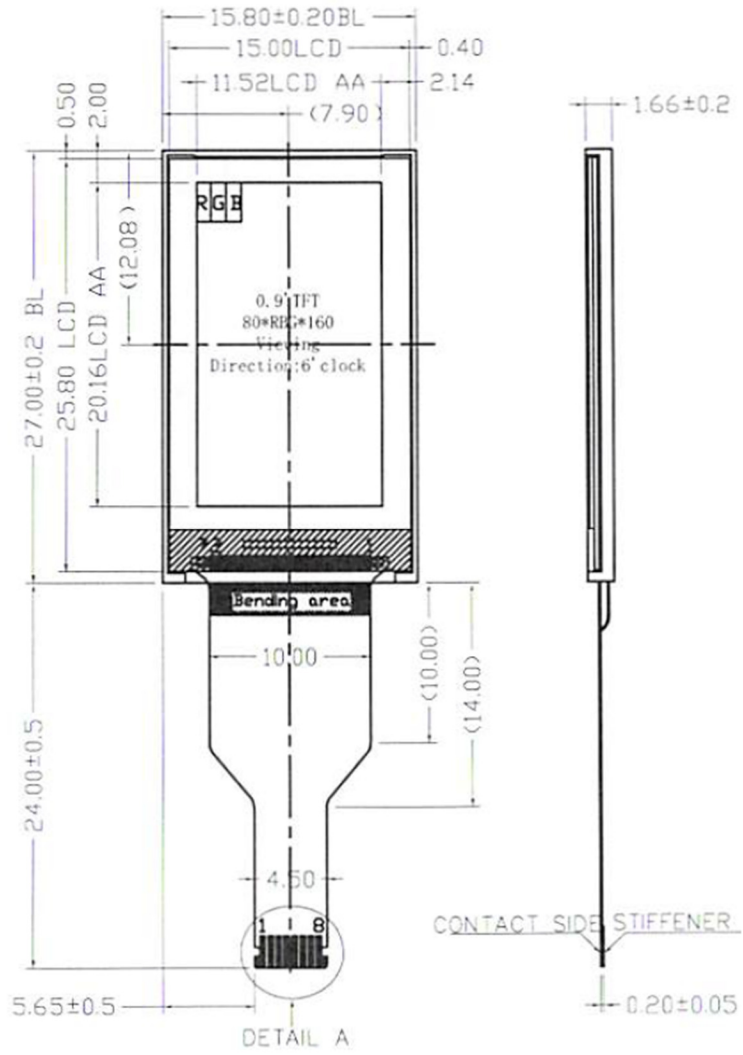
It is recommended that DNA boards be secured using the provided holes to mechanically mount them to the device. Use of glues are not suggested including hot glue, epoxy, superglue, hobby cement, etc. The only adhesive approved for contact with the board is non-corrosive Silicone adhesive such as the kind available from MG Chemicals.

DNA boards are complex, utilizing multilayer PCBs, and are designed with safety and reliability in mind. Please do not modify components on the boards, remove onboard buttons, shave, cut or trim the PCB or enlarge the mounting holes. Doing so creates the potential to expose layers in the PCB and could cause a safety and/or reliability issue. Evolv reserves the right to deny a warranty claim for any and all board modifications or improper use.

Mechanical Dimensions







3D models of the DNA 75C available on our website in IGES, STEP, and Solidworks formats.