



3W Grow Light Planter



N7 Cat

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Summary

Small indoor LED grow light, built in watering port (front), excess water collection and evaporation vent (back). Note...

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Small indoor LED grow light, built in watering port (front), excess water collection and evaporation vent (back).

Note my boat project has revealed some limitations with FDM plastics, mainly around water tightness. There are a number of different ways to get around this problem, dip exterior of bowl in melted paraffin wax (melts at 37 deg C) or coat exterior of bowl in epoxy resin.

BOM:

- Grow Light 3W 400-840nm (<https://www.aliexpress.com/item/32814205527.html>)
- Resistor (For my particular build I used a 1 Ohm 1 Watt but you may require a different setup based on your power supply) (<https://www.aliexpress.com/item/32803425964.html>)

- M3 X 3 X 5.3 Embedded Nuts: (old link no longer works - possible substitution M3 X D5 X L3) <https://www.aliexpress.com/item/4000232858343.html>
- M3 X 6 Machine Screws: (<https://www.aliexpress.com/item/32798146322.html>)
- An Appropriately Sized Self Adhesive Heat Sink (No part specified as sizing will depend on heat dissipation requirements and your specific operating environment - do not operate without a heat sink - for my build a 14 mm X 14 mm heat sink fit well)
- DC Power Supply 1A 3V (no part specified as you will need to use one appropriate for your region / local requirements). See notes below re: alternative methods to drive LED.
- Suggested alternate driving method vs resistor shown in post 1.2 V - 3.6 V input 3W LED driver - I think this has current limiting to 700 mA but as I've not used one myself yet you will have to do your own research on whether this is suitable <https://www.aliexpress.com/item/33009837807.html>

Update 3/15/2020 "iz kinda smol" - added a tall version

Print Settings

Printer Brand:

Creality

Printer:

Ender 3

Rafts:

No

Supports:

No

Filament: Generic PETG

Notes:

Note: Lamp support which holds the LED must be made of a high temp material like PETG

Print-ability Note: I had to discard numerous prints due to the top of the lamp being quite thin and flexible; it would catch on the print head under high acceleration of the bed so slowing down print speed to 75% or even 50% helped.

Caution:

- The LED emits light in the UV spectrum, so avoid looking directly into the light source.
- The LED module and heat sink gets quite hot so avoid touching it in operation.
- Ensure that the heat sink you choose is capable of passively dissipating the heat generated.
- Ensure that a current limiting resistor of appropriate wattage and resistance is chosen. There are numerous web based calculators that you can use to determine resistor values based on the specifics of your LED and power supply.
- There are numerous alternative ways to drive the LED, constant current power supplies, buck converters, batteries... I found an informative youtube video if you want to go that route (search: High Power LED Tutorial #1 - How to Drive 1W and 3W LEDs by Julian Ilett)
- I am not an electronics expert by any means so use your own due diligence and proceed at your own risk. As with any DIY electronics I would not recommend operating unattended.

Post-Printing



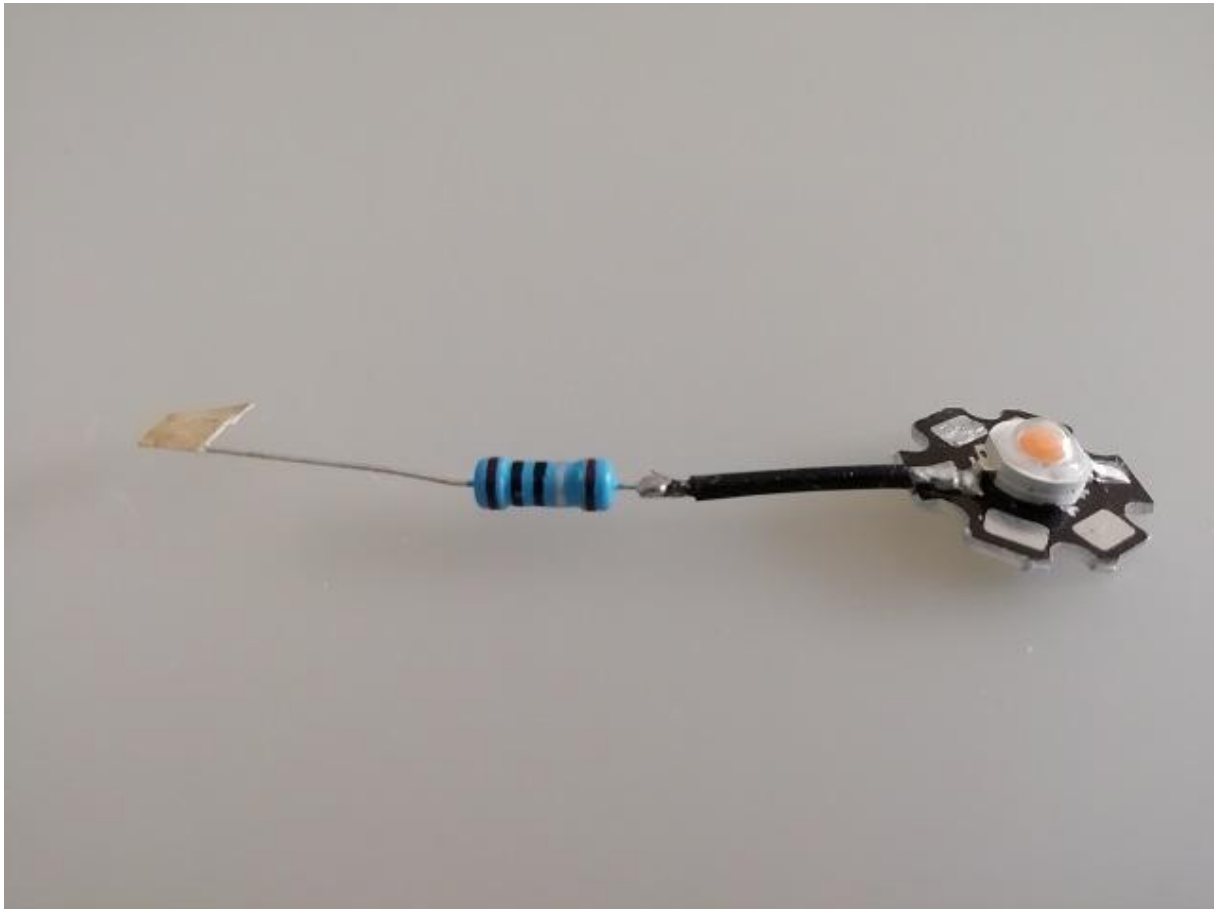
Insert embedded nut using low temp on soldering iron (note I found using a second embedded nut helps alignment)



Embedded nut in place



Secure the LED holder with a M3 X 6 button head screw



Solder resistor to (-) terminal of LED - note there is probably a better way of doing this (crimping maybe) someone more experienced with electronics can comment



Adhere heat sink firmly in place on the back of the LED module. Route wire through the integral channel and solder (+) to (+), (-) has been connected to the other end of the resistor lead which is already soldered to the (-) of the LED module



Heat stake (kinda melt and squish :) the integrated PETG post to the LED module



All heat stakes complete - at this point it might also be a good idea to apply strain relief to the wire (I later applied some hot melt glue to the wire near where it enters to hold it in place)



Attach the cover - note the orientation of the cover (there are three big cutouts in the back that align with the wire and screw holes). The cover "snaps" in place

Category: Outdoor & Garden

Model files



lamp_shroud.stl



planter_tall.stl



lamp_support.stl



planter.stl

[Find source .stl files on Thingiverse.com](#)

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