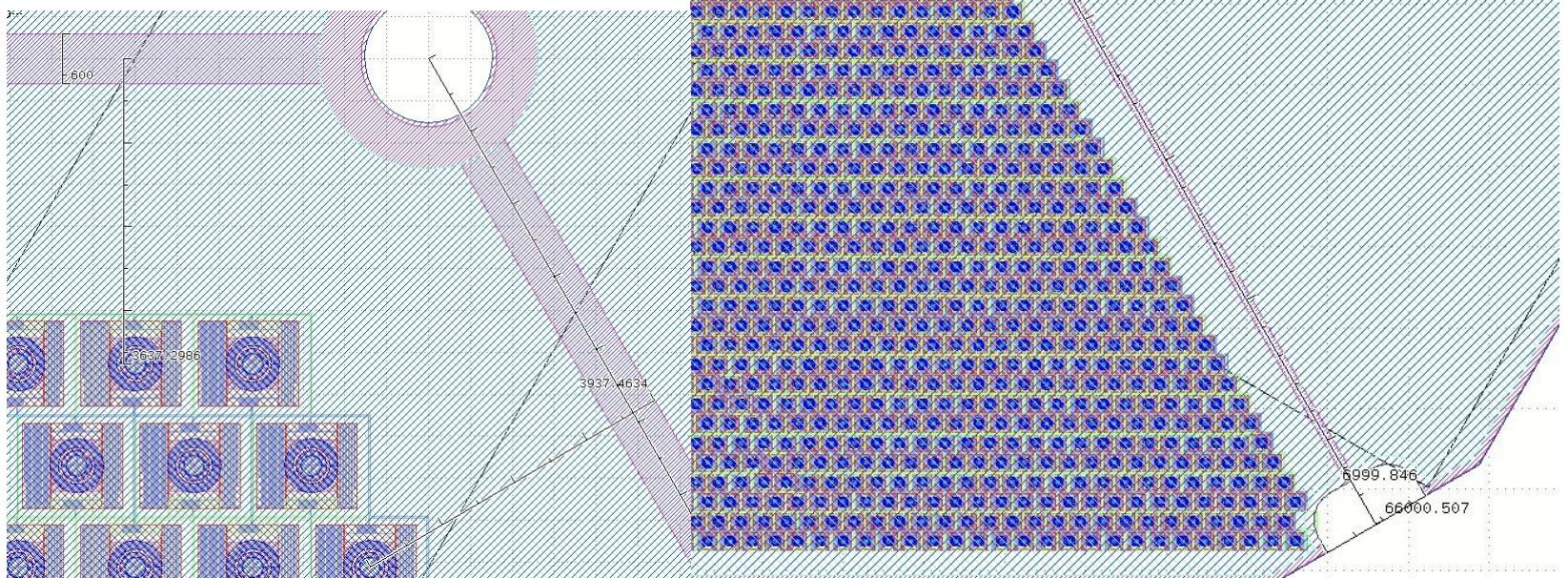


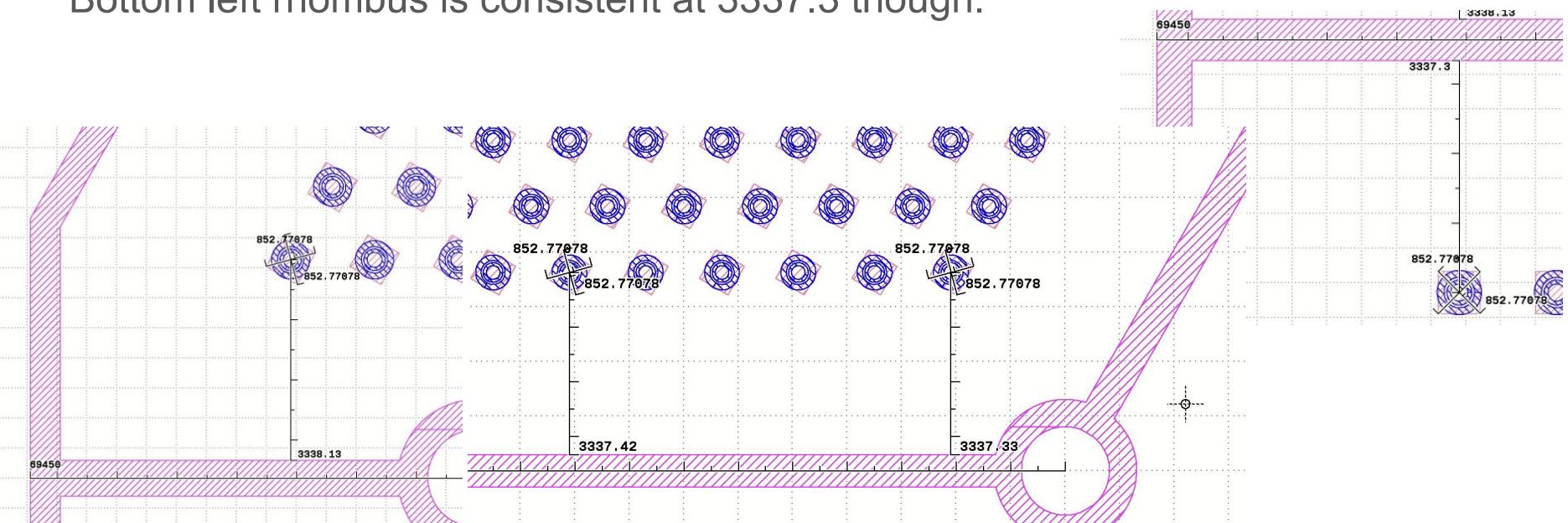
Measure for Collimator



Inconsistent Positions?

For top left rhombus, detector centers get ~18nm closer to the bottom each step to the left, for a total of $18\text{nm} \times 45 = 0.8\text{um}$ difference from the leftmost to the rightmost.

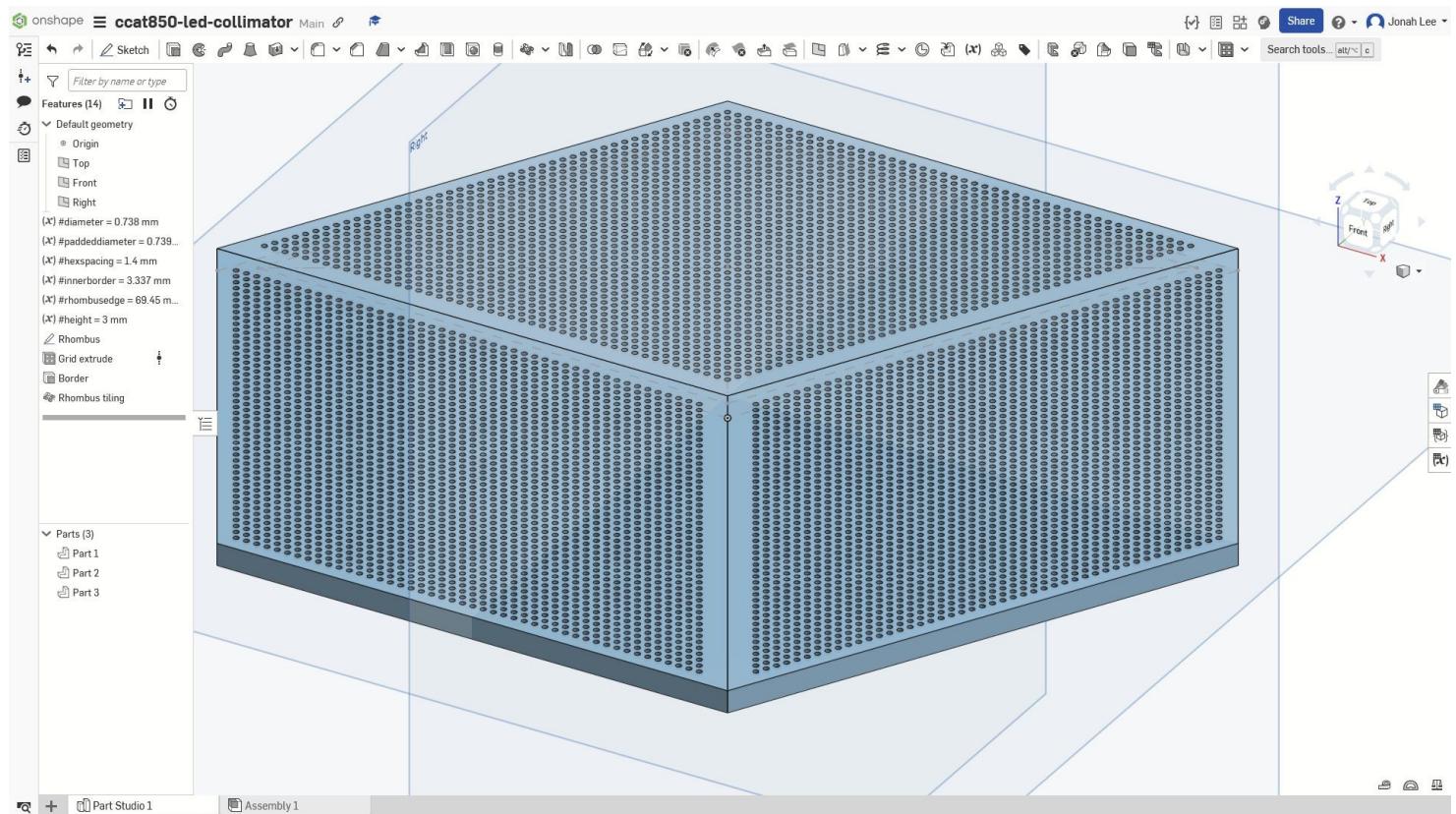
Bottom left rhombus is consistent at 3337.3 though.



Collimator CAD Model

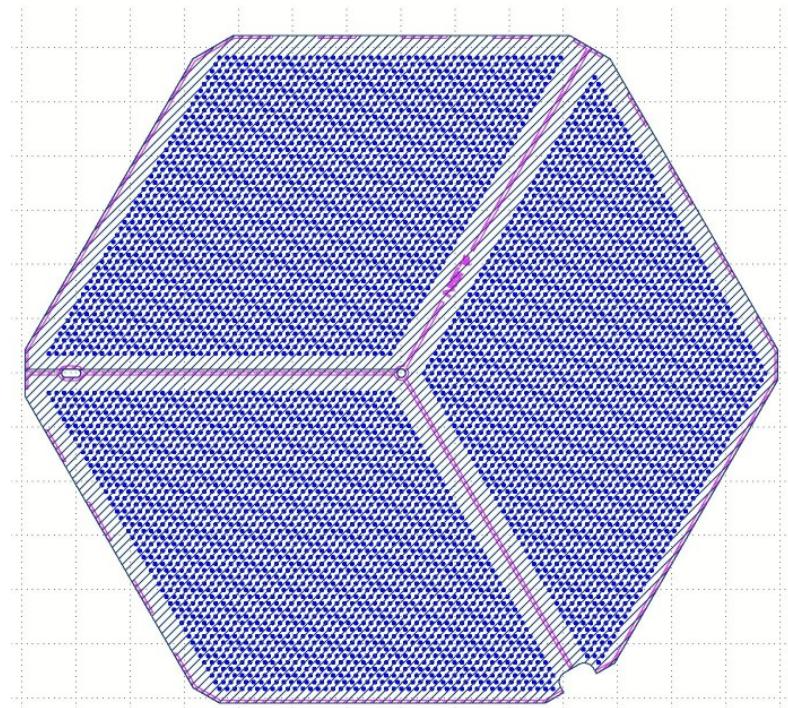
<https://cad.onshape.com/documents/4a9874995d3b4039a34f4491/w/a61d1c1f9ee3ea8193c6d7eb/e/afbea4677e4648f6492246a2>

Parameterized
design & low
feature count
allows easy
reworking

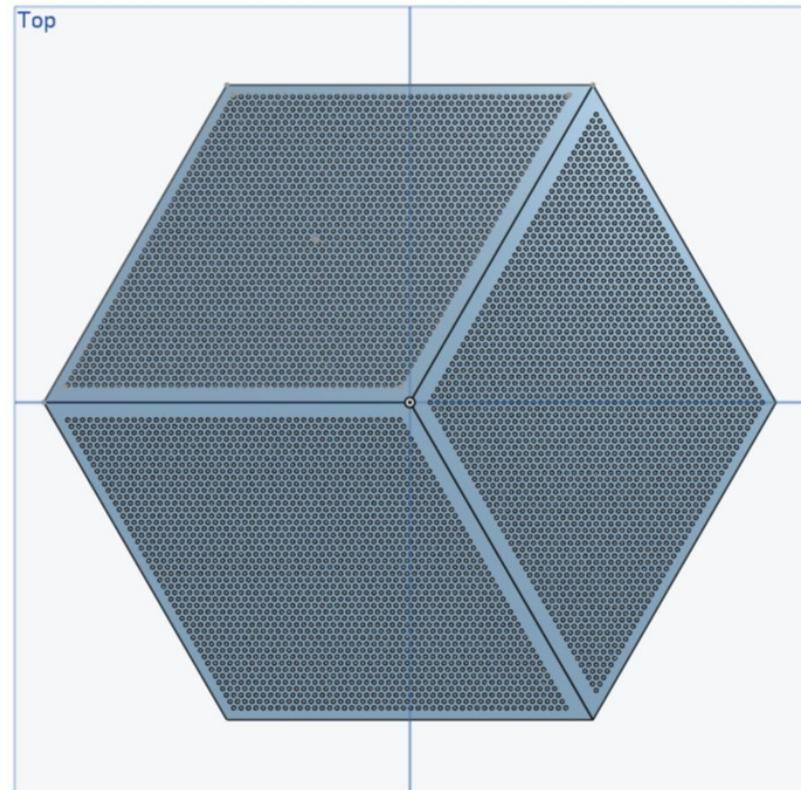


Collimator CAD Model

array.cif [KLayout]



[ccat850-led-collimator](#) [onshape]

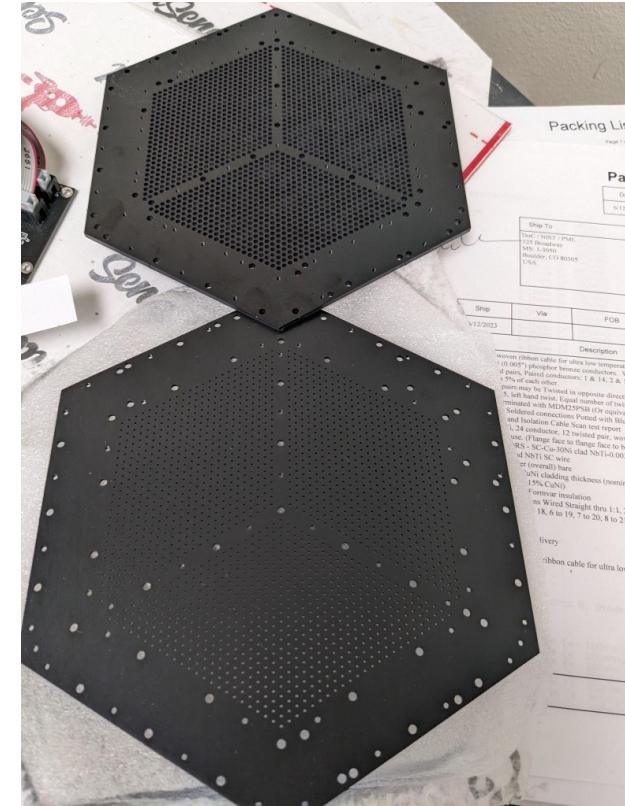


TODO: Add mounting holes - need CAD Model

Does the new collimator need to have the same overall dimensions?

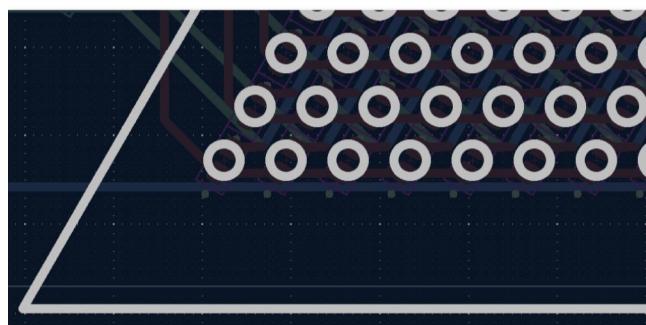
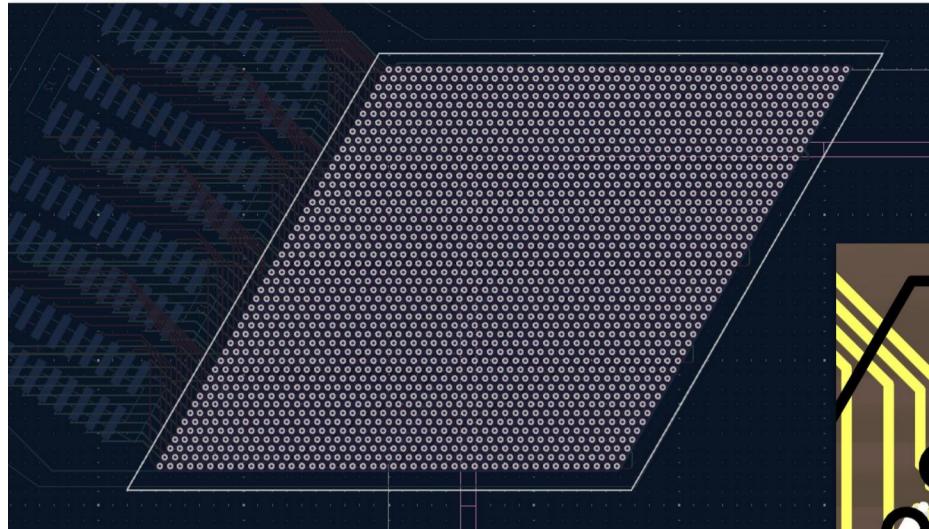
Need to add mounting holes.

Maybe the new collimator CAD model should just be a modified version of the existing model.

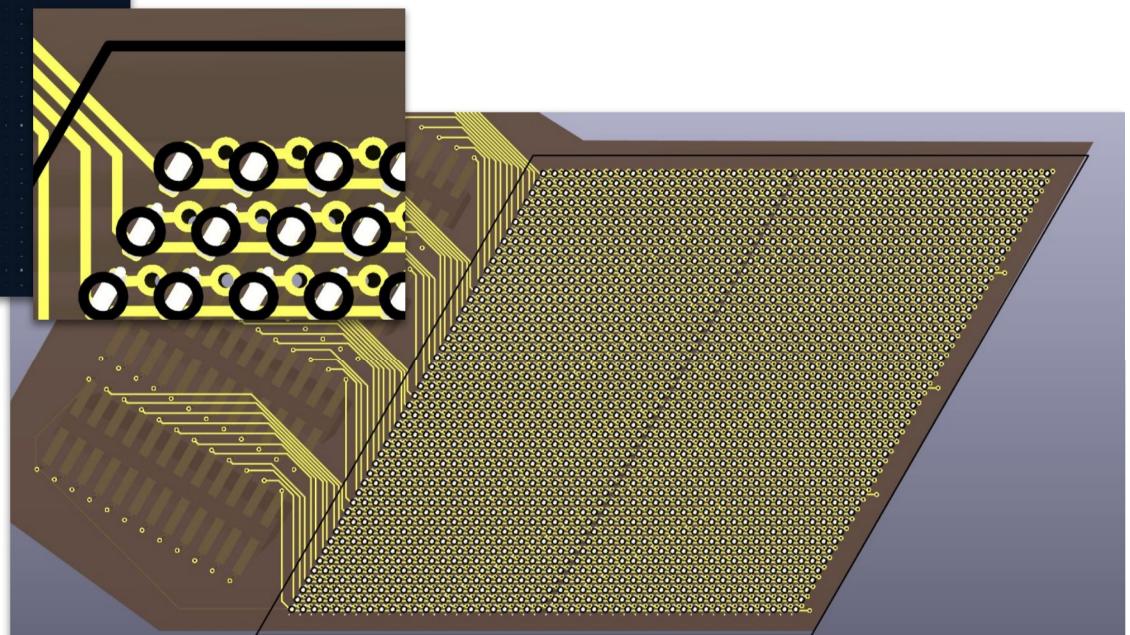


Existing Collimator ([source](#))

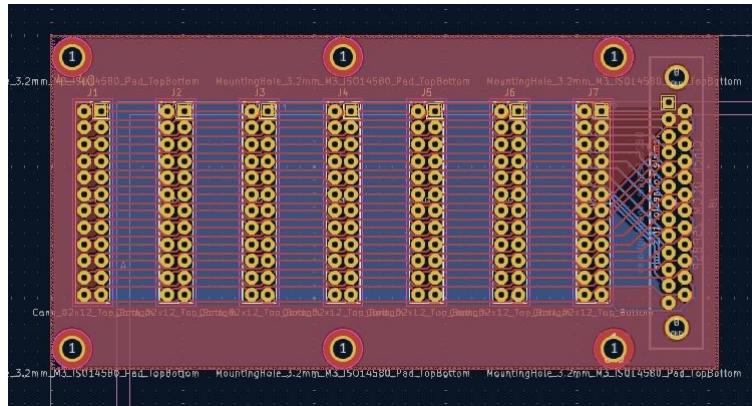
PCB/Collimator - confirming positions match



Export face as .dxf from onshape & overlay in KiCAD

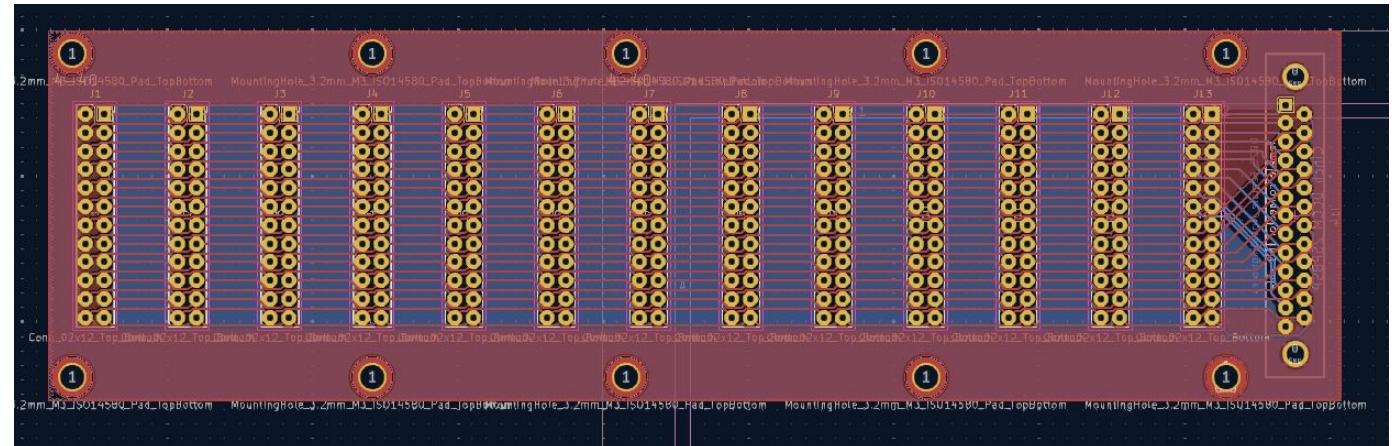


Multiplexer

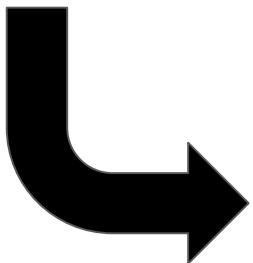


7 outputs → 12 outputs

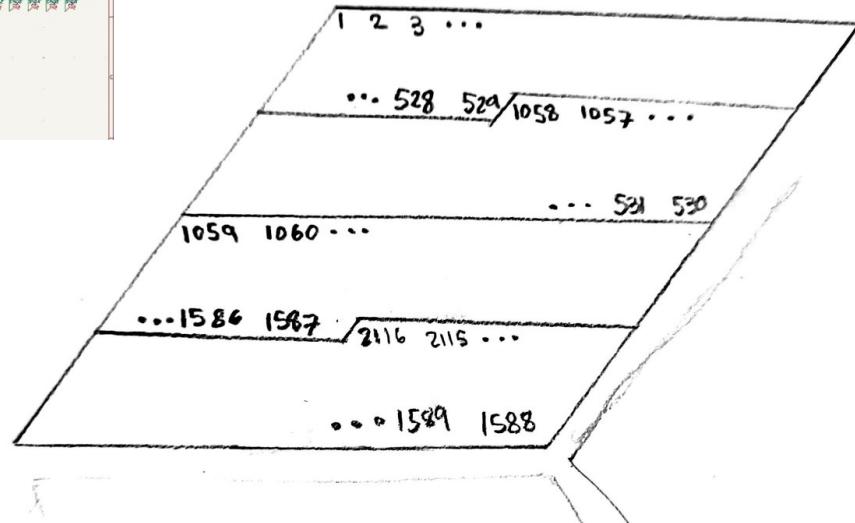
<https://github.com/jonahjlee/ccat850-led-mapping/tree/main/multiplexer>



Mapping Pins to LEDs



LED REFERENCE POSITIONS



March 5th - Detector Meeting

Notes: [Jonah's Questions](#) / [NIST Collaboration Notes](#)

Conclusions:

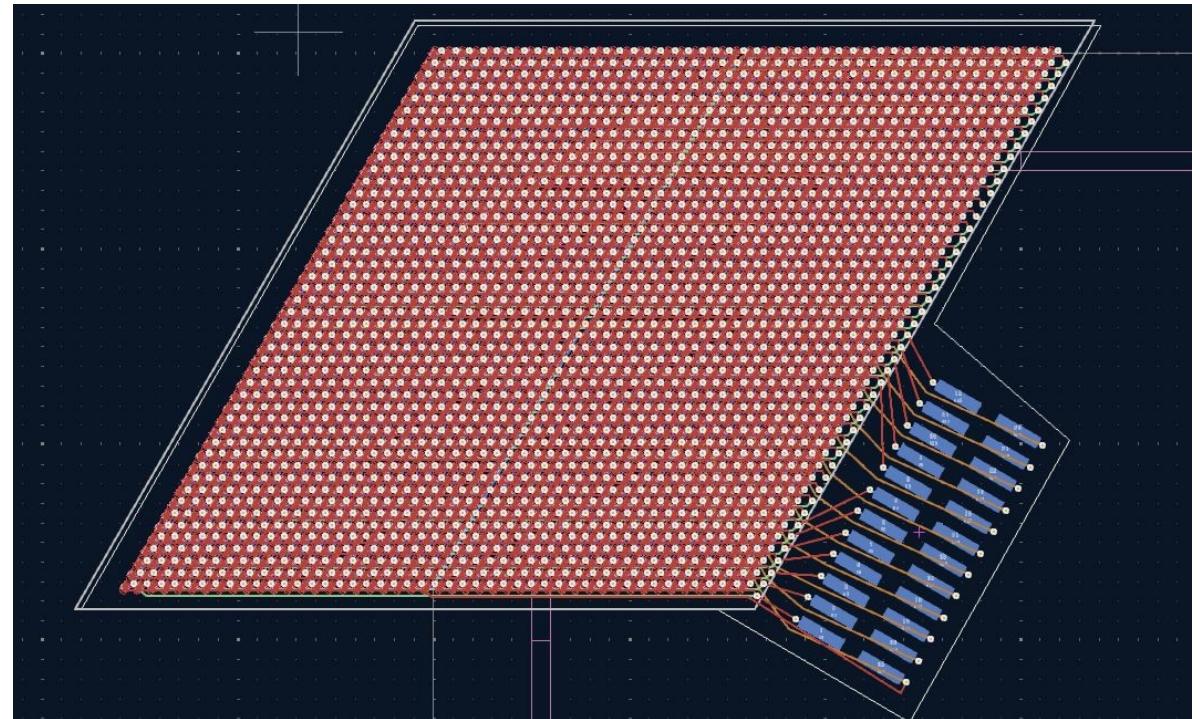
- Clearances & PCB Design - OK
- Use any red 0201 LED available from JLCPCB; default footprint OK
- Split connector on-board instead of using multiplexer
- Use 3 PCBs (1 per rhombus) instead of monolithic
 - Cheaper due to JLC minimum order quantity, and more resilient
 - Requires 1 mirrored version to clear space on one side
- Current limitations OK for 12 LEDs, can adjust resistor value
 - Just need enough current to see that the device is on
- Collimator can be based on existing model - needs modification to mount on 850GHz assembly & updated number of holes

V2: Use a single connector for 4 networks

Effectively multiplexing
on-board.

Actually simplifies the
wiring.

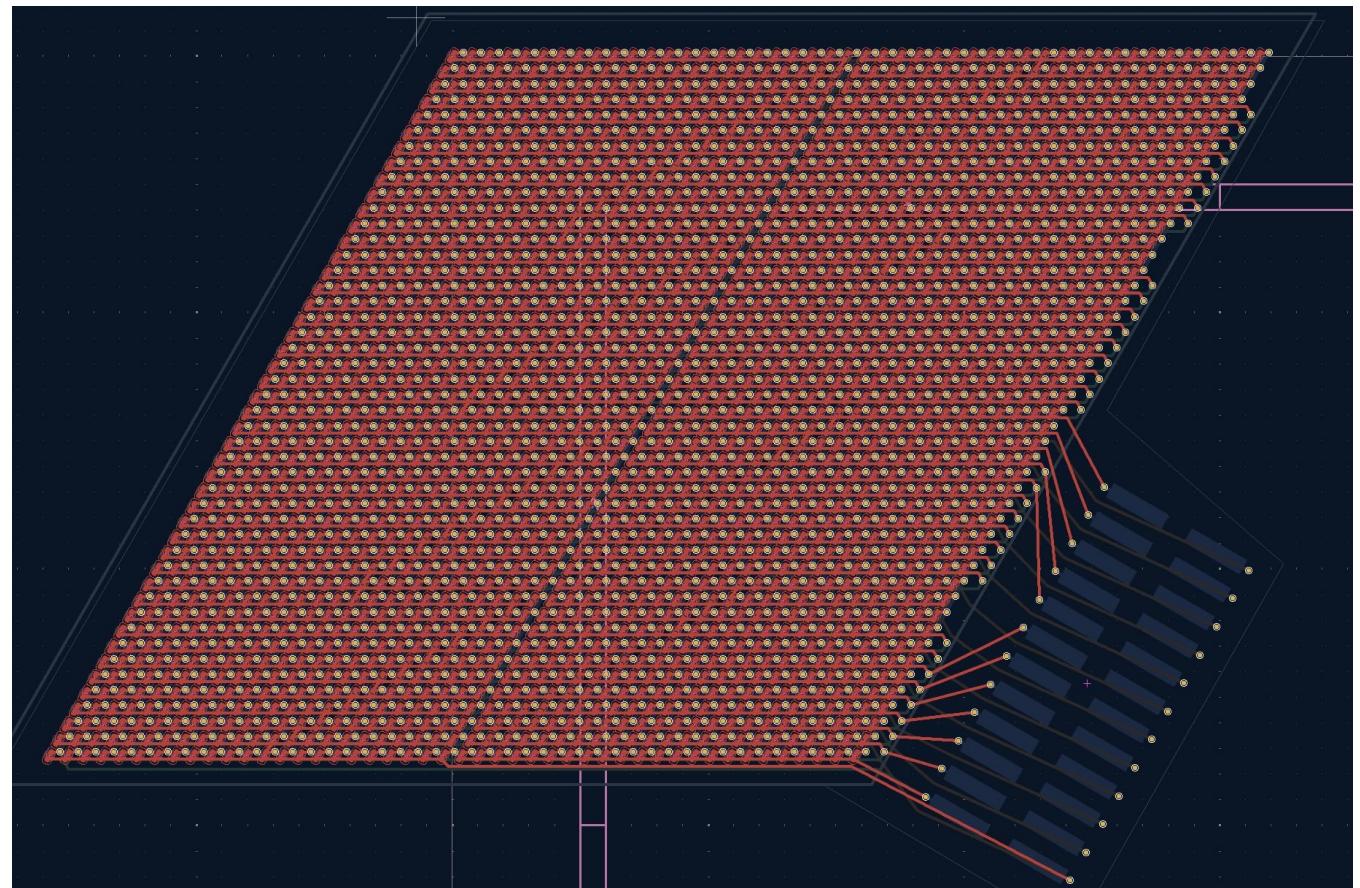
Space savings might mean
mirrored version is not
needed?



V2 Layers: Front

Featuring:

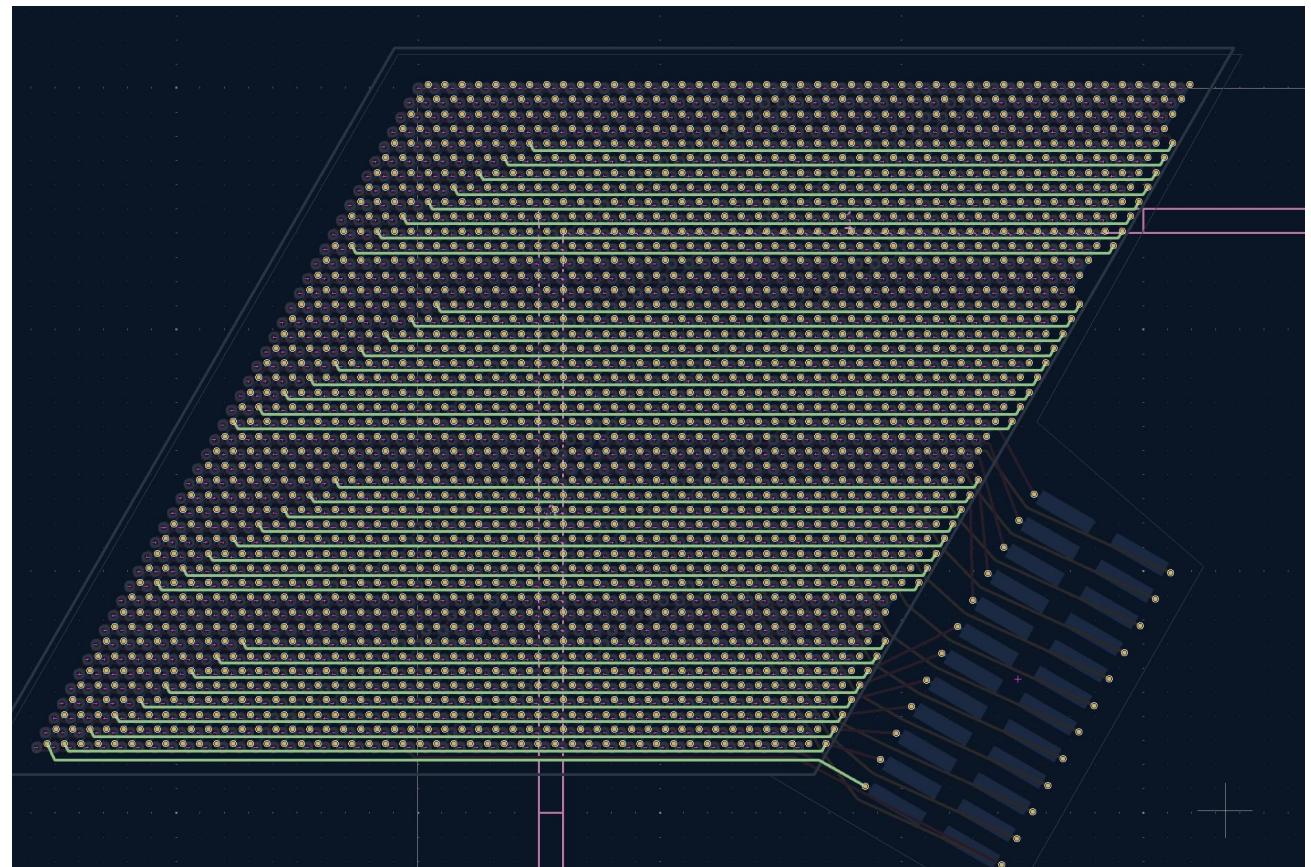
- vias for pad 2
- row connections
- “shorts” between rows/columns
- tracks to half of the connector
- Misc track at bottom to route disconnected row



V2 Layers: Inner Layer 1

Featuring:

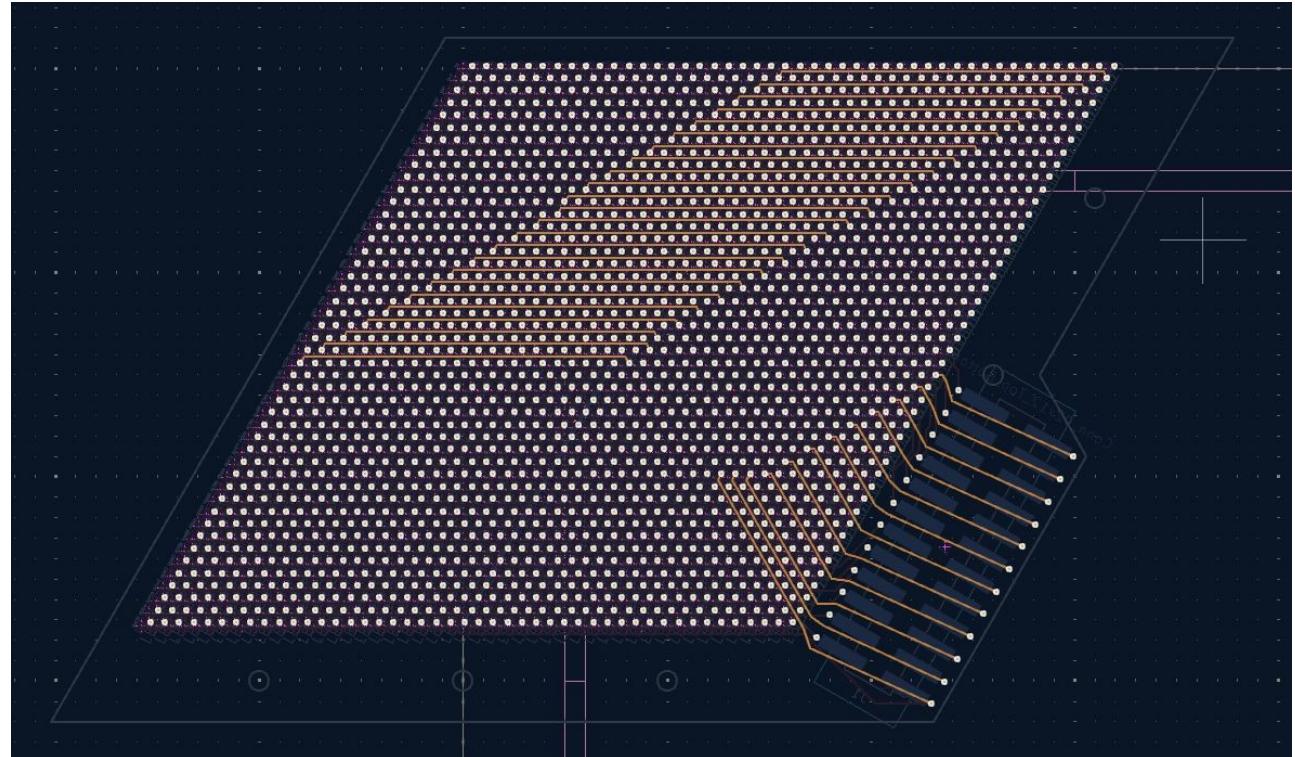
- Connections between vias which extend off to the edge, which connect front rows to their net
- Misc track at the bottom to route disconnected column



V2 Layers: Inner Layer 2

Featuring:

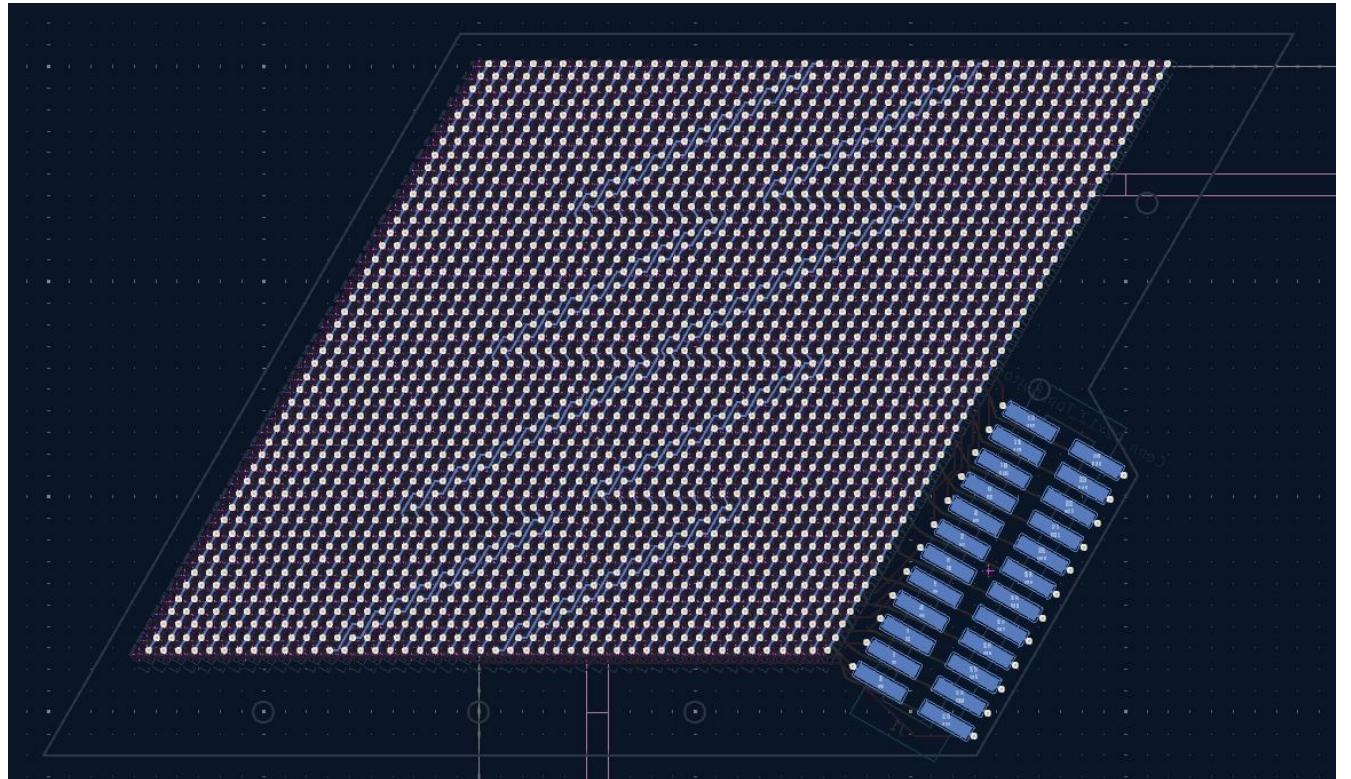
- The connections which join the separated halves of each matrix
- The second half of the connector tracks



V2 Layers: Back

Featuring:

- Columns which go (mostly) all the way down
 - It doesn't go all the way sometimes due to half-row weirdness
- Wonky connections where the matrix diagonal was squished
- The connector footprint



JLC DFM Checker

Part Selection

https://www.lcsc.com/products/LED-Indication-Discrete_528.html

Filter → 0201 Package → Red

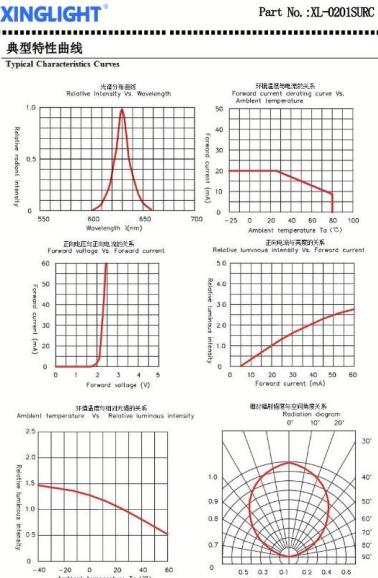
4 options

Only XINGLIGHT has enough stock available

Images	Pricing	Quantity	Availability	Mfr.Part #	Manufacturer	Description
 Datasheet	10+ \$0.0605 100+ \$0.0478 300+ \$0.0414 1000+ \$0.0366 More LCSC-Reels Available	<input type="button" value="Add"/> Min: 10 Mult: 10 Full Reel: 5000	24070 (12830 + 11240 + 0) In Stock	XL-0201SURC	<small>Asian Brands</small> XINGLIGHT	Positive Stick Red 120° 0201 LED Indication - Discrete ROHS
 Datasheet	5+ \$0.2503 50+ \$0.1976 150+ \$0.175 500+ \$0.1469 More LCSC-Reels Available	<input type="button" value="Add"/> Min: 5 Mult: 5 Full Reel: 4000	2410 (2410 + 0 + 0) In Stock	APG0603SEC-E-TT	Kingbright	10mA Colorless Transparent Lens 120mcd 624nm Red 140° 1.93V 0201 LED Indication - Discrete ROHS
 Datasheet	5+ \$0.251 50+ \$0.1965 150+ \$0.1731 500+ \$0.144 More LCSC-Reels Available	<input type="button" value="Add"/> Min: 5 Mult: 5 Full Reel: 4000	2055 (1420 + 635 + 0) In Stock	APG0603SURC-TT	Kingbright	10mA 30mcd Colorless Transparent Lens 631nm Red 140° 1.92V 0201 LED Indication - Discrete ROHS
 Datasheet	1+ \$0.1862 200+ \$0.0743 500+ \$0.0718 1000+ \$0.0706 <small>PREORDER</small>	<input type="button" value="Add"/> Min: 1 Mult: 1 Full Reel: 4000	0	IN-S21AT5R	Inolux	5mA 18mcd 621nm Red 110° 1.8V 0201 LED Indication - Discrete ROHS

Part Selection

https://www.lcsc.com/product-detail/LED-Indication-Discrete_XINGLIGHT-XL-0201SURC_C3646923.html

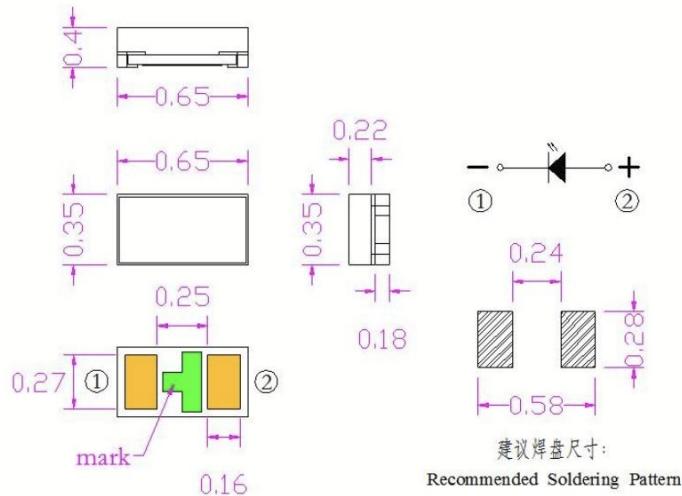


XINGLIGHT: sufficient stock (>20,000)

2x taller than KingBright/NanoPoint

Tolerance is +/- 0.25mm??

This can't be right;
they probably just
didn't want to make
any guarantee



备注: 1. 以上尺寸单位均为 mm
Remarks: All dimensions are in millimeters.

2. 未特别标注公差的尺寸公差均为±0.25mm
Tolerance is ±0.25mm unless otherwise noted

Connector

https://www.lcsc.com/products/Female-Headers_645.html

24 pin, 2.54mm spacing

→ arbitrary choice for now:

https://www.lcsc.com/product-detail/Female-Headers_chxunda-XDM254-2-12-S-8-5-G0_C19268781.html

PCB Assembly

1. Assign LCSC part numbers in schematic
(<https://jlcpcb.com/help/article/how-to-generate-bom-and-centroid-files-from-kicad-8> guide - may be outdated since field nam is different from Fabrication-Toolkit README)
2. Use <https://github.com/bennymeg/Fabrication-Toolkit> to export BOM & CPL (positions.csv). Had to fix column order for positions.csv

Top Designator	Comment	Footprint	Matched Part Detail	Qty	Source	Lib Type	Total Cost	<input checked="" type="checkbox"/> Select 
D1,D10,D100,D1...	LED	0201	XL-0201SURC C3646923  5mA 40mcd~75mcd 620nm~630nm -30°C~+85... 					<input checked="" type="checkbox"/>
D19,D190,D1900...	LED	0201	XL-0201SURC C3646923  5mA 40mcd~75mcd 620nm~630nm -30°C~+85... 					<input checked="" type="checkbox"/>
D354,D355,D356...	LED	0201	XL-0201SURC C3646923  5mA 40mcd~75mcd 620nm~630nm -30°C~+85... 					<input checked="" type="checkbox"/>
D534,D535,D536...	LED	0201	XL-0201SURC C3646923  5mA 40mcd~75mcd 620nm~630nm -30°C~+85... 					<input checked="" type="checkbox"/>
D714,D715,D716...	LED	0201	XL-0201SURC C3646923  5mA 40mcd~75mcd 620nm~630nm -30°C~+85... 					<input checked="" type="checkbox"/>
D895,D896,D897...	LED	0201	XL-0201SURC C3646923  5mA 40mcd~75mcd 620nm~630nm -30°C~+85... 	10593	JLCPCB	Extended	\$295.5447 	<input checked="" type="checkbox"/>
D1179,D118,D11...	LED	0201	XL-0201SURC C3646923  5mA 40mcd~75mcd 620nm~630nm -30°C~+85... 					<input checked="" type="checkbox"/>
D1359,D136,D13...	LED	0201	XL-0201SURC C3646923  5mA 40mcd~75mcd 620nm~630nm -30°C~+85... 					<input checked="" type="checkbox"/>
D1539,D154,D15...	LED	0201	XL-0201SURC C3646923  5mA 40mcd~75mcd 620nm~630nm -30°C~+85... 					<input checked="" type="checkbox"/>
D1719,D172,D17...	LED	0201	XL-0201SURC C3646923  5mA 40mcd~75mcd 620nm~630nm -30°C~+85... 					<input checked="" type="checkbox"/>
D2079,D208,D20...	LED	0201	XL-0201SURC C3646923  5mA 40mcd~75mcd 620nm~630nm -30°C~+85... 					<input checked="" type="checkbox"/>

Please carefully check the packages of selected parts before proceeding.

Preview & Quote

\$392.96 USD

PCB Bill of Materials Component Placements **Quote & Order**

Automatically saved, last updated on 7 March, 17:39

Charge Details

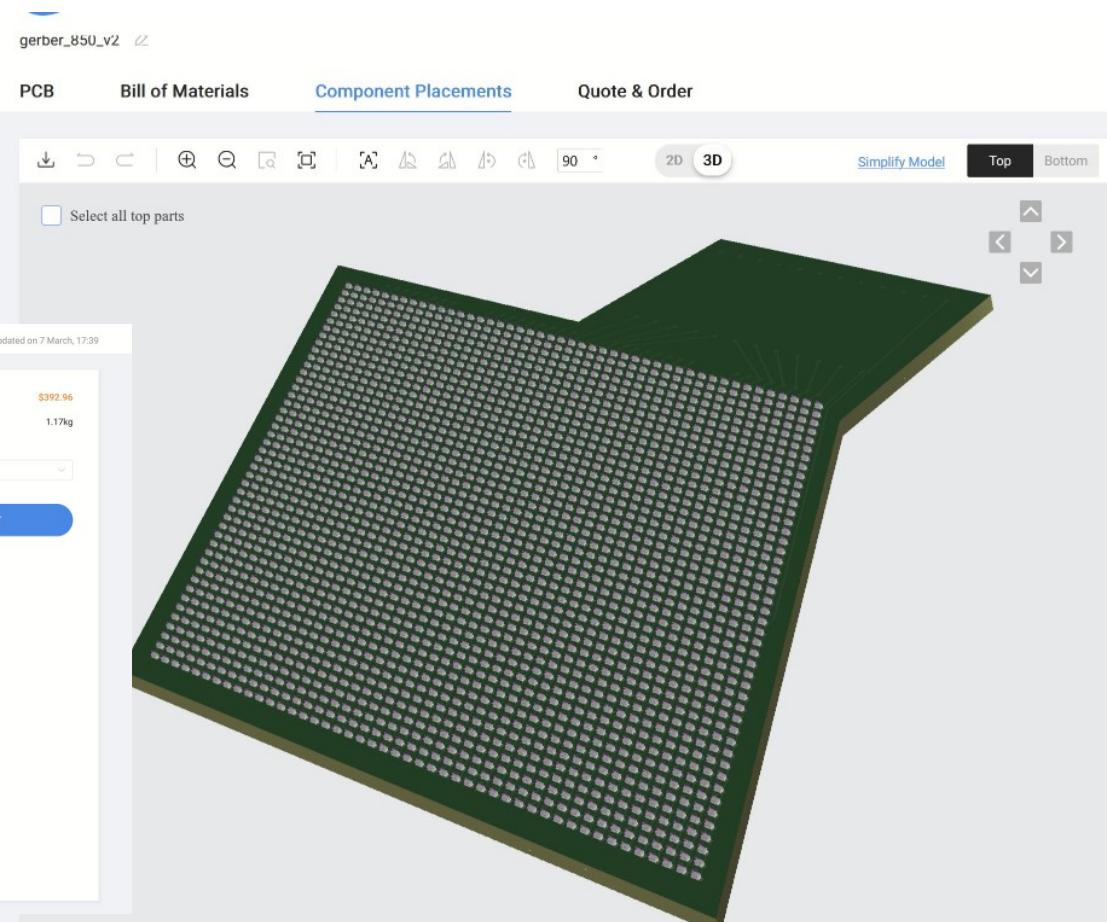
PCB Price	\$29.30
Engineering fee:	\$24.00
Via Covering:	\$0.00
Board:	\$4.30
Confirm Production file:	\$1.00

Standard PCBA Price

Setup Fee:	\$25.00
Stencil:	\$7.86
Panel:	\$0.00
Large Size:	\$0.00
Components(1 items):	\$295.54
Feeders Loading fee:	\$1.50
SMT Assembly	\$33.29
Confirm Parts Placement:	\$0.00
Packaging fee:	\$0.47

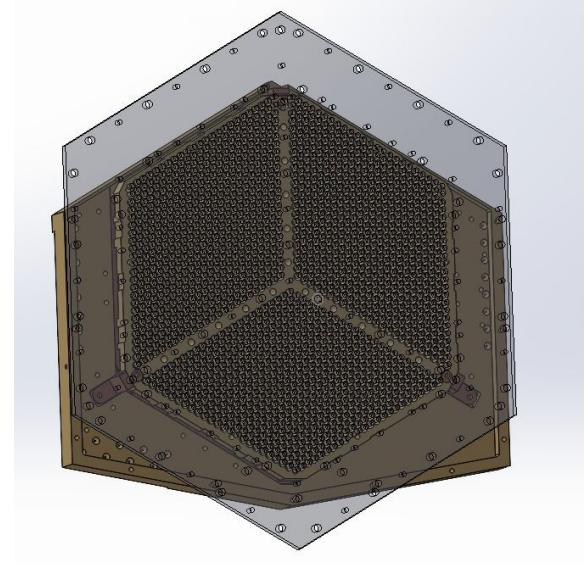
Build Time:

PCB: 3 days	\$0.00
Assembly: <input checked="" type="radio"/> 2-3 days	\$0.00
<input type="radio"/> 1 - 2 days	\$47.15



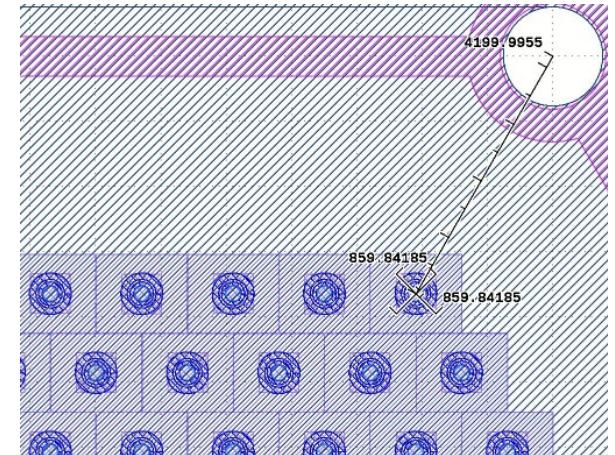
March 10th - Collimator Discussion

- Use 280GHz design as base
- Single collimator, same thickness as both combined
 - No need to block out so much light
 - 850GHz holes will be quite narrow anyway
- Mounting
 - Just add clearance holes for all possible locations
 - Leave existing holes in design - more is better
 - Allows for flexibility - could clamp to feedhorns or mount to base with/without standoffs.



Collimator modifications

- Looks like center-nearest detector center distance is exactly 4.2mm
- LED diagonal diameter is 738um, set collimator hole diameter to 800um
- Change linear pattern to 46x46, 1.4mm spacing





Tolerances for Collimator Holes

- XINGLIGHT 0.25mm tolerance doesn't make sense so we use [SunLED](#) 0.08mm size tolerance for reference.
- If we assume 0.08mm tolerance for both placement and size of the holes, and .05mm tolerance for pick-and-place accuracy ([source](#)).
- $0.738 + \sqrt{(0.08)^2 + (0.08)^2 + (0.08)^2 + (0.05)^2} \rightarrow 0.885\text{mm}$

Use .9mm diameter holes, unless this cannot be machined.

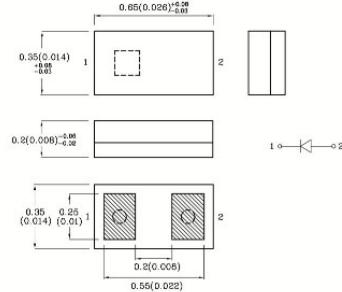
edit: see slide 70 for hole size updates

- Features**
- Ideal for indication light on hand held products
 - Long life and robust package
 - Standard Package: 4,000pc's/ Reel
 - MSL (Moisture Sensitivity Level): 2
 - Halogen-free
 - RoHS compliant



ATTENTION
ORIGINATE REGULATIONS
FOR HANDLING
ELECTROSTATIC
DISCHARGE
SENSITIVE
DEVICES

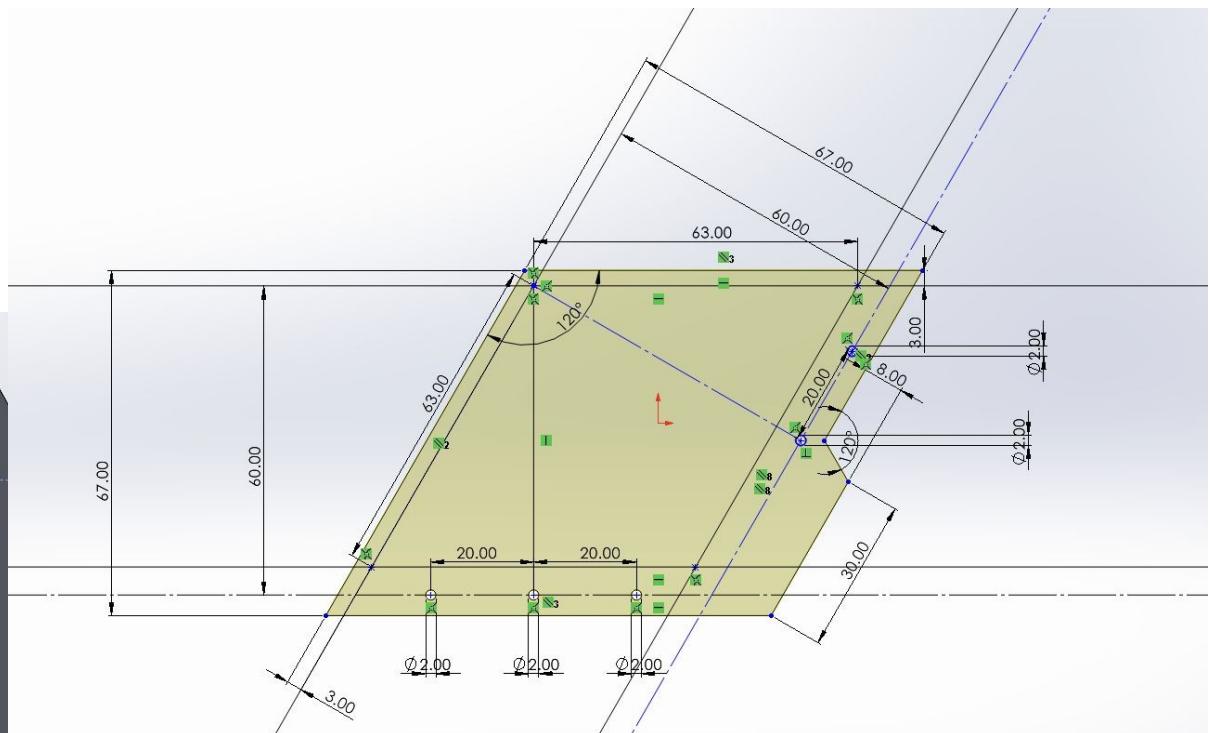
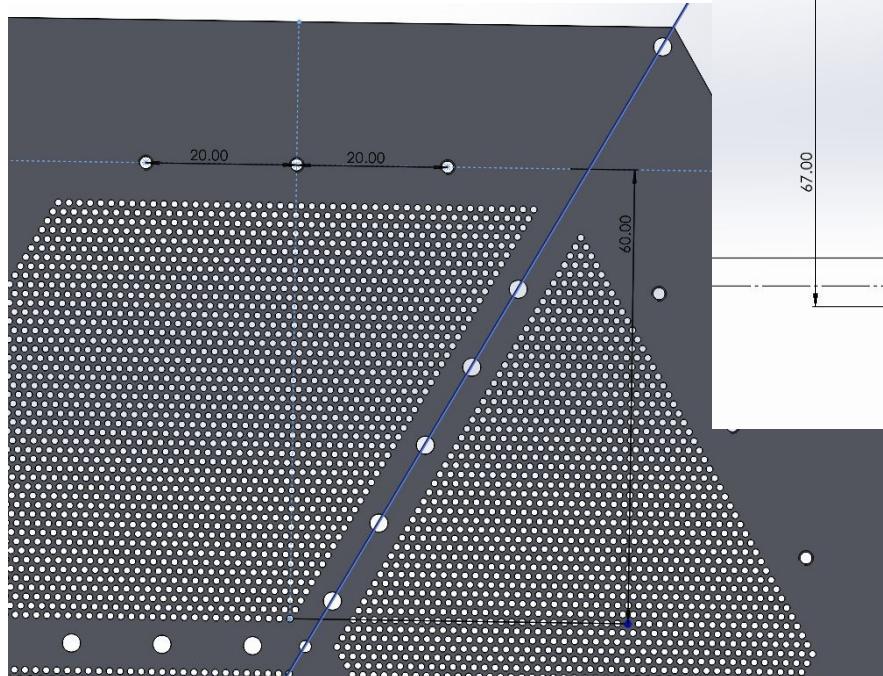
Package Schematics



Collimator Design

- 0.9mm diameter for collimator holes (vs. led diagonal 0.738mm)
- thickness - TBD (based on machine shop input / spread angle)
- M2 screw clearance holes for the array mount
- Clamping holes in between rhombi
- M2 threaded holes for mounting the rhombi - 3 per side, holes cut in PCB to match
- Extra M2 clearance sized holes in the corners of the hexagon

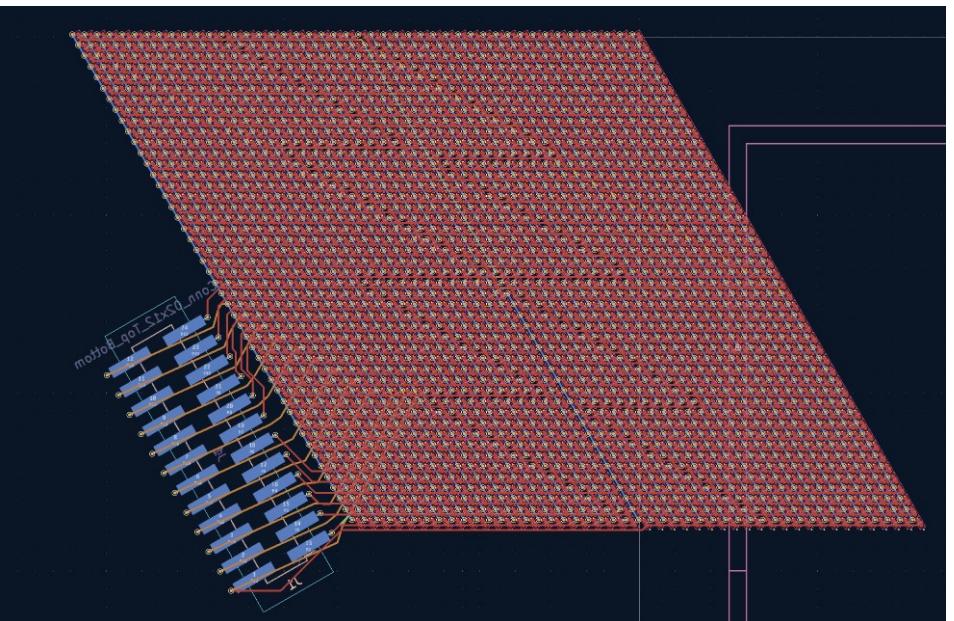
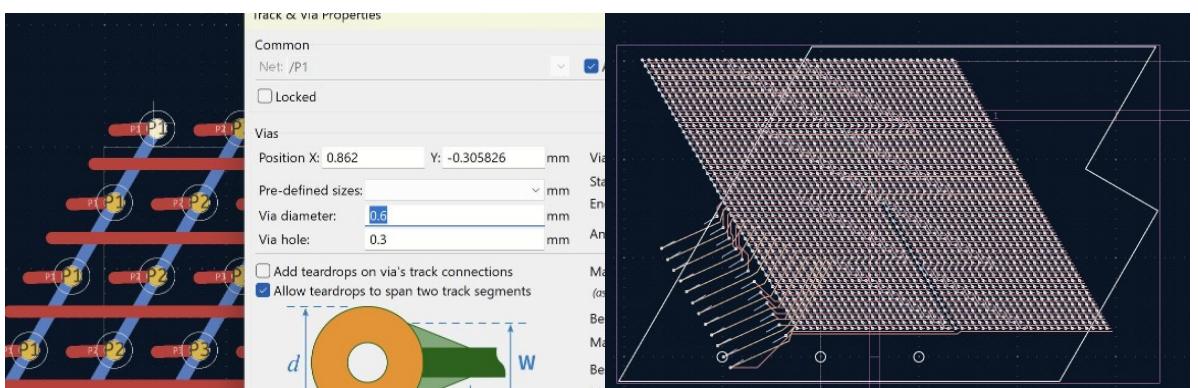
PCB Edge.Cuts



Mirrored Rhombus

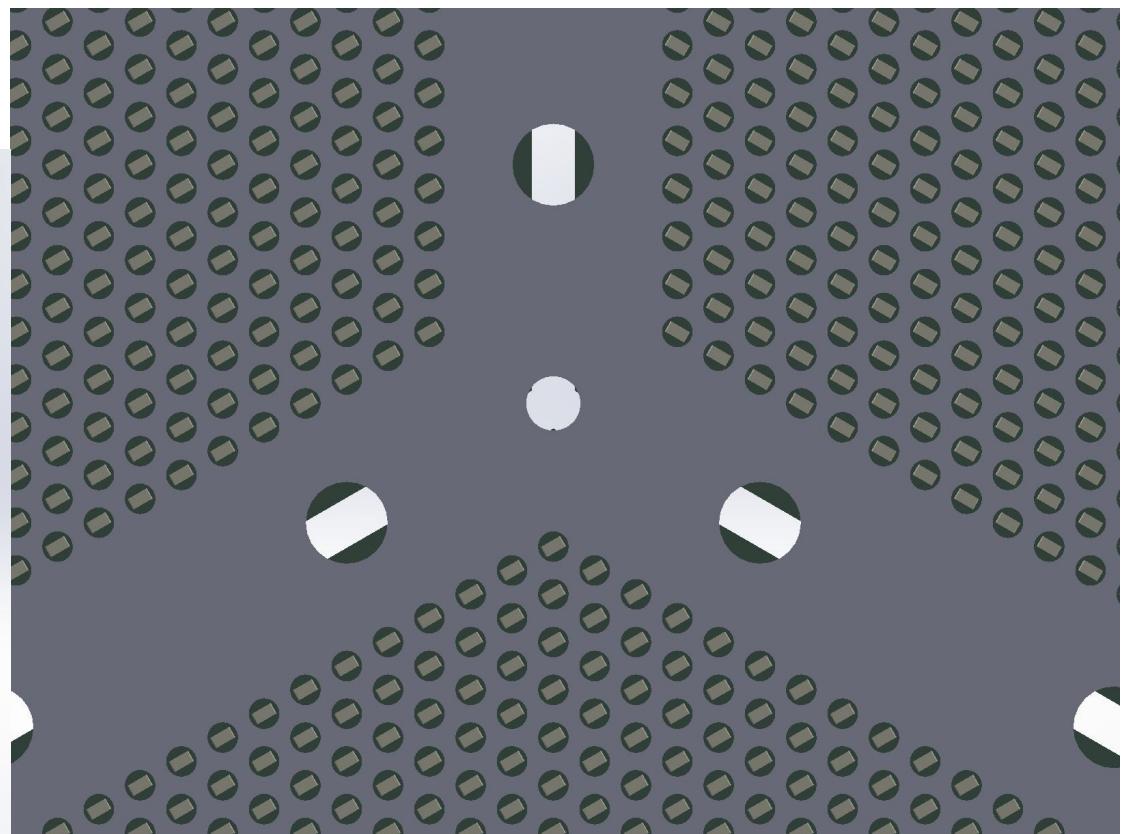
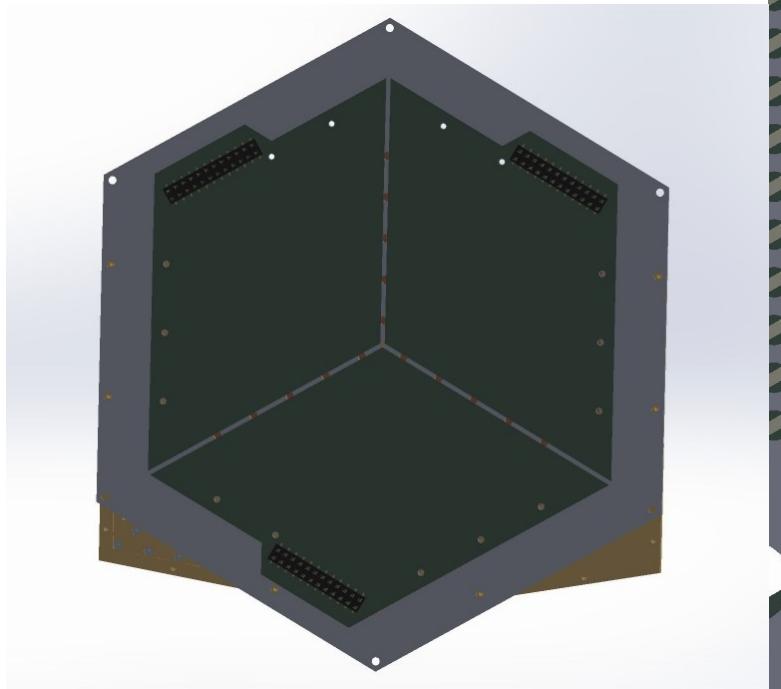
1. Delete footprints
2. Record reference position
3. Mirror tracks & vias horizontally
4. Move exactly → set reference pos to be mirrored across y-axis
5. Now, footprints must can be replaced with inverted x positions

- a. connector: manually change x sign
- b. leds: run `led_placer_mirrored.py`

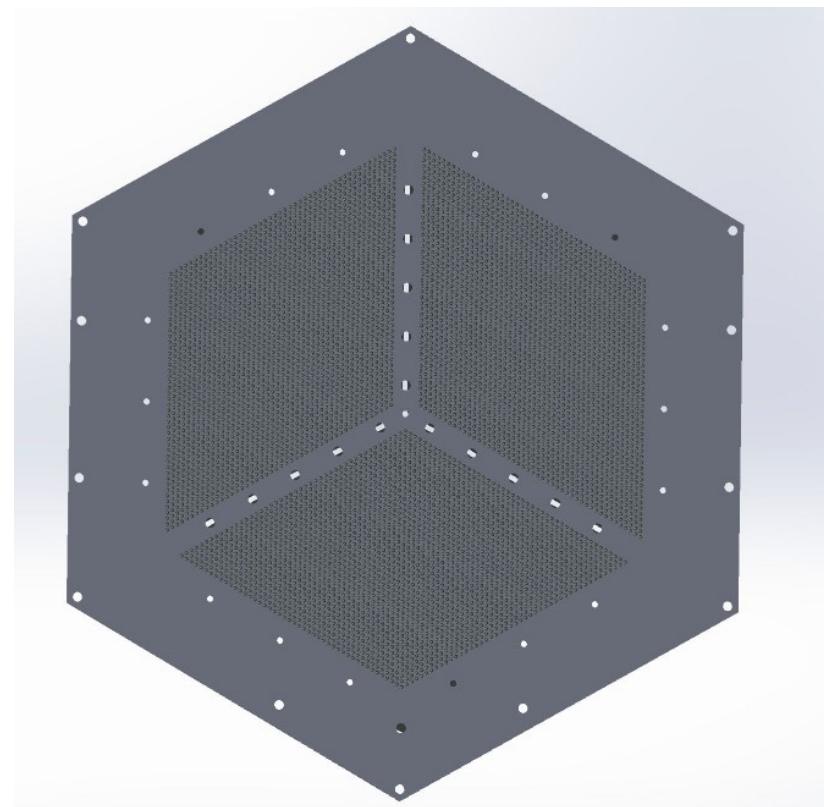
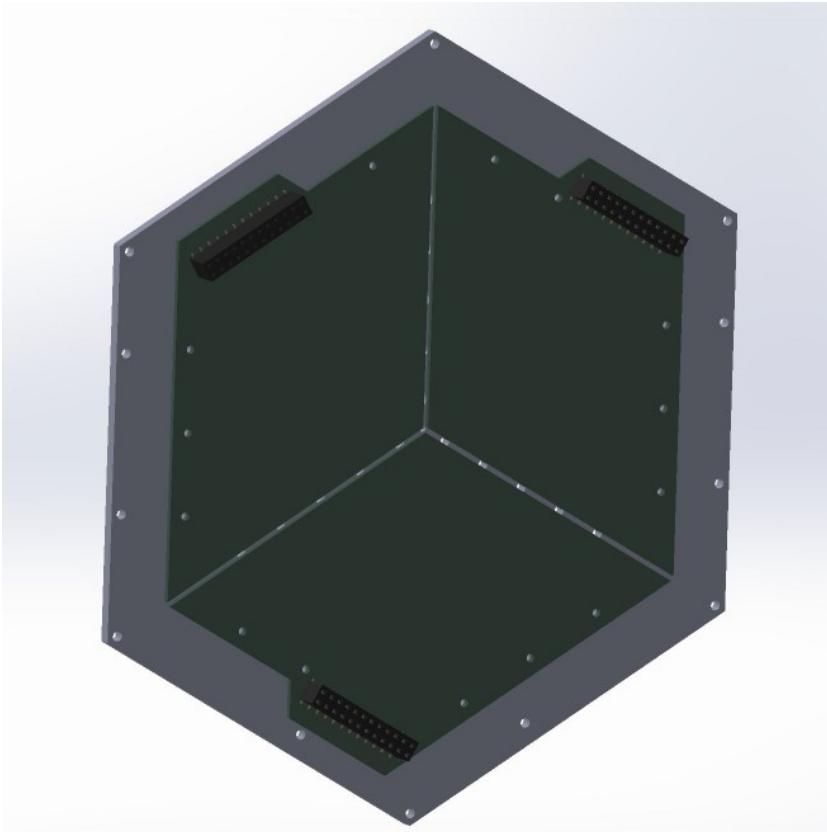


PCB Layout With Mirrored Variant

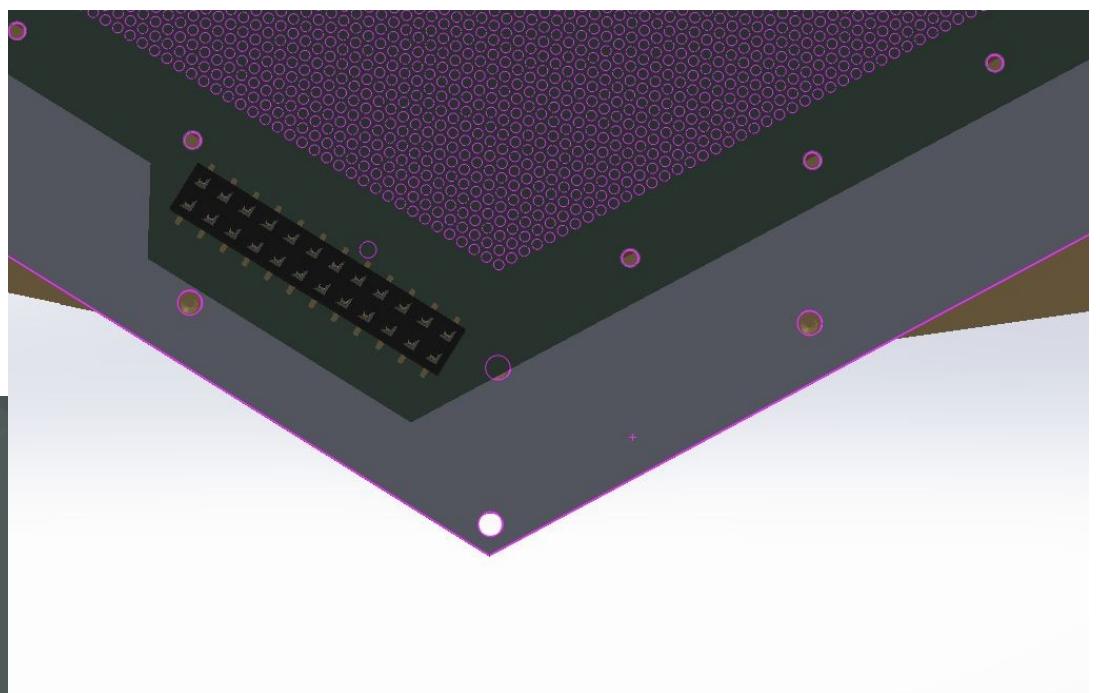
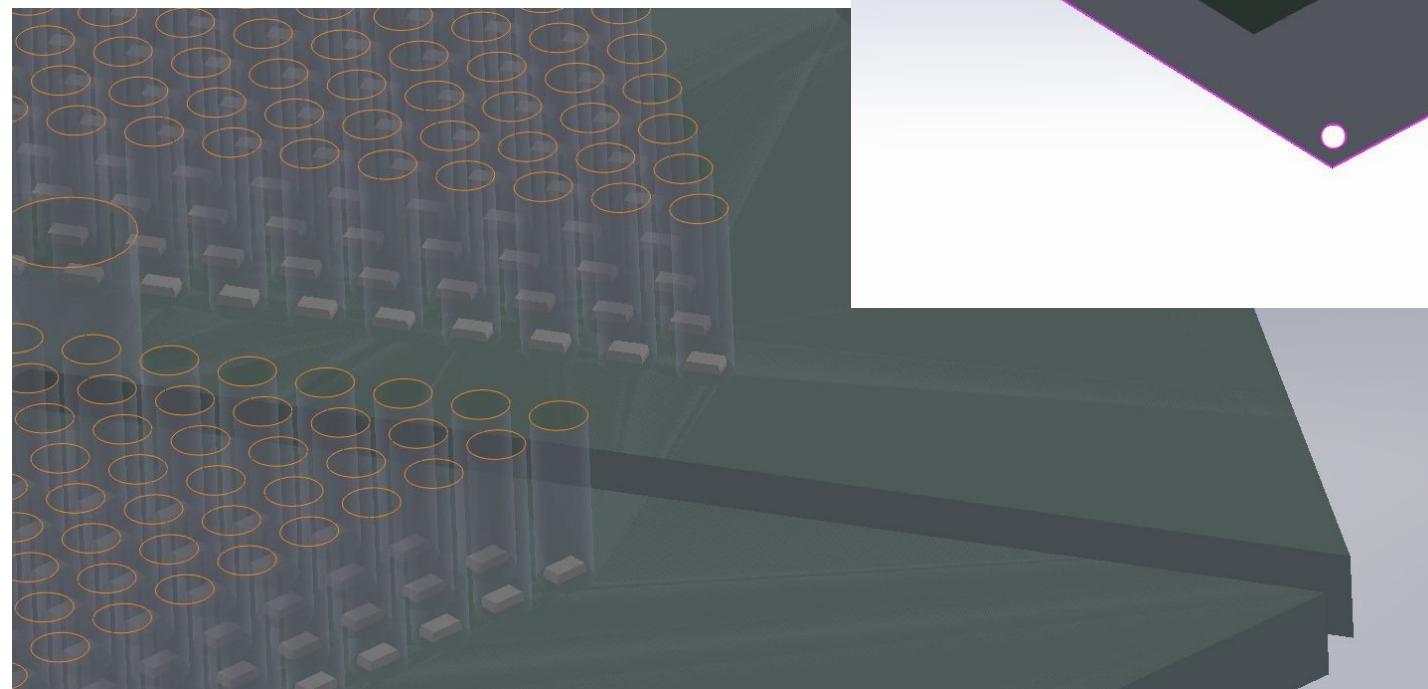
LED alignment looks good!



More Screenshots



More Screenshots



JLCPCB Quote - 2/5 populated, regular orientation

Why only 2 populated?
 → components (all the LEDs)
 make up a large portion of the cost

\$221.27

Uploaded BOM Data				Review Matched Parts			
Top Designator	Comment	Footprint	Matched Part Detail	Qty	Source	Lib Type	Total Cost
D1.D10.D100.D100...	LED	0201	XL-0201SURC 5mA 40mcd~75mcd 620nm~630nm 30°C~+85...				
D19.D190.D1900.D...	LED	0201	XL-0201SURC 5mA 40mcd~75mcd 620nm~630nm 30°C~+85...				
D354.D355.D356.D...	LED	0201	XL-0201SURC 5mA 40mcd~75mcd 620nm~630nm 30°C~+85...				
D534.D535.D536.D...	LED	0201	XL-0201SURC 5mA 40mcd~75mcd 620nm~630nm 30°C~+85...				
D714.D715.D716.D...	LED	0201	XL-0201SURC 5mA 40mcd~75mcd 620nm~630nm 30°C~+85...				
D895.D896.D897.D...	LED	0201	XL-0201SURC 5mA 40mcd~75mcd 620nm~630nm 30°C~+85...				
D1179.D118.D118...	LED	0201	XL-0201SURC 5mA 40mcd~75mcd 620nm~630nm 30°C~+85...				
D1359.D136.D136...	LED	0201	XL-0201SURC 5mA 40mcd~75mcd 620nm~630nm 30°C~+85...				
D1539.D154.D154...	LED	0201	XL-0201SURC 5mA 40mcd~75mcd 620nm~630nm 30°C~+85...				
D1719.D172.D172...	LED	0201	XL-0201SURC 5mA 40mcd~75mcd 620nm~630nm 30°C~+85...				
D2079.D208.D208...	LED	0201	XL-0201SURC 5mA 40mcd~75mcd 620nm~630nm 30°C~+85...				

Please carefully check the packages of selected parts before proceeding.

NEXT

Charge Details

PCB Price	\$29.60
Engineering fee:	\$24.00
Via Covering:	\$0.00
Board:	\$4.60
Confirm Production file:	\$1.00
Standard PCBA Price	\$191.67
Setup Fee:	\$25.00
Stencil:	\$7.86
Panel:	\$0.00
Large Size:	\$0.00
Components(1 items):	\$143.53
Feeders Loading fee:	\$1.50
SMT Assembly	\$13.31
Confirm Parts Placement:	\$0.00
Packaging fee:	\$0.47
Build Time:	
PCB: 3 days	\$0.00
Assembly: <input checked="" type="radio"/> 2 - 3 days	\$0.00
<input type="radio"/> 1 - 2 days	\$47.15

Total Price: \$221.27

Weight 821.10g

Product Description

SAVE TO CART

JLCPCB Quote - 2/5 populated, mirrored orientation

\$221.27 (same price, unsurprisingly)

Uploaded BOM Data				Review Matched Parts			
Top Designator	Comment	Footprint	Matched Part Detail	Qty	Source	Lib Type	Total Cost
D1,D10,D100,D100...	LED	0201	XL-0201SURC C0646923 5mA 40mcd~75mcd 620nm~630nm -30°C~+85...	<input type="checkbox"/>	XL-0201SURC C0646923	Select	<input type="checkbox"/>
D19,D190,D1900,D...	LED	0201	XL-0201SURC C0646923 5mA 40mcd~75mcd 620nm~630nm -30°C~+85...	<input type="checkbox"/>	XL-0201SURC C0646923	Select	<input type="checkbox"/>
D354,D355,D356,D...	LED	0201	XL-0201SURC C0646923 5mA 40mcd~75mcd 620nm~630nm -30°C~+85...	<input type="checkbox"/>	XL-0201SURC C0646923	Select	<input type="checkbox"/>
D534,D535,D536,D...	LED	0201	XL-0201SURC C0646923 5mA 40mcd~75mcd 620nm~630nm -30°C~+85...	<input type="checkbox"/>	XL-0201SURC C0646923	Select	<input type="checkbox"/>
D714,D715,D716,D...	LED	0201	XL-0201SURC C0646923 5mA 40mcd~75mcd 620nm~630nm -30°C~+85...	<input type="checkbox"/>	XL-0201SURC C0646923	Select	<input type="checkbox"/>
D895,D896,D897,D...	LED	0201	XL-0201SURC C0646923 5mA 40mcd~75mcd 620nm~630nm -30°C~+85...	<input type="checkbox"/>	XL-0201SURC C0646923	Select	<input type="checkbox"/>
D1179,D118,D118...	LED	0201	XL-0201SURC C0646923 5mA 40mcd~75mcd 620nm~630nm -30°C~+85...	<input type="checkbox"/>	XL-0201SURC C0646923	Select	<input type="checkbox"/>
D1359,D136,D136...	LED	0201	XL-0201SURC C0646923 5mA 40mcd~75mcd 620nm~630nm -30°C~+85...	<input type="checkbox"/>	XL-0201SURC C0646923	Select	<input type="checkbox"/>
D1539,D154,D154...	LED	0201	XL-0201SURC C0646923 5mA 40mcd~75mcd 620nm~630nm -30°C~+85...	<input type="checkbox"/>	XL-0201SURC C0646923	Select	<input type="checkbox"/>
D1719,D172,D172...	LED	0201	XL-0201SURC C0646923 5mA 40mcd~75mcd 620nm~630nm -30°C~+85...	<input type="checkbox"/>	XL-0201SURC C0646923	Select	<input type="checkbox"/>
D2079,D208,D208...	LED	0201	XL-0201SURC C0646923 5mA 40mcd~75mcd 620nm~630nm -30°C~+85...	<input type="checkbox"/>	XL-0201SURC C0646923	Select	<input type="checkbox"/>

Please carefully check the packages of selected parts before proceeding.

Charge Details

PCB Price	\$29.60
Engineering fee:	\$24.00
Via Covering:	\$0.00
Board:	\$4.60
Confirm Production file:	\$1.00

Standard PCBA Price

Setup Fee:	\$25.00
Stencil:	\$7.86
Panel:	\$0.00
Large Size:	\$0.00
Components(1 items):	\$143.53
Feeders Loading fee:	\$1.50
SMT Assembly	\$13.31
Confirm Parts Placement:	\$0.00
Packaging fee:	\$0.47

Build Time:

PCB: 3 days	\$0.00
Assembly: <input checked="" type="radio"/> 2 - 3 days	\$0.00
<input type="radio"/> 1 - 2 days	\$47.15

Total Price:
\$221.27

Weight 821.10g

Product Description

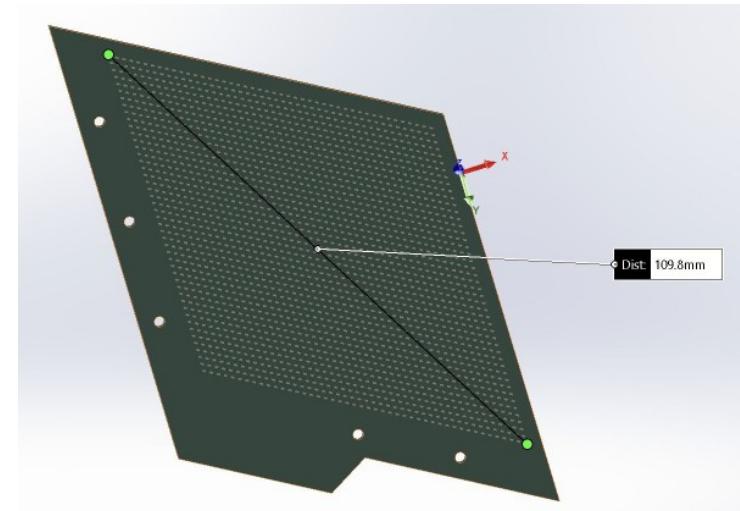
SAVE TO CART

Detectors Meeting - March 19th 2024

- Hole sizing
 - Adding tolerances in quadrature may not reflect how tolerances actually combine
 - Differences in thermal expansion coefficient between PCB/collimator will cause a shift over length of board
 - This is better with the 3 rhombus configuration since displacement will not accumulate as much as with a monolithic board
 - Standard hole diameter may be necessary for manufacturing purposes (e.g. we may want to do 1mm instead of 0.9mm)

Relative Thermal Expansion

- linear expansion coefficient α changes with temperature¹
 - this is likely negligible if we aren't otherwise close to having clearance issues
- Values shown are range seen in various sources for α at room temp.
- PCB (FR4) ($1.2 \times 10^{-5} \text{ K}^{-1}$ - $1.8 \times 10^{-5} \text{ K}^{-1}$)
- Al 6061 ($2.3 \times 10^{-5} \text{ K}^{-1}$ - $2.4 \times 10^{-5} \text{ K}^{-1}$)
- Worst case relative (Al - FR4) shift / K
 - $2.4 \times 10^{-5} \text{ K}^{-1} - 1.2 \times 10^{-5} \text{ K}^{-1} = 1.2 \times 10^{-5} \text{ K}^{-1}$
- Worst case relative shift at $\Delta T = -300\text{K}$
 - $-300\text{K} \times 1.2 \times 10^{-5} \text{ K}^{-1} \times 109.8\text{mm} = 0.40\text{mm}$
 - This could be problematic



1. Source - <https://www.sciencedirect.com/science/article/abs/pii/S0921452621003057>

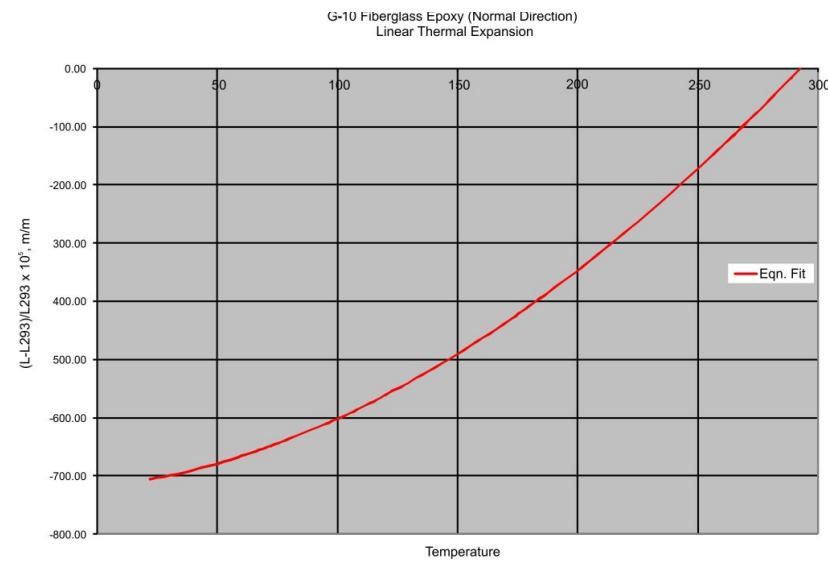
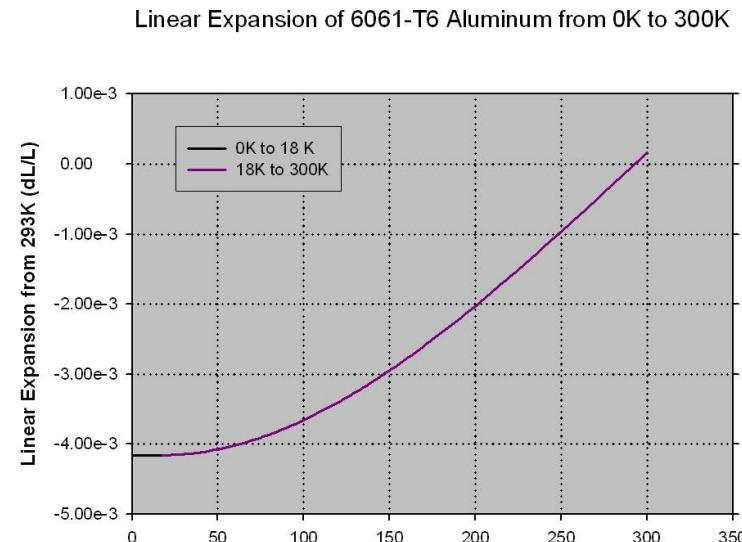
Relative Thermal Expansion - More Accurate Shift Value

https://trc.nist.gov/cryogenics/materials/6061%20Aluminum/6061_T6Aluminum_rev.htm

https://trc.nist.gov/cryogenics/materials/G-10%20CR%20Fiberglass%20Epoxy/G10CRFiberglassEpoxy_rev.htm

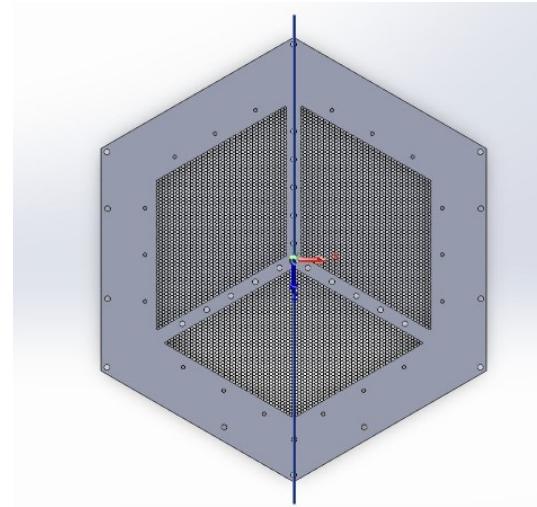
The tricky part of FR4 is that it has fabric in it, and the thermal expansion depends on the orientation of the fabric.

The worst case seems to be $0.007 - 0.004 = 0.003$ change, so $110 \text{ mm} * 0.003 = 0.33 \text{ mm}$, so close to what you already have.

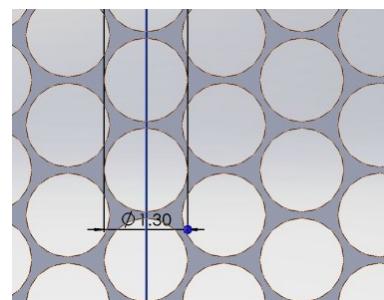


Relative Thermal Expansion - Possible Solutions

- Increase collimator hole size by 0.4mm to give extra space
- Further split boards to decrease maximum distance between mechanically coupled components (which is proportional to max relative displacement)
- Change collimator design to improve structural strength/manufacturability
- Use material with more similar α to FR4



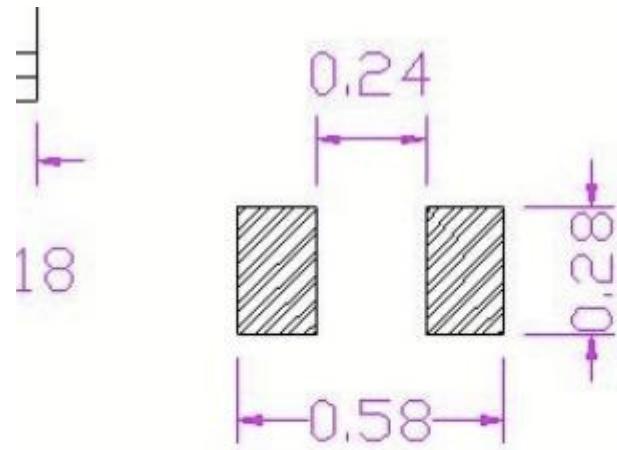
Images: 1.3mm diameter collimator holes.



This leaves only 0.1mm at the minimum distance between holes

Note: 0.9mm baseline to which 0.4mm was added is not to be relied upon because tolerances used are mostly guessed and were naively added in quadrature.

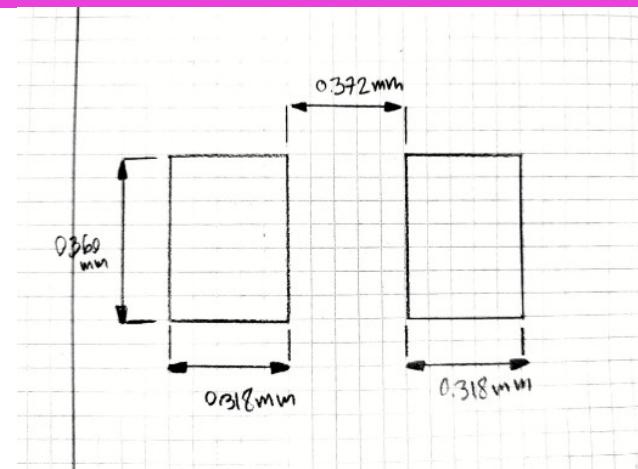
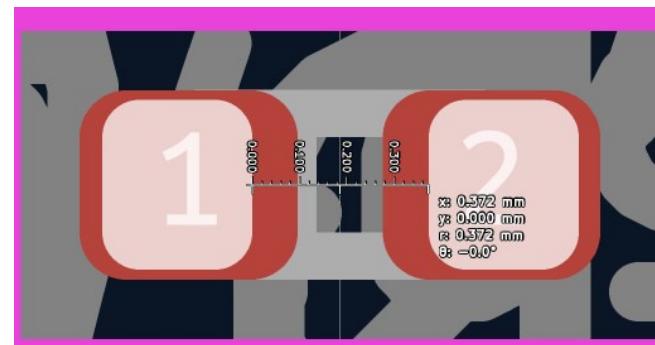
Footprint - Difference with Datasheet?



建议焊盘尺寸:

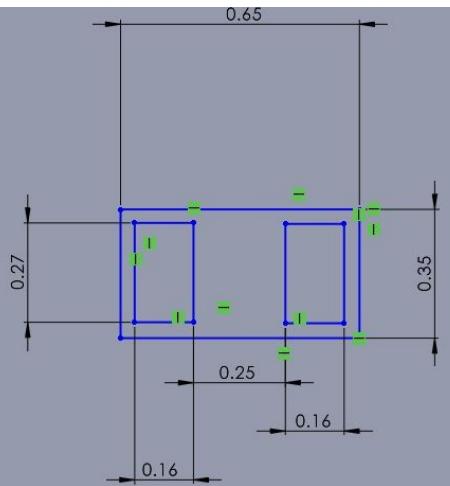
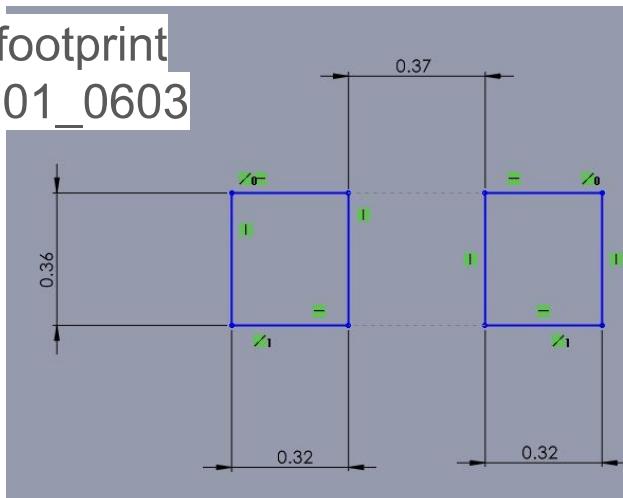
Recommended Soldering Pattern

LED_0201_0603Metric

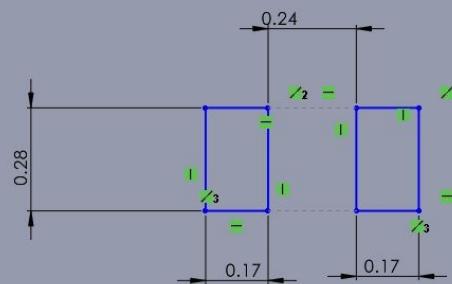


Footprint - Difference with Datasheet?

Default footprint
LED_0201_0603
Metric



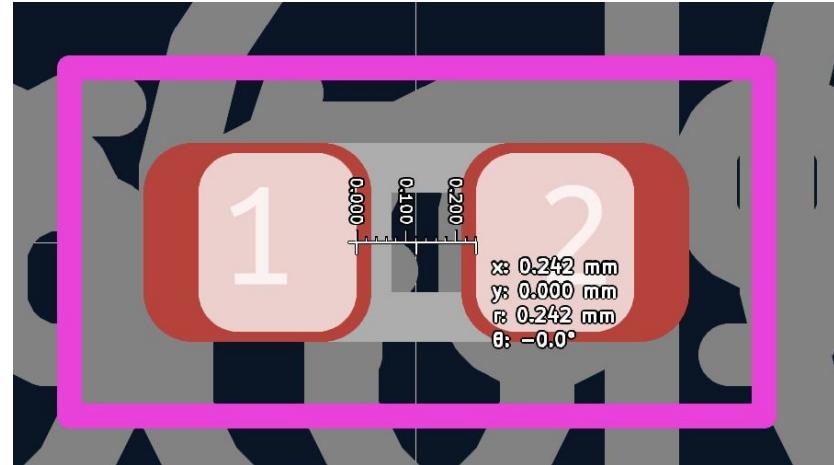
XINGLIGHT
datasheet
recommended



XINGLIGHT
datasheet
LED Model

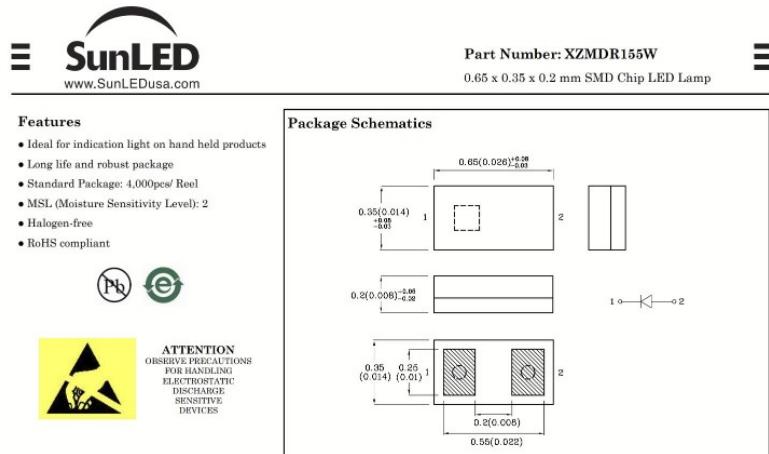
Footprint - Updated Version

- Moved solder paste pads closer together by 0.065mm each
- The gap between pads is now 0.24mm as is recommended by the XINGLIGHT datasheet
- Also removed silkscreen dot



Hole Placement Tolerances: Re-analysis

- Max LED size: $\sqrt{0.43^2+0.73^2}=0.847\text{mm}$
- Pick & Place accuracy: add $.050\text{mm} \rightarrow 0.897\text{mm}$
- Thermal expansion padding: add $.33\text{mm}/2 \rightarrow 1.060\text{mm}$
- UBC Machine shop can do as low as $\pm 0.02\text{mm}$ on diameters
- Can do $\pm 0.15\text{mm}$ down to as low as $\pm 0.03\text{mm}$ on placements



https://www.ipc.org/system/files/technical_resource/E40%26S06_03%20-%20Scott%20Wischoffer.pdf

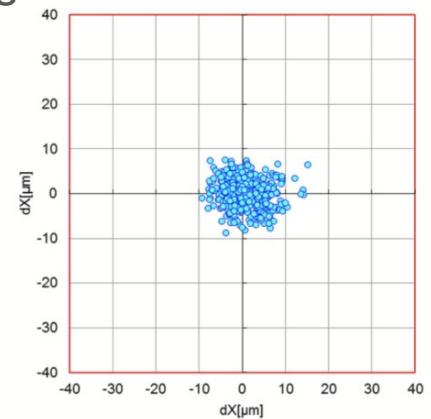
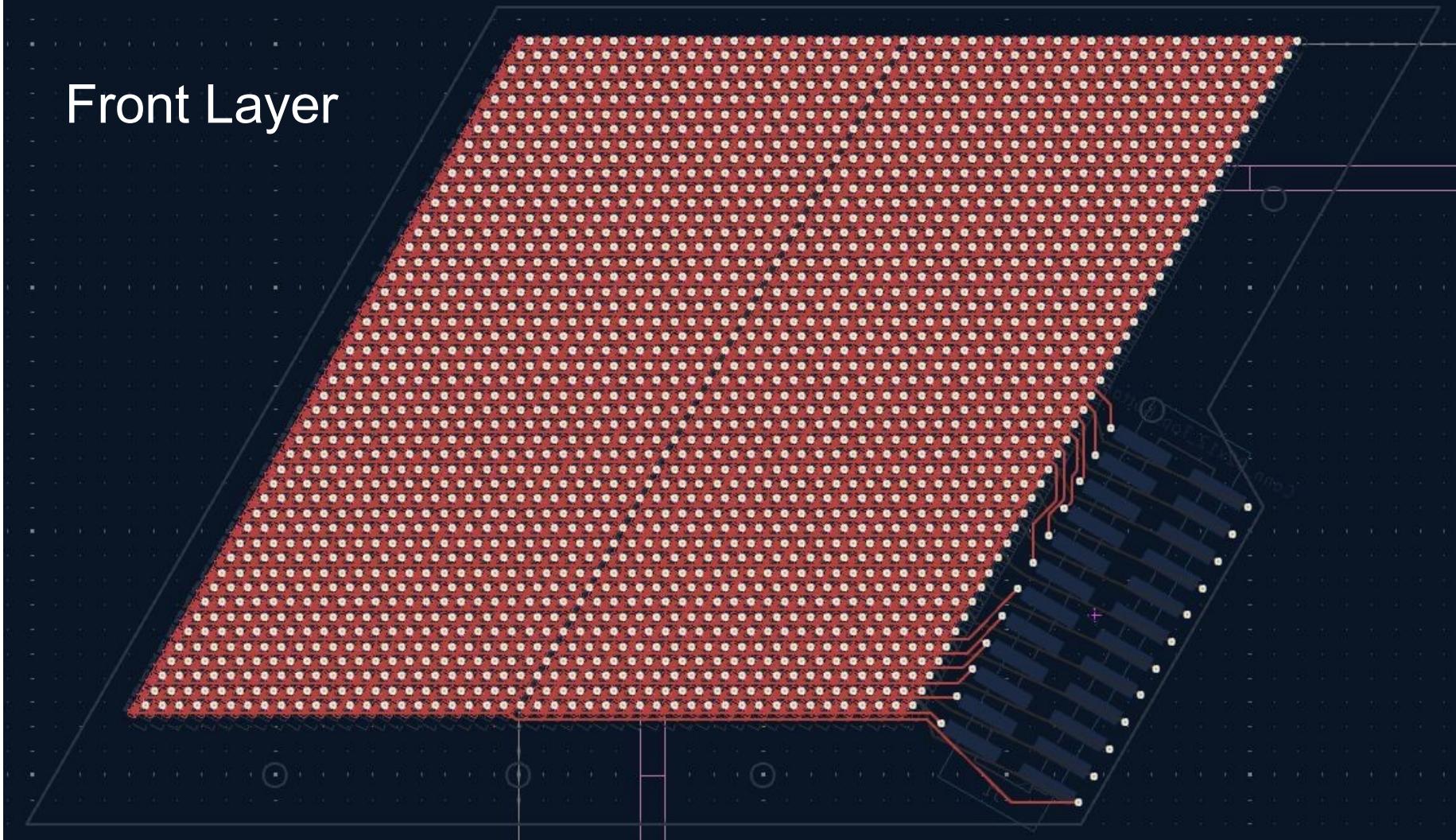


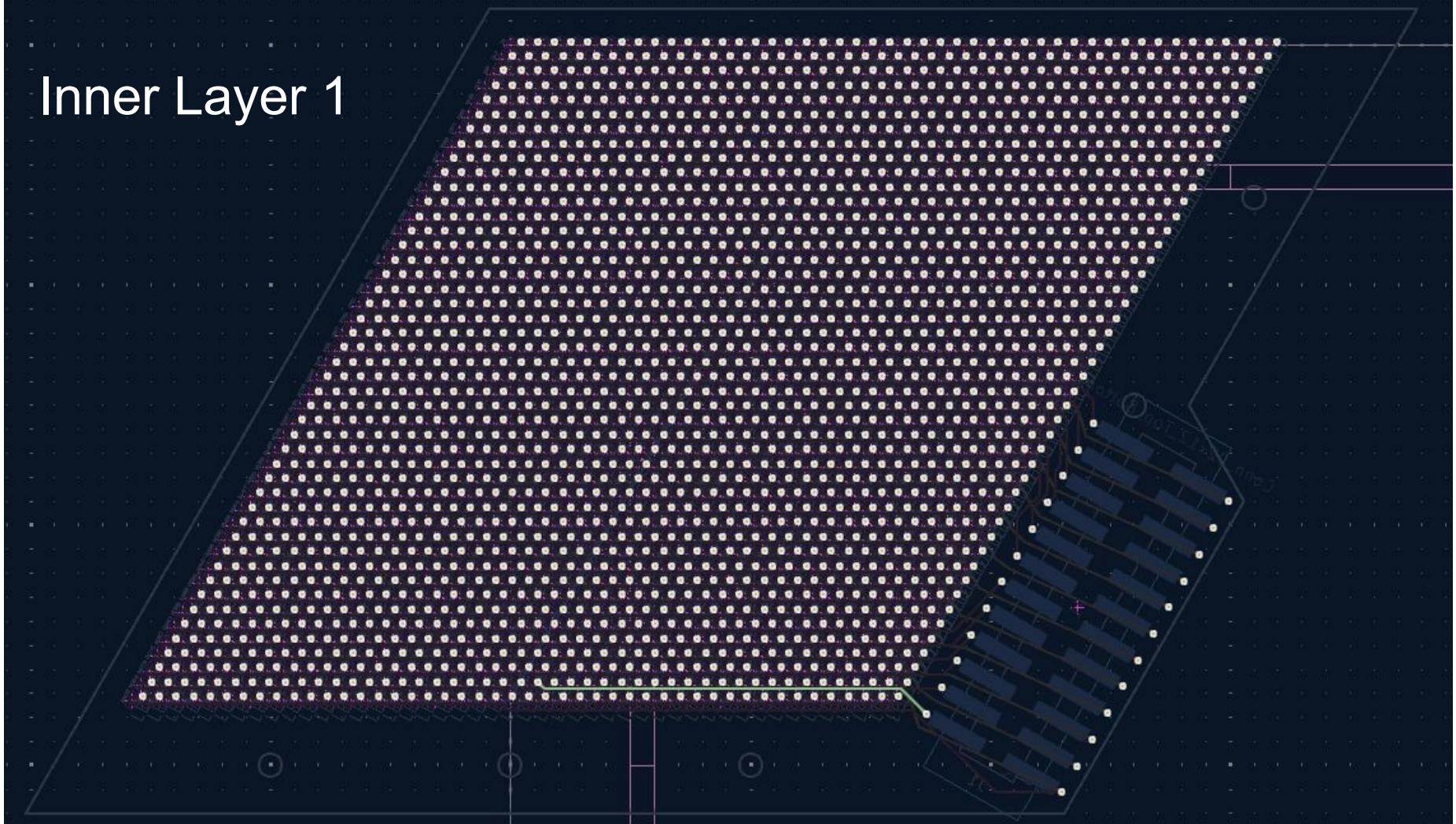
Image: 0201C (008004") placing accuracy

Figure 2

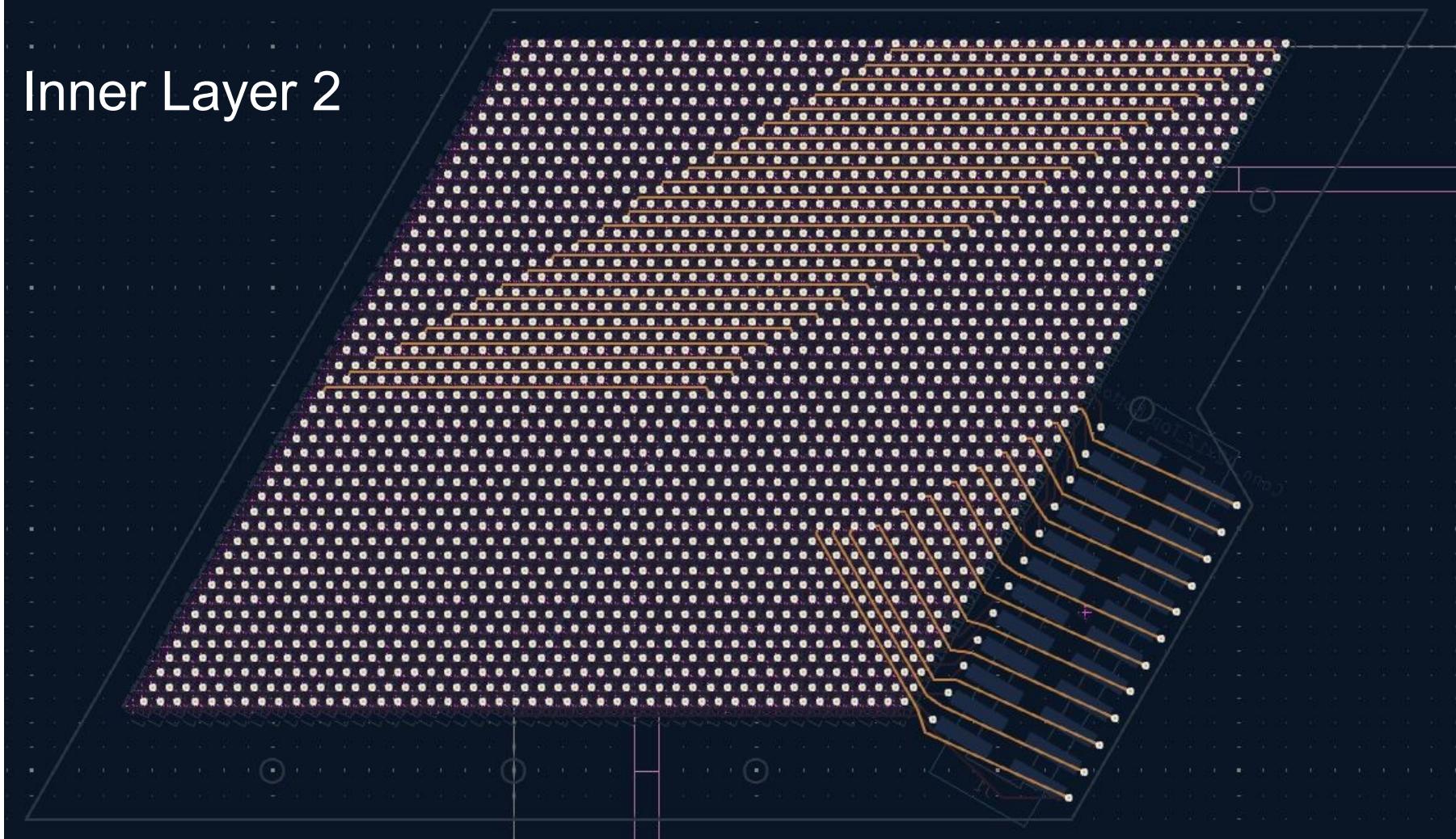
Front Layer



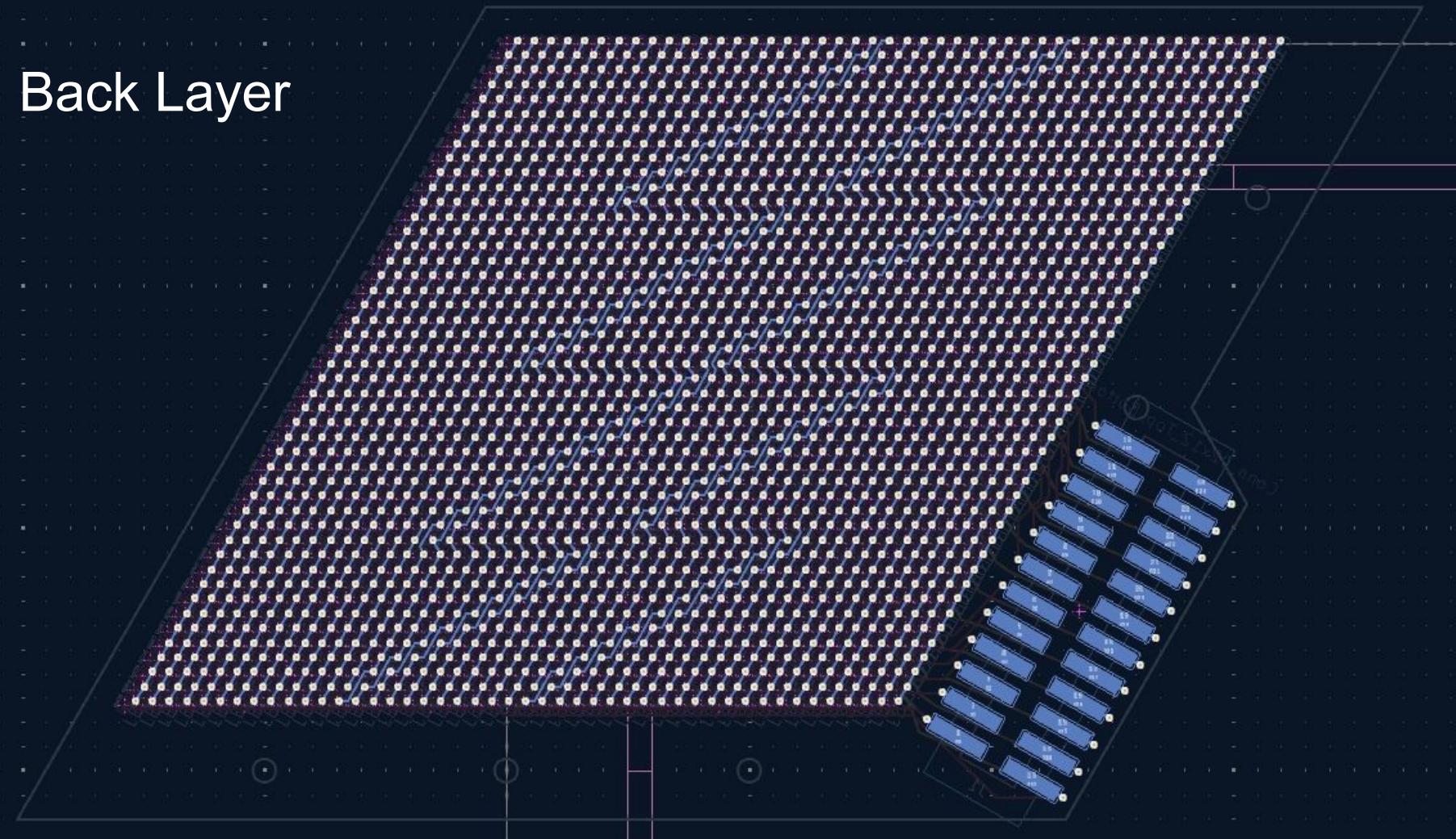
Inner Layer 1



Inner Layer 2



Back Layer



Generating Production Outputs

1. Plot Gerber/Drill files following the instructions and settings here:
<https://jlpcb.com/help/article/how-to-generate-gerber-and-drill-files-in-kicad-7>
2. Manually verify/look over Gerber/Drill files
3. Create BOM/CPL PCBA files using Fabrication Toolkit
<https://jlpcb.com/help/article/how-to-generate-bom-and-centroid-files-from-kicad-8>
 - a. In positions.csv, the rotation and layer columns must be swapped for this to work

Ordering Options from JLCPCB

- PCB Thickness
 - default: 1.6mm
- Surface finish
 - HASL (leaded), LeadFree HASL or ENIG
- Inner/outer copper weights
 - default
- Via covering
 - default: plugged
- Min. via size
 - I used large vias so there is no additional cost here
- Board outline tolerance
 - +-0.2mm (regular)
- Confirm production file
 - default: No
- Mark on PCB
 - order number

PCBA

- Must use standard to support 0201 packages
- Assembly - Top side only?
 - Could pay extra to get both sides assembled
- PCBA Qty
 - 3 regular, 2 mirrored?
- confirm parts placement
 - default: no
- Advanced
 - photo confirmation (no)
 - conformal coating (no)
 - board cleaning (no)
 - bake components (no)
 - packaging (antistatic bubble film)
 - solder paste (...)
 - etc. LEAVE ALL DEFAULT

JLCPCB: Out of stock XL-0201SURC

https://www.lcsc.com/product-detail/LED-Indication-Discrete_XINGLIGHT-XL-0201SURC_C3646923.html

Not enough stock? LCSC says 10880 available, but JLC only finds 1639.

This wasn't a problem a week ago -- maybe we just need to wait until they are back in stock

Top Side Total 11 parts detected 22 parts to be confirmed 11 parts Inventory shortage				Review Matched Parts				
Top Designator	Comment	Footprint	Matched Part Detail	Qty	Source	Lib Type	Total Cost	<input type="checkbox"/> Select
D1,D10,D100,D1...	LED	0201	XL-0201SURC C3646923 5mA 40mcd~75mcd 620nm~630nm -30°C~+85...	Q				4713 shortfall
D19,D190,D190...	LED	0201	XL-0201SURC C3646923 5mA 40mcd~75mcd 620nm~630nm -30°C~+85...	Q				4713 shortfall
D354,D355,D356...	LED	0201	XL-0201SURC C3646923 5mA 40mcd~75mcd 620nm~630nm -30°C~+85...	Q				4713 shortfall
D534,D535,D536...	LED	0201	XL-0201SURC C3646923 5mA 40mcd~75mcd 620nm~630nm -30°C~+85...	Q				4713 shortfall
D714,D715,D716...	LED	0201	XL-0201SURC C3646923 5mA 40mcd~75mcd 620nm~630nm -30°C~+85...	Q				4713 shortfall
D895,D896,D897...	LED	0201	XL-0201SURC C3646923 5mA 40mcd~75mcd 620nm~630nm -30°C~+85...	Q	6352	1639 JLCPCB	Extended	\$55.5621 ⓘ
D1179,D118,D11...	LED	0201	XL-0201SURC C3646923 5mA 40mcd~75mcd 620nm~630nm -30°C~+85...	Q				4713 shortfall
D1359,D136,D13...	LED	0201	XL-0201SURC C3646923 5mA 40mcd~75mcd 620nm~630nm -30°C~+85...	Q				4713 shortfall
D1539,D154,D15...	LED	0201	XL-0201SURC C3646923 5mA 40mcd~75mcd 620nm~630nm -30°C~+85...	Q				4713 shortfall
D1719,D172,D17...	LED	0201	XL-0201SURC C3646923 5mA 40mcd~75mcd 620nm~630nm -30°C~+85...	Q				4713 shortfall
D2079,D208,D20...	LED	0201	XL-0201SURC C3646923 5mA 40mcd~75mcd 620nm~630nm -30°C~+85...	Q				4713 shortfall

Please carefully check the packages of selected parts before proceeding.

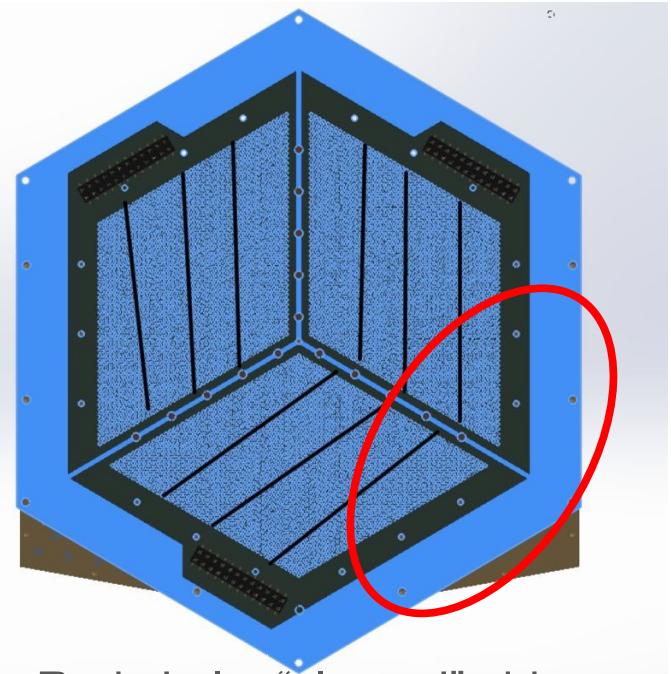
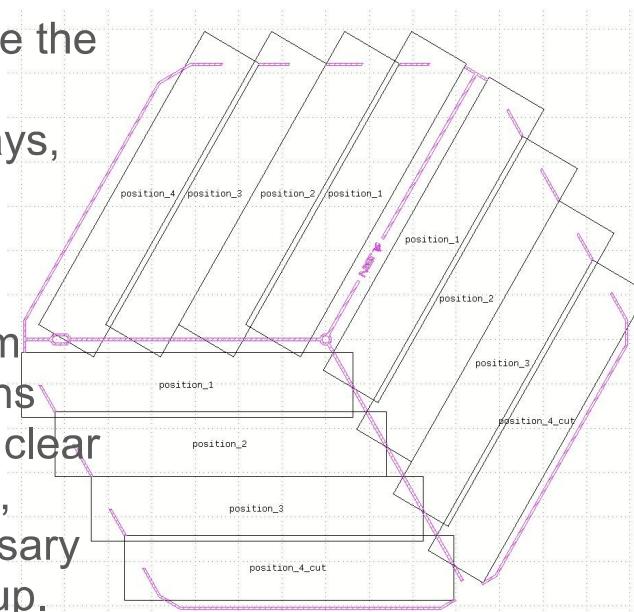
NEXT

Network Alignment

It occurred to me that I haven't verified recently that the detector networks will align with the LED networks.

This requires that we place the correct configuration of standard vs. mirrored arrays, which is OK since we have at least 2 of each.

However, I need to confirm that the connector positions are in the right location to clear space on one of the sides, as I was told this is necessary for the array mapping setup.



Red circle: "cleared" side

Led Pre-Order

JLC PCB allows for pre-ordering of parts. After the order is placed, a final price and lead time estimate is sent, and the parts are shipped to JLC's warehouse.

PCBA services can then be ordered, using the parts which will be saved in the user library.

I have reached out to JLC PCB for an estimate on their lead time.

Parts Cart Q Search

Unit Price	Qty	Total Price
\$0.0263	10600 Min: 192	\$278.78

Pre-order Items Price for pre-order items are for reference only. The confirmed price will be quoted within 48 hours after finish the payment.

 XINGLIGHT XL-0201SURC C3646923
5mA 40mcd~75mcd 620nm~630nm -30°C~+85°C Positive Stick Red 1...

Subtotal (1) **\$278.78**

ALL (All parts ordered at JLCPBCB are only for PCBA orders. Pickup service is

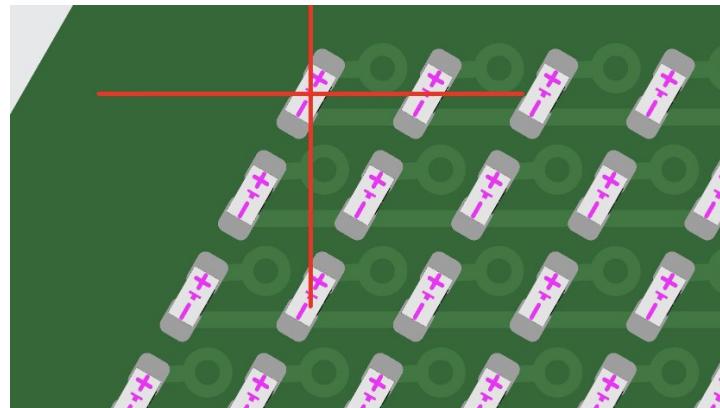
Secure Checkout 

Quotes - Non-Mirrored (3/5 Boards Assembled)

Charge Details

PCB Price	\$28.60
Engineering fee:	\$24.00
Via Covering:	\$0.00
Board:	\$4.60
Standard PCBA Price	\$54.79
Setup Fee:	\$25.00
Stencil:	\$7.86
Panel:	\$0.00
Large Size:	\$0.00
Components(1 items):	\$0.00
Feeders Loading fee: <small>?</small>	\$1.50
SMT Assembly <small>?</small>	\$19.96
Packaging fee:	\$0.47
Build Time: <small>?</small>	
PCB: 3 days	\$0.00
Assembly: <input checked="" type="radio"/> 2 - 3 days	\$0.00
<input type="radio"/> 1 - 2 days	\$47.15

DFM Preview



Total Price: \$83.39

Weight ? 938.70g

Quotes - Mirrored (2/5 Boards Assembled)

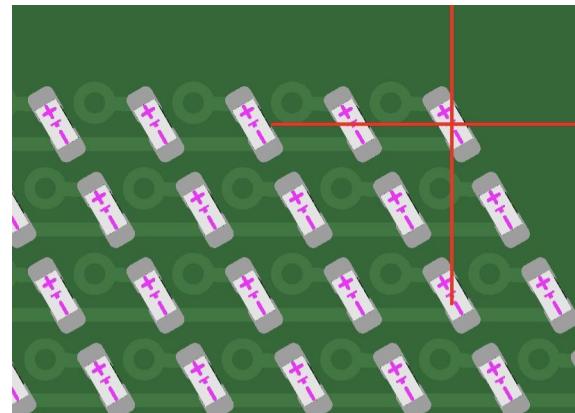
Charge Details

PCB Price	\$29.60
Engineering fee:	\$24.00
Via Covering:	\$0.00
Board:	\$4.60
Confirm Production file:	\$1.00

Standard PCBA Price	\$48.57
Setup Fee:	\$25.00
Stencil:	\$7.86
Panel:	\$0.00
Large Size:	\$0.00
Components(1 items):	\$0.00
Feeders Loading fee: ⓘ	\$1.50
SMT Assembly ⓘ	\$13.31
Confirm Parts Placement:	\$0.43
Packaging fee:	\$0.47

Build Time: ⓘ	
PCB: 3 days	\$0.00
Assembly: <input checked="" type="checkbox"/> 2 - 3 days <input type="radio"/> 1 - 2 days	\$0.00 \$47.15

DFM Preview



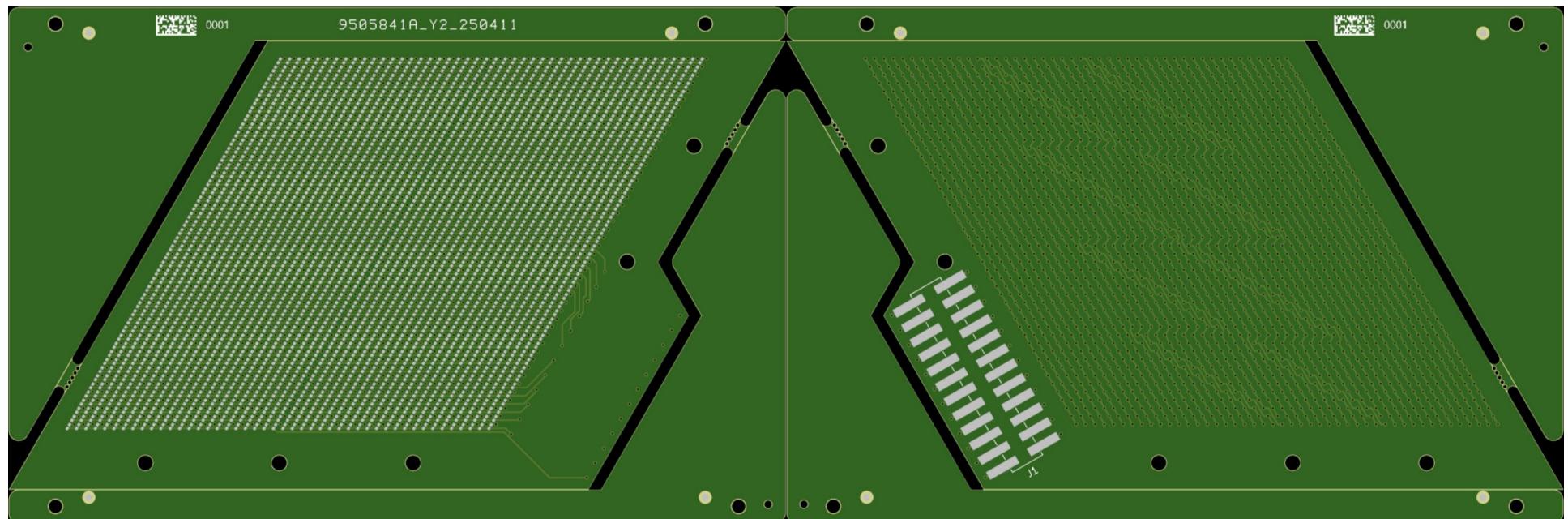
Total Price:

\$78.17

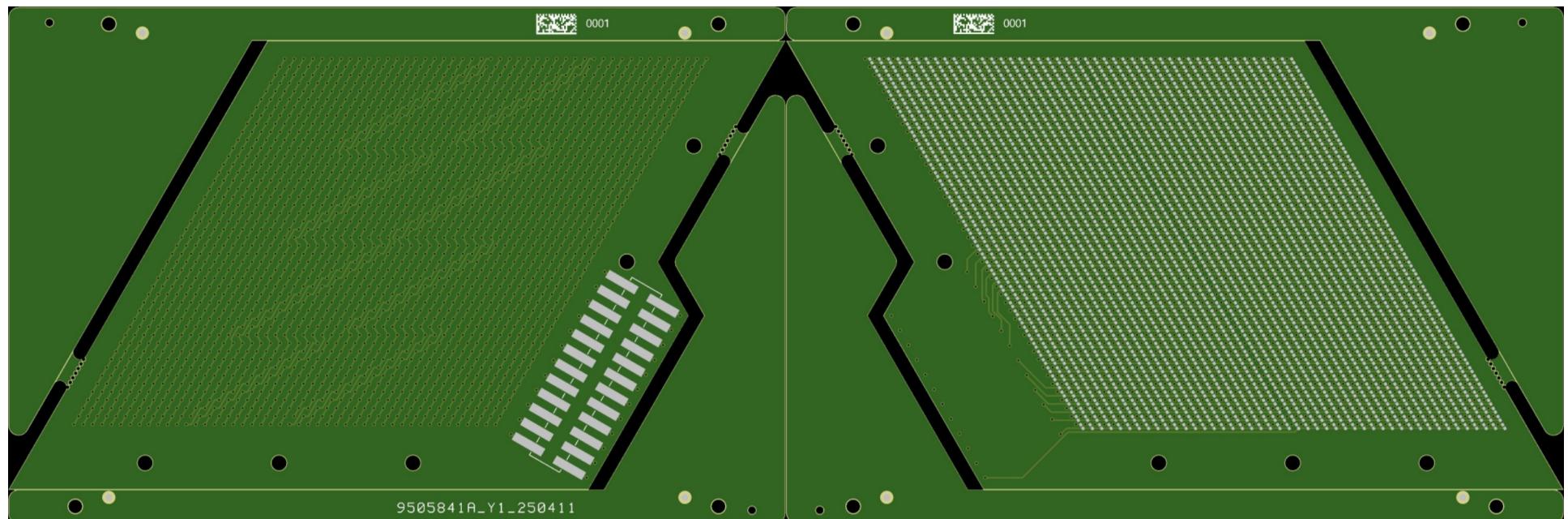
Weight ⓘ

821.10g

JLC Production Files (Standard Orientation)



JLC Production Files (Mirrored)



Order Arrived at HAA! (Pictures from Tony)

