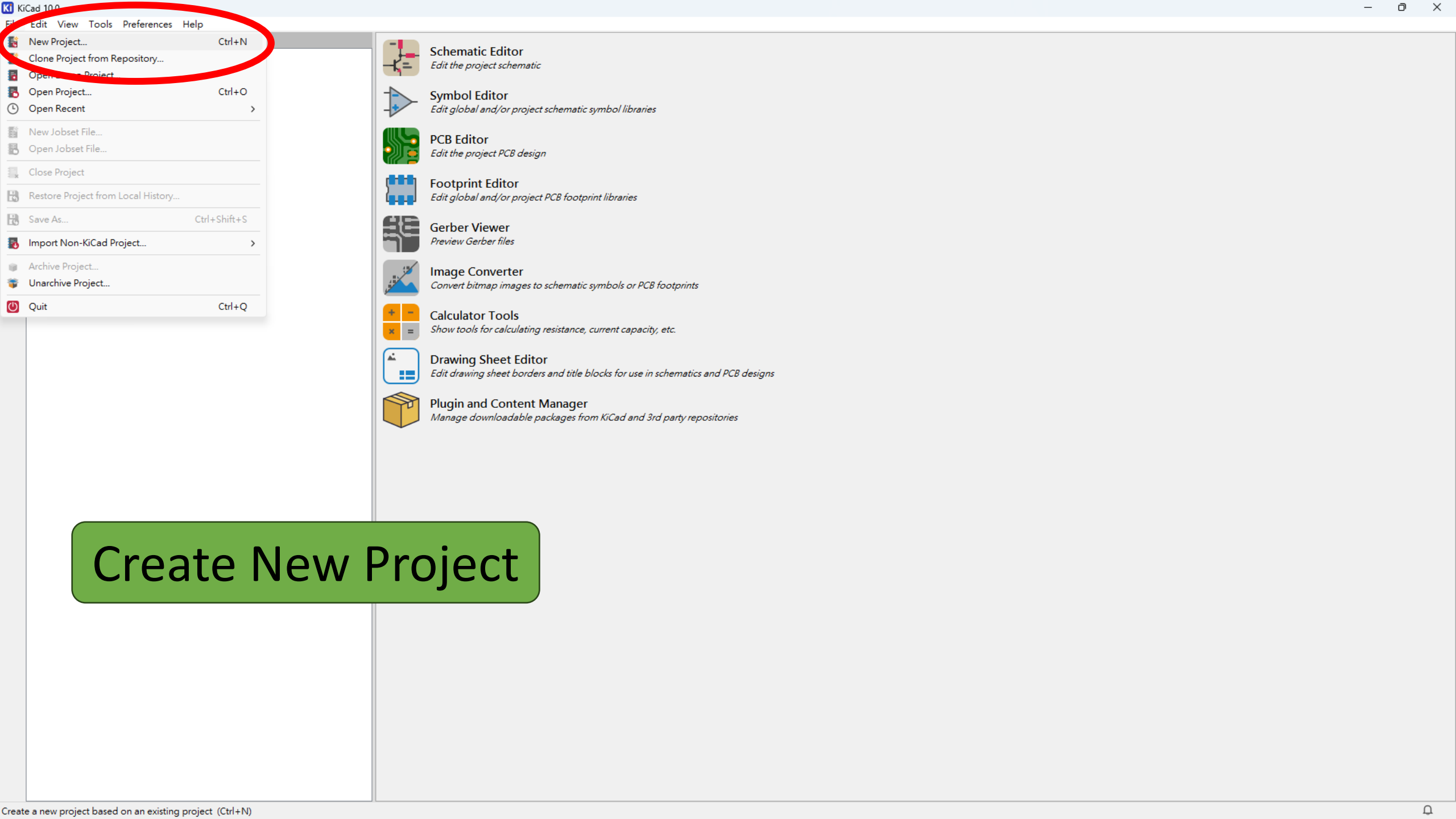
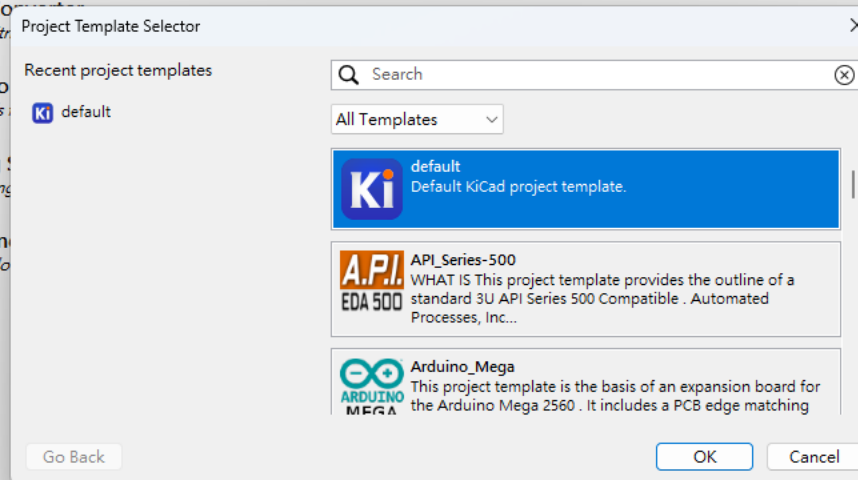


# KiCad Tutorial for a 555 Timer Circuit

TA Kai-Chun Huang



Create New Project

**Schematic Editor***Edit the project schematic***Symbol Editor***Edit global and/or project schematic symbol libraries***PCB Editor***Edit the project PCB design***Footprint Editor***Edit global and/or project PCB footprint libraries***Gerber Viewer***Preview Gerber files***Image Converter***Convert bitmaps***Calculator***Show tools***Drawing Tools***Edit drawings***Plugin Manager***Manage plugins*

# Use Default Template

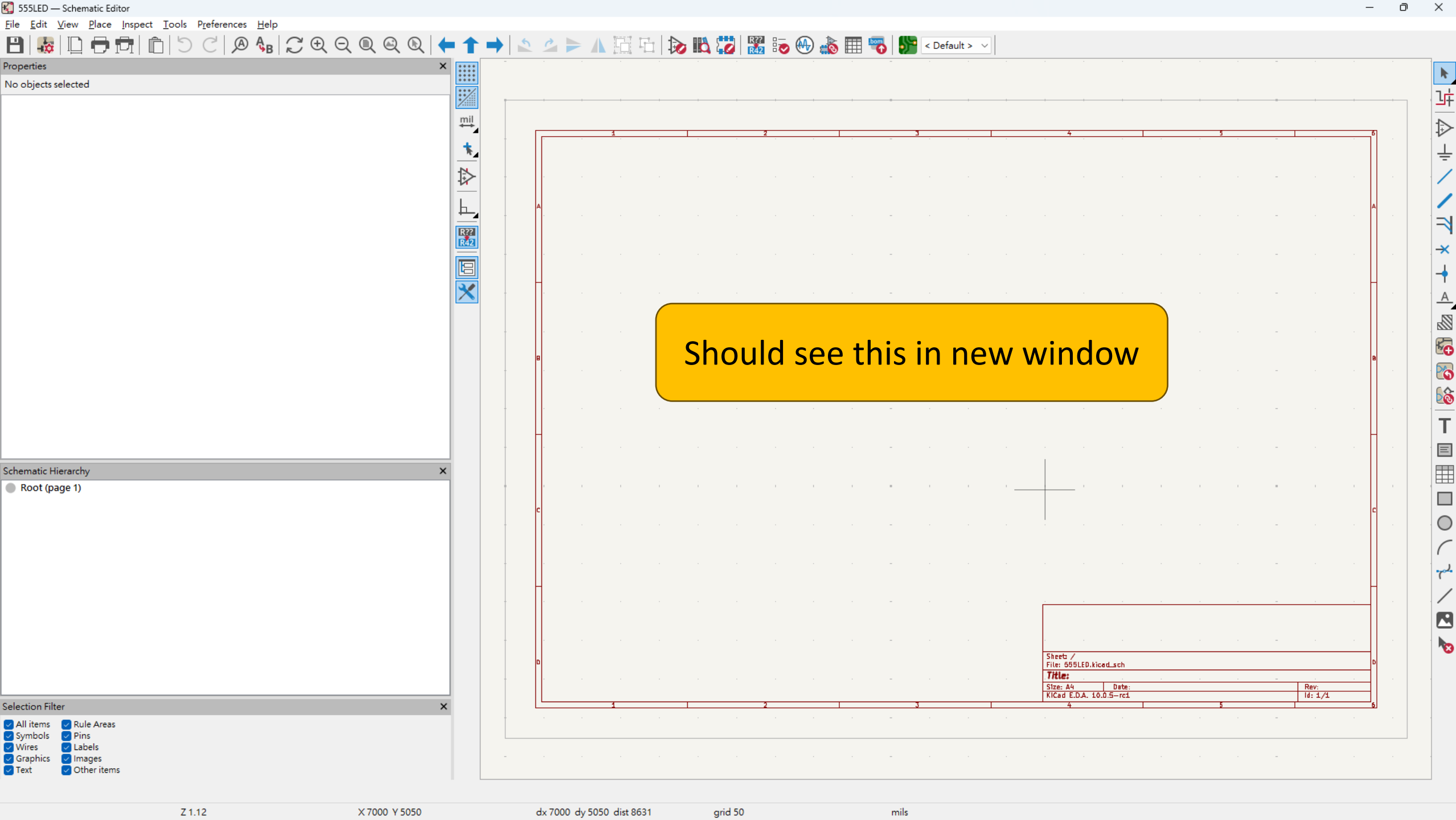
## Project Files

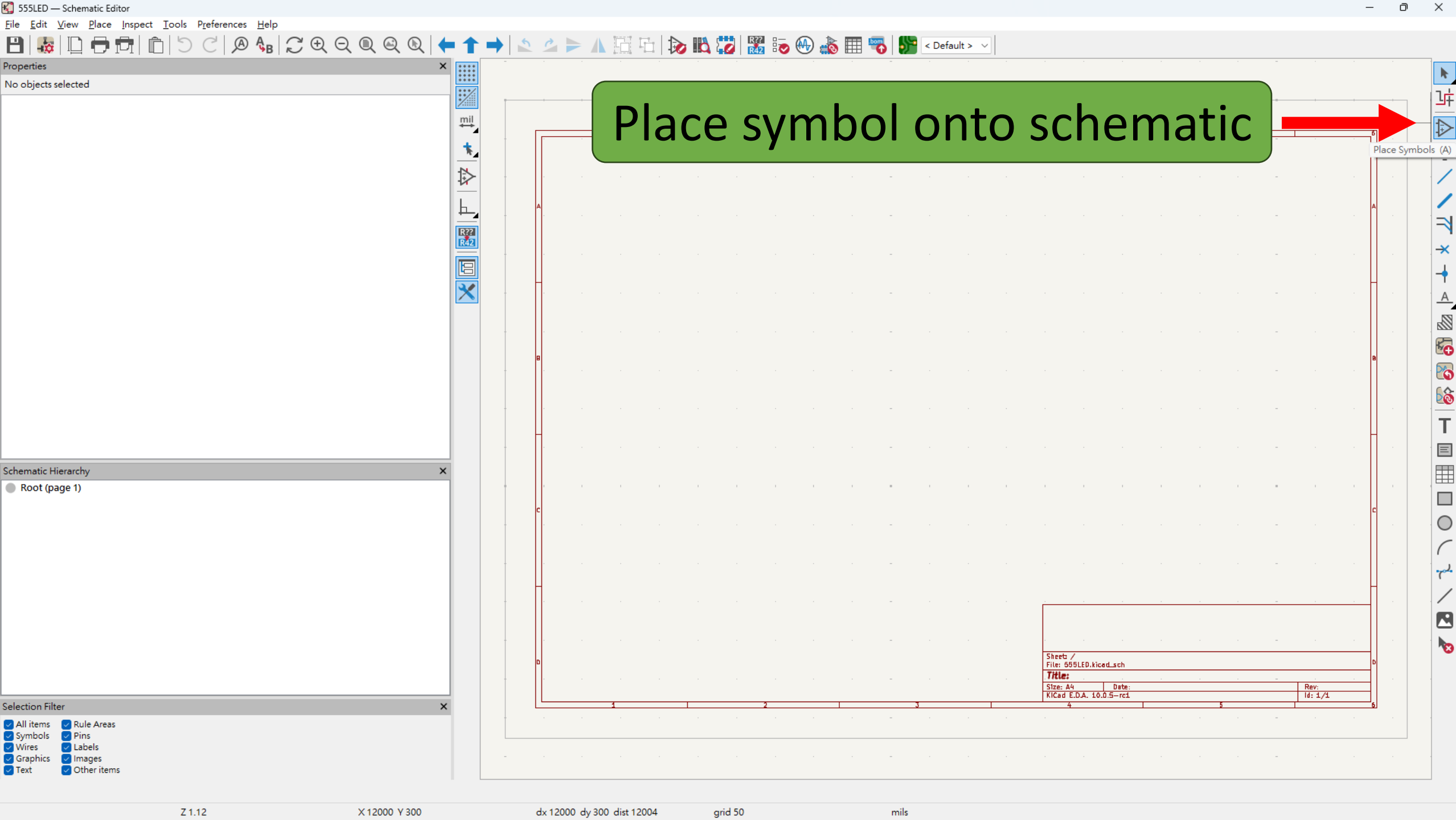
- 555LED.kicad\_pro
- 555LED.kicad\_pcb
- 555LED.kicad\_sch

**Schematic Editor***Edit the project schematic***Symbol Libraries Editor***Edit global and/or project schematic symbol libraries***PCB Editor***Edit the project PCB design***Footprint Editor***Edit global and/or project PCB footprint libraries***Gerber Viewer***Preview Gerber files***Image Converter***Convert bitmap images to schematic symbols or PCB footprints***Calculator Tools***Show tools for calculating resistance, current capacity, etc.***Drawing Sheet Editor***Edit drawing sheet borders and title blocks for use in schematics and PCB designs***Plugin and Content Manager***Manage downloadable packages from KiCad and 3rd party repositories*

# Open Schematic Editor

Should see one pcb  
and one sch file





555LED — Schematic Editor

File Edit View Place Inspect Tools Preferences Help

Properties  
No objects selected

Choose Symbol (22778 items loaded)

Search here

Item Description

Timer Assorted timer devices

ICM7555x8 CMOS General Purpose ...55 compatible, SOIC-

ICM7555xP CMOS General Purpose ...55 compatible, PDIP-

LM555xM Timer, 555 compatible, SOIC-8

LM555xMM Precision Timer, 555 compatible, VSSOP-8

LM555xN Timer, 555 compatible, PDIP-8

LMC555xM CMOS Timer, 555 compatible, SOIC-8

LMC555xMM CMOS Timer, 555 compatible, VSSOP-8

LMC555xN CMOS Timer, 555 compatible, PDIP-8

NA555D Precision Timers, 555 compatible, SOIC-8

NE555D Precision Timers, 555 compatible, SOIC-8

**NE555P Precision Timers, 555 compatible, PDIP-8**

SA555D Precision Timers, 555 compatible, SOIC-8

SA555P Precision Timers, 555 compatible, PDIP-8

SE555D Precision Timers, 555 compatible, SOIC-8

SE555P Precision Timers, 555 compatible, PDIP-8

TLC555xD Single LinCMOS Timer, 555 compatible, SOIC-8

TLC555xP Single LinCMOS Timer, 555 compatible, PDIP-8

TLC555xPS Single LinCMOS Timer,...5 compatible, VSSOP-

NE555P  
Derived from NE555D (Precision Timers, 555 compatible, SOIC-8)  
Precision Timers, 555 compatible, PDIP-8  
Keywords: single timer 555

Reference U?

Footprint Package\_DIP:DIP-8\_W7.62mm

Datasheet <http://www.ti.com/lit/ds/symlink/ne555.pdf>

Description Precision Timers, 555 compatible, PDIP-8

☐ Place repeated copies ☒ Place all units

Selection Filter

All items Rule Areas

Symbols Pins

Wires Labels

Graphics Images

Text Other items

Choose item and footprint

Footprint can be changed later

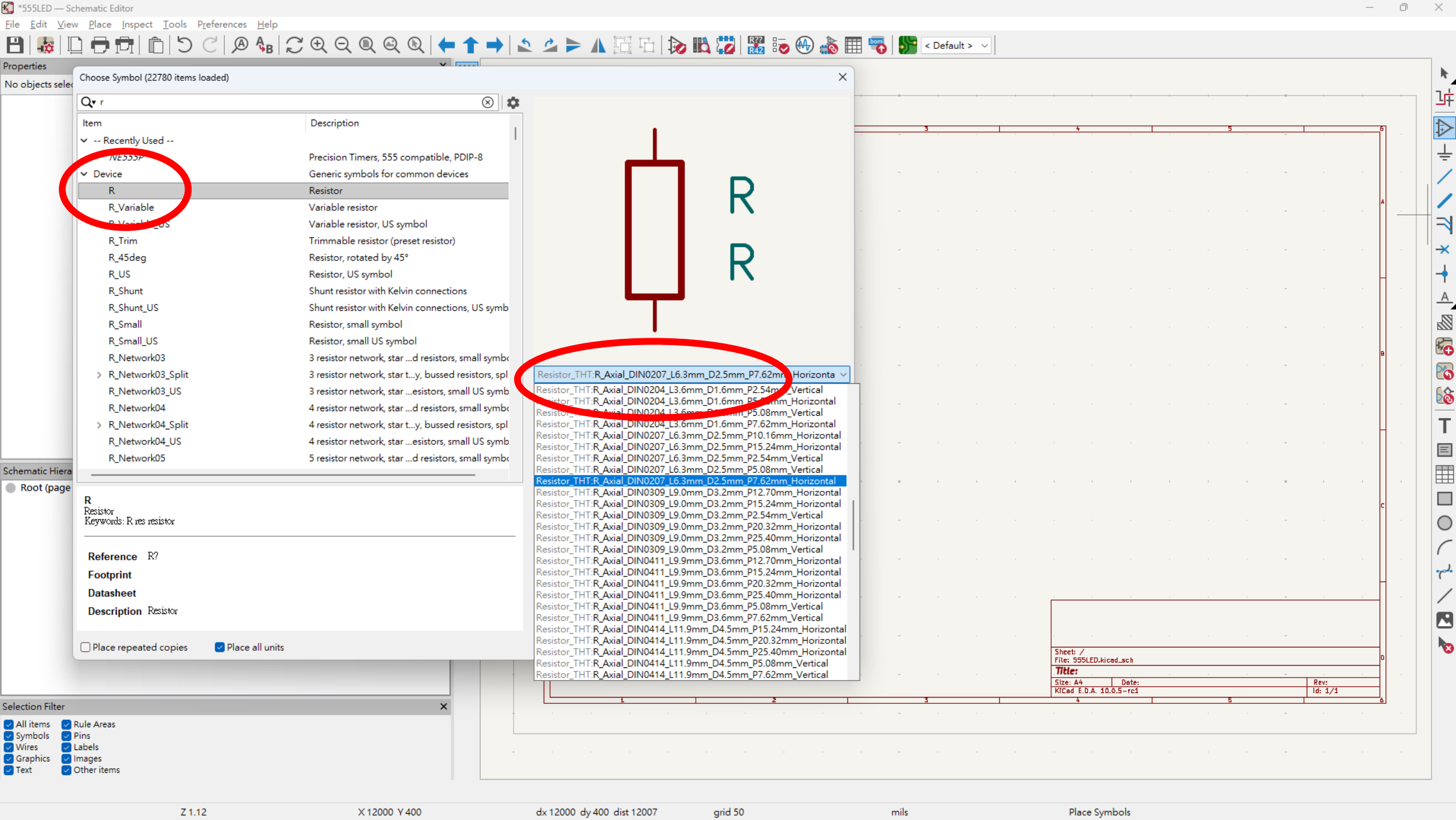
[Default] Package\_DIP:DIP-8\_W7.62mm

REF\*\*

DIP-8\_W7.62mm

Sheet /  
File: 555LED.kicad\_sch  
Title:  
Size: A4 Date:  
KICad E.D.A. 10.0.5-rc1 Rev:  
Id: 1/1

Z 1.12 X 12100 Y 400 dx 12100 dy 400 dist 12107 grid 50 mils Place Symbols



555LED — Schematic Editor

File Edit View Place Inspect Tools Preferences Help

Properties

No objects selected

Choose Symbol (22786 items loaded)

capacitor

| Item                           | Description                                       |
|--------------------------------|---------------------------------------------------|
| ✓ -- Recently Used --          |                                                   |
| C                              | Unpolarized capacitor                             |
| > Regulator_SwitchedCapacitor  | Switched capacitor / charge pump regulators       |
| ✓ Device                       | Generic symbols for common devices                |
| C_Small_US                     | capacitor, small US symbol                        |
| C_US                           | capacitor, US symbol                              |
| C_45deg                        | Unpolarized capacitor, rotated by 45°             |
| C_Small                        | Unpolarized capacitor, small symbol               |
| C                              | Unpolarized capacitor                             |
| C_Feedthrough                  | Feedthrough capacitor                             |
| C_Polarized                    | Polarized capacitor                               |
| C_Polarized_Series_2C          | Set of two polarized capacitors in series         |
| C_Polarized_Small              | Polarized capacitor, small symbol                 |
| C_Polarized_Small_Series_2C    | Set of two polarized cap... in series, small symb |
| C_Polarized_Small_US           | Polarized capacitor, small US symbol              |
| C_Polarized_Small_US_Series_2C | Polarized capacitor, small US symbol              |
| C_Polarized_US                 | Polarized capacitor, US symbol                    |
| C_Polarized_US_Series_2C       | Polarized capacitor, US symbol                    |
| C_Trim                         | Trimable capacitor                                |
| C_Trim_Differential            | Differential variable capacitor with two stators  |

C

Unpolarized capacitor

Keywords: cap capacitor

Reference ⓘ

Footprint

Datasheet

Description Unpolarized capacitor

☐ Place repeated copies ☒ Place all units

Capacitor\_THT:C\_Radial\_D6.3mm\_H11.0mm\_P2.50mm

Capacitor\_THT:C\_Radial\_D16.0mm\_H31.5mm\_P7.50mm

Capacitor\_THT:C\_Radial\_D18.0mm\_H35.5mm\_P7.50mm

Capacitor\_THT:C\_Radial\_D4.0mm\_H5.0mm\_P1.50mm

Capacitor\_THT:C\_Radial\_D4.0mm\_H7.0mm\_P1.50mm

Capacitor\_THT:C\_Radial\_D5.0mm\_H11.0mm\_P2.00mm

Capacitor\_THT:C\_Radial\_D5.0mm\_H5.0mm\_P2.00mm

Capacitor\_THT:C\_Radial\_D5.0mm\_H7.0mm\_P2.00mm

Capacitor\_THT:C\_Radial\_D6.3mm\_H11.0mm\_P2.50mm

Capacitor\_THT:C\_Radial\_D6.3mm\_H5.0mm\_P2.50mm

Capacitor\_THT:C\_Radial\_D6.3mm\_H7.0mm\_P2.50mm

Capacitor\_THT:C\_Radial\_D8.0mm\_H11.5mm\_P3.50mm

Capacitor\_THT:C\_Radial\_D8.0mm\_H7.0mm\_P3.50mm

Capacitor\_THT:C\_Rect\_L10.0mm\_W2.5mm\_P7.50mm\_MKS4

Capacitor\_THT:C\_Rect\_L10.0mm\_W3.0mm\_P7.50mm\_FKS3\_FKP3

Capacitor\_THT:C\_Rect\_L10.0mm\_W3.0mm\_P7.50mm\_MKS4

Capacitor\_THT:C\_Rect\_L10.0mm\_W4.0mm\_P7.50mm\_FKS3\_FKP3

Capacitor\_THT:C\_Rect\_L10.0mm\_W4.0mm\_P7.50mm\_MKS4

Capacitor\_THT:C\_Rect\_L10.0mm\_W5.0mm\_P5.00mm\_P7.50mm

Capacitor\_THT:C\_Rect\_L10.3mm\_W4.5mm\_P7.50mm\_MKS4

Capacitor\_THT:C\_Rect\_L10.3mm\_W5.0mm\_P7.50mm\_MKS4

Capacitor\_THT:C\_Rect\_L10.3mm\_W5.7mm\_P7.50mm\_MKS4

Capacitor\_THT:C\_Rect\_L10.3mm\_W7.2mm\_P7.50mm\_MKS4

Capacitor\_THT:C\_Rect\_L11.0mm\_W2.8mm\_P10.00mm\_MKT

Capacitor\_THT:C\_Rect\_L11.0mm\_W3.4mm\_P10.00mm\_MKT

Capacitor\_THT:C\_Rect\_L11.0mm\_W3.5mm\_P10.00mm\_MKT

Capacitor\_THT:C\_Rect\_L11.0mm\_W4.2mm\_P10.00mm\_MKT

Schematic Hierarchy

Root (page 1)

Selection Filter

☒ All items ☒ Rule Areas

☒ Symbols ☒ Pins

☒ Wires ☒ Labels

☒ Graphics ☒ Images

☒ Text ☒ Other items

Z 1.68 X 7400 Y 2400 dx 7400 dy 2400 dist 7779 grid 50 mils Place Symbols

555LED — Schematic Editor

File Edit View Place Inspect Tools Preferences Help

Properties

No objects selected

Choose Symbol (22783 items loaded)

led

| Item                 | Description                        |
|----------------------|------------------------------------|
| -- Already Placed -- |                                    |
| Device               | Generic symbols for common devices |
| LED                  | Light emitting diode               |
| LED_ARGB             | RGB LED, anode/blue/green/red      |
| LED_ABRG             | RGB LED, anode/blue/red/green      |
| LED_AGBR             | RGB LED, anode/green/blue/red      |
| LED_AGRB             | RGB LED, anode/green/red/blue      |
| LED_ARBG             | RGB LED, anode/red/blue/green      |
| LED_ARGB             | RGB LED, anode/red/green/blue      |
| LED_BAGR             | RGB LED, blue/anode/green/red      |
| LED_BARG             | RGB LED, blue/anode/red/green      |
| LED_BGAR             | RGB LED, blue/green/anode/red      |
| LED_BGKR             | RGB LED, blue/green/cathode/red    |
| LED_BGRA             | RGB LED, blue/green/red/anode      |
| LED_BGRK             | RGB LED, blue/green/red/cathode    |
| LED_BKGR             | RGB LED, blue/cathode/green/red    |
| LED_BKRG             | RGB LED, blue/cathode/red/green    |
| LED_BRAG             | RGB LED, blue/red/anode/green      |
| LED_BRGA             | RGB LED, blue/red/green/anode      |

LED  
Light emitting diode  
Keywords: LED diode

Reference D?

Footprint

Datasheet

Description Light emitting diode

Sim Pin 1=K 2=A

☐ Place repeated copies ☒ Place all units

LED

LED

LED\_SMD:LED\_2010\_5025Metric\_Pad1.52x2.65mm\_HandSolder

No default footprint

LED\_SMD:LED\_01005\_0402Metric

LED\_SMD:LED\_01005\_0402Metric\_Pad0.57x0.20mm\_HandSolder

LED\_SMD:LED\_0201\_0603Metric

LED\_SMD:LED\_0201\_0603Metric\_Pad0.64x0.40mm\_HandSolder

LED\_SMD:LED\_0402\_1005Metric

LED\_SMD:LED\_0402\_1005Metric\_Pad0.77x0.64mm\_HandSolder

LED\_SMD:LED\_0603\_1608Metric

LED\_SMD:LED\_0603\_1608Metric\_Pad1.05x0.95mm\_HandSolder

LED\_SMD:LED\_0805\_2012Metric

LED\_SMD:LED\_0805\_2012Metric\_Pad1.15x1.40mm\_HandSolder

LED\_SMD:LED\_1206\_3216Metric

LED\_SMD:LED\_1206\_3216Metric\_Pad1.42x1.75mm\_HandSolder

LED\_SMD:LED\_1206\_3216Metric\_ReverseMount\_Hole1.8x2.4mm

LED\_SMD:LED\_1210\_3225Metric

LED\_SMD:LED\_1210\_3225Metric\_Pad1.42x2.65mm\_HandSolder

LED\_SMD:LED\_1812\_4532Metric

LED\_SMD:LED\_1812\_4532Metric\_Pad1.30x3.40mm\_HandSolder

LED\_SMD:LED\_2010\_5025Metric

LED\_SMD:LED\_2010\_5025Metric\_Pad1.52x2.65mm\_HandSolder

LED\_SMD:LED\_2512\_6332Metric

LED\_SMD:LED\_2512\_6332Metric\_Pad1.52x3.35mm\_HandSolder

LED\_SMD:LED\_CSP\_Samsung\_LH1818\_2.36x2.36mm

LED\_SMD:LED\_Cree-XH

LED\_SMD:LED\_Cree-XQ

LED\_SMD:LED\_Cree-XQ\_HandSoldering

Selection Filter

☒ All items ☒ Rule Areas

☒ Symbols ☒ Pins

☒ Wires ☒ Labels

☒ Graphics ☒ Images

☒ Text ☒ Other items

Z 2.37 X 7900 Y 1000 dx 7900 dy 1000 dist 7963 grid 50 mils Place Symbols

555LED — Schematic Editor

File Edit View Place Inspect Tools Preferences Help

Properties: No objects selected

Choose Symbol (22786 items loaded)

Search: test

| Item                         | Description                                         |
|------------------------------|-----------------------------------------------------|
| Connector                    | Connector symbols (Exam...k, D-SUB, DIN, USB...)    |
| TestPoint                    | test point                                          |
| TestPoint_Alt                | test point (alternative shape)                      |
| TestPoint_Flag               | test point (alternative flag-style design)          |
| TestPoint_Probe              | test point (alternative probe-style design)         |
| TestPoint_Small              | test point                                          |
| TestPoint_Square             | test point                                          |
| CoaxialSwitch_Testpoint      | Subminiature Coaxial Switch testpoint               |
| TestPoint_2Pole              | 2-polar test point                                  |
| 4xxx                         | 4xxx series symbols                                 |
| CD4033B                      | 20V, CMOS Decade Co...100mW/Output, DIP-16          |
| MCU_Module                   | Microcontroller Modules... Breakouts (Arduino ...)  |
| Flipper_Zero                 | Portable multi-tool fo...m pin header connector     |
| RaspberryPi_Pico_Extensive   | Versatile and inexpensiv...orts Raspberry Pi Pico 2 |
| RaspberryPi_Pico_W_Extensive | Versatile and inexpensiv...s Raspberry Pi Pico 2 W  |
| Transistor_FET               | FET transistor symbols                              |
| STE40NC60                    | PowerMesh II MOSFET, N...27 (minibloc, ISOTOP)      |

TestPoint  
test point  
Keywords: test point tp

Reference TP?

Footprint

Datasheet

Description test point

☐ Place repeated copies ☒ Place all units

Selection Filter

|                                               |                                                 |
|-----------------------------------------------|-------------------------------------------------|
| <input checked="" type="checkbox"/> All items | <input checked="" type="checkbox"/> Rule Areas  |
| <input checked="" type="checkbox"/> Symbols   | <input checked="" type="checkbox"/> Pins        |
| <input checked="" type="checkbox"/> Wires     | <input checked="" type="checkbox"/> Labels      |
| <input checked="" type="checkbox"/> Graphics  | <input checked="" type="checkbox"/> Images      |
| <input checked="" type="checkbox"/> Text      | <input checked="" type="checkbox"/> Other items |

TP  
TestPoint

TestPoint:TestPoint\_Pad\_2.0x2.0mm

TestPoint:TestPoint\_Loop\_D2.60mm\_Drill1.4mm\_Beaded

TestPoint:TestPoint\_Loop\_D2.60mm\_Drill1.6mm\_Beaded

TestPoint:TestPoint\_Loop\_D3.50mm\_Drill1.4mm\_Beaded

TestPoint:TestPoint\_Loop\_D3.50mm\_Drill2.0mm\_Beaded

TestPoint:TestPoint\_Loop\_D3.80mm\_Drill1.4mm\_Beaded

TestPoint:TestPoint\_Loop\_D3.80mm\_Drill2.0mm\_Beaded

TestPoint:TestPoint\_Loop\_D3.80mm\_Drill2.5mm

TestPoint:TestPoint\_Loop\_D3.80mm\_Drill2.8mm

TestPoint:TestPoint\_Pad\_1.0x1.0mm

TestPoint:TestPoint\_Pad\_1.5x1.5mm

TestPoint:TestPoint\_Pad\_2.0x2.0mm

TestPoint:TestPoint\_Pad\_2.5x2.5mm

TestPoint:TestPoint\_Pad\_3.0x3.0mm

TestPoint:TestPoint\_Pad\_4.0x4.0mm

TestPoint:TestPoint\_Pad\_D1.0mm

TestPoint:TestPoint\_Pad\_D1.5mm

TestPoint:TestPoint\_Pad\_D2.0mm

TestPoint:TestPoint\_Pad\_D2.5mm

TestPoint:TestPoint\_Pad\_D3.0mm

TestPoint:TestPoint\_Pad\_D4.0mm

TestPoint:TestPoint\_Plated\_Hole\_D2.0mm

TestPoint:TestPoint\_Plated\_Hole\_D3.0mm

TestPoint:TestPoint\_Plated\_Hole\_D4.0mm

TestPoint:TestPoint\_Plated\_Hole\_D5.0mm

TestPoint:TestPoint\_THTPad\_1.0x1.0mm\_Drill0.5mm

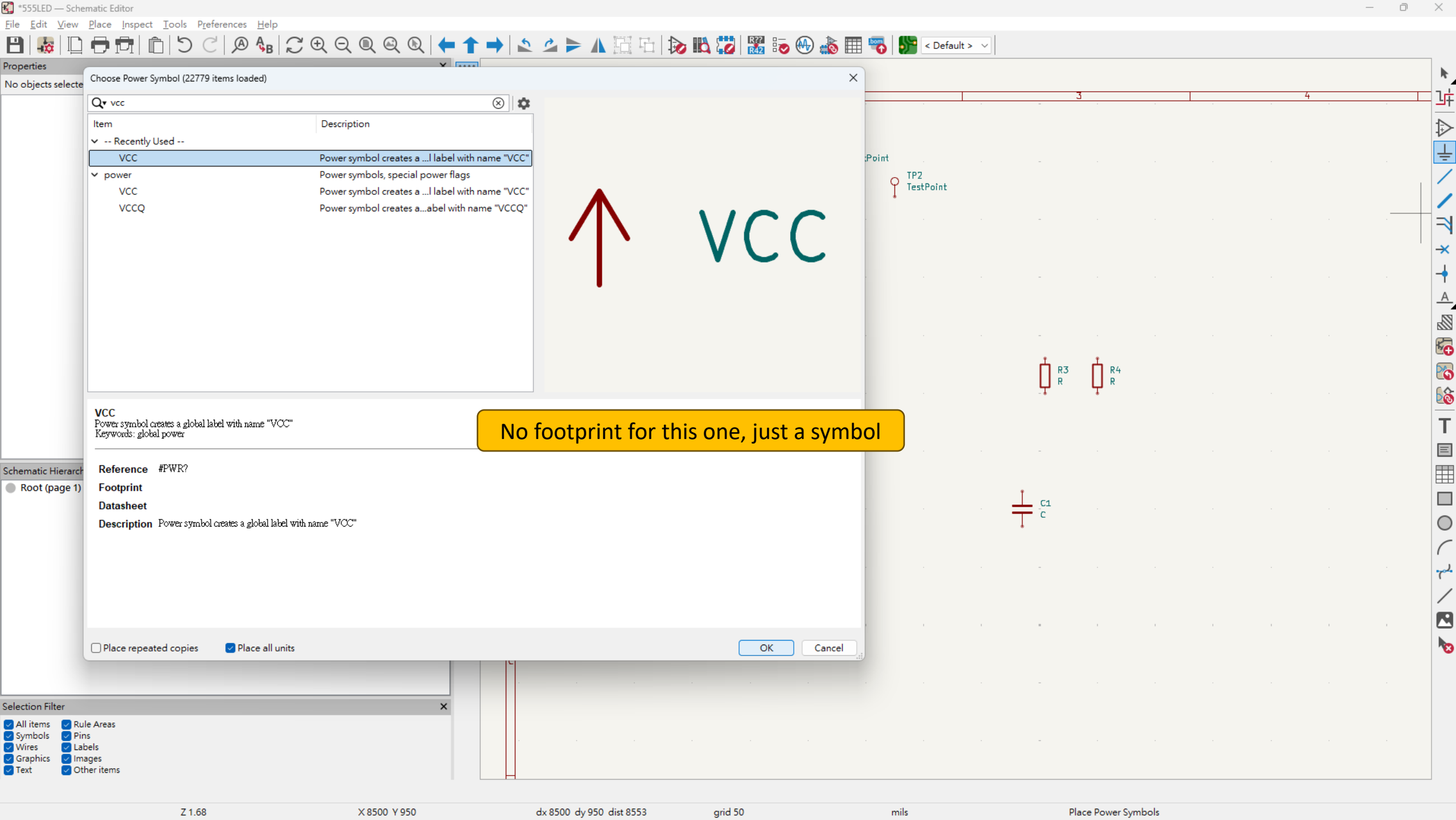
TestPoint:TestPoint\_THTPad\_1.5x1.5mm\_Drill0.7mm

TestPoint:TestPoint\_THTPad\_2.0x2.0mm\_Drill1.0mm

R1 R R R R

C1 C

Z 2.51 X 7000 Y 1300 dx 7000 dy 1300 dist 7120 grid 50 mils Place Symbols



555LED — Schematic Editor

File Edit View Place Inspect Tools Preferences Help

Properties

No objects selected

Choose Power Symbol (22781 items loaded)

Q: gnd

| Item                  | Description                                       |
|-----------------------|---------------------------------------------------|
| ▼ -- Recently Used -- |                                                   |
| GND                   | Power symbol creates a...h name "GND", ground     |
| ▼ power               |                                                   |
| GND                   | Power symbol creates a...h name "GND", ground     |
| GND1                  | Power symbol creates ...h name "GND1", ground     |
| GND2                  | Power symbol creates ...h name "GND2", ground     |
| GND3                  | Power symbol creates ...h name "GND3", ground     |
| GNDA                  | Power symbol creates a...GNDA", analog ground     |
| GNDD                  | Power symbol creates a...GNDD", digital ground    |
| GNDPWR                | Power symbol creates a...DPWR", global ground     |
| GNDREF                | Power symbol creates a...reference supply ground  |
| GNDS                  | Power symbol creates a ..."GNDS", signal ground   |
| Earth                 | Power symbol creates a ...label with name "Earth" |
| Earth_Clean           | Power symbol creates a...ith name "Earth_Clean"   |
| Earth_Protective      | Power symbol creates a ...ame "Earth_Protective"  |

**GND**  
Power symbol creates a global label with name "GND", ground  
Keywords: global power

**Reference** #PWR?

**Footprint**

**Datasheet**

**Description** Power symbol creates a global label with name "GND", ground

☐ Place repeated copies ☒ Place all units

OK Cancel

No footprint for this one, just a symbol

TP2 TestPoint

VCC

R3 R

R4 R

C1 C

Selection Filter

☒ All items ☒ Rule Areas  
☒ Symbols ☒ Pins  
☒ Wires ☒ Labels  
☒ Graphics ☒ Images  
☒ Text ☒ Other items

Z 1.68 X 8500 Y 850 dx 8500 dy 850 dist 8542 grid 50 mils Place Power Symbols

# We are using

- 2512 Resistors
- 1206 Capacitor
- 3528 LED

## But not the exact footprint, for easier hand soldering

can try to match footprint to the components, it will still be doable.

\*555LED — Schematic Editor

File Edit View Place Inspect Tools Preferences Help

Properties  
No objects selected

Schematic Hierarchy  
● Root (page 1)

Selection Filter

- ☒ All items
- ☒ Symbols
- ☒ Wires
- ☒ Graphics
- ☒ Text
- ☒ Rule Areas
- ☒ Pins
- ☒ Labels
- ☒ Images
- ☒ Other items

You will need all these symbols

U1  
NE555P

R1  
R

R2  
R

R3  
R

C1  
C

D1  
LED

TP1  
TestPoint

TP2  
TestPoint

VCC

GND

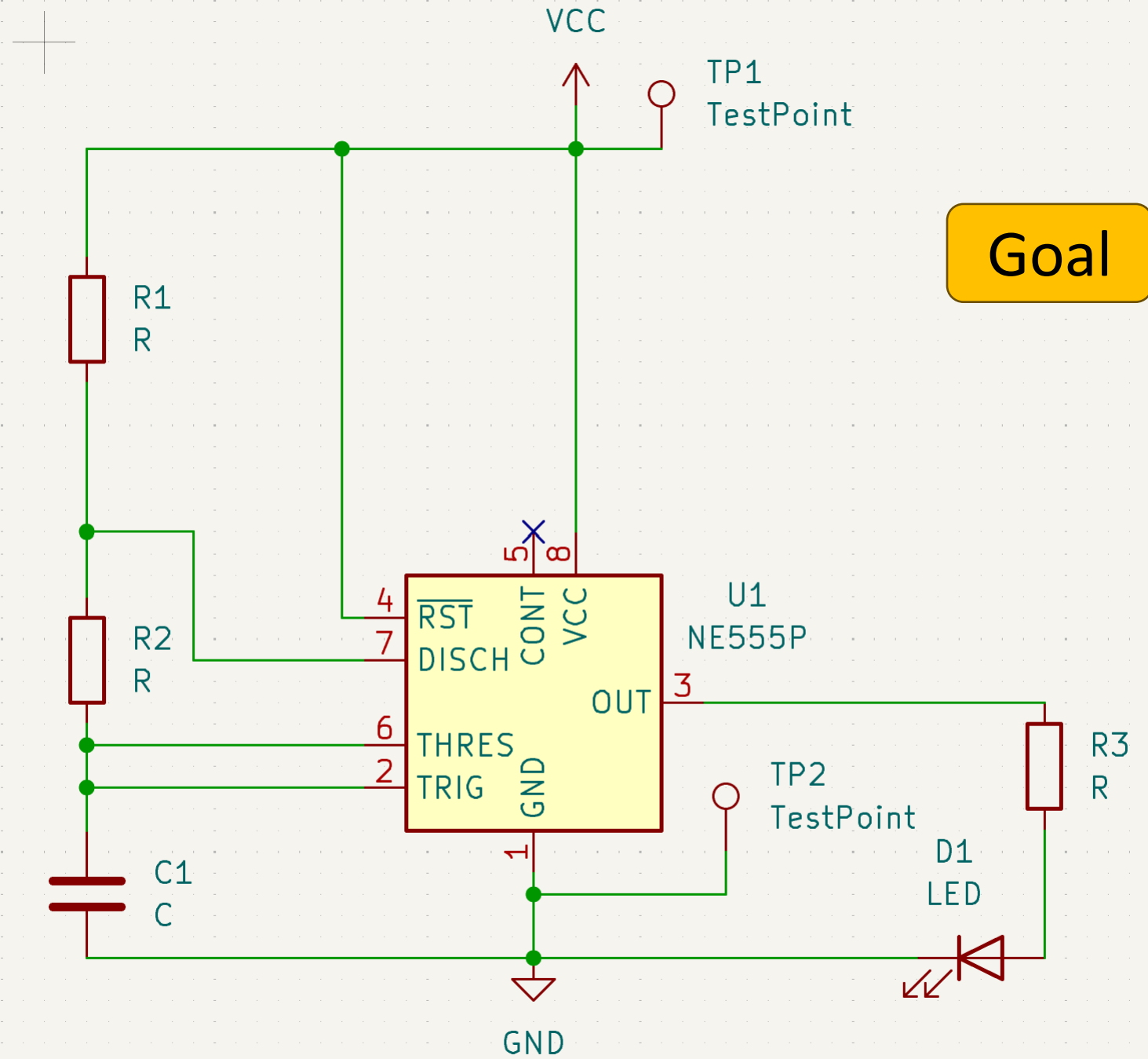
And one "No connect" flag on pin 5 of NE555P

Click on any pin to start drawing wire

Drag the symbol to move it

Connect/Draw the wires

Z 2.51 X 4050 Y 2900 dx 4050 dy 2900 dist 4981 grid 50 mils Select item(s)



555LED — Schematic Editor

File Edit View Place Inspect Tools Preferences Help

Properties  
No objects selected

Schematic Hierarchy  
● Root (page 1)

Selection Filter

- ☒ All items
- ☒ Symbols
- ☒ Wires
- ☒ Graphics
- ☒ Text
- ☒ Rule Areas
- ☒ Pins
- ☒ Labels
- ☒ Images
- ☒ Other items

Switch to PCB Editor  
Open PCB in board editor

# Switch to PCB editor after finished

VCC

TP1 TestPoint

R1 R

R2 R

C1 C

U1 NE555P

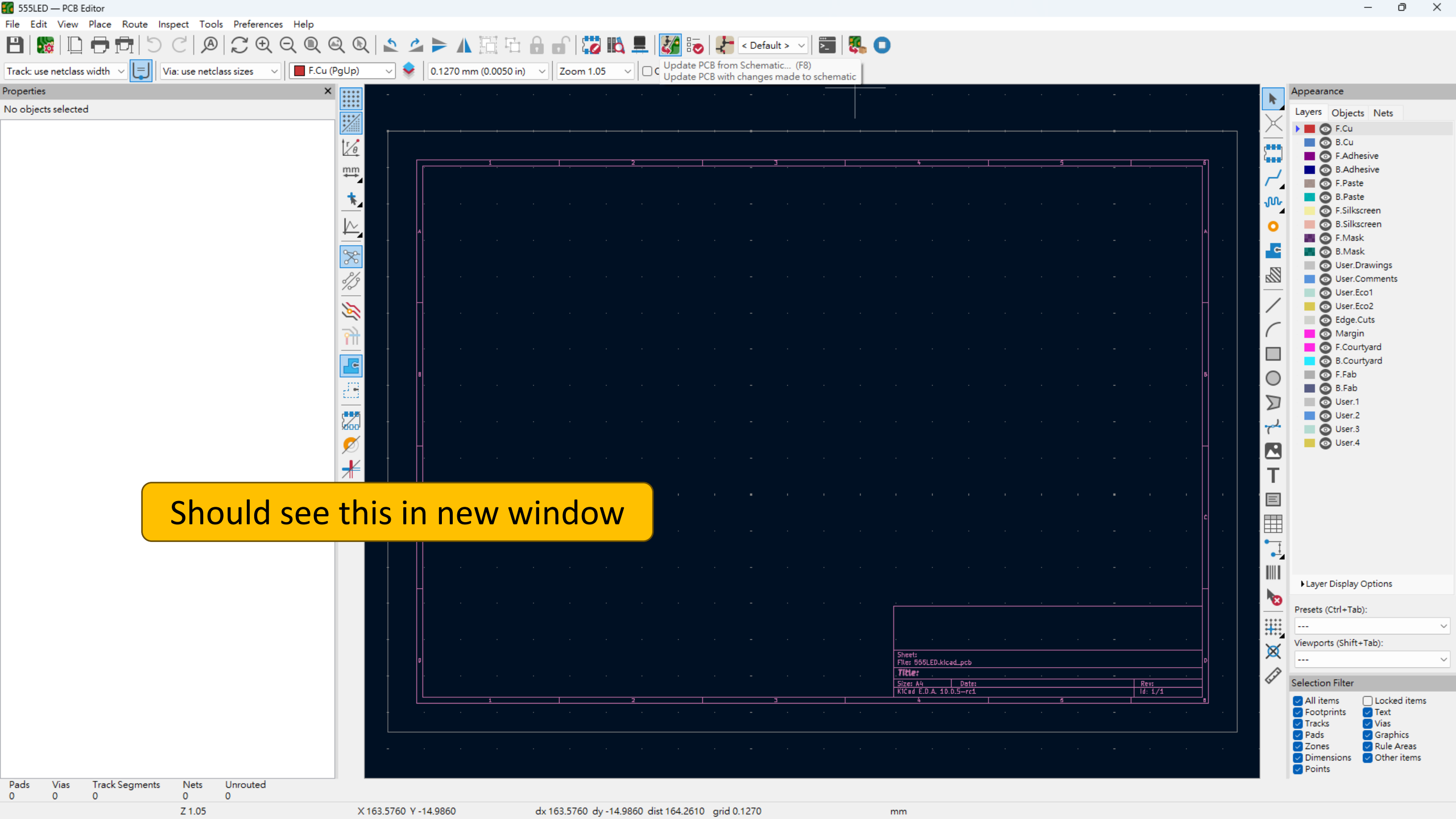
TP2 TestPoint

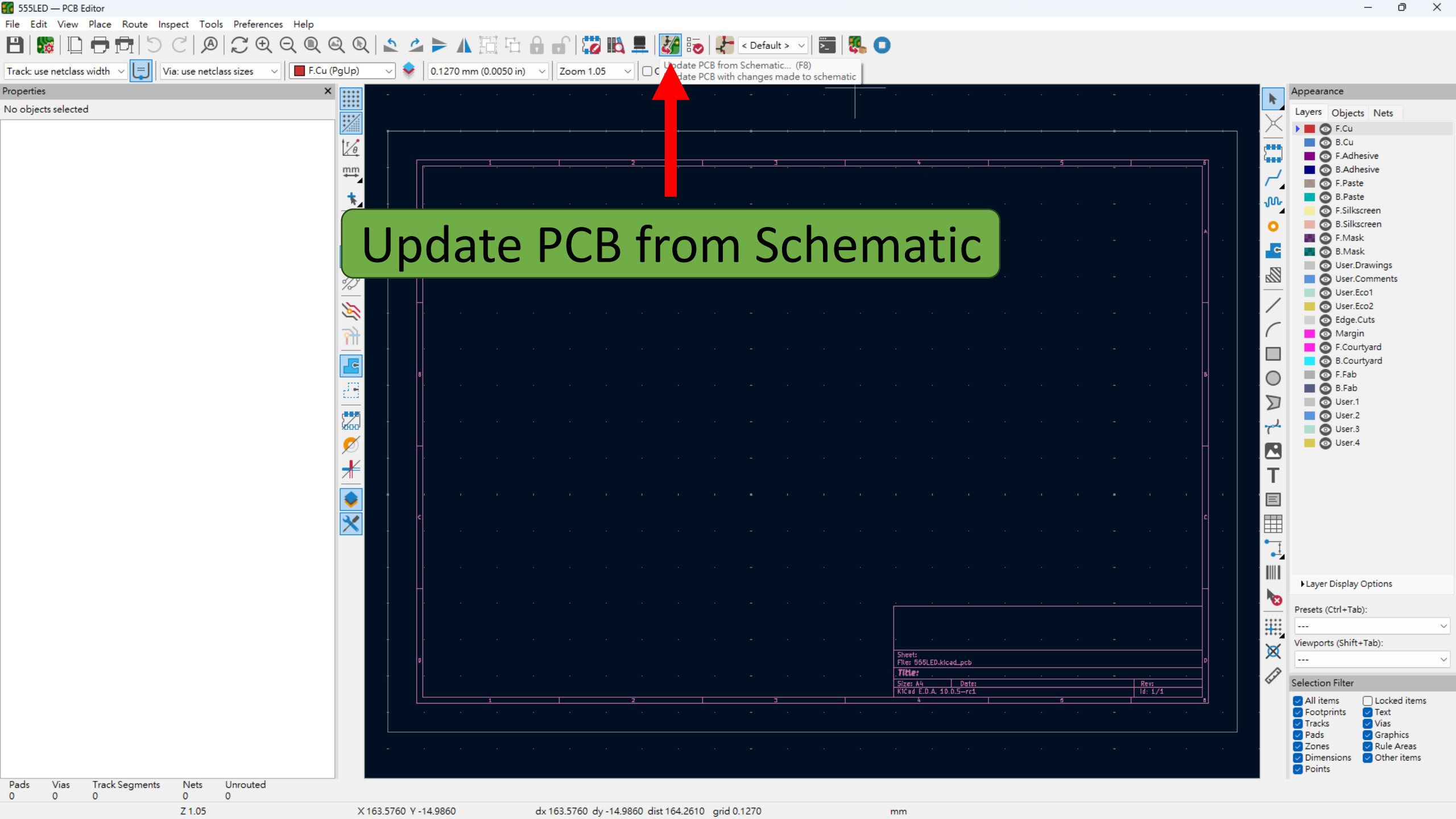
D1 LED

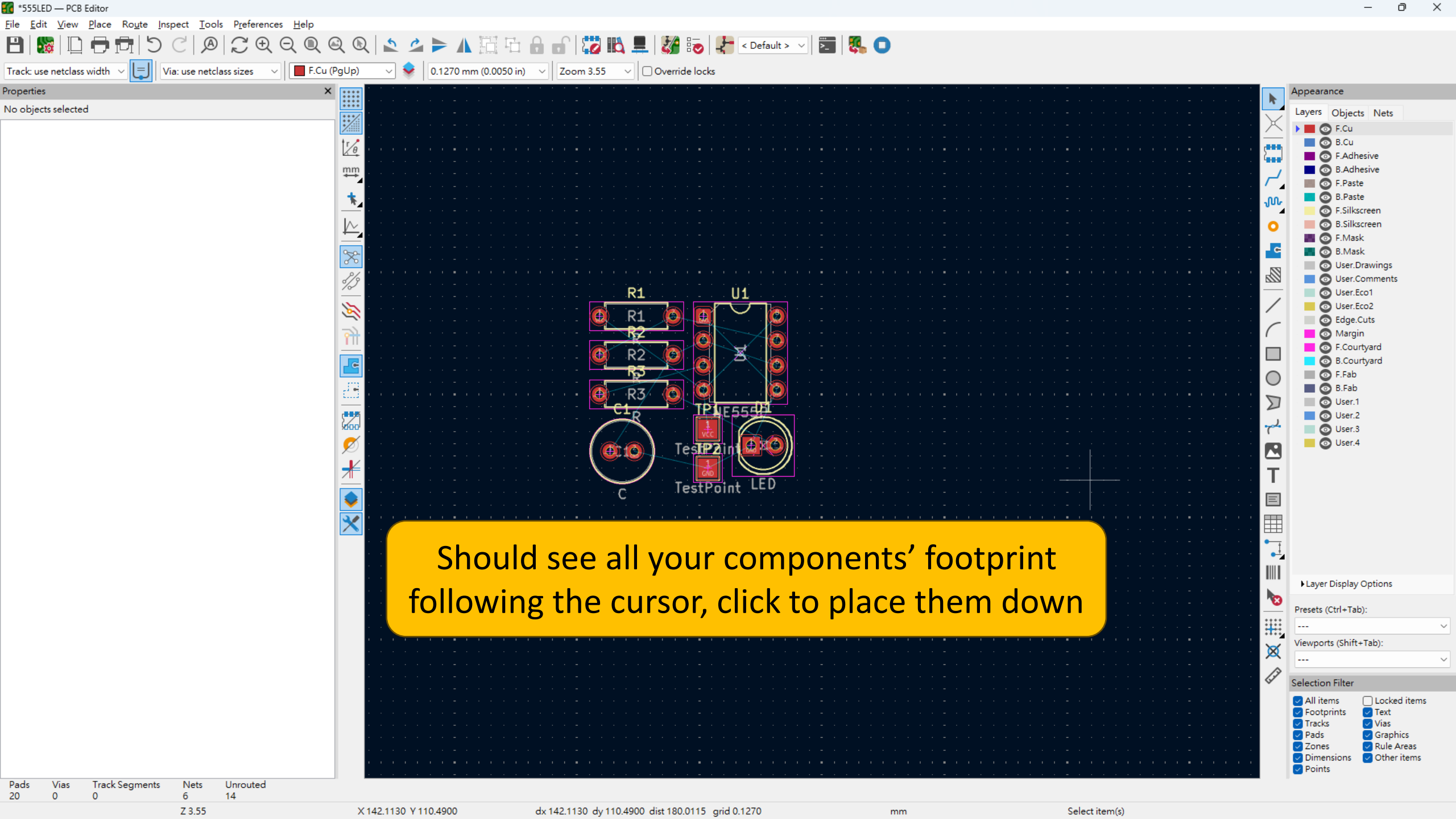
R3 R

GND

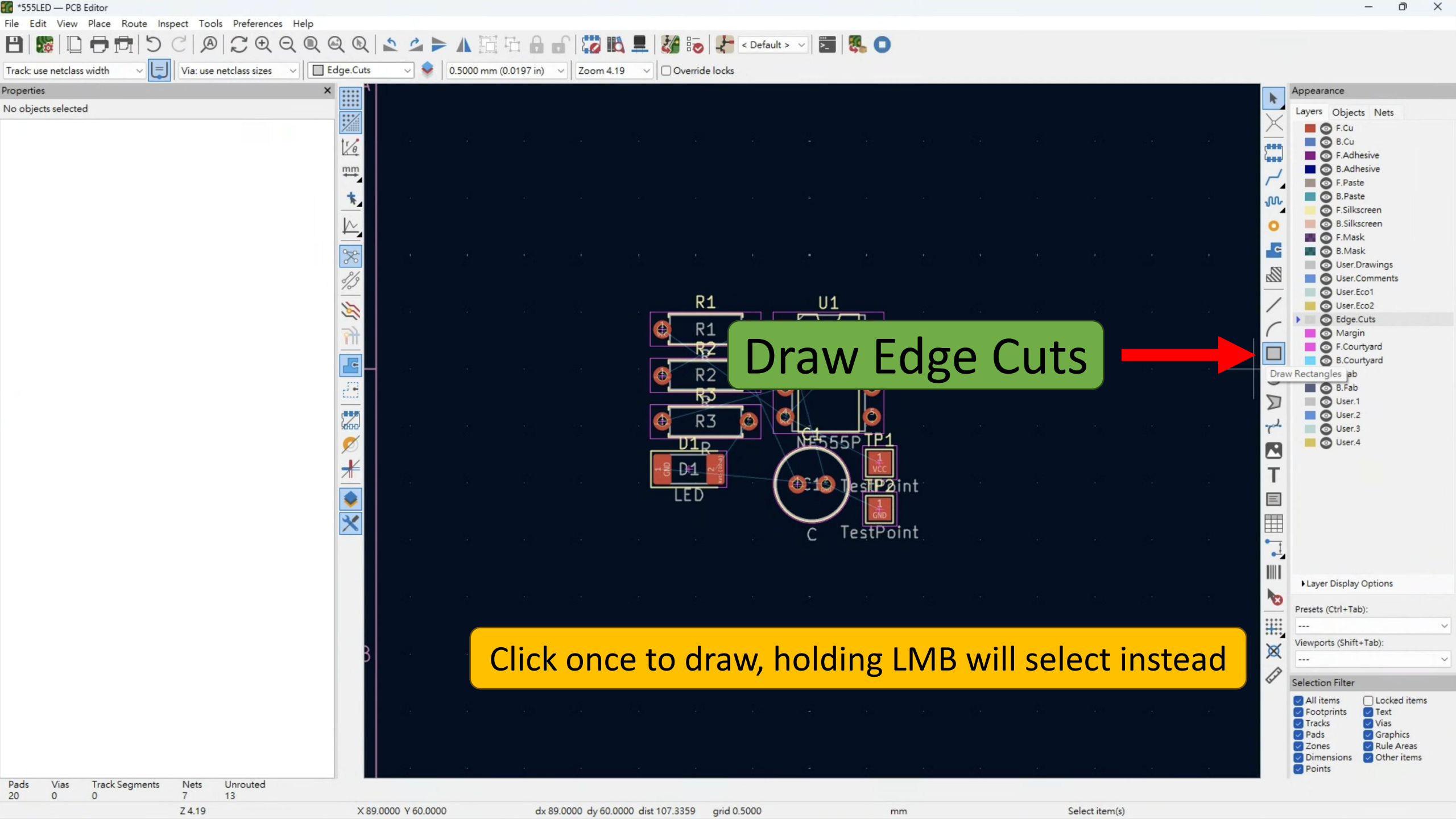
Z 2.51 X 3200 Y 400 dx 3200 dy 400 dist 3225 grid 50 mils Select item(s)





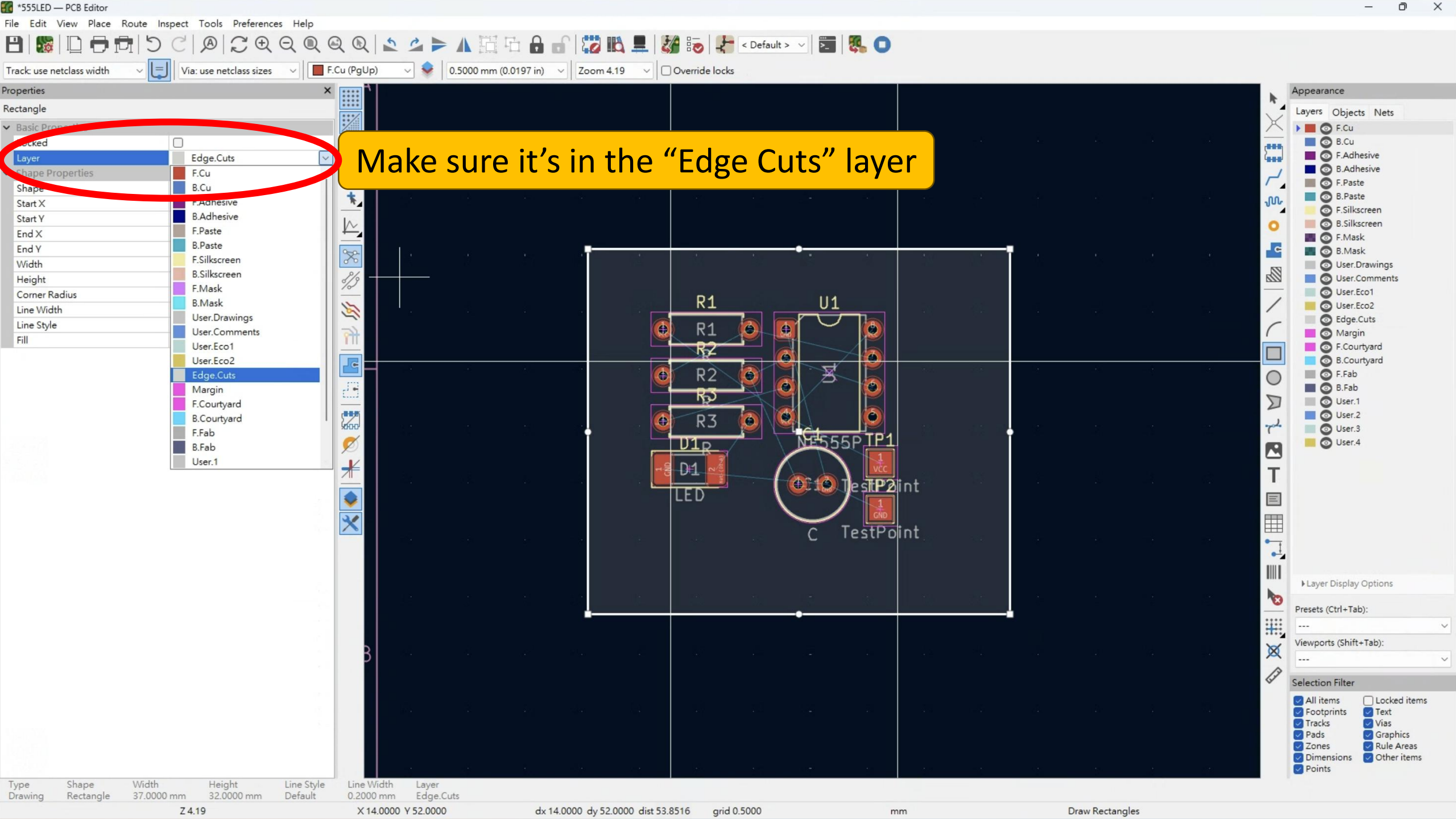


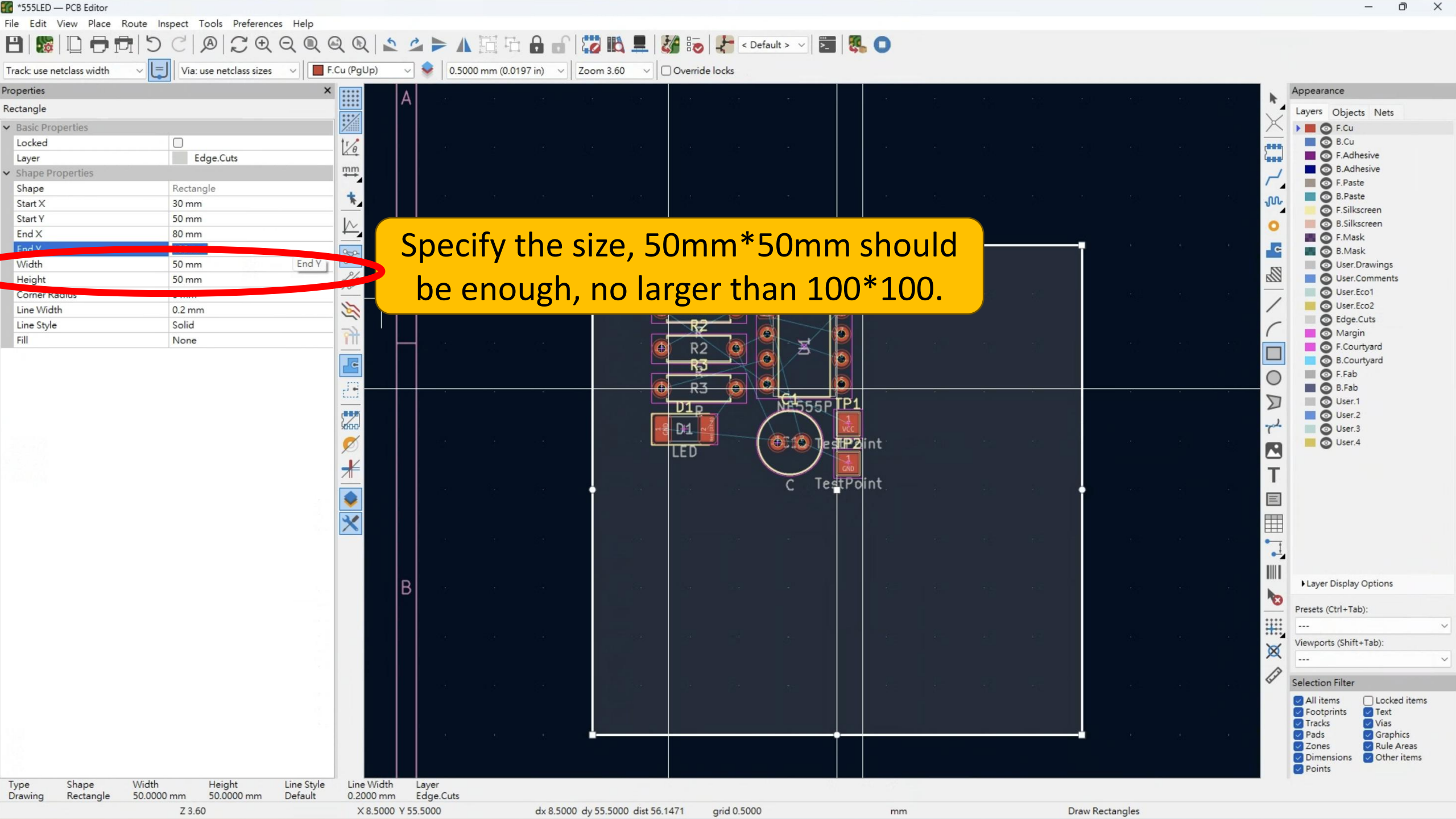
Should see all your components' footprint following the cursor, click to place them down

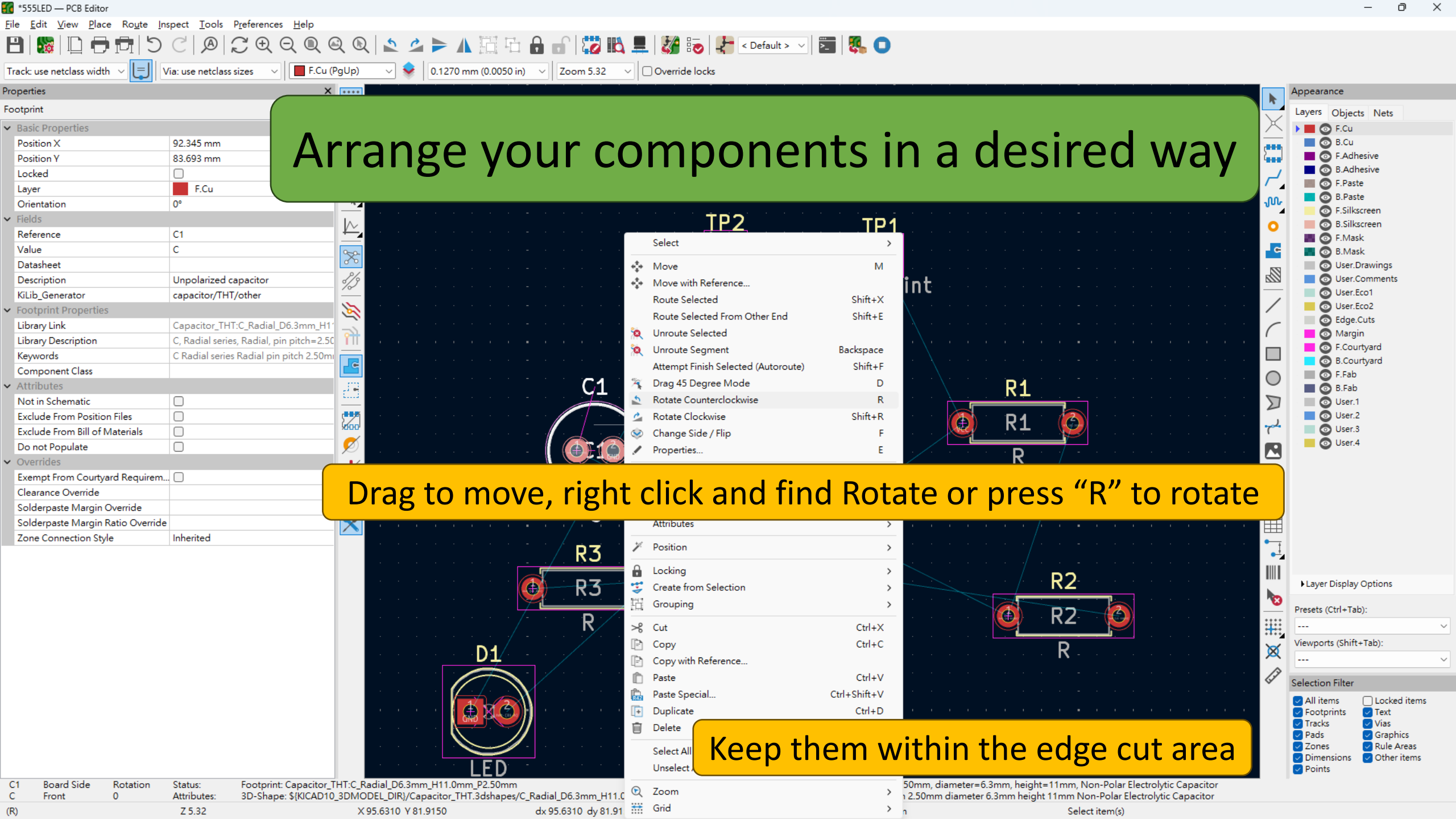


Draw Edge Cuts

Click once to draw, holding LMB will select instead



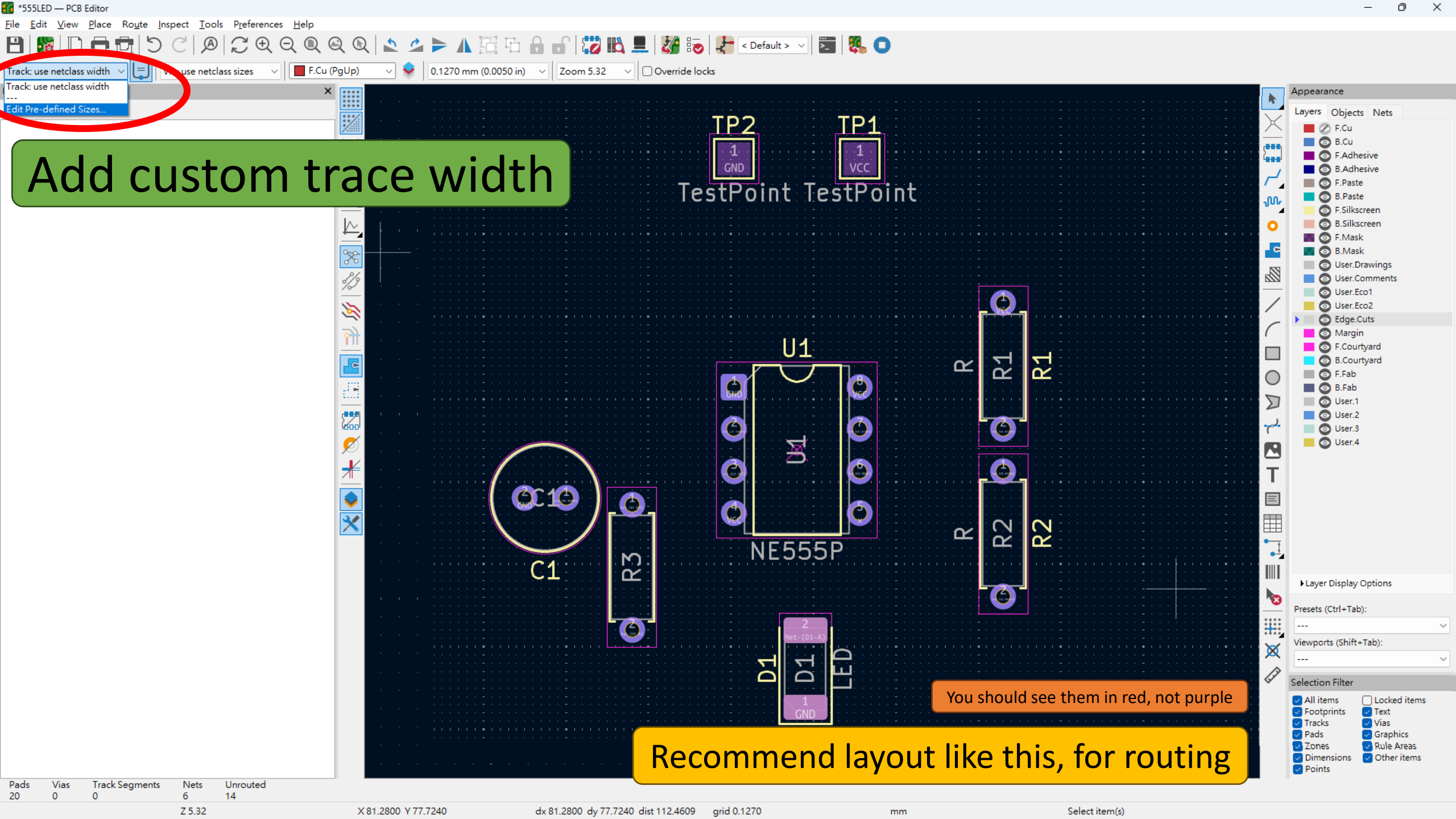


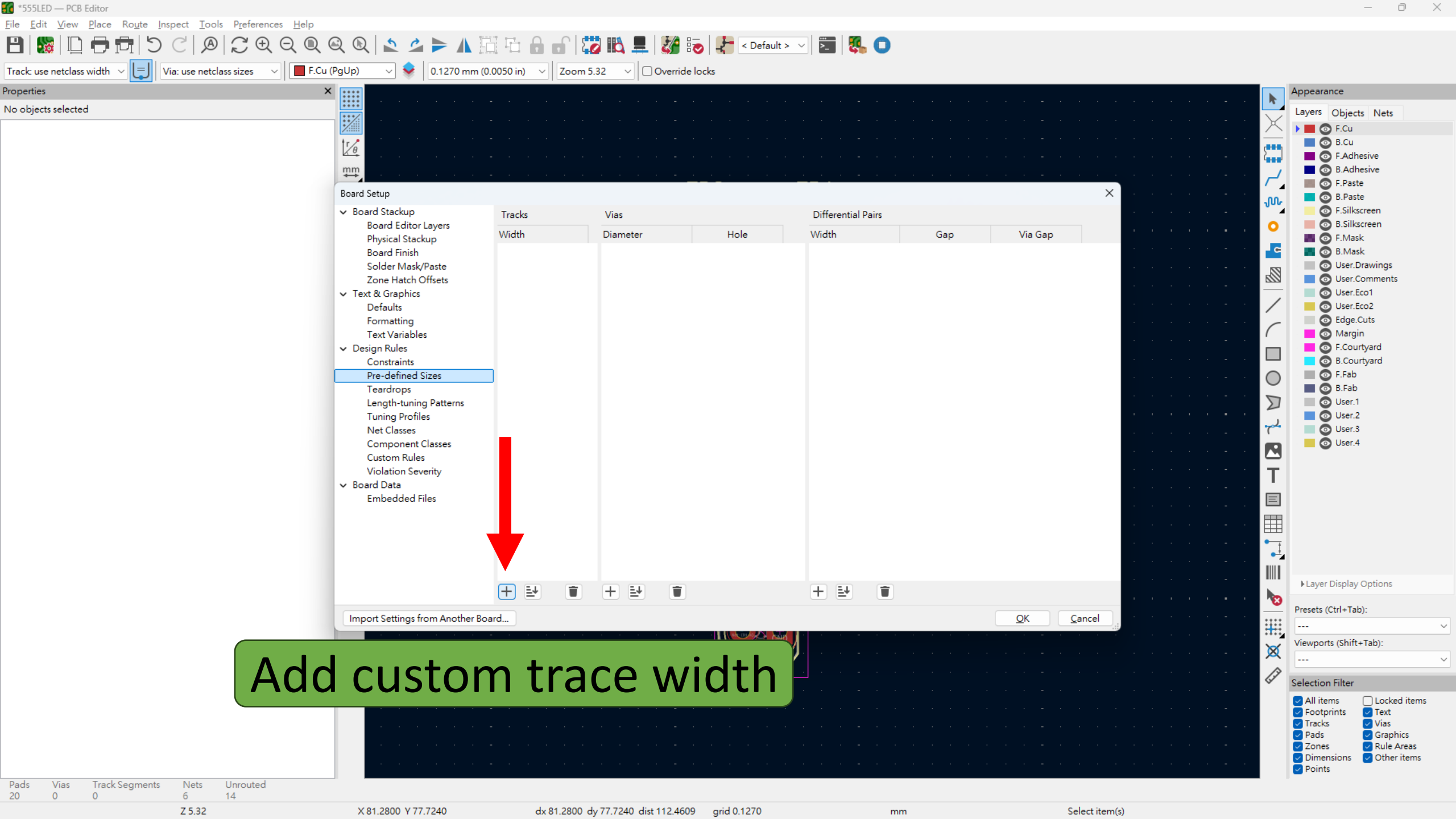


Arrange your components in a desired way

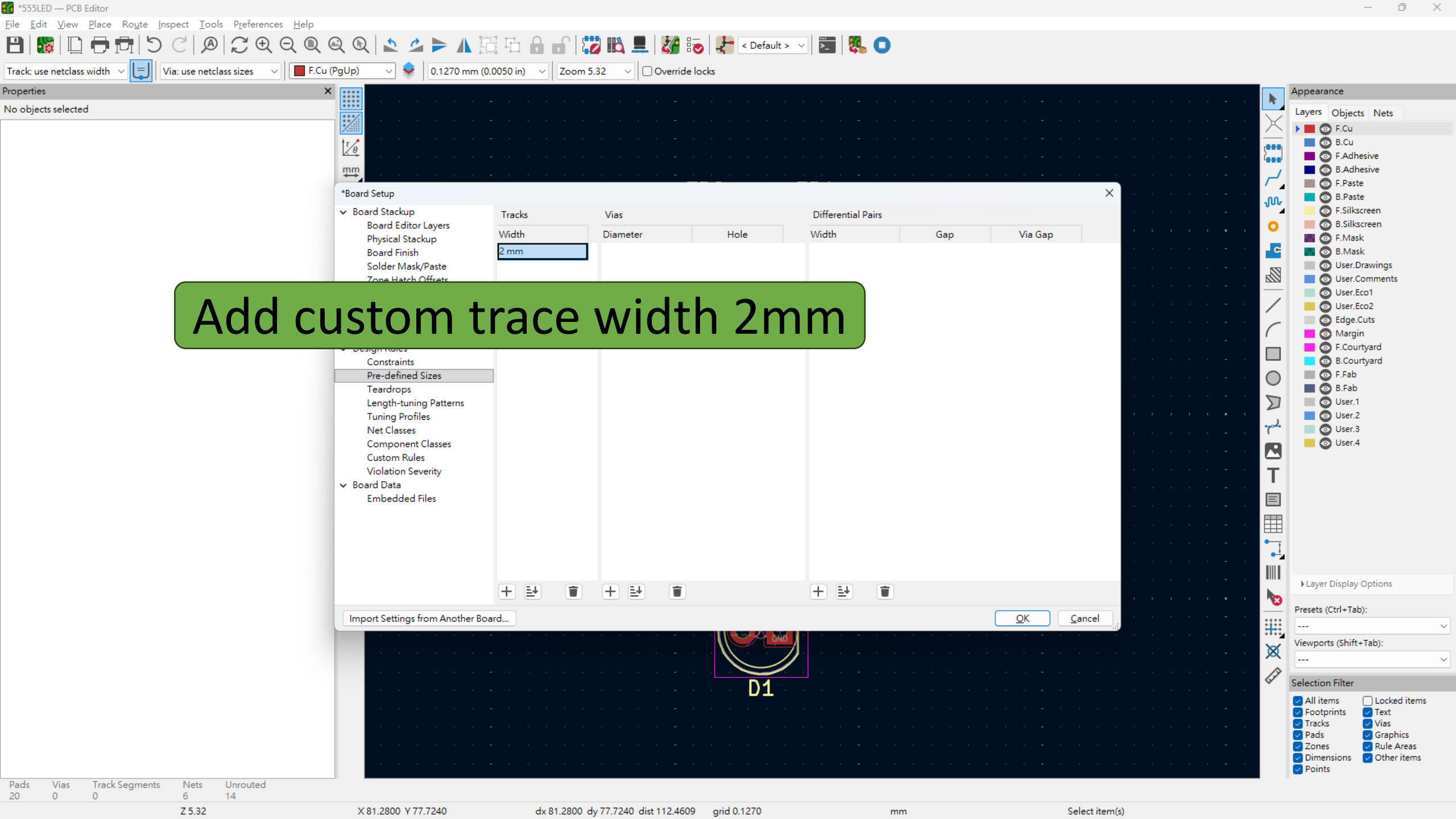
Drag to move, right click and find Rotate or press "R" to rotate

Keep them within the edge cut area





Add custom trace width



Add custom trace width 2mm

