

horizon EDA

what's new

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FOSDEM 2019

Why write an EDA package from scratch in 2016?

Why write an EDA package from scratch in 2016?

- Convenient and collaborative management of symbols, etc. avoiding redundancy
- Proper support for parts
- Unified editor
- Schematic editor that knows about nets
- Rule-driven design
- Explicit references (i.e. not by name / location)
- Make use of OpenGL 3 features
- Playground for experimentation

C++14

~ 70 kLOC

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Gtk3 $\geq$ 3.20

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Builds and runs on Linux and Windows

~ 70 kLOC

JSON

C++14

Gtk3 $\geq$ 3.20

Builds and runs on Linux and Windows

499bf624-b2f1-4366-8b9a-0eeb2c8fbb3f $\sim$ 70 kLOC

JSON

C++14

Gtk3 $\geq$ 3.20

Builds and runs on Linux and Windows

UUIDs ~ 70 kLOC

JSON C++14

Gtk3 ≥ 3.20

Builds and runs on Linux and Windows

What's wrong with libraries

- Like a file system with only one level of hierarchy
- Not a database

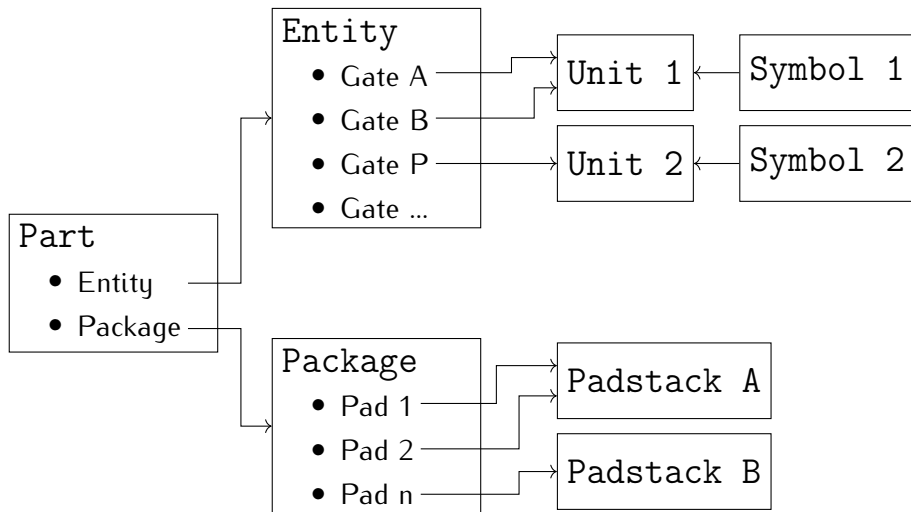
What's wrong with libraries

- Like a file system with only one level of hierarchy
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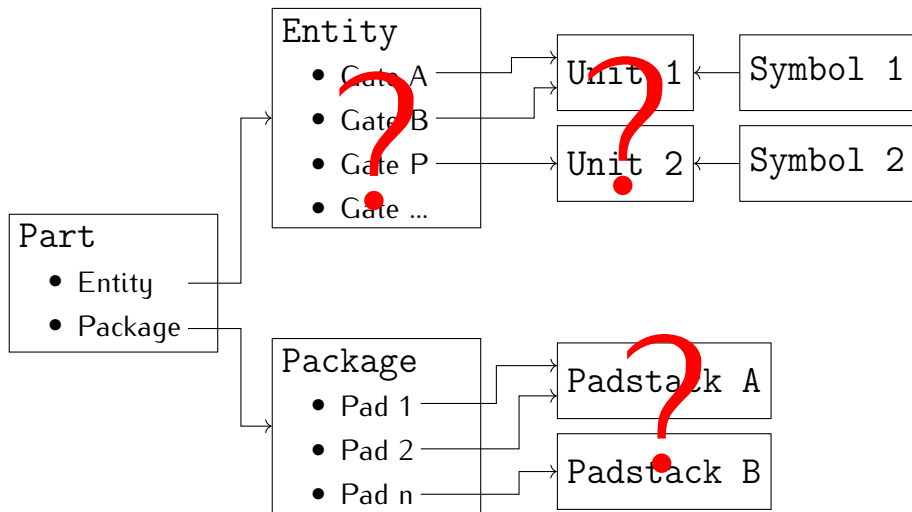
The Pool

- Each item is an individual JSON file
- Metadata is stored in a SQLite database
- Only contains real parts / parts that can be mapped to a real part

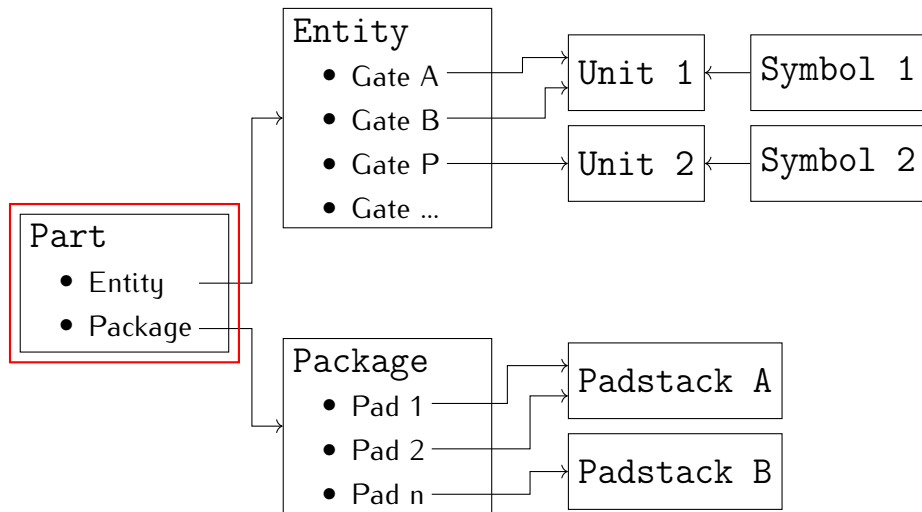
The Pool



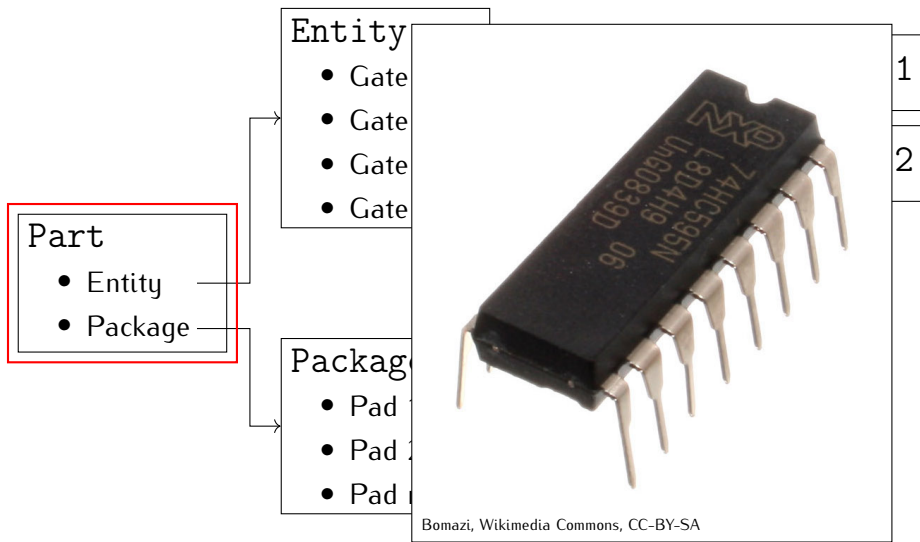
The Pool



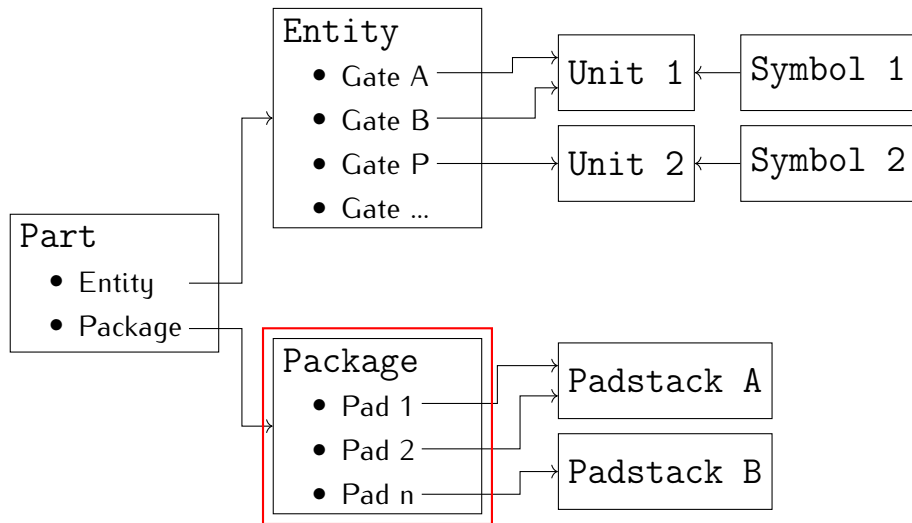
The Pool



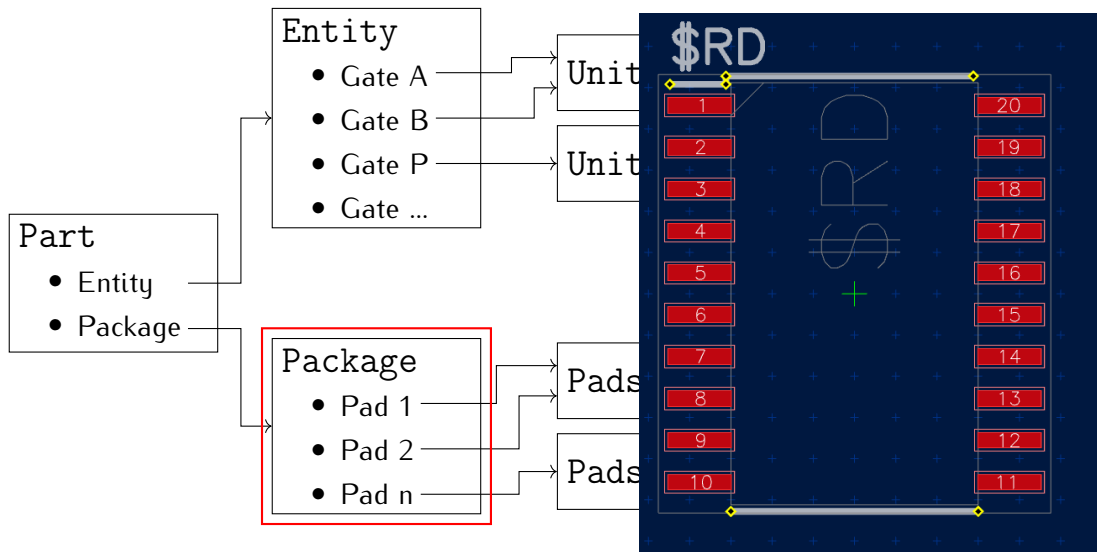
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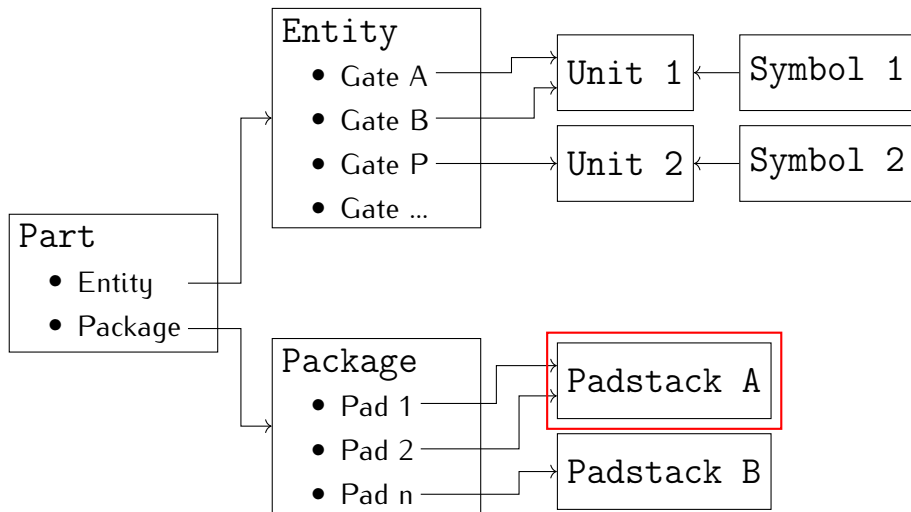
The Pool



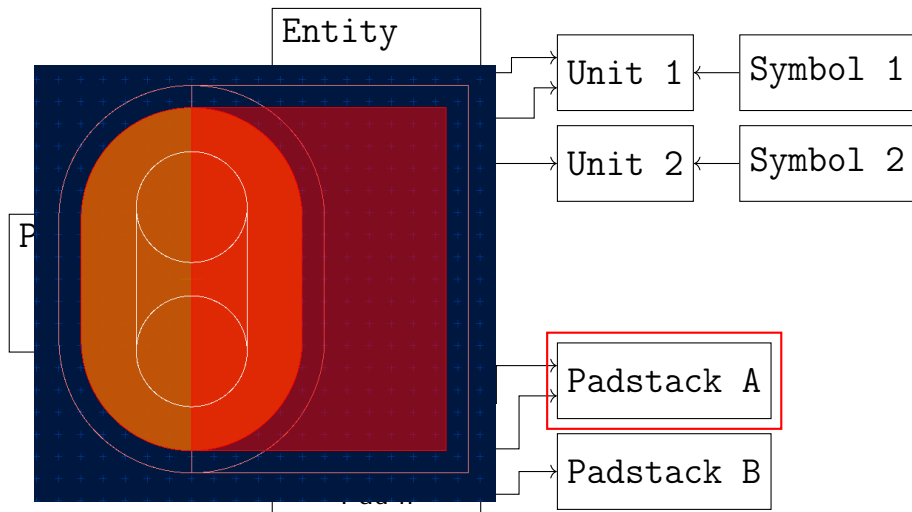
The Pool



The Pool



The Pool



The Pool

Entity

1.55mm 1.0mm

get-parameter [solder_mask_expansion]

2 *

+xy

set-shape [mask-ob obround]

Symbol 1

Symbol 2

Par

1.15mm

- get-parameter [solder_mask_expansion]

- +

1.55mm

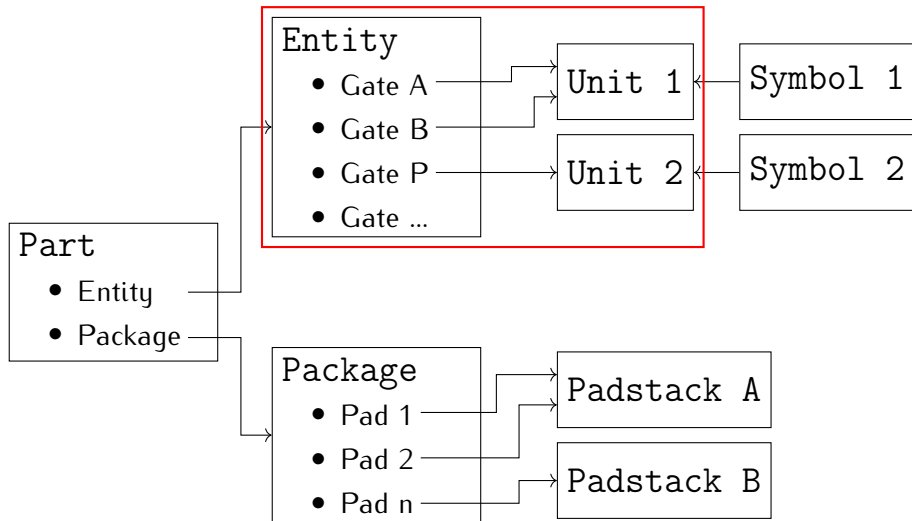
get-parameter [solder_mask_expansion]

2 * +

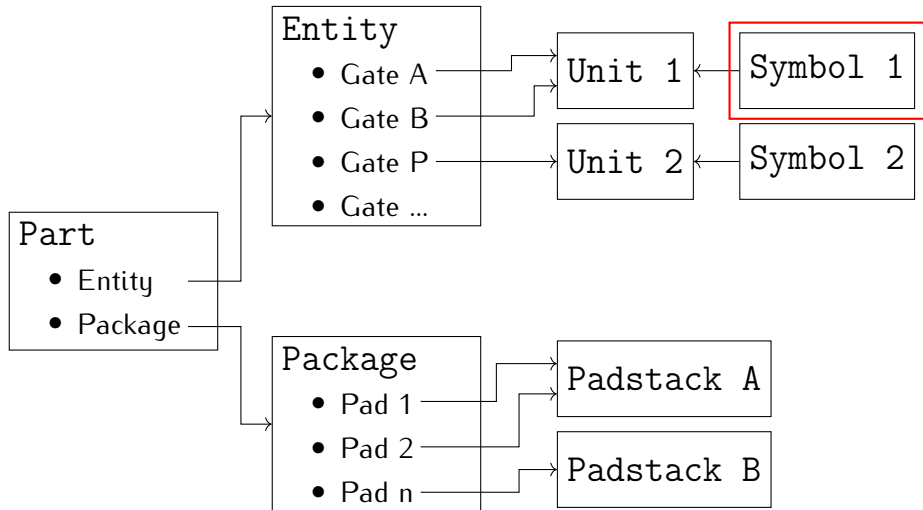
set-shape [mask-rect rectangle]

...

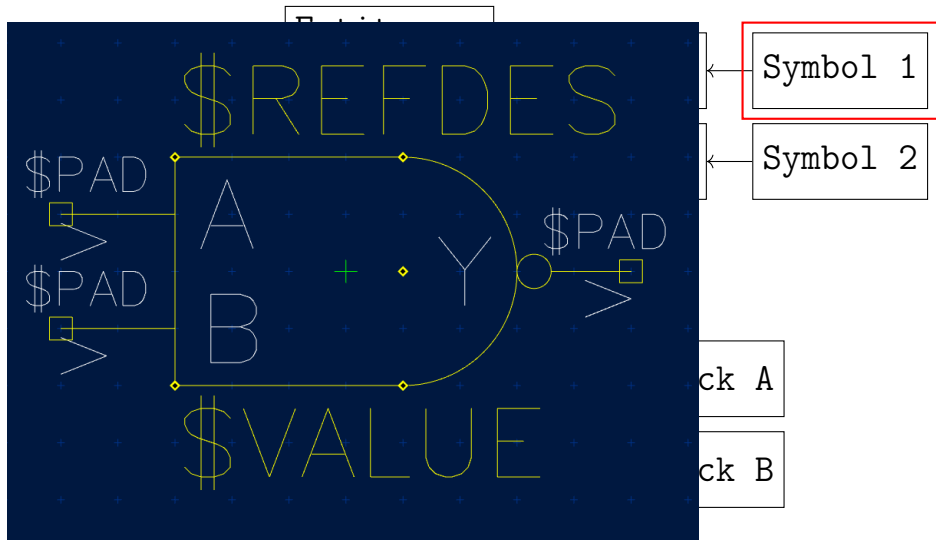
The Pool



The Pool

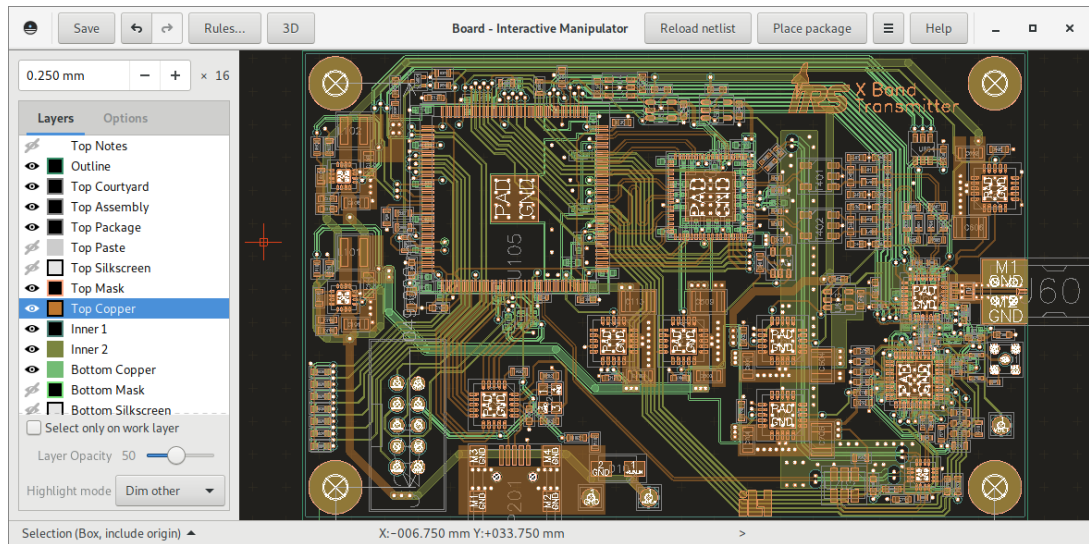


The Pool



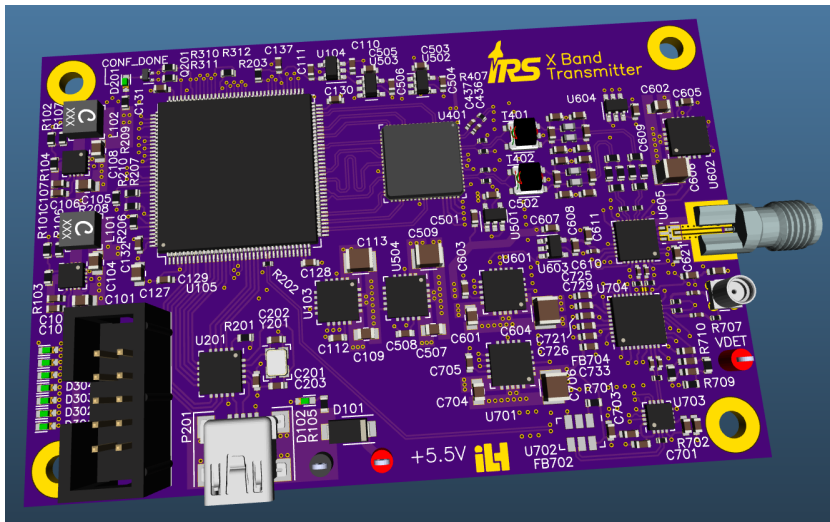
What's new

First real-world board



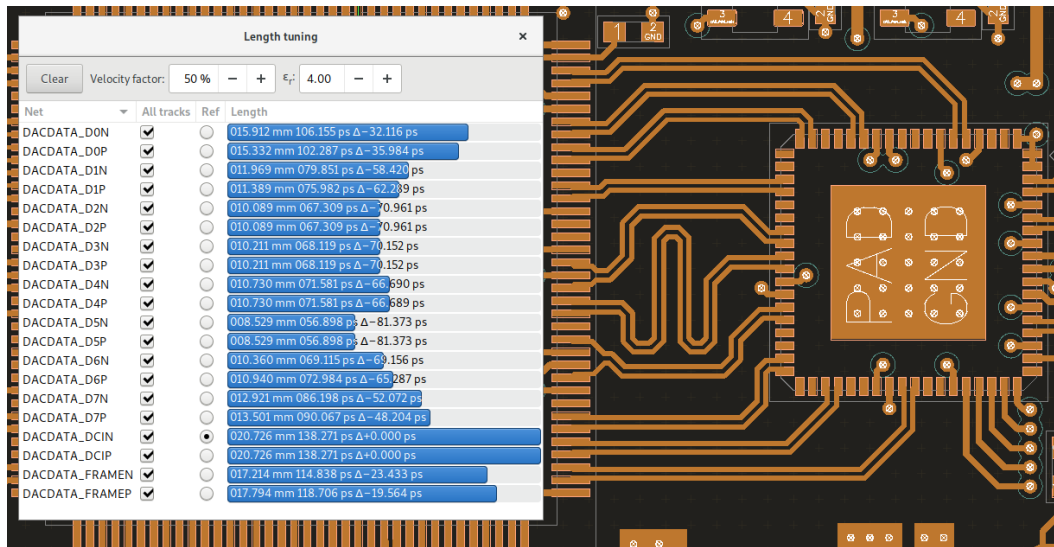
What's new

First real-world board



What's new

Length tuning



What's new

BOM Export

Export

File name

Sort column

QTY

Desc.

Columns Available

Datasheet

Columns Included

QTY
MPN
Manufacturer
Value
Ref. Des.
Package
Description

>
<
^
v

BOM Export

QTY	MPN	Manufacturer	Value	Ref. Des.	Package
53	CPL-CAP-X7R-0603-100NF-50V	CPL	100 nF	C102, C...	C0603
27	CPL-CAP-X7R-0603-1UF-25V	CPL	1 µF	C110, C1...	C0603
20	CPL-RES-0603-10K-0.1W	CPL	10 kΩ	R102, R...	R0603
9	CPL-RES-0603-681-0.1W	CPL	681 Ω	R105, R...	R0603
9	150060GS75000	Würth Elektronik	150060GS75000	D102, D...	0603 LED
9	CPL-CAP-X7R-0402-1NF-50V	CPL	1 nF	C402, C...	C0402
8	CPL-CAP-X5R-0805-10UF-16V	CPL	10 µF	C101, C1...	C0805
8	HMK105CG330JV-F	Taiyo Yuden	33 pF	C610, C...	C0402
7	HMK105CG101JV-F	Taiyo Yuden	100 pF	C403, C...	C0402
6	CPL-RES-0402-100-0.063W	CPL	100 Ω	R202, R...	R0402
5	BLM18AG601SN1D	Murata	BLM18AG601SN1D	FB101, ...	C0603
5	FC0402E50R0BST1	Vishay	50 Ω	R703, R...	R0402
5	C1210C476M4PACTU	KEMET	47 µF	C113, C...	C1210
5	TPS7A4700RGWR	Texas Instruments	TPS7A4700RGWR	U103, U...	RGW
4	CPL-RES-0603-150-0.1W	CPL	150 Ω	R602, R...	R0603
4	CRCW040249R9FKEDC	Vishay	50 Ω	R401, R...	R0402
4	LQW18ANR10G00D	Murata	100 nH	L401, L4...	LQW18AN_00
4	CBR04C101F3GAC	KEMET	100 pF	C707, C...	C0402
4	C0603C829D5GACTU	KEMET	8.2 pF	C202, C...	C0603
4	LMK107BJ106MALTD	Taiyo Yuden	10 µF	C725, C...	C0603
4	CPL-RES-0603-120-0.1W	CPL	120 Ω	R601, R...	R0603

What's new

Parametric part search

Place part

Assign part

Part Browser

Recent

Favorites

MPN Search

Capacitors

Inductors

Resistors

Manufacturer

Taiyo Yuden

KEMET

CPL

Package

C1206

C0805

C0603

C0402

Value

1.00 pF

10.00 pF

12.00 pF

18.00 pF

22.00 pF

27.00 nF

Voltage rating

6.3 V

10 V

16 V

25 V

50 V

100 V

Type

X7R

X5R

COG/NPO

Search

Reset

MPN	Manufacturer	Package	Value	Voltage rating	Type
CPL-CAP-X7R-0402-1NF-50V	CPL	C0402	1.00 nF	50 V	X7R
CPL-CAP-X7R-0402-10NF-50V	CPL	C0402	10.00 nF	50 V	X7R
CPL-CAP-X7R-0402-100NF-16V	CPL	C0402	100.00 nF	16 V	X7R
CPL-CAP-X7R-0603-1NF-50V	CPL	C0603	1.00 nF	50 V	X7R
CPL-CAP-X7R-0603-1UF-25V	CPL	C0603	1.00 μ F	25 V	X7R
CPL-CAP-X7R-0603-4.7NF-50V	CPL	C0603	4.70 nF	50 V	X7R
CPL-CAP-X7R-0603-10NF-50V	CPL	C0603	10.00 nF	50 V	X7R
CPL-CAP-X7R-0603-22NF-50V	CPL	C0603	22.00 nF	50 V	X7R
CPL-CAP-X7R-0603-47NF-50V	CPL	C0603	47.00 nF	50 V	X7R
CPL-CAP-X7R-0603-100NF-50V	CPL	C0603	100.00 nF	50 V	X7R
CPL-CAP-X7R-0603-220NF-16V	CPL	C0603	220.00 nF	16 V	X7R
CPL-CAP-X7R-0805-1UF-25V	CPL	C0805	1.00 μ F	25 V	X7R
CPL-CAP-X7R-0805-100NF-50V	CPL	C0805	100.00 nF	50 V	X7R
HMK105CG101JV-F	Taiyo Yuden	C0402	100.00 pF	100 V	COG/NPO
HMK105CG330JV-F	Taiyo Yuden	C0402	33.00 pF	100 V	COG/NPO
LMK105SD472JV-F	Taiyo Yuden	C0402	4.70 nF	10 V	COG/NPO
LMK107BJ106MALTD	Taiyo Yuden	C0603	10.00 μ F	10 V	X5R

MPN HMK105CG101JV-F

Manufacturer Taiyo Yuden

Value 100 pF

Description Multilayer ceramic capacitor

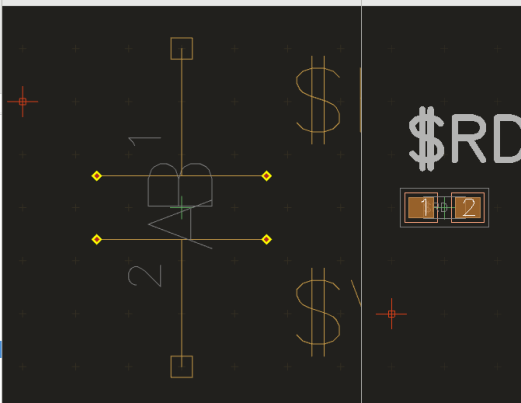
Datasheet https://www.yuden_alog/mlcc06_e.pdf

Entity Capacitor

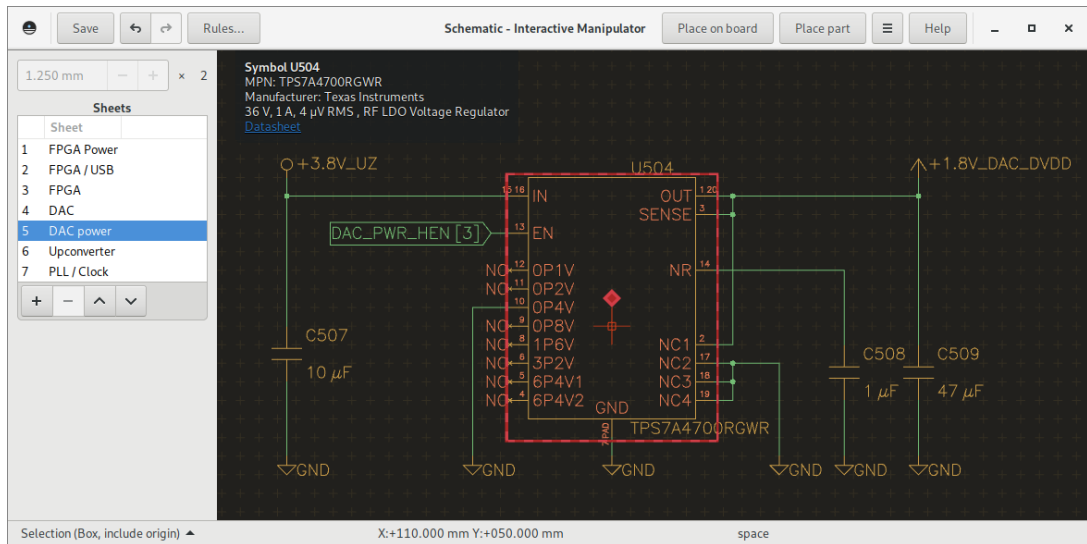
Gate Two-terminal non-polarized capacitor

Symbol Capacitor

Package C0402 (Primary)

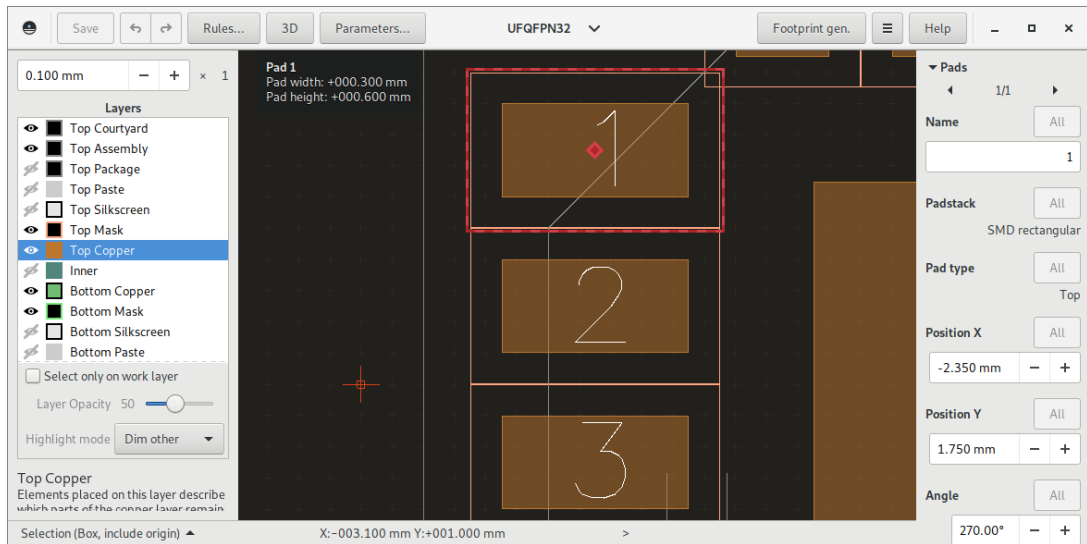


Smart head up display



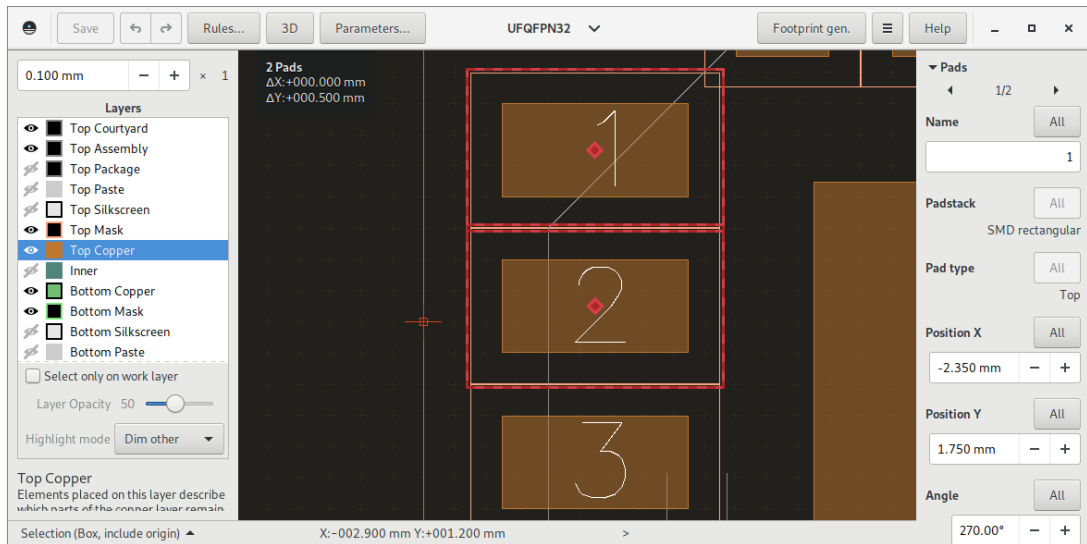
What's new

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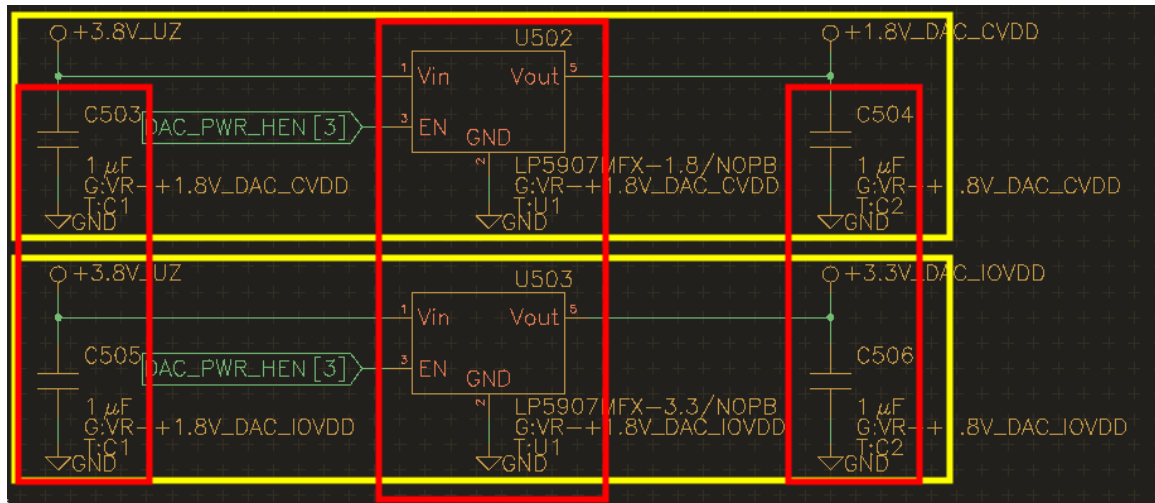


Copying placement and tracks – Motivation



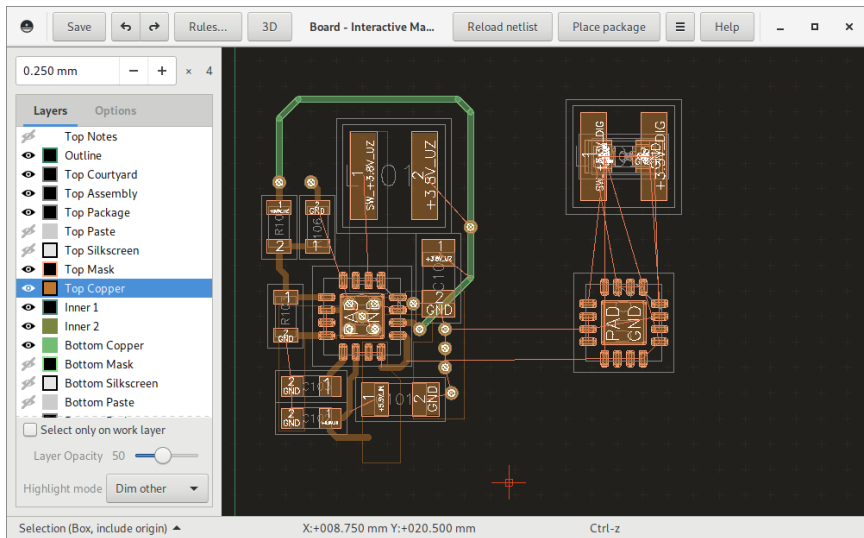
What's new

Copying placement and tracks – Schematic



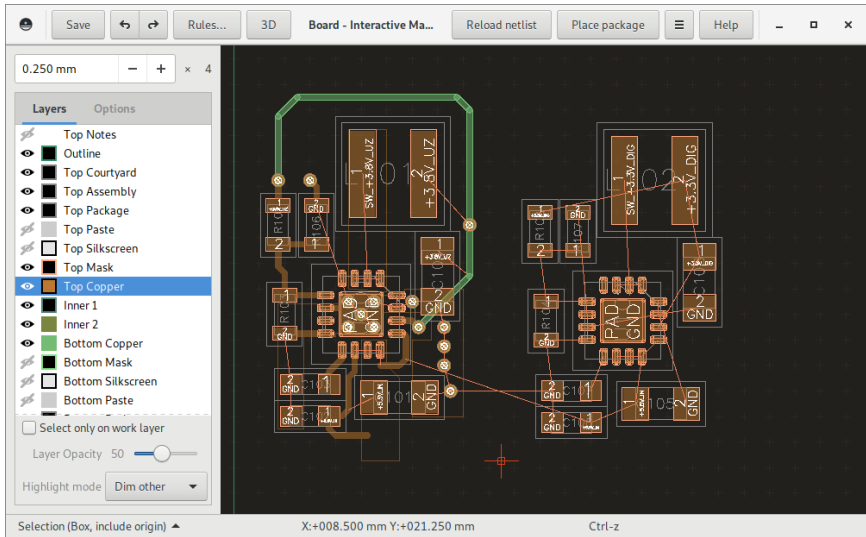
What's new

Copying placement and tracks – Board



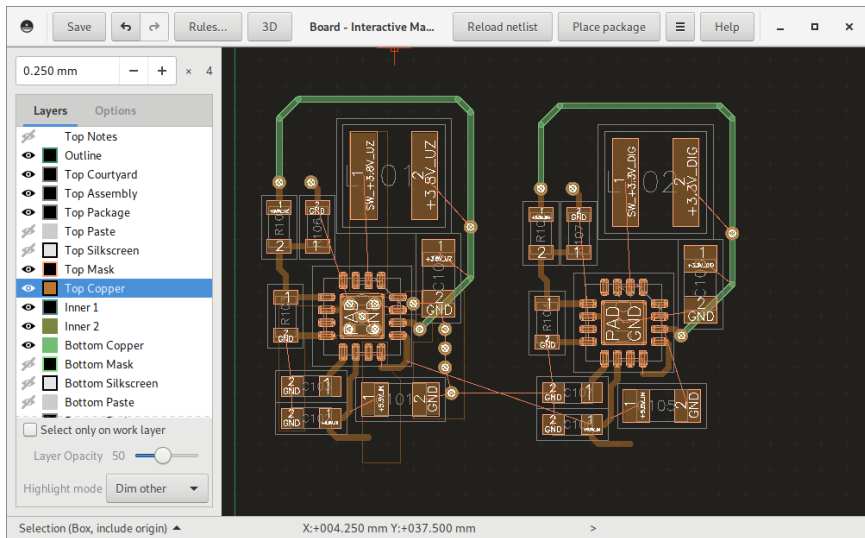
What's new

Copying placement and tracks – Board



What's new

Copying placement and tracks – Board



What's new

Even more

- Incremental search
- Smooth zooming
- Title blocks
- Customizable keyboard shortcuts
- Customizable colors
- Multithreaded DRC
- Edit board from bottom side
- Calculations in numerical entries
- Lasso and paint selection
- Keepouts

Release 1.0

Release 1.0

Improve out of the box experience

User docs

github.com/carrotIndustries/horizon

github.com/carrotIndustries/x-band-tx

Friends & Testers
People on *the internet*

That's it