Virtual production in the eC-cloud

Your Populated Board produced

“right first time”

Defining your Circuit

- Defining your BOM
  - Functionality of components.
  - Availability of components ?
  - Package to use ? Footprint definition.
  - Testing implications ?
  - Heat Management ?
  - Pricing ?
  - Etc …
- Schematics

Defining your PCB

- What are the PCB cost drivers ?
- What makes a PCB hard/impossible to make ?
- Which tools are available to help me ?
  - Offline direct consulting RFQ - All
  - Online capability catalogues - All
  - Online smart menus - Eurocircuits

STANDARD pool

Delivery format	Single PCB
PCB quantity	10
Delivery term	7 working days
Number of layers	6
PCB width (X) (mm)	100.00
PCB height (Y) (mm)	80.00
eC-registration compatible PCB	

▶ Stencils

Material definition

Select pre-defined buildup

Board thickness	1.55 mm	Board buildup	Standard
Material Tg	145-150 °C		
Outer layer copper foil	18 µm (end 35 µm)	Inner layer copper foil	35 µm
Extra PTH runs	0	Extra press cycles	0

▼ Board technology

Select classification

Outer layer trackwidth (OL-TW)	0.150 mm	Outer layer isolation distance (OL-TT-TP-PP)	0.150 mm
Outer layer annular ring (OAR)	0.125 mm	Inner layer trackwidth (IL-TW)	0.150 mm
Inner layer isolation distance (IL-TT-TP-PP)	0.150 mm	Inner layer annular ring (IAR)	0.125 mm
Smallest final hole	0.25 mm	Hole density	< 1000/dm²
Technology class	6C	Holes <= may be reduced	0.45 mm

Board definition

Top soldermask	Green	Bottom soldermask	Green
Top legend	White	Bottom legend	White
Surface finish	Any lead free finish	Milling	No
Bare Board Testing	☑	UL marking	☐

▶ Advanced options

Summary

Business customer? Select here. ☐

Service	STANDARD pool
Delivery term	7 working days
Estimated shipment date	01-10-2013
Quantity	10 PCBs
Board surface / Order surface	0.80 dm² / 8.00 dm²

Prices	Net	Gross*
Single PCB	€ 31.79	€ 38.47
Total boards	€ 317.92	€ 384.68
◉ Express transport	€ 12.48	€ 15.10
○ Economy transport	€ 10.49	€ 12.69
Total	€ 330.39	€ 399.77

* The gross prices include 21.00% VAT.

Add to basket

Useful documents

→ PCB Calculator user guide — Read more...

→ PCB design guidelines — Read more...

Alternatives

Customized matrix

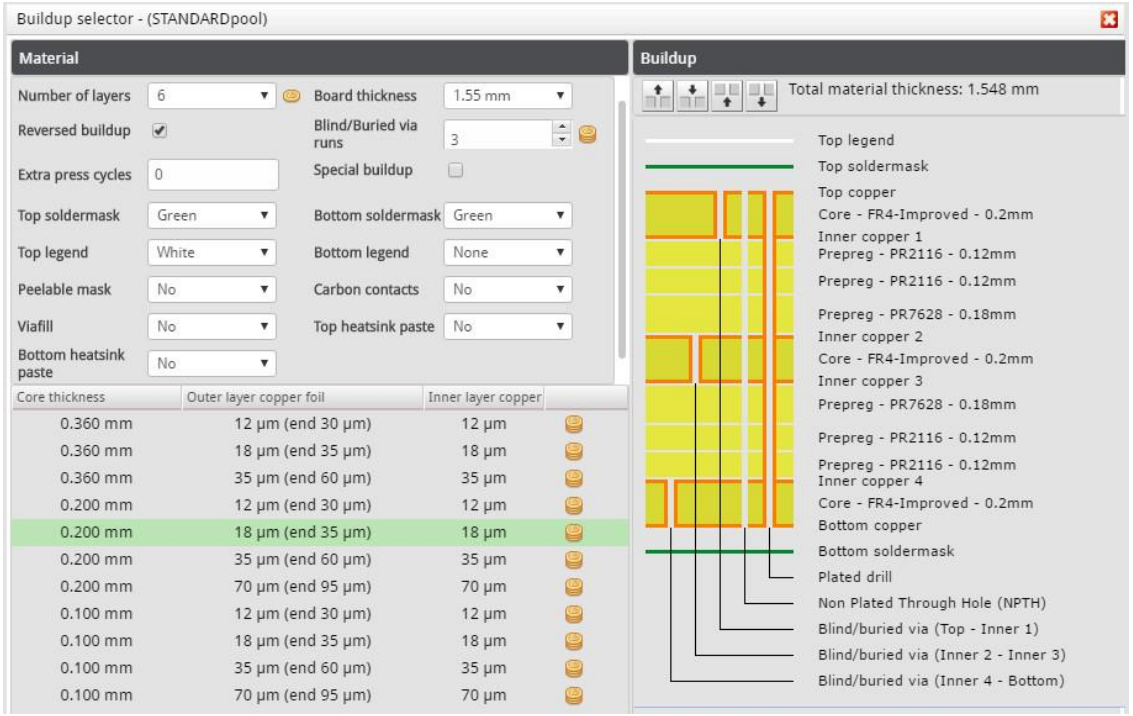
10 PCBs, 7 working days		20 PCBs, 7 working days		30 PCBs, 7 working days	
Net	Gross*	Net	Gross*	Net	Gross*
€ 31.79	€ 38.47	€ 21.17	€ 25.62	€ 17.00	€ 20.58
€ 317.92	€ 384.68	€ 423.49	€ 512.43	€ 510.13	€ 617.26
Select		Select		Select	
10 PCBs, 6 working days		20 PCBs, 6 working days		30 PCBs, 6 working days	
Net	Gross*	Net	Gross*	Net	Gross*
€ 39.90	€ 48.28	€ 26.58	€ 32.16	€ 21.34	€ 25.82
€ 399.02	€ 482.81	€ 531.53	€ 643.15	€ 640.27	€ 774.73
Select		Select		Select	

* The gross prices include 21.00% VAT.

The transport costs and total price are calculated and shown in the summary according to the selection.

Smart menu

- Technical support
  - Build wizard
    - 700 builds

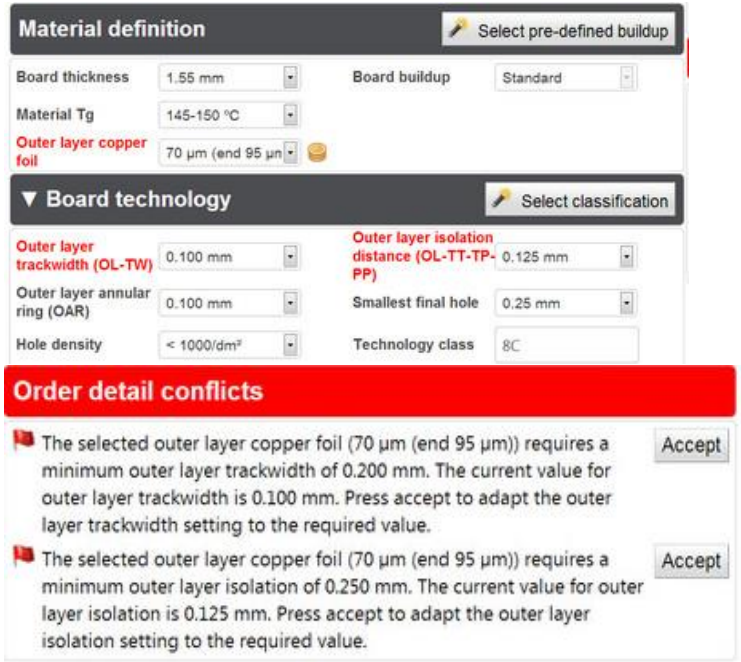


Smart menu

Build-up validation!

- faster prices, faster deliveries, lower costs

- Technical support
  - Technical validation
    - 300 rules

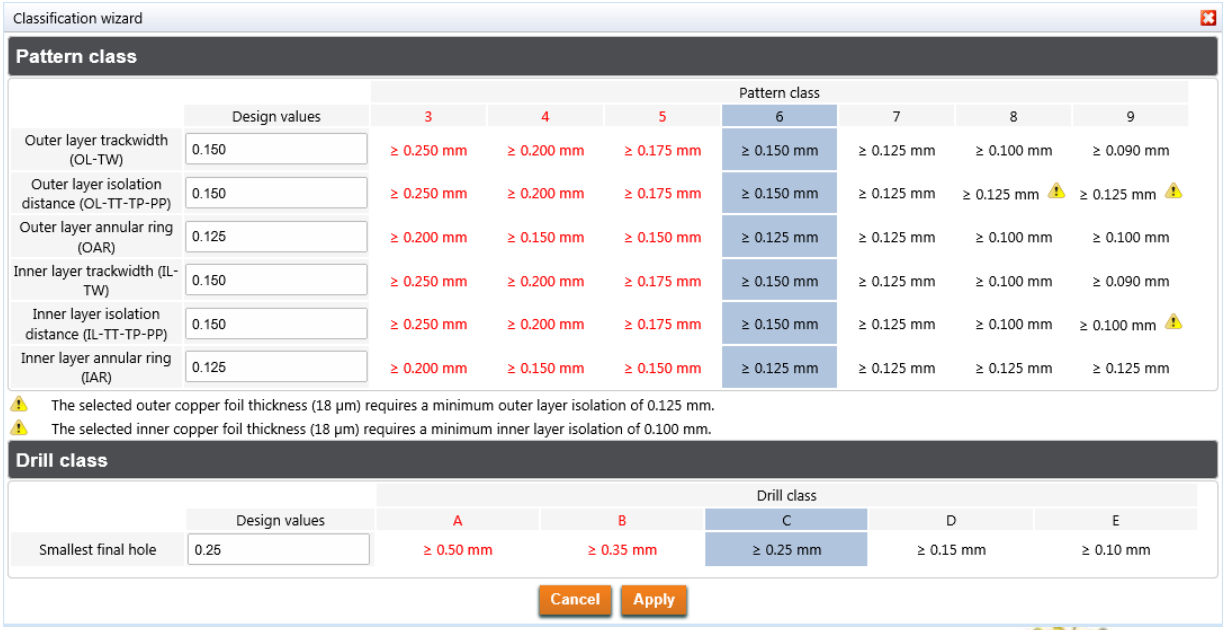


➢ No production delays

Smart menu

Technical validations!

- Technical support
  - Classification wizard
    - Pattern
    - Holes
    - Copper weight



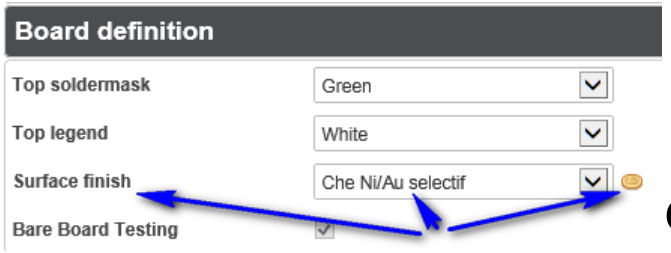
Smart menu

Classification aide!

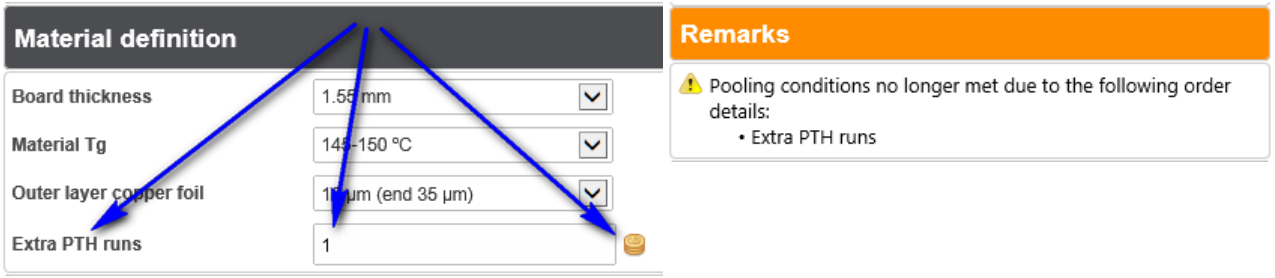
Smart menu

Price guidance!

- Poolable options
  - Extra cost expressed as single coin symbol



- Non-poolable options
  - Extra cost expressed as multiple coin symbol and remark

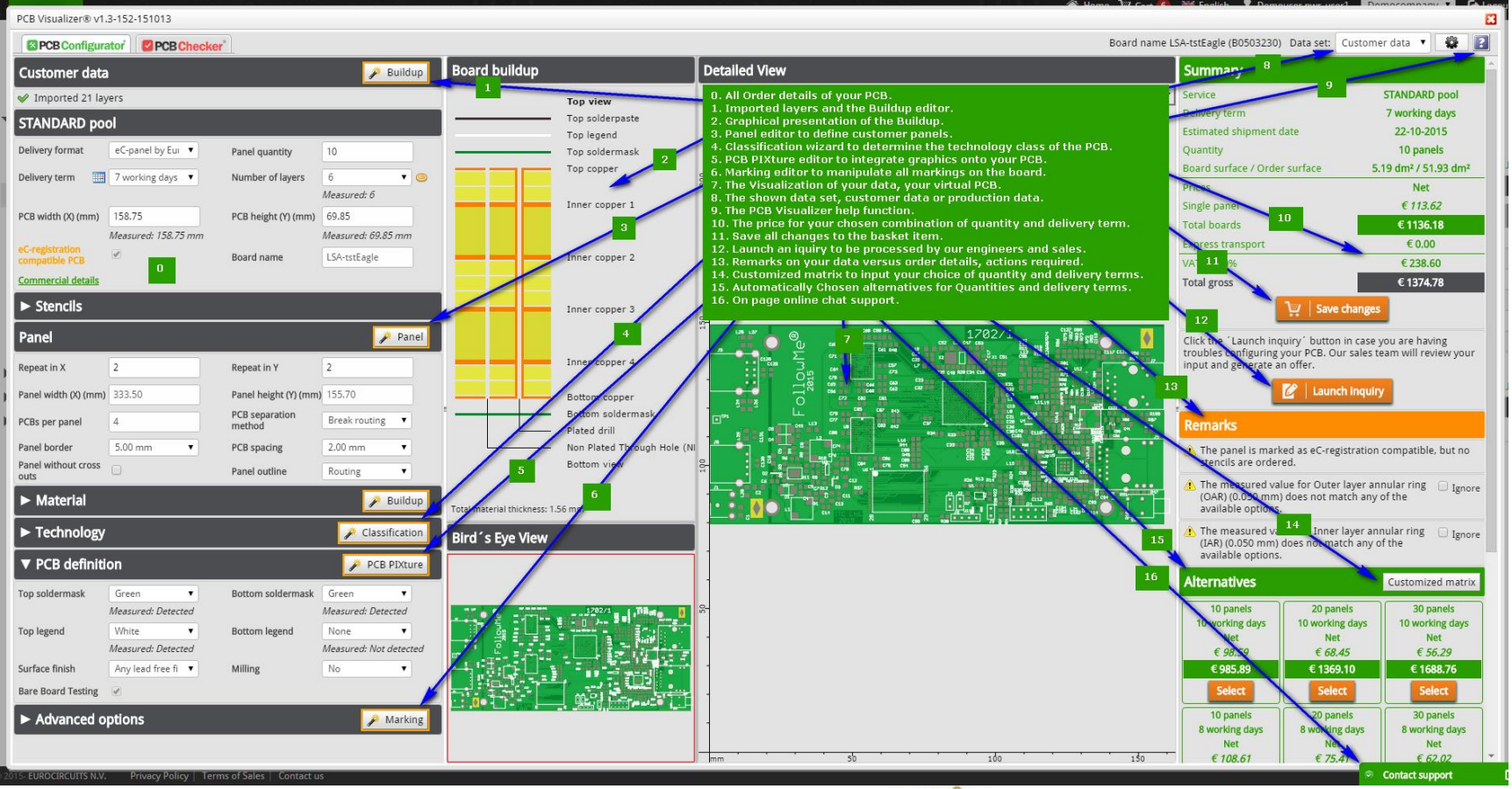


Make your board layout

- Place your components
  - Footprints
- PCB Layout
  - Traces, vias, …

PCB - details	Possible issues	Clearly defined in:			PCB Visualizer
		Gerber X	Gerber X2	Native EAGLE/KiCAD	defines
Base material	On stock / on offer	no	no	no	PCB Configurator
Number of layers	Layers complete or not	no	no	yes	Buildup editor
Definition of the layers	Clear definition / assignment	no	yes	yes	Buildup editor
Board size	Possible open or more contours	no	no	no	Outline editor
Customer panel	Definition not standardized	no	no	no	Panel editor
Copper thickness	Definition base/end Cu	no	no	no/yes	Buildup editor
build up	Definition not standardized	no	no	no/yes	Buildup editor
PTH		no	yes	yes	Drill Editor
Via / component hole		no	yes	yes	Drill Editor
NPTH		no	yes	yes	Drill Editor
Slots & Cut outs	Definition not standardized	no	yes	yes	Outline editor / Drill editor
blind & burried vias	Define the layer name correct	no/yes	yes	yes	Buildup editor
Thermal pads	Defined in CAD or not	no	no/yes	no/yes	-
Surface finish		no	no	no	PCB Configurator
Soldermask colour		no	no	no	PCB Configurator
Legend colour		no	no	no	PCB Configurator
press fit holes	Definition not standardized	no	no	no	PCB Configurator parameter
peelable mask	Definition not standardized	no	no	no	Buildup editor
Carbon contacts	Definition not standardized	no	no	no	Buildup editor
edge connector / beveling	Definition not standardized	no	no	no	PCB Configurator parameter
depth routing	Definition not standardized	no	no	no	PCB Configurator / Drill editor
via-fill	Definition not standardized	no	no	no	PCB Configurator / Drill editor
chamfered holes	Definition not standardized	no	no	no	PCB Configurator / Drill editor
PTH on the board edge	Definition not standardized	no	no	no	PCB Configurator parameter
round-edge plating	Definition not standardized	no	no	no	PCB Configurator parameter
heatsink paste	Definition not standardized	no	no	no	Buildup editor

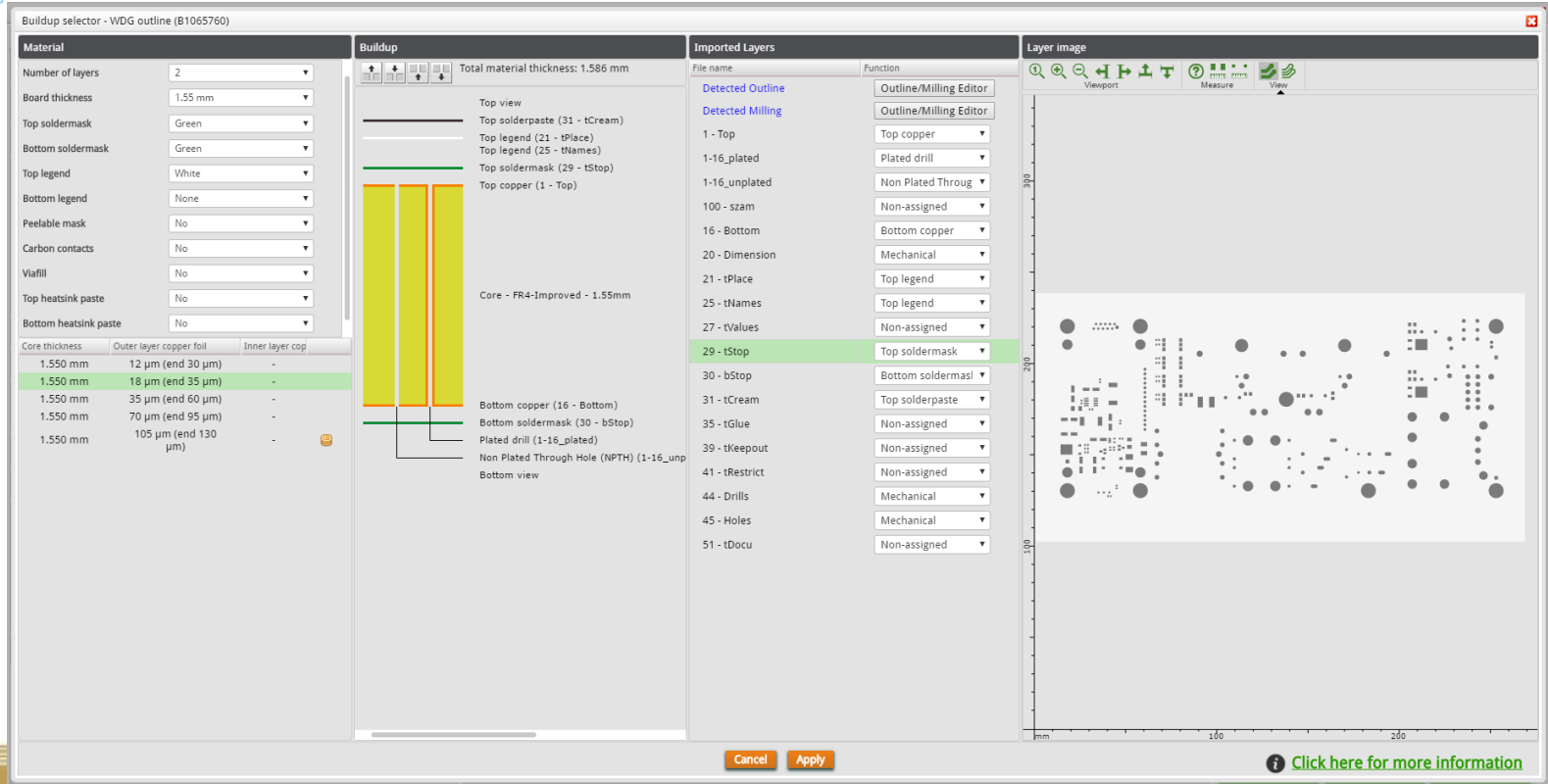
PCB data CAD to CAM



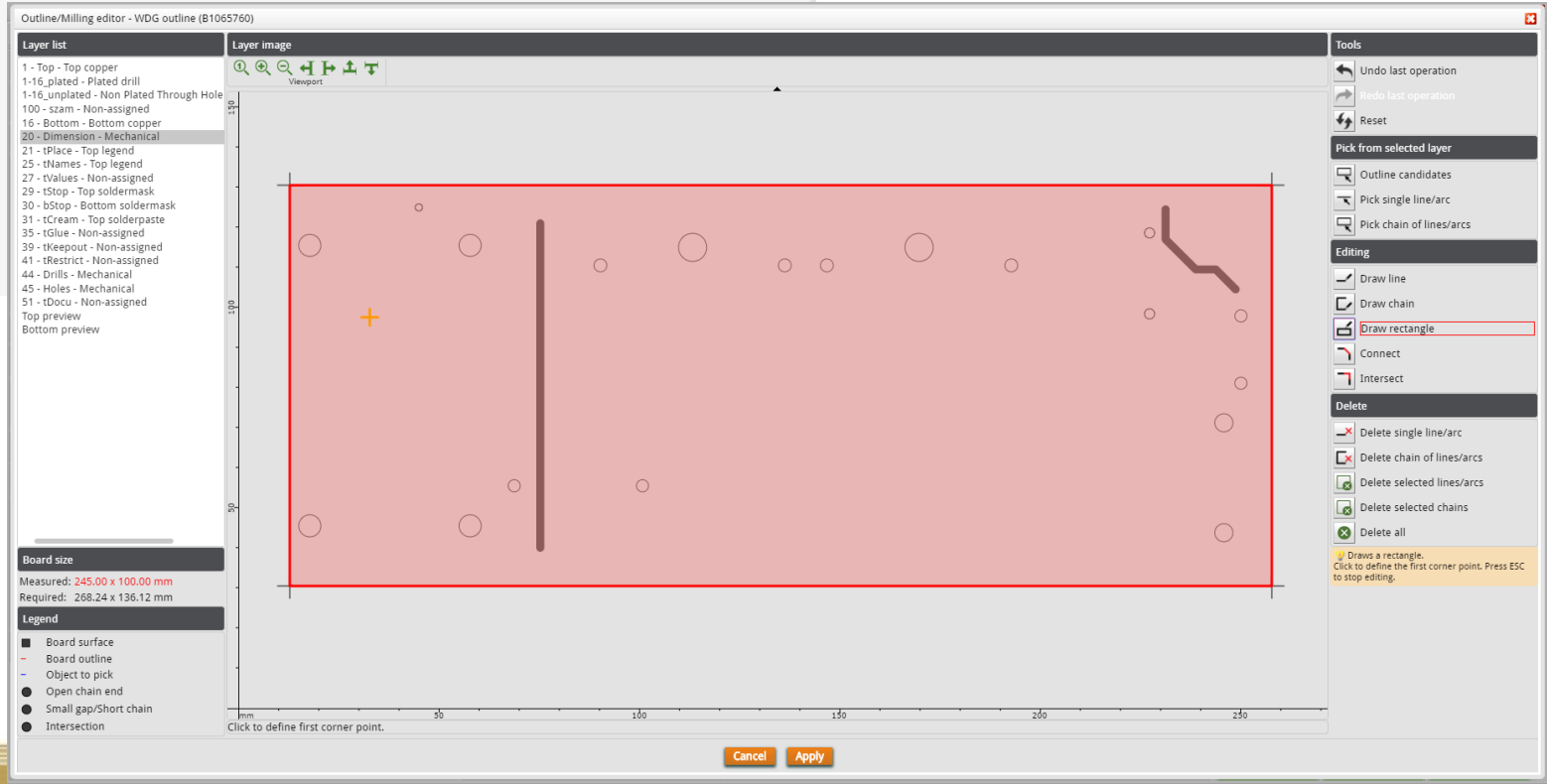
PCB Configurator :
Remove data ambiguities online

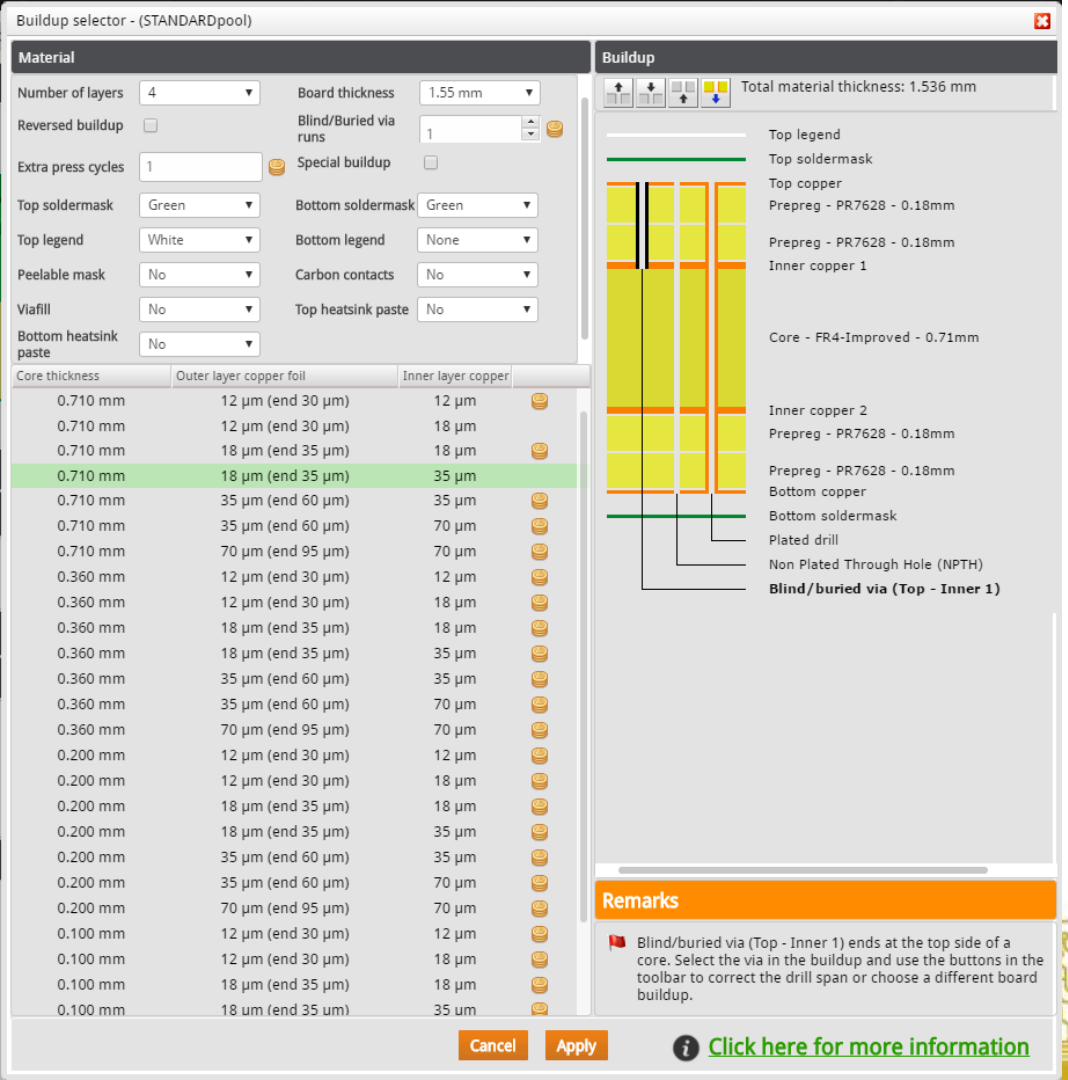
controllerBoard_L1.gbr
controllerBoard_L2.gbr
controllerBoard_L3.gbr
controllerBoard_L4.gbr
controllerBoard_L5.gbr
controllerBoard_L6.gbr
controllerBoard_L7.gbr
controllerBoard_L8.gbr
controllerBoard_L9.gbr
controllerBoard_L10.gbr
controllerBoard_L11.gbr
controllerBoard_L12.gbr
controllerBoard_L13.gbr
controllerBoard_L14.gbr
controllerBoard_L15.gbr
controllerBoard_L16.gbr
controllerBoard_L17.gbr
controllerBoard_L18.gbr

Confusing layer naming corrected with buildup editor

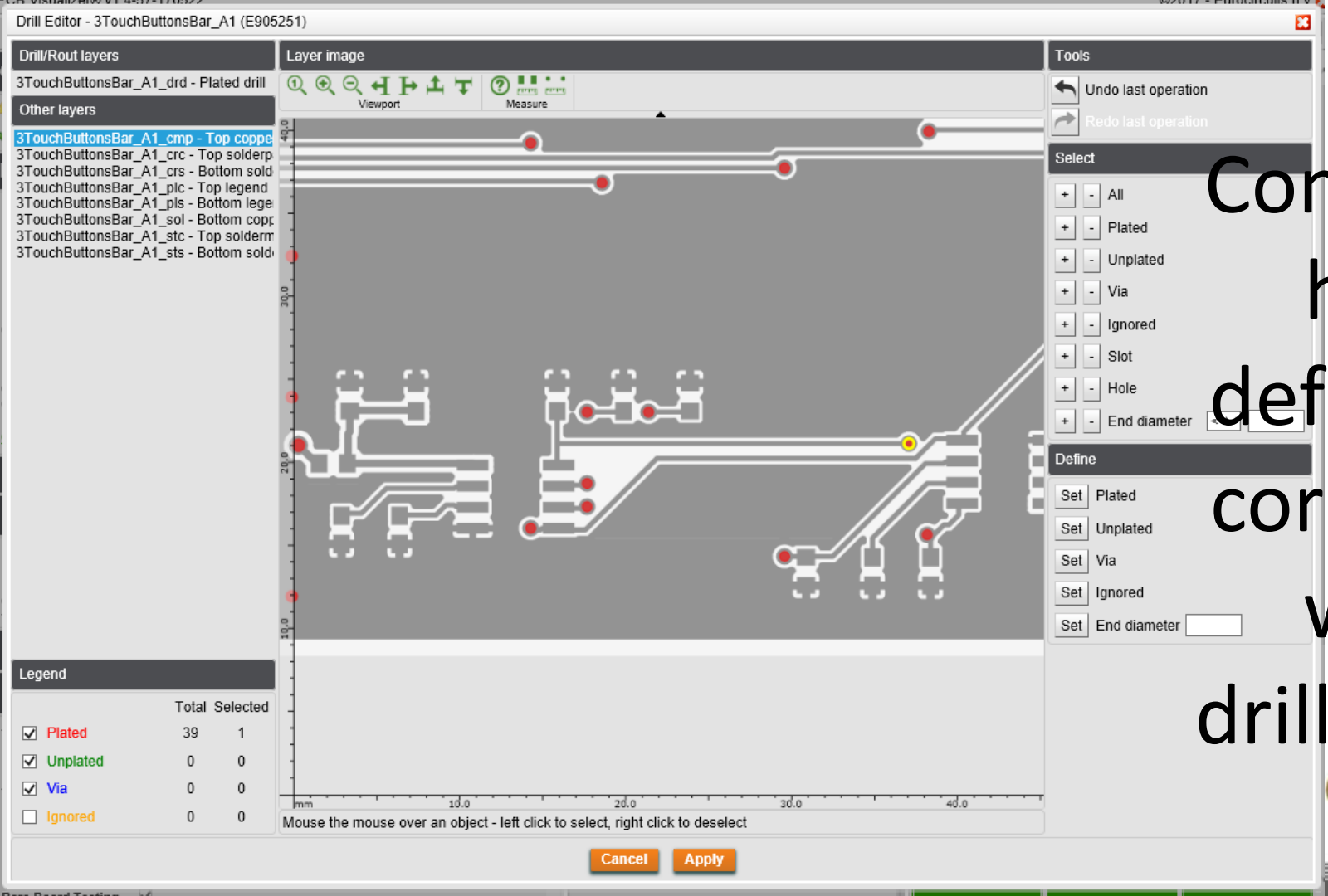


Bad outline corrected with outline editor





Bad buildup edited with buildup editor



Confusing hole definition corrected with drill editor

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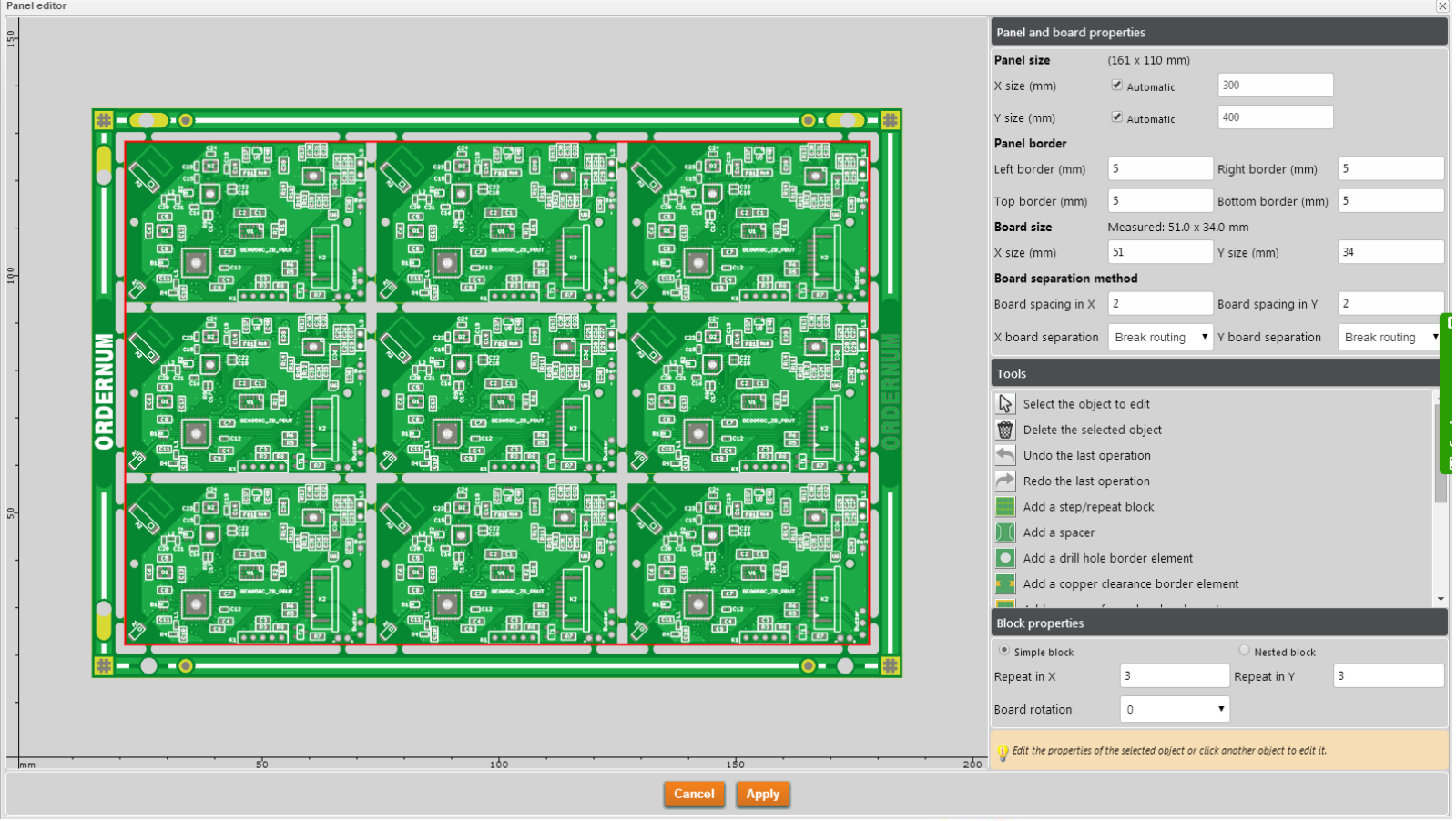
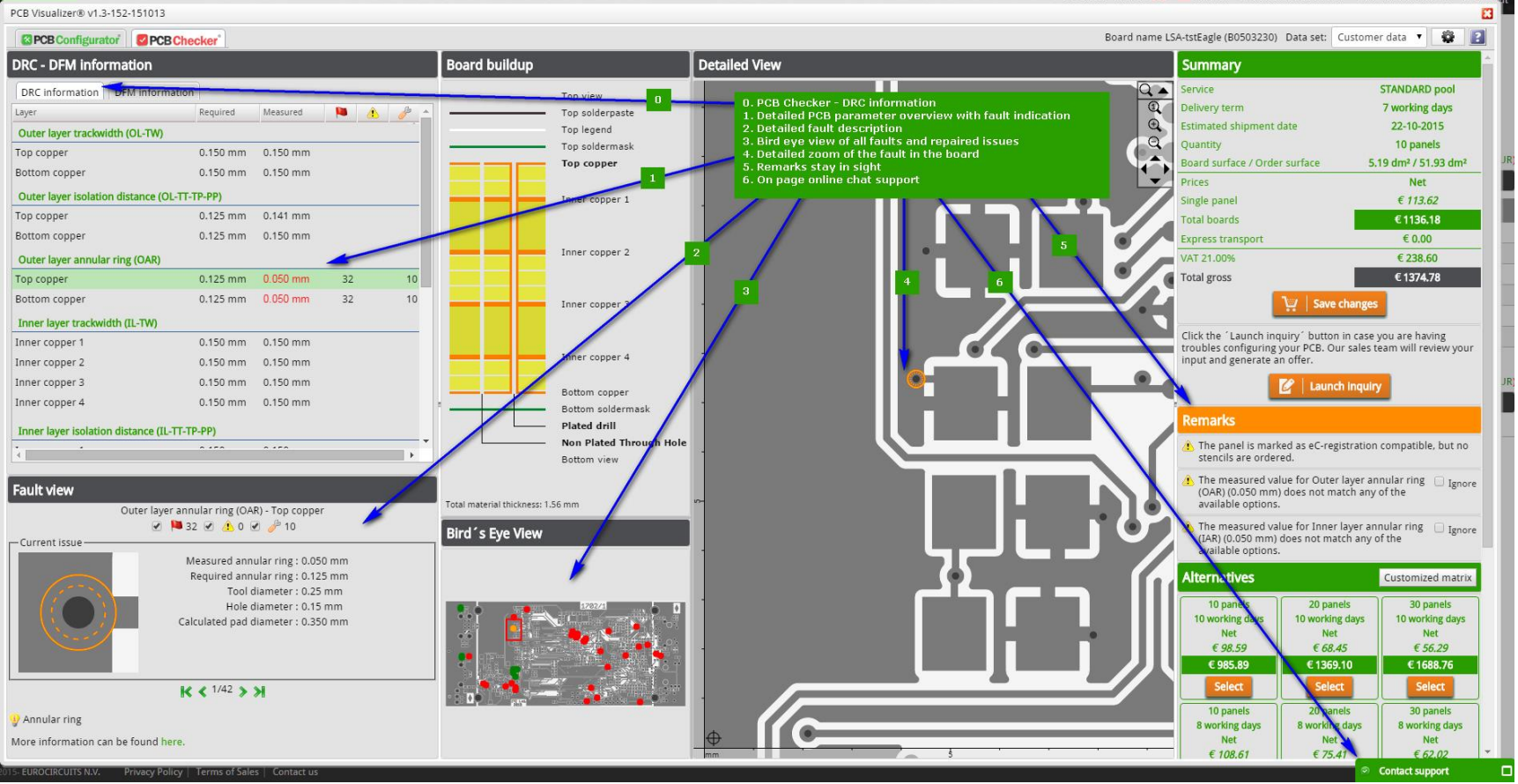


“Panel editor”



PCB Checker :
Evaluate possible DRC issues

PCB Visualizer® v1.3-152-151013

PCB Configurator | PCB Checker

Board name LSA-tstEagle (B0503230) Data set: Customer data

DRC - DFM information

DRC information | DFM information

Layer	Values
Plating	
Top copper	0.80
Bottom copper	0.71
Solderpaste surface	
Top solderpaste	1335.75 mm²
Not-connected soldermask-free pads - Potential fiducials	
Top copper	16
Bottom copper	0
Copper free of soldermask	
Top copper	14.80%
Bottom copper	3.04%

Fault view

Plating - Top copper

Current issue

Plating index : 0.80

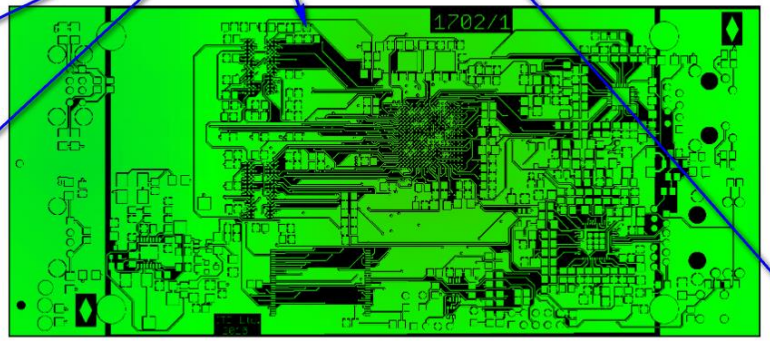
The plating index measures the uniformity of copper density on the board. A completely uniform board has an index of 1 which means that no plating problems are expected. Lower values show less uniformity, highlighted on the visual image by the red and blue areas. If the index falls to 0.4 or less, then special attention is required.

More information can be found here.

Plating

Top plating index 0.8

0. PCB Checker - DFM information
1. Plating index
2. Detailed info on the plating index of the chosen layer
3. Image of the plating index of the chosen layer
4. Calculated solder paste surface (SMD)
5. Potential fiducials
6. % Copper, free of soldermask against the board surface
7. On page online chat support



Underplating | Normal plating | Overplating

Summary

Service	STANDARD pool
Delivery term	7 working days
Estimated shipment date	22-10-2015
Quantity	10 PCBs
Board surface / Order surface	1.11 dm² / 11.09 dm²
Prices	Net
Single PCB	€ 42.27
Total boards	€ 422.69
Express transport	€ 0.00
VAT 21.00%	€ 88.77
Total gross	€ 511.46

Save changes

Click the ´Launch inquiry´ button in case you are having troubles configuring your PCB. Our sales team will review your input and generate an offer.

Launch inquiry

Remarks

The measured value for Outer layer annular ring (OAR) (0.050 mm) does not match any of the available options. Ignore

The measured value for Inner layer annular ring (IAR) (0.050 mm) does not match any of the available options. Ignore

Alternatives

Customized matrix

10 PCBs	20 PCBs	30 PCBs
7 working days	7 working days	7 working days
Net	Net	Net
€ 42.27	€ 27.92	€ 22.87
€ 422.69	€ 558.34	€ 686.09
Select	Select	Select
10 PCBs	20 PCBs	30 PCBs
6 working days	6 working days	6 working days
Net	Net	Net
€ 52.95	€ 34.97	€ 28.65
€ 529.50	€ 699.45	€ 859.58
Select	Select	Select

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Contact support

PCB Checker :
Evaluate possible DFM issues

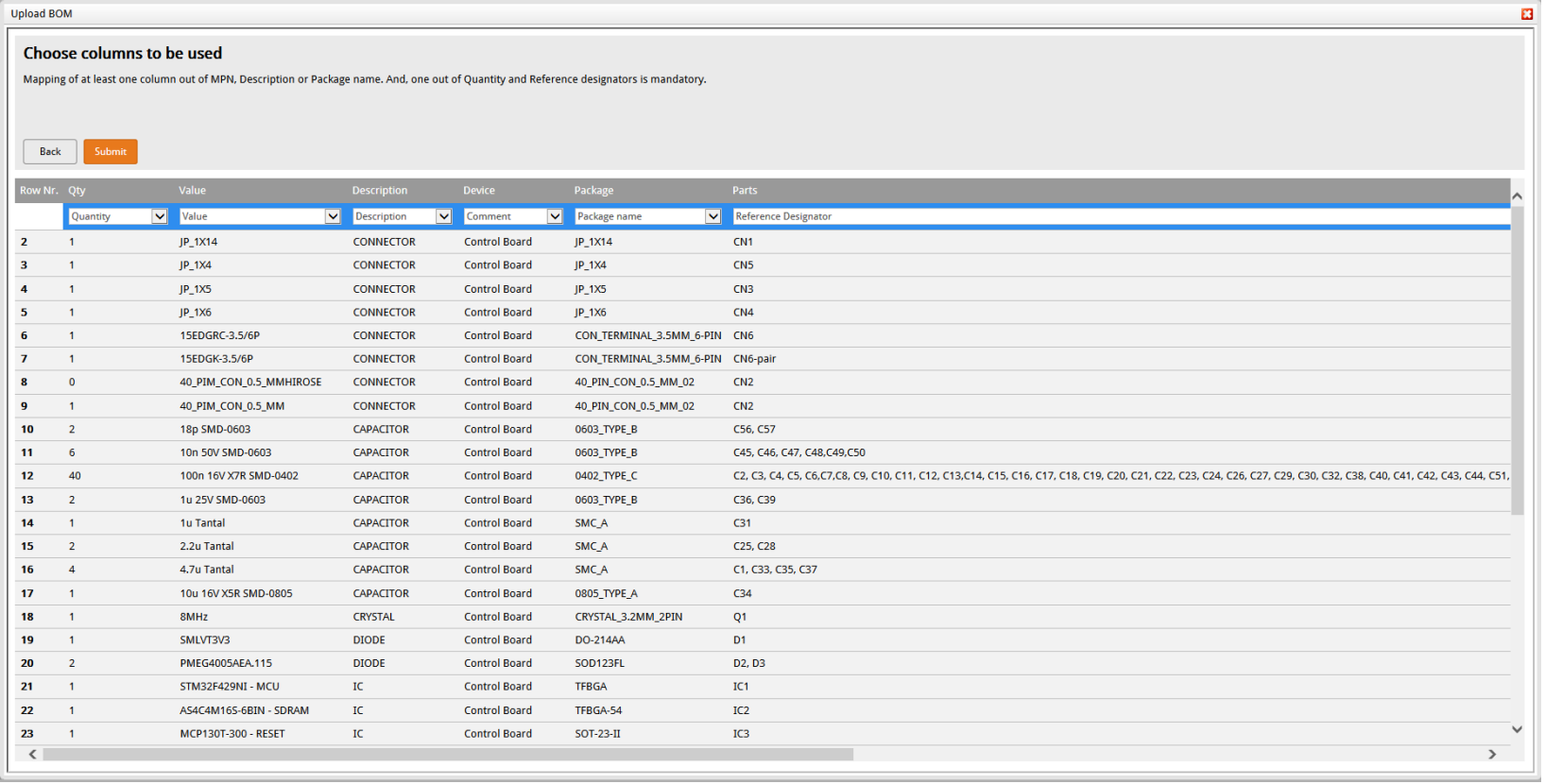
PCBA data - CAD to CAM

PCBA - details	Possible issues	Clearly defined in:			PCBA Visualizer
		BOM	CPL	Native EAGLE/KiCAD	defines
File format	Definition not standardized	no	no	yes	BOM editor / CPL editor
Component description	Definition not standardized	no	no	no	BOM editor
Manufacturing Part Number	Not clear or partial description	no	no	no	BOM editor
Supplier Part Number	Not clear or partial description	no	no	no	BOM editor
Component package	Poor definition leads to different package link in manufacturing DB	no	no	no	BOM editor
Component origin (Offset)	Different origin than manufacturing DB	no	no	no	CPL editor
Component Rotation (pin 1)	Different rotation than manufacturing DB	no	no	no	CPL editor
Component centroid	Different centroid than manufacturing DB	no	no	no	CPL editor
Component footprint	Poor definition leads to different footprint link in manufacturing DB	no	no	no	-
IPC definition of the footprint	Almost never available	no	no	no	show
Component Packaging	Need to be decided by the manufacturer	no	no	no	removed in BOM editor

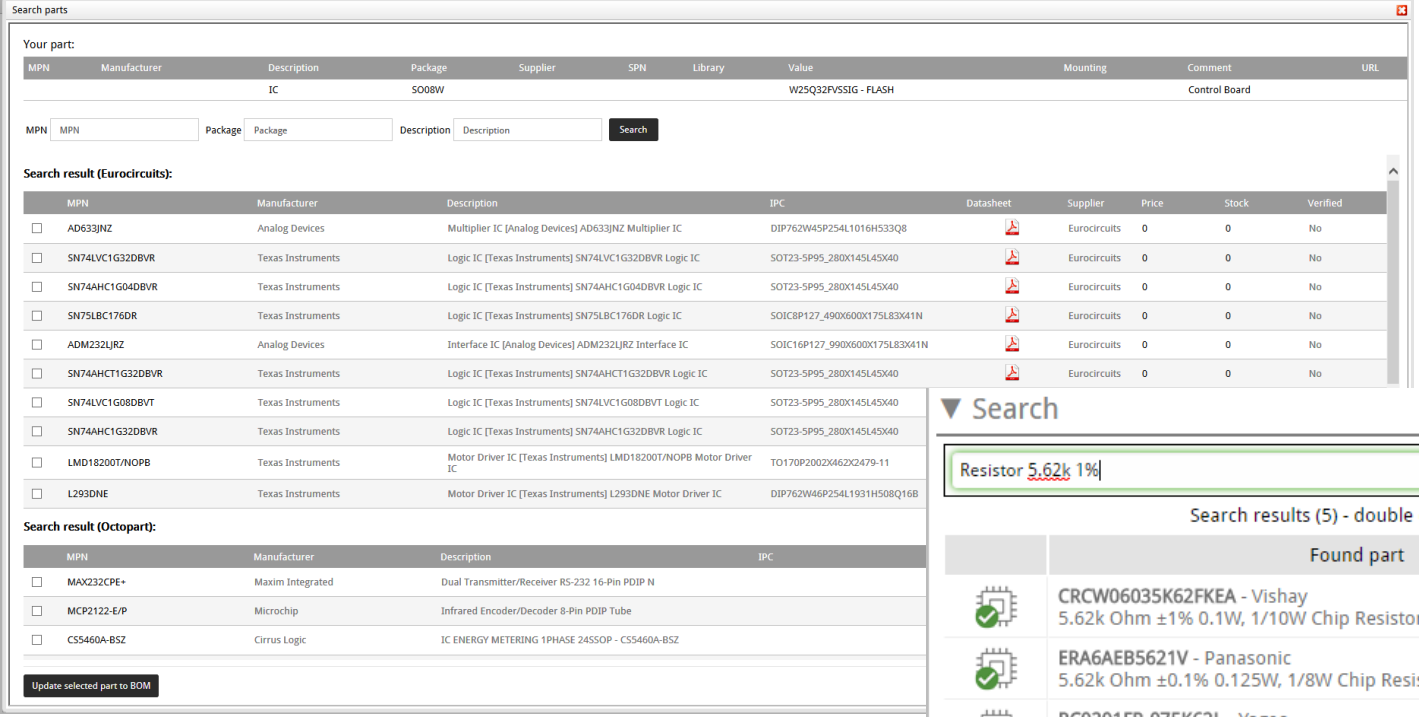
	A	B	C	D	E	F
10	9	10k	R_0603	0603_TYPE_B	R6, R7, R8, R9, R10, R11, R12, R25, R26	
11	6	10n	C_0603	0603_TYPE_B	C45, C46, C47, C48, C49, C50	
12	1	10u	C_0805	0805_TYPE_A	C34	
13	1	15EDGRC-3.5/6P	CON_TERMINAL_3.5MM_6-PIN	CON_TERMINAL_3.5MM_6-PIN	CN6	
14	2	18p	C_0603	0603_TYPE_B	C56, C57	
15	1	1k	R_0603	0603_TYPE_B	R13	
16	1	1u	CPOL-EUSMCA	SMC_A	C31	POLARI Europe
17	2	1u	C_0603	0603_TYPE_B	C36, C39	
18	2	2.2u	CPOL-EUSMCA	SMC_A	C25, C28	POLARI Europe
19	3	20k	R_0603	0603_TYPE_B	R16, R19, R22	
20	4	22	R_0603	0603_TYPE_B	R2, R3, R4, R14	
21	1	22uH	L-EUL3225M	L3225M	L1	INDUCT
22	4	4.7u	CPOL-EUSMCA	SMC_A	C1, C33, C35, C37	POLARI Europe
23	1	40_PIM_CON_0.5_MM WURTH	40_PIM_CON_0.5_MMWURTH	CON_FFC_40-PIN_0.5MM_WURTH-687140149022	CN2	
24	1	5	R_0603	0603_TYPE_B	R15	
25	1	8MHz	CRYSTAL_2PIN	CRYSTAL_3.2MM_2PIN	Q1	
26	1	AP5724WG-7	AP5724	SOT23-6	IC4	
27	1	AS4C4M16S-6BIN	SDRAM_16-BIT	TFBGA-54	IC2	
28	1	IP4252CZ8-4-TTL,13	EMIF_4CH_IP4252	EMIF_4CH_IP4252	IC7	
29	2	IRLML2246TRPBF	BSS84	SOT23	T1, T2	P-CHAN
30	1	LD-BZEN-0803	BUZZER_01	BUZZER_01	BZ1	
31	1	M95512-WMN6P	EEPROM_SPI_SO8	SO08	IC5	
32	3	MAX31856MUD+	MAX31856MUD+	TSSOP14	IC8, IC9, IC10	
33	1	MCP130T-300	MCP130	SOT-23-II	IC3	
34	2	PMEG4005AEA.115	SMF5.0AT1	SOD123FL	D2, D3	200 W T Suppre
35	1	SMLVT3V3	DIODE_SUPRESSOR_UNIDRECTION ALDO-214AA	DO-214AA	D1	
36	1	STM32F429NI	STM32F429N	TFBGA	IC1	
37	1	TSC2046	TSC2046	TSSOP16	IC11	
38	1	W25Q32FVSSIG	EEPROM_SPI_SO8SOIC8_WIDE	SO08W	IC6	

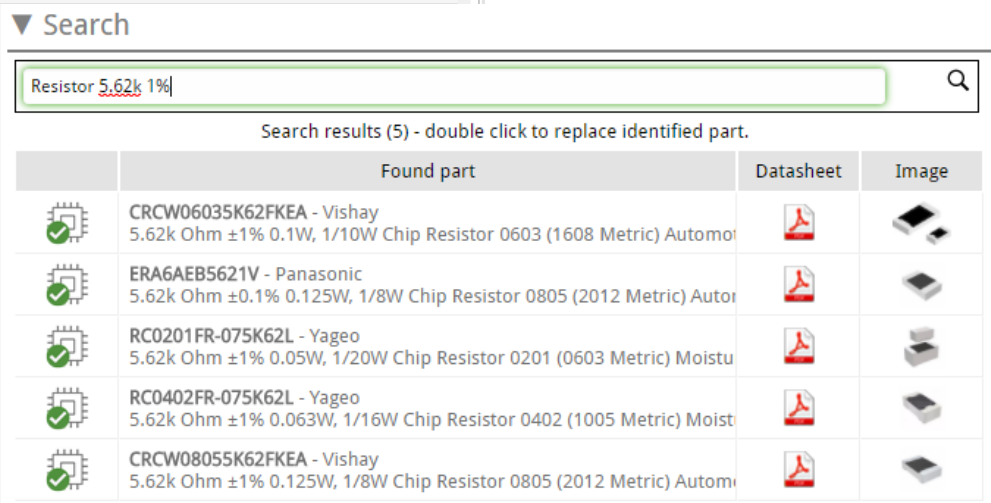
```
Qty     Value     Device     Package     Parts     Description
1         JP_1X14     JP_1X14     CN1
1         JP_1X4     JP_1X4     CN5
1         JP_1X5     JP_1X5     CN3
1         JP_1X6     JP_1X6     CN4
1         JUMPER_SMD_ROUND     JUMPER_SMD_ROUND     JP1
6     100     R_0603     0603_TYPE_B     R17, R18, R20, R21, R23, R24
2     100k     R_0603     0603_TYPE_B     R1, R27
40     100n     C_0402     0402_TYPE_C     C2, C3, C4, C5, C6, C7, C8, C9, C10, C11, C12, C13, C14, C15, C16, C17
9     10k     R_0603     0603_TYPE_B     R6, R7, R8, R9, R10, R11, R12, R25, R26
6     10n     C_0603     0603_TYPE_B     C45, C46, C47, C48, C49, C50
1     10u     C_0805     0805_TYPE_A     C34
1     15EDGRC-3.5/6P     CON_TERMINAL_3.5MM_6-PIN     CON_TERMINAL_3.5MM_6-PIN     CN6
2     18p     C_0603     0603_TYPE_B     C56, C57
1     1k     R_0603     0603_TYPE_B     R13
1     1u     CPOL-EUSMCA     SMC_A     C31     POLARIZED CAPACITOR, European symbol
2     1u     C_0603     0603_TYPE_B     C36, C39
2     2.2u     CPOL-EUSMCA     SMC_A     C25, C28     POLARIZED CAPACITOR, European symbol
3     20k     R_0603     0603_TYPE_B     R16, R19, R22
4     22     R_0603     0603_TYPE_B     R2, R3, R4, R14
1     22uH     L-EUL3225M     L3225M     L1     INDUCTOR, European symbol
4     4.7u     CPOL-EUSMCA     SMC_A     C1, C33, C35, C37     POLARIZED CAPACITOR, European symbol
1     40_PIM_CON_0.5_MMWURTH     40_PIM_CON_0.5_MMWURTH     CON_FFC_40-PIN_0.5MM_WURTH-687140149022     CN2
1     5     R_0603     0603_TYPE_B     R15
1     8MHz     CRYSTAL_2PIN     CRYSTAL_3.2MM_2PIN     Q1
1     AP5724WG-7     AP5724     SOT23-6     IC4
1     AS4C4M16S-6BIN     SDRAM_16-BIT     TFBGA-54     IC2
1     IP4252CZ8-4-TTL,13     EMIF_4CH_IP4252     EMIF_4CH_IP4252     IC7
2     IRLML2246TRPBF     BSS84     SOT23     T1, T2     P-CHANNEL MOS FET
1     LD-BZEN-0803     BUZZER_01     BUZZER_01     BZ1
1     M95512-WMN6P     EEPROM_SPI_SO8     SO08     IC5
3     MAX31856MUD+     MAX31856MUD+     TSSOP14     IC8, IC9, IC10
1     MCP130T-300     MCP130     SOT-23-II     IC3
2     PMEG4005AEA.115     SMF5.0AT1     SOD123FL     D2, D3     200 W Transient Voltage Suppressor
1     SMLVT3V3     DIODE_SUPRESSOR_UNIDRECTIONALDO-214AA     DO-214AA     D1
1     STM32F429NI     STM32F429N     TFBGA     IC1
1     TSC2046     TSC2046     TSSOP16     IC11
1     W25Q32FVSSIG     EEPROM_SPI_SO8SOIC8_WIDE     SO08W     IC6
```

- Different file formats used
- BOM output from CAD system is limited - Cryptic description of component and package

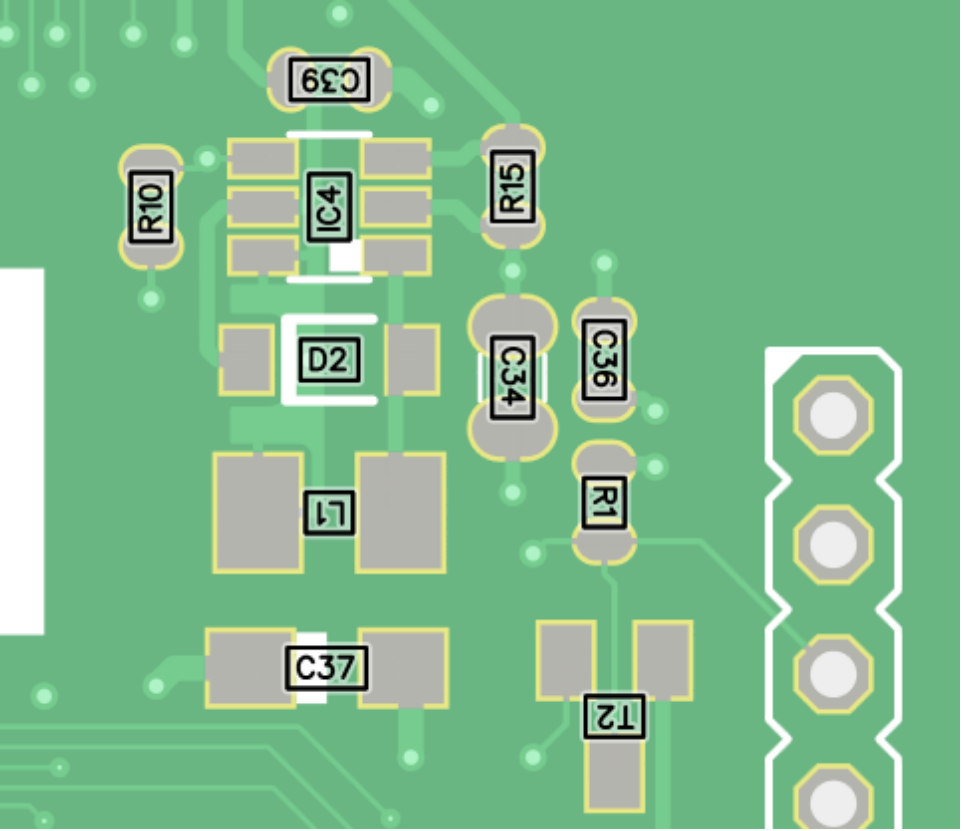


- BOM editor:
  - Detect BOM list format
  - Assign column types
  - Automated search

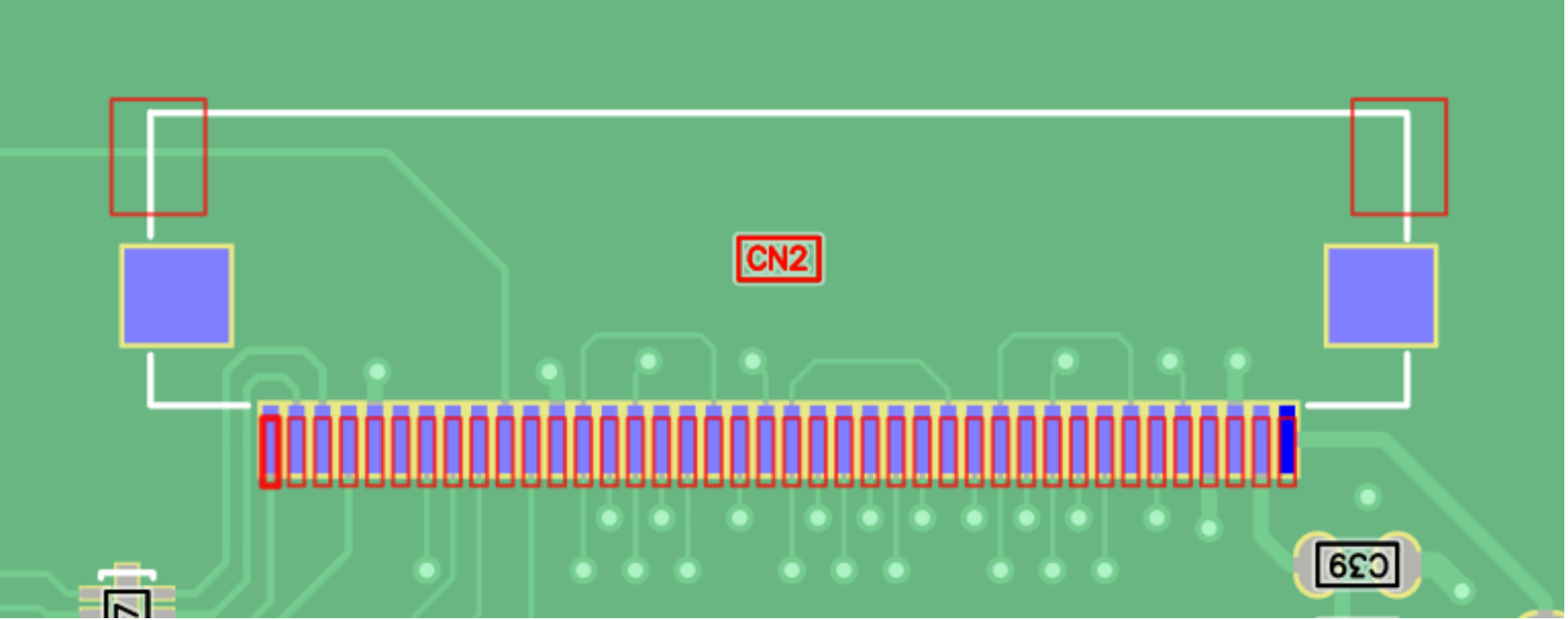




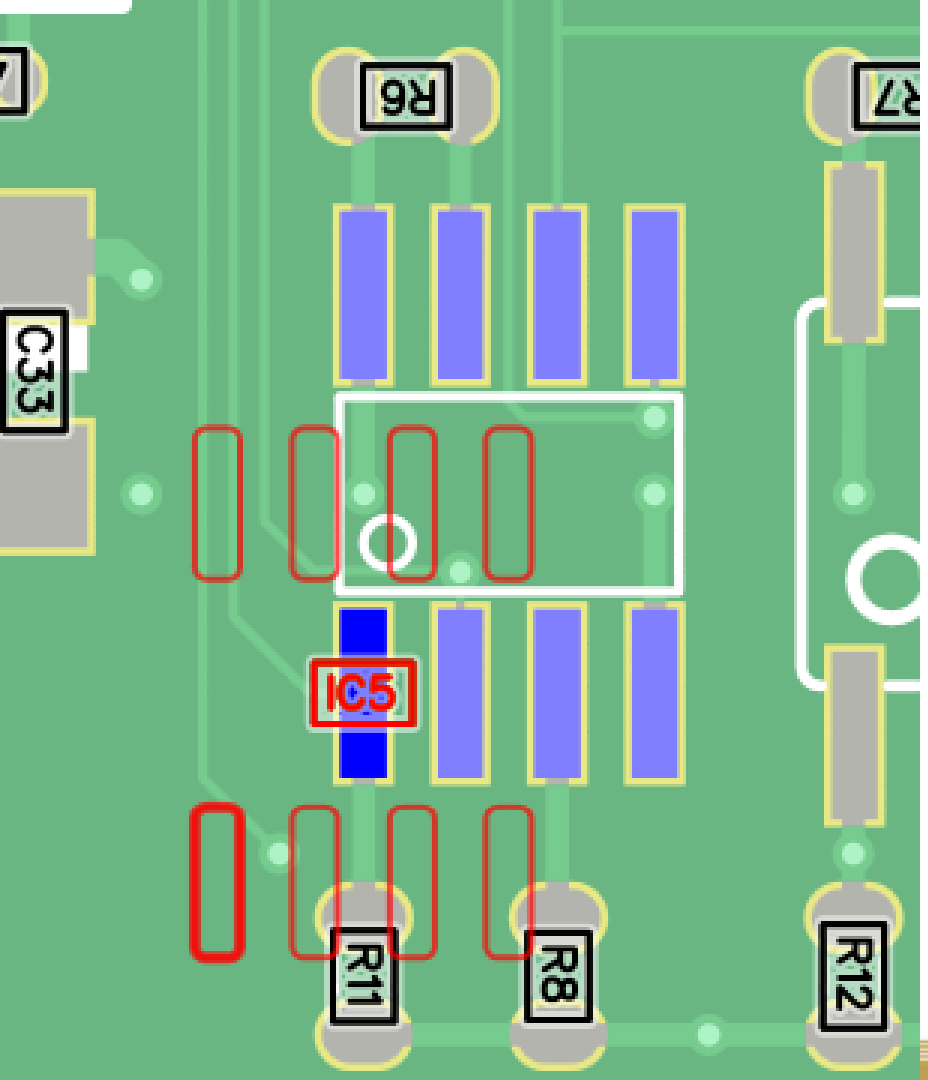
- BOM editor - Manual search
  - Integrated search on different sources
    - Eurocircuits component database
    - Supplier/Manufacturer websites
  - Direct access to spec sheets



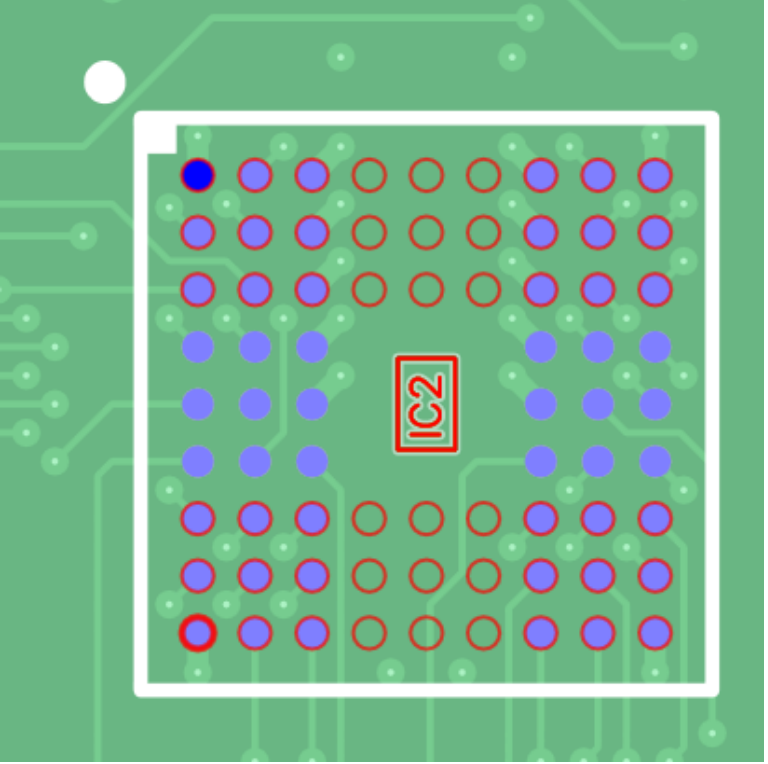
- CPL editor - Read and Visualize
  - Detect CPL format
  - Assign column types
  - Visualize component locations on PCB data

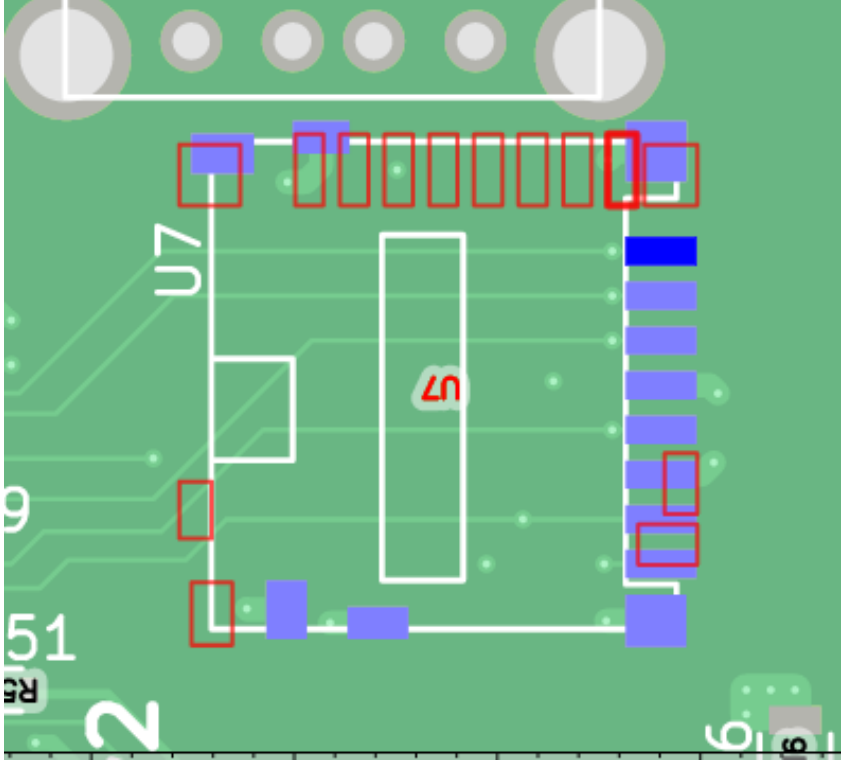


- Footprint – we check CAD-info against the eC-verified database
  - Incorrect component chosen. Same device available with different packages
  - Incorrect footprint definition in CAD library



- Location
  - PIN1 vs centroid location in CPL file





- Rotation
  - Each library can define its own default rotation
  - Verified against eC standard rotation

Package - HTSSOP-28

Package name: *

HTSSOP-28

IPC name: *

SOP29P65_970X640X120L60X24T340X970N

SOP29P65_970X640X120L60X24T340X970N.lbr edit file

Description:

Type:

SMD

Total solder points:

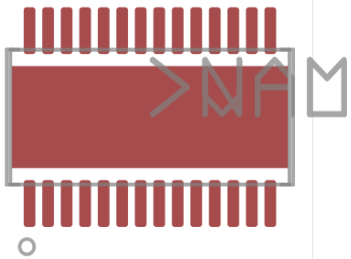
29

Package Info

Category:

Length:	Column Pitch:	Column Pins:
9.70	0.65	
Width:	**Row Pitch:**	**Row Pins:**
6.40		
Height:		**Pins:**
1.20		29

Diameter:

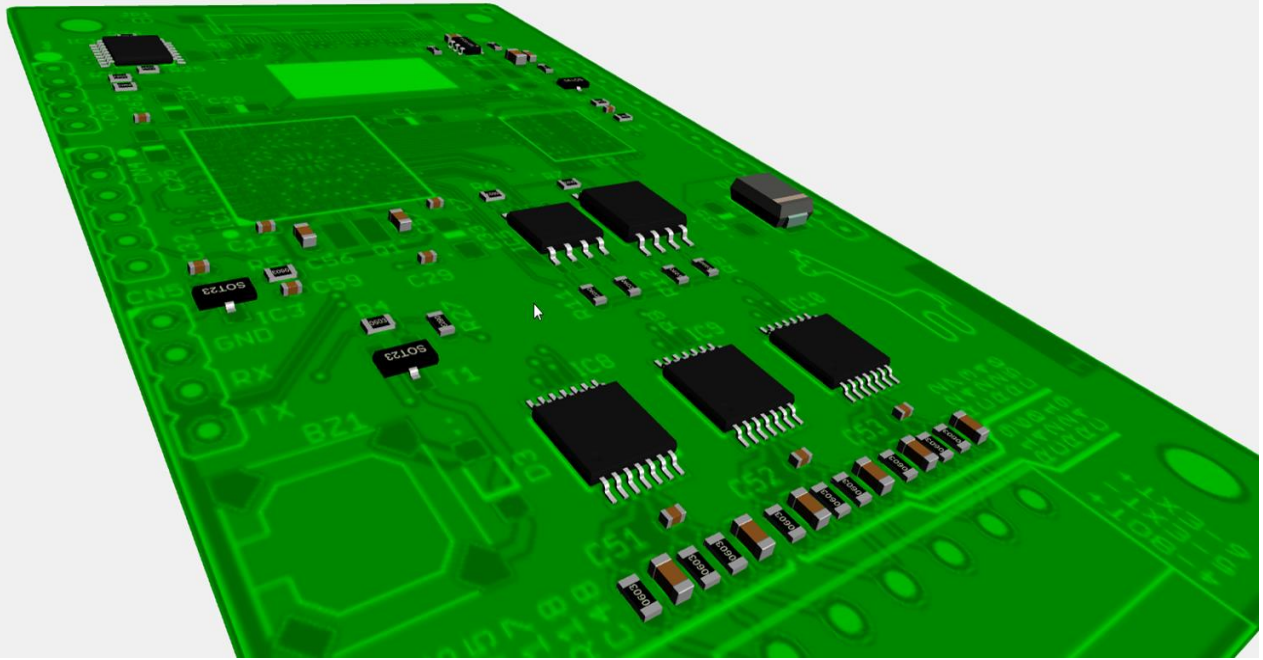


Close Save Save & New

Assembly Visualizer

the way to proceed

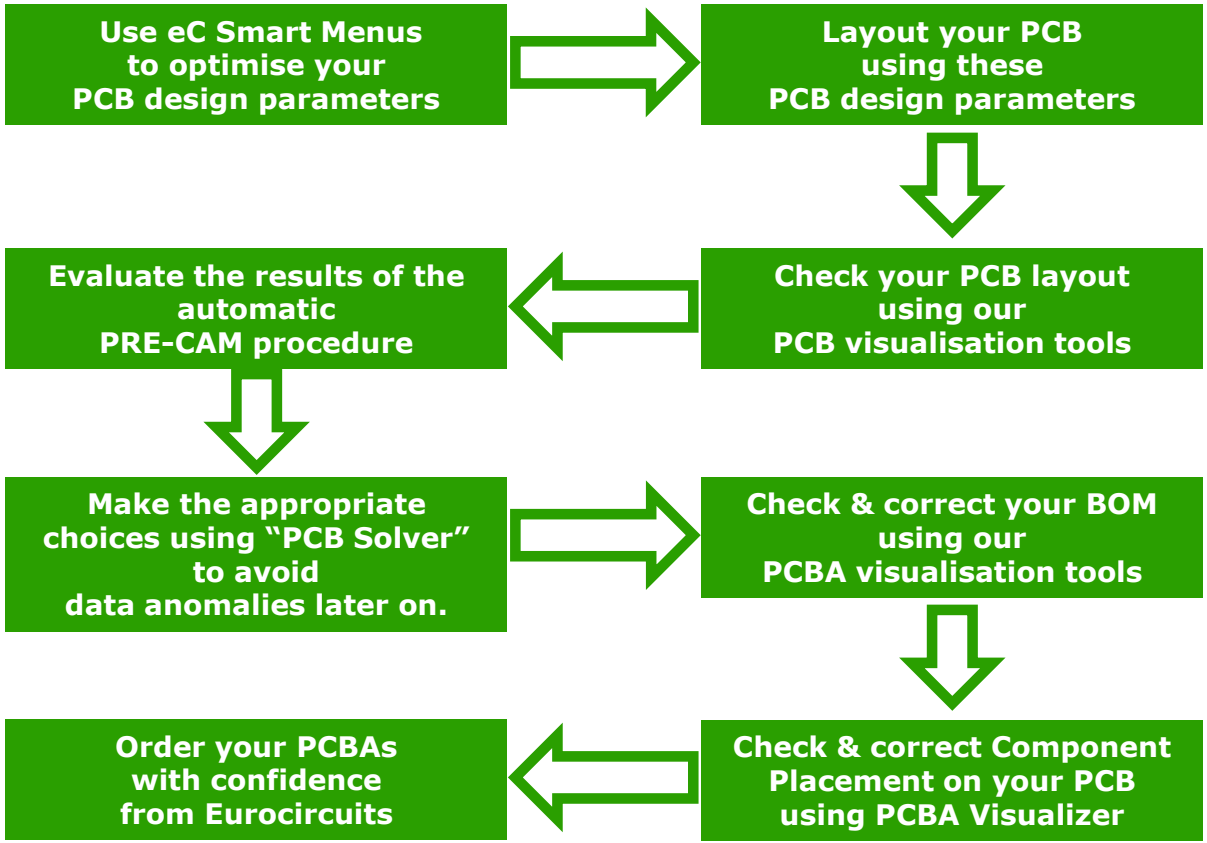
- eC-verified component database (DB)
  - Verified footprints (IPC-rules + Own practical experience)
  - Output to various CAD-packages



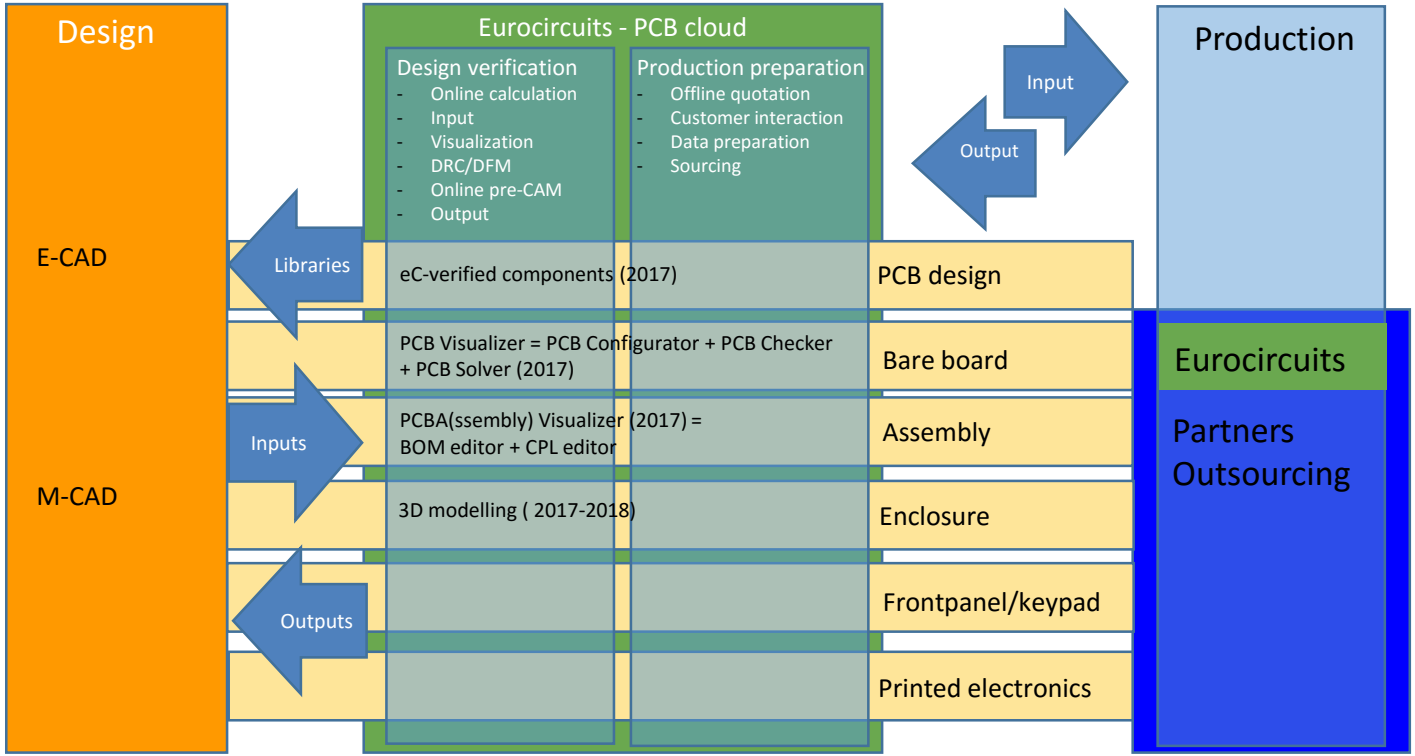
Assembly Visualizer

the way to proceed

- Eurocircuits CAM department
  - pool of electronics engineers for data preparation … to get a virtual 3D assembled board



Virtual PCBA production How?



Making electronic applications

EURO CIRCUITS

- Your board “right first time”
  - on time
  - accurate to your intentions
  - at best total cost
- Booth 7 F079
- Thanks