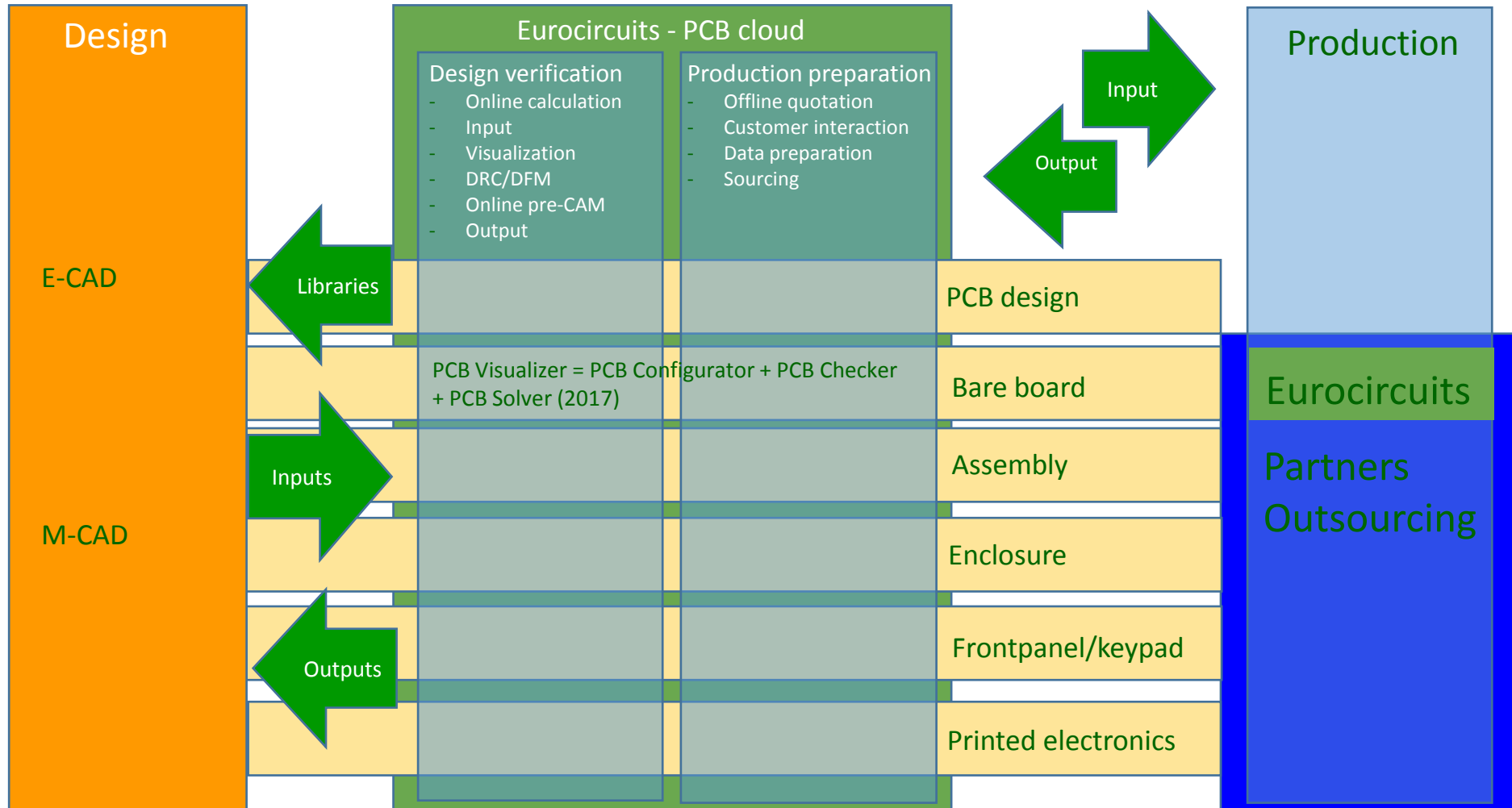


Virtual production in the eC-cloud

**Your Board produced
“right first time”**

D&E event 2016

Creating electronics



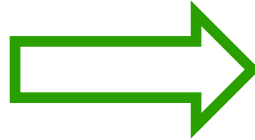
Virtual production - Goals

- Help busy designers get boards “right first time”
 - on time
 - accurate to their intentions
 - at best total cost
- Two inter-related topics
 - Design for Manufacturability (DFM)
 - What are the features that increase board costs?
 - What makes my board harder or impossible to make?
 - Clear data presentation and clear order details
 - How can I be sure the data transfer is accurate?
 - Are there any data issues that will delay delivery?

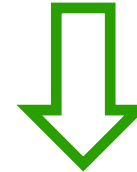
“Wonderful, but I barely have time to design the circuitry, let alone sort out fabrication.”

Virtual PCB production – How?

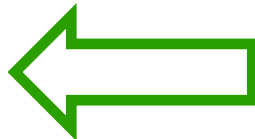
**Use eC Smart Menus
to optimise your
PCB design parameters**



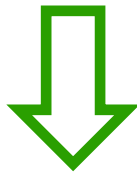
**Layout your PCB
using these
PCB design parameters**



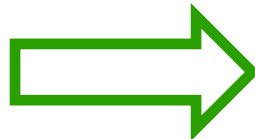
**Evaluate the results of the
automatic
PRE-CAM procedure**



**Check your PCB layout
using our
PCB visualisation tools**


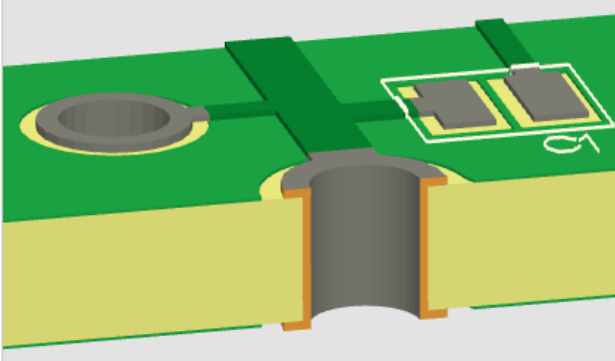


**Make the appropriate choices
using "PCB Solver" to avoid
data anomalies later on.**



**Order your PCBs
with confidence
from Eurocircuits**

Production panel efficiency

BINDI pool
Top view 


Delivery format eC-panel by Eurocircuits

Panel quantity 100

Delivery term 20 working days

Number of layers 2


PCB width (X) (mm) 55.00

PCB height (Y) (mm) 65.00


eC-registration compatible PCB ☒

Summary

Service	BINDI pool
Estimated shipment date	30-09-2016
Quantity	100 panels
Board surface / Order surface	6.21 dm² / 621.00 dm²
Prices	Net
Single panel	€ 16.23
Total boards	€ 1623.00
Express transport	€ 0.00
VAT 21.00%	€ 340.83
Total gross	€ 1963.83

 [Add to basket](#)

Stencils

Panel 

Repeat in X 4

Panel width (X) (mm) 230.00

PCBs per panel 16

Panel border 5.00 mm

Panel without cross outs ☐

Repeat in Y 4


Panel height (Y) (mm) 270.00


PCB separation method V-cutting

PCB spacing 0.00 mm

Panel outline V-cutting

Remarks

 The panel is marked as eC-registration compatible, but no stencils are ordered.

 Pooling conditions no longer met due to the following order details:

- Number of production panels

Production panel efficiency: 59%

[Improve panel efficiency and lower your price?](#)

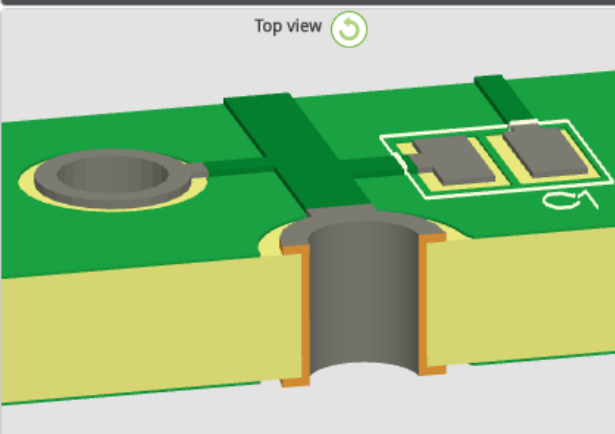
Alternatives [Customized matrix](#)

100 nanels 150 nanels 200 nanels

- 2-layer, 65x55mm in customer panel, +/- 1.600 pieces needed.
- Customer panel of 4x4 has a production panel efficiency factor of 59% and will result into a price per piece of $16.23\text{€}/16 = 1.014\text{€}$.

Production panel efficiency

BINDI pool



Top view

Delivery format: eC-panel by Eurocircuits

Panel quantity: 107

Delivery term: 20 working days

Number of layers: 2


PCB width (X) (mm): 55.00

PCB height (Y) (mm): 65.00

eC-registration compatible PCB ☒

Summary

Service	BINDI pool
Estimated shipment date	30-09-2016
Quantity	107 panels
Board surface / Order surface	5.84 dm² / 625.15 dm²
Prices	Net
Single panel	€ 10.64
Total boards	€ 1138.48
Express transport	€ 0.00
VAT 21.00%	€ 239.08
Total gross	€ 1377.56

 Add to basket

Remarks**Alternatives** Customized matrix

- Changing the customer panel to 5x3 will solve all remarks and results into a price per piece of $10.64\text{€}/15 = 0.709\text{€}$ or 30% less by simply permitting us to utilize the production panel space more efficiently.

PCB Configurator : Remove data ambiguities online

PCB Visualizer® v1.3-152-151013

PCB Configurator ☒ PCB Checker

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

Customer data

Imported 21 layers

STANDARD pool

Delivery format: eC-panel by Eur Panel quantity: 10
Delivery term: 7 working days Number of layers: 6
PCB width (X) (mm): 158.75 Measured: 158.75 mm
PCB height (Y) (mm): 69.85 Measured: 69.85 mm
eC-registration compatible PCB ☒
Commercial details 0

Stencils

Panel

Repeat in X: 2 Repeat in Y: 2
Panel width (X) (mm): 333.50 Panel height (Y) (mm): 155.70
PCBs per panel: 4 PCB separation method: Break routing
Panel border: 5.00 mm PCB spacing: 2.00 mm
Panel without cross outs ☐ Panel outline: Routing

Material

Technology

PCB definition

Top soldermask: Green Bottom soldermask: Green
Top legend: White Bottom legend: None
Surface finish: Any lead free fl Milling: No
Bare Board Testing ☒

Advanced options

Board buildup

1. Top view
2. Top solderpaste
3. Top legend
4. Top soldermask
5. Top copper
6. Inner copper 1
7. Inner copper 2
8. Inner copper 3
9. Inner copper 4
10. Bottom copper
11. Bottom soldermask
12. Plated drill
13. Non Plated Through Hole (NPTH)
14. Bottom view
15. Total material thickness: 1.56 mm

Detailed View

0. All Order details of your PCB.
1. Imported layers and the Buildup editor.
2. Graphical presentation of the Buildup.
3. Panel editor to define customer panels.
4. Classification wizard to determine the technology class of the PCB.
5. PCB PIXtore editor to integrate graphics onto your PCB.
6. Marking editor to manipulate all markings on the board.
7. The Visualization of your data, your virtual PCB.
8. The shown data set, customer data or production data.
9. The PCB Visualizer help function.
10. The price for your chosen combination of quantity and delivery term.
11. Save all changes to the basket item.
12. Launch an inquiry to be processed by our engineers and sales.
13. Remarks on your data versus order details, actions required.
14. Customized matrix to input your choice of quantity and delivery terms.
15. Automatically Chosen alternatives for Quantities and delivery terms.
16. On page online chat support.

Summary

Service	STANDARD pool
Delivery term	7 working days
Estimated shipment date	22-10-2015
Quantity	10 panels
Board surface / Order surface	5.19 dm² / 51.93 dm²
Price	Net
Single panel	€ 113.62
Total boards	€ 1136.18
Express transport	€ 0.00
VA 11 %	€ 238.60
Total gross	€ 1374.78

Save changes

Launch Inquiry

Remarks

The panel is marked as eC-registration compatible, but no stencils are ordered.

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

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

Alternatives

Customized matrix		
10 panels	20 panels	30 panels
10 working days	10 working days	10 working days
Net	Net	Net
€ 985.89	€ 1369.10	€ 1688.76
Select	Select	Select
10 panels	20 panels	30 panels
8 working days	8 working days	8 working days
Net	Net	Net
€ 108.61	€ 75.41	€ 62.02

Contact support

PCB Checker : Evaluate possible DRC issues

PCB Visualizer® V1.3-152-151013

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

DRC - DFM information

DRC Information | DFM Information

Layer	Required	Measured		
Outer layer trackwidth (OL-TW)				
Top copper	0.150 mm	0.150 mm		
Bottom copper	0.150 mm	0.150 mm		
Outer layer isolation distance (OL-TT-TP-PP)				
Top copper	0.125 mm	0.141 mm		
Bottom copper	0.125 mm	0.150 mm		
Outer layer annular ring (OAR)				
Top copper	0.125 mm	0.050 mm	32	10
Bottom copper	0.125 mm	0.050 mm	32	10
Inner layer trackwidth (IL-TW)				
Inner copper 1	0.150 mm	0.150 mm		
Inner copper 2	0.150 mm	0.150 mm		
Inner copper 3	0.150 mm	0.150 mm		
Inner copper 4	0.150 mm	0.150 mm		
Inner layer isolation distance (IL-TT-TP-PP)				

Board buildup

Top view

- Top solderpaste
- Top legend
- Top soldermask
- Top copper
- Inner copper 1
- Inner copper 2
- Inner copper 3
- Inner copper 4
- Bottom copper
- Bottom soldermask
- Plated drill
- Non Plated Through Hole
- Bottom view

Total material thickness: 1.56 mm

Detailed View

0. PCB Checker - DRC information
1. Detailed PCB parameter overview with fault indication
2. Detailed fault description
3. Bird eye view of all faults and repaired issues
4. Detailed zoom of the fault in the board
5. Remarks stay in sight
6. On page online chat support

Summary

Service	STANDARD pool
Delivery term	7 working days
Estimated shipment date	22-10-2015
Quantity	10 panels
Board surface / Order surface	5.19 dm² / 51.93 dm²
Prices	Net
Single panel	€ 113.62
Total boards	€ 1136.18
Express transport	€ 0.00
VAT 21.00%	€ 238.60
Total gross	€ 1374.78

[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 panel is marked as eC-registration compatible, but no stencils are ordered.
- The measured value for Outer layer annular ring (OAR) (0.050 mm) does not match any of the available options.
- The measured value for Inner layer annular ring (OAR) (0.050 mm) does not match any of the available options.

Alternatives

Customized matrix

10 panels 10 working days Net	20 panels 10 working days Net	30 panels 10 working days Net
€ 98.59	€ 68.45	€ 56.29
€ 985.89	€ 1369.10	€ 1688.76
Select	Select	Select

10 panels 8 working days Net	20 panels 8 working days Net	30 panels 8 working days Net
€ 108.61	€ 75.41	€ 62.02

Fault view

Outer layer annular ring (OAR) - Top copper

Current issue

Measured annular ring : 0.050 mm
Required annular ring : 0.125 mm
Tool diameter : 0.25 mm
Hole diameter : 0.15 mm
Calculated pad diameter : 0.350 mm

[More information can be found here.](#)

Bird's Eye View

PCB Checker : Evaluate possible DFM issues

PCB Visualizer® v1.3-152-151013

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

DRC - DFM Information

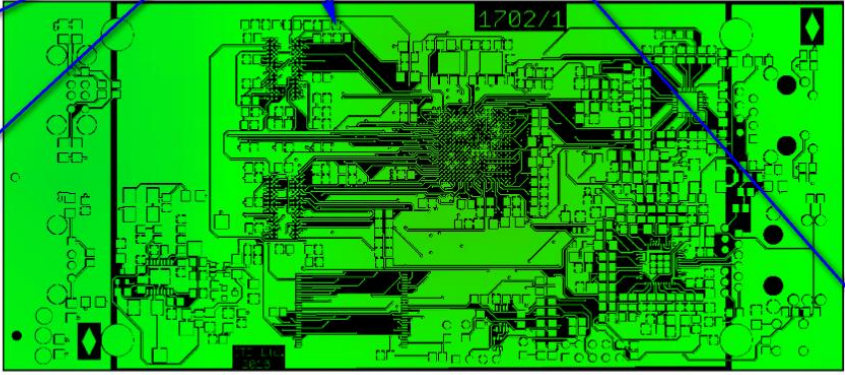
DRC information DFM information

Layer	Values
Plating	
Top copper	0.80
Bottom copper	0.71
Solderpaste surface	
Top solderpaste	1335.75 mm ²
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%

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



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](#).

Summary

Service	STANDARD pool
Delivery term	7 working days
Estimated shipment date	22-10-2015
Quantity	10 PCBs
Board surface / Order surface	1.11 dm ² / 11.09 dm ²
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	€ 699.46	€ 859.58
Select	Select	Select

[Contact support](#)

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PCB Solver : Auto repair Annular Ring issues




Board technology

Select classification

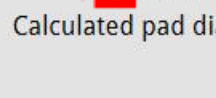
Outer layer trackwidth (OL-TW)	0.150 mm	Outer layer isolation distance (OL-TT-TP-PP)	0.150 mm
Outer layer annular ring (OAR)	0.125 mm	Smallest final hole	0.25 mm
Hole density	< 1000/dm²	Technology class	6C
Holes <= may be reduced	0.45 mm		

Fault view

Outer layer annular ring (OAR) - Top copper

☒  0 ☒  0 ☒  22

Current issue



	specified	repaired
Measured annular ring:	0.025 mm	0.150 mm
Required annular ring :	0.125 mm	
Tool diameter:	0.60 mm	0.35 mm
Hole diameter:	0.50 mm	0.25 mm
Calculated pad diameter :	0.650 mm	

⏪ < 1/22 > ⏩

$$AR = (Pad\ D - Tool\ D) / 2 \quad (Tool\ D = D\ drill\ bit)$$

Faulty AR = $(0.650\text{mm} - 0.60\text{mm}) / 2 = \mathbf{0.025\text{mm}}$

Repaired AR = $(0.650\text{mm} - 0.35\text{mm}) / 2 = \mathbf{0.150\text{mm}}$

PCB Solver : Outline Editor

PCB Visualizer® v1.3-166-151027

[illegible]

PCB Solver : Outline Editor

Outline editor - WDG demo outline (B0221812)

Layer list

140009_arduino_course_GBL - Bottom cop
140009_arduino_course_GBS - Bottom solc
140009_arduino_course_GTL - Top copper
140009_arduino_course_GTO - Top legend
140009_arduino_course_GTS - Top solderm
140009_arduino_course_TXT_plated - Plate
140009_arduino_course_TXT_unplated - Nc

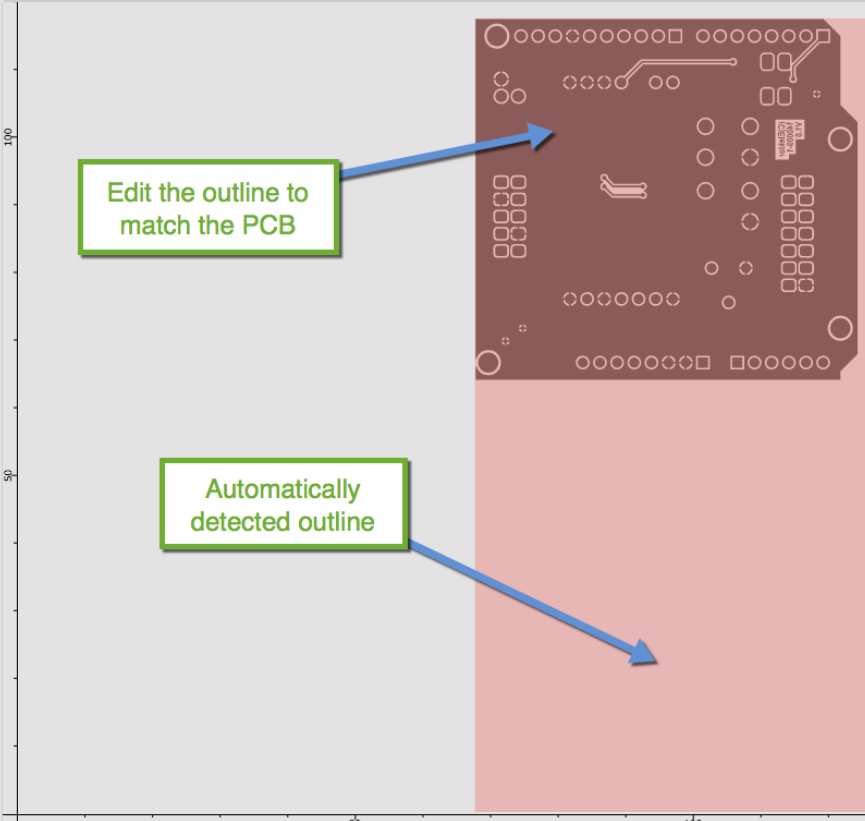
Board size

Measured: 58.57 x 117.29 mm
Required: 58.56 x 117.29 mm

Legend

- Board surface
- Board outline
- Object to pick
- Open chain end
- Small gap/Short chain
- Intersection

Layer image



Tools

- Undo last operation
- Redo last operation
- Reset
- Pick from selected layer
 - Pick single line/arc
 - Pick chain of lines/arcs
- Editing**
 - Draw line
 - Draw chain
 - Draw rectangle
 - Connect
 - Intersect
- Delete**
 - Delete single line/arc
 - Delete chain of lines/arcs
 - Delete selected lines/arcs
 - Delete selected chains
 - Delete all

Select one of the tools to edit the outline.

Cancel Apply

PCB Solver : Milling Editor

Outline/Milling editor - WDG seminar outline (B0801482)

Layer list

140009_arduino_course_GBL - Bottom cop
140009_arduino_course_GBS - Bottom sol
140009_arduino_course_GTL - Top copper
140009_arduino_course_GTO - Top legend
140009_arduino_course_GTS - Top solderr
1400 ... ourse_TXT_plated - Plated drill
1400 ... rse_TXT_unplated - Non Plated Th
Top preview
Bottom preview

Board size

Measured: 56.52 x 53.40 mm
Required: 58.63 x 117.28 mm

Legend

- Board surface
- Board outline
- Object to pick
- Open chain end
- Small gap/Short chain
- Intersection

Layer image

Outline editor
Select elements to build a closed outline contour.

Milling editor
Selecting slots or internal routings adds them to the routing data.

Click to add the highlighted chain.

Cancel Apply

Tools

- Undo last operation
- Redo last operation
- Reset

Pick from selected layer

- Outline candidates
- Pick single line/arc
- Pick chain of lines/arcs

Editing

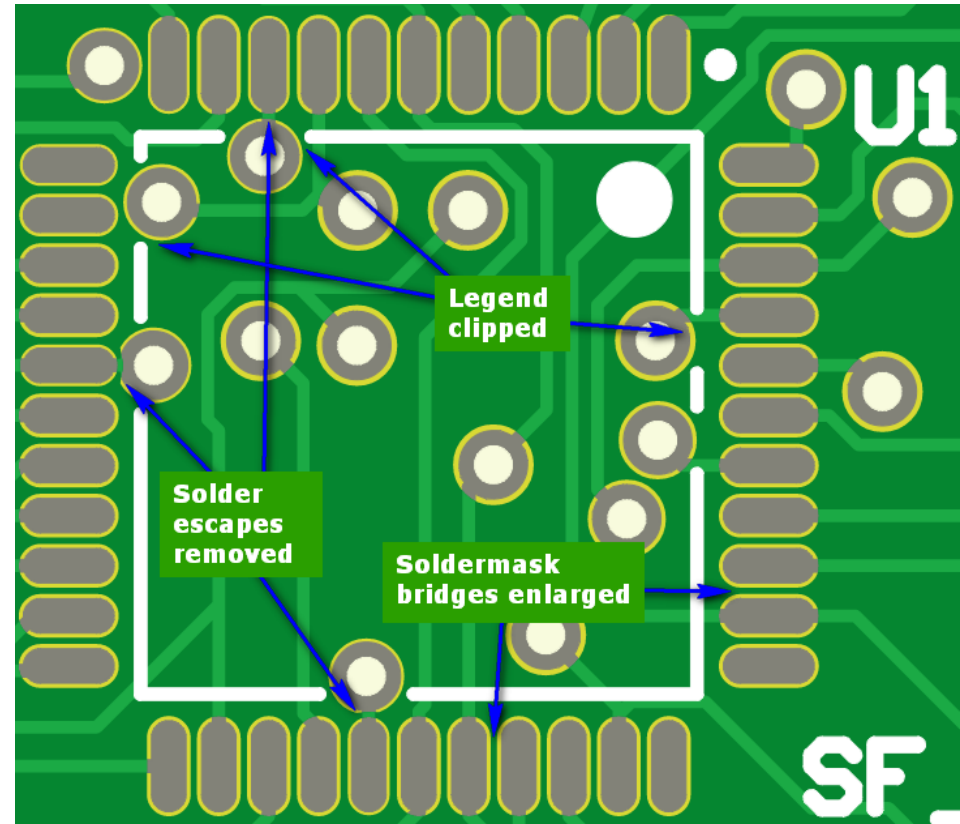
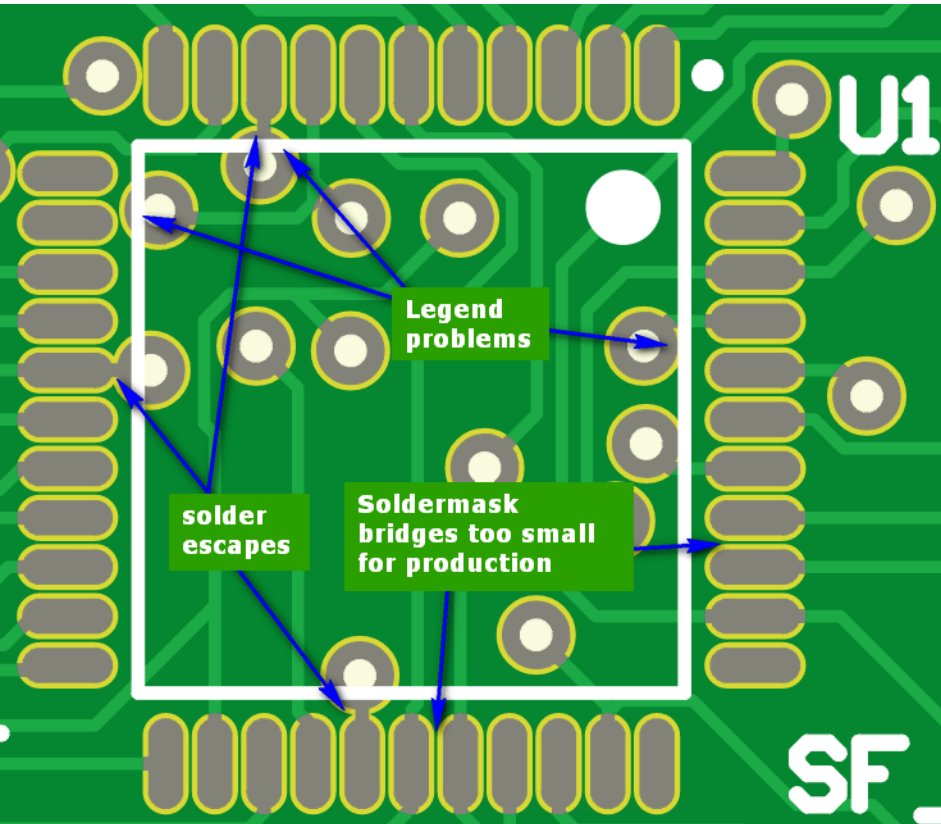
- Draw line
- Draw chain
- Draw rectangle
- Connect
- Intersect

Delete

- Delete single line/arc
- Delete chain of lines/arcs
- Delete selected lines/arcs
- Delete selected chains
- Delete all

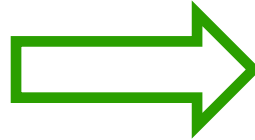
Picks a chain of objects from the reference layer.
Click to add the highlighted chain.
The available chains are shown in blue.
Press ESC to stop editing.

PCB Solver : some more examples



Making PCBs in the eC-cloud

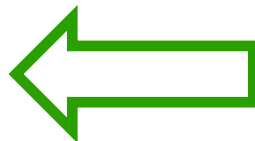
Use eC Smart Menus
to optimise your
PCB design parameters



Layout your PCB
using these
PCB design parameters



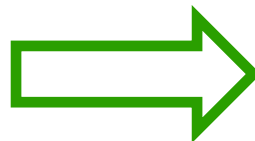
Evaluate the results of the
automatic
PRE-CAM procedure



Check your PCB layout
using our
PCB visualisation tools

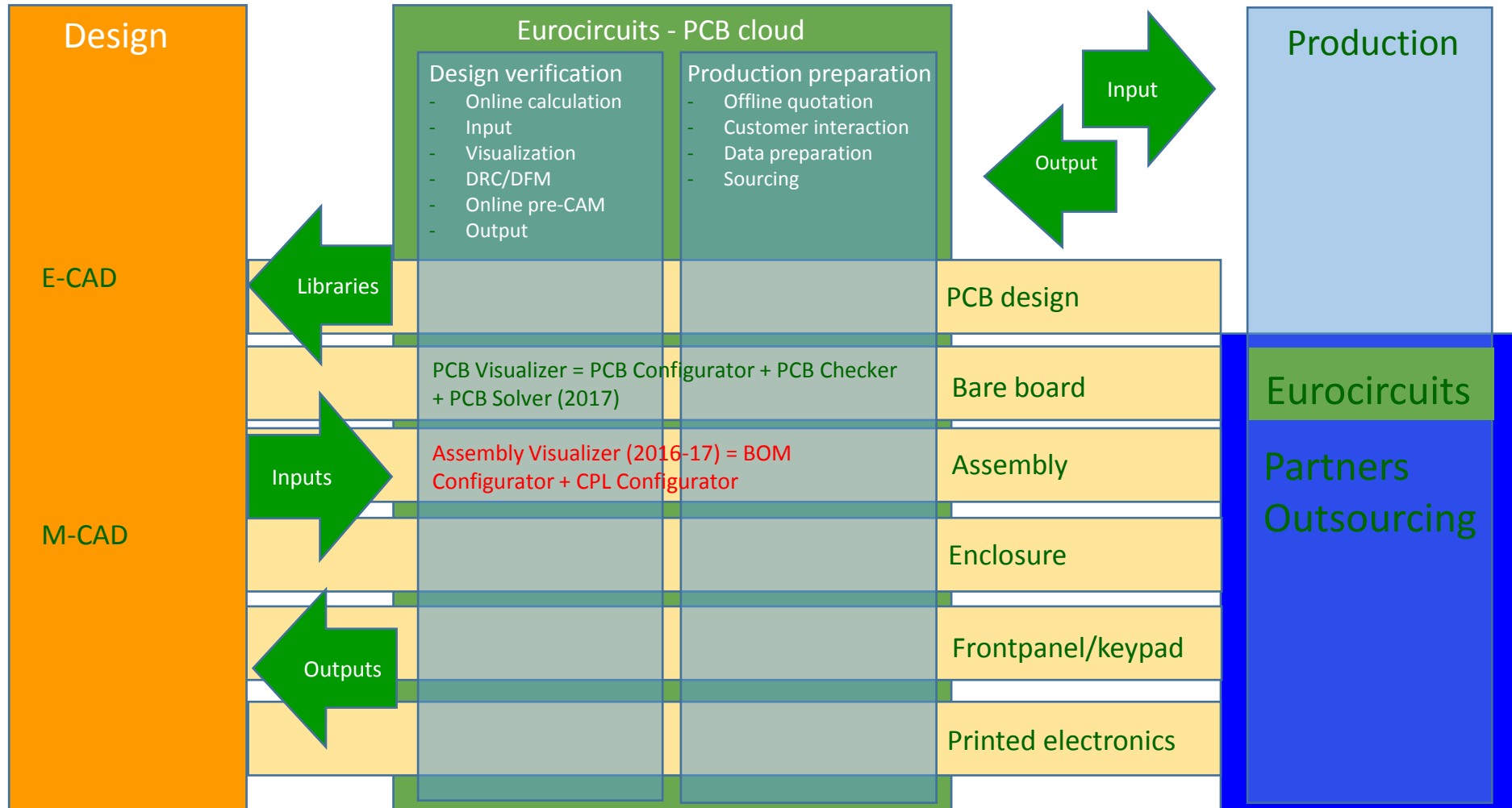


Make the appropriate choices
using "PCB Solver" to avoid
data anomalies later on.



Order your PCBs
with confidence
from Eurocircuits

Prototype assembly



Prototype assembly - Target

- We created a system that works for PCB production
 - Order pooling to cut costs
 - Cooperate with our designer customer for data prep
- We have
 - + 11.000 active Eurocircuits customers
 - + 100.000 orders/year in PCB prototyping and small batches.
 - + 300.000 jobs/year analysed through PCB Visualizer.
- We want to
 - Guide designers to create an electronic assembly that can be produced without unnecessary complications
 - Streamline the communication between designer and producer

Prototype assembly - hurdles

- BOM output from CAD system is limited
- Cryptic description of component and package

	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	POLARIZED CAPACITOR, European symbol
17	2	1u	C_0603	0603_TYPE_B	C36, C39	
18	2	2.2u	CPOL-EUSMCA	SMC_A	C25, C28	POLARIZED CAPACITOR, European symbol
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	INDUCTOR, European symbol
22	4	4.7u	CPOL-EUSMCA	SMC_A	C1, C33, C35, C37	POLARIZED CAPACITOR, European symbol
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	IP4252C28-4-TTL,13	EMIF_4CH_IP4252	EMIF_4CH_IP4252	IC7	
29	2	IRLML2246TRPBF	BSS84	SOT23	T1, T2	P-CHANNEL MOS FET
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 Transient Voltage Suppressor
35	1	SMLVT3V3	DIODE_SUPRESSOR_UNIDIRECTION	DO-214AA	D1	
36	1	STM32F429NI	ALDO-214AA	TFBGA	IC1	
37	1	TSC2046	STM32F429N	TSSOP16	IC11	
38	1	W25Q32FVSSIG	TSC2046	SO08W	IC6	
			EEPROM_SPI_SO8SOIC8_WIDE			

Prototype assembly - hurdles

- Assembler must perform lookup while the knowledge about the selected components is with the designer
 - Overhead for assembler to prepare quotation => Too expensive for prototypes or small series.
 - Communication between assembler and designer
 - Incorrect interpretations
- Heavy logistics for a small job

Prototype assembly - solution

- Supply tools to the designer to:
 - complete/validate the BOM (**B**ill **O**f **M**aterials)
 - complete/validate the CPL (**C**omponent **P**lacement **L**ist)
 - communicate between designer and production
 - create output to order assembly
- Eurocircuits Assembly Visualizer:
 - BOM Configurator (analyses + editing)
 - CPL Configurator (Virtual placement + editing)
 - eC-communicator (communication tool: designer-producer)
 - eC-generator (generation of outputs: PCB Gerber X2, Validated BOM, validated CPL, ...)

Assembly Visualizer – Step 1

- Read BOM list with intelligent tools
 - Detect BOM list format
 - Assign column types
 - Automated search

Upload BOM

Choose columns to be used

Mapping of at least one column out of MPN, Description or Package name. And, one out of Quantity and Reference designators is mandatory.

Back Submit

Row Nr.	Qty	Value	Description	Device	Package	Parts
	Quantity	Value	Description	Comment	Package name	Reference Designator
2	1	JP_1X14	CONNECTOR	Control Board	JP_1X14	CN1
3	1	JP_1X4	CONNECTOR	Control Board	JP_1X4	CN5
4	1	JP_1X5	CONNECTOR	Control Board	JP_1X5	CN3
5	1	JP_1X6	CONNECTOR	Control Board	JP_1X6	CN4
6	1	15EDGRC-3.5/6P	CONNECTOR	Control Board	CON_TERMINAL_3.5MM_6-PIN	CN6
7	1	15EDGK-3.5/6P	CONNECTOR	Control Board	CON_TERMINAL_3.5MM_6-PIN	CN6-pair
8	0	40_PIM_CON_0.5_MMHIROSE	CONNECTOR	Control Board	40_PIN_CON_0.5_MM_02	CN2
9	1	40_PIM_CON_0.5_MM	CONNECTOR	Control Board	40_PIN_CON_0.5_MM_02	CN2
10	2	18p SMD-0603	CAPACITOR	Control Board	0603_TYPE_B	C56, C57
11	6	10n 50V SMD-0603	CAPACITOR	Control Board	0603_TYPE_B	C45, C46, C47, C48, C49, C50
12	40	100n 16V X7R SMD-0402	CAPACITOR	Control Board	0402_TYPE_C	C2, C3, C4, C5, C6, C7, C8, C9, C10, C11, C12, C13, C14, C15, C16, C17, C18, C19, C20, C21, C22, C23, C24, C26, C27, C29, C30, C32, C38, C40, C41, C42, C43, C44, C51,
13	2	1u 25V SMD-0603	CAPACITOR	Control Board	0603_TYPE_B	C36, C39
14	1	1u Tantal	CAPACITOR	Control Board	SMC_A	C31
15	2	2.2u Tantal	CAPACITOR	Control Board	SMC_A	C25, C28
16	4	4.7u Tantal	CAPACITOR	Control Board	SMC_A	C1, C33, C35, C37
17	1	10u 16V XSR SMD-0805	CAPACITOR	Control Board	0805_TYPE_A	C34
18	1	8MHz	CRYSTAL	Control Board	CRYSTAL_3.2MM_2PIN	Q1
19	1	SMLVT3V3	DIODE	Control Board	DO-214AA	D1
20	2	PMEG4005AEA.115	DIODE	Control Board	SOD123FL	D2, D3
21	1	STM32F429NI - MCU	IC	Control Board	TFBGA	IC1
22	1	AS4C4M165-6BIN - SDRAM	IC	Control Board	TFBGA-54	IC2
23	1	MCP130T-300 - RESET	IC	Control Board	SOT-23-II	IC3

Assembly Visualizer – Step 2

- Manual search if automated results are ambiguous
 - Integrated search on different sources
 - Eurocircuits component database
 - Supplier/Manufacturer websites
 - Direct access to spec sheets

Search parts

Your part:

MPN	Manufacturer	Description	Package	Supplier	SPN	Library	Value	Mounting	Comment	URL
		IC	SO08W				W25Q32FVSSIG - FLASH			Control Board

MPN Package Description

Search result (Eurocircuits):

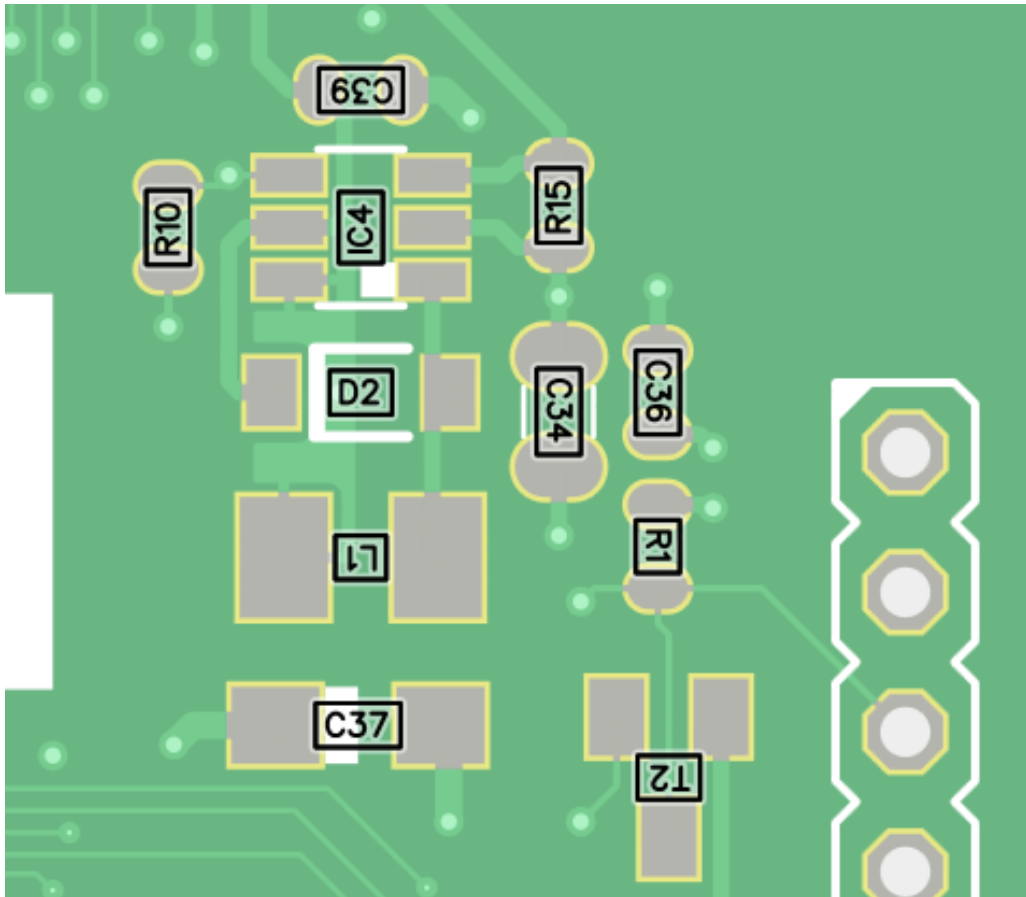
	MPN	Manufacturer	Description	IPC	Datasheet	Supplier	Price	Stock	Verified
<input type="checkbox"/>	AD633JNZ	Analog Devices	Multiplier IC [Analog Devices] AD633JNZ Multiplier IC	DIP762W45P254L1016H533Q8		Eurocircuits	0	0	No
<input type="checkbox"/>	SN74LVC1G32DBVR	Texas Instruments	Logic IC [Texas Instruments] SN74LVC1G32DBVR Logic IC	SOT23-5P95_280X145L45X40		Eurocircuits	0	0	No
<input type="checkbox"/>	SN74AHC1G04DBVR	Texas Instruments	Logic IC [Texas Instruments] SN74AHC1G04DBVR Logic IC	SOT23-5P95_280X145L45X40		Eurocircuits	0	0	No
<input type="checkbox"/>	SN75LBC176DR	Texas Instruments	Logic IC [Texas Instruments] SN75LBC176DR Logic IC	SOIC8P127_490X600X175L83X41N		Eurocircuits	0	0	No
<input type="checkbox"/>	ADM232LJRZ	Analog Devices	Interface IC [Analog Devices] ADM232LJRZ Interface IC	SOIC16P127_990X600X175L83X41N		Eurocircuits	0	0	No
<input type="checkbox"/>	SN74AHC1G32DBVR	Texas Instruments	Logic IC [Texas Instruments] SN74AHC1G32DBVR Logic IC	SOT23-5P95_280X145L45X40		Eurocircuits	0	0	No
<input type="checkbox"/>	SN74LVC1G08DBVT	Texas Instruments	Logic IC [Texas Instruments] SN74LVC1G08DBVT Logic IC	SOT23-5P95_280X145L45X40		Eurocircuits	0	0	No
<input type="checkbox"/>	SN74AHC1G32DBVR	Texas Instruments	Logic IC [Texas Instruments] SN74AHC1G32DBVR Logic IC	SOT23-5P95_280X145L45X40		Eurocircuits	0	0	No
<input type="checkbox"/>	LMD18200T/NOPB	Texas Instruments	Motor Driver IC [Texas Instruments] LMD18200T/NOPB Motor Driver IC	TO170P2002X462X2479-11		Eurocircuits	0	0	Yes
<input type="checkbox"/>	L293DNE	Texas Instruments	Motor Driver IC [Texas Instruments] L293DNE Motor Driver IC	DIP762W46P254L1931H508Q16B		Eurocircuits	0	0	No

Search result (Octopart):

	MPN	Manufacturer	Description	IPC	Datasheet	Supplier	Price	Stock	Verified
<input type="checkbox"/>	MAX232CPE+	Maxim Integrated	Dual Transmitter/Receiver RS-232 16-Pin PDIP N			Newark	5.607	14	No
<input type="checkbox"/>	MCP2122-E/P	Microchip	Infrared Encoder/Decoder 8-Pin PDIP Tube			Arrow	0.5918	600	No
<input type="checkbox"/>	C55460A-BSZ	Cirrus Logic	IC ENERGY METERING 1PHASE 24SSOP - C55460A-BSZ			Digi-Key	4.41	464	No

Assembly Visualizer – Step 3

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

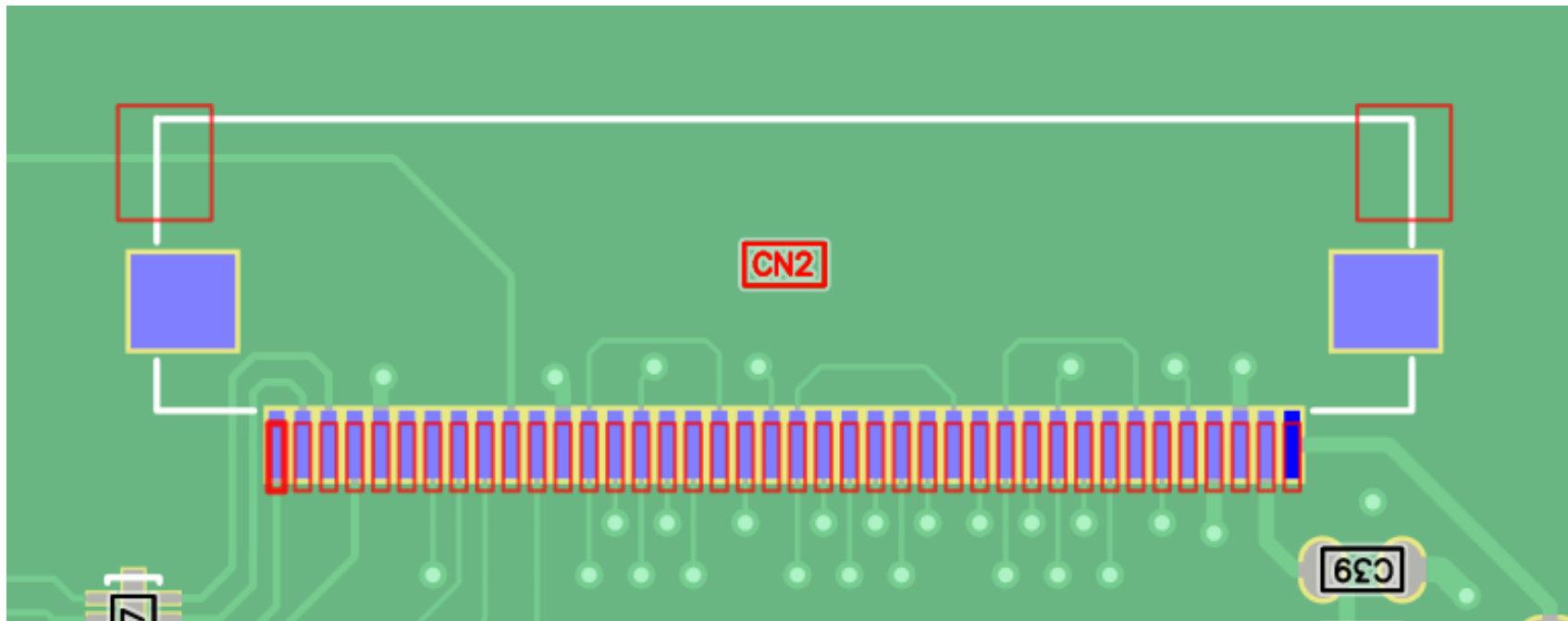


Assembly Visualizer – Step 4

- Visually validate component data:
 - Visualize component footprints on top of board data
 - PIN1 of component footprint against board legend data or board PIN1 copper pad.
- In other words – check:
 - Footprint
 - Location
 - Rotation

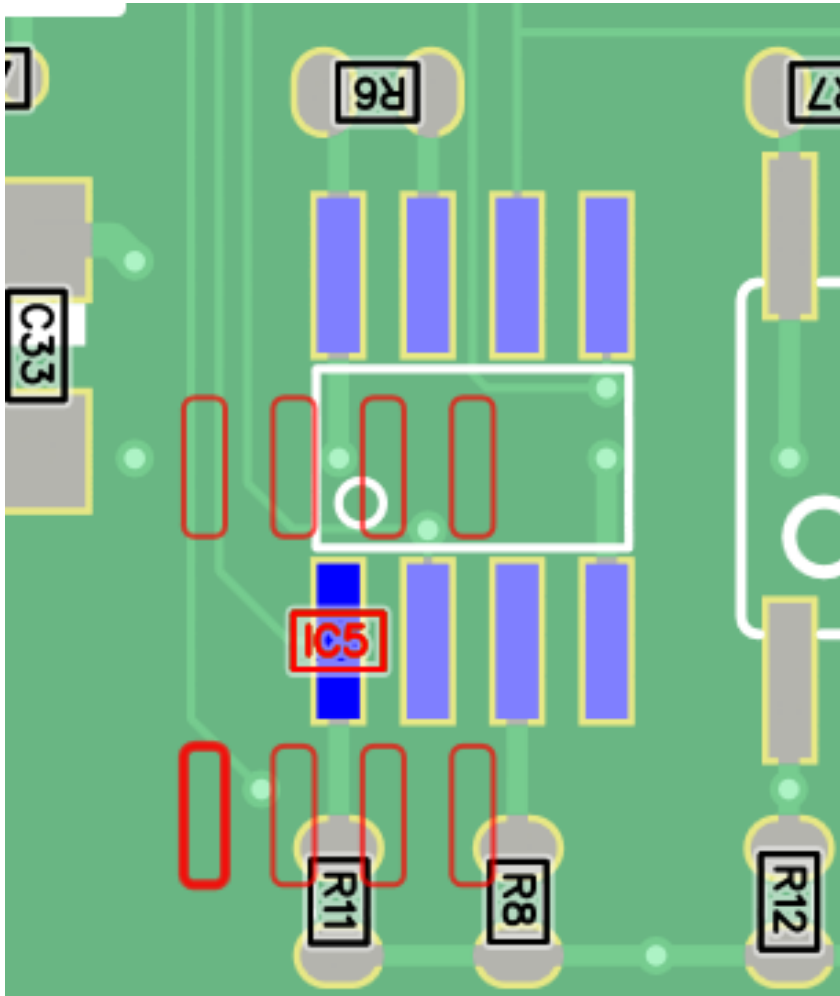
Assembly Visualizer – Step 4

- Footprint
 - Incorrect component chosen. Same device available with different packages
 - Incorrect footprint definition in CAD library



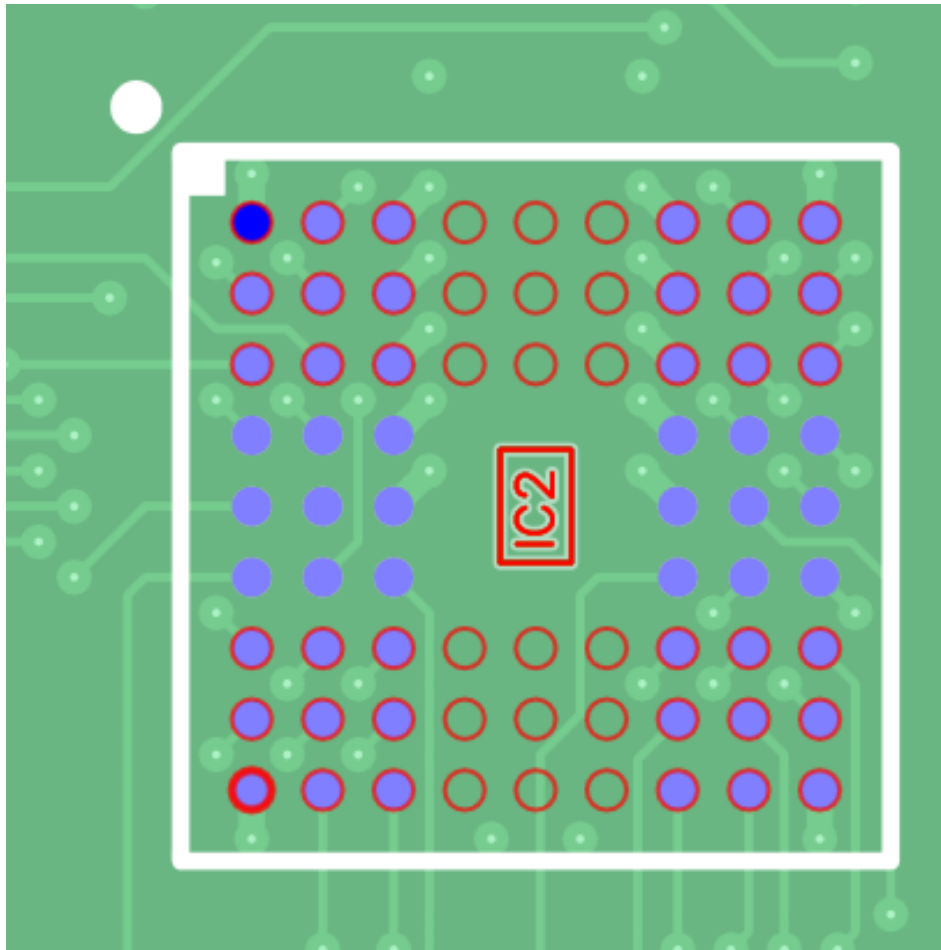
Assembly Visualizer – Step 4

- Location
 - PIN1 vs centroid location in CPL file



Assembly Visualizer – Step 4

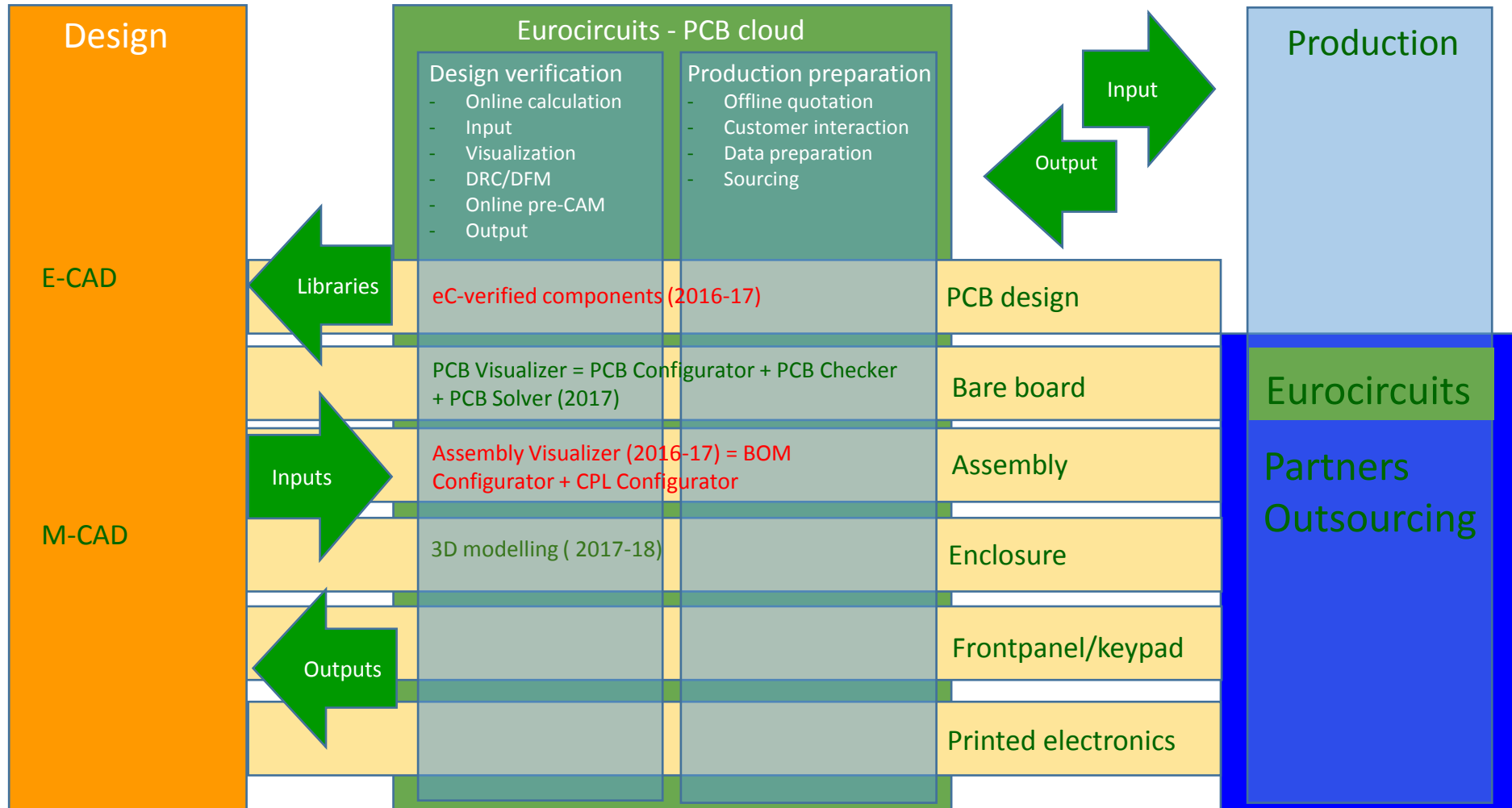
- Rotation
 - Each library can define its own default rotation
 - Verified against eC standard rotation



Assembly Visualizer – Step 5

- eC-generator (generation of outputs):
 - Validated BOM
 - Validated CPL
 - 3-D data (pdf)
- Your board “right first time”
 - on time
 - accurate to your intentions
 - at best total cost

Future Tools



Assembly Visualizer – future

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

Package - HTSSOP-28

Package name: *

HTSSOP-28

IPC name: *

SOP29P65_970X640X120L60X24T340X970N

SOP29P65_970X640X120L60X24T340X970N.lib [edit file](#)

Description:

Type:

SMD

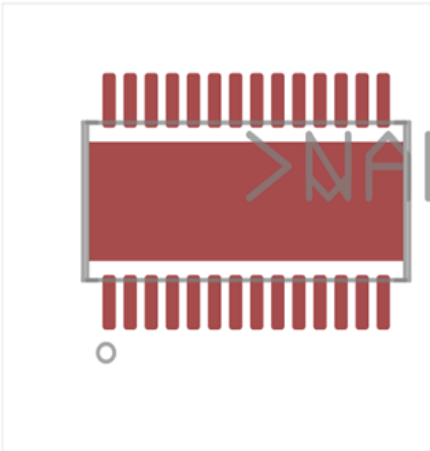
Total solder points:

29

Package Info

Category:

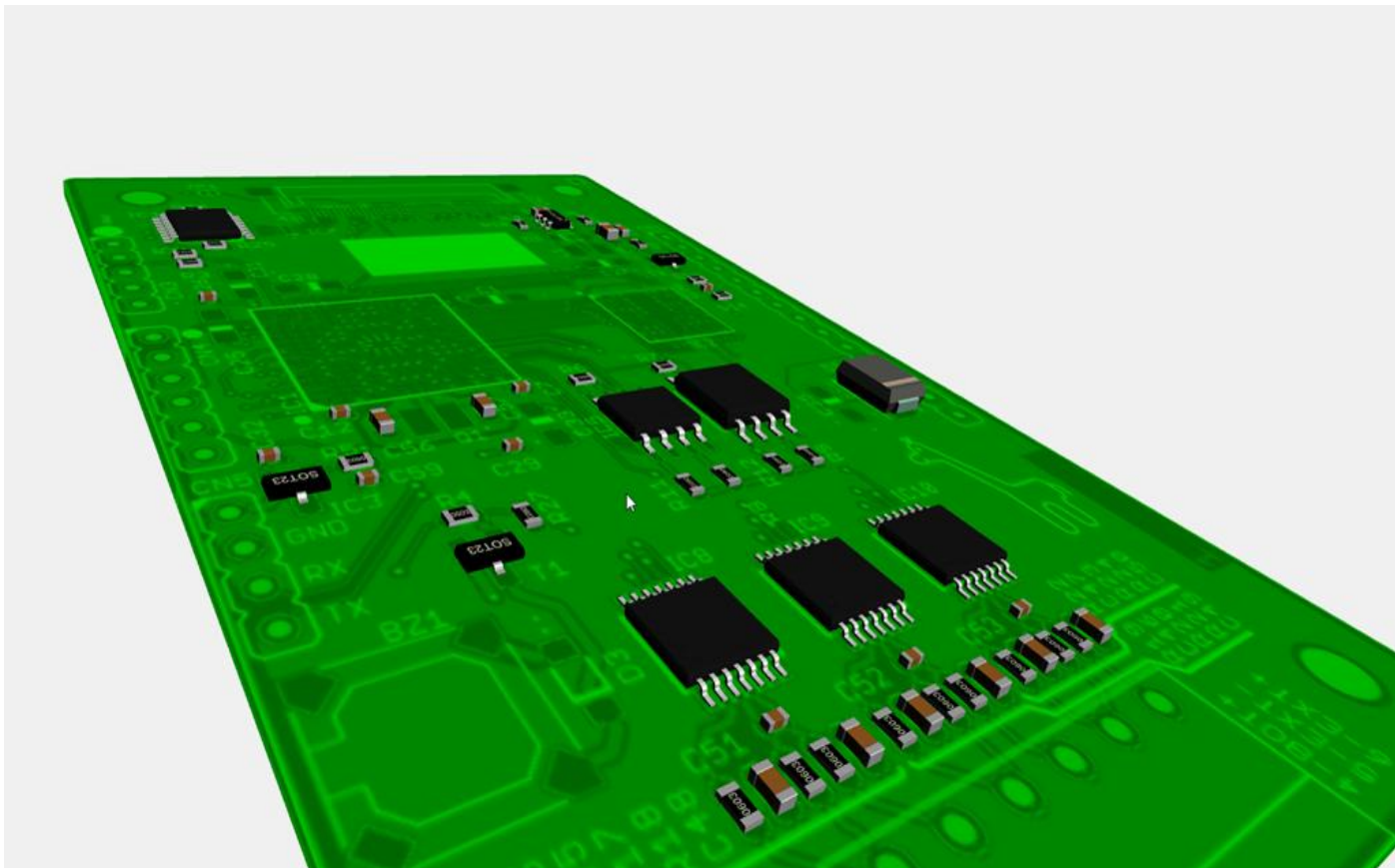
Length:	Column Pitch:	Column Pins:
9.70	0.65	
Width:	Row Pitch:	Row Pins:
6.40		
Height:		Pins:
1.20		29
Diameter:		



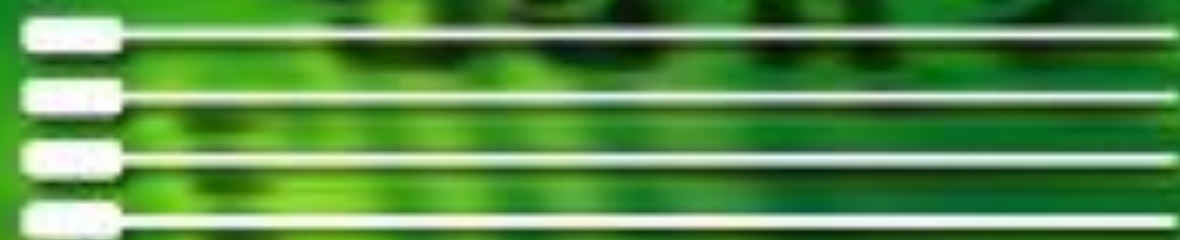
Close Save Save & New

Assembly Visualizer – future

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



EURO



CIRCUITS