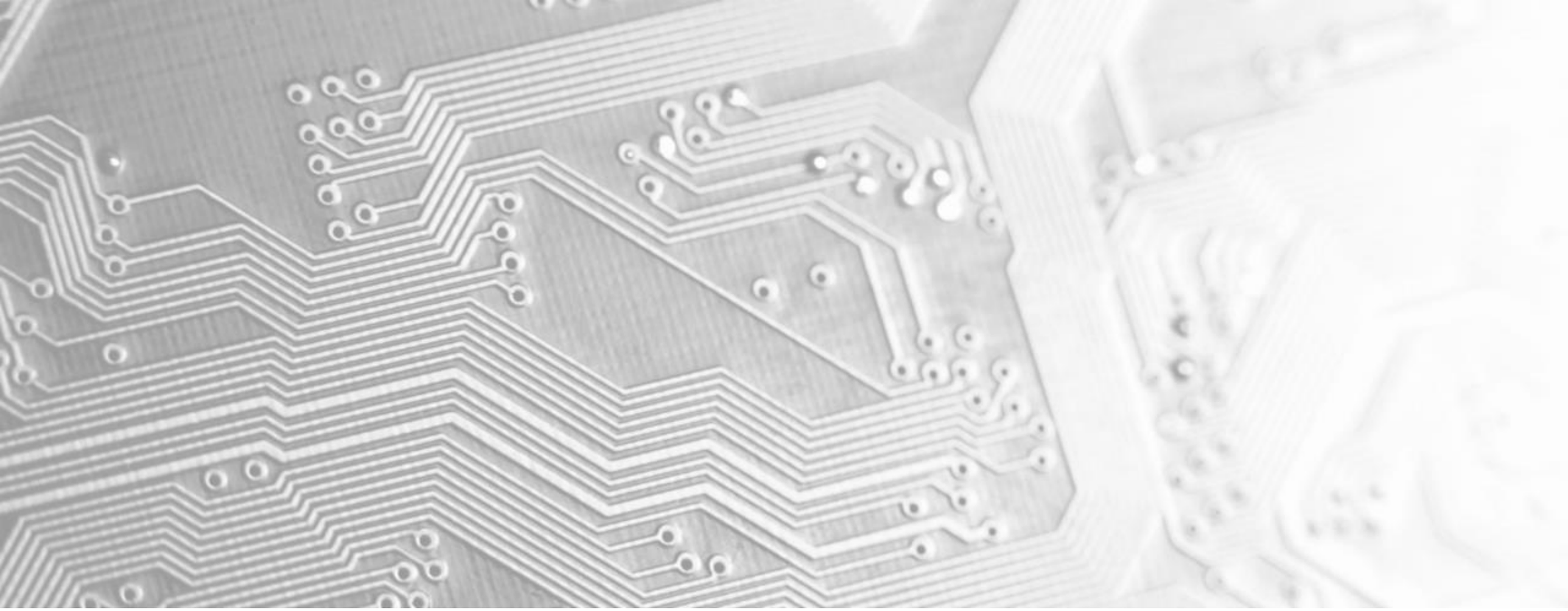


Integr8tor v8.2

Ucamco

CONFIDENTIAL

Integr8tor

Version 8.2

64 Bit

Multi Core

Introduction

We are pleased to announce the release of version 8.2 of Integr8tor.

Integr8tor v8.2 offers significant improvements, better quality and a number of bug fixes, as well as expanded functionality, as explained in these release notes.

We recommend that you install version 8.2 as soon as possible.

Overview

New Functionality and Enhancements

Input & Workflow

- Detection and flagging of duplicate input archives
- Support for password-encrypted archives
- Improved visualization of drawing input files
- Automatic processing of only the most recent ODB dataset where an archive contains multiple such datasets
- Better automatic stackup recognition
- Better registration after stackup changes
- Elimination of false errors in net compare
- Improved polarity recognition

Overview

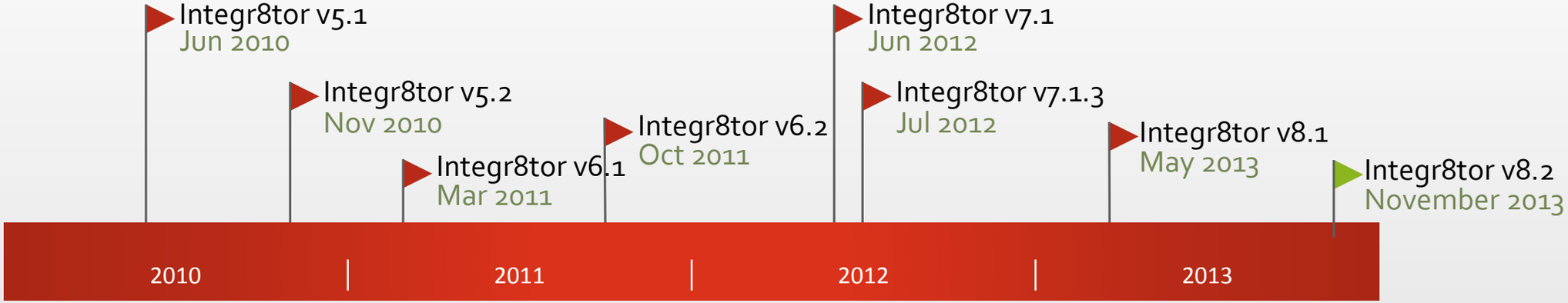
New Functionality and Enhancements

QED

- Summary section split into separate blocks
- Edge connector recognition plus area computation
- Improved SMD pad reporting
- BGA pad recognition
- New rule check of (non-)centered tracks flanked by BGA pads
- Extended Polar information

Release history

Commitment on regular updates



Version	Release date	Highlights
5.1	July 2010	• Multiple job submit via email. • CAM input report.
5.2	November 2010	• Copper clearances by type. • Scoring calculation.
6.1	March 2011	• Perspectives in Cockpit. • Improved performance.
6.2	November 2011	• Multiple QED reports. • Exposed copper calculation.
7.1	June 2012	• Localized interface. • Line width on planes.
7.1.3 maintenance release	July 2012	• Bug fix release for recovered job.
8.1	May 2013	• Support for ODB++ v7 • Compatible with Windows server 2012 and windows 8
8.2	November 2013	• See release notes

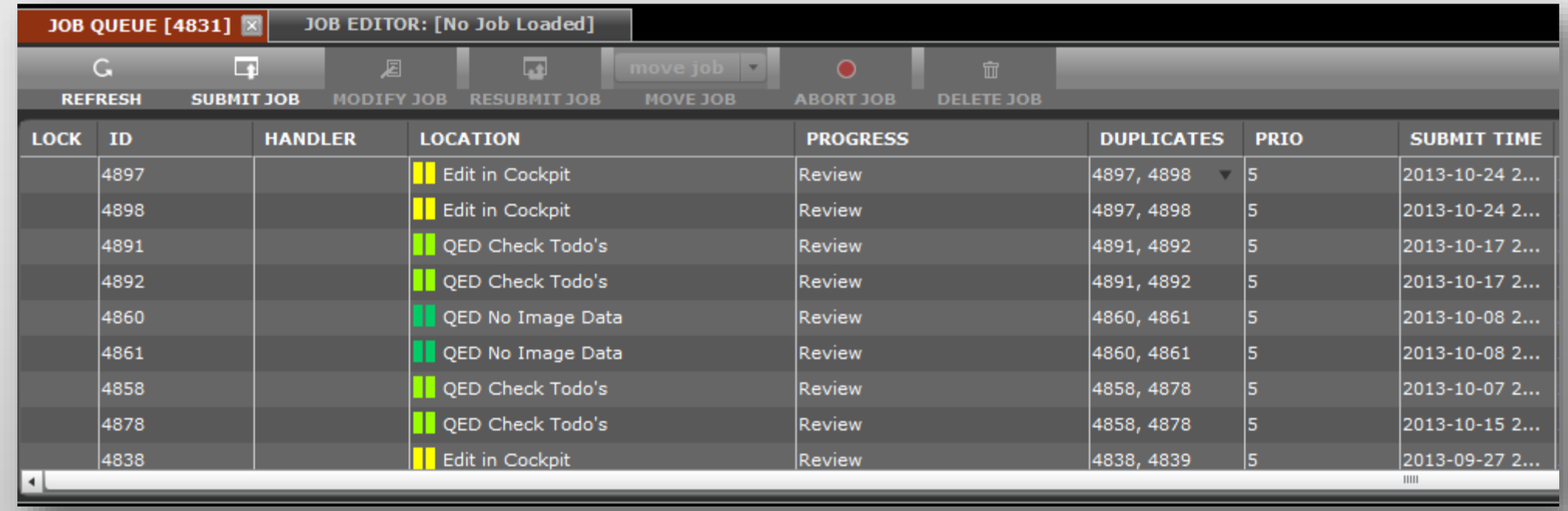
Detection and flagging of duplicate input archives

Features

- An extra column in the Job Queue indicates a duplicate input archive for this entry
- The current job's ID is shown along with the IDs of corresponding duplicate jobs
- When sorting using the Duplicates column, duplicate jobs are displayed in separate rows for clarity.

Benefits

- Clear information about duplicates in the job queue.
- Eliminates unnecessary extra work wherever an archive has already been processed.



LOCK	ID	HANDLER	LOCATION	PROGRESS	DUPLICATES	PRIO	SUBMIT TIME
	4897		Edit in Cockpit	Review	4897, 4898	5	2013-10-24 2...
	4898		Edit in Cockpit	Review	4897, 4898	5	2013-10-24 2...
	4891		QED Check Todo's	Review	4891, 4892	5	2013-10-17 2...
	4892		QED Check Todo's	Review	4891, 4892	5	2013-10-17 2...
	4860		QED No Image Data	Review	4860, 4861	5	2013-10-08 2...
	4861		QED No Image Data	Review	4860, 4861	5	2013-10-08 2...
	4858		QED Check Todo's	Review	4858, 4878	5	2013-10-07 2...
	4878		QED Check Todo's	Review	4858, 4878	5	2013-10-15 2...
	4838		Edit in Cockpit	Review	4838, 4839	5	2013-09-27 2...

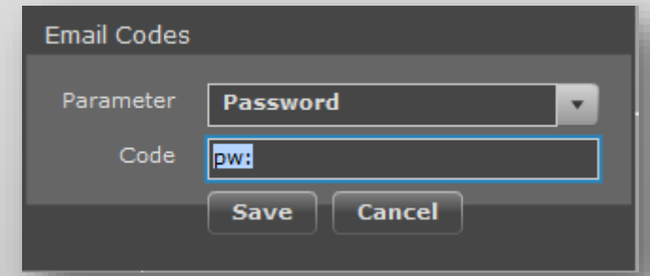
Support for password encrypted archives

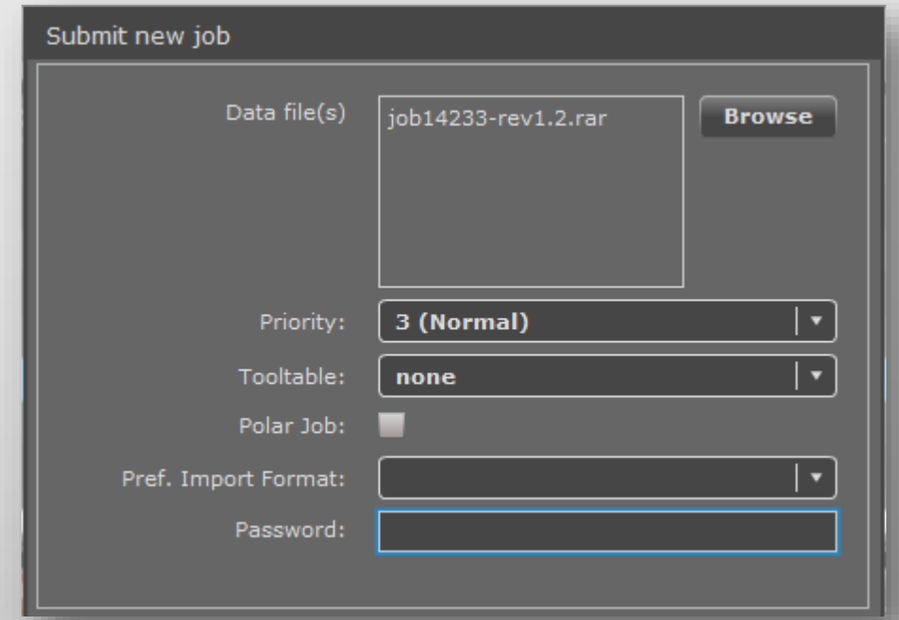
Features

- Option to define the password for encrypted archives using:
  - Submit and resubmit functions in the the Cockpit.
  - Email ,with a new Email Code.
  - Web Integr8tion.

Benefits

- Encrypted archives need not be unpacked and repacked before they are sent to Integr8tor.
- Original archives can be maintained





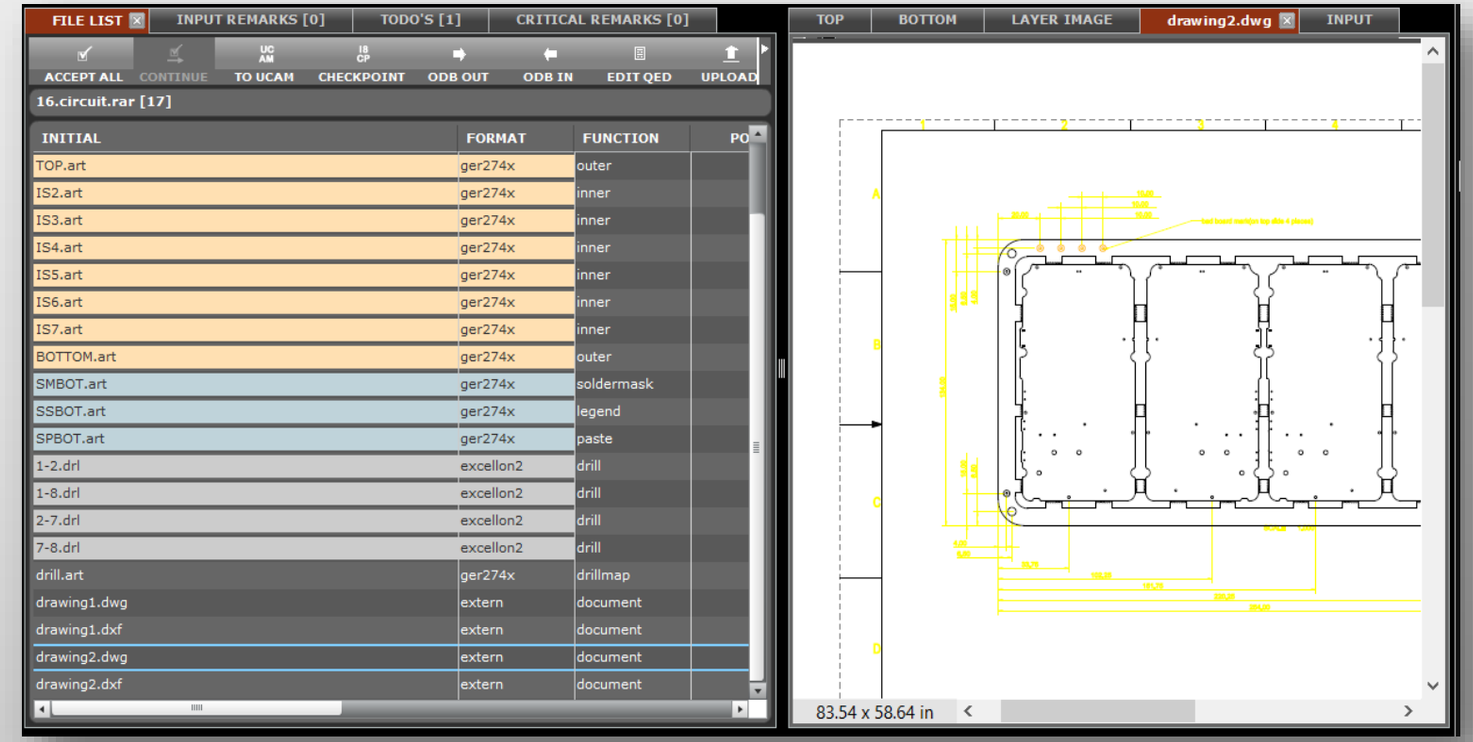
Using CAD converter for drawing input files

Features

- Integr8tor has been extended with a powerful CAD convertor which can currently handle the following popular drawing formats:
  - DXF
  - DWG
  - HPGL
- These files are converted and stored as PDF files inside the data structure.

Benefits

- No other software is needed for reading in mechanical drawing files.
- All drawings are converted to exchangeable color PDF files.

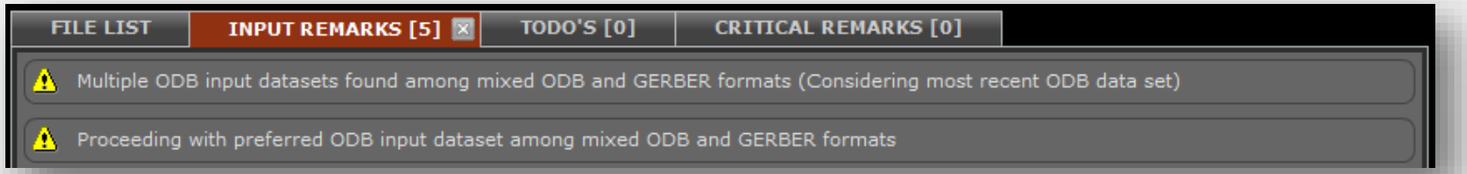


New Input enhancements

Automatic processing of most recent ODB data set

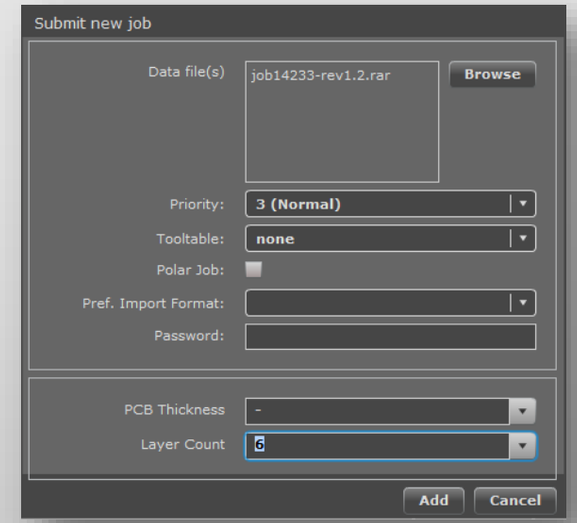
Where an archive has been submitted that contains multiple ODB data sets, Integr8tor automatically processes only the most recent data set and ignores the others.

Information is stored in the Cockpit's "Input remark" section and in the QED report.



Layer Count can be used for stackup recognition

If the Layer Count input property is added when submitting a job, this can be used to aid automatic stackup recognition



Workflow Enhancements

Integr8tor's workflow and engine have been improved, enhancing QED reporting accuracy and JOB output.

Reregistering after optional layer stackup changes

- If stackup is changed using the Cockpit editor or Ucam, registration is re-evaluated for all layers.

No more false net errors in Net Compare

- Net Compare now ignores special nets such as ODB++ $NONE$ nets, so false opens are no longer reported in the QED

Improved Polarity recognition

- New rules ensure even better layer polarity recognition

Improved SMD pad recognition

- Paste layers are now taken into account resulting in better SMD pad recognition

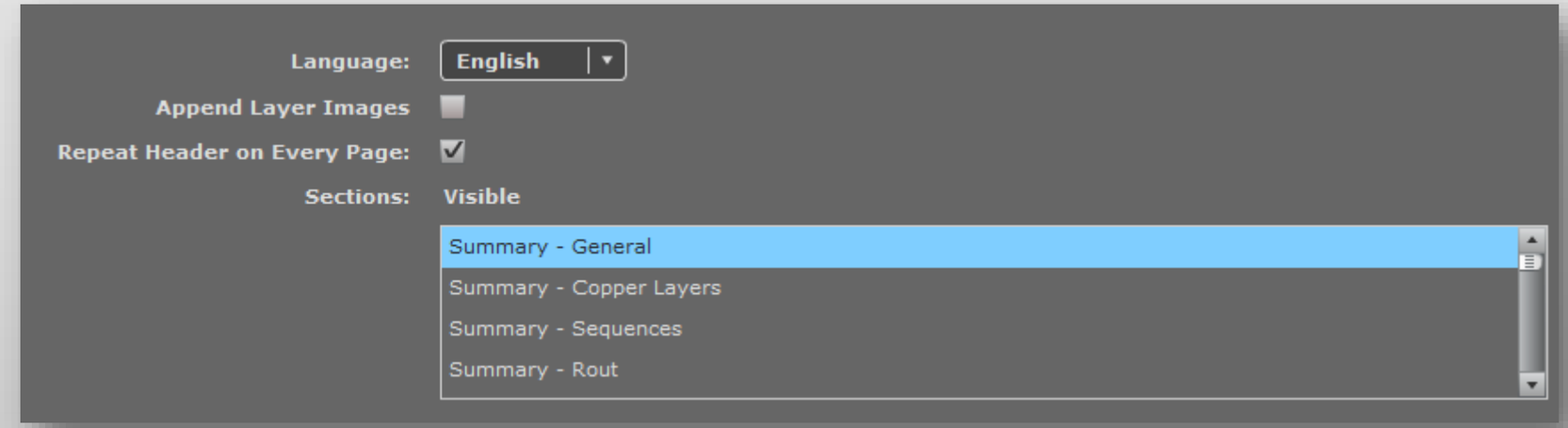
Split summary section

The summary section on the QED report has been split into 4 separate blocks.

This gives the user greater freedom to change the layout of the QED report.

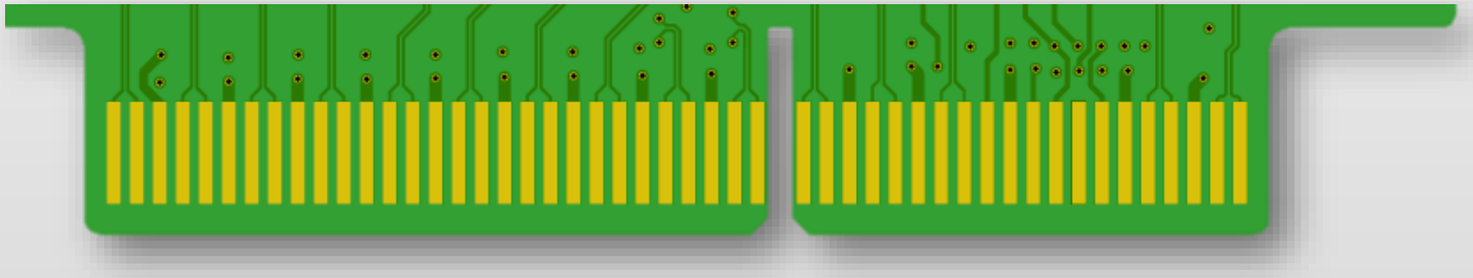
Available blocks:

- Summary – General
- Summary – Copper Layers
- Summary – Sequences
- Summary - Rout



Edge connector recognition plus area computation

- Integr8tor can now detect the presence of edge connectors. Next to this, the area of both top and bottom connector will be calculated.
- In the copper Area section, there is a new " Edge Connectors" column for the corresponding area values.
- The existence of Edge Connectors is now indicated in the Summary section



Copper Areas

Side	Total	Free Of Solder Mask	Free Of Gold Mask	Free Of Silver Mask	Edge Connectors
	dm^2	dm^2	dm^2	dm^2	dm^2
Top (including barrels)	2.4380	0.9693			0.0135
Bottom (including barrels)	2.2441	0.8810			0.0135
Total (including barrels)	4.6821	1.8503			0.0269

Extended Polar information

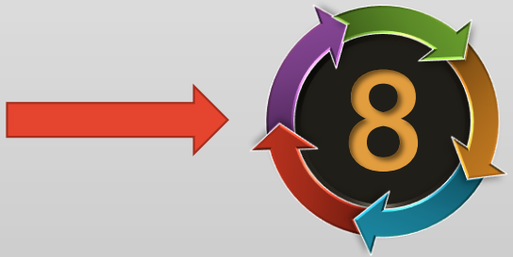
Integr8tor now converts even more elements from the Polar stackup to the qed.xml and ucam job file

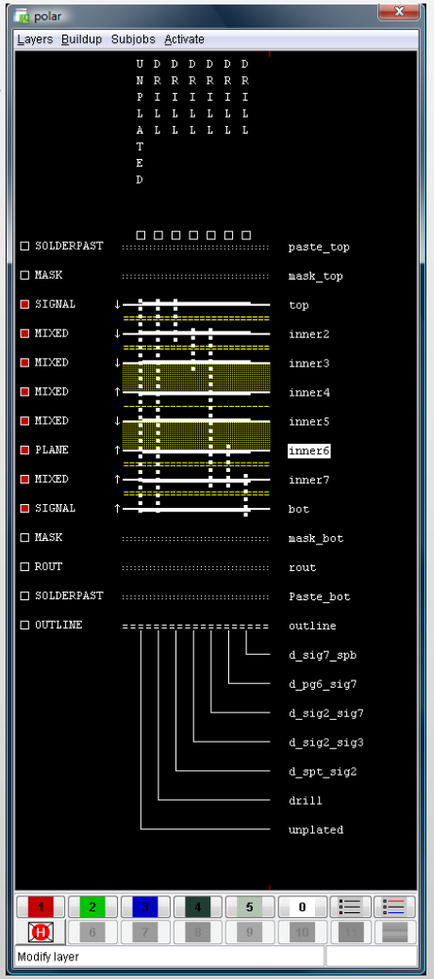
Features

- The exported job file now contains many more attributes from the Polar job.
- Information such as base thickness, dielectric constant and others are stored in the XML file for later
- Unit dependent values are stored along with the unit used.
- Previously misinterpreted parameters are corrected and stored in qed.xml and jobfile.

Benefits

- Complete stackup information is stored in the job file
- All information is available in qed.xml
- No information is lost





SMD - BGA extensions

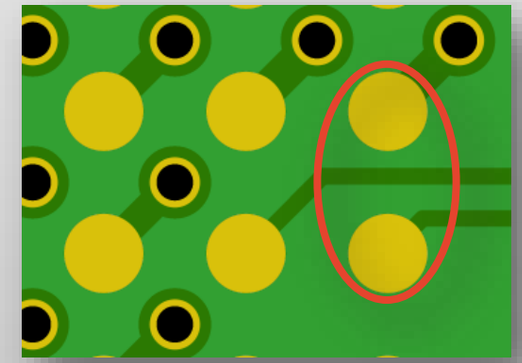
In the a new section on the QED report, detailed information about SMDs shows:

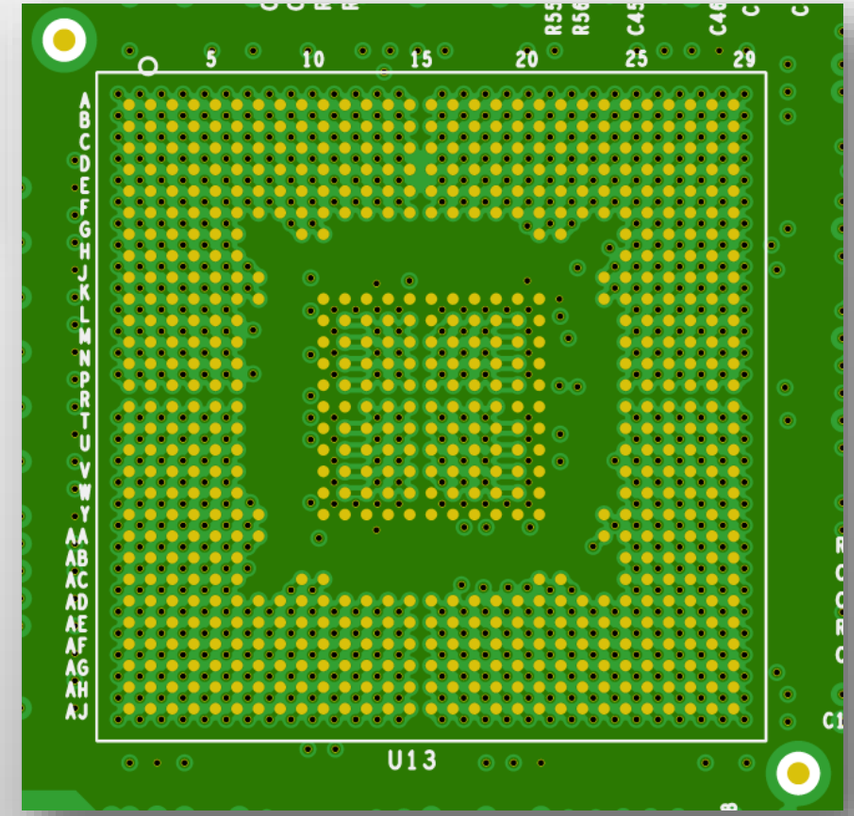
- Total number of SMD Pads.
- Number of non BGA Pads.
- Number of BGA Pads.

SMD

Side	Total SMD Pads	Non BGA Pads	BGA Pads	All Tracks in BGA Centered
Top	5081	2400	2681	No
Bottom	2768	2768	0	
All	7849	5168	2681	No

- Indication whether tracks between BGA pads are centered or not.





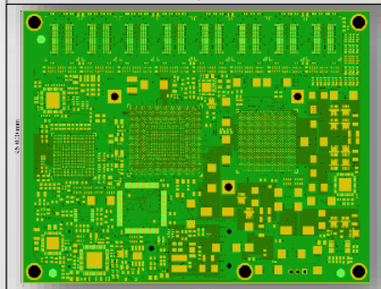
QED sample report

QED Report — Integr8tor

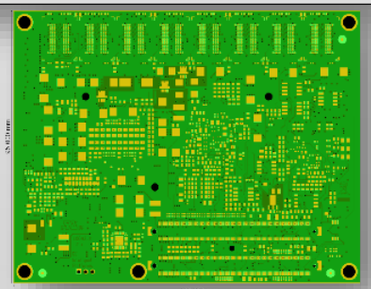
Name	pcb-4352-rev1.zip	Id.	4911 - Auto Analysis Processing
Report Generated on	Nov 8, 2013 2:46:27 PM		

Single PCB View

Top View



Bottom View



Summary - General

PCB Size	125.000 mm x 95.000 mm	Copper Layers	16
PCB Thickness	1.600 mm	Solder Mask	Both
Customer Panel Size		Solder Mask Color	Green
SMD Pads Top	3449	Legend	None
SMD Pads Bottom	2437	Legend Color	White
SMD Density Top	2904 SMD/dm^2	Paste	None
SMD Density Bottom	2052 SMD/dm^2	Peeloff Mask	None
Number of Nets	1518	Carbon Mask	None
Drill Hole Density	6541 Holes/dm^2	Electrical Test	Double Sided
Holes in SMD Pads	Yes	Max. Aspect Ratio on PTH	8.0

Summary - Sequences

Type	Sequences	Tools	Min. End Dia.	Max. End Dia.	Holes	Min. Ring on Outer	Min. Ring on Inner	Min. Clr. Hole to Copper
			mm	mm		mm	mm	mm
Blind	2	2	0.100	0.100	4267	0.098	0.098	0.220
Buried	1	1	0.200	0.200	2119		0.172	0.450
PTH	1	2	0.200	1.100	1368	0.198	0.198	0.460
Plated (Total)	4	5	0.100	1.100	7754	0.098	0.098	0.220
NPTH	1	5	0.900	4.400	13			unknown
Total	5	10	0.100	4.400	7767	0.098	0.098	0.220

QED Report — Integr8tor

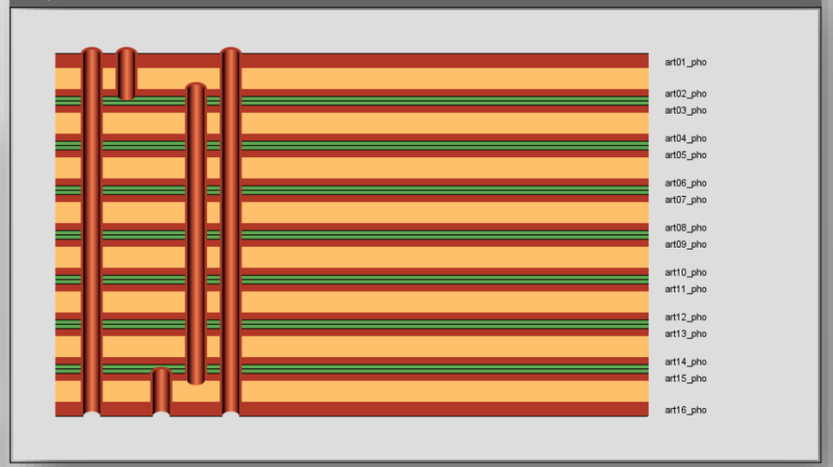
Summary - Rout

Type	Tools	Min. End Dia.	Max. End Dia.	Draw Length
		mm	mm	mm
Plated				
NPTH				
Total				

Thickness

Buildup Type	Core	Inner Thickness	0.170 mm
Outer Total Thickness	0.350 mm	Core Thickness	0.500 mm
Outer Foil Thickness	0.170 mm	Prepreg Thickness	0.080 mm
Plating Thickness	0.180 mm	Pressing Stages	

Stackup

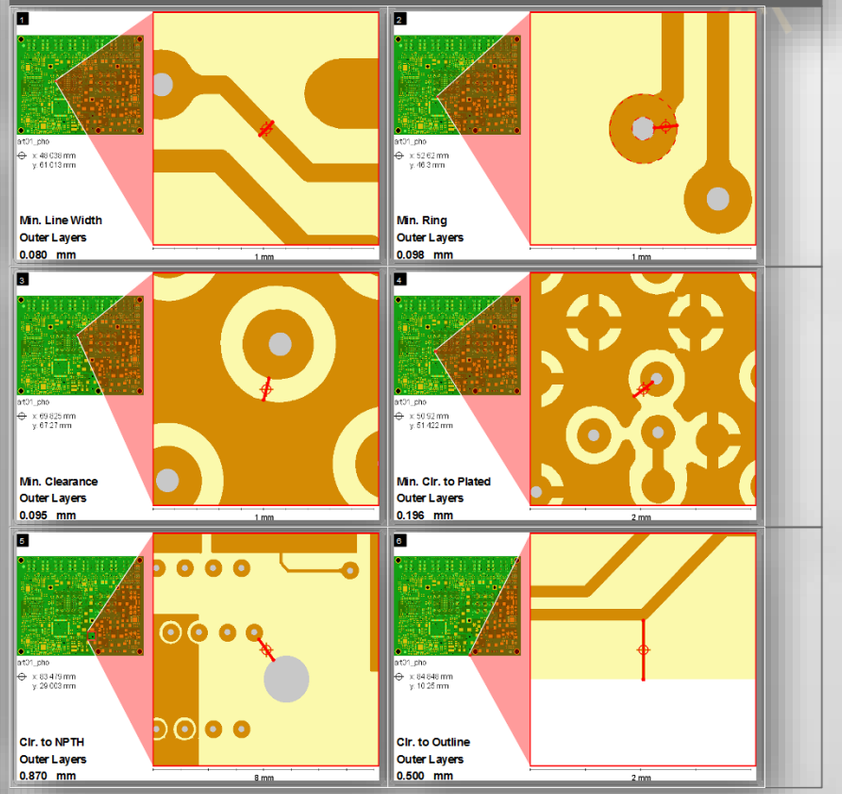


Summary - Copper Layers

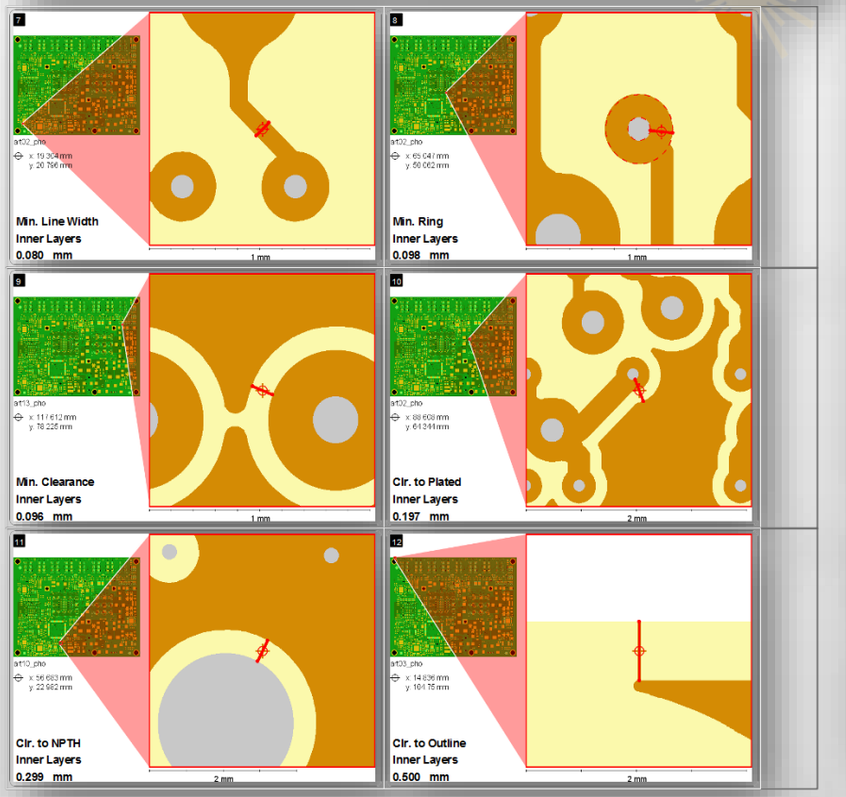
Layer Type	Min. Line Width	Min. Ring	Min. Clr. to Copper	Min. Clr. to Plated Hole	Min. Clr. to NPTH	Min. Clr. to Outline
	mm	mm	mm	mm	mm	mm
Outer	1 0.080	2 0.098	3 0.095	4 0.196	5 0.870	6 0.500
Inner	7 0.080	8 0.098	9 0.096	10 0.197	11 0.299	12 0.500

QED Report — Integr8tor

Summary Minimum Design Characteristics - Locations



QED sample report



Copper Layers

File	Pos.	Min. Line Width	Min. Ring	Min. Clr. to Copper	Min. Clr. Pad to Pad	Min. Clr. Pad to Track	Min. Clr. Track to Track	Min. Self-spacing	Min. Clr. to PTH	Min. Clr. to NPTH	Min. Clr. to Outline	Copper Area	
		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	dm^2	%
art01_pho	1	0.080	0.098	0.095	0.100	0.095	0.097	0.000	0.196	0.870	0.500	0.4824	41
art02_pho	2	0.080	0.098	0.097	0.100	0.097	0.099	0.000	0.197	0.675	0.525	0.2581	22
art03_pho	3		0.174	> 0.800	> 0.500	> 0.500	> 0.500	0.002	0.271	0.649	0.500	1.0056	85
art04_pho	4	0.080	0.173	0.100	0.100	0.100	0.113	0.018	0.275	0.660	0.510	0.1713	14
art05_pho	5	0.100	0.174	0.097	> 0.500	0.097	0.099	0.002	0.271	0.389	0.500	0.9711	82
art06_pho	6	0.080	0.172	0.097	0.100	0.098	0.119	0.025	0.272	0.310	0.525	0.1800	15
art07_pho	7	0.100	0.174	0.098	> 0.500	0.098	0.101	0.003	0.271	0.389	0.600	0.9778	82
art08_pho	8	0.080	0.173	0.098	0.100	0.098	0.119	0.020	0.273	0.625	0.510	0.1669	14
art09_pho	9	0.080	0.173	0.100	0.100	0.100	0.100	0.021	0.275	0.710	0.510	0.1526	13
art10_pho	10		0.174	0.097	> 0.500	0.097	0.098	0.003	0.271	0.299	0.600	1.0055	85
art11_pho	11	0.080	0.173	0.100	0.100	0.102	0.100	0.024	0.275	0.310	0.510	0.1524	13
art12_pho	12		0.175	0.300	> 0.500	> 0.500	0.300	0.003	0.271	0.299	0.600	0.9729	82
art13_pho	13	0.080	0.174	0.096	0.100	0.096	0.100	0.026	0.272	0.310	0.510	0.2233	19
art14_pho	14		0.174	> 0.800	> 0.500	> 0.500	> 0.500	0.003	0.271	0.649	0.600	1.0017	84
art15_pho	15	0.080	0.099	0.098	0.100	0.098	0.099	0.003	0.199	0.870	0.500	0.1901	16
art16_pho	16	0.080	0.099	0.097	0.100	0.097	0.098	0.002	0.197	0.870	0.700	0.2840	24

SMD

Side	Total SMD Pads	Non BGA Pads	BGA Pads	All Tracks in BGA Centered
Top	3449	2793	656	Yes
Bottom	2437	1781	656	Yes
All	5886	4574	1312	Yes

Solder Mask

Side	Min. Ring	Min. Clr. Mask to Mask	Min. Web	Min. Clr. Mask to Copper
	mm	mm	mm	mm
Top	0.005	0.121	0.035	0.017
Bottom	0.015	0.035	0.035	0.028

Drill Tools

File	Tool Nr.	Span	Type	End Dia.	Holes (in PCB)	Moves (in PCB)	Double Hits (in File)	Predrill Hits (in File)	Min. Ring on Outer	Min. Ring on Inner	Min. Pad Size
				mm					mm	mm	mm
drl1-2_drl	1	1-2	blind	0.100	3025	0	0	0	0.098	0.098	0.296
drl15-16_drl	1	15-16	blind	0.100	1242	0	0	0	0.099	0.099	0.298
drl2-15_drl	1	2-15	buried	0.200	2119	0	0	0		0.172	0.544
drl_dk_drl	1	1-16	PTH	0.200	1365	0	0	0	0.198	0.198	0.596
drl_dk_drl	2	1-16	PTH	1.100	3	0	0	0	0.300	0.300	1.700
drl_ndk_drl	1	1-16	NPTH	0.900	2	0	0	0			
drl_ndk_drl	2	1-16	NPTH	1.600	2	0	0	0			
drl_ndk_drl	3	1-16	NPTH	1.800	1	0	0	0			
drl_ndk_drl	4	1-16	NPTH	2.700	3	0	0	0			
drl_ndk_drl	5	1-16	NPTH	4.400	5	0	0	0			

Sequences

Span	Type	Tools	Min. End Dia.	Max. End Dia.	Holes	Min. Ring on Outer	Min. Ring on Inner	Min. Clr. Hole to Copper	Min. Clr. Hole to Hole, Within Sequence	Min. Clr. Hole to Hole, Between Sequences	Min. Clr. Hole to Outline
			mm	mm		mm	mm	mm	mm	mm	mm
1-16	PTH	2	0.200	1.100	1368	0.198	0.198	0.275	0.460	0.402	0.900
1-2	Blind	1	0.100	0.100	3025	0.098	0.098	0.196	0.300		1.165
15-16	Blind	1	0.100	0.100	1242	0.099	0.099	0.197	0.220		0.875
2-15	Buried	1	0.200	0.200	2119		0.172	0.271	0.450		0.700
All	Plated	5	0.100	1.100	7754	0.098	0.098	0.196	0.220	0.402	0.700
1-16	NPTH	5	0.900	4.400	13			0.299	> 1.600	> 0.800	1.800
All	All	10	0.100	4.400	7767	0.098	0.098	0.196	0.220	0.402	0.700

Rout Tools

File	Tool Nr.	Type	Tool Dia.	End Dia.	Draw Length	Nibble Count
			mm	mm	mm	

Routed Holes

File	Hole Nr.	Instances	X Size	Y Size	Draw Length	Nibble Count
			mm	mm	mm	

QED sample report

Scoring - Minimum Clearance

File	Pos.	Min. Clr. to Score Top	Min. Clr. to Score Right	Min. Clr. to Score Bottom	Min. Clr. to Score Left
		mm	mm	mm	mm
art01_pho	1	0.800	> 1.600	0.500	> 1.600
art02_pho	2	0.800	> 1.600	0.525	> 1.600
art03_pho	3	0.500	0.500	0.500	0.500
art04_pho	4	0.800	> 1.600	0.510	> 1.600
art05_pho	5	0.500	0.500	0.500	0.500
art06_pho	6	0.800	> 1.600	0.525	0.635
art07_pho	7	0.600	0.600	0.600	0.600
art08_pho	8	0.800	> 1.600	0.510	> 1.600
art09_pho	9	0.800	> 1.600	0.510	> 1.600
art10_pho	10	0.600	0.600	0.600	0.600
art11_pho	11	0.800	> 1.600	0.510	> 1.600
art12_pho	12	0.600	0.600	0.600	0.600
art13_pho	13	0.800	> 1.600	0.510	> 1.600
art14_pho	14	0.600	0.600	0.600	0.600
art15_pho	15	0.800	> 1.600	0.500	> 1.600
art16_pho	16	0.800	> 1.600	0.700	> 1.600

Scoring - Routing

Side	Lines	Min. Clearance	Saved Routing	Remaining Routing
		mm	mm	mm
Horizontal Score Lines				
Top	1	0.500	> 1.600	
Mid	0			
Bottom	1	0.500	> 1.600	
Vertical Score Lines				
Left	1	0.500	> 1.600	
Mid	0			
Right	1	0.500	> 1.600	
All Score Lines				
	4	0.500	440.000	0.000

Sequences Analysis

File	Pos.	Stacked Vias	Overlapped Vias	Min. Clr. Via Plug	Top Tool			Bottom Tool		
					Drill File	Tool Nr.	End Dia.	Drill File	Tool Nr.	End Dia.
				mm			mm			mm
art02_pho	2	no	0	0.154	drl2-15_drl	1	0.200	drl1-2_drl	1	0.100
art15_pho	15	no	0	0.240	drl15-16_drl	1	0.100	drl2-15_drl	1	0.200

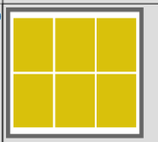
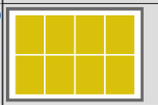
PCB (Single)

PCB Size	Outline Length
mm x mm	mm
125.000 x 95.000	440.000

Customer Panel (Delivery Array, Shipping Panel)

Original Image	Panel Size	PCB's	X Spacing	Y Spacing	Left Border	Right Border	Top Border	Bottom Border
	mm x mm		mm	mm	mm	mm	mm	mm

Production Panel (Working Panel)

Panel Name	Panel Size	Useful Area	Drawing	Pieces/Panel	Panel Fill	Panel Usage
	mm x mm	mm x mm			%	%
13x12	330.00 x 305.00	310.00 x 285.00		6	85	71
32x24	812.00 x 610.00	792.00 x 590.00		30	82	72
18x12	457.00 x 305.00	437.00 x 285.00		8	80	68
24x18	610.00 x 457.00	590.00 x 437.00		16	78	68
28x24	711.00 x 610.00	691.00 x 590.00		25	78	68
24x20	610.00 x 508.00	590.00 x 488.00		16	70	61

Panel Calculation

Id.	Customer Panel			Production Panel			Total Number
	Size	Usage	Number	Size	Usage	Number	
	mm x mm			mm x mm			

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