

Ausay Rigid PCB Manufacture Capabilities(2013.10 Updated)

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No.		Items	Capabilities(for sample)	Capabilities(for small and medium volume)
1	Material	HDI PCB material	RCC(65T&100T)、LDPP(IT-180A 1037&1086)、Normal PP 106&1080	RCC(65T&100T)、LDPP(IT-180A 1037&1086)、Normal PP 106&1080
2		Normal FR4	Shengyi S1141(Not recommend it to lead free assembly process)	Shengyi S1141(Not recommend it to No-Pb assembly process)
3		Normal Tg FR4(Halogen free)	Shengyi S1155	Shengyi S1155
4		High Tg FR4(Halogen free)	Shengyi S1165	Shengyi S1165
5		High CTI	Shengyi S1600	Shengyi S1600
6		High Tg FR4	FR408、FR408HR、IS410、FR406、GETEK、PCL-370HR;IT180A、IT-150DA;N4000-13、N4000-13EP、N4000-13SI、N4000-13EP SI;Megtron 4、Megtron 6(Panasonic);EM-827(Elite);GA-170(Grace Electron);NP-180(Nanya);TU-752、TU-662(Taiwan Union);MCL-BE-67G(H)、MCL-E-679(W)、MCL-E-679F(J)(Hitachi);VT-47(Ventec)	IT180A、GETEK、PCL-370HR、N4000-13、N4000-13EP、N4000-13SI、N4000-13EP SI
7		Ceramic powder filled high-frequency materials	Rogers4350、Rogers4003、25FR、25N	Rogers4350、Rogers4003、25FR、25N
8		PTFE Laminates	Rogers series、Taconic series、Arlon series、Nelco series、Taizhou Wangling F4BK series、TP series;	Taconic (TLX、TLF、TLY、RF、TLC、TLG series);Arlon(Diclad、AD series)
9		PTFE Bonding film	RO3001(1.5mil)、HT1.5(1.5mil)、Cuclad6700(1.5mil)	/
10		PTFE PP	Taconic TP series、TPG series(TPG-30、32、35(4.5mil、5.0mil))、TPN series、Fastrise series	/
11		Hybrid laminating	Rogers/Taconic/Arlon/Nelco laminate with FR-4 material(including partial Ro4350B hybrid laminating with FR-4)	Rogers/Taconic/Arlon/Nelco laminate with FR-4 material(including partial Ro4350B hybrid laminating with FR-4)
12	PCB type	Rigid pcb	Backplane、HDI、High multi-layer blind&buried PCB、Embedded Capacitance、Embedded resistance board、Heavy copper power PCB、Backdrill	Backplane、HDI、High multi-layer blind&buried PCB、Backdrill
13	Buildings	Blind&buried via type	mechanical blind&buried vias with less than 3 times laminating	mechanical blind&buried vias with less than 2 times laminating
14		HDI PCB	1+n+1, 1+1+n+1+1, 2+n+2, 3+n+3(n buried vias $\leq 0.3\text{mm}$),Laser blind via can be filling plating	1+n+1,1+1+n+1+1,2+n+2(n buried vias $\leq 0.3\text{mm}$),Laser blind via can be filling plating
15	Finish treatment	Lead free	HASL Lead free、Flash gold(electroplated gold,base copper ≤ 1 oz)、ENIG、Immersion Tin、Immersion silver、OSP、Hard gold、Soft gold、ENIG+OSP,ENIG+Gold finger,Hard gold+Gold finger,Immersion silver+Gold finger,Immersion Tin+Gold finger、ENEPIG	HASL Lead free、Flash gold(electroplated gold,base copper ≤ 1 oz)、ENIG、Immersion Tin、Immersion silver、OSP、Hard gold、Soft gold、ENIG+OSP,ENIG+Gold finger,Hard gold+Gold finger,Immersion silver+Gold finger,Immersion Tin+Gold finger、ENEPIG
16		Leaded	Leaded HASL	Leaded HASL
17	Plating/coating thickness	Tin thickness	80—1600 u" (16 u" on large tin area of Leaded HASL, 6 u" on large tin area of HASL lead free)	80—1600 u" (16 u" on large tin area of Leaded HASL, 6 u" on large tin area of HASL lead free)
18		Flash gold(electroplated gold)	Ni: ≥ 120 u" ; Au: 1-4 u"	Ni: ≥ 120 u" ; Au: 1-4 u"
19		ENIG	Ni: 120-315 u"; Au: 2-4 u"	Ni: 120-315 u"; Au: 2-4 u"
20		Immersion Tin	≥ 40 u"	≥ 40 u"
21		Immersion Silver	8-16 u"	8-16 u"
22		OSP	4-12 u"	4-12 u"

23	Plating/coating thickness	Hard gold	4-160 u"	4-160 u"
24		Soft gold	4-160 u"	4-160 u"
25		ENEPIG	Ni: 120-315 u", Pd: 2-6 u", Au: 2-4 u"	Ni: 120-315 u", Pd: 2-6 u", Au: 2-4 u"
26		Carbon	4--14mil	4--14mil
27		Soldermask	0.4-0.7mil (on copper area), 0.2-0.31mil(on via pad), ≥0.4mil(on circuits around the corner, just for one-time print and copper thickness<48um)	0.4-0.7mil (on copper area), 0.2-0.31mil(on via pad), ≥0.4mil(on circuits around the corner, just for one-time print and copper thickness<48um)
28		Peelable solder mask	8--31.5mil	8--31.5mil
29	Hole	Finshed mechanical hole size	4-244mil(corresponding drilling tool size 6-248mil)	5-244mil(corresponding drilling tool size 8-248mil)
30			A、Min finished hole size for PTFE material and hybrid PCB is 10mil(corresponding drilling tool size 14mil)	A、Min finished hole size for PTFE material and hybrid PCB is 12mil(corresponding drilling tool size 16mil)
31			B、Max finished hole size for blind & buried via is 12mil(corresponding drilling tool size 16mil)	B、Max finished hole size for blind & buried via is 12mil(corresponding drilling tool size 16mil)
32			C、Max finished hole size for via-in-pad plugged with solder mask is 12mil(corresponding drilling tool size 16mil)	C、Max finished hole size for via-in-pad plugged with solder mask is 12mil(corresponding drilling tool size 16mil)
33			D、Min connecting hole size is 14mil(corresponding drilling tool size is 18mil)	D、Min connecting hole size is 14mil(corresponding drilling tool size is 18mil)
34			E、Min half-hole(pth)size is 12mil(corresponding drilling tool size is 16mil)	E、Min half-hole(pth)size is 12mil(corresponding drilling tool size is 16mil)
35		Laser blind vias size for filling plating	4-6mil(priority 4mil)	4-6mil(priority 4mil)
36		Max aspect ratio for laser via filling plating	1:1(Dpeth included copper thickness)	1:1(Dpeth included copper thickness)
37		Min width/space in laser via filling plating layers	3/3.5mil(line to line);3/3mil(line to pad, pad to pad)	3/3.5mil(line to line);3/3mil(line to pad, pad to pad)
38		Laminate times for laser via filling plating pcb	≤3 times	≤3 times
39		Max aspect ratio for mechanical through-hole	8:1 (only for 4mil drill size ,it means the PCB thickness≤31.5mil)	/
40			10.6:1 (only for 6mil dirll size ,it means the pcb thickness≤63mil)	/
41			12.5:1(only for 8mil drilling size) ; 20:1(>8mil drilling size)	8:1(only for 8mil drill size) ; 10:1(>8mil drilling size)
42		Hole location tolerance	±3mil	±3mil
43		PTH tolerance	±3mil	±3mil
44		Pressfit holes tolerance	±2mil	±2mil
45		NPTH tolerance	±2mil(limited +0/-2mil or +2/-0mil)	±2mil
46		Finish hole size for via filled with resin	4-35.4mil(corresponding drilling tool size 6-39.4mil and PCB thickness must be ≥20mil when drilling tool size >20mil)	4-35.4mil(corresponding drilling tool size 6-39.4mil and PCB thickness must be ≥20mil when drilling tool size >20mil)
47		Max aspect ratio for via filled with resin board	12:1	10:1
48		Min width/space for via filled with resin board	3/4mil(line to line);3/3.5mil(line to pad,pad to pad)	3/4mil(line to line);3/3.5mil(line to pad,pad to pad)
49		Min laser drilling size	4mil(Aspect ratio≤1: 1)	4mil(Aspect ratio≤1: 1)
50		Max aspect ratio for mechanical depth-control drilling board(Blind hole drilling depth/blind hole size)	1.3:1(drilling tool size≤8mil),1.15:1(drilling tool size≥10mil)	1.3:1(drilling tool size≤8mil),1.15:1(drilling tool size≥10mil)

51	Hole	Min. depth of Mechanical depth-control(backdrill)	8mil	8mil
52		Drill hole size for backdrill	20-248mil	20-248mil
53		Insulation thickness between backdrill layers(backdrill target layer& next layer)	≥8mil	≥8mil
54		Depth tolerance to Backdrill	±4mil	±4mil
55		Countersink size and angle	Special tools:82°、90°、120°、135°(countersink drilling size 12-393.7mil)	Special:82°、90°、120°、135°(countersink drilling size 12-393.7mil)
56			Standard:Angle130°(drilling size ≤125mil)、165°(drilling size 125--248mil)	Standard:Angle130°(drilling size ≤125mil)、165°(drilling size 125--248mil)
57		Countersink angle tolerance	±10°	±10°
58		Countersink hole size tolerance	±6mil	±6mil
59		Countersink depth tolerance	±6mil	±6mil
60		Irregular slot tolerance(routing holes)	±4mil	±5mil
61		Depth tolerance of depth-control groove milling	±4mil	±4mil
62		Min tolerance for drilling slot	NPTH Slot: Length/width ≥2,width and length tolerance is ±2mil; Length/width < 2,width and length tolerance is ±3mil	NPTH Slot: Length/width ≥2,width and length tolerance is ±2mil; Length/width < 2,width and length tolerance is ±3mil
63			PTH Slot: Length/width ≥2,width and length tolerance is ±3mil; Length/width < 2,width and length tolerance is ±4mil	PTH Slot: Length/width ≥2,width and length tolerance is ±3mil; Length/width < 2,width and length tolerance is ±4mil
64		Min tolerance for routing slot	NPTH: width/length ±4mil ; PTH: width/length ±5mil	NPTH: width/length ±4mil ; PTH: width/length ±5mil
65	Pad(ring)	Min Pad size for laser drillings	10mil(for 4mil laser via),11mil(for 5mil laser via)	10mil(for 4mil laser via),11mil(for 5mil laser via)
66		Min Pad size for mechanical drillings	16mil(8mil drillings)	16mil(8mil drillings)
67		Min BGA pad size	7mil	10mil(7mil is ok for flash gold)
68		Pad size tolerance	+5%-10%	±1.5mil(pad size ≤10mil); ±10%(pad size >10mil)
69	Width/Space	Internal Layer	1/3 oz、1/2 oz: 3/3 mil	1/3 oz、1/2 oz: 3/3 mil
70			1 oz: 3/4 mil	1 oz: 3/4 mil
71			2 oz: 4/5 mil	2 oz: 4/5.5 mil
72			3 oz: 5/8 mil	3 oz: 5/8 mil
73			4 oz: 6.5/11 mil	4 oz: 6.5/11 mil
74			5 oz: 7/13.5 mil	5 oz: 7/14 mil
75			6 oz: 8/15.5 mil	6 oz: 8/16 mil
76			7 oz: 9/18 mil	7 oz: 9/19 mil
77			8 oz: 10/21mil	8 oz: 10/22mil
78			9 oz: 11/24 mil	9 oz: 11/25 mil
79			10 oz: 12/27 mil	10 oz: 12/28 mil
80		External Layer	1/3 oz: 3/3 mil	1/3 oz: 3.5/4 mil
81			1/2 oz: 3.5/3.5 mil	1/2 oz: 3.9/4.5 mil

82	Width/Space	External Layer	1 oz: 4.5/5 mil	1 oz: 4.8/5 mil
83			2 oz: 6/7 mil	2 oz: 6/8 mil
84			3 oz: 7/10 mil	3 oz: 7/12 mil
85			4 oz: 8/13 mil	4 oz: 8/16 mil
86			5 oz: 9/15.5 mil	5 oz: 9/18 mil
87			6 oz: 10/18.5 mil	6 oz: 10/21 mil
88			7 oz: 11/22 mil	7 oz: 11/25 mil
89			8 oz: 12/26 mil	8 oz: 12/29 mil
90			9 oz: 13/30 mil	9 oz: 13/33 mil
91			10 oz: 14/35 mil	10 oz: 14/38 mil
92		Width tolerance	≤10mil: ±1.0mil	≤10mil: ±1.5mil
93			>10mil: ±1.5mil	>10mil: ±2mil
94	Space	Min gap between hole wall conductor (Blind and buried via PCB)	7mil(1 time laminating), 8mil(2 times laminating), 9mil(3 times laminating)	8mil(1 times laminating), 9mil(2 or 3 times laminating)
95		Min gap between hole wall and conductor (None blind and buried via PCB)	5.5mil(≤8L),6.5mil(10-14L),7mil(>14L)	7mil(≤8L),8mil(>8L)
96		Min space between laser holes and conductor	5mil	5mil
97		Min gap between outline and out layer pattern for no copper exposure after routing	8mil	8mil
98		Min space of the V-CUT does not reveal the copper (Central Line of v-cut to internal/external circuits,H means board thickness)	H≤40mil: 12mil(20°mean V-CUT angle),13mil(30°),14.6mil(45°)	H≤40mil: 12mil(20°mean V-CUT angle),13mil(30°),14.6mil(45°)
99			40<H≤63mil: 14.2mil(20°),16mil(30°),20mil(45°)	40<H≤63mil: 14.2mil(20°),16mil(30°),20mil(45°)
100			63<H≤94.5mil: 16.5mil(20°), 20mil(30°),25.2mil(45°)	63<H≤94.5mil: 16.5mil(20°), 20mil(30°),25.2mil(45°)
101			94.5<H≤118.1mil: 18.5mil(20°),23.2mil(30°),30.3(45°)	94.5<H≤118.1mil: 18.5mil(20°),23.2mil(30°),30.3(45°)
102		Min width of internal isolated strip	8mil	8mil
103		Min gap between outline and inner layer pattern for no copper exposure after routing	10mil	10mil
104		Min space of gold finger chamfering noninterference tab	236mil	275.6mil
105		Min space bwtween hole walls in same net	6mil(thru-hole& laser hole PCB),10mil(Mechanical blind&buried PCB)	6mil(thru-hole& laser hole PCB),10mil(Mechanical blind&buried PCB)
106		Min pad space for ENIG finished	3.5mil(base copper 1/3 oz、0.5 oz)	4mil(base copper 1/3 oz、0.5 oz)
107		Min space between gold fingers	5mil	6mil
108		Min gap between pads for HASL(no slodermask)	7mil(Pad space 10mil in big copper area)	7mil(Pad space 10mil in big copper area)
109		Min gap between Peelable soldermask and pad	14mil	16mil
110		Min gap between Legend and Pad	6mil(traditional silkscreen technology)、4mil(silkscreen print technical)	6mil(traditional silkscreen technology)

111	Space	Min gap between carbon pads	13mil	15mil
112	Metal-substrate PCB	Layer counts	1-8L(Al-substrate、Cu-substrate);2-24L(Heatsink、Sweat bonding、Buried metal)	1-8L(Al-substrate、Cu-substrate);2-24L(Heatsink、Sweat bonding、Buried metal)
113		PCB size(Finished)	Max: 24"*24", Min: 0.2"*0.2" (Al-substrate、Cu-substrate、Heatsink、Sweat bonding、Buried metal)	Max: 24"*24", Min: 0.2"*0.2" (Al-substrate、Cu-substrate、Heatsink、Sweat bonding、Buried metal)
114		PCB thickness(Finished)	0.02"-0.2"	0.02"-0.2"
115		Copper thickness(Finished)	0.5-10 oz	0.5-10 oz
116		Metal thickness	0.02"-0.2"	0.02"-0.2"
117		Metal material type	AL:1100/1050/2124/5052/6061;Cu:c11000; Iron	AL:1100/1050/2124/5052/6061;Cu:c11000; Iron
118		Min finished hole size&tolerance	NPTH: 20±2mil; PTH: 40±4mil(for Al-substrate、Cu-substrate)、8±4mil(for Heatsink、Sweat bonding、Buried metal)	NPTH: 20±2mil; PTH: 40±4mil(for Al-substrate、Cu-substrate)、8±4mil(for Heatsink、Sweat bonding、Buried metal)
119		Dimension tolerance	±1.2mil(CNC) ; ±4mil(punch)	±2mil(CNC) ; ±4mil(punch)
120		PCB partial surface treatment	Leaded HASL/Lead free HASL; OSP; ENIG; ENEPIG ; Plating(Ni)Soft/Hard gold;Plating Sn	Leaded HASL/Lead free HASL; OSP; ENIG; ENEPIG ; Plating(Ni)Soft/Hard gold;Plating Sn
121		Metal partial surface treatment	Cu:Plating Ni&Au ; Al:Anodic oxidation、Hard anodic oxidation coating、Chemical passivation; Physical treatment:Sandblasting、Wire drawing	Cu:Plating Ni&Au ; Al:Anodic oxidation、Hard anodic oxidation coating、Chemical passivation; Physical treatment:Sandblasting、Wire drawing
122		Material	Metal PCB:Totking(T-110、T-111)、Ventec(VT-4A1、VT-4A2、VT-4A3)、Laird(1KA04、1KA06);Bergquist(MP06503、HT04503)、TACONIC(TLY-5、TLY-5F)	Metal PCB:Totking(T-110、T-111)、Ventec(VT-4A1、VT-4A2、VT-4A3)、Laird(1KA04、1KA06);Bergquist(MP06503、HT04503)、TACONIC(TLY-5、TLY-5F)
123		Thermal conductivity	0.3-3w/m.k(Heatsink、Al-substrate、Cu-substrate);8、33w/m.k(Sweat bonding);0.35-3w/m.k(Buried metal)	0.3-3w/m.k(Heatsink、Al-substrate、Cu-substrate);8、33w/m.k(Sweat bonding);0.35-3w/m.k(Buried metal)
124		Thermal glue thickness (dielectric layer)	3-6mil	3-6mil
125		Buried copper block size	0.118" * 0.118" -- 2.756" * 3.15"	0.118"*0.118" -- 2.756"*3.15"
126		Buried copper block drop tolerance	±1.6mil	±1.6mil
127		Min gap between Buried copper block and hole wall	12mil	12mil
128	Ceramic-substrate PCB	Layer counts	1-2L	1-2L
129		PCB size(Finished)	MAX: 4" * 4",MIN: 0.2" * 0.2"	MAX: 4" * 4",MIN: 0.2" * 0.2"
130		Surface treatment	OSP; ENIG; Immersion Silver	OSP; ENIG; Immersion Silver
131		Dielectric thickness	10mil ; 15mil ; 25mil	10mil ; 15mil ; 25mil
132		Copper thickness(Finished)	2.4mil ; 5.9mil ; 11.8mil	2.4mil ; 5.9mil ; 11.8mil
133		Material	Ceramic DBC material(ALN&Al2O3)	Ceramic DBC material(ALN&Al2O3)
134		Thermal conductivity	24-180 w/m.k	24-180 w/m.k
135	Others	Min thickness to internal layer	0.05(thru-holes PCB),0.13(with blind&buried holes)	0.075(thru-holes PCB),0.13(with blind&buried holes)
136		Layer count	1-40L	1-32L
137		PCB thickness	8 - 275.6mil	16 - 236.22mil
138		Min finished PCB size	0.4" * 0.4"	0.4" * 0.4"
139		Max finished PCB size	23*35 inch(≤2L) ; 22.5*30 inch(≥3L)	23*35 inch(≤2L) ; 22.5*30 inch(≥3L)

140	Others	Registration	≤5mil	≤6mil
141		PCB thickness tolerance	Thickness≤40mil: ±4mil	Thickness≤40mil: ±4mil
142			Thickness>40mil: ±10%	Thickness>40mil: ±10%
143			Special tolerance(Unspecified requirement on between layers):±4mil(for ≤78.74mil thickness);±6mil(for 82.7-118.1mil thickness);±10mil(for 122-275.6mil thickness)	Special tolerance(Unspecified requirement on between layers):±5mil(for ≤78.74mil thickness);±6mil(for 82.7-118.1mil thickness);±12mil(for 122-236.22mil thickness)
144		Impedance tolerance	Single-ended: ±5ohm(≤30ohm), ±10%(>30ohm) (Advanced:±5%(≥50ohm)) Differential pair: ±5ohm(≤50ohm),±10%(>50ohm) (Advanced:±5%(≥70ohm))	±5ohm(<50ohm),±10%(≥50ohm)
145		Outline size tolerance	±4mil	±4mil
146		Outline location tolerance	±4mil	±4mil
147		Min bow&twist	0.10%	0.50%
148		Max finished copper thickness to internal&external layer	Internal layer:10 oz;External layer:11 oz	Internal layer:5 oz;External layer:5 oz
149		Min isolation thickness between layers	2mil(only for base copper 0.5 oz)	2mil(only for base copper 0.5 oz)
150		Min width/height of silkscreen	Width4mil 、Height23mil(12um 、18um base copper);Width5mil 、Height30mil(35um base copper);Width6mil 、Height45mil((70um base copper)	Width4mil 、Height23mil(12um 、18um base copper);Width5mil 、Height30mil(35um base copper);Width6mil 、Height45mil((70um base copper)
151		Min Internal radius	12mil	12mil
152		V-CUT angle tolerance	±5°	±5°
153		V-CUT symmetrical tolerance	±4mil	±4mil
154		V-CUT web thickness tolerance	±4mil	±4mil
155		PCB thickness(X) range of V-CUT	Substrate thickness (excluding the outer layer of copper) 16mil ≤ X ≤ Finished thickness 126mil ; Can only do single-sided V-cut if substrate thickness ≤ 23.62mil	Substrate thickness (excluding the outer layer of copper) 16mil ≤ X ≤ Finished thickness 126mil ; Can only do single-sided V-cut if substrate thickness ≤ 23.62mil
156		Outline	Routing; V-CUT; Bridge; Stamp holes	Routing; V-CUT; Bridge; Stamp holes
157		Min width of soldermask bridge	Base coppers≤1 oz: 4mil(Green), 5mil(Other color) , 8mil(on copper area)	Base coppers≤1 oz: 4mil(Green), 5mil(Other color) , 8mil(on copper area)
158			Base copper 2 oz-4 oz: 6mil, 8mil(on copper area)	Base copper 2 oz-4 oz: 6mil, 8mil(on copper area)
159		Min width of soldermask cover line(single side)	2.5mil(partial area can be allowed 1.5mil)	2.5mil(partial area can be allowed 1.5mil)
160		Soldermask color	Green matte/glossy, Yellow, Black, Blue, Red, White, Purple	Green matte/glossy, Yellow, Black, Blue, Red, White, Purple
161		Silkscreen color	White, Yellow, Black	White, Yellow,Black
162		Angle tolerance of gold finger chamfer	±5°	±5°
163		the remaining thickness tolerance of gold finger chamfer	±5mil	±5mil
164		Min Resistance test	10ohm	10ohm
165		Max Insulation resistance test	100 Mohm	100 Mohm
166		Max Test voltage	500V	500V
167		Max Test Currency	200mA	200mA
168		Silkscreen print(just for white color)	Serial number,Barcode、Planar code	Serial number,Barcode、Planar code