1.0 Process Capability

| Seq | Process | | | Unit | Process Capability |
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| 1 | Basic Information | Surface | Surface Treatment | Tin lead /Leadfree HASL、Flash Gold、ENIG、OSP、Immersion Tin / Silver、Hard Gold | |
| 2 | | | Selective Surface Treatment | ENIG+OSP，ENIG+Gold Finger，Flash Gold+HASL，Flash Gold+Gold Finger，Immersion Silver+Gold Finger，Immersion Tin+Gold Finger | |
| 3 | | Products Capabiity | Layer Count | Layer | 1-40(≥30 Layers needs Review） |
| 4 | | | Bow and Twist | % | 0.7(≤0.5needs Process Review） |
| 5 | | | Min finished size | mm | 10*10 |
| 6 | | | Max finished Size (4L) | inch | 22.5*33.5(Needs Review If length exceeds 30 Inch) |
| 7 | | | Max finished Size (≥6L) | inch | 22.5*26.5(Needs Review If length exceeds 22.5 Inch) |
| 8 | | | Multi-press for Blind/Buried Vias | / | Multi-press Cycle≤3 times(Needs review for 2 cycles pressing) |
| 9 | | | Max finished Size (Double Sides) | inch | 23*35(Needs Review If length exceeds 30 Inch) |
| 10 | | | Finished Board Thickness | mm | 0.20-7.0(≤0.2mm Needs Review),≤0.4mm for HASL |
| 11 | | | Finished Board Thickness Tolerance(≤1.0mm) | mm | ±0.1 |
| 12 | | | Finished Board Thickness Tolerance(>1.0mm) | mm | Material Thickness±10% |
| 13 | | | Unspecified Finished Board Thickness Tolerance（No stack up requirements） | mm | Multilayer：≤2.0mm can±0.1；2.0-3.0mm can±0.15；≥3.0mm can±0.2；Double Sides+/-10% |
| 14 | | Reliable Test | Peel Strength | N/cm | 7.8 |
| 15 | | | Flammability | | 94V-0 |
| 16 | | | Ionic Contamination | ug/cm2 | ≤1 |
| 17 | | | Min Dielectric Thickness | mm | 0.075(only for HOZ Base Copper) / 1OZ if copper ground area >80% |
| 18 | | | Impedance Tolerance | % | ±5Ω(<50Ω),±10%(≥50Ω);≥50Ω±5%（Needs Review） |

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| 19 | Base Material Type | Material Type | High Tg Material | | Shengyi Tg>170℃ |
| 20 | | | Impedance Control Material | Others need Review | FR-4,FR-4 HighTg Series |
| 21 | | | RCC Material | Needs Review | Copper foil thickness 12um,Dielectric Thickness 65,80,100um (After Pressing 55,70,90um) |
| 22 | | Prepreg Type | FR-4 Prepreg、LD-1080（HDI） | | 7628 2116 1080 3313 106 |
| 23 | | Copper foil | Copper Foil | um | 12、18、35、70、105（Use 70UM base copper，After plating 105UM） |
| 24 | Innerlayer & Outerlayer Image Transfer | Machine | Scrubbing Machine | | 0.11-3.2mm,min 9*9inch |
| 25 | | Innerlayer Process Capability | laminator, Exposer | | 0.11-6.0mm,min 8*8in,max 24*24in |
| 26 | | | Etching Line | | 0.11-6.0mm,min 7*7inch |
| 27 | | | Min Inner Line Width(18um copper foil,Before Compensation) | mil | 2.5-3 |
| 28 | | | Min Inner Line Spacing(18um base copper,after compensation) | mil | 2.5 |
| 29 | | | Min Inner Line Width(35um copper foil,Before Compensation) | mil | 3.5 |
| 30 | | | Min Inner Line Spacing(35um base copper,after compensation) | mil | 2.8 |
| 31 | | | Min Inner Line Width(70um copper foil,Before Compensation) | mil | 5 |
| 32 | | | Min Inner Line Spacing(70um base copper,after compensation) | mil | 3 |
| 33 | | | Min Inner Line Width(105um copper foil,Before Compensation) | mil | 6 |
| 34 | | | Min Inner Line Spacing(105um base copper,after compensation) | mil | 3.5 |
| 35 | | | Min Inner Line Width(140um copper foil,Before Compensation) | mil | 7 |
| 36 | | | Min Inner Line Spacing(140um base copper,after compensation) | mil | 8（7mils needs review） |
| 37 | | | Min Spacing from hole edge to conductive | mil | ≤6L 8mil（Partial 7mil）、≤18L 10mil（Partial 9mil)、≥20L 12mil(Partial 11mil) |

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| 38 | | Innerlayer Process Capability | Min Innerlayer Annular Ring | mil | 4(18,35um,Partial3.5),6(70um),8(105um) |
| 39 | | | Min Innerlayer Isolation Clearance | mil | Conductive to Conductive 10mil(Partial 8mil) |
| 40 | | | Min Spacing from board edge to conductive | mil | 8（except for blind vias）、10（Blind Vias） |
| 41 | | | Min Gap width between copper ground | | 5(35um base copper) ≥2pcs （≥70um needs review) |
| 42 | | | Different copper thckness for inner core | | 18/35,35/70(needs review） |
| 43 | | | Max Finished Copper Thickness | | 5OZ(175um)、≥3OZ needs review |
| 44 | | Outer layer Process Capability | Min Outer Line Width(6-12um base copper， before compensation) | mil | 2.5-3.0(achieve copper Thickness30um-35um) |
| 45 | | | Min Outer Line Spacing(6-12/18um base copper, after compensation) | mil | 2.5 |
| 46 | | | Min Outer Line Width(18um base copper， before compensation) | mil | 4(achieve copper Thickness35um-40um) |
| 47 | | | Min Outer Line Spacing(18um base copper, after compensation) | mil | 3 |
| 48 | | | Min Outer Line Width(35um base copper， before compensation) | mil | 5.0 |
| 49 | | | Min Outer Line Spacing(35um base copper, after compensation) | mil | 4 |
| 50 | | | Min Outer Line Width(70um base copper， before compensation) | mil | 6.0 |
| 51 | | | Min Outer Line Spacing(70um base copper, after compensation) | mil | 5.0 |
| 52 | | | Spacing from Line to pad, pad to pad (After compensation) | mil | 3.5(12um)，4.0(18um、35um),5.5(70um),6.5(105、140um) |
| 53 | | | Min Outer Line Width(105um base copper， before compensation) | mil | 7.0 |
| 54 | | | Min Outer Line Spacing(105um base copper, after compensation) | mil | 6.0 |
| 55 | | | Min Outer Line Width(140um base copper， before compensation) | mil | 8.0 |
| 56 | | | Min Outer Line Spacing(140um base copper, after compensation) | mil | 7.0 |

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| 57 | | | Min Grid Line Width | mil | 5（12、18、35 um），10（70 um） |
| 58 | | | Min Grid Spacing | mil | 5（12、18、35 um），8（70 um） |
| 59 | | | Min Hole Pad Diameter | mil | 12(0.10mm mechanical or Laser Drill) |

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| 60 | Innerlayer & Outerlayer Image Transfer | Process Capability | Max size for slot tenting | | 5mm*3.0mm； the tent land should >10mil |
| 61 | | | Max diameter for tenting hole | mm | 4.5 |
| 62 | | | Min tent land width | mil | 8 |
| 63 | | | Min annular ring（after compensation, except for blind vias） | mil | 4(12、18um) Partial 3.5、4.5(35um)、 6(70um)、8(105um)、10（140um） |
| 64 | | | Min BGA diamter | mil | 10(Flash gold 8mil) |
| 65 | AOI | Machine Capability | Orbotech SK-75 AOI | / | 0.05-6.0mm,max 23.5*23.5inch |
| 66 | | | Orbotech Ves Machine | / | 0.05-6.0mm,max 23.5*23.5inch |
| 67 | Drilling | Machine Capability | MT-CNC2600 Drill machine | can process 2nd drill | 0.11-6.0mm， max 18.5*26inch ∅0.20MM钻刀 |
| 68 | | Process Capability | Min Multi-hit drill bit size | mm | 0.55 |
| 69 | | | Max aspect ratio for board thickness vs drill bit size | / | 12:1(except for ≤0.2mm drill bit,exceed 10:1 needs review) |
| 70 | | | Hole location tolerance（Compare with CAD data） | mil | ±3 |
| 71 | | | Counterbore hole | | PTH & NPTH，Top angle 130 Degree，Top diameter <6.3mm |
| 72 | | | Min spacing from hole edge to conductive(Except for blind vias) | mil | 6(≤8 L),7(≤10 L),8(≤14 L),12(≤26 L) |
| 73 | | | Max drill bit size | mm | 6.5 |
| 74 | | | Max board thickness for 0.20mm drill bit size | mm | 2.5 |
| 75 | | | Min multi-hit slot width | mm | 0.45 |
| 76 | | | Hole size tolerance for press fit | mil | ±2 |
| 77 | | | Min PTH Slot dimension tolerance | mm | ±0.15 |
| 78 | | | Min NPTH slot dimension tolerance | mm | ±2(min +0，-0.05 or +0.05，-0) |

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| 79 | Drilling | Process Capability | Min spacing from hole edge to conductive(Blind vias) | mil | 9(1 cycle pressing) 10(2 cycles pressing) 12(3 cycles pressing) |
| 80 | | | Max board thickness for 0.15mm mechanical drill | mm | 1.20(≤8 L) needs review |
| 81 | | | Min hole size for laser drill | mm | 0.10(Depth ≤55um),0.13(Depth ≤80um，0.15(Depth ≤100um) |
| 82 | | | Countersink hole angle & Diameter | | Top 82，90，120 degree， diameter≤10mm needs review |
| 83 | Wet Process | Machine Capability | Panel & Pattern plating line | | 0.20-7.0mm,max 24*30inch |
| 84 | | | Deburring Maching | | 0.20-7.0mm,min 8*8inch |
| 85 | | | Desmear Line | Can process 2nd desmear | 0.20-7.0mm,max 24*32in |
| 86 | | | Tin Plating Line | | 0.20-3.2mm,max 24*30inch |
| 87 | | Process Capability | Min hole wall copper thickness | um | average 25,min≥20 |
| 88 | | | Finished copper thickness(12um base copper) | um | ≥18 |
| 89 | | | Finished copper thickness(18um base copper) | um | ≥35(nominal thickness 52um、or 1.5Oz) |
| 90 | | | Finished copper thickness(35um base copper) | um | ≥50(nominal thickness 65um) |
| 91 | | | Finished copper thickness(70um base copper) | um | ≥85 |
| 92 | | | Min Line width for ectching marking | mil | 8(12、18um)，10(35um)，12（70um） |
| 93 | | | Max finished copper thickness for inner & Outer layers | / | 1OZ(350um)、≥4OZ needs review |
| 94 | | | Different copper thickness | / | 18/35、35/70(needs review) |
| 95 | Solder Mask | Color Capability | Solder Mask Color | / | Green, yellow, black, blue, red, white, matte green |
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| 99 | Solder Mask | Color | Component Mark Color | / | White、Yellow、Black |
| 100 | | Solder Mask Capability | Min Solder Mask Opening（Clearance）(After Compensation) | mil | 2(Partial 1.5 for Flash Gold,others can partia 1)Only for18um & 35um |
| 101 | | | Max plugged vias size | mm | 0.65mm for drill bit size |
| 102 | | | Min width for line coverage by S/M | mil | 2mil per side,Only applies to 18um and 35um base copper |
| 103 | | | Min solder mask legends width | mil | 8(min 7mil) |
| 104 | | | Min solder mask thickness | um | 10 |
| 105 | | | Solder mask thickness for via tenting | um | 10 |
| 106 | | | carbon oil line (min) | mil | 10 |
| 107 | | | carbon oil line space (min) | mil | 14 |
| 108 | | | tracer of carbon (min) | mil | 2.5 |
| 109 | | | carbon oil line trace (min) | mil | 12 |
| 110 | | | Min Spacing from carbon pattern to pads | mil | 10mil、70um base copper≥12mil |
| 111 | | | Min width for peelable mask cover line/pads | mil | 6 |
| 112 | | | Min solder mask bridge width | mil | Base copper≤1OZ，Black,white & matte ink are 6mils, other inks are 4mils. Base coper 2-4OZ, min bridge width is 6mils. |
| 113 | | | Solder Mask Hardness | H | 6 |
| 114 | Solder Mask | Peelable Mask Capability | Min spacing from peelable mask pattern to pads | mil | 12 |
| 115 | | | Max diameter for peelable mask tent hole (By screen printing) | mm | 2 |
| 116 | | | Max diameter for peelable mask tent hole (By Aluminum printing) | mm | 4.5 |
| 117 | | | Peelable mask thickness | mm | 0.2-0.5 |
| 118 | | Component Mark Capability | Min Component mark line width and height(12、18um base copper) | / | Line width 4.5mil；Height：23mil |
| 119 | | | Min Component mark line width and height(35um Base copper) | / | Line width 5mil；Height：27mil |

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| 122 | Surface Treatment | Surface Treatment Capability | Max Gold Finger Length | inch | 2 |
| 123 | | | Nickel Thickness For ENIG | um | 3-5UM |
| 124 | | | Gold Thickness For ENIG | um | 0.025-0.10 |
| 125 | | | Nickel Thickness For Gold Finger | um | 3-5UM |
| 126 | | | Gold Thickness For Gold Finger | um | 0.25-1.5 |
| 127 | | | Min Tin Thickness For HASL | um | 0.4(Copper Ground) |
| 128 | | | HASL Machine | Can process 2nd HASL | 0.6-4.0mm,min 5*5； max 20*25inch |
| 129 | | | Gold Finger surface treatment | | Flash Gold/ENIG； Flash Gold/Hard Gold |
| 130 | | | plating Au | u" | 1-5（normal 1u″） |
| 131 | | | plating NI | u" | 120-250（normal 120u″） |
| 132 | | | ENIG&OSP PAD space(min) | mil | 9mil |
| 133 | | | Immersion Gold | | 0.2-7.0mm， min 6*6in， max 21*27in |
| 134 | | | Immersion Tin Thickness | um | 0.8-1.5 |
| 135 | | | Immersion Silver Thickness | um | 0.1-0.3 |
| 136 | | | OSP thickness | um | 0.2-0.5 |
| 137 | E-Test | Machine Capability | Flying Probe Tester | | 0.4-6.0mm,max 19.6*23.5inch |
| 138 | | | Min Spacing From Test Pad to Board Edge | mm | 0.5 |
| 139 | | | Min Conductive Resistance | Ω | 5 |
| 140 | | | Max Insulation Resistance | MΩ | 250 |
| 141 | | | Max Test Voltage | V | 500 |
| 142 | | | Min Test Pad Diameter | mil | 6 |
| 143 | | | Min Test Pad to Pad Spacing | mil | 10 |
| 144 | | | Max Test Current | mA | 200 |

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| 145 | Profiling | Machine Capability | Profiling Type | / | NC Routing；V-CUT；Slot Tabs；Stamp Hole |
| 146 | | | NC Routing Machine | Can process 2nd Routing | 0.05-7.0mm,max 25.5*21.5inch |
| 147 | | | V-CUT Machine | <0.8mm for one side only | 0.6-3.0mm, Max board width for v-cut:18inch |
| 148 | | | Min Routing Bit Diameter | mm | 0.6 |
| 149 | | | Outline Tolerance(Line to Line) | mil | ±4(Complicated outline、slot need review) |
| 150 | | | V-CUT Angle Type | | 20°，30°，45°,60° |
| 151 | | Process Capability | V-CUT Angle Tolerance | o | ±5° |
| 152 | | | V-CUT Registration Tolerance | mil | ±4 |
| 153 | | | V-CUT Web Thickness Tolerance | mil | ±2 |
| 154 | | | Min Gold Finger Spacing（After Compensation） | mil | 6 |
| 155 | | | Min Spacing to avoid gold finger tab bevelled | mm | 7(For Auto-Bevelling) |
| 156 | | | Bevelling Angle Tolerance | / | ±5° |
| 157 | | | Bevelling Remain Thickness Tolerance | mil | ±5 |
| 158 | | | Min Inner Radius | mm | 0.4 |
| 159 | | | Min Spacing from Conductive to Outline | mil | 8 |
| 160 | | | Countersink or Counterbore Depth Tolerance | mm | ±0.10 |