



# Standard Printed Circuit Board Ltd.

Unit 14, 12/F., Shing Yip Industrial Building, 19-21 Shing Yip Street, Kwun Tong, Kowloon, Hong Kong  
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<b>File number: ME-M-II</b>	<b>VER: B</b>	<b>DATE: 2007-Sep-9</b>
<b>File name: Capability manual</b>		

## GENERAL DATA

SERIAL	ITEM	TECHNICAL DATA
1	Layers	2– 24(layers)
2	Max Board Size	24" x 28"
3	Min Board Thickness	4 (layers) 16mil
		6 (layers) 32mil
		8 (layers) 40mil
		10 (layers) 48mil
4	Min Line Width	4mil
5	Min Line Space	4mil
6	Min Hole Size	8mil
7	PTH Wall Thickness	0.8mil
8	PTH dia tolerance	±3mil
9	NPTH hole dia tolerance	±2mil
10	Hole Position Deviation	±3mil
11	Outline Tolerance	±4mil
12	S/M Pitch	3mil
13	Insulation Resistance	1E+12Ω(Normal)
14	Aspect ratio	10:1
15	Thermal Shock	3x10Sec@288 °C
16	Warp and Twist	≤0.7%
17	Electric Strength	> 1.3KV/mm
18	Peel Strength	1.4N/mm
19	Solder Mask Abrasion	≥6H
20	Flammability	94V-0
21	Impedance Control	±5%



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Layers/Thickness/ Outline Finish	SS/DS	4-L	6-L
Routing	0.3~2.4	0.5~2.4	0.75~2.4
Punching	0.3~1.6	0.5~1.6	0.75~1.6
V-cut	0.6~2.4	0.6~2.4	0.75~2.4

Layers/Thickness/ Outline Finish	SS/DS	ML
For 0.3~0.8	+/-0.0762	+/-0.10
For 0.8~1.2	+/-0.10	+/-0.127
For 1.2~	+/-0.127	+/-10%

Finish Surface: Gold Flash, Minimum Thickness: 0.20mm

Finish Surface: HASL, Minimum Thickness: 0.60mm

Finish Surface: All, Maximum Thickness: 3.2mm

#### 4. Drilled Hole Size and Tolerance

4.1 Minimum PTH Hole Size 0.15mm, Minimum PTH Slot size 0.4mm x 0.8mm

4.2 Minimum NPT Hole Size 0.20mm, Minimum NPT Slot Size 0.5mm x 1.0mm

#### 4.3 Tolerance

PTH: +/-0.05mm(Gold flash & Entek), +0.075/-0.05mm(HAL)min

NPTH: +/-0.05mm

#### 5. Base material

##### 5.1 Copper Clad Laminate

5.1.1 Standard Size(inch): 42x48, 41x49, 36x48, 43x49

5.1.2 Thickness(mm): 0.1,0.15,0.2,0.25,0.3,0.35,0.4,0.46,0.51,0.6,0.71,  
0.8,0.9,1.0,1.1,1.2,1.4,1.5,1.6,2.0,2.4,3.2

5.1.3 Copper THK: 0.5OZ(18um), 1OZ(35UM), 2OZ(70UM), 3OZ(105UM).....6OZ(210UM)

5.1.4 Laminate Type: FR4

5.1.5 Flammability: 94V0

#### Prepreg

Type	1080	2116	7628
Thickness	2.8mil+/-0.3mil	4.6mil+/-0.5mil	7.4mil+/-0.5mil
Size	49.5"x300mm	49.5"x300mm	49.5"x150mm



## 6. Surface Finish and Thickness

- 6.1 HASL **1~38um** in hole, **2.54~25.4um** on SMT
- 6.2 Gold Flash Ni: **2.5~7.62um**, Au: **0.05~0.25um**
- 6.3 Selective Gold Plating: Ni: **2.5~7.62um**, Au: **0.05~0.25um**
- 6.4 Immersion Gold: Ni: **2.5~7.62um**, Au: **0.127~1.27um**
- 6.5 Gold-Edge Contacts: Ni: **2.5~7.62um**, Au: **0.127~1.27um**
- 6.6 Entek M2602 (For single side and Double sides)

## 7. Solder mask

- 7.1 Heat Cured Ink: **ZSR-150 (PA-5B, NA-402)**
- 7.2 LPI resist ink: **Green gloss (FSR-8000-9G05, R500-2G, PSR2000-G35A, PSR4000-LDSM-3000 G-7, APR-8000 G-102)**
  - Green matte (LM-600 5GM)**
  - White (LSM-3000NW)**
  - Black (FSR-8000 (10C10))**
  - Red (LSM-3000SR)**
  - Blue (FSR 8b89, LSM-3000NSBL)**
  - Yellow (LSM-3000NSY-6)**
- 7.3 UV Ink: **Green (UVS-1000)**
  - White (UVM-1800W)**

## 8. Legend Ink

- 8.1 White: (ZM-400WF)
- 8.2 Black: (BK-3)
- 8.3 Yellow: (ZM-400YR)

## 9. Carbon Ink: PR-406, TU-15ST (25 Ohm/square)

## 10. Peelable Mask: B99-84B, PETERS SD 2955



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## 5.2 Surface copper plating thickness:

Board type	Bonding	Flash gold	HAL & Entek
Copper thickness	5um~10um	10um~25um	20um~40um

## 6. Etching

6.1 Etching factor: 1.5 max, 1.0Std.

6.2 Etch tolerance:

Board type	Flash gold	HAL	
Line width tolerance (min.)	+/-12%	+/-20% (L>5mil)	+/-1mil(L<=5mil)

## 7. Solder Mask (LPI) Printing:

7.1 Registration Tolerance of Solder Mask to pattern: +/-2mil (min), +/-3mils(Std)

7.2 Solder Mask Thickness: 10um~40um on line surface, 6um min. at line edge

7.4 Plugged Hole Size: 0.6mm (Max.)

7.5 Minimum Solder Mask hide: 0.35mm

7.6 Minimum Spacing of Solder Mask Opening to Line: 3mil

7.7 Minimum solder bridge: 4mil

## 8. Silkscreen Printing

### 8.1 Legend Printing

8.1.1 Minimum Line Width 6mil, Minimum height of Legend 40mil

8.1.2 Registration of Legend to Reference Hole +/-6mil

### 8.2 Carbon Printing

8.2.1 Minimum Line Width/ Spacing 10mil/14mil

8.2.2 Registration of Carbon to Reference Hole +/-7mil

### 8.3 Peelable Mask

8.3.1 Thickness of Mask 0.2mm~0.4mm

8.3.2 Maximum Size of Tenting hole 4.0mm

## 9. Profile finish:

9.1 Outline Finish Tolerance: +/-0.1mm(min), +/-0.13mm(Std.)

### 9.2 Routing

9.2.1 Minimum Milling Cutter Size 0.8mm

9.2.2 Minimum Radius of Inner Copper 0.4mm



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**9.2.3 Minimum Position Tolerance of Routing Hole (Slot) or Edge to Drill hole +/-5mil**

**9.2.4 Minimum Position Tolerance of Routing Hole to Routing Hole (Slot) +/-3mil**

**9.2.5 Minimum Position Tolerance of Routing Hole (Slot) to Routing Edge +/-4mil**

## 9.3 Punching

**9.3.1 Minimum Size of Punching Hole (Slot) 1.0mm**

**9.3.2 Maximum Size of Punching Board (panel) 350mm x 270mm**

**9.3.3 Maximum Thickness of Punching Board 1.6mm**

**9.3.4 Minimum Position Tolerance of Punching Hole (Slot) or Edge to Drill hole +/-5mil**

**9.3.5 Minimum Position Tolerance of Punching Hole to Punching Hole (Slot) +/-3mil**

**9.3.6 Minimum Position Tolerance of Punching Hole (Slot) to Punching Edge +/-4mil**

## 9.4 V-cutting

**9.4.1 Minimum Size of V-cut Board 50mm x 85 (v-cut direction) mm**

**9.4.2 Minimum Thickness of V-cut Board 0.6mm**

**9.4.3 Minimum Space of V-cut Line Per customer requirement**

**9.4.4 Minimum Space of V-cut Line to Panel Edge 3mm**

**9.4.5 Minimum Position Tolerance of V-cut Line to Primary Drilling Hole +/-7mil**

**9.4.6 Minimum Position Tolerance of V-cut Line to Second Drilling Hole +/-9mil**

**9.4.7 Minimum Position Tolerance of V-cut Line to Routing Edge +/-6mil**

**9.4.8 Minimum Position Tolerance of V-cut Line to Punching Edge +/-7mil**

**9.4.9 Minimum Position Tolerance of V-cut Line to V-cut line +/-4mil**

**9.4.10 Registration Tolerance of V-cut lines +/-4mil**

**9.4.11 V-Cut residual +/-4mil**

## 10. E-Testing

**10.1 Test Voltage 50V~300V**

**Commonly: 200V~300V**

**10.2 Isolated Resistance 1K ohm~100M ohm**

**Commonly: 20M ohm~40M ohm**

**10.3 Continuity Resistance 10 ohm~20K ohm**

**Commonly: 50 ohm~100 ohm**

## 11. FQC

### 11.1 Warp & Trap

Board Thk.	<0.5mm	0.5~0.8mm	1.0~1.2mm	>1.5mm
Warpage	1.5% max.	1% max.	0.75% max.	0.5% max.



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## Capability of Individual PROCESS

### 1. Drill Process

Min. drill bit: 0.2mm, Max drill bit 6.5mm

Min. working panel size: 6"x6", Max. working panel size: 24"x20"

Hole Position tolerance: +/-3mil (primary drilled), +/-5mil(Secondary drilled)

Min slot drill bit: 0.5mm

### 2. PTH and Panel Plating

Max. aspect ratio: 6 : 1

Copper plating thickness 5~10um

### 3. Imaging (Outer)

3.1 Minimum Line Width/Spacing 4mil/4mil (0.5OZ), 6mil/6mil (1OZ)

3.2 Minimum SMT Pitch 16 mil, Std. SMT Pith 20mil

3.3 Minimum Bonding Pitch 9 mil Std. Bonding Pitch 12mil

3.4 Minimum Theoretic Annual Ring 5mil, Std. Annual Ring 6mil

3.5 Minimum Mesh Gap: 8mil

3.6 Maximum Size of D/F Tending Hole D5.5mm, Slot Width 4.5mm (Board Thk. 0.8mm)

3.7 Registration tolerance of pattern to reference Hole: +/-2mil(min), +/-3mil(std.)

### 3.8 Film Compensation Value of Pattern:

Item	0.5 OZ	1.0 OZ	2 OZ
Outer (expect F/G board)	0.04mm	0.08mm	0.12mm
Inner	0.02mm	0.04mm	0.08mm

### 3.9 Minimum Spacing:

Item	Line-Line	Line-Logo	Line-Plane	Copper or Line-Npth	Pad or Line-Edge(R)
Spacing	4mil	5mil	4mil	8mil	10mil



Item	Via Pad-Via Pad	Comp. Pad-Comp. Pad	Pad or Line-Edge (V)	Pad or Line-Edge (P)
Spacing	4mil	4mil or 10 mil	14 mil	12 mil
Item	Line-Via Pad	Line-Comp. Plane	Via Pad-Plane	Comp. Pad-Plane
Spacing	4mil	6mil	4mil	6mil

### 3.10 Imaging (Inner)

4.1 Minimum Line Width/Spacing 4mil/4mil (0.5OZ), 6mil/6mil (1OZ)

4.2 Minimum Theoretic Annual Ring of Signal Pad & Thermal Pad 6mil

4.3 Minimum Theoretic Annual Ring of Non-Functional Pad 10mil

4.4 Minimum Clearance of Isolation Pad 12mil (via) or 10mil (PTH>1mm)

4.5 Film Compensation Value of Pattern (Ref to 3.5)

4.6 Registration Tolerance of Layer of Layer to Layer: +/-3mil (min.), +/-4mil (Std)

#### 4.7 Minimum Spacing

Item	Line-Line	Line-d	Copper or Line-Npth	Pad or Line-Edge(R)
Spacing	4mil	4mil	8mil	10mil
Item	Pad-Pad	Line-Plane	Pad or Line-Edge (V)	Pad or Line-Edge (P)
Spacing	5mil	4mil	14 mil	16 mil
Item	Pad-Plane	Plane-Plane	Line-PHT Edge (isolated)	
Spacing	4mil	6mil	6mil (4L) or 8mil (>6L)	

## 5. Pattern Plating

### 5.1 Hole wall copper plating thickness

Board type	Bonding	Flash gold	HAL & Entek
Copper thickness	5um~10um	10um~20um	18um~35um