Board shall be fabricated - Performance Class II as per IPC-6011 & IPC-6012
Material: Per IPC-4101A/24/26/29/99, Copper Clad,
High Temperature FR4 Class Epoxy Glass Rated UL94V-D, 0.5 OZ Copper for External Layers & 0.5 OZ Copper for Internal Layers,
Must be RoHS compliant & survive a Lead-Free Assembly Max dwell of 260 DEG C (6 Passes)
Tg Ratings >340 DEG C
2 Axis CTE < 3.5%
Tg > 170 DEG C (min)
Solder Mask: SMVBG Per IPC-7351, Class T, Must be RoHS Compliant
TYP LPI, D.D023 .010 to .0008 Max measured over copper plating,
must clear all lands as indicated on gerber solder mask layers, (Color = Red)
Finish: Electro-less Nickel Immersion Gold (ENIG), 2" Micro Inches Gold Over 150-250 Micro Inches Nickel
This Assembly shall be RoHS Compliant, Vendor shall deliver assembly with accompanying certificate of compliance.
Suggested Stack Up
1.4mil L1 TOP LAYER 0.5oz Cu + 0.5oz Plate
0.7mil L2 GND 0.5oz Cu
0.7mil L3 MD LAYER 1 0.5oz Cu
0.7mil L4 MD LAYER 2 0.5oz Cu
0.7mil L5 SUB 0.5oz Cu
1.4mil L6 BOTTOM LAYER 0.5oz Cu + 0.5oz Plate

Impedance Control Trace Width/Space Impedance
Differential 4 / 8 / 4 (mil) 100 ohm 5%
Single Ended 4 (mil) 50 ohm 10%

Signal traces on L1 reference L2 plane 8 Signal traces on L3 reference L2 Plane
Signal traces on L4 reference L5 plane 8 Signal traces on L6 reference L5 Plane

* Manufacturer should change the stack up to match the impedance control base on the PCB material used.

Board Thickness: 1.6mm 6 Layers FR4
Bottom Layer
Mechanical I

Board shall be fabricated - Performance Class II as per IPC-6011 & IPC-6012
Material: Per IPC-4101A/24/26/29/99, Copper Clad,
High Temperature FR4 Class Epoxy Glass Rated UL94V-D,
0.5 OZ Copper for External Layers & 0.5 OZ Copper for Internal Layers,
Must be RoHS compliant & survive a Lead-Free Assembly Max reflow of 260 DEG C (6 Passes)
Td Rating: >340 DEG C
2 Axis CTE < 3.5%
Tg > 170 DEG C (Min)

Solder Mask: SMOBC Per IPC-SM-840C, Class T, Must be RoHS Compliant
TYP LPI, D.D0D2 thru to 0.0008 Max measured over copper plating,
must clear all lands as indicated on gerber solder mask layers, (Color = Red)
Finish: Electro-less Nickel Immersion Gold (ENIG), 2”8 Micro Inches Gold Over 150~250 Mirco Inches Nickel
This Assembly shall be RoHS Compliant. Vendor shall deliver assembly with accompanying certificate of compliance.
Board shall be fabricated – Performance Class 11 as per IPC-6011 & IPC-6012
Material: Per IPC-4101A/24/26/29/99, Copper Clad,
High Temperature FR4 Class Epoxy Glass Rated UL94V-D,
0.5 OZ Copper for External Layers & 0.5 OZ Copper for Internal Layers,
Must be RoHS compliant & survive a Lead-Free Assembly Max reflow at 260 DEG C (5 Passes)
T9 Rating >340 DEG C
2 Axis CTE < 3.5%
Tg > 170 DEG C (Min)
Solder Mask: SMD5C Per IPC-2M-440C, Class T, Must be RoHS Compliant
TYP LPI, D.D.D.D2 1.5h to 0.0008 Max measured over copper plating,
must clear all lands as indicated on gerber solder mask layers, (Color = Red)
Finish: Electro-less Nickel Immersion Gold (ENIG), 2/8 Micro Inches Gold Over 150/250 Micron Inches Nickel
This Assembly shall be RoHS Compliant. Vendor shall deliver assembly with accompanying certificate of compliance.
Suggested Stack Up

<table>
<thead>
<tr>
<th>Layer</th>
<th>Material Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1 TOP LAYER</td>
<td>0.5oz Cu + 0.5oz Plate</td>
</tr>
<tr>
<td>L2 GND</td>
<td>0.5oz Cu</td>
</tr>
<tr>
<td>L3 M1 LVPEL0</td>
<td>0.5oz Cu</td>
</tr>
<tr>
<td>L4 M2 LVPEL2</td>
<td>0.5oz Cu</td>
</tr>
<tr>
<td>L5 L2</td>
<td>0.5oz Cu</td>
</tr>
<tr>
<td>L6 BOTTOM LAYER</td>
<td>0.5oz Cu + 0.5oz Plate</td>
</tr>
</tbody>
</table>

Impedance Control Trace Width/Space Impedance

Differential 4 / 8 / 4 (mil) 100 ohm 5%

Single Ended 4 (mil) 50 ohm 10%

Signal traces on L1 reference L2 plane 8 Signal traces on L3 reference L2 Plane

Signal traces on L4 reference L5 plane 8 Signal traces on L6 reference L5 Plane

* Manufacturer should change the stack up to match the impedance control base on the PCB material used.

**Mechanical**

Board shall be fabricated - Performance Class II as per IPC-6011 & IPC-6012

Material: Per IPC-4101A/24/26/29/99, Copper Clad,

- High Temperature FR4 Class Epoxy Glass rated UL94V-D,
- 0.5 OZ Copper for External Layers 8 0.5 OZ Copper for Internal Layers,
- Must be RoHS compliant 8 survive a Lead-Free Assembly Max reflow of 260 DEG C (6 Passes)
- Td Rating: >340 DEG C
- 2 Axis CTE < 3.5%
- Tg > 170 DEG C (Min)

Solder Mask: SMDG Per IPC-SH-4401, Class T, Must be RoHS Compliant,

TYP: LPI, D.D.D2 8m to 0.0008 Max measured over copper plating,

must clear all lands as indicated on gerber solder mask layers, (Color = Red)

Finish: Electro-less Nickel Immersion Gold (ENIG), 2-8 Micron Inches Gold Over 150-250 Micron Inches Nickel

This Assembly shall be RoHS Compliant. Vendor shall deliver assembly with accompanying certificate of compliance.
**Suggested Stack Up**

<table>
<thead>
<tr>
<th>Layer</th>
<th>Copper</th>
<th>Plate</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1 TOP LAYER</td>
<td>0.5oz</td>
<td>Cu + 0.5oz Plate</td>
</tr>
<tr>
<td>L2 GND</td>
<td>0.5oz</td>
<td>Cu</td>
</tr>
<tr>
<td>L3 MID LAYER1</td>
<td>0.5oz</td>
<td>Cu</td>
</tr>
<tr>
<td>L4 MID LAYER2</td>
<td>0.5oz</td>
<td>Cu</td>
</tr>
<tr>
<td>L5 PIN</td>
<td>0.5oz</td>
<td>Cu</td>
</tr>
<tr>
<td>L6 BOTTOM LAYER</td>
<td>0.5oz</td>
<td>Cu + 0.5oz Plate</td>
</tr>
</tbody>
</table>

**Impedance Control**

- Trace Width/Space
- Impedance
- Differential
- 4 / 8 / 4 (mil)
- 100 ohm 5%
- Single Ended
- 4 (mil)
- 50 ohm 10%

**Signal traces**
- on L1 reference to L2 plane 8
- Signal traces on L3 reference to L2 Plane
- Signal traces on L4 reference to L5 plane 8
- Signal traces on L6 reference to L5 Plane

* Manufacturer should change the stack up to match the impedance control based on the PCB material used.

---

**Board Thickness** 1.6mm 6 Layers FR4

**Top Solder**

**Mechanical 1**

Board shall be fabricated - Performance Class II as per IPC-6011 & IPC-6012

**Material:** Per IPC-4101A/24/26/29/99, Copper Clad,
- High Temperature FR4 Class Epoxy Glass Rated UL94V-D,
- 0.5 OZ Copper for External Layers & 0.5 OZ Copper for Internal Layers,
- Must be RoHS compliant & survive a Lead-Free Assembly Max reflow of 260 DEG C (6 Passes)
- Td Rating >340 DEG C
- 2 Axis CTE < 3.5%
- Tg > 170 DEG C (min)

**Solder Mask:** SM02C Per IPC-4499, Class T, Must be RoHS Compliant
- TYP LPI, S.DDD2 Ibe to 0.0008 Max measured over copper plating,
- Must clear all lands as indicated on gerber solder mask layers, (Color = Red)

**Finish:** Electro-less Nickel Immersion Gold (ENIG), 2”8 Micro Inches Gold Over 150-250 Micro Inches Nickel

This Assembly shall be RoHS Compliant, Vendor shall deliver assembly with accompanying certificate of compliance.
Suggested Stack Up

<table>
<thead>
<tr>
<th>Layer</th>
<th>Thickness (mil)</th>
<th>Copper Content</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1 TOP LAYER</td>
<td>0.5</td>
<td>Cu + 0.5oz Plate</td>
<td></td>
</tr>
<tr>
<td>L2 GND</td>
<td>0.5</td>
<td>Cu</td>
<td></td>
</tr>
<tr>
<td>L3 MID LAYER</td>
<td>0.5</td>
<td>Cu</td>
<td></td>
</tr>
<tr>
<td>L4 MID LAYER</td>
<td>0.5</td>
<td>Cu</td>
<td></td>
</tr>
<tr>
<td>L5 TOP LAYER</td>
<td>0.5</td>
<td>Cu + 0.5oz Plate</td>
<td></td>
</tr>
</tbody>
</table>

Impedance Control Trace/Width/Space Impedance
Differential 4 / 8 / 4 (mil) 100 ohm 5%
Single Ended 4 (mil) 50 ohm 10%

Signal traces on L1 reference L2 plane B Signal traces on L3 reference L2 Plane
Signal traces on L4 reference L5 plane B Signal traces on L6 reference L5 Plane

* Manufacturer should change the stack up to match the impedance control base on the PCB material used.

**Board Thickness 1.6mm 6 Layers FR4**

**Bottom Solder**

**Mechanical 1**

Board shall be fabricated - Performance Class II as per IPC-6011 & IPC-6012
Material: Per IPC-4101A/24/26/29/99, Copper Clad,
  High Temperature FR4 Class Epoxy Glass Rated UL94V-D,
  0.5 OZ Copper for External Layers & 0.5 OZ Copper for Internal Layers.
Must be RoHS compliant & survive a Lead-Free Assembly Max reflow of 260 DEG C (6 Passes)
Td Rating >340 DEG C
Z Axis CTE < 3.5%
Tg > 170 DEG C (Min)

Solder Mask: SMDSC Per IPC-6011, Class T, Must be RoHS Compliant
  TYP LPI, D.DOD2 fh to 0.0008 Max measured over copper plating,
must clear all lands as indicated on gerber solder mask layers, (Color = Red)
Finish: Electro-less Nickel Immersion Gold (ENIG), 2"8 Micro Inches Gold Over 150~250 Micro Inches Nickel
This Assembly shall be RoHS Compliant. Vendor shall deliver assembly with accompanying certificate of compliance.
Board shall be fabricated - Performance Class I as per IPC-6011 & IPC-6012
Material: Per IPC-4101f/24/26/29/99, Copper Clad,
High Temperature FR4 Class Epoxyl Glass Rated UL94V-D,
0.05 OZ Copper for External Layers & 0.05 OZ Copper for Internal Layers,
Must be RoHS compliant & survive a Lead-Free Assembly Max reflow of 260 DEG C (6 Passes)
Td Rating >340 DEG C
Z Axis CTE < 3.5%
Tg > 170 DEG C (Min)

Solder Mask: SM06C Per IPC-SM-840C, Class T, Must be RoHS Compliant
Typ LPI, D0.002 in to 0.0008 Max measured over copper plating,
must clear all lands as indicated on gerber solder mask layers, (Color = Red)
Finish: Electro-less Nickel Immersion Gold (ENIG), 2" Micro Inches Gold Over 150-250 Micro Inches Nickel
This Assembly shall be RoHS Compliant. Vendor shall deliver assembly with accompanying certificate of compliance.
Suggested Stack Up
1.4mil 1 L1 TOP LAYER 0.5oz Cu + 0.5oz Plate
1.2mil L2 GND 0.5oz Cu
0.7mil L3 M1 M2 M3 M4 M5 M6 M7 0.5oz Cu
0.7mil L4 M1 LWELD L2 LWELD 0.5oz Cu
0.7mil L5 DUB 0.5oz Cu
1.4mil L6 BOTTOM LAYER 0.5oz Cu + 0.5oz Plate

Impedance Control Trace Width/Space

Differential 4 / 8 / 4 (mil) 100 ohm 5%
Single Ended 4 (mil) 90 ohm 10%

The layout represents: 4 Signal traces on L1 reference L2 plane 8 Signal traces on L2 reference L1 plane
5 Signal traces on L4 reference L5 Plane 8 Signal traces on L5 reference L4 Plane

* Manufacturer should change the stack up to match the impedance control base on the PCB material used.

** MBCC-FMC-U-B **
** HKADS-13-D7-HW-0201 **
Ref Scht: U-B 12/6/2013 11:34:14 AM

Board Thickness: 1.6mm 6 Layers FR4
Top Overlay
Top Solder
Mechanical 1, Mechanical 2

Board shall be fabricated - Performance Class I) as per IPC-6011 & IPC-6012
Material: Per IPC-4101/H24/26/29/99, Copper Clad,
High Temperature FR4 Class Epoxy Glass Rated UL94V-0-D,
0.5 OZ Copper for External Layers & 0.5 OZ Copper for internal layers,
Must be RoHS compliant & survive a Lead-Free Assembly Max reflow of 260 DEG C (6 Passes)
Td Rating: >340 DEG C
Z Axis CTE < 3.5%
Tg > 170 DEG C (min)

Solder Mask: SMOG Per IPC-SM-B400, Class T, Must be RoHS Compliant
TYP LPI, D.D002 ghn to 0.0008 Max measured over copper plating,
must clear all lands as indicated on gerber solder mask layers, (Color = Red)
Finish: Electro-less Nickel Immersion Gold (ENIG), 2”8 Micro Inches Gold Over 150”250 Micro Inches Nickel
This Assembly shall be RoHS Compliant. Vendor shall deliver assembly with accompanying certificate of compliance.