Suggested Stack Up

<table>
<thead>
<tr>
<th>Layer</th>
<th>Material</th>
<th>Width/Trace</th>
<th>Impedance</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOP</td>
<td>0.5 oz Cu</td>
<td>0.5 oz Plate</td>
<td></td>
</tr>
<tr>
<td>L2 (PAD)</td>
<td>0.5 oz Cu</td>
<td>100 ohm 5%</td>
<td></td>
</tr>
<tr>
<td>BOTTOM</td>
<td>0.5 oz Cu</td>
<td>50 ohm 10%</td>
<td></td>
</tr>
</tbody>
</table>

Signal traces on L1 reference L2 plane & Signal traces on L4 reference L3 plane
* Manufacturer should change the stack up to match the impedance control base on the PCB material used.

**Table:**

<table>
<thead>
<tr>
<th>Board Thickness</th>
<th>Layers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.6mm</td>
<td>FR4</td>
</tr>
</tbody>
</table>

**Top Layer**

**Mechanical Layer**

Board shall be fabricated as per IPC-6011 & IPC-6012

Material: Per IPC-4101A/24/29/36, Copper Clad,
High Temperature FR4 Class Epoxy Glass Rated ULS400-0,
0.5 oz Copper for External Layers & 0.5 oz Copper for Internal Layers,
Must be RoHS compliant & survive a Lead-Free Assembly with reflow of 260 DEG C (6 Passes)
- Td Rating: >940 DEG C
- Z Axis CTE < 4% 
- Tg > 170 DEG C (Min)

Solder Mask: SnPb Per IPC-6089-0C, Class T, Must be RoHS Compliant
- TYP LPI, 0.0002 Min to 0.0008 Max measured over copper plating,
  must clear all lands as indicated on gerber solder mask layers, (Co)lors = Red

Finish: Electroless 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 as Performance Class II as per IPC-6011 & IPC-6012

Material: Per IPC-4101A/24/26/29/36, Copper Clad,
High Temperature FR4 Class Epoxy Glass Rated UL94V-0,
0.02 Oz Copper for External Layers & 0.01 Oz Copper for Internal Layers,
Must be RoHS compliant & survive a Lead-Free Assembly Max reflow of 260 DEG C (6 Passes)
  Td Rating >940 DEG C
  Z Axis CTE < 0.5%
  Tg > 170 DEG C (Min)

Solder Mask: SMDC Per IPC-SM-846C, Class T, Must be RoHS Compliant
Typ LPI, 0.0002 Min 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 Mil 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>Material</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1 TOP LAYER</td>
<td>0.5oz Cu + 0.5oz Plate</td>
<td>5 mil</td>
</tr>
<tr>
<td>L2 (ON)</td>
<td>0.025 mil</td>
<td></td>
</tr>
<tr>
<td>L3</td>
<td>0.025 mil</td>
<td></td>
</tr>
<tr>
<td>L4 BOTTOM LAYER</td>
<td>0.5oz Cu</td>
<td>5 mil</td>
</tr>
</tbody>
</table>

**Impedance Control**

- **Trace/Width/Space**
- **Impedance**
  - Differential: 4, 5, 7, 14.5 mil
  - Single Ended: 5 mil

Signal traces on L1 reference L2 plane & Signal traces on L4 reference L3 plane

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

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**Board Thickness:** 1.6mm ± 1 Layers FR4

**Mechanical 1:**

Top Overlay

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

**Material:** Per IPC-4101A/24/26/96, Copper Clad, High Temperature FR4 Class Epoxy Glass Rated UL-94V-0, 0.2 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: >240 DEG C
- 2 Axis CTE < 5%
- Tg > 170 DEG C

**Solder Mask:** SMD Per IPC-SM-843C, Class T, Must be RoHS Compliant

- TYP LPI, 0.0002 Min 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.
Board shall be fabricated - Performance Class II as per IPC-6011 & IPC-6012
Material: Per IPC-4101A/24/26/29/36, Copper Clad,
High Temperature F24 Class Epoxy Glass Rated UL94V-0,
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: >300 DEG C
Z Axis CTE < 3.5%
Tg > 170 DEG C (Min)
Solder Mask: SMDC Per IPC-7351, Class II, Must be RoHS Compliant
Typ LPI, 0.0002 Min 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.
Impedance Control Trace Width/Space Impedance
Differential 4.5 / 7 / 4.5 (mil) 100 ohm 5%
Single Ended 5 (mil) 50 ohm 10%

Signal traces on L1 reference L2 plane & Signal traces on L4 reference L3 plane
* Manufacturer should change the stack up to match the impedance control base on the PCB material used.

Board shall be fabricated - Performance Class II as per IPC-6011 & IPC-6012
Material: Per IPC-6011A/24/26/29/36, Copper Clad,
High Temperature FR4 Class Epoxy Glass Rated UL94V-0,
0.02 Copper for External Layers & 0.01 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 < 0.5%
    Tg > 170 DEG C (min)

Solder Mask: SMBE Per IPC-SM-9405, Class T, Must be RoHS Compliant
Typ LPV, 0.0002 Min 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), 2.0 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 II as per IPC-6011 & IPC-6012
Material: Per IPC-4101A/24/29/36, Copper Clad,
  High Temperature FR4 Class Epoxy Glass Rated UL94V-0,
  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: >140 DEG C
  2 Axis CTE < 0.5%
  Tg > 170 DEG C (Min)
Solder Mask: SMCPC Per IPC-SM-846C, Class T, Must be RoHS Compliant
Typ LPI, 0.0002 Min 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), 2.5 Mic Inches Gold over 150’250 Mic Inches Nickel
This Assembly shall be RoHS Compliant, Vendor shall deliver assembly with accompanying certificate of compliance.
Suggested Stack Up

1. Top Layer 0.05oz Cu + 0.05oz Plate
2. (ND) 0.06oz Cu
3. Bottom Layer 0.05oz Cu + 0.05oz Plate

Impedance Control Trace Width/Space Impedance
Differential 4.5 / 7 / 4.5 (mil) 100 ohm 5%
Single Ended 5.5 (mil) 50 ohm 10%

Signal traces on L1 reference L2 plane & Signal traces on L4 reference L3 Plane
* Manufacturer should change the stack up to match the impedance control base on the PCB material used.

Board Thickness: 1.6mm 4 Layers FR4

Mechanical 1
Mechanical 2

Board shall be fabricated - Performance Class II as per IPC-6011 & IPC-6012
Material: Per IPC-4401A/24/25/36, Copper Clad,
High Temperature FR4 Class Epoxy Glass Rated UL94V-0,
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)
Tg (Glass Transition Temperature) 180 DEG C
Z Axis CTE < 3.5
Tg > 170 DEG C (Min)

Solder Mask: SMD Per IPC-SM-840C, Class T, Must be RoHS Compliant
Typ LPI, 0.0002 Min to 0.0008 Max measured over copper plating,
must clear all lands as indicated on gerber solder mask layers, (Color = Red)

Finish: Electroless Nickel Immersion Gold (ENIG), 2.5 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

Layer | Description | Thickness | Material
--- | --- | --- | ---
L1 TOP LAYER | 0.5oz Cu | 4mil
L2 MID | 0.5oz Cu | 4mil
L3 BOTTOM | 0.5oz Cu | 4mil

Impedance Control Trace Width / Space Impedance Differential
--- | --- | ---
4 mil / 7 mil (4mil) | 100 ohm 5% |
5 mil / 9 mil (5mil) |
Signal traces on L1 reference L2 plane & Signal traces on L4 reference L3 Plane
* Manufacturer should change the stack up to match the impedance control based on the PCB material used.

**MBCC-10-PCB-D**  
**Design: MBCC-10-Rev.D**  
**Date: 10/23/2013 1:35:33 PM**  
**Board Thickness: 1.6mm 4 Layers FR4**

**Top Solder**
- Top Overlay

**Mechanical**
- Mechanical 1
- Mechanical 2

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

**Material:** Per IPC-4101A/24/26/29/26, Copper Clad,
- High Temperature FR4 Class Epoxy Glass Rated UL94V-0,
- 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)

**Solder Mask:** SMBPC Per IPC-SM-840C, Class T, Must be RoHS Compliant

**Typ LPI:** 0.0002 Min to 0.0008 Max measured over copper plating,
- must clear all lands as indicated on gerber solder mask layers. (Color = Red)

**Finish:** Electroless Nickel [Immersion Gold (EN), 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.