TECHNOLOGICAL NORMS OF MULTILAYER PRINTED CIRCUIT BOARDS TOPOLOGY

PCB THICKNESS:

0.30 mm

8.00 mm

MAXIMUM SIZE:

620,00 x 813,00 mm

for rigid and rigid-flex PCBs

350,00 x 500,00 mm

for multilayer PCBs

MINIMAL DIAMETER OF HOLES, mm:

- 0.50 for holes with reverse drilling technologies for backplanes
- 0.20 for serial production
- 0.15 for samples production
- 0.25 for PCBs based on PTFE and APPE
- 0.30 min. diameter of half-holes at the edges of the board
- 0.40 maximum diameter of the holes to be filled with resin

BOARD THICKNESS TO DRILLING DIAMETER RATIO:

<table>
<thead>
<tr>
<th>Hole diameter</th>
<th>Samples and Prototypes</th>
<th>Serial production</th>
</tr>
</thead>
<tbody>
<tr>
<td>0,20mm and less</td>
<td>10 :1</td>
<td>8 :1</td>
</tr>
<tr>
<td>0,30mm and less</td>
<td>12 :1</td>
<td>10 :1</td>
</tr>
<tr>
<td>0,80mm and less</td>
<td>16 :1</td>
<td>12 :1</td>
</tr>
<tr>
<td>more than 0,80mm</td>
<td>20 :1</td>
<td>15 :1</td>
</tr>
<tr>
<td>for backplanes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>for technology of filling vias with resin</td>
<td>30 :1</td>
<td></td>
</tr>
<tr>
<td>for PCBs based on PTFE and APPE</td>
<td>8 :1</td>
<td></td>
</tr>
</tbody>
</table>
TECHNOLOGICAL CAPABILITIES

Accuracy of hole sizes:
• Ø of plated holes - ± 75 µm
• Ø of non-plated holes - ± 50 µm
• Ø of plated holes for press-fit - ± 50 µm
• size of grooves, countersinks and slots - ± 150 µm

Accuracy of holes positioning ± 75 µm
Accuracy of blind holes and notches ± 100 µm

Minimum spacing from plated wall of drilling channel to copper in power layers:
• in prototypes and samples for boards with number of layers 8 and less - 140 µm
• in prototypes and samples for boards with number of layers 14 and less is 170 µm
• in prototypes and samples for boards with number of layers more than 14 - 180 µm
• in serial production PCBs with number of layers 8 and less - 180 µm
• in serial production PCBs with number of layers more than 8 - 200 µm
• for laser micro-holes - 125 µm

Minimum radius of grooves and slots milling - 0.30 mm
Minimum dielectric thickness for V-CUT processing:
• 0.40 mm for one side scribing
• 0.60 mm for both sides scribing

Maximum dielectric thickness for V-CUT processing - 3.20 mm

Scribing accuracy:
• application and alignment of lines - 0.10 mm
• scribing angle - ± 5°

Possible colors for silk-screen printing:
• white, yellow, black

Minimum size of silk-screen elements:
• in prototypes - not less than 0.70 mm
• in serial production - not less than 1.00 mm

Minimum width of solder mask bridges between pads:
• for green mask when using base foil 18 µm or less - 100 µm
• for a different color mask when using base foil 18 µm or less - 125 µm
• for mask of all colors when using base foil 35 µm - 150 µm
• for mask of all colors when using base foil 75 µm and more - 200 µm

Track width and spacing between them:

<table>
<thead>
<tr>
<th>Foil thickness</th>
<th>Samples and Prototypes</th>
<th>Serial production</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>in inner layers, mm</td>
<td></td>
</tr>
<tr>
<td>12 µm (1/3 oz)</td>
<td>0.075/0.075</td>
<td>0.075/0.075</td>
</tr>
<tr>
<td>18 µm (1/2 oz)</td>
<td>0.075/0.075</td>
<td>0.075/0.075</td>
</tr>
<tr>
<td>35 µm (1 oz)</td>
<td>0.075/0.100</td>
<td>0.075/0.100</td>
</tr>
<tr>
<td>70 µm (2 oz)</td>
<td>0.100/0.125</td>
<td>0.100/0.140</td>
</tr>
<tr>
<td>100 µm (3 oz)</td>
<td>0.125/0.200</td>
<td>0.125/0.200</td>
</tr>
<tr>
<td>200 µm (6 oz)</td>
<td>0.200/0.400</td>
<td>0.200/0.400</td>
</tr>
<tr>
<td>300 µm (9 oz)</td>
<td>0.280/0.610</td>
<td>0.280/0.750</td>
</tr>
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<td></td>
<td>in outer layers, mm</td>
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<td>0.075/0.100</td>
</tr>
<tr>
<td>18 µm (1/2 oz)</td>
<td>0.085/0.085</td>
<td>0.100/0.150</td>
</tr>
<tr>
<td>35 µm (1 oz)</td>
<td>0.115/0.125</td>
<td>0.120/0.140</td>
</tr>
<tr>
<td>70 µm (2 oz)</td>
<td>0.150/0.175</td>
<td>0.150/0.200</td>
</tr>
<tr>
<td>100 µm (3 oz)</td>
<td>0.175/0.250</td>
<td>0.175/0.300</td>
</tr>
<tr>
<td>200 µm (6 oz)</td>
<td>0.255/0.470</td>
<td>0.255/0.540</td>
</tr>
<tr>
<td>300 µm (9 oz)</td>
<td>0.330/0.760</td>
<td>0.330/0.840</td>
</tr>
</tbody>
</table>

Tracks manufacture accuracy:
• for tracks with width 0.25 mm or less in prototypes and samples - ± 25 µm
• for tracks with width more than 0.25 mm in prototypes and samples - ± 38 µm

In serial products manufacturing precision is regulated by IPC-A-600G standards and is less than ± 20%

Min. size of pads for BGA chips:
• HASL SnPb - not less than 0.250 mm
• HASL Pb free - not less than 0.350 mm
• Immersion surface finishes - not less than 0.175 mm

Minimum spacing between adjacent pads:
• in samples of boards with immersion finish when using base foil of 18 µm or less - 90 µm
• in serial boards with immersion finish when using base foil of 18 µm and less - 100 µm
• in prototypes with HASL finish when using base foil of 18 µm and less - 175 µm
• in serial boards with HASL finish when using base foil of 18 µm and less - 200 µm

Minimum size of topology elements not connected to circuits - 0.20 mm