PROCESSING GUIDELINES

Laminate: SAR20S

Metal base laminate

This product process guideline uses IPC-4101 Standard as a reference, and Shengyi make some changes according to the product characteristics of the actual situation as to making it more suitable for the Shengyi SCR20S product use.

1. Storage condition

1.1 Laminate

1.1.1 Storage condition

- Pack with original forms on the platform or on the appropriate frame, avoiding stress, prevent sheet deformation caused by inappropriate storage which may impact the subsequent PCB processes.

1.1.2 Storage environment

- Sheets should be stored in ventilated, dry, at room temperature under environment control, avoiding direct sunlight, rain and avoid erosion of corrosive gas (stored environment directly affect the quality of material).
- Minimize shifting as to avoid scratching the surface of the product, with a suitable environment and condition for storage, the shelf life can be up to one year.

1.1.3 Operation manual

- Wear clean gloves and carefully operate the laminates. Copper foil collisions, sliding will cause damage of the laminates. Bare hands action will cause contamination to copper foil surface. These defects are likely to cause adverse effects. To void scratches due to abrasion in the process of material transfer, can increase a piece of cushion paper or cushion pad in between laminates.

2、PWB Processing

2.2 Usage recommendation

- When selected copper base laminate for high power LED, the higher the power supply of the module, the higher thermal conductivity is required. The higher the thermal conductivity, the better the heat dissipation. The thinner the dielectric layer, the lower the thermal resistance, and the better the heat dissipation performance under Hi-pot conditions. For outdoor equipment with high voltage resistance requirement, when the thermal conductivity is satisfied, the thicker the dielectric layer, the higher the voltage resistance.
- Pay attention to careful handling during production, especially for mechanical processes of drilling, punching and cutting etc., be sure to avoid defects like pollution, damage, scratches and so on.
- Due to the chemical properties of copper base board, pattern fabrication should be taken appropriate etching lines (acid or alkaline) and corresponding protective measures, especially for those to prevent copper edge from erosion. There are two common measures, one is to protect edges by tapes; another is manually cut off protection film around 4mm from the edge, and grind after etching process. Both

methods can be selected according to the actual need.

- For copper base laminate warpage, simple mechanical method can replace the conventional baking with pressure to achieve leveling effect, so common metal leveling machine is available.
- The relevant cutting tools for copper base laminate need to be harder, so special drill bit, special milling / router bit, special V-CUT blade and special die and so on are needed. Cutting speed should be slow.

2.3 Drilling and Routing

- Tool selection: use special cutting tools for copper base materials, choose single-edge, double-edge cutting tools to ensure smooth chip removal, and generally use diameter of 1.6mm or above.
- Drilling parameters (for reference): drill bit diameter 2.0mm, spindle speed 45 Krpm, feed speed 0.2m/min, return speed 10m/min, hit count 15 hits, 1 panel/stack.
- Routing parameters (for reference): router diameter 2.0mm, spindle speed 35 Krpm, feed speed 6mm/s, running speed 0.3mm/s, platform speed 12mm/s, routing length 3m, 1 panel/stack.
- Pay attention to the routing quality, such like dielectric nick/edge crack phenomenon, which is mainly related to the mismatching factor of process condition and material characteristics. The process parameters above are for reference. If similar edge defect occurs, adjust parameters appropriately to ensure quality.

2.4 Punching

- Using air gun or brush to remove copper and dielectric chips caused by each punching in order to avoid bad appearance like copper damage by pressure in subsequent operation due to residual chips in the die.
- Due to the deformation of copper base and the formation of R angle when punching, copper base surface must be worked towards the cutting blade when punching, otherwise it's easy to cause the peeling off of solder mask and dielectric layer and result in poor quality.
- Punching machine: 200t or higher tonnage punching machine with special die is recommended. The punching edge length should be adjusted according to different sizes of die.
- Punching die: High efficiency die is needed, and made by special die steel. Because high proportion of fillers are contained in the thermal dielectric layer, tungsten steel and other high hardness steel fabrication for the cutting blade and punch position can prolong the life of die

2.5 Protect film

- PET film: generally colorless or green, not suitable for HAL process.
- If not peeled off before HAL process, the whole PET film will be cracked and adhered to the back of the copper base board, which is not able to be removed.

This process guide is for reference only! Should you have any questions, please feel free to contact us. ShengYi will support you with prompt and effective service.