PROCESSING GUIDELINES

Laminate: SAR10S、SAR15、SAR20、SAR20H

Excellent heat dissipation, High heat resistance Aluminum Material

This product process guideline uses GB-T31988 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 SAR10S, SAR15, SAR20 and SAR20H 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.

2、PWB Processing

2.1 Operation

- 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.

2.2 Usage recommendation

- When selected aluminum 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, the better the heat dissipation and the lower the thermal resistance, but withstanding voltage needs to be taken into account.
- Pay attention to any pollution and scratches of aluminum laminate during operation. In the mechanical processes of drilling, punching and cutting etc., be sure to avoid break or pollute the dielectric layer.
- Due to the chemical properties of aluminum board, pattern fabrication should be taken appropriate etching lines (acid or alkaline) and corresponding protective measures.
- During Hi-pot test, dirt on board surface, hole and aluminum board edge burr, sawtooth-like pattern and scratches of dielectric layer will lead to Hi-pot test fire, leakage and breakdown and result in rejection. Pay attention to board surface cleaning and edge quality, etc.
- A minimum insulation barrier must be maintained between the edge of the circuit board (or a hole in the circuit board) and the nearest conductor. The distance between edge and line is recommended to be at

least 2 mm, and the distance between hole and line is at least 3mm.

- Because most of the structure of aluminum laminate is metal and less internal stress of non-fiber dielectric, simple mechanical method can replace the conventional baking with pressure to achieve leveling effect, so common metal leveling machine is available. If warpage occurs, mechanical leveling is recommended.
- The relevant cutting tools for aluminum 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. At the same time, cutting speed should be reduced.

2.3 Drilling and Routing

- 1 Panel/Stack
- Low spindle speed, high torsion, low linear speed
- Tool selection: use special cutting tools for aluminum materials, choose single-edge, double-edge cutting tools to ensure smooth chip removal, and generally use diameter of about 2.0mm.
- Drilling parameters (for reference): feed speed 10-16mm/s; return speed 150mm/s; spindle speed 50 kpm; hit count around 200-500 hits.
- The higher the thermal conductivity, the greater the wear of the material to the drill bit / router. Process parameters are adjusted according to different thermal conductivity materials.

2.4 Punching

- Using air gun to remove aluminum chips caused by each punching in order to avoid bad appearance in subsequent operation due to residual aluminum chips in the die.
- Due to the deformation of aluminum and the formation of R angle when punching, aluminum 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. Recommend to put the aluminum surface faced upwards to the cutting blade in case of solder mask or dielectric layer peeling off and edge burrs problem.
- Punching machine: 160-200t high tonnage punching machine with special die is recommended. The punching edge length and panel edge margin should be adjusted according to different sizes of die.
- Punching die: tungsten steel and other high hardness steel should be used in the cutting blade and punch position, for high proportion of fillers are contained in the thermal dielectric layer.

2.5 Protect film

- PET film: generally colorless or green, not suitable for lead-free HAL process.
- If not peeled off before HAL process, the whole PET film will be cracked and adhered to the back of the aluminum 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.