



PROCESSING GUIDELINES

Laminate: SH260

Prepreg: SH260B

Halogen free, Low CTE, High Thermal Performance Material



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 SH260/SH260B 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).
- For double-sided copper clad laminates (cores), to 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 two years.
- For single-sided copper clad laminates, with a suitable environment and condition for storage, the shelf life can be up to one year, and the laminate internal performance can meet IPC4101E standard.

1.1.3 Operation manual

- Wear clean gloves and carefully operate the cores. Copper foil collisions, sliding will cause damage of the cores. Bare hands action will cause contamination to copper foil surface. These defects are likely to cause adverse effects.

1.2 Prepreg

1.2.1 Storage method

- Levels stored in original packaging form, avoiding stress, prevent sheet deformation caused by inappropriate storage condition.
- Leftover or cut prepregs should pack and seal with original packaging and put it back in the original packaging tray.

1.2.2 Storage environment

- Prepreg sealed packaging should be stored in free of UV irradiation environment, specific storage conditions and the storage period as follows:
 - Condition 1: 3 months when stored at <23°C and <50% RH.
 - Condition 2: 6 months when stored at <5°C.
- Note: Relative humidity affect prepreg quality the most, pay special attention on weather (conduct dehumidification process is necessary for wet weather).

1.2.3 Cutting guideline

- Cutting the best way is left to professional staff wear clean gloves during operation, prevent the pollution of prepreg surface; operation must be careful to prevent prepreg wrinkle or crack, to avoid affect prepregs.

1.2.4 Prepregs use recommendations

- If moving from a low temperature storage space to a higher temperature or ambient temperature storage space, it must go through the temperature settle process, (settle time suggested over 8 hours, depending on the temperature difference in between two storage conditions). Open package after temperature settle process is completed as to avoid affecting the quality and adhesion of prepregs.
- For PP package stored in above conditions 1 or 2, after open is required to complete the use as soon as possible, for packages opened more than 3 day, it must re-inspect and insure quality before use.
- Leftover or cut prepregs should pack and seal with original packaging and put it back in the above stated storage condition 1 or 2.
- For IQC inspection, PP testing should be finished within 5 days from the date of acceptance according to IPC-4101 standard.

2. PWB Processing

2.1 Panel cutting

- Sawing (preferred) and shearing method is recommended. Be careful of potential edge cracks when using roller cutter or caused by improper gap or cutter blade abrasion.

2.2 Thin core baking

- Thin core baking depends on actual need. If bake after cutting, it's recommended to rinse cutting panels first, which is able to remove resin powder brought by cutting and avoid etching problem.
- Baking condition: 150°C/4-8h, be sure to avoid contact directly with heater.

2.3 Thin core brown oxidation process

- Brown oxidation is recommended, to prevent moisture affecting the laminate thermal resistance, baking can be conducted after the brown oxidation process. Suggested baking condition: 120°C/ 1 hours or according to the suggestion from the brown oxidation solution suppliers. Hot pressing should be proceeded within 4 hours after baking.

2.4 Lay-up

- Ensure prepreg direction of warp and fill at lay-up process. Avoid prepreg reversal or overturn in case of multilayer board distortion after press.

2.4 Press process

- For multilayer pressing, it's recommended to keep heat-up rate at 1.5-2.5°C/min when material

temperature is from 80°C to 140°C.

- Full pressure setting is recommended at about 350 PSI (oil heated), specified value should be determined by multilayer feature (lay-up construction and resin filled area).
- Apply full pressure when the temperature of top layer ranges 80-100 °C.
- Curing condition: $\geq 220^{\circ}\text{C}$, 180min. Option for curing: Cure above 185°C for 1.5 hour, post baking for about 3 hours at 230°C.
- Maximum 8-10 layers of every open is recommended.
- 14-16 plies of kraft papers (unit weigh is 161g/m²) are suggested using at the upper and bottom for every open.
- If pressed by Adara machine, please inform us for more information.
- When adopted single sided or dummy panel for multilayer, be sure to roughen the unclad surface before use, otherwise poor bonding might happen due to smooth surface. Etching double sided board for that purpose is one of optional measures.

2.5 Drilling

- Suggested drilling parameter refers to high Tg FR-4 or halogen free material.
- Suggested hit count range is 1000-2000, use new drill for processing.
- The data below is for your reference.

Hole size (mm)	S (krpm)	F (m/min)	R (m/min)	Hit count
0.35	110	1.7	12	1200
0.4	110	2.4	12	1200
0.5	100	3.5	15	1200

*For dense hole drilling or drill hole below 0.6mm, suggest to use aluminium sheet cover or LE aluminium cover.

2.6 Desmear

- Suggest to use plasma desmear method; if potassium permanganate is used, extend desmear time or increase operation temperature (can refer to high Tg material desmear parameter to choose the suitable swelling and desmear time and temperature). The desmear could be done for 1-2 times for optimized effect, and double-sided laminate also needs the desmear process.
- Bake after drilling would help to improve desmear effect. Customer can adopt it depending on actual need. Baking condition: 190°C/2H.

2.7 Solder mask

- Be careful of panel distortion or warpage due to improper stack-up at pose baking process. Because of material property, rework after solder mask process complete is not suggested, rework after pre-baking of the solder mask can be applied.



2.8 HAL

- Suitable for lead free HAL process.

2.9 Routing/Punching

- Suitable for routing process, not suitable for punching process.
- Routing speed is recommended to reduce by 20-30% compared with normal FR-4 material.
- Properly reduce routing length to avoid milling cutter abrasion causing the edge delamination problem.

2.10 Packaging

- To prevent moisture effect on the heat resistance of base material, suggest baking finished boards at 150°C /2~4h before packaging. For a long time storage, it's advised to wrap by aluminum pack.

3. PWB Soldering

3.1 Shelf life of PWB

- 3 months with packaging protection.
- Bake at 125°C/4~8h before assembly is recommended, especially when stored more than 3 months.

3.1 Reflow

- Suitable for lead free reflow process

3.2 Manual soldering

- For separated or connected pad, manual soldering temperature should range 350-380°C and hold less than 3s for single point.

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.