



PROCESSING GUIDELINES

Laminate: S1190G

Prepreg: S1190GB

High Thermal Resistance, High Reliability Multilayer 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 S1190G/S1190GB 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 boards (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 cores, the shelf life is one year and its internal performance can meet the requirements of IPC4011E 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 vacuum foil 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, and when cutting prepreg, clean the platform first to avoid cross contamination of different types of PP resin powder.

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, (8 - 24 hours, settle time is varies depending on temperature variation 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 vacuum foil packaging and put it back in the above stated storage condition 1 or 2.

2. PWB Processing

2.1 Panel cutting

- Sawing (preferred) and cutting method is recommended. Be careful of potential edge cracks when using roller cutter.

2.2 Thin core baking

- Baking on the cores should be carried out before use to eliminate internal stress. High pressure washing the panels is recommended to prevent resin power contamination and to cause further etching problem.
- Baking condition: 175°C/3-5h, be sure to avoid contact directly with heater.

2.3 Brown oxide

- S1190G core is suitable for brown oxide. Low etching oxidation is not recommended.

2.4 Design Recommendations

- In the stacking process, the stacking sequence of the adhesive sheets should be consistent, and the overturning action should be avoided to reduce the warping, deformation, folding and other problems.
- The time from brown oxide to pressing is controlled within 12 hours. From stack-up to going into press, the time is controlled within 2 hours.
- When the buffer material may have the risk of moisture absorption, it is recommended to dry it or replace with new buffer material.
- Because of the material characteristics, it is easy to carry static electricity. So when doing stack-up, special attention should be paid to the adsorption of foreign matters on PP.
- In order to ensure good alignment effect of expansion and contraction, fixation by rivets are recommended; in case of fixation by fusion, electromagnetic heat fusion is recommended, and the best fusion effect

parameters should be evaluated in detail; in other fusion methods, PCB's own conditions should be strict, and the fusion effect should be evaluated in detail, so as to avoid layer deviation caused by poor fusion.

2.5 Press process

- Vacuum press.
- Press lamination suggested heating rate 2.5~4.0°C/min (material temperatures 80~140°C in the region).
- Lamination pressure setting, outer material temperature at about 80-100°C when increasing pressure (Note: The full pressure to use is 380-500PSI).
- Curing temperature of material temperature 195-205°C, and keep at this temperature at above 90min.
- Cooling rate < 2°C/min, material temperate when out of hot-press is < 150°C.
- If copper foil heat conduction press is used, customer needs to inform our company in advance.
- 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.

2.6 Drilling

- New drilling bit is recommended when drilling.
- Stack-up thickness is suggested no more than 2 panel/stack (according to each panel thickness about 1.6mm/stack).
- To ensure a good quality of hole wall, the life of new drills and drilling head should be limited to reduced life of 500~1500 hits
- On the basis of traditional FR-4 drilling parameters, lower chipload to be 15-20% is advised.

2.7 Baking after drill

- Baking after drill is advised, with condition 190°C/3h, be sure to avoid contact directly with heater.
- After back drilling, bake before plugging at 160-170°C/2-3h.

2.8 Desmear

- It is suggested that the specific parameters should be set according to the actual PCB structure (board thickness, hole size), and all kinds of structural boards should be fully evaluated in detail to determine the best matching desmear conditions and parameters.
- The desmear effect is as follows: there is no resin residue in the copper connection position of inner layer.
- Horizontal desmear or vertical desmear is recommended.
- The specific desmear conditions are related to the equipment, solutions model, plate thickness or hole area.
- On the premise of full load, it is suggested that the thicker the plate is, the longer the plasma debonding time is.

2.9 Punching/Routing

- Punching is not suitable for PCB profiling process, routing is recommended with reduced routing speed.
Try to avoid sudden vibration during routing process which may cause board edge detonation problem.

2.10 Packaging

- Before vacuum seal packing, baking PCBs is recommended. Baking condition should be 150°C/4-6 hours.
Minimize stacking when baking as to avoid uneven heat distribution.
- Aluminum packing is advised.

3. PWB Soldering

3.1 Shelf life of PWB

- For finished PCBs, basing on the differences of PCB constructions, the packing and storage condition, the shelf life should change accordingly. Normal shelf life should be finishing assembly within 3 months.
- After expiration of shelf life, baking is recommended and the condition should be 130°C/4-8 hours.

3.2 Reflow

- Suitable for lead free reflow process

3.3 Manual welding

- The welding temperature is 350-380 °C (temperature controlled soldering iron is used).
- Welding time of single solder joint: within 3 seconds.

During using the Shengyi S1190G/S1190GB material, if you have any questions and suggestions, please feel free to contact Shengyi, and Shengyi will provide you with an efficient and effective technical services.