



PROCESSING GUIDELINES

Laminate: S7439

Prepreg: S7439B

High performance, Low Loss, High Tg Lead Free 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 S7439/S7439B 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.

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, to avoid affect prepregs.

1.2.4 Prepregs use recommendations

- Due to the density of S7439 is larger, the resin content of prepreg need to increase 1-2% for achieving similar cured thickness when compared to standard FR-4.
- 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.
- For IQC inspection, PP test should be finished within 5 days from the date of acceptance according to IPC-4101 specification.

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 Brown oxide

- Brown oxide is recommended.
- In order to avoid excessive moisture absorption, baking after brown oxide is recommended at the condition of 120°C/1h and press within 4 hours.

2.4 Lay-up

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

2.5 Press process

- For multilayer pressing, it's recommended to keep heat-up rate at 1.5-3.0 °C/min when material temperature is from 80°C to 140°C.
- Full pressure setting is recommended at the range of 350 – 420 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: Product temperature 190-200°C, 90-120min.
- 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.

2.6 Drilling

- New drill bit, single stack and hit count reduction (300-1000hits) is recommended for getting better hole quality. Besides, reduce chip load 10-20% when compared to standard FR-4. Run trials to get proper drill parameters are necessary. Below parameters are for reference.

mm	hits	kr/min	IPM	mil/rev	IPM
0.25	1200	160	68	0.43	500
0.3	1200	155	90	0.58	500
0.4	1400	145	105	0.72	600
0.5	1200	95	72	0.76	800
0.6	1200	90	78	0.87	800
0.7	1500	80	80	1	800
0.8	1500	68	82	1.21	800
0.9	1500	62	85	1.37	800
1.0	1500	60	85	1.42	800
1.1	1500	60	90	1.5	800
1.2	1500	55	95	1.73	800
1.3	1500	50	95	1.9	800

- For dense holes area or hole size <0.6mm, LE aluminum cover layer is recommended.
- For boards with dense or heat sink holes, suggest baking after drilling by condition 190°C/3h.

2.7 Desmear

- Due to material composition and structure, its chemical resistance is good. Only taking chemical desmear is difficult to remove smear effectively, so both plasma and chemical desmear are advised. Detailed parameters follows the actual PCB structure (overall thickness, hole diameter) for setting.

- Below desmear parameters is for reference:

KMnO₄=65.5g/L NaOH=40g/L Temperature 70°C 1cycle=13min Desmear = 10~30 mg/dm²

2.8 Solder mask

- Be careful of panel distortion or warpage due to improper stack-up at pose baking process.



2.8 HAL

- Suitable for lead free HAL process

2.9 Punching/Routing

- Not suitable for punching process.
- Routing process is recommended. Reduce routing speed to prevent edge cracks from outburst mechanical force.

2.10 Packaging

- Suggest baking finished boards at 140°C/4~6h before packaging to prevent moisture effect on the heat resistance of base material,
- Package material is recommended using aluminum pack.

3. PWB Soldering

3.1 Shelf life of PWB

- 3 months with packaging protection.
- Bake at 125°C/4~6h before assembly is recommended

3.2 Reflow

- Suitable for lead free reflow process

3.3 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.