PROCESSING GUIDELINES

Laminate: S7439C
Prepreg: S7439CB

Low Loss & Heat Resistance Multilayer Material

This processing guidelines follows the IPC-4101E standard and is to provide necessary guidance for customer reference, based on S7439C/S7439CB material features.

1. Storage condition

1.1 Laminate

1.1.1 Storage method

- Keep laminates as received packaging onto a flat floor or a proper pallet. Avoid heavy pressure in case of distortion occurring due to incorrect storage method.

1.1.2 Storage condition

- Keep laminates at ventilated, dry and ambient condition. Avoid direct exposure to sunlight, rain and chemical gas.
- The shelf life of laminate maintains two years for double sided and one year for single sided at above proper storage conditions. All internal properties within shelf life meet IPC 4101E specification sheet.

1.1.3 Handling

- Handle laminates carefully wearing clean gloves. Collision and slippage will damage the cladding copper. Naked hand operation will contaminate the surface of cladding copper. All above defects may bring bad effects during production.

1.2 Prepreg

1.2.1 Storage method

- Keep prepreg horizontally with received package. Avoid heavy pressure in case of distortion occurring due to incorrect storage method.
- Be sure to re-seal any of remained prepreg with plastic film and put it away properly onto a pallet.

1.2.2 Storage condition

- All prepreg should be stored at below conditions as received packaging without any influence of ultraviolet ray.
  - Condition 1: 3 months when stored at <23℃ and <50% RH.
- Be careful of relative humidity due to its bad effect on prepreg properties. When packaging is open, it's recommended using up within 3 days.

1.2.3 Prepreg cutting

- Cut prepreg carefully and prevent pollution or crease.

1.2.4 Usage

- When brought out from cooling warehouse, prepreg should be stabilized to ambient temperature before opening package, keep at least 8 hours is recommended, depending on specified store condition.

- For panel form prepreg after cutting, all should be kept under condition 1 and used up as soon as possible. When exceeding 3 days, it's recommended retesting before use.
- For roll form prepreg remained, all should be sealed again and kept at condition 1.
- For IQC inspection, prepreg should be finished all tests within 5 day from the date of acceptance according to IPC-4101E specification.

2. PWB Processing

2.1 Panel cutting

- Sawing 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: 175℃/3-5h, be sure to avoid contact directly with heat supply.

2.3 Inner layer brown oxide

- Recommend to use brown oxide for inner layer treatment. To avoid absorption of moisture, it is advised to bake on the shelf after brown oxide process. Baking condition: 120℃/1h. After baking, pressing process should be done within 4 hours.

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.

2.5 Pressing process

- For multilayer pressing, it's recommended to keep the heat-up ramp at 1.0-2.5℃/min when the material temperature between 80℃ to 140℃.
- 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 inner layer copper area). Apply full pressure when the material temperature between 80-100 ℃.
- Curing condition: 190-200℃, 90-120min.
- If pressed by Adara machine, please inform us for more information.
- When adopted singe 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

- For good hole quality, it is recommend to use new drill bit and reduce the hole limit(300-1000 hole). The stack up is recommend 1 pieces per stack(thick board). In addition, slow down the feed 10-20% base on traditional FR-4 material. The below parameter of drilling is for reference.

Diameter (mm)	hole limit (hits)	Speed (krpm)	Feed (inch/min)	Chipload (mil/rev)	Retract (inch/min)
0.25	1200	160	68	0.43	500
0.30	1200	155	90	0.58	500
0.40	1400	145	105	0.72	600
0.50	1200	95	72	0.76	800
0.60	1200	90	78	0.87	800
0.70	1500	80	80	1.00	800
0.80	1500	68	82	1.21	800
0.90	1500	62	85	1.37	800
1.00	1500	60	85	1.42	800

- For dense hole or diameter of the hole is less than 0.6mm, it is recommend to use LE aluminum sheet for cover plate.

2.7 Baking after drilling

- Recommended baking condition: 190℃/3h, be sure to avoid contact directly with heat supply.

2.8 Desmear

- S7439C is harder to desmear compared to traditional FR-4 material. Using Plasma plus potassium permanganate method for desmear is suitable but the specified parameter should accord to the PCB structure and design.

2.9 HASL

- Suitable for lead free HASL process.

2.10 Punching/Routing

- Suitable for routing process, but not suitable for punching process.

2.11 Packaging

- To prevent moisture effect on the heat resistance of base material, suggest baking finished boards at 125-135℃/3-5h before packaging.
- It's advised to warp by aluminum pack.

3. PWB Soldering

3.1 Shelf life of PWB

- 3 months with aluminum packaging protection.
- Bake at 125℃/3-5h before assembly is recommended.

3.2 Reflow

- Suitable for lead free reflow process

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.