

This processing guide follows the IPC-4101C standard and is to provide necessary guidance for customer reference, based on S7439/S7439B 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 conditions. 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 4101C specification sheet. 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 at production.

#### 1.1.3 Handling

- Handle laminates carefully using 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 either of below conditions as received packaging without any influence of ultraviolet ray

- Condition 1: 3 months when stored at <23°C and <50% RH.
- Condition 2: 6 months when stored at <5°C.

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

- Due to the density of S7038 is larger, the resin content of prepreg need to increase 1-2% for achieving similar cured thickness when compared to standard FR-4.

- 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 or 2 and used up ASAP. 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 or 2.
- For IQC inspection, prepreg should be finished all tests within 5 day from the date of acceptance according to IPC-4101C 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: 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

- Full pressure setting is recommended at the range of 300 - 420 PSI (oil heated), specified value should be determined by multilayer feature (lay-up construction and resin filled area).
- Full pressure setting is recommended at the range of 300 - 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: >190°C, >90min.
- Maximum 8-10 layers of every open is recommended.
- 14-16 plies of kraft papers (unit weigh is 161g/m<sup>2</sup>) 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

- 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	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

Below desmear parameters is for reference:

KMnO<sub>4</sub>=65.5g/L NaOH=40g/L Temperature 70°C 1cycle=13min, Desmear = 10~30 mg/dm<sup>2</sup>

## 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 standard 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.

### 3.1 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.