



# SM-780-H

尚茂電子材料股份有限公司

ShineMore Technology Materials Co., Ltd.

Website: <http://www.shinemore.com.tw>

UL/ANSI: FR-15.0 UL FILE: E199230

Updated: 12/04/2017

(IPC-4101/126)

## General Specification

| Thickness   |             | Copper Cladding |                            | Standard Size |               | Special Size (on Request) |                |
|-------------|-------------|-----------------|----------------------------|---------------|---------------|---------------------------|----------------|
| <u>inch</u> | <u>(mm)</u> | <u>oz</u>       | <u>(<math>\mu</math>m)</u> | <u>inch</u>   | <u>(mm)</u>   | <u>inch</u>               | <u>(mm)</u>    |
| 0.002       | (0.05)      | 3/8             | (12)                       | 36.8 x 48.8   | ( 935 x 1240) | 37.0 x 49.0               | ( 941 x 1246)  |
| to          |             | to              |                            | 40.8 x 48.8   | (1035 x 1240) | 41.0 x 49.0               | ( 1043 x 1246) |
| 0.125       | (3.14)      | 12              | (410)                      | 42.8 x 48.8   | (1085 x 1240) | 43.0 x 49.0               | ( 1093 x 1246) |

## Characteristics

- Superior thermal stable material with ANSI grade of FR-15.0
- Multi-functional Epoxy with improved thermal, mechanical & electrical properties
- Different E-woven glass available (including 1027/1037/106/1067/1086/1080/3313/2116/1506/7628)
- Different copper foil types available (including HTE, RTF and VLP)

## Features

- Higher Tg (Tg>200°C , measured by DSC)
- Lower CTE in Z direction
- Suitable for IC substrate making
- Lead-free compatible
- Compliant with RoHS regulation
- Excellent dimensional stability and thickness uniformity
- Superior thermal and chemical resistance
- PCB process-friendly, with good toughness and high modulus
- Designed-in UV blocking function and AOI applicability
- With lower D<sub>k</sub>/D<sub>f</sub> compared with general FR-4.0/FR-15.0 laminates
- Superior CAF resistance and reliability properties

## Applications

- HLC Server/Cloud storage device
- Communications/ Telecom
- Instrumentation/ Industry PC/ Medical
- Infrastructure
- Automotive Electronics

| Test Items          |   | Units Metric (English) | Test Condition          | IPC Spec.         | Typical Value      | Test Method (IPC-TM-650) |                  |
|---------------------|---|------------------------|-------------------------|-------------------|--------------------|--------------------------|------------------|
| Electrical          | Dielectric Constant (D <sub>k</sub> of RC50%) | 1GHz                   | —                       | C-24/23/50        | —                  | 4.22                     | 2.5.5.9          |
|                     |   | 5GHz                   | —                       |                   | —                  | 4.17                     | Cavity Resonator |
|                     | Dissipation Factor (D <sub>f</sub> of RC50%)  | 1GHz                   | —                       | C-24/23/50        | —                  | 0.019                    | 2.5.5.9          |
|                     |   | 5GHz                   | —                       |                   | —                  | 0.021                    | Cavity Resonator |
|                     | Volume Resistivity                            | MΩ -cm                 | C-96/35/90              | > 10 <sup>6</sup> | > 10 <sup>7</sup>  | 2.5.17.1                 |                  |
| Surface Resistivity | MΩ  | C-96/35/90             | > 10 <sup>4</sup>       | > 10 <sup>6</sup> | 2.5.17.1           |                          |                  |
| Physical            | Dimensional stability                         | ppm                    | E-4/105+E-2/150         | < 300             | 200                | 2.4.39                   |                  |
|                     | Moisture absorption                           | %                      | E-24/50+D-24/23         | < 0.5             | < 0.2              | 2.6.2.1                  |                  |
|                     | Peel strength                                 | N/mm                   | 1 oz HTE (lb/in)        | 0.7 ( 4.0 )       | 1.25 -1.61 (7 – 9) | 2.4.8                    |                  |
| Thermal             | Glass Transition Temp                         | °C                     | DSC                     | >170              | 205                | 2.4.25                   |                  |
|                     |   |                        | TMA                     | --                | 185                | 2.4.24.3                 |                  |
|                     |   |                        | DMA                     | --                | 225                | 2.4.24.2                 |                  |
|                     | Z-Axis alpha 1                                | ppm/°C                 | Before Tg               | < 60              | 40                 | 2.4.24                   |                  |
|                     | Z-Axis alpha 2                                | ppm/°C                 | After Tg                | < 300             | 180                | 2.4.24                   |                  |
|                     | Z-CTE   | %                      | Expansion (50~260°C)    | < 3.0             | 2.0                | 2.4.24                   |                  |
|                     | CTE,X-,Y-axis                                 | ppm/°C                 | Pre-Tg                  | —                 | 10-15              | 2.4.24                   |                  |
|                     | Thermal resistance                            | min                    | TMA (T288°C)            | > 15              | >45                | 2.4.24.1                 |                  |
|                     | Decomposition Temp                            | °C                     | ASTM D3850 (5% wt loss) | >340              | 350                | 2.4.24.6                 |                  |
|                     | Thermal stress                                | sec                    | 288°C Solder dipping    | > 10              | > 120              | 2.4.13.1                 |                  |
| Flame Resistance    | —   | A&E-24/125             | V-0                     | V-0               | UL94               |                          |                  |

※Specification Sheet : IPC-4101/126

### ● Ordering Information

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### NOTE

1. Typical Values are for information purpose only.
2. Any sale of these products will be governed by the terms and conditions of the agreement under which they are sold.