

Data Sheet

High speed material for millimeter wave radar

Laminate R-5515
Prepreg R-5410

Aug. 2021 No.21082051

Specification / Laminate R-5515

| Property | | Units | Test Method | Condition | R-5515 (5mil #1078x1) | | |
|--------------------------|--|-----------------|--------------|---------------------|-------------------------|---------------------|---|
| | | | | | Typical Value | | |
| THERMAL | Glass Transition Temperature (Tg) | | C | TMA | As received | 170 | |
| | | | C | DMA (Tensile) | As received | 200 | |
| | Thermal Decomposition Temperature (Td) | | C | TGA | As received | 410 | |
| | Time to Delamination (T288) | Without Cu | Min | IPC TM-650 2.4.24.1 | As received | > 120 *1 | |
| | | With Cu | Min | IPC TM-650 2.4.24.1 | As received | > 120 *1 | |
| | Thermal Stress (288C) | | With Cu | Sec | IPC TM-650 2.4.13.1 | As received | - |
| | CTE : $\alpha 1$ | X - axis | ppm / C | IPC TM-650 2.4.24 | < Tg | 19 - 21 | |
| | | Y - axis | ppm / C | IPC TM-650 2.4.24 | < Tg | 19 - 21 | |
| | | Z - axis | ppm / C | IPC TM-650 2.4.24 | < Tg | 50 *1 | |
| CTE : $\alpha 2$ | | Z - axis | ppm / C | IPC TM-650 2.4.24 | > Tg | 300 *1 | |
| ELECTRICAL | Dielectric Constant (Dk) | @ 14GHz | - | IEC 63185 (2020) *2 | C-24/23/50 | 3.06 | |
| | Dissipation Factor (Df) | @ 14GHz | - | IEC 63185 (2020) *2 | C-24/23/50 | 0.002 | |
| | Volume Resistivity | | M Ω m | IPC TM-650 2.5.17.1 | C-96/35/90 | 1 x 10 ⁷ | |
| | Surface Resistivity | | M Ω | IPC TM-650 2.5.17.1 | C-96/35/90 | 1 x 10 ⁸ | |
| PHYSICAL Flammability | Water Absorption | | % | IPC TM-650 2.6.2.1 | D-24/23 | 0.19 | |
| | Peel Strength | H oz (H-VLP2) | kN / m | IPC TM-650 2.4.8 | As Received | 0.6 | |
| | Flammability | | - | UL-94 | A&E-168/70 | 94V-0 | |
| | Young's Modulus (X,Y direction) | | GPa | ASTM D3039 | As received | 9.7 | |
| | Poisson's Ratio (X,Y direction) | | - | JIS K7161-1 | As received | 0.2 | |

*1 : Sample Thickness ; 20mil = 0.5 mm

*2 : Balanced-type Circular Disk Resonance Method [IEC 63185 (2020)]

* The data in the above table are not guaranteed values.

Specification / Laminate R-5515 : Low-Dk glass

Test Method ; Balanced-type Circular Disk Resonance Method [IEC 63185 (2020)]

| Core Type (mil) | Actual Thickness | | Cloth Style | Ply | Typical Resin Content (%) | Typical Dk | | | | |
|----------------------|------------------|-------|-------------|-----|-----------------------------------|------------|-------|-------|-------|-------|
| | mil | mm | | | | 14GHz | 26GHz | 37GHz | 48GHz | 60GHz |
| 4 | 4 | 0.105 | 1067 | 1 | 82 | 3.01 | 3.00 | 3.00 | 3.00 | 3.00 |
| 5 | 5 | 0.127 | 1078 | 1 | 78 | 3.06 | 3.05 | 3.05 | 3.05 | 3.05 |
| 10 | 10 | 0.254 | 1078 | 2 | 78 | 3.06 | 3.05 | 3.05 | 3.05 | 3.05 |

| Core Type (mil) | Actual Thickness | | Cloth Style | Ply | Typical Resin Content (%) | Typical Df | | | | |
|----------------------|------------------|-------|-------------|-----|-----------------------------------|------------|-------|-------|-------|-------|
| | mil | mm | | | | 14GHz | 26GHz | 37GHz | 48GHz | 60GHz |
| 4 | 4 | 0.105 | 1067 | 1 | 82 | 0.002 | 0.002 | 0.003 | 0.003 | 0.003 |
| 5 | 5 | 0.127 | 1078 | 1 | 78 | 0.002 | 0.002 | 0.003 | 0.003 | 0.003 |
| 10 | 10 | 0.254 | 1078 | 2 | 78 | 0.002 | 0.002 | 0.003 | 0.003 | 0.003 |

* The data in the above table are not guaranteed values.

Specification / Laminate R-5410 : Low-Dk glass

Test Method ; Balanced-type Circular Disk Resonance Method [IEC 63185 (2020)]

| Cloth Style | Resin Content (%) | Typical Thickness (μm) | Typical Dk | | | | |
|-------------|------------------------|--|------------|-------|-------|-------|-------|
| | | | 14GHz | 26GHz | 37GHz | 48GHz | 60GHz |
| 1067 | 82 | 105 | 3.01 | 3.00 | 3.00 | 3.00 | 3.00 |
| 1078 | 78 | 127 | 3.06 | 3.05 | 3.05 | 3.05 | 3.05 |

| Cloth Style | Resin Content (%) | Typical Thickness (μm) | Typical Df | | | | |
|-------------|------------------------|--|------------|-------|-------|-------|-------|
| | | | 14GHz | 26GHz | 37GHz | 48GHz | 60GHz |
| 1067 | 82 | 105 | 0.002 | 0.002 | 0.003 | 0.003 | 0.003 |
| 1078 | 78 | 127 | 0.002 | 0.002 | 0.003 | 0.003 | 0.003 |

* The data in the above table are not guaranteed values.

++ Before purchase ++

【Notes before you use】

- Please verify the suitability and fitness for intended application by quality testing, evaluation or other means at your own option before any adoption, use or change of use conditions of a product listed in the datasheet.
- We would like to have a delivery specifications mutually agreed for the product that you have decided to use. The agreements defined in the delivery specifications are assigned higher priority.
- Please note that images shown may somewhat differ from the actual product in color.
- Please note that specifications and external design are subject to change for product improvement without notice.
- For details on products in the datasheet, please contact your distributor or our sales department.

【Safety Information】

- Before using the product, please read the delivery specifications carefully or contact the distributor from which you purchased the product or our sales department in order to use the product correctly.
- The products in the datasheet are Electronic circuit board materials for electronic and electrical devices. Please do not use them for other than specified use.

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