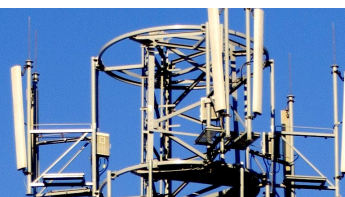


### TLF220产品手册 极低损耗覆铜板



#### Features and benefits 特性与优势

- TLF220层压板材料是陶瓷填充的PTFE复合高频覆铜板材料，介电常数为2.20
- 严格的介电常数一致性与稳定性
- 极低的介电损耗与插入损耗
- 各向同性材料
- 与无增强无填充PTFE材料相比，拥有更低的Z轴热膨胀系数
- 优秀的酸碱、溶剂及高低温耐候性

#### Areas of application 典型应用

- 毫米波应用
- 带状线或微带线路
- 光通信
- 雷达系统



| 标准厚度<br>Standard thickness                                                                              | 板材标准尺寸<br>Standard size of plate                     | 标准铜厚<br>Standard copper thickness                |
|---------------------------------------------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------|
| 5.0 mil (0.127 mm)<br>10.0 mil (0.254 mm)<br>20.0 mil (0.508 mm)<br>30.0 mil (0.762 mm)<br>*如需更大厚度需咨询厂家 | 12" X 18" (305 X 457 mm)<br>24" X 18" (610 X 457 mm) | VLP/ HVLP 铜箔<br>1/2 oz. (18 μm)<br>1 oz. (35 μm) |

| 序号<br>No | 性能<br>Property                                            |              | 测试方法<br>Test Method | 测试条件<br>Test Condition | 单位<br>Unit        | 典型值<br>Typical Value |
|----------|-----------------------------------------------------------|--------------|---------------------|------------------------|-------------------|----------------------|
| 1        | 介电常数 10 GHz<br>Permittivity at 10GHz                      |              | IPC TM-650 2.5.5.5  | 23°C                   | —                 | 2.20 ± 0.04          |
|          | 介电常数 10 GHz<br>Permittivity at 10 GHz                     |              | IPC Modified        | 23°C                   | —                 | 2.20 ± 0.04          |
| 2        | 损耗角正切值 10 GHz<br>Loss Tangent at 10 GHz                   |              | IPC TM-650 2.5.5.5  | 23°C                   | —                 | 0.0011               |
| 3        | 剥离强度<br>Peel Strength                                     |              | IPC TM-650 2.4.8    | 1 oz. 电解铜箔,<br>热应力后    | N/mm<br>(lbs/in)  | 1.6<br>(9.1)         |
| 4        | 热膨胀系数CTE<br>Coefficient of<br>Thermal Expansion           | X轴<br>X-Axis | IPC TM-650 2.4.41   | 0-250°C                | ppm/°C            | 60                   |
|          |                                                           | Y轴<br>Y-Axis |                     |                        |                   | 54                   |
|          |                                                           | Z轴<br>Z-Axis |                     |                        |                   | 125                  |
| 5        | 热失重分解温度<br>Td                                             |              | ASTM D3850          | —                      | °C                | 551                  |
| 6        | 介电常数温度系数<br>Thermal Coefficient<br>of Dielectric Constant |              | IPC TM-650 2.5.5.5  | -30-150°C              | ppm/°C            | -64                  |
| 7        | 热导率<br>Thermal Conductivity                               |              | ASTM D5470          | 70°C                   | W/(m·K)           | 0.24                 |
| 8        | 表面电阻率<br>Surface Resistivity                              |              | IPC TM-650 2.5.17.1 | C-96/35/95             | MΩ                | 5.1×10 <sup>9</sup>  |
| 9        | 体积电阻率<br>Volume Resistivity                               |              | IPC TM-650 2.5.17.1 | C-96/35/95             | MΩ·cm             | 1.9×10 <sup>11</sup> |
| 10       | 吸水率<br>Moisture Absorption                                |              | IPC TM-650 2.6.2.1  | D-48/50                | %                 | 0.56                 |
| 11       | 弯曲强度<br>Flexural Strength                                 |              | IPC TM-650 2.4.4    | 23°C                   | MPa               | 179                  |
| 12       | 弯曲模量<br>Flexural Modulus                                  |              | ASTM D790           | 23°C                   | MPa               | 3725                 |
| 13       | 拉伸强度<br>Tensile Strength                                  |              | GB/T1040.4-2006     | 23°C                   | MPa               | 10                   |
| 14       | 拉伸模量<br>Tensile Modulus                                   |              | GB/T1040.4-2006     | 23°C                   | MPa               | 812                  |
| 15       | 密度<br>Density                                             |              | ASTM D792 Method A  | 23°C                   | g/cm <sup>3</sup> | 1.7                  |
| 16       | 耐燃性<br>Flammability                                       |              | UL94 Vertical Burn  | —                      | —                 | V-0                  |
| 17       | 无铅兼容性<br>Lead-Free Process Compatible                     |              | —                   | —                      | —                 | Yes                  |

说明1：典型值表示通常厚度情况下的多次测量不同批次产品性能指标的平均数值。如果对参数有特殊需求或疑问，请联系湍流电子公司。

Remark1: Typical value represent an average value from a population of tested material and on the most common thickness. For any specific requirement or question, please contact Tuanliu Electric Co.