# Summary Of Key Dielectric Characteristics

## Applications

| SINGLE LAYER | | THERMAL PERFORMANCE | | | DIELECTRIC PERFORMANCE | | OTHER | | |
|---|---|---|---|---|---|---|---|---|---|
| Part Number | Thickness[1] [.000"/µm] | Impedance[2] [°C/W] | Impedance[3] [°C in²/W] / [°C cm²/W] | Conductivity[4] [W/m-K] | Breakdown[5] [kVAC] | Permittivity[6] [Dielectric Constant] | Glass Transition[7] [°C] | U.L. Index[8] [°C] | Peel Strength[9] [lb/in] / [N/mm] |
| **HT-04503** | 3/76 | 0.45 | 0.05 / 0.32 | 2.2 | 6.0 | 7 | 150 | 140/140 | 6 / 1.1 |
| **HT-07006** | 6/152 | 0.70 | 0.11/ 0.71 | 2.2 | 11.0 | 7 | 150 | 140/140 | 6 / 1.1 |
| **MP-06503** | 3/76 | 0.65 | 0.09 / 0.58 | 1.3 | 8.5 | 6 | 90 | 130/140 | 9 / 1.6 |
| **MULTI-LAYER** | | | | | | | | | |
| **HT-09009** | 9/229 | 0.90 | 0.16 / 1.03 | 2.2 | 20.0 | 7 | 150 | 150/150 | 6 / 1.1 |
| **HT-07006** | 6/152 | 0.70 | 0.11/ 0.71 | 2.2 | 11.0 | 7 | 150 | 140/140 | 6 / 1.1 |
| **CML-11006*** | 6/152 | 1.10 | 0.21 / 1.35 | 1.1 | 10.0 | 7 | 90 | 130/130 | 10 / 1.8 |
| **HIGH POWER LIGHTING** | | | | | | | | | |
| **HPL-03015** | 1.5/38 | 0.30 | 0.02 / 0.13 | 3.0 | 2.5 | 6 | 185 | ** | 5 / 0.9 |

**Method Description**

1 - Optical
2- Internal TO-220 test RD 2018
3 - Calculation from ASTM 5470
4 - Extended ASTM 5470
5 - ASTM D149
6 - ASTM D150
7 - Internal MDSC test RD 2014
8 - U.L. 746 E
9 - ASTM D2861
*CML is available in prepreg form*
**Pending*

*Note:* For applications with an expected voltage over 480 Volts AC, Bergquist recommends a dielectric thickness greater than 0.003" (76µm).
*Note:* Maximum test voltage is a function of material and circuit design. Typical proof test does not represent the maximum.
*Note:* Circuit design is the most important consideration for determining safety agency compliance.

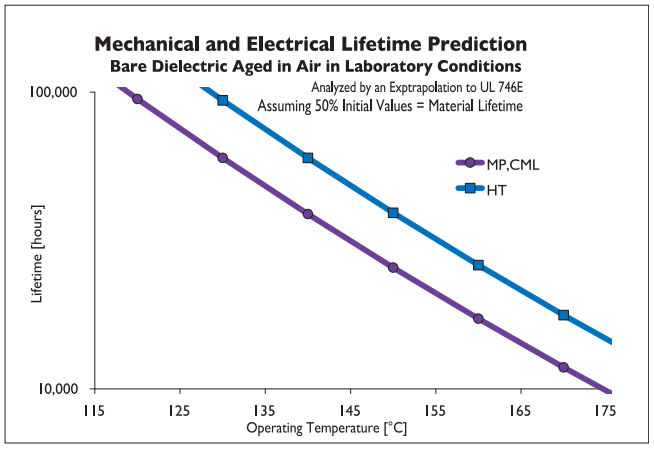
## Operating Temperatures

Choose the dielectric that best suits your operating temperature environment. For high temperature applications, such as automotive, HT offers the right solution. All of our dielectrics are U.L. recognized (HPL pending).

| MATERIAL | U.L. RTI - ELECTRO / MECHANICAL |
|---|---|
| **HT** | **140°C / 140°C** |
| **MP** | **130°C / 140°C** |
| **CML** | **130°C / 130°C** |

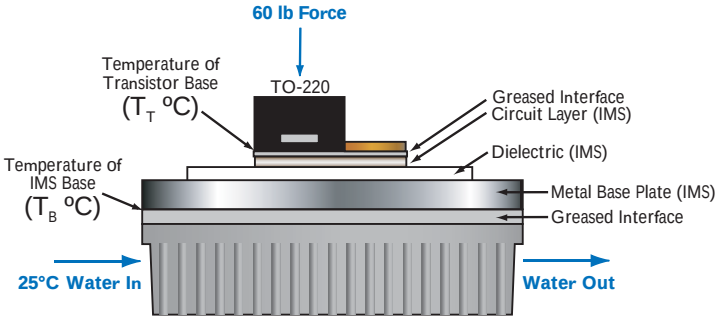
| MATERIAL | U.L. SOLDER LIMIT RATING |
|---|---|
| **HT*** | **325°C / 60 seconds** |
| **MP** | **300°C / 60 seconds** |
| **CML** | **260°C / 60 seconds** |

**Covers all soldering options including Eutectic Gold / Tin.*




## Thermal Impedance

This drawing represents RD 2018 (at 40W) TO-220 thermal performance (25°C Cold Plate Testing).




Water-cooled Heatsink

$$\theta\left(\frac{^{o}C}{W}\right) = \frac{(T_T - T_B)}{40W}$$