



PTFE + woven fiberglass cloth substrate

RP233 laminates are woven fiberglass/PTFE composite materials. Using precise control of the fiberglass/PTFE ratio, RP233 laminates offer a range of choices from the lowest dielectric constant and dissipation factor to a more highly reinforced laminate with better dimensional stability.

The woven fiberglass reinforcement in RP233 products provides greater dimensional stability than nonwoven fiberglass reinforced PTFE based laminates of similar dielectric constants. The consistency and precise control of the PTFE coated fiberglass cloth allows Relong to offer stable dielectric constants.

RP233 laminates are frequently used in filter, coupler and low noise amplifier (LNA) applications, where dielectric constant uniformity is critical. They are also used in power dividers and combiners, where low loss (D_f 0.0013) is important.

Features:

- Low Loss Tangent (0.0013@10GHz)
- Excellent Dimensional Stability
- Excellent Product Performance Uniformity

Benefits:

- Electrical Properties Are Highly Uniform Across Frequency
- Consistent Mechanical Performance
- Excellent Chemical Resistance

Typical Applications:

- Defense Microwave/RF Applications
- Phased Array Radar Antenna Network
- Low Loss Base Station Antenna
- Military Radar Feed Networks
- Missile Guidance Systems
- Digital Radio Antennas
- Filters, Couplers, LNAs

Typical Properties:

| Property | Units | Value | Test Method |
|---------------------------------------|-------------------|-----------------------|---------------------|
| 1. Electrical Properties | | | |
| Dielectric Constant | | | |
| @ 10 GHz | - | 2.33 | IPC TM-650 2.5.5.5 |
| Dissipation Factor | | | |
| @ 10 GHz | - | 0.0013 | IPC TM-650 2.5.5.5 |
| Temperature Coefficient of Dielectric | | | |
| TC ϵ_r @ 10 GHz (-10-140° C) | ppm/°C | -161 | IPC TM-650 2.5.5.5 |
| Volume Resistivity | | | |
| C96/35/90 | M Ω -cm | 1.5 x 10 ⁹ | IPC TM-650 2.5.17.1 |
| Surface Resistivity | | | |
| C96/35/90 | M Ω | 3.4 x 10 ⁷ | IPC TM-650 2.5.17.1 |
| Dielectric Breakdown | kV | >45 | IPC TM-650 2.5.6 |
| Arc Resistance | sec | >180 | IPC TM-650 2.5.1 |
| 2. Thermal Properties | | | |
| Thermal Expansion | | | |
| CTE (X) | ppm/°C | 17 | IPC TM-650 2.4.41 |
| CTE (Y) | ppm/°C | 29 | IPC TM-650 2.4.41 |
| CTE (Z) | ppm/°C | 217 | IPC TM-650 2.4.24 |
| 3. Physical Properties | | | |
| Water Absorption | % | 0.02 | IPC TM-650 2.6.2.1 |
| Density | g/cm ³ | 2.26 | ASTM D792 Method A |
| Thermal Conductivity | W/mK | 0.257 | ASTM D5470 |
| Flammability | Class | V0 | UL-94 |
| 4. Mechanical Properties | | | |
| Peel Strength | lb/in | 20 | IPC TM-650 2.4.8 |
| Tensile Modulus (Machine/Cross) | kpsi | 485, 346 | ASTM D-638 |
| Tensile Strength (Machine/Cross) | kpsi | 14.9, 11.2 | ASTM D-882 |
| Compressive Modulus | kpsi | 327 | ASTM D-695 |
| Flexural Modulus | kpsi | 437 | ASTM D-790 |

Results listed above are typical properties, they are not to be used as specification limits. The above information creates no expressed or implied warranties. The properties of Relong laminates may vary depending on the design and application.

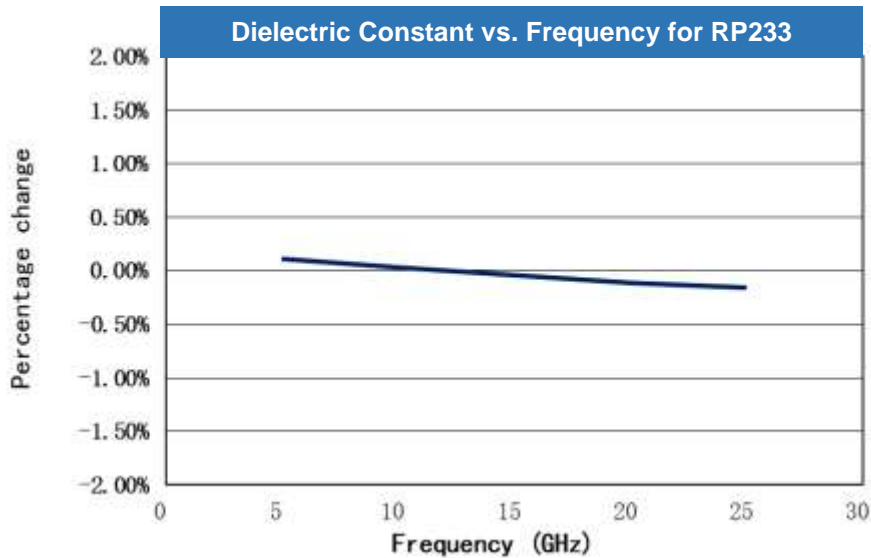


Figure 1

Demonstrates the Stability of Dielectric Constant across Frequency. This characteristic demonstrates the inherent robustness of Relong Laminates across Frequency, thus simplifying the final design process when working across EM spectrum. The stability of the Dielectric Constant of RP233 over frequency ensures easy design transition and scalability of design.

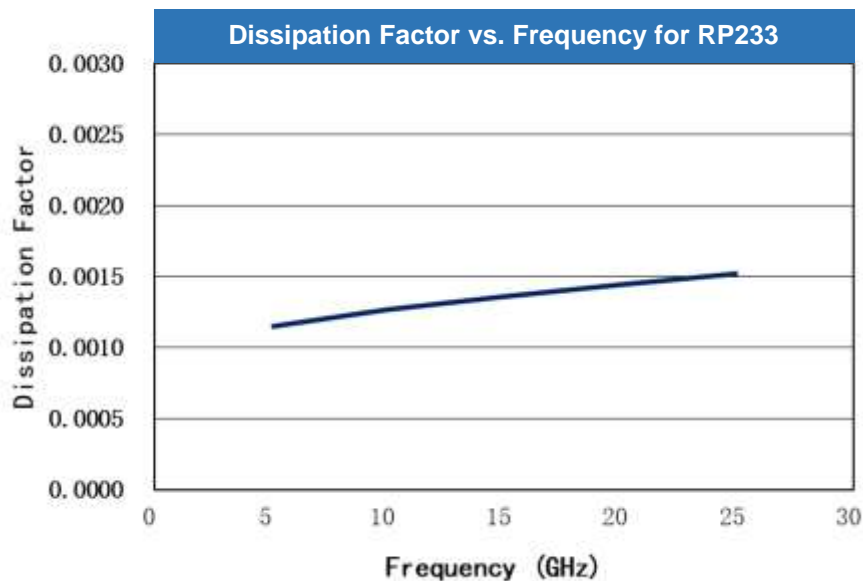


Figure 2

Demonstrates the Stability of Dissipation Factor across Frequency. This characteristic demonstrates the inherent robustness of Relong Laminates across Frequency, providing a stable platform for high frequency applications where signal integrity is critical to the overall performance of the application.

Material Availability:

RP233 laminate offers 1/2oz, 1OZ and 2OZ electrolytic copper or reverse treat copper on both side, if necessary, we also can offer other copper or rolled copper. RP233 can also be combined with metal plate, such as aluminum plate, brass plate, copper plate, etc. The advantage is that it can provide heat dissipation and mechanical support of composite medium.

RP233 Standard Master Sheets are 54" x48" and 36" x48". Common panel sizes include (not limited) :18"x 12" and 18" x 24 ".when place order, please specify dielectric thickness, cladding type, panel size and any other special considerations.