

## PTFE/Woven Fiberglass/Ceramic Filled

**Features:**

- Tighter Dielectric Tolerance
- Low Z-Axis Thermal Expansion
- Ceramic Filled PTFE
- High Thermal Conductivity
- Large Panel Size

**Benefits:**

- Higher Consistency of Performance
- Superior PTH Adhesion
- Heat Dissipation and Management
- Multiple Boards/Panel; Larger Printed Circuit Board formats

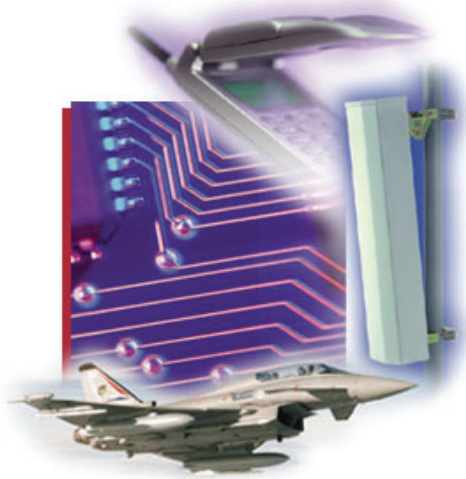
**Typical Applications:**

- High Power Applications
- Low Noise Amplifiers (LNAs)
- Low Noise Blocks (LNBs)
- Filters and Couplers

Arlon's Next Generation "AD350A" is a woven fiberglass reinforced, ceramic filled, PTFE-based composite material for use as a printed circuit board substrate. It has been redeveloped to provide higher thermal conductivity, lower thermal expansion and better interlaminar and copper bond integrity than the original AD350.

Higher thermal conductivity and low CTE allows it to be used in higher power designs, where temperature extremes are normal and heat rejection is a primary consideration. Lower CTE offers better component attachment reliability as well.

AD350A is compatible with the processing used for standard PTFE based printed circuit board substrates. Its low Z-axis thermal expansion improves plated through hole reliability compared to typical PTFE based laminates. Low X-Y expansion improves BGA solder-joint reliability.



## Typical Properties: AD350A

Property	Test Method	Condition	Result
Dielectric Constant @ 10 GHz	IPC TM-650 2.5.5.5	C23/50	3.50 ± 0.05
Dissipation Factor @ 10 GHz	IPC TM-650 2.5.5.5	C23/50	0.003
Thermal Coefficient of Er	IPC TM-650 2.5.5.5	-10°C to +140°C	-55
Copper Peel Strength (½ oz, 1 oz)	IPC TM-650 2.4.8	A, TS	15, 17 pli
Volume Resistivity (MΩ-cm)	IPC TM-650 2.5.17.1	C96/35/90	1.2 x 10 <sup>9</sup>
Surface Resistivity (MΩ)	IPC TM-650 2.5.17.1	C96/35/90	4.5 x 10 <sup>7</sup>
Arc Resistance (seconds)	IPC TM-650 2.5.1B	D48/50	>180
Tensile Modulus (kpsi)	ASTM D-638	A, 23°C	>700
Tensile Strength (kpsi)	IPC TM-650 2.4.18	A, 23°C	>20
Compressive Modulus (kpsi)	ASTM D-695	A, 23°C	>350
Flexural Modulus (kpsi)	ASTM D-790	A, 23°C	>540
Dielectric Breakdown (kv)	ASTM D-149	D48/50	>45
Density (g/cm <sup>3</sup> )	ASTM D-792 Method A	A, 23°C	2.1
Water Absorption (%)	IPC TM-650 2.6.2.2	E1/105 + D24/23	0.10
Coefficient of Thermal Expansion (ppm/°C) X Axis Y Axis Z Axis	IPC TM-650 2.4.24 TMA	0°C to 100°C	5 9 35
Thermal Conductivity (W/mK)	ASTM E-1225	100°C	0.45
Outgassing Total Mass Loss (%) Collected Volatile Condensable Material (%) Water Vapor Recovered Visible Condensate (±)	NASA SP-R-0022A Maximum 1.00% Maximum 0.10%	125°C, ≤10 <sup>-6</sup> torr	0.02 0.02  0.00 NO
Flammability	UL 94 Vertical Burn IPC TM-650 2.3.10	C48/23/50, E24/125	UL94-V0

### **Material Availability:**

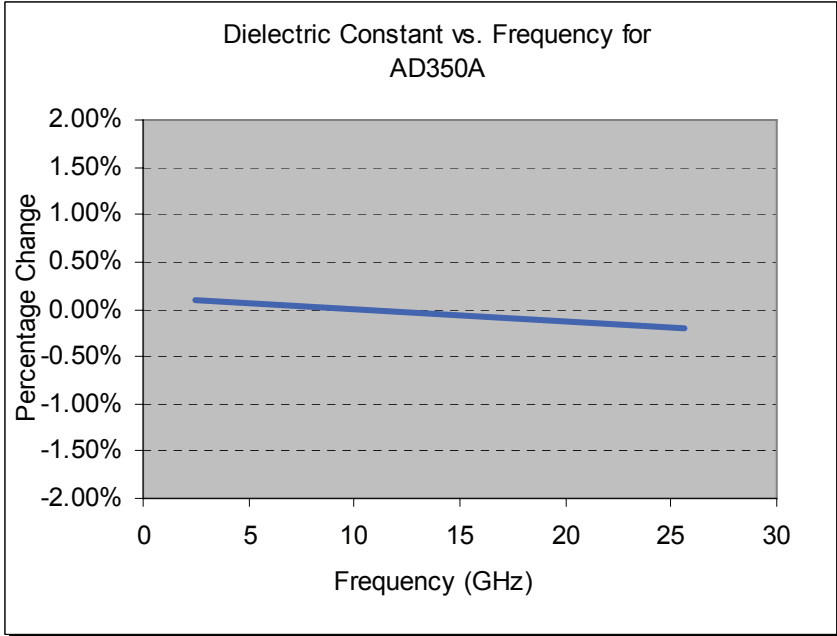
AD350A is supplied with 1/2, 1 or 2 ounce electrodeposited copper on both sides. Other copper weights and rolled copper foil are available. AD350A is also available bonded to heavy metal ground planes. Aluminum, brass or copper plate can provide an integral heat sink and mechanical support to the substrate.

When ordering AD350A, specify dielectric thickness, cladding, panel size and any other special considerations (AD350A is available in 0.010" increments).

Available master sheet sizes include 36" x 48".

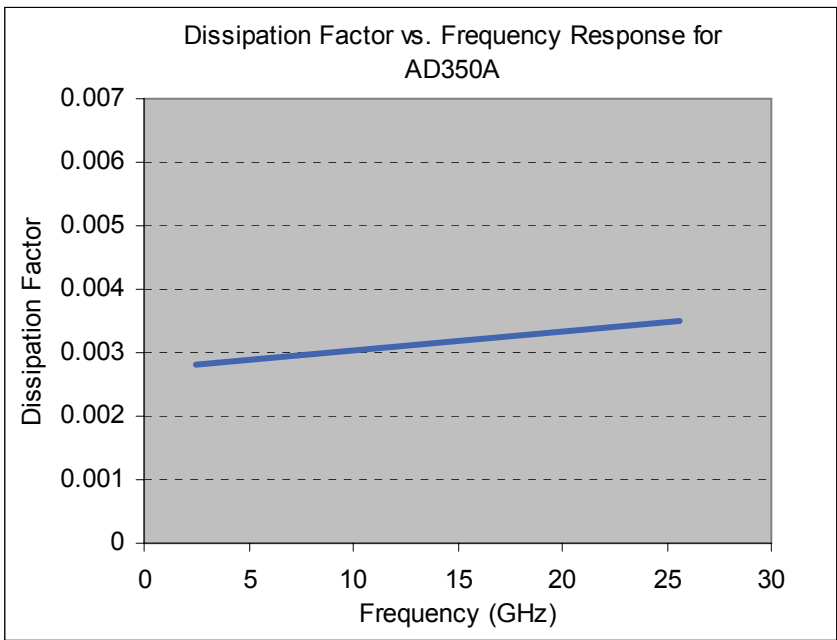
*Results listed above are typical properties; they are not to be used as specification limits. The above information creates no expressed or implied warranties. The properties of Arlon laminates may vary depending on the design and application.*

# AD350A Laminate



**Figure 1**

Demonstrates the Stability of Dielectric Constant across Frequency. This information was correlated from data generated by using a free space and circular resonator cavity. This characteristic demonstrates the inherent robustness of Arlon Laminates across Frequency, thus simplifying the final design process when working across EM spectrum. The stability of the Dielectric Constant of AD350A 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 Arlon Laminates across Frequency, providing a stable platform for high frequency applications where signal integrity is critical to the overall performance of the application.