ARLON
MICROWAVE MATERIALS

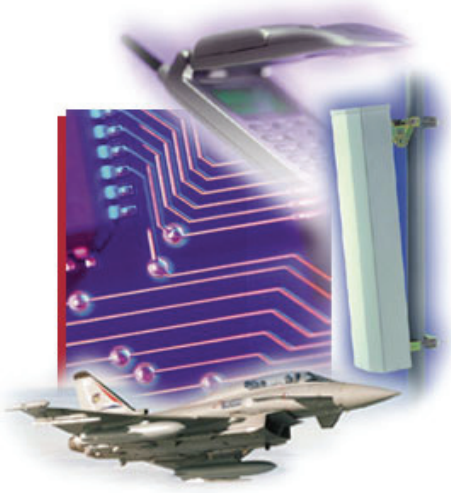
AD Series®

PTFE/Woven Fiberglass Laminates
Microwave Printed Circuit Board Substrates

Features:
- Cost-Effective Construction
- Reduced PTFE/Glass Ratio
- Volume Manufacturing

Benefits:
- PTFE Performance Stability over Frequency
- Low Loss
- Improved Registration
- Commercial Cost Structure
- Quick-Turn Delivery

Typical Applications:
- Power Amplifiers, Low Noise Amplifiers
- Antennas
- Microwave Components
- Microwave Modules



Arlon's AD Series is a group of woven fiberglass-reinforced PTFE composite materials designed for use as printed circuit board substrates. These materials combine the excellent low loss electrical properties of PTFE resin with the enhanced value of cost-effective heavier fiberglass styles to provide low cost laminate materials suitable for high volume commercial wireless communication applications.

The AD Series is currently available in a limited combination of dielectric thickness (0.015" - 0.062") and dielectric constant (2.5 - 3.5). Thicker dielectrics can be developed to meet customer requirements. The higher weight ratio of fiberglass to PTFE resin yields laminates with greater dimensional stability than is normally expected of PTFE-based substrates.

Stability of PTFE over a wide frequency range and low loss makes AD Series materials ideal for a variety of microwave and R/F applications in telecom industry. AD Series laminate materials may be processed with standard PTFE materials. Because there is a relatively higher percentage of fiberglass, thermal expansion is reduced in all directions, improving plated through hole reliability.

Typical Properties: AD Series			
Property	**Test Method**	**Condition**	**Result**
Dielectric Constant/ Dissipation Factor (10 GHz)	IPC TM-650 2.5.5.5	C23/50	AD250 2.50 / 0.0018 AD255 2.55 / 0.0018 AD270 2.70 / 0.0023 AD300 3.00 / 0.003 AD320 3.20 / 0.0038 AD350 3.50 / 0.003
Thermal Coefficient of Dielectric Constant	IPC TM-650 2.5.5.5 Adapted	-10°C to +140°C	-110
Peel Strength (lbs. per inch)	IPC TM-650 2.4.8	After Thermal Stress	AD250 -14 AD255 -14 AD270 -14 AD300 -14 AD320 -14
Volume Resistivity (MΩ-cm)	IPC TM-650 2.5.17.1	C96/35/90	1.2×10^9 (MΩ-cm)
Surface Resistivity (MΩ)	IPC TM-650 2.5.17.1	C96/35/90	4.5×10^7 (MΩ)
Arc Resistance (second)	ASTM D-495	D48/50	>180 seconds
Tensile Modulus (X,Y)	ASTM D-638	A, 23°C	706, 517 kpsi
Tensile Strength (X,Y)	ASTM D-882	A, 23°C	20.9, 17.3 kpsi
Compressive Modulus	ASTM D-695	A, 23°C	365 kpsi
Flexural Modulus	ASTM D-790	A, 23°C	540 kpsi
Breakdown (kV)	ASTM D-149	D48/50	>45
Density (g/cm^3)	ASTM D-792 Method A	A, 23°C	2.40
Water Absorption	IPC TM-650 2.6.2.2	E1/105 + D24/23	0.07%
Coefficient of Thermal Expansion (ppm/°C) X Axis Y Axis Z Axis		0°C to 100°C	 12 15 95
Thermal Conductivity (W/mK)	ASTM E-1225	100°C	0.235
Flammability	UL 94	C48/23/50, E24/125	Meets requirements of UL94-V0

Material Availability:

AD Series materials are supplied with 1/2 ounce, 1 ounce or 2 ounce electrodeposited copper foil on both sides. Aluminum, brass and copper plate may be specified, providing an integral heat sink and mechanical support to the substrate.

When ordering AD Series products, please specify dielectric constant, dielectric thickness, choice of cladding, panel size, and any other special considerations. Panels are available up to 36" x 48".

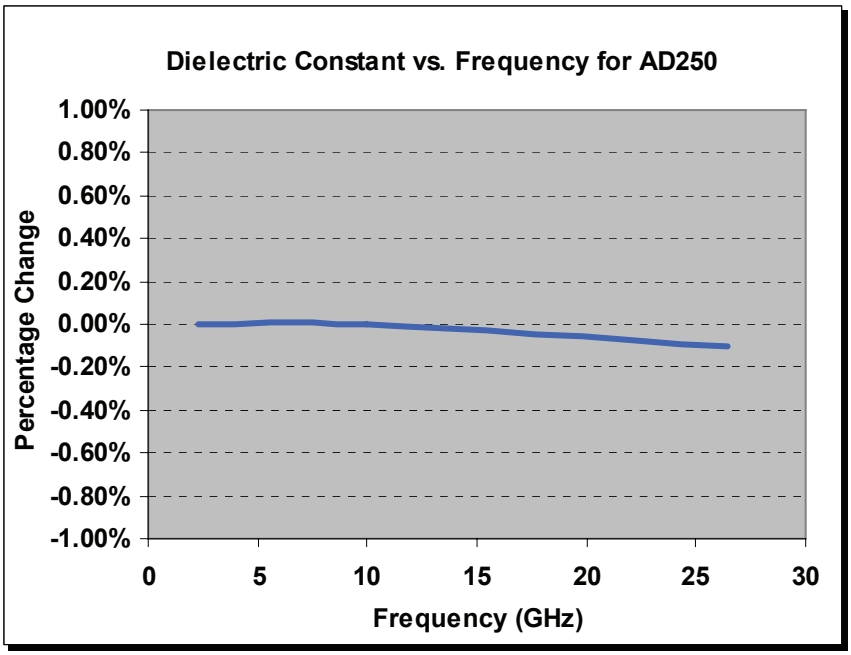


Figure 1

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 AD250 over frequency ensures easy design transition and scalability of design.

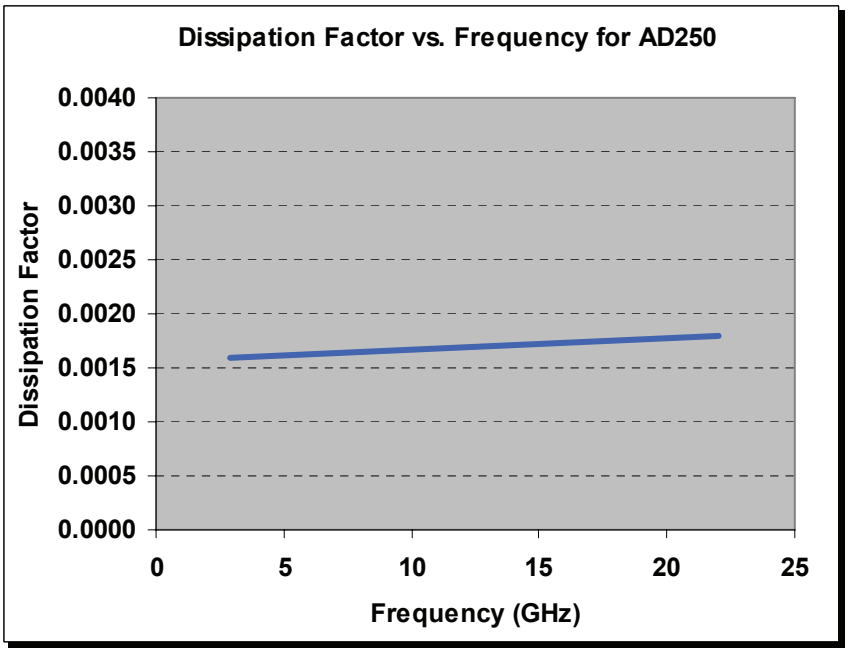


Figure 2

Demonstrates the Stability of Dissipation 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 overall performance.

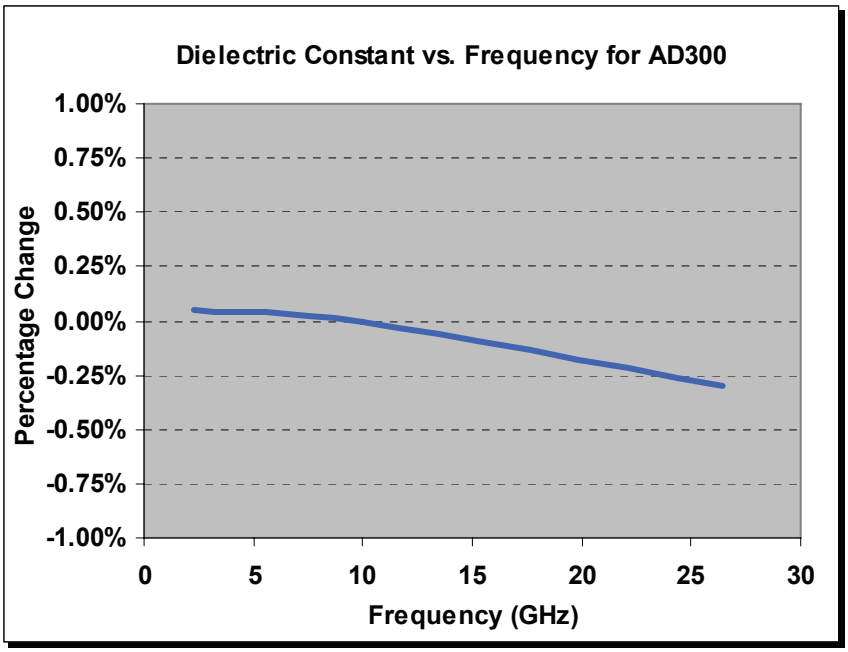


Figure 3

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 AD300 over frequency ensures easy design transition and scalability of design.

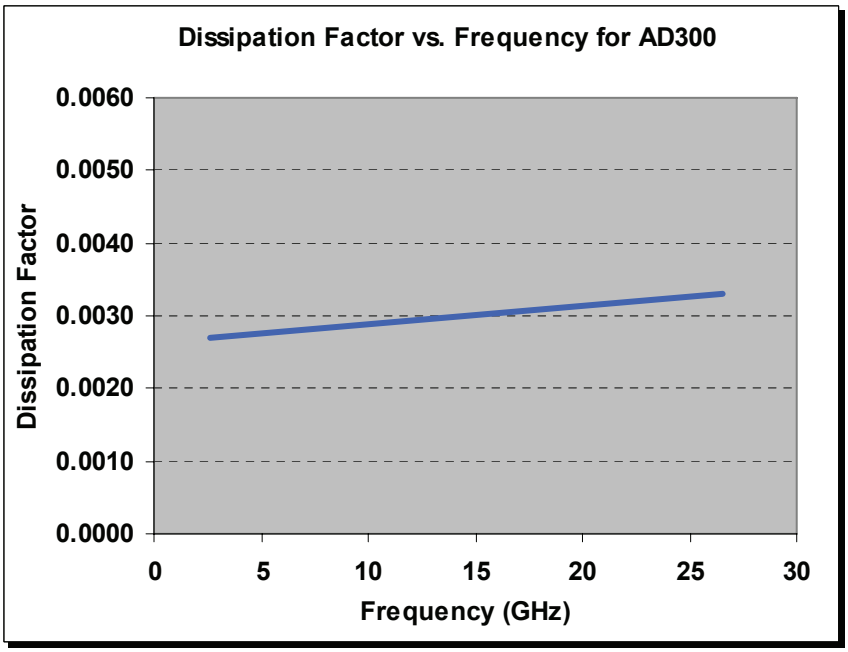


Figure 4

Demonstrates the Stability of Dissipation 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 overall performance.

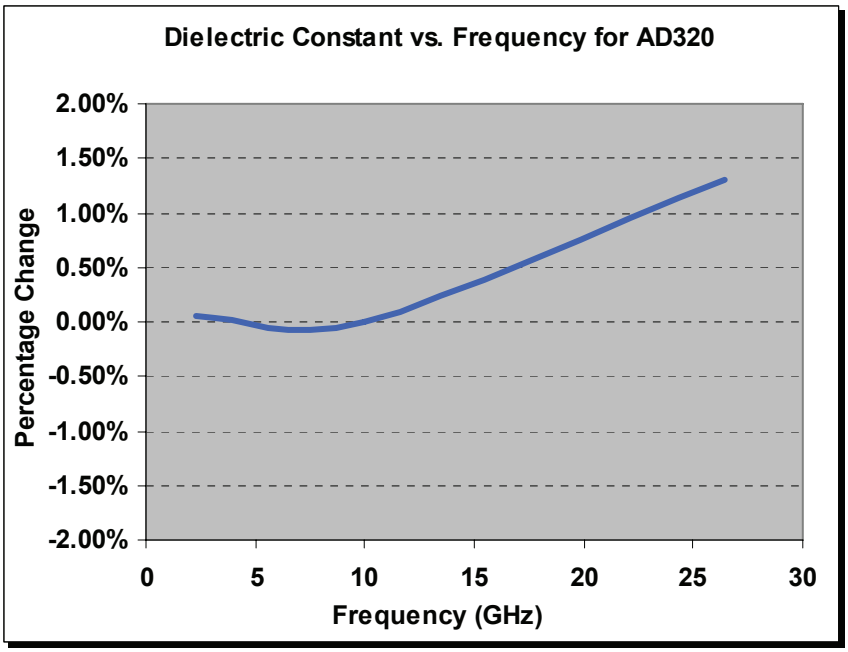


Figure 5

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 AD320 over frequency ensures easy design transition and scalability of design.

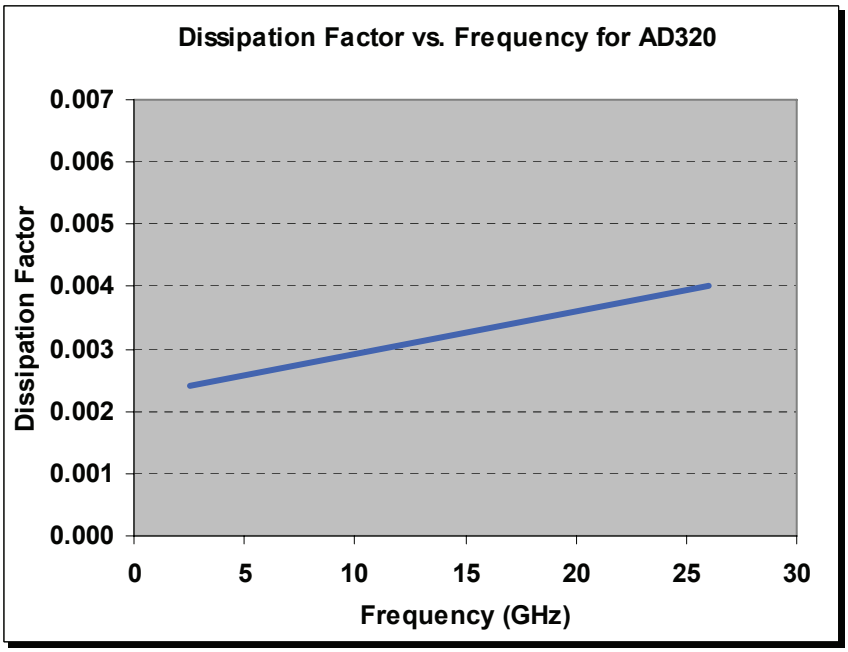


Figure 6

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 overall performance.

ARLON ELECTRONICS

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