

## PTFE/Woven Fiberglass/Micro-Ceramic Filled Laminate for RF & Microwave Printed Circuit Boards

### Features:

- Cost-Effective Construction using a PTFE and Microfine Ceramic Resin
- High Volume Manufacturing Design
- Tightest Commercial Dielectric Constant Tolerance ( $3.00 \pm 0.04$  vs. Competitive Options at  $\pm 0.05$ )
- Excellent PIM Performance
- Reduced Thermal Coefficient of Dielectric Constant (TCer)
- High Thermal Conductivity ideal for Higher Power Designs

### Benefits:

- Low Dielectric Loss (Loss Tangent)
- Low Insertion Loss (S21)
- Excellent Copper Bond Strength
- Low Moisture Absorption

### Typical Applications:

- Base Station Antennas
- Power Amplifiers (PA), Tower Mounted Amplifiers (TMA) and Tower Mounted Booster Amplifiers (TMB)
- Multimedia Transmission Systems



AD300A is a woven fiberglass reinforced PTFE/Microfine Ceramic composite material and is a significant improvement in cost/performance over traditional fluoropolymer-glass laminates. This combination offers designers an advantage for improving electrical performance through the use of advanced material without the additional cost traditionally associated with higher performance.

AD300A offers the Tightest Commercial Dielectric Constant Tolerance in the industry,  $3.00 \pm 0.04$ . In comparison, competitive offerings are currently at  $3.00 \pm 0.05$ . This tighter performance provides designers with a higher degree of impedance control, critical for maximum power transfer (S21) and for minimal insertion loss (S11). Combined with AD300A's low loss properties, these properties lead to higher antenna gain.

AD300A was specifically developed for Base Station Antennas and Base Station Power Amplifiers where low loss and low PIM is critical. Other key performance attributes include low moisture absorption, low thermal coefficient of the dielectric (CTEr), high copper peel strength and good dimensional and thermal stability. The 3.00 Dielectric Constant also provides a small degree of miniaturization that is critical to the size constraints of some antenna designs.

## Typical Properties: AD300A

Property	Test Method	Condition	Result
Dielectric Constant (10GHz)	IPC TM-650 2.5.5.5	C23/50	3.00 ± 0.04
Dielectric Constant (1MHz)	IPC TM-650 2.5.5.3	C23/50	3.00 ± 0.04
Dissipation Factor (10GHz)	IPC TM-650 2.5.5.5	C23/50	0.002
Dissipation Factor (1MHz)	IPC TM-650 2.5.5.3	C23/50	0.0014
Thermal Coefficient of Dielectric constant	IPC TM-650 2.5.5.5 Adapted	0°C to +100°C	-110
Peel Strength (lbs.per inch)	IPC TM-650 2.4.8	After Thermal Stress	13
Volume Resistivity (MΩ-cm)	IPC TM-650 2.5.17.1	C96/35/90	8.9 x 10 <sup>7</sup> megohm-cm
Surface Resistivity (MΩ)	IPC TM-650 2.5.17.1	C96/35/90	4.8 x 10 <sup>7</sup> megohm
Arc Resistance (seconds)	ASTM D-495	D48/50	>185 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	1690 kpsi
Flexural Modulus	ASTM D-790	A, 23°C	1550 kpsi
Breakdown kV	ASTM D-149	D48/50	> 42 kV
Specific Gravity (unitless) / Mass (g/cm <sup>3</sup> )	ASTM D-792 Method A	A, 23°C	2.10
Water Absorption	IPC TM-650 2.6.2.2	E1/105 + D24/23	< 0.02%
Coefficient of Thermal Expansion (ppm/°C) X Axis Y Axis Z Axis		0°C to 100°C	12 12 125
Thermal Conductivity (W/mK)	ASTM E-1225	100°C	0.49
Flammability	UL 94	C48/23/50, E24/125	Meets UL94-V0

### **Material Availability:**

AD300A is currently built on 0.020", 0.030" and 0.060" Thicknesses. Other thicknesses may be available. Inquire with Arlon Customer Service for other options. AD300A is supplied with 1/2 ounce, 1 ounce or 2 ounce electrodeposited copper foil on both sides. These materials are also available to a heavy metal ground plane. Aluminum, brass and copper plate may be specified, providing an integral heat sink and mechanical support to the substrate. AD300A is built in 36" x 48" or 36" x 72" Sheets. Common panel sizes include: 12" x 18", 16" x 18" and 18" x 24". Other panel sizes available.

*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.*



**MATERIALS FOR ELECTRONICS**

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