AD255A Laminate

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

Features:

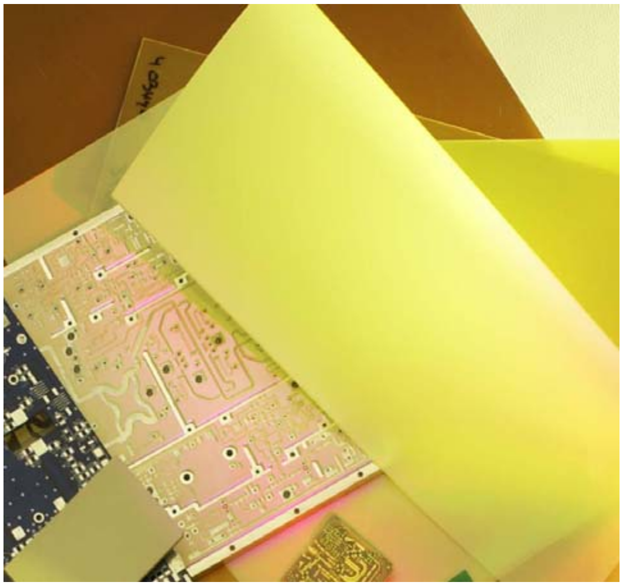
- Very Low Loss PTFE and Ceramic Filled Composite (0.0014 Loss Tangent at Base Station Frequencies)
- Dielectric Constant (2.55) with Tighter Tolerance
- Low Dielectric Loss (Loss Tangent)
- Low Profile Copper (lower conductive losses and lowest PIM)
- Low Z-Direction CTE
- Large Panel Sizes Available

Benefits:

- Higher Antenna Efficiencies
- Lower Insertion Loss
- Low PIM for Antenna Applications
- Excellent CTE for Phase Stability
- Ceramic provides higher degree of Dielectric Constant Stability as Temperatures Change or Cycle

Typical Applications:

- Base Station Antenna Applications
- Commercial Antennas
- Digital Audio Broadcasting (DAB) Antennas (Satellite Radio)



Arlon's AD255A is a woven fiberglass reinforced PTFE composite material designed as a low cost laminate with excellent low loss characteristics. Features of AD255A include lower loss through the use of optimizing the trade-off between thicker and thinner glass styles, strategic use of lower loss ceramics at the exclusion of lossier glass, as well as a tighter DK tolerance. The AD255A design offers a higher degree of performance over comparable legacy PTFE/glass laminates that have not contained ceramic. This results in lower loss, higher antenna efficiencies, lower thermal expansion properties and greater phase stability.

This material combines the excellent low loss electrical properties of PTFE resin with the thermal properties of ceramic and the enhanced value of cost effective fiberglass styles to provide low cost laminate materials suitable for high volume commercial wireless communication applications.

The electrical properties of AD255A are highly desired in applications where higher frequency and expectations for increased fidelity with broadband signals are beyond the performance capabilities offered by high temperature or low temperature ceramics and thermosets.

Stability of PTFE over a wide frequency range and its low loss properties, makes AD255A ideal for a variety of microwave and R/F applications in telecom infrastructure. The inclusion of micro-dispersed ceramic provides thermal stability to the laminate in the form of lower CTE values and greater Phase Stability across temperature. The X and Y CTE matches the CTE of copper.

AD255A 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: AD255A

Property	Test Method	Condition	Result
Dielectric Constant @ 10GHz Dielectric Constant @ 1MHz	IPC TM-650 2.5.5.5 IPC TM-650 2.5.5.3	C23/50	2.55 2.55
Loss Tangent @ 10 GHz Loss Tangent @ 1 MHz	IPC TM-650 2.5.5.6 IPC TM-650 2.5.5.3	C23/50	0.0015 0.0013
Thermal Coefficient of εr	IPC TM-650 2.5.5.5	-10°C to +140°C	- 138
Copper peel Strength (1oz) lbs (lbs. per linear inch)	IPC TM-650 2.4.8	A, TS	12
Volume Resistivity (MΩ-cm)	IPC TM-650 2.5.17.1	C96/35/90	1.1×10^{9}
Surface Resistivity (MΩ)	IPC TM-650 2.5.17.1	C96/35/90	4.5×10^{7}
Arc Resistance (seconds)	ASTM D-495	D48/50	>180
Tensile Modulus (kpsi)	ASTM D-638	A, 23°oC	> 700
Tensile Strength (kpsi)	IPC TM-650 2.4.18	A, 23°C	> 20
Compressive Modulus (kpsi)	ASTM D-695	A, 23°oC	> 350
Flexural Modulus (kpsi)	ASTM D-790	A, 23°C	> 540
Dielectric Breakdown (kV)	ASTM D-149	D48/50	> 45
Specific Gravity (g/cm^{3})	ASTM D-792 Method A	A, 23°C	2.30
Water Absorption (%)	IPC TM-650 2.6.2.2	E1/105 + D24/23	0.04
Coefficient of Thermal Expansion (ppm/^{o}C) X Axis Y Axis Z Axis	IPC TM-650 2.4.24 TMA	0°C to 100°C	 16 16 80
Thermal Conductivity (W/mK)	ASTM E-1225	100°C	0.30
Flammability	UL 94 Vertical Burn	C48/23/50, E24/125	UL94-V0

Material Availability:

Current Standard Production is based on 0.030" and 0.060" thickness designs. Other thicknesses, may be available upon request. Please contact Arlon Customer Service to discuss your application. AD255A is supplied with 1/2, 1 or 2 ounce electrodeposited copper on both sides. Reverse Treat ED Copper is recommended for Reduced PIM Performance. Inquire about PIM+ performance option.

When ordering AD255A, specify dielectric thickness, cladding, panel size and any other special considerations. Typical Panels are cut from a Master Sheet. The stardard master sheet is 36" x 48". Typical panel sizes cut from a master sheet include: 12" x 18", 18" X 24", 16" X 18". Contact Customer Service for larger master sheet or custom panel sizes.

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MATERIALS FOR ELECTRONICS

CONTACT INFORMATION

For samples, technical assistance, customer service or for more information, please contact Arlon Materials for Electronics Division at the following locations:

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