GenClad™ 280

The Next Generation Low Loss Thermoset Bond-Ply for Low-Cost Multilayer Printed Circuit Boards

Arlon's GenClad 280 is a proprietary woven fiberglass reinforced, ceramic-filled composite material engineered for optimal cost/performance efficiency in multilayer RF and high frequency printed circuit boards. Combining a non-polar thermoset resin system with a controlled-expansion ceramic filler and a low-loss thermoplastic material, GenClad offers the next generation electrical performance in a true halogen-free system that matches the electrical performance of traditional PTFE laminate systems, but offers designers the ability to cost effectively use multilayer designs.

The low dielectric constant (Er) and loss properties, low thermal coefficient of dielectric constant (TCEr), and excellent dielectric loss stability characteristics offered by GenClad 280 bond-ply prepreg makes it ideal for wireless and digital applications such as cellular telephones, down converters, low noise amplifiers, antennas — and other advanced design circuits.

Processing for GenClad materials is compatible with processing equipment used for standard FR-4 laminates and prepreg.

Features:

- Low Loss Ceramic-Filled Thermose/ Thermoplastic Hybrid System
- Rivals PTFE laminate electrical performance in a Halogen-Free system
- Light-weight material relative to standard laminate materials
- Optimal Price/Performance Ratio for cost-sensitive applications

Benefits:

- Greater Signal Integrity
- Utilizes Standard FR-4 Processes
- Excellent Thermal Properties
- Light weight, low-cost electronics

Typical Applications:

- Cellular Base Station Antennas &Power Amplifiers, Down Converters
- LNB's for direct broadcast satellite systems
- Broadband wireless access antennas
- Avionic radar applications

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GenClad™ 280

Typical Properties:

Property	Condition	GenClad 280	Test Method
1. Electrical Properties			
Dielectric Constant (may vary by thickness)			
@1 MHz		2.83	IPC TM-650 2.5.5.3
@ 10 GHz	C23/50	2.80	IPC TM-650 2.5.5.5
Dissipation Factor			
@ 1 MHz		0.0017	IPC TM-650 2.5.5.3
@ 10 GHz	C23/50	0.0020	IPC TM-650 2.5.5.5
Temperature Coefficient of εr	0 to 100°C	-60	IPC TM-650 2.5.5.5A
Volume Resistivity			
C96/35/90	MΩ-cm	$2.1x10^9$	IPC TM-650 2.5.17.1
E24/125	MΩ-cm	$7.5x10^8$	IPC TM-650 2.5.17.1
Surface Resistivity			
C96/35/90	MΩ	$1.9x10^8$	IPC TM-650 2.5.17.1
E24/125	MΩ	$7.5x10^8$	IPC TM-650 2.5.17.1
Electrical Strength, V/mil		1000	IPC TM-650 2.5.6.2
Dielectric Breakdown, kV		40.8	IPC TM-650 2.5.6
Arc Resistance		126	IPC TM-650 2.5.1
2. Thermal Properties			
Glass Transition Temperature (Tg)			
TMA	°C	130 / 190*	IPC TM-650 2.4.24
DSC	°C	135	IPC TM-650 2.4.25
Decomposition Temperature (Td)			
Initial		420	IPC TM-650 2.4.24.6
5%		460	IPC TM-650 2.4.24.6
CTE (x,y)	50 to 120°C	26	IPC TM-650 2.4.24
CTE (z)			
< Tg		50	IPC TM-650 2.4.24
> Tg		350	IPC TM-650 2.4.24
z-axis Expansion (50-260°C)		4.8	IPC TM-650 2.4.24
3. Mechanical Properties			
Peel Strength to Copper (1 oz/35 micron)		6.5	IPC TM-650 2.4.8
After Thermal Stress		6.7	IPC TM-650 2.4.8
Young's Modulus, kpsi		670	IPC TM-650 2.4.18.3
Flexural Strength (Machine / Cross), kpsi	A, 23 °C	32 / 31	IPC TM-650 2.4.4
Tensile Strength (Machine / Cross), kpsi	A, 23 °C	7.8 / 7.4	IPC TM-650 2.4.18.3
Compressive Modulus, kpsi		1630	ASTM D-3410
Poisson's Ratio (x, y)		0.25	ASTM D-3039
4. Physical Properties			
Water Absorption	E//105 + D24/23	0.04	IPC TM-650 2.6.2.1
Specific Gravity	A, 23 °C	1.35	ASTM D-792 Method A
Thermal Conductivity	100°C	0.2	ASTM E-1225
Flammability (UL File E 80166)	C48/23/50 2.3.10	N/A	UL 94 Vertical BurnIPC TM-650 2.3.10

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.

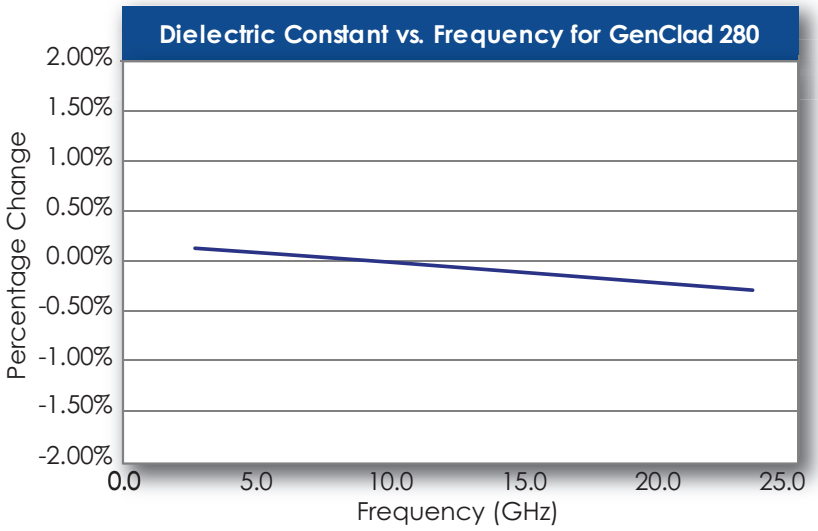

Figure 1
Demonstrates the Stability of Dielectric Constant across Frequency.This information was correlated from data generated by using a free space and circular resonator cavity. This characteristic demonstrates the inherent robustness of Arlon Laminates across Frequency, thus simplifying the final design process when working across EM spectrum. When transitioning from FR-4 designs to higher frequency, the stability of the Dielectric Constant of GenClad materials over frequency insures easy design transition and scalability of design.

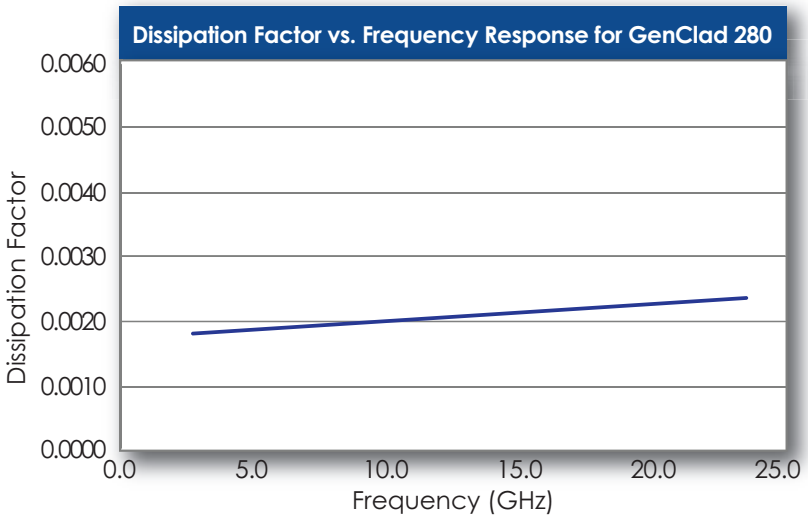

Figure 2
Demonstrates the Stability of Dissipation Factor across Frequency.This characteristic demonstrates the inherent robustness of Arlon Laminates across Frequency, providing a stable platform for high frequency applications where signal integrity is critical to the overall performance of the application.

Material Availability:

GenClad 280 prepreg is available on 104 & 106 with nominal pressed thickness of 2.6 and 3.3 mils per ply pressed thickness. Contact customer service for more details about other laminate options.

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