

TacLamplus

Ultra-thin base materials for mmWave applications

TacLamplus is a cost effective, non- reinforced microwave substrate that can be used to create very low loss structures both with single dielectric layers and multiple layers.

Exceptional copper foil adhesion allows small feature resolution and the unique composition of the dielectric facilitates clean laser ablation for micro via and component cavity formation.

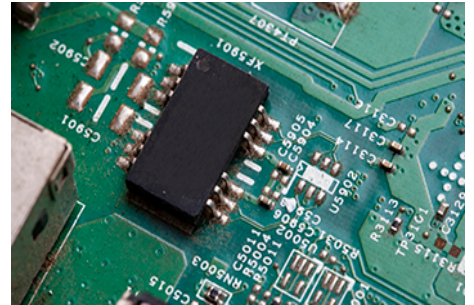
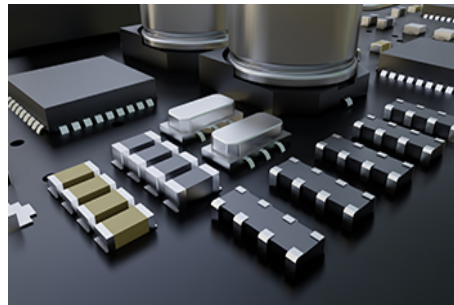
The use of metal plate such as 1 mm copper helps maintain dimensional stability and provides a sound ground plane and heat sink

Benefits

- Laser Ablatable
- Sequential Multilayer
- Very Low Loss
- Low Moisture Absorption
- High Peel Strength
- Uniform & Consistent DK

Applications

- Automotive Radar
- mmWave Radios
- Power Amplifiers



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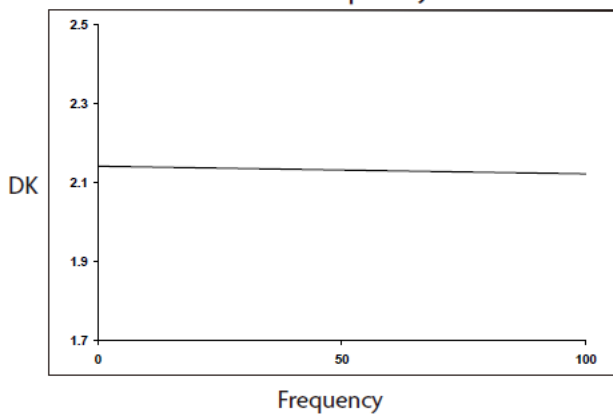
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TacLamplus Typical Values

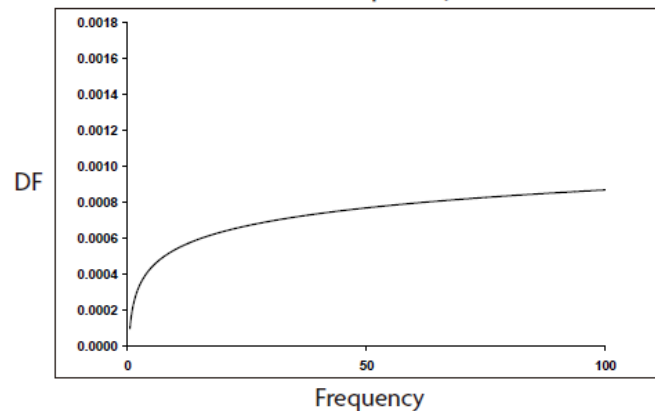
Property	Test Method	Unit	Value	Unit	Value
Dk @ 10 GHz	IPC-650 2.5.5.5.1		2.10		2.10
Dk @ 50 GHz (i)	IPC-650 2.5.5.5.1		2.10		2.10
Dk @ 90 GHz (i)	IPC-650 2.5.5.5.1		2.08		2.08
Df @ 10 GHz	IPC-650 2.5.5.5.1		0.0004		0.0004
Df @ 50 GHz (i)	IPC-650 2.5.5.5.1		0.0007		0.0007
Df @ 90 GHz (ii)	IPC-650 2.5.5.5.1		0.0008		0.0008
Insertion Loss @ 50 GHz (iii)		dB/mm	0.04	dB/mm	0.04
Moisture Absorption	IPC-650 2.6.2.1	%	0.02	%	0.02
Peel Strength	IPC-650 2.4.8	lbs./inch	>4	N/mm	>7.14
Flammability Rating	UL 94		V-0		V-0
Dielectric Breakdown	IPC-650 2.4.6	Kv	>60	Kv	>60
Volume Resistivity	IPC-650 2.5.17.1	Mohms/cm	10 ⁷	Mohms/cm	10 ⁷
Surface Resistivity	IPC-650 2.5.17.1	Mohms	10 ⁷	Mohms	10 ⁷
Arc Resistance	IPC-650-2.5.1	Seconds	>180	Seconds	>180
Specific Gravity	IPC-650 2.3.5	g/cm ³	2.17	g/cm ³	2.17
Tensile Strength	IPC-650 2.4.19	psi	4,351	N/mm ²	30
Young's Modulus	ASTM D 3039	Mpa	640	Mpa	640
Poisson's Ratio	ASTM D 3039		0.45		0.45
Specific Heat (Capacity)	ASTM E 1269 (DSC)	J/g/K	0.85	J/g/K	0.85
T _d (2% Wt. Loss)	IPC-650 2.4.24.6	°F	932	°C	500
T _d (5% Wt. Loss)	IPC-650 2.4.24.6	°F	959	°C	515
Outgassing	ECSS-Q-70	CVCM/%	<0.02	CVCM/%	<0.02
CTE (X - Y axis)	ASTM D 3386 (TMA)	ppm/°C	100	ppm/°C	100
CTE (Z axis)	ASTM D 3386 (TMA)	ppm/°C	105	ppm/°C	105
Thermal Conductivity	ASTM F433	W/M*K	0.25	W/M*K	0.25

- A. Source: Queen's University, Belfast, Ireland
- B. Source: Queen's University, Belfast, Ireland - accounting for copper foil roughness
- C. Source: EADS Project, PROKOSMOS

DK vs. Frequency



DF vs. Frequency



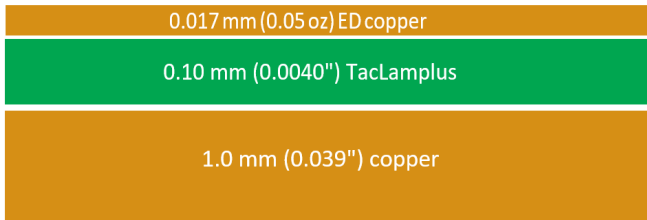
Remark : All reported values are typical and should not be used for specification purposes. In all instances, the user shall determine suitability in any given application.

How to Order						
Designation	Dk	Typical Thicknesses				
		Inches	mm			
TacLamplus	2.20 +/-0.02	0.0040	0.100			

Available Copper Cladding						
Designation	Weight	Copper Thickness		R _{MS} Treated Side		Description
		Inches	µm	µin	µm	
CH	1/2 oz / ft ²	~0.0007	~18	27	0.7	Electrodeposited
C1	1 oz / ft ²	~0.0014	~35	64	1.6	Electrodeposited

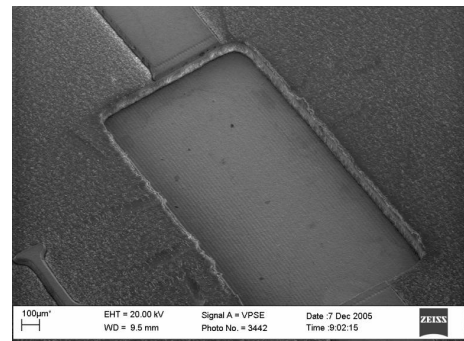
An example of our part number is :
Taclamplus-220-0040-CH/C1MM - 18" x 24" (457 mm x 610 mm)

Typical Construction for Metal-Backed Designs*



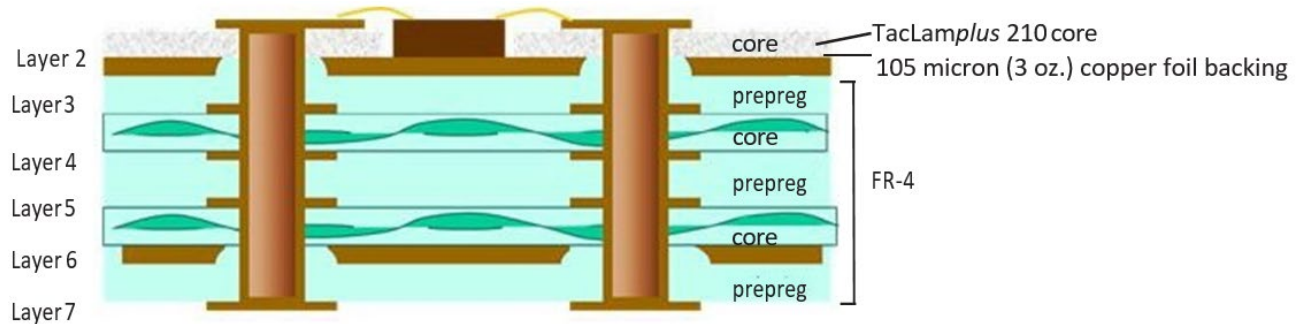
* Other combinations are available upon request

Laser Cut MMIC Cavity



TacLamplus dielectric thickness is tailored to suit short length wire bonding.

Typical Construction for Hybrid Multilayer Designs*



eguide



K-Type Cavity



Laser Microvia