ROGERS CORPORATION

\\\ Datasheet

RT/duroid® 5280LZ
High Frequency Laminates

RT/duroid® 5280LZ filled PTFE composites, reinforced with woven fiberglass, are engineered for precise stripline and microstrip circuit applications that demand dimensional stability throughout PWB processing.

The unique filler results in a low density, lightweight material for high performance weight sensitive applications. The very low dielectric constant of RT/duroid® 5280LZ laminates is uniform from panel to panel and is constant over a wide frequency range. Its low dissipation factor extends the usefulness of RT/duroid® 5280LZ laminates to Ku-band and above.

RT/duroid® 5280LZ laminates are easily cut, sheared and machined to shape. They are resistant to all solvents and reagents, hot or cold, normally used in etching printed circuits or in plating edges and holes. When ordering RT/duroid® 5280LZ laminates, it is important to specify dielectric thickness, tolerance, electrodeposited copper foil, and weight of copper foil required.

\\\ Features and Benefits:

Lowest dielectric constant available

- Critical for registration of small circuit features

Low X, Y, & Z axis CTE

- Glass-reinforced construction delivers industry-leading Z-axis CTE from -50C to 288C

Lightweight/low density

- Low circuit losses

Uniform electrical properties over a wide frequency range

\\\ Typical Applications:

- Airborne antenna systems
- Satellite communications
- Lightweight feed networks
- Military radar systems
- Missile guidance systems
- Point-to-point digital radio antennas

Thickness	Dk (Typical Values)	Df (Typical Values)
0.018"	2.10	0.0028
0.021"	2.06	0.0028
0.024"	2.10	0.0028
0.042"	2.06	0.0028
0.046"	2.10	0.0028
0.093"	2.06	0.0028

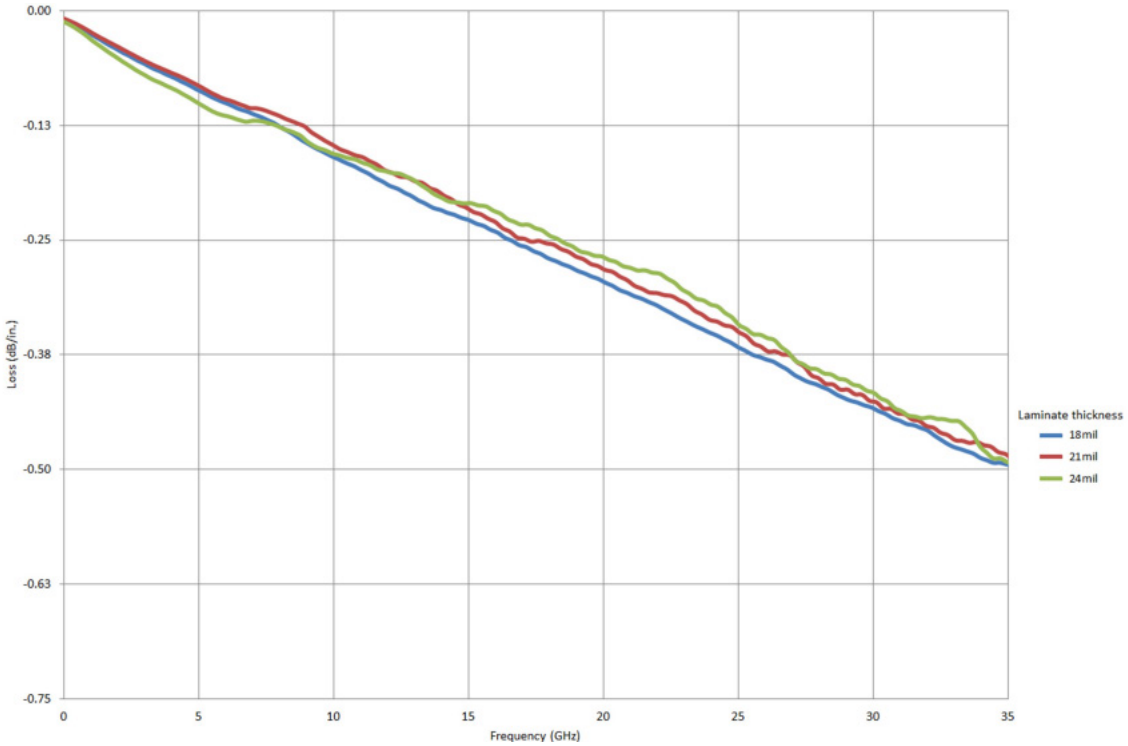
Data collected per IPC-TM-650 2.5.5.5c test method at 10 GHz

\\\ Standard Offerings

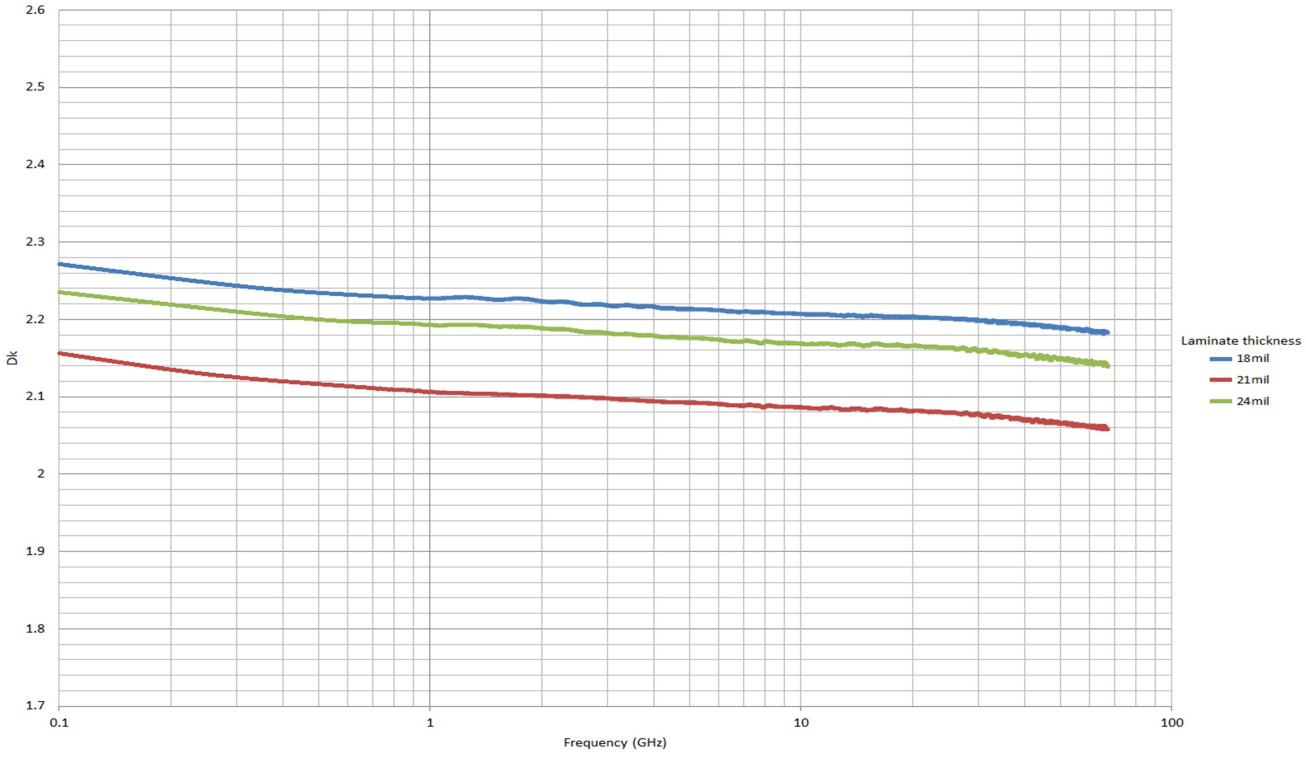
Standard Thicknesses	Standard Panel Sizes	Standard Cladding
0.018" (0.457mm) ± 0.001" 0.021" (0.533mm) ± 0.001" 0.024" (0.610mm) ± 0.001" 0.042" (1.067mm) ± 0.002" 0.046" (1.168mm) ± 0.002" 0.093" (2.362mm) ± 0.004"	12" X 18" (305 X 457 mm) 24" X 18" (610 X 457 mm)	Electrodeposited Copper Foil 1/2 oz. (18µm) 1 oz. (35µm)

Contact Customer Service or Sales Engineering to inquire about other available product configurations including additional thicknesses, panel sizes and claddings.

Microstrip insertion loss, differential length method using
RT/duroid® 5280LZ laminates of different thicknesses with 1/2 oz. copper



Design Dk, microstrip differential phase length method using
RT/duroid® 5280LZ laminates of different thicknesses with 1/2 oz. copper



\\\ Standard Properties Table

Properties		Typical Value	Units	Test Conditions		Test Method
Electrical Properties						
Dielectric Constant		2.06	-	23˚C @ 50% RH	3313 Glass	IPC TM-650 2.5.5.5
		2.10		23˚C @ 50% RH	1080 Glass	
Dissipation Factor		0.0028	-	23˚C @ 50% RH	10 GHz	IPC TM-650 2.5.5.5
Thermal Coefficient of Dielectric Constant		20	ppm/°C	-55˚C to 288˚C	10 GHz	IPC TM-650 2.5.5.5
Volume Resistivity		$1.03x10^{12}$	Ohm-cm	C-96/35/90	-	IPC TM-650 2.5.17.1
Surface Resistivity		$6.01x10^{10}$	Ohm	C-96/35/90	-	IPC TM-650 2.5.17.1
Electrical Strength (dielectric strength)		435.8	V/mil	-	-	IPC TM-650 2.5.6.2
Dielectric Breakdown		47.6	kV	D-48/50	-	IPC TM-650 2.5.6
Thermal Properties						
Decomposition Temperature (Td)		500	˚C	2 hours @ 105 ˚C	5% Weight Loss	IPC TM-650 2.3.40
Coefficient of Thermal Expansion - x		46	ppm/°C	-	-55˚C to 288˚C	IPC TM-650 2.4.41
Coefficient of Thermal Expansion - y		47	ppm/°C	-	-55˚C to 288˚C	IPC TM-650 2.4.41
Coefficient of Thermal Expansion - z		56	ppm/°C	-	-55˚C to 288˚C	IPC TM-650 2.4.41
Time to Delamination		>60	minutes	As Received	288 ˚C	IPC TM-650 2.4.24.1
Mechanical Properties						
Copper Peel Strength after Thermal Stress		13.7	lbs/in	10s @ 288˚C	18µm foil	IPC TM-650 2.4.8
Tensile Modulus (X, Y)		3,660, 2,888	psi	78°F (+/-10°F)	-	ASTM D3039
Flexural Modulus (X, Y)		6,075, 5,237	psi	78°F (+/-10°F)	-	IPC-TM-650 2.4.4
Youngs Modulus		770	ksi	78°F (+/-10°F)	-	ASTM D3039
Poissons Ratio		0.036	-	78°F (+/-10°F)	-	ASTM D3039
Dimensional Stability (MD, CMD)		(-0.19, 0.00278)	mil/inch	-	3313 Glass	IPC-TM-650 2.4.39a
Dimensional Stability (MD, CMD)		(-0.0479, -0.0583)	mil/inch	-	1080 Glass	IPC-TM-650 2.4.39a
Physical Properties						
Flammability		V-0	-	-	-	UL 94
Moisture Absorption		0.02	%	E1/105+D24/23	-	IPC TM-650 2.6.2.1
Density		1.64	g/cm^3	C-24/23/50	-	ASTM D792
NASA Outgassing	Total Mass Lost	0.02	%	24h @ 125°C	-	ASTM E595
	Collected Volatiles	<0.01	%	24h @ 125°C	-	ASTM E595
	Water Vapor Recovered	0.01	%	24h @ 125°C	-	ASTM E595

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