ROGERS CORPORATION

RO4830™ High Frequency Laminates

Data Sheet

RO4830™ thermoset laminates are well suited for price-sensitive millimeter wave applications, such as 76-81 GHz automotive radar sensors, and are a reliable, lower cost alternative to conventional PTFE-based laminates. RO4830 laminates have a slightly higher dielectric constant of 3.2 at 77GHz, versus PTFE-woven glass laminates. LoPro® reverse treated copper foil cladding contributes to RO4830 laminates' excellent insertion loss at 77GHZ of 2.2 db per inch.

Offered in dielectric thicknesses of 0.005" and 0.0094", RO4830 laminates are intended for the cap layer on FR-4 multi-layer board designs, which are commonly used for 76-81 GHz automotive radar sensor PCB applications. Flat woven e-glass and a filler with smaller and more uniform particle size contribute to good laser drilling performance. Containing the same advanced anti-oxidant package as RO4835™ laminates, RO4830 laminates are significantly more resistant to oxidation than other hydrocarbon based laminate materials (Based on studies conducted by Rogers Corporation). RO4830 laminates can be fabricated using standard epoxy/glass (FR-4) processes and are compatible with RO4400™ bond ply. These laminates have the UL-V0 flame retardant rating and are lead free solder process compatible.

Features and Benefits:

RO4000® Series Thermoset Platform

- Reduced Overall Cost of PCB Manufacturing versus PTFE Laminate Options

Optimized filler, Resin & Glass Composite System

- Dielectric Constant at 77 GHz of 3.2

Reverse Treated Smooth LoPro® Copper Foil

- Excellent Insertion Loss

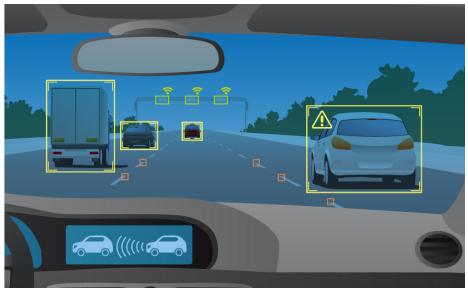
Optimized Filler & Flat Glass

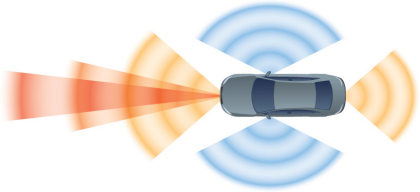
- Good Laser Drilling Performance
- Consistent Within Sheet Dielectric Constant

Typical Applications:

- 76-81 GHz Automotive Radar Sensors

AEB City, AEB Vulnerable Road Users





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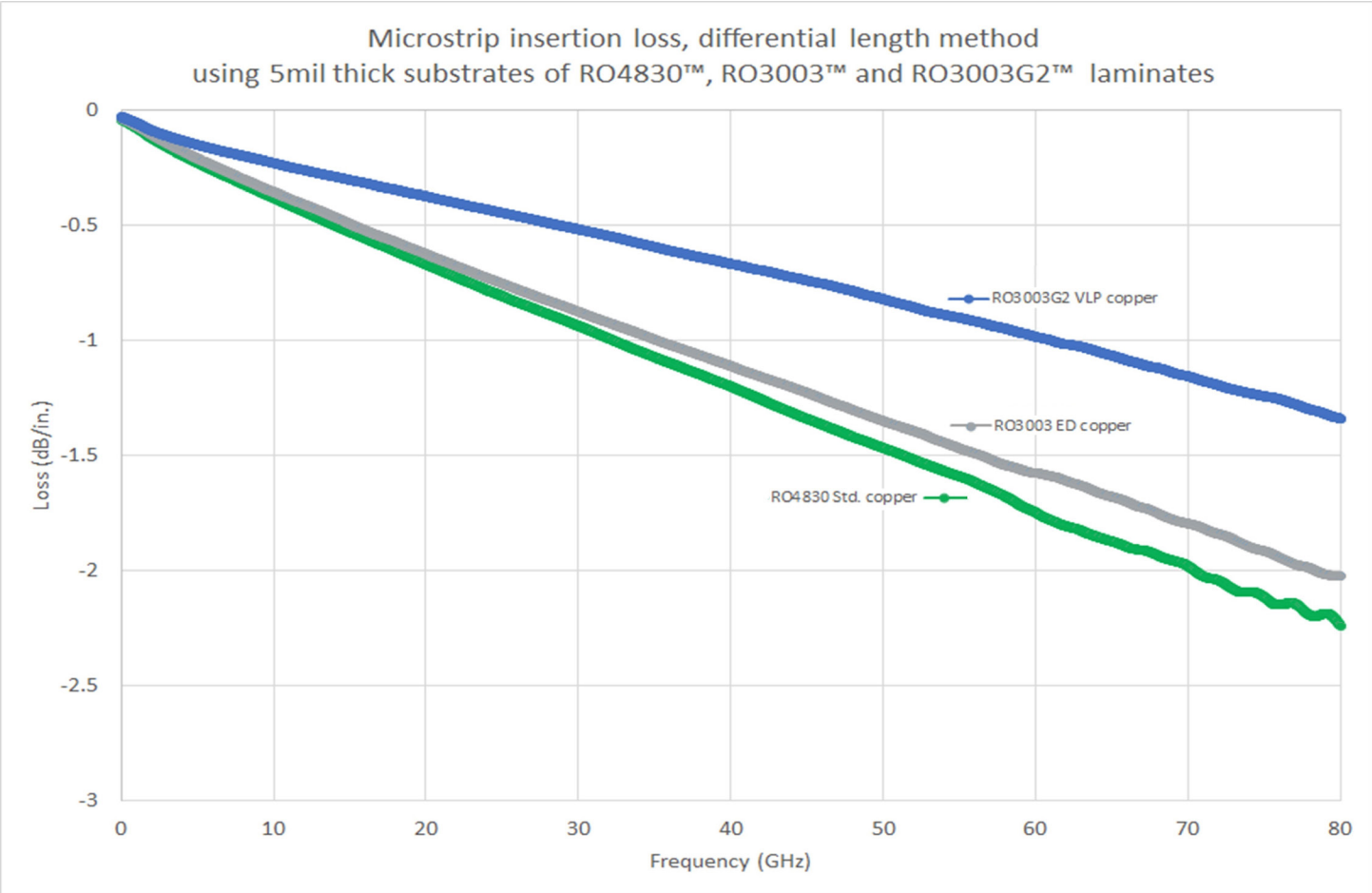

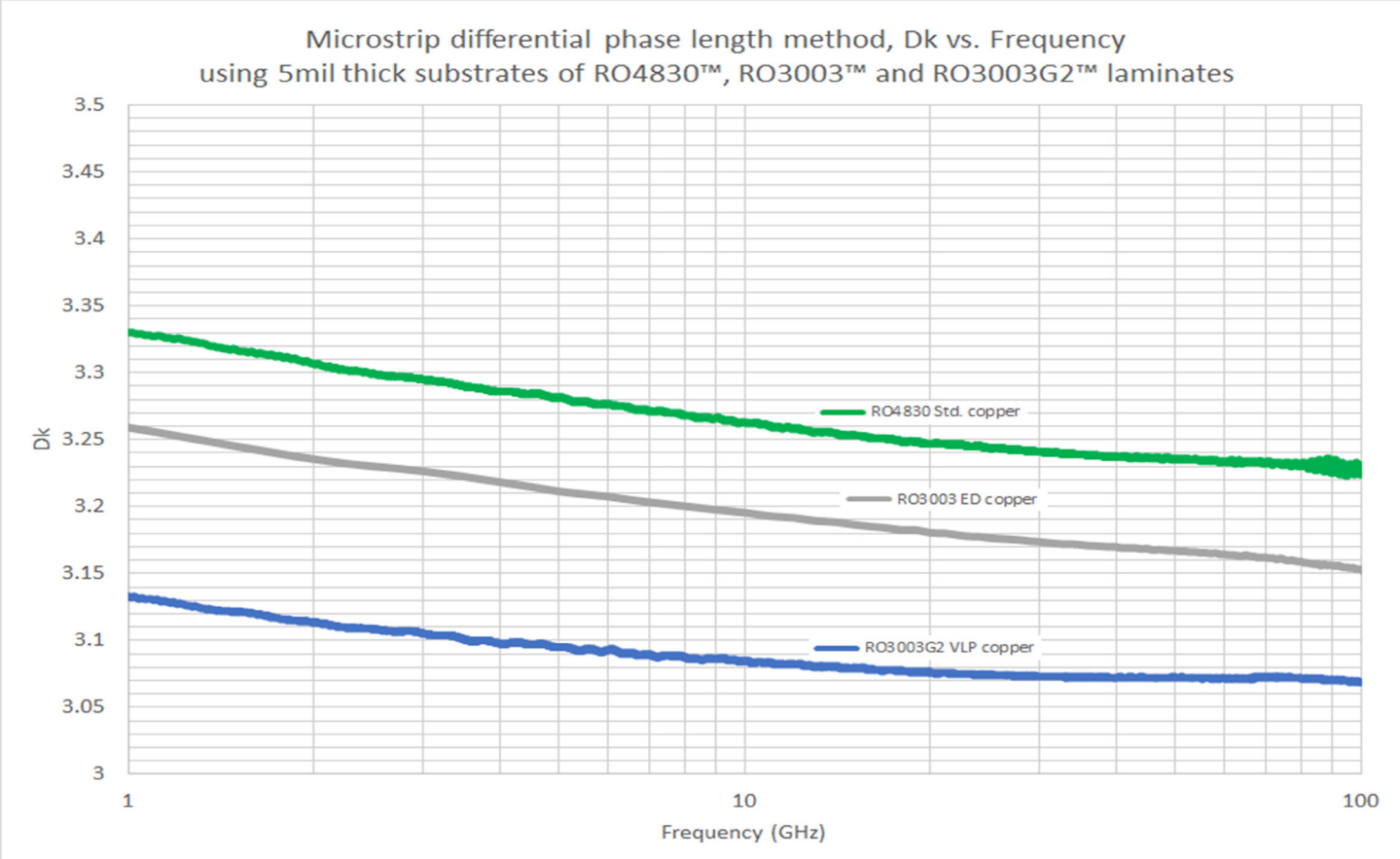

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Property		Typical Values [1] RO4830™ Dielectric Thickness 0.005″	Typical Values [1] RO4830™ Dielectric Thickness 0.0095″	Units	Condition	Test Method
[1] Dielectric Constant, ε_r Design		3.24	3.24	-	77 GHz	microstrip differential phase length
Transmission Line Loss		2.2	1.8	dB/in	77 GHz	microstrip differential phase length
Dissipation Factor, tan δ		0.0033	0.0032	-	10 GHz	split-post dielctric resonator
Thermal Coefficient of ε_r (z direction)		-30	-30	ppm/°C	-50°C to 150°C	IPC-TM-650 2.5.5.5
Dielectric Strength		78.7	59.1	kV/mm	48 hrs @ 50°C	IPC-TM-650, 2.5.6.2
		(2000)	(1500)	(V/mil)		
Water Absorption		0.15	0.13	%	D-48/50	ASTM D570
Peel Strength after Thermal Stress		0.67	0.67	N/mm	18 micron reverse treated ED foil	IPC-TM-650 2.4.8
		(3.8)	(3.8)	lbs/in		
Flammability Rating		V-0	V-0	-	C-48/23/50	UL94
Dimensional Stability	MD	-1.8 (-1.8)	-1.5 (-1.5)	mm/m (mils/in)	4 hrs @ 105°C	IPC-TM-650 2.4.39A
	CMD	-1.8 (-1.8)	-1.6 (-1.6)			
Decomposition Temperature		408	412	°C	-	ASTM D3850
Time to Delamination (T288)		>30	>30	minutes	with Cu	IPC-TM-650, 2.4.24.1
Lead-Free Process Capable		YES	YES	-	-	-
Thermal Conductivity (calculated)		0.45	0.47	W/mK	50°C	Through-plane calculation with series mixing rule
CTE	x,y	23	21	ppm/°C	0 to 150C	IPC-TM-650 2.4.41
	z	110	83			

NOTE:
Typical values are a representation of an average value for the population of the property. For specification values contact Rogers Corporation.

(1) The design Dk is an average number from several different tested lots of material and on the most common thickness/s. If more detailed information is required, please contact Rogers Corporation or refer to Rogers' technical papers in the Rogers Technology Support Hub available at http://www.rogerscorp.com.

Prolonged exposure in an oxidative environment may cause changes to the dielectric properties of hydrocarbon based materials. The rate of change increases at higher temperatures and is highly dependent on the circuit design. Although Rogers' high frequency materials have been used successfully in innumerable applications and reports of oxidation resulting in performance problems are extremely rare, Rogers recommends that the customer evaluate each material and design combination to determine fitness for use over the entire life of the end product.

Surface Roughness	Surface Area Index	Average Nodule Size
0.9 µm sq	2.0	0.2 µm

Standard Thicknesses	Standard Panel Sizes:	Standard Copper Cladding
0.005″ (0.127mm) 0.0094″ (0.239mm)	24″ X 18″ (610 X 457 mm) 24″ X 21″ (610 X 533 mm) 24″ X 36″ (610 X 914 mm) 48″ X 36″ (1219 X 914 mm)	½ oz (18µm) 1 oz (35µm) Reverse Treated EDC Foil

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The information in this data sheet is intended to assist you in designing with Rogers' circuit materials. It is not intended to and does not create any warranties express or implied, including any warranty of merchantability or fitness for a particular purpose or that the results shown on this data sheet will be achieved by a user for a particular purpose. The user should determine the suitability of Rogers' circuit materials for each application.

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RoHS Compliant

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