

RO4830TM High Frequency Laminates

RO4830TM 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 RO4835TM 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 RO4400TM bond ply. These laminates have the UL-V0 flame retardant rating and are lead free solder process compatible.

Data Sheet



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

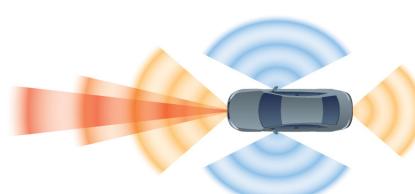
- Excellent Insertion Loss

Optimized Filler & Flat Glass

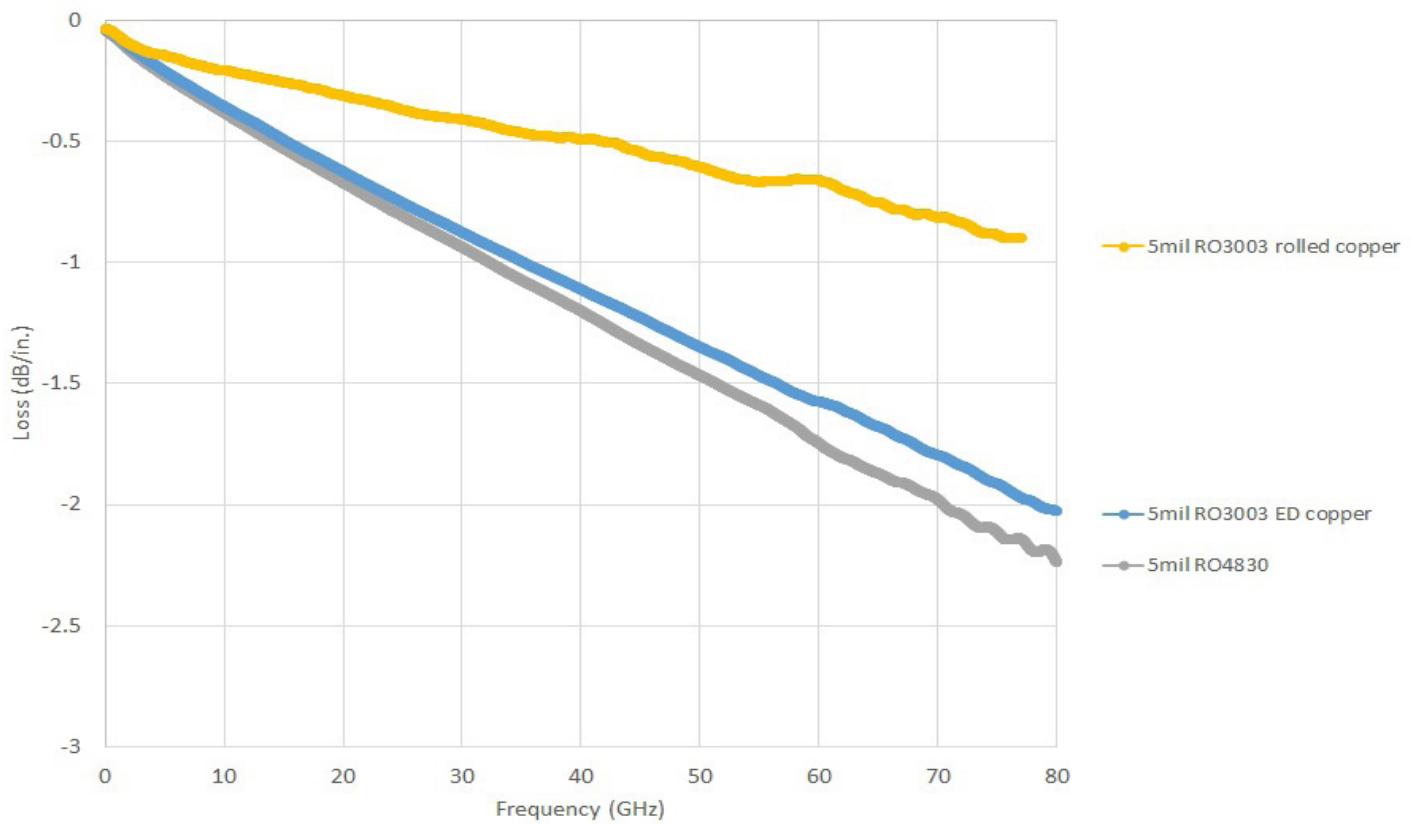
- Good Laser Drilling Performance
- Consistent Within Sheet Dielectric Constant

Typical Applications:

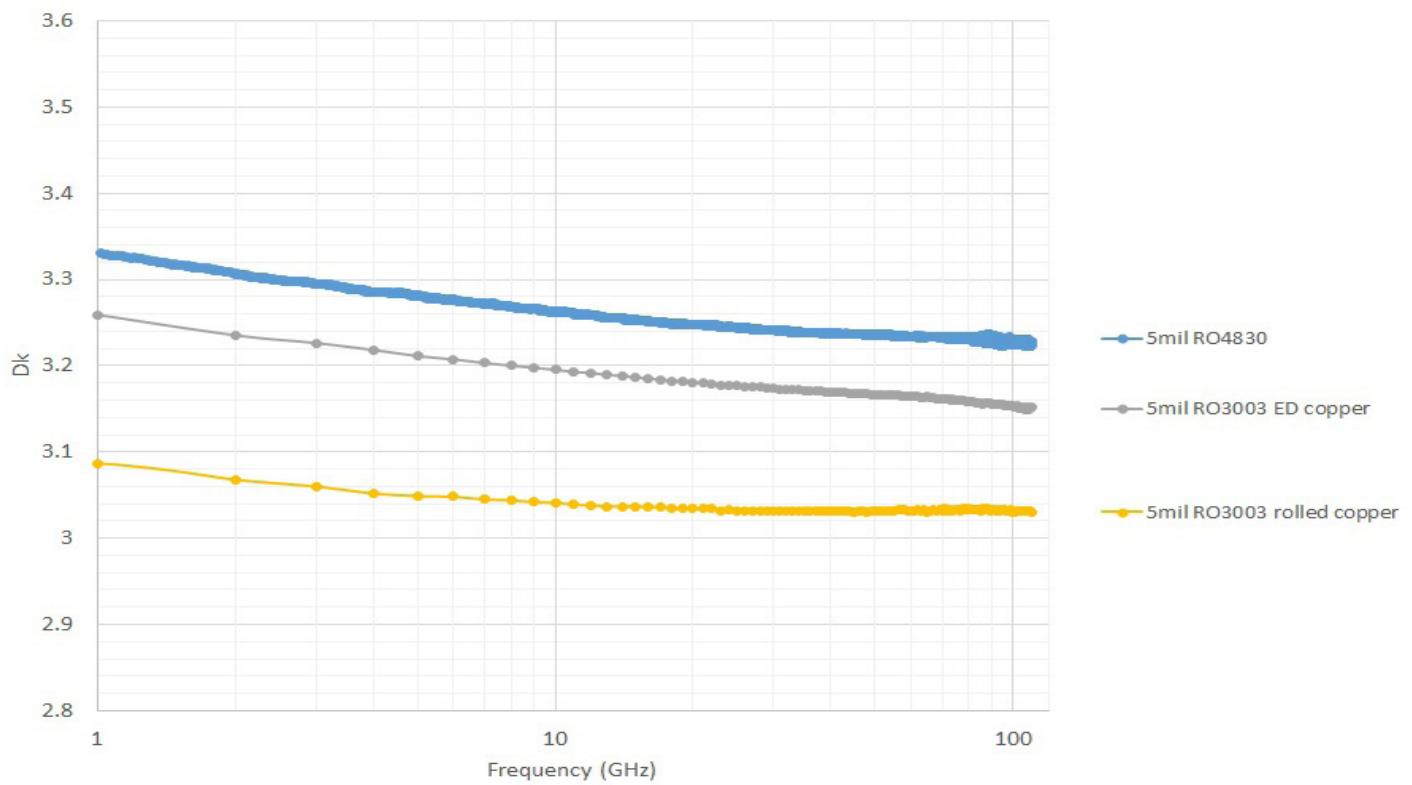
- 76-81 GHz Automotive Radar Sensors



Microstrip insertion loss, differential length method
using 5mil RO4830™ laminate and 5mil RO3003™ laminate



Microstrip differential phase length method, Dk vs. Frequency
using 5mil RO4830™ laminate and 5mil RO3003™ laminate



Property	Typical Values [1] RO4830 ^(TM)		Units	Condition	Test Method			
	Dielectric Thickness							
	0.005"	0.0095"						
[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, $\tan \delta$	0.0033	0.0032	-	10 GHz	split-post dielectric resonator			
Thermal Coefficient of ϵ_r (z direction)	-30	-30	ppm/°C	-100°C to 250°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			
	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			
	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 D_k is an average number from several different tested lots of material and on the most common thickness/s. If more detailed information is required,

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)	12"X 18" (305 X 457 mm) 24"X 18" (610 X 457 mm) 48"X 36" (1220 X 914 mm)	1/2 oz (18 μm) 1 oz (35 μm) Reverse Treated EDC Foil