ROGERS CORPORATION

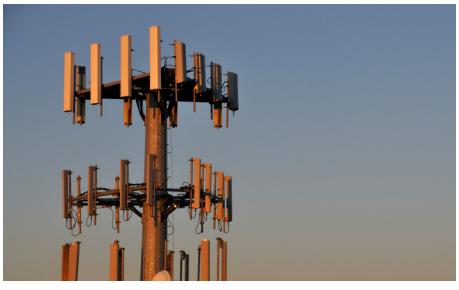
Data Sheet

RO4725JXR™ & RO4730G3™
Antenna Grade Laminates

RO4700™ series antenna grade laminates are a reliable alternative to the conventional PTFE-based laminates.

RO4725JXR™ and RO4730G3(TM) laminates have the mechanical and electrical properties that antenna designers need. The laminates have a dielectric constant (Dk) of 2.55 and 3.0 and a loss tangent (Df) of 0.0022 measured at 2.5 GHz when using LoPro® Reverse Treated EDC Foil. These values allow antenna designers to realize substantial gain values while minimizing signal loss. Materials are available with a demonstrated low PIM performance, with values better than -160 dBc (43dBm 1,900MHz signal). [2]

RO4700 series antenna grade laminates are compatible with conventional epoxy and high temperature lead-free solder processing. These laminates do not require the special treatment needed on traditional PTFE-based laminates for plated through hole preparation. Lamination can be achieved using RO4400™ bondply series at 175°C. The resin systems of RO4700JXR materials are designed to provide the properties sought after by antenna designers. The glass transition temperature exceeds 280°C (536°F), leading to a low Z-axis CTE, excellent plated through hole reliability, and lead-free solder processability.



Features/Benefits:

RO4700 Series Laminates - low loss dielectric with low profile foil

- Reduced PIM
- Low insertion loss
- RO4725JXR Dk 2.55
- RO4730G3 Dk 3.0 UL 94 V-0

Unique filler / closed microspheres

- Low density
- Light-weight 30% lighter than PTFE / Glass

Low Z-axis CTE <30ppm/°C
High Tg >280°C

- Design flexibility
- Automated assembly compatible

Low TCDk <40 ppm/°C

- Consistent circuit performance

Specially formulated thermoset resin system/filler

- Low TCDk
- 2.55 Dk & 3.0 Dk
- Ease of fabrication
- PTH process capability

Environmentally Friendly

- Lead-free process compatibility
- RoHS compliant

Some Typical Applications:

- Cellular Base Station Antennas

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Data Sheet

Property	Typical Value [1] RO4725JXR	Typical Value [1] RO4730G3	Direction	Units	Condition	Test Method
Dielectric Constant, ε_r Process	2.55 ± 0.05	3.00 ± 0.05	Z		10 GHz/23°C	IPC-TM-650, 2.5.5.5
Dielectric Constant, ε_r Design [3]	2.64	2.98	Z		1.7 GHz - 5 GHz	Differential Phase Length Method
Dissipation Factor [4]	0.0026	0.0028	Z		10 GHz/23°C	IPC-TM-650, 2.5.5.5
	0.0022				2.5GHz	
Thermal Coefficient of ε_r	+34	+34	Z	ppm/°C	-50°C to 150°C	IPC-TM-650, 2.5.5.5
Volume Resistivity (0.030")	2.16 X 10^8	9.0 X 10^7		MΩ•cm	COND A	IPC-TM-650, 2.5.17.1
Surface Resistivity (0.030")	4.8 X 10^7	7.2 X 10^5		MΩ	COND A	IPC-TM-650, 2.5.17.1
PIM [2]	-166	-165		dBc	50 ohm 0.060"	43dBm 1900MHz
Electrical Strength (0.030")	630	730	Z	V/mil		IPC-TM-650, 2.5.6.2
Flexural Strength MD	121 (17.5)	181 (26.3)		MPa (kpsi)	RT	ASTM D790
CMD	92 (13.3)	139 (20.2)				
Dimensional Stability	<0.4	<0.4	X,Y	mm/m	after etch +E2/150°C	IPC-TM-650, 2.4.39A
Coefficient of Thermal Expansion	13.9	15.9	X	ppm/°C	-55 TO 288°C	IPC-TM-650, 2.1.24
	19.0	14.4	Y			
	25.6	35.2	Z			
Thermal Conductivity	0.38	0.45	Z	W/mK°	50°C	ASTM D5470
Moisture Absorption	0.24%	0.093		%	48/50	IPC-TM-650 2.6.2.1 ASTM D570
Tg	>280	>280		°C		IPC-TM-650 2.4.24
Td	439	411		°C		ASTM D3850
Density	1.27	1.58		gm/cm^3		ASTM D792
Copper Peel Strength	8.5	4.1		pli	1 oz LoPro EDC	IPC-TM-650 2.4.8
Flammability	N/A	V-0				UL94
Lead-Free Process Compatible	YES	Yes				

NOTES:
[1] Typical values are a representation of an average value for the population of the property. For specification values contact Rogers Corporation..
[2] Using Rogers' internal test method on a 0.0607" laminate.
[3] 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.
[4] Using LoPro Reverse Treated EDC Foil

Standard Thicknesses		Standard Panel Sizes:	Standard Cladding
RO4725JXR LoPro	**RO4730G3 LoPro**	24" X 18" (610 X 457 mm)	Electrodeposited Copper Foil
0.0307" (0.780 mm) +/- 0.0020"	0.0057" (0.145mm) +/- 0.0007"	24" X 21" (610 X 533 mm)	½ oz (18µm) HH/HH
0.0607" (1.542 mm) +/- 0.0040"	0.0107" (0.272mm) +/- 0.0010"	24" X 36" (610 X 915 mm)	1 oz (35µm) H1/H1
	0.0207" (0.526mm) +/- 0.0015"	48" X 36" (1219 X 915 mm)	
RO4730G3	0.0307" (0.780mm) +/- 0.0020"		LoPro Reverse Treated Electrodeposited Copper Foil
0.0200" (0.508 mm) +/- 0.0015"	0.0607" (1.542mm) +/- 0.0040"	*Additional panel sizes available	½ oz (18µm) TH/TH
0.0300" (0.762 mm) +/- 0.0020"			1 oz (35µm) T1/T1
0.0600" (1.524 mm) +/- 0.0040"			

* Contact Customer Service or Sales Engineering to inquire about additional available product configurations

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.