

RO4360G2™ High Frequency Laminates



Features:	Benefits:
RO4000® thermoset resin system specially formulated to meet 6.15 Dk	<ul style="list-style-type: none"> • Ease of fabrication / processes similar to FR-4 • RO4000 material repeatability • Low loss • High thermal conductivity • Lower total PCB cost solution than competing PTFE products
Low Z-axis CTE / High Tg	<ul style="list-style-type: none"> • Design flexibility • Plated through-hole reliability • Automated assembly compatible
Environmentally friendly	<ul style="list-style-type: none"> • Lead free process compatible
Regional finished goods inventory	<ul style="list-style-type: none"> • Short lead times / quick inventory turns • Efficient supply chain
Typical Applications:	
<ul style="list-style-type: none"> • Base Station Power Amplifiers 	
<ul style="list-style-type: none"> • Small Cell Transceivers 	

RO4360G2™ laminates are 6.15 Dk, low loss, glass-reinforced, hydrocarbon ceramic-filled thermoset materials that provide the ideal balance of performance and processing ease. RO4360G2 laminates extend Rogers' portfolio of high performance materials by providing customers with a product that is lead-free process capable and offers better rigidity for improved processability in multi-layer board constructions, while reducing material and fabrication costs.

RO4360G2 laminates process similar to FR-4 and are automated assembly compatible. They have a low Z-axis CTE for design flexibility and have the same high Tg as all of the RO4000 product line. RO4360G2 laminates can be paired with RO4400™ prepreg and lower-Dk RO4000 laminate in multi-layer designs.

RO4360G2 laminates, with a Dk of 6.15 (Design Dk 6.4), allow designers to reduce circuit dimensions in applications where size and cost are critical. They are the best value choice for engineers working on designs including power amplifiers, patch antennas, ground-based radar, and other general RF applications.



Typical Values			RO4360G2 High Frequency Laminates		
Property	Typical Value [1]	Direction	Units	Condition	Test Method
Dielectric Constant, ϵ_r (Process Specification)	6.15 ± 0.15	Z		10 GHz/23°C	IPC-TM-650 2.5.5.5 (2) Clamped Stripline
				2.5 GHz/23°C	
[3] Dielectric Constant, ϵ_r (Recommend for use in circuit design)	6.4	Z		8 GHz - 40 GHz	Differential Phase Length Method
Dissipation Factor	0.0038	Z		10 GHz/23°C	IPC-TM-650, 2.5.5.5
	0.0030			2.5 GHz/23°C	
Thermal Conductivity	0.75		W/m/K	50°C	ASTM D-5470
Volume Resistivity	4.0 x 10 ¹³		Ω•cm	Elevated T	IPC-TM-650, 2.5.17.1
Surface Resistivity	9.0 x 10 ¹²		Ω	Elevated T	IPC-TM-650, 2.5.17.1
Electrical Strength	784	Z	V/mil		IPC-TM-650, 2.5.6.2
Tensile Modulus	17000 (2500)		MPa (kpsi)	40 hrs 50%RH/23°C	ASTM D638
Tensile Strength	131 (19)	X	MPa (kpsi)	40 hrs 50%RH/23°C	ASTM D638
	97 (14)	Y			
Flexural Strength	213 (31)	X	MPa (kpsi)	40 hrs 50%RH/23°C	IPC-TM-650, 2.4.4
	145 (21)	Y			
Dimensional Stability	0.1	X	mils/inch	N/A	IPC-TM-650, 2.4.39A
	0.3	Y			
Lead-Free Process Compatible	Yes		N/A	N/A	
Coefficient of Thermal Expansion	13	X	ppm/°C	-50°C to 288°C After Replicated Heat Cycle	IPC-TM-650, 2.1.41
	14	Y			
	28	Z			
Tg	>280		°C	N/A	ASTM D3850 using TMA
Td	407°C		°C	N/A	ASTM D3850 using TGA
T288	>30	Z	min	30 min / 125°C Prebake	IPC-TM-650 2.4.24.1
Moisture Absorption	0.08		%	50°C/48hr	IPC-TM-650 2.6.2.1 ASTM D570
Thermal Coefficient of ϵ_r	-131 @ 10 GHz	Z	ppm/°C	-50°C to 150°C	IPC-TM-650, 2.5.5.5
Density	2.16		gm/cm ³	RT	ASTM D792
[4] Copper Peel Strength	5.2 (0.91)		pli (N/mm)	Condition B	IPC-TM-650 2.4.8
Flammability	94V-0				UL94 File QMTS2.E102763

(1) Typical values are a representation of an average value for the population of the property. For specification values contact Rogers Corporation.

(2) Clamped stripline method can potentially lower the actual dielectric constant due to presence of airgap. Dielectric constant in practice may be higher than the value listed.

(3) 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. Refer to Rogers technical article "The Influence of Test Method, Conductor Profile, and Substrate Anisotropy on the Permittivity Values Required for Accurate Modeling of High Frequency Planar Circuits!" available on our website at www.rogerscorp.com/acm/technology.

(4) Results based on 1oz data

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.

Standard Thickness	Standard Panel Size:	Standard Copper Cladding
0.008" (0.203mm), 0.012" (0.305mm) 0.016" (0.406mm), 0.020" (0.508mm) 0.024" (0.610mm), 0.032" (0.813mm), 0.060" (1.524mm)	12" X 18" (305 X 457 mm) 24" X 18" (610 X 457 mm) 48" X 36" (1.224 m X 915 mm)	½ oz. (18µm), 1 oz. (35µm) and 2 oz. (70µm) electrodeposited copper foil

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.

These commodities, technology and software are exported from the United States in accordance with the Export Administration regulations. Diversion contrary to U.S. law prohibited. The world runs better with Rogers., the Rogers' logo, RO4400, RO4000 and RO4360G2 are licensed trademarks of Rogers Corporation.

© 2014 Rogers Corporation, Printed in U.S.A. All rights reserved. Revised 1093 082114 Publication #92-143