

RO3200™ Series High Frequency Circuit Materials

Features:

- Woven glass reinforcement improves rigidity for easier handling.
- Uniform electrical and mechanical performance is ideal for complex multilayer high frequency structures.
- Low dielectric loss for high frequency performance (RO3203) can be used in applications exceeding 20 GHz.
- Excellent mechanical properties over a wide range of dielectric constants are ideal for multilayer board designs.
- Low in-plane expansion coefficient (matched to copper) is suitable for use with epoxy glass multilayer board hybrid designs and reliable surface mounted assemblies.
- Excellent dimensional stability for high production yields.
- Economically priced for volume manufacturing.
- Surface smoothness allows for finer line etching tolerances.

Typical Applications:

- Automotive Collision Avoidance Systems
- Automotive Global Positioning Satellite Antennas
- Wireless Telecommunications Systems
- Microstrip Patch Antennas
- Direct Broadcast Satellites
- Datalink on Cable Systems
- Remote Meter Readers
- Power Backplanes
- LMDS and Wireless Broadband
- Base Station Infrastructure

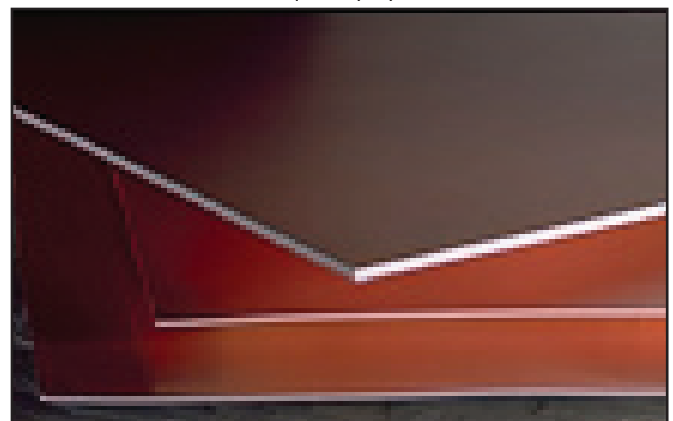
RO3203™, RO3206™ and RO3210™ High Frequency Circuit Materials are ceramic-filled laminates reinforced with woven fiberglass. These materials are engineered to offer exceptional electrical performance and mechanical stability at competitive prices. The RO3200™ Series High Frequency Materials were designed as an extension of the RO3000® Series High Frequency Circuit Materials with one distinguishing characteristic - **improved mechanical stability.**

The dielectric constant of RO3203 High Frequency Circuit Materials is 3.02. This, along with a dissipation factor of 0.0016, extends the useful frequency range beyond 40 GHz. The dielectric constant for RO3206 laminate is 6.15 and 10.2 for RO3210 laminate. The dissipation factor for RO3206 and RO3210 laminates is 0.0027

RO3200 series laminates combine the surface smoothness of a non-woven PTFE laminate, for finer line etching tolerances, with the rigidity of a woven-glass PTFE laminate. These materials can be fabricated into printed circuit boards using standard PTFE circuit board processing techniques as described in the application note, "Fabrication Guidelines for RO3000® Series High Frequency Circuit Materials."

Available cladding options are ½, 1 or 2 oz./ft² (17, 35, 70 µm thick) electrodeposited copper foil.

RO3200™ series laminates are manufactured under an ISO 9002 certified quality system.



The information in this data sheet is intended to assist you in designing with Rogers' circuit material laminates. 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 material laminates for each application.

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Typical Values

RO3200™ series High Frequency Laminates

PROPERTY	TYPICAL VALUE			DIRECTION	UNITS	CONDITION	TEST METHOD
	RO3203	RO3206	RO3210				
Dielectric Constant, ϵ_r	3.02±0.040 ⁽¹⁾	6.15±0.15	10.2±0.50	Z		10 GHz/23°C	IPC-TM-650, 2.5.5.5
Dissipation Factor, $\tan \delta$	0.0016	0.0027	0.0027	Z		10 GHz/23°C	IPC-TM-650, 2.5.5.5
Volume Resistivity	10 ⁷	10 ⁷	10 ⁴	Z	Mohm cm	A	ASTM D257
Surface Resistivity	10 ⁷	10 ⁷	10 ⁴	Z	Mohm	A	ASTM D257
Dimensional Stability	0.08	0.08	0.08	X,Y	mm/m +E2/150	after etch	IPC-TM-650, 2.4.3.9
Tensile Modulus		240 215	140 140	X Y	kpsi	RT	ASTM D638
Flexural Modulus	400 300	650 520	510 460	X Y	kpsi	A	ASTM D790
Tensile Strength	12.5 13	9 8	9 7	X Y	kpsi	RT	ASTM D638
Flexural Strength	9 8	14 13	12 10	X Y	kpsi	A	ASTM D790
Moisture Absorption	<0.1	<0.1	<0.1		%	D24/23	IPC-TM-650, 2.6.2.1
Thermal Conductivity	0.47 (3.2)	0.63 (4.4)	0.81 (5.5)		W/m/K	Float 100°C (BTU in/ft ² /hr/°F)	ASTM C518
Coefficient of Thermal Expansion	58 13	34 13	34 13	Z X,Y	ppm/°C	-55 to 288°C	ASTM D3386
Td	500	500	500			°C TGA	ASTM D 3850
Density	2.1	2.7	3.0			23°C	ASTM D792
Copper Peel Strength	10 (1.74)	7 (1.30)	13 (2.4)		lbs/in (N/mm)	After Solder	IPC-TM-650, 2.4.8
Flammability	94V-0	94V-0	94V-0				UL
Lead-Free Process Compatible	Yes	Yes	Yes				

(1) The nominal dielectric constant of an .060" thick RO3203™ laminate as measured by the IPC-TM-650, 2.5.5.5 will be 3.04, due to the elimination of biasing caused by gaps in the test fixture. For further information, refer to ROGERS T.R. 5242.

STANDARD THICKNESS:	STANDARD PANEL SIZE:	STANDARD COPPER CLADDING:
RO3203: 0.010" (0.254mm) 0.020" (0.508mm) 0.030" (0.762mm) 0.060" (1.524mm)	RO3206/RO3210: 0.025" (0.635mm) 0.050" (1.270mm)	18" X 12" (457 X 305mm) 18" X 24" (457 X 610mm) 18" X 36" (457 X 915mm) 18" X 48" (457 X 1.224m)
		½ oz. (17µm), 1 oz. (35µm), 2 oz. (70µm) electrodeposited copper foil.

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