ROGERS CORPORATION

\\\ Datasheet

RT/duroid® 6006
High Frequency Laminates

RT/duroid® 6006 microwave laminates are ceramic-PTFE composites designed for electronic and microwave circuit applications requiring a high dielectric constant. RT/duroid 6006 laminate is available with a dielectric constant value of 6.15.

RT/duroid 6006 microwave laminates feature ease of fabrication and stability in use. They have tight dielectric constant and thickness control, low moisture absorption, and good thermal mechanical stability.

RT/duroid 6006 laminates are supplied clad both sides with 1/2 oz. to 2 oz./ft2 (18 to 70 mm) standard and reverse treated electrodeposited copper foil. Thick aluminum, brass, or copper plate on one side may be specified.

Standard tolerance dielectric thicknesses of 0.010", 0.025", 0.050", 0.075", and 0.100" (0.254, 0.635, 1.270, 1.905, 2.54 mm) are available. When ordering RT/duroid 6006 laminates, it is important to specify dielectric thickness and weight of copper foil required.

\\\ Features and Benefits:

- High dielectric constant for circuit size reduction
- Low loss. Ideal for operating at X-band or below
- Tight εr and thickness control for repeatable circuit performance

\\\ Typical Applications:

- Patch Antennas
- Satellite Communications Systems
- Power Amplifiers
- Aircraft Collision Avoidance Systems
- Ground Radar Warning Systems

Standard Thicknesses	Standard Panel Sizes	Standard Claddings
0.025" (0.635mm) +/- 0.0015" 0.050" (1.270mm) +/- 0.0020" 0.075" (1.900mm) +/- 0.0030" *Additional non-standard thicknesses available from 0.005" - 0.200" in increments of 0.005"	10" X 10" (254mm X 254mm) 10" X 20" (254mm X 508mm) 18" X 12" (457mm X 305mm) *Additional panel sizes available	Electrodeposited Copper Foil ½ oz. (18µm) *HH/HH* 1 oz. (35µm) *H1/H1* *Additional claddings, such as heavy metal, resistive foil and unclad are available
*Contact Customer Service or Sales Engineering to inquire about additional available product configurations		

\\\ Standard Properties Table

PROPERTY	RT/duroid 6006	DIRECTION	UNITS	CONDITIONS	TEST METHOD
[2]Dielectric Constant ε_r Process	6.15± 0.15	Z		10 GHz 23°C	IPC-TM-650 2.5.5.5 Clamped stripline
[3]Dielectric Constant ε_r Design	6.45	Z		8 GHz - 40 GHz	Differential Phase Length Method
Dissipation Factor, tan δ	0.0027	Z		10 GHz/A	IPC-TM-650 2.5.5.5
Thermal Coefficient of ε_r	-410	Z	ppm/°C	-50 to 170°C	IPC-TM-650 2.5.5.5
Surface Resistivity	$7X10^7$		Mohm	A	IPC 2.5.17.1
Volume Resistivity	$2X10^7$		Mohm•cm	A	IPC 2.5.17.1
Tensile Properties					ASTM D638 (0.1/min. strain rate)
Young's Modulus	627 (91) 517 (75)	X Y	MPa (kpsi)	A	
ultimate stress	20 (2.8) 17 (2.5)	X Y	MPa (kpsi)	A	
ultimate strain	12 to 13 4 to 6	X Y	%	A	
Compressive Properties					ASTM D695 (0.05/min. strain rate)
Young's Modulus	1069 (155)	Z	MPa (kpsi)	A	
ultimate stress	54 (7.9)	Z	MPa (kpsi)	A	
ultimate strain	33	Z	%		
Flexural Modulus	2634 (382) 1951 (283)	X	MPa (kpsi)	A	ASTM D790
ultimate stress	38 (5.5)	X Y	MPa (kpsi)	A	
Deformation under load	0.33 2.10	Z Z	%	24 hr/ 50°C/ 7MPa 24 hr/ 150°C/ 7 MPa	ASTM D261
Moisture Absorption	0.05		%	D48/50°C, 0.050" (1.27mm) thick	IPC-TM-650, 2.6.2.1
Density	2.7		g/cm^3		ASTM D792
Thermal Conductivity	0.49		W/m/°K	80°C	ASTM C518
Coefficient of Thermal Expansion	47 34, 117	X Y,Z	ppm/°C	23°C/50% RH	IPC-TM-650 2.4.41
Td	500		°C TGA		ASTM D3850
Specific Heat	0.97 (0.231)		J/g/K (BTU/lb/°F)		Calculated
Copper Peel	14.3 (2.5)		pli (N/mm)	after solder float	IPC-TM-650 2.4.8
Flammability Rating	V-0				UL94
Lead-Free Process Compatible	Yes				

[1] SI unit given first with other frequently used units in parentheses.
[2] Dielectric constant is based on .025 dielectric thickness, one ounce electrodeposited copper on two sides.
[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. Refer to Rogers' technical paper "Dielectric Properties of High Frequency Materials" available at http://www.rogerscorp.com/acs.

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

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