Data Sheet

RT/duroid® 6002

High Frequency Laminates

RT/duroid® 6002 microwave material was the first low loss and low dielectric constant laminate to offer superior electrical and mechanical properties essential in designing complex microwave structures which are mechanically reliable and electrically stable.

The thermal coefficient of dielectric constant is extremely low from -55ºC to+150ºC (-67°F to 302°F) which provides the designers of filters, oscillators and delay lines the electrical stability needed in today's demanding applications.

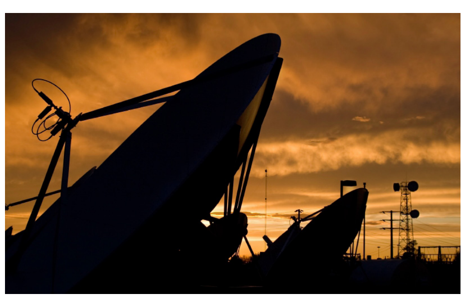
A low Z axis coefficient of thermal expansion (CTE) ensures excellent reliability of plated through-holes. RT/duroid 6002 materials have been successfully temperature cycled (-55ºC to 125ºC [-67°F to 257°F]) for over 5000 cycles without a single via failure.

Excellent dimensional stability (0.2 to 0.5 mils/inch) is achieved by matching the X and Y coefficient of expansion to copper. This often eliminates double etching to achieve tight positional tolerances.

The low tensile modulus (X,Y) greatly reduces the stress applied to solder joints and allows the expansion of the laminate to be constrained by a minimum amount of low CTE metal, (6 ppm/ºC) further increasing surface mount reliability.

½ oz. to 2 oz./ft.^{2} electrodeposited copper, ½ oz. to 1 oz. reverse treated electrodeposited copper or ½ oz. to 2 oz./ ft.^{2} rolled copper may be specified as cladding on dielectric thicknesses from 0.005" to 0.125" (0.13 to 3.18mm). RT/duroid 6002 laminate is also available clad with aluminum, brass, or copper plates and resistive foils.

Applications particularly suited to the unique properties of RT/duroid 6002 material include flat and non-planar structures such as antennas, complex multi-layer circuits with inter-layer connections, and microwave circuits for aerospace designs in hostile environments. RT/duroid 6002 laminates have Underwriters Laboratories recognition under classification 94V-0 (Vertical Flammability Test).



Features and Benefits

Low Loss
- Excellent high frequency performance

Excellent mechanical and electrical properties
- Reliable multi-layer board constructions

Extremely low thermal coefficient of dielectric constant
- Excellent dimensional stability

In-plane expansion coefficient matched to copper
- Allows for more reliable surface mounted assemblies
- Ideal for applications sensitive to temperature change
- Excellent dimensional stability

Low Z-axis expansion
- Reliable plated through-holes

Low outgassing
- Ideal for space applications

Some Typical Applications:
- Phased Array Antennas
- Ground Based and Airborne Radar Systems
- Global Positioning System Antennas
- Power Backplanes
- High Reliability Complex Multi-layer Circuits
- Commercial Airline Collision Avoidance
- Beam Forming Networks

ROGERS CORPORATION

Data Sheet

Property	Typical Value RT/duroid 6002	Direction	Units [1]	Conditions	Test Method
Dielectric Constant, ε_r Process	2.94 ± 0.04	Z	-	10GHz/23°C	IPC-TM-650, 2.5.5.5
[2]Dielectric Constant, ε_r Design	2.94			8GHz-40GHz	Differential Phase Length Method
Dissipation Factor, TAN δ	0.0012	Z	-	10 GHz/23°C	IPC-TM-650, 2.5.5.5
Thermal Coefficient of ε_r	+12	Z	ppm/°C	10 GHz 0-100°C	IPC-TM-650, 2.5.5.5
Volume Resistivity	10^6	Z	Mohm cm	A	ASTM D257
Surface Resistivity	10^7	Z	Mohm	A	ASTM D257
Tensile Modulus	828 (120)	X,Y	MPa (kpsi)	23°C	ASTM D638
Ultimate Stress	6.9 (1.0)	X,Y	MPa (kpsi)		
Ultimate Strain	7.3	X,Y	%		
Compressive Modulus	2482 (360)	Z	MPa (kpsi)		ASTM D638
Moisture Absorption	0.02	-	%	D48/50	IPC-TM-650, 2.6.2.1 ASTM D570
Thermal Conductivity	0.60	-	W/m/K	80°C	ASTM C518
Coefficient of Thermal Expansion (-55 to 288 °C)	16 16 24	X Y Z	ppm/°C	23°C/50% RH	IPC-TM-650 2.4.41
Td	500		°C TGA		ASTM D3850
Density	2.1		gm/cm3		ASTM D792
Specific Heat	0.93 (0.22)	-	J/g/K (BTU/lb/°F)	-	Calculated
Copper Peel	8.9 (1.6)		lbs/in (N/mm)		IPC-TM-650 2.4.8
Flammability	V-O				UL94
Lead-Free Process Compatible	YES				

NOTES:
Typical values are a representation of an average value of the population of the property. For specification values contact Rogers Corporation.
[1] S1 Units given first, with other frequently used units in parentheses.
[2] 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 or refer to Roger's technical reports on the Rogers Technology Support Hub at http://www.rogerscorp.com.

Standard Thickness	Standard Panel Size	Standard Copper Cladding
0.010" (0.254mm) 0.020" (0.508mm) 0.030" (0.762mm) 0.060" (1.524mm)	18" X 12" (457mm X 305mm) 18" X 24" (457mm X 610mm)	½ oz. (18µm) and 1oz (35µm) electrodeposited and rolled copper cladding Other claddings may be available. Contact customer service.

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