

XT/duroid® 8100

High Frequency Materials



XT/duroid® 8100 woven glass reinforced thermoplastic circuit materials provide an excellent solution for printed circuit board applications used in demanding environmental conditions.

XT/duroid 8100 circuit materials are excellent for high frequency/high speed applications. Both dielectric constant and dissipation factor are stable over a wide range of frequencies.

XT/duroid 8100 is thermally stable, with a melt temperature higher than PTFE materials. The XT/duroid products possess impressive chemical and radiation resistance. These lead-free solder capable laminates are green materials which are naturally flame retardant and halogen free.

Dielectric thickness of 0.002" (0.0508mm) and 0.004" (0.102mm) is available with ½ oz very low profile electrodeposited copper foil cladding.

Data Sheet

FEATURES AND BENEFITS:

Stable dielectric constant and dissipation factor over a wide frequency range

- High reliability
- Uniform electrical properties over frequency

High maximum operating temperature

- Can be used in applications where high temperature stability is necessary

Excellent chemical resistance

- Ease of processing
- Resistant to solvents and reagents used to process circuit boards
- Operates in harsh chemical environments

Environmentally friendly

- Halogen-free / inherently flame retardant
- Lead-free solder capable
- Low smoke / toxicity

SOME TYPICAL APPLICATIONS:

- Flex-to-install applications
- Lightweight feed manifolds
- Semiconductor burn-in
- Conformal circuitry
- Oil and gas exploration

PROPERTIES	TYPICAL VALUES XT/duroid 8100		DIRECTION	UNITS	CONDITIONS	TEST METHOD
	0.002" 0.0508mm	0.004" 0.102mm				
Dielectric Constant, ϵ_r Process	3.54 ± 0.05	3.32 ± 0.05	Z		10 GHz/23°C	IPC-TM-2.5.5.5.1
[2] Dielectric Constant, ϵ_r Design	3.54	3.32	Z		8 GHz - 40 GHz	Differential Phase Length Model
Dissipation Factor	0.0049	0.0038	Z		10 GHz/23°C	IPC-TM-650, 2.5.5.5.1
Thermal Coefficient of ϵ_r	9	9	Z	ppm/°C	-100°C to 250°C	IPC-TM-650, 2.5.5.5.1
Copper Peel Strength	6.2	6.3		pli (N/mm)		IPC-TM-650 2.4.8
Outgassing	TBD	TBD				ASTM E-595
T260	PASS	PASS				
T288	PASS	PASS				
Flammability*	VTM-0	VTM-0				UL94
Volume Resistivity		10 ¹⁰	Z	MΩ•cm	COND A	IPC-TM-650, 2.5.17.1
Surface Resistivity		10 ⁶	X, Y	MΩ	COND A	IPC-TM-650, 2.5.17.1
Dielectric Strength	2.58	2.27	Z	KV/mil		IPC-TM-650, 2.5.6.2
Young's Modulus	11543	7853		MPa (kpsi)	RT	ASTM D638
Tensile Strength	216	190		MPa (kpsi)	RT	ASTM D638
Dimensional Stability	0.03 0.037	-0.025 -0.01	X - MD Y - CMD	mm/m (mils/ inch)	150°C Bake	IPC-TM-650 2.4.39A
Coefficient of Thermal Expansion 0 - 150°C	16.5	19	X	ppm/°C		IPC-TM-650, 2.1.41
	18	21	Y			
	57	76	Z			
Thermal Conductivity	0.3	0.3		W/m/K		ASTM C518
Moisture Absorption	0.05 0.15	0.21 0.32		%	D24/23 D48/50	IPC-TM-650 2.6.2.1 ASTM D570
Tg	172	176		°C TMA		ASTM D3850
Lead-Free Process Compatible	YES	YES				
Halogen Free	YES	YES				

*Reported UL values are preliminary and reflect anticipated results of full UL testing.

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

[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. Refer to Rogers' technical paper "Dielectric Properties of High Frequency Materials" available at <http://www.rogerscorp.com>.

Standard Thicknesses	Panel Sizes	Copper Cladding
0.002" (0.0508mm) ± 12.5% 0.004" (0.102mm) ± 12.5%	12" X 18" (305 X 457mm) 24" X 18" (610 X 457mm) Other panel sizes and rolls are available.	½ oz. (18 mm) very low profile electrodeposited copper foil.

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Revised 1116 040715 Publication #92-155