ROGERS CORPORATION

Advanced Circuit Materials

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Data Sheet
XT/duroid 8100

XT/duroid® 8100 High Frequency Materials

Features:	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

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

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.

Property	TYPICAL VALUES [1] XT/duroid 8100		Direction	Units	Condition	Test Method
	0.002" 0.0508mm	0.004" 0.102mm				
Dielectric Constant, εr Process	3.54 ± 0.05	3.32 ± 0.05	Z		10 GHz/23°C	IPC-TM-2.5.5.5.1
[2] Dielectric Constant, εr Design	3.54	3.32	Z		8 GHz - 40 GHz	Differential Phase Length Method
Dissipation Factor	0.0049	0.0038	Z		10 GHz/23°C	IPC-TM-650, 2.5.5.5.1
Thermal Coefficient of εr	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/acm.

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. (18mm) very low profile 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.

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