High Frequency
Circuit Materials

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RT/duroid® 5880

Glass Microfiber Reinforced Polytetrafluoroethylene Composite

RT/duroid® 5880 glass microfiber reinforced PTFE composite is designed for exacting stripline and microstrip circuit applications.

Glass reinforcing microfibers are randomly oriented to maximize benefits of fiber reinforcement in the directions most valuable to circuit producers and in the final circuit application.

The dielectric constant of RT/duroid 5880 laminates is uniform from panel to panel and is constant over a wide frequency range. Its low dissipation factor extends the usefulness of RT/duroid 5880 to Ku-band and above.

RT/duroid 5880 laminate is easily cut, sheared and machined to shape. It has excellent dimensional stability and is resistant to all solvents and reagents, hot or cold, normally used in etching printed circuits or in plating edges and holes.

Normally supplied as a laminate with electrodeposited copper of 1/4 to 2 ounces/ ft.^{2}on both sides, RT/duroid 5880 composites can also be clad with rolled copper foil for more critical electrical applications. Cladding with aluminum, copper or brass plate may also be specified.

When ordering RT/duroid 5880 laminates, it is important to specify dielectric thickness, tolerance, rolled or electrodeposited copper foil, and weight of copper foil required.

(See reverse for product data)

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RT/duroid 5880 Properties:

PROPERTY	TYPICAL VALUE			DIRECTION	UNITS	CONDITION	TEST METHOD
Dielectric Constant, ε_r	2.20 2.20 ± 0.02 spec.			Z Z	 ---	C24/23/50 C24/23/50	1 MHz IPC-TM-650 2.5.5.3 10 GHz IPC-TM-650 2.5.5.5
Dissipation Factor, tan δ	0.0004 0.0009			Z Z	---	C24/23/50 C24/23/50	1 MHz IPC-TM-650 2.5.5.3 10 GHz IPC-TM-650 2.5.5.5
Volume Resistivity	2 X 10^7			Z	Mohm cm	C93/35/90	ASTM D257
Surface Resistivity	3 X 10^8			Z	Mohm	C93/35/90	ASTM D257
Tensile Modulus	Test at 23 C 1070 (156) 860 (125)	Test at 100 C 450 (65) 380 (55)		X Y	MPa (kpsi)	A	ASTM D638
ultimate stress	29 (4.2) 27 (3.9)	20 (2.9) 18 (2.6)		X Y	MPa (kpsi)		
ultimate strain	6.0 4.9	7.2 5.8		X Y	%		
Compressive Modulus	710 (103) 710 (103) 940 (136)	500 (73) 500 (73) 670 (97)		X Y Z	MPa (kpsi)	A	ASTM D695
ultimate stress	27(3.9) 52 (7.5)	22 (3.2) 21 (3.1) 43 (6.3)		X Y Z	MPa (kpsi)		
ultimate strain	8.5 7.7 12.5	8.4 7.8 17.6		X Y Z	%		
Deformation Under Load	Test at 150 C 1.0			Z	%	24 hr/14 MPa (2kpsi)	ASTM D621
Water Absorption Thickness = 0.8 mm (0.031) Thickness = 1.6 mm (0.062)	0.9 (0.02) 13 (0.015)				mg (%)	D24/23	ASTM D570
Specific Gravity	2.2						ASTM D792
Heat Distortion Temperature	>260 (>500)			X,Y	C (F)	1.82 MPa (264 psi)	ASTM D648
Specific Heat	0.96 (0.23)				J/g/K (BTU/lb/ F)		Calculated
Thermal Conductivity	0.20			Z	W/m/K		ASTM C518
Thermal Expansion	X	Y	Z	<<<	mm/m		ASTM D3386 (10K/min)
	-6.1	-8.7	-18.7			-100 C	
	-0.9	-1.8	-6.9			15	(Values given are total change from a base temperature of 35 C)
	-0.5	-0.9	-4.5			25	
	1.1	1.5	8.7			75	
	2.3	3.2	28.3			150	
	3.8	5.5	69.5			250	

[1] SI unit given first with other frequently used units in parentheses.
[2] References: Internal TR's 1430, 2224, 2854. Test were at 23°C unless otherwise noted. Typical values should not be used for specification limits.

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