

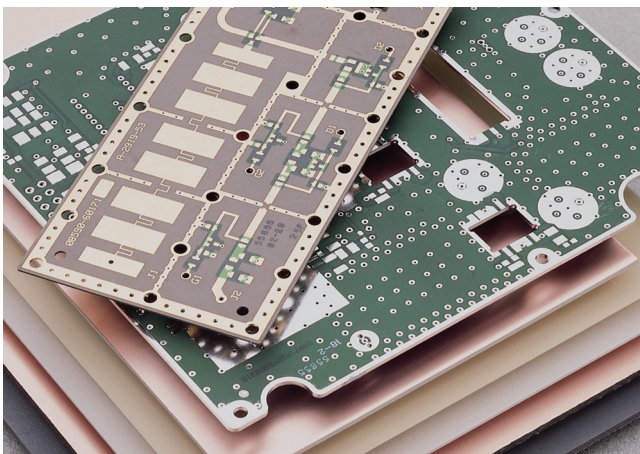
RT/duroid® 5870 /5880 High Frequency Laminates

Features:

- Lowest electrical loss for reinforced PTFE material.
- Low moisture absorption.
- Isotropic
- Uniform electrical properties over frequency.
- Excellent chemical resistance.

Some Typical Applications:

- Commercial Airline Telephones
- Microstrip and Stripline Circuits
- Millimeter Wave Applications
- Military Radar Systems
- Missile Guidance Systems
- Point to Point Digital Radio Antennas



RT/duroid® 5870 and 5880 glass microfiber reinforced PTFE composites are 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 5870 and 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 5870 and 5880 to Ku-band and above.

RT/duroid 5870 and 5880 laminates are easily cut, sheared and machined to shape. They are 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 $\frac{1}{4}$ to 2 ounces/ft.² (8 to 70 μ m) on both sides, RT/duroid 5870 and 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 5870 and 5880 laminates, it is important to specify dielectric thickness, tolerance, rolled or electrodeposited copper foil, and weight of copper foil required.

The information in this data sheet is intended to assist you in designing with Rogers' circuit material laminates. 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 material laminates for each application.

PROPERTY	TYPICAL VALUE				DIRECTION	UNITS	CONDITION	TEST METHOD	
	RT/duroid® 5870		RT/duroid 5880						
Dielectric Constant, ϵ_r	2.33		2.20		Z		C24/23/50	1 MHz IPC-TM-650, 2.5.5.3 10 GHz IPC-TM-2.5.5.5	
	2.33 ± 0.02 spec.		2.20 ± 0.02 spec.		Z		C24/23/50		
Dissipation Factor, $\tan \delta$	0.0005		0.0004		Z		C24/23/50	1 MHz IPC-TM-650, 2.5.5.3 10 GHz IPC-TM-2.5.5.5	
	0.0012		0.0009		Z		C24/23/50		
Thermal Coefficient of ϵ_r	-115		-125			ppm/°C	-50 - 150°C	IPC-TM-650, 2.5.5.5	
Volume Resistivity	2 X 10 ⁷		2 X 10 ⁷		Z	Mohm cm	C96/35/90	ASTM D257	
Surface Resistivity	2 X 10 ⁸		3 X 10 ⁷		Z	Mohm	C/96/35/90	ASTM D257	
Tensile Modulus	Test at 23°C	Test at 100°C	Test at 23°C	Test at 100°C		MPa (kpsi)	A	ASTM D638	
	1300 (189)	490 (71)	1070 (156)	450 (65)	X				
ultimate stress	50 (7.3)	34 (4.8)	29 (4.2)	20 (2.9)	X	MPa (kpsi)	A	ASTM D638	
	42 (6.1)	34 (4.8)	27 (3.9)	18 (2.6)	Y				
ultimate strain	9.8	8.7	6.0	7.2	X	%	A	ASTM D638	
	9.8	8.6	4.9	5.8	Y				
Compressive Modulus	1210 (176)	680 (99)	710 (103)	500 (73)	X	MPa (kpsi)	A	ASTM D695	
	1360 (198)	860 (125)	710 (103)	500 (73)	Y				
	803 (120)	520 (76)	940 (136)	670 (97)	Z				
ultimate stress	30 (4.4)	23 (3.4)	27 (3.9)	22 (3.2)	X	MPa (kpsi)	A	ASTM D695	
	37 (5.3)	25 (3.7)	29 (5.3)	21 (3.1)	Y				
	54 (7.8)	37 (5.3)	52 (7.5)	43 (6.3)	Z				
ultimate strain	4.0	4.3	8.5	8.4	X	%	A	ASTM D695	
	3.3	3.3	7.7	7.8	Y				
	8.7	8.5	12.5	17.6	Z				
Deformation Under Load, Test at 150°C	1.0				Z	%	24hr/14 MPa (2 Kpsi)	ASTM D621	
Heat Distortion Temperature	>260 (>500)		>260 (>500)		X,Y	°C (°F)	1.82 MPa (264 psi)	ASTM D648	
Specific Heat	0.96 (0.23)		0.96 (0.23)			J/g/K		Calculated	
Moisture Absorption	Thickness 0.31" (0.8mm)	0.9 (0.02)		0.9 (0.02)		mg (%)	D24/23	ASTM D570	
	0.62" (1.6mm)	13 (0.015)		13 (0.015)					
Thermal Conductivity	0.22		0.20		Z	W/m/K		ASTM C518	
Thermal Expansion	X	Y	Z	X	Y	Z	mm/m	ASTM D3386 (10K/min) (Values given are total change from a base temperature of 35°C)	
	-5.0	-5.5	-11.6	-6.1	-8.7	-18.7			-100°C
	-0.6	-0.9	-4.0	-0.9	-1.8	-6.9			15
	-0.3	-0.4	-2.6	-0.5	-0.9	-4.5			25
	0.7	0.9	7.5	1.1	1.5	8.7			75
	1.8	2.2	22.0	2.3	3.2	28.3			150
	3.4	4.0	58.9	3.8	5.5	69.5			250
Td	500		500			°C TGA		ASTM D3850	
Density	2.2		2.2					ASTM D792	
Copper Peel	20.8 (3.7)		22.8 (4.0)			pli (N/mm)	after solder float	IPC-TM-650 2.4.8	
Flammability	94V-0		94V-0					UL	
Lead-Free Process Compatible	Yes		Yes						

[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.

STANDARD THICKNESS:	STANDARD PANEL SIZE:	STANDARD COPPER CLADDING:
0.005" (0.127mm), 0.031" (0.787mm)	18" X 12" (457 X 305mm)	¼ oz. (8 µm) electrodeposited copper foil.
0.010" (0.254mm), 0.062" (1.575mm)	18" X 24" (457 X 610mm)	½ oz. (17µm), 1 oz. (35µm), 2 oz. (70µm) electrodeposited and rolled copper foil.
0.015" (0.381mm), 0.125" (3.175mm)	18" X 36" (457 X 915mm)	
0.020" (0.508mm),	18" X 48" (457 X 1.224m)	

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