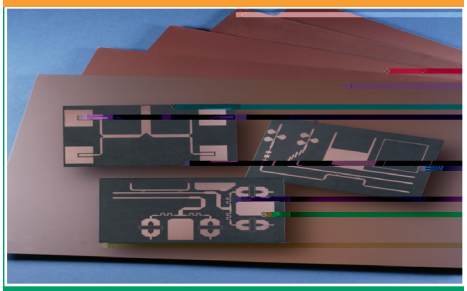
ROGERS CORPORATION

Data Sheet



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

Advanced Connectivity Solutions
100 S. Roosevelt Avenue, Chandler, AZ 85226
Tel: 480-961-1382 Fax: 480-961-4533 www.rogerscorp.com

PROPERTY	TYPICAL VALUES RT/duroid 5870		TYPICAL VALUES RT/duroid 5880		DIRECTION	UNITS[3]	CONDITION	TEST METHOD
[1]Dielectric Constant, ε_r Process	2.33 2.33 ± 0.02 spec.		2.20 2.20 ± 0.02 spec.		Z Z	N/A	C24/23/50 C24/23/50	1 MHz IPC-TM-650 2.5.5.3 10 GHz IPC-TM 2.5.5.5
[4]Dielectric Constant, ε_r Design	2.33		2.20		Z	N/A	8 GHz - 40 GHz	Differential Phase Length Method
Dissipation Factor, tan δ	0.0005 0.0012		0.0004 0.0009		Z Z	N/A	C24/23/50 C24/23/50	1 MHz IPC-TM-650, 2.5.5.3 10 GHz IPC-TM-2.5.5.5
Thermal Coefficient of ε_r	-115		-125		Z	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 10^7		3 X 10^7		Z	Mohm	C/96/35/90	ASTM D257
Specific Heat	0.96 (0.23)		0.96 (0.23)		N/A	J/g/K (cal/g/C)	N/A	Calculated
Tensile Modulus	Test at 23 °C	Test at 100 °C	Test at 23 °C	Test at 100 °C	N/A	MPa (kpsi)	A	ASTM D638
	1300 (189)	490 (71)	1070 (156)	450 (65)	X			
	1280 (185)	430 (63)	860 (125)	380 (55)	Y			
ultimate stress	50 (7.3)	34 (4.8)	29 (4.2)	20 (2.9)	X			
	42 (6.1)	34 (4.8)	27 (3.9)	18 (2.6)	Y			
ultimate strain	9.8	8.7	6.0	7.2	X	%		
	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			
	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	%		
	3.3	3.3	7.7	7.8	Y			
	8.7	8.5	12.5	17.6	Z			
Moisture Absorption	0.02		0.02		N/A	%	.062" (1.6mm) D48/50	ASTM D570
Thermal Conductivity	0.22		0.20		Z	W/m/K	80°C	ASTM C518
Coefficient of Thermal Expansion	22 28 173		31 48 237		X Y Z	ppm/°C	0-100°C	IPC-TM-650, 2.4.41
Td	500		500		N/A	°C TGA	N/A	ASTM D3850
Density	2.2		2.2		N/A	gm/cm^3	N/A	ASTM D792
Copper Peel	27.2 (4.8)		31.2 (5.5)		N/A	pli (N/mm)	1 oz (35mm) EDC foil after solder float	IPC-TM-650 2.4.8
Flammability	V-0		V-0		N/A	N/A	N/A	UL94
Lead-Free Process Compatible	Yes		Yes		N/A	N/A	N/A	N/A

[1] Specification values are measured per IPC-TM-650, method 2.5.5.5 @ ~10GHz, 23°C. Testing based on 1 oz. electrodeposited copper foil. ε_r values and tolerance reported by IPC-TM-650 method 2.5.5.5 are the basis for quality acceptance, but for some products these values may be incorrect for design purposes, especially microstrip designs. We recommend that prototype boards for new designs be verified for desired electrical performance.
[2] Typical values should not be used for specification limits, except where noted.
[3] SI unit given first with other frequently used units in parentheses.
[4] 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 Thickness	Standard Panel Size	Standard Copper Cladding	Non-Standard Copper Cladding
0.005" (0.127mm) 0.031" (0.787mm) 0.010" (0.254mm) 0.062" (1.575mm) 0.015" (0.381mm) 0.020" (0.508mm) Non-standard thicknesses are available	18" X 12" (457 X 305mm) 18" X 24" (457 X 610mm) Non-standard sizes may be available up to 18" X 48" (457 X 1219 mm)	½ oz. (18µm) and 1 oz. (35µm) electrodeposited and rolled copper foil	¼ oz. (9 µm) electrodeposited copper foil ½ oz. (18µm), 1 oz. (35µm) and 2 oz. (70µm) reverse treat copper foil 2 oz. (70µm) electrodeposited and rolled copper foil
		Thick metal claddings may be available based on dielectric and plate thickness. Contact customer service for more information on available non-standard and custom thicknesses, claddings and panel sizes	

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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