

Property	Typical Value		Direction	Units	Condition	Test Method
	RO4003C	RO4350B				
Dielectric Constant, $\epsilon_r$ Process	3.38 ± 0.05	<sup>(1)</sup> 3.48 ± 0.05	Z	--	10 GHz/23°C	IPC-TM-650 2.5.5.5 Clamped Stripline
<sup>(2)</sup> Dielectric Constant, $\epsilon_r$ Design	3.55	3.66	Z	--	8 to 40 GHz	Differential Phase Length Method
Dissipation Factor tan, $\delta$	0.0027 0.0021	0.0037 0.0031	Z	--	10 GHz/23°C 2.5 GHz/23°C	IPC-TM-650 2.5.5.5
Thermal Coefficient of $\epsilon_r$	+40	+50	Z	ppm/°C	-50°C to 150°C	IPC-TM-650 2.5.5.5
Volume Resistivity	1.7 X 10 <sup>10</sup>	1.2 X 10 <sup>10</sup>		MΩ•cm	COND A	IPC-TM-650 2.5.17.1
Surface Resistivity	4.2 X 10 <sup>9</sup>	5.7 X 10 <sup>9</sup>		MΩ	COND A	IPC-TM-650 2.5.17.1
Electrical Strength	31.2 (780)	31.2 (780)	Z	KV/mm (V/mil)	0.51mm (0.020")	IPC-TM-650 2.5.6.2
Tensile Modulus	19,650 (2,850) 19,450 (2,821)	16,767 (2,432) 14,153, (2,053)	X Y	MPa (ksi)	RT	ASTM D638
Tensile Strength	139 (20.2) 100 (14.5)	203 (29.5) 130 (18.9)	X Y	MPa (ksi)	RT	ASTM D638
Flexural Strength	276 (40)	255 (37)		MPa (kpsi)		IPC-TM-650 2.4.4
Dimensional Stability	<0.3	<0.5	X,Y	mm/m (mils/inch)	after etch +E2/150°C	IPC-TM-650 2.4.39A
Coefficient of Thermal Expansion	11 14 46	10 12 32	X Y Z	ppm/°C	-55 to 288°C	IPC-TM-650 2.4.41
Tg	>280	>280		°C TMA	A	IPC-TM-650 2.4.24.3
Td	425	390		°C TGA		ASTM D3850
Thermal Conductivity	0.71	0.69		W/m/°K	80°C	ASTM C518
Moisture Absorption	0.06	0.06		%	48 hrs immersion 0.060" sample Temperature 50°C	ASTM D570
Density	1.79	1.86		gm/cm <sup>3</sup>	23°C	ASTM D792
Copper Peel Strength	1.05 (6.0)	0.88 (5.0)		N/mm (pli)	after solder float 1 oz. EDC Foil	IPC-TM-650 2.4.8
Flammability	N/A	<sup>(3)</sup> V-0				UL 94
Lead-Free Process Compatible	Yes	Yes				

Standard Thickness	Standard Panel Size	Standard Copper Cladding
RO4003C: 0.008" (0.203mm), 0.012 (0.305mm), 0.016"(0.406mm), 0.020" (0.508mm) 0.032" (0.813mm), 0.060" (1.524mm)	12" X 18" (305 X457 mm) 24" X 18" (610 X 457 mm) 24" X 36" (610 X 915 mm) 48" X 36" (1.224 m X 915 mm)	½ oz. (17µm) electrodeposited copper foil (.5ED/.5ED)
		1 oz. (35µm) electrodeposited copper foil (1ED/1ED)
		2 oz. (70µm) electrodeposited copper foil (2ED/2ED)
		<b>PIM Sensitive Applications:</b>
		½ oz (17µm) LoPro Reverse Treated EDC (.5TC/.5TC)
		1 oz (35µm) LoPro Reverse Treated EDC (1TC/1TC)
RO4350B: *0.004" (0.101mm), 0.0066" (0.168mm) 0.010" (0.254mm), 0.0133" (0.338mm), 0.0166" (0.422mm), 0.020"(0.508mm), 0.030" (0.762mm), 0.060"(1.524mm)	*0.004" (0.101mm) material is not available in panel sizes larger than 24"x18" (610 X 457mm)	
Note: Material clad with LoPro foil add 0.0007" (0.018mm) to dielectric thickness		

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