

Data Sheet



AD Series™ Antenna Materials

AD250C™, AD255C™, AD260A™, AD300D™, AD320A™, an AD350A™ Laminate Materials

The AD Series™ antenna materials from Rogers Corporation are high performance, specialty materials that are specifically engineered an man fact re to meet the eman s of to ay's wireless antenna markets. Increase antenna performance req irements are a constant tren in the market to ay. Rogers has the materials nee e to meet the esign nee s of this market both to ay an into the f t re.

The AD Series antenna pro cts are glass-reinforce , PTFE base materials that provi e controlle ielectri constant, low loss performance, an very goo passive intermo lation (PIM) performance. The woven glass reinforcement affor s goo cir it processability an enables high yiel cir it boar fabrication.

The AD Series antenna pro cts are man fact re to meet the wi e variety of ielectri constant options that are nee e for to ay's antenna req irements. Dielectri constant options are availa le at 2.50, 2.55, 2.60, 3.00, 3.20, an 3.50 with a typical tolerance of ±0.05. The variety of options an tight control help to ena le the cir it to meet the esire impe ance every time.

All AD Series antenna pro cts are man fact re with stan ar electro eposite (ED) an reverse treate ED copper foil options. This provi es choices that are s ffient to help re ce both cir it losses an antenna PIM. Typical PIM val es sing reverse treate ED copper foil are -159 Bc at 30 mil thickness an -163 Bc at 60 mil thickness. These are typical val es o taine sing the extensive PIM testing capa ility at Rogers at 1900 MHz sing a two tone, reflecte metho on a 50Ω microstrip test vehicle.

A itionally, the AD Series antenna pro cts are pro ce in a wi e variety of thicknesses. Some pro cts s ch as the AD250™ laminate are availa le from 10 mils thro gh 250 mils. Others are more selective an offer fewer options. Please cons lt with yo r sales engineer or c stomer service representative for assistance in selecting the material options that are s ita le for yo r application.

Lastly, as PTFE base composites, the AD Series antenna materials have very low loss (typically less than 0.002 at 10 GHz), very low moist re a sorption (less than 0.1%), an very high copper peel strength (greater than 10 pli).

These feat res com ine together make the AD Series laminates an i eal choice for antenna applications.

FEATURES AND BENEFITS:

Low loss tangent (<0.002 at 10 GHz)
- Excellent cir it performance in all typical wireless freq en y an s

Controlle ielectri constant (±0.05)
- Repeata le cir it performance

Very low PIM (-159 Bc at 30 mil, 1900 MHz)
- Excellent antenna performance an re ce yiel loss e to PIM relate iss es

Excellent imensional sta ility
- Repeata le cir it performance an improve man fact ring yiel s

TYPICAL APPLICATIONS:

- Cell lar infrastr ct re base station antenna
- A tomotive telematics antenna systems
- Commercial satellite ra io antenna

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Electrical Properties[1]	AD250C	AD255C	AD260A	Units	Test Conditions		Test Method
PIM (30mil/60mil)[2]	-159/-163	-159/-163	-159/-163	Bc	Reflecte 43 Bm swept tones at 1900 MHz, S1/S1		Rogers Internal 50 ohm
Dielectric Constant (process)	2.52	2.55	2.60	-	23°C @ 50% RH	10 GHz	IPC TM-650 2.5.5.5 (IPC TM-650 2.5.5.3)
Dielectric Constant (esign)	2.50	2.60	2.65	-	C-24/23/50	10 GHz	Microstrip Differential Phase Length
Dissipation Factor (process)	0.0013	0.0013	0.0017	-	23°C @ 50% RH	10 GHz	IPC TM-650 2.5.5.5
Thermal Coefficient of Dielectric Constant	-117	-110	-148	ppm/°C	0°C to 100°C	10 GHz	IPC TM-650 2.5.5.5
Vol me Resistivity	4.8 x 10^8	7.4 x 10^8	1.1 x 10^9	Mohm-cm	C-96/35/90	-	IPC TM-650 2.5.17.1
S rface Resistivity	4.1 x 10^7	3.6 x 10^7	5.3 x 10^7	Mohm	C-96/35/90	-	IPC TM-650 2.5.17.1
Electrical Strength (ielectric strength)	979	911	1072	V/mil	-	-	IPC TM-650 2.5.6.2
Dielectric Break own	>40	>40	>40	kV	D-48/50	X/Y irection	IPC TM-650 2.5.6
Thermal Properties[1]							
Decomposition Temperat re (T)	>500	>500	>500	°C	2hrs @ 105°C	5% Weight Loss	IPC TM-650 2.3.40
Coefficient of Thermal Expansion - x	47	34	46	ppm/°C	-	-55°C to 288°C	IPC TM-650 2.4.41
Coefficient of Thermal Expansion - y	29	26	73	ppm/°C	-	-55°C to 288°C	IPC TM-650 2.4.41
Coefficient of Thermal Expansion - z	196	196	250	ppm/°C	-	-55°C to 288°C	IPC TM-650 2.4.41
Thermal Con ctivity	0.33	0.35	0.34	W/mK	-	z irection	ASTM D5470
Time to Delamination	>60	>60	>60	min tes	as-received	288°C	IPC TM-650 2.4.24.1
Mechanical Properties[1]							
Copper Peel Strength after Thermal Stress	2.6 (14.8)	2.4 (13.6)	2.5 (14.3)	N/mm (l s/in)	10s @288°C	35 µm foil	IPC TM-650 2.4.8
Flex ral Strength (MD/CMD)	8.8/6.4 (60.7/44.1)	8.8/6.4 (60.7/44.1)	11.8/10.2 (81.4/70.3)	MPa (ksi)	25°C ± 3°C	-	ASTM D790
Tensile Strength (MD/CMD)	6.0/5.6 (41.4/38.6)	8.1/6.6 (55.8/45.5)	15.0/13.0 (103.4/89.6)	MPa (ksi)	23°C/50% RH	-	ASTM D3039/D3039-14
Flex Mo l s (MD/CMD)	885/778 (6,102/5,364)	930/818 (6,412/5,640)	1,071/1,074 (7,384/7,405)	MPa (ksi)	25°C ± 3°C	-	IPC-TM-650 Test Metho 2.4.4
Dimensional Sta ility (MD/CMD)	0.02/0.06	0.03/0.07	0.16/0.20	mils/inch	after etch + bake	-	IPC-TM-650 2.4.39a
Physical Properties[1]							
Flamma ility	V-0						