

Specification No. PS-CWC-0049	Description Antenna, External Multi-band (MS_Omni)		
Customer Microsoft	Date 2004-11-05	Rev A	Reference

Specification for Centurion External Multi-band Antenna
For Microsoft Omni
Reference Part Number MAF94081
Customer P/N : **XXXXXXXXXXXX(TBD)**



Specification is subject to change without notice

A	5 Nov 04	Initial	EL Kua	CS Por	KC Lim
Rev.	Issue Date	Changes	Initiator	Approval	Approval

Specification No. PS-CWC-0049	Description Antenna, External Multi-band (MS_Omni)		
Customer Microsoft	Date 2004-11-05	Rev A	Reference

Print MAF94081

Specification Summary

Electrical Specification

Frequency : 2.4-2.5 GHz, 4.9 - 6 GHz

VSWR : < 2.0:1 across both bands

Gain : > 0 dBi (peak) in all bands

Omni-directional pattern in Azimuth (Free Space)

Mechanical Specification

Elbow cycle: 180 degrees movement, 500x, acceptance criteria is antenna remains in 0, 90, 180 position attached to the Omni module after cycling

Drop : 6x at 1 meter onto hard floor attached to Omni module only, 1x on each axis

Temperature : Operating temp 0 to 50 C
Storage temp -40 to 70 C

Specification No. PS-CWC-0049	Description Antenna, External Multi-band (MS_Omni)		
Customer Microsoft	Date 2004-11-05	Rev A	Reference

Electrical Performance

The antenna is a center feed modified half-wavelength dipole fed with 1.13mm coaxial cable. Performance is as given here:

General Information			
Customer:		Microsoft	
Date:		3 Nov 2004	
Frequency Bands:		2400-2500 MHz, 4900 – 5875 MHz	
Antenna Type:		External	
Input Connection:		Coaxial terminated with IPEX MHF connector	
Prepared by:	CS Por		G:\\CHAMBER\\ANTSPEC\\CWC0049_MS-Omni\\Specification MAF94081 (3 Nov 2004).doc
Comments:			

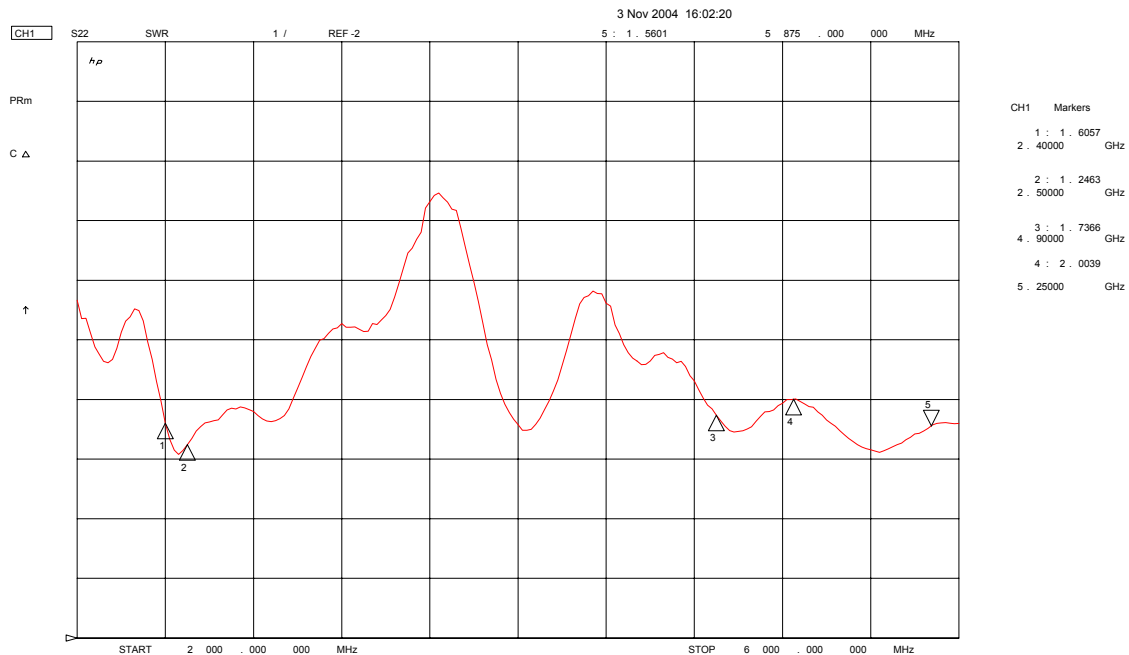
Electrical Performance Summary: VSWR				
Specification	< 2:1			
Measurement Configuration	Data			
Antenna measured as is without device	Freq. (MHz)	VSWR	Freq. (MHz)	VSWR
	2400	1.61		
	2500	1.25		
	4900	1.74		
	5250	2.00		
	5875	1.56		

Electrical Performance Summary: Peak Gain, Azimuth				
Specification	As measured nominal performance			
Measurement Configuration	Data			
Antenna measured as is without device	Freq. (MHz)	Peak Gain (dBi)	Freq. (MHz)	Peak Gain (dBi)
	2400	1.6	5150	4.0
	2450	2.0	5250	4.0
	2500	0.9	5350	4.4
	4900	3.8	5750	3.9
	5000	4.5	5875	4.6

Specification No. PS-CWC-0049	Description Antenna, External Multi-band (MS_Omni)		
Customer Microsoft	Date 2004-11-05	Rev A	Reference

--	--	--	--	--

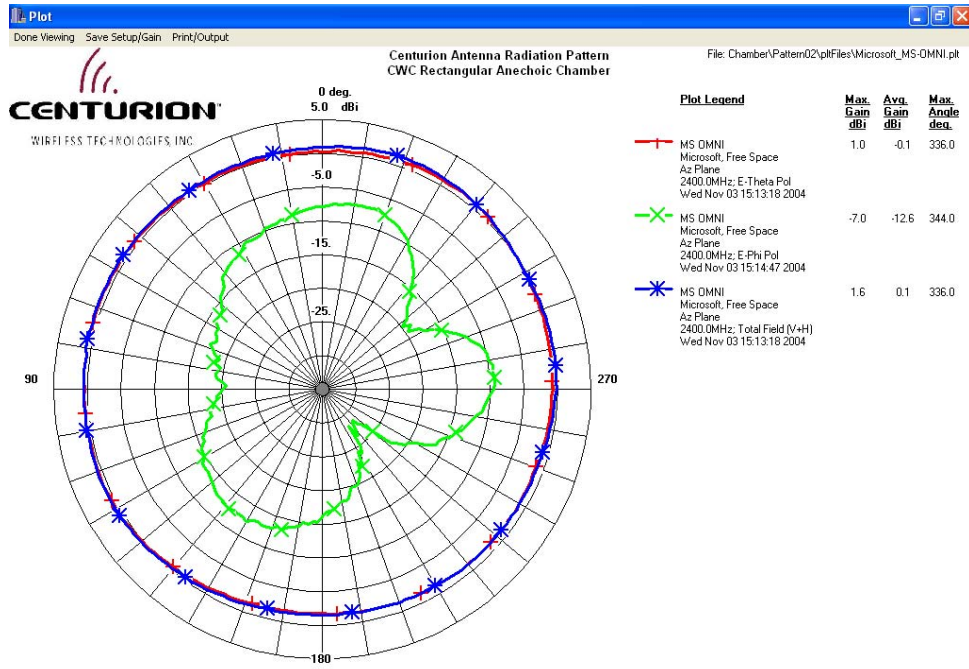
Electrical Performance Summary: Average Gain, Azimuth				
Specification	As measured nominal performance			
Measurement Configuration	Data			
Antenna measured as is without device	Freq. (MHz)	Ave Gain (dBi)	Freq. (MHz)	Ave Gain (dBi)
	2400	0.1	5150	1.3
	2450	1.3	5250	1.3
	2500	0.3	5350	1.5
	4900	1.2	5750	0.9
	5000	1.8	5875	1.5



VSWR data

Specification No. PS-CWC-0049	Description Antenna, External Multi-band (MS_Omni)		
Customer Microsoft	Date 2004-11-05	Rev A	Reference

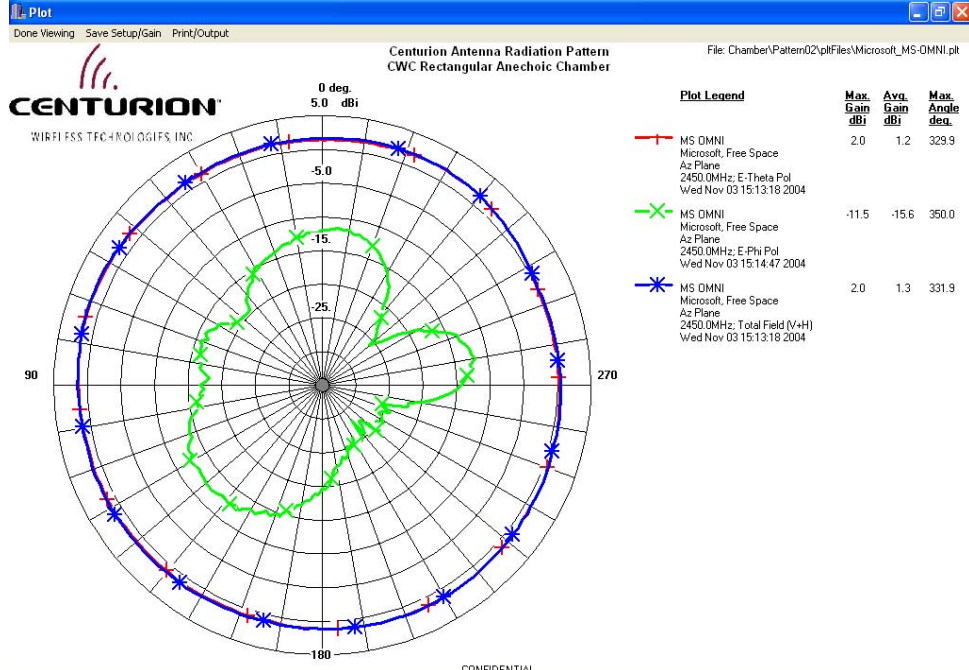
Gain Plots



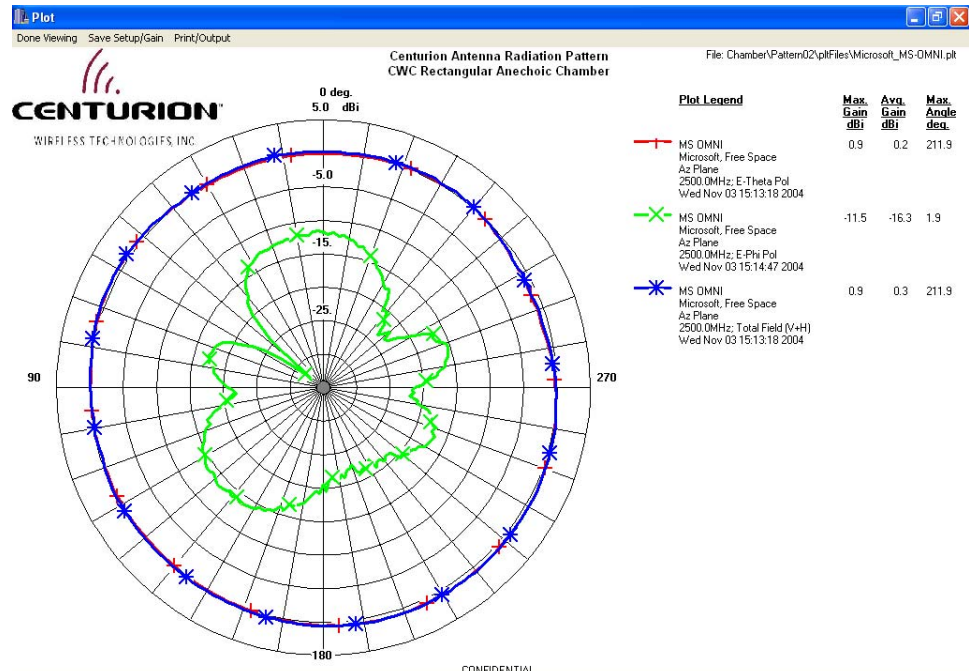
CONFIDENTIAL

THE INFORMATION CONTAINED IN THIS DOCUMENT IS OF A PROPRIETARY NATURE AND IS INTENDED TO BE KEPT CONFIDENTIAL BETWEEN THE SENDER AND THE INTENDED RECIPIENT. IT MAY NOT BE REPRODUCED OR USED WITHOUT EXPRESS WRITTEN PERMISSION OF CENTURION WIRELESS TECHNOLOGIES, INC., LINCOLN, NEBRASKA, USA.

Specification No. PS-CWC-0049	Description Antenna, External Multi-band (MS_Omni)		
Customer Microsoft	Date 2004-11-05	Rev A	Reference

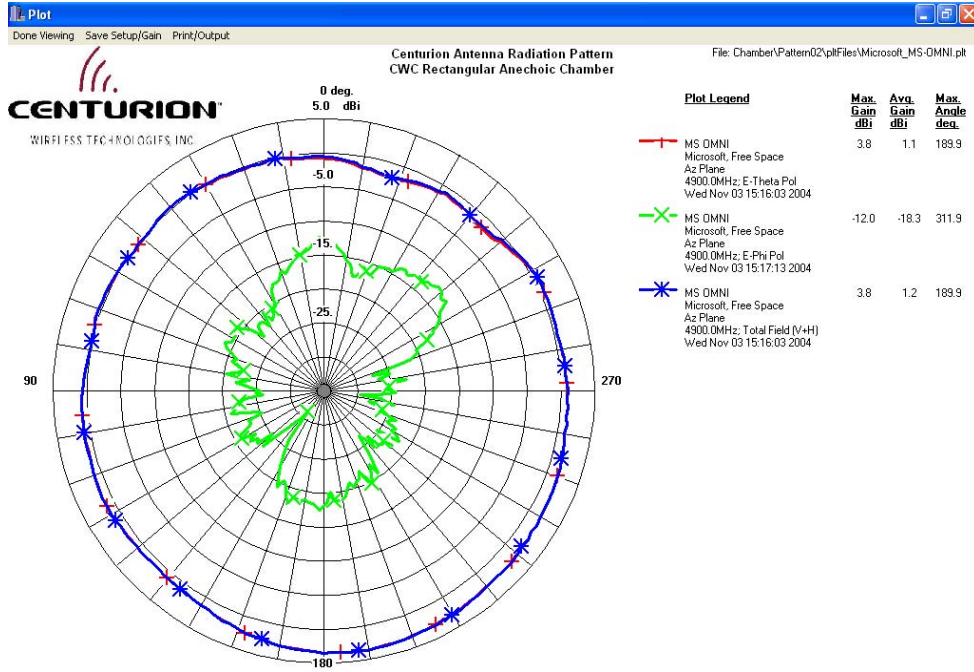


THE INFORMATION CONTAINED IN THIS DOCUMENT IS OF A PROPRIETARY NATURE AND IS INTENDED TO BE KEPT CONFIDENTIAL BETWEEN THE SENDER AND THE INTENDED RECIPIENT. IT MAY NOT BE REPRODUCED OR USED WITHOUT EXPRESS WRITTEN PERMISSION OF CENTURION WIRELESS TECHNOLOGIES, INC., LINCOLN, NEBRASKA, USA.



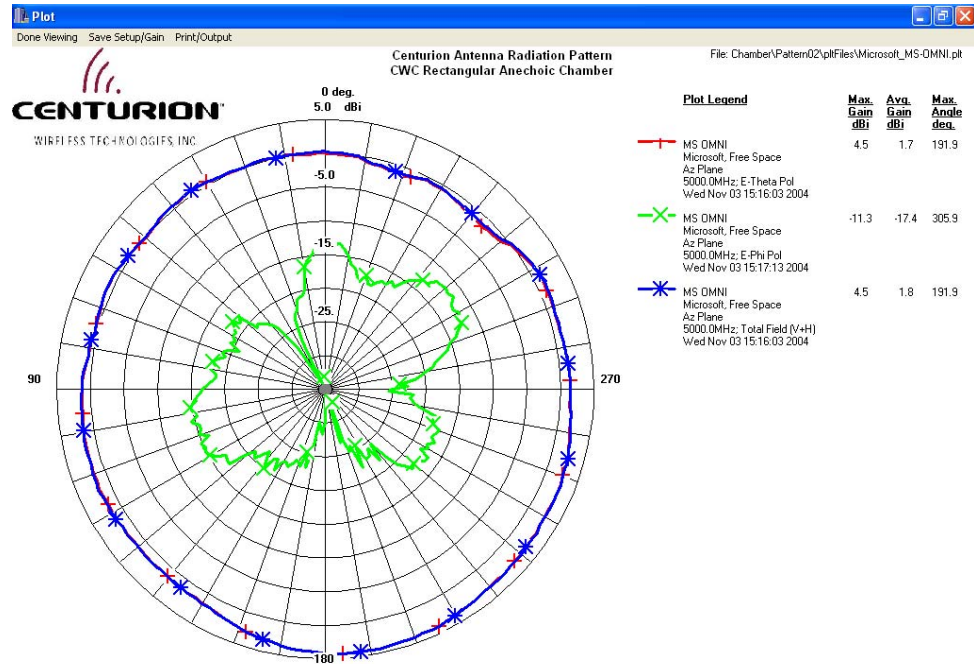
THE INFORMATION CONTAINED IN THIS DOCUMENT IS OF A PROPRIETARY NATURE AND IS INTENDED TO BE KEPT CONFIDENTIAL BETWEEN THE SENDER AND THE INTENDED RECIPIENT. IT MAY NOT BE REPRODUCED OR USED WITHOUT EXPRESS WRITTEN PERMISSION OF CENTURION WIRELESS TECHNOLOGIES, INC., LINCOLN, NEBRASKA, USA.

Specification No. PS-CWC-0049	Description Antenna, External Multi-band (MS_Omni)		
Customer Microsoft	Date 2004-11-05	Rev A	Reference



CONFIDENTIAL

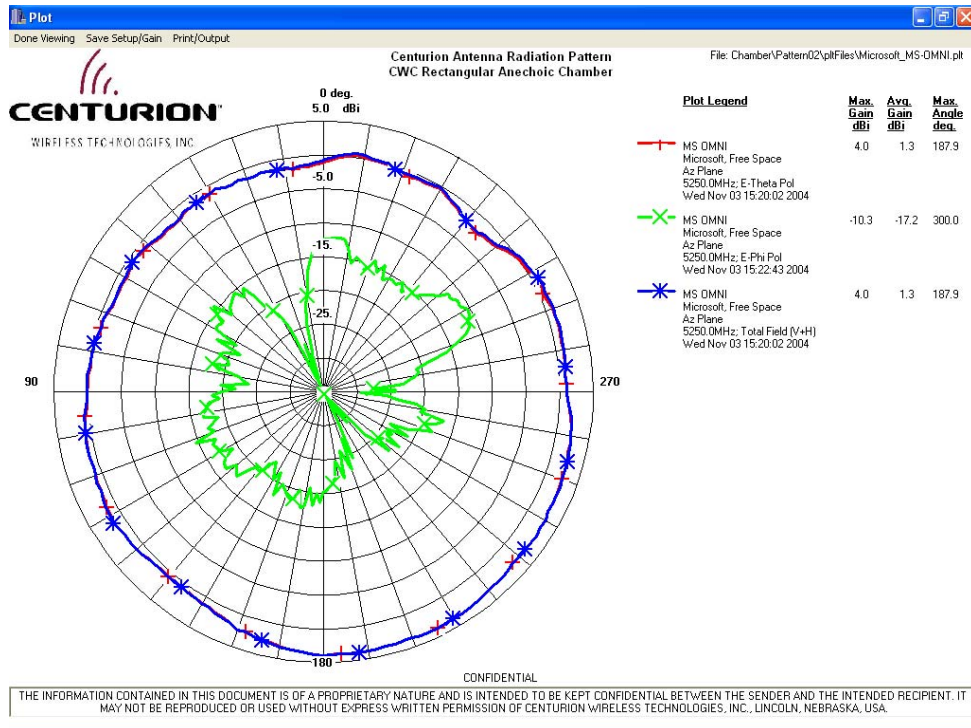
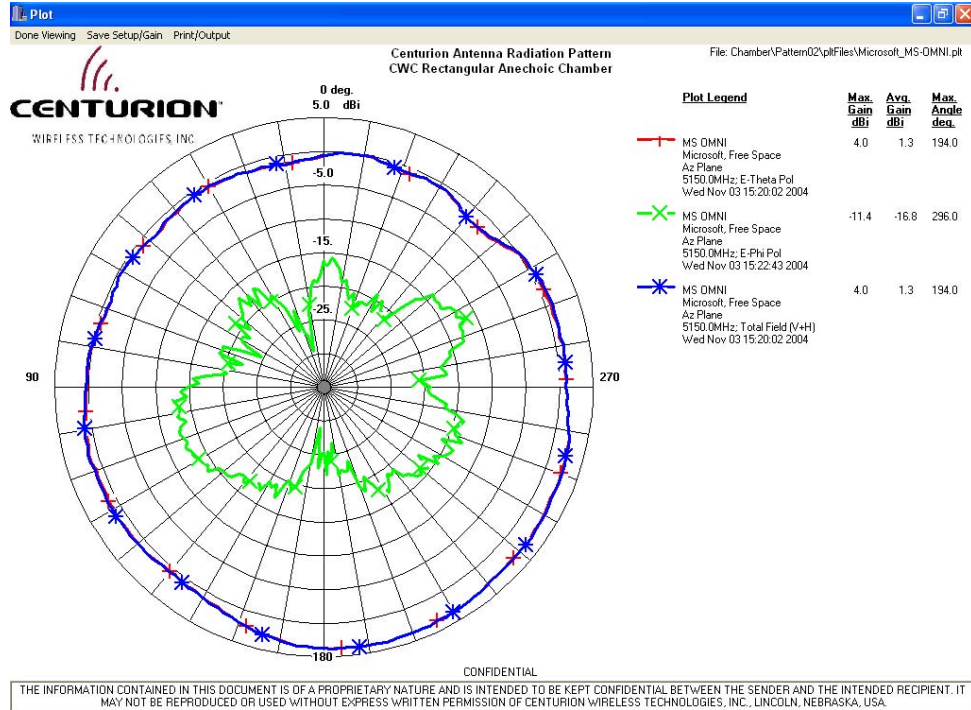
THE INFORMATION CONTAINED IN THIS DOCUMENT IS OF A PROPRIETARY NATURE AND IS INTENDED TO BE KEPT CONFIDENTIAL BETWEEN THE SENDER AND THE INTENDED RECIPIENT. IT MAY NOT BE REPRODUCED OR USED WITHOUT EXPRESS WRITTEN PERMISSION OF CENTURION WIRELESS TECHNOLOGIES, INC., LINCOLN, NEBRASKA, USA.



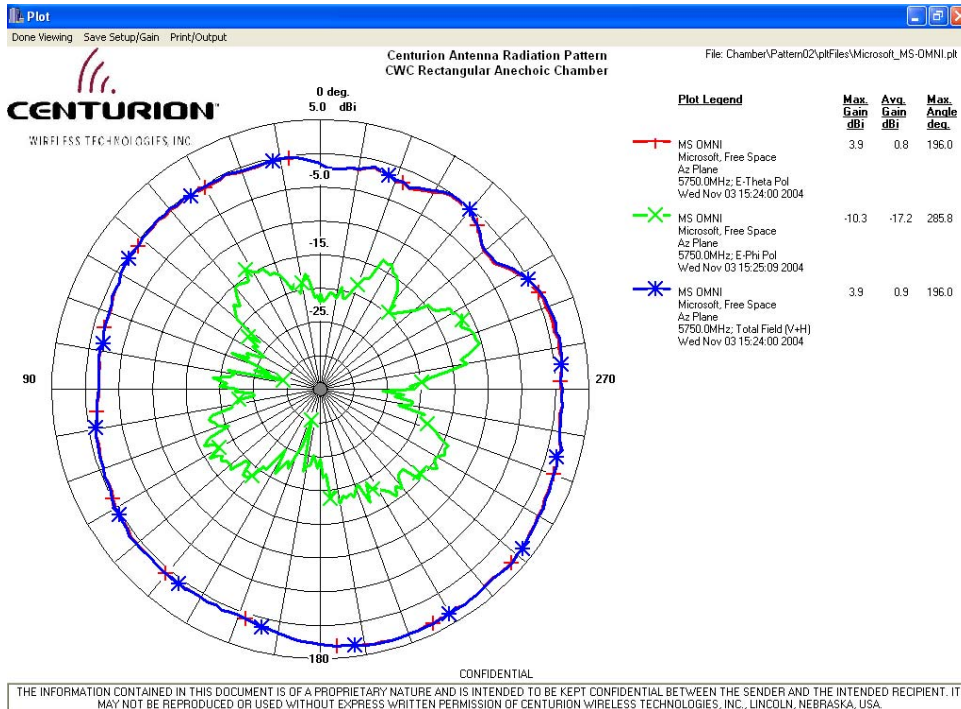
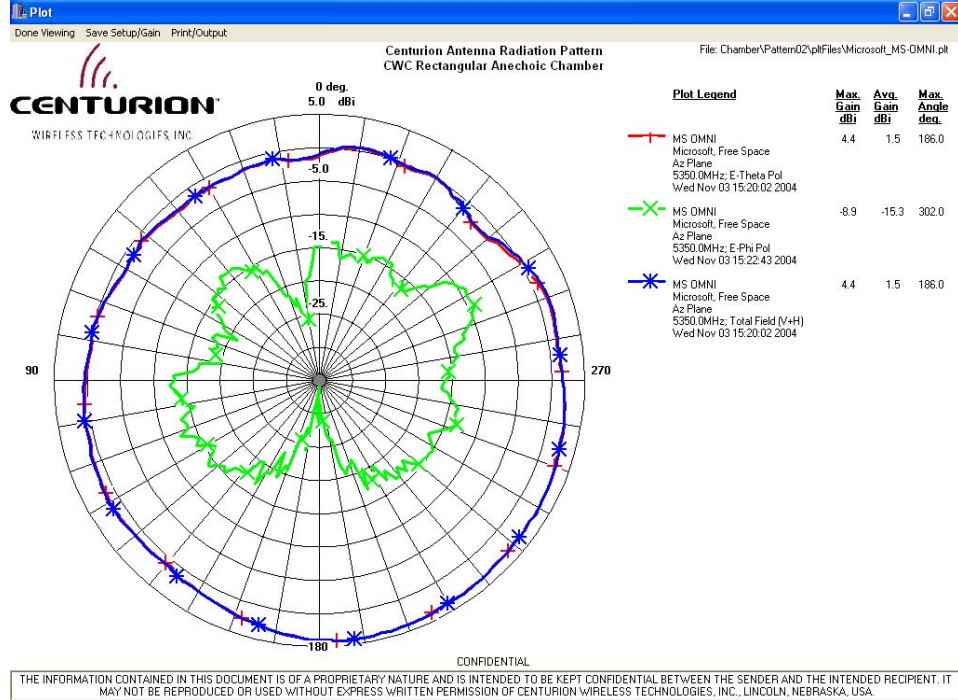
CONFIDENTIAL

THE INFORMATION CONTAINED IN THIS DOCUMENT IS OF A PROPRIETARY NATURE AND IS INTENDED TO BE KEPT CONFIDENTIAL BETWEEN THE SENDER AND THE INTENDED RECIPIENT. IT MAY NOT BE REPRODUCED OR USED WITHOUT EXPRESS WRITTEN PERMISSION OF CENTURION WIRELESS TECHNOLOGIES, INC., LINCOLN, NEBRASKA, USA.

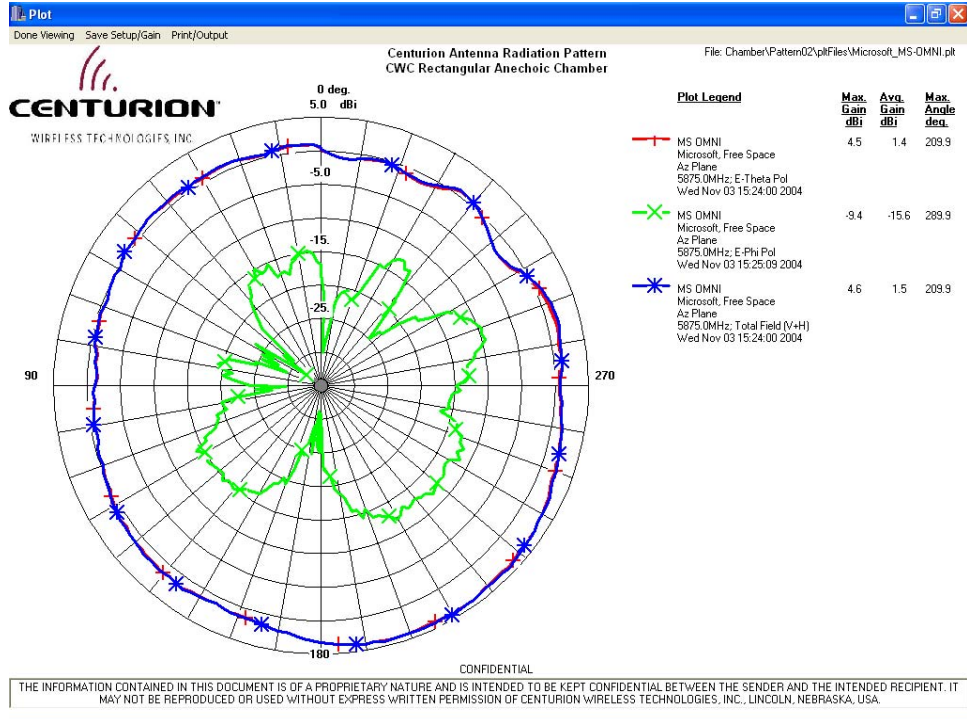
Specification No. PS-CWC-0049	Description Antenna, External Multi-band (MS_Omni)		
Customer Microsoft	Date 2004-11-05	Rev A	Reference



Specification No. PS-CWC-0049	Description Antenna, External Multi-band (MS_Omni)		
Customer Microsoft	Date 2004-11-05	Rev A	Reference



Specification No. PS-CWC-0049	Description Antenna, External Multi-band (MS_Omni)		
Customer Microsoft	Date 2004-11-05	Rev A	Reference



In Situ Performance

Specification No. PS-CWC-0049	Description Antenna, External Multi-band (MS_Omni)		
Customer Microsoft	Date 2004-11-05	Rev A	Reference



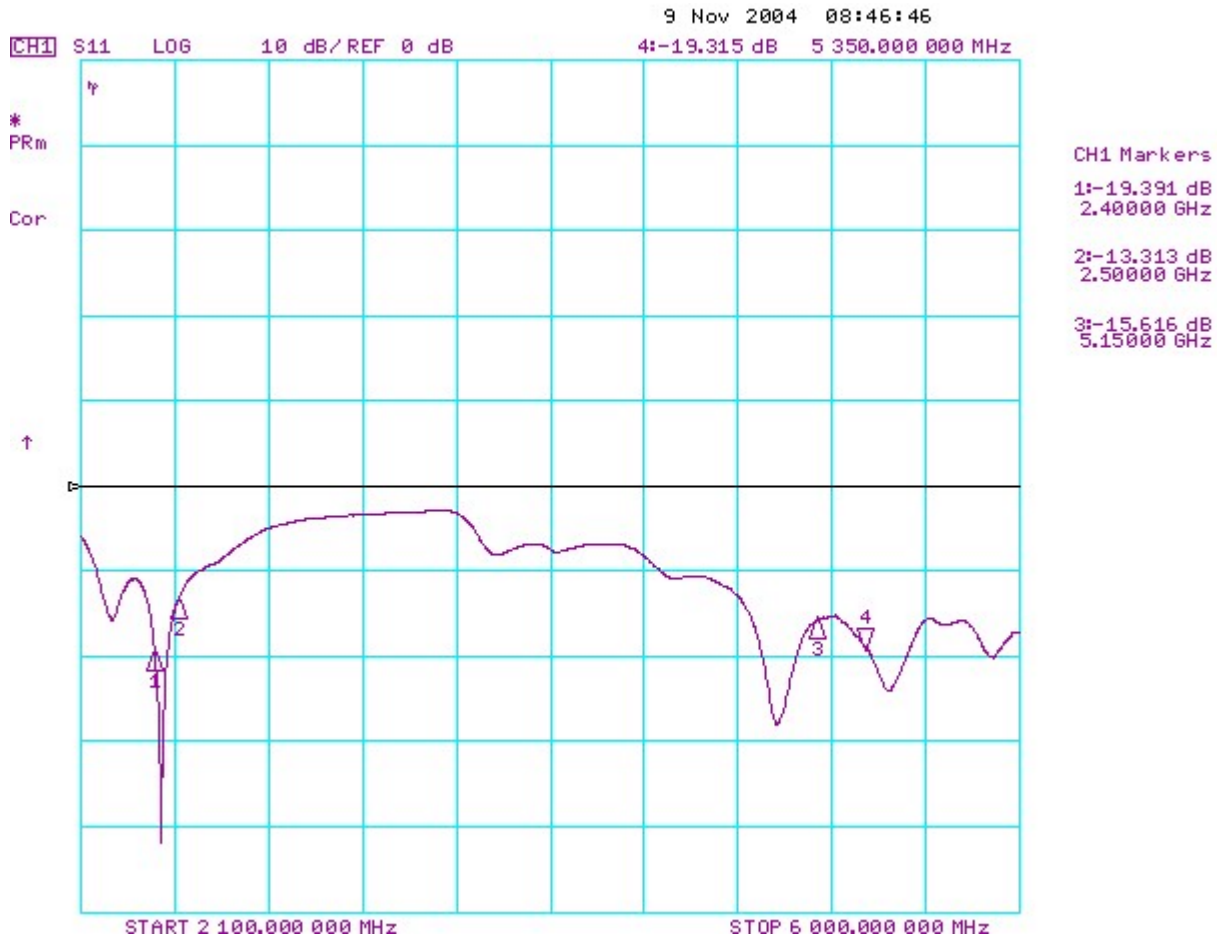
Specification No. PS-CWC-0049	Description Antenna, External Multi-band (MS_Omni)		
Customer Microsoft	Date 2004-11-05	Rev A	Reference

Electrical Performance Summary: Return-loss				
Specification	< -10dB			
Measurement Configuration	Data			
Antenna measured with device	Freq. (MHz)	Return-loss (dB)		
	2400	-19.39		
	2500	-13.31		
	5150	-15.62		
	5350	-19.31		

Electrical Performance Summary: Peak Gain. Azimuth				
Specification	As measured nominal performance			
Measurement Configuration	Data			
Antenna measured with device	Freq. (MHz)	Peak Gain (dBi)	Freq. (MHz)	Peak Gain (dBi)
	2400	4.1	5150	2.1
	2450	3.8	5250	2.6
	2500	2.9	5350	2.7
	4900	2.6	5750	3.0
	5000	3.0		

Electrical Performance Summary: Average Gain. Azimuth				
Specification	As measured nominal performance			
Measurement Configuration	Data			
Antenna measured with device	Freq. (MHz)	Ave Gain (dBi)	Freq. (MHz)	Ave Gain (dBi)
	2400	-0.1	5150	-0.3
	2450	0.9	5250	-0.7
	2500	1.3	5350	-1.1
	4900	0.1	5750	-1.6
	5000	0.6		

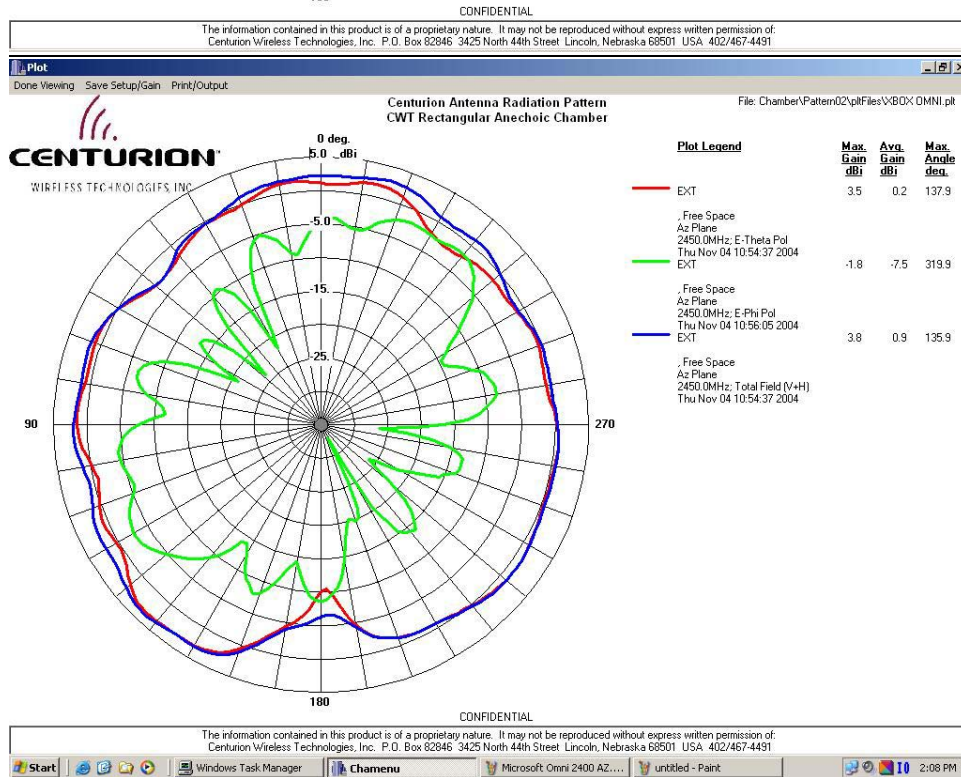
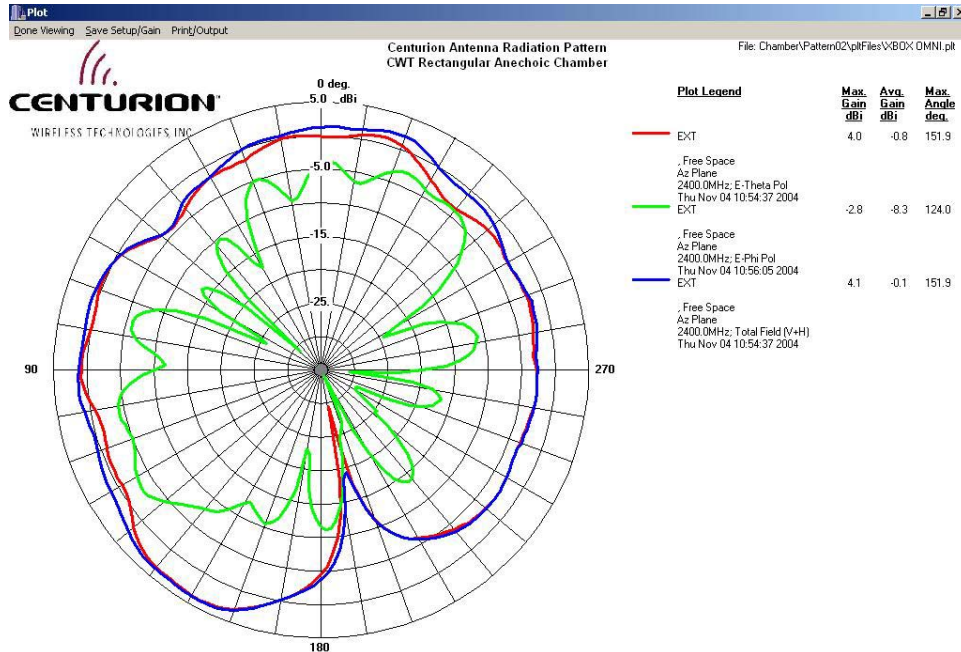
Specification No. PS-CWC-0049	Description Antenna, External Multi-band (MS_Omni)		
Customer Microsoft	Date 2004-11-05	Rev A	Reference



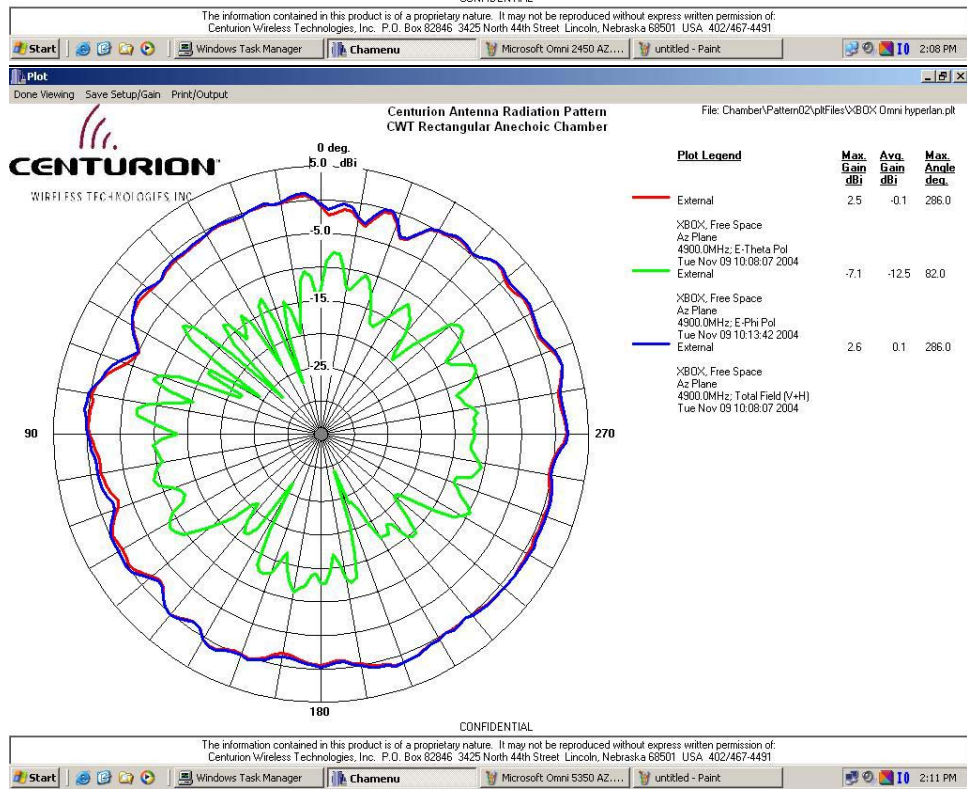
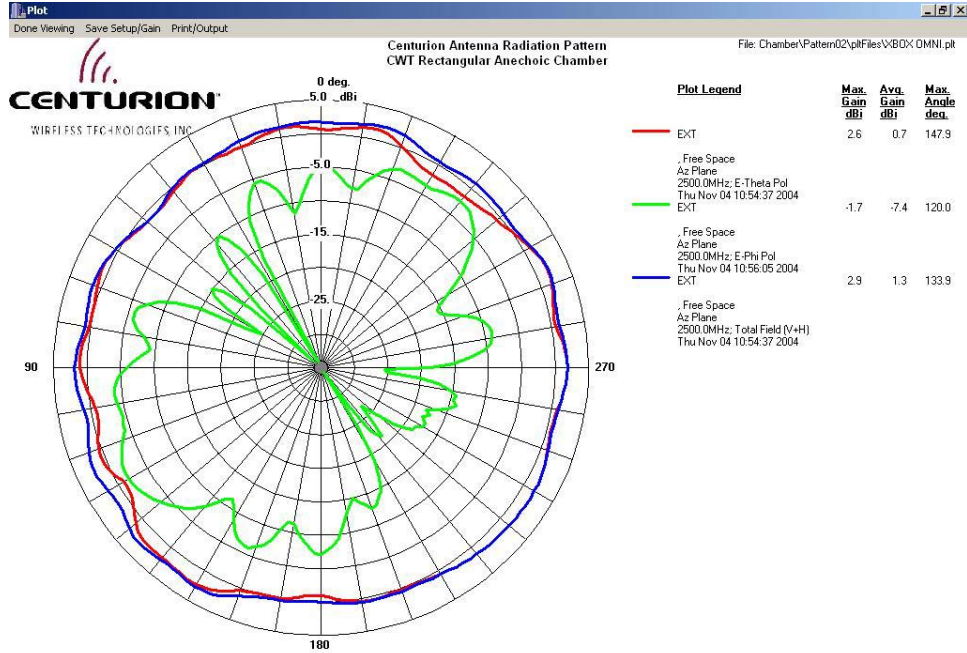
Return-loss

Specification No. PS-CWC-0049	Description Antenna, External Multi-band (MS_Omni)		
Customer Microsoft	Date 2004-11-05	Rev A	Reference

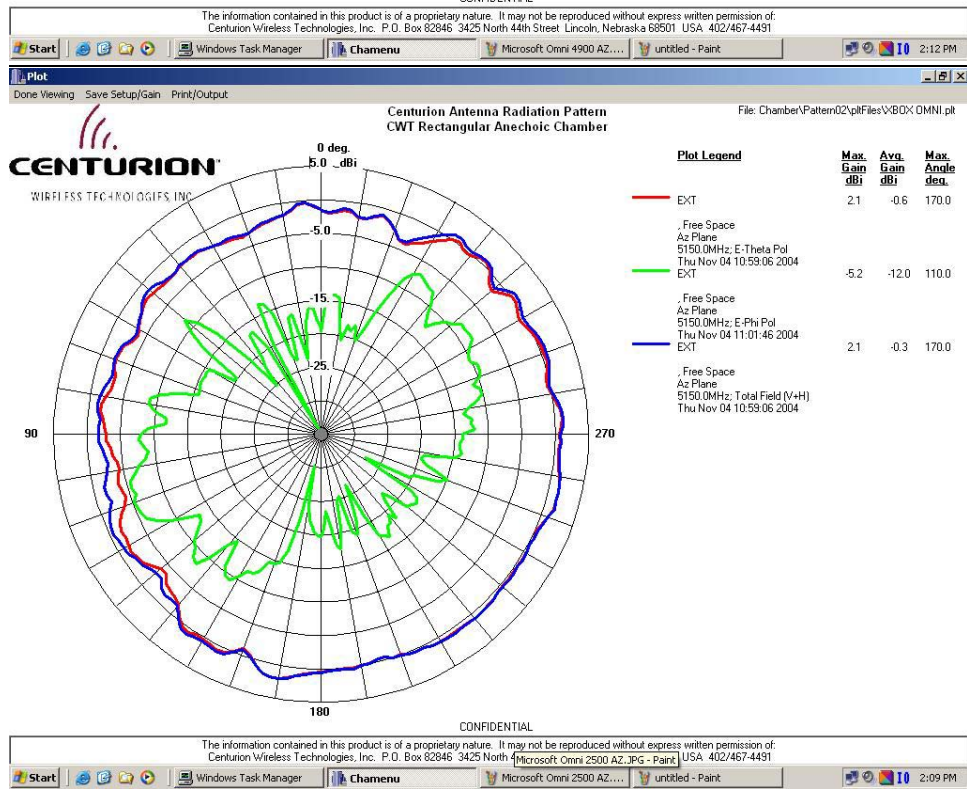
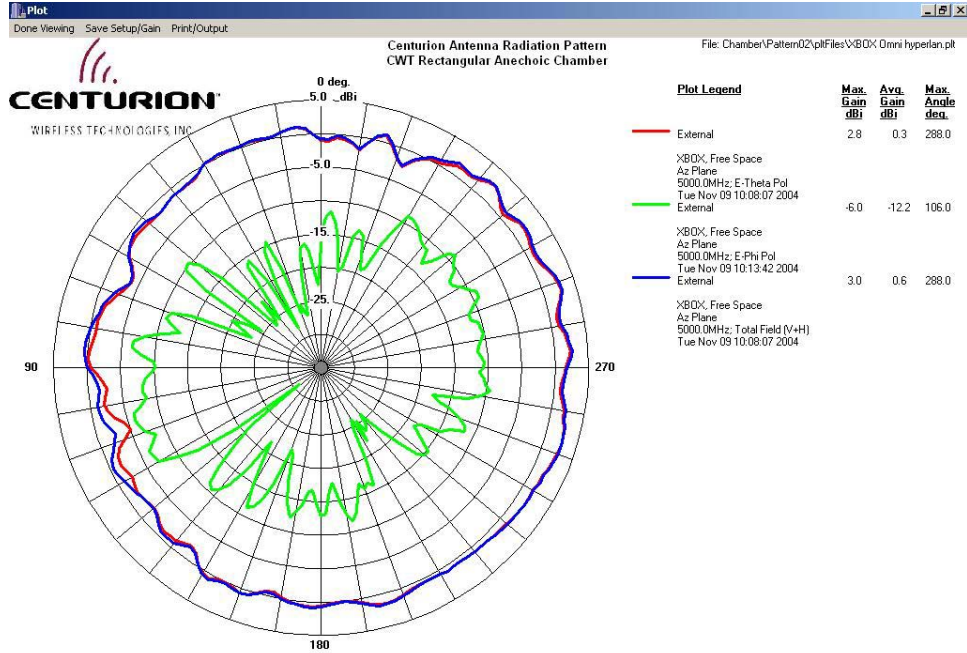
Gain Plots



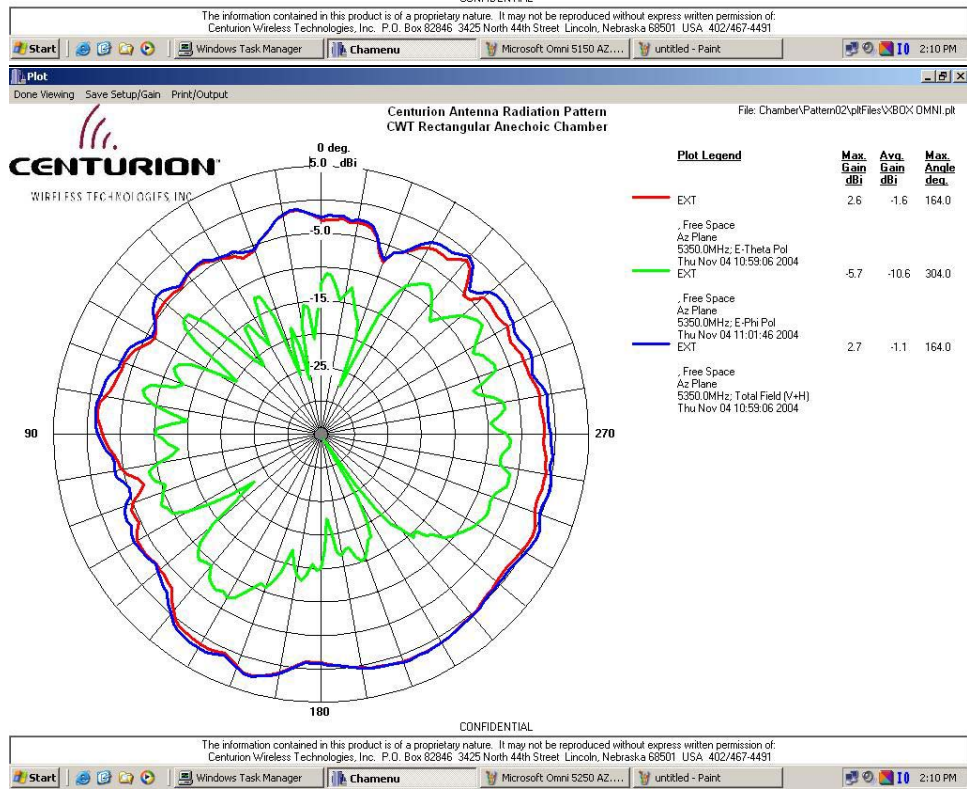
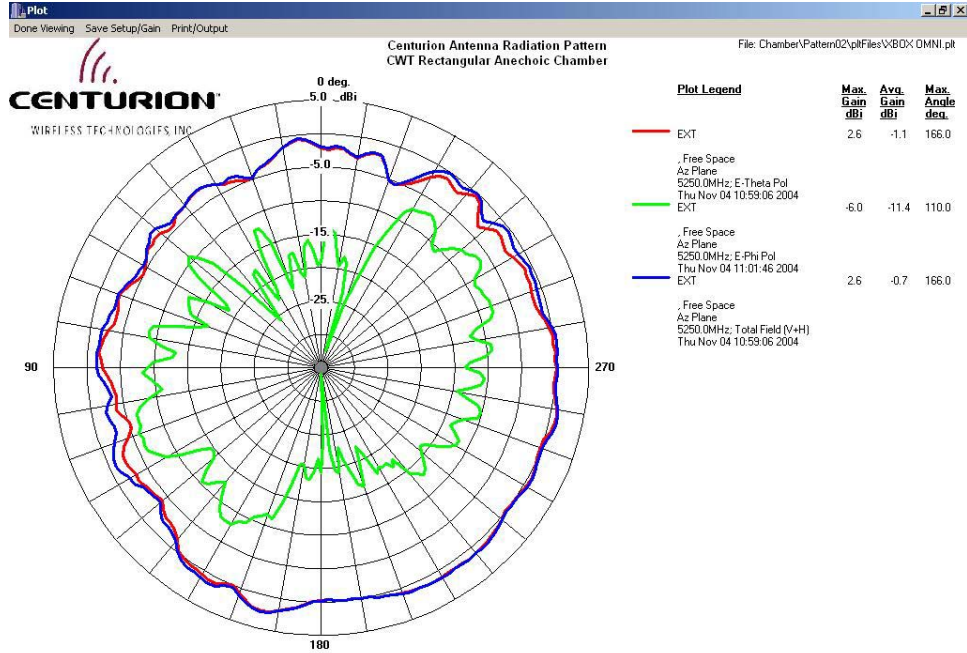
Specification No. PS-CWC-0049	Description Antenna, External Multi-band (MS_Omni)		
Customer Microsoft	Date 2004-11-05	Rev A	Reference



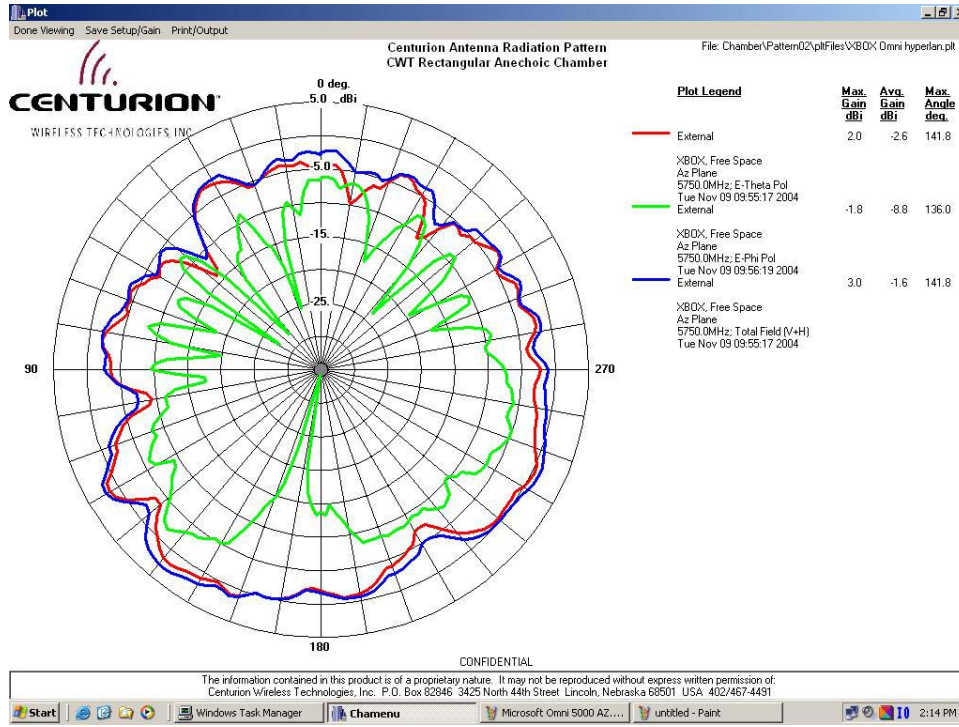
Specification No. PS-CWC-0049	Description Antenna, External Multi-band (MS_Omni)		
Customer Microsoft	Date 2004-11-05	Rev A	Reference



Specification No. PS-CWC-0049	Description Antenna, External Multi-band (MS_Omni)		
Customer Microsoft	Date 2004-11-05	Rev A	Reference



Specification No. PS-CWC-0049	Description Antenna, External Multi-band (MS_Omni)		
Customer Microsoft	Date 2004-11-05	Rev A	Reference



Materials

The antenna consists of an elbow, a coaxial cable (terminated with IPEX U.FL connector at one end) soldered to a FPC, shells (2 pieces ultrasonically welded).

The following sections provide typical specifications for the materials of construction. Because the materials are commodity items, Centurion will adjust suppliers as necessary to maintain quality and production. The attached materials may be substituted with equivalent materials from vendors other than those shown.

Materials for Elbow and Sheath

Component	Material
Elbow	PU, 255A, Black, SP
Shell	ABS, Terluran GP-22, Black

Specification No. PS-CWC-0049	Description Antenna, External Multi-band (MS_Omni)		
Customer Microsoft	Date 2004-11-05	Rev A	Reference

Product Data Sheet

09/99 TL GP-22

Terluran® GP-22

Acrylonitrile/Butadiene/Styrene

ABS

Terluran® GP-22 acrylonitrile/butadiene/styrene copolymer (ABS) is an easy flow, general purpose, injection molding grade with high resistance to impact and heat deflection. It is intended for a wide range of applications, particularly in consumer products, telecommunications, appliance housings and automotive components.

Property Description	Method	Units	Terluran® GP-22 ABS
Density	ASTM D1505	g/cm ³	1.04
Melt Volume Rate (Melt Flow Index) 200°C/5kg (cond. G) 220°C/10kg 230°C/3.8kg (cond. I)	ASTM D1238	ml/10 min. (g/10 min.)	1.5 (1.4) 20.0 (19.6) 4.4 (4.3)
Tensile Strength at Yield, Type 1, 0.125"	ASTM D638	psi (MPa)	6,500 (45)
Elongation at Yield	ASTM D638	%	2.6
Tensile Strength at Break, Type 1, 0.125"	ASTM D638	psi (MPa)	4,900 (34)
Tensile Modulus, 0.125"	ASTM D638	psi (MPa)	340,000 (2,350)
Flexural Strength, 0.125"	ASTM D790	psi (MPa)	9,400 (65)
Flexural Modulus	ASTM D790	psi (MPa)	330,000 (2,300)
Rockwell Hardness	ASTM D785	R	103
Notched Izod Impact Strength, 0.125" 73°F (23°C) 0°F (-18°C) -22°F (-30°C)	ASTM D256	ft.lbs./in. (J/m)	5.6 (300) 1.9 (100) 1.1 (60)
Heat Deflection Temperature at 264 psi, 0.250" annealed 8hrs. at 85°C unannealed	ASTM D648	°F (°C)	210 (99) 172 (78)
Heat Deflection Temperature at 66 psi, 0.250" annealed 8hrs. at 85°C unannealed	ASTM D648	°F (°C)	219 (104) 196 (91)
Vicat Softening Temperature, Rate A, Loading 2	ASTM D1525	°F (°C)	207 (97)
Flammability Rating ¹ , 0.059" (1.5 mm) thick sample	UL 94	—	HB

¹ Flammability ratings are not intended to reflect hazards presented by these materials under actual fire conditions.

Values shown are based on limited testing of unmodified, uncolored material (unless otherwise noted) and are not intended to be used in establishing maximum or minimum ranges for specification purposes.

Plastics and Fibers

BASF

Specification No. PS-CWC-0049	Description Antenna, External Multi-band (MS_Omni)		
Customer Microsoft	Date 2004-11-05	Rev A	Reference

Terluran® GP-22 ABS

Processing

Drying

Terluran® GP-22 ABS will attract moisture from the atmosphere, with the rate depending on temperature and humidity. It is recommended that the material be dried in a dehumidifying dryer at 75°C to 80°C (170°F - 175°F) for 2 - 4 hours.

Recycling

A maximum of 20% reprocessed material can be added to the virgin product provided that it has not been contaminated or previously degraded. The reprocessed material must be dried to prevent any addition of moisture to the virgin material before processing.

Not all applications permit the use of regrind. Those applications which do allow the use of regrind should be tested for the appropriate mechanical properties per the specific molded part and application.

Processing Temperatures

Injection Molding:

Melt temperatures for Terluran® GP-22 ABS lie between 430°F and 500°F (221°C - 260°C) with mold temperatures between 85°F and 140°F (30°C - 60°C).

Processing Precautions

Avoid excessive melt temperatures and long residence times as this could lead to thermal degradation.

For Technical Assistance please call:

1-800-527-TECH (1-800-527-8324) or
1-734-324-5150 if calling from outside the U.S.

© 1999 BASF Corporation

BASF Performance Plastics

Products

BASF Plastic Materials offers a broad range of performance plastics from which users can select an optimum material to meet their requirements. These materials include several types of Ultramid® polyamides (PA6, 66, 6/66, 6/6T), Ultraform® acetal copolymer (POM), Ultradur® polybutylene terephthalates, Luran® styrene/ acrylonitrile, Luran® S acrylonitrile/styrene/ acrylate (ASA) and ASA/polycarbonate blends (ASA/PC), Terluran® acrylonitrile/butadiene/styrene (ABS), Terlurux® methylmethacrylate/ acrylonitrile/ butadiene/styrene (MABS), Ultrason® E polyethersulfone (PES), and Ultrason® S polysulfone (PSU).

Important: While the descriptions, designs, data and information contained herein are presented in good faith and believed to be accurate, it is provided for your guidance only. Because many factors may affect processing or application/use, we recommend that you make tests to determine the suitability of a product for your particular purpose prior to use. NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE MADE REGARDING PRODUCTS DESCRIBED OR DESIGNS, DATA OR INFORMATION SET FORTH, OR THAT THE PRODUCTS, DESIGNS, DATA OR INFORMATION MAY BE USED WITHOUT INFRINGING THE INTELLECTUAL PROPERTY RIGHTS OF OTHERS. IN NO CASE SHALL THE DESCRIPTIONS, INFORMATION, DATA OR DESIGNS PROVIDED BE CONSIDERED A PART OF OUR TERMS AND CONDITIONS OF SALE. Further, you expressly understand and agree that the descriptions, designs, data and information furnished by BASF hereunder are provided gratis and BASF assumes no obligation or liability for the description, designs, data and information given or results obtained, all such being given and accepted at your risk.

Luran, Terluran, Ultradur, Ultraform, Ultramid, and Ultrason are registered trademarks of BASF AG.

Terlurux is a registered trademark of BASF Corporation.

BASF Corporation
Plastic Materials
3000 Continental Drive North
Mount Olive, New Jersey 07828-1234
Tel: 800-BC-RESIN
Fax: 973-426-3912

BASF Corporation
Plastics Applications Center
1609 Biddle Avenue
Wyandotte, Michigan 48192
Tel: 734-324-5105
Fax: 734-324-5384

BASF Canada
345 Carlingview Drive
Toronto, Ontario M9W 6N9
Canada
Tel: 416- 675-3611
Fax: 416-674-2588

BASF Mexicana S.A. de C.V.
Insurgentes Sur 975
Col. Ciudad de los Deportes
Delegación Benito Juárez
03710 México, D.F.
México
Tel: 011-52-5-325-2624
Fax: 011-52-5-611-6751

World Wide Web: <http://www.basf.com/plastics>

BASF SMART FAX

Automated telephone request system to deliver datasheets to you via fax. Dial the phone number below and follow the voice commands.

Request document no. 1 for complete listing.

800-TOP-FAX1 (734-283-8373 outside the U.S.)

Plastics and Fibers

BASF

Specification No. PS-CWC-0049	Description Antenna, External Multi-band (MS_Omni)		
Customer Microsoft	Date 2004-11-05	Rev A	Reference

Bayer Corporation



TEXIN 255

Thermoplastic Polyurethane

Polyester-Based Grade

PLASTICS

Product Information

Description

Texin 255 resin is a polyester-based thermoplastic polyurethane with a Shore hardness of approximately 55D.* It can be processed by injection molding; extrusion processes are not recommended.

Applications

In addition to excellent fuel and oil resistance, Texin 255 resin offers outstanding abrasion resistance, impact strength, toughness, and flexibility. Applications include toplifts, seals, gaskets, sleeves, casters, and gears. However, as with any product, use of 255 resin in a given application must be tested (including field testing, etc.) in advance by the user to determine suitability.

Storage

Texin thermoplastic polyurethane resins are hygroscopic and will absorb ambient moisture. The presence of moisture can adversely affect processing characteristics and the quality of parts. Therefore, the resins should remain in their sealed containers and be stored under cool and dry conditions until used. Storage temperature should not exceed 86°F (30°C). Unused resin from opened containers, or reground material that is not to be used immediately, should be stored in sealed containers.

Drying

Prior to processing, Texin 255 resin must be thoroughly dried in a desiccant dehumidifying hopper dryer. Hopper inlet air temperature should be 210–230°F (99–110°C). To achieve the recommended moisture content of less than 0.03%, the inlet air dew point should be 0°F (-18°C) or lower. The hopper capacity should be sufficient to provide a minimum residence time of 2 hours.

Injection Molding

General-purpose screws are satisfactory for use with Texin 255 resin. The recommended screw length-to-diameter (L/D) ratio is 20:1 with a compression ratio of 2.5–3:1. Screws with a compression ratio greater than 4:1 should be avoided.

Typical Injection Molding Conditions	
Barrel Temperature:	
Rear	380–410°F (190–210°C)
Middle	380–420°F (195–220°C)
Front	390–430°F (195–225°C)
Nozzle	400–440°F (200–230°C)
Ideal Melt Temperature	410°F (210°C)
Mold Temperature:	
Stationary Part	60–110°F (15–45°C)
Moving Part	60–110°F (15–45°C)
Injection Pressure:	
1st Stage	7,000–13,000 psi
2nd Stage	6,000–10,000 psi
Clamp Pressure	3–5 ton/in ² of projected part area
Shot Weight	40–80% of rated barrel capacity
Timers (per 0.125-in cross section):	
Boost	5–15 sec
2nd Stage	10–25 sec
Cool	25–40 sec

Typical values for mold shrinkage to be taken into account are as follows:

Cross Section	Mold Shrinkage
Less than 1/8 inch	7–10 mils per inch
1/8 to 1/4 inch	10–15 mils per inch
Over 1/4 inch	15–20 mils per inch

For treatments such as postcuring, an additional 1 to 1.5 mil per inch should be added.

* These items are provided as general information only. They are approximate values and are not part of the product specifications.

Specification No. PS-CWC-0049	Description Antenna, External Multi-band (MS_Omni)		
Customer Microsoft	Date 2004-11-05	Rev A	Reference

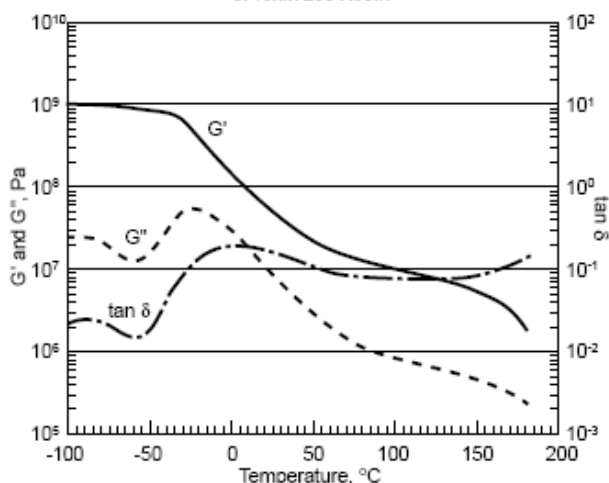
Regrind Usage

For Texin resin, up to 20% regrind may be used with virgin material, depending upon the end-use requirements of the molded part and provided that the material is kept free of contamination and is properly dried (see section on Drying). Any regrind used must be generated from properly molded parts, sprues, and/or runners. All regrind used must be clean, uncontaminated, and thoroughly blended with virgin resin prior to drying and processing. Under no circumstances should degraded, discolored, or contaminated material be used for regrind. Materials of this type should be discarded.

Improperly mixed and/or dried resin may diminish the desired properties of Texin resin. You must conduct testing on finished parts produced with any amount of regrind to ensure that your end-use performance requirements are fully met. Regulatory organizations (e.g., UL) may have specific requirements limiting the allowable amount of regrind. Because third party regrind generally does not have a traceable heat history, nor offer any assurance that proper temperatures, conditions, and/or materials were used in processing, extreme caution must be exercised in buying and using regrind from third parties.

The use of regrind material should be avoided entirely in those applications where resin properties equivalent to virgin material are required, including but not limited to color quality, impact strength, resin purity, and/or load-bearing performance.

Dynamic Mechanical Analysis
of Texin 255 Resin



Health and Safety Information

Appropriate literature has been assembled which provides information concerning the health and safety precautions that must be observed when handling Texin 255 resin. Before working with this product, you must read and become familiar with the available information on its hazards, proper use and handling. This cannot be overemphasized. Information is available in several forms, e.g., material safety data sheets and product labels. Consult your local Bayer Corporation representative or contact Bayer's Product Safety and Regulatory Affairs Department in Pittsburgh, PA.

Specification No.	Description		
PS-CWC-0049	Antenna, External Multi-band (MS_Omni)		
Customer	Date	Rev	Reference
Microsoft	2004-11-05	A	

Typical Physical Properties* of Natural Resin	ASTM Test Method (Other)	Units		Texin 255 Resin	
		U.S. Conventional	SI Metric	U.S. Conventional	SI Metric
General					
Specific Gravity	D 792 (ISO 1183)			1.21	
Shore Hardness	D 2240 (ISO 868)	D Scale		55	
Taber Abrasion:	D 3489 (ISO 4649)				
H-18, 1000-g Load, 1,000 Cycles		mg Loss		50	
Bayshore Resilience	D 2632	%		40	
Mold Shrinkage at 100-mil Thickness:	D 955 (ISO 2577)				
Flow Direction		in/in (mm/mm)		0.008	
Cross-Flow Direction		in/in (mm/mm)		0.008	
Mechanical					
Tensile Strength	D 412 (ISO 37)	lb/in ²	MPa	6,000	41.4
Tensile Stress at 50% Elongation	D 412 (ISO 37)	lb/in ²	MPa	1,800	12.4
Tensile Stress at 100% Elongation	D 412 (ISO 37)	lb/in ²	MPa	2,000	13.8
Tensile Stress at 300% Elongation	D 412 (ISO 37)	lb/in ²	MPa	4,000	27.6
Ultimate Elongation	D 412 (ISO 37)	%		500	
Shear Strength	D 732	lb/in ²	MPa	5,585	38.5
Tear Strength, Die "C"	D 624 (ISO 34)	lbf/in	kN/m	900	157.6
Flexural Modulus:	D 790 (ISO 178)				
158°F (70°C)		lb/in ²	MPa	9,000	62
73°F (23°C)		lb/in ²	MPa	20,000	138
-22°F (-30°C)		lb/in ²	MPa	175,000	1,207
Compression Set:	D 395-B (ISO 815)				
As Molded (Post-Cured)**					
22 Hours at 212°F (100°C)		%		75 (50)	
22 Hours at 158°F (70°C)		%		65 (35)	
22 Hours at 73°F (23°C)		%		20 (15)	
Compressive Load:	D 575				
2% Deflection		lb/in ²	MPa	140	1.0
5% Deflection		lb/in ²	MPa	565	3.9
10% Deflection		lb/in ²	MPa	1,075	7.4
15% Deflection		lb/in ²	MPa	1,465	10.1
20% Deflection		lb/in ²	MPa	1,840	12.7
25% Deflection		lb/in ²	MPa	2,245	15.5
50% Deflection		lb/in ²	MPa	5,890	40.6
Instrumented Impact, Total Energy:	D 3763 (ISO 6603)				
100-mil Thickness, 5 mph, 3-in Clamp		ft-lb	J	42.6	57.8
73°F (23°C)		ft-lb	J	36.9	50.0
-22°F (-30°C)					
Thermal					
Deflection Temperature Under Load:	D 648 (ISO 75)				
66 psi		°F	°C	139	59
Coefficient of Linear Thermal Expansion	D 696	in/in°F	mm/mm°C	7.3 E-05	13.1 E-05
Low-Temperature Brittle Point	D 746 (ISO 974)	°F	°C	<-90	<-68
Glass Transition Temperature (Tg)	(DMA)#	°F	°C	-15	-26
Vicat Softening Temperature (Rate A)	D 1525 (ISO 306)	°F	°C	334	168
Flammability***					
UL94 Flame Class:	(UL94)				
0.062-in (1.57-mm) Thickness		Rating			HB ^a

* These items are provided as general information only. They are approximate values and are not part of the product specifications.

** Postcured 16 hrs at 230°F (110°C).

*** Flammability results are based on small-scale laboratory tests for purposes of relative comparison and are not intended to reflect the hazards presented by this or any other material under actual fire conditions.

DMA—Dynamic Mechanical Analysis.

^a Natural and black colors.

Specification No. PS-CWC-0049	Description Antenna, External Multi-band (MS_Omni)		
Customer Microsoft	Date 2004-11-05	Rev A	Reference

Texin 255 Resin Property Changes after Aging	ASTM Test Method (Other)	Unit of Change	70 Hrs	7 Days	14 Days	21 Days
Hot Air at 257°F (125°C)	D 573 (ISO 216)					
Tensile Strength		%	-20	-11	-23	-27
Tensile Stress at 100% Elongation		%	+7	-2	+8	+4
Tensile Stress at 300% Elongation		%	-23	-15	-27	-30
Ultimate Elongation		%	+28	+24	+35	+30
Hardness		Shore D	+1	0	-5	-4
Hot Air at 212°F (100°C)	D 573 (ISO 216)					
Tensile Strength		%	+3	+8	+14	+14
Tensile Stress at 100% Elongation		%	+11	+4	+13	+14
Tensile Stress at 300% Elongation		%	+1	-5	-1	+1
Ultimate Elongation		%	-3	+7	+14	+11
Hardness		Shore D	-2	-1	0	0
ASTM Oil #1 at 212°F (100°C)	D 471 (ISO 175)					
Tensile Strength		%	+18	-4	-20	-29
Tensile Stress at 100% Elongation		%	+12	+14	+14	+15
Tensile Stress at 300% Elongation		%	+7	+2	-9	-14
Ultimate Elongation		%	+8	+12	+24	+16
Hardness		Shore D	+2	+1	-2	0
Volume		%	-1	0	-1	-1
ASTM Oil #3 at 212°F (100°C)	D 471 (ISO 175)					
Tensile Strength		%	+19	—	—	-18
Tensile Stress at 100% Elongation		%	+16	—	—	+13
Tensile Stress at 300% Elongation		%	+13	—	—	-12
Ultimate Elongation		%	+6	—	—	+20
Hardness		Shore D	+2	—	—	-1
Volume		%	+2	—	—	+4
Fuel A at 73°F (23°C)	D 471 (ISO 175)					
Tensile Strength		%	+6	-3	+6	-1
Tensile Stress at 100% Elongation		%	+2	-2	+3	+5
Tensile Stress at 300% Elongation		%	+5	-11	-1	+3
Ultimate Elongation		%	-4	+9	-4	-2
Hardness		Shore D	-4	+1	-1	+6
Volume		%	0	0	0	0
Fuel C at 73°F (23°C)	D 471 (ISO 175)					
Tensile Strength		%	+4	-4	-10	-11
Tensile Stress at 100% Elongation		%	-19	-27	-32	-27
Tensile Stress at 300% Elongation		%	-22	-34	-35	-28
Ultimate Elongation		%	+5	+6	-2	-8
Hardness		Shore D	-7	-4	-6	-8
Volume		%	+6	+10	+14	+14

Bayer Corporation

Polymers Division • Plastics • 100 Bayer Road • Pittsburgh, PA 15205-9741 • Phone: 412 777-2000

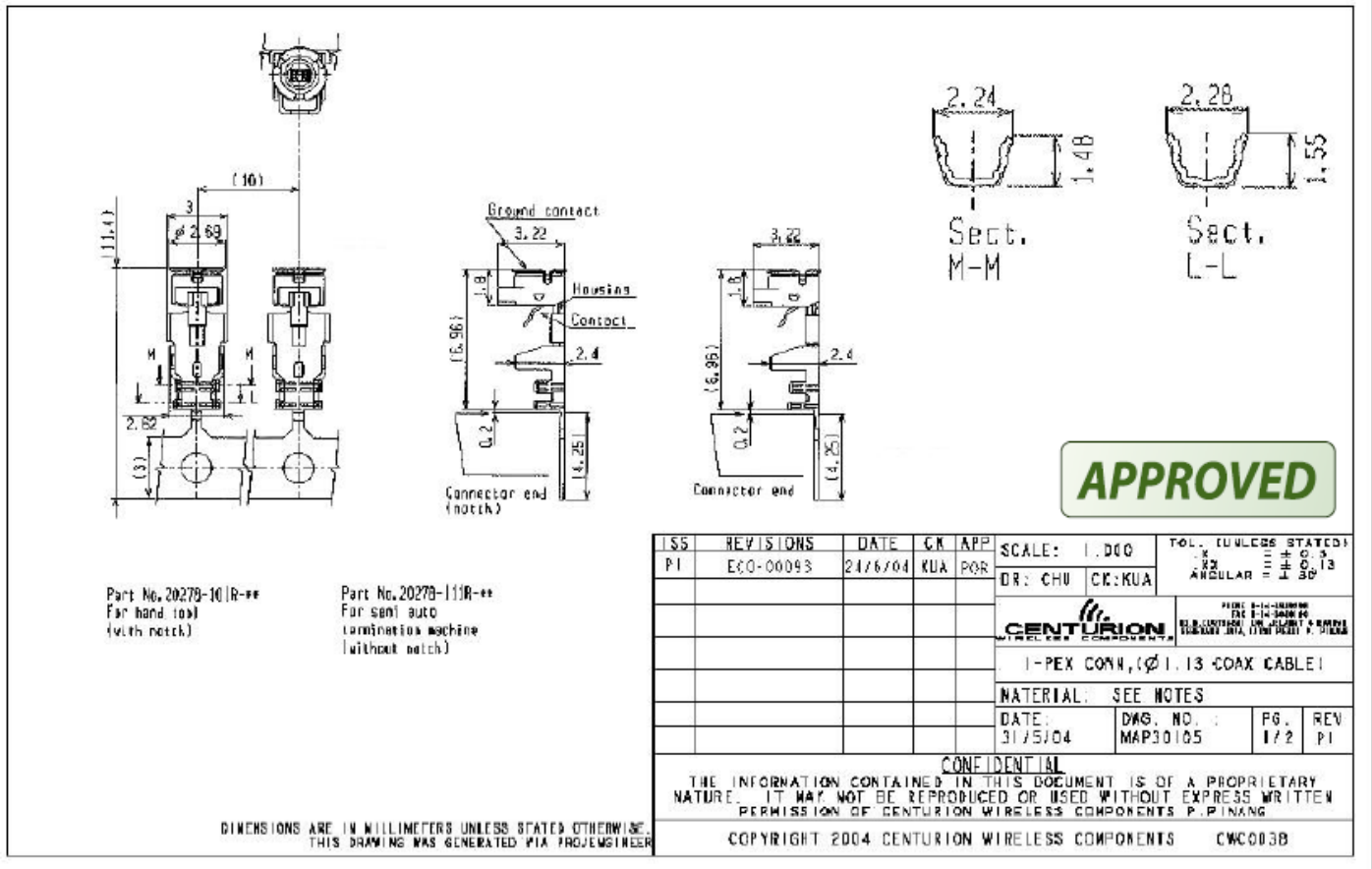
The conditions of your use and application of our products, technical assistance and information (whether verbal, written or by way of production evaluations), including any suggested formulations and recommendations, are beyond our control. Therefore, it is imperative that you test our products, technical assistance and information to determine to your own satisfaction whether they are suitable for your intended uses and applications. This application-specific analysis at least must include testing to determine suitability from a technical as well as health, safety, and environmental standpoint. Such testing has not necessarily been done by Bayer Corporation. All information is given without warranty or guarantee. It is expressly understood and agreed that customer assumes and hereby expressly releases Bayer from all liability, in tort, contract or otherwise, incurred in connection with the use of our products, technical assistance, and information. Any statement or recommendation not contained herein is unauthorized and shall not bind Bayer. Nothing herein shall be construed as a recommendation to use any product in conflict with patents covering any material or its use. No license is implied or in fact granted under the claims of any patent.

Sales Offices

9 Corporate Park Drive, Suite 240, Irvine, CA 92714-5113, (714) 833-2351
2505 Hillsboro Road, Suite 203, Nashville, TN 37212-5317, (615) 298-3566
2401 Walton Boulevard, Auburn Hills, MI 48326-1957, (810) 475-7700
9801 West Higgins Road, Suite 420, Rosemont, IL 60018-4704, (847) 682-5560
Raritan Plaza III, Edison, NJ 08837-3605, (908) 225-1030

Specification No. PS-CWC-0049	Description Antenna, External Multi-band (MS_Omni)		
Customer Microsoft	Date 2004-11-05	Rev A	Reference

IPEX U.FL Connector print



Specification No.	Description		
PS-CWC-0049	Antenna, External Multi-band (MS_Omni)		
Customer	Date	Rev	Reference
Microsoft	2004-11-05	A	

Notes

- Material
 - Housing: PBT, UL94V-0, black
 - Contact: phosphor bronze, gold plating
 - Ground contact: phosphor bronze, gold plating
- Packing: reel
- Mating partner part No.: 20279-001E-01

5-2 Unmating

- In case of unmating by pulling tool. Please use the pulling tool as the following drawings, and please pull plug to vertical direction as directly as possible.
- In case of unmating directly by hand. Please catch the catching area of plug, and please pull plug to vertical direction as directly as possible.

5-3 Mating

Please mate the connector straightly to vertical direction as much as possible, adjusting the mating axis of plug and receptacle. An excessive slant angle mating may break the connector, please don't do it.

5-4 Permissible load of cable at mating

5-5 Suggestions for mating & unmating operation.

5-1 Mating.

Please mate the connector straightly to vertical direction as much as possible, adjusting the mating axis of plug and receptacle. An excessive slant angle mating may break the connector, please don't do it.

APPROVED

ISS	REVISIONS	DATE	GM	APP	SCALE: 1:100	TOL. (UNLESS STATED):
P1	ECO-00093	24/6/04	KUA	POR	DR: CHU CK: KUA	± 0.1 ± 0.13 ANGULAR ± 0.3
						P/N: 8-14-000000 TEL: 8-14-000000 FAX: 8-14-000000 E-MAIL: 8-14-000000
						1-PEX CONN, Ø1.13 COAX CABLE
MATERIAL: SEE NOTES						
DATE: 31/5/04						
DWS. NO.: MAP30105						
PG. 2/2						REV. P1
CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DOCUMENT IS OF A PROPRIETARY NATURE. IT MAY NOT BE REPRODUCED OR USED WITHOUT EXPRESS WRITTEN PERMISSION OF CENTURION WIRELESS COMPONENTS P. PINANG						
COPYRIGHT 2004 CENTURION WIRELESS COMPONENTS CWC003B						

Specification No. PS-CWC-0049	Description Antenna, External Multi-band (MS_Omni)		
Customer Microsoft	Date 2004-11-05	Rev A	Reference

1.13mm Coaxial cable print

ITEM	DETAILS	
CONDUCTOR	MATERIAL	SILVER-COATED COPPER WIRE
	COMPOSITION	7/0.079
INSULATION	MATERIAL	SUMIFLON [®] P (NATURAL)
	NOM. THICK.	0.22
SHIELD	MATERIAL	SILVER-COATED COPPER WIRE
	COMPOSITION	SINGLE BRAID OF 0.05
JACKET	MATERIAL	SUMIFLON [®] E (COLOR) *
	NOM. THICK.	0.11

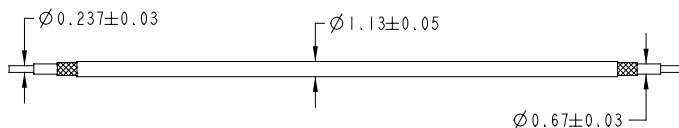
* WHITE, BLACK, BLUE, GRAY

ELECTRICAL PROPERTIES (AT 20°C)

ITEM	UNIT	DETAILS
CONDUCTOR RESISTANCE	Ω /Km	MAX. 567
INSULATION RESISTANCE	M Ω - Km	MIN. 305
DIELECTRIC STRENGTH	ACV/lmin	500
CAPACITANCE	pF/m	97 (1kHz)
CHARACTERISTIC IMPEDANCE	Ω	50 $\pm$ 2 (TDR)
ATTENUATION**	dB/m	NOM. 1.82 (0.9GHz)
		NOM. 2.37 (1.56GHz)
		NOM. 2.70 (1.9GHz)
		NOM. 3.05 (2.4GHz)
		NOM. 3.43 (3.0GHz)
		NOM. 3.94 (4.0GHz)
		NOM. 4.45 (5.0GHz)
		NOM. 4.89 (5.8GHz)
		NOM. 6.16 (6.0GHz)

** MAXIMUM VALUE = NOM. VALUE X 1.15

DIMENSIONS ARE IN MILLIMETERS UNLESS STATED OTHERWISE.
THIS DRAWING WAS GENERATED VIA PRO/ENGINEER



ISS	REVISIONS	DATE	CK	APP	SCALE: NTS	TOL. (UNLESS STATED)
PI	ECO-00093	24/6/04	KUA	POR	DR: CHU CK:KUA	.X = $\pm$ 0.3 .XX = $\pm$ 0.13 ANGULAR = $\pm$ 30°
						PHONE 6-04-3889288 FAX 6-04-3889189 NO. 8, (LOT 5555) LRU, JELAYAT 4 BANDAR SEBERANG JAYA, 12100 PENANG, P. PINANG
						CENTURION WIRELESS COMPONENTS
						WIRE, COAX, RGI.13
						MATERIAL: SEE NOTES
					DATE: 9/6/04	DWG. NO. : PG. REV MAR40001 1/1 P1

CONFIDENTIAL

THE INFORMATION CONTAINED IN THIS DOCUMENT IS OF A PROPRIETARY NATURE. IT MAY NOT BE REPRODUCED OR USED WITHOUT EXPRESS WRITTEN PERMISSION OF CENTURION WIRELESS COMPONENTS P.PINANG

COPYRIGHT 2004 CENTURION WIRELESS COMPONENTS