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零件承认书

SPECIFICATION FOR APPROVAL

P/N of **Galtronics**	P/N of **Sercomm**
02100073-04046	**TBD**

APPROVED BY	SIGNATURE	DATE
Engineering Department Manager		2009.7.1
Mechanical Engineer	Mark Guo	2009-7-1
RF Engineer	Nortel	2009.7.1
Customer Approval		

目 录

ANTENNA SPECIFICATION

REV NO.	DATE	DESCRIPTION
S1	09-06-28	Initial Draft

DISTRIBUTION LIST: 1. 2.	3.	
APPROVED BY	**SIGNATURE**	**DATE**
Engineering Department Manager		
Mechanical Engineer Sam Zaila		
RF Engineer Marin Stoytchev		
Approved By Customer (as required):		

Preliminary Design Specification

2.4-GHz Compact Balanced Antennas For Linksys WVC100N Wireless Video Camera

Galtronics P/Ns:

02100073-04046

Sercomm P/Ns:

TBD

Antenna Type: PIFA Antenna

CONTENTS

1.0 PURPOSE AND SCOPE;

The purpose of this document is to establish a ***design*** specification for the antenna product that Galtronics is producing for Linksys. Any changes or additions to this specification can affect schedule and/or cost of the product and should be negotiated between Galtronics and Linksys before being incorporated into the specification. Upon agreement of this specification Galtronics will make no changes without written approval from Linksys. Any changes requested by Linksys will be given to Galtronics with sufficient time frame to evaluate the cost impact and react as required. The development of this product within Galtronics is conducted according to the Design Control Procedure SOP-006E.

2.0 RELATED DOCUMENTS:

SOP006E	Product Launch Procedure (Design Control)
EN006E	Reliability Guidelines
EIA-STD-556	Outer Shipping Container Bar Code Label Standard

3.0 ABBREVIATIONS AND DEFINITIONS

Ω	Ohm
°	Degree
°C	Celsius (degrees Centigrade)
cm	Centimetre
g	Grams
GHz	Gigahertz
Hz	Hertz
kg	Kilograms
MHz	Megahertz
M	Metre
mm	Millimetre
N	Newton
PCB	Printed Circuit Board
RH	Relative Humidity
W	Watt

Design Specification: A preliminary target specification to guide the design process.
Product Specification: A final specification for the qualified product.

4.0 DESCRIPTIONS AND PART NUMBER;

4.1 DESCRIPTION

These antennas are referred to as Galtronics' Compact Balanced Antennas. The patent-pending designs consist of single-piece high performance balanced antennas with coaxial cables. The cables are terminated with UFL-style connectors. Two antennas are installed per device. They will be denoted as Right Front antenna and Left Front antenna. Both antennas are a single-band single-feed design. The antennas have mounting features allowing for alignment and attachment to the plastic enclosure.

4.2 PART NUMBER

Galtronics P/N	Sercomm P/N	Frequency Band	Location in Wireless Router
02100073-04046	TBD	2.4 - 2.5 GHz	Right Front
02100073-04046	TBD	2.4 - 2.5 GHz	Left Front

5.0 ELECTRICAL SPECIFICATIONS

5.1 FREQUENCY BAND

Unlicensed ISM2400 Band: 2.4 – 2.5 GHz

5.2 IMPEDANCE - Nominal impedance: 50Ω

5.3 MATCHING REQUIREMENTS.

The compact balanced antennas do not require additional impedance matching circuitry.

5.4 VSWR REQUIREMENTS

5.4.1 VSWR Maximum

Maximum VSWR allowed is 2.0:1

5.4.2 TEST METHOD (ENGINEERING)

The antennas are tested while mounted in the wireless device. The device is positioned in free space. (Free space means the device is placed on a non-conductive surface away from any conductive objects.)

5.4.3 TEST METHOD (PRODUCTION)

In mass production it is not practical to use the device supplied by customer. Galtronics will designate reference antennas that meet VSWR requirements when installed in the wireless router. The reference antennas will then be measured in free space on production test equipment. Production antennas will be measured on the same production test equipment, and are thereby correlated to the reference antennas.

5.5 EFFICIENCY

5.5.1 MINIMUM VALUES OF ANTENNA EFFICIENCY

The efficiency of the antennas shall be a minimum of 60%.

5.5.2 TEST METHOD (ENGINEERING)

The antennas are tested while mounted inside the wireless device. The device is then tested in an anechoic chamber in free space. The efficiency of each antenna is

measured at a minimum of three frequency points across the band of interest. The antennas shall meet the minimum efficiency requirements.

5.6 ANTENNA GAIN VALUES

5.6.1 MINIMUM PEAK AND AVERAGE GAIN VALUES

The antennas shall meet the following minimum peak and average gain values:

	Azimuth Cut			
	Right Front Antenna		Left Front Antenna	
Frequency (GHz)	Power Sum Peak (dBi)	Power Sum Avg (dBi)	Power Sum Peak (dBi)	Power Sum Avg (dBi)
2.4	1.5	-3.0	2.0	-3.5
2.45	2.0	-3.0	2.0	-2.5
2.5	2.0	-3.0	2.0	-3.0

	Elevation Cut 1 (Front to Back)			
	Right Front Antenna		Left Front Antenna	
Frequency (GHz)	Power Sum Peak (dBi)	Power Sum Avg (dBi)	Power Sum Peak (dBi)	Power Sum Avg (dBi)
2.4	0.5	-2.0	1.0	-2.0
2.45	1.0	-2.0	1.0	-1.5
2.5	0.0	-2.5	0.0	-2.0

	Elevation Cut 2 (Side to Side)			
	Right Front Antenna		Left Front Antenna	
Frequency (GHz)	Power Sum Peak (dBi)	Power Sum Avg (dBi)	Power Sum Peak (dBi)	Power Sum Avg (dBi)
2.4	1.0	-2.5	1.0	-2.5
2.45	1.5	-2.0	2.0	-1.5
2.5	1.5	-2.5	2.0	-2.0

5.6.2 INDIVIDUAL ANTENNA MAX PEAK GAIN

The peak gain of individual antennas is as follows:

Frequency Band (MHz)	Typical MAX Peak Gain (dBi)
2400 - 2500	
Peak Gain Right Front Antenna	3.1
Peak Gain Left Front Antenna	3.7

5.6.3 TEST METHOD (ENGINEERING)

The wireless device with antennas installed is mounted in an anechoic chamber in free space.

The peak and average gain values are recorded for each antenna at the frequencies indicated.

6.0 MECHANICAL SPECIFICATIONS;

6.1 MECHANICAL CONFIGURATION

The appearances of the antennas are in accordance with drawing 02100073-04046.

6.2 CABLE PULL TEST

The antenna cable and solder joint shall withstand a 3 N axial pull force. The antenna element is fixed in an appropriate fixture and a 3 N axial force is slowly applied. The force is maintained for 10 seconds. There shall be no permanent damage to the antenna after the test.

7.0 ENVIRONMENTAL SPECIFICATIONS

7.1 OPERATING TEMPERATURE

Operating temperature range shall be 0° C to +60° C.

7.2 OPERATING HUMIDITY

Operating humidity range shall be 10% to 85%, non-condensing.

7.3 STORAGE TEMPERATURE

Storage temperature range shall be -20° C to +60° C.

7.2 STORAGE HUMIDITY

Storage humidity range shall be 5% to 90%, non-condensing.

8.0 QUALIFICATION

The mechanical and environmental tests mentioned above are performed according to the flow chart shown in Figure 1 below. The entire testing procedure will be conducted according to EN006E.

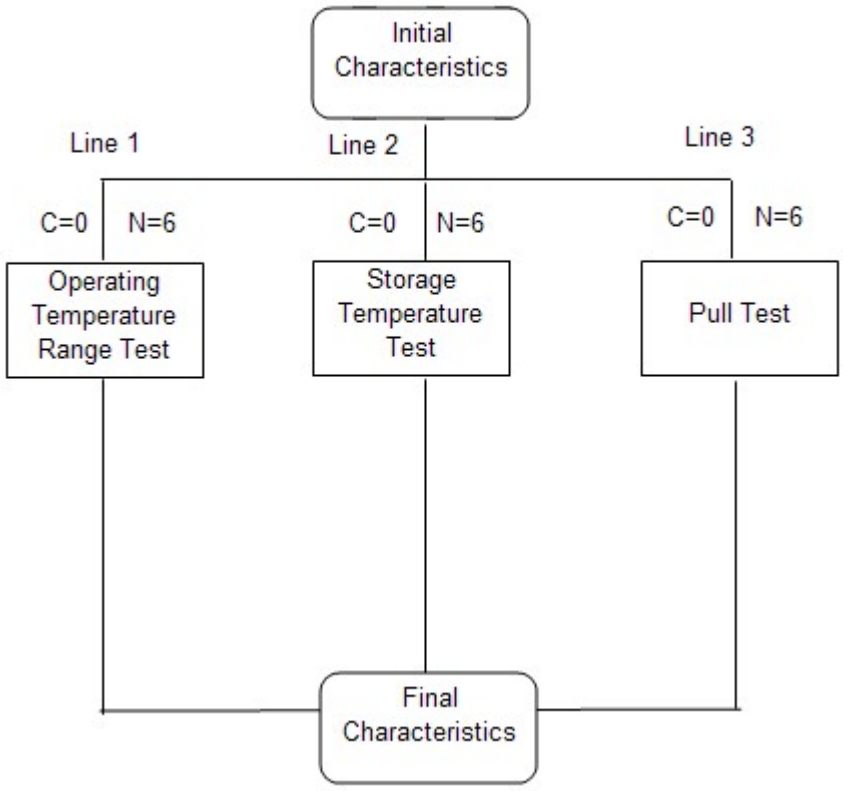

Figure 1. Property Verification Test Flow Chart
Note: n - sample size; c - allowable amount of critical failures

9.0 PACKAGING

02100073-04046 will be packed by tray, 80 pcs antennas in one tray and 2080 pcs in one box

DWG No
02100073-04046

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DRAWING COVER SHEET

REV	DATE	ECO#	DESCRIPTION
S1	2009.07.01		First Release

APPLICABLE SPEC'S:

SURFACE FINISH, MICROMETERS, CLA (UNLESS STADED) 0.8

TOLERANCES UNLESS OTHERWISE SPECIFIED:
NO PLACE (X)? TWO PLACE (X.XX)?.1
ONE PLACE (X.X)?.2 THREE PLACE (X.XXX)?.05

INTERNAL DISTRIBUTION

- ☐ PROCESS
- ☐ PURCHASING
- ☐ PRODUCTION
- ☐ PLASTICS
- ☐ QUALITY
- ☐ INCOMING INSPECTION
- ☐ FINAL INSPECTION
- ☐ MARKETING

METRIC SCREW THREAD TO ISO STANDARDS 724, 2861, 965-1 AND 965-2 INCHES SCREW THREAD TO ANSI/ASME B1.1. ALL ANGLES TO BE 90?UNLESS OTHERWISE STATED. TOLERANCE ON ANGLES ?/4? ALL TOLERANCES APPLY AFTER FINISHING. MACHINE CORNER RADS. 0.25 MAX., TO BE FREE FROM BURRS, SHARP EDGES AND ALL FOREIGN MATERIALS. FLASH ALLOWANCE FOR PLASTIC MOLDED PARTS TO BE 0.1mm UNLESS OTHERWISE STATED. DIAMETER? MUST BE CONCENTRIC WITHIN 0.08 T.I.R..ENVIRONMENTAL REQUIREMENT:COMPLIANCE WITH GALTRONICS STANDARD' SUPPLIER ENVIRONMENTAL DECLARATION PROCEDURE"(SOPOO2E)

QUALITY ASSURANCE NOTES:

NO CHANGE, SHALL BE ALLOWED ON PRODUCTION. MATERIAL WITHOUT PRIOR EXPLICIT WRITTEN APPROVAL BY GALTRONICS ENGINEERING AND PURCHASING DEPARTMENTS FOR SPECIAL REQUIREMENTS SEE FMI49

- ☒ XR PROCESS CONTROL CHART REQUIRED WITH EACH SHIPMENT
- ☐ CRITICAL DIMENSION AFFECTS FORM FIT OR FUNCTION

MATERIAL

FINISH

TITLE:

ANTENNA, HORIZONTAL DUAL 2.5 - 5 GHz

CHKD:

APRVD:

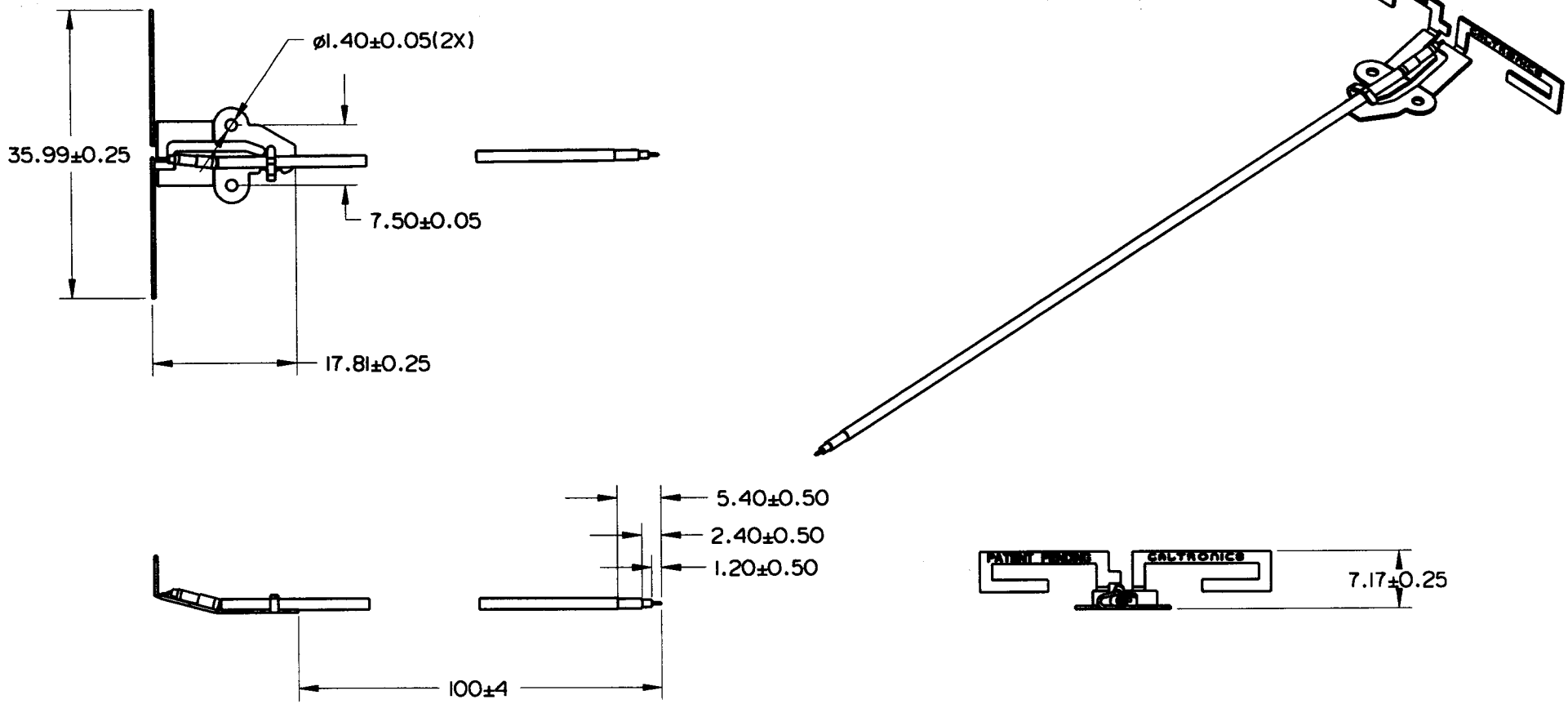
DATE:

DWG. No.
02100073-04046

REV. **S1**

DWG. NO.: A3
02100073-04046

ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE STATED. DO NOT SCALE - IF IN DOUBT, ASK!! SEE COVER SHEET FOR PERTINENT INFORMATION



NO	DESCRIPTION	MATERIAL	FINISH
2	CABLE, COAX	ø1.37 O.D., COLOR BLACK, 117MM LONG	
1	ELECTRICAL ELEMENT	STAINLESS STEEL SS304 THICKNESS 0.4 mm	NICKEL PLATING

CAD FILE: 02100073-04046

GALTRONICS

THIS PRINT IS GALTRONICS CONFIDENTIAL

ENGINEER	Sam	CHECKED	
DRAWN	MB	APPVD.	
DATE	2009.07.01	DATE	

ANTENNA, HORIZONTAL DUAL 2.5 - 5 GHz

DWG. NO.: A3 **02100073-04046** REV. SI

Linksys Wireless Video Camera WVC100N
Galtronics Embedded Antenna Solution

Update 09-06-28

Prepared by Marin Stoytchev
Galtronics Project # 4046

June 28, 2009

Introduction

- Wireless Camera product, utilizing 2.4GHz 802.11n technology, with 2x2 MIMO diversity
- Two embedded antennas needed, with limited space available inside enclosure
- Galtronics solution provides two compact, balanced antennas attached to bottom plastics of housing
  - No changes to the enclosure ID, except features for antenna attachment
  - Ground deletion of 35 mm x 5 mm is required on main PCB in areas of antennas
  - Antenna performance is updated for device with production plastics

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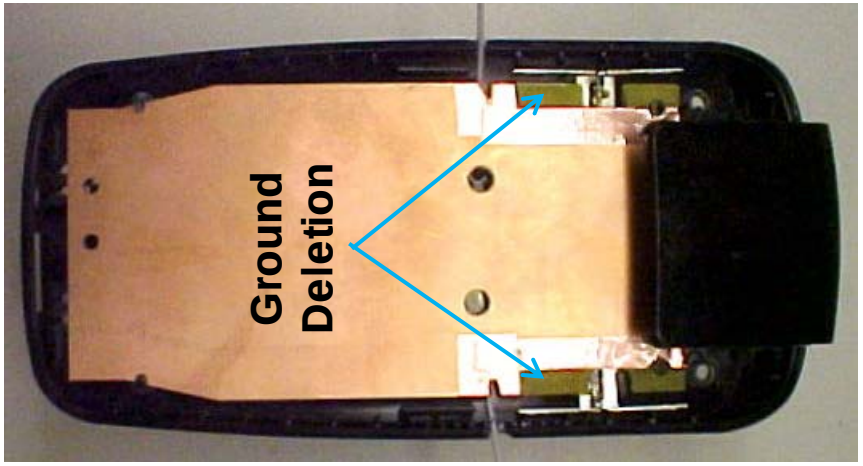
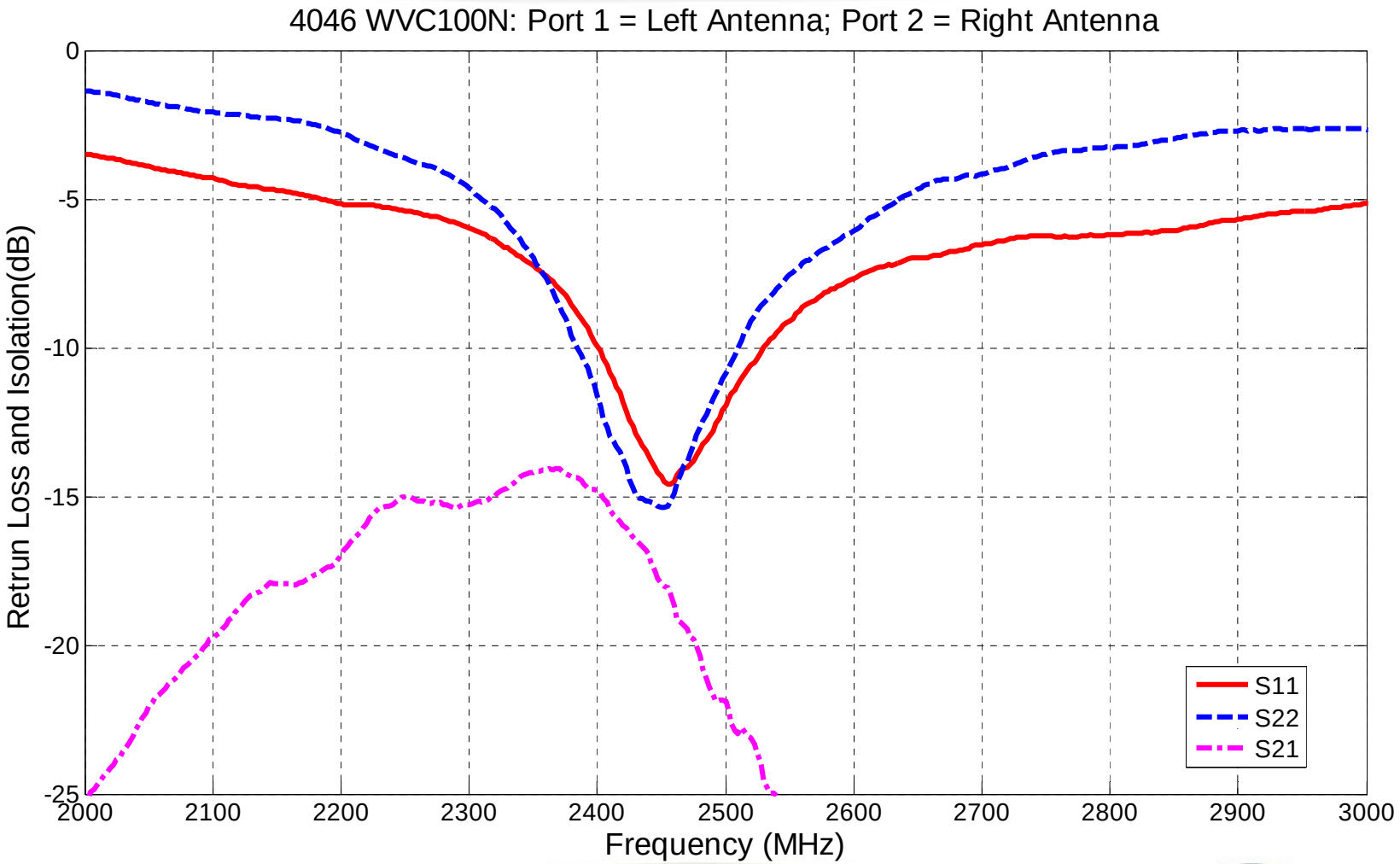
Galtronics Embedded Antenna Solution

Galtronics Proprietary Antenna Design - Patent Pending



- Galtronics proposes two 2.4-GHz antennas, denoted as **Left** and **Right**, attached to bottom plastics
  - Antennas require **35 mm x 5 mm ground deletion** on main PCB in the antenna areas as shown above
  - For testing antennas are attached to plastics using hot glue – in production antennas will be attached via heat stakes

Return Loss and Isolation



Antenna Efficiency

	Frequency (GHz)	Directivity	Peak Gain	S11	Terminal Efficiency
Left Antenna	2.400	5.74	3.21	-10.18	62.85%
	2.450	4.87	3.23	-14.16	68.67%
	2.500	5.49	3.63	-11.39	65.22%
	AVERAGE				**65.58%**

	Frequency (GHz)	Directivity	Peak Gain	S11	Terminal Efficiency
Right Antenna	2.400	3.85	2.29	-12.18	69.75%
	2.450	4.34	3.07	-15.45	74.54%
	2.500	4.43	2.96	-11.41	71.27%
	AVERAGE				**71.85%**

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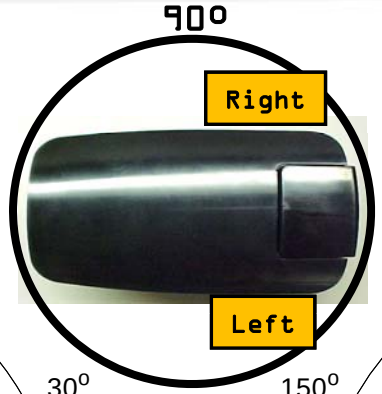
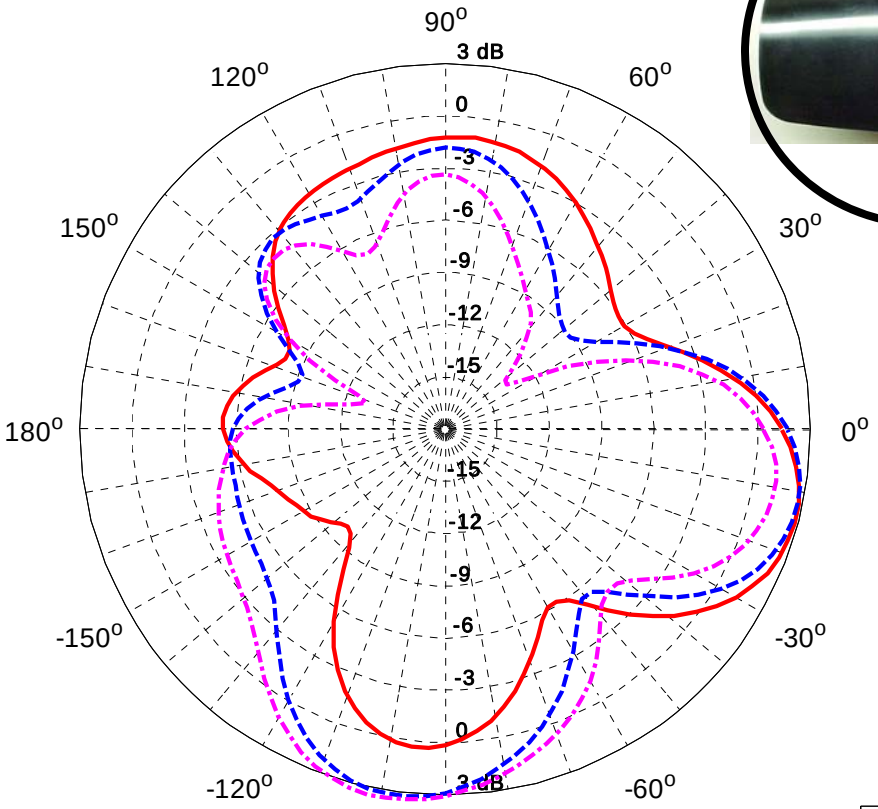
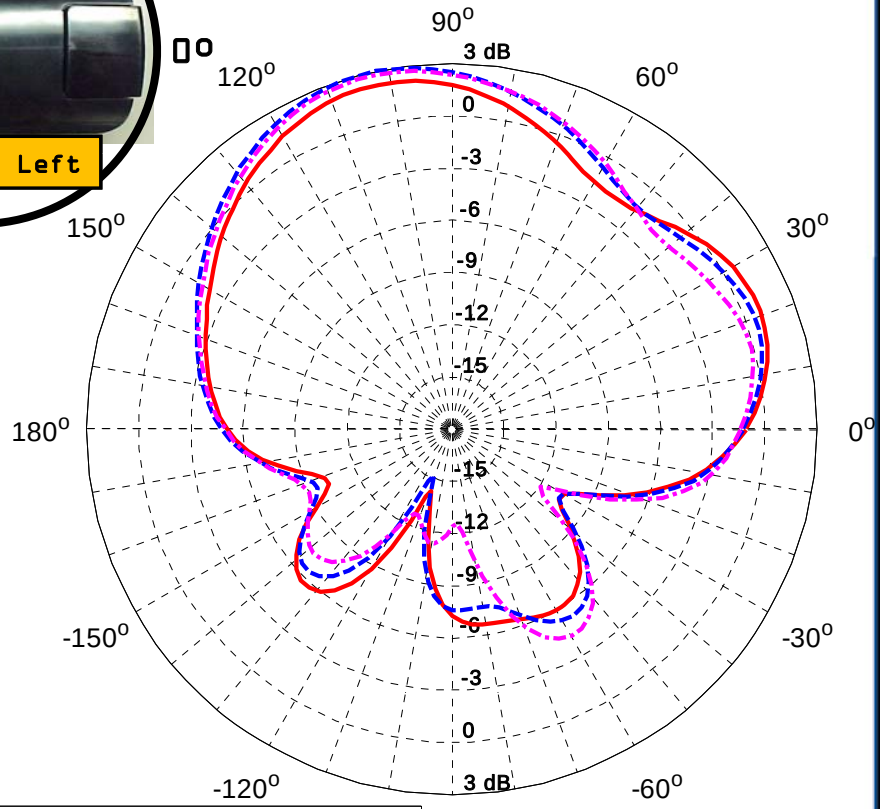
Antenna Patterns: Azimuth Cut





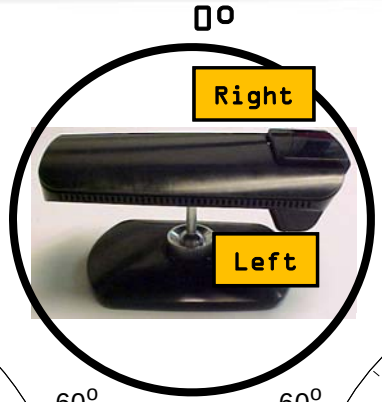
Beam$_1$ = 2400 MHz : Max Gain$_1$ = 2.83 dBi at -15°
Beam$_2$ = 2450 MHz : Max Gain$_2$ = 3.22 dBi at -99°
Beam$_3$ = 2500 MHz : Max Gain$_3$ = 3.47 dBi at -99°

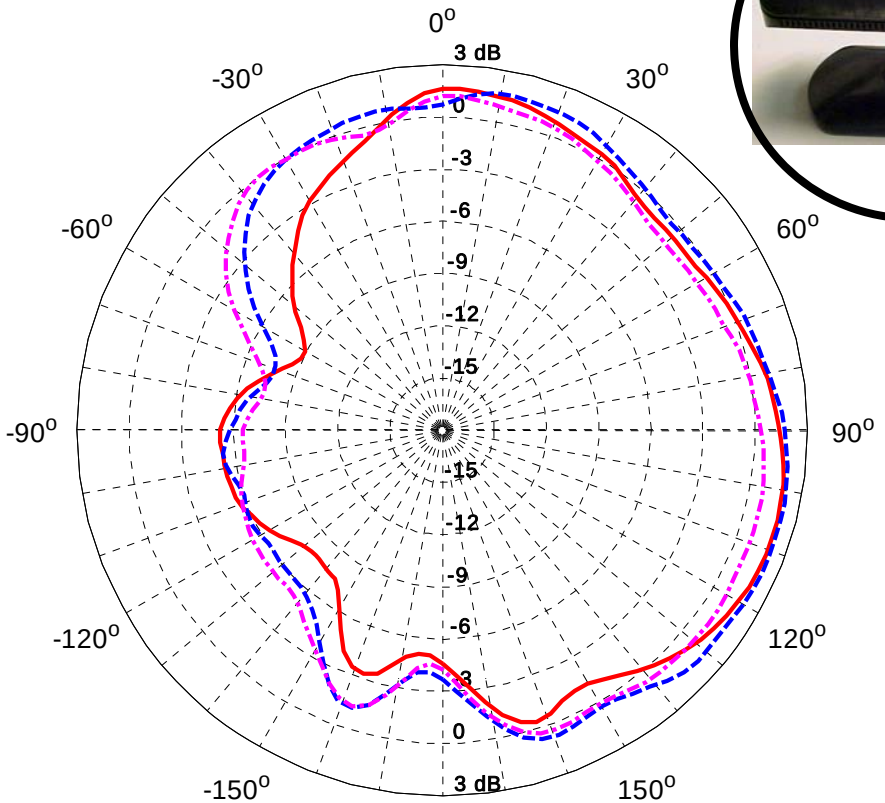


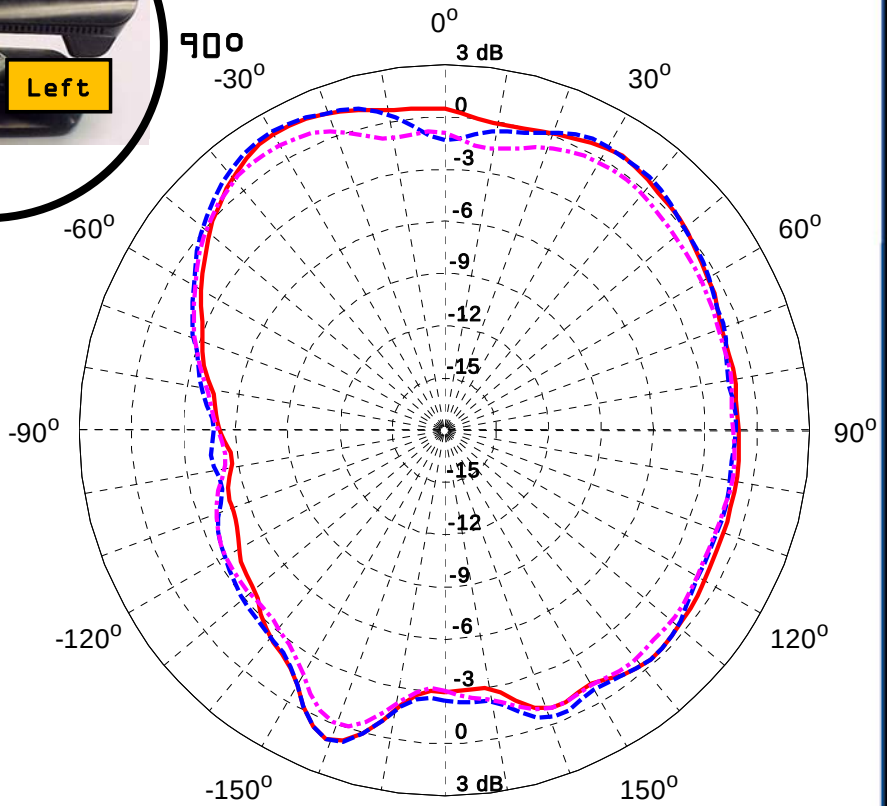
Beam$_1$ = 2400 MHz : Max Gain$_1$ = 2.26 dBi at 105°
Beam$_2$ = 2450 MHz : Max Gain$_2$ = 3.03 dBi at 105°
Beam$_3$ = 2500 MHz : Max Gain$_3$ = 2.83 dBi at 105°

GALTRONICS

Antenna Patterns: Elevation Cut 1 (Front-to-Back)

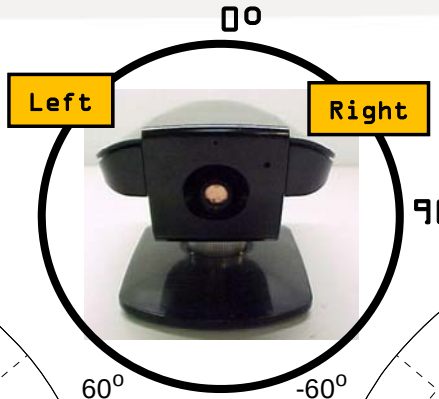


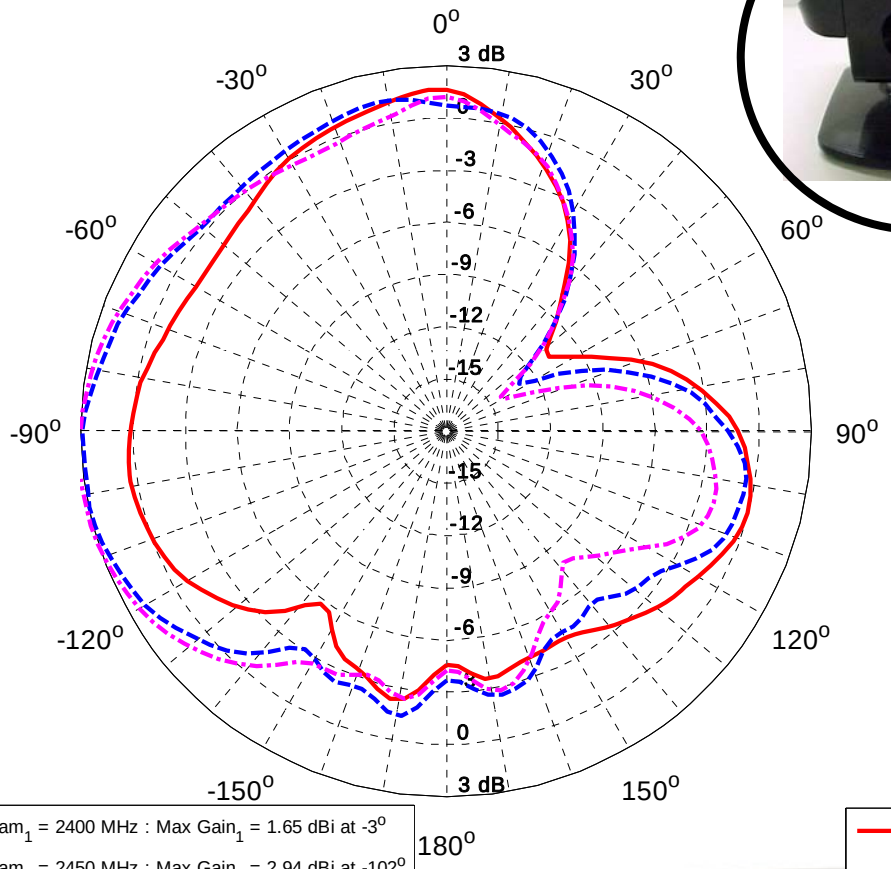


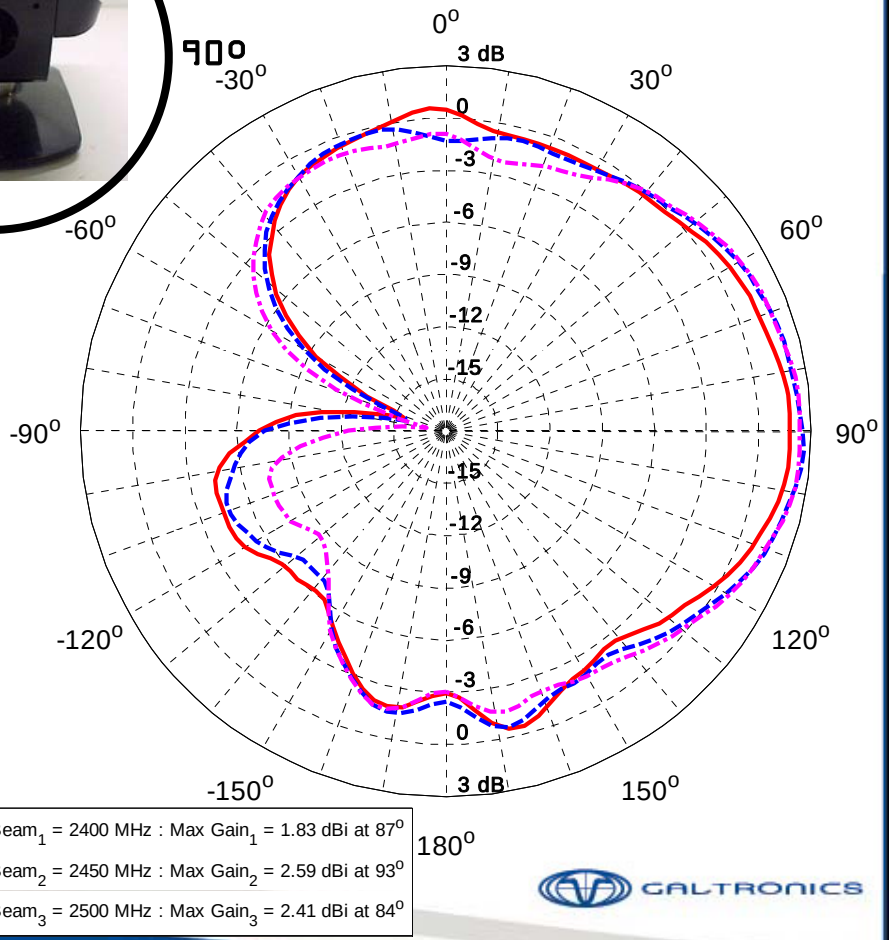


GALTRONICS

Antenna Patterns: Elevation Cut 2 (Side-to-Side)







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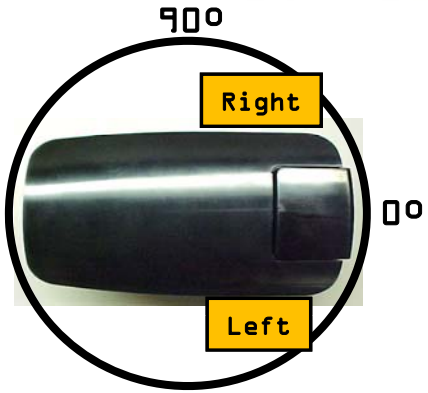
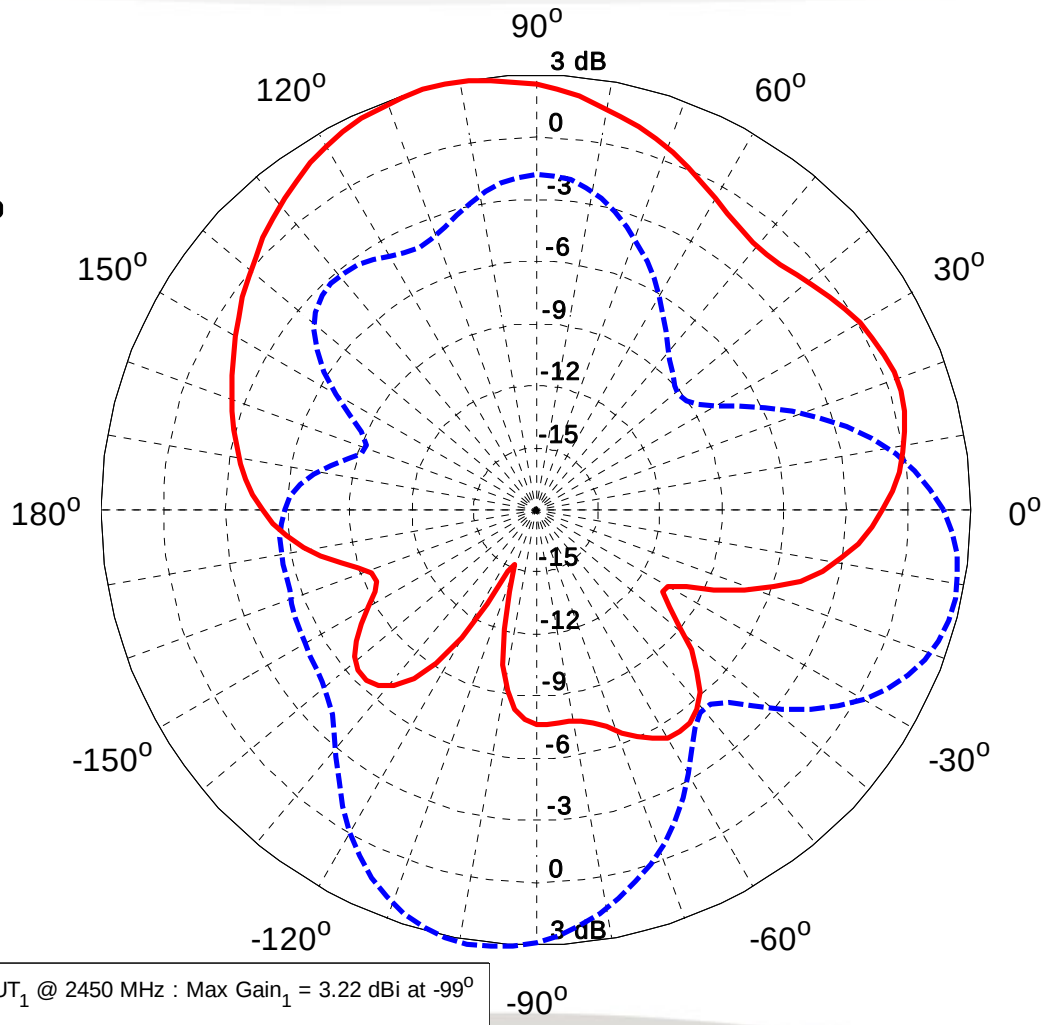
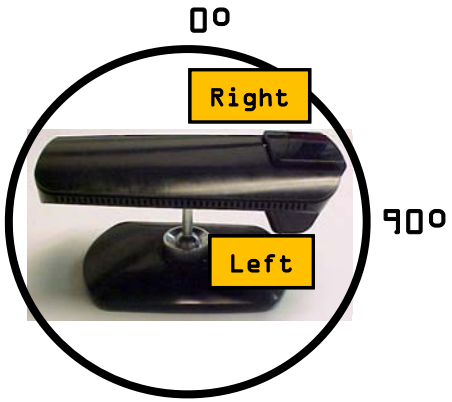
System Coverage: Azimuth Cut

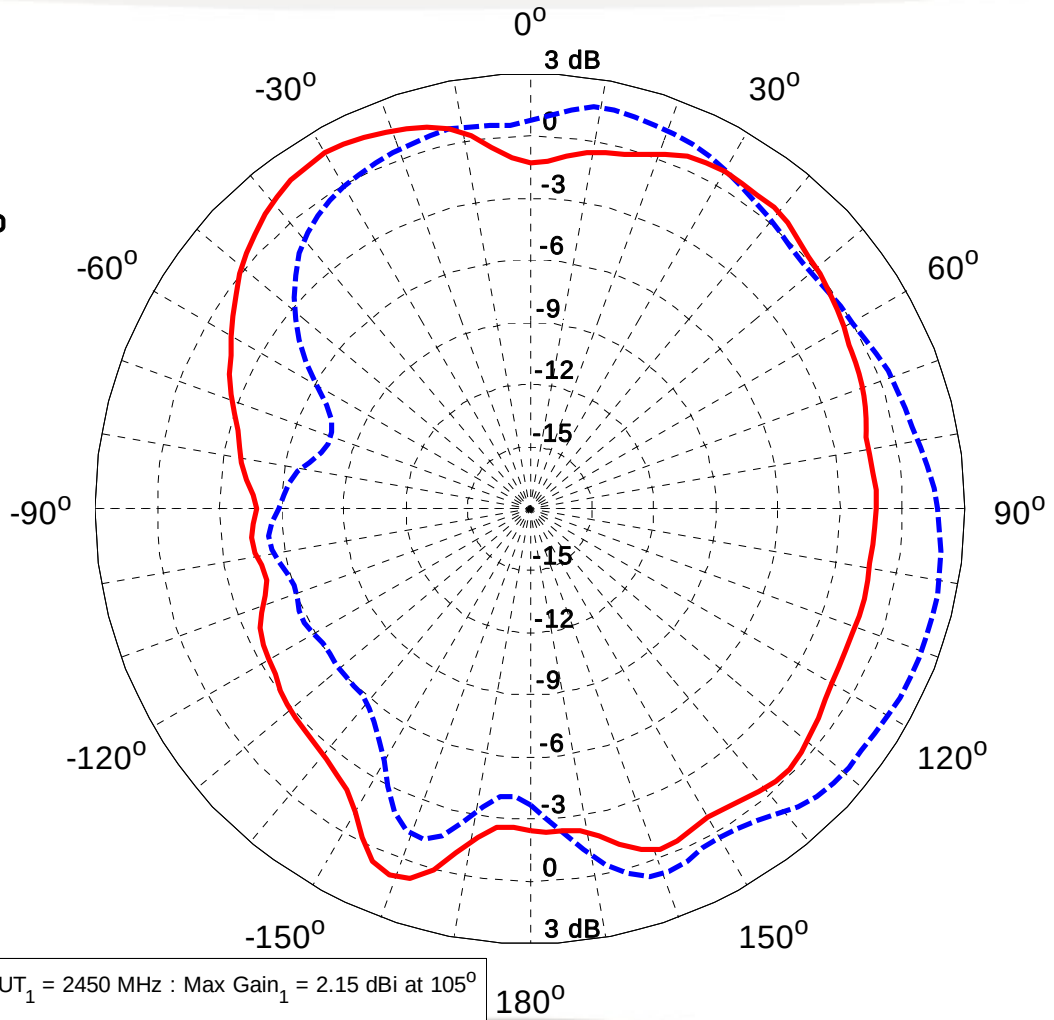




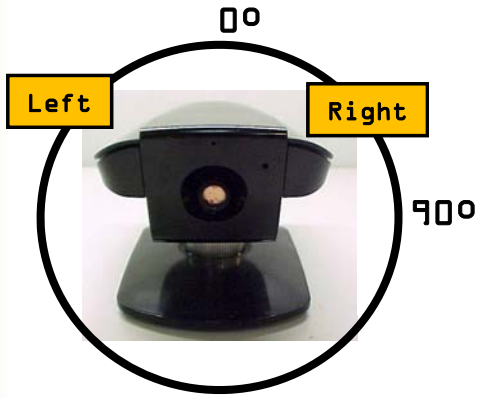
GALTRONICS

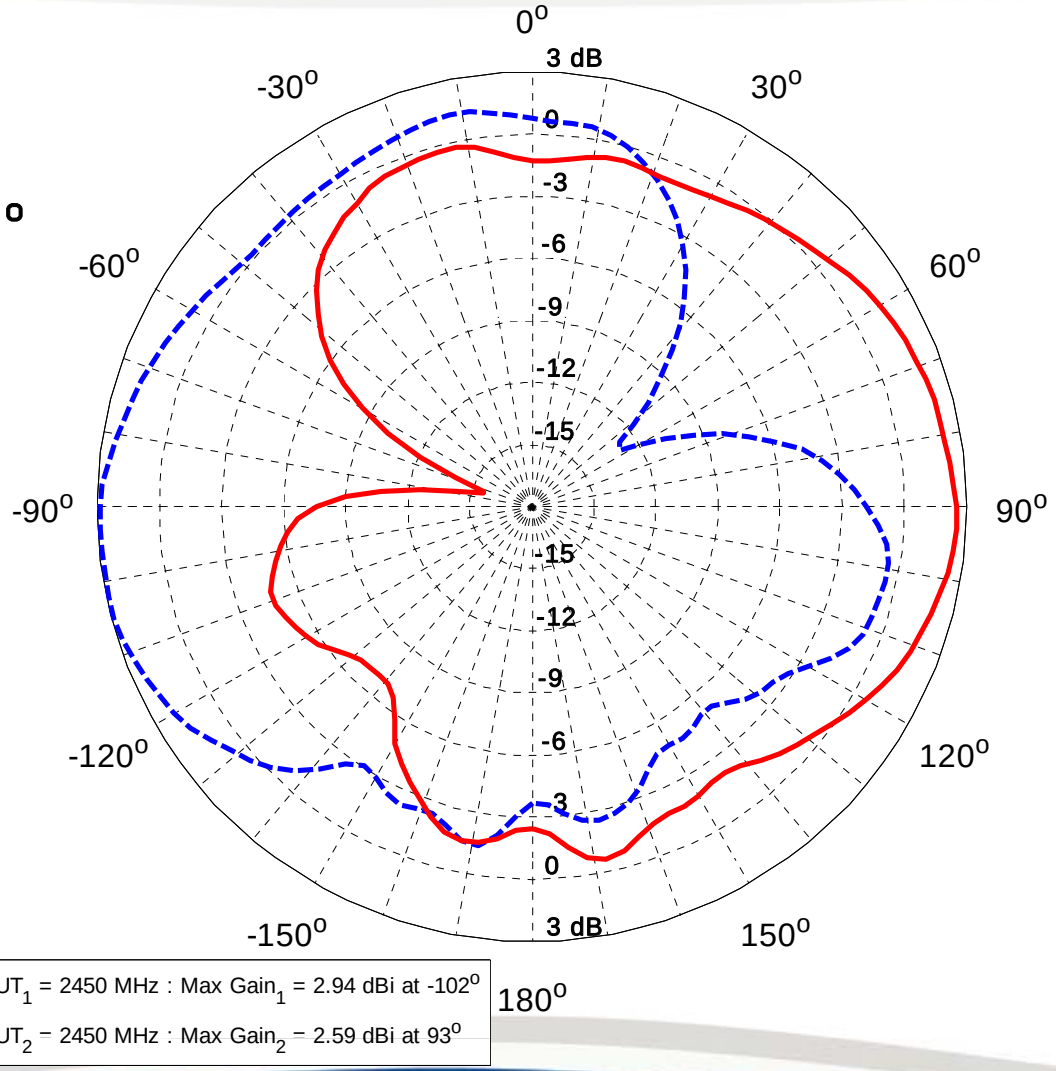
System Coverage: Elevation Cut 1 (Front-to-Back)





System Coverage: Elevation Cut 2 (Side-to-Side)





Summary

Galtronics antennas solution for Linksys WVC100N provides two compact, balanced antennas attached to the bottom plastics of the device enclosure. Antennas are tested in production plastics and show the following characteristics:

- Return Loss
  - Good
- Isolation
  - Good
- Efficiency
  - Good to Excellent
- Antenna Patterns
  - Excellent 3-D coverage and Pattern Diversity