



GALTRONICS

## ANTENNA SPECIFICATION

Revision : S3  
Part No : 3805-WAG160N  
Project No : 380500

REV NO.	DATE	DESCRIPTION
S1	22-11-07	Original release.
S2	07-12-07	Add position and update gain value.
S3	12-12-07	Customer Name: Sercomm was Cercomm
<b>DISTRIBUTION LIST:</b>	3.	
1.		
2.		
APPROVED BY	SIGNATURE	DATE
Engineering Department Manager	<i>Chanté</i>	12-12-2007
Mechanical Engineer	<i>Lei Zou</i>	Dec. 12, 07
RF Engineer	<i>Nortel</i>	
<b>Approved By Customer (as required):</b>		

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## **Preliminary Design Specification**

### **2.4 GHz Compact Balanced Antennas For Linksys WAG160N Wireless Router**

**Antenna P/N:**

**021000073-3805A2  
021000073-3805A3**

**Customer P/N**

**61721010GN  
61721011GN**

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## 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

$\Omega$	Ohm
$^\circ$	Degree
$^\circ\text{C}$	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 Antenna. The patent-pending design consists of a single-piece high performance balanced antenna with coaxial cable. The cable is stripped and pre-tinned for soldering to device PCB. Two antennas are used per unit. The antennas have mounting features allowing for alignment and attachment to plastic enclosure. The antennas are held in place using heat-staking methods.

### 4.2 PART NUMBER

Galtronics P/N	SERCOMM P/N	Frequency Band	Position
021000073-3805A2	61721010GN	2.4 - 2.5 GHz	Right
021000073-3805A3	61721011GN	2.4 - 2.5 GHz	Left

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## **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 antenna does 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 antenna is tested while mounted in the wireless router. The router 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 50%.

#### **5.5.2 TEST METHOD (ENGINEERING)**

The antennas are tested while mounted inside the wireless router. The router 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.



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### 5.6 MINIMUM PEAK AND AVERAGE GAIN

#### 5.6.1 PEAK GAIN LIMITATION

According to FCC limitation, the peak gain of the antennas shall be limited to the following values:

	Maximum Peak Gain	Typical Peak Gain (Reference)
Peak Gain Left Rear Antenna	Linksys to Define	2.1 dBi
Peak Gain Right Rear Antenna	Linksys to Define	2.1 dBi

#### 5.6.2 TEST METHOD (ENGINEERING)

The wireless router 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. The antennas shall meet the minimum peak and average gain values.

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**6.0 MECHANICAL SPECIFICATIONS****6.1 MECHANICAL CONFIGURATION**

The appearance of the antenna is in accordance with drawing 021000073-3805AX.

**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 RANGE TEST**

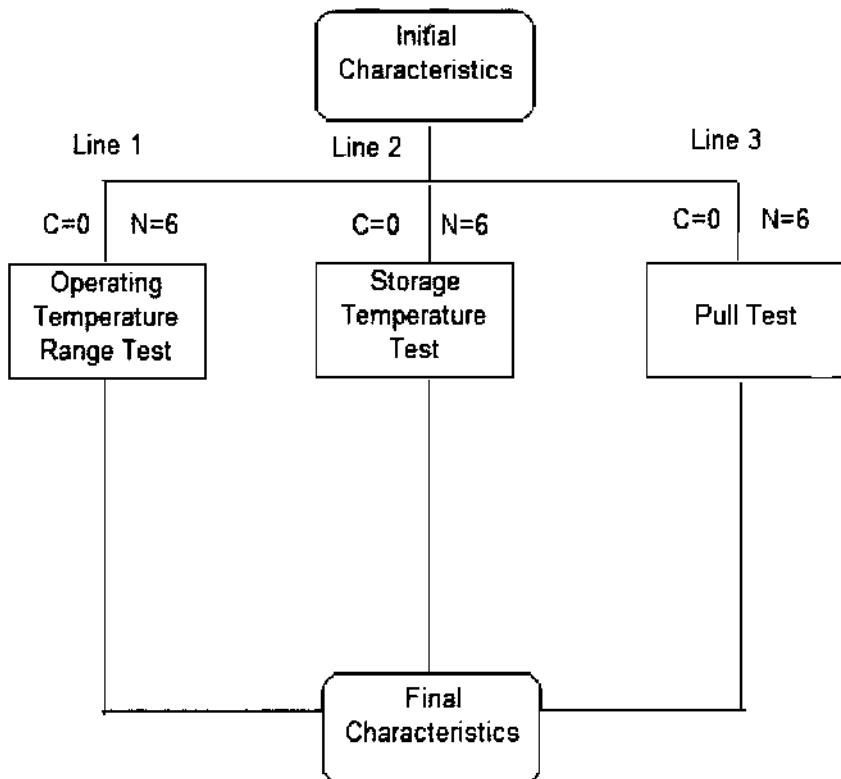
The operational temperature range shall be 0°C to +85°C at 85% RH. The antenna should be checked immediately after 1 hour soaking in each temperature including VSWR data for each. After test is completed, the antenna should function mechanically. Electrical characteristics should be within the specified range.

**7.2 STORAGE TEMPERATURE TEST**

Place the antenna in an environmental chamber at -20°C during 24 hours. Then increase temperature to value of -60°C at 90±5% RH during 2 hours, and soak the antenna 24 hours. After test is complete, there shall be no visual deterioration or damage. Electrical characteristics should be within the specified range.

**8.0 QUALIFICATION**

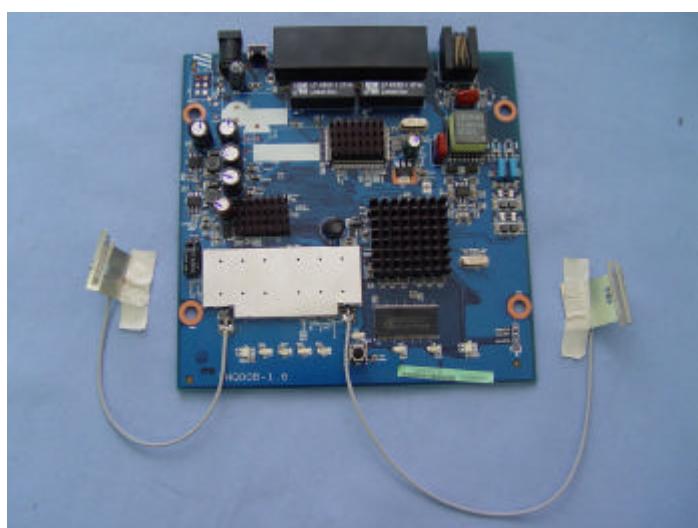
The mechanical and environmental tests mentioned above are performed according to the flow chart shown in Figure 1 below. The entire testing procedure will be conducted according to EN006E.



**Figure 2. Property Verification Test Flow Chart**

Note: n - sample size; c - allowable amount of critical failures

## 9.0 PIFA Antenna Appearance



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DWG No  
021000073-3805AX

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## DRAWING COVER SHEET

REV	DATE	ECO #	DESCRIPTION
S3	07-11-07		P/N WAS 021006073NC3805; ADDED P/N TABULATION TABLE; "A" DIMENSION WAS 153.
S4	09-11-07		-1 "A" DIM WAS 164; -2 "A" DIM WAS 173; ADDED -3.
S5	13-11-07		ADDED -4, ADDED DIMENSIONS AND TOLERANCES.
S6	30-11-07		Modify the strip dimensions. 1,2 was 2.5, 3 was 4, 6 was 7. Add label. 21.5 was 19.5.

## APPLICABLE SPEC'S:

## INTERNAL DISTRIBUTION

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

SURFACE FINISH, MICROMETERS, CLA (UNLESS STATED) 0.8

TOLERANCES UNLESS OTHERWISE SPECIFIED;

NO PLACE (X)±0.1 TWO PLACE (X,XX)±0.1

ONE PLACE (X,X)±0.2 THREE PLACE (X,XXX)±0.05

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 ±1/4°. 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 REQUIREMENTS: COMPLIANCE WITH GALTRONICS STANDARD "SUPPLIER ENVIRONMENTAL DECLARATION PROCEDURE" (SOPGO02E).

## 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		

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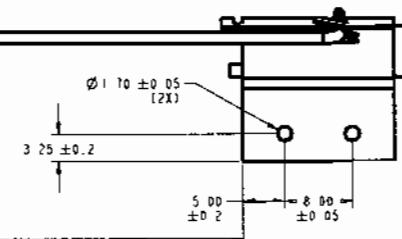
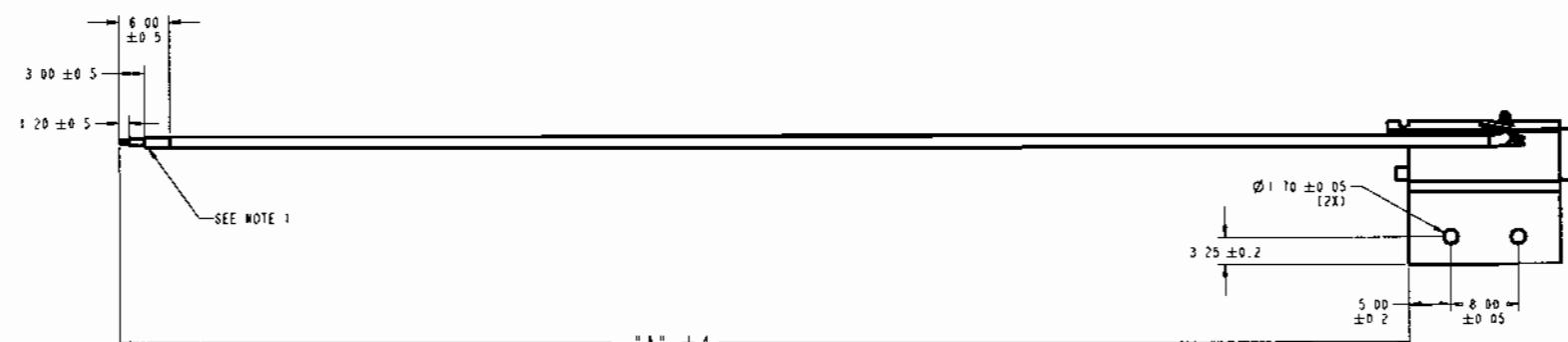
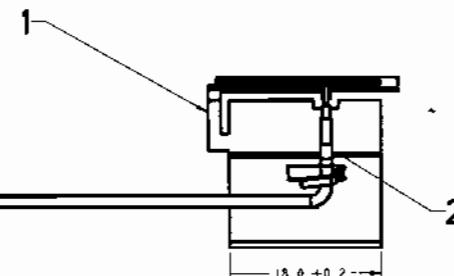
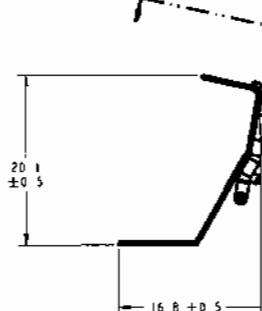
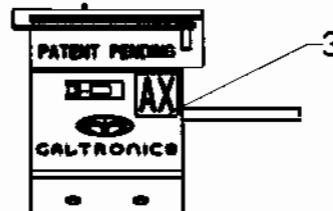
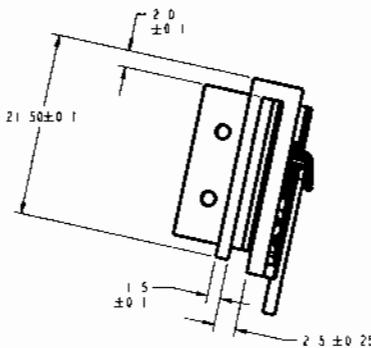
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TITLE:  MAIN ANTENNA	CHKD:	DWG. No.
	APRVD:	021000073-3805AX
	DATE: 20/11/07	REV. S6 PAGE 1 OF 2

## NOTES

1. STRIPPED AND TINNED, USING LEAD FREE SOLDER. BARE END OF COAX CABLE

PART NUMBER	"A" DIMENSION
021000073-3805A1	164
021000073-3805A2	193
021000073-3805A3	126
021000073-3805A4	75



3	LINE 1	
2	CABLE, COAX	Ø 1.17 Ø.0
1	ELECTRICAL ELEMENT	STAINLESS STEEL 30304 THICKNESS 0.4 MM
NO	DESCRIPTION	MATERIAL FINISH

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DRAWN LEO APPROVED  
DATE Dec.2.07 DATE *12/2007*

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