

Antenna Hardware Specification

Project Name:	Wizard / Prodigy	Date:	2005/June/21
Project Manager:		Rev.:	1.3

Countersign:

Chuan-Ku Liu _____

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Revision History

Revision	Revision Notes	Date	Revisers
1.0	Creation of the document	2005/Mar/26	Chuan-Ku Liu
1.1	Add peak gain for BT and WLAN	2005/June/10	Chuan-Ku Liu
1.2	Modify description and GSM typical antenna gain	2005/June/19	Chuan-Ku Liu
1.3	Remove 3.3.1 and 3.3.2	2005/June/21	Chuan-Ku Liu

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CONTENTS

Wireless LAN, Bluetooth, and GSM Antennas Specification	p. 4
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1. Overview

This document is the specification of the wireless LAN, Bluetooth, and GSM antennas for the project Wizard.

1.1 Denotations

dBi: Decibel relative isotropic antenna

VSWR: Voltage Standing Wave Ratio

Tx: Transmit frequency

Rx: Recieve frequency

EDGE: Enhanced Data rate for GSM Evolution

AMPS: Advanced Mobile Phone Service

GSM: Global Service for Mobile communication

PCS: Personal Communication System

DCS: Digital Communication System

SAR: Specific Absorption Rate

WLAN: Wireless Local Area Network

BT: Bluetooth

Peak Gain: The peak value of the antenna gain

Average Gain: The average value of the antenna gain

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2. Measurement Parameters

2.1 VSWR

VSWR indicates the matching characteristics of the antenna. VSWR is usually measured by using a network analyzer.

2.2 Radiation Pattern and Gain

The far field radiation pattern and antenna gain is usually measured in qualified anechoic chamber. Standard antenna is required for the measurement.

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3. Electrical Requirements

3.1 Wireless LAN Antenna

Antenna Type : PIFA

Typical Antenna Parameters

Frequency	VSWR	Average Gain	Peak Gain
2400 ~ 2500 MHz	2.0	-5 dBi	1 dBi

3.2 Bluetooth Antenna

Antenna Type : PIFA

Typical Antenna Parameters

Frequency	VSWR	Average Gain	Peak Gain
2400 ~ 2500 MHz	2.5	-8 dBi	-1 dBi

3.3 GSM Quad-Band Antenna

Antenna Type : PIFA

Typical Antenna Parameters

Frequency	VSWR	Average Gain	Peak Gain
824 ~ 894 MHz	3.5	-4 dBi	-0.5 dBi
880 ~ 960 MHz	3.5	-4 dBi	-0.5 dBi
1710 ~ 1850 MHz	3.5	-3 dBi	1.5 dBi
1850 ~ 1990 MHz	3.5	-3 dBi	1.5 dBi

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4. Mechanical Requirements

- (a) **Size:** Fit the placement.
- (b) **Weight:** Less than 3 gram. The weight should be balanced for placing.
- (c) **Flatness:** The surface should be flat for system fabrication.

5. Antenna Materials

The antenna must not have the materials of lead (plumbum, Pb), halogen and mercury (Hg).

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6. Transfer Speed Test Configuration

Note: The transfer speed test is the performance evaluation of the whole system.

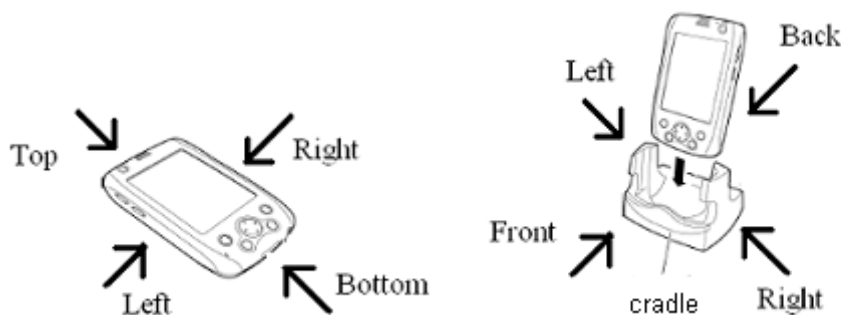
6.1 Test Methods

The eight angle conditions are defined as below.

For the pattern without cradle, the angles are Top, Right, Bottom, and Left.

For the pattern with cradle, the angles are Front, Right, Back, and Left.

The test environment is an open area without obstacle between transmitter and receiver.



6.2 Test for Bluetooth

Execute file transfer using FTP protocol between two PDA, measure the throughput.

Distance is 10 m. (including short distance function pretest)

One PDA is fixed at its maximum gain angle.

The throughput performance should be specified in general wireless spec.

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6.3 Test for Wireless LAN

Use 20 dBm output power access point to connect with PDA.

Minimum distance is 50 m.

(the exact distance would be determined by taking the RF output power level into consideration)

The throughput test software is “Chariot”.

The throughput performance should be specified in general wireless spec.

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