Ultra Wideband (UWB) Antenna

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Outline of Presentation

• Project Summary
  – Introduction to UWB
  – Introduction to Antennas

• Review of Previous Works
• Block Diagram
• Requirements and Specifications
• Equipment List
• Schedule
Intro to Antennas

• An antenna is a transducer between a guided wave propagating in a transmission line, and an electromagnetic wave propagating in an unbounded medium, like air.
Intro to UWB

• UWB is defined as a system having a bandwidth greater than 500 megahertz (MHz).
• UWB signals are pulse-based waveforms compressed in time, instead of sinusoidal waveforms compressed in frequency.
Intro to UWB (cont.)

**Time-domain behavior**

- Impulse Modulation

**Frequency-domain behavior**

- Frequency: 3 GHz to 10 GHz
- (FCC Min=500MHz)

**Narrowband Communication**

- Frequency Modulation

- Frequency: 2.4 GHz
Review of Previous Works

- Picture of a Monopole Antenna
Review of Previous Work (Standards)

- Frequency Range: 3.17 GHz to 10.56 GHz
- Channel Spacing: 528 MHz
- Symbol/Chip Rate: 3.2 MHz
- Sub Carrier Spacing: 4.125 MHz
- Others can be seen at http://cp.literature.agilent.com/litweb/pdf/59.pdf
Review of Previous Works (Patents)

- Electrically small planar UWB antenna apparatus and related system [http://www.patentstorm.us/patents/6590545.html](http://www.patentstorm.us/patents/6590545.html)
Figure 3-1
Overall System Block Diagram
Requirements and Specifications

• Omni-directional
• Small in size, low in cost
• VSWR less than 2
• Gain less than 5dB and relatively constant
• Impedance Matching
Equipment List

• Network analyzer - HP8722C or HP8410C
• Spectrum analyzer - HP8593E or HP8559A
• Signal generator - HPE4433B
• Agilent Advanced Design System (Ver 2004A)
• Sonnet 10.52
• Anechoic Chamber
• Agilent VEE pro
## Schedule

### Schedule for UWB Antenna Senior Project

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Questions

Questions are guaranteed in life; Answers aren't.