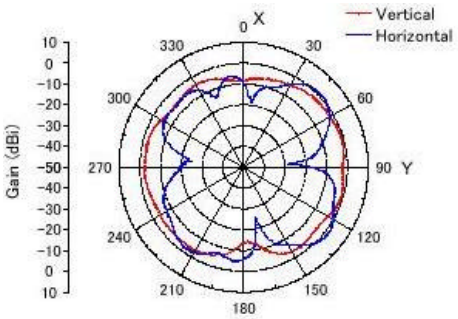
Reference Antenna Kit for Intel® PRO/Wireless LAN Mini-PCI Adapters

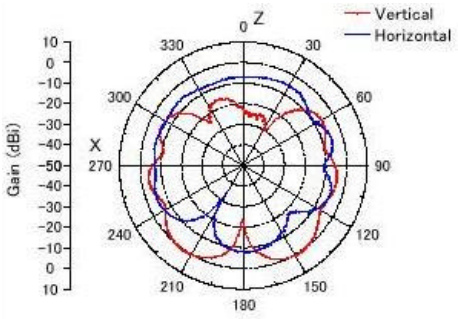
The Intel® PRO/Wireless LAN Mini-PCI adapter (models: 5000, 7100 and 2100) requires an embedded antenna in a notebook PC or other platform where the adapter is used. It is recommended that the antenna have similar characteristics to the antenna specification described in this technical reference sheet. The antenna detailed in this document is designed for operation in both 802.11a and 802.11b radio spectrums (i.e. 2.4 GHz and 5 GHz). Note: only the 5 GHz is required. This antenna is available with a 400mm (20-inch) connect cable from the external vendor as detailed on the back page.

The antenna directivity patterns in the azimuth XY and XZ planes are displayed below at both 2.4 GHz and 5.2 GHz.

2.4 GHz (802.11b) Range (Frequency: 2.45 GHz. Power: 5dBm)



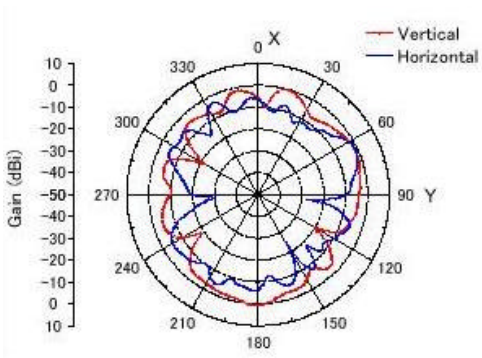
XY Plane



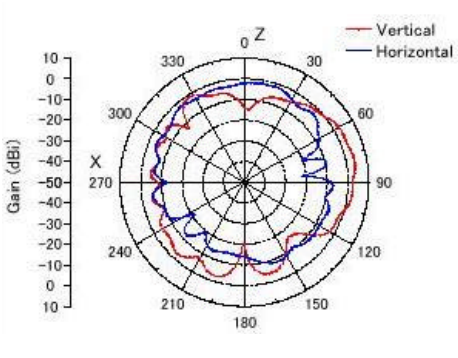
XZ Plane

Vertical Polarization peak gain:	-0.88 dBi	Vertical Polarization peak gain:	-0.60 dBi
Horizontal Polarization peak gain:	1.67 dBi	Horizontal Polarization peak gain:	-5.11 dBi
XY plane average gain:	-2.34 dBi	XZ plane average gain:	-4.07 dBi

5 GHz (802.11a) Range (Frequency: 5.25 GHz. Power: 5dBm)

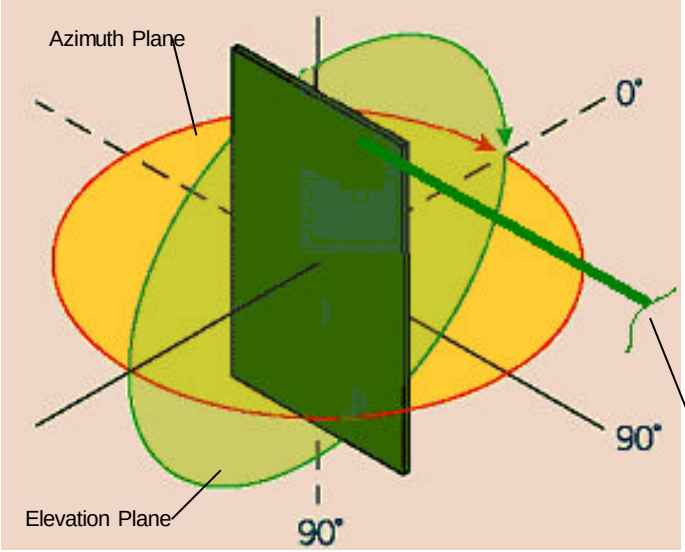


XY Plane



XZ Plane

Vertical Polarization peak gain:	-0.78 dBi	Vertical Polarization peak gain:	4.15 dBi
Horizontal Polarization peak gain:	-1.01 dBi	Horizontal Polarization peak gain:	-1.50 dBi
XY plane average gain:	-3.42 dBi	XZ plane average gain:	-1. 81dBi



Antenna Specifications

Frequency Range	802.11b – 2.4 – 2.5 GHz 802.11a – 5.15 – 5.35 GHz
Nominal Peak Antenna Gain	0 dBi
Polarization	Linear, vertical
Input VSWR	<2.0:1 Max
Input Feedpoint Impedance	50 ohms
Maximum Power Input	10 watts
Static Protection	Element and Feed are recommended
Regulatory Approvals	FCC Parts 15B and 68, UL, C-UL, Industry Canada, CE Approval, VCCI (Japan), ETSI.
Width	30.98 mm
Length	30.54 mm
Height	1.29 mm

The Hitachi-Cable antenna is constructed from rolled copper with Kapton tape on both sides. This configuration yields thin radiating elements. A Hitachi-Cable coax is directly soldered to the structure as shown above. The antenna can be mounted in the rear of the laptop LCD panel. The following shows the 2.4 GHz and 5 GHz Band Free-Space Azimuth Pattern.

Antenna Cable

The connector on the opposite end of the connect cable from the antenna, is a Hirose U.FL. connector. This connector cable and antenna assembly is designed specifically for use with Intel® PRO/Wireless 5000, 7100 and 2100 Mini-PCI Adapters.


Hirose U.FL Connector

The cable specifications are:

- Diameter 1.13 mm
- Length 400 mm

Measured Gain

The Hitachi-Cable dual-band elements were measured with 400mm (20-inch) of coaxial cables. It is estimated that this length of cable attributes ~4 dB of loss.

	With Cable Loss		Without Cable Loss (assumed 4 dB)	
Percent Gain	2.4 GHz	5.2 GHz	2.4 GHz	5.2 GHz
95%	-8.00 dBi	-6.7600 dBi	-4.00 dBi	-2.7600 dBi
90%	-2.66 dBi	-6.1200 dBi	+1.34 dBi	-2.1200 dBi
80%	-1.23 dBi	-3.6900 dBi	+2.77 dBi	+0.3100 dBi

Volume Purchasing Contact Information

Aki Kenmotsu - Hitachi Cable America, Inc. 3625 Del Amo Blvd., Suite 385. Torrance, CA 90503
Phone (310) 542-9680 - Fax (310) 542-9610

Hitachi Long Antenna Assembly. Part Number - HFD01-IT02