



APPLICATION NOTE:

Benefits of 5 GHz (dual band) 802.11a/802.11n

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“The recommended design and deployment guidelines for a hospital Wi-Fi network uses dual-band Wi-Fi CERTIFIED n access points to offer simultaneous service at both 2.4 GHz and 5 GHz. This design offers the highest data capacity and immunity to interference while accommodating all generations of Wi-Fi client devices. “

Wi-Fi Alliance

February 2011

Objective:

The purpose of this application note is to clarify the benefits of dual-band 802.11 implementations. The technical advantages are outlined in the Atheros White Paper titled, “802.11ag The Clear Choice”. While this white paper is somewhat dated, the technical content is still relevant. Changes in the market since the publication of this white paper are outlined below.

To receive the Atheros White Paper (“802.11ag The Clear Choice:”) or the Wi-Fi Alliance White Paper (“Wi-Fi in Healthcare”), please contact a Silex Territory Manager at 801-748-1199.

Dual-Band Benefits:

802.11ag Combines Best of Both Worlds

Attribute	802.11a	802.11g
Spectral Diversity Capability	<ul style="list-style-type: none">24 non-overlapping channels can segregate multiple types of traffic	<ul style="list-style-type: none">Three non-overlapping channels invite co-channel interference (the “apartment problem”)
Aggregate Available Bandwidth (standard mode)	<ul style="list-style-type: none">24 x 54 Mbps = 1,296 MbpsActual throughput on each channel ~22Mbps	<ul style="list-style-type: none">3 x 54 Mbps = 162 MbpsActual throughput on each channel with no 802.11b devices is ~22Mbps, but reduced to ~14 Mbps when 802.11b devices present
In-band Noise	<ul style="list-style-type: none">Some cordless phones transit at 5 GHz in one directionHigh signal-to-noise ratio	<ul style="list-style-type: none">Other nearby WLANDevices such as microwaves, cordless phones, baby monitorsLow signal-to-noise ratio
Ubiquity	<ul style="list-style-type: none">Mainly in emerging consumer electronic video devices, enterprise access points and VoIP handsets	<ul style="list-style-type: none">Homes, enterprise, hotspots; PC integration, data traffic and audio clients

(Source: Atheros Communications White Paper)

Market Forecast:

Due to the above benefits, dual-band solutions are increasingly being implemented in both enterprise and now consumer environments. Projected dual-band chipset growth is as follows (millions of units):

	2008	2009	2010	2011	2012	2013	2014
802.11a/b/g	44.8	13.8	5.2	1.0	0	0	0
802.11a/b/g/n	30.9	58.5	84.7	125.1	161.7	197.2	225.1
TOTAL	75.5	72.3	89.9	126.1	161.7	197.2	225.1

(Source: Techno Systems Research, 2010 Wireless Connectivity Market Analysis)

The “Apple Effect”

On January 27, 2010, Apple changed the world with the introduction of the iPad. Unit shipments for this revolutionary handheld tablet in 2010 have been projected to be over 13.8 million units (iSupply October 2010). Like previous successful Apple product introductions, the iPad has been designed with a great user experience in mind.

Part of the user experience was the decision to implement a dual-band WiFi solution to improve performance in streaming multi-media content and to improve overall wireless connectivity. While there have been initial problems reported with Apple’s implementation, Silex expects that other consumer device manufacturers will also follow Apple’s lead in implementing dual-band Wifi. Consumer adoption will result in a smaller cost difference between single and dual-band solutions which will further increase dual-band demand.

What about 802.11n?

New wireless designs are likely to be based on the new 802.11n standard. There are a variety of options for 802.11n but there will be both single-band (2.4 GHz) and dual band (2.4/5 GHz) solutions.

Summary

Silex Technology America provides a variety of both single band and dual band Wi-Fi products. Depending on the application, a lower cost single band solution may be adequate. However, as more Wi-Fi implementations move to dual-band, the cost premium is rapidly decreasing which in turn will further propagate this industry trend.

About Silex Technology America

Silex Technology, Inc. is an embedded network technology company specializing in local area network and wireless (.11 a/b/g/n) technologies providing software, modules or turnkey products. As the world's leading supplier of print servers, Silex Technology is leveraging its technology and know-how into new applications as well as developing new technologies to meet the expanding need for connectivity for consumers and business users. Silex Technology has regional offices for sales, marketing and development in Japan, U.S., Germany and China. Silex Technology is vertically integrated to support the customer from design to production maintaining the high quality standard. Silex Technology is listed on JASDAQ (6679). For more information, please visit www.silexamerica.com.

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