



# Wireless 350a

## Emerging Wireless Technologies

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### Preface

It's hard to go anywhere these days without overhearing a conversation about the stock market. Any dinner party, social event, or even business meeting is bound to have a small group of stock jockeys commenting on their individual investments and how they've performed lately. You've probably found yourself in the middle of many of these conversations yourself.

In these circles, most people fall into one of two categories. You're either one of the people who initiates these conversations and has a lot to say about what you own, or you're one who sits by doing more listening than talking. Those who dominate these conversations are usually ones that own some exciting, risky stocks that tend to eschew hype and make some pretty dramatic price swings. The listeners of the group who just nod their head tend to own boring, old stalwarts in industries like paper and box manufacturing.

If you find yourself in the second category and tend to have "stock envy", this is the paper for you. What better way to impress party guests than to amaze them with keen knowledge of cutting edge technology in a hot sector like wireless? Even if you just want to add a little juice to a stale portfolio, here's where you can get some ideas. Most of the technology and businesses discussed here are still in their infancy, leaving plenty of room for growth.

Welcome to Wireless 350a. This paper will help you with some ideas about where to put that 5% of your portfolio that you've set aside for a really forward thinking company; one that's really on the cutting edge. Not only will you be able to impress your friends, but you may learn some interesting facts about emerging technology trends in wireless.

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## How to Read This Report

The report you are reading contains some features that should make it much easier to read and extract the relevant information that you need. The features added will help the computer-based reader - one who is reading this from their terminal - as well as someone who happens to be reading from a printout. The major features are listed here:

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## Introduction

So you know a little about wireless technology and you've heard all kinds of speculation about 3G. You've done some research and already invested in a few companies that should do well over the long haul. When it comes to really high growth though, it looks like the cat is out of the bag on all the top wireless companies – investors are already privy to their plans and have priced the stock accordingly. So where do you look for some undiscovered stocks – ones that not every Joe in town knows about?

As with any industry, one of the best places to start looking is in the area of emerging technologies. These are the things that aren't being done yet and problems that aren't yet solved. These are young companies pushing novel solutions to very complex problems. These are visionaries who are fighting the common paradigms in order to gain acceptance of unique solutions.

In the case of the wireless sector, these emerging technologies are numerous yet still widely unknown. Some technologies are still on the drawing board, struggling to find the right cost/performance ratio for widespread acceptance. Others are already in commercial deployment but still find resistance from an entrenched competing technology. In both cases the opportunities for investment are unique in that the public companies are not yet on everybody's favorite list.

There are also many private companies waiting for the right market to hold their IPO.

But with every unique opportunity comes unique problems. There are often very good reasons why many companies developing emerging wireless technology are not followed by the mainstream press. Some of the companies are more hype than substance. Some have very shaky finances, moving money around in ways that some thought was only possible in organized crime circles.

Still others are pushing ideas that sound great in theory, but essentially have no business model to stand on.

Here lies the investor's dilemma – how do you invest in emerging technologies wisely, making the best choices in order to minimize inherent risk and maximize returns? If you've read any of my previous work (Wireless 101 or 201), you're probably tired of hearing my answer to that question – get the big picture. But I truly believe this is the best way to avoid the real bombs and catch the real winners. Without the context of the wireless market, investors get lost in siren's song of cool technology. So how do we look at emerging technology in the context of the wireless industry?

### What is Emerging Technology?

The first thing an investor needs to determine is what is truly an emerging technology. This term gets thrown around a lot and somehow loses its meaning. We'll look at it in a way

that is important to an investor, not to someone looking to apply skills to a new job or find a cure for a deadly disease.

For the investor, an emerging technology is one that offers a relatively undiscovered method to solve a daunting wireless problem in a cost-effective way. Notice that there wasn't anything in this definition about the technology being "radical" or "esoteric". The methods or technology itself may be non-conventional, but emerging technologies that become mainstream are typically more evolutionary than revolutionary. This is because a technology cannot succeed by itself – it must bring the whole sector with it.

That last statement is very important to grasp and we'll need to take some time to explore it in depth. An investor's failure to recognize this is often what leads to investments becoming tax write-offs. We'll discuss this and a few other concepts with respect to several emerging technologies in the wireless sector, taking time to look at the big picture as well. These technologies are by no means the only ones out there either, but they represent a good starting point for investors. After reading about some of these technologies and concepts, investors should have no problem extending their knowledge to future developments and other niche markets with emerging technology.

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### What's in the wireless future?

In this paper, we'll start with a deep look at one of the most prominent emerging technologies in the wireless industry – Software-Defined Radio (SDR). In addition, we'll explore three more areas that investors may be interested in:

- Superconducting Technology
- Fuel Cell Technology
- High Altitude Platform Systems

Each of these areas are having billions of R&D dollars dumped into them in order to solve current problems. Each of them is also at various stages of development, with some still 3-5 years away from commercial deployment. Many of these technologies are also being applied to other industries, and designers have found that they would also prove beneficial to wireless systems if they could be effectively adapted.

So sit back, relax, and pour yourself a hot cup of tea. Turn on your favorite mind-expanding music – be it classical or grunge – and get ready to think out of the box. Many of the ideas talked about here are initially pooh-poohed just because they sound so crazy. But give them the benefit of the doubt and you may find yourself converted. Even if you never decide to leap into an investment based upon these emerging technologies, you'll have no problem keeping up with the party talk.

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