Brainstorm: New Year Tech

Edited by Jason Lomberg, Technical Editor

What technology will have the biggest impact in 2009?

Bob Behrent, Bomar Interconnect, www.bomarinterconnect.com [1]

As of February 17, 2009, all TV signals will be digital, and therefore the properties of RF interconnects will be more critical than ever. While the requirements for many HDTV applications can be reliability met with RF interconnects operating at good return losses at frequencies of 3 GHz, these same connectors' properties are not adequate to handle large satellite TV applications in which the satellite feed is split. Specifically, where such satellite transmission services as Direct TV and Dish Network are deployed throughout large office complexes, hotels, hospitals, colleges and universities, connectors performing with good return loss at 8 GHz are required.

With the advent of all-digital TV signals, leading connector manufacturers understand the necessity to develop more than just an F-Type 8 GHz connector. Some have rightly concluded that large satellite TV applications need an entirely new interface product that ensures installers only use an 8 GHz mating part. To meet the challenge, this new interface must not only perform with good return loss at 8 GHz (test well to 10 GHz), but be physically unable to mate with frequency-incompatible connectors to ensure signal integrity. This is ultimately a good thing for the connector industry in general, and the HDTV market segment specifically. As "necessity is the mother of invention," new technology historically brings bring about added benefits. While the requirements of a new interface will force connector manufacturers to produce parts for large applications in which the satellite feed is split, this same new connector technology will result in the availability of traditional F-Type CATV and HDTV connectors with significantly

increased frequencies.

Paul Semenza, DisplaySearch, www.displaysearch.com [2]

Increasing attention is being paid to global warming, and with ever-larger flat panel TVs, energy consumption is becoming a key issue for consumers and producers alike. While there is no shortage of display technologies claiming lower power consumption, the reality is that LCD will continue to be the dominant technology for the foreseeable future. Given that LCDs create images through modulation of light, it will be increasingly important for the light source (which is responsible for nearly all of the energy consumption of an LCD) to be as efficient as possible.

The light source best positioned to meet this need is the light–emitting diode, or LED. LEDs are increasingly being used in the backlights for notebook PC displays, since they enable much thinner and more compact display packages, and can consume less power, which is crucial for improved battery life. Compact size and better power efficiency have not been important characteristics for the other two big markets for LCDs – desktop PC monitors and TVs – but this is changing rapidly. For TVs, a new source of competition is over how thin the set can be, with new designs less than an inch thick coming. For both TVs and monitors, new energy consumption ratings and regulations are coming into effect in different markets around the world.

While LEDs are currently more expensive than the traditional fluorescent lamps used as LCD backlights, this new technology is enabling LCD and set makers to experiment with new optical designs, in some cases reducing costs in other areas such as optical films, and in other cases using the inherent characteristics of LEDs – fast switching, narrow spectral bandwidth, and fine brightness control – to produce displays with higher visual performance, as measured by color gamut, contrast ratio, and frame rate.

The possibilities enabled by LED lighting in terms of design, efficiency, and performance mean that this will be a key technology to watch in 2009.

Kevin Kayser, National Semiconductor, www.national.com [3]

The worldwide energy crises of 2008 brought renewable energy to the forefront of everyone's mind. Converting solar irradiation into electric energy through the use of solar photovoltaic (PV) arrays is the most promising renewable technology on the market. While photovoltaic technology itself has been around for many years, it stands to have a breakout year in 2009 for three main reasons: the advent of micro-optimizer technology, new financial incentives, and easing supply constraints.

Solar PV arrays are defined as strings of series connected PV panels, which are then paralleled together and converted to AC power through a central inverter. The Achilles heel of these arrays is how a small amount of real world shading from a tree or chimney on just a few panels can cut the power output of the array in half. The solution is the advent of micro-optimizer technology, like National Semiconductor's SolarMagicTM technology, which monitors and maximizes the energy harvest of each individual panel through advanced algorithms combined with leading edge mixed signal technology, thereby recouping up to 50% of the lost power.

Rebates and feed-in tariffs have historically helped drive the solar industry towards grid parity with conventional energy sources, but the passage of the solar investment tax credit (ITC) as part of the congressional bailout bill of 2008 (HR1424) is expected to take the industry to a whole new level. For the next eight years, US residential and commercial solar installations can receive a 30% federal tax credit in addition to any state incentives. These incentives are expected to translate to greater than 50% annual growth in the US.

For the past several years, solar PV suppliers have struggled to keep up with demand. With new Chinese module manufacturing coming on line, most analysts are expecting an easing of supply constraints in 2009, which will help drive down pricing and further enhance the industry.

Shawn Thompson, Pivot International, www.pivotint.com [4]

What a difficult question to answer. With so many technologies rapidly changing and improving our world, how do you pick the one that you think will have the biggest impact in the coming year? There are so many potentials out there, LED, wireless, display technologies and just think about semiconductors.

The technology that I see having the biggest impact in 2009 is development of more advanced LED technologies. Already we are seeing the use of LED's in many areas that have not been possible before the last couple of years. The continued advances in this technology are leading to a revolution in lighting applications that will continue and see tremendous growth in 2009.

We have seen the application of LED's in many display systems including LCD's and other types of displays. We have seen the application of LED's to large signs used for advertising etc. We are already seeing the application of LED's for home lighting and automotive applications. There are systems where LED's are beings used for decorative pathway lighting also.

The next advance in LED technology will lead to lighting applications for roadways etc. While there are some products currently available for this they are still limited in several ways. Advances in LED technology is leading to a breakthrough where the standard for lighting will now be an LED system with a long life and potentially more accurate light from a spectrum content.

There are already standards in process that address LED lighting for parking lots, roadways and major highways. The application of LED lighting to these areas will completely change the way cities manage their lighting and have huge potential for saving energy costs, maintenance costs and provide better lighting.

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