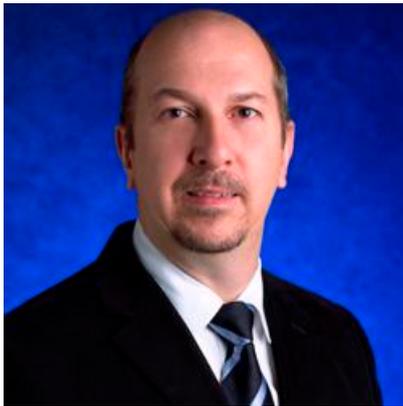


The Roundtable - Digital Power and the Marketplace

This month's question, "What needs to be done for digital power technology to become more accessible to the industry, especially for smaller companies?", was answered by Mark Adams of CUI, Chris Young of Intersil, and Rick Zarr of National Semiconductor.



Rick Zarr, a Technologist for PowerWise Products at National Semiconductor.

With the increased demand for higher efficiency in communications infrastructure and server equipment, designers are looking to more sophisticated power solutions. This is primarily driven by the way systems are dynamically altering computing and communications loads directly affecting the power supplies. These supplies can no longer expect to see constant loads and in many cases the designs will see wildly fluctuating conditions as virtualization moves applications from blade to blade. To solve this problem digital power solutions have been commercialized to provide both stable voltages under wide dynamic range loading and system monitoring / management to improve efficiency.

Some of these solutions are targeted toward Point of Load (PoL) applications where ASICs may have very large loads as an ease-of-use method for improving efficiency. There are some applications where this may be helpful, but the ASICs themselves need to be power aware and often can benefit more readily by implementing technologies such as Adaptive Voltage Scaling where gains of 30% energy savings or more can be achieved. Monitoring is already common place and devices such as the LM25066 are easily implemented providing information on the status and condition of these subsystems.

Digital power implementations can be complex and are best targeted toward large redundant supplies found in blade servers and large communication switches where the advantages of non-linear loop control and the associated complexity can most benefit the system. For PoL, there are readily available analog power solutions. Furthermore by moving more intelligence into the ASICs, larger efficiency gains can

be realized.

Rick's energy efficiency blog explores trends to reduce power @ www.national.com/energyzarr.



Mark Adams, VP of Worldwide Sales, CUI

The industry needs to place a greater emphasis on ease of use. The companies outside of the largest OEMs need a flexible, easy to implement digital power solution that will allow them to monitor their power architecture and dynamically change output voltage, sequencing, timing and ramp rates, margining, and fault limits. These smaller companies are resource limited, and while added features are nice to have, they are not a **must have**. The benefit that digital power brings to these companies is the flexibility and the benefits that don't require tools to implement, such as auto-compensation, gains in efficiency, improved transient response, and a lower component count.

When you are a resource-limited company, power becomes the necessary evil. The power architecture is not the IP that differentiates their company, rather, it is the IP that they create in their FPGAs, DSPs, ASSPs, and processors. With shorter and shorter design cycles and critical time to market deadlines these companies need a cut and paste hardware solution that can be used from one board to the next, and can then be customized via an easy to use software tool for the specific power management needs for that board.

Power management issues are not limited to the largest OEMs, though the digital power industry has primarily focused their features and tools on those customers. All companies, regardless of size, use the same technologies. The FPGA and microcontroller companies learned long ago that tools and support structures are required for all customers regardless of size. These companies know that the best and easiest tools can often win a design versus an unknown or complicated tool structure.

Until vendors provide an easy to implement "total solution", digital power usage will still be dominated by the large OEMs that have the resources to design-in this valuable technology.



Chris Young, Intersil Corporation

Today's Digital Power technology is, actually, ideally suited for small companies. Small companies need technology solutions which are affordable, require few design resources, are flexible, and offer a means to allow them to differentiate themselves from the larger companies.

Modern Digital Power offerings are highly integrated solutions requiring few external components. They are easily configured using a GUI interface. This GUI interface replaces the soldering iron and parts bin of traditional solutions by allowing design to be configured and modified by simple point and click technology. This greatly speeds up the design process, requiring fewer design resources, and making the technology very flexible to the point where last minute changes can be made...well...at literally the last minute. In terms of affordability, Digital Power controllers are unmatched in value when measured in features per cost.

So, what can be done to improve accessibility to the industry?

1. Provide more widely accessible information about the advantages of Digital Power. After more than half a decade of the availability of modern Digital Power controllers, I am still surprised to hear potential customers say that they've heard about Digital Power but see no real advantage. After presenting the evidence of the advantages, many customers are downright giddy at the prospect of taking advantage of this technology. We as a supplier base need to do a better job at getting the message to the customer.
2. Similarly we need to dispel the FUD (fear, uncertainty, and dread) that has been dispersed about Digital Power. From IP concerns to supplier stumbles, Digital Power is not immune from disinformation.
3. Provide a broader portfolio of Digital Power offerings. While there are now several offerings in Digital Power, the portfolio of products is not broad. If the industry is to adopt this technology, it needs products across the full range of applications.
4. Continue to improve on the advantages of digital power...making the products more integrated...easier to use...more flexible...and more affordable.



Amit Gattani, Akros Silicon

Power supply design has long been synonymous with the art of analog design – a whole generation of engineers have developed methods and techniques to quickly design, modify, assess and qualify power supplies for end applications. While digital power techniques can provide excellent performance flexibility and benefits, more often than not the higher cost of a solution and the different requirements of working with digital power ICs becomes a barrier for digital power adoption.

Broadly, what the industry needs are hybrid digital power solutions – the ones that hide the complexity of digital power from the designers by merging best of digital and traditional power design techniques. For instance, power startup management is an area where designers dislike the complexity of software interaction as it creates validation issues involving multiple hardware and software folks; however, with modern ASICs and FPGA, there are also some very sophisticated startup requirements that are enforced on power sub-systems. Hence it's best to keep startup parameters for power subsystems in hardware mode, even through the power supply loop dynamics are implemented with digital power techniques.

An approach where advance monitoring, management, and post-startup power options are left to digital domain while enabling power designers to continue to get an intuitive and hands-on feel of power system startup and performance, will make designers' validation job easier, keep the solution cost down, and ease the industry into adopting digital power.

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