

Reflections on PCIM Europe 2006

By Chris Ambarian, Senior Analyst, iSuppli Corporation

It was great to see so many old friends and new faces at PCIM in Nürnberg last month. It was also encouraging to see that so many people were there despite the fact that it's an "Electronica" year. It's without doubt a sign of the health and vibrancy of our little corner of the industry.

So, what did you observe at the show?

The great system-sell

What I observed as a long-time components guy (who had admittedly been away from the show for a few years) is that components are getting harder and harder to find – at least sitting by themselves.

Everywhere one looked, even among many single-component suppliers, one found examples of "solutions." Module suppliers showing the motors that their modules are driving. Maybe even the washing machine that the motor and drive go into. In fact, to me one of the great differentiators at the show was how "complete" the solution (that any given supplier displayed) was.

Most who know me know that I've long advocated the system- or solution-sell, so this was a welcome sight for the most part. But I also noticed what I call the "shiny objects" trend – which is the addition of a lot of flash, but without a corresponding increase in substance. It's all very nice to show the front of a car or a refrigerator or a conveyor belt – but that also needs to be accompanied by a breadboard and an oscilloscope and some stuff to play with on the computer. In the end, this isn't Las Vegas (i.e., the CES show) – this is a show for engineers, ideally to show us up close



how the latest parts work and what we can do with them, and not to just try to distract us with "shiny objects." In this regard, the exhibitors had mixed marks, and there's some room for improvement.

There were however some suppliers who are definitely headed in the right direction. I saw some excellent displays, most typically from those suppliers who make the ever-more-important ICs that control the power devices. In this regard, folks like TI and National really set the pace, with exhibits that nicely balanced their newest parts, plus reference design boards, plus live circuit demonstrations with computer models and information right there on the stand.

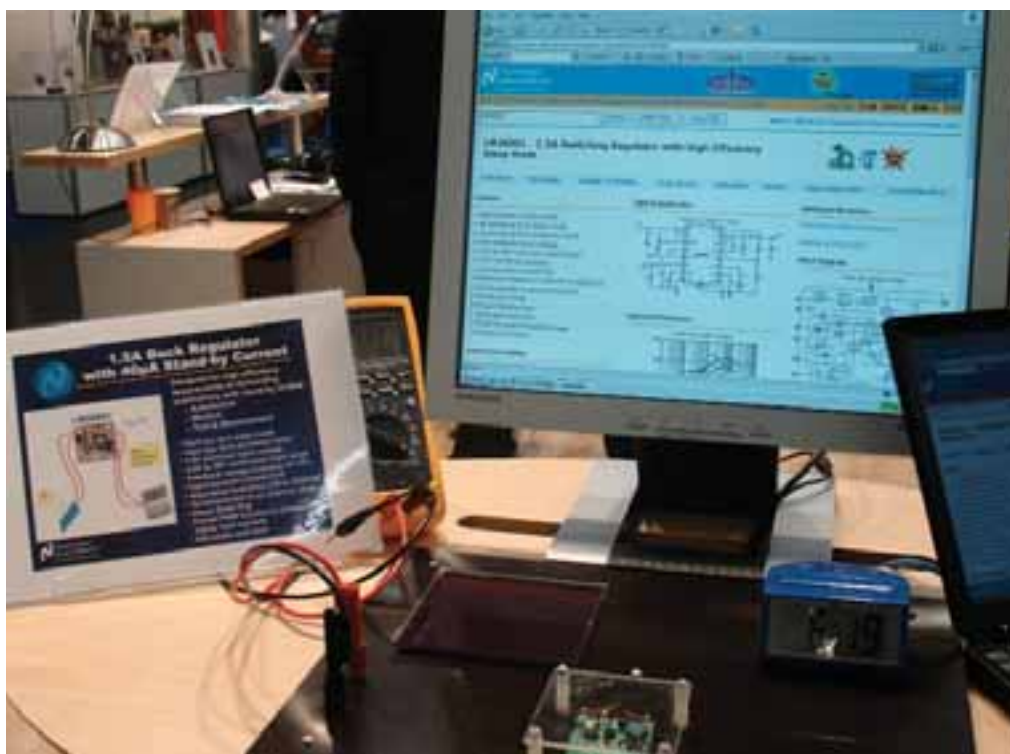
But components aren't dinosaurs yet

Though there was a clear trend toward packaging one's line-card all into example end-products, there were still a few good old component folks around too. For them, the focus is still on the products and their performance (and thankfully so in the case of ABB and

Semikron, whose end-customers make equipment that would have taken up a lot more space – though it might have been fun to see them try to get a locomotive in there).

This all brings up the ongoing question of what will continue to make sense in the future as a component, and what will be integrated into one chip or one package. This month, TI has announced a 45nm design node using 193nm wet lithography – and they specifically mentioned in their announcement that this technology is designed to leverage their integrated "SmartReflex" power management approach. (It is interesting to note that TI is marketing their solutions for portable electronics with primary emphasis on their power management efficiency!) In any case, this is probably the leading edge example today of power that will be integrated in a full SoC implementation. But these of course won't drive motors.

It can be anticipated that with the next generation of control chips and SOI (silicon on insulator) technology, we will see the economical integration of power up to around 5-10W (of delivered power) on board the main IC chips. In portable applications (i.e., 1-2V), this means more and more of the main loads will be driven from a single chip. At higher system voltages and power levels, you'll see monolithic approaches for battery chargers and POE chips, but you'll still see external discretes driving larger loads for the foreseeable future. This isn't news; what is news will be how much of the control and drive will be able to be brought on board as smaller geometries are applied to power management.



A National Semiconductor display – an example of doing it right, with a breadboard, devices operating, loads, meter, computer, device info. Nice.

Another interesting development in integration was shown at the Mitsubishi booth, where they showed IGBTs with integrated diodes. They have devices with freewheeling diodes for mainstream bridge applications, and they also have 1200V IGBTs with reverse blocking diodes for use in matrix converters. This integration is a clear advantage from a module assembly cost standpoint, and given the relative simplicity of the chip design there shouldn't be much of a silicon cost penalty. What remains to be seen now will be whether there will be any significant performance differentials between these integrated devices and optimized discretes. Their present claims (unverified by me) are that their IGBT performance is equivalent to 3rd-generation planar devices (the market is on 5th generation now), with acceptable performance on the diodes. So if better discrete chips are available, there still may be advantages to those.

Finally, not to forget, it must be recognized that in industrial power applica-

tions, a significant portion (sometimes most) of the cost comes from packaging and mechanical design. In this area, there was a healthy amount of innovation on display from both component suppliers (e.g., Mitsubishi, Fuji, and Semikron), as well as from Danish pump maker Grundfos. The guiding principle for all of these exemplary manufacturers is that strong interdisciplinary knowledge in materials and manufacturing engineering can result in a greater impact on cost than silicon improvements can provide.

All in, PCIM Europe showcased a lot of advancements in the world of power, with a decidedly European focus. In the North American shows, the focus of late has been very much on digitalized power conversion; while this was given some treatment at PCIM, the focus was appropriately much stronger on industrial and automotive applications and devices. Even the sessions on hybrid electric vehicles focused on the different requirements of the European market as compared with the Japan and

US markets. Given the importance of power semiconductors to the European market, and the specialized and localized focus of the show, I'd say that PCIM Europe is further solidifying its relevance and importance to the European power market.

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