Distributor’s Reference Designs Lend Helping Hand to Engineers

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The continuing pressure on designers to develop products faster, cheaper, with greater performance, improved functionality and lower power consumption, places considerable stress on the traditional design process. Add in the fact that at the component level device complexity is nearly doubling every 18 months, and what you are left with is a growing need of design expertise that spans multiple disciplines. As a result, there is a rising trend by developers to leverage reference designs from component distributors such as Avnet, to not only shorten their design cycle, but to reduce risk and improve product features.

The concept of reference designs is not new. Semiconductor suppliers such as Texas Instruments, Analog Devices, National Semiconductor, and many others have a long history of providing application notes and reference designs that show design engineers how to use their parts. What is new is the offering of “block-level” and “system-level” reference designs from distributors, which demonstrate how to connect multiple chips, from multiple suppliers, to create more complete solutions that developers are looking for.

Avnet works with our key suppliers to implement designs showcasing their newest products in a proven hardware platform or development kit. In many cases, we see our engineering customers copy various sections of these platforms for their own designs in order to speed the development process. From power supply solutions for FPGAs to high-speed memory interfaces and PCI Express links with embedded processors, engineers can leverage the schematic, layout, and bill-of-material information that is provided as part of a downloadable reference design package.

In addition to the hardware based reference designs, software reference designs also enable platforms to perform a certain task. There is growing interest in this area, as engineers struggle with the expanding adoption of embedded operating systems such as Linux and Window Embedded System 7, and real-time operating systems, such as ThreadX, and QNX. Both hardware and software engineers are looking for ways to jumpstart their projects. Having access to a suite of code examples or reference designs showing a platform running a simple application on top of a given OS is a big deal in terms of time to market and reduced risk. It also allows them to focus their efforts on the value-add features they can offer and not spend time re-inventing the wheel.

To best understand the value reference designs can bring to designers, we can look at the recent introduction of the Avnet Co-Processing Development Kit (www.em.avnet.com/spartan6omap [1]) as shown in Figure 1. The Co-Processing kit combines a Texas Instruments OMAP L138 applications processor with a Xilinx

Spartan-6 FPGA. Avnet worked closely with Xilinx, TI, MathWorks, and RidgeRun to not only architect and develop a hardware platform, but also to implement the Linux operating system on the ARM, code examples for the DSP and a complete model-based design flow for application development. With the equivalent of approximately 4 man-years of work, designers can leverage the hardware and software design examples from this kit to speed their own development. They can reduce design risk by copying various parts of the schematics and layout and feel assured with the verified and optimized circuit examples.

Figure 1. Avnet's Spartan-6 OMAP Co-Processing Development Kit

Distributors such as Avnet continue to make considerable investments in engineering resources and tools that enable the creation of hardware and software reference designs. The value and benefits this brings to the engineering community is significant. With nearly 40 percent of our design oriented customers leveraging various elements of these internally created reference designs, Avnet is helping designers cope with the increasing pressure of shorter design cycles and added design complexity. Avnet's reference designs are available through our Design Resource Center (DRC) at www.em.avnet.com/drc [2].

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