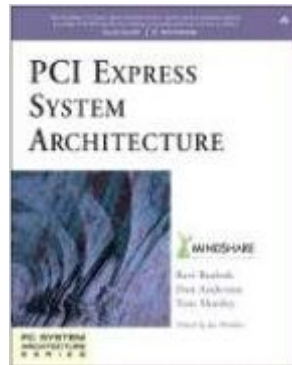# PCI Express System Architecture

Synopsis

We have always recommended these books to our customers and even our own engineers for developing a better understanding of technologies and specifications. We find the latest PCI Express book from MindShare to have the same content and high quality as all the others. Nader Saleh, CEO/President, Catalyst Enterprises, Inc.PCI Express is the third-generation Peripheral Component Inter-connect technology for a wide range of systems and peripheral devices. Incorporating recent advances in high-speed, point-to-point interconnects, PCI Express provides significantly higher performance, reliability, and enhanced capabilities at a lower cost than the previous PCI and PCI-X standards. Therefore, anyone working on next-generation PC systems, BIOS and device driver development, and peripheral device design will need to have a thorough understanding of PCI Express.PCI Express System Architecture provides an in-depth description and comprehensive reference to the PCI Express standard. The book contains information needed for design, verification, and test, as well as background information essential for writing low-level BIOS and device drivers. In addition, it offers valuable insight into th

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Customer Reviews

I was disappointed by this book. It took a lot of time to explain the basics of the spec but did not provide any additional design help or expanded technical info. I have had mixed results with other books for other buses in this series and this one is no better. If you carefully read the spec you will

get about 97% of what is in this book. In several places the book simply uses parts of from the spec. directly. I wish the book took the time to create better figures and tables than what is in the spec. The spec is very poor on figures and tables and to use any portion of them is just a short cut in writing the book. I really wanted a book that either did not require reading the spec or a book that redid all of the poorly drawn or written parts of the spec. Also the spec is not very well organized, the book did a little bit better than the spec. in that category, but not as much as it should have. Again, it seems like a lot of short cuts were taken and no effort was made to really provide more detailed or organized information than the minimum. Perhaps that was the purpose of the book, but that is not what is needed. I just do not understand all of the positive reviews, unless the reviewers did not carefully read the spec. and did not know better. I just did not want to pay for shortcuts in the writing.

There are two problems with this book. First, it uses figures from the specification. The PCI Express specification is very poor when it comes to figures, tables and charts. I had hoped that this book was going to have some decent figures, tables and charts, and provide more design help than the specification. Instead it simply rewords the specification. The second problem is that it is out of date. There has been numerous engineering change orders generated by the PCI special interest group [sig] against rev. 1.0a. The PCI sig has just come out with revision 1.1. This book covers neither. I have ordered a different book that someone told me about. I have been told this other book has addressed the above two problems, I hope so.

In my opinion it is simply a re-write of the specification with no additional insight into the design of PCI Express hardware or software. In fact it follows the specification in the lack of design useful flow charts for hardware and the lack of detailed hardware figures. It provides little design information over what you can read in the specification and many of the figures are just those of the specification or look alike. The link states are done in the same manner as the specification with only minor additional information and there is no architectures of different ways the components can be built. It takes a lot of pages to explain some fairly simply concepts and wastes about 100 pages on third party information and restating waveform information from the specification. It has no glossary of terms and only a five page index.

The index on this thing is worthless... The whole point of having a reference book, in my opinion, is to have quick, easy access to information when I need it. The point is not to have to read the book

from cover to cover in order to find the information you need. Each time I try to get something out of this book, I get more and more frustrated.On one hand, there's the PCI-E spec, which is horribly written and incomplete, but completely searchable due to its being available in PDF form; on the other hand, you have this better-written but almost completely unsearchable book. Great.

I think this is the best reference to date, March 2, 06. I found one omission that was costly to fix however, when accessing memory under 4-Gig, you must use the short header with the 32-bit address. Intel chip set checks this, they're the bandwidth police. The book does not mention this.

I've done PCI designs in the past but this was my first PCIe design. After a few hours of reading, I was familiar enough to tackle an FPGA design. I did find that I had to read it in a different order than it's written. I have almost a dozen post-its bookmarking useful pages.

PCI Express System Architecture by MindShare is simply a continuation of a great series of books. I have a complete set starting with their first release of ISA System Architecture back in the 80's.What makes this new book beneficial is that it really helps design engineers like myself to better understand a specification that's really not written with "design" in mind. Not to bash the PCI-SIG, but it's not in their charter to step engineers through design, rather they inform us about what these new interconnects entail and their strengths over previous architectures. MindShare takes over in this missing "education" area with their broad ranging books and classes.PCI Express System Architecture starts with a comprehensive overview of previous architectures, like PCI, 66Mhz/64bit PCI, PCI-X, DDR/QDR PCI-X. For a design engineer who's used to understanding old school North/South bridge chipsets, they now get a proper and clear introduction to Root Complexes, Switches, and newer I/O hubs.Other strengths of this book include an excellent section on the explanation of PCI Express's new QoS as well as both traffic and virtual classes.Physical layer is also explained well, broken into a logical chapter and electrical chapter. Complete transmitter and receiver characteristics are explained well. These are vital numbers to know for any PHY level designer.Link Training, Hot Plug, and Power Management chapters have been written in great detail and are clear and easy to understand.For those engineers who are designing add-in cards, this book also covers all the important connector pin-outs and signals, all the way up to x16 lane widths.My only wish is a more comprehensive section on Spread Spectrum Clocking, but you can't ask for everything....Good Job MindShare!

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