AMD
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Designing with the Versal Adaptive SoC: Power and Board Design

VER-PWR-BD (v1.0)

Course Specification

Course Description

This course provides a system-level understanding of power and thermal issues related to designing with the AMD Versal™ adaptive SoC. PCB design considerations for the Versal devices are also covered.

The emphasis of this course is on:

- Estimating power using power analysis
- Managing thermal design
- Understanding Versal device packaging
- Implementing proper pin-to-board connection
- Using the Schematic Review Checklist to validate a PCB design

What's New for 2025.2

- New lab: Simulating PDN Decoupling
- All labs have been updated to the latest software versions

Level – VER 2

Course Details

- 2 days instructor led training (online or in person)
- 19 lectures
- 4 labs

Price – $1,600 or 16 AMD Training credits

Course Part Number – VER-PWR-BD

Who Should Attend? – Hardware designers and system architects wanting to develop an effective power distribution network for the Versal device

Prerequisites

- Designing with the Versal Adaptive SoC: Architecture
- Designing with the Versal Adaptive SoC: Design Methodology
- Familiarity with the AMD Vivado™ Design Suite

Software Tools

- Vivado Design Suite 2025.2
- Power Design Manager tool 2025.2

Hardware

- Architecture: Versal adaptive SoC

After completing this comprehensive training, you will have the necessary skills to:

- Design an efficient power distribution network for AMD Versal adaptive SoC designs
- Leverage the Power Design Manager tool for power estimation
- Dynamically manage power consumption
- Solve thermal challenges
- Apply PCB design guidelines for board interfaces with Versal devices

Course Outline

Day 1

- **AMD Versal Adaptive SoC Architecture Overview for Existing Users**
  Introduces to students who already have familiarity with AMD architectures the new and updated features found in the Versal devices. Also provides an overview of the Versal portfolio. {Lecture}
- **Power Solutions Overview**
  Introduces key power concepts and explores some of capabilities of the Versal devices and introduces the power distribution network flow. {Lecture}
- **Packaging**
  Describes key elements when modeling a PDN and dives deeper into packaging considerations. {Lecture}
- **Thermal Solutions Overview**
  Introduces key thermal concepts and explores some of capabilities of the Versal devices. {Lecture}
- **Power Management**
  Discusses power domains and how they can be controlled along with basic techniques used to lower overall power consumption. {Lecture, Demo}
- **Power Design Manager**
  Discusses using the new Power Design Manager tool, including import and export functions. {Lecture, Lab}
- **Power Reduction Techniques**
  Describes various options to reduce power during the design process. {Lecture}
- **Power Supply Backgrounder**
  Reviews linear and switching power supplies and common terms used to specify power supply characteristics. {Lecture}

Day 2

- **Board System Design Overview**
  Introduces PCB design topics. {Lecture}
- **Designing the Power Supply**
  Consolidates the thermal management concepts of the course for achieving a successful design. {Lecture, Lab}
- **Designing PL Interfaces**
  Focuses on bank structure and physical organization of the PL package pins. {Lecture}
- **Designing PS Interfaces**
  Covers the unique features of the dedicated PS I/O interface along with pin-planning techniques. {Lecture}
- **Designing Memory Interfaces**
  Discusses high-speed connections, routing, and design guidelines for DDR4/LPDDR4 and DDR5/LPDDR5 memories. {Lecture}
- **Designing Transceiver Interfaces**
  Describes the serial transceiver organization and proper trace requirements. {Lecture}
- **PCB Simulation – Introduction to Signal Integrity**
  Discusses reflection and crosstalk effects and provides options to minimize both effects. Introduces memory and serial transceiver IBIS simulation. {Lecture}

- **PCB Simulation – Introduction to Power Integrity**
  Discusses power distribution network modeling and simulation options. {Lecture, Lab}
- **PCB Simulation – Introduction to Thermal Simulation**
  Discusses aspects of thermal simulation. {Lecture}
- **Board System Design Guidance**
  Outlines the steps and documentation for specific PCB topics. {Lecture}
- **PCB Verification – Schematic Review Checklist**
  Reviews PCB design verification using the Schematic Review Checklist. {Lecture, Lab}

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- Student cancellations received less than 7 days before the first day of class are entitled to a 100% credit toward a future class.
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Online or in person training with real hardware

- Morgan Advanced Programmable Systems, Inc. has set up a training VPN where engineer participants can take classes online using the same computers and devCards used during in-person training.
- Even better, and upon request, you can use these computers after hours on training days to experiment with labs. This is not possible for in-person training.
- Additionally, just like in-person training, the laptops and devCards, tools, OS, and licensing are set up in advance.
- In some ways, live online-training is better than in-person…for example, you can grant the instructor permission to look at your Vivado, PetaLinux terminal, or Vitis for extended periods of time if your lab is not going exactly has planned to a missed step.
- This is often more comfortable than two engineers crowding around a laptop screen.
- Taking remote training also allows you to learn some tips and tricks for working remote. Whether your devCard is in the lab down the hall, or across the world via VPN, you can control your AMD based device quickly and efficiently.