IS5 - SD UHS II (Ultra High Speed II)

This course covers UHS-II which is the enhanced version of SD

Objectives

- This course explains how legacy SD commands are transported over UHS II.
- The hardware layer is detailed, including the analog part.
- The link layer operation is explained through sequences clarifying flow control and acknowledgement mechanisms.
- The course describes the low power modes.
- The enumeration and configuration for a point-to-point or ring topology is studied.
- Data protection system is also covered.

- This training has been delivered several times to companies developing SoCs for wireless / consumer market.

A more detailed course description is available on request at training@ac6-training.com

Prerequisites

- Experience of mass-storage interface, such as SD/MMC or USB mass storage class is recommended.

Course Environment

- Theoretical course
  - PDF course material (in English) supplemented by a printed version for face-to-face courses.
  - Online courses are dispensed using the Teams video-conferencing system.
  - The trainer answers trainees' questions during the training and provide technical and pedagogical assistance.
- At the start of each session the trainer will interact with the trainees to ensure the course fits their expectations and correct if needed

Target Audience

- Any embedded systems engineer or technician with the above prerequisites.

Course Outline

OVERVIEW

- Description of a NAND flash
- Connection topologies
- Interface speed
- Protocol layers
- Transactions

PHYSICAL LAYER

- Range definition for data rates
- Impedance and termination scheme
- Line states
- 8b10b coding scheme
- Control symbols
- Test modes, loopback

LINK LAYER

- Packet framing
- Message packets
- Physical Lane State Machine
- Data Link State Machine
- Power management
- Flow control
- Data integrity
- Scrambling
- Boot code loading

PHY-LINK INTERFACE

- Interface signals
- Clock generation
- Timing diagrams

COMMON TRANSACTION LAYER

- Packet formats
- Transition to Dormant mode
- Device initialization
- Enumeration
- Configuration
- Registers mapping and description
- Timing rules

SD TRANSACTION LAYER

- Summary of legacy SD commands
- Transaction Control and Management state machine
- Basic transaction rules
- Error handling

DATA PROTECTION SYSTEM

- System and user password
- Encryption key
- DPS command set