IM5 - CSI-2

This course covers the Camera Serial Interface v2 (CSI-2)

Objectives

- The course starts with an overview of MIPI specification.
- The layers are described using a bottom-top approach, starting with D-PHY and ending with CSI-2.
- Forward and Reverse capabilities of a D-PHY are studied.
- The course details the electrical characteristics of D-PHY.
- Access to configuration and status registers through CCI is covered.
- Multi-lane distribution and merging of packets is explained.
- The course focuses on the low level protocol, based on short and long packets used to transport images, embedded data and framing informations.
- Data formats and possible compression of raw data is detailed to understand how the long packet payload is organized.
- Companies interested in attending this course must adhere to MIPI organization.
- This course has been designed for engineers in charge of SoC architecture, functional verification or silicon validation.

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

Prerequisites

- Basic knowledge on video transport.

Environnement du cours

- Cours théorique
  - Support de cours au format PDF (en anglais) et une version imprimée lors des sessions en présentiel
  - Cours dispensé via le système de visioconférence Teams (si à distance)
  - Le formateur répond aux questions des stagiaires en direct pendant la formation et fournit une assistance technique et pédagogique
- Au début de chaque demi-journée une période est réservée à une interaction avec les stagiaires pour s'assurer que le cours répond à leurs attentes et l'adapter si nécessaire

Audience visée

- Tout ingénieur ou technicien en systèmes embarqués possédant les prérequis ci-dessus.

Plan du cours

INTRODUCTION TO MIPI SPECIFICATIONS

I2C PROTOCOL

- START, STOP, repeated START sequences
- Random read / write access
- Sequential read / write access
- Clock stretching

D-PHY

- Universal lane module architecture
- Control character usage
- Uni-directional data lanes
- Bi-directional data lanes, turnaround procedure
- Clock lane
- High-Speed data transmission in bursts
- System power states
- Low power states, escape mode
- Low power data transmission
- High-Speed clock transmission
- Fault detection

CAMERA SERIAL INTERFACE (CSI-2)

- Overview
- Camera Control Interface
- Color spaces
- Data transmission interface
- Recommended memory storage according to image format
- Recommended receiver error behaviour
- Conformance test suite