Course Number H7214B Opt. 210, Dedicated

Eye Diagram Analysis

Course Overview

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Telecommunications and Data Communications Engineers: This course provides the basics of eye diagram measurements. Learn the theoretical and practical fundamentals of eye-diagram analysis and gain experience making eye diagram and accurate extinction ratio measurements.

What you will learn

- How the eye diagram is constructed
- Waveform test basics and definitions
- How to make accurate eye diagram measurements
- How to make accurate extinction ratio measurements
- Gain experience setting up and performing mask tests
- Gain experience using high-speed oscilloscopes

Specifications

Course Type

Application Training

Audience

Scientists, Engineers, and Technicians

Prerequisites

- Basic understanding of data communication and telecom transmission systems
- Experience with digitizing oscilloscopes is desired.

Course Length

4 to 8 hours

Delivery Method

Dedicated – at customer site with customer's equipment

Course Format

Course content is about 40% lecture and 60% lab.

Detailed Course Agenda

Introduction

- Why use the eye diagram waveform?
- Open Systems Interconnection (OSI) reference model
- Physical layer specific test – digital
- Other physical layer tests – analog

Eye Diagram Analysis Basics

- What is the eye diagram?
- Eye diagram measurement setup
- Why characterize the eye diagram?
- "Golden" receiver bandwidth
- Uncalibrated/Unfiltered test equipment
- Signal Processing of Digital Communication Analyzer
- Raw performance or compliance testing
- Standards defining eye diagrams
- Key parameters: sampling time and decision thresholds
- Types of eye diagram analysis
- Histogram definition and examples
- Impact of noise

Eye Diagram Analysis (Hands On)

- Electro-static discharge protection
- Connector care, inspection, and cleaning
- Lab equipment setup
- Calibrate vertical channel and dark level
- Measure dark level using a histogram
- Measure logic '0' and logic '1'
- Extinction ratio definition and measurement
- Measure eye height and width
- Measure crossing percentage, duty cycle distortion

- Measure jitter
- What is Q?
- Q-factor on digital communications analyzers
- Measure Q-factor
- What is the mask test?
- Mask testing
- Measurement pitfalls, tips and tricks
- Non-integrated test equipment
- Time base conversions for simple setup and analysis
- Manual extinction ratio
- Custom masks
- Mask coordinate system
- Basic procedure to modify a built-in mask
- Basic procedure to create a simple mask
- Simple mask
- Basic procedure to create masks for uploading
- Example mask
- Mask mapped to coordinates
- Mask file format example
- Mask polygons
- Triggering issues

Ordering Information

To order the *Eye Diagram Analysis* course (H7214B Opt 210), call:
US (800) 593-6632
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