multiLane

DATASHEET

Innovation for the next generation

AT4039B-JIT

4-Lane BERT | 28 Gbps NRZ

4 Differential Error Detectors with CDR | 4 Differential Pulse Pattern Generators | Adaptive FFE on receivers | Receiver Sensitivity | Jitter and Interference Injection | ISI Channel Emulator

Summary

The AT line of products is highly integrated for the Advantest V93000 system and fits right underneath the load board, in the cavity of the test head extender. Due to this, the signal path to the DUT is kept extremely short.

The AT line of instruments is made to work for packaged silicon systems as well as for wafer probing and is meant to enable at-speed testing of SerDes, transceivers, amplifiers and other active and passive high-speed digital components. The AT family consists of pattern generators, error detectors and sampling oscilloscopes.

AT4039B-JIT

100G BERT

Introduction

The AT4039B-JIT is a full feature four-lane differential 100 Gb/s NRZ BERT that covers bitrates of 1.25 to 28.125 Gbps. AT4039B-JIT enables jitter tolerance testing with sinusoidal jitter injection up to 100 MHz.
The GUI makes it possible to individually control each TX level. The user may also inject error sequences into the stream. The receiver features a combination of DFE and FFE equalization that compensates for up to 30 dB of loss at Nyquist and a CTLE equalizer with 10 dB dynamic range.

Key Features

Transmit

- Low cost, instrument-grade BERT optimized for high speed data analysis and JTOL of 100G transceivers.
- The wide range of bitrate coverage allows physical testing for Ethernet, HDMI 2, USB 3.1, PCIe, Fiber-Channel and others.
- Ability to tune the bit rate in very fine steps to facilitate finding the locking margin.
- Supports user-defined patterns.

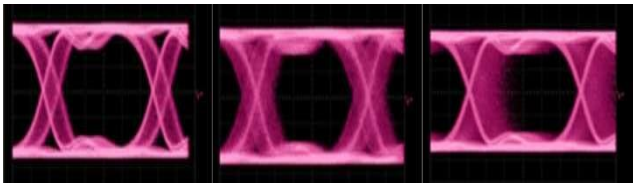

Figure 1: Sinusoidal and Random Jitter Injection

Receive

- Adaptive equalizer and channel IL estimator > 10 dB (FFE+DFE).
- Control of CTLE slider channel by channel
- Quadruple port CDR, being able to recover the supported rates.

Target Applications

- Production testing of transceivers and consumer electronics interfaces
- Testing for functional and SI functionality
- Jitter tolerance of receivers
- Transceiver functional tester, for simple validation

General:

- API libraries with documentation for Smartest and windows.
- LabView driver and Python wrapper available

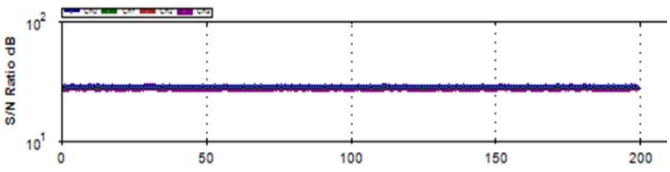

Figure 2: SNR capture over time

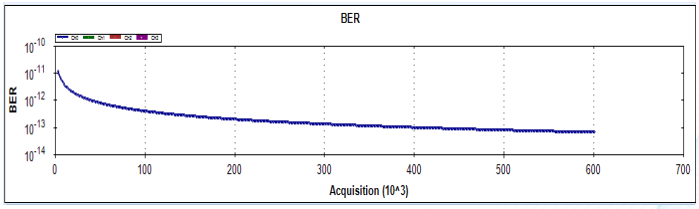

Figure 3: BER curves for one channel with 1 error inserted at the MSB and LSB respectively

Electrical Specifications

Parameter	Specifications
Bit Rates	NRZ: 1.12 – 1.56 and 3.25 – 28.125 Gbps
TX Amplitude Differential	0 – 2200 mVpp at 26 GBd
Patterns	PRBS 7/9/11/13/15/16/23/31 /58 - Square wave
TX Amplitude Adjustment	Steps of 2 mV
Equalizing Filter Spacing	1 UI
Random Jitter RMS	320 fs
Rise / Fall Time (20–80%)	14 / 14 ps
Error Detector sensitivity	30 mVpp
SJ Amplitude max	100 ps
SJ Frequency	40 kHz to 100 MHz
Inter-Lane Skew	Supported up to 100 ps
Error Detector CDR	Supported
Input Equalizer Dynamic Range	Up to 30 dB
TX/RX connectors	Blind-mate SMPM
Reference clock Output	Bitrate / 32, 64, 165 LVPECL
Clock Input Range	80-700 MHz with an optimal value of 156.25MHz
Clock Input Amplitude	200 - 1200 mV
Clock Input Impedance	50 Ω
Temperature range	-15 to 75 °C
Weight	~1.5 kg
Power (ATE version only)	12 V, 1.5A

Mechanical Dimensions

The AT4039B-JIT is customized to fit and seamlessly function inside an Advantest HSIO test head extender.

Dimensions: 265.6 x 40.5 x 58 mm3

Ordering Information

Option	Description
AT4039B-JIT	4 Channels 28 Gbps BERT

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