Anritsu envision:ensure

Easy, Fast, High-Sensitivity PAM4 TDECQ Measurement

PAM4 Analysis Software MP2110A-095
BERTWave MP2110A

BERTWave

Data traffic volumes continue to increase driven by demand for flat-rate video streaming and other cloud services. As a result, 100 Gbit/s transmission equipment optical interfaces are starting to transition to 200 GbE and 400 GbE offering more capacity. These 200 GbE and 400 GbE transmission formats are adopting the PAM4*1 technology as a substitute for the previous NRZ technology.

The MP2110A-095 software option adds PAM4 signal analysis functions to the MP2110A sampling oscilloscope. Since it also supports PAM4 signal measurements including TDECQ*2 as well as NRZ signals, it is the ideal all-in-one solution for evaluating the quality of optical modules at speeds from 25 Gbps to 400 Gbps.

[Target Applications]
Evaluating PHY layer performance of optical transceiver modules (CFP8, SFP56, QSFP56, OSFP, QSFP-DD) and component devices

Features

Easy

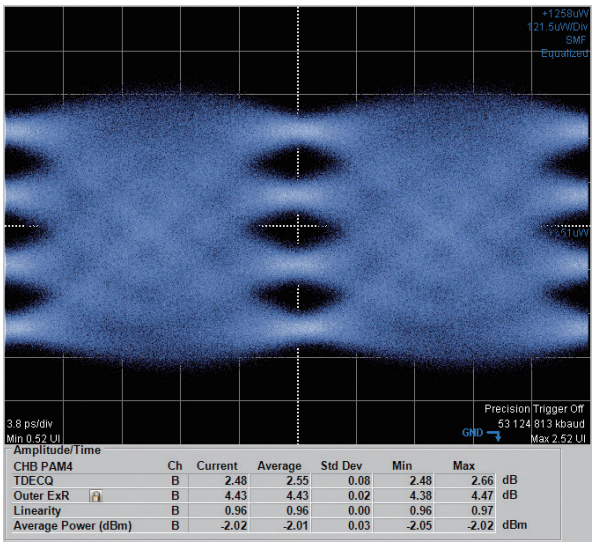
TDECQ measurement using a reference filter and equalizer*3 is supported. Measurement results are obtained with good reproducibility and correlation with other makers' oscilloscopes. Not only 26 Gbaud, but also 53 Gbaud measurements are supported.

Fast

The fast sampling speed of 250 ksample/s*4 cuts measurement times to help improve productivity.

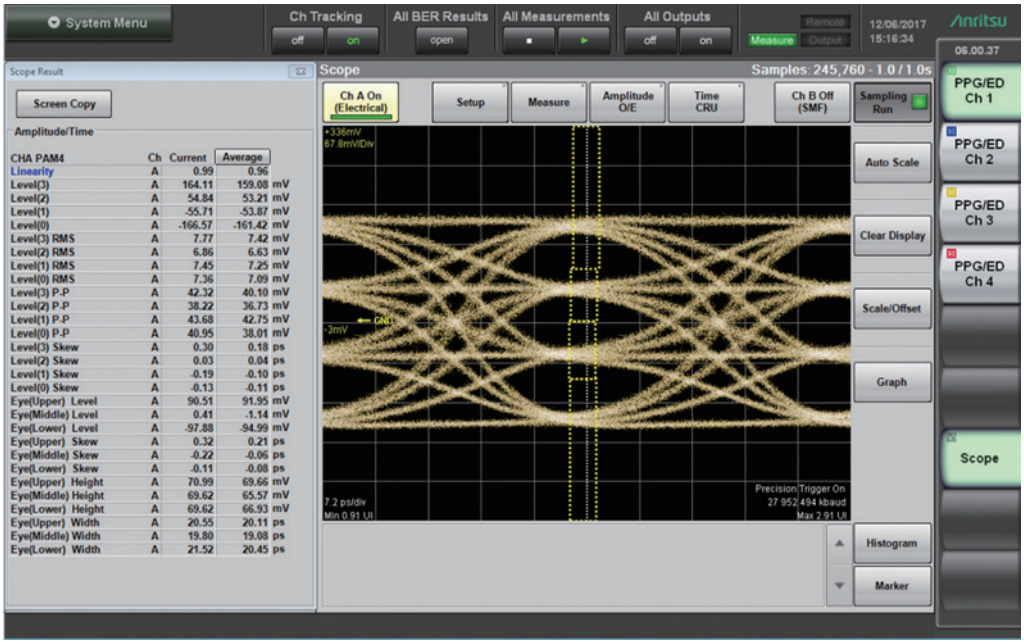
Low Noise

This O/E module with world-beating sensitivity and a low noise of 3.4 µW improves line yields by supporting accurate measurement of PAM4 signals with narrow Eye openings.



53 Gbaud PAM4 TDECQ Measurement

*1: PAM4 (Pulse Amplitude Modulation): Method for improving transmission capacity using fourth-order amplitude modulation
*2: TDEQ (Transmitter and Dispersion Eye Closure for PAM4): Typical measurement index expressing PAM4 optical signal quality; equivalent to NRZ Eye Mask test and specified by IEEE802.3
*3: TDECQ Equalizer: Reference equalizer used at TDECQ measurement specified by IEEE802.3
At Feed Forward Equalization (FFE), requires calculation of FFE Tap value to optimize TDECQ measured value for input waveform
*4: In Eye mode



With display of up to 32 selectable measurement items, the large number of PAM4 measurement results can be displayed on one screen. In addition, all measurement results, including those not on-screen, can be captured by remote commands. And pre- and post-TDECQ equalized results can also be captured by just one measurement.

Specifications

PAM4 Measurements	Average Power (dBm, µW)*1 TDECQ (dB)*1 Outer Extinction Ratio (dB)*1 Outer OMA (µW)*1 Linearity Levels (0/1/2/3) Levels P-P (0/1/2/3) Levels RMS (0/1/2/3) Level Skews (0/1/2/3) Eye Levels (Upper/Middle/Lower) Eye Heights (Upper/Middle/Lower) Eye Widths (Upper/Middle/Lower) Eye Skews (Upper/Middle/Lower)
Filters	50 GbE/100 GbE/200 GbE/400 GbE: 26.5625 Gbaud MM TDECQ (11.2 GHz) 26.5625 Gbaud SM TDECQ (13.3 GHz) 26.5625 Gbaud (19.3 GHz) 53.1250 Gbaud SM TDECQ (26.6 GHz) 53.1250 Gbaud (38.7 GHz)*2 64GFC: 28.9000 Gbaud MM TDECQ (12.4 GHz) 28.9000 Gbaud SM TDECQ (14.45 GHz)
TDECQ Measurement	TDECQ Equalizer No. of Taps: Choice of 5, 7, and 9 Tap Width: 1 UI (T-spaced) Threshold Adjustment (IEEE802.3cd) Target SER can be specified
Bands	Optical Channel: 35 GHz (SMF)/25 GHz (MMF)*2 Electrical Channel: 40 GHz
Optical Noise	3.4 µW rms (typ.)

*1: Optical signal only
*2: Uses filter response correction by digital signal processing (software) to secure reference filter band

Ordering Information

Please specify the model, name and quantity when ordering.
The names listed in the chart below are Order Names. The actual name of the item may differ from the Order Name.

Model	Name
MP2110A-095	PAM4 Analysis Software
MP2110A-195	PAM4 Analysis Software Retrofit*3
MP2110A-395	PAM4 Analysis Software Retrofit*3

The PAM4 analysis software can be installed in the Sampling Oscilloscope MP2110A.
*3: Sometimes, depending on the serial number, the customer can perform the retrofit, but sometimes return to the factory may be necessary. Contact your sales representative for more details.