

OFC 2020

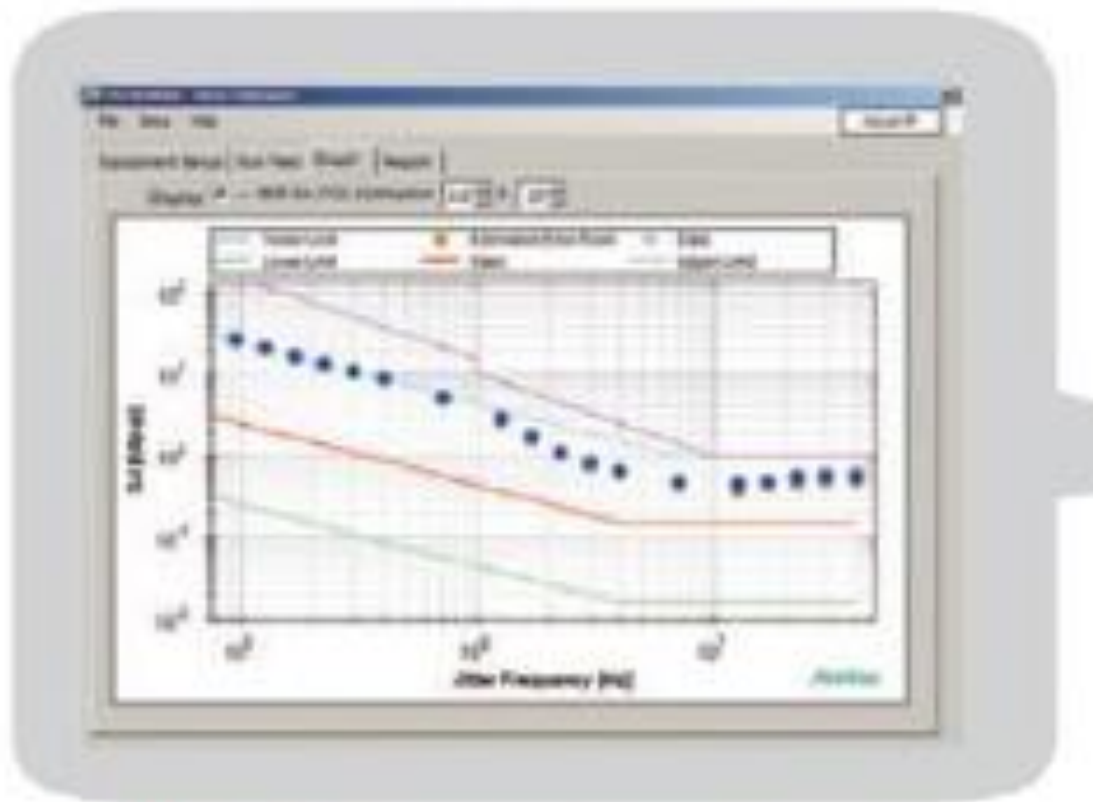
400G PAM4 JTOL Test with FEC



400G Testing AND Beyond

400G PAM4 JTOL Test with FEC

Signal Quality Analyzer-R MP1900A



Jitter Tolerance Measurement
(MX183000A-PL001)

BERTWave MP2110A



MP1900A PAM4 1st Transmit

MP1900A PAM4 Error Detector

MP1900A JTOL Test

MP2110A CR (DUT)

MP2110A PPG

MP2110A PPG

MP2110A ED

MX183000A-PL031
DUT Error Counts Import

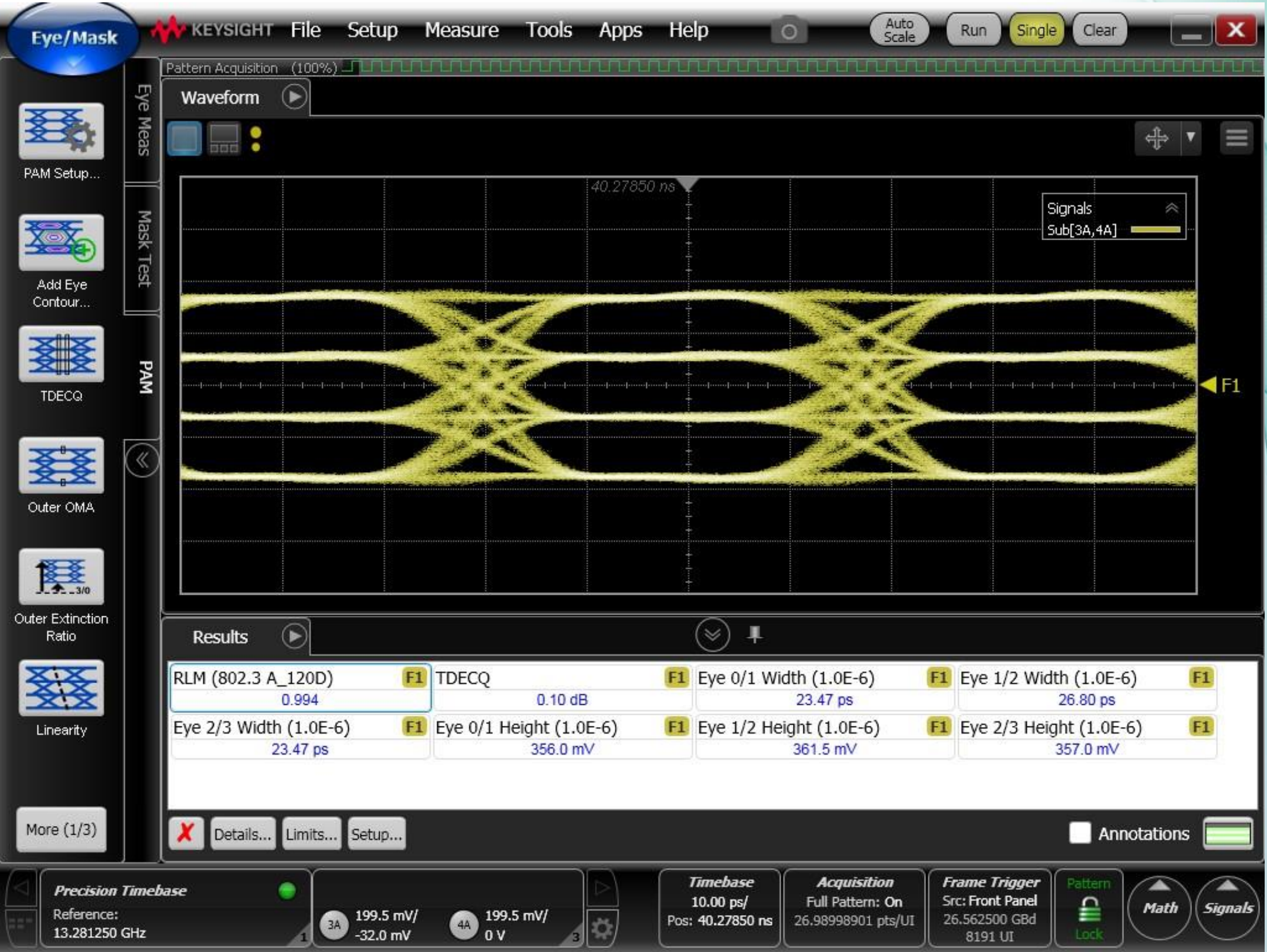
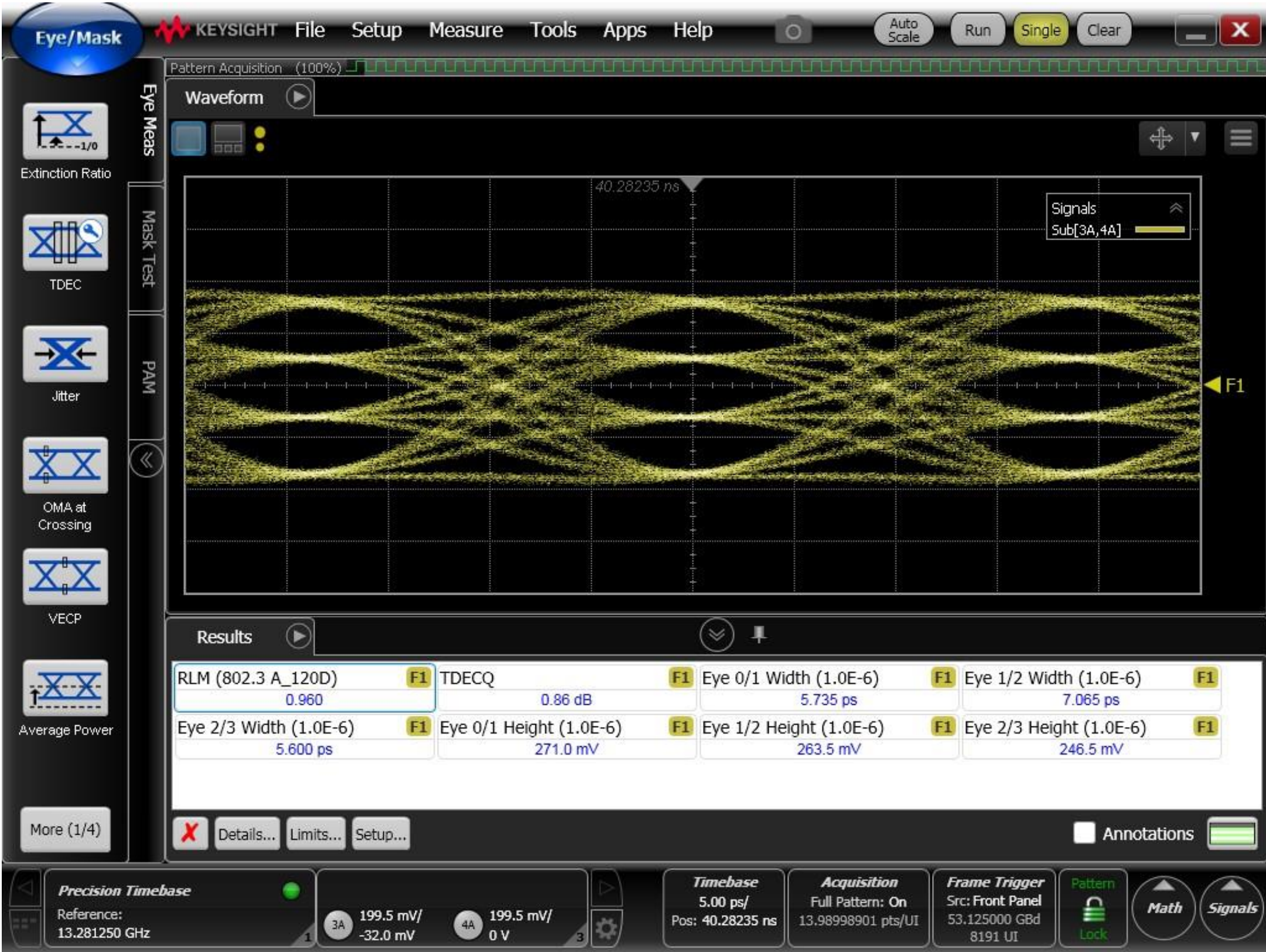


High Quality Waveform PAM4 PPG MU196020A

World best electrical performance for TDECQ evaluation of optical Tx

53.125Gbaud

26.5625Gbaud

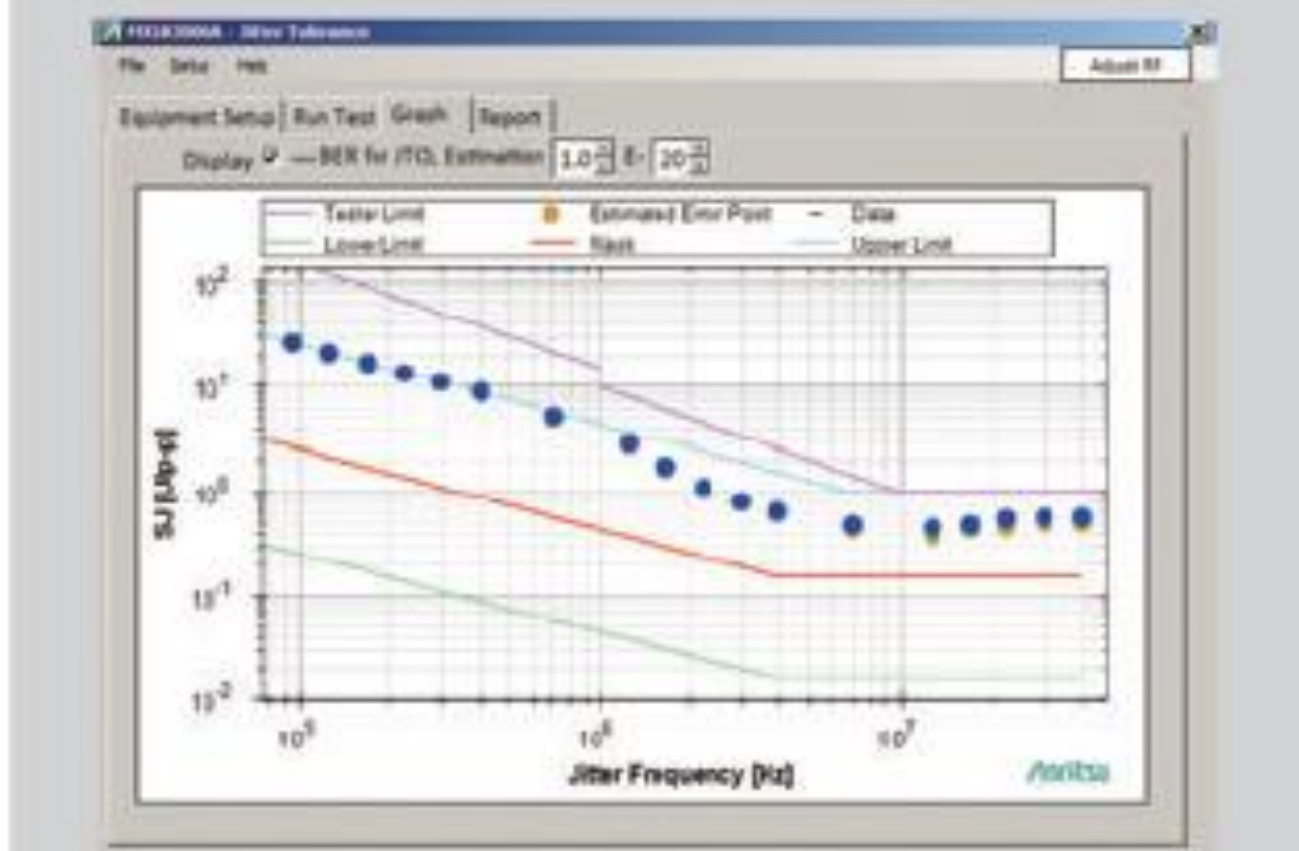


Electrical TDECQ: 0.86 dB
RLM: 0.96
Eye width: 5.7 ps(0/1), 7.1 ps(1/2), 5.6 ps(2/3)

Electrical TDECQ: 0.10 dB
RLM: 0.99
Eye width: 23.5 ps(0/1), 26.8 ps(1/2), 23.5 ps(2/3)

Jitter/Noise/ISI Tolerance Measurement

MX183000A Software Measurement Screen



4 Tap Emphasis

Jitter/Noise Addition

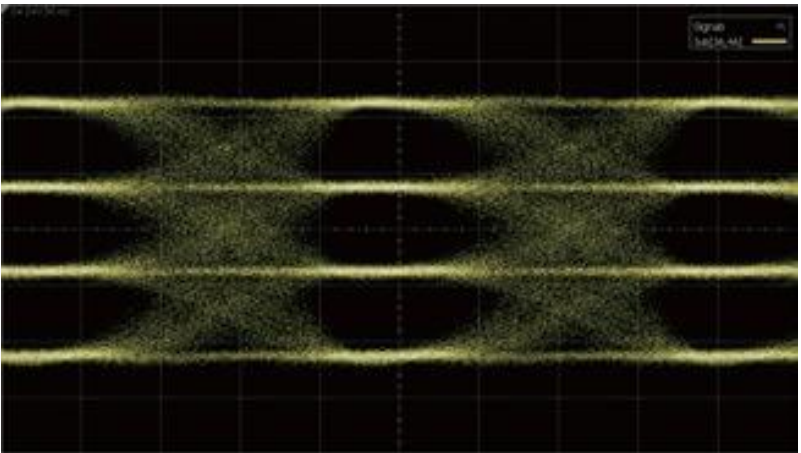
Built-in Clock Recovery

PCB Trace

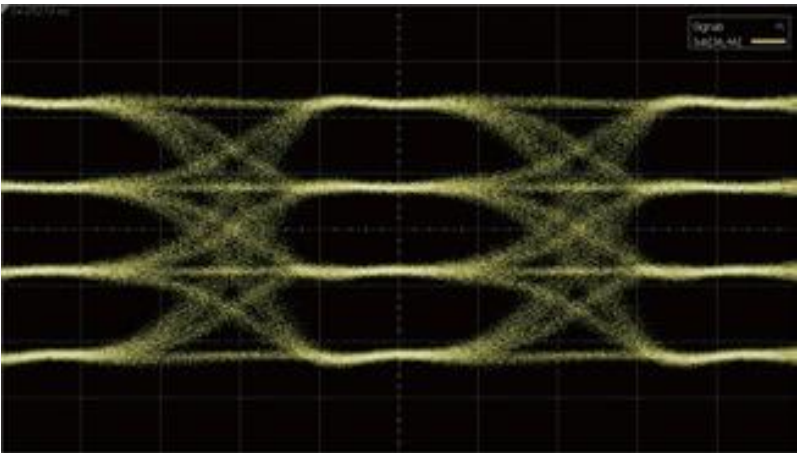
DUT Rx
DUT Tx

Asynchronous Clock

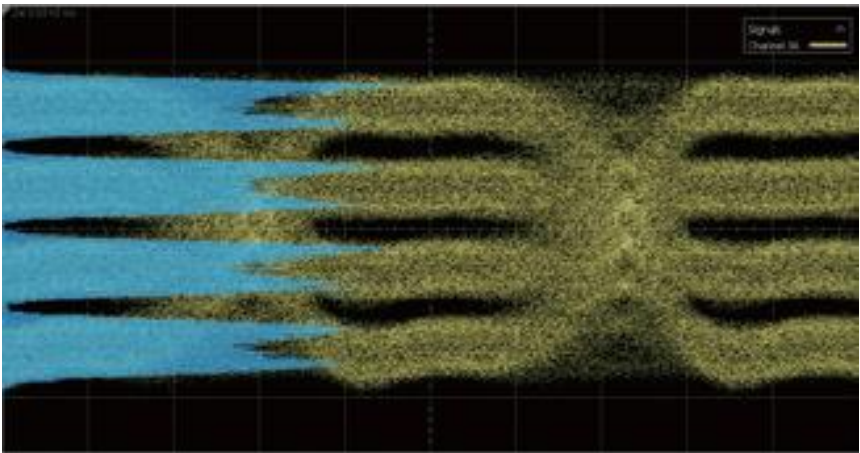
PCB Trace



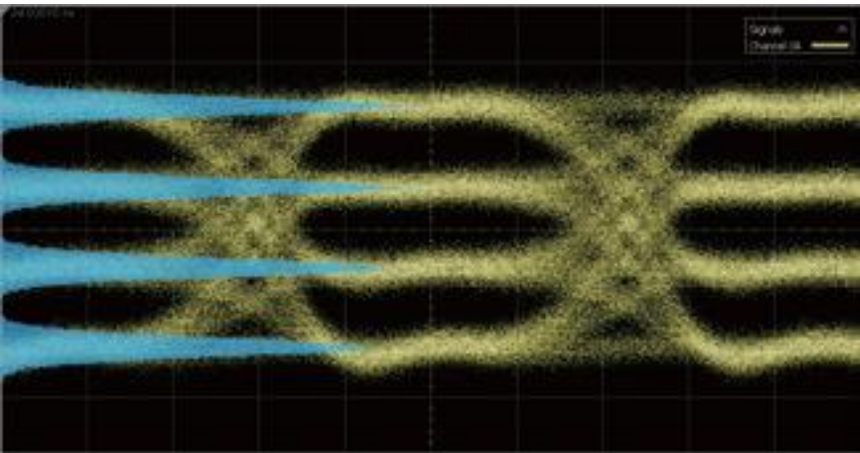
Sine-Wave Jitter (SJ)



Random Jitter (RJ)

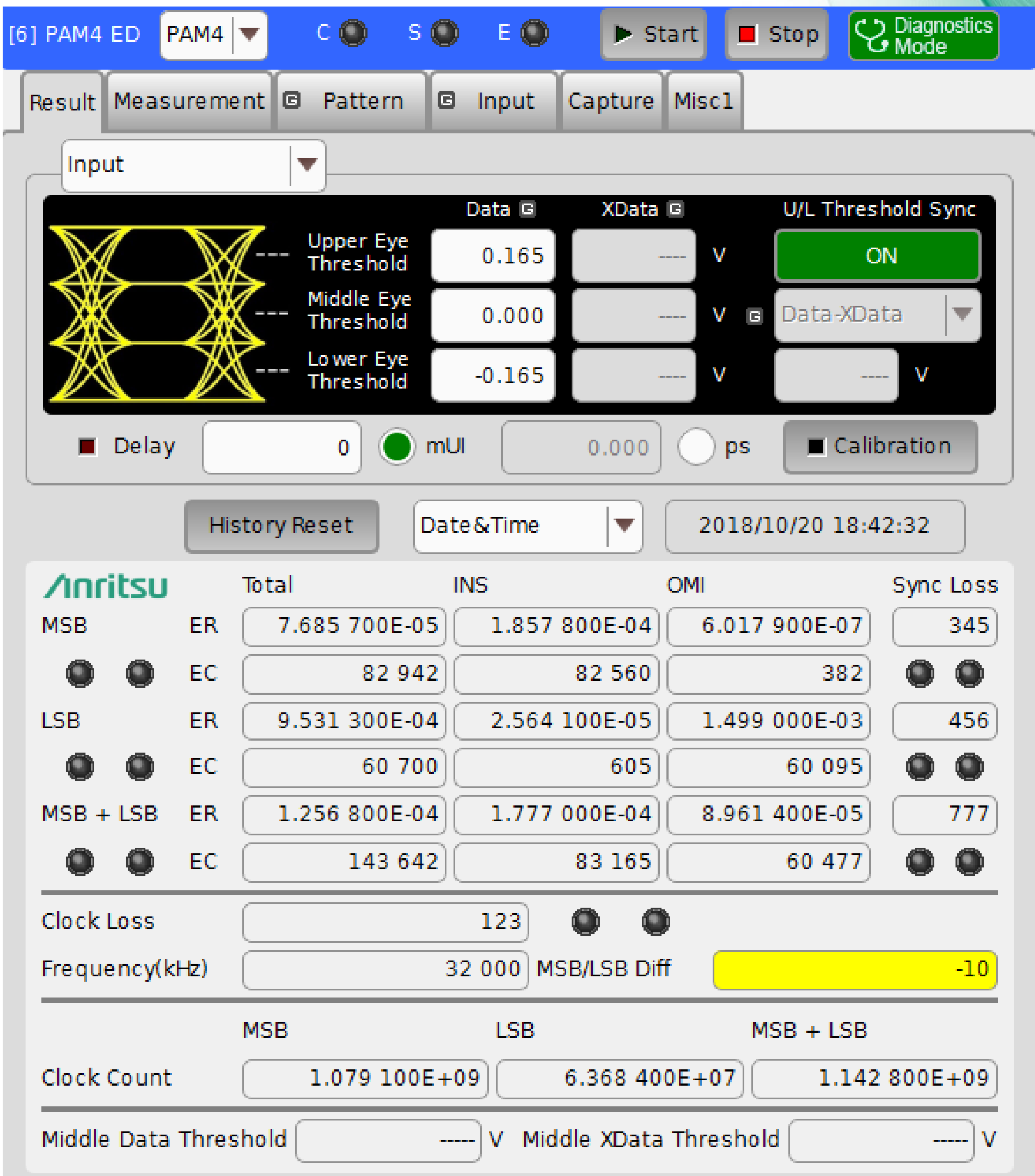
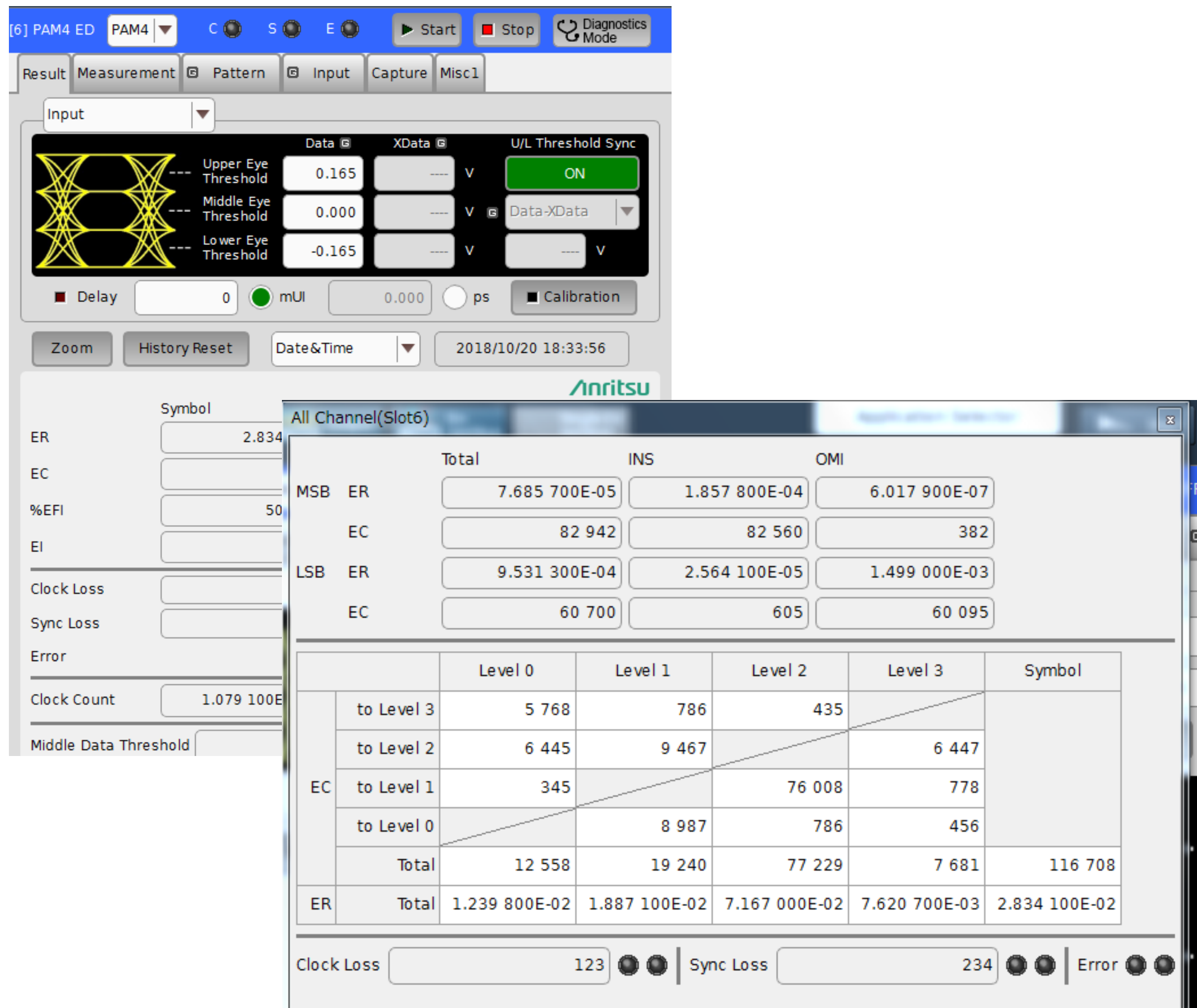


CM/DM Noise



White Noise

PAM4 ED Diagnostic



PAM4 Burst Error Insertion and Error Capture for FEC Analysis



[7] PAM4 PPG

PAM4

OFF

Warming Up

Output

Emphasis

Pattern

Error Addition

Misc1

Misc2

Error Addition

OFF

RS-FEC Symbol Error

RS-FEC 50G 1Lane

Source

Internal

Variation

Repeat

Total SER for All Lane

1

E

-4

Single

Symbol Error per Codeword

1

Max Correctable Symbol Error

15

File

Cursor Addr 0

Position 0

Pattern Addr 685

Block

1

Block Length

4194304

symbol

Viewer Mode

Notation

Symbol(PAM4)

Format

Pattern

Error

Lower(0↔)

Middle(1↔)

Upper(2↔)

Middle/Lower(0↔)

Upper/Middle(1↔)

Upper/Middle/Lower(0↔3)

Move and Search

Pattern

«Q»

Jump

Line

Q»

Error Search

Continuous Error

≥

1

symbol

Target

All

◀

▶

◀

▶

1/128

First Block

Previous Block

Next Block

Last Block

First Error Block/Address	Last Error Block/Address	Error Counts Upper/Middle/Lower	Continuous Error Counts	CaptureDepth				
1	969	1	4194249	2109	4198	2089	4198	4194304

