XAUI Jitter Specifications Issues

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XAUI Jitter Task

◆ **Transmitter**

- Pattern for transmit testing
- Jitter Eye Mask
- Jitter High Pass corner frequency

◆ **Channel**

- Added jitter by the channel
- Pattern for testing channel

◆ **Receiver**

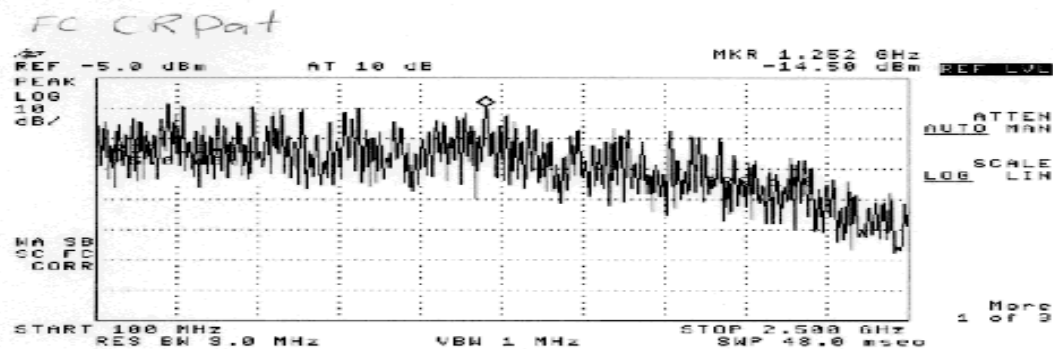- Jitter Tolerance pattern
- PLL corner frequency
- Receiver eye mask

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Jitter Methodology

◆ **Based on SONET and FC Jitter Methodology.**

◆ **SONET great care in jitter transfer and generation.**

◆ **FC more flexible with jitter transfer but the receiver must operate with 0.39 UI at δt of high frequency jitter.**

◆ **XAUI is more like FC link point-point with high amount of ISI/DCD (0.39 UI TBD) due to the PCB.**

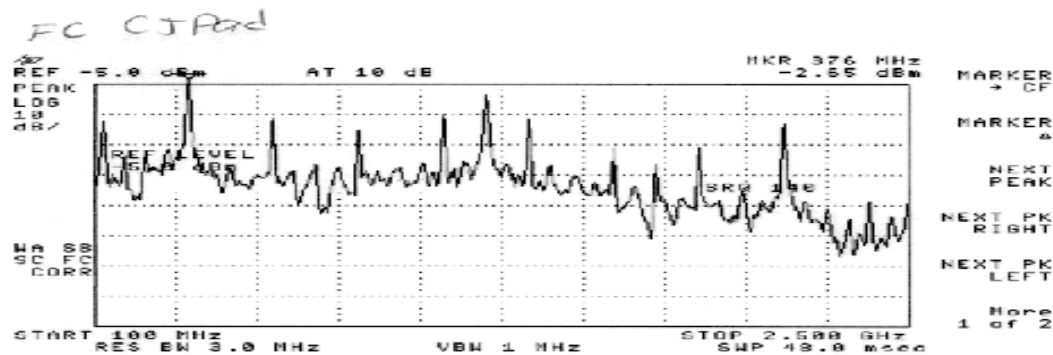BROADCOM.

FC Jitter Patterns Usage

◆ **High transition like D21.5 to induces SSO.**

◆ **FC CRPAT 8b/10b random data pattern.**

◆ **K28.5+/K28.5- ideal for testing channel and component.**

◆ **K28.7+/K28.7- ideal for random jitter testing.**

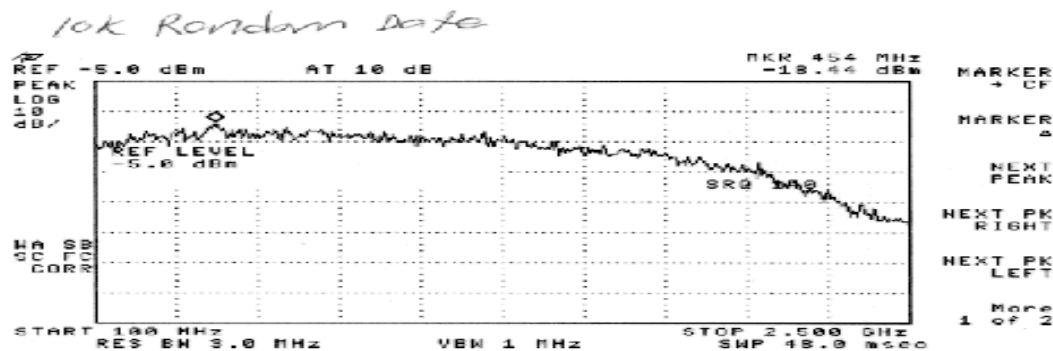◆ **FC CJTPAT ideal for testing clock recovery and PLL jitter tolerance testing.**

Peak Levels

-14.56 dBm

-2.65 dBm

-18.40 dBm

Jitter Tolerance Template
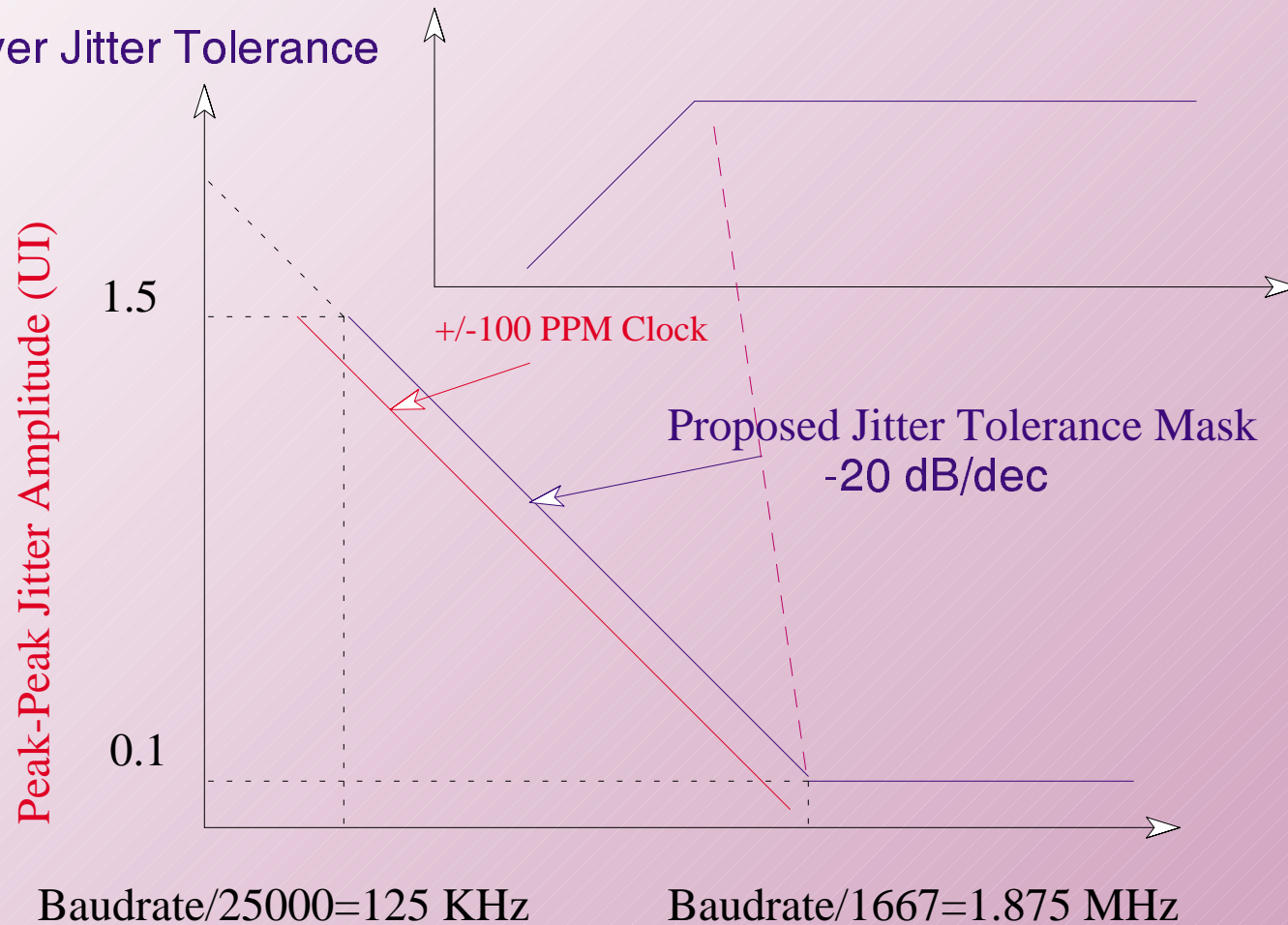
Based on FC

Transmitter Jitter Filter

Receiver Jitter Tolerance

Peak-Peak Jitter Amplitude (UI)

1.5

0.1

+/-100 PPM Clock

Proposed Jitter Tolerance Mask
-20 dB/dec

Baudrate/25000=125 KHz   Baudrate/1667=1.875 MHz
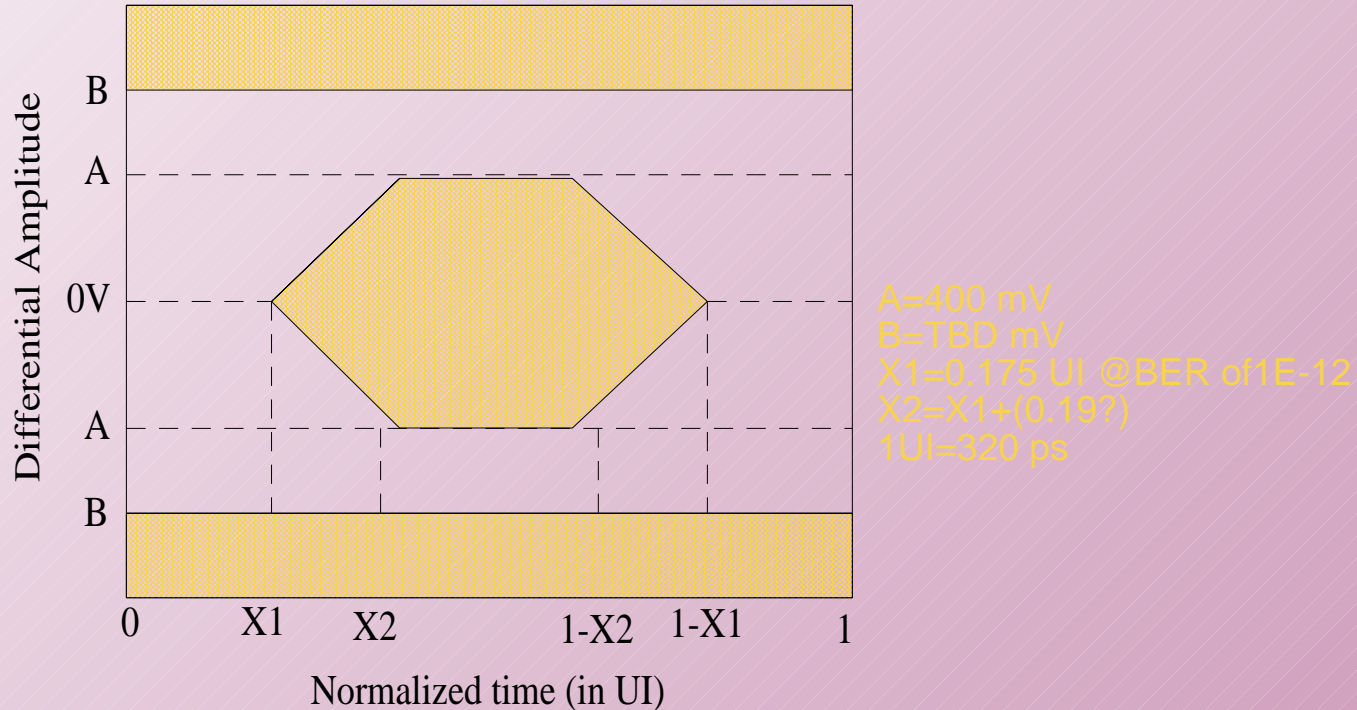
Sinusoidal Jitter Frequency

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Merits of Jitter Corner Frequency

◆ Clock +/-100 PPM lies under jitter tolerance with corner frequency baudrate/1667.

◆ Increasing the corner frequency will ease transmitter jitter compliance and integration, but we need to consider:

  ● Receiver PLL bandwidth must then be increased at least to the new corner frequency.
  ● Deviating from industry standard corner frequency has risk of making some pre-standards XAUI none compliant.
  ● Other XAUI based standards have selected already baudrate/1667 for PLL BW.

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XAUI Transmitter

◆ **DJ(max) = 0.17 and TJ(max) = 0.35 UI.**

- Assume jitter high pass corner frequency of baudrate/1667.

A=400 mV
B=TBD mV
X1=0.175 UI @BER of1E-12
X2=X1+(0.19?)
1UI=320 ps

Differential Amplitude

B

A

0V

A

B

0   X1   X2   1-X2   1-X1   1

Normalized time (in UI)

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XAUI Transmitter

◆ **DJ(max) = 0.39 UI (TBD) TJ(max) = 0.65 UI, allow 70 ps for channel DJ.**

● Assume jitter corner frequency of baudrate/1667.

A=100 mV
B=TBD mV
X1=0.325 UI @BER of1E-12
X2=X1+0.125 UI
1UI=320 ps

Differential Amplitude

B
A
0V
A
B

0   X1 X2 1-X2 1-X1   1

Normalized time (in UI)

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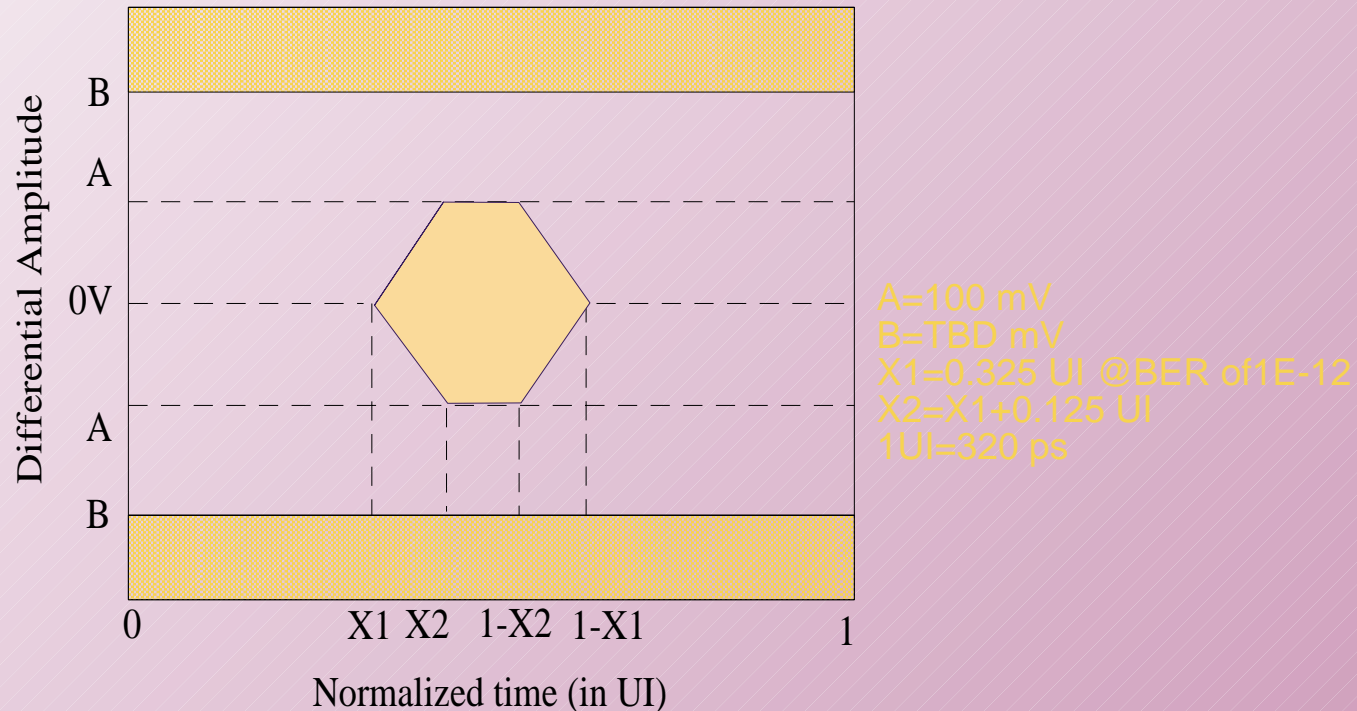
Proposed Jitter Testing

◆ **XAUI channel will be tested with K28.5+/-.**

◆ **XAUI transmitter must be tested with pattern containing highest and lowest 8B/10B transition.**

◆ **XAUI receiver will be tested with CJTPAT modified for XAUI as well as SSO and random pattern.**

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