MMF TDECQ / SECQ discrepancies and corner cases

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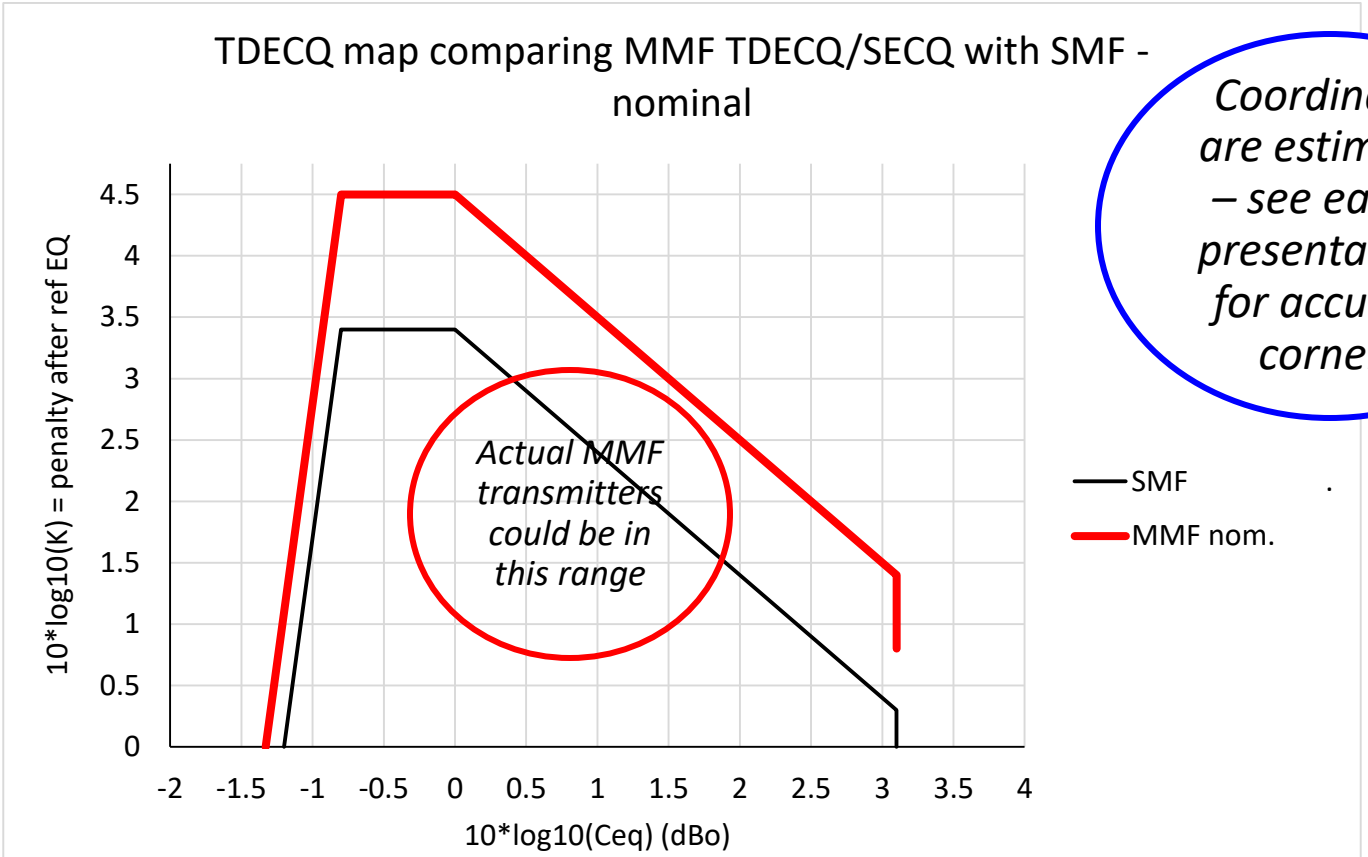
New material about transition time on slides 6 and 7 (D1.1 comments 8 and 9)
New material about over-emphasis on slides 6 and 8 (D1.1 comments 5 and 6)

TDECQ map comparing MMF TDECQ/SECQ with SMF - nominal

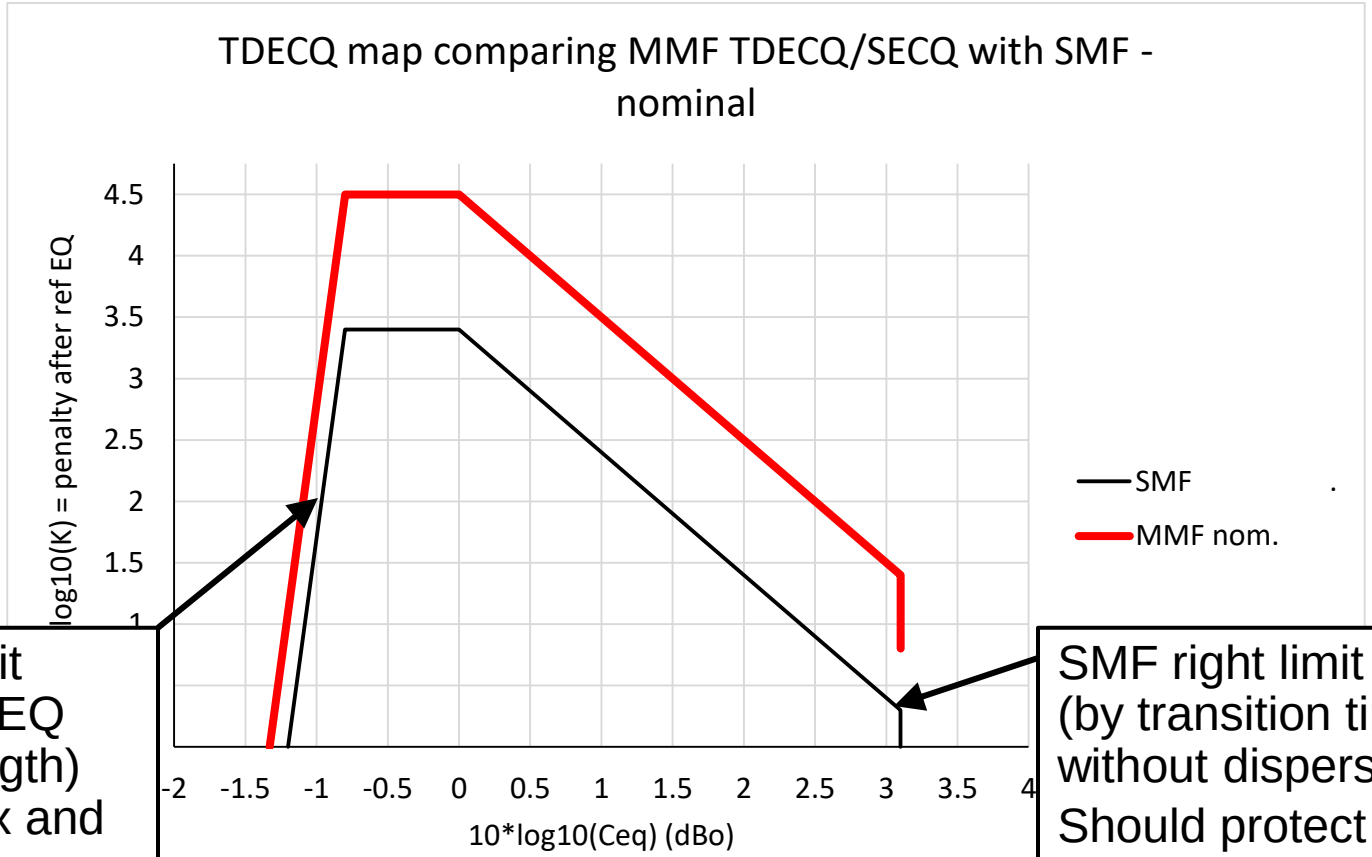


MMF TDECQ limit (4.5 dB) is much higher than highest SMF (3.4 dB)

Determines top and diagonal limits

Nominal left and right limits are also the same – but it's not that simple

TDECQ map comparing MMF TDECQ/SECQ with SMF - nominal



SMF left limit defined (by EQ cursor strength) for both max and min dispersion

Protects receiver from range of possible signals

limit (4.5 dB) is much higher than hig

mines top and diagonal limits

nd right limits are also the same – bu

SMF right limit defined (by transition time) without dispersion

Should protect receiver because effect of chromatic dispersion will be small for slowest signal

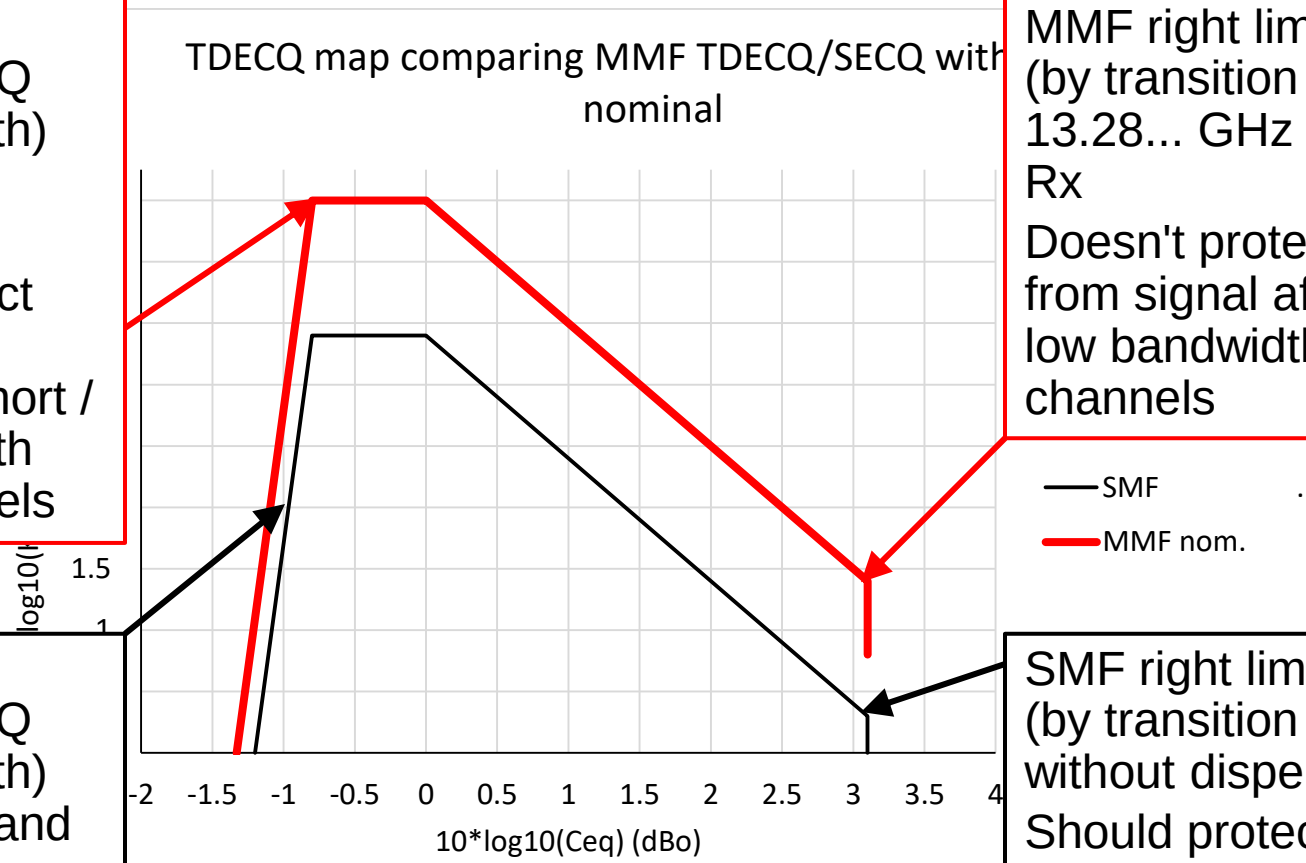
TDECQ map comparing MMF TDECQ/SECQ with SMF - nominal

MMF left limit defined (by EQ cursor strength) for 11.2 GHz reference Rx

Doesn't protect receiver from signal after short / high bandwidth optical channels

MMF right limit defined (by transition time) for 13.28... GHz reference Rx

Doesn't protect receiver from signal after long / low bandwidth optical channels



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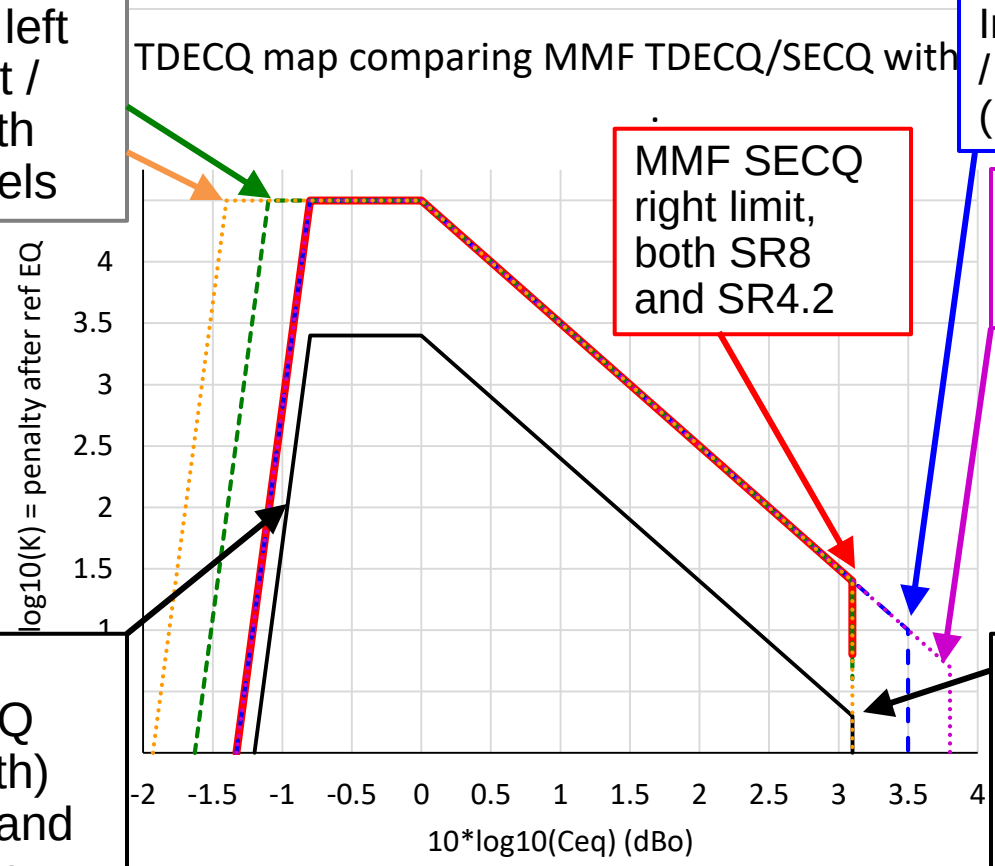
TDECQ map comparing MMF TDECQ/SECQ with SMF - actual

Implied MMF left limits for short / high bandwidth optical channels



MMF SECQ right limit, both SR8 and SR4.2

Implied MMF right limit for long / low bandwidth SR8 channel (11.2 GHz overall BW)

Implied MMF right limit for long / low bandwidth SR4.2 channel (9 GHz overall BW)

SMF left limit defined (by EQ cursor strength) for both max and min dispersion

Protects receiver from range of possible signals

SMF right limit defined (by transition time) without dispersion

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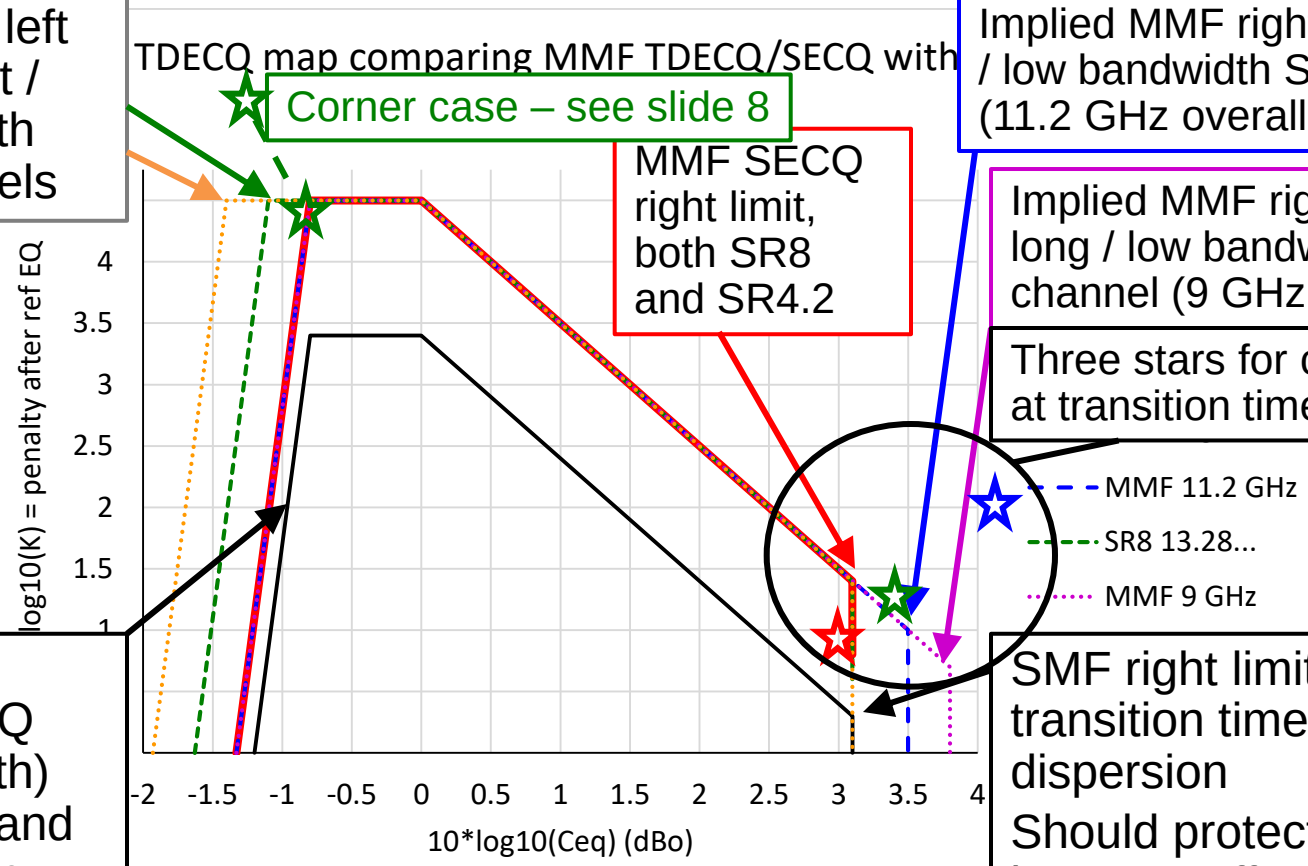
TDECQ map comparing MMF TDECQ/SECQ with SMF – corner cases

Implied MMF left limits for short / high bandwidth optical channels



Implied MMF right limit for long / low bandwidth SR8 channel (11.2 GHz overall BW)

Implied MMF right limit for long / low bandwidth SR4.2 channel (9 GHz overall BW)

Three stars for clean signals at transition time limit

SMF left limit defined (by EQ cursor strength) for both max and min dispersion

Protects receiver from range of possible signals

SMF right limit defined (by transition time) without dispersion

Should protect receiver because effect of chromatic dispersion will be small for slowest signal

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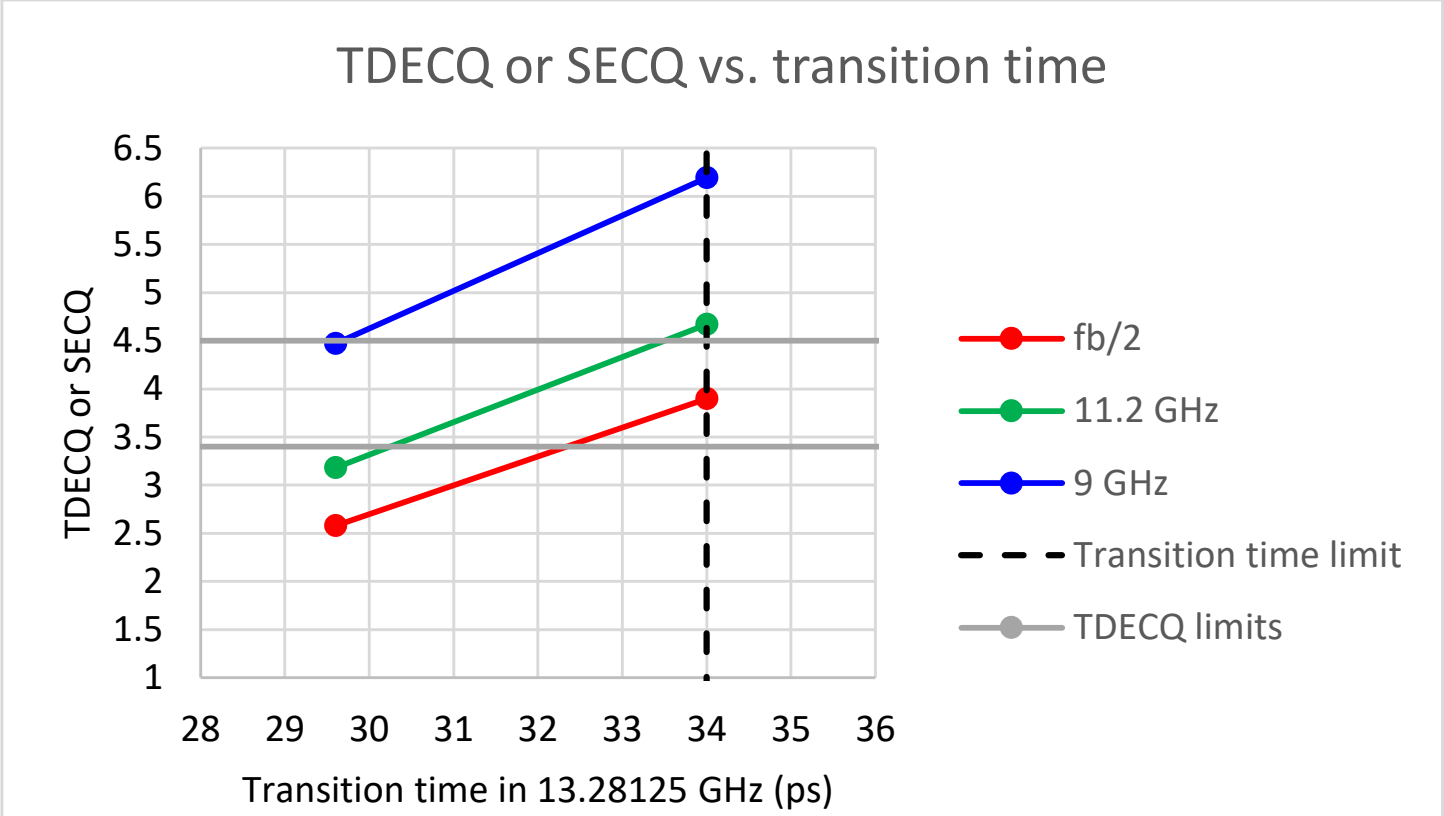


The slowest BT4 signals that satisfies the TDECQ limit, if measured in 13.28125 GHz, if there is no sinusoidal jitter, are:

32 to 33 ps for 3.4 dB (SMF)

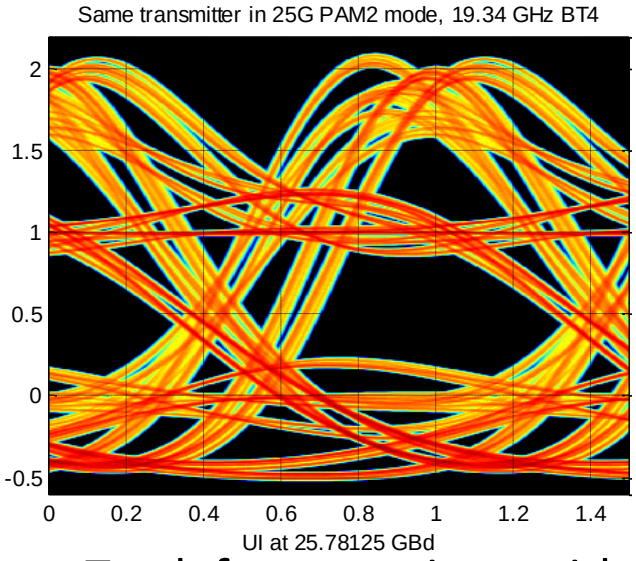
33 to 34 ps for 100 m MMF

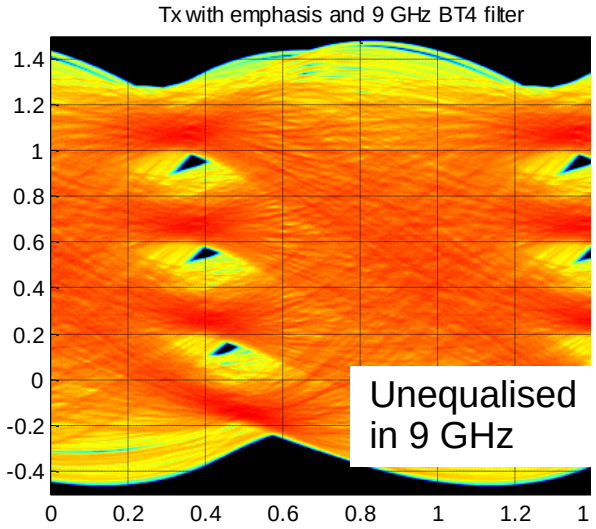
29 to 30 ps for 150 m MMF **Comment 8: This limit should be tightened, or the transition time measured in the same bandwidth as TDECQ**

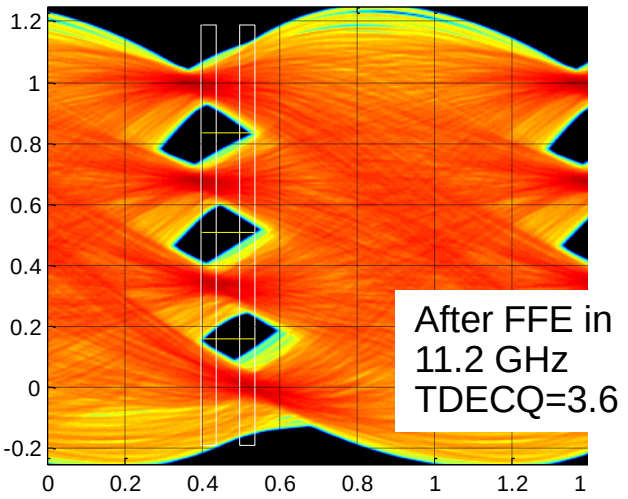
Note that the SRS signal is faster than this because part of the penalty is provided by SJ (**27.5 ps** in fb/2 for 150 m MMF)

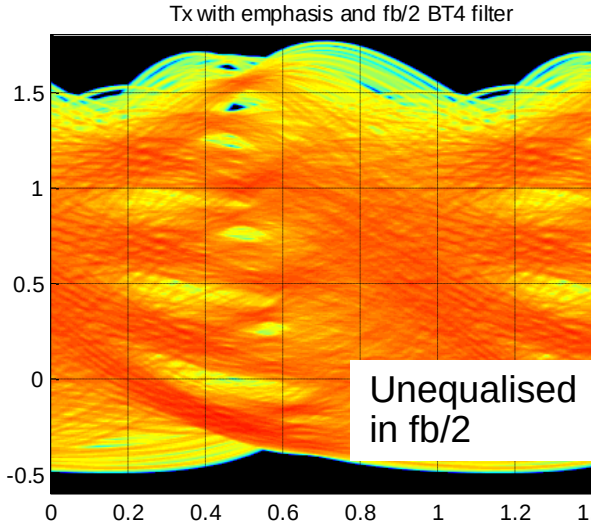
If the transition times were measured in the same bandwidth as the associated TDECQ, the lines would be close to each other, where the red line is

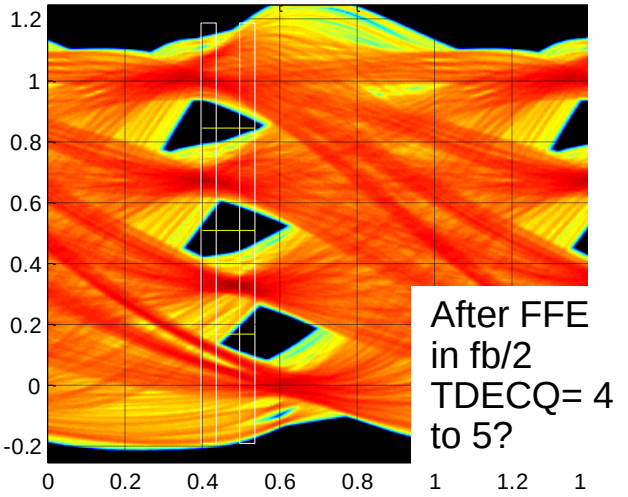
Example over-emphasised signal (top left green stars on slide 6)









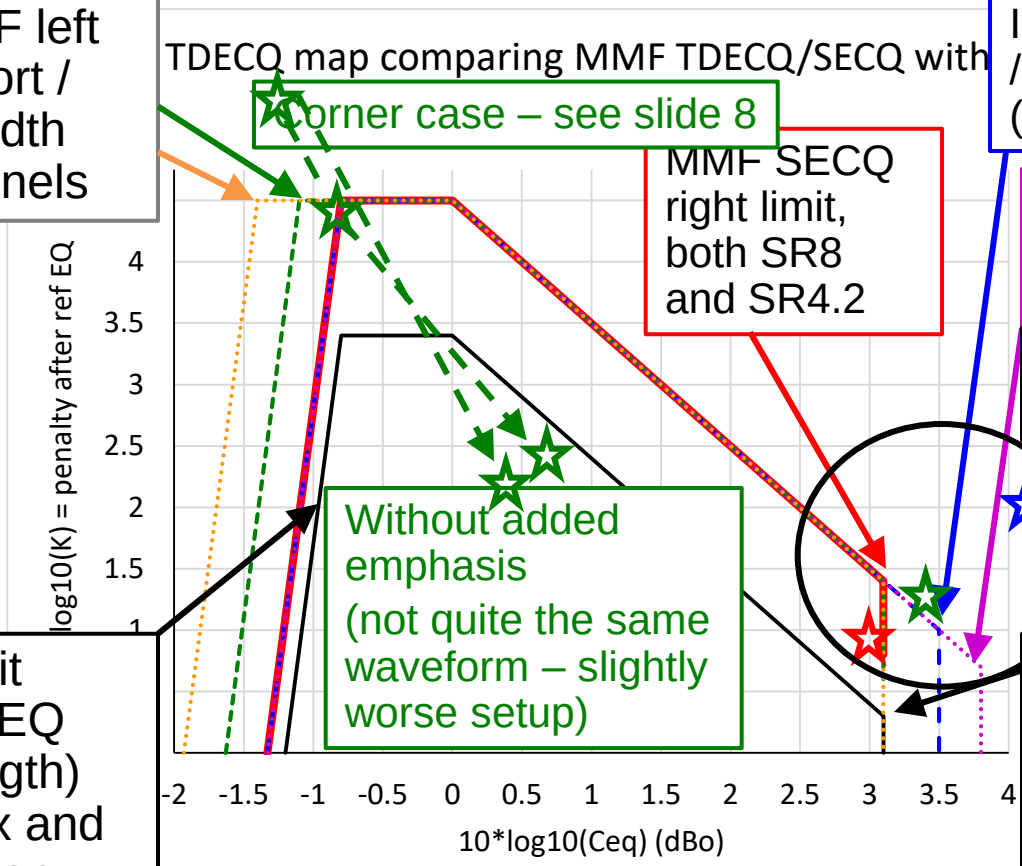


- Top left: transmitter with PAM2 signal
- 0 and 1 are OMA's zeros and threes
- Note different y scales
- This over-emphasised signal benefits from the low bandwidth in MMF TDECQ
- Fails back-to back

Should either measure TDECQ in fb/s as well as 11.2 or 9 GHz, or increase minimum cursor tap, or both

TDECQ map comparing MMF TDECQ/SECQ with SMF – corner cases+

Implied MMF left limits for short / high bandwidth optical channels



Implied MMF right limit for long / low bandwidth SR8 channel (11.2 GHz overall BW)

Implied MMF right limit for long / low bandwidth SR4.2 channel (9 GHz overall BW)

Three stars for clean signals at transition time limit

SMF left limit defined (by EQ cursor strength) for both max and min dispersion

Protects receiver from range of possible signals

SMF right limit defined (by transition time) without dispersion

Should protect receiver because effect of chromatic dispersion will be small for slowest signal

limit (4.5 dB) is much higher than hi

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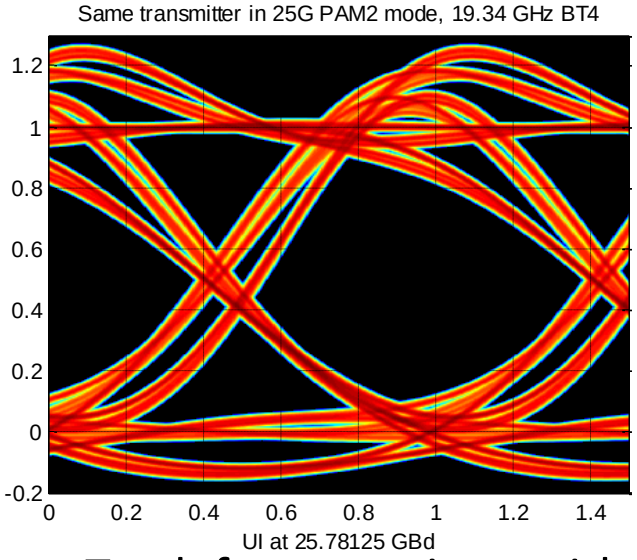
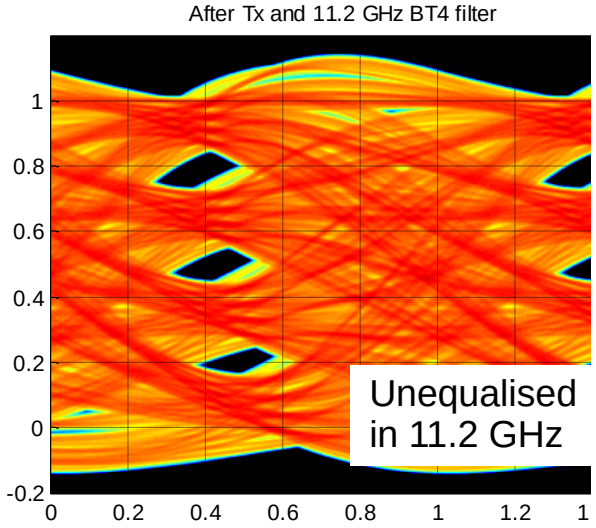
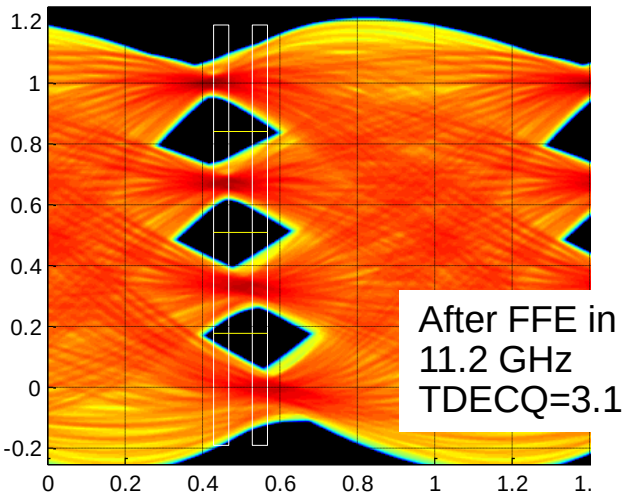
Example near-neutral signal (middle green star on slide 9)







- Top left: transmitter with PAM2 signal
- 0 and 1 are OMA's zeros and threes
- Note different y scales
- This signal does not benefit from the low bandwidth in MMF TDECQ