OTDR Waveform comparison Using PON Demo Box

A comparison of different manufacturers OTDR waveforms on a test setup representing the difficulties of PON testing (high loss elements, short distances, etc.)

Test model

OTDR1

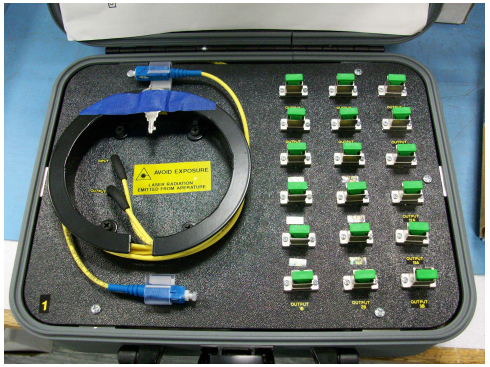
OTDR2

OTDR3

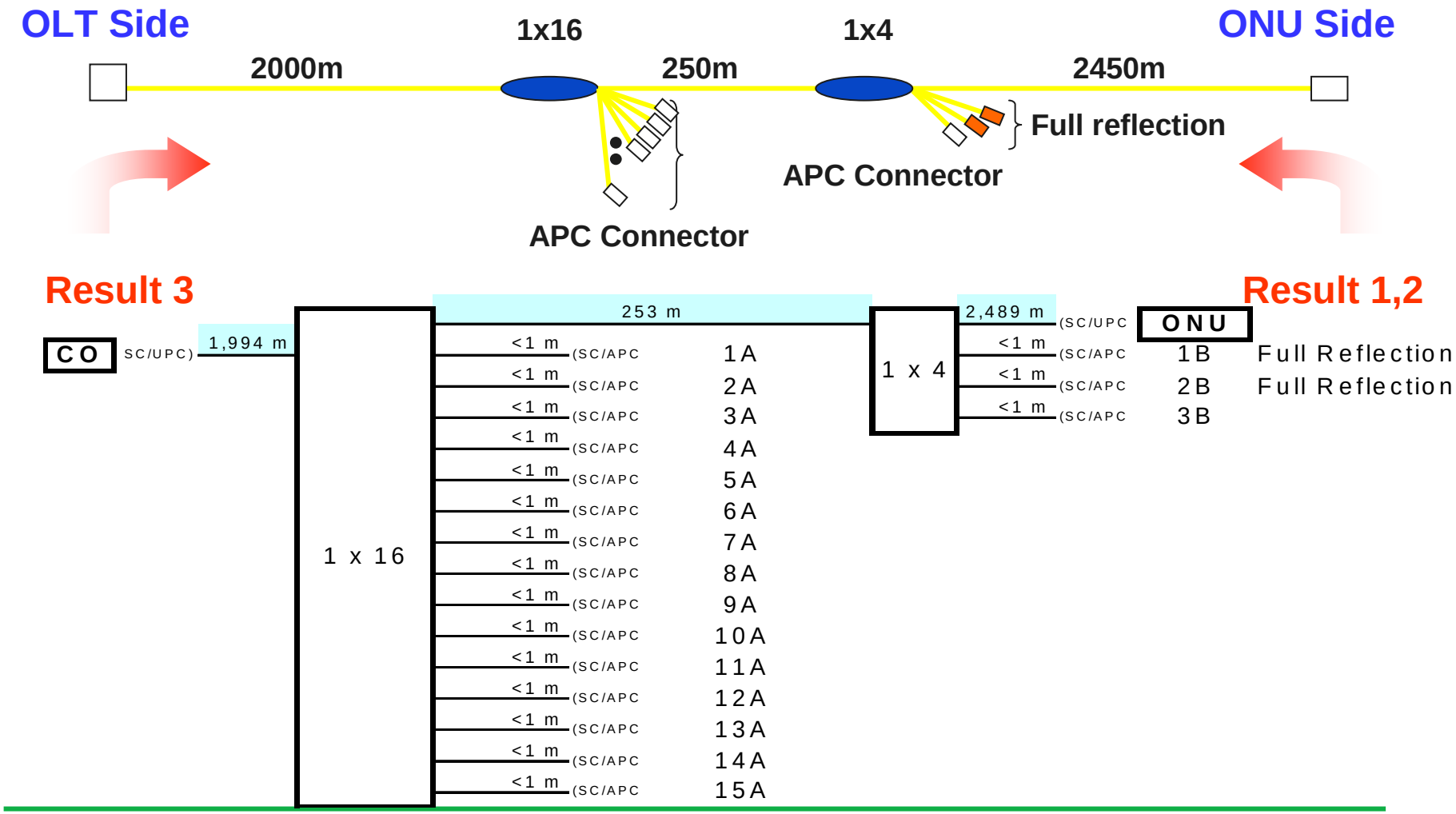
OTDR4

OTDR5

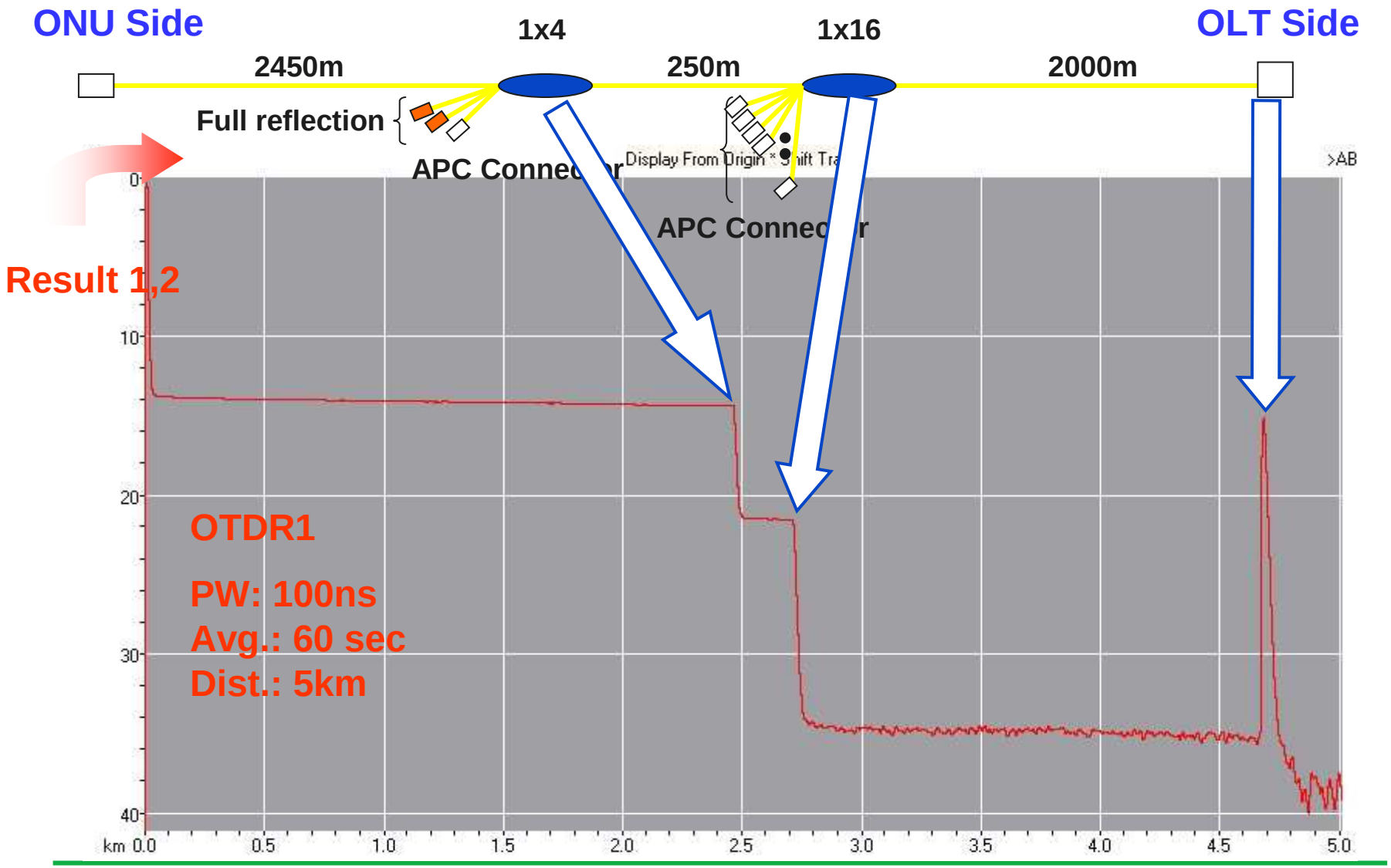
PON test box & extra cables



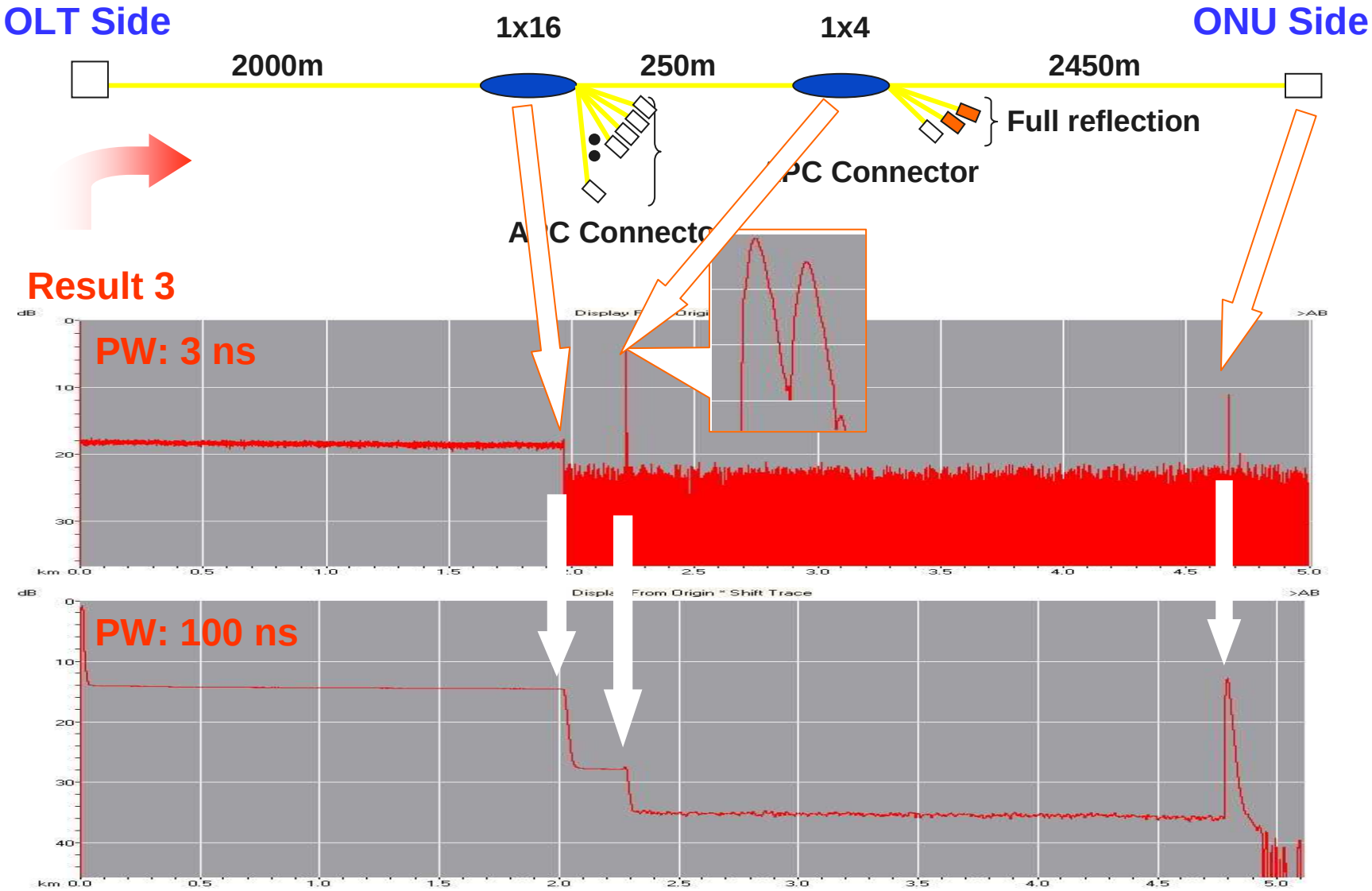
Measurement Setup



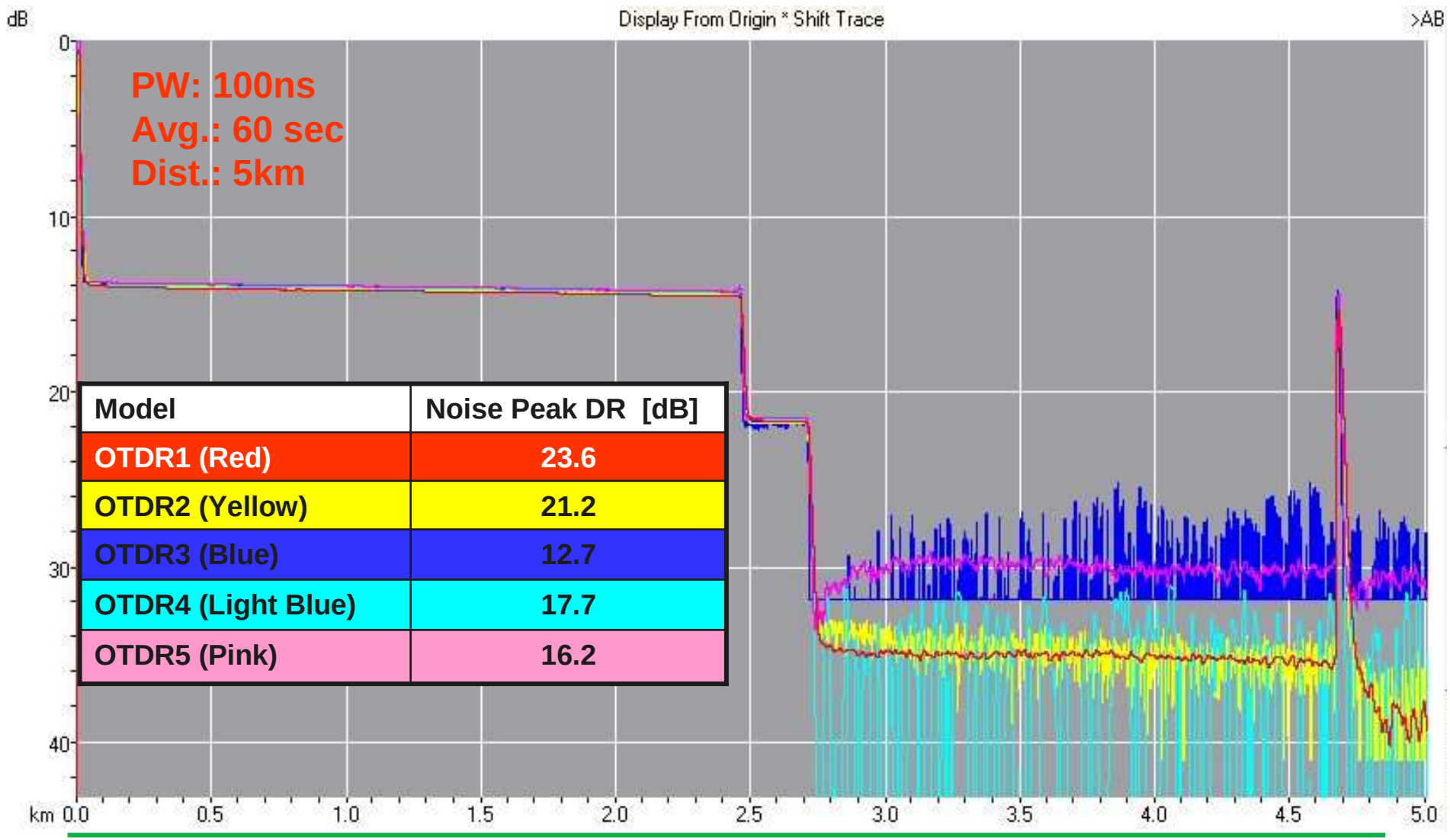
Measurement Setup (Result 1, 2)



Measurement Setup (Result 3)

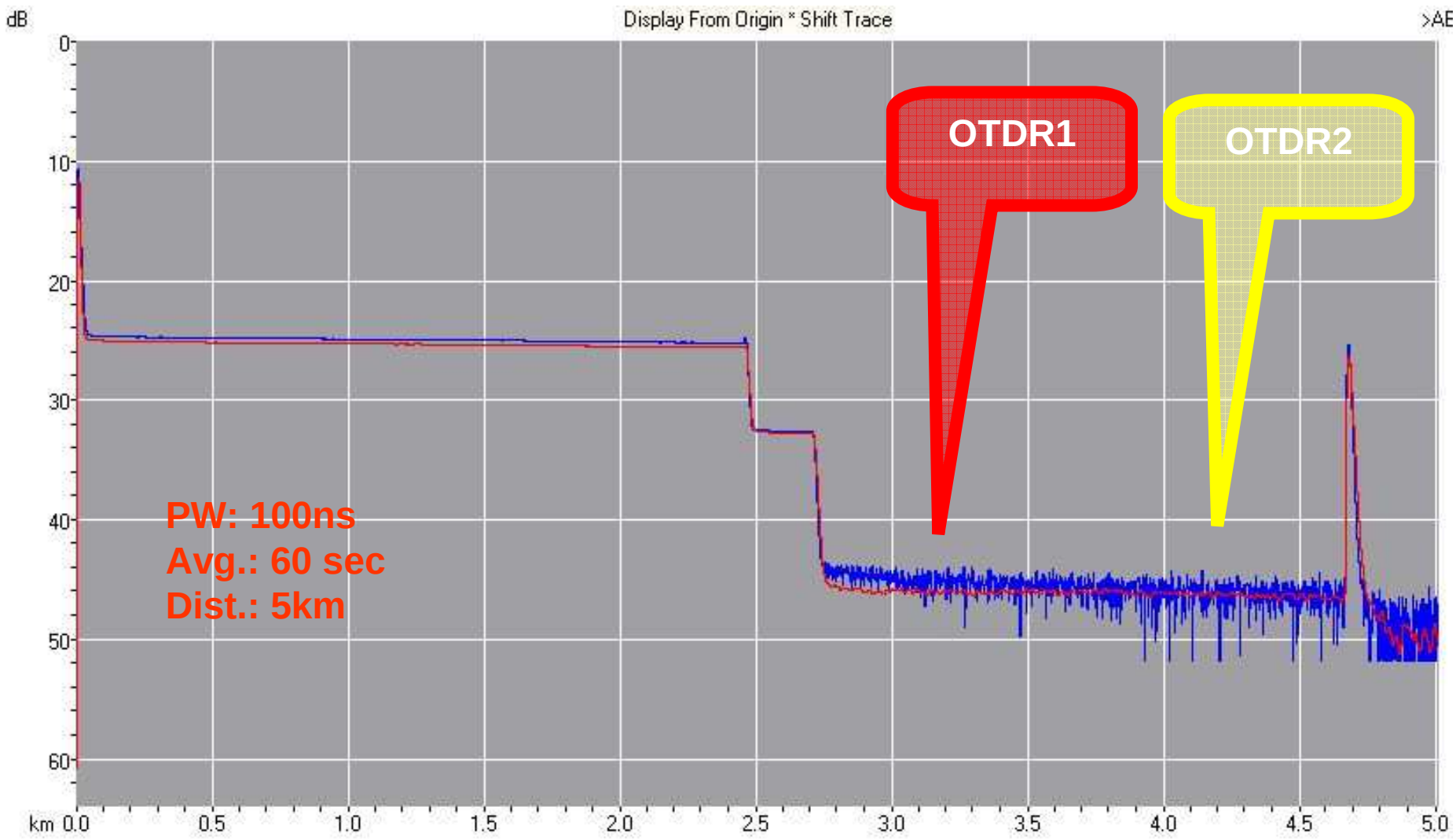


Result 1: Waveform from ONU to OLT

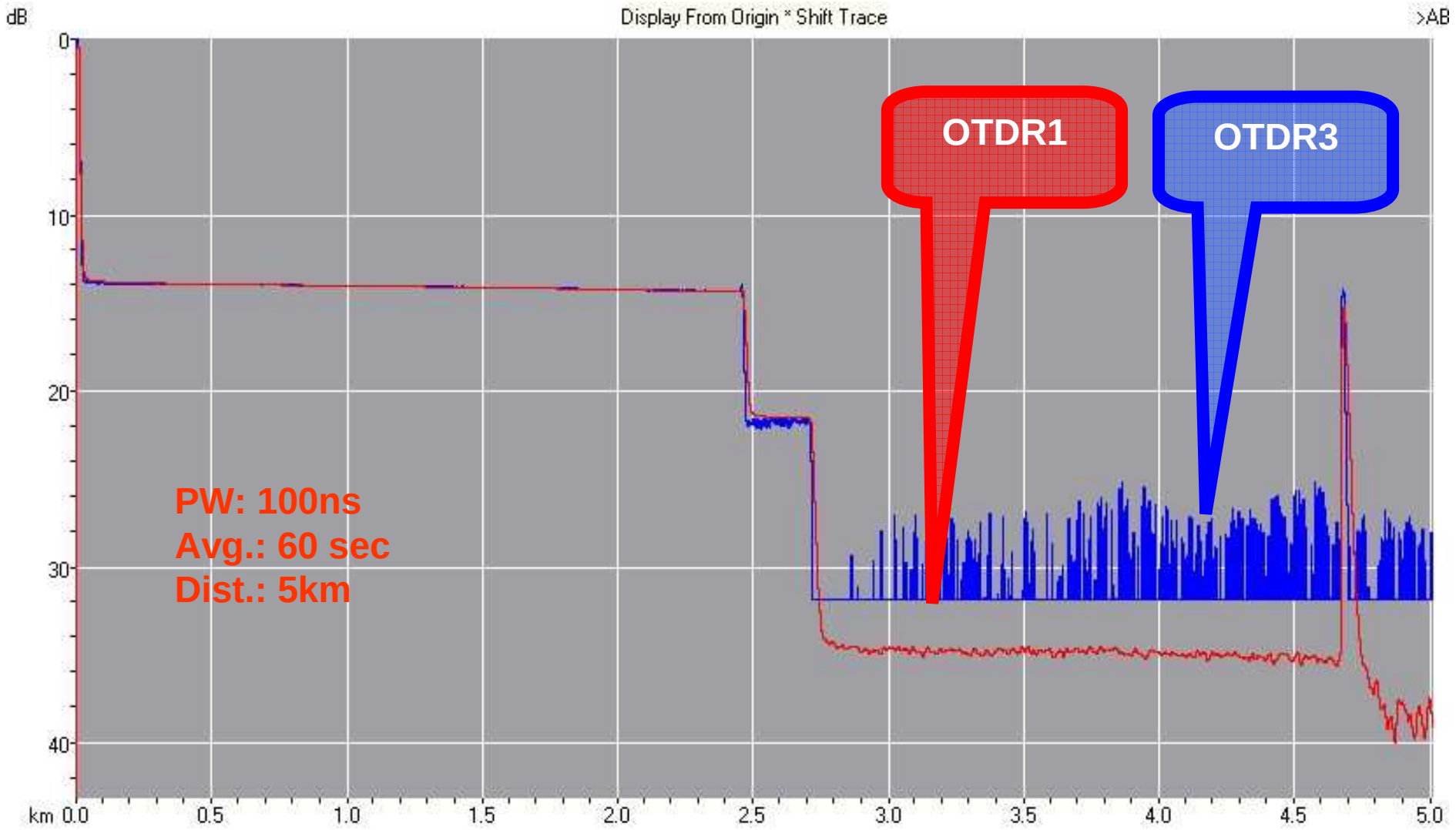


Model	Noise Peak DR [dB]
OTDR1 (Red)	23.6
OTDR2 (Yellow)	21.2
OTDR3 (Blue)	12.7
OTDR4 (Light Blue)	17.7
OTDR5 (Pink)	16.2

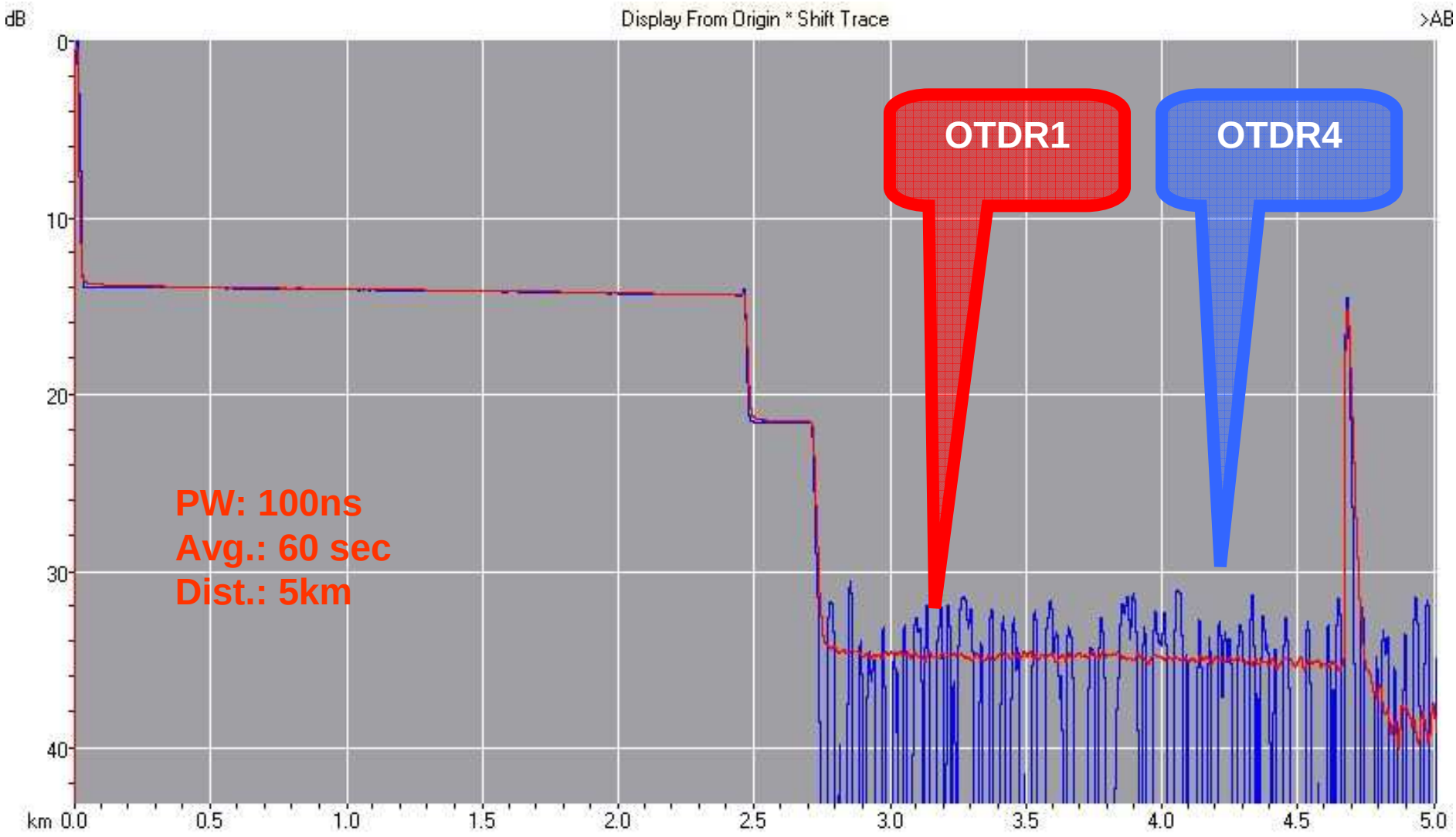
Result 1-1: Waveform from ONU to OLT(OTDR1 vs. OTDR2)



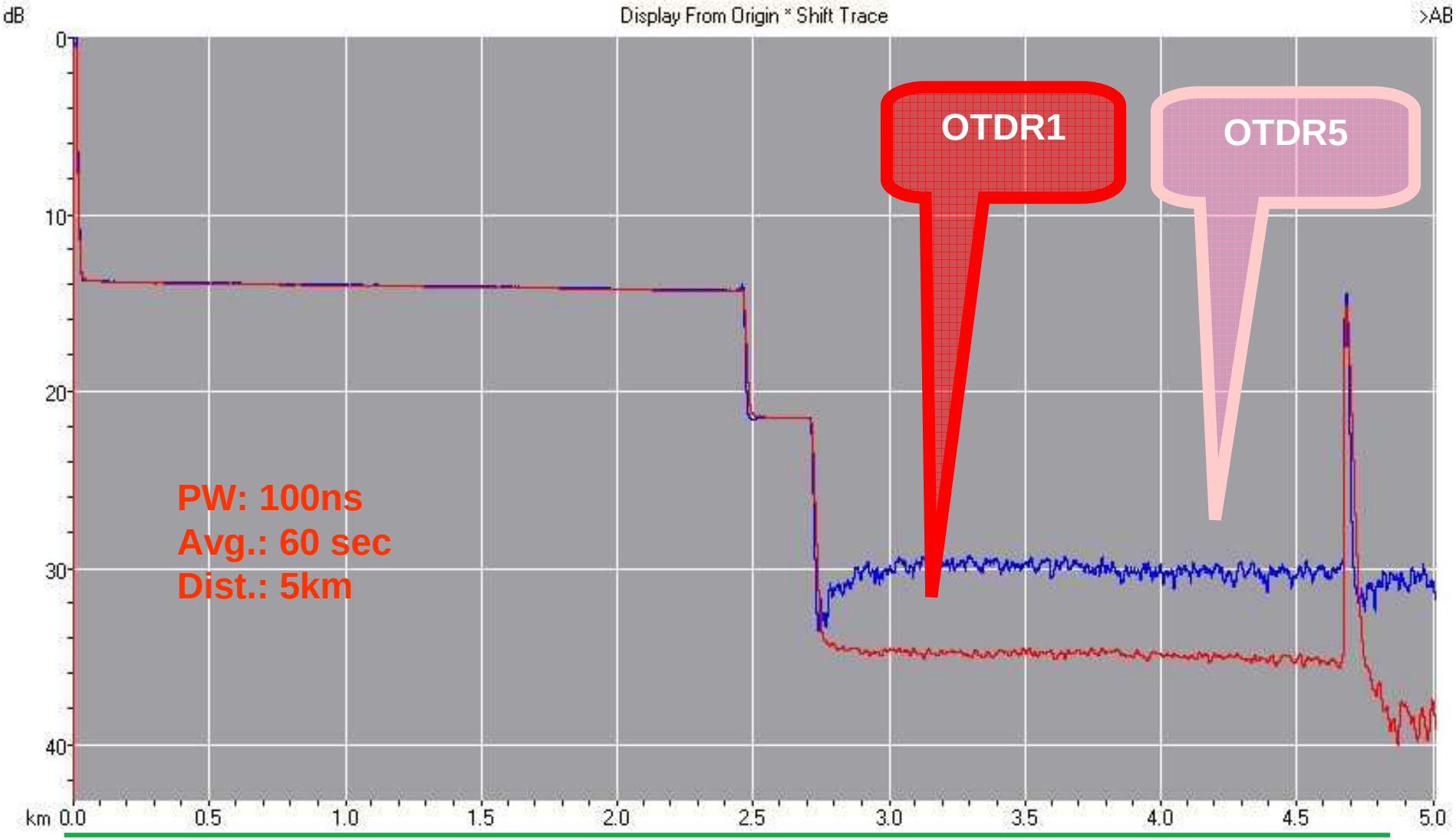
Result 1-2: Waveform from ONU to OLT(OTDR1 vs. OTDR3)



Result 1-3: Waveform from ONU to OLT(OTDR1 vs. OTDR4)



Result 1-4: Waveform from ONU to OLT(OTDR1 vs. OTDR5)

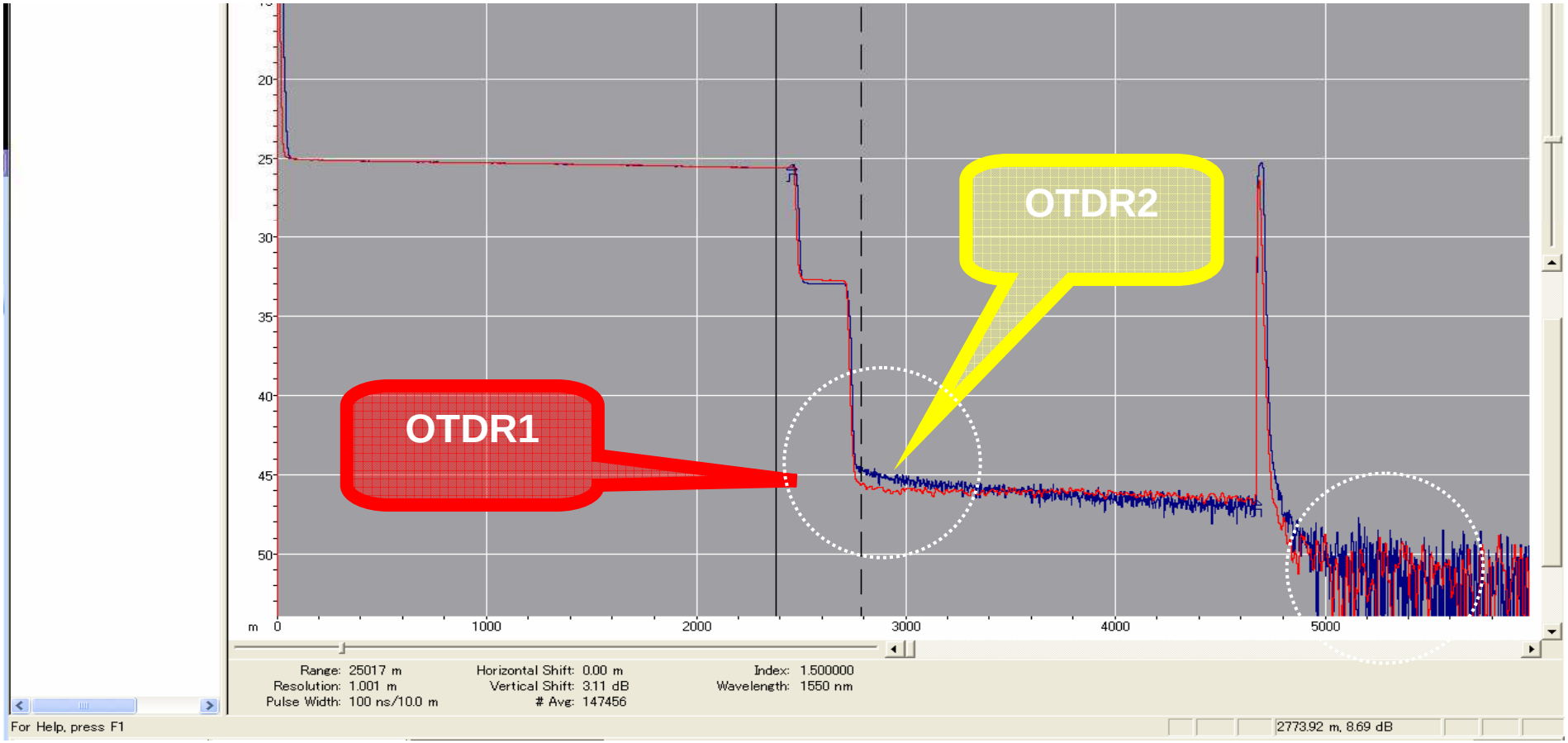


Result 2-1: Waveform from ONU to OLT (OTDR1 vs. OTDR2)

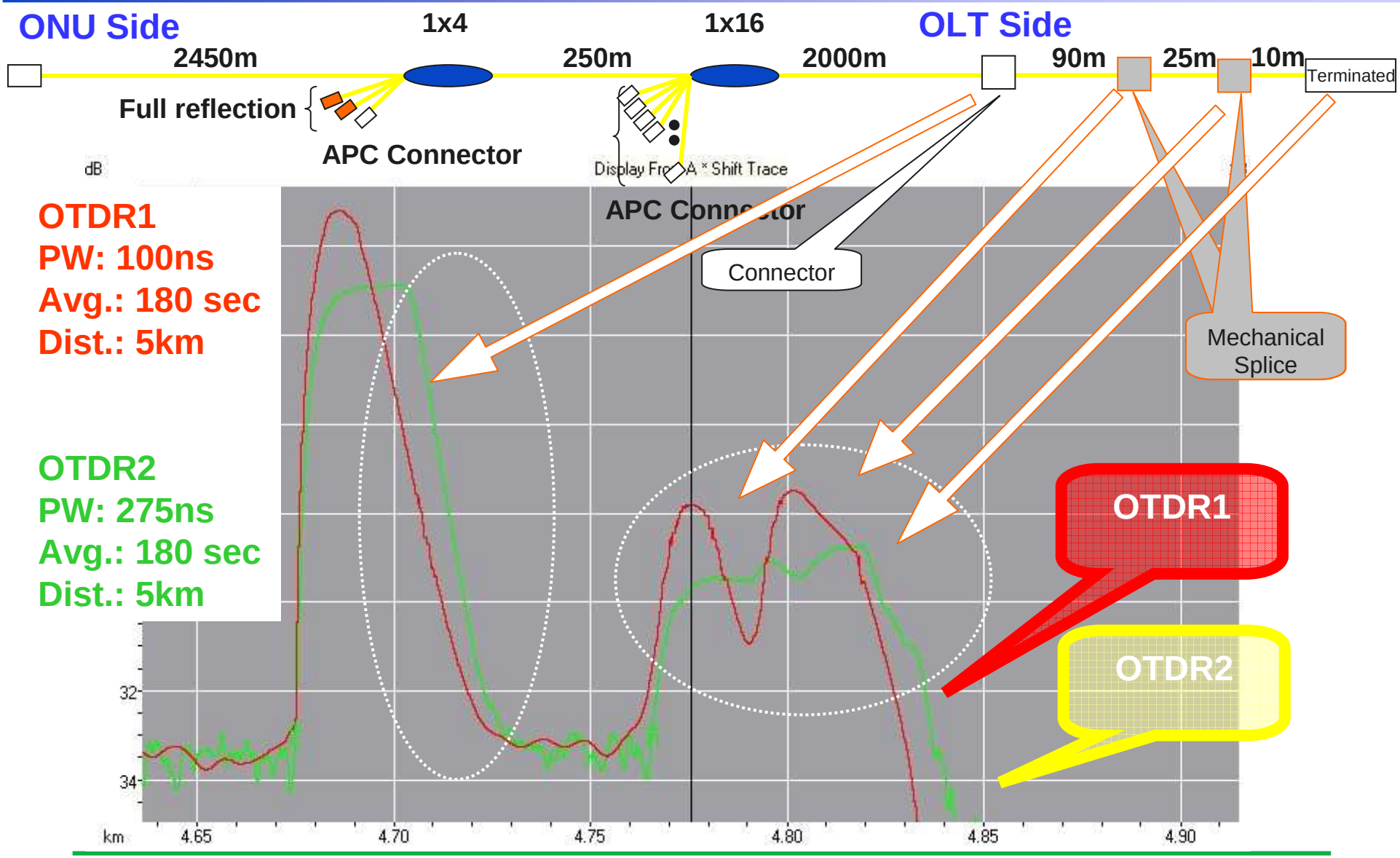
OTDR1 Pulse width=100ns, but OTDR2 uses 275ns

➔*Dynamic Range is still worse than OTDR1 despite the larger pulse width*

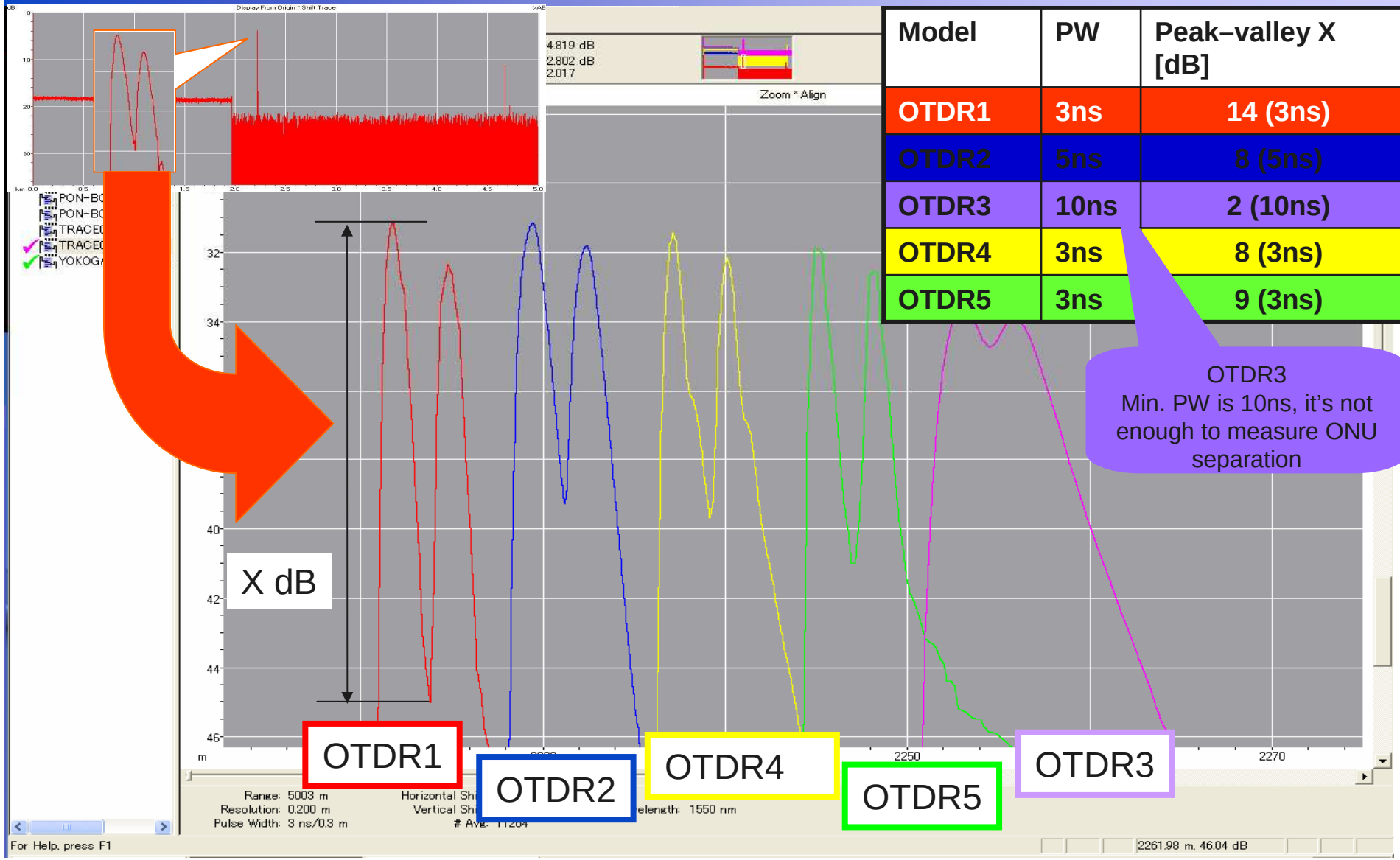
➔*Surely, OTDR1 Dead zone is much better ?*



Result 2-2: Waveform from ONU to OLT (OTDR1 vs. OTDR2)



Result 3: Waveform from OLT to ONU (Compare DZ)



Model	PW	Peak–valley X [dB]
OTDR1	3ns	14 (3ns)
OTDR2	5ns	8 (5ns)
OTDR3	10ns	2 (10ns)
OTDR4	3ns	8 (3ns)
OTDR5	3ns	9 (3ns)

OTDR3
Min. PW is 10ns, it's not enough to measure ONU separation