65.3.3 CDR lock timing measurement

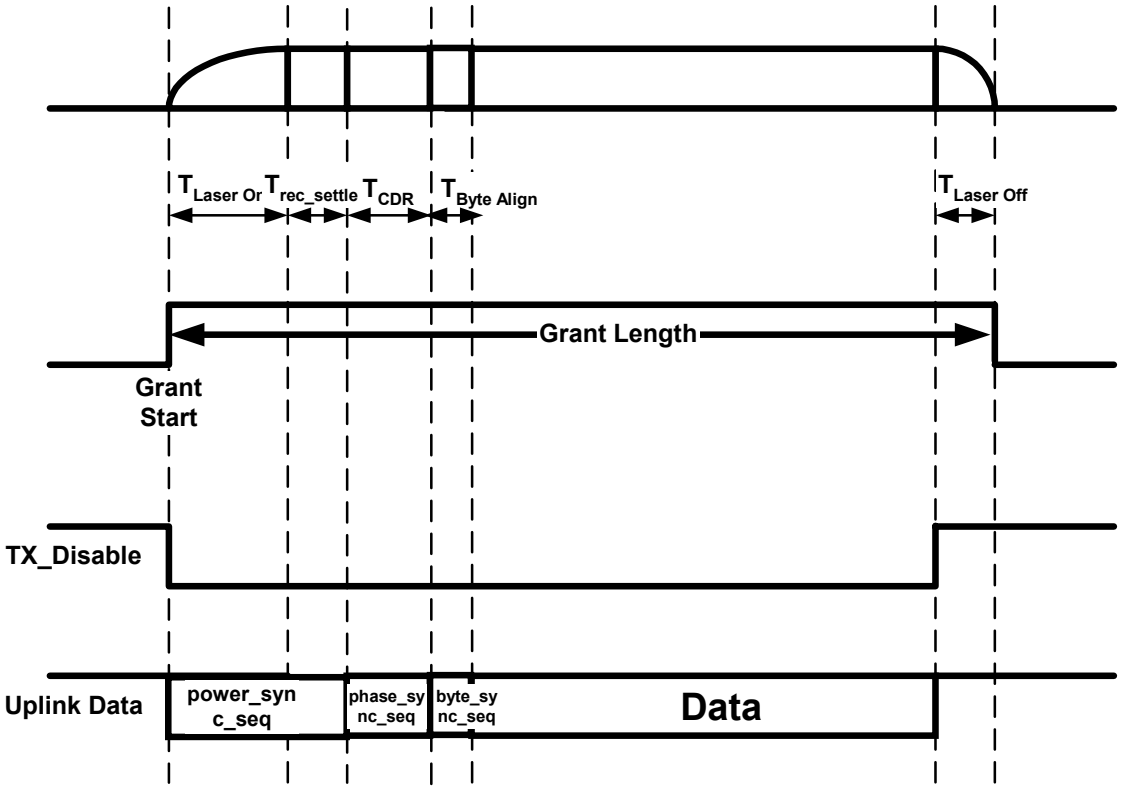

Figure 65-13: EPON timing parameter definition

65.3.3.1 Definitions

Denote T_{CDR_lock} as the time beginning from the time that the electrical signal after the PMD at TP4, reaches the conditions specified in section 58.8.15.1 for receiver settling time, and ending at the time the CDR acquires the phase and frequency of the electrical signal (Recovered phase reaching up to xxxUI difference, assuring BER of 1e-12) and maintains jitter specifications. T_{CDR_lock} is presented in Figure 65-13. The data transmitted may be any valid 8B/10B symbols (or a specific phase synchronization sequence). The signal at TP4, at the beginning of the locking, may have any valid 8B/10B pattern, jitter, or frequency shift matching the standard specifications.

The Standard defines a maximal value for T_{CDR_lock}. The measured value should be less than that number.

65.3.3.2 Test specification

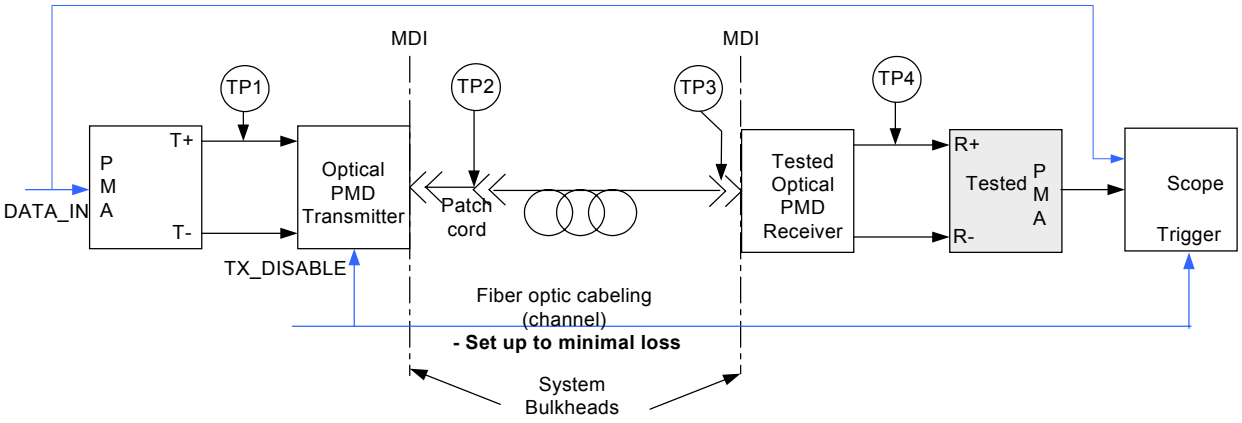

Figure 65-14: CDR lock time measurement setup

Figure 65-14 illustrates the tests setup for the OLT PMA receiver (uplink) T_{CDR_lock} time. The test assumes that there is an optical PMD transmitter at the ONU with well-known parameters, having a fixed known T_{laser_on} time and an optical PMD receiver at the OLT with well-known parameters, having a fixed known $T_{Receiver\_settling}$ time as defined in section 58.8.14 and 58.8.15. After T_{laser_on} + $T_{Receiver\_settling}$ time the parameters at TP4 reach to (90% or ±1dB) from their steady state values.

Measuring T_{CDR_lock} time as the time from the TX_DISABLE assertion, minus the known T_{laser_on} + $T_{Receiver\_settling}$ time, to the time the electrical signal at the output of the PMA reaches up to xxxUI difference from the input signal of the transmitting PMA, (assuring BER of 1e-12 for non-FEC systems or BER of 1e-4 for FEC enabled systems) and maintaining its jitter specifications. The signal at TP4, at the beginning of the locking, may have any valid 8B/10B pattern, jitter, or frequency shift matching the standard specifications.

A non-rigorous way to describe this test setup would be (using a transmitter PMD at the ONU, with a known T_{laser_on} time and a receiver PMD at the OLT, with a known $T_{Receiver\_settling}$ time):

For a tested PMA receiver with a declared T_{CDR_lock} time, measure the phase and jitter of the recovered PMA receiver signal after T_{CDR_lock} time from the TX_DISABLE trigger minus the reference T_{laser_on} + $T_{Receiver\_settling}$ time, reassuring synchronization within xxxUI from the ONU PMA input signal and conformance to the specified steady state phase frequency and jitter values.