141.7.13 Laser On/Off timing measurement

T_{on} is defined in 141.7.13.1, value is less than 128 ns (defined in Table 141–11 and Table 141–12).

$T_{receiver\_settling}$ is defined in 141.7.13.2 (informative), value is less than {TBD} ns (defined in Table 141–9 and Table 141–10).

T_{CDR} is defined in {TBD, Clause 142}, value is less than {TBD} ns.

T_{off} is defined in 141.7.13.1, value is less than 128 ns (defined in Table 141–11 and Table 141–12).

141.7.13.1 Definitions

For each of the channels, T_{on} is denoted as the time beginning from the falling edge of the Tx_Enable line to the ONU PMD and ending at the time that the optical signal at TP2 of the ONU PMD is within 15% of its steady state parameters (average launched power, wavelength, RMS spectral width, transmitter and dispersion penalty, optical return loss tolerance, jitter, $RIN_{15}OMA$, extinction ratio and eye mask opening) as defined in Table 141–11 and Table 141–12. T_{on} is presented in Figure 141–1. The data transmitted may be any valid 256B/257B symbols.

For each of the channels, T_{off} is denoted as the time beginning from the rising edge of the Tx_Enable line to the ONU PMD and ending at the time that the optical signal at TP2 of the ONU PMD reaches the specified average launch power of off transmitter as defined in Table 141–11 and Table 141–12. T_{off} is presented in Figure 141–1. The data transmitted may be any valid 256B/257B symbols.

141.7.13.2 Test specification

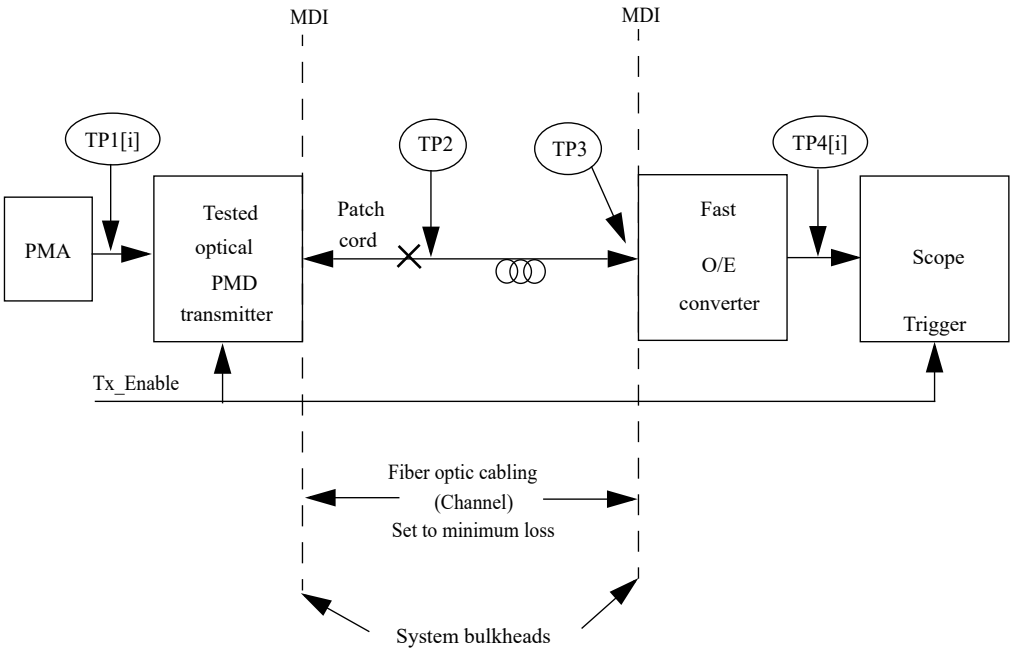

Figure 141–2—ONU PMD Laser on/off time measurement setup

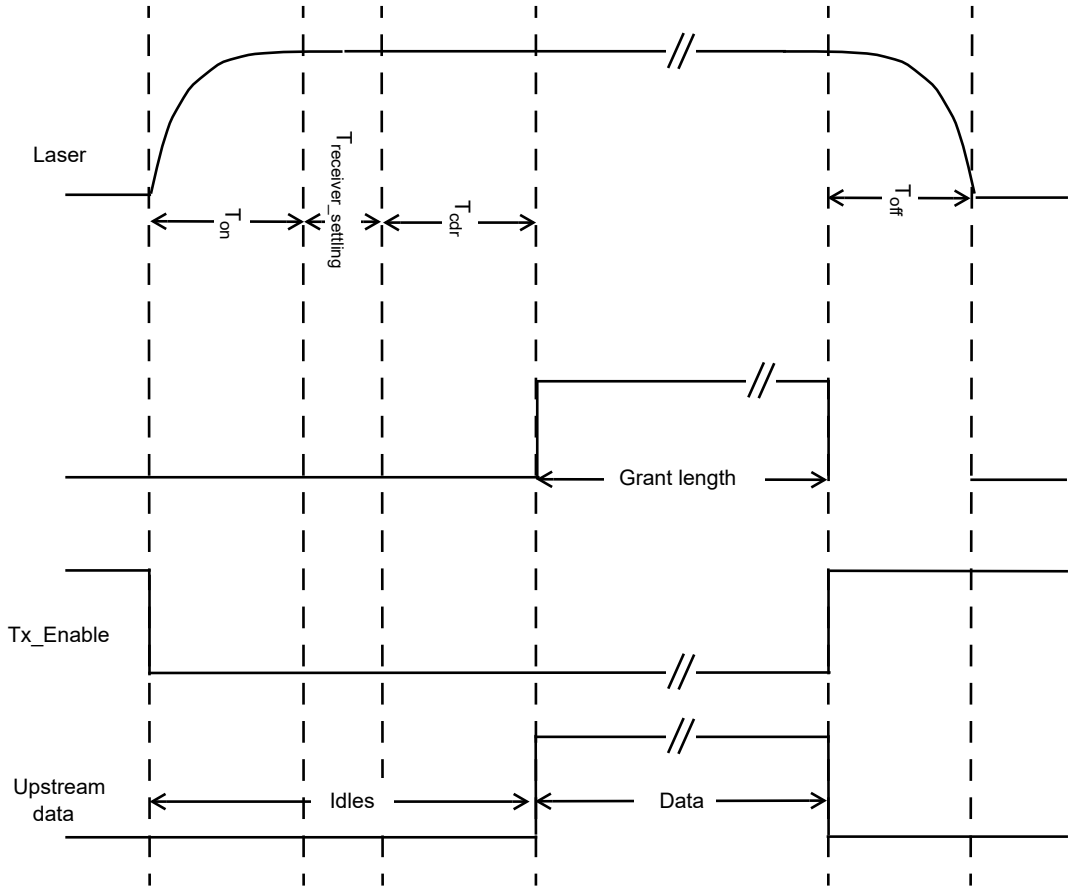

Figure 141–1—P2MP timing parameter definition, per channel

The test setup for measuring T_{on} and T_{off} is described in Figure 141–2. An O/E converter is used to convert the optical signal at TP3 to an electrical signal at TP4 where it is assumed that the response time of the converter is considerably shorter that the T_{on} value under measurement. A scope, with a variable delay, can measure the time from the Tx_Enable trigger to the time the optical signal reaches all its specified conditions. The delay to the scope trigger is adjusted until the point that the received signal meets all its specified conditions. This is the T_{on} in question.

A non-rigorous way to describe this test setup would be: for a PMD with a declared T_{on} and T_{off}, measure all PMD optical parameter after T_{on} and T_{off} from the Tx_Enable trigger, reassuring conformance 15% of the steady state values. Notice that only the steady state optical OFF power must be conformed when measuring T_{off} time, since that is the only relevant parameter.