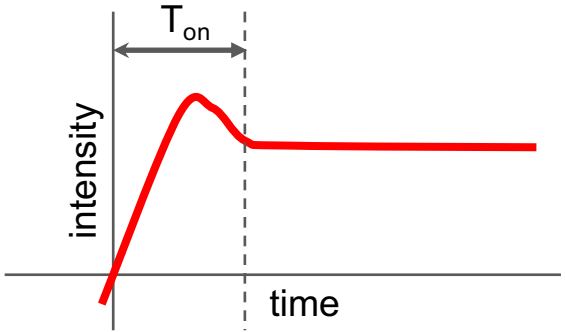
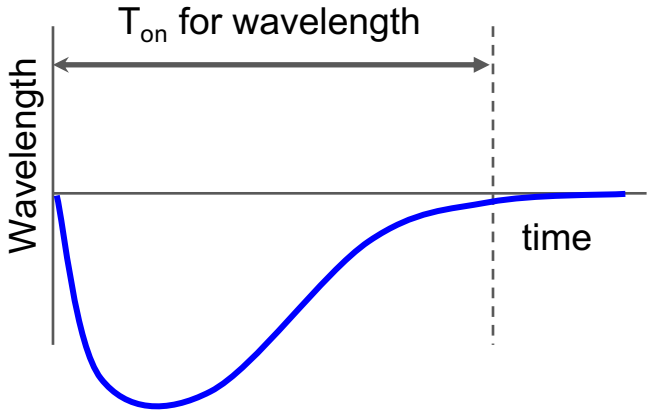
Super-PON timing

Liang Du (Amazon)

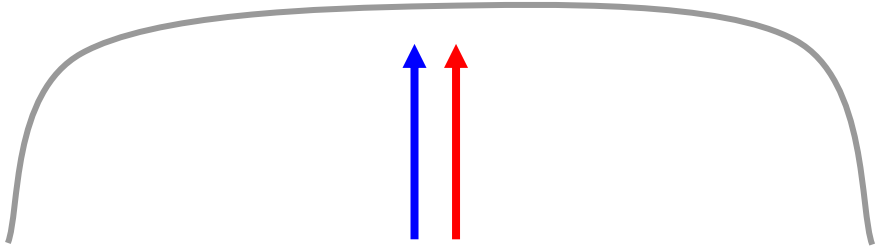
Supported by:
Xiangjun Zhao (Google)
Glen Kramer (Broadcom)

ONU laser turn on for TWDM PONs



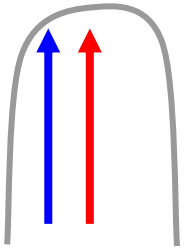


Channel for TDM PONs



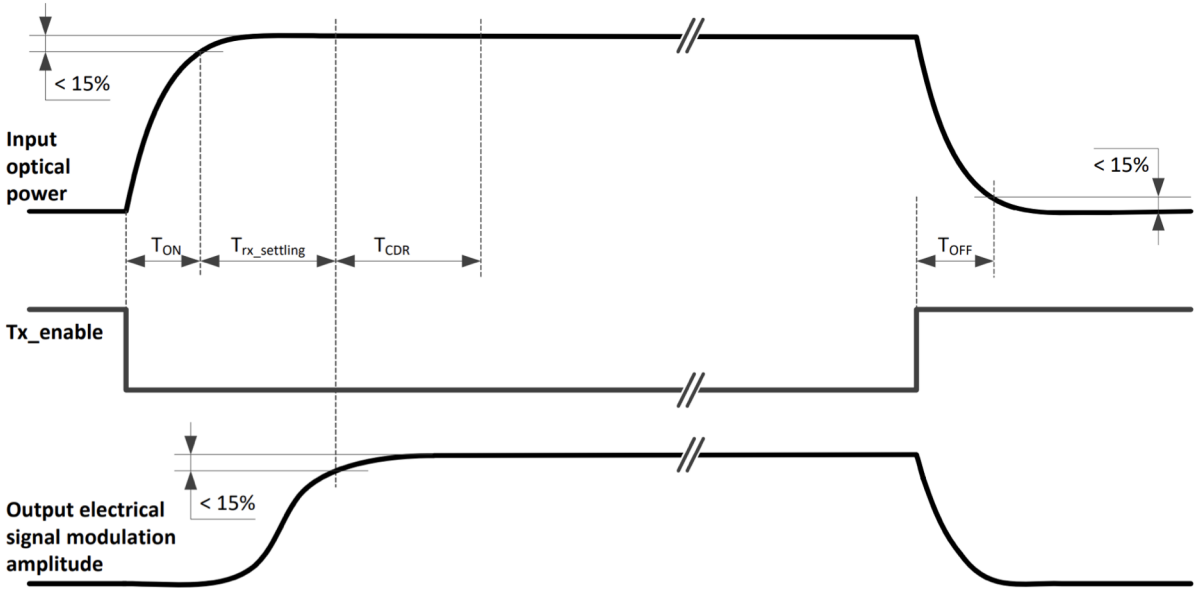
Burst on wavelength drift much less than the filter bandwidth

Channel for TWDM PONs



Wavelength drifts are converted to intensity fluctuations by the narrow optical filters

Different timing allowances



	802.3av	802.3ca	802.3cs
T_{ON}	512ns	128ns	256ns
T_{Rx}	800ns	800ns	800ns
T_{CDR}	400ns	400ns	400ns
T_{OFF}	512ns	128ns	128ns

- Length of sequences is typically a programmable field in implementation, standards define the worst case that is still considered standard compliant
- EDFA time constants are much longer. No need to consider amplifier transients in timing

Black link: ONU to OLT - Table 200-10

	Current values (in draft)		Proposed values		
Parameter	**10 Gb/s**	**2.5 Gb/s**	**10 Gb/s**	**2.5 Gb/s**	**Unit**
Clear link passband	±15		±15		GHz
Maximum ripple (within the clear link passband)	+2		+2		dB
Maximum (residual) chromatic dispersion	+200	+1000	+50	+1020	ps/nm
Minimum (residual) chromatic dispersion	-400	-400	-600	-600	ps/nm
Minimum optical return loss at transmitter	+20		+20		dB
Maximum discrete reflectance between transmitter and receiver					dB
Maximum differential group delay	+12		+12		ps
Maximum inter-channel crosstalk			0.1		dB
Maximum optical path OSNR penalty	2	1	2	1	dB
Maximum power excursion			10	10	dB
Burst-mode gain excursion[1]			0.5	0.5	dB
[1] For 4 channels with aligned bursts at the maximum allowed upstream power					

Instructions to editor

- Modify the value of the turn-on time parameter in table 200-7 to be 256 ns
- Modify the value of the turn-off time parameter in table 200-7 to be 128 ns
- Insert the bottom 2 lines of the table on slide 4 into table 200-10
  (with highlights removed)