

Considerations for 10Gb/s EPON PHY

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Considerations for 3 PMD classes (1/3)

■ Consider 3 PMD classes of 10Gb/s symmetric EPON based on the following assumptions.

- Existing PON (GE-PON,BPON) infrastructure should be used.
- 10Gb/s EPON and 1Gb/s EPON should coexist in a same fiber.
- Optical overlay of RF video should be supported.

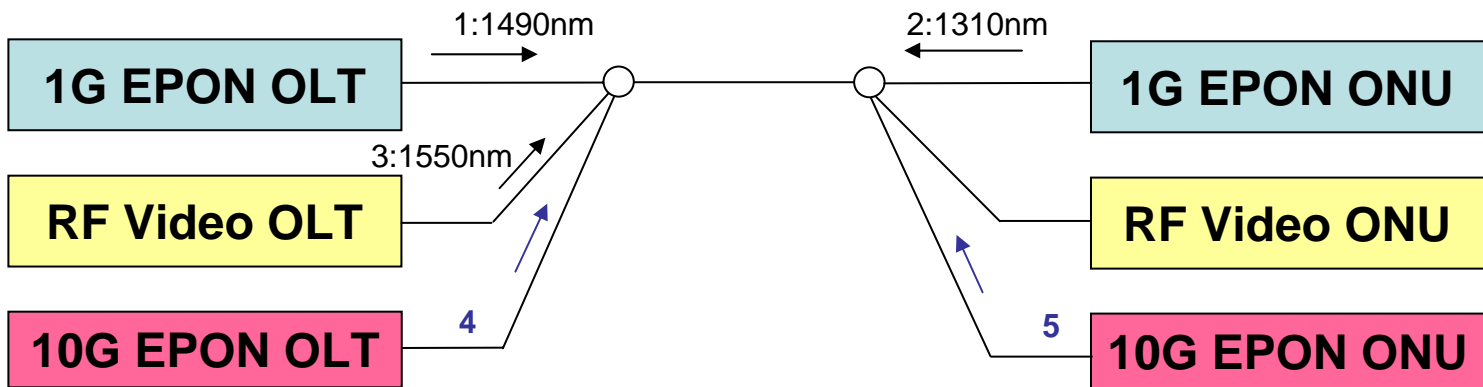


Fig.1 System model

Considerations for 3 PMD classes (2/3)

- Consider 3 power Budgets for 10Gb/s symmetric EPON based on 10G continuous mode characteristics

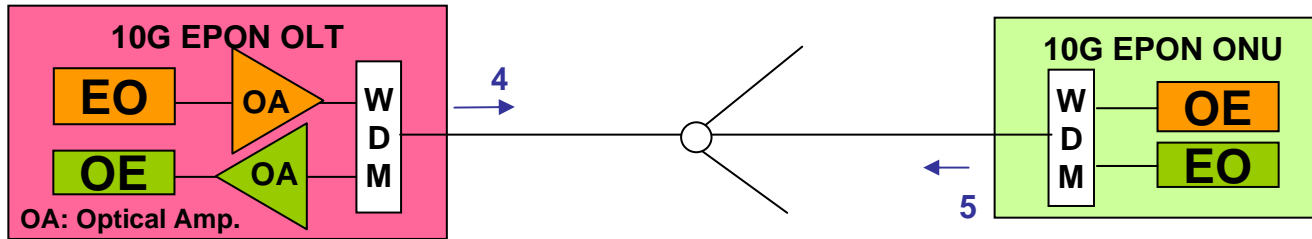


Fig.2 Considered system configuration

Classes	Targeted Power Budget	OLT side						ONU side				Study Result
		Device		Spec.		Optical Amp.		Device		Spec.		
				Band	Power	Type	Gain			Band	Power	
1	23 [dB] *Note1	EO	LN+LD	L or C	+6 [dBm]	----	----	OE	PIN	L or C	-17 [dBm]	23[dB]
		OE	APD	C	-22[dBm]	----	----	EO	EML	C	+1 [dBm]	23[dB]
2	26 [dB] *Note1	EO	EML	L	0[dBm]	EDFA	9[dB]	OE	PIN	L	-17[dBm]	26[dB]
		OE	PIN	C	-15[dBm]	SOA	10[dB]	EO	EML	C	+1 [dBm]	26[dB]
3	31 [dB] *Note2	EO	EML	L	0[dBm]	EDFA	14[dB]	OE	PIN	L	-17[dBm]	31[dB]
		OE	PIN	C	-12[dBm]	SOA	18[dB]	EO	EML	C	+1 [dBm]	31[dB]

Note1: Referred PX10 & PX20 upstream available power budget including channel insertion loss and penalties defined table 60-9 , IEEE Std 802.3ah-2004.

Note2: Referred BPON Class C including penalty defined table 4-d,ITU-T G.983.1.

Considerations for 3 PMD classes (3/3)

■ Wavelength Plan

- C band and/or L band can be used.
- C band (1539-1565 nm) is defined for additional digital services include RF Video service (1550-1560nm) by G.983.3.
- L band is defined for future band by G.983.3.

■ Technical feasibility

- Technically feasible in terms of power budget.
- The following items are technical issues.
 - Burst mode characteristics for 10Gb/s upstream.
 - ONU: Tx / OLT: Rx
 - Optical amplifier types (EDFA/SOA/Others) and its characteristics.
 - Burst mode operation
 - Noise Figure
 - Channel insertion loss (min/max) and some penalties.

Conclusion

We propose adding the following items to Objectives.

- 3 PMD classes for 10Gb/s symmetric EPON to meet the following conditions.**
 - Existing PON (GE-PON,BPON) infrastructure should be used.**
 - 10Gb/s EPON and 1Gb/s EPON should coexist in a same fiber.**
 - Optical overlay of RF video should be supported.**