

# Unification of 25G receiver sensitivity for 100G EPON

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# Motivation

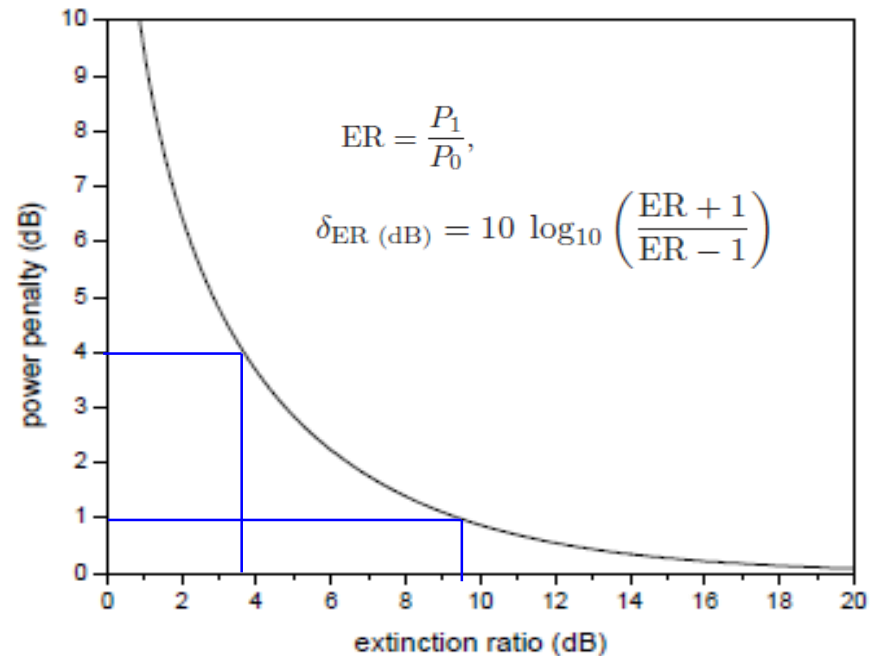
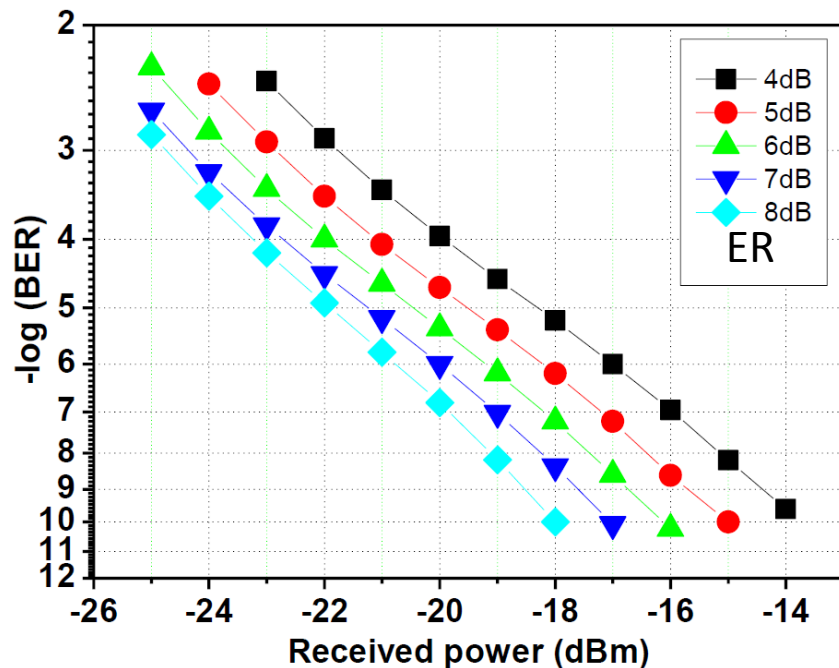
- 25G APD receiver is a crucial device to implement 100G EPON. And a receiver sensitivity is very important to build PDM parameters.
- Several contributions provided experiment results of 25G APD receiver for 100G EPON application.
- However, provided sensitivity values of 25G APD receiver were not equal to each contribution since experiment condition was not the same.

# Summary of 25G APD receiver sensitivity

Contributor	BER	Sensitivity	Tx wavelength	Tx ER	Tx type	Ref
Finisar	$10^{-3}$	-28.5 dBm	1310 nm	10.7 dB	EML	[1]
Finisar	$10^{-3}$	-23.8 dBm	1308.08 nm	5.2 dB	DML	[1]
ETRI	$10^{-3}$	-25.0 dBm	1309.08 nm	7 dB	EML	[2]
SiFotonics	$10^{-3}$	-27.0 dBm	1300 nm	9.5 dB	No information	[3]
ZTE	$10^{-3}$	-29 dBm	1309 nm	No information	No information	[4]
<b>Difference</b>		<b><math>\Delta</math> 5.2 dB</b>	<b><math>\Delta</math> 10 nm</b>	<b><math>\Delta</math> 5.5 dB</b>	<b>EML, DML</b>	

- 1) [http://www.ieee802.org/3/ca/public/meeting\\_archive/2016/03/cole\\_3ca\\_1\\_0316.pdf](http://www.ieee802.org/3/ca/public/meeting_archive/2016/03/cole_3ca_1_0316.pdf)
- 2) [http://www.ieee802.org/3/ca/public/meeting\\_archive/2016/03/lee\\_3ca\\_1\\_0316.pdf](http://www.ieee802.org/3/ca/public/meeting_archive/2016/03/lee_3ca_1_0316.pdf)
- 3) [http://www.ieee802.org/3/ca/public/meeting\\_archive/2016/05/pan\\_3ca\\_1b\\_0516.pdf](http://www.ieee802.org/3/ca/public/meeting_archive/2016/05/pan_3ca_1b_0516.pdf)
- 4) [http://www.ieee802.org/3/ca/public/meeting\\_archive/2016/05/guo\\_3ca\\_1a\\_0516.pdf](http://www.ieee802.org/3/ca/public/meeting_archive/2016/05/guo_3ca_1a_0516.pdf)

# Sensitivity difference as ER of signal



[Example of 25G APD received power as a function of ER]

- Receiver sensitivity depends on ER (extinction ratio) and type of laser source such as EML and DML.
  - Sensitivity is degraded by decreasing ER

# Conclusion

- Receiver sensitivity is very important to decide PMD parameters.
- To unify sensitivity value, it is necessary to measure sensitivity under same experimental condition such as ER of laser source.
- We propose that the experiment condition should be as follows;
  - Laser source type: EML
  - Modulation formant: NRZ
  - ER: 6 dB as the same with 802.3 av
  - Wavelength: 1310 nm