

# PIN ROSA Sensitivity

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# Overview

- Continuing advancements in SiGe TIA design are allowing for improvements in receiver sensitivity
- This allows for margin in the previously proposed PIN Receiver Power Budget\*:

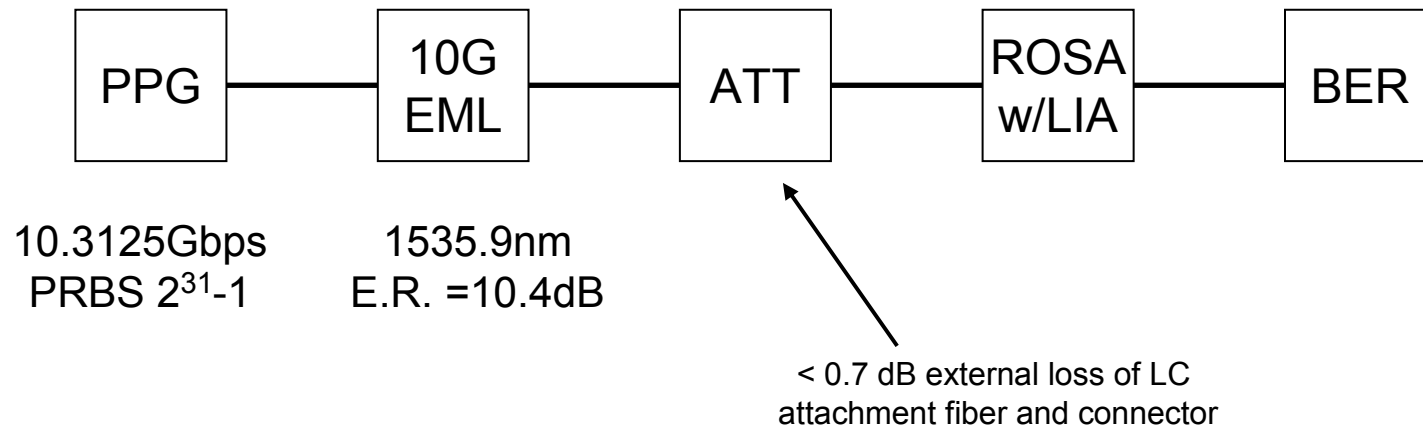
$\lambda$  : 157x nm

With E-FEC/ with RS(255,239) in ()

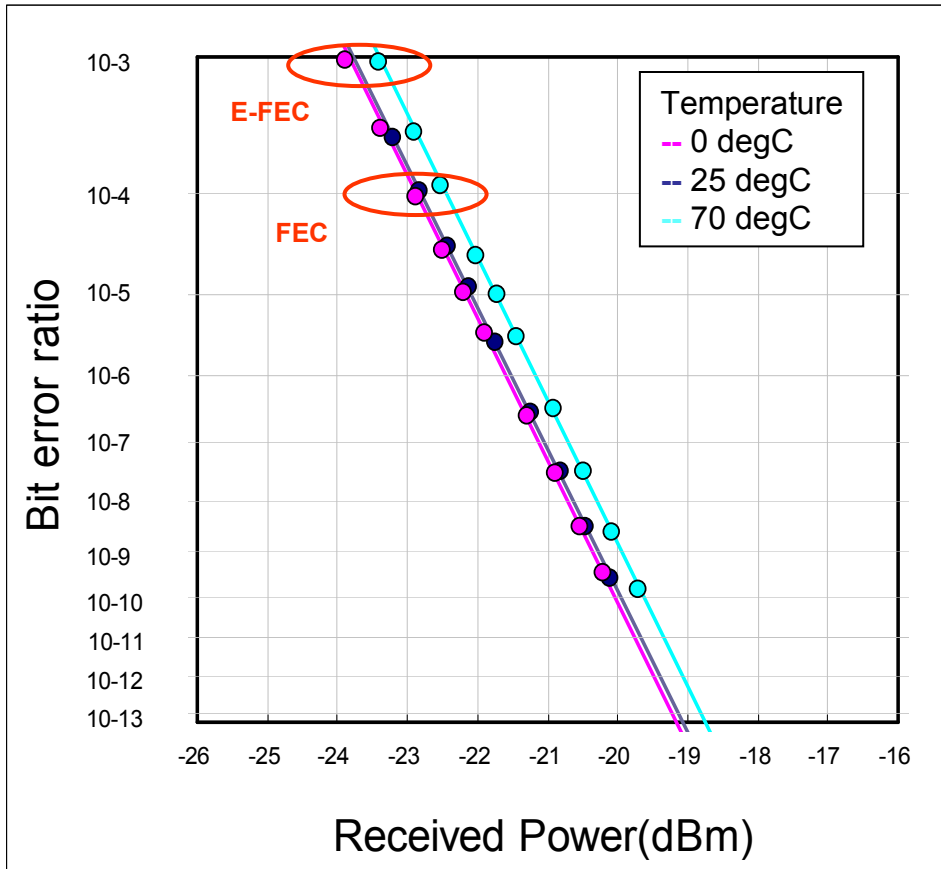
	PX10	PX20	B++	Mean Power (dBm)
CH IL (dB)	20	24	29	
Path Penalty (dB)	1	1	1	EML TX, <20km
Tx (OLT)	EML	EML + SOA	EML + SOA/EDFA	
Rx (ONU)	PIN	PIN	PIN	
ER (dB)	9	9	9	
ONU Sensitivity	-20 (-19)	-20 (-19)	-20 (-19)	BER<10 <sup>-2</sup> or 10 <sup>-3</sup> (BER<10 <sup>-4</sup> )
OLT Launch (min)	+1 (+2)	+5 (+6)	+10 (+11)	
OLT Launch (Max)	+4 (+5)	+8 (+9)	+13 (+14)	
Overload	-1 (0)	-2 (-1)	-2 (-1)	

\*See Geneva: 3av\_0705\_takizawa\_1.pdf

# Test Setup



# Test Results



Note: Includes Att loss

## PIN ROSA Specifications

	10 <sup>-12</sup> BER	10 <sup>-4</sup> BER	10 <sup>-3</sup> BER
<b>Typical</b>	-21 dBm	23.5 dBm	24.5 dBm
<b>Worst Case*</b>	-19 dBm	-22 dBm	-23 dBm

- \* Worst Case Power
- \* Worst Case Temperature
- \* Worst Case Process
- \* Guardbanding (4 Sigma from peak)

# Link Budget

PIN ROSA Sensitivity (worst case)	-23dBm (BER < 10 <sup>-3</sup> )
WDM filter and Optical Crosstalk	+1dB
Resulting PIN ONU Sensitivity	<b>-22 dBm</b>

- 22dBm allows for 2dB margin on the proposed ONU sensitivity of -20dBm (BER<10<sup>-3</sup>)

	PX10	PX20	B++	Mean Power (dBm)
ONU Sensitivity	-20 (-19)	-20 (-19)	-20 (-19)	BER<10 <sup>-2</sup> or 10 <sup>-3</sup> (BER<10 <sup>-4</sup> )

\*See Geneva: 3av\_0705\_takizawa\_1.pdf

# Conclusions

- Worst Case Sensitivity of PIN at ONU:  
-23dBm<sub>(BER<10<sup>-3</sup>)</sub>
- This enables margin necessary to support high volume ONU production

**End**