

# 10G EPON Power Budget

2 Nov 2007 Version

Compiled by Frank Effenberger

# Supporters

# Conditions

- All the values are given in ITU formalism (average power, nominal ER = 9 dB)
  - These are used to calculate OMA values, which will be the normative values in the specification
- Minimum ER limit will be specified separately
  - Likely values would be 8dB for OLT, 6dB for ONU
- The receiver sensitivities in the budget tables are defined at the BER of  $10^{-3}$
- They assume a FEC code with a coding gain of equal or better than RS(255, 223)
- If the selected FEC code gain is less, then the budget values must be adjusted upward to compensate

# Downstream Power Budget

Budget	PR10	PR20	PR30
Wavelength (nm)	15xx	15xx	1577
OLT Tx max (dBm)	+4	+9	+5
OLT Tx min (dBm)	+1	+5	+2
OLT Tx Technology	EML	EML+SOA	EML
Max Channel Loss (dB)	20	24	29
Penalty (dB)	1	1	1
ONU Sensitivity (dBm)	-20	-20	-28
ONU Rx Technology	PIN w/ FEC	PIN w/ FEC	APD w/ FEC
Min Channel Loss (dB)	5	10	15
ONU Rx Overload (dBm)	-1	-1	-10

# Upstream Power Budget

Budget	PR10	PR20	PR30
Wavelength (nm)	1270nm	1270nm	1270nm
ONU Tx max (dBm)	+4	+4	+9
ONU Tx min (dBm)	-1	-1	+4
ONU Tx Technology	DML	DML	Hi DML
Max Channel Loss (dB)	20	24	29
Penalty (dB)	1	1	1
OLT Sensitivity (dBm)	-22	-26	-26
OLT Rx Technology	APD w/ FEC	APD w/ FEC	APD w/ FEC
Min Channel Loss (dB)	5	10	15
OLT Rx Overload (dBm)	-1	-6	-6

# Exact Budget Calculations

- Values contained herein are reflected in the optical link spreadsheet
- Following slides are snapshots of that document
  - Apologize in advance for small fonts!
  - See spreadsheet for better look

# PR10 Downstream

Parameter name	Value	Unit	Description	Value min	Value max
<b>Transmitter parameters</b>					
ITU_ERnom	9.00	dB	Extinction Ratio used to convert average power values to OMA values	0.00	9.00
ITU_Tx_Ave_Min	1.00	dBm	Average output power in ITU format (min)	-99.00	99.00
ITU_Tx_Ave_Max	4.00	dBm	Average output power in ITU format (max)	-99.00	99.00
IEEE_Tx_OMA_Min	2.91	dBm	Average output power in IEEE OMA format (min)		
Tx_Wavelength_Min	1580.00	nm	Transmitter wavelength (min)	1200.00	1600.00
Tx_Wavelength_Max	1600.00	nm	Transmitter wavelength (max)	1200.00	1600.00
Tx_Wavelength_Uc	1590.00	nm	Transmitter wavelength (central wavelength)	1580.00	1600.00
Tx_Chirp_Parameter_Max	0.00	-	Chirp parameter for transmitter signal (max) [C] (Normal DML's are negative)		
Tx_Data_Rate	10312.50	MBd	Effective data rate in Mbaud	9500	11500
<b>Link parameters</b>					
Fibre_Attenuation_Curve	lambda^-4	-	Fibre attenuation curve type (lambda^-4,G652AB,G652CD models)		
Fibre_Attenuation_Curve_Type	min	-	Maximum / minimum value curve (not available for lambda^-4 model)		
Fibre_Attenuation_Base_Value	0.35	dB/km	Base fibre attenuation (for lambda^-4 model)	0	1
Fibre_Attenuation_Base_Wavelength	1550.00	nm	Base wavelength for fibre attenuation estimation		
Fibre_Attenuation_Value	0.34	dB/km	Fibre attenuation at base wavelength		
Channel_Length_Max	10	km	Maximum distance between an ONU and the OLT	0.5	20
Fibre_Loss	3.44	dB	Fibre (no connectors) CHIL @ Tx_Uc		
PSC_Split_count	16.00	-	Number of splitter ports (powers of 2 only)	2	64
PSC_Loss_Curve	max	-	Type of PSC loss curve (minimum, average and maximum types)		
PSC_Loss	14.93	dB	PSC induced CHIL		
Nonlinear_Penalties	1.00	dB	Nonlinear penalties in the fibre plant (SBS + SRS induced)		10
Excess_Loss	0.63	dB	Connectors, splices and any other excess loss		
ITU_Optical_Path_Penalty	1.00	dB	Optical path penalty in accordance with ITU definition	0	5
Channel_Loss_Min	5.00	dB	Channel Insertion Loss (CHIL) (min) - user input	0	20.00
Channel_Loss_Max	20.00	dB	Channel Insertion Loss (CHIL) (max)		29
Dispersion_Uo_Min	1300.00	nm			
Dispersion_Uo_Max	1300.00	nm			
Dispersion_So	0.09	ps/nm^2.km			
Dispersion_D_Min	20.99	ps/(nm.km)			
Dispersion_D_Max	19.90	ps/(nm.km)			
Dispersion_Penalty	0.11	dB	Dispersion penalty calculated following 3av_0705_saeki_1.pdf		
<b>Receiver parameters</b>					
ITU_Rx_Sensitivity_Ave	-20.00	dBm	Average power receiver sensitivity @ BER 1e-3		
ITU_Rx_Sensitivity_Ave_OMA	-18.09	dBm	OMA receiver sensitivity (dBm) @ BER 1e-3		
ITU_Rx_Sensitivity_Ave_OMA	68.39	uW	OMA receiver sensitivity (uW) @ BER 1e-3		
IEEE_Rx_Stressed_Sensitivity_Ave	-19.00	dBm	Average stressed receiver sensitivity in IEEE formalism @ BER 1e-3		
IEEE_Rx_Stressed_Sensitivity_OMA	-17.09	dBm	OMA stressed receiver sensitivity in IEEE formalism (dBm) @ BER 1e-3		
IEEE_Rx_Stressed_Sensitivity_OMA	79.33	uW	OMA stressed receiver sensitivity in IEEE formalism (uW) @ BER 1e-3		
Rx_Overload	-1.00	dBm	This is what the overload needs to be...		
<b>Check Conditions</b>					
Dispersion_Penalty <= ITU_Optical_Path_Penalty			PASSED		

# PR20 Downstream

Parameter name	Value	Unit	Description	Value min	Value max
<b>Transmitter parameters</b>					
ITU_ERnom	9.00	dB	Extinction Ratio used to convert average power values to OMA values	0.00	9.00
ITU_Tx_Ave_Min	5.00	dBm	Average output power in ITU format (min)	-99.00	99.00
ITU_Tx_Ave_Max	9.00	dBm	Average output power in ITU format (max)	-99.00	99.00
IEEE_Tx_OMA_Min	6.91	dBm	Average output power in IEEE OMA format (min)		
Tx_Wavelength_Min	1580.00	nm	Transmitter wavelength (min)	1200.00	1600.00
Tx_Wavelength_Max	1600.00	nm	Transmitter wavelength (max)	1200.00	1600.00
Tx_Wavelength_Uc	1590.00	nm	Transmitter wavelength (central wavelength)	1580.00	1600.00
Tx_Chirp_Parameter_Max	0.00	-	Chirp parameter for transmitter signal (max) [C] (Normal DML's are negative)		
Tx_Data_Rate	10312.50	MBd	Effective data rate in Mbaud	9500	11500
<b>Link parameters</b>					
Fibre_Attenuation_Curve	lambda^-4	-	Fibre attenuation curve type (lambda^-4,G652AB,G652CD models)		
Fibre_Attenuation_Curve_Type	min	-	Maximum / minimum value curve (not available for lambda^-4 model)		
Fibre_Attenuation_Base_Value	0.35	dB/km	Base fibre attenuation (for lambda^-4 model)	0	1
Fibre_Attenuation_Base_Wavelength	1550.00	nm	Base wavelength for fibre attenuation estimation		
Fibre_Attenuation_Value	0.34	dB/km	Fibre attenuation at base wavelength		
Channel_Length_Max	20	km	Maximum distance between an ONU and the OLT	0.5	20
Fibre_Loss	6.88	dB	Fibre (no connectors) CHIL @ Tx_Uc		
PSC_Split_count	16.00	-	Number of splitter ports (powers of 2 only)	2	64
PSC_Loss_Curve	max	-	Type of PSC loss curve (minimum, average and maximum types)		
PSC_Loss	14.93	dB	PSC induced CHIL		
Nonlinear_Penalties	1.00	dB	Nonlinear penalties in the fibre plant (SBS + SRS induced)		10
Excess_Loss	1.19	dB	Connectors, splices and any other excess loss		
ITU_Optical_Path_Penalty	1.00	dB	Optical path penalty in accordance with ITU definition	0	5
Channel_Loss_Min	10.00	dB	Channel Insertion Loss (CHIL) (min) - user input	0	24.00
Channel_Loss_Max	24.00	dB	Channel Insertion Loss (CHIL) (max)		29
Dispersion_Uo_Min	1300.00	nm			
Dispersion_Uo_Max	1300.00	nm			
Dispersion_So	0.09	ps/nm^2.km			
Dispersion_D_Min	20.99	ps/(nm.km)			
Dispersion_D_Max	19.90	ps/(nm.km)			
Dispersion_Penalty	0.40	dB	Dispersion penalty calculated following 3av_0705_saeki_1.pdf		
<b>Receiver parameters</b>					
ITU_Rx_Sensitivity_Ave	-20.00	dBm	Average power receiver sensitivity @ BER 1e-3		
ITU_Rx_Sensitivity_Ave_OMA	-18.09	dBm	OMA receiver sensitivity (dBm) @ BER 1e-3		
ITU_Rx_Sensitivity_Ave_OMA	68.39	uW	OMA receiver sensitivity (uW) @ BER 1e-3		
IEEE_Rx_Stressed_Sensitivity_Ave	-19.00	dBm	Average stressed receiver sensitivity in IEEE formalism @ BER 1e-3		
IEEE_Rx_Stressed_Sensitivity_OMA	-17.09	dBm	OMA stressed receiver sensitivity in IEEE formalism (dBm) @ BER 1e-3		
IEEE_Rx_Stressed_Sensitivity_OMA	79.33	uW	OMA stressed receiver sensitivity in IEEE formalism (uW) @ BER 1e-3		
Rx_Overload	-1.00	dBm	This is what the overload needs to be...		
<b>Check Conditions</b>					
Dispersion_Penalty <= ITU_Optical_Path_Penalty			PASSED		



# PR30 Downstream

Parameter name	Value	Unit	Description	Value min	Value max
<b>Transmitter parameters</b>					
ITU_ERnom	9.00	dB	Extinction Ratio used to convert average power values to OMA values	0.00	9.00
ITU_Tx_Ave_Min	2.00	dBm	Average output power in ITU format (min)	-99.00	99.00
ITU_Tx_Ave_Max	5.00	dBm	Average output power in ITU format (max)	-99.00	99.00
IEEE_Tx_OMA_Min	3.91	dBm	Average output power in IEEE OMA format (min)		
Tx_Wavelength_Min	1574.00	nm	Transmitter wavelength (min)	1200.00	1600.00
Tx_Wavelength_Max	1580.00	nm	Transmitter wavelength (max)	1200.00	1600.00
Tx_Wavelength_Uc	1577.00	nm	Transmitter wavelength (central wavelength)	1574.00	1580.00
Tx_Chirp_Parameter_Max	0.00	-	Chirp parameter for transmitter signal (max) [C] (Normal DML's are negative)		
Tx_Data_Rate	10312.50	MBd	Effective data rate in Mbaud	9500	11500
<b>Link parameters</b>					
Fibre_Attenuation_Curve	lambda^-4	-	Fibre attenuation curve type (lambda^-4,G652AB,G652CD models)		
Fibre_Attenuation_Curve_Type	min	-	Maximum / minimum value curve (not available for lambda^-4 model)		
Fibre_Attenuation_Base_Value	0.35	dB/km	Base fibre attenuation (for lambda^-4 model)	0	1
Fibre_Attenuation_Base_Wavelength	1550.00	nm	Base wavelength for fibre attenuation estimation		
Fibre_Attenuation_Value	0.35	dB/km	Fibre attenuation at base wavelength		
Channel_Length_Max	20	km	Maximum distance between an ONU and the OLT	0.5	20
Fibre_Loss	6.92	dB	Fibre (no connectors) CHIL @ Tx_Uc		
PSC_Split_count	32.00	-	Number of splitter ports (powers of 2 only)	2	64
PSC_Loss_Curve	max	-	Type of PSC loss curve (minimum, average and maximum types)		
PSC_Loss	18.40	dB	PSC induced CHIL		
Nonlinear_Penalties	1.00	dB	Nonlinear penalties in the fibre plant (SBS + SRS induced)		10
Excess_Loss	2.68	dB	Connectors, splices and any other excess loss		
ITU_Optical_Path_Penalty	1.00	dB	Optical path penalty in accordance with ITU definition	0	5
Channel_Loss_Min	15.00	dB	Channel Insertion Loss (CHIL) (min) - user input	0	29.00
Channel_Loss_Max	29.00	dB	Channel Insertion Loss (CHIL) (max)		29
Dispersion_Uo_Min	1300.00	nm			
Dispersion_Uo_Max	1300.00	nm			
Dispersion_So	0.09	ps/nm^2.km			
Dispersion_D_Min	19.90	ps/(nm.km)			
Dispersion_D_Max	19.57	ps/(nm.km)			
Dispersion_Penalty	0.38	dB	Dispersion penalty calculated following 3av_0705_saeki_1.pdf		
<b>Receiver parameters</b>					
ITU_Rx_Sensitivity_Ave	-28.00	dBm	Average power receiver sensitivity @ BER 1e-3		
ITU_Rx_Sensitivity_Ave_OMA	-26.09	dBm	OMA receiver sensitivity (dBm) @ BER 1e-3		
ITU_Rx_Sensitivity_Ave_OMA	20.88	uW	OMA receiver sensitivity (uW) @ BER 1e-3		
IEEE_Rx_Stressed_Sensitivity_Ave	-27.00	dBm	Average stressed receiver sensitivity in IEEE formalism @ BER 1e-3		
IEEE_Rx_Stressed_Sensitivity_OMA	-25.09	dBm	OMA stressed receiver sensitivity in IEEE formalism (dBm) @ BER 1e-3		
IEEE_Rx_Stressed_Sensitivity_OMA	24.22	uW	OMA stressed receiver sensitivity in IEEE formalism (uW) @ BER 1e-3		
Rx_Overload	-10.00	dBm	This is what the overload needs to be...		
<b>Check Conditions</b>					
Dispersion_Penalty <= ITU_Optical_Path_Penalty			PASSED		

# PR10 Upstream

Parameter name	Value	Unit	Description	Value min	Value max
<b>Transmitter parameters</b>					
ITU_ERnom	9.00	dB	Extinction Ratio used to convert average power values to OMA values	0.00	9.00
ITU_Tx_Ave_Min	-1.00	dBm	Average output power in ITU format (min)	-99.00	99.00
ITU_Tx_Ave_Max	4.00	dBm	Average output power in ITU format (max)	-99.00	99.00
IEEE_Tx_OMA_Min	0.91	dBm	Average output power in IEEE OMA format (min)		
Tx_Wavelength_Min	1260.00	nm	Transmitter wavelength (min)	1200.00	1600.00
Tx_Wavelength_Max	1280.00	nm	Transmitter wavelength (max)	1200.00	1600.00
Tx_Wavelength_Uc	1270.00	nm	Transmitter wavelength (central wavelength)	1260.00	1280.00
Tx_Chirp_Parameter_Max	-2.00	-	Chirp parameter for transmitter signal (max) [C] (Normal DML's are negative)		
Tx_Data_Rate	10312.50	Mbd	Effective data rate in Mbaud	9500	11500
<b>Link parameters</b>					
Fibre_Attenuation_Curve	lambda^-4	-	Fibre attenuation curve type (lambda^-4,G652AB,G652CD models)		
Fibre_Attenuation_Curve_Type	min	-	Maximum / minimum value curve (not available for lambda^-4 model)		
Fibre_Attenuation_Base_Value	0.35	dB/km	Base fibre attenuation (for lambda^-4 model)	0	1
Fibre_Attenuation_Base_Wavelength	1310.00	nm	Base wavelength for fibre attenuation estimation		
Fibre_Attenuation_Value	0.36	dB/km	Fibre attenuation at base wavelength		
Channel_Length_Max	10	km	Maximum distance between an ONU and the OLT	0.5	20
Fibre_Loss	3.64	dB	Fibre (no connectors) CHIL @ Tx_Uc		
PSC_Split_count	16.00	-	Number of splitter ports (powers of 2 only)	2	64
PSC_Loss_Curve	max	-	Type of PSC loss curve (minimum, average and maximum types)		
PSC_Loss	14.93	dB	PSC induced CHIL		
Nonlinear_Penalties	1.00	dB	Nonlinear penalties in the fibre plant (SBS + SRS induced)		10
Excess_Loss	0.43	dB	Connectors, splices and any other excess loss		
ITU_Optical_Path_Penalty	1.00	dB	Optical path penalty in accordance with ITU definition	0	5
Channel_Loss_Min	5.00	dB	Channel Insertion Loss (CHIL) (min) - user input	0	20.00
Channel_Loss_Max	20.00	dB	Channel Insertion Loss (CHIL) (max)		29
Dispersion_Uo_Min	1300.00	nm			
Dispersion_Uo_Max	1324.00	nm			
Dispersion_So	0.09	ps/nm^2.km			
Dispersion_D_Min	-1.90	ps/(nm.km)			
Dispersion_D_Max	-6.42	ps/(nm.km)			
Dispersion_Penalty	-0.41	dB	Dispersion penalty calculated following 3av_0705_saeki_1.pdf		
<b>Receiver parameters</b>					
ITU_Rx_Sensitivity_Ave	-22.00	dBm	Average power receiver sensitivity @ BER 1e-3		
ITU_Rx_Sensitivity_Ave_OMA	-20.09	dBm	OMA receiver sensitivity (dBm) @ BER 1e-3		
ITU_Rx_Sensitivity_Ave_uW	50.84	uW	OMA receiver sensitivity (uW) @ BER 1e-3		
IEEE_Rx_Stressed_Sensitivity_Ave	-21.00	dBm	Average stressed receiver sensitivity in IEEE formalism @ BER 1e-3		
IEEE_Rx_Stressed_Sensitivity_OMA	-19.09	dBm	OMA stressed receiver sensitivity in IEEE formalism (dBm) @ BER 1e-3		
IEEE_Rx_Stressed_Sensitivity_uW	58.97	uW	OMA stressed receiver sensitivity in IEEE formalism (uW) @ BER 1e-3		
Rx_Overload	-1.00	dBm	This is what the overload needs to be...		
<b>Check Conditions</b>					
Dispersion_Penalty <= ITU_Optical_Path_Penalty			PASSED		

# PR20 Upstream

Parameter name	Value	Unit	Description	Value min	Value max
<b>Transmitter parameters</b>					
ITU_ERnom	9.00	dB	Extinction Ratio used to convert average power values to OMA values	0.00	9.00
ITU_Tx_Ave_Min	-1.00	dBm	Average output power in ITU format (min)	-99.00	99.00
ITU_Tx_Ave_Max	4.00	dBm	Average output power in ITU format (max)	-99.00	99.00
IEEE_Tx_OMA_Min	0.91	dBm	Average output power in IEEE OMA format (min)		
Tx_Wavelength_Min	1260.00	nm	Transmitter wavelength (min)	1200.00	1600.00
Tx_Wavelength_Max	1280.00	nm	Transmitter wavelength (max)	1200.00	1600.00
Tx_Wavelength_Uc	1270.00	nm	Transmitter wavelength (central wavelength)	1260.00	1280.00
Tx_Chirp_Parameter_Max	-2.00	-	Chirp parameter for transmitter signal (max) [C] (Normal DML's are negative)		
Tx_Data_Rate	10312.50	Mbd	Effective data rate in Mbaud	9500	11500
<b>Link parameters</b>					
Fibre_Attenuation_Curve	lambda^-4	-	Fibre attenuation curve type (lambda^-4,G652AB,G652CD models)		
Fibre_Attenuation_Curve_Type	min	-	Maximum / minimum value curve (not available for lambda^-4 model)		
Fibre_Attenuation_Base_Value	0.35	dB/km	Base fibre attenuation (for lambda^-4 model)	0	1
Fibre_Attenuation_Base_Wavelength	1310.00	nm	Base wavelength for fibre attenuation estimation		
Fibre_Attenuation_Value	0.36	dB/km	Fibre attenuation at base wavelength		
Channel_Length_Max	20	km	Maximum distance between an ONU and the OLT	0.5	20
Fibre_Loss	7.27	dB	Fibre (no connectors) CHIL @ Tx_Uc		
PSC_Split_count	16.00	-	Number of splitter ports (powers of 2 only)	2	64
PSC_Loss_Curve	max	-	Type of PSC loss curve (minimum, average and maximum types)		
PSC_Loss	14.93	dB	PSC induced CHIL		
Nonlinear_Penalties	1.00	dB	Nonlinear penalties in the fibre plant (SBS + SRS induced)		10
Excess_Loss	0.80	dB	Connectors, splices and any other excess loss		
ITU_Optical_Path_Penalty	1.00	dB	Optical path penalty in accordance with ITU definition	0	5
Channel_Loss_Min	10.00	dB	Channel Insertion Loss (CHIL) (min) - user input	0	24.00
Channel_Loss_Max	24.00	dB	Channel Insertion Loss (CHIL) (max)		29
Dispersion_Uo_Min	1300.00	nm			
Dispersion_Uo_Max	1324.00	nm			
Dispersion_So	0.09	ps/nm^2.km			
Dispersion_D_Min	-1.90	ps/(nm.km)			
Dispersion_D_Max	-6.42	ps/(nm.km)			
Dispersion_Penalty	-0.86	dB	Dispersion penalty calculated following 3av_0705_saeki_1.pdf		
<b>Receiver parameters</b>					
ITU_Rx_Sensitivity_Ave	-26.00	dBm	Average power receiver sensitivity @ BER 1e-3		
ITU_Rx_Sensitivity_Ave_OMA	-24.09	dBm	OMA receiver sensitivity (dBm) @ BER 1e-3		
ITU_Rx_Sensitivity_Ave_uW	28.09	uW	OMA receiver sensitivity (uW) @ BER 1e-3		
IEEE_Rx_Stressed_Sensitivity_Ave	-25.00	dBm	Average stressed receiver sensitivity in IEEE formalism @ BER 1e-3		
IEEE_Rx_Stressed_Sensitivity_OMA	-23.09	dBm	OMA stressed receiver sensitivity in IEEE formalism (dBm) @ BER 1e-3		
IEEE_Rx_Stressed_Sensitivity_uW	32.58	uW	OMA stressed receiver sensitivity in IEEE formalism (uW) @ BER 1e-3		
Rx_Overload	-6.00	dBm	This is what the overload needs to be...		
<b>Check Conditions</b>					
Dispersion_Penalty <= ITU_Optical_Path_Penalty			PASSED		

# PR30 Upstream

Parameter name	Value	Unit	Description	Value min	Value max
<b>Transmitter parameters</b>					
ITU_ERnom	9.00	dB	Extinction Ratio used to convert average power values to OMA values	0.00	9.00
ITU_Tx_Ave_Min	4.00	dBm	Average output power in ITU format (min)	-99.00	99.00
ITU_Tx_Ave_Max	9.00	dBm	Average output power in ITU format (max)	-99.00	99.00
IEEE_Tx_OMA_Min	5.91	dBm	Average output power in IEEE OMA format (min)		
Tx_Wavelength_Min	1260.00	nm	Transmitter wavelength (min)	1200.00	1600.00
Tx_Wavelength_Max	1280.00	nm	Transmitter wavelength (max)	1200.00	1600.00
Tx_Wavelength_Uc	1270.00	nm	Transmitter wavelength (central wavelength)	1260.00	1280.00
Tx_Chirp_Parameter_Max	-2.00	-	Chirp parameter for transmitter signal (max) [C] (Normal DML's are negative)		
Tx_Data_Rate	10312.50	MBd	Effective data rate in Mbaud	9500	11500
<b>Link parameters</b>					
Fibre_Attenuation_Curve	lambda^-4	-	Fibre attenuation curve type (lambda^-4,G652AB,G652CD models)		
Fibre_Attenuation_Curve_Type	min	-	Maximum / minimum value curve (not available for lambda^-4 model)		
Fibre_Attenuation_Base_Value	0.35	dB/km	Base fibre attenuation (for lambda^-4 model)	0	1
Fibre_Attenuation_Base_Wavelength	1310.00	nm	Base wavelength for fibre attenuation estimation		
Fibre_Attenuation_Value	0.36	dB/km	Fibre attenuation at base wavelength		
Channel_Length_Max	20	km	Maximum distance between an ONU and the OLT	0.5	20
Fibre_Loss	7.27	dB	Fibre (no connectors) CHIL @ Tx_Uc		
PSC_Split_count	32.00	-	Number of splitter ports (powers of 2 only)	2	64
PSC_Loss_Curve	max	-	Type of PSC loss curve (minimum, average and maximum types)		
PSC_Loss	18.40	dB	PSC induced CHIL		
Nonlinear_Penalties	1.00	dB	Nonlinear penalties in the fibre plant (SBS + SRS induced)		10
Excess_Loss	2.33	dB	Connectors, splices and any other excess loss		
ITU_Optical_Path_Penalty	1.00	dB	Optical path penalty in accordance with ITU definition	0	5
Channel_Loss_Min	15.00	dB	Channel Insertion Loss (CHIL) (min) - user input	0	29.00
Channel_Loss_Max	29.00	dB	Channel Insertion Loss (CHIL) (max)		29
Dispersion_Uo_Min	1300.00	nm			
Dispersion_Uo_Max	1324.00	nm			
Dispersion_So	0.09	ps/nm^2.km			
Dispersion_D_Min	-1.90	ps/(nm.km)			
Dispersion_D_Max	-6.42	ps/(nm.km)			
Dispersion_Penalty	-0.86	dB	Dispersion penalty calculated following 3av_0705_saeki_1.pdf		
<b>Receiver parameters</b>					
ITU_Rx_Sensitivity_Ave	-26.00	dBm	Average power receiver sensitivity @ BER 1e-3		
ITU_Rx_Sensitivity_Ave_OMA	-24.09	dBm	OMA receiver sensitivity (dBm) @ BER 1e-3		
ITU_Rx_Sensitivity_Ave_OMA	28.09	uW	OMA receiver sensitivity (uW) @ BER 1e-3		
IEEE_Rx_Stressed_Sensitivity_Ave	-25.00	dBm	Average stressed receiver sensitivity in IEEE formalism @ BER 1e-3		
IEEE_Rx_Stressed_Sensitivity_OMA	-23.09	dBm	OMA stressed receiver sensitivity in IEEE formalism (dBm) @ BER 1e-3		
IEEE_Rx_Stressed_Sensitivity_OMA	32.58	uW	OMA stressed receiver sensitivity in IEEE formalism (uW) @ BER 1e-3		
Rx_Overload	-6.00	dBm	This is what the overload needs to be...		
<b>Check Conditions</b>					
Dispersion_Penalty <= ITU_Optical_Path_Penalty			PASSED		

# Number of PMDs

	Tx Min/Max (dBm)	Tx $\lambda$ (nm)	Rx Sens/Ovr (dBm)	Rx $\lambda$ (nm)
OLT #1	+1/+4	15xx-15xx	-22/-1	1260-1280
OLT #2	+2/+5	1574-1580	-26/-6	1260-1280
OLT #3	+5/+9	15xx-15xx	-26/-6	1260-1280
ONU #1	-1/+4	1260-1280	-20/-1	15xx-15xx
ONU #2	+4/+9	1260-1280	-28/-10	1574-1580