



# Channel Capacity Calculator

Version 1.4

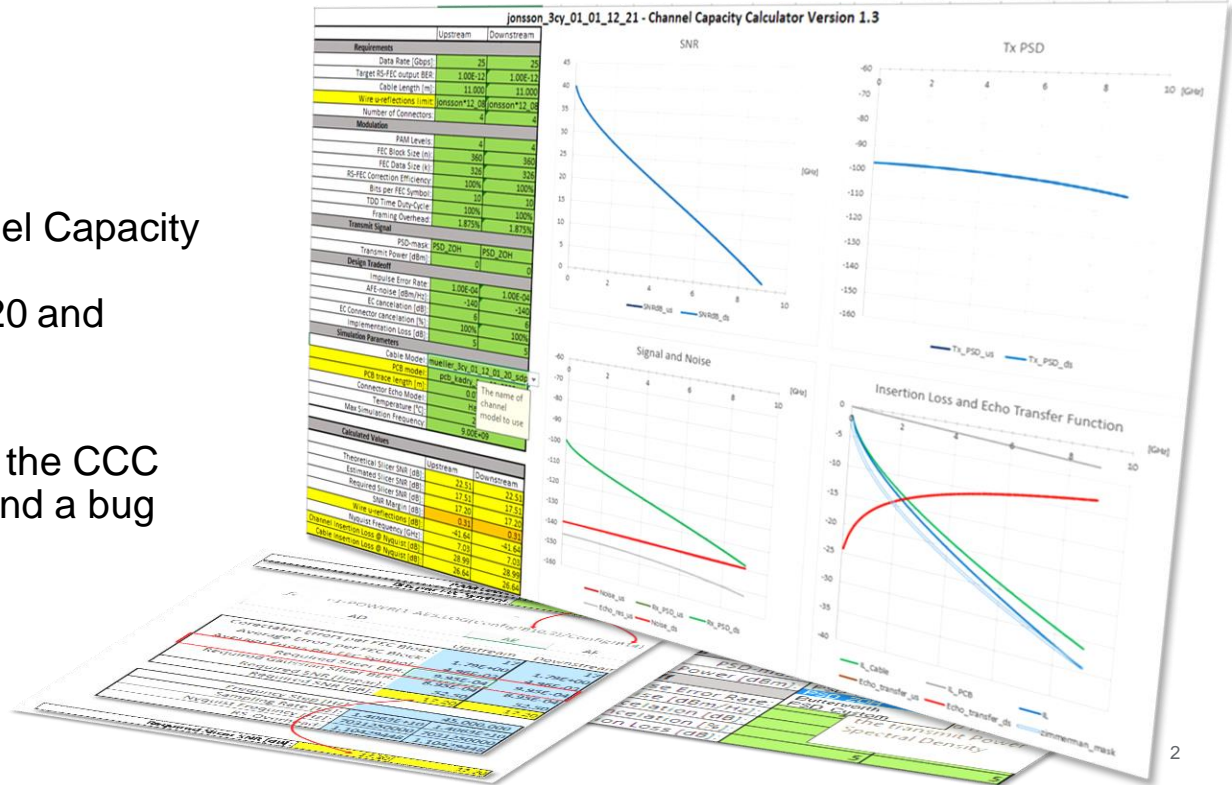
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April 20, 2021

802.3cy

# Introduction

- We introduced the Channel Capacity Calculator (CCC) tool in [jonsson\\_3cy\\_01\\_10\\_28\\_20](#) and updated it last in [jonsson\\_3cy\\_01\\_01\\_12\\_21](#)
- This contribution updates the CCC with new enhancements and a bug fix



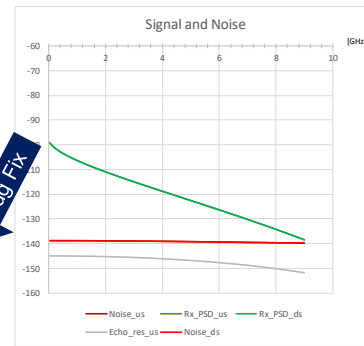
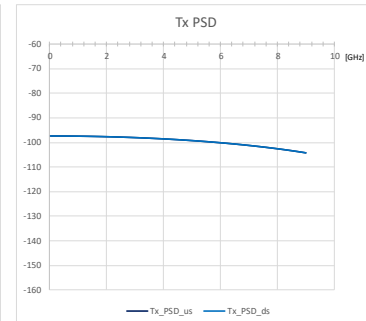
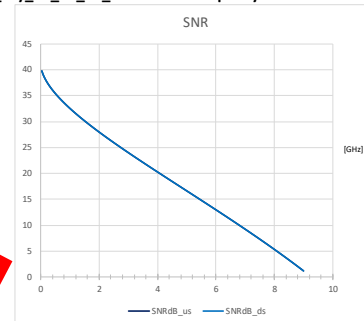
# Updates In New Version

The following enhancements have been made to the CCC:

- Minor bug fix for required Slicer SNR calculation
- Echo Cancellation of connectors is now in dB (was in % before)
- New Insertion Loss limit line from the cable experts

jonsson\_3cy\_01\_04\_20\_21 - Channel Capacity Calculator Version 1.4

	Upstream	Downstream
<b>Requirements</b>		
Data Rate [Gbps]:	25	25
Target RS-FEC output BER:	1.00E-12	1.00E-12
Cable Length [m]:	11,000	11,000
Wire u-reflections limit:	jonsson*12_08	jonsson*12_08
Number of Connectors:	4	4
<b>Modulation</b>		
PAM Levels:	4	4
FEC Block Size (n):	360	360
FEC Data Size (k):	326	326
RS-FEC Correction Efficiency:	100%	100%
Bits per FEC Symbol:	10	10
TDD Time Duty-Cycle:	100%	100%
Framing Overhead:	1.875%	1.875%
<b>Transmit Signal</b>		
PSD-mask:	PSD_ZOH	PSD_ZOH
Transmit Power [dBm]:	0	0
<b>Design Tradeoff</b>		
Impulse Error Rate:	1.00E-04	1.00E-04
AFE-noise [dBm/Hz]:	-140	-140
EC cancellation [dB]:	6	6
EC Connector cancellation [dB]:	50	50
Implementation Loss [dB]:	5	5
<b>Simulation Parameters</b>		
Cable Model:	mueller_3cy_01_12_01_20_sdp	
PCB model:	pcb_kadry_3cy_02_0820	
PCB trace length [m]:	0.0762	
Connector Echo Model:	Hard	
Temperature [°C]:	20	
Max Simulation Frequency:	9.00E+09	
<b>Calculated Values</b>		
	Upstream	Downstream
Theoretical Slicer SNR [dB]:	22.50	22.50
Estimated Slicer SNR [dB]:	17.50	17.50
Required Slicer SNR [dB]:	17.20	17.20
SNR Margin [dB]:	0.30	0.30
Wire u-reflections [dB]:	-41.64	-41.64
Nyquist Frequency [GHz]:	7.03	7.03
Channel Insertion Loss @ Nyquist [dB]:	28.99	28.99
Cable Insertion Loss @ Nyquist [dB]:	26.64	26.64



Change

Bug Fix

New



Essential technology, done right™