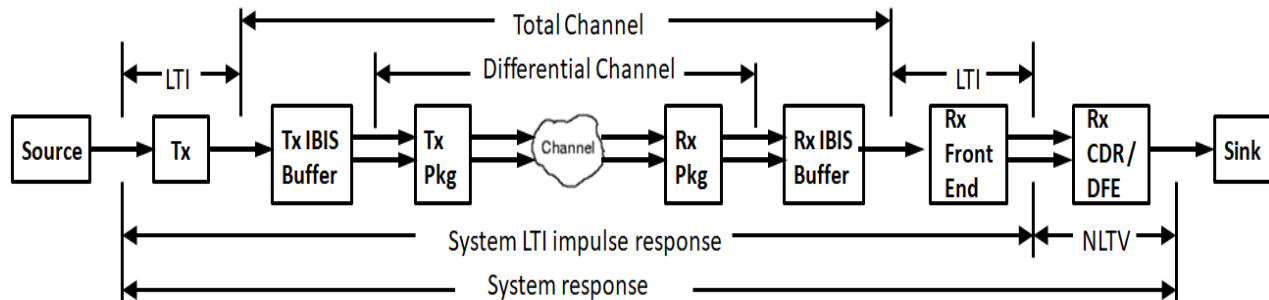## Subject: Summary of Features in SerDesDesign Tools

Author: John Baprawski; John Baprawski Inc. (JB)

Date: Oct. 7, 2021

This paper discusses features on the web site: **https://www.serdesdesign.com**

A SerDes system for a single channel has the typical structure shown in this figure.

See details in **About the SerDes System Tool...**

Many of the features available in the SerDesDesign.com tools are free others are available for a fee. This document is a summary of some of the SerDesDesign.com features for SerDes System Channel Simulation using the web page: **serdes-system-tool**.

Channel Impulse Background

All channel simulators (CS) based on the IBIS standard are able to model SerDes systems as shown in the above figure. SerDes system contain transmitters (Tx), receivers (Rx) and a differential channel. Oftentimes, parts of the channel are defined using S-parameters. Necessarily, S-parameters are defined with an upper frequency maximum. Per the IBIS definition the total channel includes all content between the output of the Tx behavioral (AMI) model and Rx behavioral (AMI) model. This includes the Tx IBIS Buffer, Tx Pkg, Channel, Rx Pkg and Rx IBIS Buffer.

Summary of Features Available for Free

SerDesDesign.com SerDes System Tool provides free detailed SerDes system behavioral modeling for all the blocks shown in the above figure. The behavioral modeling includes the following:

- Tx models:
    - FFE defined with taps, with tap codes, with digital registers, and as a black box.
    - CTLE defined with peaking characteristics, poles/zeros, time domain waveforms, and frequency domain spectrums.
    - Supports de-embedding Tx IBIS characteristic from the Tx data to obtain the Tx AMI model.
    - Supports corner cases Typical, Slow and Fast.

- Total channel:
  - With channel impulse response exported from another channel simulator, including use of an anti-aliasing filter.
  - With IBIS sections defined with RLC circuits, defined based on the IBIS standard, or defined with S-parameters based on the AMI standard.
  - With Tx/Rx package S-parameters.
  - With main channel S-parameters.
- Rx models:
  - FFE defined with taps, with tap codes, with digital registers, and as a black box.
  - CTLE defined with peaking characteristics, poles/zeros, time domain waveforms, and frequency domain spectrums; with up to 4 sections.
  - With nonlinearity defined with an atanh function, Rapp function, tabular data, or multiple sets of tabular data; the nonlinearity set selected can be coordinated with the CTLE selected; the nonlinearity can include filtering before/after the nonlinearity; the nonlinearity can define an AGC functionality.
  - With CDR with user specified Observable Jitter Transfer Function characteristic frequency.
  - With DFE defined with taps, with tap limits, or with tap codes.

SerDesDesign.com also supports free SerDes systems behavioral modeling for **repeaters** including **Electrical-Optical-Electrical repeaters.**

Summary of Features available for a Fee

For additional fees, SerDesDesign.com supports these features:

- Converting Tx/Rx behavioral models to IBIS-AMI model which can be used in any channel simulator compliant with the IBIS standard.
  - See the price list at the **Store**,
- Personal copy of the SerDesDesign.com channel simulator for installation and use on one's local Windows 64-bit PC.
  - See details at: **Premium Account**
- Custom IBIS-AMI modeling per customer's requirements.
  - Contact us with your requirements at **info@serdesdesign.com**

Terms & Conditions | Privacy Policy