

Spartan-6 FPGA GTP Transceivers IBIS-AMI Signal Integrity Simulation Kit

User Guide

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Revision History

The following table shows the revision history for this document.

Date	Version	Revision
12/16/11	1.0	Initial Xilinx release.

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Spartan-6 FPGA GTP Transceivers IBIS-AMI Signal Integrity Simulation Kit

Introduction

The Spartan®-6 FPGA GTP transceivers support serial communication rates up to 3.2 Gb/s. These highly configurable transceivers can be programmed to support a variety of standard protocols, including PCIe Gen1, XAUI, SATA-1, 2, and more. This document provides reference information about the I/O buffer information specification algorithmic modeling interface (IBIS-AMI) Signal Integrity Simulation Kit and the Tx and Rx control parameters available to the user. This user guide describes the file structure of the kit, followed by how to control the parameters to set up specific simulations.

File Structure

This transceiver model kit includes:

- Model executables for Windows (.dll) and Linux (.so):
 - 32-bit Windows:
 - s6_gtp_ami_tx.dll
 - s6_gtp_ami_rx.dll
 - 32-bit Linux:
 - s6_gtp_ami_tx.linux.so
 - s6_gtp_ami_rx.linux.so
- AMI files for transmitter and receiver:
 - s6_gtp_ami_tx.ami
 - s6_gtp_ami_rx.ami
- IBIS file for transmitter and receiver:
 - xilinx_s6_gtp.ibs
- GTP package models:
 - xilinx_s6_lxt_fg676_pkg_max.s4p
 - xilinx_s6_lxt_fg676_pkg_min.s4p
- SiSoft QCD simulation kit
 - xilinx_s6_gtp_v3p0.klp

Control Parameters

This section describes how to use the control parameters with the Spartan-6 FPGA GTP transceivers IBIS-AMI models. Refer to [UG386, Spartan-6 FPGA GTP Transceivers User Guide](#) for more information.

Transmitters

The Spartan-6 FPGA GTP transmitters provide scalable output swing and pre-emphasis settings.

Model-Specific Parameters

[Table 1](#) lists model-specific parameters.

Table 1: Model-Specific Parameters

Parameter Name	Description
Process	Select silicon process corner for simulation. tt = Typical (default) ss = Slow ff = Fast

Transmitter-Specific Parameters

In [Table 2](#), control parameters are in decimal format unless otherwise specified.

Table 2: Transmitter-Specific Parameters

Parameter Name	Description
A_TXDIFFCTRL	Adjust transmitter output amplitude swing. There are 16 settings represented by 16 codes. The swing level for each code could vary with the process corner selection. The minimum output swing (differential peak-to-peak) is 205 mV (code 0). The maximum swing is 1,106 mV (code 15). Default = 10 (1,054 mV)
A_TXPREEMPHASIS	Adjust transmitter precursor emphasis. Pre-cursor tap is spaced 1UI from the main cursor. There are eight settings, represented by eight decimal codes in the model. 0 = 0 dB 1 = 0.8 dB 2 = 1.7 dB 3 = 2.5 dB 4 = 3.5 dB 5 = 4.5 dB 6 = 6.1 dB 7 = 7.6 dB Default = 0

Receivers

The Spartan-6 FPGA GTP receivers provide programmable termination mode and linear equalization settings to improve signal integrity.

Model-Specific Parameters

Table 3 lists model-specific parameters.

Table 3: Model-Specific Parameters

Parameter Name	Description
Process	Select silicon process corner for simulation. tt = Typical (default) ss = Slow ff = Fast

Receiver-Specific Parameters

In Table 4, control parameters are in decimal format unless otherwise specified.

Table 4: Receiver-Specific Parameters

Parameter Name	Description
RX_TERMINATION_MODE ⁽¹⁾	Select RX termination voltage. 0 = Internal_Cap_Enabled, VTT = 0 1 = Internal_Cap_Enabled, VTT = VTTRX Default = 1
RXEQMIX	Select RX equalization setting. 0 (2'b00) = -0.3 dB (Minimum) 1 (2'b01) = 2.6 dB 2 (2'b10) = 5.4 dB 3 (2'b11) = 8.4 dB (Maximum) Default = 2
1. For specific Use Mode configuration, refer to Use Mode 1 and 3 in the RX Analog Front End section of UG386 , <i>Spartan-6 FPGA GTP Transceivers User Guide</i> .	

Model Revision History

Table 5 lists the revision history of this model.

Table 5: Receiver-Specific Parameters

Revision	Date	Comment
2.0	11/01/2010	Correlated IBIS-AMI model: - Transmitter—Hardware correlated - Receiver—HSPICE correlated