

Quick Start Guide

Example Linear 12G EQ Agilent ADS Project

Version 3
April 2024

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1 Document Revision History

Revision	Editor	Comment	Date
1	Liang Liu	Initial creation of Quick Start Guide for example ADS project.	19-August-2014
2	Liang Liu	Update to match the new models files	12-Sept-2014
3	Lucas Wolter	Updated for public release.	29-April-2024

2 Overview

This document is a Quick Start Guide for a custom Agilent ADS project using the a linear Buffer Repeater in a generic channel topology. Table 1 below lists pertinent information related to the delivered project.

Table 1: Quick Start Guide related information

Item	Value/Comment
IBIS-AMI Simulator	<i>Agilent ADS</i>
IBIS-AMI Simulator version	2013.06. TI strongly recommends updating to version 2013.06 or later to enable certain features such as single-schematic retimer/redriver simulations.
TI device models included	DS80PCI810 Linear Repeater DS125BR401A Linear Repeater (A-side channels only) DS125BR820 Linear Repeater DS125BR111 Linear Repeater
Other device models included	<i>None.</i> When interfacing to the linear repeater, only generic TX/RX models were used. Customer will need to replace these with other vendors' models if desired.
Project names	<i>Agilent_ADS_2013.06.7ads:</i> ADS project using Linear 12G EQ Repeater.
Supported platforms	<ul style="list-style-type: none"> • 32-bit Windows • 64-bit Windows • 64-bit Linux

The topology implemented in the example project matches Figure 1 below. There are two main parts to this topology:

1. Link between a generic TX (pattern generator) and the Linear 12G EQ Repeater.
2. Link between the Linear 12G EQ Repeater and a generic RX (scope).

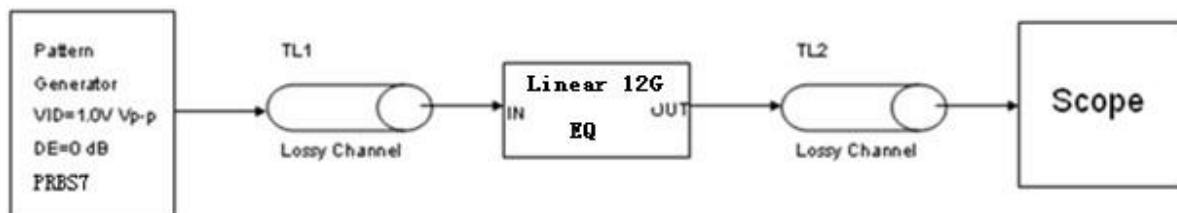


Figure 1: Link topology for the Linear 12G EQ example project

3 Project Quick Start Guide

The Linear 12G EQ example project included in this distribution contains one schematic:

- **ASIC_Linear_12G_EQ_ASIC_RX:** Link between a Generic ASIC TX model, the Linear 12G EQ Repeater, and a generic ASIC RX model. Contains:
 - a. A generic TX model *which should be replaced by the ASIC vendor's TX model*
 - b. A generic FR4 trace model *which should be replaced by actual channel*
 - c. The Linear 12G EQ RX model (can be replaced by other linear repeater models depending on your application)
 - d. A generic RX model *which should be replaced by the ASIC vendor's RX model*

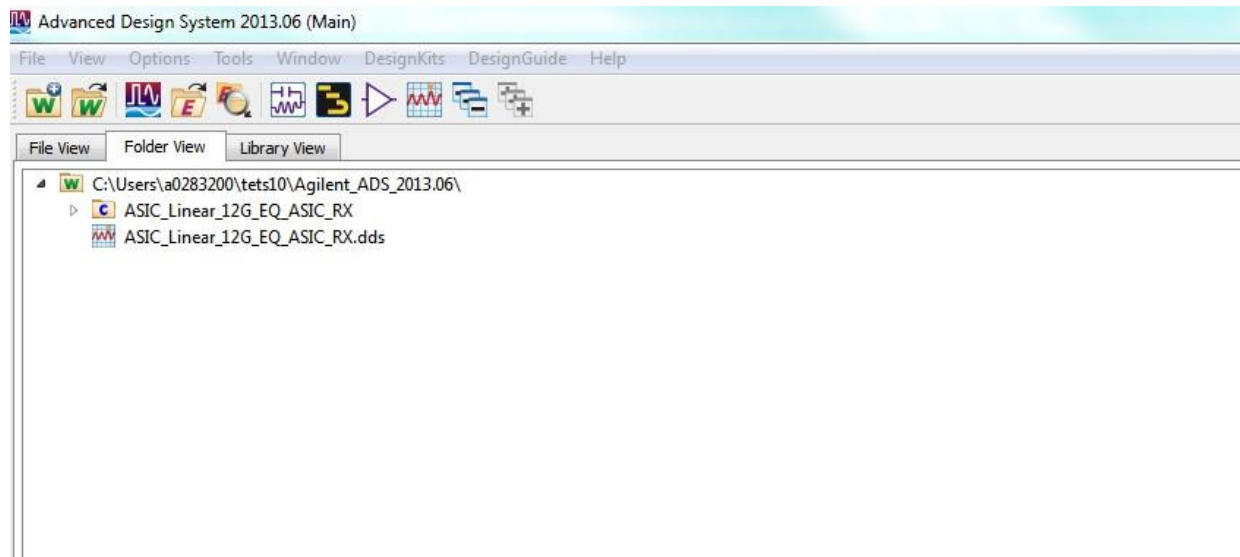


Figure 2: ADS main window showing the available schematic

The recommended procedure for simulating the enclosed example project is as follows:

1. Open the project. From the main ADS control window, select “File > Unarchive Workspace or Project”, then browse to the project file provided with this release: Agilent_ADS_2013.06.7zads. ADS will ask you to name the project and specify where you want it to be placed.
2. Open the ASIC_Linear_12G_EQ_ASIC_RX schematic.
3. Replace the generic TX IBIS-AMI model with the desired ASIC vendor TX model. This can be done by double-clicking on the TX_AMI model. Browse to and select

the desired IBIS model to replace the generic TX model that is currently instantiated in the schematic. Note that this generic TX model does not contain any de-emphasis or amplitude control and is solely for the purpose of completing the simulation setup.

4. Replace the generic TX package model with the package model supplied by the ASIC TX vendor. Do this by double-clicking on the TX package s-parameter block and selecting the new s-parameter file. Note that the example ASIC TX package used in this schematic has a port ordering such that port 1 goes to port 3 and port 2 goes to port 4. If the package model supplied by the ASIC TX vendor has a different port ordering, then the schematic hook-up will need to be edited to make sure the signal propagates through the package and into the channel correctly.
5. Replace the generic FR4 trace model with your system's channel.
6. Replace the generic RX package model with the package model supplied by the ASIC RX vendor. Note that the example ASIC RX package used in this schematic has a port ordering such that port 1 goes to port 3 and port 2 goes to port 4. If the package model supplied by the ASIC RX vendor has a different port ordering, then the schematic hook-up will need to be edited to make sure the signal propagates through the package and into the channel correctly.
7. Replace the generic RX IBIS-AMI model with the desired ASIC vendor RX model. Note that the generic RX model included in this project does not have any equalization, so it is effectively a scope.

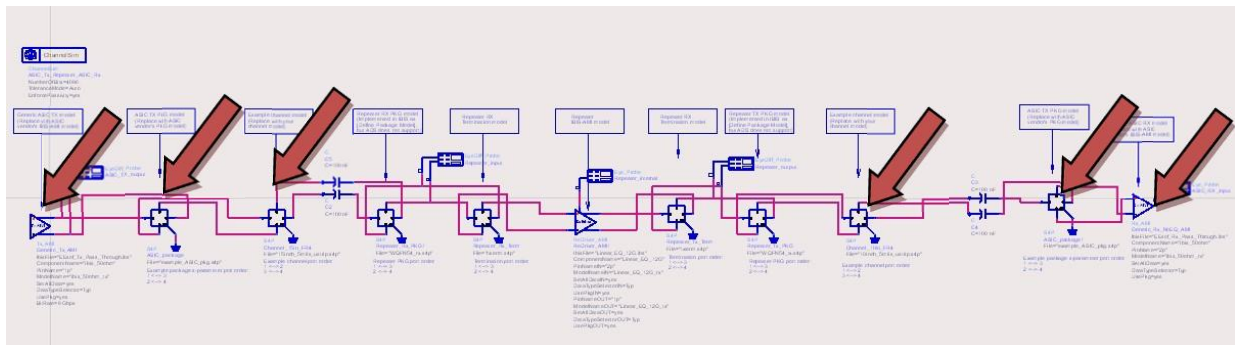




Figure 3: Schematic (user should replace the items with arrows pointing to them)

8. Simulate the ASIC_Linear_12G_EQ_ASIC_RX schematic by clicking on the  button. As the schematic is simulating ADS will display the simulation progress. Before simulating you can adjust the Linear 12G EQ's settings by double-clicking on the Linear 12G EQ model and going to the AMI parameters tab. The range of possible settings for this model is described in the model user's guide.

9. Once the simulation completes, the plot window will appear. To plot the resulting post-equalized eye, click on the  button and click again in the blank area to drop down a plot axis.
10. When the plot is inserted, the “Plot Traces & Attributes” window will open up. Select one of the “Density” plots and then click on “>>Add>>”. Click “OK” to plot the eye. The example project contains a data display page called ASIC_TX_Linear 12G EQ_ASIC_RX.dds that plots the eye along the signal path similar to the figures below.

4 Example result plots

Using the example project discussed in the previous section, one example result is shown here.

Linear 12G EQ always work in linear mode, so the output differential voltage (VOD) of the repeater is a function of the input differential voltage.

Select the right EQ boost setting(BST, from 0 to 3), according to the loss at the input side of Linear 12G EQ

Set LTI_mode as '1' for both receiver and transmitter

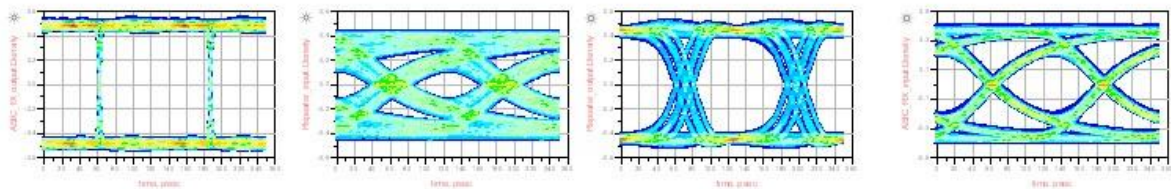


Figure 4: ASIC TX amplitude=1000mVppd, BST=3, VOD=6