IDT™ 89EBP0602Q SATA 6.25Gbps Evaluation Board Manual

(Evaluation Board: 18-702-000)

December 2010

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Description of the EBP0602Q SATA 6G Evaluation Board

Notes

Introduction

The 89HP0602Q 6.25Gbps Signal Repeater (also referred to as P0602Q in this manual) is a member of the IDT Signal Integrity Products family. It is a 2-channel repeater that supports 1 bidirectional SATA 6G lane. The main function of a signal repeater is to extend the reach of signals over a board trace or a cable beyond that which can be achieved natively by a SATA host controller or hard disk.

The 89EBP0602Q (EBP0602Q) evaluation board provides an evaluation platform for the P0602Q signal repeater. The evaluation board provided by IDT can be configured to test the functionality of the P0602Q device in a wide variety of system topologies.

Board Features

Hardware

- P0602Q Signal Repeater for extending SATA 6G reach
  - Single P0602Q device enabling 1 bidirectional SATA 6G lane on a single board
  - SATA connectors on each side of the board allow cables connecting to Host and Target devices.
- Numerous user-selectable configurations set using onboard jumpers and DIP-switches
  - Transmitter swing on the P0602Q Transmitter pins.
  - Receiver Equalization on the P0602Q Receiver pins.

Revision History

December 8, 2010: Initial publication of evaluation board manual.

Notes

Installation of the EBP0602Q (SATA 6G) Evaluation Board

Notes

EBP0602Q Installation

This chapter discusses the steps required to configure and install the EBP0602Q evaluation board. All available DIP switches and jumper configurations are explained in detail.

The primary installation steps are:

1. Configure jumper/switch options suitable for the evaluation or application requirements.
2. Connect the SATA 6G cable between the Host and EBP0602Q. Connect the SATA 6G cable between the EBP0602Q and the SATA device, such as an external SATA storage drive.
3. Apply power via USB or SATA power connectors.

The EBP0602Q board is typically shipped with all jumpers and switches configured to their default settings. In most cases, the board does not require further modification or setup.

For technical support, please visit the IDT website and fill out the Technical Support Request form at http://www.idt.com/?app=TechSupport&prodFamily=signal%20integrity%20products.

Hardware Description

The IDT 89HP0602Q is a 6.25Gbps Repeater IC that reconditions high-speed serial data streams. The 89HP0602Q contains two half-duplex data lanes, where each half-duplex lane consists of a differential equalizer, as well as a transmit driver that includes de-emphasis.

The EBP0602Q consists of single P0602Q device.

Basic requirements for the board to run are:

- SATA Host Controller.
- SATA Target Device (HDD).

Power Sources

The EBP0602Q can be powered via a 15-pin SATA or USB connector. Header W3 (see Table 2.1) is used to select the proper power source for the EBP0602Q from SATA 15-pin or USB connectors.

Power Source Headers		
Ref. Designator	Type	Description
W3	Header	1-2: 5V source from USB Connectors (J27) 2-3: 5V source from SATA 15-pin Power Connector (J8)

Table 2.1 Power Source Headers

Notes

External Power Source

External power is supplied to the EBP0602Q board through a 15-pin SATA power connector (J8) or USB connector (J27) via Header W3. The external power supply provides +5V to the EBP0602Q as described in Table 2.2. The +12V and +3.3V are unused.

Pin	Signal
1	3.3V
2	3.3V
3	3.3V
4	GND
5	GND
6	GND
7	5V
8	5V
9	5V
10	GND
11	SPIN-UP
12	GND
13	12V
14	12V
15	12V

Table 2.2 External Power Connector — J8

1.2V Voltage Regulator

A 5V to 1.2V voltage regulator (VR2) provides the 1.2V supply voltage (VDD) to the P0602Q.

Boot Configuration Vector

A boot configuration vector consisting of the signals listed in Table 2.3 is sampled by the P0602Q during power-on. The boot configuration vector defines the essential parameters for repeater operation and is set using DIP switches S2 as defined in Table 2.3.

Signal	Description
S1[1]: ARXEQ S1[2]: BRXEQ	Channel A & B Receiver Equalization. VSS: 2dB (Default) OPEN: 6dB VDD: 14dB
S1[3]: ATXSW S1[4]: BTXSW	Channel A & B Transmit Swing. VSS: 0.5Vdiff-pkpk OPEN: 0.8Vdiff-pkpk VDD: 0.95Vdiff-pkpk (Default)

Table 2.3 Boot Configuration Vector Signals

Notes

LEDs

There are LED indicators on the EBP0602Q which convey status feedback. A description of each is provided in Table 2.4.

Location	Color	Definition
DS4	Green	5V Power Indicator
DS3	Green	1.2V Power Indicator

Table 2.4 LED Indicators

SATA Connectors

The P0602Q repeater has no special orientation requirements with respect to the host controller or disk drive. SATA connectors J1 and J2 can be attached via cable to either the host or hard disk drive. It is important, however, to properly set the receiver equalization and transmitter line correctly based on the cable length being used.

EBP0602Q Board Figures

The top and bottom views of the board are shown in Figures 2.1 and 2.2 respectively.

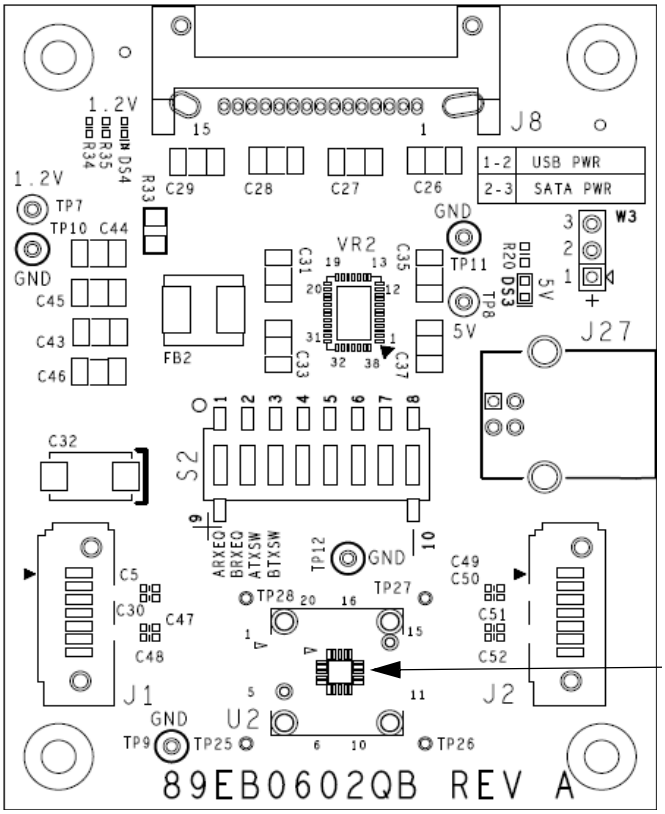

Figure 2.1 EBP0602Q Board Topside Figure

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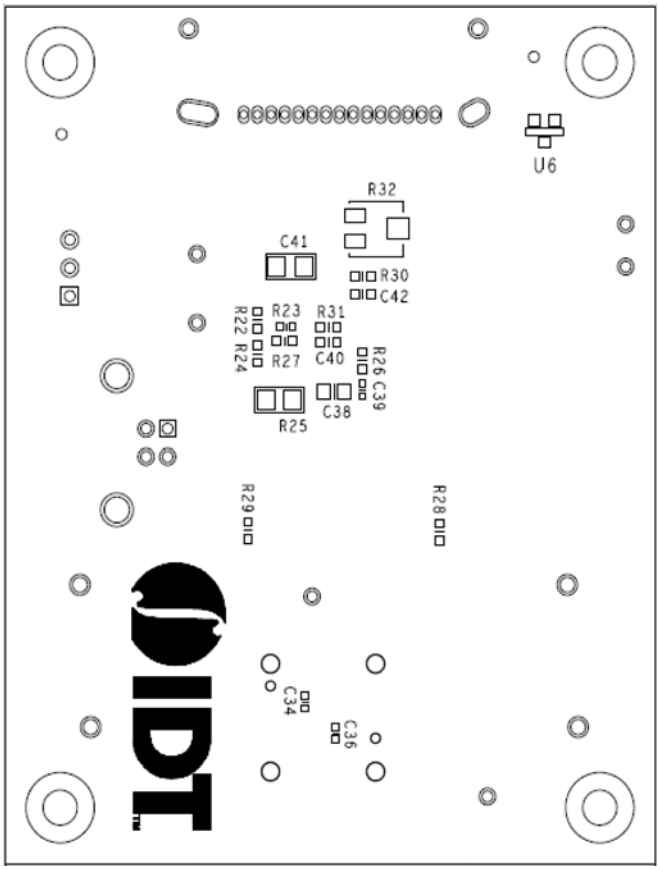

Figure 2.2 EBP0602Q Board Bottom Figure

Schematics

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Schematics

REVISIONS				
DCN	REV	DESCRIPTION	DATE	CHANGE BY
	A	INITIAL RELEASE	2010-07-18	K. LEUNG

IDT 89HP0602Q SATA EVALUATION BOARDS

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TITLE: 89HP0602Q Evaluation Boards			
SIZE: B	DRAWING NO.: P0602Q-U/S-EB-001	FAB P/N: 18-702-000	REV.: A
AUTHOR: K. Leung		CHECKED BY: D. Huang	
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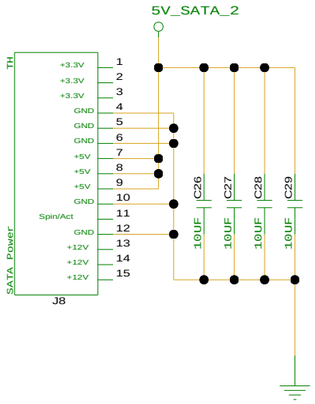

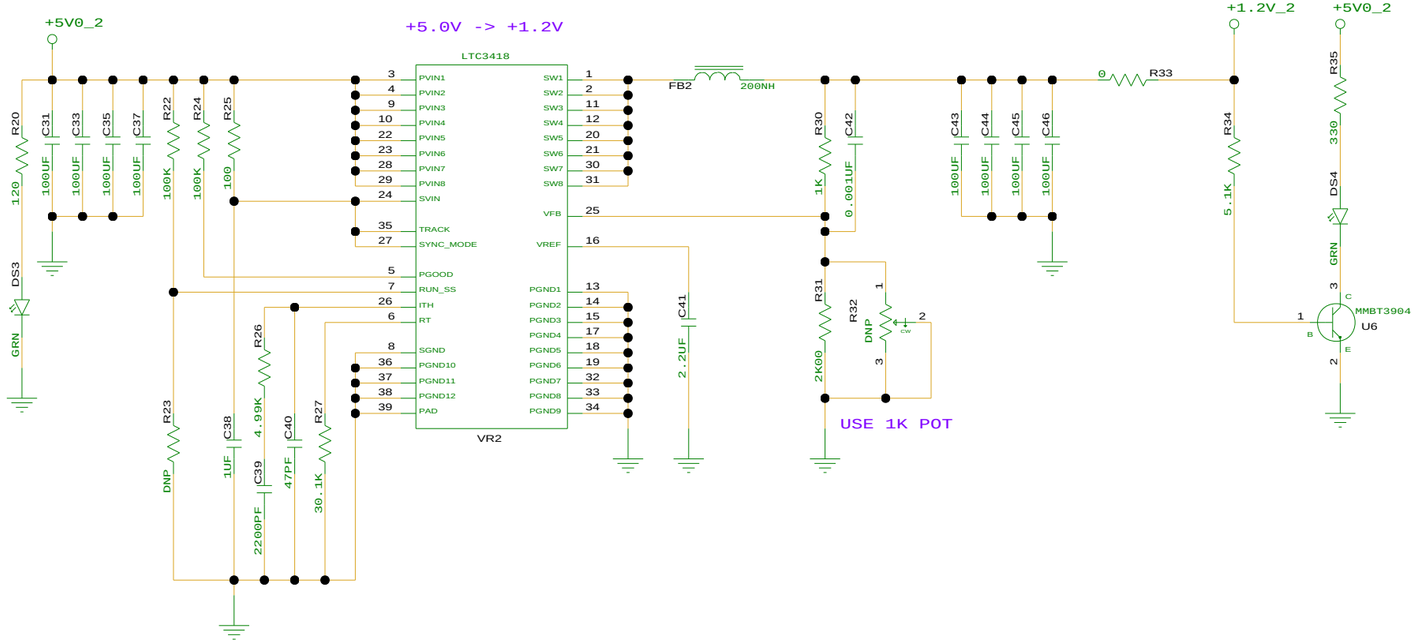

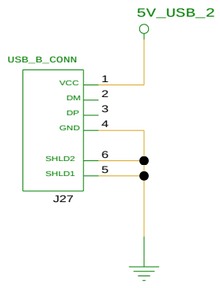

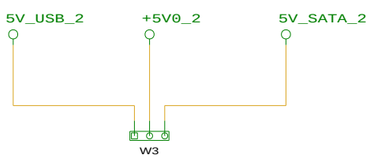

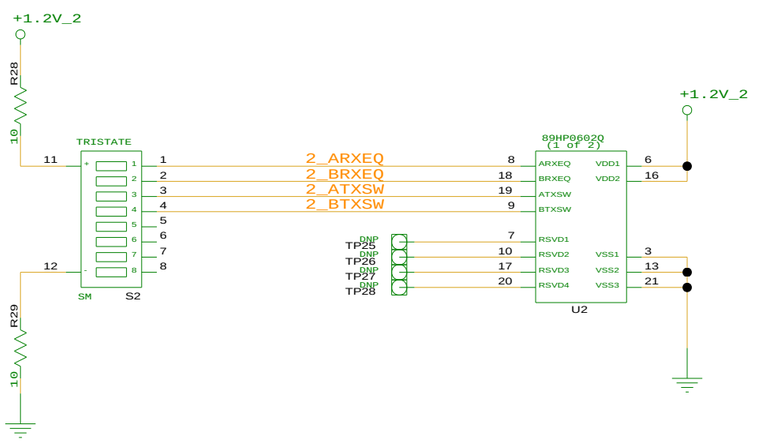

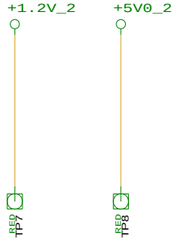

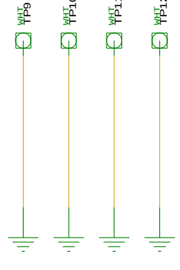

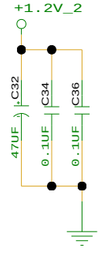

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89HP0602Q, POWER

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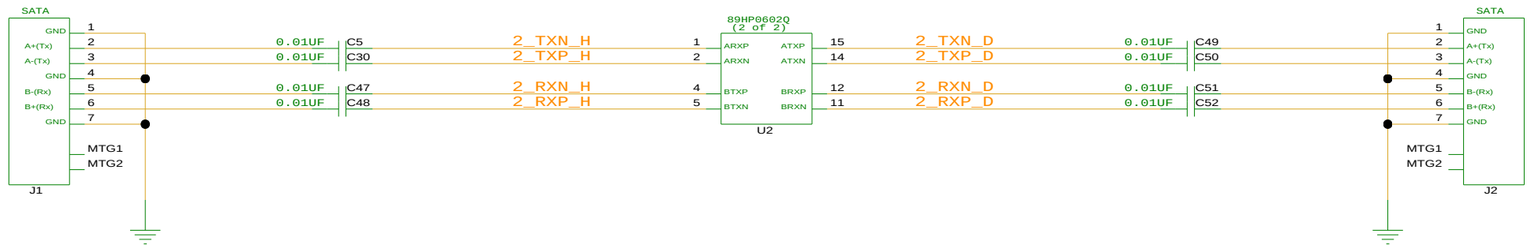

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