IDT™ 89EBP0602Q USB3.0 Evaluation Board Manual

(Evaluation Board: 18-702-001)

November 2010

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Description of the EBP0602Q USB3.0 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 USB3.0 channel. The main function of a signal repeater is to extend the reach of USB3.0 signals over a board trace or a cable far beyond that which can be achieved natively by a USB3.0 device.

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.

The EBP0602Q is also used by IDT to reproduce system-level hardware or software issues reported by customers.

Board Features

Hardware

- P0602Q Signal Repeater for USB 3.0
  - Single P0602Q device enabling 1 bidirectional USB3.0 channel on a single board
  - USB3.0 connector on each side of the board allow USB3.0 cables plugs into Host and Target devices.
  - Additional USB-SMA breakout cards can be provided upon request for testing purposes.
- 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

November 24, 2010: Initial publication of evaluation board manual.

Notes

Installation of the EBP0602Q (USB3.0) 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 USB3.0 cable between the Host and EBP0602Q. Connect the USB3.0 cable between the EBP0602Q and the USB3.0 device, such as an external USB3.0 storage drive.

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:

- USB3.0 Host Controller.
- USB3.0 Target.

Power Sources

The EBP0602Q can be powered via a 15-pin SATA or USB3.0 connectors. Header W2 (see Table 2.1) is used to select the proper power source for the EBP0602Q from USB 3.0 connectors either J6 or J7.

Power Source Headers		
Ref. Designator	Type	Description
W1	Header	1-2: 5V source from USB 3.0 Connectors (see W2 below) 2-3: 5V source from SATA 15-pin Power Connector (J5)
W2	Header	1-2: 5V source from USB 3.0 Connectors (J6) 2-3: 5V source from USB 3.0 Connectors (J7)

Table 2.1 Power Source Headers

Notes

External Power Source

If necessary, external power is supplied to the EBP0602Q board through a 15-pin SATA power connector attached to J5 or USB 3.0 connector (J6 or J7) via Header W1. 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 — J5

1.2V Voltage Regulator

A 5V to 1.2V voltage regulator (VR1) 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 S1 as defined in Table 2.3.

Signal	Description
S1[1]: ARXEQ S1[2]: BRXEQ	Channel A & B Receiver Equalization. VSS: 2dB 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

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
DS1	Green	5V Power Indicator
DS2	Green	1.2V Power Indicator

Table 2.4 LED Indicators

EBP0602Q Board Figures

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

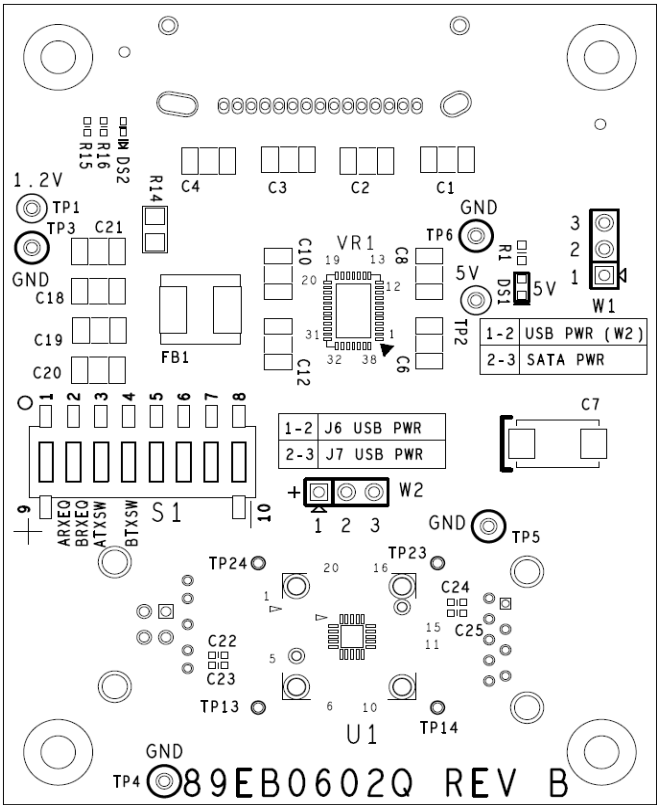

Figure 2.1 EBP0602Q Board Topside Figure

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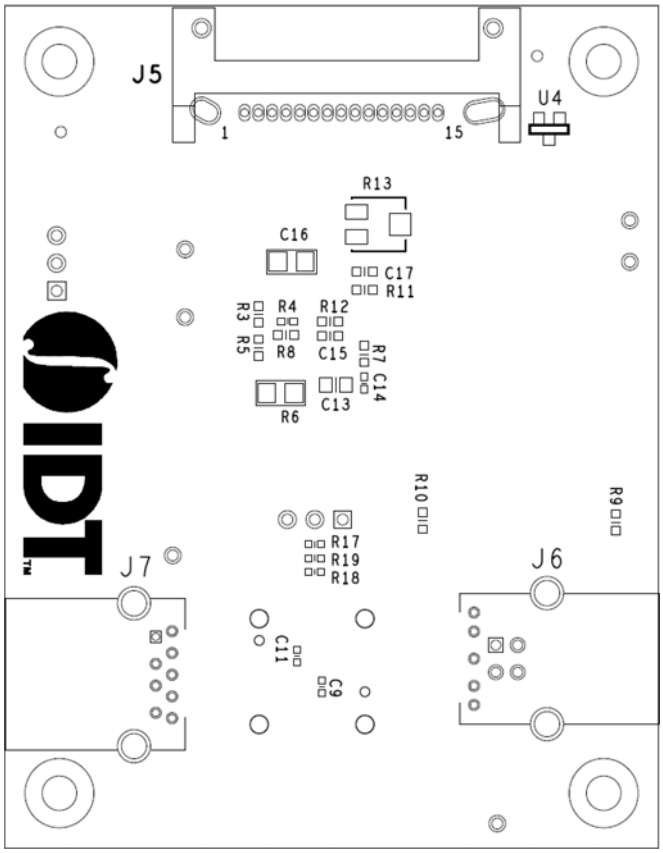

Figure 2.2 EBP0602Q Board Bottom Figure

Schematics

Notes

Schematics

REVISIONS				
DCN	REV	DESCRIPTION	DATE	CHANGE BY
	B	INITIAL RELEASE	2010-10-20	D. HUANG

IDT 89HP0602Q (20-QFN) USB 3.0 EVALUATION BOARDS

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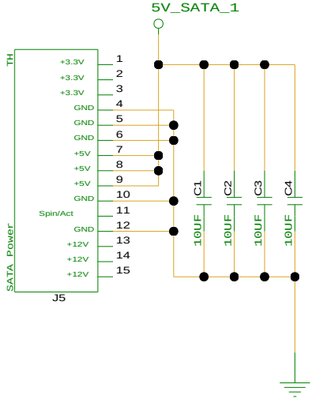

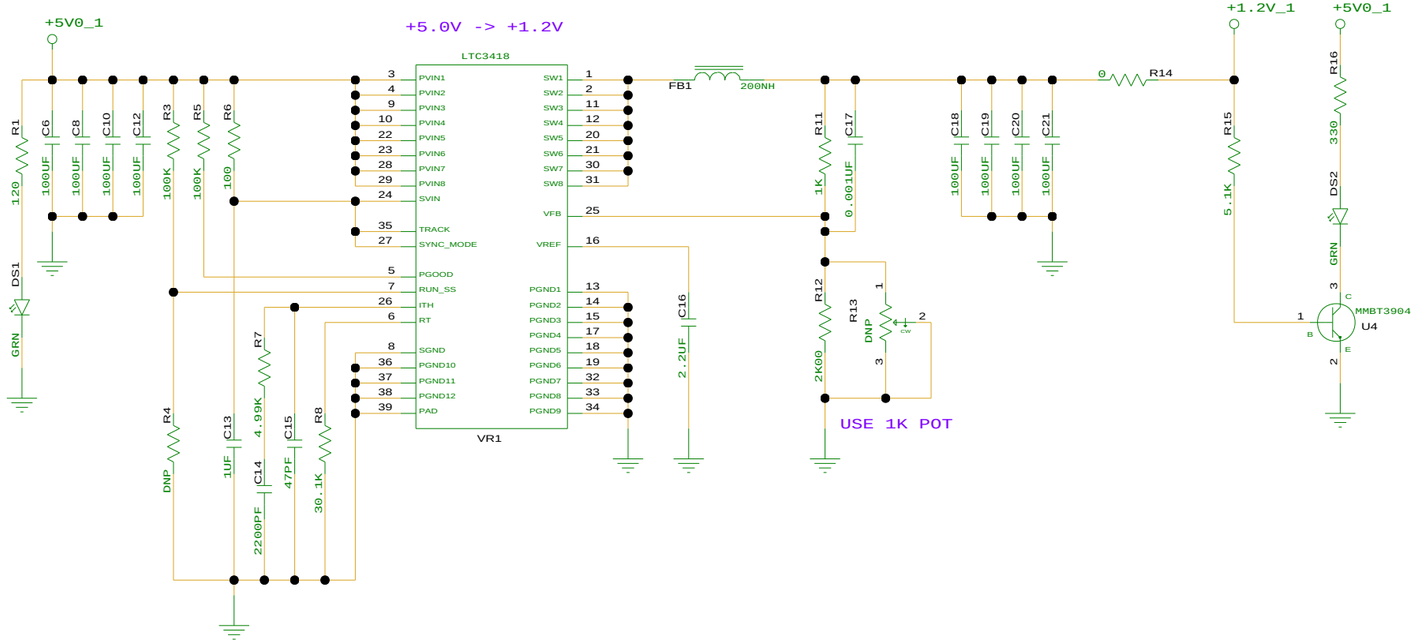

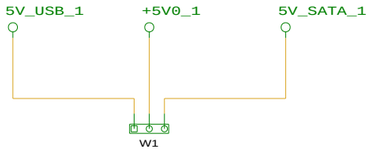

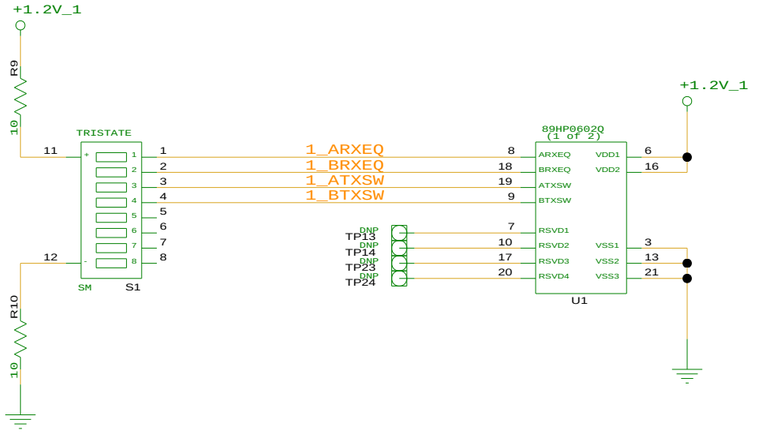

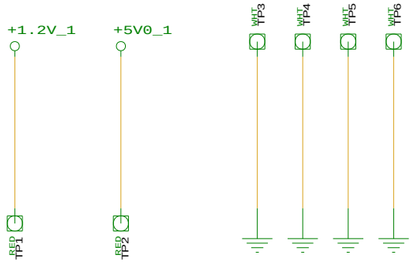

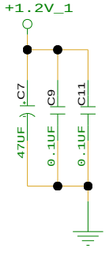

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89HP0602Q, POWER

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K. Leung	D. Huang

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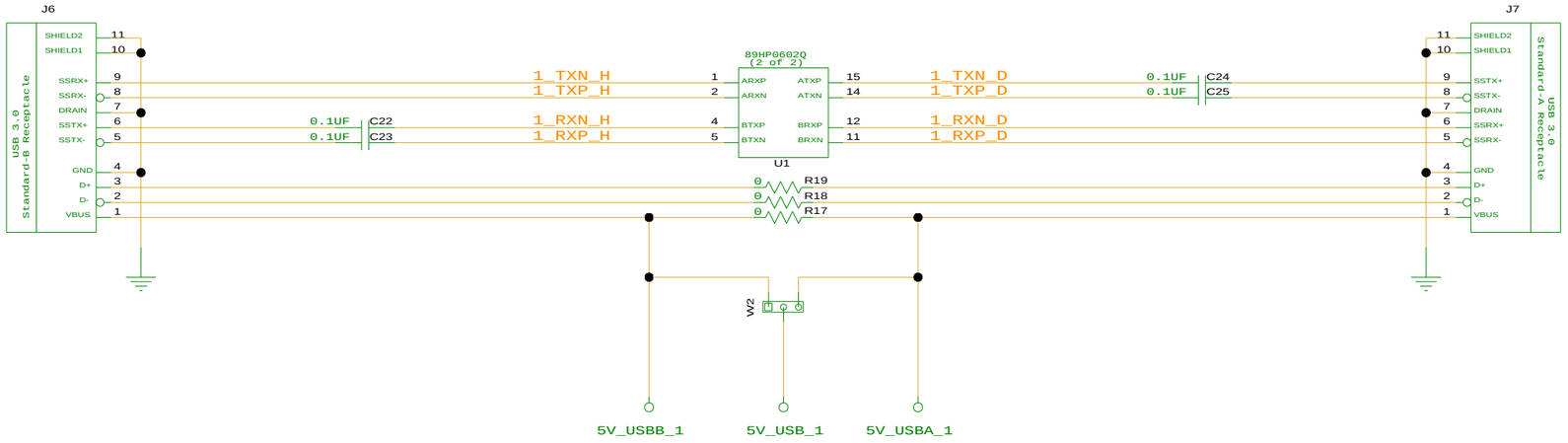

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