

Introduction

The evaluation board is designed to help the customer evaluate the 5P49V5943/44, the latest addition to the family of programmable devices in IDT's Timing portfolio. When the board is connected to a PC running IDT Timing Commander[™] Software through USB, the device can be configured and programmed to generate frequencies with best-in-class performances.

Board Overview

Use the following diagram and table to identify: power supply jacks, USB connector, input and output frequency SMA connectors.

Figure 1. 5P49V4943/44 Evaluation Board

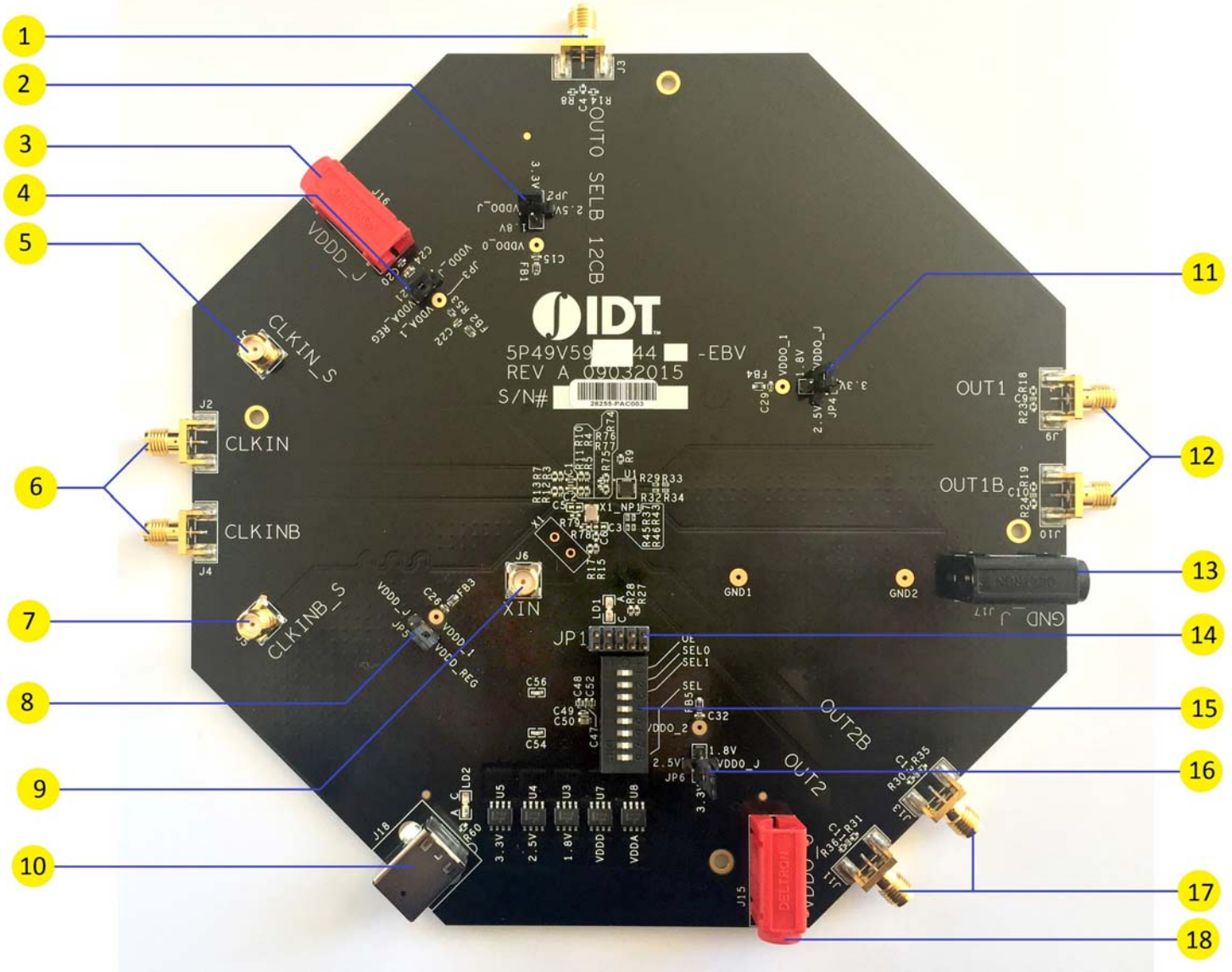


Table 1: 5P49V5943/44 EBV Pins and Functions

| Item | Name | On-Board Connector Label | Function |
|------|--------------------------------------|--------------------------|---|
| 1 | Output 0 | J3 | Single ended buffered output of input reference clock |
| 2 | Output Voltage Power Supply Selector | OUT0_SELB_I2C : JP2 | 4-way header to select a power supply method for output 0. The center pin is the output voltage. Use jumper JP2 to select 3.3V, 2.5V, 1.8V or VDDO_J supply. VDDO_J is the voltage from J15 |
| 3 | Power Supply Jack | J16 | Connect 3.3V, 2.5V or 1.8V for the core voltage of the device |
| 4 | Input Voltage Power Supply Selector | JP3 | Provides selection of VDDA_REG supply from regulators or VDDD_J supply from J16 |
| 5 | CLKIN_S | J1 | SMA Pair used to monitor differential input CLKIN |
| 6 | Clock Input | J2/J4 | Used as primary clock input in 5P49V5943 |
| 7 | CLKINB_S | J5 | SMA Pair used to monitor differential input CLKINB |
| 8 | Input Voltage Power Supply Selector | JP5 | Provides selection of VDDD_REG supply from regulators or VDDD_J supply from J16 |
| 9 | Xin | J6 | Used as primary single ended clock input in 5P49V5944. Maximum full swing limited to 1.2V |
| 10 | USB Interface | J18 | Used for connection with a PC and for interaction with the IDT Timing Commander Software. |
| 11 | Output Voltage Power Supply Selector | OUT1 : JP4 | 4-way header to select a power supply method for output 1. The center pin is the output voltage. Use jumper JP4 to select a 3.3V, 2.5V, 1.8V or VDDO_J supply. VDDO_J is the voltage from J15 |
| 12 | Output 1 | J10/J9 | Can be differential pair output or two individual single ended outputs |
| 13 | Ground Jack | J17 | Used for grounding. If J15 and/or J16 is used for power supply, this jack functions as the power return. |
| 14 | Aardvark Connector | JP1 | For Aardvark connection |
| 15 | DIP Switch | U2 | S1: Output Enable(OE/SD) S2: Sel0 S3: Sel1 S8: Sel [1:0] ; Default: I ² C mode |
| 16 | Output Voltage Power Supply Selector | JP6 | 4-way header to select a power supply method for output 2. The center pin is the output voltage. Use jumper JP6 to select a 3.3V, 2.5V, 1.8V or VDDO_J supply. VDDO_J is the voltage from J15 |
| 17 | Output 2 | J13/J11 | Can be differential pair output or two individual single ended outputs |
| 18 | Output Voltage Jack | J15 | Connect 3.3V, 2.5V or 1.8V for the core voltage of the device |

Board Power Supply

Power Supply Options

Bench Power Supply – An external power supply can be used to supply a 3.3V, 2.5V or 1.8V supply. To supply VDDD_J with a bench power supply, connect power to J16. Concurrently, place the jumpers in JP3 to connect VDDA_1 to VDDD_J.

USB Power Supply – When the board is connected to a PC through a USB cable, on-board voltage regulators will generate a 3.3V for the device. In this case, place the jumpers in JP3 to connect VDDA_1 to VDDA/D. See JP3 jumper position for VDDA/D in the [Figure 2](#). USB power source is recommended for ease of use.

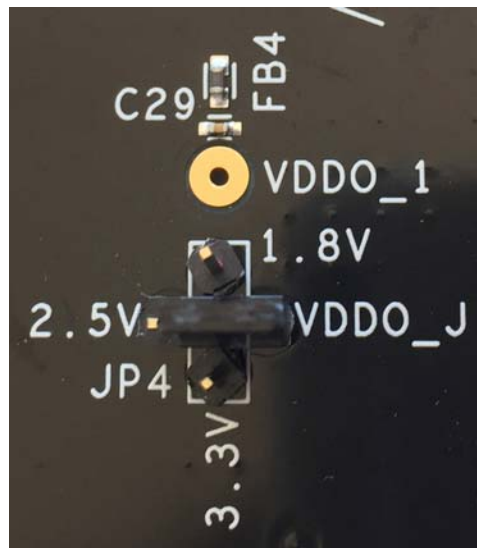
Figure 2. Selecting the VDDA_REG side will select power source from on-board regulators powered by USB; Selecting the VDDD_J side will select external bench power supply



Output Clock Voltages

Similar to VDDA_1 having two sources, each output voltage is also provided with two sources to choose from: Bench power supply or USB power supply connection. The selection is made by a 4-way header as shown in [Figure 3](#) below. Selection of VDDO_J will enable external power supply (J15 and J16 are connected to external power supply); selection of 3.3V, 2.5V or 1.8V will enable the on-board voltage regulators powered by USB port.

Figure 3. In the 4-way header, the central pin is the output and the other pins are 1.8V, 2.5V, 3.3V and VDDO_J (from J15) respectively. Jumper settings are selected according to the output voltage required for outputs 0, 1 and 2.



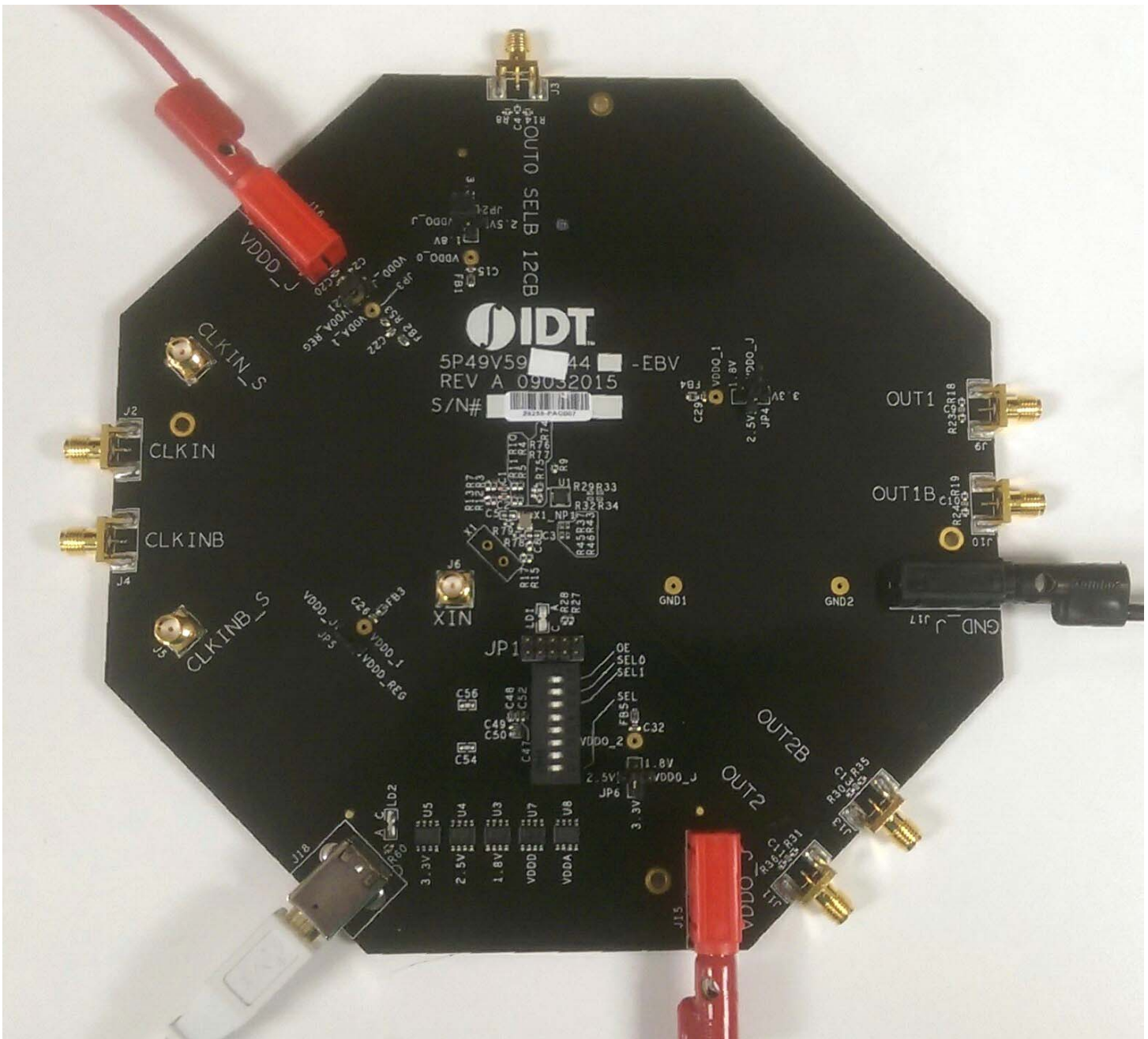
Connecting the Board

The board is connected to a PC through a USB connector for configuring and programming the device, as shown in [Figure 4](#) below. The USB interface will also provide +5V power supply to the board, from which on-board voltage regulators generate various voltages for the core as well as for each output.

The board can also be powered by a bench power supply by connecting two banana jacks J15, J16 for output and core voltages, respectively. Please see board power supply section for details.

Note: The USB port only supports USB 2.0; USB 3.0 is not supported at this time.

Figure 4. Connecting 5P49V5943/44 - EVB USB Port for Communications with Timing Commander Software and input voltage supplies



On-Board Crystal

A 25MHz crystal is installed on the board. Note: For the 5P49V5943, the clock input is given through J2 and J4 SMA connections.

Board Default Frequency Output

When 25MHz crystal is installed, the device will have the following default outputs: OUT0 = 25MHz, OUT1=100MHz

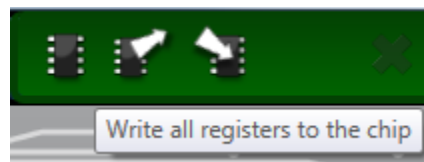
Configuration and Setup

Use the following steps to setup the board using I²C and start the configuration of the board.

1. Set SEL pin (pin 8) of dip switch (U2) to "0" to select I2C mode.
2. Connect J18 to a USB port of the PC using the supplied I2C cable.
3. Launch VC5 Timing Commander Software (refer to VC5 Timing Commander User Guide - Getting Started Step 1~7)
[Download the VersaClock 5 Timing Commander User Guide Here](#)
4. Following the Getting Started steps in the Timing Commander software, an I2C connection is established between the GUI software and the VersaClock 5 chip.
5. Select "Open Settings File" if you have existing settings or "New Settings File" and select 5P49V5943 or 5P49V5944 depending on your evaluation board. In the same screen, browse for a personality file, by clicking on the button at the bottom right, to be used with the evaluation board.
6. Connect to the EVB by clicking on the microchip icon located at the top right of the Timing Commander.



7. Once connected, new options will be available on a green background indicating that the EVB has successfully connected with the board. Write the settings to the chip by clicking on the write all registers to the chip option.



8. All intended outputs should now be available for measurement.

Board Schematics

Evaluation board schematics are shown on the following pages.

Figure 5. 5P49V5943/44 VersaClock 5 Evaluation Board Schematics – Page 1

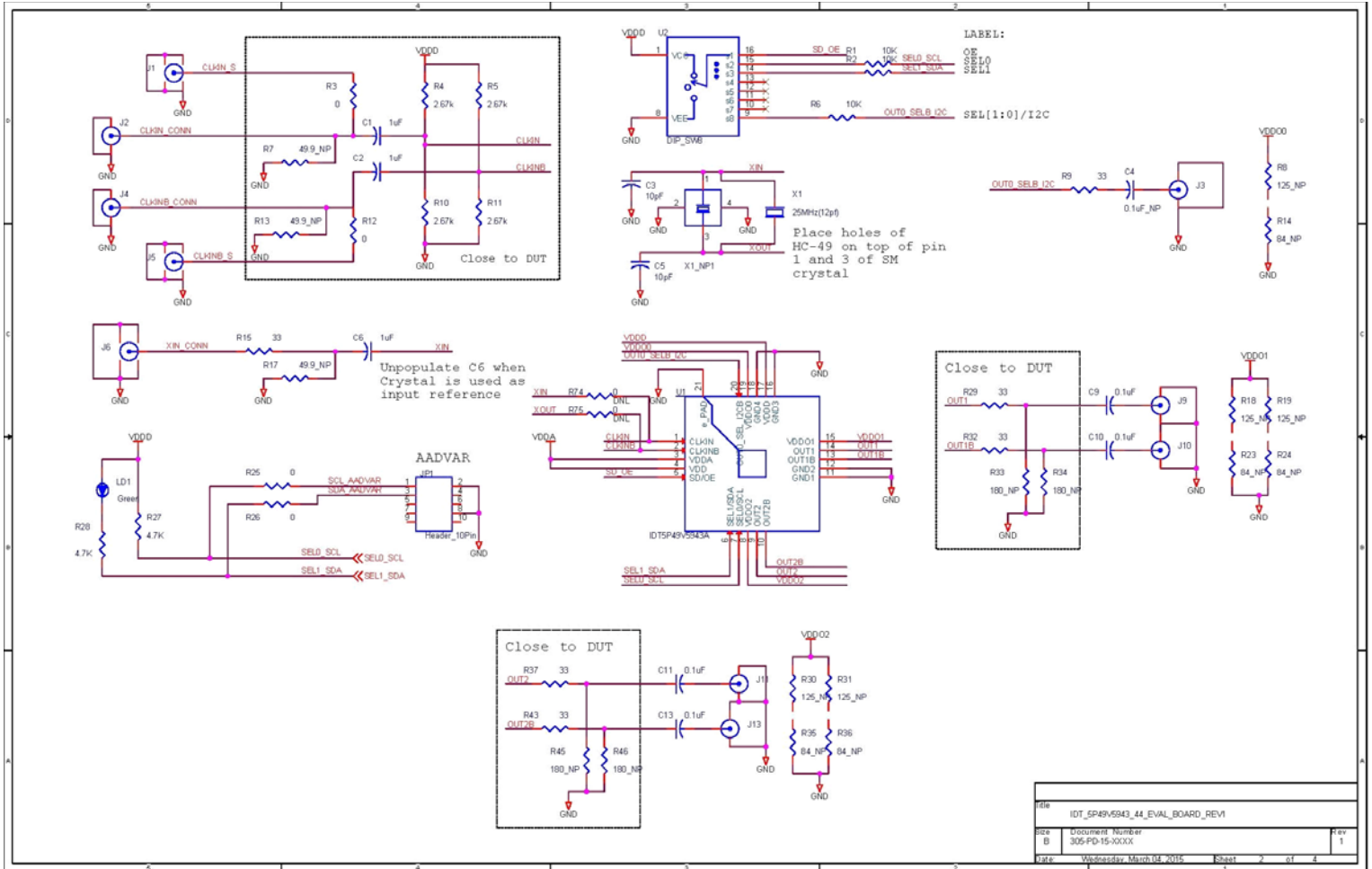
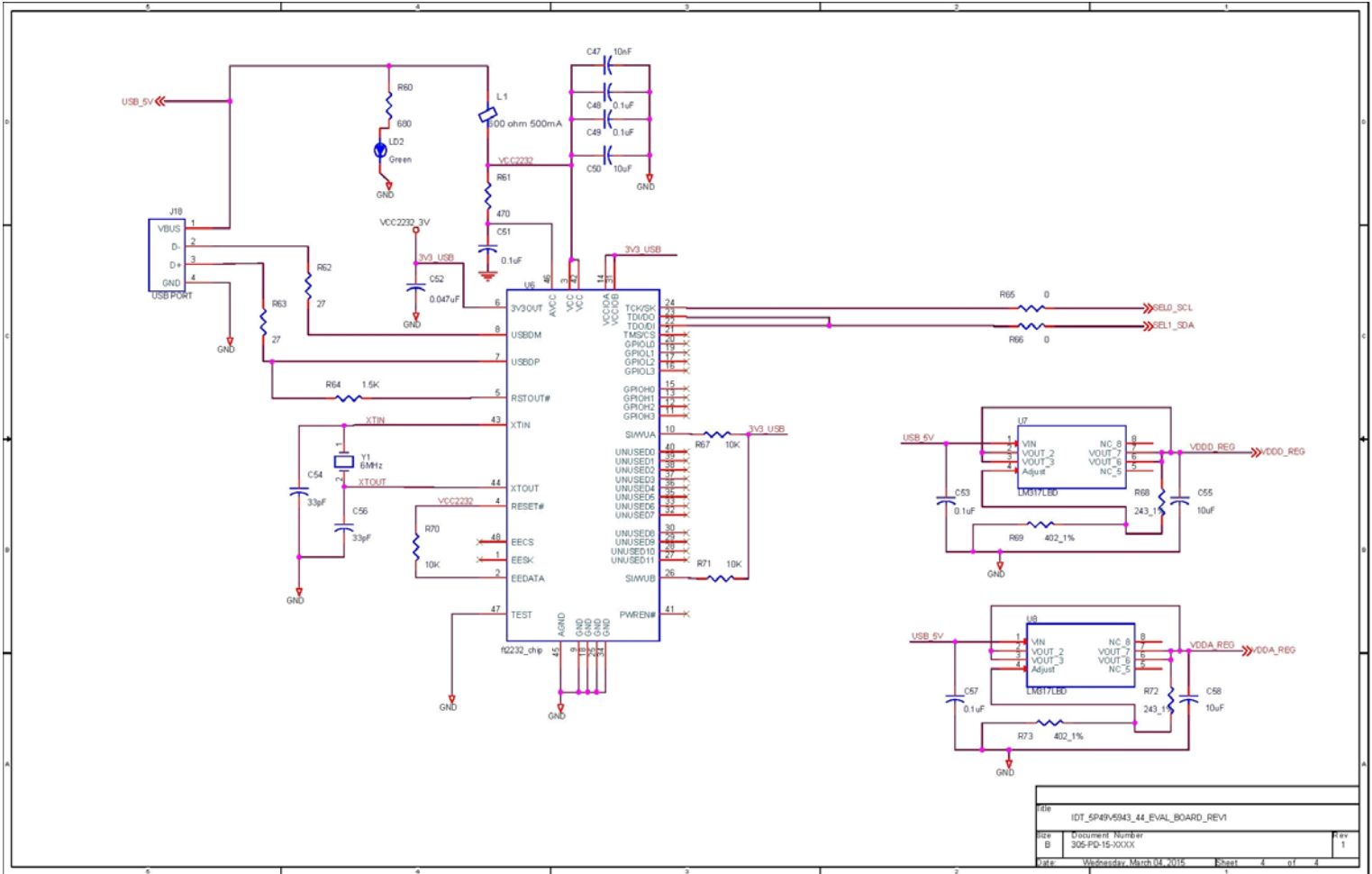


Figure 7. 5P49V5943/44 Evaluation Board Schematics – Page 3

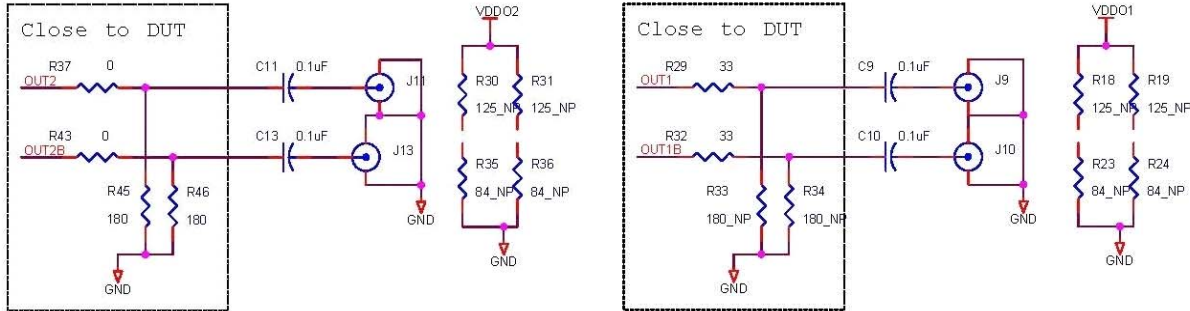


Signal Termination Options

Termination options for OUTPUT 1 and 2 for the 5P49V5943 and 5P49V5944 EVB board are displayed in Figure 8. The termination circuits are designed to optionally terminate the output clocks in LVPECL and LVDS signal types by populating (or not-populating) some resistors. DC or AC coupling of these outputs are also supported.

Table 2 and Table 3 tabulate component installations to support LVPECL and LVDS signal types for OUTPUT 1 and 2 on the 5P49V5943 and 5P49V5944 EVB. Please note that by doing so, the output signals will be measured and terminated by an oscilloscope with a 50Ω internal termination.

Figure 8. 5P49V5943 Output Termination Options



Termination Options for 5P49V5943 and 5P49V5944

Table 2: Termination Options for OUTPUT1

| Signal Type | Series Resistors: R29, R32 | Pull-down Resistors: R33, R34 | Series Capacitor: C9, C10 | Resistor Network: R18, R19, R23, R24 |
|-------------|-------------------------------|----------------------------------|------------------------------|---|
| LVC MOS | 33 Ω | Not installed | 0.1 μF | Not installed |

Table 3: Termination Options for OUTPUT2

| Signal Type | Series Resistors: R37, R43 | 150-ohm pull-down: R45, R46 | Series Capacitor: C11, C13 | Resistor Network: R30, R31, R35, R36 |
|-------------|-------------------------------|--------------------------------|-------------------------------|---|
| LVPECL | 0 Ω | Not installed | 0.1 μF | Not installed |

As noted, 4-resistor network is not installed in Table 2 and 3 because oscilloscope with internal 50Ω termination is utilized for signal termination and measurement. If an AC-coupled, stand-alone LVPECL output is needed (without oscilloscope connections), the 4-resistor network needs to be installed accordingly.

Orderable Part Numbers

The following evaluation board part numbers are available for order.

Table 4: Orderable Part Numbers

| Part Number | Description |
|--------------------|--|
| EVKVC5-5943ALL | 5P49V5943 Evaluation board with one output of each type of signal termination. |
| EVKVC5-5944ALL | 5P49V5944 Evaluation board with one output of each type of signal termination. |



Corporate Headquarters
6024 Silver Creek Valley Road
San Jose, CA 95138 USA

Sales
1-800-345-7015 or
408-284-8200
Fax: 408-284-2775
www.IDT.com

Tech Support
www.idt.com/support/technical-support

DISCLAIMER Integrated Device Technology, Inc. (IDT) and its subsidiaries reserve the right to modify the products and/or specifications described herein at any time and at IDT's sole discretion. All information in this document, including descriptions of product features and performance, is subject to change without notice. Performance specifications and the operating parameters of the described products are determined in the independent state and are not guaranteed to perform the same way when installed in customer products. The information contained herein is provided without representation or warranty of any kind, whether express or implied, including, but not limited to, the suitability of IDT's products for any particular purpose, an implied warranty of merchantability, or non-infringement of the intellectual property rights of others. This document is presented only as a guide and does not convey any license under intellectual property rights of IDT or any third parties.

IDT's products are not intended for use in applications involving extreme environmental conditions or in life support systems or similar devices where the failure or malfunction of an IDT product can be reasonably expected to significantly affect the health or safety of users. Anyone using an IDT product in such a manner does so at their own risk, absent an express, written agreement by IDT.

Integrated Device Technology, IDT and the IDT logo are registered trademarks of IDT. Product specification subject to change without notice. Other trademarks and service marks used herein, including protected names, logos and designs, are the property of IDT or their respective third party owners.

Copyright ©2015 Integrated Device Technology, Inc.. All rights reserved.