

# EVB-USB3300-XLX User Manual



The information contained herein is proprietary to SMSC, and shall be used solely in accordance with the agreement pursuant to which it is provided. Although the information is believed to be accurate, no responsibility is assumed for inaccuracies. SMSC reserves the right to make changes to this document and to specifications and product descriptions at any time without notice. Neither the provision of this information nor the sale of the described semiconductor devices conveys any licenses under any patent rights or other intellectual property rights of SMSC or others unless specifically specified otherwise. The product may contain design defects or errors known as anomalies, including but not necessarily limited to any which may be identified in this document, which may cause the product to deviate from published specifications. SMSC products are not designed, intended, authorized or warranted for use in any life support or other application where product failure could cause or contribute to personal injury or severe property damage. Any and all such uses without prior written approval of an officer of SMSC will be fully at the risk of the customer. SMSC is a registered trademark of Standard Microsystems Corporation ("SMSC").

SMSC DISCLAIMS AND EXCLUDES ANY AND ALL WARRANTIES, INCLUDING WITHOUT LIMITATION ANY AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE, AND AGAINST INFRINGEMENT AND THE LIKE, AND ANY AND ALL WARRANTIES ARISING FROM ANY COURSE OF DEALING OR USAGE OF TRADE. IN NO EVENT SHALL SMSC BE LIABLE FOR ANY DIRECT, INCIDENTAL, INDIRECT, SPECIAL, PUNITIVE, OR CONSEQUENTIAL DAMAGES; OR FOR LOST DATA, PROFITS, SAVINGS OR REVENUES OF ANY KIND; REGARDLESS OF THE FORM OF ACTION, WHETHER BASED ON CONTRACT; TORT; NEGLIGENCE OF SMSC OR OTHERS; STRICT LIABILITY; BREACH OF WARRANTY; OR OTHERWISE; WHETHER OR NOT ANY REMEDY OF BUYER IS HELD TO HAVE FAILED OF ITS ESSENTIAL PURPOSE, AND WHETHER OR NOT SMSC HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

SMSC EVB-USB3300-XLX Revision 0.4 (06-29-07)



#### 1 Introduction

The SMSC USB3300 USB Transceiver features a ULPI interface to support systems implementing a USB Host, Device, or On-the-Go (OTG) system. SMSC supplies a complete family of PHY products to meet the needs of many applications.

#### 2 Overview

The EVB-USB3300-XLX is a Daughter Card designed to plug into a user's Xilinx ML401 development system using a header connector. The card attaches to a USB link layer to create a USB Host, Device, or On-the-Go (OTG) system. The digital interface meets the UTMI+ Low Pin Interface (ULPI) specification. The ULPI specification can be downloaded from the SMSC web site at http://www.smsc.com/main/catalog/usb3300.html. The EVB-USB3300-XLX includes the USB300 and all associated external components. Figure 3 shows a schematic of the EVB.

## 2.1 3.3 Volt Power Supply

The EVB-USB3300-XLX requires a 3.3 volt supply capable of providing 80mA of current to be present at the J2 header pins 16, 19, 22 and 25. For device only applications this is the only power the EVB-USB3300-XLX requires.

#### 2.2 Crystal Oscillator

A 24 MHz crystal is connected to the internal oscillator of the USB3300. A PLL circuit in the USB3300 generates the 60MHz CLKOUT signal used by the link layer.

#### 2.3 USB Connector

A standard Mini-AB connector is provided to attach a USB cable.

#### 2.4 Supplying VBUS Power

In host or OTG applications the EVB-USB3300-XLX must provide 5 volts on  $V_{BUS}$ . The EVB-USB3300-XLX includes a 5 volt switch that can connect 5 volts to  $V_{BUS}$ . The EVB-USB3300-XLX 5 volt supply can come from either external power supplied at J5 or from header J1 pins 1, 4, 7 and 10. Jumper J6 must be installed to source +5V for the ML501 header. When using J5 to supply external power, J6 must be removed.

The 5 volt switch is controlled by the CPEN signal from the USB3300. The CPEN state is controlled by ULPI registers in the USB3300 per the ULPI specification. The 5 volt switch has an undervoltage lockout that turns the switch off if the VBUS voltage is low and the switch prevents reverse current flow (backdrive) when in the off state. The switch does not provide protection from reverse currents when in the on state. The user should take care to ensure the switch is off when  $V_{BUS}$  is being sourced by the USB cable.

In host mode, connector J7 should be installed to add capacitance to  $V_{BUS}$ . The USB2.0 specification requires this extra capacitance be present in host implementations.



# 2.5 Digital I/O

The ULPI signals are routed to connector J1 for connection to the ML401. Each signal on J1 is described in Table 2.1. All ULPI signals are 3.3V CMOS compatible.

Table 2.1 Signals on 3x13-Pin Header

J1 Pin	Signal Name	J1 Pin	Signal Name	J1 Pin	Signal Name
1	+5V	2	GND	3	Reset
4	+5V	5	GND	6	NXT
7	+5V	8	GND	9	CLKOUT
10	+5V	11	GND	12	DIR
13	NC	14	GND	15	STP
16	+3.3V	17	GND	18	DATA7
19	+3.3V	20	GND	21	DATA6
22	+3.3V	23	GND	24	DATA5
25	+3.3V	26	GND	27	DATA4
28	NC	29	GND	30	DATA3
31	RSVD1	32	GND	33	DATA2
34	RSVD2	35	GND	36	DATA1
37	RSVD3	38	GND	39	DATA0



## 2.6 ULPI Signal Test Points

The headers J2, J3 and J4 provide easy access to the ULPI signals, and each pin has a silk screen label as shown in Figure 1.

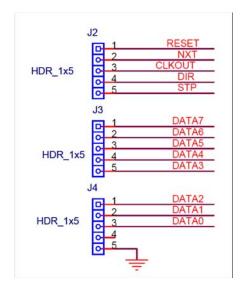


Figure 1 ULPI Signal Test Points

## 2.7 Block Diagram

The EVB-USB3300-XLX block diagram shows how the jumpers are used on the board.

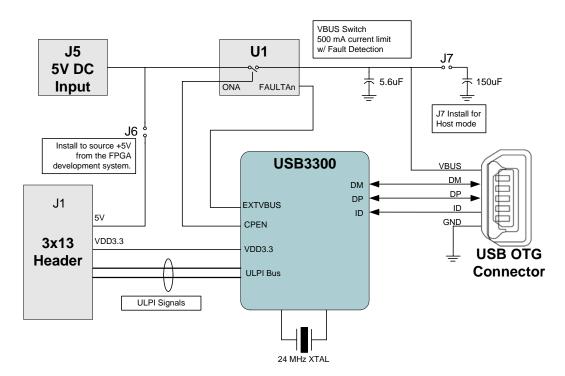


Figure 2 EVB-USB3300-XLX Block Diagram



# 2.8 Schematic Diagram

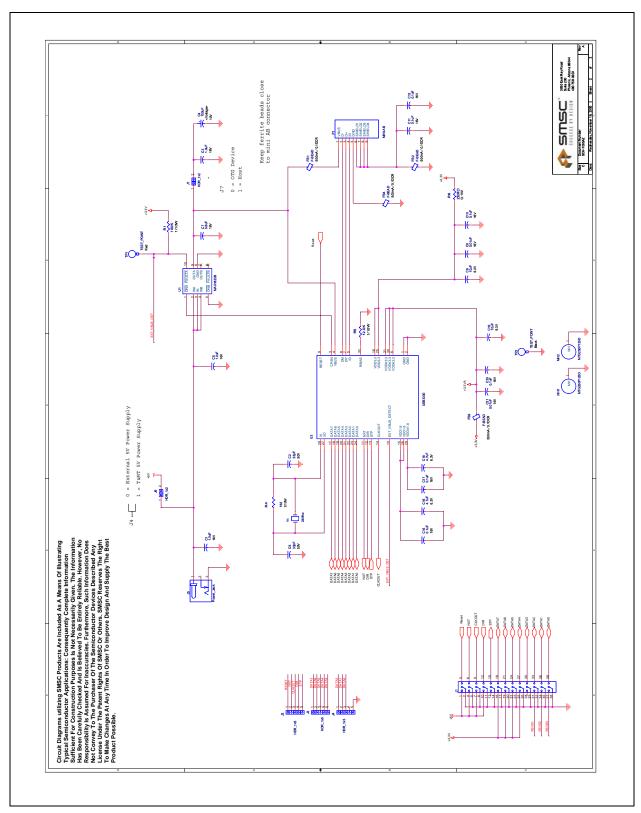


Figure 3 EVB-USB3300-XLX Schematic

