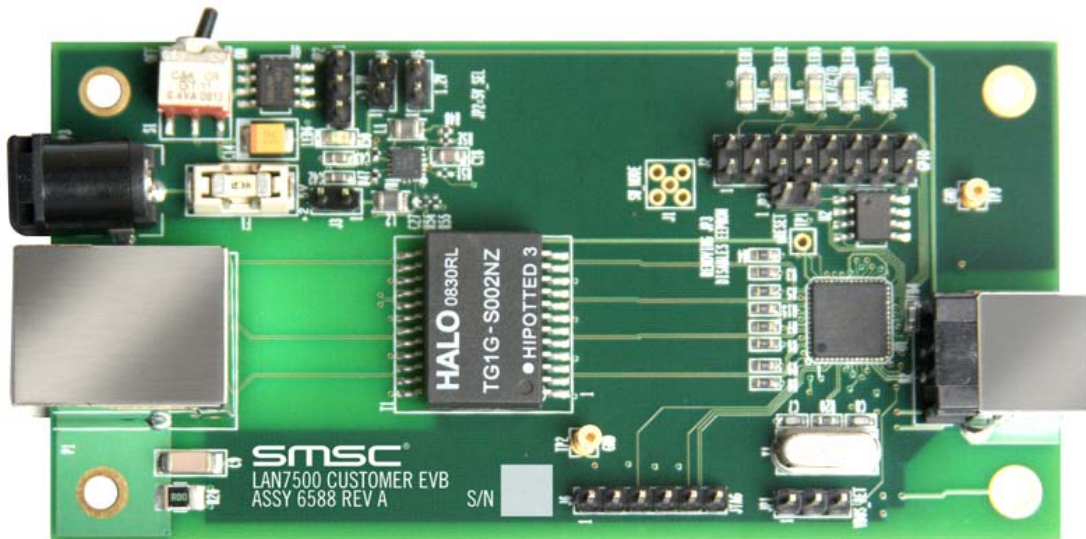


EVB-LAN7500 Evaluation Board User Manual



Copyright © 2012 SMSC or its subsidiaries. All rights reserved.

Circuit diagrams and other information relating to SMSC products are included as a means of illustrating typical applications. Consequently, complete information sufficient for construction purposes is not necessarily given. Although the information has been checked and is believed to be accurate, no responsibility is assumed for inaccuracies. SMSC reserves the right to make changes to specifications and product descriptions at any time without notice. Contact your local SMSC sales office to obtain the latest specifications before placing your product order. The provision of this information does not convey to the purchaser of the described semiconductor devices any licenses under any patent rights or other intellectual property rights of SMSC or others. All sales are expressly conditional on your agreement to the terms and conditions of the most recently dated version of SMSC's standard Terms of Sale Agreement dated before the date of your order (the "Terms of Sale Agreement"). The product may contain design defects or errors known as anomalies which may cause the product's functions to deviate from published specifications. Anomaly sheets are available upon request. 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 and further testing and/or modification will be fully at the risk of the customer. Copies of this document or other SMSC literature, as well as the Terms of Sale Agreement, may be obtained by visiting SMSC's website at <http://www.smsc.com>. SMSC is a registered trademark of Standard Microsystems Corporation ("SMSC"). Product names and company names are the trademarks of their respective holders.

The Microchip name and logo, and the Microchip logo are registered trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.

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.

1 Introduction

The LAN7500 is a high performance Hi-Speed USB 2.0 to 10/100/1000 Ethernet controller. With applications ranging from embedded systems, set-top boxes, and PVR's, to USB port replicators, USB to Ethernet dongles and test instrumentation, the device is a high performance and cost competitive USB to Ethernet connectivity solution.

The LAN7500 contains an integrated 10/100/1000 Ethernet MAC and PHY, Filtering Engine, USB PHY, Hi-Speed USB 2.0 device controller, TAP controller, EEPROM controller, and a FIFO controller with a total of 32 KB of internal packet buffering.

The internal USB 2.0 device controller and USB PHY are compliant with the USB 2.0 Hi-Speed standard. The device implements Control, Interrupt, Bulk-in, and Bulk-out USB Endpoints.

The Ethernet controller supports auto-negotiation, auto-polarity correction, HP Auto-MDIX, and is compliant with the IEEE 802.3, IEEE 802.3u, IEEE 802.3ab standards. ARP and NS offload is also supported.

The EVB-LAN7500 is an Evaluation Board (EVB) that utilizes the LAN7500 to provide a fully functional USB to Ethernet interface. The EVB-LAN7500 provides a fully integrated Ethernet port and USB port via the onboard RJ45 and USB Type B connectors. The EVB-LAN7500 is fully configurable for both self- and bus-powered modes of operation and provides an external +5V power supply barrel connector for use with a wall-mounted power supply when in self-powered mode. Additional headers provide access to the LAN7500 GPIO/LEDs. The onboard 4K EEPROM can be used to load the EVB-LAN7500's USB configuration parameters and MAC address. The EEPROM can be optionally disabled via a jumper.

LAN7500 software drivers are available for Windows XP, Windows Vista, Mac OSX, Linux, and Win CE. Additional manufacturing and diagnostic tools are available for debugging and external EEPROM configuration.

A simplified block diagram of the EVB-LAN7500 can be seen in [Figure 1.1](#).

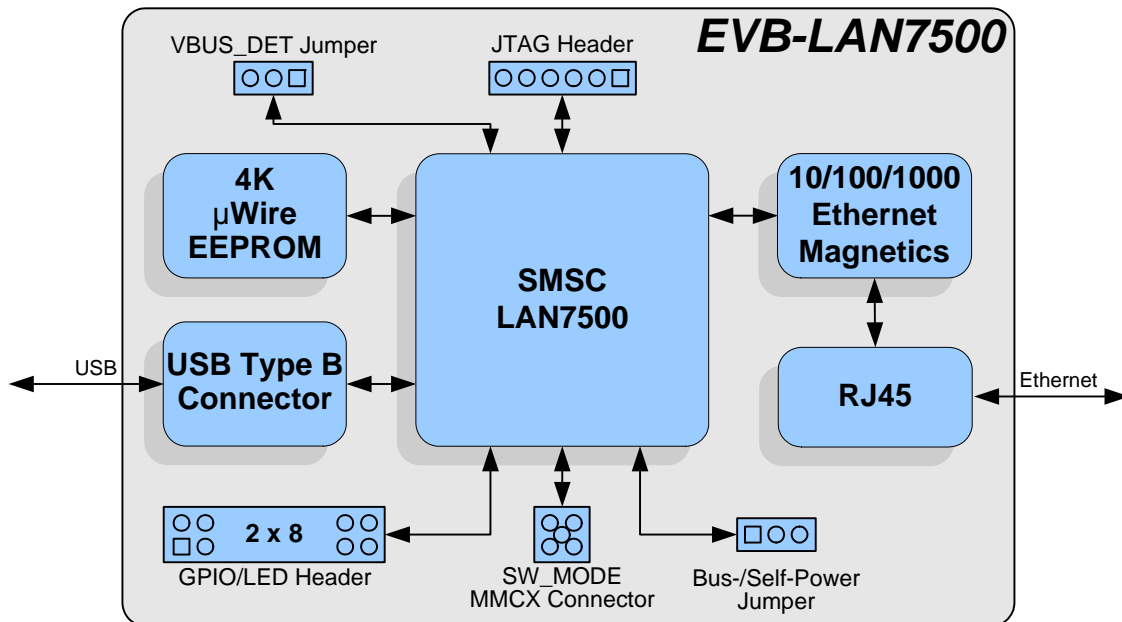


Figure 1.1 EVB-LAN7500 Block Diagram

1.1 References

Concepts and material available in the following documents may be helpful when using the EVB-LAN7500.

Table 1.1 References

DOCUMENT	LOCATION
SMSC LAN7500 Datasheet	http://www.smsc.com/lan7500
AN8-13 Suggested Magnetics	http://www.smsc.com/lan7500
SMSC EVB-LAN7500 Evaluation Board Schematic	http://www.smsc.com/lan7500

2 Board Details

The following sections describe the various board features including jumpers, LEDs, test points and system connections. A top view of the EVB-LAN7500 is shown in Figure 2.1.

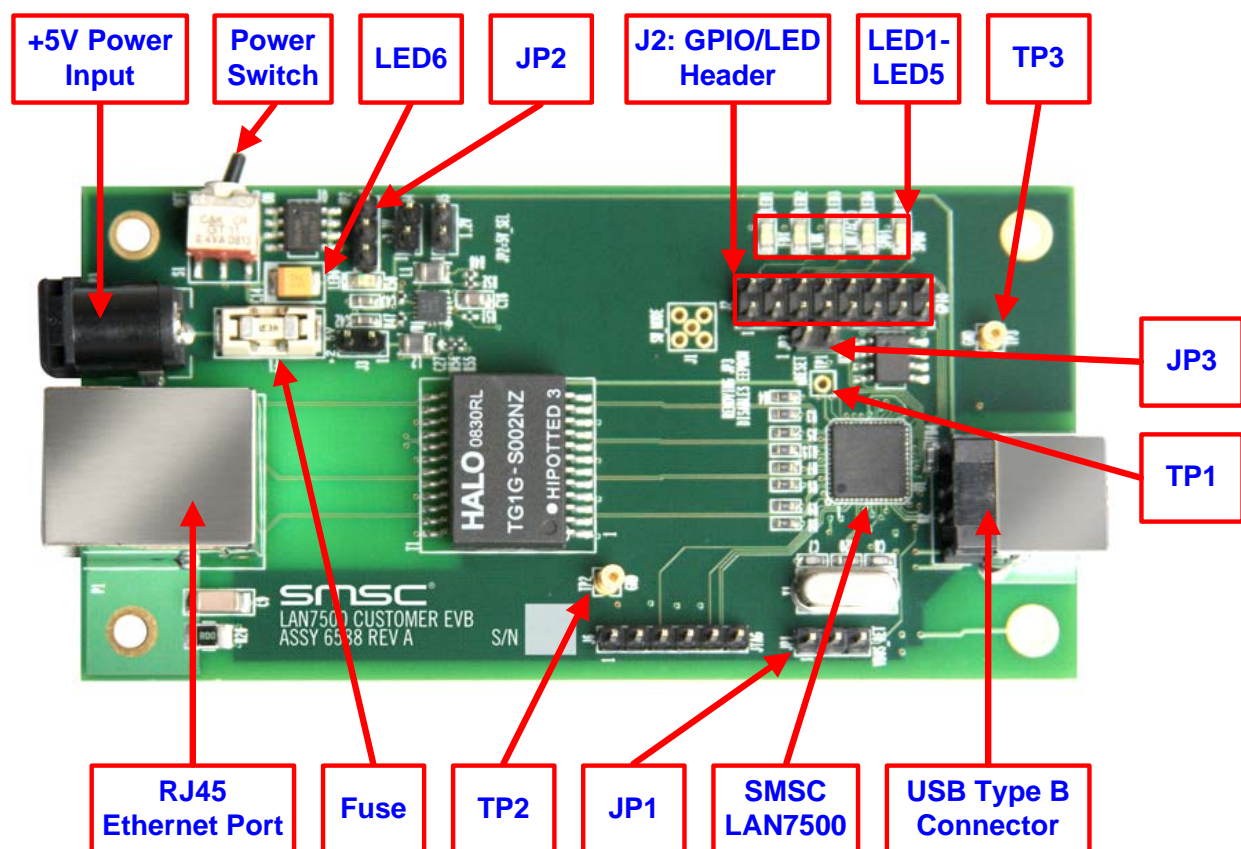


Figure 2.1 EVB-LAN7500 Top View

2.1 Jumpers

The following tables describe the default settings and jumper descriptions for the EVB-LAN7500. These defaults are the recommended configurations for evaluation of the EVB-LAN7500. These settings may be changed as needed, however, any deviation from the default settings should be approached with care and knowledge of the schematics and datasheet. An incorrect jumper setting may disable the board.

Note: The EVB-LAN7500 jumpers and EEPROM are programmed for self-powered operation by default. To operate in bus-powered mode, the jumpers must be reconfigured and the EEPROM must be reprogrammed using the SMSC Windows Manufacturing Utility or DOS Utility Suite. Refer to www.smsc.com for additional information.

Note: A dashed line in the *Settings* column indicates the board's default jumper setting.

Table 2.1 Jumpers

JUMPER PAIR	DESCRIPTION	SETTINGS	
JP1	VBUS_DET Select	1 2	Bus-Powered Operation
		2---3	Self-Powered Operation
JP2	+5V Power Select	1 2	Bus-Powered Operation
		2---3	Self-Powered Operation
JP3	EEPROM Enable/Disable	1---2	IN: EEPROM Enabled OUT: EEPROM Disabled

2.2 LEDs

Table 2.2 LEDs

REFERENCE	INDICATION															
LED1	Ethernet Full Duplex															
LED2	Ethernet Link															
LED3	Ethernet Activity															
LED4	Speed 0															
	This signal, combined with Speed 1, indicates the current Ethernet link speed. The speed is indicated as shown below:															
	<table border="1"> <thead> <tr> <th>SPEED (Mbps)</th> <th>SPEED 0 (LED4)</th> <th>SPEED 1 (LED5)</th> </tr> </thead> <tbody> <tr> <td>No Link</td> <td>Off</td> <td>Off</td> </tr> <tr> <td>10</td> <td>On</td> <td>Off</td> </tr> <tr> <td>100</td> <td>Off</td> <td>On</td> </tr> <tr> <td>1000</td> <td>On</td> <td>On</td> </tr> </tbody> </table>	SPEED (Mbps)	SPEED 0 (LED4)	SPEED 1 (LED5)	No Link	Off	Off	10	On	Off	100	Off	On	1000	On	On
	SPEED (Mbps)	SPEED 0 (LED4)	SPEED 1 (LED5)													
	No Link	Off	Off													
10	On	Off														
100	Off	On														
1000	On	On														

Table 2.2 LEDs (continued)

REFERENCE	INDICATION
LED5	Speed 1 This signal, combined with Speed 0, indicates the current Ethernet link speed. Refer to the LED4 (Speed 0) description for additional information.
LED6	3.3V Power Good Note: When measuring the suspend current, LED6 or R27 must be unpopulated.

2.3 Test Points

Table 2.3 Test Points

TEST POINT	DESCRIPTION	CONNECTION
TP1	Unpopulated nRESET testpoint	nRESET
TP2	Single pin populated gold post GND testpoint	GND
TP3	Single pin populated gold post GND testpoint	GND

2.4 System Connections

Table 2.4 System Connections

CONNECTOR	DESCRIPTION	PART
P1	RJ45	Stewart SS-6488S-A-NF
P2	USB Type-B Plug (Right Angle)	AMP 292304-1
P3	+5V Power Supply Barrel Connector (for self-powered mode only)	CUI PJ-102AH

2.5 Headers

Table 2.5 Headers

HEADER	DESCRIPTION
J1	Internal use only (DNP)
J2	GPIO header
J3	+2.5V power header
J4	+3.3V power header
J5	+1.2V power header
J6	JTAG interface - Internal use only

Table 2.6 GPIO/LED J2 Header Pinout

HEADER PIN	DESCRIPTION	HEADER PIN	DESCRIPTION
1	VDDVARIO: +2.5V	9	GPIO7
2	VDDVARIO: +2.5V	10	GPIO6
3	GPIO1/LED1	11	GPIO9
4	GPIO0/LED0	12	GPIO8
5	GPIO3/LED3	13	GPIO11
6	GPIO2/LED2	14	GPIO10
7	GPIO5	15	Ground
8	GPIO4/LED4	16	Ground

2.6 Switches

Table 2.7 Power Switch

SWITCH	DESCRIPTION	FUNCTION
S1	SPDT tiny toggle power switch	Connects +5V brick power to board

Note: The EVB-LAN7500 includes a 3A fuse (F1) to protect from overcurrent conditions. If this fuse becomes damaged, it can be replaced with a 3A Littlefuse-154003.

2.7 Mechanicals

Figure 2.2 details the EVB-LAN7500 mechanical dimensions.

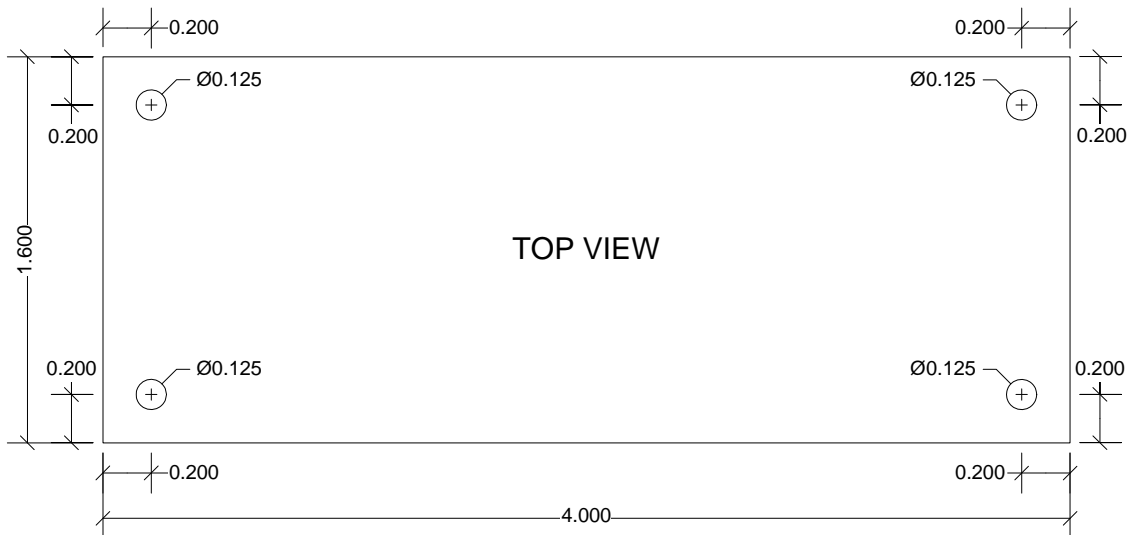


Figure 2.2 EVB-LAN7500 Mechanicals

3 User Manual Revision History

Table 3.1 Customer Revision History

REVISION LEVEL & DATE	SECTION/FIGURE/ENTRY	CORRECTION
Rev. 1.0 (11-29-12)		Document co-branded: Microchip logo added, modification to legal disclaimer.
Rev. 1.0 (11-03-10)		Initial release.