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**EVB-LAN7430
Evaluation Board
User's Guide**

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NOTES:

Preface

NOTICE TO CUSTOMERS

All documentation becomes dated, and this manual is no exception. Microchip tools and documentation are constantly evolving to meet customer needs, so some actual dialogs and/or tool descriptions may differ from those in this document. Please refer to our web site (www.microchip.com) to obtain the latest documentation available.

Documents are identified with a “DS” number. This number is located on the bottom of each page, in front of the page number. The numbering convention for the DS number is “DSXXXXA”, where “XXXX” is the document number and “A” is the revision level of the document.

For the most up-to-date information on development tools, see the MPLAB® IDE online help. Select the Help menu, and then Topics to open a list of available online help files.

INTRODUCTION

This chapter contains general information that will be useful to know before using the EVB-LAN7430 Evaluation Board. Items discussed in this chapter include:

- [Document Layout](#)
- [Conventions Used in this Guide](#)
- [The Microchip Web Site](#)
- [Development Systems Customer Change Notification Service](#)
- [Customer Support](#)
- [Document Revision History](#)

DOCUMENT LAYOUT

This document describes how to use the EVB-LAN7430 Evaluation Board as a high-performance and low-cost USB/Ethernet connectivity solution.

The manual layout is as follows:

- **Chapter 1. “Overview”** – Shows a brief description of the EVB-LAN7430 Evaluation Board.
- **Chapter 2. “Board Details and Configuration”** – Includes information about the EVB-LAN7430 Evaluation Board.
- **Chapter 3. “Using the EVB-LAN7430”** – Includes information on how to use the EVB-LAN7430 Evaluation Board.
- **Appendix A. “EVB-LAN7430 Evaluation Board”** – This appendix shows the EVB-LAN7430 Evaluation Board schematic.
- **Appendix B. “Schematics”** – This appendix shows the EVB-LAN7430 Evaluation Board schematic.
- **Appendix C. “Bill of Materials”** – This appendix includes the EVB-LAN7430 Evaluation Board Bill of Materials (BOM).

CONVENTIONS USED IN THIS GUIDE

This manual uses the following documentation conventions:

DOCUMENTATION CONVENTIONS

Description	Represents	Examples
Arial font:		
Italic characters	Referenced books	<i>MPLAB[®] IDE User's Guide</i>
	Emphasized text	...is the <i>only</i> compiler...
Initial caps	A window	the Output window
	A dialog	the Settings dialog
	A menu selection	select Enable Programmer
Quotes	A field name in a window or dialog	"Save project before build"
Underlined, italic text with right angle bracket	A menu path	<u><i>File>Save</i></u>
Bold characters	A dialog button	Click OK
	A tab	Click the Power tab
N'Rnnnn	A number in verilog format, where N is the total number of digits, R is the radix and n is a digit.	4'b0010, 2'hF1
Text in angle brackets < >	A key on the keyboard	Press <Enter>, <F1>
Courier New font:		
Plain Courier New	Sample source code	#define START
	Filenames	autoexec.bat
	File paths	c:\mcc18\h
	Keywords	_asm, _endasm, static
	Command-line options	-Opa+, -Opa-
	Bit values	0, 1
	Constants	0xFF, 'A'
Italic Courier New	A variable argument	<i>file.o</i> , where <i>file</i> can be any valid filename
Square brackets []	Optional arguments	mcc18 [options] <i>file</i> [options]
Curly brackets and pipe character: { }	Choice of mutually exclusive arguments; an OR selection	errorlevel {0 1}
Ellipses...	Replaces repeated text	var_name [, var_name...]
	Represents code supplied by user	void main (void) { ... }

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- **General Technical Support** – Frequently Asked Questions (FAQs), technical support requests, online discussion groups, Microchip consultant program member listing
- **Business of Microchip** – Product selector and ordering guides, latest Microchip press releases, listing of seminars and events, listings of Microchip sales offices, distributors and factory representatives

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- **Emulators** – The latest information on Microchip in-circuit emulators. This includes the MPLAB REAL ICE and MPLAB ICE 2000 in-circuit emulators.
- **In-Circuit Debuggers** – The latest information on the Microchip in-circuit debuggers. This includes MPLAB ICD 3 in-circuit debuggers and PICkit 3 debug express.
- **MPLAB IDE** – The latest information on Microchip MPLAB IDE, the Windows Integrated Development Environment for development systems tools. This list is focused on the MPLAB IDE, MPLAB IDE Project Manager, MPLAB Editor and MPLAB SIM simulator, as well as general editing and debugging features.
- **Programmers** – The latest information on Microchip programmers. These include production programmers such as MPLAB REAL ICE in-circuit emulator, MPLAB ICD 3 in-circuit debugger and MPLAB PM3 device programmers. Also included are nonproduction development programmers such as PICSTART Plus and PIC-kit 2 and 3.

CUSTOMER SUPPORT

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- Distributor or Representative
- Local Sales Office
- Field Application Engineer (FAE)
- Technical Support

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Technical support is available through the web site at:

<http://www.microchip.com/support>

DOCUMENT REVISION HISTORY

Revisions	Section/Figure/Entry	Correction
DS50002841A (01-18-19)	Initial release	

Chapter 1. Overview

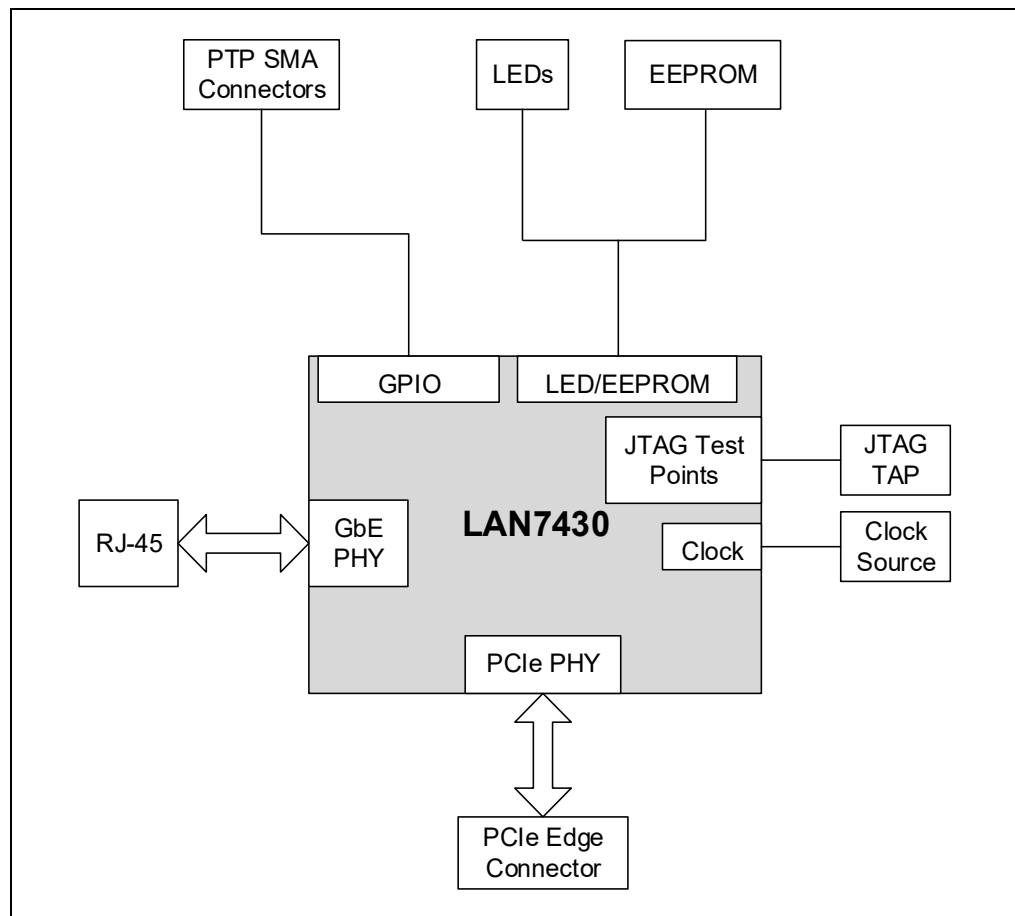
1.1 INTRODUCTION

The EVB-LAN7430 Evaluation Board features LAN7430, PCIe to Gigabit Ethernet bridge device. LAN7430 has an integrated 10/100/1000 Mbps Ethernet PHY, PCIe PHY, Gigabit Ethernet MAC, OTP memory, EEPROM controller, clock/reset/power management functions, PCIe endpoint controller, DMA controller and JTAG TAP. The device supports IEEE 802.3az Energy Efficient Ethernet (EEE), IEEE 1588-2008, and advanced power management features, which makes this device highly suitable across many application areas. This evaluation board requires a single lane PCIe slot.

The scope of this document is to describe the EVB-LAN7430 evaluation board setup and the corresponding jumper configuration.

A simplified block diagram of the board is shown in [Figure 1-1](#).

FIGURE 1-1: EVB-LAN7430 BLOCK DIAGRAM



1.2 REFERENCES

Concepts and material available in the following documents will be helpful when reading this document. Visit www.microchip.com for the latest documentation.

- *LAN7430 Data Sheet*
- *EVB-LAN7430 Schematic*
- *Application Note: Implementing IEEE 1588-2008 with LAN7430*

1.3 TERMS AND ABBREVIATIONS

- EEE - Energy Efficient Ethernet
- EVB - Evaluation Board
- GND - Ground
- PHY - Physical Transceiver
- PTP - Point to Point
- SMA Connector - Sub-Miniature version A Connector

Chapter 2. Board Details and Configuration

2.1 BOARD DETAILS

This section includes the following EVB-LAN7430 board details:

- [Power](#)
- [Resets](#)
- [Clock](#)
- [Configuration](#)

2.1.1 Power

The board receives 3.3V supply through the PCIe interface. An internal 2.5V voltage regulator supplies power to the 2.5V tolerant supply pins such as the AVDDH_1/ AVDDH_2 and VPH pins, and the VDD12_SW_OUT pin supplies 1.2V to three VDD12CORE pins and VP and VPTX pins. An on-board power scheme can supply 3.3V to LAN7430 and other devices through the auxiliary pin of the PCIe interface.

2.1.2 Resets

Jumper J2 is required to be populated if the reset function is required for the board.

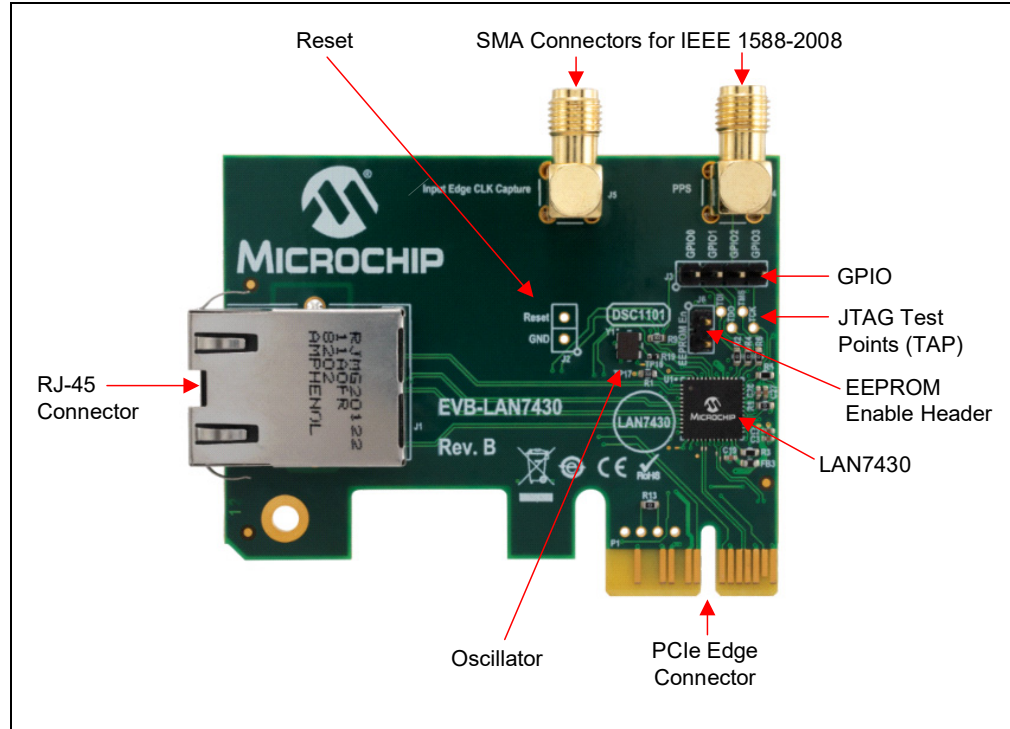
2.1.3 Clock

The evaluation board utilizes an external 25 MHz crystal oscillator.

2.1.4 Configuration

[Figure 2-1](#) describes the board features and configuration settings.

FIGURE 2-1: EVB-LAN7430 TOP VIEW WITH CALLOUTS



2.1.4.1 JUMPER SETTINGS

Table 2-1 describes the jumper settings. The default configuration is shown in bold.

TABLE 2-1: JUMPERS

Jumper	Label	Description	Open	Close
J2	Reset	Provides the hardware reset to the board	(Default) Board performs normal operation.	Resets the board
J6	EEPROM En	Enables optional EEPROM	EEPROM is disabled. Internal OTP is used to configure LAN7430.	(Default) EEPROM is enabled.

2.1.4.2 HEADERS AND CONNECTORS

Table 2-2 describes the functions of the headers on the board.

TABLE 2-2: HEADERS AND CONNECTORS

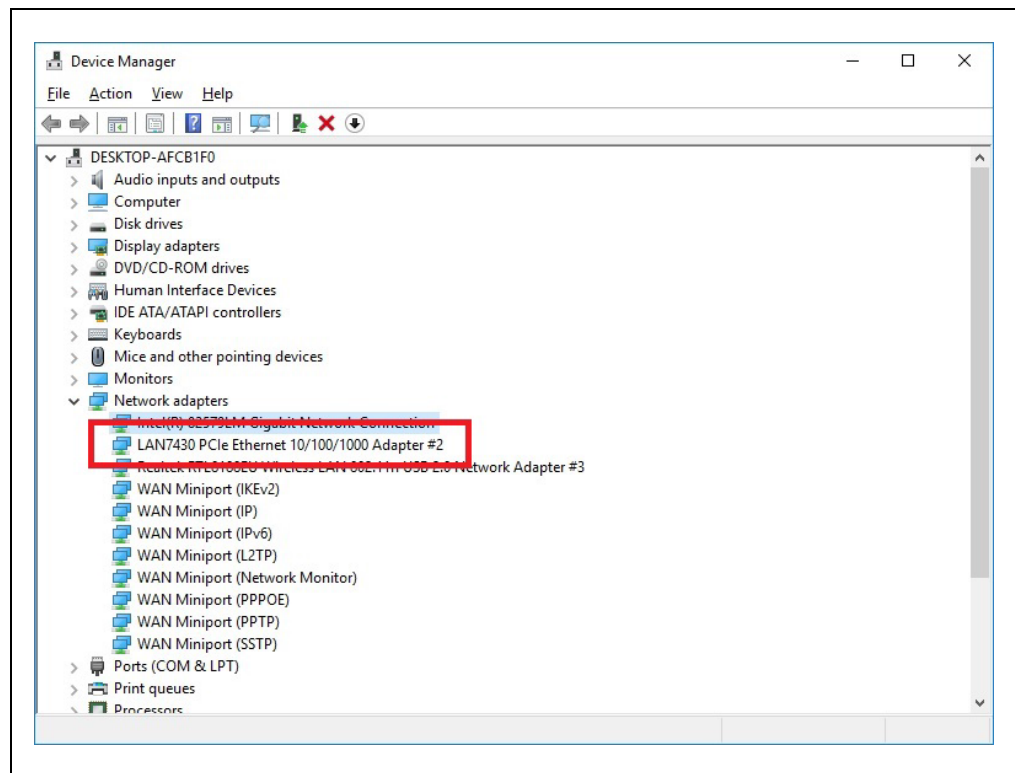
Header	Label	Description
J1	8P8C (RJ-45) connector	Connects an Ethernet cable
J3	GPIO1, GPIO2, GPIO 3, GPIO4	General purpose input/output (I/O)
J4	PPS	IEEE 1588 Pulse Per Second (PPS) input
J5	Input Edge clock Capture	IEEE 1588 Input Edge Clock Capture
JTAG TAP	TDI/TDO/TMS/TCK	Signals to enable fly-wiring of JTAG TAP from LAN7430 to the PCIe connector. When using the TAP, remove R13.

Chapter 3. Using the EVB-LAN7430

The EVB-LAN7430 board is connected to a PCIe slot of a PC. The LAN7430 device supports Windows 10 and Linux operating system. The drivers are provided on the LAN7430 device's product page for both operating systems. A 'readme' file is also provided with the drivers, which describes the driver installation process in detail.

Once the drivers are installed correctly for Windows 10, for example, the board can be detected in Device Manager as shown in [Figure 3-1](#).

FIGURE 3-1: LAN7430 DETECTED IN DEVICE MANAGER



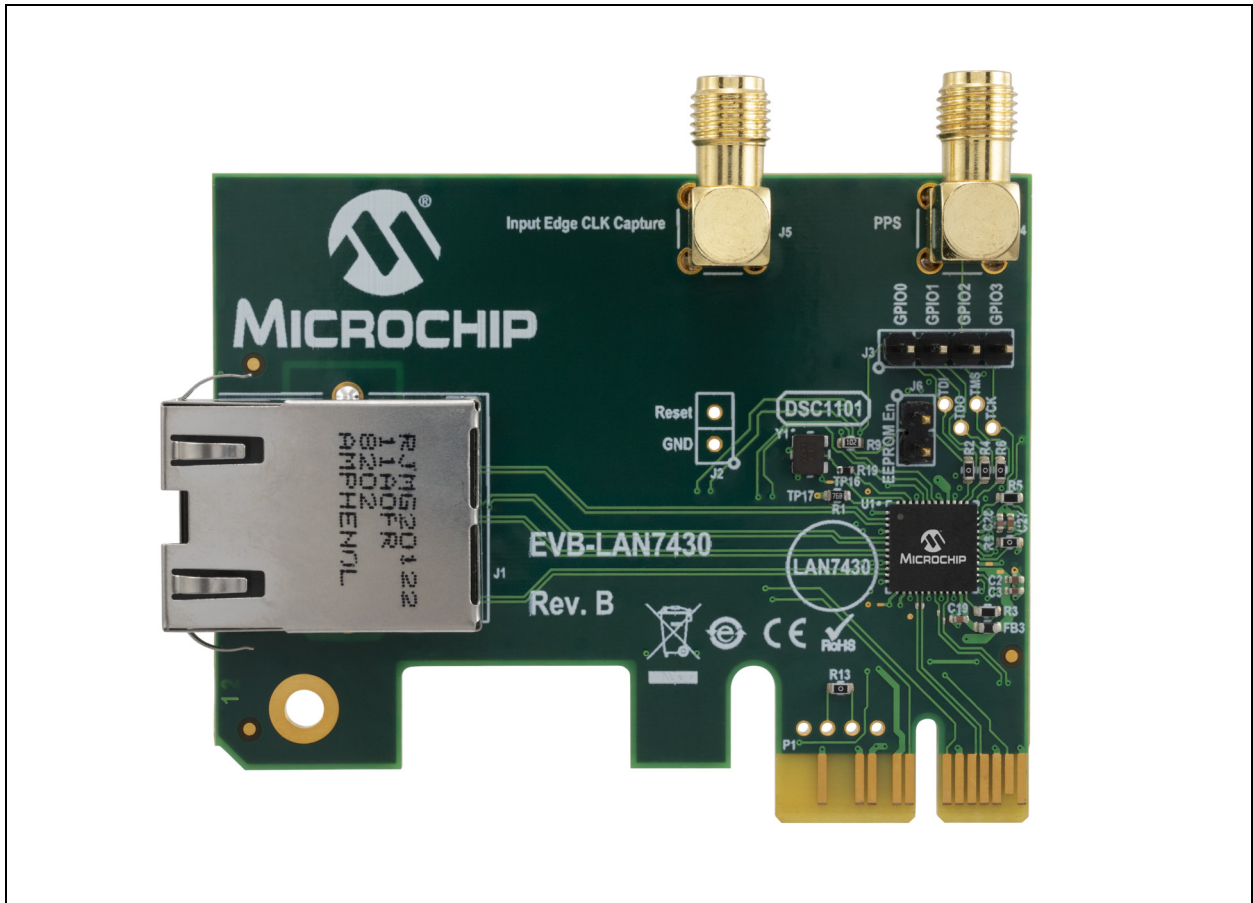
Once the PC detects the LAN7430 board correctly, the PC can then be connected to the Internet using an Ethernet cable to test the board.

NOTES:

Appendix A. EVB-LAN7430 Evaluation Board

A.1 INTRODUCTION

This appendix shows the EVB-LAN7430 Evaluation Board.

FIGURE A-1: EVB-LAN7430 EVALUATION BOARD

NOTES:

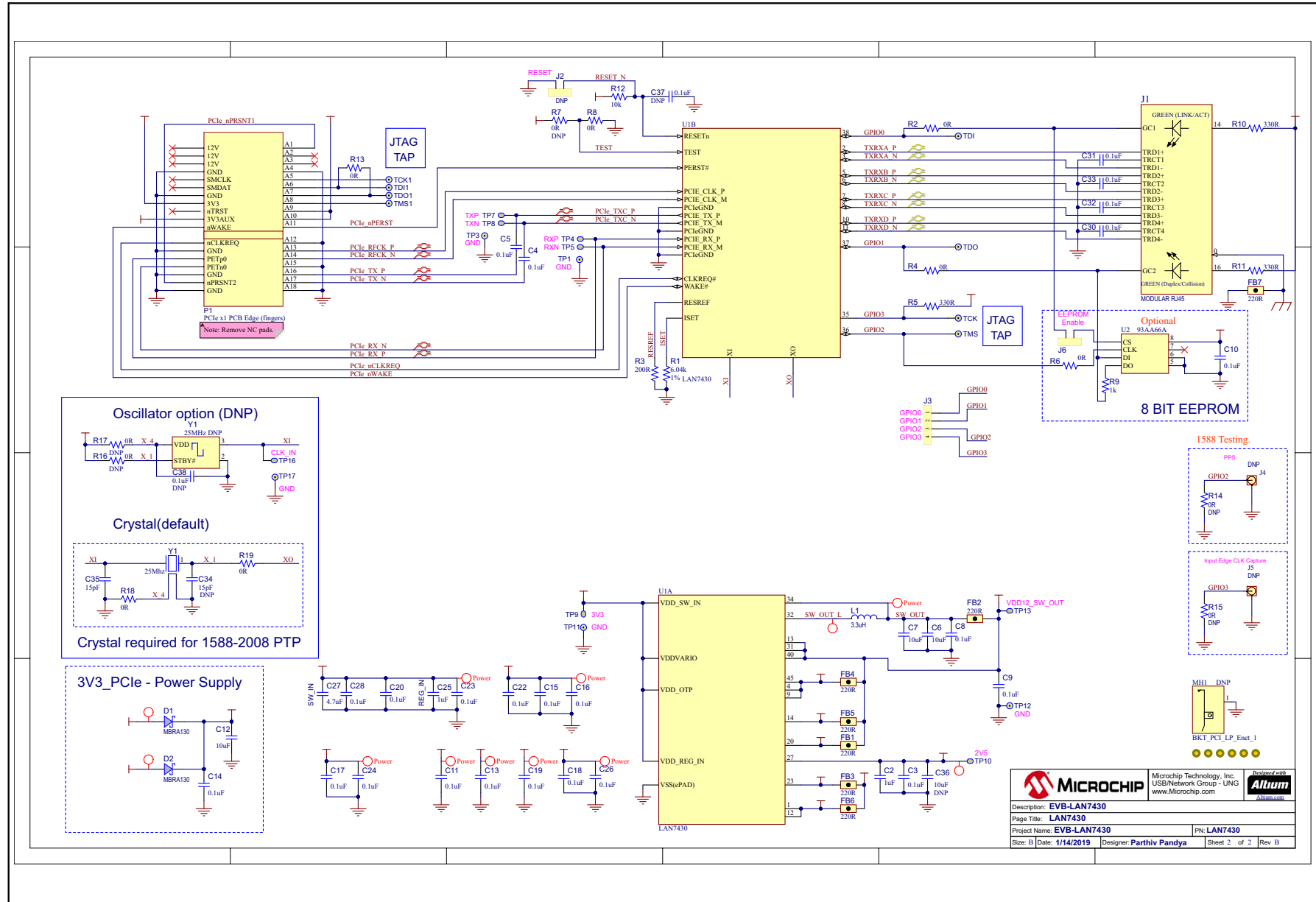


Appendix B. Schematics

B.1 INTRODUCTION

This appendix shows the EVB-LAN7430 Evaluation Board schematics.

FIGURE B-1: EVB-LAN7430 EVALUATION BOARD SCHEMATICS



		Microchip Technology, Inc. USB/Network Group - UNG www.microchip.com			
Description: EVB-LAN7430					
Page Title: LAN7430					
Project Name: EVB-LAN7430				PN: LAN7430	
Size: B		Date: 1/14/2019		Designer: Parthiv Pandya	
		Sheet 2 of 2		Rev B	



Appendix C. Bill of Materials

C.1 INTRODUCTION

This appendix includes the EVB-LAN7430 Bill of Materials (BOM).

TABLE C-1: EVB-LAN7430 BILL OF MATERIALS

Item	Qty	Reference	Description	Populated	Manufacturer	Manufacturer Part Number
1	2	C2, C25	CAP CER 1uF 35V 10% X5R SMD 0402	YES	Murata Electronics North America	GRM155R6YA105KE11D
2	15	C3, C8, C9, C11, C13, C15, C16, C17, C18, C19, C20, C22, C23, C24, C28	CAP CER 0.1uF 50V 10% X7R SMD 0402	YES	TDK Corporation	C1005X7R1H104K050BB
3	8	C4, C5, C10, C14, C30, C31, C32, C33	CAP CER 0.1uF 50V 10% X7R SMD 0402	YES	TDK Corporation	C1005X7R1H104K050BB
4	3	C6, C7, C12	CAP CER 10UF 25V 20% X5R SMD 0603	YES	Murata Electronics North America	GRM188R61E106MA73D
5	1	C26	CAP CER 0.1uF 16V 10% X7R SMD 0402	YES	Murata	GRM155R71C104KA88D
6	1	C27	CAP CER 4.7uF 6.3V 20% X5R SMD 0402	YES	Murata	GRM155R60J475ME47D
7	1	C35	CAP CER 15pF 50V 5% NP0 SMD 0402	YES	Murata	GRM1555C1H150JA01D
8	2	D1, D2	DIO SCKTY MBRA130LT3G 410mV 1A 30V SMD DO-214AC SMA	YES	ON Semiconductor	MBRA130LT3G
9	6	FB1, FB2, FB3, FB4, FB5, FB6	FERRITE 500mA 220R SMD 0603	YES	Murata	BLM18AG221SN1D
10	1	FB7	FERRITE 220R @ 100MHz 2A SMD 0603	YES	Murata Electronics North America	BLM18EG221SN1D
11	1	J1	CON MODULAR JACK RJ45 10/100/1000 MAGNETICS 2xLEDs SHIELD TH R/A	YES	Amphenol Commercial Products	RJMG2012211A0FR
12	1	J3	CON HDR-2.54 Male 1x4 Gold 5.84MH TH VERT	YES	Würth Electronics Inc	61300411121
13	1	J6	CON HDR-2.54 Male 1x2 Gold 5.84MH TH VERT	YES	FCI	77311-118-02LF
14	1	L1	INDUCTOR 3.3UH 2.25A 20% SMD L3W2.5H1.5	YES	TDK Corporation	VLF302515MT-3R3M
15	1	MH1	Bracket, BKT_PCI_LP_Enet_1, GLOBE	YES	Keystone	
16	1	R1	RES TKF 6.04k 1% 1/10W SMD 0603	YES	Yageo	9T06031A6041FBHFT
17	5	R2, R4, R6, R8, R13	RES TKF 0R 1/10W SMD 0603	YES	Panasonic	ERJ-3GSY0R00V
18	1	R3	RES TKF 200R 1% 1/10W SMD 0603	YES	Panasonic	ERJ-3EKF2000V
19	3	R5, R10, R11	RES TKF 330R 1% 1/10W SMD 0603	YES	Panasonic	ERJ-3EKF3300V
20	1	R9	RES TKF 1k 5% 1/10W SMD 0603	YES	Panasonic	ERJ-3GEYJ102V
21	1	R12	RES TKF 10k 1% 1/10W SMD 0603	YES	Panasonic	ERJ-3EKF1002V
22	2	R18, R19	RES TKF 0R SMD 0402	YES	Panasonic	ERJ-2GE0R00X
23	1	U1	MCHP INTERFACE PCIe-GiGe ETHERNET LAN7430 SQFN-48	YES	Microchip Technology	LAN7430/YXX
24	1	U2	MCHP MEMORY SERIAL EEPROM 4k Microwire 93AA66A-I/SN SOIC-8	YES	Microchip	93AA66A-I/SN
25	1	C34	CAP CER 15pF 50V 5% NP0 SMD 0402	NO	Murata	GRM1555C1H150JA01D
26	1	C36	CAP CER 10UF 25V 20% X5R SMD 0603	NO	Murata Electronics North America	GRM188R61E106MA73D
27	1	C37	CAP CER 0.1uF 50V 10% X7R SMD 0402	NO	TDK Corporation	C1005X7R1H104K050BB

TABLE C-1: EVB-LAN7430 BILL OF MATERIALS (CONTINUED)

Item	Qty	Reference	Description	Populated	Manufacturer	Manufacturer Part Number
28	1	C38	CAP CER 0.1uF 50V 10% X7R SMD 0402	NO	TDK Corporation	C1005X7R1H104K050BB
29	1	J2	CON HDR-2.54 Male 1x2 Gold 5.84MH TH VERT	NO	FCI	77311-118-02LF
30	2	J4, J5	CON RF Coaxial SMA Female TH R/A	NO	TE Connectivity AMP Connectors	5-1814400-1
31	1	R7	RES TKF 0R 1/10W SMD 0603	NO	Panasonic	ERJ-3GSY0R00V
32	2	R14, R15	RES TKF 0R 1/16W SMD 0402	NO	Yageo	RC0402JR-070RL
33	2	R16, R17	RES TKF 0R SMD 0402	NO	Panasonic	ERJ-2GE0R00X
34	1	Y1	MCHP CLOCK OSCILLATOR SINGLE 25MHZ DSC1001CI2-025.0000T CDFN-4	NO	Microchip Technology	DSC1001CI2-025.0000T
35	1	Y1	CRYSTAL 25MHz 10pF SMD ABM8G	YES	Abracon LLC	ABM8G-25.000MHZ-4Y-T3



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