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**LAN8840 EDS2
Daughter Card
User's Guide**

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Preface

NOTICE TO CUSTOMERS

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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 LAN8840 EDS2 Daughter Card User's Guide. Items discussed in this chapter include:

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

DOCUMENT LAYOUT

This document features the LAN8840 EDS2 Daughter Card. The manual layout is as follows:

- **Chapter 1. “Overview”** – This chapter provides an overview of the LAN8840 EDS2 Daughter Card and a brief description of the card's features.
- **Chapter 2. “Getting Started”** – This chapter provides information on the setup and operation of the LAN8840 EDS2 Daughter Card.
- **Chapter 3. “Hardware”** – This chapter shows the different connection types found on the LAN8840 EDS2 Daughter Card.
- **Chapter 4. “System Boot”** – This chapter explains how to utilize device tree overlays when booting the host system.
- **Appendix A. “Schematics”** – This section shows the schematic drawings of the LAN8840 EDS2 Daughter Card.
- **Appendix B. “Bill of Materials”** – This section shows the Bill of Materials (BOM) for the LAN8840 EDS2 Daughter Card.
- **Appendix C. “PCB Layers”** – This section shows the PCB layers of the LAN8840 EDS2 Daughter Card.

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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- **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.

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- 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
DS50003709A (07-11-24)	Initial release.	

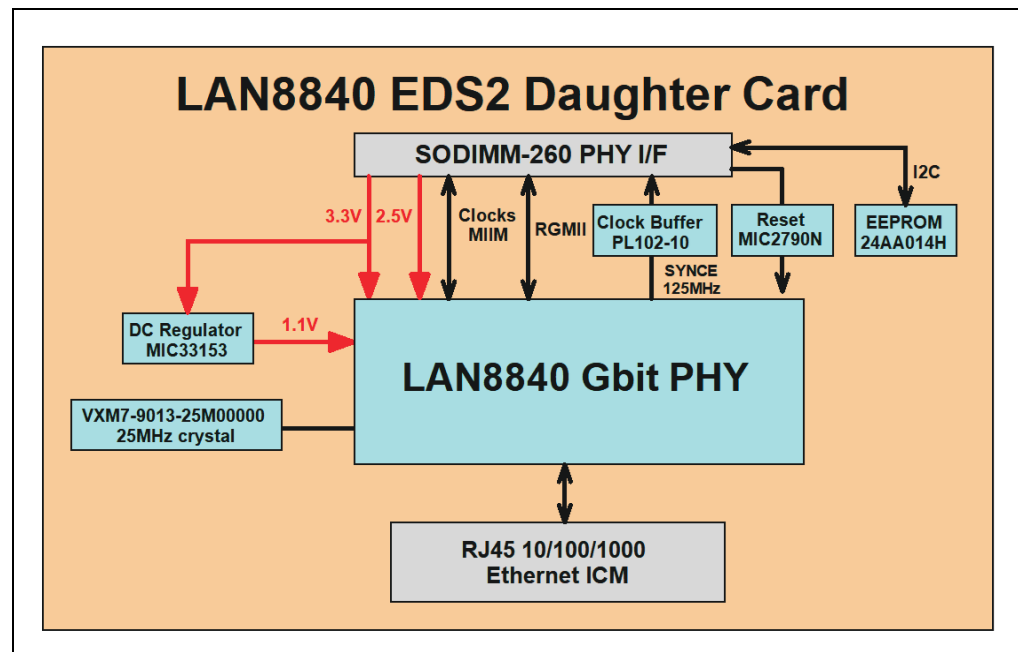
Chapter 1. Overview

1.1 INTRODUCTION

The LAN8840 EDS2 Daughter Card is designed for evaluation of the Microchip LAN8840 Gigabit Ethernet RGMII PHY when used with a Microchip EDS2 compatible host board. A SODIMM 260-pin connector for the EDS2 Host - LAN8840 EDS2 Daughter Card Interface is used due to its high performance, high pin count, and low cost.

This document describes the LAN8840 EDS2 Daughter Card setup and user interface features. A simplified block diagram is shown in [Figure 1-1](#).

FIGURE 1-1: EVB-LAN8840 EDS2 DAUGHTER CARD BLOCK DIAGRAM



1.2 FEATURES

Below are the features of the LAN8840 EDS2 Daughter Card:

- Microchip LAN8840 Gigabit Ethernet Transceiver with RGMII and IEEE 1588v2 Support
- Microchip VXM7-9013-25M0000 crystal for 25 MHz
- Microchip MIC33153 4 MHz Internal Inductor PWM regulator for 1.1V generation
- Microchip MIC2790N Reset supervisor with Reset LED indicator
- Microchip 24AA014H I²C Serial EEPROM for board identification
- Microchip PL102-10TC Clock buffer for 125 MHz SYNCE clock
- 10/100/1000 Mb RJ45 Integrated Connector and Magnetics with LEDs
- MDC/MDIO management interface
- Compliant with the SODIMM EDS2 Interface Specification
- PHY Reset DIP switch feature to keep the LAN8840 in Reset, useful for development
- 1x3 header to select between 3.3V and 2.5V VDDAH transceiver voltage
- Test points for GPIOs, Power rails, and GND
- GPIOs can be used for IEEE1588 (Precision Time Protocol) timestamp capture and to clear event interrupts.

1.3 REFERENCES

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

- *LAN8840 Data Sheet*
- *EVB-LAN8840 Daughter Card Schematics*
- *LAN8840 Hardware Design Checklist*
- *EVB-LAN9668 EDS2 Schematics*
- *EVB-LAN9668 EDS2 User's Guide*

1.4 ACRONYMS AND DEFINITIONS

[Table 1-1](#) shows the terms used in this user guide.

TABLE 1-1: ACRONYMS AND DEFINITIONS

Term	Definition
ARP	Address Resolution Protocol
COM	Communications Port
DHCP	Dynamic Host Configuration Protocol
DIP	Dual In-line Package
DSUB	D - Subminiature
EP	Extended Page
GPIO	General Purpose Input/Output
ICM	Integrated Connector Magnetic
IEEE	Institute of Electrical and Electronics Engineers
I/O	Input/Output
IP	Internet Protocol
LAN	Local Area Network
LSB	Least Significant Byte/Bit

TABLE 1-1: ACRONYMS AND DEFINITIONS (CONTINUED)

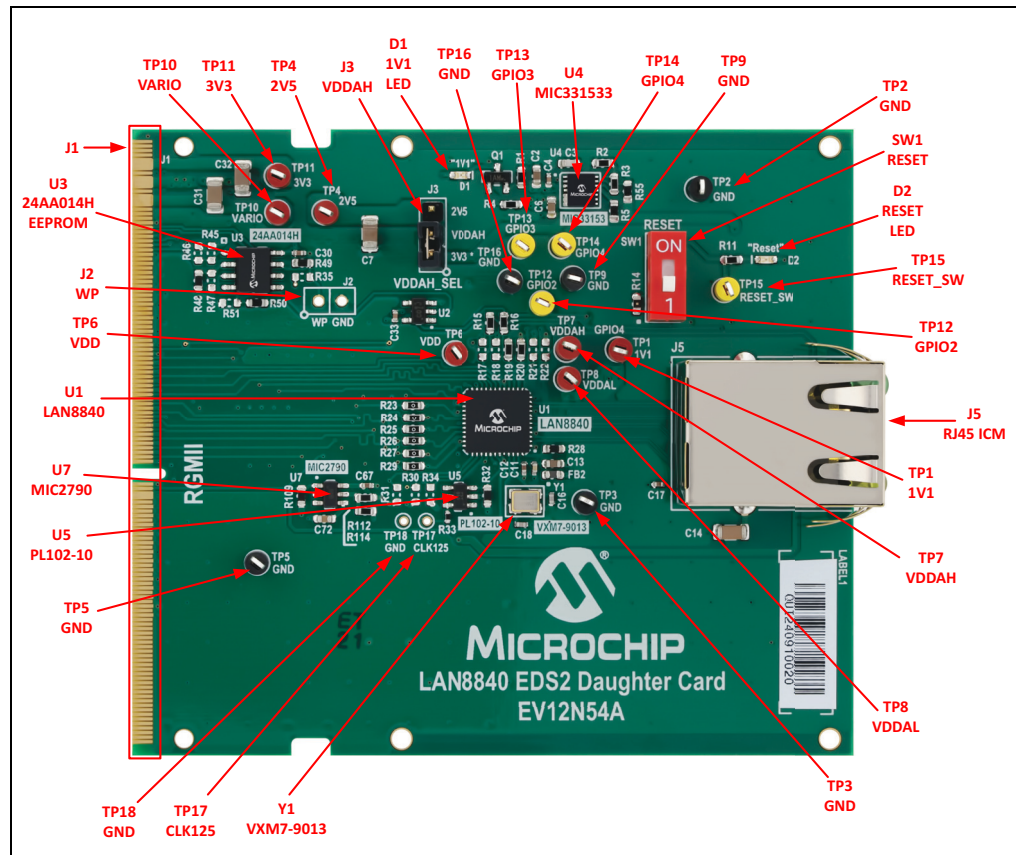
Term	Definition
MAC	Media Access Controller
MDIO	Management/Data Input/Output
MII	Media Independent Interface
NIC	Network Interface Card
OUI	Organizationally Unique Identifier
PC	Personal Computer
PCB	Printed Circuit Board
PCS	Physical Coding Sublayer
PHY	Physical Layer Transceiver
PDU	Payload Data Unit
PN	Part Number
QSGMII	Quad Serial Gigabit Media Independent Interface
Q-USGMII	Quad Universal Serial Gigabit Media Independent Interface
SMA	Sub-Miniature version A
TCXO	Temperature-Compensated Crystal Oscillator
TFTP	Trivial File Transfer Protocol
UART	Universal Asynchronous Receiver/Transmitter
USB	Universal Serial Bus
VDFN	Very-small Dual Flat, No Leads
VM	Virtual Machine
VREG	Voltage regulator
XO	Crystal oscillator
SODIMM	Small Outline Dual In-line Memory Module

NOTES:

2.1 INTRODUCTION

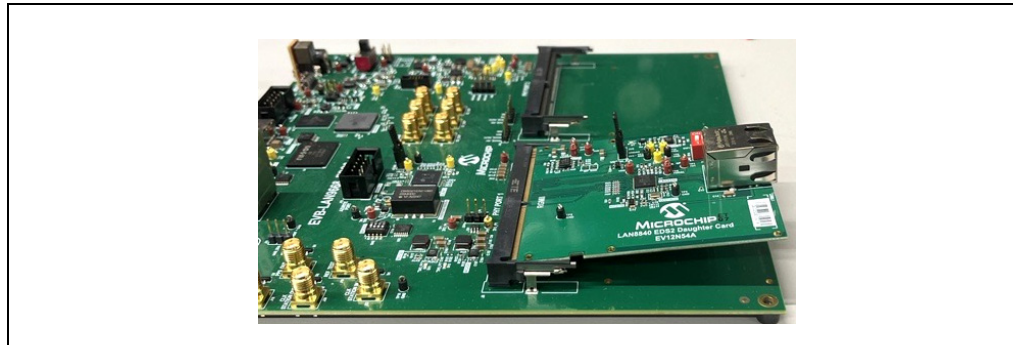
2.2 LAN8840 EDS2 DAUGHTER CARD INSTALLATION

FIGURE 2-1: LAN8840 EDS2 DAUGHTER CARD



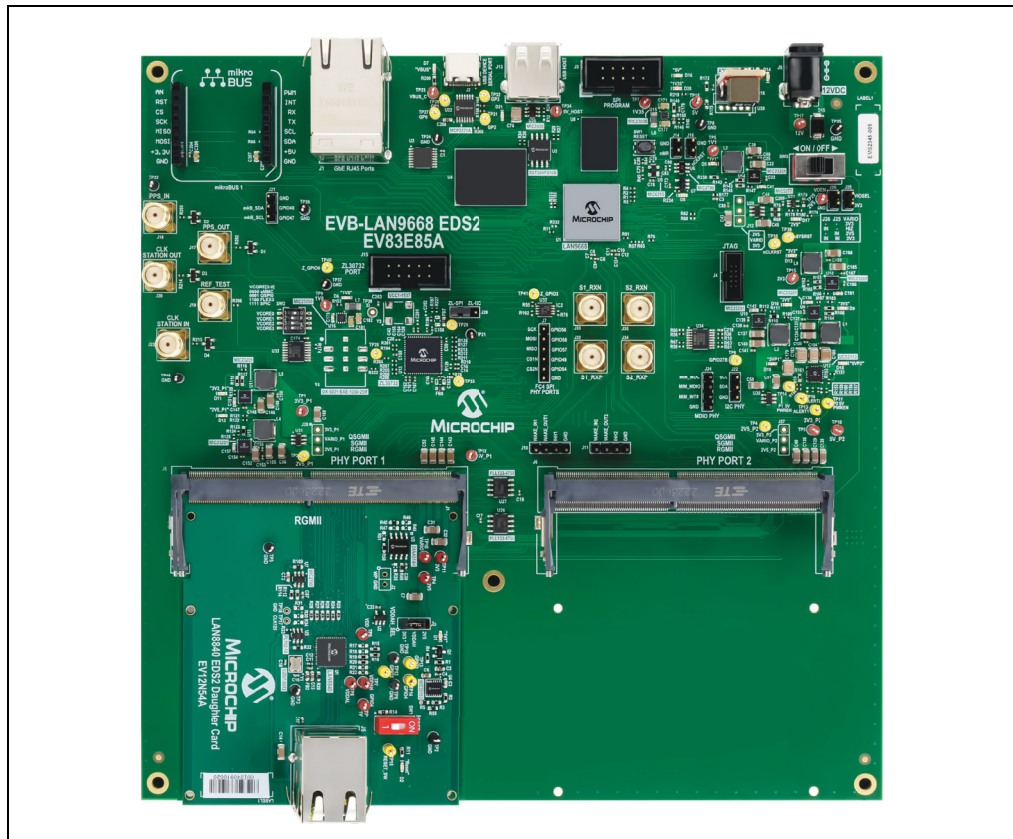
1. Verify that the host board power is OFF.
2. Grab the daughter card by its board edges. Align to SODIMM EDS2 receptacle and insert the board fingers' edge at a 45-degree angle into the SODIMM connector as shown in [Figure 2-2](#).

FIGURE 2-2: LAN8840 EDS2 DAUGHTER CARD INSTALLATION



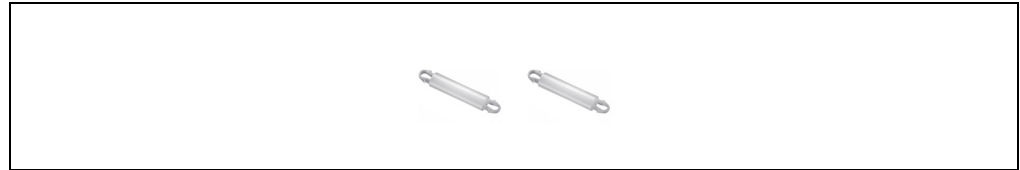
3. Push daughter card down until it latches into the SODIMM receptacle latches.
4. After installation the boards should look as shown in [Figure 2-3](#).

FIGURE 2-3: EVB-LAN9668 EDS2 WITH LAN8840 EDS2



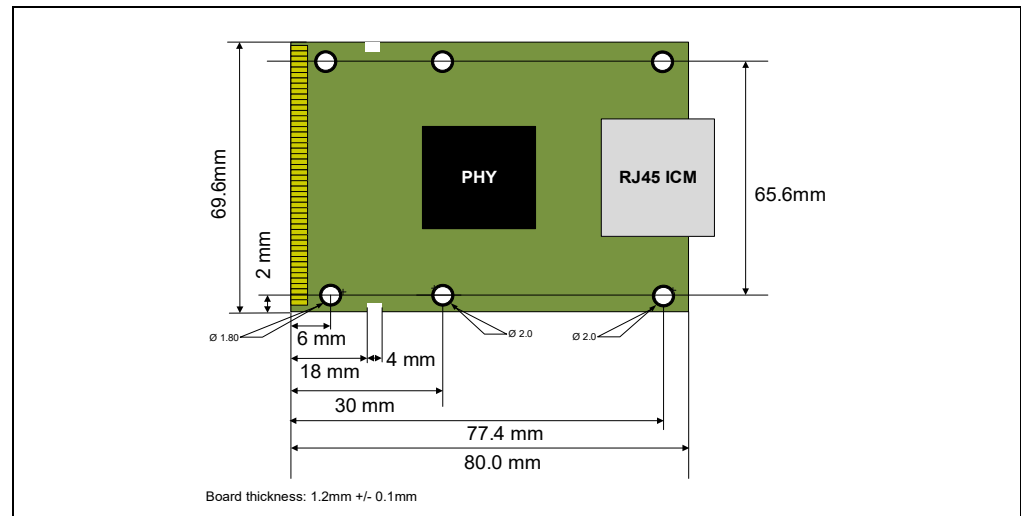
5. (Optional step) Secure the board with two snap lock pins (Würth Elektronik part number 709652500, included in the kit and available at [digikey.com](https://www.digikey.com) and [mouser.com](https://www.mouser.com)). These pins prevent board movement and remove stress from the SODIMM connector due to the RJ45 cable weight and movement. See [Figure 2-4](#).

FIGURE 2-4: SNAP LOCK PINS



6. The LAN8840 EDS2 Daughter Card has four (4) snap lock mounting holes, two (2) at 30 mm from the board fingers' edge, and two (2) at 77.4 mm from the board fingers' edge as shown in [Figure 2-5](#). If the EDS2 host has mounting holes at 77.4 mm, use those. Otherwise, use the ones at 30 mm.

FIGURE 2-5: LAN8840 EDS2 DAUGHTER CARD SNAP LOCK MOUNTING HOLES



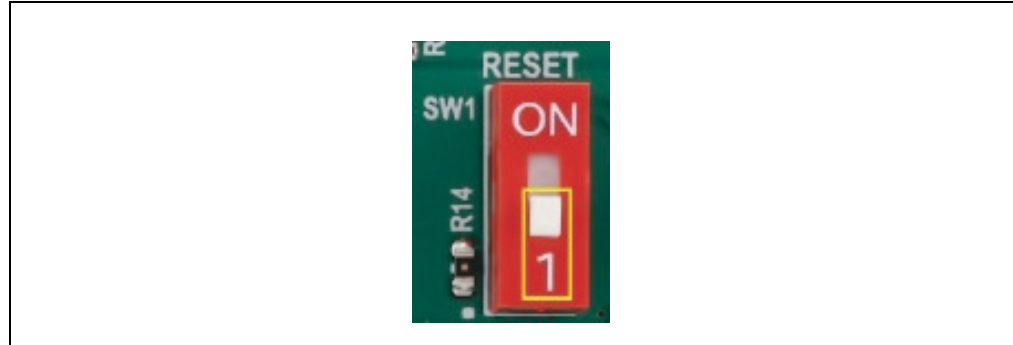
7. To use the snap lock pins, first install the snap lock pins on the host board, and then insert the daughter card into the SODIMM EDS2 receptacle. Align the snap locks with the corresponding mounting holes and press the daughter card down until snap locks are fastened. A pair of long-nose pliers can be used to close the pin locks for easy board installation and removal.

2.3 QUICK START

Perform the following steps to start using the LAN8840 EDS2 Daughter Card:

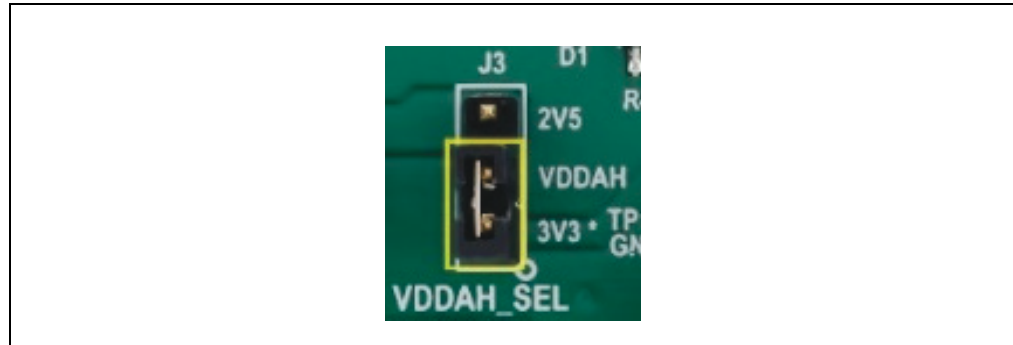
1. Verify if the SW1 slide switch is set as shown in [Figure 2-6](#).

FIGURE 2-6: SW1 SLIDE SWITCH



2. Check if there is a shunt jumper at J3[1-2] as shown in [Figure 2-7](#).

FIGURE 2-7: SHUNT JUMPER



3. Connect a USB-C® serial cable to EVB-LAN9668 EDS2 and host PC for the terminal console.
4. Connect a 12V supply with a DC plug to EVB-LAN9668 EDS2.
5. Power up the EVB-LAN9668 EDS2 host board.
6. Connect the Ethernet cable to the RJ45 connector on the LAN8840 EDS2 Daughter Card.
7. See [Chapter 4. “System Boot”](#) for details of the boot process.

2.4 LAN8840 EDS2 DAUGHTER CARD REMOVAL

To remove the LAN8840 EDS2 Daughter Card from the SODIMM EDS2 receptacle:

1. Verify that the host board power is OFF.
2. Disconnect the RJ45 cable.
3. If snap locks are used, release them from the daughter card. A pair of long-nose plier can be used to close the latch pins for easy release.
4. Gently pull the SODIMM receptacle arms away from the daughter card; it should snap upwards.
5. Grab the daughter card by its edges and remove it from the SODIMM EDS2 receptacle.

Chapter 3. Hardware

3.1 INTRODUCTION

This section provides a description of the LAN8840 EDS2 Daughter Card hardware, including headers, test points, LEDs, and switches on the board.

The top side and bottom side of the LAN8840 EDS2 Daughter Card are shown in [Figure 3-1](#) and [Figure 3-2](#), respectively.

FIGURE 3-1: LAN8840 EDS2 DAUGHTER CARD (TOP SIDE)

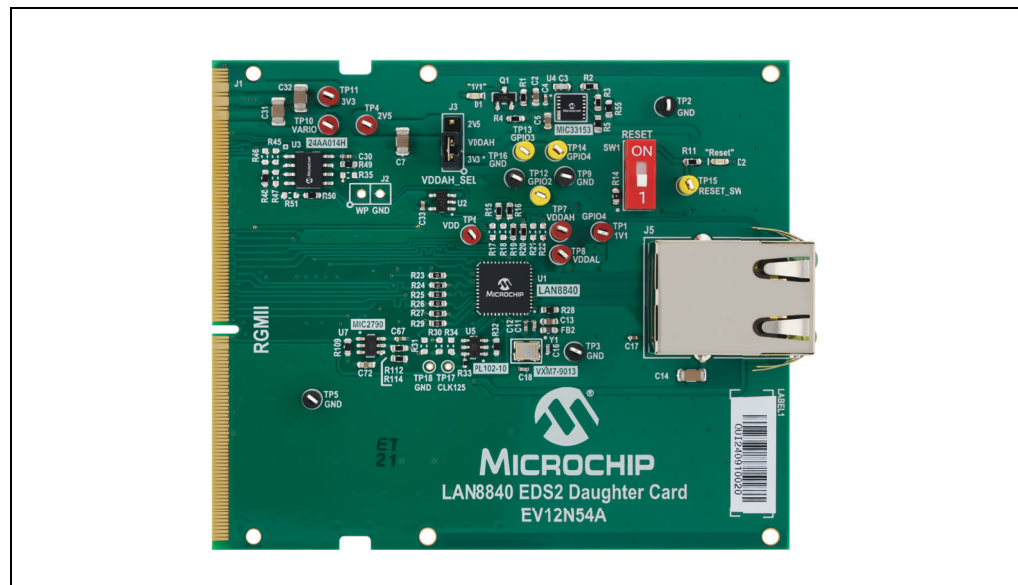
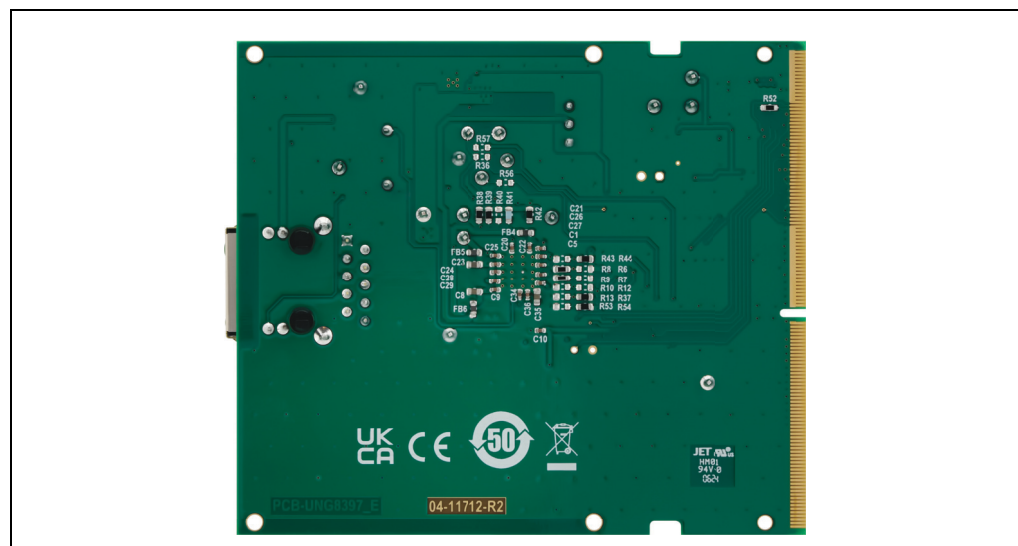


FIGURE 3-2: LAN8840 EDS2 DAUGHTER CARD (BOTTOM SIDE)



3.2 CONNECTORS

Table 3-1 describes the connectors on the LAN8840 EDS2 Daughter Card.

TABLE 3-1: LAN8840 EDS2 DAUGHTER CARD CONNECTORS

Reference Designator	Name	Description
J1	SODIMM-260 pin Edge Connector	Provides power and signals for operation. Connects to Microchip EDS2 compatible host.
J2	WP Header 1x2	EEPROM Write Protect footprint (header not installed). Used to disable write protection during factory programming.
J3	VDDAH Header 1x3	Used to select the LAN8840 VDDAH power. [1-2] 3.3V (Default) [2-3] 2.5V
J5	RJ45 ICM	Ethernet RJ45 1 Gb connector with integrated magnetics.

3.3 TEST POINTS

Table 3-2 lists the test points on the LAN8840 EDS2 Daughter Card.

TABLE 3-2: LAN8840 EDS2 DAUGHTER CARD TEST POINTS

Test Point	Color	Description
TP1	Red	1V1
TP2	Black	GND
TP3	Black	GND
TP4	Red	2V5
TP5	Black	GND
TP6	Red	VDD
TP7	Red	VDDAH
TP8	Red	VDDAL
TP9	Black	GND
TP10	Red	VARIO
TP11	Red	3V3
TP12	Yellow	GPIO2/IEEE1588
TP13	Yellow	GPIO3/IEEE1588
TP14	Yellow	GPIO4/IEEE1588
TP15	Yellow	RESET_SW
TP16	Black	GND
TP17	—	CLK125
TP18	—	GND

3.4 LEDS

Table 3-3 describes the LEDS on the LAN8840 EDS2 Daughter Card.

TABLE 3-3: LAN8840 EDS2 DAUGHTER CARD LEDS

Reference Designator	Name	Description
D1	1V1	Green LED 1V1 indicator
D2	RESET	Red LED RESET indicator
J5 - Left	RJ45 - Left	Yellow LED connected to LAN8840 LED1/GPIO0
J5 - Right	RJ45 - Right	Green LED connected to LAN8840 LED2/GPIO1

3.5 CONFIGURATION STRAPS

Table 3-4 lists the configuration straps on the LAN8840 EDS2 Daughter Card.

TABLE 3-4: LAN8840 EDS2 DAUGHTER CARD CONFIGURATION STRAPS

Reference Designator PU/PD	Name	Description
R40/R20*	PHYAD2	0* – AD2 = 0 1 – AD2 = 1
R41*/R18	PHYAD1	This connects to external signal PHYID to support two daughter cards on the same EDS2 host.
R42*/R17	PHYAD0	0 – AD0 = 0 1* – AD0 = 1
R38*/R22	ALLPHYADD	0 – Responds to PHY address 0 1* – Does not respond to PHY address 0
R54*/R53	MODE4	MODE[4:1] 1100 – Auto-Negotiation Enabled, 10/100 FDX/HDX, 100BT Full, EEE Enabled. For details in other modes, see data sheet.
R44*/R43	MODE3	
R56/R8*	MODE2	
R7/R9*	MODE1	
R12/R10	MODE0	
R37*/R13	CLK125_EN	0 – 125 MHz clock output on pin 42 disabled 1* – 125 MHz clock output on pin 42 enabled
R32*	LED_MODE	0 – Tri-color LED 1* – Individual LED
R39*/R21	MAGJACK	0 – Normal register settings 1* – MAGJACK register settings, center taps on device side shorted

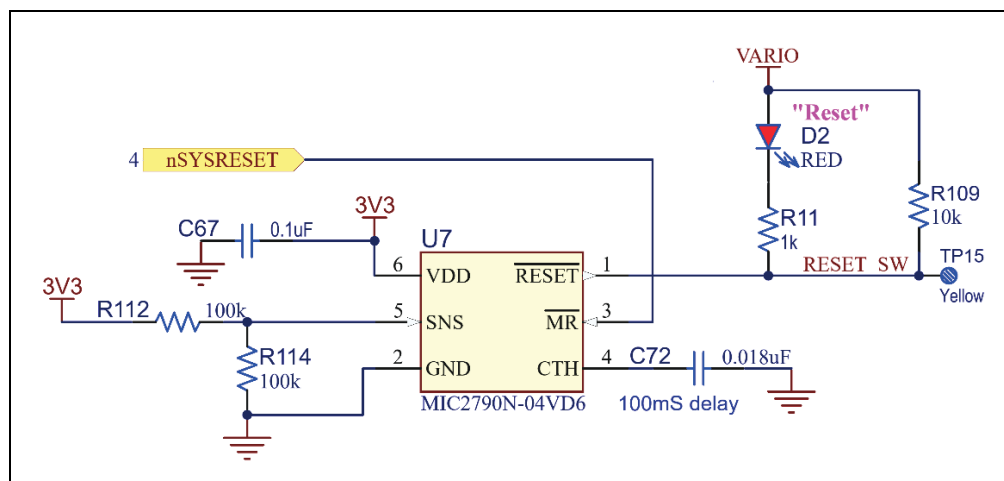
Note 1: Only one of the two PU/PD resistors is installed.

2: * indicates default.

3.6 RESET

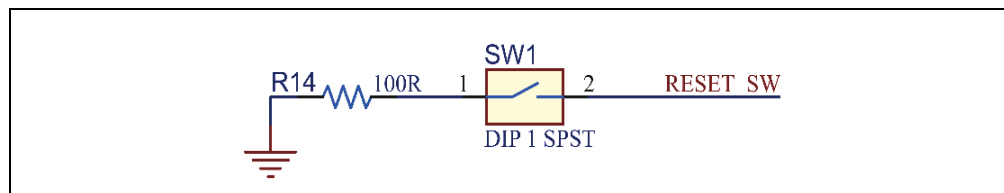
The LAN8840 EDS2 Daughter Card includes a Reset circuit using the Microchip MIC2790 Reset supervisor as shown in Figure 3-3. The system Reset signal, **nSYSRESET**, is driven from the SODIMM EDS2 host interface and is connected to the MIC2790 master Reset input MR. When MR goes low, the MIC2790 Reset output on net **RESET_SW** goes low, resetting the LAN8840 and turning on the Reset LED D2. The **RESET_SW** net will go high 100 milliseconds after **nSYSRESET** goes high, turning the Reset LED off and releasing the LAN8840 from Reset. The configuration straps are sampled when **RESET_SW** goes high.

FIGURE 3-3: LAN8840 EDS2 DAUGHTER CARD RESET CIRCUIT



The Reset switch SW1, as shown in Figure 3-4, can be used to place the LAN8840 EDS2 Daughter Card in Reset without affecting the rest of the system. This is useful when testing and updating the LAN8840 Linux® driver after the system has booted up.

FIGURE 3-4: LAN8840 EDS2 DAUGHTER CARD RESET SWITCH SW1



3.7 CLOCKS

The LAN8840 EDS2 Daughter Card uses a Microchip VXM7-9013-25M0000 25 MHz crystal for the LAN8840 clock reference.

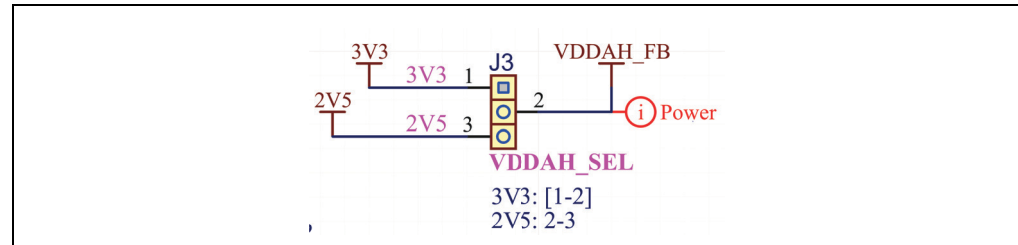
The LAN8840 generates a 125 MHz clock for Synchronous Ethernet (SyncE) applications. The clock is buffered with a Microchip PL102-10TC buffer to drive to the SODIMM EDS2 connector.

3.8 POWER

The LAN8840 EDS2 Daughter Card requires 3.3V, 2.5V, and 1.1V. The EDS2 SODIMM EDS2 interface provides 3.3V, 2.5V, and VARIO (3.3V or 2.5V). An on-board Microchip MIC33153 switching regulator is used to generate the 1.1V required by the LAN8840 analog, digital core, and PLL power inputs.

1x3 Header J3 is used for voltage selection of the LAN8840 VDDAH power input (VDDAH_FB) as shown in [Figure 3-5](#). The board is set from the factory with a shunt jumper at J3[1-2] to select 3.3V.

FIGURE 3-5: LAN8840 EDS2 DAUGHTER CARD VDDAH POWER INPUT



3.9 LAN8840 EDS2 DAUGHTER CARD EEPROM

The LAN8840 EDS2 Daughter Card includes a Microchip 24AA014H EEPROM with half array write protection (40H to 7Fh) for identification. Only some locations in the protected area starting at 40h are programmed as shown in [Figure 3-6](#). Details on these fields are specified in [Table 3-5](#).

FIGURE 3-6: EEPROM CONTENTS

Offset(h)	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00000000	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
00000010	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
00000020	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
00000030	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
00000040	A3	01	00	01	0A	10	88	40	01	00	45	56	31	32	4E	35
00000050	34	41	45	32	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
00000060	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
00000070	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	AA	00	00	AA

TABLE 3-5: EDS2 DAUGHTER CARD EEPROM

Byte Address	Name	Type	Description
40	KEY	INT	Magic number = A3h
41	REV	INT	EEPROM Revision
42	DCTYPE	INT	Daughter Card type: 0 = PHY, 1 = SWITCH
43	NPORTS	INT	Number of ports
44	MACIF	INT	MAC Interface: RMII 07h RGMII 09h RGMII_ID 0Ah RGMII_RXID 0Bh RGMII_TXID 0Ch SGMII 04h QSGMII 13h

TABLE 3-5: EDS2 DAUGHTER CARD EEPROM (CONTINUED)

Byte Address	Name	Type	Description
45	DPN_PNUM	INT	Device Part number: 23:20 Product Family 0 - KSZ 1 - LAN 2 - VSC 19:16 Part Number upper 4 bits
46			Device Part number bits 15:8
47			Device Part number bits 7:0
48	CTRLIF	INT	Control interface: 7:5 Reserved 4:3 SPI Mode 2 SPI Control available 1 I ² C Control available 0 MIIM Control available
49	SPIR	INT	SPI rate
4A	DEVT	ASCII	Dev Tools Part number
4B			
4C			
4D			
4E			
4F			
50			
51			
52	BREVU	ASCII	UNG Board Revision Letter
53	BREVD	ASCII	Dev Tools Board Revision Number
7C	IDBYTE0	INT	ID BYTE 1 = AAh
7D	IDBYTE1	INT	ID BYTE 2 = 00h
7E	IDBYTE2	INT	ID BYTE 3 = 00h
7F	CHECKSUM	INT	CHECKSUM = AAh

Chapter 4. System Boot

4.1 INTRODUCTION

This chapter describes the boot process using the EVB-LAN9668 EDS2 host using Linux software running on the LAN9668. The boot process for other EDS2 host platforms should be similar.

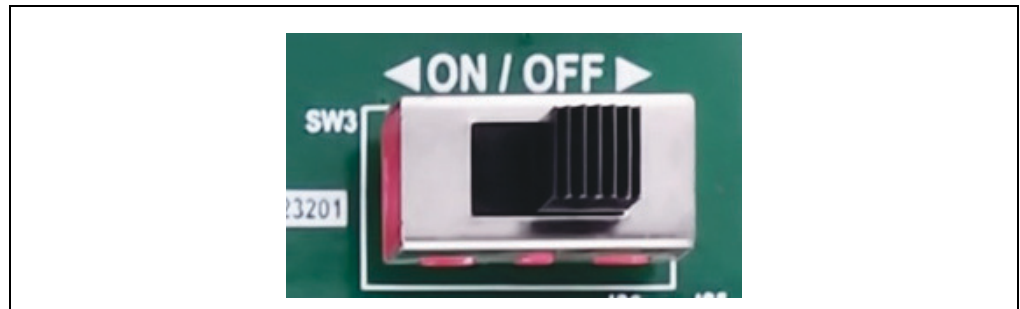
The EDS2 host board should be properly configured with Linux and the driver supporting the LAN8840 EDS2 Daughter Card. Refer to the software documentation for each EDS2 host platform for specific configuration and software details.

4.2 EVB-LAN9668 EDS2 SYSTEM POWER-UP

At this point the LAN8840 EDS2 Daughter Card should be installed in the correct SOD-IMM EDS2 connector. Perform the following steps to power up the EVB-LAN9668 EDS2:

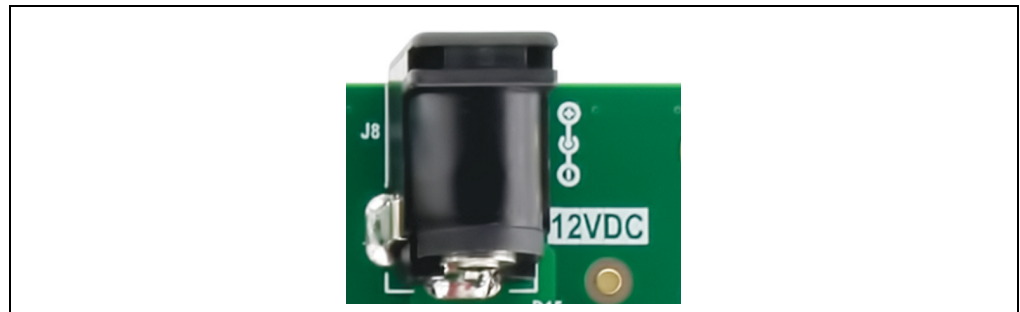
1. Verify that the EVB-LAN9668 EDS2 power switch is set to OFF (right) position. See [Figure 4-1](#).

FIGURE 4-1: LAN9668 POWER SWITCH



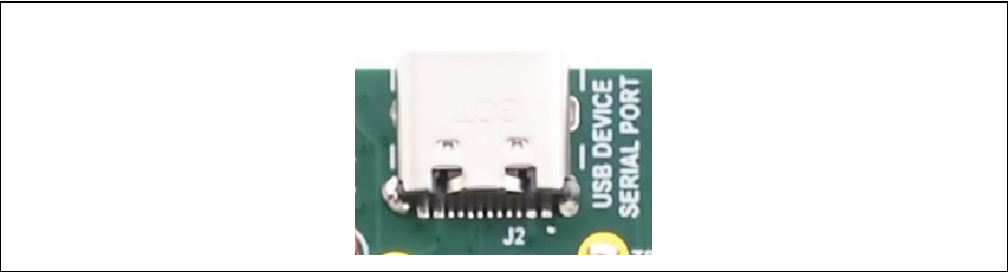
2. Connect 12V 1A (minimum) power supply with a DC plug to DC Jack J8 on the EVB-LAN9668 EDS2. See [Figure 4-2](#).

FIGURE 4-2: LAN9668 DC JACK



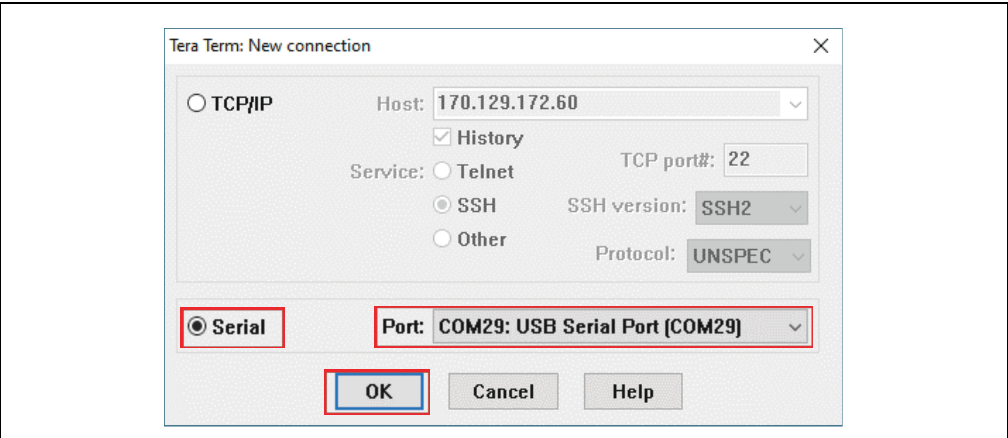
- 3. Connect a USB-C cable into the USB-C receptacle J2 on the EVB-LAN9668 EDS2 and then insert the other end into a PC. See [Figure 4-3](#).

FIGURE 4-3: EVB-LAN9668 EDS2 USB-C® SERIAL PORT



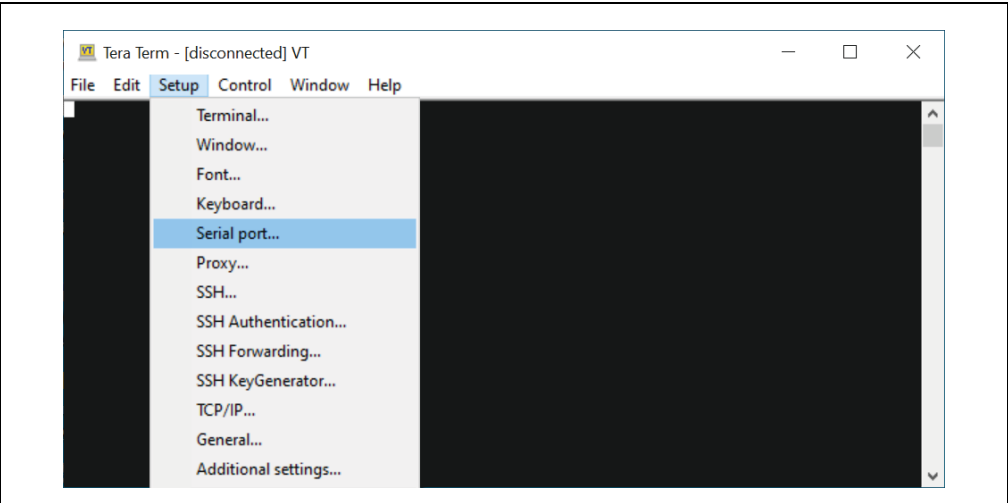
- 4. Slide the EVB-LAN9668 EDS2 power switch SW3 to the left ON position to turn on board power.
- 5. Open Tera Term. Select Serial radial button and look for COMx:USB Serial Port.
- 6. COM29 is shown in [Figure 4-4](#). Windows may assign a different port number. Click on **OK**.

FIGURE 4-4: TERA TERM SERIAL PORT SELECTION



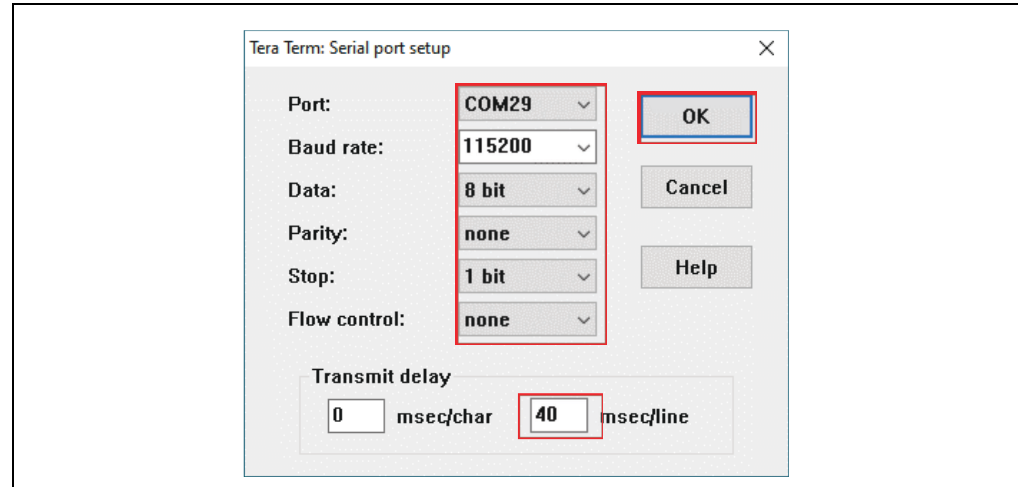
- 7. Go to the Setup menu and select Serial port. See [Figure 4-5](#).

FIGURE 4-5: TERA TERM SETUP MENU



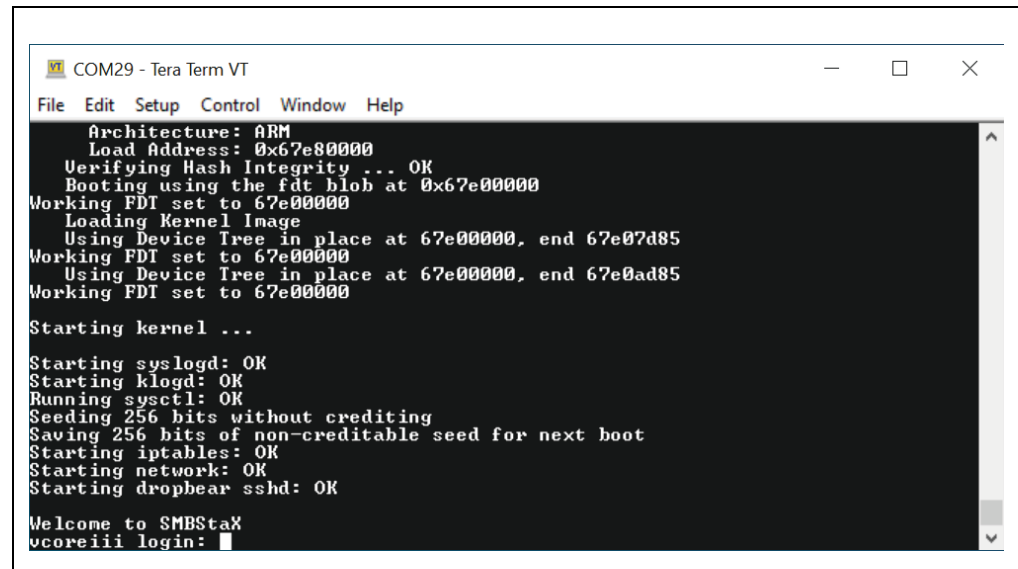
8. Set the selected port to 115200, 8-bit, no parity, 1 stop bit, no flow control, and 40 msec/line. Click on **OK**. See [Figure 4-6](#).

FIGURE 4-6: TERA TERM SERIAL PORT SETUP



9. Check if the Tera Term screen appears with a login prompt. See [Figure 4-7](#).

FIGURE 4-7: TERA TERM LOGIN PROMPT



10. At login prompt, enter `root`. See [Figure 4-8](#).

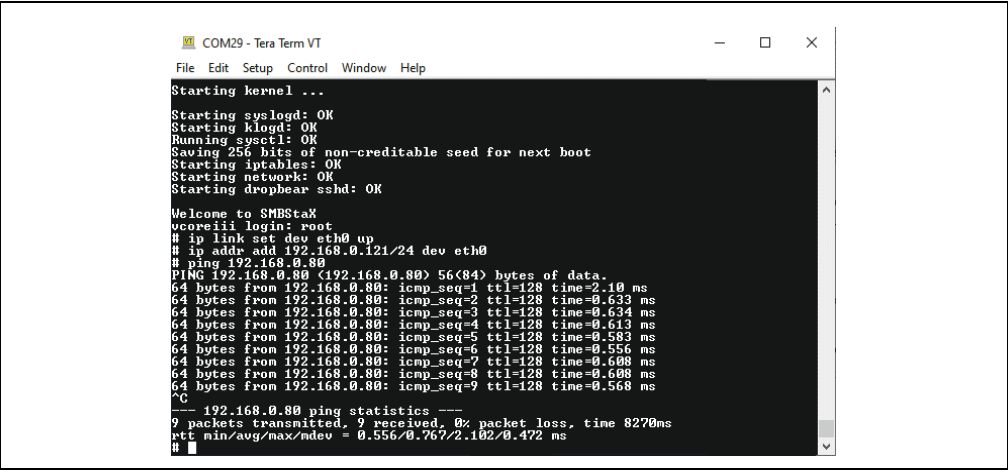
Note: For the succeeding steps, it is assumed that a host PC with an Ethernet port that can be pinged at 192.168.0.80 is available.

11. If the daughter card is on the right receptacle (PHY PORT2), replace `eth0` with `eth1` in the commands. Enter the following commands:


```
#ip link set dev eth0 up
#ip addr add 192.168.0.121/24 dev eth0
```
12. Connect Ethernet cable to the LAN8840 EDS2 Daughter Card RJ45 port. Then, enter the following command:


```
#ping 192.168.0.80
```

FIGURE 4-8: LINUX® PING





LAN8840 EDS2 DAUGHTER CARD USER'S GUIDE

Appendix A. Schematics

A.1 INTRODUCTION

This appendix shows the LAN8840 EDS2 Daughter Card schematics.

FIGURE A-1: LAN8840 EDS2 DAUGHTER CARD

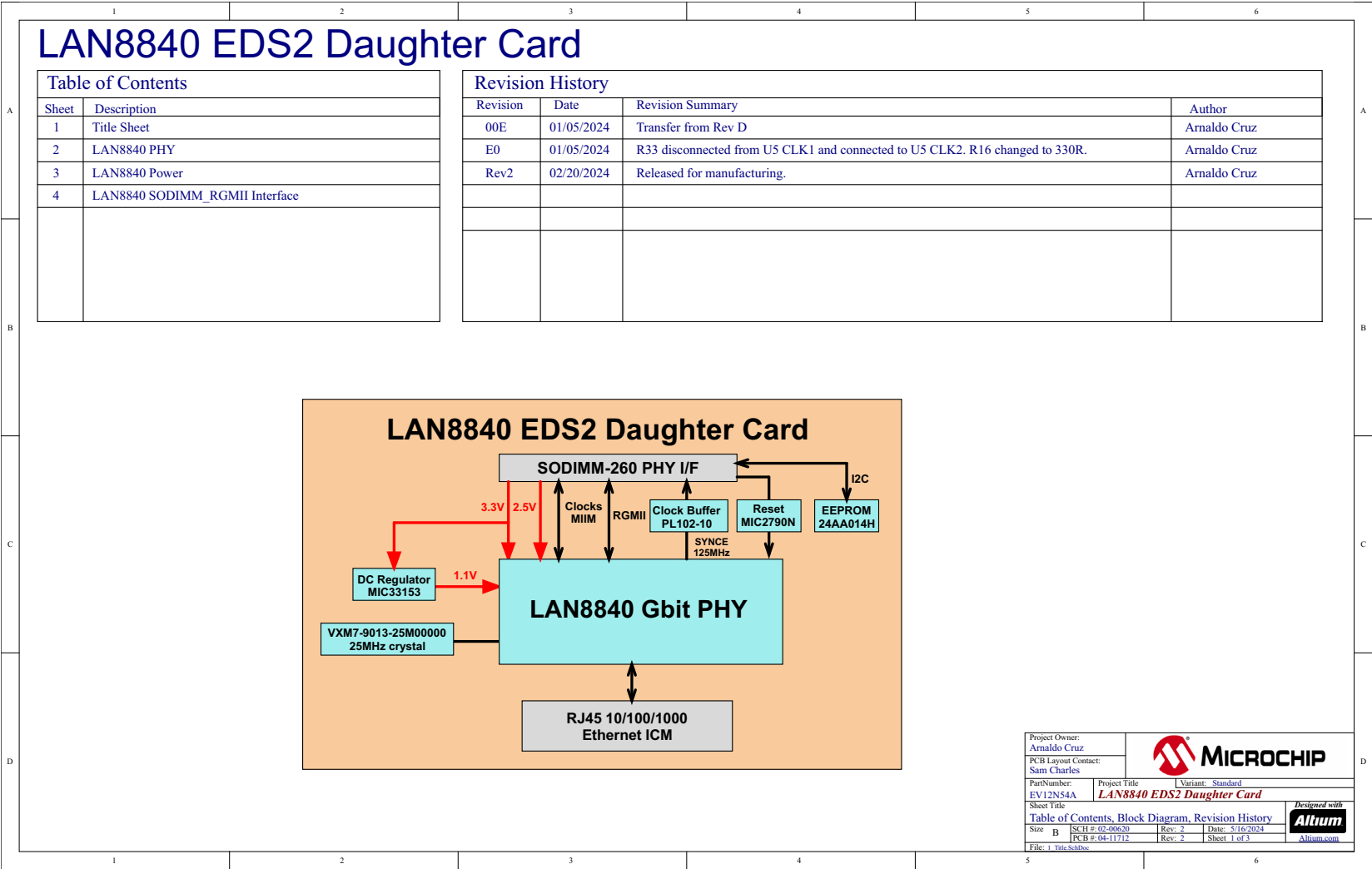
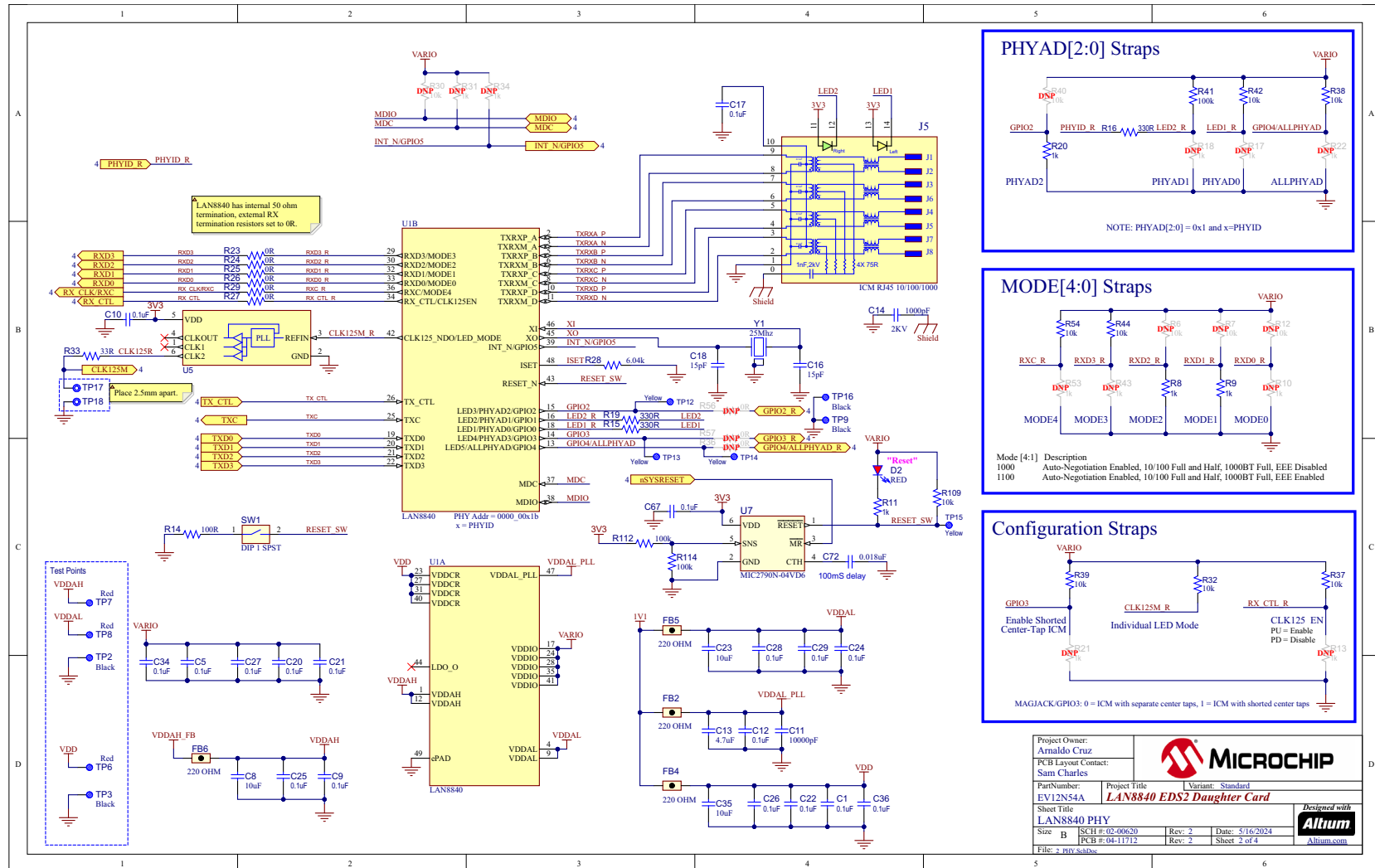


FIGURE A-2: LAN8840 EDS2 DAUGHTER CARD PHY



The image displays a PCB layout for a daughter card, specifically the EV12N54A. The layout includes a detailed schematic of the MIC33153 voltage regulator circuit, component placement callouts, and a bill of materials table.

Component Placement Callouts:

- J3:** A 3-pin header with pins 1, 2, and 3. Pin 1 is labeled VDDAH, pin 2 is labeled FB, and pin 3 is labeled VDDAH_SEL. The callout indicates "3V3: [1-2]" and "2V5: 2-3".
- JP2:** A 2-pin header with pins 1 and 2. The callout indicates "3V3: [1-2]" and "2V5: 2-3".

Schematic Diagram:

The schematic shows the MIC33153 voltage regulator (U4) connected to a 3V3 supply. The input (VIN) is connected to the 3V3 supply through a 10k resistor (R5). The output (OUT) is connected to the 1V1 supply through a 27.4k resistor (R3). The feedback (FB) is connected to the output through a 34.8k resistor (R2). The enable (EN) is connected to ground through a 4.7uF capacitor (C4). The output is filtered by a 4.7uF capacitor (C6). The output voltage is regulated to 1V1. The output is connected to a green LED (D1) through a 330R resistor (R1). The output is also connected to a 1V1 test point (TP1).

Bill of Materials Table:

Label	Part Number	Quantity	Description
FD1	EV12N54A	1	EV12N54A
FD2	EV12N54A	1	EV12N54A
FD3	EV12N54A	1	EV12N54A
FD4	EV12N54A	1	EV12N54A
FD5	EV12N54A	1	EV12N54A
FD6	EV12N54A	1	EV12N54A

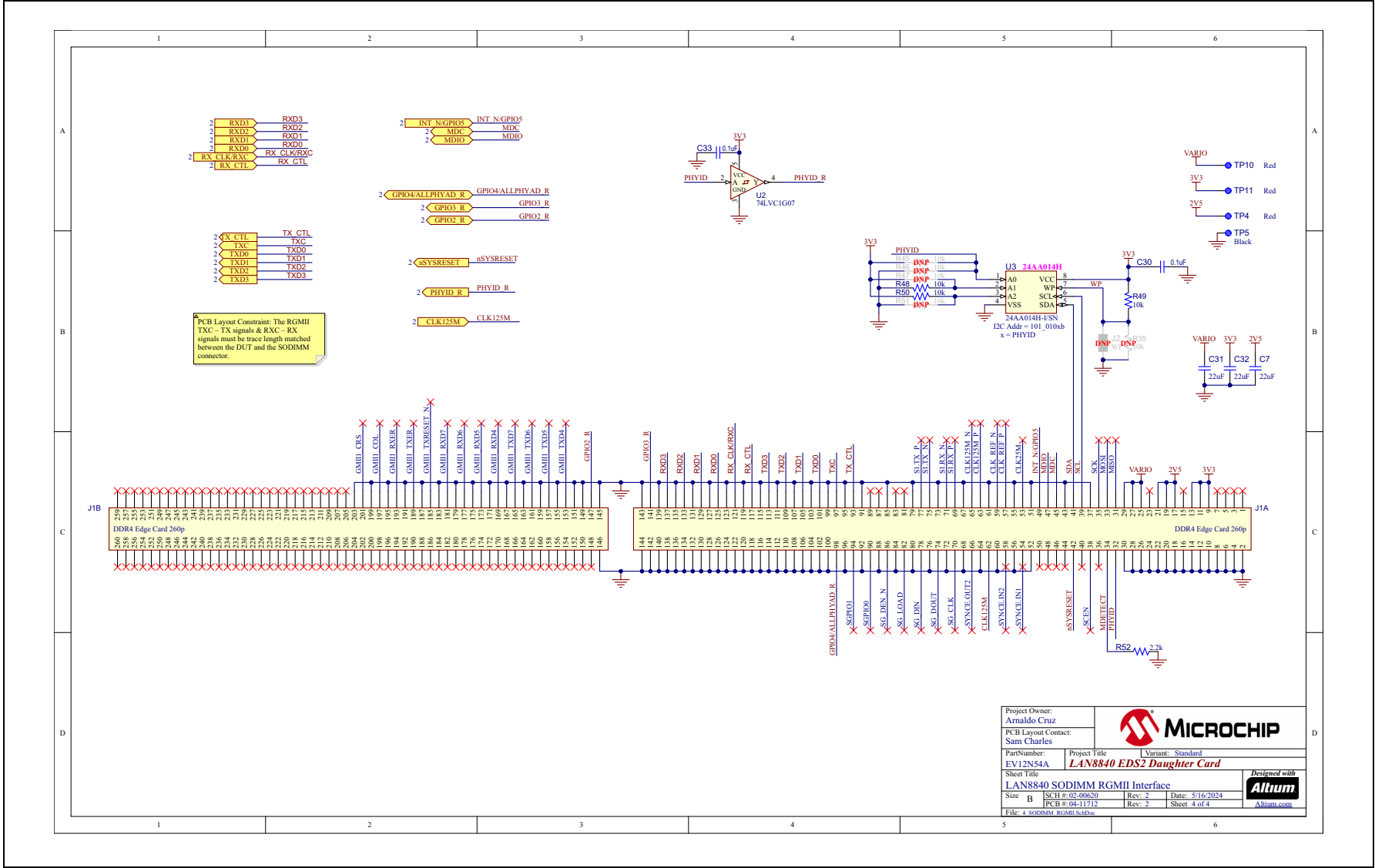
Project Information:

Project Owner: Arnaldo Cruz
 PCB Layout Contact: Sam Charles
 Part Number: EV12N54A
 Project Title: LAN8840 EDS2 Daughter Card
 Variant: Standard
 Sheet Title: LAN8840 Power
 Size: B
 SCH #: 02-00620
 Rev: 2
 Date: 5/16/2024
 PCB #: 04-11712
 Rev: 2
 Sheet: 3 of 4
 File: 1_Power.kicad

Microchip and Altium Logos:

The Microchip logo is located at the bottom right of the page. The Altium logo is located at the bottom right of the page.

FIGURE A-4: LAN8840 EDS2 DAUGHTER CARD SODIMM_RGMII INTERFACE



NOTES:



Appendix B. Bill of Materials

B.1 INTRODUCTION

This appendix contains the LAN8840 Bill of Materials (BOM).

TABLE B-1: BILL OF MATERIALS

Item	Qty	Reference	Description	Populated	Manufacturer	Manufacturer Part Number
1	21	C1, C4, C5, C9, C10, C12, C17, C20, C21, C22, C24, C25, C26, C27, C28, C29, C30, C33, C34, C36, C67	CAP CER 0.1uF 50V 10% X7R SMD 0402	Yes	TDK Corporation	C1005X7R1H104K050BB
2	3	C2, C6, C13	CAP CER 4.7uF 10V 10% X5R SMD 0603	Yes	KEMET	C0603C475K8PACTU
3	1	C3	CAP CER 470pF 25V 5% NP0 SMD 0603	Yes	AVX	06033A471JAT2A
4	3	C7, C31, C32	CAP CER 22uF 10V 10% X7R SMD 1206	Yes	Samsung Electro-Mechanics America, Inc	CL31B226KPHNNNE
5	3	C8, C23, C35	CAP CER 10uF 6.3V 20% X5R SMD 0603	Yes	AVX	06036D106MAT2A
6	1	C11	CAP CER 10000pF 16V 10% X7R SMD 0402	Yes	KEMET	C0402C103K4RACTU
7	1	C14	CAP CER 1000pF 2KV 10% X7R SMD 1206	Yes	Johanson Dielectrics Inc	202R18W102KV4E
8	2	C16, C18	CAP HiQ 15pF 50V 5% NP0 2.32GHz SMD 0402	Yes	Johanson Technology Inc	500R07S150JV4T
9	1	C72	CAP CER 0.018uF 50V 10% X7R SMD 0603	Yes	KEMET	C0603C183K5RACTU
10	1	D1	DIO LED GREEN 2V 30mA 35mcd Clear SMD 0603	Yes	Lite-On Inc	LTST-C191KGKT
11	1	D2	DIO RED 2V 20mA 54mcd CLEAR SMD 0603	Yes	Lite-On Inc.	LTST-C191KRKT
12	4	FB2, FB4, FB5, FB6	FERRITE 500mA 220R SMD 0603	Yes	Murata Electronics North America	BLM18AG221SN1D
13	0	J2	CON HDR-2.54 Male 1x2 Gold 5.84MH TH VERT	DNP	FCI	77311-118-02LF
14	1	J3	CON HDR-2.54 Male 1x3 Gold 5.84MH TH VERT	Yes	FCI	68000-103HLF
15	1	J5	CONN MAGJACK 1PORT 1000 BASE-T	Yes	Pulse Electronics Network	JD1-0001NL
16	1	JP2	MECH HW JUMPER 2.54mm 1x2 GOLD	MECH	Sullins Connector Solutions	QPC02SXGN-RC
17	1	Q1	TRANS BJT NPN MMBT3904 40V 200mA 310mW SOT-23-3	Yes	Micro Commercial Components Corporation	MMBT3904-TP
18	4	R1, R15, R16, R19	RES TKF 330R 1% 1/10W SMD 0603	Yes	Panasonic	ERJ-3EKF3300V
19	1	R2	RES TKF 34.8k 1% 1/10W SMD 0603	Yes	Panasonic Electronic Components	ERJ-3EKF3482V
20	1	R3	RES TKF 27.4k 1% 1/10W SMD 0603 AEC-Q200	Yes	Panasonic Electronic Components	ERJ-3EKF2742V
21	5	R4, R8, R9, R11, R20	RES TKF 1k 1% 1/10W SMD 0603	DNP	Panasonic	ERJ-3EKF1001V
22	13	R5, R32, R37, R38, R39, R42, R44, R48, R49, R50, R54, R55, R109	RES TKF 10k 1% 1/10W SMD 0603	DNP	Vishay	CRCW060310K0FKEA
23	0	R6, R7, R12, R30, R35, R40, R45, R46, R47, R51	RES TKF 10k 1% 1/10W SMD 0603	Yes	Vishay	CRCW060310K0FKEA
24	0	R10, R13, R17, R18, R21, R22, R31, R34, R43, R53	RES TKF 1k 1% 1/10W SMD 0603	Yes	Panasonic	ERJ-3EKF1001V
25	1	R14	RES TKF 100R 1% 1/10W SMD 0603 AEC-Q200	Yes	D1_Rohm Semiconductor	KTR03EZPF1000
26	6	R23, R24, R25, R26, R27, R29	RES TKF 0R 1/10W SMD 0603	DNP	Panasonic	ERJ-3GSY0R00V

TABLE B-1: BILL OF MATERIALS (CONTINUED)

Item	Qty	Reference	Description	Populated	Manufacturer	Manufacturer Part Number
27	1	R28	RES TKF 6.04k 1% 1/10W SMD 0603 AEC-Q200	Yes	Vishay / Dale	CRCW06036K04FKEA
28	1	R33	RES TKF 33R 1% 1/10W SMD 0402	Yes	Panasonic Electronic Components	ERJ-2RKF33R0X
29	0	R36, R56, R57	RES TKF 0R 1/10W SMD 0603	Yes	Panasonic	ERJ-3GSY0R00V
30	1	R41	RES TF 100k 1% 1/8W SMD 0603	Yes	Vishay	MCT06030C1003FP500
31	1	R52	RES TKF 2.2k 1% 1/10W SMD 0603	Yes	Panasonic	ERJ-3EKF2201V
32	2	R112, R114	RES TKF 100k 1% 1/10W AEC-Q200 SMD 0603	Yes	Panasonic Electronic Components	ERJ-3EKF1003V
33	1	SW1	SWITCH DIP 1 SPST 24V 25mA 418117270901 TH	Yes	Würth Elektronik	418117270901
34	7	TP1, TP4, TP6, TP7, TP8, TP10, TP11	MISC, TEST POINT MULTI PURPOSE MINI RED	Yes	Keystone	5000
35	5	TP2, TP3, TP5, TP9, TP16	MISC, TEST POINT MULTI PURPOSE MINI BLACK	Yes	Keystone	5001
36	4	TP12, TP13, TP14, TP15	MISC, TEST POINT PC MINI, 0.040" D YELLOW	Yes	Keystone	5004
37	1	U1	MCHP INTERFACE ETHERNET LAN8840 QFN-48	Yes	Microchip Technology	LAN8840T-V/PSA
38	1	U2	IC BUFFER NON-INVERT SN74LVC1G07DBVR SOT-23-5	Yes	Texas Instruments	SN74LVC1G07DBVR
39	1	U3	MCHP MEMORY SERIAL EEPROM 1kb I ² C 24AA014H-I/SN 8SOIC	Yes	Microchip Technology	24AA014H-I/SN
40	1	U4	MCHP ANALOG SWITCHER Buck 0.6V to 3.6V MIC33153YHJ-TR VFDFN-14	Yes	Microchip Technology	MIC33153YHJ-TR
41	1	U5	MCHP CLOCK GENERATION BUFFER1:3 15-145,170Mhz SOT-23-6	Yes	Microchip Technology	PL102-10TC
42	1	U7	MCHP ANALOG SUPERVISOR 0.4V to 5.5V MIC2790N-04VD6 SOT-23-3	Yes	Microchip Technology	MIC2790N-04VD6
43	1	Y1	MCHP CRYSTAL 25Mhz 10pF SMD L3.2W2.5H0.8	Yes	Microchip Technology	VXM7-9013-25M0000000

NOTES:



LAN8840 EDS2 DAUGHTER CARD USER'S GUIDE

Appendix C. PCB Layers

C.1 INTRODUCTION

This appendix contains the LAN8840 EDS2 Daughter Card's silkscreen top and bottom layers.

FIGURE C-1: LAN8840 EDS2 DAUGHTER CARD TOP SILK SCREEN

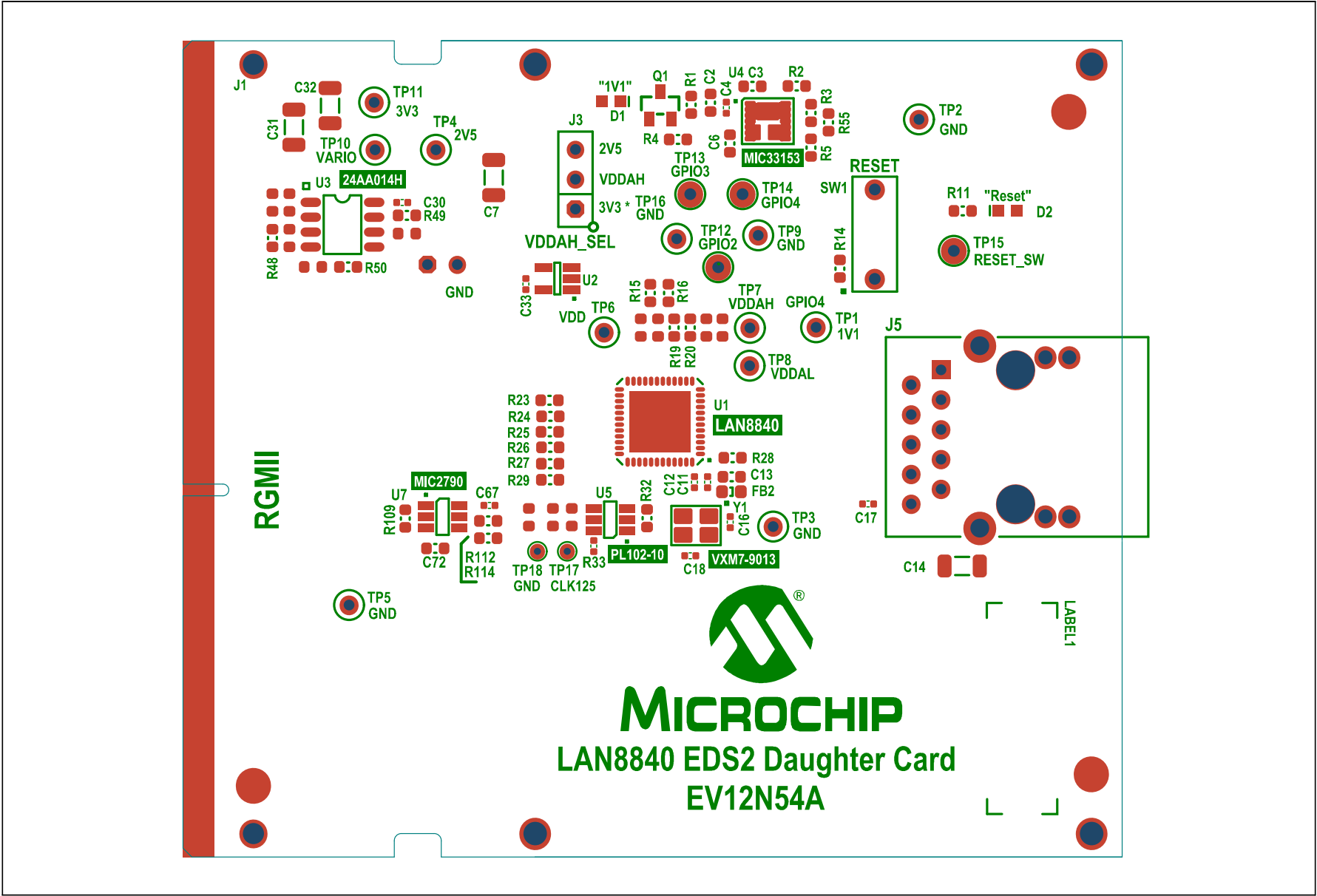


FIGURE C-2: LAN8840 EDS2 DAUGHTER CARD TOP LAYER

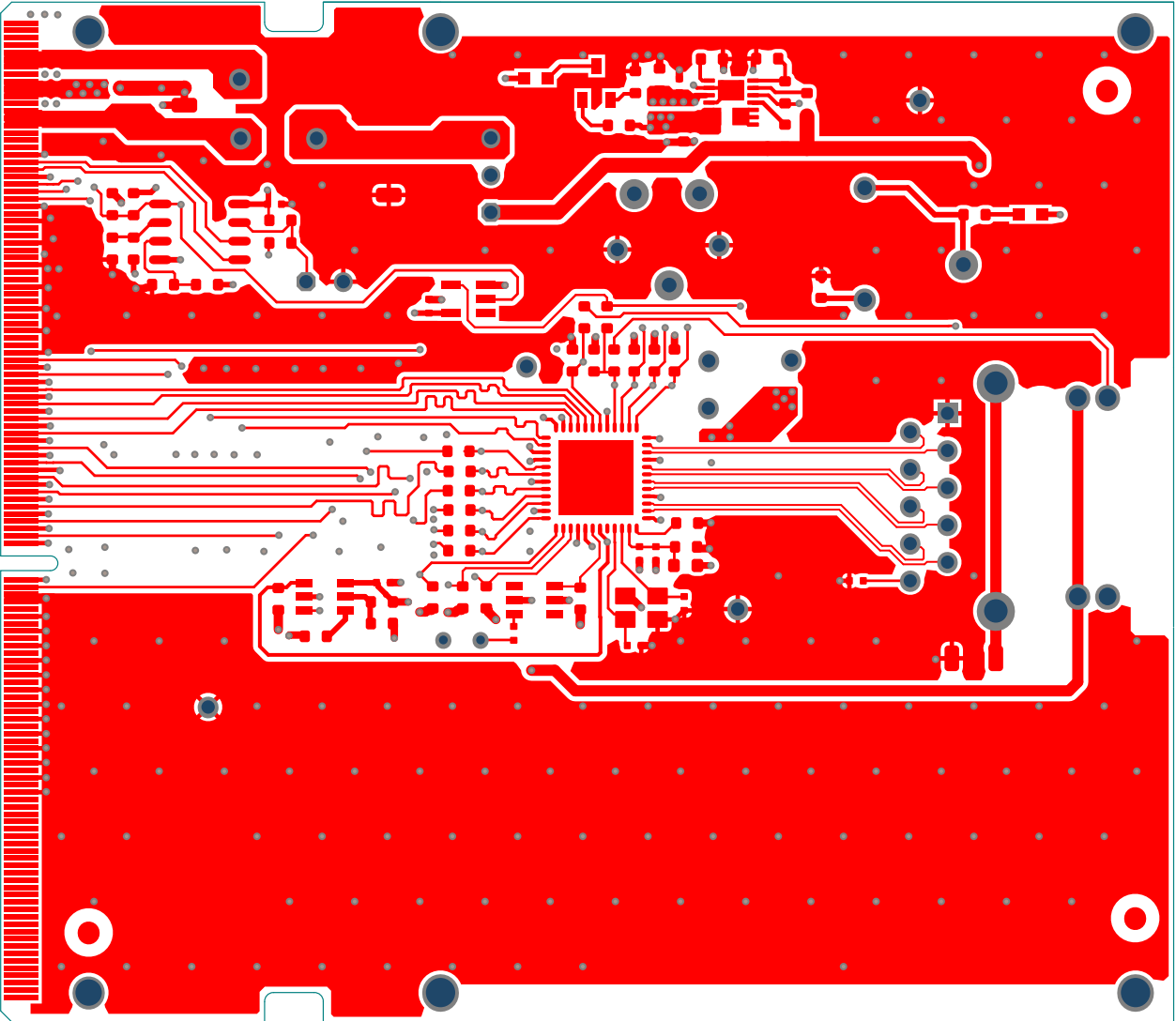


FIGURE C-3: LAN8840 EDS2 DAUGHTER CARD BOTTOM LAYER

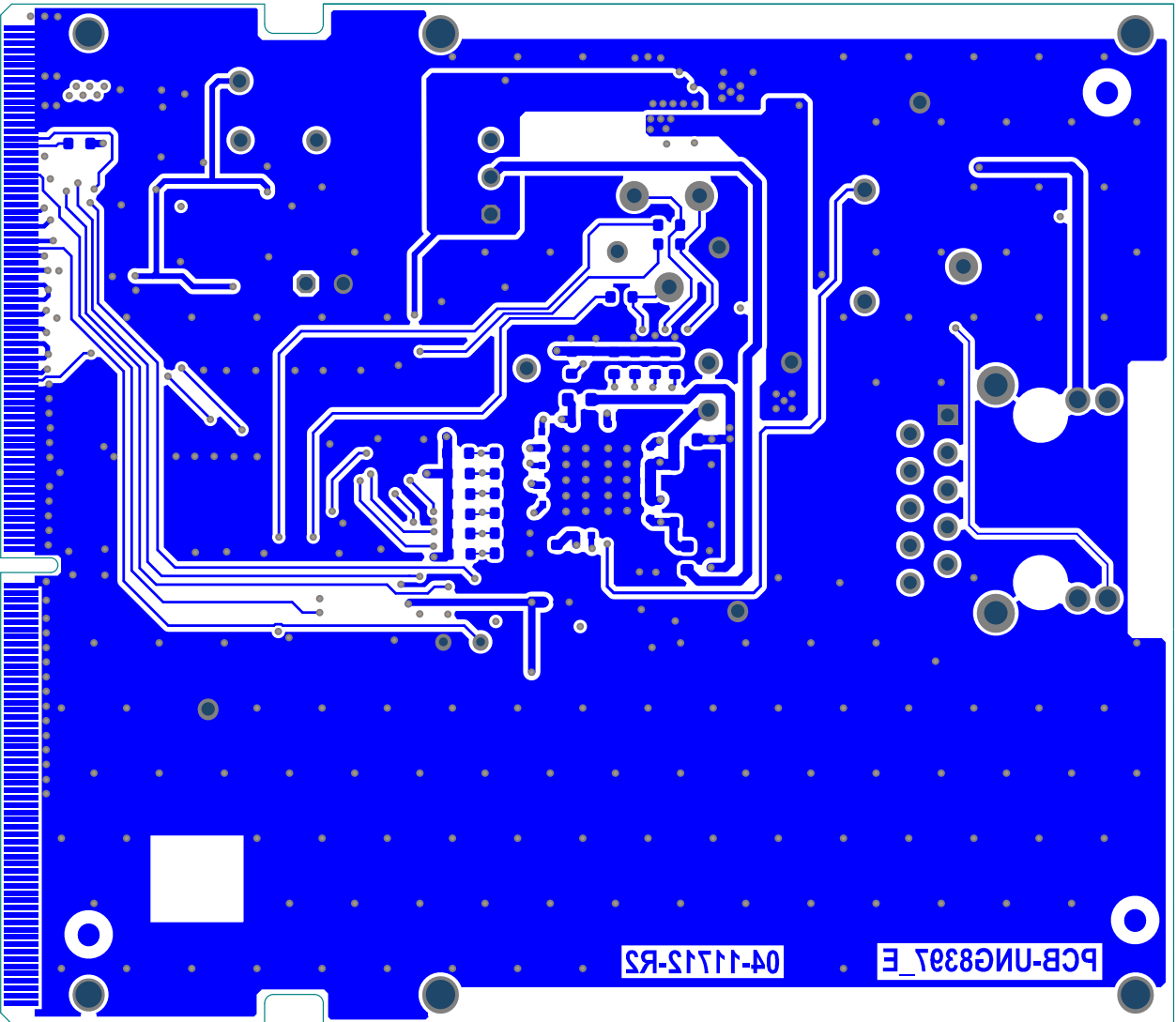
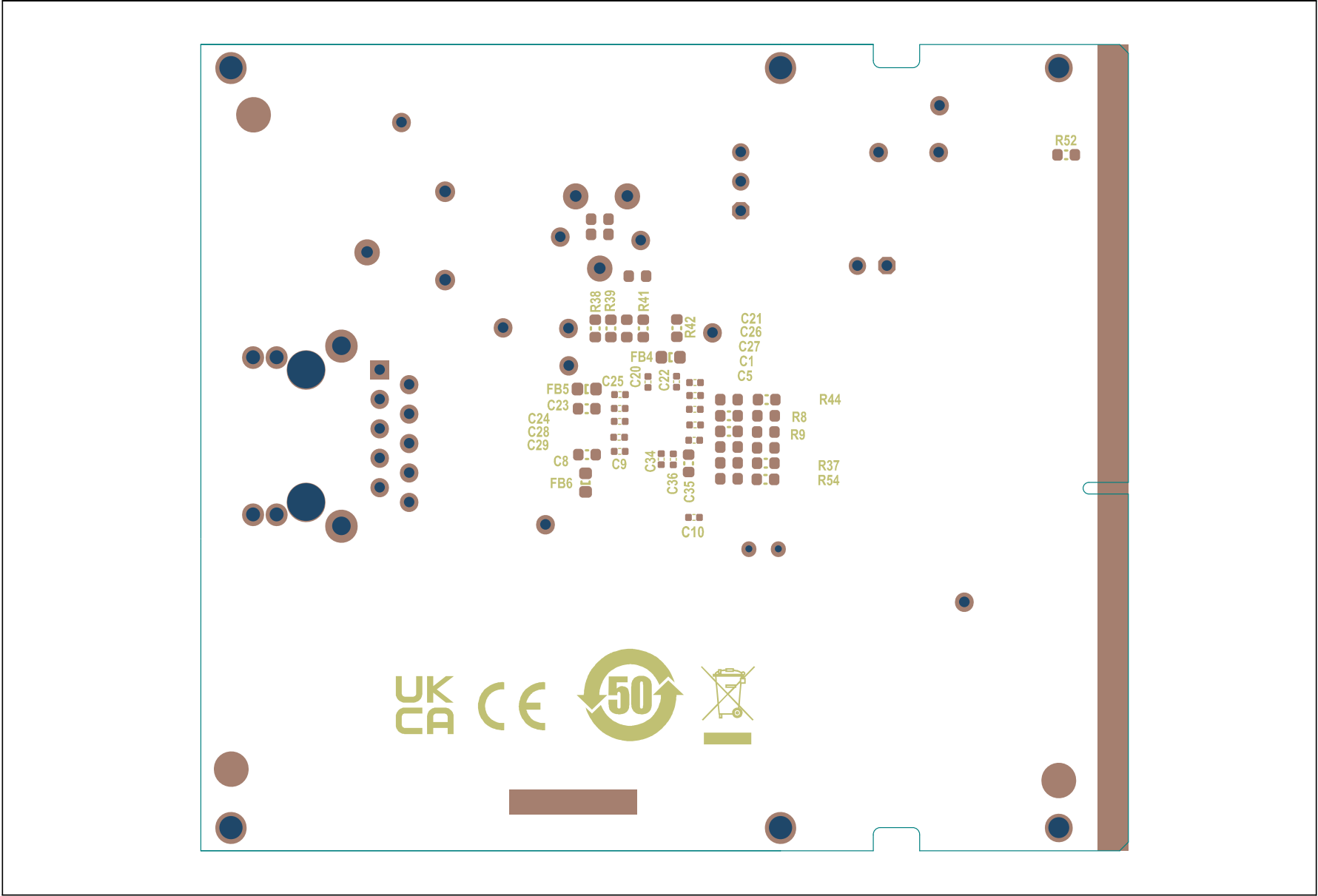


FIGURE C-4: LAN8840 EDS2 DAUGHTER CARD BOTTOM SILK SCREEN



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Tel: 408-436-4270

Canada - Toronto
Tel: 905-695-1980
Fax: 905-695-2078

ASIA/PACIFIC

Australia - Sydney
Tel: 61-2-9868-6733

China - Beijing
Tel: 86-10-8569-7000

China - Chengdu
Tel: 86-28-8665-5511

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Tel: 86-20-8755-8029

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China - Qingdao
Tel: 86-532-8502-7355

China - Shanghai
Tel: 86-21-3326-8000

China - Shenyang
Tel: 86-24-2334-2829

China - Shenzhen
Tel: 86-755-8864-2200

China - Suzhou
Tel: 86-186-6233-1526

China - Wuhan
Tel: 86-27-5980-5300

China - Xian
Tel: 86-29-8833-7252

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Tel: 86-592-2388138

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Tel: 86-756-3210040

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India - New Delhi
Tel: 91-11-4160-8631

India - Pune
Tel: 91-20-4121-0141

Japan - Osaka
Tel: 81-6-6152-7160

Japan - Tokyo
Tel: 81-3-6880-3770

Korea - Daegu
Tel: 82-53-744-4301

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Malaysia - Penang
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Philippines - Manila
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Fax: 45-4485-2829

Finland - Espoo
Tel: 358-9-4520-820

France - Paris
Tel: 33-1-69-53-63-20
Fax: 33-1-69-30-90-79

Germany - Garching
Tel: 49-8931-9700

Germany - Haan
Tel: 49-2129-3766400

Germany - Heilbronn
Tel: 49-7131-72400

Germany - Karlsruhe
Tel: 49-721-625370

Germany - Munich
Tel: 49-89-627-144-0
Fax: 49-89-627-144-44

Germany - Rosenheim
Tel: 49-8031-354-560

Israel - Hod Hasharon
Tel: 972-9-775-5100

Italy - Milan
Tel: 39-0331-742611
Fax: 39-0331-466781

Italy - Padova
Tel: 39-049-7625286

Netherlands - Drunen
Tel: 31-416-690399
Fax: 31-416-690340

Norway - Trondheim
Tel: 47-7288-4388

Poland - Warsaw
Tel: 48-22-3325737

Romania - Bucharest
Tel: 40-21-407-87-50

Spain - Madrid
Tel: 34-91-708-08-90
Fax: 34-91-708-08-91

Sweden - Gothenberg
Tel: 46-31-704-60-40

Sweden - Stockholm
Tel: 46-8-5090-4654

UK - Wokingham
Tel: 44-118-921-5800
Fax: 44-118-921-5820