EVB-LAN9252-SPI
Quick Start Guide

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Signed for and on behalf of Microchip Technology Inc. at Chandler, Arizona, USA.

Rodger Richey
Director of Development Tools

4/4/17

Date

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Preface

NOTICE TO CUSTOMERS

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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 and configuring the EVB-LAN9252-SPI. 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 configure the EVB-LAN9252-SPI, such as the DIGIO and SPI, as well as various setup options, scanning, and programming. The manual layout is as follows:

- **Chapter 1. "Overview"** – Shows a brief description of the EVB-LAN9252-SPI board quick setup.
- **Chapter 2. "EVB-LAN9252-SPI"** – Provides instructions in configuring SPI.
- **Appendix A. "EVB-LAN9252-SPI Evaluation Board Schematics"** – This appendix shows how to set up Master in Windows.

CONVENTIONS USED IN THIS GUIDE

This manual uses the following documentation conventions:

DOCUMENTATION CONVENTIONS

Description	Represents	Examples
Arial font:		
Italic characters	Referenced books	*MPLAB® IDE User's Guide*
	Emphasized text	...is the *only* 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	*File>Save*
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	*`file`*`.o`, where *`file`* can be any valid filename
Square brackets [ ]	Optional arguments	`mcc18 [options]` *`file`* `[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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- **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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- Distributor or Representative
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- Field Application Engineer (FAE)
- Technical Support

Customers should contact their distributor, representative or field application engineer (FAE) for support. Local sales offices are also available to help customers. A listing of sales offices and locations is included in the back of this document.

Technical support is available through the web site at:
http://www.microchip.com/support

DOCUMENT REVISION HISTORY

Revisions	Section/Figure/Entry	Correction
DS50002604A (05-30-17)	Initial release of document	

Chapter 1. Overview

1.1 INTRODUCTION

The EVB-LAN9252-SPI board is intended to be a generic interface to many third party processors used in EtherCAT Slave applications. The EVB-LAN9252-SPI is designed to be a simple interface to the SPI port, with test points for power and ground. The evaluation board uses standard RJ45 connectors to connect to the EtherCAT system and can be used to begin software development of the EtherCAT Slave code before the final hardware is completed.

1.1.1 References

The following documents should be referenced when using this quick start guide. See your Microchip representative for availability.

- *LAN9252 - 2/3-Port EtherCAT Slave Controller with Integrated Ethernet PHYs*
- *LAN9252 Migration Guide from the Beckhoff ET1100*
- *LAN9252_C2000_SDK_V1.0*
- *LAN9252_C2000_SDK_V1.1*

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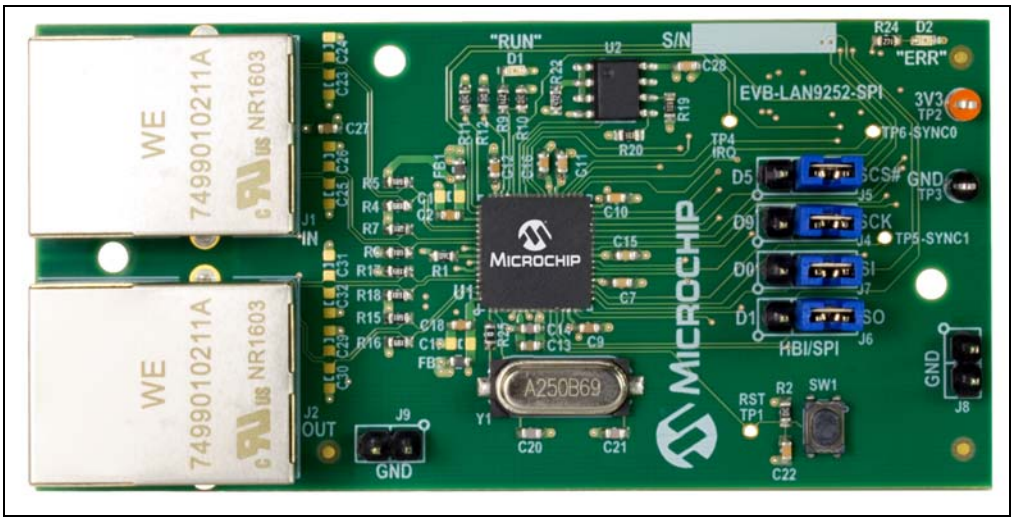
Chapter 2. EVB-LAN9252-SPI

2.1 EVB-LAN9252-SPI BOARD DESIGN

This section is an overview of the EVB-LAN9252-SPI board design and interface. The board is intended to provide an interface to the SPI port of a microcontroller development platform.

FIGURE 2-1: EVB-LAN9252-SPI TOP VIEW



2.1.1 SPI Headers

The four signals used for SPI communication with LAN9252 are exposed via headers (**J4-J7**). These can direct the signals to the connector J3 as HBI or SPI, or be used to fly-wire SPI between boards.

- **J4** is connected to pin 19 of LAN9252. Connect a jumper between pins 1 and 2 to route the signal to the D9 pin of J3. Jumper pins 2 and 3 to connect the signal to pin SCK of J3. Alternatively, remove the jumper and wire the SPI Clock directly to pin 2 of this header.
- **J5** is connected to pin 50 of the LAN9252. Connect a jumper between pins 1 and 2 to route the signal to the D5 pin of J3. Jumper pins 2 and 3 to connect the signal to pin SCS# of J3. Alternatively, remove the jumper and wire the SPI Chip Select directly to pin 2 of this header.
- **J6** is connected to pin 13 of the LAN9252. Connect a jumper between pins 1 and 2 to route the signal to the D1 pin of J3. Jumper pins 2 and 3 to connect the signal to pin S0 of J3. Alternatively, remove the jumper and wire the SPI Slave Data Out (SPI Master In) directly to pin 2 of this header.
- **J7** is connected to pin 17 of the LAN9252. Connect a jumper between pins 1 and 2 to route the signal to the D0 pin of J3. Jumper pins 2 and 3 to connect the signal to pin SI of J3. Alternatively, remove the jumper and wire the SPI Slave Data In (SPI Master Out) directly to pin 2 of this header.

2.1.2 Power

When connected to a compatible development system through **J3**, the power test points are to be used to confirm a proper voltage is present on the board. When wiring the board to an external development board, the power test points are used to connect an external power supply to the board.

- **TP2** is tied to the 3.3V supply for the LAN9252 and the EEPROM for configuration.
- **TP3** is tied to the GND plane of the board. Additional GND access can be found on **J8** and **J9**.

2.1.3 Digital Interface Connector

EVB-LAN9252-SPI also has a mass interface connector on the bottom of the board. This interface is used to connect many of the LAN9252 signals to third party development platforms. These pins enable evaluation of HBI and SPI abstraction using LAN9252. LAN9252 must also be configured with the correct ESI (EtherCAT Slave Information) via EEPROM for these signals to be active.

FIGURE 2-2: EVB-LAN9252-SPI BOTTOM VIEW

2.2 INTERFACING WITH A THIRD PARTY PROCESSOR VIA SPI

The EVB-LAN9252-SPI can be connected to any microprocessor development platform with exposed SPI pins. Once the pins have been connected properly, software development can begin. The process can be broken down into three steps:

2.2.1 Connect pins

1. Connect the SPI pins to **J4-J7**.
2. Connect to Power Test Points to a bench supply, or 3.3V supply on the processor board. Connect GND to **TP3** and 3.3V to **TP2**.

2.2.2 Configure Slave Software

There are four ways to program the processor to act as an EtherCAT Slave Device. The different methods have different degrees of development needed to get to a solution ready for the next stage in the process.

- When using an existing EtherCAT Slave solution, refer to the LAN9252 Migration guide for details on how to replace the existing ET1100 interface libraries with the LAN9252 equivalent. All other code can remain the same.
- When using a processor with a LAN9252 SDK, the Slave Source Code (SSC) tool from Beckhoff can be used to automatically generate EtherCAT Slave code. In the SDK are template files that are used to speed the process along. Refer to the LAN9252 product page for the latest SDKs in the software library section.
- The `EVB-LAN9252_HBIPLUS_SDK_V1.3` is an example of an SDK that has template libraries to help with development.
- When using a processor that only has LAN9252 drivers, the Slave Source Code tool can still be used. There will not be template files for faster development, and the developer will need to manually add the LAN9252 driver files into the SSC and develop the processor specific interface code to the necessary peripherals used.
  - The `LAN9252_C2000_Drivers_V1.0` is an example of the drivers provided for the LAN9252.
- When using a processor without any drivers, the developer will need to develop both the LAN9252 SPI interface libraries as well as the processor specific interface code to the peripherals used.

2.2.3 Configure System from EtherCAT Master

Once the Slave Source Code has been developed and programmed onto the processor, the LAN9252 can be connected to an EtherCAT Master. Use the ESI files and EEPROM configuration settings to properly set up the LAN9252 for the desired digital communication. Debug and test the Slave code in the full EtherCAT development environment.

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Appendix A. EVB-LAN9252-SPI Evaluation Board Schematics

A.1 INTRODUCTION

This appendix shows the EVB-LAN9252-SPI Evaluation Board Schematics.

FIGURE A-1: LAN9252-1

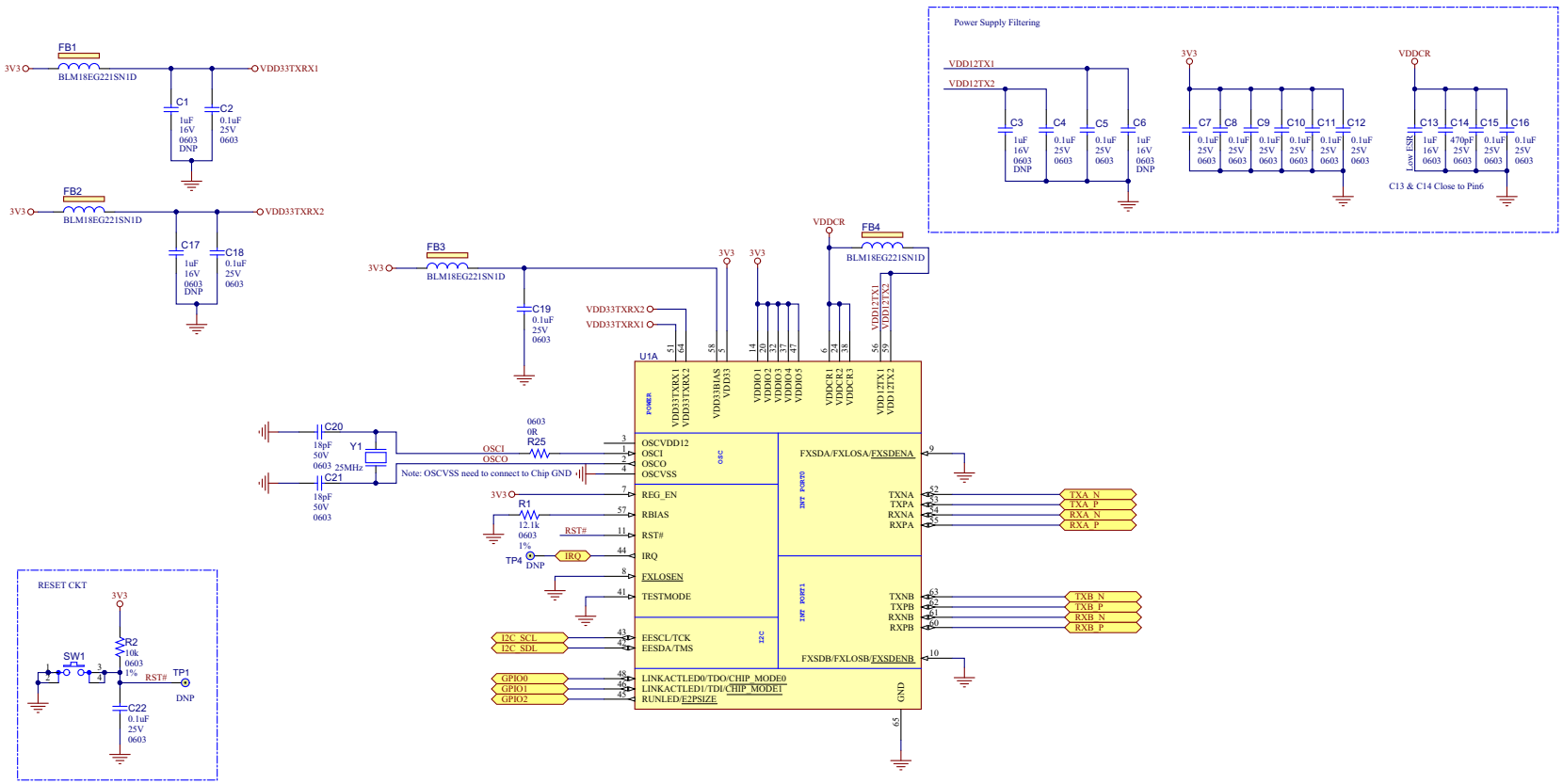


FIGURE A-2: LAN CONNECTORS, STRAP & EEPROM

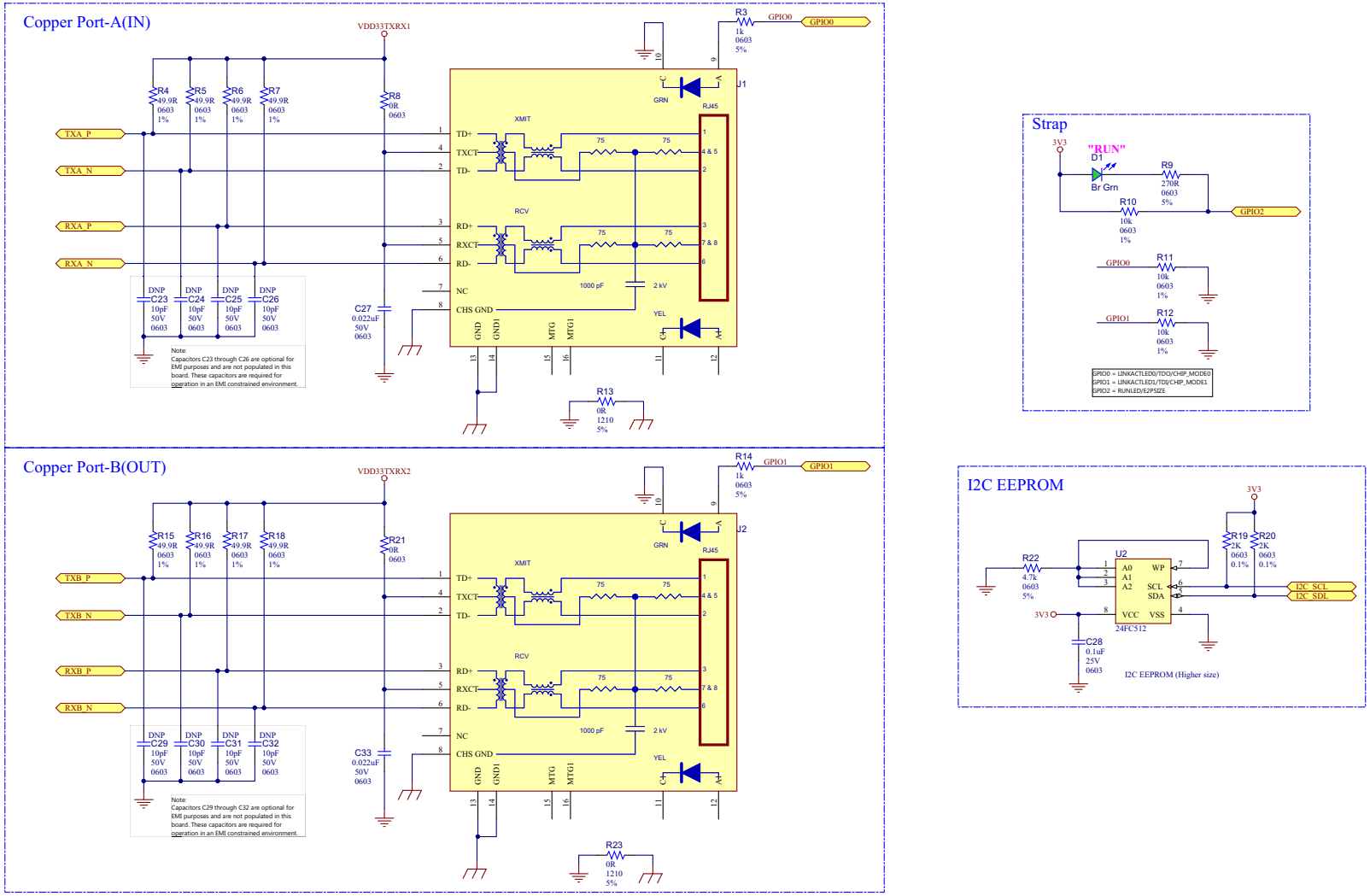
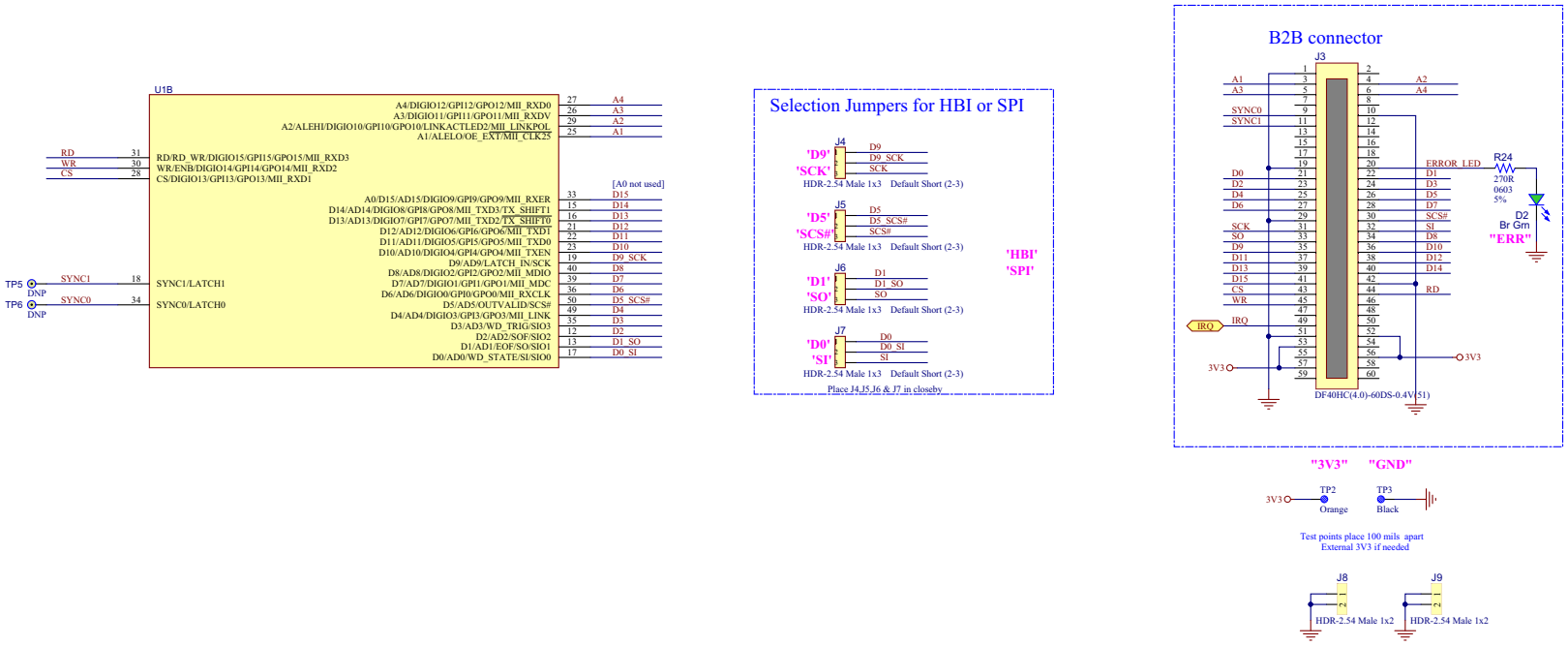


FIGURE A-3: LAN9252-2



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