



MICROCHIP

EVB-LAN9252-SPI Quick Start Guide

Note the following details of the code protection feature on Microchip devices:

- Microchip products meet the specification contained in their particular Microchip Data Sheet.
- Microchip believes that its family of products is one of the most secure families of its kind on the market today, when used in the intended manner and under normal conditions.
- There are dishonest and possibly illegal methods used to breach the code protection feature. All of these methods, to our knowledge, require using the Microchip products in a manner outside the operating specifications contained in Microchip's Data Sheets. Most likely, the person doing so is engaged in theft of intellectual property.
- Microchip is willing to work with the customer who is concerned about the integrity of their code.
- Neither Microchip nor any other semiconductor manufacturer can guarantee the security of their code. Code protection does not mean that we are guaranteeing the product as "unbreakable."

Code protection is constantly evolving. We at Microchip are committed to continuously improving the code protection features of our products. Attempts to break Microchip's code protection feature may be a violation of the Digital Millennium Copyright Act. If such acts allow unauthorized access to your software or other copyrighted work, you may have a right to sue for relief under that Act.

Information contained in this publication regarding device applications and the like is provided only for your convenience and may be superseded by updates. It is your responsibility to ensure that your application meets with your specifications. MICROCHIP MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND WHETHER EXPRESS OR IMPLIED, WRITTEN OR ORAL, STATUTORY OR OTHERWISE, RELATED TO THE INFORMATION, INCLUDING BUT NOT LIMITED TO ITS CONDITION, QUALITY, PERFORMANCE, MERCHANTABILITY OR FITNESS FOR PURPOSE. Microchip disclaims all liability arising from this information and its use. Use of Microchip devices in life support and/or safety applications is entirely at the buyer's risk, and the buyer agrees to defend, indemnify and hold harmless Microchip from any and all damages, claims, suits, or expenses resulting from such use. No licenses are conveyed, implicitly or otherwise, under any Microchip intellectual property rights unless otherwise stated.

Trademarks

The Microchip name and logo, the Microchip logo, AnyRate, AVR, AVR logo, AVR Freaks, BeaconThings, BitCloud, CryptoMemory, CryptoRF, dsPIC, FlashFlex, flexPWR, Helder, JukeBlox, KEELOQ, KEELOQ logo, Kleer, LANCheck, LINK MD, maXStylus, maXTouch, MediaLB, megaAVR, MOST, MOST logo, MPLAB, OptoLyzer, PIC, picoPower, PICSTART, PIC32 logo, Prochip Designer, QTouch, RightTouch, SAM-BA, SpyNIC, SST, SST Logo, SuperFlash, tinyAVR, UNI/O, and XMEGA are registered trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.

ClockWorks, The Embedded Control Solutions Company, EtherSynch, Hyper Speed Control, HyperLight Load, IntelliMOS, mTouch, Precision Edge, and Quiet-Wire are registered trademarks of Microchip Technology Incorporated in the U.S.A.

Adjacent Key Suppression, AKS, Analog-for-the-Digital Age, Any Capacitor, AnyIn, AnyOut, BodyCom, chipKIT, chipKIT logo, CodeGuard, CryptoAuthentication, CryptoCompanion, CryptoController, dsPICDEM, dsPICDEM.net, Dynamic Average Matching, DAM, ECAN, EtherGREEN, In-Circuit Serial Programming, ICSP, Inter-Chip Connectivity, JitterBlocker, KleerNet, KleerNet logo, Mindi, MiWi, motorBench, MPASM, MPF, MPLAB Certified logo, MPLIB, MPLINK, MultiTRAK, NetDetach, Omniscient Code Generation, PICDEM, PICDEM.net, PICkit, PICtail, PureSilicon, QMatrix, RightTouch logo, REAL ICE, Ripple Blocker, SAM-ICE, Serial Quad I/O, SMART-I.S., SQI, SuperSwitcher, SuperSwitcher II, Total Endurance, TSHARC, USBCheck, VariSense, ViewSpan, WiperLock, Wireless DNA, and ZENA are trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.

SQTP is a service mark of Microchip Technology Incorporated in the U.S.A.

Silicon Storage Technology is a registered trademark of Microchip Technology Inc. in other countries.

GestIC is a registered trademark of Microchip Technology Germany II GmbH & Co. KG, a subsidiary of Microchip Technology Inc., in other countries.

All other trademarks mentioned herein are property of their respective companies.

© 2017, Microchip Technology Incorporated, All Rights Reserved.

ISBN: 9781522417620

QUALITY MANAGEMENT SYSTEM
CERTIFIED BY DNV
= ISO/TS 16949 =

Microchip received ISO/TS-16949:2009 certification for its worldwide headquarters, design and wafer fabrication facilities in Chandler and Tempe, Arizona; Gresham, Oregon and design centers in California and India. The Company's quality system processes and procedures are for its PIC® MCUs and dsPIC® DSCs, KEELOQ® code hopping devices, Serial EEPROMs, microperipherals, nonvolatile memory and analog products. In addition, Microchip's quality system for the design and manufacture of development systems is ISO 9001:2000 certified.

Object of Declaration: EVB-LAN9252-SPI

EU Declaration of Conformity

This declaration of conformity is issued by the manufacturer.

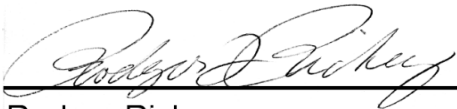
The development/evaluation tool is designed to be used for research and development in a laboratory environment. This development/evaluation tool is not a Finished Appliance, nor is it intended for incorporation into Finished Appliances that are made commercially available as single functional units to end users under EU EMC Directive 2004/108/EC and as supported by the European Commission's Guide for the EMC Directive 2004/108/EC (8th February 2010).

This development/evaluation tool complies with EU RoHS2 Directive 2011/65/EU.

This development/evaluation tool, when incorporating wireless and radio-telecom functionality, is in compliance with the essential requirement and other relevant provisions of the R&TTE Directive 1999/5/EC and the FCC rules as stated in the declaration of conformity provided in the module datasheet and the module product page available at www.microchip.com.

For information regarding the exclusive, limited warranties applicable to Microchip products, please see Microchip's standard terms and conditions of sale, which are printed on our sales documentation and available at www.microchip.com.

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



Rodger Richey
Director of Development Tools



Date

NOTES:

Table of Contents

Preface	7
Introduction.....	7
Document Layout	7
Conventions Used in this Guide	8
The Microchip Web Site	9
Development Systems Customer Change Notification Service	9
Customer Support	9
Document Revision History	10
Chapter 1. Overview	
1.1 Introduction	11
1.1.1 References	11
Chapter 2. EVB-LAN9252-SPI	
2.1 EVB-LAN9252-SPI Board Design	13
2.1.1 SPI Headers	13
2.1.2 Power	14
2.1.3 Digital Interface Connector	14
2.2 Interfacing with a Third Party Processor via SPI	14
2.2.1 Connect pins	14
2.2.2 Configure Slave Software	15
2.2.3 Configure System from EtherCAT Master	15
Appendix A. EVB-LAN9252-SPI Evaluation Board Schematics	
A.1 Introduction	17
Worldwide Sales and Service	22

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 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	<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) { ... }

THE MICROCHIP WEB SITE

Microchip provides online support via our web site at www.microchip.com. This web site is used as a means to make files and information easily available to customers. Accessible by using your favorite Internet browser, the web site contains the following information:

- **Product Support** – Data sheets and errata, application notes and sample programs, design resources, user's guides and hardware support documents, latest software releases and archived software
- **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

DEVELOPMENT SYSTEMS CUSTOMER CHANGE NOTIFICATION SERVICE

Microchip's customer notification service helps keep customers current on Microchip products. Subscribers will receive e-mail notification whenever there are changes, updates, revisions or errata related to a specified product family or development tool of interest.

To register, access the Microchip web site at www.microchip.com, click on Customer Change Notification and follow the registration instructions.

The Development Systems product group categories are:

- **Compilers** – The latest information on Microchip C compilers, assemblers, linkers and other language tools. These include all MPLAB C compilers; all MPLAB assemblers (including MPASM assembler); all MPLAB linkers (including MPLINK object linker); and all MPLAB librarians (including MPLIB object librarian).
- **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

Users of Microchip products can receive assistance through several channels:

- Distributor or Representative
- Local Sales Office
- 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*

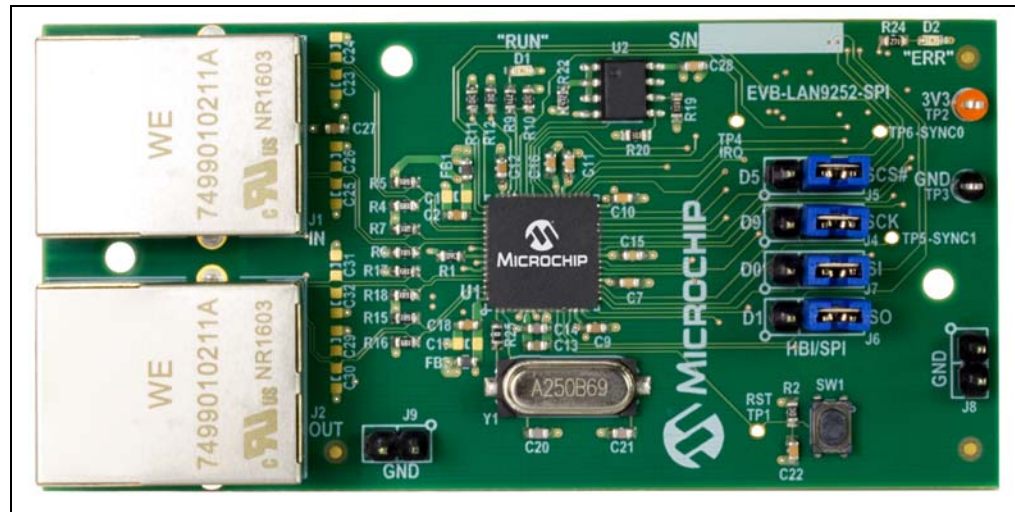
NOTES:

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 S1 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



2.2.2 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.

NOTES:

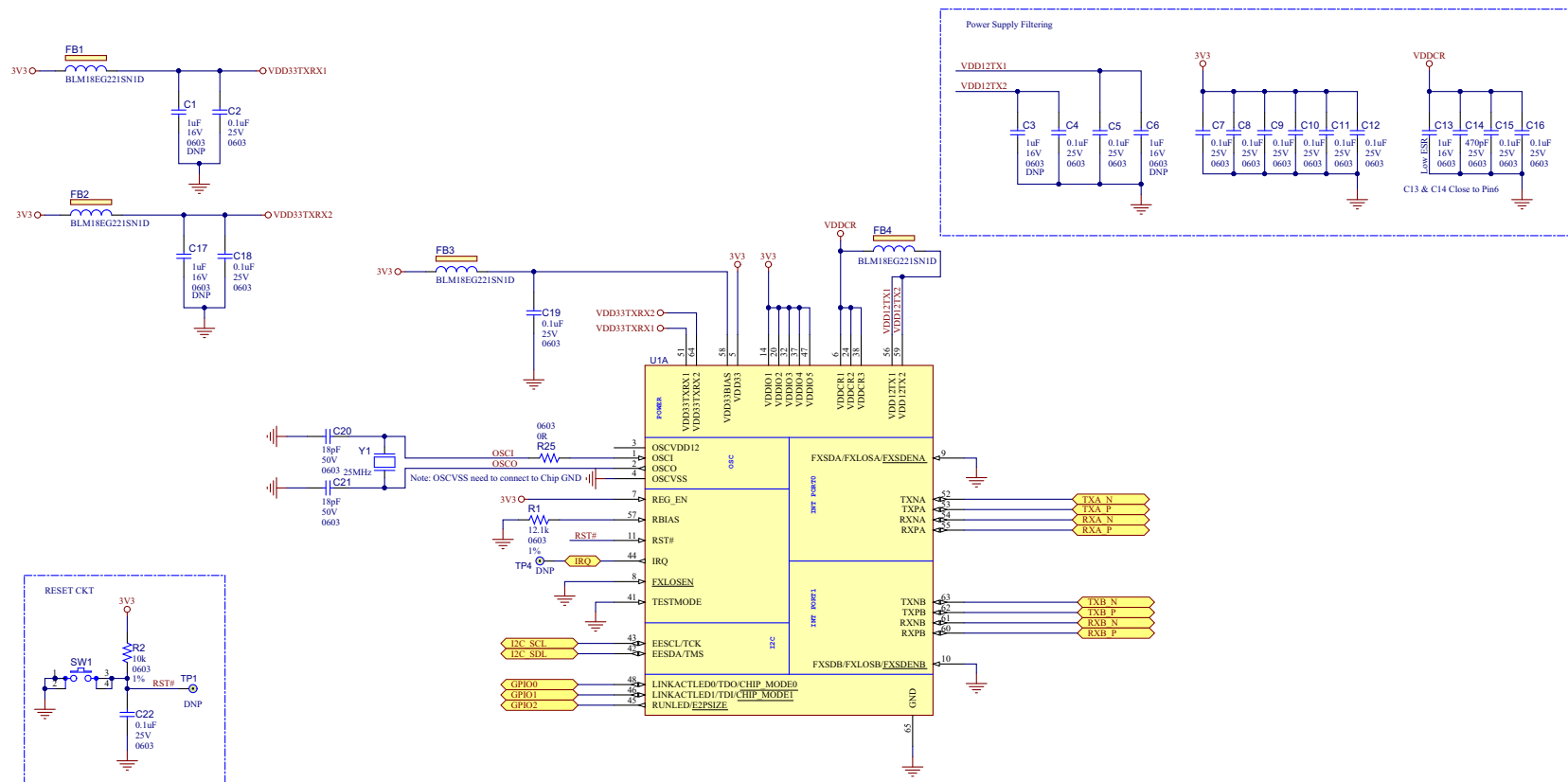
Appendix A. EVB-LAN9252-SPI Evaluation Board Schematics

A.1 INTRODUCTION

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

FIGURE A-1: LAN9252-1

LAN9252-PART1



Copper Port-A(IN)

VDD33TXRX1

TXA_P

TXA_N

RXA_P

RXA_N

DNP C23 10pF 50V 0603

DNP C24 10pF 50V 0603

DNP C25 10pF 50V 0603

DNP C26 10pF 50V 0603

Note: Capacitors C23 through C26 are optional for EMI purposes and are not populated in this board. These capacitors are required for operation in an EMI constrained environment.

C27 0.022uF 50V 0603

TXCT

TXCT

RD+

RD-

RXCT

RXCT

NC

CHS GND

GND

MTG

MTG

C

2kV

1000 pF

GPIO0

GPIO1

GPIO2

Copper Port-B(OUT)

VDD33TXRX2

TXB_P

TXB_N

RXB_P

RXB_N

DNP C29 10pF 50V 0603

DNP C30 10pF 50V 0603

DNP C31 10pF 50V 0603

DNP C32 10pF 50V 0603

Note: Capacitors C29 through C32 are optional for EMI purposes and are not populated in this board. These capacitors are required for operation in an EMI constrained environment.

C33 0.022uF 50V 0603

TXCT

TXCT

RD+

RD-

RXCT

RXCT

NC

CHS GND

GND

MTG

MTG

C

2kV

1000 pF

GPIO1

GPIO0

GPIO1

GPIO2

I2C EEPROM

U2 24FC512

R22 4.7k 0603 5%

R19 2k 0603 1%

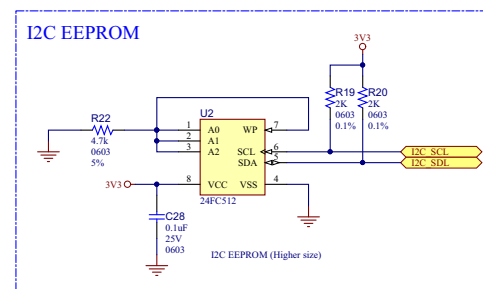
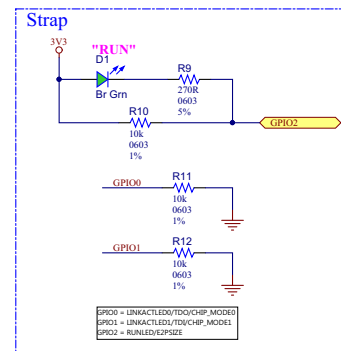
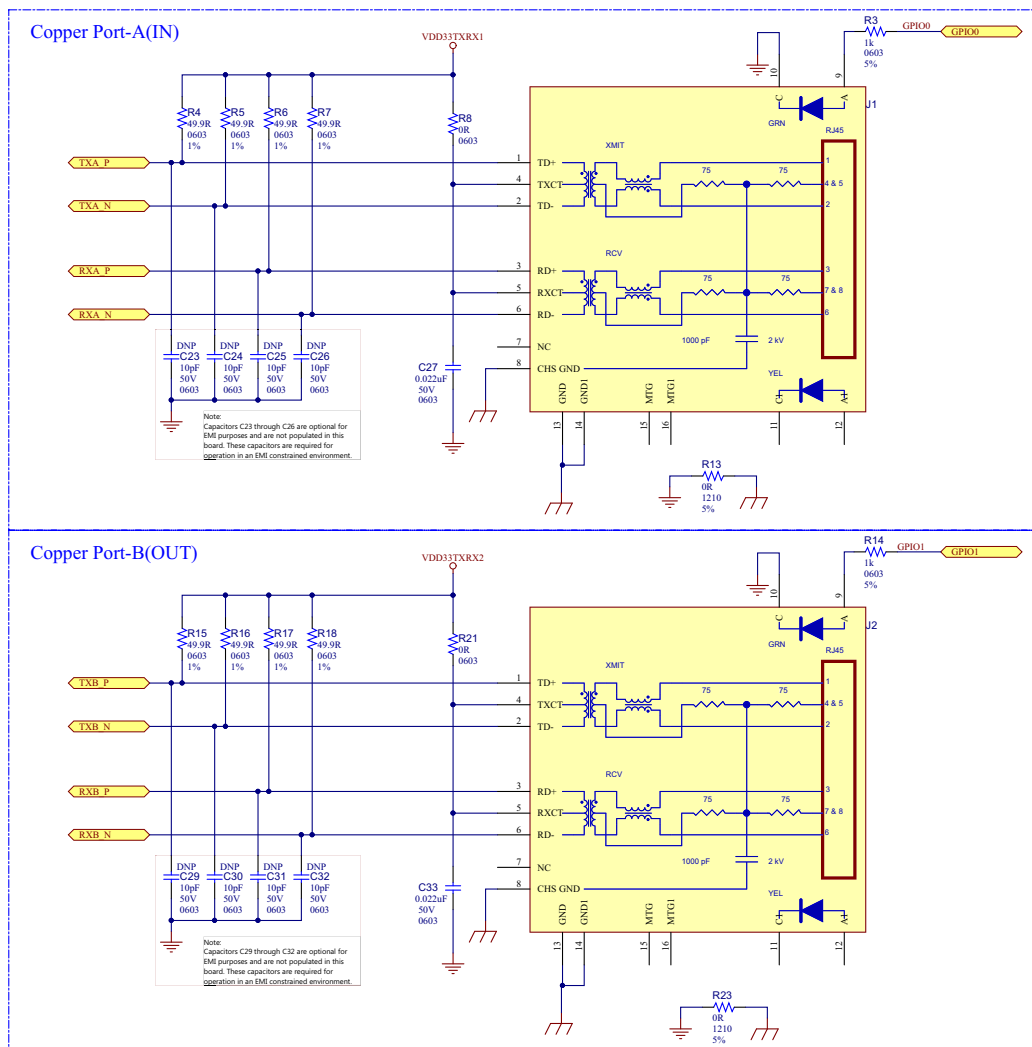
R20 2k 0603 1%

C28 0.1uF 25V 0603

I2C SCL

I2C SDA

I2C EEPROM (Higher size)



NOTES:

Worldwide Sales and Service

AMERICAS

Corporate Office
2355 West Chandler Blvd.
Chandler, AZ 85224-6199
Tel: 480-792-7200
Fax: 480-792-7277
Technical Support:
<http://www.microchip.com/support>
Web Address:
www.microchip.com

Atlanta
Duluth, GA
Tel: 678-957-9614
Fax: 678-957-1455

Austin, TX
Tel: 512-257-3370

Boston
Westborough, MA
Tel: 774-760-0087
Fax: 774-760-0088

Chicago
Itasca, IL
Tel: 630-285-0071
Fax: 630-285-0075

Dallas
Addison, TX
Tel: 972-818-7423
Fax: 972-818-2924

Detroit
Novi, MI
Tel: 248-848-4000

Houston, TX
Tel: 281-894-5983

Indianapolis
Noblesville, IN
Tel: 317-773-8323
Fax: 317-773-5453
Tel: 317-536-2380

Los Angeles
Mission Viejo, CA
Tel: 949-462-9523
Fax: 949-462-9608
Tel: 951-273-7800

Raleigh, NC
Tel: 919-844-7510

New York, NY
Tel: 631-435-6000

San Jose, CA
Tel: 408-735-9110
Tel: 408-436-4270

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

ASIA/PACIFIC

Asia Pacific Office
Suites 3707-14, 37th Floor
Tower 6, The Gateway
Harbour City, Kowloon

Hong Kong
Tel: 852-2943-5100
Fax: 852-2401-3431

Australia - Sydney
Tel: 61-2-9868-6733
Fax: 61-2-9868-6755

China - Beijing
Tel: 86-10-8569-7000
Fax: 86-10-8528-2104

China - Chengdu
Tel: 86-28-8665-5511
Fax: 86-28-8665-7889

China - Chongqing
Tel: 86-23-8980-9588
Fax: 86-23-8980-9500

China - Dongguan
Tel: 86-769-8702-9880

China - Guangzhou
Tel: 86-20-8755-8029

China - Hangzhou
Tel: 86-571-8792-8115
Fax: 86-571-8792-8116

China - Hong Kong SAR
Tel: 852-2943-5100
Fax: 852-2401-3431

China - Nanjing
Tel: 86-25-8473-2460
Fax: 86-25-8473-2470

China - Qingdao
Tel: 86-532-8502-7355
Fax: 86-532-8502-7205

China - Shanghai
Tel: 86-21-3326-8000
Fax: 86-21-3326-8021

China - Shenyang
Tel: 86-24-2334-2829
Fax: 86-24-2334-2393

China - Shenzhen
Tel: 86-755-8864-2200
Fax: 86-755-8203-1760

China - Wuhan
Tel: 86-27-5980-5300
Fax: 86-27-5980-5118

China - Xian
Tel: 86-29-8833-7252
Fax: 86-29-8833-7256

ASIA/PACIFIC

China - Xiamen
Tel: 86-592-2388138
Fax: 86-592-2388130

China - Zhuhai
Tel: 86-756-3210040
Fax: 86-756-3210049

India - Bangalore
Tel: 91-80-3090-4444
Fax: 91-80-3090-4123

India - New Delhi
Tel: 91-11-4160-8631
Fax: 91-11-4160-8632

India - Pune
Tel: 91-20-3019-1500

Japan - Osaka
Tel: 81-6-6152-7160
Fax: 81-6-6152-9310

Japan - Tokyo
Tel: 81-3-6880-3770
Fax: 81-3-6880-3771

Korea - Daegu
Tel: 82-53-744-4301
Fax: 82-53-744-4302

Korea - Seoul
Tel: 82-2-554-7200
Fax: 82-2-558-5932 or
82-2-558-5934

Malaysia - Kuala Lumpur
Tel: 60-3-6201-9857
Fax: 60-3-6201-9859

Malaysia - Penang
Tel: 60-4-227-8870
Fax: 60-4-227-4068

Philippines - Manila
Tel: 63-2-634-9065
Fax: 63-2-634-9069

Singapore
Tel: 65-6334-8870
Fax: 65-6334-8850

Taiwan - Hsin Chu
Tel: 886-3-5778-366
Fax: 886-3-5770-955

Taiwan - Kaohsiung
Tel: 886-7-213-7830

Taiwan - Taipei
Tel: 886-2-2508-8600
Fax: 886-2-2508-0102

Thailand - Bangkok
Tel: 66-2-694-1351
Fax: 66-2-694-1350

EUROPE

Austria - Wels
Tel: 43-7242-2244-39
Fax: 43-7242-2244-393

Denmark - Copenhagen
Tel: 45-4450-2828
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

France - Saint Cloud
Tel: 33-1-30-60-70-00

Germany - Garching
Tel: 49-8931-9700

Germany - Haan
Tel: 49-2129-3766400

Germany - Heilbronn
Tel: 49-7131-67-3636

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 - Ra'anana
Tel: 972-9-744-7705

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: 47-7289-7561

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