MTCH101 Evaluation Kit User's Guide

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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 "DSXXXXXA", where "XXXXX" 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 MTCH101 Evaluation Kit User's Guide. Items discussed in this chapter include:

- Document Layout
- Conventions Used in this Guide
- Recommended Reading
- The Microchip Web Site
- Development Systems Customer Change Notification Service
- Customer Support
- Revision History

DOCUMENT LAYOUT

This document describes how to use the MTCH101 Evaluation Kit User's Guide. The document is organized as follows:

- **Chapter 1. "MTCH101 Evaluation Kit Overview"**
- **Appendix A. "MTCH101 Controller Board Schematic"**
- **Appendix B. "MTCH101 Controller Board Layout "**
- **Appendix C. "MTCH101 Sensor Board Layout "**

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) { ... }`

RECOMMENDED READING

This user's guide describes how to use Microchip's MTCH101 Evaluation Kit. Other useful documents are listed below. The following Microchip documents are available and recommended as supplemental reference resources.

http://www.microchip.com

***"MTCH101 Single-Channel Proximity Detector"* Data Sheet (DS40001664)**

This data sheet provides detailed information regarding the MTCH101.

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:

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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 PICkit 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.

REVISION HISTORY

Revision A (October 2014)

Initial release of this document.

Chapter 1. MTCH101 Evaluation Kit Overview

1.1 INTRODUCTION

The MTCH101 Evaluation Kit is one of the quickest ways to implement and start evaluating Microchip's mTouch™ technology with minimum effort. The MTCH101 controller and the evaluation board feature a single-channel input which handles one Capacitive Touch Input sensor. The controller and the board can be used as a companion chip reporting back to a host system, although the evaluation board functions in complete autonomy and provides Touch feedback using an LED.

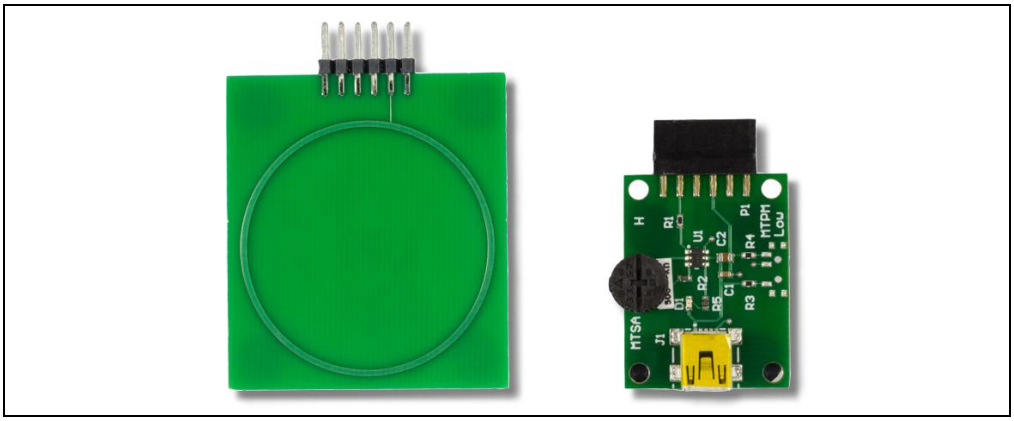
1.1.1 Kit Contents

- MTCH101 Controller Board
- MTCH101 Proximity Sensor Board
- Mini to USB-B Cable

1.2 HARDWARE SETUP

The MTCH101 Evaluation Kit includes the controller board onto which the MTCH101 chip is implemented, as well as a Proximity Sensor daughter board. The kit can also handle sensors to be used as buttons.

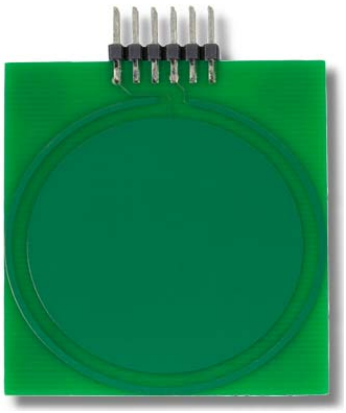
FIGURE 1-1: MTCH101 EVALUATION KIT BOARDS



1.2.1 MTCH101 Proximity Sensor Board

The Proximity Sensor board needs to be connected to the main controller board in order to get a fully functional Touch Input system.

FIGURE 1-2: MTCH101 PROXIMITY SENSOR BOARD



Users can connect their own sensor to the main board by using pin 2 of the header connector located to the right of the MTCH101 chip, labeled U1 on the board. The header connector also provides an optional Ground output on pin 4.

1.2.2 MTCH101 Controller Board

FIGURE 1-3: MTCH101 CONTROLLER BOARD

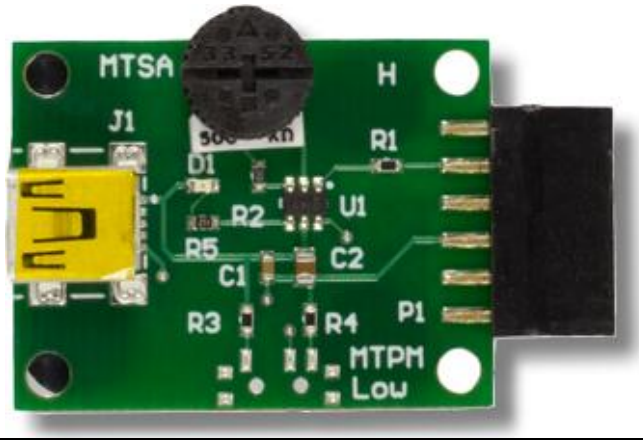


Figure 1-3 shows the Controller board with the MTCH101 chip (U1 Chip on board). It is responsible for the touch event detection, its processing, and its output by lighting the red LED (D1). It expects a capacitive touch sensor on the female 12-pin header connector to the right of the chip. The Proximity sensor board included in the package can be connected or the user can connect one sensor to pin 2 of the 12-pin header connector.

1.2.2.1 POWER-UP

To the left of the U1 chip is the mini-USB connector (J1) used to power the controller board. This connector only provides voltage (5V) to the board. It is not used for any communications.

1.2.2.2 TOUCH SENSITIVITY ADJUSTMENT

At the top of the controller board, a potentiometer (MTSA Label) allows alteration to the sensitivity of the Touch or Proximity sensor. This directly affects the voltage of MTSA input of the MTCH101 controller. For further information on Sensitivity Adjustment, please refer to the MTCH101 data sheet (DS40001664).

1.2.2.3 POWER CONSUMPTION MANAGEMENT

The MTCH101 controller provides a way to manage two working modes with different power consumption options for the system. These modes are called Normal and Low-Power. They are selected by input pin MTPM of the MTCH101 controller.

When powered, by default the board sets the controller to work in Normal mode by applying a high level to the MTPM pin. The user can select the Low-Power mode by shorting the two headers labeled '**MTPM Low**' at the bottom-right part of the controller board. Disconnecting the headers returns the board to a 'Normal' working mode and consumption.

1.2.2.4 INPUT INTERFACE

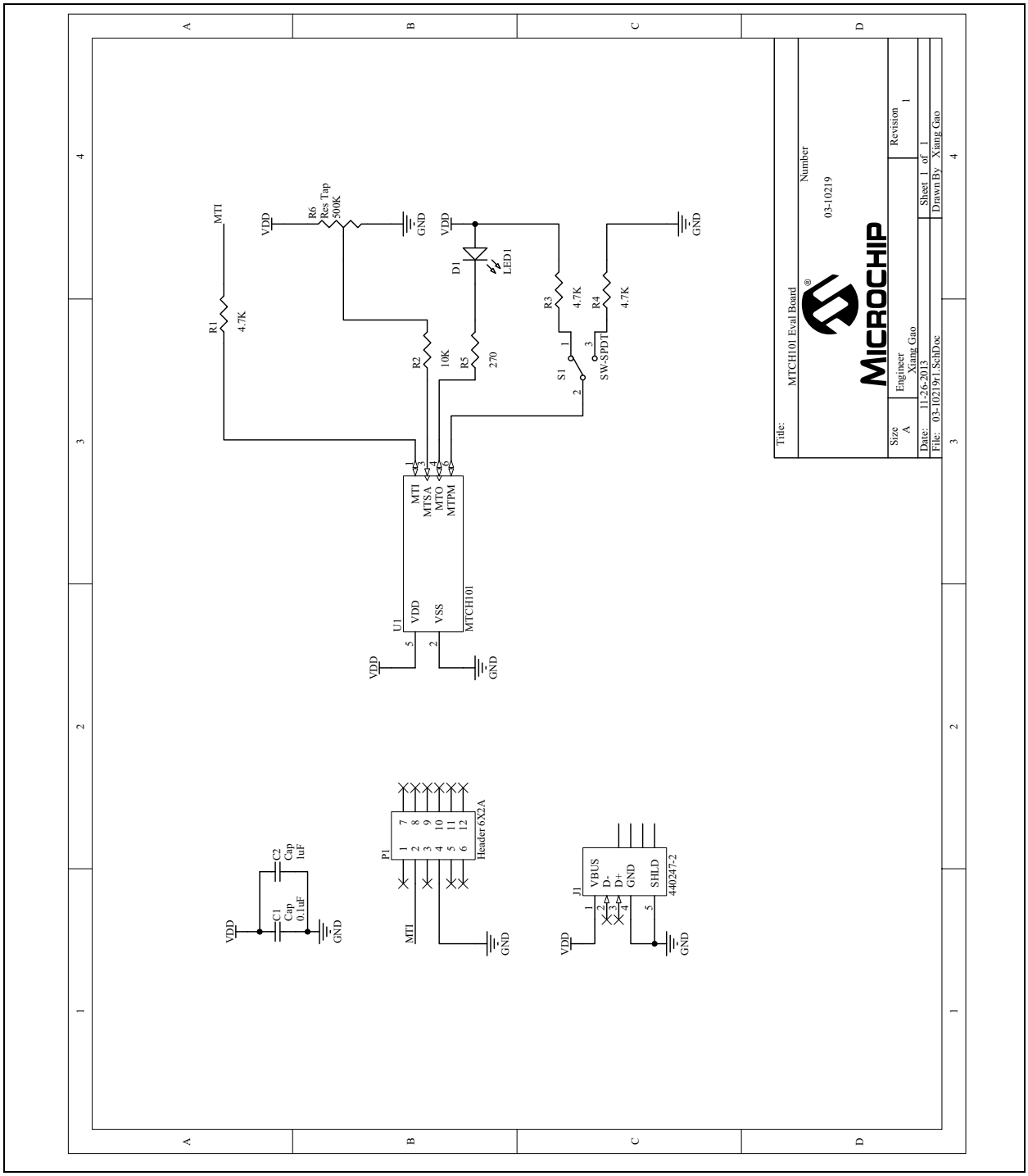
The MTCH101 controller board uses pin 2 of the 12-pin header connector to detect Touch or Proximity events from a sensor. This input is connected to the MTI pin of the MTCH101 controller through a 4.7K resistor. This allows a sensor to be directly connected to the board.

1.2.2.5 EVENT OUTPUT INTERFACE

The MTCH101 controller uses its MTO pin to transmit a Touch or Proximity event to a host. The MTCH101 Controller board uses this output to light up the red LED, whenever a Touch or Proximity event is detected.

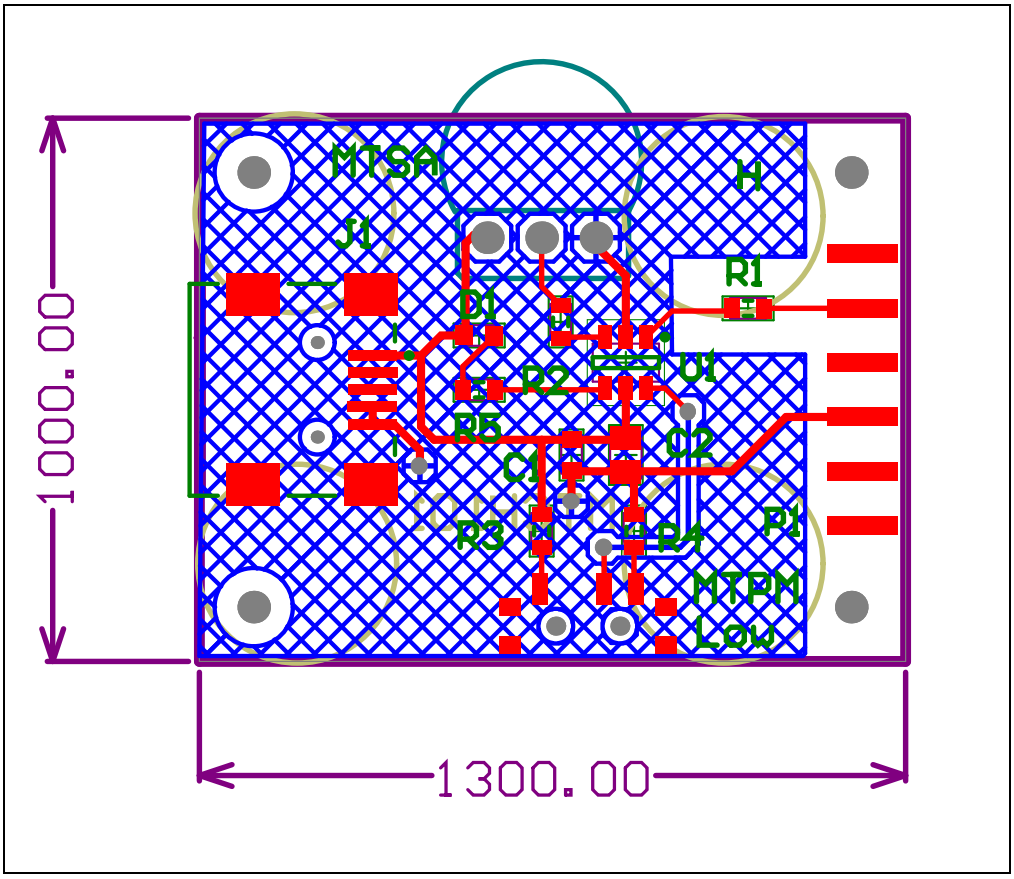
Appendix A. MTCH101 Controller Board Schematic

FIGURE A-1: MTCH101 CONTROLLER BOARD SCHEMATIC



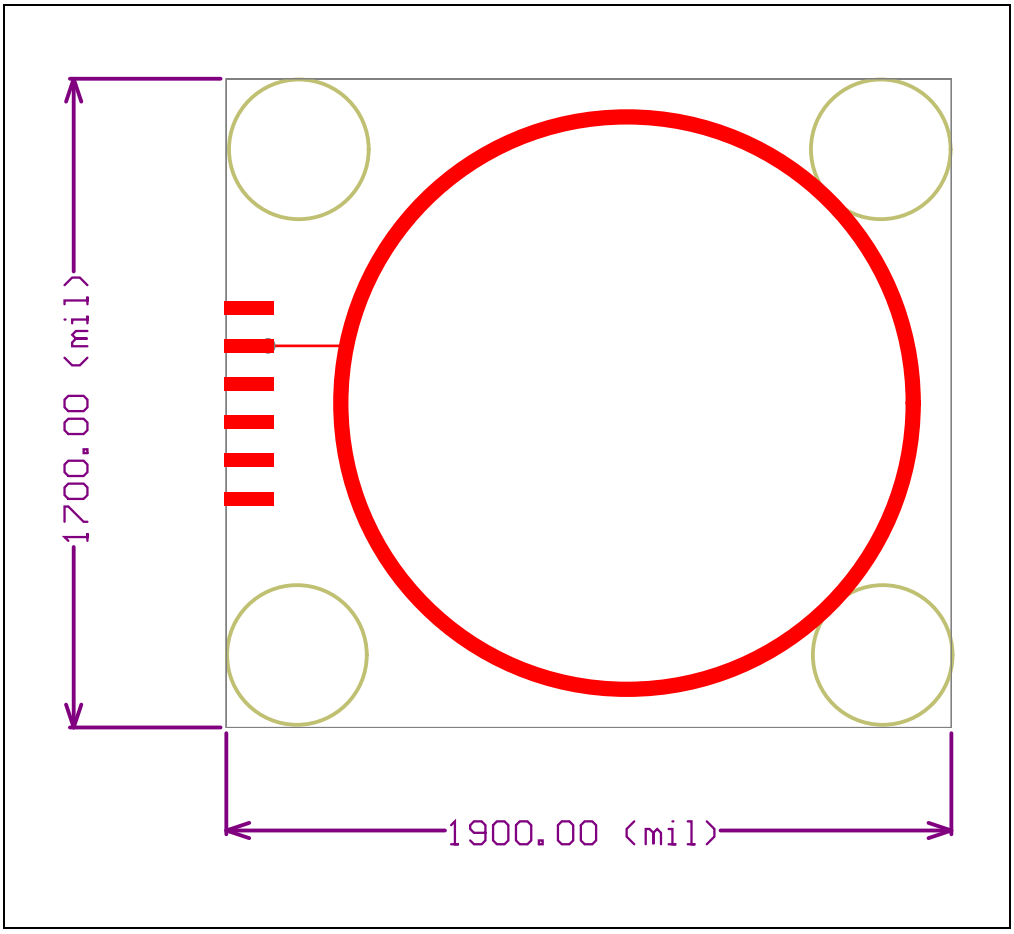
Appendix B. MTCH101 Controller Board Layout

FIGURE B-1: MTCH101 CONTROLLER BOARD LAYOUT



Appendix C. MTCH101 Sensor Board Layout

FIGURE C-1: MTCH101 SENSOR BOARD LAYOUT



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