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.
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INTRODUCTION

This chapter contains general information that will be useful to know before using the MCP2515 PICtail Plus Daughter Board. Items discussed in this chapter include:

- Document Layout
- Conventions Used in this Guide
- Recommended Reading
- The Microchip Web Site
- Customer Support
- Document Revision History

DOCUMENT LAYOUT

This document describes how to use the MCP2515 PICtail Plus Daughter Board. The manual layout is as follows:

- **Chapter 1. “Product Overview”** – Important information about the MCP2515 PICtail Plus Daughter Board.
- **Chapter 2. “Installation and Operation”** – This chapter includes a detailed description of each function of the demo board and instructions for how to begin using the board.
- **Appendix A. “Schematic and Layouts”** – Shows the schematic and layout diagrams for the MCP2515 PICtail Plus Daughter Board.
- **Appendix B. “Bill Of Materials (BOM)”** – Lists the parts used to build the MCP2515 PICtail Plus Daughter Board.
CONVENTIONS USED IN THIS GUIDE

This manual uses the following documentation conventions:

### DOCUMENTATION CONVENTIONS

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

RECOMMENDED READING

This user's guide describes how to use MCP2515 PICtail Plus Daughter Board. The following Microchip documents are available and recommended as supplemental reference resources:

**MCP2515 Data Sheet, “Stand-Alone CAN Controller With SPI Interface”**, DS21801
This data sheet provides detailed information regarding the MCP2515 Product Family.

**MCP2551 Data Sheet, “High-Speed CAN Transceiver”, DS21667**
This data sheet provides detailed information regarding the MCP2551 Product Family.

This user’s guide provides detailed information regarding the Explorer 16 Development Board and its functionality.

This user’s guide provides detailed information regarding the PICkit Serial Analyzer functionality.

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

CUSTOMER SUPPORT

Users of Microchip products can receive assistance through several channels:

- Distributor or Representative
- Local Sales Office
- Field Application Engineer (FAE)
- Technical Support
- Development Systems Information Line

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://support.microchip.com
DOCUMENT REVISION HISTORY

Revision A (September 2008)

• Initial Release of this Document.
Chapter 1. Product Overview

1.1 OVERVIEW

This chapter provides an overview of the MCP2515 PICtail Plus Daughter Board and covers the following topics:

- Overview
- What is the MCP2515 PICtail Plus Daughter Board?
- What the MCP2515 PICtail Plus Daughter Board kit includes.

1.2 WHAT IS THE MCP2515 PICTAIL PLUS DAUGHTER BOARD?

The MCP2515 PICtail Plus Daughter Board is a simple Controller Area Network (CAN) board designed to be used with boards containing the PICtail Plus connector. The board also has the PICkit Serial connector for interfacing to the PICkit Serial Analyzer tool.

The CAN node consists of the MCP2515 Stand-Alone CAN controller and MCP2551 CAN transceiver. The PICkit Plus and PICkit Serial connectors allow the board to be interfaced to a variety of PICmicros so that the user can develop a CAN node.

The board also contains headers or test points for most of the MCP2515 pins to allow the external functions to be monitored/evaluated.

![MCP2515 PICtail Plus Daughter Board](image)
1.3 WHAT THE MCP2515 PICTAIL PLUS DAUGHTER BOARD KIT INCLUDES

The MCP2515 PICtail Plus Daughter Board kit includes:

- MCP2515 PICtail Plus Daughter Board (102-00194)
- Analog and Interface Products Demonstration Boards CD-ROM (DS21912)
  - MCP2515 CAN PICtail Plus Daughter Board User’s Guide (DS51762)
Chapter 2. Installation and Operation

2.1 HARDWARE OVERVIEW

The MCP2515 PICtail Plus Daughter Board can be connected to either a PIC/development board with the PICkit Plus connector or the PICkit™ Serial connector. Figure 2-1 below shows the connections to the Explorer 16 Development Board (DM240001).

2.2 CONNECTING THE BOARD

FIGURE 2-1: Hardware Overview.
2.3 OPERATION

The user can write firmware for the MCP2515 PICtail Plus Daughter Board in order to create a custom CAN node. Check the Explorer 16 and PICkit Serial web pages for the latest firmware and/or software supporting the MCP2515 or general SPI interfaces.
Appendix A. Schematic and Layouts

A.1 INTRODUCTION

This appendix contains the following schematics and layouts for the MCP2515 PICtail Plus Daughter Board:

- Board Schematic
- Board - Top Layer
- Board - Silk-screen Layer
- Board - Bottom Layer
A.5 BOARD - BOTTOM LAYER
## Appendix B. Bill Of Materials (BOM)

### TABLE B-1: BILL OF MATERIALS

<table>
<thead>
<tr>
<th>Qty</th>
<th>Reference</th>
<th>Description</th>
<th>Manufacturer</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>C4, C5</td>
<td>CAP .1UF 16V CERAMIC X7R 0603</td>
<td>Panasonic® - ECG</td>
<td>ECJ-1VB1C104K</td>
</tr>
<tr>
<td>2</td>
<td>C6, C7</td>
<td>CAP CERAMIC 22PF 50V 0603 SMD</td>
<td>Panasonic - ECG</td>
<td>ECJ-1VC1H220J</td>
</tr>
<tr>
<td>3</td>
<td>D1, D2, D3</td>
<td>LED SUPER RED 0805 SMD</td>
<td>Para Light Corp. (USA)</td>
<td>L-C170SRCT-U1</td>
</tr>
<tr>
<td>1</td>
<td>J5</td>
<td>CONN D-SUB PLUG R/A 9POS 30GOLD</td>
<td>Tyco® Electronics/Amp</td>
<td>517840-4</td>
</tr>
<tr>
<td>1</td>
<td>JP2</td>
<td>CONN HEADER VERT 2POS .100 TIN</td>
<td>Tyco Electronics/Amp</td>
<td>3-644695-2</td>
</tr>
<tr>
<td>1</td>
<td>PCB</td>
<td>RoHS Compliant Bare PCB, MCP2515 PICTail Plus Daughter Board</td>
<td>Microchip Technology Inc.</td>
<td>104-000194</td>
</tr>
<tr>
<td>3</td>
<td>R1, R2, R17</td>
<td>R RES 475 OHM 1/8W 1% 0805 SMD</td>
<td>Panasonic - ECG</td>
<td>ERJ-6ENF4750V</td>
</tr>
<tr>
<td>1</td>
<td>R16</td>
<td>RES 120 OHM 1/10W 1500PPM 5% 0805 SMD</td>
<td>Panasonic - ECG</td>
<td>ERA-S15J121V</td>
</tr>
<tr>
<td>2</td>
<td>R3, R4</td>
<td>RES 10K OHM 1/10W 5% 0603 SMD</td>
<td>Panasonic - ECG</td>
<td>ERJ-3GEYJ103V</td>
</tr>
<tr>
<td>1</td>
<td>U1</td>
<td>Stand-Alone CAN Controller With SPI Interface</td>
<td>Microchip Technology Inc.</td>
<td>MCP2515-I/ST</td>
</tr>
<tr>
<td>1</td>
<td>U2</td>
<td>High-Speed CAN Transceiver</td>
<td>Microchip Technology Inc.</td>
<td>MCP2551-I/IN</td>
</tr>
<tr>
<td>1</td>
<td>Y1</td>
<td>CRYSTAL 20.000MHZ 18PF FUND SMD</td>
<td>Abracon Corp.</td>
<td>ABM3B-20.000MHZ-B2-T</td>
</tr>
</tbody>
</table>

**Note:** The components listed in this Bill of Materials are representative of the PCB assembly. The released BOM used in manufacturing uses all RoHS-compliant components.