



MICROCHIP

**WINC1500 PICtail™ /PICtail
Plus Daughter Board
User's 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in this publication regarding device applications and the like is provided only for your convenience and may be superseded by updates.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.

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.

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

Trademarks

The Microchip name and logo, the Microchip logo, AnyRate, AVR, AVR logo, AVR Freaks, BeaconThings, BitCloud, CryptoMemory, CryptoRF, dsPIC, FlashFlex, flexPWR, Heldo, JukeBlox, KEELOQ, KEELOQ logo, Klear, 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, KlearNet, KlearNet 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: 978-1-5224-1666-1

Object of Declaration: WINC1500 PICtail™/PICtail Plus Daughter Board User's Guide

EU Declaration of Conformity

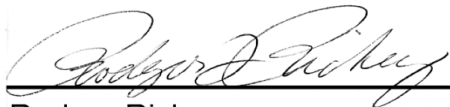
This declaration of conformity is issued by the manufacturer.

The development/evaluation tool is designed to be used for research and development in a laboratory environment. This development/evaluation tool is not intended to be a finished appliance, nor is it intended for incorporation into finished appliances that are made commercially available as single functional units to end users. This development/evaluation tool complies with 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:



WINC1500 PICTAIL™/PICTAIL PLUS DAUGHTER BOARD USER'S GUIDE

Table of Contents

Chapter 1. Introduction

| | |
|------------------------|----|
| 1.1 Kit Contents | 13 |
| 1.2 Features | 13 |

Chapter 2. Hardware

| | |
|----------------------------------|----|
| 2.1 Headers and Connectors | 15 |
| 2.2 Peripherals | 17 |

Chapter 3. Getting Started

| | |
|--|----|
| 3.1 Plugging into PIC18 Explorer Board | 19 |
| 3.2 Plugging into Explorer 16 Development Board | 20 |
| 3.3 Plugging into Explorer 16/32 Development Board | 21 |
| A.1 Reference Schematics | 23 |
| B.1 WINC1500 PICtail/PICtail Plus Daughter Board Bill Of Materials | 27 |

WINC1500 PICtail™/PICtail Plus Daughter Board User's Guide

NOTES:



WINC1500 PICTAIL™/PICTAIL PLUS DAUGHTER BOARD USER'S GUIDE

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 “DSXXXXXXXXA”, where “XXXXXXXX” 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® X 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 WINC1500 PICtail™/PICtail Plus Daughter Board. 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](#)
- [Document Revision History](#)

DOCUMENT LAYOUT

This document describes how to use the WINC1500 PICtail™/PICtail Plus Daughter Board (also referred as WINC1500 daughter board or daughter board). This user's guide is composed of the following chapters:

- **Chapter 1. “Introduction”** provides an overview of the WINC1500 PICtail/PICtail Plus Daughter Board and its features.
- **Chapter 2. “Hardware”** provides hardware details of the WINC1500 PICtail/PICtail Plus Daughter Board.
- **Chapter 3. “Getting Started”** describes how to start using the WINC1500 PICtail/PICtail Plus Daughter Board.
- **Appendix A. “Schematics”** provides the WINC1500 PICtail/PICtail Plus Daughter Board reference schematics and PCB information.
- **Appendix B. “Bill of Materials”** provides the bill of materials for the components used in the design and manufacture of the WINC1500 PICtail/PICtail Plus Daughter Board.

WINC1500 PICtail™/PICtail Plus Daughter Board User's Guide

CONVENTIONS USED IN THIS GUIDE

This manual uses the following documentation conventions:

DOCUMENTATION CONVENTIONS

| Description | Represents | Examples |
|--|--|--|
| 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 |
| Text in angle brackets < > | A key on the keyboard | Press <Enter>, <F1> |
| 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' |
| <i>Italic Courier New</i> | 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) { ... } |
| Notes | A Note presents information that we want to re-emphasize, either to help you avoid a common pitfall or to make you aware of operating differences between some device family members. A Note can be in a box, or when used in a table or figure, it is located at the bottom of the table or figure. | Note: This is a standard note box. |
| | | CAUTION This is a caution note. Note 1: This is a note used in a table. |

RECOMMENDED READING

This user's guide describes how to use the WINC1500 PICtail/PICtail Plus Daughter Board. The following Microchip document is available and recommended as supplemental reference resources.

- **WINC1500-MR210PB IEEE 802.11 b/g/n IoT Module Data Sheet (DS70005304)**
- **WINC1500B IEEE 802.11 b/g/n Network Controller SoC Data Sheet**
- **PICDEM™ PIC18 Explorer Demonstration Board User's Guide (DS51721)**
- **Explorer 16 Development Board User's Guide (DS51589)**
- **ATECC508A Product page**
- **WINC1500 PICtail/PICtail Plus Daughter Board Design Package**

THE MICROCHIP WEB SITE

Microchip provides online support via our web site at: <http://www.microchip.com>. This web site makes files and information easily available to customers. Accessible by most Internet browsers, 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 listings
- **Business of Microchip** – Product selector and ordering guides, latest Microchip press releases, listings of seminars and events; and 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 and other language tools
- **Emulators** – The latest information on the Microchip in-circuit emulator, MPLAB REAL ICE™
- **In-Circuit Debuggers** – The latest information on the Microchip in-circuit debugger, MPLAB ICD 3
- **MPLAB X IDE** – The latest information on Microchip MPLAB X IDE, the Windows® Integrated Development Environment for development systems tools
- **Programmiers** – The latest information on Microchip programmers including the PICkit™ 3 development programmer

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://support.microchip.com>.

DOCUMENT REVISION HISTORY

Revision A (May 2017)

This is the initial released version of this document.

WINC1500 PICtail™/PICtail Plus Daughter Board User's Guide

NOTES:

Chapter 1. Introduction

Thank you for purchasing a WINC1500 PICTail™/PICTail Plus Daughter Board. This document provides detailed information about the Microchip Technology WINC1500 PICTail/PICTail Plus Daughter Board.

The WINC1500 PICTail/PICTail Plus Daughter Board is a demonstration and development board for the WINC1510-MR210PB certified Wi-Fi module.

This daughter board has PICTail and PICTail Plus connectors to interface with a PIC microcontroller on the development boards that supports either PICTail or PICTail Plus interface. The daughter board can be plugged into multiple Microchip Technology demonstration and development boards. For example, the daughter board is appropriate for 8-bit microcontroller development using the PIC18 Explorer Board or for 16-bit microcontroller development using Explorer 16 Development Board.

The supporting software stacks and application notes are available for download from the Microchip web site at:

www.microchip.com/mplab/mplab-harmony/mplab-harmony-2-0-2.

CAUTION

Power to the WINC1500 PICTail/PICTail Plus Daughter Board must be in the range of 3.0V to 3.6V. Ensure that the daughter board is plugged into a development/demonstration board that meets the voltage requirement; otherwise, damage to the WINC1500 board may occur.

This chapter includes the following topics:

[1.1 “Kit Contents”](#)

[1.2 “Features”](#)

1.1 KIT CONTENTS

The WINC1500 PICTail/PICTail Plus Daughter Board kit contains the following:

- One WINC1500 PICTail/PICTail Plus Daughter Board, which contains the ATWINC1510-MR210PB module

1.2 FEATURES

The following are the key features of the WINC1500 PICTail/PICTail Plus Daughter Board:

- Option to switch power source between the USB and PICTail/PICTail Plus interface base board
- The UART debug interface of the WINC1500 daughter board can be directly accessed from the PC through the USB header (J7)
- User LEDs for indications
- Power measurement header
- I²C debug header for RF validation
- GPIO debug header

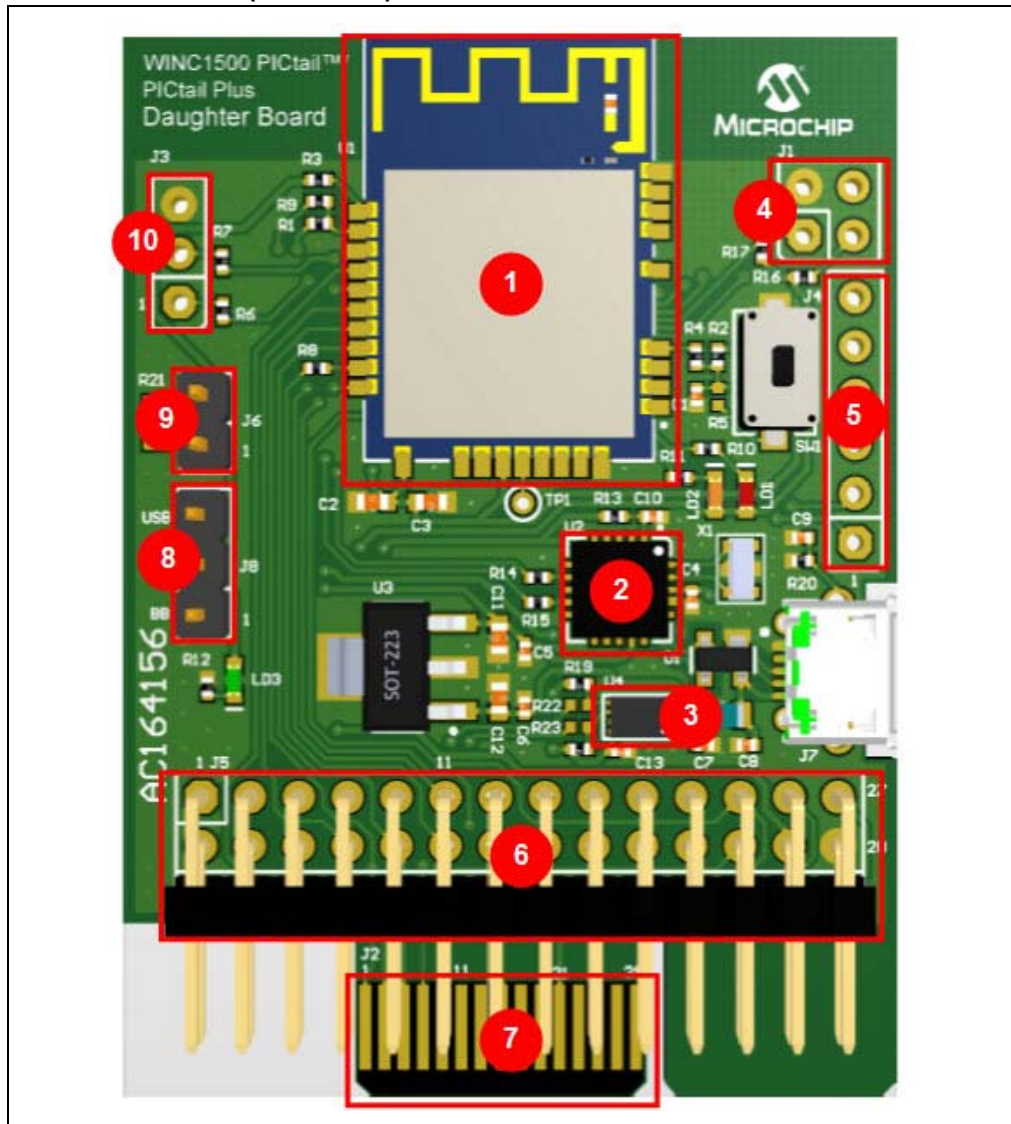
WINC1500 PICtail™/PICtail Plus Daughter Board User's Guide

Figure 1-1 illustrates the top view of the WINC1500 PICtail/PICtail Plus Daughter Board with the following components:

1. ATWINC1510-MR210PB module (U1)
2. MCP2200 (U2)
3. ATECC508A Crypto IC (U4)
4. I²C debug header (J1)
5. GPIO debug header (J4)
6. PICtail header (J5)
7. PICtail Plus connector (J2)
8. Power selection connector (J8)
9. Power measurement connector (J6)
10. UART debug header (J3)

For additional information on these features, refer to [Chapter 2. "Hardware"](#).

FIGURE 1-1: WINC1500 PICTAIL/PICTAIL PLUS DAUGHTER BOARD (TOP VIEW)



Chapter 2. Hardware

This chapter describes the hardware features of the WINC1500 PICtail/PICtail Plus Daughter Board.

2.1 HEADERS AND CONNECTORS

This section provides the details of each component on the WINC1500 PICtail/PICtail Plus Daughter Board. For the location of these components, see [Figure 1-1](#).

2.1.1 PICtail Plus Connector (J2)

The WINC1500 PICtail/PICtail Plus Daughter Board has a 30-pin card edge connector to interface with 16-bit and 32-bit development board's PICtail Plus connector, refer to [Table 2-1](#).

2.1.2 PICtail Connector (J5)

The WINC1500 PICtail/PICtail Plus Daughter Board has a 28-pin right angle connector to interface with the 8-bit development board's PICtail Plus connector.

[Table 2-1](#) provides the pinout details of the PICtail/PICtail Plus connectors.

TABLE 2-1: PICTAIL/PICTAIL PLUS CONNECTOR PINOUT

| Pin on PICtail Plus 30-pin connector (J2) | Pin on PICtail 28-pin connector (J5) | Pin on ATWINC1510-MR210PB | Function |
|---|--------------------------------------|---------------------------|------------------------|
| 28 | 25 | 4 | ATWINC1500 RESET |
| 14 | 11 | 11 | ATWINC1500 WAKE |
| 18 | 27 | 13 | ATWINC1500 IRQ |
| 30 | 23 | 22 | ATWINC1500 CHIP ENABLE |
| 1 | 24 | 16 | SPI_SS |
| 7 | 8 | 15 | SPI_MOSI |
| 5 | 10 | 17 | SPI_MISO |
| 3 | 12 | 18 | SPI_SCK |
| 9,10,15,16 | 28 | 9,12, 28 | GND |
| 22 | 26 | 20, 23 ⁽¹⁾ | Vcc |

Note 1: The Vcc of the base board is connected to the Vcc of the module through a power selection connector when jumper is placed on the 1-2 of the header (J8).

2.1.3 I²C Debug Header (J1)

The WINC1500 PICtail/PICtail Plus Daughter Board has an UART debug header which connects the I²C debug interface to the ATWINC1510-MR210PB module. This header is not populated. [Table 2-2](#) provides the pinout details of the I²C debug header.

TABLE 2-2: I²C DEBUG HEADER PINOUT

| Pin on I ² C debug header (J1) | Pin on ATWINC1510-MR210PB | Function |
|---|---------------------------|----------------|
| 1 | 2 | ATWINC1500 SCL |
| 2 | 9, 12, 28 | GND |
| 3 | 3 | ATWINC1500 SDA |
| 4 | — | No connection |

2.1.4 GPIO Debug Header (J4)

The WINC1500 PICtail/PICtail Plus Daughter Board has an UART debug header which connects the GPIO debug interface to the ATWINC1510-MR210PB module. This header is not populated. [Table 2-3](#) provides the pinout details of the GPIO debug header.

TABLE 2-3: GPIO DEBUG HEADER PINOUT

| Pin on GPIO debug header (J4) | Pin on ATWINC1510-MR210PB | Function |
|-------------------------------|---------------------------|-------------------|
| 1 | 11 | ATWINC1500 WAKE |
| 2 | 21 | ATWINC1500 GPIO_1 |
| 3 | 25 | ATWINC1500 GPIO_3 |
| 4 | 26 | ATWINC1500 GPIO_4 |
| 5 | 27 | ATWINC1500 GPIO_5 |
| 6 | 1 | ATWINC1500 GPIO_6 |

2.1.5 UART Debug Header (J3)

The WINC1500 PICtail/PICtail plus daughter board has an UART debug header which connects the UART debug interface to the ATWINC1510-MR210PB module. This header is not populated. [Table 2-4](#) provides the pinout of the UART debug header.

TABLE 2-4: UART DEBUG HEADER PINOUT

| Pin on I ² C debug header (J1) | Pin on ATWINC1510-MR210PB | Function |
|---|---------------------------|--------------------|
| 1 | 19 | ATWINC1500 UART RX |
| 2 | 14 | ATWINC1500 UART TX |
| 3 | 9,12, 28 | GND |

2.1.6 Power Source Selection Connector (J8)

The jumper header J8, on the WINC1500 PICtail/PICtail Plus Daughter Board, is used to select power source for the daughter board. The daughter board can be powered either from the power supply of the base board or from the external USB supply.

Mounting the jumper in position 1-2 (pin 1 marked with overlay “BB” in the PCB) will power the daughter board from the base board, and mounting the jumper in position 2-3 (pin 3 marked with overlay “USB” in the PCB) will power the daughter board from the USB supply.

When the daughter board is powered from the external USB supply, it can still be interfaced to any base board with the PICtail/PICtail Plus connectors. The GND for the PICtail daughter board and base board are common, and the both will operate at 3.3V. A 5V input from the USB supply is provided to LDO (U3) to obtain the 3.3V for supplying the daughter board.

2.1.7 Power Measurement Header (J6)

The jumper header J6, on the WINC1500 PICtail/PICtail Plus Daughter Board, can be used to measure the current consumption of the ATWINC1510-MR210PB module. The power to the ATWINC1510-MR210PB module is routed through this header.

To measure the current consumption of the module, connect a voltmeter directly across the pins of J6. A 1Ω resistor is connected in parallel with the jumper header J6 which provides 1:1 relationship between the voltage and current measured across the jumper.

2.2 PERIPHERALS

2.2.1 USB-to-UART Serial Converter (U2)

The WINC1500 PICtail/PICtail Plus Daughter Board has an on-board USB-to-UART serial bridge/converter, which is used for observing UART debug logs from the ATWINC1510-MR210PB module. The PC console can be connected to the daughter board using a standard-A to micro-B or micro-AB cable.

The following UART configuration to be used in the PC console:

- Baud rate: 115200
- Data: 8 bit
- Parity: None
- Stop bit: 1
- Flow control: None

2.2.2 User LED

Two user LEDs are available on the WINC1500 PICtail/PICtail Plus Daughter Board which can be turned ON and OFF. The LED can be activated by driving the connected I/O line to GND. [Table 2-5](#) provides the pinout details of the user LEDs.

TABLE 2-5: USER LED PINOUT

| LED | Pin on ATWINC1510-MR210PB | Function |
|-----|------------------------------|---------------------------------|
| LD1 | 1 | ATWINC1500 GPIO_6 Red LED |
| LD2 | 27 | ATWINC1500 GPIO_5 Orange LED |

2.2.3 Power LED (LD3)

A power indication LED on the WINC1500 PICtail/PICtail Plus Daughter Board. This LED will be ON when the daughter board is provided with an adequate power supply.

2.2.4 Crypto Device - ATECC508A (U4)

The WINC1500 PICtail/PICtail Plus Daughter Board contains a ATECC508A Crypto authentication device. The I²C pins required for interfacing with the ATECC508A device is connected only to the PICtail Plus connector. The ATECC508A device is interfaced with the host MCU through 0R resistors, R22 and R23.

The 0R resistors are not mounted in the Rev 1 of the board and users need to solder these pads. These resistors are mounted from the Rev 1.2 of the board. The revision of the board could be found from the text in the bottom copper layer "04-10608 REV X.X", where X.X indicates the revision of the board.

[Table 2-6](#) provides the pinout details of the Crypto device.

TABLE 2-6: CRYPTO DEVICE- ATECC508A PINOUT

| Pin on PICtail Plus 30-pin connector (J2) | Pin on ATECC508A | Function |
|---|------------------|---------------|
| 6 | 6 | ATECC508A SCL |
| 8 | 5 | ATECC508A SDA |

Chapter 3. Getting Started

This chapter demonstrates how the WINC1500 PICtail/PICtail Plus Daughter Board can be plugged into the PIC18 Explorer, Explorer 16, and Explorer 16/32 Development Boards.

The WINC1500 Daughter Board can be plugged into multiple Microchip Technology demonstration and development boards. This allows the developer to choose the microcontroller that best suits the customer's development environment.

The PICtail connector (J5) can be plugged into 8-bit demonstration and development board, such as PIC 18 Explorer Board (DM183032). The PICtail Plus card edge connector (J2) can be plugged into Explorer 16 Development Board (DM240001).

This chapter includes the following topics:

3.1 “Plugging into PIC18 Explorer Board”

3.2 “Plugging into Explorer 16 Development Board”

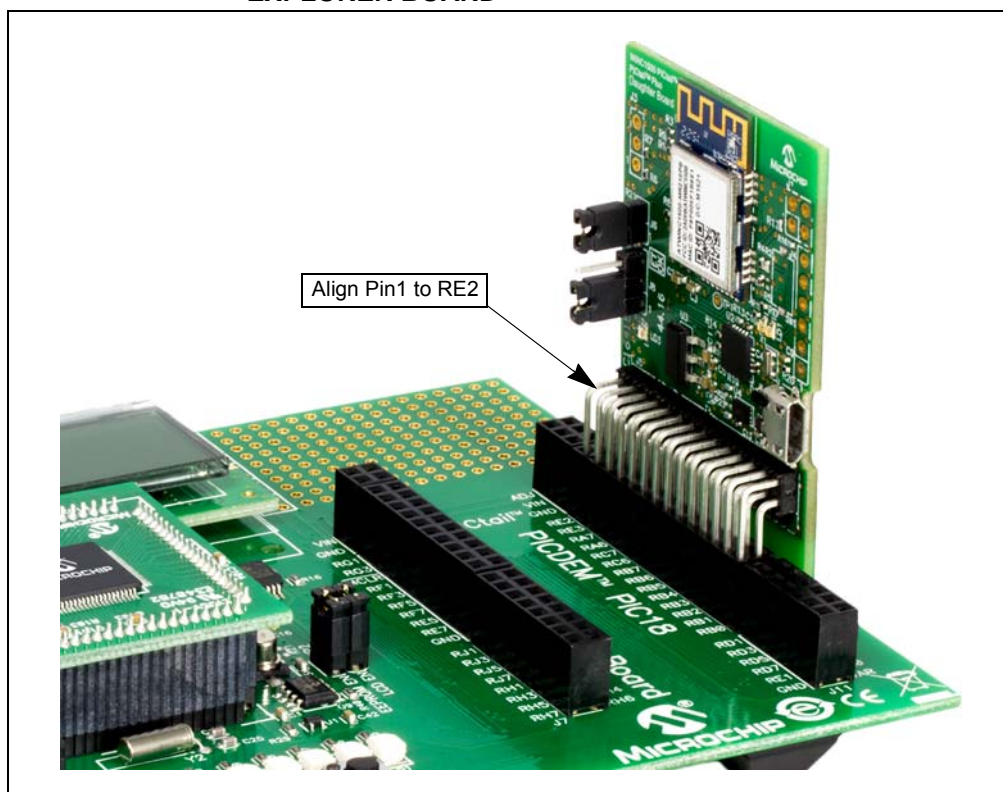
3.3 “Plugging into Explorer 16/32 Development Board”

3.1 PLUGGING INTO PIC18 EXPLORER BOARD

The WINC1500 PICtail/PICtail Plus Daughter Board can be plugged into the PICtail connector (J3) of the PIC18 Explorer Board. Ensure that the pin1 is aligned to RE2 as shown in [Figure 3-1](#).

| CAUTION |
|---|
| Ensure that the PIC18F87J11 PIM is plugged into the PIC18 Explorer Board. This sets the system voltage V_{DD} to 3.3V, which is required by the WINC1500 PICtail/PICtail Plus Daughter Board. |

FIGURE 3-1: WINC1500 DAUGHTER BOARD PLUGGED INTO PIC18 EXPLORER BOARD

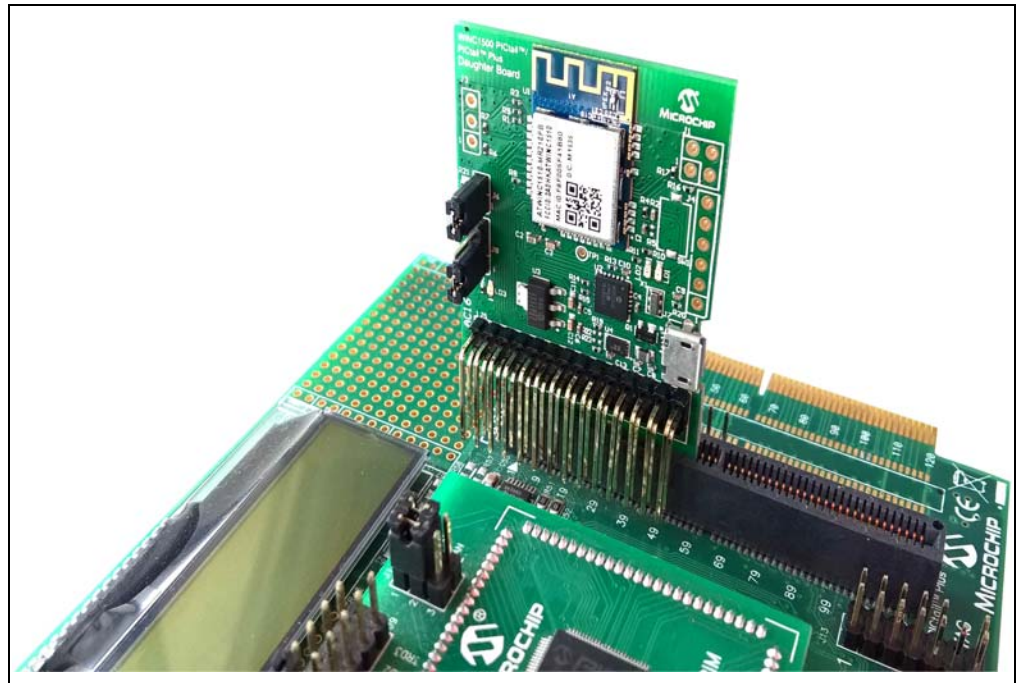


3.2 PLUGGING INTO EXPLORER 16 DEVELOPMENT BOARD

The WINC1500 PICtail/PICtail Plus Daughter Board can be plugged into the Explorer 16 Development Board, as illustrated in [Figure 3-2](#).

The WINC1500 daughter board with 30-pin card edge connector can be plugged into the top (pin 1-30) of the PICtail Plus connector. This will connect the WINC1500 module to the SPI Port 1 on the PIC microcontroller that is plugged into the PIM socket. If the daughter board is plugged into the mid-section of the PICtail Plus connector, this will connect to SPI Port 2 on the PIC microcontroller.

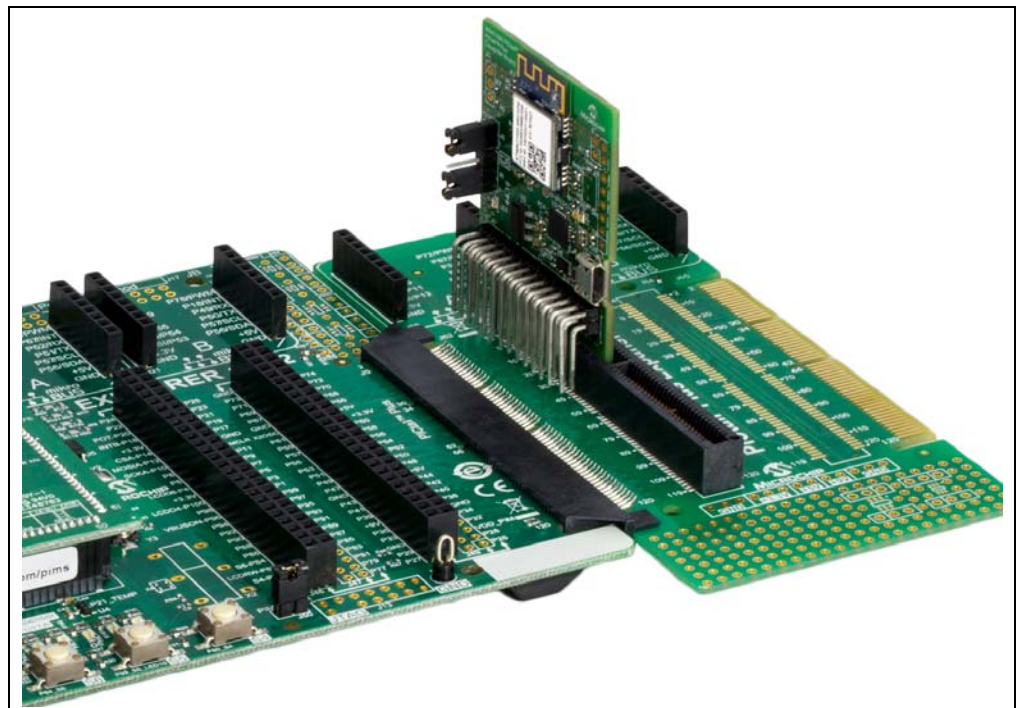
FIGURE 3-2: WINC1500 DAUGHTER BOARD PLUGGED INTO EXPLORER 16 DEVELOPMENT BOARD



3.3 PLUGGING INTO EXPLORER 16/32 DEVELOPMENT BOARD

The WINC1500 PICtail/PICtail Plus Daughter Board can be plugged into the Explorer 16/32 Development Board, as illustrated in [Figure 3-3](#). This setup requires the PICtail Plus expansion board to be plugged into the Explorer 16/32 development board.

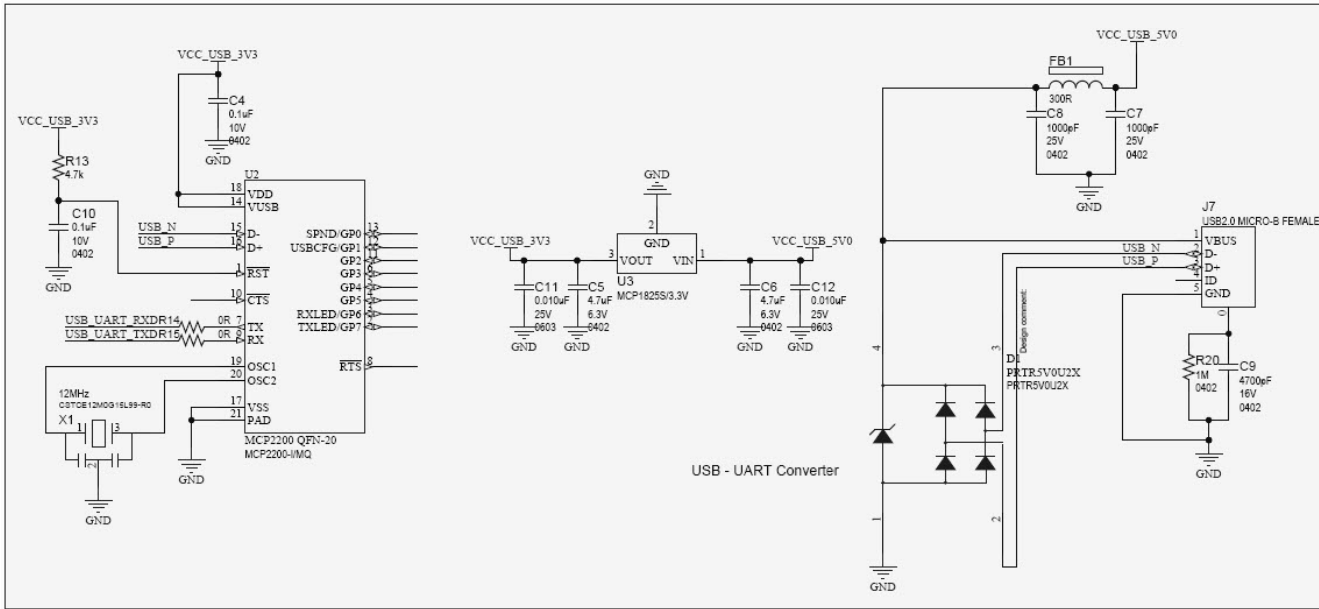
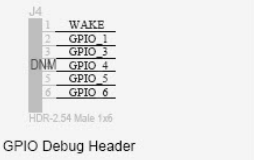
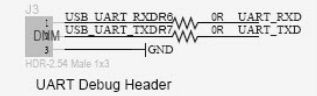
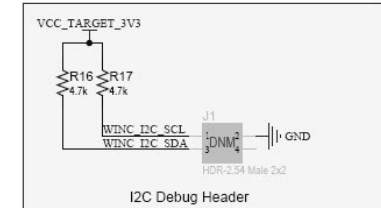
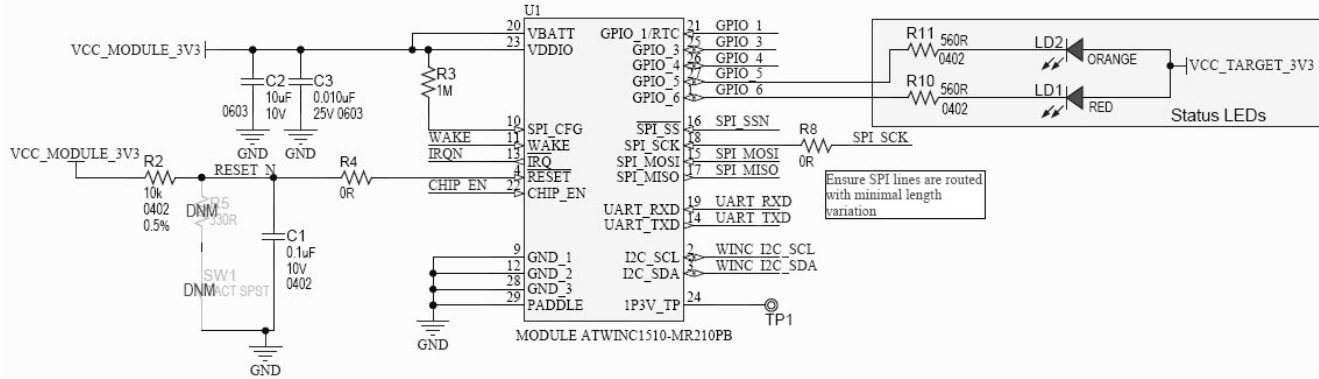
FIGURE 3-3: WINC1500 DAUGHTER BOARD PLUGGED INTO EXPLORER 16/32 DEVELOPMENT BOARD



WINC1500 PICtail™/PICtail Plus Daughter Board User's Guide

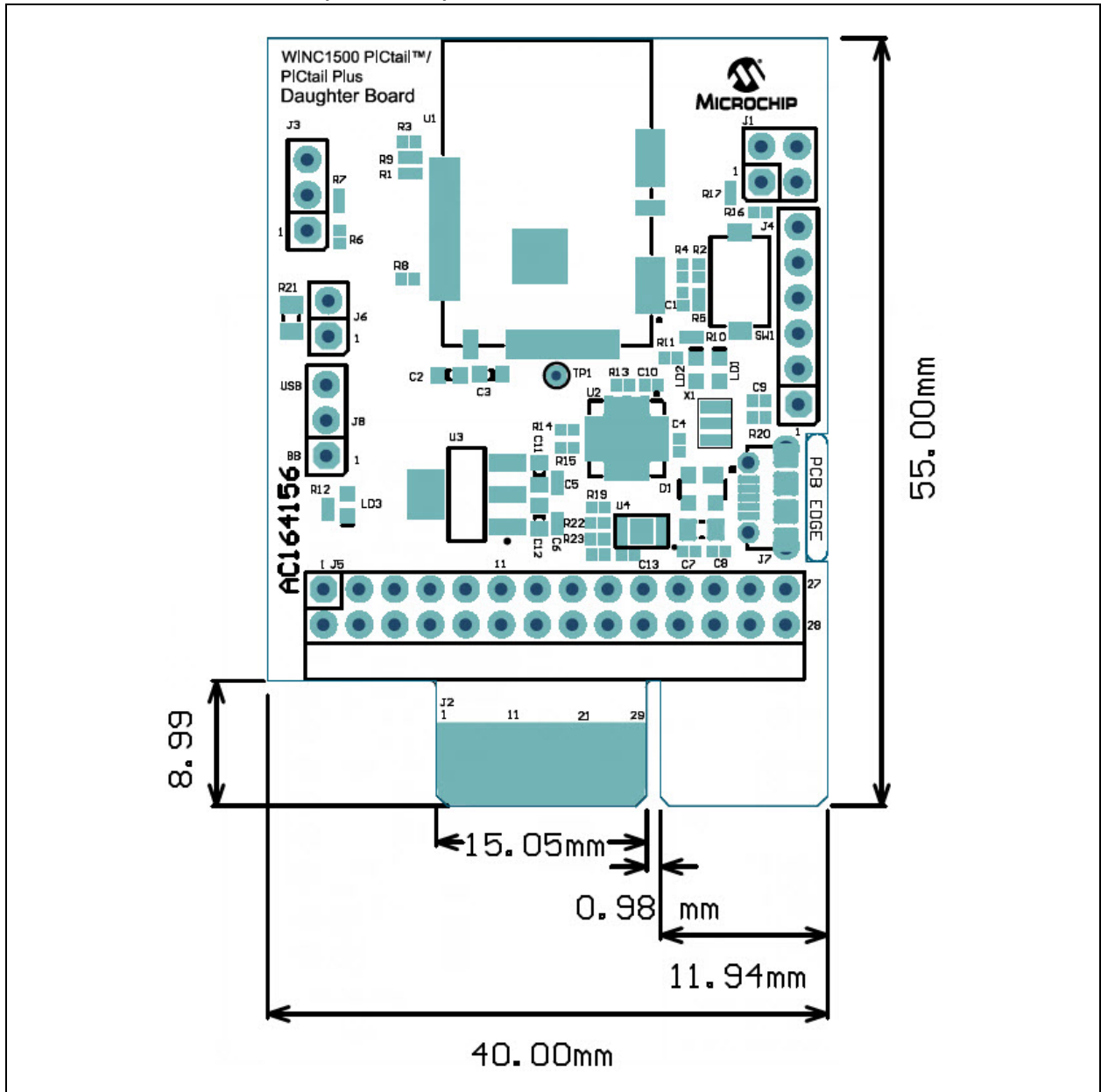
NOTES:

FIGURE A-2: WINC1500 PICTAIL/PICTAIL PLUS MODULE SCHEMATICS



Note: Power to the WINC1500 PICTail/PICTail Plus Daughter Board must be in the range of 3.0V to 3.6V. Ensure that the daughter board is plugged into a development/demonstration board that meets this voltage requirement; otherwise, damage to the WINC1500 may occur. Only 3.3V I/O compatible MCU must be interfaced with this board, as all the module I/O lines operate at 3.3V.

FIGURE A-3: WINC1500 PICTAIL/PICTAIL PLUS DAUGHTER BOARD SILK SCREEN (TOP VIEW)



WINC1500 PICtail™/PICtail Plus Daughter Board User's Guide

NOTES:



WINC1500 PICTAIL™/PICTAIL PLUS DAUGHTER BOARD USER'S GUIDE

Appendix B. Bill of Materials

B.1 WINC1500 PICTAIL/PICTAIL PLUS DAUGHTER BOARD BILL OF MATERIALS

TABLE B-1: BILL OF MATERIALS

| Reference | Description | Manufacturer | Part Number | Quantity |
|--|--|----------------------------------|--------------------|----------|
| C1, C4, C10, C13 | CAP CER 0.1 µF 10V 10% X5R SMD 0402 | Kemet | C0402C104K8PACTU | 4 |
| C2 | CAP CER 10 µF 10V 20% X5R SMD 0603 | Panasonic | ECJ-1VB1A106M | 1 |
| C3, C11, C12 | CAP CER 0.010 µF 25V 10% X7R SMD 0603 | Yageo | CC0603KRX7R8BB103 | 3 |
| C5, C6 | CAP CER 4.7 µF 6.3V 20% X5R SMD 0402 | Murata Electronics North America | GRM155R60J475ME47D | 2 |
| C7, C8 | CAP CER 1000 pF 25V 5% C0G SMD 0402 | TDK Corporation | C1005C0G1E102J | 2 |
| C9 | CAP CER 4700 pF 16V 10% X7R SMD 0402 | Murata Electronics North America | GRM155R71C472KA01D | 1 |
| D1 | DIO TVS PRTR5V0U2X 5.5V SMD SOT-143 | NXP Semiconductors | PRTR5V0U2X,215 | 1 |
| FB1 | FERRITE 300R@100 MHz 2A SMD 0805 | Laird-Signal Integrity Products | MI0805L301R-10 | 1 |
| J5 | CON HDR-2.54 Male 2x14 Gold 5.84MH TH R/A | Sullins Connector Solutions | PBC14DBDN | 1 |
| J6 | CON HDR-2.54 Male 1x2 Gold 5.84MH TH VERT | FCI | 77311-118-02LF | 1 |
| J7 | CON USB2.0 MICRO-B FEMALE TH/SMD R/A | FCI | 10118194-0001LF | 1 |
| J8 | CON HDR-2.54 Male 1x3 Tin 5.84MH TH VERT | Samtec | TSW-103-07-T-S | 1 |
| JP1, JP2 | MECH HW JUMPER 2.54 mm 1x2 | 3M | 969102-0000-DA | 2 |
| LD1 | DIO LED RED 2V 30 mA 2mcd Clear SMD 0603 | Lite-On | LTST-C190EKT | 1 |
| LD2 | DIO LED ORANGE 2V 30 mA 90mcd Clear SMD 0603 | Lite-On | LTST-C190KFKT | 1 |
| LD3 | DIO LED GREEN 2.1V 30 mA 6mcd Clear SMD 0603 | Lite-On | LTST-C190GKT | 1 |
| R1, R4, R6, R7, R8, R9, R14, R15, R22, R23 | RES TKF 0R SMD 0402 | Panasonic | ERJ-2GE0R00X | 8 |

WINC1500 PICtail™/PICtail Plus Daughter Board User's Guide

TABLE B-1: BILL OF MATERIALS (CONTINUED)

| Reference | Description | Manufacturer | Part Number | Quantity |
|-------------------------|--|----------------------------------|--------------------|----------|
| R2 | RES TF 10k 0.5% 1/16W SMD 0402 | SUSUMU | RR0510P-103-D | 1 |
| R3, R20 | RES TKF 1M 5% 1/16W SMD 0402 | Yageo | RC0402JR-071ML | 2 |
| R10, R11, R12 | RES TKF 560R 5% 1/10W SMD 0402 | Panasonic | ERJ-2GEJ561X | 3 |
| R13, R16, R17, R18, R19 | RES TKF 4.7K 1% 1/10W 0402 | KOA Speer | RK73H1ETTP4701F | 5 |
| R21 | RES TKF 1R 1% 1/8W SMD 0805 | Panasonic | ERJ-6RQF1R0V | 1 |
| U4 | IC INTERFACE ATECC508A UDFN-8 | Atmel | ATECC508A-MAHDA-T | 1 |
| X1 | RESONATOR 12 MHz 0.1% SMD CSTCE-G | Murata Electronics North America | CSTCE12M0G15L99-R0 | 1 |
| U1 | MCHP RF WI-FI 802.11b/g/n ATWINC1510-MR210PB MODULE-28 | Microchip Technology Inc. | ATWINC1510-MR210PB | 1 |
| U2 | MCHP INTERFACE USB UART MCP2200-I/MQ QFN-20 | Microchip Technology Inc. | MCP2200-I/MQ | 1 |
| U3 | MCHP ANALOG LDO 3.3V MCP1825ST-3302E/DB SOT-223-3 | Microchip Technology Inc. | MCP1825ST-3302E/DB | 1 |
| R5 | RES TKF 330R 5% 1/10W SMD 0402 | Panasonic Electronic Components | ERJ-2GEJ331X | 1 |
| SW1 | SWITCH TACT SPST 32V 50mA KSR231GLFS SMD | C&K Components | KSR231GLFS | 1 |

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 - Druen
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