



**UCS1003-2  
Evaluation Board  
User's Guide**

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This declaration of conformity is issued by the manufacturer.

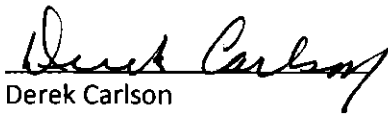
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Signed for and on behalf of Microchip Technology Inc. at Chandler, Arizona, USA

  
Derek Carlson  
VP Development Tools

12-Sep-14  
Date

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**NOTES:**

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## Preface

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### 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 the UCS1003-2 Evaluation 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 UCS1003-2 Evaluation Board. The manual layout is as follows:

- **Chapter 1. “Product Overview”** – Important information about the UCS1003-2 Evaluation Board.
- **Chapter 2. “Installation and Operation”** – Includes instructions on installing and getting started with the UCS1003-2 Evaluation Board.
- **Chapter 3. “Hardware Overview”** – Shows hardware details of the UCS1003-2 Evaluation Board.
- **Appendix A. “Schematics and Layouts”** – Shows the schematic and layout diagrams for the UCS1003-2 Evaluation Board.
- **Appendix B. “Bill of Materials (BOM)”** – Lists the parts used to build the UCS1003-2 Evaluation Board.

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## CONVENTIONS USED IN THIS GUIDE

This manual uses the following documentation conventions:

### DOCUMENTATION CONVENTIONS

| Description                                      | Represents                                                                                          | Examples                                                    |
|--------------------------------------------------|-----------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| <b>Arial font:</b>                               |                                                                                                     |                                                             |
| Italic characters                                | Referenced books                                                                                    | <i>MPLAB<sup>®</sup> 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&gt;Save</i></u>                                  |
| Bold characters                                  | A dialog button                                                                                     | Click <b>OK</b>                                             |
|                                                  | A tab                                                                                               | Click the <b>Power</b> 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>                                         |
| <b>Courier New font:</b>                         |                                                                                                     |                                                             |
| 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)<br>{ ...<br>}                              |

## RECOMMENDED READING

This user's guide describes how to use the UCS1003-2 Evaluation Board. Other useful documents are listed below. The following Microchip documents are available and recommended as supplemental reference resources.

- **UCS1003-1/2/3 Data Sheet – “USB Port Power Controller with Charger Emulation” (DS200005346)**
- **AN 24.20 – “Using the UCS100x as a Single or Dual Mode Charger” (DS20005246)**
- **AN 25.16 – “USB Charging Port ESD Protection Tips for UCS100x” (DS20005230)**
- **AN 26.0 – “UCS1002 Current Limit Operation and Features” (DS20005247)**

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- Technical Support

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

## DOCUMENT REVISION HISTORY

### Revision A (March 2016)

- Initial Release of this Document.

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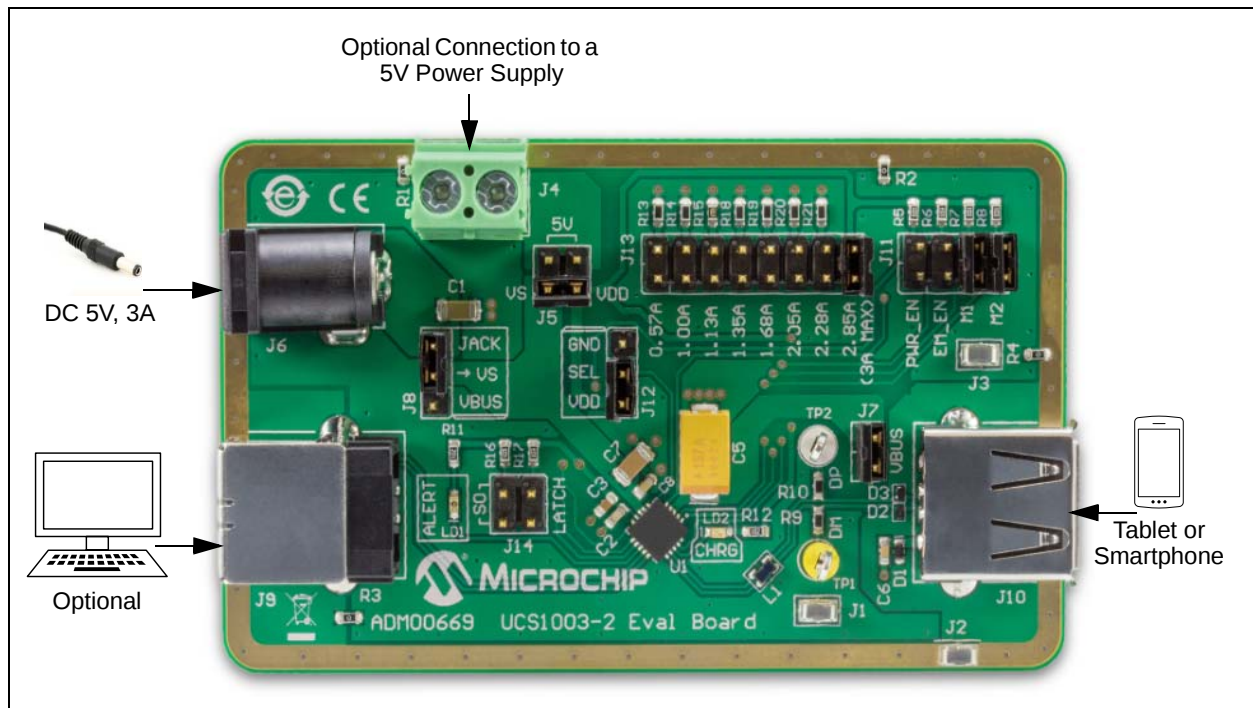
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NOTES:

## Chapter 1. Product Overview

### 1.1 INTRODUCTION

The UCS1003-2 device is a Universal Serial Bus (USB) port power switch with charger emulation. All of the functions of the UCS1003-2 device can be tested and observed with the UCS1003-2 Evaluation Board. A block diagram of this evaluation board test setup is shown in [Figure 1-1](#).



**FIGURE 1-1:** UCS1003-2 Evaluation Board – Charger Emulation Test Setup Block Diagram.

### 1.2 EVALUATION SYSTEM FEATURES

The evaluation setup is comprised of the UCS1003-2 Evaluation Board and a downstream tablet or cell phone device, which allows the user to:

- Observe the Charger Emulation functionality
- Observe the BC1.2 Charging Downstream Port (CDP), Dedicated Charging Port (DCP) and Standard Downstream Port (SDP) functionality
- Observe the USB Pass-Through functionality

The hardware platform provides the following features to the user:

- Jumpers for Modes of Operation: Dedicated Charger Emulation (DCE), DCP, CDP and USB Pass-Through
- Jumper for Fault Handling: Latch upon Fault or Auto-Recovery
- Jumper for Current-Limiting of 0.57A to 2.85A
- Jumper for PWR\_EN

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## 1.3 WHAT THE UCS1003-2 EVALUATION BOARD KIT CONTAINS

This UCS1003-2 Evaluation Board Kit includes:

- UCS1003-2 Evaluation Board (ADM00669)
- Provided 5V Wall Power Adapter
- Important Information Sheet

## Chapter 2. Installation and Operation

### 2.1 GETTING STARTED

#### 2.1.1 System Requirements

To use the UCS1003-2 Evaluation Board, the following are required:

- A 5V supply capable of 5V, 3.0A, or the wall transformer provided in the evaluation kit.
- Various downstream USB devices to charge, such as tablets and cell phones.
- A PC with a USB port to demonstrate CDP, SDP or USB Enumeration.

#### 2.1.2 Evaluation Board Jumper Configuration

[Table 2-1](#) describes each jumper setting used with this evaluation board.

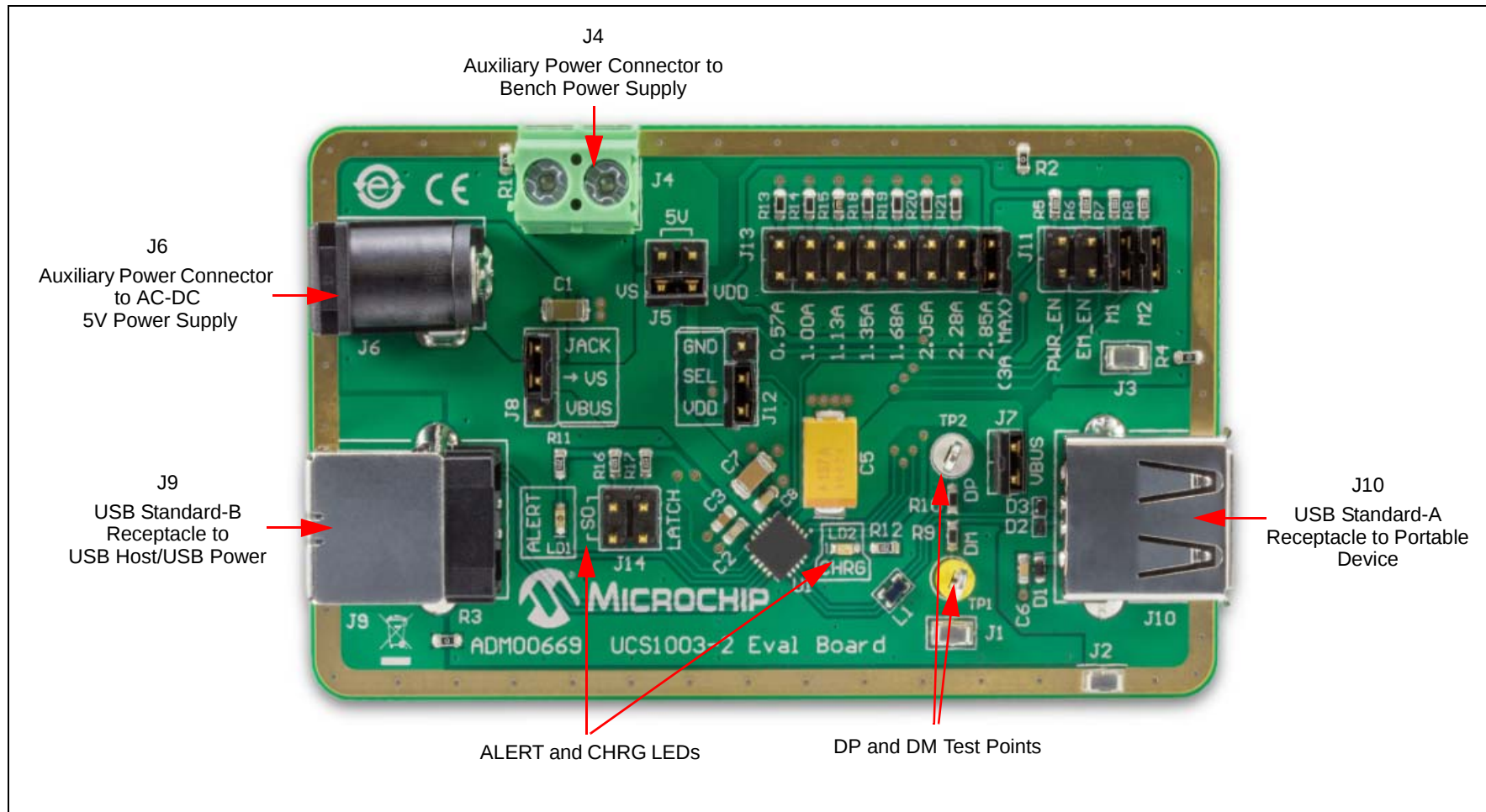
**TABLE 2-1: UCS1003-2 EVALUATION BOARD JUMPER DESCRIPTION**

| Jumper Designator  | Jumper Position | Pin Name                         | Function Description                                                                                                                            |
|--------------------|-----------------|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| J5 <sup>(2)</sup>  | 1-2             | V <sub>S</sub>                   | V <sub>S</sub> connected to 5V bench power supply                                                                                               |
|                    | 1-3             | V <sub>S</sub> , V <sub>DD</sub> | V <sub>S</sub> and V <sub>DD</sub> tied together                                                                                                |
|                    | 3-4             | V <sub>DD</sub>                  | V <sub>DD</sub> connected to 5V bench power supply                                                                                              |
| J7 <sup>(1)</sup>  | 1-2             | V <sub>BUS</sub>                 | V <sub>BUS</sub> pins of the UCS1003-2 connected to the V <sub>BUS</sub> of the USB connector                                                   |
| J8 <sup>(2)</sup>  | 1-2             | V <sub>S</sub>                   | V <sub>S</sub> supply connected to the V <sub>BUS</sub> of the USB host                                                                         |
|                    | 2-3             | V <sub>S</sub>                   | V <sub>S</sub> connected to the 5V input jack                                                                                                   |
| J11                | 1-2             | PWR_EN                           | Enables or disables the port power switch;<br>Jumper Placed = Logic Low: PWR_EN polarity is set by the SEL pin (see jumper J12)                 |
|                    | 3-4             | EM_EN                            | These pins determine Active mode selection (Dedicated Charger Emulation, Data Pass-Through, BC 1.2 SDP, CDP, DCP);<br>Jumper Placed = Logic Low |
|                    | 5-6             | M1                               |                                                                                                                                                 |
|                    | 7-8             | M2                               |                                                                                                                                                 |
| J12 <sup>(1)</sup> | 1-2             | SEL                              | Jumper Placed = Logic Low: PWR_EN is active-low                                                                                                 |
|                    | 2-3             |                                  | Jumper Placed = Logic High: PWR_EN is active-high                                                                                               |
| J13 <sup>(1)</sup> | —               | ILIM                             | Current limit selection between 0.57A to 2.85A (typical)                                                                                        |
| J14                | 1-2             | LATCH                            | Jumper Placed = Logic Low: LATCH = 0, auto-recovery enabled<br>Jumper Open = Logic High: LATCH = 1, auto-recovery disabled                      |
|                    | 3-4             | S0                               | Jumper Placed = Logic Low: S0 = 0, Active mode<br>Jumper Open = Logic High: S0 = 1, Detect mode                                                 |

**Note 1:** Each of the J7, J12 and J13 headers must be populated with one jumper for the UCS1003-2 Evaluation Board to be functional.

**2:** The headers that select the power supply source (J5 and J8) must always have 2 jumpers populated on them in total. For more information, see [Section 3.1.1 “Power Source”](#).

Refer to [Figure 2-1](#) for the jumper location.



**FIGURE 2-1:** UCS1003-2 Evaluation Board Test Setup.

## 2.1.3 Configuration for Dedicated Charger Emulation (DCE) Mode

The Dedicated Charger Emulation (DCE) mode configures the UCS1003-2 Evaluation Board to cycle through emulation profiles until the charging current increases above the threshold of 175 mA. To configure the evaluation board for the DCE mode, follow these steps:

1. Configure the jumper settings as shown in [Table 2-2](#).
2. Apply 5V. The UCS1003-2 is set to the Detect state and awaits a downstream device attachment.
3. Connect a tablet or a cell phone to the USB port J10.

When a charger emulation profile is applied and the charging current increases above 175 mA, LD2 (labeled CHRG) will illuminate and charging will continue.

**TABLE 2-2: UCS1003-2 EVALUATION BOARD JUMPER DESCRIPTION FOR DCE MODE<sup>(1)</sup>**

| Jumper Designator | Jumper Position | Pin Name         | Function Description                                                                                                                                  |
|-------------------|-----------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| J7                | 1-2             | V <sub>BUS</sub> | Jumper Placed = V <sub>BUS</sub> pins of the UCS connected to the V <sub>BUS</sub> of the USB connector                                               |
| J11               | 1-2             | PWR_EN           | Jumper Open = Logic High: Port power switch enabled                                                                                                   |
|                   | 3-4             | EM_EN            | Jumper Open = Logic High                                                                                                                              |
|                   | 5-6             | M1               | Jumper Placed = Logic Low                                                                                                                             |
|                   | 7-8             | M2               | Jumper Placed = Logic Low                                                                                                                             |
| J12               | 2-3             | SEL              | Jumper Placed = Logic High: PWR_EN is active-high                                                                                                     |
| J13               | 15-16           | ILIM             | Jumper Placed on Positions 15-16 and not placed on all the other pins of the header J13: Current limit selection is set to 2.85A typical (3A maximum) |
| J14               | 1-2             | LATCH            | Jumper Placed = Logic Low: LATCH = 0, auto-recovery enabled                                                                                           |
|                   | 3-4             | S0               | Jumper Open = Logic High: S0 = 1, Detect mode                                                                                                         |

**Note 1:** The power source selection is not mentioned in this table. The headers that select the power supply source (J5 and J8) must always have 2 jumpers populated on them in total. For more information, see [Section 3.1.1 "Power Source"](#).

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## 2.1.4 Configuration for BC1.2 Charging Downstream Port (CDP) Mode

The Charging Downstream Port (CDP) mode configures the UCS1003-2 Evaluation Board to handshake respond, enumerate the USB and charge the downstream device. To configure the evaluation board for the CDP mode, follow these steps:

1. Configure the jumper settings as shown in [Table 2-3](#).
2. Connect a cable from USB port J9 (USB-B) to an upstream PC USB port.
3. Apply 5V. The UCS1003-2 is set to the Active state and awaits a downstream device to provide handshake stimulus on the DP pin upon attachment.

**TABLE 2-3: UCS1003-2 EVALUATION BOARD JUMPER DESCRIPTION FOR CDP MODE<sup>(1)</sup>**

| Jumper Designator | Jumper Position | Pin Name         | Function Description                                                                                                                                  |
|-------------------|-----------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| J7                | 1-2             | V <sub>BUS</sub> | Jumper Placed = V <sub>BUS</sub> pins of the UCS connected to the V <sub>BUS</sub> of the USB connector                                               |
| J11               | 1-2             | PWR_EN           | Jumper Open = Logic High: Port power switch enabled                                                                                                   |
|                   | 3-4             | EM_EN            | Jumper Open = Logic High                                                                                                                              |
|                   | 5-6             | M1               | Jumper Placed = Logic High                                                                                                                            |
|                   | 7-8             | M2               | Jumper Placed = Logic High                                                                                                                            |
| J12               | 2-3             | SEL              | Jumper Placed = Logic High: PWR_EN is active-high                                                                                                     |
| J13               | 15-16           | ILIM             | Jumper Placed on Positions 15-16 and not placed on all the other pins of the header J13: Current limit selection is set to 2.85A typical (3A maximum) |
| J14               | 1-2             | LATCH            | Jumper Placed = Logic Low: LATCH = 0, auto-recovery enabled                                                                                           |
|                   | 3-4             | S0               | Jumper Open = Logic High: S0 = 0, Active mode                                                                                                         |

**Note 1:** The power source selection is not mentioned in this table. The headers that select the power supply source (J5 and J8) must always have 2 jumpers populated on them in total. For more information, see [Section 3.1.1 "Power Source"](#).

## 2.1.5 Configuration for BC1.2 Dedicated Charging Port (DCP) Mode

The Dedicated Charging Port (DCP) mode configures the UCS1003-2 Evaluation Board to handshake respond and charge the downstream device. The DCP is similar to the Chinese Telecommunications Industry Standard YD/T 1591-2009. To configure the evaluation board for the DCP mode, follow these steps:

1. Configure the jumper settings as shown in [Table 2-4](#).
2. Apply 5V. The UCS1003-2 is set to the Active state and awaits a downstream device to handshake upon attachment.
3. Connect a tablet or a cell phone to the USB port J10.

**TABLE 2-4: UCS1003-2 EVALUATION BOARD JUMPER DESCRIPTION FOR DCP MODE<sup>(1)</sup>**

| Jumper Designator | Jumper Position | Pin Name         | Function Description                                                                                                                                  |
|-------------------|-----------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| J7                | 1-2             | V <sub>BUS</sub> | Jumper Placed = V <sub>BUS</sub> pins of the UCS connected to the V <sub>BUS</sub> of the USB connector                                               |
| J11               | 1-2             | PWR_EN           | Jumper Open = Logic High: Port power switch enabled                                                                                                   |
|                   | 3-4             | EM_EN            | Jumper Open = Logic High                                                                                                                              |
|                   | 5-6             | M1               | Jumper Placed = Logic Low                                                                                                                             |
|                   | 7-8             | M2               | Jumper Placed = Logic High                                                                                                                            |
| J12               | 2-3             | SEL              | Jumper Placed = Logic High: PWR_EN is active-high                                                                                                     |
| J13               | 15-16           | ILIM             | Jumper Placed on Positions 15-16 and not placed on all the other pins of the header J13: Current limit selection is set to 2.85A typical (3A maximum) |
| J14               | 1-2             | LATCH            | Jumper Placed = Logic Low: LATCH = 0, auto-recovery enabled                                                                                           |
|                   | 3-4             | S0               | Jumper Open = Logic High: S0 = 0, Active mode                                                                                                         |

**Note 1:** The power source selection is not mentioned in this table. The headers that select the power supply source (J5 and J8) must always have 2 jumpers populated on them in total. For more information, see [Section 3.1.1 “Power Source”](#).

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## 2.1.6 Configuration for BC1.2 SDP Mode

The Standard Downstream Port (SDP) mode configures the UCS1003-2 Evaluation Board to close the high-speed switch and allow the USB to enumerate. To configure the evaluation board for the SDP mode, follow these steps:

1. Configure the jumper settings as shown in [Table 2-5](#).
2. Connect a cable from USB port J9 (USB-B) to an upstream PC USB port.
3. Apply 5V. The UCS1003-2 is set to the Active state and awaits a downstream device to enumerate the USB upon attachment.

**TABLE 2-5: UCS1003-2 EVALUATION BOARD JUMPER DESCRIPTION FOR SDP MODE<sup>(1)</sup>**

| Jumper Designator | Jumper Position | Pin Name         | Function Description                                                                                                                                  |
|-------------------|-----------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| J7                | 1-2             | V <sub>BUS</sub> | Jumper Placed = V <sub>BUS</sub> pins of the UCS connected to the V <sub>BUS</sub> of the USB connector                                               |
| J11               | 1-2             | PWR_EN           | Jumper Open = Logic High: Port power switch enabled                                                                                                   |
|                   | 3-4             | EM_EN            | Jumper Open = Logic Low                                                                                                                               |
|                   | 5-6             | M1               | Jumper Placed = Logic High                                                                                                                            |
|                   | 7-8             | M2               | Jumper Placed = Logic Low                                                                                                                             |
| J12               | 2-3             | SEL              | Jumper Placed = Logic High: PWR_EN is active-high                                                                                                     |
| J13               | 15-16           | ILIM             | Jumper Placed on Positions 15-16 and not placed on all the other pins of the header J13: Current limit selection is set to 2.85A typical (3A maximum) |
| J14               | 1-2             | LATCH            | Jumper Placed = Logic Low: LATCH = 0, auto-recovery enabled                                                                                           |
|                   | 3-4             | S0               | Jumper Open = Logic Low: S0 = 0, Active mode                                                                                                          |

**Note 1:** The power source selection is not mentioned in this table. The headers that select the power supply source (J5 and J8) must always have 2 jumpers populated on them in total. For more information, see [Section 3.1.1 "Power Source"](#).

## Chapter 3. Hardware Overview

### 3.1 INTRODUCTION

The UCS1003-2 Evaluation Board provides the means to demonstrate all of the UCS1003-2 functionality. The LEDs indicate the status information.

#### 3.1.1 Power Source

The UCS1003-2 Evaluation Board requires 5V, 3.0A. It has two power supply connectors:

- J6 jack for AC-DC wall adapters
- J4 for connection with wires from a laboratory power supply

The board allows using only one of these power supplies or both (for the evaluating split supply feature).

According to the note from the Electrical Characteristics table from the data sheet, for split supply systems using the Attach Detection feature, the  $V_S$  must not exceed  $V_{DD} + 150$  mV. If this condition cannot be met, then  $V_{DD}$  and  $V_S$  can be tied together, to avoid a voltage difference higher than 150 mV between them.

The  $V_S$  and  $V_{DD}$  supply source is selected by populating jumpers on the J5 and J8 headers. The two headers must always have two jumpers populated on them in total. The board is not functional if the jumpers are populated in other configurations. See [Table 3-1](#) for J5 and J8 jumper options.

**TABLE 3-1: POWER SUPPLY SELECTION OPTIONS WITH J5 AND J8 HEADERS**

| Available Power Source(s)          |                                 |                                                         | Populated Positions for Jumper J5               | Populated Positions for Jumper J8                |
|------------------------------------|---------------------------------|---------------------------------------------------------|-------------------------------------------------|--------------------------------------------------|
| AC-DC Adapter Connected to Jack J6 | USB Port Connected to Jumper J9 | Bench Power Supply Connected with Wires to Connector J4 |                                                 |                                                  |
| Yes                                | No                              | No                                                      | 1-3 ( $V_S$ tied to $V_{DD}$ ) <sup>(1)</sup>   | 2-3 ( $V_S$ tied to jack J6) <sup>(1)</sup>      |
| No                                 | No                              | Yes                                                     | 1-2 ( $V_S$ tied to 5V) <sup>(2)</sup>          | N/A                                              |
|                                    |                                 |                                                         | 3-4 ( $V_{DD}$ tied to 5V) <sup>(2)</sup>       |                                                  |
| Yes                                | No                              | Yes                                                     | 3-4 ( $V_{DD}$ tied to 5V) <sup>(3)</sup>       | 2-3 ( $V_S$ tied to jack J6) <sup>(3)</sup>      |
| No                                 | Yes                             | Yes                                                     | 3-4 ( $V_{DD}$ tied to 5V) <sup>(3,4)</sup>     | 1-2 ( $V_S$ tied to $V_{BUS}$ ) <sup>(3,4)</sup> |
| No                                 | Yes                             | No                                                      | 1-3 ( $V_S$ tied to $V_{DD}$ ) <sup>(3,4)</sup> | 1-2 ( $V_S$ tied to $V_{BUS}$ ) <sup>(3,4)</sup> |

**Note 1:** Simple setup that can be made with the AC-DC adapter from the UCS1003-2 Evaluation Board Kit.

**2:** This setup can be used to evaluate the charging process at different supply voltages (up to 5.5 V) and to have an indication of the charging current from the bench power supply.

**3:** This setup can be used to evaluate the split power supply feature.

**4:** This setup can be used only if the USB port connected to jumper J9 is capable of delivering the required charging current.

# UCS1003-2 Evaluation Board User's Guide

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## 3.2 STAND-ALONE FUNCTIONALITY

The UCS1003-2 is intended for the stand-alone USB charger and BC1.2 CDP, DCP and SDP applications. The green LED (LD2 – CHRG) indicates that the charging current has exceeded the 175 mA threshold ( $I_{BUS\_CHG}$ ).

See [Table 2-1](#) for the description of jumpers.

### 3.2.1 Charger Emulation Mode Configurations

The Charger Emulation mode of the UCS1003-2 is controlled by the pin states: M1, M2 and EM\_EN. These are the jumpers located on the J11 header.

### 3.2.2 Attach Detection and Power States

The UCS1003-2 can use the attach detection functionality or force the Active mode power state. This is controlled by jumper J14, position 3-4.

## 3.3 FAULT HANDLING

The UCS1003-2 has two modes of Fault handling that can be configured for the LATCH upon Fault or auto-recovery. Jumper J14, position 1-2, selects the Fault handling. When a Fault condition is detected, the red LED (marked as LD1 – ALERT) turns on.

See [Table 2-1](#) for the description of jumpers.

## 3.4 CURRENT LIMITING

The UCS1003-2 is capable of eight selectable current limits (see the “*UCS1003-1/2/3 Data Sheet*” for detailed information). Jumper J13 selects the current-limiting value.

See [Table 2-1](#) for the description of jumpers.

## 3.5 HIGH-SPEED USB DATA SWITCH

The UCS1003-2 contains a series of USB 2.0-compliant high-speed switch between the DP and DM input and output pins. This switch is functional in CDP, SDP and USB pass-through configurations. When used in one of these configurations, a port from a PC must be connected to the J9 USB connector.

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## **Appendix A. Schematics and Layouts**

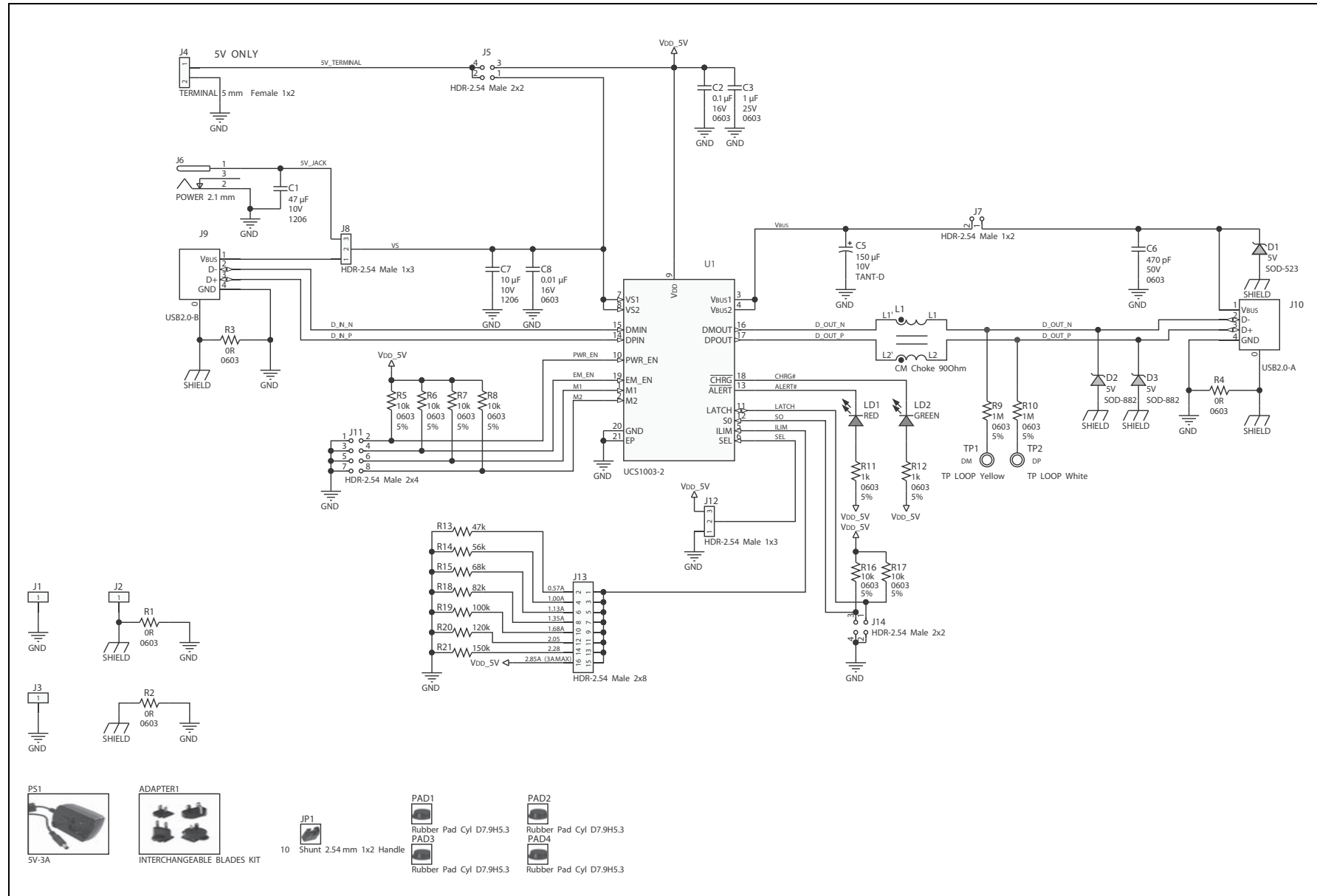
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### **A.1 INTRODUCTION**

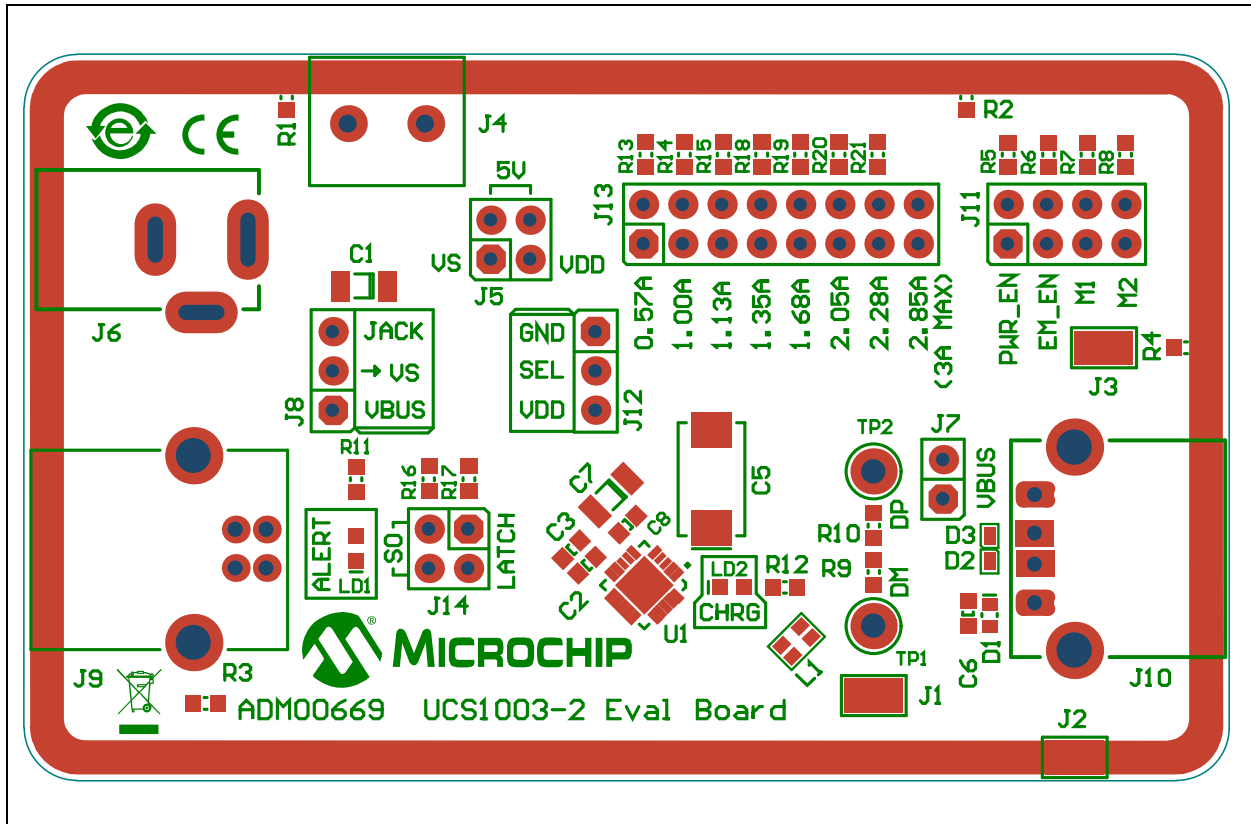
This appendix contains the following schematics and layouts for the UCS1003-2 Evaluation Board:

- [Board – Schematic](#)
- [Board – Top Silk](#)
- [Board – Top Silk and Copper](#)
- [Board – Top Copper](#)
- [Board – Bottom Copper](#)
- [Board – Bottom Silk and Copper](#)
- [Board – Bottom Silk](#)

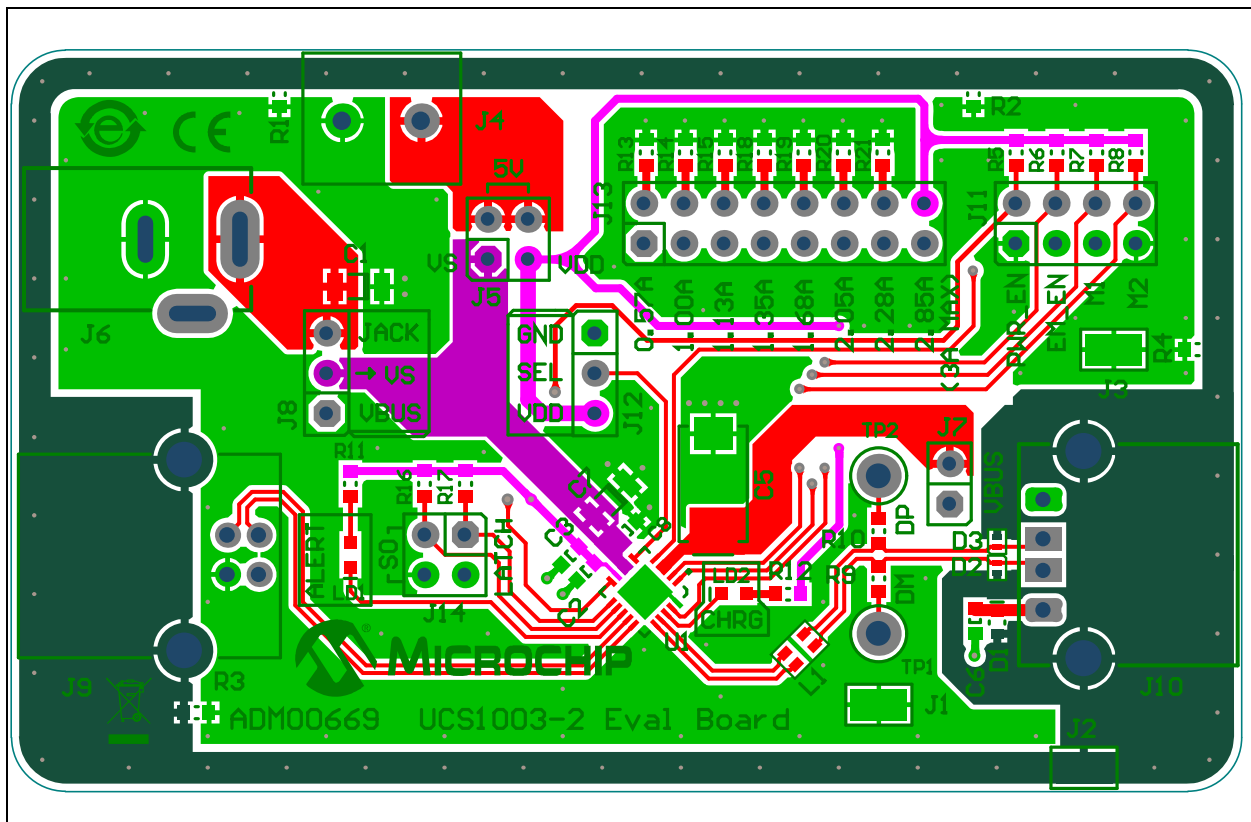
## A.2 BOARD – SCHEMATIC



## A.3 BOARD – TOP SILK

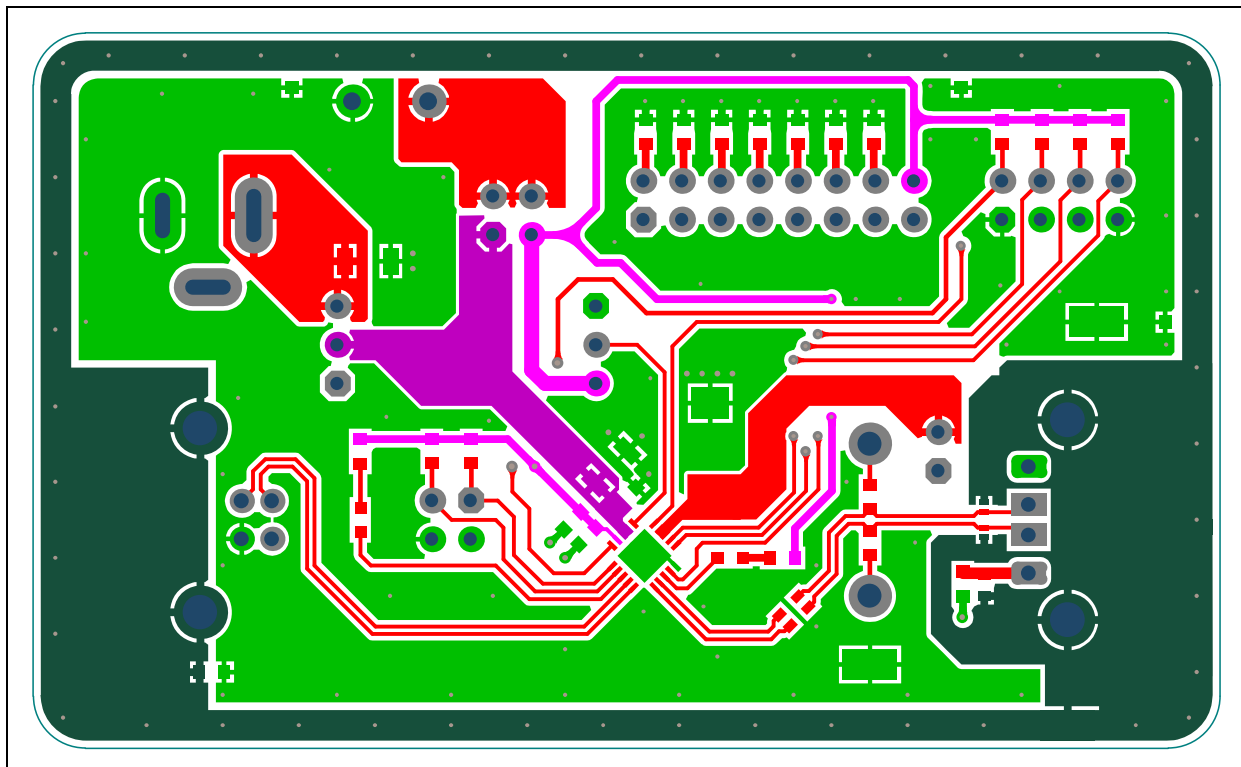


## A.4 BOARD – TOP SILK AND COPPER

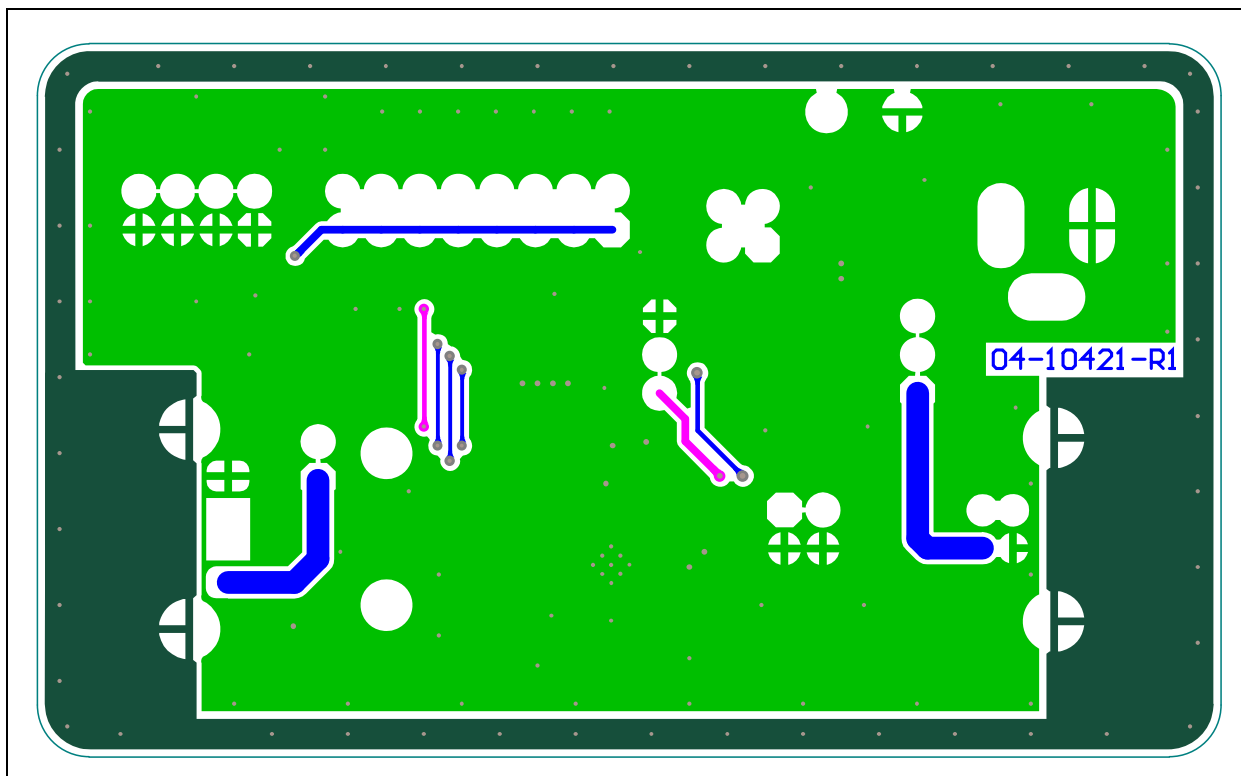


# UCS1003-2 Evaluation Board User's Guide

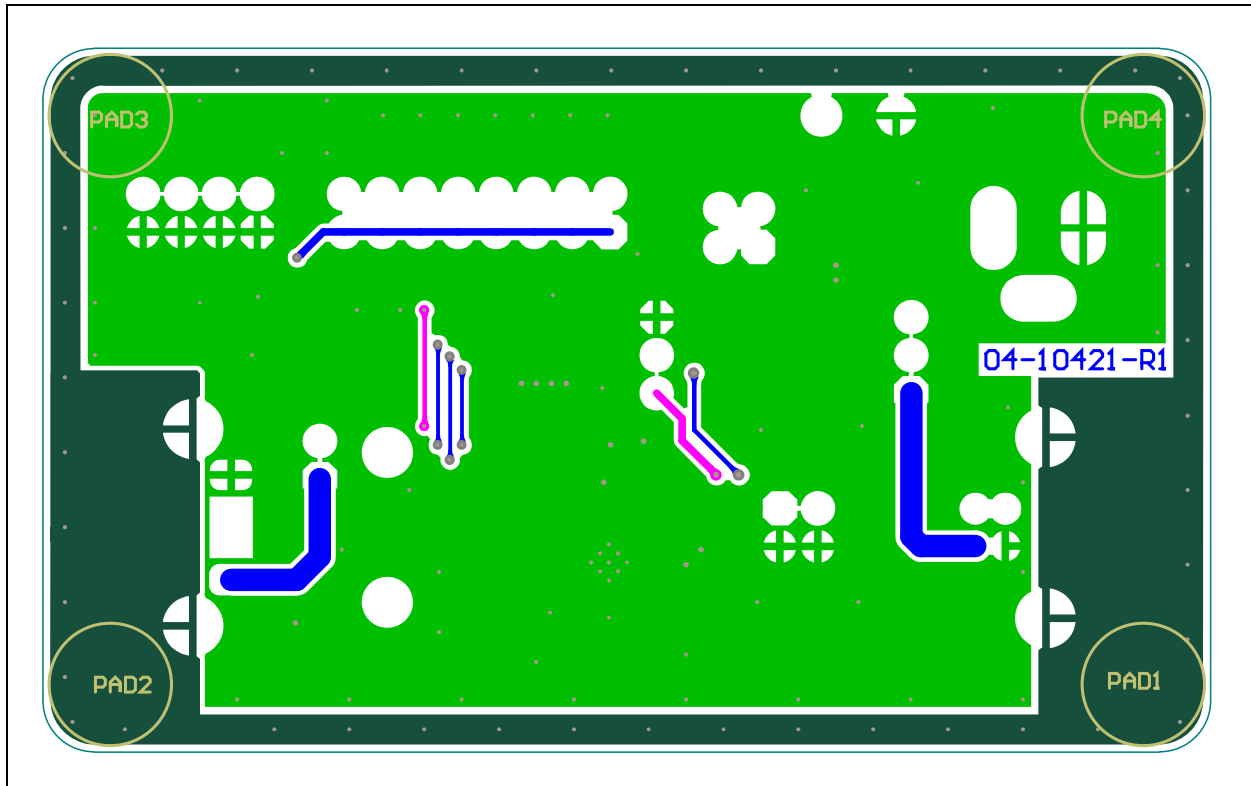
## A.5 BOARD – TOP COPPER



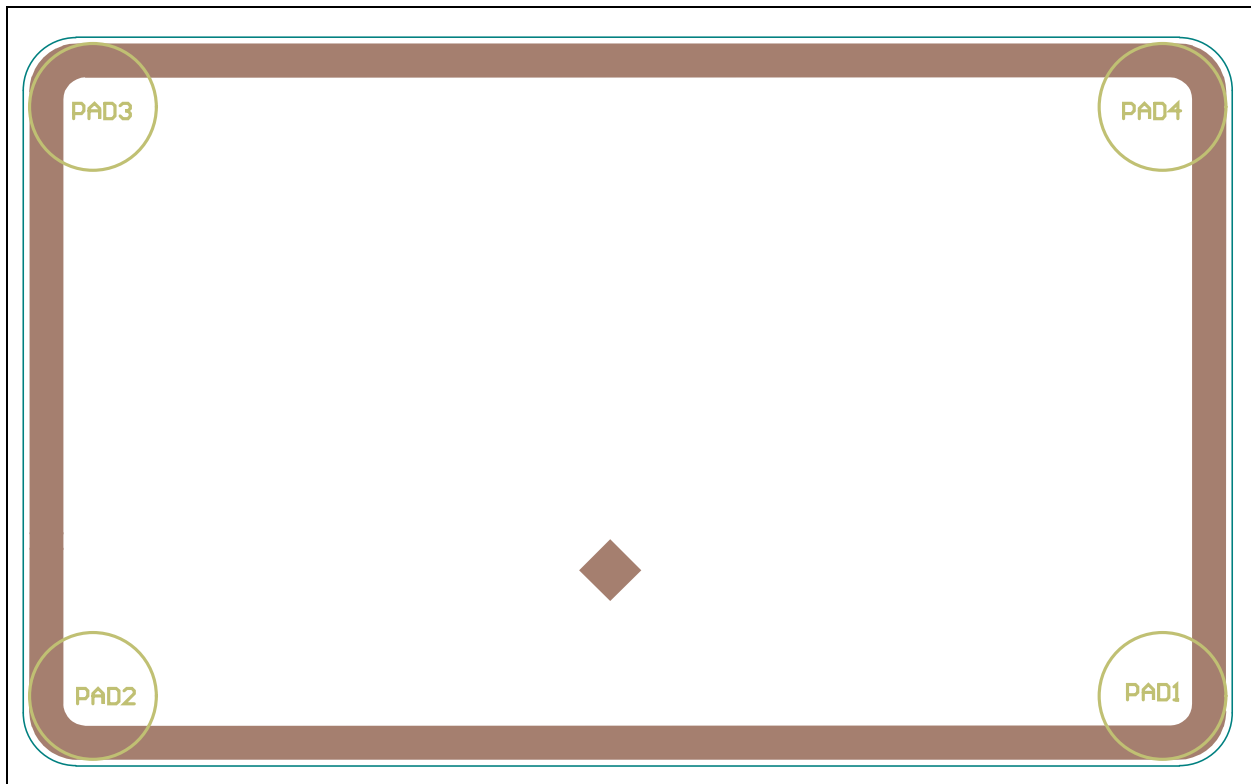
## A.6 BOARD – BOTTOM COPPER



## A.7 BOARD – BOTTOM SILK AND COPPER



## A.8 BOARD – BOTTOM SILK



# UCS1003-2 Evaluation Board User's Guide

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NOTES:

## Appendix B. Bill of Materials (BOM)

**TABLE B-1: BILL OF MATERIALS (BOM)**

| Qty. | Designator     | Description                                              | Manufacturer                            | Part Number        |
|------|----------------|----------------------------------------------------------|-----------------------------------------|--------------------|
| 1    | C1             | Cap. Ceramic, 47 $\mu$ F, 10V, 20%, X5R SMD, 1206        | KEMET®                                  | C1206C476M8PACTU   |
| 1    | C2             | Cap. Ceramic, 0.1 $\mu$ F, 16V, 10%, X7R SMD, 0603       | AVX Corporation                         | 0603YC104KAT2A     |
| 1    | C3             | Cap. Ceramic, 1 $\mu$ F, 25V, 10%, X7R SMD, 0603         | TDK Corporation                         | C1608X7R1E105K     |
| 1    | C5             | Cap. Tantalum, 150 $\mu$ F, 10V, 10%, 100m, SMD D        | AVX Corporation                         | TPSD157K010R0100   |
| 1    | C6             | Cap. Ceramic, 470 pF, 50V, 10%, X7R SMD, 0603            | Johanson Dielectrics                    | 500R14W471KV4T     |
| 1    | C7             | Cap. Ceramic, 10 $\mu$ F, 10V, 20%, X7R SMD, 1206        | Murata                                  | GRM31CR71A106KA01L |
| 1    | C8             | Cap. Ceramic, 0.01 $\mu$ F, 16V, 10%, X7R SMD, 0603      | Samsung Electro-Mechanics America, Inc. | CL10B103KO8NNNC    |
| 1    | D1             | Diode Zener, T5V0S5-7, 5V, 150 mW, SMD, SOD-523          | Diodes® Incorporated                    | T5V0S5-7           |
| 2    | D2, D3         | Diode Zener, PESD5V0X1BL, 5V, SMD, SOD-882               | NXP Semiconductors                      | PESD5V0X1BL,315    |
| 3    | J1, J2, J3     | Conn. TP Loop, Tin, SMD                                  | Harwin Plc.                             | S1751-46R          |
| 1    | J4             | Conn. Terminal, 5 mm, 18A, Female, 1x2 TH, R/A           | Phoenix Contact                         | 1935161            |
| 2    | J5, J14        | Conn. Header-2.54, Male, 2x2, Gold, 5.84 MH TH, Vertical | Samtec, Inc.                            | HTSW-102-07-G-D    |
| 1    | J6             | Conn. Power, 2.1 mm, 5.5 mm, Switch, TH, R/A             | CUI Inc.                                | PJ-002A            |
| 1    | J7             | Conn. Header-2.54, Male, 1x2, Tin, 6.10 MH TH, Vertical  | Molex®                                  | 0022284020         |
| 2    | J8, J12        | Conn. Header-2.54, Male, 1x3, Tin, 5.84 MH TH, Vertical  | Samtec, inc.                            | TSW-103-07-T-S     |
| 1    | J9             | Conn. USB 2.0, STD-A, Female, TH, R/A                    | TE Connectivity, Ltd.                   | 292304-1           |
| 1    | J10            | Conn. USB 2.0, STD-A, Female, TH, R/A                    | FCI                                     | 87520-0010BLF      |
| 1    | J11            | Conn. Header-2.54, Male, 2x4, Gold, 5.84 MH TH, Vertical | Samtec, inc.                            | TSW-104-08-L-D     |
| 1    | J13            | Conn. Header-2.54, Male, 2x8, Gold, 5.84 MH TH, Vertical | FCI                                     | 68602-116HLF       |
| 1    | L1             | Inductor Choke, Common Mode, 90k, 0805                   | Murata Electronics®                     | DLW21HN900SQ2L     |
| 1    | LD1            | Diode LED, Red, 1.95V, 30 mA, 700 mcd, Clear, SMD, 0603  | Kingbright Corp.                        | APTD1608SURCK      |
| 1    | LD2            | Diode LED, Green, 2.2V, 25 mA, 15 mcd, Clear, SMD, 0603  | Kingbright Corp.                        | APT1608SGC         |
| 1    | PCB            | UCS1001-3 – Printed Circuit Board                        | —                                       | 04-10421           |
| 4    | R1, R2, R3, R4 | Resistor TKF, 0R, 1/10W, SMD, 0603                       | NIC Components Corp.                    | NRC06Z0TRF         |

**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.

# UCS1003-2 Evaluation Board User's Guide

**TABLE B-1: BILL OF MATERIALS (BOM) (CONTINUED)**

| Qty. | Designator               | Description                                               | Manufacturer                    | Part Number         |
|------|--------------------------|-----------------------------------------------------------|---------------------------------|---------------------|
| 6    | R5, R6, R7, R8, R16, R17 | Resistor TKF, 10k, 5%, 1/10W, SMD, 0603                   | Panasonic® - ECG                | ERJ-3GEYJ103V       |
| 2    | R9, R10                  | Resistor TKF, 1M, 5%, 1/10W, SMD, 0603                    | Yageo Corporation               | 9C06031A1004JLHFT   |
| 2    | R11, R12                 | Resistor TKF, 1k, 5%, 1/10W, SMD, 0603                    | Panasonic - ECG                 | ERJ-3GEYJ102V       |
| 1    | R13                      | Resistor TKF, 47k, 1%, 1/10W, SMD, 0603                   | Panasonic - ECG                 | ERJ-3EKF4702V       |
| 1    | R14                      | Resistor TKF, 56k, 1%, 1/10W, SMD, 0603                   | Stackpole Electronics, Inc.     | RMCF0603FT56K0      |
| 1    | R15                      | Resistor TKF, 68k, 1%, 1/10W, SMD, 0603                   | Stackpole Electronics, Inc.     | RMCF0603FT68K0      |
| 1    | R18                      | Resistor TKF, 82k, 1%, 1/10W, SMD, 0603                   | Panasonic Electronic Components | ERJ-3EKF8202V       |
| 1    | R19                      | Resistor TKF, 100k, 1%, 1/10W, SMD, 0603                  | Panasonic - ECG                 | ERJ-3EKF1003V       |
| 1    | R20                      | Resistor TKF, 120k, 1%, 1/10W, SMD, 0603                  | Panasonic - ECG                 | ERJ-3EKF1203V       |
| 1    | R21                      | Resistor TKF, 150k, 1%, 1/10W, SMD, 0603                  | Panasonic - ECG                 | ERJ-3EKF1503V       |
| 1    | TP1                      | Conn. TP Loop, Yellow, TH                                 | Keystone Electronics Corp.      | 5014                |
| 1    | TP2                      | Conn. TP Loop, White, TH                                  | Keystone                        | 5012                |
| 1    | U1                       | Microchip Interface USB Power Switch, UCS1003-2-BP QFN-20 | Microchip Technology Inc.       | <b>UCS1003-2-BP</b> |

**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.

**TABLE B-2: BILL OF MATERIALS – MECHANICAL PARTS**

| Qty. | Designator             | Description                                                                         | Manufacturer     | Part Number  |
|------|------------------------|-------------------------------------------------------------------------------------|------------------|--------------|
| 1    | ADAPTER1               | Mechanical HW Adapter Interchangeable Blades Kit for Phihong R-series Wall Adapters | Phihong USA Inc. | RPBAG        |
| 10   | JP1                    | Mechanical HW Jumper, 2.54 mm, 1x2, Handle Gold                                     | TE Connectivity  | 881545-2     |
| 4    | PAD1, PAD2, PAD3, PAD4 | Mechanical HW Rubber Pad, Cylindrical, D7.9 H5.3, Black                             | 3M               | SJ61A11      |
| 1    | PS1                    | Mechanical HW Power Supply, 5V, 3A, DC, 2.1 mm                                      | Phihong USA Inc. | PSA15R-050PV |

**Note 1:** 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.

# Bill of Materials (BOM)

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NOTES:

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