

DS2488 Evaluation Kit

Evaluates: DS2488

General Description

The DS2488 evaluation kit (EV kit) provides the hardware and software necessary to exercise the features of the DS2488. The EV system consists of two boards: the DS9401 and DS2488 EV kit boards. The DS2488 board contains two DS2488 parts. The evaluation software runs on Windows® 10, 8, and 7 operating systems. It provides a handy user interface to exercise the features of the DS2488.

Features

- Demonstrates the Features of the DS2488
- Fully Compliant with USB Specification v2.0
- Software Runs on Windows 10, 8, and 7
- Convenient On-Board Test Points

DS2488 EV Kit Contents

| QTY | DESCRIPTION |
|-----|--|
| 1 | DS9401 1-Wire® master with 5V charging board |
| 1 | DS2488 EV kit evaluation board with two DS2488 parts |
| 2 | USB Type-A to Micro-USB Type-B Cable |

[Ordering Information](#) appears at end of data sheet.

Windows is a registered trademark and service mark of Microsoft Corporation.

1-Wire is a registered trademark of Maxim Integrated Products, Inc.

Quick Start

Required Equipment

This section includes a list of recommended equipment and instructions on how to set up the Windows-based PC for the evaluation software.

- DS9401 (included)
- DS2488 EV kit (included)
- 2 USB Type A to Micro-USB Type B cable (included)
- PC with a Windows 10, 8, or 7 operating system and two spare USB 2.0 or higher ports
- Download DS2488 EV kit software

Software and Hardware Installation and Setup

- 1) Unplug any Maxim adapters before installing software.
- 2) Install Prolific drivers from http://www.prolific.com.tw/US/ShowProduct.aspx?p_id=225&pcid=41 if not already installed.
- 3) Unzip the EV kit software folder.
- 4) Run **setup.exe** to run installer.
- 5) Click the **Install** button on the **Application Install - Security Warning** notification to install the EV kit software (see [Figure 1](#)).
- 6) Connect JB1 on DS9401 board (see [Figure 2](#)).

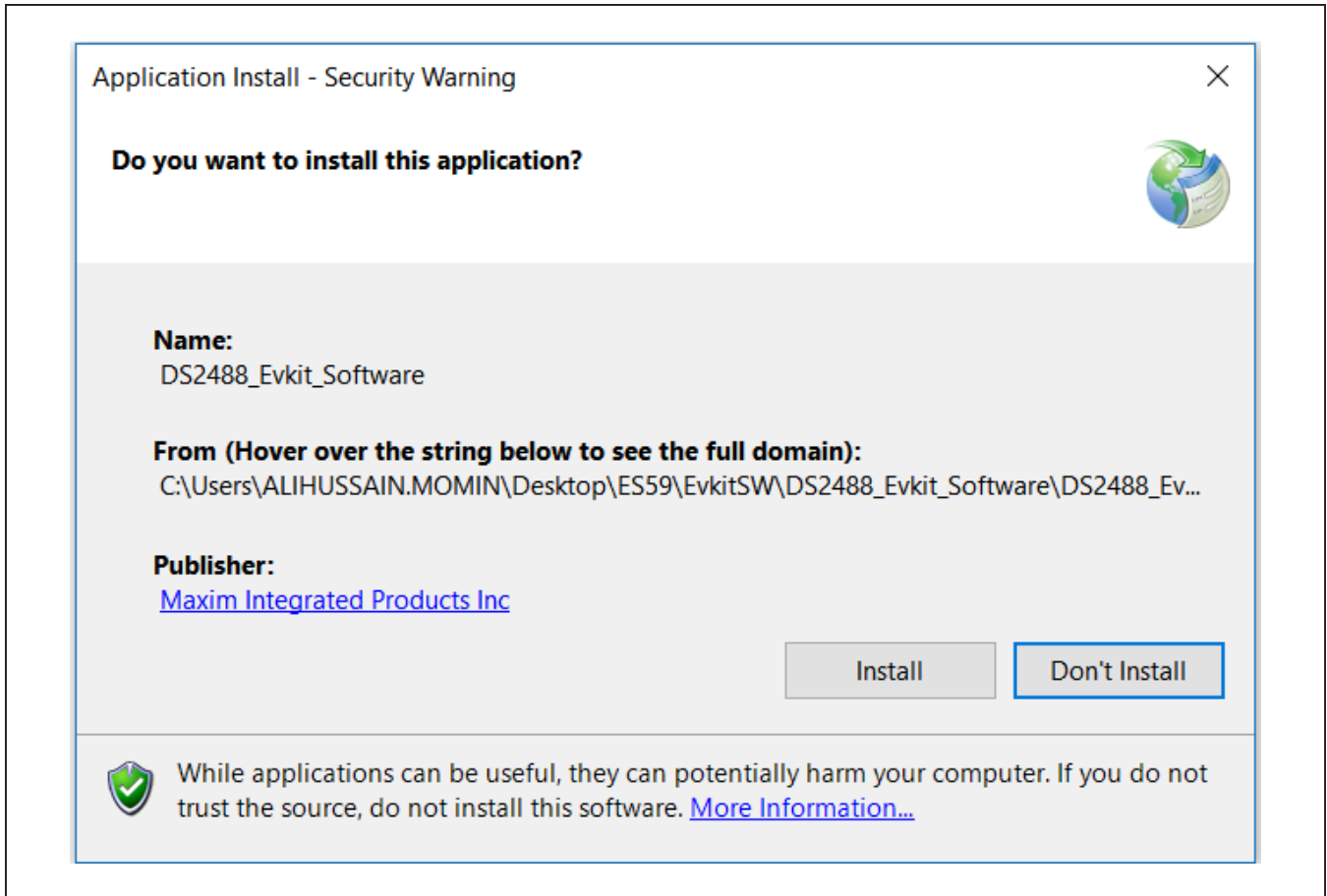


Figure 1. Install Warning

- 7) Connect JB1, JB2, JB3, JB5, JB6 and the VL row on JB4 on the DS2488 EV kit board (see [Figure 3](#)).
- 8) Connect the DS9401 and DS2488 EV kit boards to the PC using the USB cables. Ensure no other prolific devices are connected to the PC.
- 9) Connect the DS9401 to the DS2488 EV kit board.
- 10) Launch the DS2488 EV kit software.

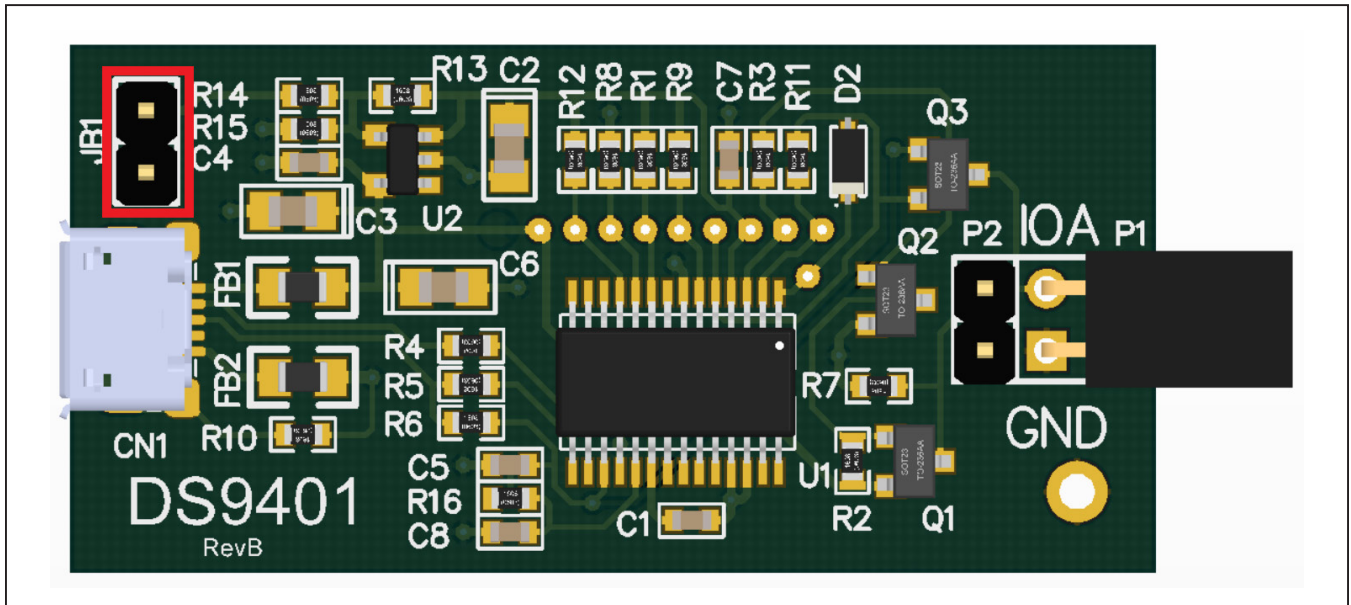


Figure 2. DS9401 Board

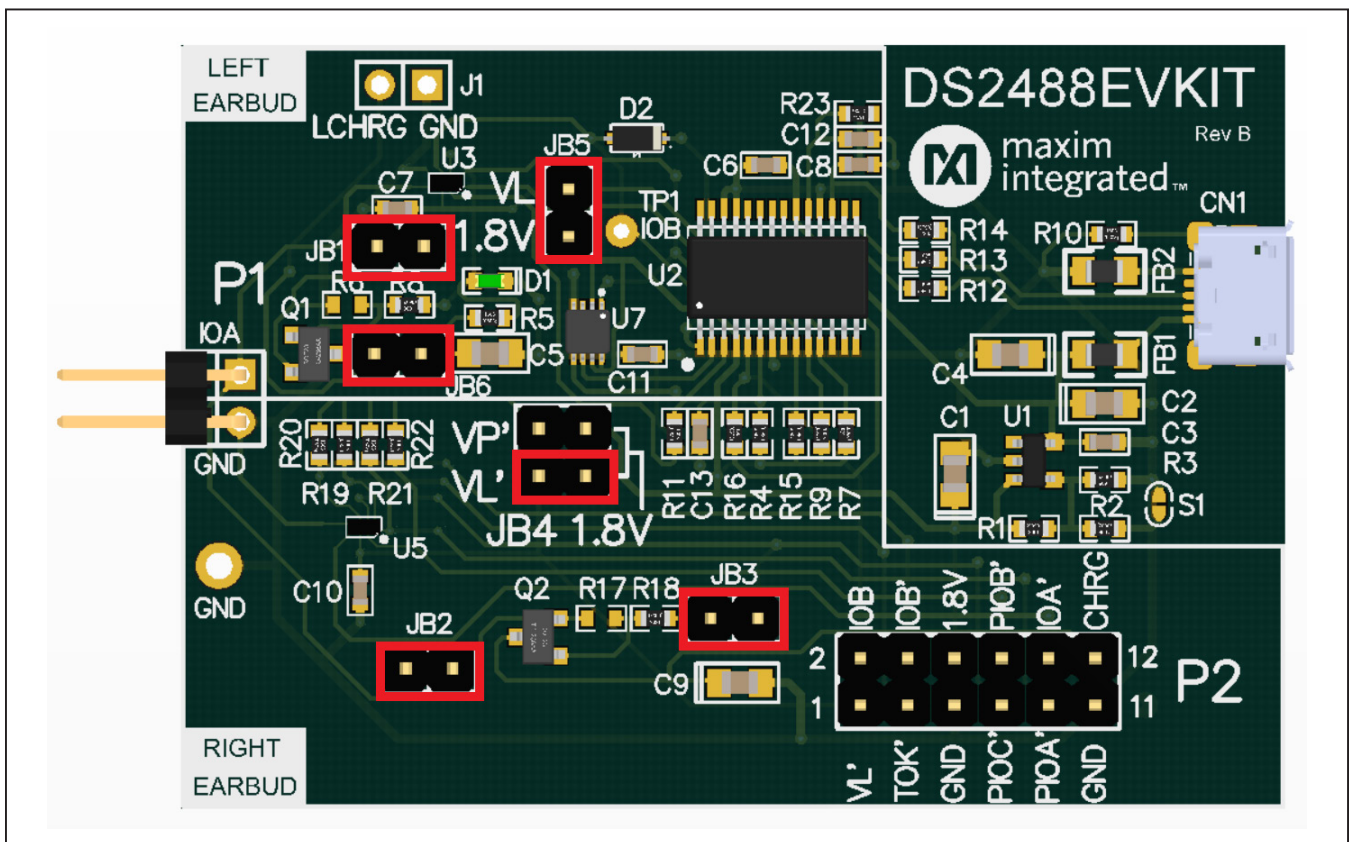


Figure 3. DS2488 EV Kit Board

- 11) Click on **Auto Detect** (see [Figure 4](#)).
- 12) Click on **Connect** (see [Figure 4](#)) and the window automatically changes to the **TWS Demo** tab if a connection to the hardware is successful (see [Figure 5](#)).

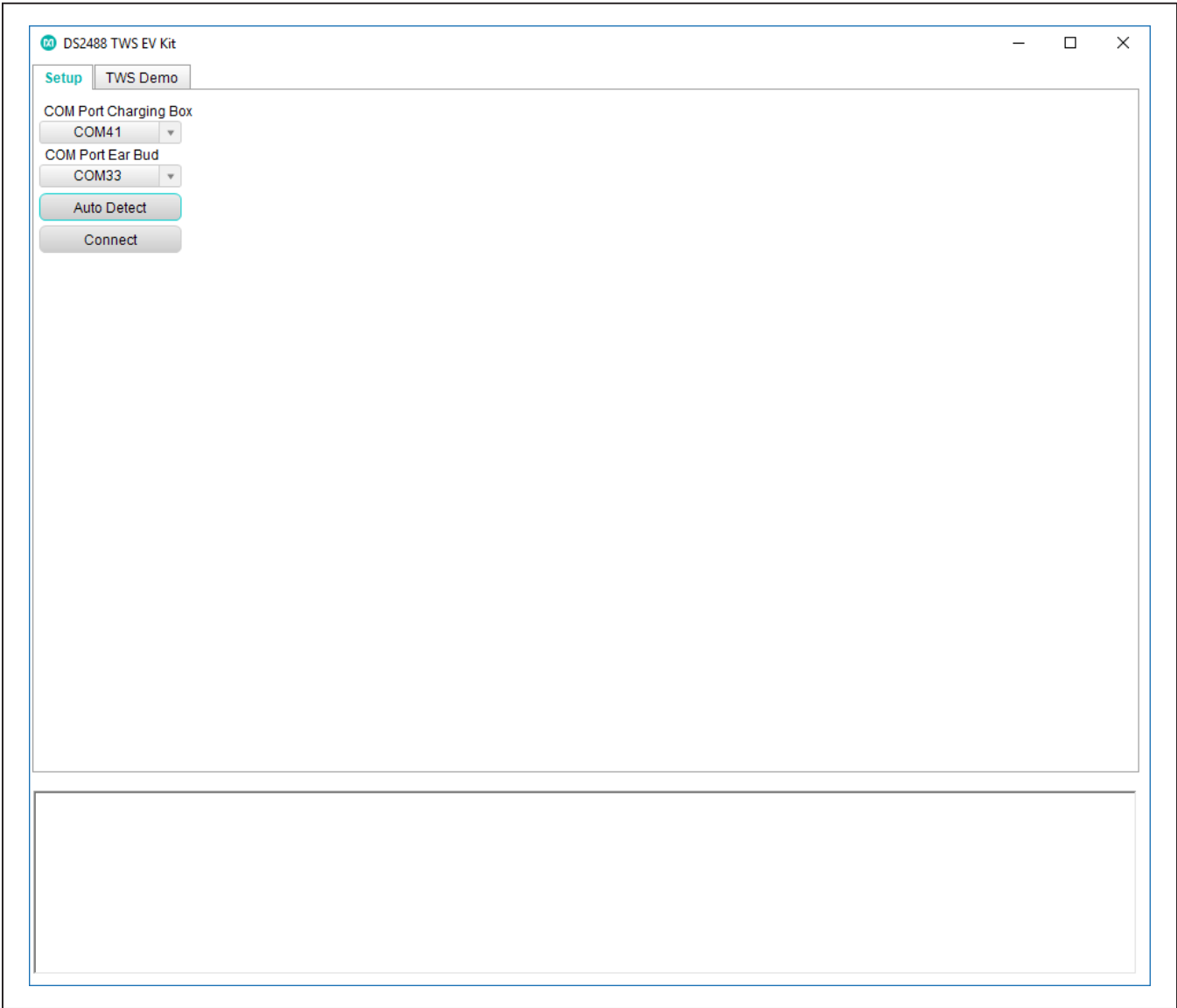


Figure 4. EV Kit Setup Tab

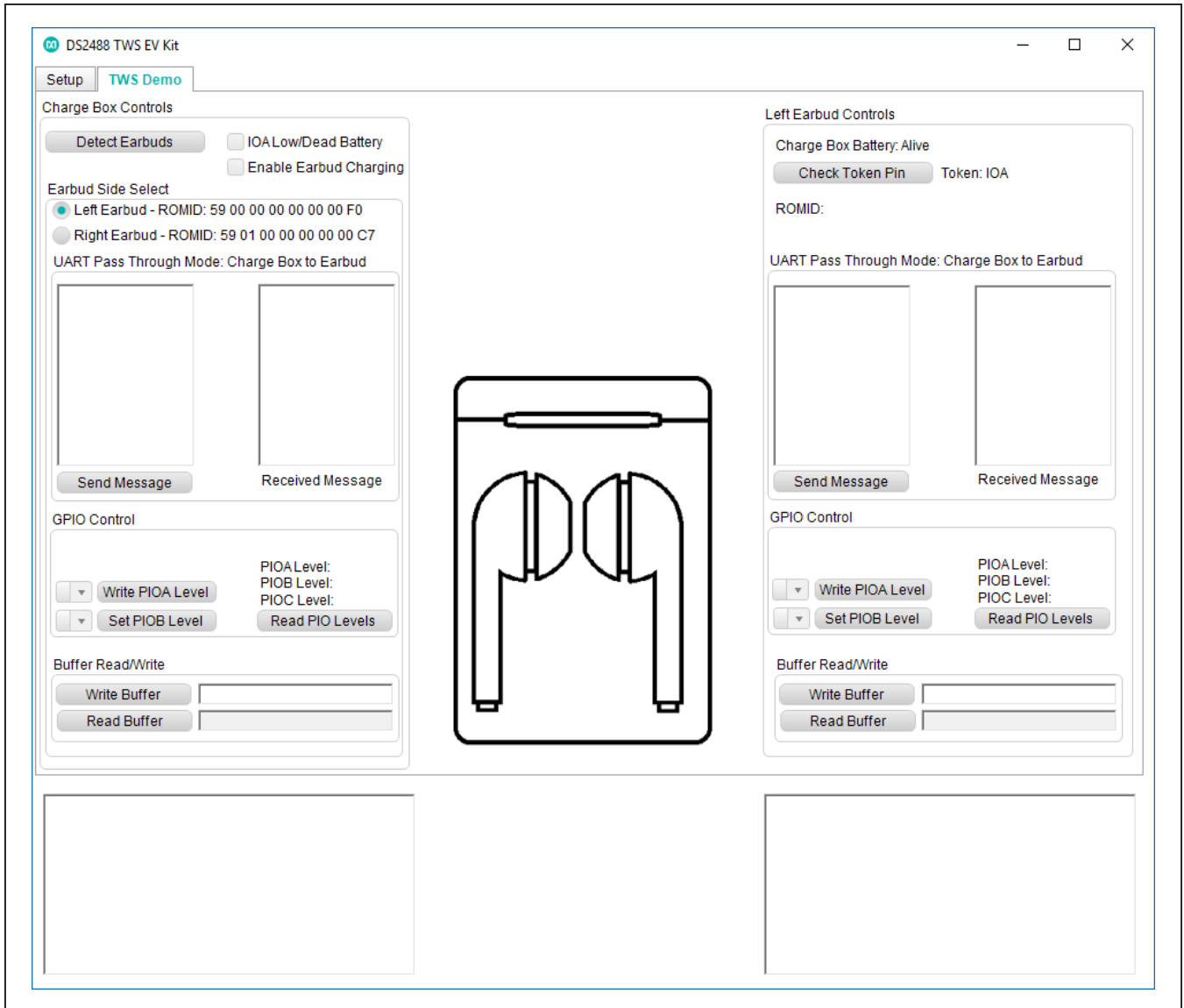


Figure 5. EV Kit Software Demo Tab

EV Kit Supported Functions

The DS2488 EV kit program is designed as a usage example.

Use the software to evaluate the DS2488 and the GUI displays the 1-Wire sequences for each step to assist the firmware engineer.

Table 1. Usage Flows

| FLOW | DESCRIPTION |
|----------------------|---|
| Detect Earbuds | Does a 1-Wire, Search ROM to determine which earbuds are connected to the charge box. |
| IOA Low/Dead Battery | Set IOA to logic-low to simulate dead battery, or to pass token to IOB |
| Send Message | Uses UART to send message between charge box and ear bud |
| Write PIOA Level | Use 1-Wire commands to set the PIOA level |
| Set PIOB Level | Set PIOB level using pin from the prolific chip |
| Read PIO Levels | Uses 1-Wire commands to read the levels of the PIO pin |
| Write buffer | Writes specified hex data to 8-byte buffer |
| Read buffer | Reads written data in 8-byte buffer |

Ordering Information

| PART | TYPE |
|--------------|--------|
| DS2488EVKIT# | EV Kit |

#Denotes RoHS compliance.

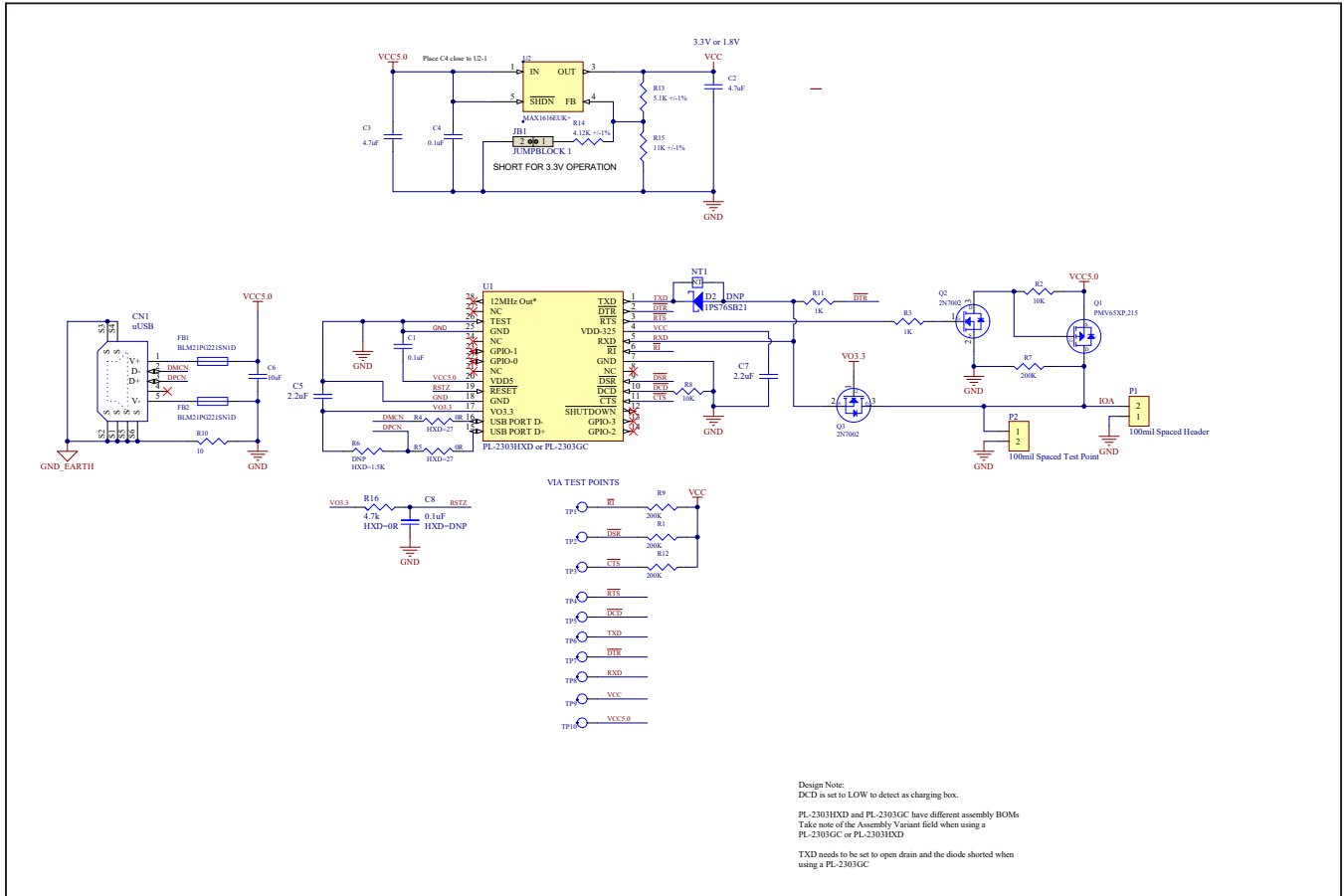
DS9401 Bill of Materials

| DESIGNATOR | QTY | DESCRIPTION | MANUFACTURER | PART NO. |
|-----------------|-----|--|----------------------------------|-------------------|
| C1, C4, C8 | 3 | CAP CER 0.1UF 16V X7R 0603 | Kemet | C0603C104K4RACTU |
| C2, C3 | 2 | CAP CER 4.7UF 16V Y5V 0805 | Samsung Electro-Mechanics | CL21F475ZOFNNNE |
| C6 | 1 | CAP CER 10UF 10V Y5V 0805 | Yageo | C2012Y5V1A106Z |
| C7,C5 | 2 | CAP CER 2.2UF 6.3V 10% X5R 0603 | Yageo | CC0603KRX5R5BB225 |
| CN1 | 1 | CONN RCPT USB2.0 MICRO B SMD R/A | Amphenol ICC (FCI) | 10118193-0001LF |
| D2 | 1 | DIODE SCHOTTKY 40V 200MA SOD323 (DNP) | Nexperia USA Inc. | 1PS76SB21,115 |
| FB1, FB2 | 2 | FERRITE BEAD 220 OHM 0805 1LN | Murata Electronics North America | BLM21PG221SN1D |
| JB1 | 1 | CONN HEADER VERT 2POS 2.54MM | Amphenol ICC (FCI) | 68000-102HLF |
| P1 | 1 | CONN HDR 2POS 0.1 GOLD PCB R/A | Sullins Connector Solutions | PPPC021LGBN-RC |
| P2 | 1 | CONN HEADER VERT 2POS 2.54MM | Amphenol ICC (FCI) | 68000-102HLF |
| Q1 | 1 | MOSFET P-CH 20V 2.8A SOT-23 | PMV65XP,215 | PMV65XP,215 |
| Q2, Q3 | 2 | MOSFET N-CH 60V 115MA SOT23-3 | Diodes Incorporated | 2N7002-7-F |
| R1, R7, R9, R12 | 4 | RES SMD 200K OHM 1% 1/10W 0603 | Yageo | RC0603FR-07200KL |
| R2, R8 | 2 | RES SMD 1K OHM 1% 1/10W 0603 | Panasonic Electronic Components | ERJ-3EKF1002V |
| R3, R11 | 2 | RES SMD 1K OHM 1% 1/10W 0603 | Yageo | RC0603FR-071KL |
| R4, R5 | 2 | RES SMD 0.0 OHM JUMPER 1/10W | Panasonic Electronic Components | ERJ-3GEY0R00V |
| R6 | 1 | DNP | | |
| R10 | 1 | RES SMD 10 OHM 1% 1/10W 0603 | Yageo | RC0603FR-0710RL |
| R13 | 1 | RES SMD 5.1K OHM 1% 1/10W 0603 | Bourns Inc. | CR0603-FX-5101ELF |
| R14 | 1 | RES 4.12K OHM 1% 1/10W 0603 | Stackpole Electronics Inc | RMCF0603FT4K12 |
| R15 | 1 | RES 11K OHM 1% 1/10W 0603 | Stackpole Electronics Inc | RMCF0603FT11K0 |
| R16 | 1 | RES SMD 4.7K OHM 1% 1/10W 0603 | Rohm Semiconductor | MCR03ERTF4701 |
| U1 | 1 | USB to Serial Bridge | Prolific | PL-2303GC |
| U2 | 1 | High-Voltage, Low-Power Linear Regulator | Maxim Integrated Products | MAX1616EUK+ |

DS2488EVKIT Bill of Materials

| DESIGNATOR | QTY | DESCRIPTION | MANUFACTURER | PART NO. |
|--------------------------------|-----|--|-------------------------------------|-------------------|
| C1, C2 | 2 | CAP CER 4.7UF 16V Y5V 0805 | Samsung Electro-Mechanics | CL21F475ZOFNNNE |
| C3, C6, C7, C10, C11, C12 | 6 | CAP CER 0.1UF 16V X7R 0603 | Kemet | C0603C104K4RACTU |
| C4 | 1 | CAP CER 10UF 10V Y5V 0805 | Yageo | C2012Y5V1A106Z |
| C5, C9 | 2 | CAP CER 2.2UF 16V Y5V 0805 | Yageo | CC0805ZRY5V7BB225 |
| C8, C13 | 2 | CAP CER 2.2UF 6.3V X5R 0603 | Taiyo Yuden | JMK107BJ225KA-T |
| CN1 | 1 | CONN RCPT USB2.0 MICRO B SMD R/A | Amphenol ICC (FCI) | 10118193-0001LF |
| D1 | 1 | Green 523nm LED Indication - Discrete 3.2V 0603 | Dialight | 5988081107F |
| D2 | 1 | DIODE SCHOTTKY 40V 200MA SOD323 | Nexperia USA Inc. | 1PS76SB21,115 |
| FB1, FB2 | 2 | FERRITE BEAD 220 OHM 0805 1LN | Murata Electronics North America | BLM21PG221SN1D |
| JB1, JB2, JB3, JB5, JB6, J1 | 6 | CONN HEADER VERT 2POS 2.54MM | Amphenol ICC (FCI) | 68000-102HLF |
| JB4 | 1 | CONN HEADER VERT 4POS 2.54MM | Amphenol ICC (FCI) | 67996-104HLF |
| P1 | 1 | CONN HEADER R/A 2POS 2.54MM | Sullins Connector Solutions | PRPC002SBAN-M71RC |
| P2 | 1 | CONN HEADER VERT 12POS 2.54MM | Amphenol | 67996-212HLF |
| Q1, Q2 | 2 | TRANS PNP 40V 0.6A SOT23 | On Semiconductor | MMBT4403LT1G |
| R1 | 1 | RES SMD 5.1K OHM 1% 1/10W 0603 | Panasonic Electronic Components | ERJ-3EKF5101V |
| R2 | 1 | RES SMD 4.12K OHM 1% 1/10W 0603 | Panasonic Electronic Components | ERJ-3EKF4121V |
| R3 | 1 | RES SMD 11K OHM 0.1% 1/10W 0603 | Panasonic Electronic Components | ERA-3AEB113V |
| R4, R7 | 2 | RES SMD 200K OHM 1% 1/10W 0603 | Panasonic Electronic Components | ERJ-3EKF2003V |
| R5, R8, R18 | 3 | RES SMD 680 OHM 1% 1/10W 0603 | Vishay Dale | CRCW0603680RFKEA |
| R6, R17 | 2 | 100K/0603 | Yageo | RC0603FR-07100KL |
| R9 | 1 | RES SMD 10K OHM 1% 1/10W 0603 | Panasonic Electronic Components | ERJ-3EKF1002V |
| R10 | 1 | RES SMD 10 OHM 1% 1/10W 0603 | Yageo | RC0603FR-0710RL |
| R11 | 1 | RES SMD 220 OHM 1% 1/10W 0603 | Panasonic Electronic Components | ERJ-3EKF2200V |
| R12, R13 | 2 | RES SMD 0.0 OHM JUMPER 1/10W | Panasonic Electronic Components | ERJ-3GEY0R00V |
| R14 | 1 | DNP | | |
| R15, R19, R20, R21, R22 | 5 | RES SMD 100K OHM 1% 1/10W 0603 | Vishay Dale | CRCW0603100KFKEA |
| R16 | 1 | RES SMD 1K OHM 1% 1/10W 0603 | Yageo | RC0603FR-071KL |
| R23 | 1 | RES SMD 4.7K OHM 1% 1/10W 0603 | Vishay Dale | CRCW06034K70FKEA |
| U1 | 1 | Linear Voltage Regulator | Maxim Integrated Products | MAX1616EUK+ |
| U2 | 1 | USB to Serial Bridge | Prolific/Techtonica | PL-2303GC |
| U3, U5 | 2 | 1-Wire Dual Port Link | Maxim Integrated | DS2488X+U |
| U7 | 1 | IC FF D-TYPE SNGL 1BIT US8 | ON Semiconductor | NC7SZ74K8X |

DS9401 Schematic



Revision History

| REVISION NUMBER | REVISION DATE | DESCRIPTION | PAGES CHANGED |
|-----------------|---------------|-----------------|---------------|
| 0 | 9/20 | Initial release | — |

For pricing, delivery, and ordering information, please visit Maxim Integrated's online storefront at <https://www.maximintegrated.com/en/storefront/storefront.html>.

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