

## Evaluates: 1-Wire Peripheral and iButton Devices

## DS9481R USB-to-1-Wire/iButton Adapter

### General Description

The DS9481R is a USB-to-1-Wire® adapter for easy PC connectivity to 1-Wire devices. The adapter provides an RJ11 connector with the signals to communicate with all 1-Wire and iButton® devices that support a 3.3V data I/O level. Additionally, the adapter provides the support and signaling to program 1-Wire/iButton EEPROM and one-time programmable (OTP)/EPROM devices. To provide a total hardware solution, the DS9481R can readily be used with the DS9120 socket adapter to create a 1-Wire PC programmer for 1-Wire peripheral devices (contact factory for more information). The equivalent peripheral hardware solution for the iButton is the DS1402D-DR8.

### Adapter Contents

QTY	DESCRIPTION
1	USB-to-1-Wire adapter Analog Devices DS9481R-3C7+
1	USB Type A-to-USB Mini-Type B cable Qualtek Electronics Corp. 3021003-03

### Features

- Driver Support for Windows® 11 and Windows 10 Operating Systems
- Enumerates as a Virtual PC COM Port by Use of the Prolific PL-2303GC USB-to-UART Bridge IC
- Emulates the DS2480B 1-Wire Line Driving Functionality
- 1-Wire OTP/EPROM Programming Provided Without the Need of an External Power Supply (12V on OW, 7V on PULSE)
- 3.3V Read/Write Operation to 1-Wire/iButton Devices
- RJ11 Interface for Standard Connectivity Accessories such as the DS9120 Socket Adapter
- Supports Standard and Overdrive 1-Wire Communication
- Provides Strong Pullup to 3.3V
- Fully Compliant with USB 2.0 Specification

### Ordering Information

PART	TYPE
DS9481R-3C7+	Adapter

+Denotes lead(Pb)-free and RoHS compliant.

### DS9481R USB-to-1-Wire/iButton Adapter



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Windows is a registered trademark of Microsoft Corporation.

19-5608; Rev 1; 3/23

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### Quick Start

#### Recommended Equipment

- Analog Devices DS9481R (included in adapter)
- USB type-A to USB Mini type-B cable (included in adapter)
- RJ11 cable assembly (not included)
- PC with a Windows 11 or Windows 10 OS and a spare USB port

**Note:** In the following sections, software-related items are identified by bolding. Text in **bold** refers to items directly from the adapter software. Text in **bold and underlined** refers to items from the Windows operating system.

#### Procedure

- 1) Do the following to install the PL-2303GC Prolific driver:
  - a) Download the latest driver version from [Prolific](#).
  - b) **Open** and **Run** the latest version of the Driver Installer.
  - c) Follow the directions of the **Install Wizard** until **Finish** is reached for the PL-2303 USB-to-serial driver installation. Close by clicking the **Finish** button.
- 2) Do the following to install the 1-Wire drivers:
  - a) Go to the [Download 1-Wire/iButton Drivers for Windows](#) webpage..
  - b) From the **Choose Operating System** drop-down list, select your OS.
  - c) From the **Select File** drop-down list, select 32-bit or 64-bit 1-Wire drivers for the architecture being used by your OS.
  - d) Click the **Download** button.
  - e) When prompted by the question **Do you want to run or save this file?**, select **Run**.
  - f) When you get a security warning that says **Do you want to run the software?**, select **Run**.
  - g) Read and check the box if you accept the license agreement and click **Install**.
  - h) Click the **Finish** button to exit the Setup Wizard.
- 3) The DS9481R USB-to-1-Wire adapter uses both the Prolific PL-2303GC and the Analog Devices MAXQ610 to emulate a virtual COM-to-1-Wire port on any PC. Find the enumeration of the virtual COM port by inserting the DS9481R into a spare USB port on the computer. Determine the COM port by looking in **Control Panel**→**System**→**Hardware**→**Device Manager** and expand **Ports (COM & LPT)**. The port is COM5 in the example shown in Figure 2.



Figure 1. DS9481R USB-to-1-Wire/iButton Adapter and Cable

# DS9481R USB-to-1-Wire/ iButton Adapter

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You have now completed the installation of the DS9481R adapter. Obtain the adapter software and directions for installation for your 1-Wire/iButton peripheral device by contacting the Analog Devices online [Technical Support Portal](#).

## Detailed Description of Connectors

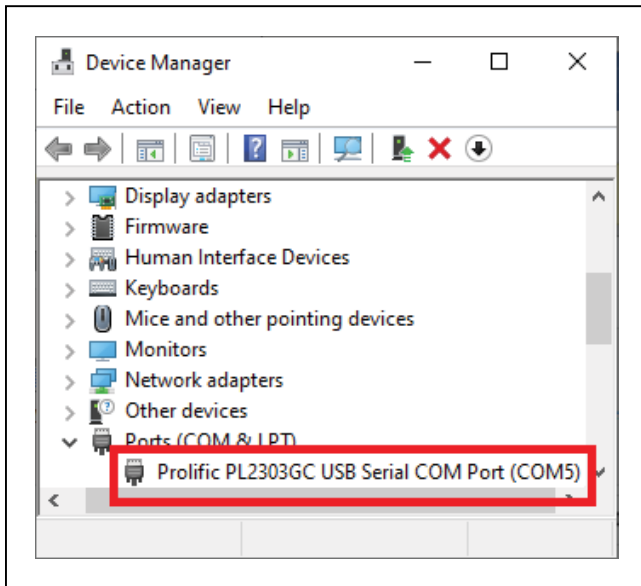


Figure 2. DS9481R COM Port

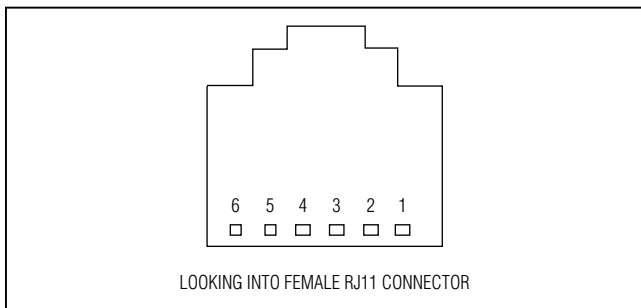


Figure 3. 1-Wire RJ11 Port

Table 1. 1-Wire RJ11 Pinout

CONNECTOR PIN	SIGNAL NAME
1	3.3V
2	GND
3	OW (DATA)
4	OWGND
5	PULSE
6	GP

## RJ11 Pinout

Table 1 and Figure 3 show the RJ11 pinout mounted on the DS9481R PCB at J1. The RJ11 pin 1 can supply 3.3V and can be used for auxiliary board power. The GND is the ground of the 3.3V supply. The signal OW (DATA) stands for the 1-Wire data bus. The ground return for OW (DATA) is the signal OWGND. The PULSE signal is to be used as the VCC power supply for OTP 1-Wire peripheral parts. The PULSE signal is typically 3.3V, but also can provide the needed programming pulse for OTP parts. The GP signal is reserved for future general-purpose usage and is functionally not used by the DS9481R.

## Mini-USB Pinout

The 5-position Mini-USB type AB connector is mounted at CN1 of the DS9481R PCB, as shown in Table 2.

## Hardware/Firmware Capabilities

The DS9481R uses both the Prolific PL-2303GC and the Analog Devices MAXQ610. The PL-2303GC is fully compliant with the USB 2.0 specification for the Windows 11 and Windows 10 OS and provides a bridge for the USB-to-UART connection. The MAXQ610 is loaded with firmware that emulates the functionality of the DS2480B serial-to-1-Wire line driver at a lower 3.3V operation voltage. The MAXQ610 functions as a UART-to-1-Wire bridge and can serve custom application needs with firmware programmability.

Table 2. Mini-USB Type AB USB Pinout

CONNECTOR PIN	SIGNAL NAME
1	5.0V
2	DMCN
3	DPCN
4	NC
5	GND
6-9	GND_EARTH

**DS9481R EV Kit Bill of Materials**

DESIGNATION	QTY	DESCRIPTION
C1, C6, C21	3	4.7uF, 16V Y5V ceramic capacitors (0805) TDK Corp. C2012Y5V1C475Z
C2, C3	2	2.2uF, 16V Y5V ceramic capacitors (0805) Murata GRM21BF51C225ZA01L
C4, C7	2	0.22uF Q10%, 16V X7R ceramic capacitors (0603) TDK Corp. C1608X7R1C224K
C5, C15, C22	3	10nF ±5%, 16V X7R ceramic capacitors (0603) AVX 06035C103JAT2A
C8, C12, C13, C14, C20, C23	6	0.1uF, 16V X7R ceramic capacitors (0603) KEMET C0603C104K4RACTU
C10	1	10uF, 10V Y5V ceramic capacitor (0805) TDK Corp. C2012Y5V1C106Z
C16	0	Do not populate, 470pF ceramic capacitor (0603)
C17, C18	2	1uF, 10V X7R ceramic capacitor (0603) Taiyo Yuden LMK107B7105KA-T
C26	1	2.2uF, 16V X5R ceramic capacitors (0603)
C19	1	10pF, 16V NP0 ceramic capacitor (0603) TDK Corp. C1608C0G1H100D
C9, C24, C25	0	Do not populate, capacitors
CN1	1	USB Mini-AB connector, right-angle, SMD, 5-position JAE Electronics DX3R005HN2E700
D1	1	30V, 200mA Schottky diode (SOT23) Diodes Inc./Zetex BAT54TA
D2	1	15V, 350mA zener diode (SOT23) Diodes Inc. MMBZ5245B-7-F
D3	1	Orange LED (TSS type) (0603) Panasonic/SSG LNJ812R83RA
D4	1	Dual CC Schottky diode (SOT23) Diodes Inc./Zetex BAT54CTA
FB1, FB2	2	220W, 2000mA ferrite chips (0805) Murata BLM21PG221SN1D
J1	1	6-position, right-angle, PCB-mounted jack Tyco 5520425-3
J2	0	Do not populate, JTAG connector
Q1, Q3	2	130mA, 50V p-channel MOSFETs (SOT23-3) Fairchild Semiconductor BSS84
Q2, Q4, Q5, Q7	4	115mA, 60V n-channel MOSFETs (SOT23) Diodes, Inc. 2N7002-7-F
Q6	1	3.9A, 20V p-channel MOSFET (SOT23) NXP PMV65XP,215
R1, R29	0	Do not populate, resistors
R2, R3, R5	0	Do Not Populate Resistors
R4, R16, R21	3	1.5kOHM Q1%, 1/10W SMD resistors (0603) Panasonic ECG ERJ-3EKF1501V
R6, R24	2	10kOHM Q1%, 1/10W SMD resistors (0603) Yageo RC0603FR-0710KL
R7, R14, R26	3	1kOHM Q1%, 1/10W SMD resistors (0603) Yageo RC0603FR-071KL
R8, R13, R17, R20, R27, R30	5	100kOHM Q1%, 1/10W SMD resistors (0603) Yageo RC0603FR-07100KL

**DS9481R EV Kit Bill of Materials (continued)**

DESIGNATION	QTY	DESCRIPTION
R9	1	979Ohm Q5%, 1/10W SMD resistor (0603)
		Yageo RC0603FR-07750RL
R10, R29	1	00Ohm Q1%, 1/10W SMD resistor (0603)
		Panasonic ECG ERJ-3GEY0R00V
R11	1	330Ohm Q1%, 0.1W SMD resistor (0603)
		Rohm MCR03EZPF33R0
R12, R15, R22	3	4.99Ohm Q1%, 1/10W SMD resistors (0603)
		Yageo RC0603FR-074R99L
R18	1	2.2kOHM Q5%, 1/10W SMD resistor (0603)
		Stackpole Electronics RMCF 1/16 2.2K 1% R
R19	1	4.7k OHM Q5% (0603)
R23	1	51kOHM Q0.1%, 1/10W SMD resistor (0603)
		Panasonic ECG ERA-3AEB513V
R25	1	11kOHM Q0.1%, 1/10W SMD resistor (0603)
		Vishay/Dale TNPW060311K0BEEA
R28	1	100Ohm Q1%, 1/10W SMD resistor (0603)
		Yageo RC0603FR-0710RL
R31	1	32.4kOHM Q1%, 1/10W SMD resistor (0603)
		Vishay/Dale TNPW060332K4BEEA
R32	1	30.1kOHM Q0.1%, 1/10W SMD resistor (0603)
		Panasonic ECG ERJ-3EKF3012V
R33	1	50kOHM Q1%, 1/10W SMD resistor (0603)
		Panasonic ECG ERJ-3EKF4992V
R36	1	27 Ohm Q1%, 1/10W SMD (0603)
RT1	1	0.12A, 30V PTC resettable fuse (1206)
		Bourns MF-NSMF012-2
SW1	0	Do not populate, switch
U1	1	Low-dropout, 300mA linear regulator (5 SOT23)
		Analog Devices MAX8887EZK33+T
		(Top Mark: ADPZ)
U2	1	12V, 30mA Flash memory programming supply (8 SO)
		Analog Devices MAX662ACSA+
U3	1	TinyLogicM UHS inverter (5 SOT23)
		Fairchild NC7SZ04M5X
U4	0	Do not populate, Silicon oscillator
U5	1	USB-to-serial bridge controller (28 SSOP)
		Prolific PL-2303GC SSOP
U6	1	16-bit microcontroller with infrared module (32 TQFN-EP*)
		Analog Devices MAXQ610A-9410+
U7	1	2-channel ESD protector (6 FDFN)
		Analog Devices MAX13204EALT+
		(Top Mark: BV)
U8	1	High-voltage, low-power linear regulators (5 SOT23)
		Analog Devices MAX1616EUK+
		(Top Mark: ABZD)
U9	1	1.8V comparator (5 SOT23) STMicroelectronics TS3021ILT
—	1	PCB: DS9481R REV A5

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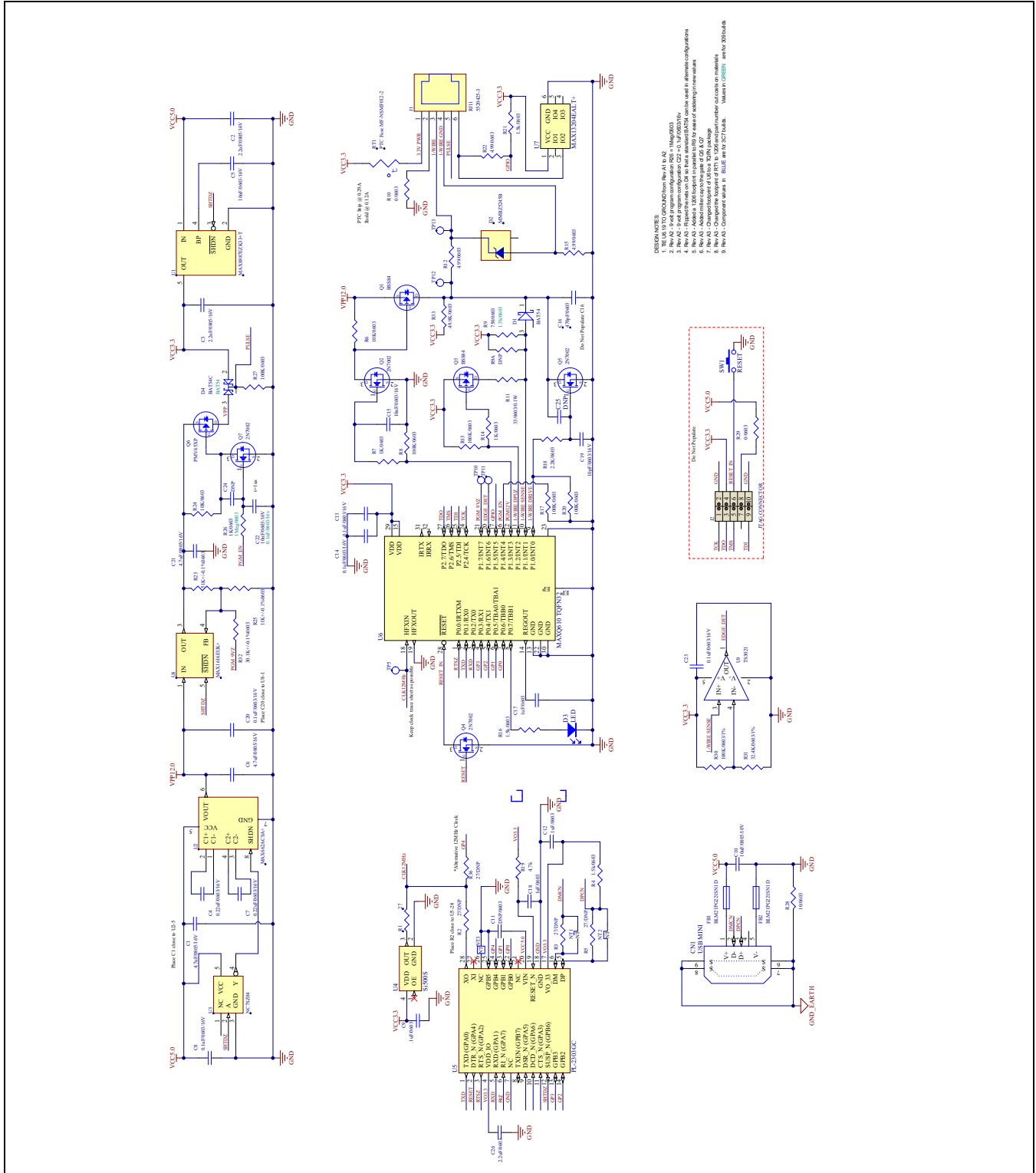


Figure 4. DS9481R Adapter Board Schematic

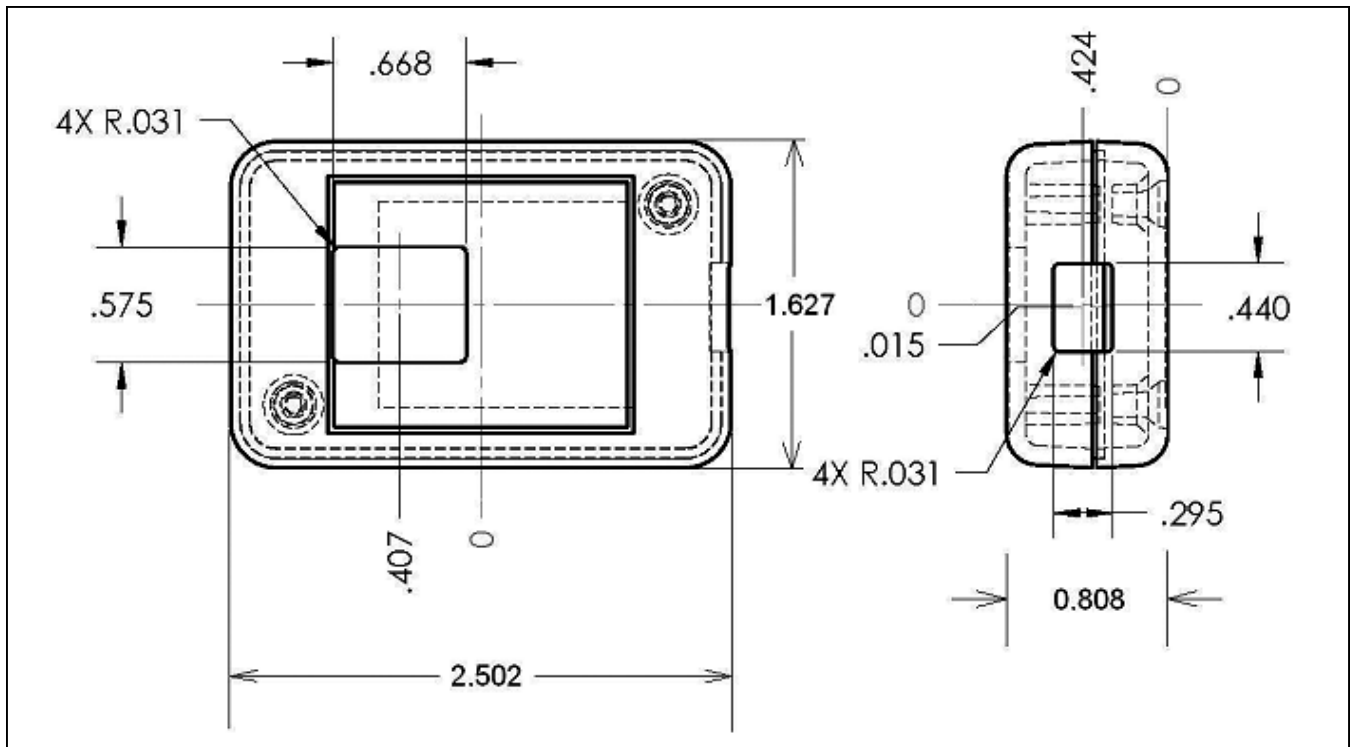
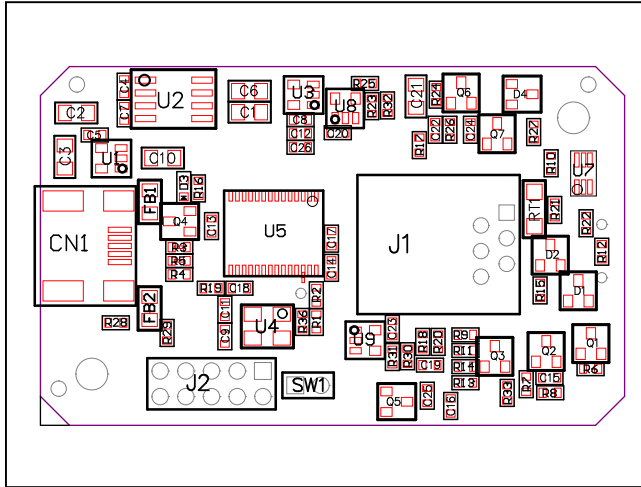


Figure 5. DS9481R Adapter Enclosure Dimensions

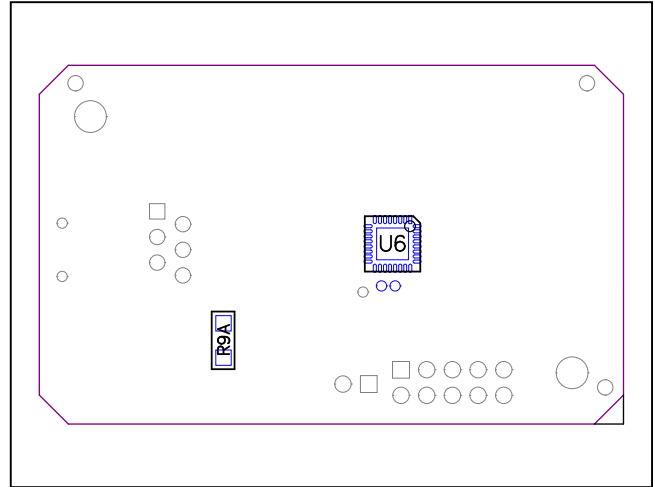
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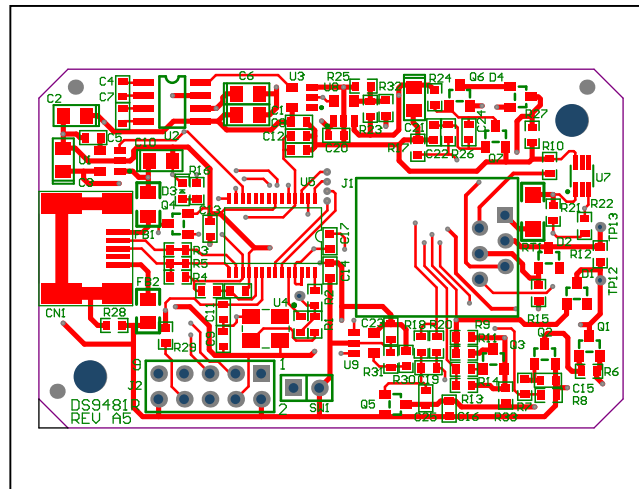
## DS9481R EV Kit PCB Layout



DS9481R Adapter Board—Top Assembly



DS9481R Adapter Board—Bottom Assembly



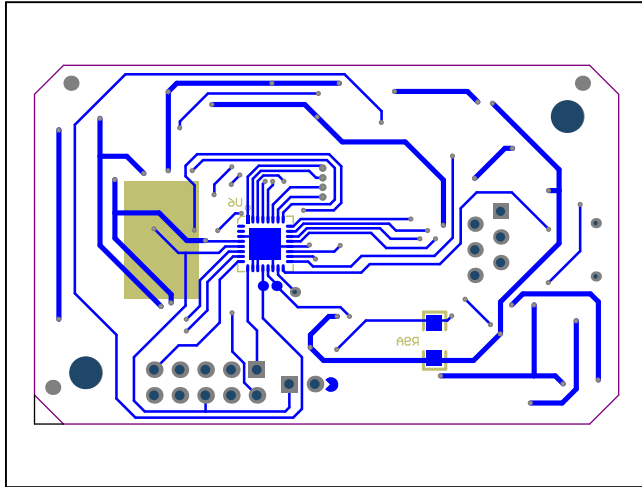
DS9481R Adapter Board—Top Silkscreen



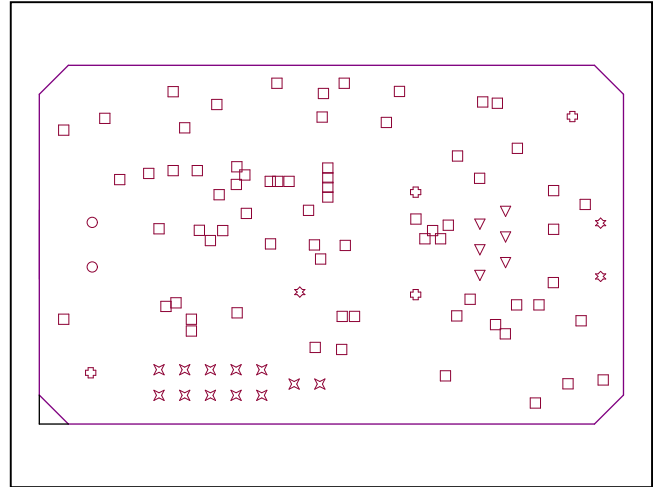
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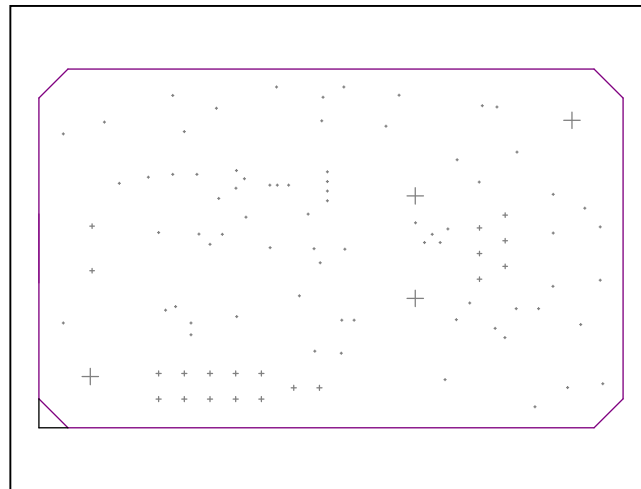
## DS9481R EV Kit PCB Layout (continued)



DS9481R Adapter Board—Top Assembly



DS9481R Adapter Board—Bottom Assembly



DS9481R Adapter Board—Top Silkscreen

### Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	10/10	Initial release	—
1	3/23	Updated for hardware changes	All

