DS9090EVKIT
Evaluation System

General Description

The DS9090EVKIT evaluation system (EV system) consists of a DS9490+ USB-to-1-Wire®/iButton® adapter for PC connectivity, a DS9120P+ socket board with RJ11 cable, and seven different 1-Wire devices. This EV system provides the special hardware and software system to exercise the features of 1-Wire devices with memory or PIO/switches, except 1-Wire EPROM devices. (EPROM devices such as the DS2502 and DS2506 require a different adapter (DS9481R-3C7) to perform an EPROM write. This adapter can be purchased separately.) 1-Wire EPROM devices are available for sampling.

The EV system software consists of the OneWireViewer (a Java® program) that runs under Windows® OS and comes as part of the 1-Wire drivers installation package.

Benefits and Features

- Easy Setup with USB Adapter
- Fully Compliant with USB 2.0 Specification
- Software Runs on Windows 8, Windows 7, Windows Vista®, and Windows XP® OS (32-Bit and 64-Bit Versions)
- Convenient On-Board Test Points and Dual TO92 Socket
- Standard RJ11 Connector Interfaces to DS9120 Socket Boards
- Free Download of 1-Wire Drivers and OneWireViewer Demonstration Software
- Compatible with Other 1-Wire Devices Purchased Separately

EV System Contents

QTY	PART	DESCRIPTION
1	DS9120P+	Socket board (Dual TSOC and TO92)
1	DS9490R#	1-Wire USB adapter with RJ11
3	DS2401P+	64-bit silicon serial number (3 TO92)
3	DS2406P+	1-Wire, dual-addressable switch plus 1Kb EPROM memory

QTY	PART	DESCRIPTION
3	DS2411P+	Silicon serial number with V_{CC} input
3	DS2413P+	1-Wire dual-channel addressable switch
3	DS2431P+	1024-bit 1-Wire EEPROM
3	DS24B33+	1-Wire 4Kb EEPROM
3	DS28E07P+	1024-bit 1-Wire EEPROM
1	Cable	RJ11 male to RJ11 male cable

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![maxim integrated logo]

DS9090EVKIT Evaluation System

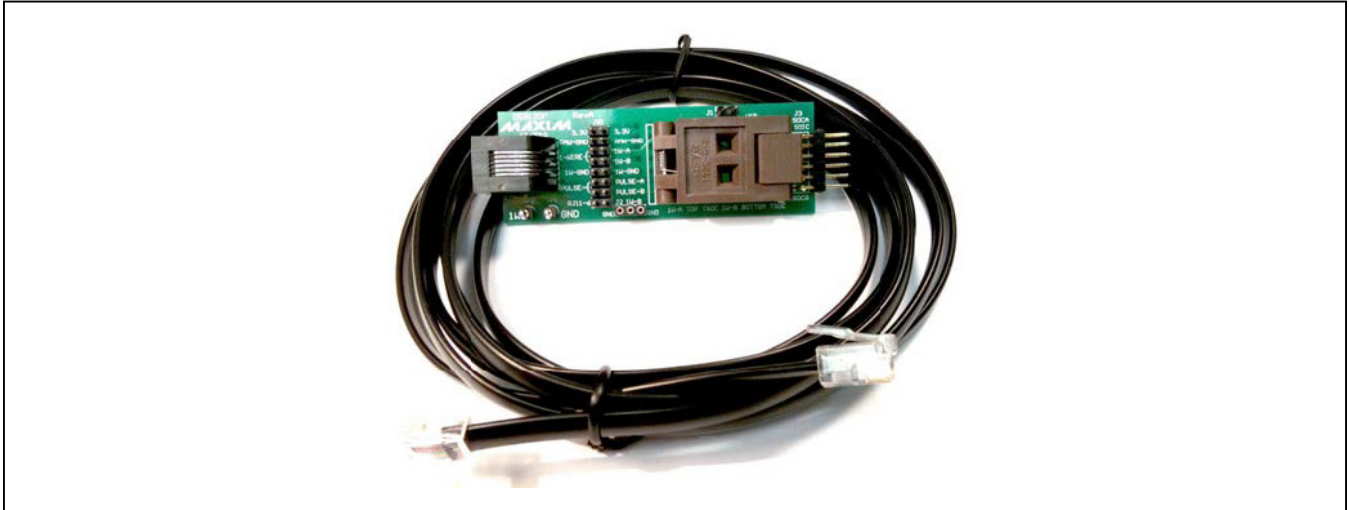*Figure 1. DS9120P+ Socket Board*

Figure 2. DS9490R# USB-to-1-Wire/iButton Adapter

Figure 3. Typical Setup

DS9090EVKIT EV System Files

FILE	DESCRIPTION
OneWireDrivers_xXX.msi	OneWireViewer (Installation file)

Quick Start

Required Equipment

- DS9490R# USB-to-1-Wire/iButton adapter (included)
- DS9120P+ socket adapter (included)
- Computer with a Windows 8, Windows 7, Windows Vista, or Windows XP operating system (32-bit or 64-bit) and a spare USB 2.0 or higher port
- TSOC or TO92 parts (included)
- OneWireViewer software with bundled drivers

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

DS9090EVKIT Setup

Procedure

1) Install the 1-Wire drivers. See the *Installing the DS9490R# and 1-Wire Drivers* section for instructions.

2) DS9120P+ jumper settings:
   a) Remove jumpers from the JB1 to leave only the middle three jumpers connected. See Figure 4.

   b) Note that when evaluating a DS2413P device, jumpers J1 and J4 are to be populated. For all other 1-Wire slave devices, do not populate J1 or J4 with a jumper. When using the DS2413P in socket S1, the user can populate R3 and R4 with 10kΩ pullups; otherwise, these need to be added externally. PIOA can be observed on J3:1 and PIOB can be observed on J3:5. See Figure 9 for resistor and pin location.

   c) Note that when evaluating a DS2411P device, is necessary to place a jumper to 3.3V and a wire must be soldered to jump R3 and R5. See Figure 5.

   Note: Refer to the DS9120P and each device IC data sheet for complete schematic and pin input and output to confirm proper operation for each device to be evaluated.

3) Insert the DS9490R# into a spare USB port of the PC. Only after OneWire Drivers Installation is completed should the DS9490R# be inserted. Once inserted, wait for the operating system to complete the plug-and-play process. For Windows 2003 and XP (SP2), the OS prompts about installing the DS9490R# device with the **Add Hardware** wizard before continuing. Newer operating systems complete the plug-and-play process without the wizard. During the installation process, the drivers are set up to point to the USB adapter as the default port type and port 1 (USB1) as the default port number. The default port type and number settings can be changed at any time after installation by running the **Default 1-Wire** Net program that is installed with the drivers. To do so, simply click on **Start | Programs | 1-Wire Drivers xXX** (xXX represents the OS architecture, either x86 or x64). Then click on the icon labeled **Default 1-Wire** Net. If problems are encountered during installation, refer to **Application Note 1740: White Paper 6: 1-Wire Drivers Installation Guide for Windows**, specifically the "Appendix A: 1-Wire USB Adapter (DS9490) Installation Help" section.

4) Connect the DS9120P+ to the DS9490R# with the supplied RJ11-to-RJ11 cable. One end of the cable should be plugged into the DS9120P+ board and the other end into the DS9490R#. See Figure 6.

5) Insert the 1-Wire device of interest into the DS9120P+ socket. See Figure 7 for proper chip orientation.

Run the **OneWireViewer**.
   Click on **Start | Programs | 1-Wire Drivers xXX**. Then click on the **OneWireViewer** icon. This runs the OneWireViewer. If the OneWireViewer cannot find a suitable Java Runtime Environment (JRE), it prompts the user with a message to download the latest one from www.java.com. Once the OneWireViewer is running, the 64-bit ROM ID values (i.e., the 1-Wire network addresses) of all 1-Wire chips inserted into the evaluation board are displayed. Clicking on the chip's address selects the chip and starts communicating with it. The OneWireViewer then makes other tabs available that contain functionality to exercise the chip (i.e., read and write data, files, exercise PIO pins, etc.). It is also possible to run the OneWireViewer on OS platforms other than Windows, but it could require special setup and/or additional software installation. Refer to the OneWireViewer website for more information at **www.maximintegrated.com/onewireviewer**.

6) When properly installed, the follow GUI should appear as shown in Figure 8.

3.3V   3.3V
RAW-GND   RAW-GND
1-WIRE   1-W-A
1-WIRE   1-W-B
1W-GND   1W-GND
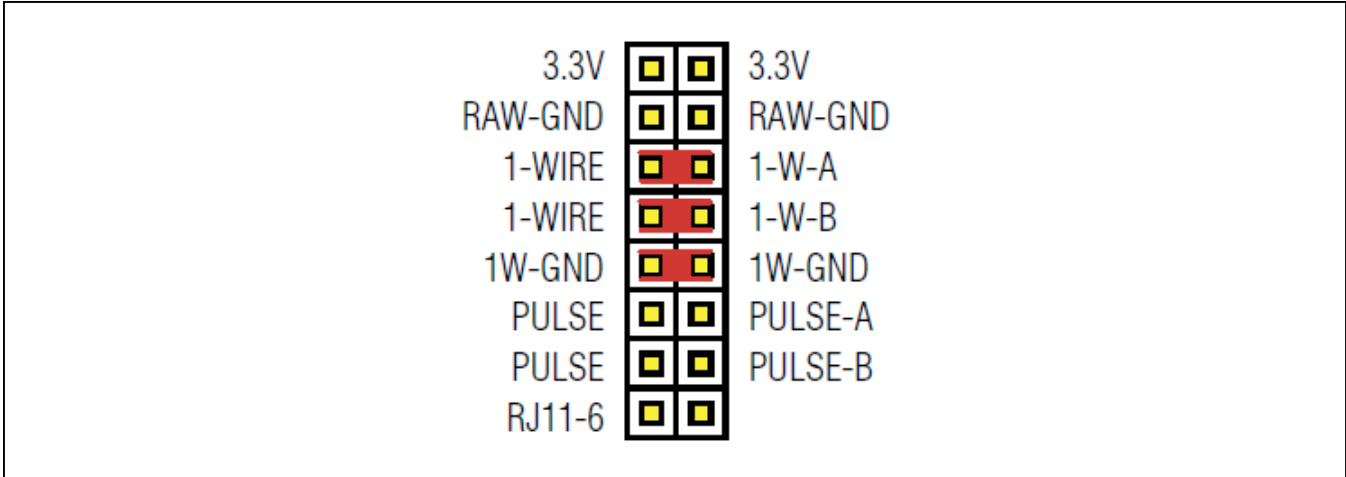PULSE   PULSE-A
PULSE   PULSE-B
RJ11-6

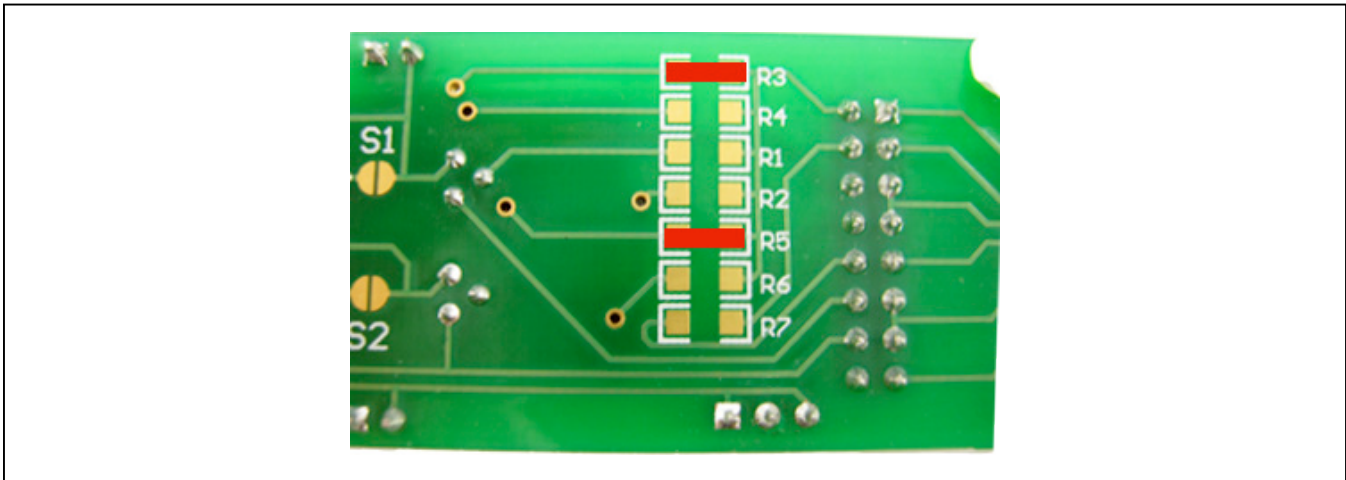*Figure 4. Jumper Settings for Parasitic Power*

Figure 5. DS9120P Modification for DS2411P+

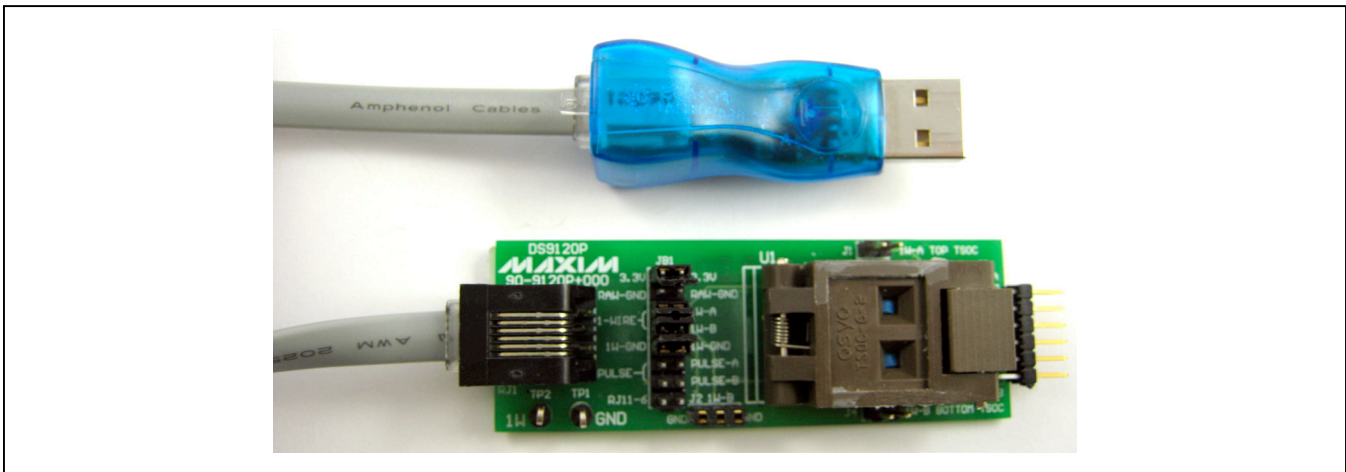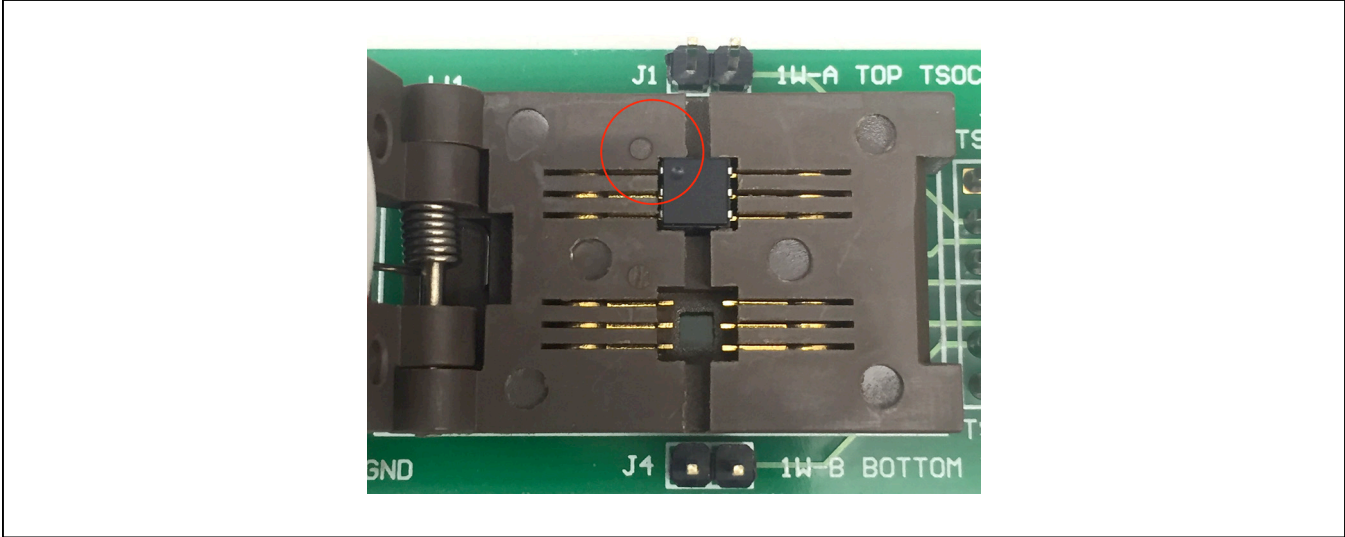*Figure 6. DS9120P+ to DS9490R#*

Figure 7. Chip Orientation Example
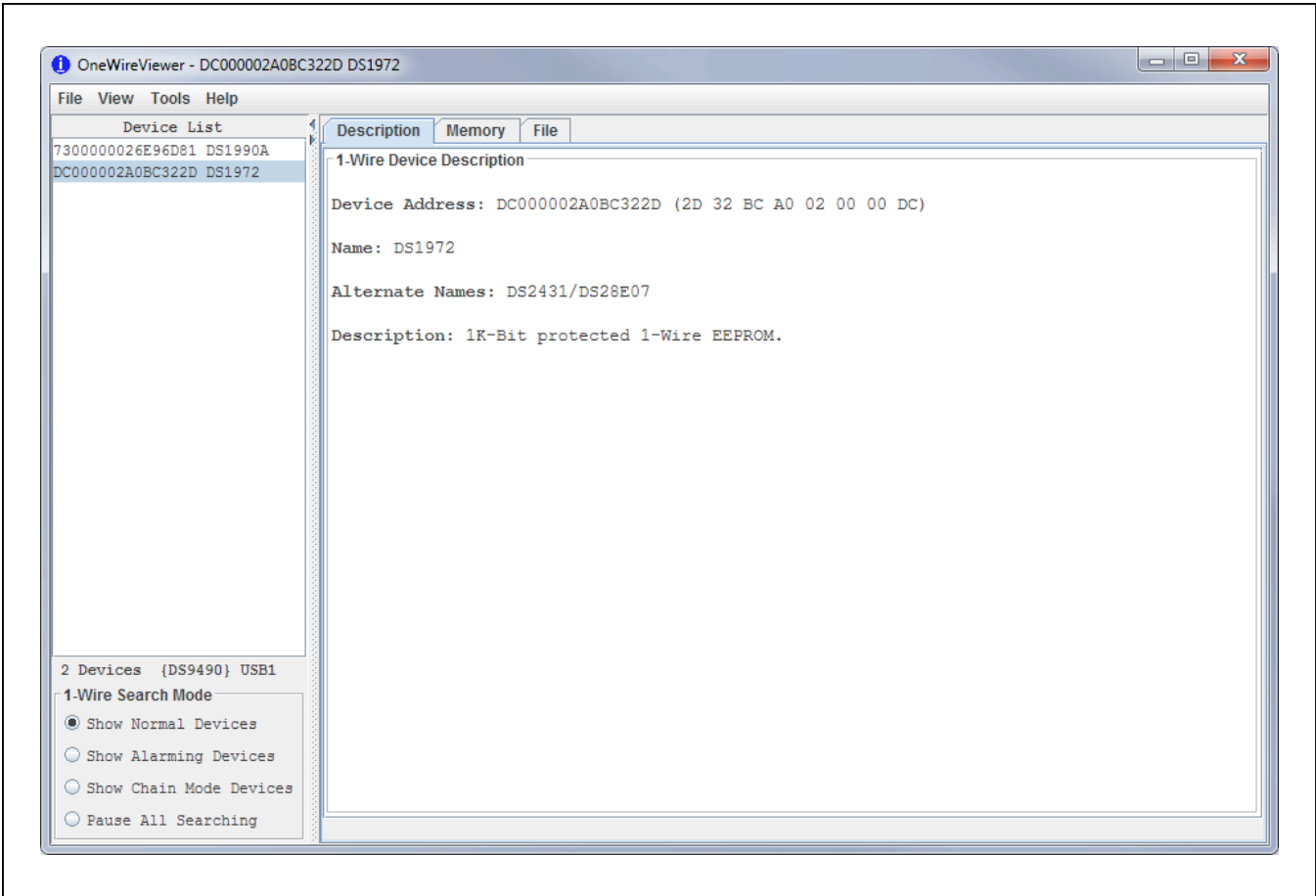
Figure 8. OneWireViewer Screen Example

DS9090EVKIT Operation

In order to start communicating with the part, it is necessary to have the DS9490R# adapter connected and have a part placed into the DS9120P+ socket.

- Select the 1-Wire device to evaluate and insert it into the appropriate socket, ensuring it is properly oriented. Jumper the appropriate enable pins for the TSOC socket. See the *DS9090EVKIT Setup* section for help.

- Run the **OneWireViewer**. If any difficulty is encountered, see the *Troubleshooting Guide* section. Another helpful resource is **Application Note 3358: OneWireViewer User's Guide**.

The **OneWireViewer** presents a **Device List** window located on the left-hand side of the main screen. It displays a list of the different 1-Wire devices found connected to the DS9490R#. The 1-Wire device type inserted into the socket or header of the evaluation board should be shown in the **Device List** window, along with the 64-bit ROM ID lasered into the device. Figure 8 shows the **DS1972** in the Device List window, along with its 64-bit ROM ID value of **DC000002A0BC322D**.

- From the **Device List** window, select the part by clicking on it.

- Once the 1-Wire device has been selected, the right-hand side of the main **OneWireViewer** screen is populated with different tabs. There are at least three tabs for each device contained in the DS9090EVKIT: **Description**, **Memory**, and **File**. A fourth tab labeled **Switch** is also available on those parts containing switches.

- Clicking on the **Memory** tab brings up the Memory Viewer. The user has the choice of reading/writing any of the memory banks listed in the Banks section of the Memory Viewer. When done editing the raw page (entering in a hexadecimal number for each byte), press **Commit Changes** to write to the memory.

- Click the **Commit Changes** button to write the changes to the device memory.

- Clicking **Refresh** rereads the contents of the 1-Wire memory.

- The **File** tab allows writing files to the device's memory. To do this, the user needs to first **Format the Device**, then **Create/Read/Write/Delete** files and directories.

- The **Switch** tab allows reading and toggling of the PIO pin states and clearing of activity latches. Refer to **Application Note 3358** for further instructions on how to use the many features of the OneWireViewer.

Detailed Description of Hardware

RJ11 Pin Assignment

Table 1 shows the pin assignment at RJ11 on the DS9120P+ socket board and the DS9490R# USB-to-1-Wire/iButton adapter.

Table 1. 1-Wire RJ11 Pinout

PIN NUMBER	SIGNAL NAME	DESCRIPTION
1	3.3V	Used only for DS2411
2	GND	Not used for this EV kit
3	1W	1-Wire Data
4	GND	1-Wire Ground Reference
5	PULSE	Not used for this EV kit
6	(Reserved)	Not used for this EV kit

Troubleshooting Guide

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
Operating system prompt giving installation error.	The 1-Wire adapter's device driver did not get installed properly.	Refer to Application Note 1740: White Paper 6: 1-Wire Drivers Installation Guide for Windows, specifically the "Appendix A: 1-Wire USB Adapter (DS9490) Installation Help" section.
Cannot communicate through 1-Wire adapter.	The PC port hardware is not functioning properly.	Does the port work with other applications, such as a keyboard or mouse? If not, contact the motherboard vendor for BIOS updates or new drivers.
	The 1-Wire adapter is not functioning.	Try the 1-Wire adapter on another PC. If the problem persists, use a different 1-Wire adapter or order a new adapter of this type.
	The adapter type selected is not what is connected.	Run the **Default 1-Wire Net** application and select the correct adapter type and/or port number.
Software finds 1-Wire adapter, but does not read a 1-Wire device.	Possible broken wire in the RJ11 cable or the USB connector of the DS9490R.	Check the cable for broken wires.

Appendix A: Extended Setup Guide

Installing the DS9490R# and 1-Wire Drivers

The DS9490R# USB-to-1-Wire/iButton adapter also requires 1-Wire drivers to operate the 1-Wire port. Unless you have been using 1-Wire devices before, e.g., with a different adapter, the drivers need to be installed before this evaluation kit can function. Follow these steps to install the 1-Wire Drivers software package. For installation details, refer to **Tutorial 4373: OneWireViewer and iButton Quick Start Guide**.

1) To download the 1-Wire Drivers software package, go to **www.maximintegrated.com/1-wiredrivers**. Click on the button that takes you to the download page. Select the applicable version of the Windows operating system. Then select the file that corresponds to your computer's configuration (32-bit or 64-bit), and click **Download**. The web page provides assistance on how to detect whether your computer runs a 32-bit or 64-bit operating system.

2) When prompted with the question **Do you want to run or save this file?** select **Run**.

3) When you get a security warning that reads **Do you want to run the software?** select **Run**.

4) Read and check the box if you accept the license agreement. Click **Install**.

5) Click the **Finish** button to exit the **Setup Wizard**.

6) Now return to the **Procedure** section and execute Step 2.
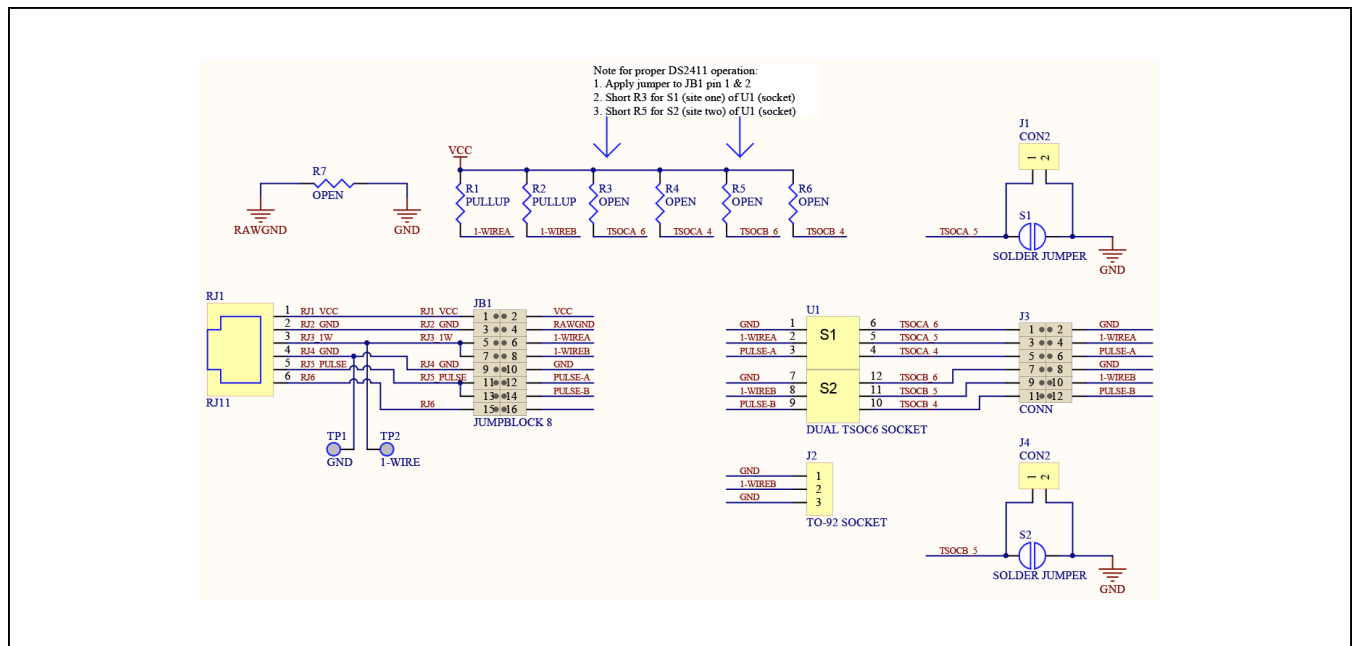
Schematic and Layout Diagrams

Figure 9. DS9120P+ Socket Board Schematic
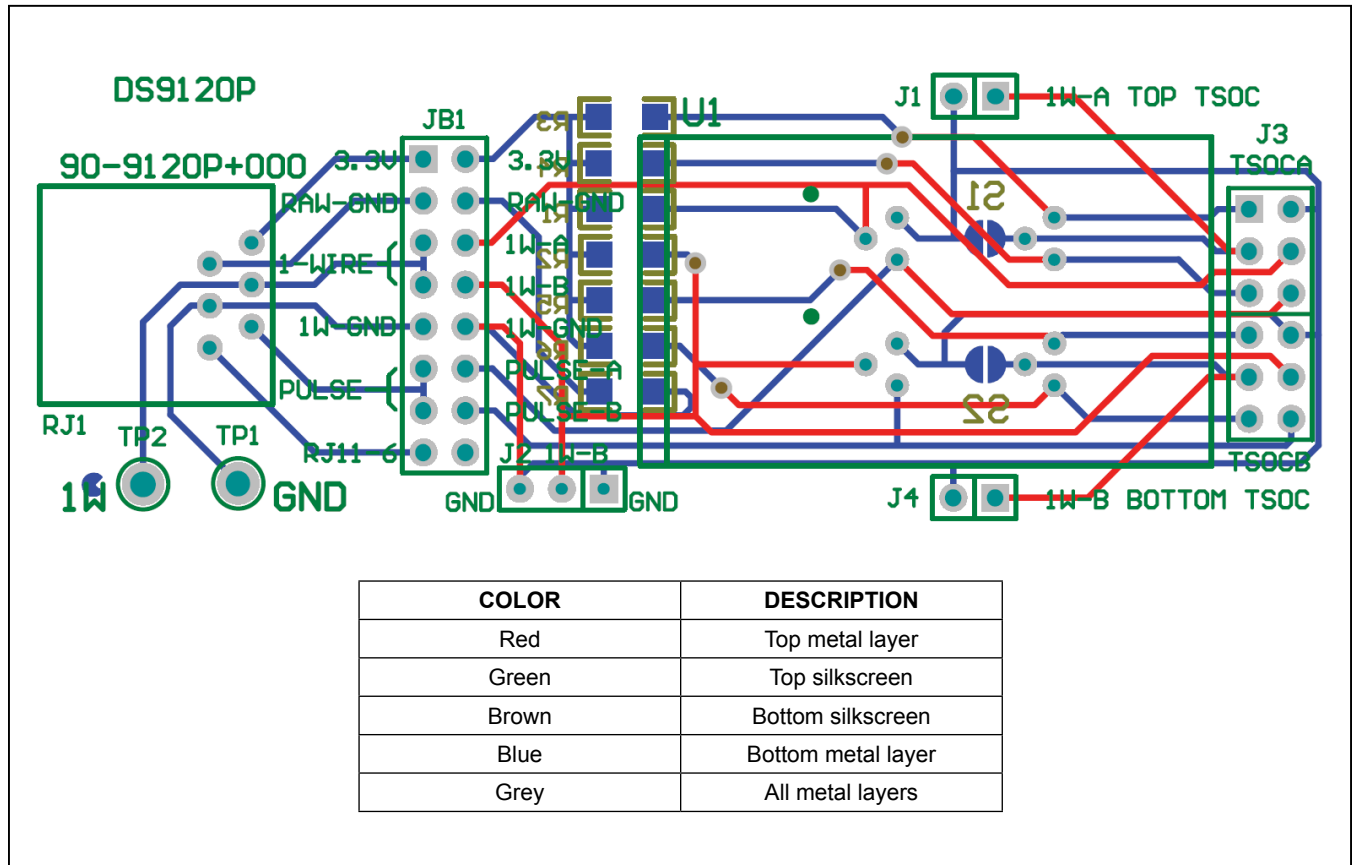
Schematic and Layout Diagrams (continued)

COLOR	DESCRIPTION
Red	Top metal layer
Green	Top silkscreen
Brown	Bottom silkscreen
Blue	Bottom metal layer
Grey	All metal layers

Figure 10. DS9120P+ Socket Board Composite Layout

Ordering Information

PART	TYPE
DS9090EVKIT#	EV System

#Denotes RoHS compliant.

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	4/15	Initial release	—
1	4/16	Included part (DS28E07) that system can evaluate	1–9

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