

## MAX11947 Evaluation Kit

Evaluates: MAX11947

### General Description

The MAX11947 evaluation kit (EV kit) includes two fully assembled and tested circuit boards (PCBs) that contain all the components necessary to evaluate the performance and functionality of the MAX11947 AISG V2.0/V3.0-compliant, fully integrated modem with a 4:1 multiplexer.

The EV kit includes Windows® 10-compatible software that provides a simple graphical user interface (GUI) for controlling the circuit board through a standard USB micro connection. The GUI provides the user access to hardware controls through a MAX32625PICO board.

The MAX32625PICO board is a rapid development platform designed to help engineers quickly implement designs with the MAX32625 Arm® Cortex®-M4 microcontroller with FPU. The board also includes the MAX14750 PMIC that can directly power the entire MAX11947EV kit board.

Additional features of the MAX11947 include on board crystal reference, SMA connectors for RF ports, optional component footprints for filter design and an off-board RS485 interface providing 2.75kVRMS of isolation.

### Features

- USB-Powered Operation
- Low-Voltage and Low-Power Operation
- On-Board Crystal Reference
- On-Board SPI Interface Circuit
- User-Selectable VCC Supply Voltage
  - +3.3V
  - +5V
- LED Indicators
  - Power
  - Active Port
  - Operational Modes
- Simple Windows 10-compatible GUI Control
- Lead(Pb)-Free and RoHS Compliant
- Fully Assembled and Tested

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### Quick Start

#### Required Equipment

- User-supplied Windows PC
  - Two spare USB ports
- MAX11947 EV kit
  - Two MAX11947 EV kit circuit boards
  - Two USB A-micro B cables
- One or more 50Ω coax cable
  - SMA connectors on both ends

#### Recommended Equipment

- Two-channel oscilloscope
- Spectrum analyzer
- Multimeter

#### Optional Equipment

- External power supply
- User supplied RS485 peripheral

### MAX11947 EV Kit Files

FILE	DESCRIPTION
MAX11947EVKit.exe	EV kit control application
MAX11947EVKit.exe.config	XML configuration file
MAX11947EVKit.pdb	Program debug database
MaximStyle.dll	Application extension
MaximStyle.pdb	Debug database
RegisterView.xml	XML SPI register definition file
unins000.dat	Uninstall data file
unins000.exe	Uninstall application

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

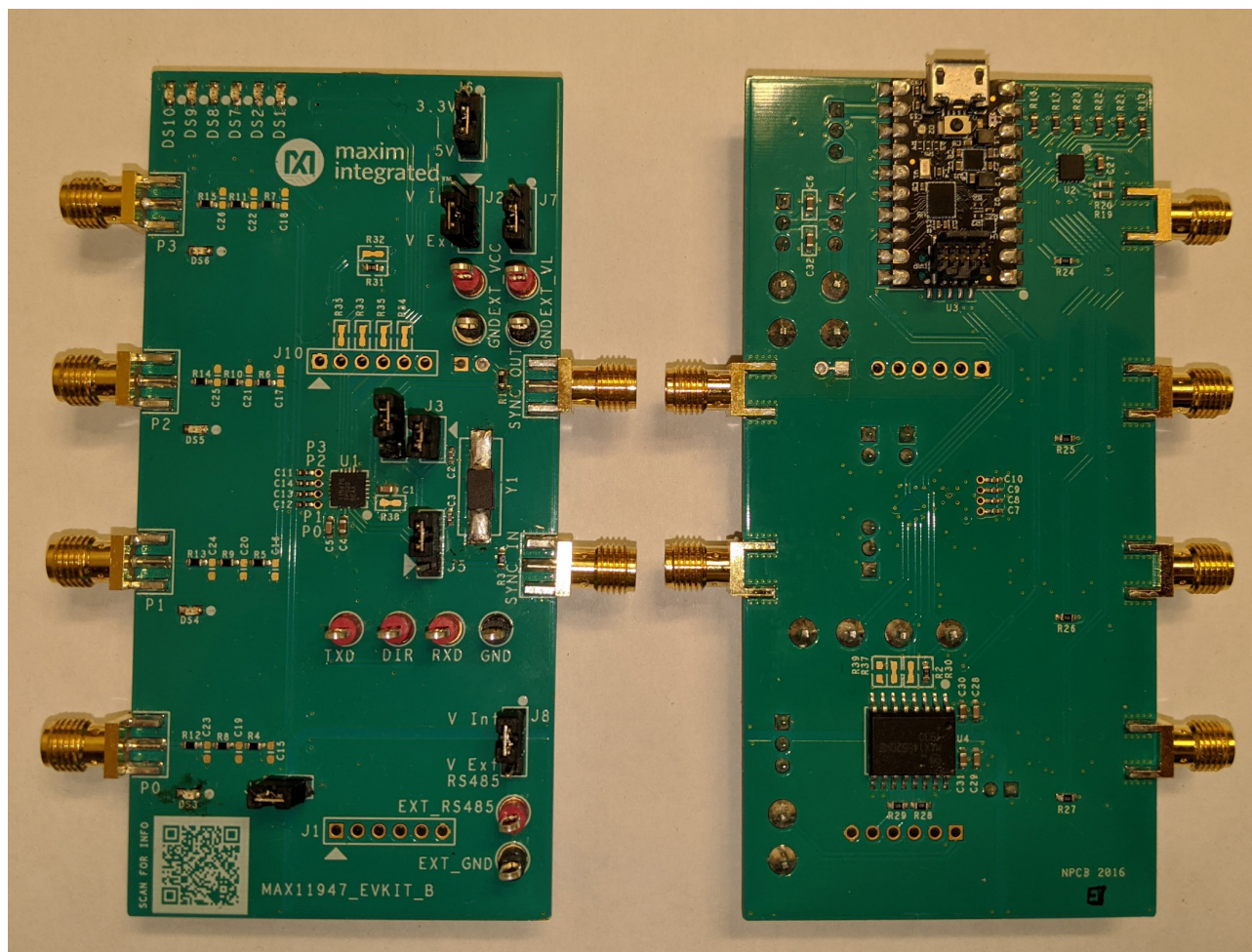


Figure 1. The MAX11947 EV Kit Circuit Board, Top (left) and Bottom (right) Views

Procedure

The MAX11947 EV kit contains two fully assembled and tested surface-mount boards. Follow the steps below to begin operational evaluation of the performance and features of the MAX11947 AISG modem with Integrated 4:1 RF MUX.

- 1) Verify that shunts on both boards are installed across their default positions as defined in [Table 1](#) and shown in [Figure 2](#) below.
- 2) Connect the two EV kit boards using any of the RF ports (P0–P3) and the 50Ω cable(s).
- 3) Visit [www.maximintegrated.com/MAX11947](http://www.maximintegrated.com/MAX11947). On the device landing page select the **Design Resources** tab then follow the link to download the EV kit software. Once the download has completed, run the installation program. All required files are copied to the local hard drive and icons can be created in the Windows Start menu.
- 4) Connect the software to the hardware.
  - a) Connect one (1) USB A to micro-B cable to the PC and one EV kit board (PCB1). Red and green LEDs, 4 each, should be illuminated on the top side of the board along with a single green LED on the bottom.
  - b) Start the MAX11947EVKit program by opening its icon in the Start menu or double clicking the executable in the installation folder.
  - c) A splash screen showing the program revision information replaces by a custom graphical user interface (GUI).
  - d) Select the COM port listed in the connection section drop-down box then click the **Connect** button.
  - e) Select the **Auto Update** checkbox in the Data Configuration section. The P0 selected LED should be the only one illuminated on the top of the board. The LED on the PICO module should be flashing blue and green indicating communication activity with the PC.
  - f) Repeat steps a-e for the second board (PCB2), ensuring to use the newly identified port, resulting in two application windows independently connected to two PCBs.

Table 1. Quick Start Jumper Settings

JUMPER	POSITION
J2	1-2
J3	1-2
J4	Open
J5	2-3
J6	2-3
J7	1-2
J8	1-2
J9	1-2

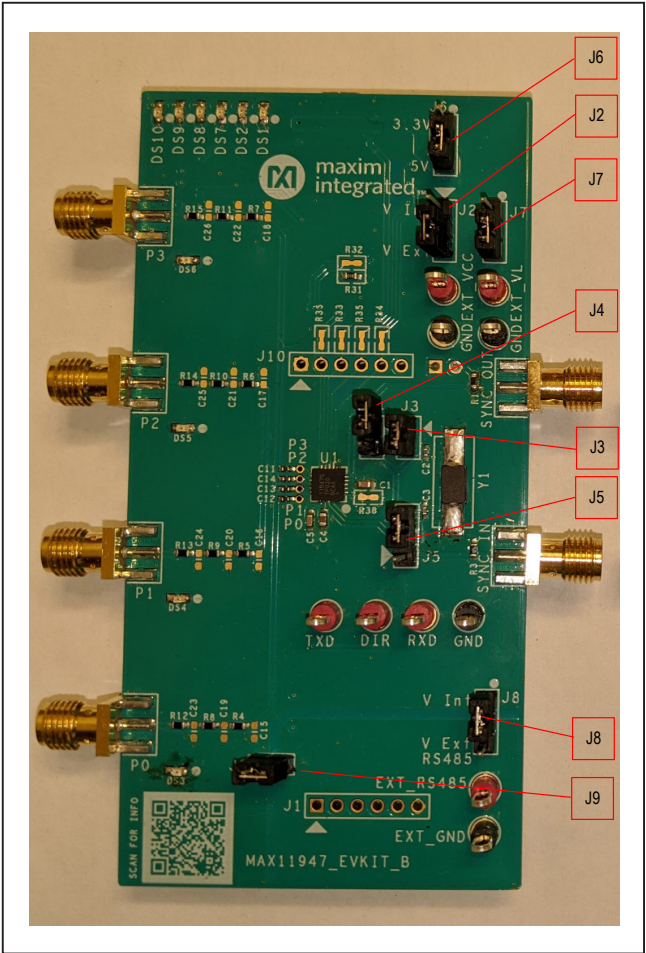


Figure 2. MAX11947 EV Kit Board—Jumper Locations

- 5) Map the connections
  - a. Select one PCB (PCB1 or PCB2) as a temporary transmitter and one as receiver.
  - i. Using the GUI, enable a continuous carrier on the transmit board by clicking the **TX ON** button.
  - ii. Select the desired RF output port (P0-P3)

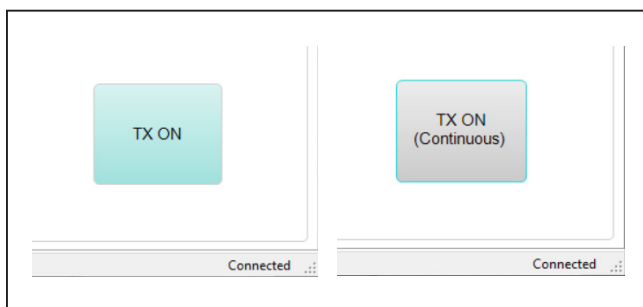


Figure 3. TX ON Button States, Continuous Carrier Disabled (left) and Continuous Carrier Enabled (right)

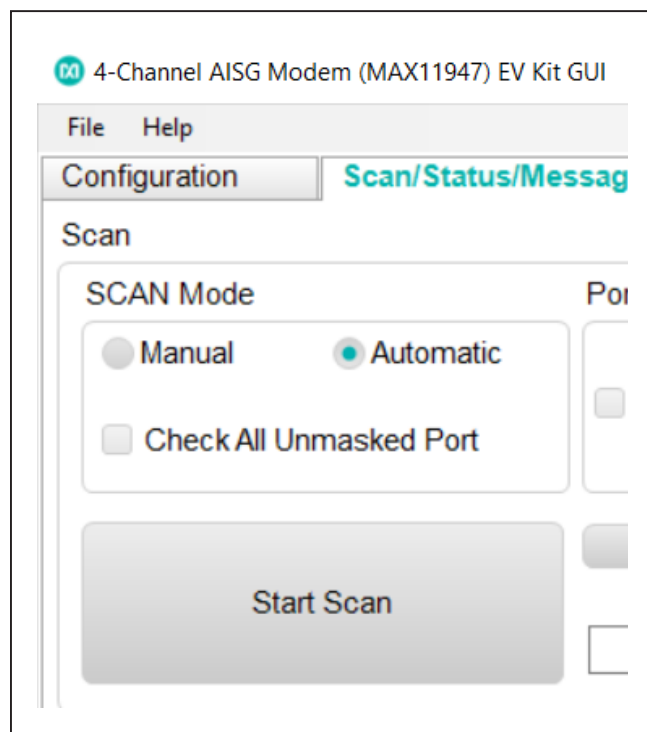


Figure 4. Start Scan Button

- b. Scan the ports on the receiver.
      - i. Using the second GUI window, select the **Scan/Status/Messaging** tab
      - ii. Scan settings:
        1. Automatic
        2. Full Dwell
        3. 1X Bit Period
      - iii. Click the **Start Scan** button
    - c. Note the **AISG Carrier** indicator, identifying the RF port where the carrier was detected.
- 6) On the receiver PCB GUI
  - a. Select the **Configuration** tab
  - b. Change the port selection to match the port where the carrier was detected in step 5c.
- 7) On the transmitter PCB GUI
  - a. Disable the output by clicking the **TX ON (Continuous)** button
  - b. Select the **Scan/Status/Messaging** tab
  - c. Enter a hex string message of several bytes (user choice how many) with a space between each byte, i.e. 55 AA 99 33 etc.
  - d. Click the **Send Message** button
- 8) Back on the receiver PCB GUI
  - a. Select the **Scan/Status/Messaging** tab.
  - b. Click the **Read Message** button
    - i. The message typed into the transmitter PCB GUI should appear in the RX message box.

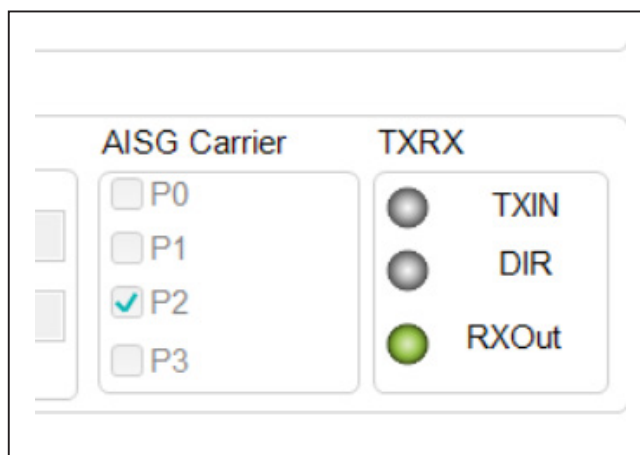


Figure 5. Port Scan Indicators—AISG Carrier Detected on Port 2



Detailed Description of Hardware

Overview

The MAX11947 EV kit circuit boards (PCBs) provide a flexible environment for evaluating the performance of the MAX11947 AISG Modem with 4:1 RF MUX. The compact 2 x 4 PCB is functionally divided into three sections. The top third of the board incorporates a MAX32625PICO (PICO) module (on the bottom of the board) which sources power for rest of the PCB, controls the LED indicators, and enables communications through both the SPI and TX/RX interface on the MAX11947.

The center section contains the MAX11947 and minimal support components such as supply bypass capacitors, filter or DC block capacitors, the pullup resistor for SYNCOUT, and an 8.704MHz reference crystal. The MAX11947 RF ports are routed to the board edge using 50Ω microstrip through several SMT component footprints allowing for custom filtering for the AISG/RF signal boundary. The off-board connections are through edge-launch SMA connectors.

The lower third of the board integrates the MAX14852 (also on the bottom layer), providing an isolated RX/TX connection with the MAX11947. The MAX14852 combines 2.75kVRMS of isolation with ±35kV ESD protection. The off-board signaling is available through an unpopulated SIP (J1) connector, where a pin-strip or header can be installed or a user defined connector can be wired directly. The device can be powered from the on-board VL supply or by an off-board supply.

Power Supplies

Each PCB can be run entirely from the USB sourced power supplies of 5V (direct USB) or 3.3V (regulated output from PICO module). The two MAX11947 supply domains are selected using shorting block jumpers. Both the VCC and VL supplies can be connected to either on-board or external supplies through J2 for VCC and J7 for VL. The on-board VL supply is constrained to 3.3V due to limitations on the digital interface with the PICO module. However, the on-board VCC source can use the regulated 3.3V level or the 5V USB source by selecting either with the J6 jumper. Supply currents can be monitored using J2 for VCC or J3 for VL.

The MAX14852 is connected to the VL domain by default using J8. An external, isolated, power supply can be used for the off-board interface by swapping the position of J8 to use the external connection and removing J9 (GND short).

LED Indicators

There are 11 LED indicators on the PCB. One LED is located on the PICO module, and turns green when connected to a PC USB port, and turns blue when communicating with the PC. DS1 and DS2 are yellow and indicate the status of the SCAN operating mode of the MAX11947; they illuminate only when the Manual scan mode is selected. DS3–DS6 are green and placed near the four SMA connectors for the RF ports, P0–P3. All of these are illuminated when the USB power is applied. Once the GUI control is enabled, only the selected port is illuminated. DS7–DS10 are unused by the current GUI release (Rev 1.2.4) but are populated and could be implemented by end user edits to the software. Contact the factory for more details.

SPI Interface

The SPI signals from the MAX32625PICO are limited to 3.3V operation, thus restricting the supported, on-board VL supply to that voltage. However, the MAX11947 specifies VL anywhere within the 1.6V to 5.5V range. The SPI signals (CSB, SCLK, MOSI, MISO) and the transmit logic signals (TXIN/RXOUT/DIR) must be disconnected from the PICO module when using an external VL supply level set to any value other than 3.3V.

Table 2. LED Indicator Functions

LED ID	COLOR	FUNCTION
DS1	YELLOW	Manual scan selected
DS2	YELLOW	Manual scan active
DS3	GREEN	P0 selected
DS4	GREEN	P1 selected
DS5	GREEN	P2 selected
DS6	GREEN	P3 selected
DS7–DS10	RED	Undefined

Operation of the PCB at VL levels other than 3.3V requires the user to make several modifications. First, a SPI controller is suggested which can tolerate the target supply levels with appropriate VIH and VIL capabilities. Second the SPI and RX/TX logic signals must be disconnected from the PICO module. These signals are disconnected by removing resistors placed in series between the module and the MAX11947. The RXOUT connection (RXD), routed through R31, should be opened by removing the 1k $\Omega$  resistor. All the other signals use SMT footprints with copper shorts. These are opened by carefully cutting and removing the copper foil on the surface of the board between the component pads. Damage to the SMT pads should be minimized to support reconnecting the PICO module at a later time.

Once the signals are isolated from the PICO module, the external SPI signals can be connected through J10. Note, that the SPI signal levels are required to meet the VIH/VIL/VOH/VOL specifications for the MAX11947 and it determines by the VL level applied. The TX/RX signals can remain connected to the MAX14852 and the DIR signal from the MAX11947 controls RS-485 TX or RX operation in half-duplex mode. However, the MAX14852 is only specified down to 1.71V, so another signaling source can be required when operating the MAX11947 below that level.

### Frequency Reference

The MAX11947 EV kit PCB includes a crystal to provide the 8.704MHz reference frequency required by the MAX11947. The crystal was selected to match the XTAL1/XTAL2 input requirements and has been validated for operation across the -40°C to +105°C temperature range for both the startup and operation.

The MAX11947 can also operate with a single-ended input reference signal (clock or oscillator) such as the SYNC output from another MAX11947. When this mode is desired, the user must provide a reference signal meeting the XTAL1 input specifications which are referenced to VCC. Install J4 to ground the input to XTAL2 and switch J5 jumper to pins 1-2 which connects the XTAL1 pin to the edge launch SMA connector labeled SYNC IN.

Another SMA connector is provided, along with a 1k pull-up, for the open drain SYNC OUT signal. Connecting the SYNC OUT of one MAX11947 board to the properly configured SYNC IN of the second MAX11947 can demonstrate the daisy chain capabilities of the AISG modem.

### RS-485 Interface

The MAX14852 RS-485 transceiver provides modem TX/RX communication path which is independent from the PICO module. The MAX11947 RXOUT and TXIN signals are connected to the MAX14852 TXD and RXD pins, which provides pass-through communications between the RS-485 bus and the RF domain. The DIR signal from the MAX11947 acts as both the receiver enable (REN, active low) and driver output enable (DE, active high) inputs to the MAX14852, providing flow-control with the RS-485 bus.

The off-board interface is powered by the on-board VL net by default but can be powered independently as well. Test point connections are provided for the external power and ground connections and can be selected using J8. The external power connections are also provided along with the RS-485 bus connections on J1, a 1x6 SIP through-hole connector footprint. The connector footprint is designed to accommodate a standard 0.025 square post pin strip on 0.1 center. Optionally, discrete wire connections for each signal can be employed for a custom interconnect.

The MAX14852 allows for up to 2.75kVRMS isolation between supply domains. When an isolated external supply is connected, remove J9, which shorts the external ground to the main board ground.

### RF Ports

The four multiplexed RF ports of the MAX11947 are connected to four SMA connectors on the left side of the board. Each port includes a 470pF filtering capacitor and a series DC blocking capacitor. 50 $\Omega$  microstrip is used to route between the MAX11947 MUX ports and the board edge where a multistage  $\pi$ -network is available for the installation of additional components for filtering and impedance matching requirements.

Edge launch SMA connectors are provided, one for each RF port, to ensure a high-fidelity interconnect within a small footprint.

### Jumper Options

The numerous jumpers on the PCB provide the flexibility to change the operating conditions and capabilities of the MAX11947. There are 10 components with the J designation, two of these are the 1x6 SIP outlines: J1 and J10. The following table provides listing of all valid jumper positions and the function controlled.

**Table 3. Jumper Functions**

JUMPER	POSITION	FUNCTION
J2	1-2	VCC connected to on-board source
	2-3	VCC connected to EXT_VCC test point
J3	1-2	VL connection to the MAX11947
	-	VL current meter connection for the MAX11947
J4	-	XTAL2 connected to Y1, oscillator enabled
	1-2	XTAL2 connected to GND, apply 8.704MHz at SYNC_IN
J5	1-2	External reference mode, XTAL1 connected to SYNC_IN
	2-3	XTAL1 connected to Y1, oscillator enabled
J6	1-2	On-board VCC option connected to 3.3V
	2-3	On-board VCC option connected to 5V
J7	1-2	VL source connected to on-board 3.3V
	2-3	VL source connected to EXT_VL test point
J8	1-2	On-board VL used for RS-485 supply
	2-3	EXT_RS485 test point connected for RS-485 supply
J9	-	RS-485 GND reference Isolated from board GND
	1-2	RS-485 GND connected to board GND

## Detailed Description of Software

### Overview

The MAX11947 evaluation kit tool is a Windows 10 application (APP) installed on a host PC. When combined with the firmware installed on the MAX32625PICO module, PC-to-SPI communications are enabled. The APP provides controls for monitor and/or modification of the register contents within the MAX11947 which provide configuration and status information to and from the device.

The APP provides a few simple menu options including Save Configuration, Load Configuration, and Exit options under the **File** menu. The **Help** menu provides an About option which displays the initial splash screen (Figure 6) that is also displayed upon initial execution of the GUI based application. The splash screen can be disabled by checking the appropriate box.

The main features of the APP are broken into three functional groups arranged on separate tabs within the main GUI framework: Configuration (Figure 7), Scan/Status/Messaging (Figure 8), and Register Map (Figure 10). Each of these tabs is also broken into various sections which is discussed in detail below. The GUI starts on the **Configuration** tab and the other tabs are inaccessible until a valid connection is made with a MAX11947 EV kit over a USB Comm Port.

The bottom status strip of the main window displays three pieces of information. The left-most block is for messages from the APP including the firmware version of the connected PCB. The right-most block states Disconnected or Connected, and the middle block indicates the state (enabled or disabled) of the UART in a connected PICO module.



Figure 6. MAX11947 EV Kit Tool Splash Screen

## Configuration Tab

The **Configuration** tab is displayed by default following the start of the software and after the Splash Screen. The first action is to select and connect the GUI to an EV kit PCB. The **Connection** section, located in the upper left corner of the Configuration tab, populates the **COM Port** drop-down box with any MAX11947 EV kit boards that have been connected to the computer's USB ports and are not already connected to another instance of the GUI. Select an available port and click the **Connect** button to begin interacting with the hardware.

Immediately below the Connection block is the **Data Configuration** group box. The tools in this section allow manipulation of the UART pins on the PICO module, and enable the **Auto Update** function of the GUI. Auto Update

periodically reads all the register values in the device and updates the GUI to reflect the actual status of the device.

The **Power** section provides a set of radio buttons to switch between the **Active**, **Standby** and **Power Down** modes of the MAX11947. A check box is also provided which allows the crystal oscillator to be left on when the Power Down mode is selected, ensuring the **SYNCOUT** signal is available for use as needed.

The **MUX** section, as the name implies, controls the selection of which RF Port is connected to the modem. The controls are further divided into two groups, the MUX-to-Port common connection and the individual port selected when the modem is connected. The buttons only allow one of the options to be selected within each group. The selection of the Disconnected option deselects any active port and all ports are terminated to ground.



The **SYNCOUT** group is next to the **MUX** and includes a **Disabled** option or allows the user to select the output drive level.

The bottom section is for configuring the **RX/TX** configuration power levels. Settings in this section include a drop-down list to select the RX sensitivity threshold and one for

the TX output power level. Radio buttons are provided to switch between the supported Data Rates (9.6kbps is the default for AISG v). Finally, a **TX ON** button is provided which produces a continuous AISG carrier on the selected port. Once the button is clicked, the name changes to **TX ON (Continuous)** to indicate the modem is actively transmitting.

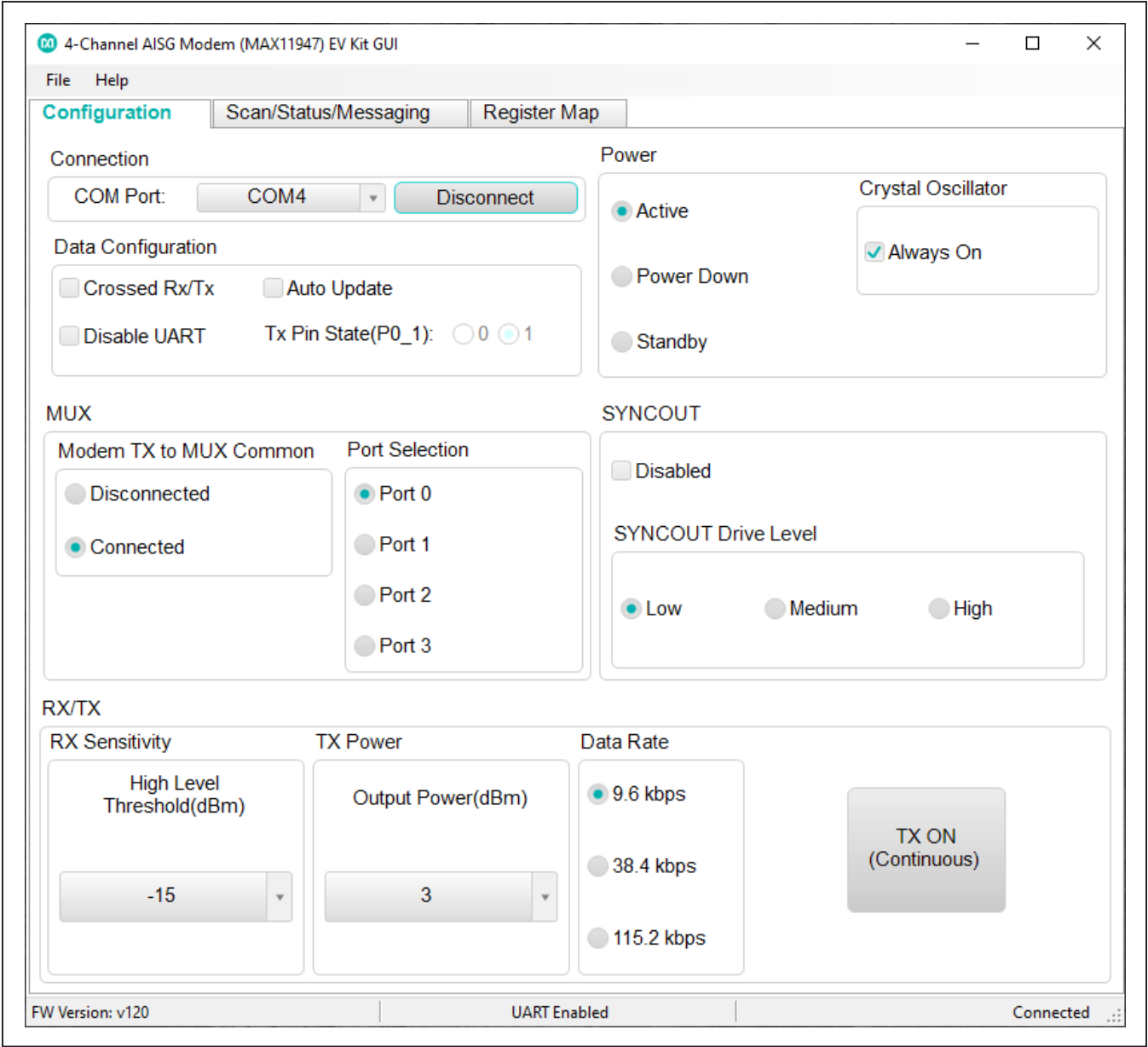


Figure 7. MAX11947 EV Kit Tool Configuration Tab

Scan/Status/Messaging Tab

The configuration and performance of a Port scan are provided on the first tool group on this tab, titled Scan. The Scan block is then further divided into **SCAN Mode**, **Port Mask (Excluded)** and **Dwell Settings**. The SCAN Mode section can switch between Manual and Automatic scan and provides a checkbox to enable scan on all unmasked ports regardless of carrier detection status.

The **Start Scan** button initiates the scan process within the MAX11947. The automatic scan is completed too quickly to allow feedback during the scan process, however if any port had an AISG carrier detected, it reports in the **Status** section. The **Index** button and **Current Port** text box are activated during a manual scan; the button increments through the ports and the text box displays the currently connected port, if any.

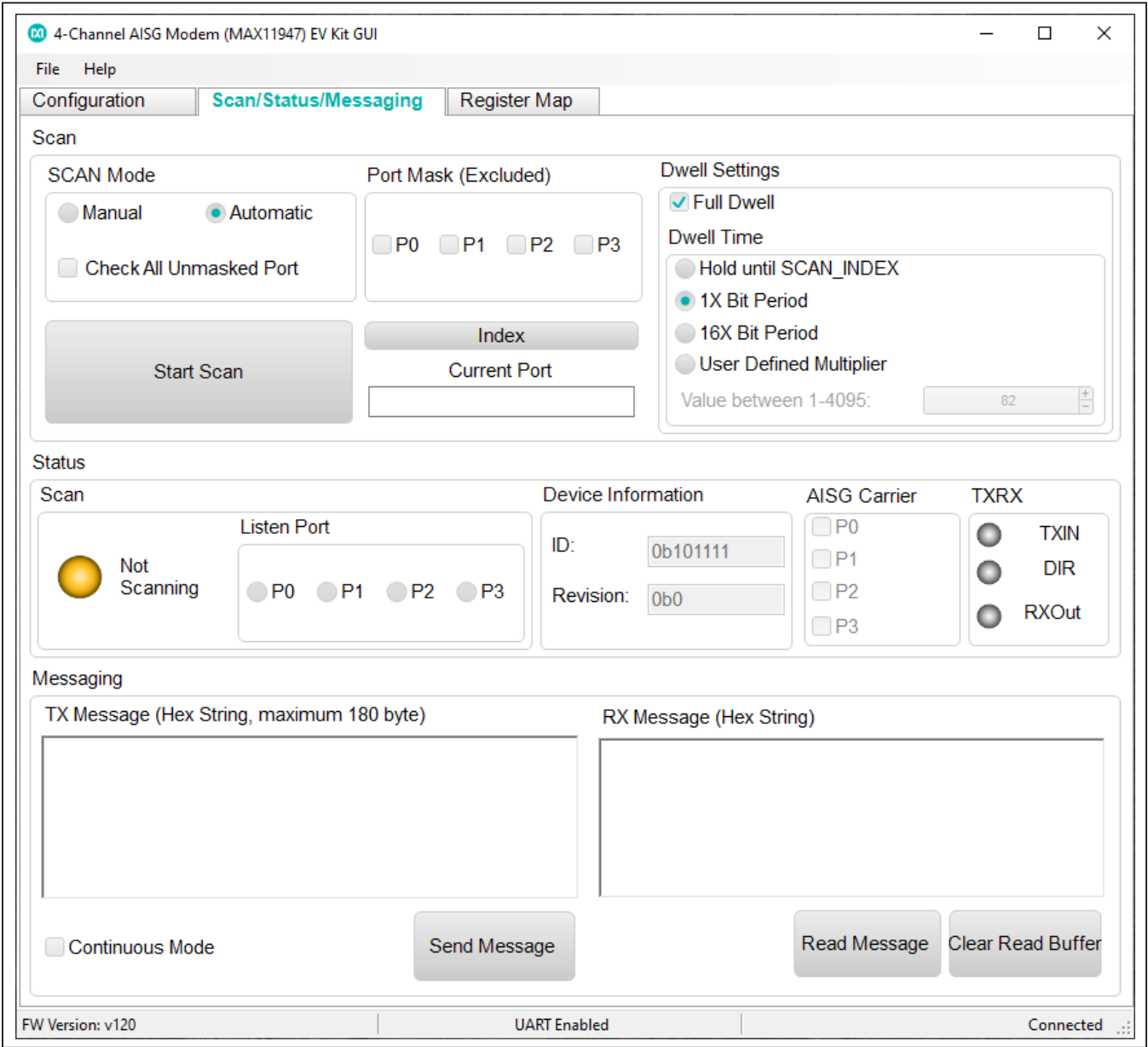


Figure 8. MAX11947 EV Kit Tool Scan/Status/Messaging Tab

Additional scan settings include the **Port Mask (Excluded)** options for skipping selected ports. The **Dwell Settings** impact how long the automatic scan lasts. Enabling the **Full Dwell** option causes the state machine to wait for the entire **Dwell Time** selected.

The Status section cannot be modified directly, but rather displays the state of the various bits within the Scan register of the MAX11947. When Auto Update is enabled, the state of the various monitors are updated accordingly.

The final section of this tab is the Messaging block which allows the user to send and receive messages from the GUI to the MAX1947 for transmission and to read any messages that the MAX11947 has received. The message format is a text string of hexadecimal space separated values which can be up to 180 bytes in length. The hexadecimal message is sent once by clicking on the **Send Message** button. The Continuous Mode option for sending messages is useful for evaluating spectral emissions when transmitting a modulated signal. An error condition has been identified that occurs when attempting a <Read Message> on the receiver GUI that throws a message as shown in [Figure 9](#). Click the **Continue** option

to proceed. Normal operation of the receiver GUI returns when continuous messaging is disabled.

Received messages, up to the 180-byte limit, are stored in the PICO module until cleared by the user. The message is retrieved by clicking on the **Read Message** button. The **Clear Read Buffer** option clears the buffer on the PICO module, ensuring a clear buffer for future messages.

Register Map Tab

The Register Map tab is relatively self-explanatory. It provides a few buttons to **Write All Registers**, **Read Register X**, and **Write Register X**, where X is the currently selected register address from the list. Click the desired register address and name on the left side of the tab to display the contents within the register at the top of the page in either hex or decimal format. Each bit field within the register is shown with the contents at the top of the bit field description table. The bit fields can be individually modified by clicking the field (to switch states) and entering the new value (for multi-bit fields).

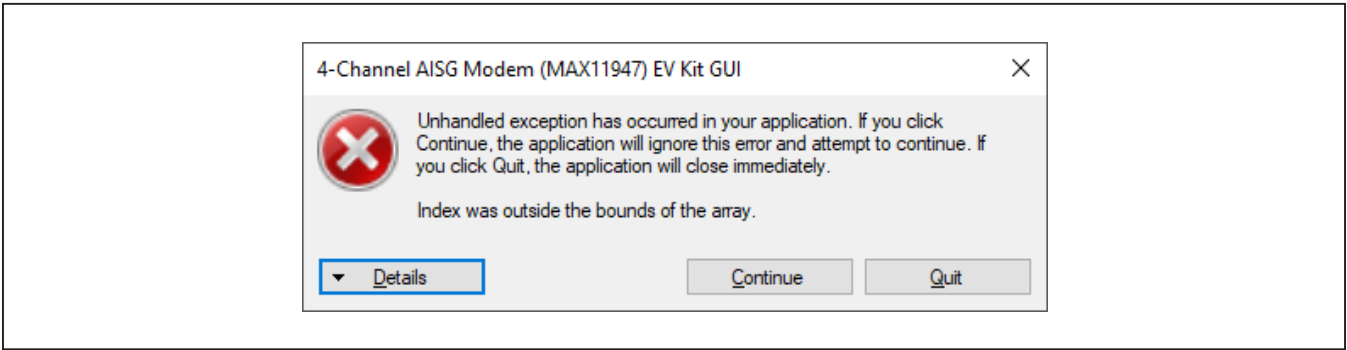


Figure 9. Potential Error Message Due to Continuous Messaging Mode

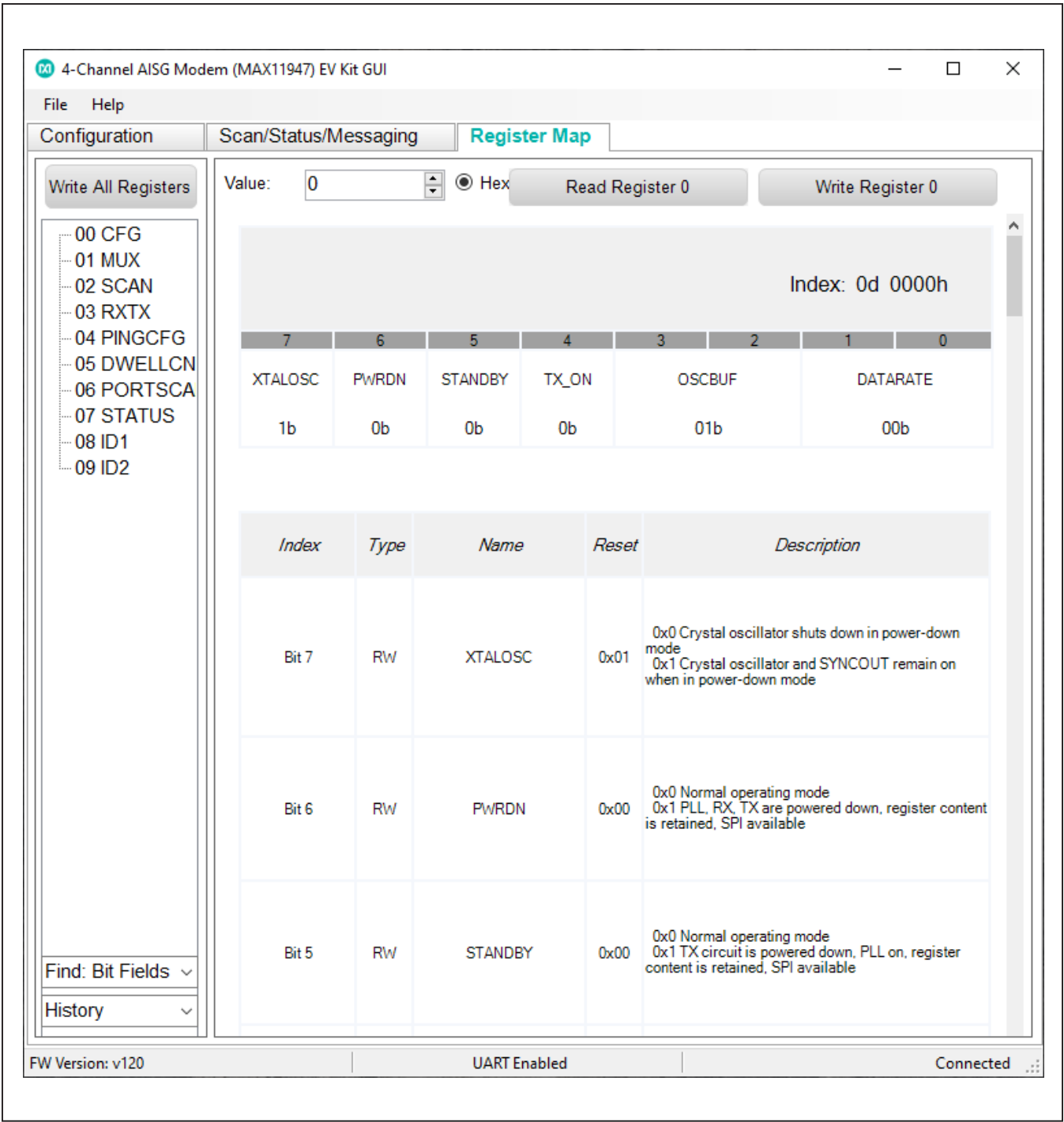


Figure 10. MAX11947 EV Kit Tool Register Map Tab



## Component Suppliers

SUPPLIER	PHONE	WEBSITE
Murata Electronics North America, Inc.	770-436-1300	www.murata-northamerica.com
NDK America, Inc	408-428-0800	www.ndk.com
Susumu International USA	208-328-0307	www.susumu-usa.com
Taiyo Yuden	800-348-2496	www.t-yuden.com
TDK Corp.	847-803-6100	www.component.tdk.com

**Note:** Indicate that you are using the MAX11947 when contacting these component suppliers.

## Ordering Information

PART	TYPE
MAX11947EVKIT#	EV Kit

#Denotes RoHS compliance.

## MAX11947 Evaluation Kit

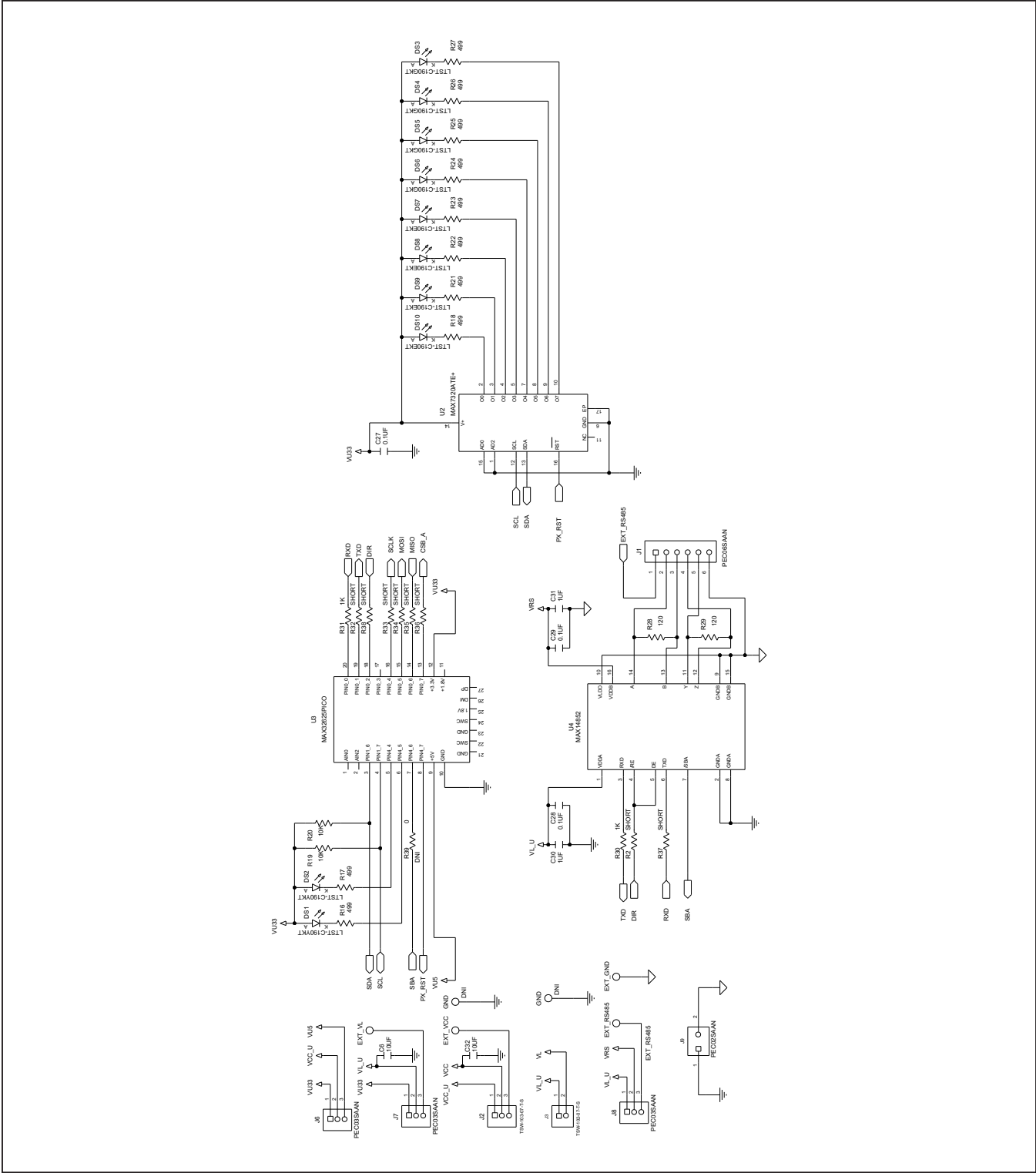
Evaluates: MAX11947

## MAX11947 EV Kit Bill of Materials

ITEM	REF_DES	DNI/DNP	QTY	MFG PART #	MANUFACTURER	VALUE	DESCRIPTION
1	C1, C5, C27-C29	-	5	885012206071;CGJ3E2X7R1E104K080AA; C1608X7R1E104K080AA;C0603C104K3RAC; GRM188R71E104KA01;C1608X7R1E104K; 06033C104KAT2A;CGA3E2X7R1E104K080AA	WURTH ELECTRONICS INC; TDK;TDK;KEMET;AVX;TDK	0.1UF	CAPACITOR; SMT; 0603; CERAMIC; 0.1uF; 25V; 10%; X7R; -55degC to + 125degC; +/-15% from -55degC to +125degC
2	C2, C3	-	2	C0402C390J5GAC; GRM1555C1H390JA01	KEMET;MURATA	39PF	CAPACITOR; SMT; 0402; CERAMIC; 39pF; 50V; 5%; COG; -55degC to + 125degC; 0 +/-30PPM/degC
3	C4, C30, C31	-	3	UMK107AB7105KA;CC0603KRX7R9BB105	TAIYO YUDEN;YAGEO	1UF	CAPACITOR; SMT (0603); CERAMIC CHIP; 1UF; 50V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R
4	C6, C32	-	2	C1608X5R1A106K080AC	TDK	10UF	CAPACITOR; SMT (0603); CERAMIC CHIP; 10UF; 10V; TOL=10%; MODEL=; TG=-55 DEGC TO +85 DEGC; TC=X5R
5	C7-C10	-	4	C0402S471K5RAC; GRM155R71H471K; GRM155R71H471KA01;C1005X7R1H471K050BA	KEMET;MURATA; MURATA;TDK	470PF	CAPACITOR; SMT (0402); CERAMIC CHIP; 470PF; 50V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R
6	C11-C14	-	4	TMK105BJ104KV; GRM155R61E104KA87	TAIYO YUDEN;MURATA	0.1UF	CAPACITOR; SMT (0402); CERAMIC CHIP; 0.1UF; 25V; TOL=10%; TG=-55 DEGC TO +85 DEGC; TC=X5R
7	DIR, RXD, TXD	-	3	5011	KEYSTONE	N/A	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.445IN; BOARD HOLE=0.063IN; BLACK; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;
8	DS1, DS2	-	2	LTST-C190YKT	LITE-ON ELECTRONICS INC.	LTST-C190YKT	DIODE; LED; STANDARD; YELLOW; SMT (0603); PIV=5.0V; IF=0.02A; -55 DEGC TO +85 DEGC
9	DS3-DS6	-	4	LTST-C190GKT	LITE-ON ELECTRONICS INC.	LTST-C190GKT	DIODE; LED; WATER CLEAR GREEN; SMT (0603); VF=2.1V; IF=0.03A; -55 DEGC TO +85 DEGC
10	DS7-DS10	-	4	LTST-C190EKT	LITE-ON ELECTRONICS INC.	LTST-C190EKT	DIODE; LED; STANDARD; RED; SMT (0603); PIV=2V; IF=0.02A
11	EXT_GND, EXT_RS485, EXT_VCC, EXT_VL	-	4	5010	KEYSTONE	N/A	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.445IN; BOARD HOLE=0.063IN; RED; PHOSPHOR BRONZE WIRE SIL;
12	J1, J10	-	2	PEC06SAAN	SULLINS ELECTRONICS CORP.	PEC06SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 6PINS
13	J2, J5	-	2	TSW-103-07-T-S	SAMTEC	TSW-103-07-T-S	CONNECTOR; THROUGH HOLE; TSW SERIES; SINGLE ROW; STRAIGHT; 3PINS
14	J3, J4	-	2	TSW-102-07-T-S	SAMTEC	TSW-102-07-T-S	CONNECTOR; THROUGH HOLE; TSW SERIES; SINGLE ROW; STRAIGHT; 2PINS; -55 DEGC TO +105 DEGC
15	J6-J8	-	3	PEC03SAAN	SULLINS	PEC03SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 3PINS
16	J9	-	1	PEC02SAAN	SULLINS	PEC02SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 2PINS
17	P0-P3, SYNC_IN, SYNC_OUT	-	6	132322	AMPHENOL	132322	CONNECTOR; FEMALE; BOARDMOUNT; SMA END LAUNCH RECEPT. JACK; 0.25IN SQUARE FLANGE; 0.062IN BOARD THICKNESS; STRAIGHT; 5PINS
18	R1	-	1	PLT0603Z2500AS	VISHAY DALE	250	RESISTOR; 0603; 250 OHM; 0.05%; 5PPM; 0.15W; THIN FILM
19	R3	-	1	CRCW060349R9FK	VISHAY DALE	49.9	RESISTOR; 0603; 49.9 OHM; 1%; 100PPM; 0.10W; THICK FILM
20	R4-R15	-	12	CRCW06030000Z0	VISHAY DALE	0	RESISTOR; 0603; 0 OHM; 0%; JUMPER; 0.1W; THICK FILM
21	R16-R18, R21-R27	-	10	CRCW0603499RFX;RK73H1J4990FT; ERJ-3EKF4990;RC1608F4990	KOA;VISHAY;PANASONIC; SAMSUNG	499	RESISTOR; 0603; 499 OHM; 1%; 100PPM; 0.10W; THICK FILM
22	R19, R20	-	2	TNPW060310K0BE; RN731JTTD1002B	VISHAY DALE; KOA SPEER ELECTRONICS	10K	RESISTOR; 0603; 10K OHM; 0.1%; 25PPM; 0.1W; THICK FILM
23	R28, R29	-	2	CRCW0603120RFK	VISHAY DALE	120	RESISTOR, 0603, 120 OHM, 1%, 100PPM, 0.10W, THICK FILM
24	R30, R31	-	2	RR0816P-102-B-T5;PCF0603R-1K0B	SUSUMU CO LTD; TT ELECTRONICS	1K	RESISTOR; 0603; 1K OHM; 0.1%; 25PPM; 0.063W; METAL FILM
25	U1	-	1	MAX11947GTP+	MAXIM	MAX11947GTP+	IC; UCON; 4 CHANNEL AISG INTEGRATED MODEM; TQFN20-EP
26	U2	-	1	MAX7320ATE+	MAXIM	MAX7320ATE+	IC; INFC; I2C PORT EXPANDER WITH EIGHT PUSH-PULL OUTPUT; TQFN16-EP
27	U3	-	1	MAX32625PICO	MAXIM	MAX32625PICO	MODULE; BOARD; MAX32625PICO BOARD DESIGN FOR MAX32625 ARM CORTX-M4F; BOARD; LAMINATED PLASTIC WITH COPPER CLAD
28	U4	-	1	MAX14852GWE+	MAXIM	MAX14852	EVKIT PART-IC; PACKAGE CODE: W16M+10; OUTLINE DRAWING NO.: 21-0042; LAND PATTERN DRAWING NO.: 90-0107; WSOIC16 300MIL
29	Y1	-	1	SSL87040N1HS188F0-0	HONG KONG CRYSTALS	8.704MHZ	CRYSTAL; SMT; 18PF; 8.704MHZ; +/-30PPM; +/-50PPM ;
30	PCB	-	1	MAX11947	MAXIM	PCB	PCB:MAX11947
31	R39	DNP	0	CRCW06030000Z0	VISHAY DALE	0	RESISTOR; 0603; 0 OHM; 0%; JUMPER; 0.1W; THICK FILM
32	TP1_GND-TP3_GND	DNP	0	5010	KEYSTONE	N/A	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.445IN; BOARD HOLE=0.063IN; RED; PHOSPHOR BRONZE WIRE SIL;
33	C15-C26	DNP	0	N/A	N/A	OPEN	PACKAGE OUTLINE 0603 NON-POLAR CAPACITOR
34	R2, R32-R38	DNP	0	N/A	N/A	SHORT	PACKAGE OUTLINE 0603 RESISTOR
TOTAL			88				

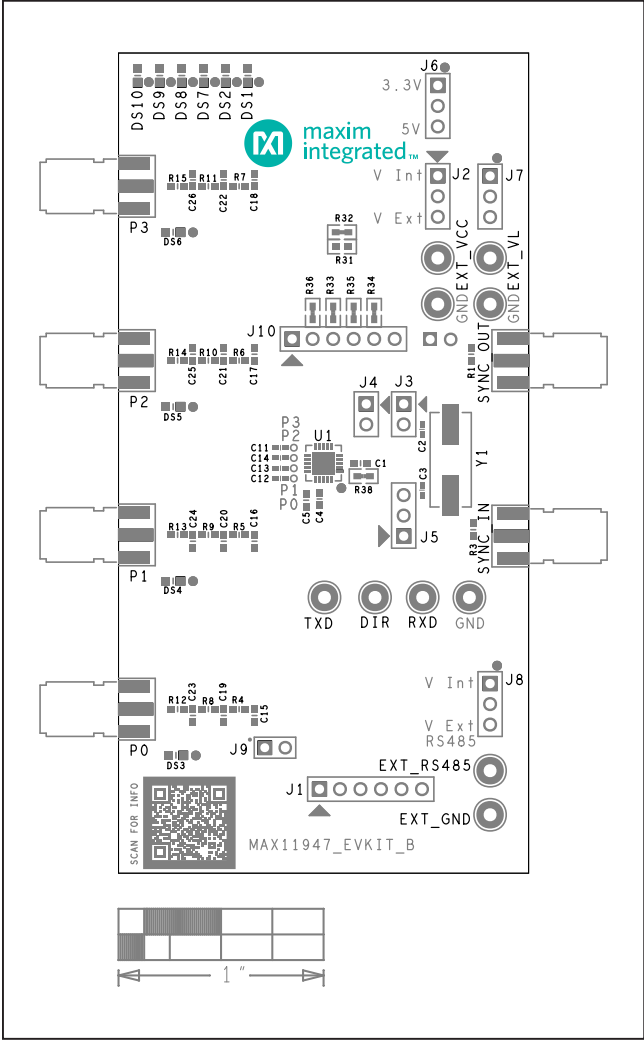


MAX11947 EV Kit Schematics (continued)

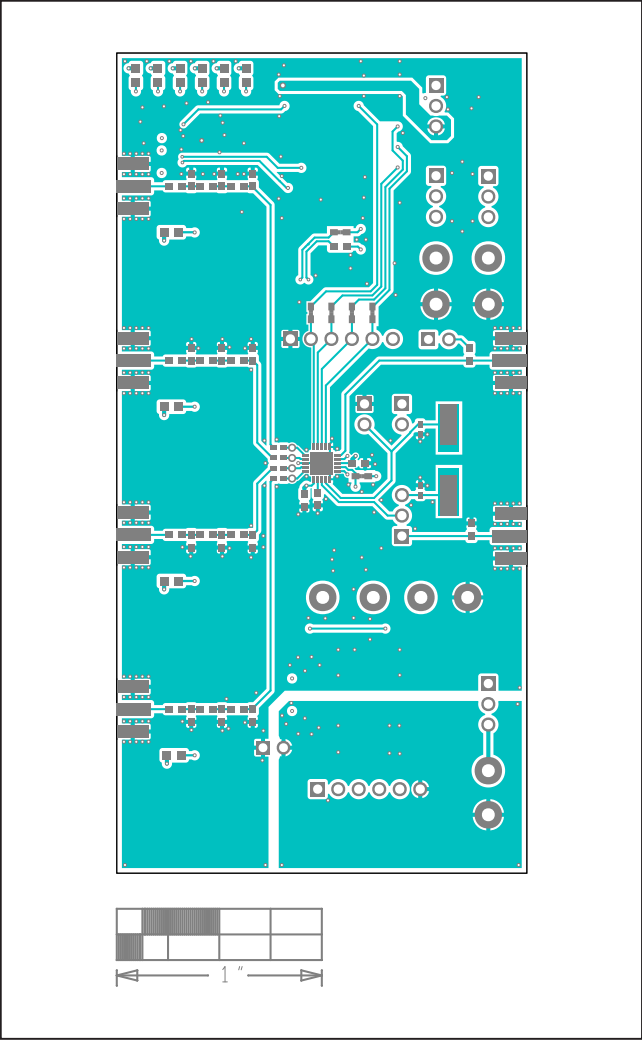




MAX11947 EV Kit PCB layouts

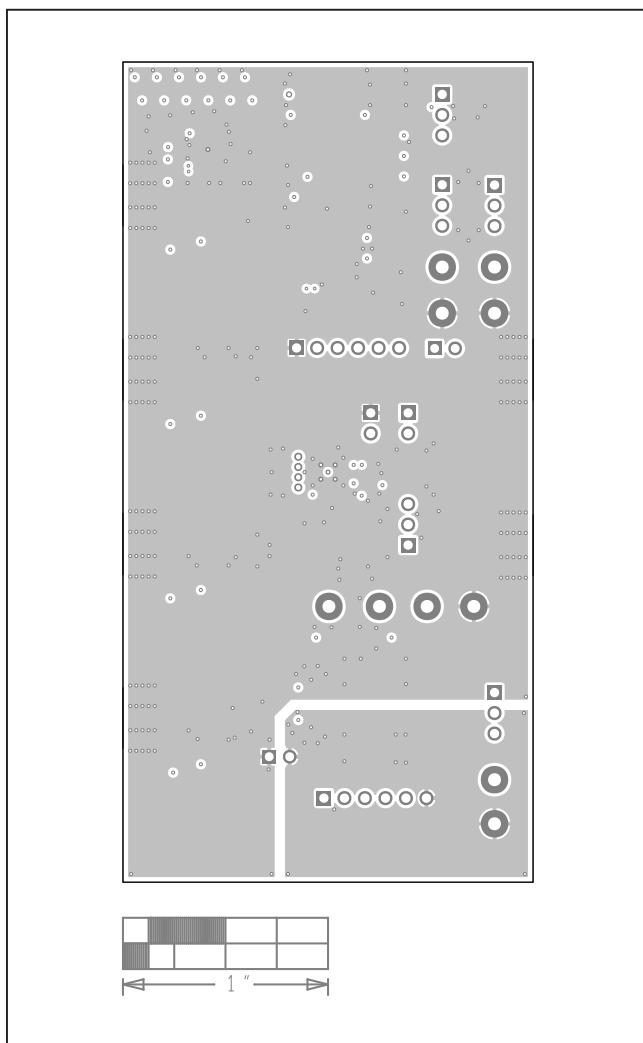


MAX11947 EV Kit Component Placement Guide—Top Silkscreen

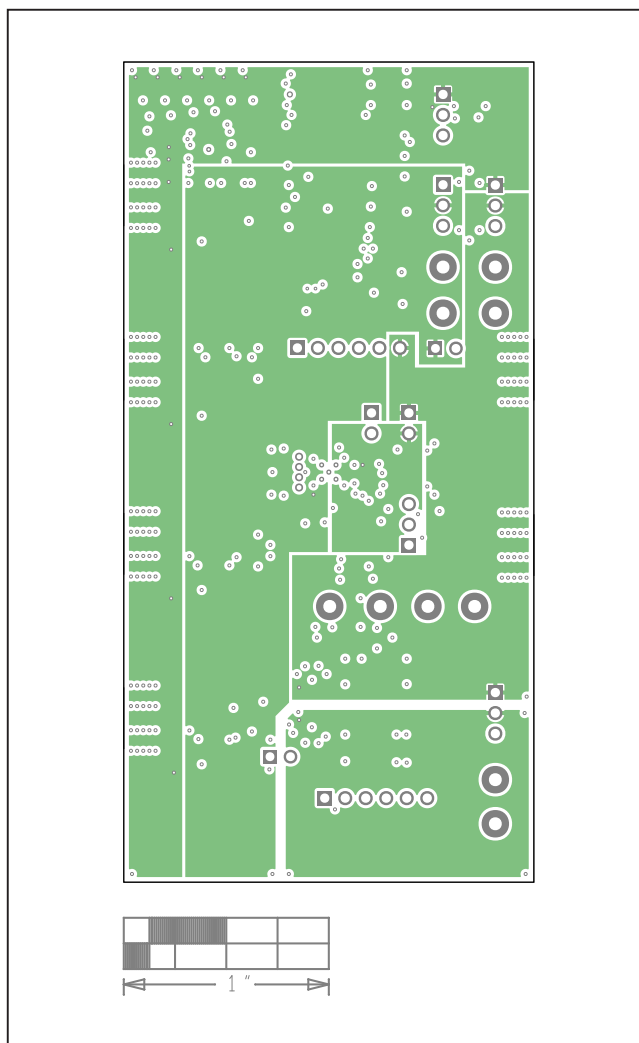


MAX11947 EV Kit PCB Layout—Top

## MAX11947 EV Kit PCB layouts (continued)

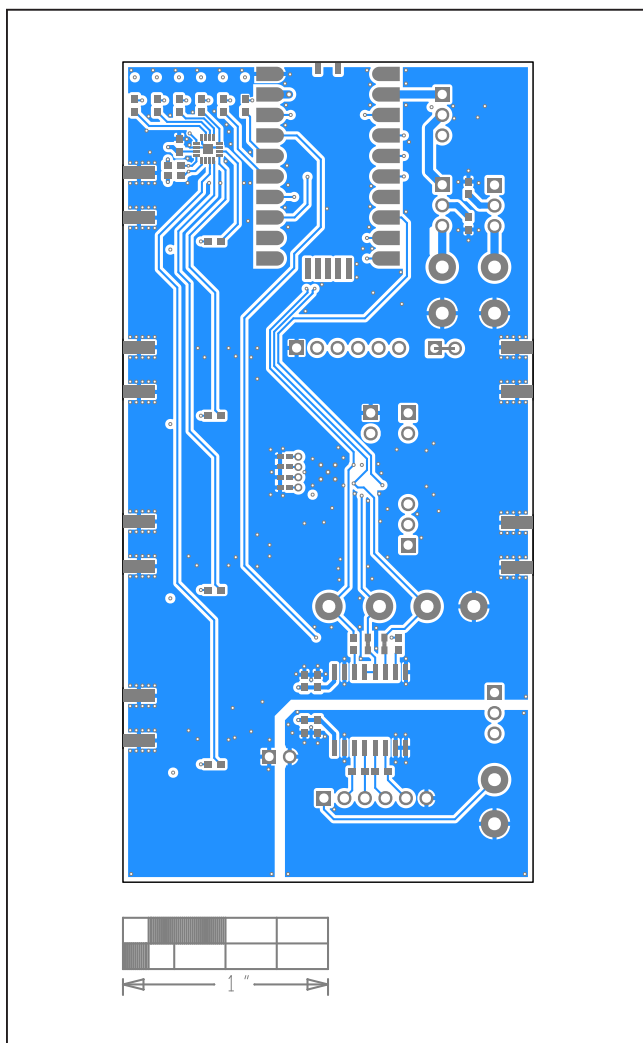


MAX11947 EV Kit PCB Layout—Internal2

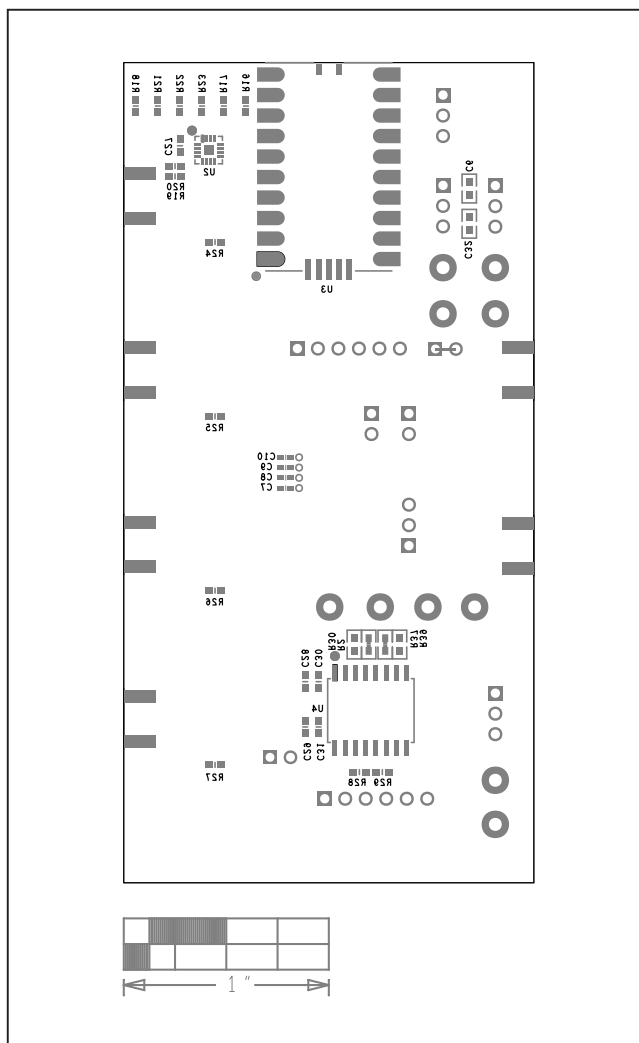


MAX11947 EV Kit PCB Layout—Internal3

## MAX11947 EV Kit PCB layouts (continued)



MAX11947 EV Kit PCB Layout—Bottom



MAX11947 EV Kit PCB Layout—Bottom Silkscreen

## Revision History

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

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