## General Description

The MAX14434–MAX14436 evaluation kit (EV kit) provides a proven design to evaluate the MAX14434–MAX14436 four-channel unidirectional digital isolators. Three types of evaluation boards are available to support different channel direction configurations of the MAX14434–MAX14436 family. All evaluation boards support the wide-body 16-pin SOIC package type. See Table 1 for EV kit options.

The EV kit should be powered from two independent isolated power supplies with nominal output voltage in range from 1.71V to 5.5V. For evaluating the electrical parameters of the device without any isolation between the two sides, a single power supply can also be used.

The MAX14434FWEVKIT# comes populated with MAX14434FAWE+, but can also be used to evaluate the following digital isolators: MAX14434BAWE+, MAX14434CAWE+, MAX14434EAWE+. The MAX14435FWEVKIT# comes populated with the MAX14435FAWE+ but can also be used to evaluate the following isolators: MAX14435CAWE+, MAX14435BAWE+, MAX14435EAWE+, MAX14435RAWE+, MAX14435SAWE+, MAX14435UAWE+, and MAX14435VAWE+.

The MAX14436WEVKIT# comes populated with the MAX14436FAWE+, but can also be used to evaluate the following digital isolators: MAX14436BAWE+, MAX14436CAWE+, MAX14436EAWE+.

## Features

- Broad Range of Data Transfer Rates (from DC to 200Mbps)
- Four Unidirectional Channels with 3 Different Channel Direction Configurations
- SMA Connectors for Easy Connection to External Equipment
- Wide Power Supply Voltage Range from 1.71V to 5.5V
- Guaranteed Up to $5kV_{RMS}$ Isolation for the Wide-Body SOIC Package for 60s

***Ordering Information* appears at end of data sheet.**

## Table 1. EV Kit Options

| EVKIT PART # | TARGET DEVICE | PACKAGE TYPE | COMMENT |
|---|---|---|---|
| MAX14434FWEVKIT# | MAX14434FAWE+ | 16-SOIC wide-body | 200Mbps IC populated |
| MAX14435FWEVKIT# | MAX14435FAWE+ | 16-SOIC wide-body | 200Mbps IC populated |
| MAX14436FWEVKIT# | MAX14436FAWE+ | 16-SOIC wide-body | 200Mbps IC populated |



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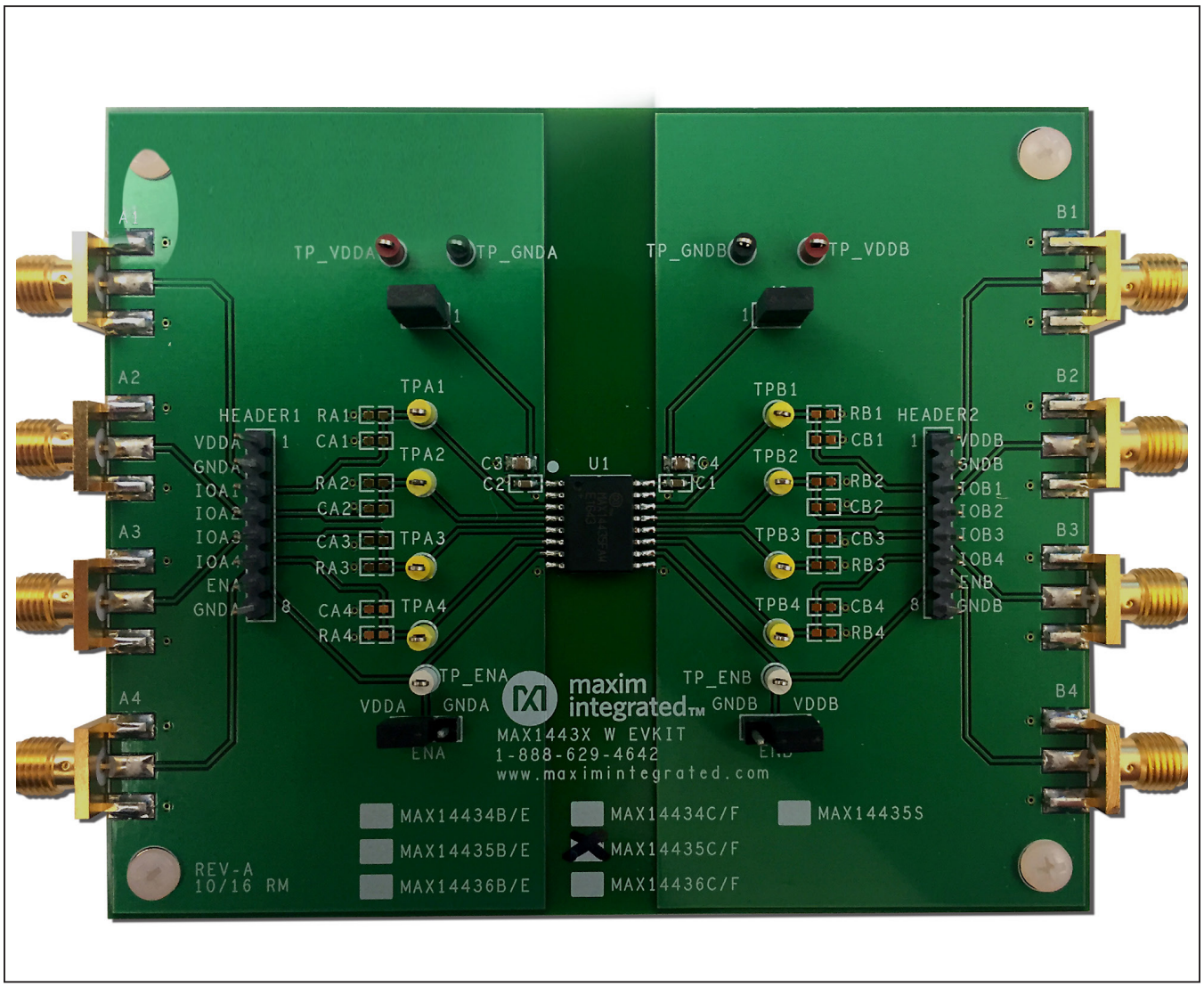



*Figure 1. Photograph of Evaluation Kit*

## Quick Start

### Required Equipment

- MAX14434FW, MAX14435FW, or MAX14436FW
- Two DC power supplies with output range of 1.71V to 5.5V
- Signal/function generator
- Oscilloscope

### Procedure

The MAX14434FW, MAX14435FW, and MAX14436FW EV kits are fully assembled and ready for evaluation. For manual verification follow the steps below to verify board functionality:

1) Verify jumper settings. See Table 2 for all shunt positions.
   - J1 and J2 are closed.
   - Jumper ENA is either in 1-2 position if U1 ENA (pin 7) has active-high polarity, or in 2-3 position if U1 $\overline{ENA}$ (pin 7) has active-low polarity.
   - Jumper ENB is in 1-2 position.
2) Connect one DC power supply between the EV kit's TP_VDDA and TP_GNDA test points; connect the other DC power supply between TP_VDDB and TP_GNDB test points.
3) Set both DC power supply outputs between 1.71V and 5.5V, and then enable the power supply outputs. ***Note:*** *It is also possible to power the EV kits from a single power supply to test electrical parameters but this invalidates the digital isolation of the IC.*
4) Connect the signal/function generator to an input SMA connector or test point of side A and observe the isolated signal on the corresponding side B output, using an oscilloscope.

## Table 2. EV Kits Board Connectors and Shunt Positions

| CONNECTOR | SHUNT POSITION | DESCRIPTION |
|---|---|---|
| **SIDE A** | | |
| HEADER1 | 1 | Test point or input header for $V_{DDA}$ |
| | 2 | Test point or input header for GNDA |
| | 3 | Test point or input header for I/O; same as A1 SMA |
| | 4 | Test point or input header for I/O; same as A2 SMA |
| | 5 | Test point or input header for I/O; same as A3 SMA |
| | 6 | Test point or input header for I/O; same as A4 SMA |
| | 7 | Test point or input header for side A enable; same as ENA jumper pin 2 |
| | 8 | Test point or input header for GNDA |
| A1 (SMA) | n/a | I/O on side A |
| A2 (SMA) | n/a | I/O on side A |
| A3 (SMA) | n/a | I/O on side A |
| A4 (SMA) | n/a | I/O on side A |
| J1 | Open | Use current meter to measure current of side A |
| | 1-2* | Connect power supply to $V_{DDA}$ |
| ENA | 1-2* | Connect side A enable pin to $V_{DDA}$; side A outputs are enabled if ENA is active-high or high-impedance if active-low. |
| | 2-3 | Connect side A enable pin to GNDA; side A outputs are high-impedance if ENA is active-high or enabled if active-low. |

## Table 2. EV Kits Board Connectors and Shunt Positions (continued)

| CONNECTOR | SHUNT POSITION | DESCRIPTION |
|---|---|---|
| **SIDE B** | | |
| HEADER2 | 1 | Test point or input header for $V_{DDB}$ |
| | 2 | Test point or input header for GNDB |
| | 3 | Test point or input header for I/O; same as B1 SMA |
| | 4 | Test point or input header for I/O; same as B2 SMA |
| | 5 | Test point or input header for I/O; same as B3 SMA |
| | 6 | Test point or input header for I/O; same as B4 SMA |
| | 7 | Test point or input header for side B enable; same as ENB jumper pin 2 |
| | 8 | Test point or input header for GNDB |
| B1 (SMA) | n/a | I/O on side B |
| B2 (SMA) | n/a | I/O on side B |
| B3 (SMA) | n/a | I/O on side B |
| B4 (SMA) | n/a | I/O on side B |
| J2 | Open | Use current meter to measure current of side B |
| | 1-2* | Connect power supply to $V_{DDB}$ |
| ENB | 1-2* | Connect side B enable pin to $V_{DDB}$; side B outputs are enabled if ENB is active high or high-impedance if active-low |
| | 2-3 | Connect side B enable pin to GNDB; side B outputs are high-impedance. |

**Default configuration*

## Table 3. EV Kits Test Points

| TEST POINT | DESCRIPTION |
|---|---|
| **SIDE A** | |
| TP_VDDA | Test point for $V_{DDA}$ |
| TP_GNDA | Test point for GNDA |
| TPA1 | Test point for SMA connector A1 |
| TPA2 | Test point for SMA connector A2 |
| TPA3 | Test point for SMA connector A3 |
| TPA4 | Test point for SMA connector A4 |
| TP_ENA | Test point for jumper ENA pin 2 |
| **SIDE B** | |
| TP_VDDB | Test point for $V_{DDB}$ |
| TP_GNDB | Test point for GNDB |
| TPB1 | Test point for SMA connector B1 |
| TPB2 | Test point for SMA connector B2 |
| TPB3 | Test point for SMA connector B3 |
| TPB4 | Test point for SMA connector B4 |
| TP_ENB | Test point for jumper ENB pin 2 |

## Detailed Description of Hardware

The EV kits are powered from two power supplies as described below.

### External Power Supplies

Power to the MAX14434FW, MAX14435FW, and MAX14436FW EV kits is derived from two external sources which can both be between +1.71V and +5.5V. Connect one source between the $V_{DDA}$ and GNDA test points, and the other source between the $V_{DDB}$ and GNDB test points. Each supply can be set independently and can be present over the entire range from 1.71V to 5.5V, regardless of the level or presence of the other supply. The MAX14434-MAX14436 level-shift the data, transmitting them across the isolation barrier.

Four SMA connectors on each side of the board allow easy connections to signal generator(s) and oscilloscope. A typical test setup is shown in Figure 2.

### Decoupling Capacitors

Each power supply is decoupled with a 10µF ceramic capacitor in parallel with a 0.1µF ceramic capacitor, which are placed close to the U1 $V_{DDA}$ and $V_{DDB}$ pin.

### Termination

Each input and output has an unpopulated 0603 SMT resistor (RA1-RA4, RB1-RB4) and an unpopulated 0603 SMT capacitor (CA1–CA4, CB1–CB4) to GND_ to allow termination based on customer requirements.

### Shunt Positions

Jumpers J1 and J2 are installed between the external power supplies and U1 power supply pins to allow supply current measurement. Uninstall the J1 and J2 shunts and connect current meters on both side A and side B to measure the MAX14434-MAX14436 supply current.

Jumper ENA is provided to enable or disable the side A of the isolator channels. To enable the devices with active-high enable pin on the side A (MAX1443_B/C/E/F), connect the ENA shunt to $V_{DDA}$. To enable the devices with active-low enable pin on the side A (MAX14435R/S/U/V), connect the ENA shunt to GNDA. The side A outputs are high-impedance when disabled.

Jumper ENB is provided to enable or disable the side B of the isolator channels. Connect the ENB shunt to $V_{DDB}$ to enable the side B channels, or connect to GNDB to disable the side B channels. The side B outputs are high-impedance when disabled. See Table 2 for all shunt positions.

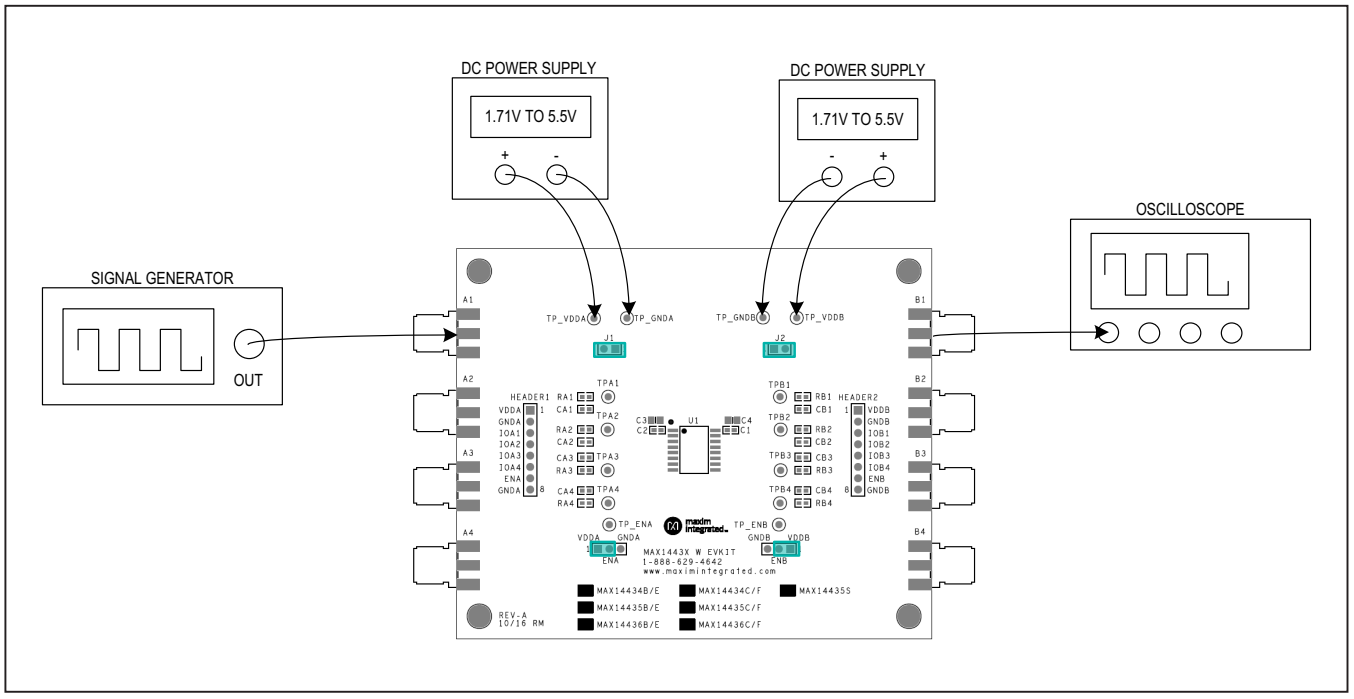



*Figure 2. EV Kit Typical Test Setup*

## Ordering Information

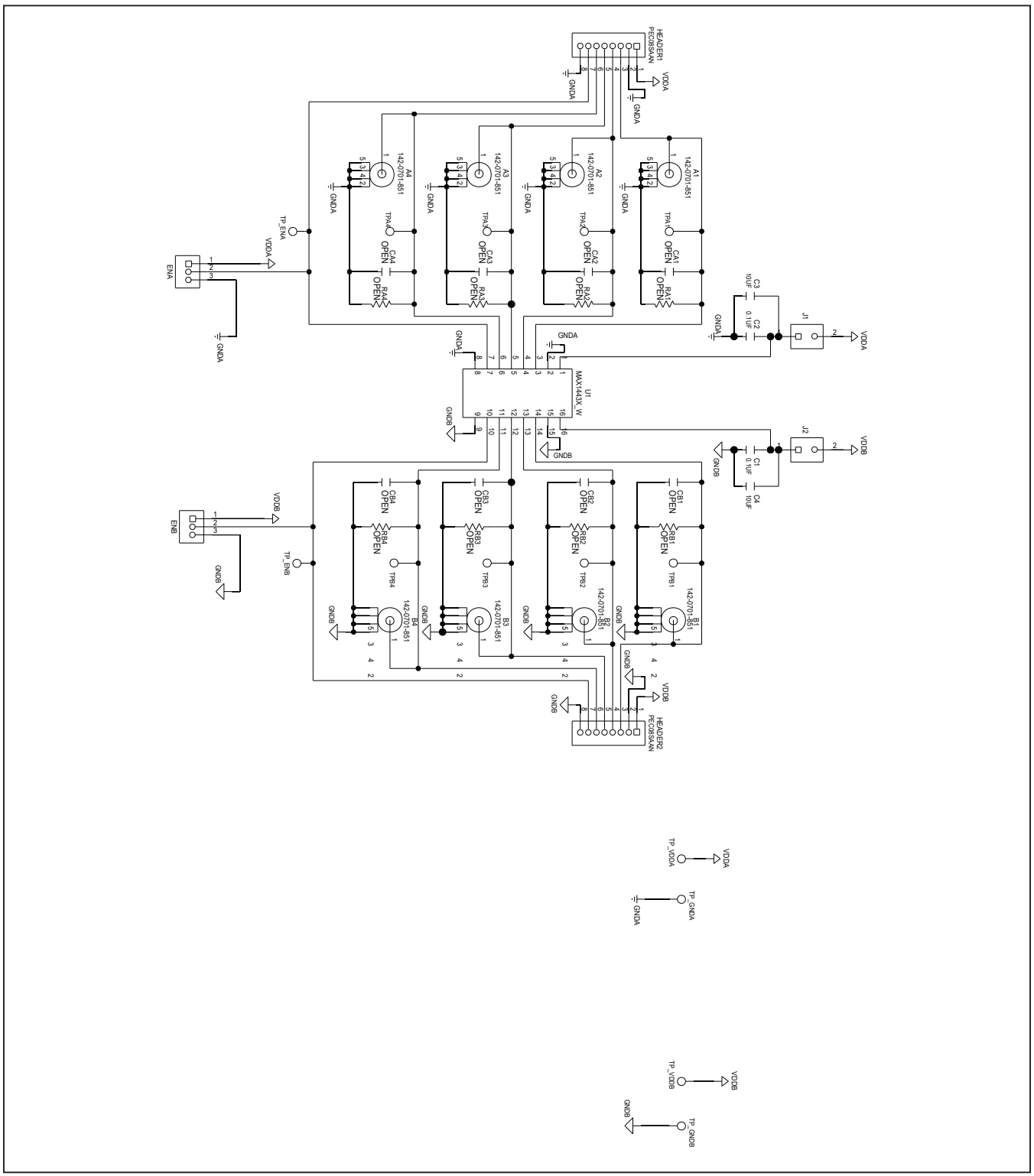
| PART | TYPE |
|---|---|
| MAX14434FWEVKIT# | EVKIT with installed MAX14434FAWE+ |
| MAX14435FWEVKIT# | EVKIT with installed MAX14435FAWE+ |
| MAX14436FWEVKIT# | EVKIT with installed MAX14436FAWE+ |

*#Denotes RoHS compliant.*

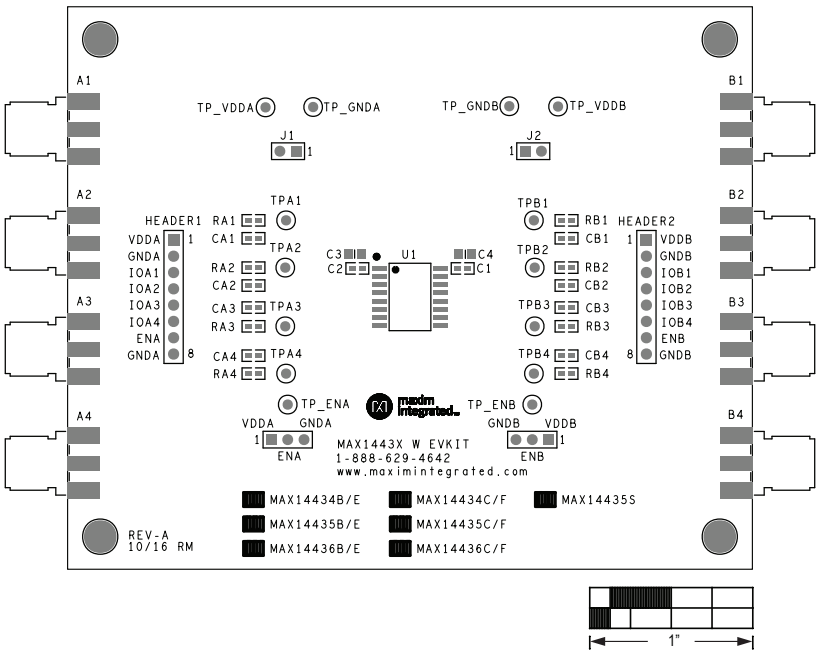
## MAX14434-MAX14436 EV Kit Bill of Materials

| ITEM | REF_DES | DNI/DNP | QT | MFG PART # | MANUFACTURER | VALUE | DESCRIPTION | COMMENTS |
|---|---|---|---|---|---|---|---|---|
| 1 | A1-A4, B1-B4 | - | 8 | 142-0701-851 | JOHNSON COMPONENTS | 142-0701-851 | CONNECTOR; END LAUNCH JACK RECEPTACLE; BOARDMOUNT; STRAIGHT THROUGH; 2PINS; | |
| 2 | C1, C2 | - | 2 | ECJ-1VB1H104K; GRM188R71H104KA; CGJ3E2X7R1H104K080AA; C1608X7R1H104K080AA; CL10B104KB8NFN; CL10B104KB8NNN | PANASONIC; MURATA; TDK; SAMSUNG | 0.1UF | CAPACITOR; SMT (0603); CERAMIC CHIP; 0.1UF; 50V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R; | |
| 3 | C3, C4 | - | 2 | CL21B106KOQNNN | SAMSUNG ELECTRONICS | 10UF | CAPACITOR; SMT (0805); CERAMIC CHIP; 10UF; 16V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R | |
| 4 | ENA, ENB | - | 2 | PEC03SAAN | SULLINS | PEC03SAAN | CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 3PINS | |
| 5 | HEADER1, HEADER2 | - | 2 | PEC08SAAN | SULLINS ELECTRONICS CORP. | PEC08SAAN | CONNECTOR; MALE; THROUGH HOLE; .100IN CONTACT CENTER; MALE BREAKAWAY HEADER ; STRAIGHT; 8PINS | |
| 6 | J1, J2 | - | 2 | PEC02SAAN | SULLINS | PEC02SAAN | CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 2PINS | |
| 7 | MTH1-MTH4 | - | 4 | EVKIT_STANDOFF_4-40_3/8 | ? | EVKIT_STANDOFF_4-40_3/8 | KIT; ASSY-STANDOFF 3/8IN; 1PC. STANDOFF/FEM/HEX/4-40IN/(3/8IN)/NYLON; 1PC. SCREW/SLOT/PAN/4-40IN/(3/8IN)/NYLON | |
| 8 | SU1-SU4 | - | 4 | STC02SYAN | SULLINS ELECTRONICS CORP. | STC02SYAN | TEST POINT; JUMPER; STR; TOTAL LENGTH=0.256IN; BLACK; INSULATION=PBT CONTACT=PHOSPHOR BRONZE; COPPER PLATED TIN OVERALL | |
| 9 | TPA1-TPA4, TPB1-TPB4 | - | 8 | 5004 | KEYSTONE | N/A | TEST POINT; PIN DIA=0.1IN; TOTAL LENGTH=0.3IN; BOARD HOLE=0.04IN; YELLOW; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH; | |
| 10 | TP_ENA, TP_ENB | - | 2 | 5002 | KEYSTONE | N/A | TEST POINT; PIN DIA=0.1IN; TOTAL LENGTH=0.3IN; BOARD HOLE=0.04IN; WHITE; PHOSPHOR BRONZE WIRE SILVER; | |
| 11 | TP_GNDA, TP_GNDB | - | 2 | 5001 | KEYSTONE | N/A | TEST POINT; PIN DIA=0.1IN; TOTAL LENGTH=0.3IN; BOARD HOLE=0.04IN; BLACK; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH; | |
| 12 | TP_VDDA, TP_VDDB | - | 2 | 5000 | KEYSTONE | N/A | TEST POINT; PIN DIA=0.1IN; TOTAL LENGTH=0.3IN; BOARD HOLE=0.04IN; RED; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH; | |
| 13 | U1 | - | 1 | MAX1443X_W | MAXIM | MAX1443X_W | EVKIT PART-IC; MAX1443X SERIES; PACKAGE DWG NO.: 21-0042; PACKAGE LAND PATTERN: 90-0107; WSOIC16 | |
| 14 | CA1-CA4, CB1-CB4 | DNP | 0 | N/A | N/A | OPEN | PACKAGE OUTLINE 0603 NON-POLAR CAPACITOR | |

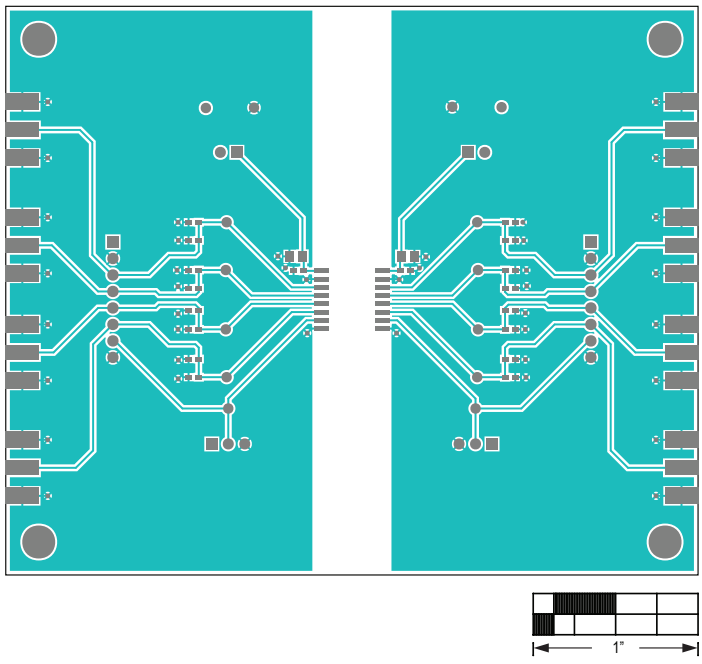
## MAX14434–MAX14436 EV Kit Schematic



## MAX14434–MAX14436 EV Kit PCB Layout Diagrams

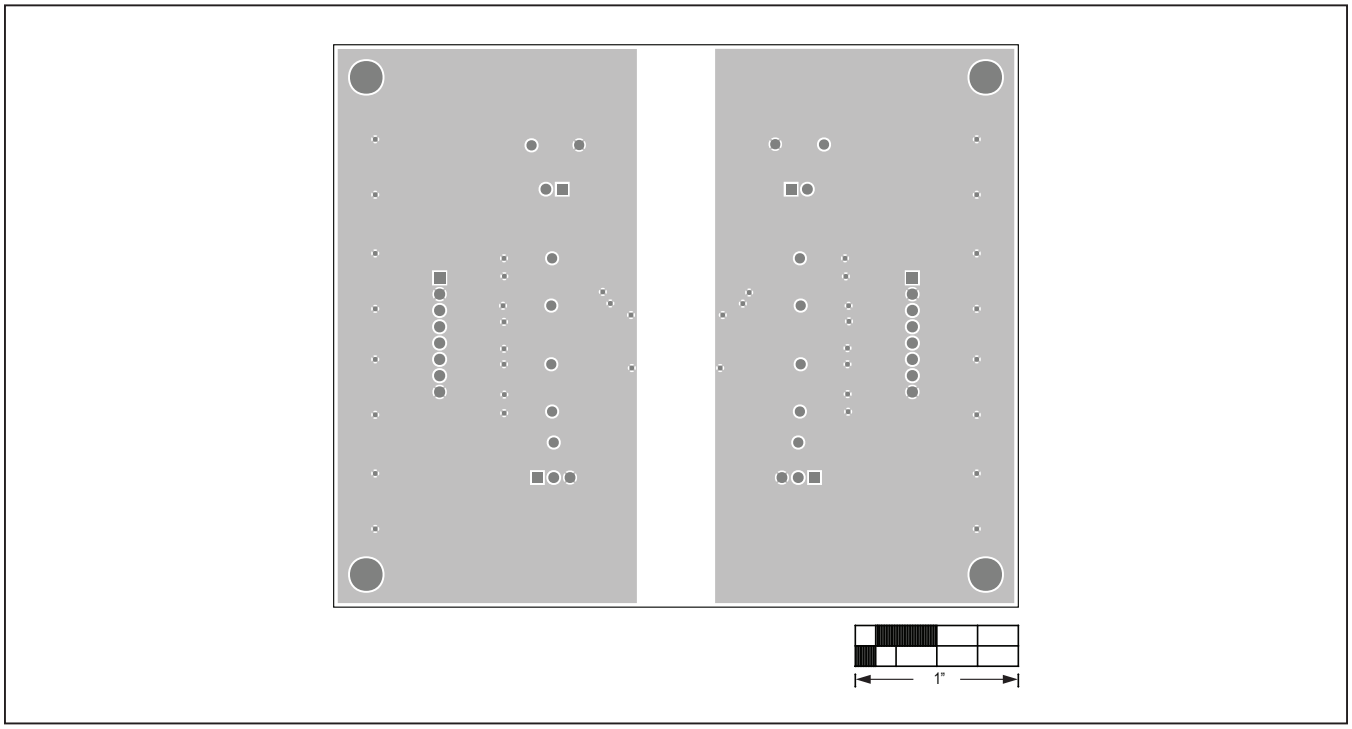



*MAX14434–MAX14436 EV Kit—Top Silkscreen*

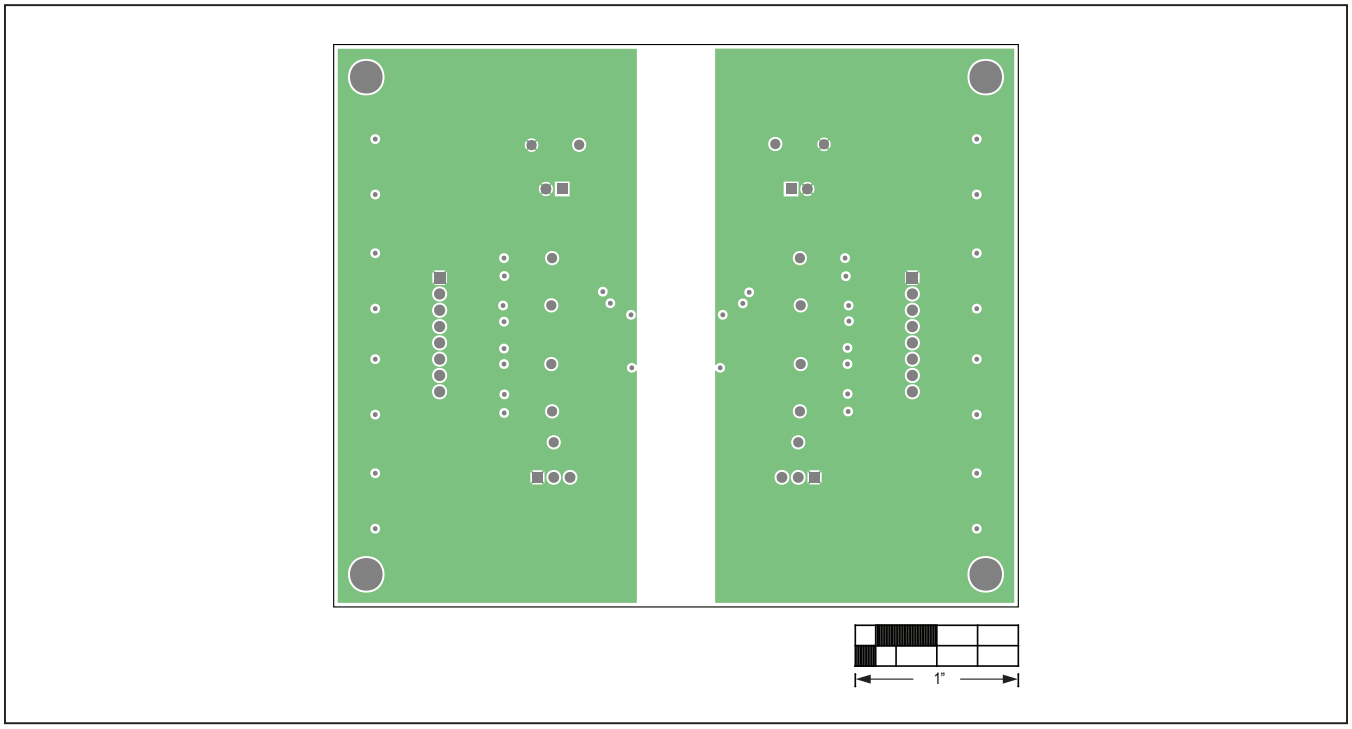



*MAX14434–MAX14436 EV Kit—Top*

## MAX14434-MAX14436 EV Kit PCB Layout Diagrams (continued)

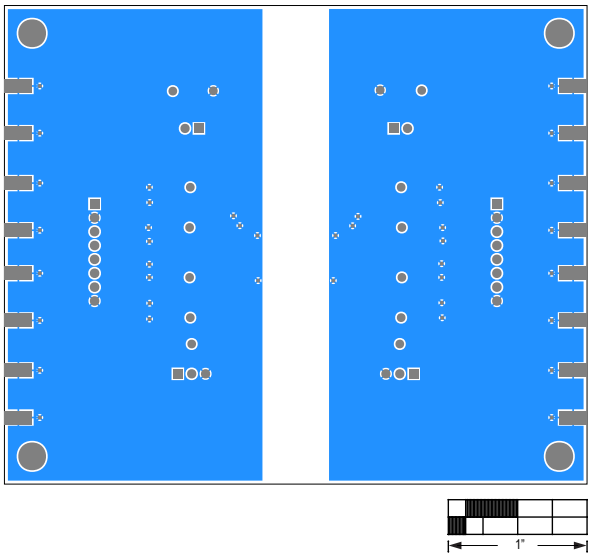



*MAX14434–MAX14436 EV Kit—L2 GND*




*MAX14434–MAX14436 EV Kit—L3 PWR*

## MAX14434–MAX14436 EV Kit PCB Layout Diagrams (continued)




*MAX14434–MAX14436 EV Kit—Bottom*

## Revision History

| REVISION NUMBER | REVISION DATE | DESCRIPTION | PAGES CHANGED |
|---|---|---|---|
| 0 | 7/17 | Initial release | — |
| 1 | 2/19 | Removed future product designation from MAX14434FWEVKIT# in the *Ordering Information* table | 6 |

For pricing, delivery, and ordering information, please contact Maxim Direct at 1-888-629-4642, or visit Maxim Integrated's website at www.maximintegrated.com.

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