

MAX17222 Evaluation Kit

Evaluates: MAX17220–MAX17225

General Description

The MAX17222 evaluation kit (EV kit) evaluates the MAX17220–MAX17225 IC family of ultra-low quiescent current step-up DC-DC converters. The MAX17222 EV kit features two independent circuits to evaluate two different IC packages of the MAX17220–MAX17225 family. Both circuits on the EV kit operate over an input range of 400mV to 5.5V, depending on load, with 0.88V typical startup with 3k Ω load. Each circuit provides resistor-configurable output voltages from 1.8V to 5V in 100mV/step.

The EV kit comes with the MAX17222ELT+ and MAX17225ENT+ installed.

Features

- Two Independent Circuits on One Board
 - Evaluates the MAX17220–MAX17225 IC Family in a 6-pin μ DFN
 - Evaluates the MAX17220–MAX17225 IC Family in a 6-pin Wafer-Level Package (WLP)
- 400mV to 5.5V Input Range
- 1.8V to 5V Configurable Output Voltage in 100mV/step
- Up to 100mA/225mA/425mA Output Current
- Proven 2-Layer 1oz Copper PCB Layout
- Demonstrates Compact Solution Size
- Fully Assemble and Tested

MAX17222 EV Kit Files

| FILE | DESCRIPTION |
|---|---------------------------|
| MAX17222 EV BOM | EV Kit Bill of Material |
| MAX17222 EV PCB Layout Diagrams | EV Kit Layout |
| MAX17222 EV Schematic | EV Kit Schematic |
| MAX17222 EV Minimal Component Schematic | Minimal Component Circuit |

Ordering Information appears at end of data sheet.

Quick Start

Required Equipment

- MAX17222 EV kit
- 1.8V to 5V, 3A DC power supply
- Electronic load capable of 225mA to 425mA
- Digital voltmeter (DVM)

Procedure

The EV kit is fully assembled and tested. Follow the steps below to verify board operation.

Caution: Do not turn on power supply until all connections are completed.

<<Testing the 3V Output Circuit>>

- 1) Verify that jumper JU101 is in its default position, as shown in [Table 2](#).
- 2) Connect the power supply between the IN and nearest GND terminal posts.
- 3) Connect the electronic load between the 3V output and nearest GND terminal posts.
- 4) Connect the DVM between the 3V output and nearest GND terminal posts.
- 5) Set the input power supply to 1.8V and turn on the power supply.
- 6) Set the electronic load to 225mA and enable the electronic load.
- 7) Verify that the voltage at the 3V terminal post is approximately 3V.

<<Testing the 5V Output Circuit>>

- 1) Verify that jumper JU1 is in its default position, as shown in [Table 1](#).
- 2) Connect the power supply between the IN1 and nearest GND1 terminal posts.
- 3) Connect the electronic load between the 5V output and nearest GND1 terminal posts.
- 4) Connect the DVM between the 5V output and a nearest GND1 terminal posts.
- 5) Set the input power supply to 3V, and turn on the power supply.
- 6) Set the electronic load to 425mA, and enable the electronic load.
- 7) Verify that the voltage at the 5V terminal post is approximately 5V.

Detailed Description of Hardware

The MAX17222 EV kit evaluates the MAX17220–MAX17225 IC family of ultra-low quiescent current step-up DC-DC converters. The MAX17222 EV kit features two independent circuits to evaluate two different IC packages of the MAX17220–MAX17225 family. Both circuits on the EV kit operate over an input range of 400mV to 5.5V. Each circuit provides resistor-configurable output voltages from 1.8V to 5V in 100mV/step.

The MAX17222 EV Kit comes with a MAX17222ELT+ (µDFN) and a MAX17225ENT+ (WLP) installed. The MAX17222ELT+ circuit is configured for a 3V output, and can deliver 225mA with 1.8V input. The MAX17225ENT+ circuit is configured for a 5V output, and can deliver 425mA with 3V input.

EN for the MAX17225 Circuit

The MAX17225 circuit on the EV kit provides a jumper (JU1) to enable or disable the MAX17225. Refer to [Table 1](#) for JU1 jumper settings.

EN for the MAX17222 Circuit

The MAX17222 circuit on the EV kit provides a jumper (JU101) to enable/disable the MAX17222. Refer to [Table 2](#) for JU101 jumper settings.

Battery Holders

The MAX17222 EV kit provides battery holders for each of the two circuits. The battery holder V1 can accommodate a CR1632 Lithium Coin cell to power the MAX17225 circuit, while the V101 can hold an Energizer 364/363 silver oxide cell to power the MAX17222 circuit.

Table 1. EN on MAX17225 (JU1)

| JU1 SHUNT POSITION | DESCRIPTION |
|--------------------|---|
| 1-2* | Enabled. EN = IN1 (through pullup resistor R2) |
| 2-3 | Disabled. EN = GND1 |
| Not Installed | Enabled. EN = high (through internal pullup resistor) |

*Default position.

Spare Resistors and Inductors

The EV kit provides spare resistors and inductors on the PCB's bottom side. The spare resistors can be used to reconfigure the EV kit to a different output voltage (2V, 2.5V, 3V, or 3.3V). The spare inductors can be used to reconfigure the EV Kit output current ratings.

Table 2. EN on MAX17222 (JU101)

| JU101 SHUNT POSITION | DESCRIPTION |
|----------------------|---|
| 1-2* | Enabled. EN = IN (through pullup resistor R102) |
| 2-3 | Disabled. EN = GND |
| Not Installed | Enabled. EN = high (through internal pullup resistor) |

*Default position.

Component Suppliers

| SUPPLIER | WEBSITE |
|------------------|-------------------|
| Coilcraft | www.coilcraft.com |
| Murata/TOKO | www.murata.com |
| TDK | www.tdk.com |
| Würth Elektronik | www.we-online.com |

Note: Indicate that you are using the MAX17220–MAX17225 when contacting these component suppliers.

Ordering Information

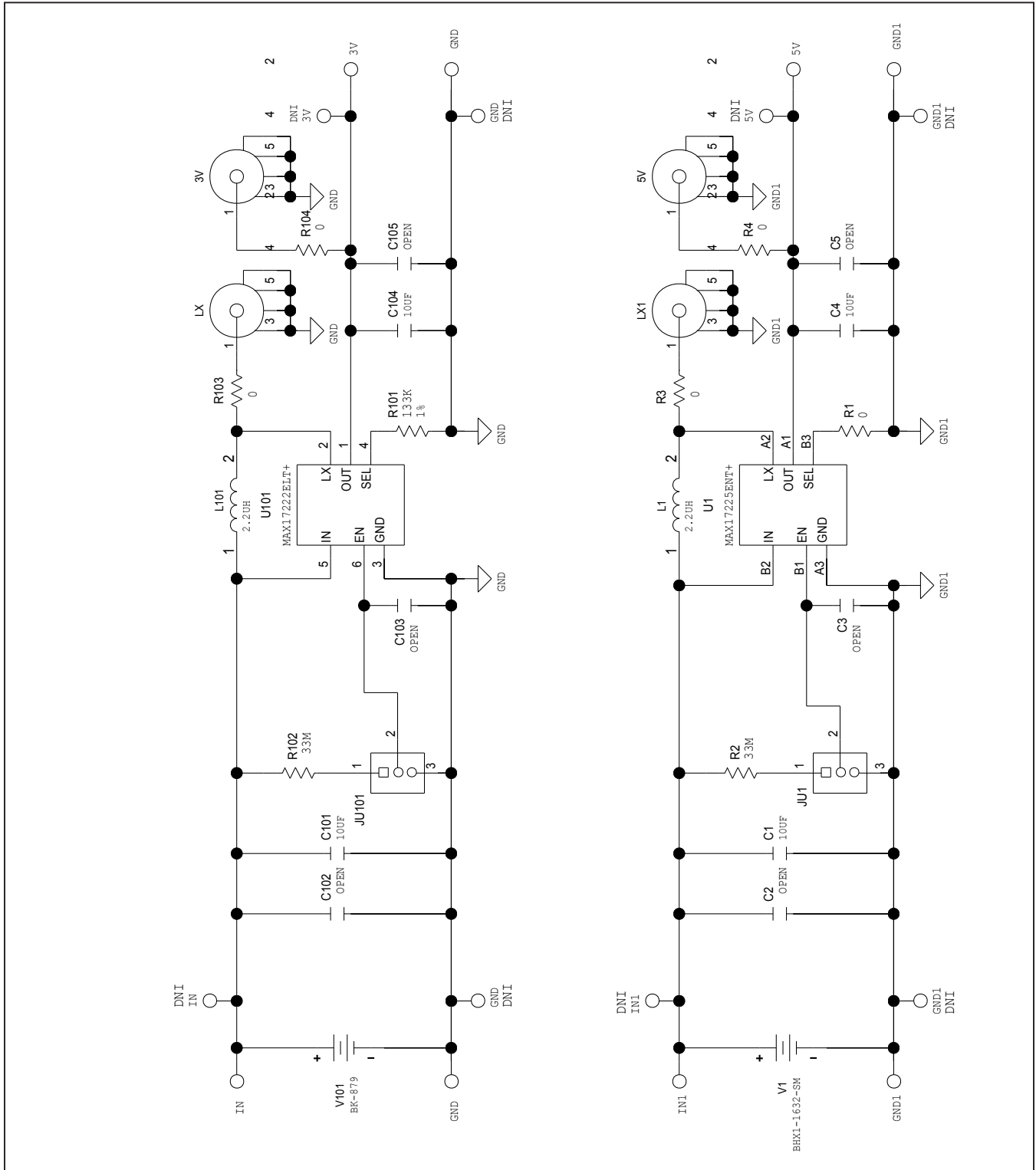
| PART | TYPE |
|----------------|--------|
| MAX17222EVKIT# | EV Kit |

#Denotes RoHS

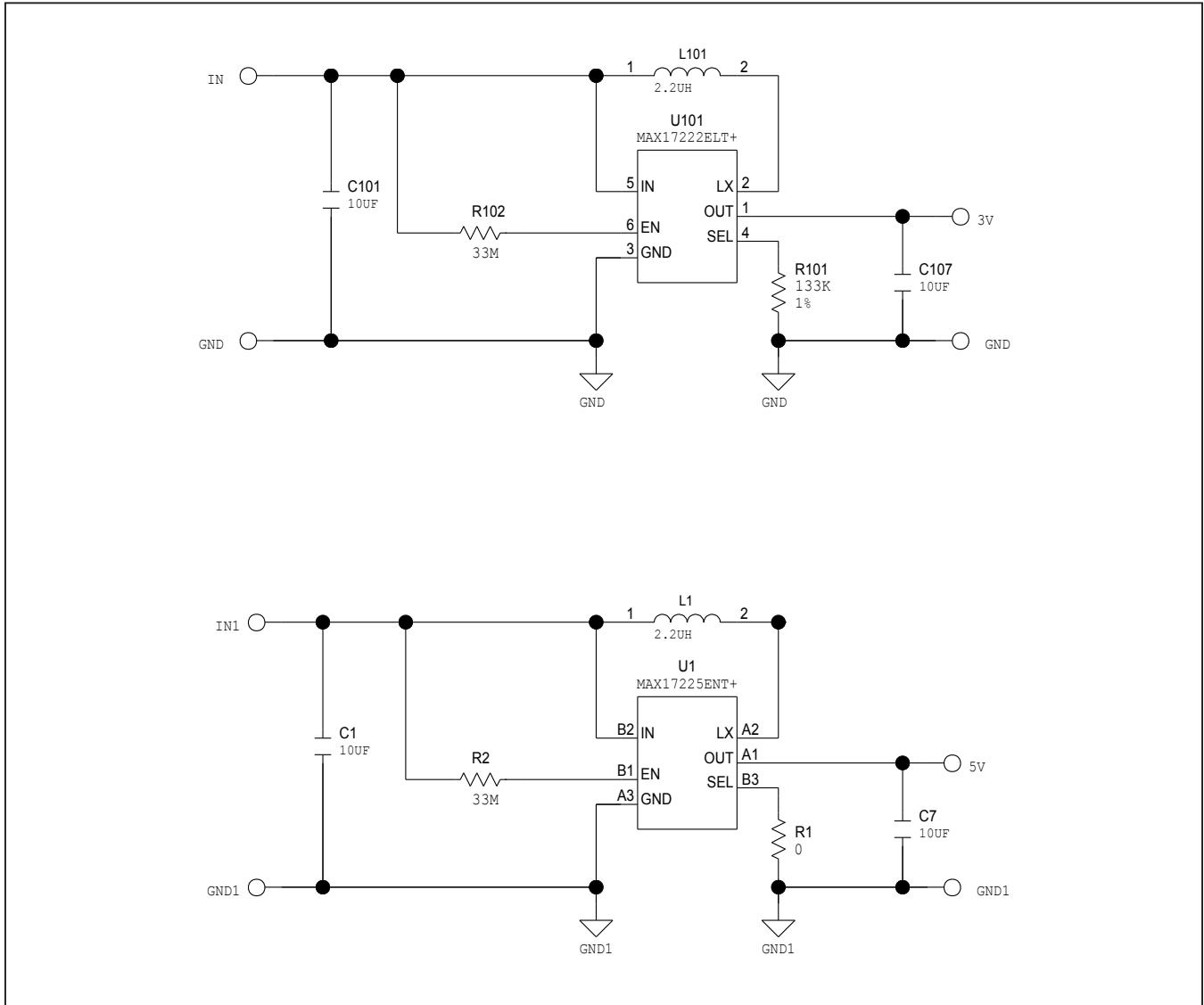
MAX17222 EV Kit Bill of Materials

| ITEM | REF DES | DNI/D NP | QTY | MFG PART # | MFG | VALUE | DESCRIPTION |
|-------|---------------------------|----------|-----|-------------------------------|----------------------------------|----------------|---|
| 1 | 3V, 5V, LX, LX1 | - | 4 | 131-4353-00 | TEKTRONICS | 131-4353-00 | CONNECTOR; WIREMOUNT; CIRCUIT BOARD TEST POINT MINIATURE PROBE; STRAIGHT; 4PINS; |
| 2 | C1, C101 | - | 2 | GRM155R60J106ME44 | MURATA | 10UF | CAPACITOR; SMT (0402); CERAMIC CHIP; 10UF; 6.3V; TOL=20%; TG=-55 DEGC TO +85 DEGC; TC=X5R; |
| 3 | C4, C104 | - | 2 | GRM155R61A106ME44 | MURATA | 10UF | CAPACITOR; SMT (0402); CERAMIC CHIP; 10UF; 10V; TOL=20%; TG=-55 DEGC TO +85 DEGC; TC=X5R; |
| 4 | IN, J1-J4, GND, IN1, GND1 | - | 8 | 1514-2 | KEYSTONE | 1514-2 | TERMINAL; TURRET; PIN DIA=0.090IN; TOTAL LENGTH=0.105IN; BOARD HOLE=0.098IN; BRASS; TIN PLATING; |
| 5 | JU1, JU101 | - | 2 | PEC03SAAN | SULLINS | PEC03SAAN | CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 3PINS |
| 6 | L1 | - | 1 | DFE201612E-2R2M | MURATA | 2.2UH | INDUCTOR; SMT (0806); WIREWOUND CHIP; 2.2UH; TOL=+/-20%; 1.8A |
| 7 | L1C | - | 1 | MLP1005M1R0DTS1 | TDK | 1UH | INDUCTOR; SMT (0402); FERRITE CHIP; 1UH; TOL=+/-20%; 0.5A |
| 8 | L1F | - | 1 | DFE160808S-1R0M=P2 | MURATA | 1UH | INDUCTOR; SMT (0603); MAGNETICALLY SHIELDED; 1UH; TOL=+/-20%; 1.9A |
| 9 | L1V | - | 1 | DFM18PAN2R2MG0L | MURATA | 2.2UH | INDUCTOR; SMT (0603); CERAMIC CHIP; 2.2UH; TOL=+/-20%; 1.1A; |
| 10 | L1W | - | 1 | DFE201612E-1R0M | MURATA | 1UH | INDUCTOR; SMT (0806); WIREWOUND CHIP; 1UH; TOL=+/-20%; 2.9A |
| 11 | L1X | - | 1 | 74479299222 | WURTH ELECTRONICS INC | 2.2UH | INDUCTOR; SMT (1210); MOLDED CHIP; 2.2UH; TOL=+/-20%; 2.1A |
| 12 | L1Y | - | 1 | 74438357022 | WURTH ELECTRONICS INC | 2.2UH | EVKIT PART-INDUCTOR; SMT; SHIELDED; 2.2UH; TOL=+/-20%; 5.2A; |
| 13 | L101 | - | 1 | XFL4020-222ME | COILCRAFT VISHAY | 2.2UH | INDUCTOR; SMT; METAL COMPOSITE CORE; 2.2UH; TOL=+/-20%; 8A; -40 DEGC TO +125 DEGC |
| 14 | R1 | - | 1 | CRCW12060000ZS; ERJ-8GEY0R00V | DALE/PANASONIC | 0 | RESISTOR; 1206; 0 OHM; 0%; JUMPER; 0.25W; THICK FILM |
| 15 | R2, R102 | - | 2 | HMC0402JT33M0 | STACKPOLE ELECTRONICS INC | 33M | RESISTOR; 0402; 33M OHM; 5%; 400PPM; 0.063W; THICK FILM |
| 16 | R3, R4, R103, R104 | - | 4 | ERJ-2GE0R00X | PANASONIC | 0 | RESISTOR; 0402; 0 OHM; 0%; JUMPER; 0.10W; THICK FILM |
| 17 | R101, R101C | - | 2 | RMCF1206FT133K | STACKPOLE ELECTRONICS INC | 133K | RESISTOR; 1206; 133K OHM; 1%; 100PPM; 0.25W; THICK FILM |
| 18 | R101A | - | 1 | RMCF1206FT768K | STACKPOLE ELECTRONICS INC | 768K | RESISTOR; 1206; 768K OHM; 1%; 100PPM; 0.25W; THICK FILM |
| 19 | R101B | - | 1 | RMCF1206FT324K | STACKPOLE ELECTRONICS INC | 324K | RESISTOR; 1206; 324K OHM; 1%; 100PPM; 0.25W; THICK FILM |
| 20 | R101D | - | 1 | RMCF1206FT80K6 | STACKPOLE ELECTRONICS INC | 80.6K | RESISTOR; 1206; 80.6K OHM; 1%; 100PPM; 0.25W; THICK FILM |
| 21 | SU1, SU101 | - | 2 | SX1100-B | KYCON | SX1100-B | TEST POINT; JUMPER; STR; TOTAL LENGTH=0.24IN; BLACK; INSULATION=PBT; PHOSPHOR BRONZE CONTACT=GOLD PLATED |
| 22 | U1 | - | 1 | MAX17225ENT+ | MAXIM | MAX17225ENT+ | EVKIT PART - IC; PACKAGE OUTLINE: 21-100128; PACKAGE CODE: N60E1+1; WLP6 |
| 23 | U101 | - | 1 | MAX17222ELT+ | MAXIM | MAX17222ELT+ | EVKIT PART - IC; PACKAGE OUTLINE: 21-0164; PACKAGE CODE: L622-1; DFN6 |
| 24 | V1 | - | 1 | BHX1-1632-SM | MEMORY PROTECTION DEVICES INC. | BHX1-1632-SM | BATTERY HOLDER; SMT; CR1632 SURFACE MOUNT BATTERY RETAINER WITH INSULATOR; CONTACTS: PHOSPHOR BRONZE C5191; NICKEL PLATED 80-150U THICK |
| 25 | V101 | - | 1 | BK-879 | MEMORY PROTECTION DEVICES INC. | BK-879 | BATTERY HOLDER; SMT; COIN CELL RETAINER FOR 6.8MM DIA. BATTERIES; 0.25MM PHOSPHOR BRONZE; NICKEL PLATED |
| 26 | PCB | - | 1 | MAX | MAXIM | PCB | PCB:MAX |
| 27 | MTH1-MTH4 | DNI | 4 | SJ-5003(BLACK) | 3M ELECTRONIC SOLUTIONS DIVISION | SJ-5003(BLACK) | BUMPER; BLACK-HEMISPHERICAL SHAPE EVKIT EH0231; 0.44D/0.2BH; RESILIENT ELASTOMER POLYURETHANE |
| 28 | C2, C3, C102, C103 | DNP | 0 | N/A | N/A | OPEN | PACKAGE OUTLINE 0402 NON-POLAR CAPACITOR |
| 29 | C5, C105 | DNP | 0 | N/A | N/A | OPEN | PACKAGE OUTLINE 0603 NON-POLAR CAPACITOR |
| 30 | TP1-TP8 | DNP | 0 | 5002 | KEYSTONE | N/A | TEST POINT; PIN DIA=0.1IN; TOTAL LENGTH=0.3IN; BOARD HOLE=0.04IN; WHITE; PHOSPHOR BRONZE WIRE SILVER; |
| TOTAL | | | 49 | | | | |

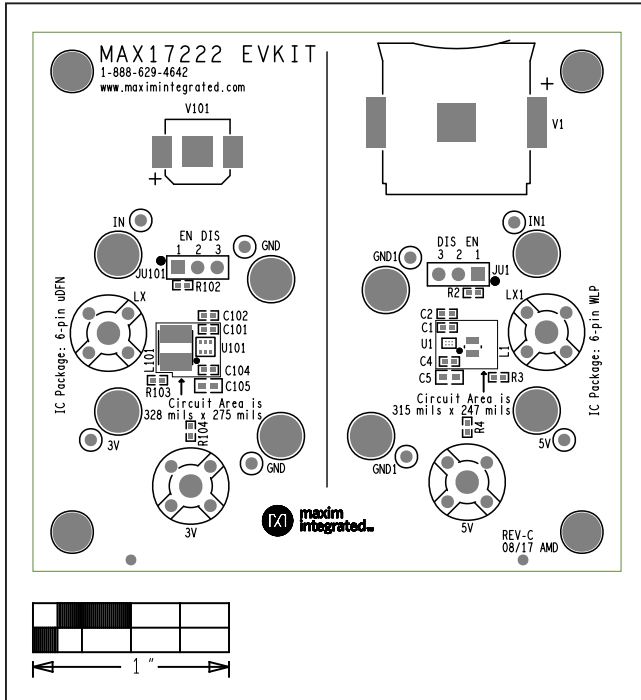
MAX17222 EV Kit Schematic



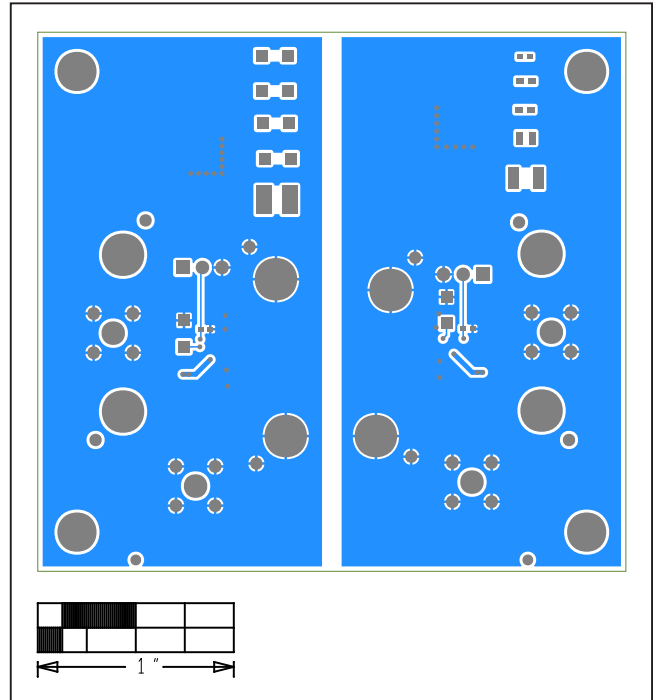
MAX17222 Minimal Component Circuit Schematic



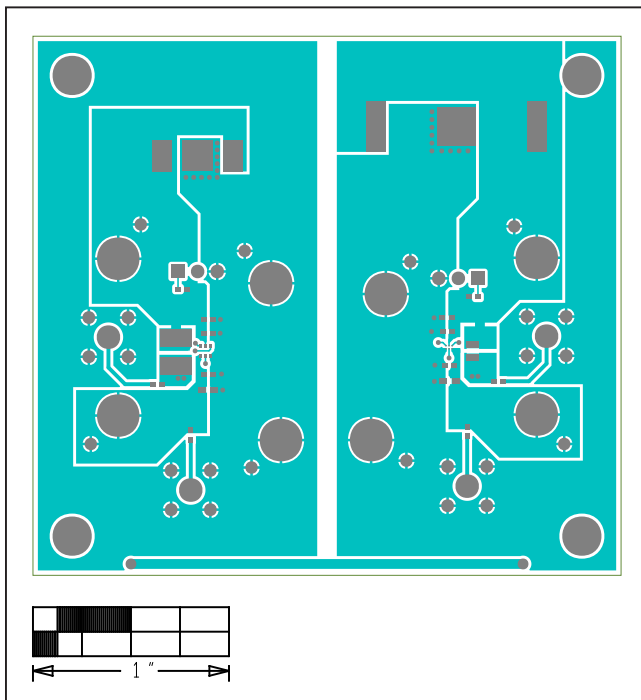
MAX17222 EV Kit PCB Layout Diagrams



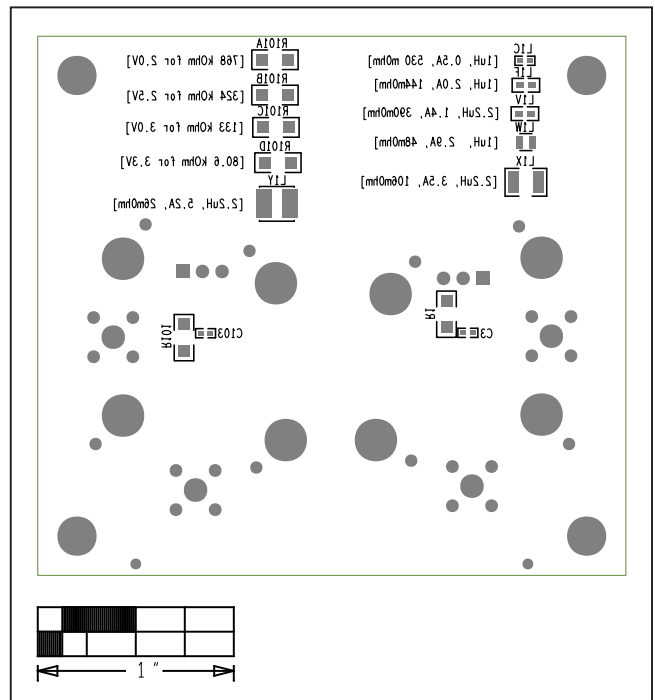
MAX17222 EV Kit—Top Silkscreen



MAX17222 EV Kit—Bottom



MAX17222 EV Kit—Top



MAX17222 EV Kit— Bottom Silkscreen

Revision History

| REVISION NUMBER | REVISION DATE | DESCRIPTION | PAGES CHANGED |
|-----------------|---------------|---|---------------|
| 0 | 1/17 | Initial release | — |
| 1 | 3/17 | Updated <i>Bill of Materials</i> | 4 |
| 2 | 4/17 | Updated text and replaced schematic, BOM, and PCB layout diagrams | 1–8 |
| 3 | 8/17 | Updated text and replaced schematic, BOM, and PCB layout diagrams | 1–8 |

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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