

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 load. Each circuit provides resistor-configurable output voltages from 1.8V to 5V in 100mV/step. Additionally, each circuit output on the EV kit delivers up to 100mA, 225mA, or 425mA of current, depending on the input voltage to the output voltage ratio.

The EV kit comes with the MAX17222ELT+ installed, while the MAX17225ENT+ is a future product.

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) (Future Products)
- 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
- 1.5V, 3A DC power supply
- Electronic load capable of 100mA
- Digital voltmeter (DVM)

Procedure <<Testing the 3V Output Circuit>>

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.

- 1) Verify that jumpers JU101 and JU102 are in their default positions, as shown in [Table 2](#).
- 2) Connect the 1.5V power supply between the IN and nearest GND terminal posts.
- 3) Connect the 100mA electronic load between the 3V and nearest GND terminal posts.
- 4) Connect the DVM between the 3V and nearest GND terminal posts.
- 5) Turn on the power supply.
- 6) Enable the electronic load.
- 7) Verify that the voltage at the 3V terminal post is approximately 3V.

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. Additionally, each circuit output on the EV kit delivers up to 100mA, 225mA, or 425mA of current, depending on the input voltage to the output voltage ratio.

The MAX17222 circuit on the EV kit comes with the MAX17222ELT+ (μ DFN) installed, configured for a 3V output. The 3V output can deliver 100mA of current at 1.5V input.



EN for the MAX17225 Circuit

The MAX17225 circuit on the EV kit provides a set of jumpers (JU1 and JU2) to configure the EN pin of the MAX17225. Different settings of these two jumpers can simulate different pullup/pulldown scenarios at the EN pin. Refer to [Table 1](#) for JU1 and JU2 jumper settings.

EN for the MAX17222 Circuit

The MAX17222 circuit on the EV kit provides a set of jumpers (JU101 and JU102) to configure the EN pin of the MAX17222. Different settings of these two jumpers can simulate different pullup/pulldown scenarios at the EN pin. Refer to [Table 2](#) for JU101 and JU102 jumper settings.

Table 1. EN on MAX17225 (JU1, JU2)

JU1 SHUNT POSITION	JU2 SHUNT POSITION	DESCRIPTION
Installed*	1-2*	Enabled. EN = IN1
	2-3	Disabled. EN = GND1
	Not Installed	Enabled. EN = high (through internal pullup resistor)
Not Installed	1-2	Enabled. EN = IN1 (through pullup resistor R2)
	2-3	Disabled. EN = GND1 (through pulldown resistor R2)
	Not Installed	Enabled. EN = high (through internal pullup)

*Default position.

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.

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. Note that the (0402 case size) inductors are used for evaluating the future MAX17220.

Table 2. EN on MAX17222 (JU101, JU102)

JU101 SHUNT POSITION	JU102 SHUNT POSITION	DESCRIPTION
Installed*	1-2*	Enabled. EN = IN
	2-3	Disabled. EN = GND
	Not Installed	Enabled. EN = high (through internal pullup resistor)
Not Installed	1-2	Enabled. EN = IN (through pullup resistor R102)
	2-3	Disabled. EN = GND (through pulldown resistor R102)
	Not Installed	Enabled. EN = high (through internal pullup)

*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

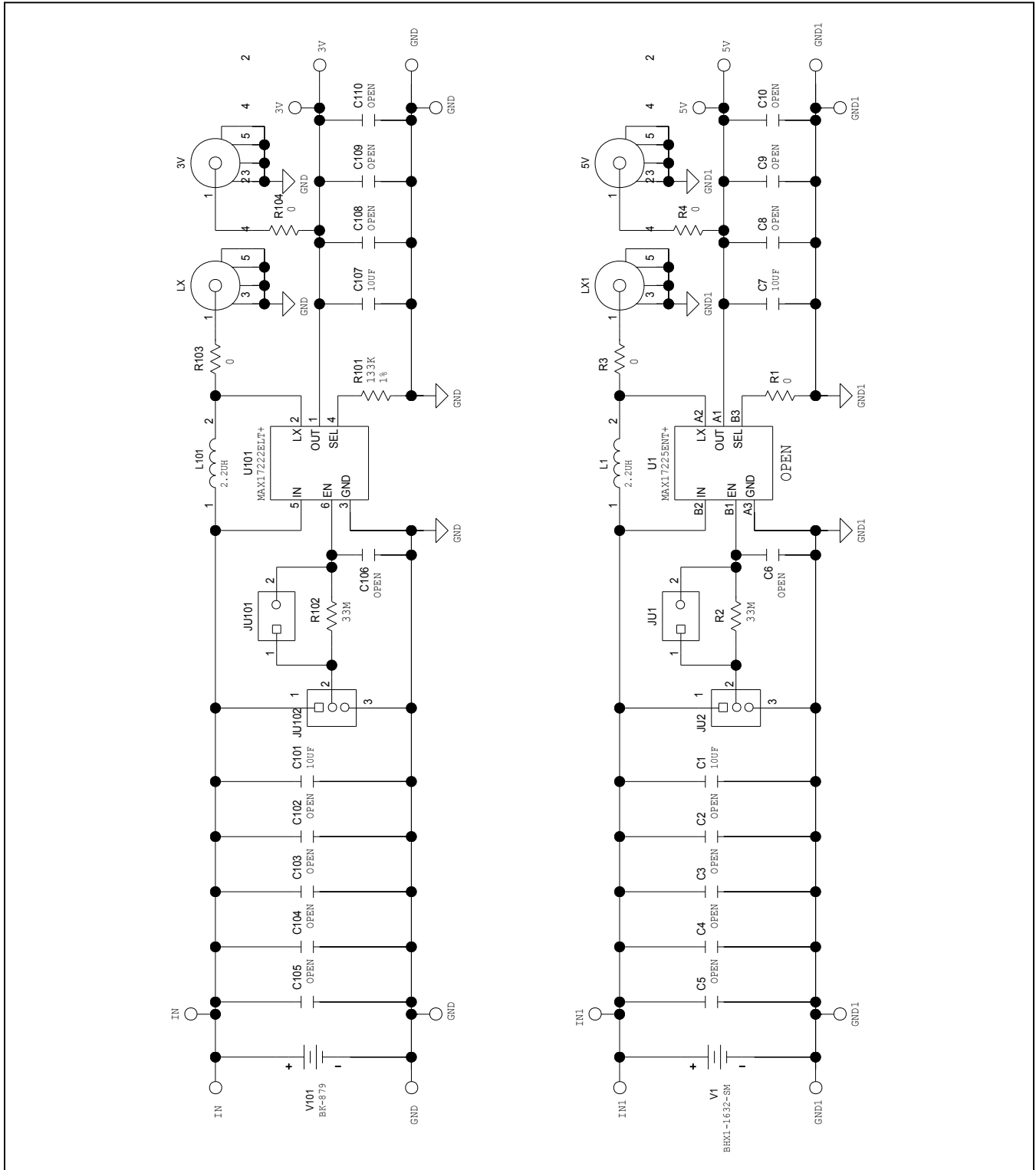
MAX17222 EV Kit Bill of Materials

ITEM	REF_DES	DNI/ DNP	QTY	MFG PART #	MANUFACTURER	VALUE	DESCRIPTION	COMMENTS
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	GRM155R60J106M E44	MURATA	10UF	CAPACITOR; SMT (0402); CERAMIC CHIP; 10UF; 6.3V; TOL=20%; TG=-55 DEGC TO +85 DEGC; TC=X5R;	
3	C7, C107	-	2	GRM155R61A106M E44	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	PEC02SAAN	SULLINS	PEC02SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 2PINS	
6	JU2, JU102	-	2	PEC03SAAN	SULLINS	PEC03SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 3PINS	
7	L1	-	1	DFE201612E-2R2M	MURATA	2.2UH	INDUCTOR; SMT (0806); WIREWOUND CHIP; 2.2UH; TOL=+/-20%; 1.8A	
8	L101	-	1	XFL4020-222ME	COILCRAFT	2.2UH	INDUCTOR; SMT; METAL COMPOSITE CORE; 2.2UH; TOL=+/-20%; 8A; -40 DEGC TO +125 DEGC	
9	R1	-	1	CRCW12060000ZS; ERJ-6GEY0R00V	VISHAY DALE/PANASONIC	0	RESISTOR; 1206; 0 OHM; 0%; JUMPER; 0.25W; THICK FILM	
10	R2, R102	-	2	HMC0402JT33M0	STACKPOLE ELECTRONICS INC	33M	RESISTOR; 0402; 33M OHM; 5%; 400PPM; 0.063W; THICK FILM	
11	R3, R4, R103, R104	-	4	ERJ-2GE0R00X	PANASONIC	0	RESISTOR; 0402; 0 OHM; 0%; JUMPER; 0.10W; THICK FILM	
12	R101, R101C	-	2	RMCF1206FT133K	STACKPOLE ELECTRONICS INC	133K	RESISTOR; 1206; 133K OHM; 1%; 100PPM; 0.25W; THICK FILM	
13	R101A	-	1	RMCF1206FT768K	STACKPOLE ELECTRONICS INC	768K	RESISTOR; 1206; 768K OHM; 1%; 100PPM; 0.25W; THICK FILM	
14	R101B	-	1	RMCF1206FT324K	STACKPOLE ELECTRONICS INC	324K	RESISTOR; 1206; 324K OHM; 1%; 100PPM; 0.25W; THICK FILM	
15	R101D	-	1	RMCF1206FT80K6	STACKPOLE ELECTRONICS INC	80.6K	RESISTOR; 1206; 80.6K OHM; 1%; 100PPM; 0.25W; THICK FILM	
16	SU1, SU2, SU101, SU102	-	4	SX1100-B	KYCON	SX1100-B	TEST POINT; JUMPER; STR; TOTAL LENGTH=0.24IN; BLACK; INSULATION=PBT; PHOSPHOR BRONZE CONTACT=GOLD PLATED	
17	TP1-TP8	-	8	5002	KEYSTONE	N/A	TEST POINT; PIN DIA=0.1IN; TOTAL LENGTH=0.3IN; BOARD HOLE=0.04IN; WHITE; PHOSPHOR BRONZE WIRE SILVER;	

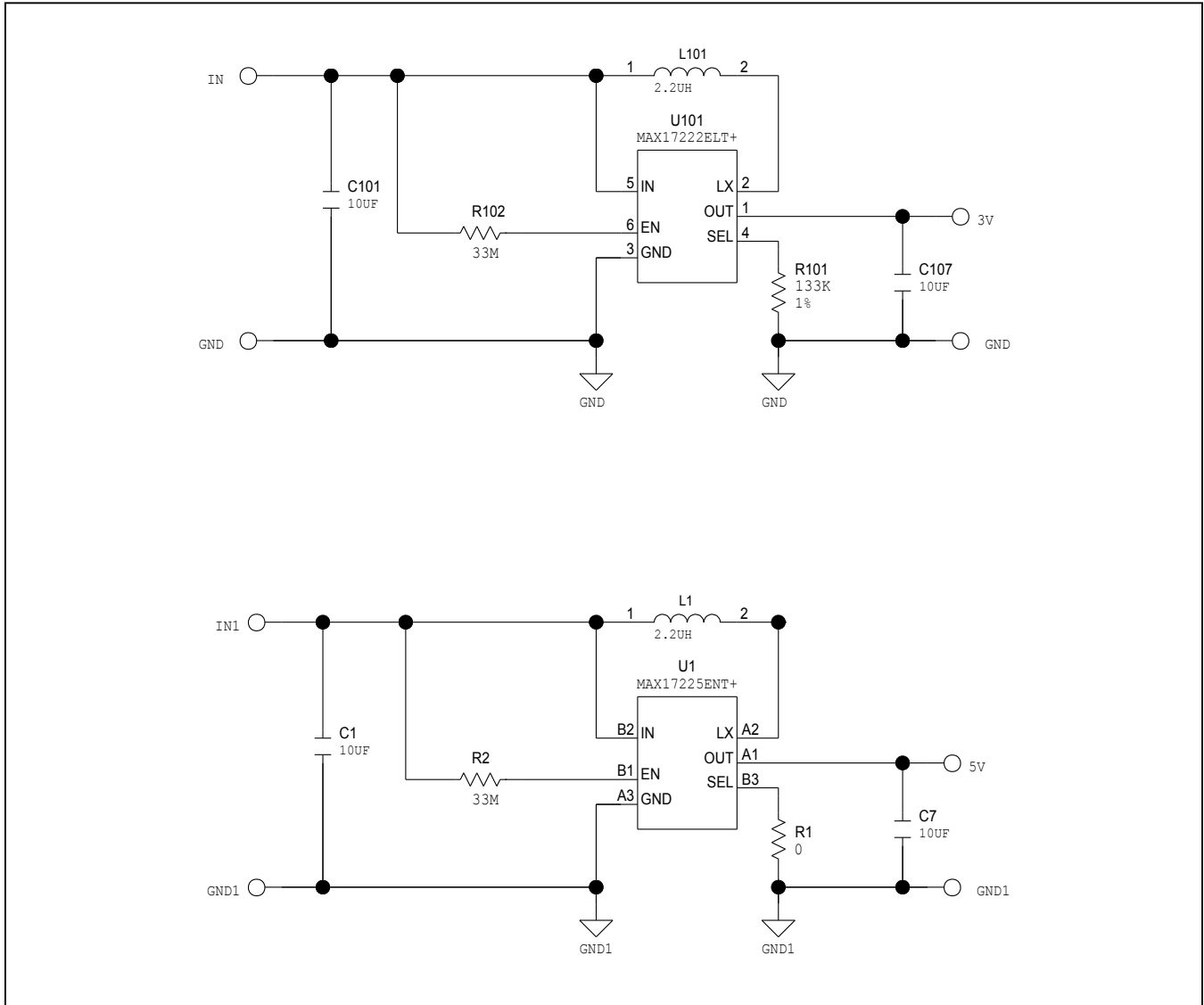
MAX17222 EV Kit Bill of Materials (continued)

ITEM	REF_DES	DNI/ DNP	QTY	MFG PART #	MANUFACTURER	VALUE	DESCRIPTION	COMMENTS
18	U101	-	1	MAX17222ELT+	MAXIM	MAX17222ELT+	EVKIT PART - IC; PACKAGE OUTLINE: 21-0164; PACKAGE CODE: L622-1; DFN6	
19	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	
20	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	
21	L1C	DNI	1	MLP1005M1R0DT0 S1	TDK	1UH	INDUCTOR; SMT (0402); FERRITE CHIP; 1UH; TOL=+/-20%; 0.5A	(ALTERNATE PART FOR L1)
22	L1F	DNI	1	DFE160808S-1R0M=P2	MURATA	1UH	INDUCTOR; SMT (0603); MAGNETICALLY SHIELDED; 1UH; TOL=+/-20%; 1.9A	(ALTERNATE PART FOR L1)
23	L1V	DNI	1	MFD160810-2R2M	MURATA	2.2UH	EVKIT PART-INDUCTOR; SMT (0603); MAGNETICALLY SHIELDED; 2.2UH; TOL=+/-20%; 1.1A	(ALTERNATE PART FOR L1)
24	L1W	DNI	1	DFE201612E-1R0M	MURATA	1UH	INDUCTOR; SMT (0806); WIREWOUND CHIP; 1UH; TOL=+/-20%; 2.9A	(ALTERNATE PART FOR L1)
25	L1X	DNI	1	74479299222	WURTH ELECTRONICS INC	2.2UH	INDUCTOR; SMT (1210); MOLDED CHIP; 2.2UH; TOL=+/-20%; 2.1A	(ALTERNATE PART FOR L1)
26	L1Y	DNI	1	74438357022	WURTH ELECTRONICS INC	2.2UH	INDUCTOR; SMT; SHIELDED; 2.2UH; TOL=+/-20%; 5.2A	(ALTERNATE PART FOR L1)
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-C6, C102-C106	DNP	0	N/A	N/A	OPEN	PACKAGE OUTLINE 0402 NON-POLAR CAPACITOR	
29	C8-C10, C108-C110	DNP	0	N/A	N/A	OPEN	PACKAGE OUTLINE 0603 NON-POLAR CAPACITOR	
30	U1	DNP	0	MAX17225ENT+	MAXIM	MAX17225ENT+	EVKIT PART - IC; PACKAGE OUTLINE: 21-100128; PACKAGE CODE: N60E1+1; WLP6	OPEN
31	PCB	-	1	MAX	MAXIM	PCB	PCB Board:MAX17222 EVALUATION KIT	
TOTAL			60					

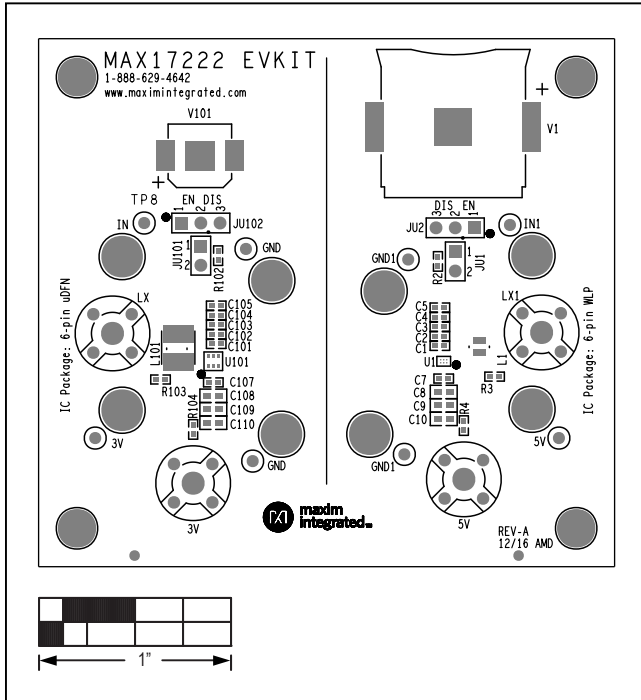
MAX17222 EV Kit Schematic



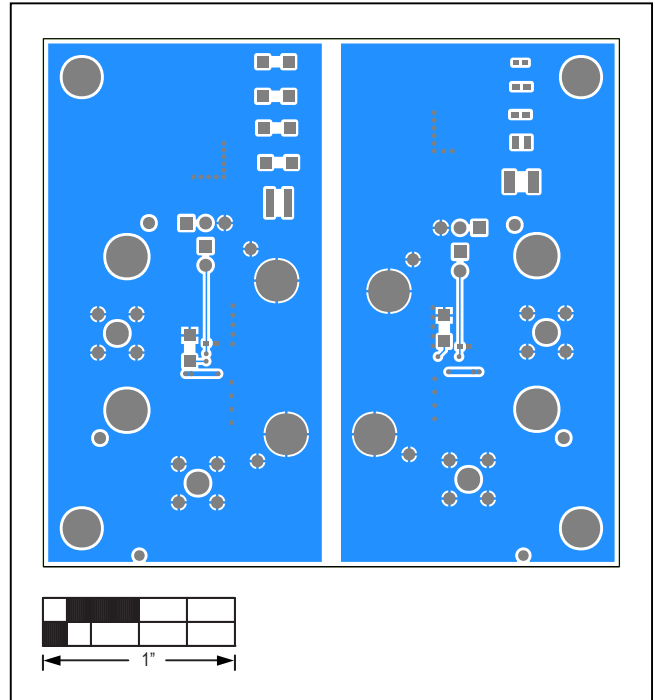
MAX17222 Minimal Component Circuit Schematic



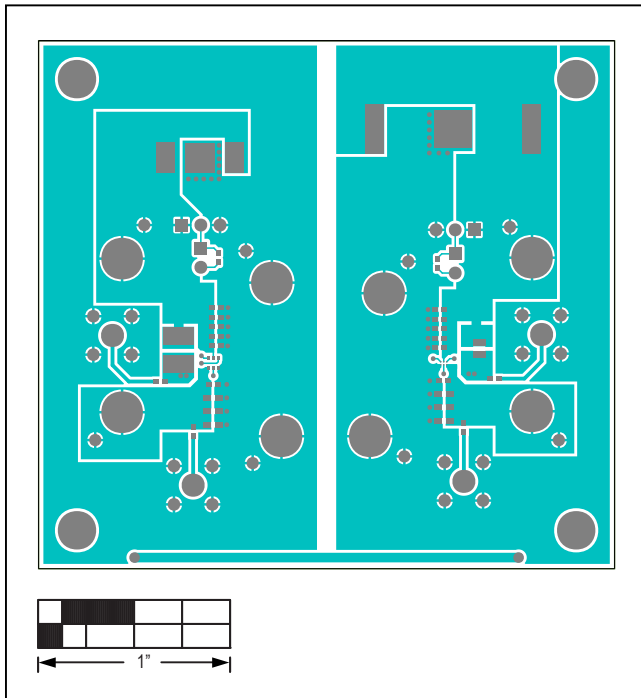
MAX17222 EV Kit PCB Layout Diagrams



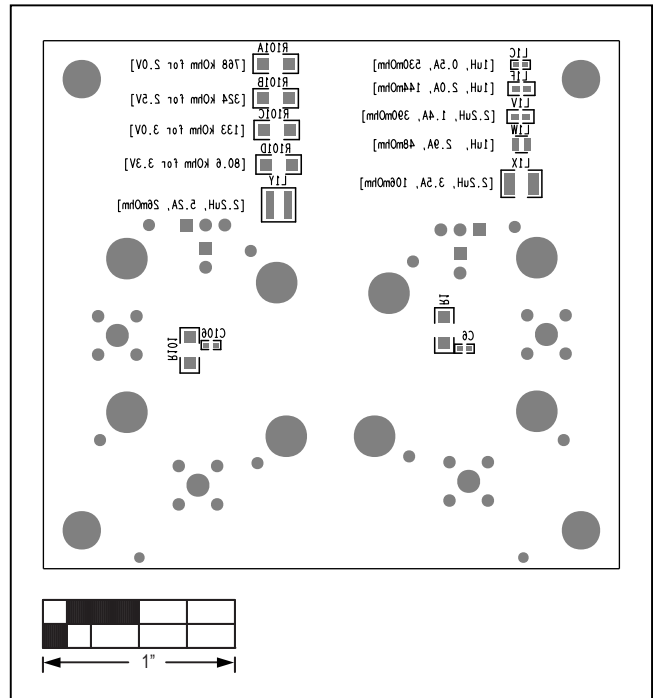
MAX17222 EV Kit—Top Silkscreen



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	—

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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