

## MAX38908 TDFN Evaluation Kit

Evaluates: MAX38908

### General Description

The MAX38908 TDFN evaluation kit (EV kit) evaluates the MAX38908 in a TDFN package. The MAX38908 is a low input voltage, high output current linear regulator. The EV kit operates over an input range of 0.9V to 5.5V and a bias voltage range from 2.7V to 20V. The EV kit provides a resistor configurable output voltage range from 0.6V to 5.0V. The EV kit can deliver up to 4A of current.

### Features

- Evaluates the MAX38908 IC in a 14-pin (3mm x 3mm) TDFN
- 0.9V to 5.5V Input Range
- 2.7V to 20V Bias Voltage to Provide Wider Supply Options
- 0.6V to 5.0V Resistor Configurable Output Voltage (Default Output Set to 1V)
- Up to 4A Output Current
- Proven 4-Layer 1-oz Copper PCB Layout
- Demonstrates Compact Solution Size
- Fully Assembled and Tested

### MAX38908 TDFN EV Kit Files

FILE	DESCRIPTION
MAX38908 TDFN EV Kit BOM	EV Kit Bill of Material
MAX38908 TDFN EV Kit PCB Layout	EV Kit Layout
MAX38908 TDFN EV Kit Schematic	EV Kit Schematic

### Quick Start

#### Required Equipment

- MAX38908 TDFN EV kit
- 5.5V, 5A DC power supply (IN)
- 3V, 10mA DC power supply (BIAS)
- Electronic load capable of 4A
- 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.**

- 1) Verify that jumper JU1 is shunted on pins 1 and 2 (EV kit enabled).
- 2) Connect the 5.5V power supply between the IN and nearest GND terminal posts.
- 3) Connect the 3V (or higher, up to 20V) power supply between the BIAS and nearest GND terminal posts.
- 4) Connect the 4A electronic load between the OUT and nearest GND terminal posts.
- 5) Connect the DVM between the OUT and nearest GND terminal posts.
- 6) Turn on the power supply.
- 7) Verify that the voltage at the OUT terminal post is 1V within the device and the resistor divider's accuracy specifications.
- 8) Decrease the power supply to 1.3V (To minimize power dissipation at full load).
- 9) Enable the electronic load.
- 10) Verify that the voltage at the OUT terminal post is 1V within the device and the resistor divider's accuracy specifications.

### Detailed Description of Hardware

The MAX38908 TDFN EV kit evaluates the MAX38908 in a TDFN package. The MAX38908 is a low input voltage, high output current linear regulator that delivers 4A of output current. This regulator requires only 300mV of input-to-output headroom at full load.

The MAX38908 TDFN EV kit operates over an input range of 0.9V to 5.5V and a bias voltage range from 2.7V to 20V. The EV kit comes with the MAX38908ATD+ installed and the output voltage is set to 1V by 1% accurate feedback resistors R1 and R2. The EV Kit output can be reconfigured to other voltages from 0.6V to 5.0V by replacing feedback resistors R1 and R2. Refer to the *MAX38908 IC data sheet* for feedback resistor calculation.

#### EN (Enable)

The EV kit provides a jumper JU1 to enable or disable the MAX38908. See [Table 1](#) for jumper setting of jumper JU1.

**Table 1. EN (JU1)**

SHUNT POSITION	DESCRIPTION
1-2*	Enabled. EN = IN*
2-3	Disabled. EN = GND

\*Default position.

#### Bias (BIAS)

The EV kit provides a bias input (BIAS) to accept an input voltage to control the LDO's regulating FET. The bias input voltage must be at least 2V above the output voltage. (i.e., if  $V_{OUT} = 1.0V$ , then  $BIAS \geq 3.0V$ , up to 20V)

#### Power OK (POK)

The EV kit provides a power ok (POK) output to indicate the device regulation status. The POK is open-drain and requires a pullup resistor between 10kΩ to 100kΩ. The EV kit POK is pullup to  $V_{OUT}$  through a 100kΩ resistor R3 by default. The POK can also be pullup to  $V_{IN}$  or an external voltage source. To pullup POK with  $V_{IN}$ , remove resistor R3 and install a resistor with the desired value to R4.

### Component Suppliers

SUPPLIER	WEBSITE
Kemet	www.kemet.com
Murata/TOKO	www.murata.com
TDK	www.tdk.com
Samsung Electro-Mechanics America, Inc.	www.samsungsem.com

**Note:** Indicate that you are using the MAX38908 when contacting these component suppliers.

### Ordering Information

PART	TYPE
MAX38908EVK#TDFN	EV Kit

#Denotes RoHS

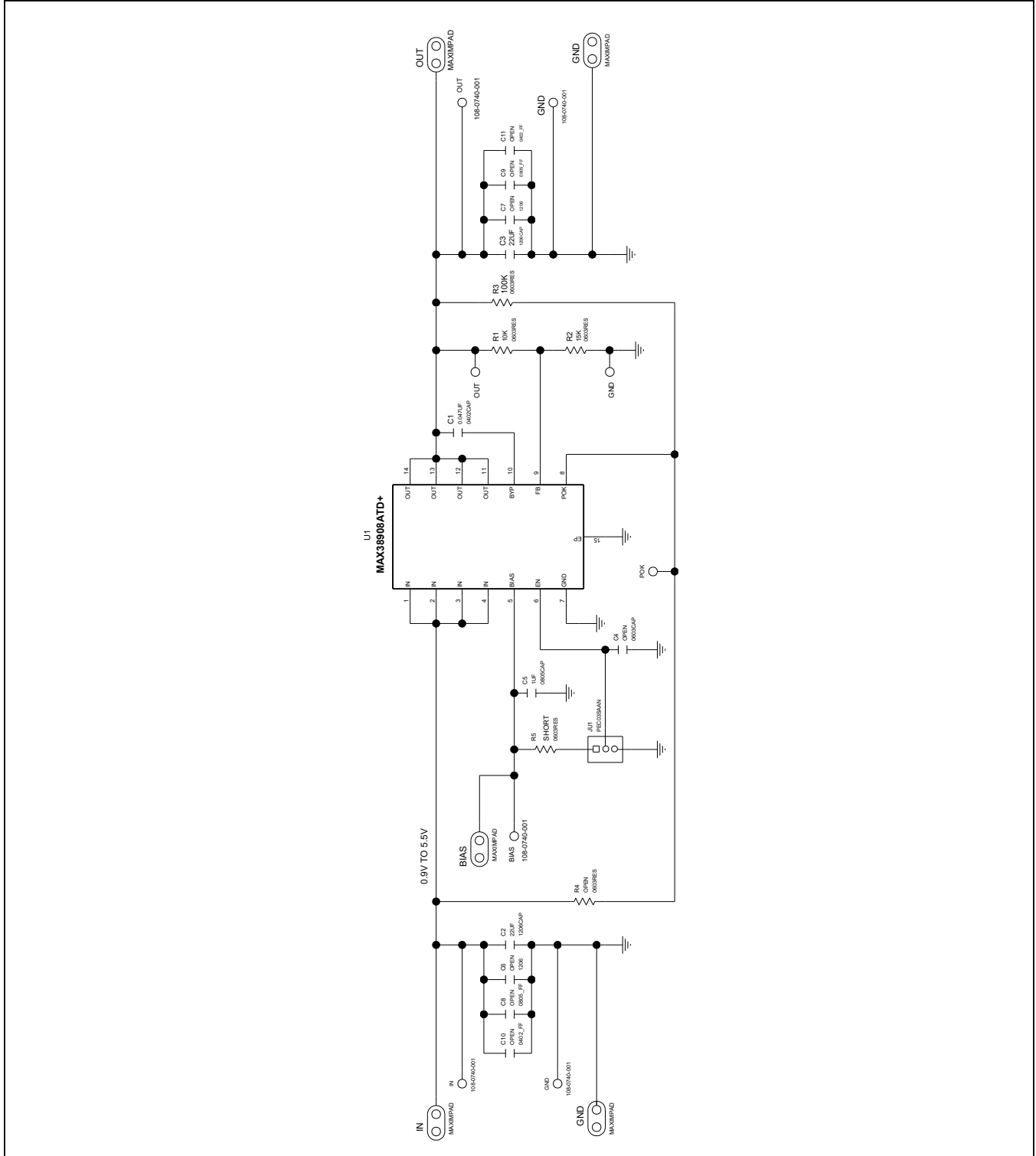
MAX38908 TDFN EV Kit Bill of Materials

ITEM	QTY	REF DES	VAR STATUS	MAXINV	MFG PART #	MANUFACTURER	VALUE	DESCRIPTION
1	5	BIAS_GND, GND2_IN_OUT	Pref	01-10807400011P-80	108-0740-001	EMERSON NETWORK POWER	108-0740-001	CONNECTOR; MALE; PANELMOUNT; BANANA JACK; STRAIGHT; 1PIN
2	5	BIAS_PAD_GND_PAD, GND_PAD2_IN_PAD, OUT_PAD	Pref	01-9020BUSS20AWG-00	9020 BUSS	WEICO WIRE	MAXIMPAD	EVK KIT PARTS; MAXIM PAD; WIRE; NATURAL; SOLID; WEICO WIRE; SOFT DRAWN BUS TYPE-S; 20AWG
3	1	C1	Pref	20-0U047-03	C1005X7R1E473K050BC; GRM155R71E473K; GCM155R71E473KA55	TDK;MURATA; MURATA	0.047UF	CAPACITOR; SMT (0402); CERAMIC CHIP; 0.047µF; 25V; TOL = 10%; TG = -55°C TO +125°C
4	2	C2, C3	Pref	20-0022U-A28	GRM31CR70J226K; GCM31CR70J226KE23	MURATA;MURATA	22UF	CAPACITOR; SMT (1206); CERAMIC CHIP; 22µF; 6.3V; TOL = 10%; MODEL = GRM SERIES; TG = -55°C TO +125°C; TC = X7R
5	1	C5	Pref	20-0001U-CA96	CGA4J3X7R1H105M125AB	TDK	1UF	CAPACITOR; SMT (0805); CERAMIC CHIP; 1µF; 50V; TOL = 20%; TG = -55°C TO +125°C; TC = X7R; AUTO
6	1	JU1	Pref	01-PEC03SAAN3P-21	PEC03SAAN	SULLINS	PEC03SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 3PINS
7	1	POK	Pref	02-TPMINI5002-00	5002	KEYSTONE	N/A	TEST POINT; PIN DIA = 0.1IN; TOTAL LENGTH = 0.3IN; BOARD HOLE = 0.04IN; WHITE; PHOSPHOR BRONZE WIRE SILVER; NOT FOR COLD TEST
8	1	R1	Pref	80-0010K-V8	CHPHT0603K1002FGT	VISHAY SFERNICE	10K	RESISTOR; 0603; 10KΩ; 1%; 100PPM; 0.0125W; THICK FILM
9	1	R2	Pref	80-0015K-24	CRCW060315K0FK	VISHAY DALE	15K	RESISTOR; 0603; 15KΩ; 1%; 100PPM; 0.10W; THICK FILM
10	1	R3	Pref	80-0100K-24	CRCW0603100KFK; RC0603FR-07100KL; RC0603FR-13100KL; ERJ-3EKF1003; AC0603FR-07100KL	VISHAY DALE; YAGEO; YAGEO;PANASONIC	100K	RESISTOR; 0603; 100K; 1%; 100PPM; 0.10W; THICK FILM
11	1	SU1	Pref	02-JMPFS1100B-00	S1100-B;SX1100-B; STC02SYAN	KYCON; KYCON; SULLINS ELECTRONICS CORP.	SX1100-B	TEST POINT; JUMPER; STR; TOTAL LENGTH = 0.24IN; BLACK; INSULATION = PBT; PHOSPHOR BRONZE CONTACT = GOLD PLATED
12	1	TP_GND	Pref	02-TPMINI5001-00	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; RECOMMENDED FOR BOARD THICKNESS = 0.062IN; NOT FOR COLD TEST
13	1	TP_OUT	Pref	02-TPMINI5000-00	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; RECOMMENDED FOR BOARD THICKNESS=0.062IN; NOT FOR COLD TEST
14	1	U1	Pref	00-SAMPLE-01	MAX38908ATD+	MAXIM	MAX38908ATD+	EVKIT PART - IC; MAX38908ATD+; 4A PERFORMANCE NMOS LDO LINEAR REGULATORS; PACKAGE OUTLINE DRAWING: 21-0137; PACKAGE CODE: T1433+2C; PACKAGE LAND PATTERN: 90-0063
15	1	PCB	-	EPCB38908TDFN	MAX38908TDFN	MAXIM	PCB	PCB:MAX38908TDFN
<b>TOTAL</b>	<b>24</b>							

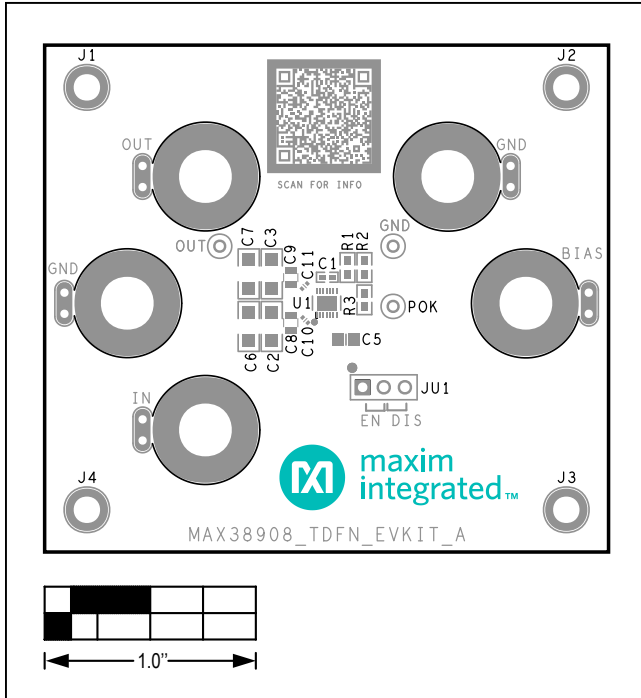
DO NOT PURCHASE(DNP)

ITEM	QTY	REF DES	VAR STATUS	MAXINV	MFG PART #	MANUFACTURER	VALUE	DESCRIPTION
1	4	J1-J4	DNP	08-SOH4400120630ALU-00	METAL_STANDOFF_ 4-40_1/2_6.3	MAXIM	METAL_STANDOFF_ 4-40_1/2_6.3	KIT; ASSY-STANDOFF 1/2IN; FEMALE-THREADED; HEX; 4-40; 1/2IN; ALUMINUM WITH SCREW; PHILLIPS; PAN; 4-40; 1/4IN; 18-8 STAINLESS STEEL
2	1	C4	DNP	N/A	N/A	N/A	OPEN	PACKAGE OUTLINE 0603 NON-POLAR CAPACITOR - EVKIT
3	2	C6, C7	DNP	N/A	N/A	N/A	OPEN	CAPACITOR; SMT (1206); OPEN; IPC MAXIMUM LAND PATTERN
4	2	C8, C9	DNP	N/A	N/A	N/A	OPEN	CAPACITOR; SMT (0805); OPEN; FORMFACTOR
5	2	C10, C11	DNP	N/A	N/A	N/A	OPEN	CAPACITOR; SMT (0402); OPEN; FORMFACTOR
6	1	R4	DNP	N/A	N/A	N/A	OPEN	PACKAGE OUTLINE 0603 RESISTOR - EVKIT
7	1	R5	DNP	N/A	N/A	N/A	SHORT	PACKAGE OUTLINE 0603 RESISTOR - EVKIT
<b>TOTAL</b>	<b>13</b>							

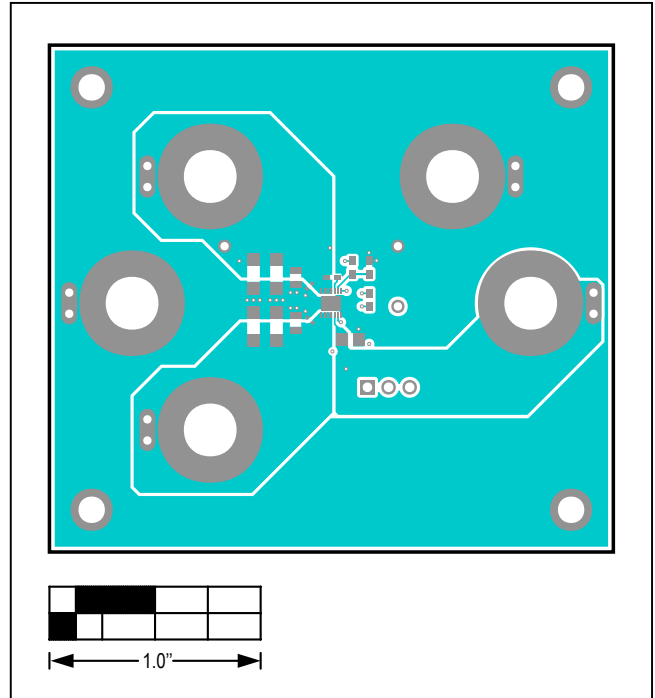
MAX38908 TDFN EV Kit Schematic



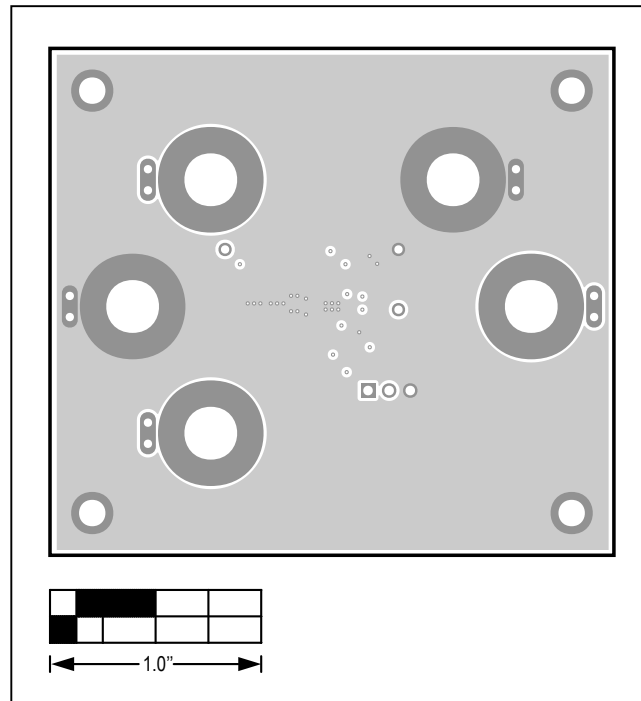
MAX38908 TDFN EV Kit PCB Layout Diagrams



MAX38908 TDFN EV PCB Layout—Top Silkscreen

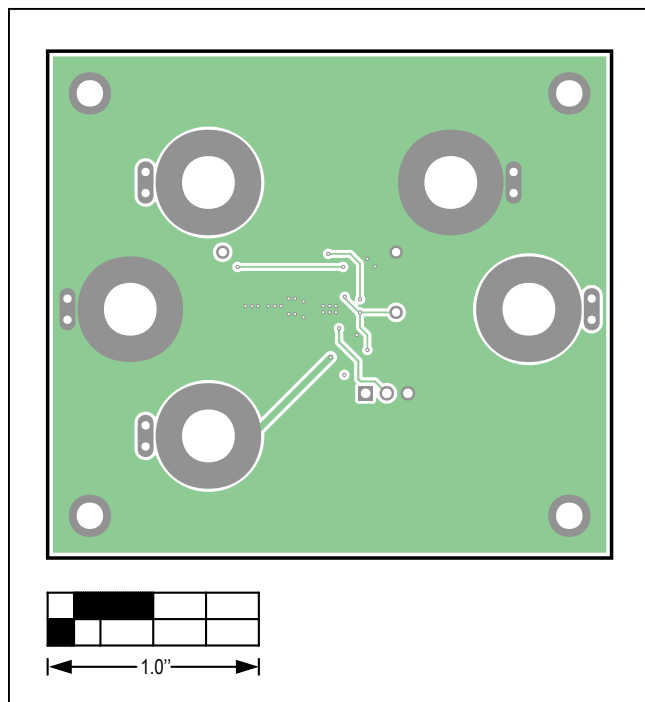


MAX38908 TDFN EV PCB Layout—Top Layer

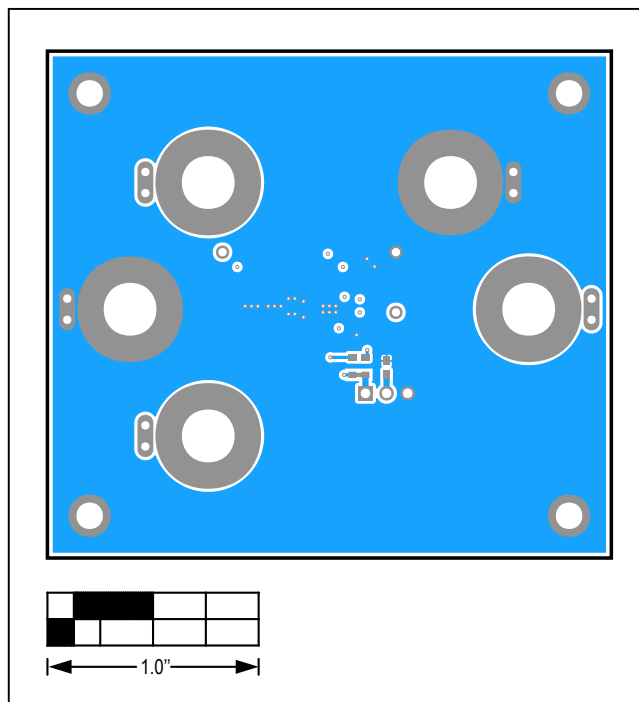


MAX38908 TDFN EV PCB Layout—Internal Layer 2

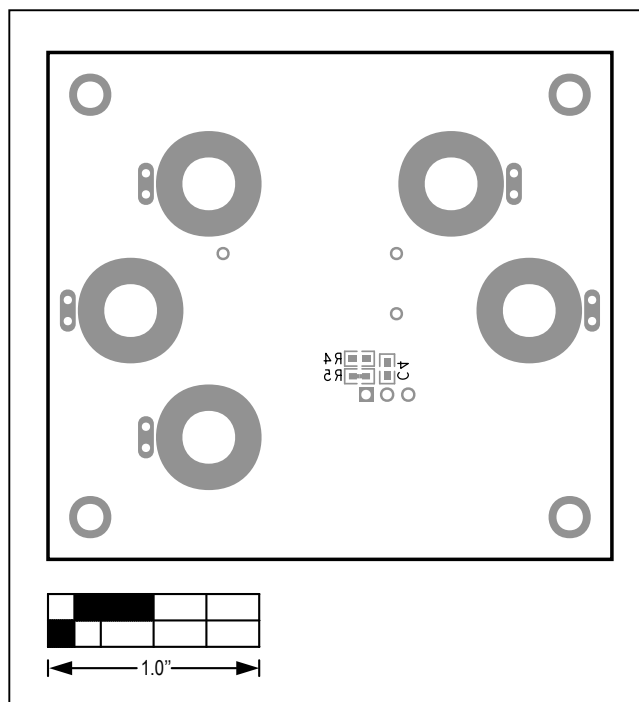
MAX38908 TDFN EV Kit PCB Layout Diagrams (continued)



MAX38908 TDFN EV Kit PCB Layout—Internal Layer 3



MAX38908 TDFN EV PCB Layout—Bottom Layer



MAX38908 TDFN EV PCB Layout—Bottom Silkscreen

### Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	8/19	Initial release	—

For pricing, delivery, and ordering information, please visit Maxim Integrated's online storefront at <https://www.maximintegrated.com/en/storefront/storefront.html>.

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## MAXESSENTIAL01+

### Description

The Essential Analog toolkit contains a unique collection of Maxim's high-performance, analog building block products. This curated group of parts represent a selection of Maxim's vast product lines, specific to 20 product categories, from key performance areas including power efficiency, precise measurement, reliable connectivity, and robust protection.

The ICs in the toolkit offer the breadth of each product category: low power, low noise, multi-channel, high resolution, high accuracy, and high speed. All these features empower your designs and bring value to your systems.

At 6.4cm x 8.9cm x 1.3cm, the box itself is small, lightweight, and easy to carry. Products are guarded from ESD using a gel and ESD-protected box.

A guide that labels each of the part types inside the box supports the toolkit. Go to the Maxim website to find more information for the individual part numbers.

When planning your next design, pick up an Essential Analog toolkit to review Maxim's high-performance analog products.

### Key Features

- Small, 6.4cm x 8.9cm x 1.3cm Package
- ESD Protection-Lined Package
- Accelerate Your Design with Quick Access





What's Included in the Box?

Efficient Power				
Buck	Boost	Buck-Boost	LDO	Continua
MAX38640 MAX15026	MAX17225 MAX668	MAX77827 MAX77816	MAX38902B MAX1510	MAX38888
Precision Measurement				
ADC	DAC	Audio Amp	Op Amp	CSA
MAX11410 MAX11168	MAX5541 MAX5715	MAX98357A MAX98390	MAX40075 MAX40100	MAX44284 MAX40201
Rugged Connectivity				
RS-485	RS-232	CAN	BTR Switch	Wireless
MAX14780E MAX3485AE	MAX13235E MAX33250E	MAX13054A MAX33054E	MAX14778 MAX14763	MAX41460 MAX7034
Robust Protection				
Supervisor	Temp Sensor	Isolator	Ideal Diode/V <sub>REF</sub>	RTC
MAX16150 MAX16140	MAX6680 MAX31875	MAX12930 MAX22445	MAX40203 MAX6078A	MAX31341B DS3231MZ