

MAX38907 TQFN Evaluation Kit

Evaluates: MAX38907

General Description

The MAX38907 TQFN evaluation kit (EV kit) evaluates the MAX38907 in a TQFN package. The MAX38907 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 jumper selectable output voltage range from 0.6V to 5.0V. Additionally, each output voltage selection can be adjusted $\pm 5\%$ for margining. The EV kit can deliver up to 4A of current.

Features

- Evaluates the MAX38907 IC in a 20-Pin (5mm x 5mm) TQFN
- 0.9V to 5.5V Input Range
- 2.7V to 20V Bias Voltage to Provide Wider Supply Options
- 0.6V to 5.0V Jumper Selectable Output Voltage
- Up to 4A Output Current
- Proven 4-Layer 1-oz Copper PCB Layout
- Demonstrates Compact Solution Size
- Fully Assembled and Tested

MAX38907 TQFN EV Kit Files

FILE	DESCRIPTION
MAX38907 TQFN EV Kit BOM	EV Kit Bill of Material
MAX38907 TQFN EV Kit PCB Layout	EV Kit Layout
MAX38907 TQFN EV Kit Schematic	EV Kit Schematic

Ordering Information appears at end of data sheet.

Quick Start

Required Equipment

- MAX38907 TQFN EV kit
- 5.5V, 5A DC power supply (IN)
- 8V, 10mA DC power supply (BIAS)
- Electronic load capable of 4A
- Digital voltmeter (DVM)

Procedure

The EV kit is fully assembled and tested. Use the following steps 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) Verify that jumper JU2 is shunted on pins 1 and 2 (POK pulled up to IN).
- 3) Verify that jumpers SELA, SELB, and SELC are shunted on pins 1 and 2 (OUT = 5.0V).
- 4) Verify that jumper MRG is shunted on pins 1 and 2 (Add 5% margin to the output voltage).
- 5) Connect the 5.5V power supply between the IN and nearest GND terminal posts.
- 6) Connect the 8V (or higher, up to 20V) power supply between the BIAS and nearest GND terminal posts.
- 7) Connect the 4A electronic load between the OUT and nearest GND terminal posts.
- 8) Connect the DVM between the OUT and nearest GND terminal posts.
- 9) Turn on the power supply.
- 10) Verify that the voltage at the OUT terminal post is 5.25V within the device and the resistor divider's accuracy specifications.
- 11) Enable the electronic load.
- 12) Verify that the voltage at the OUT terminal post is 5.25V within the device and the resistor divider's accuracy specifications.

Detailed Description of Hardware

The MAX38907 TQFN Evaluation kit (EV kit) evaluates the MAX38907 in a TQFN package. The MAX38907 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 MAX38907 TQFN 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 MAX38907ATP+ installed and the output voltage is jumper selectable from 0.6V to 5.0V. Additionally, each output voltage selection can be adjusted $\pm 5\%$ for margining. Refer to the *MAX38907 IC data sheet* for additional detail on output voltage and margin setting.

EN (Enable)

The EV kit provides a jumper JU1 to enable or disable the MAX38907. See [Table 1](#) for jumper JU1 setting.

Bias (BIAS)

The EV kit provides a bias input (BIAS) to accept an input voltage to control the LDO's regulating FET.

Table 1. EN (JU1)

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

*Default position.

The bias input voltage must be at least 2V above the output voltage. (i.e. If OUT = 1.0V, then BIAS \geq 3.0V, up to 20V.)

Power OK (POK)

The MAX38907 features a power ok (POK) output to indicate the device regulation status. The POK is open-drain and requires a pullup resistor between 10k Ω to 100k Ω . The EV kit provides a jumper JU2 to select a pullup voltage source for POK. See [Table 2](#) for jumper JU2 setting.

Output Voltage Selection (SELA, SELB, SELC, MRG)

The MAX38907 EV kit provides output voltage selection jumpers (SELA, SELB, SELC) to set the output voltage during power-up. In addition, the EV kit provides a margin setting jumper (MRG) to margin the output $\pm 5\%$ with respect to each selected output voltage. See [Table 3](#) for output voltage selection jumper setting.

Table 2. POK (JU2)

SHUNT POSITION	DESCRIPTION
1-2*	POK pulled up to IN through R4 (100k Ω)
2-3	POK pulled up to OUT through R3 (100k Ω)
Not Installed	POK pulled up to an external voltage source (between 0V to 5.5V) through an external resistor (between 10k Ω to 100k Ω)

*Default position.

Table 3. TBD

SELA	SELB	SELC	OUT (V) AT MRG = GND (2-3)	OUT (V) AT MRG = OPEN (PIN 1 ONLY)	OUT (V) AT MRG = 5.1V (1-2)
Pin 1 only	Pin 1 only	Pin 1 only	0.57	0.6	0.63
2-3	Pin 1 only	Pin 1 only	0.6175	0.65	0.6825
1-2	Pin 1 only	Pin 1 only	0.665	0.7	0.735
Pin 1 only	2-3	Pin 1 only	0.7125	0.75	0.7875
2-3	2-3	Pin 1 only	0.76	0.8	0.84
1-2	2-3	Pin 1 only	0.8075	0.85	0.8925
Pin 1 only	1-2	Pin 1 only	0.855	0.9	0.945
2-3	1-2	Pin 1 only	0.9025	0.95	0.9975
1-2	1-2	Pin 1 only	0.95	1.0	1.05
Pin 1 only	Pin 1 only	2-3	0.9975	1.05	1.1025
2-3	Pin 1 only	2-3	1.045	1.1	1.155
1-2	Pin 1 only	2-3	1.0925	1.15	1.2075

Table 3. TBD (continued)

SELA	SELB	SELC	OUT (V) AT MRG = GND (2-3)	OUT (V) AT MRG = OPEN (PIN 1 ONLY)	OUT (V) AT MRG = 5.1V (1-2)
Pin 1 only	2-3	2-3	1.14	1.2	1.26
2-3	2-3	2-3	1.1875	1.25	1.3125
1-2	2-3	2-3	1.235	1.3	1.365
Pin 1 only	1-2	2-3	1.425	1.5	1.575
2-3	1-2	2-3	1.71	1.8	1.89
1-2	1-2	2-3	1.9	2.0	2.1
Pin 1 only	Pin 1 only	1-2	2.09	2.2	2.31
2-3	Pin 1 only	1-2	2.375	2.5	2.625
1-2	Pin 1 only	1-2	2.565	2.7	2.835
Pin 1 only	2-3	1-2	2.85	3.0	3.15
2-3	2-3	1-2	3.135	3.3	3.465
1-2	2-3	1-2	3.42	3.6	3.78
Pin 1 only	1-2	1-2	3.8	4.0	4.2
2-3	1-2	1-2	4.275	4.5	4.725
1-2	1-2	1-2	4.75	5.0	5.25

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

Ordering Information

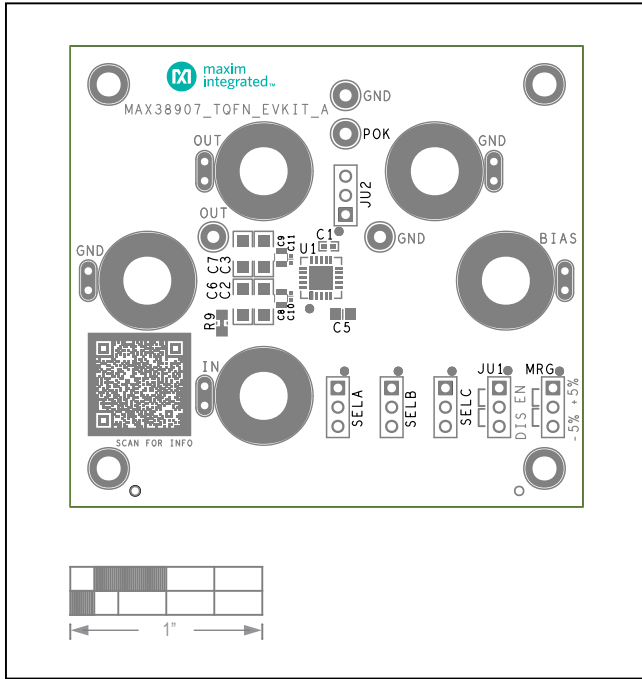
PART	TYPE
MAX38907EVK#TQFN	EV Kit

#Denotes RoHS compliance.

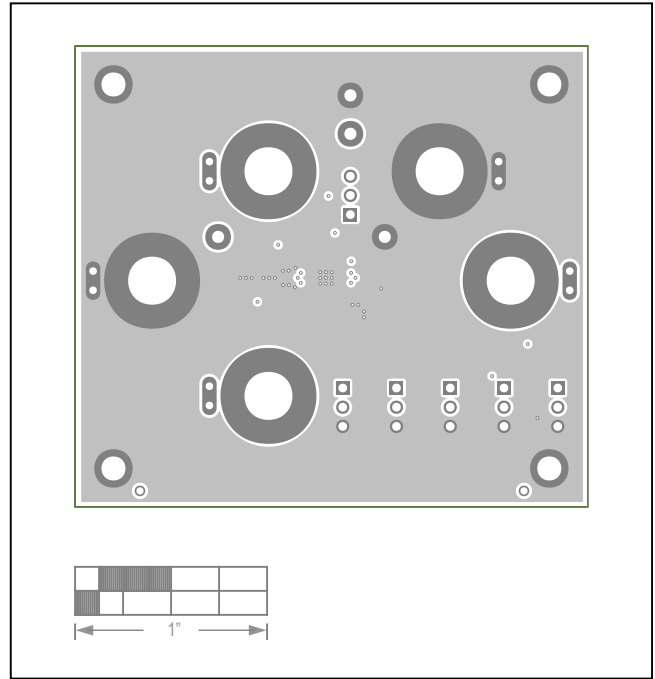
MAX38907 TQFN EV Kit Bill of Materials

ITEM	REF_DES	DNI/DNP	QTY	MFG PART #	MANUFACTURER	VALUE	DESCRIPTION	COMMENTS
1	BIAS, GND, GND2, IN, OUT	-	5	108-0740-001	EMERSON NETWORK POWER	108-0740-001	CONNECTOR; MALE; PANELMOUNT; BANANA JACK; STRAIGHT; 1PIN	
2	BIAS_PAD, GND_PAD, GND_PAD2, IN_PAD, OUT_PAD	-	5	9020 BUSS	WEICO WIRE	MAXIMPAD	EVK KIT PARTS; MAXIM PAD; WIRE; NATURAL; SOLID; WEICO WIRE; SOFT DRAWN BUS TYPE-S; 20AWG	
3	C1	-	1	C1005X7R1E473K050BC; GRM155R71E473K; GCM155R71E473KA55	TDK;MURATA;MURATA	0.047UF	CAPACITOR; SMT (0402); CERAMIC CHIP; 0.047UF; 25V; TOL=10%; TG=-55 DEGC TO +125 DEGC	
4	C2, C3	-	2	GRM31CR70J226K; GCM31CR70J226KE23	MURATA;MURATA	22UF	CAPACITOR; SMT (1206); CERAMIC CHIP; 22UF; 6.3V; TOL=10%; MODEL=GRM SERIES; TG=-55 DEGC TO +125 DEGC; TC=X7R	
5	C5	-	1	CGA4J3X7R1H105M125AB	TDK	1UF	CAPACITOR; SMT (0805); CERAMIC CHIP; 1UF; 50V; TOL=20%; TG=-55 DEGC TO +125 DEGC; TC=X7R; AUTO	
6	D1	-	1	MM3Z5V1T1	ON SEMICONDUCTOR	5.1V	DIODE, ZNR, SMT (SOD-323), PD=0.20W, VZ=5.1V @ IZT=0.005A	
7	JU1, JU2, MRG, SELA, SELB, SELC	-	6	PEC03SAAN	SULLINS	PEC03SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 3PINS	
8	POK	-	1	5012	KEYSTONE	N/A	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.445IN; BOARD HOLE=0.063IN; WHITE; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;	
9	R1	-	1	CRCW12063K01FK	VISHAY DALE	3.01K	RESISTOR; 1206; 3.01K OHM; 1%; 100PPM; 1/4W; THICK FILM	
10	R2-R4	-	3	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	SU1-SU6	-	6	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	TP_GND1, TP_GND2	-	2	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;	
13	TP_OUT	-	1	5014	KEYSTONE	N/A	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.445IN; BOARD HOLE=0.063IN; YELLOW; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;	
14	U1	-	1	MAX38907ATP+	MAXIM	MAX38907ATP+	EVKIT PART - IC; 4A PERFORMANCE NMOS LDO LINEAR REGULATORS; PACKAGE OUTLINE DRAWING: 21-0140; PACKAGE CODE: T2055+4C; PACKAGE LAND PATTERN: 90-0009	
15	PCB	-	1	MAX38907TQFN	MAXIM	PCB	PCB;MAX38907TQFN	-
16	J1-J4	DNP	0	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	
17	C4	DNP	0	N/A	N/A	OPEN	PACKAGE OUTLINE 0603 NON-POLAR CAPACITOR	
18	C6, C7	DNP	0	N/A	N/A	OPEN	CAPACITOR; SMT (1206); OPEN; IPC MAXIMUM LAND PATTERN	
19	C8, C9	DNP	0	N/A	N/A	OPEN	CAPACITOR; SMT (0805); OPEN; FORMFACTOR	
20	C10, C11	DNP	0	N/A	N/A	OPEN	CAPACITOR; SMT (0402); OPEN; FORMFACTOR	
21	R5	DNP	0	N/A	N/A	SHORT	PACKAGE OUTLINE 0603 RESISTOR	
22	R9	DNP	0	N/A	N/A	SHORT	PACKAGE OUTLINE 0805 RESISTOR	
TOTAL			37					

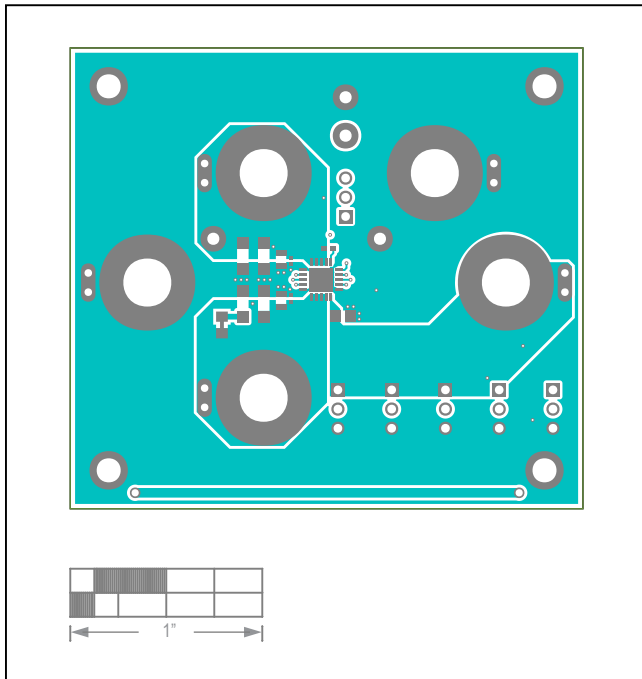
MAX38907 TQFN EV Kit PCB Layout Diagrams



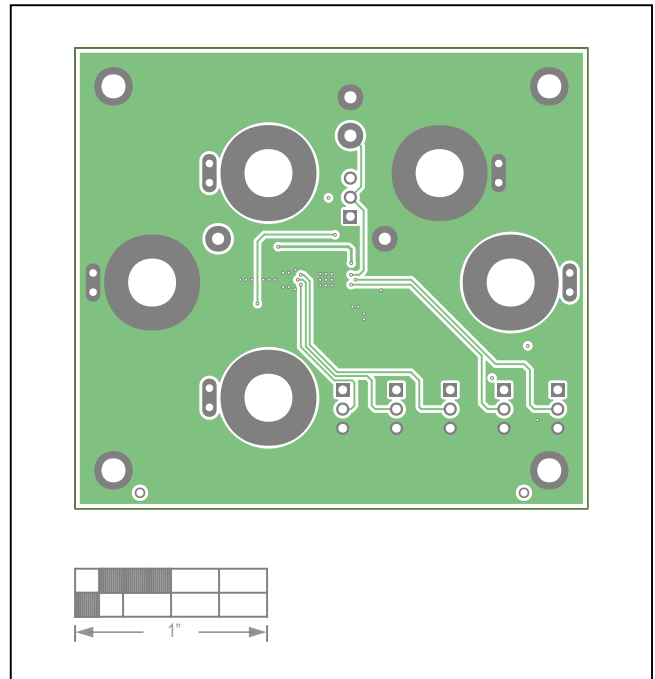
MAX38907 TQFN EV Kit PCB Layout—Top Silkscreen



MAX38907 TQFN EV Kit PCB Layout—Internal2

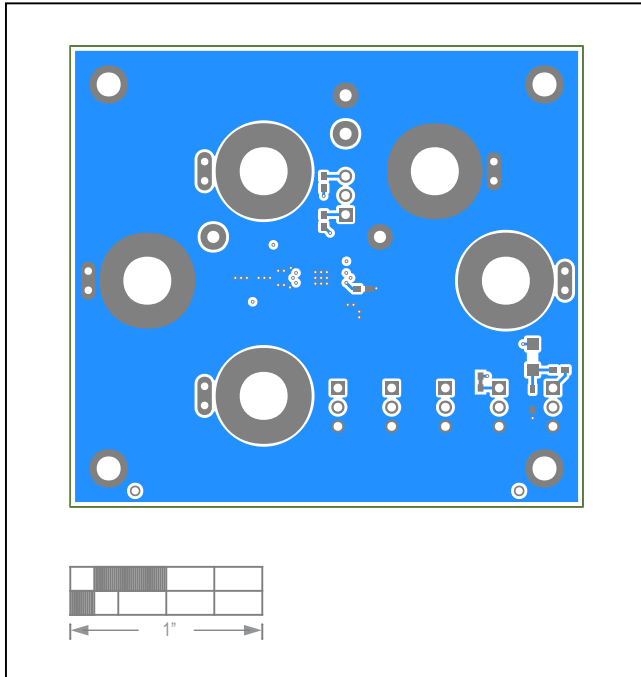


MAX38907 TQFN EV Kit PCB Layout—Top

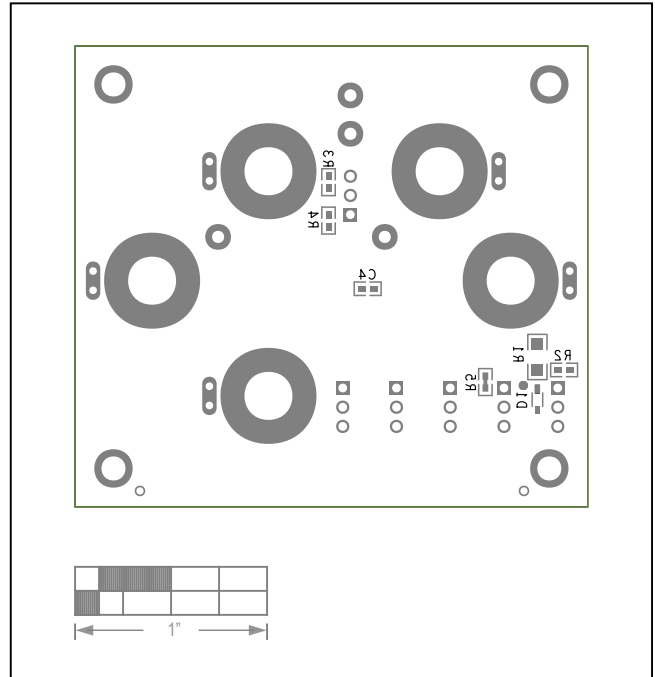


MAX38907 TQFN EV Kit PCB Layout—Internal3

MAX38907 TQFN EV Kit PCB Layout Diagrams (continued)



MAX38907 TQFN EV Kit PCB Layout—Bottom



MAX38907 TQFN EV Kit PCB Layout—Silk Bottom

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	10/20	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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