

# MAX20019/MAX20020 Evaluation Kits

## Evaluate: MAX20019/MAX20020

### General Description

The MAX20019/MAX20020 evaluation kits (EV kits) are fully assembled and tested PCBs that demonstrate the MAX20019 and MAX20020 dual step-down converters with integrated high-side and low-side MOSFETs.

The EV kits provide a high-efficiency power-conversion solution and generate low output voltage from the dual step-down converters: OUT1 steps down up to 16V high input to 3.3V to provide the power to OUT2, while OUT2 steps down the OUT1 voltage to 1.8V. The 3.2MHz switching-frequency operation allows for the use of all-ceramic capacitors and minimizes external components. The EV kits feature on/off jumper controls to enable/disable OUT1 and OUT2.

### Features

- 3.5V to 16V Operating Supply Voltage
- 5V, 3.3V, 3.0V, and 2.8V Options at 500mA Synchronous Step-Down Converter (OUT1)
- 1.8V, 1.5V, 1.2V, and 1V Options at 500mA Synchronous Step-Down Converter (OUT2)
- 3.2MHz Operation Minimizes System Solution Size
- Minimized External Components
- Proven PCB Layout
- Fully Assembled and Tested

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

### Quick Start

#### Required Equipment

- MAX20019 or MAX20020 EV kit
- Variable 25V power supply capable of supplying 2A
- Electronic load
- Two voltmeters

#### Procedure

The EV kits are fully assembled and tested. Follow the steps below to verify board operation. **Caution: Do not turn on the power supply until all connections are completed.**

- 1) Preset the power supply to 8V. Turn off the power supply.
- 2) Preset the electronic load to 300mA. Turn off the electronic load.
- 3) Connect the positive lead of the power supply to the VSUP PCB pad. Connect the negative lead of the power supply to the PGND PCB pad.
- 4) Connect the positive terminal of the electronic load to the VOUT2 PCB pad. Connect the negative terminal of the electronic load to the PGND2 PCB pad.
- 5) Enable outputs VOUT1 and VOUT2 by installing the shunt on jumper JU1.
- 6) Turn on the power supply.
- 7) Verify that the voltage across the VOUT1 and PGND1 PCB pads is 3.3V.
- 8) Verify that the voltage across the VOUT2 and PGND2 PCB pads is 1.8V.
- 9) Turn on the electronic load.
- 10) Verify that the voltage across the VOUT1 and PGND1 PCB pads is 3.3V  $\pm$ 3%.
- 11) Verify that the voltage across the VOUT2 and PGND2 PCB pads is 1.8V  $\pm$ 3%.
- 12) Turn off the electronic load.
- 13) Turn off the power supply.

### Detailed Description

The MAX20019/MAX20020 EV kits integrate dual high-efficiency DC-DC step-down converters. OUT1 steps down a high input voltage to 3.3V at up to 500mA, while OUT2 steps down OUT1 voltage to 1.8V. VOUT1 and VOUT2 can be enabled/disabled by JU1 jumper.

#### Enable Control (JU1)

The JU1 jumper is used to enable or disable VOUT1 and VOUT2. Install a shunt on JU1 to enable VOUT1 and VOUT2 normal operation. Remove shunts on JU1 to enter shutdown mode. See [Table 1](#) for enable control.

**Table 1. Enable Control (JU1)**

SHUNT POSITION	MODE
On	Normal Operation
Off	Shutdown

### Ordering Information

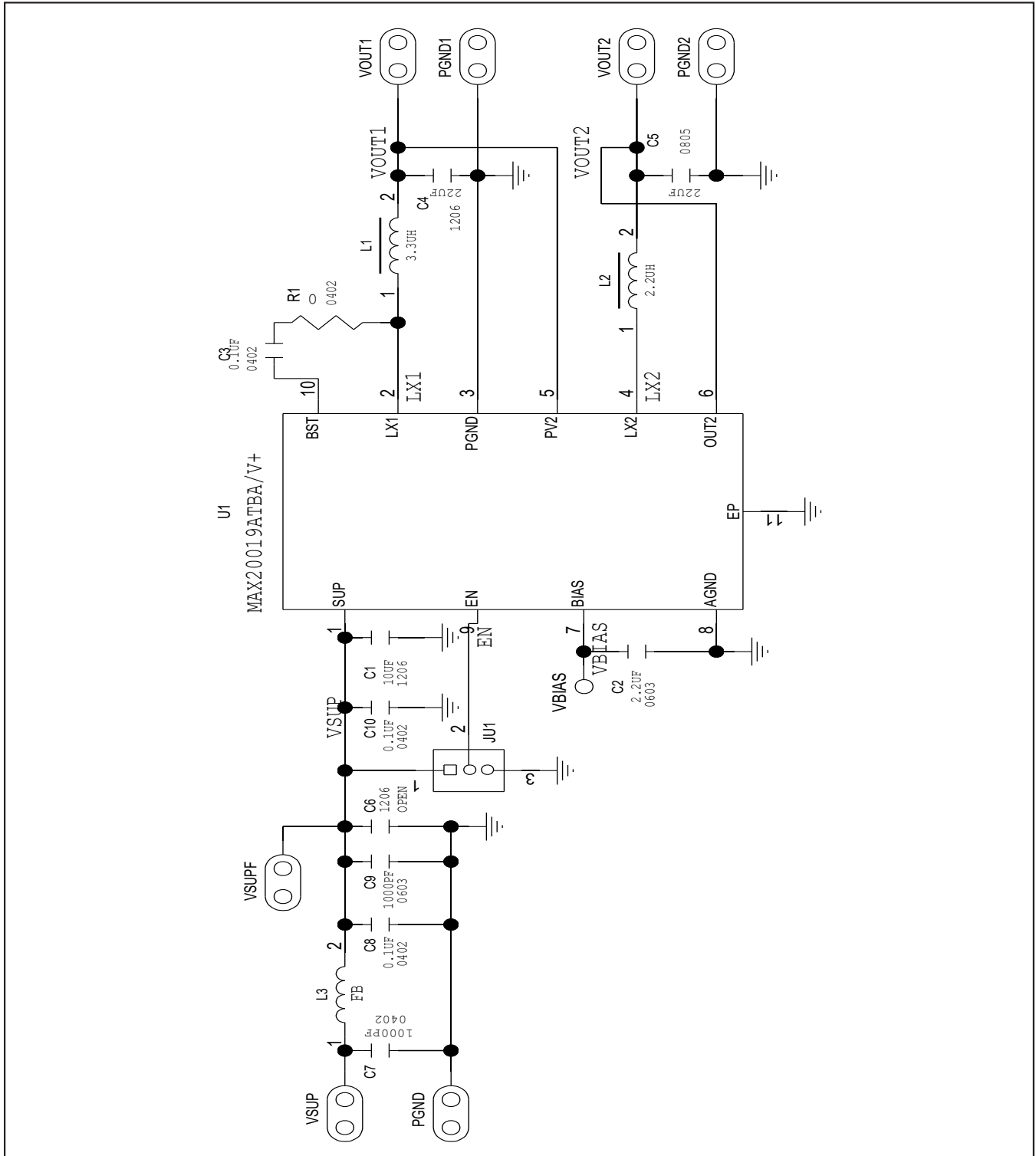
PART	TYPE
MAX20019EVKIT#	EV Kit
MAX20020EVKIT#	EV Kit

#Denotes RoHS compliance.

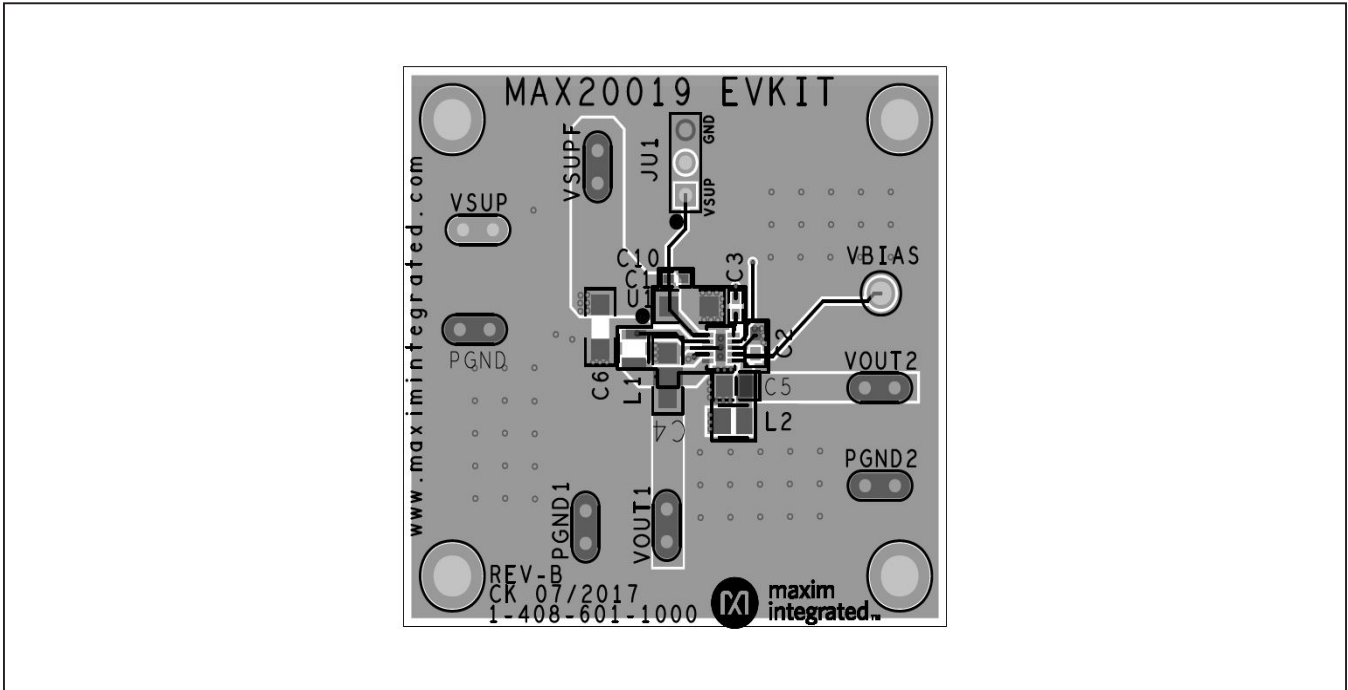
MAX20019/MAX20020 EV Kits Bill of Materials

REF DES	QTY	VALUE	DESCRIPTION	MFG PART #	MANUFACTURER
C1	1	10UF	CAPACITOR; SMT (1206); CERAMIC CHIP; 10UF; 35V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R AUTO	CGA5L1X7R1V106K	TDK
C2	1	2.2UF	CAPACITOR; SMT (0603); CERAMIC CHIP; 2.2UF; 6.3V; TOL=10%; MODEL=C SERIES; TG=-55 DEGC TO +125 DEGC; TC=X7R AUTO	CGA3E1X7R0J225K	TDK
C3	1	0.1UF	CAPACITOR; SMT (0402); CERAMIC CHIP; 0.1UF; 16V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R AUTO	CGA2B1X7R1C104K050BC	TDK
C4	1	22UF	CAPACITOR; SMT (1206); CERAMIC CHIP; 22UF; 6.3V; TOL=20%; TG=-55 DEGC TO +125 DEGC; TC=X7R; AUTO	CGA5L1X7R0J226M	TDK
C5	1	22UF	CAPACITOR; SMT (0805); CERAMIC CHIP; 22UF; 4V; TOL=20%; TG=-55 DEGC TO +125 DEGC; TC=X7S; AUTO	CGA4J1X7S0G226M	TDK
C6*		DNP	DO NOT POPULATE (DNP)	DNP	
C7	1	1000PF	CAPACITOR; SMT (0402); CERAMIC CHIP; 1000PF; 50V; TOL=10%; MODEL=C SERIES; TG=-55 DEGC TO +125 DEGC; TC=X7R AUTO	CGA2B2X7R1H102K050BA	TDK
C8, C10	2	0.1UF	CAPACITOR; SMT (0402); CERAMIC CHIP; 0.1UF; 50V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R	CGA2B3X7R1H104K	TDK
C9	1	1000PF	CAPACITOR; SMT (0603); CERAMIC CHIP; 1000PF; 50V; TOL=20%; TG=-55 DEGC TO +125 DEGC; TC=X7R AUTO	CGA3E2X7R1H102M080AA	TDK
JU1	1	N/A	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 3PINS	PEC03SAAN	SULLINS
L1	1	3.3UH	INDUCTOR; SMT; ORIGINAL FINE COPPER; 3.3UH; TOL=+/-20%; 2.2A	TFM252012ALMA-3R3MTAA	TDK
L2	1	2.2UH	INDUCTOR; SMT; ORIGINAL FINE COPPER; 2.2UH; TOL=+/-20%; 2.1A	TFM201610ALMA-2R2MTAA	TDK
L3	1	500	INDUCTOR; SMT (1206); FERRITE-BEAD; 500; TOL=+/-25%; 2.5A	742792116	WURTH ELECTRONICS INC.
PGND, PGND1, PGND2, VOUT1, VOUT2, VSUP, VSUPF	7	N/A	EVK KIT PARTS; MAXIM PAD; WIRE; NATURAL; SOLID; WEICO WIRE; SOFT DRAWN BUS TYPE-S; 20AWG	9020 BUSS	WEICO WIRE
R1	1	0	RESISTOR; 0402; 0 OHM; 0%; JUMPER; 0.2W; THICK FILM	CRCW04020000Z0EDHP	VISHAY DRALORIC
U1	1	N/A	EVKIT PART-IC; VCON; 3.2MHZ; 500MA DUAL CONVERTER FOR AUTOMOTIVE CAMERA; TDFN10-EP	MAX20019ATBAV+	MAXIM
VBIAS	1	N/A	TESTPOINT WITH 1.80MM HOLE DIA, RED; MULTIPURPOSE; NOT FOR COLD TEST	5010	KEYSTONE
-	1	-	PCB: MAX20019EVKIT	-	MAXIM
*C6 - when populated		10UF	CAPACITOR; SMT (1206); CERAMIC CHIP; 10UF; 16V; TOL=20%; MODEL=C SERIES; TG=-55 DEGC TO +125 DEGC; TC=X7R AUTO	CGA5L1X7R1C106M160AC	TDK

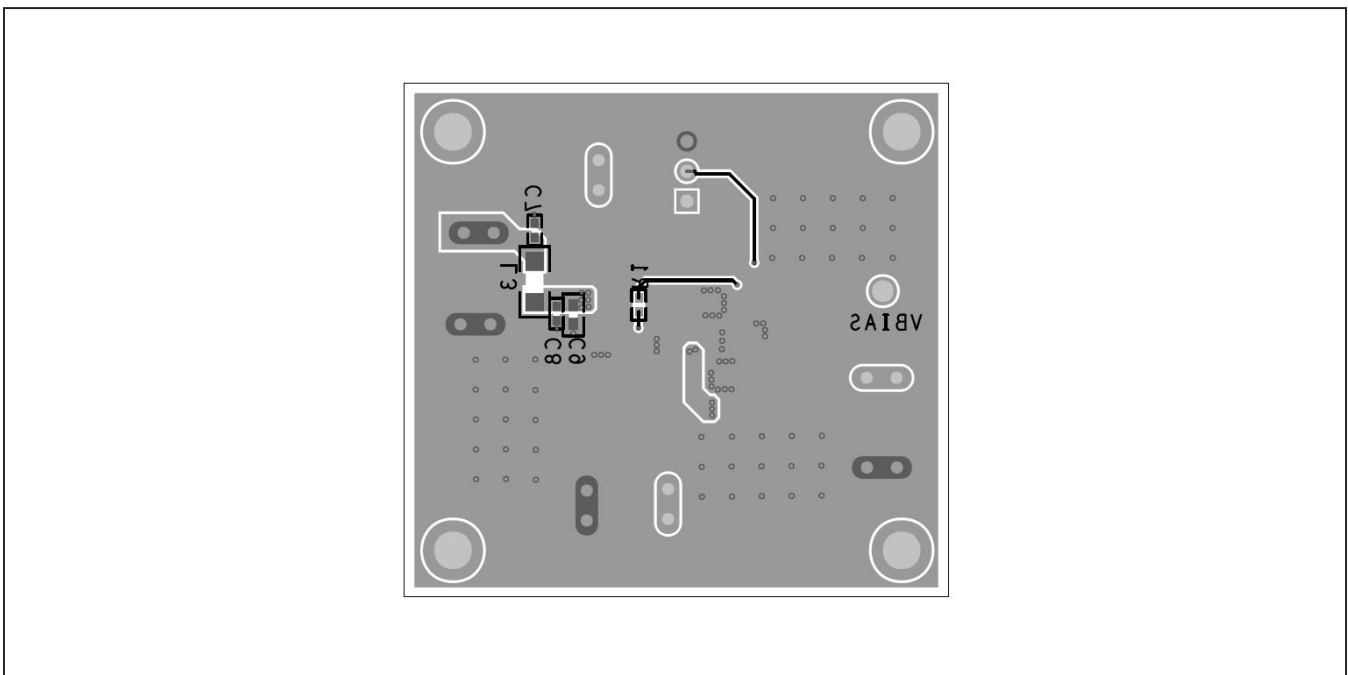
MAX20019/MAX20020 EV Kits Schematic



MAX20019/MAX20020 EV Kits PCB Layouts

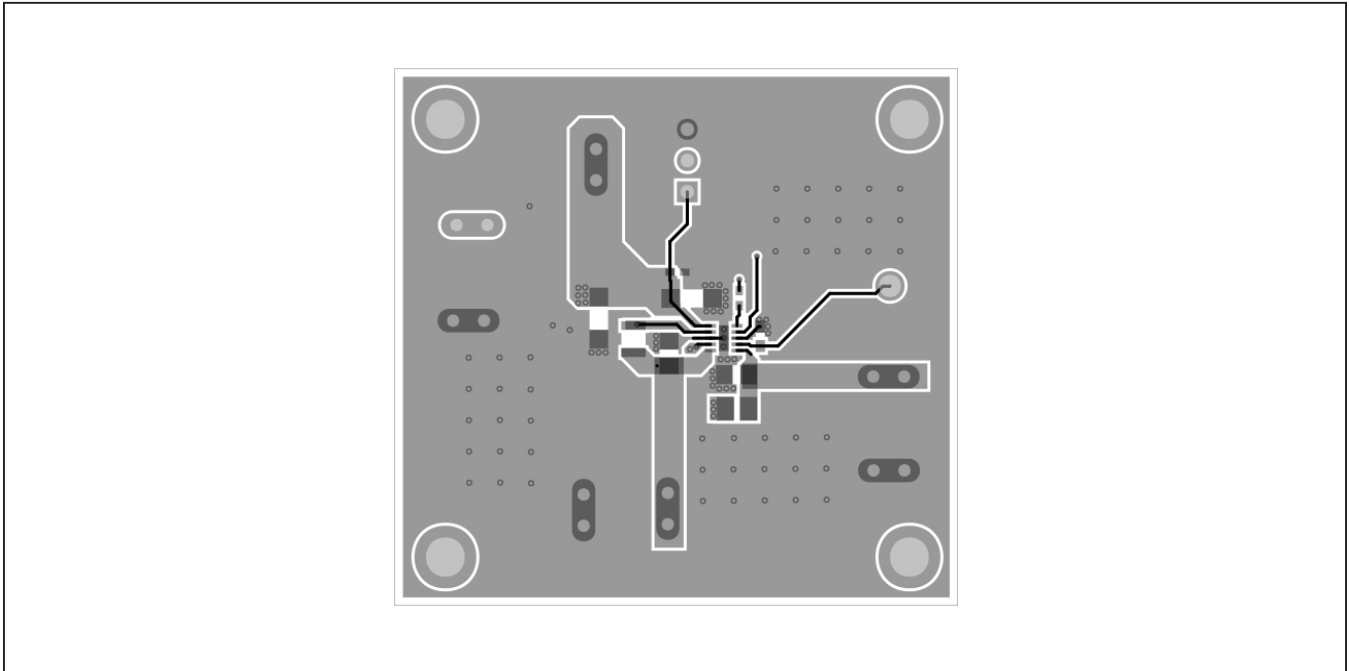


MAX20019/MAX20020 EV Kits Component Placement Guide—Top Silkscreen

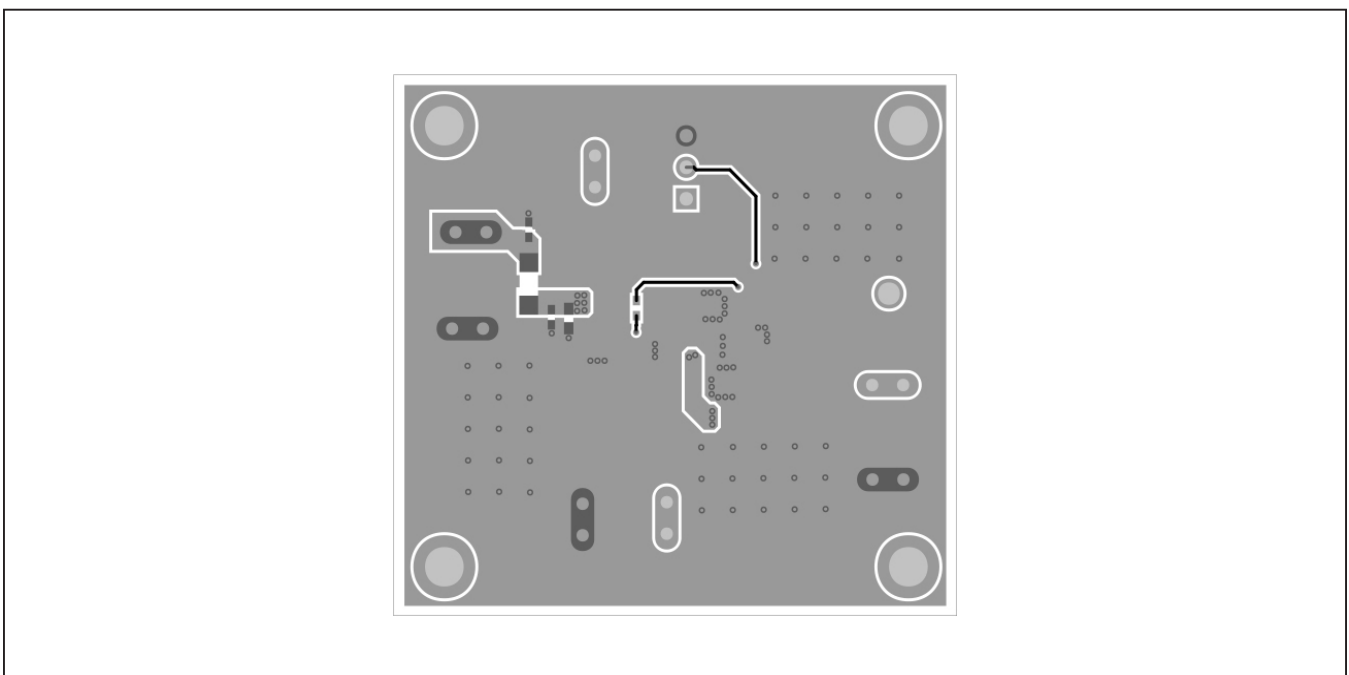


MAX20019/MAX20020 EV Kits Component Placement Guide—Bottom Silkscreen

**MAX20019/MAX20020 EV Kits PCB Layouts (continued)**

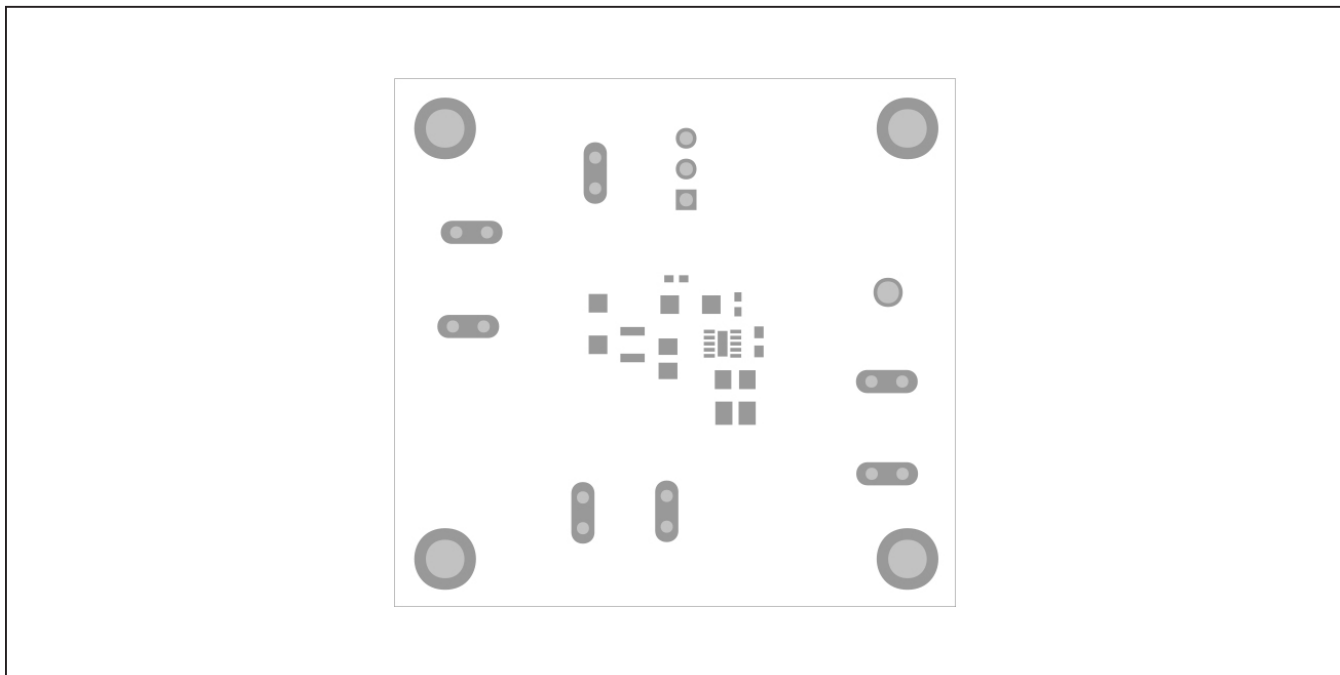


*MAX20019/MAX20020 EV Kits PCB Layout—Top*

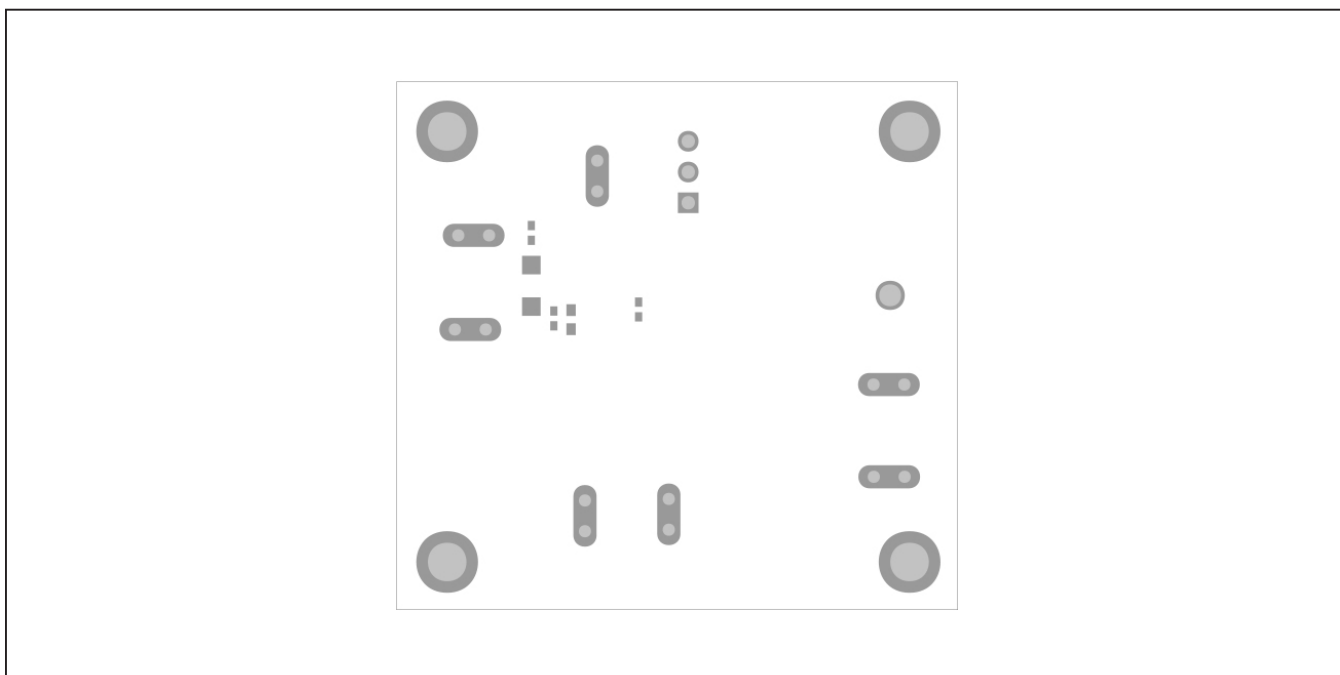


*MAX20019/MAX20020 EV Kits PCB Layout—Bottom*

**MAX20019/MAX20020 EV Kits PCB Layouts (continued)**



MAX20019/MAX20020 EV Kits PCB Layout—Top Mask



MAX20019/MAX20020 EV Kits PCB Layout—Bottom Mask

## Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	8/17	Initial release	—
1	1/20	Updated <i>Ordering Information</i> table	2

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

*Maxim Integrated cannot assume responsibility for use of any circuitry other than circuitry entirely embodied in a Maxim Integrated product. No circuit patent licenses are implied. Maxim Integrated reserves the right to change the circuitry and specifications without notice at any time.*



# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Maxim Integrated:](#)

[MAX20020EVKIT#](#)