MAX20310 Evaluation Kit

Evaluates: MAX20310

General Description

The MAX20310 evaluation kit (EV kit) is a fully assembled and tested circuit for evaluating the MAX20310 medical wearable, power-management solution with I²C capability for low-power medical applications. The device includes a voltage monitor multiplexer, a button monitor, a single-inductor, multiple-output (SIMO) buck-boost regulator, and two low-dropout (LDO) linear regulators.

Refer to the MAX20310 IC data sheet for detailed information regarding the operation and features of the devices.

Features

- RoHS Compliant
- Proven PCB Layout
- Fully Assembled and Tested
- I²C Serial Interface
- Multiple Inductor Options Included

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

Quick Start

Required Equipment

Before beginning, the following equipment is needed:

- MAX20310 EV kit
- Power supply capable of supplying +0.8V to +2.0V
- Digital multimeter (DMM)
- I²C master device

Procedure

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

1) Connect the positive terminal of the power supply to GND and the common terminal to BATN (Note 1).
2) Pull the $\overline{KIN}$ pin to BATN until the device wakes up (400ms (typ)).
3) Use the DMM to measure the voltage at B1OUT and verify that it is 1.8V.
4) Use the I²C master to configure the MAX20310 as desired.

Detailed Description of Hardware

The MAX20310 evaluation kit (EV kit) evaluates the MAX20310 medical wearable, power-management solution. The device is optimized for low-voltage applications and operates on battery voltages from 0.8V to 2.0V. The EV kit breaks out all device bumps for ease of measurement.

Negative Supply

The MAX20310 requires a negative power supply configuration. Therefore, the positive terminal of a battery or power supply connects to GND and the negative terminal connects to BATN. There is no reverse-battery protection on the MAX20310 EV kit, so users are strongly advised to verify power connections before connecting a battery or turning on a supply.

Note 1: *MAX20310 is powered by a negative supply. See Detailed Description.*

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Inductors

All four of the MAX20310's voltage rails are generated by a single-inductor, multiple-output (SIMO) buck-boost regulator. In order to provide maximum flexibility in evaluating the MAX20310 and selecting an inductor, this EV kit contains several inductors of different values and from different suppliers. Table 1 provides the part numbers, manufacturers, and values of the included inductors.

See Table 2 and Table 3 for pin descriptions of connectors J1 and J2.

Table 1. Inductors

INSTALLED	VALUE (µH)	SIZE (METRIC)	MANUFACTURER PART NUMBER	MANUFACTURER
Yes	1.5	2016, 1.0mm thick	DFE201610E-1R5M=P2	Murata
No	4.7	2520, 1.0mm thick	DFE252010F-4R7M=P2	Murata
No	3.3	2520, 1.0mm thick	DFE252010F-3R3M=P2	Murata
No	2.2	2016, 1.0mm thick	DFE201610E-2R2M	Murata
No	4.7	2016, 1.0mm thick	DFE201610E-4R7M=P2	Murata
No	6.8	2520, 1.0mm thick	DFE252010F-6R8M=P2	Murata
No	1	2010, 1.0mm thick	SRP2010-1R0M	Bourns

Table 2. Connector J1

PIN	MAX20310	DESCRIPTION
1	GND	Ground
2	MON	Voltage Monitor Output
3	MPC	Multipurpose Control Input
4	SDA	I²C Serial Data Input/Output
5	$\overline{KIN}$	Key Input
6	SCL	I²C Serial Clock Input
7	$\overline{KOUT}$	Key Output
8	$\overline{RST}$	Power-On Reset Output
9	MPO	Multipurpose Output
10	GND	Ground

Table 3. Connector J2

PIN	SIGNAL	DESCRIPTION
1	GND	Ground
2	L2OUT	LDO2 Output
3	L1OUT	LDO1 Output
4	CAP	Internal Supply Decoupling
5	B1OUT	SIMO Output 1
6	B2OUT	SIMO Output 2
7	LX	Inductor Switch Connection
8	BATN	Battery Negative Terminal
9	GND	Ground

Component Suppliers

SUPPLIER	WEBSITE
Bourns Inc.	www.bourns.com
Murata Americas	www.murata.com
TDK Corp	www.component.tdk.com

Note: *Indicate that you are using the MAX20310EVKIT when contacting these component suppliers.*

Ordering Information

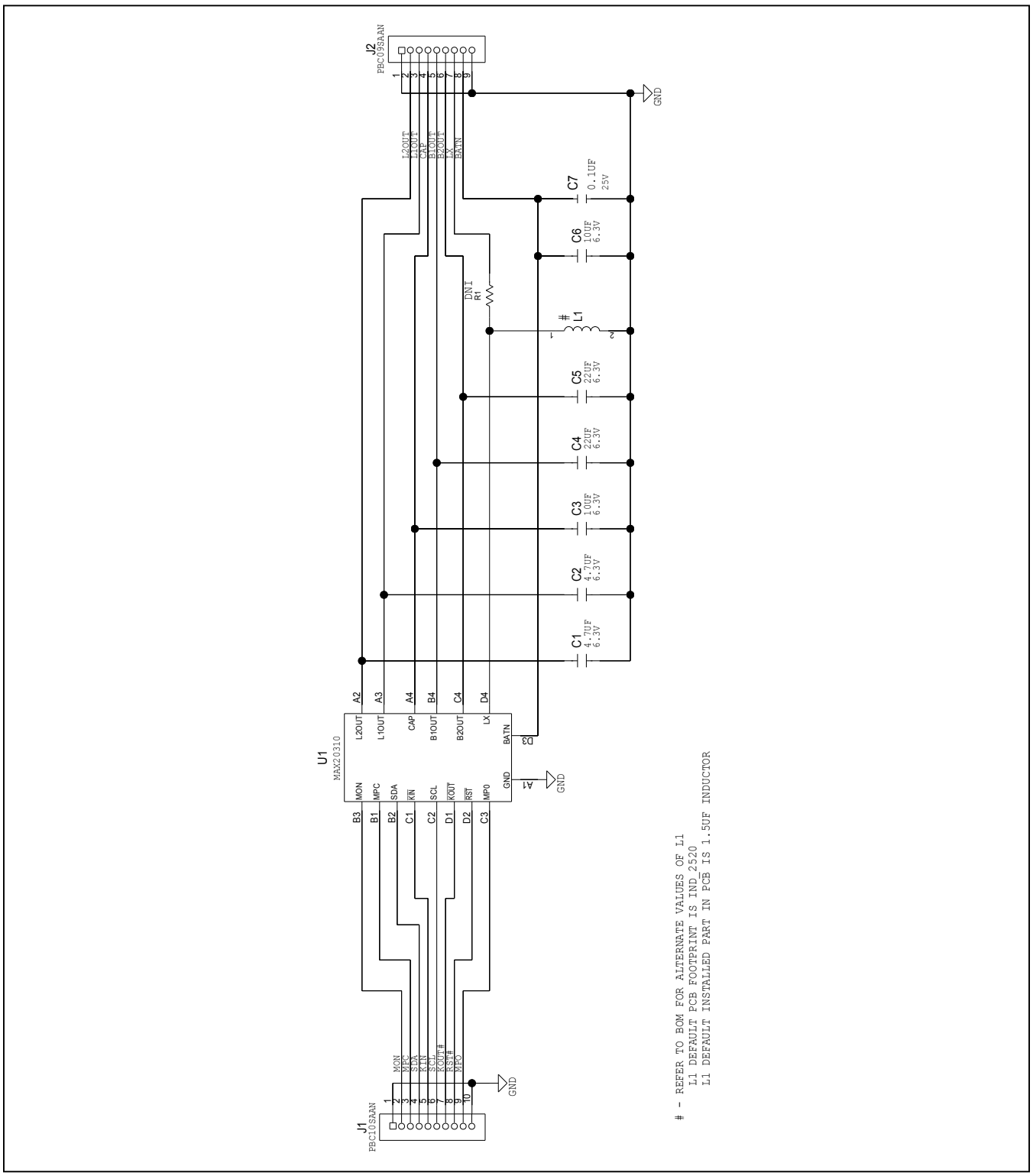
PART	TYPE
MAX20310EVKIT#	EV Kit

#Denotes RoHS compliant.

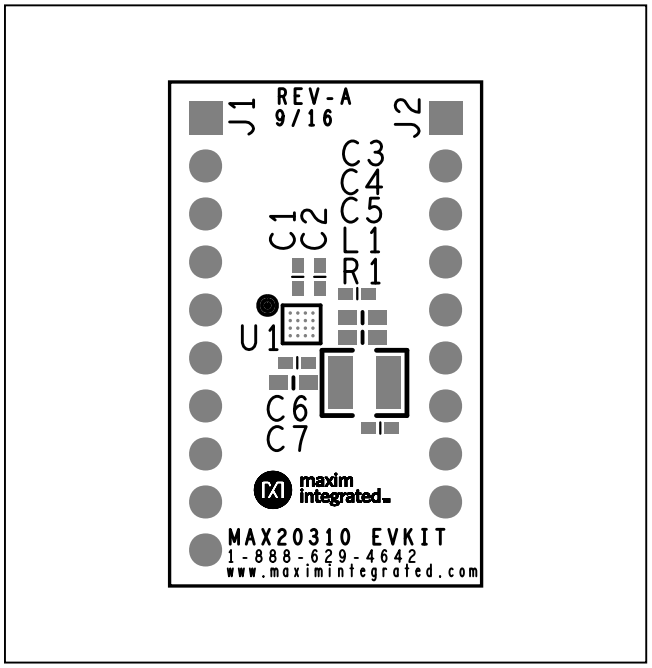
MAX20310 EV Kit Bill of Materials

ITEM	REF_DES	DNI/DNP	QTY	MFG PART #	MANUFACTURER	VALUE	DESCRIPTION	COMMENTS
1	C1, C2	-	2	JMK105BBJ475MV-F; C1005X5R0J475M050BC	TAIYO YUDEN; TDK	4.7UF	CAPACITOR; SMT (0402); CERAMIC CHIP; 4.7UF; 6.3V; TOL=20%; TG=-55 DEGC TO +85 DEGC; TC=X5R	
2	C3, C6	-	2	GRM155R60J106ME44; C1005X5R0J106M050BC; CL05A106MQ5NUN; C0402C106M9PAC	MURATA; TDK; SAMSUNG ELECTRONICS; KEMET	10UF	CAPACITOR; SMT (0402); CERAMIC CHIP; 10UF; 6.3V; TOL=20%; TG=-55 DEGC TO +85 DEGC; TC=X5R	
3	C4, C5	-	2	C1608X5R0J226M080AC	TDK	22UF	CAPACITOR; SMT (0603); CERAMIC CHIP; 22UF; 6.3V; TOL=20%; MODEL=C SERIES; TG=-55 DEGC TO +85 DEGC;	
4	C7	-	1	C0603C104K3RAC; GRM188R71E104KA01; C1608X7R1E104K	KEMET/MURATA/TDK	0.1UF	CAPACITOR; SMT; 0603; CERAMIC; 0.1uF; 25V; 10%; X7R; -55degC to + 125degC; +/-15% from -55degC to +125degC;	
5	J1	-	1	PBC10SAAN	SULLINS ELECTRONICS CORP.	PBC10SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 10PINS; -65 DEGC TO +125 DEGC	
6	J2	-	1	PBC09SAAN	SULLINS ELECTRONICS CORP	PBC09SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 9PINS; -65 DEGC TO +125 DEGC	
7	L1	-*	1	DFE201610E-1R5M=P2	MURATA	1.5UH	INDUCTOR; SMT (0806); MAGNETICALLY SHIELDED; 1.5UH; TOL=+/-20%; 2.1A;	
8	U1	-	1	MAX20310	MAXIM	MAX20310	EVKIT PART IC; PACKAGE OUTLINE 16 BUMPS WLP PKG. 0.40MM PITCH; 21-0491; W161F1+1	
9	L1	DNI	1	DFE252010F-4R7M=P2	MURATA	4.7UH	INDUCTOR; SMT (1008); MAGNETICALLY SHIELDED; 4.7UH; TOL=+/-20%; 1.4A	(Alternate part for L1)
10	L1	DNI	1	DFE252010F-3R3M=P2	MURATA	3.3UH	INDUCTOR; SMT (1008); MAGNETICALLY SHIELDED; 3.3UH; TOL=+/-20%; 1.6A	(Alternate part for L1)
11	L1	DNI	1	DFE201610E-2R2M	MURATA	2.2UH	INDUCTOR; SMT (2016); METAL ALLOY CHIP; 2.2UH; TOL=+/-20%; 2.6A	(Alternate part for L1)
12	L1	DNI	1	DFE201610E-4R7M=P2	MURATA	4.7UH	INDUCTOR; SMT (2016); METAL ALLOY CHIP; 4.7UH; TOL=+/-20%; 1.3A	(Alternate part for L1)
13	L1	DNI	1	DFE252010F-6R8M=P2	MURATA	6.8UH	INDUCTOR; SMT (1008); MAGNETICALLY SHIELDED; 6.8UH; TOL=+/-20%; 1.1A	(Alternate part for L1)
14	L1	DNI	1	SRP2010-1R0M	BOURNS	1UH	INDUCTOR; SMT (0806); MAGNETICALLY SHIELDED; 1UH; TOL=+/-20%; 2.6A	(Alternate part for L1)
15	R1	DNP	0	CRCW04020000ZS	VISHAY DALE	0	RESISTOR; 0402; 0 OHM; 0%; JUMPER; 0.063W; THICK FILM;	
16	PCB	-	1	MAX20310	MAXIM	PCB	PCB Board:MAX20310 EVALUATION KIT	
TOTAL			18					

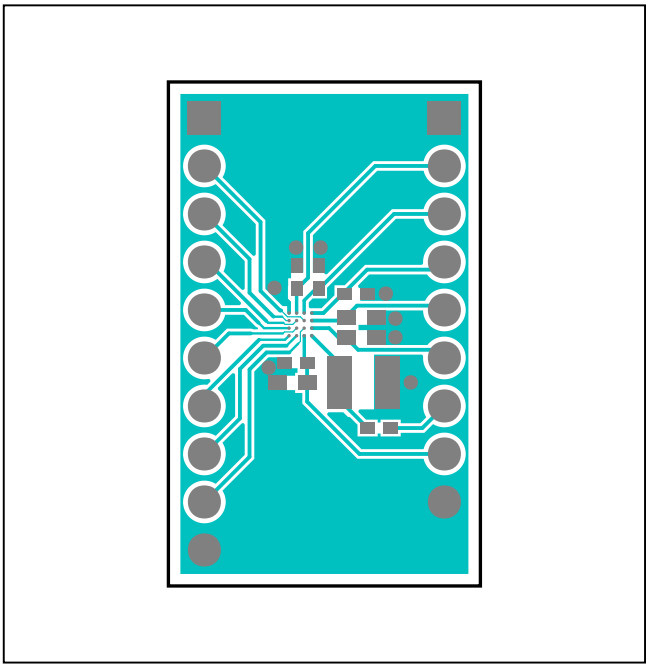
MAX20310 EV Kit Schematic



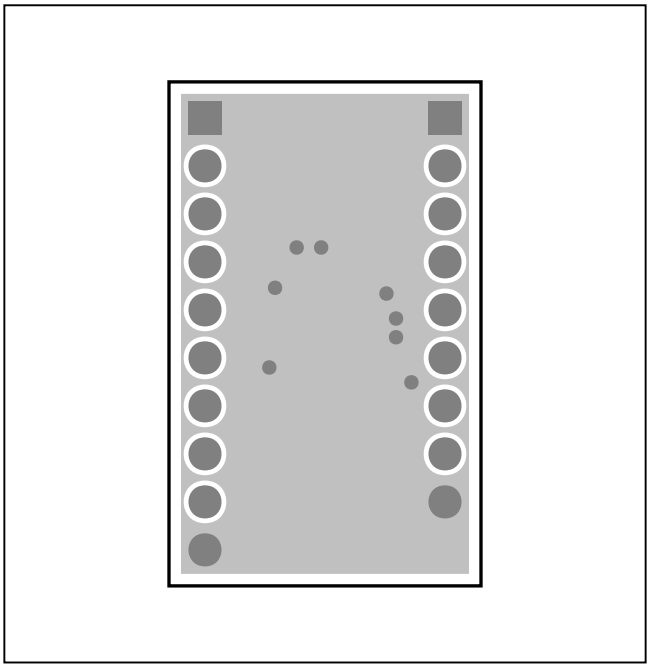
MAX20310 EV Kit PCB Layout Diagrams



MAX20310 EV Kit—Top Silkscreen

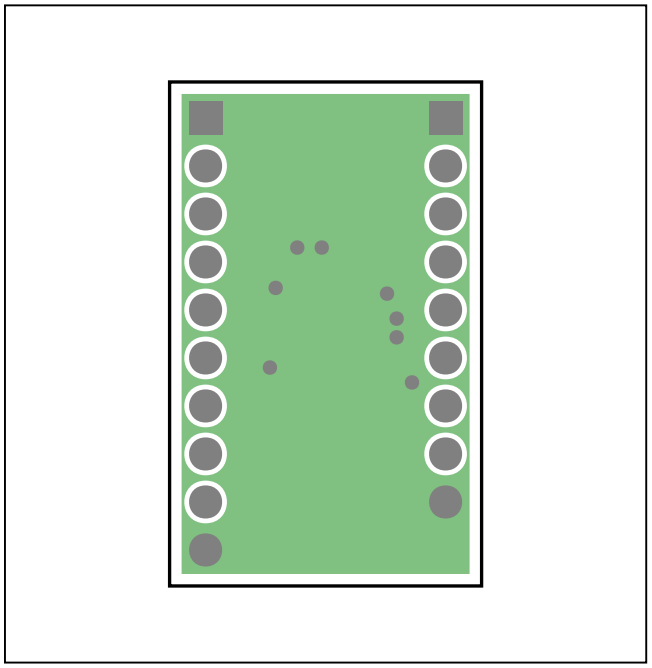


MAX20310 EV Kit—Top

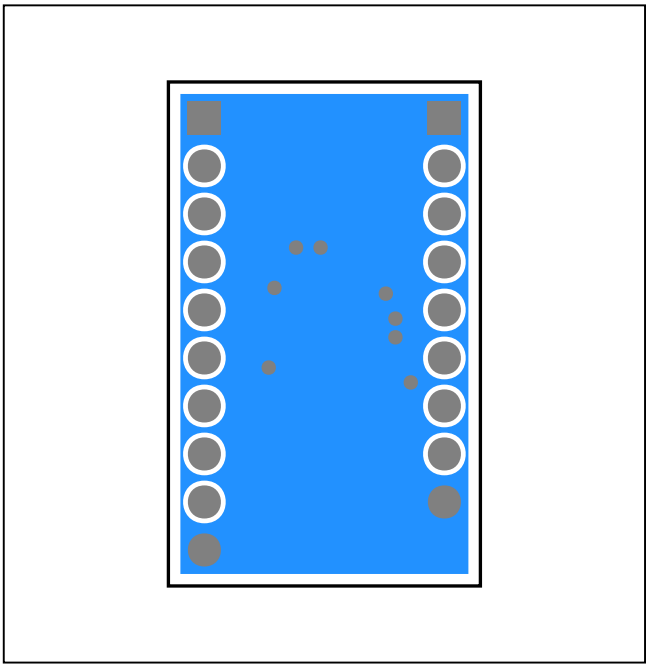


MAX20310 EV Kit—Layer 2 GND

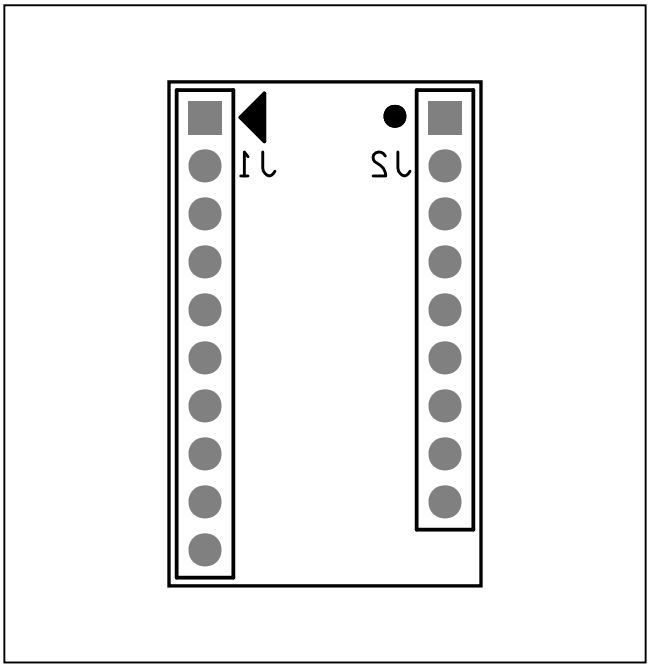
MAX20310 EV Kit PCB Layout Diagrams (continued)



MAX20310 EV Kit—Layer 3 Power



MAX20310 EV Kit—Bottom



MAX20310 EV Kit—Bottom Silkscreen

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	1/17	Initial release	—

