

Evaluates: MAXQ1061

MAXQ1061 Evaluation Kit

General Description

The MAXQ1061 evaluation kit (EV kit) provides a platform for evaluating the capabilities of the MAXQ1061 cryptographic controller. The device makes it fast and easy to implement full security for embedded, connected products without requiring firmware development. The coprocessor can be designed-in from the start or added to an existing design to guarantee confidentiality, authenticity, and integrity of the device. It is ideal for connected embedded devices, industrial networking, PLC, and network appliances.

EV Kit Contents

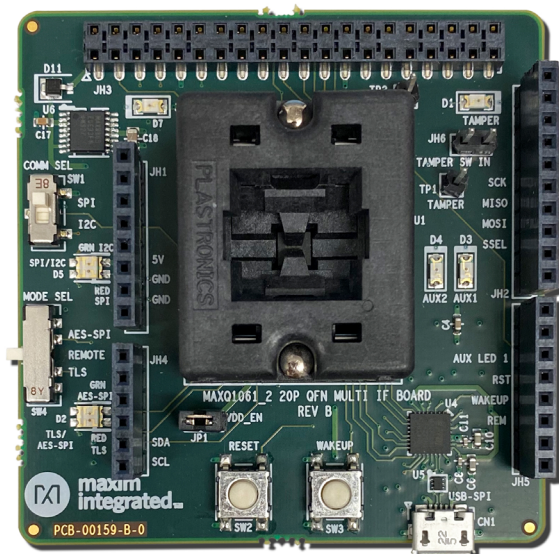
- MAXQ1061 Multi IF Board
- MAXQ1061 Samples (MAXQ1062 no longer offered)
- Raspberry Pi Clearance Header
- USB Type A to Micro-USB Type B Cable

Features

- Compatible with Raspberry Pi 3 Model B/B+ and Raspberry Pi 2 Model B
- Compatible with 3.3V Arduino Uno Motherboards
- USB Connector for USB 2.0-to-SPI/I²C Communication
- Selectable Communication Protocol (SPI/I²C)
- Selectable Mode (AES-SPI/REMOTE/TLS)
- Tamper Jumper with Tamper LED
- Socket for MAXQ1061 IC
- On-Board Regulator

[Ordering Information](#) appears at end of data sheet.

MAXQ1061 EV Kit Board



*Raspberry Pi is a registered trademark and service mark of Raspberry Pi Foundation.
Arduino is a registered trademark of Arduino, LLC.*

19-8693; Rev 4; 1/24

Quick Start

Required Equipment

- MAXQ1061 Multi IF Board (included)
- MAXQ1061 Samples (included)

Procedure

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

- 1) Open the socket and insert a MAXQ1061 IC

into one of the cavities. **Note:** The plus (+) on the package must be aligned with the white arrow on the PCB, as shown in [Figure 1](#).

- 2) Install jumper on JP1 as shown in [Figure 1](#).

Hardware Description

The EV kit is designed to be compatible with a variety of platforms, including Raspberry Pi, Arduino Uno boards, and PC operating Linux OS. It also enables wired connections to a custom board.

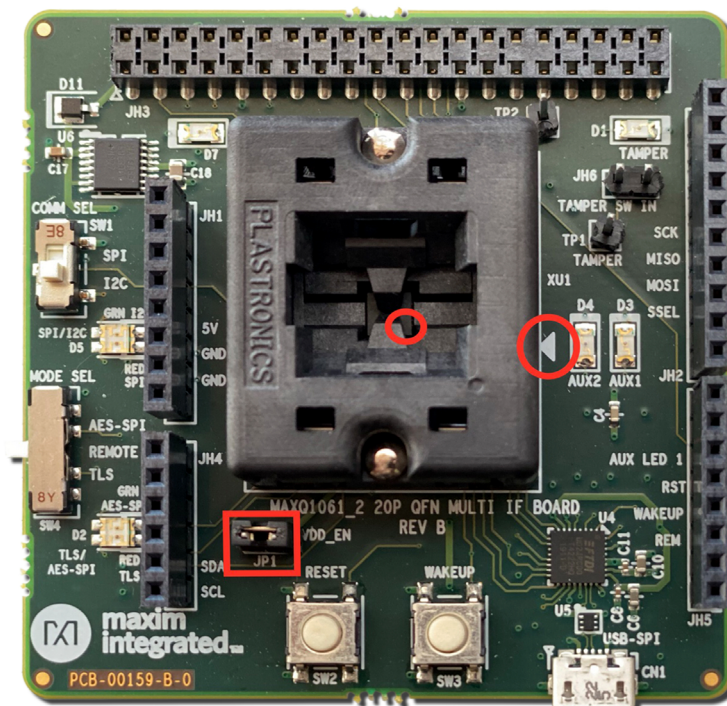


Figure 1. IC Positioning in Socket

Raspberry Pi

The EV kits are compatible with Raspberry Pi 3 Model B/ B+ and Raspberry Pi 2 Model B through connector JH3. The included Raspberry Pi header must be installed in JH3 on the bottom side of the board to provide clearance between the EV kit and the Raspberry Pi. See [Figure 2](#).

Note: The Raspberry Pi forces the WAKEUP pin state, so the WAKEUP pushbutton has no effect.

Arduino Uno-Compatible Boards

Connectors JH1, JH2, JH4, and JH5 on the EV kits plug into Arduino Uno connector-compatible boards such as the STM Nucleo®. The EV kits are only compatible with 3.3V I/O boards.

Linux PC

The EV kits connect to and receive power from the PC through the USB connector, CN1.

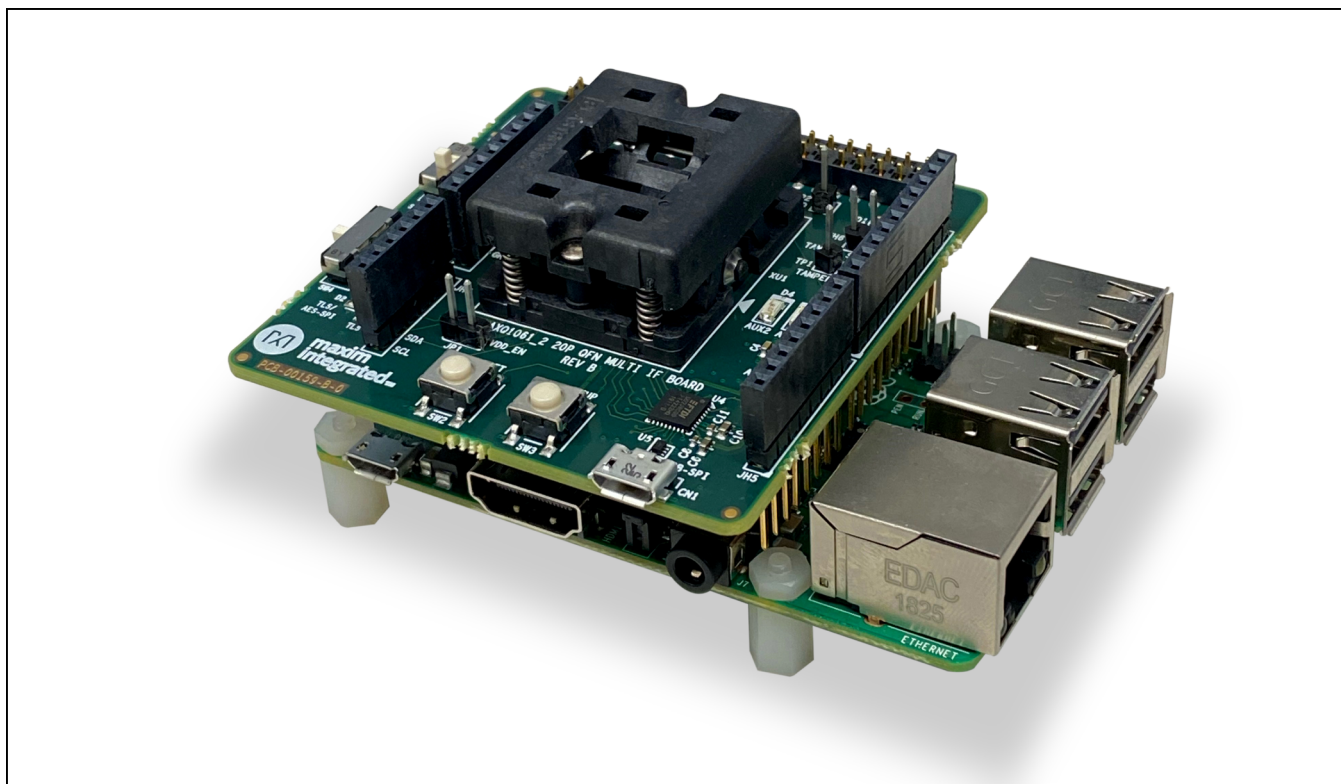


Figure 2. MAXQ1061 EV Kit Board Attached to a Raspberry Pi

Nucleo is a registered trademark of STMicroelectronics International NV or its affiliates in the EU and/or elsewhere.

Hardware Settings

[Table 1](#), [Table 2](#), and [Table 3](#) describe the jumpers, switches, and LED settings.

EV Kit Software Development Kit (SDK)

The software development kit (SDK) provides several tools for evaluating the MAXQ1061 using one of the supported platforms. For instructions on how to download the SDK, contact your Analog Devices representative.

Table 1. Jumper Settings

JUMPER	SETTING	FUNCTION
JH6	Open*	Tamper signal is disabled.
	Closed	Tamper signal is enabled.
JP1	Open	Disables power supply to the MAXQ1061 IC.
	Closed*	Enables power supply to the MAXQ1061 IC.

*Default setting.

Table 2. Switch Settings

JUMPER	SETTING	FUNCTION
SW1	I2C**	The MAXQ1061 uses the I2C pin and protocol to communicate.
	SPI	The MAXQ1061 uses SPI pins and protocol to communicate.
SW2	Pressed	Wakeup signal is enabled.
	Not pressed*	Wakeup signal is controlled by host platform.
SW3	Pressed	Reset signal is enabled.
	Not pressed*	Reset signal is controlled by host platform.
SW4	AES-SPI	Selects the AES-SPI mode.
	REMOTE	The host platform selects the mode.
	TLS	Selects the TLS mode.

*Default setting.

**Idle if USB connected.

Table 3. LED Information

LED	COLOR ON/OFF	FUNCTION
D1	RED ON	Tamper signal is enabled.
	OFF	Tamper signal is disabled.
D2	RED	TLS mode is selected.
	GREEN	AES-SPI mode is selected.
D3	GREEN ON	LED driven high by microcontroller platform.
	OFF	Low by default.
D4	YELLOW ON	LED driven high by PC platform.
	OFF	Low by default.
D5	RED	SPI communication protocol is selected.
	GREEN	I ² C communication protocol is selected.
D7	GREEN ON	The board is correctly powered on.
	OFF	The board is powered off.

Ordering Information

PART	TYPE
MAXQ1061EVKIT#	EV Kit

#Denotes RoHS compliance.

MAXQ1061 EV Kit Bill of Materials

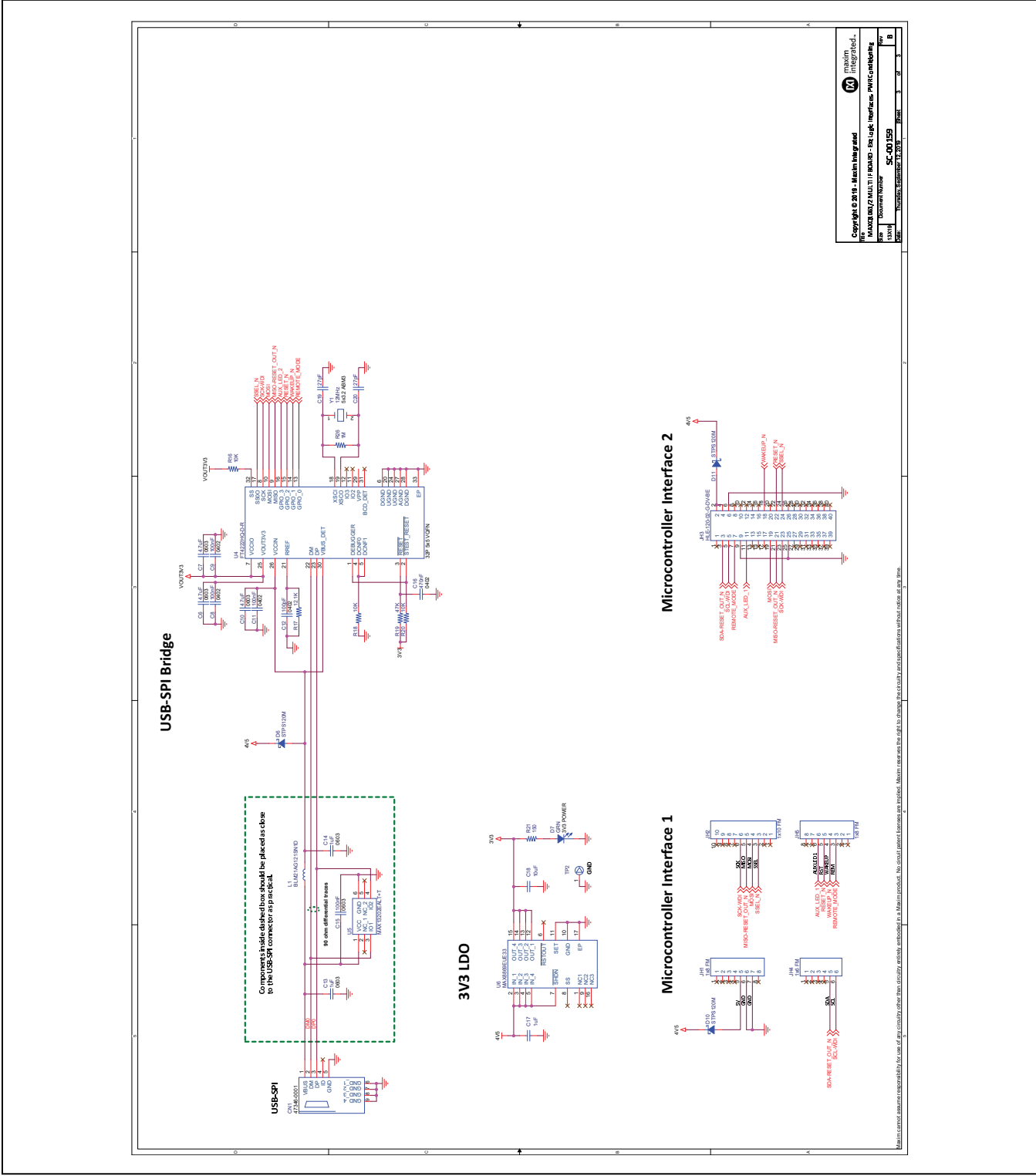
QTY	PART REFERENCE	VALUE	BOM DESCRIPTION	MANUFACTURER_PN	MANUFACTURER
3	C1,C3,C17	1uF	CAP CER 1uF 16V 10% X7R 0603	GCM188R71C105KA64D	Murata
3	C2,C4,C5	100nF	CAP CER 0.1uF 16V 10% X7R 0603	C0603C104K4RACTU	Kemet
3	C6,C7,C10	4.7uF	CAP CER 4.7uF 10V 10% X5R 0603	C0603C475K8PACTU	Kemet
3	C8,C9,C11	100nF	CAP CER 0.1uF 16V 10% X7R 0402	GRM155R71C104KA88D	Murata Electronics
1	C12	100pF	CAP CER 100PF 50V +/-1% NP0 0402	04025A101FAT2A	AVX Corporation
2	C13,C14	1uF	CAP CER 1uF 35V 10% X5R 0603	GMK107B1105KA-T	Taiyo Yuden
1	C15	100nF	CAP CER 0.1uF 50V 10% X7R 0603	C0603C104K5RACTU	Kemet
1	C16	470nF	CAP CER 0.47uF 10V 10% X5R 0402	GRM155R61A474KE15J	Murata Electronics North America
1	C18	10uF	CAP CER 10uF 10V 10% X7R 0805	GRM218R71A106KE51L	Murata
2	C19,C20	27pF	CAP CER 27PF 50V 5% NP0 0402	GRM1555C1H270JA01D	Murata Electronics
1	CN1	MICRO USB B R/A	CONN RCPT SPOS MICRO USB B R/A	47346-0001	Molex
1	D1	RED	LED 660NM RED WTR CLR 1206 SMD	SML-LX1206SRC-TR	Lumex Opto
2	D2,D5	LTST-C155GEKT	LED GREEN/RED CLEAR 1210	LTST-C155GEKT	Lite-On Inc
2	D3,D7	GRN	LED 565NM WTR CLR GREEN 1206 SMD	SML-LX1206GC-TR	Lumex Opto
1	D4	YEL	LED ALINGAP YELLOW CLR 1206 SMD	SML-LX1206SYC-TR	Lumex Opto
3	D6,D10,D11	STPS120M	DIODE SCHOTTKY 20V 1A STMITTE	STPS120M	STMicroelectronics
2	JH1,JH5	1x8 FM	CONN RCPT 8POS GOLD .100"	ESQ-108-39-G-S	Samtec
1	JH2	1x10 FM	CONN RCPT 10POS GOLD .100"	ESQ-110-39-G-S	Samtec
1	JH3	HLE-120-02-G-DV-BE	CONN RCPT 40POS .100" SMD GLD	HLE-120-02-G-DV-BE	Samtec
1	JH4	1x6 FM	CONN RCPT 6POS GOLD .100"	ESQ-106-39-G-S	Samtec
2	JH6,JP1	JUMPER	CONN HEADER .100 SINGL STR 2POS (2x1)	PEC02SAAN	Sullins
1	L1	BLM21AG1215N1D	FERRITE BEAD 120 OHM 0805 1LN	BLM21AG1215N1D	Murata Electronics North America
1	PCB1	PCB			
1	Q1	FDV301N	MOSFET N-CH 25V 220MA SOT-23	FDV301N	Fairchild Semiconductor
1	Q2	DMP2004K-7	MOSFET P-CH 20V 600MA SOT23-3	DMP2004K-7	Diodes Incorporated
2	R1,R2	4.75K	RES 4.75K OHM 1/10W 1% 0603 SMD	ERJ-3EKF4751V	Panasonic
4	R3,R16,R18,R20	10K	RES 10K OHM 1/10W 1% 0603 SMD	ERJ-3EKF1002V	Panasonic
1	R5	1K	RES 1K OHM 1/10W 1% 0603 SMD	ERJ-3EKF1001V	Panasonic
3	R6,R24,R25	4.7K	RES 4.7K OHM 1/10W 1% 0402 SMD	ERJ-2RKF4701X	Panasonic
1	R7	49.9K	RES 49.9K OHM 1/10W 1% 0603 SMD	ERJ-3EKF4992V	Panasonic
1	R8	332	RES 332 OHM 1/10W 1% 0603 SMD	ERJ-3EKF3320V	Panasonic
5	R9,R12,R13,R14,R21	150	RES 150 OHM 1/10W 1% 0603 SMD	ERJ-3EKF1500V	Panasonic
2	R10,R15	120	RES 120 OHM 1/10W 1% 0603 SMD	ERJ-3EKF1200V	Panasonic
1	R11	100	RES 100 OHM 1/10W 1% 0603 SMD	ERJ-3EKF1000V	Panasonic
1	R17	12.1K	RES SMD 12.1K OHM 1% 1/10W 0402	ERJ-2RKF1212X	Panasonic Electronic Components
1	R19	47K	RES 47K OHM 1/10W 1% 0603 SMD	ERJ-3EKF4702V	Panasonic
2	R22,R23	0	RES SMD 0 OHM JUMPER 1/10W 0603	RC0603JR-070RL	Yageo
1	R26	1M	RES SMD 1M OHM 1% 1/10W 0402	ERJ-2RKF1004X	Panasonic
1	SW1	CL-SB-12B-01T	SWITCH SLIDE SPDT 200MA 12V	CL-SB-12B-01T	Copal Electronics Inc
2	SW2,SW3	B3S-1000	SWITCH TACTILE SPST-NO 0.05A 24V	B3S-1000	Omron Electronics
1	SW4	CL-SB-23A-11T	SWITCH SLIDE DP3T 200MA 12V	CL-SB-23A-11T	Copal Electronics Inc
2	TP1,TP2	1P	CONN HEADER .100 SINGL STR 1POS	PEC01SAAN	Sullins
2	U1	MAXQ1061ETP+	IC CRYPTO CTRL 20TQFN	MAXQ1061ETP+	Analog Devices
2	U2,U3	NC7WZ17P6X	IC BUFF DL SCHMT TRIG UHS SC706	NC7WZ17P6X	Fairchild Semiconductor
1	U4	FT4222HQ-D-R	IC BRIDGE USB TO I2C/SPI 32VQFN	FT4222HQ-D-R	FTDI
1	U5	MAX13202EALT+T	ESD PROTECT 2CH 6-UDFN	MAX13202EALT+	Analog Devices
1	U6	MAX8869EUE33	REG LDO 3.3V/ADJ 16TSOP-EP	MAX8869EUE33+	Analog Devices
1	UX1	MAXQ1061 20P QFN SKT	20P QFN SKT 20LQ50S14040	20LQ50S14040	Plastronics
1	Y1	12MHz	CRYSTAL 12MHZ 18PF SMD	ABM3-12.000MHZ-D2Y-T	Abracon Corp

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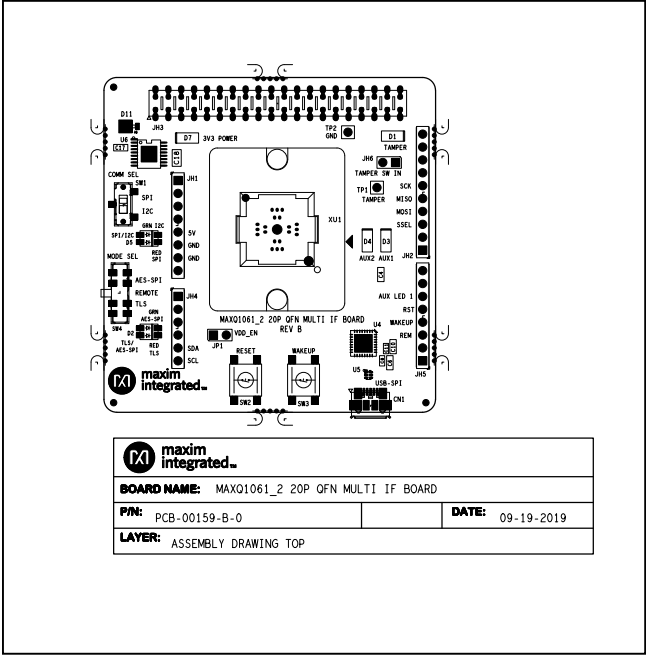
www.analog.com



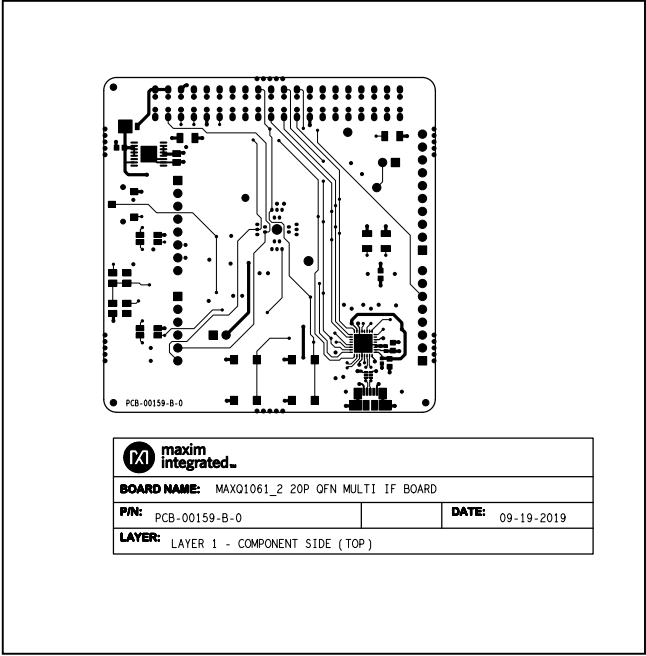
MAXQ1061 EV Kit Schematics (continued)



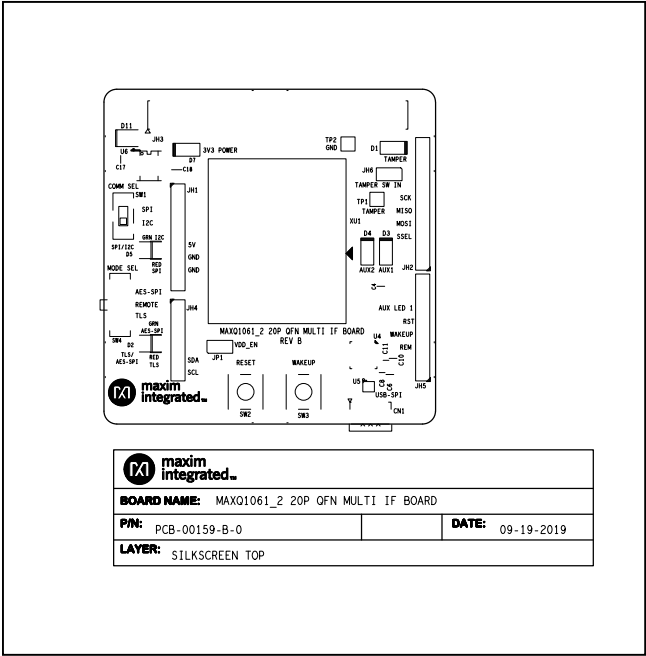
MAXQ1061 EV Kit PCB Layout Diagrams



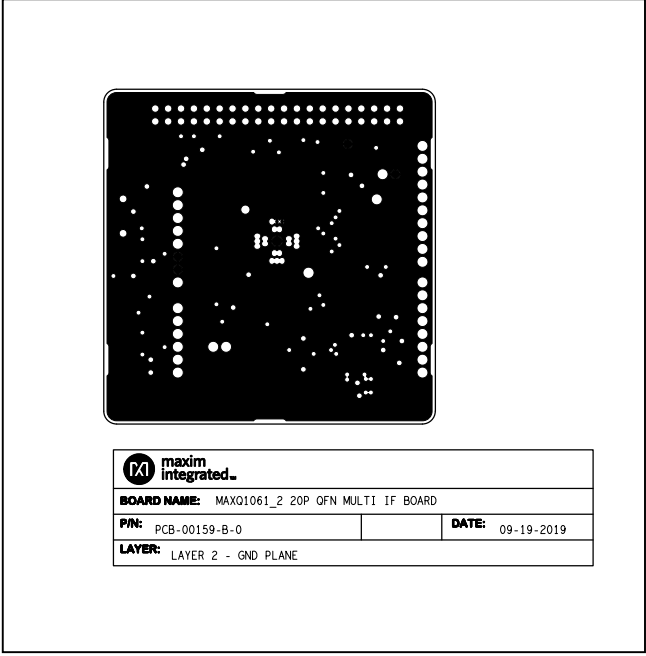
MAXQ1061 EV Kit PCB Layout—Assembly Drawing Top



MAXQ1061 EV Kit PCB Layout—Component Side (Top)

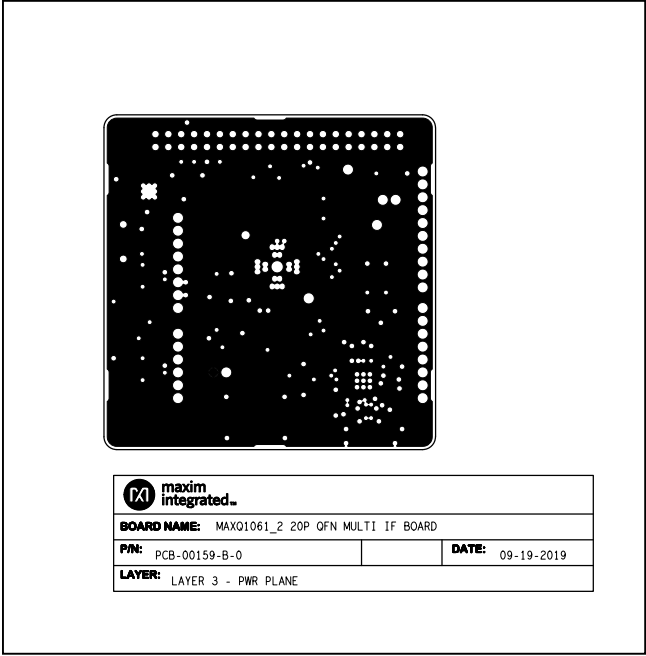


MAXQ1061 EV Kit PCB Layout—Silkscreen Top

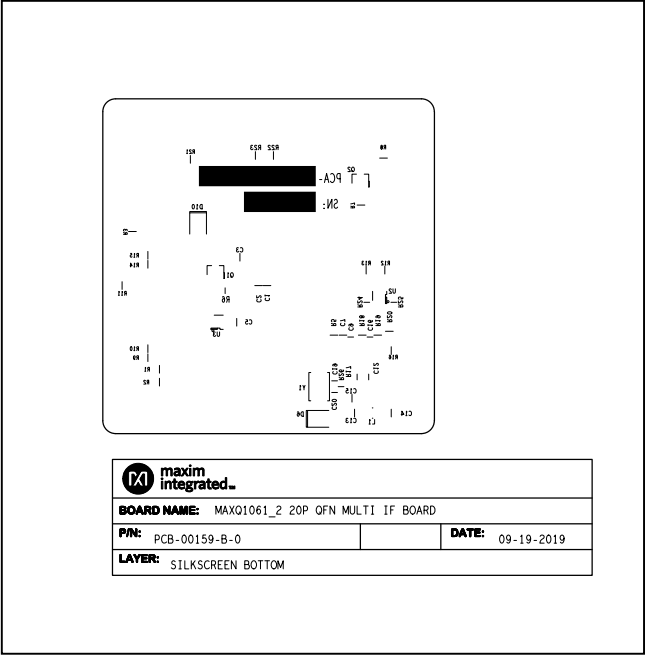


MAXQ1061 EV Kit PCB Layout—GND Plane

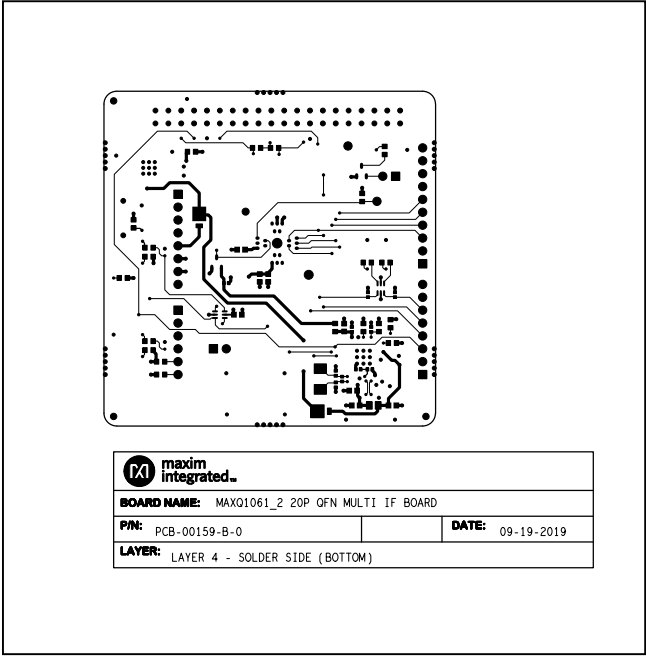
MAXQ1061 EV Kit PCB Layout Diagrams (continued)



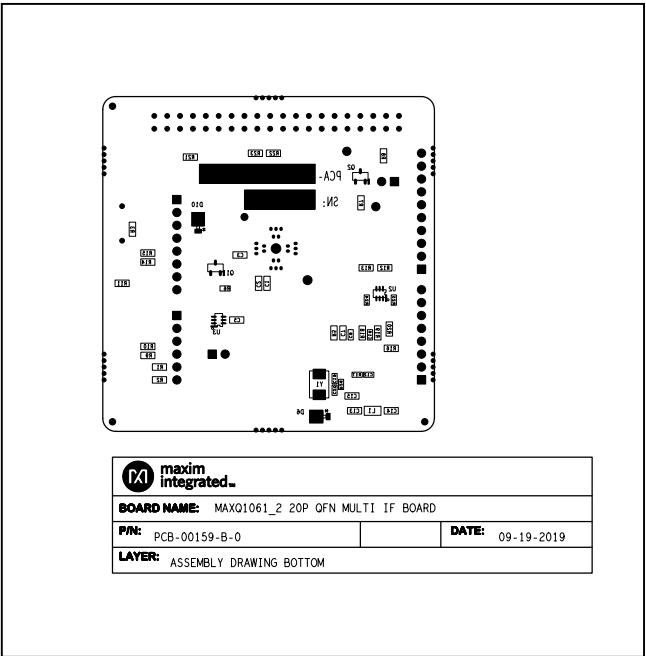
MAXQ1061 EV Kit PCB Layout—PWR Plane



MAXQ1061 EV Kit PCB Layout—Silkscreen Bottom

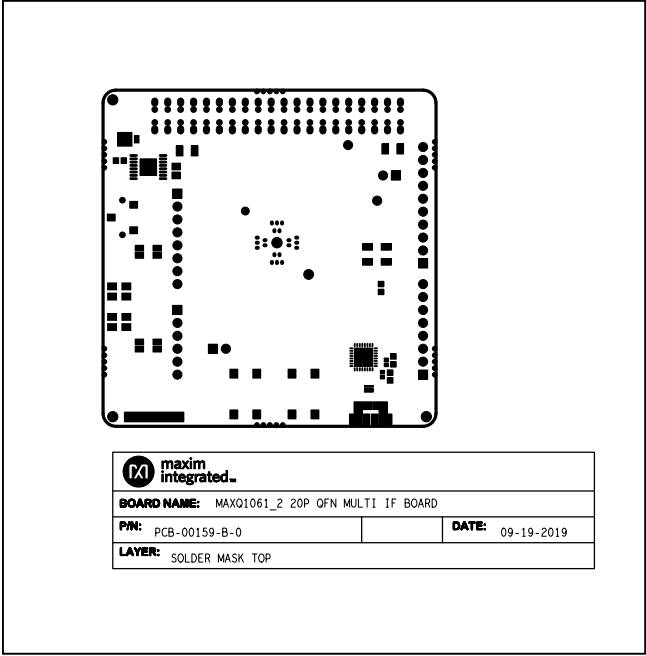


MAXQ1061 EV Kit PCB Layout—Solder Side (Bottom)

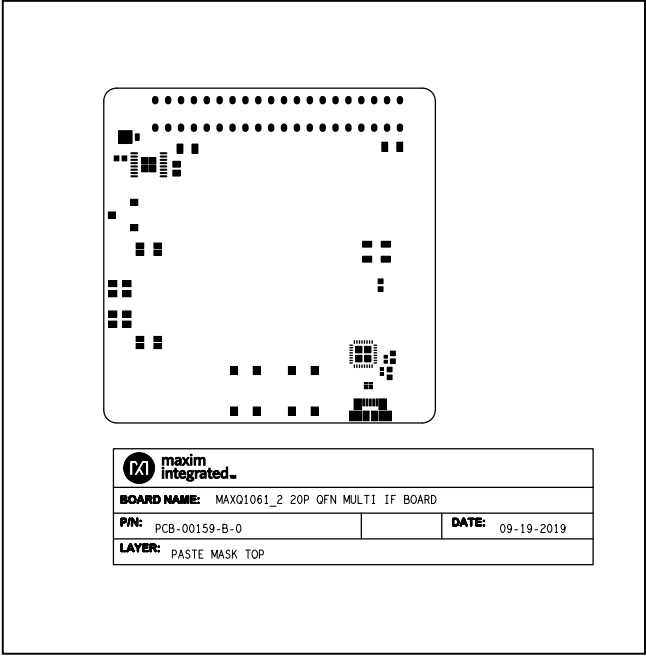


MAXQ1061 EV Kit PCB Layout—Assembly Drawing Bottom

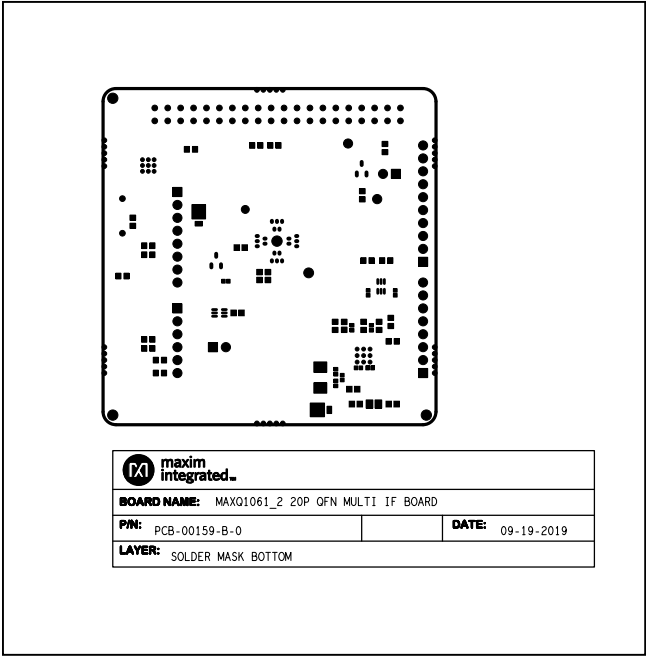
MAXQ1061 EV Kit PCB Layout Diagrams (continued)



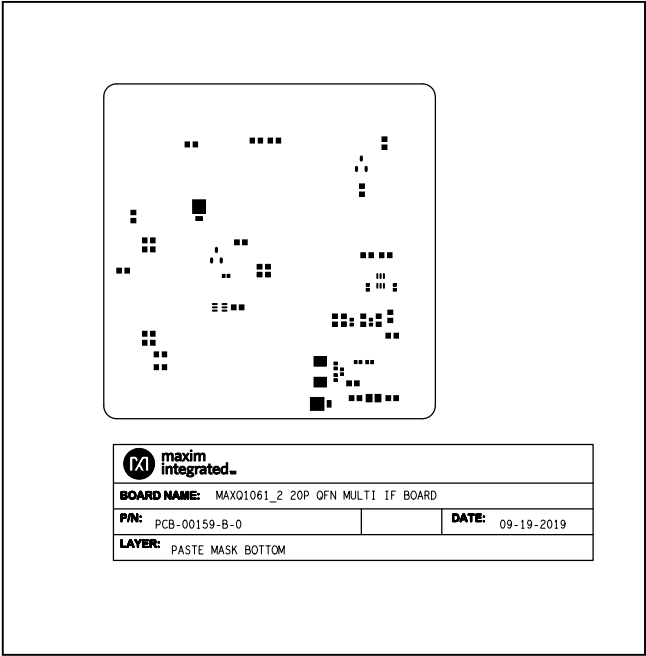
MAXQ1061 EV Kit PCB Layout—Solder Mask Top



MAXQ1061 EV Kit PCB Layout—Paste Mask Top



MAXQ1061 EV Kit PCB Layout—Solder Mask Bottom



MAXQ1061 EV Kit PCB Layout—Paste Mask Bottom

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	11/18	Initial release	—
1	12/18	Added MAXQ1062 content	1–18
2	1/20	Updated EV kit content	1–10
3	10/20	Added <i>Quick Start</i> section	2
4	1/24	Removed obsolete MAXQ1062 device from document.	1–12



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