

MAX14750 Evaluation Kit

Evaluates: MAX14720/MAX14750

General Description

The MAX14750 evaluation kit (EV kit) is a fully assembled and tested circuit for evaluating the MAX14720/MAX14750 power-management solutions with I²C capability for space-constrained, battery-powered applications. Both the MAX14720 and MAX14750 integrate a synchronous buck converter, a buck-boost converter, a linear regulator, and a power switch. The MAX14750 provides individual pin enables for each function, while the MAX14720 includes a push-button monitor and sequencing controller. Refer to the MAX14720/MAX14750 IC data sheet for detailed information regarding the operation and features of the devices.

The EV kit comes standard with the MAX14750A installed, but can also be used to evaluate the MAX14720 by replacing the MAX14750A (U1) with the MAX14720. Request a free sample of the MAX14720 when ordering the EV kit.

Features

- RoHS Compliant
- Proven PCB Layout
- Full Assembled and Tested
- I²C Serial Interface

Quick Start

Required Equipment

- GPIO controller device with four (4) IO pins
- Two (2) adjustable power supplies with 0-5V capability
- Digital multimeter (DMM)
- I²C controller device
- Cables with crabbler connections

Optional Equipment

- Electronic load
- 0402 (imperial) 0Ω resistors

Procedure

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

Caution: Do not turn on the power supply and external devices until all connections are made.

- 1) Connect the pins of the GPIO controller device to LEN (J1 pin 8), BEN (J1 pin 9), HVEN (J1 pin 10), and SWEN (J1 pin 11). Set the outputs to low.
- 2) Connect the I²C master device to GND, SDA (J1 pin 6) and SCL (J1 pin 7).
- 3) Set one power supply voltage to 3.7V and turn off the supply.
- 4) Connect the positive terminal of the 3.7V to V_{CC} (J3 pin 4) and the negative terminal to GND (J3 pin 1 and 12, J1 pin 1 and 12).
- 5) Turn on the 3.7V power supply.
- 6) Turn on the GPIO controller device and the I²C master device.
- 7) Set the second power supply voltage to the desired input voltage of the regulator or load switch to be tested and turn off the supply.
Optional: Install 0Ω resistors in the R4-9 positions as desired to connect the regulator and load switch inputs to V_{CC} or the switch output.
- 8) Connect the positive terminal of the regulator input supply to the regulator or load switch input and the negative terminal to GND.
- 9) Turn on the regulator or load switch input supply
- 10) Use the I²C master to configure the EV kit regulator(s) to be tested, if applicable.
- 11) Enable the regulator or load switch by setting the corresponding enable pin high using the GPIO controller device.
- 12) Measure the voltage of the regulator or load switch output and confirm it matches the programmed settings.
Optional: To test the regulator under load, connect the electronic load to the output pin and apply the desired load

Ordering Information appears at end of data sheet.

Detailed Description of Hardware

The MAX14750 evaluation kit (EV Kit) evaluates the MAX14720/MAX14750 compact power management solutions.

See Table 1 through Table 3 for pin descriptions of the three connectors J1–J3.

Table 1. Connector J1

PIN	MAX14720	MAX14750	DESCRIPTION
1	GND	GND	Ground
2	MON	MON	Monitor Multiplexer Output
3	N.C.	N.C.	Not Connected
4	N.C.	N.C.	Not Connected
5	$\overline{\text{RST}}$	N.C.	(MAX14720) Reset Output. (MAX14750) Not Connected
6	SDA	SDA	I ² C Serial Data Input/Output
7	SCL	SCL	I ² C Serial Clock Input
8	N.C.	LEN	(MAX14720) Not Connected (MAX14750) Linear Regulator Enable Input
9	MPC	BEN	(MAX14720) Multipurpose Control Input (MAX14750) Buck Regulator Enable
10	$\overline{\text{KOUT}}$	HVEN	(MAX14720) KEY Output (MAX14750) Buck-Boost Regulator Enable Input
11	$\overline{\text{KIN}}$	SWEN	(MAX14720) KEY Input (MAX14750) Power Switch Enable Input
12	GND	GND	Ground

Component Suppliers

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

Note: Indicate that you are using the MAX14750 when contacting these component suppliers.

Hardware Modification

Resistors R1 and R4–R9 are uninstalled by default. V_{CC} can be used to power the inputs of the four major blocks (LIN, BIN, HVIN, and SWIN) by populating R1, R5, R7, and R9 accordingly. The blocks can also be cascaded in any order by selectively populating R4, R6, R7, and R9.

The EV kit hardware is configured by default for the evaluation of the MAX14750. To evaluate the MAX14720, remove R2 and install a short at R3.

Table 2. Connector J2

PIN	SIGNAL	DESCRIPTION
1	LIN	LDO Input
2	BIN	Buck Regulator Input
3	HVIN	Buck-Boost Regulator Input (Must be connected to HVIN)
4	SWIN	Power Switch Input
5	LOUT	LDO Output
6	BOUT	Buck Regulator Output
7	HVOUT	Buck-Boost Regulator Output
8	SWOUT	Power Switch Output

Table 3. Connector J3

PIN	SIGNAL	DESCRIPTION
1	GND	Ground
2	N.C.	Not Connected
3	N.C.	Not Connected
4	VCC	Chip Power Input
5	N.C.	Not Connected
6	CAP	Internal Power Decoupling
7	N.C.	Not Connected
8	N.C.	Not Connected
9	N.C.	Not Connected
10	N.C.	Not Connected
11	N.C.	Not Connected
12	GND	Ground

Ordering Information

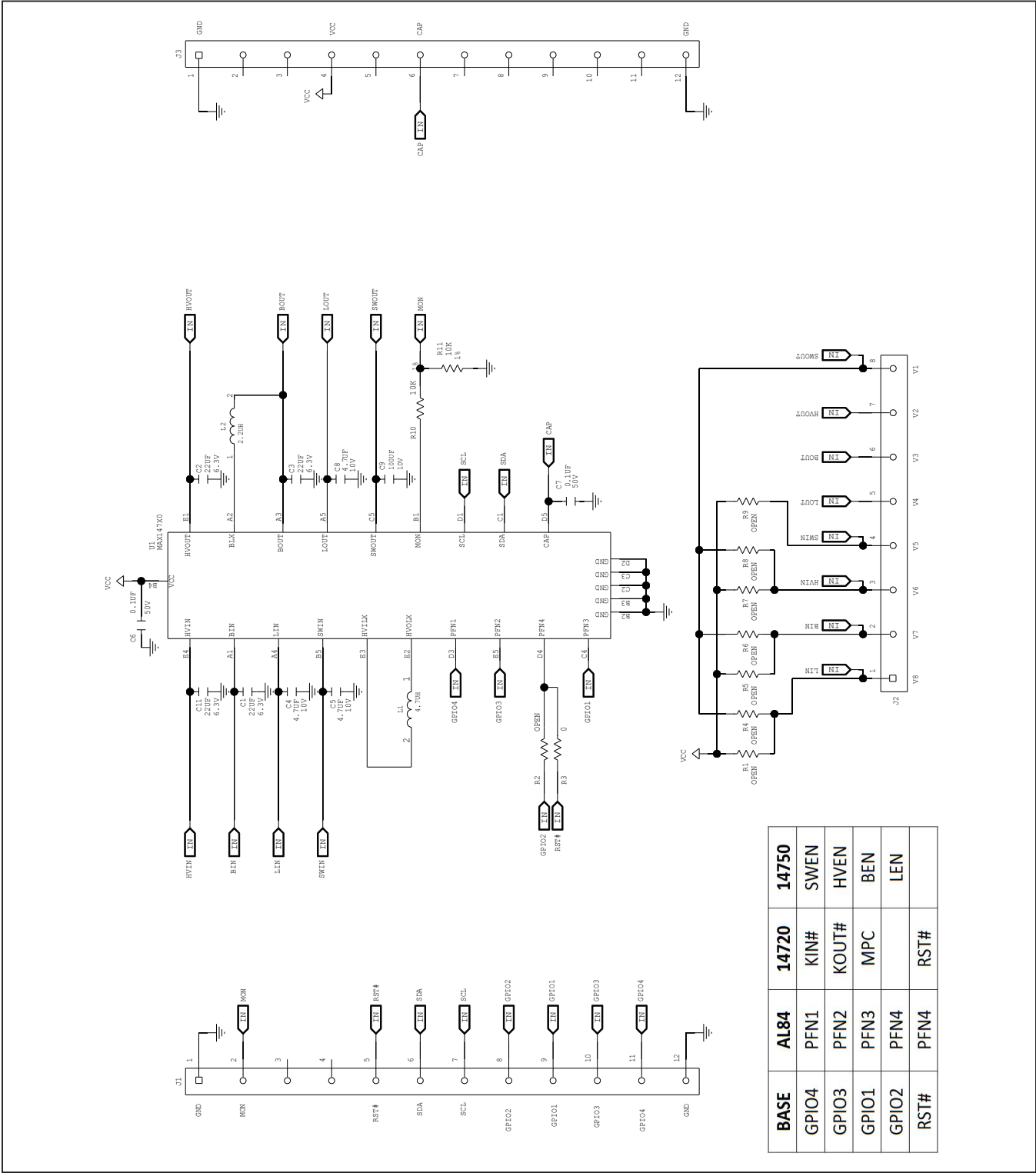
PART	TYPE
MAX14750EVKIT#	EV Kit

#Denotes RoHS compliant.

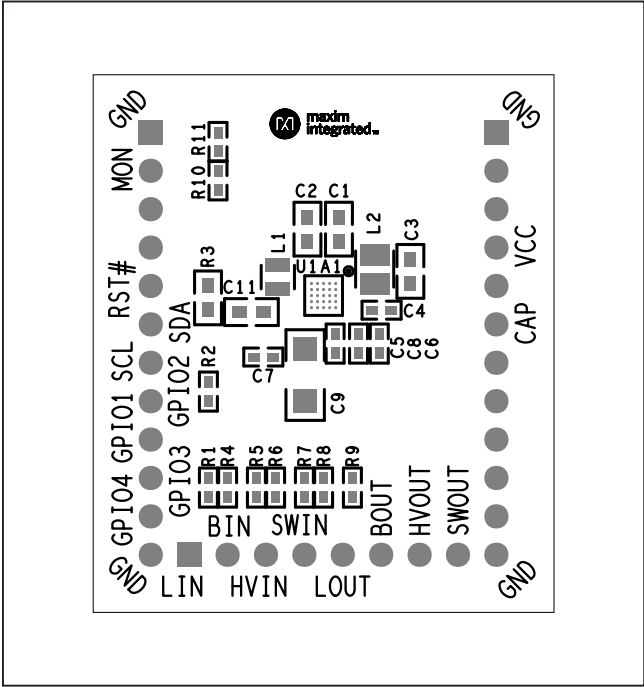
MAX14750 EV Kit Bill of Materials

ITEM	REF_DES	DNI/DNP	QTY	MFG PART #	MANUFACTURER	VALUE	DESCRIPTION	COMMENTS
1	C1-C3, C11	-	4	C1608X5R0J226M080AC	TDK	22 μ F	CAPACITOR; SMT (0603); CERAMIC CHIP; 22 μ F; 6.3V; TOL=20%; MODEL=C SERIES; TG=-55°C TO +85°C; TC=X5R	
2	C4, C5, C8	-	3	C1005X5R1A475M050BC	TDK	4.7 μ F	CAPACITOR; SMT (0402); CERAMIC CHIP; 4.7 μ F; 10V; TOL=20%; MODEL=C SERIES; TG=-55°C TO +85°C; TC=X5R	
3	C6, C7	-	2	C1005X5R1H104K050	TDK	0.1 μ F	CAPACITOR; SMT (0402); CERAMIC CHIP; 0.1 μ F; 50V; TOL=10%; MODEL=C SERIES; TG=-55°C TO +85°C; TC=X5R;	
4	C9	-	1	C3216X5R1A107M	TDK	100 μ F	CAPACITOR; SMT (1206); CERAMIC CHIP; 100 μ F; 10V; TOL=20%; MODEL=C SERIES; TG=-55°C TO +85°C; TC=X5R	
5	J1, J3	-	2	90120-0772	MOLEX	90120-0772	CONNECTOR; THROUGH HOLE; C-GRID III SINGLE ROW STRAIGHT PIN HEADER; GOLD PLATED CONTACT; STRAIGHT THROUGH; 12PINS	
6	J2	-	1	90120-0768	MOLEX	90120-0768	CONNECTOR; THROUGH HOLE; C-GRID III SINGLE ROW STRAIGHT PIN HEADER; GOLD PLATED CONTACT; STRAIGHT THROUGH; 8PINS	
7	L1	-	1	VLS201610ET-4R7M	TDK	4.7 μ H	INDUCTOR; SMT; WIREWOUND CHIP; 4.7 μ H; TOL=±20%; 0.72A	
8	L2	-	1	SRP2010-2R2M	BOURNS	2.2 μ H	INDUCTOR; SMT; POWDERED IRON CORE; 2.2 μ H; TOL=±20%; 1.7A	
9	R10, R11	-	2	CRCW040210K0FK; RC0402FR-0710K	VISHAY DALE; YAGEO PHICOMP	10K	RESISTOR; 0402; 10K; 1%; 100PPM; 0.0625W; THICK FILM	
10	R1, R3, R4-R9	DNP	0	N/A	N/A	OPEN	PACKAGE OUTLINE 0402 RESISTOR	
11	R2	-	0	RC1608J000CS; CR0603-J/-000ELF; RC0603JR-070RL	SAMSUNG ELECTRONICS/ BOURNS/YAGEO PH	0	RESISTOR; 0603; 0 OHM; 5%; JUMPER; 0.10W; THICK FILM	
12	U1	-	1	MAX14750AEWA+	MAXIM	MAX14750AEWA+	IC; MAX14750A; 25 WLP; PACKAGE CODE W252M2+1; 21-0788	
13	PCB	-	1	MAX14720	MAXIM	PCB	PCB Board:MAX14720 EVALUATION KIT	

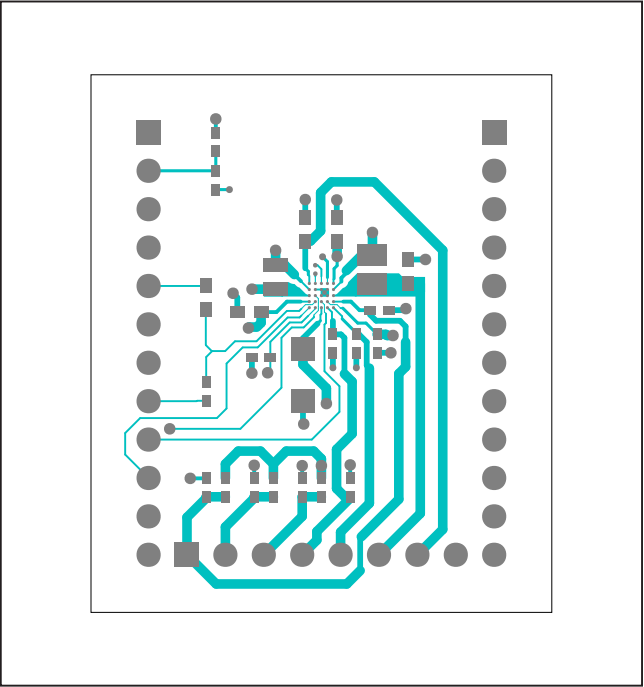
MAX14750 EV Kit Schematic



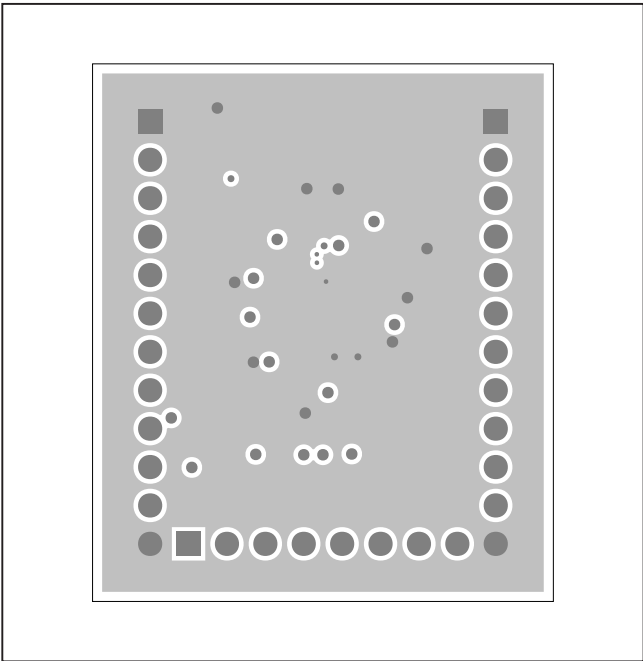
MAX14750 EV Kit PCB Layout



MAX14720/MAX14750 EV—Top Silkscreen

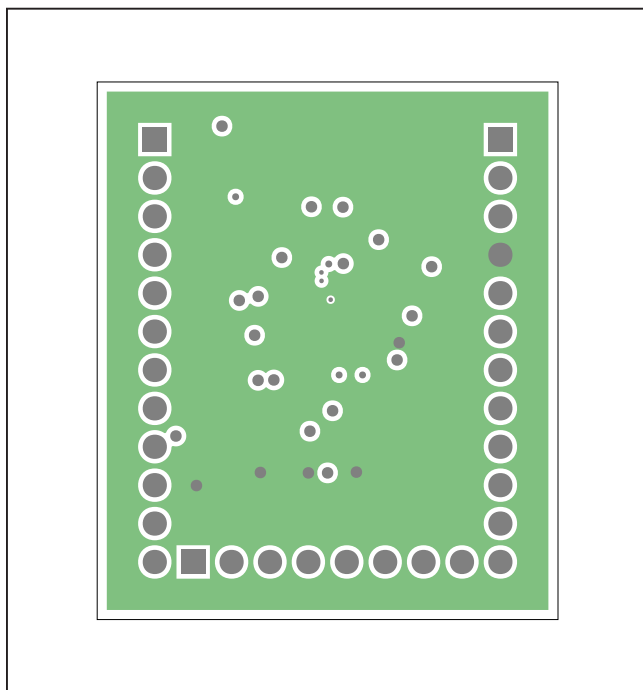


MAX14720/MAX14750 EV—Top

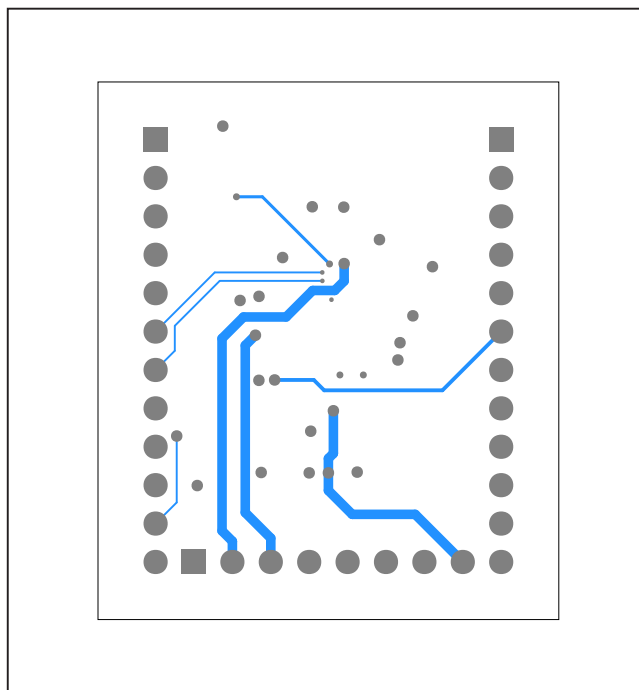


MAX14720/MAX14750 EV—Internal 2

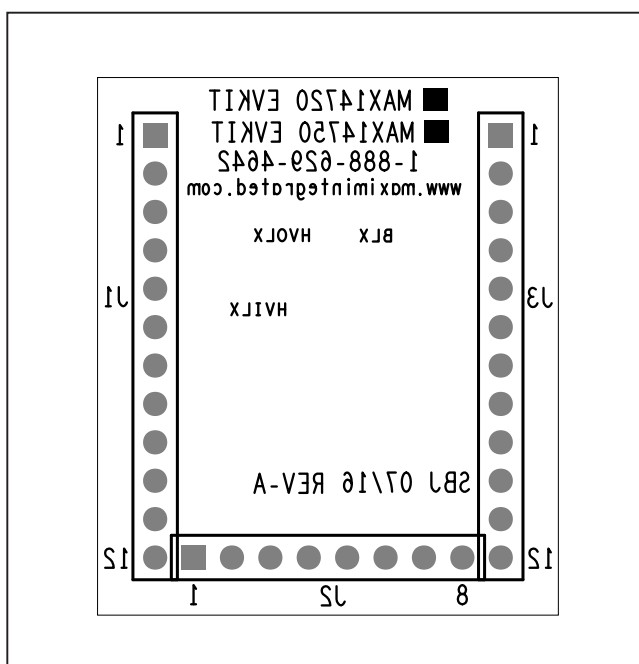
MAX14750 EV Kit PCB Layout (continued)



MAX14720/MAX14750 EV—Internal 3



MAX14720/MAX14750 EV—Bottom



MAX14720/MAX14750 EV—Bottom Silkscreen

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	10/16	Initial release	—
1	2/19	Added <i>Quick Start</i> section	1

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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