

MAX15108A Evaluation Kit

Evaluates: MAX15108A

General Description

The MAX15108A evaluation kit (EV kit) provides a proven design to evaluate the MAX15108A high-efficiency, 8A, step-down regulator with integrated switches in a 20-bump wafer-level package (WLP). The EV kit is preset for 1.5V output at load currents up to 8A from a 2.7V to 5.5V input supply. The device features a 1MHz fixed switching frequency, which allows the EV kit to achieve an all-ceramic capacitor design and fast transient responses.

Features

- Operates from a 2.7V to 5.5V Input Supply
- All-Ceramic Capacitor Design
- 1MHz Switching Frequency
- Output Voltage Range
 - 0.6V Up to $0.94 \times V_{IN}$ (Forced PWM)
- Enable Input/Power-Good Output
- Proven PCB Layout
- Fully Assembled and Tested

Ordering Information appears at end of data sheet.

Quick Start

Recommended Equipment

- MAX15108A EV kit
- 5V, 5A DC power supply
- Load capable of sinking 8A
- Digital voltmeter

Procedure

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

- 1) Connect the positive terminal of the 5V supply to the IN PCB pad and the negative terminal to the nearest PGND PCB pad.
- 2) Connect the positive terminal of the 8A load to the OUT PCB pad and the negative terminal to the nearest PGND PCB pad.
- 3) Connect the digital voltmeter across the OUT PCB pad and the nearest PGND PCB pad.
- 4) Verify that a shunt is installed on jumper JU1.
- 5) Turn on the DC power supply.
- 6) Enable the load.
- 7) Verify that the voltmeter displays 1.5V.

Detailed Description of Hardware

The MAX15108A EV kit provides a proven design to evaluate the MAX15108A high-efficiency, 8A, step-down regulator with integrated switches. The applications include distributed power systems, portable devices, and preregulators. The EV kit is preset for 1.5V output at load currents up to 8A from a 2.7V to 5.5V input supply. The device features a 1MHz fixed switching frequency, which allows the EV kit to achieve an all-ceramic capacitor design and fast transient responses. A placeholder for an input aluminum electrolytic capacitor (C22) is provided to damp the input if long wires are used; they are not required in a tight system design.

Soft-Start (SS)

The device utilizes an adjustable soft-start function to limit inrush current during startup. The soft-start time is adjusted by the value of C16, the external capacitor from SS to GND. By default, C16 is currently 0.033µF, which gives a soft-start time of approximately 2ms. To adjust the soft-start time, determine C16 using the following formula:

$$C16 = (10\mu A \times t_{SS}) / 0.6V$$

where t_{SS} is the required soft-start time in seconds and C16 is in farads.

An external tracking reference with steady-state value between 0 and $V_{IN} - 1.5V$ can be applied to SS. Refer to the *Programmable Soft-Start (SS)* section in the MAX15108A IC data sheet for a more detailed description.

Setting the Output Voltage

The EV kit can be adjusted from 0.6V up to $0.94 \times V_{IN}$ (forced PWM) by changing the values of resistors R1 and R2. To determine the value of the resistor-divider, first select R2 between 1kΩ and 20kΩ. Then use the following equation to calculate R1:

$$R1 = R2 [(V_{OUT}/V_{FB}) - 1]$$

where V_{FB} is the feedback threshold voltage ($V_{FB} = 0.6V$) and V_{OUT} is the desired output.

When R1 is changed, compensation components C14, R3, and C15 must be changed to ensure loop stability. Refer to the *Compensation Design Guidelines* section in the MAX15108A IC data sheet.

Regulator Enable (EN)

The device features a regulator enable input. For normal operation, a shunt should be installed on jumper JU1. To disable the output, remove the shunt on JU1 and the EN pin will be pulled to PGND through resistor R4. See [Table 1](#) for JU1 settings.

Table 1. Regulator Enable (EN) Jumper JU1 Description

SHUNT POSITION	EN PIN	DEVICE OUTPUT
Installed*	Connected to IN	Enabled
Not installed	Pulled to PGND through R4	Disabled

*Default position.

MAX15108A EV Kit Bill of Materials

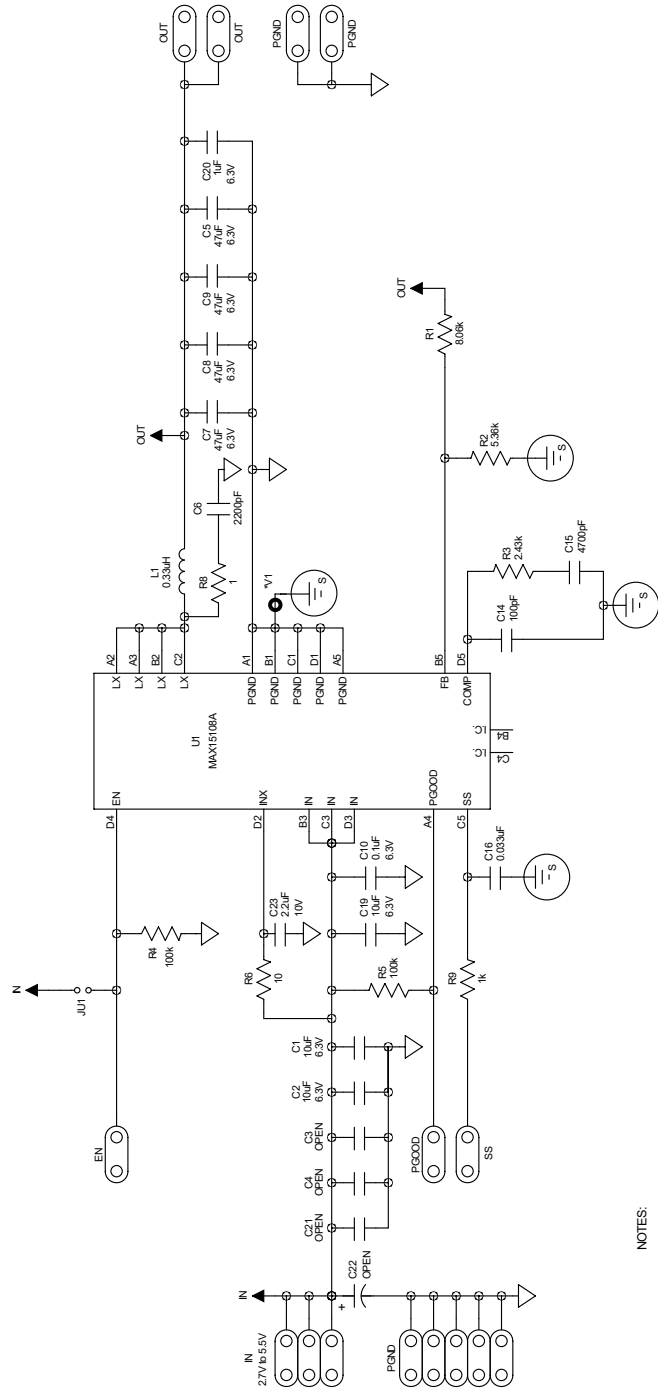
QTY	Reference Designators	Description	Manufacturer Part Number
3	C1, C2, C19	CAP, 10UF, 6.3V, 10%, X5R, CER, 0603	Murata GRM188R60J106K
0	C3, C4, C21	CAP, 0603, not installed	
4	C5, C7, C8, C9	CAP, 47UF, 6.3V, 20%, X5R, CER, 1206	Murata GRM31CR60J476M
1	C6	CAP, 2200PF, 50V, 10%, X7R, CER, 0603	TDK C1608X7R1H222K
1	C10	CAP, 0.1UF, 50V, 10%, X7R, CER, 0603	Murata GRM188R70J104KA01
1	C14	CAP, 100PF, 50V, 5%, C0G, CER, 0603	Murata GRM1885C1H101J
1	C15	CAP, 4700PF, 50V, 10%, X7R, CER, 0603	Murata GRM1885C1H101J
1	C16	CAP, 0.033UF, 16V, 10%, X7R, CER, 0603	Murata GRM188R71C333K
1	C20	CAP, 1UF, 6.3V, 10%, X7R, CER, 0603	Murata GRM188R70J105K
0	C22	CAP, 220µF, 10V, 20%, aluminum electrolytic capacitor (6.3mm x 7.7mm)	Panasonic EEE1AA221XP
1	C23	CAP, 2.2UF, 10V, 10%, X7R, CER, 0603	Murata GRM188R71A225K
1	JU1	HEADER 36-40 PINS (CUT TO FIT)	SULLINS PEC36SAAN
1	L1	INDUCTOR, 0.33UH, 20%, 18A	Vishay IHLP2525BDERR33M01
1	R1	RES, 8.06KOHM 1% 0603	any
1	R2	RES, 5.36KOHMS, 1%, 0603	any
1	R3	RES, 2.43K OHMS 1% 0603	any
2	R4, R5	RES, 100K OHMS, 5% 0603	any
1	R6	RES, 10 OHMS, 5% 0603	any
1	R8	RES, 1OHM, 1% 0805	IRC LVC-LVC0805LF-1R00-F
1	R9	RES, 1KOHM, 5% 0603	any
1	U1	WLP HC, W202D2Z+1	Maxim MAX15108AEWP+
2		SHUNT SHORTING JUMPER	SULLINS STC02SYAN

Component Suppliers

SUPPLIER	PHONE	WEBSITE
Murata Americas	770-436-1300	www.muratamericas.com
Taiyo Yuden	800-348-2496	www.t-yuden.com
TDK Corp.	847-803-6100	www.component.tdk.com
Vishay	402-563-6866	www.vishay.com

Note: Indicate that you are using the MAX15108A when contacting these component suppliers.

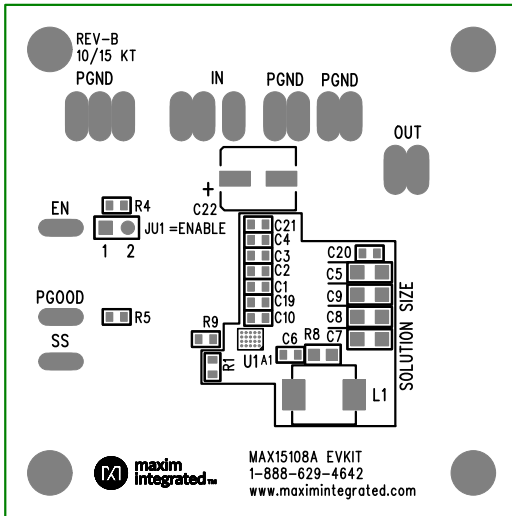
MAX15108A EV Kit Schematic



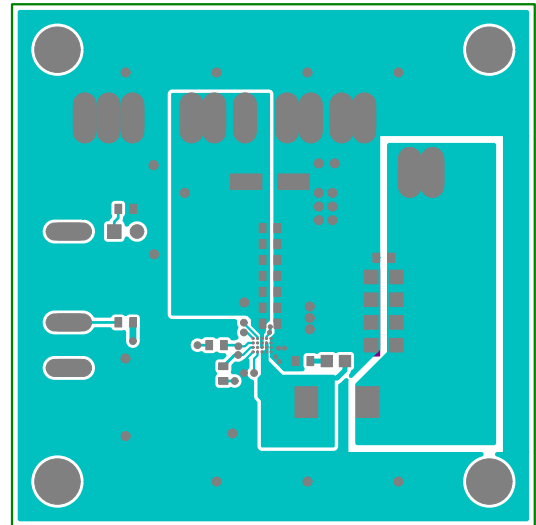
- NOTES:
- ▶ POWER GND (PGND)
TOP LAYER FLOOD, SYSTEM GND
 - ⊖ SMALL SIGNAL GND (SGND)

* VIA "V1" MUST ONLY CONNECT TO U1 SIDE GND. (NOT L2,3 BOTTOM LAYER)
REQUEST THICKEST COPPER POSSIBLE ON THE TOP LAYER

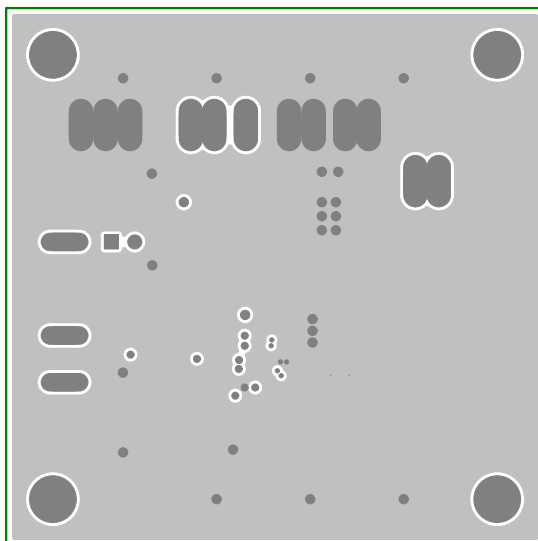
MAX15108A EV Kit PCB Layout Diagrams



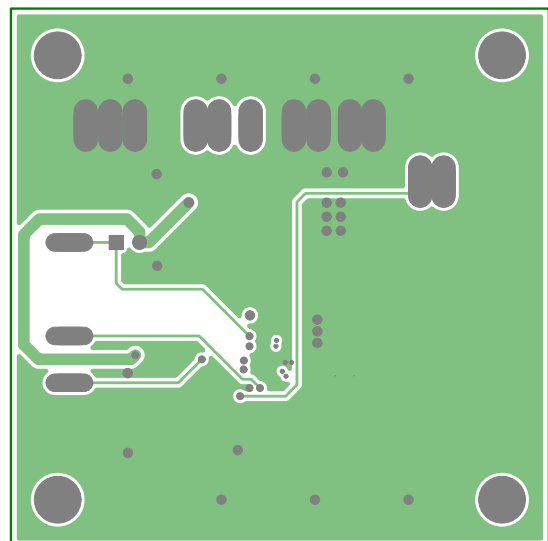
MAX15108A EV Kit—Top Silkscreen



MAX15108A EV Kit—Component Side

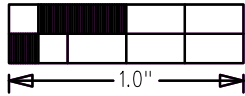
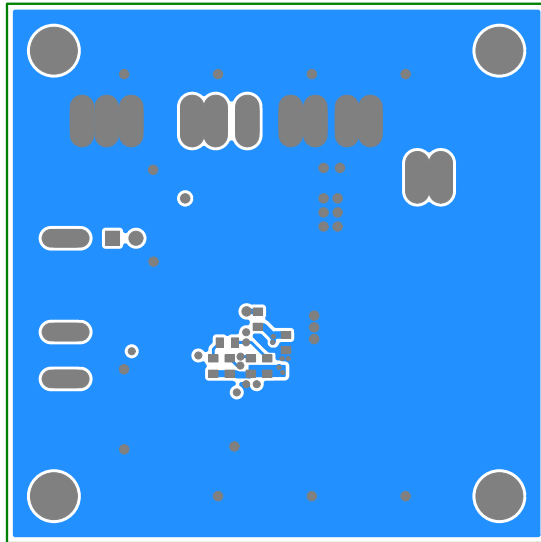


MAX15108A EV Kit—Layer 2 PGND

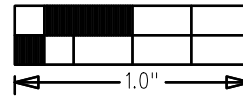
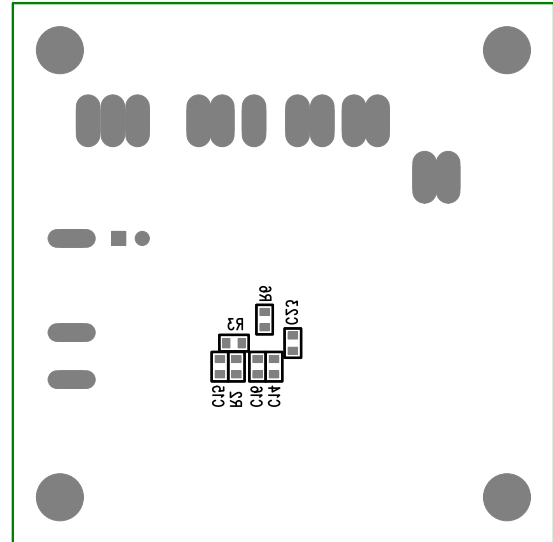


MAX15108A EV Kit—Layer 3 PGND/Signal

MAX15108A EV Kit PCB Layout Diagrams



MAX15108A EV Kit—Solder Side



MAX15108A EV Kit—Bottom Silkscreen

Ordering Information

PART	TYPE
MAX15108EVKIT#	EV Kit

#Denotes RoHS compliant.

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	7/16	Initial release	—
1	8/18	Updated <i>Bill of Materials</i>	3

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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