



MAX1510 Evaluation Kit

Evaluates: MAX1510

General Description

The MAX1510 evaluation kit (EV kit) is a fully assembled and tested surface-mount circuit board that contains the MAX1510, a low-voltage linear regulator for DDR memory termination. The low-voltage linear regulator provides a variable 0.5V to 1.5V output voltage range. The EV kit requires a 1.1V to 3.6V input voltage source, and a 3.3V low-power biasing supply. The EV kit is capable of sourcing or sinking up to 1.5A continuous.

Component List

DESIGNATION	QTY	DESCRIPTION
C1	1	220 μ F \pm 20%, 10V polymer capacitor (D4) Sanyo 10TPB220M
C2	1	10 μ F \pm 20%, 6.3V X5R ceramic capacitor (0805) TDK C2012X5R0J106M
C3	1	1 μ F \pm 10%, 6.3V X5R ceramic capacitor (0603) TDK C1608X5R0J105K
C4	1	1000pF \pm 10%, 50V X7R ceramic capacitor (0603) TDK C1608X7R1H102K
C5	1	0.33 μ F \pm 10%, 6.3V X5R ceramic capacitor (0603) TDK C1608X5R0J334K
C6	1	100 μ F \pm 20%, 6.3V X5R ceramic capacitor (1210) TDK C3225X5R0J107M
C7–C11	0	Not installed, capacitors (0603)
JU1	1	3-pin header
JU2	1	2-pin header
R1, R2	2	10k Ω \pm 1% resistors (0603)
R3	1	100k Ω \pm 5% resistor (0603)
R4	0	Not installed, resistor (0603)
U1	1	MAX1510ETB (10-pin TDFN 3mm x 3mm)
None	2	Shunts
None	1	MAX1510 PC board

Features

- ◆ 0.5V to 1.5V Output Voltage Range
- ◆ Sources or Sinks Up to 1.5A Continuous
- ◆ 1.1V to 3.6V Input Voltage Range
- ◆ External Reference Input with \pm 5mA Reference Output Buffer
- ◆ Output Remote Sense
- ◆ Open-Drain, Power-Good Output Signal
- ◆ Low-Profile Surface-Mount Components
- ◆ Fully Assembled and Tested

Ordering Information

PART	TEMP RANGE	IC PACKAGE
MAX1510EVKIT	0°C to +70°C	10 TDFN

Quick Start

Recommended Equipment

- DC power supplies
(VCC) 3.3V, 100mA
(IN) 1.1V to 3.6V, 5A
- One voltmeter

Procedure

The MAX1510 EV kit is fully assembled and tested. Follow these steps to verify board operation. **Do not turn on the power supply until all connections are completed:**

- 1) Verify that a shunt is installed across pins 1 and 2 of jumper JU1 (EV kit ON).
- 2) Verify that a shunt is installed on jumper JU2 (REF_IN pad connected to IN pad).
- 3) Connect the positive terminal of the VCC power supply to the VCC pad. Connect the negative terminal of the VCC power supply to the PGND pad.
- 4) Connect the positive terminal of the IN power supply to the IN pad. Connect the negative terminal of the IN power supply to the PGND pad.

Component Suppliers

SUPPLIER	PHONE	FAX	WEBSITE
Sanyo Device (USA) Corp.	619-661-6322	619-661-1055	www.sanyodevice.com
TDK	847-803-6100	847-390-4405	www.component.tdk.com

Note: Indicate that you are using the MAX1510 when contacting these component suppliers.



For pricing, delivery, and ordering information, please contact Maxim/Dallas Direct! at 1-888-629-4642, or visit Maxim's website at www.maxim-ic.com.

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- 5) Turn on both power supplies.
- 6) Set the IN power supply to 2.5V.
- 7) Set the VCC power supply to 3.3V.
- 8) Verify that the output (OUT) is between 1.235V and 1.265V.
- 9) Verify that the output reference (REFOUT) is between 1.24V and 1.26V.
- 10) Verify that power-good (PGOOD) is 3.3V.

Detailed Description

The MAX1510 EV kit contains a low-voltage linear regulator. The regulator delivers an accurate output voltage in the 0.5V to 1.5V range, and an input voltage in the 1.1V to 3.6V range. The control circuitry and the two internal n-channel MOSFETs of the MAX1510 operate from a separate 3.3V bias power supply.

REFIN (REF_IN Pad)

The MAX1510 REFIN pin accepts an external reference voltage and regulates the output sense voltage (OUTS) to the voltage at REFIN. As configured, the REFIN pin is one-half the voltage of the REF_IN pad. This voltage is set by resistors R1 and R2.

Remote Sensing (OUTS)

The MAX1510 output voltage can be sensed remotely using the OUTS pad. The OUTS pad is directly connected to the MAX1510 OUTS pin. The MAX1510 regulates the OUTS voltage to the REFIN voltage. To adjust the remote-sense point, cut open the PC board trace between resistor R4 pads, and connect the OUTS pad to the load.

Local Sensing (Internal)

The MAX1510 contains an internal 12k Ω resistor between OUT and OUTS. This feature provides a local output sensing, preventing output failure in the event OUTS is disconnected or improperly soldered.

REFOUT

The EV kit provides a buffered output reference voltage at the REFOUT pad. The REFOUT pin voltage is internally set equal to the REFIN pin voltage of the MAX1510 IC. As configured, the REFOUT voltage is one-half the voltage connected to the REF_IN pad. REFOUT is active when the voltage at REFIN > 0.45V and VCC > 2.65V. REFOUT is independent of the shutdown mode.

PGOOD

The MAX1510 features an open-drain signal at the PGOOD pin, which outputs a logic-low signal when the output is out of regulation or when the EV kit is in shutdown mode. A PGOOD pad is provided for interfacing to this signal. The pullup resistor R3 connected between PGOOD and VCC provides a 3.3V logic-level output signal.

Output Capacitors (C7–C10)

The output capacitors C7–C10 on the EV kit simulate the decoupling capacitors located close to the DDR memory socket. These capacitors are not required for stable output-voltage regulation.

Jumper Selection

Shutdown (SHDN)

The MAX1510 EV kit features a shutdown mode that reduces the MAX1510 quiescent current to 350 μ A (typ). Jumper JU1 selects the shutdown mode for the MAX1510. Table 1 lists the selectable jumper options.

Table 1. Jumper JU1 Functions

SHUNT LOCATION	SHDN PIN	EV KIT STATUS
1-2 (Default)	Connected to VCC	OUT Enabled
2-3	Connected to GND	OUT Disabled

Note: REFOUT is independent of the shutdown mode and is active when the voltage at REFIN > 0.45V and VCC > 2.65V.

Output-Voltage Regulation Selection

The MAX1510 EV kit's output voltage can be regulated by an external reference voltage connected to the REF_IN pad, or by the input voltage connected to the IN pad. Jumper JU2 provides an option to select the EV kit's output-voltage regulating source. Table 2 lists the selectable jumper options.

Table 2. Jumper JU2 Functions

SHUNT LOCATION	REF_IN PAD	MAX1510 EV KIT OUTPUT VOLTAGE
Installed (Default)	Connected to IN	Regulates to 0.5 x IN pad voltage
None	Connected to external reference source	Regulates to 0.5 x REF_IN pad voltage

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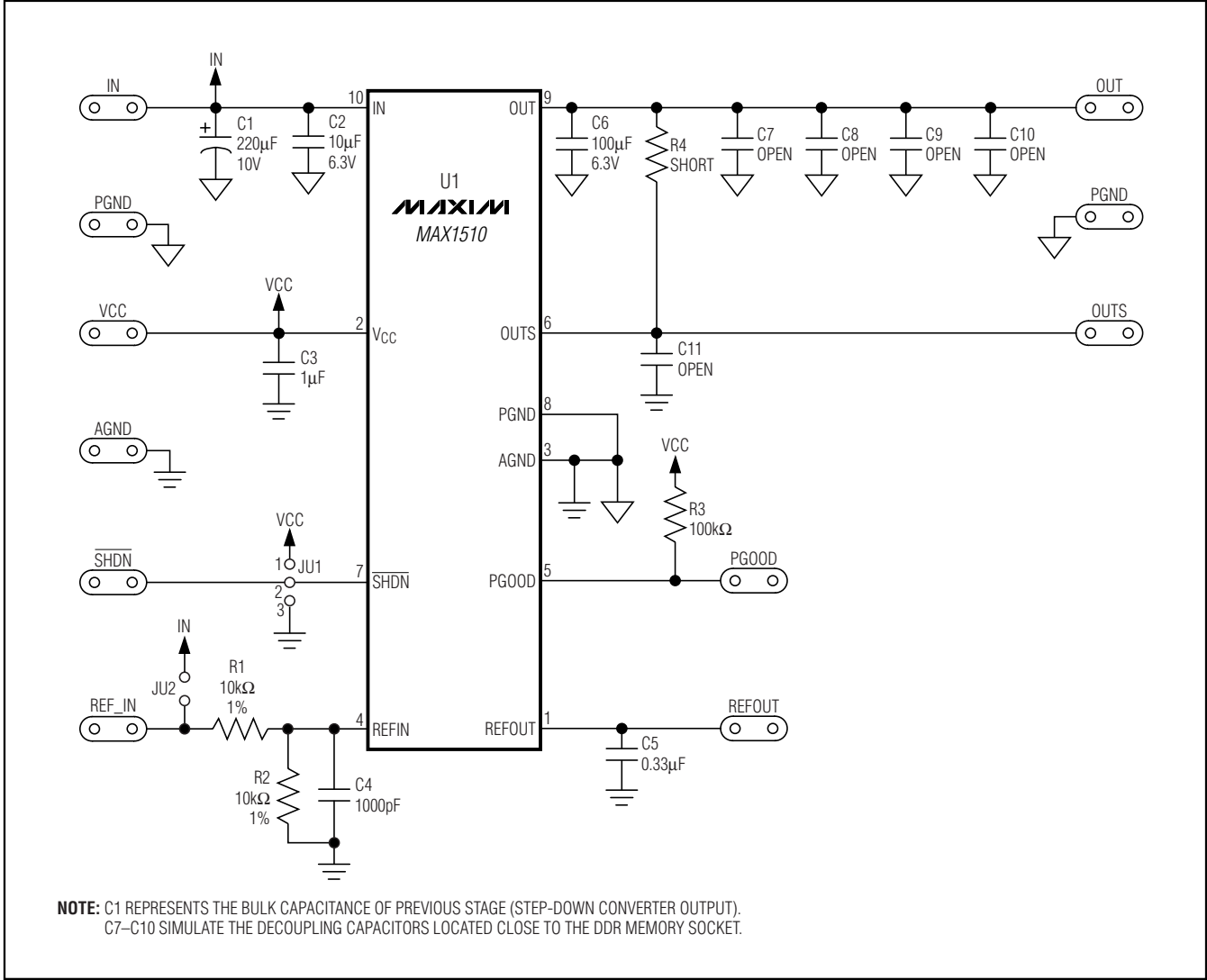


Figure 1. MAX1510 EV Kit Schematic

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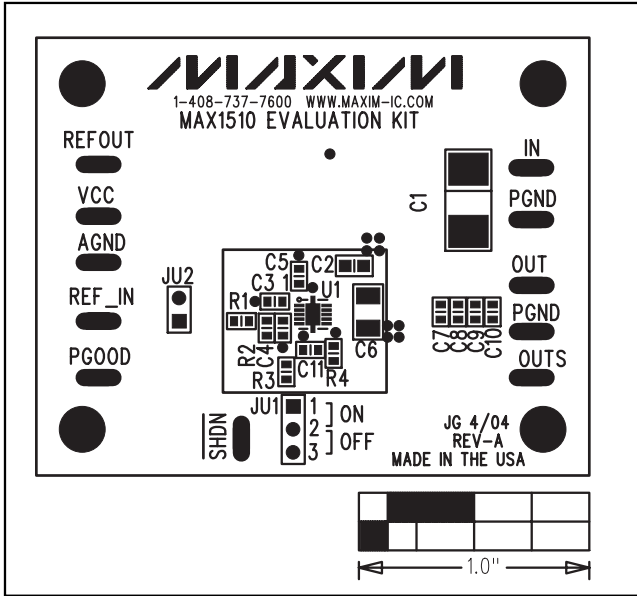


Figure 2. MAX1510 EV Kit Component Placement Guide—Component Side

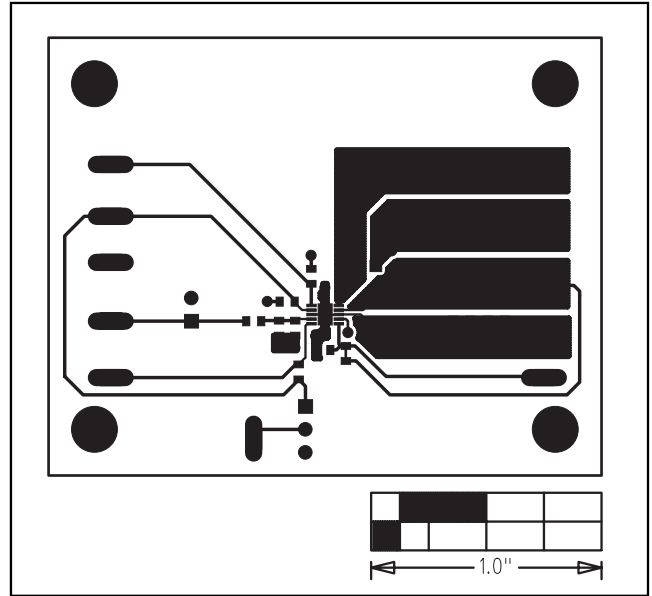


Figure 3. MAX1510 EV Kit PC Board Layout—Component Side

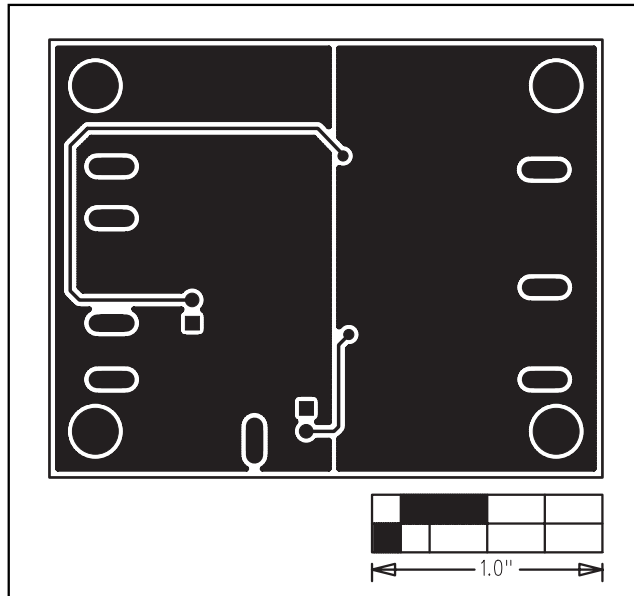


Figure 4. MAX1510 EV Kit PC Board Layout—Solder Side

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