19-2271; Rev 0; 1/02

MAXIM

MAX1896 Evaluation Kit

Evaluates: MAX1896

General Description

The MAX1896 evaluation kit (EV kit) is a fully assembled and tested surface-mount circuit board that contains a fixed-frequency 1.4MHz, pulse-width-modulated (PWM), step-up DC-DC converter. The EV kit provides a 12.0V output voltage from a 2.5V to 5.5V input source. It delivers up to 100mA output current.

The EV kit provides low quiescent current and high efficiency. It can also be used to evaluate other output voltages from VIN voltage up to 13.0V by changing the feedback resistors, R1 and R2.

Features

- **2.5V to 5.5V Input Voltage Range**
- **Output Voltage**
  Fixed 12.0V
  Adjustable Output (From VIN to 13.0V)
- **Up to 100mA Output Current**
- **1.4MHz Fixed-Frequency PWM Operation**
- **0.01µA IC Shutdown Current**
- **Surface-Mount Components**
- **Fully Assembled and Tested**

Ordering Information

PART	TEMP RANGE	IC PACKAGE
MAX1896EVKIT	0°C to +70°C	6 SOT23-6

Component List

DESIGNATION	QTY	DESCRIPTION
C1	1	10µF, 10.0V tantalum capacitor (A) AVX TAJA106K010
C2	1	4.7µF, 16.0V, X5R ceramic capacitor (1206) Taiyo Yuden EMK316BJ475ML
C3	1	0.1µF, 16.0V, X7R ceramic capacitor (0603) Taiyo Yuden EMK107BJ104KA
C4	1	100pF, 50.0V ceramic capacitor (0603) Taiyo Yuden UMK107CH101JZ or Murata GRM39C0G101J050AD
C5	1	0.033µF, 16.0V, X7R ceramic capacitor (0603) Taiyo Yuden EMK107BJ333KA or equivalent

DESIGNATION	QTY	DESCRIPTION
L1	1	10µH inductor Sumida CR43-100MC
D1	1	1A, 30.0V Schottky diode Toshiba CRS02 or Nihon EP10QY03
JU1	1	3-pin header
R1	1	107kΩ ±1% resistor (0603)
R2	1	12.4kΩ ±1% resistor (0603)
R3	1	10kΩ ±5% resistor (0603)
U1	1	MAX1896EUT (SOT23-6) top mark AAUX
None	1	Shunt
None	1	MAX1896 PC board
None	1	MAX1896 EV kit data sheet
None	1	MAX1896 data sheet

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.

Component Suppliers

SUPPLIER	PHONE	FAX	WEBSITE
AVX	843-946-0238	843-626-3123	www.avxcorp.com
Murata	770-436-1300	770-436-3030	www.murata.com
Nihon	81-33343-3411	81-33342-5407	www.niec.co.jp
Sumida	847-545-6700	847-545-6720	www.sumida.com
Taiyo Yuden	800-348-2496	847-925-0899	www.t-yuden.com
Toshiba	949-455-2000	949-859-3963	www.toshiba.com

Note: *Please indicate that you are using the MAX1896 when contacting these component suppliers.*

Quick Start

The MAX1896 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 the shunt is across jumper JU1 ($\overline{SHDN}$) pins 1 and 2.
2) Connect a voltmeter and load (if any) to the VOUT pad. Connect the load and voltmeter ground to the GND pad closest to VOUT.
3) Connect a 2.5V to 5.5V power supply to the VIN pad. Connect the power-supply ground to the GND pad closest to VIN.
4) Turn on the power supply and verify that the output voltage is 12.0V.

To evaluate other output voltages, see the *Evaluating Other Output Voltages* section.

Detailed Description

Shutdown Jumper Selection

The MAX1896 EV kit features a shutdown mode that reduces quiescent current to 0.01µA (typ) to preserve battery life. JU1 options select the circuit operating modes (shutdown or normal). Table1 shows JU1 functions.

Soft-Start Control

The MAX1896 EV kit uses a 0.033µF ceramic capacitor (C5) for soft-start control. The full-load current limit will be reached after about 8.25ms. To change the soft-start duration, replace the soft-start capacitor C5, so C5 (µF) = desired soft-start duration (ms) / 250 (ms/µF). For no soft-start operation, remove C5 and leave the SS pin open.

Evaluating Other Output Voltages

The EV kit default output voltage is 12.0V. The output voltage can also be adjusted from VIN to 13.0V by selecting R1 and R2 values. Choose R2 between 10kΩ and 50Ω:

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

where V_{FB} = 1.24V.

Table 1. Jumper JU1 Functions

SHUNT LOCATION	$\overline{SHDN}$ PIN	MAX1896 OUTPUT
1 and 2	Connected to VIN	MAX1896 enabled, VOUT = 12.0V
2 and 3	Connected to GND	Shutdown mode, VOUT = VIN - Forward Diode Voltage Drop
None	Connected to $\overline{SHDN}$ pad (driven by external source)	MAX1896 output depends on external $\overline{SHDN}$ signal

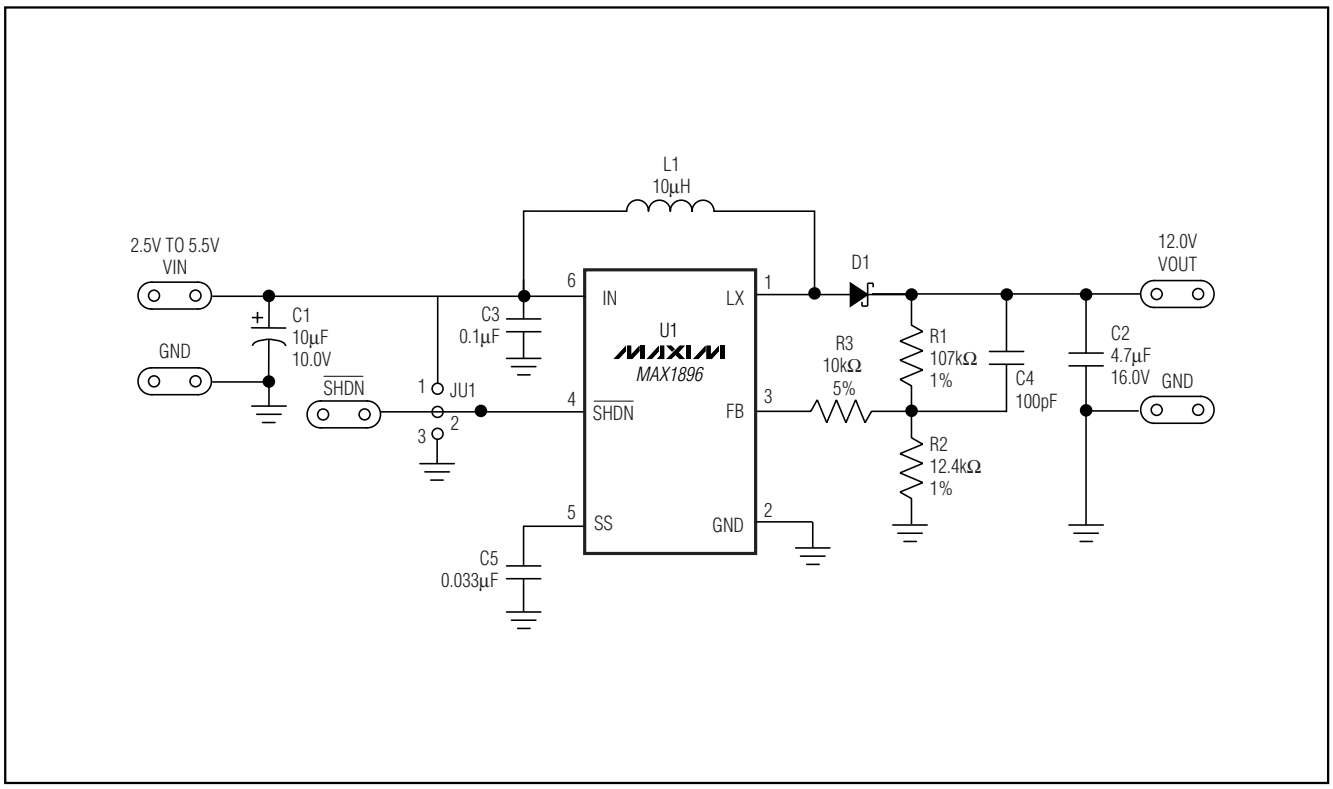


Figure 1. MAX1896 EV Kit Schematic

MAX1896 Evaluation Kit

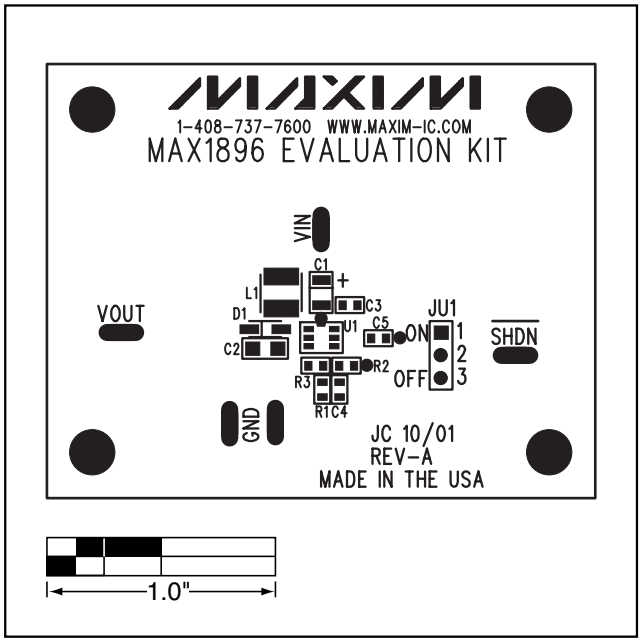


Figure 2. MAX1896 EV Kit Component Placement Guide—Component Side

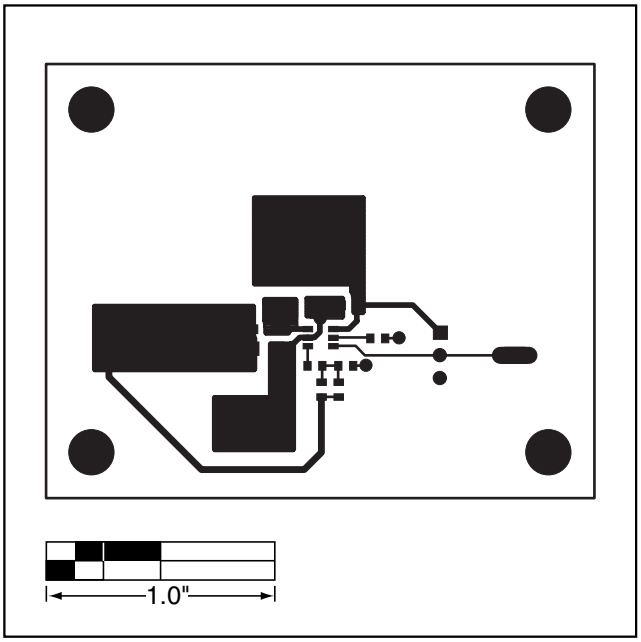


Figure 3. MAX1896 EV Kit PC Board Layout—Component Side

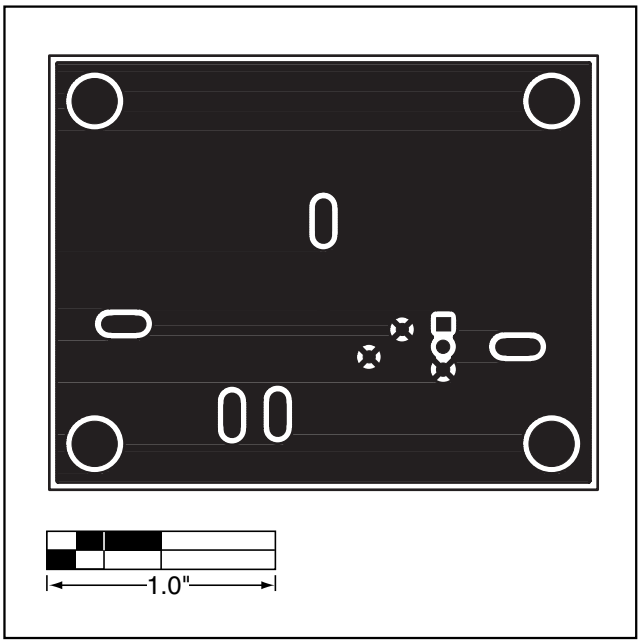


Figure 4. MAX1896 EV Kit PC Board Layout—Solder Side

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