

Evaluates: MAX830-MAX833

MAXIM

MAX831 Evaluation Kit

General Description

The MAX831 evaluation kit (EV kit) provides a regulated 5.0V output voltage while operating on input voltages from 8.0V to 30V. It drives loads up to 1A with conversion efficiency greater than 80%.

The MAX831 EV kit is a fully assembled and tested surface-mount printed circuit board. This kit comes with a 5V-output MAX831 IC, but it can also be used to evaluate the MAX833 (3.0V output), MAX832 (3.3V output), or MAX830 (adjustable output). Additional pads are provided on the board's solder side to accommodate the external feedback resistors used with the MAX830.

Component List

| DESIGNATION | QTY | DESCRIPTION |
|-------------|-----|---|
| C1, C2 | 2 | 33 μ F, 35V, low-ESR tantalum capacitor Sprague 595D336X0035R2B |
| C3, C4 | 2 | 220 μ F, 10V, low-ESR tantalum capacitor Sprague 595D227X0010R2B or AVX TPSE227M010R100 |
| C5 | 1 | 0.047 μ F ceramic capacitor |
| R1, R2, R3 | 0 | Open |
| R4 | 1 | 10k Ω , 5% resistor |
| D1 | 1 | 3A, 40V 1N5822 (SMT) Schottky diode Nihon NSQ03A04 Motorola MBR340T3 |
| L1 | 1 | 100 μ H, 1.3A inductor Coilcraft D03316-104 |
| U1 | 1 | Maxim MAX831CWE |
| J1 | 1 | 2-pin header |
| None | 1 | Shunt |
| None | 1 | MAX831 PC board |
| None | 1 | MAX831 data sheet |

Features

- ♦ 8V to 30V Input Voltage Range
- ♦ 5V Output Voltage
- ♦ Up to 1A Continuous Output Current
- ♦ 140 μ A Shutdown Supply Current
- ♦ 8mA Quiescent Current
- ♦ Internal Power Switch
- ♦ Adjustable Current Limit
- ♦ Surface-Mount Construction
- ♦ Fully Assembled and Tested

Ordering Information

| PART | TEMP. RANGE | PIN-PACKAGE |
|----------------|--------------|---------------|
| MAX831EVKIT-SO | 0°C to +70°C | Surface Mount |

Component Suppliers

| SUPPLIER | PHONE | FAX |
|-------------|----------------|----------------|
| AVX | (207) 282-5111 | (207) 283-1941 |
| Coilcraft | (708) 639-6400 | (708) 639-1469 |
| IRC | (704) 264-8861 | (704) 264-1972 |
| Motorola | (602) 244-3576 | (602) 244-4015 |
| Murata-Erie | (814) 237-1431 | (814) 238-0480 |
| Nihon | (805) 867-2555 | (805) 867-2556 |
| Sprague | (603) 224-1961 | (603) 224-1430 |

MAX831 Evaluation Kit

Quick Reference

The MAX831 EV kit is a fully assembled and tested surface-mount board. Follow the steps below to verify board operation. **Do not turn on the power supply until all connections are completed.**

- 1) Connect an 8V to 30V supply to the pad marked VIN. The ground connects to the GND pad.
- 2) Connect a voltmeter and load (if any) to the VOUT pad.
- 3) Remove the shunt on J1 for normal operation.
- 4) Turn on the power and verify that the output voltage is 5.0V.

Instructions for modifying the board for different output voltages appear in the sections *Evaluating the MAX832 and MAX833 and Other Output Voltages*.

Detailed Description

Jumper Selection

The two-pin header J1 selects the shutdown mode. Table 1 lists the jumper selectable options.

Table 1. Jumper J1 Functions

| SHUNT LOCATION | SHDN PIN | MAX831 OUTPUT |
|----------------|---------------------|--|
| OFF | Floating | MAX831 Enabled, V _{OUT} = 5.0V |
| ON | Connected to GND | Shutdown Mode, V _{OUT} = 0V |

Notes about Inductor Selection

The 100 μ H Coilcraft D03316-104 inductor that comes mounted with the EV kit has low resistance and a medium current rating (1.3A). It provides excellent performance over the line and load ranges of the MAX830/MAX831/MAX832/MAX833.

For additional information on inductor selection, refer to the MAX830–MAX833 data sheet.

Evaluating the MAX832 and MAX833

The MAX831 can be replaced by a MAX833 to generate a 3.0V output voltage with output current up to 1A, or by a MAX832 to generate a 3.3V output voltage with output current up to 1A. The only modification required is to replace the IC.

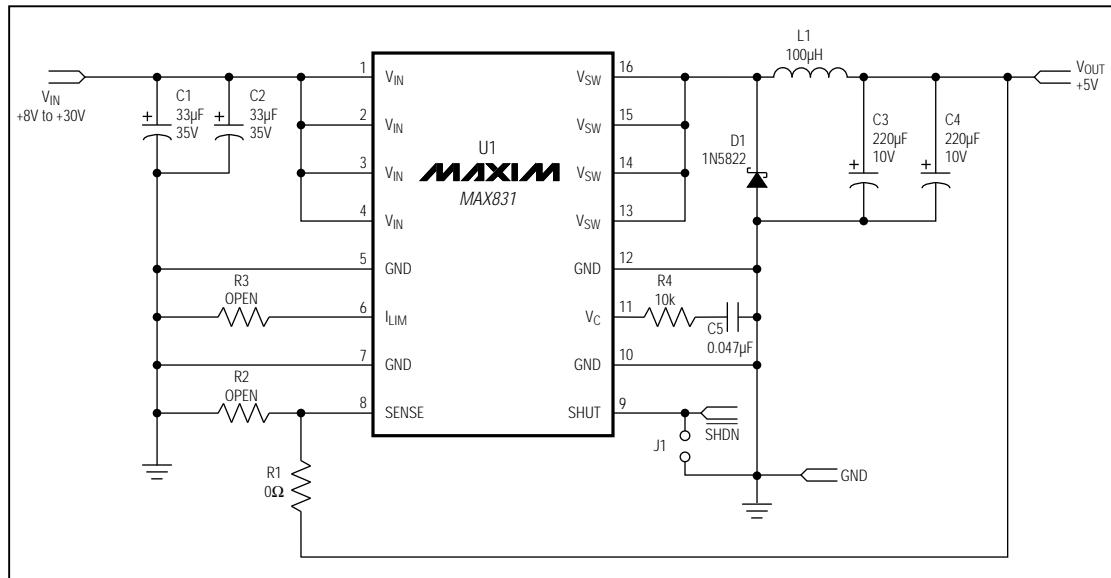


Figure 1. MAX831 EV Kit Schematic Diagram

MAX831 Evaluation Kit

Other Output Voltages

The MAX831 can be replaced with a MAX830 to generate output voltages in the 2.5V to 25V range using external resistors. Besides replacing the IC, the only other modifications required are to cut the trace shorting resistor R1, add the output-voltage-divider resistors R1 and R2 (located on the board's solder side), and **use low-ESR output capacitors with the proper voltage rating**. The *Pin Description* section of the MAX830-MAX833 data sheet gives instructions for calculating the values of external feedback resistors R1 and R2.

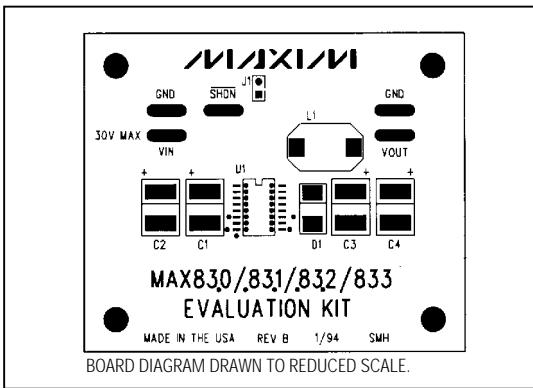


Figure 2. MAX831 EV Kit Component Placement Guide—Component Side

Reducing Current Limit

To reduce the output current to below 1A, or to reduce the peak current limit to below 1.3A, install the current-limiting resistor, R3, onto the board's solder side. See Note 7 in the MAX830-MAX833 data sheet for instructions on selecting the resistor value.

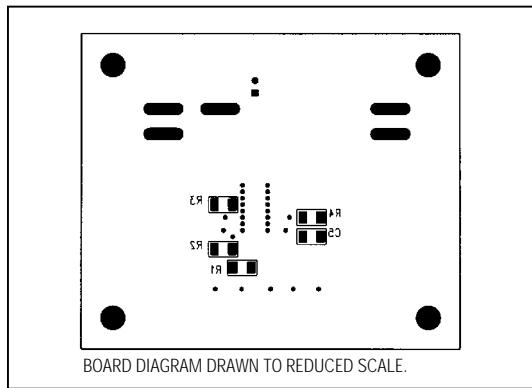


Figure 3. MAX831 EV Kit Component Placement Guide—Solder Side

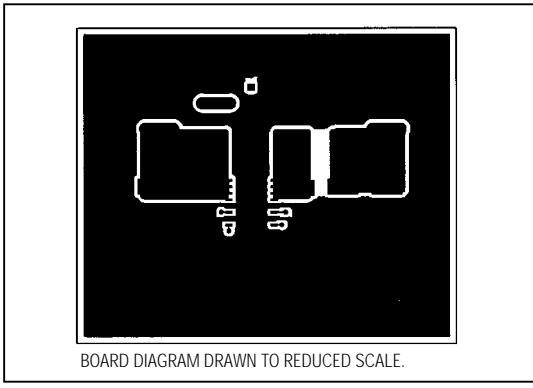


Figure 4. PC Board Layout—Component Side

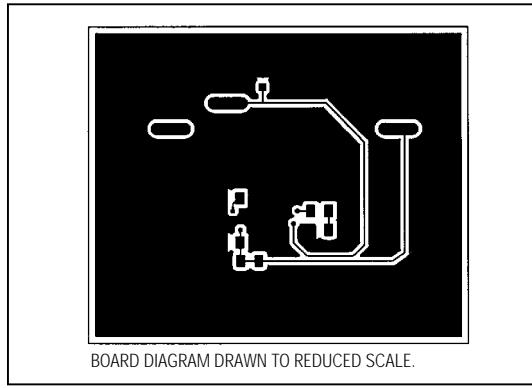


Figure 5. PC Board Layout—Solder Side

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