

# MAXIM

## MAX877 Evaluation Kit

MAX877 EV Kit

### General Description

The MAX877 evaluation kit (EV kit) provides a regulated 5V output voltage while operating from input voltages as low as 1V. The board is ideally suited for the 2.5V to 6.2V range of a three-cell to four-cell NiCd battery. It drives loads up to 210mA with greater than 80% conversion efficiency.

This EV kit is a fully assembled and tested surface-mount printed circuit board. Additional pads on the bottom of the board accommodate different size inductors or the external feedback resistors used with the MAX879.

The MAX877 EV kit comes with a MAX877CSA IC, but it can also evaluate the 3V/3.3V-output MAX878 or the adjustable-output MAX879. Simply use the MAX878CSA supplied with the kit, or order a free sample of the MAX879CSA to substitute for the MAX877CSA.

### EV Kit



### Component Suppliers

MANUFACTURER	PHONE	FAX
AVX	(800) 282-4975 (207) 282-5111	(207) 283-1941
CoilCraft	(708) 639-6400	(708) 639-1469
Coiltronics	(407) 241-7876	(407) 241-9339
Murata-Erie	(800) 831-9172	(814) 238-0490
Sprague	(603) 224-1961	(603) 224-1430
Sumida	(708) 956-0666	(708) 956-0702

### Features

- ♦ **Regulates as a Step-Up/Step-Down Converter**
- ♦ **1V to 6.2V Input Supply Range**
- ♦ **5V Output Voltage**
- ♦ **Up to 210mA Output Current**
- ♦ **20μA Shutdown Supply Current**
- ♦ **195μA Quiescent Current**
- ♦ **Internal 1A Power Switch and Active Rectifier**
- ♦ **Adjustable Current Limit Allows Low-Cost Inductors**
- ♦ **Surface-Mount Construction**
- ♦ **Fully Assembled and Tested**

### Ordering Information

PART	TEMP. RANGE	PIN-PACKAGE
MAX877EVKIT-SO	0°C to +70°C	Surface Mount

### Component List

DESIG-NATION	QTY	DESCRIPTION
C1, C3	2	100μF, 10V, low-ESR tantalum capacitors: Sprague 595D107X0010D7, AVX TP5D107M010R0100
C2, C4	0	Open
R1	1	10Ω resistor
R2, R3	0	Open
L1	1	22μH power inductor ( $I_{MAX} = 1.1A$ ): Sumida CD54-220, CoilCraft DO3316-223, Coiltronics CTX-20
U1	1	MAX877CSA (8-pin SO)
None	1	3-pin header
None	1	2-pin header
None	2	Shunt
None	1	2.00" x 2.00" PC board
None	1	MAX877 data sheet
<b>Additional Optional Components</b> (supplied, but not mounted)		
L2	1	22μH inductor (mounts on solder side): Sumida CDRH62-220 ( $I_{MAX} = 0.81A$ )
L1	1	22μH inductor: ( $I_{MAX} = 0.32A$ ) Murata-Erie LQH4N220K04M00
R1	1	300Ω resistor
R1	1	2000Ω resistor
U1	1	MAX878CSA (8-pin SO)

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Call toll free 1-800-998-8800 for free samples or literature.

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## Quick Start

The MAX877 EV kit is a fully assembled and tested surface-mount printed circuit board. Follow the steps below to verify board operation. **Do not turn on the power supply until all connections are completed.**

- 1) Connect a 2.5V to 6.2V 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) Place the shunt on JU1 across pins 2 & 3 for normal operation. JU2 does not matter for the MAX877.
- 4) Turn on the power and verify that the output voltage is 5.0V.
- 5) Instructions for modifying the board for different output voltages appear in the section *Evaluating the MAX878/MAX879*.

## Detailed Description

### Jumper Selection

The 3-pin header JU1 selects the shutdown mode. Table 1 lists the jumper selectable options.

**Table 1. Jumper JU1 Functions**

SHUNT LOCATION	SHDN PIN	MAX877 OUTPUT
2 & 3	Connected to VIN	MAX877 Enabled, VOUT = 5.0V
1 & 2	Connected to GND	Shutdown Mode, VOUT = 0V

### Inductor Selection

The 22 $\mu$ H Sumida CD54-220 inductor that comes mounted with the EV kit has low resistance and a medium (1.1A) current rating. It provides excellent performance over the line and load ranges of the MAX877/MAX878/MAX879. A lower-profile 22 $\mu$ H Sumida inductor (CDRH62-220) with a current-limit resistor (R1 = 300 $\Omega$ ) can also be used in applications where height is more critical than efficiency. For ultra-small low-current applications, the 22 $\mu$ H Murata-Erie LQH4N220K04M00 inductor is a good choice. Its dimensions are 3.2 x 4.5 x 3.6mm, and it can be used for outputs in the 30mA range with a 2000 $\Omega$  current-limit resistor. Refer to Figure 1 for typical efficiency data.

The CDRH62-220 and LQH4N220K04M00 22 $\mu$ H inductors with current-limit resistors are supplied with the EV kit as optional components.

### Resistor Selection

On this EV kit, R1 of 10 $\Omega$  is included only as a place holder for other optional resistors included in the kit. For the default current limit of 1A, R1 would be a short connecting ILIM to VIN. For additional information on current-limit resistor selection, refer to the MAX877/MAX878/MAX879 data sheet.

### Evaluating the MAX878/MAX879

The MAX877 can be replaced with a MAX878 to generate a 3.0V or 3.3V output voltage (see Table 2). Besides replacing the IC, the only other modification required is to place the shunt on JU2 for a 3.3V output or remove the shunt for a 3.0V output.

The MAX877 can also be replaced with a MAX879 to generate output voltages in the 2.7V to 6.0V range using external resistors. Besides replacing the IC, the only other modifications required are to remove the shunt on JU2 and add the output voltage divider resistors R2 and R3 (located on the bottom of the board). The *Output Voltage Selection* section of the MAX877/MAX878/MAX879 data sheet gives instructions for calculating R2 and R3 values.

**Table 2. Jumper JU2 Functions for MAX878**

SHUNT LOCATION	FB PIN	MAX878 OUTPUT*
On	Connected to GND	VOUT = 3.3V
Off	Open	VOUT = 3.0V

\* Assuming that the MAX878 is not in shutdown mode.  
Note: JU2 has no effect when using the MAX877. For the MAX879, JU2 must be opened (removed) to use R2 and R3.

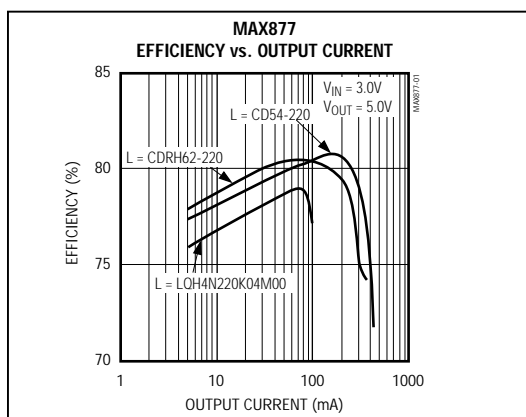


Figure 1. Typical Efficiencies for Different Inductor Choices

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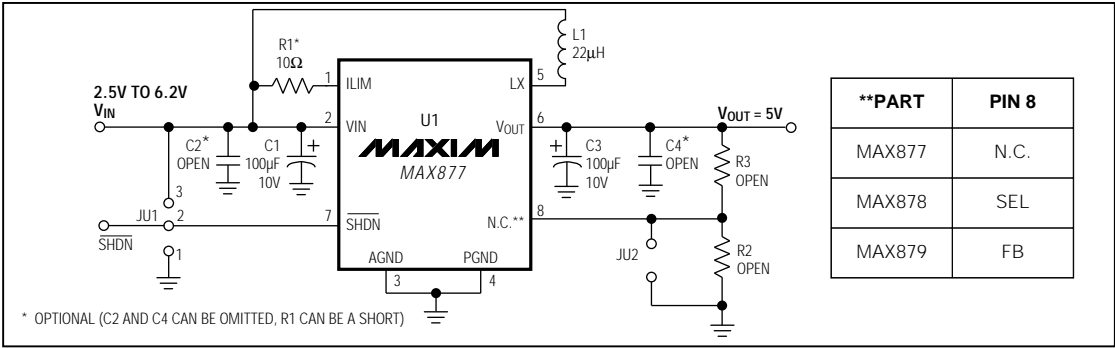


Figure 2. MAX877 EV Kit Schematic Diagram

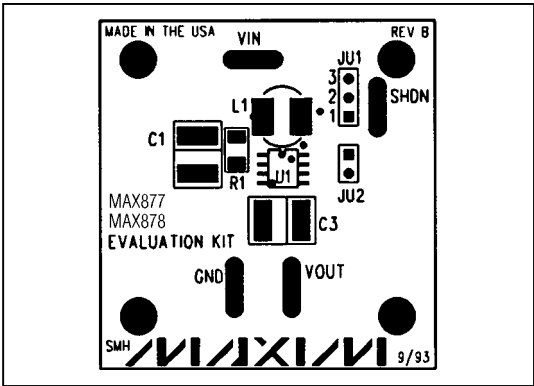


Figure 3. MAX877 EV Kit Component Placement Guide (Component Side)

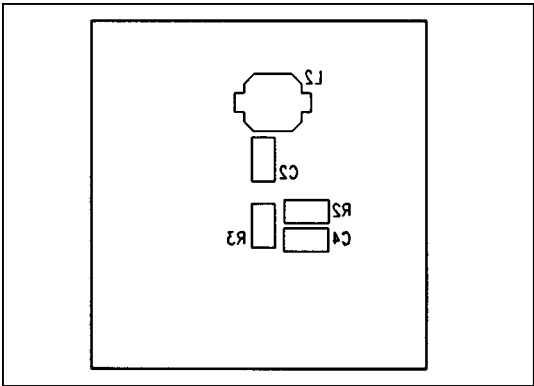


Figure 4. MAX877 EV Kit Component Placement Guide (Solder Side)

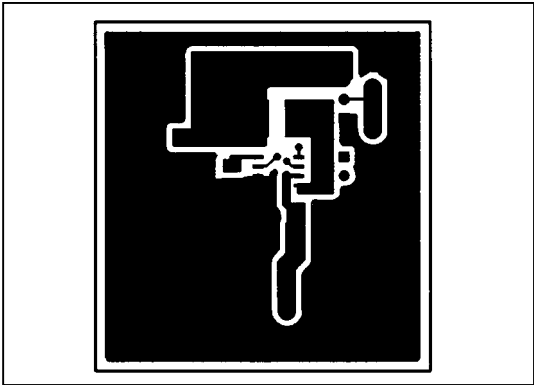


Figure 5. MAX877 EV Kit PC Layout (Component Side)

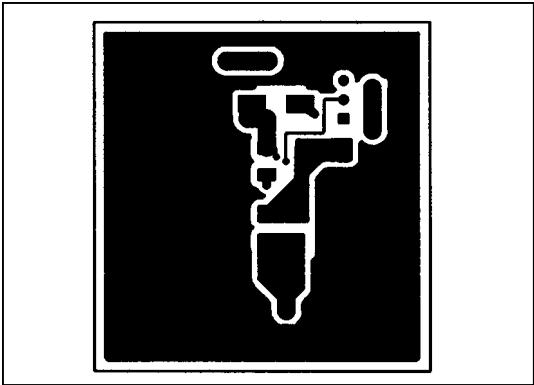


Figure 6. MAX877 EV Kit PC Layout (Solder Side)

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FAX NUMBERS:

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**Taiwan** (35) 777659

My end product is: \_ \_ \_ \_ \_

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