19-4408; Rev 0; 1/09

MAX16836 Evaluation Kit

General Description

The MAX16836 evaluation kit (EV kit) demonstrates a current-controlled, high-output-current LED driver based on the MAX16836 current regulator. The EV kit is capable of supplying regulated output currents of up to 350mA and runs at supply voltages between 6.5V to 40V.

The MAX16836 EV kit features a PWM dimming control, user-selectable three-level output-current setting, and a 5V regulated output, which supplies up to 4mA of output current. The MAX16836 EV kit also evaluates the MAX16835 IC; contact the factory for a free sample of the MAX16835 IC.

Features

- **6.5V to 40V Supply Voltage Range**
- **Selectable 150mA, 250mA, or 350mA Output Current**
- **5V Regulated Output with 4mA Source Capability**
- **Wide-Range Dimming Control with PWM**
- **Lead(Pb)-Free and RoHS Compliant**
- **Fully Assembled and Tested**

Ordering Information

PART	TYPE
MAX16836EVKIT+	EV Kit

+Denotes lead(Pb)-free and RoHS compliant.

Component List

DESIGNATION	QTY	DESCRIPTION
CS+, V5	2	Test points
C1, C2	2	0.1µF ±10%, 50V X7R ceramic capacitors (0603) Murata GRM188R71H104K TDK C1608X7R1H104K
JU1	1	2-pin header
JU2	1	3-pin header
R1	1	0.56Ω ±1%, 1/4W resistor (0805) Susumu RP2012T-R56-F

DESIGNATION	QTY	DESCRIPTION
R2	1	0.82Ω ±1%, 1/4W resistor (0805) Susumu RP2012T-R82-F
R3, R4	2	100kΩ ±5% resistors (0603)
U1	1	350mA adjustable high-brightness LED driver (16 TQFN) Maxim MAX16836ATE+
—	2	Shunts
—	1	PCB: MAX16836 Evaluation Kit+

Component Suppliers

SUPPLIER	PHONE	WEBSITE
Murata Electronics North America, Inc.	770-436-1300	www.murata-northamerica.com
Susumu International USA	208-328-0307	www.susumu-usa.com
TDK Corp.	847-803-6100	www.component.tdk.com

Note: *Indicate that you are using the MAX16836 when contacting these component suppliers.*

Quick Start

Recommended Equipment

Before beginning, the following equipment is needed:

- 0 to 30V or above, 0.5A power supply

Procedure

The MAX16836 EV kit is fully assembled and tested. Follow the steps below to verify board operation. **Caution: Do not turn on the power supply until all connections are completed.**

1) Connect a DC power supply (0 to 30V or above, 0.5A) to VIN.
2) Verify that a shunt is not installed across jumper JU1 to enable U1.
3) Verify that a shunt is installed across pins 1-2 of jumper JU2 to select 350mA output current.
4) Connect a 350mA-rated LED between LED+ and LED-.
5) Turn on the power supply and increase the input voltage to above 6.5V. The LED should glow with full brightness. Measure the LED current, which should be 350mA ±3.5%.
6) Increase the supply voltage and measure the LED current, which should be 350mA ±3.5%. Note that the maximum voltage drop between IN and OUT should be ~7V to limit the maximum power dissipation to approximately 2.5W.
7) Measure the voltage across V5, which should be 5V ±4%.

Detailed Description of Hardware

The MAX16836 EV kit demonstrates a high-output-current LED driver with accurate current control based on the MAX16836 current regulator. The MAX16836 EV kit is capable of supplying regulated output currents of up to 350mA and runs at supply voltages between 6.5V to 40V. If the supply voltage is above the LED operating voltage by more than 7V, the maximum output current should be limited to prevent the device from entering into thermal shutdown due to excessive power dissipation.

The MAX16836 EV kit features PWM dimming to control the LED brightness by varying the duty cycle of the PWM input signal. Users can select between three levels of output LED currents by setting jumper JU2 (see Table 1 for jumper settings). The MAX16836 EV kit also includes a connection for the 5V regulated output and access to the on-board current-sense resistor.

Output Current Setting

The output current can be adjusted by replacing resistors R2 or R3 with values calculated using the following equation:

$$R_{SENSE} = \frac{V_{SENSE}}{I_{LED}}$$

where R_{SENSE} is the external current-sense resistance between CS+ and GND, I_{LED} is the desired output current, and V_{SENSE} is 200mV (typ).

PWM Dimming

The PWM dimming controls the LED brightness by adjusting the duty cycle of the PWM input signal connected to the DIM input. A high at the DIM input turns on the output current and a low turns off the output current. Connect a signal with peak amplitude between 5V and 40V, frequency between 100Hz and 2kHz, and vary the duty cycle to adjust the LED brightness. LED brightness increases when duty cycle increases and vice versa. Duty cycle can be as low as 10% even at a PWM frequency of 2kHz.

5V Regulated Output

The 5V regulator can be used to power other components from the V5 test point. The 5V output supplies up to 4mA of current.

Jumper Selection

Two-pin jumper JU1 controls the EN pin of the MAX16836 and enables or disables the device. Three-pin jumper JU2 selects between three different output current settings. Table 1 lists the jumper options.

Table 1. Jumper JU1 and JU2 Functions

JUMPER	SHUNT POSITION AND FUNCTION		
	1-2 (installed)	2-3	Open
JU1	U1 disabled	—	U1 enabled*
JU2	350mA*	250mA	150mA

**Default position.*

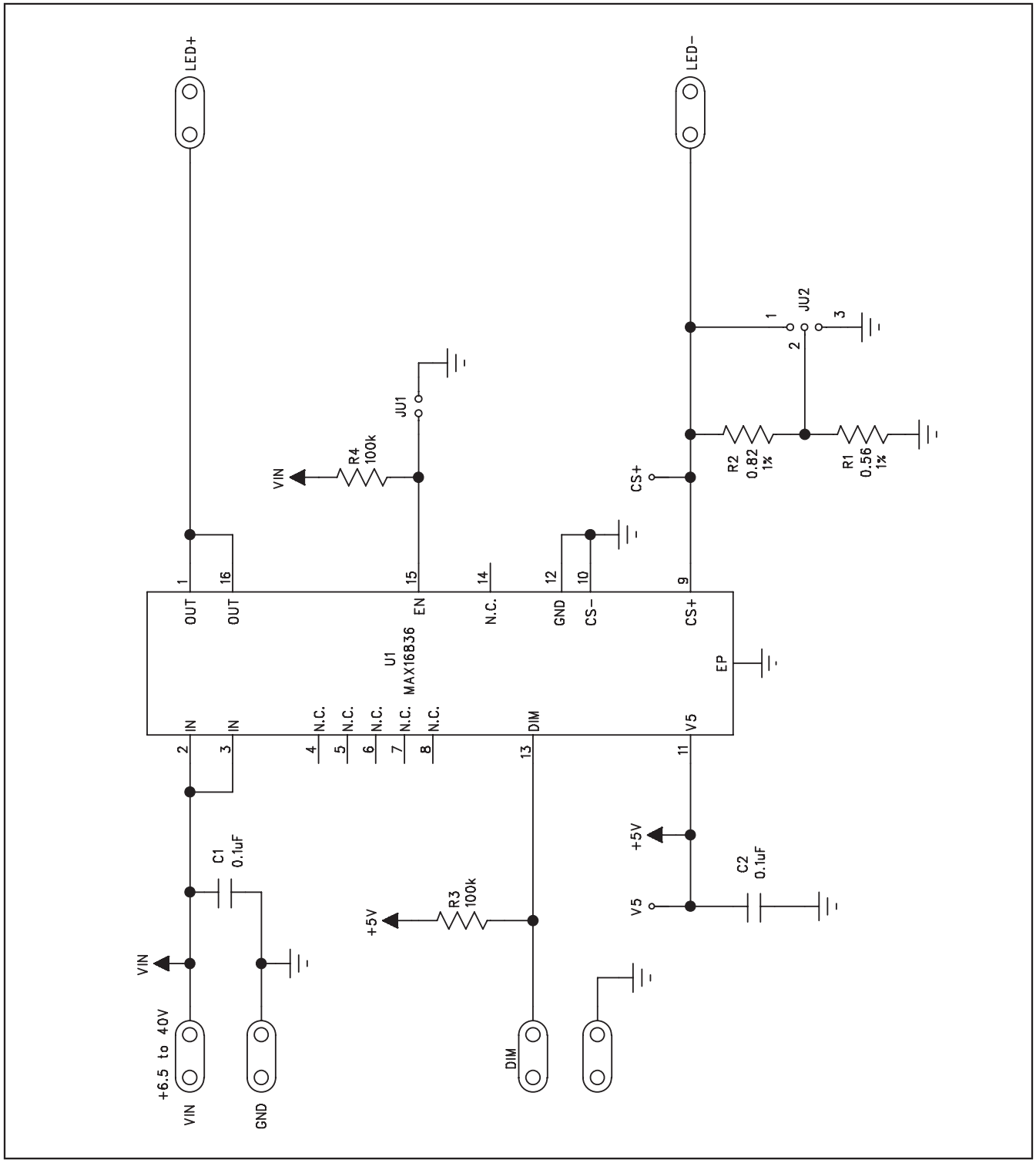

Figure 1. MAX16836 EV Kit Schematic

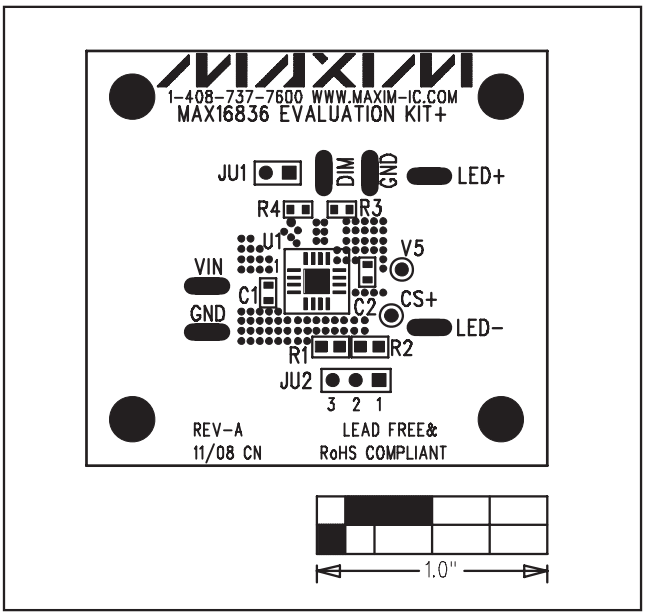

Figure 2. MAX16836 EV Kit Component Placement Guide—Components Side

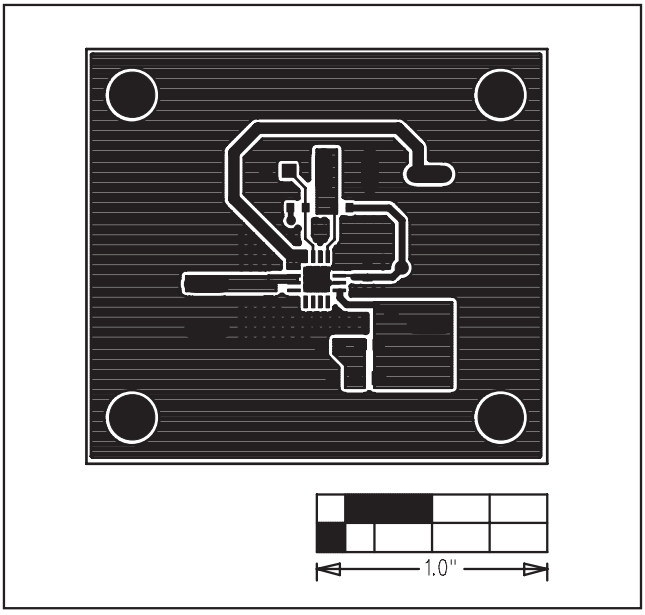

Figure 3. MAX16836 EV Kit PCB Layout—Component Side

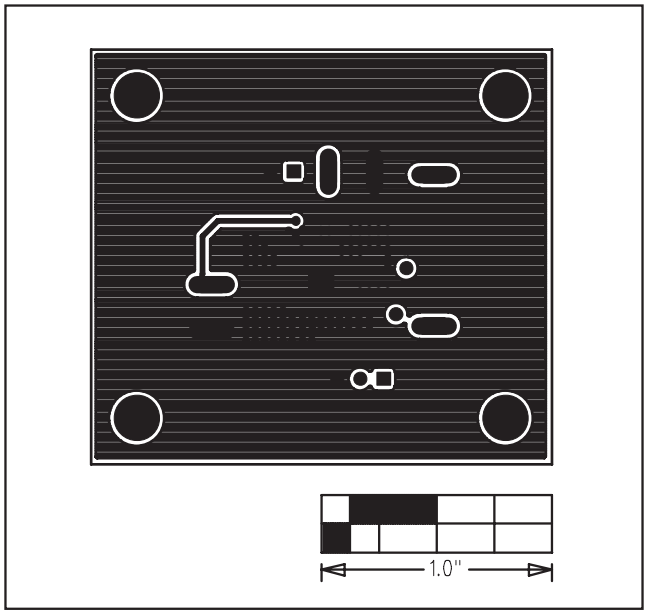

Figure 4. MAX16836 EV Kit PCB Layout—Solder Side