

MAXIM

MAX1570 Evaluation Kit

Evaluates: MAX1570

General Description

The MAX1570 evaluation kit (EV kit) is a fully assembled and tested surface-mount circuit board. The EV kit contains the MAX1570, a white LED driver with high-efficiency charge pump. The EV kit accepts a 2.7V to 5.5V input and drives up to five white LEDs with regulated constant current for uniform intensity. The MAX1570 runs at 1MHz fixed frequency, allowing tiny external components.

Features

- ◆ Excellent (0.3%) LED-to-LED Current Matching
- ◆ 2.7V to 5.5V Input Range
- ◆ 30mA/LED Drive Capability
- ◆ Five LEDs at 150mA Total Current
- ◆ 0.1 μ A (typ) IC Shutdown Current
- ◆ Digital PWM LED Dimming Control
- ◆ Fixed 1MHz Switching Frequency
- ◆ Surface-Mount Component Construction
- ◆ 16-Pin 4mm x 4mm Thin QFN Package
- ◆ Fully Assembled and Tested

Component List

| DESIGNATION | QTY | DESCRIPTION |
|-------------|-----|-------------------------------------------------------------------------------------------------------------------|
| C1, C3, C4 | 3 | 1 μ F \pm 10%, 10V X5R ceramic capacitors (0603) TDK C1608X5R1A105K or Taiyo Yuden JMK107BJ105KA |
| C2 | 1 | 4.7 μ F \pm 20%, 6.3V X5R ceramic capacitor (0805) Taiyo Yuden JMK212BJ475MG or TDK C2012X5R0J475M |
| C5 | 0 | Not installed, ceramic capacitor (0603) |
| D1-D5 | 5 | Surface-mount white LEDs |
| JU1, JU2 | 2 | 3-pin headers |
| R1 | 1 | 9.09k Ω \pm 1% resistor (0603) |
| R2, R3 | 0 | Not installed, resistor (0603) |
| U1 | 1 | MAX1570ETE (16-pin QFN (4mm x 4mm)) |
| None | 2 | Shunts |
| None | 1 | MAX1570 PC board |
| None | 1 | MAX1570 EV kit data sheet |
| None | 1 | MAX1570 data sheet |

Ordering Information

| PART | TEMP RANGE | IC PACKAGE |
|--------------|--------------|-------------------------|
| MAX1570EVKIT | 0°C to +70°C | 16 Thin QFN (4mm x 4mm) |

Quick Start

The MAX1570 EV kit is fully assembled and tested. Perform the following steps to verify board operation. **Do not turn on the power supply until all connections are completed:**

- 1) Verify that shunts are across pins 1 and 2 of jumpers JU1 (EN1) and JU2 (EN2).
- 2) Connect a 2.7V to 5.5V power supply to the VIN pad. Connect the power-supply ground to the GND pad to the right of VIN.
- 3) Turn on the power supply.
- 4) Verify that all five white LEDs are on with uniform intensity.

For instructions on dimming control, see Table 1.

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Component Suppliers

| SUPPLIER | PHONE | FAX | WEBSITE |
|-------------|--------------|--------------|-----------------------|
| Taiyo Yuden | 800-348-2496 | 847-925-0899 | www.t-yuden.com |
| TDK | 847-803-6100 | 847-390-4405 | www.component.tdk.com |

Note: Please indicate that you are using the MAX1570 when contacting these suppliers.

Detailed Description

Jumper Selection

The MAX1570 provides pins EN1 and EN2 to control ON/OFF, 1/3, 2/3, and full current, which controls the V_{SET} voltage. Jumpers JU1 and JU2 drive these two pins to either VIN or GND (see Table 1). An external signal can be used to drive any of the EN1 or EN2 control pins by removing the shunts completely from the appropriate jumpers and connecting the external signal to the appropriate connecting pads.

Setting LED Current

The default LED current is set to 15mA (with shunts across pins 1 and 2 on JU1 and JU2).

To set a desired LED current, change R1, where $R1 = 230 \times V_{SET} / I_{LED(desired)}$.

Table 1. JU1 and JU2 Functions

| JU1 SHUNT LOCATION | EN1 PIN | JU2 SHUNT LOCATION | EN2 PIN | V _{SET} VOLTAGE (mV) | MAX1570 OUTPUT |
|--------------------|------------------|--------------------|------------------|-------------------------------|-----------------------------------|
| 1 and 2 | Connected to VIN | 1 and 2 | Connected to VIN | 600 | MAX1570 is enabled, full current. |
| 1 and 2 | Connected to VIN | 2 and 3 | Connected to GND | 400 | MAX1570 is enabled, 2/3 current. |
| 2 and 3 | Connected to GND | 1 and 2 | Connected to VIN | 200 | MAX1570 is enabled, 1/3 current. |
| 2 and 3 | Connected to GND | 2 and 3 | Connected to GND | Undefined | MAX1570 is in shutdown mode. |

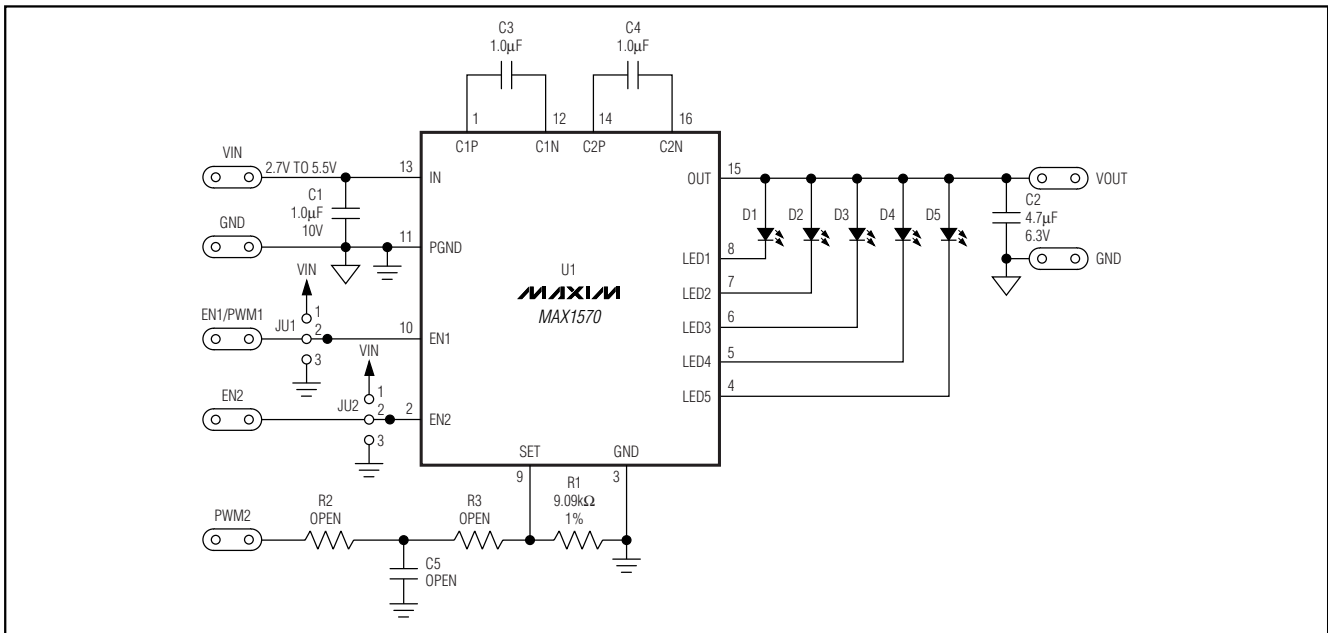


Figure 1. MAX1570 EV Kit Schematic

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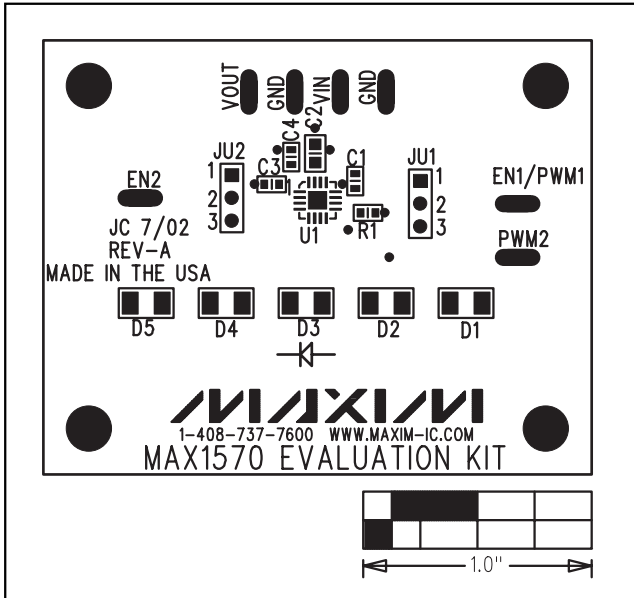


Figure 2. MAX1570 EV Kit Component Placement Guide—Top Silkscreen

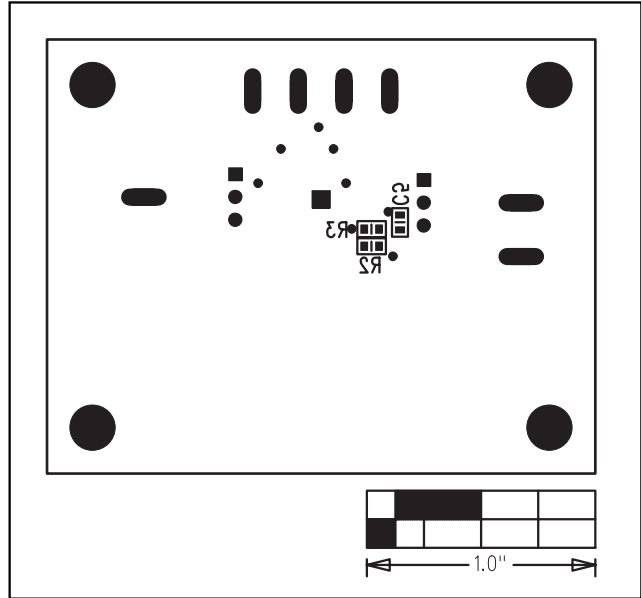


Figure 3. MAX1570 EV Kit Component Placement Guide—Bottom Silkscreen

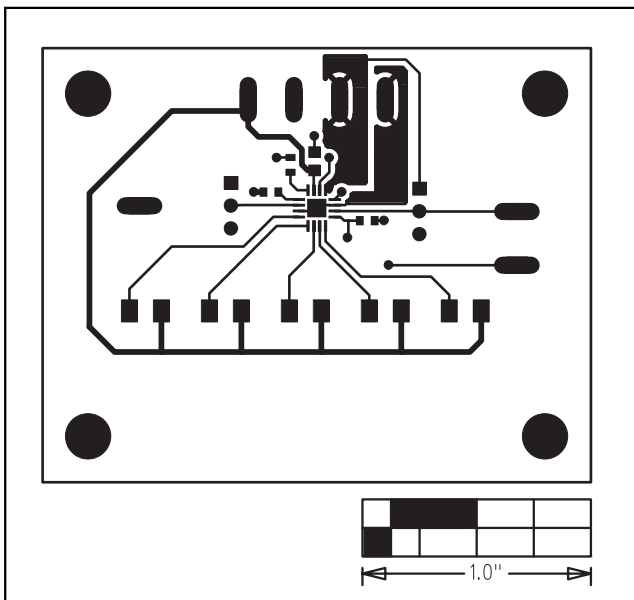


Figure 4. MAX1570 EV Kit PC Board Layout—Component Side

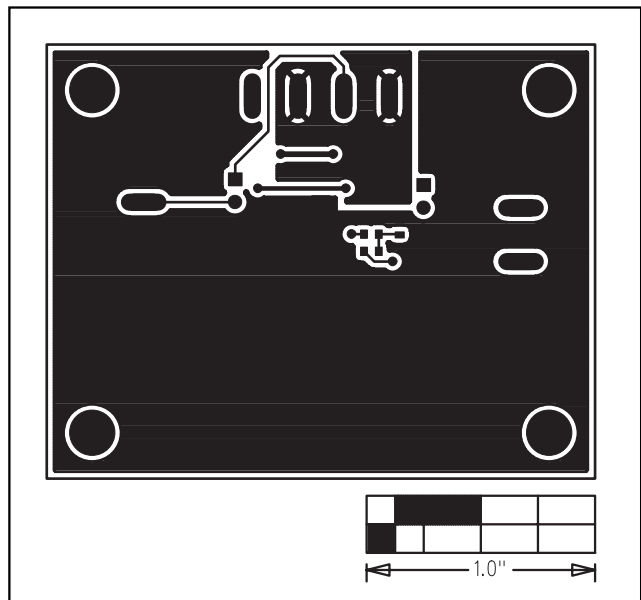


Figure 5. MAX1570 EV Kit PC Board Layout—Solder Side

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