

IS31BL3228B WHITE LED DRIVER EVALUATION BOARD GUIDE

DESCRIPTION

The IS31BL3228B is a low noise, constant frequency charge pump DC/DC converter for white LED applications. The IS31BL3228B is capable of driving up to six channels of LEDs at preset 20mA per channel from a 2.8V to 5.5V input. The current sinks may be operated individually or in parallel for driving higher current LEDs.

The serial digital input is used to enable, disable, and set current for each LED with 14 settings down to 1.8mA.

FEATURES

- Supply voltage range from 2.8V to 5.5V
- Fully programmable current with single wire
- 14 current levels
- Drives up to six channels of LEDs
- No inductors, low noise operation
- Built-in thermal protection
- Automatic soft start
- Low shutdown current: $I_{SHDN} < 3\mu A$
- UTQFN-12 (2mm × 2mm) package
- RoHS & Halogen-Free Compliance
- TSCA Compliance

QUICK START



Figure 1: Photo of IS31BL3228B Evaluation Board

RECOMMENDED EQUIPMENT

- 5.0V, 2A power supply

ABSOLUTE MAXIMUM RATINGS

- $\leq 5.5V$ power supply

Caution: Do not exceed the conditions listed above; otherwise the board will be damaged.

PROCEDURE

The IS31BL3228B evaluation board is fully assembled and tested. Follow the steps listed below to verify board operation.

Caution: Do not turn on the power supply until all connections are completed.

- 1) Connect the ground terminal of the power supply to the GND and the positive terminal to the VCC. Or connect the DC power to the connector (DC IN).
- 2) Turn on the power supply and pay attention to the supply current. If the current exceeds 600mA, please check for circuit fault.
- 3) Press Level- or Level+ button to change current of LEDs. The intensity of LEDs will be in 1 level (highest) when power on.
- 4) The button (SD/EN) controls the IS31BL3228B shutdown or enable. When power on the IS31BL3228B is enabled and the LED (D21) is on.

ORDERING INFORMATION

| Part No. | Temperature Range | Package |
|----------------------|-----------------------------|---------------------|
| IS31BL3228B-UTLS2-EB | -40°C to +85°C (Industrial) | UTQFN-12, Lead-free |

Table 1: Ordering Information

For pricing, delivery, and ordering information, please contacts Lumissil's analog marketing team at analog@Lumissil.com or (408) 969-6600.

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EVALUATION BOARD OPERATION

The IS31BL3228B evaluation board performs constant output current with Pulse Count Control (PCC wire) serial interface. The interface records rising edges of the EN/SET pin and decodes them into 14 different states.

The evaluation board uses a MCU generating Pulse signal at EN/SET pin adjusting the LEDs current. There are 14 blue LEDs (D7~D20) above the buttons showing the intensity level.

Note: IS31BL3228B solely controls the white LEDs function on the evaluation board.

SOFTWARE SUPPORT

Please refer to the integrated program.

Note: The jumper JP1 is closed (Default). If JP1 is open, the MCU in the board will stop working and EN/SET pin will be in high-impedance state. The EN/SET pin (TP3) can be connected to external MCU to control the IS31BL3228B.

Please refer to the datasheet to get more information about IS31BL3228B.

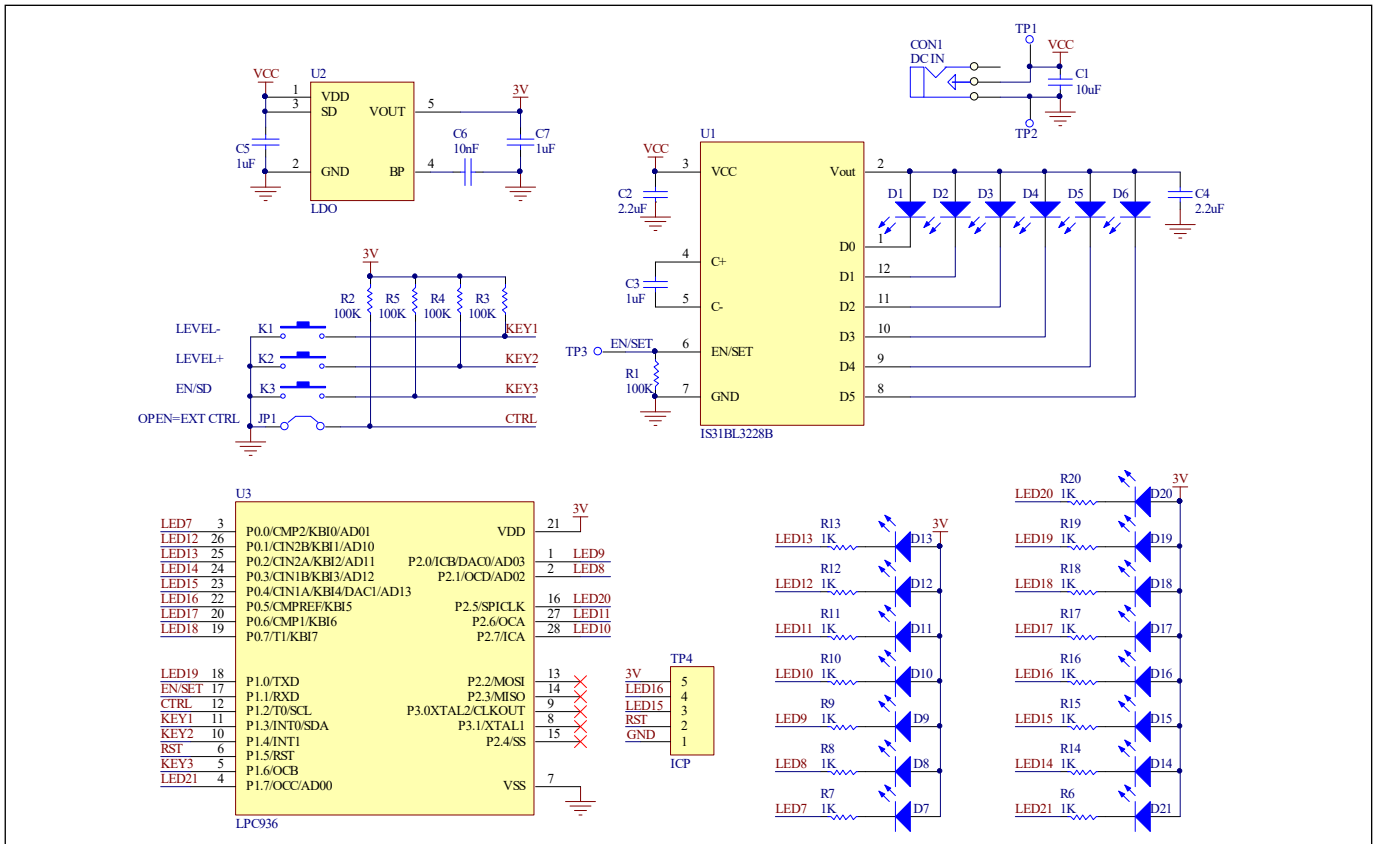


Figure 2: IS31BL3228B Application Schematic

BILL OF MATERIALS

| Name | Symbol | Description | Qty | Supplier | Part No. |
|------------|----------|-------------------------|-----|-----------|-----------------------|
| LED Driver | U1 | White LED driver | 1 | Lumissil | IS31BL3228B |
| LDO | U2 | Low-dropout regulator | 1 | PAM | PAM3101 |
| MCU | U3 | Microcontroller | 1 | NXP | LPC936 |
| LED | D7~D21 | Diode, LED Blue, SMD | 15 | Everlight | 19-217/BHC-ZL1M2RY/3T |
| LED | D1~D6 | Diode, LED White, SMD | 6 | Everlight | EHP-C04/UT01-P01/TR |
| Resistor | R1~R5 | RES,100k,1/16W,±5%,SMD | 5 | YAGEO | RC0603JR-07 100KL |
| Resistor | R6~R20 | RES,1k,1/16W,±5%,SMD | 15 | YAGEO | RC0603JR-07 1KL |
| Capacitor | C1 | CAP,10µF,16V,±10%,SMD | 1 | YAGEO | CC0805KRX7R7BB106 |
| Capacitor | C2,C4 | CAP, 2.2µF,16V,±10%,SMD | 2 | YAGEO | CC0603KRX7R7BB225 |
| Capacitor | C3,C5,C7 | CAP,1µF,16V,±10%,SMD | 3 | YAGEO | CC0603KRX7R7BB105 |
| Capacitor | C6 | CAP,10nF,16V,±10%,SMD | 1 | YAGEO | CC0603KRX7R7BB103 |
| Button | K1~K3 | Buttons SMD | 3 | | |

Bill of Materials, refer to Figure 2 above.

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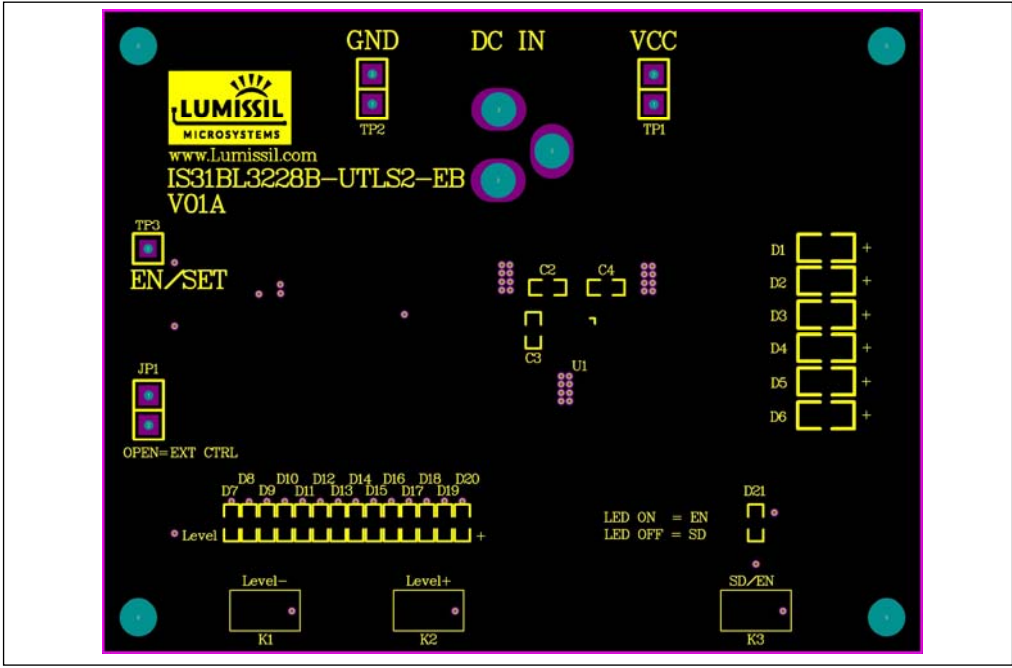


Figure 3: Board Component Placement Guide - Top Layer

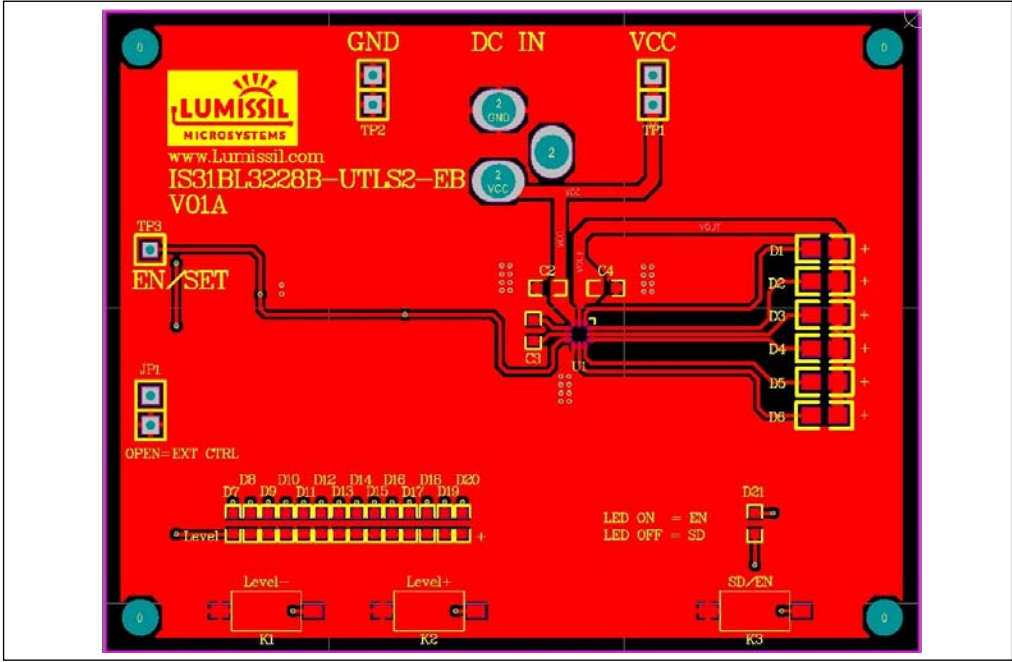


Figure 4: Board PCB Layout - Top Layer

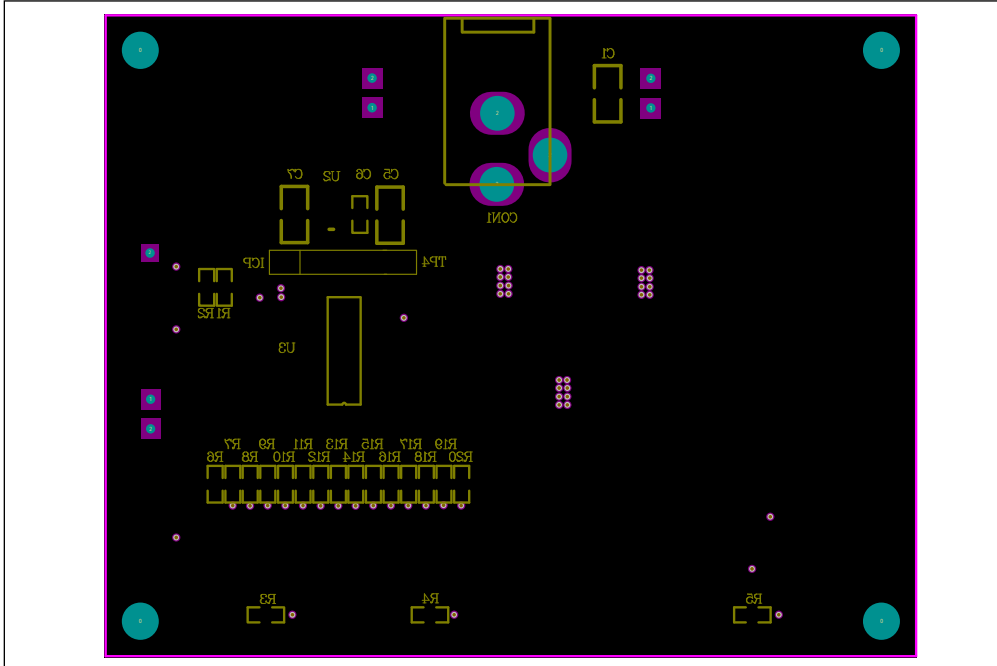


Figure 5: Board Component Placement Guide - Bottom Layer

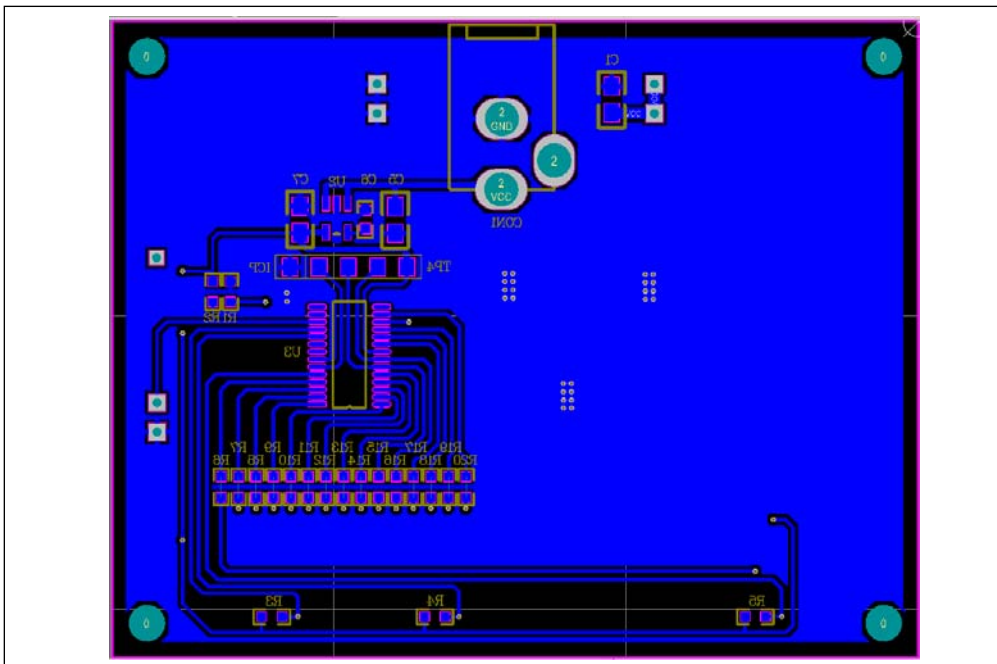


Figure 6: Board PCB Layout - Bottom Layer

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REVISION HISTORY

| Revision | Detail Information | Date |
|-----------------|-----------------------------|-------------|
| A | Initial release | 2014.11.25 |
| B | Update to new Lumissil logo | 2024.11.07 |