

ISL97801BOOSTEVALZ HPLED Driver Boost Configured Evaluation Board

Introduction

The schematic of the ISL97801BOOST EVALZ Demo Board is shown in Figure 1. This board is suitable for evaluation of the ISL97801 in a boost mode LED driving scheme. On the demo board, there are two resistors (R2 and R4). They are used to bypass the optional MOSFETs Q1 and Q2, which can be omitted in low cost applications. MOSFET Q1 is used as a fault protection switch to disconnect the input supply if a fault occurs for more than 50ms. It is also used to provide load-dump protection in automotive applications. For applications not requiring load dump or fault protection, it can bypass Q1 with R2 (0Ω).

Q2 is used as an optional PWM dimming and load isolation switch. When using PWM dimming control, the LED bias current will vary with the PWM duty-cycle due to the discharge of the output capacitor by the LED's during the PWM off time. Without Q2, (due to the discharge of the output capacitor), the linear accuracy of the average output current in the LED's can not be controlled. With Q2, the discharge of the capacitor is eliminated, leading to better linearity of the LED current. For applications not requiring high linear accuracy, MOSFET Q2 can be bypassed with Resistor (0Ω).

Using the Board

Connect the load to the output marked "2 Power Post". The load of series LEDs must be connected between the LED+ and LED- pins. The ISL97801 is a current mode output converter, and the output voltage is the product of the programmed output current and the load impedance.

If the output circuit is opened, the output voltage can rise, and the part will enter overvoltage protection and the device will be shutdown.

Set-up the required output current. The output load current is determined with the voltage on the Level pin in this demo board, and the current sense resistor R9. (Vlevel pin biased can be omitted with internal fixed voltage 0.4V if the mode pin is grounded in the actual application).

Apply a DC power voltage source on VBAT and PGND pins. For ISL97801, the allowed input voltage range is from 5V to 18V. Due to the boost function, the input DC voltage must be lower than the output voltage. The ISL97801 includes a circuit to generate a 5V voltage which is used to drive the chip, and offer a reference voltage for the system control (VDC). If the applied DC power voltage is lower than 5V, the VDC voltage will track with the applied DC power voltage. It is recommended to apply DC power voltage of over 5V for optimum demo board performance.

Apply VLEVEL voltage. The LED bias current is determined by the LEVEL pin voltage (0V to 3V range) and the sense resistor R9. The board is set-up with a 0.5Ω R9 resistor with 1V VLEVEL. The output current will be ~350mA to 400mA depending on the tolerance of the resistor.

Apply EN/PWM signal. Apply EN/PWM pin a DC signal for enable signal. If PMW dimming is needed, apply a PWM signal at EN/PWM pin.

ISL97801BOOSTEVALZ Boost Configured Evaluation Board Schematic

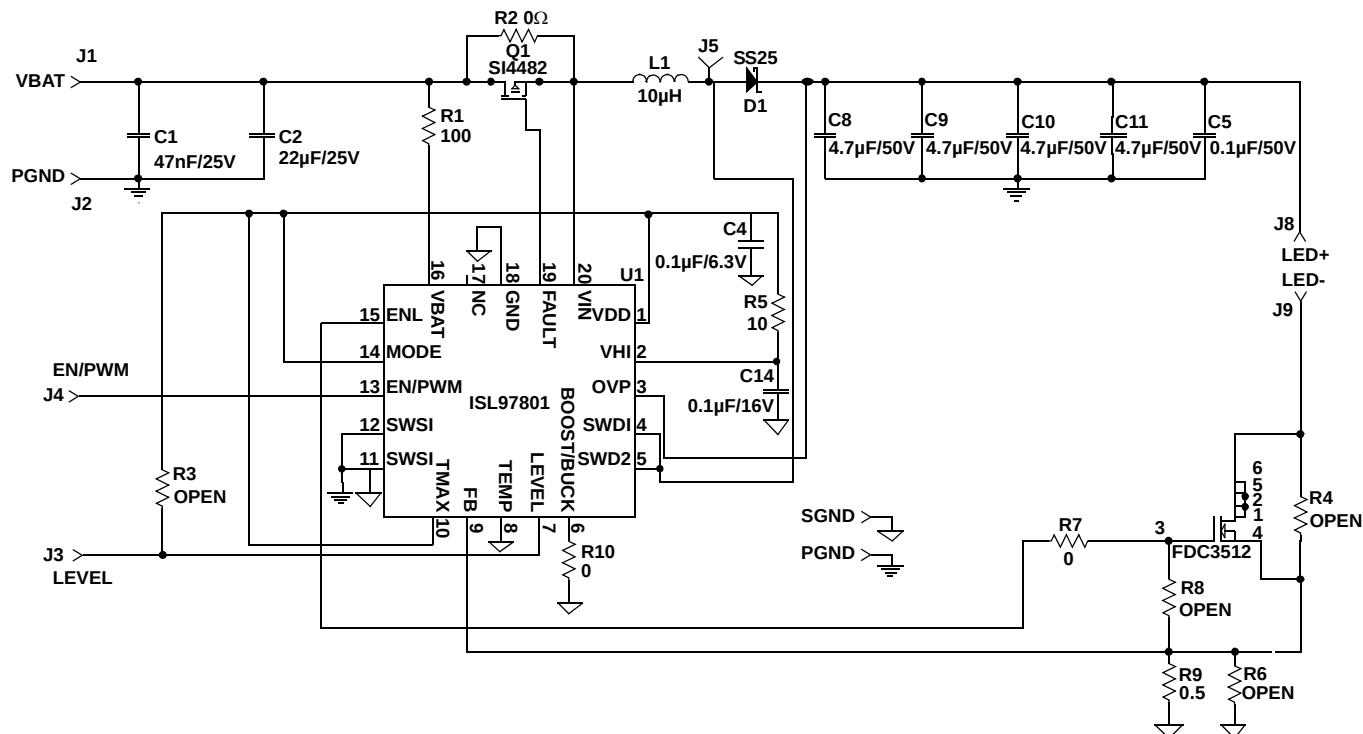


FIGURE 1. ISL97801BOOSTEVALZ BOOST CONFIGURED EVALUATION BOARD SCHEMATIC

ISL97801BOOSTEVALZ Board Layout

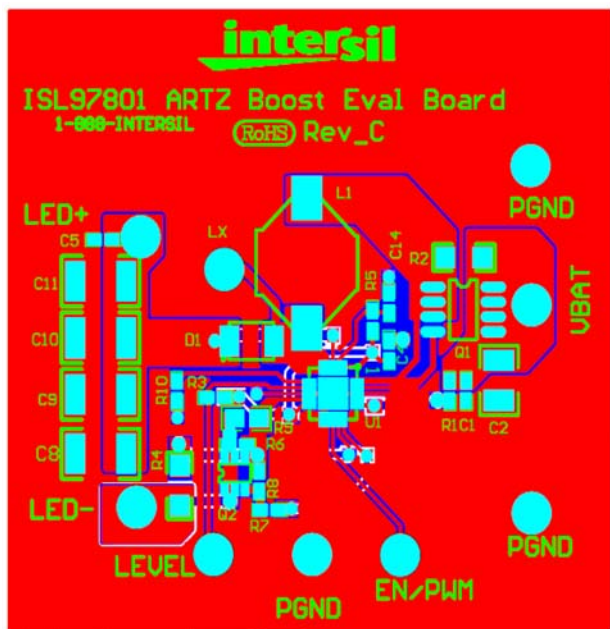


FIGURE 2. TOP VIEW

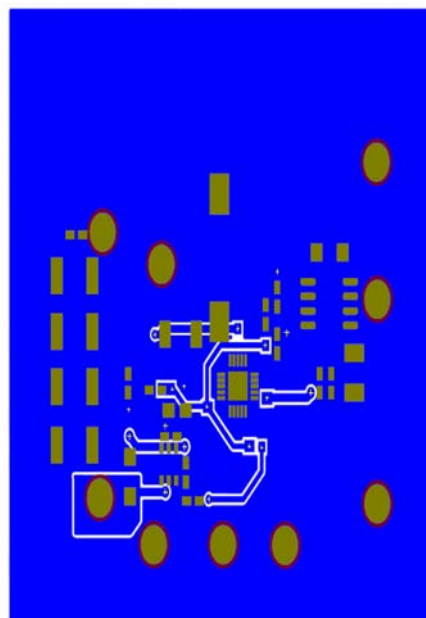


FIGURE 3. BOTTOM VIEW

Application Note 1490

TABLE 1. BILL OF MATERIALS

PART	DESIGNATOR	FOOTPRINT
0.1μF/16V	C14	603
0.1μF/50V	C5	603
0.5	R9	603
0	R10	603
0	R7	603
0	R4 (Open)	1206
0	R2	1206
Open	R6	603
4.7μF/50V	C8, C9, C10, C11	1812
10	R5	603
10μF/6.3V	C4	603
10μH	L1	DS3316
22μF/25V	C2	1210
47nF/25V	C1	603
100	R1	603
FDC3512	Q2	SOT23-6
ISL97801	U1	LPP-20
SI4482	Q1 (open)	SO-8
SS25	D1	DO-214
VBAT	J1	POWERPOST
open	R3	603
open	R8	603

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