

# ZXLD1371EV4 EVALUATION BOARD USER GUIDE

## DESCRIPTION

The ZXLD1371EV4, Figure 1, is an evaluation board for the ZXLD1371 LED driver chip. The board is in a Buck configuration with an input voltage of 48 V<sub>DC</sub> and will drive a string of 12 LEDs. It is set as a default standard for an output current of 1.5A and offers convenient connections for external control inputs and monitoring.

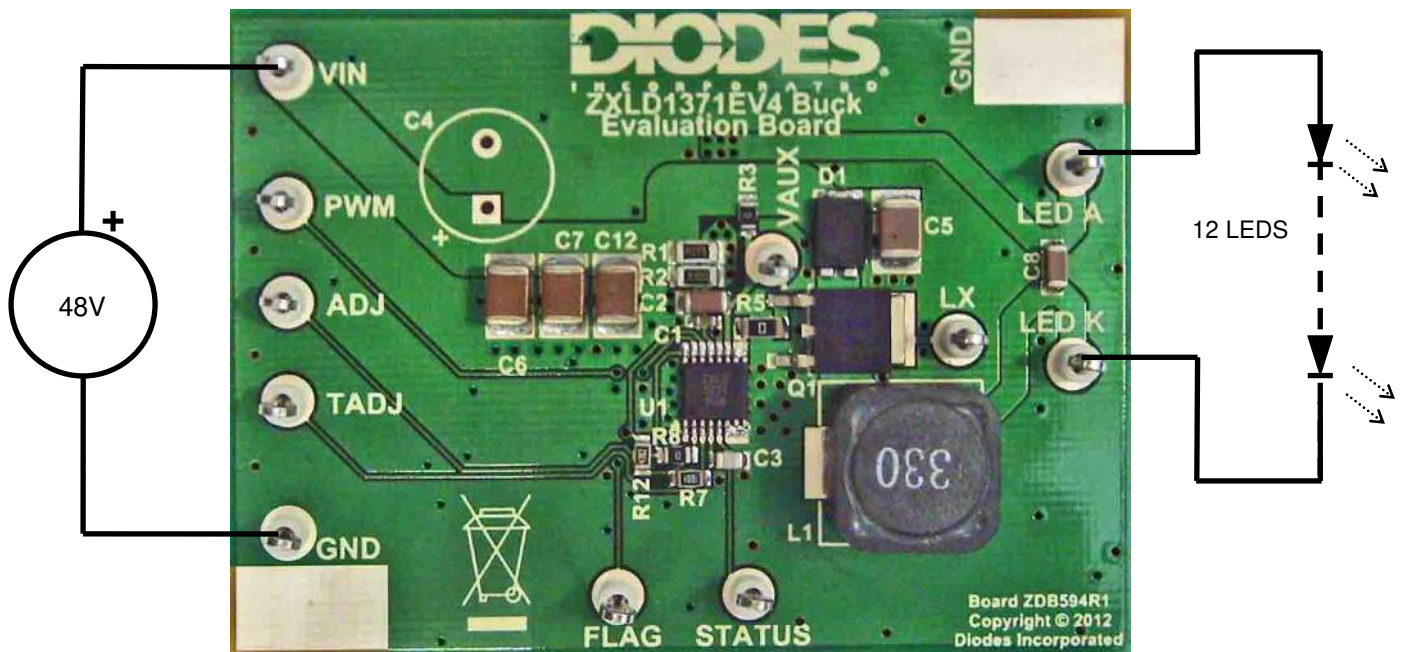


Figure 1: ZXLD1371EV4 evaluation board and connection diagram

## QUICK START

- 1) Connect 48V DC supply across Vin and GND points (observe correct polarity).
- 2) Connect LED string across LED A and LED K points (observe correct polarity). LED current is set at 1.5A, so ensure LED string is capable of this current.
- 3) Cover LED string or wear eye protection. Do not look directly at LEDs in use.
- 4) Switch on DC power supply.

### ZXLD1371EV4 Connection Point Definition

Name	Description
Vin	Positive supply voltage. 48V <sub>DC</sub>
GND	Supply Ground (0V).
PWM	External PWM dimming input
ADJ	External DC dimming input (Remove R8 for DC Dimming)
TADJ	External thermal dimming input (NTC to GND)
VAUX	VAUX monitoring point
FLAG	FLAG pin monitoring point
STATUS	STATUS pin monitoring point
LX	LX monitoring point
LED K	LED Cathode connection
LED A	LED Anode connection

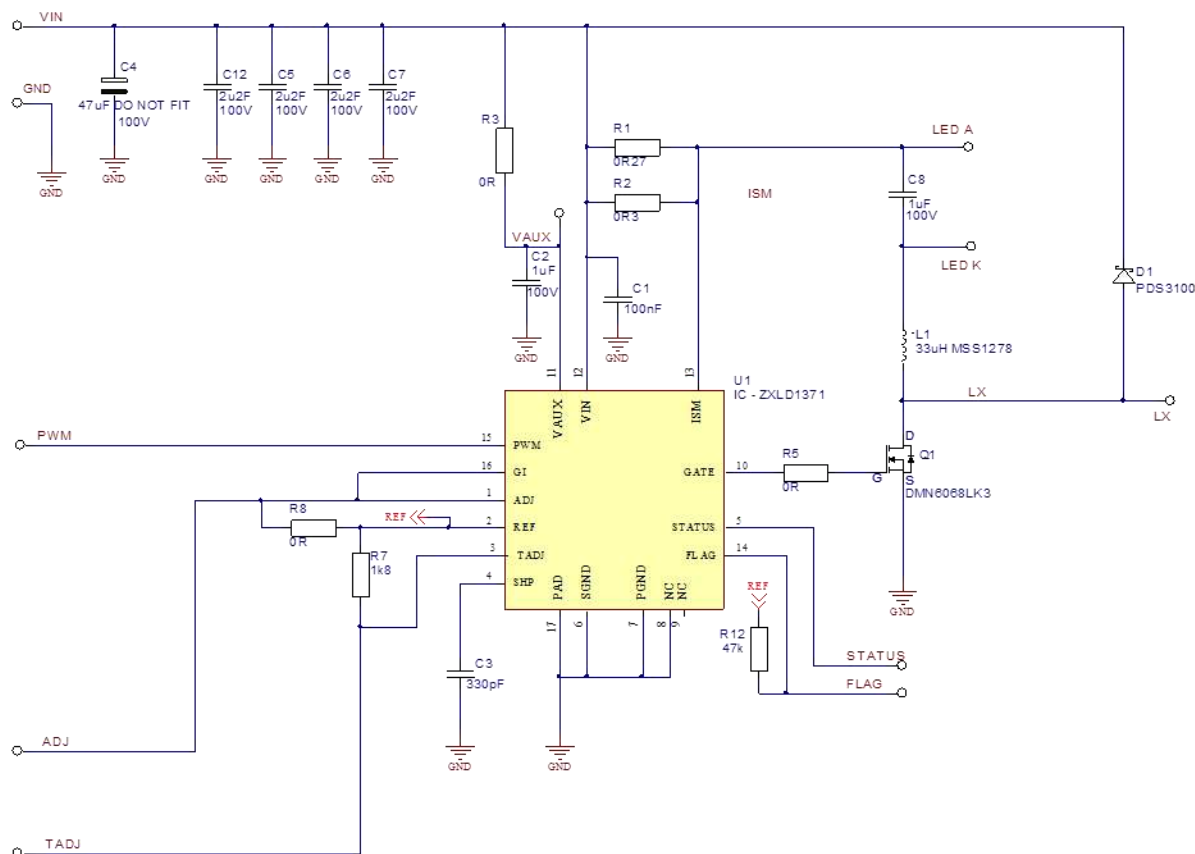


Figure 2: ZXLD1371EV4 evaluation board Schematic

### ZXLD1371EV4 EVALUATION BOARD REFERENCE DESIGN

The ZXLD1371EV4 is a Buck reference design, based around the ZXLD1371 lighting IC. The circuit will accept an input voltage of  $48V_{DC}$  and can drive an output string of 12 LEDs at 1.5A. The board has three control inputs and multiple signal monitoring points.

The PWM input allows the user to input a PWM brightness signal. It is recommended to be between 100Hz and 500Hz for maximum LED current dynamic range.

The ADJ input allows for DC dimming input, with a voltage between 0.125V and 1.25V for full brightness. In order to use an external control on ADJ, R8 must be removed.

The TADJ input is for connection of an external 10k NTC thermistor which will dim the LEDs as temperature increases, for maximizing LED lifetime. With a 10k NTC and  $R7 = 1.8k\Omega$ , the thermal trip point will be around  $70^{\circ}C$ .

The VAUX monitoring point allows easy connection to the chip auxiliary power supply and measurement of the bootstrap circuit where used. It can also be used to feed in an external source of VAUX if R3 and R4 are removed. R4 connects VAUX to LX through D2 as a bootstrap circuit, allowing for operation at low  $V_{in}$  values (5-8V). If bootstrapping is not required, remove R4 and fit  $R3 = 0\Omega$ .

FLAG and STATUS monitoring points allow these outputs of the chip to be monitored. For further information on output information on these pins see the ZXLD1371 datasheet.

The LX switching point can be monitored on the test point, in order to easily monitor the output PWM.

The LED string load can be connected across the LED A and LED K points.

**ZXLD1371EV4 (1.5A default standard version) Performance Test Data**

Vin (DC)	PF	I_in (A)	P_in (W)	P_out (W)	Vout (V)	Iout (A)	Efficiency (%)	# of LEDs
46	0.999	1.461	67.300	61.151	39.30	1.556	90.86	12
48	0.999	1.440	68.400	61.875	39.74	1.557	90.46	
50	0.997	1.340	67.300	60.598	39.02	1.553	90.04	

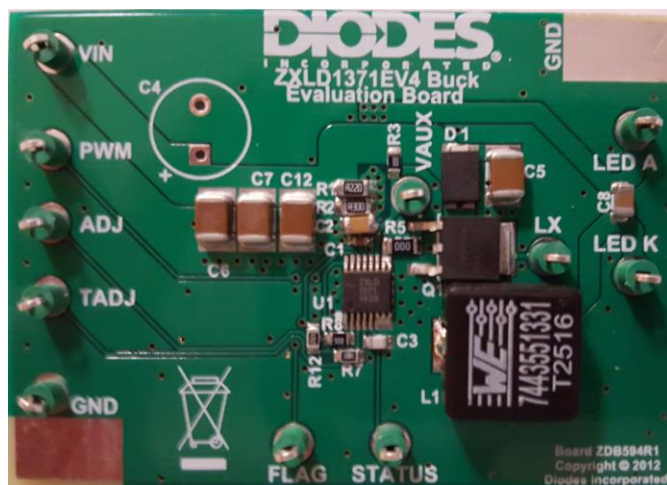
**ZXLD1371EV4 (1.5A default standard version) Component list**

QTY	PCB IDENT	VALUE	DESCRIPTION
1	U1	ZXLD1371	TSSOP16EP LED driver IC – Diodes Inc.
1	Q1	DMN6068LK3	60V N-Channel Enhancement Mode MOSFET – Diodes Inc.
1	D1	PDS3100	Freewheeling diode 3A, 100V – Diodes Inc.
1	R1	0R27	Resistor 1206 1% thick film 250ppm generic
1	R2	0R3	Resistor 1206 1% thick film 250ppm generic
2	R3, R8	0R	Resistor 0805 1% thick film 250ppm generic
1	R5	0R0	Resistor 1206 1% thick film 250ppm generic
1	R7	1k8	Resistor 0805 1% thick film 250ppm generic
1	R12	47k	Resistor 0805 1% thick film 250ppm generic
1	C1	100nF	Capacitor 0603, 100V X7R generic
2	C2, C8	1uF	Capacitor 1206, 100V X7R generic
1	C3	330pF	Capacitor 0805, 100v C0G generic
0	C4	DO NOT FIT	
4	C5, C6, C7, C12	2u2F	Capacitor, 1812, 100V X7R generic Murata GRM43ER72A225KA01L
1	L1 (for 1.5A application)	33uH/3.1A	Coilcraft MSS1278-333MLB NIC Components NPIS27H330MTRF
11	TP1, TP2, TP3, TP4, TP5, TP6, TP7, TP8, TP9, TP10, TP11	Test Point	2.15mm dia. test loops, green, generic, Hughes 100-108

Note: The component values and part numbers are correct at the time of publication. Diodes Inc. reserves the right to substitute other parts where necessary, without further notification.

**ZXLD1371EV4 EVALUATION BOARD REFERENCE DESIGN (2.4A output current version)**

The ZXLD1371EV4 is a Buck reference design, and it will accept an input voltage of 12 V<sub>DC</sub> and can drive an output string of 2 LEDs at 2.4A with 3 components change (L1, D1, and R1).



For the 2.4A output current application, use the higher current rating inductor (L1) and higher current rating of D1 as specified in the component list below and add a 0.22 Ω resistor parallel to the existing R1 on the board.

**ZXLD1371EV4 (2.4A output current version) Performance Test Data**

Vin (DC)	PF	I <sub>in</sub> (A)	P <sub>in</sub> (W)	P <sub>out</sub> (W)	Vout (V)	I <sub>out</sub> (A)	Efficiency (%)	# of LEDs
11	0.901	2.061	19.672	15.552	6.815	2.282	79.06	2
12	0.828	1.994	19.950	15.180	6.424	2.363	76.09	
13	0.746	2.027	20.610	16.123	6.823	2.363	78.23	

**ZXLD1371EV4 (2.4A output current version) Component list**

QTY	PCB IDENT	VALUE	DESCRIPTION
1	U1	ZXLD1371	TSSOP16EP LED driver IC – Diodes Inc.
1	Q1	DMN6068LK3	60V N-Channel Enhancement Mode MOSFET – Diodes Inc.
1	D1	PDS5100	Freewheeling diode 5A, 100V – Diodes Inc.
1	R1	0R27//0R22	Resistor 1206 1% thick film 250ppm generic
1	R2	0R3	Resistor 1206 1% thick film 250ppm generic
2	R3, R8	0R	Resistor 0805 1% thick film 250ppm generic
1	R5	0R0	Resistor 1206 1% thick film 250ppm generic
1	R7	1k8	Resistor 0805 1% thick film 250ppm generic
1	R12	47k	Resistor 0805 1% thick film 250ppm generic
1	C1	100nF	Capacitor 0603, 100V X7R generic
2	C2, C8	1uF	Capacitor 1206, 100V X7R generic
1	C3	330pF	Capacitor 0805, 100v C0G generic
0	C4	DO NOT FIT	
4	C5, C6, C7, C12	2u2F	Capacitor, 1812, 100V X7R generic Murata GRM43ER72A225KA01L
1	L1	33uH/5.5A	Würth 7443551331
11	TP1, TP2, TP3, TP4, TP5, TP6, TP7, TP8, TP9, TP10, TP11	Test Point	2.15mm dia. test loops, green, generic, Hughes 100-108

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