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General Description

This demonstration board utilizes the AL9910A high voltage PWM LED Buck controller providing a cost effective solution for offline high brightness LED applications. This user-friendly evaluation board provides users with quick connection to their different types LEDs string. The demonstration board can be modified to adjust the LED output current (2.5A) and the number of series connected LEDs that are driven.

Key Features

- High output current, 2.5A
- ~ 90% efficiency
- DC input voltage range up to 80V
- Low BOM cost
- PWM Dimmable

Applications

- Signage and decorative LED lighting
- High current DC-DC LED driver
- High intensity lamps
- Street lamps

AL9910A EV2 Specifications

Parameter	Value
Input Voltage	40 to 80V _{DC}
Output Power	50 – 60W
LED Current	2.5A (Adjustable)
LED Voltage	25V
Efficiency	~90%
Number of LEDs	(2) sets of 8 LEDs in parallel (Under Tested)
XY Dimension	3.00" x 3.25"
ROHS Compliance	Yes

Evaluation Board

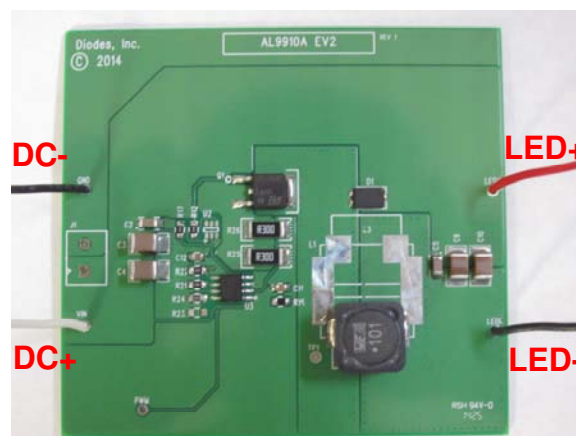


Figure 1: Top View

Connection Instructions

Input Voltage: 40 to 80V_{DC} (DC+, DC-)
 LED Outputs: LED+ (Red), LED- (Black)

Evaluation Board Schematic

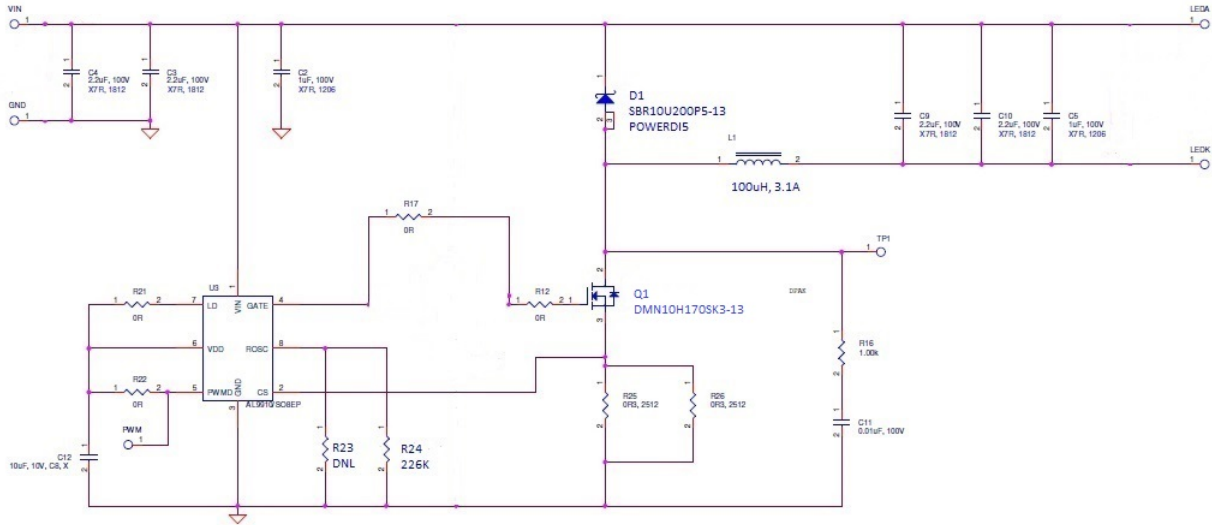


Figure 2: Evaluation Board Schematic

Evaluation Board Layout

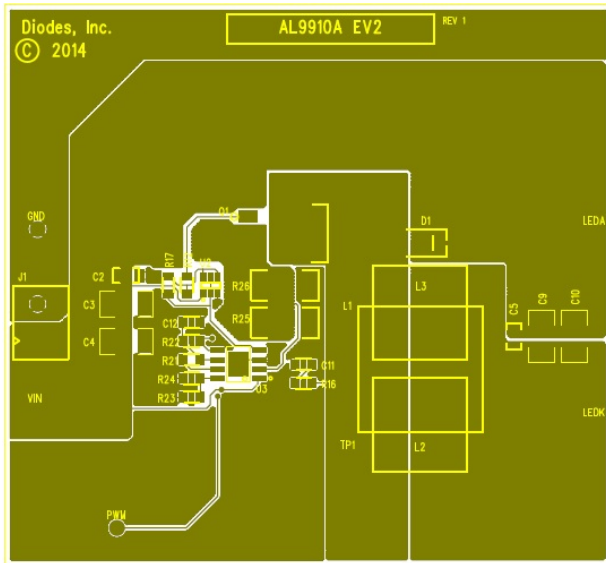


Figure 3: PCB Board Layout Top View

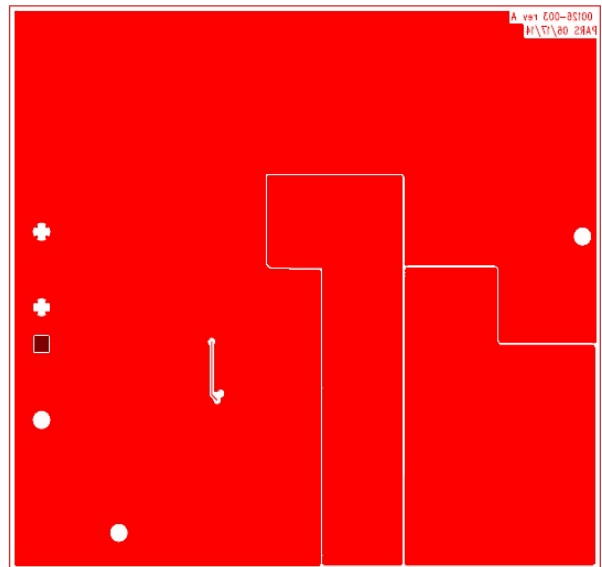


Figure 4: PCB Board Layout Bottom View

Quick Start Guide

1. By default, the evaluation board is preset at 2.5A LED Current by R25, and R26. Non-Dimmable by R22, remove R22 to allow PWM Dimming input.
2. Ensure that the DC source is switched OFF or disconnected.
3. Connect the DC line wires of power supply to “Vin and GND” on the left side of the board.
4. Connect the anode wire of external LED string to LEDA output test point.
5. Connect the cathode wire of external LED string to LEDK output test point.
6. Turn on the main switch. LED string should light up.

Bill of Material

#	Name	Quantity	Part number	Manufacturer	Description
1	U3	1	AL9910ASP-13	Diodes Inc	LED Driver
2	D1	1	SBR10U200P5-13	Diodes Inc	Super Barrier Rectifiers
3	Q1	1	DMN10H170SK3-13	Diodes Inc	MOSFET 100V/12A
4	L1	1	7447709101	Würth	100µH, 3.1A Inductor
5	R12,R17, R21,R22	4	541-0.0ACT-ND	Vishay	0Ω Resistor 1/8W 1% 0805 SMD
6	R24	1	P226KCCT-ND	Panasonic	226kΩ Resistor 1/8W 1% 0805 SMD
7	R25,R26	2	CSRN2512FKR300CT-ND	Stackpole	0.15Ω Resistor 2W 1% 2512 SMD
8	R16	1	311-1.00KCRCT-ND	Yageo	1KΩ Resistor 1/8W 1% 0805 SMD
9	C2,C5	2	587-1777-1-ND	Taiyo	1µF Cer Cap 100V 10% X7R
10	C3,C4, C9,C10	4	587-1404-1-ND	Taiyo	2.2µF Cer Cap 100V 10% X7R
11	C11	1	399-1159-1-ND	Kemet	0.01µF Cer Cap 100V 10% X7R
12	C12	1	587-2668-1-ND	Taiyo	10µF Cer Cap 10V 10% X7R

Functional Performance

Manuf	Board Type	VIN (Vdc)	IIN (A)	PIIN (W)	VLED (V)	ILED (A)	PLED (W)	ILED Ripple (%)	Efficiency (%)
Diodes Inc	AL9910AEV2 Module Board	80	0.95	76.00	26.19	2.59	67.83	20	89.25

Functional Performance

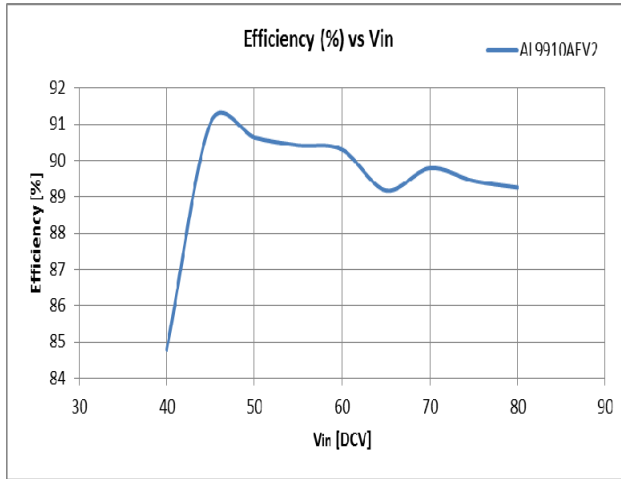


Figure 1. Efficiency vs. Vin

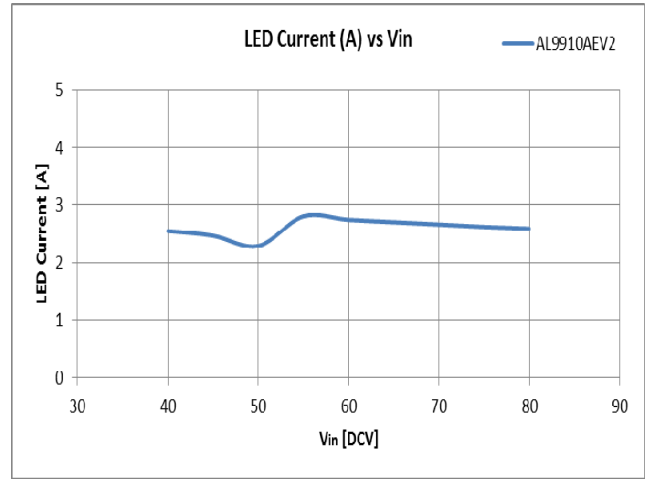


Figure 2. LED Current vs. Vin

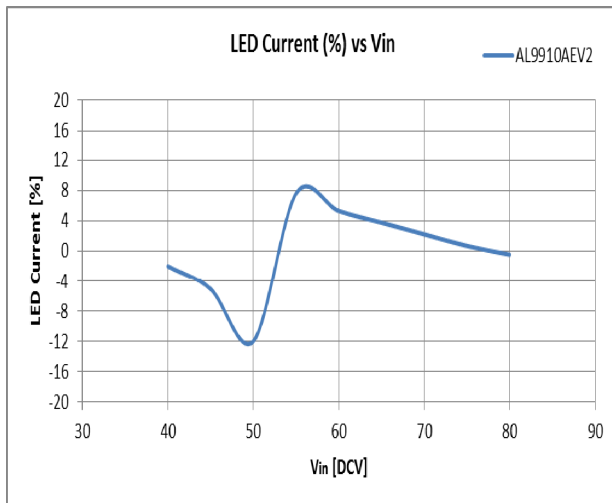
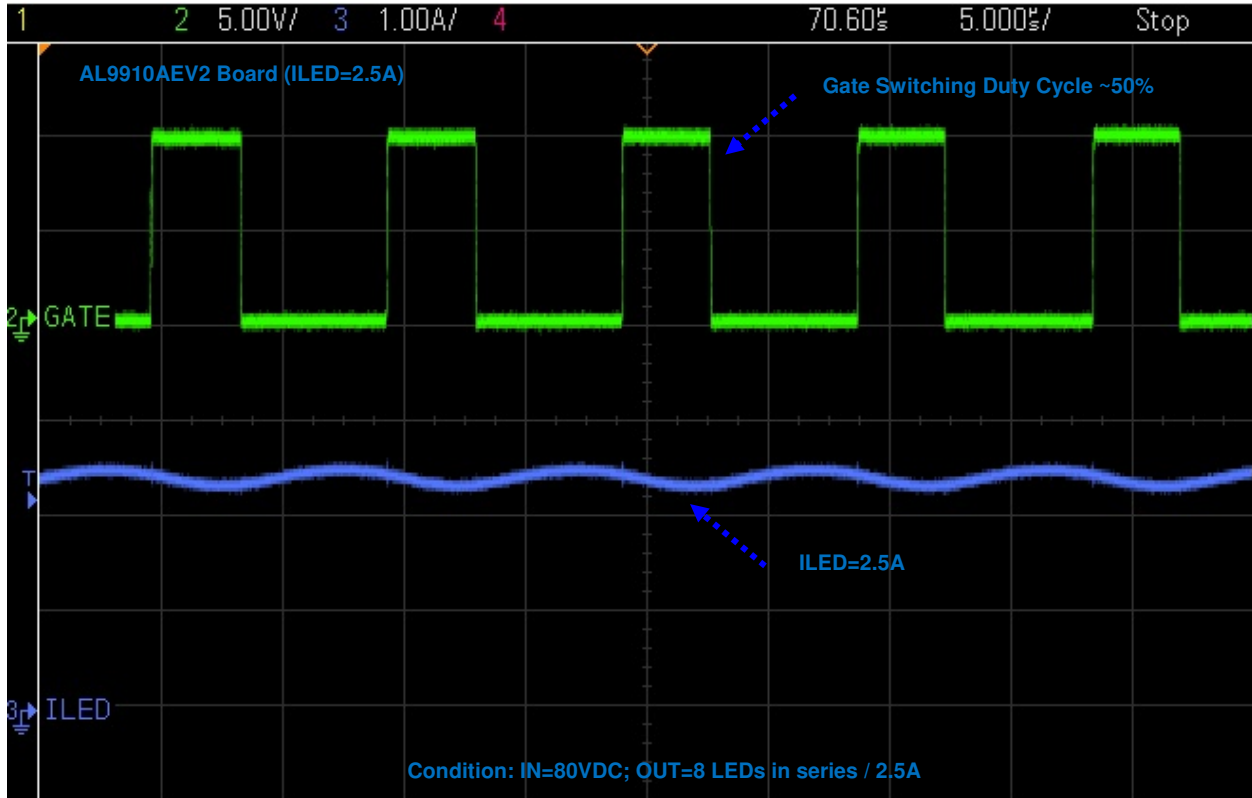


Figure 3. LED Current (%) vs. Vin

Waveform #1 (Gate Duty Cycle ILED=2.5A) => Channel 2: Gate Switching, Channel 3: ILED



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