

## AL9910AEV2 User Guide High Current and High Voltage LED Driver

#### **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 80VDC			
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**

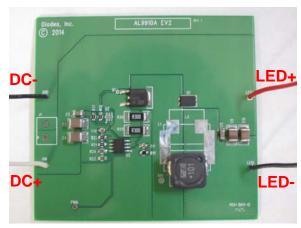
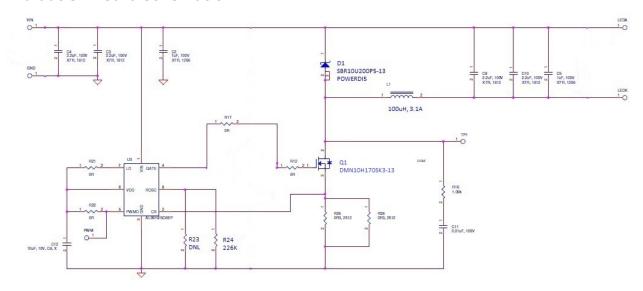


Figure 1: Top View

#### **Connection Instructions**

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

### **Evaluation Board Schematic**



**Figure 2: Evaluation Board Schematic** 

### **Evaluation Board Layout**

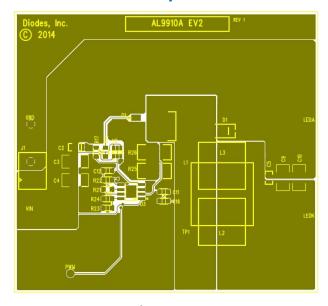
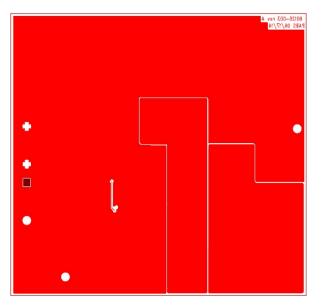


Figure 3: PCB Board Layout Top View



**Figure 4: PCB Board Layout Bottom View** 



### **AL9910AEV2 User Guide High Current Non-Dimmable**

#### **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	Wurth	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)	PIN (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



## **AL9910AEV2 User Guide** High Current Non-Dimmable

### **Functional Performance**

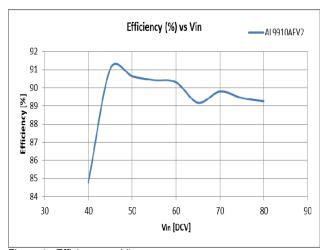


Figure 1. Efficiency vs. Vin

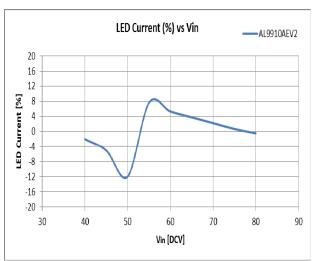


Figure 3. LED Current (%) vs. Vin

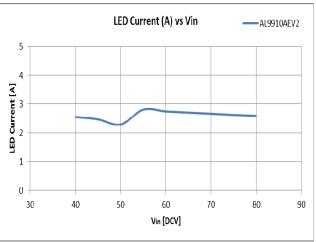
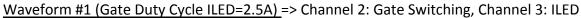
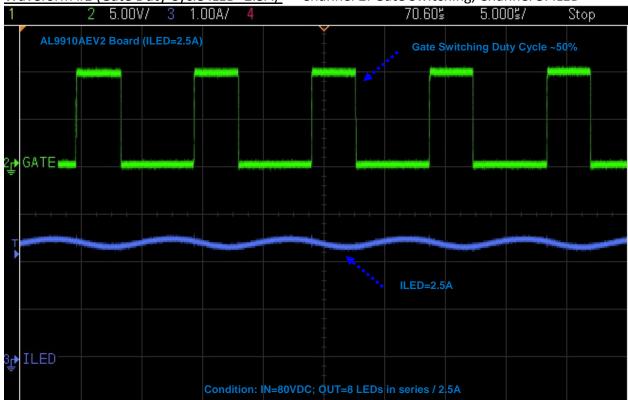


Figure 2. LED Current vs. Vin



# **AL9910AEV2 User Guide High Current Non-Dimmable**







### AL9910AEV2 User Guide High Current and High Voltage LED Driver

#### IMPORTANT NOTICE

DIODES INCORPORATED MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDS TO THIS DOCUMENT, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION).

Diodes Incorporated and its subsidiaries reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein. Diodes Incorporated does not assume any liability arising out of the application or use of this document or any product described herein; neither does Diodes Incorporated convey any license under its patent or trademark rights, nor the rights of others. Any Customer or user of this document or products described herein in such applications shall assume all risks of such use and will agree to hold Diodes Incorporated and all the companies whose products are represented on Diodes Incorporated website, harmless against all damages.

Diodes Incorporated does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel

Should Customers purchase or use Diodes Incorporated products for any unintended or unauthorized application, Customers shall indemnify and hold Diodes Incorporated and its representatives harmless against all claims, damages, expenses, and attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized application.

Products described herein may be covered by one or more United States, international or foreign patents pending. Product names and markings noted herein may also be covered by one or more United States, international or foreign trademarks.

This document is written in English but may be translated into multiple languages for reference. Only the English version of this document is the final and determinative format released by Diodes Incorporated.

#### **LIFE SUPPORT**

Diodes Incorporated products are specifically not authorized for use as critical components in life support devices or systems without the express written approval of the Chief Executive Officer of Diodes Incorporated. As used herein:

- A. Life support devices or systems are devices or systems which:
  - 1. are intended to implant into the body, or
- 2. support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in significant injury to the user.
- B. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the

failure of the life support device or to affect its safety or effectiveness.

Customers represent that they have all necessary expertise in the safety and regulatory ramifications of their life support devices or systems, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of Diodes Incorporated products in such safety-critical, life support devices or systems, notwithstanding any devices- or systems-related information or support that may be provided by Diodes Incorporated. Further, Customers must fully indemnify Diodes Incorporated and its representatives against any damages arising out of the use of Diodes Incorporated products in such safety-critical, life support devices or systems.

Copyright © 2014, Diodes Incorporated

www.diodes.com