
Evaluation Board (AL9910EV12)

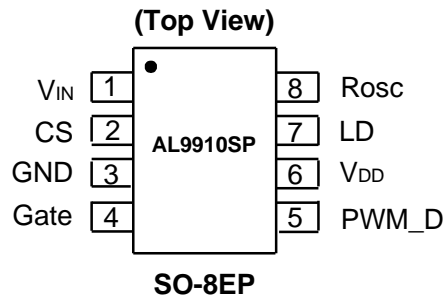


Figure 1: Top-View Evaluation Board

Features

- Non-Dimmable
- Selectable 2W-5W output power
- Active PFC with power factor >0.9
- High Efficiency
- No electrolytic capacitor
- Long operating life
- Typical Applications: Retrofit B10, E17, E14 LED Light Bulbs

AL9910 Pin Assignment



AL9910 Pin Description

Pin Name	Pin Number	Descriptions
V _{IN}	1	Input voltage
CS	2	Senses LED string current
GND	3	Device ground
Gate	4	Drives the gate of the external MOSFET
PWM_D	5	Low Frequency PWM Dimming pin, also Enable input. Internal 100kΩ pull-down to GND
V _{DD}	6	Internally regulated supply voltage. 7.5V nominal for AL9910. Can supply up to 1 mA for external circuitry. A sufficient storage capacitor is used to provide storage when the rectified AC input is near the zero crossings
LD	7	Linear Dimming by changing the current limit threshold at current sense comparator
R _{OSC}	8	Oscillator control. A resistor connected between this pin and ground sets the PWM frequency.

Specifications

Parameter	Units	Value
AC Input Voltage	V _{AC}	85 – 277
ROHS Compliance	NA	Yes

I/O Terminals

Connection Instructions:

AC1+ Input: Red – Hot

AC2- Input: Black - Neutral

DC LED1+ Output: LED1+ (Red)

DC LED2- Output: LED2- (Black)

230V_{AC} Test conditions:

AC Input Voltage: 230V_{AC}, 60Hz

LED Output Voltage: 80V_{DC} (27 LEDs)

LED Output Current: 65mA_{DC}

Output Power: 5W

Quick Start Guide

- 1) Connect +230V_{AC} AC power supply between AC1+ and AC2- headers.
- 2) Connect external 80V_{DC} LEDs to the output headers between LED1+ and LED2-.
- 3) Turn on the AC power supply.

AL9910EV12 Eval Boards in B10/E17 Sockets

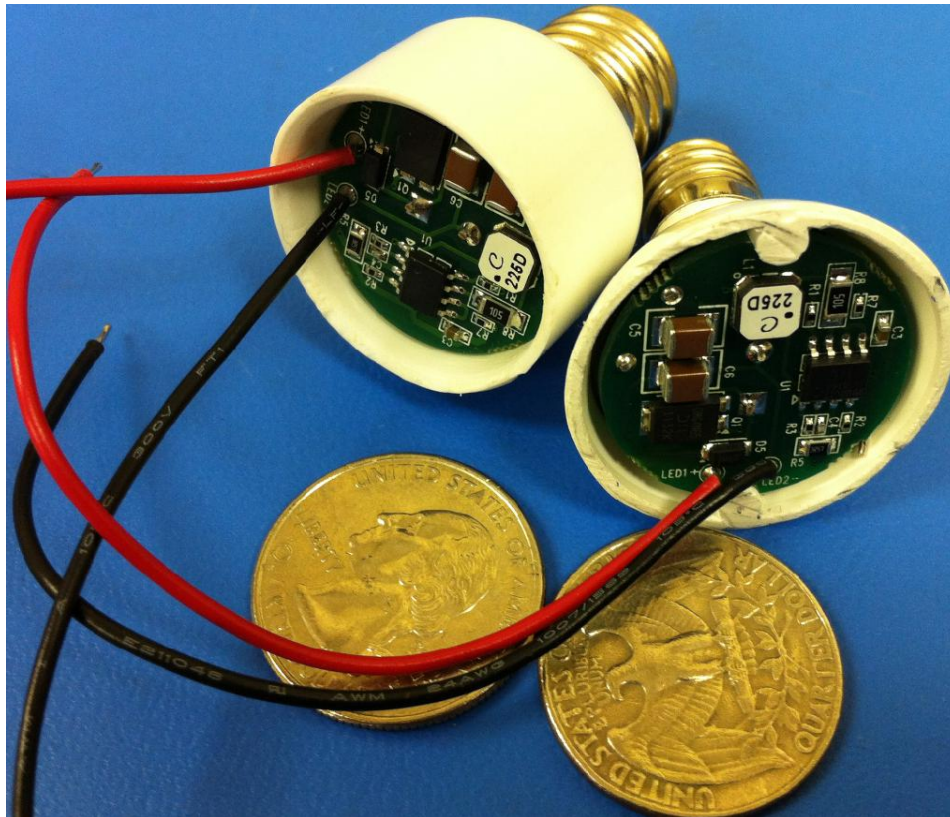
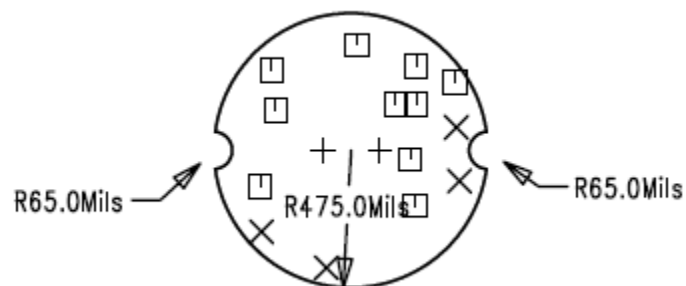


Figure 2: B10/E17 Sockets

Board Dimension

Board Dimension (components included):
 DxH (in mm) = 24.13mm x 15mm



PCB Board Layout

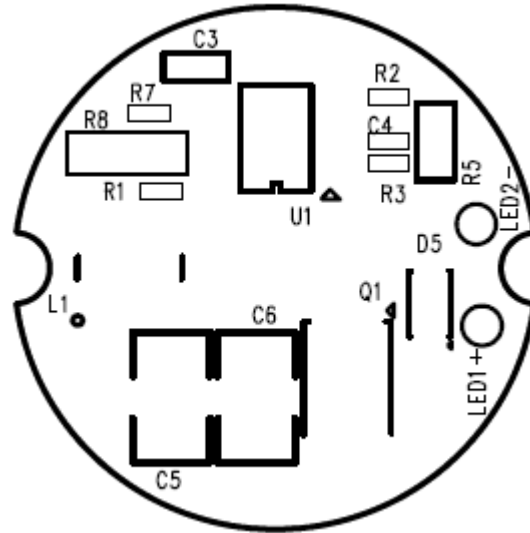


Figure 3: Top PCB Layout

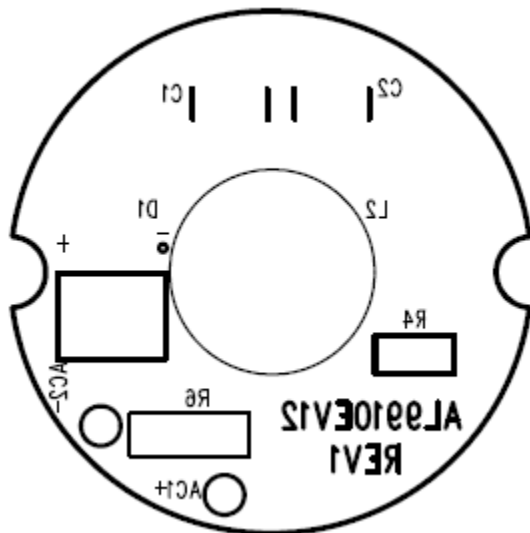


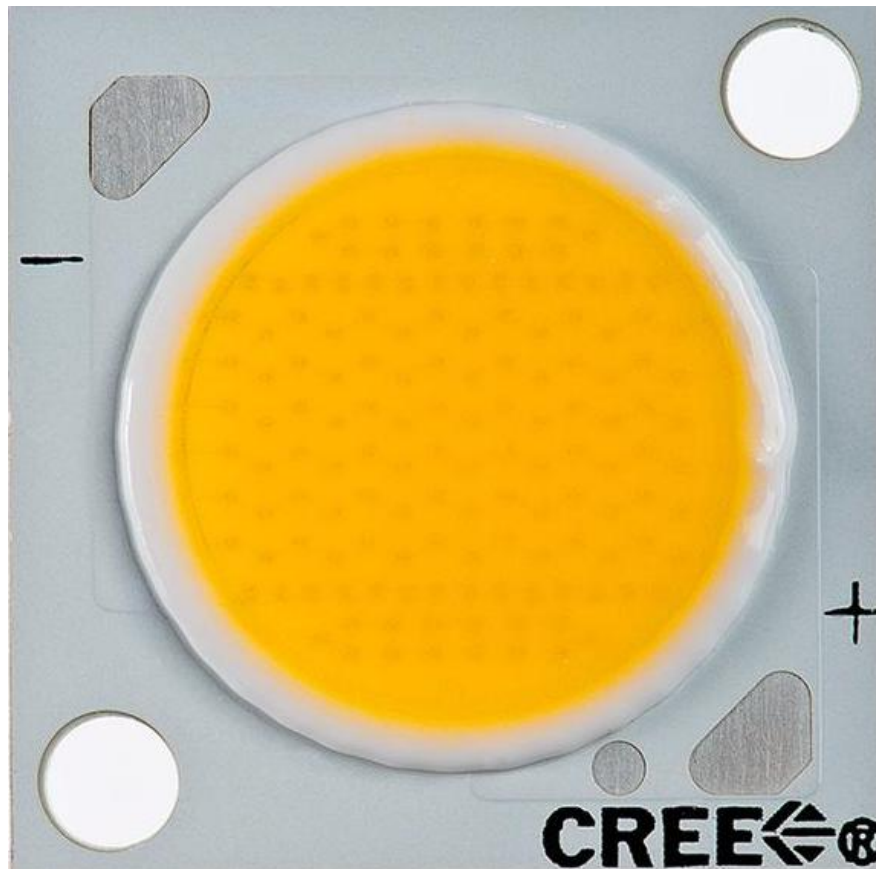
Figure 4: Bottom PCB Layout

LED Output

LED P/N: Cree XLamp CXA2011 LED (+40V per each)

LED Testing applications: 2 CXA2011 LEDs in series

LED Outputs: ~+80V (ideal) in 2Sx1P configurations.



Schematic

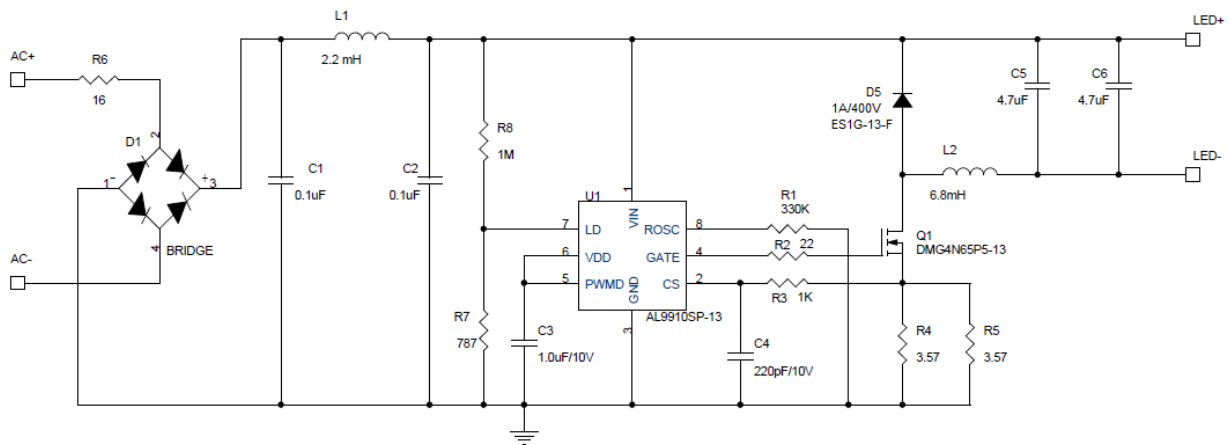
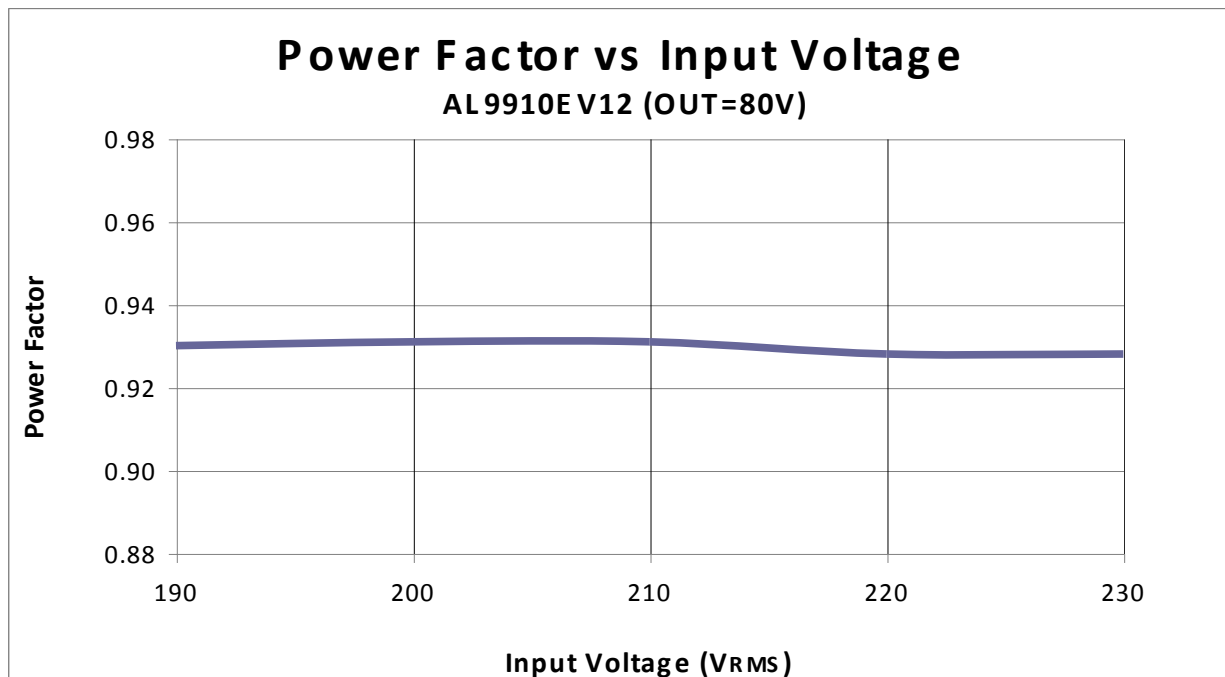
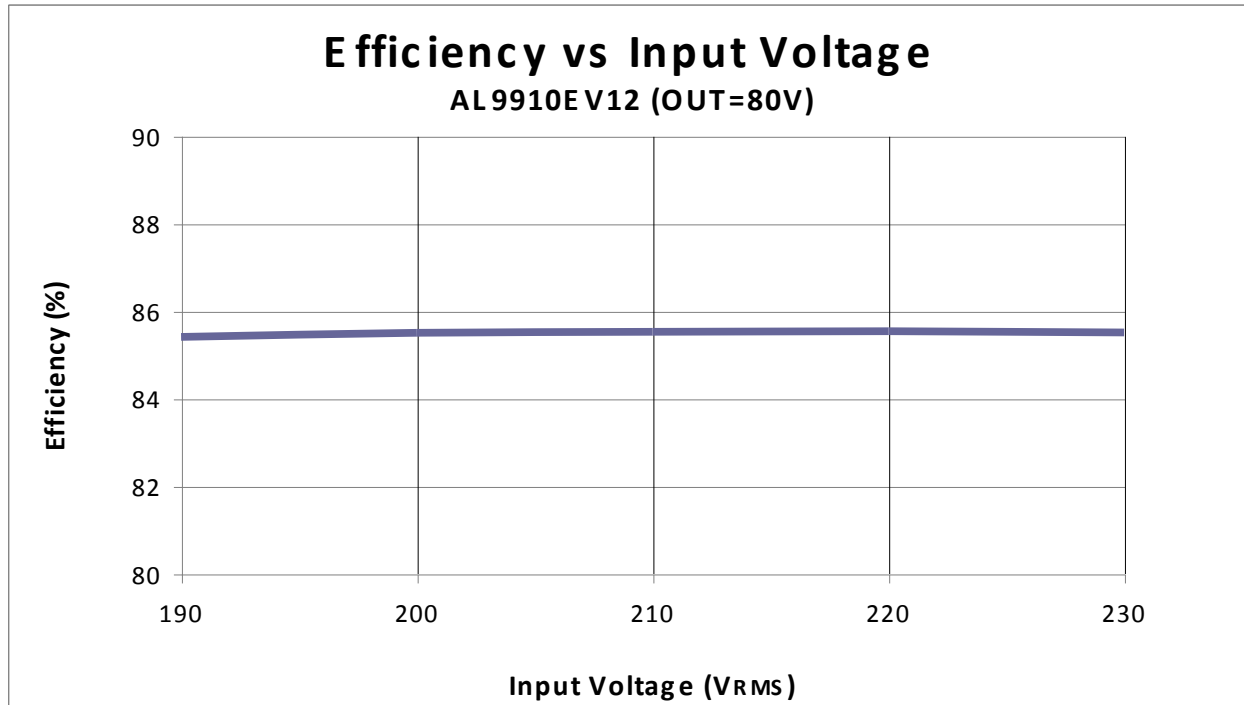


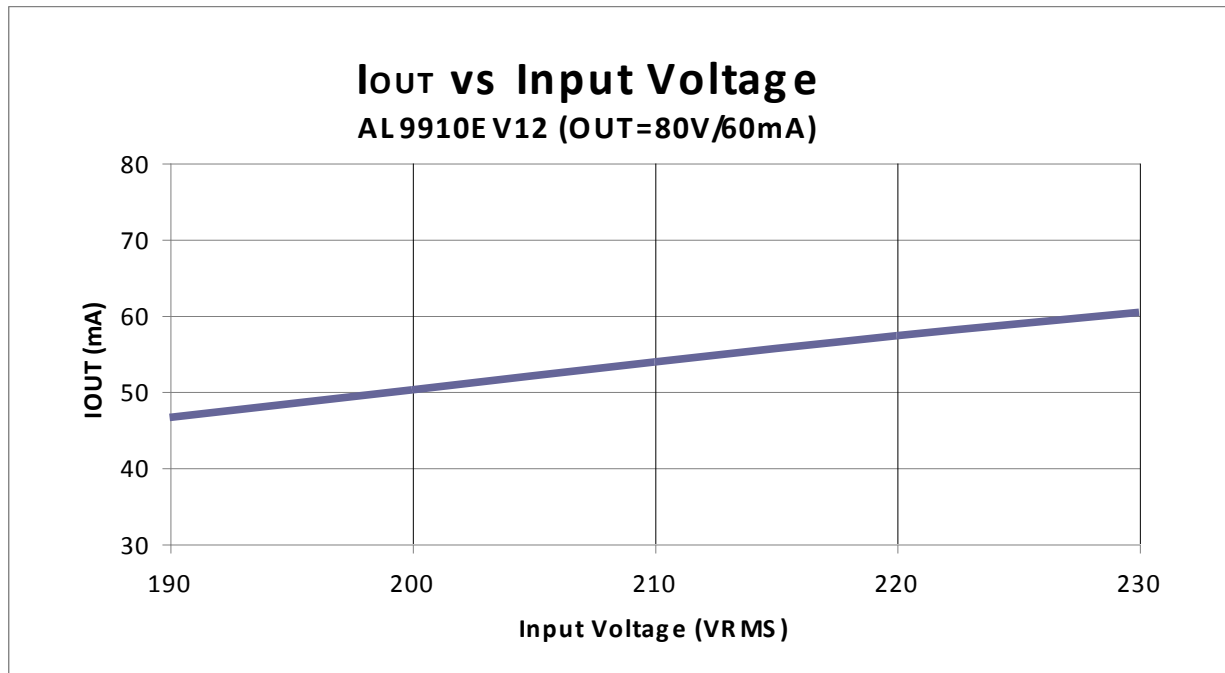
Figure 5: Evaluation Board Schematic

Bill of Material

#	Name	Quantity	Part number	Manufacturer	Description
1	U1	1	AL9910SP-13	Diodes Inc	Universal High Voltage LED Driver in SO-8EP package
2	D1,2,3,4	1	HD06-T	Diodes Inc	RECT BRIDGE GP 600V 0.8A MINIDIP
3	D5	1	ES1G-13-F	Diodes Inc	DIODE SUPER FAST 1A 400V SMA
4	Q1	1	DMG4N65P5-13	Diodes Inc	MOSFET N-CH 650V 4A PowerDI5
5	C1, C2	2	VJ1812Y104KXETW1BC	Vishay	CAP Multilayer Ceramic (MLCC) - SMD/SMT 1812 0.1μF 500V X7R 10%
6	C3	1	C1608X7R1A105K	TDK	CAP CER 1.0μF 10V X7R 0603
7	C4	1	C0402X7R1A221K	Vishay	CAP CER 220pF 10V X7R 01005
8	C5	1	C3225X7S2A475K	TDK	CAP CER 4.7μF, 100V 10% 1210
9	C6	1	C3225X7S2A475K	TDK	CAP CER 4.7μF, 100V 10% 1210
10	R1	1	CRCW0402330KFKTD	Vishay	RES 330KΩ 1/16W 1% 0402 SMD
11	R2	1	CRCW040222R0FKED	Vishay	RES 22.0Ω 1/16W 1% 0402 SMD
12	R3	1	CRCW04021K00FKED	Vishay	RES 1.0KΩ 1/16W 1% 0402 SMD
13	R4	1	CRCW08053R57FKEA	Vishay	RES 3.57Ω 1/8W 1% 0805 SMD
14	R5	1	CRCW08053R57FKEA	Vishay	RES 3.57Ω 1/8W 1% 0805 SMD
15	R6	1	CRCW120616R0FKEA	Vishay	RES 16.0Ω 1/4W 1% 1206 SMD
16	R7	1	CRCW0402787RFKED	Vishay	RES 787Ω 1/16W 1% 0402 SMD
17	R8	1	CRCW12061M00JNEA	Vishay	RES 1MΩ 1/4W 5% 1206 SMD
18	L1	1	LPS5015-225ML	Coilcraft	IND 2.2mH 64mA
19	L2	1	13R685C	Murata	IND Radial 6.8mH 0.13A

Evaluation Board Functional Performance





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