

### General Description

This demonstration board utilizes the AL8820 MR16 LED driver-converter providing a cost effective solution for non-dimmable in offline high brightness LED applications. This user-friendly evaluation board provides users with quick connection to their different types of LEDs string. The demonstration board can be modified to adjust the LED output current and the number of series connected LEDs that are driven.

A bill of materials is included that describes the parts used on this demonstration board. A schematic and layout have also been included along with measured performance characteristics. These materials can be used as a reference design for your products improving your product's time to market.

### Key Features

1. Non-Dimmable
2. Active PFC with power factor >0.9
3. High efficiency >70%
4. Low THD

### Applications

1. MR16 LED Lighting

### Specifications

Parameter	Value
AC Input Voltage	12Vac
Output Power	6.5W
LED Current	650mA
LED Voltage	10V
Power Factor	>0.9
Efficiency	70 %
XYZ Dimension	mm
ROHS Compliance	Yes

### Evaluation Board

Figure 1: Top View

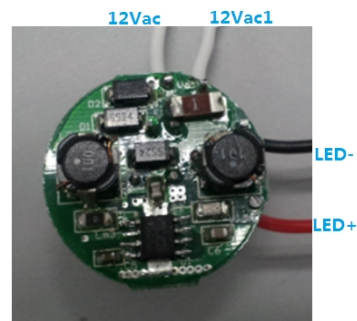
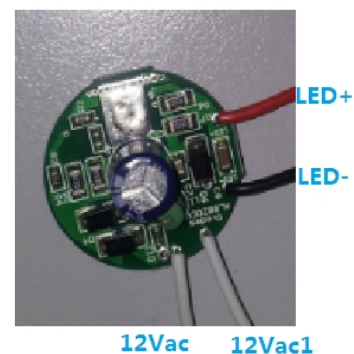


Figure 2: Bottom View



### Connection Instructions:

12VAC Input: White –12Vac  
 12VAC1 Input: White – 12Vac  
 DC LED+ Output: L+ (Red)  
 DC LED- Output: L- (Black)

### Board Layouts

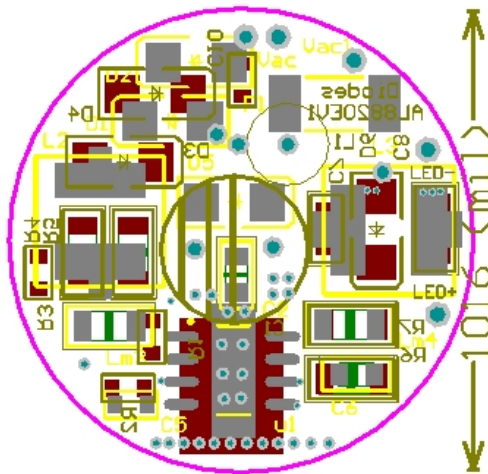


Figure 3: PCB Layout Top View

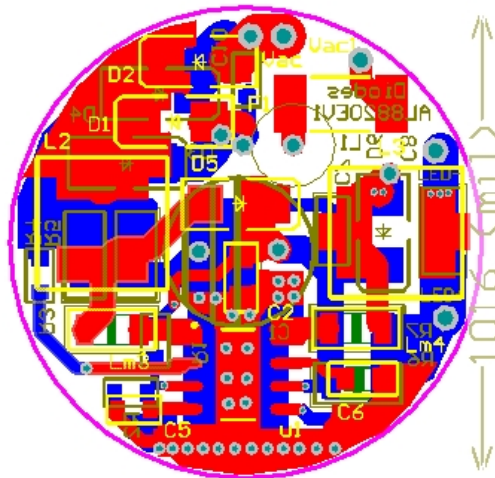


Figure 4: PCB Layout Bottom View

### Quick Start Guide

1. Preset the isolated AC source to 230/120VAC.
2. Ensure that the AC source is switched OFF or disconnected.
3. Connect two AC line wires to the AC+ and AC- terminals to the input terminals of electronic transformer
4. Connect the anode wire of the LED string to the L+ of the evaluation board.
5. Connect the cathode wire of the LED string to the L- terminal of the evaluation board.
6. Connect the output wires of electronic transformer on the evaluation board.
7. Ensure that the area around the board is clear and safe, and preferably that the board and LEDs are enclosed in a transparent safety cover.
8. Turn on the main switch. LED string should light up with LED.  
DO NOT TOUCH THE BOARD, LEDs OR BARE WIRING.

### Schematic

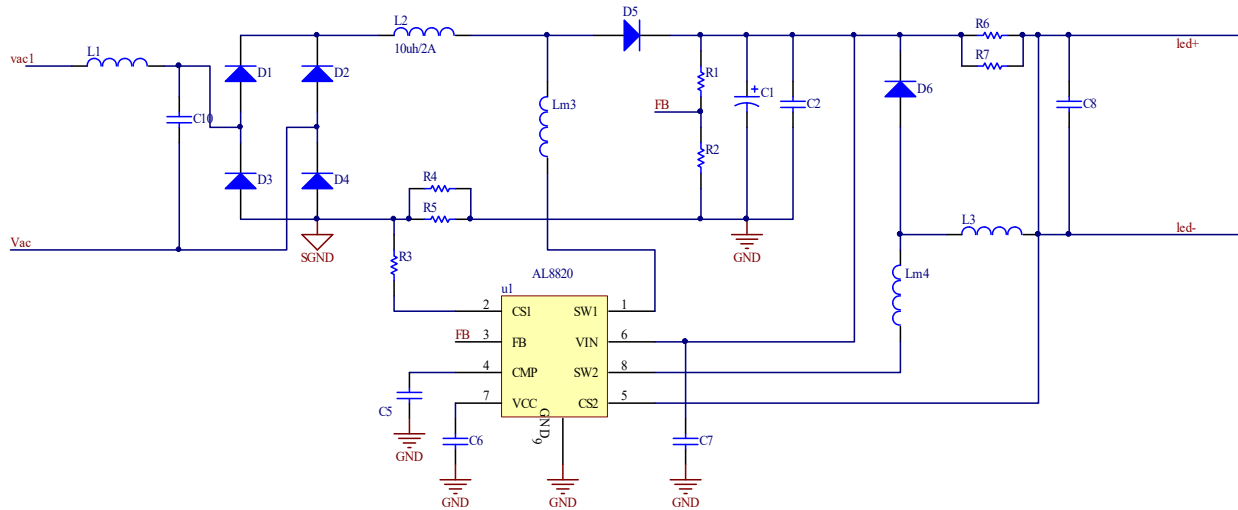


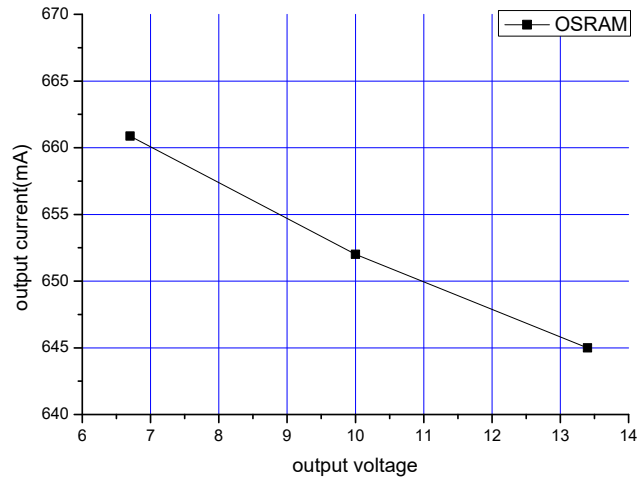
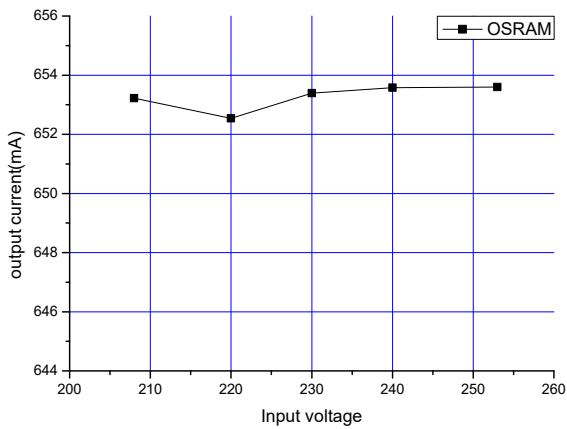
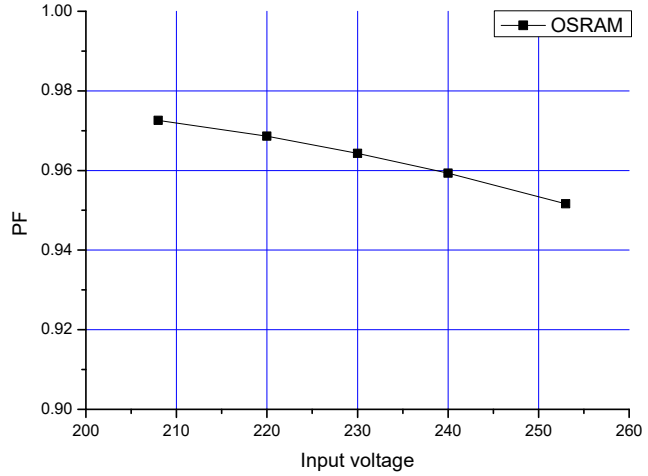
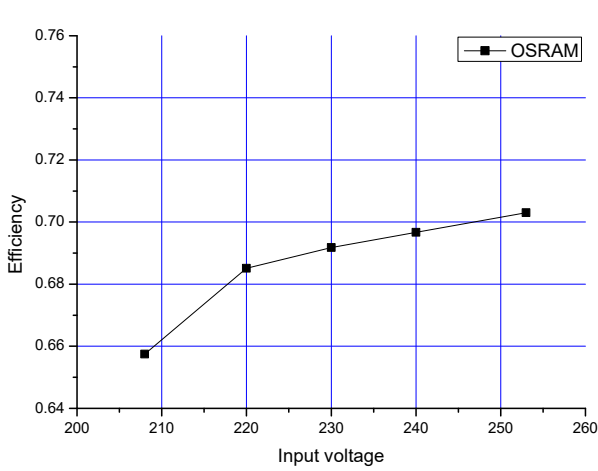
Figure 5: Schematic Circuit

### Bill of Material

#	Name	Quantity	Package	Description
1	C1	1	D8.5mmxL18	Electrolytic capacitor 220uF/35V
2	C2	1	1206	Ceramic Capacitor 2.2uF/50V
3	C5, C6	2	0603	Ceramic Capacitor 1Uf/16V
4	C7	1	0603	Ceramic Capacitor 100nF/50V
5	C8	1	1206	Ceramic Capacitor 4.7uF/25V
6	C10	1	NC	NC
7	D1, D2, D3, D4, D5, D6	6	SMA	Schottky Diode SS24
8	L1	1	0410	Color ring Inductor 2.2uH
9	L2	1	SMD	TDK CLF7045T-100M
10	L3	1	SMD	TDK CLF7045T-101M
11	Lm3, Lm4	2	R1206	Resistor 0R
12	R1	1	R0603	Resistor 51K 5%
13	R2	1	R0603	Resistor 3K 5%
14	R3	1	R0603	Resistor 560R
15	R4, R5	1	R1206	Resistor 0.33R 1%
16	R6, R7	1	R1206	Resistor 0.3R 1%
17	F1	1	2512	AEM MF2410F2.000TM(6MMX2.5MM)
18	u1	1	PSOP-8	AL8820

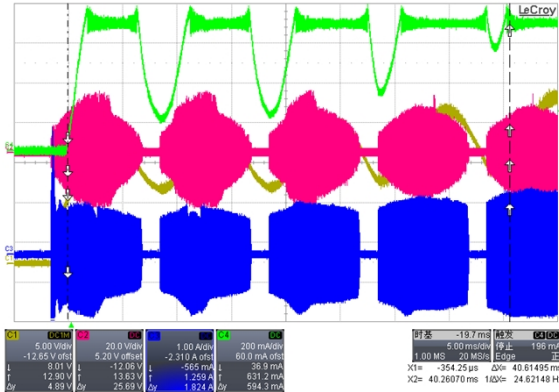
### Functional Performance

(Test Condition: With Electronic Transformer OSRAM (HTM 70/230-240) )



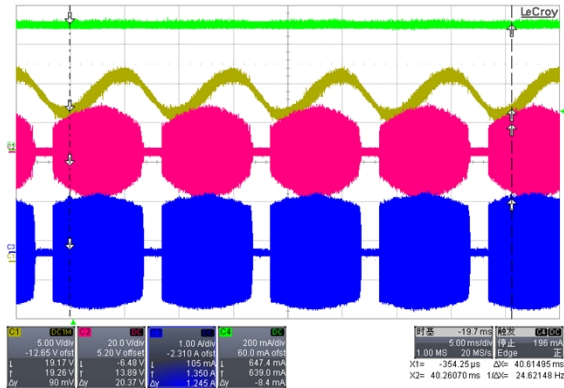
### Functional Waveform

Steady State Waveform with Electronic Transformer OSRAM (HTM 70/230-240)  
(Y-Vboost, G-Io, B-Iin, R-Vin)



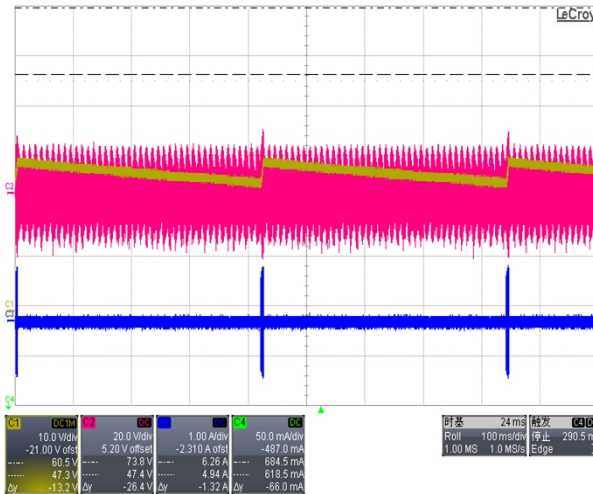
Vinac=230Vac

Start-up Waveform with ET Electronic Transformer OSRAM (HTM 70/230-240)  
(Y-Vboost, G-Io, B-Iin, R-Vin)

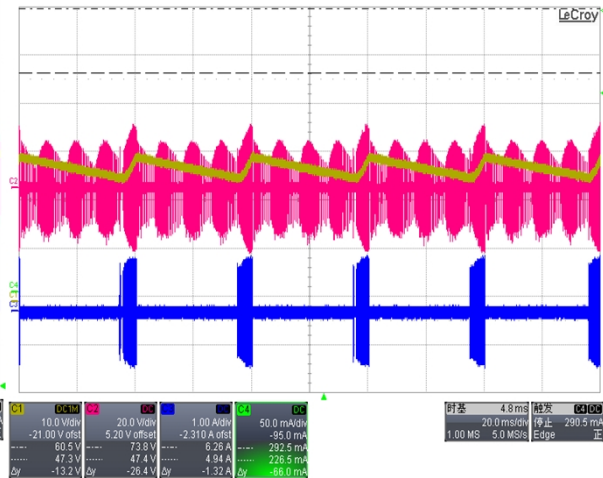


Vinac=230Vac

LED Open Waveform with Electronic Transformer OSRAM (HTM 70/230-240)  
(Y-Vboost, B-Iin, R-Vin)

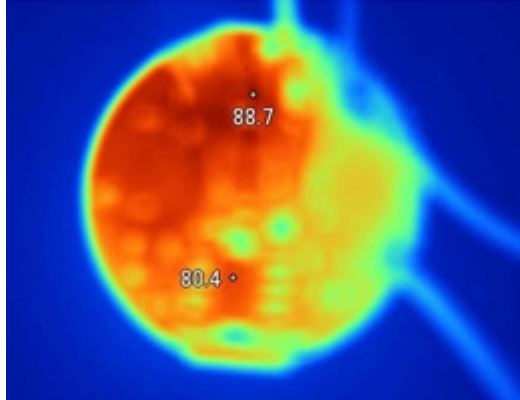


LED Short Waveform with Electronic Transformer OSRAM (HTM 70/230-240)  
(Y-Vboost, B-Iin, R-Vin)

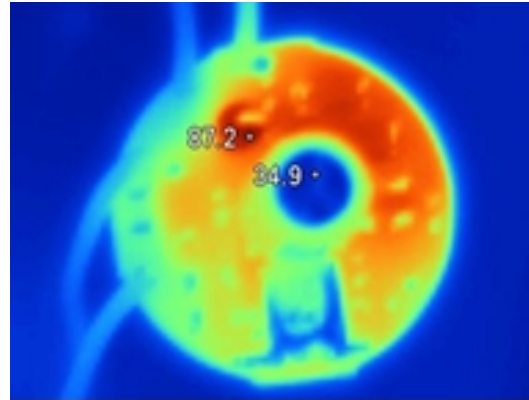


### Thermal Test

**Top**  
(With Electronic Transformer OSRAM (HTM 70/230-240) )



**Bottom**



### Transformer Compatibility List

#### 1) 120VAC to 12VAC Electronic Transformers

Index	Electronic Transformers (120VAC to 12VAC)		Performance (No Flicker)
	Brand	Model	
1	LIGHTECH	LET75(75w)	✓
2	LIGHTECH	LET75 (75w)	✓
3	LIGHTECH	LET303 (300w)	✓
4	Hatch	RS12-60M(60w)	✓
5	HATCH	RS12-150(150w)	✓
6	HATCH	RS12-30M-LED(30w)	✓
7	HATCH	VS12-60W(60w)	✓

#### 2) 230VAC to 12VAC Electronic Transformers

Index	Electronic Transformers (230VAC to 12VAC)		Performance (No Flicker)
	Brand	Model	
1	OSRAM	ET-Z 60 (20-60w)	✓
2	OSRAM	HTM 70/230-240 (20-70w)	✓
3	PHILIPS	ET-E 105(50-105w)	✓
4	PHILIPS	PRIMALINE 70(20-70w)	✓

5	SELF	SET105F-2(35-105w)	√
6	IBL	4104.00 (20-60w)	
7	FSL	EA-HF50(20-50w)	√
8	OPPLE	DB35-220/12(20-35w)	√
9	Sanxiong	(20-60w)	√
10	Yankon	ET-60E (20-60w)	√

Note: √ = No Flicker

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