

Parameters Subject to Change Without Notice

FEATURES

- Real current control without secondary feedback circuit
- High current accuracy of line regulation
- Active power factor correction
- Compatible with analog dimming
- Compatible with PWM dimming
- Frequency fold-back for deep dimming Range
- CV mode to off the LED
- Valley turn-on to low switching loss
- Cycle-by-cycle current limit
- LED short protection
- LED open protection
- Over-temperature protection

APPLICATIONS

- Offline LED Driver
- Intelligent dimming of LED driver

DESCRIPTION

The JW[®]1602 is a multi-topology LED controller with active power factor correction. It is especially designed for LED lighting system. The JW1602 controls the LED current accurately without using an opto-coupler, which can significantly simplify the design of LED lighting system.

JW1602 integrates an interface for PWM dimming and analog dimming both. The output current can be easily linearly adjusted by an analog signal on ADIM or a PWM signal on DPWM.

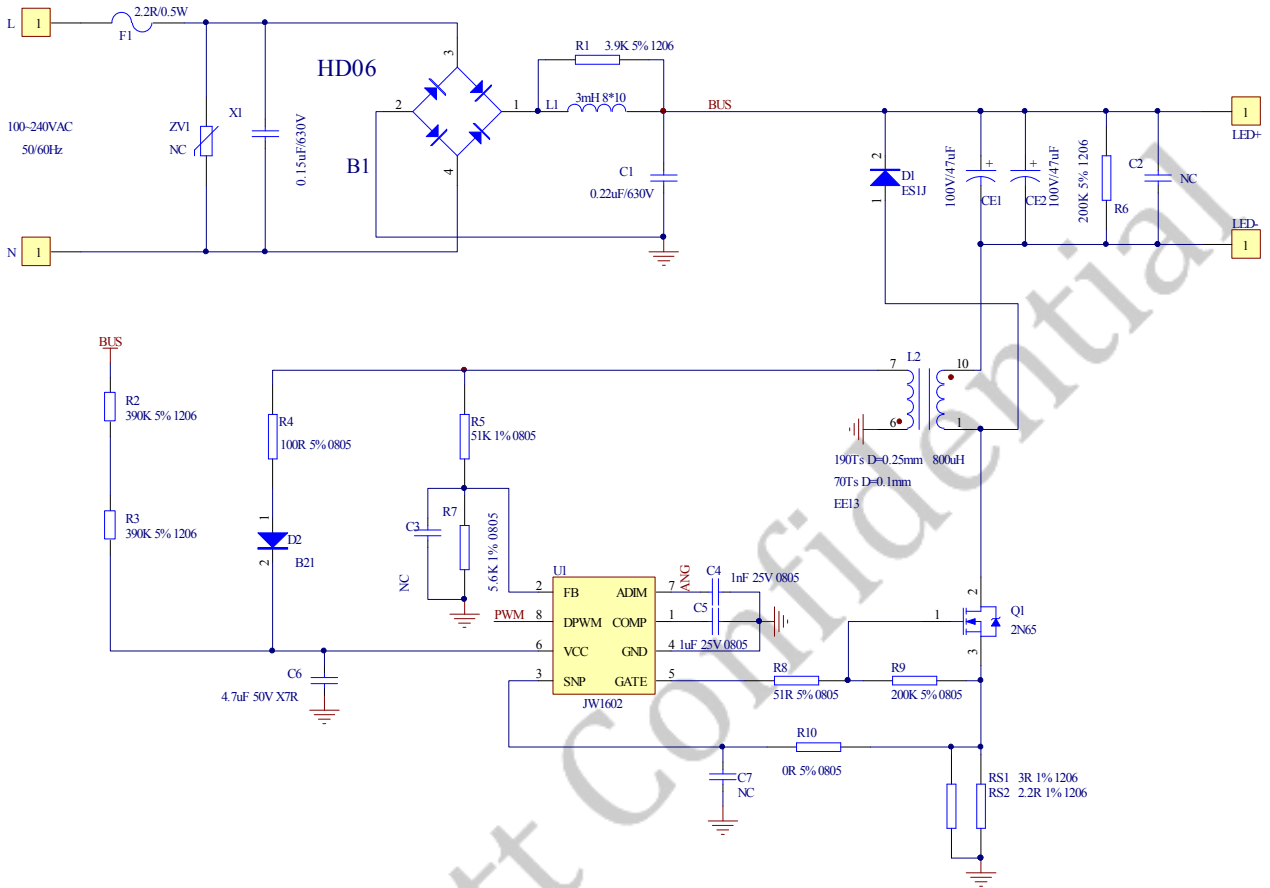
The multi-protection function largely enhances the safety and reliability of the system, including over voltage protection; short circuit protection, LED open protection, cycle-by-cycle current limit, VCC UVLO and over-temperature protection

ELECTRICAL SPECIFICATIONS

Parameter	Symbol	Value	Unit
Input Voltage	VIN	90~260	V
Output Voltage	VOU	70	V
Output Current	IOU	0.24	A



SCHEMATIC



BILL OF MATERIALS

Qty.	Designator	Value	Description	Package	Manufacturer	Manufacturer P/N
1	B1	MB6F	Bridge Rectifier	BM10F		
1	C1	0.22uF/630V	CBB Cap	RAD-0.4		
0	C2, C3, C7	NC				
1	C4	1nF 25V	MLCC	0805		
1	C5	1uF 25V	MLCC	0805		
1	C6	4.7uF 50V	MLCC, X7R	1206		
2	CE1, CE2	100V/47uF	E-cap	RB.2.4		
1	D1	ES1J	Diode	SMA		
1	D2	B21	Diode	SOD123		
1	F1	2.2R/0.5W	Fuse Resistor	AXIAL-0.4		
1	L1	2mH 8*10mm	DM inductor	L-8*10		
1	L2	800uH	Power inductor	EE13-5+5		
1	Q1	2N65	N-MOSFET	TO-251		
1	R1	3.9K 5% 1206	Resistor	1206		
2	R2, R3	390K 5% 1206	Resistor	1206		
1	R4	100R 5% 0805	Resistor	0805		
1	R5	51K 1% 0805	Resistor	0805		
1	R6	200K 5% 1206	Resistor	1206		
1	R7	5.6K 1% 0805	Resistor	0805		
1	R8	51R 5% 0805	Resistor	0805		
1	R9	200K 5% 0805	Resistor	0805		
1	R10	0R 5% 0805	Resistor	0805		
1	RS1	3R 1% 1206	Resistor	1206		
1	RS2	2.2R 1% 1206	Resistor	1206		
1	U1	JW1602	IC	SOP8	JOULWATT	JW1602
1	X1	0.15uF/630V	CBB Cap	RAD-0.4		
0	ZV1	NC		RAD-0.2		
27						

PRINTED CIRCUIT BOARD LAYEROUT

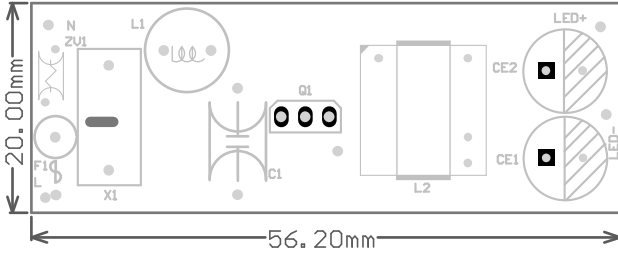


Figure1—Top Layer

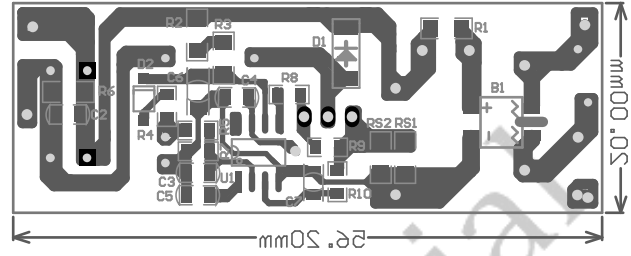


Figure2—Bottom Layer

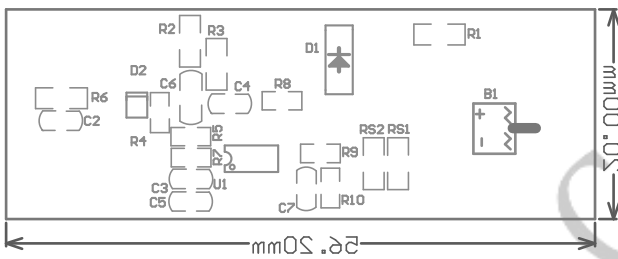


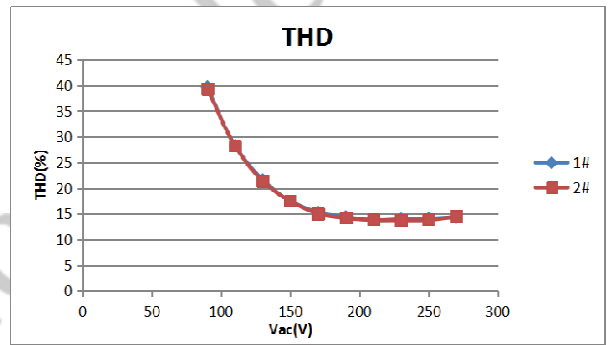
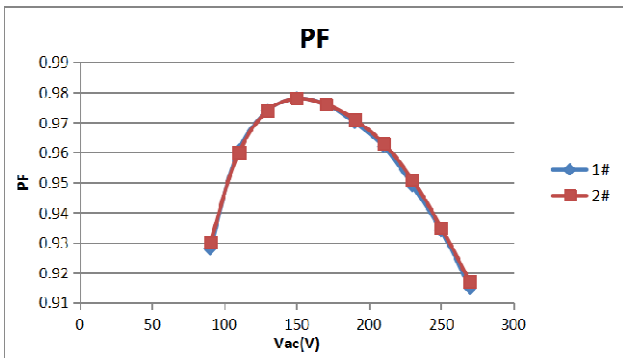
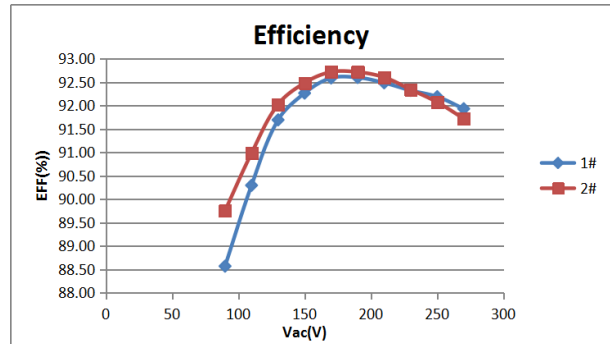
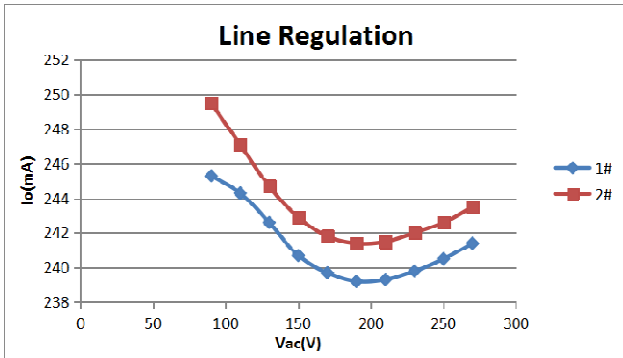
Figure3—Bottom Silk Layer

QUICK START GUIDE

1. Connect the anode of the load 23~24 LEDs whose VF falls between (3~3.3V) to “LED+” marked on the EVB, and cathode to “LED-”.
2. Set the AC source to 90V ~260V, turn off the source.
3. Connect the “Line” of AC source to the “L”, and “neutral” to “N”.
4. Turn on the AC source; the evaluation board starts operating in normal condition.
5. Change RS1 and RS2 if you want another output current.
6. For analog dimming, a 0~3.4V analog signal should be applied to Pin7 ADIM.
7. For PWM dimming, a PWM signal(high level 5.5V >> 1.6V) should be applied to Pin 8 DPWM, and the cap C4 should be larger enough to filter the voltage ripple of the PWM signal.
8. Please refer to the datasheet of JW1602 to get more information.

TYPICAL PERFORMANCE CHARACTERISTICS

TA = +25°C, unless otherwise noted



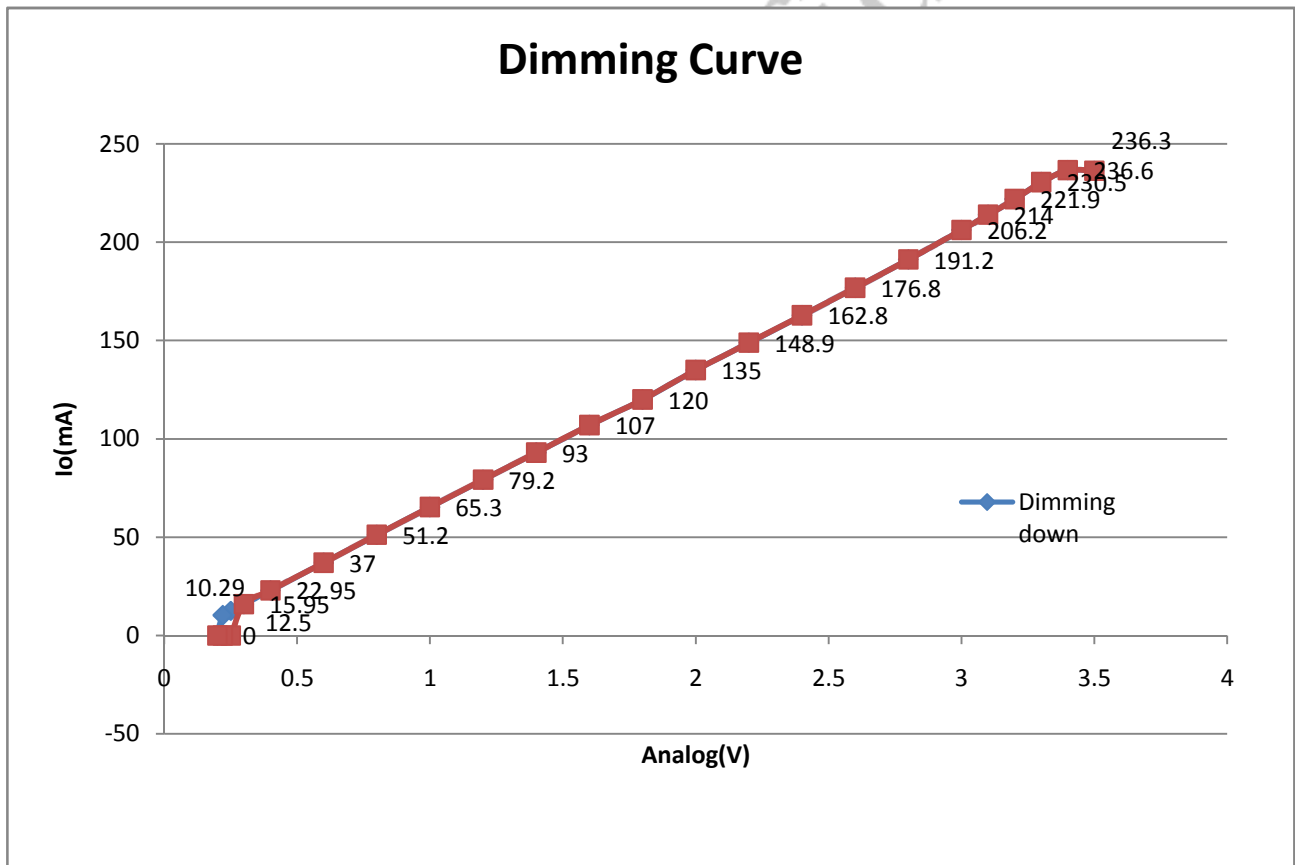
EVB 1# Spec

Vac (V)	Pin (W)	Vo (V)	Io (mA)	THD (%)	PF	EFF. (%)
90	19.47	70.3	245.3	39.7	0.928	88.57
110	19.02	70.3	244.3	28.3	0.961	90.30
130	18.6	70.3	242.6	21.68	0.974	91.69
150	18.34	70.3	240.7	17.5	0.978	92.26
170	18.2	70.3	239.7	15.3	0.976	92.59
190	18.16	70.3	239.2	14.42	0.97	92.60
210	18.19	70.3	239.3	13.83	0.962	92.48
230	18.26	70.3	239.8	14	0.949	92.32
250	18.34	70.3	240.5	14.1	0.934	92.19
270	18.46	70.3	241.4	14.4	0.915	91.93

EVB 2# Spec

V _{ac} (V)	P _{in} (W)	V _o (V)	I _o (mA)	THD (%)	PF	EFF. (%)
90	19.57	70.4	249.5	39.4	0.93	89.75
110	19.12	70.4	247.1	28.23	0.96	90.98
130	18.72	70.4	244.7	21.42	0.974	92.02
150	18.49	70.4	242.9	17.5	0.978	92.48
170	18.36	70.4	241.8	15.05	0.976	92.72
190	18.33	70.4	241.4	14.2	0.971	92.71
210	18.36	70.4	241.5	13.86	0.963	92.60
230	18.45	70.4	242	13.8	0.951	92.34
250	18.55	70.4	242.6	13.86	0.935	92.07
270	18.69	70.4	243.5	14.5	0.917	91.72

Dimming Curve



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