EV1760_S0_R0

Non-isolated Step-down LED Driver

Parameters Subject to Change Without Notice

FEATURES

- No Auxiliary Winding
- Good Line and Load Regulation (<+-1%)
- Critical Conduction Mode
- High Efficiency over universal input range
- Cycle-by-cycle Current Limit
- LED Short Protection
- LED Open Protection
- Over Temperature Protection
- SOT23-5 Package

APPLICATION

- LED Driver

ELECTRICAL SPECIFICATIONS

Parameters	Symbol	Value	Unit
Input voltage	V_{IN}	100~264	V
Output voltage	V_O	70	V
Output current	I_O	0.24	A

DESCRIPTION

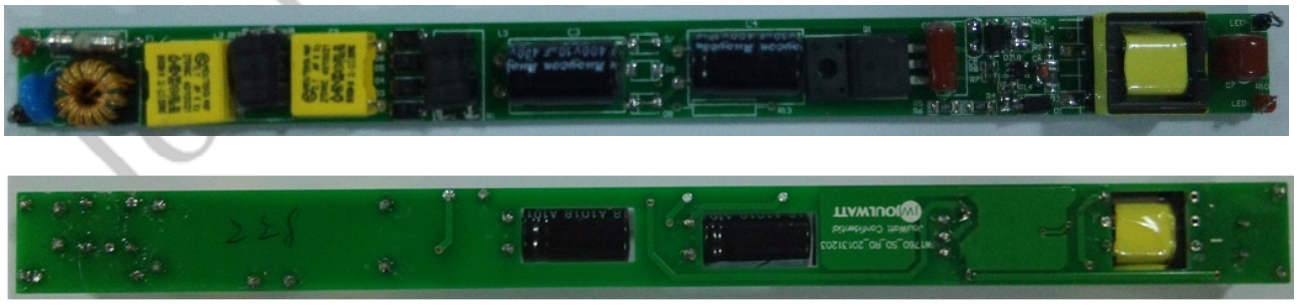
EV1760 is a 70V/240mA LED driver EVB based on JW1760.

The JW1760 is a constant current LED controller with high current accuracy which applies to non-isolation step-down LED system. Input AC voltage ranges from 100V to 264V.

High accuracy of output current is achieved by sampling the output current directly. Critical conduction mode operation reduces the switching losses and largely increases the efficiency. JW1760 is supplied from the output directly, and auxiliary winding is not needed.

JW1760 has multi-protection functions which largely enhance the safety and reliability of the system, including VCC over-voltage protection, VCC UVLO, short-circuit protection, LED open protection, cycle-by-cycle current limit and over-temperature protection.

EVALUATION BOARD

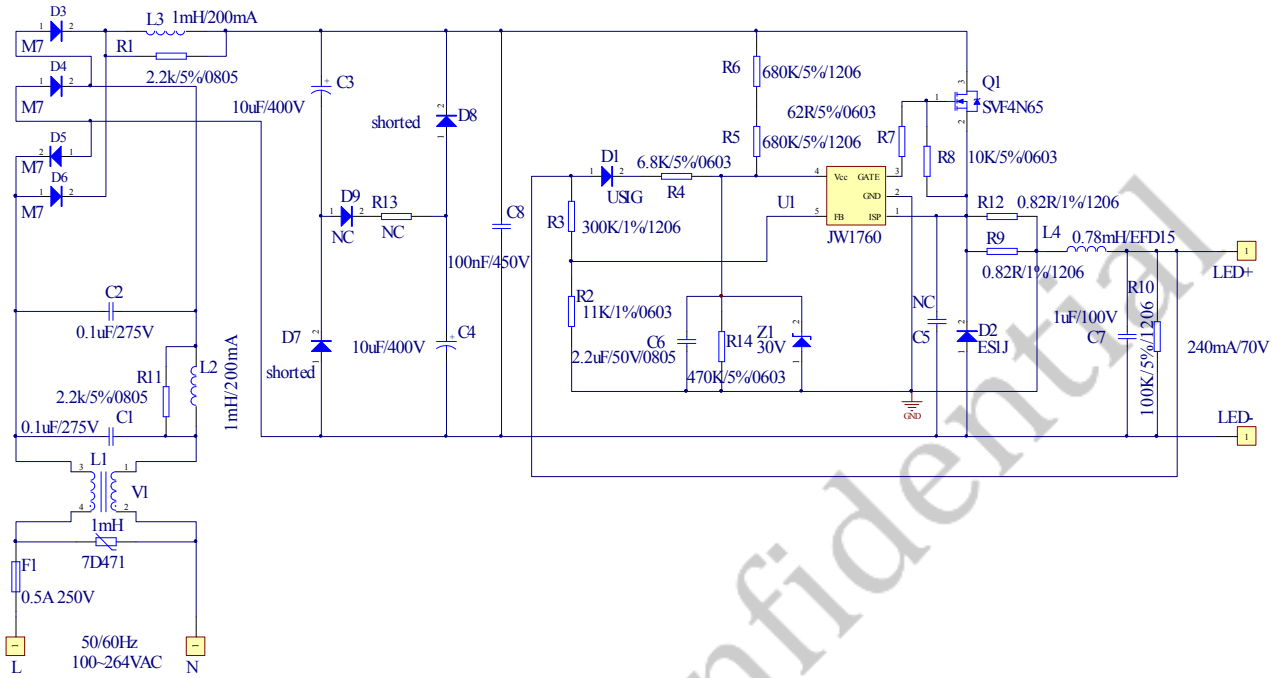


JouleWatt Confidential

JoulWatt Proprietary Information. Patent Protected.

Unauthorized Photocopy and Duplication Prohibited.

SCHEMATIC



BILL OF MATERIALS

Quantity	Designator	Comment	Description	Footprint	Manufacturer	Manufacturer P/N
2	C1, C2	0.1uF/275V	Safety capacitor	RAD-0.4		
1	C3	10uF/400V	Electrolytic capacitor	RB.2/.4		
1	C4	10uF/400V	Electrolytic capacitor	RB.2/.4		
1	C5	NC	Ceramic Cap,X7R	1206C		
1	C6	2.2uF/50V X7R	Ceramic Cap,X7R	0603C		
1	C7	1uF/100V	CBB capacitor	RAD-0.2		
1	C8	100nF/450V	CBB capacitor	RAD-0.4		
1	D1	400V/1A	Fast recovery diode	SMA		US1G

JoulWatt confidential

JoulWatt Proprietary Information. Patent Protected.
Unauthorized Photocopy and Duplication Prohibited.

Quantity	Designator	Comment	Description	Footprint	Manufacturer	Manufacturer P/N
1	D2	600V/1A	Fast recovery diode	SMA		ES1J
4	D3, D4, D5, D6	1000V/1A	Rectifier diode	SMA		M7
0	D7, D8	Shorted		SMA		
0	D9	NC		SMA		
1	F1	0.5A/250V	FUSE	AXIAL-0.6		
1	L1	1mH/200mA	Common mode inductor	CM		
2	L2, L3	1mH/200mA	Differential mode inductor	RAD-0.2		
1	L4	0.78mH	INDUCTOR	EFD15 4+4 PIN		
1	Q1	4A650V	N-MOSFET	TO-220		SVF4N65
1	R1	2.2k/5%/0805	Film resistor	0805R		
1	R2	11K/1%/0603	Film resistor	0603R		
1	R3	300K/1%/1206	Film resistor	1206R		
1	R4	6.8K/5%/0805	Film resistor	0603R		
2	R5, R6	680K/5%/1206	Film resistor	1206R		
1	R7	62R/5%/0603	Film resistor	0603R		
1	R8	10K/5%/0805	Film resistor	0603R		
2	R9	0.82R/1%/1206	Film resistor	1206R		
1	R10	100K/5%/1206	Film resistor	1206R		
1	R11	2.2k/5%/0805	Film resistor	0805R		
2	R12	0.82R/1%/1206	Film resistor	1206R		
0	R13	NC		AXIAL-0.5		

JoulWatt Confidential

JoulWatt Proprietary Information. Patent Protected.
Unauthorized Photocopy and Duplication Prohibited.

1	R14	470K/5%/0603	Film resistor	0603R		
Quantity	**Designator**	**Comment**	**Description**	**Footprint**	**Manufacturer**	**Manufacturer P/N**
1	U1	JW1760	Off-line LED controller	SOT-23-5	JoulWatt	JW1760
1	V1	7D471	Varistor	AXIAL-0.2		
1	Z1	30V	Zener Diode	D1206		

JoulWatt Confidential

JoulWatt Proprietary Information. Patent Protected.
Unauthorized Photocopy and Duplication Prohibited.

PRINTED CIRCUIT BOARDLAYEROUT

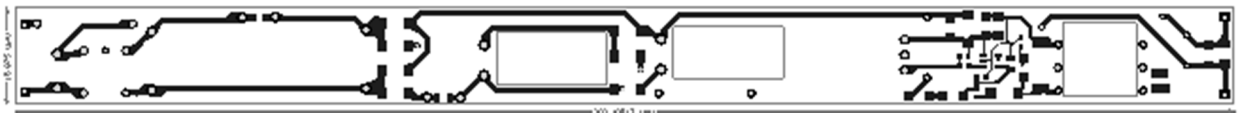


Figure1—Top Layer

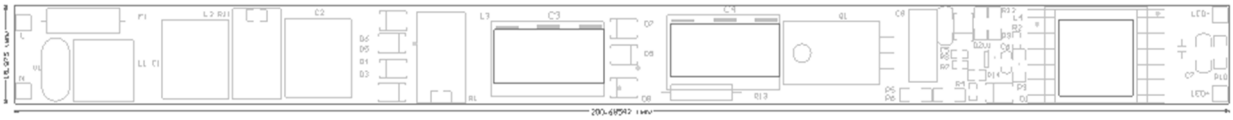


Figure2—Top Silk Layer

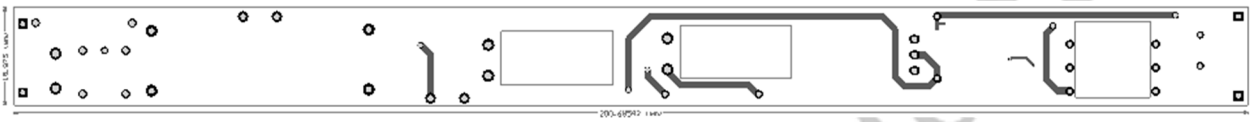


Figure3—Bottom Layer

QUICK START

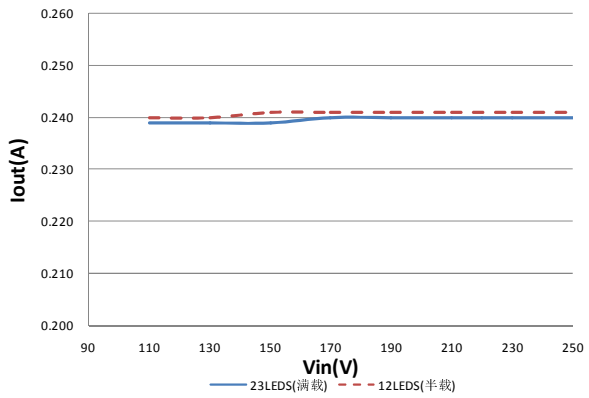
1. Connect the anode of the load (12~23LEDs whose VF falls between 3~3.3V) to “LED+” marked on the EVB, and cathode to “LED-”.
2. Set the AC source to 100V ~264V, turn off the source.
3. Connect the “Line” of AC source to the “L”, and “neutral” to “N”.
4. Turn on the AC source; the evaluation board starts operating in normal condition.
5. Change R9 and R12 if you want another output current.
6. To get more information, please refer to the datasheet of JW1760.

JoulWatt Confidential

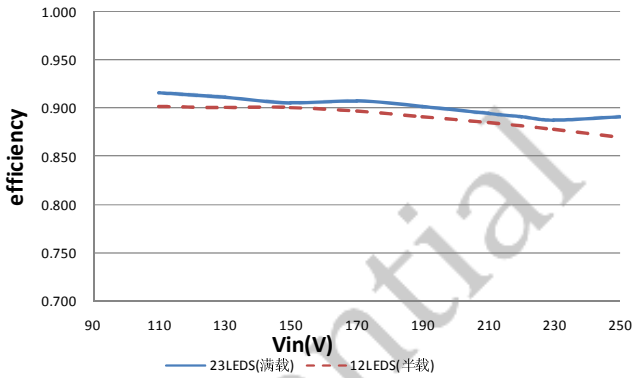
JoulWatt Proprietary Information. Patent Protected.
Unauthorized Photocopy and Duplication Prohibited.

TYPICAL PERFORMANCE CHARACTERISTICS

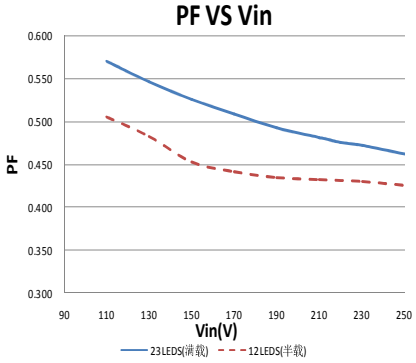
Line regulation



Efficiency VS Vin@different load

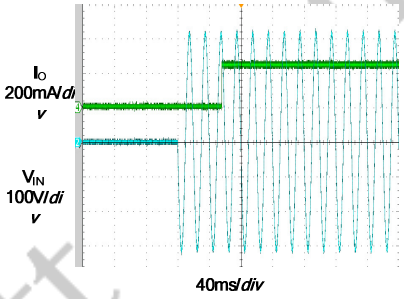


PF VS Vin



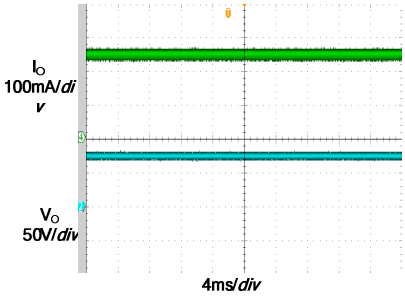
Start up

V_{IN}=220Vac,I_O=240mA,P_O=19W



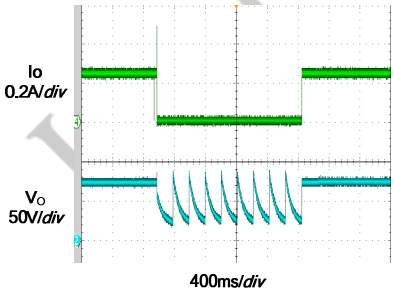
Steady state

V_{IN}=220Vac,I_O=240mA,P_O=19W



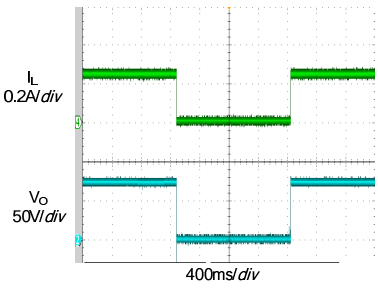
OVP

V_{IN}=220Vac,V_O=70V, P_{IN}=0.14W



SCP

V_{IN}=220Vac,I_O=240mA,P_{IN}=0.28W



JoulWatt Confidential

JoulWatt Proprietary Information. Patent Protected.
Unauthorized Photocopy and Duplication Prohibited.

IMPORTANT NOTICE

- **Joulwatt Technology Inc. reserves the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein.**
- **Any unauthorized redistribution or copy of this document for any purpose is strictly forbidden.**
- **Joulwatt Technology Inc. does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel.**

JoulWatt Confidential

Copyright© 2015 EV1760_S0_R0 Incorporated.

All rights are reserved by Joulwatt Technology Inc.