JWB19818L

Single-Channel Linear LED Driver

Parameters Subject to Change Without Notice

DESCRIPTION

JWB19818L is a single channel linear LED driver with 500V MOSFET integrated, and the output current is set by the external resistor. Patented current control strategy ensures high output current accuracy while the system is simple with few external components and very low BOM cost.

JWB19818L provides over temperature protection. When temperature inside chip exceeds OTP_{CHIP}, JWB19818L deceases LED current, which can help chip cooling.

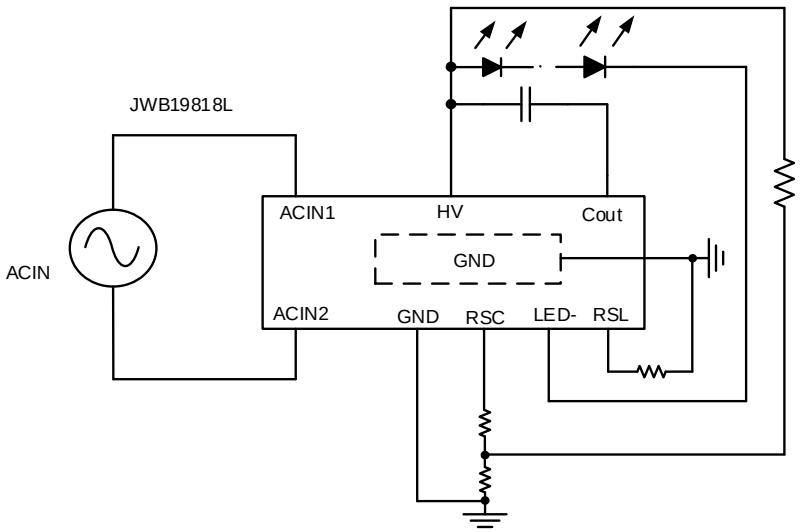
FEATURES

- 800V Bridge Rectifier Integrated
- 500V MOSFET Integrated
- High-accuracy Output Current
- Over Temperature Protection
- No EMI Issue
- Low BOM Cost
- Meet the IEC61000-3-2_2018 Standard
- Meet the Requirements of SVM <0.4, Pst_LM <1, DF> 0.7
- No TVS/MOV to Pass 550V Combined Wave
- HSOP-8 Package

APPLICATIONS

- T5/T8 Series LED Lighting
- LED Bulb Lamp, Floor Lamp

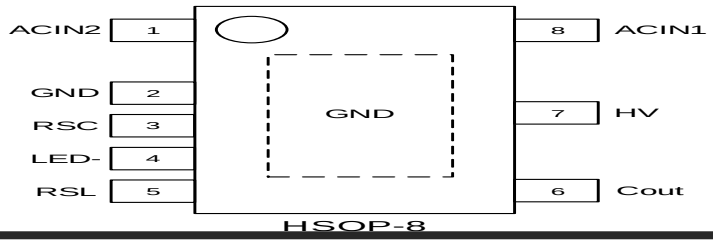
TYPICAL APPLICATION



ORDER INFORMATION

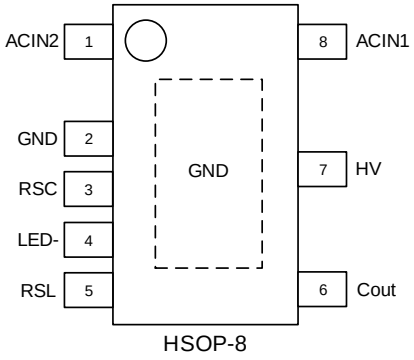
DEVICE[1)]	PACKAGE	TOP MARKING[2)]	ENVIRONMENTAL[3)]
JWB19818LHSOPD#TR	HSOP-8	JWB19818L YW□□□□□	Green

Note：



PIN CONFIGURATION

TOP VIEW



ABSOLUTE MAXIMUM RATING[1)]

LED-, Cout.....500V
RSL,RSC..... -0.3V to 1V
I_{LED-}_max@ *Ta= 25 ℃*.....100mA
I_{Cout}_max@ *Ta= 25 ℃*.....150mA
Junction Temperature[2)3)]..... 150ºC
Lead Temperature 260ºC
Storage Temperature .....-65ºC to +150ºC

RECOMMENDED OPERATING CONDITIONS

LED-, Cout.....8.5V~400V
Junction Temperature (T_J) .....-40ºC to 125ºC
I_{LED-}@220Vac..... .....<40mA
I_{LED-}@110Vac..... .....<60mA

Note：

1) Exceeding these ratings may damage the device. These stress ratings do not imply function operation of the device at any other conditions beyond those indicated under RECOMMENDED OPERATING CONDITIONS.

2) The JWB19818L series includes thermal protection that is intended to protect the device in overload conditions. Continuous operation over the specified absolute maximum operating junction temperature may damage the device.

3) The device is not guaranteed to function outside of its operating conditions.

ELECTRICAL CHARACTERISTICS

T_A=25℃, unless otherwise stated.

Advance Information, not production data, subject to change without notice.

Item	Symbol	Condition	Min.	Typ.	Max.	Unit.
Cout Minimum Input Voltage	V_{out_min}	I_{COUT}=30mA		5.6	6.0	V
Cout Maximum Voltage	V_{out_BV}	I_{COUT}=0.15mA	450	500		V
Cout Quiescent Current	I_Q	V_{COUT}=10V, V_{RSC}=3.3V		36	67	μA
Reference Voltage_Cout	V_{REF_Cout}	V_{COUT}=10V	0.484	0.5	0.516	V
LED- Minimum Input Voltage	V_{out_min}	I_{LED}=30mA			7.7	V
LED- Maximum Voltage	V_{out_BV}	I_{LED}=0.2mA	450	500		V
LED- Quiescent Current	I_Q	V_{LED}=50V, V_{RSL}=1V	60	75	100	μA
Reference Voltage_LED	V_{REF_LED}	V_{LED}=10V	565	585	605	mV
Bridge Diode BV Voltage[4)]	V_{BR_BD}		800			V
Bridge Diode Forward Voltage Drop[4)]	V_{F_BD}	I_F=1A			1.1	V
Bridge Diode Average Forward Current[4)]	$I_{F(AV)}$				0.5	A
Bridge Diode Peak Forward Surge Current 1ms Single Half Sine Wave	I_{FSM}				30	A
Thermal Protection Threshold[4)]	OTP_{CHIP}		140	150	160	℃

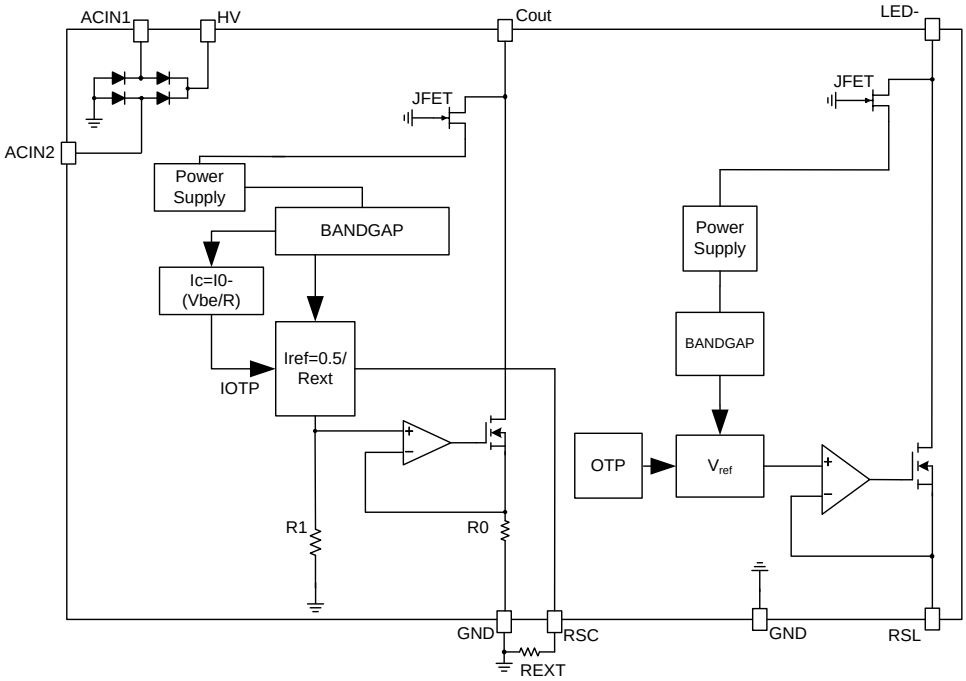
Note

4) Guaranteed by design

PIN DESCRIPTION

Pin HSOP-8	Name	Description
1	ACIN2	AC input
2	GND	Chip ground
3	RSC	Capacitor current setup pin
4	LED-	The power supply and shall be connected to cathode of the LED string
5	RSL	LED current setup pin
6	Cout	Capacitor current output pin
7	HV	High voltage pin, the positive output node of the internal bridge rectifier
8	ACIN1	AC input

BLOCK DIAGRAM



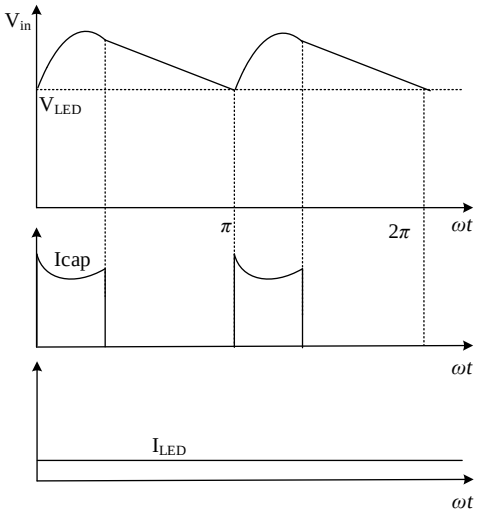
FUNCTIONAL DESCRIPTION

JWB19818L is a single channel linear LED driver for direct line operation.

Theory of Operation

The input is the rectified voltage from AC mains by the internal bridge rectifier. When HV pin is higher than the forward voltage (VF) of the LEDs, the current of LEDs begins to increase.

The Electrolytic Capacitor(E-cap) charging block works when HV pin is higher than the voltage of E-cap. The E-cap supplies current when the AC mains voltage is lower than the LED VF to eliminate the LED current ripple. The current of E-cap and LED string are shown below.



Constant peak current control

JWB19818L controls the LED peak current from the information of the current sensing resistor. The output LED peak current can be calculated as:

$$I_{peak} = V_{REF\_LED}/R_{cs}$$

Where

V_{REF_LED} is the reference voltage;

R_{cs} is the current sensing resistor connected between RSL and chip ground.

Over Temperature Protection

When the junction temperature of JWB19818L is higher than OTP_{CHIP}, LED current reduces.

APPLICATION REFERENCE

Note: Information in the following reference design sections is not part of JoulWatt component specification. Customers are responsible for determining suitability of components chosen for their purposes and should validate their design implementation to make sure the proper system functionality.

This reference design is suitable for 5W non-isolated LED driver, using JWB19818L, with few external components.

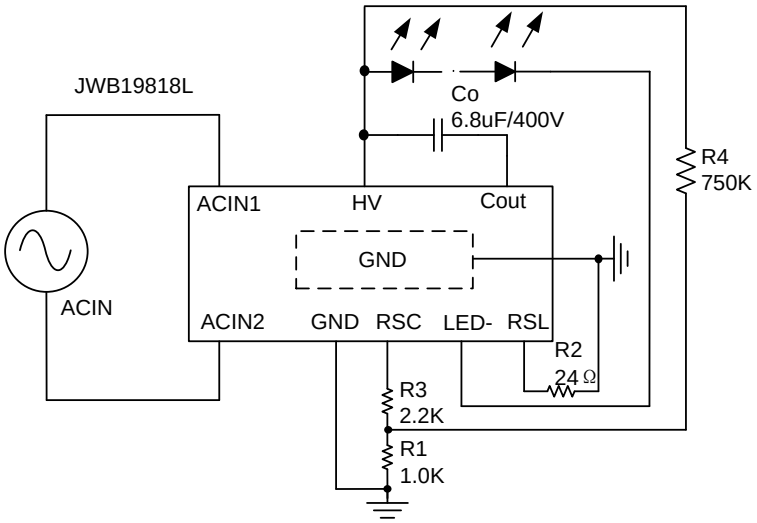
Reference 1：

V_{IN}: 207VAC~253VAC

V_{OUT}: 260V

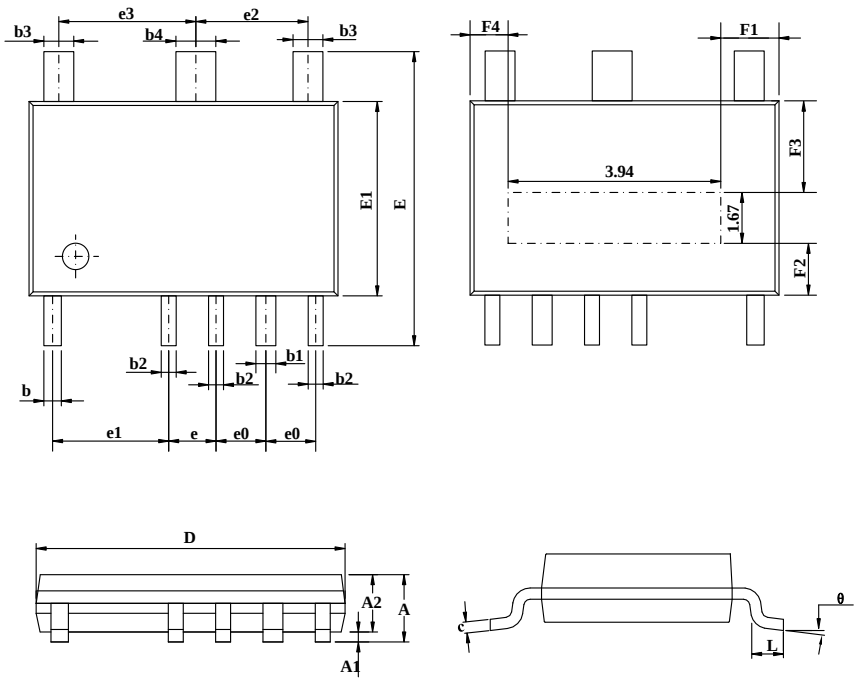
I_{OUT}: 23mA

PF: >0.7



PACKAGE OUTLINE

HSOP-8 UNIT：mm



Symbol	MILLIMETER		
	MIN	NOM	MAX
A	1.25	—	1.45
A1	0.20REF		
A2	1.05	1.15	1.25
c	0.15	0.20	0.22
D	6.00	6.20	6.40
E	5.90	6.00	6.10
E1	3.70	3.90	4.10
e	0.90	0.95	1.00
e0	0.95	1.00	1.05
e1	2.28	2.33	2.38
e2	2.20	2.25	2.30
e3	2.70	2.75	2.80
b	0.30	0.35	0.40
b1	0.35	0.40	0.45
b2	0.25	0.30	0.35
b3	0.55	0.60	0.65
b4	0.75	0.80	0.85
L	0.40	—	0.80
F1	1.55	1.60	1.65
F2	0.75	0.80	0.85
F3	1.38	1.43	1.48
F4	0.61	0.66	0.71
θ	**0 °**	—	**8 °**

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