JWB1981

Single-Channel Linear LED Driver

Parameters Subject to Change Without Notice

DESCRIPTION

JW®B1981 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.

JWB1981 provides over temperature protection. When temperature inside chip exceeds OTP_{CHIP}, JWB1981 deceases LED current, which can help chip cooling.

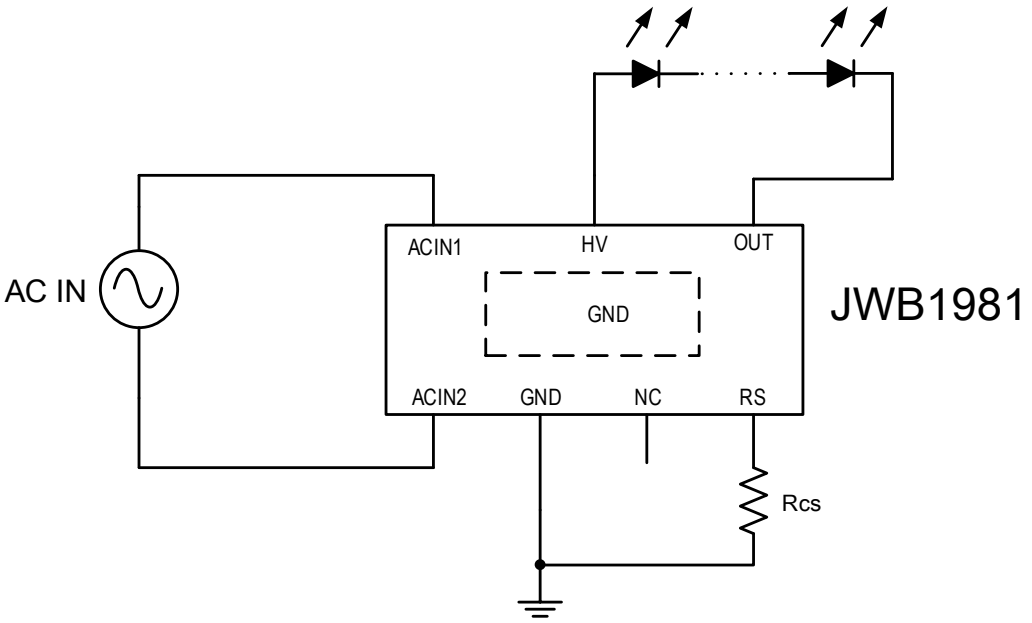
FEATURES

- 800V Bridge Rectifier Integrated
- 500V MOSFET Integrated
- High-accuracy output current.
- Over temperature protection.
- No EMI issues.
- Low BOM cost.
- HSOP-7 packages

APPLICATIONS

- T5/T8 series LED Lighting
- LED Bulb lamp, Floor Lamp

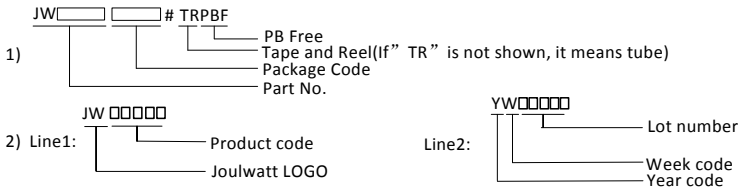
TYPICAL APPLICATION



ORDER INFORMATION

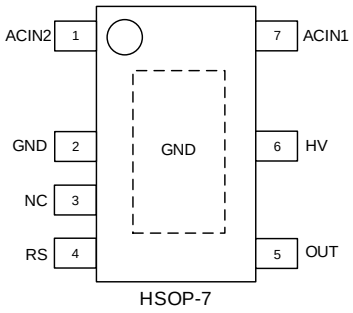
DEVICE[1)]	PACKAGE	TOP MARKING[2)]
JWB1981HSOPC#TRPBF	HSOP-7	JWB1981 YW□□□□□

Notes:



PIN CONFIGURATION

TOP VIEW



HSOP-7

ABSOLUTE MAXIMUM RATING[1)]

OUT.....500V
RS..... -0.3V to 1V
Iout_max@ *Ta= 25℃*.....100mA
Junction Temperature[2)3)]..... 150ºC
Lead Temperature 260ºC
Storage Temperature .....-65ºC to +150ºC

RECOMMENDED OPERATING CONDITIONS

OUT.....8.5V~400V
Junction Temperature (T_J) .....-40ºC to 125ºC
Iout..... .....5~50mA
Iout@220Vac..... .....<40mA
Iout@110Vac..... .....<60mA

Note：

1) Exceeding these ratings may damage the device.

2) The JWB1981 guarantees robust performance from -40°C to 150°C junction temperature. The junction temperature range specification is assured by design, characterization and correlation with statistical process controls.

3) Continuous operation over the specified absolute maximum operating junction temperature may damage the device.

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ELECTRICAL CHARATERISTICS

Ta= 25 ℃, unless otherwise stated.

Item	Symbol	Condition	Min.	Typ.	Max.	Unit.
OUT Minimum Input Voltage	V_{out_min}	I_{OUT}=30mA			7.7	V
OUT Maximum Voltage	V_{out_BV}	I_{OUT}=0mA	450	500		V
Quiescent Current	I_Q	V_{OUT}=50V, V_{RS}=1V	60	75	100	μA
Reference Voltage	V_{REF}	V_{OUT}=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		℃

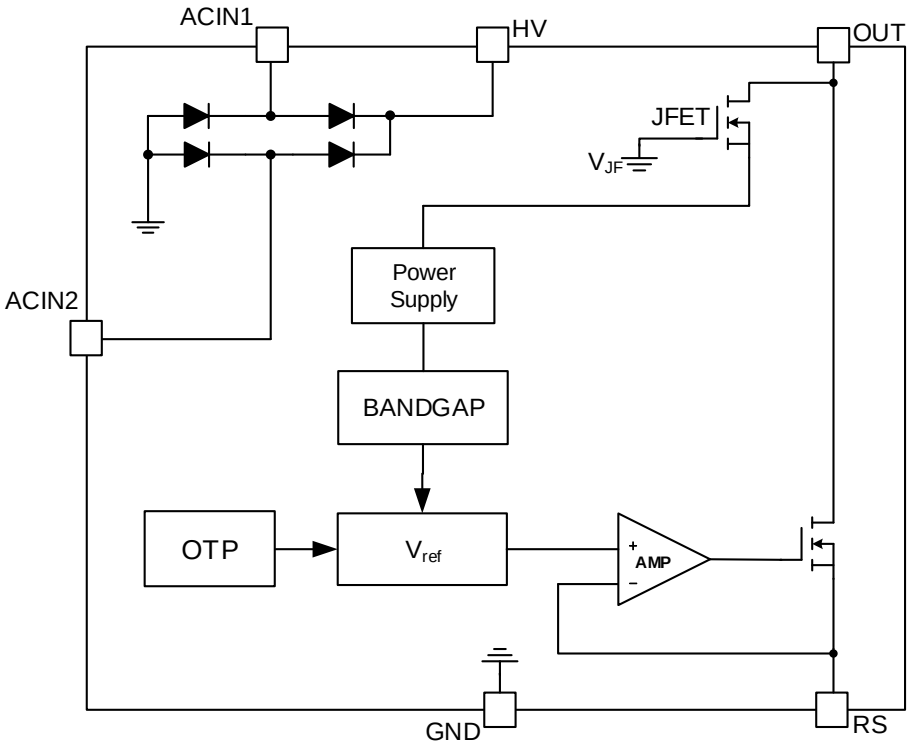
Note

4) Guaranteed by design

PIN DESCRIPTION

Pin HSOP-7	Name	Description
1	ACIN2	AC Input
2	GND	Chip ground
3	NC	No Connect
4	RS	LED current setup pin
5	OUT	The power supply and constant current output
6	HV	High Voltage Pin
7	ACIN1	AC Input

BLOCK DIAGRAM

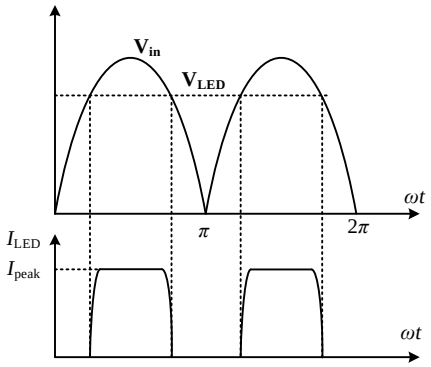


FUNCTIONAL DESCRIPTION

JWB1981 is a single channel Linear LED driver for direct line operation.

Theory of Operation

The input is the rectified voltage from AC line by bridge rectifier. When V_{IN} is higher than the forward voltage of the LEDs, the current of LEDs begins to increase, and I_{LED} reaches its maximum value when the voltage of the OUT pin is higher than V_{out_min}.



Constant peak current control

JWB1981 controls the LED peak current from the information of the current sensing resistor. The output LED peak current can be calculated as:

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

Where
V_{REF} is the reference voltage;
R_{cs} is the current sensing resistor connected between RS and chip ground.

Over Temperature Protection

When the junction temperature of JWB1981 is higher than OTP_{CHIP}, LED current reduces.

REFERENCE DESIGN

This reference design is suitable for 5W non-isolated LED driver, using JWB1981, with few external components.

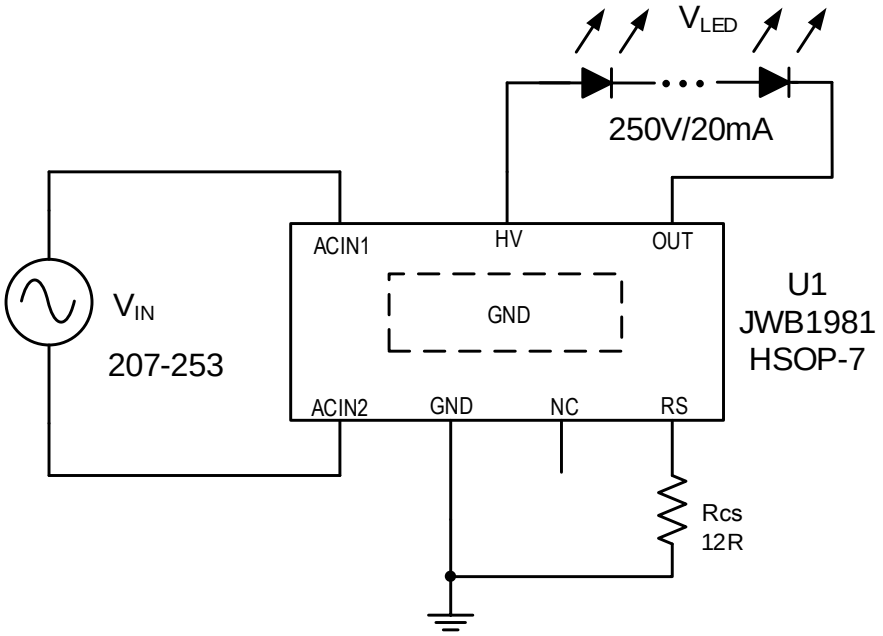
Reference 1：

V_{IN}: 207VAC~253VAC

V_{OUT}: 250V

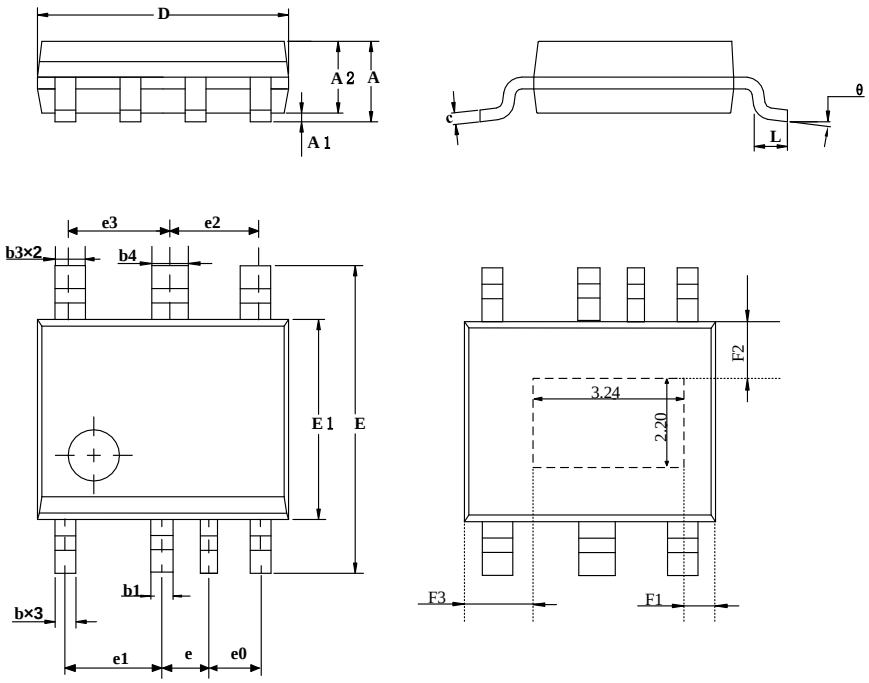
I_{OUT}: 20mA

PF: >0.7



PACKAGE OUTLINE

HSOP-7 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	—	0.22
D	6.10	6.20	6.30
E	5.90	6.00	6.10
E1	3.80	3.90	4.00
e	1.23	1.33	1.43
e0	1.17	1.27	1.37
e1	2.41	2.51	2.61
e2	2.13	2.23	2.33
e3	2.63	2.73	2.83
b	0.30	0.40	0.50
b1	0.41	0.51	0.61
b3	0.45	0.55	0.65
b4	0.70	0.80	0.90
L	0.40	—	0.80
F1	0.67REF		
F2	0.85REF		
F3	2.30REF		
θ	**0°**	—	**8°**

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