

*Parameters Subject to Change Without Notice*

### DESCRIPTION

JW<sup>®</sup>19818 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.

JW19818 provides over temperature protection. When temperature inside chip exceeds  $OTP_{CHIP}$ , JW19818 decreases LED current, which can help chip cooling.

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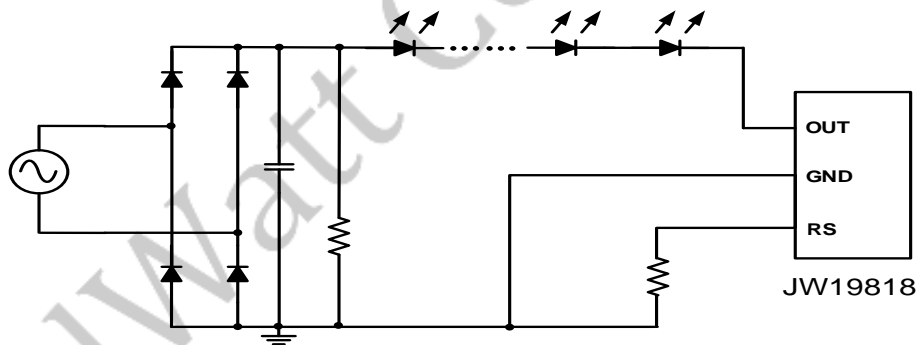
### FEATURES

- High-accuracy output current.
- Over temperature protection.
- No EMI issues.
- Low BOM cost.
- ESOP-8 packages

### APPLICATIONS

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

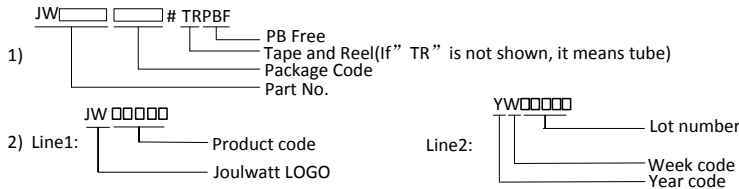
### TYPICAL APPLICATION



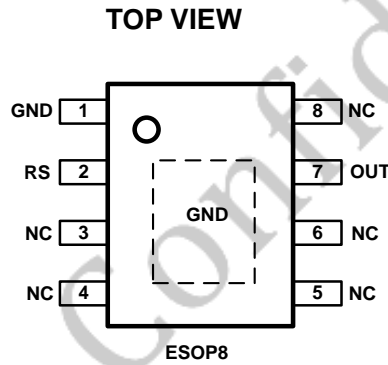
**ORDER INFORMATION**

DEVICE <sup>1)</sup>	PACKAGE	TOP MARKING <sup>2)</sup>
JW19818ESOP#TRPBF	ESOP-8	JW19818 YW□□□□□

**Notes:**



**PIN CONFIGURATION**



**ABSOLUTE MAXIMUM RATING<sup>1)</sup>**

OUT.....	500V
RS.....	-0.3V to 1V
$I_{out\_max@ Ta=25^{\circ}C}$ .....	100mA
Junction Temperature <sup>2)3)</sup> .....	150°C
Lead Temperature.....	260°C
Storage Temperature.....	-65°C to +150°C

**RECOMMENDED OPERATING CONDITIONS**

OUT.....	8.5V~450V
Junction Temperature ( $T_j$ ).....	-40°C to 125°C
$I_{out@220Vac}$ .....	<40mA
$I_{out@110Vac}$ .....	<60mA

**THERMAL PERFORMANCE<sup>4)</sup>**

	$\theta_{JA}$	$\theta_{JC}$
ESOP-8.....	50.....	10°C/W

**Note:**

- 1) Exceeding these ratings may damage the device.
- 2) The JW19818 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.
- 4) Measured on JESD51-7, 4-layer PCB.

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## ELECTRICAL CHARACTERISTICS

<i>T<sub>a</sub> = 25 °C, unless otherwise stated.</i>						
Item	Symbol	Condition	Min.	Typ.	Max.	Unit.
OUT Minimum Input Voltage	V <sub>out_min</sub>	I <sub>OUT</sub> =30mA		7.5		V
OUT Maximum Voltage	V <sub>out_BV</sub>	I <sub>OUT</sub> =0mA	450	500		V
Quiescent Current	I <sub>Q</sub>	V <sub>OUT</sub> =50V, V <sub>RS</sub> =1V	60	75	90	μA
Reference Voltage	V <sub>REF</sub>	V <sub>OUT</sub> =10V	580	600	620	mV
Thermal Protection Threshold <sup>5)</sup>	OTP <sub>CHIP</sub>			140		°C

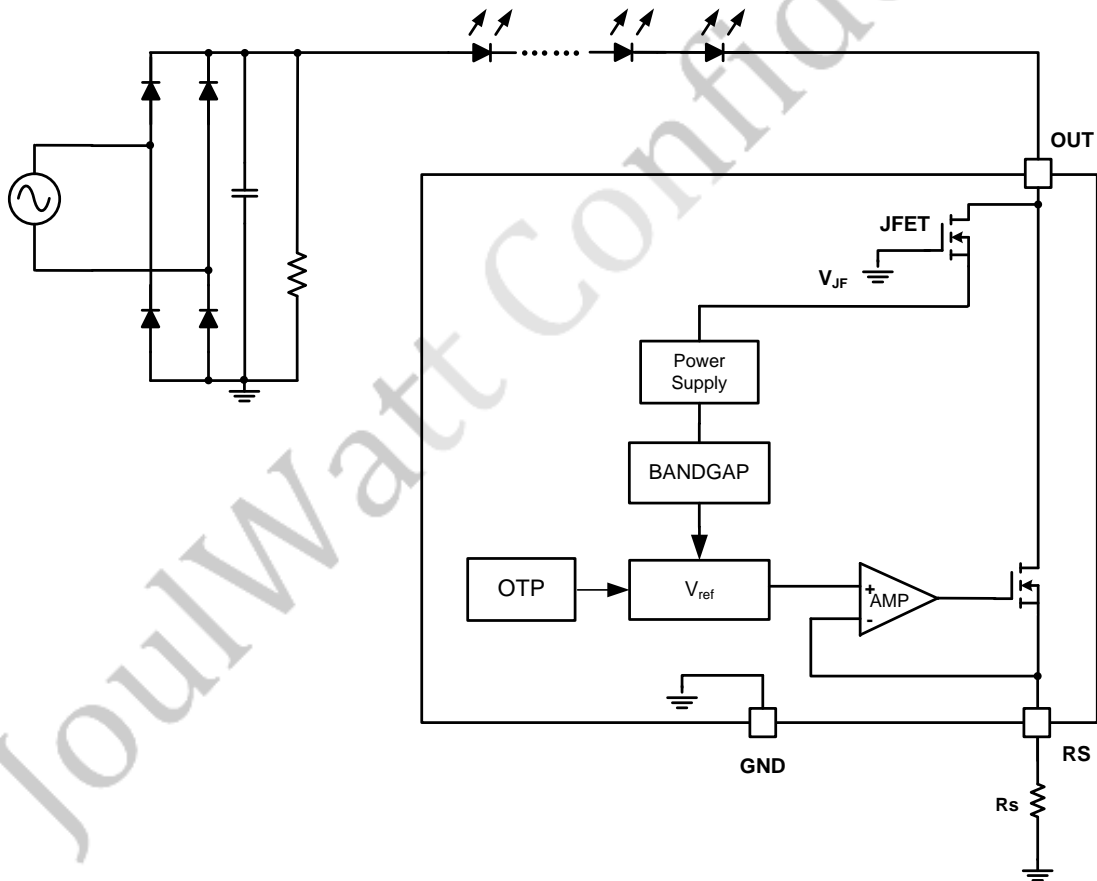
**Note**

5) Guaranteed by design

**PIN DESCRIPTION**

Pin ESOP-8	Name	Description
1	OUT	The power supply and constant current output
2	GND	Chip ground
3	RS	LED current setup pin

**BLOCK DIAGRAM**

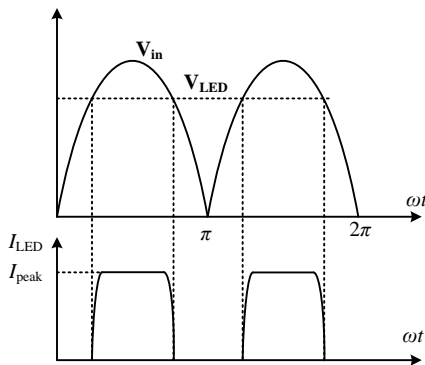


**FUNCTIONAL DESCRIPTION**

JW19818 is a single channel Linear LED driver for direct line operation.

**Theory of Operation**

Input power 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**

JW19818 controls the LED peak current from the information of the current sensing resistor. The output LED peak current can be calculated as:

$$I_{peak} = V_{REF}/R_S$$

Where

$V_{REF}$  is the reference voltage;

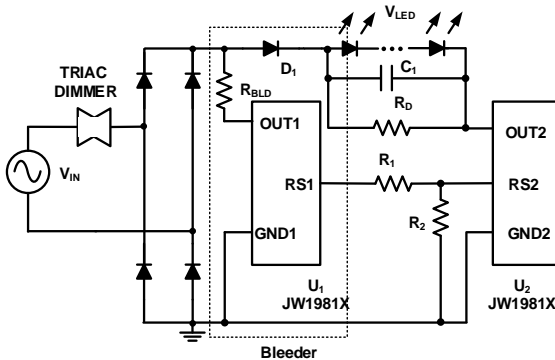
$R_S$  is the current sensing resistor connected between RS and chip ground.

**Over Temperature Protection**

When the junction temperature of JW19818 is higher than  $OTP_{CHIP}$ , LED current reduces.

APPLICATION NOTES

1: TRIAC Dimming



TRIAC Dimming can be achieved if two chips are used.  $R_{BLD}=3.3K\Omega$  is recommended to decrease the power loss of the  $U_1$ .  $D_1$  is not essential if  $C_1$  is not connected.  $R_2$  is used to set the LED current ( $I_{LED}$ ). If the instantaneous input voltage is lower than the LEDs' VF ( $V_{LED}$ ) when the TRIAC is on, the approximate value of  $I_{LED}$  is:

$$I_{LED} \approx V_{REF} \times \frac{\pi - 2 \arcsin \frac{V_{LED}}{\sqrt{2}V_{IN}}}{\pi \times R_2}$$

Where

$V_{IN}$  is the RMS value of the input voltage.

The hold current for the TRIAC dimmer is:

$$I_H = \frac{V_{REF}}{R_1 + R_2}$$

Usually  $I_H=25mA$  can ensure the normal operation of most TRIAC dimmers. For example, if  $I_{LED}=35mA$ ,  $V_{IN}=120Vac$  and  $V_{LED}=123V$ , then:

$$R_1=15\Omega, \quad R_2=8.2\Omega$$

2: PCB Design Guideline

The LED connection wire on PCB or Aluminum substrate should be as short as possible to avoid the interference caused by LC coupled noise.

The distance between high voltage wire and low voltage wire (including the Rs pin and its peripheral components) should be more than 1mm/200V.

**REFERENCE DESIGN**

This reference design is suitable for 5W non-isolated LED driver, using JW19818, with few external components.

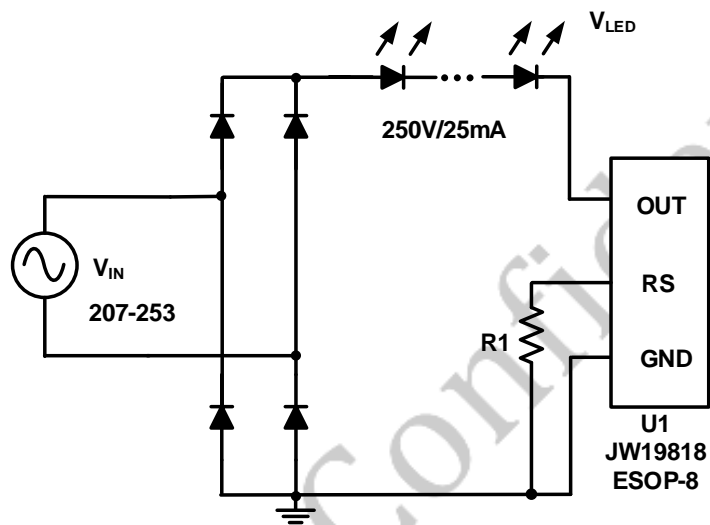
**Reference 1:**

$V_{IN}$ : 207VAC~253VAC

$V_{OUT}$ : 250-260V

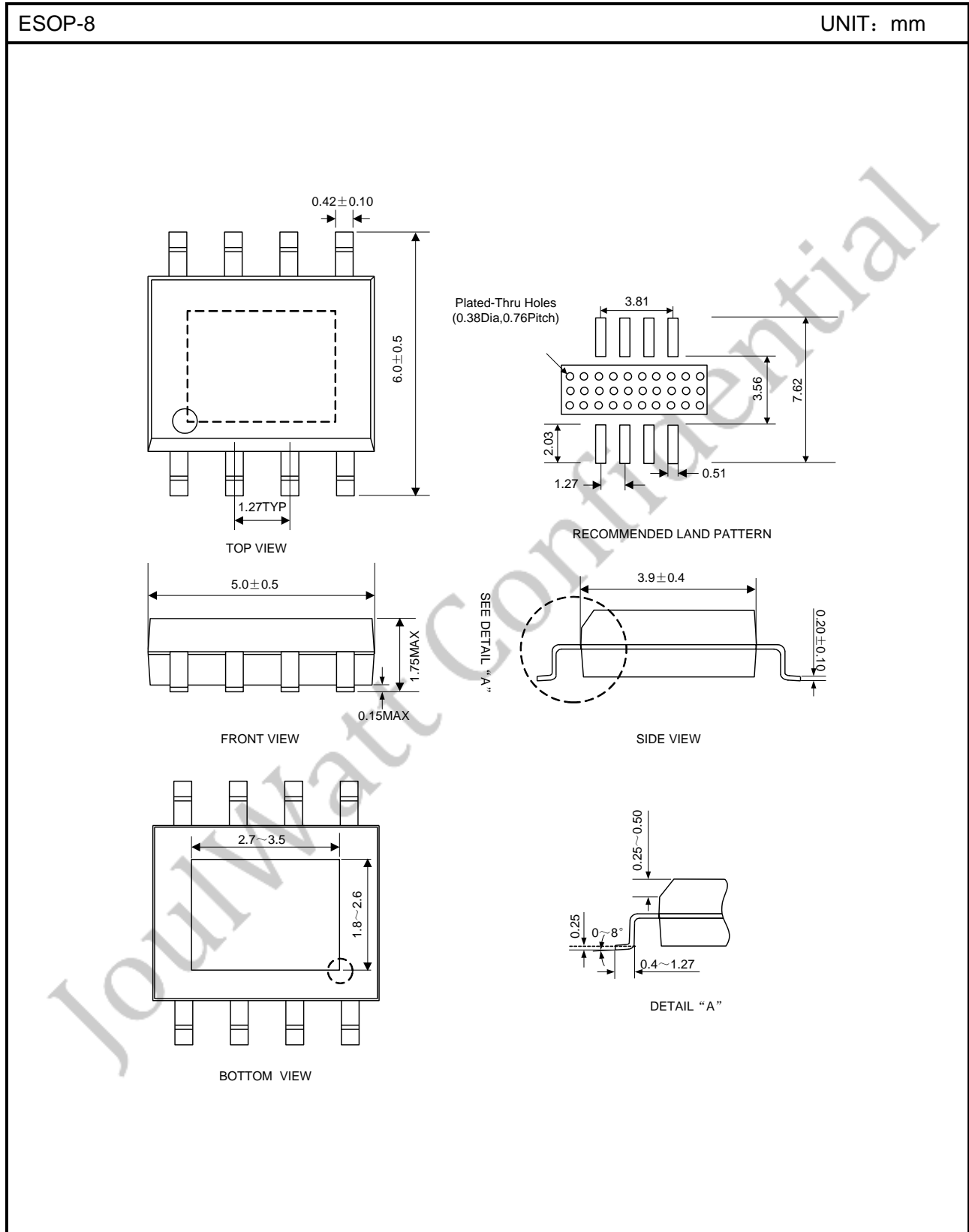
$I_{OUT}$ : 15-25mA

PF: >0.7





PACKAGE OUTLINE



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