

## Constant Current LED Driver with PWM Control

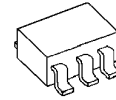
### ■ GENERAL DESCRIPTION

The NJW4615 is a constant current LED with PWM control. 35V resisting constant current control and PWM control circuit can be offered with small package.

It can achieve luminance control multiple white or blue and red LEDs. It can contribute to the reliability improvement of the system because it has an overcurrent protection and thermal shutdown circuit.

The NJW4615 is suit for an amusement, home audio, etc.

### ■ PACKAGE OUTLINE

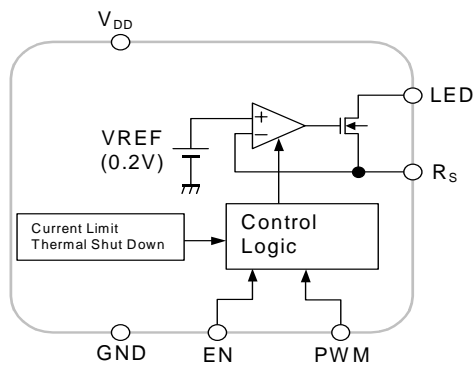


NJW4615F1

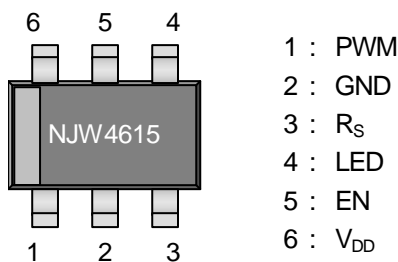
### ■ FEATURES

- Operating Voltage Range                    2.5V to 5.5V
- LED Drive Voltage                             $V_{LED} = 35V(\text{max.})$
- LED Output Current                         100mA(max.)
- Current consumption                         200 $\mu$ A
- Output current accuracy                     $\pm 1.2\%$
- To 8 of White LED can be operated.
- With PWM Luminance Control
- Internal overcurrent protection circuit
- Internal thermal shutdown circuit
- Package    SOT-23-6

### ■ BLOCK DIAGRAM



### ■ PIN CONFIGURATION



# NJW4615

## ■ ABABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETERS	SYMBOL	RATINGS	UNIT
VDD Power Supply	V <sub>DD</sub>	-0.3 to +6.0	V
Output voltage	V <sub>LED</sub>	-0.3 to +40	V
Output Current	I <sub>LED</sub>	100	mA
PWM Terminals Voltage	V <sub>PWM</sub>	+6.0 (*1)	V
EN Terminals Voltage	V <sub>EN</sub>	+6.0 (*1)	V
Power Consumption	P <sub>D</sub>	510 (*2)	mW
Junction Temperature	T <sub>j</sub>	-40 to +150	°C
Operating Temperature	T <sub>opr</sub>	-40 to +85	°C
Storage Temperature	T <sub>stg</sub>	-40 to +150	°C

(\*1): When input voltage is less than +6V, the absolute maximum control voltage is equal to the input voltage.

(\*2): Mounted on glass epoxy board based on EIA/JEDEC. (76.2 x 114.3 x 1.6mm : 2Layers)

## ■ RECOMMENDED OPERATING CONDITIONS

(Ta=25°C)

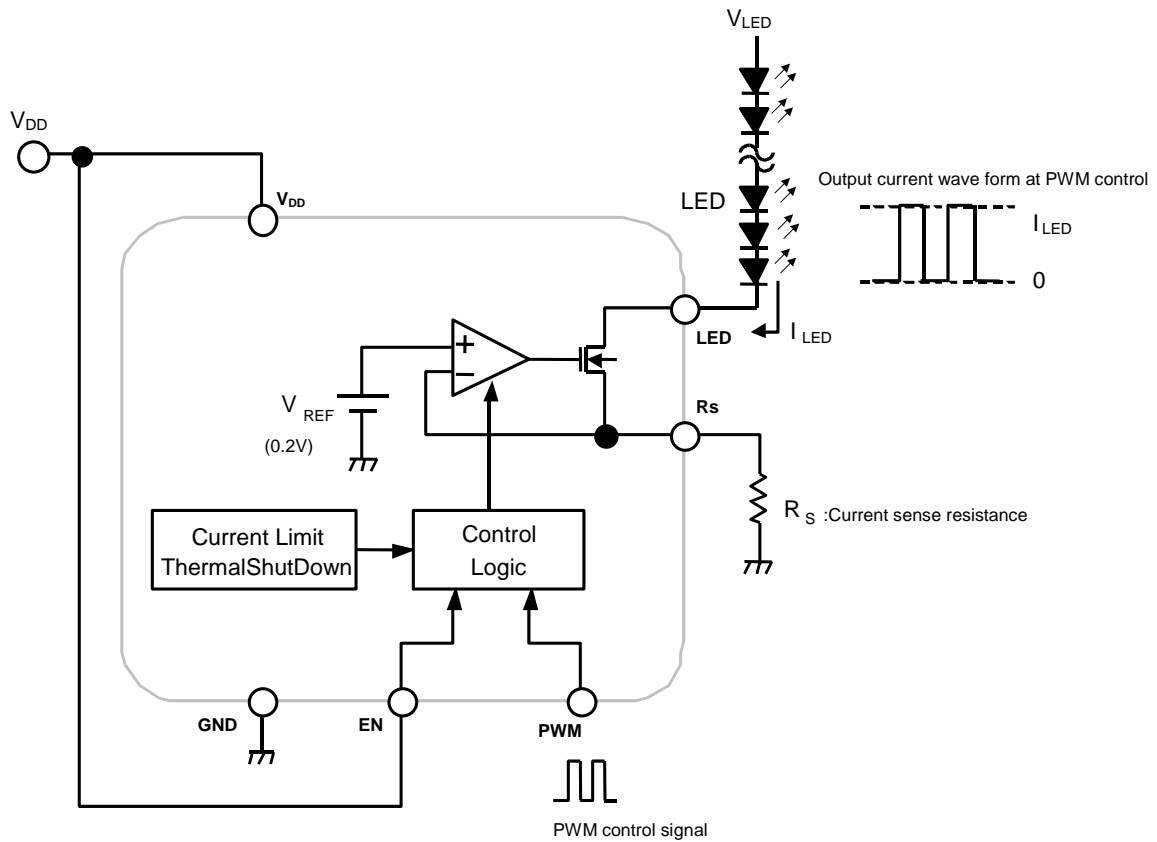
PARAMETERS	SYMBOL	CONDITIONS	MIN	TYP	MAX	Unit
Operating voltage	V <sub>DD</sub>		2.5	-	5.5	V
Output voltage	V <sub>LED</sub>		-	-	35	V

## ■ ELECTRICAL CHARACTERISTICS

(Unless otherwise noted, V<sub>DD</sub>=3.0V, V<sub>LED</sub>=1.0V, R<sub>S</sub>=10Ω, V<sub>EN</sub>=V<sub>PWM</sub>=V<sub>DD</sub>, Ta=25°C)

PARAMETERS	SYMBOL	CONDITIONS	MIN	TYP	MAX	Unit
Operating Current	I <sub>DD</sub>		-	200	320	μA
Operating Current at OFF state	I <sub>DD OFF</sub>	V <sub>EN</sub> =GND	-	-	0.1	μA
Output Current Accuracy	ΔI <sub>LED</sub>		-1.2	-	+1.2	%
Output Terminal Leak Current	I <sub>LEAK1</sub>	V <sub>EN</sub> =GND, V <sub>DD</sub> =5.5V, V <sub>LED</sub> =35V	-	-	0.1	μA
Output Terminal Leak Current 2	I <sub>LEAK2</sub>	V <sub>PWM</sub> =GND V <sub>DD</sub> =5.5V, V <sub>LED</sub> =35V	-	-	0.1	μA
EN Terminal ON Voltage	V <sub>EN ON</sub>	I <sub>LED</sub> =OFF→ON	1.6	-	V <sub>DD</sub>	V
EN Terminal OFF Voltage	V <sub>EN OFF</sub>	I <sub>LED</sub> =ON→OFF	0	-	0.3	V
PWM Terminal ON Voltage	V <sub>PWM ON</sub>	I <sub>LED</sub> =OFF→ON	0.7V <sub>DD</sub>	-	V <sub>DD</sub>	V
PWM Terminal OFF Voltage	V <sub>PWM OFF</sub>	I <sub>LED</sub> =ON→OFF	0	-	0.3V <sub>DD</sub>	V
EN Terminal Input Current	I <sub>EN</sub>		-	-	0.1	μA
PWM Terminal Input Current	I <sub>PWM</sub>		-	-	0.1	μA
RS Terminal Leak Current	I <sub>LEAK RS</sub>	V <sub>EN</sub> =GND, V <sub>RS</sub> =V <sub>LED</sub> =3V	-	-	0.1	μA
PWM Terminal ON Delay Time	t <sub>PWM ON</sub>	V <sub>PWM</sub> =L→H	-	3	-	μs
PWM Terminal OFF Delay Time	t <sub>PWM OFF</sub>	V <sub>PWM</sub> =H→L	-	1	-	μs
Maximum Output Current	I <sub>LED MAX</sub>	R <sub>S</sub> =0Ω	100	170	-	mA

## ■ TYPICAL APPLICATION



The  $R_s$  Resistance Setting formula : 
$$R_s = \frac{0.2(V)}{I_{LED}}$$

**[CAUTION]**

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