Constant Current LED Driver with PWM Control

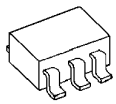
■ GENERAL DESCRIPTION

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

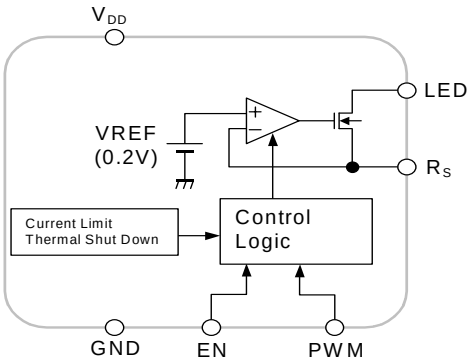


NJW4615F1

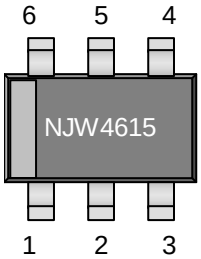
■ FEATURES

- Operating Voltage Range 2.5V to 5.5V
- LED Drive Voltage V_{LED}= 35V(max.)
- LED Output Current 100mA(max.)
- Current consumption 200μA
- Output current accuracy ±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 CONFIGRATION



1 : PWM
2 : GND
3 : R_S
4 : LED
5 : EN
6 : V_{DD}

■ **ABABSOLUTE MAXIMUM RATINGS** (Ta=25°C)

PARAMETERS	SYMBOL	RATINGS	UNIT
VDD Power Supply	V_{DD}	-0.3 to +6.0	V
Output voltage	V_{LED}	-0.3 to +40	V
Output Current	I_{LED}	100	mA
PWM Terminals Voltage	V_{PWM}	+6.0 (*1)	V
EN Terminals Voltage	V_{EN}	+6.0 (*1)	V
Power Consumption	P_D	510 (*2)	mW
Junction Temperature	Tj	-40 to +150	°C
Operating Temperature	Topr	-40 to +85	°C
Storage Temperature	Tstg	-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)

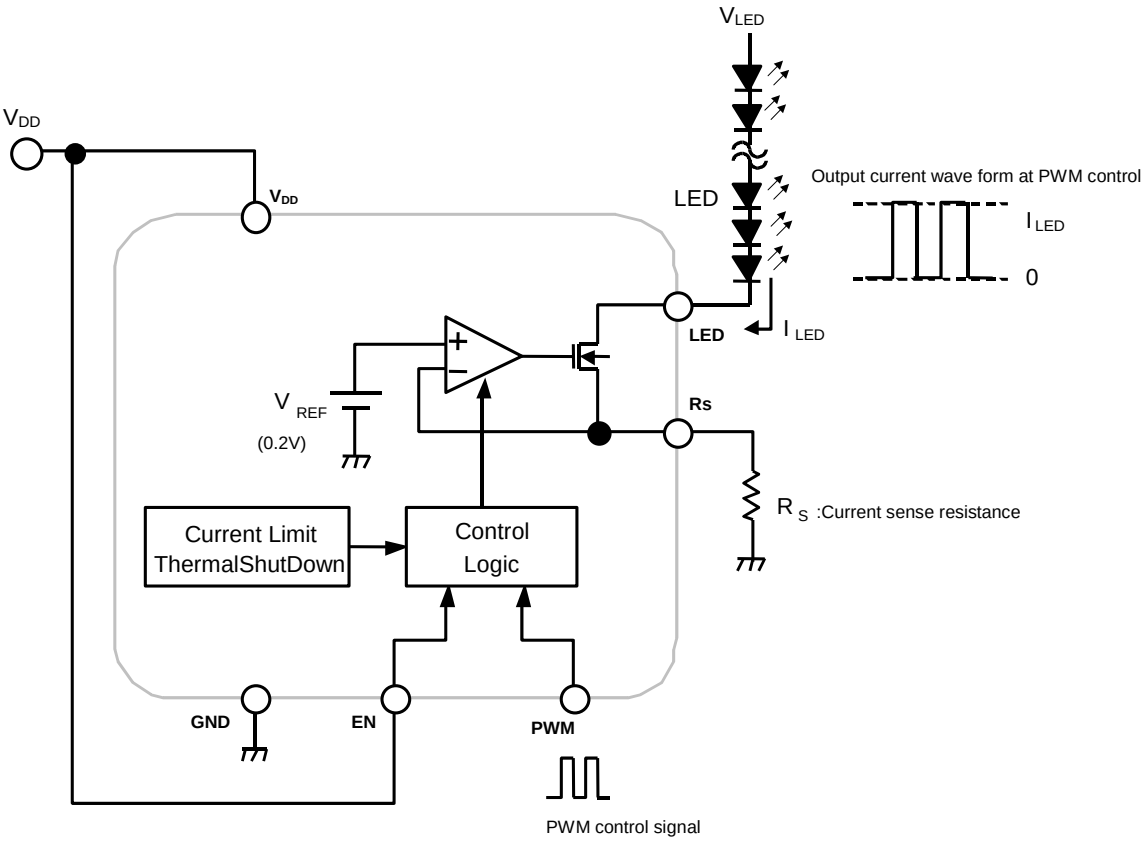
PARAMETERS	SYMBOL	CONDITIONS	MIN	TYP	MAX	Unit
Operating voltage	V_{DD}		2.5	-	5.5	V
Output voltage	V_{LED}		-	-	35	V

■ **ELECTRICAL CHARACTERISTICS**

(Unless otherwise noted, V_{DD}=3.0V, V_{LED}=1.0V, R_S=10Ω, V_{EN}=V_{PWM}=V_{DD}, Ta=25°C)

PARAMETERS	SYMBOL	CONDITIONS	MIN	TYP	MAX	Unit
Operating Current	I_{DD}		-	200	320	µA
Operating Current at OFF state	I_{DD_OFF}	V_{EN}=GND	-	-	0.1	µA
Output Current Accuracy	ΔI_{LED}		-1.2	-	+1.2	%
Output Terminal Leak Current	I_{LEAK1}	V_{EN}=GND, V_{DD} =5.5V, V_{LED} =35V	-	-	0.1	µA
Output Terminal Leak Current 2	I_{LEAK2}	V_{PWM}=GND V_{DD} =5.5V, V_{LED} =35V	-	-	0.1	µA
EN Terminal ON Voltage	V_{EN_ON}	I_{LED}=OFF→ON	1.6	-	V_{DD}	V
EN Terminal OFF Voltage	V_{EN_OFF}	I_{LED}=ON→OFF	0	-	0.3	V
PWM Terminal ON Voltage	V_{PWM_ON}	I_{LED}=OFF→ON	$0.7V_{DD}$	-	V_{DD}	V
PWM Terminal OFF Voltage	V_{PWM_OFF}	I_{LED}=ON→OFF	0	-	$0.3V_{DD}$	V
EN Terminal Input Current	I_{EN}		-	-	0.1	µA
PWM Terminal Input Current	I_{PWM}		-	-	0.1	µA
RS Terminal Leak Current	I_{LEAK_RS}	V_{EN}=GND, V_{RS} = V_{LED} =3V	-	-	0.1	µA
PWM Terminal ON Delay Time	t_{PWM_ON}	V_{PWM}=L → H	-	3	-	µs
PWM Terminal OFF Delay Time	t_{PWM_OFF}	V_{PWM}=H → L	-	1	-	µs
Maximum Output Current	I_{LED_MAX}	R_S =0Ω	100	170	-	mA

■ TYPICAL APPLICATION



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