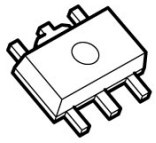
Constant Current LED Driver with PWM Control

■ GENERAL DESCRIPTION

The NJW4616 is a constant current LED Driver with PWM control. 45V 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.

■ PACKAGE OUTLINE

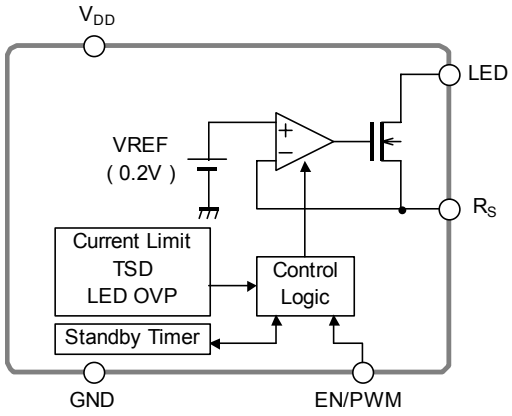


NJW4616U2
(SOT-89-5)

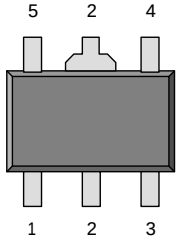
■ FEATURES

- Operating Voltage Range 2.5V to 40V
- Recommended LED Drive Voltage V_{LED}=40V(max.)
- LED Output Current I_{LED}=300mA(max.)
- Output Current Accuracy ±2.0%
- To 11 of White LED can be operated. (at LED Vf=3.4V)
- Current Consumption 450μA typ.
- With PWM Luminance Control and ON/OFF Control
- Internal Over Current Protection Circuit
- Internal Thermal Shutdown Circuit
- Package SOT-89-5

■ BLOCK DIAGRAM



■ PIN CONFIGRATION



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

* Please note that this device is still under the development and therefore the specifications are subject to change.

■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETERS	SYMBOL	RATINGS	UNIT
VDD Power Supply	V_{DD}	-0.3 to +45	V
Output voltage	V_{LED}	-0.3 to +45	V
EN/PWM Pin Voltage	V_{ENPWM}	-0.3 to +45	V
Power Consumption	P_D	625 (*1) 2400 (*2)	mW
Junction Temperature	Tj	-40 to +150	°C
Operating Temperature	Topr	-40 to +105	°C
Storage Temperature	Tstg	-40 to +150	°C

(*1): Mounted on glass epoxy board. (76.2×114.3×1.6mm:based on EIA/JDEC standard, 2Layers)

(*2): Mounted on glass epoxy board. (76.2×114.3×1.6mm:based on EIA/JDEC standard, 4Layers),
Internal Cu area: 74.2×74.2mm

■ RECOMMENDED OPERATING CONDITIONS (Ta=25°C)

PARAMETERS	SYMBOL	CONDITIONS	MIN	TYP	MAX	Unit
Operating Voltage	V_{DD}		2.5	-	40	V
Output Current	I_{LED}		20	-	300	mA
Output Voltage	V_{LED}		-	-	40	V

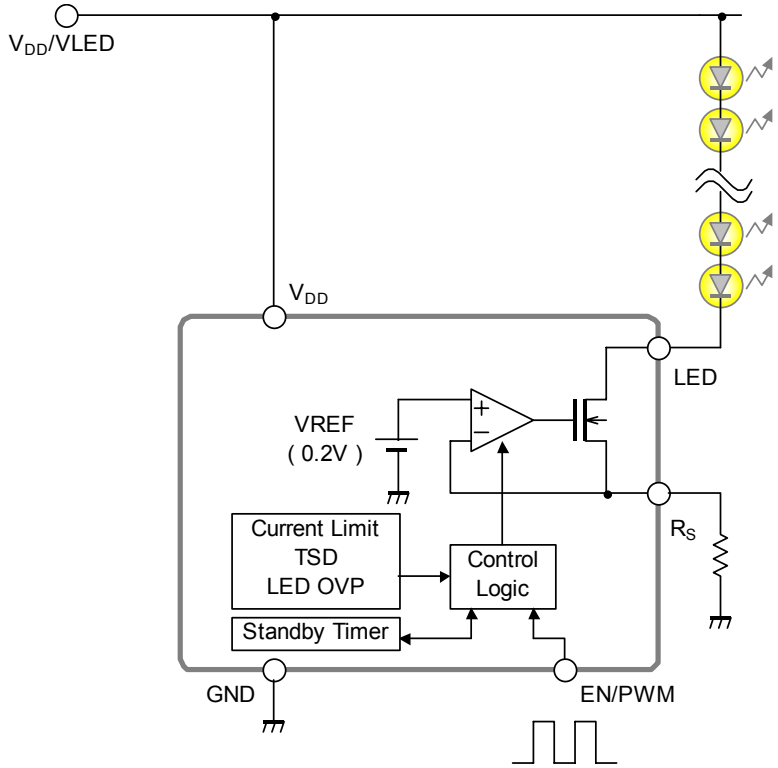
■ ELECTRICAL CHARACTERISTICS

(Unless otherwise noted, V_{DD}=12V, V_{LED}=1.0V, R_S=2Ω, V_{ENPWM}=V_{DD}, Ta=25°C)

PARAMETERS	SYMBOL	CONDITIONS	MIN	TYP	MAX	Unit
Quiescent Current	I_{DD}		-	340	550	μA
Quiescent Current at OFF State	I_{DD_OFF}	V_{ENPWM}=GND	-	-	0.1	μA
Output Current Accuracy	ΔI_{LED}		-2	-	+2	%
Output Pin Leak Current	I_{LEAK}	V_{ENPWM}=GND, V_{DD}=40V, V_{LED} =40V	-	-	0.1	μA
OFF Delay Time	t_{D_OFF}		10	25	50	ms
EN/PWM Pin ON Voltage1	$V_{ENPWM\_ON}1$	V_{DD}<5V, I_{LED}=OFF→ON	0.7V_{DD}	-	V_{DD}	V
EN/PWM Pin ON Voltage2	$V_{ENPWM\_ON}2$	V_{DD}≥5V, I_{LED}=OFF→ON	3.5	-	V_{DD}	V
EN/PWM Pin OFF Voltage	V_{ENPWM_OFF}	I_{LED}=ON→OFF	0	-	0.5	V
EN/PWM Pin Input Current	I_{ENPWM}		-	7	-	μA
RS Pin Leak Current	I_{OUT_RS}	LED=OPEN	-	4	-	μA
PWM Pin ON Delay Time	t_{PWM_ON}	V_{ENPWM}=L→H, I_{LED}=OFF→ON, R_S=0.62Ω	-	10	-	μs
PWM Pin OFF Delay Time	t_{PWM_OFF}	V_{ENPWM}=H→L, I_{LED}=ON→OFF, R_S=0.62Ω	-	1.2	-	μs
LED Short Protection Detect Voltage	V_{LED_SHORT}	R_S = 0Ω, I_{LED} =$I_{LED\,MAX}$→ $I_{LED\,MAX}$ × 0.5	-	22	-	V
Maximum Output Current	I_{LED_MAX}	R_S =0Ω	330	600	-	mA

* Please note that this device is still under the development and therefore the specifications are subject to change.

■ TYPICAL APPLICATION



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

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