GL7101

350mA High Power White LED Driver

Description

The GL7101 is high power LED driver with 350mA constant rated source current. It features low dropout voltage and low quiescent current, marking it ideal for battery powered application.

The GL7101 is available in the 5-lead SOT-23-5 package.

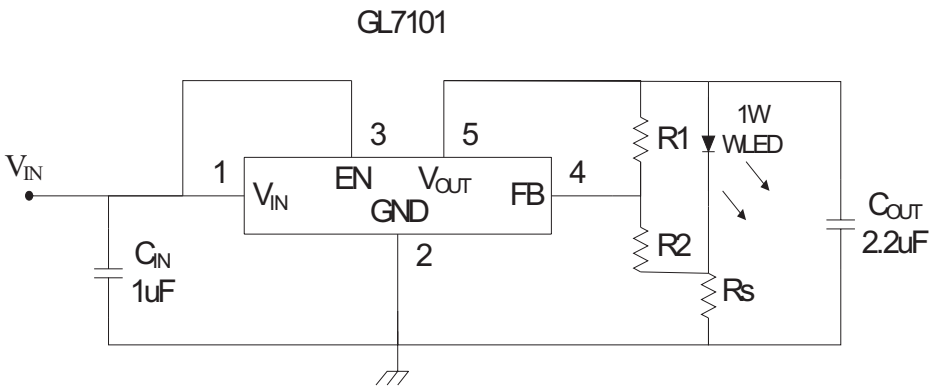
Features

- High Efficiency 92%
- Up to 350mA Constant Source Current
- Low Quiescent Current: Typ. 65uA
- 0.5uA Shutdown Current
- Short Circuit Protection
- Open Load LED Protection
- Over Temperature Protection
- Space Saving Package SOT-23-5

Application

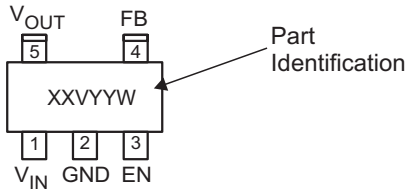
Power LED Driver

TYPICAL APPLICATIONS



MARKING INFORMATION & PIN CONFIGURATIONS

SOT-25 (SOT-23-5)



XX = Marking Code(**AA** = GL7101)
V = Voltage Code
YY = Year
W = Weekly

ORDERING INFORMATION (Green Package Products are available now!)

Ordering Number	Output Voltage	Package	Shipping
GL7101-ST25R	N / A	SOT-23-5	3000 Units / Reel

* For detail Ordering Number identification, please see last page.

ABSOLUTE MAXIMUM RATINGS

Rating	Value	Unit
Input Voltage	6.0	V
Output Current	350	mA
Output Voltage	GND-0.3 to VIN+0.3	V
Storage Temperature Range	-65 to +150	°C
Lead Temperature (Soldering, 5 sec.)	+300	°C
Thermal Resistance (Junction to Case)	+130	°C/W
Thermal Resistance (Junction to Ambient)	+250	°C/W
Internal Power Dissipation (P_D)	400	mW

OPERATING CONDITIONS

Rating	Value	Unit
Ambient Temperature Range	- 40 ~ +85	°C
Junction Temperature Range	-40 ~ +125	°C

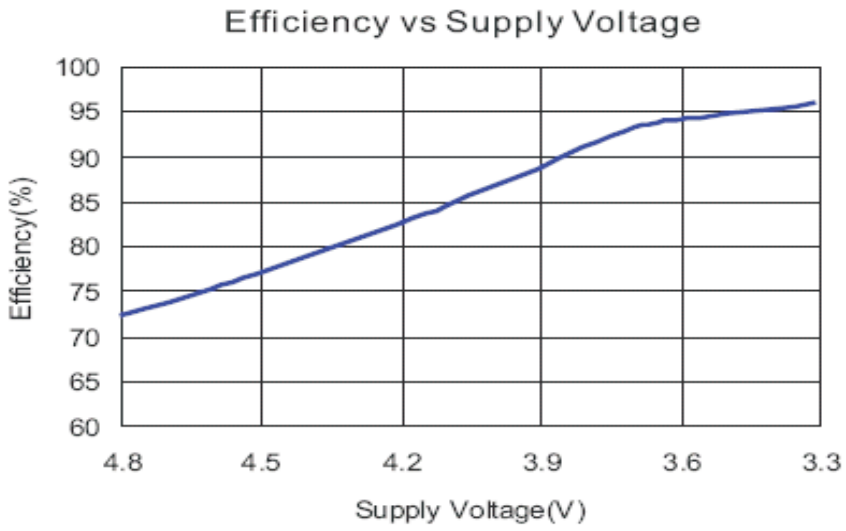
◆ ELECTRICAL CHARACTERISTICS:

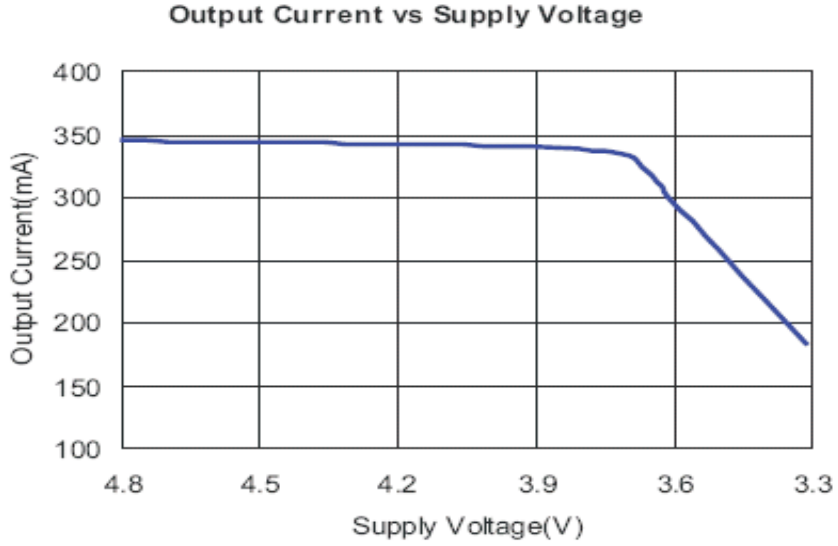
T_A=25,C_{IN}=1uF,C_{OUT}=2.2uF,Vin=3.7V,unless otherwise noted.

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Input Voltage Range		V_{IN}	-	-	5.5	V
Output Current		I_{OUT}	300	-	-	mA
Quiescent Current	No Load	I_Q	-	65	90	uA
Efficiency		η	-	90	92	%
Over Temperature Shutdown	I_{OUT}=1mA	OTS	-	150	-	°C
Over Temperature Hysteresis	I_{OUT}=1mA	OTH	-	30	-	°C

◆ Typical Performance Characteristics

T_A=25°C,C_{IN}=1uF,C_{OUT}=2.2uF,R1=62KΩ,R2=33KΩ,R_S=0.22Ω.





Application Information

In the typical application (see Figure 1), the LED current will come to the constant current level little by little after the device is powered. A 62KΩ resistor is recommended to be chosen for R1, the value chosen for R2 should be adjusted small around 33KΩ due to the disuniform LED forward voltage resulted from LED lot-to-lot or brand-to-brand variations.

Power Dissipation and Thermal Consideration

Thermal protection limits power dissipation in the GL7101. When the operation junction temperature exceeds 150 C, the OTP (Over Temperature Protection) starts the thermal shutdown and turns the pass transistor off. The pass transistor resumes operation after the junction temperature drops below 120 C.

For continuous operation, the junction temperature should be maintained below 125 C. The power dissipation is defined as:

$$P_D=(V_{IN}-V_{OUT})*I_{OUT}+V_{IN}*I_{GND}$$

The maximum power dissipation depends on the thermal resistance of IC package, PCB layout, the rate of surrounding airflow and temperature difference between junction and ambient. The maximum power dissipation can be calculated by the following formula:

$$P_{D(MAX)} = \frac{T_{J(MAX)}-T_A}{\theta_{JA}}$$

Where $T_{J(MAX)}$ is the maximum operation junction temperature 125 C. T_A is the ambient temperature. θ_{JA} is the thermal resistance from the junction to the ambient.

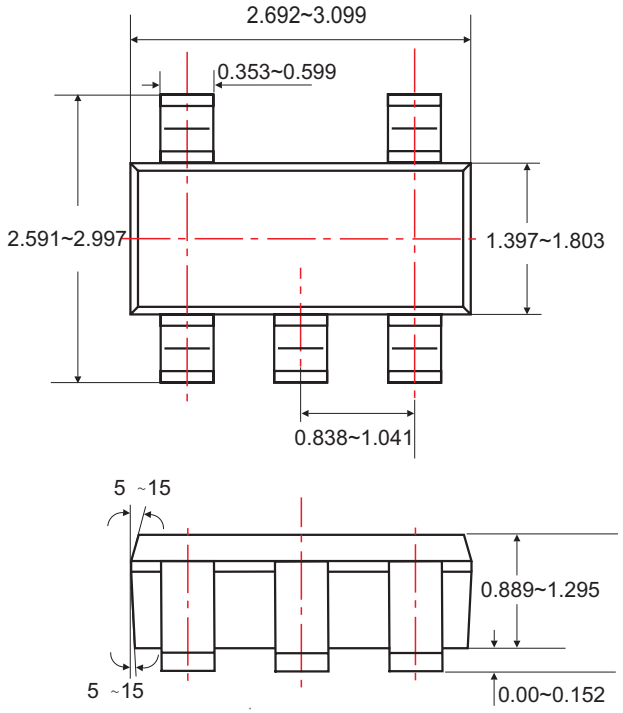
For example, θ_{JA} is 250 C/W for SOT-23, based on the standard JEDEC 51-3 for a single-layer thermal test board. The maximum power dissipation at T_A=25 C can be calculated by following formula:

$P_{D(MAX)}$= (125 C-25 C)/250=0.4W for SOT-23 package

For example, how to calculate the junction temperature of the GL7101 SOT-23 package?
If we use input voltage V_{IN}=4V, at an output current I_O=300mA and the case temperature T_A=40 C measured by the thermal couple while operating, then our power dissipation is defined as:

P_D=(4V-2.8V)*300mA+4V*70uA≦ 360mW

SOT-25(SOT-23-5) PACKAGE OUTLINE DIMENSIONS



Unit: mm

ORDERING NUMBER