1.5MHz, 1A Synchronous Constant Current Buck(Step-Down) LED Driver

PRELIMINARY DATASHEET

Datashet Brierf

General Description

FH2121 is a 1.0A constant current LED driver designed to provide a simple, high efficiency solution for driving high power LEDs.

With a 0.1V reference voltage feedback control to minimize power dissipation, an external resistor sets the current as needed for driving various types of LEDs.

Supply current with no load is 40uA and drops to <1.0uA in shutdown.

The 2.5V to 5.5V input voltage range makes the FH2121 ideally suited for single Li-Ion battery powered applications.

100% duty cycle provides low dropout operation, extending battery life in portable systems. PWM/PFM step-down mode operation provides very low output ripple voltage for noise sensitive applications.

Switching frequency is internally set at 1.5MHz, allowing the use of small surface mount inductors and capacitors.

Additional features include user accessible CTRL pin for enabling and PWM dimming of LEDs, thermal shutdown.

The device also integrates many protection features included input OVP, cycle-by-cycle current limit and over-current protection.

The FH2121 requires a minimal number of readily available, external components and is available in a space saving SOT-23-5L package.

Applications

- LED Drivers
- LED Flashlights
- Industrial Lighting
- Digital Still and Video Cameras

Key Features

- Input Voltage Range: 2.5V to 5.5V
- Continuous Output Current 1.0A
- Switching Frequency: 1.5MHz(typ.)
- LED Open Load Protection
- Built-in Over Current Limit
- Input Over Voltage Protection
- PWM Brightness Control on Enable
- PFM Mode for High Efficiency in Light Load
- Internal Soft-Start
- Low Feedback Voltage: 100mV
- No Schottky Diode Required
- Over Temperature Protected
- Low Quiescent Current: 40μA
- LED Short Protection
- Temperature Range: -40°C to +85°C

Package Type

- 5-Pin SOT-23-5L

Device Information (1)

PART NUMBER	PACKAGE	BODY SIZE (NOM)
FH2121	SOT-23 (5)	2.90mm x 1.60mm

For all available packages, see the orderable addendum at the end of the datasheet.

Typical Application Circuit

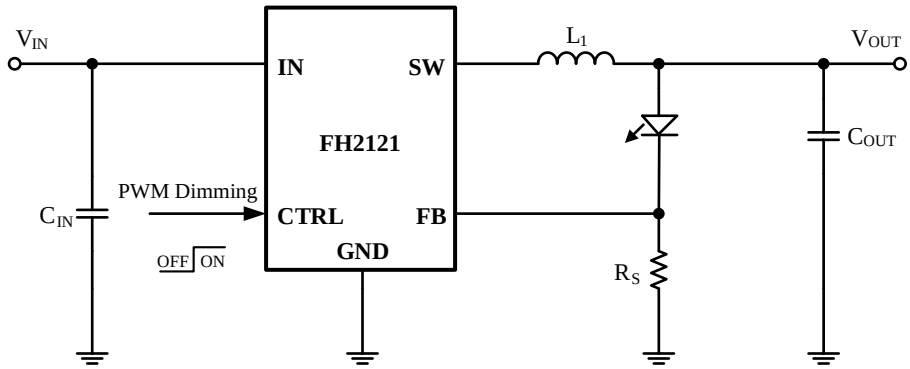
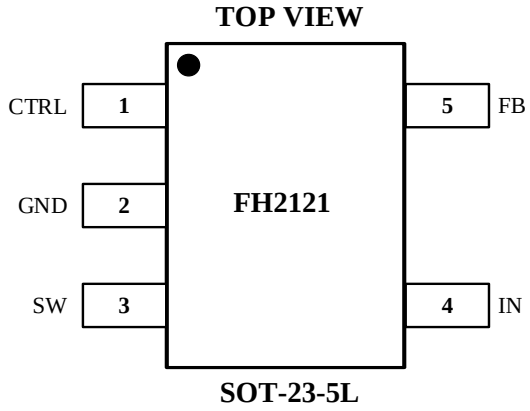


Figure 1. Basic Application Circuit

I_{LED} (A) = 0.1 / R_S (Ω)

Pin Configuration

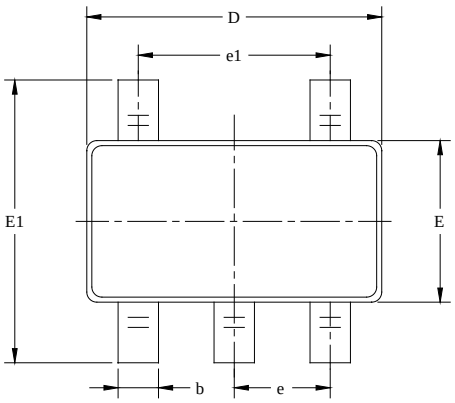


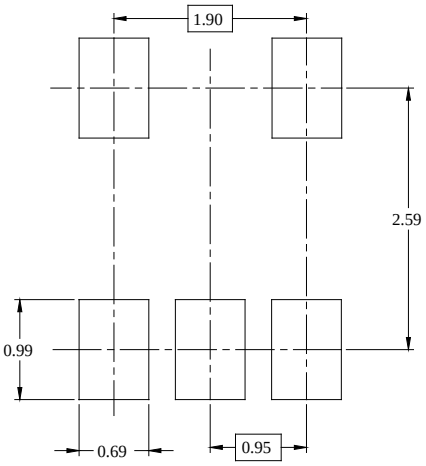
Pin Description

Pin	Name	Function
1	CTRL	CTRL pin is a multi-functional pin which can be used for enable control and PWM dimming. Should not be left floating.
2	GND	Ground Pin
3	SW	Power Switch Output. It is the switch node connection to Inductor. This pin connects to the drains of the internal P-ch and N-ch MOSFET switches.
4	IN	Power Supply Input. Must be closely decoupled to GND with a 22μF or greater ceramic capacitor.
5	FB	Feedback Reference Voltage Pin. Series connect a resistor R_S between LED and ground as a current sense. Sense the current feedback voltage to set the current rating.

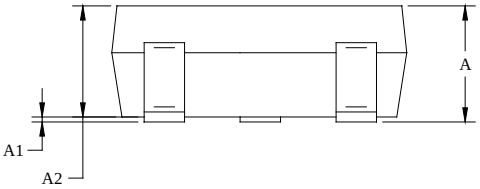
Package Information

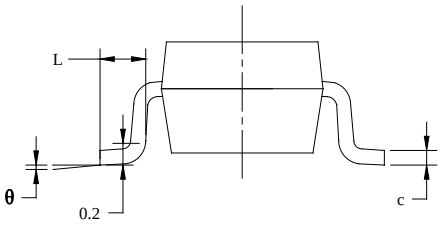
- Type: **SOT-23-5L**





RECOMMENDED LAND PATTERN(Unit: mm)





Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950 BSC		0.037 BSC	
e1	1.900BSC		0.075 BSC	
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

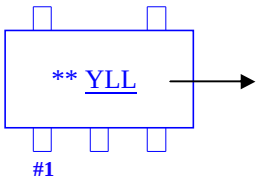
ORDERING INFORMATION

Part Number	Input Voltage	Features	Operating Temperature	Package Type	Top Mark	SPQ
FH2121M5	2.5V ~ 5.5V	● DC/DC Step-down LED driver ● Output current: 1.0A ● Frequency: 1.5MHz ● 100% Duty cycle in dropout ● V_{FB}: 0.1V	-40℃ to +85℃	SOT-23-5L	** YLL	3000EA/Reel

Note:

- **FH2121** devices are Pb-free and RoHs compliant.
- The surface prints of our semiconductor devices are subject to change during the production process and do not involve changes in electrical parameters, and we will not separately state the notice.
- If you have any other custom purchase needs, please contact our sales department.
- FOCMCU Inc. reserves the right to amend and legally interpret the electrical parameters of this chip device. (http://www.fordevices.com)

Device Name: SOT-23-5L



**: Device Code
YLL: Date Code

ESD SENSITIVITY CAUTION

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

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▲ Update by Aug.2022