

### General Description

The AL5811 is an adjustable Linear LED driver offering excellent temperature stability and output handling capability. The AL5811 simplifies the design of linear and isolated or non-isolated LED drivers by setting the LED current with standard value resistors.

The AL5811 has an open drain output that can swing from 1V up to 60V enabling it drive long LED chains. Its low 0.5V  $R_{SET}$  pin is outside of the LED current path and so accuracy is maintained while minimizing the required overhead to regulate the LED current. This reduces its power dissipation when compared to traditional linear LED drivers. This makes it ideal for driving LEDs up to 75mA. Longer LED chains can be driven by tapping  $V_{CC}$  from the chain, where the chain voltage may exceed 60V.

The AL5811EV1 evaluation board provides MSOP-8EP package.

### Key Features

- Low Reference Voltage ( $V_{RSET}=0.5V$ )
- $-40^{\circ}C$  to  $125^{\circ}C$  Temperature Range
- MSOP-8EP and U-DFN3030-6 packages

### Applications

- Linear LED Driver
- Isolated Offline LED Converters
- LED Signs
- Instrumentation Illumination

### Specifications

Parameter	Value
Input Voltage	3.5V – 60V (Low Side) >60V (Floating GND)
LED Current	75mA (Adjustable)
XY Dimension	0.62" x 0.57"
ROHS Compliance	Yes

### Top-View EVM (AL5811EV1)

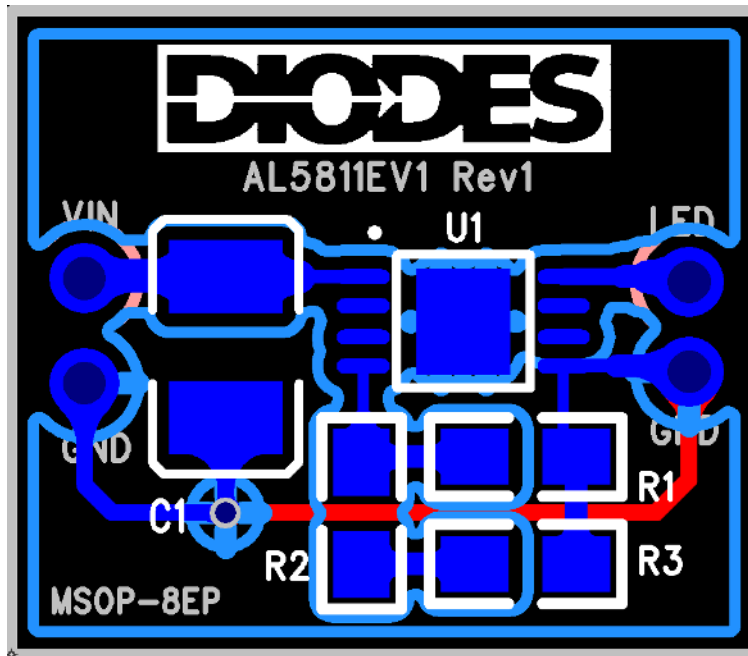


AL5811EV1 (MSOP-8EP)

### Connection Instructions

Input Voltage: Red Wire  
 Ground: Black Wires  
 LED: White Wire

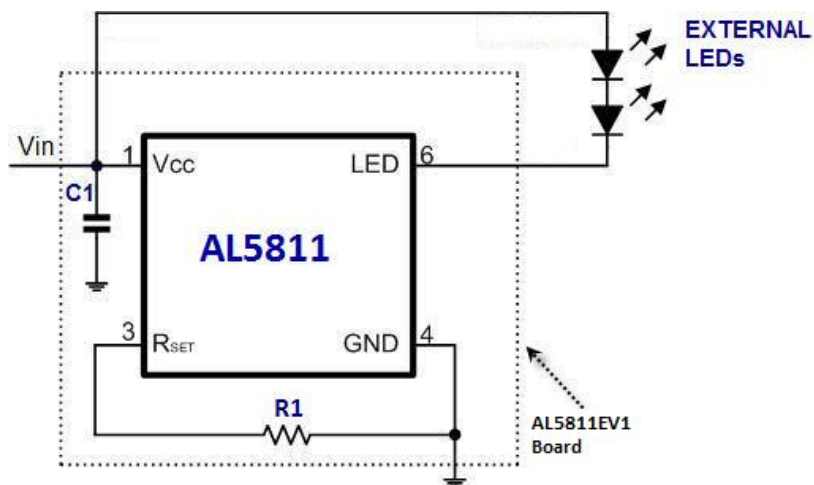
**Board Layout**



Note: By default, this evaluation board provides Low side Current LED string configuration in this user guide document. For design flexibility, multiple application circuits can be derived in both Low and High Side Current LED configurations with use of PWM dimming.

**Evaluation Board Connection Setup and Power-up Procedure**

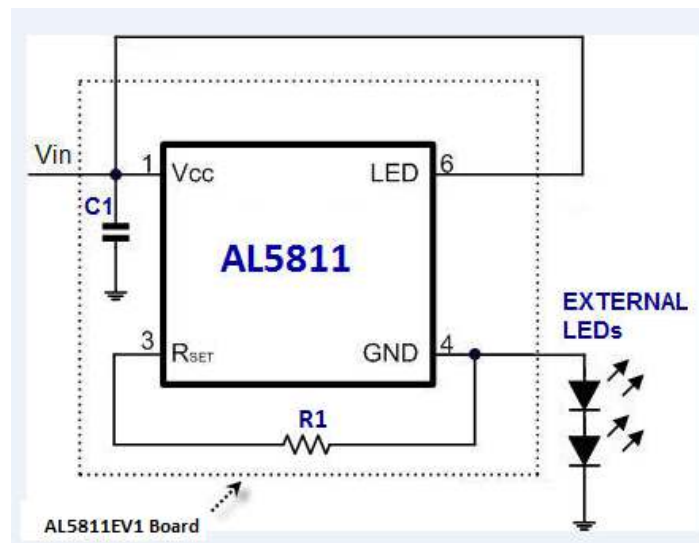
**Current LED String Procedure to Evaluation Board in Low side current LED configuration**



1. By default, the evaluation board is preset at 75mA as low side current LED configuration.
2. Ensure that the DC source is switched OFF or disconnected.
3. Connect the DC line wires of power supply to  $V_{IN}$  and GND terminals on the board.
4. Connect the anode wire of external LED string to  $V_{IN}$  of the board.
5. Connect the cathode wire of external LED string to LED terminal of the board.
6. Load 10K $\Omega$  to R1 on the board. Do not load any components on R2 and R3.
7. Ensure that the area around the board is clear and safe, and preferably that the board and LEDs are enclosed in a transparent safety cover.
8. Turn on the main switch. LED string should light up with LED.

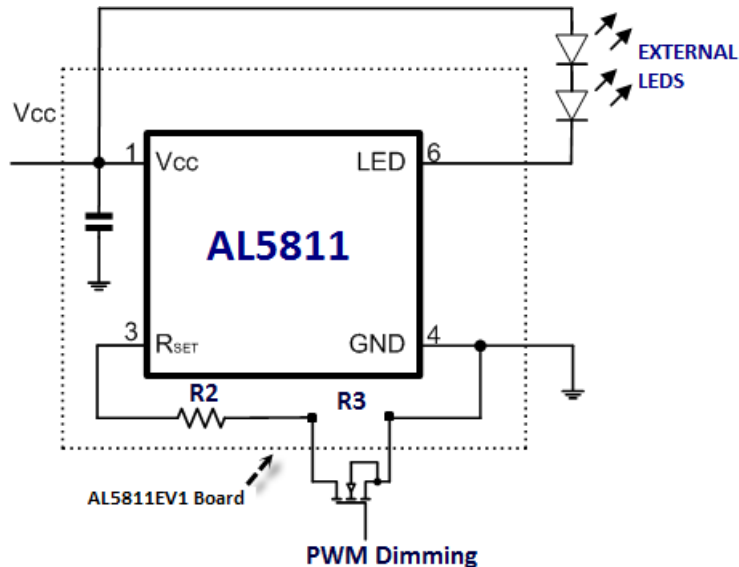
### Other Typical Circuit Design Options

#### I) Current LED String Procedure in High side current LED configuration



1. The evaluation can be configured as High side current LED configuration.
2. Ensure that the DC source is switched OFF or disconnected.
3. Connect the line wire of the DC power supply to  $V_{IN}$  and LED terminals on the board.
4. Connect the GND wire of the DC power supply to GND terminals on the board.
5. Connect the anode wire of external LED string to floating GND of the board.
6. Connect the cathode wire of external LED string to earth GND of the DC power supply.
7. Load 10K $\Omega$  to R1 on the board. Do not load any components on R2 and R3.
8. Observe MAX 60V differential between  $V_{IN}$  and floating GND when applied  $V_{IN} > 60V$ .
9. **In the high side circuit configuration, extreme high voltage may be present. Please use caution and try not to touch any components on the board or input leads.**
10. Turn on the main switch. LED string should light up with LED.

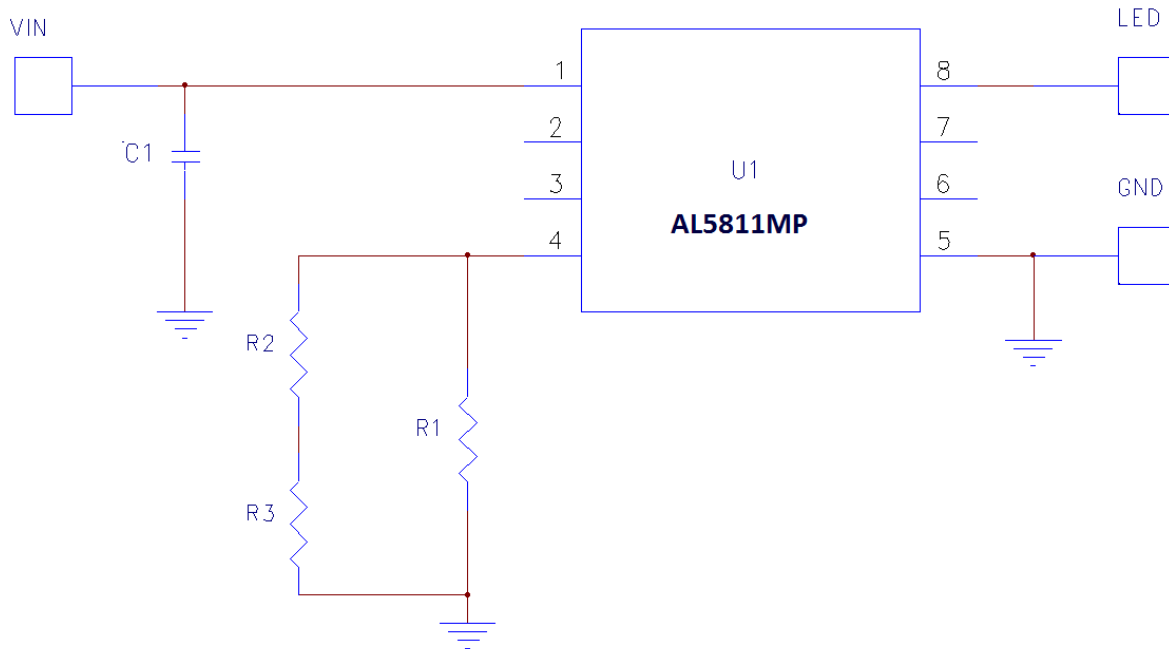
### II) Current LED String Procedure in Low side current LED configuration with PWM dimming



1. The evaluation board can be configured as Low side current LED configuration with use of PWM dimming.
2. Ensure that the DC source is switched OFF or disconnected.
3. Connect the DC line wires of power supply to V<sub>IN</sub> and GND terminals on the board.
4. Connect the anode wire of external LED string to V<sub>IN</sub> of the board.
5. Connect the cathode wire of external LED string to LED terminal of the board.
6. Load 10K $\Omega$  to R<sub>2</sub> on the board. Do not load any components on R<sub>1</sub> and R<sub>3</sub>.
7. Insert external MOSFET across R<sub>3</sub> pads of the board for PWM dimming control.
8. Ensure that the area around the board is clear and safe, and preferably that the board and LEDs are enclosed in a transparent safety cover.
9. Turn on the main switch. LED string should light up with LED.

### Schematic

For AL5811EV1 (MSOP-8EP)

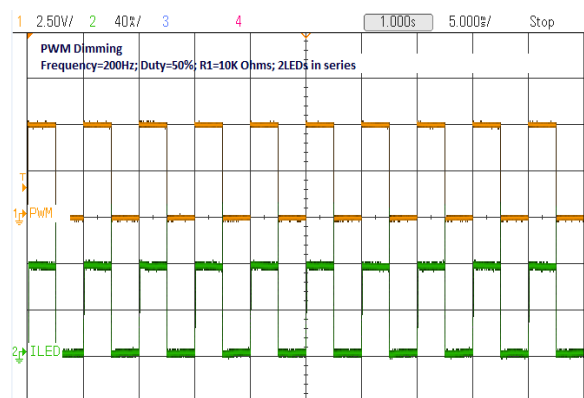
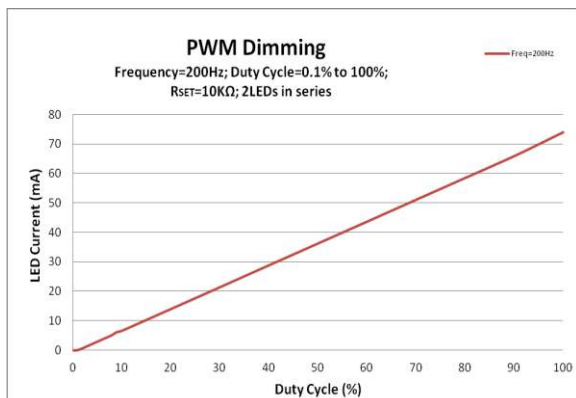
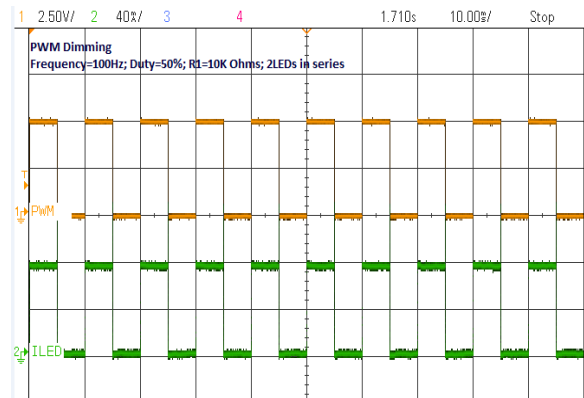
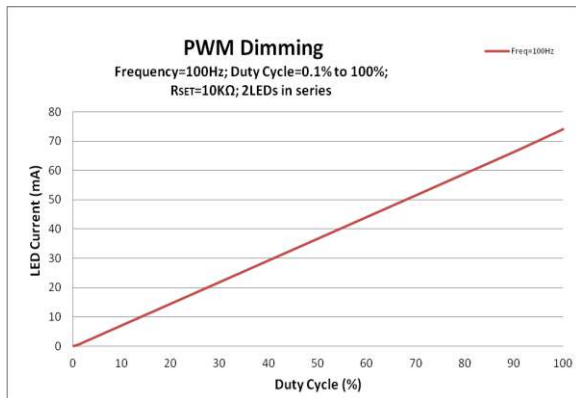
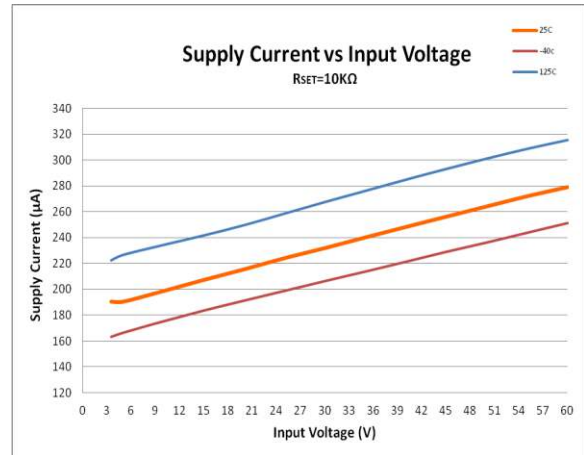
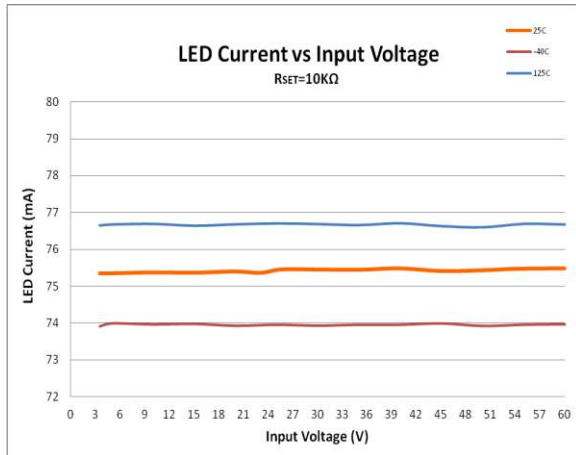


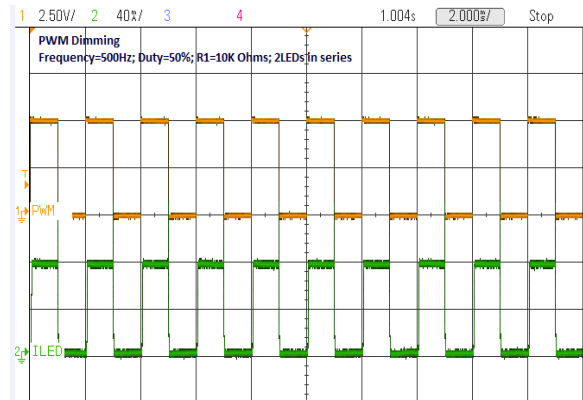
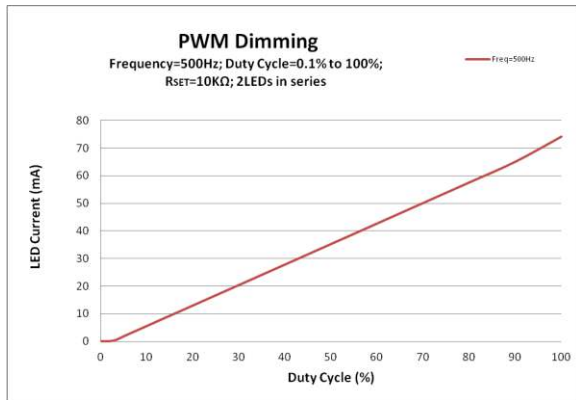
### Bill of Material

Bill of Material for AL5811EV1 MSOP-8EP Evaluation Board (Low Side Current LED String Configuration)

#	Name	Quantity	Part number	Manufacturer	Description
1	U1	1	AL5811MP	Diodes Inc	Adjustable Linear Driver in MSOP-8EP
2	C1	1	12101C104KAT2A	AVX Corp	CAP CER 0.1 $\mu$ F 100V 10% X7R 1210
3	R1	1	RR1220P-103-D	Susumu	RES 10K $\Omega$ 1/10W 0.5% 0805 SMD
4	R2, R3	0	N/A	N/A	N/A

### Functional Performance





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