

### General Description

The AL5812 is an adjustable Linear LED driver offering excellent temperature stability and output handling capability. The AL5812 simplifies the design of linear and isolated or non-isolated LED drivers by setting the LED current with standard value resistors.

The AL5812 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 150mA (commonly referred to as  $\frac{1}{2}W$  LEDs). Longer LED chains can be driven by tapping  $V_{CC}$  from the chain, where the chain voltage may exceed 60V.

The AL5812 evaluation board provides two different board types, which are AL5812MPEV1 for MSOP-8EP package and AL5812FFEV1 for U-DFN3030-6 package.

### Key Features

- Low Reference Voltage ( $V_{RSET}=0.5V$ )
- $-40^{\circ}C$  to  $125^{\circ}C$  Temperature Range
- $\pm 3\%$  LED Current Tolerance
- MSOP-8EP and U-DFN3030-6 packages

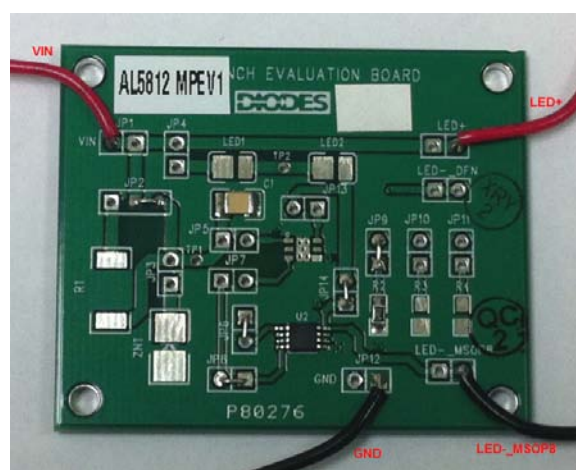
### Applications

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

### Specifications

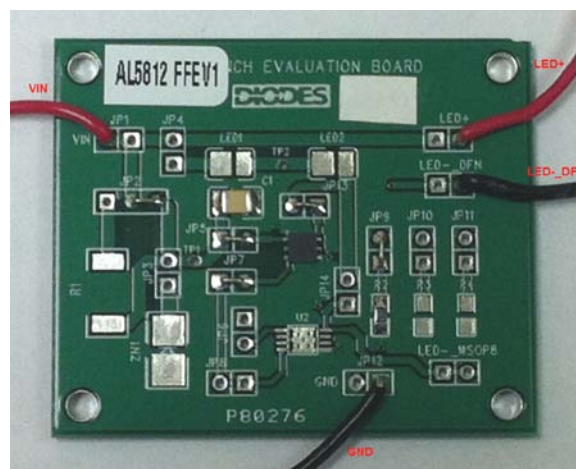
| Parameter       | Value              |
|-----------------|--------------------|
| Input Voltage   | 3.5V – 60V         |
| LED Current     | 150mA (Adjustable) |
| XY Dimension    | 1.97" x 1.64"      |
| ROHS Compliance | Yes                |

### Top-View EVM (AL5812MPEV1)



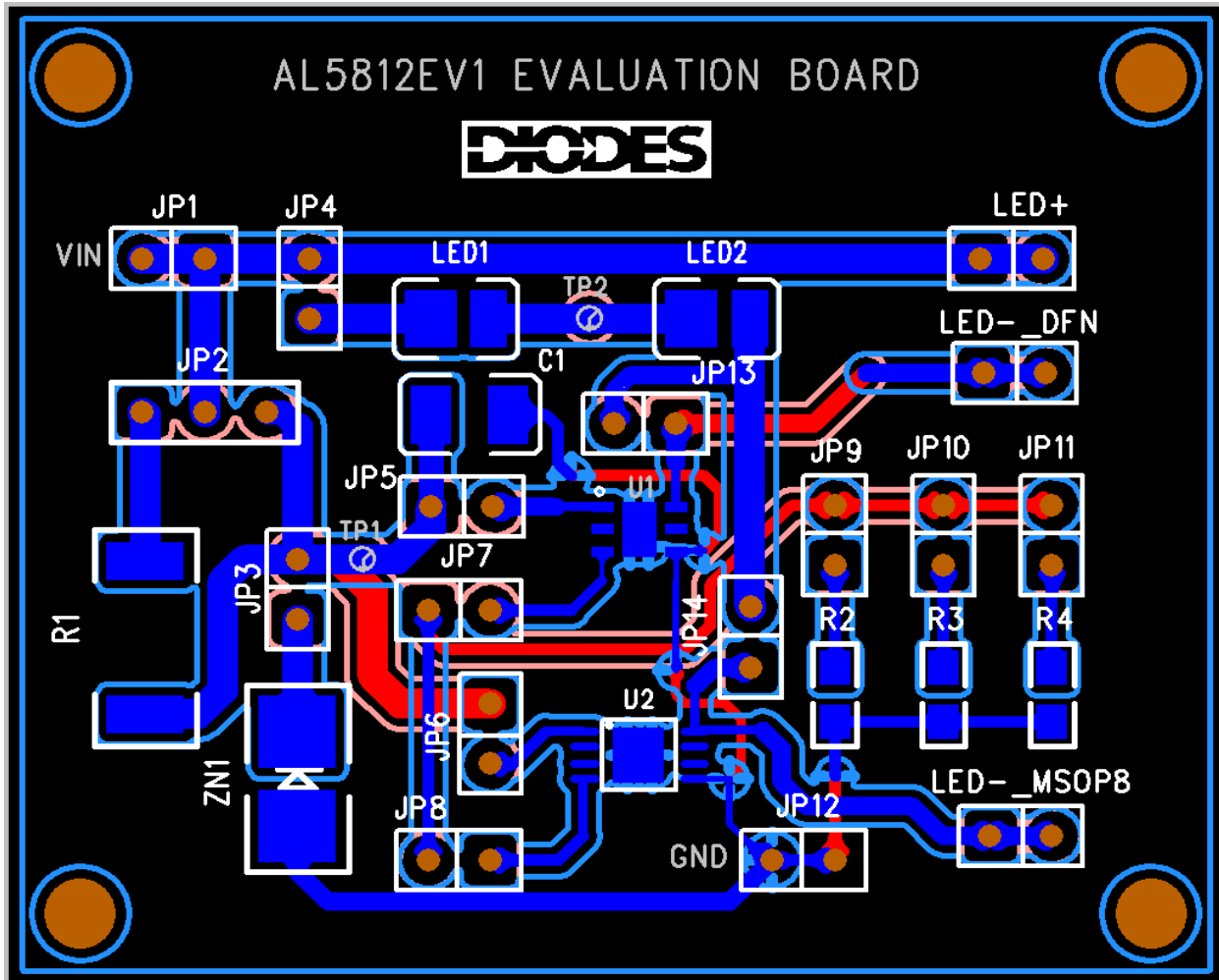
AL5812MPEV1 (MSOP-8EP)

### Top-View EVM (AL5812FFEV1)



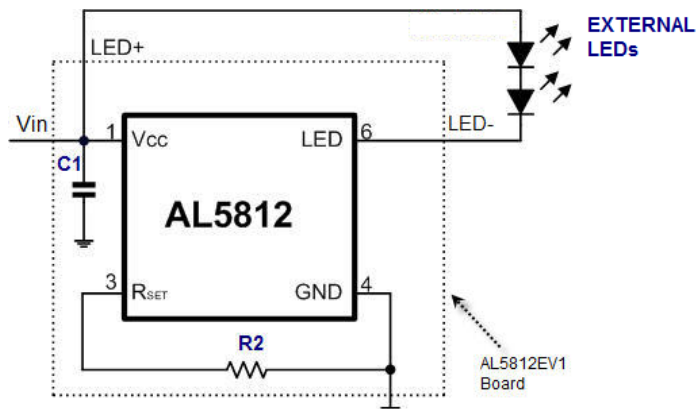
AL5812FFEV1 (U-DFN3030-6)

Board Layout



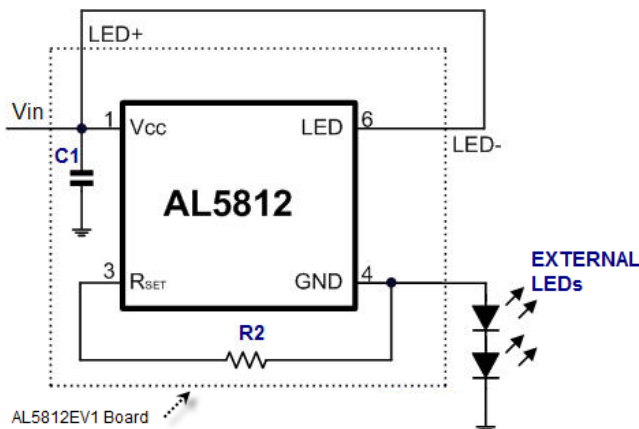
Note: This evaluation board provides Low side Current LED string configuration by default. For design flexibility, multiple application circuits can be derived in both Low and High Side Current LED configurations.

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



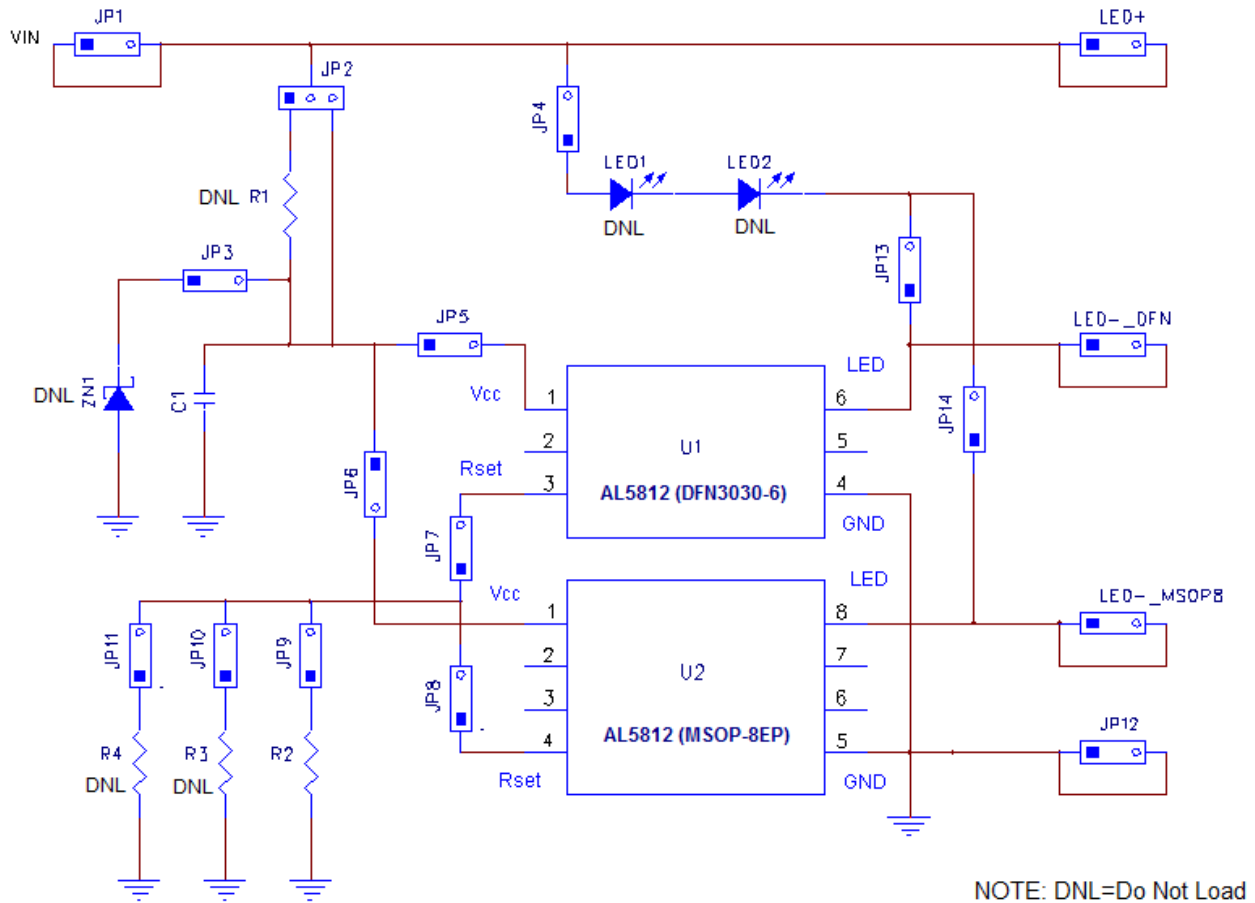
1. By default, the evaluation board is preset at 150mA as low side current LED configuration.
2. Ensure that the DC source is switched OFF or disconnected.
3. Connect the anode wire of external LED string to LED+ of the evaluation board.
4. Connect the cathode wire of external LED string to LED-\_MSOP8 terminal (AL5812MPEV1) or to LED-\_DFN terminal (AL5812FFEV1) of the evaluation board.
5. Connect two DC line wires to the VIN and GND terminals on the evaluation board.
6. 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.
7. Turn on the main switch. LED string should light up with LED.

### Current LED String Procedure in High side configuration



1. Connect LED+ directly to LED-\_MSOP8 terminal (AL5812MPEV1) or to LED-\_DFN terminal (AL5812FFEV1) of the evaluation board.
2. Connect the anode wire of external LED string to floating GND of the evaluation board.
3. Connect the cathode wire of external LED string to earth GND of the DC power supply.
4. Connect the DC source wire to VIN terminal of the evaluation board.
5. Observe MAX 60V differential between VIN and floating GND when applied VIN > 60V.
6. **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.**

### Schematic



### Bill of Material

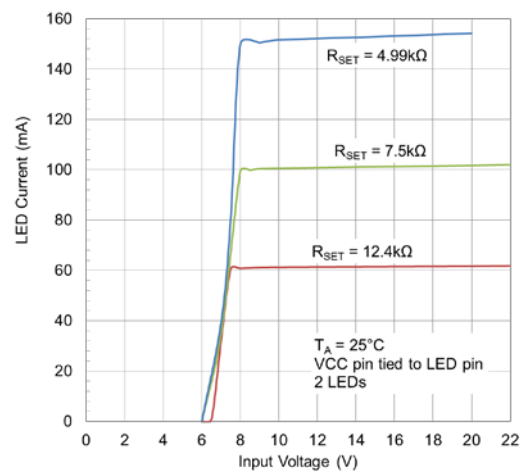
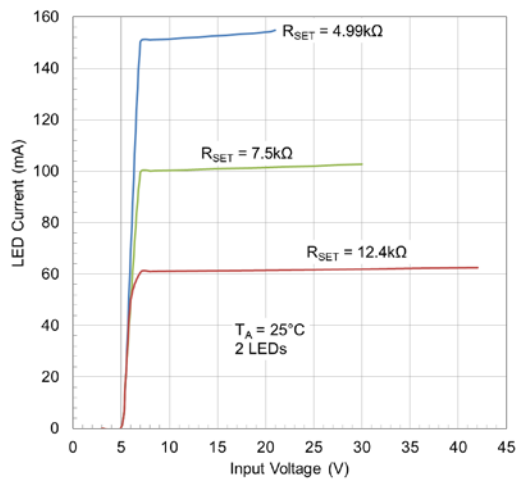
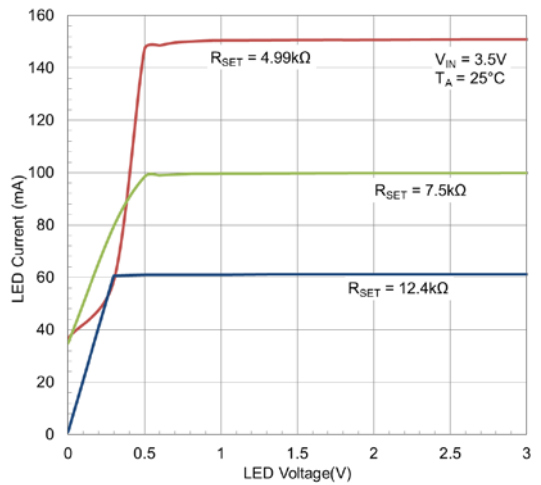
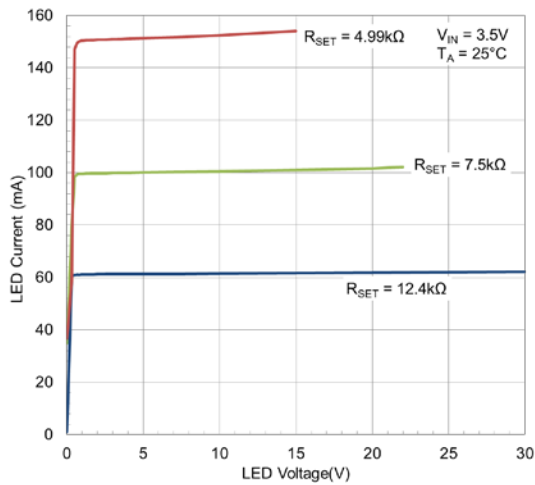
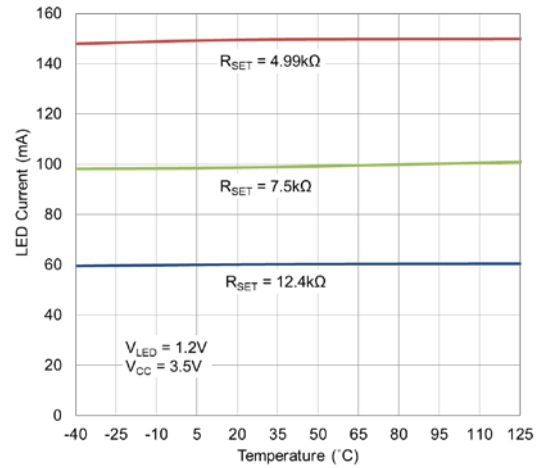
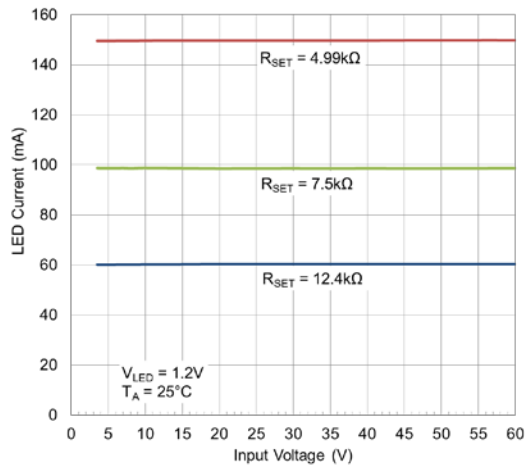
#### Bill of Material for AL5812FFE1 U-DFN3030-6 (Low Side Current LED String Configuration)

| # | Name | Quantity | Part number      | Manufacturer | Description                             |
|---|------|----------|------------------|--------------|---|
| 1 | U1   | 1        | AL5812FF         | Diodes Inc   | Adjustable Linear Driver in U-DFN3030-6 |
| 2 | R2   | 1        | RR1220P-4991-D-M | Susumu       | RES 4.99KΩ 1/10W 0.5% 0805 SMD          |
| 3 | C1   | 1        | 12101C104KAT2A   | AVX Corp     | CAP CER 0.1μF 100V 10% X7R 1210         |

#### Bill of Material for AL5812MPEV1 MSOP-8EP (Low Side Current LED String Configuration)

| # | Name | Quantity | Part number      | Manufacturer | Description                          |
|---|------|----------|------------------|--------------|--------------------------------------|
| 1 | U2   | 1        | AL5812MP         | Diodes Inc   | Adjustable Linear Driver in MSOP-8EP |
| 2 | R2   | 1        | RR1220P-4991-D-M | Susumu       | RES 4.99KΩ 1/10W 0.5% 0805 SMD       |
| 3 | C1   | 1        | 12101C104KAT2A   | AVX Corp     | CAP CER 0.1μF 100V 10% X7R 1210      |

### Functional Performance



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