

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

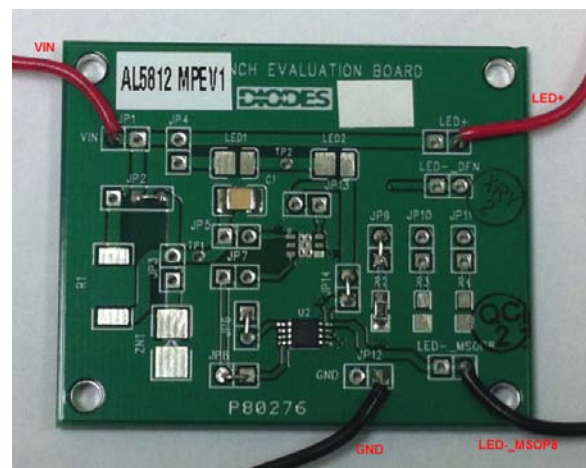
Applications

- 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)



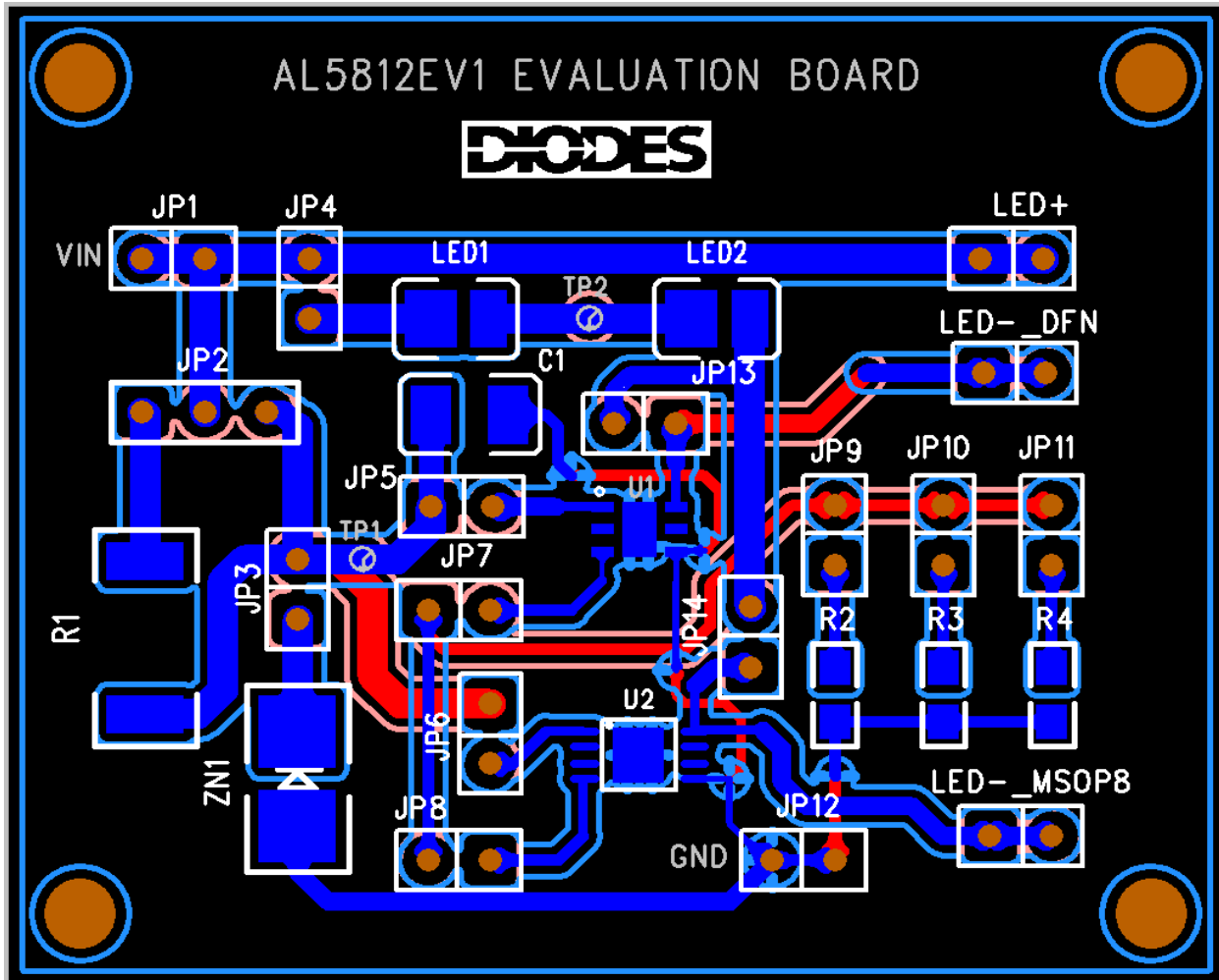
AL5812MPEV1 (MSOP-8EP)

Top-View EVM (AL5812FFEV1)



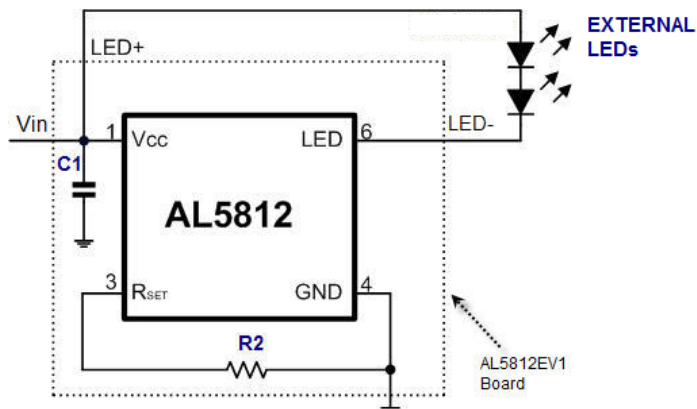
AL5812FFEV1 (U-DFN3030-6)

Board Layout



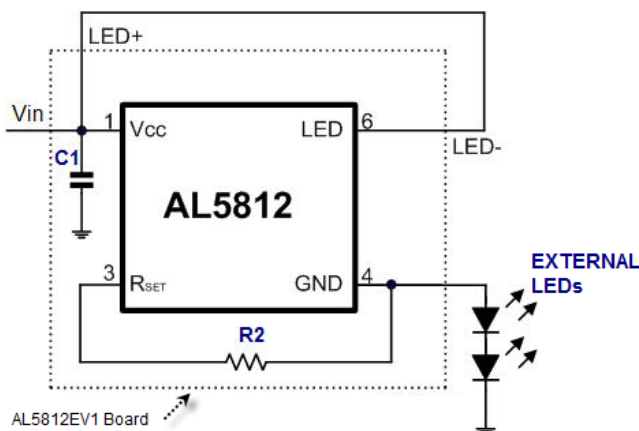
Note: This evaluation board provides Low side Current LED string configuration by default. For design flexibility, multiple application circuits can be derived in both Low and High Side Current LED configurations.

Evaluation Board Connection Setup and Power-up Procedure



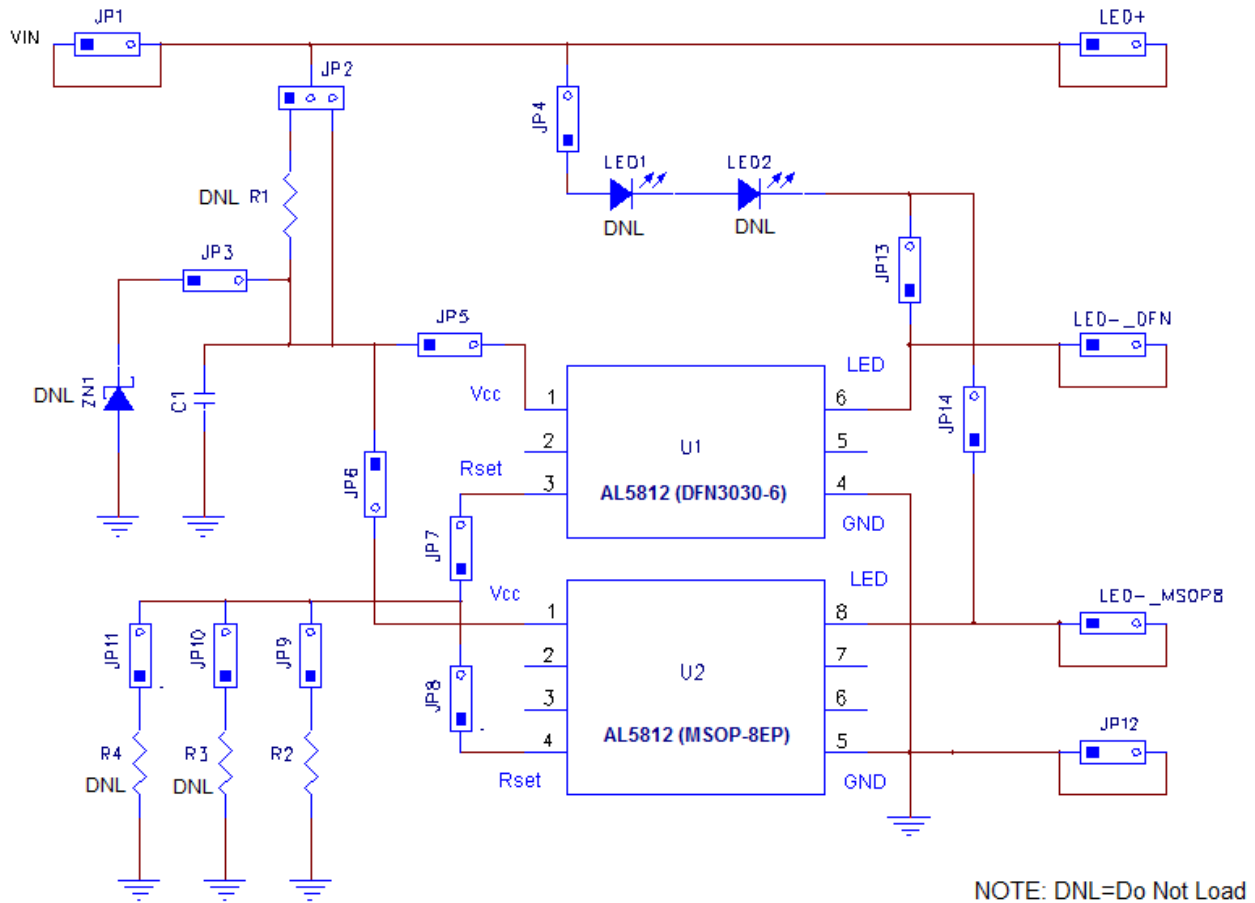
1. By default, the evaluation board is preset at 150mA as low side current LED configuration.
2. Ensure that the DC source is switched OFF or disconnected.
3. Connect the anode wire of external LED string to LED+ of the evaluation board.
4. Connect the cathode wire of external LED string to LED-_MSOP8 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

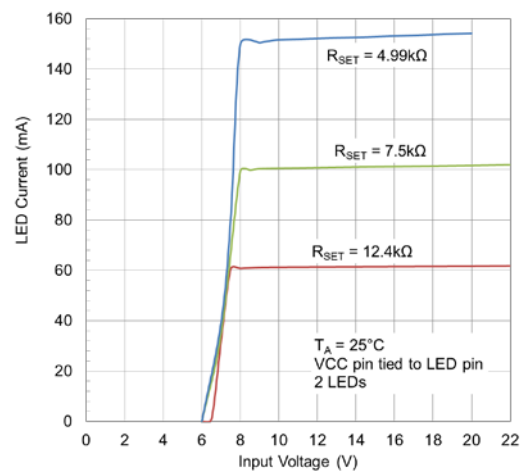
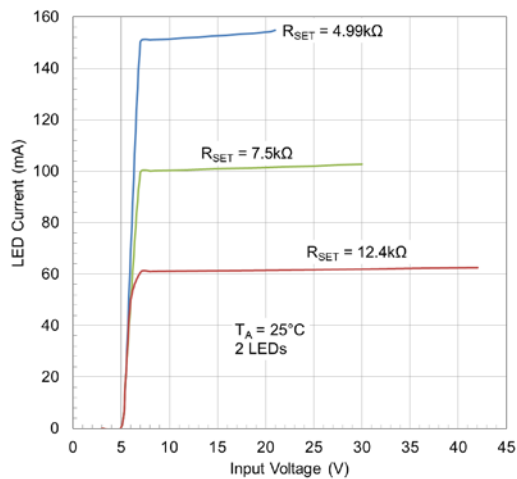
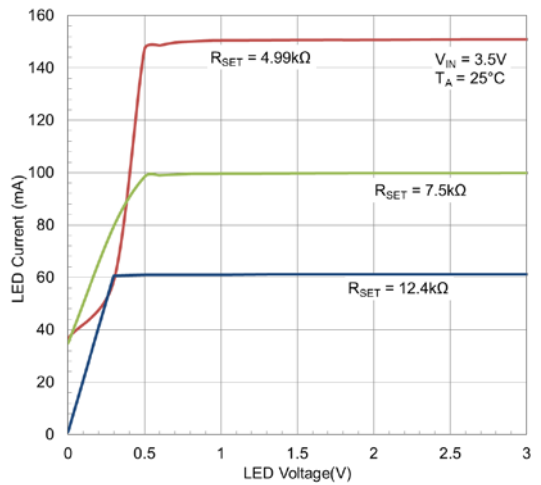
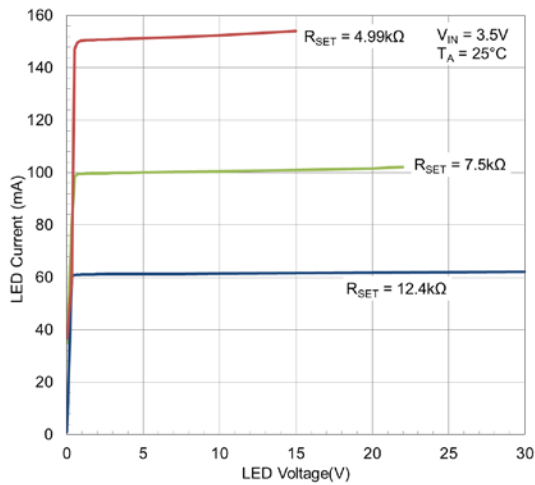
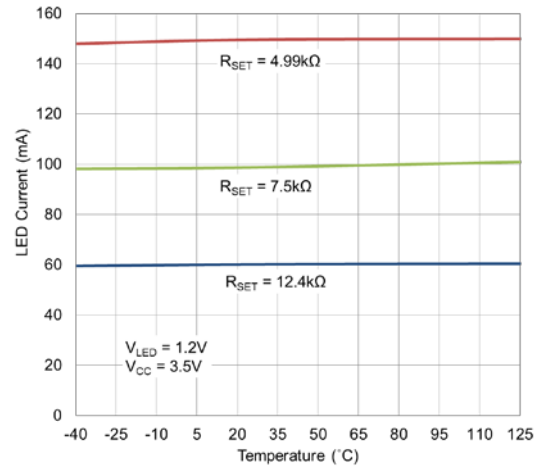
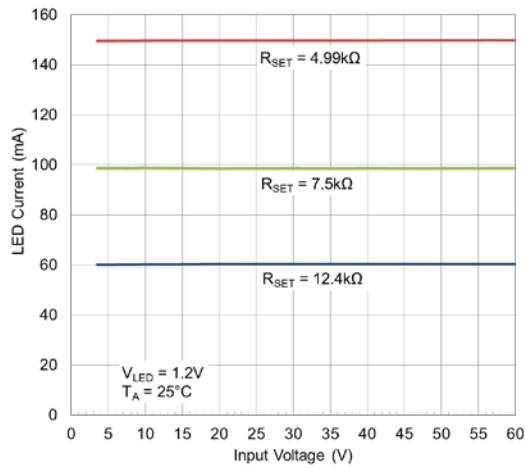
Bill of Material for AL5812FFE1 U-DFN3030-6 (Low Side Current LED String Configuration)

#	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



IMPORTANT NOTICE

DIODES INCORPORATED MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDS TO THIS DOCUMENT, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION).

Diodes Incorporated and its subsidiaries reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein. Diodes Incorporated does not assume any liability arising out of the application or use of this document or any product described herein; neither does Diodes Incorporated convey any license under its patent or trademark rights, nor the rights of others. Any Customer or user of this document or products described herein in such applications shall assume all risks of such use and will agree to hold Diodes Incorporated and all the companies whose products are represented on Diodes Incorporated website, harmless against all damages.

Diodes Incorporated does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel.

Should Customers purchase or use Diodes Incorporated products for any unintended or unauthorized application, Customers shall indemnify and hold Diodes Incorporated and its representatives harmless against all claims, damages, expenses, and attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized application.

Products described herein may be covered by one or more United States, international or foreign patents pending. Product names and markings noted herein may also be covered by one or more United States, international or foreign trademarks.

This document is written in English but may be translated into multiple languages for reference. Only the English version of this document is the final and determinative format released by Diodes Incorporated.

LIFE SUPPORT

Diodes Incorporated products are specifically not authorized for use as critical components in life support devices or systems without the express written approval of the Chief Executive Officer of Diodes Incorporated. As used herein:

A. Life support devices or systems are devices or systems which:

1. are intended to implant into the body, or
2. support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in significant injury to the user.

B. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or to affect its safety or effectiveness.

Customers represent that they have all necessary expertise in the safety and regulatory ramifications of their life support devices or systems, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of Diodes Incorporated products in such safety-critical, life support devices or systems, notwithstanding any devices- or systems-related information or support that may be provided by Diodes Incorporated. Further, Customers must fully indemnify Diodes Incorporated and its representatives against any damages arising out of the use of Diodes Incorporated products in such safety-critical, life support devices or systems.

Copyright © 2012, Diodes Incorporated

www.diodes.com