

A80802 Evaluation Board User Guide

DESCRIPTION

The ALT80802 Evaluation Board is designed to help system designers evaluate the operation and performance of the ALT80802 Wide Input Voltage, Adjustable Frequency, Buck-Boost or Buck, 2 Amp LED Driver. This board is configured in a buck-boost configuration, which allows operation while driving LED strings with a forward voltage drop below, equal to or higher than the input voltage.

FEATURES

- ALT80802 Buck-Boost or Buck LED driver
- Optional external binning/dimming control of regulated LED current level
- Optional PWM control for pulse width modulation dimming of LED current
- Fault pin (FFn) output with externally supplied pull-up rail

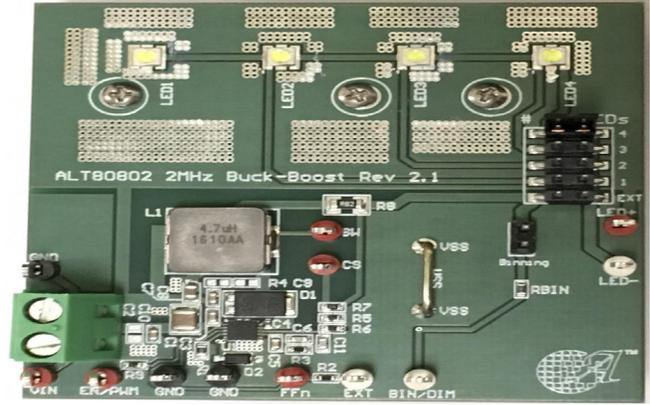


Figure 1: ALT80802 Evaluation Board

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Table 1: ALT80802 Evaluation Board Configurations

Configuration Name	Part Number	Output Current (mA)
ALT80802 Buck-Boost Evaluation Board	APEK80802KEJ-01-BB-T	350

Table 2: General Specifications

Specification	Min	Nom	Max	Units
Input Operating Voltage	3.8	-	50	V
Switching Frequency	-	2	-	MHz

USING THE EVALUATION BOARD

This section provides an overview of the connections and configuration options of the ALT80802 Evaluation Board. Each group of connections highlighted in Figure 2 has a detail section below. The ALT80802 datasheet contains detailed information on the use and functionality of each pin and should be consulted for more detailed information than is contained in this user guide.

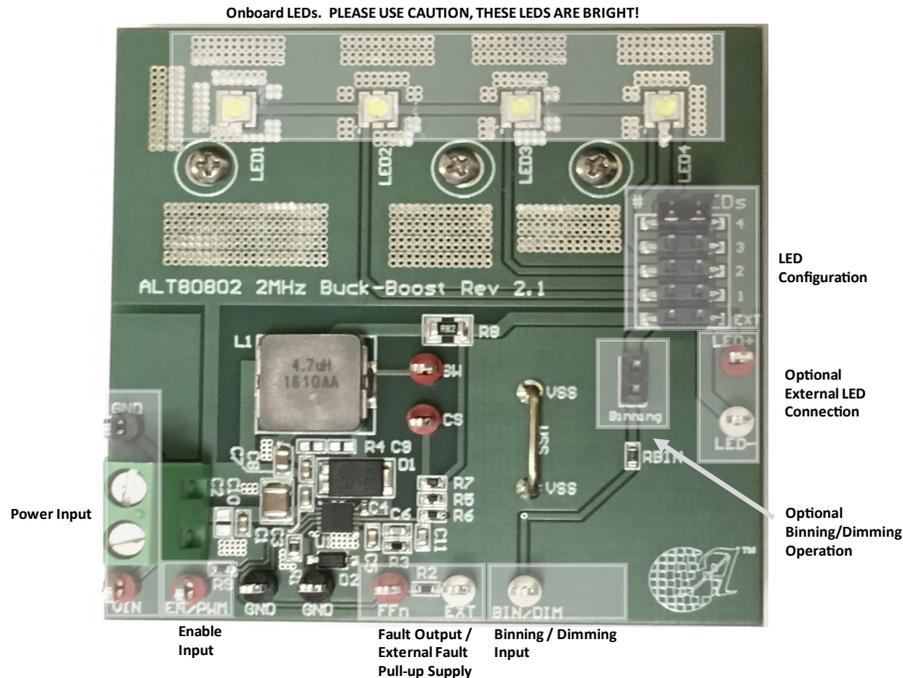


Figure 2: Setup and Connection Diagram

CAUTION: THE LEDS SUPPLIED ON THIS BOARD ARE VERY BRIGHT. PLEASE DO NOT LOOK DIRECTLY AT THEM. THE STATIC SHIELDING BAG THAT WAS PROVIDED WITH THIS BOARD CAN BE USED AS A SHIELD TO HELP REDUCE THE INTENSITY OF THE LIGHT.

Power Input

Connect a power supply to VIN and GND of the input terminal block or to the VIN and GND test points. It is best to use short, cables that are at least 18 AWG.

Board Configuration

LEDs: The evaluation board is equipped with 4 white LEDs. The number of LEDs can be connected as desired by placing shunts on the pins of the “# of LEDs” 5×2 pin header. Alternatively, a different LED or string of LEDs can be powered by shorting the “EXT” pair of pins on the 5×2 pin header and connecting the LEDs to the LED+ and LED- test points.

The “Binning” 2-pin header allows the user to apply an external voltage signal to adjust the regulated LED current level. Small variations above and below 200 mV applied to the BIN/DIM test points will result in a significant change in LED current. Consult the evaluation board schematic for details on how this network is set up.

The ALT80802’s FFn pin is an open-drain pull-down that asserts low during certain fault conditions. The FFn test point on the evaluation board is tied directly to the ALT80802’s FFn pin. Apply a voltage to the EXT test point to provide an appropriate pull-up if FFn is to be monitored.

PCB LAYOUT

Figures 4 and 5 below show the top and bottom layers of the ALT80802 evaluation board.

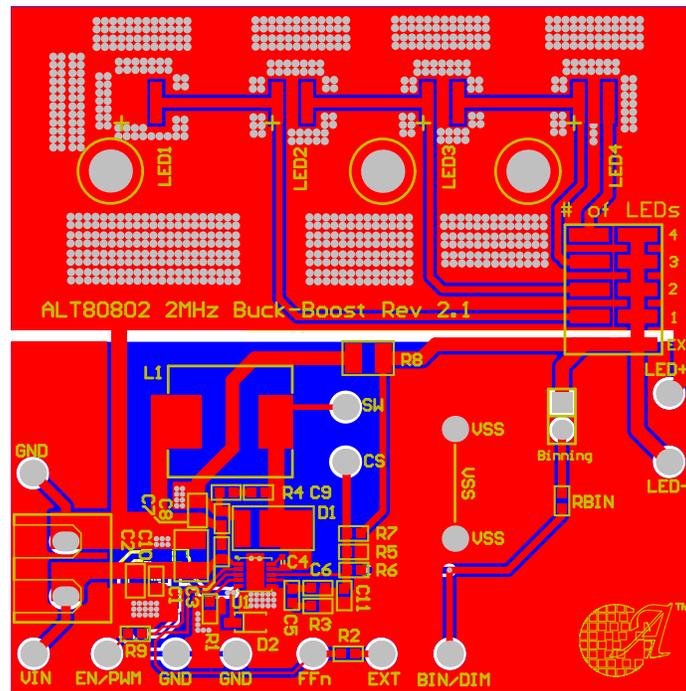


Figure 4: Top Layer

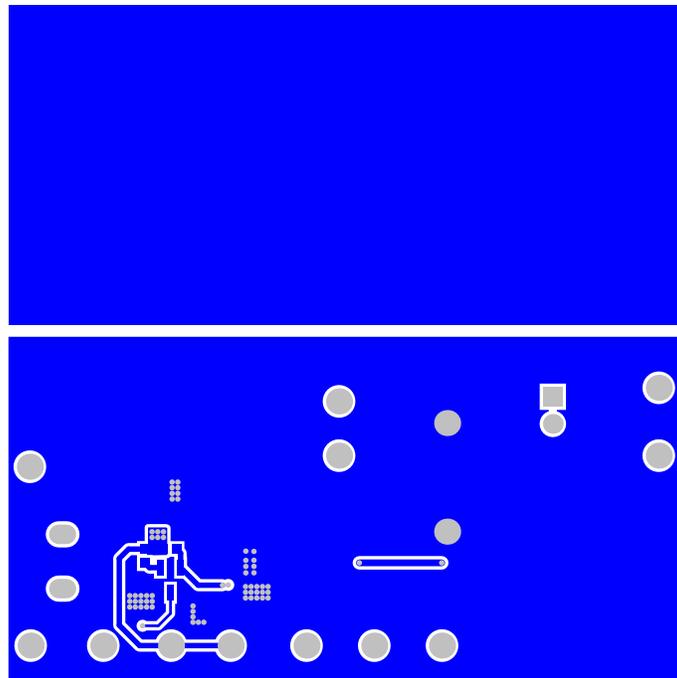


Figure 5: Bottom Layer

BILL OF MATERIALS

Table 3: ALT80802 Evaluation Board Bill of Materials

ELECTRICAL COMPONENTS				
Designator	Quantity	Description	Manufacturer	Manufacturer Part Number
PCB	1	ALT80802 2 MHz Buck Boost EVAL PCB, Rev. 2.1	Allegro MicroSystems	-
U1	1	ALT80802 2 A LED Driver	Allegro MicroSystems	-
R1	1	Resistor, 8.06 kΩ, 1/10 W, 1%	Vishay	CRCW06038K06FKEA
R2	1	Resistor, 8.06 kΩ, 1/10 W, 1%	Vishay	CRCW060310K0FKEA
R3	1	Resistor, 8.06 kΩ, 1/10 W, 1%	Vishay	CRCW06032K49FKEA
R4	0	Not used	-	-
R5, R9	2	Resistor, 8.06 kΩ, 1/10 W, 1%	Vishay	CRCW06032K00FKEA
R6	1	Resistor, 8.06 kΩ, 1/10 W, 1%	Vishay	CRCW0603120RFKEA
R7	1	Resistor, 8.06 kΩ, 1/10 W, 1%	Vishay	CRCW06031K00FKEA
R8	1	Resistor, 8.06 kΩ, 1/10 W, 1%	Panasonic	-
R10	1	Resistor, 8.06 kΩ, 1/10 W, 1%	Vishay	CRCW060340R2FKEA
R11	1	Resistor, 8.06 kΩ, 1/10 W, 1%	Vishay	CRCW0603100RFKEA
RBIN	1	Resistor, 8.06 kΩ, 1/10 W, 1%	Panasonic	ERJ-3EKF5600V
C1	1	Capacitor, Ceramic, 4.7 μF, 50 V, 10%, X7R	TDK	
C2, C9	0	Not used	-	-
C7	1	Capacitor, Ceramic, 0.47 μF, 50 V, 10%, X7R	TDK	CGA4J3X7R1H474K125AB
C3, C8, C10	3	Capacitor, Ceramic, 100 nF, 50 V, 10%, X7R	Murata	GCJ188R71H104KA12D
C4	1	Capacitor, Ceramic, 220 nF, 50 V, 10%, X7R	TDK	CGA2B2X7R1C224K050BA
C5	1	Capacitor, Ceramic, 1.5 nF, 50 V, 5%, C0G	Murata	GCM1885C1H152JA16D
C6	1	Capacitor, Ceramic, 22 pF, 100 V, 5%, C0G	Myrata	GCM1885C2A220JA16D
C11	1	Capacitor, Ceramic, 560 pF, 100 V, 10%, X7R	Kemet	C0603Y561K1RACAUTO
D1	1	Diode, Schottky, 60 V, 5 A, 670 mV @ 5 A	Diodes Incorporated	PDS560-13
D2	1	Diode, Schottky, 40 V, 1 A, 410 mV @ 1 A	Diodes Incorporated	1N5819HW-7-F
Q1	1	Transistor, NPN, 65 V, 0.1 A SOT23	Onsemi	BC846ALT1G
L1	1	Inductor, 4.7 μH, 9.8 A _{SAT} 15.32 mΩ Max	Vishay	IHLP4040DZER4R7M8A
LED1, LED2, LED3, LED4	4	LED White 700 mA, 3.05 V	Osram	LUW CQAR-MUNQ
JP1	1	Header, 2 × 5, 0.1"	Molex	15912100
JP2	1	Header, 2 × 1, 0.1"	Sullins	PEC02SAAN
X1	1	Connector, Screw Terminal, 2-way	On Shore Technology	OSTTC022162
'VIN', 'EN', 'FFn', 'SW', 'LED+', 'CS'	6	Test Points, Red, 0.063" diameter	Keystone	5010
'EXT', 'BIN/DIM', 'LED-'	3	Test Points, White, 0.063" diameter	Keystone	5012
'GND'	3	Test Points, Black, 0.063" diameter	Keystone	5011
'VSS'-BAR	1.2"	WIRE BUS BAR 18AWG 100'	-	-
Jumper	1	SHUNT LP W/ HANDLE 2 POS 30AU	TE Connectivity	881545-2
OTHER COMPONENTS				
Designator	Quantity	Description	Manufacturer	Manufacturer Part Number
HS1	1	Heatsink	CTS	7-340-2PP-BA
HS2	1	Heatsink	CTS	7-340-1PP-BA
SCREW	3	Machine Screw PAN PHILLIPS 2-56	-	PMSSS 256 0025 PH
HEX NUT	3	HEX NUT 3/16" STN STEEL 2-56	-	NHSS256
WASHER	3	WASHER INT TOOTH #2 STN STEEL	-	INT LWSS 002

RELATED LINKS

<https://www.allegromicro.com/en/products/regulate/led-drivers/led-drivers-for-lighting/alt80802>

Revision History

Number	Date	Description
-	May 25, 2023	Initial release

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