

Introduction

The AAT3151 EVAL board demonstrates the functionality of the AAT3151 and its application as a white LED backlight driver. The AAT3151 is a low-noise, constant frequency charge pump DC/DC converter with tri-mode load switch (1X), fractional (1.5X), and doubling (2X) conversion to maximize efficiency and operate over a wide input voltage range.

The AAT3151 is programmable with the AS²Cwire™ (Advanced Simple Serial Control™) serial interface and is capable of driving up to four independent LED channels. LED constant current levels are set from a 16-level logarithmic scale, and four additional low-current settings are available down to 50µA.

This document describes the evaluation board and its accompanying user interface. In addition, a brief Getting Started section is included to help the user begin operating the evaluation board. A schematic of the complete circuit is shown in Figure 1, and the actual board layout is given in Figures 2 and 3. For additional information, please consult the AAT3151 product datasheet.

Schematic

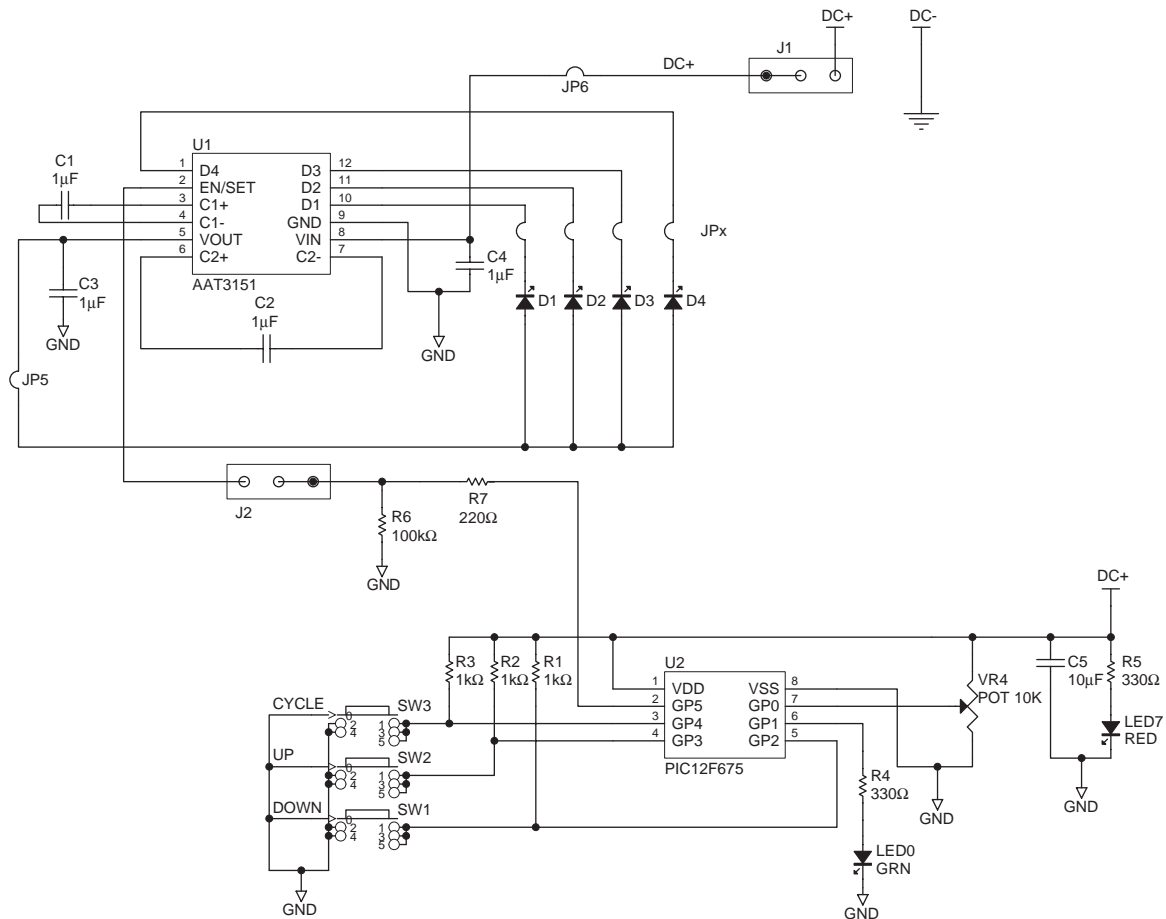


Figure 1: Evaluation Board Schematic.

Getting Started

In most cases, the board ships mounted onto a battery pack. The battery pack holds three AAA size, conventional alkaline batteries. A jumper is inline with the battery supply for connecting/disconnecting power. There is an additional jumper labeled ON SRL OFF, which provides access to EN/SET. For operation, ensure that it is in the ON SRL position. To apply power to the board, connect the supply by jumpering ON, MCU. The red LED7 should illuminate, indicating that power has been connected.

The user interface is provided by three buttons: CYCLE, UP and DOWN. The modes of operation are detailed in Table 1. Each button handles a particular function. The CYCLE button toggles on/off auto-cycling. The UP button increments to the next number of EN/SET edges. When the UP button is held down, the MCU will auto-increment through all of the settings after a short delay. Pressing the DOWN button decrements the number of EN/SET edges. When the DOWN button is held, the MCU will auto-decrement through all of the settings.

User Interface Functionality

Button(s) Pushed ¹	Description
CYCLE ²	Toggle on/off auto-cycling. Auto-increments EN/SET edges and cycles through the available brightness level settings.
UP	Increment the number of EN/SET edges. Toggles through the available brightness level settings for the backlighting section. If held down, auto-cycle through the settings.
DOWN	Decrement the number of EN/SET edges. Toggles through the available brightness level settings for the backlighting section. If held down, auto-cycle through the settings.
CYCLE + UP	Increment the address. Cycles through addresses 1, 2, and 3 (i.e., main/sub, main-only, sub-only).
UP + DOWN	Switch to the next current level scale. Cycles through the 20mA, 30mA, 15mA, and Low Current scales.
CYCLE + UP + DOWN	Reset. Enable line is pulled low.

Table 1: User Interface Functionality.

1. The '+' sign indicates that these buttons are all pressed and released together.

2. The auto-cycling speed is adjusted with the 10K POT, VR4. Turn clockwise to speed up and counter-clockwise to slow down.

Printed Circuit Board

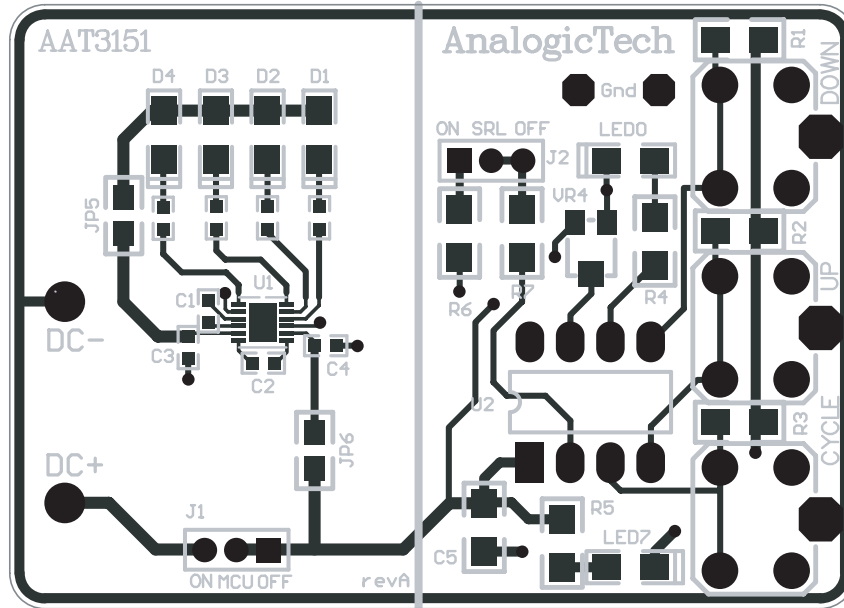


Figure 2: Top Layer (not to scale).

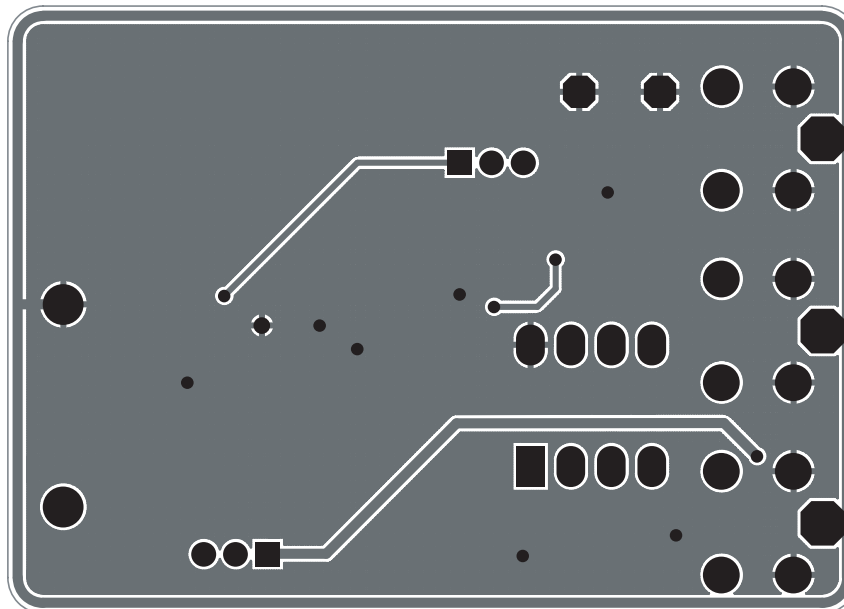


Figure 3: Bottom Layer (not to scale)¹.

AAT3151 EVAL Component Listing

Component	Part Number	Description	Manufacturer
U1	AAT3151	High Efficiency 1X/1.5X/2X Charge Pump for White LED; TDFN33-12 Package	AnalogicTech
U2	PIC12F675	8-Bit CMOS, FLASH-Based μ C; 8-Pin PDIP Package	Microchip
D1-D4	LW M673	Mini-TOPLED White LED; SMT Package	OSRAM
R1-R3	Chip Resistor	1k Ω , 5%, 1/4W; 1206	Vishay
C1-C4	ECJ-1VB1A105K	1 μ F, 10V, X5R, 10%; 0603	Panasonic-ECG
J1, J2	PRPN401PAEN	Connecting Header, 2mm Zip	Sullins Electronics
LED0	CMD15-21UGC/TR8	Green LED; 1206	Chicago Miniature Lamp
LED7	CMD15-21SRC/TR8	Red LED; 1206	Chicago Miniature Lamp
C5	GRM31CR70J106KA01L	10 μ F, 6.3V, X7R, 10%; 1206	Murata
R4, R5	Chip Resistor	330 Ω , 5%, 1/4W; 1206	Vishay
R6	Chip Resistor	100k Ω , 5%, 1/4W; 1206	Vishay
R7	Chip Resistor	220 Ω , 5%, 1/4W; 1206	Vishay
JPx	Chip Resistor	0 Ω , 5%; 0603	Vishay
JP5, JP6	Chip Resistor	0 Ω , 5%; 0805	Vishay
VR4	EVN-5ESX50B14	10K POT; 3mm Squared SMD	Panasonic-ECG
SW1-SW3	PTS645TL50	Switch Tact, SPST, 5mm	ITT Industries

Table 2: Component Listing.

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