

Introduction

The AAT3152 EVAL board demonstrates the functionality of the AAT3152 and its application as a white LED backlight driver. The AAT3152 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 AAT3152 is programmable with the S²Cwire™ (Simple Serial Control™) serial interface and is capable of driving up to four independent LED channels. Main/sub control is available with eight constant current level settings from 20mA 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 AAT3152 product datasheet.

Schematic

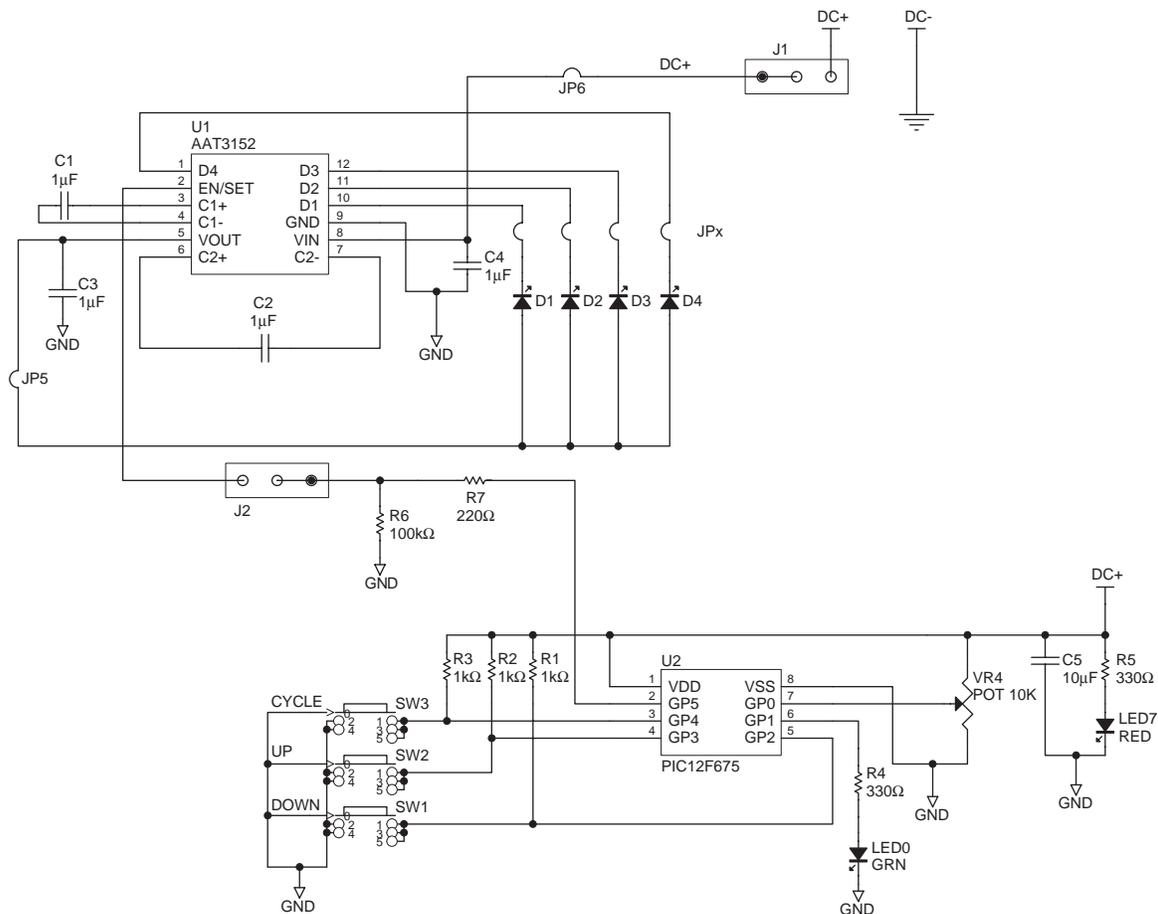


Figure 1: Evaluation Board Schematic.

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. It 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 + 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

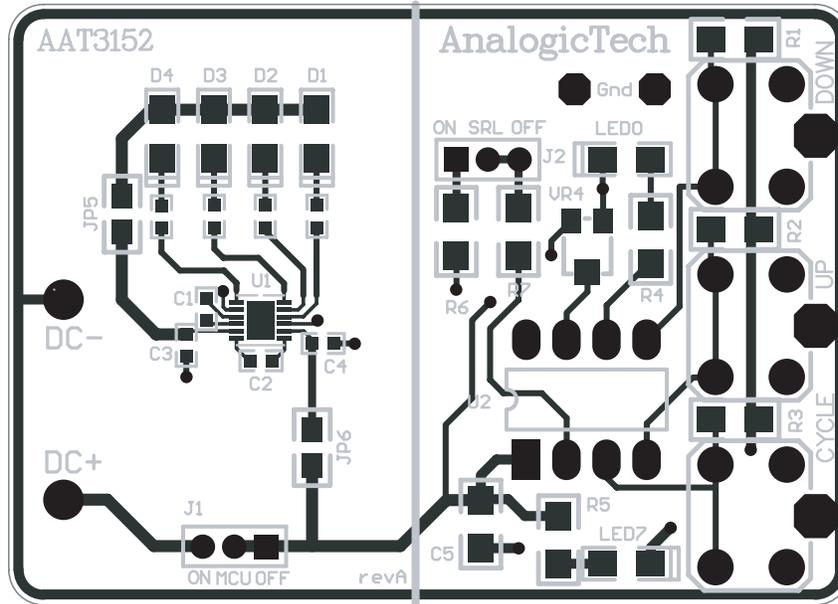


Figure 2: Top Layer (not to scale).

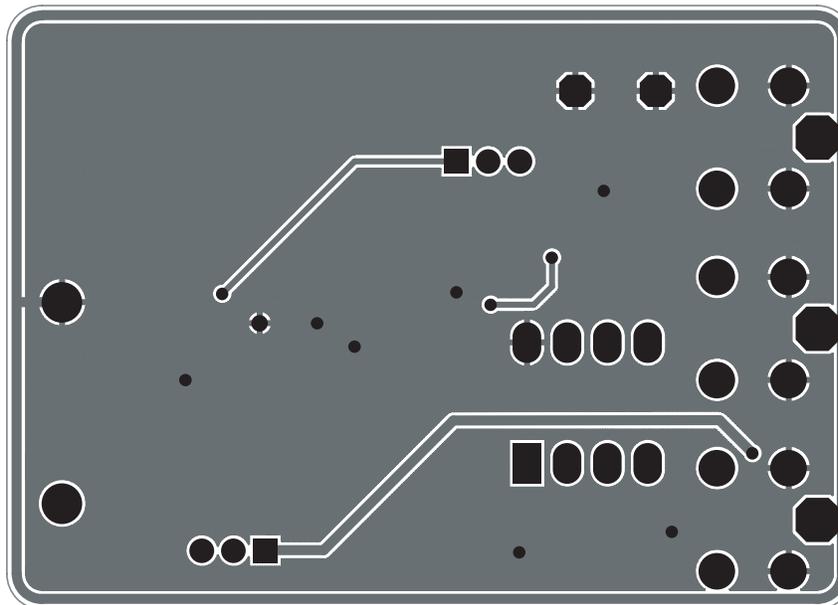


Figure 3: Bottom Layer (not to scale).

AAT3152 EVAL Component Listing

| Component | Part Number | Description | Manufacturer |
|-----------|--------------------|---|------------------------|
| U1 | AAT3152 | 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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