

Introduction

The AAT3175 EVAL board demonstrates the functionality of the AAT3175 and its application as a white LED flash driver. The AAT3175 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 AAT3175 is programmable with AnalogicTech's S²Cwire™ (Simple Serial Control™) serial interface and has four independent, constant current LED channels. LED constant current levels are set according to a 16-level logarithmic scale. The device is able to achieve a flash current level of 300mA while requiring only 1μF capacitors.

This document describes the evaluation board and its accompanying user interface. A brief “Getting Started” section is also included to help the user begin operating the evaluation board. A schematic of the complete circuit appears in Figure 1; Figures 2 and 3 depict the actual board layout. For additional information, please consult the AAT3175 product datasheet.

Schematic

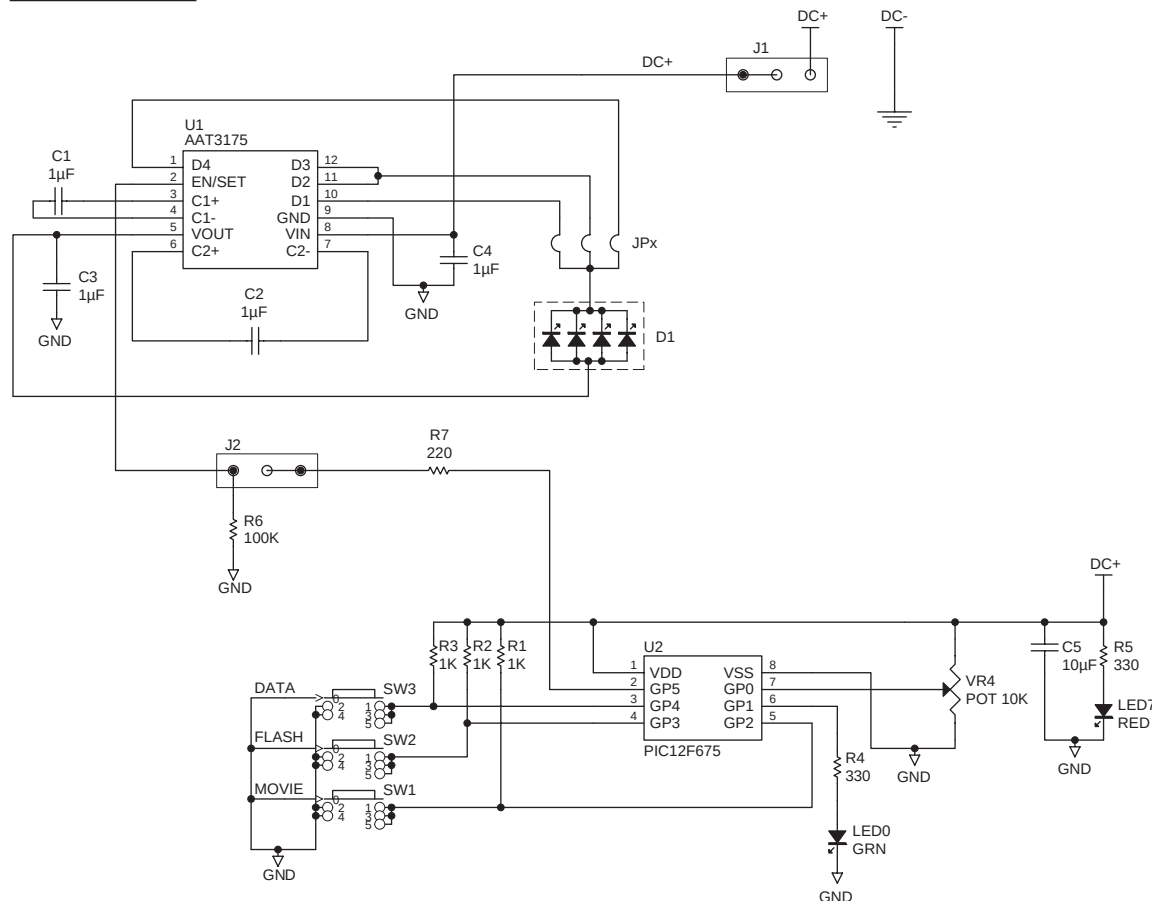


Figure 1: AAT3175 Evaluation Board Schematic.

Getting Started

The board has two terminals labeled DC- and DC+ for the input power supply connection. A jumper is inline with the supply bus for connecting/disconnecting power (J1). To apply power to the board, connect the supply by jumpering ON, MCU; the red LED7 should illuminate, indicating that power has been connected to the board. There is an additional jumper labeled ON SRL OFF, which provides access to EN/SET. For operation with the accompanying microcontroller and user interface, ensure that the jumper is in the ON SRL position.

The user interface is provided by three buttons: DATA, FLASH, and MOVIE. The modes of operation are detailed in Table 1. The DATA button increments the data setting until reaching 16, at which point it wraps back to 1. Use the DATA button to set the current for flash and movie modes. As an example, pressing the DATA button 4 times will set the microcontroller to use 5 EN/SET edges for flash or movie (the default of 1, plus 4 gives 5). Pushing the FLASH button will release a flash pulse. The current level for the flash pulse is determined by the data setting. The duration of the flash pulse is determined by the trim pot VR4. The flash pulse duration can be set from 10ms to 2 seconds by adjusting VR4. The MOVIE button toggles the device on and off. The current level is also determined by the data setting. To reset the microcontroller, press all three buttons together and then release them. The data setting will be reset back to 1. To see the effect of each current level step, enable the device with the MOVIE button and then use the DATA button to traverse the 16 settings with the LED on.

User Interface Functionality

Button(s) Pushed ¹	Description
DATA	Increments through the 16 data settings. Hold down to auto-cycle. (Does not turn light on; just sets DATA.)
FLASH	Generate flash pulse. Current level determined by DATA setting. Duration determined by trim pot VR4 (adjustable from 10ms to 2 sec).
MOVIE	Toggle the device ON/OFF. Current level determined by DATA setting.
CYCLE + UP + DOWN	Reset.

Table 1: User Interface Functionality.

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

Printed Circuit Board

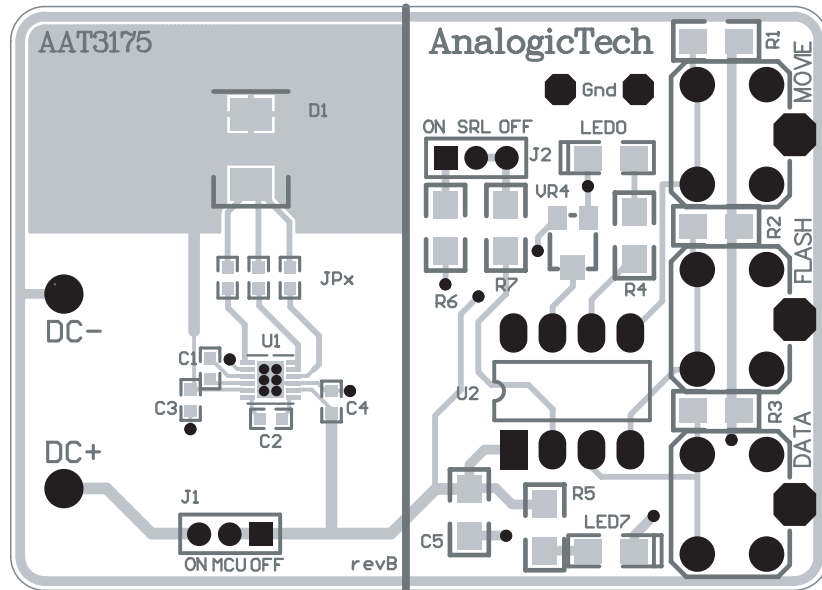


Figure 2: AAT3175 Evaluation Board Top Layer (not to scale).

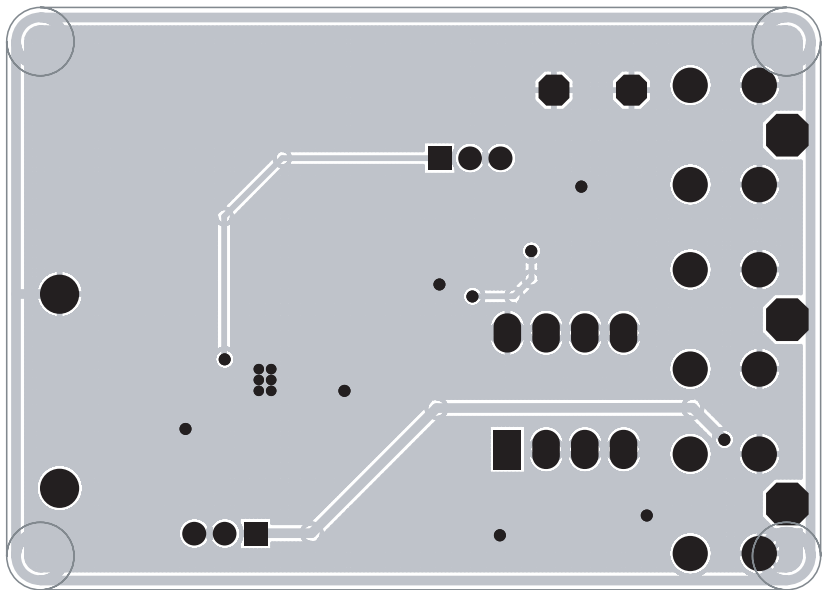


Figure 3: AAT3175 Evaluation Board Bottom Layer (not to scale).

AAT3175 EVAL Component Listing

Component	Part Number	Description	Manufacturer
U1	AAT3175	High Efficiency 1X/1.5X/2X CP for White LED; TDFN33-12 Package	AnalogicTech
U2	PIC12F675	8-Bit CMOS, FLASH-based μ C; 8-Pin PDIP Package	Microchip
D1	LMFLC4500	4-Die, 2-Pin, High Luminosity LED	Lumimicro
R1-R3	Chip Resistor	1K Ω , 5%, 1/4W; 1206	Vishay
C1-C4	GRM188R61A105KA93D	1 μ F, 10V, X5R, 10%; 0603	Murata
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
JP7, JP8	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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Advanced Analogic Technologies, Inc.
 830 E. Arques Avenue, Sunnyvale, CA 94085
 Phone (408) 737-4600
 Fax (408) 737-4611