

Introduction

The AAT3172 EVAL board demonstrates the functionality of the AAT3172 and its application as a high current white LED flash driver. The device consists of a tri-mode charge pump with load switch (1X), fractional (1.5X), and doubling (2X) conversion modes to provide excellent efficiency for both flash and movie modes.

Two LED channels are provided with excellent current matching. By utilizing the two LED channels, better light efficiency can be achieved with two LEDs as opposed to one. The charge pump is designed to deliver 600mA total LED drive current.

Through the Advanced Simple Serial Control™ interface (AS²Cwire™), an additional constant voltage mode is available. Constant voltage mode produces a regulated 4.5V output that is capable of driving loads up to 100mA. In addition to driving LEDs for flash applications, other loads such as keypad lighting can also be powered from the 4.5V output.

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. The actual board layout is also provided. For additional information, please consult the AAT3172 product datasheet.

Schematic

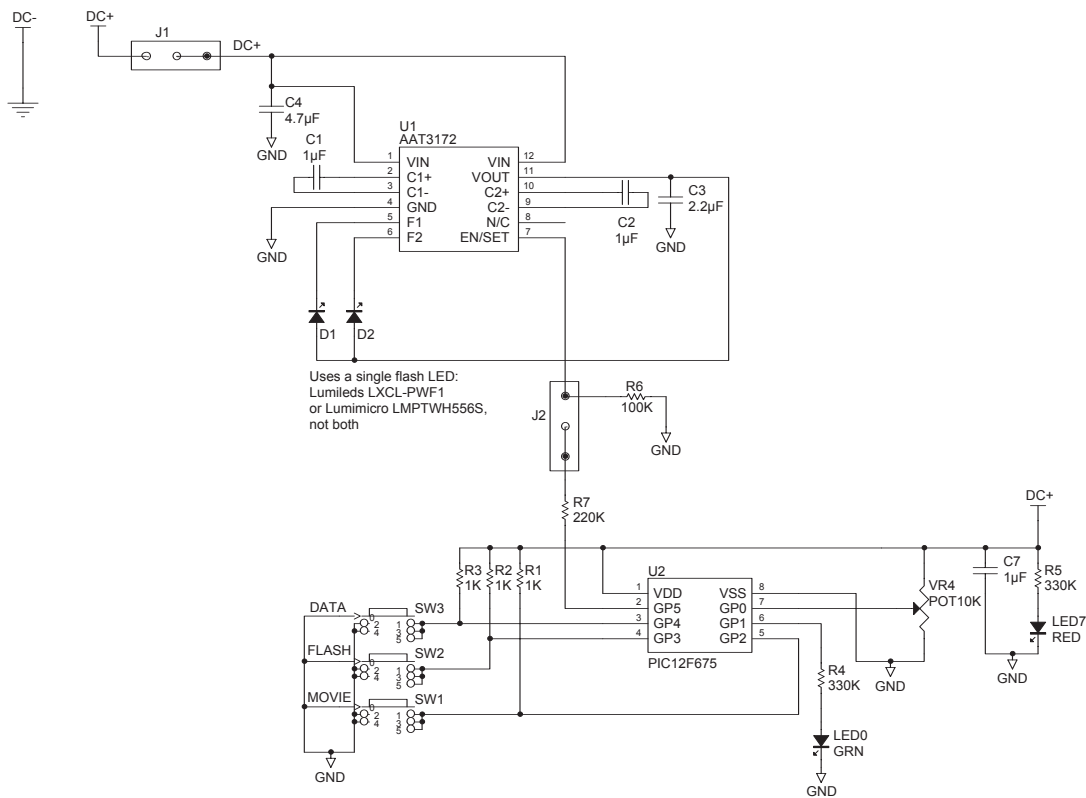


Figure 1: AAT3172 Evaluation Board Schematic.

Getting Started

In most cases, the board ships mounted onto a battery pack. The battery pack holds three AAA size, conventional alkaline batteries. When no battery pack is present, external power can be applied to the DC+ and DC- terminals.

A jumper labeled J1 is inline with the battery supply terminal DC+ for connecting/disconnecting power. To apply power to the board, connect the supply by jumpering ON, MCU. The red LED7 should illuminate, indicating that power has been connected. There is an additional jumper labeled J2 that provides access to the EN/SET pin of the AAT3172. Ensure that ON SRL is also jumpered so that the microcontroller is connected to the EN/SET pin.

The user interface is provided by three buttons: DATA, FLASH, and MOVIE. The modes of operation are detailed in Table 1. The FLASH button generates a flash pulse. By default, the FLASH button generates a pulse at full current. The MOVIE button toggles on/off movie mode illumination. The DATA button is used to set different current levels. When the DATA button is held down, the MCU will auto-cycle through the available brightness level settings after a short delay. Some functions require that multiple buttons are pressed and released together.

User Interface Functionality

Button(s) Pushed ¹	Description
DATA	Increments through the 16 data settings. Hold down to auto-cycle (does not turn LED on, just sets data).
FLASH ²	Generate flash pulse. Current level determined by DATA and HI/LO settings (defaults to HI scale, DATA 1). Trim-pot VR4 sets duration.
MOVIE	Toggle on/off movie mode illumination. Current level determined by DATA and HI/LO settings. Leave on to see effects of changing DATA and HI/LO settings.
DATA + MOVIE	Independent channel control; increment through addresses 0, 1, 2.
FLASH + MOVIE	HI/LO register control. Toggle through the four HI/LO register settings.
DATA + FLASH + MOVIE	Reset, shutdown.

Table 1: User Interface Functionality.

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

2. Flash pulse duration is adjustable from 10ms to 2 seconds. Rotate trim-pot VR4 clockwise to reduce the duration.

Printed Circuit Board

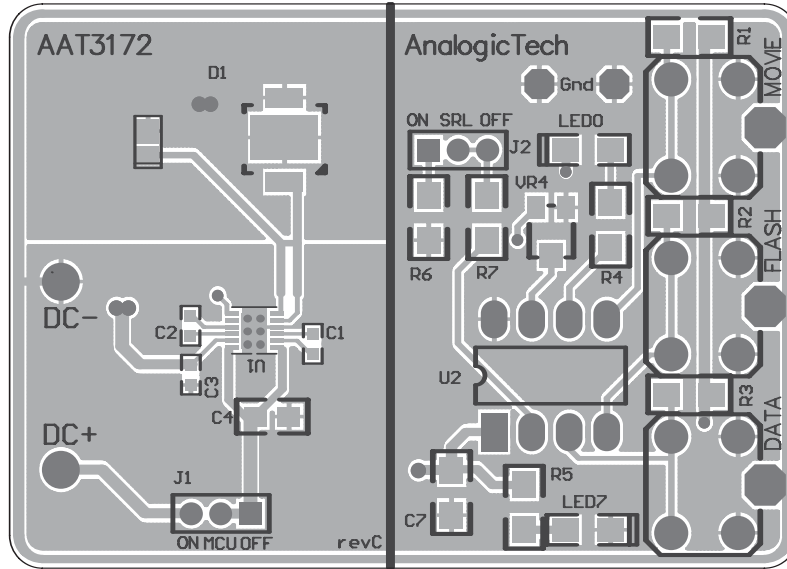


Figure 2: AAT3172 Evaluation Board Top Layer (not to scale).

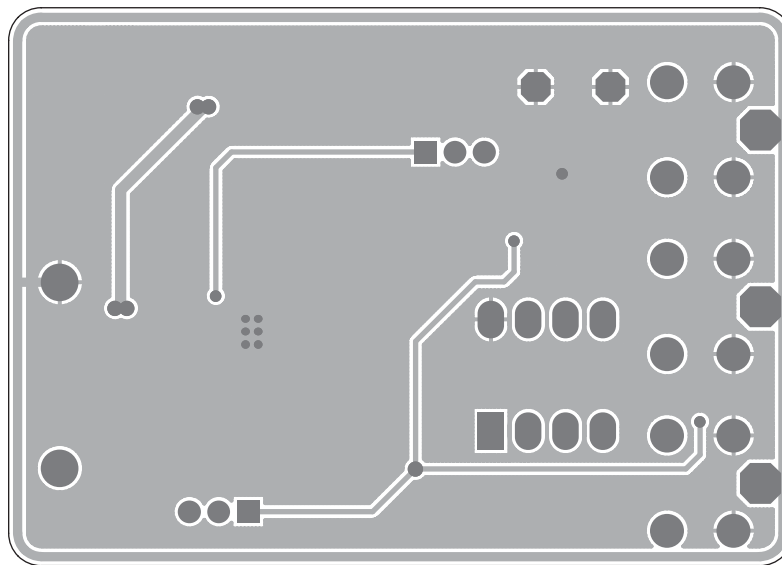


Figure 3: AAT3172 Evaluation Board Bottom Layer (not to scale).

AAT3172 EVAL Component Listing

Component	Part Number	Description	Manufacturer
U1	AAT3172	Tri-mode High Efficiency Charge Pump for White LED Flash; TDFN33-12 Package	AnalogicTech
U2	PIC12F675	8-Bit CMOS, FLASH-Based μ C; 8-Pin PDIP Package	Microchip
D1	LXCL-PWF1	High Brightness Flash LED	Lumileds
R1 - R3	Chip Resistor	1K, 5%, 1/4W; 1206	Vishay
C1 - C2	GRM18	1 μ F, 10V, X5R, 10%; 0603	Murata
C3	GRM18	2.2 μ F, 10V, X5R, 10%; 0603	Murata
C4	GRM18	4.7 μ F, 6.3V, X5R, 10%; 0603	Murata
C7	GRM31	1 μ F, 10V, X5R, 10%; 1206	Murata
R4 - R5	Chip Resistor	330K, 5%, 1/4W; 1206	Vishay
R6	Chip Resistor	100K, 5%, 1/4W; 1206	Vishay
R7	Chip Resistor	220K, 5%, 1/4W; 1206	Vishay
VR4	EVN-5ESX50B14	10K POT; 3mm Squared SMD	Panasonic-ECG
LED0	CMD15-21UGC/TR8	Green LED; 1206	Chicago Miniature Lamp
LED7	CMD15-21SRC/TR8	Red LED; 1206	Chicago Miniature Lamp
J1 - J2	PRPN401PAEN	Connecting Header, 2mm	Sullins Electronics
SW1 - SW3	PTS645TL50	Switch Tact, SPST, 5mm	ITT Industries

Table 2: Component Listing.

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