

Introduction

The AAT4297 EVAL board demonstrates the operation of the AAT4297 SmartSwitch™. This device has six low side N-channel load switches, which are serially controlled. The AAT4297 operates from 1.8V to 5.5V, making it ideal for use in 2.5V, 3.3V, or 5V systems, as well as systems powered by lithium-ion/polymer batteries. For demonstration purposes, an AAT3110 voltage doubling charge pump has been incorporated to provide a regulated voltage source to power the system load, which is an RGB LED.

AAT4297 is controlled by an S²Cwire™ (Simple Serial Control™) interface with easy control and efficiency. The device is enabled with the desired switch configuration after a short set of data pulses is sent to the EN/SET input and holding the line pulled to a logic high. In the enabled state, the AAT4297 typically consumes less than 3µA of quiescent current. When EN/SET is pulled to a logic low, the device is disabled and each output switch is placed in a high impedance open state. The switch resistance of the low side N-channel MOSFET switches is approximately 2Ω.

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 and the actual board layout are also included in the documentation. For additional information, please consult the AAT4297 product datasheet.

Schematic

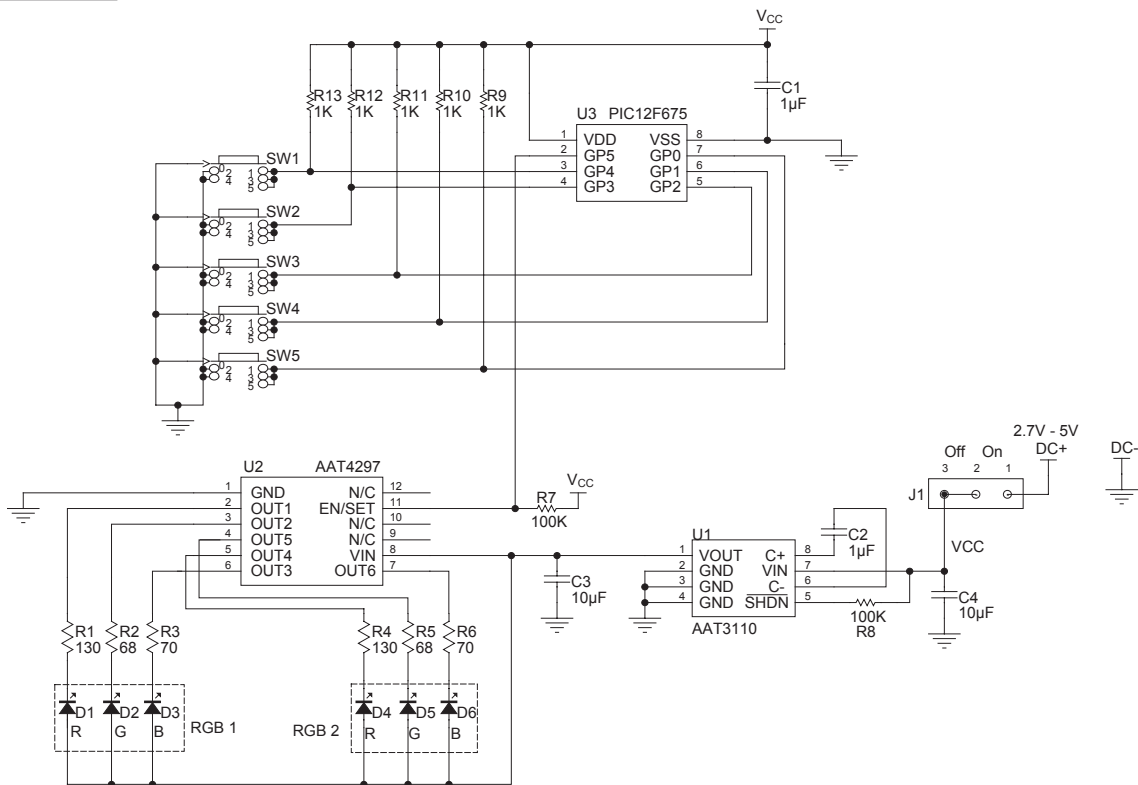


Figure 1: Evaluation Board Schematic

Getting Started

An external power supply is required; connect the positive terminal to DC+ and the negative terminal to DC-. The power supply voltage level can be set anywhere between 1.8V and 5.5V. To simulate operation from an Li-Ion battery source, set the power supply to 3.6V. After applying power to the board, ensure that the jumper "J1" is in the ON position.

There are five switches on the board, labeled SW1 through SW5. When a switch or combination of switches are pressed and released, the on-board microcontroller sends the corresponding S²Cwire programming data to the AAT4297's EN/SET pin. The AAT4297 output settings table can be found in the product data sheet (Table 1, page 10). Two common Anode type RGB LEDs are used for system load. The AAT4297's low-side switches connect each red, green and blue LED to ground with a series ballast resistor to control the forward current through the LED. The circuit is typically used for fashion lighting applications in portable products such as mobile phone handsets.

By pressing SW2+SW3+SW4 together, all outputs should be turned on. All outputs are reset and RGBs should turn off by pressing SW1+SW5 together.

Holding switches SW1 and SW5 together for longer than 1.5 seconds will activate auto cycling through the microcontroller. The microcontroller will submit a burst of edges, pause, and submit another burst of edges and so on. It starts by submitting 64 edges, then submitting 63 edges, and so on, submitting 1 edge at the end. Two RGB LEDs should blink three times before the sequence of auto-cycling. Other detailed operations are described in Table 1.

User Interface Functionality

Switch(es) Pushed	Description
SW2	[Push/Release once] Toggle On/Off of S1 and S4 (red LED only on both RGBs)
SW3	[Push/Release once] Toggle On/Off of S2 and S5 (green LED only on both RGBs)
SW4	[Push/Release once] Toggle On/Off of S3 and S6 (blue LED only on both RGBs)
SW1 + SW2	[Push/Release once] Toggle On/Off of S1 (red LED only on RGB1)
SW1 + SW3	[Push/Release once] Toggle On/Off of S2 (green LED only on RGB1)
SW1 + SW4	[Push/Release once] Toggle On/Off of S3 (blue LED only on RGB1)
SW5 + SW2	[Push/Release once] Toggle On/Off of S4 (red LED only on RGB2)
SW5 + SW3	[Push/Release once] Toggle On/Off of S5 (green LED only on RGB2)
SW5 + SW4	[Push/Release once] Toggle On/Off of S6 (blue LED only on RGB2)
SW1 + SW5	[Push/Release once] Reset: Turn off all
	[Hold 1.5+ sec.] Auto Cycling. Blinks (On/Off) for three times and goes into Binary-decrement mode for 3 times
SW2 + SW3 + SW4	[Push/Release once] Reset: Turn on all

Table 1: User Interface Functionality.

Printed Circuit Board

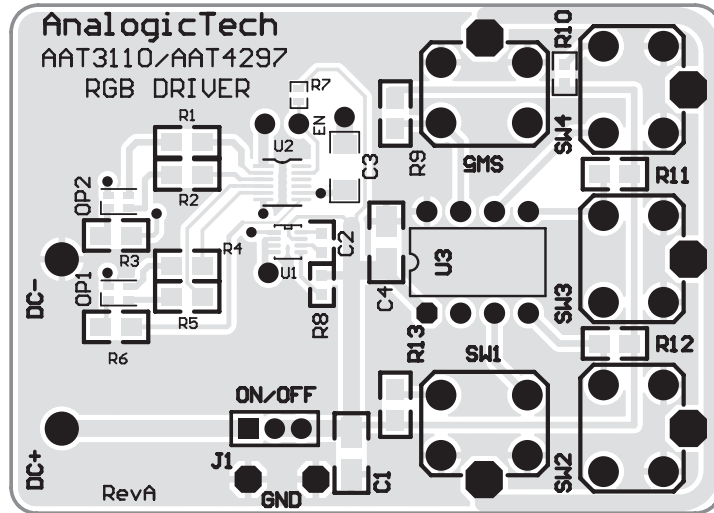


Figure 2: AAT4297 Evaluation Board Top Layer (not to scale).

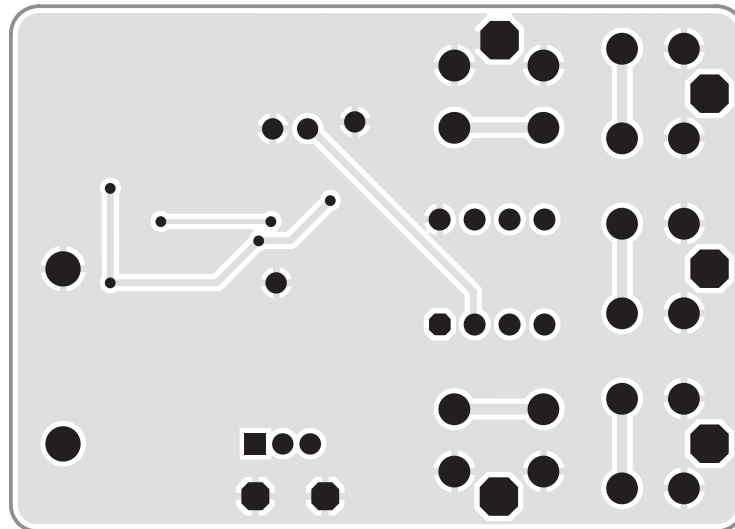


Figure 3: AAT4297 Evaluation Board Bottom Layer (not to scale).

AAT4297 EVAL Component Listing

Component	Part Number	Description	Manufacturer
U1	AAT4297ITP	Single RGB Controller; TSOPJW-12 Package	AnalogicTech
U2	AAT3110IJS	Regulated Charge Pump, SC70JW-8 Package	AnalogicTech
U3	PIC12F675	8-bit CMOS, FLASH-based μ C; 8-pin PDIP Package	Microchip
SW1 - SW5	PTS645TL50	Switch Tact, SPST, 5mm	ITT Industries
R1, R4	Chip Resistor	130 Ω , 1%, 1/4W; 0805	Vishay
R2, R5	Chip Resistor	68 Ω , 1%, 1/4W; 0805	Vishay
R3, R6	Chip Resistor	70 Ω , 1%, 1/4W; 0805	Vishay
R7	Chip Resistor	100K Ω , 5%, 1/4W; 0402	Vishay
R8	Chip Resistor	100K Ω , 5%, 1/4W; 0805	Vishay
R9 - R12	Chip Resistor	1K Ω , 5%, 1/4W; 1206	Vishay
C3, C4	GRM319R61A106KE19	10 μ F, 10V, X5R, 10%, 1206	Murata
C2	GRM185R60J105KE21	1 μ F, 6.3V, X7R, 10%, 0603	Murata
C1	GRM319R71A105KA01	1 μ F, 10V, X7R, 10%, 1206	Murata
RGB1, RGB2	1615 SMD LED Series	Common Anode RGB	Lasemtech
J1	PRPN401PAEN	Conn. Header, 2mm zip	Sullins Electronics

Table 2: AAT4297 Evaluation Board Component Listing.

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