

Introduction

The AAT4296 evaluation board demonstrates the AAT4296 SmartSwitch™ as a microprocessor I/O expander. The AAT4296 operates from 1.8V to 5.5V, making it ideal for 2.5V, 3.3V, or 5V systems, as well as systems powered by lithium-ion/polymer batteries.

The AAT4296 is controlled by AnalogicTech's S²Cwire™ (Simple Serial Control™) interface, which offers easy control and efficiency. Each switch features a typical turn-on and turn-off time of 280µs. When the AAT4296 output is programmed for the off or logic low state, the output is internally connected to ground. The switch resistance to the low side N-channel is approximately 2Ω.

This document describes the evaluation board and its accompanying user interface. 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 AAT4296 product datasheet.

Schematic

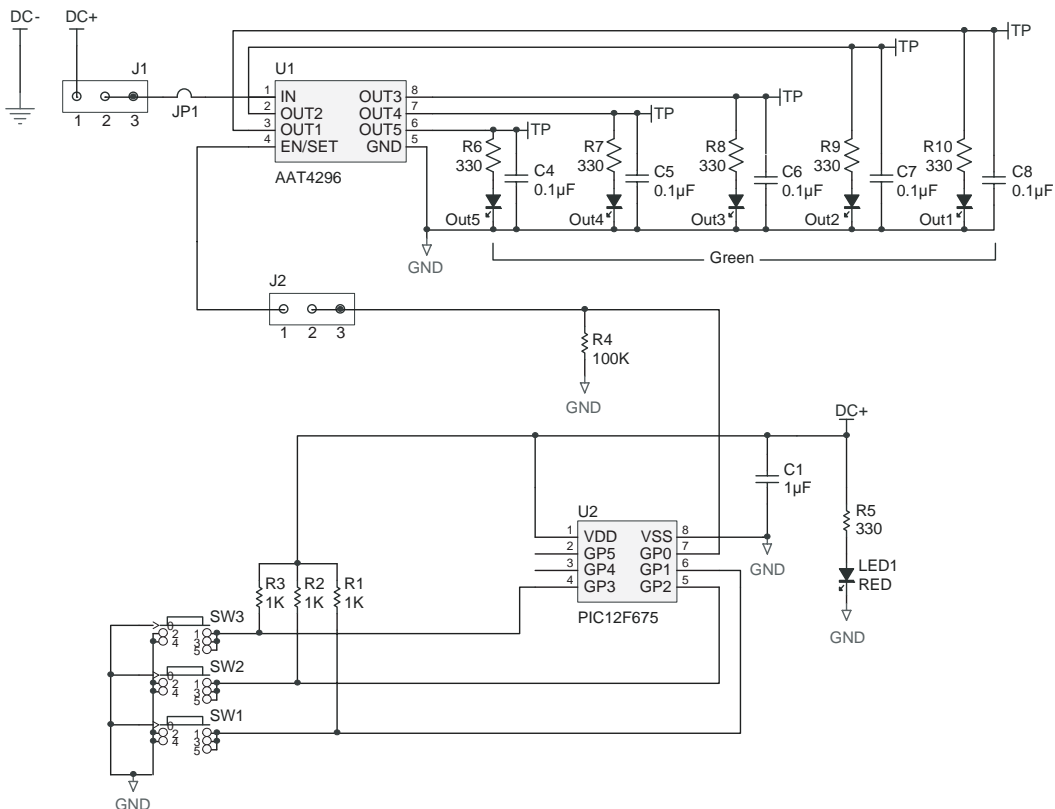


Figure 1: Evaluation Board Schematic.

Getting Started

An external power supply is needed to power this evaluation board. Connect the power source positive output to DC+ and the negative output to DC-. The power supply voltage level can be set to any level between 1.8V to 5.5V. After applying power to the board, ensure that the jumper "J1" is in the ON position. The red LED1 should illuminate, indicating that power has been connected to the board. There is an additional jumper labeled J2, which provides access to the EN/SET signal from the on-board microcontroller. Ensure that it is in the ON position for normal operation.

There are three buttons on the board, SW1 to SW3. After a button or a combination of buttons are pressed and released, the on-board microcontroller will write the corresponding data word to program the desired switch state. The evaluation board is supplied with LEDs connected to each output to indicate output switch state. These LEDs may be removed if the AAT4296 is to be used to control an application circuit and the additional current consumption of the indicator LED is not desired.

There are additional PCB pads provided for switch output bypass capacitors (C4 to C8). Placement of output bypass capacitors is optional. In addition, R6 to R10 are preset to 330Ω to act as ballast resistors to limit the forward current through each indicator LED. If the indicator LEDs are removed from the board, R6 through R10 should be replaced with 0Ω jumpers. Please refer to the AAT4296 datasheet applications section for additional information. The switch position truth table "AAT4296 Output Settings" can be found in the device datasheet.

Toggling SW1 and SW3 together 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 will start by submitting 32 edges and then decrement by one edge per cycle until the final cycle, which will submit 1 edge. All LEDs should blink five times before the auto-cycling sequence. All states reset and all LEDs turn off when all three buttons are pushed and released together. The detailed operations are described in Table 1.

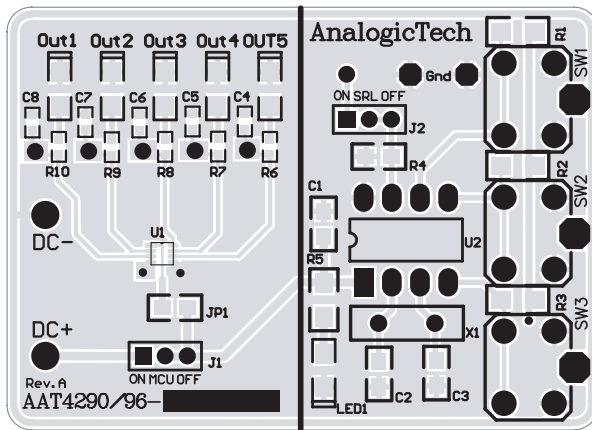
The AAT4296 outputs can be probed via the test points near the output capacitors (C4 to C8).

User Interface Functionality

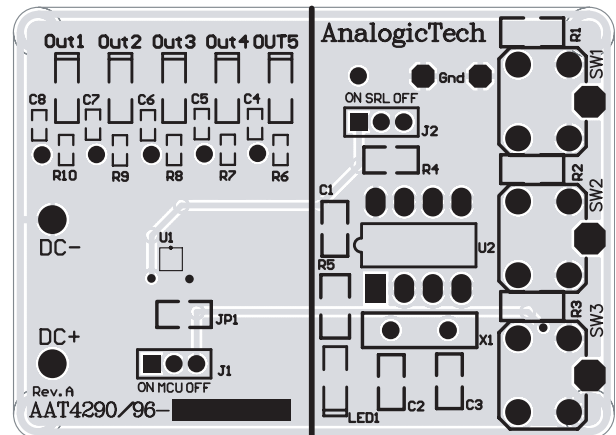
Button(s) Pushed ¹	Description
SW1	[Push/Release Once] Toggle On/Off of Output Channel 1.
SW2	[Push/Release Once] Toggle On/Off of Output Channel 2.
SW3	[Push/Release Once] Toggle On/Off of Output Channel 3.
SW1 + SW2	[Push/Release Together] Toggle On/Off of Output Channel 4.
SW2 + SW3	[Push/Release Together] Toggle On/Off of Output Channel 5.
SW1 + SW3	[Push/Release Together] Auto Cycling. All Outputs Blink (On/Off) Five Times and Go into Binary Increment Mode.
SW1 + SW2 + SW3	[Push/Release Together] Reset: All Outputs Go Off.

Table 1: User Interface Functionality.

Printed Circuit Board



**Figure 2: AAT4296 Evaluation Board
Top Layer (not to scale).**



**Figure 3: AAT4296 Evaluation Board
Bottom Layer (not to scale).**

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

AAT4296 EVAL Component Listing

Component	Part Number	Description	Manufacturer
U1	AAT4296IJS	Five Channel Push/Pull I/O Expander; SC70JW-8 Package	AnalogicTech
U2	PIC12F675	8-Bit CMOS, FLASH-Based μ C; 8-Bin PDIP Package	Microchip
SW1 - SW3	PTS645TL50	Switch Tact, SPST, 5mm	ITT Industries
R1 - R3	Chip Resistor	1K Ω , 5%, 1/4W; 1206	Vishay
R4	Chip Resistor	100K Ω , 5%, 1/4W; 0805	Vishay
R5	Chip Resistor	330 Ω , 5%, 1/4W; 1206	Vishay
R6 - R10	Chip Resistor	330 Ω , 5%, 1/4W; 0603	Vishay
JP1	Chip Resistor	0 Ω , 5%; 0805	Vishay
C1	ECJ-2YB1A105K	1 μ F, 10V, X5R, 10%; 0805	Panasonic-ECG
C4-C8 (optional)	GRM188R71C104KA01D	0.1 μ F, 16V, 10%; 0603	Murata
J1, J2	PRPN401PAEN	Connecting Header, 2mm Zip	Sullins Electronics
LED1	CMD15-21SRC/TR8	Red LED; 1206	Chicago Miniature Lamp
OUT1 - OUT5	CMD15-21UGC/TR8	Green LED; 1206	Chicago Miniature Lamp

Table 2: Component Listing.

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