ANALOGIC TECH™

Introduction

The AAT4298 EVAL board demonstrates the AAT4298 SmartSwitch™ with a microprocessor I/O expander application. This application shows how a microcontroller can free up five I/O ports by connecting one I/O port to the AAT4298's EN/SET pin. The AAT4298 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 AAT4298 is controlled by an S^{2}Cwire™ (Simple Serial Control™) interface with easy control and efficiency. Each switch features a typical turn-on and turn-off time of 280µs. The AAT4298 comes with an optional Fast Auto-Discharge feature which utilizes an internal ~2Ω resistor switch that, upon turning off, quickly discharges the output voltage.

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 AAT4298 product datasheet.
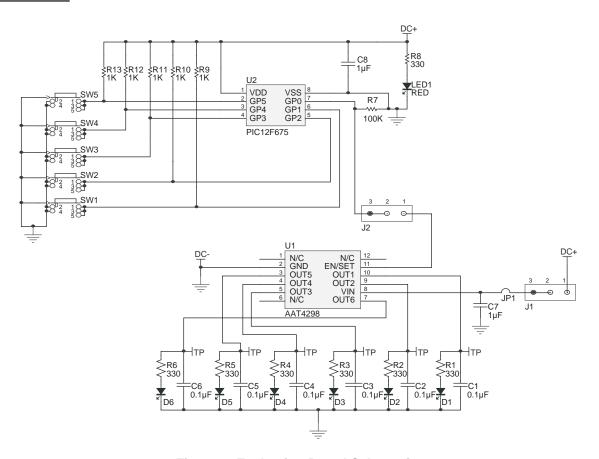
Schematic

Figure 1: Evaluation Board Schematic.

Getting Started

An external power supply is needed to connect the positive terminal to the DC+ and the negative terminal to the DC-. The power supply voltage level can be set anywhere between 1.8V and 5.5V. After applying power to the board, ensure 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 EN/SET. Ensure that it is in the left position for normal operation.

There are five buttons on the board, labeled SW1 to SW5. After a button or combination of buttons is triggered, the corresponding LED for OUT1 to OUT6 will toggle ON or OFF, indicating that the selected state has been submitted through the EN/SET line from the microcontroller to the AAT4298.   The detailed operations are described in Table 1.

Holding the SW5 button for 1.5 seconds will activate the state into auto-cycling through the settings detailed in the "AAT4298 Output Settings" table in the product datasheet. The microcontroller will submit a burst of edges, pause, and submit another burst of edges and so on. It will start by submitting 64 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 sequence of auto-cycling. By pushing and releasing the SW5 button once, all states are reset and all LEDs should turn off.

The AAT4298 outputs can be probed via the test points near the output capacitors (C1 to C6).

User Interface Functionality

Button(s) Pushed[1]	Description
SW1	[Push/Release once] Toggles output channel 1 on/off.
SW2	[Push/Release once] Toggles output channel 2 on/off.
SW3	[Push/Release once] Toggles output channel 3 on/off.
SW4	[Push/Release once] Toggles output channel 4 on/off.
SW1 + SW2	[Push/Release together] Toggles output channel 5 on/off.
SW3 + SW4	[Push/Release together] Toggles output channel 6 on/off.
SW5	[Push/Release once] Reset; all outputs turn off.
SW5	[Hold for ~1.5 seconds] Auto-cycling; all outputs blink (on/off) five times and device begins binary increment mode.

Table 1: User Interface Functionality.

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

Printed Circuit Board

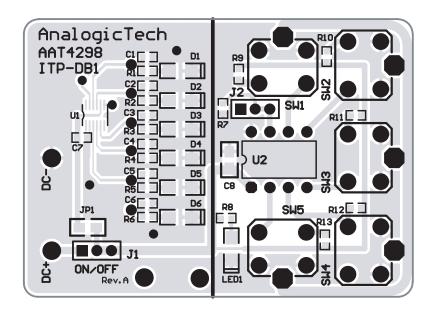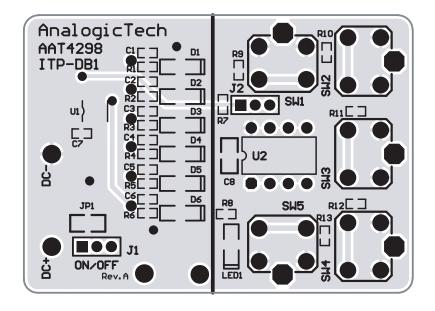**Figure 2: AAT4298 Evaluation Board Top Layer (not to scale).**

Figure 3: AAT4298 Evaluation Board Bottom Layer (not to scale).

AAT4298 EVAL Component Listing

Component	Part Number	Description	Manufacturer
U1	AAT4298ITP	Six-Channel Push/Pull I/O Expander; TSOPJW-12 Package	AnalogicTech
U2	PIC12F675	8-Bit CMOS, FLASH-based µC; 8-Pin PDIP Package	Microchip
SW1 - SW5	PTS645TL50	Switch Tact, SPST, 5mm	ITT Industries
R1 - R6, R8	Chip Resistor	330Ω, 5%, 1/4W; 0603	Vishay
R7	Chip Resistor	100KΩ, 5%, 1/4W; 0603	Vishay
R9 - R13	Chip Resistor	1KΩ, 5%, 1/4W; 0603	Vishay
JP1	Chip Resistor	0Ω, 5%; 0805	Vishay
C1 - C6 (optional)	GRM188R71C104KA01D	0.1µF, 16V, 10%; 0603	MuRata
C7	GRM188R61A105KA61B	1µF, 10V, X5R, 10%; 0603	MuRata
C8	GRM21BR71C105KA01B	1µF, 16V, X7R, 10%; 0805	MuRata
J1, J2	PRPN401PAEN	Connecting Header, 2mm Zip	Sullins Electronics
LED1	CMD15-21SRC/TR8	Red LED; 1206	Chicago Miniature Lamp
OUT1 - OUT6	CMD15-21UGC/TR8	Green LED; 1206	Chicago Miniature Lamp

Table 2: Component Listing.

Advanced Analogic Technologies, Inc.

830 E. Arques Avenue, Sunnyvale, CA 94085
Phone (408) 737-4600
Fax (408) 737-4611