

Introduction

The AAT4290IJS-1-DB3 EVAL board demonstrates the AAT4290 SmartSwitch™, which has five P-channel MOSFETs and is configured for use as a microprocessor I/O expander application. Having independent drain outputs and a common source input, the device operates with an input voltage range of 1.8V to 5.5V, making it ideal for 1.8V, 2.5V, 3.3V, or 5V systems, as well as systems powered by lithium-ion/polymer batteries. The AAT4290 features a 500ns slew rate limited turn-on time and is controlled by an S²Cwire™ (Simple Serial Control™) interface, which permits ease of control and efficiency.

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 shown in Figures 2 and 3. For additional information, please consult the AAT4290 product datasheet.

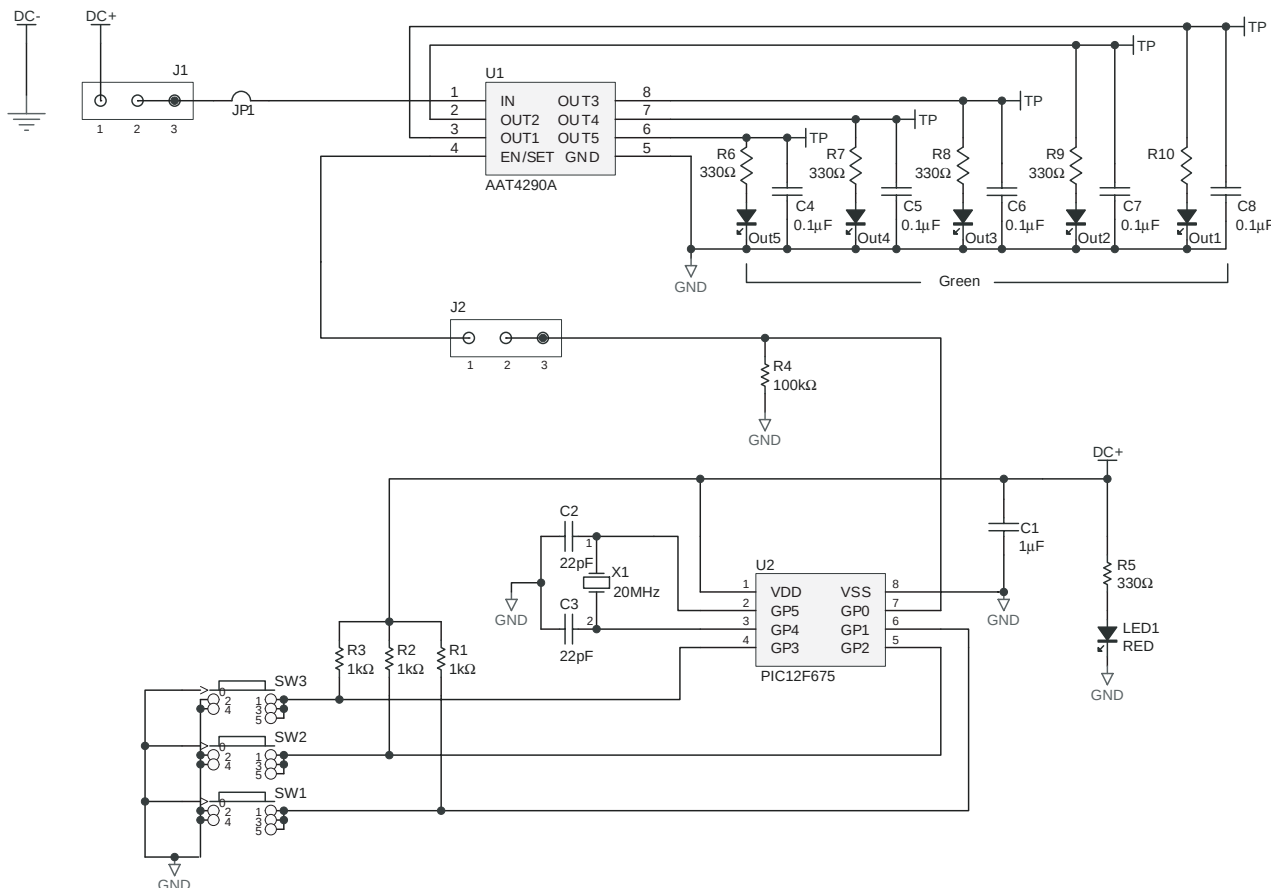


Figure 1: AAT4290IJS-1-DB3 Evaluation Board Schematic.

Getting Started

The AAT4290IJS-1-DB3 evaluation board is typically mounted on a battery pack. The battery pack holds three AAA size, conventional alkaline batteries. A jumper is inline with the battery supply for connecting/disconnecting power. There is an additional jumper labeled ON SRL OFF, which provides access to EN/SET. Ensure that the jumper is in the ON SRL position for normal operation. To apply power to the board, ensure the jumper is at the ON MCU position. The red LED1 should illuminate indicating that power has been connected.

The AAT4290 may be operated from an external power source. The batteries should be removed from the battery pack. External power may be applied to the DC+ and DC- points on the board. The external power source should be set from 1.8V to 5.5V before the AAT4290 is turned on by moving the jumper on J1 to the "ON MCU" position.

There are three buttons on the board (SW1, SW2, and SW3) that enable and disable the ON and OFF state for the five output channels. Once a button (or a combination of buttons) is toggled, the corresponding LED for OUT1 to OUT5 will turn ON or OFF accordingly, depending on the previous state. This indicates that the selected state has been submitted through the EN/SET line to the AAT4290. Detailed operations are listed in Table 1. Toggling SW1 and SW3 at once, activates the auto-cycling state through the "AAT4290 Output Settings" table found in the product datasheet. In other words, the microcontroller will submit a burst of edges, pause, and submit another burst of edges and so on. It will start by submitting 31 edges, next submit 30 edges, etc.; next, submit 1 edge and then start over. All LEDs should blink five times before the sequence of auto-cycling. By toggling all three buttons together, all LEDs should turn off.

The AAT4290 outputs can be probed via the test points near the output capacitors (C4 to C8).

Button(s) Pushed	Description
SW1	Toggle on/off of output Channel 1.
SW2	Toggle on/off of output Channel 2.
SW3	Toggle on/off of output Channel 3.
SW1 + SW2	Toggle on/off of output Channel 4.
SW2 + SW3	Toggle on/off of output Channel 5.
SW1 + SW3	Auto cycling. All outputs blinks (on and off) five times and enter binary-increment mode. Auto cycling repeats three times.
SW1 + SW2 + SW3	Reset. All outputs turn off.

Table 1: User Interface Functionality.

Printed Circuit Board

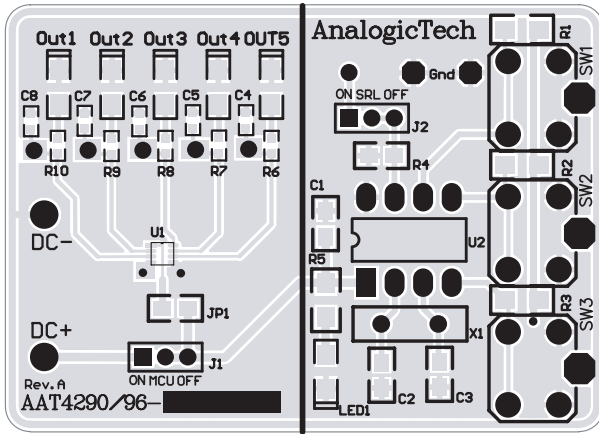


Figure 2: Top Layer (not to scale).

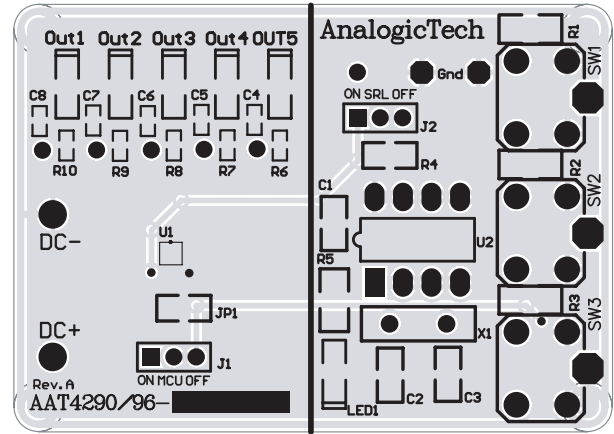


Figure 3: Bottom Layer (not to scale).

AAT4290IJS-1-DB3 EVAL Component Listing

Component	Part#	Description	Manufacturer
U1	AAT4290	I/O Expander Load Switch with Serial Control; SC70JW-8 Package	AnalogicTech
U2	PIC12F675	8-bit CMOS, FLASH-Based μ C; 8-Pin PDIP Package	Microchip
SW1 - SW3	PTS645TL50	Switch Tact, SPST, 5mm	ITT Industries
R1 - R3	Chip Resistor	1K, 5%, 1/4W; 1206	Vishay
R4	Chip Resistor	100K, 5%, 1/4W; 0805	Vishay
R5	Chip Resistor	330K, 5%, 1/4W; 1206	Vishay
R6-R10	Chip Resistor	330K, 5%, 1/4W; 0603	Vishay
JP1	Chip Resistor	00, 5%; 0805	Vishay
C1	ECJ-2YB1A105K	1 μ F, 10V, X5R, 10%; 0805	Panasonic-ECG
C2, C3	VJ0805A220KXAA	22pF, 50V, NPO, 10%; 0805	Vishay
C4-C8 (optional)	GRM188R71C104KA01D	0.1 μ F, 16V, 10%; 0603	Murata
J1, J2	PRPN401PAEN	Con. Header, 2mm zip	Sullins Electronics
X1	X439-ND	Quartz Crystal 20MHz HC-49US	ECS Inc
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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