MikroBUS Adaptor				
J8	**Function**	**FPGA Pin**	**Pin Name**	**Voltage**
1	AD_CH0	U11(2)	A/D Converter MCP39x3-E/SS CH0	3.3V max
2	MIKRO_RST	C9	GPIO7PB2/CLKIN_S_5	3.3V max
3	MIKRO_CS	D1	GPIO244NB2	3.3V max
4	MIKRO_SCK	D11	GPIO20PB2/DQS	3.3V max
5	MIKRO_MISO	D12	GPIO20NB2/DQS	3.3V max
6	MIKRO_MOSI	D13	GPIO23PB2	3.3V max
7	+3.3V	–	–	–
8	GND	–	–	–
J9				
1	MIKRO_PWM	C17	GPIO28NB2	3.3V
2	MIKRO_INT	C2	GPIO245NB2	3.3V
3	MIKRO_RX	C4	GPIO251NB2	3.3V
4	MIKRO_TX	C5	GPIO255PB2	3.3V
5	MIKRO_SCL	C6	GPIO1PB2	3.3V
6	MIKRO_SDA	C7	GPIO0NB2	3.3V
7	+5.0V	–	–	–
8	GND	–	–	–

Six Channel Delta Sigma A/D Converter				
U11	**Function**	**FPGA Pin**	**Pin Name**	**Voltage**
18	ADC_DR_N	E11	GPIO22PB2	3.3V
21	ADC_CLK_IN	E10	GPIO19NB2	3.3V
23	ADC_CS_N	E1	GPIO244PB2/CCC_SW_CLKIN_S_0	3.3V
24	ADC_SCK	E5	GPIO250NB2	3.3V
25	ADC_SDO	E4	GPIO252NB2/DQS	3.3V
26	ADC_SDI	E3	GPIO248PB2/CCC_SW_PLL1_OUT1	3.3V
27	ADC_RST	E16	GPIO33NB2	3.3V

LEDs and User Buttons				
	Function	**FPGA Pin**	**Pin Name**	**Voltage**
	LED1_GREEN	D6	GPIO254NB2	Active High
	LED1_RED	D7	GPIO0PB2	Active High
	LED2_GREEN	D8	GPIO2NB2/DQS	Active High
	LED2_RED	D9	GPIO4NB2	Active High
	USER_BUTTON1	E13	GPIO23NB2	Active High
	USER_BUTTON2	E14	GPIO24NB2	Active High

FUTURE ELECTRONICS

Microsemi Power Matters.

Future Electronics – Microsemi Avalanche Quick Start Guide

Product Overview

The Avalanche Development Kit allows developers to quickly prototype for the lowest power mid-range FPGA platform in the market. At the heart of the kit is a 300k LE (logic element) PolarFire non-volatile FPGA from Microsemi. The PolarFire FPGA family is a cost optimized, lowest power mid-range density FPGA family with proven security and exceptional reliability.

The Avalanche Kit is loaded with several key components including the Panasonic WIFI module PAN9320, 64 Mb of Serial Flash, 4Gb DDR3 Synchronous DRAM, VSC8531 Gigabit Ethernet PHY, Embedded FlashPro5 and UART for USB programming on the PF300. In addition, there is a 6-channel, Delta Sigma Analog to Digital Converter, push buttons and LEDs.

Coupled to the PolarFire FPGA are 3 industry-leading interface standards to enable developers to implement virtually any design they can imagine:

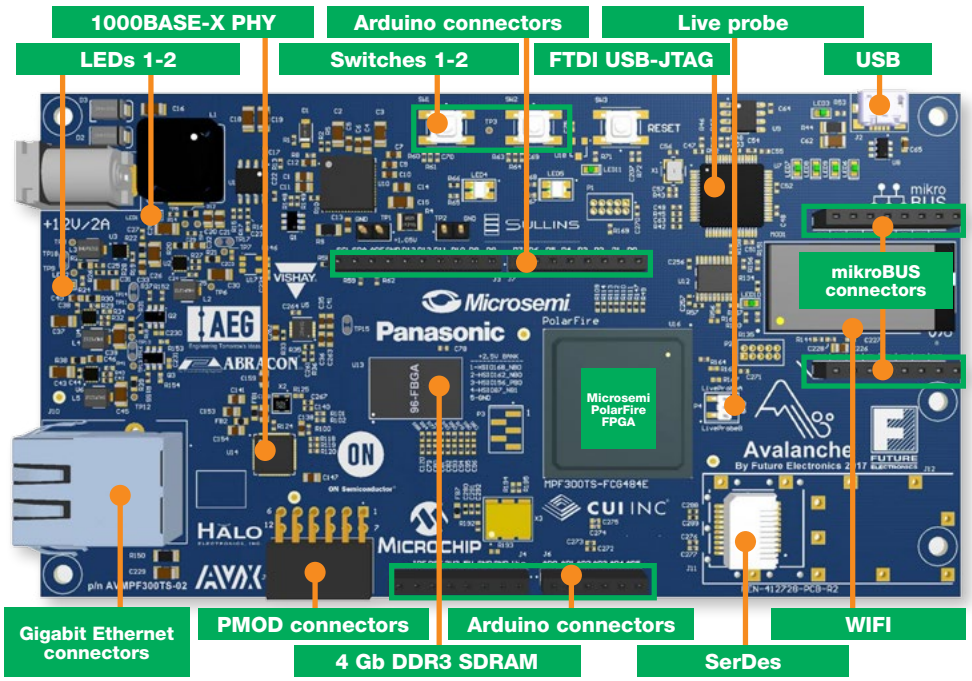
I - Arduino™ shield
II - mikroBUS™ socket
III - PMod™ Connector/Interface

There are hundreds, if not thousands, of peripherals that can be connected to the Avalanche Kit. Developers can work with all kind sensors, drivers, displays, wireless modules, etc.

The Avalanche board also offers SerDes channels for development purposes.

Board Components

The following key components are found on the Microsemi Avalanche Board.



Software Installation

Tools are available for download at https://www.microsemi.com/products/fpga-soc/design-resources/design-software/libero-soc-polarfire#downloads. You can download either Windows or Linux Libero SoC development software. Following are instructions for Windows:

- Download and install the latest revision of Libero SoC (and Service Packs) by following Libero SoC – InstallShield Wizard

License Installation

In order to run Libero SoC, you must first request then install a license.

- A Gold license is required to program the PolarFire Avalanche Kit. A Software ID letter enclosed with the kit contains Software ID and instructions on how to generate a Libero Gold license.
- After you register the SWID, your license will arrive by email
- To install a Node Locked disk ID license in Windows, add or update your LM_LICENSE_FILE environment variable so it points to the new License.dat file by following the instruction found in: https://www.microsemi.com/document-portal/doc_download/131602-libero-software-installation-and-licensing-guide

To get schematics, guides, example code, etc., please download from the Product Page of Microsemi Avalanche Kit on www.FutureElectronics.com/MicrosemiAvalanche

The Out-of-The-Box demo based on RISC-V architecture for the Avalanche Development Board

This demo uses the RISC-V soft core processor and requires a Terminal (ie. PuTTY) to interact with it.

Upon board power-up, the **LED 2 Green** will start blinking like a heartbeat at around 2 Hz frequency.

Press **Switch 1** to activate / deactivate the Morse code emitter.

- Upon activation, the message "Morse Emitter on!" will be received on your terminal. From that point, any character typed in the Terminal window will be converted in Morse and blinked by LED 1 Red on the board.
- When deactivated, Terminal input will be ignored.

Press **Switch 2** to activate the Built-In Test routine

- Different tests will be launch in succession to test different parts of the board (LEDs, DDR3, etc.) and results will be displayed on the Terminal window. The heartbeat of **LED 2 Green** will be interrupted during the BIT process.

Tips:

Make sure you can see "FlashPro5 Port" under the Ports section in Windows Device Manager. Take note of the COM port assigned to the device. In your Terminal, use a Serial connection at **Speed:**115200/8/1 with **Parity:** None and **Flow Control:** None.

Arduino™ Connectors					
J3	**Function**	**FPGA Pin**	**Pin Name**		**Voltage**
1	ARD_IO8	A3	GPIO247NB2	(Diff CLK -)	3.3V
2	ARD_IO9	A2	GPIO247PB2/CLKIN_S_2/CCC_SW_CLKIN_S_2/CCC_SW_PLL1_OUT0	(Diff CLK +)	3.3V
3	ARD_IO10	A13	GPIO11NB2	(Diff_Data2 -)	3.3V
4	ARD_IO11	A12	GPIO11PB2/CLKIN_S_7	(Diff_Data2 +)	3.3V
5	ARD_IO12	A16	GPIO29NB2	(Diff_Data3 -)	3.3V
6	ARD_IO13	A15	GPIO29PB2/CLKIN_S_9/CCC_SE_CLKIN_S_9	(Diff_Data3 +)	3.3V
7	GND	–	–		–
8	ARD_AVREF	–	+3.3V		–
9	ARD_SDA	B8	GPIO5PB2		3.3V
10	ARD_SCL	B7	GPIO1NB2		3.3V
J4					
1	NC	–	–		–
2	GND	–	–		–
3	GND	–	–		–
4	+5.0V	–	–		–
5	+3.3V	–	–		–
6	ARD_RESET	E15	GPIO33PB2/CCC_SE_CLKIN_S_10/CCC_SE_PLL1_OUT0		3.3V
7	+3.3V	–	–		–
8	NC	–	–		–
J6					
1	AD_CH0	U11(2)	A/D Converter MCP39x3-E/SS CH0		3.3V max
2	AD_CH1	U11(5)	A/D Converter MCP39x3-E/SS CH1		3.3V max
3	AD_CH2	U11(6)	A/D Converter MCP39x3-E/SS CH2		3.3V max
4	AD_CH3	U11(9)	A/D Converter MCP39x03-E/SS CH3		3.3V max
5	AD_CH4	U11(10)	A/D Converter MCP39x3-E/SS CH4		3.3V max
6	AD_CH5	U11(13)	A/D Converter MCP39x3-E/SS CH5		3.3V max
J7					
1	ARD_IO0	F3	GPIO252PB2/DQS		3.3V
2	ARD_IO1	B10	GPIO8NB2/DQS		3.3V
3	ARD_IO2	B1	GPIO246NB2/DQS		3.3V
4	ARD_IO3	A8	GPIO5NB2		3.3V
5	ARD_IO4	A7	GPIO3NB2	(Diff_Data0 -)	3.3V
6	ARD_IO5	A6	GPIO3PB2	(Diff_Data0 +)	3.3V
7	ARD_IO6	A5	GPIO253NB2	(Diff_Data1 -)	3.3V
8	ARD_IO7	B4	GPIO253PB2	(Diff_Data1 +)	3.3V

PMOD Connectors				
J3	**Function**	**FPGA Pin**	**Pin Name**	**Voltage**
1	PMOD_D0_N	B15	GPIO27NB2	3.3V
2	PMOD_D1_N	B13	GPIO6NB2	3.3V
3	PMOD_D2_N	C12	GPIO9NB2	3.3V
4	PMOD_D3_N	B3	GPIO249NB2	3.3V
5	GND	–	–	–
6	+3.3V	–	–	–
7	PMOD_D0_P	B14	GPIO27PB2/CLKIN_S_8/CCC_SE_CLKIN_S_8/CCC_SE_PLL0_OUT0	3.3V
8	PMOD_D1_P	B12	GPIO6PB2/CLKIN_S_4	3.3V
9	PMOD_D2_P	C11	GPIO9PB2/CLKIN_S_6	3.3V
10	PMOD_D3_P	B2	GPIO249PB2/CLKIN_S_3/CCC_SW_CLKIN_S_3	3.3V
11	GND	–	–	–
12	+3.3V	–	–	–