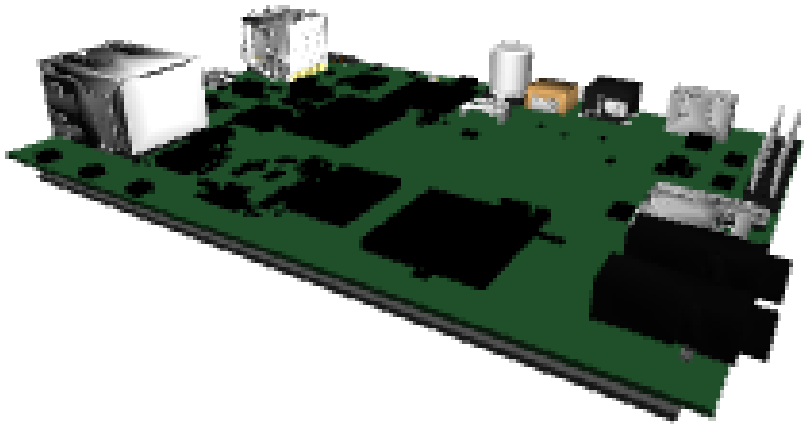
Poblano 43C



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Board Description

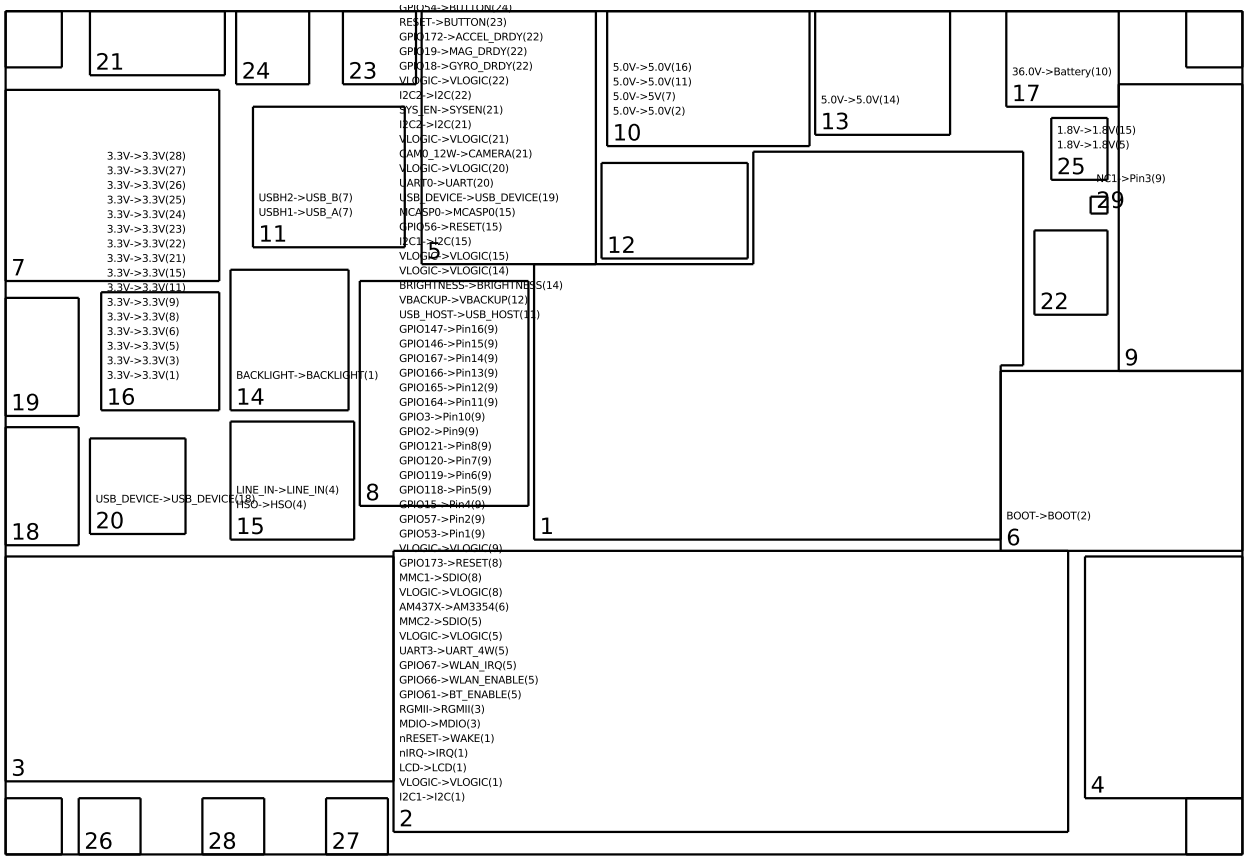
The Poblano 43C is a powerful, single board computer (SBC) based on a TI Cortex-A9 processor (AM4378) that supports the Yocto Project build system with wireless connectivity provided by the TI WiLink8 and a [Newhaven 4.3-inch capacitive multi-touch LCD touchscreen](https://store.gumstix.com/newhaven-43-capacitive-multi-touch-lcd-screen.html) *(sold separately)*. The Poblano 43C is a drop-in replacement for the Pepper 43C.

Board Dimensions

11.0cm x 7.5cm

Contents

1 Modules on Board



1.1 LCD Display

1.1.1 4.3” Flip-Side Connector For Newhaven Capacitive Multi-Touch Screen (v9) (1)

A 4.3 inch LCD and a capacitive touch screen connector, mounted on the backside, that connects to TI Sitara AM4378 (2)

1.2 Processors

1.2.1 TI Sitara AM4378 (v13) (2)

TI’s AM4379 microprocessors, based on the ARM Cortex-A9. Includes 512MB of DDR3L RAM and built-in power management provided by TPS65218.

Requires:

- 5.0V from 5V/5A Regulator (10)
- BOOT from Boot MicroSD Card Slot for AM3354 (6)

Provides:

- RESET to Flip-side Tactile Switch (23)
- MMC2 to TI WiLink8 (5)
- MMC1 to 8GB eMMC Memory (8)
- GPIO56 to Audio Codec (15)
- VBACKUP to CoinCell Backup (12)
- GPIO67 to TI WiLink8 (5)
- GPIO66 to TI WiLink8 (5)
- GPIO61 to TI WiLink8 (5)
- nRESET to 4.3” Flip-Side Connector For Newhaven Capacitive Multi-Touch Screen (1)
- GPIO2 to 20-Pin Male Header (9)
- GPIO3 to 20-Pin Male Header (9)
- USB_HOST to 3-Port USB Hub (11)
- BRIGHTNESS to Backlight Controller (14)
- MDIO to Gigabit Ethernet (3)
- MCASP0 to Audio Codec (15)
- UART0 to USB-UART (20)
- UART3 to TI WiLink8 (5)
- RGMII to Gigabit Ethernet (3)
- GPIO118 to 20-Pin Male Header (9)
- GPIO119 to 20-Pin Male Header (9)
- GPIO117 to Flip-side Red LED (27)
- GPIO172 to 9-Axis IMU (22)
- GPIO173 to 8GB eMMC Memory (8)
- GPIO15 to 20-Pin Male Header (9)
- nIRQ to 4.3” Flip-Side Connector For Newhaven Capacitive Multi-Touch Screen (1)
- CAM0_12W to 27-Pin Connector (COM side) (21)
- GPIO18 to 9-Axis IMU (22)
- SYS_EN to 27-Pin Connector (COM side) (21), 1.8V/0.6A Regulator (25), Flip-side Green LED (26)
- GPIO19 to 9-Axis IMU (22)
- GPIO52 to Flip-side Blue LED (28)
- GPIO53 to 20-Pin Male Header (9)
- GPIO54 to Flip-side Tactile Switch (24)

- VLOGIC to 4.3” Flip-Side Connector For Newhaven Capacitive Multi-Touch Screen (1), TI WiLink8 (5), 8GB eMMC Memory (8), 20-Pin Male Header (9), Backlight Controller (14), Audio Codec (15), USB-UART (20), 27-Pin Connector (COM side) (21), 9-Axis IMU (22)
- GPIO57 to 20-Pin Male Header (9)
- I2C1 to 4.3” Flip-Side Connector For Newhaven Capacitive Multi-Touch Screen (1), Audio Codec (15)
- I2C2 to 27-Pin Connector (COM side) (21), 9-Axis IMU (22)
- GPIO147 to 20-Pin Male Header (9)
- GPIO146 to 20-Pin Male Header (9)
- LCD to 4.3” Flip-Side Connector For Newhaven Capacitive Multi-Touch Screen (1)
- USB_DEVICE to Micro-B Jack (19)
- GPIO121 to 20-Pin Male Header (9)
- GPIO120 to 20-Pin Male Header (9)
- AM437X to Boot MicroSD Card Slot for AM3354 (6)
- GPIO167 to 20-Pin Male Header (9)
- GPIO166 to 20-Pin Male Header (9)
- GPIO165 to 20-Pin Male Header (9)
- GPIO164 to 20-Pin Male Header (9)

1.3 Network

1.3.1 Gigabit Ethernet (v8) (3)

This 10/100/1000 Base-T connector offers gigabit Ethernet over twisted pair for networking functionality.

This networking interface is connected to RGMII on TI Sitara AM4378 (2).

1.3.2 TI WiLink8 (v14) (5)

The TI Wilink8 module includes BT4.1 and 802.11(a/b/g/n) signals on one antenna.

The module connects to the following buses:

- SDIO from TI Sitara AM4378 (2) for 802.11 traffic.
- 4-wire UART from TI Sitara AM4378 (2) for BT traffic.
- WiFi Enable from TI Sitara AM4378 (2).
- WiFi IRQ from TI Sitara AM4378 (2).
- BT Enable from TI Sitara AM4378 (2).

To function, the clock on the SDIO bus from TI Sitara AM4378 (2) must be run at 32.768kHz which is provided by a dedicated crystal.

1.4 Audio

1.4.1 Dual Audio (in / out) (v9) (4)

These two standard 3-position 3.5mm audio jacks offer stereo line input and stereo audio output. They are connected to Audio Codec (15).

1.4.2 Audio Codec (v13) (15)

A low-power stereo audio codec with stereo headphone amplifier, as well as multiple inputs and outputs programmable in single-ended or fully differential configurations.

For more information, visit `http://www.ti.com/product/tlv320aic3106`.

This module provides the following output buses:

- LINE_IN to Dual Audio (in / out) (4)
- HSO to Dual Audio (in / out) (4)

1.5 Memory

1.5.1 Boot MicroSD Card Slot for AM3354 (v9) (6)

A Micro SD card slot provides boot memory to BOOT on TI Sitara AM4378 (2) .

1.5.2 8GB eMMC Memory (v7) (8)

This NAND flash memory from Micron has a capacity of 8GB; used for general storage.

This flash module is connected to MMC1 on TI Sitara AM4378 (2). The module can be reset via GPIO173 on TI Sitara AM4378 (2).

1.6 USB

1.6.1 Dual Stacked USB Type A (v6) (7)

A dual type-A USB host stacked vertically that allows you to connect USB devices to the board.

It is connected to:

- USBH1 on 3-Port USB Hub (11)
- USBH2 on 3-Port USB Hub (11)

1.6.2 3-Port USB Hub (v10) (11)

This USB hub offers three interfaces for USB ports from USB_HOST on TI Sitara AM4378 (2).

This hub is connected to the following USB ports:

- Dual Stacked USB Type A (7)
- Dual Stacked USB Type A (7)

1.6.3 Micro-B Jack (v8) (18)

A USB micro-B port allows your design to connect as a USB device to a USB host.

This module is connected to USB_DEVICE on USB-UART (20).

1.6.4 Micro-B Jack (v8) (19)

A USB micro-B port allows your design to connect as a USB device to a USB host.

This module is connected to USB_DEVICE on TI Sitara AM4378 (2).

1.7 Headers

1.7.1 20-Pin Male Header (v10) (9)

A header offering up to 20 pins for various GPIO or PWM signals of your choice.

To output signals at a custom voltage, a zero ohm resistor can be depopulated and an external reference provided.

This module has the following connections:

- Pin16 to GPIO147 from TI Sitara AM4378 (2)
- Pin15 to GPIO146 from TI Sitara AM4378 (2)
- Pin14 to GPIO167 from TI Sitara AM4378 (2)
- Pin13 to GPIO166 from TI Sitara AM4378 (2)
- Pin12 to GPIO165 from TI Sitara AM4378 (2)
- Pin11 to GPIO164 from TI Sitara AM4378 (2)
- Pin10 to GPIO3 from TI Sitara AM4378 (2)
- Pin9 to GPIO2 from TI Sitara AM4378 (2)
- Pin8 to GPIO121 from TI Sitara AM4378 (2)
- Pin3 to NC1 from NC (29)
- Pin2 to GPIO57 from TI Sitara AM4378 (2)
- Pin1 to GPIO53 from TI Sitara AM4378 (2)
- Pin7 to GPIO120 from TI Sitara AM4378 (2)
- Pin6 to GPIO119 from TI Sitara AM4378 (2)
- Pin5 to GPIO118 from TI Sitara AM4378 (2)

- Pin4 to GPIO15 from TI Sitara AM4378 (2)

27 pin connector used on Overo COMs.Implemented as a test pad.

1.8 Power

1.8.1 5V/5A Regulator (v3) (10)

Takes 6 - 36V input from Battery 2-Cell Balance Connector (17) and provides up to 5A at 5V to:

- TI Sitara AM4378 (2)
- Dual Stacked USB Type A (7)
- 3-Port USB Hub (11)
- 3.3V/1.5A Regulator (16)

1.8.2 CoinCell Backup (v3) (12)

The 6.8mm coin cell battery holder offers a short-term backup power option for your design.

This battery is connected to VBACKUP on TI Sitara AM4378 (2).

1.8.3 Backlight Controller (v4) (14)

The backlight controller regulates the intensity of illumination on LCD touch displays

Converts BRIGHTNESS from TI Sitara AM4378 (2) to BACKLIGHT on 4.3” Flip-Side Connector For Newhaven Capacitive Multi-Touch Screen (1)

1.8.4 3.3V/1.5A Regulator (v9) (16)

This DC to DC step down regulator provides a 3.3V DC output at 1.5A needed by certain components on this board. It is capable of accepting an input voltage between 3.1 to 16V DC. Currently, its input is 5V from 5V/5A Regulator (10).

This regulator provides 3.3V to:

- 4.3” Flip-Side Connector For Newhaven Capacitive Multi-Touch Screen (1)
- Gigabit Ethernet (3)
- TI WiLink8 (5)
- Boot MicroSD Card Slot for AM3354 (6)
- 8GB eMMC Memory (8)
- 20-Pin Male Header (9)
- 3-Port USB Hub (11)

- Audio Codec (15)
- 27-Pin Connector (COM side) (21)
- 9-Axis IMU (22)
- Flip-side Tactile Switch (23)
- Flip-side Tactile Switch (24)
- 1.8V/0.6A Regulator (25)
- Flip-side Green LED (26)
- Flip-side Red LED (27)
- Flip-side Blue LED (28)

1.8.5 1.8V/0.6A Regulator (v6) (25)

This DC-DC regulator has an integrated inductor and tiny footprint. It provides power to modules that need a 1.8V input.

- 3.3V from 3.3V/1.5A Regulator (16)
- SYS_EN from TI Sitara AM4378 (2)

The following modules receive 1.8V DC from this regulator:

- TI WiLink8 (5)
- Audio Codec (15)

1.9 Power Connectors

1.9.1 Barrel Connector (5V 3A) (v6) (13)

This power jack is compatible with Gumstix 5V/3.5A DC power adapter using a 4.0mm x 1.7mm barrel connector. It provides more current than a standard 5V DC power supply, suitable for use with multi-processor designs.

This power jack provides 5V to the following modules:

- Backlight Controller (14)

1.9.2 Battery 2-Cell Balance Connector (v6) (17)

This is a standard 2S LiPo balance connector (XH Type). Although it's a 2S connector, it can provide 16.0V or 36.0V.

This connector provides 36.0V to:

- 5V/5A Regulator (10)

1.10 Connectivity

1.10.1 USB-UART (v14) (20)

Also known as an FTDI, this USB to UART converter allows a USB connection to the board to behave as a virtual RS232 serial connection. It offers direct and complete access to the system from a development machine.

This USB to UART converter connects a host machine from Micro-B Jack (18) to UART0 on TI Sitara AM4378 (2).

1.11 Sensors

1.11.1 9-Axis IMU (v16) (22)

This module provides 3-axis acceleration, 3-axis rotational rates and 3-axis magnetic field information. It is connected via a SPI bus. Data-ready pins are provided.

Its I2C bus is connected to I2C2 on TI Sitara AM4378 (2)

It has the following data ready signals:

- ACCEL_DRDY to GPIO172 on TI Sitara AM4378 (2)
- GYRO_DRDY to GPIO18 on TI Sitara AM4378 (2)
- MAG_DRDY to GPIO19 on TI Sitara AM4378 (2)

1.12 IO

1.12.1 Flip-side Tactile Switch (v5) (23)

This 4.9 sq. mm light touch switch provides a user input for the signal on . It can be found on the flip-side of the board.

1.12.2 Flip-side Tactile Switch (v5) (24)

This 4.9 sq. mm light touch switch provides a user input for the signal on . It can be found on the flip-side of the board.

1.12.3 Flip-side Green LED (v4) (26)

This 1608 standard size green LED, placed on the backside, provides an indicator for the signal SYS_EN on TI Sitara AM4378 (2).

1.12.4 Flip-side Red LED (v6) (27)

This 1608 standard size red LED, placed on the backside, provides an indicator for the signal GPIO117 on TI Sitara AM4378 (2).

1.12.5 Flip-side Blue LED (v4) (28)

This 1608 standard size blue LED, placed on the backside, provides an indicator for the signal GPIO52 on TI Sitara AM4378 (2).

1.13 Mechanical

1.13.1 Mounting Hole (2.2mm)

A #0 mounting hole for securing the board with mounting pins.

1.13.2 Mounting Hole (2.2mm)

A #0 mounting hole for securing the board with mounting pins.

1.13.3 Mounting Hole (2.2mm)

A #0 mounting hole for securing the board with mounting pins.

1.13.4 Mounting Hole (2.2mm)

A #0 mounting hole for securing the board with mounting pins.

2 Module Connections Graph

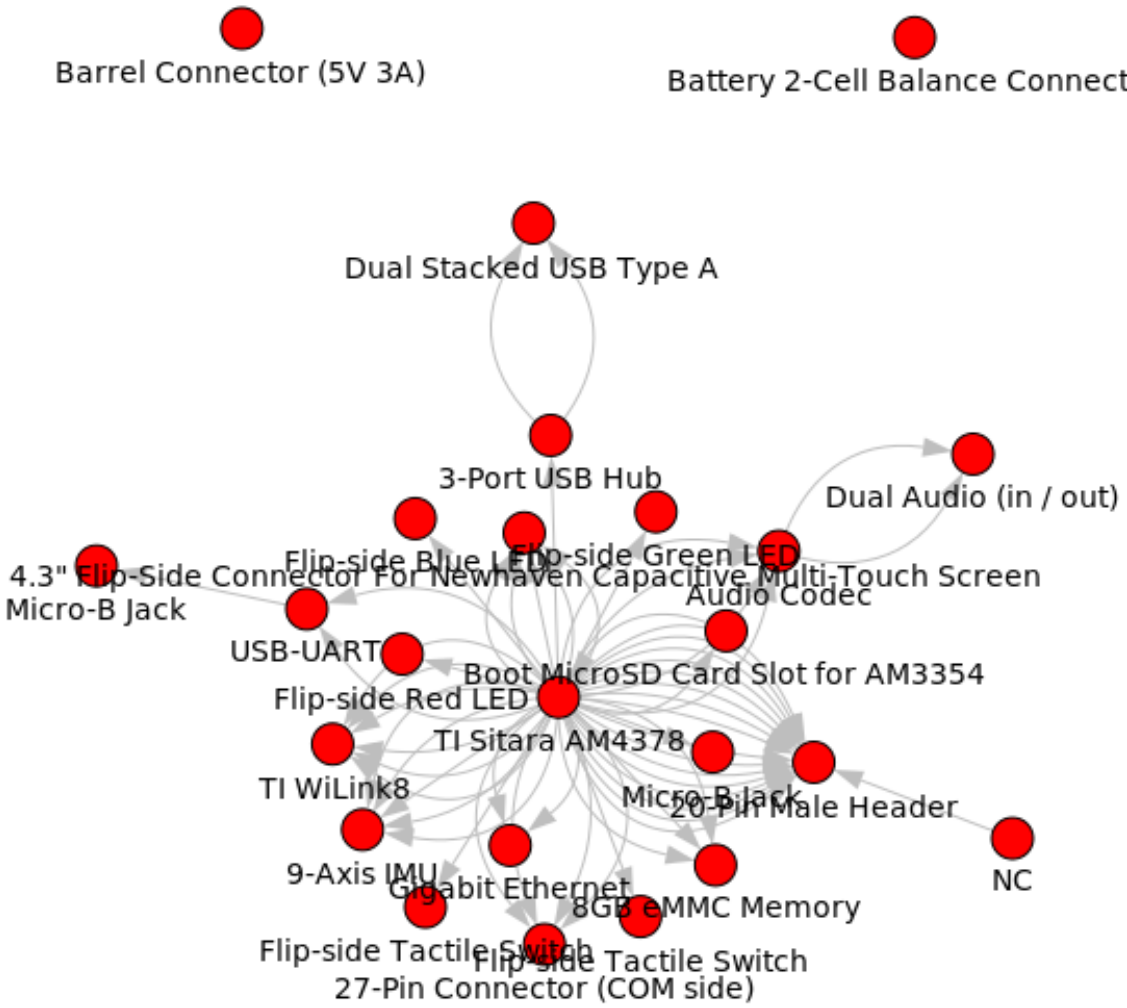


Figure 1: excludes power modules

3 Module Power Graph