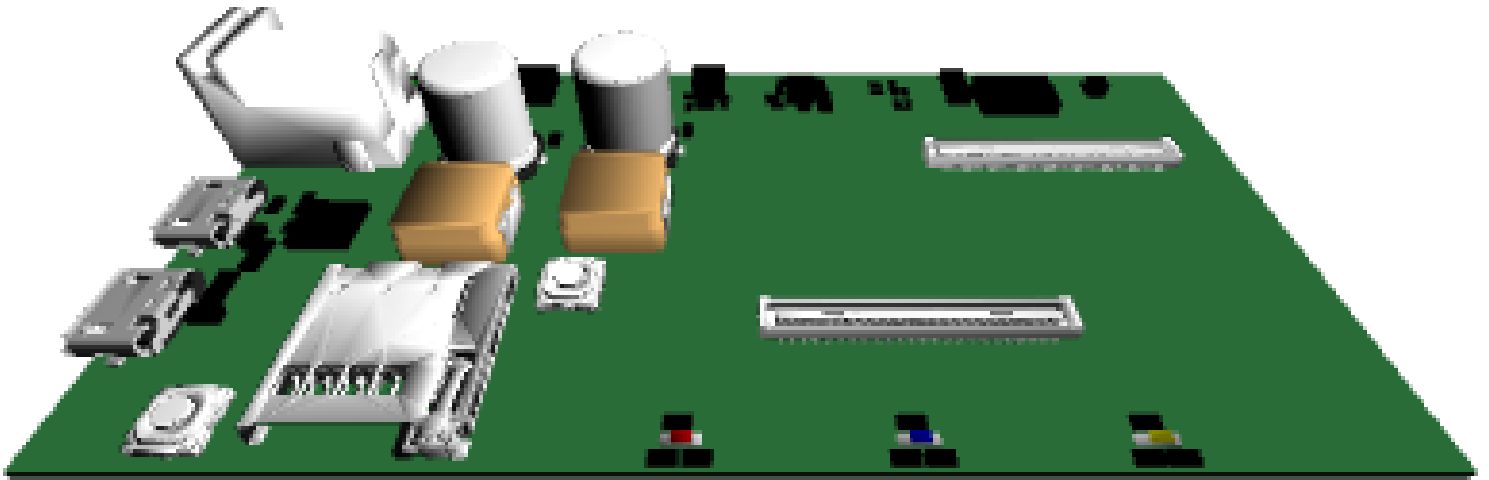


Intel Joule Module Sensor Board



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Board Description

Intel Joule Module Sensor Board

Board Dimensions

9.0cm x 4.5cm



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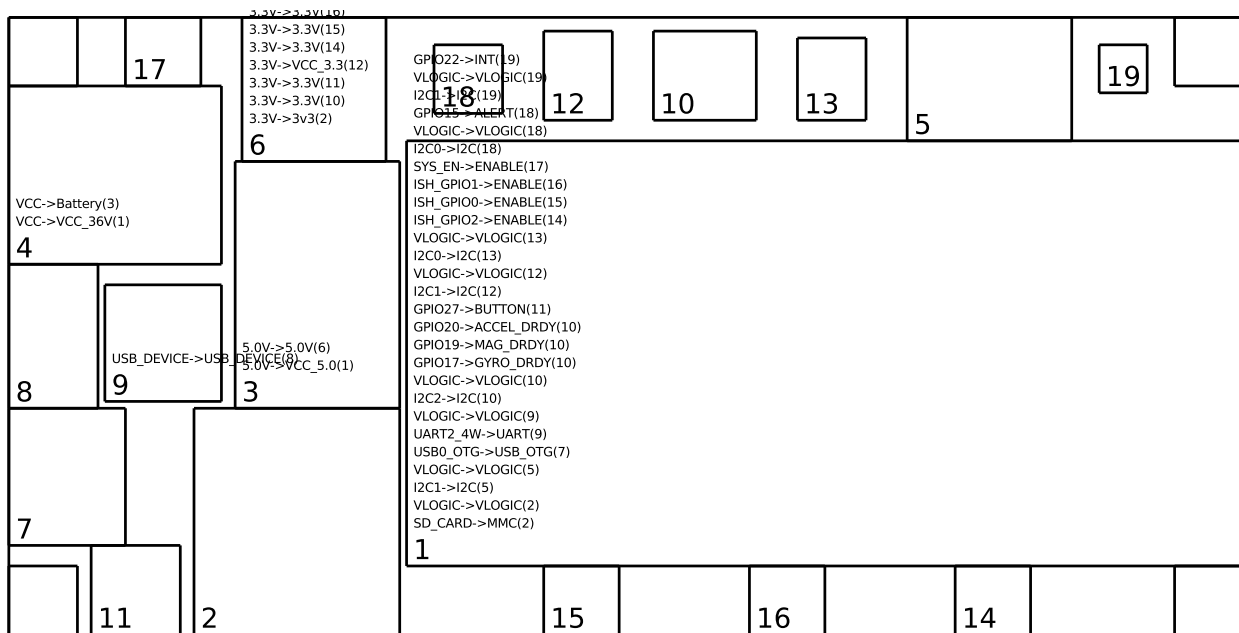
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1 Modules on Board



1.1 COM Connectors

1.1.1 Intel Joule Module Connector (v7) (1)

- VCC_5.0 from 5V/5A Regulator (3)
- VCC_36V from Barrel Connector (20V 3A) (4)

The Tesla connectors provide the following outputs:

- GPIO15 to Ambient Temperature Sensor (18)
- GPIO17 to 9-Axis IMU (10)
- SD_CARD to microSD slot (2)
- USB0_OTG to Micro-AB USB (7)
- VLOGIC to:
 - microSD slot (2)
 - Real Time Clock (5)
 - USB-UART (9)
 - 9-Axis IMU (10)
 - Humidity Sensor (12)
 - Barometer (13)
 - Ambient Temperature Sensor (18)
 - RGB Light Sensor (19)



- ISH.GPIO2 to Yellow LED (14)
- ISH.GPIO1 to Blue LED (16)
- ISH.GPIO0 to Red LED (15)
- GPIO19 to 9-Axis IMU (10)
- SYS_EN to Green LED (17)
- GPIO27 to Tactile Switch (11)
- UART2_4W to USB-UART (9)
- GPIO20 to 9-Axis IMU (10)
- GPIO22 to RGB Light Sensor (19)
- I2C0 to:
 - Barometer (13)
 - Ambient Temperature Sensor (18)
- I2C1 to:
 - Real Time Clock (5)
 - Humidity Sensor (12)
 - RGB Light Sensor (19)
- I2C2 to 9-Axis IMU (10)

1.2 Memory

1.2.1 microSD slot (v5) (2)

A Micro SD card slot provides memory to SD_CARD on Intel Joule Module Connector (1).

1.3 Power

1.3.1 5V/5A Regulator (v3) (3)

Takes 6 - 36V input from Barrel Connector (20V 3A) (4) and provides up to 5A at 5V to:

- Intel Joule Module Connector (1)
- 3.3V/1.5A Regulator (6)

1.3.2 Real Time Clock (v8) (5)

This real-time clock backup is powered by a coin cell battery.

This module is connected to I2C1 on Intel Joule Module Connector (1).



1.3.3 3.3V/1.5A Regulator (v9) (6)

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 (3).

This regulator provides 3.3V to:

- microSD slot (2)
- 9-Axis IMU (10)
- Tactile Switch (11)
- Humidity Sensor (12)
- Yellow LED (14)
- Red LED (15)
- Blue LED (16)
- Green LED (17)
- RGB Light Sensor (19)

1.4 Power Connectors

1.4.1 Barrel Connector (20V 3A) (v2) (4)

This power jack is compatible with Gumstix 20V/3A DC power adapter using a barrel connector.

This power jack provides 20V to the following modules:

- Intel Joule Module Connector (1)
- 5V/5A Regulator (3)

1.5 USB

1.5.1 Micro-AB USB (v6) (7)

A micro-AB USB port offers USB On-the-Go connectivity. Devices can be connected to your design (e.g., USB peripherals) using a USB OTG cable, or your design can be connected to a host as a device using a micro-B to standard-A cable.

This port is connected to USB0_OTG on Intel Joule Module Connector (1).

1.5.2 Micro-B Jack (v8) (8)

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 (9).



1.6 Connectivity

1.6.1 USB-UART (v14) (9)

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 (8) to UART2_4W on Intel Joule Module Connector (1).

1.7 Sensors

1.7.1 9-Axis IMU (v16) (10)

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 Intel Joule Module Connector (1)

It has the following data ready signals:

- ACCEL_DRDY to GPIO20 on Intel Joule Module Connector (1)
- GYRO_DRDY to GPIO17 on Intel Joule Module Connector (1)
- MAG_DRDY to GPIO19 on Intel Joule Module Connector (1)

1.7.2 Humidity Sensor (v1) (12)

This Silicon Labs Si7021-A20 humidity and temperature sensor reads humidity at a maximum possible resolution of 0.025°RH, accurate to within 2°RH, and temperature at a maximum possible resolution of 0.01°C, accurate to within 0.4°C.

This humidity and temperature sensor is connected to I2C1 on Intel Joule Module Connector (1).

Visit <http://www.silabs.com/products/sensors/humidity-sensors/Pages/si7013-20-21.aspx> for more information.

1.7.3 Barometer (v7) (13)

An ultra-compact, low-power barometer useful for aerial vehicles. The barometer module offers a high resolution reading, accurate to within 10 cm and is optimized for altimeter and variometer applications. At altitudes close to sea level, covering the barometer module with a light piece of foam may help to improve the accuracy of readings.

This module is connected to I2C0 on Intel Joule Module Connector (1).

Visit <http://www.meas-spec.com/downloads/MS5611-01BA03.pdf> for details.



1.7.4 Ambient Temperature Sensor (v7) (18)

This Texas Instruments TMP102 temperature sensor reads temperatures at a maximum possible resolution of 0.0625°C, accurate to within 0.5°C.

This temperature sensor is connected to I2C0 on Intel Joule Module Connector (1). The overtemperature alert pin is connected to GPIO15 on Intel Joule Module Connector (1)

Visit <http://www.ti.com/product/tmp102> for more information.

1.7.5 RGB Light Sensor (v1) (19)

This Intersil Digital RGB light sensor provides accurate RGB spectral response over I2C.

This RGB light sensor is connected to I2C1 on Intel Joule Module Connector (1).

Visit <http://www.intersil.com/en/products/optoelectronics/ambient-light-sensors/light-to-digital-sensor-ISL29125.html> for more information.

1.8 IO

1.8.1 Tactile Switch (v9) (11)

This 4.9 sq. mm light touch switch provides a user input for the signal GPIO27 on Intel Joule Module Connector (1).

1.8.2 Yellow LED (v13) (14)

This 1608 standard size yellow LED provides an indicator for the signal ISH_GPIO2 on Intel Joule Module Connector (1).

1.8.3 Red LED (v11) (15)

This 1608 standard size red LED provides an indicator for the signal ISH_GPIO0 on Intel Joule Module Connector (1).

1.8.4 Blue LED (v14) (16)

This 1608 standard size blue LED provides an indicator for the signal ISH_GPIO1 on Intel Joule Module Connector (1).

1.8.5 Green LED (v13) (17)

This 1608 standard size green LED provides an indicator for the signal SYS_EN on Intel Joule Module Connector (1).



1.9 Mechanical

1.9.1 Mounting Hole (2.2mm)

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

1.9.2 Mounting Hole (2.2mm)

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

1.9.3 Mounting Hole (2.2mm)

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



2 Module Connections Graph

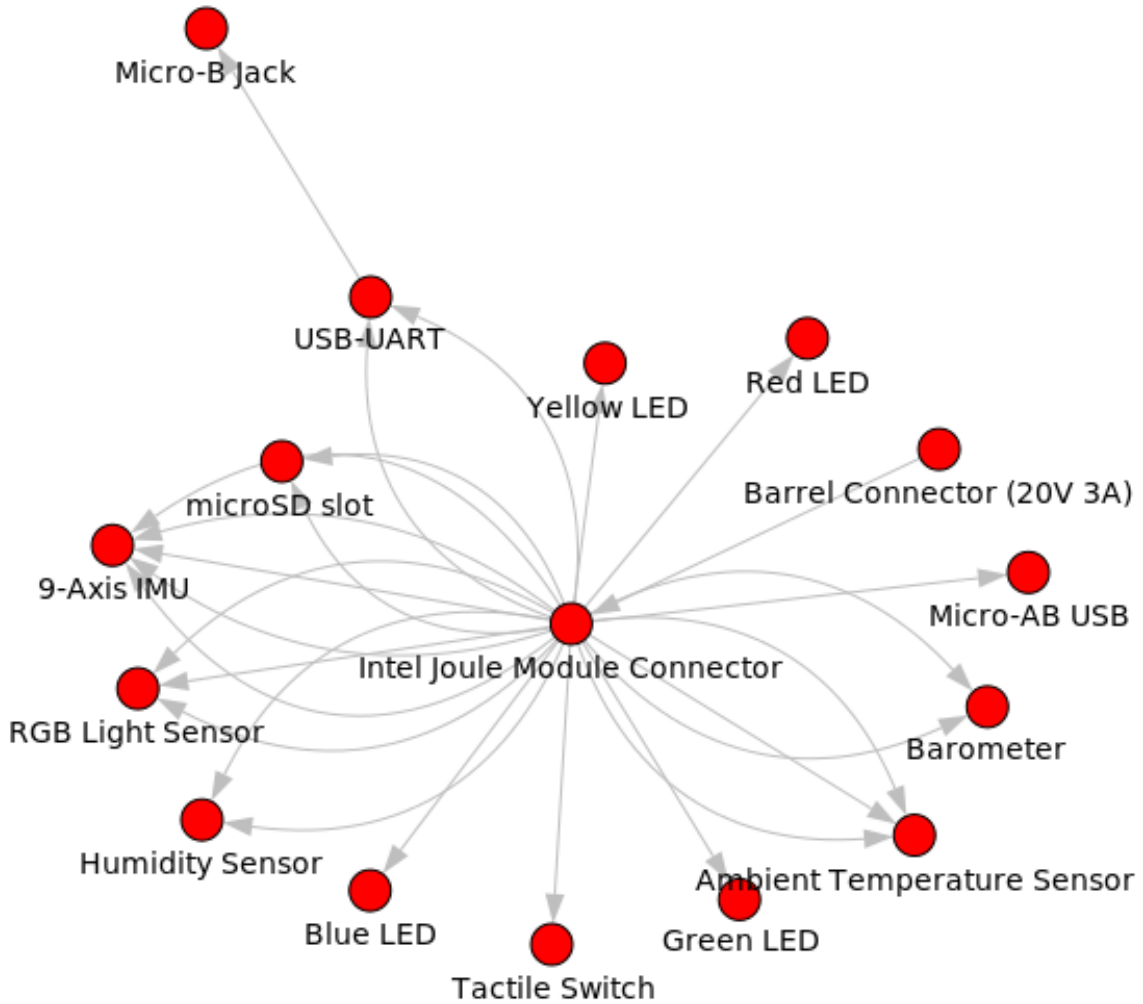


Figure 1: excludes power modules



3 Module Power Graph

