ARDUINO NANO 33 BLE SENSE

Code: ABX00031



Small, powerful, BT connected and with all the sensors you may need to design innovative applications.

Estimate shipping date, mid July 2019.

This compact and reliable Nano board is built around the NINA B306 module for BLE and Bluetooth 5 communication; the module is based on Nordic nRF 52840 processor that contains a powerful Cortex M4F and the board has a rich set of sensors that allow the creation of innovative and highly interactive designs.

Its architecture, fully compatible with Arduino IDE Online and Offline, has a 9 axis Inertial Measurement Unit (IMU), temperature, pressure, humidity, light, color and even gestures sensors and a microphone that are managed through our specialised libraries. Its reduced power consumption, compared to other same size boards, together with the Nano form factor opens up a wide range of applications.

This allows the design of wearable devices and gesture based projects that need to communicate to other devices at a close range. Arduino Nano 33 BLE Sense is ideal for interactive automation projects thanks to the multiprotocol BT 5.0 radio.

Dimensions: 45x18mm

TECH SPECS

This board is based on the nRF 52840 microcontroller.

Clock	64MHz
Flash	1MB
RAM	256KB

Please note: Arduino Nano 33 BLE Sense only supports 3.3V I/Os and is **NOT** 5V tolerant so please make sure you are not directly connecting 5V signals to this board or it will be damaged. Also, as opposed to Arduino Nano boards that support 5V operation, the 5V pin does NOT supply voltage but is rather connected, through a jumper, to the USB power input.

To avoid such risk with existing projects, where you should be able to pull out a Nano and replace it with the new Nano 33 BLE Sense, we have the 5V pin on the header, positioned between RST and A7 that is not connected as default factory setting. This means that if you have a design that takes 5V from that pin, it won't work immediately, as a precaution we put in place to draw your attention to the 3.3V compliance on digital and analog inputs.

5V on that pin is available only when two conditions are met: you make a solder bridge on the two pads marked as VUSB and you power the NANO

33 IoT through the USB port. If you power the board from the VIN pin, you won't get any regulated 5V and therefore even if you do the solder bridge, nothing will come out of that 5V pin. The 3.3V, on the other hand, is always available and supports enough current to drive your sensors.

Please make your designs so that sensors and actuators are driven with 3.3V and work with 3.3V digital IO levels. 5V is now an option for many modules and 3.3V is becoming the standard voltage for electronic ICs.

The Bluetooth is managed by a NINA B306 module.

The IMU is a **LSM9DS1** and it is managed through I2C.

The LPS22HB reads barometric pressure and environmental temperature.

The HTS221 senses relative humidity.

The ADPS-9960 is a digital proximity, ambient light, RGB and gesture sensor.

The MP34DT05 is the digital microphone

Crypto keys are managed by the ATECC608A crypto chip.

The board has a two 15 pins connectors - one on each side -, pin to pin compatible with the original Arduino Nano.

Pin	Funcion	Type	Description
1	D13	Digital	GPIO
2	+3V3	Power Out	Internally generated power output to external devices
3	AREF	Analog	Analog Reference; can be used as GPIO
4	A0/DAC0	Analog	ADC in/DAC out; can be used as GPIO
5	A1	Analog	ADC in; can be used as GPIO
6	A2	Analog	ADC in; can be used as GPIO
7	A3	Analog	ADC in; can be used as GPIO
8	A4/SDA	Analog	ADC in; I2C SDA; Can be used as GPIO (*)

9	A5/SCL	Analog	ADC in; I2C SCL; Can be used as GPIO(*)
10	A6	Analog	ADC in; can be used as GPIO
11	A7	Analog	ADC in; can be used as GPIO
12	V_{USB}	Power In/Out	Normally NC; can be connected to V_{USB} pin of the USB connector by shorting a jumper
13	RST	Digital In	Active low reset input (duplicate of pin 18)
14	GND	Power	Power Ground
15	VIN	Power In	Vin Power input
16	TX	Digital	USART TX; can be used as GPIO
17	RX	Digital	USART RX; can be used as GPIO
18	RST	Digital	Active low reset input (duplicate of pin 13)
19	GND	Power	Power Ground
20	D2	Digital	GPIO
21	D3/PWM	Digital	GPIO; can be used as PWM
22	D4	Digital	GPIO
23	D5/PWM	Digital	GPIO; can be used as PWM
24	D6/PWM	Digital	GPIO; can be used as PWM
25	D7	Digital	GPIO
26	D8	Digital	GPIO
27	D9/PWM	Digital	GPIO; can be used as PWM
28	D10/PWM	Digital	GPIO; can be used as PWM
29	D11/MOSI	Digital	SPI MOSI; can be used as GPIO
30	D12/MISO	Digital	SPI MISO; can be used as GPIO

(*) As opposed to other Arduino Nano boards, pins A4 and A5 have an internal pull up and default to be used as an I^2C Bus so usage as analog inputs is not recommended. Opposed to Arduino Nano boards that support 5V operation, the 5V pin does NOT supply voltage but is rather connected, through a jumper, to the USB power input.

On the bottom side of the board, under the communication module, **debug signals** are arranged as 3x2 test pads with 100 mil pitch. Pin 1 is the bottom left one with the USB connector on the left and the test pads on the right.

Pin	Function	Type	Description
1	+3V3	Power Out	Internally generated power output to be used as voltage reference
2	SWD	Digital	nRF52480 Single Wire Debug Data
3	SWCLK	Digital In	nRF52480 Single Wire Debug Clock
5	GND	Power	Power Ground
6	RST	Digital In	Active low reset input

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