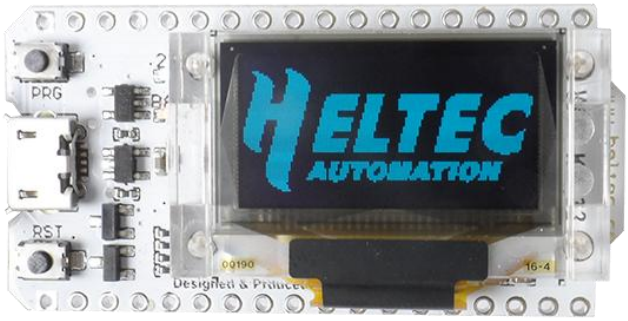
WiFi Kit 32

Development Kit



Document version

Version	Time	Description
V1.0	2017-06-01	Documents creating
V2.0	2019-05-30	Document structure update
V2.1	2020-05-07	Document structure update

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Content

1. Description

1.1 Overview

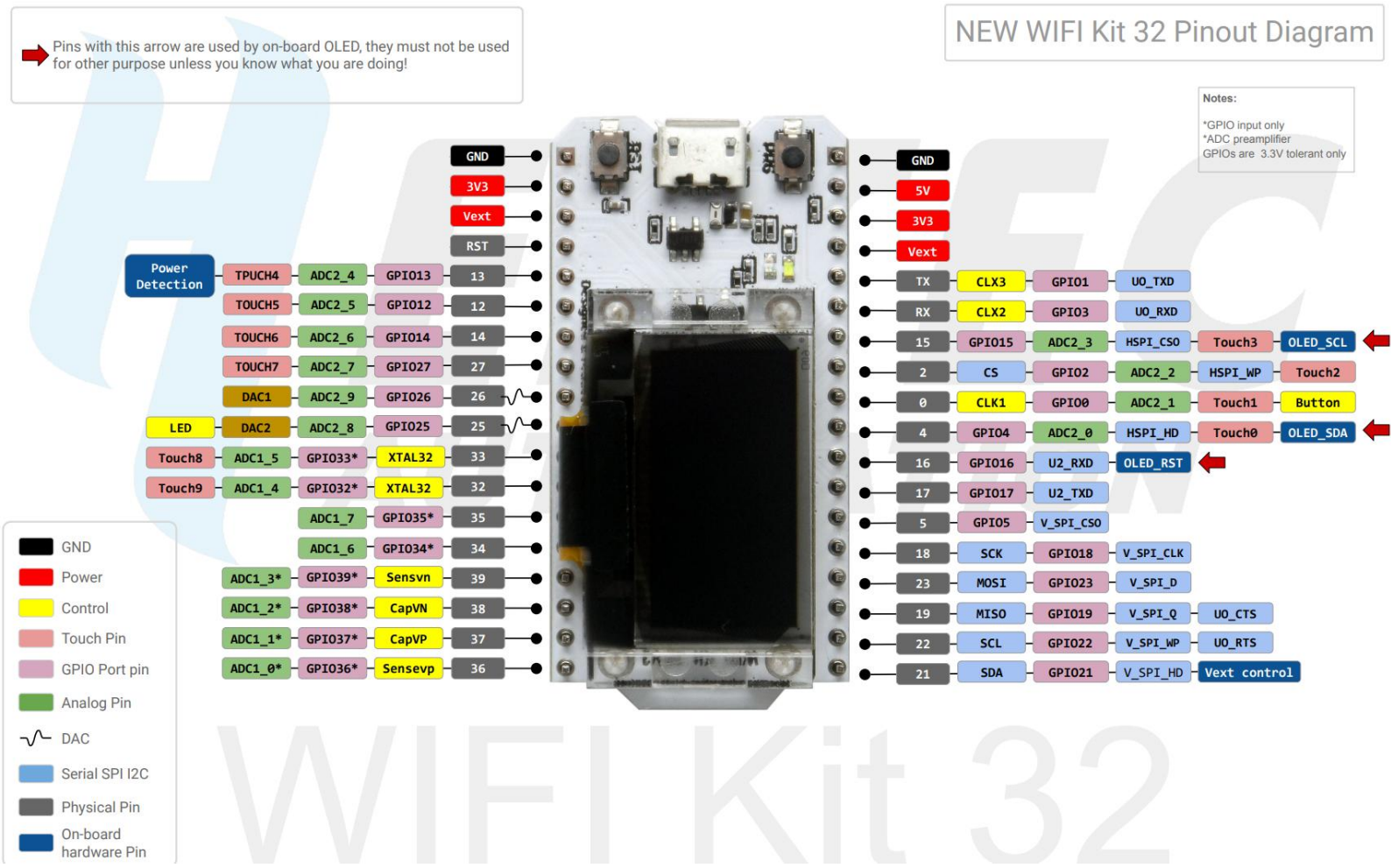
WiFi Kit 32 is a classic IoT dev-board designed & produced by Heltec Automation(TM), it’s a highly integrated product based on ESP32 (include Wi-Fi and BLE), Li-Po battery management system, 0.96〞 OLED are also included. It’s the best choice for smart cities, smart farms, smart home, and IoT makers.

1.2 Product features

- Microprocessor: ESP32 (dual-core 32-bit MCU + ULP core);
- Micro USB interface with a complete voltage regulator, ESD protection, short circuit protection, RF shielding, and other protection measures;
- Onboard SH1.25-2 battery interface, integrated lithium battery management system (charge and discharge management, overcharge protection, battery power detection, USB / battery power automatic switching);
- Onboard Wi-Fi, Bluetooth 2.4GHz PCB antenna;
- Onboard 0.96-inch 128*64 dot matrix OLED display, which can be used to display debugging information, battery power, and other information;
- Integrated CP2102 USB to serial port chip, convenient for program downloading, debugging information printing;
- Compatible with the Arduino development environment.

2. Pin Definition

2.1 Pin assignment



2.2 Pin description

- **Header J2**

Table 2-2-1 Pin description

No.	Name	Type	Function
1	GND	P	Ground.
2	5V	P	5V Power Supply.
3	Ve	P	Output 3.3V, power supply for external sensor.
4	Ve	P	Output 3.3V, power supply for external sensor.

5	RX	I/O	GPIO44, U0RXD, connected to CP2102 TXD.
6	TX	I/O	GPIO43, U0RXD, connected to CP2102 RXD.
7	RST	I	CHIP_PU, connect to RST switch.
8	0	I/O	GPIO0, connect to PRG switch.
9	36	I/O	GPIO36, SPIIO7, FSPICLK, SUBSPICLK, Vext Ctrl.
10	35	I/O	GPIO35, SPIIO6, FSPID, SUBSPID, LED Write Ctrl.
11	34	I/O	GPIO34, SPIIO5, FSPICS0, SUBSPICS0.
12	33	I/O	GPIO33, SPIIO4, FSPIHD, SUBSPIHD.
13	47	I/O	GPIO47, SPICLK_P_DIFF, SUBSPICLK_P_DIFF.
14	48	I/O	GPIO48, SPICLK_N_DIFF, SUBSPICLK_N_DIFF.
15	26	I/O	GPIO26, SPICS1.
16	21	I/O	GPIO21, OLED RST.
17	20	I/O	GPIO20, U1CTS, ADC2_CH9, CLK_OUT1, USB_D+[1].
18	19	I/O	GPIO19, U1RTS, ADC2_CH8, CLK_OUT2, USB_D-[2].

Header J3

Table 2-2-2 Pin description

No.	Name	Type	Function
1	GND	P	Ground.
2	3V3	P	3.3V Power Supply.
3	3V3	P	3.3V Power Supply.
4	37	I/O	GPIO37, SPIDQS, FSPIQ, SUBSPIQ.
5	46	I/O	GPIO46.
6	45	I/O	GPIO45.
7	42	I/O	GPIO42, MTMS.
8	41	I/O	GPIO41, MTDI.
9	40	I/O	GPIO40, MTDO.
10	39	I/O	GPIO39, MTCK.
11	38	I/O	GPIO38, FSPIWP, SUBSPIWP.

[1] DP pin connectable to USB socket, solder R29

[2] DN pin connectable to USB socket, solder R3

12	1	I/O	GPIO1, ADC1_CH0[3], TOUCH1, Read VBAT Voltage.
13	2	I/O	GPIO2, ADC1_CH1, TOUCH2.
14	3	I/O	GPIO3, ADC1_CH2, TOUCH3.
15	4	I/O	GPIO4, ADC1_CH3, TOUCH4.
16	5	I/O	GPIO5, ADC1_CH4, TOUCH5.
17	6	I/O	GPIO6, ADC1_CH5, TOUCH6.
18	7	I/O	GPIO7, ADC1_CH6, TOUCH7.

3. Specifications

3.1 General specifications

Table 3-1: General specifications

Parameters	Description
Master Chip	ESP32(240MHz Tensilica LX6 dual-core + 1 ULP, 600 DMIPS)
USB to Serial Chip	CP2102
Wi-Fi	802.11 b/g/n (802.11n up to 150 Mbps)
Bluetooth	Bluetooth V4.2 BR/EDR and Bluetooth LE specification
Display Size	0.96-inch OLED
Hardware Resource	UART x 3; SPI x 2; I2C x 2; I2S x 1; 12-bits ADC input x 18; 8-bits DAC output x 2; GPIO x 22， GPI x 6
Memory	4MB(64M-bits) SPI FLASH; 520KB internal SRAM
Interface	Micro USB x 1; 18 x 2.54 pin x 2
Battery	3.7V Lithium(SH1.25 x 2 socket)

[3] ADC1_CH0 is used to read the lithium battery voltage, the voltage of the lithium battery is:

VBAT = 100 / (100+390) * VADC_IN1

Operating temperature	-20 ~ 70 ℃
Dimensions	51 x 25.5 x 10.6 mm

3.2 Power supply

Except when USB or 5V Pin is connected separately, lithium battery can be connected to charge it. In other cases, only a single power supply can be connected.

Table 3-2: Power supply

Power supply mode	Minimum	Typical	Maximum	Company
USB powered（≥500mA）	4.7	5	6	V
Lithium battery(≥250mA)	3.3	3.7	4.2	V
5V pin(≥500mA)	4.7	5	6	V
3V3 pin(≥150mA)	2.7	3.3	3.5	V

3.3 Power output

Table 3-3: Power output

Output Pin	Minimum	Typical	Maximum	Company
3.3V Pin			500	mA
5V Pin (USB Powered only)		Equal to the input current		
External device power control (Vext 3.3V)			350	mA

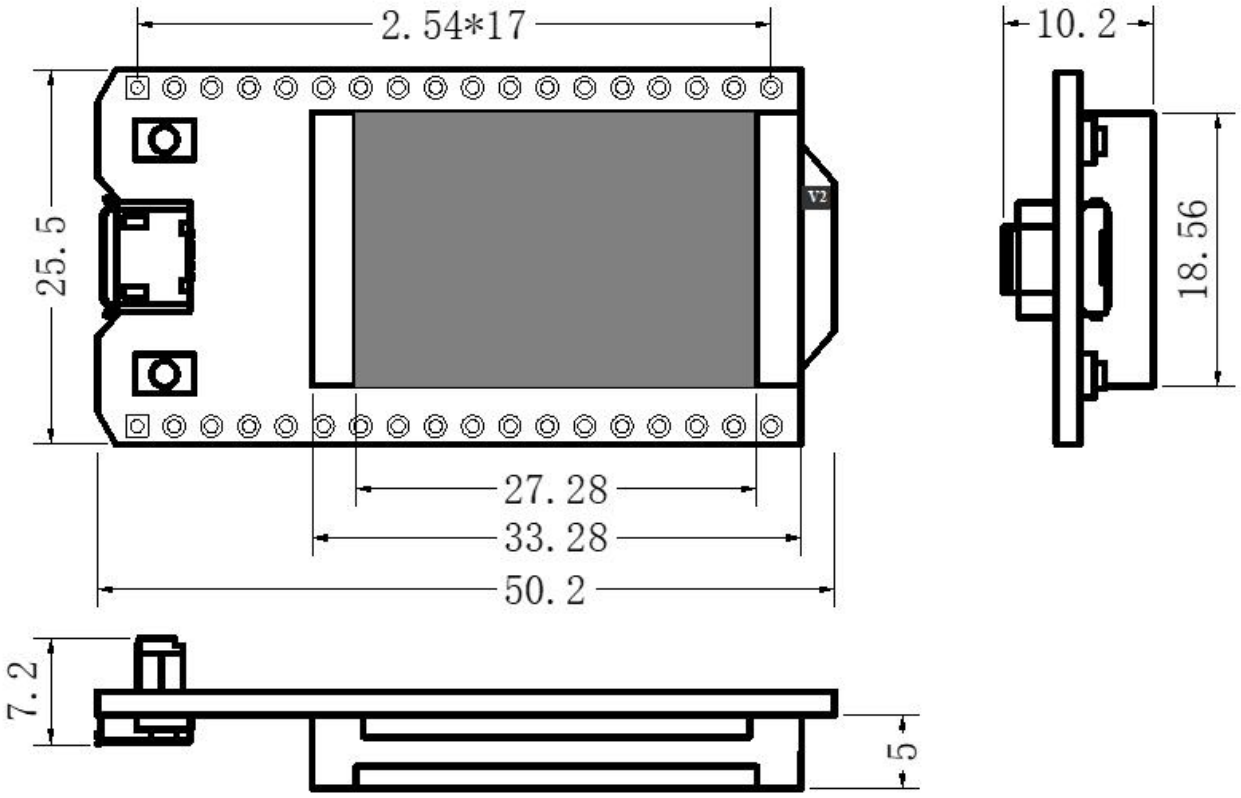
3.4 Power characteristics

Table 3-4: Power characteristics

Mode	Min.	Typical	Max.	Company
WiFi Scan		115		mA
WiFi AP		135		mA

4. Hardware resource

4.1 Physical dimensions



5. Resource

5.1 Relevant Resource

- Pin map
- Schematic diagram
- Downloadable resource

5.2 Contact Information

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