Description

WACIO Lite is a small-size, 802.11n AP board that achieves a data rate up to 150Mbps. It is 3 times faster than the legacy 11g model.

This product supports different mode like AP/router. It is ideal for multi-purpose installation to share wireless connection.

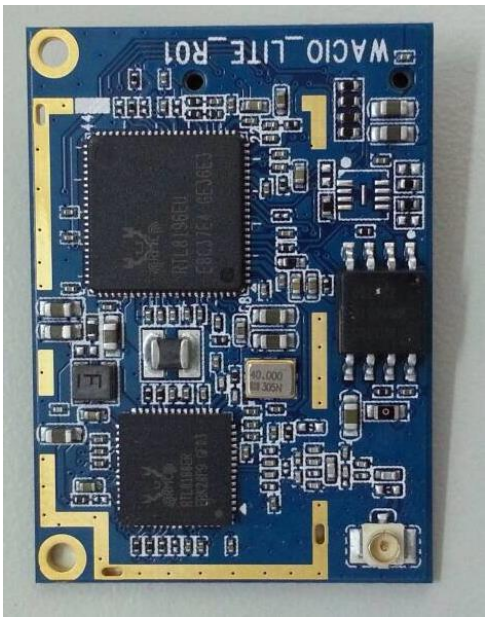
By supporting 64/128-bits WEP, TKIP,WPA, WPA2,AES and WPS, helps to protect your data and privacy during transmission.

This module is formed by CPU and WiFi mounted on your system board with 24-pin header for different application that need to build your product with wireless connectivity.

Highlight

- Support Interface LAN, USB, UART and GPIOs.
- Support boot from Flash
- WiFi Data Rate up to 150Mbps
- LAN Data Rate up to 100Mbps
- USB throughput up to 20Mbps
- Security: 64/128-bits WEP, TKIP,WPA, WPA2, AES, WPS
- Multi-modes: AP/router/gateway/bridge/client
- Support unique mode called WiFi repeater (AP-Client)
- Support built-in web server.
- Embedded Linux SDK to be developed by customer
- URL/AT command set for APP
- UART bridge to TCP/IP Socket client/server
- Application range for IOTs/M2M/Storage/IP CAM/Image Streaming… and 3G/4G (option)
- Sensor network for Zigbee/GPS/BT/NFC….(option)
- Cloud Development (option)
- HomeKit Development (option)
- OTA Development (option)
- APP Development (option)

Top View



Bottom View

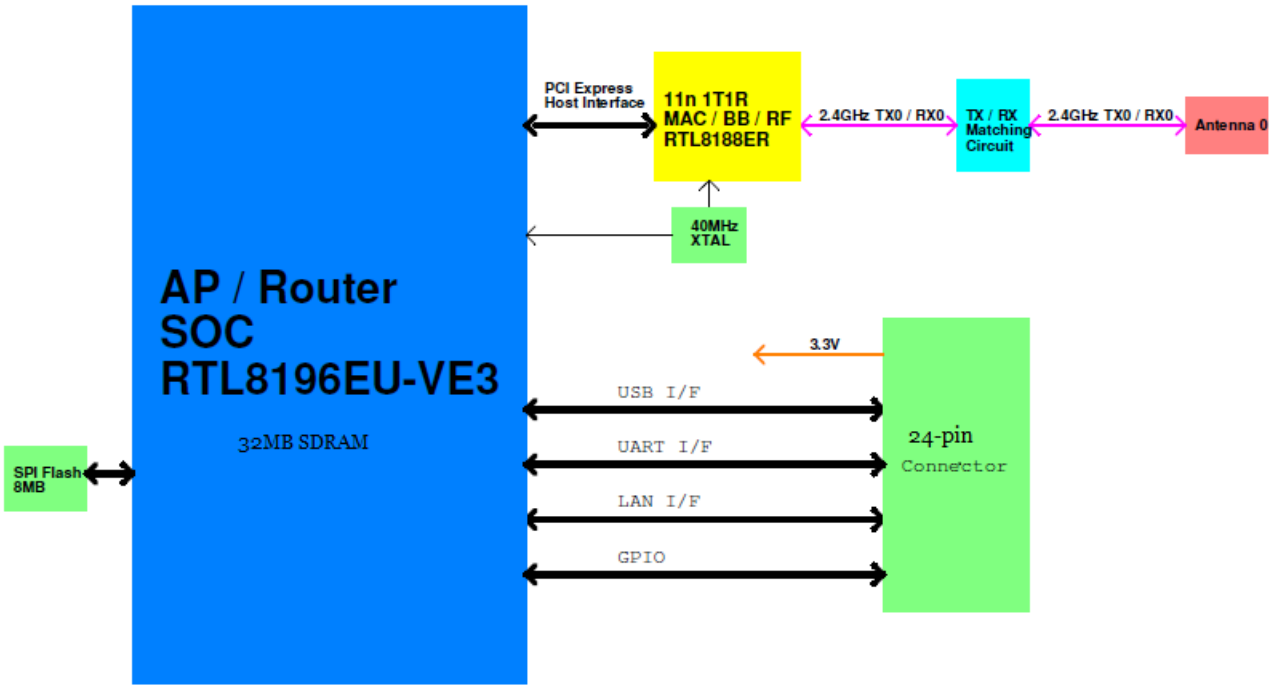
Specification

Hardware Features:

Standard	IEEE 802.11 b/g/n standards compliant
Wireless LAN	1T1R Mode
Antenna	iPex connector for external antenna use
24-pin-header	802.11n 20MHz/40MHz ; 802.11b/g USA, Canada (FCC):11 channels (2.412GHz~2.462GHz) Europe (CE): 13 channels (2.412GHz~2.472GHz) Japan (TELEC): 14 channels (2.412GHz~2.4835GHz)
Memory Size	Flash/SDRAM – 8MB/32MB
Frequency Range	2.400 ~ 2.4835GHz (subject to local regulations)
Number of Selectable Channels	802.11n 20MHz/40MHz ; 802.11b/g USA, Canada (FCC):11 channels (2.412GHz~2.462GHz) Europe (CE): 13 channels (2.412GHz~2.472GHz) Japan (TELEC): 14 channels (2.412GHz~2.4835GHz)
Data Rate	802.11n: up to 150Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps 802.11b: 1, 2, 5,5, 11Mbps
Coverage Area	Up to 3 times faster than existing 802.11 b/g products
Transmit Power(EIRP)	11n HT40 MCS7 : +13 dBm +/- 1 dBm 11g OFDM: +15 dBm +/- 1 dBm 11b CCK: +18 dBm +/- 1 dBm
Receiver Sensitivity	-66dBm at HT40 MCS7 -73dBm at 54Mpbs -86dBm at 11Mpbs
Dimension	About 25x35 mm
Operation Current	Stand-by 200mA /Normal 350mA

Operation Voltage	3.3V +/- 0.1V
Surface of Module Temperature	50+℃ @room temperature 25℃ Add heat dispersion solution to control module temperature under 80℃ in closed box
Environment Requirement	Operation Temperature : 0℃ ~ 40℃ Humidity: 10% ~ 90%(Non-condensing)
Certifications	By request
Material	RoHS Compliant

Block Diagram



Software Features:

- **Networking (AP/router)**
  - ✧ DHCP Client/Relay/Server
  - ✧ Dynamic DNS
  - ✧ NTP Client
  - ✧ DNS Cache/Proxy
  - ✧ Firewall

- **WiFi:**
  - ✧ One transmit and one receive paths(1T1R)
  - ✧ 20MHz/40MHz bandwidth.
  - ✧ Support multiple SSID
  - ✧ CPU clock rate up to 400MHz
  - ✧ Support WPS
  - ✧ High security with build-in: WEP 64/128, TKIP, WPA, WPA2

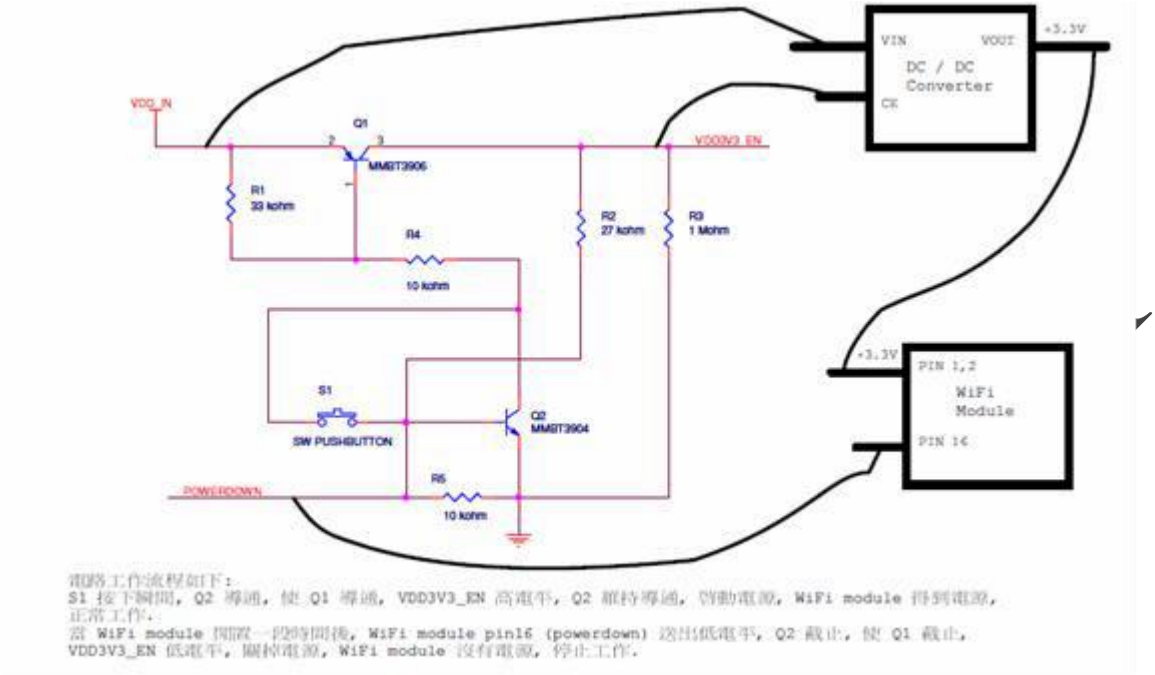
  802.11n 20MHz/40MHz ;
  802.11b/g

- USA, Canada (FCC):11 channels (2.412GHz~2.462GHz) Europe (CE): 13 channels (2.412GHz~2.472GHz) Japan (TELEC): 14 channels (2.412GHz~2.4835GHz)
- USB_20Mbps max. throughput
  5 GPIOs could be defined for various functions like
  USB LED/WLAN LED,

For example
(1) No Wifi : LED off
(2) Wifi Ready : LED off, but flash 1 sec per 3 sec
(3) User Connect: LED on always, (User link will have some traffic to

Make ittle LED flash)
(4) Wifi Traffic : LED flash (about 1 time/sec) like web page
surfing (5) WiFi Heavy Traffic : LED fast flash (about 10times/sec)

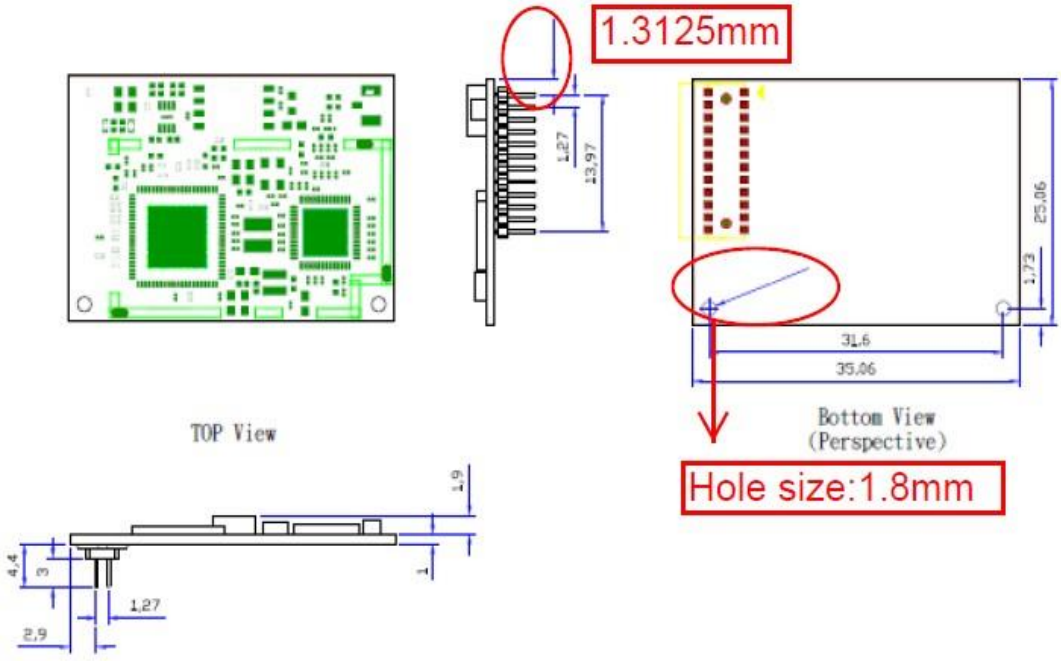
WiFi Idle power down mode — 3 min/5min/10min, need to use the following additional circuit to turn off 3.3V voltage of module for power saving, it depends on customer's SoC GPIO or push button to turn on 3.3V voltage of module again.



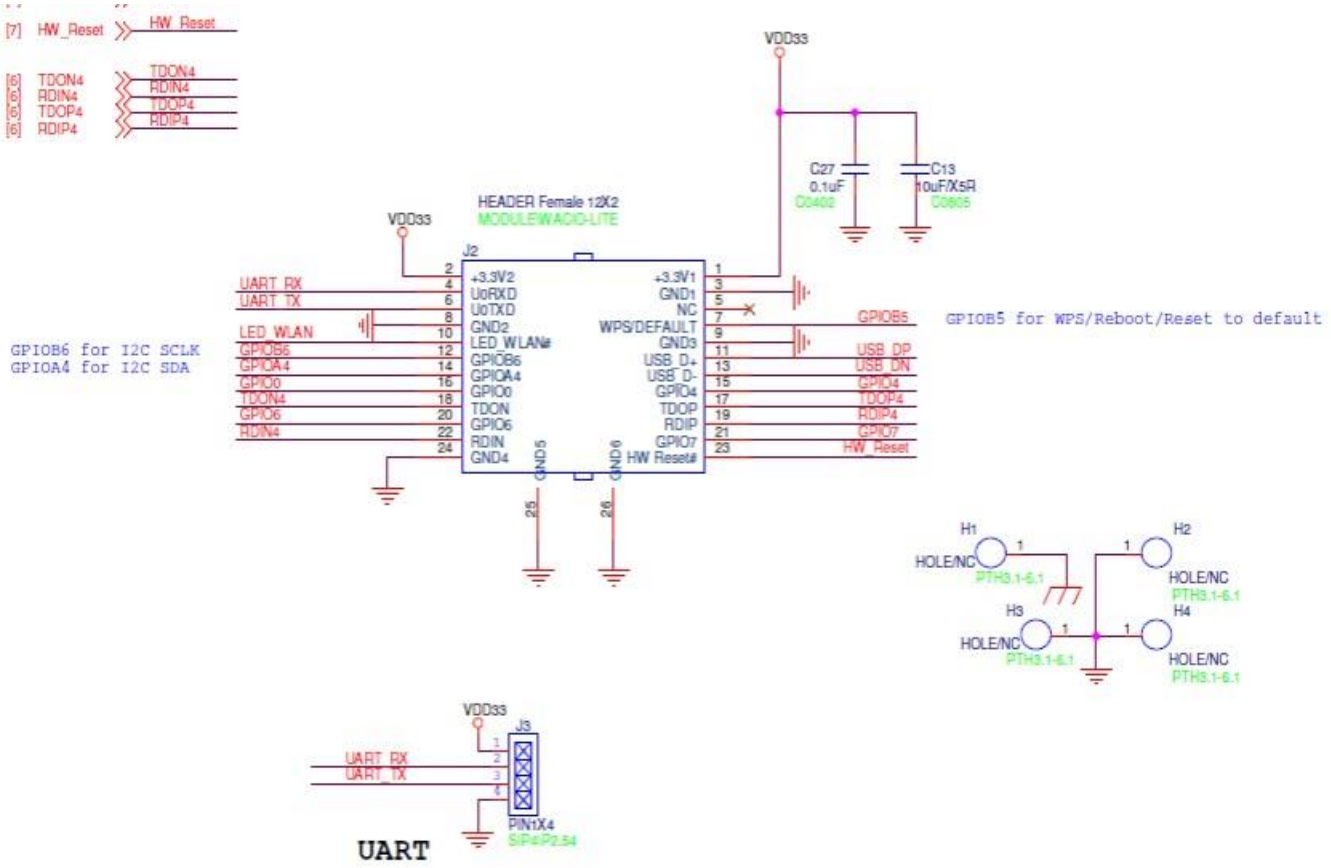
- UART Bridge function can use Canonical mode to send data line -by-line
  1)received data from Client Socket then send to UART directly
  2)received data from Server Socket then send to UART directly
  3)received data from UART then send to both Client and Server Socket

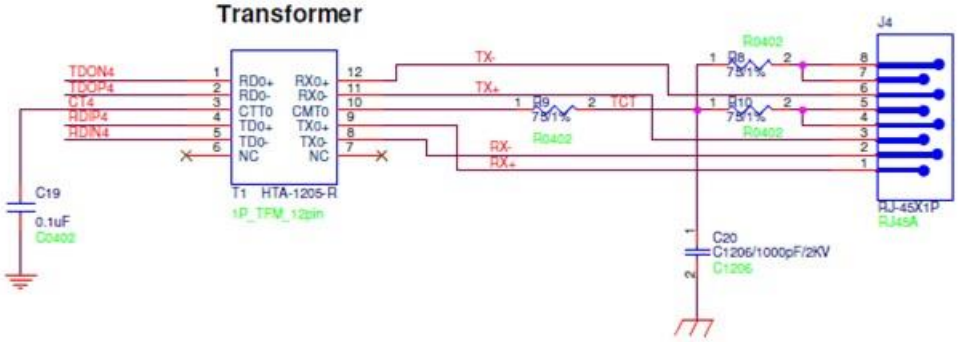
- I2C SCLK/ SDA can be used for NFC configuration of WiFi SSID/Password

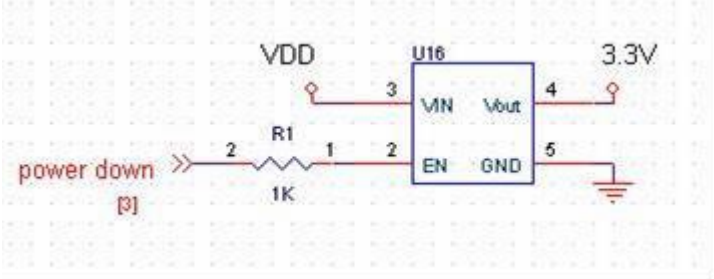
Application Circuit Reference :

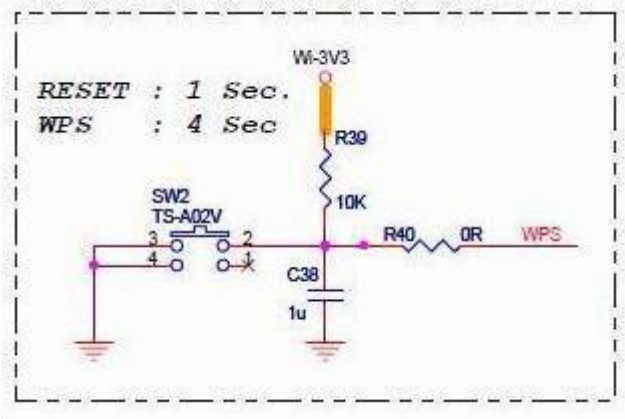


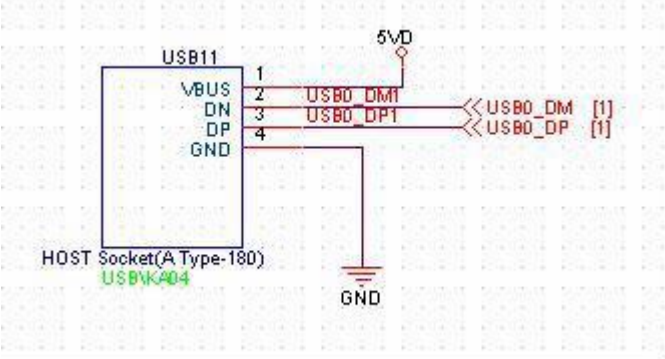
Host Board Photo


[7] HW_Reset
HW_Reset
[6] TDON4
[6] RDIN4
[6] TDOP4
[6] RDIP4
TDON4
RDIN4
TDOP4
RDIP4
VDD33
C27
0.1uF
C0402
C13
10uF/X5R
C0805
HEADER Female 12X2
MODULEWACIO-LITE
J2
UART_RX
UART_TX
LED_WLAN
GPIOB6
GPIOA4
GPIO0
TDON
GPIO6
RDIN
GND4
+3.3V2
U0RXD
U0TXD
GND2
LED_WLAN#
GPIOB6
GPIOA4
GPIO0
TDON
GPIO6
RDIN
GND4
+3.3V1
GND1
NC
WPS/DEFAULT
GND3
USB_D+
USB_D-
GPIO4
TDOP
RDIP
GPIO7
HW_Reset#
GPIOB5
USB_DP
USB_DN
GPIO4
TDOP4
RDIP4
GPIO7
HW_Reset
GND5
GND6
25
26
GPIOB6 for I2C SCLK
GPIOA4 for I2C SDA
GPIOB5 for WPS/Reboot/Reset to default
H1
HOLE/NC
PTH3.1-6.1
H2
HOLE/NC
PTH3.1-6.1
H3
HOLE/NC
PTH3.1-6.1
H4
HOLE/NC
PTH3.1-6.1
VDD33
J3
UART_RX
UART_TX
PIN1X4
SIP4/P2.54
UART


Ethernet
Transformer
J4
TDON4
TDOP4
CT4
RDIP4
RDIN4
RD0+
RD0-
CTT0
TD0+
TD0-
NC
RX0+
RX0-
CMT0
TX0+
TX0-
NC
T1 HTA-1205-R
1P_TFM_12pin
TX-
TX+
RX-
RX+
TCT
R9
75/1%
R0402
R8
75/1%
R0402
R10
75/1%
R0402
C19
0.1uF
C0402
C20
C1206/1000pF/2KV
C1206
RJ-45X1P
RJ45A


VDD
U16
3.3V
VIN
Vout
EN
GND
R1
1K
power down
[3]





Normal 24-Pin Definition

I/O Direction	Pin Name	Pin	Pin	Pin Name	I/O Direction
P	3.3V	2	1	3.3V	P
AI	UART RX_15th	4	3	GND	G
AO	UART TX_14th	6	5	NC	
G	GND	8	7	GPIOB5 (WPS/Reboot/Default)_7th	I/O
O	GPIO5 (LED_WLAN#)_42th	10	9	GND	G
I/O	GPIOB6	12	11	USB_DP_80th	AI/O
I/O	GPIOA4_16th	14	13	USB_DN_81th	AI/O
I/O	GPIO0_45th	16	15	GPIO4_44th	I/O
AI/O	ETH_TDON4_20th	18	17	ETH_TDOP4_19th	AI/O

I/O	GPIO6	20	19	ETH_RDIP4_22th	AI/O
AI/O	ETH_RDIN4_23th	22	21	GPIO7 (CTS Relay)	I/O
G	GND	24	23	NC	

Pin -12 could be defined as I2C/SCLK
Pin -14 could be defined as I2C/SDA

HomeKit 24-Pin Definition

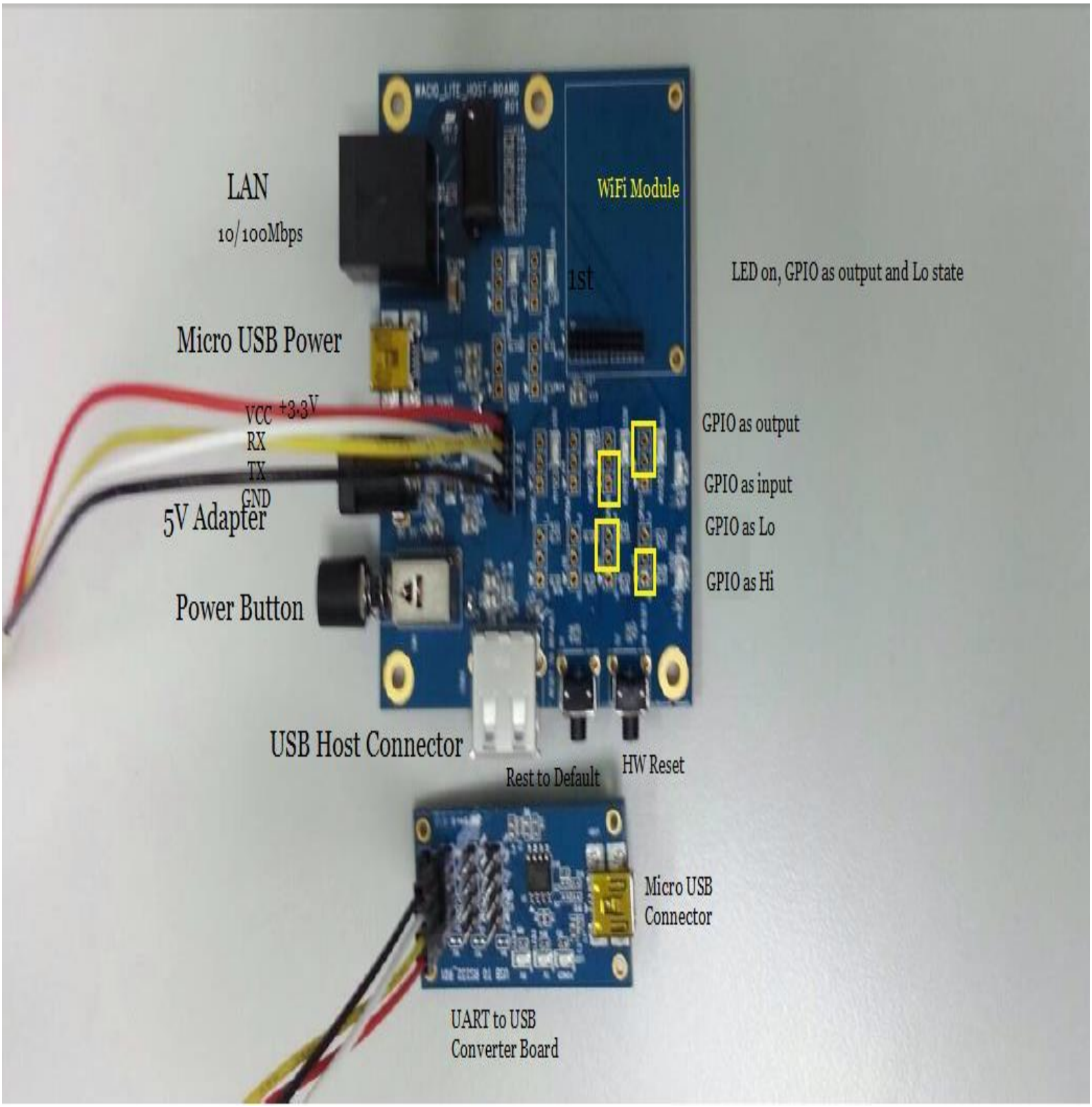
I/O Direction	Pin Name	Pin	Pin	Pin Name	I/O Direction
P	3.3V	2	1	3.3V	P
AI	UART RX_15th	4	3	GND	G
AO	UART TX_14th	6	5	NC	
G	GND	8	7	GPIOB5 (WPS/Reboot/Default)_7th	I/O
O	GPIO5 (LED_WLAN#)_42th	10	9	GND	G
I/O	NC (Apple CP)	12	11	USB_DP_80th	AI/O
I/O	NC (Apple CP)	14	13	USB_DN_81th	AI/O
I/O	GPIO0_45th	16	15	GPIO4_44th	I/O
AI/O	ETH_TDON4_20th	18	17	ETH_TDOP4_19th	AI/O
I/O	GPIO6	20	19	ETH_RDIP4_22th	AI/O
AI/O	ETH_RDIN4_23th	22	21	GPIO7 (CTS Relay)	I/O
G	GND	24	23	NC	

NOTE: Type symbol definition:

I: Input
O: Output
I/O (low active): Bi-Directional Input/Output
P: Digital Power

AI: Analog Input
AO: Analog Output
AI/O: Analog Bi-Directional Input/Output
G: Digital Ground

Product Dimension and Drawing


LAN
10/100Mbps
WiFi Module
1st
LED on, GPIO as output and Lo state
Micro USB Power
VCC +3.3V
RX
TX
GND
5V Adapter
GPIO as output
GPIO as input
GPIO as Lo
GPIO as Hi
Power Button
USB Host Connector
Rest to Default
HW Reset
Micro USB
Connector
UART to USB
Converter Board