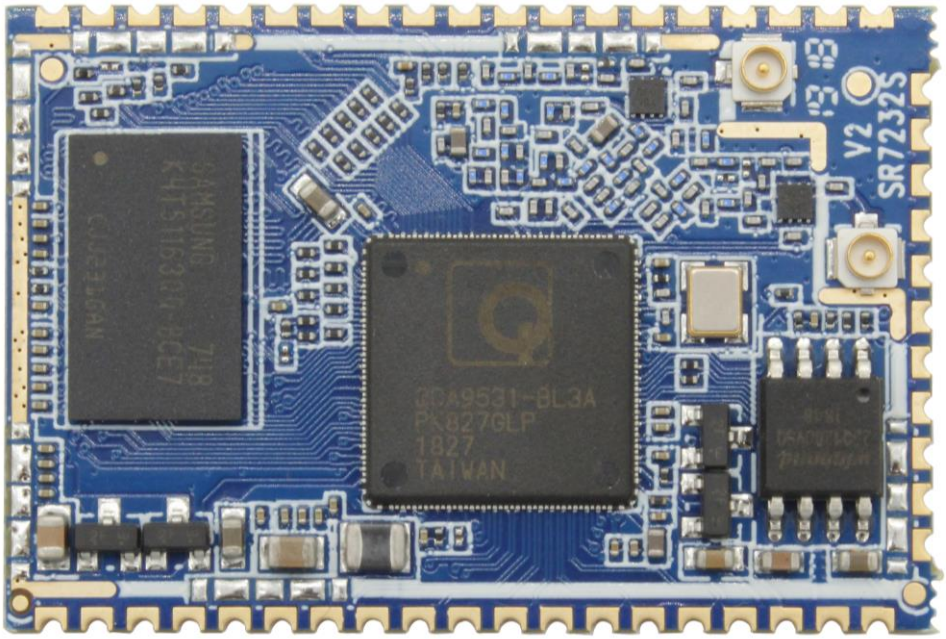
COMIOT 06

802.11b/g/n Wireless Router Core Module



Product Specification

VERSION 1.0

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1. Introduction

The ComIoT-06 module is a complete small form factor 802.11 b/g/n Wi-Fi solution that optimized for low-cost, low power, highly integrated AP or consumer electronic devices. This module is also a highly integrated small 802.11 b/g/ n Wi-Fi gateway module. ComIoT-06 module integrates Wi-Fi function, network port, serial port, USB and routing system in one package. Only a few simple external circuits are required to apply the module perfectly.

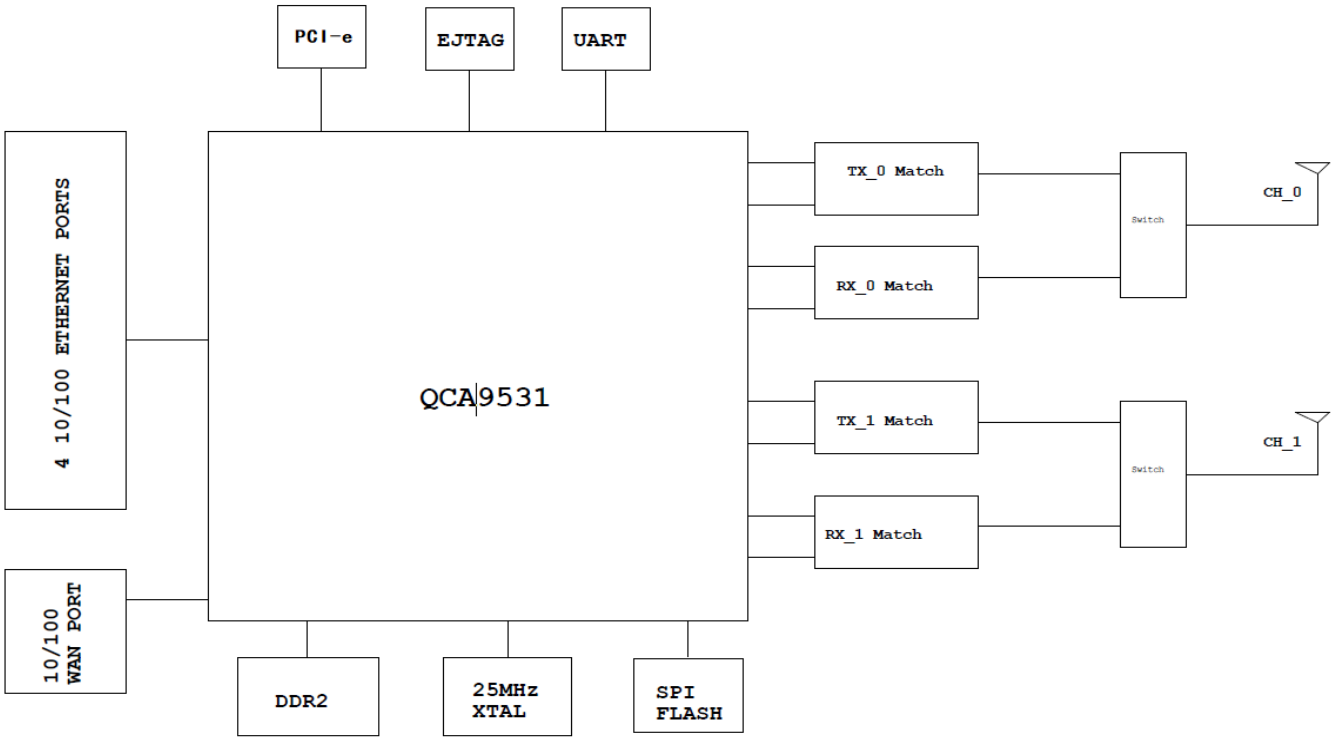
This module is based on a single chip QCA9531, which integrates 802.11n 2x2 MAC/BB/radio with internal PA and LNA. It supports 802.11n wireless standard operation up to 150Mbps in the 20MHz channel bandwidth and 300Mbps in the 40MHz channel bandwidth. The Wi-Fi is downward compatible IEEE 802.11b/g wireless standard and data rate.

The module supports AP mode and client mode at the same time, including massive service application software that to reduce research and design work of customer.

2. Hardware Overview

2.1 Block Diagram

The block diagram of the COMIOT 06 is shown in below diagram.



2.2 Hardware Features

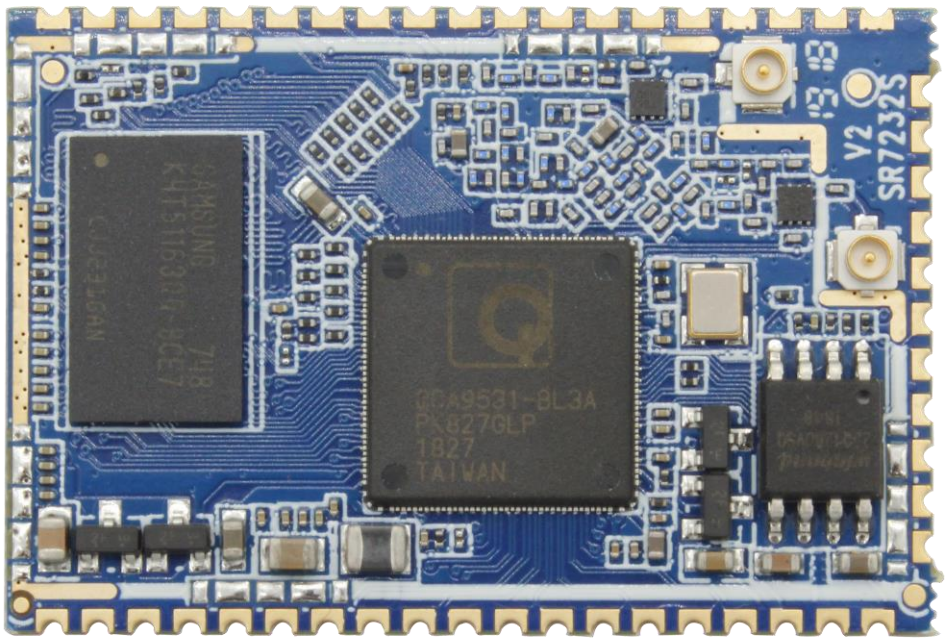
- The MIPS R24k supports 64KByte I-Cache and 32Kbyte D-Cache, targeted to operate at up to 550MHz.
- DD2 memory up to 1Gbit.(128MB)
- SPI NOR Flash memory up to 256Mbit. (32MB)
- 4 LAN ports and 1 WAN port.
- PCI Express Root complex
- High-speed UART for console support.
- USB 2.0 host/device mode support.
- GPIO/LED support.

2.3 Hardware Specification

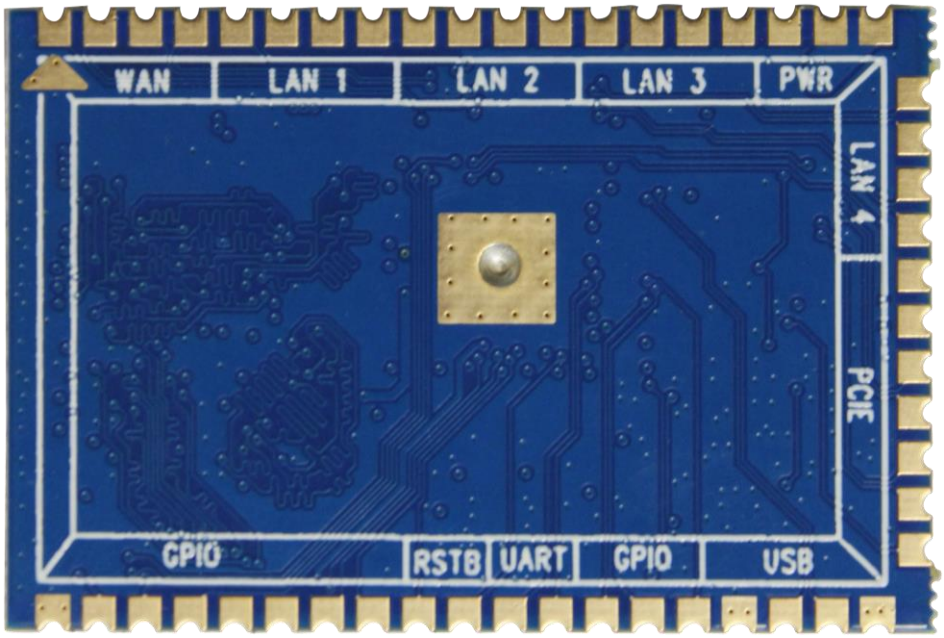
Item	**Description**
Chipset	Qualcomm QCA9531
Wi-Fi Frequency	2.40~2.4835GHz
Wi-Fi Standard	IEEE 802.11b/g/n (2x2)
Wi-Fi Modulation	11b: DBPSK, DQPSK, CCK, DSSS 11g: BPSK, QPSK, 16QAM, 64QAM, OFDM 11n: MCS0~15 OFDM
Wi-Fi Data Rate	11b: 1, 2, 5.5, 11Mbps 11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps 11n: MCS0~5, up to 300Mbps
Form Factor	LCC
Main Interface	Ethernet x 5, UART x 1, USB x 1, PCIE x 1
PCB Layer	4 Layer
Dimension	40.5mm (W) x 27.5mm (L) x 1.0 (H)
Antenna Connector	Standard IPEX
Operating Temperature	-10°C to +70°C
Storage Temperature	-40°C to +150°C
Operation Voltage	3.3V +/-10%
Power Consumption	1.5W Average
GPIO Voltage	2.5V +/-10%

2.4 Physical Product View

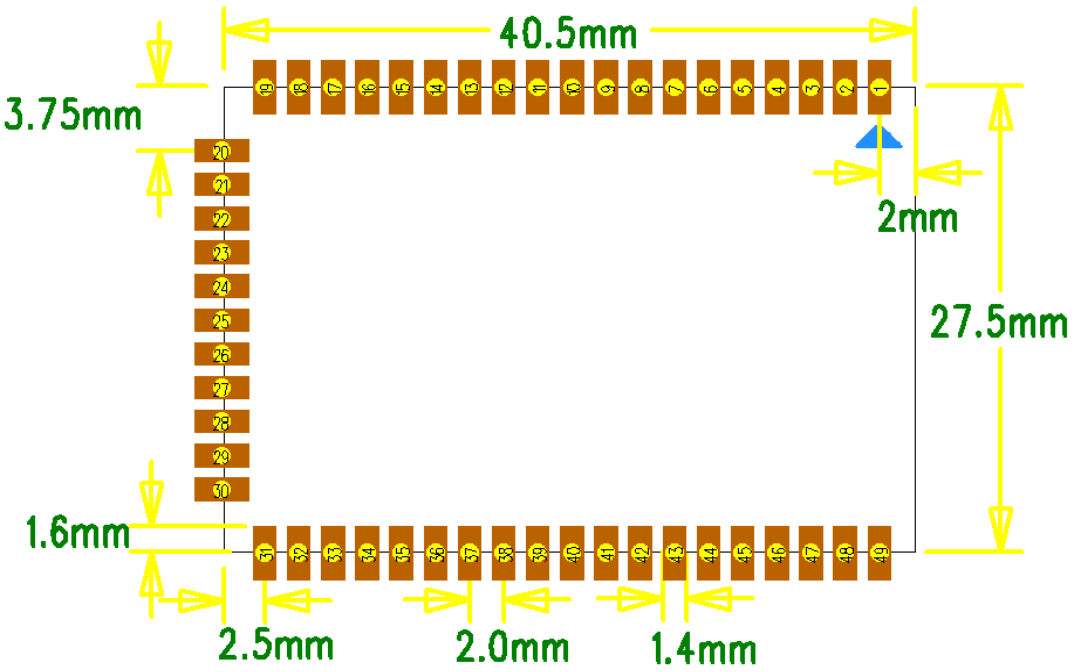
Top View



Bottom View



2.5 Physical Dimensions



2.6 Pin Assignments

Pin No.	Symbol	Status	Pin Description	
1	WAN_RX+	IA	Ethernet port	WAN
2	WAN_RX-	IA	Ethernet port	
3	WAN_TX+	OA	Ethernet port	
4	WAN_TX-	OA	Ethernet port	
5	LAN_P0_TX+	OA	Ethernet port	LAN1
6	LAN_P0_TX-	OA	Ethernet port	
7	LAN_P0_RX+	IA	Ethernet port	
8	LAN_P0_RX-	IA	Ethernet port	
9	LAN_P1_RX+	IA	Ethernet port	LAN2
10	LAN_P1_RX-	IA	Ethernet port	
11	LAN_P1_TX+	OA	Ethernet port	
12	LAN_P1_TX-	OA	Ethernet port	
13	LAN_P2_TX+	OA	Ethernet port	LAN3

14	LAN_P2_TX-	OA	Ethernet port	LAN3
15	LAN_P2_RX+	IA	Ethernet port	LAN3
16	LAN_P2_RX-	IA	Ethernet port	LAN3
17	VDD2.0_OUT	P	Power Supply Output for Peripheral Network Transformer	
18	DC 3.3V	P	3.3V Input 1000mA, Recommended Voltage 3.3V, Min 2.97V, Max. 3.63V	
19	DC 3.3V	P		
20	LAN_P3_RX+	IA	Ethernet port	LAN4 / NC (Can be left open if not used)
21	LAN_P3_RX-	IA	Ethernet port	
22	LAN_P3_TX+	OA	Ethernet port	
23	LAN_P3_TX-	OA	Ethernet port	
24	PCIE0_TX_N	OA	Differential transmit.	PCI-E / NC (Can be left open if not used)
25	PCIE0_TX_P	OA		
26	PCIE0_RX_P	IA	Differential receive.	
27	PCIE0_RX_N	IA		
28	PCIE0_CLK_P	OA	Differential reference clock (100Mhz).	
29	PCIE0_CLK_N	OA		
30	PCIE0_RST_L	OD	PCI Express reset, open drain, should be pulled up to vdd33 through 1k resistor.	
31	GND	P	Ground	
32	USB_DM	IA/OA	USB signal, carries USB data to and from the USB 2.0 PHY	
33	USB_DP	IA/OA		
34	GND	P	Ground	
35	GPIO_11	I/O	LAN_PORT0_LED	
36	GPIO_12	I/O	2.4G_wifi_LED	
37	GPIO_13	I/O	SYSTEM_LED	
38	UART_RX	I	Serial data in	
39	UART_TX	O	Serial data out	
40	RESET	IH	External power on reset, it has an internal 10 K pull up resistance, the external pull low effective.	
41	GPIO_14	I/O	LAN_PORT1_LED	
42	GPIO_15	I/O	LAN_PORT2_LED	
43	GPIO_16	I/O	LAN_PORT3_LED	

44	GPIO_17	I/O	JUMPSTART
45	VDD2.5_OUT	P	I/O Voltage Output
46	GPIO_2	I/O	GPIO
47	GPIO_1	I/O	GPIO
48	GPIO_4	I/O	LED7/WAN LED, do not pull up.
49	GND	P	Ground

3. Electrical Specification

3.1 Recommended Operating Rating

	Symbol	Min	Typical	Max	Unit
DC supply voltage	3.3V	3.0	3.3	3.6	V
Operating Temperature	/	-10	25	70	Degree °C

3.2 DC Characteristics

Symbol	Parameter	Min	Typical	Max	Unit
3.3V	Standby	--	5	--	mA
	Tx Current (Dual Chain)	--	950	--	mA
	Rx Current (Dual Chain)	--	420	--	mA

3.3 Environments

Environment Condition	
Temperature	Operating Temperature: -20°C ~ 70°C
	Storage Temperature: -10°C ~ 70°C
Humidity	Operating Humidity: 5% ~95% (Non-condensing)
	Storage Humidity: 5% ~95% (Non-condensing)

4. RF Specification

4.1 IEEE 802.11b

Feature	Description
WLAN Standard	IEEE 802.11b, Wi-Fi Compliant
Number of Channels	CH1~CH13 (DSSS/CCK)
Output Power	802.11b@1Mbps: 18dBm ± 1.5dB@EVM ≤ -10dB
	802.11b@2Mbps: 18dBm ± 1.5dB@EVM ≤ -10dB
	802.11b@5.5Mbps: 18dBm ± 1.5dB@EVM ≤ -10dB
	802.11b@11Mbps: 18dBm ± 1.5dB@EVM ≤ -10dB
Receive Sensitivity (PER ≤ 8%)	802.11b@1Mbps: PER @ -93dBm, Typical
	802.11b@2Mbps: PER @ -93dBm, Typical
	802.11b@5.5Mbps: PER @ -91dBm, Typical
	802.11b@11Mbps: PER @ -86dBm, Typical

4.2 IEEE 802.11g

Feature	Description
WLAN Standard	IEEE 802.11g, Wi-Fi Compliant
Number of Channels	CH1~CH13 (OFDM)
Output Power	802.11g@6Mbps: 17dBm ± 1.5dB@EVM ≤ -5dB
	802.11g@9Mbps: 17dBm ± 1.5dB@EVM ≤ -8dB
	802.11g@12Mbps: 17dBm ± 1.5dB@EVM ≤ -10dB
	802.11g@18Mbps: 17dBm ± 1.5dB@EVM ≤ -13dB
	802.11g@24Mbps: 17dBm ± 1.5dB@EVM ≤ -16dB

	802.11g@36Mbps: 16dBm ± 1.5dB@EVM ⩽ -19dB
	802.11g@48Mbps: 14dBm ± 1.5dB@EVM ⩽ -22dB
	802.11g@54Mbps: 14dBm ± 1.5dB@EVM ⩽ -25dB
Receive Sensitivity (PER ≤ 8%)	802.11g@6Mbps: PER @ -90dBm, Typical
	802.11g@9Mbps: PER @ -89dBm, Typical
	802.11g@12Mbps: PER @ -88dBm, Typical
	802.11g@18Mbps: PER @ -87dBm, Typical
	802.11g@24Mbps: PER @ -86dBm, Typical
	802.11g@36Mbps: PER @ -83dBm, Typical
	802.11g@48Mbps: PER @ -75dBm, Typical
	802.11g@54Mbps: PER @ -72dBm, Typical

4.3 IEEE 802.11n (HT20)

Feature	**Description**
WLAN Standard	IEEE 802.11n HT20, Wi-Fi Compliant
Number of Channels	CH1~CH13 (OFDM)
Output Power	802.11n@MCS0: 17dBm ± 1.5dB@EVM ⩽ -5dB
	802.11n@MCS1: 17dBm ± 1.5dB@EVM ⩽ -10dB
	802.11n@MCS2: 17dBm ± 1.5dB@EVM ⩽ -13dB
	802.11n@MCS3: 17dBm ± 1.5dB@EVM ⩽ -16dB
	802.11n@MCS4: 16dBm ± 1.5dB@EVM ⩽ -19dB
	802.11n@MCS5: 15dBm ± 1.5dB@EVM ⩽ -22dB
	802.11n@MCS6: 14dBm ± 1.5dB@EVM ⩽ -25dB
	802.11n@MCS7: 14dBm ± 1.5dB@EVM ⩽ -27dB
Receive Sensitivity (PER ≤ 8%)	802.11n@MCS0: PER @ -90dBm, Typical
	802.11n@MCS1: PER @ -88dBm, Typical
	802.11n@MCS2: PER @ -86dBm, Typical
	802.11n@MCS3: PER @ -82dBm, Typical
	802.11n@MCS4: PER @ -79dBm, Typical
	802.11n@MCS5: PER @ -75dBm, Typical
	802.11n@MCS6: PER @ -73dBm, Typical
	802.11n@MCS7: PER @ -70dBm, Typical

4.4 IEEE 802.11n (HT40)

Feature	Description
WLAN Standard	IEEE 802.11n HT40, Wi-Fi Compliant
Number of Channels	CH3~CH11 (OFDM)
Output Power	802.11n@MCS0: 16dBm ± 1.5dB@EVM ⩽ -5dB
	802.11n@MCS1: 16dBm ± 1.5dB@EVM ⩽ -10dB
	802.11n@MCS2: 16dBm ± 1.5dB@EVM ⩽ -13dB
	802.11n@MCS3: 16dBm ± 1.5dB@EVM ⩽ -16dB
	802.11n@MCS4: 15dBm ± 1.5dB@EVM ⩽ -19dB
	802.11n@MCS5: 14dBm ± 1.5dB@EVM ⩽ -22dB
	802.11n@MCS6: 13dBm ± 1.5dB@EVM ⩽ -25dB
	802.11n@MCS7: 13dBm ± 1.5dB@EVM ⩽ -27dB
Receive Sensitivity (PER ≤ 8%)	802.11n@MCS0: PER @ -88dBm, Typical
	802.11n@MCS1: PER @ -85dBm, Typical
	802.11n@MCS2: PER @ -83dBm, Typical
	802.11n@MCS3: PER @ -80dBm, Typical
	802.11n@MCS4: PER @ -75dBm, Typical
	802.11n@MCS5: PER @ -72dBm, Typical
	802.11n@MCS6: PER @ -70dBm, Typical
	802.11n@MCS7: PER @ -68dBm, Typical