Datasheet
IGX QCA9378
Hardware Module - IGX-UACB1-9378a6-BT

Intelligraphics
Intelligent Connected Secure

IGX-UACB1-9378a6-BT

»» 802.11ac Dual Band
2Tx2R Wi-Fi + Bluetooth v4.1
Combo USB Stamp Module

This module is an 802.11 ac/a/b/g/n dual-band 2×2 WiFi and Bluetooth (BT) combo USB stamp module designed for devices, which require high throughput and lower-power consumption. It's a highly integrated module that supports 2-stream 802.11ac/a/b/g/n MIMO technology with data rate from MCS 0-15 in 20/40/80MHz channels and BT v4.1LE.

KEY FEATURES

- IEEE Standards Support, 802.11a, 802.11b, 802.11g, 802.11n, and 802.11ac.
- Supports channel widths 20/40MHz at 2.4GHz and 20/40/80MHz at 5GHz.
- Supports USB interface for WLAN and BT.
- Supports BT v4.1LE system.
- Backwards compatible with BT versions of 1.1, 1.2, 2.0, 2.1, 3.0+HS and 4.0LE.
- Supports Class 1 or Class 2 BT transmitter operation.
- Dual-stream 802.11n support for 20 and 40MHz channels provide the PHY layer rates up to 300Mbps.
- Dual-stream IEEE 802.11ac support for 80MHz channels provide the PHY layer rates up to 867Mbps.
- Supports Wi-Fi Direct for Linux and Android OS.
- Supports MU-MIMO.
- Fully compliance with the USB v2.0 specification.
- Supporting OS: **Windows 7, Linux, Android**
- Supports Wake on WLAN and BT function.
- Advanced coexistence mechanism between Wi-Fi and BT ensures that the best possible wireless experience, maximum performance, and lowest power consumption.
- Two I-PEX connectors for external antenna enable the highest design flexibility.
- Individual power calibration ensures high performance and stable quality.
- The RoHS and REACH compliances meet the environment-friendly requirements.

INTERFACE AND POWER SUPPLY

- 14 pins I/O stamp module
- WLAN/BT RF interface
- USB interface (USB 2.0 for WLAN, and USB 1.1 for BT)
- 3.3V/1.5A power supply required

SPECIFICATIONS

1. Software Specification

Standards	IEEE 802.11ac; 802.11a; 802.11b; 802.11g; 802.11n; 802.11h, WMM, DFS & TPC
Driver Support	**Windows 7/8/8.1/10, Linux, Android**
Security	64/128-bits WEP, WPA, WPA2, IEEE 802.1x, EAP-FAST, PEAPv1/EAP-GTC, PEAPv0/EAP-MSCHAPv2, PEAP-TLS, LEAP, EAP-TLS, EAP-TTLS

2. Wi-Fi Portion

Main Chipset	QCA QCA9378-7
TX/RX	2T2R
Frequency Range	2.400 ~ 2.497GHz, 5.15 ~ 5.85GHz
Modulation Technique	**802.11a/b/g:** DSSS (DBPSK, DQPSK, CCK) OFDM (BPSK, QPSK, 16-QAM, 64-QAM) DSSS (Direct Sequence Spread Spectrum) with DBPSK (Differential Binary Phase Shift Keying 1Mbps), DQPSK (Differential Quaternary Phase Shift Keying 2Mbps), and CCK (Complementary Code Keying 5.5 &11Mbps), and OFDM (Orthogonal Frequency Division Multiplexing with BPSK for 6, 9Mbps, QPSK for 12, 18Mbps, 16QAM for 24, 36Mbps, 64QAM for 48, 54Mbps) **802.11n a/g:** OFDM (BPSK, QPSK, 16-QAM, 64-QAM)

	802.11ac: OFDM (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM)
Host Interface	USB 2.0
Operation Voltage	3.3V DC ± 5% (including voltage ripple)
Current consumption @3.3V, 25°C	

Mode	**Average**		**Peak**	
	2.4GHz	**5GHz**	**2.4GHz**	**5GHz**
WLAN Tx	850mA	1080mA	960mA	1260mA
WLAN Rx	160mA	160mA	280mA	280mA
Driver disable	110mA		220mA	
Standby WLAN+BT	100mA		200mA	

*WLAN Tx/Rx means continuous Tx/Rx

**Current consumption, measured on PC platform.

The maximum power-on inrush current consumption is 1.5A within 10us.

Output Power (for each chain; tolerance +1.5/-1.5 dB)

802.11a:

Test Frequencies	**6-12_ Target**	**18_ Target**	**24_ Target**	**36_ Target**	**48_ Target**	**54_ Target**
5180	14	14	14	13	12	12
5320	14	14	14	13	12	12
5500	14	14	14	13	12	12
5600	14	14	14	13	12	12
5700	14	14	14	13	12	12
5825	14	14	14	13	12	12

802.11b:

Test Frequencies	**1/2_ Target**	**5.5_ Target**	**11_ Target**
2412	15	15	15
2442	15	15	15
2472	15	15	15

802.11g:

Test Frequencies	6-12_ Target	18_ Target	24_ Target	36_ Target	48_ Target	54_ Target
2412	14	14	14	14	14	14
2442	14	14	14	14	14	14
2472	14	14	14	14	14	14

802.11n / Frequency Range (HT20):

Test Frequencies	MCS 0/8	MCS 1/9	MCS 2/10	MCS 3/11	MCS 4/12	MCS 5/13	MCS 6/14	MCS 7/15
5180	11	11	11	11	11	11	11	11
5240	11	11	11	11	11	11	11	11
5320	11	11	11	11	11	11	11	11
5500	11	11	11	11	11	11	11	11
5700	11	11	11	11	11	11	11	11
5745	11	11	11	11	11	11	11	11
5825	11	11	11	11	11	11	11	11

802.11n / Frequency Range (HT40):

Test Frequencies	MCS 0/8	MCS 1/9	MCS 2/10	MCS 3/11	MCS 4/12	MCS 5/13	MCS 6/14	MCS 7/15
5190	11	11	11	11	11	11	11	11
5230	11	11	11	11	11	11	11	11
5270	11	11	11	11	11	11	11	11
5510	11	11	11	11	11	11	11	11
5670	11	11	11	11	11	11	11	11
5755	11	11	11	11	11	11	11	11
5795	11	11	11	11	11	11	11	11

802.11n / Frequency Range (HT20):

Test Frequencies	MCS 0/8	MCS 1/9	MCS 2/10	MCS 3/11	MCS 4/12	MCS 5/13	MCS 6/14	MCS 7/15
2412	14	14	14	14	14	14	14	14
2447	14	14	14	14	14	14	14	14
2472	14	14	14	14	14	14	14	14

802.11n / Frequency Range (HT40):

Test Frequencies	MCS 0/8	MCS 1/9	MCS 2/10	MCS 3/11	MCS 4/12	MCS 5/13	MCS 6/14	MCS 7/15
2422	14	14	14	14	14	14	14	14
2447	14	14	14	14	14	14	14	14
2462	14	14	14	14	14	14	14	14

802.11ac / Frequency Range (HT80):

Test Frequencies	MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8	MCS 9
5210	8	8	8	8	8	8	8	8	7	7
5290	8	8	8	8	8	8	8	8	7	7
5530	8	8	8	8	8	8	8	8	7	7
5610	8	8	8	8	8	8	8	8	7	7
5690	8	8	8	8	8	8	8	8	7	7
5775	8	8	8	8	8	8	8	8	7	7

Dimension (mm)	27 x 25 x 3.8 (± 0.2)
Security	WEP, WPA, WPA2, AES, TKIP
Operation Temperature	-10 ~ 60°C (ambient) Note: Customer is highly recommended to conduct thermal verification if the module mainly acts on high-duty transmission (Tx) on the small mainboard with an ambient temperature near to 60°C.
Storage Temperature	-35 ~ 70°C ,R.H:90%
RF port	2 RF connector for external antenna (ANT-0 and ANT1)
PID/VID	**PID:** 9378 **VID:** 0CF3
Regulation Compliance	FCC, IC, others by request
Health & Environment-Friendly	RoHS, REACH

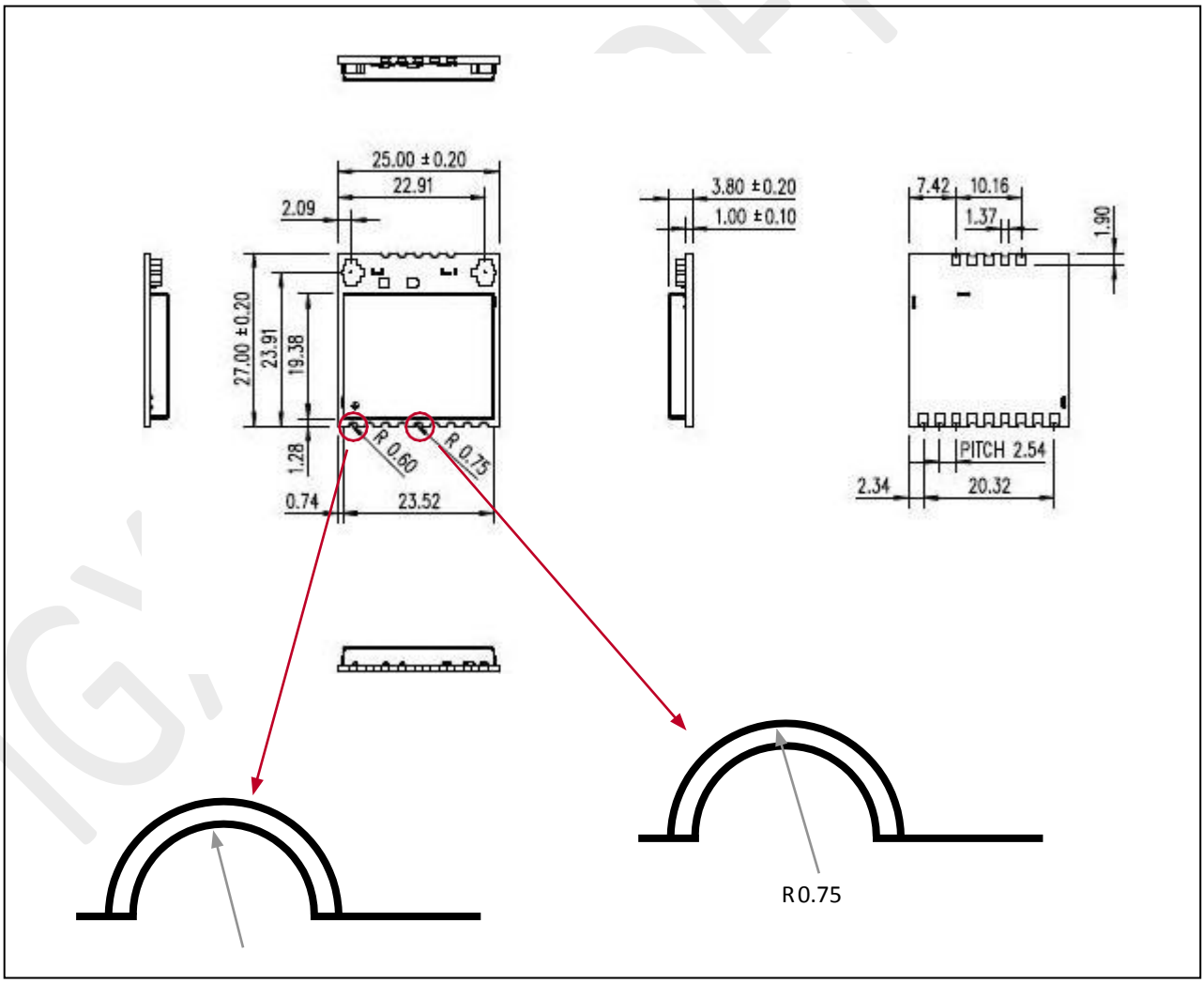
3. Bluetooth Portion:

<table>
<tr><td>Main chipset</td><td>QCA QCA9378-7</td></tr>
<tr><td>Compliance</td><td>BT v4.1LE</td></tr>
<tr><td>Frequency Range</td><td>2402 ~ 2480MHz</td></tr>
<tr><td>Initial Carrier Frequency Tolerance</td><td>± 20kHz (typical)</td></tr>
<tr><td>Modulation Technique</td><td>Frequency hopping, 1600 hops/sec</td></tr>
<tr><td>Channel Spacing</td><td>1MHz</td></tr>
<tr><td>Channels Support</td><td>79 channels for Bluetooth, 40 channels for BLE</td></tr>
<tr><td>Operation Voltage</td><td>3.3V ± 5% (including voltage ripple)</td></tr>
<tr><td>Current consumption @3.3V, 25°C</td><td>
<table>
<tr><th></th><th>Avg. (mA)</th><th>Max. (mA)</th></tr>
<tr><td>Idle mode</td><td>160</td><td>310</td></tr>
<tr><td>Continuous DH5 TX</td><td>220</td><td>370</td></tr>
<tr><td>Continuous 2DH5 TX</td><td>220</td><td>370</td></tr>
<tr><td>Continuous 3DH5 TX</td><td>220</td><td>370</td></tr>
</table>
*Measured on PC platform.
</td></tr>
<tr><td>Output power (dBm)</td><td>Class 1, BT output power is adjusted by FW.</td></tr>
<tr><td>Sensitivity</td><td>-80dBm (typ.) for pi/4-DQPSK, 0.1%BER</td></tr>
<tr><td>Operation Temperature</td><td>-10 ~ 60°C (ambient)

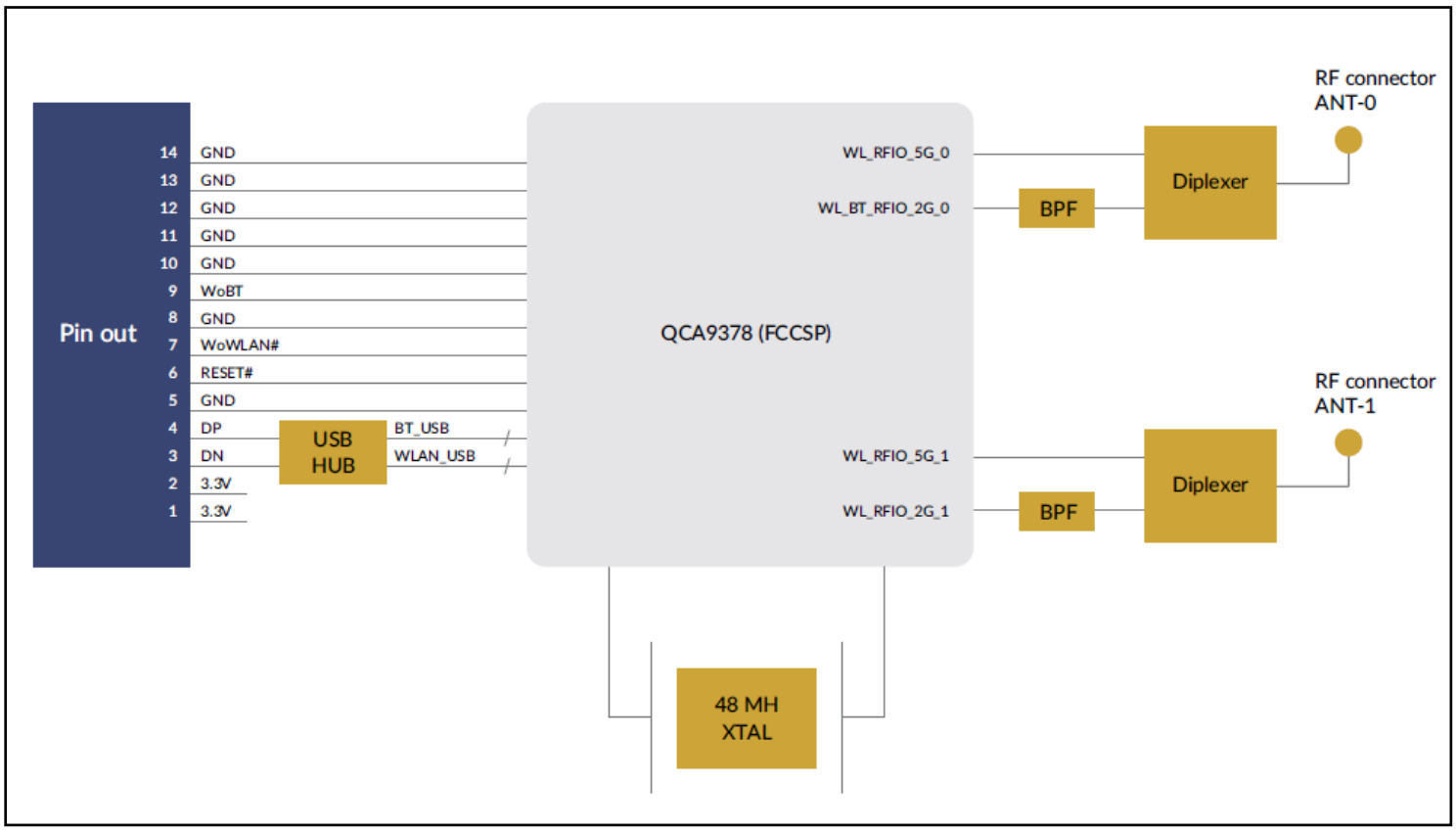
Note: Customer is highly recommended to conduct thermal verification if the module mainly acts on high-duty transmission (Tx) on the small mainboard with an ambient temperature near to 60°C.</td></tr>
<tr><td>Storage Temperature</td><td>-35 ~ 70°C , R.H. : 90%</td></tr>
</table>

RF port	1 RF connector (co-used with WLAN ANT-0) for external antenna
PID/VID	**PID:** 3004 **VID:** 0CF3
Regulation Compliance	FCC, IC, others by request
Health & Environment-Friendly	RoHS, REACH

OUTLINE



Block Diagram



Pin Assignment

Pin No.	Pin Name	Remark	I/O
1	+3.3V		I
2	+3.3V		I
3	USB_D-		I/O
4	USB_D+		I/O
5	GND		-
6	RESET#		I
7	WOWLAN#		O
8	GND		-
9	WOBT#		O
10	GND		-
11	GND		-
12	GND		-
13	GND		-
14	GND		-