GT1216 OEM Installation Manual

Version 1.0

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1. The RF module limited to OEM installation ONLY.

• The OEM integrator is responsible for the compliance to all the rules that apply to the product into which this certified

• RF module is integrated.

2. This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

3. This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

• This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

− Reorient or relocate the receiving antenna.

− Increase the separation between the equipment and receiver.

− I Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

− I Consult the dealer or an experienced radio/TV technician for help.

• FCC Caution

• Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. This transmitter must not be co−located or operating in conjunction with any other antenna or ransmitter.

• **FCC RF Exposure requirements**

• This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

• **This device is intended only for OEM integrators under the following conditions:**

• The antenna must be installed such that 20 cm is maintained between the antenna and users, and The transmitter module may not be co−located with any other transmitter or antenna. As long as 2 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end−product for any additional compliance requirements required with this module installed.

• **IMPORTANT NOTE:**

• In the event that these conditions cannot be met (for example certain laptop configurations or colocation with another   transmitter), then the FCC authorization is no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

• **End Product Labeling**

• This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following:
  "Contains FCC ID: **2ADF6GT1216**".

• The grantee's FCC ID can be used only when all FCC/ IC compliance requirements are met.

• **Manual Information To the End User**

• The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

• The end user manual shall include all required regulatory information/warning as show in this manual.

• **Operations in 2.412-2.472GHz band are for indoor use only.**

The module is limited to mobile installations

There is a requirement that the grantee provide guidance to the host manufacturer for compliance with Part 15B requirements.

Features：

- **Wireless Specification**
  - ♦ Standard supported: IEEE802.11b/g/n
  - ♦ Frequency: 2.412 to 2.484GHz
  - ♦ Channels: up to 13 channels
- **Performance Specification**
  - ♦ Host data rates
  - ♦ UART: 115200bps, 8, n, 1
  - ♦ SPI: up to 12 Mbps
  - ♦ Link rates up to 150MHz
- **Protocols**
  - ♦ Internet protocols: IPv4/IPv6, TCP/UDP, ARP/NDP, DHCPv4, ICMPv6
  - ♦ Security protocols：WPS, WPA, WPA2, WAPI, WEP, TKIP
- **Typical application**
  - ♦ Household appliances
  - ♦ Gaming consoles
  - ♦ Handheld terminals
  - ♦ Embedded wireless products
  - ♦ security monitoring device
  - ♦ industrial remote control
  - ♦ Home automation

The GT1216 module contains a Qualcomm® QCA4004 chip. The QCA4004 is a single chip system on a chip (SoC) 1x1 802.11 b/g/n device optimized for low-power embedded applications with single-stream capability for both Tx and Rx.

The QCA4004 includes a TCP/IP and UDP offload capability. This capability can reduce Flash requirements on a host MCU by up to 100 KBytes and also free up CPU cycles. The IP stack is a simultaneous IPv4/IPv6 stack with a BSD-like interface to simplify porting and integration with common embedded operating systems. The supported features of the QCA4004 (support for DHCP, multicast, and ARP) include:

- ARP
- Forwarding
- Fragmentation/reassembly (supported with limitation)
- IPv4/v6 header processing
- UDP/TCP socket support
- DHCP v4
- Neighbor discovery
- Broadcast/multicast
- Path MTU discovery
- Address auto-configuration
- Multicast

- TCP zero-copy feature

GT1216 provides integrated power management and control functions and extremely low power operation for maximum battery life across all operational states.

- Transmit: 250 mA @16dBm;
- Receive: 75 mA (typical)
- Power saving mode: 1.09 mA(DTIM=1)
- Standby mode(Sleep): 130uA

Sleep state minimizes power consumption while network services are not required, yet the system needs to remain available for use within a short time.

- IEEE 802.11b/g/n, single stream 1x1
- Single-band 2.4 GHz
- Integrated PA, LNA, with support for external PA and external LNA
- Green Tx power saving mode
- Low power listen mode
- Two-layer PCB design
- Link rates up to 150 Mbps

Standard & Certifications:

- CE
- FCC
- ROHS compliant

Specification

Standards	2009 IEEE 802.11 b/g/n		
Antenna U.FL	1 x Ipex Connectors		
RF connector impedance	50 ohm		
Operating Frequency	802.11b/g/n :2.412 to 2.484GHz		
Output Power (Per Antenna @ -25dB EVM)	802.11b	11	18±3
	802.11g	6	18±3
		54	14±3
	802.11n	6.5	18±3
		135	13±3
Receive Sensitivity (PER <10%)	Symbol	Rate/Mbps	IEEE limited/dbm	Typical Sensitivity/dbm
	802.11 b	11	-76	-86
	802.11g	6	-82	-85
		54	-65	-68
	802.11n	6.5	-82	-85
		135	-61	-64
Power Supply			
Input Voltage / Average Power	3.3V / 0.3W		
Environmental			
Output Power (Per Antenna @ -25dB EVM)	Temperature	Humidity	
	-40 ~ 85	5% to 90% Non-Condensing	
Dimensions			
Dimensions(PCBA)	18mm x 26 mm		
Manufacturing compliant	Lead-free RoHS		

Mechanical Specification
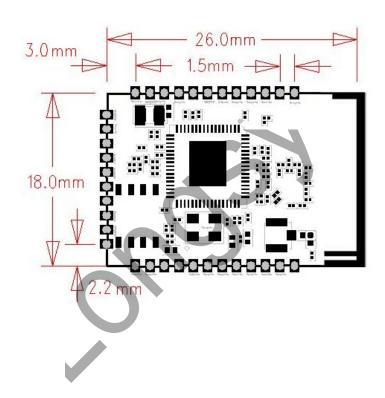
PCB Dimension:

- Size: 26 x 18 x 2.5 mm (height is 3.6mm when a coax cable is plugged into the u.FL connector)
- Operating voltage: 3.3 V ± 10%
- Operating humidity: 20-70%
- Operating temperature range:
  - Industrial: -40°C ~ +85°C
  - Commercial: -10°C ~ +65°C

Pin Out Definitions

Signal Name	Pin	Description
USB_DP	14	USB device / manufacturing test and configuration
USB_DN	15	interface
CHIP_PWD#	18	Power down control signal; setting this pin low forces
WAKEUP	19	the module in to its lowest power state
TDO	2	GPIO with multiplexed functions.
TCK/I2C_CLK	3	
UART1_TXD/I2S0_BCK/TM	4	
UART1_RXD/I2S0_MCK/TMS	5	
UART0_CTS	6	
I2C_DATA/TDI	7	
SPI_CLK//I2S1_MCK	8	
UART0_RTS	9	
UART0_TXD	10	
SPI_INT/I2S1_SDO	11	
SPI_MISO/I2S1_WS/JTAG_EN	12	
SPI_MOSI/I2S1_BCK	13	
UART0_RXD/I2S1_SDI/HM0	16	
SPI_CS/HM1	17	
TRST	20	
GPIO16	21	
GND	1	Ground
	22	
	26	
	34	
VDD33	25	3.3V supply for whole module
NC	23	Leave for future
	24	
	27	
	28	
	29	

Signal Name	Pin	Description
	30	
	31	
	32	
	33	

	Bootstrap	Alt1	Alt2	Alt3	Alt4	Alt5
2	EN_LINEAR	GPIO13	GPIO13	GPIO13	GPIO13	TDO
3	-	I2C_CLK	I2C_CLK	12C_CLK	12C_CLK	TCK
4	TEST_MODE	UART1_TxD	UART1_TxD	I2S0_BCK	I2S0_BCK	GPIO11
5	-	UART1_RxD	UART1_RxD	I2S0_MCK	I2S0_MCK	TMS
6	-	UART0_CTS	UART0_CTS	GPIO9	GPIO9	GPIO9
7	-	I2C_DATA	I2C_DATA	I2C_DATA	I2C_DATA	TDI
8	-	SPI_CLK	SD_CLK	SPI_CLK	I2S1_MCK	SPI_CLK
9		UART0_RTS	UART0_RTS	GPIO8	GPIO8	GPIO8
10		UART0_TXD	UART0_TXD	GPIO7	GPIO7	GPIO7
11	-	SPI_INT	SD_DATA(1)	SPI_INT	I2S1_SDO	SPI_INT
12	EJTAG_SEL	SPI_MISO	SD_DATA(0)	SPI_MISO	I2S1_WS	SPI_MISO
13	-	SPI_MOSI	SD_DATA(3)	SPI_MOSI	I2S1_BCK	SPI_MOSI
16	HM0	UART0_RXD	SD_DATA(2)	GPIO2	I2S1_SDI	UART0_RXD
17	HM1	SPI_CS	SD_CMD	SPI_CS	GPIO0	SPI_CS
20	-	GPIO21	GPIO21	I2S0_WS	I2S0_WS	TRST
21		GPIO16	GPIO16	GPIO16	GPIO16	GPIO16

Antenna Spec

GT1216 module with a built-in printed antenna is an intelligent Internet of Everything platform which can be powered by alljoyn with low power wireless connectivity

GT1216's PCB antenna:

FREQ.   GAIN

2400   0.41dbi

2440   0.89dbi

2483.5   0.92 dbi

Shenzhen   Longsys Electronics Co.,Ltd   **www.Longsys.com**

8/F, 1 Building. Finance Base, NO.8, KeFa Road, Shenzhen, China   Tel: 86-755-86168848

10/F, CHINA AEROSPACE CENTRE,143 HOI BUN ROAD, HK   Tel: 852-23850111