

User Manual of AP6256

1. Introduction

- The AMPAK Technology® AP6256 is a fully Wi-Fi and Bluetooth functionalities module with seamless roaming capabilities and advance security, also it could interact with different vendors' 802.11a/b/g/n/ac 1x1 Access Points with SISO standard and can accomplish up to speed of 433.3Mbps with single stream in 802.11ac to connect the wireless LAN. Furthermore AP6256 included SDIO interface for Wi-Fi, UART/ PCM interface for Bluetooth. In addition, this compact module is a total solution for a combination of Wi-Fi + BT technologies. The module is specifically developed for tablet, OTT box and portable devices.

2. General Specification

2.1 General Specification

Model Name	AP6256
Product Description	1Tx/1Rx 802.11 ac/a/b/g/n Wi-Fi + BT 5.0 Module
Dimension	L x W: 12 x 12(Typ.)mm · H : 1.65 (Max.) mm (with shielding cover) L x W: 12 x 12(Typ.)mm · H : 1.37 (Max.) mm (without shielding cover)
WiFi Interface	SDIO V3.0/ 2.0
BT Interface	UART / PCM
Operating temperature	-20°C to 50°C
Storage temperature	-40°C to 125°C
Humidity	Operating Humidity 10% to 95% Non-Condensing

2.2 DC Characteristics

Voltage rails	Min.	Typ.	Max.	Unit
VBAT	3.2	3.3	4.8	V
VDDIO	1.6	1.8 / 3.3	3.6	V

2.3 Output Power tolerance

- tolerance : 2.4GHz(± 1.5 dB), 5GHz(± 2 dB)

2.4 Product Details

- 2.4GHz RF Specification

Conditions : VBAT=3.3V ; VDDIO=3.3V ; Temp:25°C

Feature	Description
WLAN Standard	IEEE 802.11b/g/n & Wi-Fi compliant
Frequency Range	2.400 GHz ~ 2.4835 GHz (2.4GHz ISM Band)
Number of Channels	2.4GHz : Ch1 ~ Ch13
Modulation	802.11b : DQPSK 、 DBPSK 、 CCK 802.11 g/n : OFDM /64-QAM 、 16-QAM 、 QPSK 、 BPSK

- 5GHz RF Specification

Conditions : VBAT=3.3V ; VDDIO=3.3V ; Temp:25°C

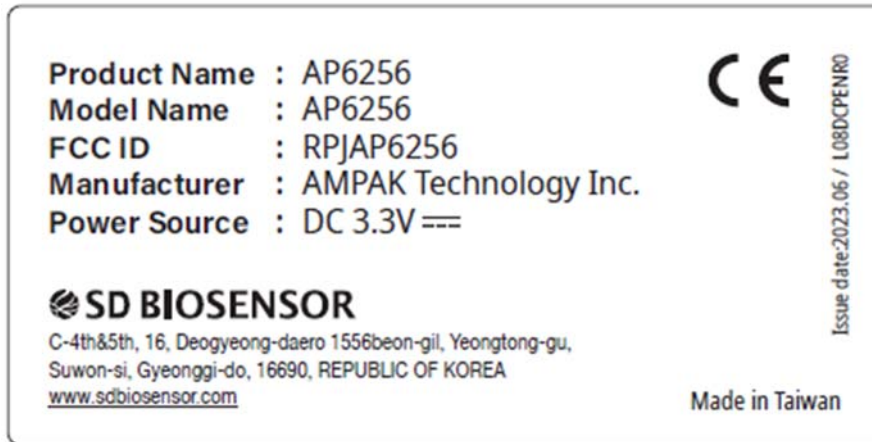
Feature	Description
WLAN Standard	IEEE 802.11a/n/ac & Wi-Fi compliant
Frequency Range	5.15~5.35GHz 、 5.47~5.725GHz 、 5.725~5.85GHz (5GHz UNII Band)
Number of Channels	5.18~5.35GHz : Ch36 ~ Ch64 5.5~5.7GHz : Ch100 ~ Ch140 5.745~5.825GHz : Ch149 ~ Ch165
Modulation	802.11a : OFDM /64-QAM 、 16-QAM 、 QPSK 、 BPSK 802.11n : OFDM /64-QAM 、 16-QAM 、 QPSK 、 BPSK 802.11ac : OFDM /256-QAM 、 OFDM /64-QAM 、 16-QAM 、 QPSK 、 BPSK

- Bluetooth RF Specification

Conditions : VBAT=3.3V ; VDDIO=3.3V ; Temp:25°C

Feature	Description
General Specification	
Bluetooth Standard	GFSK 、 DQPSK 、 8DPSK 、 LE(1Mbps)
Host Interface	UART
Frequency Band	2402 MHz ~ 2480 MHz
Number of Channels	79 channels for classic 、 40 channels for BLE
Modulation	FHSS, GFSK, DPSK, DQPSK

3. Label



Approval Statement

FCC approval

RF Software restrictions

1. Contention-Based Protocol, as demonstrated in the FCC test report, is permanently embedded in the module and is not host-dependent, can't change by anyone.
2. Operation of transmitters in the 5.25-5.35GHz, 5.47-5.725GHz bands is this Modular device will only associate and connect with a low-power indoor access point or subordinate device and never directly connect to other client devices.
This feature is include in its firmware and can't change by anyone.
3. Operation of transmitters in the 5.25-5.35GHz, 5.47-5.725GHz bands is this Modular device will always initiate transmission under the control of a low-power indoor AP or subordinate except for brief transmissions before joining a network. These short messages will only occur if the client has detected an indoor AP or subordinate operating on a channel. These brief messages will have a time-out mechanism such that if it does not receive a response from an AP it will not continually repeat the request.

This device complies with Part 15 of the FCC`s 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 undesirable operation.

To satisfy FCC exterior labeling requirements, the following text must be placed on the exterior of the end product.

Contains Transmitter module FCC ID: RPJAP6256

Federal Communications Commission (FCC) Statement

15.21

You are cautioned that changes or modifications not expressly approved by the part responsible for compliance could void the user's authority to operate the equipment.

15.105(b)

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.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.
- The OEM integrator is responsible for ensuring the end-user has no manual instruction to remove or install module.
- The module is limited to installation in mobile or fixed applications.

FCC RF Radiation Exposure Statement

1) This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

2) This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

This equipment should be installed.

This module is intended for OEM integrators only. Per FCC KDB 996369 D03 OEM Manual v01 guidance, the following conditions must be strictly followed when using this certified module:

KDB 996369 D03 OEM Manual v01 rule sections:

2.2 List of applicable FCC rules

This module has been tested for compliance to FCC Part 15 Subpart C (15.247) and Subpart E (15.407).

2.3 Summarize the specific operational use conditions

The module is tested for standalone mobile RF exposure use condition. Any other usage conditions such as colocation with other transmitter(s) will need a separate reassessment through a class II permissive change application or new certification.

Further operation restrictions on the host product include:

*Prohibited for control of or Communications with unmanned aircraft systems.

2.4 Limited module procedures

Not applicable.

2.5 Trace antenna designs

Not applicable.

2.6 RF exposure considerations

This equipment complies with FCC mobile radiation exposure limits set forth for an uncontrolled environment.

This equipment should be installed and operated with a minimum distance of 20cm between the radiator & your body. A separate SAR/Power Density evaluation is required to confirm compliance with relevant FCC portable RF exposure rules.

2.7 Antennas

The following antennas have been certified for use with this module; antennas of the same type with equal or lower gain may also be used with this module except for operations within the 5.925~7.125GHz band.

Use of other antenna types or the same type of antenna with higher gain than listed above must performed additional testing and appropriate permissive change approval.

Note2: Additional testing/submission (C2PC) will required if device not met the antenna and RF exposure requirements.

2.8 Label and compliance information

The final end product must be labeled in a visible area with the following: "Contains FCC ID: RPJAP6256".

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

2.9 Information on test modes and additional testing requirements

This transmitter is tested in a standalone mobile RF exposure condition and any co-located or simultaneous transmission with other transmitter(s) class II permissive change reevaluation or new certification.

2.10 Additional testing, Part 15 Subpart B disclaimer

This transmitter module is tested as a subsystem and its certification does not cover the FCC Part 15 Subpart B (unintentional radiator) rule requirement applicable to the final host. The final host will still need to be reassessed for compliance to this portion of rule requirements if applicable.

As long as all 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 can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not 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.

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.

OEM/Host manufacturer responsibilities

OEM/Host manufacturers are ultimately responsible for the compliance of the Host and Module.

The final product must be reassessed against all the essential requirements of the FCC rule such as FCC Part 15 Subpart B before it can be placed on the US market. This includes reassessing the transmitter module for compliance with the Radio and EMF essential requirements of the FCC rules. This module must not be incorporated into any other device or system without retesting for compliance as multi-radio and combined equipment.

Modules: extended to host manufacturers by integration instructions.