



GoPro STMD1 WiFi Bluetooth Module User Manual

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GoPro STMD1 WiFi Bluetooth Module



Introduction

The STMD1 SiP module is one of the product families in USI's product offering, targeting for system integration requiring a smaller form factor. It also provides the standard migration to high data rate for USI's current SIP customers.

The purpose of this document is to define the product specification for 802.11a/b/g/n/ac Wi-Fi with BT5.0 combo module. All the data in this document is based on the SYNAPTICS SYN43456 datasheet and other documents provided from SYNAPTICS.

This product is designated for using in embedded applications mainly in the IoT device, which required small size and high data rate wireless connectivity.

Brief Technology Features

- Full IEEE 802.11a/b/g/n/ac legacy compatibility.
- Support 20, 40 and 80MHz channels for the 1×1 5GHz radio, and 20 MHz channels for the 1×1 2.4GHz radio.
- Supports standard SDIO v3.0 (including DDR50 mode at 50MHz and SDR104 mode at 208 MHz, 4 bit and 1 bit) interfaces for WiFi control.
- Supports UART/I2S interfaces for BT control.
- Lead Free design which supporting Green design requirement, RoHS Compliance, and halogen free.
- Small size suitable for low volume system integration. Low power consumption & excellent power management performance extend battery life.
- Easy for integrating into IoT device with flexible system configuration and antenna design.

Wireless Specification

The STMD1 module complies with the following features and standards;

Features	Description
WLAN Standards	IEEE 802 Part 11a/b/g/n/ac Single-stream spatial multiplexing up to 433.3 Mbps data rate
Bluetooth	Bluetooth TM 5.0 compliance
Antenna Port	Support single streaming antenna shared between Bluetooth and WLAN
Frequency band	2.412 to 2.472GHz (1 to 13 channels)
	5.180 to 5.825GHz

OEM Integrators Installation Manual

Important Notice to OEM integrators

1. This module is limited to OEM installation ONLY.
2. This module is limited to installation in mobile or fixed applications, according to Part 2.1091(b).
3. The separate approval is required for all other operating configurations, including portable configurations with respect to Part 2.1093 and different antenna configurations
4. For FCC Part 15.31 (h) and (k): The host manufacturer is responsible for additional testing to verify compliance as a composite system. When testing the host device for compliance with Part 15 Subpart B, the host manufacturer is required to show compliance with Part 15 Subpart B while the transmitter module(s) are installed and operating. The modules should be transmitting and the evaluation should confirm that the module's intentional emissions are compliant (i.e. fundamental and out of band emissions). The host manufacturer must verify that there are no additional unintentional emissions other than what is permitted in Part 15 Subpart B or emissions are compliant with the transmitter(s) rule(s).

Antenna Installation

1. The antenna must be installed such that 20 cm is maintained between the antenna and users
2. The transmitter module may not be co-located with any other transmitter or antenna.
3. To comply with FCC/IC regulations limiting both maximum RF output power and human exposure to RF radiation, the maximum antenna gain including cable loss in a mobile exposure condition must not exceed:

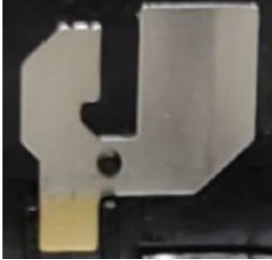
Peak gain of Antenna:

- 1.47dBi @ 2.412 GHz
- 1.64dBi @ 2.442 GHz
- 1.28dBi @ 2.462 GHz
- 4.58dBi @ 5.2GHz
- 4.37dBi @ 5.3GHz
- 3.68dBi @ 5.6GHz
- 3.50dBi @ 5.785GHz

In the event that these conditions cannot be met (for example certain laptop configurations or colocation with another transmitter), then the FCC/IC authorization is no longer considered valid and the FCC ID/IC 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/IC authorization.

Antenna Specifications

Below show antenna specification for the certification test in detail

	WLAN/BT Dual-band Antenna	
Photo		
Type	PIFA	
Appearance	Stamped Metal	
Peak Gain <i>Ungiv</i> <i>Indus</i>	Frequency	Peak Gain
	2412MHz	1.47dBi
	2442MHz	1.64dBi
	2462MHz	1.28dBi
	5200MHz	4.58dBi
	5300MHz	4.37dBi
	5600MHz	3.68dBi
	5785MHz	3.50dBi

Note Information

USI uses various test mode programs for test set up which operate separate from production firmware. Host integrators should contact USI for assistance with test modes needed for module/host compliance test requirements.

Federal Communication Commission Compliance Statement

STMD1

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.

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 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.

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 transmitter.
 Operations in the 5.15-5.25GHz band are restricted to indoor usage only.

Radiation Exposure Statement:
 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.

KDB 996369 D03 OEM Manual v01 rule sections:

List of applicable FCC rules :
 This module has been tested for compliance to FCC Part 15 .247 and 15.407.

Summarize the specific operational use conditions
 The module is tested for standalone mobile RF exposure use condition. Any other usage conditions such as co location with other transmitter(s) or being used in a portable condition will need a separate reassessment through a class II permissive change application or new certification.

Limited module procedures: Not
Trace antenna design: Not applicable

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
 Universal Scientificminimum distance of 20cm between the radiator & your body. If the module is installed in a portable host, a separate SAR evaluation is required to confirm compliance with relevant FCC portable RF exposure rules.

Antenna:

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. The antenna must be installed such that 20 cm can be maintained between the antenna and users.

Stamped Metal Antenna:

Antenna Type	PIFA
Peak gain	0.09dBi @ 2.412 GHz, tolerance 0.7dB -0.37dBi @ 2.442 GHz, tolerance 0.8dB -0.6dBi @ 2.462 GHz, tolerance 0.7dB 1.08dBi @ 5.15GHz – 5.25GHz, tolerance 0.7dB 2.62dBi @ 5.25GHz – 5.35GHz , tolerance 0.7dB 2.99dBi @ 5.47GHz – 5.725GHz, tolerance 0.3dB 2.72dBi @ 5.725GHz – 5.85GHz, tolerance 0.7dB

Label and compliance information

The final end product must be labeled in a visible area with the following: "Contains FCC ID: CNFSTMD1". The grantee's FCC ID can be used only when all FCC compliance requirements are met.

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) or portable use will require a separate class II permissive change re-evaluation or new certification.

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 shown 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.

List of applicable FCC rules

This module has been tested and found to comply with 15.247 and 15.407 requirements for Modular Approval.

US Information

Name of the company: USI America, Inc

Address of the company: 2000 Regency Parkway, Suite 420, Cary, NC 27518

Phone number: 919-466-8688 Ext. 109

ISED Compliance Statement

This device complies with ISED's licence-exempt RSSs. 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.

Radiation Exposure Statement:

This equipment complies with ISED 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: (For module device use)

1. The antenna must be installed such that 20 cm is maintained between the antenna and users, and
2. The transmitter module may not be co-located with any other transmitter or antenna.

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 Canada authorization is no longer considered valid and the IC 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 Canada 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 IC: 10193A-STMD1".

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.

RSS-247 Section 6.4 (5) (6) (for local area network devices, 5GHz)

The device could automatically discontinue transmission in case of absence of information to transmit, or operational failure. Note that this is not intended to prohibit transmission of control or signaling information or the use of repetitive codes where required by the technology.

Caution:

1. The device for operation in the band 5150–5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems;
2. where applicable, antenna type(s), antenna models(s), and worst-case tilt angle(s) necessary to remain compliant with the e.i.r.p. elevation mask requirement set forth in section 6.2.2.3 shall be clearly indicated.

CE RF Exposure Information

This device has been tested and meets applicable limits for Radio Frequency (RF) exposure. To comply with the RF exposure requirements, this module must be installed in a host platform that is intended to be operated in a minimum of 20 cm separation distance to the user.

Hereby, USI declares that the radio equipment type WiFi/BT Module is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address:

<https://www.usiglobal.com/tw/STMD1/DoC.pdf>

In all cases assessment of the final product must be met against the Essential requirements of the RE Directive Articles 3.1(a) and (b), safety and EMC respectively, as well as any relevant Article 3.3 requirements.

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1. The Stamped metal antenna (maximum gain: 0.09dBi@2.4GHz, 2.99dBi@5GHz;) were verified in the conformity testing, and for compliance the antenna shall not be modified. A separate approval is required for all other operating configurations, including different antenna configurations.
2. If any other simultaneous transmission radio is installed in the host platform toget her with this module, or above restrictions cannot be kept, a separate RF exposure assessment and CE equipment certification is required.


The device is restricted to indoor use only when operating in the 5150 to 5350 MHz fr equency range.

	AT	BE	BG	HR	CY	CZ	DK
	EE	FI	FR	DE	EL	HU	IE
	IT	LV	LT	LU	MT	NL	PL
	PT	RO	SK	SI	ES	SE	UK(NI)
	IS	LI	NO	CH	TR		

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STMD1 module, Wi-Fi/Bluetooth user manual, revision 1.0

Documents / Resources



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STMD1, CNFSTMD1, STMD1 WiFi Bluetooth Module, STMD1, WiFi Bluetooth Module, Bluetooth Module, Module, WiFi Module, STMD1 Module