FitShow (Xiamen) Information Technology Co., Ltd.

FS-BT-F5

FITSHOW APP

This specification provides an introduction to the basic functions of the FS-BT-F5 module, including the electrical specifications, RF performance, pin dimensions, and reference schematic design of the module.

Readers can refer to this document to have a detailed understanding and application of the overall functional parameters of the module. If you have any questions, please log in to https://www.fitshow.com/ to contact our company or customer service.

product overview

1.1 Functional Features

FS-BT-F5 is a small-sized and low-cost standardized Bluetooth dual-mode (BT+BLE) transmitter developed by Sports ShowTransmission module.The module supports Bluetooth 5.1+BR+EDR+BLE specifications. Support dynamic stacking and protocols Profile configuration enables product functions to be configured through software, providing ultimate flexibility. At the same timeIt supports OTA upgrades,which is convenient for later maintenance and updates.

1.2 product application

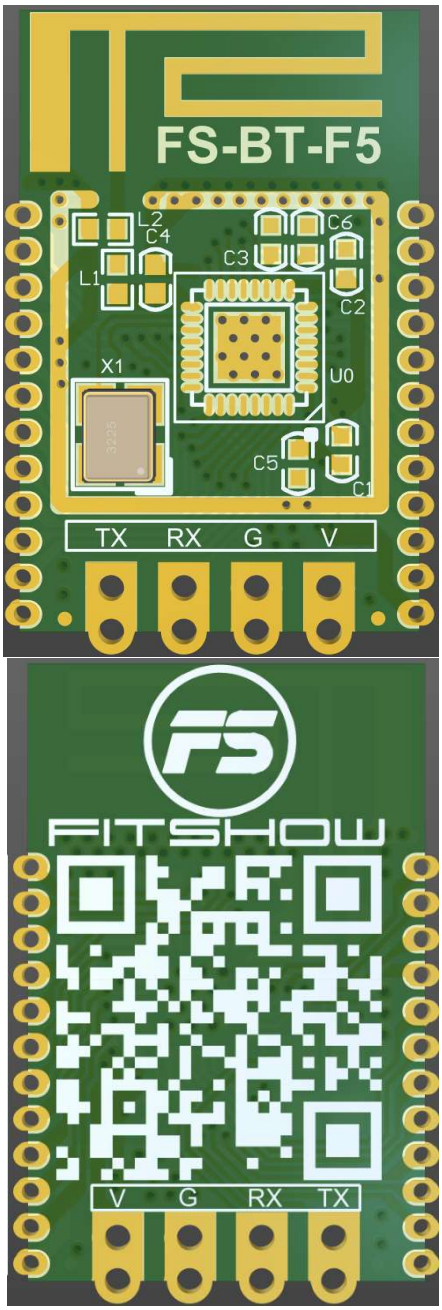
The FS-BT-F5 module only needs to be connected to VCC,GND,TX and RX wires to complete data transparent transmissionFunction; It can also be applied to many small-sized accessories or fitness small products through stamp holes. shipmentDongxiu has strong R&D capabilities and can easily achieve interconnection of users' Bluetooth devices, data transmission and other functionsThis kind of application. Our company can customize and design based on the FS-BT-F5 standard module according to the customer's requirements Provide Bluetooth modules that comply with the customer's usage norms and offer corresponding software and hardware support.

1.3 Applicable Fields

- Smart skipping ropes, abdominal wheels and other fitness accessories
- Fitness equipment such as smart treadmills, spinning bikes, rowing machines, fat-burning machines, and strength training equipment
- Smart home products
- industrial control equipment

Product Parameter

Bluetooth protocol	Bluetooth V5.1
Frequency	2402~2480MHz
Modulation system	GFSK, π/4-DQPSK、8DPSK
RF output power	BT:-7.37dBm BLE:-8.91dBm
support services	Peripheral UUID : FFF0、FTMS ()
sensitivity	-90dBm
temperature	-20 ~ +70 ℃
voltage	+ 3 ~ + 5 V
size	21.8 x 14 mm
IO driving capability	<8mA
Support baud rate	4096, 4800, 9600, 19200, 38400, 57600, 115200
Supports audio decoding formats	MP2, MP3, WMA, APE, FLAC, AAC, MP4, M4A, WAV, AIF, AIFC
hardware version	V1.0.0
Framework version	3.1.2
application protocol	FitShow / FTMS



Electrical specifications

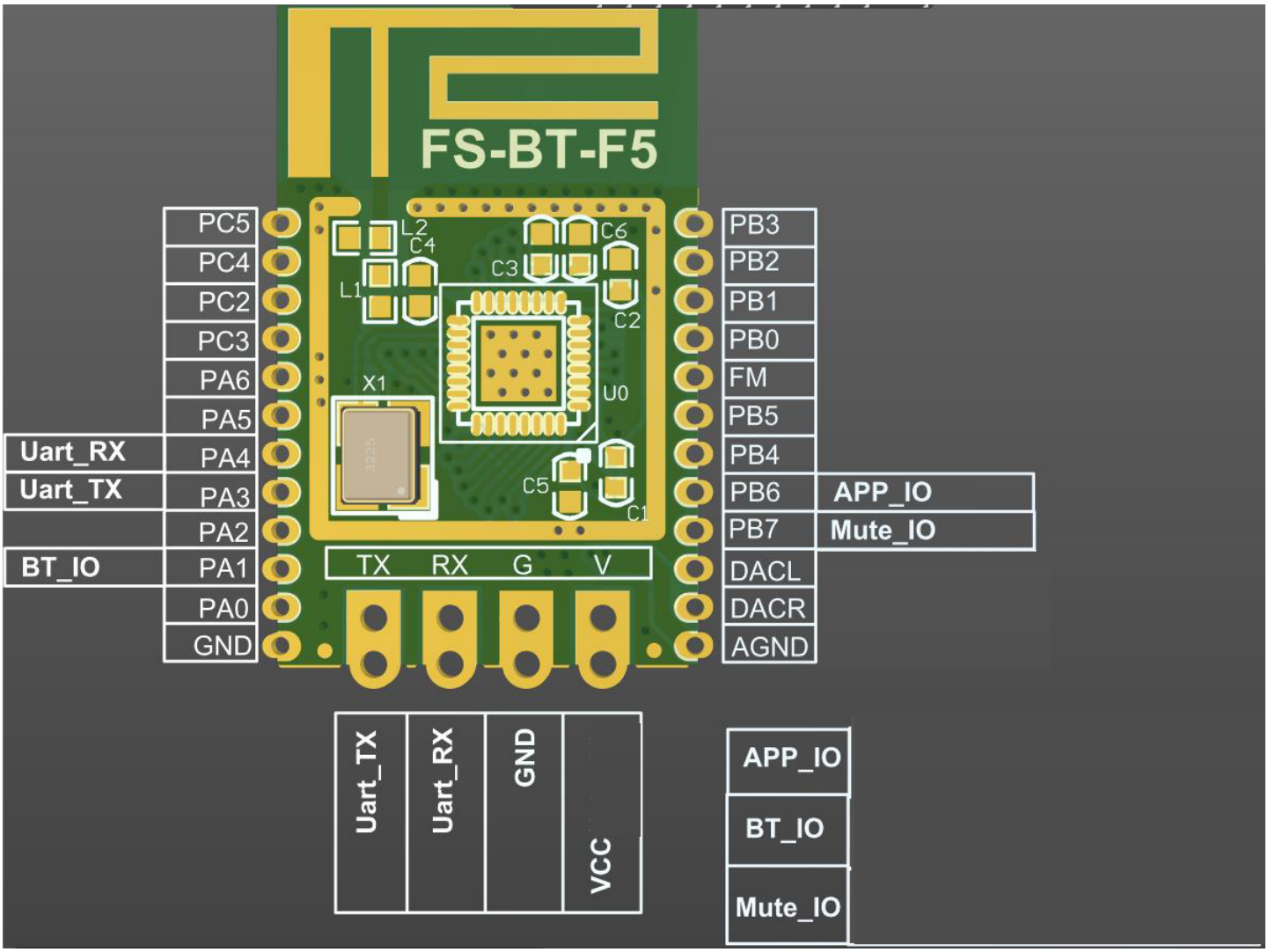
nominal parameter

Item	Symbol	Min	Typical	Max	Unit
input voltage	VCC	3	3.3	5	V
Serial port voltage	TX/RX		3.0	3.3	V
storage temperature	T-STG	-65	25	150	℃
welding temperature	T-SLD			260	℃

Note: 1) The listed electrical characteristics are target specifications for reference only. Some data may be updated based on actual tests.

2) The voltage value shown is based on the GND inside the module.
Any voltage exceeding the "maximum rated value" may cause permanent damage to the equipment.

Pin description

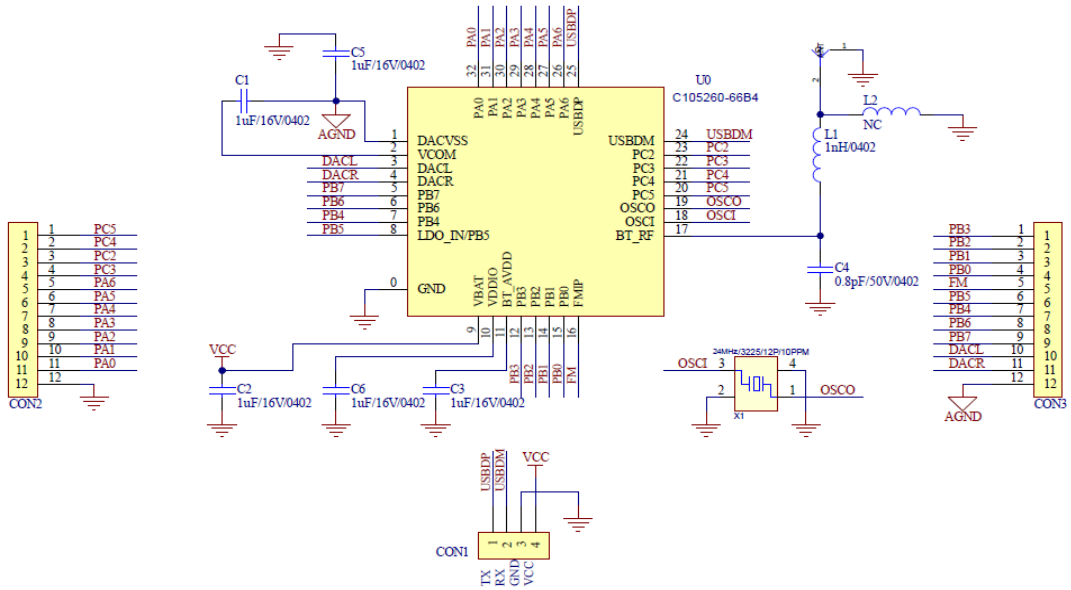


PIN NO	Name	I/O Type	Drive (mA)	Funetion	Cher Funclion
1	AGND	P	/		DAC Ground
2	VCOM		/		
3	DACL	O	/		DAC Left Chennel
4	DACR	O	/		DAC Right Channel
5	PB7	I/O	24/8	GPIO	SDOCLK_BF:SDOClock(BF) AMUXIR: Analog ChannellRight; SP12DOA: SPI2 Data Out(A); IIC_SDA_C: IIC DAT(C); ADC9: ADC Input Channel 9; PWM5: Timer5 PWM Output: UARTIRXA: Uartl Data In(A);
6	PB6	I/O	24/8	GPIO	AMUXIL: Analog Channell Left; SP12CLKA: SPI2 Data Out(A); IIC_SCL_C: IIC SCL(C); ADC8: ADC Input Channel 8; TMR3: Timer3 Clock Input: UARTIRXA: Uartl Data Out(A);
7	PB4	I/O	24/8	GPIO	SPIO_DAT2A(2): SPIO Data2 Out_A(2); ADC7: ADC Input Channel 7; CLKOUT1 UART2TXC:Uart2 Data Out(C) UART2RXC:Uart2 Data In(C):
8	LDO_IN	P	/		Battery Charger In
	PB5	I/O	8	GPIO (High Voltage Resistance)	SPI2DIA: SPI2 Data Input(A); PWM3: Timer3 PWM Output; CAP1:Timerl Capture; UARTOTXC:Uant0 Data Out(C); UARTORXC:Uant0 Data In(C);
9	VCC	P	/		Battery Power Supply
10	VDDIO	P	/		IO Power 3.3v
11	BT_AVDD	P	/		BT Power
12	PB3	I/O	/	GPIO	SDODAT_D:SDO Data(D); ADC6: ADC Input Channel 6; PWM2: Timer2 PWM Ouput; UART2RXB:Uart2 Data ln(B);
13	PB2	I/O	8	GPIO (High Voltage Resistance)	SDOCMD_D:SDO Command(D) SPIIDIA: SP11 Data In(A); CAPO: Timer0 Capture; UART2TXB: Uart2 Data Out(B);
14	PB1	I/O	24/8	GPIO (pull up)	Long Press Reset; SPI1DOA: SPI1 Data Out(A); ADC5: ADC lnput Channel 5; TMR2: Timer2 Clock Input; UARTORXB: Uart0 Data ln(B); SPDIF_IN_D: Sony/Philips Digital Interface Input(D)

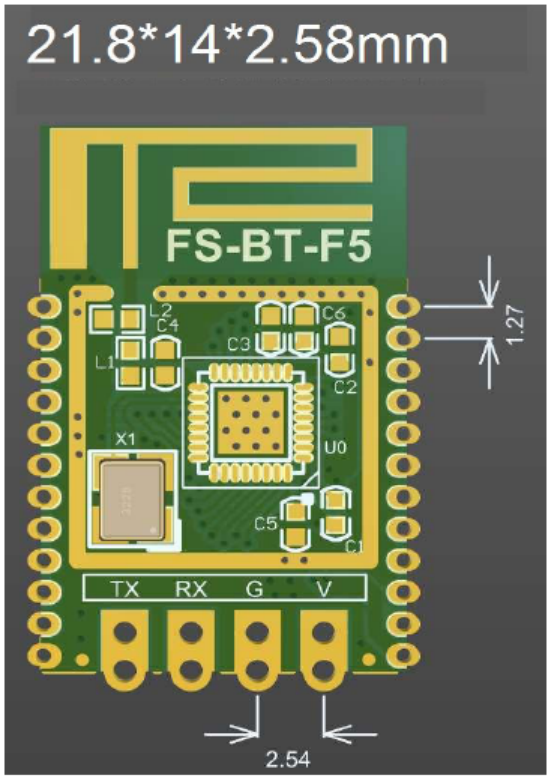
15	PB0	I/O	8	GPIO (High Voltage Resistance)	SDOCLK_D:SDOClock(D) SPIICLKA:SPII Clock(A); UARTOTXB: Uartl Data Out(B); TMR5: Timer5 Clock lnput; SPDIF_IN_C:Sony/Philips Digital Interface Inpul(C)
16	FMIP	/	/		FM Antenna
17	BT_RF	/	/		BT Antenna
18	BT_SOCI	I	/		BT OSC ln
19	BT_SOCO	0	/		BT OSC Out
20	PC5	I/O	24/8	GPIO	SDOCLK_AE: SDO ClOck(AE) SPIIDOB: SPIl Data Out(B): IIC_SDA_B: IIC SDA(B); ADC12: ADC Input Channel 12; TMRI: Timert Clock lnput; UART2RXD:Uart2 Data In（D）;
21	PC4	I/O	24/8	GPIO	SDOCMD_A:SDO Commnand(A); SPIO_DAT3AB(3): SPIO Data3(AB); SPIICLKB; SPI1 Clock(B); IIC_SCL_B: IIC SCL(B); ADCI1: ADC Input Channel 11; PWM1: Timer1 PWM Output; UART2TXD:Uart2 Data Out (D);
22	PC3	I/O	24/8	GPIO	SDODAT_A:SDO DataA); SP10_DAT2B(2): SP10 Data2(B); SPIIDIB:SPI1 Data In(B); CAP2: Timer2 Capture; UARToTXD: Uart0 Data Out (D); UARTORXD: Uart0 Data In(D);
23	PC2	I/O	24/8		SP10_DIB(1): SP10 Data lnput(B); ALNK_MCLK_B: ALNK Master Clock(B): ADC10:ADC lnput Channel 10; CAP5: Timer5 Capture; UARTIRXB: Uartl Data ln(B);
24	Uart_RX	I/O	4	USB Negative Data (pull down)	SP12DOB: SP12 Data Out(B); IIC_SDA_A: IIC SDA(A); ADC14: ADC Input Channel 14; UARTIRXD: Uartl Data In(D）;
25	Uart_TX	I/O	4	USB Positive Data (pull down)	SPI2CLKB:SPI2 Clock(B); IIC_SCL_A: IIC SC(LA); ADC13: ADC Input Channel 13; UARTITXD: Uartl Data Output(D);
26	PA6	I/O	24/8		ALNK_DAT3_A: Audio Link Data3_A; ALNK_LRCK_B: Audio Link Word SclcctB IIC_SDA_D: IIC SDA(D); ADC4: ADC Input Channel 4; CAP4: Timer4 Capture; UARTORXA: Uart0 Data In(A); SPDIF_IN_B: Sony/Philips Digital Interface Input(B)

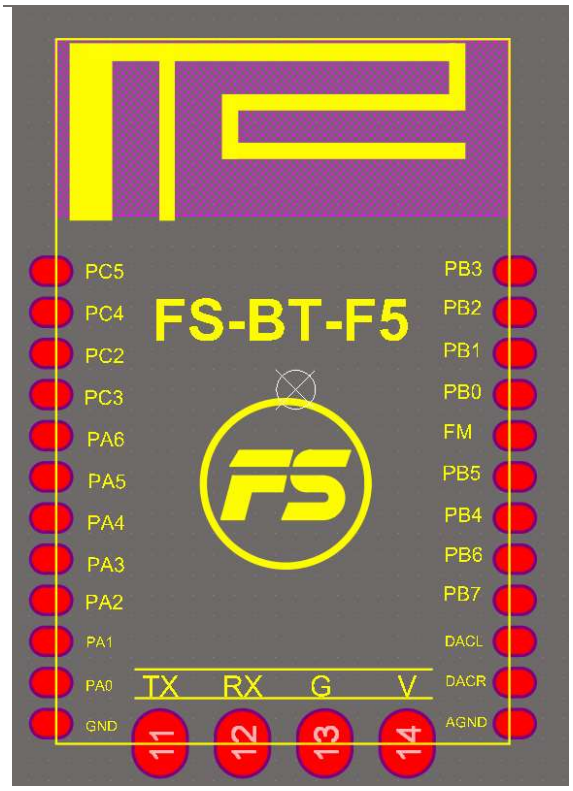
27	PA5	I/O	24/8		ALNK_DAT2_A: Audio Link Dau2_A; ALNK_SCLK_B: Audio Link Serial Clock(B); IIC_SCL_D:IIC SCL(D); PWMO: Timer0 PWM Output; UARTOTXA: Uart0 Data Output(A); SPDIF_IN_A: Sony/Philips Digital Interface Input(A)
28	PA4	I/O	24/8		SDOCMD_CE:SDO Command(CE) AMUXOR:Analog ChanneIO Right; PLNK_DATI: PLNK Datal; ALNK_LRCK_A: Audio Link word Select (A); ALNK_DAT3_B: Audio Link Data3 B. UARTI_RTS: Uartl Request to send; ADC3: ADC Input Channel 3; TMR4: Timer4 Clock Input; UART2RXA: Uart2 Data In(A);
29	PA3	I/O	24/8		SDODAT_C:SDO Data(C); AMUXOL: Analog Channel0 Left; PLNK_SCLK: PLNK Serial Clock; ALNK_SCLK_A: Audio Link Serial Clock(A); ALNK_DAT2_B: Audio Link Data2_B; UARTI_CTS: Uartl Clear to send; ADC2: ADC Input Channel 3; PWM5: Timer5 PWM Ouput; UART2TXA:Uartl Data Output(D);
30	PA2	I/O	24/8	GPIO	SDOCLK_C:SDO Clock(C); MIC_BlAS: Microphone Bias Output ALNK_MCLK_A: ALNK Master Clock A; ALNK_DATl_B: Audio Link Datal_B; CAP3:Timer3 Capture;
31	PA1	I	24/8		M1C: MIC Input Channel; ADCl: ADC Input Channel 1; PWM4: Timcr4 PWM Oupat; UARTIRXC: Uart0 Data ln(C);
32	PA0	I/O	/		SDPG: SD Power Supply ALNK_DATO_A: Audio Link Data0_A; ALNK_DATO_B: Audio Link Data0_B; ADC0: ADC Input Channel 0; CLKOUTD UARTITXC:Uantl Data Output(C);

schematic diagram



Module size and packaging





matters need attention

The operating frequency of Bluetooth is 2.4GHz. It is necessary to avoid the influence of various factors on wireless transmission and reception as much as possible.

notice:

▶The product housing part surrounding the module should avoid using metal

▶Metal screws and other components inside the product should be kept away from the RF section of the module

▶To maximize the RF performance, the user's motherboard layout should follow the following suggestions:

1)Antenna clearance area: There must be no copper on the user's motherboard directly below the module antenna area foil

(Including power supply, ground and signal layers)

2) Module position: Ideally, the module should be placed at one corner of the user's motherboard, with the PCB antenna located at the remote end of the motherboard. This position can minimize the clear zone of the antenna

Federal Communications Commission (FCC) Statement

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

Note: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.

Warning: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

RF exposure statement:

This device complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. The device is installed and operated without restriction.

This device complies with Innovation, Science and Economic Development Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

(1) this device may not cause interference, and

(2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d' ISED applicables aux appareils radio exempts de licence. L' exploitation est autorisée aux deux conditions suivantes:

(1) l' appareil ne doit pas produire de brouillage, et

(2) l' utilisateur de l' appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d' en compromettre le fonctionnement.

ISED RF exposure statement:

This equipment complies with ISED radiation exposure limits set forth for an uncontrolled environment.The device has been evaluated to meet general RF exposure requirement.

Le maté riel est conforme aux limites de dose d'exposition aux rayonnements é noncé s pour fac un autre environnement.ce dispositif a é té é valué à satisfaire l'exigence gé né rale de l'exposition aux rf.

OEM Guidance

1. Applicable FCC rules

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

2. The specific operational use conditions

This module can be used in IoT devices. The input voltage to the module is nominally 3~5V DC. The operational ambient temperature of the module is -20 to 70 degree C. Only the embedded PCB antenna is allowed. Any other external antenna is prohibited.

3. Limited module procedures

N/A

4. Trace antenna design

N/A

5. RF exposure considerations

This device complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. The device is installed and operated without restriction.

6. Antenna

Antenna type :PCB Antenna; Antenna Max. Peak Gain 2.83 dBi

7. Label and compliance information

When the module is installed in the host device, the FCC ID label must be visible through a window on the final device or it must be visible when an access panel, door or cover is easily re-moved. If not, a second label must be placed on the outside of the final device that contains the following text: “Contains FCC ID: 2AUIE-FSBTF5

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

8. Information on test modes and additional testing requirements

a)The modular transmitter has been fully tested by the module grantee on the required number of channels,modulation types, and modes, it should not be necessary for the host installer to re-test all the available transmitter modes or settings. It is recommended that the host product manufacturer, installing the modular transmitter,perform some investigative measurements to confirm that the resulting composite system does not exceed the spurious emissions limits or band edge limits (e.g., where a different antenna may be causing additional emissions).

b)The testing should check for emissions that may occur due to the intermixing of emissions with the other transmitters, digital circuitry, or due to physical properties of the host product (enclosure). This investigation is especially important when integrating multiple modular transmitters where the certification is based on testing each of them in a stand-alone configuration. It is important to note that host product manufacturers should not assume that because the modular transmitter is certified that they do not have any responsibility for final product compliance.

c)If the investigation indicates a compliance concern the host product manufacturer is obligated to mitigate the issue. Host products using a modular transmitter are subject to all the applicable individual technical rules as well as to the general conditions of operation in Sections 15.5, 15.15, and 15.29 to not cause interference. The operator of the host product will be obligated to stop operating the device until the interference have been corrected .

9. Additional testing, Part 15 Subpart B disclaimer

The final host / module combination need to be evaluated against the FCC Part 15B criteria for unintentional radiators in order to be properly authorized for operation as a Part15 digital device. The host integrator installing this module into their product must ensure that the final composite product complies with the FCC requirements by a technical assessment or evaluation to the FCC rules,including the transmitter operation and should refer to guidance in KDB 996369. For host products with certified modular transmitter, the frequency range of investigation of the composite system is specified by rule in Sections 15.33(a)(1) through (a)(3), or the range applicable to the digital device, as shown in Section 15.33(b)(1), whichever is the higher frequency range of investigation. When testing the host product, all the transmitters must be operating. The transmitters can be enabled by using publiclyavailable drivers and turned on, so the transmitters are active. In certain conditions it might be appropriate to use a technology-specific call box (test set) where accessory devices or drivers are not available. When testing for emissions from the unintentional radiator, the transmitter shall be placed in the receive mode or idle mode, if possible. If receive mode only is not possible then, the radio shall be passive (preferred) and/or active scanning. In these cases, this would need to enable activity on the communication BUS (i.e., PCIe, SDIO, USB) to ensure the unintentional radiator circuitry is enabled.

Testing laboratories may need to add attenuation or filters depending on the signal strength of any active beacons (if applicable) from the enabled radio(s). See ANSI C63.4, ANSI C63.10 for further general testing details.

End Product Labeling
The final end product must be labeled in a visible area with the following: Contains IC: 34271-FSBTF5.

Plaque signalétique du produit final
Le produit final doit être étiqueté dans un endroit visible avec l'inscription suivante: Contient des IC: 34271-FSBTF5.

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.

Manuel d'information à l'utilisateur final
L'intégrateur OEM doit être conscient de ne pas fournir des informations à l'utilisateur final quant à la façon d'installer ou de supprimer ce module RF dans le manuel de l'utilisateur du produit final qui intègre ce module.
Le manuel de l'utilisateur final doit inclure toutes les informations réglementaires requises et avertissements comme indiqué dans ce manuel.