

FSC-BT826HC

4.2 Dual Mode Bluetooth Module Data Sheet

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Release Record

Version Number	Release Date	Comments
Revision 1.0	2018-12-17	First Release
Revision 1.1	2019-08-29	Add certificate picture

1. INTRODUCTION

FSC-BT826HC is a fully integrated Bluetooth module that complies with Bluetooth 4.2 dual mode protocols(BR/EDR/BLE). It supports SPP, BLE, ANCS, iBeacon, profiles. It integrates Baseband controller in a small package (Integrated chip antenna) , so the designers can have better flexibilities for the product shapes.

FSC-BT826HC can be communicated by UART port. With Feasycom's Bluetooth stack, Customers can easily transplant to their software. Please refer to Feasycom stack design guide.

1.2 Feature

- ◆ Fully qualified Bluetooth 4.2/4.0/3.0/2.1/2.0/1.2/1.1
- ◆ Postage stamp sized form factor.
- ◆ Low power.
- ◆ Class 1.5 support (high output power)
- ◆ The default UART Baud rate is 115.2Kbps and can support from 1200bps up to 921.6Kbps.
- ◆ UART, I²C, PCM / I²S data connection interfaces.
- ◆ Support the OTA upgrade.
- ◆ Bluetooth stack profiles support: SPP, HID, MAP, and all BLE protocols.

1.3 Application

- ◆ Smart Watch and Bluetooth Bracelet
- ◆ Health & Medical devices
- ◆ Wireless POS
- ◆ Measurement and monitoring systems
- ◆ Industrial sensors and controls
- ◆ Asset Tracking

2. GENERAL SPECIFICATION

General Specification	
Chipset	Realtek RTL8761
Product	FSC-BT826HC
Dimension	13mm x 26.9mm x 2.4mm
Bluetooth Specification	Bluetooth V4.2
Power Supply	3.3 Volt DC
Output Power	5.5 dBm
Sensitivity	-82dBm@0.1%BER
Frequency Band	2.402GHz -2.480GHz ISM band
Modulation	GFSK
Baseband Crystal OSC	40MHz
channels	40CH
RF Input Impedance	50 ohms
Antenna	Integrated chip antenna
Interface	Data: UART, I ² C, PCM / I ² S
Profile	SPP, GATT(BLE Standard) MFI,Airsync,ANCS, iBeacon, MAP(optional)
Temperature	-20°C to +70 °C
Humidity	10%~95% Non-Condensing
Environmental	RoHS Compliant

Table 1

3. PHYSICAL CHARACTERISTIC

FSC-BT826HC dimension is 26.9mm(L)x13mm(W)x2.4mm(H).

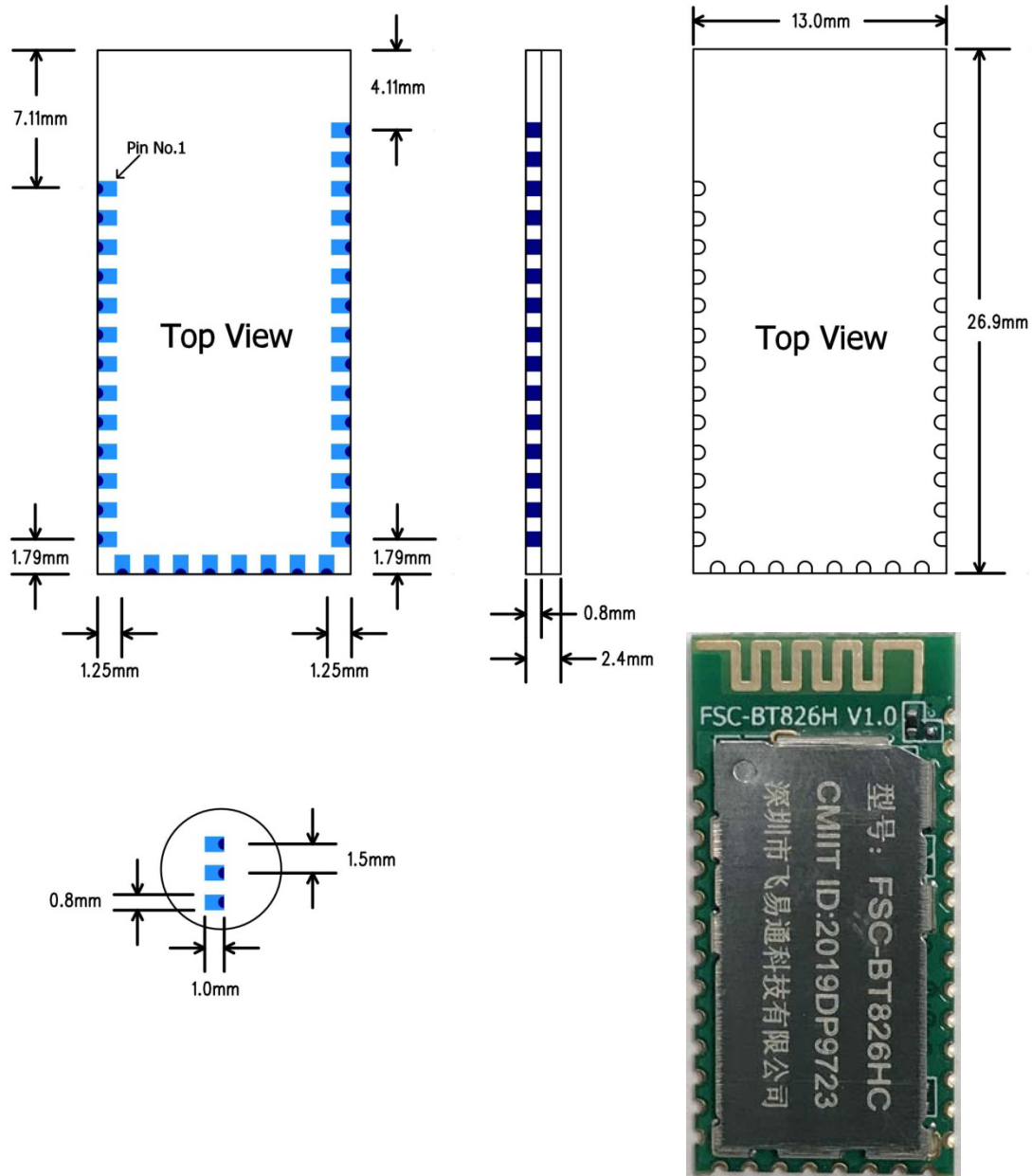


Figure 2: Package Dimensions (TOP VIEW)

4. PIN DEFINITION DESCRIPTIONS

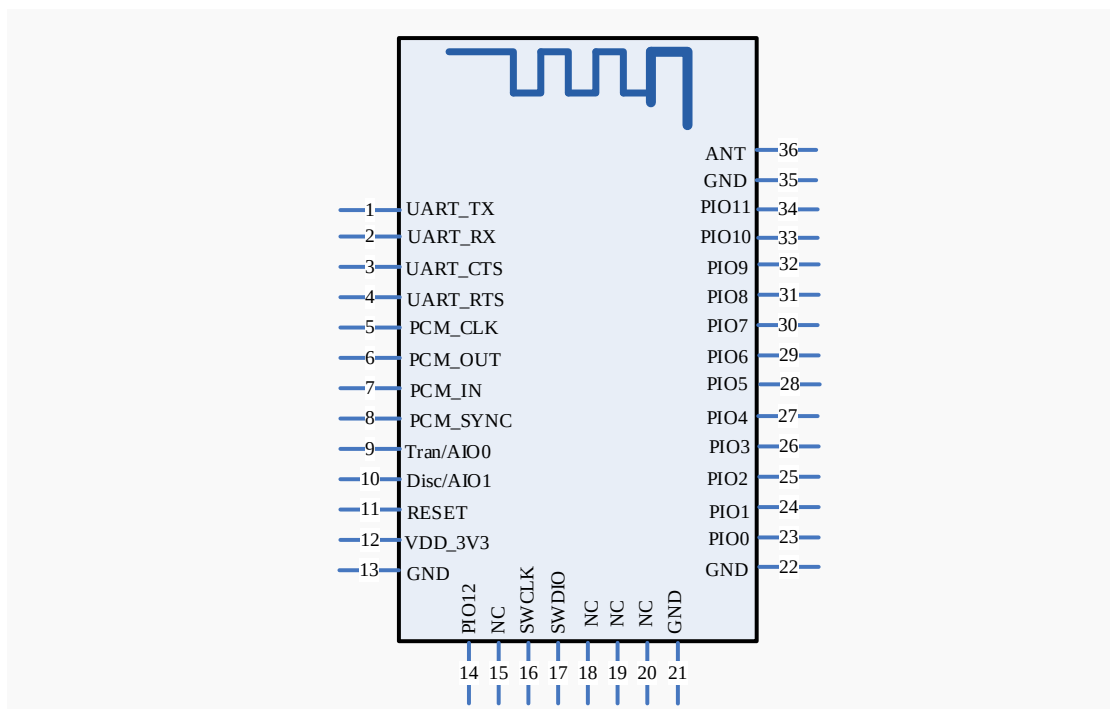


Figure 3: PIN description

Pin	Pin Name	Pad Type	Description
1	UART_TX	CMOS output	UART data output
2	UART_RX	CMOS input	UART data input
3	UART_CTS	CMOS input	UART clear to send active low Alternative Function: Programmable input/output line
4	UART_RTS	CMOS output	UART request to send active low Alternative Function: Programmable input/output line
5	PCM_CLK	Bi-directional	Synchronous data clock
6	PCM_OUT	CMOS Output	Synchronous data output
7	PCM_IN	CMOS Input	Synchronous data input
8	PCM_SYNC	Bi-directional	Synchronous data Sync
9	Tran/AIO0	I/O	Host MCU change UART transmission mode. (Default) Alternative Function: Analogue programmable I/O line.
10	Disc/AIO1	I/O	Host MCU disconnect bluetooth. (Default). Alternative Function: Analogue programmable I/O line.
11	RESET	CMOS input	Reset if low. Input debounced so must be low for >5ms to cause a reset.

12	VDD_3V3	VDD	Power supply voltage 3.3V
13	GND	VSS	Power Ground
14	PIO12	I/O	Programmable input/output line
15	NC	NC	NC
16	SWCLK	Bi-directional	Debugging through the clk line(Default)
17	SWDIO	Bi-directional	Debugging through the data line(Default)
18	NC	NC	NC
19	NC	NC	NC
20	NC	NC	NC
21	GND	VSS	Power Ground
22	GND	VSS	Power Ground
23	PIO0	I/O	Programmable input/output line
24	PIO1	I/O	Programmable input/output line
25	PIO2	I/O	Programmable input/output line
26	PIO3	I/O	Programmable input/output line
27	PIO4	I/O	Programmable input/output line Alternative Function: BT Power Mode, low level in run mode, it will be set to high level when fall asleep.
28	PIO5	I/O	With the use of the Pin 9.
29	PIO6	I/O	Programmable input/output line Alternative Function: I ² C CLK line (Default)
30	PIO7	I/O	Programmable input/output line Alternative Function: I ² C DATA line (Default)
31	PIO8	I/O	With the use of the Pin 10.
32	PIO9	I/O	Programmable input/output line Alternative Function: LED(Default)
33	PIO10	I/O	Programmable input/output line Alternative Function: BT Status(Default)
34	PIO11	I/O	Programmable input/output line
35	GND	VSS	Power Ground

36	EXT_ANT	RF signal output	By default, this PIN is floating. This PIN can connect to an external antenna to improve the Bluetooth signal coverage. If you need to use an external antenna, by modifying the module on the 0R resistance to block out the on-board antenna; Or contact Feasycom for modification.
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Table 2

5. Interface Characteristics

5.1 UART Interface

Four signals are used to implement the UART function. When FSC-BT826HC is connected to another digital device, UART_RX and UART_TX transfer data between the two devices. The remaining two signals, UART_CTS and UART_RTS, can be used to implement RS232 hardware flow control where both are active low indicators.

The interface consists of four-line connection as described in below:

Signal name	Driving source	Description
UART-TX	FSC-BT826HC module	Data from FSC-BT826HC module
UART-RX	Host	Data from Host
UART-RTS	FSC-BT826HC module	Request to send output of FSC-BT826HC module
UART-CTS	Host	Clear to send input of FSC-BT826HC module

Table 3

Default Data Format

Property	Possible Values
BCSP-Specific Hardware	Enable
Baud Rate	115. 2 Kbps
Flow Control	None
Data bit length	8bit
Parity	None
Number of Stop Bits	1

Table 4

5.2 I²C Interface

- ◆ Up to two I²C bus interfaces can support both master and slave mode with a frequency up to 400KHZ.
- ◆ Provide arbitration function, optional PEC(packet error checking) generation and checking.
- ◆ Supports 7 –bit and 10 –bit addressing mode and general call addressing mode.

The I²C interface is an internal circuit allowing communication with an external I²C interface which is an industry standard two line serial interface used for connection to external hardware. These two serial lines are known as a serial data line (SDA) and a serial clock line (SCL). The I²C module provides two data transfer rates: 100 kHz of standard mode or 400kHz of the fast mode. The I²C module also has an arbitration detect function to prevent the situation where more than one master attempts to transmit data to the I²C bus at the same time. A CRC-8 calculator is also provided in I²C interface to perform packet error checking for I²C data.

5.3 Analog to digital converter (ADC)

- ◆ 12-bit SAR ADC engine with up to 1 MSPS conversion rate
- ◆ Conversion range: VSSA to VDDA
- ◆ Temperature sensor

One 12-bit 1 μ s multi-channel ADC is integrated in the device.

An analog watchdog block can be used to detect the channels, which are required to remain within a specific threshold window. A configurable channel management block of analog inputs also can be used to perform conversions in single, continuous, scan or discontinuous mode to support more advanced usages. The ADC can be triggered from the events generated by the general-purpose timers (TMx) and the advanced-control timers (TM1) with internal connection. The temperature sensor can be used to generate a voltage that varies linearly with temperature. Each device is factory-calibrated to improve the accuracy and the calibration data are stored in the system memory area.

5.4 PCM Interface Characteristics

The FSC-BT826HC supports a PCM digital audio interface that is used for transmitting digital audio/voice data to/from the Audio Codec. Features are supported as below

- ◆ Supports Master and Slave mode
- ◆ Programmable long/short Frame Sync
- ◆ Supports 8-bit A-law/ μ -law, and 13/16-bit linear PCM formats
- ◆ Supports sign-extension and zero-padding for 8-bit and 13-bit samples
- ◆ Supports padding of Audio Gain to 13-bit samples
- ◆ PCM Master Clock Output: 64, 128, 256, or 512kHz
- ◆ Supports SCO/ESCO link

5.4.1 PCM Format

FrameSync is the synchronizing function used to control the transfer of DAC_Data and ADC_Data. A Long FrameSync indicates the start of ADC_Data at the rising edge of FrameSync (Figure 3), and a Short FrameSync indicates the start of ADC_Data at the falling edge of FrameSync (Figure 4).

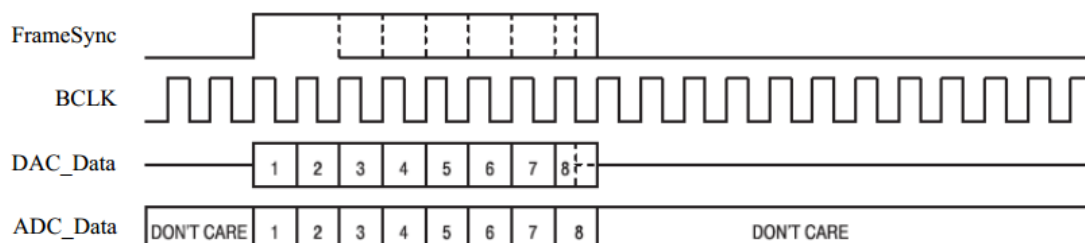


Figure 4: Long FrameSync

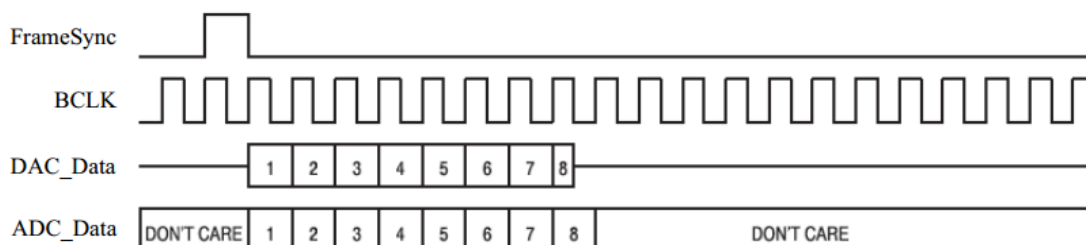


Figure 5: Short FrameSync

5.4.2 Sign Extension and Zero Padding for 8-Bit and 13-Bit Samples

For 16-bit linear PCM output, 3 or 8 unused bits may be sign extended/zero padded.

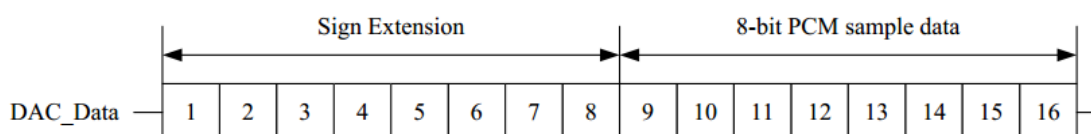


Figure 6: 16-Bit Output Data with 8-Bit PCM Sample Data and Sign Extension

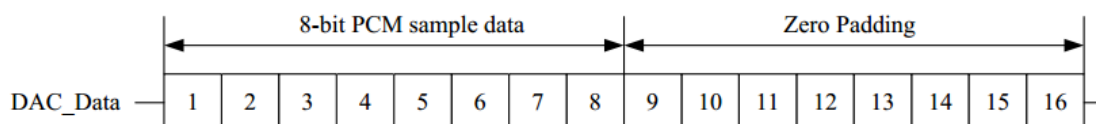


Figure 7: 16-Bit Output Data with 8-Bit PCM Sample Data and Zero Padding

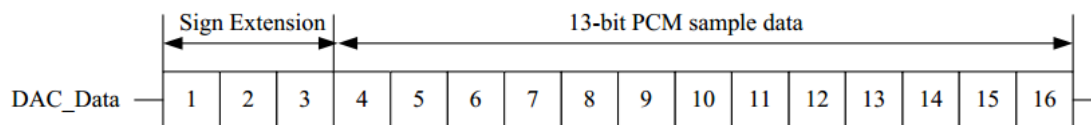


Figure 8: 16-Bit Output Data with 13-Bit PCM Sample Data and Sign Extension

For 16-bit linear PCM output, 3-bit programmable audio gain value can be padded to 13-bit sample data.

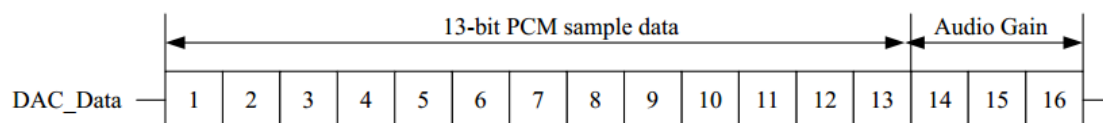


Figure 9: 16-Bit Output Data with 13-Bit PCM Sample Data and Audio Gain

5.4.3 PCM Interface Timing

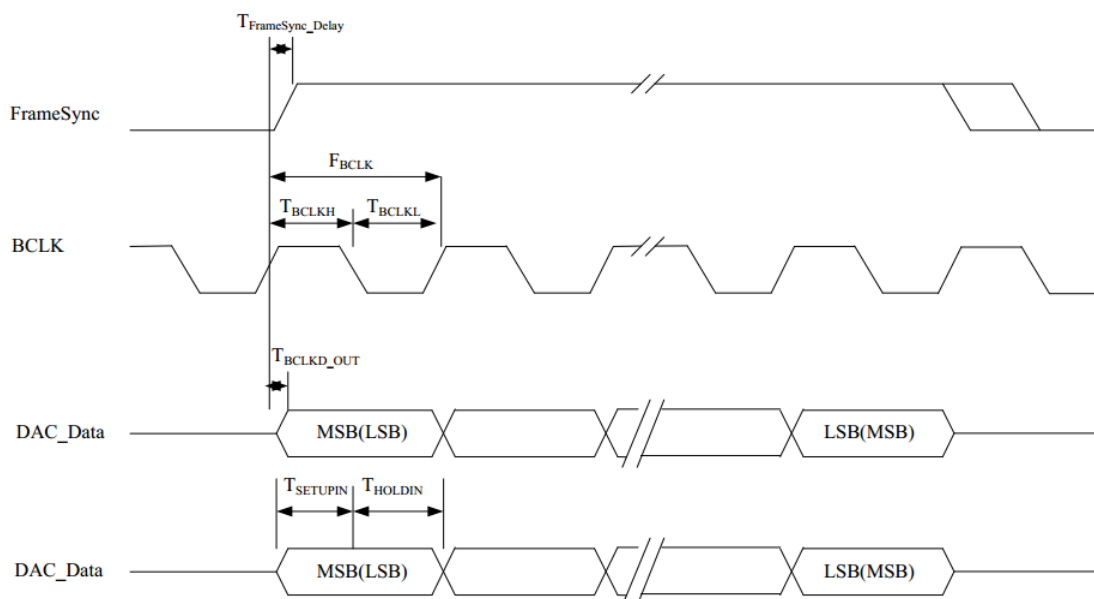


Figure 10: PCM Interface (Long FrameSync)

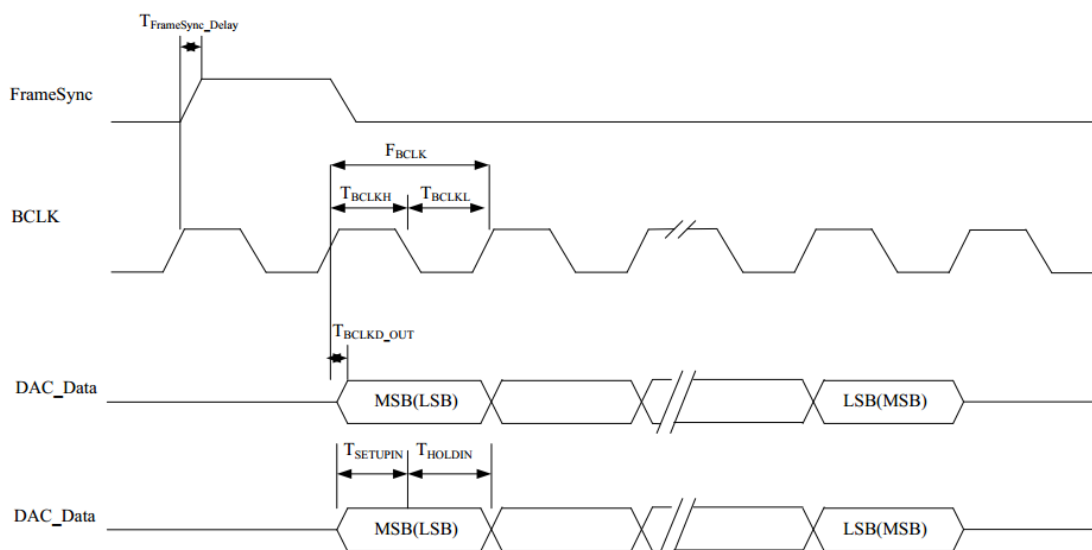


Figure 11: PCM Interface (Short FrameSync)

Symbol	Description	Min.	Typ.	Max.	Unit
F_{BCLK}	Frequency of BCLK (Master)	64	-	512	kHz
$F_{FrameSync}$	Frequency of Frame Sync (Master)	-	8	-	kHz
F_{BCLK}	Frequency of BCLK (Slave)	64	-	512	kHz
$F_{FrameSync}$	Frequency of Frame Sync (Slave)	-	8	-	kHz
D	Data Size	8	8	16	bits
N	Number of Slots Per Frame	1	1	1	Slots

Table 5: PCM Interface Clock Specifications

Symbol	Description	Min.	Typ.	Max.	Unit
T_{BCLKH}	High Period of BCLK	980	-	-	ns
T_{BCLKL}	Low Period of BCLK	970	-	-	ns
$T_{FrameSync\_Delay}$	Delay Time from BCLK High to Frame Sync High	-	-	75	ns
T_{BCLKD_OUT}	Delay Time from BCLK High to Valid DAC_Data	-	-	125	ns
$T_{SETUPIN}$	Set-up Time for ADC_Data Valid to BCLK Low	10	-	-	ns
T_{HOLDIN}	Hold Time for BCLK Low to ADC_Data Invalid	125	-	-	ns

Table 6: PCM Interface Timing

5.4.4 PCM Interface Signal Levels

The PCM signal level ranges from 1.8V to 3.3V.

6. RECOMMENDED TEMPERATURE REFLOW PROFILE

The re-flow profiles are illustrated in Figure 11 and Figure 12 below.

- Follow: IPC/JEDEC J-STD-020 C
- Condition:
 - Average ramp-up rate(217°C to peak): 1~2°C/sec max.
 - Preheat: 150~200°C, 60~180 seconds
 - Temperature maintained above 217°C: 60~150 seconds
 - Time within 5°C of actual peak temperature: 20~40 sec.
 - Peak temperature: 250+0/-5°C or 260+0/-5°C
 - Ramp-down rate: 3°C/sec max.
 - Time 25°C to peak temperature: 8 minutes max
 - Cycle interval: 5 minus

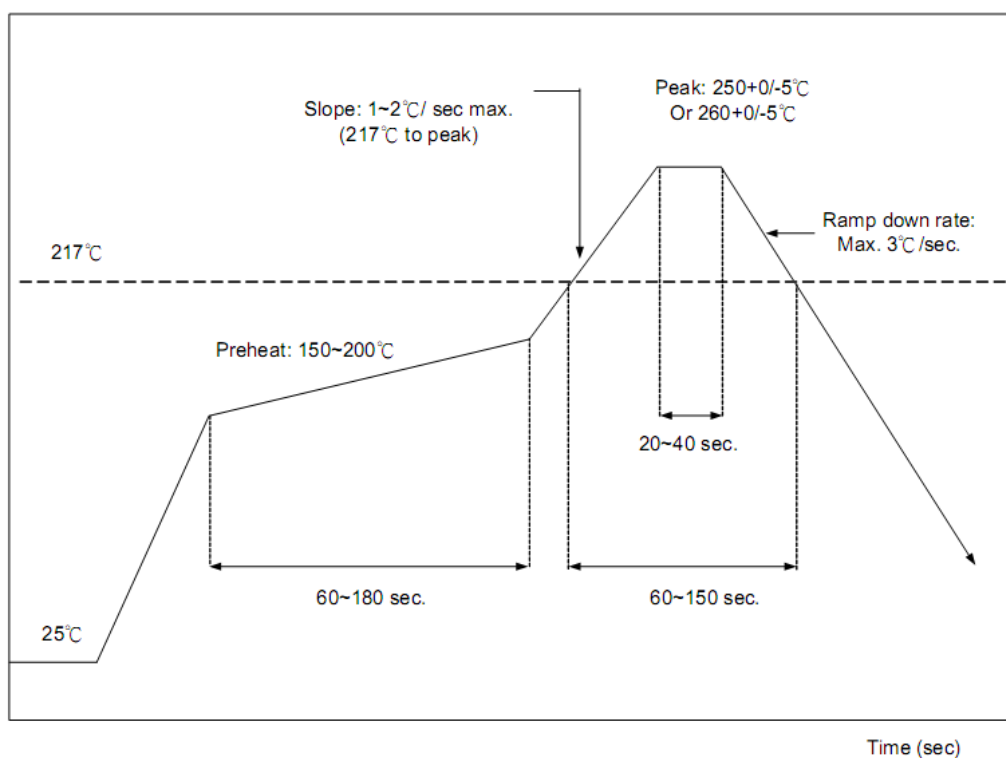


Figure 12: Typical Lead-free Re-flow Solder Profile

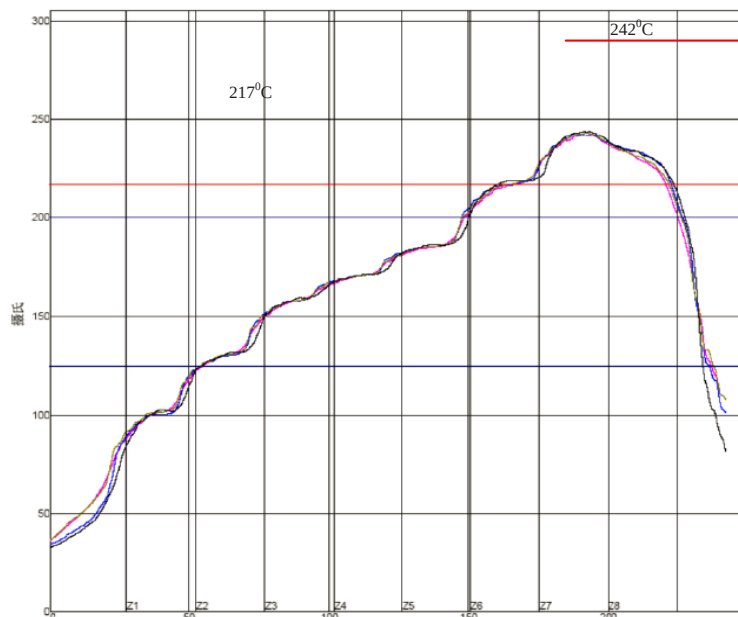


Figure 13 : Typical Lead-free Re-flow

The soldering profile depends on various parameters according to the use of different solder and material. The data here is given only for guidance on solder re-flow.

FSC-BT826HC will withstand up to two re-flows to a maximum temperature of 245°C.

7. Reliability and Environmental Specification

7.1 Temperature test

Put the module in demo board which uses exit power supply, power on the module and connect to mobile. Then put the demo in the -20°C space for 1 hour and then move to $+70^{\circ}\text{C}$ space within 1 minute, after 1 hour move back to -20°C space within 1 minute. This is 1 cycle. The cycles are 32 times and the units have to pass the testing.

7.2 Vibration Test

The module is being tested without package. The displacement requests 1.5mm and sample is vibrated in three directions(X,Y,Z). Vibration frequency set as 0.5G, a sweep rate of 0.1 octave/min from 5Hz to 100Hz last for 90 minutes each direction. Vibration frequency set as 1.5G, a sweep rate of 0.25 octave/min from 100Hz to 500Hz last for 20 minutes each direction.

7.3 Desquamation test

Use clamp to fix the module, measure the pull of the component in the module, make sure the module's soldering is good.

7.4 Drop test

Free fall the module (condition built in a wrapper which can defend ESD) from 150cm height to cement ground, each side twice, total twelve times. The appearance will not be damaged and all functions OK.

7.5 Packaging information

After unpacking, the module should be stored in environment as follows:

- Temperature: $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$
- Humidity: <60%
- No acidity, sulfur or chlorine environment

The module must be used in four days after unpacking.

8. Layout and Soldering Considerations

8.1 Soldering Recommendations

FSC-BT826HC is compatible with industrial standard reflow profile for Pb-free solders. The reflow profile used is dependent on the thermal mass of the entire populated PCB, heat transfer efficiency of the oven and particular type of solder paste used. Consult the datasheet of particular solder paste for profile configurations.

Feasycom will give following recommendations for soldering the module to ensure reliable solder joint and operation of the module after soldering. Since the profile used is process and layout dependent, the optimum profile should be studied case by case. Thus following recommendation should be taken as a starting point guide.

8.2 Layout Guidelines

It is strongly recommended to use good layout practices to ensure proper operation of the module. Placing copper or any metal near antenna deteriorates its operation by having effect on the matching properties. Metal shield around the antenna will prevent the radiation and thus metal case should not be used with the module. Use grounding vias separated max 3 mm apart at the edge of grounding areas to prevent RF penetrating inside the PCB and causing an unintentional resonator. Use GND vias all around the PCB edges.

The mother board should have no bare conductors or vias in this restricted area, because it is not covered by stop mask print. Also no copper (planes, traces or vias) are allowed in this area, because of mismatching the on-board antenna.

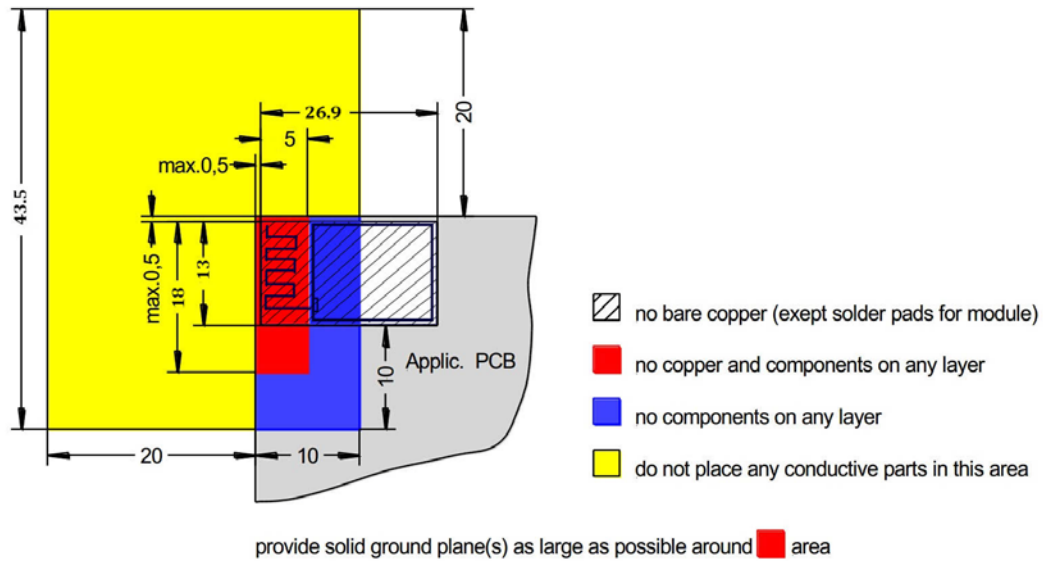


Figure 14: FSC-BT826HC Restricted Area

Following recommendations helps to avoid EMC problems arising in the design. Note that each design is unique and the following list do not consider all basic design rules such as avoiding capacitive coupling between signal lines. Following list is aimed to avoid EMC problems caused by RF part of the module. Use good consideration to avoid problems arising from digital signals in the design.

Ensure that signal lines have return paths as short as possible. For example if a signal goes to an inner layer through a via, always use ground vias around it. Locate them tightly and symmetrically around the signal vias. Routing of any sensitive signals should be done in the inner layers of the PCB. Sensitive traces should have a ground area above and under the line. If this is not possible, make sure that the return path is short by other means (for example using a ground line next to the signal line).

9. Certificate

Has passed SRRC, ROHS certification.

无线电发射设备 Radio Transmission Equipment 型号核准证 Type Approval Certificate	
深圳市飞易通科技有限公司:	
根据《中华人民共和国无线电管理条例》，经审查，下列无线电发射设备符合中华人民共和国无线电管理规定和技术标准，其核准代码为：CMIIT ID: 20190P9723 to the provisions with its CMIIT ID:	
有效期: 五年 Validity	
2019年 10月 10日 Year Month Date	
编号: 2019-9723 Number	
设备名称: 蓝牙模块 Equipment Name	
设备型号: FSC-BT826HC Equipment Type	
主要功能: 数据传输 Main Functions	
调制方式: GFSK, π/4-DQPSK, 8DPSK Modulation Mode	
主要技术参数及其指标值: Main Technical Parameters	
频率范围: 2400-2483.5MHz Frequency Range	发射功率: ≤20dBm (EIRP) Transmitting Power
频率容限: ≤±200Hz Frequency Tolerance	杂散发射限值: ≤-30dBm Spurious Emission Limits
占用带宽: ≤2MHz Occupied Bandwidth	



Attestation of Global Compliance
Recognized by China National Accreditation Service for
Conformity Assessment & Taiwan Accreditation
Foundation

Tel: 0086-755-83583833
Fax: 0086-755-25316612
E-mail: agc@agc-cert.com
Web: Http://www.agc-cert.com

Unit 2, Meihua Road 171,
Shangmeilin Street, Futian District,
Shenzhen City, China (518000)

CERTIFICATE OF COMPLIANCE

Registration No.: AGC03285190702-C001
Certificate Holder: Shenzhen Feasycom Technology Co., LTD.
Room 2004A, 20th Floor, Huichao Technology
Building, Jinhai Road, Xixiang, Baoan District, Shenzhen, China
Product Designation: Bluetooth Module
Brand Name: N/A
Model / Series Models: FSC-BT826, FSC-BT826N, FSC-BT826HD, FSC-BT826HC, FSC-BT826H,
FSC-BT826E, FSC-BT826EN
Manufacturer: N/A

Requirement	Applied Standards	Document Evidence	Result
2011/65/EU & (EU) 2015/863	IEC 62321-3-1:2013 Ed 1.0 IEC 62321-5:2013 Ed 1.0 / IEC 62321-4: 2013+A1:2017 Ed 1.1 IEC 62321-7-2:2017 Ed 1.0 / IEC 62321-6:2015 Ed 1.0 IEC 62321-7-1:2015 Ed 1.0 / IEC 62321-8:2017 Ed 1.0	Test Report: AGC03285190702-001	Conform



Signed for and on behalf of AGC
Issue Date: Jul. 29, 2019

Recognized by Attestation of Global Compliance (Shenzhen) Co., Ltd. in accordance with the EC Council 2011/65/EU. The certificate doesn't imply assessment of the production. The Applicant of the certificate is authorized to use this certificate in connection with EC declaration of conformity to the Directive. The certificate is only applicable to the equipments described above. This certificate shall not be re-produced except in full without the written approval of Attestation of Global Compliance (Shenzhen) Co., Ltd.

Note: 1. This certificate is part of the full test report(s) and should be used in conjunction with it.
2. As specified by client, testing the mandatory requirement section.

10. Application Schematic

FCC Regulatory notices

Modification statement

TSC Auto ID Technology Co., Ltd. has not approved any changes or modifications to this device by the user. Any changes or modifications could void the user's authority to operate the equipment.

Interference statement

This device complies with Part 15 of the FCC Rules and Industry 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.

RF exposure

This equipment complies with FCC and ICSED radiation exposure limits set forth for an uncontrolled environment. The antenna should be installed and operated with minimum distance of 20cm between the radiator and your body. Antenna gain must be below 2dBi.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. The host end product must include a user manual that clearly defines operating requirements and conditions that must be observed to ensure compliance with current FCC RF exposure guidelines.

For portable devices, in addition to above, a separate approval is required to satisfy the SAR requirements of FCC Part 2.1093.

If the device is used for other equipment that separate approval is required for all other operating configurations, including portable configurations with respect to 2.1093 and different antenna configurations.

FCC Class B digital device notice

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.

Labelling Requirements for the Host device

The host device shall be properly labelled to identify the modules within the host device. The certification label of the module shall be clearly visible at all times when installed in the host device, otherwise the host device must be labelled to display the FCC ID and ICSED of the module, preceded by the words "Contains transmitter module", or the word "Contains", or similar wording expressing the same meaning, as follows:

Model: FSC-BT826HC

Contains FCC ID: VTV-FSCBT826HC

The host OEM user manual must also contain clear instructions on how end users can find and/or access the module and the FCC ID and ISSED.

Model: FSC-BT826HC

Contains FCC ID: VTV-FSCBT826HC

OEM Statement

- a. The module manufacturer must show how compliance can be demonstrated only for specific host or hosts
- b. The module manufacturer must limit the applicable operating conditions in which the transmitter will be used, and
- c. The module manufacturer must disclose that only the module grantee can make the evaluation that the module is compliant in the host. When the module grantee either refuses to make this evaluation, or does not think it is necessary, the module certification is rendered invalid for use in the host, and the host manufacturer has no choice other than to use a different module, or take responsibility (§ 2.929) and obtain a new FCC ID for the product.
- d. The module manufacturer must provide the host manufacturer with the following requirements:
 - i. 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).

2.2 List of applicable FCC rules

List the FCC rules that are applicable to the modular transmitter. These are the rules that specifically establish the bands of operation, the power, spurious emissions, and operating fundamental frequencies.

DO NOT list compliance to unintentional-radiator rules (Part 15 Subpart B) since that is not a condition of a module grant that is extended to a host manufacturer. See also Section 2.10 below concerning the need to notify host manufacturers that further testing is required.³

Explanation: This module meets the requirements of Part 15 Subpart C Section 15.247

2.3 Summarize the specific operational use conditions

Describe use conditions that are applicable to the modular transmitter, including for example any limits on antennas, etc. For example, if point-to-point antennas are used that require reduction in power or compensation for cable loss, then this information must be in the instructions. If the use condition limitations extend to professional users, then instructions must state that this information also extends to the host manufacturer's instruction manual. In addition, certain information may also be needed, such as peak gain per frequency band and minimum gain, specifically for master devices in 5 GHz DFS bands.

Explanation: The EUT uses PCB antenna, antenna gain: 2dBi. There is no restriction on the installation method.

2.4 Limited module procedures

If a modular transmitter is approved as a "limited module," then the module manufacturer is responsible

for approving the host environment that the limited module is used with. The manufacturer of a limited module must describe, both in the filing and in the installation instructions, the alternative means that the limited module manufacturer uses to verify that the host meets the necessary requirements to satisfy the module limiting conditions.

A limited module manufacturer has the flexibility to define its alternative method to address the conditions that limit the initial approval, such as: shielding, minimum signaling amplitude, buffered modulation/data inputs, or power supply regulation. The alternative method could include that the limited module manufacturer reviews detailed test data or host designs prior to giving the host manufacturer approval.

This limited module procedure is also applicable for RF exposure evaluation when it is necessary to demonstrate compliance in a specific host. The module manufacturer must state how control of the product into which the modular transmitter will be installed will be maintained such that full compliance

of the product is always ensured. For additional hosts other than the specific host originally granted with a

limited module, a Class II permissive change is required on the module grant to register the additional host as a specific host also approved with the module.

Explanation: The module is not a limited module

2.5 Trace antenna designs

For a modular transmitter with trace antenna designs, see the guidance in Question 11 of KDB Publication 996369 D02 FAQ – Modules for Micro-Strip Antennas and traces. The integration information shall include for the TCB review the integration instructions for the following aspects: layout of trace design, parts list (BOM), antenna, connectors, and isolation requirements.⁴

- a) Information that includes permitted variances (e.g., trace boundary limits, thickness, length, width, shape(s), dielectric constant, and impedance as applicable for each type of antenna);
- b) Each design shall be considered a different type (e.g., antenna length in multiple(s) of frequency, the wavelength, and antenna shape (traces in phase) can affect antenna gain and must be considered);
- c) The parameters shall be provided in a manner permitting host manufacturers to design the printed circuit (PC) board layout;
- d) Appropriate parts by manufacturer and specifications;
- e) Test procedures for design verification; and
- f) Production test procedures for ensuring compliance.

The module grantee shall provide a notice that any deviation(s) from the defined parameters of the antenna trace, as described by the instructions, require that the host product manufacturer must notify the

module grantee that they wish to change the antenna trace design. In this case, a Class II permissive change application is required to be filed by the grantee, or the host manufacturer can take responsibility through the change in FCC ID (new application) procedure followed by a Class II permissive change application.

Explanation: Yes. The module without trace antenna designs

2.6 RF exposure considerations

It is essential for module grantees to clearly and explicitly state the RF exposure conditions that permit a host product manufacturer to use the module. Two types of instructions are required for RF exposure information: (1) to the host product manufacturer, to define the application conditions (mobile, portable –

xx cm from a person's body); and (2) additional text needed for the host product manufacturer to provide

to end users in their end-product manuals. If RF exposure statements and use conditions are not provided,

then the host product manufacturer is required to take responsibility of the module through a change in FCC ID (new application).

Explanation: This module complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This module is designed to comply with the FCC statement, FCC ID is: VTV-FSCBT826HC. The antenna should be installed and operated with minimum distance of 20cm between the radiator and your body

2.7 Antennas

A list of antennas included in the application for certification must be provided in the instructions. For modular transmitters approved as limited modules, all applicable professional installer instructions must be included as part of the information to the host product manufacturer. The antenna list shall also identify the antenna types (monopole, PIFA, dipole, etc. (note that for example an “omni-directional antenna” is not considered to be a specific “antenna type”)).

For situations where the host product manufacturer is responsible for an external connector, for example

with an RF pin and antenna trace design, the integration instructions shall inform the installer that unique

antenna connector must be used on the Part 15 authorized transmitters used in the host product. The module manufacturers shall provide a list of acceptable unique connectors.

Explanation: The EUT uses PCB antenna, antenna gain: 2dBi.

2.8 Label and compliance information

Grantees are responsible for the continued compliance of their modules to the FCC rules. This includes advising host product manufacturers that they need to provide a physical or e-label stating “Contains FCC

ID” with their finished product. See Guidelines for Labeling and User Information for RF Devices – KDB Publication 784748.

Explanation: The host system using this module, should have label in a visible area indicated by the following texts: "Contains FCC ID: VTV-FSCBT826HC

2.9 Information on test modes and additional testing requirements⁵

Additional guidance for testing host products is given in KDB Publication 996369 D04 Module Integration Guide. Test modes should take into consideration different operational conditions for a standalone

modular transmitter in a host, as well as for multiple simultaneously transmitting modules or other transmitters in a host product.

The grantee should provide information on how to configure test modes for host product evaluation for

different operational conditions for a stand-alone modular transmitter in a host, versus with multiple, simultaneously transmitting modules or other transmitters in a host.

Grantees can increase the utility of their modular transmitters by providing special means, modes, or instructions that simulates or characterizes a connection by enabling a transmitter. This can greatly simplify a host manufacturer’s determination that a module as installed in a host complies with FCC requirements.

Explanation: Data transfer module demo board can control the EUT work in RF test mode at specified test channel

2.10 Additional testing, Part 15 Subpart B disclaimer

The grantee should include a statement that the modular transmitter is only FCC authorized for the specific rule parts (i.e., FCC transmitter rules) listed on the grant, and that the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. If the grantee markets their product as being Part 15 Subpart B compliant (when it also contains unintentional-radiator digital circuitry), then the grantee shall provide a notice stating that the final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.

Explanation: The module without unintentional-radiator digital circuitry, so the module does not require an evaluation by FCC Part 15 Subpart B. The host should be evaluated by the FCC Subpart B