FSC-BT691

BLE 5.1 Single Mode Bluetooth Module Datasheet

Version 1.3.1

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Revision History

Version	Data	Notes	
1.0	2020/07/25	Initial Version	Marsh
1.1	2020/9/24	EEPROM changes Flash	Marsh
1.2	2021/01/05	Add FCC,CE,IC,SRRC Certificate	Marsh
1.3	2021/4/29	Updata	Marsh
1.3.1	2021/10/19	1,Storage: -40°C to +85°C, 2,Update the application description	Devin Wan

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1. INTRODUCTION

Overview

FSC-BT691 is Bluetooth Low Energy (BLE) 5.1 Module. integrating a 2.4 GHz transceiver and an ARM® Cortex-M0+TM microcontroller with a RAM of 48 kB and a One-Time Programmable (OTP) memory of 32 kB.

It can be used as a standalone application processor or as a data pump in hosted systems.
Very low active RF, MCU current and low-power mode current consumption provide excellent battery lifetime and allow for operation on small coin cell batteries and in energy-harvesting applications.

The BLE firmware includes the L2CAP service layer protocols, Security Manager (SM), Attribute Protocol (ATT), the Generic Attribute Profile (GATT), and the Generic Access Profile (GAP). All profiles published by the Bluetooth® SIG as well as custom profiles are supported.

The device is suitable for disposables, wireless sensor nodes, beacons, proximity tags and trackers, smart HID devices (stylus, keyboards, mice, and trackpads), toys, and medical and industrial applications.

Features

- 2.4-GHz RF Transceiver Compatible With Bluetooth Low Energy (BLE) 5.1
- Supports up to three BLE connections
- Typical cold boot to radio active 35 ms
- 16 MHz 32-bit ARM® Cortex-M0+ with SWD interface
- Dedicated Link Layer Processor
- AES-128 Encryption Processor
- 32 kB One-Time-Programmable (OTP)
- 48 kB Retainable System RAM
- 144 kB ROM
- Clock-less hibernation mode: 270 nA
- 10-bit ADC for battery voltage monitoring
- Built-in temperature sensor for die temperature monitoring
- TX: 3.5 mA, RX: 2.2 mA (system currents with DC-DC, VBAT_HIGH =3 V and 0 dBm)
- Programmable transmit output power from -19.5 dBm to +2.5 dBm
- -94 dBm receiver sensitivity
- Support SPI, UART, I2C interface
- Support the OTA upgrade
- Wide Operating Voltage Range:1.65V to 3.6V
- Operating Temperature: -40°C to +85°C

Application

- Medical applications
- Beacons
- Proximity tags and trackers
- Wearable devices
- Low power consumption devices
- Industrial appliances

Module picture as below showing

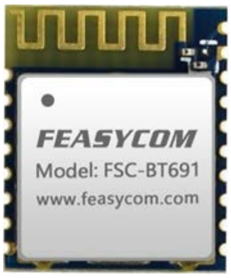

Figure 1: FSC-BT691 Picture

2. General Specification

Table 1: General Specifications

Categories	Features	Implementation
Wireless Specification	Bluetooth Version	Bluetooth Low Energy 5.1
	Frequency	2.400 - 2.483.5 GHz
	Transmit Power	-19.5 dBm to +2.5 dBm
	Receive Sensitivity	-94 dBm (Typical)
	Modulation	GFSK
Host Interface and Peripherals	UART Interface	TX, RX, CTS, RTS
		General Purpose I/O
		Default 115200,N,8,1
		Baudrate support from 1200 to 921600
		5, 6, 7, 8 data bit character
	GPIO	6 (maximum – configurable) lines
		Pull-up resistor (33 KΩ) control
		Read pin-level
	I2C Interface	2 (configurable from GPIO total). Up to 400 kbps
	ADC Interface	Analog input voltage range: 0.4V ~ 1.4V(or 2.4V) based on configure
		Supports single 10-bit SAR ADC conversion
		2 channels (configured from GPIO total)
		Up to 200MSPS conversion
	PWM	2 PWM outputs
		Supports edge-alignment or center-alignment Supports fault detection
Profiles	Class Bluetooth	No Support
	Bluetooth Low Energy	GATT Client & Peripheral - Any Custom Services
Maximum Connections	Classic Bluetooth	Supports up to three BLE connections
FW upgrade		J-Link
150	Supply	1.65V ~ 3.6V
Power Consumption		1.6uA (Sleep)
Physical	Dimensions	10mm X 11.9mm X 2mm; Pad Pitch 0.8mm
Environmental	Operating	-40°C to +85°C
	Storage	-40°C to +85°C
Miscellaneous	Lead Free	Lead-free and RoHS compliant
	Warranty	One Year
Humidity		10% ~ 90% non-condensing
MSL grade:		MSL 3
ESD grade:	Human Body Model	±2000V
	Charged Device Model	±2500V

3. HARDWARE SPECIFICATION

3.1 Block Diagram and PIN Diagram

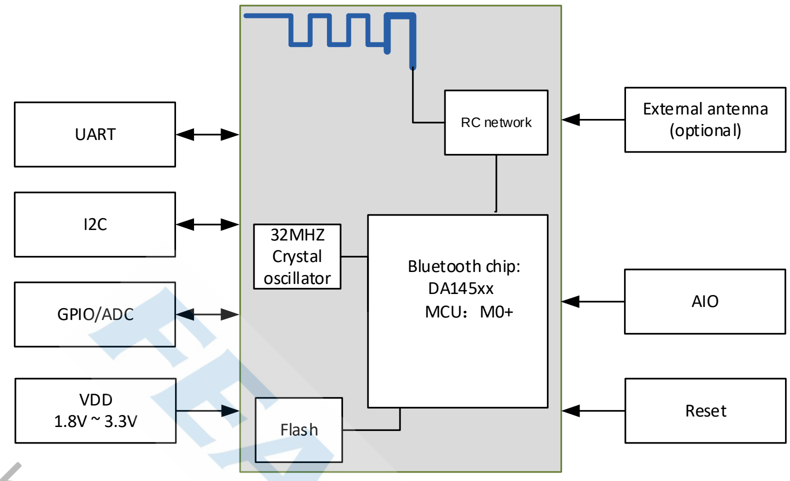
UART
I2C
GPIO/ADC
VDD
1.8V ~ 3.3V
RC network
32MHZ Crystal oscillator
Bluetooth chip: DA145xx
MCU： M0+
Flash
External antenna (optional)
AIO
Reset

Figure 1: Block Diagram

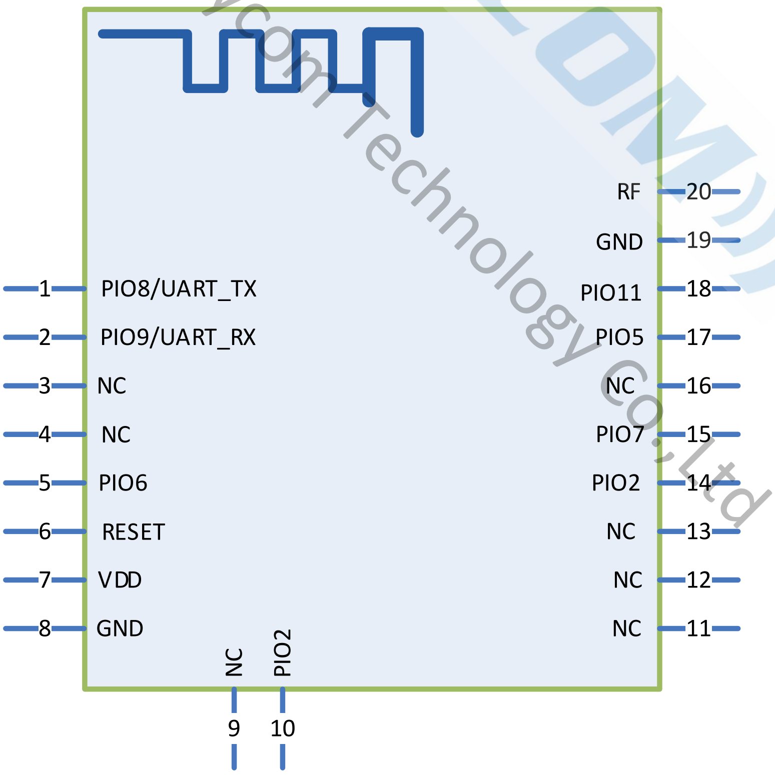
1 PIO8/UART_TX
2 PIO9/UART_RX
3 NC
4 NC
5 PIO6
6 RESET
7 VDD
8 GND
9 NC
10 PIO2
11 NC
12 NC
13 NC
14 PIO2
15 PIO7
16 NC
17 PIO5
18 PIO11
19 GND
20 RF

Figure 2: FSC-BT691 PIN Diagram(Top View)

3.2 PIN Definition Descriptions

Table 2: Pin definition

Pin	Pin Name	Type	Pin Descriptions	Notes
1	PIO8	I/O	Programmable input/output line	
	UART_TX	O	Serial Transmitter Data	
2	PIO9	I/O	Programmable input/output line	
	UART_RX	I	Serial Receiver Data	
3	NC		NC (Do not connect to any pin)	
4	NC		NC (Do not connect to any pin)	
5	PIO6	I/O	Programmable input/output line	
	ADC2	I	Analog to Digital Converter input 2.	
6	RESET	I	RST active Low hardware reset (default).	
7	VDD	VDD	Power supply voltage 1.8V-3.3V	
8	GND	Vss	Power Ground	
9, 13	NC		NC (Do not connect to any pin)	
10,14	PIO2	I/O	Programmable input/output line	
	ADC1	I	Alternative Function: Analog to Digital Converter input 1.	
11,12	NC		NC (Do not connect to any pin)	
15	PIO7	I/O	Programmable input/output line	
	ADC3	I	Alternative Function: Analog to Digital Converter input 3.	
16	NC		NC (Do not connect to any pin)	
17	PIO5	I/O	Programmable input/output line	
18	PIO11	I/O	Programmable input/output line	
19	GND	Vss	Power Ground	
20	RF	O	RF signal output .	

4. PHYSICAL INTERFACE

4.1 Power Supply

The transient response of the regulator is important. If the power rails of the module are supplied from an external voltage source, the transient response of any regulator used should be 20µs or less. It is essential that the power rail recovers quickly.

4.2 Reset

Comprises a reset (RST) pad which is active high. It contains an RC filter with a resistor of 65 kΩ and a capacitor of 3.5 pF to suppress spikes. It also contains a 25 kΩ pull-down resistor. This pad should be driven externally by a field-effect transistor (FET) or a single button connected to VBAT. The typical latency of the RST pad is in the range of 2 µs.

4.3 General Purpose Analog IO

The FSC-BT691 is equipped with a high-speed ultra-low-power 10-bit general purpose Analog-to-Digital Converter (GPADC). It can operate in unipolar (single ended) mode as well as in bipolar (differential) mode. The ADC has its own voltage regulator (LDO) of 0.9 V, which represents the full-scale reference voltage.

- 10-bit dynamic ADC with 125 ns typical conversion time
- Maximum sampling rate 1 Msample/s
- 128x averaging; conversion time 1 ms, up to 11b ENOB
- Ultra-low power (20 uA typical supply current at 100 ksample/s)
- Two single-ended or two differential external input channels (GPIOs)
- Battery, DCDC outputs, and the internal VDD monitoring channels
- Chopper function
- Offset adjust
- Common-mode input level adjust
- Configurable attenuator: 1x, 2x, 3x and 4x
- Input shifter

4.4 General Purpose Digital IO

There are 6 general purpose digital IOs defined in the module. All these GPIOs can be configured by software to realize various functions, such as button controls, LED drives or interrupt signals to host controller, etc. Do not connect them if not use.

The I/O type of each I/O pins can be configured by software individually as Input or Push-pull output mode. After the chip is reset, the I/O mode of all pins is input mode with no pull-up and pull-down enable. Each I/O pin has an individual pull-up and pull-down resistor which is about 30 kΩ ~ 50 kΩ for VDD and Vss.

4.5 RF Interface

The Radio Transceiver implements the RF part of the BLE protocol. Together with the Bluetooth 5.1 PHY layer, it provides up to 93 dB RF link budget for a reliable wireless communication. All RF blocks are supplied by on-chip low-drop out-regulators (LDOs). The bias scheme is programmable per block and optimized for minimum power consumption.

- Single ended RFIO interface, 50Ω matched
- Alignment free operation
- -94 dBm receiver sensitivity
- Configurable transmit output power from -19.5 dBm up to 2.5 dBm
- Ultra-low power consumption
- Fast frequency tuning minimizes overhead

4.6 Serial Interfaces

4.6.1 UART

FSC-BT691 provides one channels of Universal Asynchronous Receiver/Transmitters (UART)(Full-duplex asynchronous communications). The UART Controller performs a serial-to-parallel conversion on data received from the peripheral and a parallel-to-serial conversion on data transmitted from the CPU.

This is a standard UART interface for communicating with other serial devices. The UART interface provides a simple mechanism for communicating with other serial devices using the RS232 protocol.

When the module 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.

This module output is at 3.3V CMOS logic levels (tracks VCC). Level conversion must be added to interface with an RS-232 level compliant interface.

Some serial implementations link CTS and RTS to remove the need for handshaking. We do not recommend linking CTS and RTS except for testing and prototyping. If these pins are linked and the host sends data when the FSC-BT691 deasserts its RTS signal, there is significant risk that internal receive buffers will overflow, which could lead to an internal processor crash. This drops the connection and may require a power cycle to reset the module. We recommend that you adhere to the correct CTS/RTS handshaking protocol for proper operation.

Table 3: Possible UART Settings

Parameter	Possible Values	
Baudrate	Minimum	1200 baud (≤2%Error)
	Standard	115200bps(≤1%Error)
	Maximum	921600bps(≤1%Error)
Flow control		RTS/CTS, or None
Parity		None, Odd or Even
Number of stop bits		1 /1.5/2
Bits per channel		5/6/7/8

When connecting the module to a host, please make sure to follow .

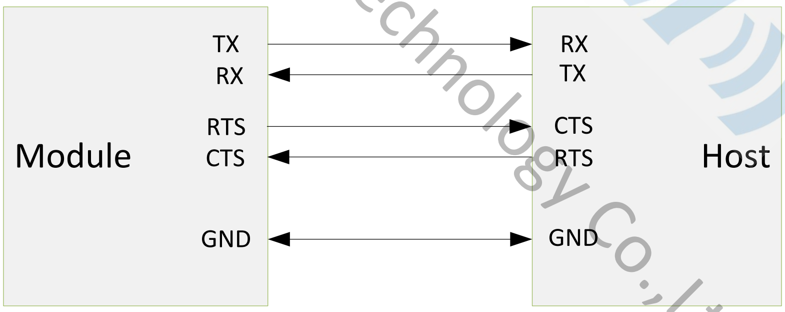

Figure 4: UART Connection

4.6.2 I^{2}C Interface

The I2C Interface is a programmable control bus that provides support for the communications link between Integrated Circuits in a system. It is a simple two-wire bus with a software-defined protocol for system control, which is used in temperature sensors and voltage level translators to EEPROMs, general-purpose I/O, and A/D and D/A converters.

- Two-wire I2C serial interface consisting of a serial data line (SDA) and a serial clock (SCL)
- Clock synchronization
- 32 locations deep transmit/receive FIFOs (32× 8-bit Rx and 32× 10-bit Tx)

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- Master transmit and Master receive operation
- Slave transmit and Slave receive operation
- 7-bit or 10-bit addressing
- 7-bit or 10-bit combined format transfers
- Bulk transmit mode
- Default slave address of 0x055
- Interrupt or polled-mode operation
- Handles bit and byte waiting at both bus speeds
- Programmable SDA hold time
- DMA support

5. ELECTRICAL CHARACTERISTICS

5.1 Absolute Maximum Ratings

Absolute maximum ratings for supply voltage and voltages on digital and analogue pins of the module are listed below. Exceeding these values causes permanent damage.

The average PIO pin output current is defined as the average current value flowing through any one of the corresponding pins for a 100mS period. The total average PIO pin output current is defined as the average current value flowing through all of the corresponding pins for a 100mS period. The maximum output current is defined as the value of the peak current flowing through any one of the corresponding pins.

Table 4: Absolute Maximum Rating

Symbol	Description	Min	Trp	Max	Unit
VDD	BT Input voltage	-0.2	-	3.6	V
VI	Input voltage	-0.2	-	3.6	V
VO	Output voltage	VSS	-	VDD_H	V
TOP	Operating Temperature	-40	-	85	°C
TSTG	Storage Temperature	-40	-	85	°C

Note: Exceeding one or more of the limiting values may cause permanent damage to FSC-BT691.
Caution: Electrostatic sensitive device, comply with protection rules when operating.

5.2 DC Electrical Characteristics

Table 5: Voltage and current

Symbol	Parameter	Min	Type	Max	Unit	Test Conditions
V_{DD}-V_{SS} -	DC Power Supply	1.8		3.3	V	TA=25°C
T_A -	Operating Temperature	-40	25	+85	°C	-
I1	Standby Current in Sleep mode	-	1.6	-	uA	48K+RCX
VOH	Output high level voltage	VDD-0.3	-	VDD	V	-
VOL	Output low level voltage	VSS	-	VSS+0.3	V	-
VIH	Input high level voltage	1.8	-	3.3	V	-
VIL	Input low level voltage	VSS	-	VSS+0.3	V	-

5.3 AC Electrical Characteristics

Table 6: RF

Symbol	Parameter	Min	Type	Max	Unit
General frequency					
Fop	Operating frequency	2400	-	2483.5	MHz
N_{CH}	number of channels	-	40	-	1
Transmitter					
PRF	Output power	-19.5	-	2.5	dBm
PBW	20dB Bandwidth for Modulated Carrier at 1Mbps	-	1.5	-	MHz
Receiver					
RXSENS	Sensitivity (0.1%BER) @1Mbps	-	-94	-	dBm

6. MSL & ESD

Table 7: MSL and ESD

Parameter	Value	
MSL grade:	MSL 3	
ESD grade:	Human Body Model Charged Device Model	±2000V ±2500V

7. RECOMMENDED TEMPERATURE REFLOW PROFILE

Prior to any reflow, it is important to ensure the modules were packaged to prevent moisture absorption. New packages contain desiccate (to absorb moisture) and a humidity indicator card to display the level maintained during storage and shipment. If directed to bake units on the card, please check the Picture below and follow instructions specified by IPC/JEDEC J-STD-033.

Note: The shipping tray cannot be heated above 65°C. If baking is required at the higher temperatures displayed in the Picture below, the modules must be removed from the shipping tray.

Any modules not manufactured before exceeding their floor life should be re-packaged with fresh desiccate and a new humidity indicator card. Floor life for MSL (Moisture Sensitivity Level) 3 devices is 168 hours in ambient environment 30°C/60%RH.

Table 8: Recommended baking times and temperatures

MSL	125°C Baking Temp.		90°C/≤ 5%RH Baking Temp.		40°C/ ≤ 5%RH Baking Temp.	
	Saturated @ 30°C/85%	Floor Life Limit + 72 hours @ 30°C/60%	Saturated @ 30°C/85%	Floor Life Limit + 72 hours @ 30°C/60%	Saturated @ 30°C/85%	Floor Life Limit + 72 hours @ 30°C/60%
3	9 hours	7 hours	33 hours	23 hours	13 days	9 days

Feasycom surface mount modules are designed to be easily manufactured, including reflow soldering to a PCB. Ultimately it is the responsibility of the customer to choose the appropriate solder paste and to ensure oven temperatures during reflow meet the requirements of the solder paste. Feasycom surface mount modules conform to J-STD-020D1 standards for reflow temperatures.

The soldering profile depends on various parameters necessitating a set up for each application. The data here is given only for guidance on solder reflow.

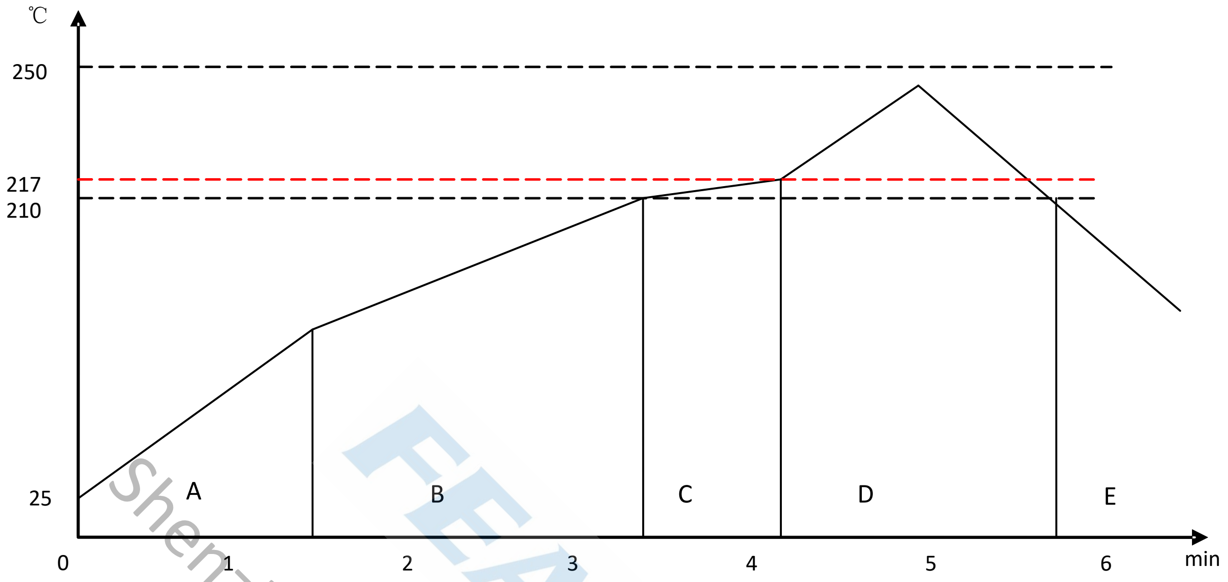


Figure 5: Typical Lead-free Re-flow

Pre-heat zone (A) — This zone raises the temperature at a controlled rate, **typically 0.5 – 2 °C/s**. The purpose of this zone is to preheat the PCB board and components to 120 ~ 150 °C. This stage is required to distribute the heat uniformly to the PCB board and completely remove solvent to reduce the heat shock to components.

Equilibrium Zone 1 (B) — In this stage the flux becomes soft and uniformly encapsulates solder particles and spread over PCB board, preventing them from being re-oxidized. Also with elevation of temperature and liquefaction of flux, each activator and rosin get activated and start eliminating oxide film formed on the surface of each solder particle and PCB board. **The temperature is recommended to be 150° to 210° for 60 to 120 second for this zone.**

Equilibrium Zone 2 (C) (optional) — In order to resolve the upright component issue, it is recommended to keep the temperature in 210 – 217 ° for about 20 to 30 second.

Reflow Zone (D) — The profile in the figure is designed for Sn/Ag3.0/Cu0.5. It can be a reference for other lead-free solder. The peak temperature should be high enough to achieve good wetting but not so high as to cause component discoloration or damage. Excessive soldering time can lead to intermetallic growth which can result in a brittle joint. The recommended peak temperature (Tp) is 230 ~ 250 °C. The soldering time should be 30 to 90 second when the temperature is above 217 °C.

Cooling Zone (E) — The cooling ate should be fast, to keep the solder grains small which will give a longer-lasting joint. **Typical cooling rate should be 4 °C.**

8. MECHANICAL DETAILS

8.1 Mechanical Details

- Dimension: 10mm(W) x 11.9mm(L) x 2 mm(H) Tolerance: ±0.2mm
- Module size: 10mm X 11.9mm Tolerance: ±0.2mm
- Pad size: 0.9mmX0.6mm Tolerance: ±0.1mm
- Pad pitch: 1.1mm Tolerance: ±0.1mm

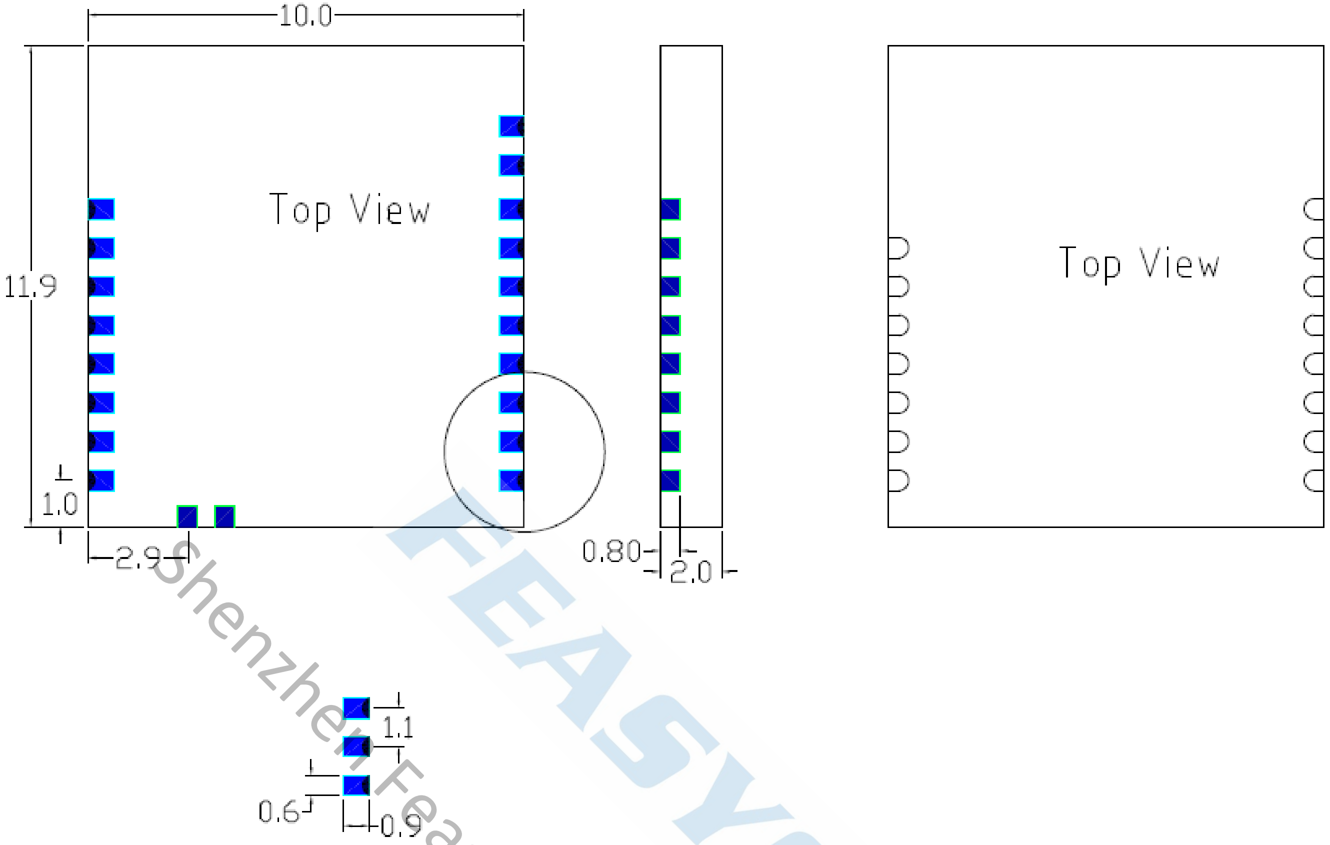


Figure 6: FSC-BT691 footprint

9. HARDWARE INTEGRATION SUGGESTIONS

9.1 Soldering Recommendations

FSC-BT691 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.

9.2 Layout Guidelines (Internal Antenna)

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.

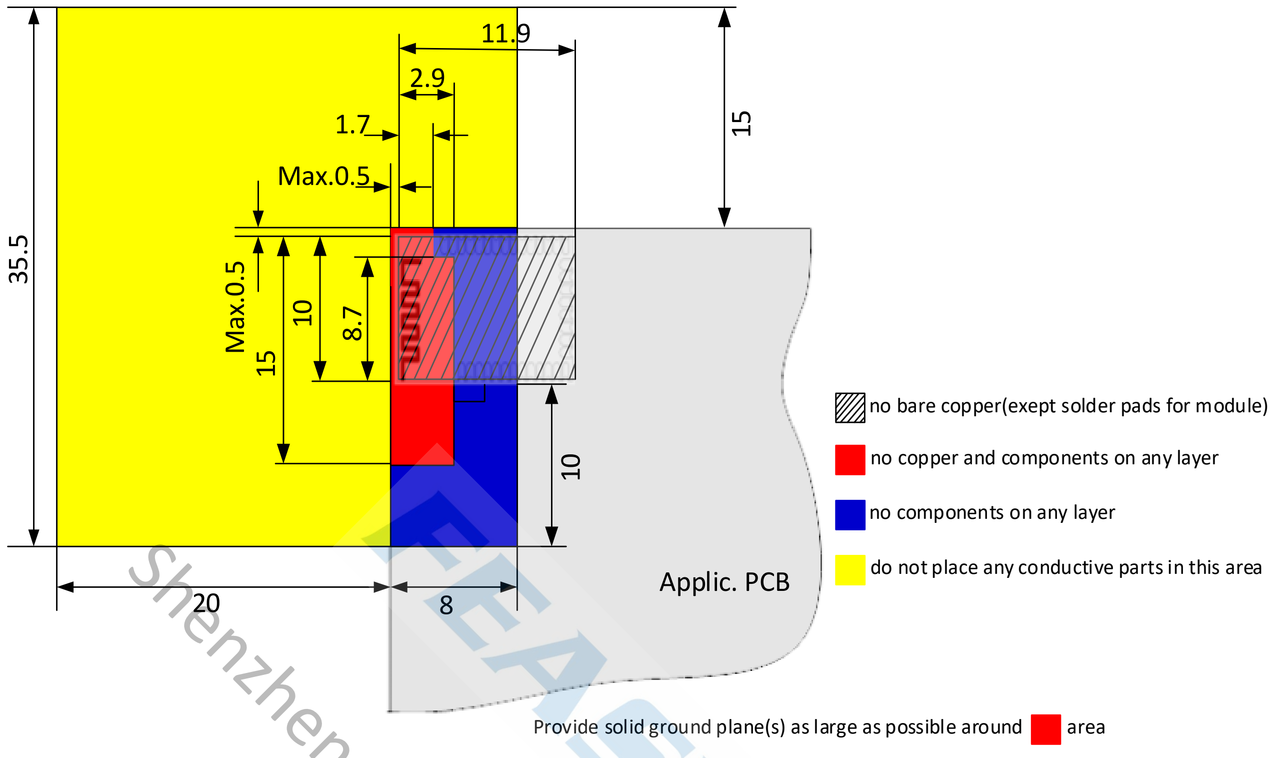

11.9
2.9
1.7
Max.0.5
15
35.5
Max.0.5
15
10
8.7
10
20
8
Applic. PCB
▨ no bare copper(exept solder pads for module)
🟥 no copper and components on any layer
🟦 no components on any layer
🟨 do not place any conductive parts in this area
Provide solid ground plane(s) as large as possible around 🟥 area

Figure 7: Restricted Area (Design schematic, for reference only.   Unit: mm)

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).

9.3 Layout Guidelines(External Antenna)

Placement and PCB layout are critical to optimize the performances of a module without on-board antenna designs. The trace from the antenna port of the module to an external antenna should be 50Ω and must be as short as possible to avoid any interference into the transceiver of the module. The location of the external antenna and RF-IN port of the module should be kept away from any noise sources and digital traces. A matching network might be needed in between the external antenna and RF-IN port to better match the impedance to minimize the return loss.

As indicated in picture below, RF critical circuits of the module should be clearly separated from any digital circuits on the system board. All RF circuits in the module are close to the antenna port. The module, then, should be placed in this way that module digital part towards your digital section of the system PCB.

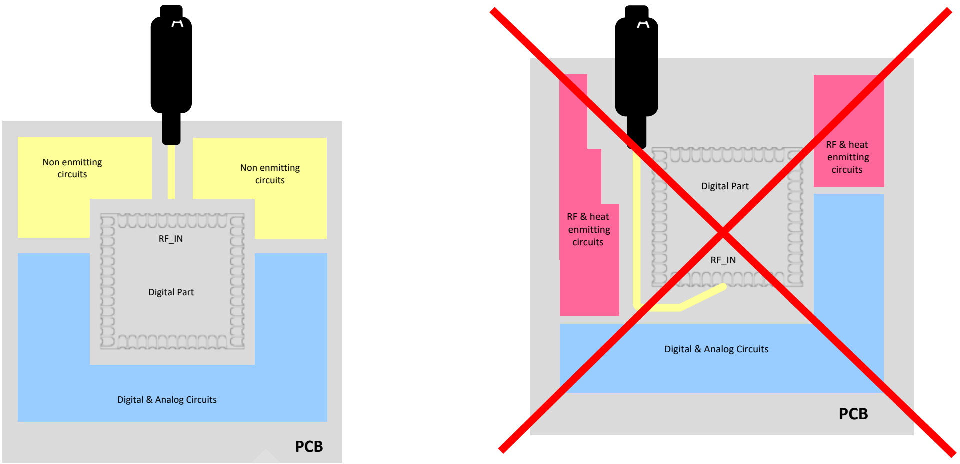

Non enmitting circuits
Non enmitting circuits
RF_IN
Digital Part
Digital & Analog Circuits
PCB
RF & heat enmitting circuits
Digital Part
RF & heat enmitting circuits
RF_IN
Digital & Analog Circuits
PCB

Figure 8: Placement the Module on a System Board

9.3.1 Antenna Connection and Grounding Plane Design

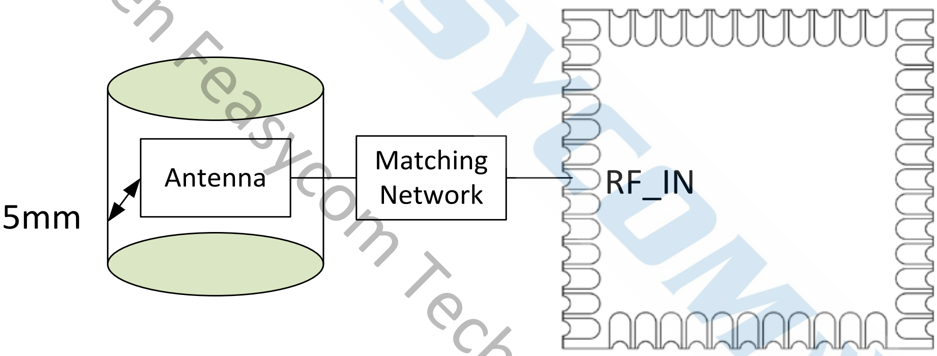

5mm
Antenna
Matching Network
RF_IN

Figure 9: Leave 5mm Clearance Space from the Antenna

General design recommendations are:

- The length of the trace or connection line should be kept as short as possible.
- Distance between connection and ground area on the top layer should at least be as large as the dielectric thickness.
- Routing the RF close to digital sections of the system board should be avoided.
- To reduce signal reflections, sharp angles in the routing of the micro strip line should be avoided. Chamfers or fillets are preferred for rectangular routing; 45-degree routing is preferred over Manhattan style 90-degree routing.

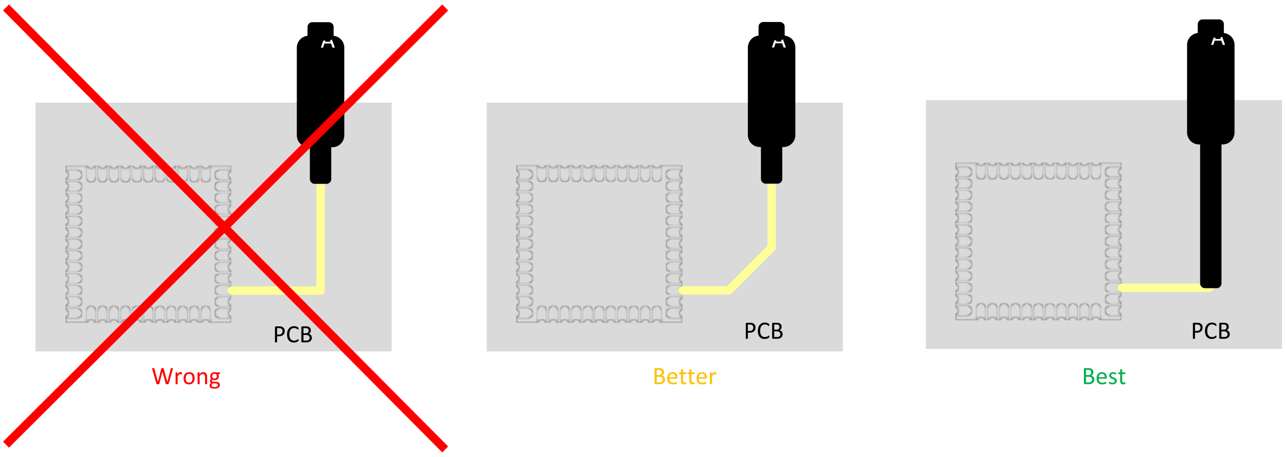
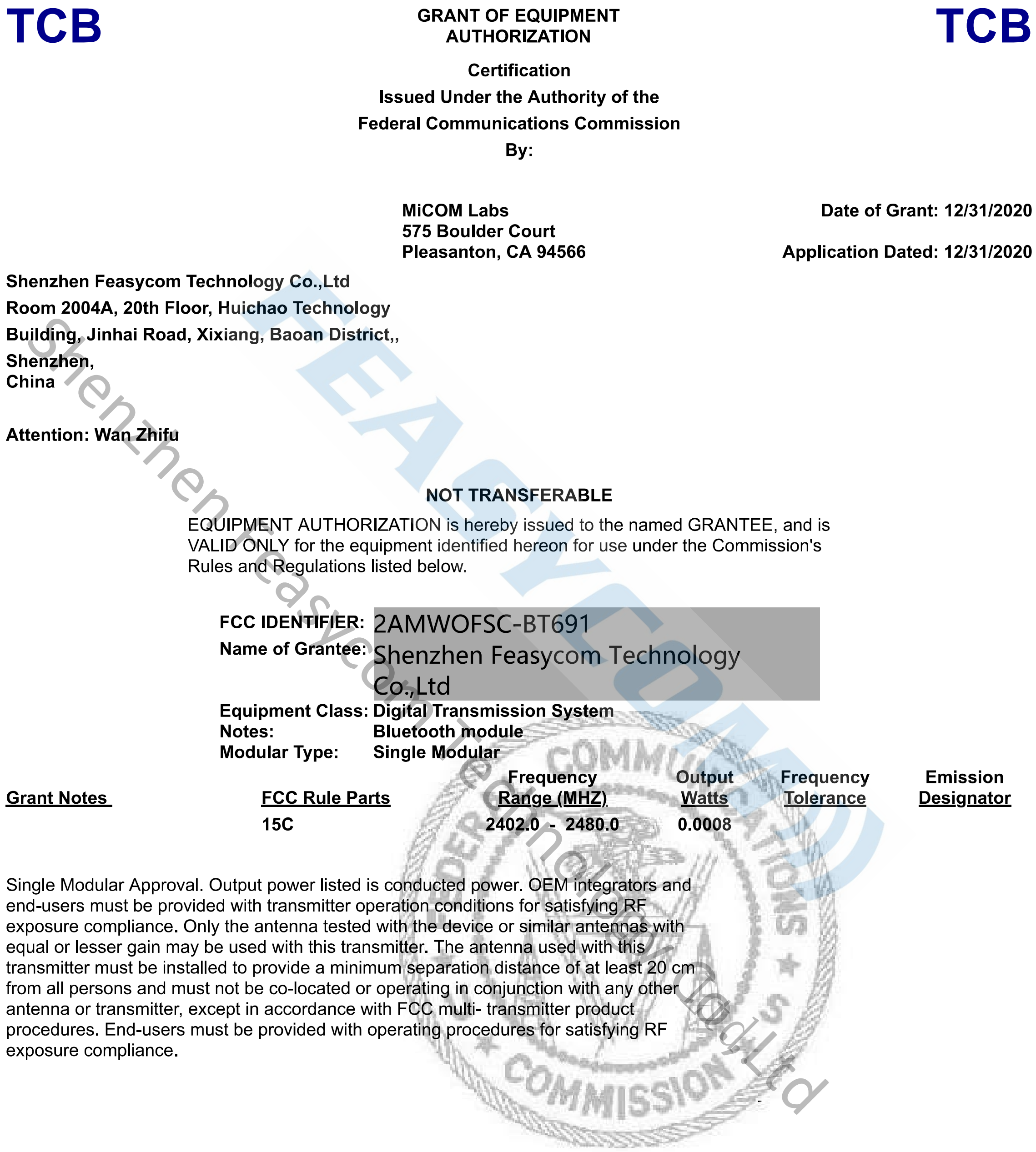


Figure 10: Recommended Trace Connects Antenna and the Module

- Routing of the RF-connection underneath the module should be avoided. The distance of the micro strip line to the ground plane on the bottom side of the receiver is very small and has huge tolerances. Therefore, the impedance of this part of the trace cannot be controlled.
- Use as many vias as possible to connect the ground planes.

10. Certificate

10.1 FCC Certificate



TCB **GRANT OF EQUIPMENT AUTHORIZATION** **TCB**

Certification
Issued Under the Authority of the
Federal Communications Commission
By:

MiCOM Labs
575 Boulder Court
Pleasanton, CA 94566

Date of Grant: 12/31/2020

Application Dated: 12/31/2020

Shenzhen Feasycom Technology Co.,Ltd
Room 2004A, 20th Floor, Huichao Technology
Building, Jinhai Road, Xixiang, Baoan District,,
Shenzhen,
China

Attention: Wan Zhifu

NOT TRANSFERABLE

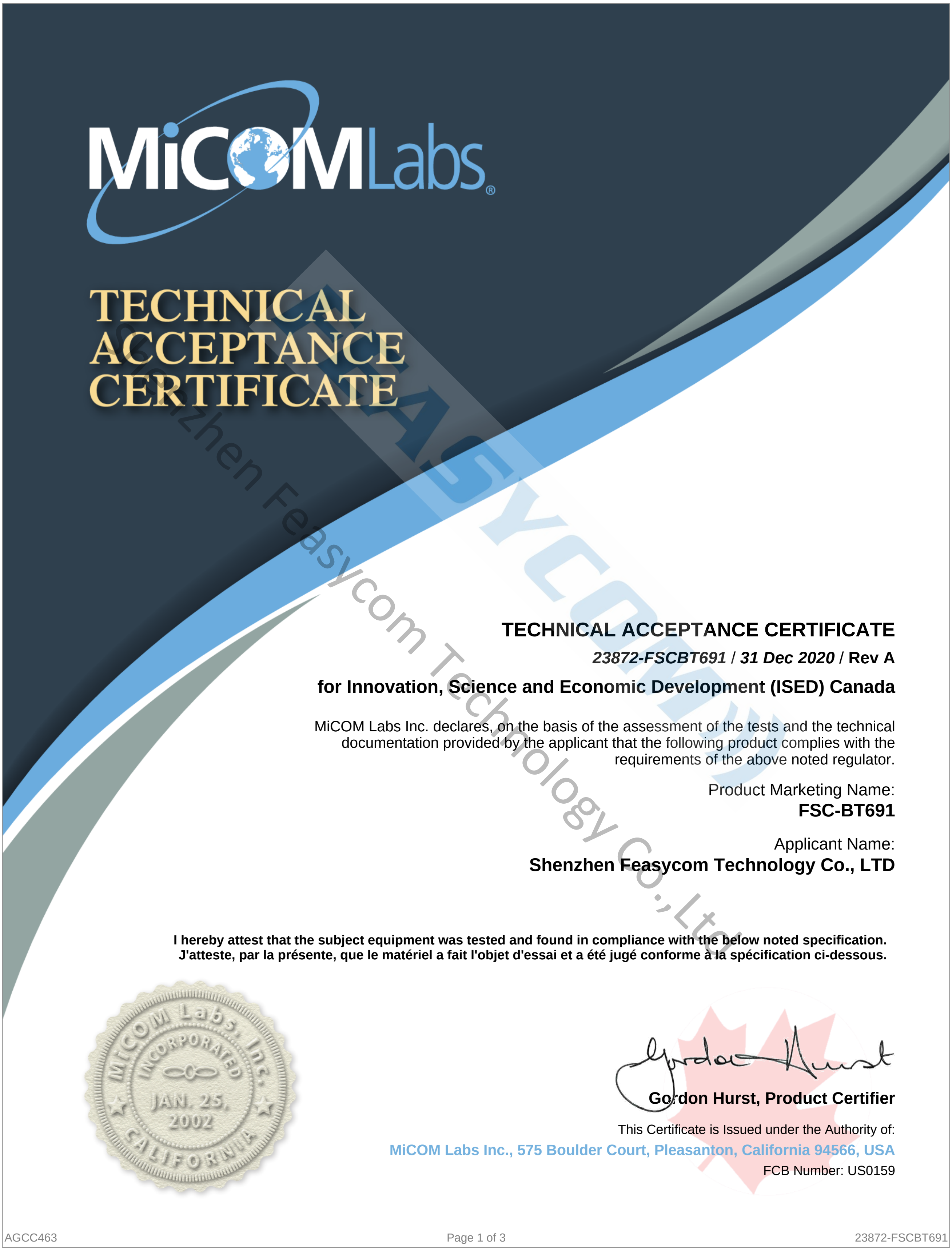
EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is VALID ONLY for the equipment identified hereon for use under the Commission's Rules and Regulations listed below.

FCC IDENTIFIER: 2AMWOFSC-BT691
Name of Grantee: Shenzhen Feasycom Technology Co.,Ltd
Equipment Class: **Digital Transmission System**
Notes: **Bluetooth module**
Modular Type: **Single Modular**

Grant Notes	FCC Rule Parts	Frequency Range (MHZ)	Output Watts	Frequency Tolerance	Emission Designator
	15C	2402.0 - 2480.0	0.0008		

Single Modular Approval. Output power listed is conducted power. OEM integrators and end-users must be provided with transmitter operation conditions for satisfying RF exposure compliance. Only the antenna tested with the device or similar antennas with equal or lesser gain may be used with this transmitter. The antenna used with this transmitter must be installed to provide a minimum separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter, except in accordance with FCC multi- transmitter product procedures. End-users must be provided with operating procedures for satisfying RF exposure compliance.

10.2 IC Certificate



MiCOM Labs

TECHNICAL ACCEPTANCE CERTIFICATE

TECHNICAL ACCEPTANCE CERTIFICATE

23872-FSCBT691 **/** ***31 Dec 2020*** **/ Rev A**

for Innovation, Science and Economic Development (ISED) Canada

MiCOM Labs Inc. declares, on the basis of the assessment of the tests and the technical documentation provided by the applicant that the following product complies with the requirements of the above noted regulator.

Product Marketing Name:
FSC-BT691

Applicant Name:
Shenzhen Feasycom Technology Co., LTD

I hereby attest that the subject equipment was tested and found in compliance with the below noted specification.
J'atteste, par la présente, que le matériel a fait l'objet d'essai et a été jugé conforme à la spécification ci-dessous.

JAN. 25, 2002

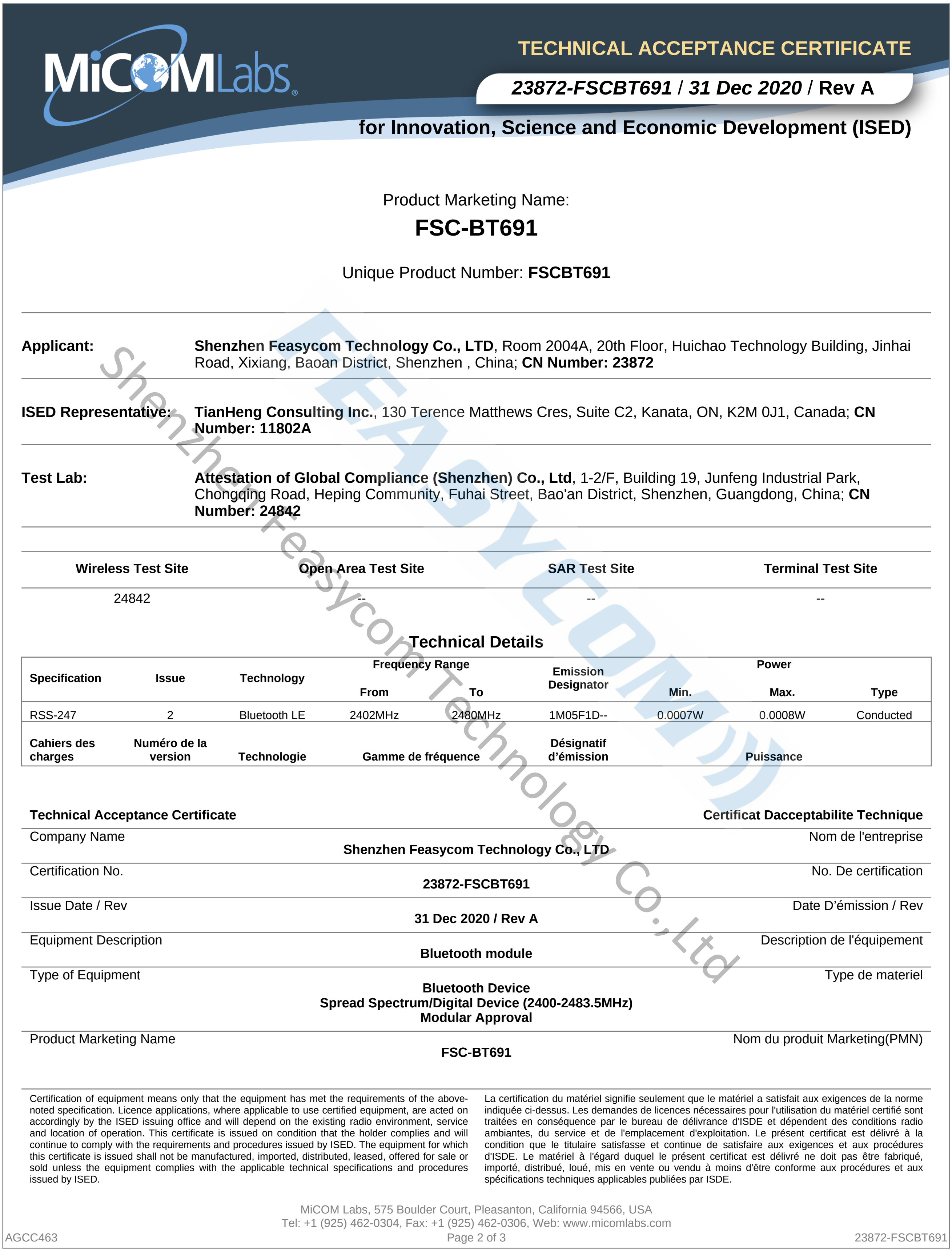
Gordon Hurst

Gordon Hurst, Product Certifier

This Certificate is Issued under the Authority of:
MiCOM Labs Inc., 575 Boulder Court, Pleasanton, California 94566, USA
FCB Number: US0159

Doc - Cert v2.1

AGCC463 Page 1 of 3 23872-FSCBT691



MiCOMLabs

TECHNICAL ACCEPTANCE CERTIFICATE

23872-FSCBT691 / *31 Dec 2020* / **Rev A**

for Innovation, Science and Economic Development (ISED)

Product Marketing Name:

FSC-BT691

Unique Product Number: **FSCBT691**

Applicant:	**Shenzhen Feasycom Technology Co., LTD**, Room 2004A, 20th Floor, Huichao Technology Building, Jinhai Road, Xixiang, Baoan District, Shenzhen , China; **CN Number: 23872**
ISED Representative:	**TianHeng Consulting Inc.**, 130 Terence Matthews Cres, Suite C2, Kanata, ON, K2M 0J1, Canada; **CN Number: 11802A**
Test Lab:	**Attestation of Global Compliance (Shenzhen) Co., Ltd**, 1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China; **CN Number: 24842**

Wireless Test Site	Open Area Test Site	SAR Test Site	Terminal Test Site
24842	--	--	--

Technical Details

Specification	Issue	Technology	Frequency Range		Emission Designator	Power		
			From	To		Min.	Max.	Type
RSS-247	2	Bluetooth LE	2402MHz	2480MHz	1M05F1D--	0.0007W	0.0008W	Conducted
Cahiers des charges	**Numéro de la version**	**Technologie**	**Gamme de fréquence**		**Désignatif d'émission**	**Puissance**		

Technical Acceptance Certificate		**Certificat Dacceptabilite Technique**
Company Name	**Shenzhen Feasycom Technology Co., LTD**	Nom de l'entreprise
Certification No.	**23872-FSCBT691**	No. De certification
Issue Date / Rev	**31 Dec 2020 / Rev A**	Date D'émission / Rev
Equipment Description	**Bluetooth module**	Description de l'équipement
Type of Equipment	**Bluetooth Device** **Spread Spectrum/Digital Device (2400-2483.5MHz)** **Modular Approval**	Type de materiel
Product Marketing Name	**FSC-BT691**	Nom du produit Marketing(PMN)

Certification of equipment means only that the equipment has met the requirements of the above-noted specification. Licence applications, where applicable to use certified equipment, are acted on accordingly by the ISED issuing office and will depend on the existing radio environment, service and location of operation. This certificate is issued on condition that the holder complies and will continue to comply with the requirements and procedures issued by ISED. The equipment for which this certificate is issued shall not be manufactured, imported, distributed, leased, offered for sale or sold unless the equipment complies with the applicable technical specifications and procedures issued by ISED.

La certification du matériel signifie seulement que le matériel a satisfait aux exigences de la norme indiquée ci-dessus. Les demandes de licences nécessaires pour l'utilisation du matériel certifié sont traitées en conséquence par le bureau de délivrance d'ISDE et dépendent des conditions radio ambiantes, du service et de l'emplacement d'exploitation. Le présent certificat est délivré à la condition que le titulaire satisfasse et continue de satisfaire aux exigences et aux procédures d'ISDE. Le matériel à l'égard duquel le présent certificat est délivré ne doit pas être fabriqué, importé, distribué, loué, mis en vente ou vendu à moins d'être conforme aux procédures et aux spécifications techniques applicables publiées par ISDE.

Doc - Cert v2.1

MiCOM Labs, 575 Boulder Court, Pleasanton, California 94566, USA
Tel: +1 (925) 462-0304, Fax: +1 (925) 462-0306, Web: www.micomlabs.com

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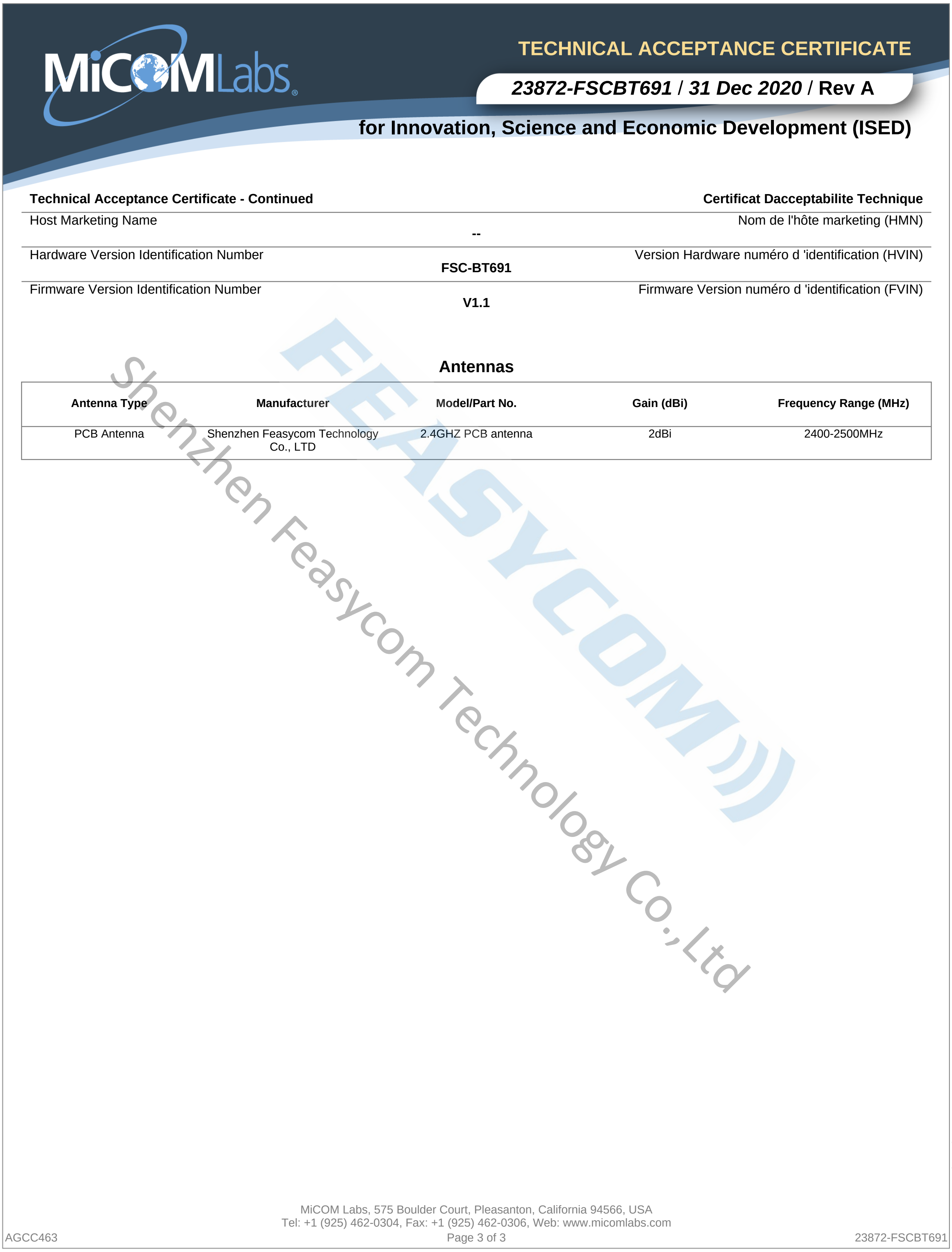

TECHNICAL ACCEPTANCE CERTIFICATE

***23872-FSCBT691* / *31 Dec 2020* / Rev A**

for Innovation, Science and Economic Development (ISED)

Technical Acceptance Certificate - Continued		**Certificat Dacceptabilite Technique**
Host Marketing Name	--	Nom de l'hôte marketing (HMN)
Hardware Version Identification Number	**FSC-BT691**	Version Hardware numéro d 'identification (HVIN)
Firmware Version Identification Number	**V1.1**	Firmware Version numéro d 'identification (FVIN)

Antennas

Antenna Type	Manufacturer	Model/Part No.	Gain (dBi)	Frequency Range (MHz)
PCB Antenna	Shenzhen Feasycom Technology Co., LTD	2.4GHZ PCB antenna	2dBi	2400-2500MHz

Doc - Cert v2.1

MiCOM Labs, 575 Boulder Court, Pleasanton, California 94566, USA
Tel: +1 (925) 462-0304, Fax: +1 (925) 462-0306, Web: www.micomlabs.com

AGCC463
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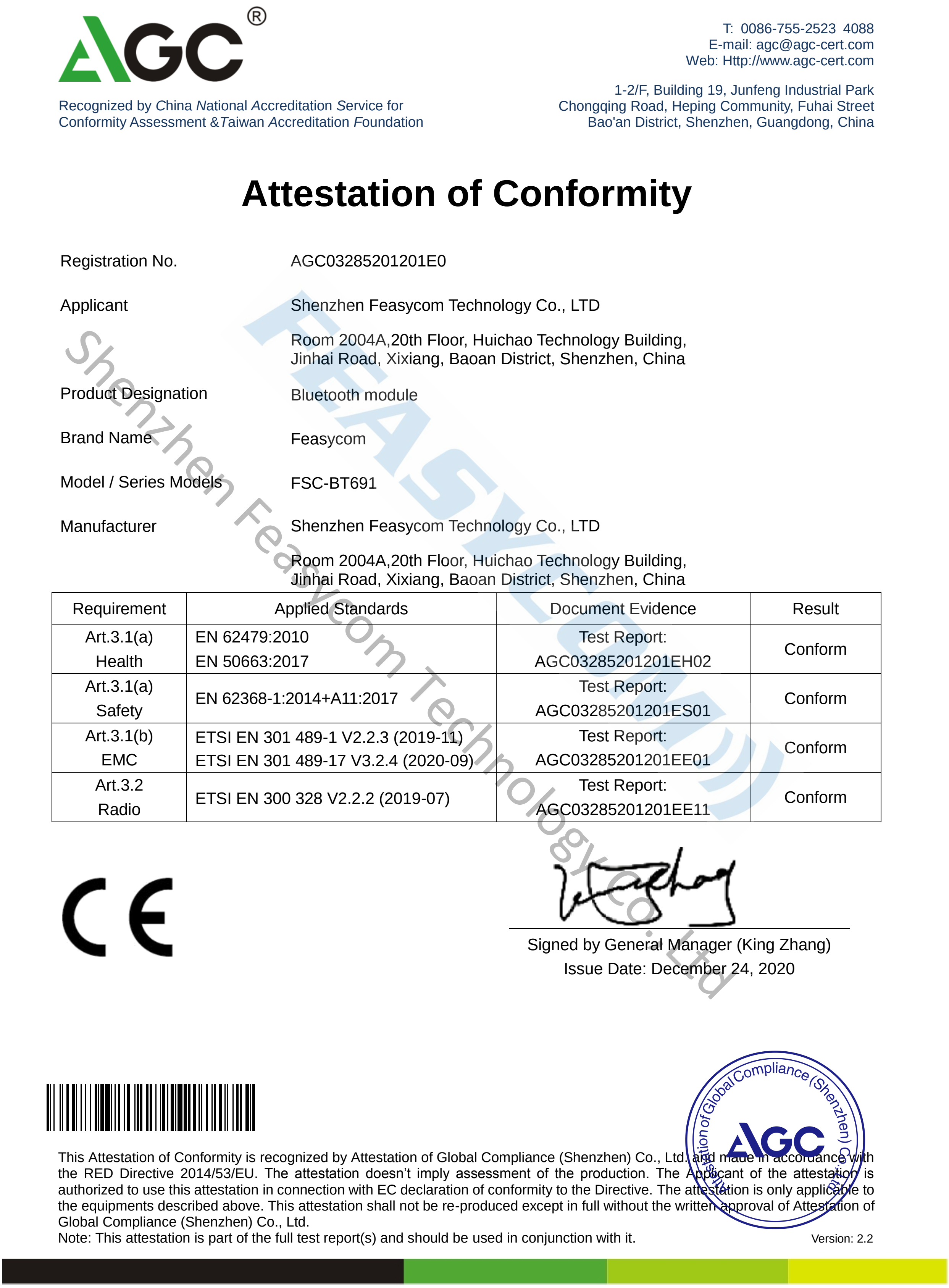
10.3 CE Certificate



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Web: Http://www.agc-cert.com

1-2/F, Building 19, Junfeng Industrial Park
Chongqing Road, Heping Community, Fuhai Street
Bao'an District, Shenzhen, Guangdong, China

Attestation of Conformity

Registration No.	AGC03285201201E0
Applicant	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	Feasycom
Model / Series Models	FSC-BT691
Manufacturer	Shenzhen Feasycom Technology Co., LTD Room 2004A,20th Floor, Huichao Technology Building, Jinhai Road, Xixiang, Baoan District, Shenzhen, China

Requirement	Applied Standards	Document Evidence	Result
Art.3.1(a) Health	EN 62479:2010 EN 50663:2017	Test Report: AGC03285201201EH02	Conform
Art.3.1(a) Safety	EN 62368-1:2014+A11:2017	Test Report: AGC03285201201ES01	Conform
Art.3.1(b) EMC	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-17 V3.2.4 (2020-09)	Test Report: AGC03285201201EE01	Conform
Art.3.2 Radio	ETSI EN 300 328 V2.2.2 (2019-07)	Test Report: AGC03285201201EE11	Conform

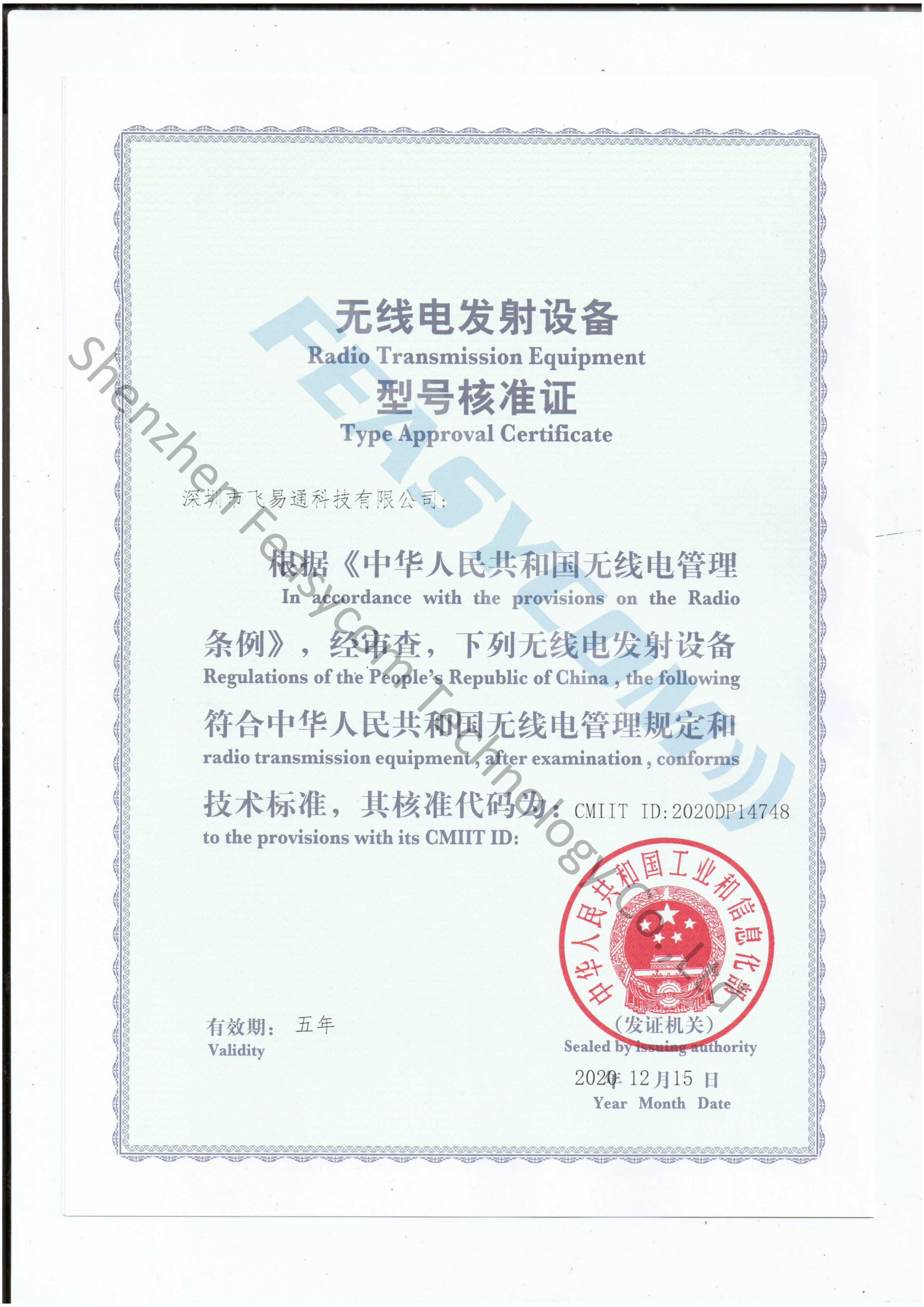
CE

Signed by General Manager (King Zhang)
Issue Date: December 24, 2020

This Attestation of Conformity is recognized by Attestation of Global Compliance (Shenzhen) Co., Ltd. and made in accordance with the RED Directive 2014/53/EU. The attestation doesn't imply assessment of the production. The Applicant of the attestation is authorized to use this attestation in connection with EC declaration of conformity to the Directive. The attestation is only applicable to the equipments described above. This attestation shall not be re-produced except in full without the written approval of Attestation of Global Compliance (Shenzhen) Co., Ltd.
Note: This attestation is part of the full test report(s) and should be used in conjunction with it.

Version: 2.2

10.4 SRRC Certificate



无线电发射设备
Radio Transmission Equipment
型号核准证
Type Approval Certificate

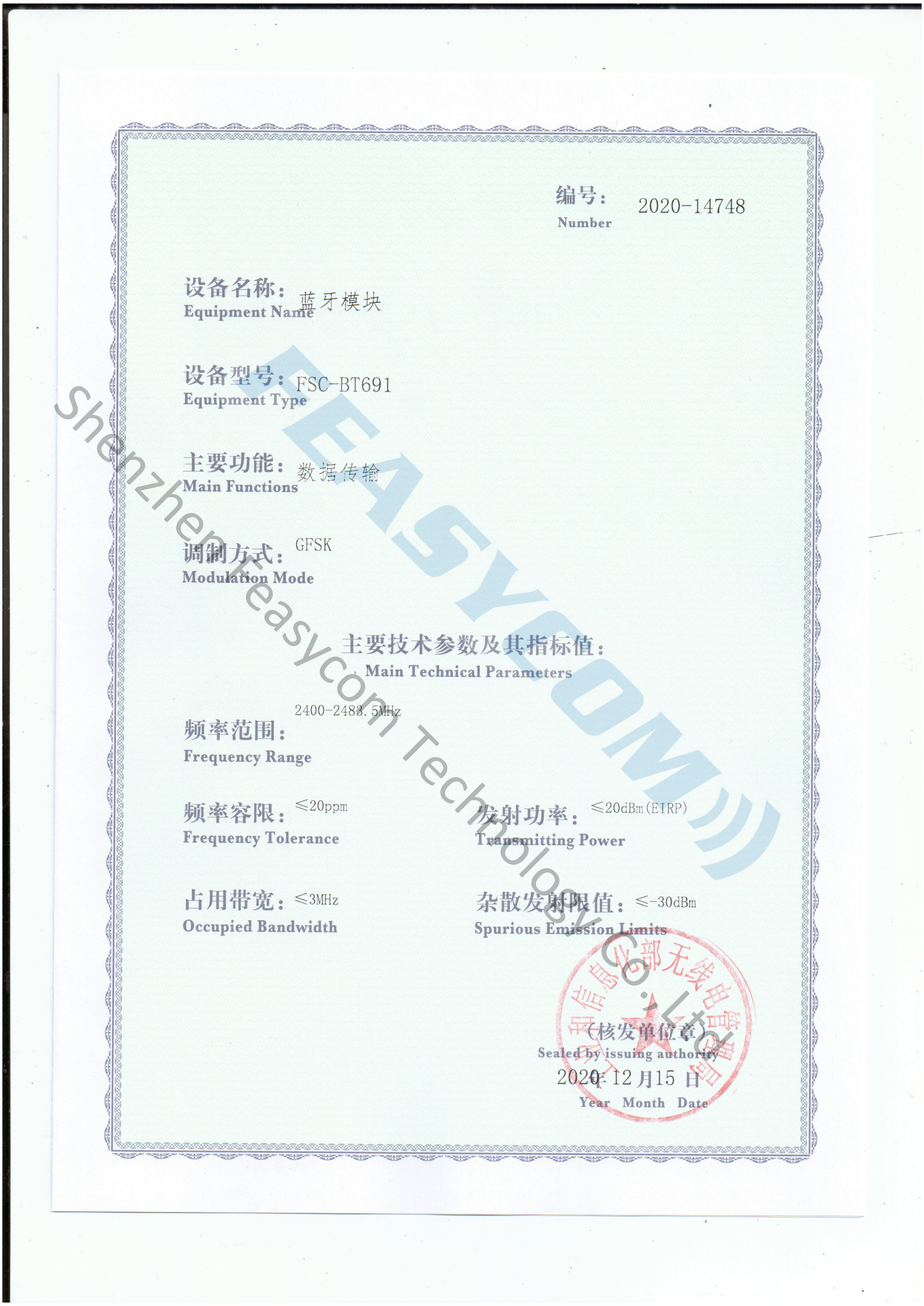
深圳市飞易通科技有限公司:

根据《中华人民共和国无线电管理
In accordance with the provisions on the Radio
条例》，经审查，下列无线电发射设备
Regulations of the People's Republic of China , the following
符合中华人民共和国无线电管理规定和
radio transmission equipment , after examination , conforms
技术标准，其核准代码为：CMIIT ID:2020DP14748
to the provisions with its CMIIT ID:

有效期： 五年
Validity

中华人民共和国工业和信息化部
（发证机关）
Sealed by issuing authority

2020年 12月15 日
Year Month Date



编号：2020-14748
Number

设备名称：蓝牙模块
Equipment Name

设备型号：FSC-BT691
Equipment Type

主要功能：数据传输
Main Functions

调制方式：GFSK
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

频率容限：≤20ppm
Frequency Tolerance

发射功率：≤20dBm(EIRP)
Transmitting Power

占用带宽：≤3MHz
Occupied Bandwidth

杂散发射限值：≤-30dBm
Spurious Emission Limits

（核发单位章）
Sealed by issuing authority

2020年12月15日
Year Month Date

11. PRODUCT PACKAGING INFORMATION

11.1 Default Packing

a, Tray vacuum

b, Tray Dimension: 180mm * 195mm

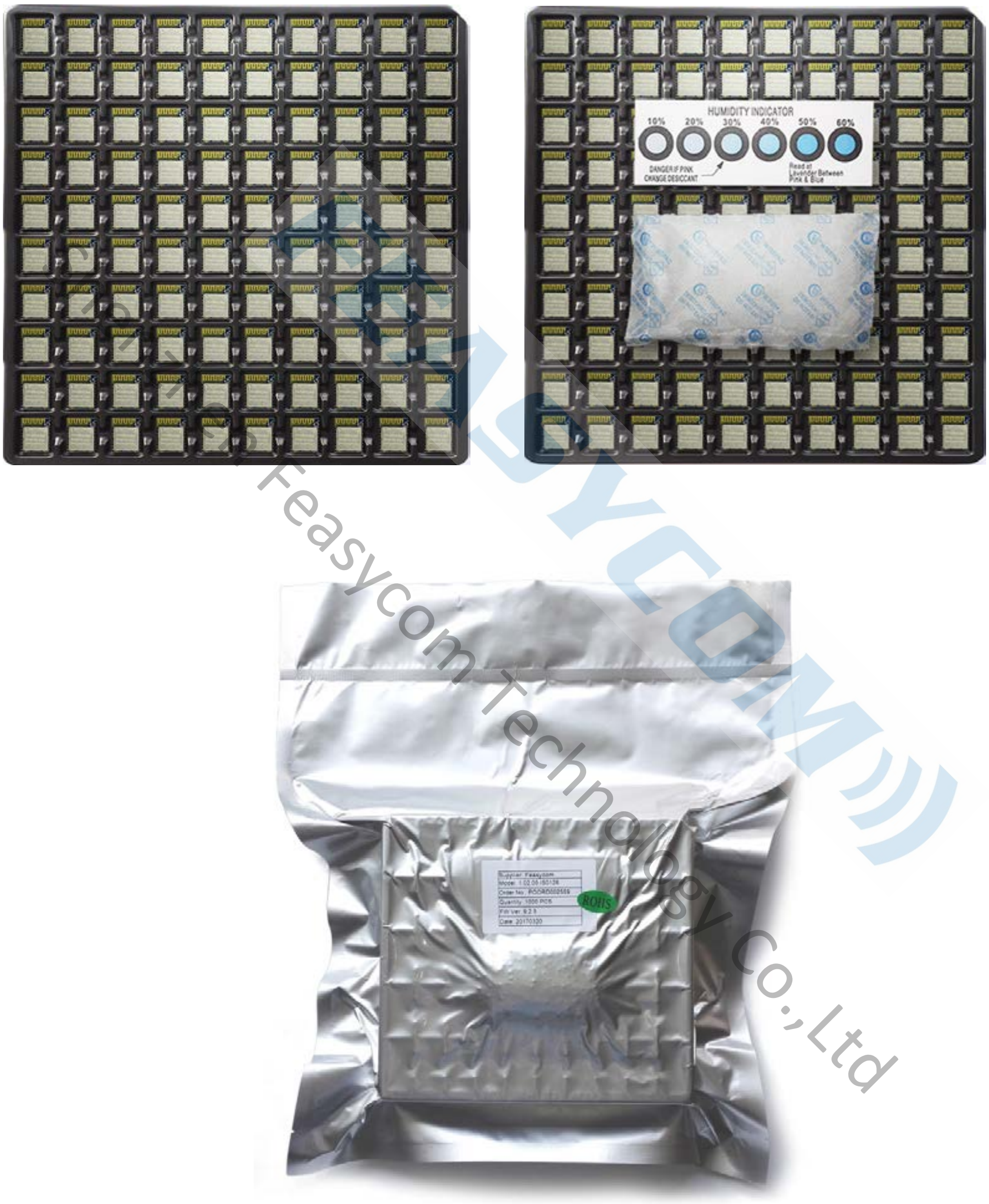
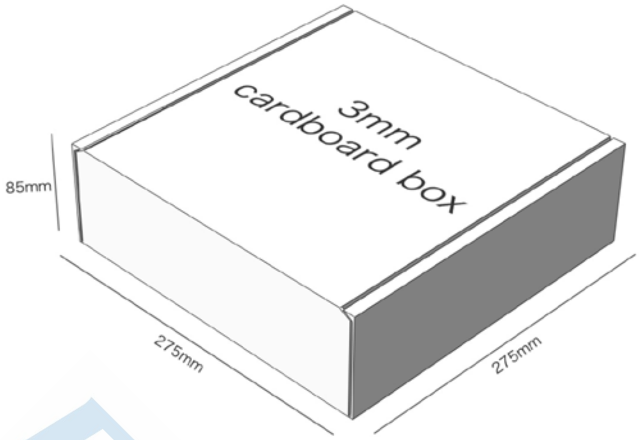

HUMIDITY INDICATOR
10%
20%
30%
40%
50%
60%
DANGER IF PINK
CHANGE DESICCANT
Read at
Lavender Between
Pink & Blue
ROHS

Figure 11: Tray vacuum

11.2 Packing box(Optional)

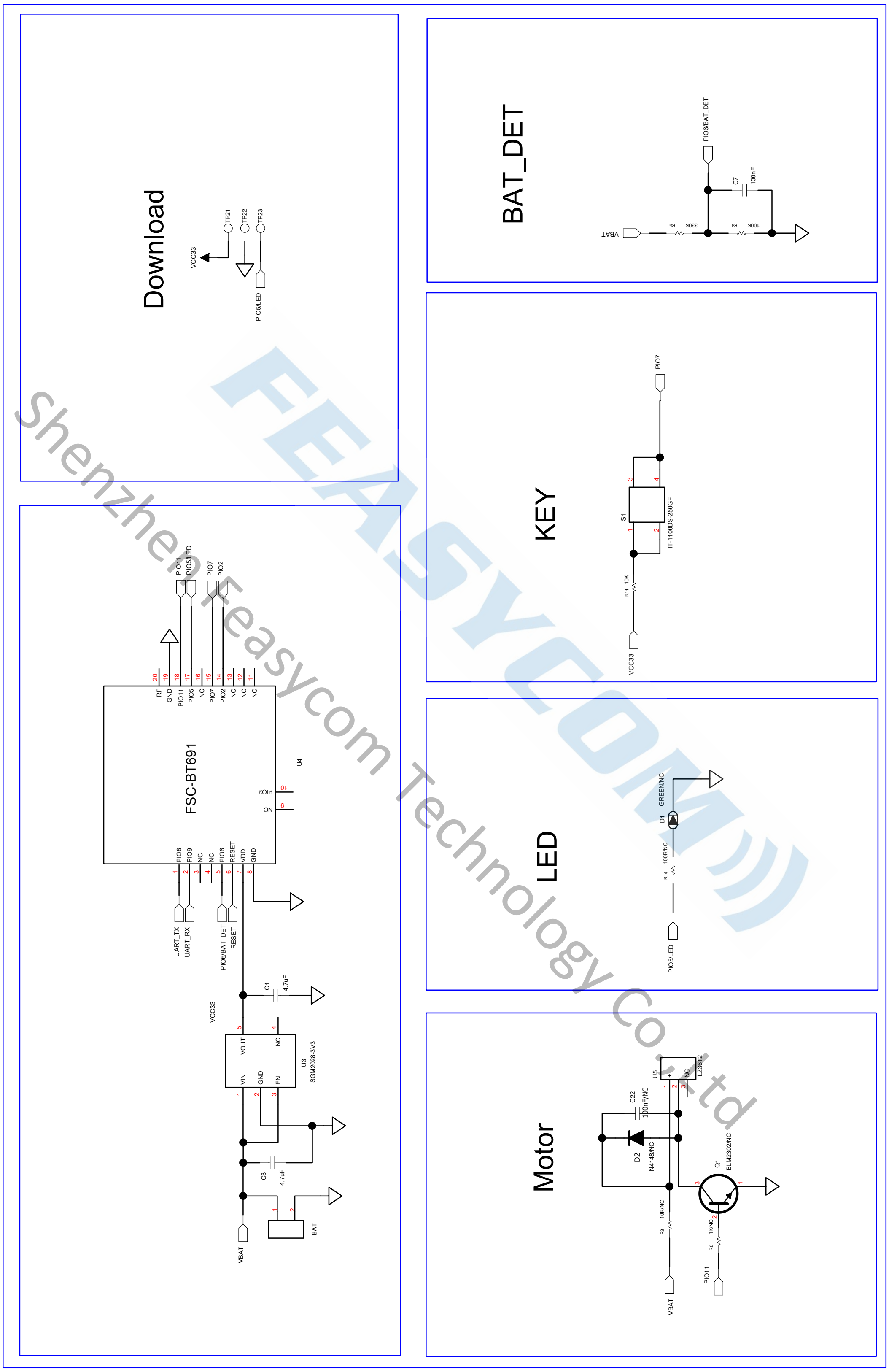

3mm
cardboard box
85mm
275mm
275mm

* If require any other packing, must be confirmed with customer

* Package: 2000PCS Per Carton (Min Carton Package)

Figure 12: Packing Box

12. APPLICATION SCHEMATIC


Download
VCC33
TP21
TP22
TP23
PIO5/LED
BAT_DET
PIO6/BAT_DET
C7
100nF
VBAT
R5
330K
R4
100K
KEY
PIO7
S1
IT-1100DS-250GF
R11
10K
VCC33
LED
D4
GREEN/NC
R14
100R/NC
PIO5/LED
Motor
U5
LZ3612
C22
100nF/NC
D2
IN4148/NC
Q1
BLM2302/NC
R3
10R/NC
R6
1K/NC
VBAT
PIO11
FSC-BT691
U4
RF
GND
PIO11
PIO5
NC
PIO7
PIO2
PIO8
PIO9
PIO6
RESET
VDD
UART_TX
UART_RX
PIO6/BAT_DET
RESET
C1
4.7uF
VCC33
U3
SGM2028-3V3
VOUT
VIN
EN
C3
4.7uF
VBAT
BAT