Date :2025-02-27

Company：freecle Inc.
Model : able glass
FCC ID：2BMFO-FREECLE

Technical Specification

1. Frequency Range : 2400 - 2483.5MHz (Carrier Frequency:2402 – 2480MHz)
2. Output Power : 2.5mW or less
3. Moderation Type : GFSK, π/4-DQPSK, 8DQPSK
4. Number of Channel : 79 ch
5. Channel Spacing : 1 MHz
6. Antenna Type : Multilayer Antenna
7. Antenna Maximum Gain : 1.6dBi
8. Version of BT : 5.1
9. BT Model : QCC5124 VFBGA
10. EDR : YES
11. Power input: battery (Li-Ion Battery 3.7V)

Installation Guide

The module works together with product. Fig. 1example.

Federal Communications Commission (FCC) Statement

15.105(b)
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off

and on, the user is encouraged to try to correct the interference by one or more of the following measures:
-Reorient or relocate the receiving antenna.
-Increase the separation between the equipment and receiver.
-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-Consult the dealer or an experienced radio/TV technician for

15.19
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.

15.21
You are cautioned that changes or modifications not expressly approved by the part responsible for compliance could void the user's authority to operate the equipment.

FCC RF Radiation Exposure Statement:
1. This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
2. For portable operation, this device has been tested and meets FCC RF exposure guidelines. When used with an accessory that contains metal may not ensure compliance with FCC RF exposure guidelines.

FCC

This module has been tested and found to comply with the following requirements for Modular Approval.

- Part 15.247 - Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.

Summarize the specific operational use conditions

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

RF exposure considerations

1) This equipment is intended for portable RF exposure condition.

2) In the end product, the antenna(s) must not be co-located or operation in conjunction with any other antenna or transmitter except in accordance with multi-transmitter product procedures. User and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying the RF exposure compliance.

Antennas

This radio transmitter has been approved by the FCC to operate with the antenna types listed below with the maximum permissible gain indicated.

Antenna types not included in this list shall be re-assessed for subsequent permissive changes.

The OEM must design the host so that the antenna will be installed as an integrated antenna for the host and the end user shall not be able to access, remove or replace the antenna.

Technology	Frequency (MHz)	Modulation	Antenna	
			Type	Gain(dBi)
BT	2402~2480	GFSK, π/4-DQPSK, 8DQPSK	Multilayer	1.6

Required End Product Labeling

Any device incorporating this module must display an external, visible, permanently affixed label with the FCC ID preceded by the term as follows.

Contains FCC ID：2BMFO-FREECLE

§ 15.19 Labelling requirements shall be complied on end user device.

Labelling rules for special device, please refer to §2.925, § 15.19 (a)(5) and relevant KDB publications. For E-label, please refer to §2.935.

Test Modes

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

Additional testing, Part 15 Subpart B disclaimer

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.

The final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.

Note EMI Considerations

Note that a host manufacture is recommended to use KDB996369 D04 Module Integration Guide recommending as "best practice" RF design engineering testing and evaluation in case non-linear interactions generate additional non-compliant limits due to module placement to host components or properties.

For standalone mode, reference the guidance in KDB996369 D04 Module Integration Guide and for simultaneous mode; see KDB996369 D02 Module Q&A Question 12, which permits the host manufacturer to confirm compliance.

How to make changes

Only Grantees are permitted to make permissive changes, if the module will be used differently than granted conditions, please contact us to ensure modifications will not affect compliance.

Test Plan for host Product:

This module does not contain a shield and therefore is limited. The host integrator is required to contact grantee to file a Class II Permissive Change for each host specific installation. The following testing should be performed to demonstrate continued compliance.

Contact information:

Company Name: freecle Inc.

Address: Rainbowbldg 1F, 2-20-13 Shimomeguro, Meguro-Ku Tokyo 153-0064 Japan

Contact Email: info@freecle.co.jp

Contact Phone: +81-80-9417-5049

1. Part 15 Subpart B disclaimer

Host manufacturer is responsible for compliance of the host system with module installed with all other applicable requirements for the system such as Part 15B. These tests should be based on ANSI C63.4 as guidance.

Item	Standard	Method	Remark
Conducted Emissions at Mains Terminals (150kHz-30MHz)	47 CFR Part 15, Subpart B	ANSI C63.4:2014	AC Power Line Conducted Emissions Voltage need to evaluate according to FCC Part 15.207(a) requirement when the host product is designed to be connected to the public utility (AC) power line.
Radiated Emissions (9KHz-30MHz)	47 CFR Part 15, Subpart B	ANSI C63.4:2014	According to FCC Part15.33
Radiated Emissions (30MHz-1GHz)	47 CFR Part 15, Subpart B	ANSI C63.4:2014	According to FCC Part15.33
Radiated Emissions (Above 1GHz)	47 CFR Part 15, Subpart B	ANSI C63.4:2014	According to FCC Part15.33 Test :1GHz to 5th harmonic of the highest frequency or 40 GHz, whichever

			is lower.
Test mode: Host normal operation and Bluetooth link mode.			

2. The host product will need to evaluate according to FCC Part 15 Subpart C 15.247 for Bluetooth:

(1). Maximum conducted power of channel 2402MHz-2480 MHz from the original grant is 0.66dBm at 2402MHz channel, followed by an in-host measurement to be made showing that the conducted powers must <0.66dBm. base on the original report, the test mode of conducted power for host product should be setting as 2402MHz channel and 2Mbps.

(2). AC Power Line Conducted Emissions Voltage need to evaluate according to FCC Part 15.207(a) requirement when the host product is designed to be connected to the public utility (AC) power line. Test channel and data rate list as below：

Test Channels for Conducted Emissions	Date rate for Conducted Emissions
2402MHz	1Mbps, 2Mbps, 3Mbps
2440MHz	1Mbps, 2Mbps, 3Mbps
2480MHz	1Mbps, 2Mbps, 3Mbps

(3) Radiated spurious emissions and band edge on channel 2402 and 2480MHz with the other co-located transmitters. The test modes for these tests need to be setting as below, These tests can be based on C63.10 as guidance and radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a).

(3). Test Channels for RSE	Date rate for RSE	worst-case mode for RSE
2402MHz	1Mbps, 2Mbps, 3Mbps	1Mbps
2440MHz	1Mbps, 2Mbps, 3Mbps	1Mbps, 3Mbps
2480MHz	1Mbps, 2Mbps, 3Mbps	1Mbps

Test Channels for Band-edge	Date rate	worst-case mode for Band-edge
2402MHz	1Mbps, 2Mbps, 3Mbps	1Mbps
2480MHz	1Mbps, 2Mbps, 3Mbps	3Mbps

3. RF exposure evaluation

1) This module transmitter is authorized and intended for portable host platform for stand-alone mode. If

the max. output power is <2.5mW, it can meet SAR exemption requirement.

2) If the portable host product has multiple transmitters, additional SAR exemption evaluation for the simultaneous transmission of co-located transmitters should be performed according to KDB 447498 to ensure continuing compliance with FCC rule part 2.1093 & 1.1310 by C2PC. Guidance is provided in KDB 996369 D02 and D04.

For the host product is not installed according to this guide, the module certification will be invalid, and a new grant certification will be required for the host product.

KDB 996369 D03 section 2.4 Limited module procedures

Limited module procedures

This module does not contain a shield and therefore is limited. The host integrator may work with the Grantee to file a Class II Permissive Change for each host specific installation.

Contact information:

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Address: Rainbowbldg 1F, 2-20-13 Shimomeguro, Meguro-Ku Tokyo 153-0064 Japan

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Contact Phone: +81-80-9417-5049

If the host product is powered by AC power then additional AC Powerline Conducted Emissions needs to apply.

This module does not contain a shield and therefore is limited. The host integrator is required to contact grantee to file a Class II Permissive Change for each host specific installation. The test plan should be performed to demonstrate continued compliance.

Shielding: the following testing should be performed to demonstrate continued compliance.

Test item	Requirement
transmitter's power is measured as conducted. *note 1	The transmitter's conducted power should continue compliance with the rule part.
Band edge*note 2	The band edge should continue compliance with the rule part.
Spurious radiated emission*note 2	The spurious radiated emission should continue compliance with the rule part.

Note 1: If the transmitter's power is measured as conducted, and if the C2PC investigation indicates that the module's power has increased from the original filing test report, the manufacturer, lab, and TCB must investigate to determine if the initial module tested in a standalone module was improperly granted. The module may require a new FCC ID. An inquiry can be submitted to review a specific case, but the C2PC can only be given once the issue is resolved.

Note 2: Any radiated emission and band edge that does not comply with regulations must be corrected then the C2PC can only be granted once resolved.

Note 3: The test method is accordance with the ANSI C63.10-2013.

1. Voltage regulation

The host integrator will be required to supply regulated voltage to the module through the host based upon the following operating range.

Minimum Operating Voltage：3.0 VDC

Maximum Operating Voltage：4.2 VDC