



FCC RF EXPOSURE EVALUATION REPORT

APPLICANT : Flaircomm Microelectronics, Inc.
PRODUCT NAME : Bluetooth Module BT5.0
MODEL NAME : FLC-BTM702IQ2D
BRAND NAME : Flairmicro
FCC ID : P4I-BTM702D
STANDARD(S) : 47CFR 2.1091
KDB 447498
ISSUE DATE : 2018-10-16

Reviewed By: *Gan Yueming*
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Change History		
Issue	Date	Reason for change
1.0	2018-10-16	First edition



1. Technical Information

Note: Provide by manufacturer.

1.1. Applicant and Manufacturer Information

Applicant:	Flaircomm Microelectronics, Inc.
Applicant Address:	7F, Guomai Building, 116 East JiangBin Ave, Fuzhou, Fujian, China
Manufacturer:	Flaircomm Microelectronics, Inc.
Manufacturer Address:	7F, Guomai Building, 116 East JiangBin Ave, Fuzhou, Fujian, China

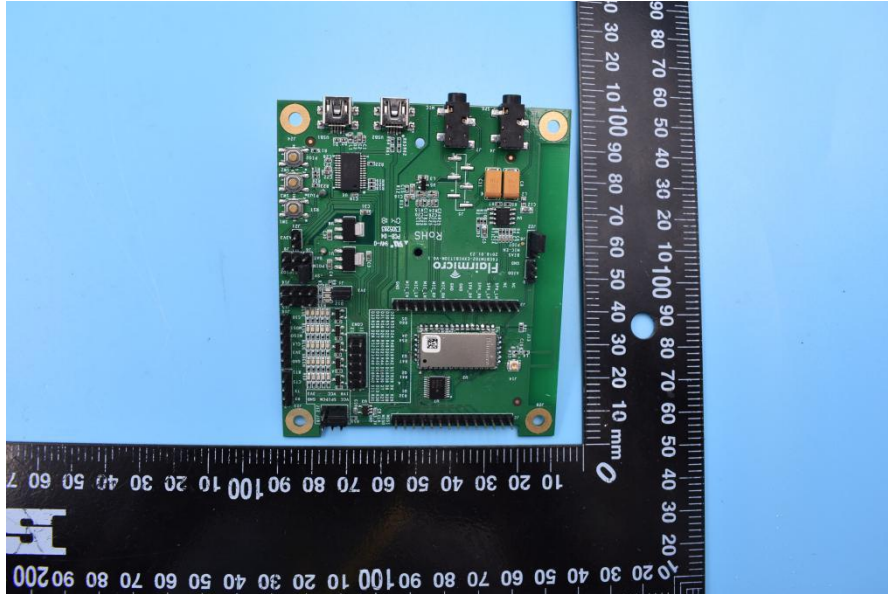
1.2. Equipment Under Test (EUT) Description

EUT Type:	Bluetooth Module BT5.0
Hardware Version:	V1.0
Software Version:	V1.0
Frequency Bands:	Bluetooth: 2402MHz-2480MHz
Modulation Mode:	Bluetooth (BDR+EDR): GFSK, $\pi/4$ -DQPSK, 8-DPSK Bluetooth BLE: GFSK
Antenna Type:	PCB Antenna
Antenna Gain:	0dBi

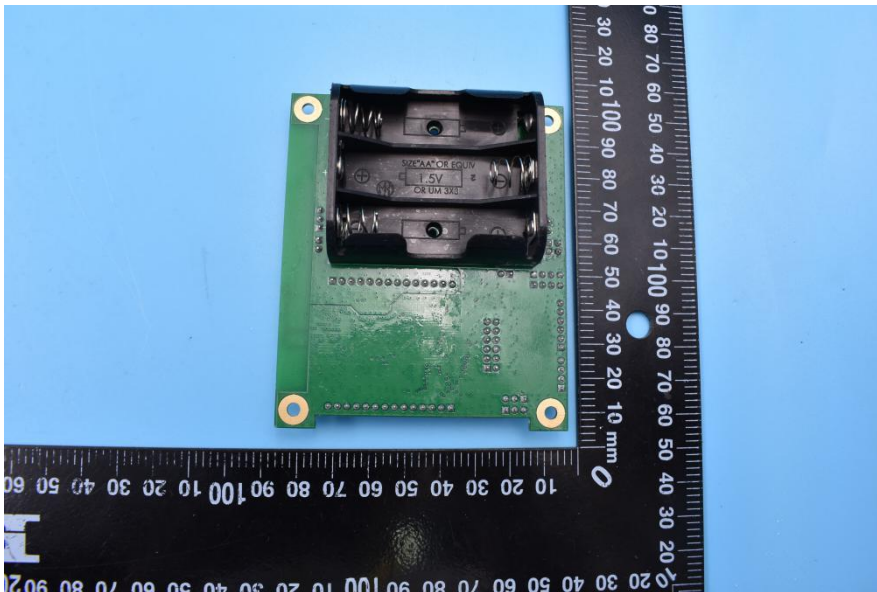
Note: This test report is updated from report SZ18080241S03, based on the similarity between before, only the FLC-BTM702IQ2C support aptX and without shielding case, the FLC-BTM702IQ2D support aptX, with shielding case. It is not affect the test result.

1.3. Photographs of the EUT

1. EUT Front View



2. EUT Back View





1.4. Identification of all used EUT

The EUT identity consists of numerical and letter characters, the letter character indicates the test sample, and the following two numerical characters indicate the software version of the test sample.

EUT Identity	Hardware Version	Software Version
1#	V1.0	V1.0

1.5. Applied Reference Documents

Leading reference documents for testing:

No.	Identity	Document Title
1	47 CFR§2.1091	Radio frequency Radiation Exposure Evaluation: mobile devices
2	KDB 447498 D01v06	General RF Exposure Guidance



2. Device Category And RF Exposure Limit

Per user manual, Based on 47CFR 2.1091, this device belongs to mobile device category with General Population/Uncontrolled exposure.

Mobile Devices:

47CFR 2.1091(b)

For purposes of this section, a mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. In this context, the term "fixed location" means that the device is physically secured at one location and is not able to be easily moved to another location. Transmitting devices designed to be used by consumers or workers that can be easily re-located, such as wireless devices associated with a personal computer, are considered to be mobile devices if they meet the 20 centimeter separation requirement.

GENERAL POPULATION / UNCONTROLLED EXPOSURE

The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity. Warning labels placed on low-power consumer devices such as cellular telephones are not considered sufficient to allow the device to be considered under the occupational/controlled category, and the general population/uncontrolled exposure limits apply to these devices.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f ²)	30
30-300	27.5	0.073	0.2	30
300-1500	-	-	f/1500	30
1500-100,000	-	-	1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density



3. Measurement of RF Output Power

<Bluetooth output Power>

Mode	Channel	Frequency (MHz)	Peak power (dBm)		
			1Mbps	2Mbps	3Mbps
BR / EDR	CH 00	2402	6.98	4.78	5.14
	CH 39	2441	8.58	6.61	6.95
	CH 78	2480	8.80	6.72	7.08
Tune-up Limit			9.50	7.50	7.50

Mode	Channel	Frequency (MHz)	Peak power (dBm)
			GFSK
LE	CH 00	2402	8.74
	CH 19	2440	9.76
	CH 39	2480	10.21
Tune-up Limit			10.50

Note: According to KDB 447498, maximum source-based time-average power including tune-up limit will be used for calculating MPE.



4. RF Exposure Evaluation

Standalone transmission MPE evaluation

Bands	Frequency (MHz)	Maximum Tune-up Limit (dBm)	Antenna Gain (dBi)	EIRP (mW)	Power density (mW/cm ²)	Limit for MPE (mW/cm ²)
Bluetooth	2480	10.50	0	11.22	0.002	1.0

Note:

MPE calculation method

$$\text{Power Density} = \text{EIRP}/4\pi R^2$$

Where: EIRP = P+G

P = Output Power (dBm)

G = Antenna Gain (dBi)

R = Separation Distance (20cm)



Annex A General Information

1. Identification of the Responsible Testing Laboratory

Company Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Department:	Morlab Laboratory
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China
Responsible Test Lab Manager:	Mr. Su Feng
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2. Identification of the Responsible Testing Location

Name:	Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China

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