

# **FCC Test Report**

# Report No.: AGC03285190701FE02

FCC ID		2AMWOFSC-BP103
APPLICATION PURPOSE		Original Equipment
PRODUCT DESIGNATION	:	Bluetooth Beacon
BRAND NAME	:	Feasycom
MODEL NAME		FSC-BP103
APPLACANT	÷	Shenzhen Feasycom Technology Co., LTD.
DATE OF ISSUE	:	Aug. 05, 2019
STANDARD(S)		FCC Part 15.247
REPORT VERSION	:	V1.0

# Attestation of Global Compliance (Shenzhen) Co., Ltd

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#### **REPORT REVISE RECORD**

Report Version	Revise Time Issued Date		Valid Version	Notes	
V1.0		Aug. 05, 2019	Valid	Initial Release	





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#### **1. VERIFICATION OF COMPLIANCE**

Applicant	Shenzhen Feasycom Technology Co., LTD.		
Address	Room 2004A, 20th Floor, Huichao Technology Building, Jinhai Road, Xixiar Baoan District, Shenzhen, China		
Manufacturer	Shenzhen Feasycom Technology Co., LTD.		
Address	Room 2004A, 20th Floor, Huichao Technology Building, Jinhai Road, Xixiang Baoan District, Shenzhen, China		
Factory	Shenzhen Feasycom Technology Co., LTD.		
Address	Room 2004A, 20th Floor, Huichao Technology Building, Jinhai Road, Xixiang Baoan District, Shenzhen, China		
Product Designation	Bluetooth Beacon		
Brand Name	Feasycom		
Test Model	FSC-BP103		
Date of test	Jul, 23, 2019 to Aug. 05, 2019		
Deviation	None		
Condition of Test Sample	Normal		
Test Result	Pass		
Report Template	AGCRT-US-BLE/RF		

We hereby certify that:

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with radiated emission limits of FCC part 15.247.

Tested By

sky don

Sky Dong(Dong Huihui)

Huihui) Aug. 05, 2019

Reviewed By

Max Zhang

Max Zhang(Zhang Yi)

Aug. 05, 2019

Approved By

Forrest in

Forrest Lei(Lei Yonggang) Authorized Officer

Aug. 05, 2019





### 2.GENERAL INFORMATION

#### 2.1PRODUCT DESCRIPTION

The EUT is designed as a "Bluetooth Beacon". It is designed by way of utilizing the GFSK technology to achieve the system operation.

#### A major technical description of EUT is described as following

<b>Operation Frequency</b>	2.402 GHz to 2.480GHz			
RF Output Power	4.75dBm(Max)			
Bluetooth Version	V 5.0			
Modulation	BR  GFSK, EDR  π/4-DQPSK,  BDPSK BLE  GFSK 1Mbps  GFSK 2Mbps			
Number of channels	40 Channel			
Antenna Designation	PCB Antenna(Comply with requirements of the FCC part 15.203)			
Antenna Gain	2dBi			
Hardware Version	V1.6			
Software Version	V1.6			
Power Supply	DC 3V by battery			
Noto: The EUT descent sup	and BD/EDD			

Note: The EUT doesn't support BR/EDR.

#### 2.2. TABLE OF CARRIER FREQUENCYS

Frequency Band	Channel Number	Frequency
20 .00	0	2402MHZ
0	G1 _G	2404MHZ
2400~2483.5MHZ		
	38	2478 MHZ
	39	2480 MHZ





#### 2.3 RELATED SUBMITTAL(S)/GRANT(S)

This submittal(s) (test report) is intended for FCC ID: 2AMWOFSC-BP103 filing to comply with the FCC Part 15.247 requirements.

#### 2.4TEST METHODOLOGY

Both conducted and radiated testing was performed according to the procedures in ANSI C63.10 (2013). Radiated testing was performed at an antenna to EUT distance 3 meters.

#### 2.5 SPECIAL ACCESSORIES

Refer to section 2.2.

#### **2.6 EQUIPMENT MODIFICATIONS**

Not available for this EUT intended for grant.





#### **3. MEASUREMENT UNCERTAINTY**

The reported uncertainty of measurement y  $\pm U$ , where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

- Uncertainty of Conducted Emission, Uc = ±3.2 dB
- Uncertainty of Radiated Emission below 1GHz, Uc = ±3.9 dB
- Uncertainty of Radiated Emission above 1GHz, Uc = ±4.8 dB
- Uncertainty of total RF power, conducted,  $Uc = \pm 0.8$ dB
- Uncertainty of RF power density, conducted,  $Uc = \pm 2.6 dB$
- Uncertainty of spurious emissions, conducted, Uc = ±2.7dB
- Uncertainty of Occupied Channel Bandwidth: Uc = ±2 %





#### 4. DESCRIPTION OF TEST MODES

NO.	TEST MODE DESCRIPTION
1	Low channel TX
2	Middle channel TX
3	High channel TX

Note:

1. Only the result of the worst case was recorded in the report, if no other cases.

2. For Radiated Emission, 3axis were chosen for testing for each applicable mode.

3. For Conducted Test method, a temporary antenna connector is provided by the manufacture.

4. The test software is the SmartRF Studio 7\_2.10.0 which can set the EUT into the individual test modes.





## **5. SYSTEM TEST CONFIGURATION**

#### **5.1 CONFIGURATION OF TESTED SYSTEM**

EUT

#### **5.2 EQUIPMENT USED IN TESTED SYSTEM**

ltem	em Equipment Model No.		ID or Specification	Remark	
1	Bluetooth Beacon	FSC-BP103	2AMWOFSC-BP103	EUT	

#### **5.3. SUMMARY OF TEST RESULTS**

FCC RULES	DESCRIPTION OF TEST	RESULT	
15.247 (b)(3) Peak Output Power		Compliant	
15.247 (a)(2)	6 dB Bandwidth	Compliant	
15.247 (d)	5.247 (d) Conducted Spurious Emission		
15.247 (e) Maximum Conducted Output Power Density		Compliant	
15.209	Radiated Emission	Compliant	
15.207	Conducted Emission	N/A	

Note: The conducted limits are not required for devices which only employ battery power for operation.





#### 6. TEST FACILITY

Test Site	Attestation of Global Compliance (Shenzhen) Co., Ltd			
Location	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China			
Designation Number	CN1259			
FCC Test Firm Registration Number	975832			
A2LA Cert. No.	5054.02			
Description	Attestation of Global Compliance(Shenzhen) Co., Ltd is accredited by A2LA			

#### TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	Jun. 12, 2019	Jun. 11, 2020
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Dec. 20, 2018	Dec. 19, 2019
2.4GHz Fliter	EM Electronics	2400-2500MHz	N/A	Feb. 27, 2019	Feb. 26, 2020
Attenuator	ZHINAN	E-002	N/A	Aug. 28, 2018	Aug. 27, 2019
Horn antenna	SCHWARZBECK	BBHA 9170	#768	Sep. 21, 2017	Sep. 20, 2020
Active loop antenna (9K-30MHz)	ZHINAN	ZN30900C	18051	Jun. 14, 2018	Jun. 13, 2020
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	May. 26, 2018	May. 25, 2020
Broadband Preamplifier	ETS LINDGREN	3117PA	00225134	Oct. 25, 2018	Oct. 24, 2019
ANTENNA	SCHWARZBECK	VULB9168	D69250	Sep. 28, 2017	Sep. 27, 2019



 $\label{eq:attestation} Attestation of Global Compliance (Shenzhen) Co., Ltd.$ 



### 7. PEAK OUTPUT POWER

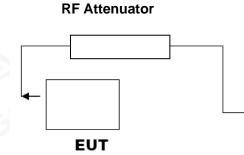
#### 7.1. MEASUREMENT PROCEDURE

For peak power test:

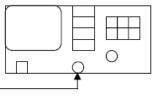
- 1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- 2. RBW > DTS bandwidth
- 3. VBW≥3\*RBW.
- 4. SPAN≥VBW.
- 5. Sweep: Auto.
- 6. Detector function: Peak.
- 7. Trace: Max hold.

Allow trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power, after any corrections for external attenuators and cables.

#### 7.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION) PEAK POWER TEST SETUP



#### Spectrum Analyzer



RF Cable





#### 7.3. LIMITS AND MEASUREMENT RESULT

	PEAK OUTPUT POWER MEASUREMENT RESULT									
FOR GFSK MOUDULATIONFrequency (GHz)Peak Power (dBm)Applicable Limits (dBm)Pass or Fail										
2.402	4.75	30	Pass							
2.440	4.61	30	Pass							
2.480	4.40	30	Pass							



Spectrum ÷ Ref Level 20.00 dBm RBW 2 MHz SWT 928.7 ns 👄 VBW 10 MHz Att 30 dB Mode Auto FFT ●1Pk Max 4.75 dBn 2.40173530 GH M1[1] 10 dBm 0 dBm--10 dBm -20 dBm -30 dBm-40 dBm -50 dBm· -60 dBm--70 dBm CF 2.402 GHz 1001 pts Span 5.0 MHz

Date: 25.JUL.2019 10:54:09





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CH19

Ref Level 2	0.00 dBm		e RB	W 2 MHz		Ę
Att	30 dB	<b>SWT</b> 92	8.7 ns 👄 🛛 🛛	W 10 MHz	Mode Auto FFT	
●1Pk Max						
					M1[1]	 4.61 dB 2.43974530 GF
10 dBm				M1		
0 dBm						
-10 dBm						
-20 dBm						
-30 dBm						
-40 dBm						
-50 dBm						
-60 dBm						
-70 dBm						
CF 2.44 GHz				1001	pts	Span 5.0 MH:
					Measuring	25.07.2019 10:54:41

Date: 25.JUL.2019 10:54:40

#### CH39

		01	100		
Spectrum					Ē
Ref Level 20.00 dBm		RBW 2 MHz			
Att 30 dB	SWT 928.7 ns	VBW 10 MHz	Mode Auto FFT		
1Pk Max					
			M1[1]		4.40 dBr 2.47973030 GH
10 dBm		M1		-	
		¥			
0 dBm					
10 dBm					
-20 dBm					
-30 dBm					
-40 dBm					
-40 0811					
-50 dBm					
-60 dBm					
-70 dBm					
CF 2.48 GHz		1001	pts		Span 5.0 MHz
)(			Measuring		

Date: 25.JUL.2019 10:54:57





#### 8.6 DB BANDWIDTH

#### **8.1. MEASUREMENT PROCEDURE**

- 1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- 2. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- 3. Set SPA Centre Frequency = Operation Frequency, RBW= 100 KHz, VBW $\ge$ 3×RBW.
- 4. Set SPA Trace 1 Max hold, then View.

Note: The EUT was tested according to ANSI C63.10 for compliance to FCC PART 15.247 requirements.

#### 8.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

The same as described in section 7.2.

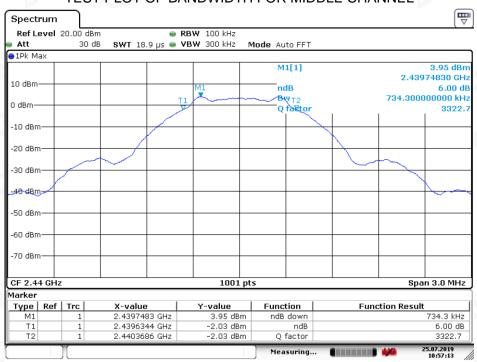
#### **8.3. LIMITS AND MEASUREMENT RESULTS**

LIMITS AND MEASUREMENT RESULT								
Anniisekie Limite		Applicable Limits						
Applicable Limits	Test Data	Criteria						
	Low Channel	722.3	PASS					
>500KHZ	Middle Channel	734.3	PASS					
	High Channel	725.3	PASS					

10 dBm         71         722.300000           0 dBm         71         0 dBm           -10 dBm         0 dBm         0 dBm           -20 dBm         0 dBm         0 dBm           -30 dBm         0 dBm         0 dBm           -20 dBm         0 dBm         0 dBm           -20 dBm         0 dBm         0 dBm           -30 dBm         0 dBm         0 dBm           -30 dBm         0 dBm         0 dBm           -70 dBm         0 dBm <td< th=""><th></th><th>20.00 dBm</th><th></th><th>RBW 100 kHz</th><th></th><th></th><th>· · · · · · · · · · · · · · · · · · ·</th></td<>		20.00 dBm		RBW 100 kHz			· · · · · · · · · · · · · · · · · · ·
M1[1]     4.       10 dBm     T1       0 dBm     T1       0 dBm     Q factor       -10 dBm     Q factor       -20 dBm     Q factor       -30 dBm     -30 dBm       -50 dBm     -50 dBm       -60 dBm     -60 dBm       -70 dBm     1001 pts       Span 3.       Marker       Type     Ref       Type     Ref		30 dB	8 SWT 18.9 µs 🖷	<b>VBW</b> 300 kHz	Mode Auto FFT	-	
10 dBm     T1     PidB     722.3000000       10 dBm     T1     Pivit2     722.3000000       10 dBm     Cractor     Cractor     Cractor       30 dBm     Cractor     Cractor     Cractor       50 dBm     Cractor     Cractor     Cractor       60 dBm     Cractor     Cractor     Span 3.       CF 2.402 CHz     1001 pts     Span 3.       Type     Ref     Trc     X-value     Y-value     Function	TEK Max				M1[1]		4.40 dE
10 dBm     T1     PdB     722.3000000       10 dBm     Q factor     Q factor       20 dBm     Q factor     Q factor       30 dBm     Q dBm     Q dBm       40 dBm     Q dBm     Q dBm       50 dBm     Q dBm<							2.40225170 G
0 dBm Q factor 10 dBm Q factor 10 dBm Q factor 10 dBm Q factor 20 dBm	0 dBm						6.00
10 dBm         20 dBm           20 dBm         30 dBm           30 dBm         40 dBm           50 dBm         50 dBm           50 dBm         50 dBm           60 dBm         50 dBm           70 dBm         1001 pts           Span 3.           farker           Type         Ref           Trc         X-value           Y-value         Function	10			T1			722.300000000 k
20 dBm 30 dBm 40 dBm 50 dBm 50 dBm 70 dBm	ubiii			<u></u>	Q facto	r .	332
20 dBm 30 dBm 40 dBm 50 dBm 50 dBm 70 dBm							
30 dBm     40 dBm       40 dBm     50 dBm       50 dBm     50 dBm       60 dBm     50 dBm       70 dBm     50 dBm							
30 dBm     40 dBm       40 dBm     50 dBm       50 dBm     50 dBm       70 dBm     50 dBm       Type   Ref   Trc   X-value   Y-value   Function   Function Result							
40 dBm         50 dBm           50 dBm         50 dBm           50 dBm         50 dBm           70 dBm         1001 pts           Span 3.           arker           Type   Ref   Trc   X-value   Y-value   Function   Function Result							
40 dBm         50 dBm           50 dBm         50 dBm           50 dBm         50 dBm           70 dBm         1001 pts           Span 3.           arker           Type   Ref   Trc   X-value   Y-value   Function   Function Result			$\sim$				
50 dBm         60 dBm<	Jo ubili						
60 dBm         60 dBm<	40-d8m-						
60 dBm         60 dBm<	Ť						
70 dBm	50 dBm						
70 dBm							
IF 2.402 GHz Span 3. arker Type   Ref   Trc   X-value   Y-value   Function   Function Result	50 dBm —						
F 2.402 GHz     1001 pts     Span 3.       arker     Type   Ref   Trc   X-value   Y-value   Function   Function Result							
arker Type   Ref   Trc   X-value   Y-value   Function   Function Result	70 dBm —						
arker Type   Ref   Trc   X-value   Y-value   Function   Function Result							
Type   Ref   Trc   X-value   Y-value   Function   Function Result	F 2.402 G	Ηz		1001	pts		Span 3.0 MH
	arker						
	Type   Ref	Trc	X-value	Y-value	Function	Fur	nction Result
	M1	1	2.4022517 GHz	4.40 dBi			722.3 k⊦
							6.00 d 3325.9

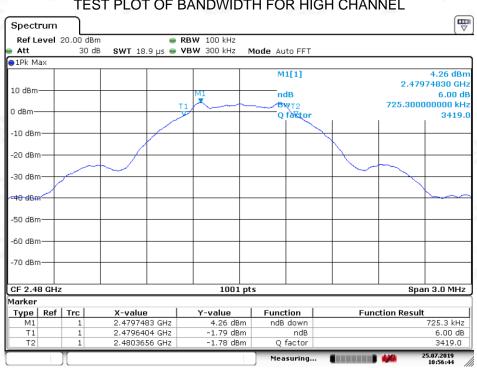
Date: 25.JUL.2019 10:57:29





TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL

Date: 25.JUL.2019 10:57:13



TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL

Date: 25.JUL.2019 10:56:44





#### 9. CONDUCTED SPURIOUS EMISSION

#### 9.1. MEASUREMENT PROCEDURE

- 1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- 2, Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- 3. Set SPA Trace 1 Max hold, then View.

Note: The EUT was tested according to ANSI C63.10 for compliance to FCC PART 15.247 requirements.

#### 9.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

The same as described in section 7.2.

#### 9.3. MEASUREMENT EQUIPMENT USED

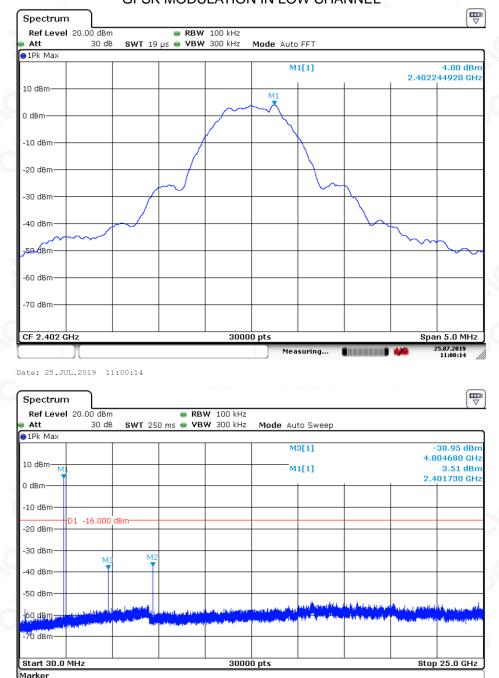
The same as described in section 6.

#### 9.4. LIMITS AND MEASUREMENT RESULT

LIMITS AND MEASUREMENT RESULT								
	Measurement Result							
Applicable Limits	Test Data	Criteria						
In any 100 KHz Bandwidth Outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produce by the intentional radiator shall be at least 20 dB below that in 100KHz bandwidth within the band that contains the highest level of the desired power.	At least -200Bc than the reference level	PASS PASS						







#### TEST RESULT FOR ENTIRE FREQUENCY RANGE GFSK MODULATION IN LOW CHANNEL

Date: 25.JUL.2019 11:00:51

1

2.40173 GHz

7.206794 GHz

4.80468 GHz

TypeRefTrcM11

M2

M3



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Function

Measuring.

Y-value 3.51 dBm

-37.62 dBm

-38.95 dBm

**Function Result** 

5.07.2019 11:00:52

[₩ Spectrum ● RBW 100 kHz SWT 19 µs ● VBW 300 kHz Ref Level 20.00 dBm 30 dB Att Mode Auto FFT ●1Pk Max M1[1] 4.30 dBm 2.440256080 GHz 10 dBm M1 0 dBm -10 dBm -20 dBm· -30 dBm -40 dBm -50 dBm--60 dBm -70 dBm Span 5.0 MHz 30000 pts CF 2.44 GHz 25.07.2019 11:01:38 Measuring..

#### GFSK MODULATION IN MIDDLE CHANNEL

Date: 25.JUL.2019 11:01:38

Spect	rum											
Ref Le	evel 2	20.00 dE 30 i		-	RBW 100 kHz VBW 300 kHz		<b>.</b>					``````````````````````````````````````
ALL 1Pk Ma	24	30 1	JB SWI 250	Jms 💻	YBW 300 KH2	MO	ae Au	to Swee	эр			
10 dBm·	ML							1[1] 2[1]				-0.11 dBn 40020 GH: 39.74 dBn
0 dBm—											7.2	19159 GH
-10 dBm												
-20 dBm		L -15.70										
-30 dBm			ма									
-40 dBm	-											
-50 dBm									ل الد	La i		
-60 dBm		a de la coloria de			والمام ومحمدها فرماسيل					n <sup>t</sup> ictiospinopost Noticitation	The second se	and the second
Ludidd	(maple of the second	ويعار ومراجع	an a <mark>hain a hain dalah</mark> a a sa	unar <sup>i</sup> tradi	nti ya Maka wa wa 1200 yi 120a U	i ditere	aliji abau	dava biali	1	in teller, mente teller og til	, na shara pila	(Red Alignment of the second s
Start 3	0.0 MI	Hz			3000	0 pts					Stop	25.0 GHz
Marker												
Туре	Ref	Trc	X-value		Y-value		Func	tion		Fund	tion Result	
M1 M2		1	2.4400		-0.11 d -39.74 d							
M2 M3		1	4.8804		-39.74 u -41.89 d							
							Mea	suring				25.07.2019 11:02:24

Date: 25.JUL.2019 11:02:23



[₩ Spectrum Ref Level 20.00 dBm RBW 100 kHz SWT 19 µs - VBW 300 kHz 30 dB Mode Auto FFT Att 1Pk Max M1[1] 3.65 dBm 2.480258250 GHz 10 dBm M1 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBM -60 dBm -70 dBm· Span 5.0 MHz 30000 pts CF 2.48 GHz 25.07.2019 11:03:12 Measuring.. Date: 25.JUL.2019 11:03:12 [₩ Spectrum RBW 100 kHz Ref Level 20.00 dBm 30 dB SWT 250 ms 👄 VBW 300 kHz Att Mode Auto Sweep ●1Pk Max M3[1] 43.19 dBn 4.959490 GHz 10 dBm M1[1] 2.20 dBm 2.479970 GH 0 dBm -10 dBm D1 -16.350 dBm--20 dBm -30 dBm -40 dBm· -50 dBm 60 dBm 70 dBm Start 30.0 MHz 30000 pts Stop 25.0 GHz Marker TypeRefTrcM11 Function Function Result X-value Y-value 2.47997 GHz 7.439015 GHz 4.95949 GHz 2.20 dBm -35.52 dBm -43.19 dBm M2 МЗ 25.07.2019 11:03:38 Measuring... 

**GFSK MODULATION IN HIGH CHANNEL** 

Date: 25.JUL.2019 11:03:38

Note: The peak emissions without marker on the above plots are fundamental wave and need not to compare with the limit.



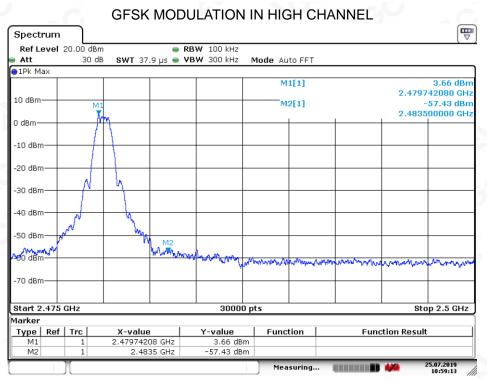


#### [₩ Spectrum Ref Level 20.00 dBm 🖷 RBW 100 kHz Att 30 dB SWT 19 µs 👄 VBW 300 kHz Mode Auto FFT ⊖1Pk Max M2[1] 45.24 dBr 2.40000000 GH 10 dBm M1[1] 3.70 dBm 2.402026250 GHz 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm 60 dBm 1.000 / 200 -70 dBm Stop 2.405 GHz Start 2.39 GHz 30000 pts Marker **Y-value** 3.70 dBm -45.24 dBm **Function Result** Function Type Ref Trc X-value 2.40202625 GHz Μ1 M2 2.4 GHz 5.07.2019 Measuring.

TEST RESULT FOR BAND EDGE

GFSK MODULATION IN LOW CHANNEL

Date: 25.JUL.2019 10:58:32



Date: 25.JUL.2019 10:59:12



 $\label{eq:Attestation} Attestation of Global Compliance (Shenzhen) Co., Ltd.$ 



#### **10. MAXIMUM CONDUCTED OUTPUT POWER SPECTRAL DENSITY**

#### **10.1 MEASUREMENT PROCEDURE**

- (1). Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- (2). Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- (3). Set SPA Trace 1 Max hold, then View.

Note: The method of PKPSD in the KDB 558074 item 10.2 was used in this testing.

#### **10.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)**

Refer To Section 7.2.

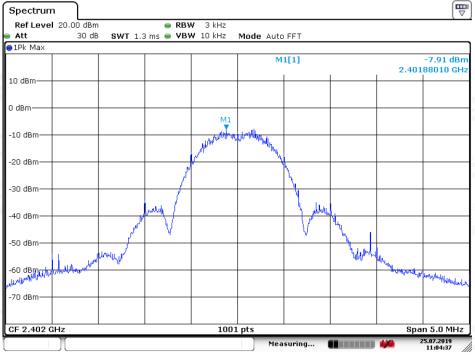
#### **10.3 MEASUREMENT EQUIPMENT USED**

Refer To Section 6.

#### **10.4 LIMITS AND MEASUREMENT RESULT**

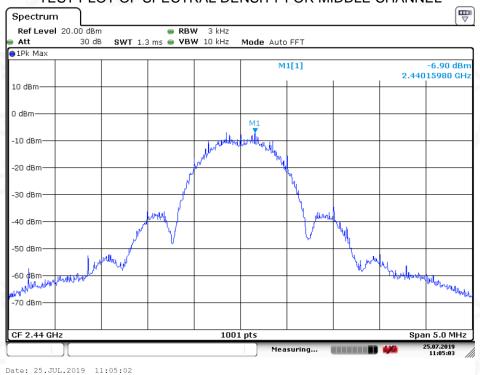
Channel No.	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Result
Low Channel	-7.91	8	Pass
Middle Channel	-6.90	8	Pass
High Channel	-7.38	8	Pass

#### TEST PLOT OF SPECTRAL DENSITY FOR LOW CHANNEL

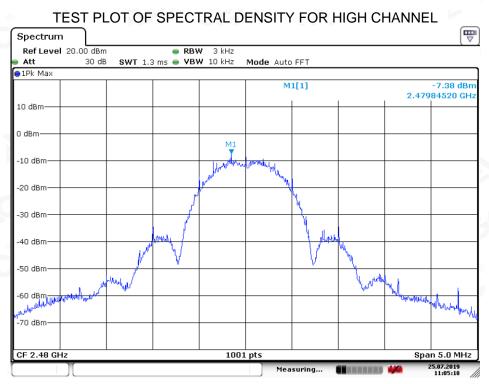


Date: 25.JUL.2019 11:04:37





TEST PLOT OF SPECTRAL DENSITY FOR MIDDLE CHANNEL



Date: 25.JUL.2019 11:05:18





#### **11. RADIATED EMISSION**

#### **11.1. MEASUREMENT PROCEDURE**

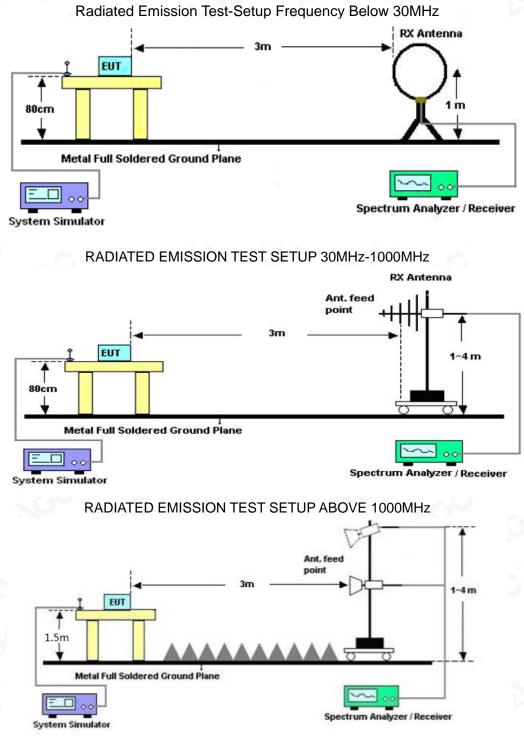
- 1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
- 2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
- 3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
- 4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
- 5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
- 6. For emissions above 1GHz, use 1MHz RBW and 3MHz VBW for peak reading. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
- 7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
- 8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
- 9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
- 10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High Low scan is not required in this case.





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#### 11.2. TEST SETUP





#### **11.3. LIMITS AND MEASUREMENT RESULT**

15.209 Limit in the below table has to be followed

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

Note: All modes were tested For restricted band radiated emission, the test records reported below are the worst result compared to other modes.

#### 11.4. TEST RESULT

#### **RADIATED EMISSION BELOW 30MHZ**

No emission found between lowest internal used/generated frequencies to 30MHz.





#### Report No.: AGC03285190701FE02 Page 27 of 43

EUT	Bluetooth Beacon	Bluetooth Beacon Model Name								
Temperature	25° C	Relative Humidity	55.4%							
Pressure	960hPa	Test Voltage	Normal Voltage							
Test Mode	Mode 1	Mode 1 Antenna								
110	FCC PART 15	B CLASS B(Horizontal)								

#### **RADIATED EMISSION BELOW 1GHZ**



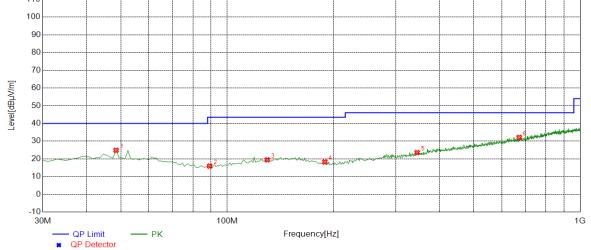
2	NO.	Freq. [MHz]	Level [dBµV/m ]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
2	1	46.4900	20.84	14.77	40.00	19.16	150	7	Horizontal
ſ	2	67.8300	18.75	12.59	40.00	21.25	100	2	Horizontal
	3	113.4200	18.30	12.79	43.50	25.20	150	138	Horizontal
	4	206.5400	18.49	12.46	43.50	25.01	150	276	Horizontal
	5	388.9000	25.46	19.39	46.00	20.54	100	344	Horizontal
	6	706.0900	32.13	26.08	46.00	13.87	100	344	Horizontal

**RESULT: PASS** 





EUT	Bluetooth Beacon	Model Name	FSC-BP103
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Vertical
110	FCC PART 1	5 B CLASS B(Vertical)	



NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	48.4300	24.83	14.71	40.00	15.17	100	213	Vertical
2	89.1700	15.91	10.26	43.50	27.59	100	164	Vertical
3	129.9100	19.43	14.14	43.50	24.07	100	173	Vertical
4	189.0800	18.24	12.57	43.50	25.26	100	228	Vertical
5	345.2500	23.52	17.67	46.00	22.48	100	286	Vertical
6	672.1400	32.11	25.51	46.00	13.89	100	356	Vertical

# RESULT: PASS

Note:

1. Factor=Antenna Factor + Cable loss, Margin=Measurement-Limit.

2. All test modes had been tested. The mode 1 is the worst case and recorded in the report.





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#### **RADIATED EMISSION ABOVE 1GHZ**

EUT	Bluetooth Beacon	Model Name	FSC-BP103
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Value Type
4804.000	53.95	0.08	54.03	74	-19.97	peak
4804.000	47.31	0.08	47.39	54	-6.61	AVG
7206.000	54.12	2.21	56.33	74	-17.67	peak
7206.000	48.44	2.21	50.65	54 💿	-3.35	AVG
C.	8			C.	C	

EUT	Bluetooth Beacon	Model Name	FSC-BP103
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Value Type
4804.000	52.53	0.08	52.61	74	-21.39	peak
4804.000	46.52	0.08	46.6	54	-7.4	AVG
7206.000	53.53	2.21	55.74	74	-18.26	peak
7206.000	47.46	2.21	49.67	54	-4.33	AVG
		-0	0			
			C	0		1 . (1

Factor = Antenna Factor + Cable Loss – Pre-amplifier.





EUT	Bluetooth Beacon	Model Name	FSC-BP103
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 2	Antenna	Horizontal

Frequency	Meter Reading	Factor	Emission Level	🛛 Limits 🚩 🚺	Margin	Volue Tar
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Value Type
4880.000	51.9	0.14	52.04	74	-21.96	peak
4880.000	45.29	0.14	45.43	54	-8.57	AVG
7320.000	53.89	2.36	56.25	74	-17.75	peak
7320.000	47.59	2.36	49.95	54	-4.05	AVG
- C.	© P			C.	3	
	C					0

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT	Bluetooth Beacon	Model Name	FSC-BP103
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 2	Antenna	Vertical

r Reading dBµV)	Factor (dB)	Emission Level	Limits	Margin	Value Type
dBµV)	(dB)		1 mm 1 mm 1		
	(ub)	(dBµV/m)	(dBµV/m)	(dB)	value Type
50.75	0.14	50.89	74	-23.11	peak
46.63	0.14	46.77	54	-7.23	AVG
43.64	2.36	46	74	-28	peak
38.79	2.36	41.15	54	-12.85	AVG
		20			
	46.63 43.64 38.79	46.63         0.14           43.64         2.36	46.63         0.14         46.77           43.64         2.36         46	46.63         0.14         46.77         54           43.64         2.36         46         74	46.63         0.14         46.77         54         -7.23           43.64         2.36         46         74         -28

Factor = Antenna Factor + Cable Loss – Pre-amplifier.





EUT	Bluetooth Beacon	Model Name	FSC-BP103
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna	Horizontal

Meter Reading	Factor	Emission Level	🛛 Limits 🚩	Margin	Value Trees
(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	- Value Type
52.21	0.22	52.43	74	-21.57	peak
46.67	0.22	46.89	54	-7.11	AVG
53.86	2.64	56.5	74	-17.5	peak
48.33	2.64	50.97	54	-3.03	AVG
0		4 64		8	
- C	0		~0~		0
	(dBµV) 52.21 46.67 53.86	(dBµV)         (dB)           52.21         0.22           46.67         0.22           53.86         2.64	(dBµV)         (dB)         (dBµV/m)           52.21         0.22         52.43           46.67         0.22         46.89           53.86         2.64         56.5	(dBµV)         (dB)         (dBµV/m)         (dBµV/m)           52.21         0.22         52.43         74           46.67         0.22         46.89         54           53.86         2.64         56.5         74	(dBµV)         (dB)         (dBµV/m)         (dBµV/m)         (dBµ           52.21         0.22         52.43         74         -21.57           46.67         0.22         46.89         54         -7.11           53.86         2.64         56.5         74         -17.5

Model Name EUT **Bluetooth Beacon** FSC-BP103 25° C **Relative Humidity** 55.4% **Temperature** 960hPa **Test Voltage** Normal Voltage Pressure **Test Mode** Mode 3 Antenna Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	- Value Type
4960.000	50.78	0.22	51	74	-23	peak
4960.000	44.91	0.22	45.13	54	-8.87	AVG
7440.000	52.75	2.64	55.39	74	-18.61	peak
7440.000	48.09	2.64	50.73	54	-3.27	AVG
		C.			0 -	G
3		~ GY				

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier. RESULT: PASS

#### Note:

Other emissions from 1G to 25 GHz are considered as ambient noise. No recording in the test report. Factor = Antenna Factor + Cable loss - Amplifier gain, Over=Measure-Limit.

The "Factor" value can be calculated automatically by software of measurement system.





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#### TEST RESULT FOR RESTRICTED BANDS REQUIREMENTS

EUT	Bluetooth Beacon	Model Name	FSC-BP103
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Horizontal

Spectrum								T)
Ref Level : Att TDF	116.00 di		e RBW 7 μs e VBW		e Auto FFT			
1Pk Max								
 110 dBµV/m—					M1[1]			79 dBµ∀∕ı
								22550 GH
100 dBµV/m-					M2[1]		43.	74,dBµV/I 00000 GH
					1	1	1 /	
90 dBµV/m					_			
80 dBµV/m								
	-D2 74	\$.000 dBµV/m			-			
70 dBµV/m								
60 dBµV/m								
		dD: Aller						
50 dBµV/m	1 54.000	аврул			12		$\sim$	
~	~~	+ - +	$\sim$	~~~~"	i m			
40 dBµV/m								
30 dBµV/m		<u> </u>						
20 dBµV/m								
Start 2.37 G	Hz			1001 pts			Stop	2.405 GHz
4arker Type   Ref	Trol	X-value	Y-va		unction	Fun	ction Result	
Type Ref M1	1	2.402255 G		dBµV/m	inction	Fun	cuon kesult	
M2	1	2.39 G		dBµV/m				
	1				Measuring			5.07.2019

#### AV

Spectrum	L					
Ref Level : Att	116.00		<ul> <li>RBW 1 MHz</li> <li>VBW 3 MHz</li> </ul>	Mode Auto FF	r	
TDF		20 0B SWI 5.7 µS	W S MH2	MOUE AUTO FF	I	
1Rm AvgPwr						
110 dBuV/m-				M1[1]		97.18 dBµV/m 2.4019760 GHz
				M2[1]		35.58 dBµV/m
100 dBµV/m						2.390000 GHz
90 dBµV/m						
90 ubµv/m						
80 dBµV/m			_			
	-D2 7	74.000 dBµV/m				
70 dBµV/m						
60 dBµV/m						
D	1 54.00	0 dBµV/m	_			
50 dBµV/m						
40 dBuV/m				M2		
	~	$ \frown $	$\rightarrow$	I		
30 dBµV/m						
20 dBµV/m-						
Start 2.37 G			1001	_		Oton 0 405 011-
arker	HZ		1001 pt	5		Stop 2.405 GHz
Type   Ref	Trc	X-value	Y-value	Function	Fun	ction Result
M1	1	2.401976 GHz	97.18 dBµV/m			
M2	1	2.39 GHz	35.58 dBµV/m			
				Measuring		25.07.2019 11:08:29

Date: 25.JUL.2019 11:08:28

25.JUL.2019 11:08:03

#### **RESULT: PASS**



 $\label{eq:attestation} Attestation of Global Compliance (Shenzhen) Co., Ltd.$ 

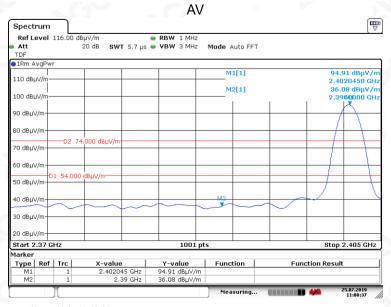


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EUT	Bluetooth Beacon	Model Name	FSC-BP103
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Vertical
		PK	

Ref Level Att TDF	110.00 0		<ul> <li>RBW 1 MHz</li> <li>VBW 3 MHz</li> </ul>	Mode Auto FFT			
1AP Max							
 110 dBµV/m—				M1[1]		95.54	
				M2[1]		2.4022 43.76	
1 100 dBµV/m-				M2[1]		2.3900	
				1	1	I 2	500 0
0 dBµV/m							$\rightarrow$
						/	1
30 dBµV/m							$\rightarrow$
		4.000 dBµV/m					
′0 dBµV/m					_		-+
						i (	- 1
50 dBµV/m							$\neg$
i0 dBuV/m	1 54.000	) dBµV/m					
on ashr/w+				M2		~	
Ю dBµV/m	$\sim\sim$	-		$\sim$	$\sim$		
+0 ubμv/m						í l	
30 dBµV/m							
, o abp 1,						í l	
20 dBµV/m						i	
start 2.37 G	Hz		1001 p	ts		Stop 2.4	05 GH
larker							
Type   Ref	Trc	X-value	Y-value	Function	Fund	tion Result	
M1	1	2.402255 GHz	95.54 dBµV/m				
M2	1	2.39 GHz	43.76 dBµV/m				

Date: 25.JUL.2019 11:08:49



Date: 25.JUL.2019 11:08:36

**RESULT: PASS** 





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EUT	Bluetooth Beacon	Model Name	FSC-BP103
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna	Horizontal
	DIA		

Ref Level 116.00 dBµV/m		RBW 1 MHz		_	
Att 20 dB SW	<b>T</b> 3.8 µs	VBW 3 MHz	Mode Auto FF	Γ	
1AP Max					
110 dBµV/m			M1[1]		97.11 dBµV/
			MOLT		2.4797250 G
100 dBpWm			M2[1]		46.34 dBµV/ 2.4835000 G
			1		2.4000000
90 dBµV/m					
30 dBµV/m					
D2 74.000 dBµV/m					
60 dBµV/m					
D1 54.000 dBµV/m					
50 dBµV/m					
	$\sim$	$\rightarrow \rightarrow$	$\sim$		
40 dBµV/m-					
30 dBµV/m					
20 dBµV/m					
Start 2.478 GHz		1001 p	ts		Stop 2.5 GH
1arker					
Type Ref Trc X-valu		Y-value	Function	Fun	ction Result
	25 GHz	97.11 dBµV/m			
M2 1 2.48	35 GHz	46.34 dBµV/m			

		AV			
Spectrum					
RefLevel 116.00 Att TDF		<ul> <li>RBW 1 MHz</li> <li>VBW 3 MHz</li> </ul>	Mode Auto FFT		, , , , , , , , , , , , , , , , , , ,
1Rm AvgPwr					
110 dBµV/m			M1[1]		96.43 dBµV/n 2.4800770 GH
100 dBµV/m			M2[1]		38.32 dBµV/n 2.4835000 GH
90 dBµV/m		_		_	
80 dBµV/m					
70 dBµV/m	74.000 dBµV/m				
50 dBµV/m D1 54.0	000 dBµV/m				
40 dBµV/m	M2				
30 dBµV/m					
20 dBµV/m				_	
Start 2.478 GHz		1001 pts	5		Stop 2.5 GHz
Marker					
Type Ref Trc M1 1	2.480077 GHz	Y-value 96.43 dBµV/m	Function	Functio	n Result
M1 1 M2 1	2.480077 GHz 2.4835 GHz	38.32 dBµV/m			
T T			Measuring	••••••••••••••••••••••••••••••••••••••	25.07.2019 11:09:55

Date: 25.JUL.2019 11:09:55

#### **RESULT: PASS**

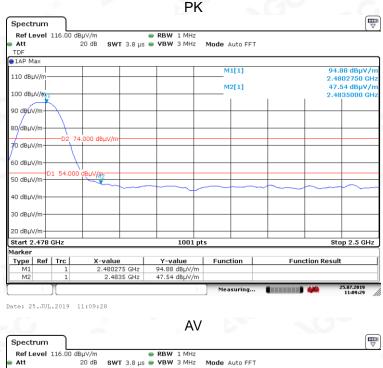


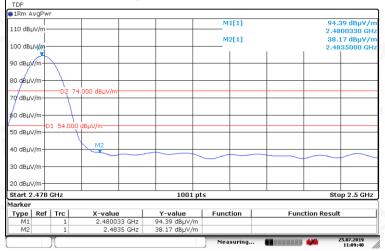
 $\label{eq:attestation} Attestation of Global Compliance (Shenzhen) Co., Ltd.$ 



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EUT	Bluetooth Beacon	Model Name	FSC-BP103
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna	Vertical
		DI	





#### Date: 25.JUL.2019 11:09:40

#### **RESULT: PASS**

**Note**: The factor had been edited in the "Input Correction" of the Spectrum Analyzer. So the Amplitude of test plots is equal to Reading level plus the Factor in dB. Use the A dB( $\mu$ V) to represent the Amplitude. Use the F dB( $\mu$ V/m) to represent the Field Strength. So A=F.





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## **APPENDIX A: PHOTOGRAPHS OF TEST SETUP**

RADIATED EMISSION TEST SETUP BELOW 1GHZ



RADIATED EMISSION TEST SETUP ABOVE 1GHZ





 $\label{eq:Attestation} Attestation of Global Compliance (Shenzhen) Co., Ltd.$ 



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#### APPENDIX B: PHOTOGRAPHS OF EUT

ALL VIEW OF EUT



TOP VIEW OF EUT

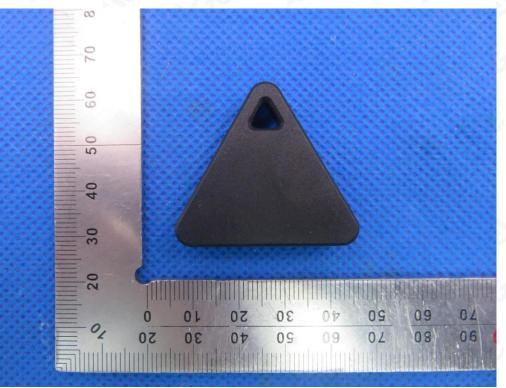




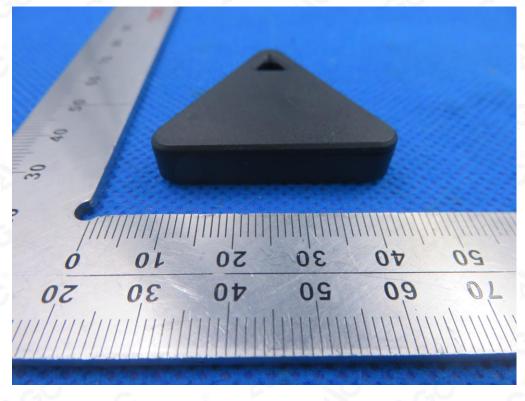


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#### BOTTOM VIEW OF EUT



SIDE FACE VIEW OF EUT-1

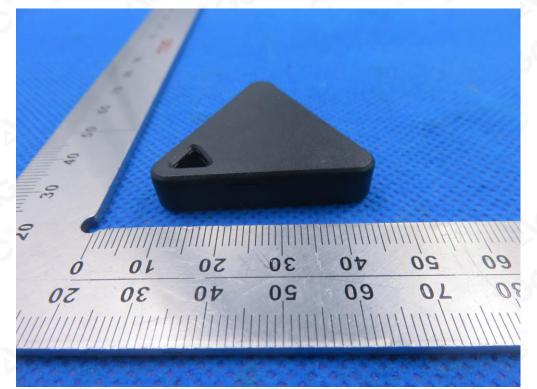




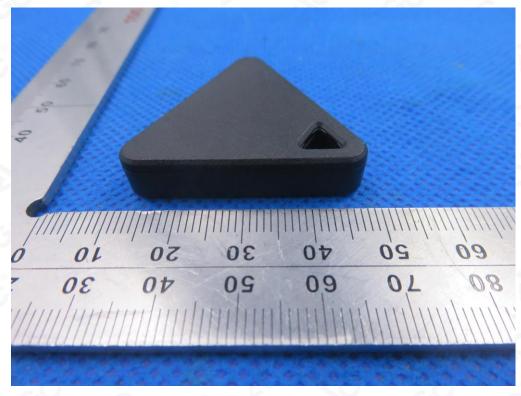


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#### SIDE FACE VIEW OF EUT-2



SIDE FACE VIEW OF EUT-3





 $\label{eq:Attestation} Attestation of Global Compliance (Shenzhen) Co., Ltd.$ 



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OL 0'Z Ò OL 3.0 0.9 0,2 

**OPEN VIEW OF EUT-1** 

**OPEN VIEW OF EUT-2** 



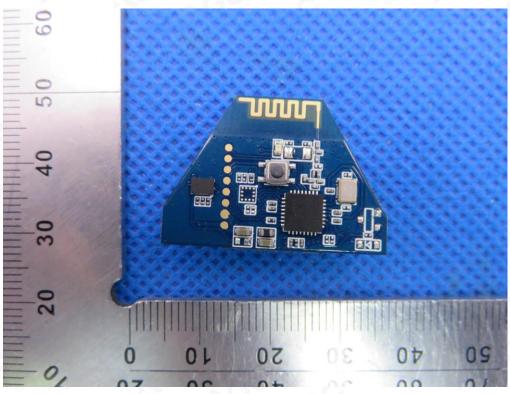


 $\label{eq:attestation} Attestation of Global Compliance (Shenzhen) Co., Ltd.$ 

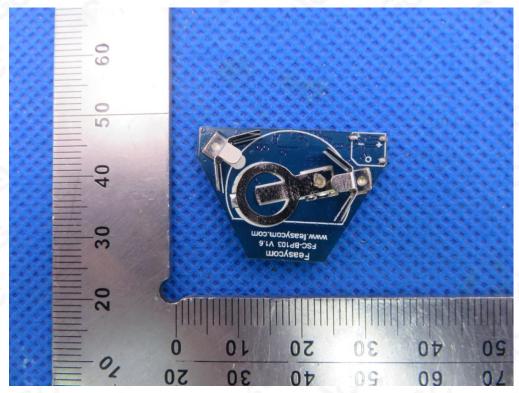


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#### **INTERNAL VIEW OF EUT-2**

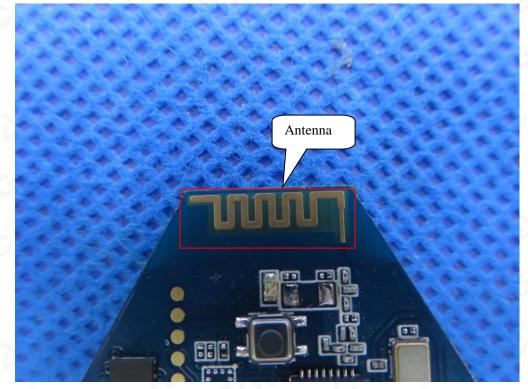




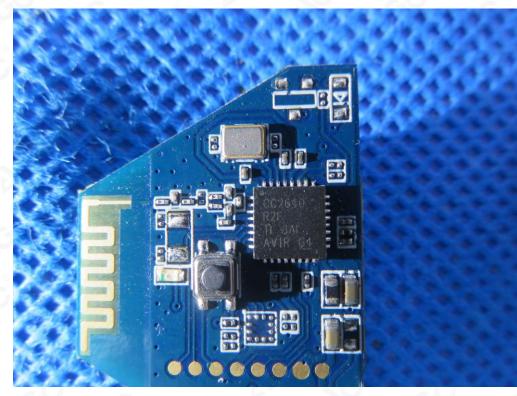


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#### **INTERNAL VIEW OF EUT-3**



**INTERNAL VIEW OF EUT-4** 





 $\label{eq:attestation} Attestation of Global Compliance (Shenzhen) Co., Ltd.$ 

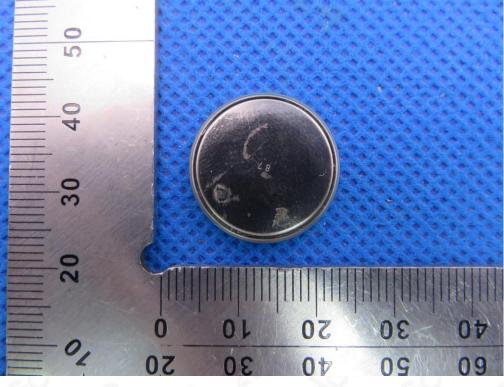


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#### **VIEW OF BATTERY-1**



#### **VIEW OF BATTERY-2**



#### ----END OF REPORT----



Attestation of Global Compliance(Shenzhen)Co.,Ltd.

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