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FCC PART 15 SUBPART C
FCC PART 15.247
TEST REPORT

FCC ID:2BVHB-TAGME5

Report No: CTSL2620230165ER

Product Name: Electronic badge

Main Test Model: TagME5.0

Series Models: N/A

Applicant: Shenzhen Yishi erniao Technology Co., Ltd.

EXECUTIVE SUMMARY

A sample of this product was tested and found to be in compliance with
FCC PART 15C, FCC PART 15 SUBPART C (15.249).

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CTSL Testing (Dongguan) Co., Ltd.
Main company address: Building1, Houjie Road Houjie Town,Guangdong Province,
Dongguan City P.R.C.

Test Report

FCC ID:2BVHB-TAGME5

Applicant Name	Shenzhen Yishi erniao Technology Co., Ltd.				
Applicant Address	4th Floor, Building 1, Jiawei New Energy Industrial Park, Innovation World, Longgang District, Shenzhen City, China				
Manufacturer Name	Shenzhen Yishi erniao Technology Co., Ltd.				
Manufacturer Address	4th Floor, Building 1, Jiawei New Energy Industrial Park, Innovation World, Longgang District, Shenzhen City, China				
Trade Mark	bluebot®				
Product name	Electronic badge				
Main Test Model	TagME5.0				
Series Models	N/A				
Standard	**FCC Part 15 Subpart C (15.247)** **ANSI C63.10:2020**				
Test Location	ISO/IEC 17025 by ILAC-MRA is A2LA 7556.01 CTSL Testing (Dongguan) Co., Ltd. Room 112, Building 1, No. 15, Jiaoyuansongshan Hetian Village, Houjie Town Dongguan City, Guangdong, People's Republic of China				
Receipt Date	2026.1.26	**Test period**	2026.1.26-2026.2.6	**Issue Date**	2026.2.6
Conclusion	**The equipment under test was found to be compliance with the requirements of the standards applied.**				
Performs Testing:	Ethan Zhao	Ethan zhao	(Special seal)		
Test Report Reviewer:	Steve Qin	Steve Qin			
Test Report Authorizer:	Alan Li	Alan Li			

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1. General Information

1.1. General Description of EUT (Equipment Under Test)

Product Information		
Product Name	:	Electronic badge
Main Test Model	:	TagME5.0
Series Models	:	N/A
Power supply	:	DC 5V
Battery	:	DC 3.7V/450mAh
Software Version	:	V1.0
Hardware Version	:	V1.0
Equipment Under Test		
Testing sample ID	:	CTSL2620230165-S1
Test supplied	:	☐ supplied by the manufacturer ☒ supplied by the lab (Auxiliary test supplied by test Lab)
Switching Power Supply information	:	DC 5V
Wireless Specification		
Supported Type	:	Bluetooth 5.0(BLE)
Modulation Type	:	GFSK
Transmit data rate (LE)	:	LE 1 Mbps
Transmitter rate	:	1MHz
Number of channels	:	40 Channels
Channel separation	:	1MHz
Antenna Gain& type	:	Refer to Section 1.2 of the report.
Sample Type	:	Prototype production
Type of Device	:	☒ Portable Device; ☐ Mobile Device; ☐ Modular Device

Note: For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

1.2. Antenna Information

Ant No.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	--	--	Chip antenna	--	1.7

Note:
1. The antenna gain is declared by the customer and the laboratory is not responsible for the accuracy of the antenna gain.
2.The test results of this report only apply to the sample as received.

2. SUMMARY OF TEST

2.1. Test Standards

FCC Rules Part 15.247: Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.
ANSI C63.10:2020: American National Standard for Testing Unlicensed Wireless Devices
FCC KDB 558074 D01 15.247 Meas Guidance v05r02

2.2. Summary of test result

No.	Description of Test Item	FCC Standard Section	Results
1	6dB Bandwidth & 99% Bandwidth	§15.247(a)(2)	PASS
2	Maximum Peak Output Power	15.247(b)(3)	PASS
3	Power Spectral Density	15.247(e)	PASS
4	Conducted Band Edge	15.247(d)	PASS
5	Conducted Spurious Emissions	15.247(d)	PASS
6	Radiated Spurious Emissions and Band Edge	15.109/ 15.205/ 15.209/ 15.247(d)	PASS
7	AC Power Line Conducted Emissions	15.207(a)	PASS
8	Antenna Requirement	15.203	PASS

Note: “N/A” denotes test is not applicable in this test report.

2.3. Test Facilities

EMC Lab :

A2LA Certificate Number: 7556.01;
CTSL Testing (Dongguan) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.
The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.10 and CISPR 16-1-4:2010.

FCC-Registration No.: 0037614732;
Test Firm Registration Number:750639;
CTSL Testing (Dongguan) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

Industry Canada Registration Number. Is: 34801;
CAB identifier: CN0192;
CTSL Testing (Dongguan) Co., Ltd. The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing.

Name of Firm : CTSL Testing (Dongguan) Co.,ltd.

EMC test location/satellite location:
Room 112, Building 1, No. 15, Jiaoyuansongshan Hetian Village, Houjie Town Dongguan City, Guangdong, People's Republic of China City, Guangdong, China

2.4. Measurement uncertainty

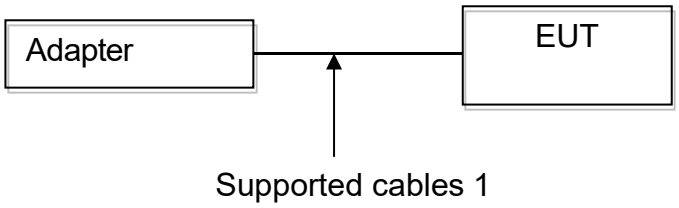
Test Item	Uncertainty
Uncertainty for Conduction emission test	±3.48dB
Uncertainty for spurious emissions test (Below 30MHz)	±1.62 dB
Uncertainty for spurious emissions test (30MHz-1GHz)	±4.60 dB(Polarize: H)
	±4.68 dB(Polarize: V)
Uncertainty for spurious emissions test (1GHz to 25GHz)	±4.96dB
Uncertainty for radio frequency	7×10^{-8}
Uncertainty for conducted RF Power	1.08dB
Uncertainty for Power density test	0.26dB

Note: This uncertainty represents an expanded uncertainty expressed at approximately The 95% confidence level using a coverage factor of k=2.

2.5. Block Diagram

For radiated emissions test: EUT was placed on a turn table, which is 0.8 (or 1.5) meter high above ground. EUT was beset into Bluetooth test mode by software before test.

Connect EUT Antenna Terminal, Radiated Spurious Emissions& Band Edge Test



(**EUT**: Electronic badge)

2.6. Assistant equipment used for test

Item	Equipment	Brand	Model Name/Type No.	FCC ID	Series No.
1	Adapter	Xiaomi	AD652G	-	-

Supported cables				
Item	**Shielded Type**	**Ferrite Core**	**Length**	**Note**
1	NO	NO	0.5m	USB Extension Cable, supplied by the Lab.

2.7. Channel List

BLE 1M&2M							
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
00	**2402**	01	2404	02	2406	03	2408
04	2410	05	2402	06	2414	07	2416
08	2418	09	2420	10	2422	11	2424
12	2426	13	2428	14	2430	15	2432
16	2434	17	2436	18	2438	**19**	**2440**
20	2442	21	2444	22	2446	23	2448
24	2450	25	2452	26	2454	27	2456
28	2458	29	2460	30	2480	31	2464
32	2466	33	2468	34	2470	35	2472
36	2474	37	2476	38	2478	**39**	**2480**

2.8. Power Setting of Test Software

Software Name	Pandora_R22.24.1701		
Frequency (MHz)	2402	2440	2480
BLE 1M-GFSK Setting	Default	Default	Default

Note: This information is provided by the applicant.

2.9. Test Equipment

For Conducted Emission Test						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESCI 3	AT005	GUANGZHOU NEM	May 16,25	May 15,26
LISN	Rohde & Schwarz	ENV216	AT006	LISAI	July 31,25	July 30,26
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	AT007	CCIC (Shenzhen)	July 10,25	July 09,26
CE Cable	Times Microwave	LMR195UF-NMNM-1.50M	AT041	GUANGZHOU NEM	May 16,25	May 15,26
Test Software	FARAD	EZ-EMC Ver.3A1.1+	N/A	N/A	N/A	N/A

For Radiated Emission Test (9kHz-30MHz)						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
EMI TestReceiver	Rohde& Schwarz	ESCI 7	AT001	Ti Group	July 31,24	July 30,26
Active Loop Antenna	ZHINAN	ZN30900C	AT063	LISAI	Aug 03,24	Aug 02,26
Test Software	FARAD	EZ-EMC Ver.3A1.1+	N/A	N/A	N/A	N/A
9kHz-30MHz Cable	Times Microwave	LMR195UF-NMNM-9M	AT045	GUANGZHOU NEM	May 16,25	May 15,26

For Radiated Emissions Test (30MHz-1000MHz)						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
EMI Test Receiver	Rohde& Schwarz	ESCI 7	AT001	Ti Group	Jun 12,25	Jun 11,26
Trilog-Broadband Antenna	SCHWARZBECK	VULB 9168	AT002	LISAI	Aug 03,24	Aug 02,26
Test Software	FARAD	EZ-EMC Ver.3A1.1+	N/A	N/A	May 16,25	May 15,26
30-1000MHz Cable	Times Microwave Systems	LMR195UF-NMRNMR-3.00M+ LMR400UF-NMNM-3.00M+ LMR400UF-NMNM-3.00M	AT042+AT043+AT044	GUANGZHOU NEM	May 16,25	May 15,26

For Radiated Emission test (Above 1000MHz)						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
Horn Antenna 1-18G	SCHWARZBECK	BBHA 9120 D	AT003	Shenzhen Academy of Metrology & Quality Inspection	Sep 23,24	Sep 22,26
Horn Antenna 18-40GHz	XIBAO	XB-WDB18-40K	AT064	LISAI	Feb 25,25	Feb 24,26
Broadband Preamplifier	SCHWARZBECK	BBV 9718 D	AT004	CCIC (Shenzhen)	July 10,25	July 9,26
Low Noise Amplifier	MWRFtest	DLA8-18-40G-2078	AT065	GUANGZHOU NEM	July 10,25	July 9,26
Spectrum Analyzer 40G	Keysight	N9020B	AT066	GUANGZHOU NEM	May 13,25	May 12,26
Spectrum Analyzer 26.5G	Keysight	N9020A	AT050	GUANGZHOU NEM	Jun 12,25	Jun 11,26
Radio switching unit	TiGroup	SU319	AT055	N/A	N/A	N/A
Filtering unit	TiGroup	SU319F	AT056	N/A	N/A	N/A
Test Software	BL	BL410-E V25.5 en	N/A	N/A	N/A	N/A
Above 1GHz Cable	Times Microwave Systems	SFT205-NMNM-7.0M+ SFT205-NMNM-2.0M	AT057+ AT058	N/A	N/A	N/A

For Connect EUT Antenna Terminal Test (RF Test system)						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
Spectrum analyzer	Keysight	N9020A	AT050	GUANGZHOU NEM	Jun 12,25	Jun 11,26
Analog signal source	Keysight	N5173B	AT051	GUANGZHOU NEM	Jun 12,25	Jun 11,26
WIDEBAND RADIO COMMUNICATION TESTER	Rohde& Schwarz	CMW500	AT052	GUANGZHOU NEM	Jun 12,25	Jun 11,26
Power probe unit	Ti Group	SU319P	AT053	GUANGZHOU NEM	Jun 12,25	Jun 11,26
Switch unit	Ti Group	SU319S	AT054	N/A	N/A	N/A
Test Software	BL	BL410R 3.5.2.621	N/A	N/A	N/A	N/A

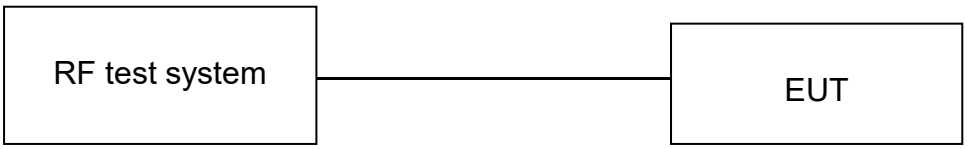
Remark: The power sensor is integrated into the Power Probe unit

3. 6DB BANDWIDTH

3.1. Limit

Systems using digital modulation techniques operate in the 2400-2483.5 MHz, the minimum 6 dB bandwidth shall be at least 500 kHz.

3.2. Test Setup



3.3. Spectrum Analyzer Setting

6dB Bandwidth	
Spectrum Parameters	**Setting**
RBW	100KHz
VBW	300KHz
Span	2MHz(BLE 1M mode)
Sweep Time	Auto
Detector	Peak
Trace Mode	Max Hold

3.4. Test Procedure

a. The test according to ANSI C63.10 clause 11.8.
b. Connect EUT antenna terminal to the spectrum analyzer with RF cable.
c. Spectrum analyzer setting parameters in accordance with section 3.3.
d. Set the EUT transmit continuously with maximum output power.
e. Allow trace to stabilize, measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.
f. Repeat above procedures until all channels and test modes were measured.
g. Record the results in the test report.

3.5. Test Result

Test Mode	Antenna	Channel& Frequency	6dB Bandwidth	6dB Bandwidth Conducted Limit	Result
		MHz	MHz	KHz	
BLE 1M-GFSK	Ant1	CH00 2402	0.642	≥500	PASS
		CH19 2440	0.638		
		CH39 2480	0.638		

3.6.Original Test record

BLE 1M-GFSK_Ant1_CH00 2402MHz

BLE 1M-GFSK_Ant1_CH19 2440MHz

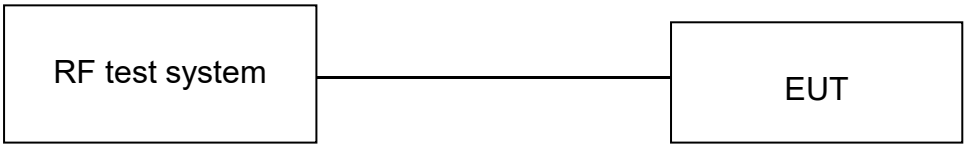
BLE 1M-GFSK_Ant1_CH39 2480MHz

4. 99% BANDWIDTH

4.1.Limit

None; for reporting purpose only.

4.2. Test Setup



4.3. Spectrum Analyzer Setting

99% Occupied Bandwidth	
Spectrum Parameters	**Setting**
RBW	30KHz
VBW	100KHz
Span	2MHz(BLE 1M mode)
Sweep Time	Auto
Detector	Peak
Trace Mode	Max Hold

4.4. Test Procedure

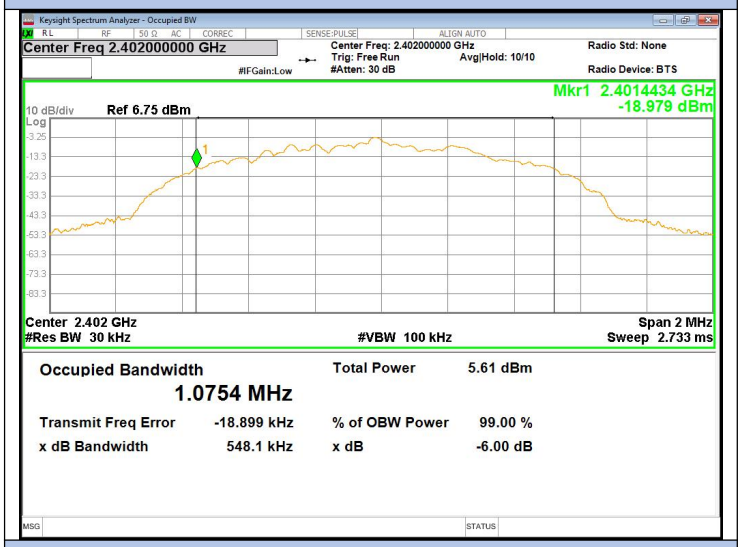
a. The test according to ANSI C63.10 clause 6.9.3.
b. Connect EUT antenna terminal to the spectrum analyzer with RF cable.
c. Spectrum analyzer setting parameters in accordance with section 4.3.
d. Set the EUT transmit continuously with maximum output power.
e. Repeat above procedures until all channels and test modes were measured.
f. Record the results in the test report.

4.5.Test Data

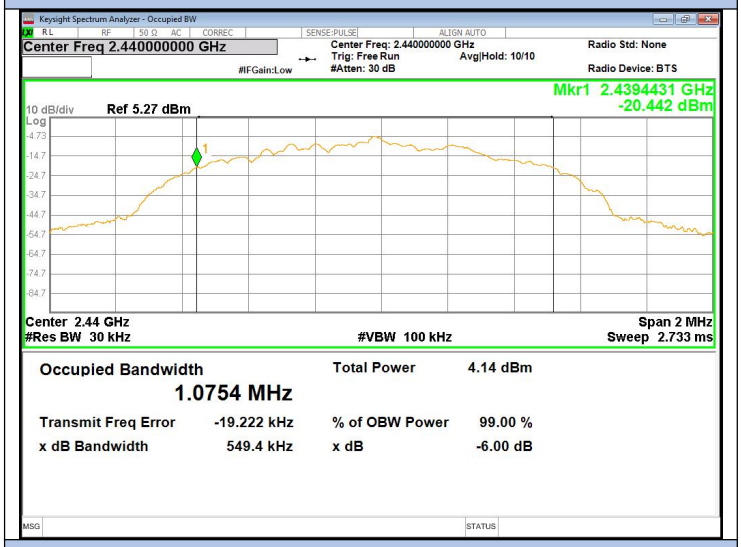
Test Mode	Antenna	Channel& Frequency	Occupied Channel Bandwidth
		MHz	MHz
BLE 1M-GFSK	Ant1	CH00 2402	1.075
		CH19 2440	1.075
		CH39 2480	1.077

4.6.Original Test record

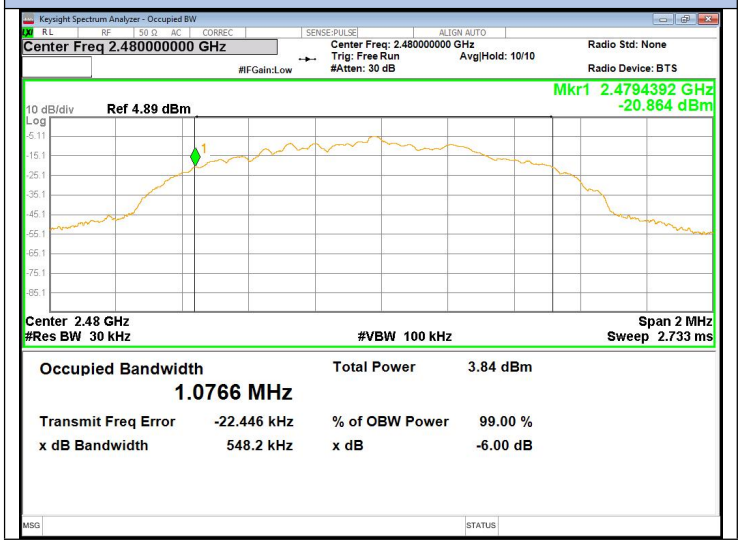
BLE 1M-GFSK_Ant1_CH00 2402MHz



BLE 1M-GFSK_Ant1_CH19 2440MHz



BLE 1M-GFSK_Ant1_CH39 2480MHz

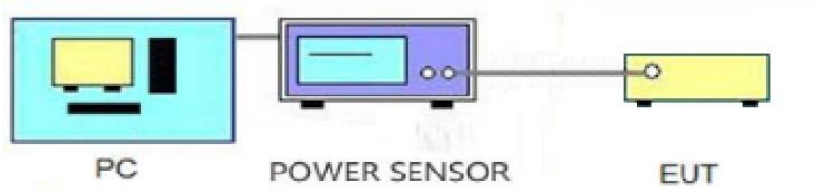


5. MAXIMUM PEAK OUTPUT POWER

5.1. Limit

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

5.2. Test Setup



5.3. Test Procedure

a. Connect each EUT's antenna output to power sensor by RF cable.
b. Measure the PK output power of each antenna port by power sensor.

5.4. Test Result

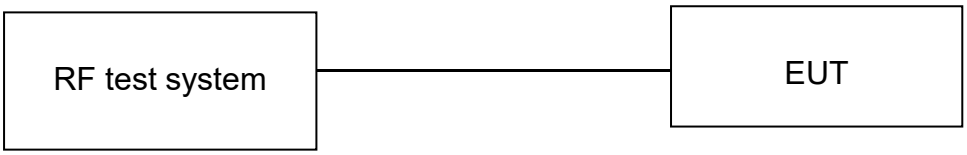
Test Mode	Antenna	Channel& Frequency	Peak Output Power	Limit	Result
		MHz	dBm	dBm	
BLE 1M-GFSK	Ant1	CH00 2402	1.41	30	PASS
		CH19 2440	-0.88		
		CH39 2480	-1.24		

6. POWER SPECTRAL DENSITY

6.1.Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

6.2.Test Setup



6.3.Spectrum Analyzer Setting

Spectrum Parameters	Setting
RBW	3KHz
VBW	10KHz
Span	1.5 times the DTS bandwidth
Sweep Time	Auto
Detector	Peak
Trace Mode	Max Hold

6.4.Test Procedure

a. Connect EUT antenna terminal to the spectrum analyzer with RF cable.
b. Spectrum analyzer setting parameters in accordance with section 6.3.
c. Set the EUT transmit continuously with maximum output power.
d. Allow trace to stabilize, use the marker-to-peak function to set the marker to the peak of the emission.
e. Repeat above procedures until all modes and channels were measured.
f. Record the results in the test report.

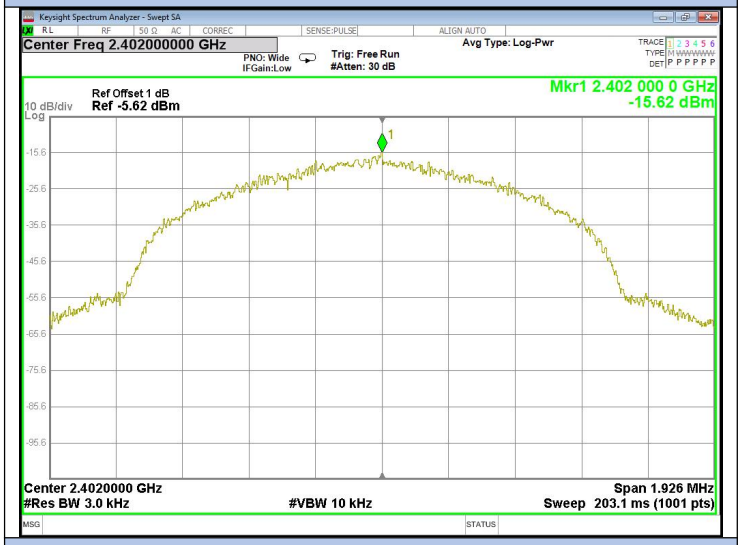
6.5.Test Result

Test Mode	Antenna	Channel& Frequency	Peak Power Spectral Density	Limit	Result
		MHz	dBm/3KHz	dBm/3KHz	
BLE 1M-GFSK	Ant1	CH00 2402	-15.62	8.00	PASS
		CH19 2440	-17.01		
		CH39 2480	-17.11		

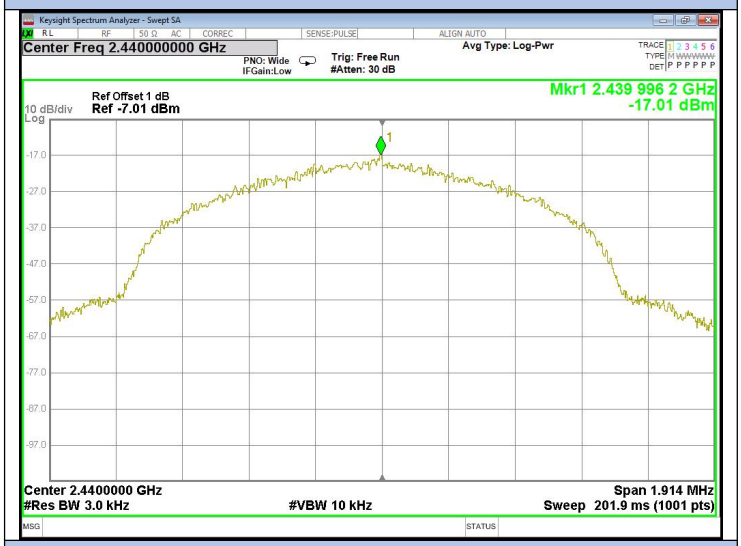
Note:
1) If the test results under the Peak detector meet the limit requirements, then there is no need to consider the coefficient obtained by multiplying by the Duty cycle.

6.6.Original Test record

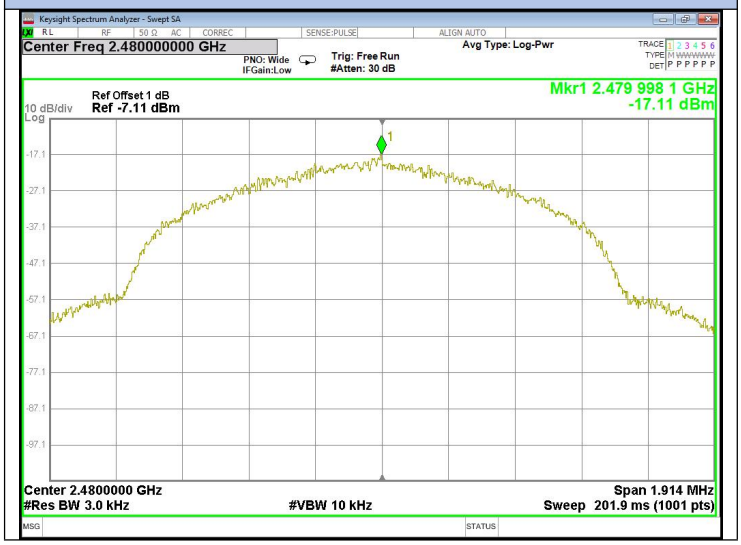
BLE 1M-GFSK_Ant1_CH00 2402MHz



BLE 1M-GFSK_Ant1_CH19 2440MHz



BLE 1M-GFSK_Ant1_CH39 2480MHz

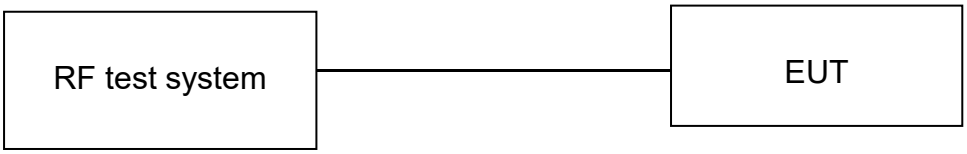


7. Conducted Band Edge

7.1. Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, 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) (see §15.205(c)).

7.2. Test Setup



7.3. Spectrum Analyzer Setting

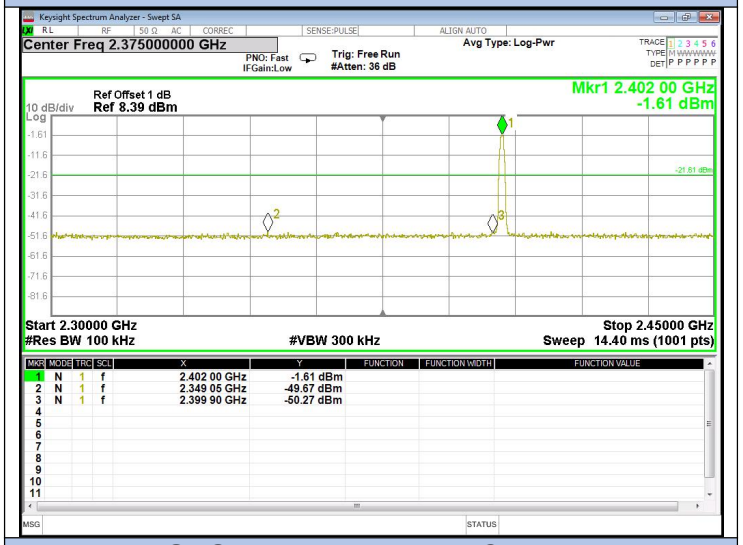
Spectrum Parameters	Setting
RBW	100KHz
VBW	300KHz
Span	1.5times the DTS bandwidth
Sweep Time	Auto
Detector	Peak
Trace Mode	Max Hold

7.4. Test Procedure

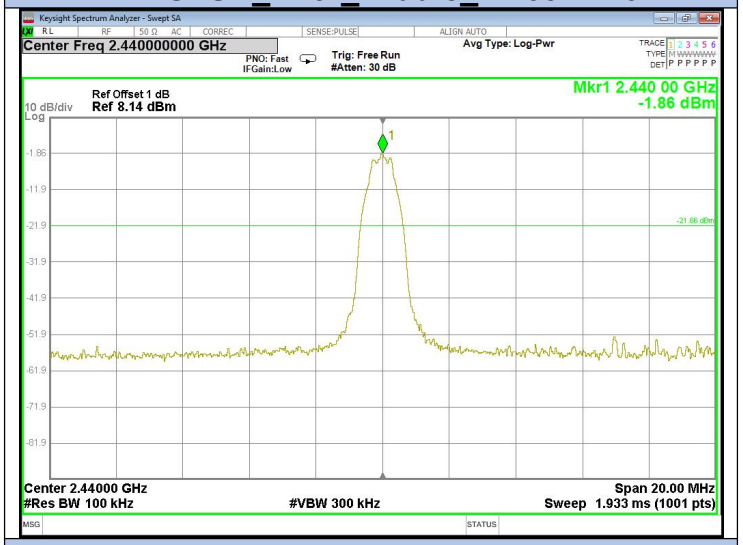
a. Connect EUT antenna terminal to the spectrum analyzer with RF cable.
b. Spectrum analyzer setting parameters in accordance with section 7.3.
c. Set the EUT transmit continuously with maximum output power.
d. Allow trace to stabilize, use the marker function to mark the highest emission level outside the authorized band.
e. Repeat above procedures until all modes and channels were measured.
f. Record the results in the test report
g. BLE 1M-GFSK, all have been tested, the test data was recorded in report.

7.5.Test Result

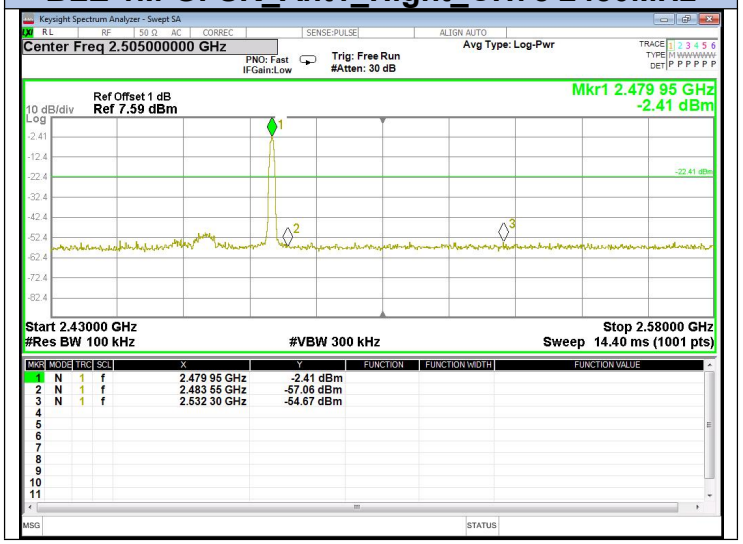
BLE 1M-GFSK_Ant1_Low_CH00 2402MHz



BLE 1M-GFSK_Ant1_Middle_CH39 2440MHz



BLE 1M-GFSK_Ant1_Hight_CH78 2480MHz

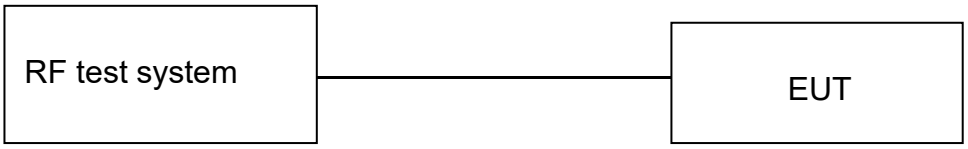


8. Conducted Spurious Emissions

8.1. Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, 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) (see §15.205(c)).

8.2. Test Setup



8.3. Spectrum Analyzer Setting

Spectrum Parameters	Setting
RBW	100KHz
VBW	300KHz
Start frequency	30MHz
Stop frequency	25.0GHz
Sweep Time	Auto
Detector	Peak
Trace Mode	Max Hold

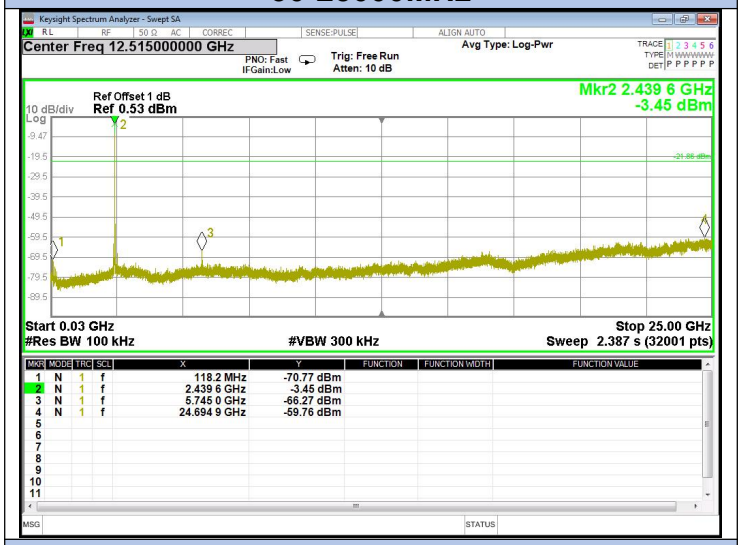
8.4. Test Procedure

a. Connect EUT antenna terminal to the spectrum analyzer with RF cable.
b. Spectrum analyzer setting parameters in accordance with section 8.3.
c. Set the EUT transmit continuously with maximum output power.
d. Allow trace to stabilize, use the marker function to mark the highest emission level outside the authorized band.
e. Repeat above procedures until all modes and channels were measured.
f. Record the results in the test report.
g. BLE 1M-GFSK, all have been tested, the test data was recorded in report.

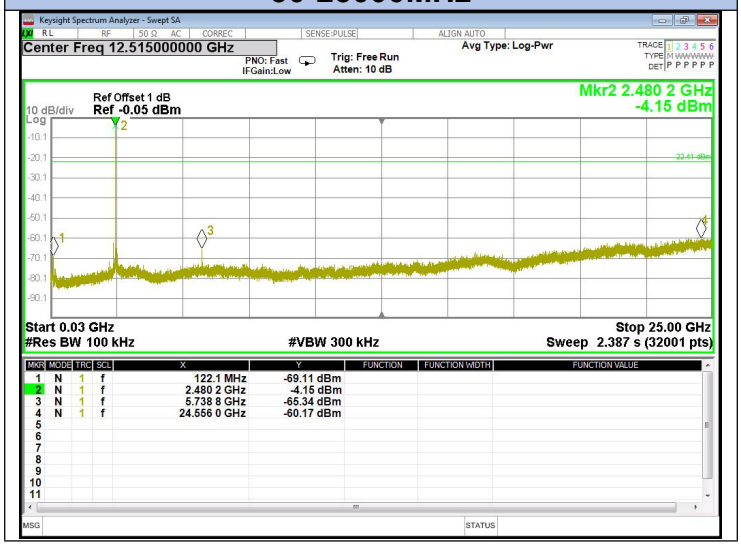
8.5.Test Result

BLE 1M-GFSK_Ant1_CH00 2402MHz
30-25000MHz

BLE 1M-GFSK_Ant1_CH19 2440MHz
30-25000MHz



BLE 1M-GFSK_Ant1_CH39 2480MHz
30-25000MHz



9. Radiated Spurious Emissions and Band Edge

9.1. Limit

All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

15.205 Restricted frequency band

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	([2])

15.209 Limit

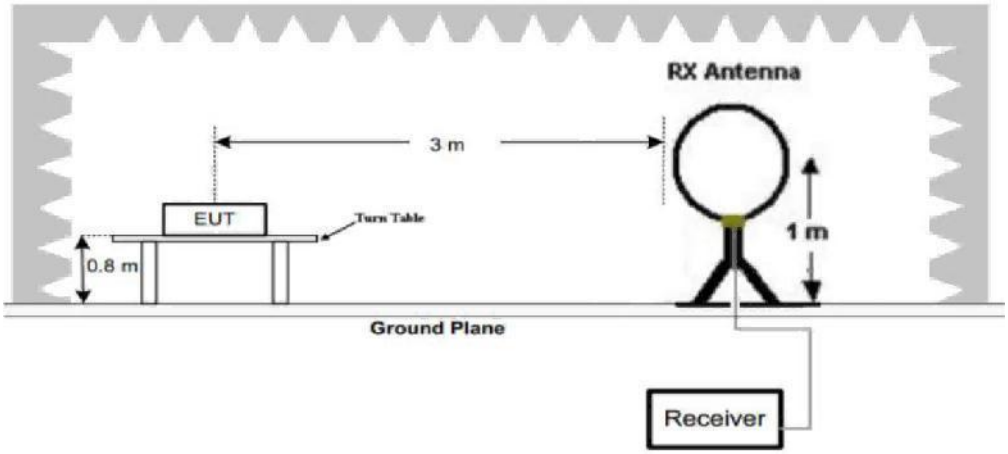
Frequency (MHz)	Field Strength(μV/m)	Distance(m)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Note:

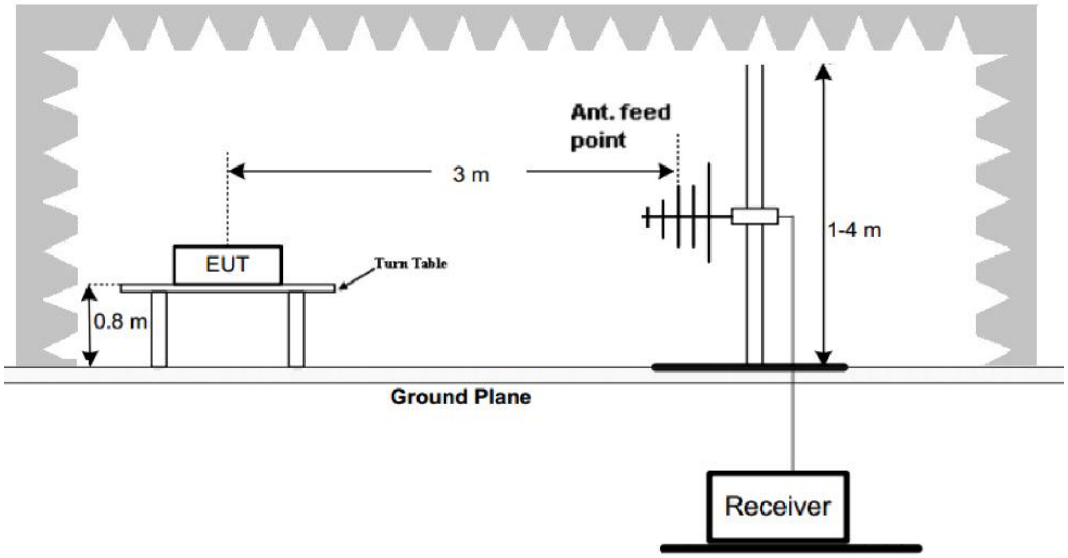
(1) Emission level dBμV = 20 log Emission level μV/m.
(2) The smaller limit shall apply at the cross point between two frequency bands.
(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

9.2. Test Setup

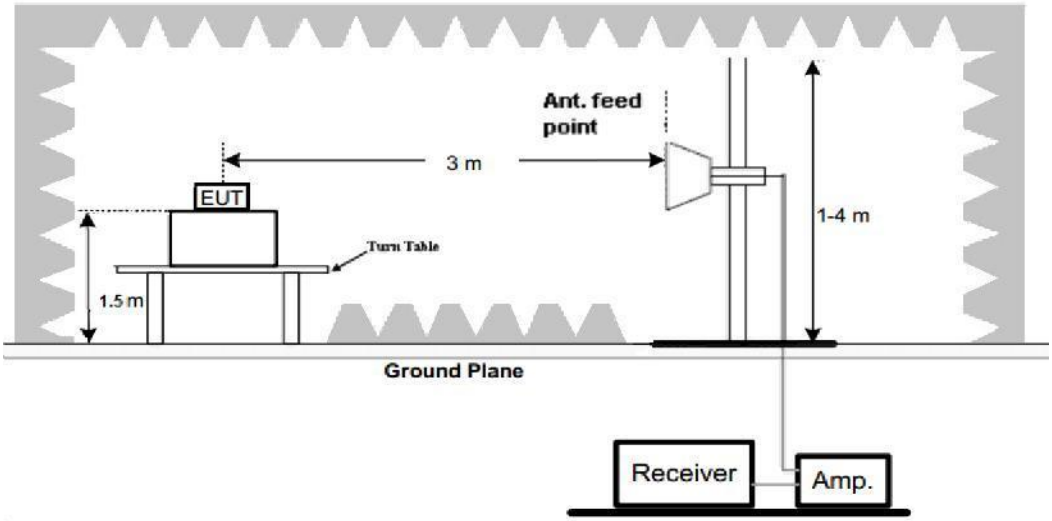
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz

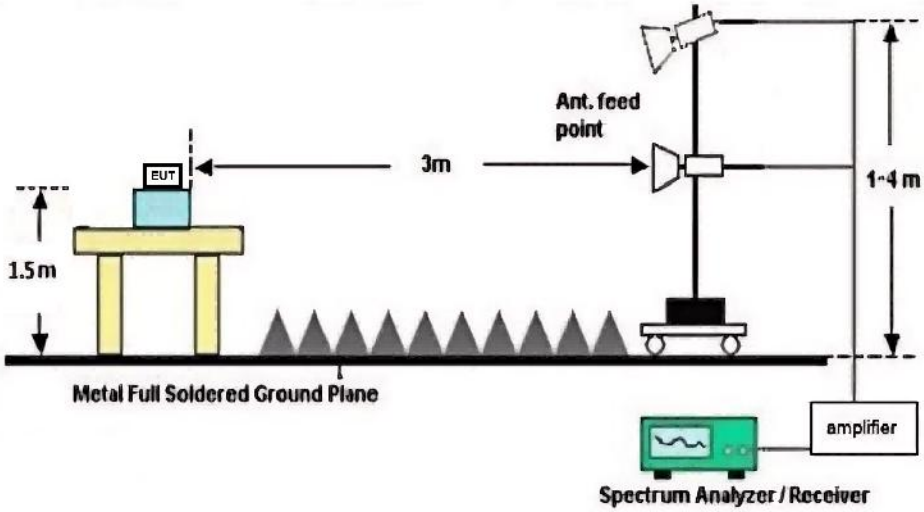


(B) Radiated Emission Test Set-Up, Frequency below 1000MHz



(C) Radiated Emission Test Set-Up, Frequency above 1GHz





9.3. Spectrum Analyzer Setting

For 9KHz-150KHz	
Spectrum Parameters	**Setting**
RBW	300Hz (for Peak&AVG)/CISPR 200Hz (for QP)
VBW	300Hz (for Peak&AVG)/CISPR 200Hz (for QP)
Start frequency	9KHz
Stop frequency	150KHz
Sweep Time	Auto
Detector	PEAK/QP/AVG
Trace Mode	Max Hold

For 150KHz-30MHz	
Spectrum Parameters	**Setting**
RBW	9KHz
VBW	9KHz
Start frequency	150KHz
Stop frequency	30MHz
Sweep Time	Auto
Detector	QP
Trace Mode	Max Hold

For 30MHz-1GHz	
Spectrum Parameters	**Setting**
RBW	120KHz
VBW	300KHz
Start frequency	30MHz
Stop frequency	1GHz
Sweep Time	Auto
Detector	QP
Trace Mode	Max Hold

For Above 1GHz		
Spectrum Parameters	**Setting**	
RBW	1MHz	
VBW	PEAK Measurement	AVG Measurement
	3MHz	Duty cycle≥98%, VBW=10Hz
		Duty cycle＜98%,VBW≥1/T
Start frequency	1GHz	
Stop frequency	25GHz	
Sweep Time	Auto	
Detector	PEAK	
Trace Mode	Max Hold	

9.4. Test Procedure

a. EUT was placed on a turn table, which is 0.8-meter high above ground for below 1GHz test, and which is 1.5-meter high above ground for above 1GHz test.
b. The diameter of the turntable is 2 meters. The EUT is located at the center of the edge of the test support table. Since the turntable is large enough, the EUT is placed at the center of the edge of the test support table as well as at the center of the turntable.
c. EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower.
d. Set the EUT transmit continuously with maximum output power.
e. The turn table can rotate 360 degrees to determine the position of the maximum emission level.
f. The antenna can be moved up and down between 1 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on test.
g. EMI TestReceiver setting parameters in accordance with section 9.3.
h. Repeat above procedures until all channels and test modes were measured.
i. Record the results in the test report.

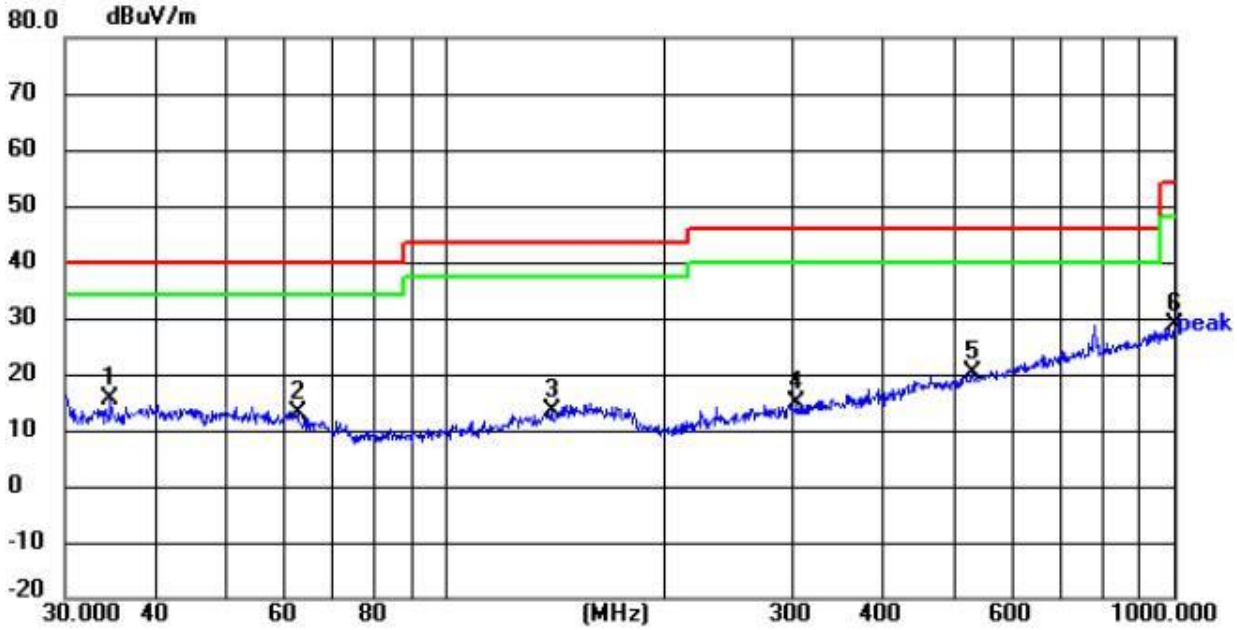
Note:

1. For emissions above 1GHz, if peak level complies with average limit, then the average level is deemed to comply with average limit.
2. The frequency 2402MHz ,2440MHz and 2480MHz is fundamental frequency which no limit, the limit on plots is automatically generated by the software, it's not fundamental limit, we can't remove it.
3. For 30-1000MHz Radiation emissions, BLE 1M-GFSK, mode all have been tested, only worse case: BLE 1M-GFSK mode with CH00 2402MHz is reported. it was conducted under both DC 5V input voltages. There was no significant change in radiation emission. Only the test data under DC 5V zvoltage was recorded and included in the report.
4. Radiated emission test from 9KHz to 10th harmonic of fundamental was verified, and no emission found except system noise floor in 9KHz to 30MHz and not recorded in this report.
5. The amplitude of 18GHz to 25GHz spurious emission-that-is attenuated by more than 20dB below the-permissible-limit has no need-to-be-reported.
6. Radiated emission test from 25GHz to 40GHz of fundamental was verified, and no emission found except system noise floor in 25GHz to 40GHz and not recorded in this report.

9.5. Test Result

Radiated Emissions 30-1000MHz

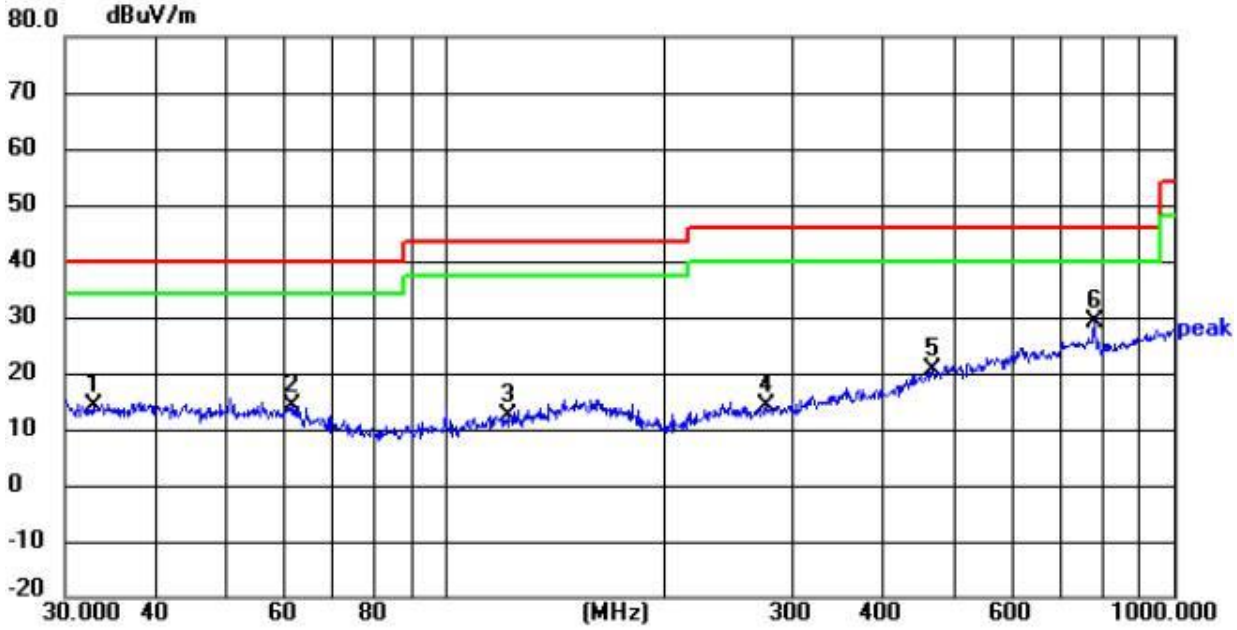
EUT: Electronic badge
M/N: TagME5.0
Test Voltage: DC 3.7V
Ant. Pol.: Horizontal
Test Mode: TX Mode
Note: only worse case: BLE 1M-GFSK mode with CH00 2402MHz is reported
Detailed results are shown below



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	34.6385	27.52	- 12. 10	15.42	40.00	-24.58	QP
2	62.6507	26.36	- 13.50	12.86	40.00	-27. 14	QP
3	139.8508	25.56	- 12. 19	13.37	43.50	-30. 13	QP
4	303.5437	26.62	- 11.62	15.00	46.00	-31.00	QP
5	530.1014	26.33	-6.25	20.08	46.00	-25.92	QP
6	1000.0000	28.01	0.77	28.78	54.00	-25.22	QP

Remarks:
1. Margin = Result (Result =Reading + Factor)–Limit
2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

EUT: Electronic badge
M/N: TagME5.0
Test Voltage: DC 3.7V
Ant. Pol.: Vertical
Test Mode: TX Mode
Note: only worse case: BLE 1M-GFSK mode with CH00 2402MHz is reported
Detailed results are shown below



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	32.8637	26.45	- 12.30	14.15	40.00	-25.85	QP
2	61.3463	27.58	- 13.35	14.23	40.00	-25.77	QP
3	121.9755	25.78	- 13.56	12.22	43.50	-31.28	QP
4	276.1235	26.49	- 12.33	14.16	46.00	-31.84	QP
5	465.5994	27.78	-7.41	20.37	46.00	-25.63	QP
6	776.8778	30.67	- 1.70	28.97	46.00	- 17.03	QP

Remarks:
1. Margin = Result (Result =Reading + Factor)–Limit
2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

Radiated Emissions Above 1GHz - BLE 1M-GFSK

Temperature:	25 °C	Relative Humidity:	60%
Test Mode:	Low CH (GFSK)	Test Voltage:	DC 3.7V

Peak

Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4804.00	36.13	31.78	8.6	32.09	44.42	74	-29.58	Vertical
7206.00	34.12	36.15	11.65	32	49.92	74	-24.08	Vertical
9608.00	35	37.95	14.14	31.62	55.47	74	-18.53	Vertical
12010.00	*					74		Vertical
14412.00	*					74		Vertical
4804.00	38.73	31.78	8.6	32.09	47.02	74	-26.98	Horizontal
7206.00	33.92	36.15	11.65	32	49.72	74	-24.28	Horizontal
9608.00	33.05	37.95	14.14	31.62	53.52	74	-20.48	Horizontal
12010.00	*					74		Horizontal
14412.00	*					74		Horizontal

Avg

Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4804.00	28.83	31.78	8.6	32.09	37.12	54	-16.88	Vertical
7206.00	20.97	36.15	11.65	32	36.77	54	-17.23	Vertical
9608.00	19.71	37.95	14.14	31.62	40.18	54	-13.82	Vertical
12010.00	*					54		Vertical
14412.00	*					54		Vertical
4804.00	32.85	31.78	8.6	32.09	41.14	54	-12.86	Horizontal
7206.00	22.79	36.15	11.65	32	38.59	54	-15.41	Horizontal
9608.00	19.9	37.95	14.14	31.62	40.37	54	-13.63	Horizontal
12010.00	*					54		Horizontal
14412.00	*					54		Horizontal

Remark:
1.Final Level =Receiver Read level + Antenna Factor + Cable Loss- Preamplifier Factor
2.The emission levels of other frequencies are very lower than the limit and not show in test report.
3.“*", means this data is the too weak instrument of signal is unable to test

Temperature:	25 °C	Relative Humidity:	60%
Test Mode:	Middle CH (GFSK)	Test Voltage:	DC 3.7V

Peak

Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4880.00	37.61	31.85	8.67	32.12	46.01	74	-27.99	Vertical
7320.00	31.82	36.37	11.72	31.89	48.02	74	-25.98	Vertical
9760.00	31.89	38.35	14.25	31.62	52.87	74	-21.13	Vertical
12200.00	*					74		Vertical
14640.00	*					74		Vertical
4880.00	42.03	31.85	8.67	32.12	50.43	74	-23.57	Horizontal
7320.00	33.72	36.37	11.72	31.89	49.92	74	-24.08	Horizontal
9760.00	33.8	38.35	14.25	31.62	54.78	74	-19.22	Horizontal
12200.00	*					74		Horizontal
14640.00	*					74		Horizontal

Avg

Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4880.00	26.89	31.85	8.67	32.12	35.29	54	-18.71	Vertical
7320.00	21.82	36.37	11.72	31.89	38.02	54	-15.98	Vertical
9760.00	17.91	38.35	14.25	31.62	38.89	54	-15.11	Vertical
12200.00	*					54		Vertical
14640.00	*					54		Vertical
4880.00	29.18	31.85	8.67	32.12	37.58	54	-16.42	Horizontal
7320.00	22.65	36.37	11.72	31.89	38.85	54	-15.15	Horizontal
9760.00	21.77	38.35	14.25	31.62	42.75	54	-11.25	Horizontal
12200.00	*					54		Horizontal
14640.00	*					54		Horizontal

Remark:
1.Final Level =Receiver Read level + Antenna Factor + Cable Loss- Preamplifier Factor
2.The emission levels of other frequencies are very lower than the limit and not show in test report.
3.“*", means this data is the too weak instrument of signal is unable to test

Temperature:	25 °C	Relative Humidity:	60%
Test Mode:	High CH (GFSK)	Test Voltage:	DC 3.7V

Peak

Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4960.00	34.85	31.93	8.73	32.16	43.35	74	-30.65	Vertical
7440.00	33.67	36.59	11.79	31.78	50.27	74	-23.73	Vertical
9920.00	34.06	38.81	14.38	31.88	55.37	74	-18.63	Vertical
12400.00	*					74		Vertical
14880.00	*					74		Vertical
4960.00	39.42	31.93	8.73	32.16	47.92	74	-26.08	Horizontal
7440.00	35.21	36.59	11.79	31.78	51.81	74	-22.19	Horizontal
9920.00	32.79	38.81	14.38	31.88	54.1	74	-19.9	Horizontal
12400.00	*					74		Horizontal
14880.00	*					74		Horizontal

Avg

Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4960.00	24.92	31.93	8.73	32.16	33.42	54	-20.58	Vertical
7440.00	19.03	36.59	11.79	31.78	35.63	54	-18.37	Vertical
9920.00	18.15	38.81	14.38	31.88	39.46	54	-14.54	Vertical
12400.00	*					54		Vertical
14880.00	*					54		Vertical
4960.00	33.37	31.93	8.73	32.16	41.87	54	-12.13	Horizontal
7440.00	23.31	36.59	11.79	31.78	39.91	54	-14.09	Horizontal
9920.00	20.53	38.81	14.38	31.88	41.84	54	-12.16	Horizontal
12400.00	*					54		Horizontal
14880.00	*					54		Horizontal

Remark:
1.Final Level =Receiver Read level + Antenna Factor + Cable Loss- Preamplifier Factor
2.The emission levels of other frequencies are very lower than the limit and not show in test report.
3.“*", means this data is the too weak instrument of signal is unable to test

Radiated Band Edge - BLE 1M-GFSK

Low CH (GFSK)

Peak

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2310.00	39.77	27.61	5.36	30.18	42.56	74	-31.44	Horizontal
2390.00	38.79	27.59	5.38	30.18	41.58	74	-32.42	Horizontal
2310.00	36.8	27.61	5.36	30.18	39.59	74	-34.41	Vertical
2390.00	39.99	27.59	5.38	30.18	42.78	74	-31.22	Vertical

Avg

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2310.00	33.71	27.61	5.36	30.18	36.5	54	-17.5	Horizontal
2390.00	28.82	27.59	5.38	30.18	31.61	54	-22.39	Horizontal
2310.00	33.52	27.61	5.36	30.18	36.31	54	-17.69	Vertical
2390.00	31.46	27.59	5.38	30.18	34.25	54	-19.75	Vertical

Remark.

1.Final Level =Receiver Read level + Antenna Factor + Cable Loss - Preamplifier Factor

2.The amplitude of spurious emissions which are attenuated more than 20 dB below the limits are not reported.

3.All restriction band have been tested, and only the worst case is shown in report

High CH(GFSK)

Peak

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	38.72	27.53	5.47	29.93	41.79	74	-32.21	Horizontal
2500.00	40.78	27.55	5.49	29.93	43.89	74	-30.11	Horizontal
2483.50	43.51	27.53	5.47	29.93	46.58	74	-27.42	Vertical
2500.00	40.22	27.55	5.49	29.93	43.33	74	-30.67	Vertical

Avg

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	33.78	27.53	5.47	29.93	36.85	54	-17.15	Horizontal
2500.00	32.61	27.55	5.49	29.93	35.72	54	-18.28	Horizontal
2483.50	34.85	27.53	5.47	29.93	37.92	54	-16.08	Vertical
2500.00	30.1	27.55	5.49	29.93	33.21	54	-20.79	Vertical

Remark.

1.Final Level =Receiver Read level + Antenna Factor + Cable Loss - Preamplifier Factor

2.The amplitude of spurious emissions which are attenuated more than 20 dB below the limits are not reported.

3.All restriction band have been tested, and only the worst case is shown in report

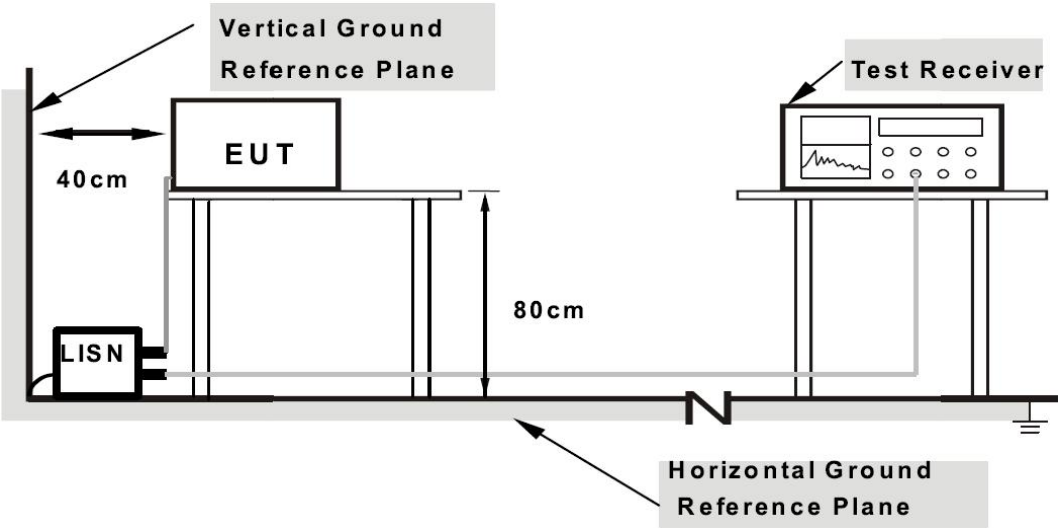
10. AC Power Line Conducted Emissions

10.1. Limit

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Note:
1. * Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

10.2. Test Setup



10.3. Spectrum Analyzer Setting

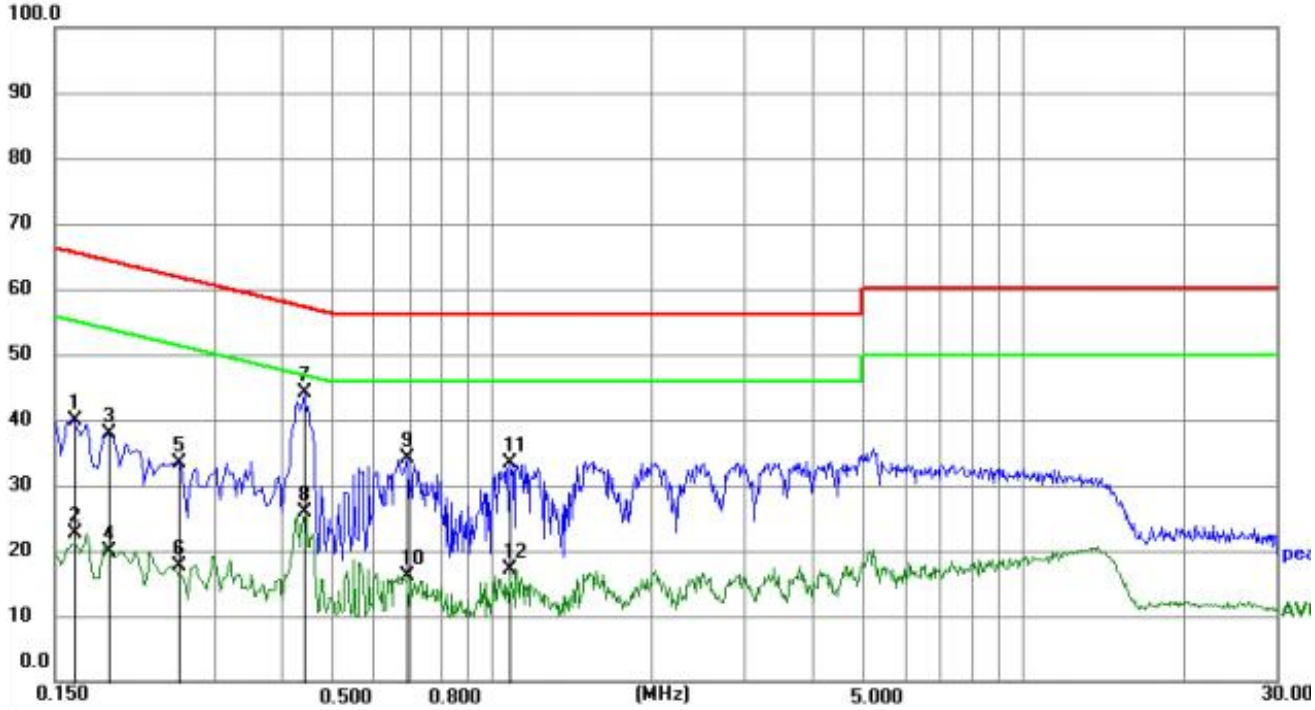
Spectrum Parameters	Setting
RBW	9KHz
VBW	9KHz
Start frequency	150KHz
Stop frequency	30MHz
Sweep Time	Auto
Detector	QP/AVG
Trace Mode	Max Hold

10.4. Test Procedure

a. The EUT was placed on a non-metallic table, 80cm above the ground plane.
b. The EUT Power connected to the power mains through a line impedance stabilization network.
c. Provides a 50ohm coupling impedance for the EUT (Please refer the block diagram of the test setup and photographs).
d. Set the EUT transmit continuously with maximum output power.
e. EMI TestReceiver setting parameters in accordance with section 10.3.
f. The AC line is checked to find out the maximum conducted emission. To find the maximum emission levels, the relative positions of equipment and all the interface cables shall be changed according to ANSI C63.10:2020 on Conducted Emission Test.
g. Record the results in the test report. (only worse case: BLE 1M-GFSK mode with CH00 2402MHz is reported)

10.5. Test Result

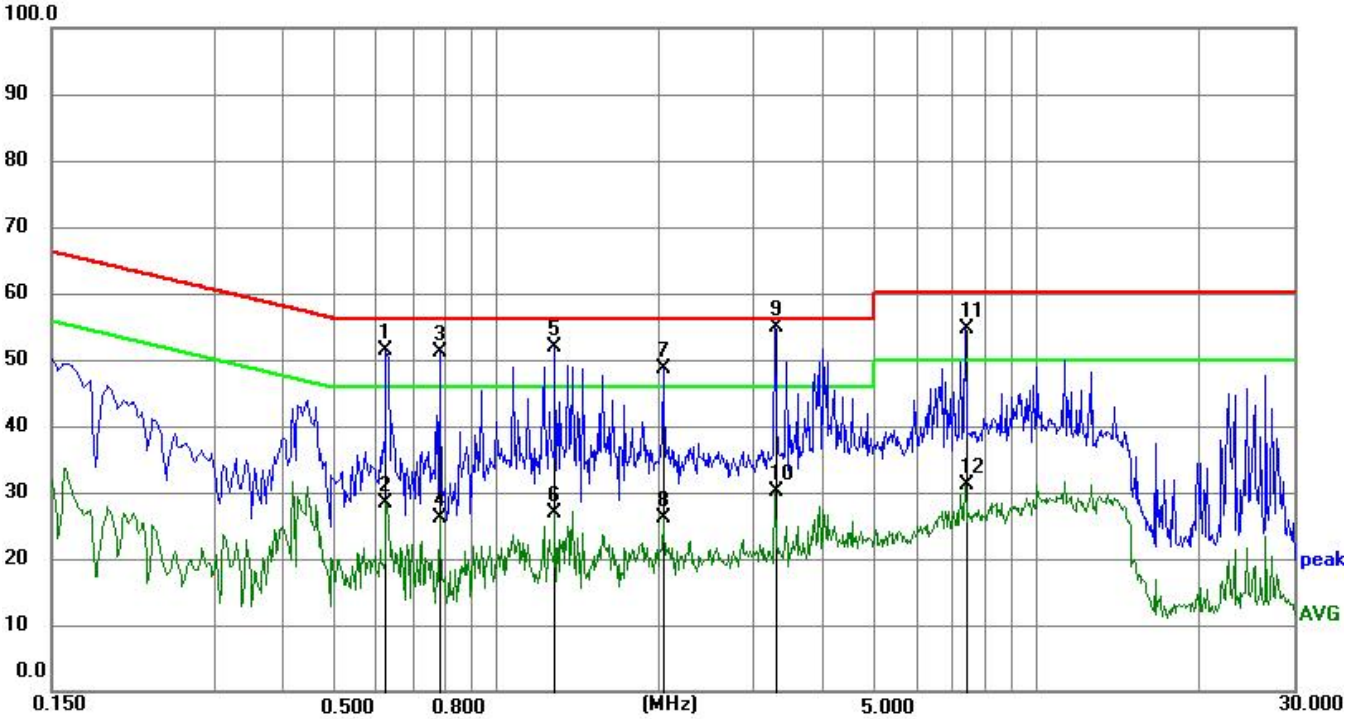
EUT: Electronic badge
M/N: TagME5.0
Test Voltage: AC 120V 60Hz
Phase: Live
Test Mode: TX Mode
Note: only worse case: BLE 1M-GFSK mode with CH00 2402MHz is reported
Detailed results are shown below



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1635	29.64	10.22	39.86	65.28	25.42	peak
2	0.1635	12.39	10.22	22.61	55.28	32.67	AVG
3	0.1905	27.72	10.17	37.89	64.01	26.12	peak
4	0.1905	9.78	10.17	19.95	54.01	34.06	AVG
5	0.2580	23.23	10.17	33.40	61.50	28.10	peak
6	0.2580	7.58	10.17	17.75	51.50	33.75	AVG
7	0.4425	33.82	10.21	44.03	57.01	12.98	peak
8	0.4425	15.59	10.21	25.80	47.01	21.21	AVG
9	0.6900	24.02	10.20	34.22	56.00	21.78	peak
10	0.6900	5.98	10.20	16.18	46.00	29.82	AVG
11	1.0859	23.01	10.34	33.35	56.00	22.65	peak
12	1.0859	6.78	10.34	17.12	46.00	28.88	AVG

Remark:1.All readings are Quasi-Peak and Average values
2.During the test, pre-scan all modes, only the worst case is recorded in the report. AC conductedemission pre-test at both at DC 5V modes, recorded worst case DC 5V.

EUT: Electronic badge
M/N: TagME5.0
Test Voltage: AC 120V 60Hz
Phase: Neutral
Test Mode: TX Mode
Note: only worse case: BLE 1M-GFSK mode with CH00 2402MHz is reported
Detailed results are shown below



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1635	28.87	10.15	39.02	65.28	26.26	peak
2	0.1635	9.16	10.15	19.31	55.28	35.97	AVG
3	0.2490	22.95	10.11	33.06	61.79	28.73	peak
4	0.2490	7.76	10.11	17.87	51.79	33.92	AVG
5	0.3300	20.92	10.16	31.08	59.45	28.37	peak
6	0.3300	7.59	10.16	17.75	49.45	31.70	AVG
7	0.4470	30.00	10.20	40.20	56.93	16.73	peak
8	0.4470	10.85	10.20	21.05	46.93	25.88	AVG
9	0.6719	21.62	10.27	31.89	56.00	24.11	peak
10	0.6719	6.52	10.27	16.79	46.00	29.21	AVG
11	1.1084	21.26	10.32	31.58	56.00	24.42	peak
12	1.1084	5.29	10.32	15.61	46.00	30.39	AVG

Remark:1.All readings are Quasi-Peak and Average values
2.During the test, pre-scan all modes, only the worst case is recorded in the report. AC conducted emission pre-test at both at DC 5V modes, recorded worst case DC 5V.

11. ANTENNA REQUIREMENTS

11.1. Limit

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §§15.211, 15.213, 15.217, 15.219, 15.221, or §15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

11.2. Test Result

The antennas used for this product is Chip antenna, so compliance with antenna requirements. (Please refer to the EUT Internal Photos for details)

12.APPENDIX

"EUT of External Photos, EUT Internal Photos & Test Setup Photos" Please refer to the Annex A, Annex B& Annex C document.

CTSL2620230165ER Annex A. EUT External Photos
CTSL2620230165ER Annex B. EUT Internal Photos
CTSL2620230165ER Annex C. Test Setup Photos

----------***End of Test Report***----------