

# Shenzhen Toby Technology Co., Ltd.

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# **FCC Radio Test Report** FCC ID: 2AFMD-FM25

## **Original Grant**

Report No. TB-FCC145005

SHENZHEN SPRING TECHNOLOGY CO,.LIMITED **Applicant** 

**Equipment Under Test (EUT)** 

**EUT Name** Bluetooth FM Transmitter

Model No. FM25

N/A **Brand Name** 

2015-08-05 **Receipt Date** 

**Test Date** 2015-08-05 to 2015-08-18

2015-08-19 **Issue Date** 

FCC Part 15: 2014, Subpart C(15.247) **Standards** 

ANSI C63.10:2013 **Test Method** 

Conclusions **PASS** 

In the configuration tested, the EUT complied with the standards specified above,

The EUT technically complies with the FCC and IC requirements

**Test/Witness Engineer** 

Approved&

**Authorized** 

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in the report.

TB-RF-074-1.0

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## 1. General Information about EUT

### 1.1 Client Information

**Applicant**: SHENZHEN SPRING TECHNOLOGY CO,.LIMITED

Address : 5/Fablock, NO162 TongFuYu industry park KuKeng GuanLan

LongHua new district, Shenzhen, China.

Manufacturer : SHENZHEN SPRING TECHNOLOGY CO,.LIMITED

Address : 5/Fablock, NO162 TongFuYu industry park KuKeng GuanLan

LongHua new district, Shenzhen, China.

## 1.2 General Description of EUT (Equipment Under Test)

EUT Name	1	Bluetooth FM Transmitte	er			
Models No.	:	FM25	M25			
Model Difference	•	N/A	TOBY			
a Compa		Operation Frequency: 2402MHz~2480MHz				
		Number of Channel:	Bluetooth 4.0 (BLE): 40 channels see note(3)			
Product Description		RF Output Power:	-1.759 dBm Conducted Power			
		Antenna Gain:	0 dBi PCB Antenna			
		Modulation Type:	GFSK			
A TOTAL		Bit Rate of Transmitter:	1Mbps(GFSK)			
Power Supply	:	DC Voltage supplied from	m Car Charger.			
Power Rating	:	Car Charger Input: DC 9~26V Output: 5V				
Connecting I/O Port(S)		Please refer to the User's Manual				

#### Note:

- (1) This Test Report is FCC Part 15.247 for Bluetooth BLE, the test procedure follows the FCC KDB 558074 D01 DTS Meas Guidance v03r03.
- (2) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
- (3) Antenna information provided by the applicant.
- (4) Channel List:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	14	2430	28	2458

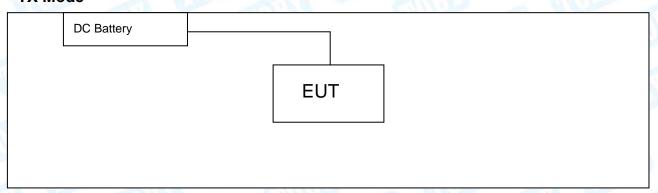


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01	2404	15	2432	29	2460
02	2406	16	2434	30	2462
03	2408	17	2436	31	2464
04	2410	18	2438	32	2466
05	2412	19	2440	33	2468
06	2414	20	2442	34	2470
07	2416	21	2444	35	2472
08	2418	22	2446	36	2474
09	2420	23	2448	37	2476
10	2422	24	2450	38	2478
11	2424	25	2452	39	2480
12	2426	26	2454		
13	2428	27	2456		

## 1.3 Block Diagram Showing the Configuration of System Tested

## **TX Mode**



## 1.4 Description of Support Units

Equipment Information								
Name Model S/N Manufacturer Used "√"								
1	1	1 500	1	1				
	Cable Information							
Number	Number Shielded Type Ferrite Core Length Note							
	anii y	0000	3 M					





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## 1.5 Description of Test Mode

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned follow was evaluated respectively.

For Conducted Test					
Final Test Mode Description					
Mode 1	DC Charging with TX Mode				

For Radiated Test					
Final Test Mode	Description				
Mode 2	DC Charging with TX Mode				
Mode 3 TX Mode (Channel 00/20/39)					

#### Note:

(1) For all test, we have verified the construction and function in typical operation. And all the test modes were carried out with the EUT in transmitting operation in maximum power with all kinds of data rate.

According to ANSI C63.10 standards, the measurements are performed at the highest, middle, lowest available channels, and the worst case data rate as follows:

Bluetooth BLE Mode: GFSK Modulation Transmitting mode.

- (2) During the testing procedure, the continuously transmitting with the maximum power mode was programmed by the customer.
- (3) The EUT is considered a mobile unit; in normal use it was positioned on X-plane. The worst case was found positioned on X-plane. Therefore only the test data of this X-plane was used for radiated emission measurement test.

## 1.6 Description of Test Software Setting

During testing channel& Power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of RF setting.

Test Software Version	N/A		
Channel	CH 00	CH 20	CH 39
BLE Mode	DEF	DEF	DEF



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## 1.7 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 %.

Test Item	Parameters	Expanded Uncertainty (U <sub>Lab</sub> )
MUDE	Level Accuracy:	
Conducted Emission	9kHz~150kHz	±3.42 dB
	150kHz to 30MHz	±3.42 dB
Radiated Emission	Level Accuracy:	±4,60 dB
Radiated Effilssion	9kHz to 30 MHz	±4.00 dB
Radiated Emission	Level Accuracy:	±4.40 dB
Radiated Emission	30MHz to 1000 MHz	±4.40 db
Radiated Emission	Level Accuracy:	±4.20 dB
Radiated Emission	Above 1000MHz	±4.20 dB

### 1.8 Test Facility

The testing report were performed by the Shenzhen Toby Technology Co., Ltd., in their facilities located at 1A/F., Bldg.6, Yusheng Industrial Zone, The National Road No.107 Xixiang Section 467, Xixiang, Bao'an, Shenzhen, Guangdong, China. At the time of testing, the following bodies accredited the Laboratory:

#### CNAS (L5813)

The Laboratory has been accredited by CNAS to ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories for the competence in the field of testing. And the Registration No.: CNAS L5813.

### FCC List No.: (811562)

The Laboratory is listed in the United States of American Federal Communications Commission (FCC), and the registration number is 811562.

#### IC Registration No.: (11950A-1)

The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing. The site registration: Site# 11950A-1.

May 22, 2014 certificated by TUV Rheinland(China) Co., Ltd. with TUV certificate No.: UA 50282953 0001 and report No.: 17026822 002. The certificate is valid until the next scheduled audit or up to 18 months, at the discretion of TUV Rhineland.



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# 2. Test Summary

	FCC Part	t 15 Subpart C(15.247)/ RSS 247	Issue 1	
Standa	rd Section	Test Item	(III) DES	Remark
FCC	IC	rest item	Judgment	
15.203	1	Antenna Requirement	PASS	N/A
15.207	RSS-GEN 7.2.4	Conducted Emission	PASS	N/A
15.205	RSS-GEN 7.2.2	Restricted Bands	PASS	N/A
15.247(a)(2)	RSS 247 5.2 (1)	6dB Bandwidth	PASS	N/A
15.247(b)	RSS 247 5.4 (4)	Peak Output Power	PASS	N/A
15.247(e)	RSS 247 5.2 (2)	Power Spectral Density	PASS	N/A
15.247(d)	RSS 247 5.5	Transmitter Radiated Spurious Emission	PASS	N/A

Note: "/" for no requirement for this test item.

N/A is an abbreviation for Not Applicable.



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# 3. Test Equipment

Conducted Emission Test						
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date	
EMI Test Receiver	Rohde & Schwarz	ESCI	100321	Aug. 07, 2015	Aug. 06, 2016	
RF Switching Unit	Compliance Direction Systems Inc	RSU-A4	34403	Aug. 07, 2015	Aug. 06, 2016	
AMN	SCHWARZBECK	NNBL 8226-2	8226-2/164	Aug. 07, 2015	Aug. 06, 2016	
LISN	Rohde & Schwarz	ENV216	101131	Aug. 07, 2015	Aug. 06, 2016	
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Date	
					Cal. Due	
Spectrum	Agilont	E4407D	MV4E40G4EG	Son 04 2014		
Analyzer	Agilent	E4407B	MY45106456	Sep. 01, 2014	Aug. 31, 2015	
EMI Test Receiver	Rohde & Schwarz	ESCI	100010/007	Aug. 07, 2015	Aug. 06, 2016	
Bilog Antenna	ETS-LINDGREN	3142E	00117537	Mar. 28, 2015	Mar. 27, 2016	
Bilog Antenna	ETS-LINDGREN	3142E	00117542	Mar. 28, 2015	Mar. 27, 2016	
Horn Antenna	ETS-LINDGREN	3117	00143207	Mar. 28, 2015	Mar. 27, 2016	
Horn Antenna	ETS-LINDGREN	3117	00143209	Mar. 28, 2015	Mar. 27, 2016	
Pre-amplifier	Sonoma	310N	185903	Mar. 28, 2015	Mar. 27, 2016	
Pre-amplifier	HP	8447B	3008A00849	Mar. 28, 2015	Mar. 27, 2016	
Cable	HUBER+SUHNER	100	SUCOFLEX	Mar. 28, 2015	Mar. 27, 2016	
Positioning Controller	ETS-LINDGREN	2090	N/A	N/A	N/A	



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## 4. Conducted Emission Test

### 4.1 Test Standard and Limit

4.1.1Test Standard FCC Part 15.207

#### 4.1.2 Test Limit

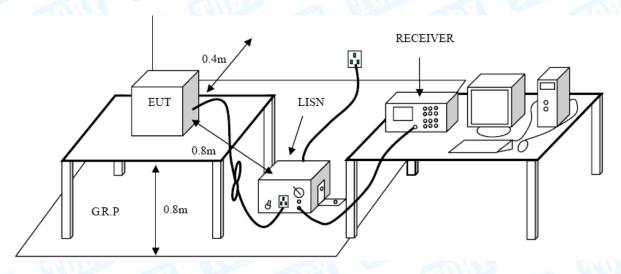
### **Conducted Emission Test Limit**

	Maximum RF Lin	e Voltage (dBμV)
Frequency	Quasi-peak Level	Average Level
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
500kHz~5MHz	56	46
5MHz~30MHz	60	50

#### Notes:

- (1) \*Decreasing linearly with logarithm of the frequency.
- (2) The lower limit shall apply at the transition frequencies.
- (3) The limit decrease in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

### 4.2 Test Setup



### 4.3 Test Procedure

The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/50uH of coupling impedance for the measuring instrument.

Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.



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I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

LISN at least 80 cm from nearest part of EUT chassis.

The bandwidth of EMI test receiver is set at 9kHz, and the test frequency band is from 0.15MHz to 30MHz.

## 4.4 EUT Operating Mode

Please refer to the description of test mode.

### 4.5 Test Data

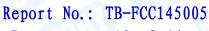
Please see the next page.





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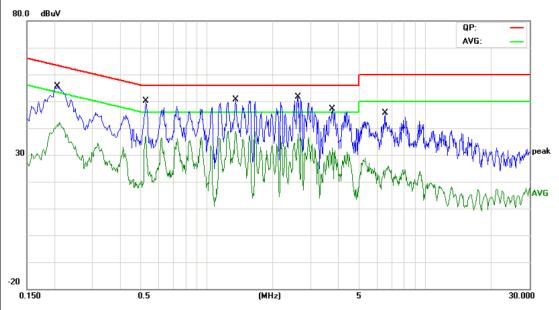
EUT:	Bluetoo	oth FM Transmitte	Model:	FM25
Temperature:	25 ℃		Relative Humidity:	55%
Test Voltage:	DC 9V	Contract of the second	an and	33
Terminal:	Line	- W		
Test Mode:	DC Cha	arging with BLE T	X 2402 MHz	A. M. C.
Remark:	Only wo	orse case is repor	ted	3
30 dBuV		**************************************		QP: — AVG: — Pea
0.150		(MHz)	ect Measure-	30.000
	•	Level Fact	or ment	O∨er
	MHz	dBuV dB	dBuV dBuV	dB Detector
1 0				
		45.86 10.02		4.09 QP
2 0.:	3100	29.45 10.02	2 39.47 49.97 -1	0.50 AVG
2 0.3 3 0.3	3100 5299	29.45 10.03 42.19 10.03	2 39.47 49.97 -1 3 52.22 56.00 -3	0.50 AVG 3.78 QP
2 0.3 3 0.3 4 0.3	3100 5299 5299	29.45 10.03 42.19 10.03 26.87 10.03	2 39.47 49.97 -1 3 52.22 56.00 -3 3 36.90 46.00 -9	0.50 AVG 3.78 QP 9.10 AVG
2 0.3 3 0.3 4 0.3 5 * 0.3	3100 5299 5299 7260	29.45 10.03 42.19 10.03 26.87 10.03 42.70 10.13	2 39.47 49.97 -1 3 52.22 56.00 -3 3 36.90 46.00 -9 1 52.81 56.00 -3	0.50 AVG 3.78 QP 9.10 AVG 3.19 QP
2 0.3 3 0.3 4 0.3 5 * 0.3 6 0.3	3100 5299 5299 7260 7260	29.45 10.03 42.19 10.03 26.87 10.03 42.70 10.13 27.27 10.13	2 39.47 49.97 -1 3 52.22 56.00 -3 3 36.90 46.00 -3 1 52.81 56.00 -3 1 37.38 46.00 -8	0.50 AVG 3.78 QP 9.10 AVG 3.19 QP 8.62 AVG
2 0.3 3 0.3 4 0.3 5 * 0.3 6 0.3 7 1.3	3100 5299 5299 7260 7260 5700	29.45 10.03 42.19 10.03 26.87 10.03 42.70 10.13 27.27 10.13 38.29 10.06	2 39.47 49.97 -1 3 52.22 56.00 -3 3 36.90 46.00 -9 1 52.81 56.00 -3 1 37.38 46.00 -8 6 48.35 56.00 -7	0.50 AVG 3.78 QP 9.10 AVG 3.19 QP 8.62 AVG 7.65 QP
2 0.3 3 0.3 4 0.3 5 * 0.3 6 0.3 7 1.3 8 1.3	3100 5299 5299 7260 7260 5700	29.45 10.03 42.19 10.03 26.87 10.03 42.70 10.1 27.27 10.1 38.29 10.06	2 39.47 49.97 -1 3 52.22 56.00 -3 3 36.90 46.00 -3 1 52.81 56.00 -3 1 37.38 46.00 -3 6 48.35 56.00 -3 6 32.65 46.00 -1	0.50 AVG 3.78 QP 9.10 AVG 3.19 QP 8.62 AVG 7.65 QP 3.35 AVG
2 0.3 3 0.3 4 0.3 5 * 0.3 6 0.7 7 1.3 8 1.3 9 2.3	3100 5299 5299 7260 7260 5700 5700	29.45 10.03 42.19 10.03 26.87 10.03 42.70 10.13 27.27 10.13 38.29 10.06 41.31 10.04	2 39.47 49.97 -1 3 52.22 56.00 -3 3 36.90 46.00 -3 1 52.81 56.00 -3 1 37.38 46.00 -3 6 48.35 56.00 -3 6 32.65 46.00 -1 4 51.35 56.00 -4	0.50 AVG 3.78 QP 9.10 AVG 3.19 QP 8.62 AVG 7.65 QP 3.35 AVG 4.65 QP
2 0.3 3 0.3 4 0.3 5 * 0.3 6 0.3 7 1.3 8 1.3 9 2.3	3100 5299 5299 7260 7260 5700 5700 7180	29.45 10.03 42.19 10.03 26.87 10.03 42.70 10.13 27.27 10.13 38.29 10.06 22.59 10.06 41.31 10.04	2 39.47 49.97 -1 3 52.22 56.00 -3 3 36.90 46.00 -3 1 52.81 56.00 -3 1 37.38 46.00 -3 6 48.35 56.00 -3 6 32.65 46.00 -1 4 51.35 56.00 -4 4 33.42 46.00 -1	0.50 AVG 3.78 QP 9.10 AVG 3.19 QP 8.62 AVG 7.65 QP 3.35 AVG 4.65 QP 2.58 AVG
2 0.3 3 0.3 4 0.3 5 * 0.7 6 0.7 7 1.3 8 1.3 9 2.3 10 2.3 11 8.3	3100 5299 5299 7260 7260 5700 5700 7180 7180	29.45 10.03 42.19 10.03 26.87 10.03 42.70 10.13 27.27 10.13 38.29 10.06 41.31 10.04	2 39.47 49.97 -1 3 52.22 56.00 -3 3 36.90 46.00 -9 1 52.81 56.00 -3 1 37.38 46.00 -8 6 48.35 56.00 -3 6 32.65 46.00 -1 4 51.35 56.00 -4 4 33.42 46.00 -1 0 50.01 60.00 -9	0.50 AVG 3.78 QP 9.10 AVG 3.19 QP 8.62 AVG 7.65 QP 3.35 AVG 4.65 QP





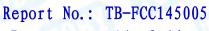
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EUT:	Bluetooth FM Transmitter	Model:	FM25			
Temperature	: <b>25</b> ℃	Relative Humidity:	55%			
Test Voltage:	DC 9V	DC 9V				
Terminal:	Neutral					
Test Mode:	DC Charging with BLE TX 2	2402 MHz				
Remark:	Only worse case is reported	Only worse case is reported				



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB	dBuV	dBu∨	dB	Detector
1		0.2072	45.39	10.12	55.51	63.31	-7.80	QP
2		0.2072	31.20	10.12	41.32	53.31	-11.99	AVG
3		0.5260	40.07	10.02	50.09	56.00	-5.91	QP
4		0.5260	26.35	10.02	36.37	46.00	-9.63	AVG
5		1.3580	40.62	10.12	50.74	56.00	-5.26	QP
6		1.3580	28.72	10.12	38.84	46.00	-7.16	AVG
7	*	2.6099	41.52	10.06	51.58	56.00	-4.42	QP
8		2.6099	27.85	10.06	37.91	46.00	-8.09	AVG
9		3.7540	36.99	10.06	47.05	56.00	-8.95	QP
10		3.7540	22.57	10.06	32.63	46.00	-13.37	AVG
11		6.5339	35.65	10.06	45.71	60.00	-14.29	QP
12		6.5339	14.09	10.06	24.15	50.00	-25.85	AVG

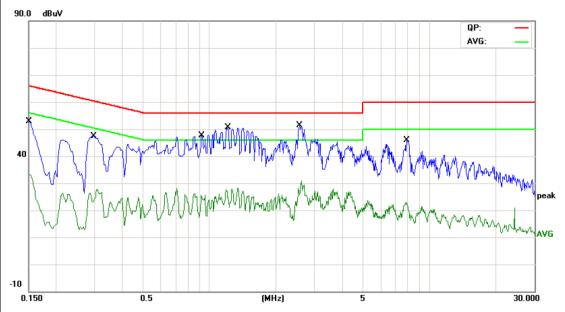
<sup>\*:</sup>Maximum data x:Over limit !:over margin





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EUT:	Bluetooth FM Transmitter	Model:	FM25
Temperature:	<b>25</b> ℃	Relative Humidity:	55%
Test Voltage:	DC 12V		33
Terminal:	Line		CITIES .
Test Mode:	DC Charging with BLE TX 24	02 MHz	Alle
Remark:	Only worse case is reported		
90.0 dBuV			
			QP: —



No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
	MHz	dBu∨	dB	dBu∨	dBu∨	dB	Detector
1	0.1499	42.78	10.12	52.90	66.00	-13.10	QP
2	0.1499	23.23	10.12	33.35	56.00	-22.65	AVG
3	0.2980	37.36	10.09	47.45	60.30	-12.85	QP
4	0.2980	13.61	10.09	23.70	50.30	-26.60	AVG
5	0.9220	37.54	10.12	47.66	56.00	-8.34	QP
6	0.9220	15.05	10.12	25.17	46.00	-20.83	AVG
7	1.2100	40.50	10.14	50.64	56.00	-5.36	QP
8	1.2100	14.78	10.14	24.92	46.00	-21.08	AVG
9 *	2.5660	41.22	10.06	51.28	56.00	-4.72	QP
10	2.5660	15.73	10.06	25.79	46.00	-20.21	AVG
11	7.8539	35.74	10.09	45.83	60.00	-14.17	QP
12	7.8539	12.71	10.09	22.80	50.00	-27.20	AVG

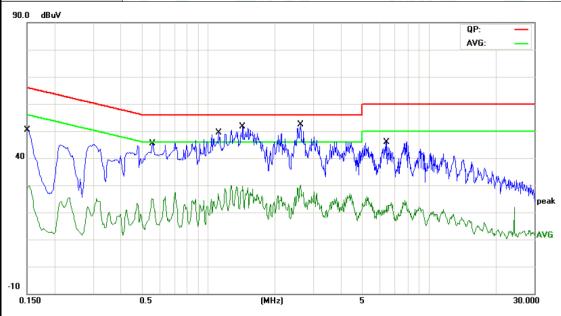
<sup>\*:</sup>Maximum data x:Over limit !:over margin





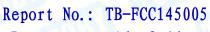
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EUT:	Bluetooth FM Transmitter	Model:	FM25			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 12V	DC 12V				
Terminal:	Neutral					
Test Mode:	DC Charging with BLE TX 2	2402 MHz	2			
Remark:	Only worse case is reported					
90.0 dBuV			an.			



No. N	Vlk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	O∨er	
		MHz	dBu∀	dB	dBu∨	dBu∀	dB	Detector
1		0.1499	40.55	9.92	50.47	66.00	-15.53	QP
2		0.1499	19.08	9.92	29.00	56.00	-27.00	AVG
3		0.5580	35.43	10.05	45.48	56.00	-10.52	QP
4		0.5580	14.80	10.05	24.85	46.00	-21.15	AVG
5		1.1140	39.43	10.06	49.49	56.00	-6.51	QP
6		1.1140	15.29	10.06	25.35	46.00	-20.65	AVG
7		1.4299	41.69	10.06	51.75	56.00	-4.25	QP
8		1.4299	19.52	10.06	29.58	46.00	-16.42	AVG
9 3	*	2.6180	42.41	10.04	52.45	56.00	-3.55	QP
10		2.6180	19.98	10.04	30.02	46.00	-15.98	AVG
11		6.4379	35.93	10.03	45.96	60.00	-14.04	QP
12		6.4379	12.28	10.03	22.31	50.00	-27.69	AVG

<sup>\*:</sup>Maximum data x:Over limit !:over margin





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EUT:	Bluetooth FM Tr	ansmitter	Model:	FM2	5			
Temperature:	25 ℃		Relative Humidity	<b>55</b> %	Alle			
Гest Voltage:	DC 26V			11:33				
Terminal:	Line	Line						
Test Mode:	DC Charging wi	th BLE TX 24	102 MHz		MUL			
Remark:	Only worse case	e is reported		13				
90.0 dBuV								
				QP: AVG:				
M	×	4	X dit , do					
40		APRIMINAL AND		Make				
-	~\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	MAN TANKAN		* 10 h Approx	MM			
~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	V John Wall		THE THIRD OF THE PARTY OF THE P	V. u	TA NALLA			
	M . A (1)	, M. M	10 to 10 10 10 10 10 10 10 10 10 10 10 10 10	Pylyvor/VIV	^\\/\/ <sub>\/\/\</sub> AV			
	M-	ν ι			, , , , , V/V <b>V</b> A			
10								
0.150	0.5	(MHz)	5		30.000			
No. Mk.	Reading	Correct	Measure- ment Limit	O∨er				
	Freq. Level  MHz dBuV	Factor dB	ment Limit	dB	Detector			
	1883 44.85	10.12	54.97 64.11	-9.14				
	1883 28.38	10.12	38.50 54.11	-9.14 -15.61	QP AVG			
	5060 41.96	10.02	51.98 56.00	-4.02	QP			
	5060 32.06	10.02	42.08 46.00	-3.92	AVG			
	1060 40.55	10.15	50.70 56.00	-5.30	QP			
	1060 29.94	10.15	40.09 46.00	-5.91	AVG			
	9020 39.91	10.07	49.98 56.00	-6.02	QP			
8 1.	9020 27.64	10.07	37.71 46.00	-8.29	AVG			
9 * 2.	5020 42.42	10.06	52.48 56.00	-3.52	QP			
10 2.	5020 27.12	10.06	37.18 46.00	-8.82	AVG			
11 3.	3100 41.87	10.06	51.93 56.00	-4.07	QP			
12 3.	3100 27.10	10.06	37.16 46.00	-8.84	AVG			





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	Dideloc	oth FM Trans	smitter	Model:		FM2	5	
emperature:	25 ℃	CITTLE		Relative Hu	midity:	55%	Alle	
est Voltage:	DC 26\	DC 26V						
Terminal:	Neutral	Neutral						
Test Mode:	DC Cha	DC Charging with BLE TX 2402 MHz						
Remark:	Only we	orse case is	reported	C.		13		
90.0 dBuV								
						QP: AVG:	_	
						711.42		
M	×	* * *	. X	×				
40		<del>a. A. X. A. A. B. B. A.</del>	<u>1.1888) (18</u>	in Mala Masaet	MMMAA	Ada.		
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1 \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	4   1						**************************************	
- A 3.4	Company (Males)	/ " " W \	ALIV. AMILY. M		<b>የ</b> ም የምርላ	of the second	ΛΛΛοον pe	
	'	Ди	`\				W pe	
10								
0.150	0.5		(MHz)	5			30.000	
0.150		Reading	(MHz)				30.000	
		Reading Level		Measure- ment	Limit	Over	30.000	
No. Mk. F	F	_	Correct	Measure-	<b>Limit</b>	<b>O∨er</b> dB	30.000 Detector	
No. Mk. F	Freq.	Level	Correct Factor	Measure- ment				
No. Mk. F	Freq. MHz	<b>Level</b> dBuV	Correct Factor	Measure- ment	dBu∀	dB	Detector	
No. Mk. F	Freq. MHz <b>5060</b>	dBuV 36.35	Correct Factor dB 10.02	Measure- ment dBuV 46.37	dBu∀ <b>56.00</b>	dB -9.63	Detector	
No. Mk. F	Freq. MHz 5060	dBuV 36.35 27.97	Correct Factor dB 10.02	Measurement  dBuV  46.37  37.99	dBu√ 56.00 46.00	-9.63 -8.01	Detector QP AVG	
No. Mk. F  1 0.8 2 * 0.8 3 0.8 4 0.8	Freq.  MHz  5060  5060  8059	dBuV 36.35 27.97 34.52	Correct Factor dB 10.02 10.02	Measure- ment  dBuV  46.37  37.99  44.59	dBu√ 56.00 46.00 56.00	-9.63 -8.01 -11.41 -9.56	Detector QP AVG QP	
No. Mk. F  1 0.8 2 * 0.8 3 0.8 4 0.8 5 0.8	Freq.  MHz  5060  5060  8059	dBuV 36.35 27.97 34.52 26.37	Correct Factor dB 10.02 10.02 10.07	Measurement  dBuV  46.37  37.99  44.59  36.44	dBuV 56.00 46.00 56.00 46.00	-9.63 -8.01 -11.41 -9.56	Detector QP AVG QP AVG	
No. Mk. F  1 0.8 2 * 0.8 3 0.8 4 0.8 5 0.8 6 0.8	Freq. MHz 5060 5060 8059 8059	dBuV 36.35 27.97 34.52 26.37 33.63	Correct Factor dB 10.02 10.02 10.07 10.07	Measurement  dBuV  46.37  37.99  44.59  36.44  43.75	dBuV 56.00 46.00 56.00 46.00	-9.63 -8.01 -11.41 -9.56 -12.25	Detector QP AVG QP AVG	
No. Mk. F  1 0.8 2 * 0.8 3 0.8 4 0.8 5 0.9 6 0.9 7 1.6	Freq.  MHz  5060  5060  8059  8059  9060	ABuV 36.35 27.97 34.52 26.37 33.63 26.59	Correct Factor dB 10.02 10.02 10.07 10.07 10.12 10.12	Measurement  dBuV  46.37  37.99  44.59  36.44  43.75  36.71	dBuV 56.00 46.00 56.00 46.00 46.00	-9.63 -8.01 -11.41 -9.56 -12.25 -9.29	Detector QP AVG QP AVG	
No. Mk. F  1 0.8 2 * 0.8 3 0.8 4 0.8 5 0.8 6 0.8 7 1.6 8 1.6	Freq.  MHz  5060  5060  8059  8059  9060  1060	ABuV 36.35 27.97 34.52 26.37 33.63 26.59 35.61	Correct Factor dB 10.02 10.02 10.07 10.07 10.12 10.12 10.15	Measurement  dBuV  46.37  37.99  44.59  36.44  43.75  36.71  45.76	dBuV 56.00 46.00 56.00 46.00 46.00 56.00	-9.63 -8.01 -11.41 -9.56 -12.25 -9.29 -10.24	Detector QP AVG QP AVG QP AVG	
No. Mk. F  1 0.8 2 * 0.8 3 0.8 4 0.8 5 0.9 6 0.9 7 1.7 8 1.7 9 2.8	Freq.  MHz  5060  5060  8059  8059  9060  1060	Level dBu√ 36.35 27.97 34.52 26.37 33.63 26.59 35.61 26.61	Correct Factor  dB  10.02  10.02  10.07  10.07  10.12  10.12  10.15  10.15	Measure- ment  46.37  37.99  44.59  36.44  43.75  36.71  45.76  36.76	dBuV 56.00 46.00 56.00 46.00 46.00 56.00 46.00	-9.63 -8.01 -11.41 -9.56 -12.25 -9.29 -10.24 -9.24 -9.54	Detector QP AVG QP AVG QP AVG	
No. Mk. F  1 0.8 2 * 0.8 3 0.8 4 0.8 5 0.9 6 0.9 7 1.6 8 1.6 9 2.8 10 2.8	Freq.  MHz  5060  5060  8059  8059  9060  1060  1060  5020	Level dBu√ 36.35 27.97 34.52 26.37 33.63 26.59 35.61 26.61 36.40	Correct Factor  dB  10.02  10.02  10.07  10.07  10.12  10.12  10.15  10.06	Measurement  dBuV  46.37  37.99  44.59  36.44  43.75  36.71  45.76  36.76  46.46	dBuV 56.00 46.00 56.00 46.00 56.00 46.00 56.00 46.00	-9.63 -8.01 -11.41 -9.56 -12.25 -9.29 -10.24 -9.24 -9.54	Detector QP AVG QP AVG QP AVG QP AVG	



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## 5. Radiated Emission Test

## 5.1 Test Standard and Limit

5.1.1 Test Standard FCC Part 15.209

5.1.2 Test Limit

### Radiated Emission Limits (9kHz~1000MHz)

Frequency (MHz	Field Strength (microvolt/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

## Radiated Emission Limit (Above 1000MHz)

Frequency	Class A (dBuV	//m)(at 3 M)	Class B (dBuV/m)(at 3		
(MHz)	Peak	Average	Peak	Average	
Above 1000	80	60	74	54	

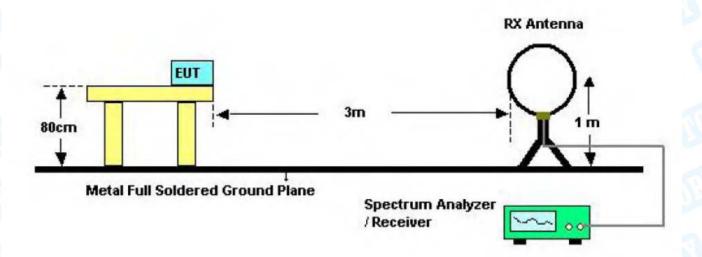
### Note:

- (1) The tighter limit applies at the band edges.
- (2) Emission Level(dBuV/m)=20log Emission Level(uV/m)

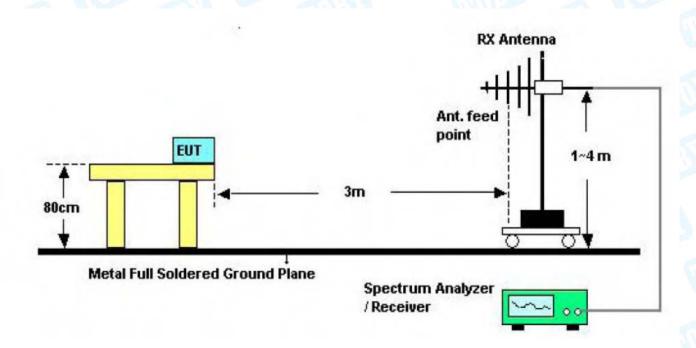


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## 5.2 Test Setup



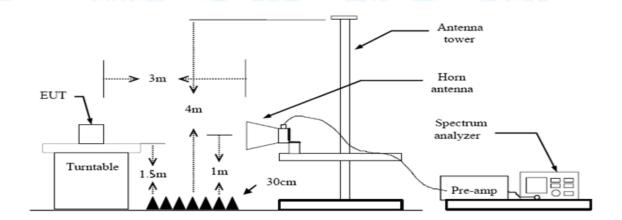
Below 30MHz Test Setup



Below 1000MHz Test Setup







Above 1GHz Test Setup

### 5.3 Test Procedure

- (1) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz. The EUT was placed on a rotating 0.8m high above the ground, the table was rotated 360 degrees to determine the position of the highest radiation.
- (2) Measurements at frequency above 1GHz. The EUT was placed on a rotating 1.5m high above the ground. RF absorbers covered the ground plane with a minimum area of 3.0m by 3.0m between the EUT and measurement receiver antenna. The RF absorber shall not exceed 30cm in high above the conducting floor. The table was rotated 360 degrees to determine the position of the highest radiation.
- (3) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.
- (4) The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- (5) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit Bellow 1 GHz, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. But the Peak Value and average value both need to comply with applicable limit above 1 GHz.
- (6) Testing frequency range below 1GHz the measuring instrument use VBW=120 kHz with Quasi-peak detection.
- (7) Testing frequency range above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.
- (8) For the actual test configuration, please see the test setup photo.

## 5.4 EUT Operating Condition

The Equipment Under Test was set to Continual Transmitting in maximum power.



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## 5.5 Test Data

Remark: During testing above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10Hz with Peak Detector for Average Values.

Test data please refer the following pages.





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25 °C			Dalatina	I ! al ! 4	==0/	
	100000	1 Last	<b>Relative Humidity:</b> 55%			67
DC 1	2V		811	(m)	11:33	
Horiz	ontal	ARIT				
BLE	TX 2402 M	ode	alle			and the same
Only	worse case	e is reported	1		13	
				FCC		
				6	Margin -t	o dB
1	2 	3 X		×		
×						
50 60 70	80	(MHz)	30	0 400	500 600 700	1000.00
	Poading	Corroot	Mozeuro			
Freq.	_			Limit	O∨er	
MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detecto
1.3004	54.94	-24.41	30.53	40.00	-9.47	peak
00.2286	59.13	-21.82	37.31	43.50	-6.19	peak
45.8608	58.93	-21.51	37.42	43.50	-6.08	peak
88.4122	59.81	-20.85	38.96	43.50	-4.54	peak
34.7456	56.60	-17.80	38.80	46.00	-7.20	peak
52.9433	54.10	-14.59	39.51	46.00	-6.49	peak
	BLE Only  50 60 70  Freq.	Only worse case  Reading Freq. Level  MHz dBuV  51.3004 54.94  00.2286 59.13  45.8608 58.93  88.4122 59.81  64.7456 56.60  52.9433 54.10	BLE TX 2402 Mode  Only worse case is reported  Reading Correct Freq. Level Factor  MHz dBuV dB/m  51.3004 54.94 -24.41  00.2286 59.13 -21.82  45.8608 58.93 -21.51  88.4122 59.81 -20.85  64.7456 56.60 -17.80  52.9433 54.10 -14.59	BLE TX 2402 Mode Only worse case is reported  The provided state of the provided state o	BLE TX 2402 Mode Only worse case is reported  FCC	BLE TX 2402 Mode Only worse case is reported  FCC 158 3M Rediate Margin 15  Reading Correct Measure Freq. Level Factor ment Limit Over MHz dBuV dB/m dBuV/m dBuV/m dB  30.2286 59.13 -21.82 37.31 43.50 -6.19  45.8608 58.93 -21.51 37.42 43.50 -6.08  88.4122 59.81 -20.85 38.96 43.50 -4.54  64.7456 56.60 -17.80 38.80 46.00 -7.20  52.9433 54.10 -14.59 39.51 46.00 -6.49



TOBY

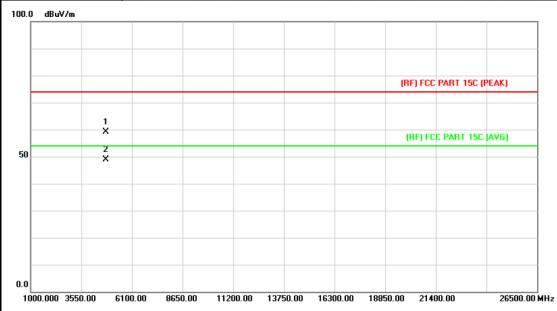
EUT: Bluetooth FM Transmitter Model: FM25 Temperature: 25 ℃ **Relative Humidity:** 55% **DC 12V** Test Voltage: Ant. Pol. Vertical **Test Mode:** BLE TX 2402 Mode Remark: Only worse case is reported 80.0 dBuV/m FCC 15B 3M Radiation Margin -6 dB 30.000 60 70 80 (MHz) 600 700 1000.000 50 300 400 500

No	o. Mk	κ. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	51.3004	60.65	-24.41	36.24	40.00	-3.76	peak
2		99.8777	59.07	-21.83	37.24	43.50	-6.26	peak
3		144.3348	54.95	-21.63	33.32	43.50	-10.18	peak
4		264.7456	53.91	-17.80	36.11	46.00	-9.89	peak
5		352.9433	53.59	-14.59	39.00	46.00	-7.00	peak
6		618.5366	47.99	-8.76	39.23	46.00	-6.77	peak

<sup>\*:</sup>Maximum data x:Over limit !:over margin



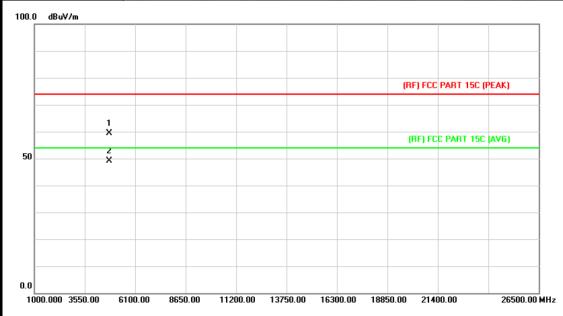
EUT:	Bluetooth FM Transmitter	Model:	FM25				
Temperature:	25 ℃	Relative Humidity:	55%				
Test Voltage:	DC 12V	DC 12V					
Ant. Pol.	Horizontal	Horizontal					
Test Mode:	BLE Mode TX 2402 MHz		a Villa				
Remark:	No report for the emission which more than 10 dB below the prescribed limit.						



١	No.	Mk.	Freq.	Reading Level		Measure- ment	Limit	O∨er	
			MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1			4803.364	45.69	13.44	59.13	74.00	-14.87	peak
2	,	*	4804.457	35.47	13.44	48.91	54.00	-5.09	AVG



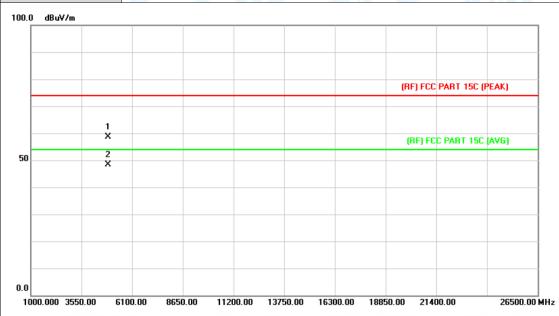
EUT:	Bluetooth FM Transmitter	Model:	FM25				
Temperature:	25 ℃	55%					
Test Voltage:	DC 12V						
Ant. Pol.	Vertical						
Test Mode:	BLE Mode TX 2402 MHz	WILD ST	J. Hilliam				
Remark:	No report for the emission which more than 10 dB below the						
	prescribed limit.						



No	o. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4803.641	45.93	13.44	59.37	74.00	-14.63	peak
2	*	4804.311	35.69	13.44	49.13	54.00	-4.87	AVG



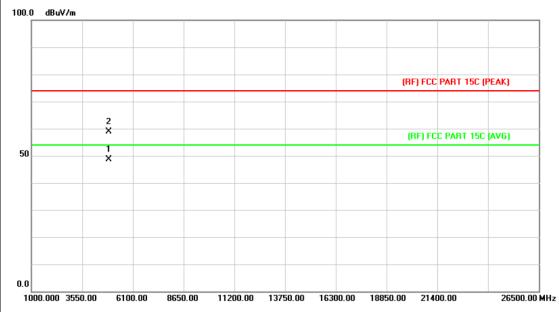
EUT: Bluetooth FM Transmitter Model: FM25 Temperature: 25 ℃ **Relative Humidity:** 55% **DC 12V** Test Voltage: Ant. Pol. Horizontal **Test Mode:** BLE Mode TX 2442 MHz Remark: No report for the emission which more than 10 dB below the prescribed limit.



No	. Mk	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4883.514	44.79	13.92	58.71	74.00	-15.29	peak
2	*	4884.810	34.37	13.92	48.29	54.00	-5.71	AVG



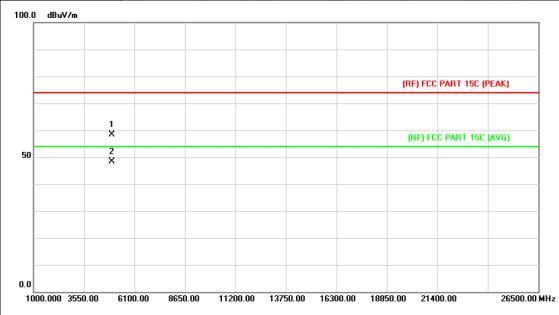
EUT:	Bluetooth FM Transmitter	Model:	FM25				
Temperature:	25 °C Relative Humidity: 55%						
Test Voltage:	DC 12V						
Ant. Pol.	Vertical						
Test Mode:	BLE Mode TX 2442 MHz						
Remark:	No report for the emission which more than 10 dB below the prescribed limit.						
			l l				



N	o. Mk	ι. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4884.359	34.71	13.92	48.63	54.00	-5.37	AVG
2		4884.481	45.02	13.92	58.94	74.00	-15.06	peak



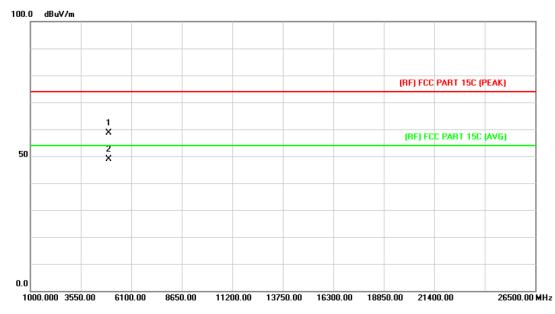
			MILL TO THE REST OF THE PARTY O				
EUT:	Bluetooth FM Transmitter	FM25					
Temperature:	25 ℃ Relative Humidity: 55%						
Test Voltage:	DC 12V						
Ant. Pol.	Horizontal	Horizontal					
Test Mode:	BLE Mode TX 2480 MHz	WILLIAM STATE	Jan Hilliam				
Remark:	No report for the emission which more than 10 dB below the						
	prescribed limit.						



	No. N	∕lk.	Freq.	Reading Level		Measure- ment	Limit	Over	
			MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
_	1		4959.651	43.95	14.36	58.31	74.00	-15.69	peak
7	2 *		4960.617	34.09	14.36	48.45	54.00	-5.55	AVG



EUT:	Bluetooth FM Transmitter	Model:	FM25				
Temperature:	<b>25</b> ℃	55%					
Test Voltage:	DC 12V						
Ant. Pol.	Vertical						
Test Mode:	BLE Mode TX 2480 MHz		a line				
Remark:	No report for the emission which more than 10 dB below the						
	prescribed limit.						



No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4959.614	44.33	14.36	58.69	74.00	-15.31	peak
2	*	4960.867	34.49	14.36	48.85	54.00	-5.15	AVG



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## 6. Restricted Bands Requirement

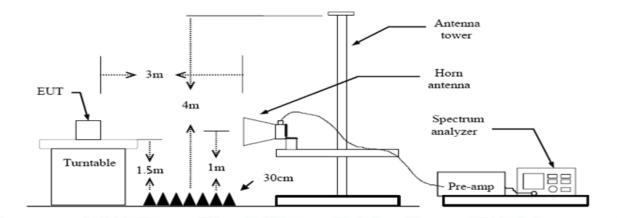
#### 6.1 Test Standard and Limit

6.1.1 Test Standard FCC Part 15.209 FCC Part 15.205

6.1.2 Test Limit

Restricted Frequency	Class B (dBuV/m)(at 3 M)			
Band (MHz)	Peak	Average		
2310 ~2390	74	54		
2483.5 ~2500	74	54		

### 6.2 Test Setup



### 6.3 Test Procedure

- (1) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz. The EUT was placed on a rotating 0.8m high above the ground, the table was rotated 360 degrees to determine the position of the highest radiation.
- (2) Measurements at frequency above 1GHz. The EUT was placed on a rotating 1.5m high above the ground. RF absorbers covered the ground plane with a minimum area of 3.0m by 3.0m between the EUT and measurement receiver antenna. The RF absorber shall not exceed 30cm in high above the conducting floor. The table was rotated 360 degrees to determine the position of the highest radiation.
- (3) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.
- (4) The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- (5) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit



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Bellow 1 GHz, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. But the Peak Value and average value both need to comply with applicable limit above 1 GHz.

- (6) Testing frequency range below 1GHz the measuring instrument use VBW=120 kHz with Quasi-peak detection.
- (7) Testing frequency range above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.
- (8) For the actual test configuration, please see the test setup photo.

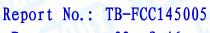
## 6.4 EUT Operating Condition

The Equipment Under Test was set to Continual Transmitting in maximum power.

### 6.5 Test Data

Remark: During testing above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10Hz with Peak Detector for Average Values.

Test data please refer the following pages.

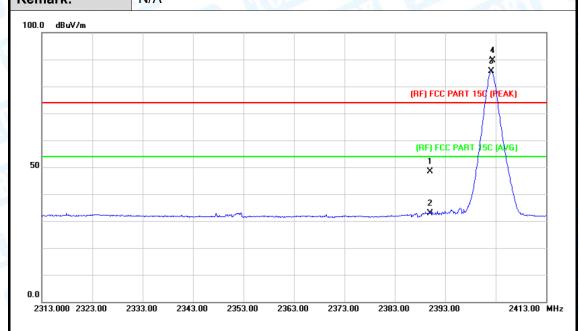




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## (1) Radiation Test

EUT:	Bluetooth FM Transmitter	Model:	FM25		
Temperature:	25 °C Relative Humidity: 55%				
Test Voltage:	DC 12V				
Ant. Pol.	Horizontal		All Or		
Test Mode:	BLE Mode TX 2402 MHz				
Remark:	N/A				

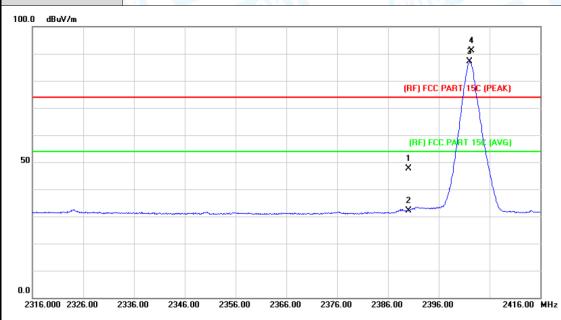


No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	O∨er	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	47.54	0.77	48.31	74.00	-25.69	peak
2		2390.000	32.07	0.77	32.84	54.00	-21.16	AVG
3	*	2402.100	84.84	0.82	85.66	Fundamental	Frequency	AVG
4	Χ	2402.400	88.79	0.82	89.61	Fundamental F	requency	peak





EUT:	Bluetooth FM Transmitter	Model:	FM25				
Temperature:	<b>25</b> ℃	Relative Humidity:	55%				
Test Voltage:	DC 12V	mm Visit	133				
Ant. Pol.	Vertical	Vertical					
Test Mode:	BLE Mode TX 2480 MHz						
Remark:	N/A	Time and	3				
100.0 dBuV/m							



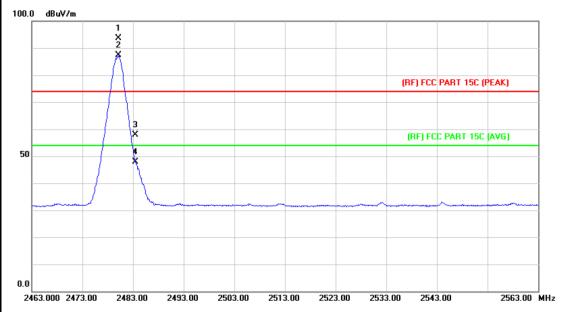
No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	46.82	0.77	47.59	74.00	-26.41	peak
2		2390.000	31.27	0.77	32.04	54.00	-21.96	AVG
3	*	2402.100	86.19	0.82	87.01	Fundamental	Frequency	AVG
4	Х	2402.400	90.39	0.82	91.21	Fundamental	Frequency	peak





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EUT:	Bluetooth FM Transmitter	Model:	FM25		
Temperature:	25 ℃	Relative Humidity:	55%		
Test Voltage:	DC 12V				
Ant. Pol.	Horizontal				
Test Mode:	BLE Mode TX 2480 MHz				
Remark:	N/A		72 _ (1)		



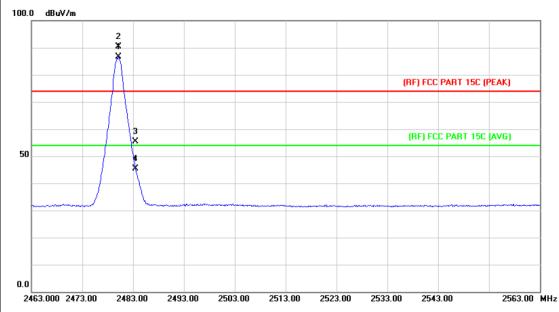
No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	Χ	2480.200	92.39	1.15	93.54	Fundamental	Frequency	peak
2	*	2480.200	86.26	1.15	87.41	Fundamental	Frequency	AVG
3		2483.500	56.81	1.17	57.98	74.00	-16.02	peak
4		2483.500	46.69	1.17	47.86	54.00	-6.14	AVG





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EUT:	Bluetooth FM Transmitter	Model:	FM25		
Temperature:	25 ℃	Relative Humidity:	55%		
Test Voltage:	DC 12V				
Ant. Pol.	Vertical				
Test Mode:	BLE Mode TX 2480 MHz				
Remark:	N/A				



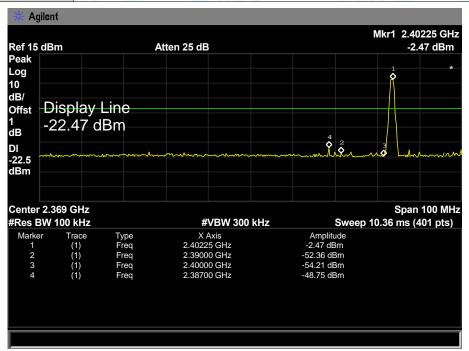
No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	2480.100	85.39	1.15	86.54	Fundamenta	l Frequency	AVG
2	Х	2480.200	89.16	1.15	90.31	Fundamenta	l Frequency	peak
3		2483.500	54.14	1.17	55.31	74.00	-18.69	peak
4		2483.500	44.27	1.17	45.44	54.00	-8.56	AVG

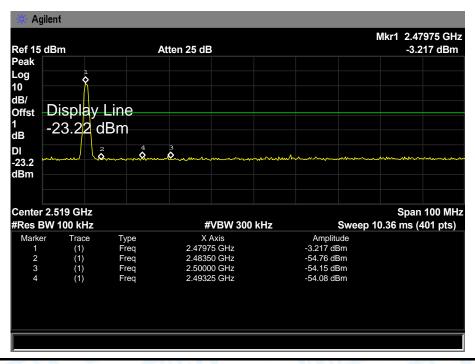




## (2) Conducted Test

EUT:	Bluetooth FM Transmitter	Model:	FM25			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 12V	DC 12V				
Test Mode:	BLE Mode TX 2402MHz / BLE Mode TX 2480MHz					
Remark:	The EUT is programed in continuously transmitting mode					







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## 7. Bandwidth Test

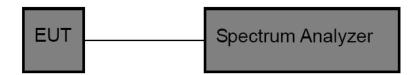
### 7.1 Test Standard and Limit

7.1.1 Test Standard FCC Part 15.247 (a)(2)

7.1.2 Test Limit

FCC Part 15 Subpart C(15.247)/ RSS 247 Issue 1					
Test Item	Limit	Frequency Range(MHz)			
Bandwidth	>=500 KHz (6dB bandwidth)	2400~2483.5			

## 7.2 Test Setup



### 7.3 Test Procedure

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) The bandwidth is measured at an amplitude level reduced 6dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst –case (i.e the widest) bandwidth.
- (3)Measure the channel separation the spectrum analyzer was set to Resolution Bandwidth:100 kHz, and Video Bandwidth:300 kHz, Detector: Peak, Sweep Time set auto.

## 7.4 EUT Operating Condition

The EUT was set to continuously transmitting in each mode and low, middle and high channel for the test.





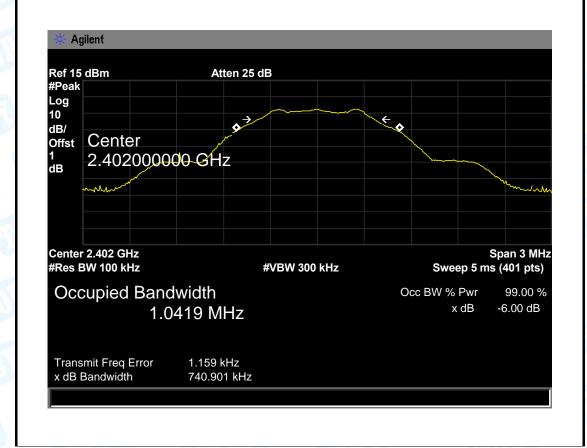
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## 7.5 Test Data

Bluetooth FM Transmitter Model:		FM25	
25 ℃	Relative Humidity:	55%	
DC 12V			
BLE TX Mode			
cy 6dB Bandwidth	99% Bandwidth	Limit	
(kHz)	(kHz)	(kHz)	
740.901	1041.90		
740.923	1036.70	>=500	
739.756	1037.70		
	25 ℃ DC 12V BLE TX Mode  cy 6dB Bandwidth (kHz) 740.901 740.923	25 °C Relative Humidity:  DC 12V  BLE TX Mode  cy 6dB Bandwidth (kHz) (kHz)  740.901 1041.90  740.923 1036.70	

#### **BLE Mode**

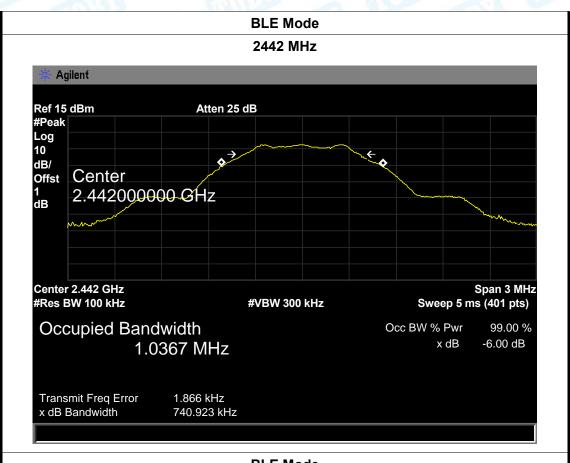
#### 2402 MHz

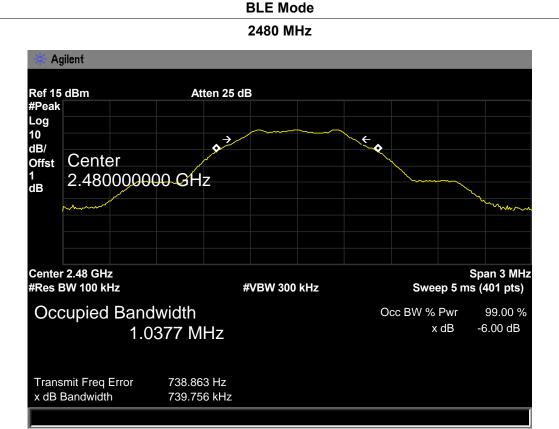






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## 8. Peak Output Power Test

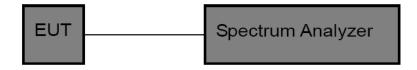
### 8.1 Test Standard and Limit

8.1.1 Test Standard FCC Part 15.247 (b)

8.1.2 Test Limit

FCC Part 15 Subpart C(15.247)/ RSS 247 Issue 1			
Test Item	Limit	Frequency Range(MHz)	
Peak Output Power	1 Watt or 30 dBm	2400~2483.5	

## 8.2 Test Setup



#### 8.3 Test Procedure

The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement is according to section 9.1.1 of KDB 558074 D01 DTS Meas Guidance v03r03.

- (1) Set the RBW≥DTS Bandwidth
- (2) Set VBW≥3\*RBW
- (3) Set Span≥3\*RBW
- (4) Sweep time=auto
- (5) Detector= peak
- (6) Trace mode= maxhold.
- (7) Allow trace to fully stabilize, and then use peak marker function to determine the peak amplitude level.

## 8.4 EUT Operating Condition

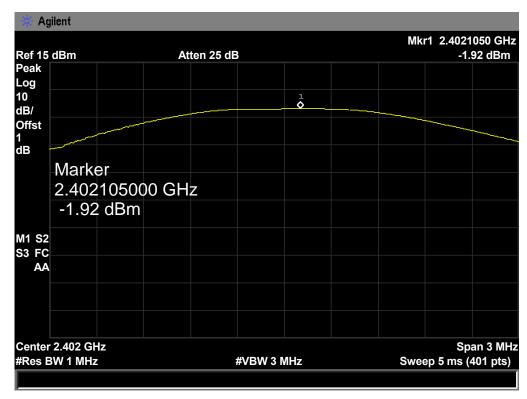
The EUT was set to continuously transmitting in the max power during the test.



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## 8.5 Test Data

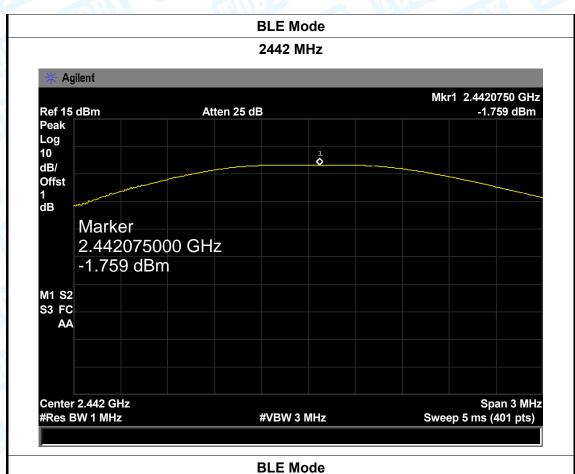
EUT:	Bluetooth FM Transmitter		Model:		FM25
Temperature:	25 ℃		Relative Humidity:		55%
Test Voltage:	DC 12V	7:33			
Test Mode:	BLE TX N	/lode	1	CIII)	73
Channel freque	ncy (MHz)	Test Result (dBm) Lir		Limit (dBm)	
2402		-1.920		30	
2442		-1.75	59		
2480		-2.216			
		BLE M	ode		
		2402 N	ЛHz		

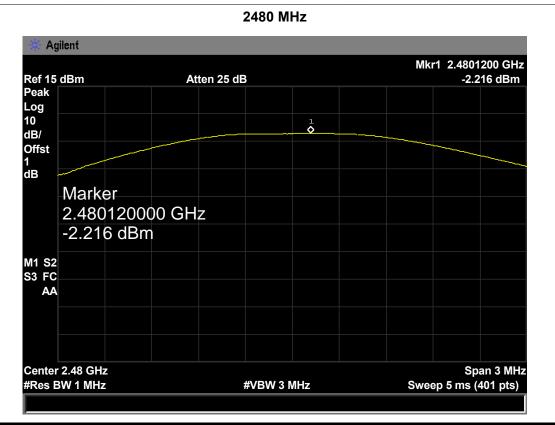






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## 9. Power Spectral Density Test

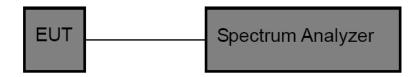
### 9.1 Test Standard and Limit

9.1.1 Test Standard FCC Part 15.247 (e)

9.1.2 Test Limit

FCC Part 15 Subpart C(15.247)			
Test Item	Limit	Frequency Range(MHz)	
Power Spectral Density	8dBm(in any 3 kHz)	2400~2483.5	

## 9.2 Test Setup



### 9.3 Test Procedure

The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement according to section 10.2 of KDB 558074 D01 DTS Meas Guidance v03r03.

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Set analyser center frequency to DTS channel center frequenyc.
- (3) Set the span to 1.5 times the DTS bandwidth.
- (4) Set the RBW to: 3 kHz(5) Set the VBW to: 10 kHz
- (6) Detector: peak(7) Sweep time: auto
- (8) Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

## 9.4 EUT Operating Condition

The EUT was set to continuously transmitting in each mode and low, Midle and high channel for the test.

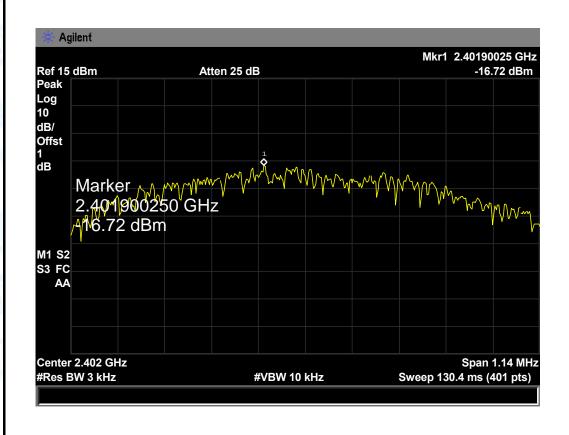


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## 9.5 Test Data

EUT:	Bluetooth	FM Transmitter	er Model:		FM25
Temperature:	25 ℃	Relative Humidi		dity:	55%
Test Voltage:	DC 12V			CONTRACT OF THE PARTY OF THE PA	
Test Mode:	BLE TX Mode				
Channel Freq	uency	Power Density		Limit (dBm)	
(MHz)		(3 kHz/dBm)			
2402	2402		<b>7</b> 2		
2442	2442 -1		55		8
2480		-16.94			
BLE Mode					

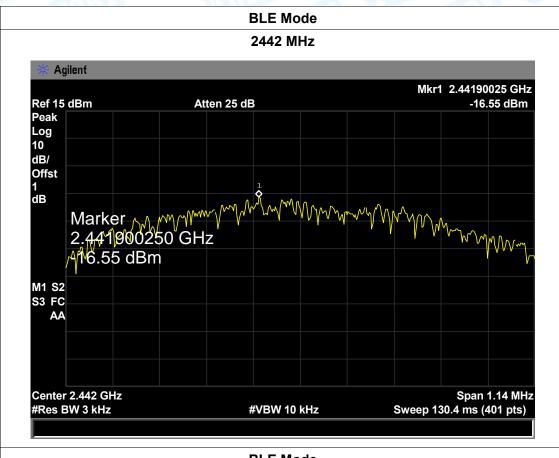
## 2402 MHz

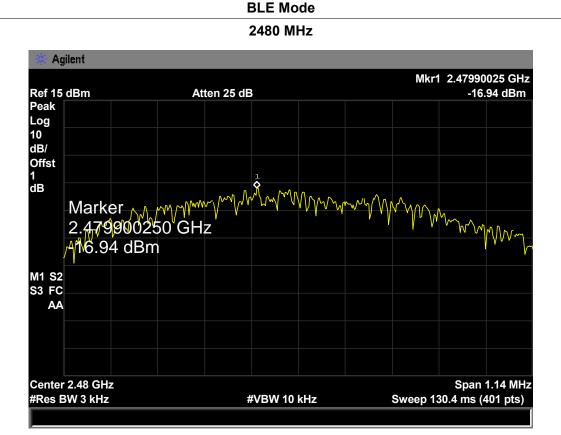






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## 10. Antenna Requirement

## 10.1 Standard Requirement

10.1.1 Standard FCC Part 15.203

### 10.1.2 Requirement

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.

#### 10.2 Antenna Connected Construction

The directional gains of the antenna used for transmitting is 0dBi, and the antenna de-signed with permanent attachment and no consideration of replacement. Please see the EUT photo for details.

The EUT antenna is a PCB Antenna. It complies with the standard requirement.

Antenna Type		
✓ Permanent attached antenna	Minney Co	
□ Unique connector antenna		
☐ Professional installation antenna	COT	