

Test Report

Product name: 2T2R Wi-Fi + Bluetooth Module

Trademark: n.a.

Model no......: T7663B2

Series Model(s).: n.a.

FCC ID.....: 2ANM3T7663B2

IC: 23165-T7663B2

HVIN: T7663B2

Report No: C240918050-RF01

Test Standards: CFR47 FCC Part 15: Subpart C Section 15.247
CFR47 FCC Part 15: Subpart C Section 15.207
CFR47 FCC Part 15: Subpart C Section 15.209
RSS-247 Issue 3
RSS-Gen Issue 5

Applicant: Shenzhen Chuangwei-RGB Electronics Co., Ltd.

Address of applicant: 13F-16F, Unit A, Skyworth Building, Shennan Road,
Nanshan District, Shenzhen, Guangdong, China.

Manufacturer.....: Shenzhen Chuangwei-RGB Electronics Co., Ltd.

Manufacturer Address.....: 13F-16F, Unit A, Skyworth Building, Shennan Road,
Nanshan District, Shenzhen, Guangdong, China.

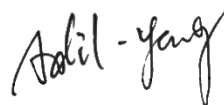
Date of Test Date.....: Sep 18, 2024 to Jan 20, 2025

Date of issue.: Mar 29, 2025

Test result.....: Compliance

Prepared By

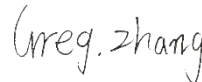
:



Adil Yang/Engineer

Reviewed By

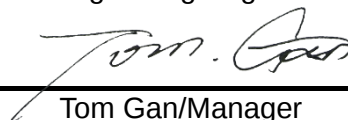
:



Greg Zhang/Engineer

Approved By

:



Tom Gan/Manager

The test results in the report only apply to the tested sample. The test report shall be invalid without all the signatures of testing engineers, reviewer and approver. Any objections must be raised to CSIC within 15 days since the date when the report is received. It will not be taken into consideration beyond this limit.

Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	Mar.29, 2025	Initial Issue	ALL	Adil Yang

Table of Contents

	Page
1. TEST SUMMARY	4
1.1. TEST DESCRIPTION	4
1.2. TEST FACILITY	5
1.3. MEASUREMENT UNCERTAINTY	5
2. GENERAL INFORMATION	6
2.1. GENERAL DESCRIPTION OF EUT	6
2.2. DESCRIPTION OF TEST MODES AND TEST FREQUENCY	7
2.3. MEASUREMENT INSTRUMENTS LIST	9
2.4. DESCRIPTION OF THE TEST MODES	11
2.5. TEST SOFTWARE AND POWER LEVEL	11
2.6. BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED	12
2.7. DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS	12
2.8. ENVIRONMENTAL CONDITIONS FOR TESTING	12
3. EMC TEST	13
3.1. RADIATED SPURIOUS EMISSION MEASUREMENT	13
3.2. ANTENNA REQUIREMENT	28
4. TEST PHOTOS	29
5. EUT PHOTOS	30

1. TEST SUMMARY

1.1. TEST DESCRIPTION

Test procedures according to the technical standards:

Item	Clause	Result	Note
Conducted Emission on AC Mains	Part 15.207(a) RSS-Gen 8.8	PASS*	
Maximum Conducted Output Power	Part 15.247(b)(3) RSS-247 5.4(d)	PASS*	
Radiated Spurious Emission	Part 15.247(c) Part 15.205 RSS-247 3.3	PASS	
Conducted Spurious Emissions Measured in 100 kHz Bandwidth	Part 15.247(d) RSS-247 5.5	PASS*	
Carrier Frequency Separation	Part 15.247(a)(1) RSS-247 5.1(b)	PASS*	
Number of Hopping Frequency	Part 15.247(a)(1)(iii) RSS-247 5.1(d)	PASS*	
Time of Occupancy	Part 15.247(a)(1)(iii) RSS-247 5.1(d)	PASS*	
20dB Bandwidth	Part 15.247(a)(1) RSS-247 5.1	PASS*	
99% Bandwidth	RSS-Gen 6.7	PASS*	
Antenna Requirement	Part 15.247(b)(4) Part 15.203	PASS	

Note:

- 1) "PASS*", The manufacturer added an optional antenna. We have retested the Radiated Spurious Emissions item. The other test terms were not affected, thus, the other test data were continued to be referenced. details refer to the original test report C240918049-RF01 published by Shenzhen Central Standard International Center Co., Ltd. on Nov 21,2024.
- 2) All tests are according to ANSI C63.10-2013.
- 3) The statements of test result on the above are decided by the request of test standard only; the measurement uncertainties are not factored into this compliance determination.
- 4) The information of measurement uncertainty is available upon the customer's request.

1.2. TEST FACILITY

Shenzhen Central Standard International Center Co., Ltd. (CSIC)

Room 201, Building 1, Mogen Fashion Industrial Park, No. 10, Shilongzai Road, Xinshi Community, Dalang Street, Longhua District, Shenzhen.

The test facility is recognized, certified or accredited by the following organizations:

CNAS Registration No.: L11671

FCC Registration No.: 0031378433 Designation Number: CN1317

IC CAB identifier: CN0051

A2LA Lab Cert. No.: 6426.01

1.3. MEASUREMENT UNCERTAINTY

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements as below table.

Below is the best measurement capability for Shenzhen Central Standard International Center Co., Ltd.

Test Items	Measurement Uncertainty	Notes
RF output power, conducted	$\pm 1.04\text{dB}$	(1)
Unwanted Emissions, conducted	$\pm 1.38\text{dB}$	(1)
All emissions, radiated 9KHz-30MHz	$\pm 4.44\text{dB}$	(1)
All emissions, radiated 30-1GHz	$\pm 4.56\text{dB}$	(1)
All emissions, radiated 1G-6GHz	$\pm 4.84\text{dB}$	(1)
All emissions, radiated >6G	$\pm 4.84\text{dB}$	(1)
Conducted Emission (9KHz-150KHz)	$\pm 3.22\text{dB}$	(1)
Conducted Emission (150KHz-30MHz)	$\pm 3.24\text{dB}$	(1)

Note(1): This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

2. GENERAL INFORMATION

2.1. GENERAL DESCRIPTION OF EUT

EUT(Product Specifications)	
Product Name:	2T2R Wi-Fi + Bluetooth Module
Model:	T7663B2
Series Model(s):	n.a.
Power supply:	DC 3.3V
Hardware version:	VER 00.03
Software version:	7E7. 09.19
Technical Specification of Bluetooth	
Operating Frequency	2402 - 2480 MHz
Type of Modulation	GFSK, $\pi/4$ DQPSK, 8DPSK
Channel Number	79 channels
Channel Separation	1MHz
Bluetooth Version	Bluetooth 5.1
Antenna Type	IFA
Max. Antenna Gain	4.30 dBi.

Note:

1. For a more detailed features description, please refer to the manufacture's specifications or the user's manual.
2. Full tests were applied to the sample C240918050-Y01/01 only in this document.

2.2. DESCRIPTION OF TEST MODES AND TEST FREQUENCY

The EUT has been tested under typical operating condition. The Applicant provides communication tools software to control the EUT for staying in continuous transmitting mode for testing.

Operation Frequency List for Bluetooth:

Channel	Frequency(MHz)	Channel	Frequency(MHz)
00	2402.00	20	2422.00
01	2403.00	21	2423.00
02	2404.00	22	2424.00
03	2405.00	23	2425.00
04	2406.00	24	2426.00
05	2407.00	25	2427.00
06	2408.00	26	2428.00
07	2409.00	27	2429.00
08	2410.00	28	2430.00
09	2411.00	29	2431.00
10	2412.00	30	2432.00
11	2413.00	31	2433.00
12	2414.00	32	2434.00
13	2415.00	33	2435.00
14	2416.00	34	2436.00
15	2417.00	35	2437.00
16	2418.00	36	2438.00
17	2419.00	37	2439.00
18	2420.00	38	2440.00
19	2421.00	39	2441.00
40	2442.00	60	2462.00
41	2443.00	61	2463.00
42	2444.00	62	2464.00
43	2445.00	63	2465.00
44	2446.00	64	2466.00
45	2447.00	65	2467.00
46	2448.00	66	2468.00
47	2449.00	67	2469.00
48	2450.00	68	2470.00
49	2451.00	69	2471.00
50	2452.00	70	2472.00
51	2453.00	71	2473.00
52	2454.00	72	2474.00
53	2455.00	73	2475.00

54	2456.00	74	2476.00
55	2457.00	75	2477.00
56	2458.00	76	2478.00
57	2459.00	77	2479.00
58	2460.00	78	2480.00
59	2461.00	--	--

GFSK, $\pi/4$ DQPSK, 8DPSK		
Test Channel	EUT Channel	Test Frequency (MHz)
lowest	CH00	2402
middle	CH39	2441
highest	CH78	2480

2.3. MEASUREMENT INSTRUMENTS LIST

RF Connected Test					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Spectrum Analyzer	Agilent	N9020A	MY50200391	May. 26, 2025
2	Power sensor	KEYSIGHT	U2021XA	MY55080015	May. 26, 2025
3	Power sensor	KEYSIGHT	U2021XA	MY54250016	May. 26, 2025
4	Power sensor	KEYSIGHT	U2021XA	MY54250020	May. 26, 2025
5	Power sensor	KEYSIGHT	U2021XA	MY54210030	May. 26, 2025
6	Vector Signal Generator	Agilent	N5182A	MY50140130	May. 26, 2025
7	Signal generator	Agilent	SML03	100925	May. 26, 2025
8	Power sensor Box	MWRFTest	N/A	N/A	N/A
9	RF Switch Box	MWRFTest	MW100-RFCB	N/A	N/A
10	MTS 8310	MWRFTest	V: 2.0.0.0		

Radiation Test equipment					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	EMI TEST RECEIVER	R&S	ESIB26	100342	May. 26, 2025
2	Amplifier	EMCO	EM330	980204	May. 26, 2025
3	Amplifier	MW	DPA8-1000-18000-1012	8220837	Mar. 06, 2025
4	Amplifier	SKET	LNPA_1840-50	SK201801801	Mar. 05, 2025
5	Loop Antenna	SCHNARZBECK	FMZB1519B	00023	Nov. 12, 2025
6	Bilog Antenna	Sunol Sciences	JB1	n.a.	Jul. 01, 2025
7	Horn Antenna	COMMW	ZAB-1-18G-50	20171109	Jul. 01, 2025
8	Horn Antenna	COM-MW	ZLB7-18-40G-777	3231081	Mar. 26, 2025
9	3M Chamber	Maor	9*6*6	--	Mar. 01, 2026
10	EZ-EMC	Farad	V3.1		

Mains Terminal Disturbance Voltage Test equipment					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	EMI Test Receiver	R&S	ESRP3	101936	May. 26, 2025
2	LISN	R&S	ENV216	100002	May. 26, 2025
3	LISN	MEB	NNB 42	--	May. 26, 2025
4	Shelding Room	Maor	8*4*3	--	Mar. 01, 2025
8	EZ-EMC	Fara	V3.1		

Note:

- 1) The cable loss has calculated in test result which connection between each test instruments.

2.4. DESCRIPTION OF THE TEST MODES

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 above was evaluated respectively.

Worst Mode	Description	Data Rate
Mode 1	TX BDR CH00	1 Mbps
Mode 2	TX BDR CH39	1 Mbps
Mode 3	TX BDR CH78	1 Mbps
Mode 4	TX EDR CH00	2 Mbps
Mode 5	TX EDR CH39	2 Mbps
Mode 6	TX EDR CH78	2 Mbps
Mode 7	TX EDR CH00	3 Mbps
Mode 8	TX EDR CH39	3 Mbps
Mode 9	TX EDR CH78	3 Mbps

Note:

- 1) The measurements are performed at the high, middle, low available channels.
- 2) All the bit rate of transmitter have been tested and found the lowest rate is found to be the worst case and recorded.
- 3) This test was performed with EUT in X, Y, Z position and worst case was found when EUT in X position.
- 4) For radiated emission above 1 GHz test, 1GHz-25GHz have been pre-tested and in this report only recorded the worst case. The remaining spurious points are all below the limit value of 20dB.

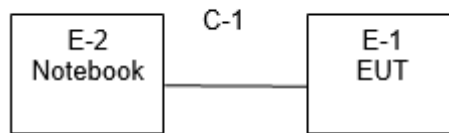
2.5. TEST SOFTWARE AND POWER LEVEL

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level.

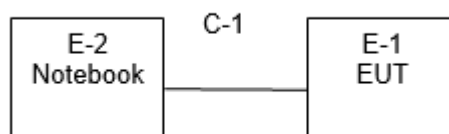
RF Function	Type	Mode Or Modulation type	Ant Gain(dBi)	Power Class	Software For Testing
Bluetooth	BT	GFSK	4.30	7	WCN Combo Tool V.W1942
		$\pi/4$ DQPSK		7	
		8DPSK		7	

2.6. BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

a. Radiated Spurious Emission Test



b. Conducted Emission Test



2.7. DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Necessary accessories					
Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note
N/A	N/A	N/A	N/A	N/A	N/A

Support units					
Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note
E-2	Notebook	DELL	Vostro 3400	N/A	N/A
E-3	Router	GL iNet	GL-MT3000	N/A	N/A
C-1	USB Cable	N/A	100cm	N/A	N/A

Note:

- 1) The support equipment was authorized by Declaration of Confirmation.
- 2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- 3) The Router FCC ID: 2AFIW-MT3000; IC ID: 23019-MT3000.

2.8. ENVIRONMENTAL CONDITIONS FOR TESTING

Test Item	Temperature (°C)	Relative Humidity (%)	Test Voltage	Tested by
Radiated Spurious Emission	24.3	52.0	AC 110V 60Hz	Adil Yang

3. EMC TEST

3.1. Radiated Spurious Emission Measurement

Limit

In any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the Restricted band specified on Part15.205 (a)&209(a) and RSS-247 3.3 limit in the table and according to ANSI C63.10-2013 and RSS-Gen below has to be followed.

LIMITS OF RADIATED EMISSION MEASUREMENT (0.009MHz - 1000MHz)

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

LIMITS OF RADIATED EMISSION MEASUREMENT (1GHz-25 GHz)

FREQUENCY (MHz)	(dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

- 1) The limit for radiated test was performed according to FCC PART 15C.
- 2) The tighter limit applies at the band edges.
- 3) Emission level (dBuV/m)=20log Emission level (uV/m).

LIMITS OF RESTRICTED FREQUENCY BANDS

For FCC:

FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (GHz)
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
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	Above 38.6
13.36-13.41			

For IC:

FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (GHz)
0.090-0.110	13.36-13.41	960-1427	9.0-9.2
0.495-0.505	16.42-16.423	1435-1626.5	9.3-9.5
2.1735-2.1905	16.69475-16.69525	1645.5-1646.5	10.6-12.7
3.020-3.026	16.80425-16.80475	1660-1710	13.25-13.4
4.125-4.128	25.5-25.67	1718.8-1722.2	14.47-14.5
4.17725-4.17775	37.5-38.25	2200-2300	15.35-16.2
4.20725-4.20775	73-74.6	2310-2390	17.7-21.4
5.677-5.683	74.8-75.2	2483.5-2500	22.01-23.12
6.215-6.218	108-138	2655-2900	23.6-24.0
6.26775-6.26825	149.9-150.05	3260-3267	31.2-31.8
6.31175-6.31225	156.52475-156.52525	3332-3339	36.43-36.5
8.291-8.294	156.7-156.9	3345.8-3358	Above 38.6
8.362-8.366	162.0125-167.17	3500-4400	--
8.37625-8.38675	167.72-173.2	4500-5150	--
8.41425-8.41475	240-285	5350-5460	--
12.29-12.293	322-335.4	7250-7750	--
12.51975-12.52025	399.9-410	8025-8500	--
12.57675-12.57725	608-614	--	--

For Radiated Emission	
Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak/QP/AVG
Start Frequency	9 KHz/150KHz(Peak/QP/AVG)
Stop Frequency	150KHz/30MHz(Peak/QP/AVG)
RB / VB (emission in restricted band)	200Hz (From 9kHz to 0.15MHz)/
	9KHz (From 0.15MHz to 30MHz);
	200Hz (From 9kHz to 0.15MHz)/
	9KHz (From 0.15MHz to 30MHz)
Attenuation	Auto
Detector	Peak/QP
Start Frequency	30 MHz(Peak/QP)
Stop Frequency	1000 MHz (Peak/QP)
RB / VB (emission in restricted band)	120 kHz / 300kHz
Attenuation	Auto
Detector	Peak/AVG
Start Frequency	1000 MHz(Peak/AVG)
Stop Frequency	10th carrier hamonic(Peak/AVG)
RB / VB (emission in restricted band)	1 MHz / 3 MHz(Peak)
	1 MHz/1/T MHz(AVG)

For Restricted band	
Spectrum Parameter	Setting
Detector	Peak/AVG
Start/Stop Frequency	Lower Band Edge: 2310 to 2410 MHz
	Upper Band Edge: 2476 to 2500 MHz
RB / VB	1 MHz / 3 MHz(Peak)
	1 MHz/1/T MHz(AVG)
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~90kHz / RB 200Hz for Peak & AVG
Start ~ Stop Frequency	90kHz~110kHz / RB 200Hz for QP
Start ~ Stop Frequency	110kHz~490kHz / RB 200Hz for Peak & AVG
Start ~ Stop Frequency	490kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

Test Procedure

- The measuring distance of 3 m shall be used for measurements at frequency 0.009MHz up to 1GHz, and above 1GHz.
- The EUT was placed on the top of a rotating table 0.8 meters (above 1GHz is 1.5 m) above the ground at a 3-meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- The height of the equipment shall be 0.8 m (above 1GHz is 1.5 m); the height of the test antenna shall vary between 1 m to 4 m. horizontal and vertical polarizations of the antenna are set to make the measurement.
- 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 QuasiPeak detector mode re-measured.
- If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement is performed.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

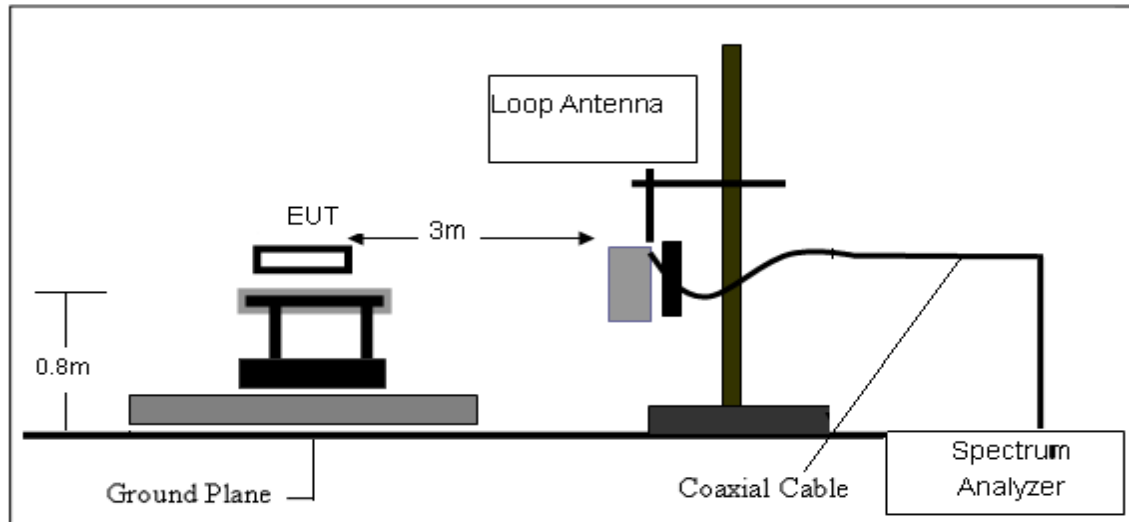
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axes. The worst-case emissions were reported.

DEVIATION FROM TEST STANDARD

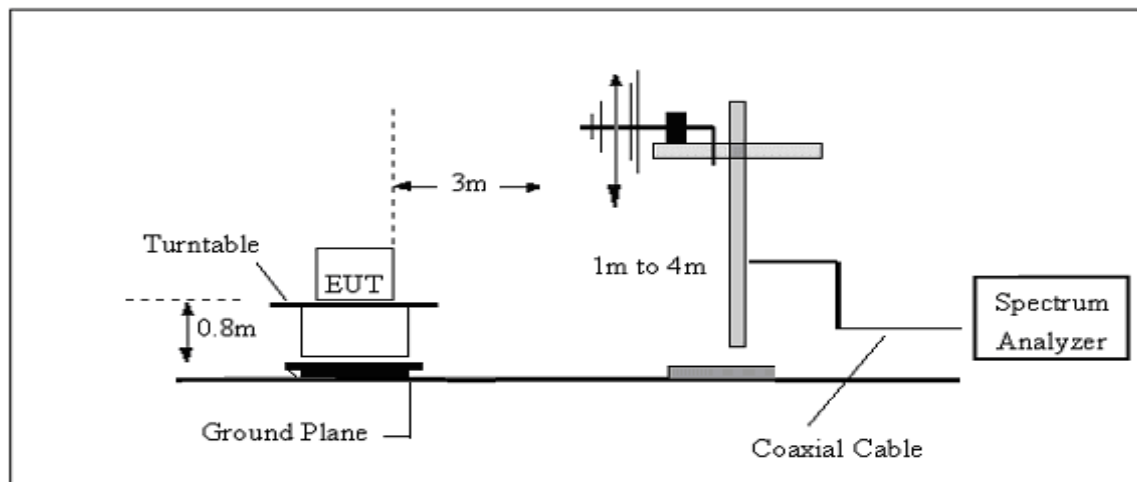
No deviation.

Test Setup

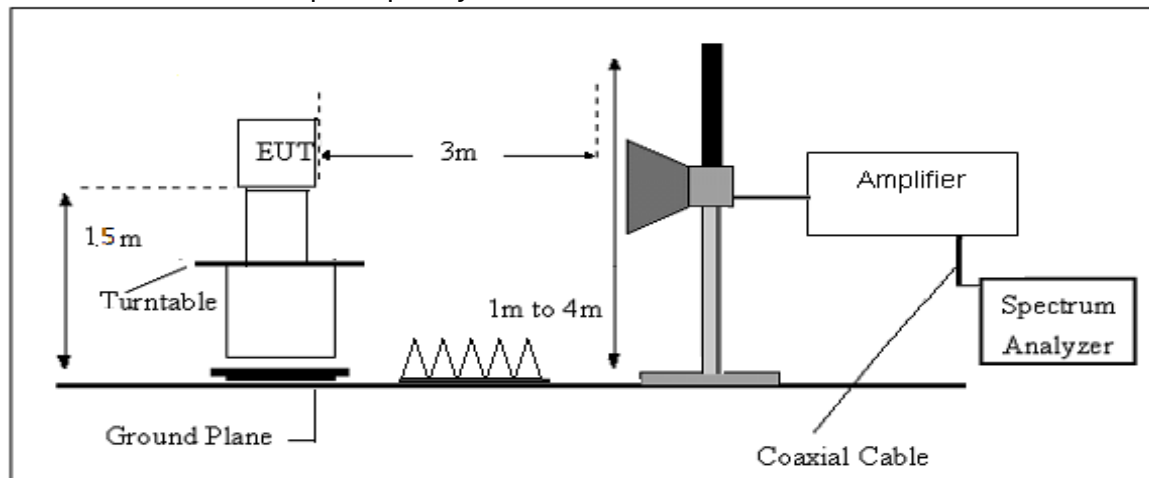
1. Radiated Emission Test-Up Frequency Below 30MHz



2. Radiated Emission Test-Up Frequency 30MHz~1GHz



3. Radiated Emission Test-Up Frequency Above 1GHz



EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.5 Unless otherwise a special operating condition is specified in the follows during the testing.

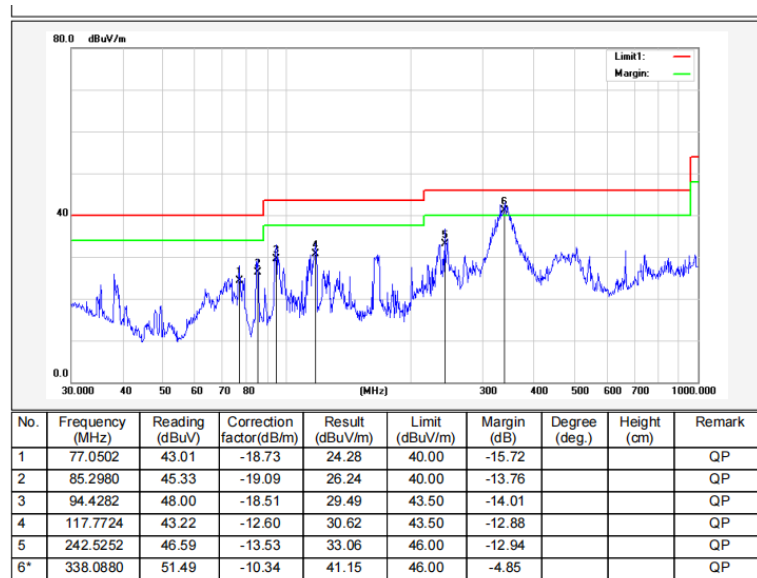
Test Result

Below 1G:

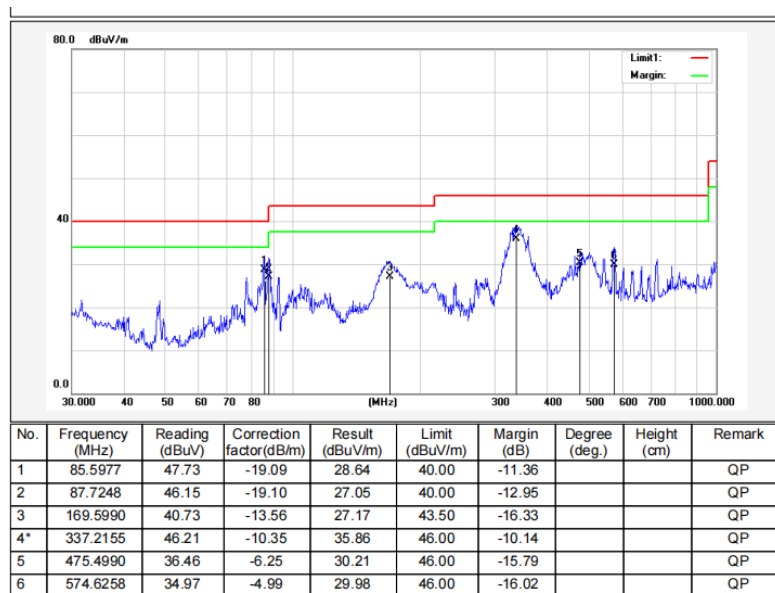
Note: All modes have been tested, and the report only reflects the worst mode.

Test Mode : working Test Voltage : AC 110V/60Hz

Horizontal



Vertical



Correction Factor = antenna factor + cable loss – amplifier gain;

Reading = Reading Amplitude in the instrument;

Result = Correction Factor + Reading;

Margin = Result – Limit.

Above 1GHz:
GFSK - Low (worst mode) Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4842	58.52	-13.14	45.38	74	-28.62	peak
2	4842	52.73	-13.14	39.59	54	-14.41	AVG
3	6134	56.51	-9.98	46.53	74	-27.47	peak
4	6134	52.25	-9.98	42.27	54	-11.73	AVG
5	7596	55.9	-7.26	48.64	74	-25.36	peak
6	7596	52.31	-7.26	45.05	54	-8.95	AVG
7	11404	54.85	-1.87	52.98	74	-21.02	peak
8	11404	48.61	-1.87	46.74	54	-7.26	AVG
9	15756	54.29	6.55	60.84	74	-13.16	peak
10	15756	43.29	6.55	49.84	54	-4.16	AVG
11	17524	53.52	9.07	62.59	74	-11.41	peak
12	17524	40.94	9.07	50.01	54	-3.99	AVG

GFSK - Low (worst mode) Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3992	60.07	-15.01	45.06	74	-28.94	peak
2	3992	52.29	-15.01	37.28	54	-16.72	AVG
3	5080	59.81	-12.5	47.31	74	-26.69	peak
4	5080	53.31	-12.5	40.81	54	-13.19	AVG
5	6916	58.45	-8.8	49.65	74	-24.35	peak
6	6916	53.78	-8.8	44.98	54	-9.02	AVG
7	11404	55.87	-1.87	54	74	-20	peak
8	11404	49.7	-1.87	47.83	54	-6.17	AVG
9	15212	54.82	6.63	61.45	74	-12.55	peak
10	15212	43.04	6.63	49.67	54	-4.33	AVG
11	17864	54.82	9.35	64.17	74	-9.83	peak
12	17864	41.33	9.35	50.68	54	-3.32	AVG

GFSK - Middle (worst mode) Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4944	59.74	-12.85	46.89	74	-27.11	peak
2	4944	53.31	-12.85	40.46	54	-13.54	AVG
3	5998	58.72	-10.12	48.6	74	-25.4	peak
4	5998	53.29	-10.12	43.17	54	-10.83	AVG
5	7426	56.99	-7.09	49.9	74	-24.1	peak
6	7426	52.7	-7.09	45.61	54	-8.39	AVG
7	11336	55.85	-2.04	53.81	74	-20.19	peak
8	11336	49.73	-2.04	47.69	54	-6.31	AVG
9	15382	54.16	7.02	61.18	74	-12.82	peak
10	15382	42.19	7.02	49.21	54	-4.79	AVG
11	17796	54.87	8.92	63.79	74	-10.21	peak
12	17796	41.31	8.92	50.23	54	-3.77	AVG

GFSK - Middle (worst mode) Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5080	57.6	-12.5	45.1	74	-28.9	peak
2	5080	51.37	-12.5	38.87	54	-15.13	AVG
3	6950	57.39	-8.79	48.6	74	-25.4	peak
4	6950	50.97	-8.79	42.18	54	-11.82	AVG
5	8310	55.52	-7.28	48.24	74	-25.76	peak
6	8310	52.75	-7.28	45.47	54	-8.53	AVG
7	11404	54.87	-1.87	53	74	-21	peak
8	11404	48.82	-1.87	46.95	54	-7.05	AVG
9	15756	54.51	6.55	61.06	74	-12.94	peak
10	15756	42.46	6.55	49.01	54	-4.99	AVG
11	18000	51.92	10.19	62.11	74	-11.89	peak
12	18000	40.62	10.19	50.81	54	-3.19	AVG

GFSK - High (worst mode) Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3720	59.41	-16.15	43.26	74	-30.74	peak
2	3720	55.83	-16.15	39.68	54	-14.32	AVG
3	5080	58.25	-12.5	45.75	74	-28.25	peak
4	5080	51.51	-12.5	39.01	54	-14.99	AVG
5	7902	56.42	-8.06	48.36	74	-25.64	peak
6	7902	46.93	-8.06	38.87	54	-15.13	AVG
7	11098	55.1	-2.54	52.56	74	-21.44	peak
8	11098	44.21	-2.54	41.67	54	-12.33	AVG
9	13172	53.17	0.25	53.42	74	-20.58	peak
10	13172	43.34	0.25	43.59	54	-10.41	AVG
11	15076	53.96	5.56	59.52	74	-14.48	peak
12	15076	39.79	5.56	45.35	54	-8.65	AVG

GFSK - High (worst mode) Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3992	59.84	-15.01	44.83	74	-29.17	peak
2	3992	52.22	-15.01	37.21	54	-16.79	AVG
3	8242	56.68	-7.48	49.2	74	-24.8	peak
4	8242	50.24	-7.48	42.76	54	-11.24	AVG
5	10112	55.76	-4.19	51.57	74	-22.43	peak
6	10112	49.71	-4.19	45.52	54	-8.48	AVG
7	13036	55.21	-0.29	54.92	74	-19.08	peak
8	13036	47.32	-0.29	47.03	54	-6.97	AVG
9	15280	54.23	6.75	60.98	74	-13.02	peak
10	15280	41.79	6.75	48.54	54	-5.46	AVG
11	17796	53.02	8.92	61.94	74	-12.06	peak
12	17796	40.59	8.92	49.51	54	-4.49	AVG

$\pi/4$ DQPSK - Low (worst mode) Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3720	60.65	-16.15	44.5	74	-29.5	peak
2	3720	55	-16.15	38.85	54	-15.15	AVG
3	6134	58.53	-9.98	48.55	74	-25.45	peak
4	6134	51.89	-9.98	41.91	54	-12.09	AVG
5	7392	56.84	-7.13	49.71	74	-24.29	peak
6	7392	51.19	-7.13	44.06	54	-9.94	AVG
7	11404	56.27	-1.87	54.4	74	-19.6	peak
8	11404	49.5	-1.87	47.63	54	-6.37	AVG
9	15756	55.1	6.55	61.65	74	-12.35	peak
10	15756	42.5	6.55	49.05	54	-4.95	AVG
11	17830	55.32	9.12	64.44	74	-9.56	peak
12	17830	41.02	9.12	50.14	54	-3.86	AVG

 $\pi/4$ DQPSK - Low (worst mode) Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4026	58.49	-15.01	43.48	74	-30.52	peak
2	4026	51.04	-15.01	36.03	54	-17.97	AVG
3	6168	56.83	-9.92	46.91	74	-27.09	peak
4	6168	50.33	-9.92	40.41	54	-13.59	AVG
5	7562	55.26	-7.22	48.04	74	-25.96	peak
6	7562	50.57	-7.22	43.35	54	-10.65	AVG
7	11302	54.43	-2.14	52.29	74	-21.71	peak
8	11302	49.63	-2.14	47.49	54	-6.51	AVG
9	16776	53.93	7.49	61.42	74	-12.58	peak
10	16776	41.87	7.49	49.36	54	-4.64	AVG
11	18000	52.11	10.19	62.3	74	-11.7	peak
12	18000	40.6	10.19	50.79	54	-3.21	AVG

 $\pi/4$ DQPSK - Middle (worst mode) Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	6338	56.78	-9.95	46.83	74	-27.17	peak
2	6338	50.81	-9.95	40.86	54	-13.14	AVG
3	7358	56.48	-7.23	49.25	74	-24.75	peak
4	7358	51.18	-7.23	43.95	54	-10.05	AVG
5	10214	54.23	-3.78	50.45	74	-23.55	peak
6	10214	47.87	-3.78	44.09	54	-9.91	AVG
7	12424	55.96	-1.81	54.15	74	-19.85	peak
8	12424	49.12	-1.81	47.31	54	-6.69	AVG
9	15348	53.99	6.93	60.92	74	-13.08	peak
10	15348	42.26	6.93	49.19	54	-4.81	AVG
11	18000	51.59	10.19	61.78	74	-12.22	peak
12	18000	40.57	10.19	50.76	54	-3.24	AVG

$\pi/4$ DQPSK - Middle (worst mode) Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4910	59.63	-12.91	46.72	74	-27.28	peak
2	4910	52.12	-12.91	39.21	54	-14.79	AVG
3	6304	58.92	-9.91	49.01	74	-24.99	peak
4	6304	53.2	-9.91	43.29	54	-10.71	AVG
5	8344	57.14	-7.2	49.94	74	-24.06	peak
6	8344	53.64	-7.2	46.44	54	-7.56	AVG
7	11404	56.28	-1.87	54.41	74	-19.59	peak
8	11404	48.93	-1.87	47.06	54	-6.94	AVG
9	15348	54.69	6.93	61.62	74	-12.38	peak
10	15348	43.04	6.93	49.97	54	-4.03	AVG
11	18000	54.31	10.19	64.5	74	-9.5	peak
12	18000	40.59	10.19	50.78	54	-3.22	AVG

 $\pi/4$ DQPSK - High (worst mode) Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4910	58.88	-12.91	45.97	74	-28.03	peak
2	4910	49.13	-12.91	36.22	54	-17.78	AVG
3	6134	57.96	-9.98	47.98	74	-26.02	peak
4	6134	50.49	-9.98	40.51	54	-13.49	AVG
5	7426	56.69	-7.09	49.6	74	-24.4	peak
6	7426	50.33	-7.09	43.24	54	-10.76	AVG
7	11404	55.56	-1.87	53.69	74	-20.31	peak
8	11404	48.85	-1.87	46.98	54	-7.02	AVG
9	15178	55.22	6.43	61.65	74	-12.35	peak
10	15178	42.62	6.43	49.05	54	-4.95	AVG
11	17932	53.87	9.79	63.66	74	-10.34	peak
12	17932	40.02	9.79	49.81	54	-4.19	AVG

 $\pi/4$ DQPSK - High (worst mode) Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	6916	56.63	-8.8	47.83	74	-26.17	peak
2	6916	48.88	-8.8	40.08	54	-13.92	AVG
3	8344	55.76	-7.2	48.56	74	-25.44	peak
4	8344	48.35	-7.2	41.15	54	-12.85	AVG
5	10044	55.3	-4.59	50.71	74	-23.29	peak
6	10044	49.3	-4.59	44.71	54	-9.29	AVG
7	13172	55.61	0.25	55.86	74	-18.14	peak
8	13172	47.71	0.25	47.96	54	-6.04	AVG
9	15212	54.03	6.63	60.66	74	-13.34	peak
10	15212	42.86	6.63	49.49	54	-4.51	AVG
11	17694	53.45	9.05	62.5	74	-11.5	peak
12	17694	40.75	9.05	49.8	54	-4.2	AVG

8DPSK - Low (worst mode) Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	5046	57.29	-12.62	44.67	74	-29.33	peak
2	5046	51.15	-12.62	38.53	54	-15.47	AVG
3	6134	57.77	-9.98	47.79	74	-26.21	peak
4	6134	52.25	-9.98	42.27	54	-11.73	AVG
5	8378	55.63	-7.1	48.53	74	-25.47	peak
6	8378	50.28	-7.1	43.18	54	-10.82	AVG
7	11370	54.45	-1.94	52.51	74	-21.49	peak
8	11370	48.72	-1.94	46.78	54	-7.22	AVG
9	15348	52.53	6.93	59.46	74	-14.54	peak
10	15348	42.39	6.93	49.32	54	-4.68	AVG
11	17966	52.47	9.99	62.46	74	-11.54	peak
12	17966	40.33	9.99	50.32	54	-3.68	AVG

8DPSK - Low (worst mode) Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4944	58.5	-12.85	45.65	74	-28.35	peak
2	4944	51.64	-12.85	38.79	54	-15.21	AVG
3	6168	58.01	-9.92	48.09	74	-25.91	peak
4	6168	51.57	-9.92	41.65	54	-12.35	AVG
5	7358	57.36	-7.23	50.13	74	-23.87	peak
6	7358	50.25	-7.23	43.02	54	-10.98	AVG
7	11404	55.65	-1.87	53.78	74	-20.22	peak
8	11404	48.74	-1.87	46.87	54	-7.13	AVG
9	15212	54.78	6.63	61.41	74	-12.59	peak
10	15212	42.53	6.63	49.16	54	-4.84	AVG
11	17898	53.94	9.59	63.53	74	-10.47	peak
12	17898	40.59	9.59	50.18	54	-3.82	AVG

8DPSK - Middle (worst mode) Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	6032	58.64	-10.1	48.54	74	-25.46	peak
2	6032	47.57	-10.1	37.47	54	-16.53	AVG
3	7392	56.7	-7.13	49.57	74	-24.43	peak
4	7392	47.02	-7.13	39.89	54	-14.11	AVG
5	10656	55.42	-2.77	52.65	74	-21.35	peak
6	10656	45.68	-2.77	42.91	54	-11.09	AVG
7	12084	56.31	-2.26	54.05	74	-19.95	peak
8	12084	47.3	-2.26	45.04	54	-8.96	AVG
9	15246	54.28	6.7	60.98	74	-13.02	peak
10	15246	42.23	6.7	48.93	54	-5.07	AVG
11	17864	54.5	9.35	63.85	74	-10.15	peak
12	17864	41.28	9.35	50.63	54	-3.37	AVG

8DPSK - Middle (worst mode) Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5046	57.62	-12.62	45	74	-29	peak
2	5046	51.59	-12.62	38.97	54	-15.03	AVG
3	6134	57.5	-9.98	47.52	74	-26.48	peak
4	6134	51.66	-9.98	41.68	54	-12.32	AVG
5	7256	57.4	-7.7	49.7	74	-24.3	peak
6	7256	51.08	-7.7	43.38	54	-10.62	AVG
7	11268	54.46	-2.21	52.25	74	-21.75	peak
8	11268	48.42	-2.21	46.21	54	-7.79	AVG
9	15042	55.25	5.26	60.51	74	-13.49	peak
10	15042	42.77	5.26	48.03	54	-5.97	AVG
11	17524	53.25	9.07	62.32	74	-11.68	peak
12	17524	40.88	9.07	49.95	54	-4.05	AVG

8DPSK - High (worst mode) Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	6168	56.73	-9.92	46.81	74	-27.19	peak
2	6168	48.97	-9.92	39.05	54	-14.95	AVG
3	7392	55.49	-7.13	48.36	74	-25.64	peak
4	7392	49.14	-7.13	42.01	54	-11.99	AVG
5	10078	54.59	-4.37	50.22	74	-23.78	peak
6	10078	48.72	-4.37	44.35	54	-9.65	AVG
7	12356	55.26	-2.09	53.17	74	-20.83	peak
8	12356	48.82	-2.09	46.73	54	-7.27	AVG
9	15756	53.78	6.55	60.33	74	-13.67	peak
10	15756	42.4	6.55	48.95	54	-5.05	AVG
11	17422	52.92	9.04	61.96	74	-12.04	peak
12	17422	40.75	9.04	49.79	54	-4.21	AVG

8DPSK - High (worst mode) Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5080	58.79	-12.5	46.29	74	-27.71	peak
2	5080	52.62	-12.5	40.12	54	-13.88	AVG
3	6304	57.65	-9.91	47.74	74	-26.26	peak
4	6304	52.19	-9.91	42.28	54	-11.72	AVG
5	7562	57.01	-7.22	49.79	74	-24.21	peak
6	7562	52.81	-7.22	45.59	54	-8.41	AVG
7	11132	56.45	-2.48	53.97	74	-20.03	peak
8	11132	49	-2.48	46.52	54	-7.48	AVG
9	15790	55.63	6.78	62.41	74	-11.59	peak
10	15790	41.85	6.78	48.63	54	-5.37	AVG
11	17422	54.45	9.04	63.49	74	-10.51	peak
12	17422	40.7	9.04	49.74	54	-4.26	AVG

Node:

- 1、 Testing was carried out within frequency range 9kHz to the tenth harmonics. The measurement results below 30MHz and 18GHz - 26.5GHz were greater than 20dB below the limit, so only the radiated spurious emissions from 30MHz to 18GHz were reported..
- 2、 Radiated emissions measured in frequency above 1GHz were made with an instrument using peak/average detector mode.
- 3、 Average test would be performed if the peak result were greater than the average limit or as required by the applicant.

4、 Result formula:

Correction Factor = antenna factor + cable loss – amplifier gain;

Reading = Reading Amplitude in the instrument;

Result = Correction Factor + Reading;

Margin (dB) = result in dBuV/m – limit in dBuV/m.

Restricted band Requirements							
GFSK - Low (worst mode)							
Horizontal							
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2379.35	67.22	-21.07	46.15	74	-27.85	peak
2	2379.35	56.75	-21.07	35.68	54	-18.32	AVG
3	2390	63.23	-21.03	42.2	74	-31.8	peak
4	2390	54.49	-21.03	33.46	54	-20.54	AVG
Vertical							
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2386.76	65.86	-21.05	44.81	74	-29.19	peak
2	2386.76	56.69	-21.05	35.64	54	-18.36	AVG
3	2390	65.06	-21.03	44.03	74	-29.97	peak
4	2390	56.97	-21.03	35.94	54	-18.06	AVG
GFSK - High (worst mode)							
Horizontal							
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.5	72.32	-20.91	51.41	74	-22.59	peak
2	2483.5	61.25	-20.91	40.34	54	-13.66	AVG
3	2487.6	69.99	-20.91	49.08	74	-24.92	peak
4	2487.6	58.73	-20.91	37.82	54	-16.18	AVG
Vertical							
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.5	69.97	-20.91	49.06	74	-24.94	peak
2	2483.5	60.45	-20.91	39.54	54	-14.46	AVG
3	2487.3	71.1	-20.91	50.19	74	-23.81	peak
4	2487.3	58.78	-20.91	37.87	54	-16.13	AVG

Correction Factor = antenna factor + cable loss – amplifier gain;

Reading = Reading Amplitude in the instrument;

Result = Correction Factor + Reading;

Margin = Result – Limit

$\pi/4$ DQPSK - Low (worst mode)							
Horizontal							
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2388.28	65.23	-21.03	44.2	74	-29.8	peak
2	2388.28	55.52	-21.03	34.49	54	-19.51	AVG
3	2390	61.57	-21.03	40.54	74	-33.46	peak
4	2390	55.98	-21.03	34.95	54	-19.05	AVG
Vertical							
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2386	65.42	-21.05	44.37	74	-29.63	peak
2	2386	57.28	-21.05	36.23	54	-17.77	AVG
3	2390	63.03	-21.03	42	74	-32	peak
4	2390	57.44	-21.03	36.41	54	-17.59	AVG
$\pi/4$ DQPSK - High (worst mode)							
Horizontal							
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.5	88.92	-20.91	68.01	74	-5.99	peak
2	2483.5	59.41	-20.91	38.5	54	-15.5	AVG
3	2486.35	69.79	-20.91	48.88	74	-25.12	peak
4	2486.35	59.44	-20.91	38.53	54	-15.47	AVG
Vertical							
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.5	72.48	-20.91	51.57	74	-22.43	peak
2	2483.5	61.42	-20.91	40.51	54	-13.49	AVG
3	2486.95	73.43	-20.91	52.52	74	-21.48	peak
4	2486.95	59.17	-20.91	38.26	54	-15.74	AVG

Correction Factor = antenna factor + cable loss – amplifier gain;

Reading = Reading Amplitude in the instrument;

Result = Correction Factor + Reading;

Margin = Result – Limit

8DPSK - Low (worst mode)							
Horizontal							
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2386.95	64.29	-21.04	43.25	74	-30.75	peak
2	2386.95	55.26	-21.04	34.22	54	-19.78	AVG
3	2390	61.6	-21.03	40.57	74	-33.43	peak
4	2390	56.55	-21.03	35.52	54	-18.48	AVG
Vertical							
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2386	63.07	-21.05	42.02	74	-31.98	peak
2	2386	57.8	-21.05	36.75	54	-17.25	AVG
3	2390	60.16	-21.03	39.13	74	-34.87	peak
4	2390	57.06	-21.03	36.03	54	-17.97	AVG
8DPSK - High (worst mode)							
Horizontal							
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2483.5	90.1	-20.91	69.19	74	-4.81	peak
2	2483.5	58.92	-20.91	38.01	54	-15.99	AVG
3	2485.05	71.32	-20.91	50.41	74	-23.59	peak
4	2485.05	59.22	-20.91	38.31	54	-15.69	AVG
Vertical							
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2483.5	71.31	-20.91	50.4	74	-23.6	peak
2	2483.5	60.03	-20.91	39.12	54	-14.88	AVG
3	2494.35	80.3	-20.92	59.38	74	-14.62	peak
4	2494.35	57.63	-20.92	36.71	54	-17.29	AVG

Correction Factor = antenna factor + cable loss – amplifier gain;

Reading = Reading Amplitude in the instrument;

Result = Correction Factor + Reading;

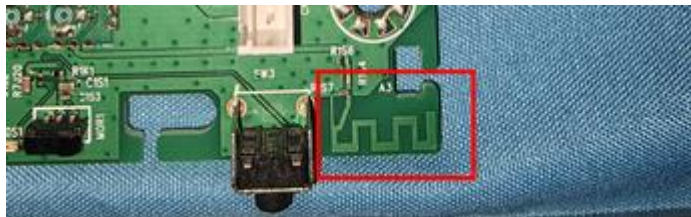
Margin = Result – Limit

3.2. ANTENNA REQUIREMENT

According to the manufacturer declared, the EUT has IFA Antenna, the directional gain of antenna is Bluetooth antenna Gain: 4.30 dBi;, and the antenna and other components are all on the same PCB and cannot be replaced. Therefore, the EUT is considered sufficient to comply with the provision.

EUT ANTENNA

The Bluetooth is IFA Antenna. It complies with the standard requirement.



4. TEST PHOTOS

Please refer to Appendix C Test Setup.

5. EUT PHOTOS

External Photos Please refer to Appendix A and Internal Photos Please refer to Appendix B.

*****THE END*****