FCC Test Report

Report No: FCS202408191W02

Issued for

Applicant:	RTT Europe DOO Novi Sad
Address:	Vase Stajica br.18, apartment 8, Novi Sad, Republic of Serbia, 21000
Product Name:	Personal Tag
Brand Name:	N/A
Model Name:	PROD TAG 210
FCC ID:	2BLSS-PRODTAG210
Issued By: Flux Compliance Service Laboratory Add: Room 105 Floor Bao hao Technology Building 1 NO.15 Gong ye West Road Hi-Tech Industrial, Song shan lake Dongguan	

TEST RESULT CERTIFICATION

Applicant's name :	RTT Europe DOO Novi Sad
Address :	Vase Stajica br.18, apartment 8, Novi Sad, Republic of Serbia, 21000
Manufacture's Name :	RTT Europe DOO Novi Sad
Address :	Vase Stajica br.18, apartment 8, Novi Sad, Republic of Serbia, 21000

Product description

Product Name.....:	Personal Tag
Brand Name .....:	N/A
Model Name .....:	PROD TAG 210
Series Model.....:	N/A
Test Standards .....:	FCC Rules and Regulations Part 15 Subpart C, Section 249
Test procedure :	ANSI C63.10-2013

This device described above has been tested by Flux Compliance Service Laboratory, the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.
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Date of Test :	
Date of performance of tests :	Aug.05, 2024 ~ Aug.13, 2024
Date of Issue :	Oct.24, 2024
Test Result :	**Pass**

Tested by : Scott shen

(Scott Shen)

Reviewed by : Duke Qian

(Duke Qian)

Approved by : Jack Wang

(Jack Wang)

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Revision History

Rev.	Issue Date	Contents
00	Oct.24, 2024	Initial Issue

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part 15.249, Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	N/A	
15.203	Antenna Requirement	Pass	
15.249 &15.209	Radiated Emission	Pass	
15.249	20dB Bandwidth	Pass	

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

(2)All tests are according to ANSI C63.10-2013

1.1 TEST FACTORY

Company Name:	Flux Compliance Service Laboratory
Address:	Room 105 Floor Bao hao Technology Building 1 NO.15 Gong ye West Road Hi-Tech Industrial, Song shan lake Dongguan
FCC Test Firm Registration Number: 514908 Designation number: CN0127 A2LA accreditation number：5545.01 ISED Number：25801 CAB ID ： CN0097	

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y** ± **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** %.

No.	Item	Uncertainty
1	RF output power, conducted	±0.71dB
2	Unwanted Emissions, conducted	±2.988 dB
3	Conducted Emission (9KHz-150KHz)	±4.13 dB
4	All emissions radiated (9KHz -30MHz)	±3.1 dB
5	Conducted Emission (150KHz-30MHz)	±4.74 dB
6	All emissions,radiated(<1G) 30MHz-1000MHz	±5.2 dB
7	All emissions,radiated 1GHz -18GHz	±4.66 dB
8	All emissions,radiated 18GHz -40GHz	±4.31 dB
9	Occupied bandwidth	±4%

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product Name	Personal Tag
Trade Name	N/A
Model Name	PROD TAG 210
Series Model	N/A
Model Difference	N/A
Product Description	The EUT is a Personal Tag Operation Frequency: 922MHz Modulation Type: GFSK Antenna Designation: Chip Antenna Antenna Gain(Peak) 0.75 dBi Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.
Channel List	Please refer to the Note 2.
Power Supply	Input: DC 5V from wireless charger
Battery	Rated Voltage: DC 3.7V Capacity: 560mAh
Hardware Version	N/A
Software Version	N/A

Note:

1. For a more detailed features description, please refer to the manufacturer’s specifications or the User’s Manual.

2.

Channel	Frequency (MHz)
01	922

3. Table for Filed Antenna

Ant	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	N/A	PROD TAG 210	Chip Antenna	NA	0.75	Antenna

The EUT antenna is spring loaded Antenna. No antenna other than that furnished by the responsible party shall be used with the device.

2.2 DESCRIPTION OF TEST MODES

For conducted test items and radiated spurious emissions
Each of these EUT operation mode(s) or test configuration mode(s) mentioned below was evaluated respectively..

Worst Mode	Description	Data/Modulation
Mode 1	TX CH01	GFSK

Note:

(1) All above mode have been measurement, only worst data was reported.

(2) New Battery is used during all test.

(3) We have be tested for all avaiable U.S. voltage and frequencies(For 120V,50/60Hz and 240V, 50/60Hz) for which the device is capable of operation, and the worst case of 120V,50/60Hz is shown in the report

(4) The EUT was programmed to be in continuously transmitting mode and the transmit duty cycle is not less than 98%.

2.3 DESCRIPTION OF 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.

Accessories Equipment

Description	Manufacturer	Model	S/N	Rating
N/A	N/A	N/A	N/A	N/A

Auxiliary Equipment

Description	Manufacturer	Model	S/N	Rating
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Note:

(1) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

(2) “YES” is means “with core”; “NO” is means “without core”.

2.4 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test equipment

Kind of Equipment	Manufacturer	Type No.	Company No.	Last calibration	Calibrated until
EMI Test Receiver	R&S	ESRP 3	FCS-E001	2023.08.29	2024.08.28
Signal Analyzer	R&S	FSV40-N	FCS-E012	2023.08.29	2024.08.28
Active loop Antenna	ZHINAN	ZN30900C	FCS-E013	2023.08.29	2024.08.28
Bilog Antenna	SCHWARZBECK	VULB 9168	FCS-E002	2023.08.29	2024.08.28
Horn Antenna	SCHWARZBECK	BBHA 9120D	FCS-E003	2023.08.29	2024.08.28
SHF-EHF Horn Antenna (18G-40GHz)	A-INFO	LB-180400-KF	FCS-E018	2023.08.29	2024.08.28
Pre-Amplifier(0.1M-3GHz)	EMCI	EM330N	FCS-E004	2023.08.29	2024.08.28
Pre-Amplifier (1G-18GHz)	N/A	TSAMP-0518SE	FCS-E014	2023.08.29	2024.08.28
Pre-Amplifier (18G-40GHz)	TERA-MW	TRLA-0400	FCS-E019	2023.08.29	2024.08.28
Temperature & Humidity	HTC-1	victor	FCS-E005	2023.08.29	2024.08.28
Testing Software	EZ-EMC(Ver.STSLAB 03A1 RE)				

Conduction Test equipment

Kind of Equipment	Manufacturer	Type No.	Company No.	Last calibration	Calibrated until
EMI Test Receiver	R&S	ESPI	FCS-E020	2023.08.29	2024.08.28
LISN	R&S	ENV216	FCS-E007	2023.08.29	2024.08.28
LISN	ETS	3810/2NM	FCS-E009	2023.08.29	2024.08.28
Temperature & Humidity	HTC-1	victor	FCS-E008	2023.08.29	2024.08.28
Testing Software	EZ-EMC(Ver.EMC-CON 3A1.1)				

RF Connected Test

Kind of Equipment	Manufacturer	Type No.	Company No.	Last calibration	Calibrated until
MXA SIGNAL Analyzer	Keysight	N9020A	FCS-E015	2023.08.29	2024.08.28
Spectrum Analyzer	Agilent	E4447A	MY50180039	2023.08.29	2024.08.28
Spectrum Analyzer	R&S	FSV-40	101499	2023.08.29	2024.08.28
Power Sensor	Agilent	UX2021XA	FCS-E021	2023.08.29	2024.08.28
Testing Software	EZ-EMC(Ver.STSLAB 03A1 RE)				

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION LIMITS

Operating frequency band. In case the emission fall within the restricted band specified on Part 15.249 limit in the table below has to be followed.

FREQUENCY (MHz)	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

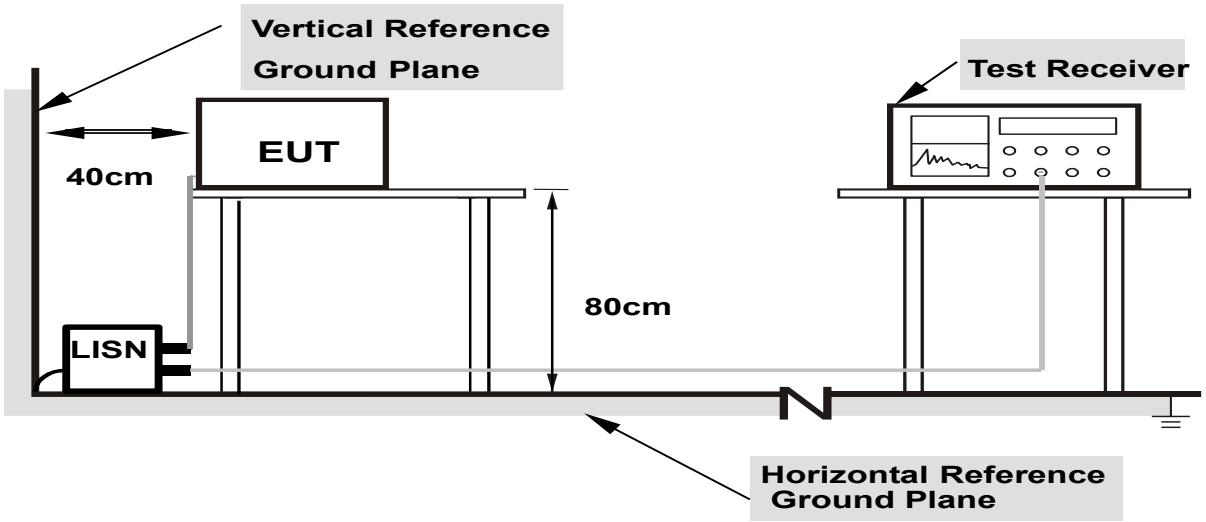
The following table is the setting of the receiver

Receiver Parameters	**Setting**
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.1.2 TEST PROCEDURE

a. The EUT was 0.8 meters from the horizontal ground plane and 0.4 meters from the vertical 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.
b. 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.
c. 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.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 TEST SETUP



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.1.4 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

3.1.5 TEST RESULTS

Note: The product is charged through the DC power input of an external wireless charger, so this test item is not applicable.

3.2 RADIATED EMISSION MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on Part 15.205(a), then the Part 15.209(a)and Part 15.249 limit in the table 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
30~40.66	100	3
40.70~70	100	3

LIMITS OF RADIATED EMISSION MEASUREMENT (FCC 15.249)

Frequency of Emission (MHz)	**Field Strength of fundamental ((millivolts /meter)**	**Field Strength of Harmonics (microvolts/meter)**
902-928	50	500

Notes:

(1) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

Spectrum Parameter	Setting
Detector	Peak
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	RB>20BW,VB=20xRB

Receiver Parameter	**Setting**
Start ~ Stop Frequency	9kHz~90kHz / RB 200Hz for PK-AV
	90kHz~110kHz / RB 200Hz for QP
	110kHz~490KHz / RB 9kHz for PK-AV
	490kHz~30MHz / RB 9kHz for QP
	30MHz~1000MHz / RB 100kHz for QP-PK

3.2.2 TEST PROCEDURE

a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. 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.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit,
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

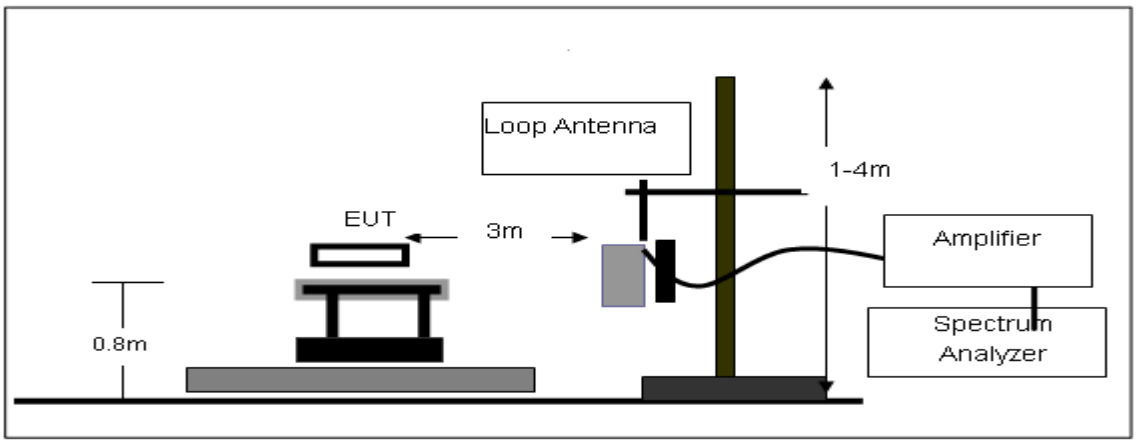
Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

3.2.3 DEVIATION FROM TEST STANDARD

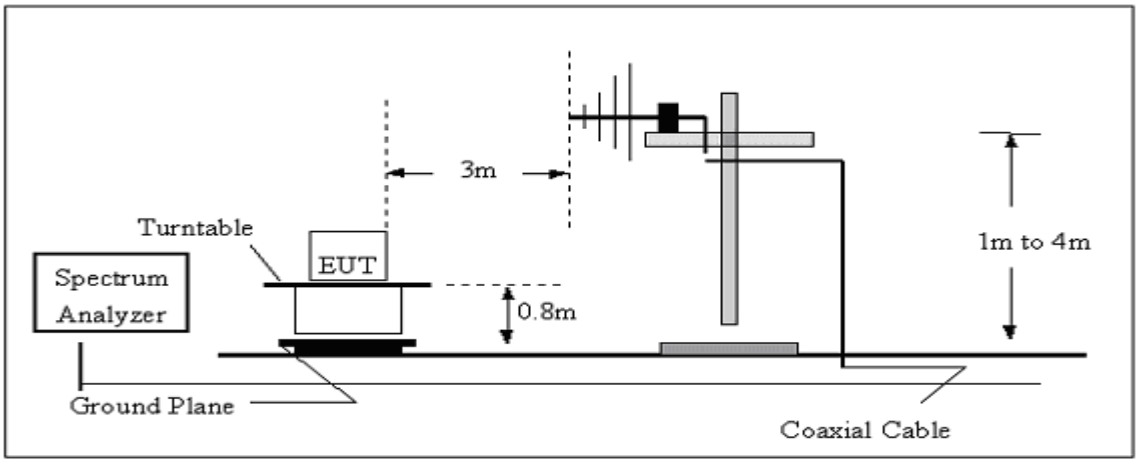
No deviation

3.2.4 TEST SETUP

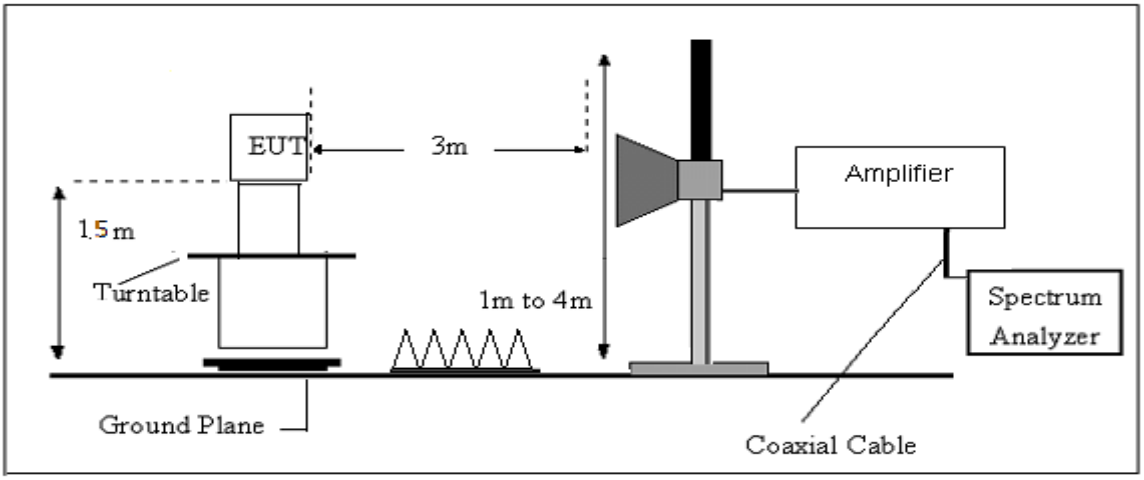
（A）Radiated Emission Test-Up Frequency Below 30MHz



（B）Radiated Emission Test-Up Frequency 30MHz~1GHz



（C）Radiated Emission Test-Up Frequency Above 1GHz



3.2.5 FIELD STRENGTH CALCULATION

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

Where

FS = Field Strength

CL = Cable Attenuation Factor (Cable Loss)

RA = Reading Amplitude

AG = Amplifier Gain

AF = Antenna Factor

For example

Frequency	FS	RA	AF	CL	AG	Factor
(MHz)	(dBμV/m)	(dBμV/m)	(dB)	(dB)	(dB)	(dB)
300	40	58.1	12.2	1.6	31.9	-18.1

Factor=AF+CL-AG

3.2.6 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

Below 30 MHz

Temperature:	26 ℃	Relative Humidity:	60%
Pressure:	1010 hPa	Polarization:	---
Test Voltage:	DC 3.7V		
Test Mode:	TX Mode		

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

NOTE:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor =40 log (specific distance/test distance)(dB);

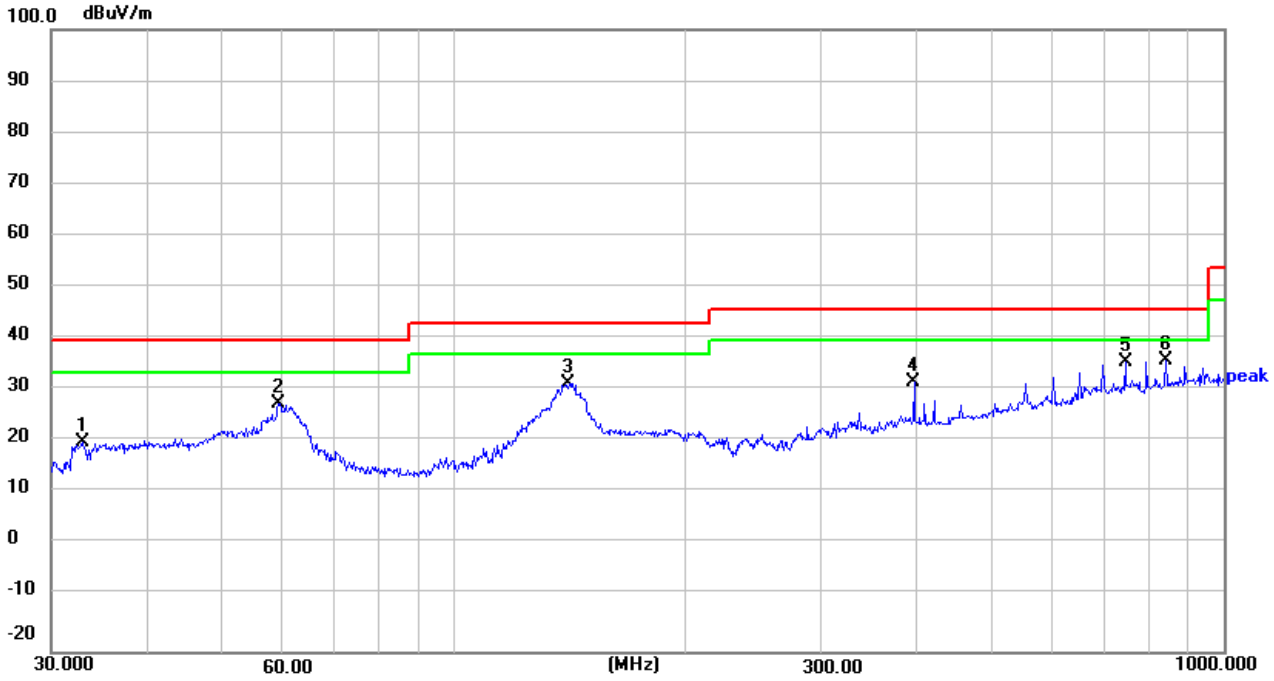
Limit line = specific limits(dBuv) + distance extrapolation factor.

Between 30MHz – 1000 MHz Radiation Spurious

Temperature:	22.4 ℃	Relative Humidity:	52.4%
Pressure:	1010hPa	Phase:	Horizontal
Test Voltage:	DC 3.7V	Test Mode:	Model 1

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	32.9791	37.87	-17.36	20.51	40.00	-19.49	peak
2	59.2323	45.15	-17.21	27.94	40.00	-12.06	peak
3	141.3296	49.00	-17.21	31.79	43.50	-11.71	peak
4	396.2412	46.66	-14.66	32.00	46.00	-14.00	peak
5	744.8660	43.06	-7.02	36.04	46.00	-9.96	peak
6 *	842.1295	41.91	-5.51	36.40	46.00	-9.60	peak

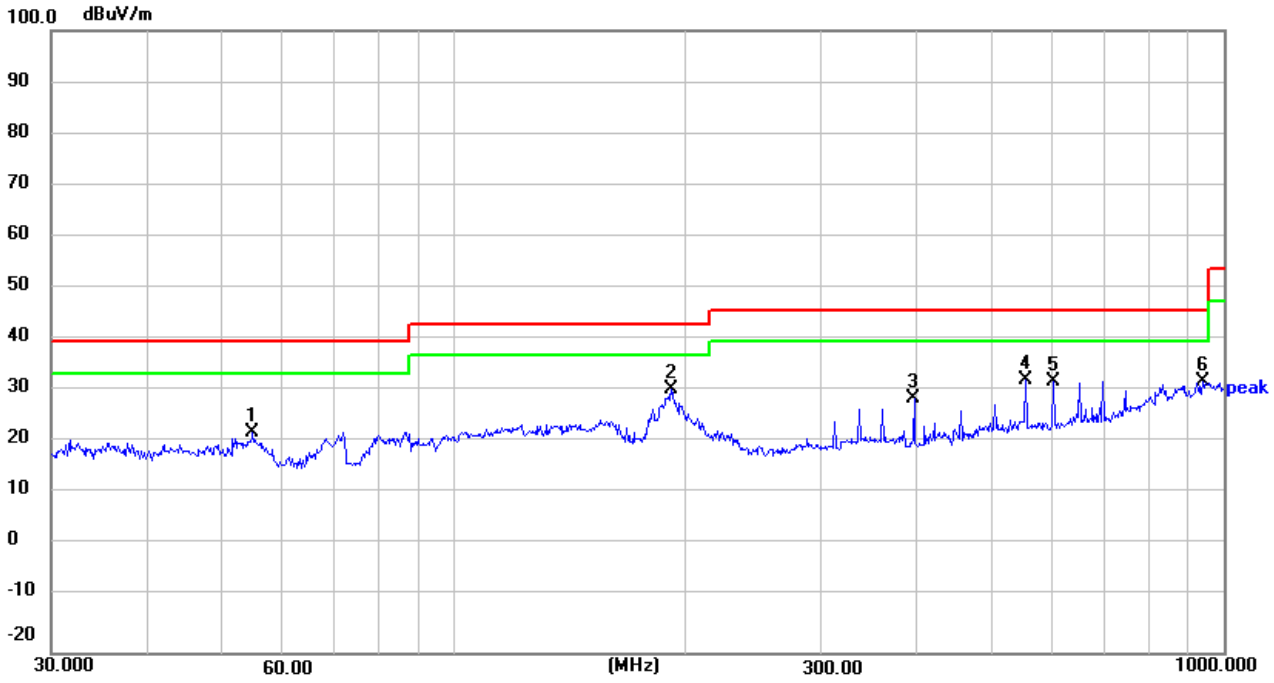
Remark:
1. Margin = Result (Result =Reading + Factor)–Limit



Temperature:	22.4 ℃	Relative Humidity:	52.5%
Pressure:	1010hPa	Phase:	Vertical
Test Voltage:	DC 3.7V	Test Mode:	Model 1

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	54.8348	39.65	-17.03	22.62	40.00	-17.38	peak
2 *	191.7450	50.38	-19.55	30.83	43.50	-12.67	peak
3	396.2412	43.93	-14.66	29.27	46.00	-16.73	peak
4	552.8831	43.73	-11.07	32.66	46.00	-13.34	peak
5	601.4265	42.20	-9.69	32.51	46.00	-13.49	peak
6	938.8324	36.22	-3.80	32.42	46.00	-13.58	peak

Remark:
1. Margin = Result (Result =Reading + Factor)–Limit



Fundamental frequency:

PK

Frequency (MHz)	Reading (dBμV/m)	Amplifier	Loss	Antenna Factor	Factor(dB) Corr.	Result (dBμV/m)	Limit (dBμV/m)	Margin(dB)	Polarization
	PEAK	（dB）	（dB）	（dB/m）		PEAK	PEAK	PEAK	
922.0	81.37	40.00	5.73	25.12	-9.15	72.22	114.00	-41.78	Vertical
922.0	82.25	40.00	5.73	25.12	-9.15	73.10	114.00	-40.90	Horizontal

Note: The PEAK result is already less than the AV limit, and there is no need to calculate the AV result.

Above 1G Radiation Spurious

Frequency (MHz)	Reading (dBμV)	Amplifier （dB）	Loss （dB）	Antenna Factor （dB/m）	Corrected Factor （dB）	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
Mid Channel (922 MHz)										
1100.01	67.46	46.30	3.70	24.30	-18.30	49.16	74	-24.84	PK	Vertical
1100.01	56.48	46.30	3.70	24.30	-18.30	38.18	54	-15.82	AV	Vertical
1100.11	68.02	46.30	3.70	24.30	-18.30	49.72	74	-24.28	PK	Horizontal
1100.11	56.84	46.30	3.70	24.30	-18.30	38.54	54	-15.46	AV	Horizontal
1516.86	65.98	44.90	4.19	25.00	-15.71	50.27	74	-23.73	PK	Vertical
1516.86	56.33	44.90	4.19	25.00	-15.71	40.62	54	-13.38	AV	Vertical
1517.03	66.24	44.90	4.19	25.00	-15.71	50.53	74	-23.47	PK	Horizontal
1517.03	57.12	44.90	4.19	25.00	-15.71	41.41	54	-12.59	AV	Horizontal
1844.40	64.87	44.10	5.30	25.00	-13.80	51.07	74	-22.93	PK	Vertical
1844.40	55.67	44.10	5.30	25.00	-13.80	41.87	54	-12.13	AV	Vertical
1844.94	65.54	44.10	5.30	25.00	-13.80	51.74	74	-22.26	PK	Horizontal
1844.94	53.87	44.10	5.30	25.00	-13.80	40.07	54	-13.93	AV	Horizontal
2144.85	62.89	43.80	5.40	25.90	-12.50	50.39	74	-23.61	PK	Vertical
2144.85	52.14	43.80	5.40	25.90	-12.50	39.64	54	-14.36	AV	Vertical
2144.91	62.22	43.80	5.40	25.90	-12.50	49.72	74	-24.28	PK	Horizontal
2144.91	50.49	43.80	5.40	25.90	-12.50	37.99	54	-16.01	AV	Horizontal
2766.87	67.39	44.40	6.20	27.60	-10.60	56.79	74	-17.21	PK	Vertical
2766.87	51.36	44.40	6.20	27.60	-10.60	40.76	54	-13.24	AV	Vertical
2766.99	64.98	44.40	6.20	27.60	-10.60	54.38	74	-19.62	PK	Horizontal
2766.99	51.20	44.40	6.20	27.60	-10.60	40.60	54	-13.40	AV	Horizontal
4000.05	65.37	44.20	7.90	29.70	-6.60	58.77	74	-15.23	Pk	Vertical
4000.05	48.25	44.20	7.90	29.70	-6.60	41.65	54	-12.35	AV	Vertical
3999.79	68.07	44.20	7.90	29.70	-6.60	61.47	74	-12.53	Pk	Horizontal
3999.79	48.16	44.20	7.90	29.70	-6.60	41.56	54	-12.44	AV	Horizontal
7236.05	55.90	43.50	11.40	35.50	3.40	59.30	74	-14.70	Pk	Vertical
7236.05	37.86	43.50	11.40	35.50	3.40	41.26	54	-12.74	AV	Vertical
7236.20	56.25	43.50	11.40	35.50	3.40	59.65	74	-14.35	Pk	Horizontal
7236.20	39.16	43.50	11.40	35.50	3.40	42.56	54	-11.44	AV	Horizontal
9104.91	52.88	45.00	12.57	37.40	4.97	57.85	74	-16.15	Pk	Vertical
9104.91	40.66	45.00	12.57	37.40	4.97	45.63	54	-8.37	AV	Vertical
9104.97	53.17	45.00	12.57	37.40	4.97	58.14	74	-15.86	Pk	Horizontal
9104.97	38.82	45.00	12.57	37.40	4.97	43.79	54	-10.21	AV	Horizontal

Band edge Requirements

Frequency (MHz)	Reading (dBμV)	Amplifier （dB）	Loss （dB）	Antenna Factor （dB/m）	Corrected Factor （dB）	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
GFSK										
902.00	66.11	43.80	2.82	23.50	-17.48	48.63	74	-25.37	PK	Vertical
902.00	52.39	43.80	2.82	23.50	-12.99	39.40	54	-14.60	AV	Vertical
902.00	66.92	43.80	2.82	23.50	-12.99	53.93	74	-20.07	PK	Horizontal
902.00	51.16	43.80	2.82	23.50	-12.99	38.17	54	-15.83	AV	Horizontal
928.00	68.45	43.80	2.82	23.50	-17.48	50.97	74	-23.03	PK	Vertical
928.00	50.06	43.80	2.82	23.50	-12.78	37.28	54	-16.72	AV	Vertical
928.00	68.44	43.80	2.82	23.50	-12.78	55.66	74	-18.34	PK	Horizontal
928.00	50.24	43.80	2.82	23.50	-12.78	37.46	54	-16.54	AV	Horizontal

Low measurement frequencies is range from 850 to 902 MHz, high measurement frequencies is range from 928 to 1000 MHz.

Only show the worst point data of the emissions in the frequency 850-902 MHz and 928-1000 MHz.

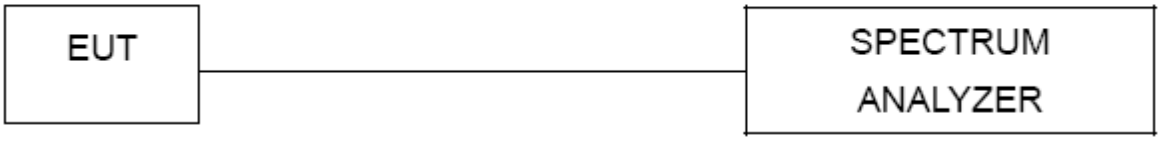
4. BANDWIDTH TEST

4.1 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,

b. Spectrum Setting : RBW= 3KHz, VBW≧RBW, Sweep time = Auto.

4.2 TEST SETUP



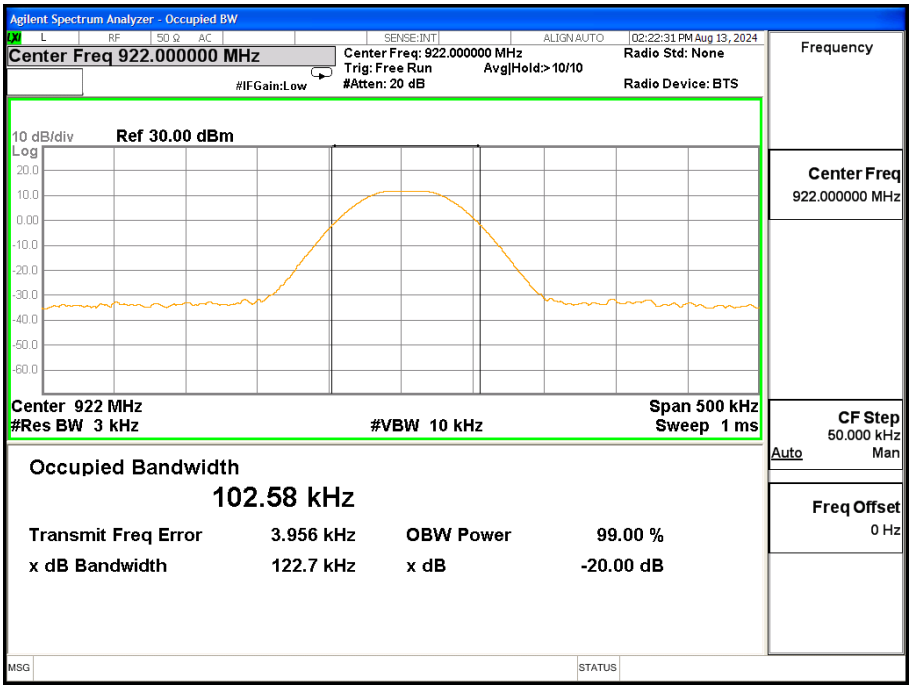
4.3 EUT OPERATION CONDITIONS

TX mode.

4.4 TEST RESULTS

Test Channel	Frequency (MHz)	20 dB Bandwidth (MHz)	99% Bandwidth (MHz)
CH01	922	0.123	0.103

CH01



5. ANTENNA REQUIREMENT

5.1 STANDARD REQUIREMENT

According to the FCC Part 15 Paragraph 15.203, 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.

5.2 EUT ANTENNA

The EUT antenna is Chip Antenna.It conforms to the standard requirements.

※※※※※END OF THE REPORT※※※※※