



Test Report No.:
FCC2022-0064-RF2

RF Test Report

EUT : SAGA
MODEL : OV1
BRAND NAME : 
APPLICANT : OSOM Products Inc.
Classification Of Test : N/A

CVC Testing Technology Co., Ltd.



Applicant		Name: OSOM Products Inc.	
		Address: 21701 Stevens Creek Blvd #2270, Cupertino, CA 95015, USA	
Manufacturer		Name: OSOM Products Inc.	
		Address: 21701 Stevens Creek Blvd #2270, Cupertino, CA 95015, USA	
Equipment Under Test		Product Name: SAGA	
		Model/Type: OV1	
		Brand Name: 	
		Serial NO.: N/A	
		Sample NO.:15-1	
Date of Receipt.	2022.09.13	Date of Testing	2022.09.13~2022.10.24
Test Specification		Test Result	
FCC Part 15, Subpart C, Section 15.225 Canada RSS-210 Issue 10 (2020-04) Canada RSS-Gen Issue 5+A1+A2(2021-02)		PASS	
Evaluation of Test Result	The equipment under test was found to comply with the requirements of the standards applied.		
	Seal of CVC Issue Date: 2022.10.24		
Tested by:	Reviewed by:	Approved by:	
			
Xu ZhenFei Name Signature	Liu YongHai Name Signature	Chen HuaWen Name Signature	
Other Aspects: NONE.			
Abbreviations:OK, Pass= passed Fail = failed N/A= not applicable EUT= equipment, sample(s) under tested			

This test report relates only to the EUT, and shall not be reproduced except in full, without written approval of CVC.



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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
FCC2022-0064-RF2	Original release	2022.10.24



1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart C Section 15.225, RSS-210; RSS-Gen			
TANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK
FCC 15.207 RSS-Gen 8.8	AC Power Line Conducted Emission	PASS	Meet the requirement of limit.
FCC 15.225 (a)&(b)&(c) RSS 210 B.6 (a)&(b)&(c)	The field strength of Fundamental Emission	PASS	Meet the requirement of limit.
FCC 15.225 (d) FCC 15.209 RSS 210 B.6 (d)	Radiated Emissions	PASS	Meet the requirement of limit.
FCC 15.225 (e) RSS 210 B.6	Frequency tolerance	PASS	Meet the requirement of limit.
FCC 15.215 (c)	20dB Bandwidth	PASS	Meet the requirement of limit.
RSS-Gen 6.7	99% Occupied Bandwidth	PASS	Meet the requirement of limit.
FCC 15.203	Antenna Requirement	PASS	No antenna connector is used.



1.1 LIST OF TEST AND MEASUREMENT INSTRUMENTS

Test Equipment	Type/Mode	SERIAL NO.	Equipment No.	Manufacturer	Cal. Due
WIFI & Bluetooth Test System 1					/
Communication Shielded Room 1	4m*3m*3m	CRTDSWKS44301	VGDS-0699	CRT	2024/04/24
Spectrum Analyzer	FSV40	101580	DZ-000238-3	R&S	2023/06/05
Comprehensive Test Instrument	CMW270	100304	DZ-000240-1	R&S	2022/12/09
Analog Signal Generator	SMB100A	181858	DZ-000238-2	R&S	2023/06/05
Vector Signal Generator	SGT100A	111661	DZ-000238-1	R&S	2023/06/05
RF Radio Frequency Switch	JS0806-2	19H9080187		Tonscend	2023/06/06
Programmable DC Power Supply	E3644A	MY58036222	DZ-000178	KEYSIGHT	2023/04/21
Spectrum Analyzer	FSV40	101580	DZ-000238-3	R&S	2023/06/05
Radiation SpuriousTest System					/
3m Semi-Anechoic Chamber	FACT-4	ST08035	WKNA-0024	ETS	2024/12/12
Loop Antenna	FMZB1513	1513-170	EM-000384	SCHWARZBECK	2023-03-04
Spectrum Analyzer	N9010B	MY57470323	DZ-000174	KEYSIGHT	2023/03/02
EMI Test Receiver	N9038A-508	MY532290079	EM-000397	Agilent	2023/03/02
Broadband Antenna	VULB 9163	9163-530	EM-000342	SCHWARZBECK	2023/06/25
Waveguide Horn Antenna	HF906	360306/008	WKNA-0024-8	R&S	2023/03/04
Waveguide Horn Antenna	BBHA9170	00949	DZ-000209-2	SCHWARZBECK	2023/07/31
Preamplifier	BBV 9721	9721-050	DZ-000209-1	SCHWARZBECK	2023/06/05
5G Bandstop Filters	WRCJV12-4900-5100-5900-6100-50EE	1	DZ-000186	WI	2022/12/20
Comprehensive tester	CMW500	159000	DZ-000240-2	R&S	2022/12/20
Conducted emission					/
EMI Test Receiver	ESCI	100857	WKNB-0081	R&S	2022-12-08
EMI Test Receiver	ESR3	102394	VG DY-0705	R&S	2023-03-04
LISN	NSLK 8127	8127644	VG DY-0150	SCHWARZBECK	2023-09-04
LISN	NSLK 8128	8128-316	VG DY-0149	SCHWARZBECK	2023-09-04
LISN	NSLK 8129	8129-268	EM-000388	SCHWARZBECK	2023-03-03
Plus Limiter (＃1)	VTSD 9561 F-N	00515	VG DY-0808	SCHWARZBECK	2023-03-04
Plus Limiter (＃2)	VTSD 9561	9561-F017	VG DY-0152	SCHWARZBECK	2024-09-04
Impedance Stabilization Network	ISN T800	27095	WKNE-0195	TESEQ	2023-09-04
Impedance Stabilization Network	NTFM8158	8158-0092	VG DY-0356	SCHWARZBECK	2023-06-07
ImpedanceStabilizationNetwork	NTFM8131	#184	EM-000498	SCHWARZBECK	2023-06-07
Voltage Probe	TK9420	9420-499	VG DY-0128	SCHWARZBECK	2023-03-04
Power Divider	4901.17.B	22643830	DB-0016	HUBER+SUHNER	2023-09-01
Video Signal Generator	GV-798+	151064920001	VGDS-0215	PROMAX	2023-05-30
AudioSignalGenerator	GAG-810	EK871591	EM-000309	GW	2022-12-08
Shielding Room(＃1)	GP1A	001	WKNF-0001	LEINING	2024-08-08



1.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

No.	ITEM	FREQUENCY	UNCERTAINTY
1	Radiated Spurious Emissions	9KHz ~ 30MHz	±0.769dB
		30MHz ~ 1GMHz	±0.877dB
		1GHz ~ 18GHz	±0.777dB
		18GHz ~ 40GHz	±1.315dB
2	Conducted Emissions	9kHz~30MHz	±2.66dB

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

1.3 TEST LOCATION

The tests and measurements refer to this report were performed by EMC testing Lab. of CVC Testing Technology Co., Ltd.

Address: No.3, TiantaiyiRoad, KaitaiAvenue, ScienceCity, Guangzhou, China

Post Code: 510663 Tel: 0755-23763060-8805

Fax: 0755-23763060 E-mail: sz-kf@cvc.org.cn

<http://www.cvc.org.cn>

2 GENERAL INFORMATION

2.1 GENERAL PRODUCT INFORMATION

PRODUCT	SAGA
BRAND	
TEST MODEL	OV1
ADDITIONAL MODEL	N/A
FCC ID	2AW49200731A
IC ID	26394-200731A
POWER SUPPLY	DC 3.89 from Battery or USB host unit
MODULATION TYPE	ASK
OPERATING FREQUENCY	13.56MHz
NUMBER OF CHANNEL	1
ANTENNA TYPE (Note 4)	Loop antenna
I/O PORTS	Refer to user's manual
HARDWARE REVISION	MP
SOFTWARE REVISION	SQ3A.220705.126
CABLE SUPPLIED	USB line, 1.2Meter, Shielded without ferrite
Note: - For more detailed features description, please refer to the manufacturer's specifications or the User's Manual. - For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report. - EUT photo refer to the report (Report NO.: FCC2022-0064-E). - Since the above data and/or information is provided by the client relevant results or conclusions of this report are only made for these data and/or information, CVC is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion	

2.2 OTHER INFORMATION

The EUT only have one channel.

CHANNEL	FREQUENCY (MHz)
1	13.56



2.3 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports

The worst case was found when positioned on X axis for radiated emission. Following channel(s) was (were) selected for the final test as listed below:

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE	FT	PLC	BW	
A	√	√	√	√	DC 3.89V from Battery with NFC

Where **RE**: Radiated Emission

FT: Frequency tolerance

PLC: Power Line Conducted Emission

BW: 20dB Bandwidth/99% Occupied Bandwidth

RADIATED EMISSION TEST:

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, XYZ axis, antenna ports (if EUT with antenna diversity architecture) and packet type.
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	TESTED CHANNEL	TESTED FREQUENCY (MHZ)	MODULATION TYPE	AXIS
A	1	13.56	ASK	X

FREQUENCY TOLERANCE:

- ☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, antenna ports (if EUT with antenna diversity architecture), and packet types.
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	TESTED CHANNEL	TESTED FREQUENCY (MHZ)	MODULATION TYPE	AXIS
A	1	13.56	ASK	X

**POWER LINE CONDUCTED EMISSION TEST:**

- ☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, antenna ports (if EUT with antenna diversity architecture), and packet types.
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	TESTED CHANNEL	TESTED FREQUENCY (MHZ)	MODULATION TYPE	AXIS
A	1	13.56	ASK	-

20dB bandwidth/99% OCCUPIED BANDWIDTH

- ☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, antenna ports (if EUT with antenna diversity architecture), and packet types.
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	TESTED CHANNEL	TESTED FREQUENCY (MHZ)	MODULATION TYPE	AXIS
A	1	13.56	ASK	X

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	TEST VOLTAGE (SYSTEM)	TESTED BY
RE	23deg. C, 53%RH	DC 3.89V from Battery	Liu ShiWei
FT	25deg. C, 50%RH	DC 3.89V from Battery	Liu ShiWei
PLC	25deg. C, 50%RH	DC 3.89V from Battery	Liu ShiWei
BW	25deg. C, 50%RH	DC 3.89V from Battery	Liu ShiWei



2.4 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product, according to the specifications of the manufacturers. It must comply with the requirements of the following standards:

FCC PART 15, Subpart C. Section 15.225

ANSI C63.10-2020

Canada RSS-210 Issue 10 (2020-04)

Canada RSS-Gen Issue 5+A1+A2(2021-02)

All test items have been performed and recorded as per the above standards

2.5 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.

During the tests.

Support Equipment							
NO	Description	Brand	Model No.	Serial Number	Supplied by		
N/A	N/A	N/A	N/A	N/A	N/A		
Support Cable							
NO	Description	Quantity (Number)	Length (m)	Detachable (Yes/ No)	Shielded (Yes/ No)	Cores (Number)	Supplied by
1	N/A	N/A	N/A	N/A	N/A	N/A	N/A

3 TEST TYPES AND RESULTS

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 Limit

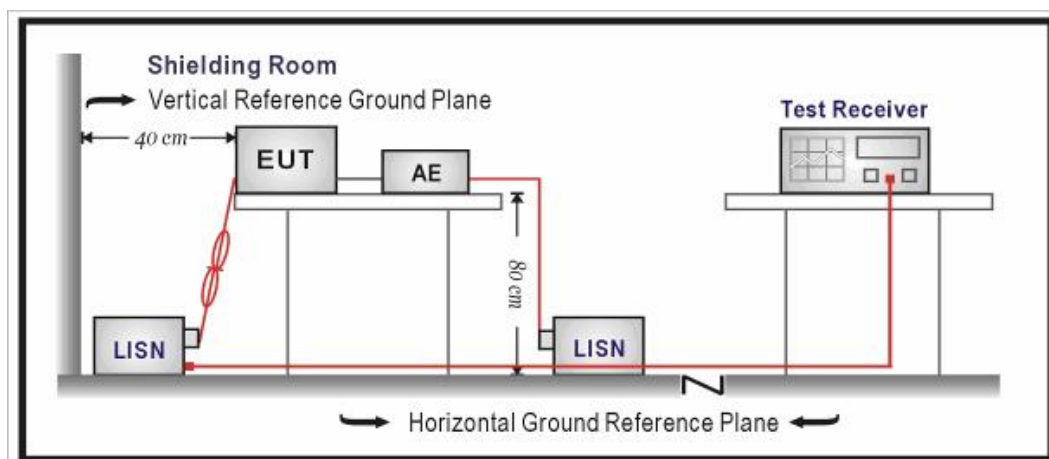
Frequency (MHz)	Conducted Limits(dBμV)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56 *	56 to 46*
0.5 - 5	56	46
5 - 30	60	50

NOTE: 1. The lower limit shall apply at the transition frequencies.
NOTE: 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

3.1.2 Measurement procedure

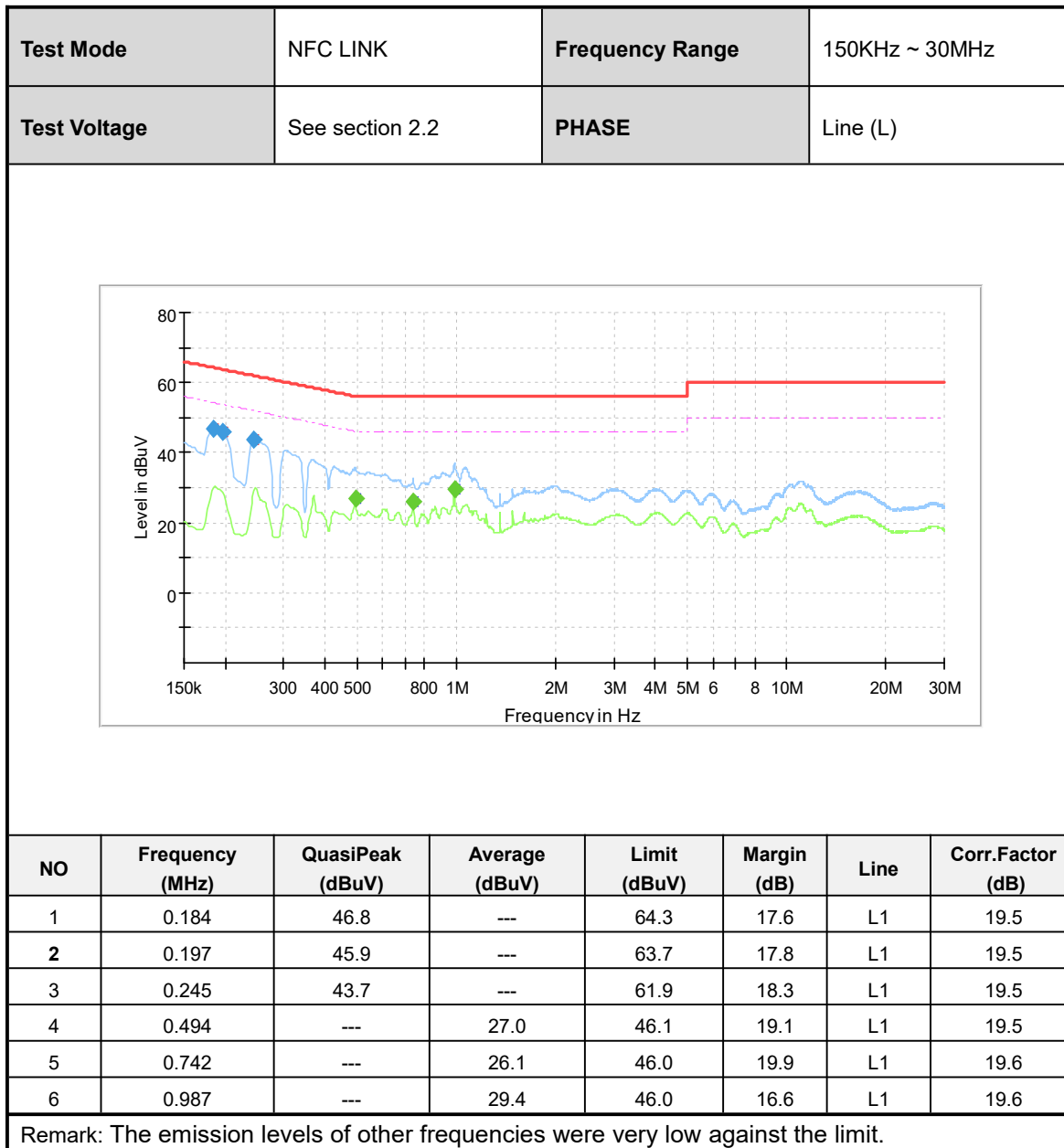
- The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the Test photographs) Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source. The equipment under test shall be placed on a support of non-metallic material, the height of which shall be 1.5m above the ground,
- The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
- Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.

3.1.3 Test setup



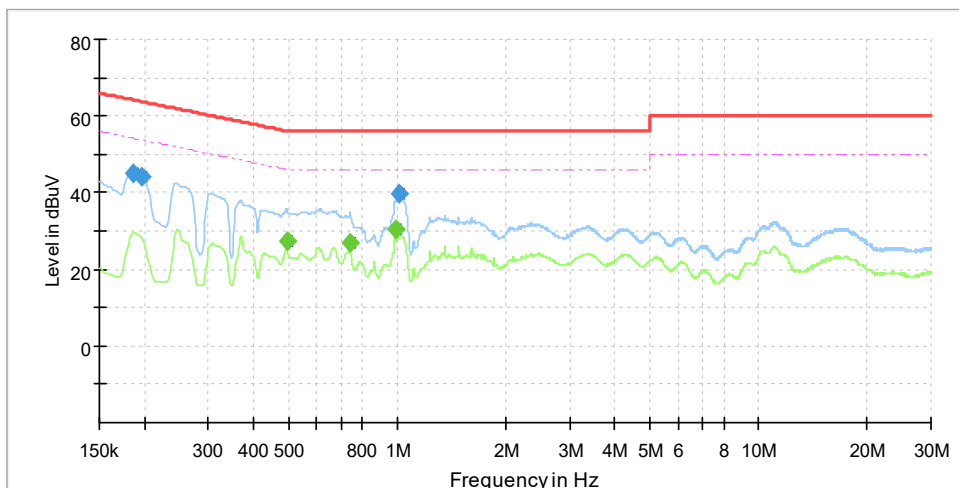
3.1.4 Test results

CONDUCTED WORST-CASE DATA:





Test Mode	NFC LINK	Frequency Range	150KHz ~ 30MHz
Test Voltage	See section 2.2	PHASE	Line (L)



NO	Frequency (MHz)	QuasiPeak (dBuV)	Average (dBuV)	Limit (dBuV)	Margin (dB)	Line	Corr.Factor (dB)
1	0.186	45.0	---	64.2	19.2	N	19.5
2	0.197	44.3	---	63.7	19.5	N	19.5
3	0.494	---	27.2	46.1	18.9	N	19.6
4	0.740	---	27.1	46.0	18.9	N	19.6
5	0.987	---	30.3	46.0	15.7	N	19.6
6	1.016	39.9	---	56.0	16.1	N	19.6

Remark: The emission levels of other frequencies were very low against the limit.



3.2 RADIATED EMISSIONS

3.2.1 Limits

§15.225

IC RSS-210, Annex B.6

IC RSS-GEN, Section 8.9

(a) The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.

(b) Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.

(c) Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.

(d) The field strength of any emissions appearing outside of the 13.110– 14.010 MHz and shall not exceed the general radiated emission limits in § 15.209 as follows:

§15.209 (a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

FREQUENCIES (MHz)	FIELD STRENGTH (Microvolts/Meter)	MEASUREMENT DISTANCE (Meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTE: 1. The lower limit shall apply at the transition frequencies.
NOTE: 2. Emission level (dBuV/m) = 20 log Emission level (uV/m).

Note: The limits in CFR 47, Part 15, Subpart C, paragraph 15.209(a), are identical to those in RSS-Gen section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as report in the table) using free space impedance of 377 Ohms, For example. the measurement at frequency X kHz resulted in a level of Y dBuV/m, which is equivalent to $Y-51.5 = Z$ dBuA/m, which has the same margin, WdB to the corresponding RSS-Gen Table 6 limit as it has to 15.209(a) limit.

3.2.2 Measurement procedure

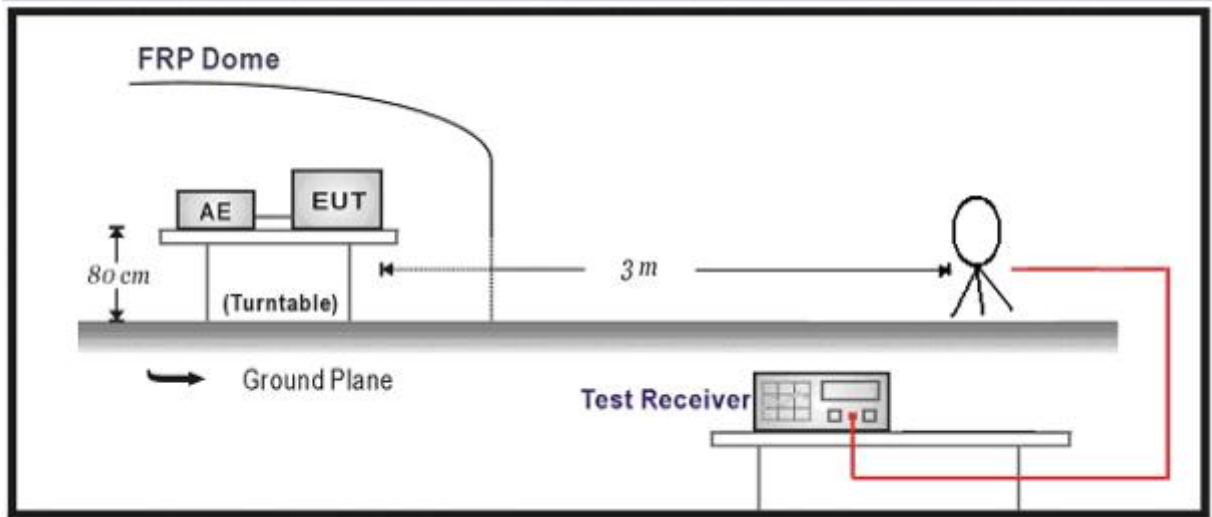
- a. The EUT was placed on the top of a rotating table 1.5 meters(above 1GHz) and 0.8 meters(below 1GHz) above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. For below 1GHz was used bilog antenna, and above 1GHz was used horn antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. For below 30MHz, a loop antenna with its vertical plane is place 3m from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. And the centre of the loop shall be 1m above the ground.
- g. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, For battery operated equipment, the equipment tests shall be perform using fresh batteries. The turntable was rotated to maximize the emission level.

NOTE:

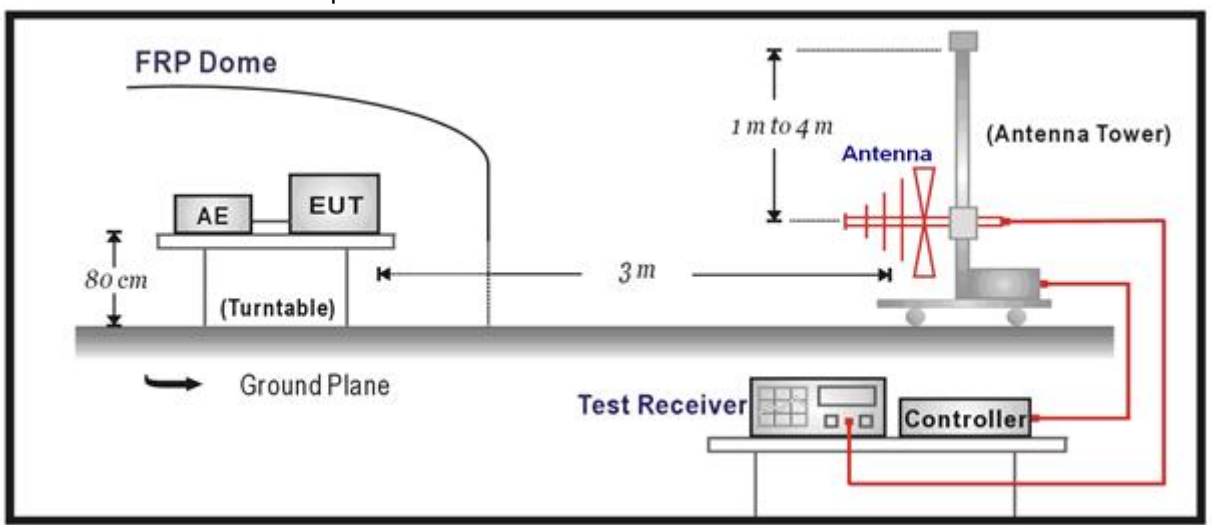
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle < 98%) or 10Hz(Duty cycle > 98%) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.
5. The testing of the EUT was performed on all 3 orthogonal axes; the worst-case test configuration was reported on the file test setup photo.

3.2.3 Test setup

Below 30MHz Test Setup:

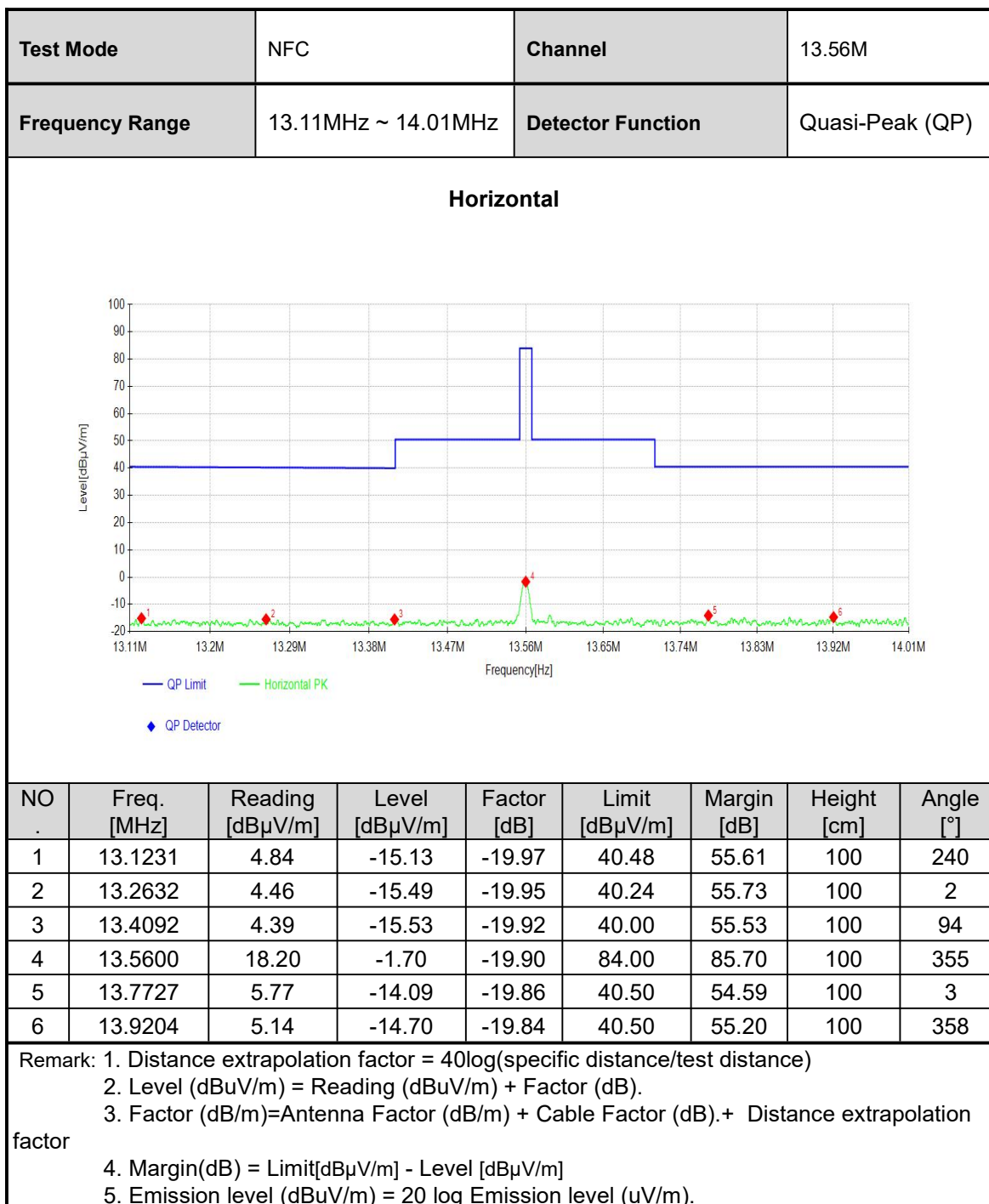


Below 1GHz Test Setup:

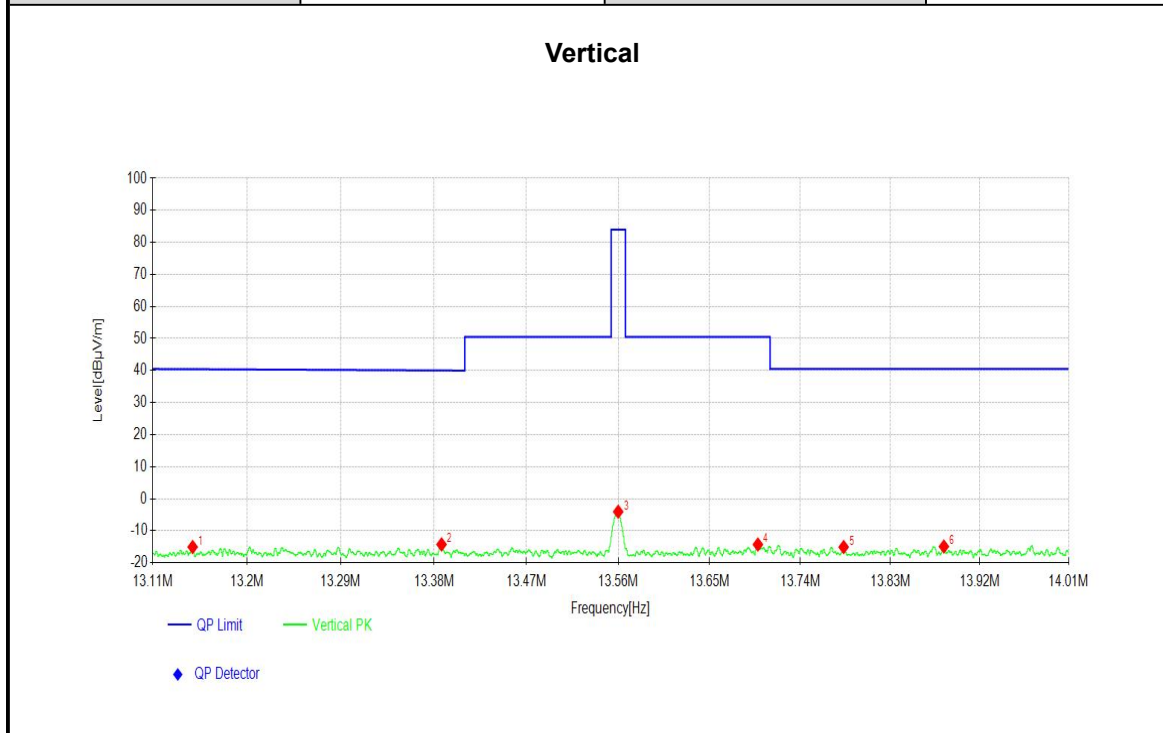


3.2.4 Test results

Result of The field strength of Fundamental Emission



Test Mode	NFC	Channel	13.56M
Frequency Range	13.11MHz ~ 14.01MHz	Detector Function	Quasi-Peak (QP)



NO	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]
1	13.1481	4.90	-15.06	-19.96	40.44	55.50	100	202
2	13.3874	5.65	-14.27	-19.92	40.04	54.31	100	71
3	13.5599	15.85	-4.05	-19.90	84.00	88.05	100	275
4	13.6979	5.58	-14.29	-19.87	50.50	64.79	100	231
5	13.7833	4.78	-15.08	-19.86	40.50	55.58	100	298
6	13.8838	4.93	-14.91	-19.84	40.50	55.41	100	123

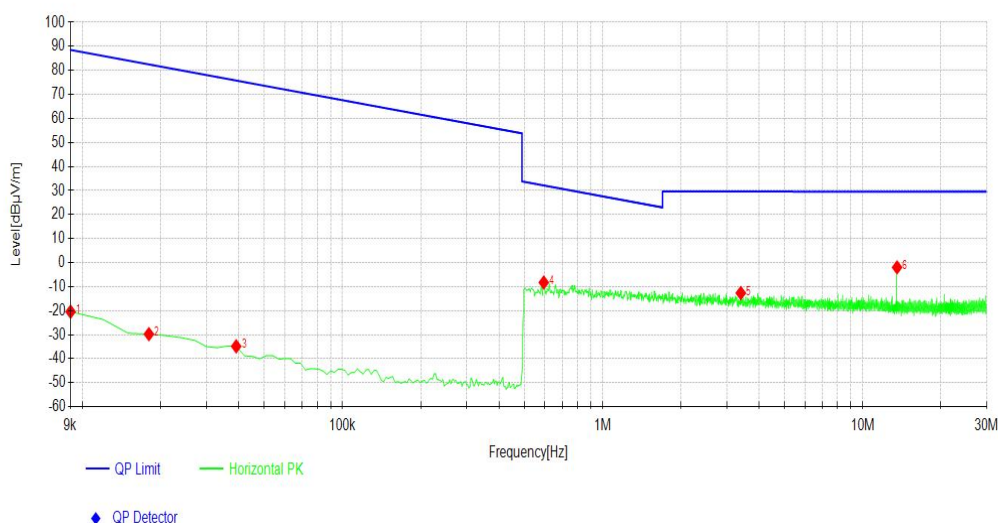
Remark: 1. Distance extrapolation factor = $40\log(\text{specific distance}/\text{test distance})$
 2. Level (dBμV/m) = Reading (dBμV/m) + Factor (dB).
 3. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB). + Distance extrapolation factor
 4. Margin(dB) = Limit[dBμV/m] - Level [dBμV/m]
 5. Emission level (dBμV/m) = $20 \log$ Emission level (uV/m).



Result of Radiated Emissions(9kHz~30MHz)

Test Mode	NFC	Channel	13.56M
Frequency Range	9kHz ~ 30MHz	Detector Function	Quasi-Peak (QP)

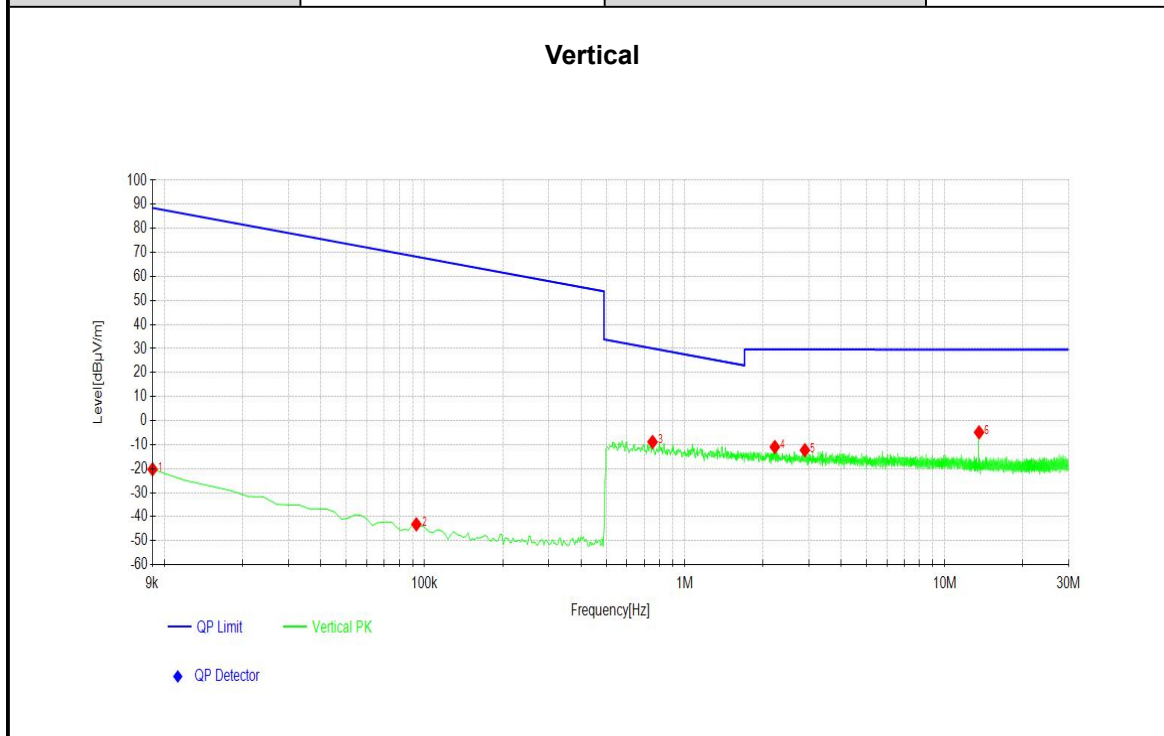
Horizontal



NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]
1	0.0090	39.06	-20.42	-59.48	88.52	108.94	100	44
2	0.0180	29.60	-29.75	-59.35	82.50	112.25	100	350
3	0.0390	24.31	-34.83	-59.14	75.78	110.61	100	266
4	0.5939	10.53	-8.27	-18.80	32.13	40.40	100	158
5	3.3983	6.37	-12.66	-19.03	29.56	42.22	100	0
6	13.5603	17.93	-1.97	-19.90	29.55	31.52	100	354

Remark: 1. Distance extrapolation factor = $40\log(\text{specific distance}/\text{test distance})$
2. Level (dBuV/m) = Reading (dBuV/m) + Factor (dB).
3. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) + Cable Factor (dB). + Distance extrapolation factor
4. Margin(dB) = Limit[dBμV/m] - Level [dBμV/m]
5. Emission level (dBuV/m) = $20 \log$ Emission level (uV/m).

Test Mode	NFC	Channel	13.56M
Frequency Range	9kHz ~ 30MHz	Detector Function	Quasi-Peak (QP)



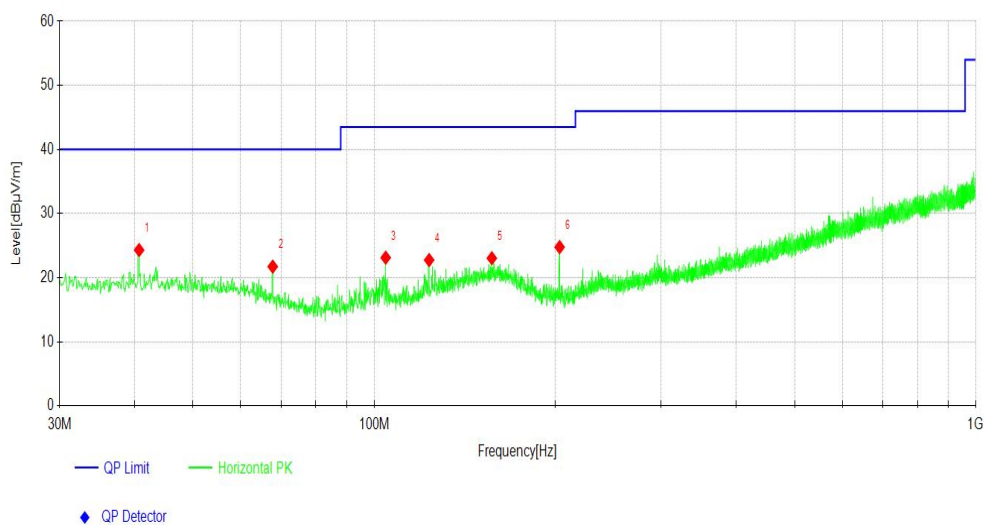
NO	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]
1	0.0090	39.22	-20.26	-59.48	88.52	108.78	100	10
2	0.0930	16.26	-43.17	-59.43	68.24	111.41	100	3
3	0.7529	10.10	-8.87	-18.97	30.06	38.93	100	63
4	2.2226	8.12	-10.96	-19.08	29.57	40.53	100	240
5	2.9004	6.71	-12.29	-19.00	29.56	41.85	100	119
6	13.5603	15.03	-4.87	-19.90	29.55	34.42	100	286

Remark: 1. Distance extrapolation factor = $40 \log(\text{specific distance}/\text{test distance})$
2. Level (dBuV/m) = Reading (dBuV/m) + Factor (dB).
3. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) + Cable Factor (dB). + Distance extrapolation factor
4. Margin(dB) = Limit[dBμV/m] - Level [dBμV/m]
5. Emission level (dBuV/m) = $20 \log$ Emission level (uV/m).

Result of Radiated Emissions(30MHz~1GHz)

Test Mode	NFC	Channel	13.56M
Frequency Range	30MHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

Horizontal



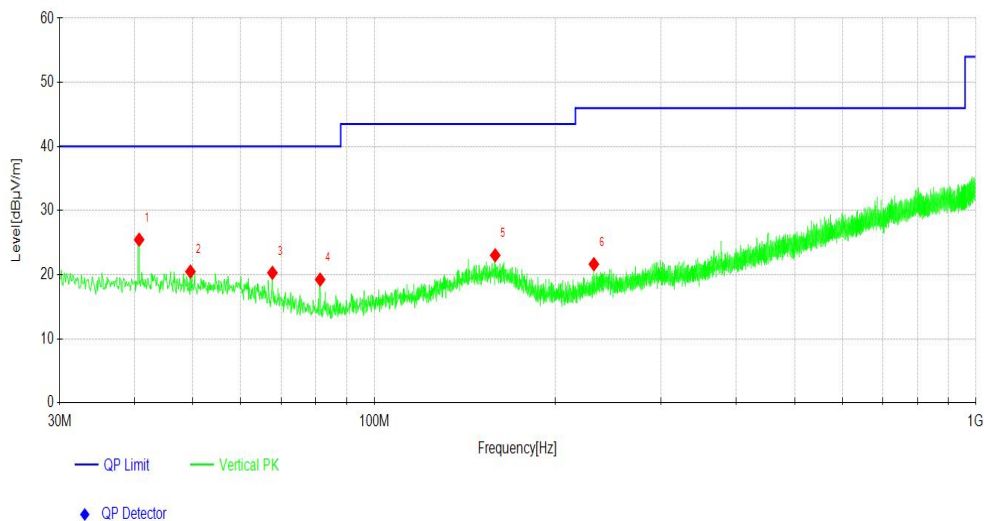
NO	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]
1	40.6711	4.72	24.31	19.59	40.00	15.69	200	150
2	67.8338	4.39	21.72	17.33	40.00	18.28	200	292
3	104.5035	6.54	23.12	16.58	43.50	20.38	200	90
4	123.4203	4.71	22.75	18.04	43.50	20.75	200	84
5	156.8887	2.24	23.04	20.80	43.50	20.46	100	202
6	203.3563	7.77	24.77	17.00	43.50	18.73	100	58

Remark: 1. Level (dBuV/m) = Reading (dBuV/m) + Factor (dB).
2. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. Margin(dB) = Limit[dBμV/m] - Level [dBμV/m]
4. Emission level (dBuV/m) = 20 log Emission level (uV/m).



Test Mode	NFC	Channel	13.56M
Frequency Range	30MHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

Vertical



NO	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]
1	40.6711	5.87	25.46	19.59	40.00	14.54	100	88
2	49.4990	1.07	20.48	19.41	40.00	19.52	100	227
3	67.7368	2.93	20.28	17.35	40.00	19.72	100	358
4	81.3181	3.89	19.23	15.34	40.00	20.77	100	232
5	158.9259	2.14	23.02	20.88	43.50	20.48	100	177
6	231.8772	3.62	21.63	18.01	46.00	24.37	100	340

Remark: 1. Level (dBuV/m) = Reading (dBuV/m) + Factor (dB).
2. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. Margin(dB) = Limit[dBμV/m] - Level [dBμV/m]
4. Emission level (dBuV/m) = 20 log Emission level (uV/m).

3.3 FREQUENCY TOLERANCE

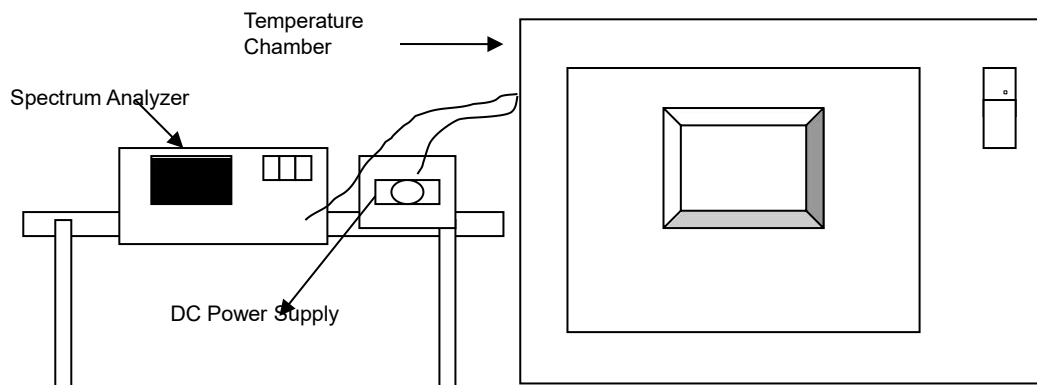
3.3.1 LIMIT OF FREQUENCY TOLERANCE

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ (100ppm) of the operating frequency over a temperature variation of -20 degrees to $+50$ degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

3.3.2 TEST PROCEDURES

- The EUT was placed inside the environmental test chamber and powered by nominal DC voltage.
- Turn the EUT on and couple its output to a spectrum analyzer.
- Turn the EUT off and set the chamber to the highest temperature specified.
- Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
- Repeat step c) and d) with the temperature chamber set to the lowest temperature.
- The test chamber was allowed to stabilize at $+20$ degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

3.3.3 TEST SETUP





3.3.4 TEST RESULTS

FREQUENCY STABILITY VERSUS TEMP.									
TEMP. (°C)	POWER SUPPLY (V)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift
		(MHz)	ppm	(MHz)	ppm	(MHz)	ppm	(MHz)	ppm
50	3.89	13.560607	44.32	13.560603	44.47	13.560611	45.06	13.560603	44.47
40	3.89	13.560602	44.40	13.560605	44.62	13.560610	44.99	13.560600	44.25
30	3.89	13.560597	44.03	13.560603	44.47	13.560616	45.43	13.560606	44.69
20	3.89	13.560596	43.95	13.560599	44.17	13.560613	45.21	13.560602	44.40
10	3.89	13.560598	44.10	13.560598	44.10	13.560615	45.35	13.560605	44.62
0	3.89	13.560603	44.47	13.560600	44.25	13.560614	45.28	13.560602	44.40
-10	3.89	13.560605	44.62	13.560608	44.84	13.560607	44.76	13.560598	44.10
-20	3.89	13.560603	44.47	13.560607	44.76	13.560608	44.84	13.560603	44.47
20	4.46	13.560599	44.17	13.560605	44.62	13.560614	45.28	13.560604	44.54
	3.60	13.560606	44.69	13.560598	44.10	13.560616	45.43	13.560598	44.10

3.4 20dB BANDWIDTH

3.4.1 LIMITS OF 20dB BANDWIDTH

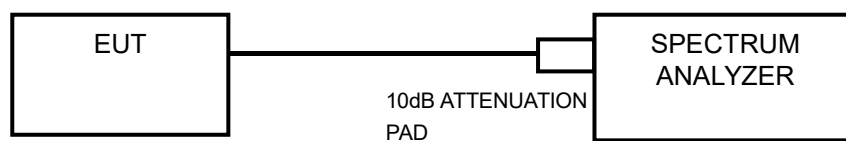
The 20dB bandwidth shall be specified in operating frequency band. (13.11MHz – 14.01MHz)

3.4.2 TEST PROCEDURE

- Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
- The resolution bandwidth of 1kHz and the video bandwidth of 3kHz were used.
- Measured spectrum width with power higher than 20dB below carrier.

Note: Because the measured signal is CW or CW-like adjust the RBW per C63.10 would not be practical since measured bandwidth will always follow the RBW and the result will be approximately the RBW

3.4.3 TEST SETUP

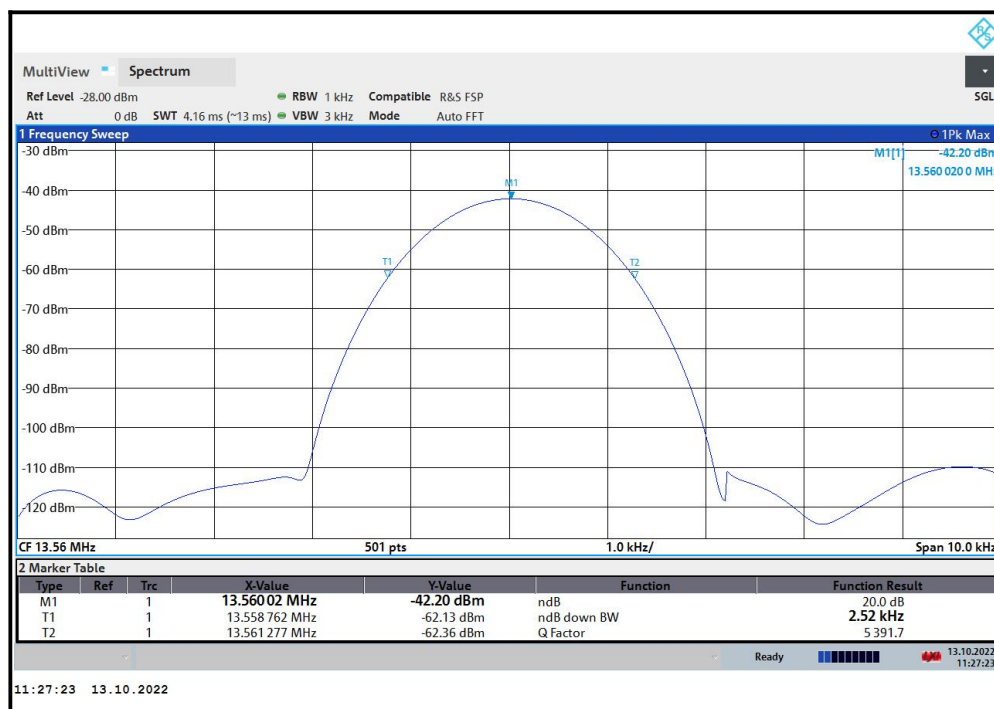




3.4.4 TEST RESULTS

CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (kHz)
1	13.56	2.52

Lower & Upper Test Frequency Point (MHz)	Test Frequency (MHz)	P/F
Lower	13.5587	PASS
Upper	13.5612	PASS



3.5 99% OCCUPIED BANDWIDTH

3.5.1 LIMITS OF 20dB BANDWIDTH

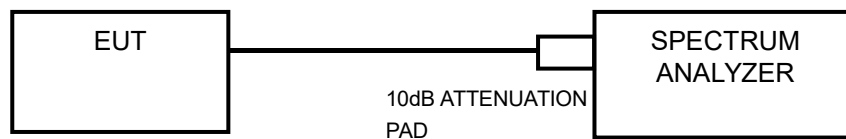
The 20dB bandwidth shall be specified in operating frequency band. (13.11MHz – 14.01MHz)

3.5.2 TEST PROCEDURE

- a. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
- b. The resolution bandwidth of 1kHz and the video bandwidth of 3kHz were used.
- c. Measured spectrum width with power higher than 20dB below carrier.

Note: Because the measured signal is CW or CW-like adjust the RBW per C63.10 would not be practical since measured bandwidth will always follow the RBW and the result will be approximately the RBW

3.5.3 TEST SETUP

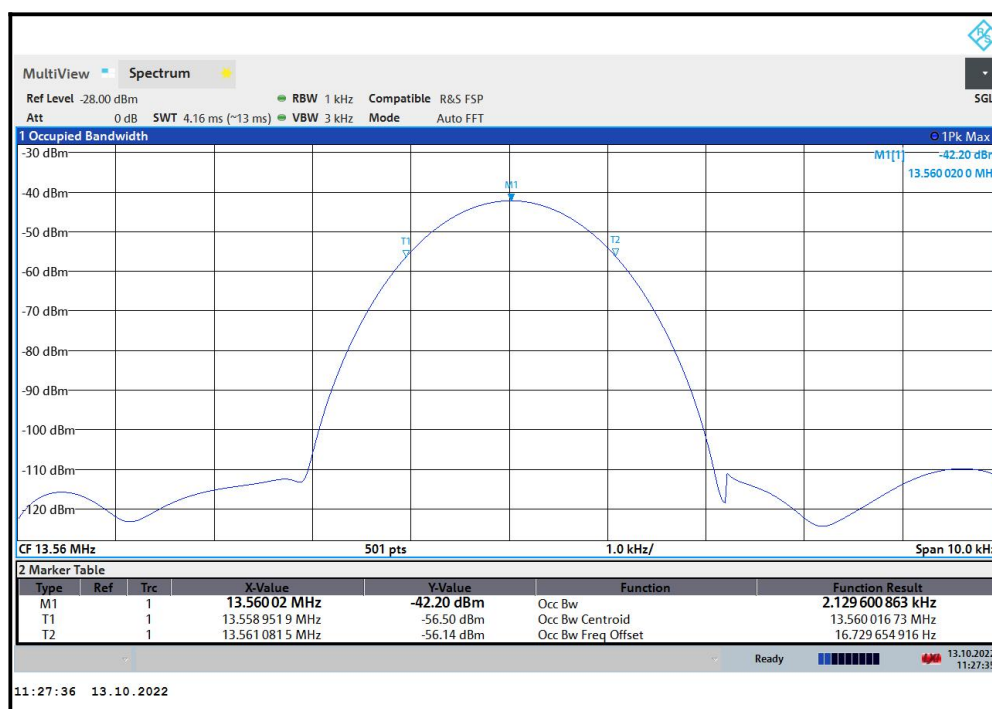




3.5.4 TEST RESULTS

CHANNEL	CHANNEL FREQUENCY (MHz)	99% Occupied Bandwidth (kHz)
1	13.56	2.129

Lower & Upper Test Frequency Point (MHz)	Test Frequency (MHz)	P/F
Lower	13.5589	PASS
Upper	13.5610	PASS





4 PHOTOGRAPHS OF TEST SETUP

Please refer to the attached file (Test Photos).



5 PHOTOGRAPHS OF THE EUT

Please refer to the attached file (External Photos report and Internal Photos).

Important

- (1) The test report is valid with the official seal of the laboratory and the signatures of Test engineer, Author and Reviewer simultaneously.
- (2) The test report is invalid if altered.
- (3) Any photocopies or part photocopies in the test report are forbidden without the written permission from the laboratory.
- (4) Objections to the test report must be submitted to the laboratory within 15 days.
- (5) Generally, commission test is responsible for the tested samples only.

Address of the laboratory:

CVC Testing Technology Co., Ltd.

Address: No.3, Tiantaiyi Road, Kaitai Avenue, Science City, Guangzhou, China

Post Code: 510663 Tel: 020-32293888

FAX: 020-32293889 E-mail: office@cvc.org.cn