



TEST REPORT

APPLICANT : Hot Pepper, Inc.

PRODUCT NAME : 4G Feature Phone

MODEL NAME : HPP-LF2

BRAND NAME : Hot Pepper

FCC ID : 2APD4-A90L

STANDARD(S) : 47 CFR Part 15 Subpart B

RECEIPT DATE : 2019-08-21

TEST DATE : 2019-08-21 to 2019-09-07

ISSUE DATE : 2020-01-09

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Change History		
Version	Date	Reason for change
1.0	2020-01-09	First edition



1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	Hot Pepper, Inc.
Applicant Address:	5151 California Ave., Suite 100, Irvine 92617, USA
Manufacturer:	Hot Pepper, Inc.
Manufacturer Address:	5151 California Ave., Suite 100, Irvine 92617, USA

1.2. Equipment Under Test (EUT) Description

EUT Type:	4G Feature Phone
Serial No:	(N/A, marked #1 by test site)
Hardware Version:	A90L_MAINBOARD_P1
Software Version:	HPP-LF2-V1.0.3-190809

Note:

1. For a more detailed description, please refer to specification or user's manual supplied by the applicant and/or manufacturer



2. Test Results

2.1. Applied Reference Documents

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart B:

No.	Identity	Document Title
1	47 CFR Part 15	Radio Frequency Devices

Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Test Date	Test Engineer	Result
1	15.107	Conducted Emission	2019.09.06	Yaming Luo	PASS
2	15.109	Radiated Emission	2019.09.06	Yaming Luo	PASS

NOTE: The tests were performed according to the method of measurements prescribed in ANSI C63.4-2014.



2.2. EUT Setup and Operating Conditions

Frequency range was investigated: Conducted emission test: from 150 KHz to 30 MHz; Radiated emission test: from 30MHz to 6000MHz.

Test Item	
Mode 1	EUT + PC USB Link Note: EUT connects with the PC network port through the USB cable, opens the data link of data packet transmission test software "WINTHRAX".
Mode 2	EUT + Adapter
Mode 3	EUT + Adapter + MP4
Remark: The above test modes in boldface were the worst cases of tests; only the test data of these modes was reported.	

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15 - 35
Relative Humidity (%):	30 - 60
Atmospheric Pressure (kPa):	86 - 106

3. 47 CFR Part 15B Requirements

3.1. Conducted Emission

3.1.1. Requirement

According to FCC section 15.107, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 Ω line impedance stabilization network (LISN).

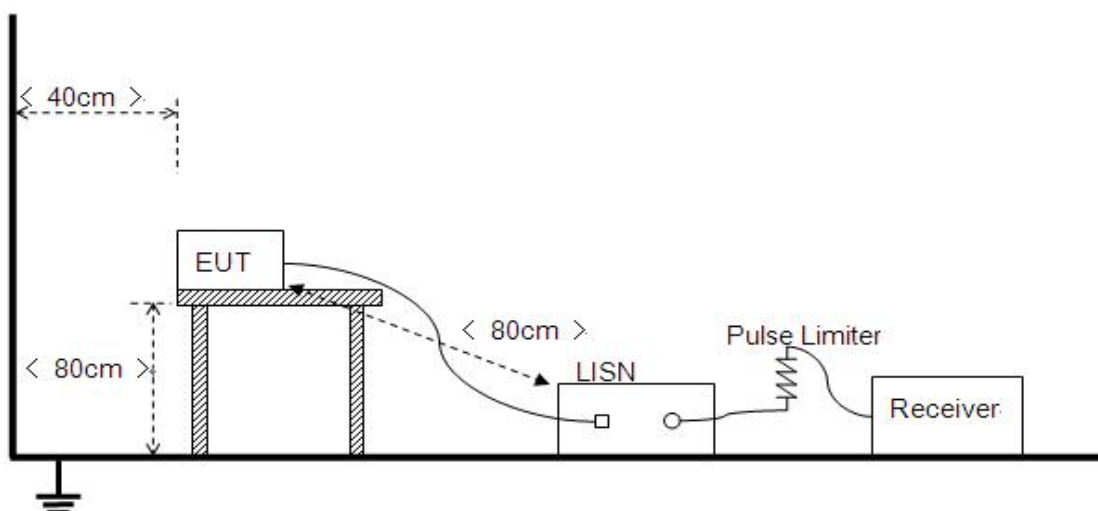
Frequency range (MHz)	Conducted Limit (dB μ V)	
	Quasi-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50

NOTE:

- The limit subjects to the Class B digital device.
- The lower limit shall apply at the band edges.
- The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

3.1.2. Test Setup

Please refer to Annex A for the photographs of the Test Configuration.





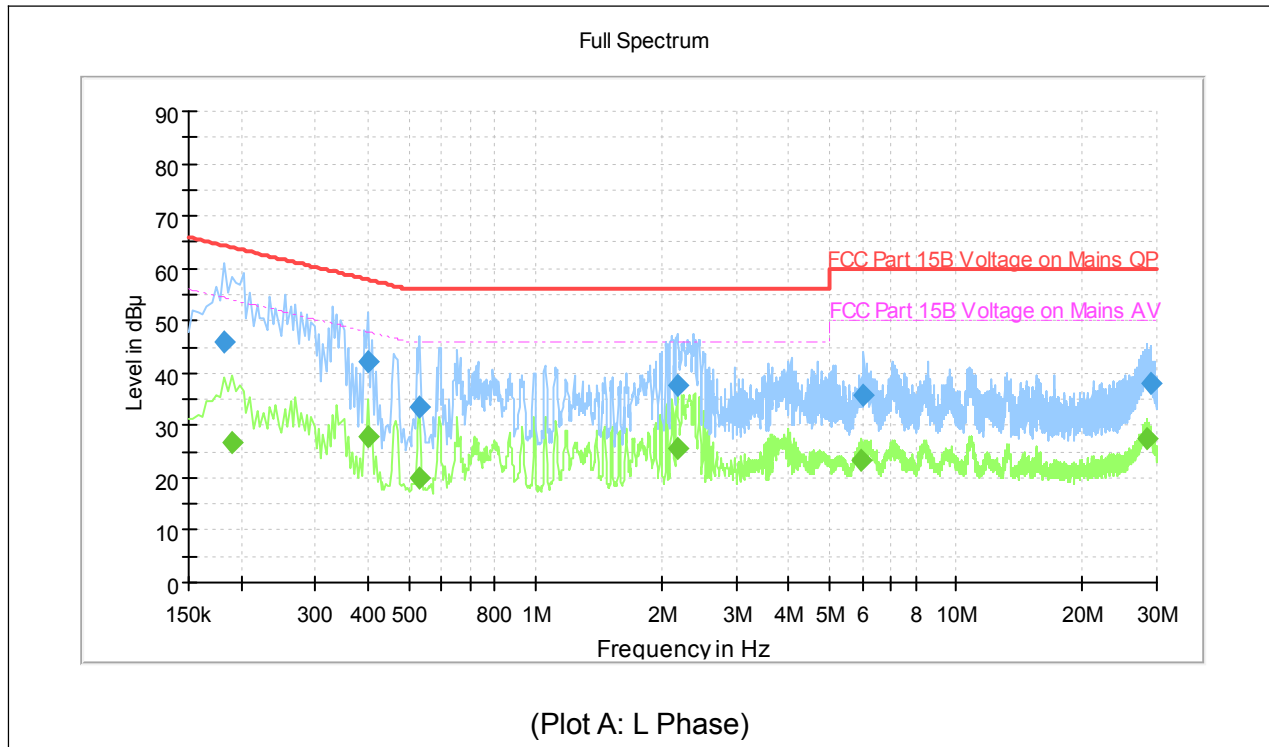
The EUT is placed on a 0.8m high insulating table, which stands on the grounded conducting floor, and keeps 0.4m away from the grounded conducting wall. The EUT is connected to the power mains through a LISN which provides 50Ω/50μH of coupling impedance for the measuring instrument. A Pulse Limiter is used to protect the measuring instrument. The factors of the whole test system are calibrated to correct the reading.

The power strip or extension cord has been investigated to make sure that the LISN integrity is maintained with respect to the impedance characteristics as prescribed in ANSI C63.4-2014 at Clause 4.3.

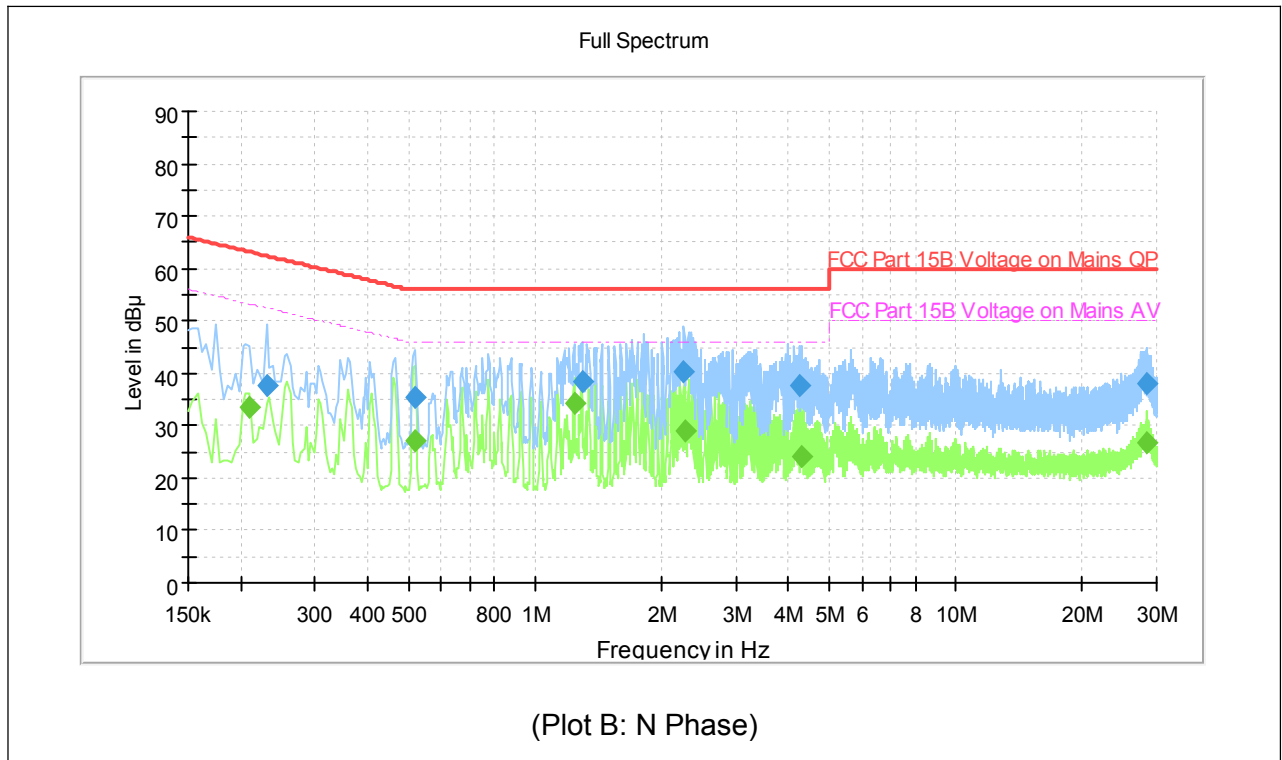
3.1.3. Test Result

The maximum conducted interference is searched using Peak (PK), Quasi-peak (QP) and Average (AV) detectors; the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. All test modes are considered, refer to recorded points and plots below.

A. Test Plot and Suspicious Points:



Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	Verdict
0.182000	45.84	---	64.39	18.55	L1	10.2	PASS
0.190000	---	26.70	54.04	27.34	L1	10.2	PASS
0.402000	---	28.03	47.81	19.79	L1	10.2	PASS
0.402000	42.03	---	57.81	15.78	L1	10.2	PASS
0.530000	33.52	---	56.00	22.48	L1	10.2	PASS
0.530000	---	19.85	46.00	26.15	L1	10.2	PASS
2.178000	---	25.74	46.00	20.26	L1	10.3	PASS
2.182000	37.73	---	56.00	18.27	L1	10.3	PASS
5.974000	---	23.49	50.00	26.51	L1	10.5	PASS
6.042000	35.63	---	60.00	24.37	L1	10.5	PASS
28.522000	---	27.42	50.00	22.58	L1	10.6	PASS
28.986000	38.14	---	60.00	21.86	L1	10.6	PASS



Frequency (MHz)	MaxPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	Verdict
0.210000	---	33.35	53.21	19.86	N	10.2	PASS
0.230000	37.69	---	62.45	24.76	N	10.2	PASS
0.518000	---	27.26	46.00	18.74	N	10.2	PASS
0.518000	35.54	---	56.00	20.46	N	10.2	PASS
1.238000	---	34.09	46.00	11.91	N	10.3	PASS
1.294000	38.51	---	56.00	17.49	N	10.3	PASS
2.262000	40.29	---	56.00	15.71	N	10.3	PASS
2.266000	---	29.18	46.00	16.82	N	10.3	PASS
4.242000	37.65	---	56.00	18.35	N	10.4	PASS
4.278000	---	24.24	46.00	21.76	N	10.4	PASS
28.486000	---	26.89	50.00	23.11	N	10.5	PASS
28.486000	38.13	---	60.00	21.87	N	10.5	PASS



3.2. Radiated Disturbance

3.2.1. Requirement

According to FCC section 15.109 (a), the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency range (MHz)	Field Strength Limitation at 3m Measurement Distance	
	($\mu\text{V/m}$)	(dB $\mu\text{V/m}$)
30.0 - 88.0	100	20log 100
88.0 - 216.0	150	20log 150
216.0 - 960.0	200	20log 200
Above 960.0	500	20log 500

As shown in FCC section 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector. When average radiated emission measurements are specified in this part, including emission measurements below 1000MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules.

Note:

- 1) The tighter limit shall apply at the boundary between two frequency range.
- 2) Limitation expressed in dB $\mu\text{V/m}$ is calculated by $20\log$ Emission Level($\mu\text{V/m}$).

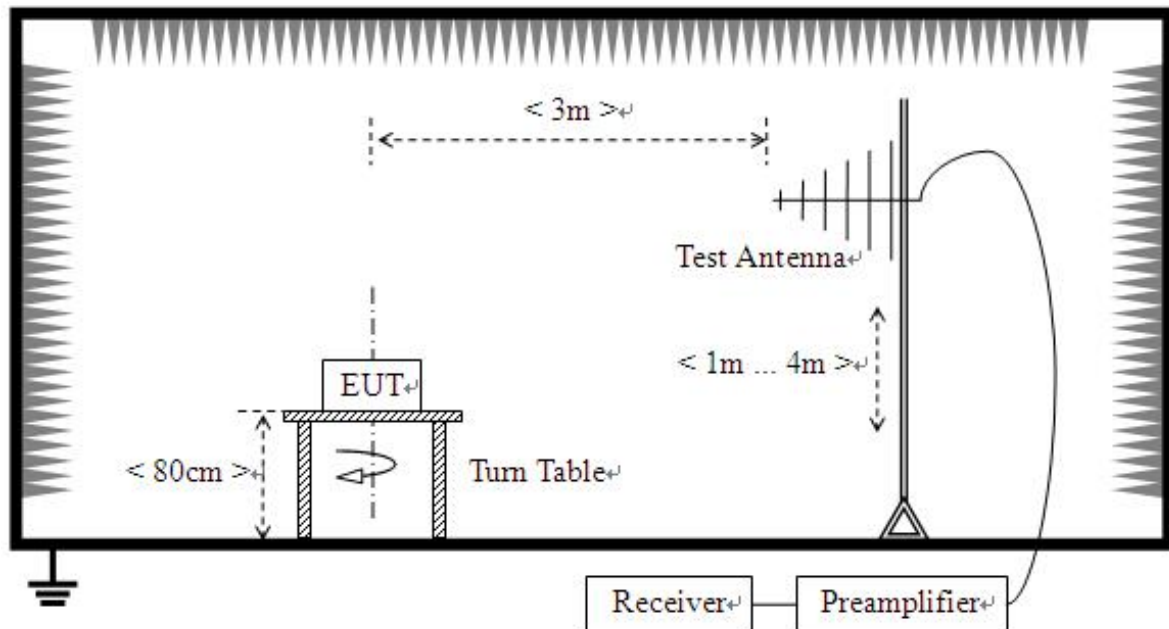
3.2.2. Frequency range of measurement

According to 15.33(b)(1), the frequency range of radiated measurement for the EUT is listed in the following table:

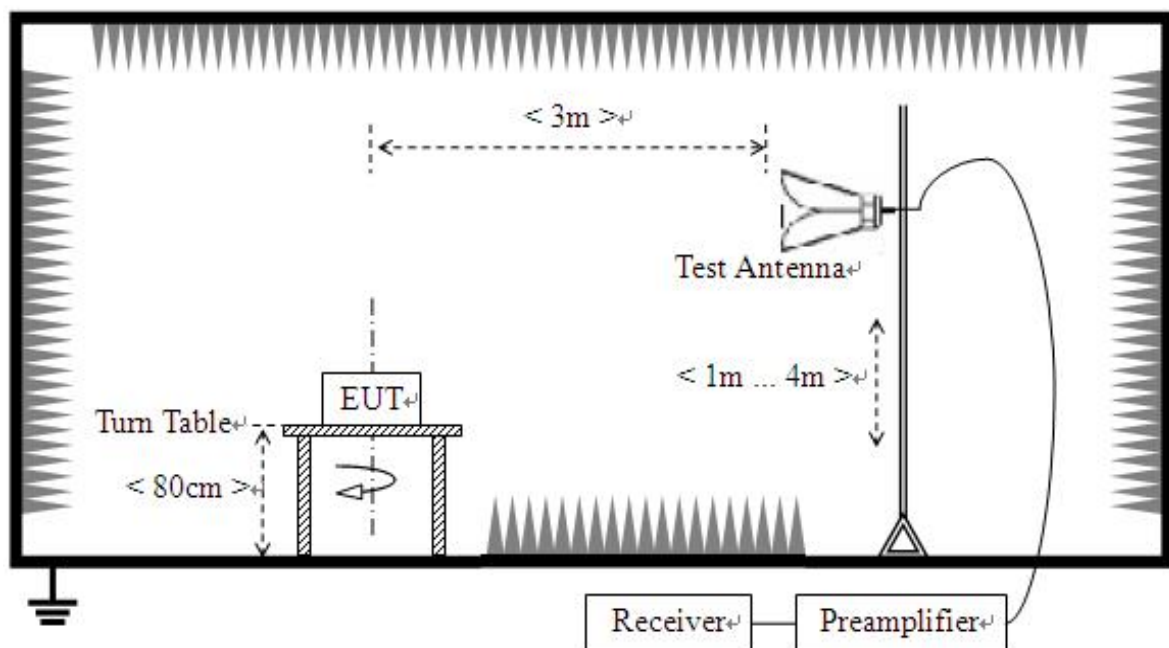
Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30.
1.705-108	1000.
108-500	2000.
500-1000	5000.
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower.

3.2.3. Test Setup

- 1) For radiated emissions from 30MHz to 1GHz



- 2) For radiated emissions above 1GHz





The test is performed in a 3m Semi-Anechoic Chamber; the antenna factor, cable loss and so on of the site (factors) is calculated to correct the reading. The EUT is placed on a 0.8m high insulating Turn Table, and keeps 3m away from the Test Antenna, which is mounted on a variable-height antenna master tower.

For the test Antenna:

In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) and Horn Test Antenna (above 1GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength. The emission levels at both horizontal and vertical polarizations should be tested.

For Radiated emission below 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. 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. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case 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 Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

For Radiated emission above 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. 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.

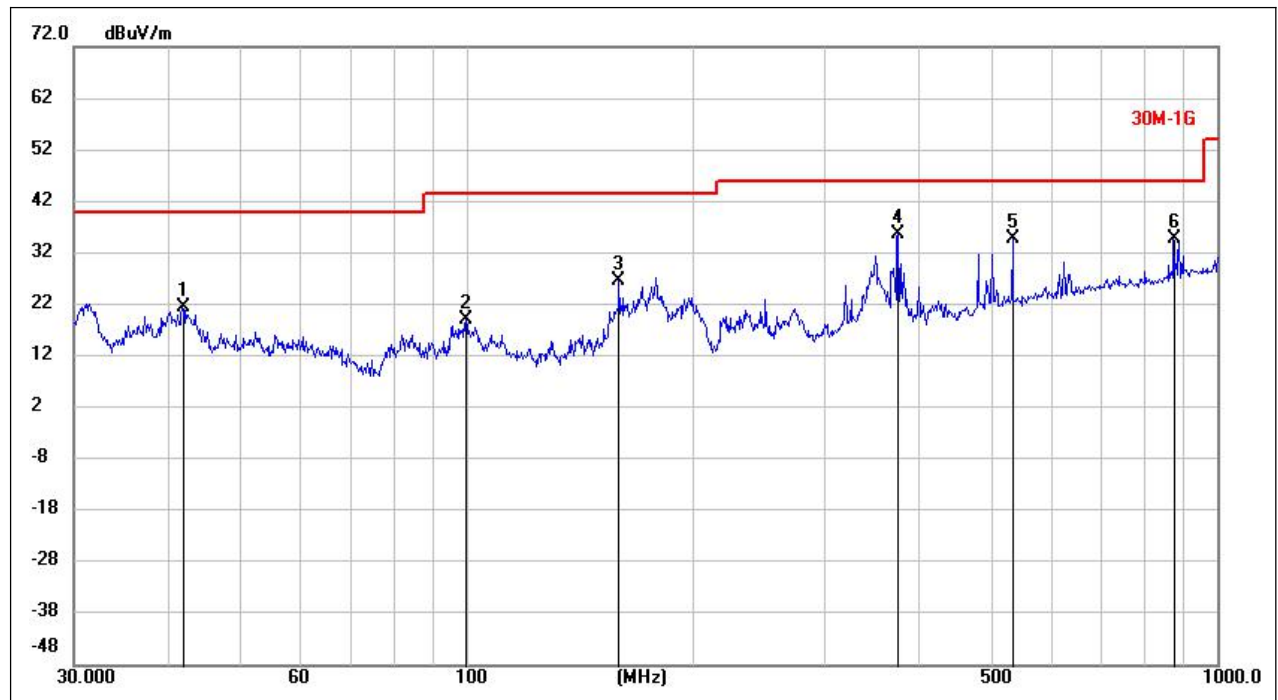


- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case 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 quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

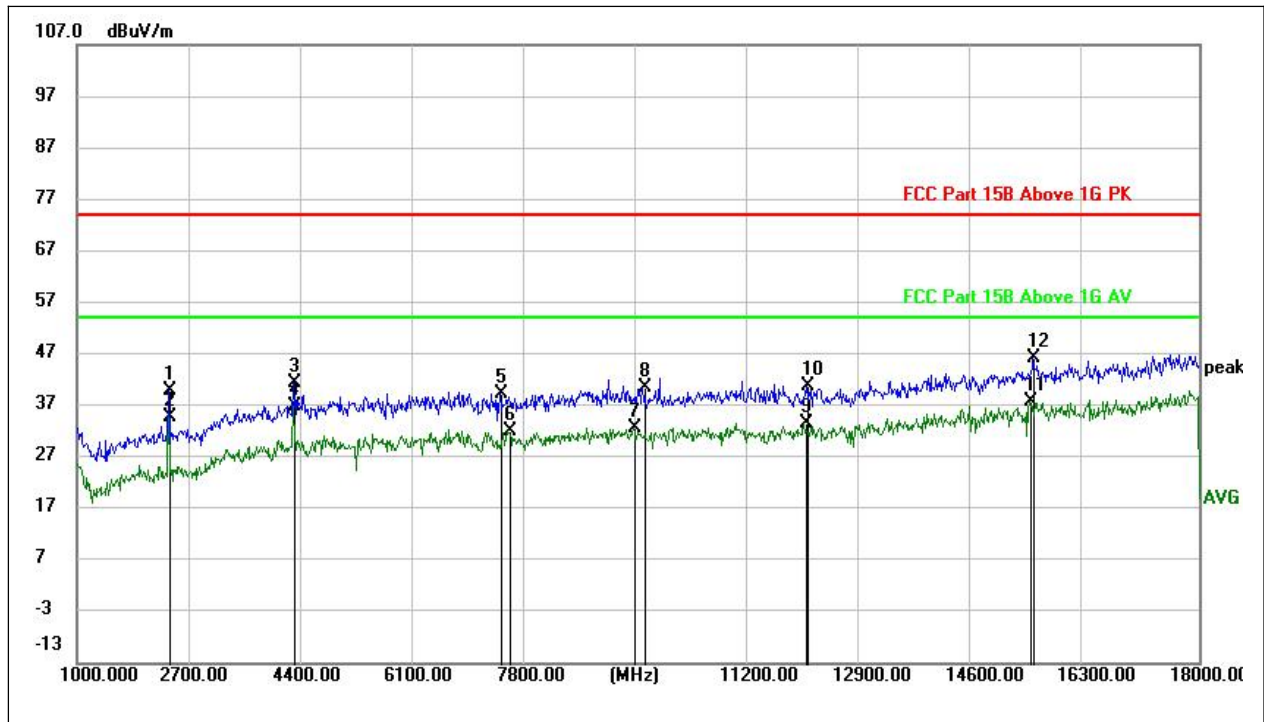
- 1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasipeak detection (QP) at frequency below 1GHz.
- 2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
- 3. All modes of operation were investigated and the worst-case emissions are reported.

3.2.4. Test Result



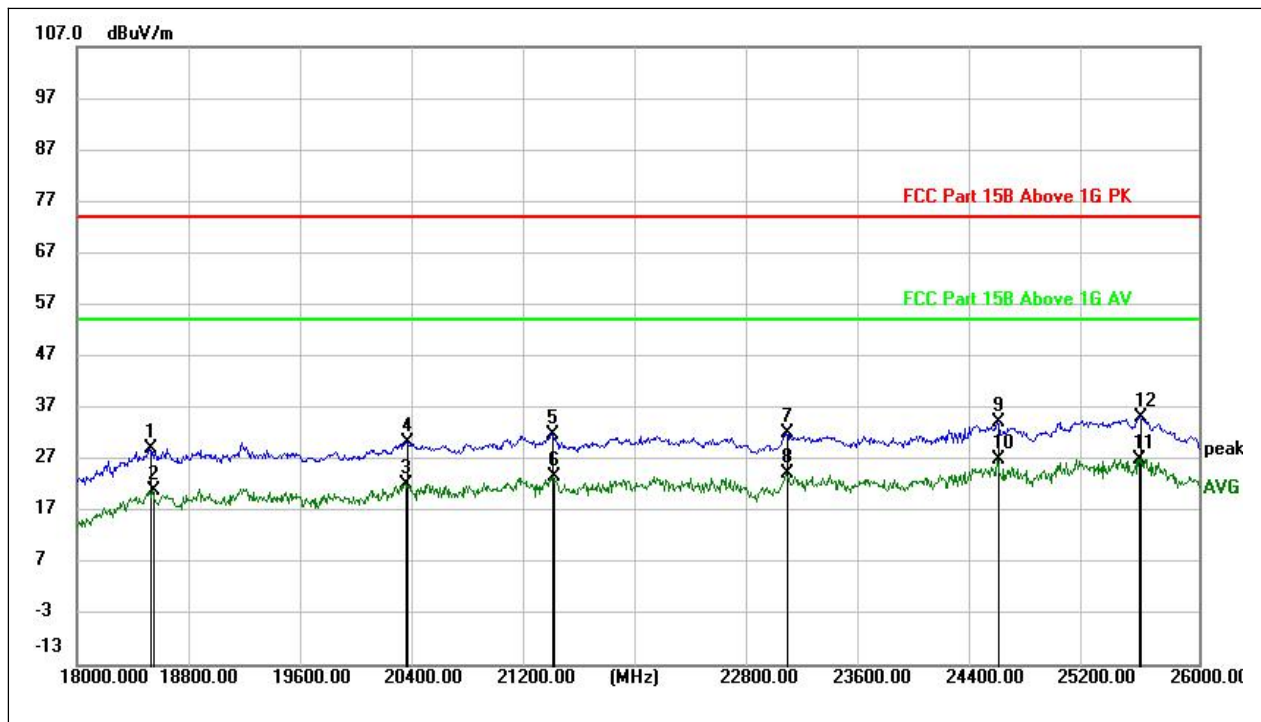
(Plot A: ANT- Horizontal, 30MHz - 1GHz)

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
41.8596	21.63	40.00	18.37	H	15.04	PASS
99.8777	19.02	43.50	24.48	H	15.09	PASS
159.7844	26.73	43.50	16.77	H	12.13	PASS
375.9385	35.81	46.00	10.19	H	18.54	PASS
533.8321	34.84	46.00	11.16	H	18.24	PASS
875.2470	34.75	46.00	11.25	H	22.11	PASS



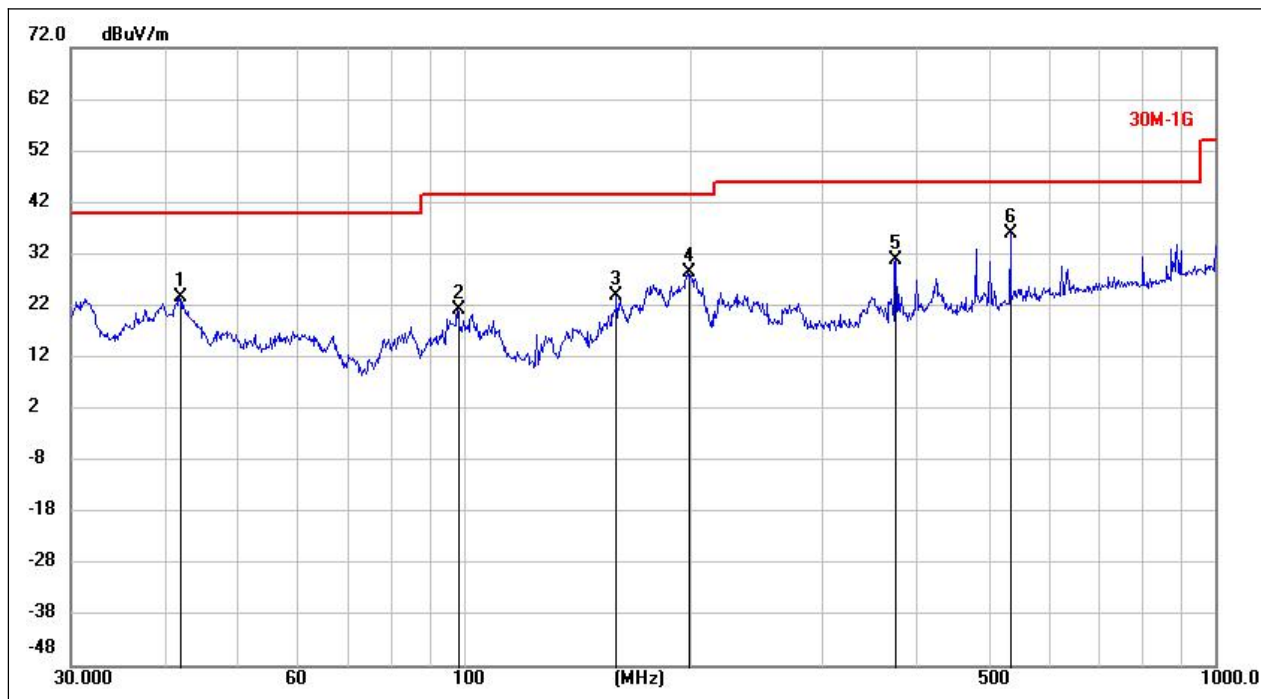
(Plot B: ANT- Horizontal, 1GHz - 18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
2405.050	40.00	---	74.00	34.00	H	-12.18	PASS
2405.050	---	34.72	54.00	19.28	H	-12.18	PASS
4291.200	41.34	---	74.00	32.66	H	-4.78	PASS
4291.200	---	36.85	54.00	17.15	H	-4.78	PASS
7425.150	39.35	---	74.00	34.65	H	-1.56	PASS
7550.950	---	31.98	54.00	22.02	H	-0.87	PASS
9450.700	---	32.59	54.00	21.41	H	0.68	PASS
9586.700	40.66	---	74.00	33.34	H	0.80	PASS
12042.350	---	33.58	54.00	20.42	H	3.23	PASS
12075.500	40.91	---	74.00	33.09	H	3.11	PASS
15439.800	---	37.87	54.00	16.13	H	10.05	PASS
15501.000	46.24	---	74.00	27.76	H	10.68	PASS



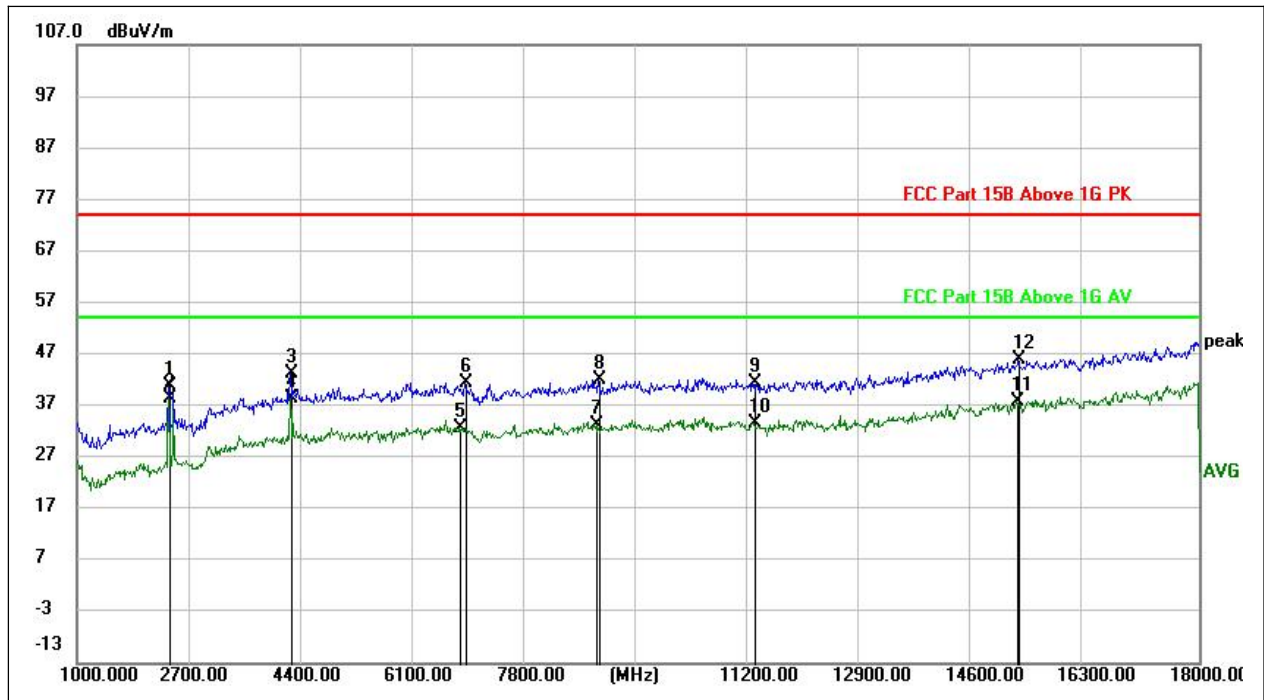
(Plot B: ANT- Horizontal, 18GHz - 26GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
18524.800	29.19	---	74.00	44.81	H	37.43	PASS
18541.600	---	21.05	54.00	32.95	H	37.42	PASS
20341.600	---	22.11	54.00	31.89	H	37.47	PASS
20352.400	30.36	---	74.00	43.64	H	37.47	PASS
21385.600	31.86	---	74.00	42.14	H	37.53	PASS
21403.600	---	23.51	54.00	30.49	H	37.52	PASS
23056.800	31.99	---	74.00	42.01	H	37.36	PASS
23056.800	---	24.24	54.00	29.76	H	37.36	PASS
24562.000	34.16	---	74.00	39.84	H	37.47	PASS
24562.000	---	27.02	54.00	26.98	H	37.47	PASS
25574.800	---	27.08	54.00	26.92	H	37.59	PASS
25586.000	35.22	---	74.00	38.78	H	37.61	PASS



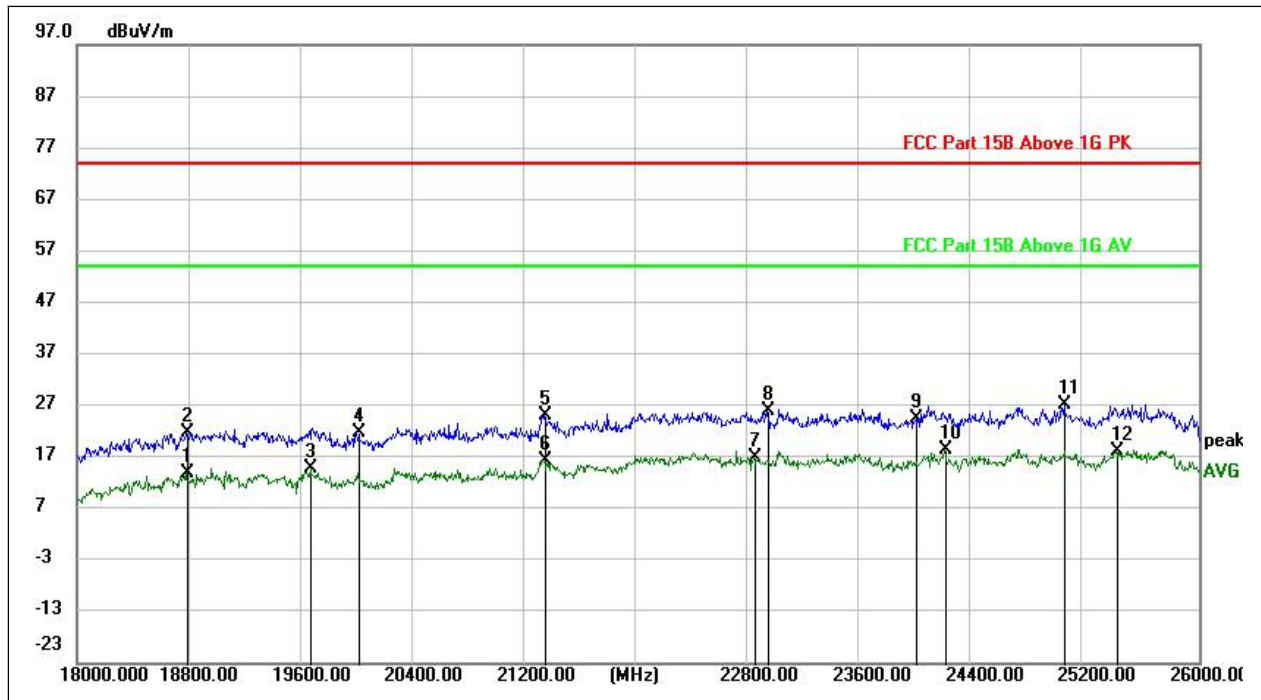
(Plot C: ANT- Vertical, 30MHz - 1GHz)

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
41.8596	23.61	40.00	16.39	V	15.04	PASS
98.1419	21.10	43.50	22.40	V	13.66	PASS
159.7844	23.88	43.50	19.62	V	12.13	PASS
198.5880	28.38	43.50	15.12	V	14.08	PASS
375.9385	30.79	46.00	15.21	V	18.54	PASS
533.8321	35.86	46.00	10.14	V	18.24	PASS



(Plot D: ANT- Vertical, 1GHz - 18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
2405.050	40.67	---	74.00	33.33	V	-12.18	PASS
2405.050	---	38.32	54.00	15.68	V	-12.18	PASS
4235.100	43.35	---	74.00	30.65	V	-4.96	PASS
4235.100	---	38.51	54.00	15.49	V	-4.96	PASS
6811.450	---	32.71	54.00	21.29	V	-2.15	PASS
6887.950	41.35	---	74.00	32.65	V	-2.16	PASS
8882.050	---	33.42	54.00	20.58	V	0.13	PASS
8920.300	42.00	---	74.00	32.00	V	0.09	PASS
11261.200	41.54	---	74.00	32.46	V	2.22	PASS
11261.200	---	33.56	54.00	20.44	V	2.22	PASS
15247.700	---	37.81	54.00	16.19	V	9.50	PASS
15274.050	46.02	---	74.00	27.98	V	9.38	PASS



(Plot D: ANT- Vertical, 18GHz - 26GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
18786.000	---	13.90	54.00	40.10	V	37.37	PASS
18789.600	21.71	---	74.00	52.29	V	37.37	PASS
19671.200	---	14.75	54.00	39.25	V	37.29	PASS
20002.800	21.63	---	74.00	52.37	V	37.58	PASS
21330.800	25.18	---	74.00	48.82	V	37.55	PASS
21330.800	---	16.21	54.00	37.79	V	37.55	PASS
22832.800	---	16.93	54.00	37.07	V	37.48	PASS
22923.200	25.97	---	74.00	48.03	V	37.40	PASS
23987.600	24.60	---	74.00	49.40	V	37.44	PASS
24187.600	---	18.34	54.00	35.66	V	37.46	PASS
25045.600	27.33	---	74.00	46.67	V	37.44	PASS
25418.800	---	18.11	54.00	35.89	V	37.49	PASS



3.3. Radiated Emissions from FM Receivers

3.3.1. Limits of Radiated Emissions from FM Receivers

Frequency range (MHz)	Quasi-Peak Limit (dB μ V/m)	
	Fundamental	Harmonics
30 – 300	60	52
300 – 1000	60	56

Note:

1. The limit is applicable to 3m measurement distance.
2. The lower limit shall apply at the transition frequency.
3. Additional provisions may be required for cases where interference occurs.

3.3.2. Test Procedure

1. The test is performed in a 3m Semi-Anechoic Chamber; the antenna factor. The EUT is placed on a 0.8m high insulating Turn Table, and keeps 3m away from the Test Antenna, which is mounted on a variable-height antenna master tower.
2. For each suspected emission, the EUT is arranged to its worst case and then the Test Antenna is tuned to the heights from 1 to 4m and the Turn Table is tuned from 0 to 360 degrees to find the maximum reading.
3. The Test Antenna height is varied from 1 to 4m above the ground to determine the maximum value of the field strength. Both the vertical and the horizontal polarizations of the Test Antenna are considered to perform the tests.
4. The maximum radiated emission is searched using PK, and QP detectors; the emission levels more than the limits, and that have narrow margins from the limits will be re-measured with QP detectors.

3.3.3. Test Setup

For radiated emissions from 30MHz to 1GHz

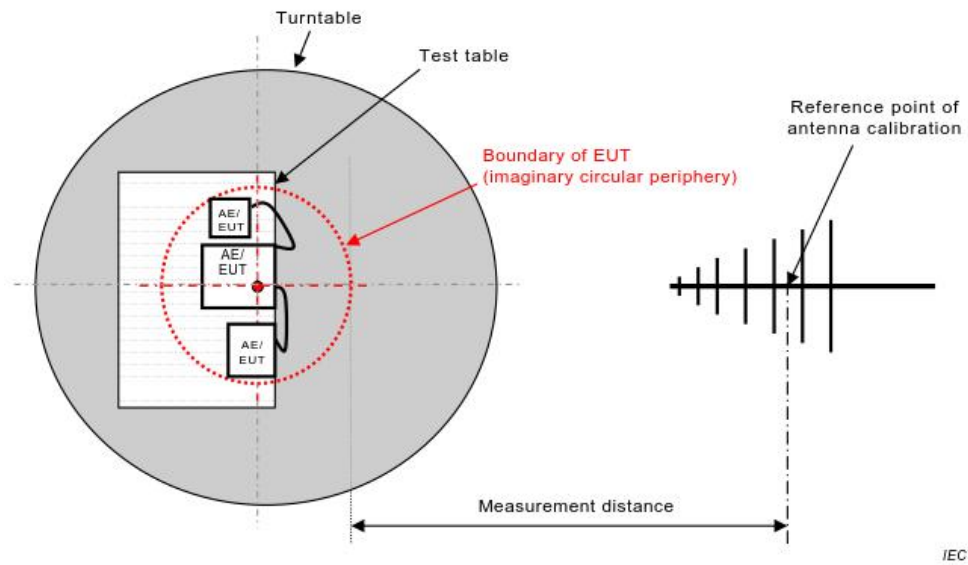


Figure C.1 – Measurement distance

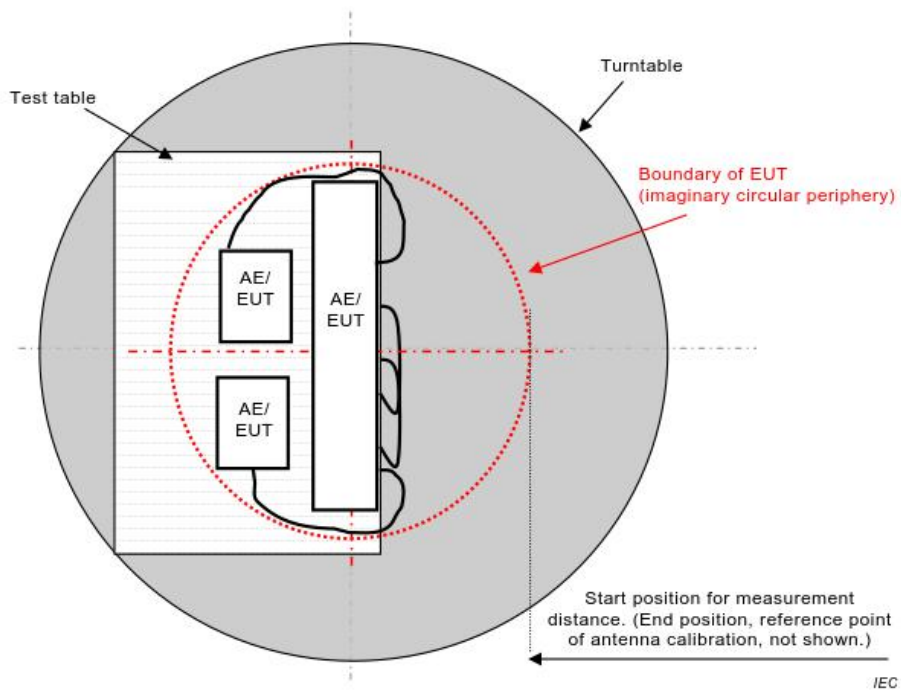
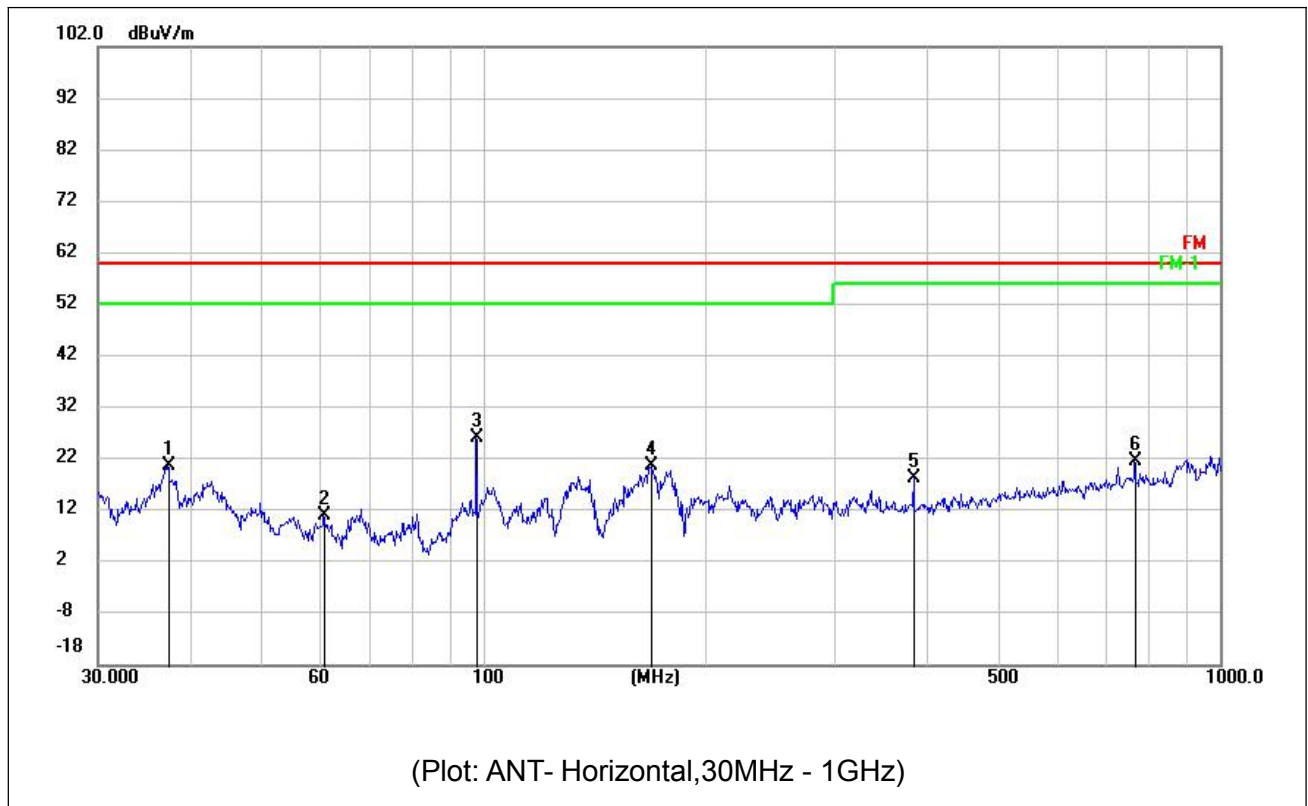


Figure C.2 – Boundary of EUT, Local AE and associated cabling

3.3.4. Test Result



Frequency (MHz)	QuasiPeak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
37.4099	20.84	60.00	39.16	H	-18.13	PASS
60.8642	11.19	60.00	48.81	H	-17.89	PASS
98.0043	26.08	60.00	33.92	H	-18.82	PASS
169.3613	20.84	60.00	39.16	H	-20.14	PASS
383.9991	18.42	60.00	41.58	H	-14.16	PASS
768.0745	21.77	60.00	38.23	H	-6.96	PASS



(Plot: ANT-Vertical,30MHz - 1GHz)

Frequency (MHz)	QuasiPeak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
37.1094	35.12	60.00	24.88	V	-18.28	PASS
56.2172	22.30	60.00	37.70	V	-17.31	PASS
98.0043	38.15	60.00	21.85	V	-18.82	PASS
180.2692	25.07	60.00	34.93	V	-19.74	PASS
364.0042	29.51	60.00	30.49	V	-14.75	PASS
728.0806	22.91	60.00	37.09	V	-7.98	PASS



Annex A Test Uncertainty

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in Measurement" (GUM) published by ISO.

Uncertainty of Conducted Emission Measurement

Measuring Uncertainty for a Level of Confidence of 95%(U=2Uc(y))	150kHz-30MHz	2.61dB
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Uncertainty of Radiated Emission Measurement

Measuring Uncertainty for a Level of Confidence of 95%(U=2Uc(y))	30MHz-200MHz	±3.66dB
	200MHz-1000MHz	±3.87dB
	1GHz-6GHz	±4.50dB



Annex B Testing Laboratory Information

1. Identification of the Responsible Testing Laboratory

Laboratory Name:	Kehu-Morlab Test Laboratory
Laboratory Address:	Unit 101, No.1732 Gangzhong Road, Xiamen Area, Pilot Free Trade Zone (Fujian) P.R. China
Telephone:	+86-0592-5612050
Facsimile:	+86-0592-5612095

2. Identification of the Responsible Testing Location

Name:	Kehu-Morlab Test Laboratory
Address:	Unit 101, No.1732 Gangzhong Road, Xiamen Area, Pilot Free Trade Zone (Fujian) P.R. China

3. Accreditation Certificate

Accredited Testing Laboratory:	The FCC designation number is CN1249. (Kehu-Morlab Test Laboratory)
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4. Test Software Utilized

No	Model	Version Number	Producer	Test Item
1	EZ_EMG	V1.1.4.2	FARAD	RE
2	EMC32	V10.20.01	Rode&Schwarz	CE

5. Conducted Emission Test Equipments

No.	Equipment Name	Serial No.	Model No.	Manufacturer	Cal.Date	Cal.Due Date
1	EMI Receiver	102174	ESR3	ESR3	2019.01.08	2020.01.07
2	LISN	101338	ENV432	ENV432	2019.01.14	2020.01.13
3	Pulse Limiter (10dB)	317	VTSD 9561 F	VTSD 9561 F	2019.01.14	2020.01.13
4	Coaxial cable(BNC) (30MHz-3GHz)	EMC01	N/A	Morlab	2019.01.14	2020.01.13

6. Radiated Test Equipments

No.	Equipment Name	Serial No.	Model No.	Manufacturer	Cal. Date	Cal.Due
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						Date
1	Anechoic Chamber	N/A	9m*6m*6m	ETS-Lindgren	2017.07.21	2020.07.20
2	Signal Analyzer	101294	FSV40	R&S	2019.01.04	2020.01.03
3	Active Ring Antenna	FMZB 1513 #269	FMZB 1513	Schwarzbeck	2019.01.02	2020.01.01
4	Linear Log Periodic Broad Band Antenna	949	VULB 9163	Schwarzbeck	2018.09.25	2020.09.24
5	Ultra-Wideband Horn Antenna	102615	HF907	R&S	2019.01.19	2020.01.18
6	Coaxial cable (N male) (9kHz -3GHz)	EMC02	N/A	Morlab	2019.01.04	2020.01.03
7	Coaxial cable (N male) (9kHz -3GHz)	EMC03	N/A	Morlab	2019.01.04	2020.01.03
8	Coaxial cable (N male) (1GHz-26.5GHz)	EMC04	N/A	Morlab	2019.01.04	2020.01.03
9	Coaxial cable (N male) (1GHz-26.5GHz)	EMC05	N/A	Morlab	2019.01.04	2020.01.03
10	Pre-amplifier (1GHz-18GHz)	8810011	PAP-1G18	CDSI	2019.01.04	2020.01.03

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