

TEST REPORT

Applicant:	TOTEM ACOUSTIQUE INC.
Address of Applicant:	9165, Champ d'Eau, St. Leonard, Quebec, H1P3M3, Canada
Manufacturer:	TOTEM ACOUSTIQUE INC.
Address of Manufacturer:	9165, Champ d'Eau, St. Leonard, Quebec, H1P3M3, Canada
Product name:	Active Speaker
Model:	KIN Play
Rating(s):	100-120V ~ , 60Hz or 220-240V ~ , 50Hz, 300W
Trademark:	TOTEM 
Standards:	FCC Part 15.247: 2019 RSS-247 Issue 2
FCC ID:	2AQ6V-KINPLAY
IC :	24314-KINPLAY
Data of Receipt:	2020-08-12
Date of Test:	2020-08-12~2020-09-21
Date of Issue:	2020-09-22
Test Result	Pass*

* In the configuration tested, the test item complied with the standards specified above.

Authorized for issue by:

Test by:

Sep.22, 2020 Eleven Liang

Project Engineer

Date

Name/Position

Signature



Reviewed by:

Sep.22, 2020

Pauler Li

Project Manager

Date

Name/Position

Signature

Possible test case verdicts:

test case does not apply to the test object ...: N/A
test object does meet the requirement: P (Pass)
test object does not meet the requirement ...: F (Fail)

Testing Laboratory information:

Testing Laboratory Name: ITL Co., LTD
Address.....: No.8, Jinqianling Street 5, Huangjiang, Dongguan,
Guangdong, China.
Testing location : Same as above
Tel : 0086-769-39001678
Fax : 0086-20-62824387
E-mail : itl@i-testlab.com

General remarks:

The test results presented in this report relate only to the object tested.

The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report.

This report would be invalid test report without all the signatures of testing technician and approver.

This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.

General product information:

/

1 Test Summary

Test	Test Requirement	Test method	Result
Antenna Requirement	FCC PART 15 C section 15.247 (c) and Section 15.203	FCC PART 15 C section 15.247 (c) and Section 15.203	PASS
Conducted Spurious Emission (30 MHz to 25 GHz)	FCC PART 15 C section 15.247(d); RSS 247 5.5	ANSI C63.10:2013 Clause 6.7 & DA 00-705	PASS
Radiated Spurious Emission (9 kHz to 25 GHz)	FCC PART 15 C section 15.247(d); RSS 247 5.5	ANSI C63.10:2013 Clause 6.4, 6.5 and 6.6 & DA 00-705	PASS
Remark:			
N/A: not applicable. Refer to the relative section for the details. EUT: In this whole report EUT means Equipment Under Test. Tx: In this whole report Tx (or tx) means Transmitter. Rx: In this whole report Rx (or rx) means Receiver. RF: In this whole report RF means Radio Frequency. ANSI C63.10:2013 the detail version is ANSI C63.10:2013 in the whole report. DA 00-705: "Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems"			

2 Contents

	Page
TEST REPORT	1
1 TEST SUMMARY	3
2 CONTENTS	4
3 GENERAL INFORMATION	5
3.1 CLIENT INFORMATION	5
3.2 GENERAL DESCRIPTION OF E.U.T.	5
3.3 DETAILS OF E.U.T.	5
3.4 DESCRIPTION OF SUPPORT UNITS	5
3.5 TEST LOCATION	6
3.6 DEVIATION FROM STANDARDS	6
3.7 ABNORMALITIES FROM STANDARD CONDITIONS	6
3.8 OTHER INFORMATION REQUESTED BY THE CUSTOMER	6
3.9 TEST FACILITY	6
3.10 MEASUREMENT UNCERTAINTY	6
4 INSTRUMENTS USED DURING TEST	7
5 TEST RESULTS	8
5.1 E.U.T. TEST CONDITIONS	8
5.2 ANTENNA REQUIREMENT	10
5.3 RADIATED SPURIOUS EMISSIONS	11
5.3.1 Harmonic and other spurious emissions	14
5.4 CONDUCTED EMISSIONS AT MAINS TERMINALS 150 KHz TO 30 MHz	26
5.4.1 Measurement Data	28

3 General Information

3.1 Client Information

Applicant: TOTEM ACOUSTIQUE INC.
Address of Applicant: 9165, Champ d'Eau, St. Leonard, Quebec, H1P3M3, Canada

3.2 General Description of E.U.T.

Name: Active Speaker
Model No.: KIN Play
Trade Mark: 

Operating Frequency: 2402 MHz to 2480 MHz for Bluetooth.
Channels: 79 channels with 1MHz step for Bluetooth
Bluetooth Version: 4.1
This report is for classic mode.
Modulation Technique: Frequency Hopping Spread Spectrum (FHSS)
Type of Modulation: GFSK, ($\pi/4$) DQPSK, 8DPSK for Bluetooth
Dwell time: Per channel is less than 0.4s.
Antenna Type: PCB antenna
Antenna gain: 0 dBi
Function: Bluetooth speaker

3.3 Details of E.U.T.

EUT Power Supply: AC for power supply
Rated power: 100-240V ~ , 50/60Hz
Test mode: The program used to control the EUT for staying in continuous transmitting and receiving mode is programmed. Channel lowest (2402MHz), middle (2441MHz) and highest (2480MHz) are chosen for Bluetooth full testing.
Normal mode: the Bluetooth has been tested on the Modulation of GFSK;
EDR mode: the Bluetooth has been tested on the Modulation of ($\pi/4$)DQPSK and 8DPSK, compliance test and record the worst case on ($\pi/4$)DQPSK and 8DPSK

3.4 Description of Support Units

The EUT has been tested as an independent unit for fixed frequency by testing lab.

3.5 Test Location

All the tests were performed in ITL Co., Ltd. Which is located at No.8, JinQianLing street 5, DongHuan Road, Huangjiang Town, Dongguan, China

Tel: 0086-769-39001678

No test is subcontracted

3.6 Deviation from Standards

Biconical and log periodic antennas were used instead of dipole antennas.

3.7 Abnormalities from Standard Conditions

None.

3.8 Other Information Requested by the Customer

None.

3.9 Test Facility

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

- CNAS Lab code:L9342
- FCC Designation No.:CN5035
- IC Registration NO.: 12593A
- NVLAP LAB CODE: 600199-0

3.10 Measurement Uncertainty

The below measurement uncertainties given below are based on a 95% confidence level (base on a coverage factor (k=2).)

Parameter	Uncertainty
Radio frequency	$\pm 1.06 \times 10^{-7}$
total RF power, conducted	1.37 dB
RF power density , conducted	2.89 dB
All emissions, radiated	± 3.35 dB
Temperature	± 0.23 °C
Humidity	± 0.3 %
DC and low frequency voltages	± 0.3 %

4 Instruments Used during Test

No.	Test Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due
ITL-114	Spectrum Analyzer	Agilent	N9010A	MY51250936	2020/01/15	2021/01/14
ITL-154	EMI test receiver 9kHz to 26.5GHz	R&S	ESR26	101257	2020/01/15	2021/01/14
ITL-116	Pre Amplifier	HP	8447F	3113A05905	2020/01/15	2021/01/14
ITL-117	Wideband Amplifier Super Ultra	Mini-circuits	ZVA-183- S+	469101134	2020/01/15	2021/01/14
ITL-164	Trilog-Broadband Antenna	Schwarzbeck	VULB 9168	9168-0844	2017/11/16	2020/11/16
ITL-110	Horn Antenna	A-INFOMW	JXTXLB- 10180-N	J2031090612 133	2020/01/15	2021/01/14
ITL-125	EMI Test receiver	R&S	ESCI	100910	2020/06/17	2021/06/16
ITL-103	Two-line v- network	R&S	ENV216	100120	2019/10/15	2020/10/14
ITL-115	50Ω Coaxial Cable	Mini-circuits	CBL	C001	2020/06/19	2021/06/18
ITL-100	Semi-Anechoic chamber	ETS Lindgren	FACT3 2.0	CT09015	2018/12/29	2021/12/28
ITL-101	Shielded Room	ETS•Lindgren	8*4*3	CT09010	2018/01/27	2021/01/26

5 Test Results

5.1 E.U.T. test conditions

Test Voltage: Input: AC 120V, 60 Hz

Temperature: 20.0 -25.0 °C

Humidity: 38-50 % RH

Atmospheric Pressure: 1000 -1010 mbar

Test frequencies and frequency range: According to the 15.31(m) Measurements on intentional radiators or receivers, other than TV broadcast receivers, shall be performed and, if required, reported for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table:

According to the 15.33 (a) For an intentional radiator, the spectrum shall be investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to at least the frequency shown in the following table:

Number of fundamental frequencies to be tested in EUT transmit band

Frequency range in which	Number of	Location in frequency range
1 MHz or less	1	Middle
1 MHz to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top, 1 near middle and 1 near bottom

Frequency range of radiated emission measurements

Lowest frequency generated	Upper frequency range of measurement
9 kHz to below 10 GHz	10th harmonic of highest fundamental frequency or to 40 GHz,
At or above 10 GHz to below	5th harmonic of highest fundamental frequency or to 100 GHz,
At or above 30 GHz	5th harmonic of highest fundamental frequency or to 200 GHz,

EUT channels and frequencies list for Bluetooth:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	11	2413	22	2424
1	2403	12	2414	23	2425

2	2404	13	2415	24	2426
3	2405	14	2416	25	2427
4	2406	15	2417	26	2428
5	2407	16	2418	27	2429
6	2408	17	2419	28	2430
7	2409	18	2420	29	2431
8	2410	19	2421	30	2432
9	2411	20	2422	31	2433
10	2412	21	2423	32	2434
33	2435	49	2451	65	2467
34	2436	50	2452	66	2468
35	2437	51	2453	67	2469
36	2438	52	2454	68	2470
37	2439	53	2455	69	2471
38	2440	54	2456	70	2472
39	2441	55	2457	71	2473
40	2442	56	2458	72	2474
41	2443	57	2459	73	2475
42	2444	58	2460	74	2476
43	2445	59	2461	75	2477
44	2446	60	2462	76	2478
45	2447	61	2463	77	2479
46	2448	62	2464	78	2480
47	2449	63	2465		
48	2450	64	2466		

Test frequencies are the lowest channel: 0 channel (2402 MHz), middle channel: 39 channel (2441

MHz) and highest channel: 78 channel (2480 MHz)

5.2 Antenna requirement

Standard requirement

15.203 requirement:

For intentional device. According to 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.

15.247(c) (1)(i) requirement:

(i) Systems operating in the 2400-2483.5 MHz bands that are used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

EUT Antenna

The antenna is a PCB antenna and no consideration of replacement. The best case gain of the antenna is 0 dBi.

Test result: The unit does meet the FCC requirements.

5.3 Radiated Spurious Emissions

Test Requirement:	FCC Part15 C section 15.247 and RSS-247 (d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating. The radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that Contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, and provided the transmitter demonstrates compliance with the peak conducted power limits.
Test Method:	ANSI C63.10:2013 Clause 6.4, 6.5 and 6.6 & DA 00-705
Test Status:	Pre-test the EUT in continuous transmitting mode at the lowest, middle and highest channel with different data packet. Compliance test in continuous transmitting mode with normal mode (DH5) as the worst case was found.
Detector:	For PK value: RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz, 9kHz for <30 MHz, VBW $\geq$ RBW Sweep = auto Detector function = peak Trace = max hold For AV value: RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz, 9kHz for <30 MHz, VBW =10 Hz Sweep = auto Detector function = peak Trace = max hold

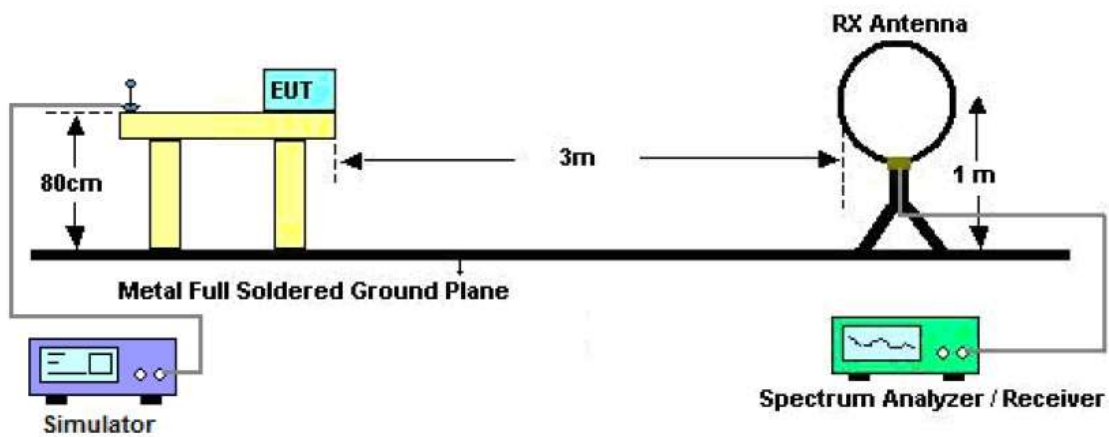
15.209 Limit:

Frequency (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

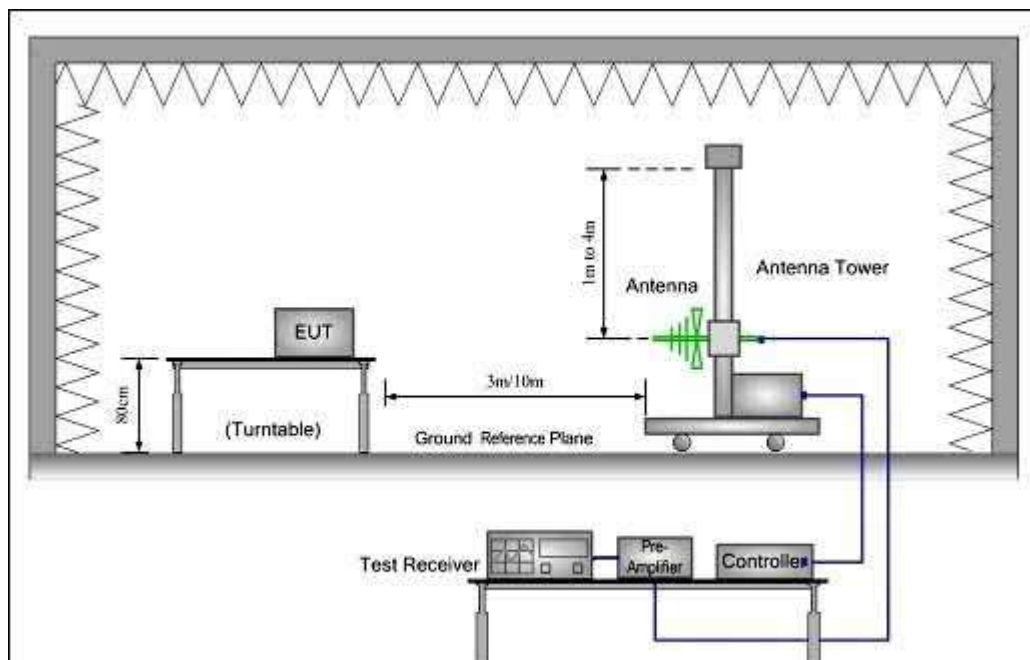
Above 960	500	3
-----------	-----	---

Test Configuration:

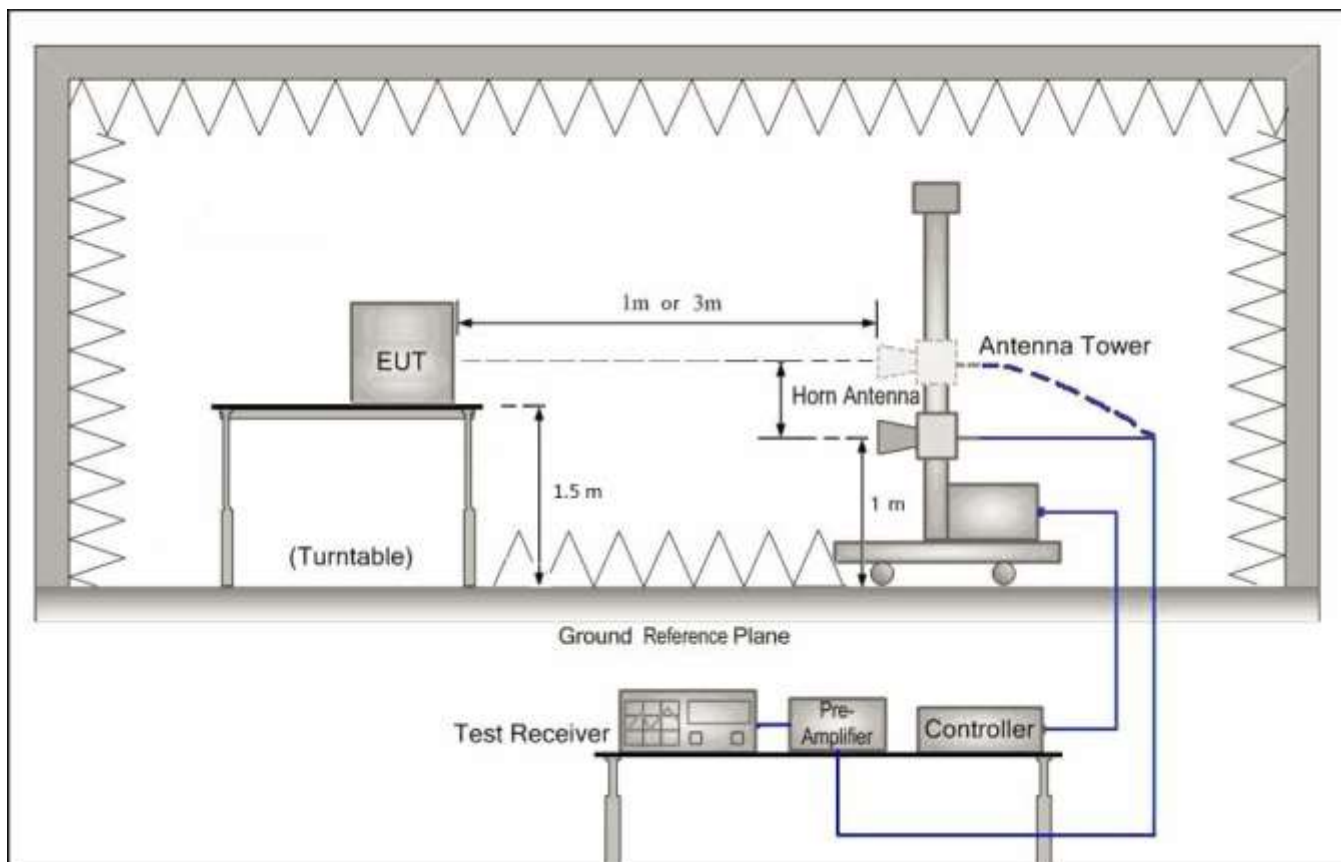
- 1) 9kHz to 30MHz emissions:



- 2) 30 MHz to 1 GHz emissions:



3) 1 GHz to 40 GHz emissions:



Test Procedure: The receiver was scanned from 30MHz to 25GHz. When an emission was found, the table was rotated to produce the maximum signal strength. An initial pre-scan was performed for in peak detection mode using the receiver. The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. After pre-test, it was found that the worse radiation emission was get at the X position. So the data shown was the X position only. The worst case emissions were reported.

Now set the VBW to 10 Hz, while maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit specified in Section 15.209. If the dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a "duty cycle correction factor", derived from $20\log(\text{dwell time}/100 \text{ ms})$, in an effort to demonstrate compliance with the 15.209 limit. Submit this data.

5.3.1 Harmonic and other spurious emissions

Worst case mode DH5

Test at low Channel in transmitting status

9kHz~30MHz Test result

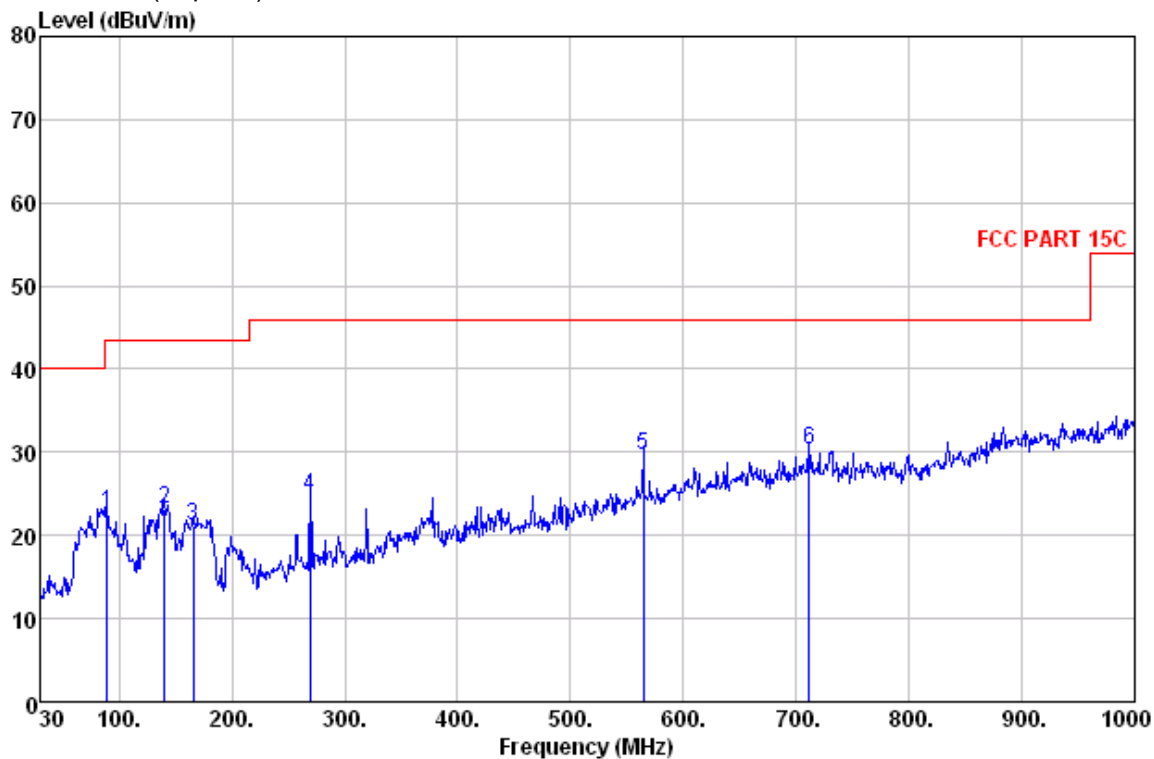
The Low frequency, which started from 9kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not report

30 MHz~1 GHz Spurious Emissions .Quasi-Peak Measurement

Horizontal:

Peak scan

Level (dBμV/m)



Quasi-peak measurement

No.	Freq MHz	Read Level dBμV	Antenna Factor dB	Cable Loss dB	Preamp Factor dB	Level dBμV/m	Limit Line dBμV/m	Over Limit dB	Pol/ Phase	Remark
1	89.170	37.70	12.38	1.10	28.38	22.80	43.50	-20.70	HORIZONTAL	QP
2	140.580	33.35	16.72	1.41	28.22	23.26	43.50	-20.24	HORIZONTAL	QP
3	165.800	31.36	16.66	1.54	28.33	21.23	43.50	-22.27	HORIZONTAL	QP
4	269.590	32.87	17.14	2.01	27.22	24.80	46.00	-21.20	HORIZONTAL	QP
5	564.470	30.81	24.74	2.96	28.78	29.73	46.00	-16.27	HORIZONTAL	QP
6	711.910	27.92	27.08	3.35	28.07	30.28	46.00	-15.72	HORIZONTAL	QP

Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor

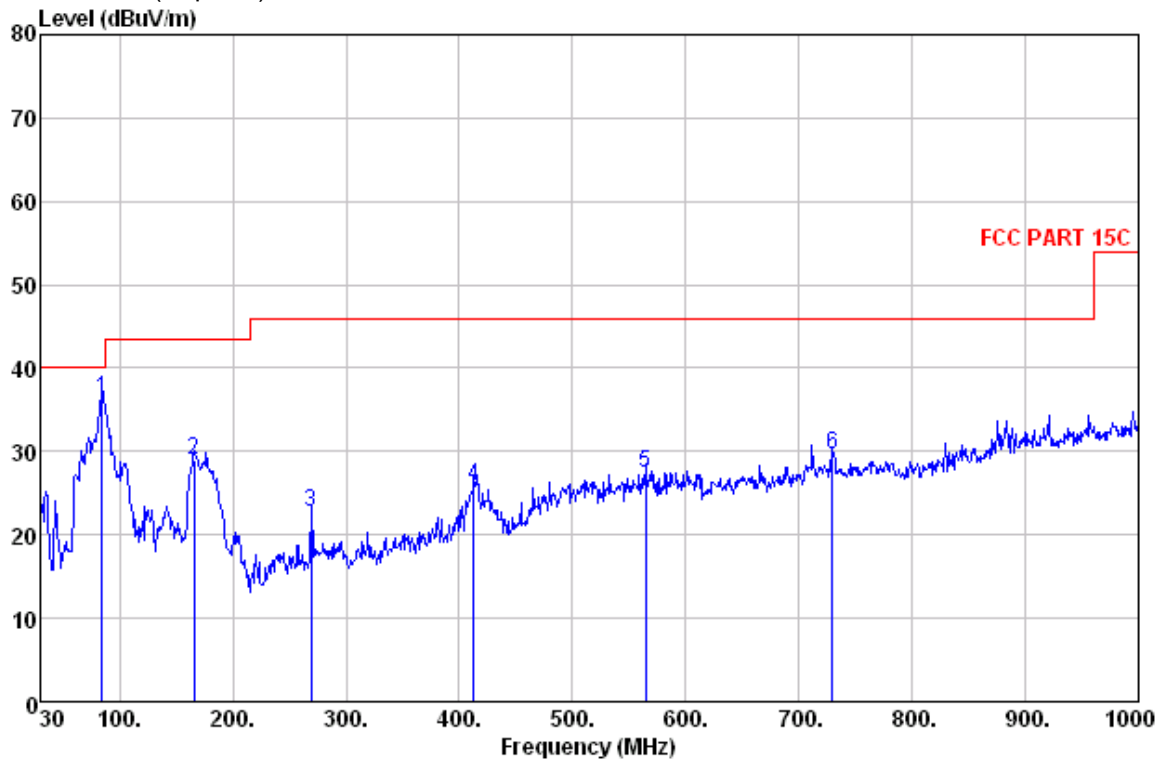
Test at low Channel in transmitting status

30 MHz~1 GHz Spurious Emissions .Quasi-Peak Measurement

Vertical:

Peak scan

Level (dBμV/m)



Quasi-peak measurement

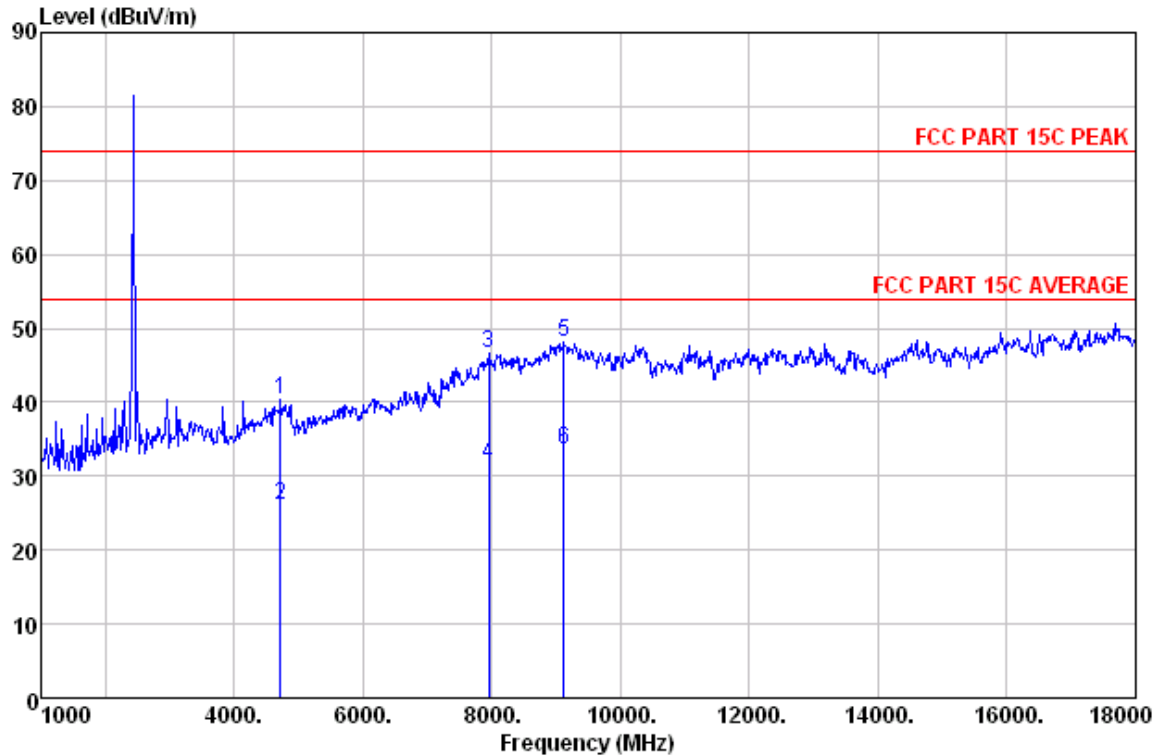
No.	Freq MHz	Read Level dBμV	Antenna Factor dB	Cable Loss dB	Preamp Factor dB	Level dBμV/m	Limit Line dBμV/m	Over Limit dB	Pol/ Phase	Remark
1	84.320	51.29	12.26	1.07	28.23	36.39	40.00	-3.61	VERTICAL	QP
2	165.800	39.18	16.66	1.54	28.33	29.05	43.50	-14.45	VERTICAL	QP
3	269.590	30.74	17.14	2.01	27.22	22.67	46.00	-23.33	VERTICAL	QP
4	413.150	30.47	21.06	2.50	28.15	25.88	46.00	-20.12	VERTICAL	QP
5	564.470	28.55	24.74	2.96	28.78	27.47	46.00	-18.53	VERTICAL	QP
6	729.370	26.79	27.02	3.40	27.58	29.63	46.00	-16.37	VERTICAL	QP

Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor

Spurious emissions above 1GHz

Horizontal:

Peak scan

Level (dB μ V/m)

Freq MHz	Read Level dBuV	Antenna Factor dB	Cable Loss dB	Preamp Factor dB	Level dBuV/m	Limit Line dBuV/m	Over Limit dB	Pol/ Phase	Remark
4723.000	25.31	33.28	9.48	27.64	40.43	74.00	-33.57	HORIZONTAL	Peak
4723.000	11.00	33.28	9.48	27.64	26.12	54.00	-27.88	HORIZONTAL	Average
7953.000	23.96	37.02	12.86	27.30	46.54	74.00	-27.46	HORIZONTAL	Peak
7953.000	9.00	37.02	12.86	27.30	31.58	54.00	-22.42	HORIZONTAL	Average
9126.000	22.44	38.80	14.00	27.19	48.05	74.00	-25.95	HORIZONTAL	Peak
9126.000	8.00	38.80	14.00	27.19	33.61	54.00	-20.39	HORIZONTAL	Average

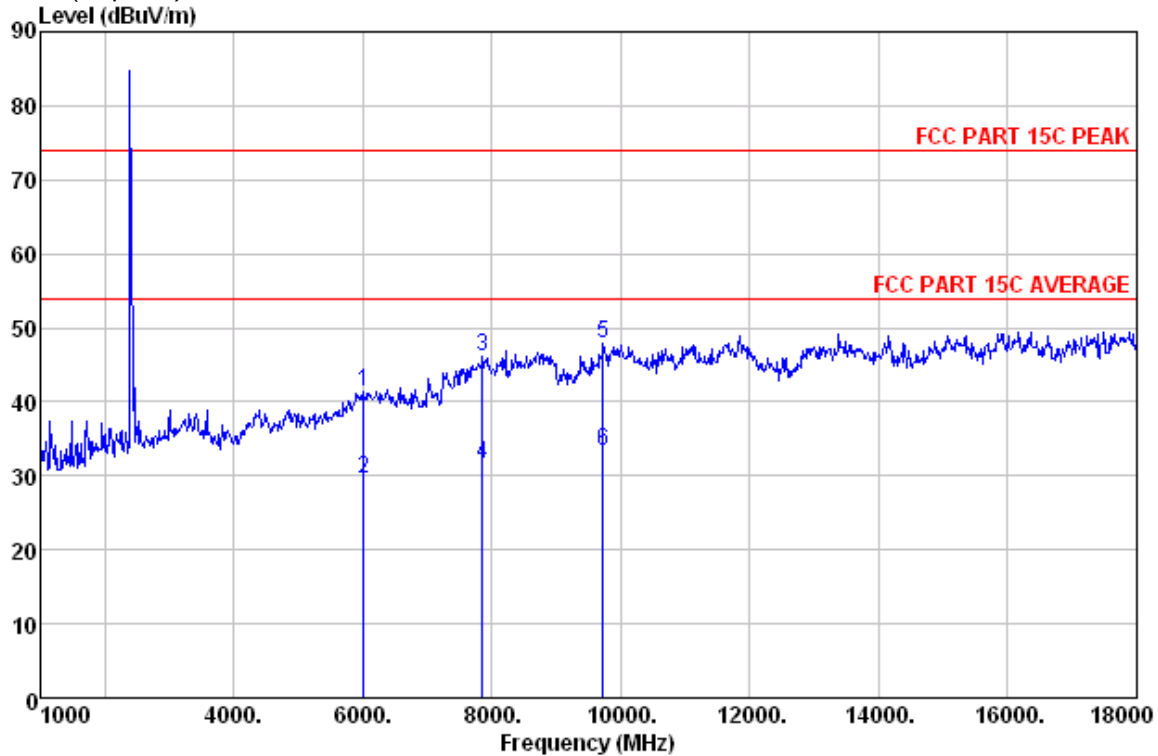
Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor

Note: The emission above limit is fundamental emission, which is not subject to the limit.

Vertical:

Peak scan

Level (dBμV/m)



Freq MHz	Read Level dBμV	Antenna Factor dB	Cable Loss dB	Preamp Factor dB	Level dBμV/m	Limit Line dBμV/m	Over Limit dB	Pol/ Phase	Remark
6015.000	21.82	35.99	10.92	27.42	41.31	74.00	-32.69	VERTICAL	Peak
6015.000	9.99	35.99	10.92	27.42	29.48	54.00	-24.52	VERTICAL	Average
7851.000	23.62	37.06	12.76	27.31	46.13	74.00	-27.87	VERTICAL	Peak
7851.000	9.01	37.06	12.76	27.31	31.52	54.00	-22.48	VERTICAL	Average
9721.000	21.61	38.89	14.46	27.13	47.83	74.00	-26.17	VERTICAL	Peak
9721.000	7.00	38.89	14.46	27.13	33.22	54.00	-20.78	VERTICAL	Average

Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor

Note: The emission above limit is fundamental emission, which is not subject to the limit.

Test at Middle Channel in transmitting status

Worst case mode DH5

9kHz~30MHz Test result

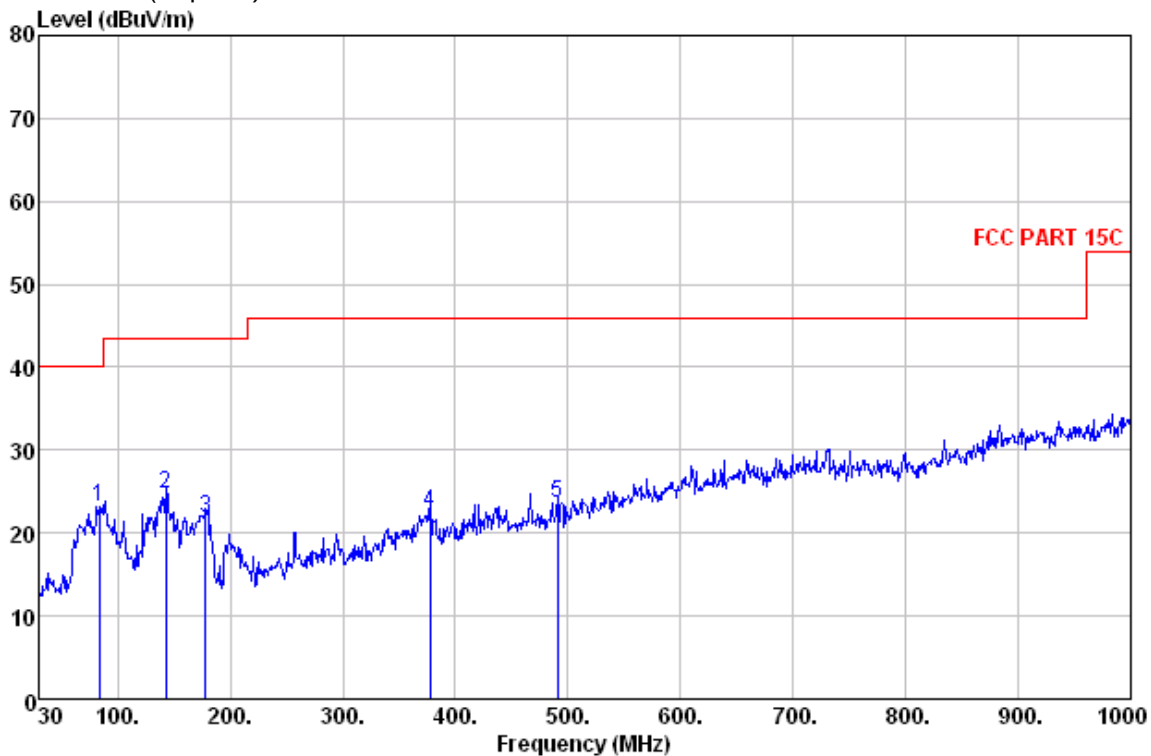
The Low frequency, which started from 9kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not report

30 MHz~1 GHz Spurious Emissions .Quasi-Peak Measurement

Horizontal:

Peak scan

Level (dBμV/m)



Quasi-peak measurement

No.	Freq MHz	Read Level dBμV	Antenna Factor dB	Cable Loss dB	Preamp Factor dB	Level dBμV/m	Limit Line dBμV/m	Over Limit dB	Pol/ Phase	Remark
1	83.350	38.03	12.23	1.06	28.20	23.12	40.00	-16.88	HORIZONTAL	QP
2	142.520	34.84	16.77	1.42	28.30	24.73	43.50	-18.77	HORIZONTAL	QP
3	178.410	32.78	15.46	1.60	27.91	21.93	43.50	-21.57	HORIZONTAL	QP
4	377.260	28.47	20.13	2.37	28.38	22.59	46.00	-23.41	HORIZONTAL	QP
5	490.750	26.57	22.86	2.75	28.65	23.53	46.00	-22.47	HORIZONTAL	QP

Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor

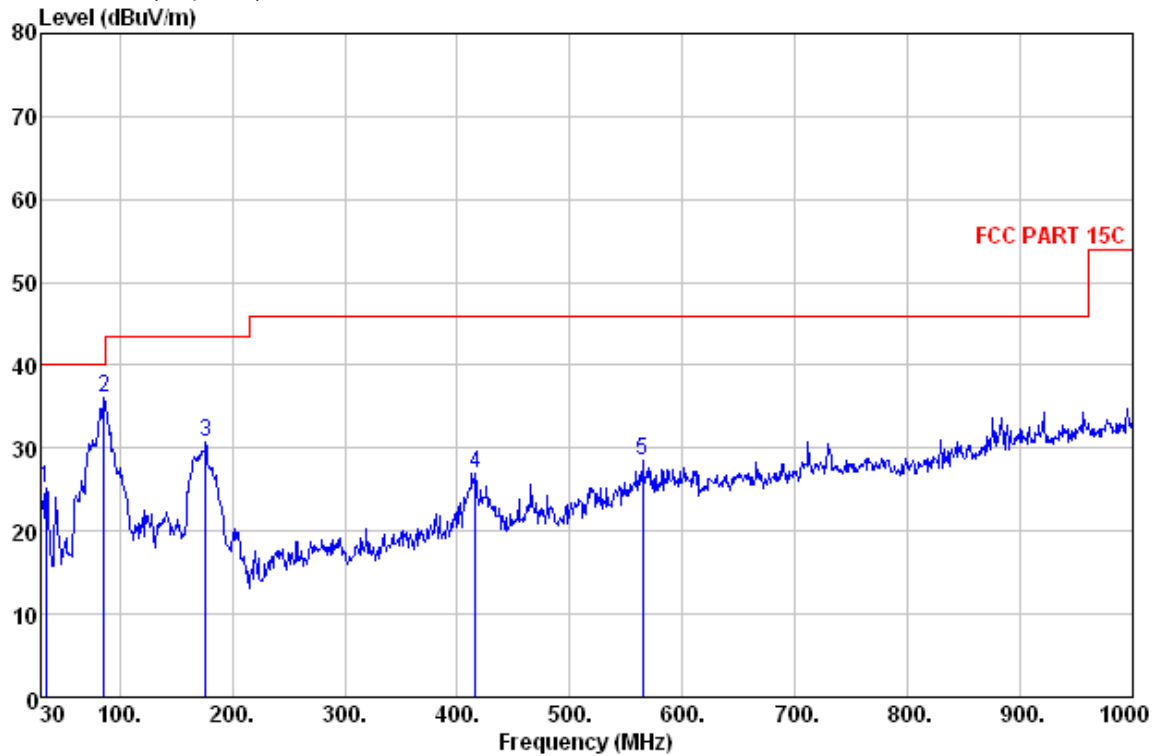
Test at Middle Channel in transmitting status

30 MHz~1 GHz Spurious Emissions .Quasi-Peak Measurement

Vertical:

Peak scan

Level (dBμV/m)



Quasi-peak measurement

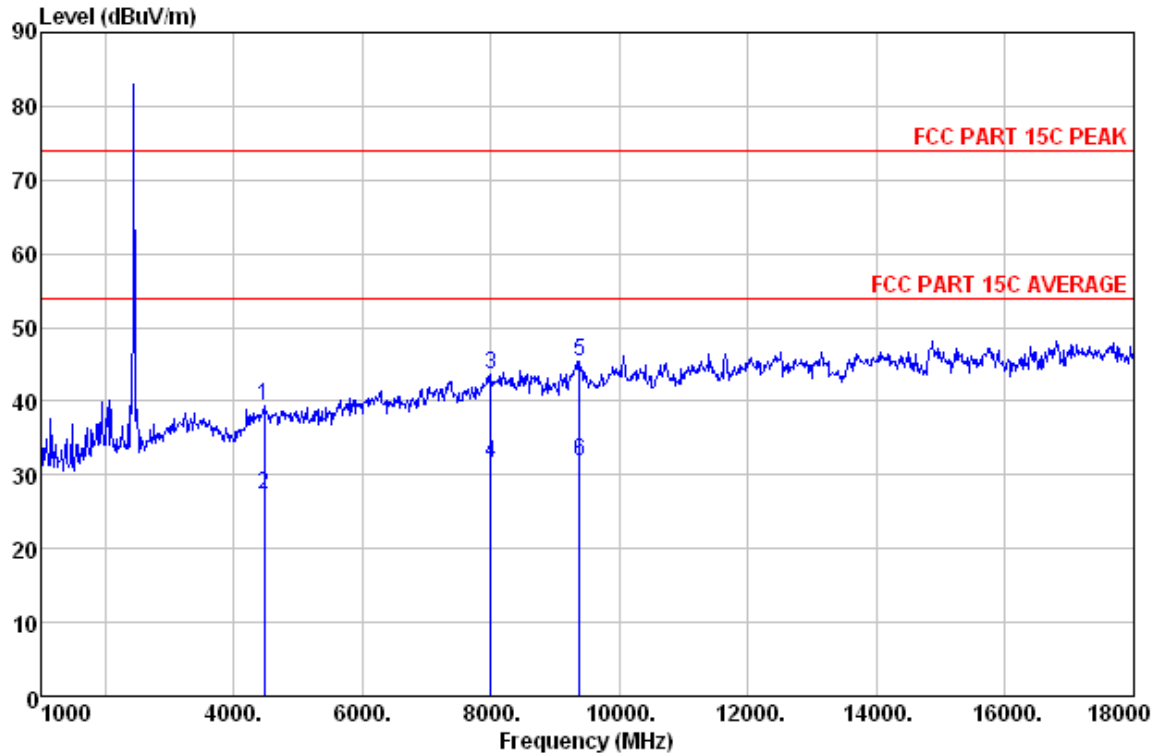
No.	Freq MHz	Read Level dBμV	Antenna Factor dB	Cable Loss dB	Preamp Factor dB	Level dBμV/m	Limit Line dBμV/m	Over Limit dB	Pol/ Phase	Remark
1	34.850	36.63	16.45	0.67	28.60	25.15	40.00	-14.85	VERTICAL	QP
2	86.260	50.98	12.31	1.08	28.29	36.08	40.00	-3.92	VERTICAL	QP
3	176.470	41.59	15.65	1.59	28.04	30.79	43.50	-12.71	VERTICAL	QP
4	416.060	31.38	21.12	2.51	28.14	26.87	46.00	-19.13	VERTICAL	QP
5	564.470	29.51	24.74	2.96	28.78	28.43	46.00	-17.57	VERTICAL	QP

Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor

Spurious emissions above 1GHz

Horizontal:

Peak scan

Level (dB μ V/m)

Freq MHz	Read Level dBuV	Antenna Factor dB	Cable Loss dB	Preamp Factor dB	Level dBuV/m	Limit Line dBuV/m	Over Limit dB	Pol/ Phase	Remark
4468.000	24.87	32.87	9.19	27.69	39.24	74.00	-34.76	HORIZONTAL	Peak
4468.000	13.00	32.87	9.19	27.69	27.37	54.00	-26.63	HORIZONTAL	Average
8004.000	20.99	37.01	12.91	27.30	43.61	74.00	-30.39	HORIZONTAL	Peak
8004.000	9.00	37.01	12.91	27.30	31.62	54.00	-22.38	HORIZONTAL	Average
9381.000	19.57	38.80	14.23	27.16	45.44	74.00	-28.56	HORIZONTAL	Peak
9381.000	6.00	38.80	14.23	27.16	31.87	54.00	-22.13	HORIZONTAL	Average

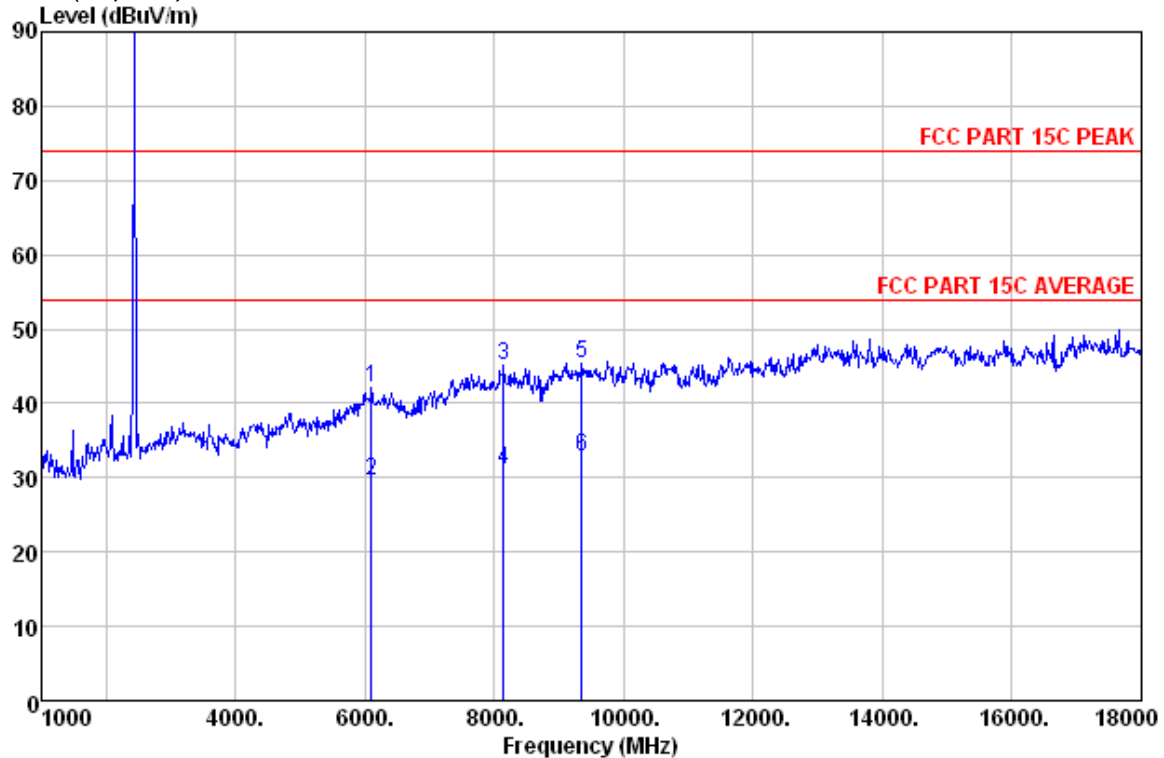
Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor

Note: The emission above limit is fundamental emission, which is not subject to the limit.

Vertical:

Peak scan

Level (dBμV/m)



Freq MHz	Read Level dBμV	Antenna Factor dB	Cable Loss dB	Preamp Factor dB	Level dBμV/m	Limit Line dBμV/m	Over Limit dB	Pol/ Phase	Remark
6100.000	22.51	35.90	11.00	27.41	42.00	74.00	-32.00	VERTICAL	Peak
6100.000	10.00	35.90	11.00	27.41	29.49	54.00	-24.51	VERTICAL	Average
8140.000	22.02	37.22	13.05	27.29	45.00	74.00	-29.00	VERTICAL	Peak
8140.000	8.01	37.22	13.05	27.29	30.99	54.00	-23.01	VERTICAL	Average
9347.000	19.52	38.80	14.20	27.17	45.35	74.00	-28.65	VERTICAL	Peak
9347.000	7.00	38.80	14.20	27.17	32.83	54.00	-21.17	VERTICAL	Average

Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor

Note: The emission above limit is fundamental emission, which is not subject to the limit.

Test at high Channel in transmitting status

Worst case mode DH5

9kHz~30MHz Test result

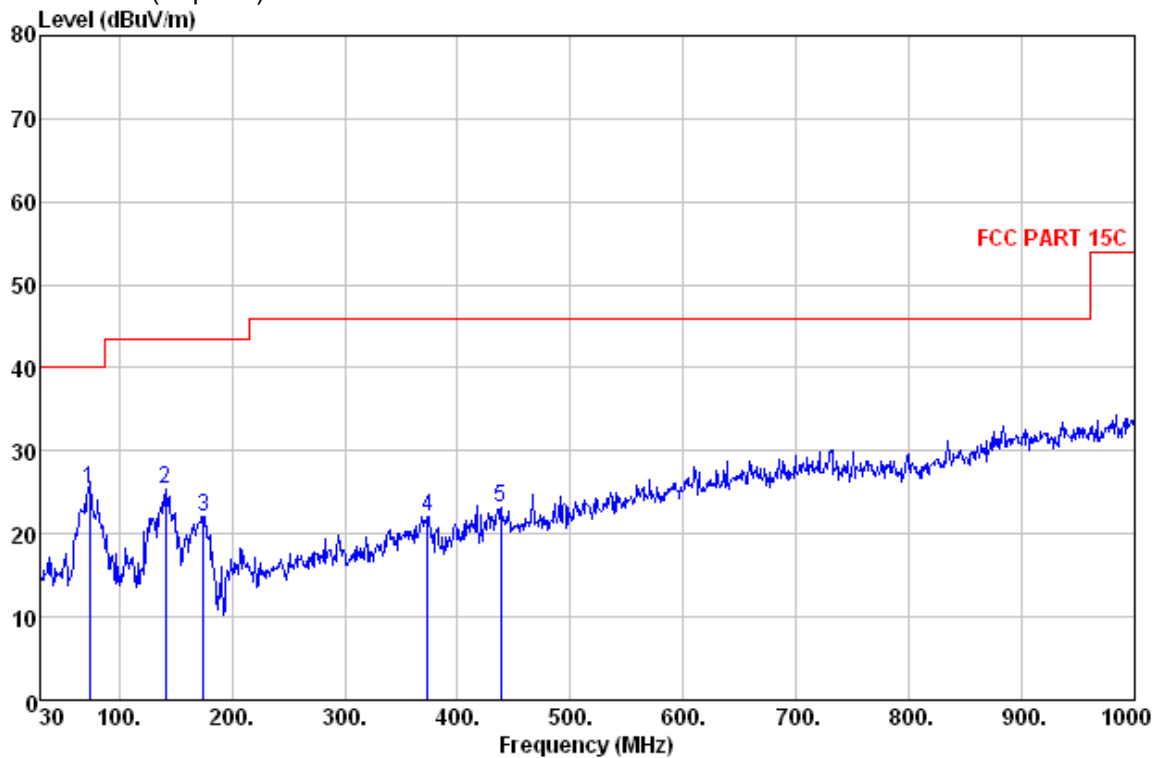
The Low frequency, which started from 9kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not report

30 MHz~1 GHz Spurious Emissions .Quasi-Peak Measurement

Horizontal:

Peak scan

Level (dBμV/m)



Quasi-peak measurement

No.	Freq MHz	Read Level dBuV	Antenna Factor dB	Cable Loss dB	Preamp Factor dB	Level dBuV/m	Limit Line dBuV/m	Over Limit dB	Pol/ Phase	Remark
1	73.650	38.71	13.82	1.00	28.22	25.31	40.00	-14.69	HORIZONTAL	QP
2	141.550	35.52	16.75	1.42	28.26	25.43	43.50	-18.07	HORIZONTAL	QP
3	174.530	32.89	15.83	1.58	28.18	22.12	43.50	-21.38	HORIZONTAL	QP
4	373.380	28.06	20.02	2.35	28.33	22.10	46.00	-23.90	HORIZONTAL	QP
5	438.370	27.29	21.64	2.59	28.37	23.15	46.00	-22.85	HORIZONTAL	QP

Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor

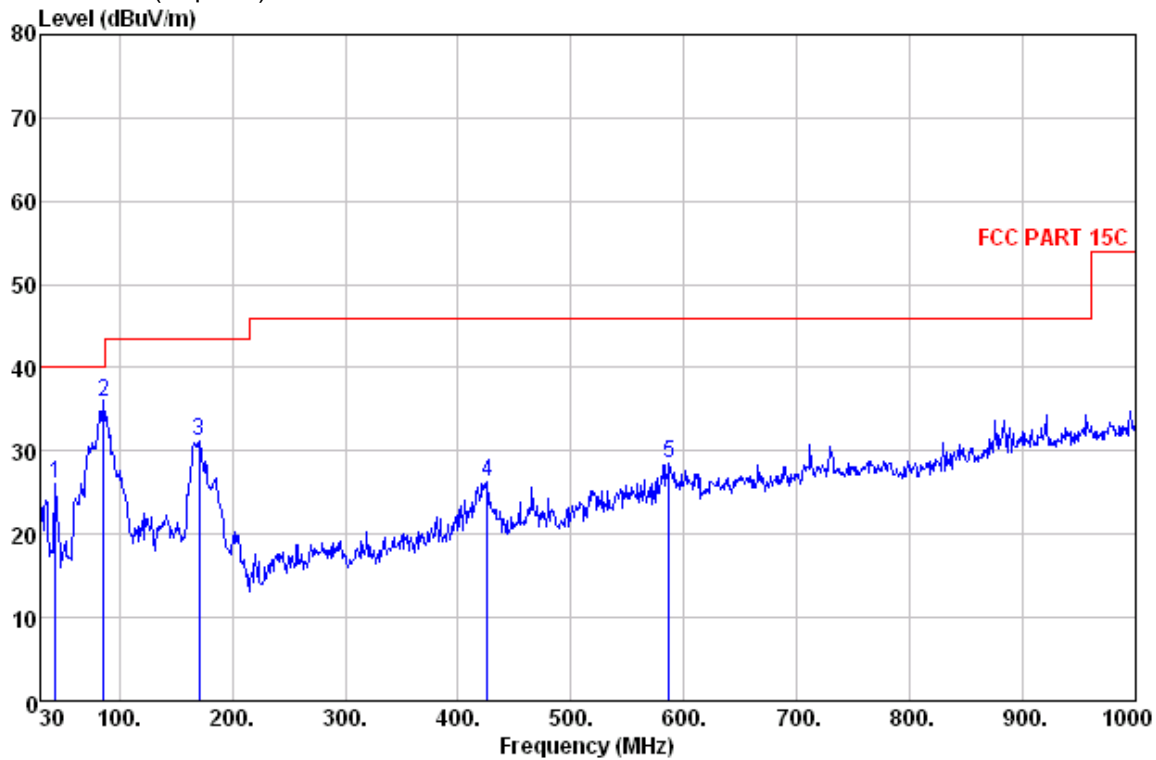
Test at High Channel in transmitting status

30 MHz~1 GHz Spurious Emissions .Quasi-Peak Measurement

Vertical:

Peak scan

Level (dBμV/m)



Quasi-peak measurement

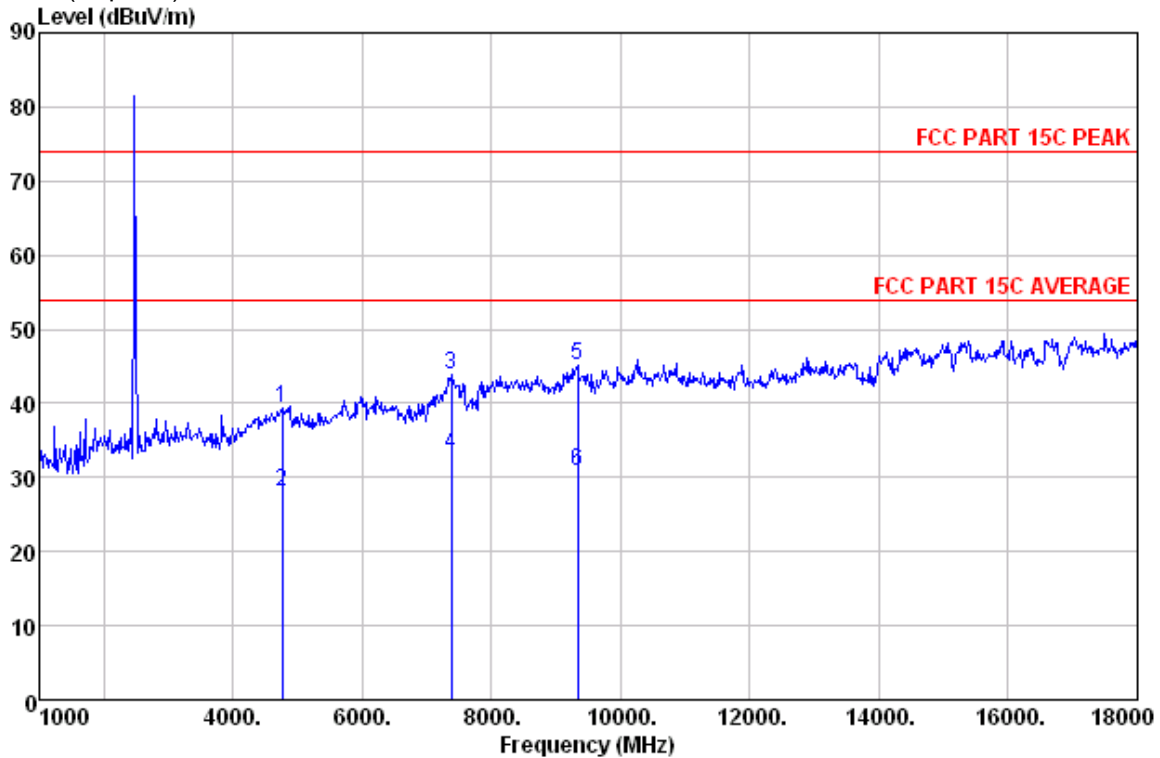
No.	Freq MHz	Read Level dBuV	Antenna Factor dB	Cable Loss dB	Preamp Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Pol/ Phase	Remark
1	43.580	36.57	17.07	0.75	28.39	26.00	40.00	-14.00	VERTICAL	QP
2	86.260	50.81	12.31	1.08	28.29	35.91	40.00	-4.09	VERTICAL	QP
3	170.650	41.80	16.20	1.56	28.45	31.11	43.50	-12.39	VERTICAL	QP
4	425.760	30.56	21.35	2.54	28.12	26.33	46.00	-19.67	VERTICAL	QP
5	586.780	28.63	25.32	3.02	28.46	28.51	46.00	-17.49	VERTICAL	QP

Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor

Spurious emissions above 1GHz

Horizontal:

Peak scan

Level (dB μ V/m)

Freq MHz	Read Level dBuV	Antenna Factor dB	Cable Loss dB	Preamp Factor dB	Level dBuV/m	Limit Line dBuV/m	Over Limit dB	Pol/ Phase	Remark
4757.000	24.06	33.31	9.52	27.63	39.26	74.00	-34.74	HORIZONTAL	Peak
4757.000	12.99	33.31	9.52	27.63	28.19	54.00	-25.81	HORIZONTAL	Average
7375.000	21.87	37.00	12.30	27.33	43.84	74.00	-30.16	HORIZONTAL	Peak
7375.000	11.00	37.00	12.30	27.33	32.97	54.00	-21.03	HORIZONTAL	Average
9330.000	19.32	38.80	14.19	27.17	45.14	74.00	-28.86	HORIZONTAL	Peak
9330.000	5.00	38.80	14.19	27.17	30.82	54.00	-23.18	HORIZONTAL	Average

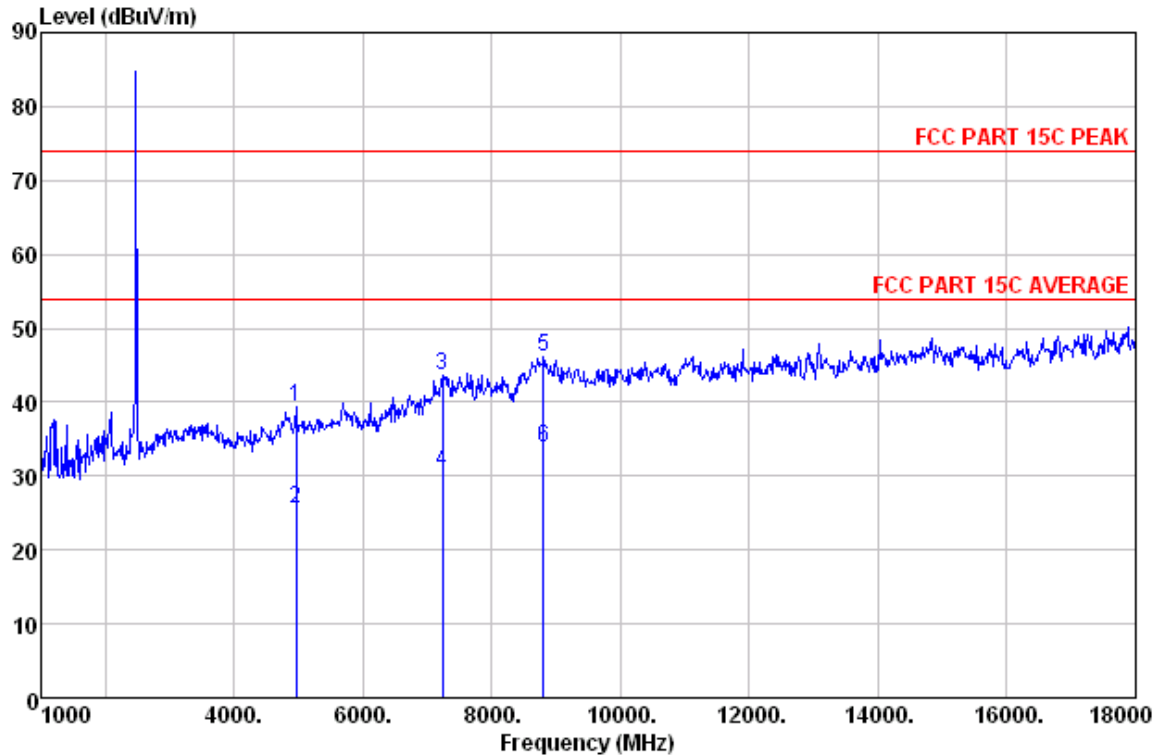
Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor

Note: The emission above limit is fundamental emission, which is not subject to the limit.

Vertical:

Peak scan

Level (dBμV/m)



Freq MHz	Read Level dBμV	Antenna Factor dB	Cable Loss dB	Preamp Factor dB	Level dBμV/m	Limit dBμV/m	Over Limit dB	Pol/ Phase	Remark
4961.000	23.63	33.47	9.76	27.60	39.26	74.00	-34.74	VERTICAL	Peak
4961.000	10.00	33.47	9.76	27.60	25.63	54.00	-28.37	VERTICAL	Average
7239.000	22.03	36.78	12.16	27.33	43.64	74.00	-30.36	VERTICAL	Peak
7239.000	9.01	36.78	12.16	27.33	30.62	54.00	-23.38	VERTICAL	Average
8803.000	21.15	38.41	13.70	27.23	46.03	74.00	-27.97	VERTICAL	Peak
8803.000	9.00	38.41	13.70	27.23	33.88	54.00	-20.12	VERTICAL	Average

Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor

Note: The emission above limit is fundamental emission, which is not subject to the limit.

Remark:

- 1). The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
Final Test Level = Receiver Reading + Antenna Factor + Cable Loss - Preamplifier Factor.
- 2). As shown in Section, for frequencies above 1000 MHz, the above field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.
- 3). The test only perform the EUT in transmitting status since the test frequencies were over 1GHz only required transmitting status.

Test result: The unit does meet the FCC and RSS-247 requirements.

5.4 Conducted Emissions at Mains Terminals 150 kHz to 30 MHz

Test Requirement: FCC Part 15 C section 15.207 and RSS-GEN

Test Method: ANSI C63.10:2013 Clause 6.2 & DA 00-705

Frequency Range: 150 kHz to 30 MHz

Detector: Peak for pre-scan (9 kHz Resolution Bandwidth)

Test Limit

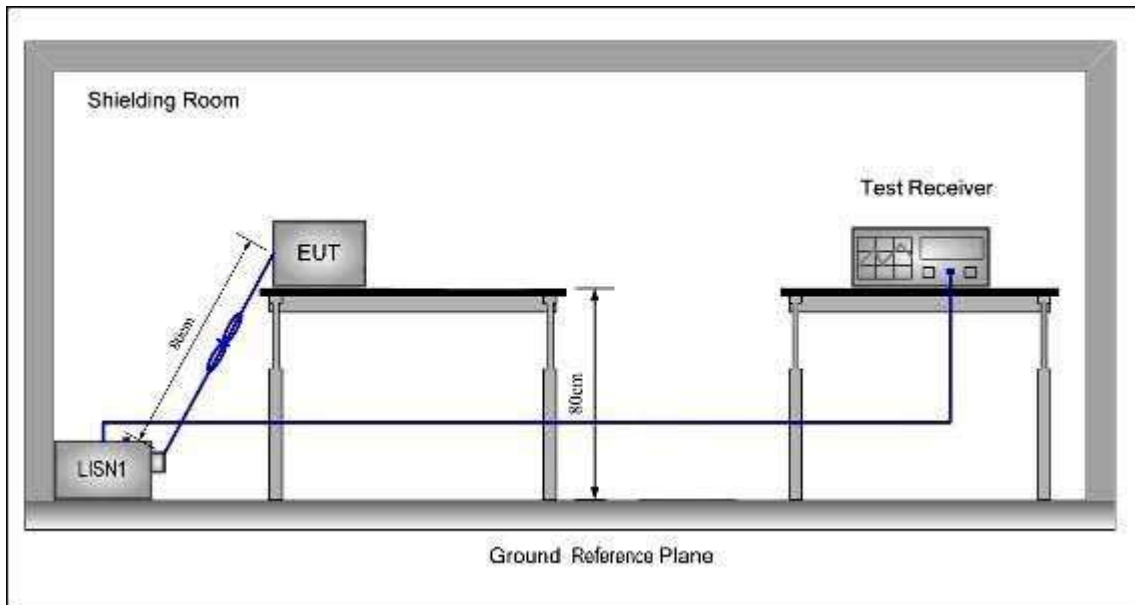
Limits for conducted disturbance at the mains ports of class B

Frequency Range	Class B Limit dB(μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
NOTE 1 The limit decreases linearly with the logarithm of the frequency in the range 0,15 MHz to 0,50 MHz.		

EUT Operation:

Test in normal operating mode. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage.

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Test Configuration:**Test procedure:**

1. The mains terminal disturbance voltage test was conducted in a shielded room.
2. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.

5.4.1 Measurement Data

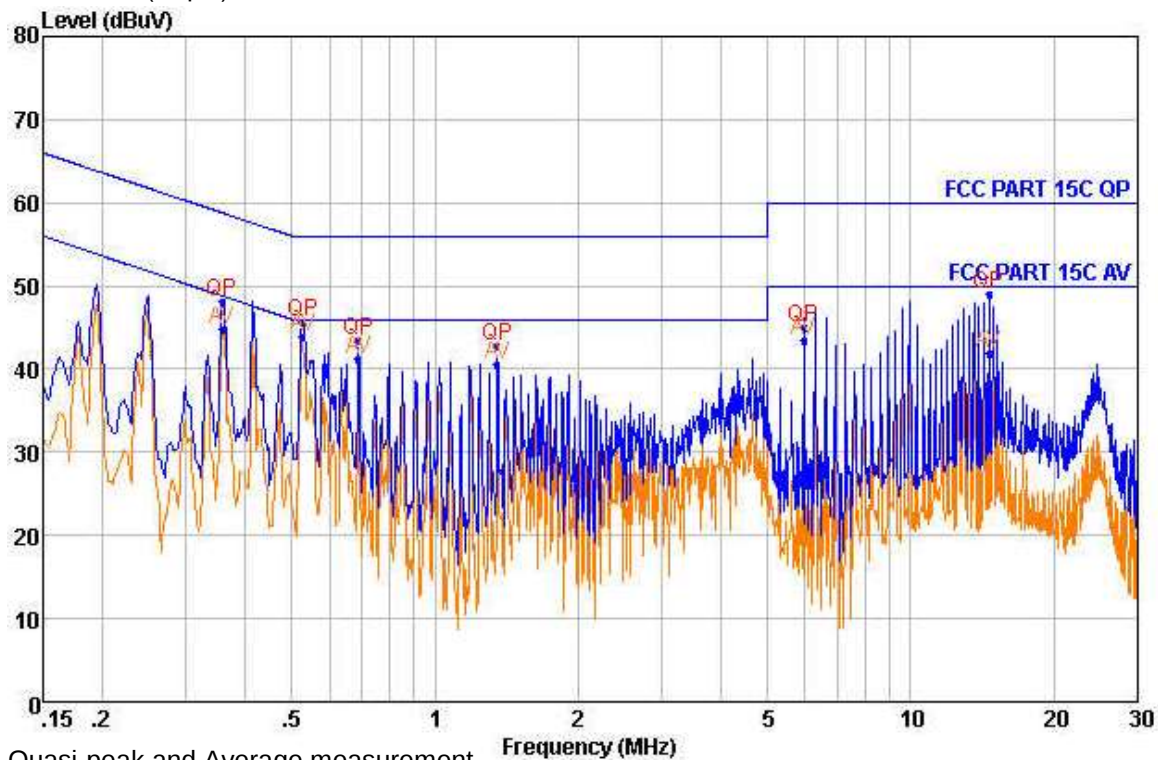
An initial pre-scan was performed on the live and neutral lines with peak detector. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected. For EUT the communicating was worst case mode.

The following Quasi-Peak and Average measurements were performed on the EUT

Live line

Peak Scan:

Level (dBμV)

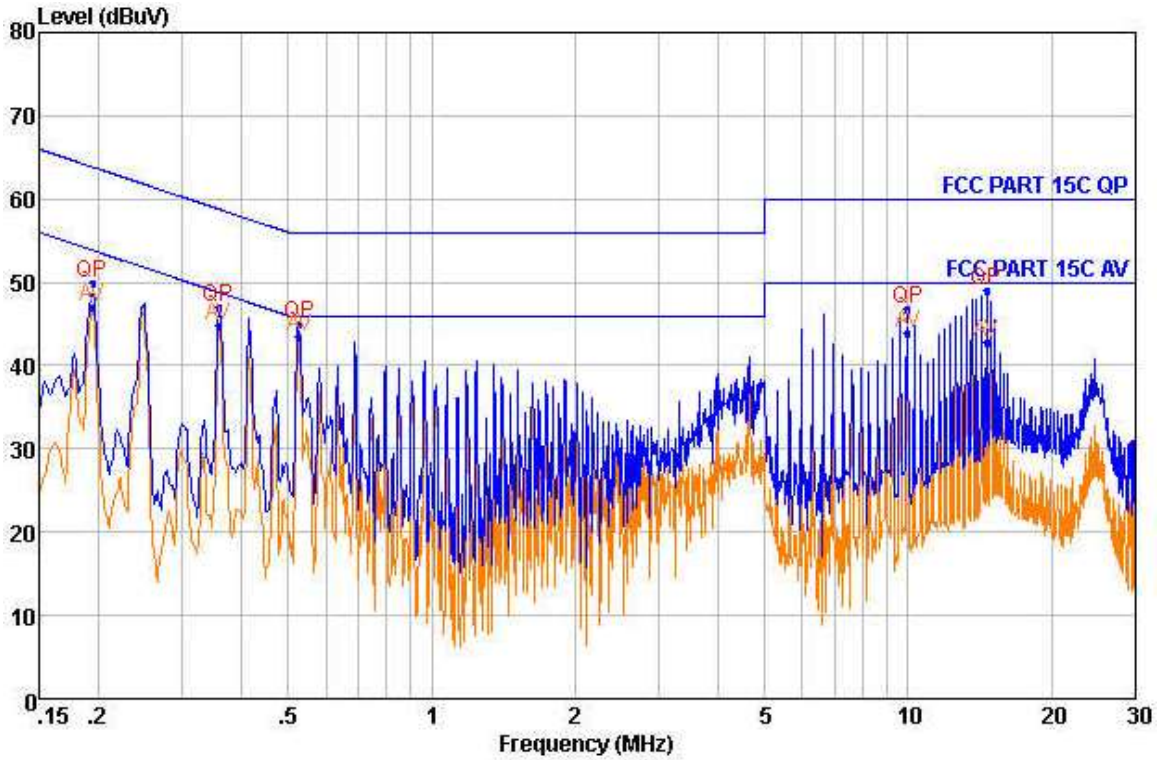


Quasi-peak and Average measurement

NO.	Freq MHz	Level dBμV	Remark	LISN Factor dB	Cable Loss dB	Limit Line dBμV	Over Limit dB
1	0.358	48.18	QP	9.66	0.25	58.78	-10.60
2	0.358	44.81	Average	9.66	0.25	48.78	-3.97
3	0.527	45.65	QP	9.66	0.27	56.00	-10.35
4	0.527	43.88	Average	9.66	0.27	46.00	-2.12
5	0.690	43.45	QP	9.71	0.29	56.00	-12.55
6	0.690	41.25	Average	9.71	0.29	46.00	-4.75
7	1.352	42.81	QP	9.66	0.32	56.00	-13.19
8	1.352	40.51	Average	9.66	0.32	46.00	-5.49
9	5.961	45.10	QP	9.65	0.41	60.00	-14.90
10	5.961	43.42	Average	9.65	0.41	50.00	-6.58
11	14.594	49.08	QP	9.71	0.46	60.00	-10.92
12	14.594	41.83	Average	9.71	0.46	50.00	-8.17

Neutral Line

Peak Scan:

Level (dB μ V)

Quasi-peak and Average measurement

NO.	Freq MHz	Level dBuV	Remark	LISN Factor dB	Cable Loss dB	Limit Line dBuV	Over Limit dB
1	0.194	49.97	QP	9.64	0.21	63.84	-13.87
2	0.194	47.04	Average	9.64	0.21	53.84	-6.80
3	0.358	46.95	QP	9.66	0.25	58.78	-11.83
4	0.358	44.72	Average	9.66	0.25	48.78	-4.06
5	0.527	44.94	QP	9.66	0.27	56.00	-11.06
6	0.527	43.53	Average	9.66	0.27	46.00	-2.47
7	9.966	46.90	QP	9.62	0.44	60.00	-13.10
8	9.966	43.89	Average	9.62	0.44	50.00	-6.11
9	14.594	49.03	QP	9.63	0.46	60.00	-10.97
10	14.594	42.70	Average	9.63	0.46	50.00	-7.30

--End of Report--