

TEST REPORT

Applicant:	ChamSys Ltd
Address of Applicant:	Unit H5 Adanac North, Adanac Drive, Nursling, Southampton, SO16 0BT
Manufacturer:	ChamSys Ltd
Address of Manufacturer:	Unit H5 Adanac North, Adanac Drive, Nursling, Southampton, SO16 0BT
Product name:	MagicQ Consoles
Model(s):	MagicQ 250M
Rating(s):	POWER RATING: AC 100-240V 50-60Hz Max: 4A,351W 115V AC; Max: 2A, 351W 230V AC USB POWER OUTPUT: 5V DC 300mA
Trademark:	CHAMSYS
Standards:	47 CFR PART 15 Subpart C section 15.247
FCC ID:	2AQWR-MOSTAD
Data of Receipt:	2025-04-17
Date of Test:	2025-04-17~2025-10-30
Date of Issue:	2025-10-30
Test Result	Pass*

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

Authorized for issue by:

Test by:

Oct.30, 2025

Chivas Tsang

Project Engineer

Date

Name/Position

Signature

Reviewed by:

Oct.30, 2025

Victor Meng

Project Manager

Date

Name/Position

Signature

Testing Laboratory information:

Testing Laboratory Name: ITL Co., Ltd

Address : No. 8 Jinqianling Street 5, Huangjiang Town, Dongguan,
Guangdong, 523757 P.R.C.

Testing location : Same as above

Tel : 0086-769-39001678

Fax : 0086-20-62824387

E-mail : itl@i-testlab.com

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)

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:

The module has passed the certification, and all data were referred to the modular original report No.4789482589-US-R0-V0 with the exception of Antenna requirement, Radiated Spurious Emission and Conducted Emissions.

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
Occupied Bandwidth	FCC PART 15 C section 15.247 (a)(2)	ANSI C63.10:2013	PASS
Maximum Conducted Output Power	FCC PART 15 C section 15.247(b)(3)	ANSI C63.10: 2013	PASS
Power Spectral Density	FCC PART 15 C section 15.247(e)	ANSI C63.10:2013	PASS
Conducted Spurious Emission (30 MHz to 25GHz)	FCC PART 15 C section 15.209 &15.247(d)	ANSI C63.10:2013	PASS
Radiated Spurious Emission (9 KHz to 25 GHz)	FCC PART 15 C section 15.209 &15.247(d)	ANSI C63.10:2013	PASS
Band Edges	FCC PART 15 C section 15.209 &15.247(d)	ANSI C63.10:2013	PASS
Conducted Emissions at Mains Terminals	FCC PART 15 C section 15.207	ANSI C63.10:2013	PASS
Radiated Emissions which fall in the restricted bands	FCC PART 15 C section 15.209	ANSI C63.10:2013	PASS
Duty Cycle	FCC PART 15 C section 15.247	ANSI C63.10:2013	PASS

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3 General Information

3.1 Client Information

Applicant: ChamSys Ltd
Address of Applicant: Unit H5 Adanac North, Adanac Drive, Nursling, Southampton, SO16 0BT

3.2 General Description of E.U.T.

Name: MagicQ Consoles
Model No.: MagicQ 250M
Trade Mark: CHAMSYS
Operating Frequency: 802.11 b/g/n/ax(HT20): 2412MHz - 2462MHz
802.11 n/ax(HT40): 2422MHz - 2452MHz
802.11b, 802.11g, 802.11n (20MHz): 11

Working Frequency of Each Channel:			
channel	Frequency	channel	Frequency
1	2412	8	2447
2	2417	9	2452
3	2422	10	2457
4	2427	11	2462
5	2432		
6	2437		
7	2437		

Channels:

802.11n (40MHz): 7

Working Frequency of Each Channel:			
channel	Frequency		
1	2422		
2	2427		
3	2432		
4	2437		
5	2442		
6	2447		
7	2452		

Type of Modulation CCK, OFDM, QPSK, BPSK, 16QAM, 64QAM

Antenna Type: IPEX Antenna with 2.65 dBi peak gain

3.3 Details of E.U.T.

EUT Power Supply: AC 100-240V 50/60 Hz

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 tests were performed at:

ITL Co., Ltd

No. 8 Jinqianling Street 5, Huangjiang Town, Dongguan, Guangdong, 523757 P.R.C.

0086-769-39001678

itl@i-testlab.com

No tests were sub-contracted.

3.6 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**

3.7 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	2.25%
total RF power, conducted	± 1.34 dB
RF power density, conducted	± 1.49 dB
All emissions, radiated	± 2.72 dB
Temperature	± 5.02 dB
Humidity	$\pm 0.8^{\circ}\text{C}$
DC and low frequency voltages	± 1.5 %

4 Instruments Used during Test

No.	Test Equipment	Manufacturer	Model	Serial No.	Cal Data	Due Date
DGITL-115	50Ω Coaxial Cable	Mini-circuits	CBL	C001	2025.03.14	2026.03.14
DGITL-182	Test software	2.0.0.0	MTS 8310	/	/	/
DGITL-190	Filter	COM-MW	K6-2400-2483.5-100S5010-007	12230496	2025.01.10	2026.01.09
DGITL-191	Filter	COM-MW	K6-5150-5850-100S5010-003	12234382	2025.01.10	2026.01.09
DGITL- 301	Semi-Anechoic chamber	ETS•Lindgren	9*6*6	CT000874-1181	2023.08.02	2026.08.02
DGITL- 307	EMI test receiver	SCHWARZBECK	ESVS10	833616/003	2025.03.14	2026.03.14
DGITL-376	Wideband Radio Communication Tester	SCHWARZBECK	CMW500	LR114195	2025.03.14	2026.03.14
DGITL-349a	Vector Signal Generator	ROHDE&SCHWARZ	SMBV100A	259268	2025.03.14	2026.03.14
DGITL- 306	Spectrum Analyzer	Agilent Technologies	N9010A	MY54200334	2025.03.14	2026.03.14
DGITL- 352	Pre Amplifier	Mini-Circuits	ZFC-1000HX	SN292801110	2025.03.14	2026.03.14
DGITL-375	Spectrum Analyzer	SCHWARZBECK	FSV40-N	6625-01-588-5515	2025.03.14	2026.03.14
DGITL-309	Horn Antenna	ETS Lindgren	3117	SN00152265	2025.05.13	2027.05.14
DGITL-308	Bilog Antenna	ETS· Lindgren	3142E	156975	2025.05.13	2027.05.14
DGITL-350	Wideband Amplifier Super Ultra	Mini-Circuits	ZVA-183X-S+	SN986401426	2025.03.14	2026.03.14
DGITL-371	Pre Amplifier	teramicrowave	TALA-0040G35	18081001	2025.03.14	2026.03.14
DGITL-363	Active Loop Antenna	SCHWARZBECK	FMZB1519B	00062	2024.05.15	2026.05.11

5 Test Results

5.1 E.U.T. test conditions

Test Voltage: AC 120V, 60Hz

Temperature: 23.2 -25.0 °C

Humidity: 38-50 % RH

Atmospheric Pressure: 1000 -1010 mbar

Requirements: **15.31(e):** 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. For battery operated equipment, the equipment tests shall be performed using a new battery.

15.32: Power supplies and CPU boards used with personal computers and for which separate authorizations are required to be obtained shall be tested as follows: Testing shall be in accordance with the procedures specified in Section 15.31 of this part.

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:

Working Frequency of Each Channel:			
channel	Frequency	channel	Frequency
1	2412	8	2447
2	2417	9	2452
3	2422	10	2457
4	2427	11	2462
5	2432		
6	2437		
7	2437		

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. All testing shall be performed under maximum output power condition, and to measure its highest possible emissions level, more detailed description as follows:

Test Mode List		
Test Mode	Description	Remark
TM1	802.11b	2412MHz, 2437MHz, 2462MHz
TM2	802.11g	2412MHz, 2437MHz, 2462MHz
TM3	802.11n (20MHz)	2412MHz, 2437MHz, 2462MHz
TM5	802.11n (40MHz)	2422MHz, 2437MHz, 2452MHz

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.

5.2.1 Test Result (Antenna requirement)

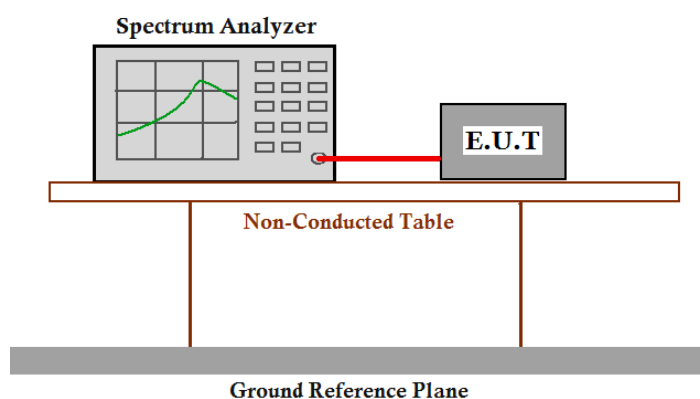
The antenna is a IPEX Antenna and no consideration of replacement. The best-case gain of the antenna is 2.65 dBi.

The unit does meet the FCC requirements.

5.3 Occupied Bandwidth

Test Requirement:	FCC Part 15 C section 15.247 (a)(2) Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.
Test Method:	ANSI C63.10:2013
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, channels and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.

5.3.1 Test Configuration



Test Procedure:

1. The testing follows the Measurement Procedure of ANSI C63.10-2013 Section 11.8 and 6.9.3.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Use the spectrum analyzer "Channel Bandwidth" function to measurement the 6dB EBW and 99% OBW.
5. For 6dB EBW Use the following spectrum analyzer settings: RBW: 100 kHz/VBW: 300 kHz / Detector: Peak /Trace mode: Max hold / Sweep time: Auto couple /Allow trace to fully stabilize.
6. For 99% OBW Use the following spectrum analyzer settings: Set RBW = approximately 1% EBW or 1.5 times to 5.0 times the OBW, VBW > 3 x RBW.
7. Record the measurement results in the test report.

5.3.2 Test Result (-6dB bandwidth)

Please refer to the test report No.4789482589-US-R0-V0.

5.3.3 Test Result (99% power bandwidth)

Please refer to the test report No.4789482589-US-R0-V0.

5.4 Maximum Conducted Output Power

Test Requirement: FCC Part 15 C section 15.247

(b)(3) For systems using digital modulation in the 902-928 MHz,

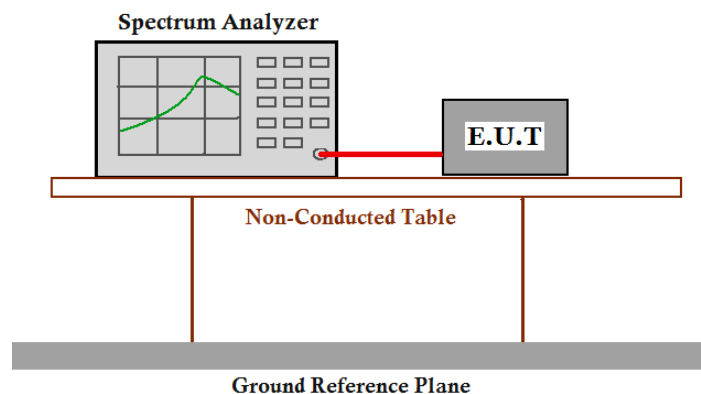
2400-2483.5 MHz and 5725-5850 MHz bands: 1 Watt.

Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b) (1), (b) (2), and (b) (3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Test Method: ANSI C63.10:2013

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

5.4.1 Test Configuration



Test Procedure:

1. The testing follows the Measurement Procedure of ANSI C63.10-2013 Section 11.9.2.2.4.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Use the following spectrum analyzer settings:
Set instrument center frequency to DS channel center frequency/Set span to at least 1.5 times the OBW / RBW = 1% to 5% of the OBW, not to exceed 1 MHz. / Set VBW $\geq$ [3 x RBW]. / Detector: RMS / Sweep time: Auto / Trace mode: Average / Trace average at least 100 traces in power averaging(rms) mode.
5. Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function with band limits set equal to the OBW band edges.
6. Add $[10 \log (1 / D)]$, where D is the duty cycle), to the measured PSD to compute the average PSD during the actual transmission time.
7. Record the measurement results in the test report.

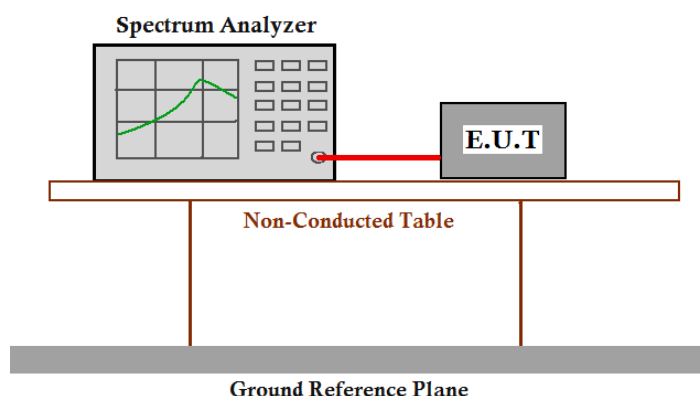
5.4.2 Test Result (Maximum Conducted Output Power)

Please refer to the test report No.4789482589-US-R0-V0.

5.5 Power Spectral Density

Test Requirement:	FCC Part 15 C section 15.247 (e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.
Test Method:	ANSI C63.10:2013
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, channel and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.

5.5.1 Test Configuration



Test Procedure:

1. The testing follows the Measurement Procedure of ANSI C63.10-2013 Section 11.10.5.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.

The path loss was compensated to the results for each measurement.

3. Set to the maximum power setting and enable the EU'T transmit continuously.
4. Use the following spectrum analyzer settings:

Set instrument center frequency to DTS channel center frequency / Set the span to 1.5 times the DTS bandwidth / RBW: 3 kHz / VBW: 10 kHz / Detector: RMS / Sweep time: Auto couple / Trace mode: Average / Employ trace averaging (rms) mode over a minimum of 100 traces / Use the peak marker function to determine the maximum power level.

5. Add $[10 \log (1 / D)]$, where D is the duty cycle), to the measured PSD to compute the average PSD

during the actual transmission time.

6. Record the measurement results in the test report.

5.5.2 Test Result (Power Spectral Density)

Please refer to the test report No.4789482589-US-R0-V0.

5.6 Conducted Spurious Emissions

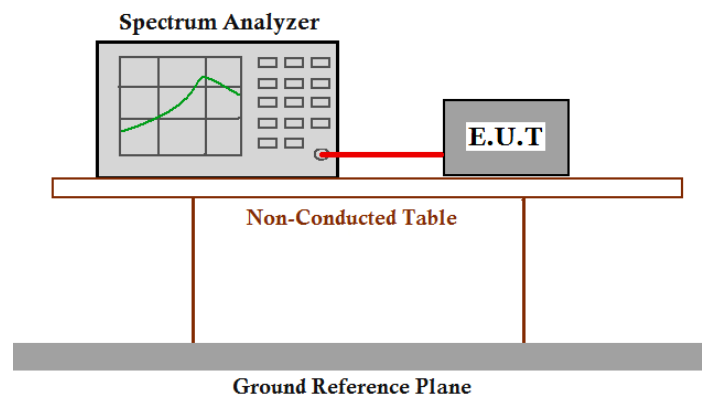
Test Requirement: FCC Part 15 C section 15.247

(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 30 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. Provided the transmitter demonstrates compliance with the averaging conducted power limits.

Test Method: ANSI C63.10:2013

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

5.6.1 Test Configuration



Test Procedure:

1. The testing follows the Measurement Procedure of ANSI C63.10-2013 Section 11.11 and 11.13
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Use the following spectrum analyzer settings

Reference level measurement: Set spectrum analyzer center frequency to DTS channel center frequency / Set the span to >1.5 times the DTS bandwidth / RBW: 100kHz/VBW: 300kHz/Detector: Peak / Sweep time: Auto couple / Trace mode: Max hold / Allow trace to fully stabilize Use the peak marker function to determine the maximum PSD level and attenuate it by 20dB. Emission level measurement: Set the center frequency and span to encompass frequency range to be measured / RBW: 100kHz/VBW: 300kHz/ Detector:

Peak / Sweep time: Auto couple / Trace mode: Max hold / Allow trace to fully stabilize / Use the peak marker function to determine the maximum amplitude level.

5. Record the measurement results in the test report.

5.6.2 Test Result (Conducted Spurious Emissions)

Please refer to the test report No.4789482589-US-R0-V0.

5.7 Radiated Spurious Emissions

Test Requirement: FCC Part 15 C section 15.247

(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

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

Detector: For PK value:

RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz

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, 9 kHz for < 30 MHz

VBW = 10 Hz

Sweep = auto

Detector function = peak

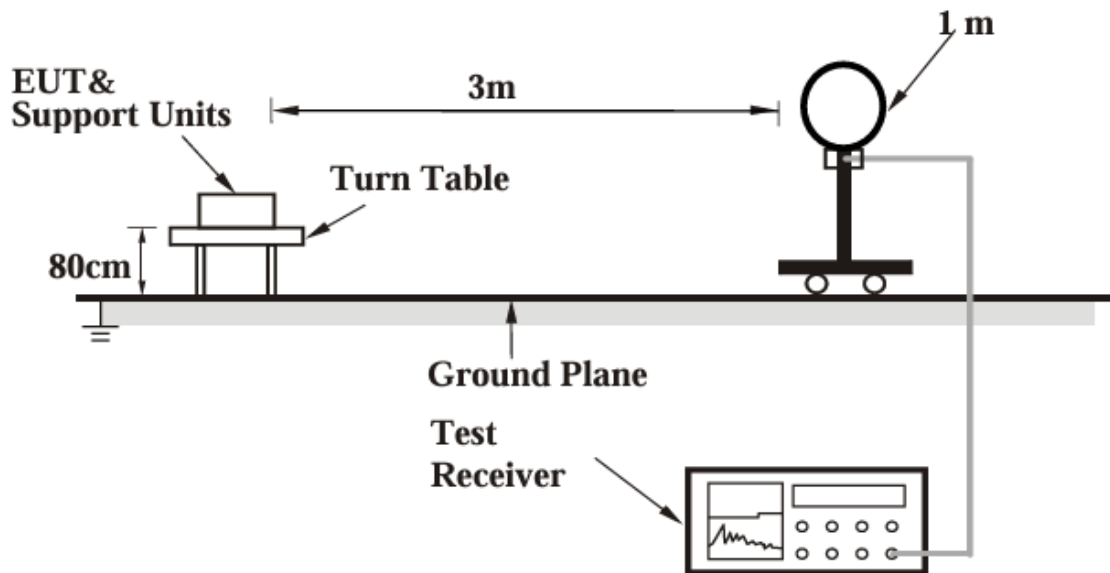
Trace = max hold

15.209 Limit:

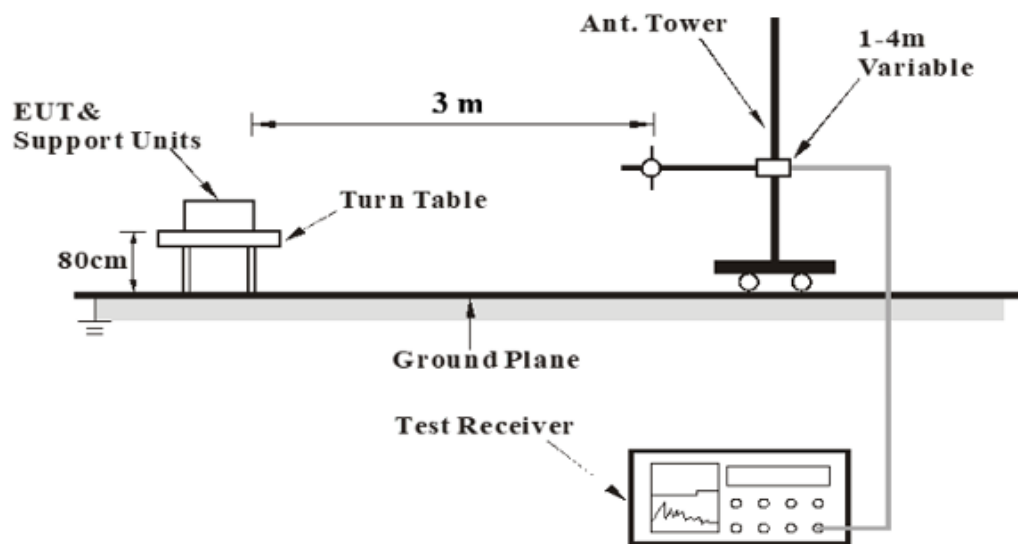
40.0 dB μ V/m between 30 MHz & 88MHz
43.5 dB μ V/m between 88MHz & 216MHz
46.0 dB μ V/m between 216MHz & 960MHz
54.0 dB μ V/m above 960MHz

5.7.1 Test Configuration

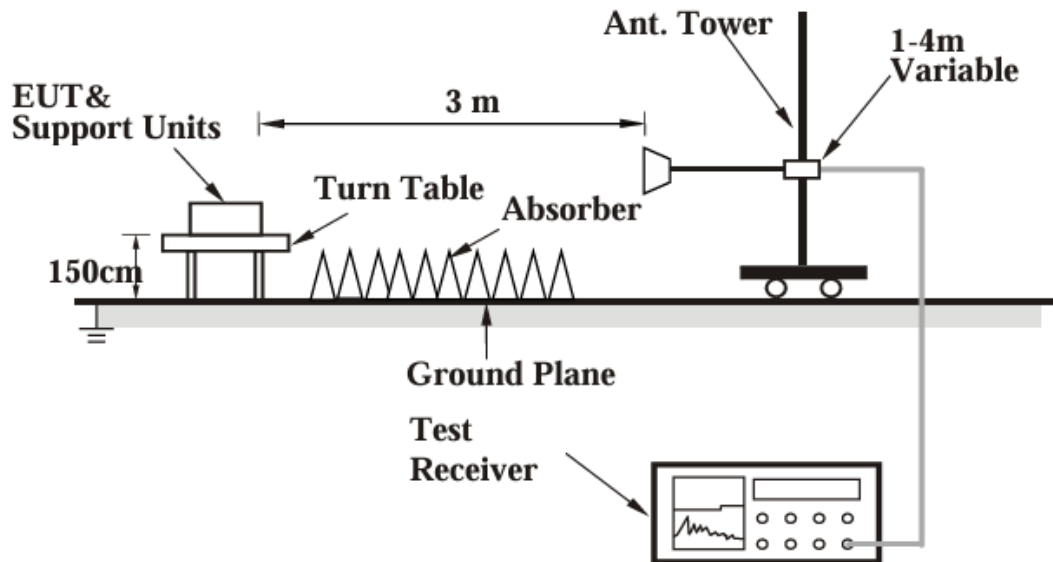
- 1) 9 kHz to 30 MHz emissions:



- 2) 30 MHz to 1 GHz emissions:



3) 1 GHz to 40 GHz emissions:



Test Procedure: (1) The receiver was scanned from 0.009MHz 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.

(2) 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.

(3) Pre-test under all modes below 1GHz; choose the worst case mode record On the report.

5.7.2 Harmonic and other spurious emissions

5.7.3 Test Result (Radiated Spurious Emissions 30 MHz~1 GHz)

Worst case mode 802.11b

9 kHz~30 MHz Test Result

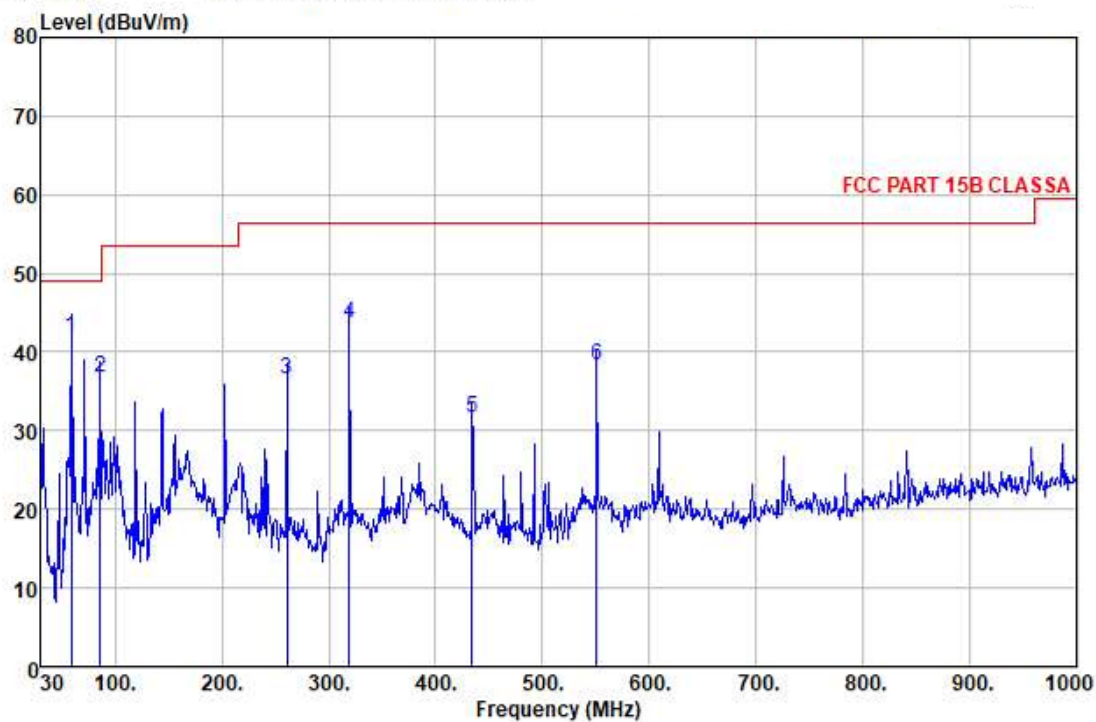
The Low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not report.

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

Horizontal:

Peak scan

Level (dBμV/m)



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	59.100	64.19	5.02	0.88	28.23	41.86	49.10	-7.24	HORIZONTAL	QP
2	86.260	55.67	8.40	1.08	28.29	36.86	49.10	-12.24	HORIZONTAL	QP
3	260.860	49.24	12.90	1.97	27.57	36.54	56.40	-19.86	HORIZONTAL	QP
4	319.060	55.29	13.78	2.19	27.52	43.74	56.40	-12.66	HORIZONTAL	QP
5	434.490	41.73	15.71	2.57	28.29	31.72	56.40	-24.68	HORIZONTAL	QP
6	550.890	46.39	17.95	2.92	28.89	38.37	56.40	-18.03	HORIZONTAL	QP

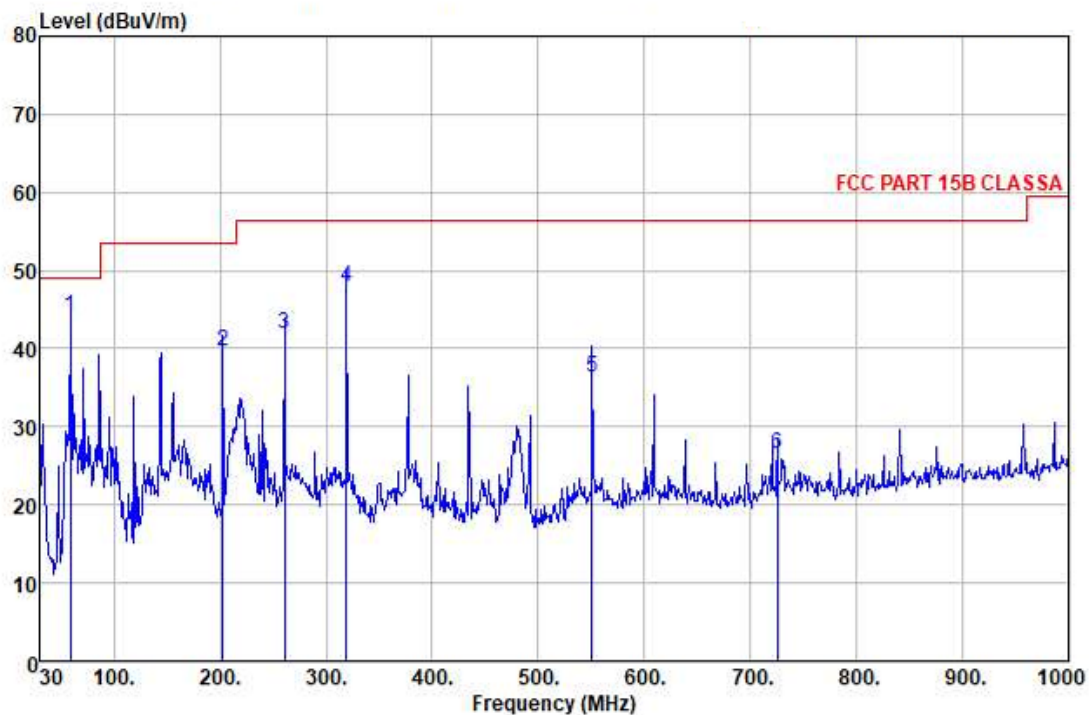
Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor

Quasi-peak measurement

Vertical:

Peak scan

Level (dB μ V/m)



No.	Freq MHz	Read Level dB μ V	Antenna Factor dB	Cable Loss dB	Preamp Factor dB	Level dB μ V/m	Limit Line dB μ V/m	Over Limit dB	Pol/Phase	Remark
1	59.100	66.35	5.02	0.88	28.23	44.02	49.10	-5.08	VERTICAL	QP
2	202.660	55.52	10.31	1.72	27.79	39.76	53.50	-13.74	VERTICAL	QP
3	260.860	54.57	12.90	1.97	27.57	41.87	56.40	-14.53	VERTICAL	QP
4	319.060	59.54	13.78	2.19	27.52	47.99	56.40	-8.41	VERTICAL	QP
5	550.890	44.45	17.95	2.92	28.89	36.43	56.40	-19.97	VERTICAL	QP
6	725.490	30.44	20.30	3.39	27.60	26.53	56.40	-29.87	VERTICAL	QP

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

Quasi-peak measurement

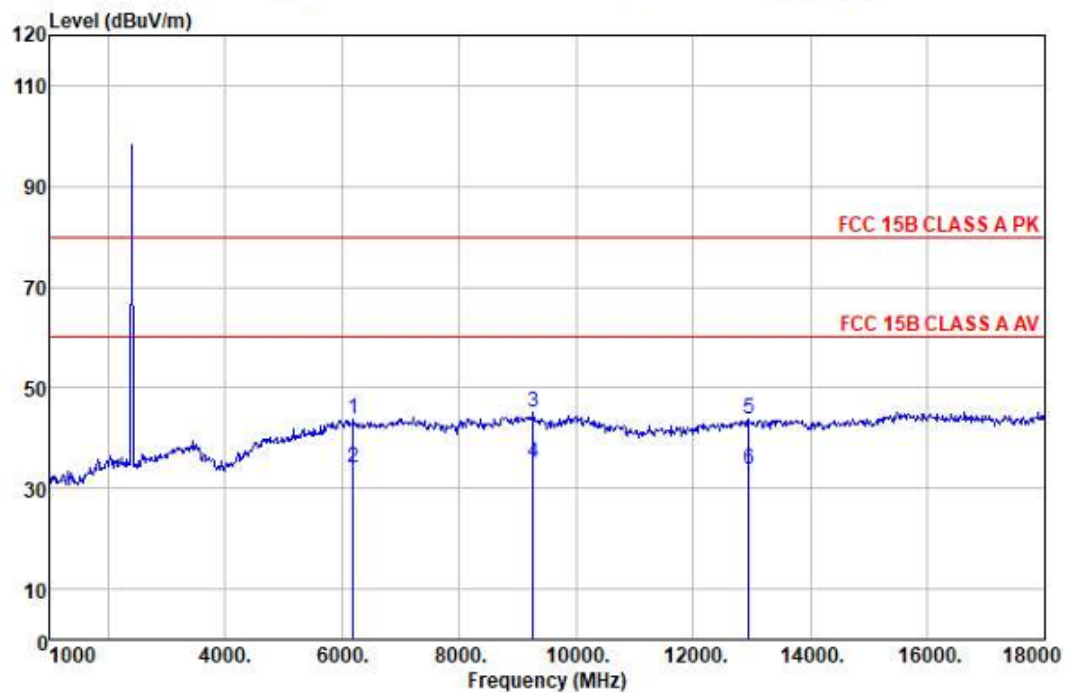
5.7.1 Spurious emissions above 1GHz

Test at Channel 1 (2.412 GHz) in transmitting status

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 dBuV/m	Over Limit dB	Pol/Phase	Remark
6185.000	24.23	35.81	11.09	27.40	43.73	80.00	-36.27	HORIZONTAL	Peak
6185.000	14.63	35.81	11.09	27.40	34.13	60.00	-25.87	HORIZONTAL	Average
9262.000	19.22	38.80	14.13	27.18	44.97	80.00	-35.03	HORIZONTAL	Peak
9262.000	9.26	38.80	14.13	27.18	35.01	60.00	-24.99	HORIZONTAL	Average
12951.000	12.49	40.58	17.14	26.50	43.71	80.00	-36.29	HORIZONTAL	Peak
12951.000	2.62	40.58	17.14	26.50	33.84	60.00	-26.16	HORIZONTAL	Average

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

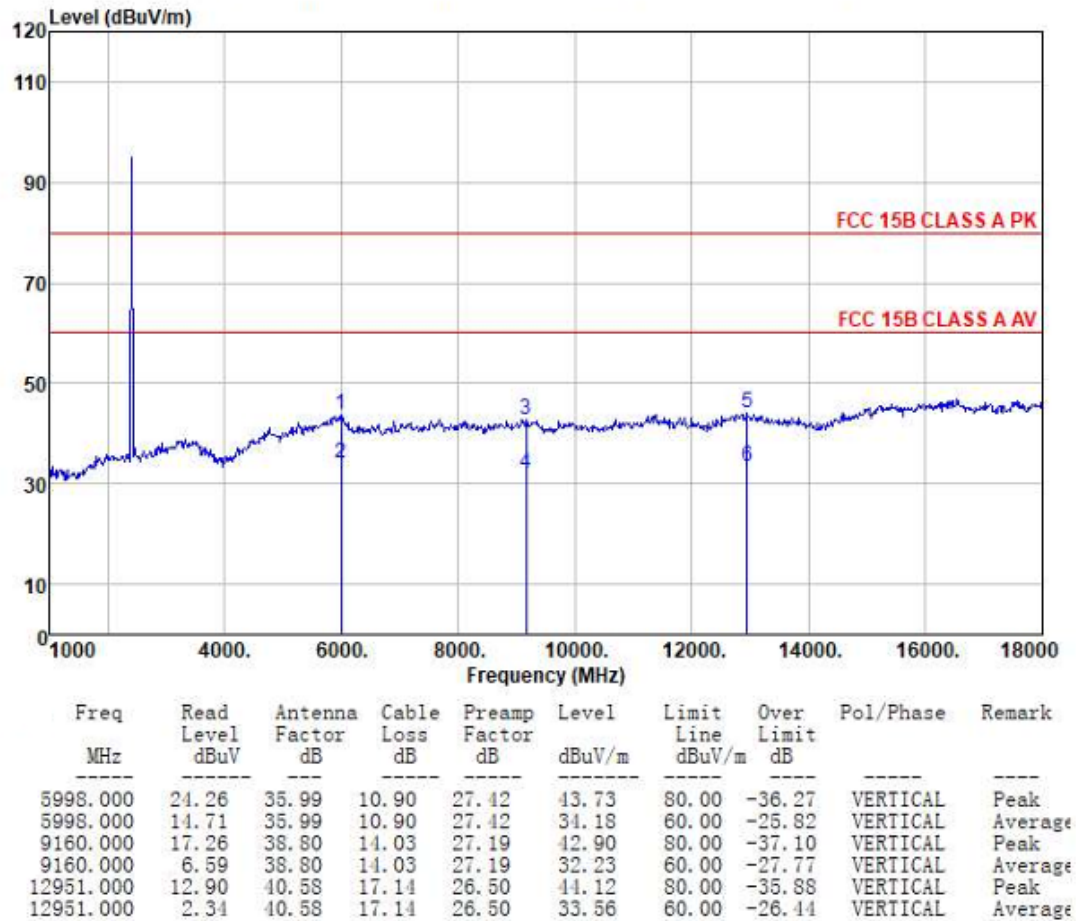
Peak and Average measurement

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

Vertical:

Peak scan

Level (dB μ V/m)



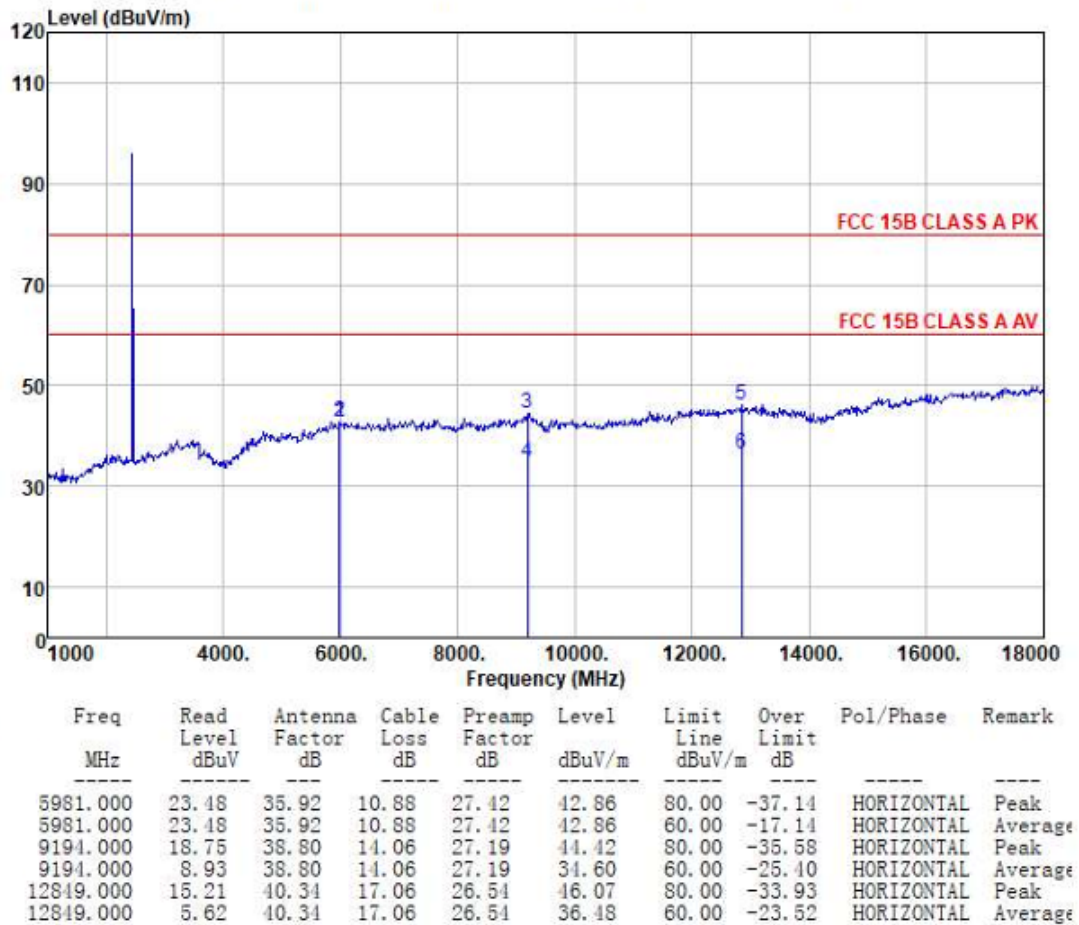
Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor

Peak and Average measurement

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

Test at Channel 6 (2.437 GHz) in transmitting status**Horizontal:**

Peak scan

Level (dB μ V/m)**Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor**

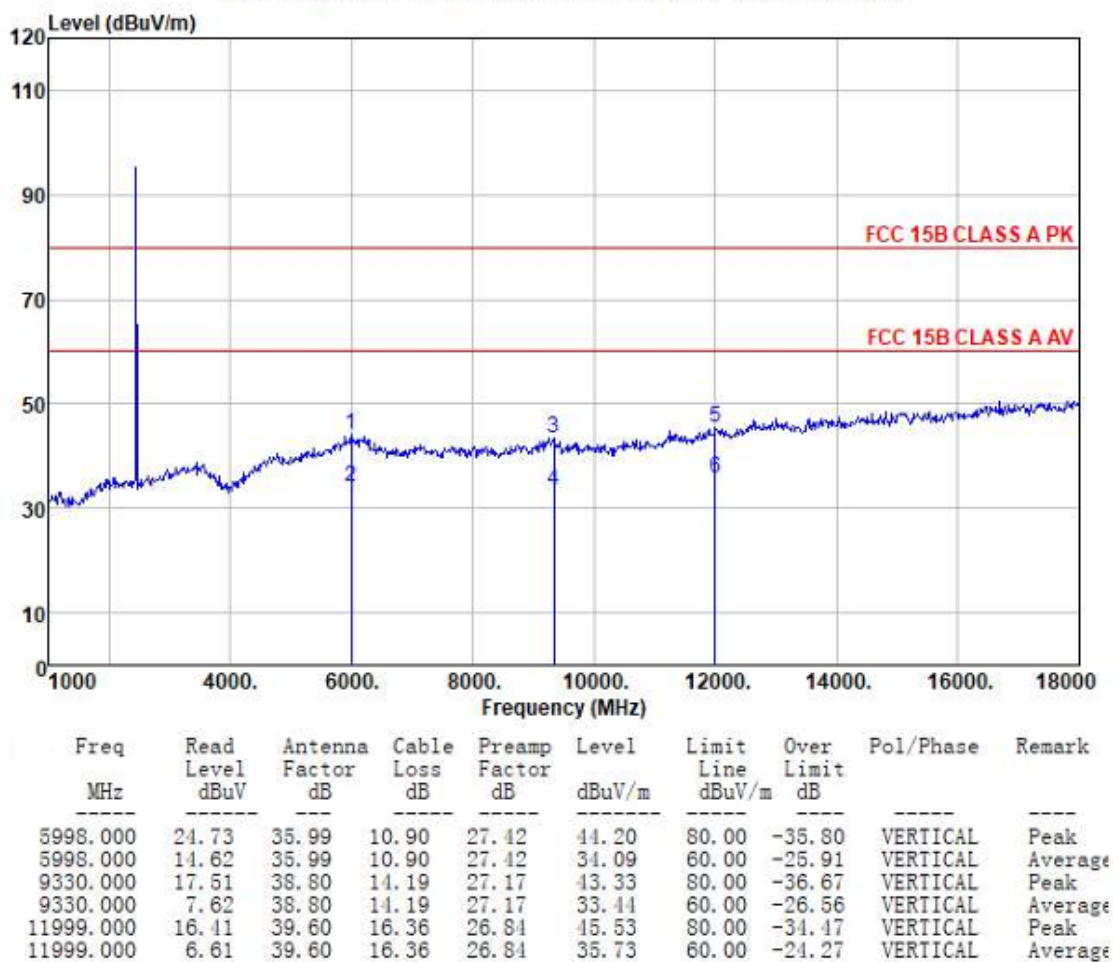
Peak and Average measurement

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

Vertical:

Peak scan

Level (dB μ V/m)



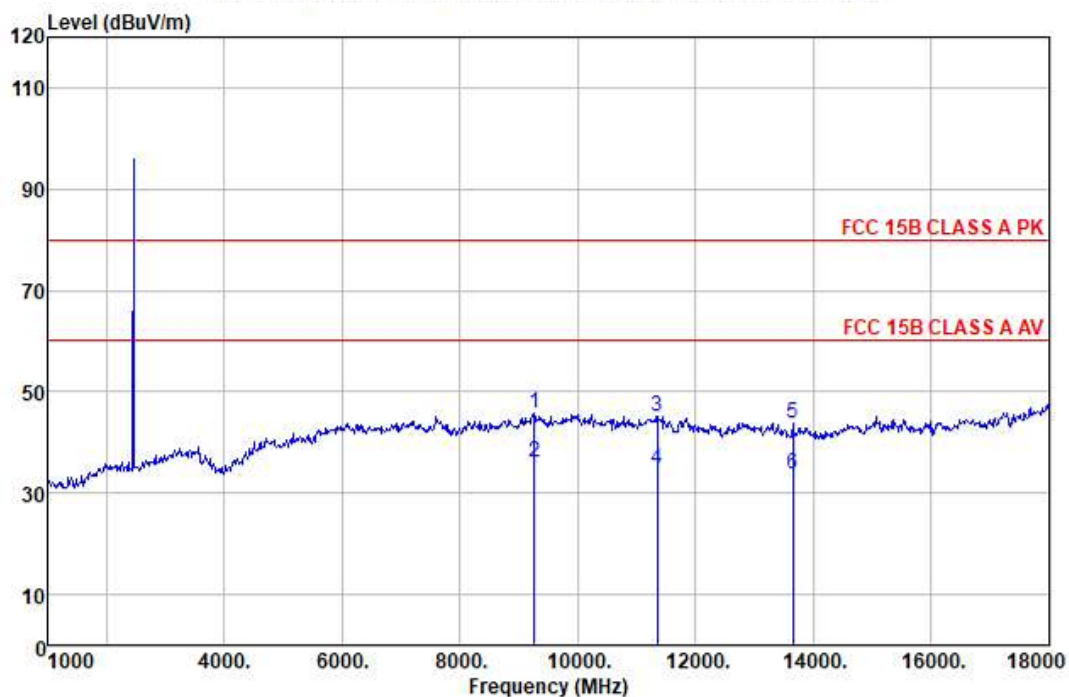
Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor

Peak and Average measurement

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

Test at Channel 11 (2.462 GHz) in transmitting status**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
9262.000	20.12	38.80	14.13	27.18	45.87	80.00	-34.13	HORIZONTAL	Peak
9262.000	10.35	38.80	14.13	27.18	36.10	80.00	-43.90	HORIZONTAL	Average
11353.000	16.93	39.48	15.84	26.99	45.26	80.00	-34.74	HORIZONTAL	Peak
11353.000	6.35	39.48	15.84	26.99	34.68	80.00	-45.32	HORIZONTAL	Average
13648.000	12.55	39.76	17.70	26.29	43.72	80.00	-36.28	HORIZONTAL	Peak
13648.000	2.49	39.76	17.70	26.29	33.66	80.00	-46.34	HORIZONTAL	Average

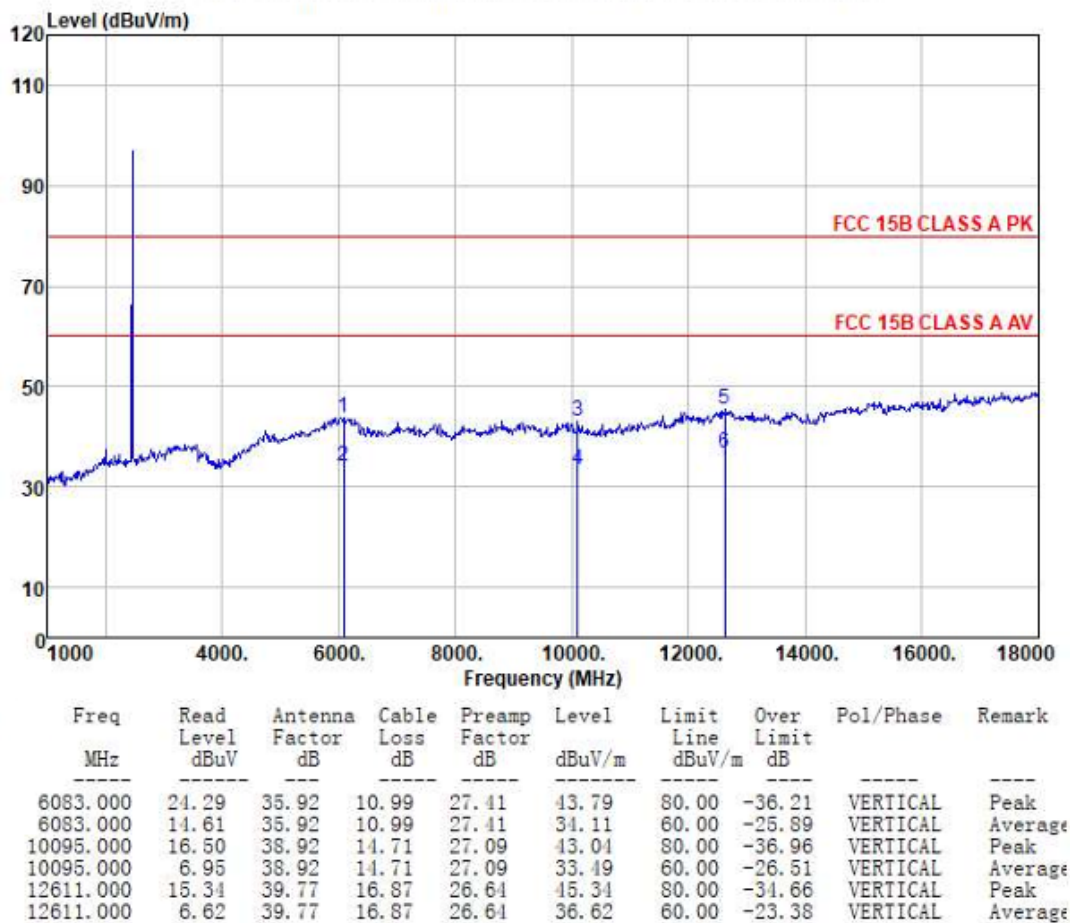
Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor

Peak and Average measurement

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

Vertical:

Peak scan

Level (dB μ V/m)**Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor**

Peak and Average measurement

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

The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier.

The basic equation with a sample calculation is as follows:

Correct= Antenna Factor + Cable Factor –Preamplifier Factor

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor –Preamplifier Factor.

No any other emissions level which are attenuated less than 20dB below the limit.

According to 15.31(o), the amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Hence there are no other emissions have been reported.

Remark:

- 1). For this intentional radiator operates below 25 GHz. The spectrum shall be investigated to the tenth harmonics of the highest fundamental frequency. And above the third harmonic of this intentional radiator, the disturbance is very low. So the Test Result only displays to 3rd harmonic.
- 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 requirements.

5.8 Radiated Emissions which fall in the restricted bands

Test Requirement:	FCC Part 15 C section 15.247 (d) In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).
Test Method:	ANSI C63.10:2013
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, channels and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.

5.8.1 Test Configuration

Test site:	(Semi-Anechoic Chamber)
Measurement Distance:	3m
Limit:	40.0 dB μ V/m between 30 MHz & 88MHz; 43.5 dB μ V/m between 88MHz & 216MHz; 46.0 dB μ V/m between 216MHz & 960MHz; 54.0 dB μ V/m above 960MHz.
Detector:	For PK value: RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz 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 VBW = 10Hz Sweep = auto Detector function = peak Trace = max hold

Section 15.205 Restricted bands of operation.

(a) Except as shown in paragraph (d) of this section. Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	
13.36 - 13.41	322 - 335.4		

5.8.2 Test Result (Radiated Emissions which fall in the restricted bands)

Pre-test under all modes; choose the worst case mode record on the report.

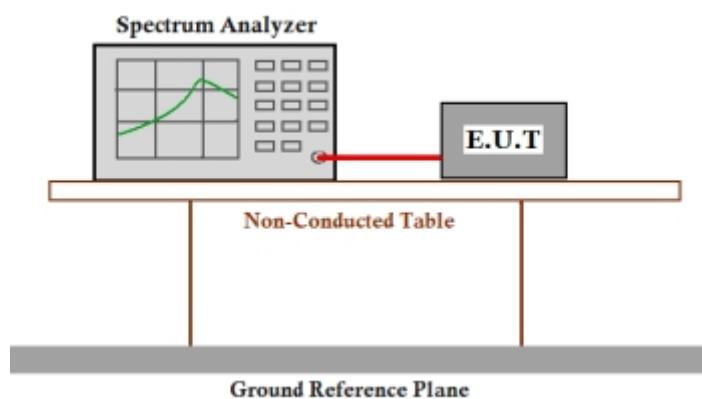
Test mode: 802.11b

Frequency (MHz)	Reading Level (dBμV/m)	Correct (dB/m)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Antenna polarization	Detector
Low Channel							
2310.000	32.14	6.54	39.19	74.00	-33.92	H	PK
2310.000	18.74	6.54	25.69	54.00	-27.99	H	AV
2390.000	32.64	6.61	40.15	74.00	-33.03	V	PK
2390.000	19.05	6.61	25.75	54.00	-27.49	V	AV
High Channel							
2483.500	33.26	6.70	39.96	74.00	-33.41	H	PK
2483.500	19.48	6.70	26.18	54.00	-27.29	H	AV
2500.000	32.67	6.72	39.39	74.00	-34.59	V	PK
2500.000	18.48	6.72	25.20	54.00	-28.44	V	AV

5.9 Band Edges Requirement

Test Requirement:	FCC Part 15 C section 15.247 (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 30 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. Provided the transmitter demonstrates compliance with the conducted power limits.
Frequency Band:	2400 MHz to 2483.5 MHz
Test Method:	ANSI C63.10:2013
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, channels and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.

5.9.1 Test Configuration



Test Procedure:

1. The testing follows the Measurement Procedure of ANSI C63.10-2013 Section 11.11 and 11.13
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Use the following spectrum analyzer settings

Reference level measurement: Set spectrum analyzer center frequency to DTS channel center frequency / Set the span to >1.5 times the DTS bandwidth / RBW: 100kHz/VBW: 300kHz/Detector: Peak / Sweep time: Auto couple / Trace mode: Max hold / Allow trace to fully stabilize Use the peak marker function to

determine the maximum PSD level and attenuate it by 20dB. Emission level measurement: Set the center frequency and span to encompass frequency range to be measured /RBW: 100kHz/VBW: 300kHz/ Detector: Peak / Sweep time: Auto couple / Trace mode: Max hold / Allow trace to fully stabilize / Use the peak marker function to determine the maximum amplitude level.

5. Record the measurement results in the test report.

5.9.2 Test Result (Band Edges)

Please refer to the test report No.4789482589-US-R0-V0.

5.10 Conducted Emissions at Mains Terminals 150 kHz to 30 MHz

Test Requirement: FCC Part 15 C section 15.207

Test Voltage: AC 120V, 60Hz

Test Method: ANSI C63.10:2013 Clause 6.2

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

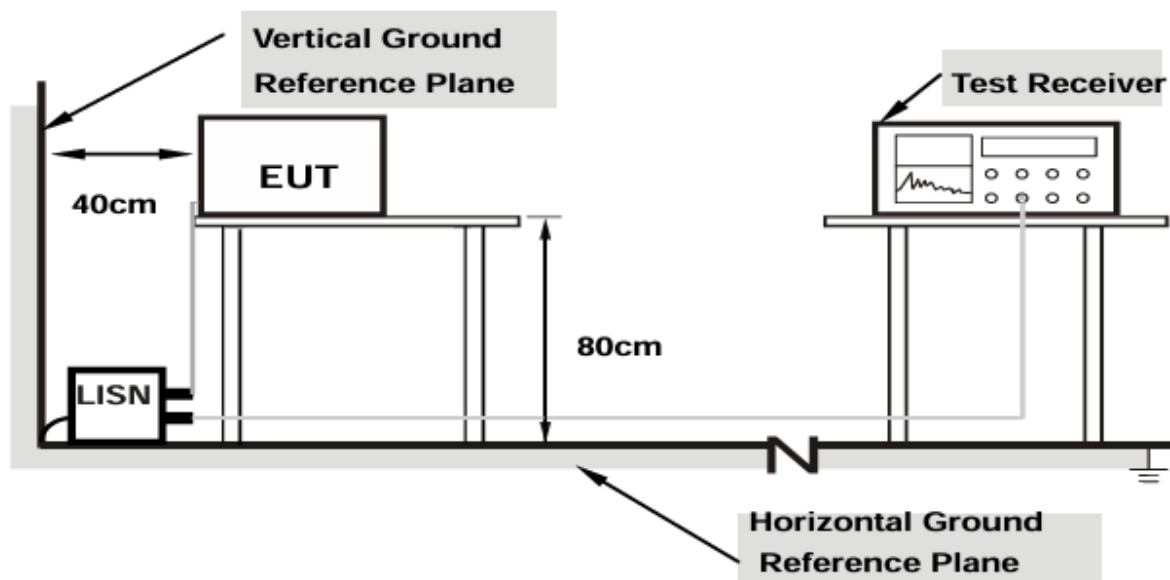
Frequency Range (MHz)	Class B Limit (dB μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
NOTE 1: The limit decreases linearly with the logarithm of the frequency in the range 0,15 MHz to 0,50 MHz.		

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, channels and antenna ports (if EUT with antenna diversity architecture).

5.10.1 Test Configuration



Test procedure:

1. The mains terminal disturbance voltage test was conducted in a shielded room.
2. The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a $50\Omega/50\mu\text{H} + 5\Omega$ linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
3. 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.
4. The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0,4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0,8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0,8 m from the LISN 2.

5.10.2 Test Result (Conducted Emissions at Mains Terminals 150 kHz to 30 MHz)

An initial pre-scan was performed on the live and neutral lines with peak detector.

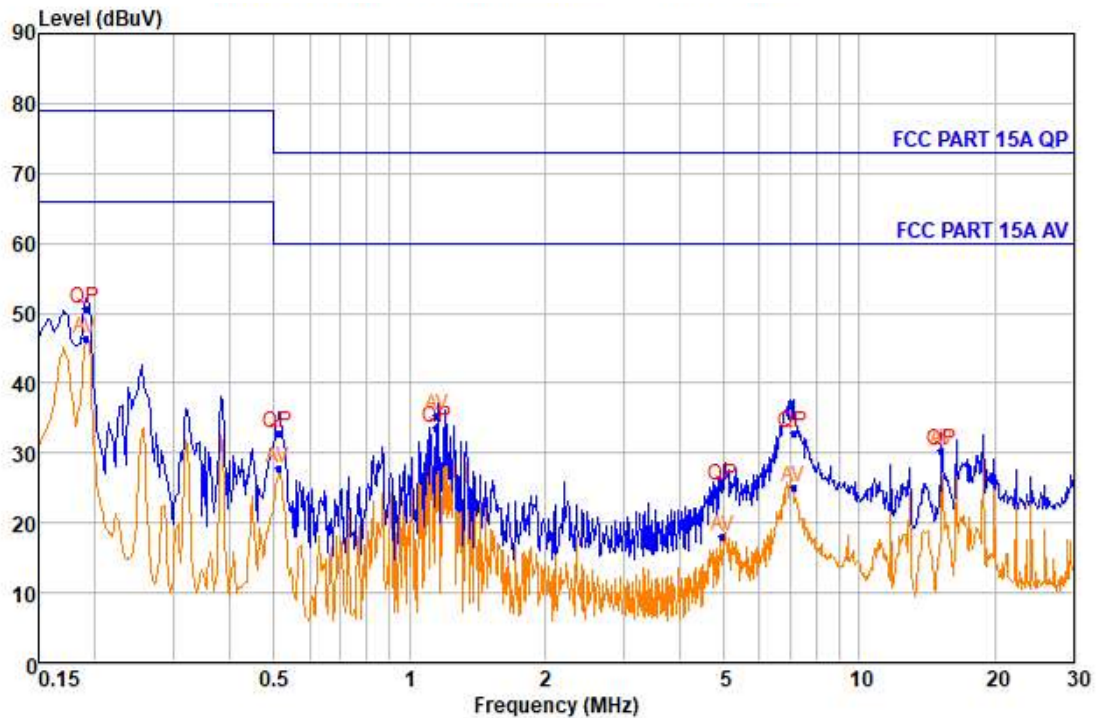
Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected. For EUT the 802.11 b mode was worst case mode.

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

Live Line:

Peak scan

Level (dB μ V/m)



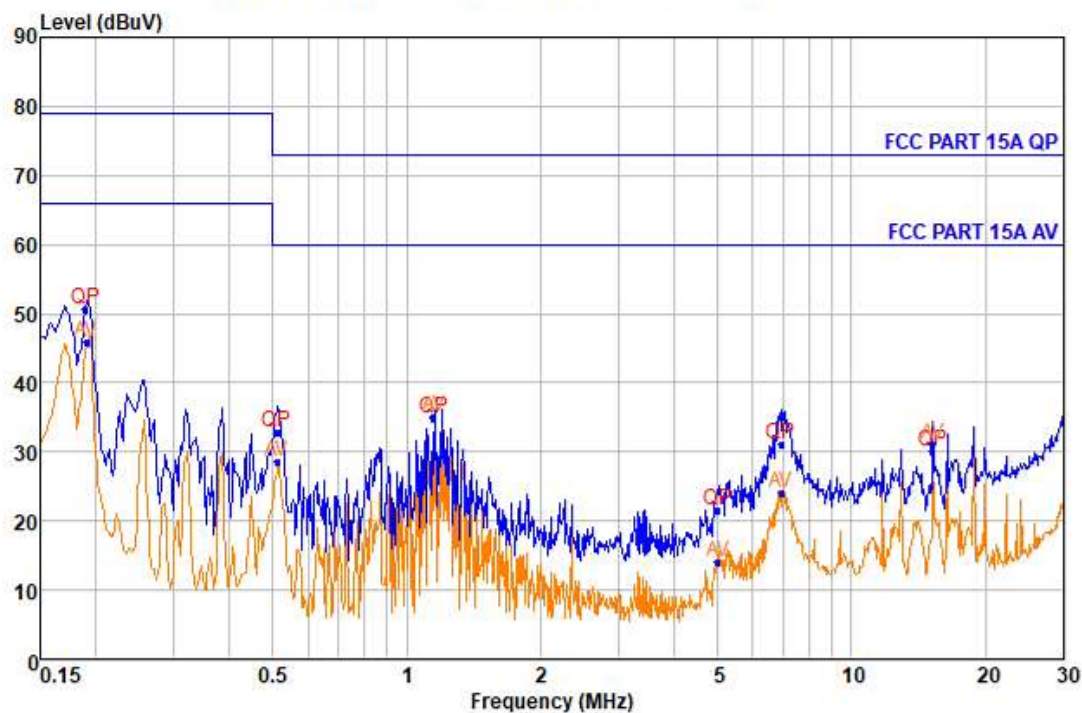
NO.	Freq MHz	Level dB μ V	Remark	LISN Factor dB	Cable Loss dB	Limit Line dB μ V	Margin dB
1	0.190	50.69	QP	9.68	0.21	79.00	-28.31
2	0.190	46.46	Average	9.68	0.21	66.00	-19.54
3	0.512	32.83	QP	9.65	0.27	73.00	-40.17
4	0.512	27.92	Average	9.65	0.27	60.00	-32.08
5	1.151	33.70	QP	9.67	0.32	73.00	-39.30
6	1.151	35.33	Average	9.67	0.32	60.00	-24.67
7	4.968	25.24	QP	9.60	0.40	73.00	-47.76
8	4.968	18.06	Average	9.60	0.40	60.00	-41.94
9	7.122	32.87	QP	9.70	0.42	73.00	-40.13
10	7.122	24.95	Average	9.70	0.42	60.00	-35.05
11	15.188	30.38	QP	9.71	0.46	73.00	-42.62
12	15.188	30.27	Average	9.71	0.46	60.00	-29.73

Level=Read Level + LISN Factor + Cable Loss

Quasi-peak and Average measurement

Neutral Line:

Peak scan

Level (dB μ V/m)

NO.	Freq MHz	Level dBμV	Remark	LISN Factor dB	Cable Loss dB	Limit Line dBμV	Margin dB
1	0.190	50.59	QP	9.64	0.21	79.00	-28.41
2	0.190	45.85	Average	9.64	0.21	66.00	-20.15
3	0.512	32.84	QP	9.67	0.27	73.00	-40.16
4	0.512	28.47	Average	9.67	0.27	60.00	-31.53
5	1.151	34.89	QP	9.63	0.32	73.00	-38.11
6	1.151	35.06	Average	9.63	0.32	60.00	-24.94
7	5.000	21.45	QP	9.62	0.40	73.00	-51.55
8	5.000	14.06	Average	9.62	0.40	60.00	-45.94
9	6.937	31.00	QP	9.62	0.42	73.00	-42.00
10	6.937	23.94	Average	9.62	0.42	60.00	-36.06
11	15.188	30.01	QP	9.63	0.46	73.00	-42.99
12	15.188	31.12	Average	9.63	0.46	60.00	-28.88

Level=Read Level + LISN Factor + Cable Loss

Quasi-peak and Average measurement

5.11 Duty Cycle

5.11.1 Test Configuration

Preferably, all measurements of maximum conducted (average) output power will be performed with the EUT transmitting continuously (i.e., with a duty cycle of greater than or equal to 98%).

When continuous operation cannot be realized, then the use of sweep triggering/signal gating techniques can be used to ensure that measurements are made only during transmissions at the maximum power control level. Such sweep triggering/signal gating techniques will require knowledge of the minimum transmission duration (T) over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation. Sweep triggering/signal gating techniques can then be used if the measurement/sweep time of the analyzer can be set such that it does not exceed T at any time that data are being acquired (i.e., no transmitter OFF-time is to be considered). When continuous transmission cannot be achieved and sweep triggering/signal gating cannot be implemented, alternative procedures are provided that can be used to measure the average power; however, they will require an additional measurement of the transmitter duty cycle (D). Within this subclause, the duty cycle refers to the fraction of time over which the transmitter is ON and is transmitting at its maximum power control level. The duty cycle is considered to be constant if variations are less than $\pm 2\%$; otherwise, the duty cycle is considered to be non-constant.

The term "maximum power control level" is intended to distinguish between operating power levels of the EUT and differences in power levels of individual symbols that occur with some modulation types such as quadrature amplitude modulation (QAM). During testing, the EUT is not required to transmit continuously its highest possible symbol power level. Rather, it should transmit all the symbols and should do so at the highest power control level (i.e., highest operating power level) of the EUT.

Measurements of duty cycle and transmission duration shall be performed using one of the following techniques:

- a) A diode detector and an oscilloscope that together have a sufficiently short response time to permit accurate measurements of the ON and OFF times of the transmitted signal.
- b) The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the ON and OFF times of the transmitted signal:
 - 1) Set the center frequency of the instrument to the center frequency of the transmission.
 - 2) Set $RBW \geq OBW$ if possible; otherwise, set RBW to the largest available value.
 - 3) Set $VBW \geq RBW$. Set detector = peak or average.

4) The zero-span measurement method shall not be used unless both RBW and VBW are $> 50/T$ and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring the duty cycle shall not be used if $T \leq 16.7 \mu\text{s}$.)

5.11.2 Test Result (Duty Cycle)

Please refer to the test report No.4789482589-US-R0-V0.

-- End of test report --