

TEST REPORT

Applicant:	KLIPSCH L.L.C.
Address of Applicant:	3502 Woodview Trace, Suite 200, Indianapolis, IN 46268, United States.
Manufacturer:	KLIPSCH L.L.C.
Address of Manufacturer:	3502 Woodview Trace, Suite 200, Indianapolis, IN 46268, United States.
Product name:	WIRELESS TRANSMITTER
Model:	WIRELESS SUBS (For WIRELESS TRANSMITTER)
Rating(s):	Main Unit: 5V d.c., 1A (For), External Switching mode power supply: I/P: 100-240V~, 50/60Hz O/P: 5V d.c., 1A
Trademark:	KLIPSCH
FCC register number :	935596
Standards:	FCC Part 15.247 :2016 RSS-247 Issue 1
FCC ID:	STI-R1012SWI
IC:	5788A-R1012SWI
Data of Receipt:	2016-08-26
Date of Test:	2016-08-26~2016-10-18
Date of Issue:	2016-10-19
Test Result	Pass*

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

Authorized for issue by:

Test by:

Jumy qiu

Oct.19, 2016 Jumy Qiu

Project Engineer

Reviewed by:

Pauler Li

Oct.19, 2016

Pauler Li

Project Engineer

Date

Name/Position

Signature

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: I-Test Laboratory

Address.....: 1-2 floor, South Block, Building A2 , No 3 Keyan Lu,
Science City, Guangzhou, Guangdong Province, P.R. China

Testing location : Same as above

Tel : 0086-20-32209330

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.

Note:

The EUT include one WIRELESS SUBWOOFER. All testing should have been conducted on the WIRELESS SUBS.

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 (99% and 6dB)	FCC PART 15 C section 15.247 (a)(2) RSS 247 5.1(2)	ANSI C63.10:2013 Clause 6.9 and KDB 558074 D01 v03r04	PASS
Maximum Peak Output Power	FCC PART 15 C section 15.247(b)(3) RSS 247 5.4(2)	ANSI C63.10: 2013 Clause 6.10 and KDB 558074 D01 v03r04 (Power Output Option 2-Method#1).	PASS
Peak Power Spectral Density	FCC PART 15 C section 15.247(e) RSS 247 5.1(2)	ANSI C63.10:2013 Clause 6.11 and KDB 558074 D01 v03r04 (PSD Option 1).	PASS
Conducted Spurious Emission (30MHz to 25GHz)	FCC PART 15 C section 15.209 &15.247(d) RSS 247 5.5	ANSI C63.10:2013 Clause 6.7 and KDB 558074 D01 v03r04	PASS
Radiated Spurious Emission 30 MHz to 25 GHz)	FCC PART 15 C section 15.209 &15.247(d) RSS 247 5.5	ANSI C63.10:2013 Clause 6.4, 6.5 and 6.6 & KDB 558074 D01 v03r04	PASS
Band Edges Measurement	FCC PART 15 C section 15.209 &15.247(d) RSS 247 5.5	ANSI C63.10:2013 Clause 6.9 & KDB 558074 D01 v03r04	PASS
Conducted Emissions at Mains Terminals	FCC PART 15 C section 15.207 RSS GEN Table 2	ANSI C63.10:2013 Clause 6.2	PASS

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3 General Information

3.1 Client Information

Applicant: KLIPSCH L.L.C.
Address of Applicant: 3502 Woodview Trace, Suite 200, Indianapolis, IN 46268, United States.

3.2 General Description of E.U.T.

Name: WIRELESS TRANSMITTER
Model No.: WIRELESS SUBS
Trade Mark: KLIPSCH
Operating Frequency: 2405.35 MHz to 2477.35 MHz
Channel Spacing: 2 MHz

Channels:

Channel No.	Frequency
2	2405.35 MHz
...	...
20	2441.35 MHz
...	...
38	2477.35 MHz

Type of Modulation: QPSK
Hardware version: OGA
Software version: SWA12_WA2_R01_ToOrchard
Antenna Type: Printed Antenna

3.3 Details of E.U.T.

EUT Power Supply: AC Power, Class II
Main Unit: 5V d.c., 1A (For),
External Switching mode power supply:
Rated power: I/P: 100-240V~, 50/60Hz
O/P: 5V d.c., 1A
I/P: 100-240V~, 50/60Hz, 2A (For R-10SWi / R-12SWi)
Test mode: The program used to control the EUT for staying in continuous transmitting and receiving mode is programmed. Channel lowest (2405.35 MHz), middle (2441.35 MHz) and highest (2477.35 MHz) are chosen for full testing.
Power cord: Direct plug

3.4 Description of Support Units

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

Details of Support Equipment(s)

Description	Manufacturer	Model No.	Connection	Working state
OSCILLATOR	KENWOOD	AG-203A	/	Normal

3.5 Test Location

All tests were performed at:

I-Test Laboratory

1-2 floor, South Block, Building A2 , No 3 Keyan Lu, Science City, Guangzhou, Guangdong Province, P.R. China

0086-20-32209330

itl@i-testlab.com

No tests were sub-contracted.

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:L4957)
- FCC (Registration No.:935596)
- IC (Registration NO.:8368A)

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	2016/01/25	2017/01/25
ITL-154	EMI test receiver 9kHz to 26.5GHz	R&S	ESR26	101257	2016/01/05	2017/01/05
ITL-116	Pre Amplifier	HP	8447F	3113A05905	2016/01/25	2017/01/25
ITL-117	Wideband Amplifier Super Ultra	Mini-circuits	ZVA-183- S+	469101134	2016/01/25	2017/01/25
ITL-105	Biconilog Antenna	ETS•Lindgren	3142D	00108096	2015/01/24	2018/01/24
ITL-110	Horn Antenna	A-INFOMW	JXTXLB- 10180-N	J2031090612 133	2015/01/24	2018/01/24
ITL-102	EMI Test receiver	R&S	ESCI	100910	2016/06/17	2017/06/17
ITL-103	Two-line v- network	R&S	ENV216	100120	2016/06/17	2017/06/17
ITL-115	50Ω Coaxial Cable	Mini-circuits	CBL	C001	2016/06/17	2017/06/17
ITL-100	Semi-Anechoic chamber	ETS•Lindgren	FACT3 2.0	CT09015	2014/06/17	2017/06/17
ITL-145	Loop Antenna	ZHINAN	ZN30900 A	002489	2016/01/25	2017/01/25
ITL-146	Horn Antenna	Schwarzbeck	BBHA 9170	B09806543	2016/06/17	2017/06/17
ITL-101	Shielded Room	ETS•Lindgren	8*4*3	CT09010	2015/03/09	2018/03/09

5 Test Results

5.1 E.U.T. test conditions

Test Voltage: AC 120V

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:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
2	2405.35	21	2443.35
3	2407.35	22	2445.35
4	2409.35	23	2447.35
5	2411.35	24	2449.35
6	2413.35	25	2451.35
7	2415.35	26	2453.35
8	2417.35	27	2455.35
9	2419.35	28	2457.35
10	2421.35	29	2459.35
11	2423.35	30	2461.35
12	2425.35	31	2463.35
13	2427.35	32	2465.35
14	2429.35	33	2467.35
15	2431.35	34	2469.35
16	2433.35	35	2471.35
17	2435.35	36	2473.35
18	2437.35	37	2475.35
19	2439.35	38	2477.35
20	2441.35		

Test frequencies are the lowest channel: 2 channel (2405.35 MHz), middle channel: 20 channel (2441.35 MHz) and highest channel: 38 channel (2477.35 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

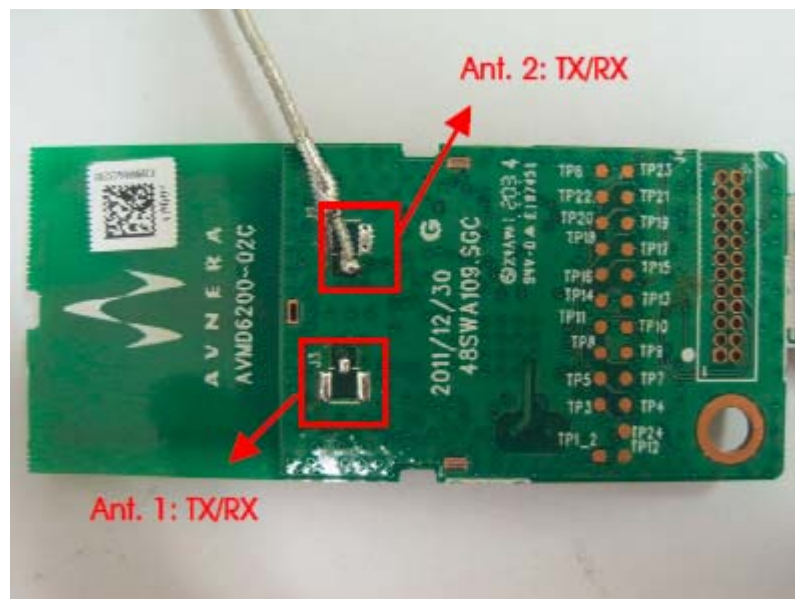
Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	-	AVMD6200-02C	Printed Antenna	NA	3.9
2	-	AVMD6200-02C	Printed Antenna	NA	3.5

Note: The EUT has two antennas.

Either Ant. 1 or Ant. 2 can be used as transmitting/receiving antenna.

The EUT supports the antenna with TX/RX diversity function.

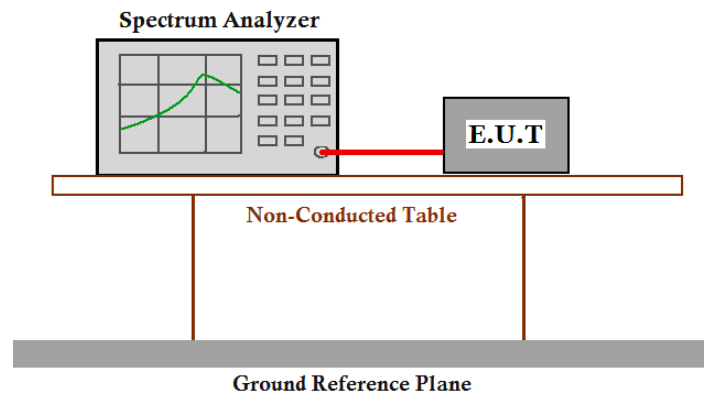
Due to Ant. 1 and Ant. 2 are identical and the Ant. 2 generated higher output power than Ant. 1, so all the tests were base on this setting and recorded in this report.



Test result: The unit does meet the FCC requirements.

5.36 dB Bandwidth

Test Requirement:	FCC Part 15 C section 15.247 and RSS 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 Clause 6.9 and KDB 558074 D01 v03r04
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.
Test Configuration:	



Test Procedure:

1. Remove the antenna from the EUT and then connect a low attention attenuation RF cable (Cable loss =0.5dB) from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW=100 kHz. VBW = 100 kHz, Sweep = auto; Detector Function = Peak. Trace = Max Hold, Set span to encompass the entire emission bandwidth of the signal.
3. Mark the peak power frequency and -6dB (upper and lower) power frequency.
4. Repeat until all the test status is investigated.
5. Report the worst case.

Test result (6 dB bandwidth)

Channel No.	Frequency (MHz)	Measured 6dB bandwidth (MHz)	Limit	Result
2	2405.35	1.635	≥500KHz	Pass
20	2441.35	1.633		Pass
38	2477.35	1.632		Pass

Test result (99% bandwidth)

Channel No.	Frequency (MHz)	Bandwidth (MHz)	Limit	Result
2	2405.35	1.8010	≥500KHz	Pass
20	2441.35	1.7971		Pass
38	2477.35	1.7958		Pass

6dB bandwidth:

Result plot as follows:

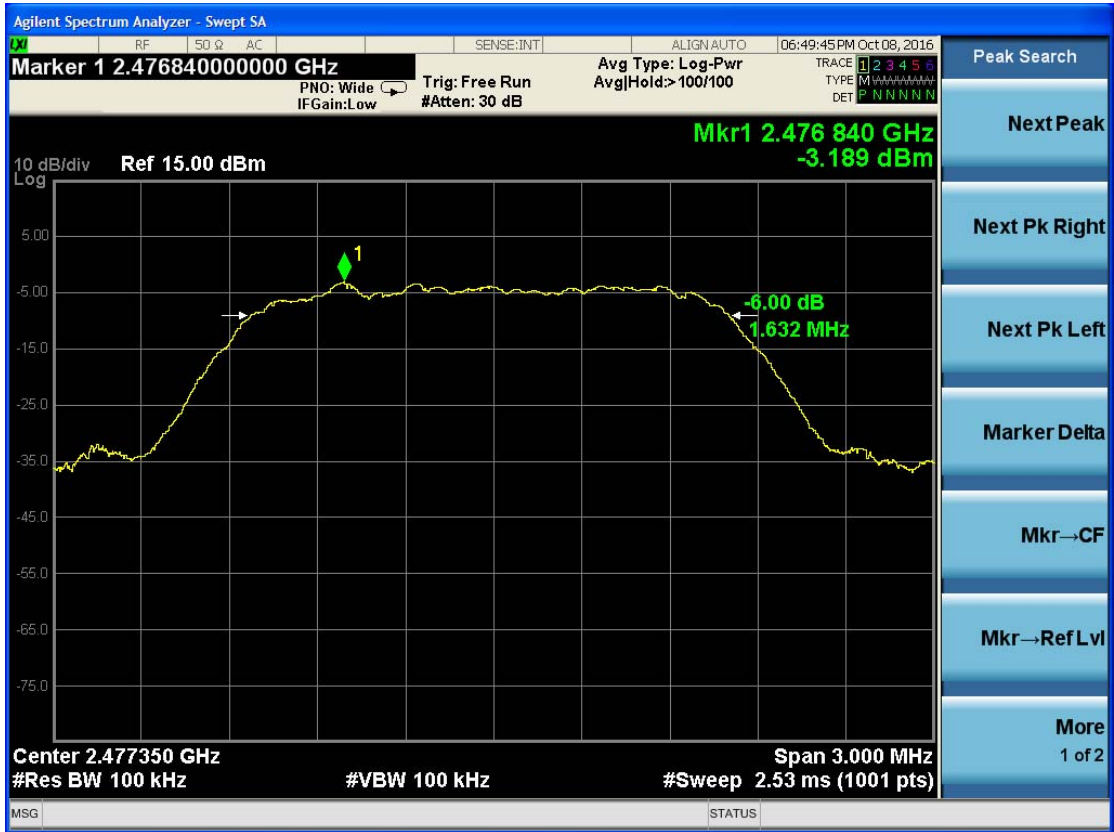
Channel 2: 2405.35 MHz:



Channel 20:2441.35MHz:



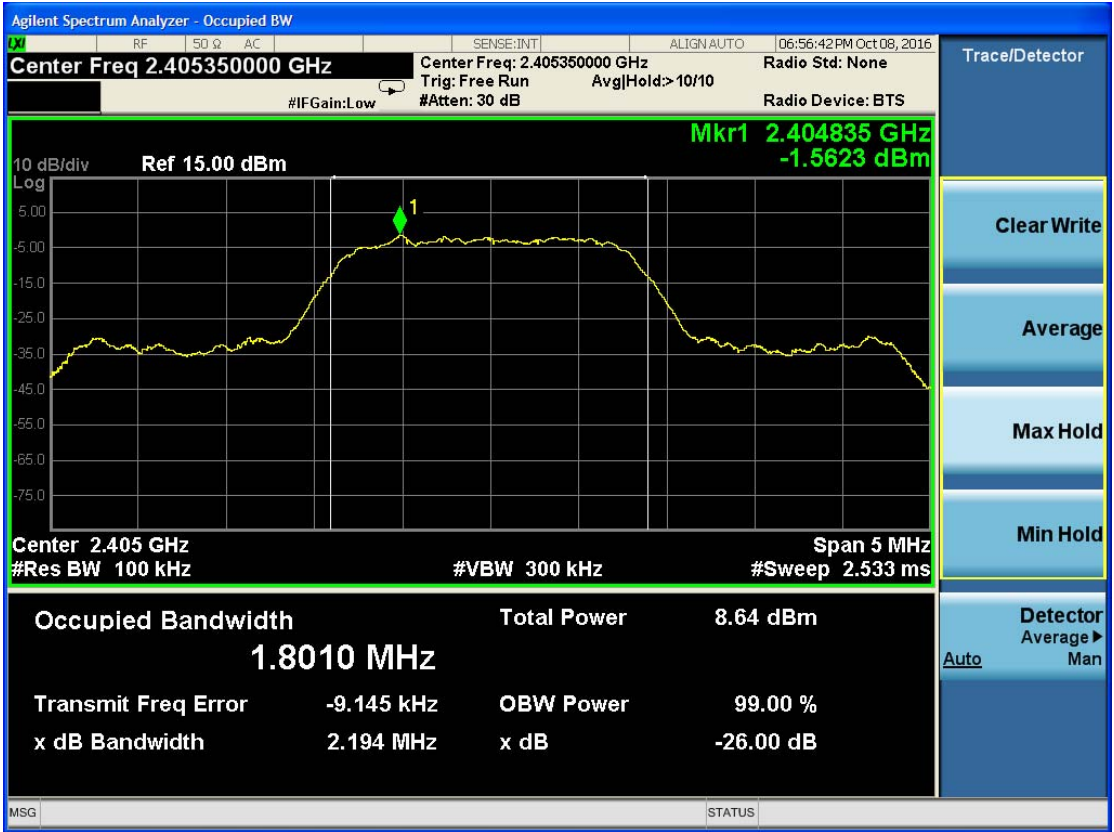
Channel 38:2477.35MHz:



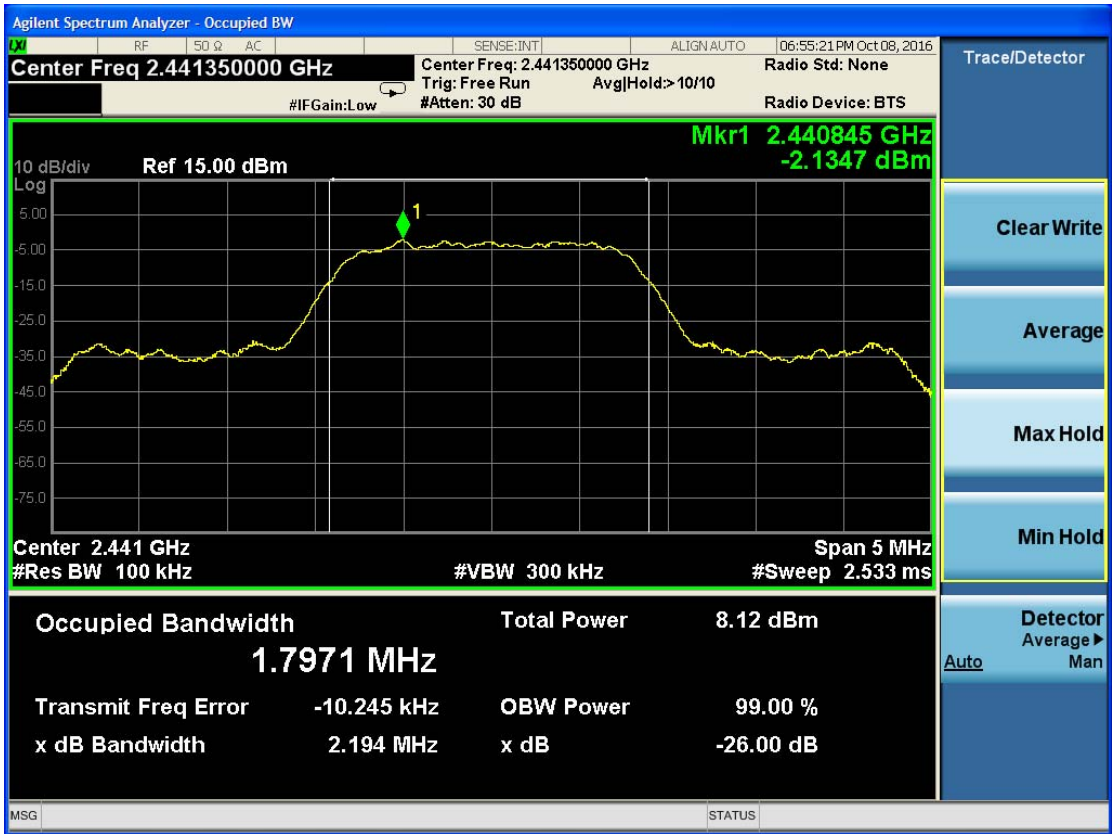
99% bandwidth:

Result plot as follows:

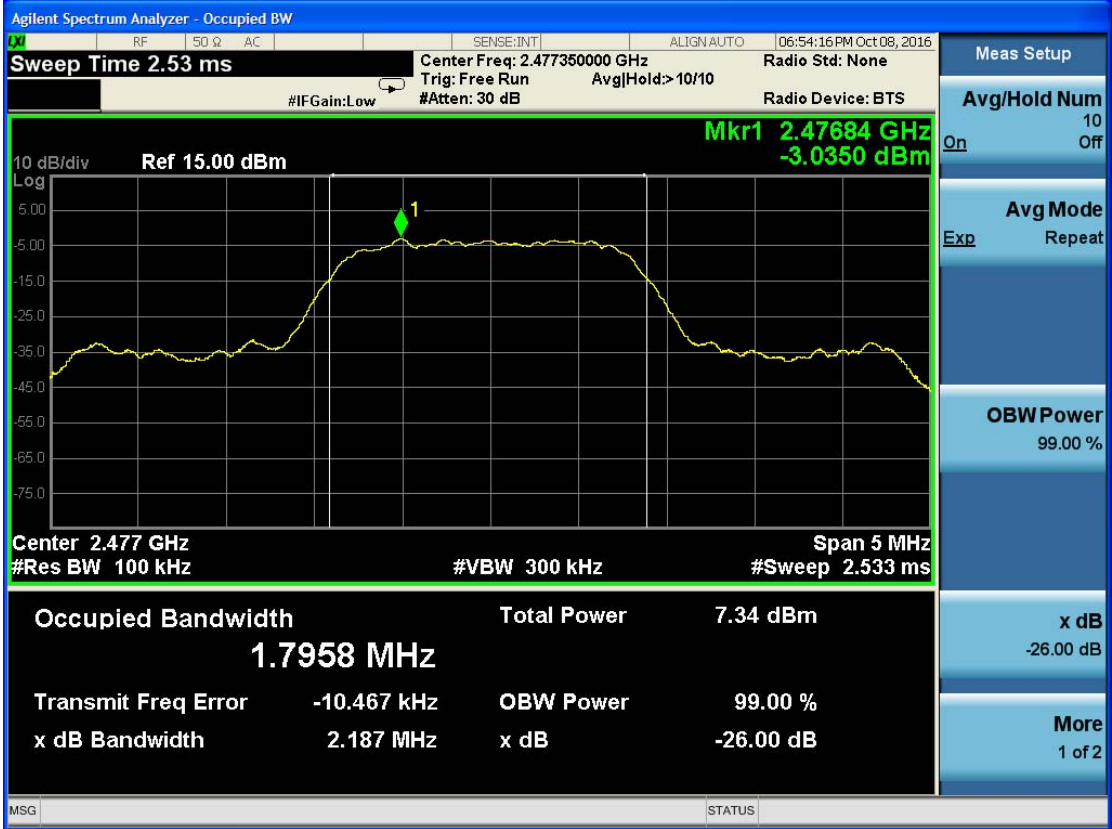
Channel 2: 2405.35 MHz:



Channel 20:2441.35MHz:



Channel 38:2477.35MHz:



5.4 Maximum Peak Output Power

Test Requirement: FCC Part 15 C section 15.247 and RSS-247

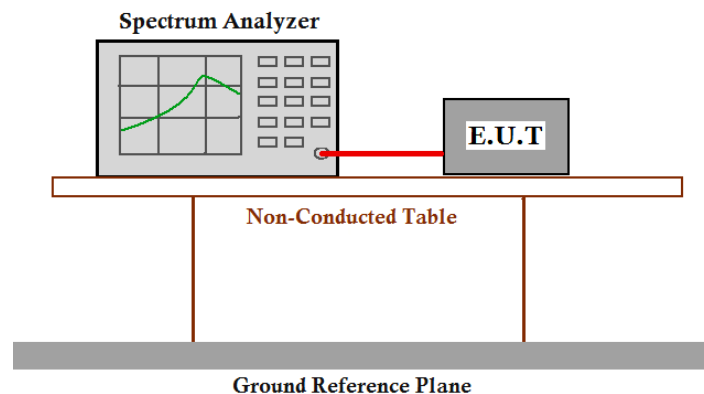
(b)(3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt.

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 Clause 6.10 and KDB 558074 D01 v03r04 (Power Output Option 2-Method #1).

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.

Test Configuration:



Test Procedure:

1. Remove the antenna from the EUT and then connect a low attention attenuation RF cable (Cable loss = 0.5dB) from the antenna port to the spectrum.
2. Set span to encompass the entire emission bandwidth (EBW) of the signal.
3. Set RBW = 1 MHz.
4. Set VBW $\geq$ 3 MHz.
5. Use sample detector mode if bin width (i.e., span/number of points in spectrum display) $<$ 0.5 RBW. Otherwise use peak detector mode.
6. Use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at full control power for entire sweep of every sweep.

If the device transmits continuously, with no off intervals or reduced power intervals, the trigger may be set to "free run".

7. Trace average 100 traces in power averaging mode.

8. Compute power by integrating the spectrum across the 26 dB EBW of the signal. The integration can be performed using the spectrum analyzer's band power measurement function with band limits set equal to the EBW band edges or by summing power levels in each 1 MHz band in linear power terms. The 1 MHz band power levels to be summed can be obtained by averaging, in linear power terms, power levels in each frequency bin across the 1 MHz.

9. Measure the channel power of the test frequency with special test status.

10. Repeat until all the test status is investigated.

11. Report the worst case.

Channel No.	Frequency (MHz)	Reading Power (dBm)	Output Power (dBm)	Limit (dBm)	Result
2	2405.35	1.995	2.495	30	Pass
20	2441.35	1.476	1.976		Pass
38	2477.35	0.618	1.118		Pass

Remark: 1) Output Peak Power=Reading Peak Power+Cable loss

2) Cable loss=0.5dB

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

Result plot as follows:

Channel 2: 2405.35 MHz:



Channel 20: 2441.35MHz:



Agilent Spectrum Analyzer - Swept SA

RF 50 Ω AC SENSE:INT ALIGN: AUTO 06:39:07 PM Oct 08, 2016

Marker 1 2.477110000000 GHz PNO: Fast IF Gain: Low Trig: Free Run #Atten: 30 dB Avg Type: Log-Pwr Avg|Hold> 100/100

TRACE 1 2 3 4 5 6
TYPE M
DET F N N N N N

10 dB/div Ref 15.00 dBm Log

Mkr1 2.477 11 GHz 0.618 dBm

Center 2.47735 GHz Span 20.00 MHz
#Res BW 1.0 MHz #VBW 3.0 MHz #Sweep 2.53 ms (1001 pts)

MSG STATUS

Peak Search

Next Peak

Next Pk Right

Next Pk Left

Marker Delta

Mkr→CF

Mkr→Ref Lvl

More

1 of 2

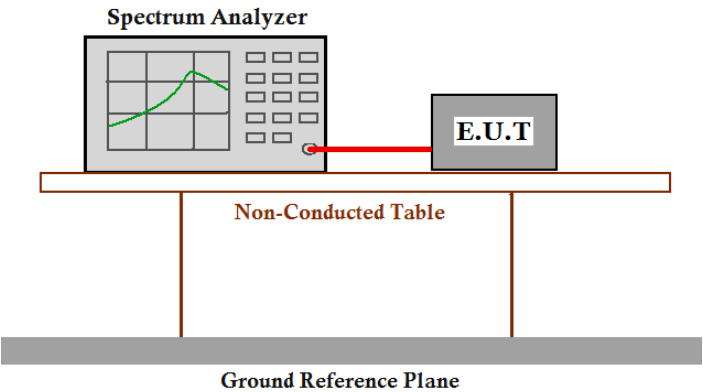
5.5Peak Power Spectral Density

Test Requirement: FCC Part 15 C section 15.247 and RSS 247 5.1(2)
(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 Clause 6.11 and KDB 558074 D01 v03r04 (PSD Option 1).

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.

Test Configuration:



Test Procedure:

1. Remove the antenna from the EUT and then connect a low attention attenuation RF cable
(Cable loss = 0.5 dB) from the antenna port to the spectrum analyzer or power meter.
2. Set the spectrum analyzer:
 - a) Set CENTER FREQUENCY = Frequency from Power Spectral Density Test Matrix (see 6.10.2)
 - b) Set SPAN = 30 kHz (For devices with a nominal 40 MHz BW, 50 MHz span will be needed)
 - c) Set REFERENCE LEVEL = 20 dBm
 - d) Set ATTENUATION = 0 dB (add internal attenuation, if necessary)
 - e) Set SWEEP TIME = Coupled
 - f) Set RBW = 3 kHz
 - g) Set VBW = 30 kHz
 - h) Set DETECTOR = Peak
 - i) Set MKR = Center Frequency
 - j) Set TRACE = CLEAR WRITE

Place the radio in continuous transmit mode. Set the TRACE to MAX HOLD, and after the trace stabilizes, the TRACE to VIEW. Set the marker on the peak of the signal and then adjust the center frequency of the spectrum analyzer to the marker frequency.

After viewing the EUT waveform on the spectrum analyzer, perform the following spectrum analyzer functions to capture the trace:

Set SPAN = 30 kHz

Set SWEEP TIME = 10 s

Set TRACE = MAX HOLD

Set MKR = PEAK SEARCH

3. Measure the Power Spectral Density of the test frequency with special test status.
4. Repeat until all the test status is investigated.
5. Report the worse case.

Test result:

Channel No.	Frequency (MHz)	Reading Value (dBm/3kHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Result
2	2405.35	-17.533	-17.033	8	Pass
20	2441.35	-17.977	-17.477		Pass
38	2477.35	-18.871	-18.371		Pass

Remark: 1) Output Peak Power=Reading Peak Power+Cable loss
2) Cable loss=0.5dB

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

Result plot as follows:

Channel 2:2405.35 MHz:



Channel 20:2441.35MHz:

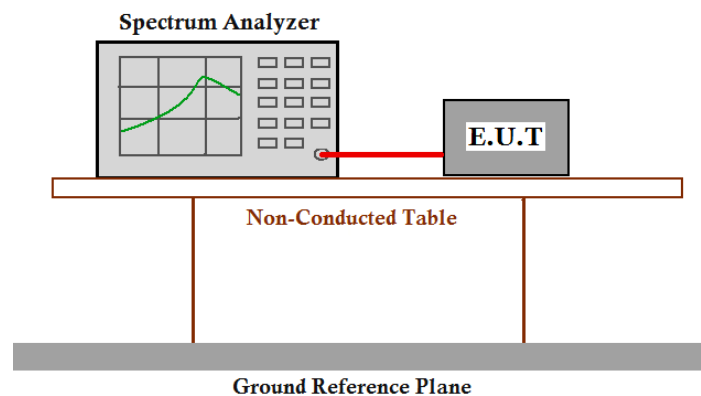


Channel 38:2477.35 MHz:



5.6 Conducted Spurious Emissions

Test Requirement:	FCC Part 15 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. Provided the transmitter demonstrates compliance with the peak conducted power limits.
Test Method:	ANSI C63.10:2013 Clause 6.7 and KDB 558074 D01 v03r04
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.
Test Configuration:	



Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum analyzer or power meter.
2. Set the spectrum analyzer: RBW=100 KHz, VBW = 300KHz. Sweep = auto; Detector Function = Peak. Trace = Max Hold, Scan up through 10th harmonic.
3. Measure the Conducted Spurious Emissions of the test frequency with special test status.
4. Repeat until all the test status is investigated.
5. Report the worse case.

Result plot as follows:

Channel 2: 2405.35 MHz



Channel 20: 2441.35 MHz



Channel 38: 2477.35 MHz



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

5.7 Radiated Spurious Emissions

Test Requirement: FCC Part 15 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 & KDB 558074 D01 v03r04

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, 9kHz for < 30 MHz

VBW = 10 Hz

Sweep = auto

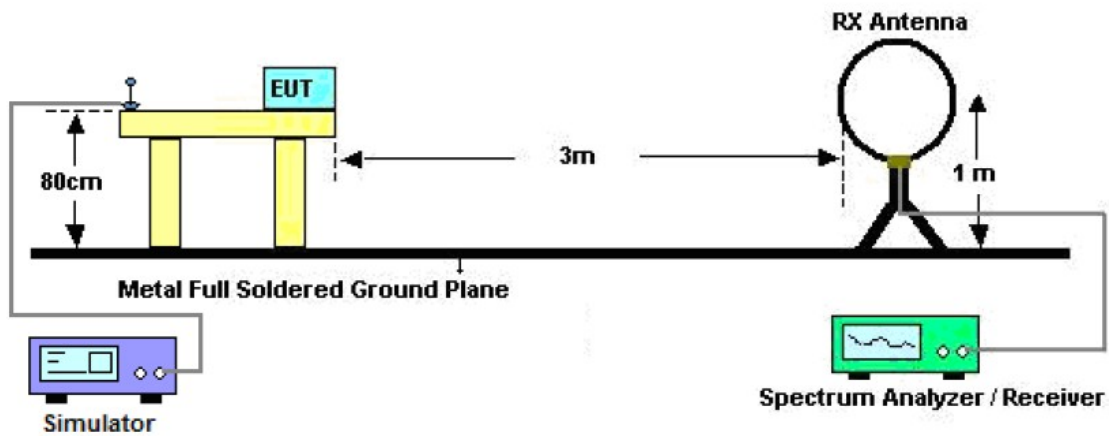
Detector function = peak

Trace = max hold

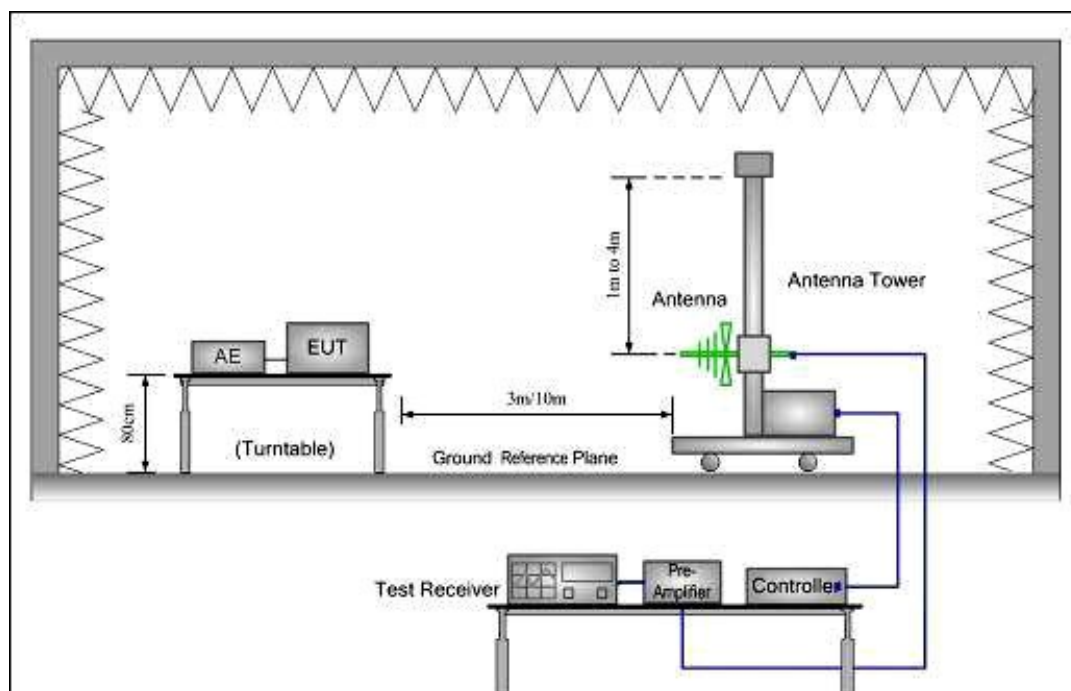
15.209 Limit: 40.0 dB μ V/m between 30 MHz & 88 MHz
43.5 dB μ V/m between 88 MHz & 216 MHz
46.0 dB μ V/m between 216 MHz & 960 MHz
54.0 dB μ V/m above 960 MHz

Test Configuration:

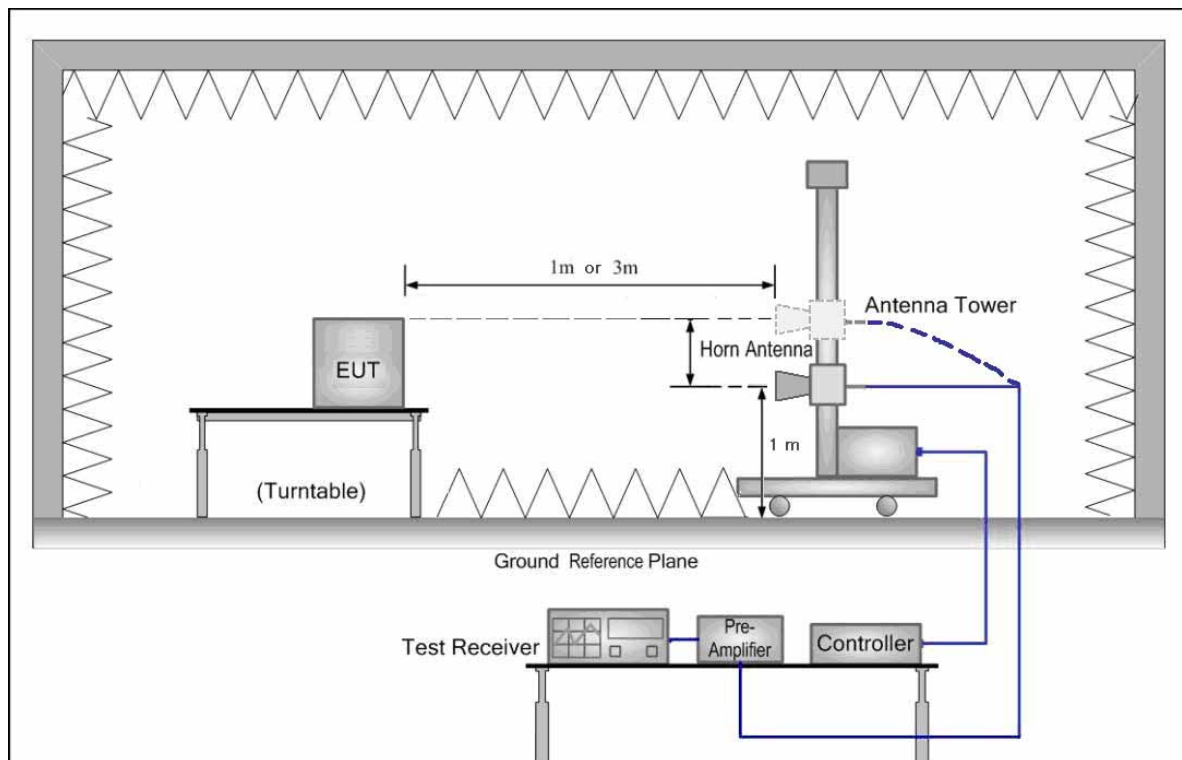
- 1) 9kHz to 30MHz emissions:



- 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. The worst case emissions were reported.

From 30MHz to 1GHz, read the Quasi-Peak field strength of the emissions with receiver QP detector RBW=120 kHz.

Above 1GHz, read the Peak field strength and Average field strength.

Read the Peak field strength through RBW=1MHz, VBW=3MHz in spectrum analyzer setting; Read the Average field strength through RBW=1MHz, VBW=10Hz in spectrum analyzer setting; 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 average field strength 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.

5.7.1 Harmonic and other spurious emissions

Test at Channel 2 (2405.35 MHz) in transmitting status

9kHz~30MHz Test result

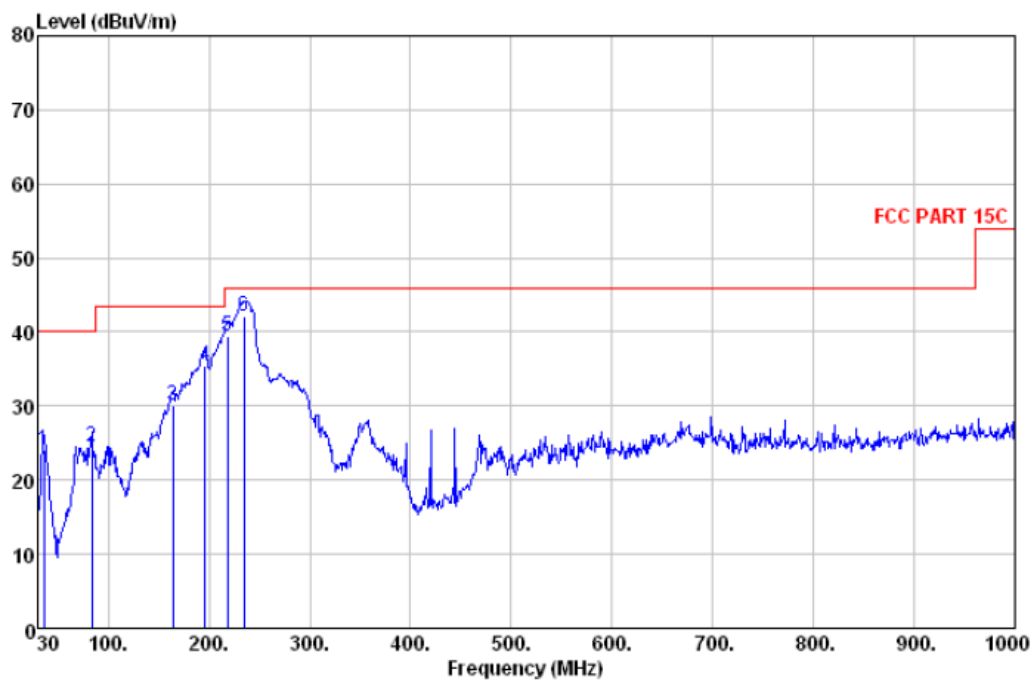
The Low frequency, which started from 9kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not report

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

Horizontal:

Peak scan

Level (dBμV/m)

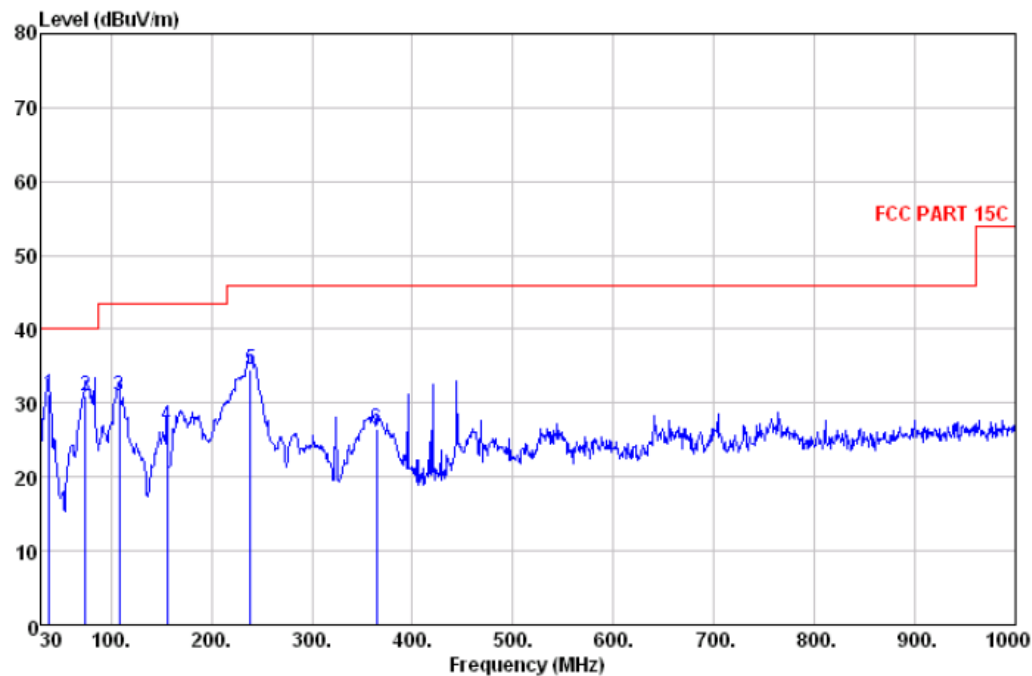


Quasi-peak measurement

No.	Freq MHz	Level dBμV/m	Remark	Antenna Factor dB/m	Cable Loss dB	Limit Line dBμV/m	Margin dB	A/pos cm	T/pos deg
1	35.820	24.10	QP	14.51	0.68	40.00	-15.90	100	213
2	83.350	24.62	QP	7.60	1.06	40.00	-15.38	100	152
3	163.860	30.10	QP	7.57	1.53	43.50	-13.40	100	108
4	195.870	35.42	QP	8.41	1.69	43.50	-8.08	200	301
5	218.180	39.51	QP	9.88	1.79	46.00	-6.49	200	306
6	234.670	42.17	QP	10.92	1.86	46.00	-3.83	200	192

Level=Read Level + Antenna Factor + Cable Loss

Vertical:
Peak scan
Level (dBμV/m)



Quasi-peak measurement

No.	Freq MHz	Level dBμV/m	Remark	Antenna Factor dB/m	Cable Loss dB	Limit Line dBμV/m	Margin dB	A/pos cm	I/pos deg
1	38.730	31.27	QP	12.79	0.71	40.00	-8.73	100	324
2	74.620	31.04	QP	7.37	1.01	40.00	-8.96	100	223
3	108.570	30.87	QP	8.50	1.22	43.50	-12.63	100	105
4	156.100	27.07	QP	7.64	1.49	43.50	-16.43	200	296
5	238.550	34.44	QP	10.90	1.88	46.00	-11.56	200	56
6	364.650	26.60	QP	14.63	2.32	46.00	-19.40	200	27

Level=Read Level + Antenna Factor + Cable Loss

1~25 GHz Harmonics & Spurious Emissions. Peak & Average Measurement

Peak Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dB μ V)	Emission Level (dB μ V/m)	Limit (dB μ V/m)	Antenna polarization
4810.70	34.32	9.60	27.62	36.39	52.69	74	V
7216.05	34.74	12.16	27.33	34.67	54.24	74	V
4810.70	34.32	9.60	27.62	32.45	48.75	74	H
7216.05	34.74	12.16	27.33	35.94	55.51	74	H

Average Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dB μ V)	Emission Level (dB μ V/m)	Limit (dB μ V/m)	Antenna polarization
4810.70	34.32	9.60	27.62	23.01	39.31	54	V
7216.05	34.74	12.16	27.33	22.71	42.28	54	V
4810.70	34.32	9.60	27.62	22.21	38.51	54	H
7216.05	34.74	12.16	27.33	23.04	42.61	54	H

Test at Channel 20 (2441.35 MHz) in transmitting status

9 kHz~30MHz Test result

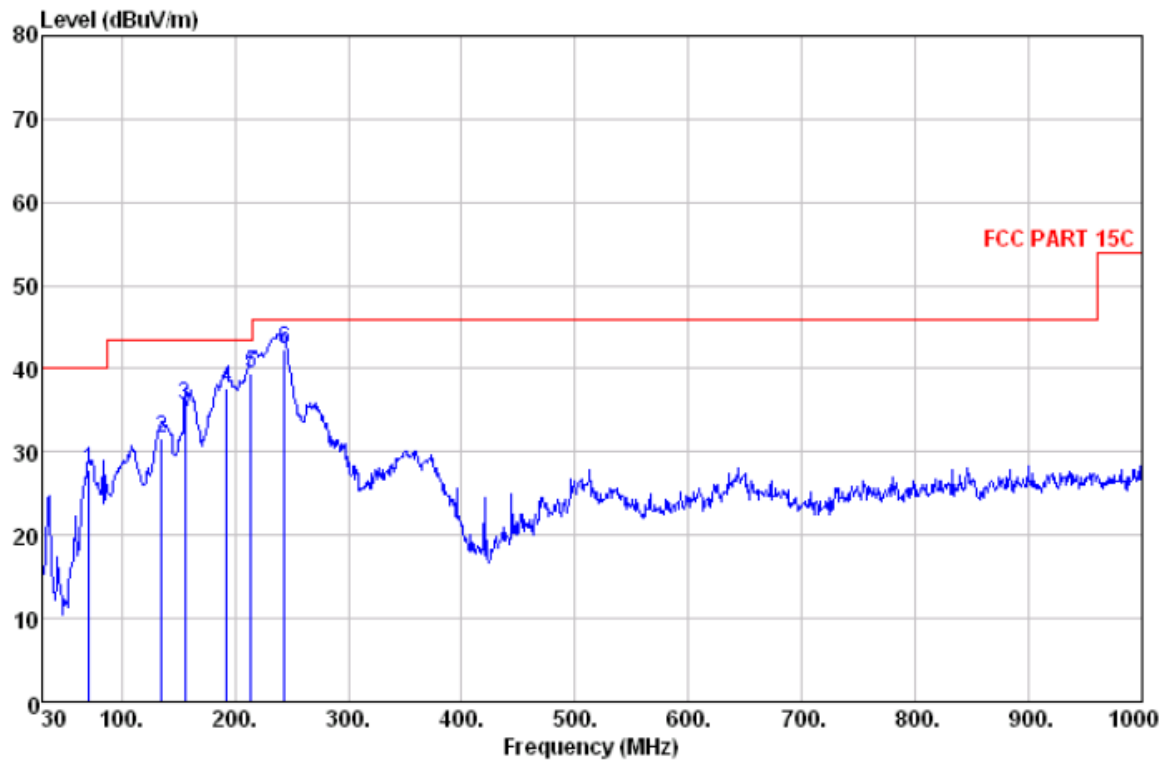
The Low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not report

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

Horizontal:

Peak scan

Level (dBμV/m)



Quasi-peak measurement

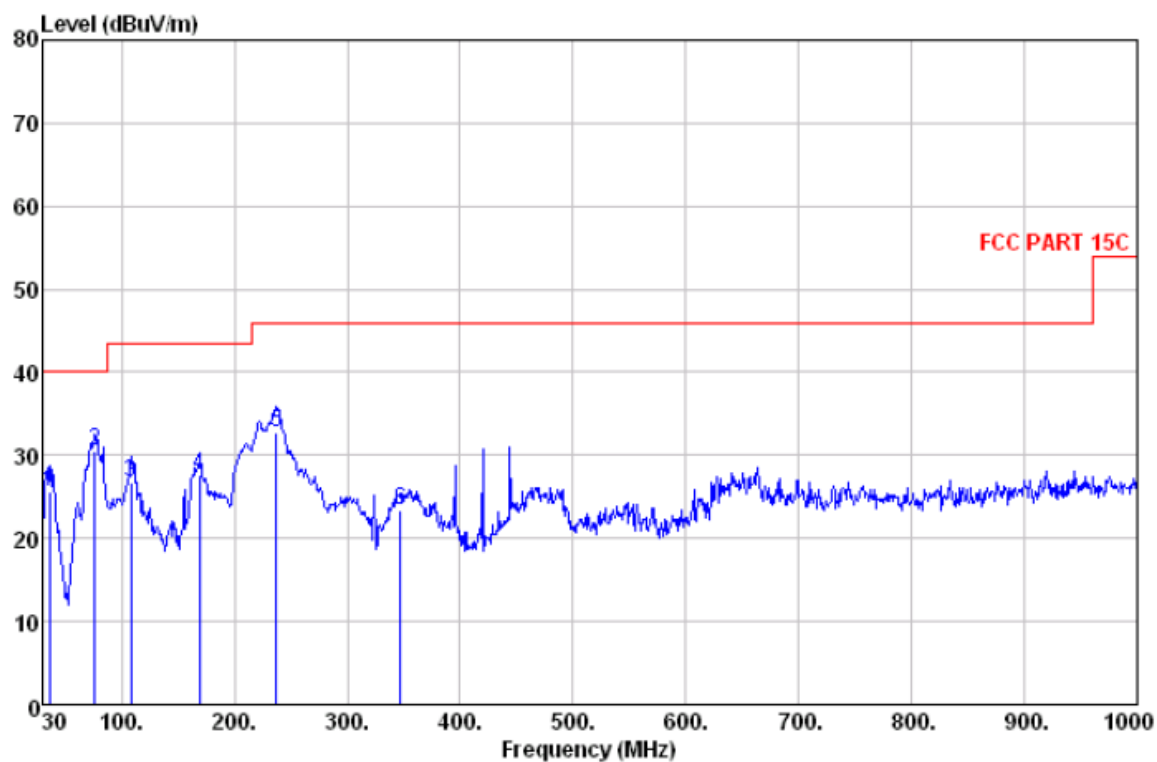
No.	Freq MHz	Level dBμV/m	Remark	Antenna Factor dB/m	Cable Loss dB	Limit Line dBμV/m	Margin dB	A/pos cm	T/pos deg
1	71.710	27.84	QP	7.14	0.99	40.00	-12.16	100	102
2	135.730	31.67	QP	7.40	1.39	43.50	-11.83	100	112
3	156.100	35.77	QP	7.64	1.49	43.50	-7.73	100	158
4	192.960	37.65	QP	8.54	1.67	43.50	-5.85	100	141
5	214.300	39.53	QP	9.46	1.77	43.50	-3.97	100	205
6	243.400	42.29	QP	11.10	1.90	46.00	-3.71	100	196

Level=Read Level + Antenna Factor + Cable Loss

Vertical:

Peak scan

Level (dB μ V/m)



Quasi-peak measurement

No.	Freq MHz	Level dB μ V/m	Remark	Antenna Factor dB/m	Cable Loss dB	Limit Line dB μ V/m	Margin dB	A/pos cm	T/pos deg
1	35.820	25.68	QP	14.51	0.68	40.00	-14.32	200	174
2	76.560	30.60	QP	7.40	1.02	40.00	-9.40	100	153
3	108.570	26.83	QP	8.50	1.22	43.50	-16.67	100	223
4	168.710	27.63	QP	8.17	1.55	43.50	-15.87	200	231
5	237.580	32.87	QP	10.90	1.87	46.00	-13.13	200	245
6	347.190	23.40	QP	13.84	2.27	46.00	-22.60	203	305

Level=Read Level + Antenna Factor + Cable Loss

1~25 GHz Harmonics & Spurious Emissions. Peak & Average Measurement

Peak Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4882.70	34.37	9.66	27.61	35.12	51.54	74.00	V
7324.05	35.07	12.23	27.33	34.03	54.00	74.00	V
4882.70	34.37	9.66	27.61	36.86	53.28	74.00	H
7324.05	35.07	12.23	27.33	37.62	57.59	74.00	H

Average Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4882.70	34.37	9.66	27.61	23.74	40.16	54.00	V
7324.05	35.07	12.23	27.33	26.97	46.94	54.00	V
4882.70	34.37	9.66	27.61	25.03	41.45	54.00	H
7324.05	35.07	12.23	27.33	27.18	47.15	54.00	H

Test at Channel 38 (2477.35 MHz) in transmitting status

9kHz~30MHz Test result

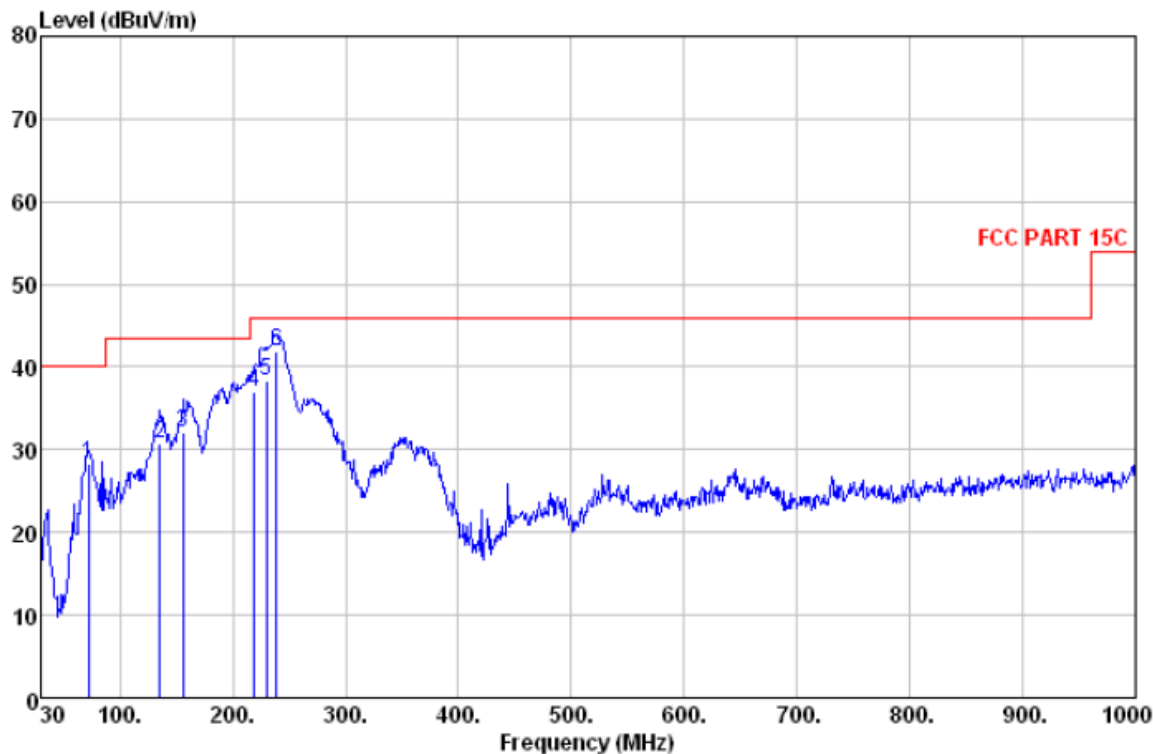
The Low frequency, which started from 9kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not report

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

Horizontal:

Peak scan

Level (dBμV/m)



Quasi-peak measurement

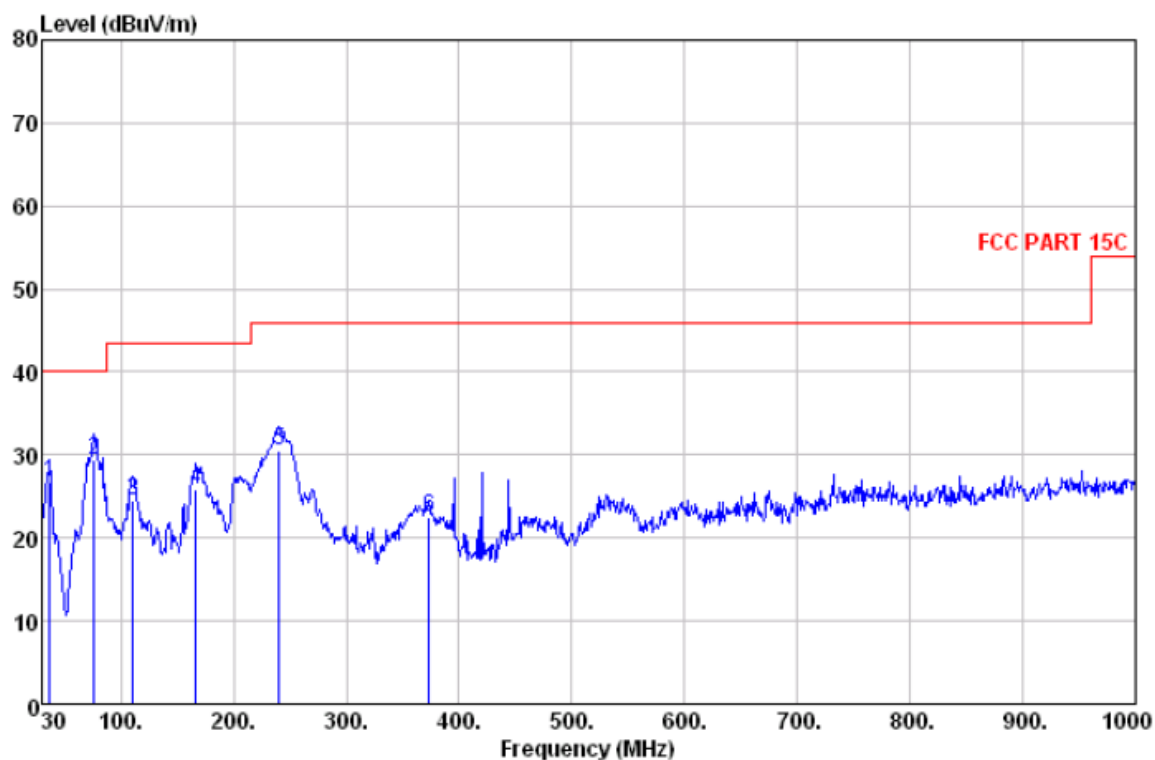
No.	Freq MHz	Level dBμV/m	Remark	Antenna Factor dB/m	Cable Loss dB	Limit Line dBμV/m	Margin dB	A/pos cm	T/pos deg
1	72.185	28.25	QP	7.18	0.99	40.00	-11.75	100	127
2	135.730	30.73	QP	7.40	1.39	43.50	-12.77	100	203
3	155.864	32.09	QP	7.64	1.49	43.50	-11.41	100	188
4	219.150	36.92	QP	10.00	1.79	46.00	-9.08	201	200
5	230.000	38.42	QP	11.20	1.84	46.00	-7.58	100	77
6	238.780	42.00	QP	10.90	1.88	46.00	-4.00	100	127

Level=Read Level + Antenna Factor + Cable Loss

Vertical:

Peak scan

Level (dB μ V/m)



Quasi-peak measurement

No.	Freq MHz	Level dB μ V/m	Remark	Antenna Factor dB/m	Cable Loss dB	Limit Line dB μ V/m	Margin dB	A/pos cm	T/pos deg
1	36.790	26.77	QP	13.92	0.69	40.00	-13.23	100	144
2	76.560	29.51	QP	7.40	1.02	40.00	-10.49	100	52
3	110.510	24.51	QP	8.47	1.24	43.50	-18.99	100	41
4	166.770	25.87	QP	7.82	1.54	43.50	-17.63	282	288
5	240.490	30.48	QP	10.93	1.89	46.00	-15.52	200	179
6	373.380	22.58	QP	15.04	2.35	46.00	-23.42	200	24

Level=Read Level + Antenna Factor + Cable Loss

1~25 GHz Harmonics & Spurious Emissions. Peak & Average Measurement

Peak Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4954.70	34.42	9.71	27.60	31.31	47.84	74.00	V
7432.05	35.40	12.31	27.32	34.68	55.07	74.00	V
4954.70	34.42	9.71	27.60	35.02	51.55	74.00	H
7432.05	35.40	12.31	27.32	34.13	54.52	74.00	H

Average Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4954.70	34.42	9.71	27.60	22.05	38.58	54.00	V
7432.05	35.40	12.31	27.32	23.09	43.48	54.00	V
4954.70	34.42	9.71	27.60	24.23	40.76	54.00	H
7432.05	35.40	12.31	27.32	26.17	46.56	54.00	H

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 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 from intentional radiators and emissions from unintentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this Part.

Hence there 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.

The unit does meet the FCC and RSS-247 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: Clause 6.4, 6.5 and 6.6 & KDB558074
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.
Test site:	Measurement Distance: 3m (Semi-Anechoic Chamber)
Limit:	40.0 dB μ V/m between 30MHz & 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		

Test Result:

Test at Channel 2 (2405.35MHz) in transmitting
status

Antenna polarization: Vertical

Frequency (MHz)	Antenna factors (dB/m)	Cable loss(dB)	Preamp factor(dB)	Peak Reading Level (dBμV)	Average Reading Level (dBμV)	Peak Emission Level (dBμV/m)	Average Emission Level (dBμV/m)
2310.000	26.65	6.45	27.78	34.02	20.26	39.34	25.58
2390.000	26.56	6.46	27.79	32.84	21.30	38.07	26.53
2500.000	25.70	6.62	27.80	34.08	21.01	38.60	25.53
2483.500	25.79	6.61	27.80	35.69	22.30	40.29	26.90

Antenna polarization: Horizontal

Frequency (MHz)	Antenna factors (dB/m)	Cable loss(dB)	Preamp factor(dB)	Peak Reading Level (dBμV)	Average Reading Level (dBμV)	Peak Emission Level (dBμV/m)	Average Emission Level (dBμV/m)
2310.000	26.65	6.45	27.78	34.01	22.30	39.33	27.62
2390.000	26.56	6.46	27.79	37.58	22.56	42.81	27.79
2500.000	25.70	6.62	27.80	37.45	23.32	41.97	27.84
2483.500	25.79	6.61	27.80	37.29	22.79	41.89	27.39

Test at Channel 20 (2441.35 MHz) in transmitting status

Antenna polarization: Vertical

Frequency (MHz)	Antenna factors (dB/m)	Cable loss(dB)	Preamp factor(dB)	Peak Reading Level (dBμV)	Average Reading Level (dBμV)	Peak Emission Level (dBμV/m)	Average Emission Level (dBμV/m)
2310.000	26.65	6.45	27.78	38.09	22.50	43.41	27.82
2390.000	26.56	6.46	27.79	35.99	24.34	41.22	29.57
2500.000	25.70	6.62	27.80	36.14	22.49	40.66	27.01
2483.500	25.79	6.61	27.80	35.22	22.89	39.82	27.49

Antenna polarization: Horizontal

Frequency (MHz)	Antenna factors (dB/m)	Cable loss(dB)	Preamp factor(dB)	Peak Reading Level (dBμV)	Average Reading Level (dBμV)	Peak Emission Level (dBμV/m)	Average Emission Level (dBμV/m)
2310.000	26.65	6.45	27.78	36.50	23.41	41.82	28.73
2390.000	26.56	6.46	27.79	35.40	20.44	40.63	25.67
2500.000	25.70	6.62	27.80	35.02	21.51	39.54	26.03
2483.500	25.79	6.61	27.80	34.42	22.99	39.02	27.59

Test at Channel 38 (2477.35 MHz) in transmitting status

Antenna polarization: Vertical

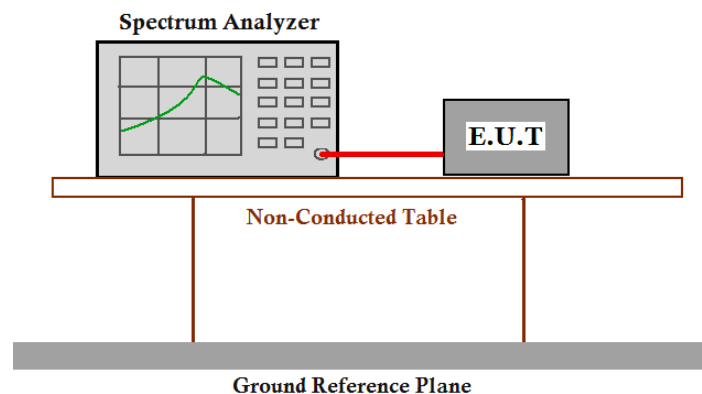
Frequency (MHz)	Antenna factors (dB/m)	Cable loss(dB)	Preamp factor(dB)	Peak Reading Level (dBμV)	Average Reading Level (dBμV)	Peak Emission Level (dBμV/m)	Average Emission Level (dBμV/m)
2310.000	26.65	6.45	27.78	32.60	20.88	37.92	26.20
2390.000	26.56	6.46	27.79	33.32	20.76	38.55	25.99
2500.000	25.70	6.62	27.80	36.66	22.13	41.18	26.65
2483.500	25.79	6.61	27.80	36.02	22.22	40.62	26.82

Antenna polarization: Horizontal

Frequency (MHz)	Antenna factors (dB/m)	Cable loss(dB)	Preamp factor(dB)	Peak Reading Level (dBμV)	Average Reading Level (dBμV)	Peak Emission Level (dBμV/m)	Average Emission Level (dBμV/m)
2310.000	26.65	6.45	27.78	33.30	22.05	38.62	27.37
2390.000	26.56	6.46	27.79	36.42	23.45	41.65	28.68
2500.000	25.70	6.62	27.80	32.15	22.59	36.67	27.11
2483.500	25.79	6.61	27.80	37.32	21.53	41.92	26.13

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 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. Provided the transmitter demonstrates compliance with the peak conducted power limits.
Frequency Band:	2400 MHz to 2483.5 MHz
Test Method:	ANSI C63.10: Clause 6.9 & KDB558074.
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.
Test Configuration:	



Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum analyzer or power meter.
2. Set RBW=1000 kHz, VBW=3000 KHz, suitable frequency span including 1000 kHz bandwidth from band edge.
3. Measure the Conducted Spurious Emissions and Radiated Emissions of the test frequency with special test status.
4. Repeat until all the test status is investigated.
5. Report the worse.

Test result with plots as follows:

The band edges was measured and recorded Result:

The Lower Edges attenuated more than 20dB.

The Upper Edges attenuated more than 20dB.

Result plot as follows:

Channel 2: 2405.35 MHz



Channel 38: 2.447.35 MHz



5.10 Conducted Emissions at Mains Terminals 150 kHz to 30MHz

Test Requirement: FCC Part 15 C section 15.207

Test Method: ANSI C63.10: Clause 6.2

Frequency Range: 150 kHz to 30 MHz

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

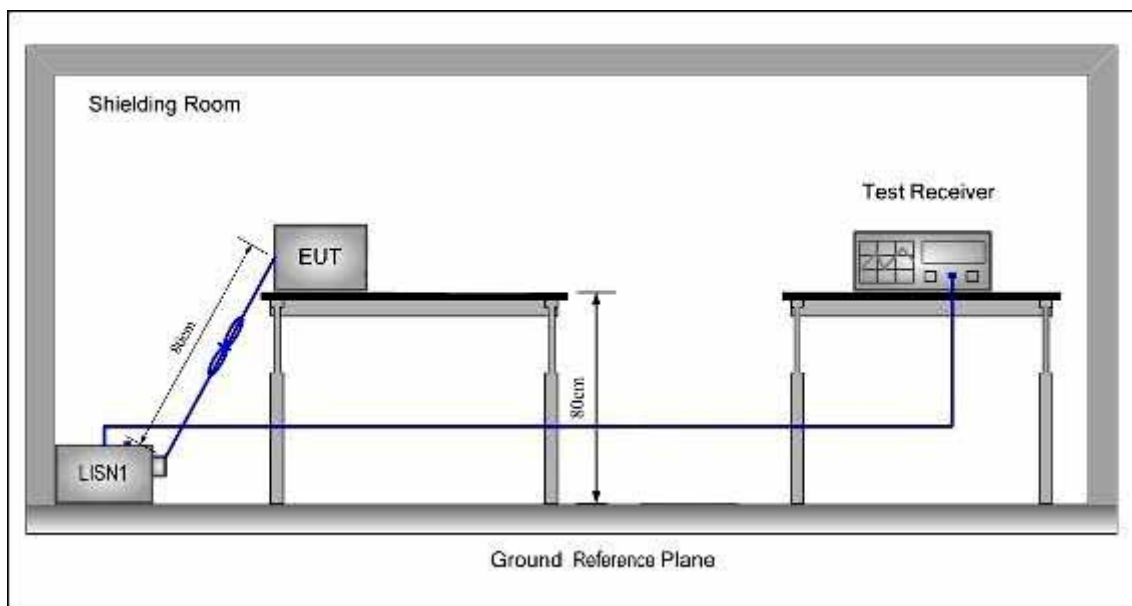
Test Limit

Limits for conducted disturbance at the mains ports of class B

Frequency Range	Class B Limit dB(μV)	
	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).

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.

5.10.1 Measurement Data

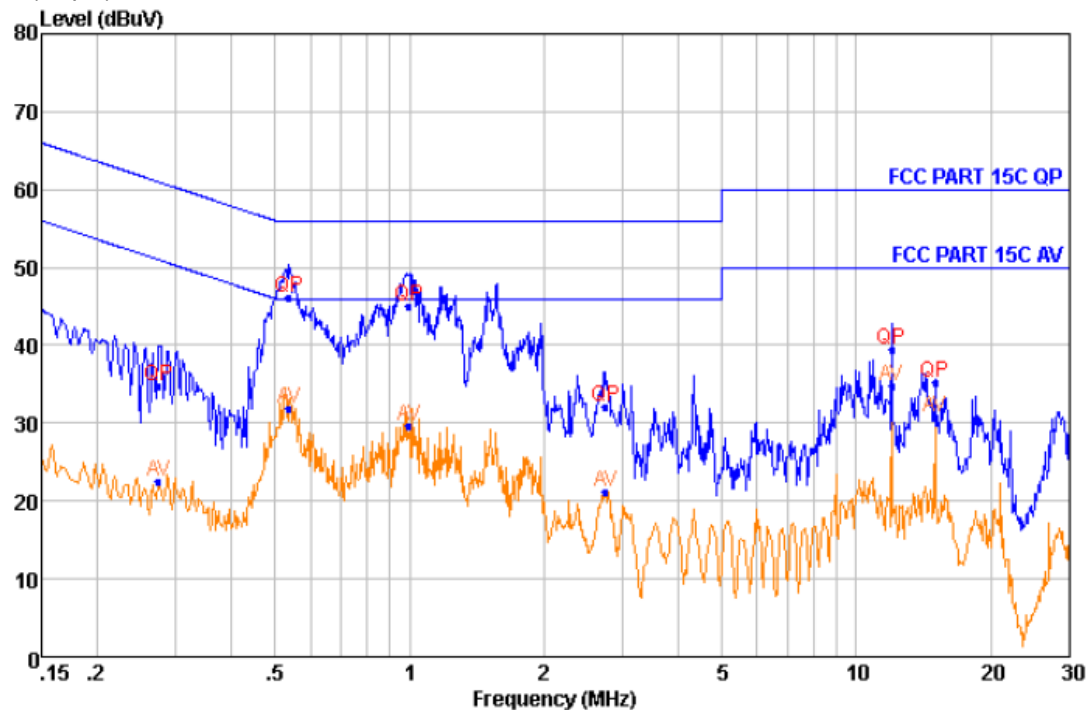
An initial pre-scan was performed on the live and neutral lines with peak detector.

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)



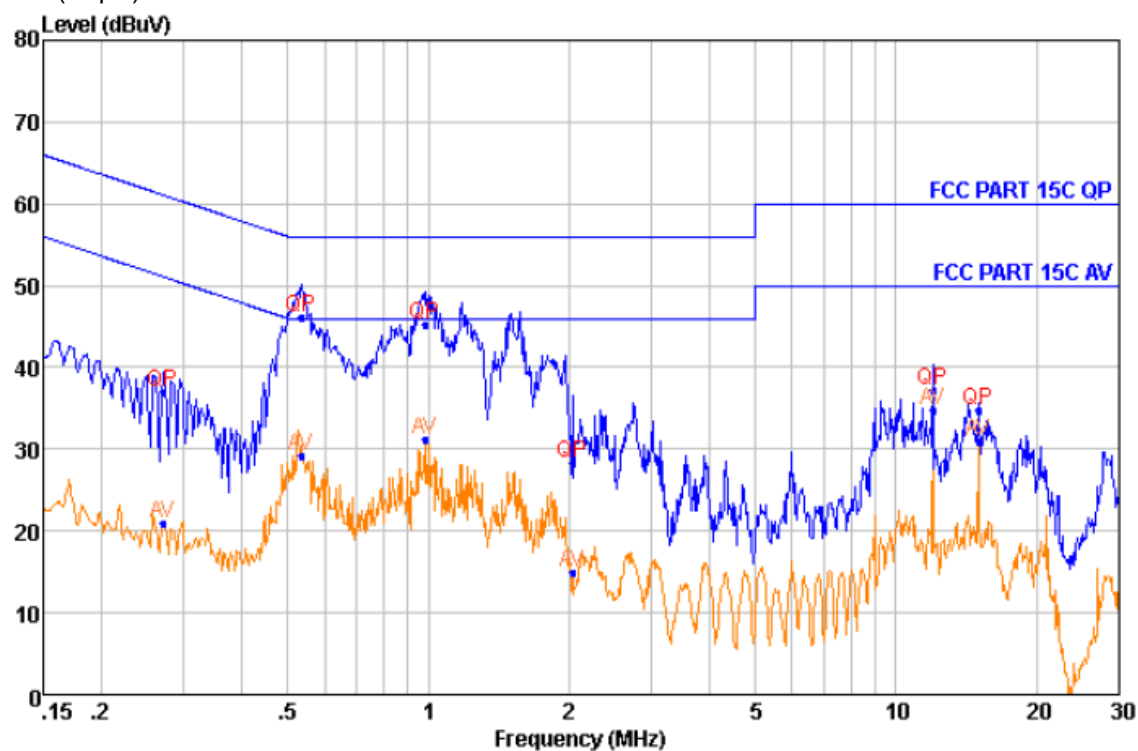
Quasi-peak and Average measurement

NO.	Freq MHz	Level dBμV	Remark	LISN Factor dB	Cable Loss dB	Limit Line dBμV	Over Limit dB
1	0.274	34.79	QP	9.47	0.41	60.98	-26.19
2	0.274	22.45	Average	9.47	0.41	50.98	-28.53
3	0.537	46.18	QP	9.32	0.44	56.00	-9.82
4	0.537	31.85	Average	9.32	0.44	46.00	-14.15
5	0.998	45.03	QP	9.27	0.47	56.00	-10.97
6	0.998	29.75	Average	9.27	0.47	46.00	-16.25
7	2.744	32.06	QP	9.31	0.51	56.00	-23.94
8	2.744	21.20	Average	9.31	0.51	46.00	-24.80
9	11.975	39.43	QP	9.37	0.56	60.00	-20.57
10	11.975	34.67	Average	9.37	0.56	50.00	-15.33
11	15.000	35.18	QP	9.36	0.57	60.00	-24.82
12	15.000	30.81	Average	9.36	0.57	50.00	-19.19

Neutral 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	0.270	36.93	QP	9.37	0.41	61.12	-24.19
2	0.270	20.91	Average	9.37	0.41	51.12	-30.21
3	0.534	46.10	QP	9.36	0.44	56.00	-9.90
4	0.534	29.14	Average	9.36	0.44	46.00	-16.86
5	0.981	45.23	QP	9.37	0.47	56.00	-10.77
6	0.981	31.30	Average	9.37	0.47	46.00	-14.70
7	2.030	28.24	QP	9.39	0.49	56.00	-27.76
8	2.030	14.99	Average	9.39	0.49	46.00	-31.01
9	11.975	37.24	QP	9.59	0.56	60.00	-22.76
10	11.975	34.71	Average	9.59	0.56	50.00	-15.29
11	15.000	34.86	QP	9.66	0.57	60.00	-25.14
12	15.000	30.93	Average	9.66	0.57	50.00	-19.07

-- End of test report --