RF TEST REPORT

Report No.:	SET2014-01536
Product Name:	Smart Wireless Gateway
FCC ID:	2ABCTHA200
Model No. :	Linxee - HA200+
Applicant:	LINXEE (BEIJING) TECHNOLOGY LTD.
Address:	801,8F, Taipeng Mansion,No.10 Haidian North 2nd Street, Haidian District,Beijing,China.
Issued by:	CCIC-SET
Lab Location:	Electronic Testing Building, Shahe Road, Xili, Nanshan District, Shenzhen, 518055, P. R. China
	Tel: 86 755 26627338 **Fax:** 86 755 26627238

Test Report

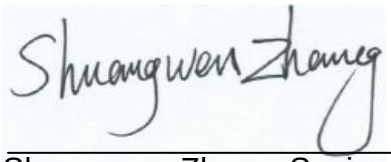
Product Name ..... :	Smart Wireless Gateway
Brand Name ..... :	Linxee
Trade Name ..... :	Linxee
Applicant ..... :	LINXEE (BEIJING) TECHNOLOGY LTD.
Applicant Address ..... :	801,8F, Taipeng Mansion,No.10 Haidian North 2nd Street,Haidian District,Beijing,China.
Manufacturer ..... :	LONG BEN TECHNOLOGY LIMITED
Manufacturer Address ..... :	NO.19,Jianshe Road, Shima Village, Tangxia Town, Dongguan City, China.
Test Standards ..... :	47 CFR Part 15 Subpart C：Radio Frequency Devices ANSI C63.10:2009：American National Standard for Testing Unlicensed Wireless Devices KDB558074 D01 DTS Meas Guidance v03r01
Test Result ..... :	PASS

Tested by ..... :

2014.03.02

Lu Lei，Test Engineer

Reviewed by..... :



2014.03.02

Shuangwen Zhang, Senior Egineer

Approved by ..... :

2014.03.02

Wu Li'an，Manager

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Change History		
Issue	Date	Reason for change
1.0	Mar 02,2014	First edition

1. GENERAL INFORMATION

1.1 EUT Description

EUT Type ..... : Smart Wireless Gateway
Serial No. ..... : (n.a, marked #1 by test site)
Hardware Version..... : N/A
Software Version ..... : N/A
Frequency Range..... : 2.405GHz - 2.480GHz (at interval of 5MHz)
Modulation Type ..... : DSSS
Antenna Type ..... : External Antenna
Antenna Gain ..... : 3dBi

Note 1: The EUT is a 2.4G Zigbee module; it's operating at 2.4GHz ISM band.
Please refer to the photographs of the EUT. For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacture.
Note 2: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

1.2 Support Equipment

No.	Equipment	Brand Name	Model Name	Manufacturer	Serial No.
1	Notebook	DELL	PP11L	DELL	H5914A03

1.3 Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart C (Wi-Fi, 2.4GHz ISM band radiators) for the EUT FCC ID Certification:

No.	Identity	Document Title
1	47 CFR Part 15 Subpart C 2012	Radio Frequency Devices
2	ANSI C63.10 2009	American National Standard for Testing Unlicensed Wireless Devices

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

No.	Section	Description	Result
1	15.203	Antenna Requirement	PASS
2	15.247(b)	Peak Output Power	PASS
3	15.247(a)	Bandwidth	PASS
4	15.247(d)	Conducted Spurious Emission	PASS

5	15.247(d)	Band Edge	PASS
6	15.207	Conducted Emission	PASS
7	15.209 ,15.247(c)	Radiated Emission	PASS
8	15.247(e)	Power spectral density (PSD)	PASS

The tests of Conducted Emission and Radiated Emission were performed according to the method of measurements prescribed in ANSI C63.10 2009.

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Channel
Peak Conducted Output Power Power Spectral Density 6dB Bandwidth Spurious RF conducted emission Radiated Emission 9kHz~1GHz& Radiated Emission 1GHz~10th Harmonic	DSSS	11/19/26
Band Edge	DSSS	11/26

1.4 Facilities and Accreditations

1.4.1 Facilities

CNAS-Lab Code: L1659

CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd. CCIC is a third party testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L1659. A 12.8*6.8*6.4 (m) fully anechoic chamber was used for the radiated spurious emissions test.

FCC-Registration No.: 406086

CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration 406086, Renewal date Nov. 19, 2011, valid time is until Nov. 18, 2014.

IC-Registration No.: 11185A-1

CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd. EMC Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 11185A-1 on July. 15, 2013, valid time is until July. 15, 2016.

1.4.2 Test Environment Conditions

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

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

2. 47 CFR PART 15C REQUIREMENTS

2.1 Antenna requirement

2.1.1 Applicable Standard

According to FCC 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

And according to FCC 47 CFR Section 15.247(c), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

2.1.2 Antenna Information

Antenna Category: External antenna
An External antenna was soldered to the antenna port of EUT via an adaptor cable, can't be removed.

Antenna General Information:

No.	EUT Model	Ant. Type	Gain(dBi)
1	Smart Wireless Gateway	External	3.0

2.1.3 Result: comply

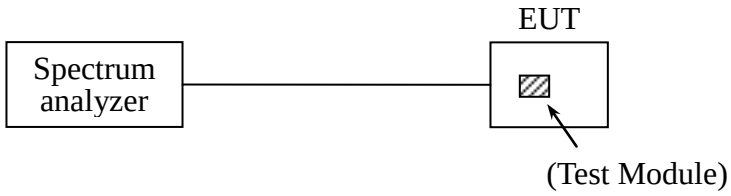
The EUT has a permanently and irreplaceable attached antenna. Please refer to the EUT internal photos.

2.2 Peak Output Power

2.2.1 Requirement

According to FCC section 15.247(b)(3), For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: The maximum peak conducted output power of the intentional radiator shall not exceed1 Watt.

2.2.2 Test Description



The measured output power was calculated by the reading of the spectrum analyzer and calibration.

A. Test Setup:

The EUT (Equipment under the test) which is powered by the Battery is coupled to the Spectrum analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading, all test result in Spectrum analyzer.

B. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal.Due Date
Spectrum Analyzer	R&S	FSP40	1164.4391.40	2014.06.10

2.2.3 Test Result

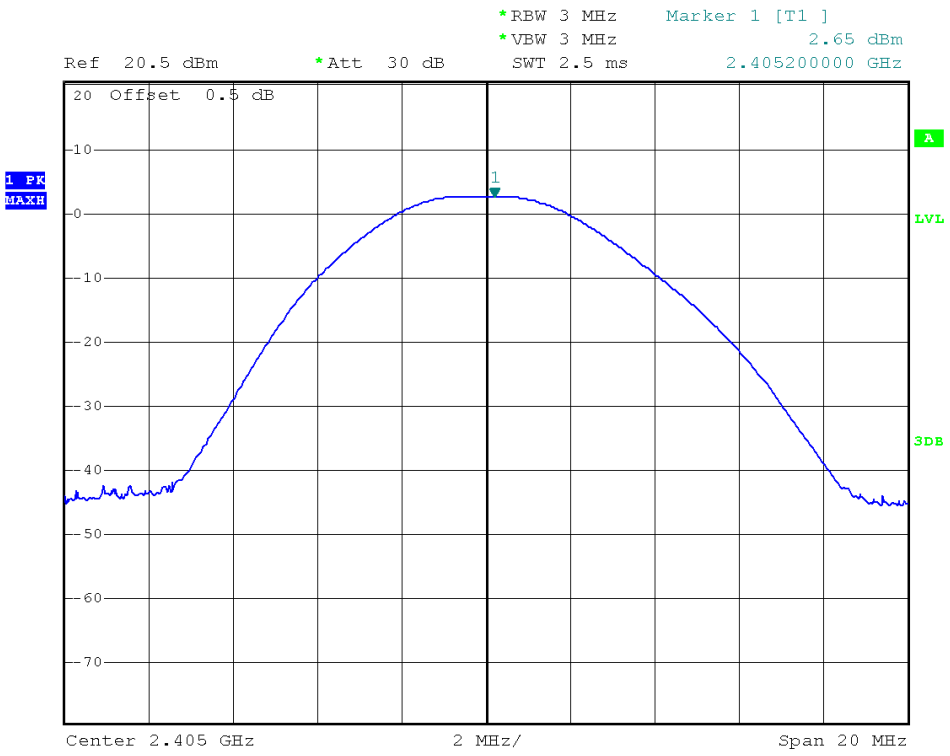
The lowest, middle and highest channels are selected to perform testing to verify the conducted RF output peak power of the Module.

A. Test Verdict:

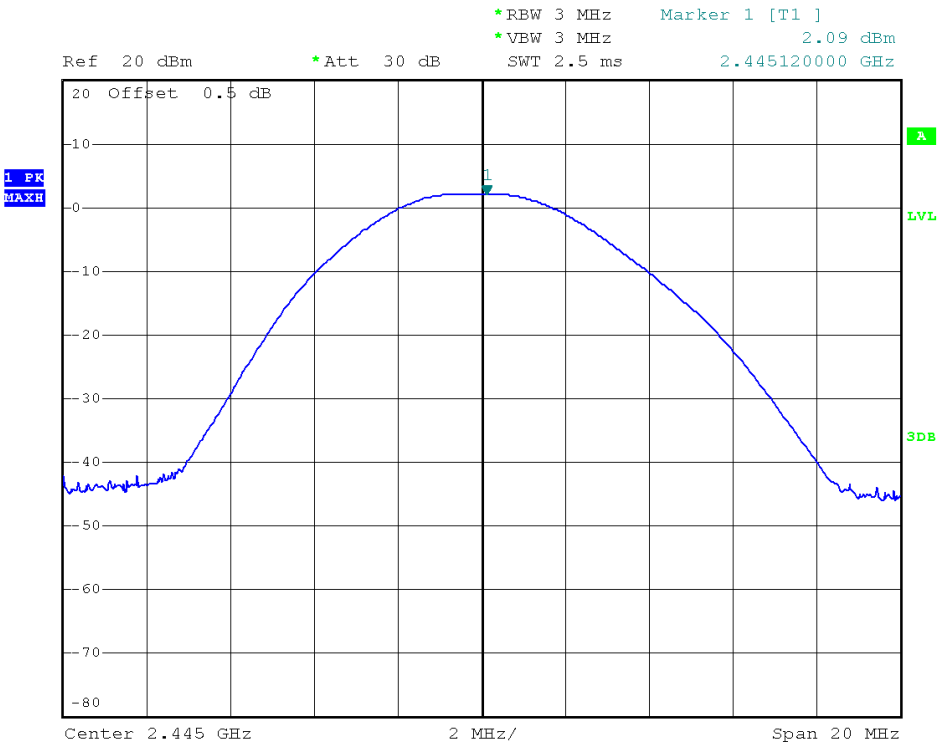
Channel	Frequency (MHz)	Measured Output Peak Power(dBm)	Refer to Plot	Limits (dBm)	Result
11	2405	2.65	Plot 2.2 A	30	PASS
19	2445	2.09	Plot 2.2 B	30	PASS
26	2480	1.91	Plot 2.2 C	30	PASS

Note: 1. The test results including the cable lose.

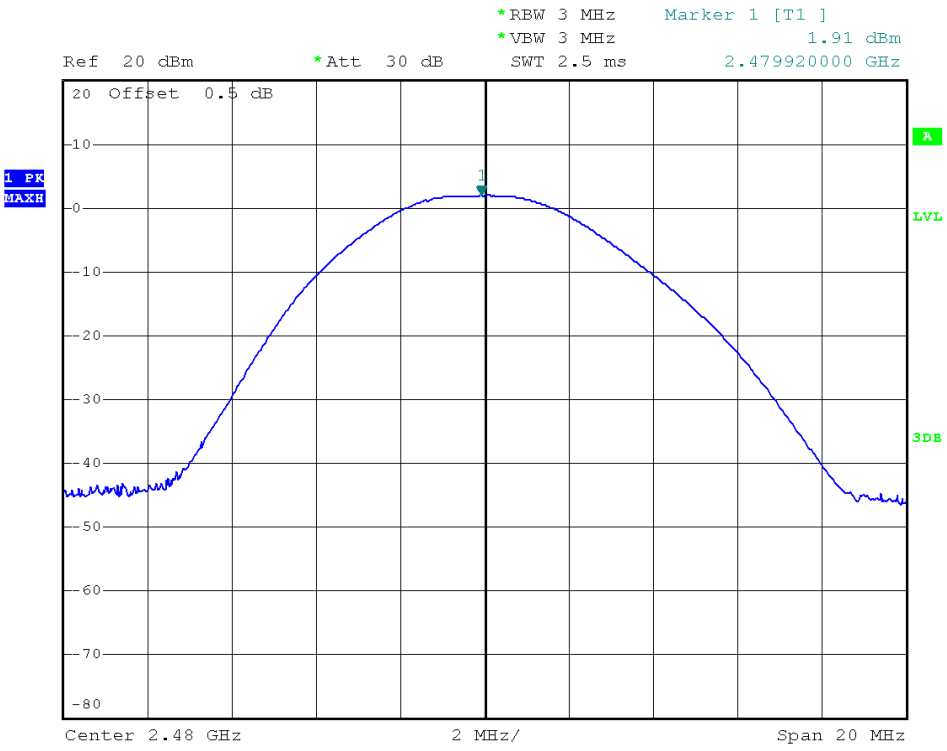
B. Test Plots:



(Plot 2.2 A: Channel 11: 2405MHz)



(Plot 2.2 B: Channel 19: 2445MHz)



(Plot 2.2 C: Channel 26: 2480MHz)

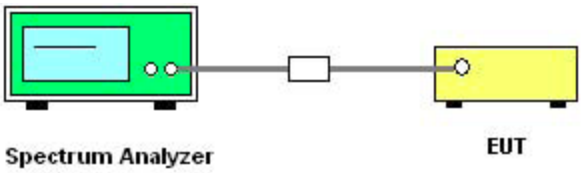
2.3 Bandwidth

2.3.1 Requirement

According to FCC section 15.247(a) (2), Systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

2.3.2 Test Description

A. Test Set:



The EUT which is powered by the Battery, is coupled to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss and Atten as the factor is calibrated to correct the reading.

Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. In order to make an accurate measurement, set the span greater than RBW.

A. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal.Due Date
Spectrum Analyzer	R&S	FSP40	1164.4391.40	2014.06.10

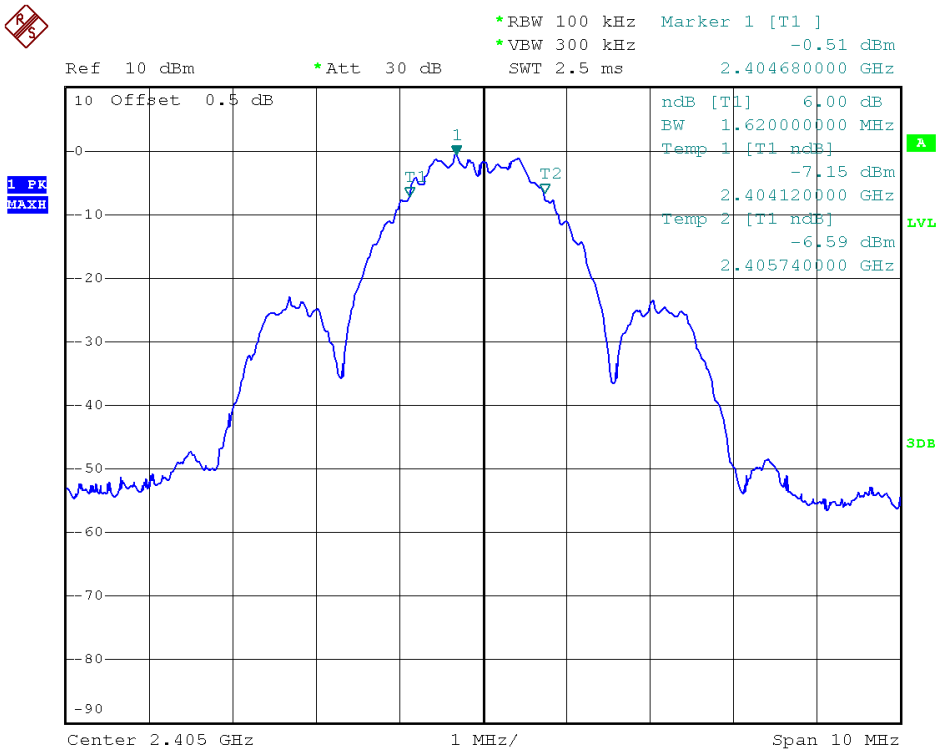
2.3.3 Test Result

The lowest, middle and highest channels are selected to perform testing to record the 6 dB bandwidth of the Module.

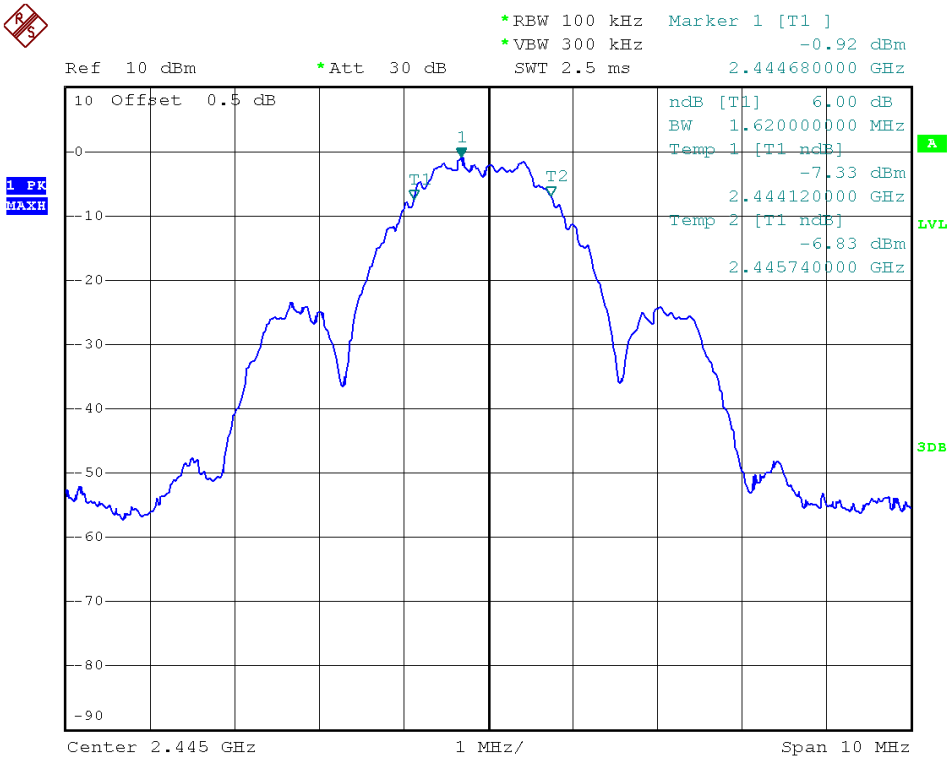
A. Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Refer to Plot	Limits(kHz)	Result
11	2405	1.62	Plot 2.3 A	≥500	PASS
19	2445	1.62	Plot 2.3 B	≥500	PASS
26	2480	1.64	Plot 2.3 C	≥500	PASS

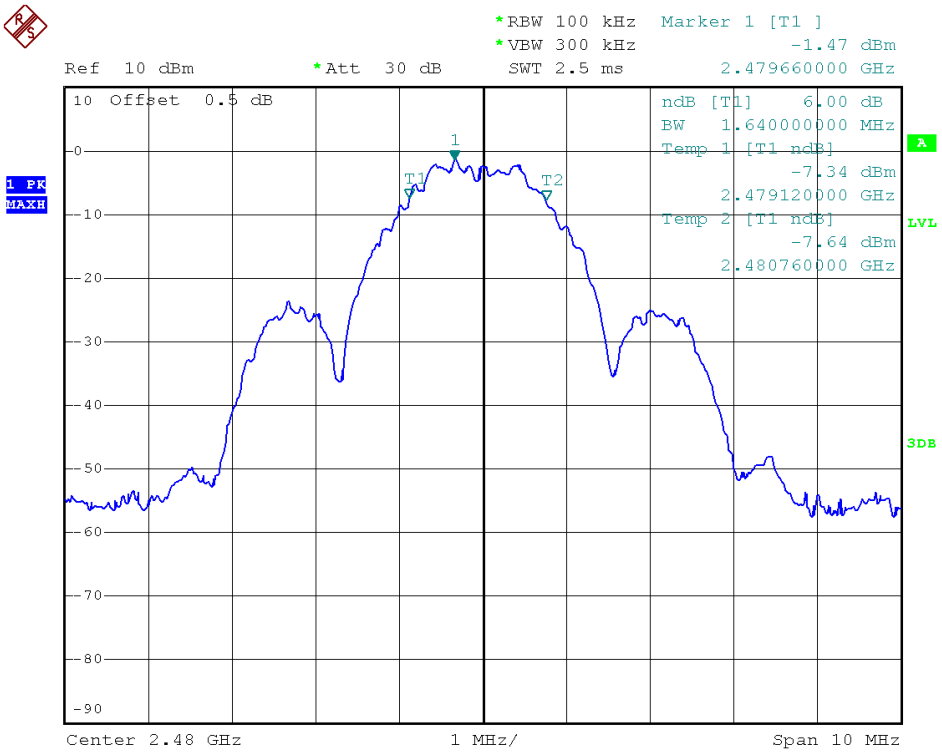
B. Test Plots:



(Plot 2.3 A: Channel 11: 2405MHz)



(Plot 2.3 B: Channel 19: 2445 MHz)



(Plot 2.3 C: Channel 26: 2480MHz)

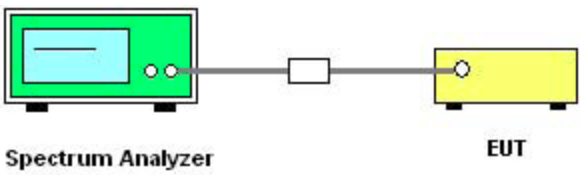
2.4 Conducted Spurious Emissions

2.4.1 Requirement

According to FCC section 15.247(c), in any 100kHz 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 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

2.4.2 Test Description

A. Test Set:



The EUT which is powered by the Battery, is coupled to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss and Atten as the factor is calibrated to correct the reading.

Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. In order to make an accurate measurement, set the span greater than RBW.

B. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal.Due Date
Spectrum Analyzer	R&S	FSP40	1164.4391.40	2014.06.10

2.4.3 Test Result

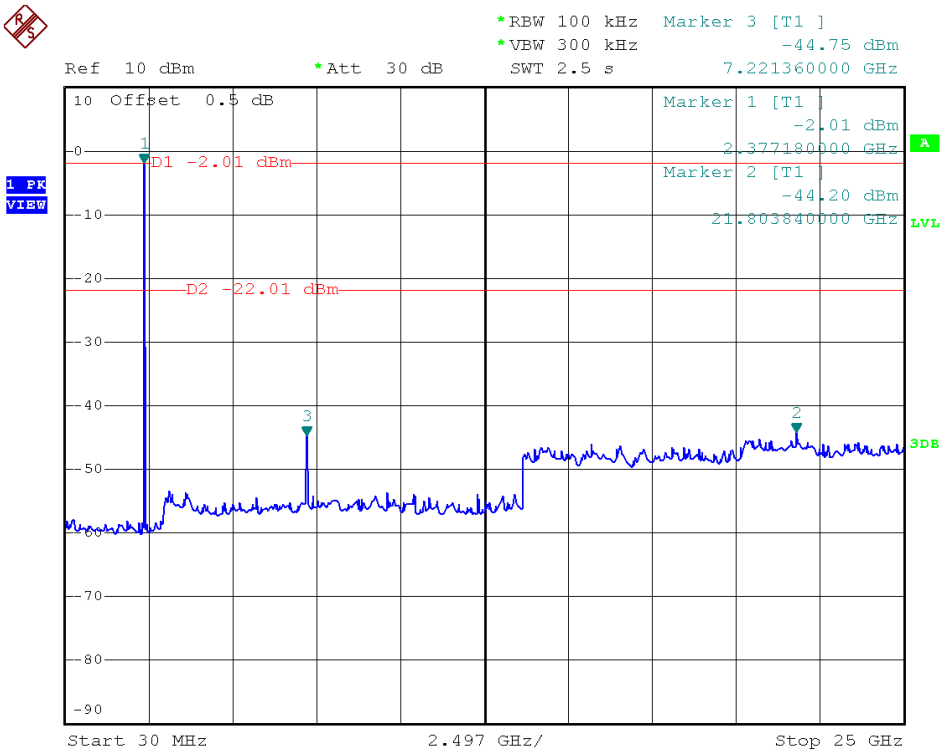
The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the spurious emissions.

A. Test Verdict:

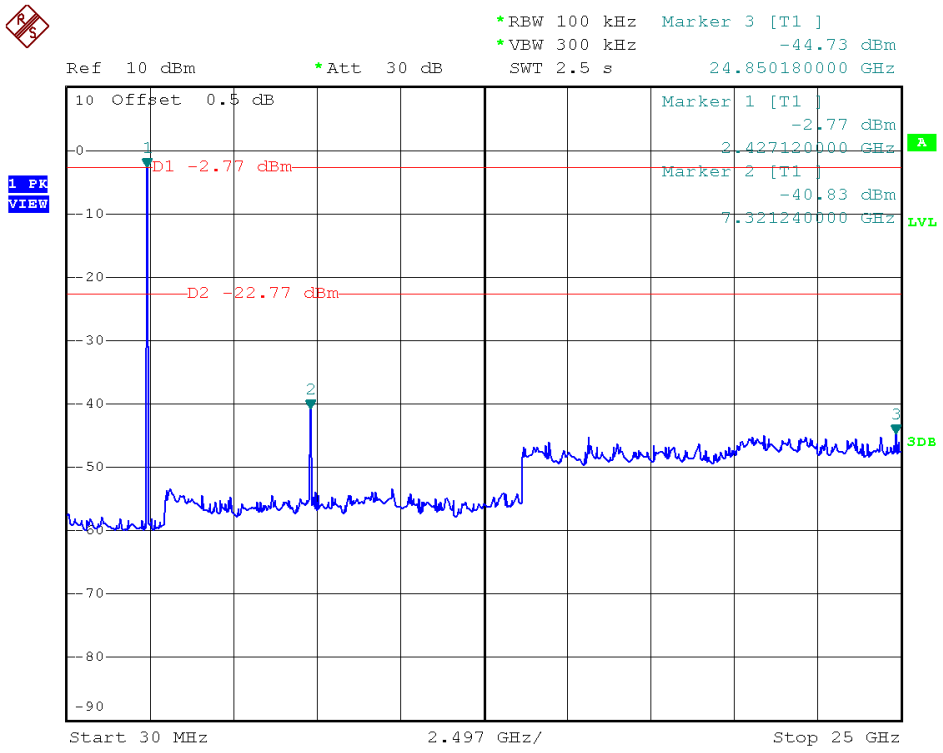
Channel	Frequency (MHz)	Refer to Plot	Limit (dBc)	Verdict
11	2405	Plot 2.4 A	-20	PASS
19	2445	Plot 2.4 B	-20	PASS
26	2480	Plot 2.4 C	-20	PASS

B. Test Plots:

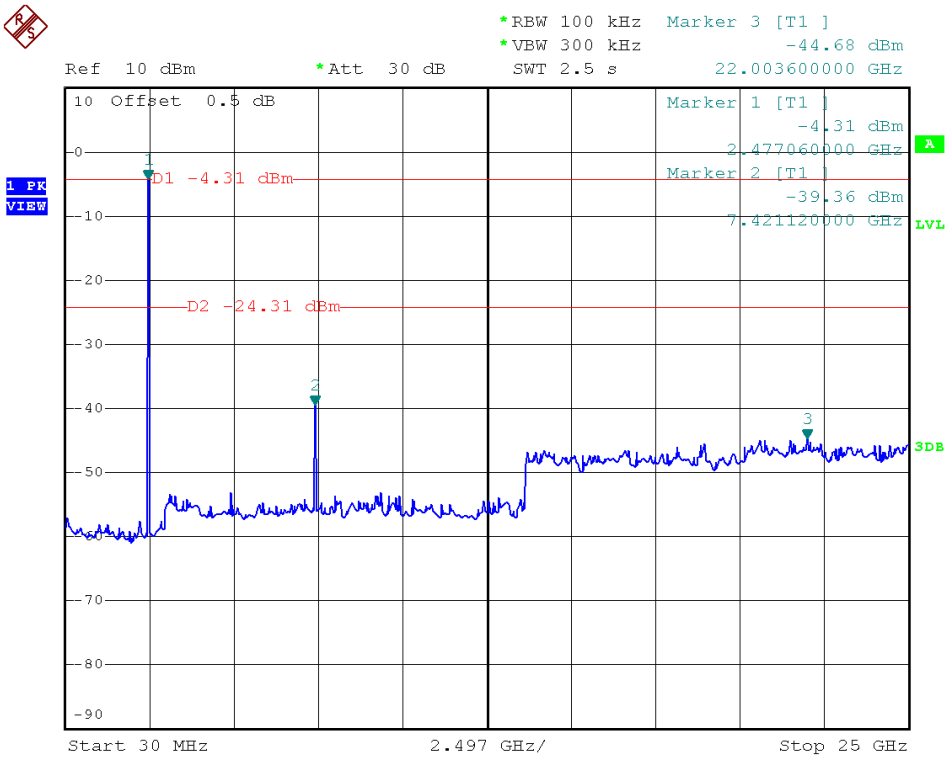
Note: the power of the Module transmitting frequency should be ignored.



(Plot 2.4 A: Channel = 11, 30MHz to 25GHz)



(Plot 2.4 B: Channel = 19, 30MHz to 25GHz)



(Plot 2.4 C: Channel = 26, 30MHz to 25GHz)

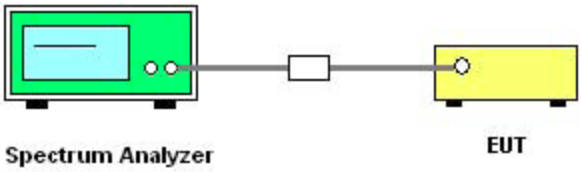
2.5 Power spectral density (PSD)

2.5.1 Requirement

According to FCC section 15.247(d), the same method of determining the conducted output power shall be used to determine the power spectral density. If a peak output power is measured, then a peak power spectral density measurement is required. If an average output power is measured, then an average power spectral density measurement should be used.

2.5.2 Test Description

A. Test Set:



The EUT which is powered by the Battery, is coupled to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss and Atten as the factor is calibrated to correct the reading.

Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. In order to make an accurate measurement, set the span greater than RBW.

B. Test Procedure

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS channel bandwidth.
3. Set the RBW ≥ 3 kHz.
4. Set the VBW ≥ 3 x RBW.
5. Detector = peak.
6. Sweep time = auto couple
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

C. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal.Due Date
Spectrum Analyzer	R&S	FSP40	1164.4391.40	2014.06.10

2.5.3 Test Result

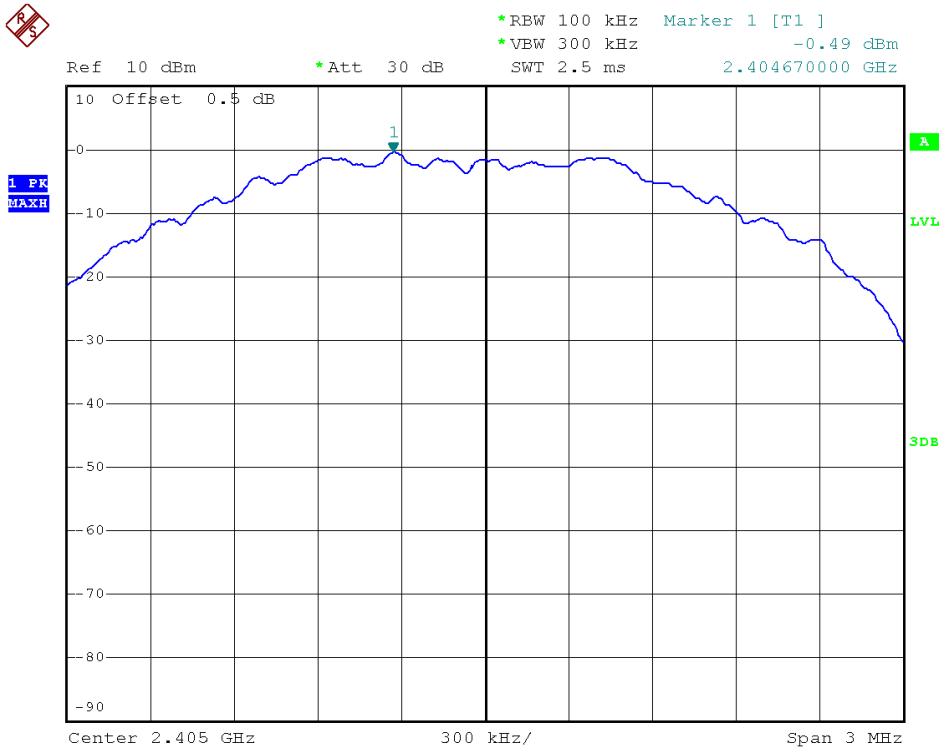
The lowest, middle and highest channels are tested to verify the band edge emissions.

A. Test Verdict:

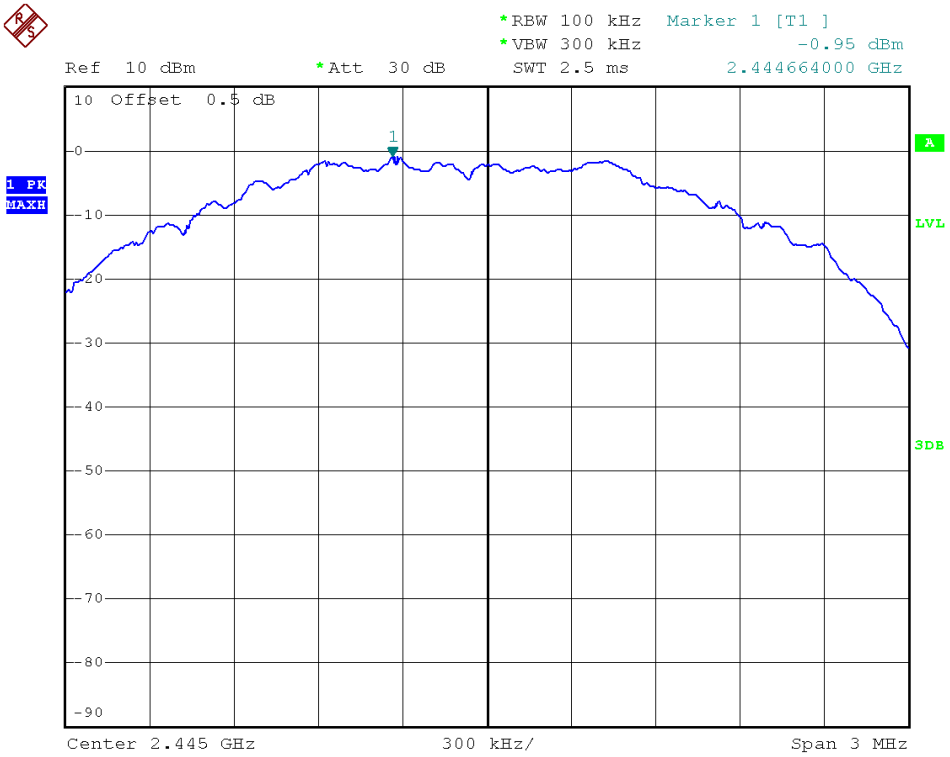
Spectral power density (dBm)					
Channel	Frequency (MHz)	Measured PSD (dBm)	Refer to Plot	Limit (dBm/3kHz)	Verdict
11	2405	-0.49	Plot 2.5 A	8	PASS
19	2445	-0.95	Plot 2.5 B	8	PASS
26	2480	-1.39	Plot 2.5 C	8	PASS
Measurement uncertainty: ±1.3dB					

Note: 1. The test results including the cable lose.

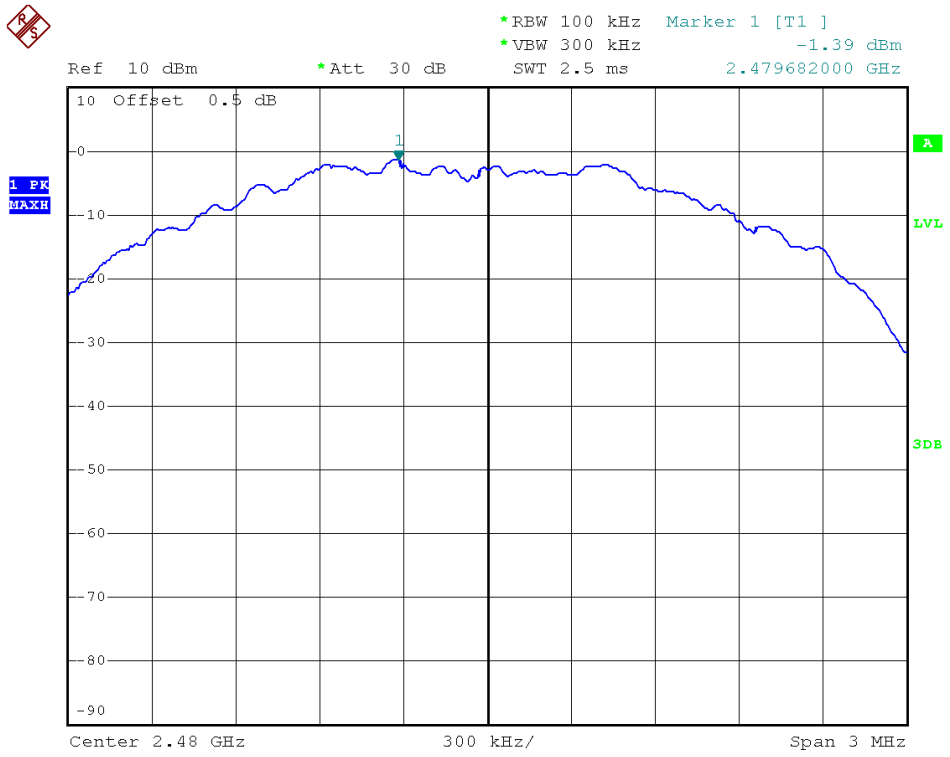
B. Test Plots:



(Plot 2.5 A: Channel = 11)



(Plot 2.5 B: Channel = 19)



(Plot 2.5 C: Channel = 26)

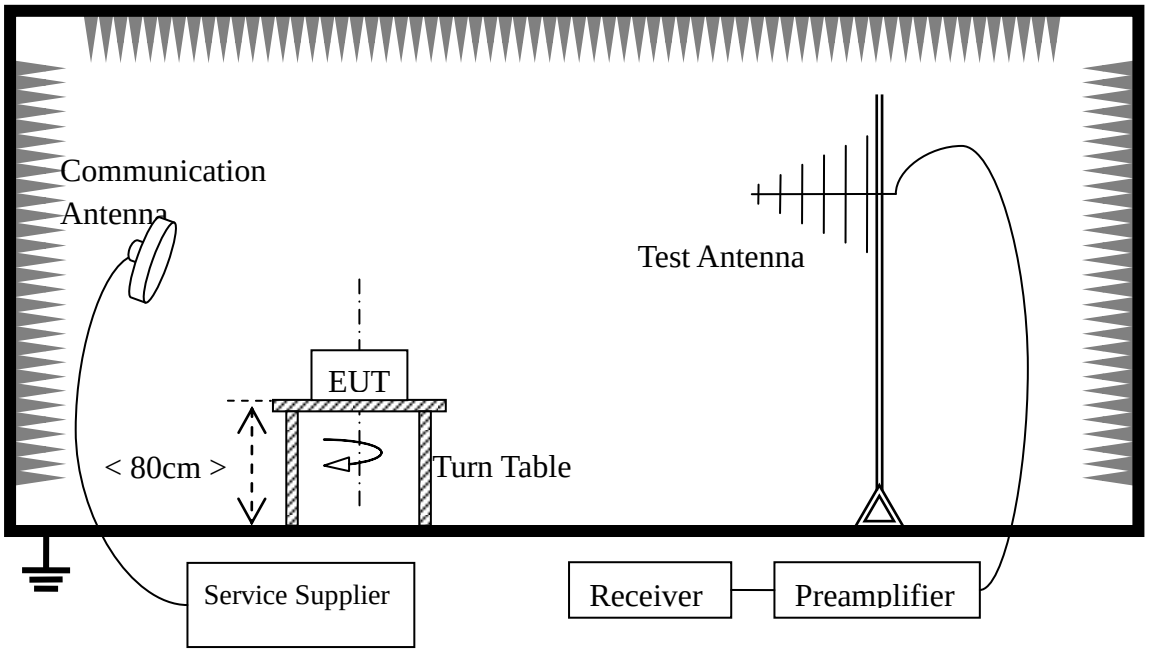
2.6 Band Edge

2.6.1 Requirement

According to FCC section 15.247(d), in any 100kHz 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 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

2.6.2 Test Description

A. Test Setup



The Module of the EUT is powered by the Battery charged with the AC Adapter. The Module is located in a 3m Semi-Anechoic Chamber; the antenna factors, cable loss and so on of the site as factors are calculated to correct the reading.

For the Test Antenna:

Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength.

B. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Due Date
Receiver	R&S	ESIB26	A0304218	2014.06.07
Full-Anechoic Chamber	Albatross	12.8m*6.8m*6.4m	A0412372	2014.06.07
Double ridge horn antenna	R&S	HF906	100150	2014.06.10
Ultra-wideband antenna	R&S	HL562	100089	2014.06.10
Ampilier 1G~18GHz	R&S	MITEQ AFS42-00101800	25-S-42	2014.06.05

2.6.3 Test Result

Radiated band edge Measurement:

The lowest and highest channels are tested to verify the band edge emissions.

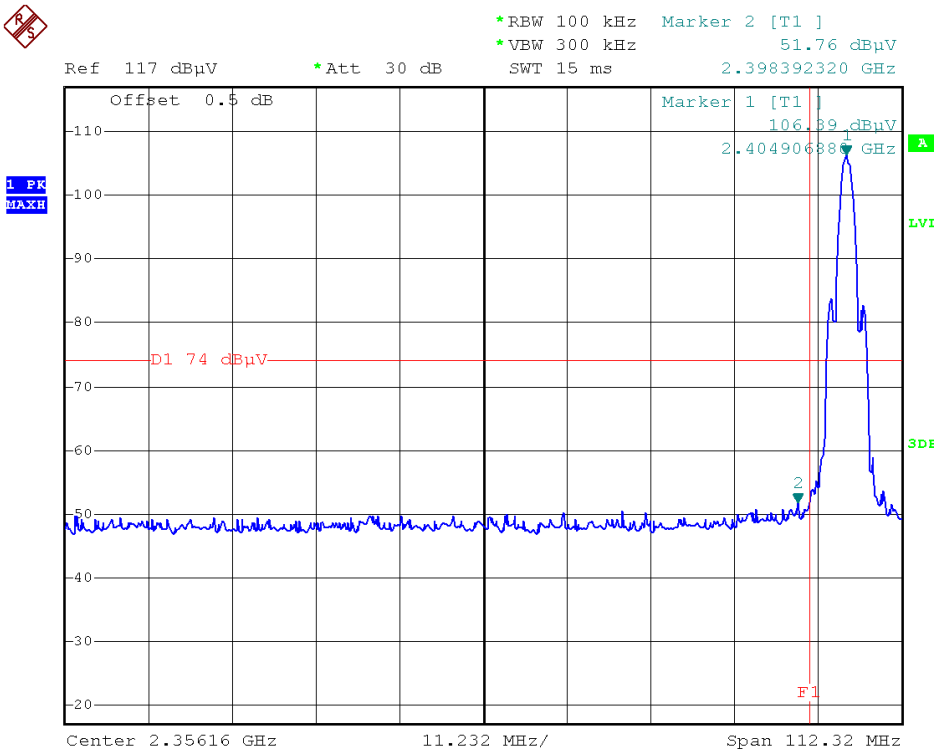
The measurement results are obtained as below:
E [dBμV/m] =U_R + A_T + A_{Factor} [dB]; A_T =$L_{Cable\ loss}$ [dB]-G_{preamp} [dB]
A_T: Total correction Factor except Antenna
U_R: Receiver Reading
G_{preamp}: Preamplifier Gain
A_{Factor}: Antenna Factor at 3m

NOTE 1: The red vertical lines “F1” in the following charts is to indicate the frequencies 2400MHz and 2483.5MHz respectively
NOTE 2: Both horizontal and vertical polarity direction of the test antenna has been performed, only the worst case recorded in this report.

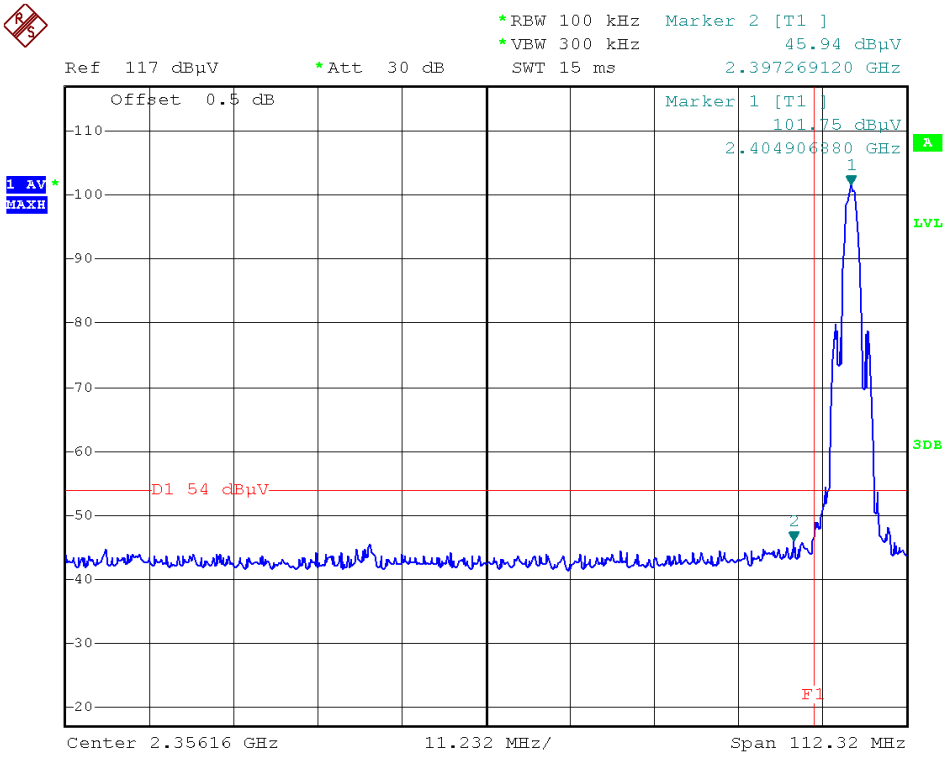
A. Test Verdict:

Channel	Frequency (MHz)	Detector PK/ AV	Receiver Reading UR (dBuV)	AT (dB)	AFactor (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
11	2398.392	PK	51.76	-31.7	28.3	48.36	74	Pass
11	2397.269	AV	45.94	-31.7	28.3	42.54	54	Pass
26	2484.678	PK	53.96	-29.45	29.2	53.71	74	Pass
26	2483.519	AV	52.88	-29.45	29.2	52.63	54	Pass

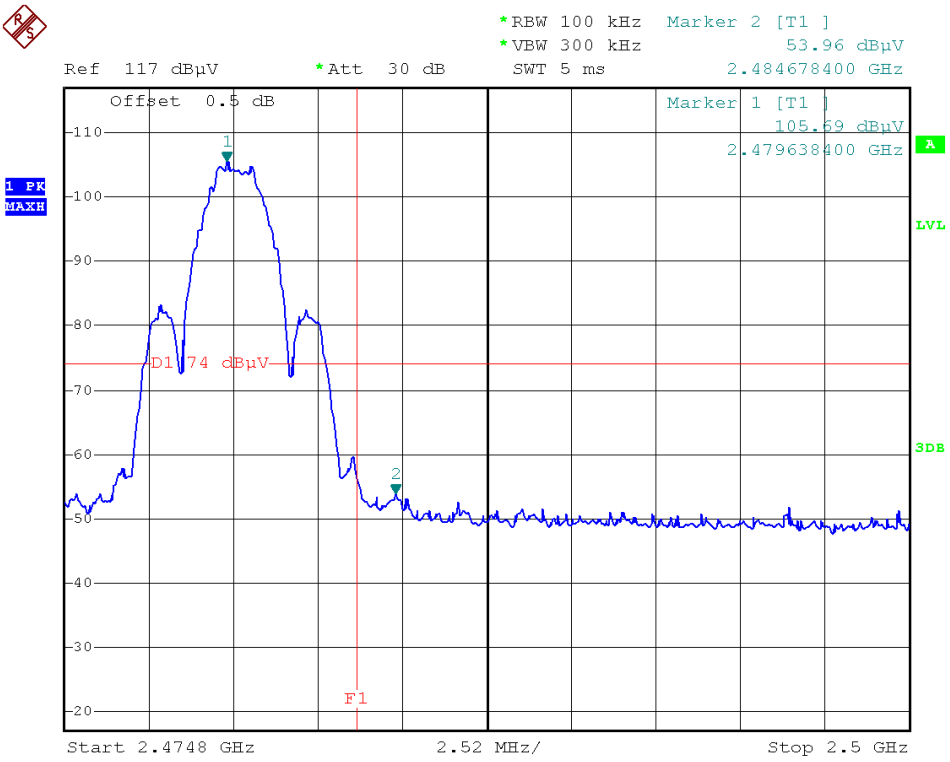
B. Test Plots:



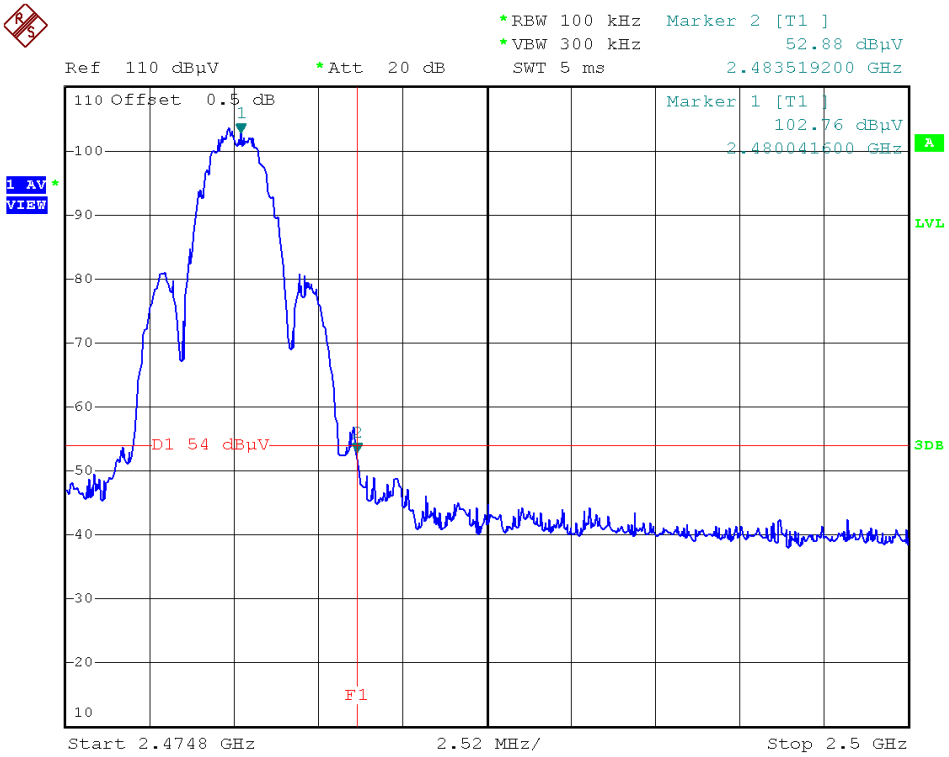
(Plot 2.6 A1: Channel = 11 Peak)



(Plot 2.6 A2: Channel = 11 AVG)



(Plot 2.6 A3: Channel = 26 Peak)



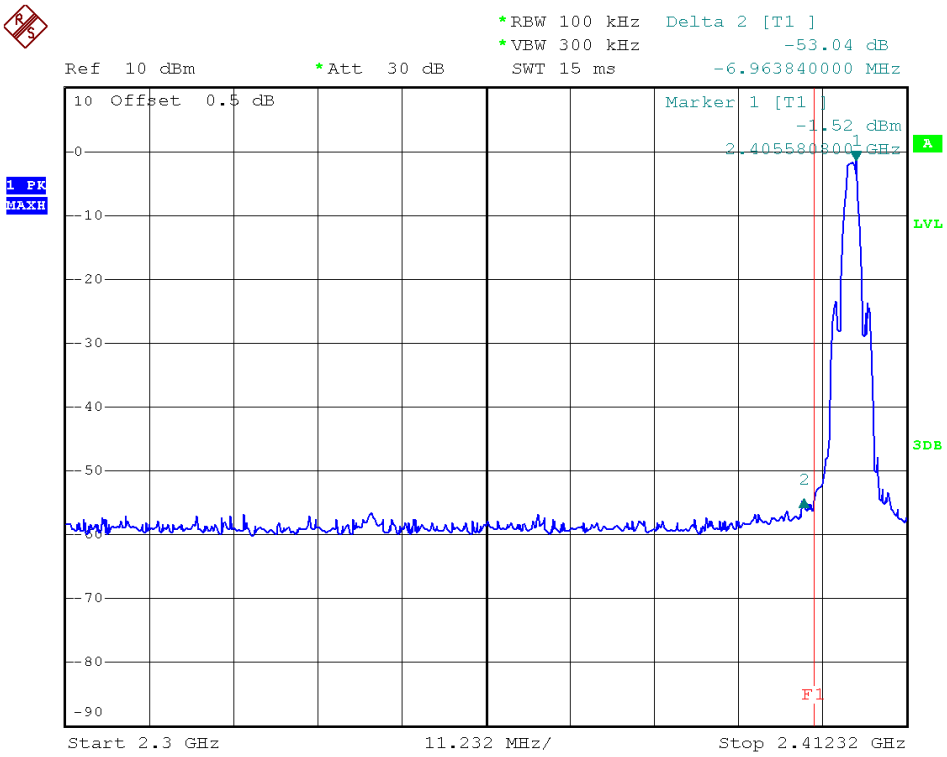
(Plot 2.6 A4: Channel = 26 AVG)

Conducted Band Edge Measurement

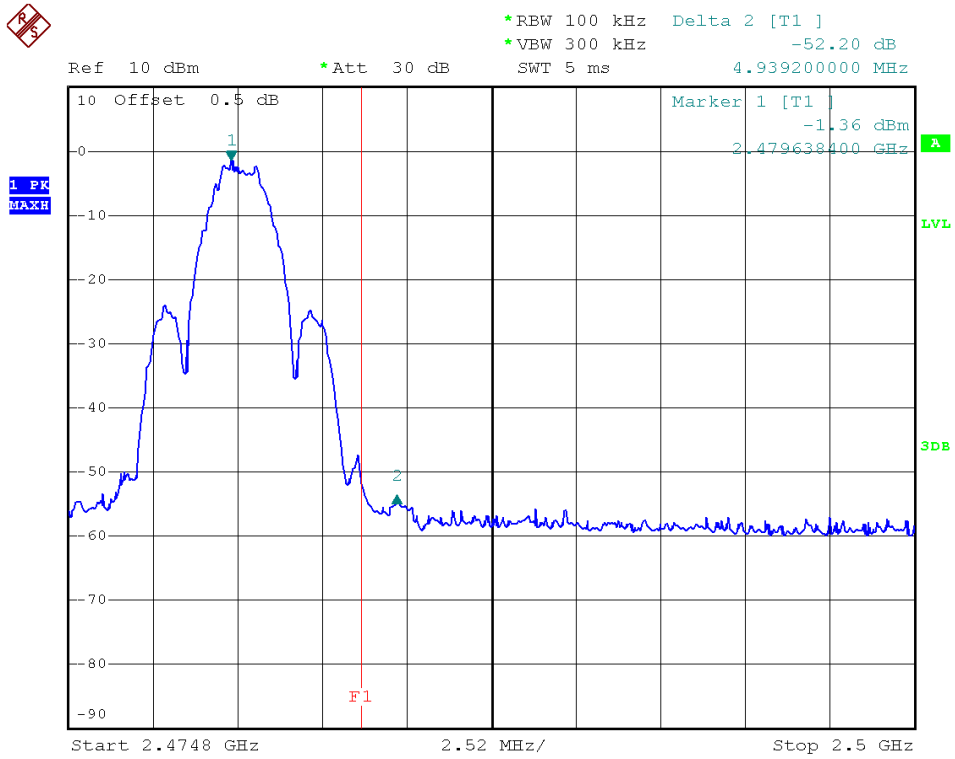
A. Test Verdict:

Frequency (MHz)	Delta Peak to Band emission (dBc)	Detector	Limit (dBc)	Refer to Plot	Verdict
Out of left side band					
2398.617	-53.04	PK	-20.00	Plot 2.6 E1	Pass
Out of right side band					
2484.578	-52.20	PK	-20.00	Plot 2.6 E2	Pass

B. Test Plots:



(Plot 2.6 E1: Channel =11 2405MHz)



(Plot 2.6 E2: Channel =26 2480MHz)

2.7 Conducted Emission

2.7.1 Requirement

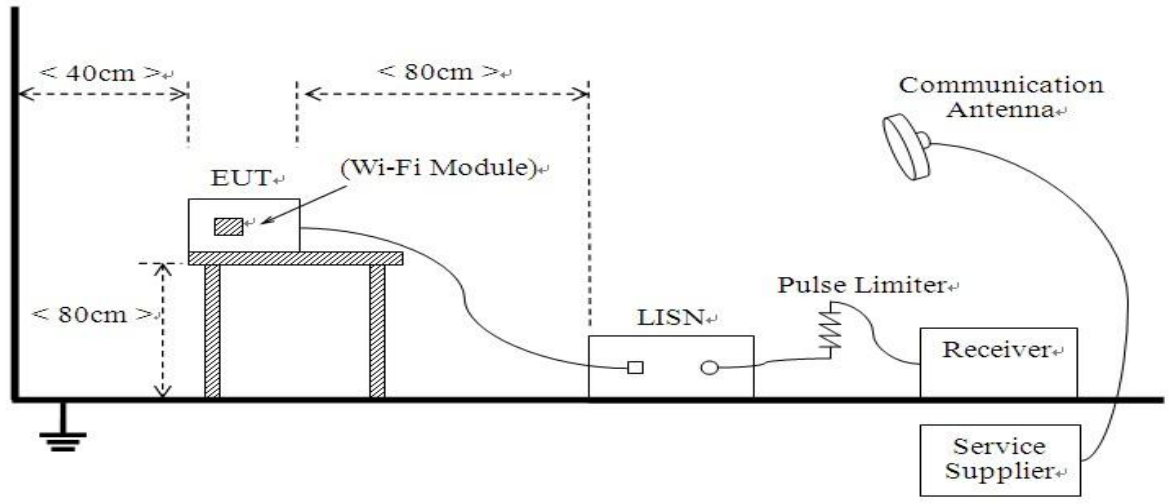
According to FCC section 15.207, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a 50μH/50Ω line impedance stabilization network (LISN).

Frequency range (MHz)	Conducted Limit (dBμV)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50

NOTE:
(a) The lower limit shall apply at the band edges.
(b) The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

2.7.2 Test Description

A. Test Setup:



The Table-top EUT was placed upon a non-metallic table 0.8m above the horizontal metal reference ground plane. EUT was connected to LISN and LISN was connected to reference Ground Plane. EUT was 80cm from LISN. The set-up and test methods were according to ANSI C63.4:2009

The EUT is powered by a PC. The factors of the site are calibrated to correct the reading. During the measurement, the EUT is activated and controlled by the Wi-Fi Service Supplier (SS) via a Common Antenna.

B. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal.Due Date
Test Receiver	ROHDE&SCHWARZ	ESCS30	A0304260	2014.06.10
LISN	ROHDE&SCHWARZ	ESH2-Z5	A0304221	2014.06.10

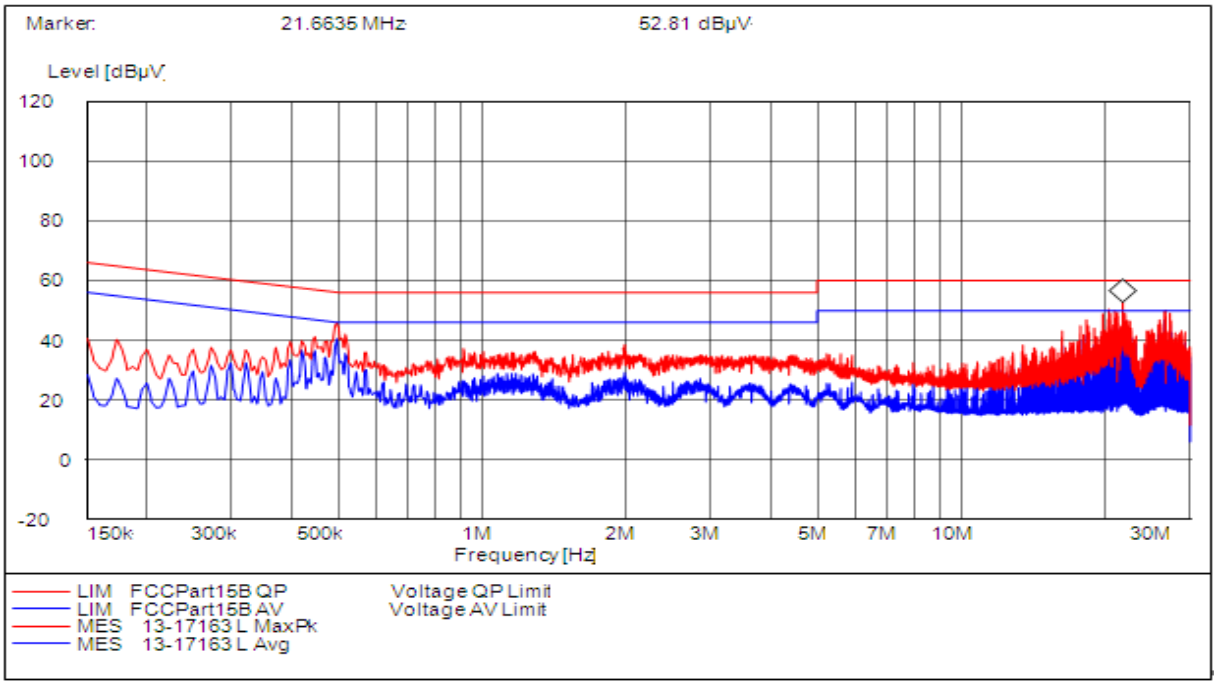
2.7.3 Test Result

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

A. Test setup:

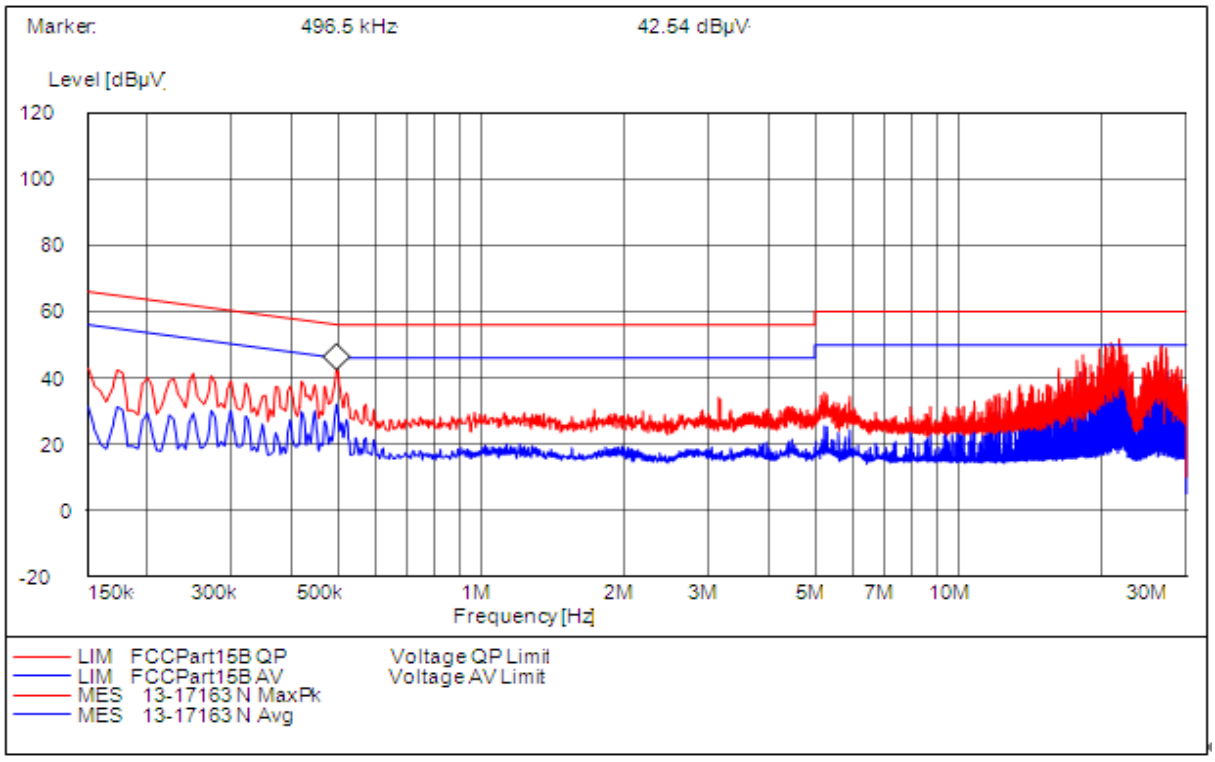
The EUT configuration of the emission tests is EUT + PC.

B. Test Plots:



Conducted Disturbance at Mains Terminals							
L Test Data							
QP				AV			
Frequency (MHz)	Limits (dBμV)	Measurement Value (dBμV)	Margin (dB)	Frequency (MHz)	Limits (dBμV)	Measurement Value (dBμV)	Margin (dB)
0.4965	56.10	45.93	10.17	0.4965	46.10	40.59	5.51
0.5146	56	40.92	15.08	0.5146	46	36.74	19.26
21.6635	60	49.81	10.19	21.6635	50	46.35	3.65
L Test Curve							

(Plot A: L Phase)



Conducted Disturbance at Mains Terminals							
N Test Data							
QP				**AV**			
Frequency (MHz)	**Limits (dBμV)**	**Measurement Value (dBμV)**	**Margin (dB)**	**Frequency (MHz)**	**Limits (dBμV)**	**Measurement Value (dBμV)**	**Margin (dB)**
0.1500	66	43.61	22.49	0.1500	56	31.43	14.57
0.5000	56	41.94	14.06	0.5000	46	32.02	13.98
21.6635	60	49.77	10.23	5.9012	50	46.31	3.69
N Test Curve							

(Plot B: N Phase)

Test Result: PASS

2.8 Radiated Emission

2.8.1 Requirement

According to FCC section 15.247(c), radiated emission outside the frequency band attenuation below the general limits specified in FCC section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in FCC section 15.205(a), must also comply with the radiated emission limits specified in FCC section 15.209(a).

According to FCC section 15.209 (a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	20log(2400/F(KHz))+80	300
0.490 - 1.705	24000/F(kHz)	20log(24000/F(KHz))+40	30
1.705 - 30.0	30	20log(30)+40	30
30 - 88	100	40.0	3
88 - 216	150	43.5	3
216 - 960	200	46.0	3
Above 960	500	54.0	3

Note:

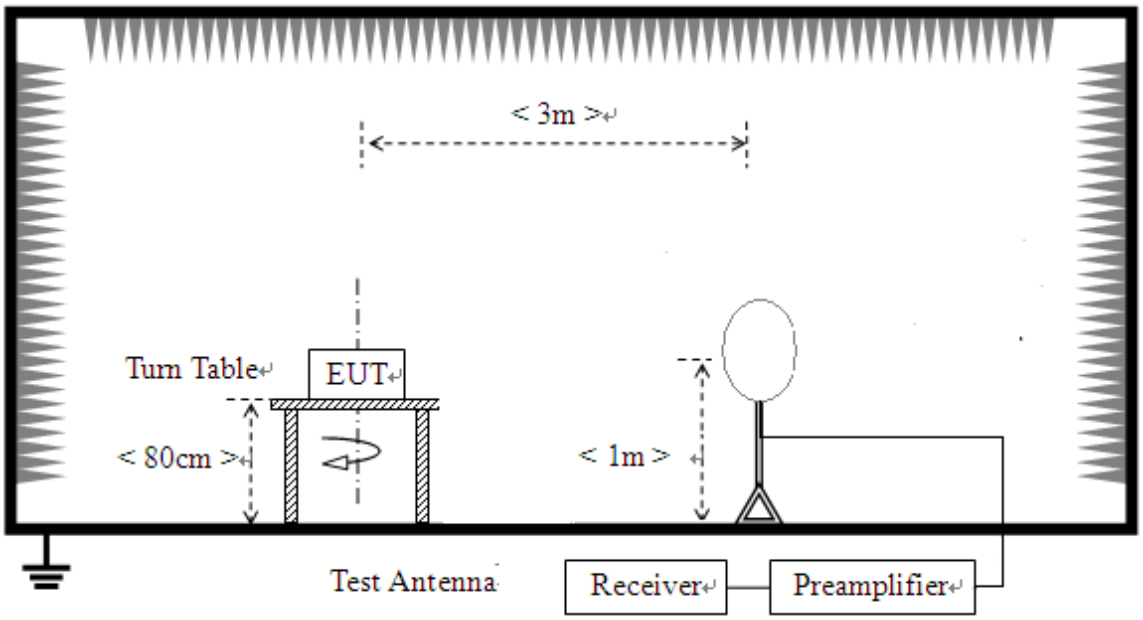
1. For Above 1000MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.
2. For above 1000MHz, limit field strength of harmonics: 54dBuV/m@3m (AV) and 74dBuV/m@3m (PK)

In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), also should comply with the radiated emission limits specified in Section 15.209(a)(above table)

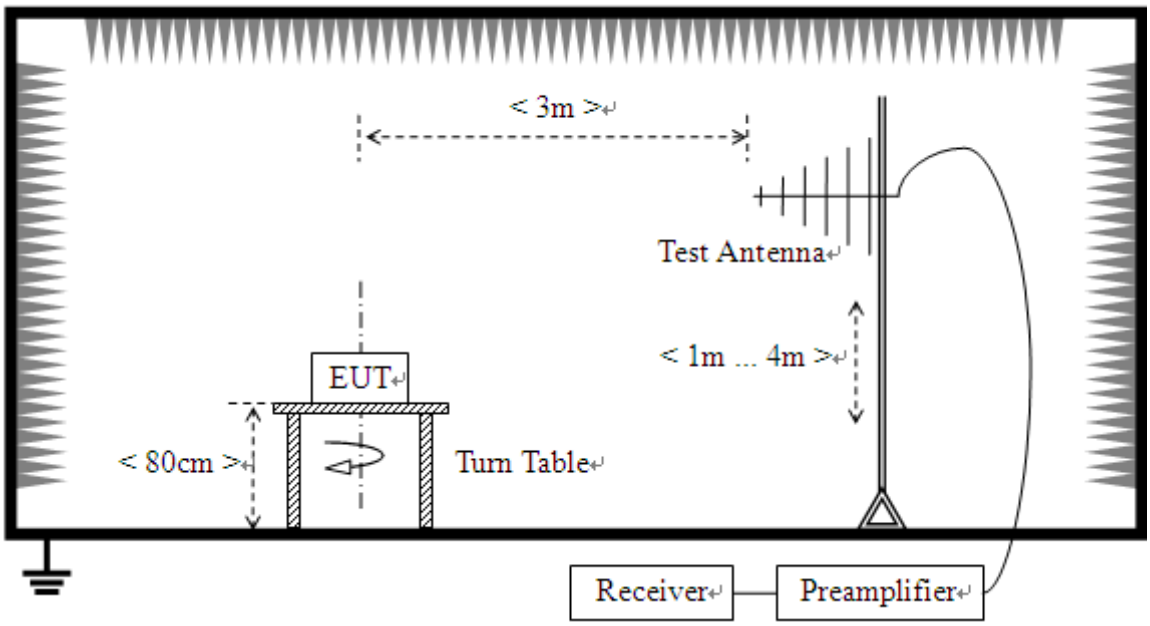
2.8.2 Test Description

A. Test Setup:

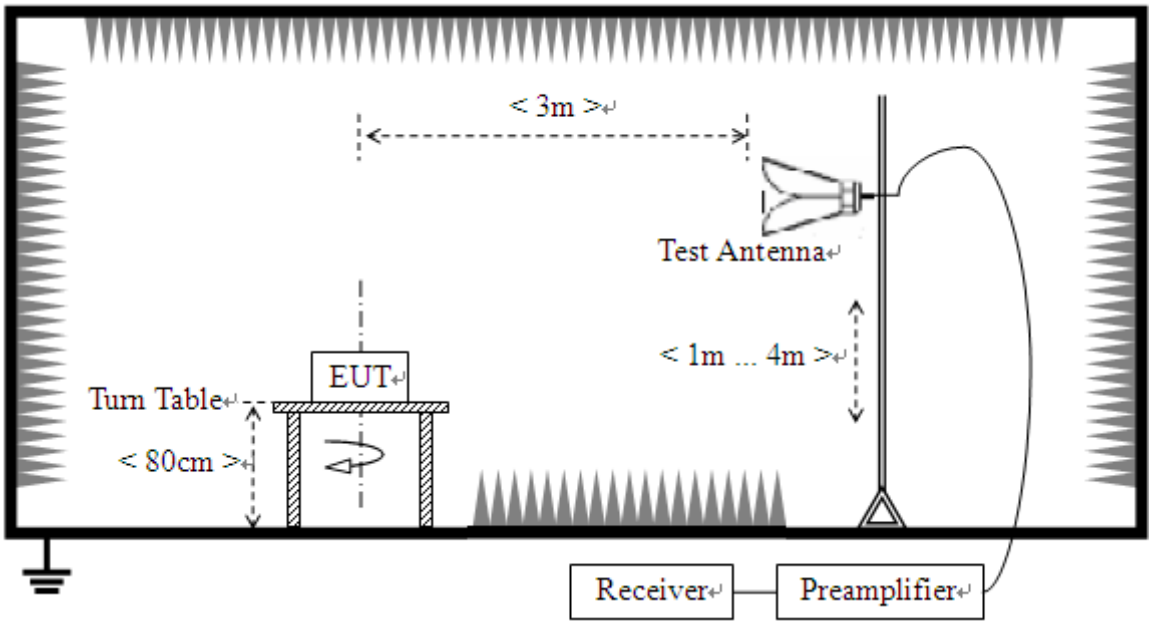
(1) For radiated emissions from 9kHz to 30MHz



(2) For radiated emissions from 30MHz to1GHz



(3) For radiated emissions above 1GHz



The test site semi-anechoic chamber has met the requirement of NSA tolerance 4dB according to the standards: ANSI C63.4 (2009). The EUT was set-up on insulator 80cm above the Ground Plane. The set-up and test methods were according to ANSI C63.4.

The EUT was powered by the PC. The Module is located in a 3m Semi-Anechoic Chamber; the antenna factors, cable loss and so on of the site as factors are calculated to correct the reading. During the measurement, the digital modulation operation of the hybrid system, with the frequency hopping operation turned off, the EUT is activated and controlled by the PC, set to operate under WIFI test mode.

For the Test Antenna:

(a) In the frequency range of 9kHz to 30MHz, magnetic field is measured with Loop Test Antenna. The Test Antenna is positioned with its plane vertical at 1m distance from the EUT. The center of the Loop Test Antenna is 1m above the ground. During the measurement the Loop Test Antenna rotates about its vertical axis for maximum response at each azimuth about the EUT.
(b) In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) and Horn Test Antenna (above 1GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength. The emission levels at both horizontal and vertical polarizations should be tested.

B. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal.Due Date
Receiver	R&S	ESIB26	A0304218	2014.06.07
Full-Anechoic Chamber	Albatross	12.8m*6.8m*6.4m	A0412372	2014.06.07
Test Antenna - Bi-Log	Schwarzbeck	VULB 9163	9163-274	2014.06.09
Test Antenna - Horn	R&S	BBHA 9120D	9120C-963	2014.06.09
Test Antenna - Horn	R&S	HF960	100150	2014.06.09
Test Antenna – Horn (18-25GHz)	ETS	UG-596A/U	A0902607	2014.06.05
Test Antenna -Loop	Schwarzbeck	HFH2-Z2	100047	2014.06.02
Ampilier 1G~18GHz	R&S	MITEQ AFS42-00101800	25-S-42	2014.06.05
Ampilier 18G~40GHz	R&S	JS42-18002600-28-5A	12111.0980.00	2014.06.05
amplifier 20M~3GHz	R&S	PAP-0203H	22018	2014.06.10

2.8.3 Test Result

According to ANSI C63.4 selection 4.2.2, because of peak detection will yield amplitudes equal to or greater than amplitudes measured with the quasi-peak (or average) detector, the measurement data from a spectrum analyzer peak detector will represent the worst-case results, if the peak measured value complies with the quasi-peak limit, it is unnecessary to perform an quasi-peak measurement.
The measurement results are obtained as below:

$E\ [dB\mu V/m] = U_R + A_T + A_{Factor}\ [dB]$; $A_T = L_{Cable\ loss}\ [dB] - G_{preamp}\ [dB]$

A_T: Total correction Factor except Antenna

U_R: Receiver Reading

G_{preamp}: Preamplifier Gain

A_{Factor}: Antenna Factor at 3m

$L_{Cable\ loss}$: Cable loss

During the test, the total correction Factor AT and A_{Factor} were built in test software.

Note: All radiated emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.
The minimum clock frequency was 24MHz,the radiated frequency range from 9KHz to 25GHz.

Note: 1.The radiated measurement are performed the each test mode (b/g/n) and channel (low/mid/high), the datum recorded below (802.11b mode, the middle channel) is the worst case for all the test mode and channel.

2. ULTRA-BROADBAND ANTENNA for the radiation emission test below 1G.

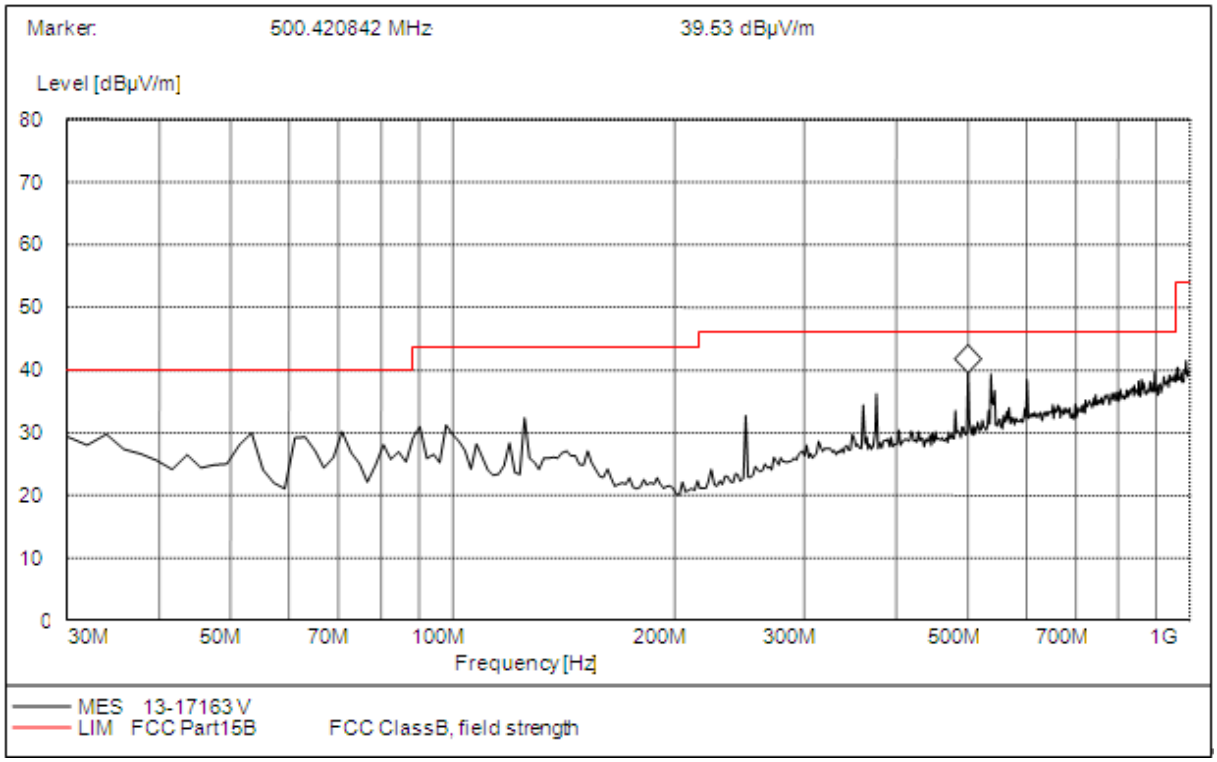
3. HORN ANTENNA for the radiation emission test above 1G.

Test plots for the whole measurement frequency range：

For 9KHz to 30MHz

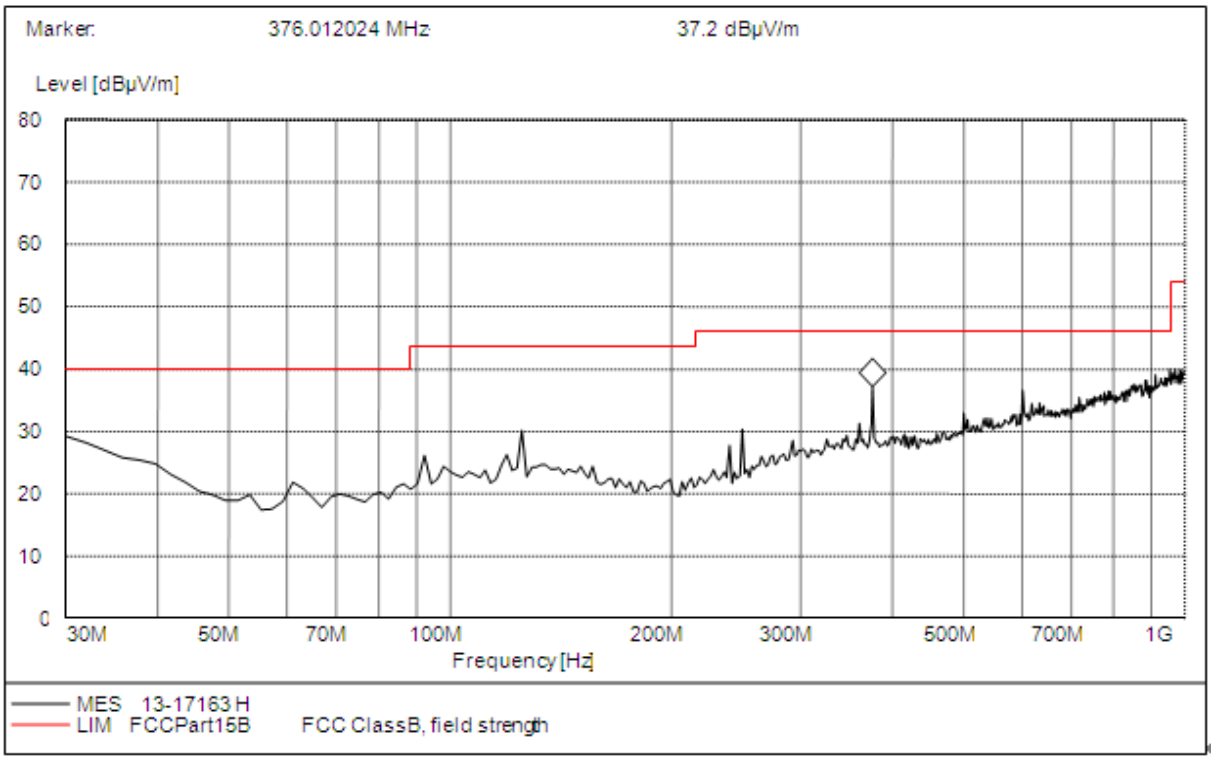
The test has been performed, and the Radiated Emission level is too low to the limit.

For 30MHz to 1000 MHz



(Plot A: 30MHz to 1GHz, Antenna Vertical)

Frequency (MHz)	QuasiPeak (dBµ V/m)	Bandwidth (kHz)	Antenna height (cm)	Limit (dBµ V/m)	Margin (dB)	Antenna	Verdict
33.940000	29.79	120.000	100.0	40.00	10.21	Vertical	Pass
131.080000	32.15	120.000	100.0	43.50	11.35	Vertical	Pass
500.420842	39.53	120.000	100.0	46.00	6.47	Vertical	Pass



(Plot B: 30MHz to 1GHz, Antenna Horizontal)

Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Antenna height (cm)	Limit (dBµV/m)	Margin (dB)	Antenna	Verdict
30.000000	29.24	120.000	100.0	40.00	10.76	Horizontal	Pass
131.080000	39.58	120.000	100.0	43.50	13.92	Horizontal	Pass
376.012024	37.20	120.000	100.0	46.00	8.80	Horizontal	Pass

For 1GHz to 25GHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（2405MHz）											
No.	Frequency (MHz)	Emssion Level		Limit (dBuV/m)	Margin (dB)	Antenna Height	Table Angle	Raw Value	Antenna Factor	Cable Factor	Pre-amplifier
1	*2405.00	108.67	PK	/	/	1.00 H	118	112.07	28.3	4.90	-36.6
1	*2405.00	98.03	AV	/	/	1.00 H	118	101.43	28.3	4.90	-36.6
2	4810.00	65.95	PK	74.00	8.05	1.00 H	24	62.75	32.7	7.00	-36.5
2	4810.00	51.59	AV	54.00	2.41	1.00 H	24	48.39	32.7	7.00	-36.5
3	7215.00	50.64	PK	74.00	23.36	1.00 H	107	41.24	35.8	8.90	-35.3
3	7215.00	43.46	AV	54.00	10.54	1.00 H	107	34.06	35.8	8.90	-35.3

4	9620.00	50.22	PK	74.00	23.78	1.00 H	39	37.62	37.2	10.20	-34.8
4	9620.00	44.54	AV	54.00	9.46	1.00 H	39	31.94	37.2	10.20	-34.8

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（2405MHz）											
No.	Frequency (MHz)	Emssion Level		Limit (dBuV/m)	Margin (dB)	Antenna Height	Table Angle	Raw Value	Antenna Factor	Cable Factor	Pre-amplifier
1	*2405.00	109.21	PK	/	/	1.00 V	109	112.61	28.3	4.90	-36.6
1	*2405.00	99.12	AV	/	/	1.00 V	109	102.52	28.3	4.90	-36.6
2	4810.00	66.68	PK	74.00	7.32	1.00 V	62	63.48	32.7	7.00	-36.5
2	4810.00	51.62	AV	54.00	2.38	1.00 V	62	48.42	32.7	7.00	-36.5
3	7215.00	51.03	PK	74.00	22.97	1.00 V	349	41.63	35.8	8.90	-35.3
3	7215.00	43.66	AV	54.00	10.34	1.00 V	349	34.26	35.8	8.90	-35.3
4	9620.00	54.59	PK	74.00	19.41	1.00 V	211	41.99	37.2	10.20	-34.8
4	9620.00	45.88	AV	54.00	8.12	1.00 V	211	33.28	37.2	10.20	-34.8

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（2445MHz）											
No.	Frequency (MHz)	Emssion Level		Limit (dBuV/m)	Margin (dB)	Antenna Height	Table Angle	Raw Value	Antenna Factor	Cable Factor	Pre-amplifier
1	*2445.00	107.00	PK	/	/	1.00 H	202	110.20	28.3	5.10	-36.6
1	*2445.00	99.35	AV	/	/	1.00 H	202	102.55	28.3	5.10	-36.6
2	4890.00	67.99	PK	74.00	6.01	1.00 H	187	64.59	32.3	7.60	-36.5
2	4890.00	52.39	AV	54.00	1.61	1.00 H	187	48.99	32.3	7.60	-36.5
3	7335.00	54.25	PK	74.00	19.75	1.00 H	107	44.85	36.1	8.60	-35.3
3	7335.00	48.14	AV	54.00	5.86	1.00 H	107	38.74	36.1	8.60	-35.3
4	9780.00	49.78	PK	74.00	24.22	1.00 H	144	37.18	37.2	10.20	-34.8
4	9780.00	42.83	AV	54.00	11.17	1.00 H	144	30.23	37.2	10.20	-34.8

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（2445MHz）											
No.	Frequency (MHz)	Emssion Level		Limit (dBuV/m)	Margin (dB)	Antenna Height	Table Angle	Raw Value	Antenna Factor	Cable Factor	Pre-amplifier
1	*2445.00	108.10	PK	/	/	1.00 V	104	111.30	28.3	5.10	-36.6
1	*2445.00	97.52	AV	/	/	1.00 V	104	100.72	28.3	5.10	-36.6
2	4890.00	68.16	PK	74.00	5.84	1.00 V	304	64.76	32.3	7.60	-36.5
2	4890.00	52.53	AV	54.00	1.47	1.00 V	304	49.13	32.3	7.60	-36.5
3	7335.00	49.30	PK	74.00	24.70	1.00 V	203	39.90	36.1	8.60	-35.3
3	7335.00	46.76	AV	54.00	7.24	1.00 V	203	37.36	36.1	8.60	-35.3
4	9780.00	48.89	PK	74.00	25.11	1.00 V	172	36.29	37.2	10.20	-34.8
4	9780.00	43.95	AV	54.00	10.05	1.00 V	172	31.35	37.2	10.20	-34.8

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（2480MHz）											
No.	Frequency (MHz)	Emssion Level		Limit (dBuV/m)	Margin (dB)	Antenna Height	Table Angle	Raw Value	Antenna Factor	Cable Factor	Pre-amplifier
1	*2480.00	110.63	PK	/	/	1.00 H	325	113.93	28.6	4.70	-36.6
1	*2480.00	99.73	AV	/	/	1.00 H	325	103.03	28.6	4.70	-36.6
2	4960.00	69.09	PK	74.00	4.91	1.00 H	311	65.29	33	7.00	-36.2
2	4960.00	53.13	AV	54.00	0.87	1.00 H	311	49.33	33	7.00	-36.2
3	7440.00	50.05	PK	74.00	23.95	1.00 H	330	40.65	36.2	8.50	-35.3
3	7440.00	46.63	AV	54.00	7.37	1.00 H	330	37.23	36.2	8.50	-35.3
4	9920.00	51.54	PK	74.00	22.46	1.00 H	42	38.94	37.2	10.20	-34.8
4	9920.00	48.55	AV	54.00	5.45	1.00 H	42	35.95	37.2	10.20	-34.8

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（2480MHz）											
No.	Frequency (MHz)	Emssion Level		Limit (dBuV/m)	Margin (dB)	Antenna Height	Table Angle	Raw Value	Antenna Factor	Cable Factor	Pre-amplifier
1	*2480.00	112.27	PK	/	/	1.00 V	34	115.57	28.6	4.70	-36.6
1	*2480.00	99.60	AV	/	/	1.00 V	34	102.90	28.6	4.70	-36.6
2	4960.00	69.22	PK	74.00	4.78	1.00 V	55	65.42	33	7.00	-36.2
2	4960.00	53.21	AV	54.00	0.79	1.00 V	55	49.41	33	7.00	-36.2
3	7440.00	50.95	PK	74.00	23.05	1.00 V	258	41.55	36.2	8.50	-35.3
3	7440.00	47.78	AV	54.00	6.22	1.00 V	258	38.38	36.2	8.50	-35.3
4	9920.00	50.38	PK	74.00	23.62	1.00 V	254	37.78	37.2	10.20	-34.8
4	9920.00	47.97	AV	54.00	6.03	1.00 V	254	35.37	37.2	10.20	-34.8

REMARKS: 1. Emission level (dBuV/m) =Raw Value (dBuV) +Antenna Factor (dB/m) + Cable Factor (dB) +Pre-amplifier Factor

2. The other emission levels were very low against the limit.

3. The other emission levels were very low against the limit.

4. Margin value = Limit value- Emission level.

5. The limit value is defined as per 15.247

6. “ * “ : Fundamental frequency

** END OF REPORT **