



REPORT No.: SZ16100050W02

FCC RF TEST REPORT

APPLICANT : VR Technology(shenzhen)Limited

PRODUCT NAME : 3Wand

MODEL NAME : 3Wand G1

TRADE NAME : N/A

BRAND NAME : 3Glasses

FCC ID : 2AKA6-G1

STANDARD(S) : 47 CFR Part 15 Subpart C

ISSUE DATE : 2016-11-09

SHENZHEN MORLAB COMMUNICATIONS TECHNOLOGY Co., Ltd.



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MORLAB GROUP

FL1-3, Building A, FeiYang Science Park, No.8 LongChang Road,
Block67, BaoAn District, ShenZhen , GuangDong Province, P. R. China

Tel: 86-755-36698555
Http://www.morlab.com

Fax: 86-755-36698525
E-mail: service@morlab.cn



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Change History		
Issue	Date	Reason for change
1.0	2016-11-09	First edition



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TEST REPORT DECLARATION

Applicant	VR Technology(shenzhen)Limited
Applicant Address	Room4A, Tower A1, Dinital Technology Park ,No.2, Gaoxin South 7th Road,Nanshan District,Shenzhen,China
Manufacturer	BYD Precision Manufacture Company Limited
Manufacturer Address	No.1 Baoping Road, Baolong Industrial Area, Longgang, Shenzhen, Guangdong Province
Product Name	3Wand
Model Name	3Wand G1
Brand Name	3Glasses
HW Version	G1-MB-V4
SW Version	N/A
Test Standards	47 CFR Part 15 Subpart C
Test Date	2016-10-31 to 2016-11-10
Test Result	PASS

Tested by : Zou Jian
Zou Jian

Reviewed by : Qiu Xiaojun
Qiu Xiaojun

Approved by : Peng Huarui
Peng Huarui



1. TECHNICAL INFORMATION

Note: Provide by applicant.

1.1 Applicant Information

Company:	VR Technology(shenzhen)Limited
Address:	Room4A, Tower A1, Dinital Technology Park ,No.2, Gaoxin South 7th Road,Nanshan District,Shenzhen,China

1.2 Equipment under Test (EUT) Description

Brand Name:	3Glasses
Trade Name:	N/A
Model Name:	3Wand G1
Frequency Range:	The frequency range used is 2402MHz - 2436MHz
Channel Number:	Refer 1.2.1
Modulation Type:	GFSK
Antenna Type:	PIFA Antenna
Antenna Gain:	2 dBi

NOTE:

The EUT is a 3Wand, it is operating at 2.4GHz ISM band. The lowest, middle, highest channel numbers of the EUT used and tested in this report are separately 3 (2402MHz), 18 (2418MHz) and 36 (2436MHz).

The EUT connected to the serial port of the computer with a serial communication cable, we use the dedicated software to control the EUT continuous transmission.

For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

1.2.1 The channel number and frequency of EUT

Channel	Frequency (MHz)	Channel	Frequency (MHz)
3	2402	21	2421
6	2406	24	2424
9	2409	27	2427
12	2412	30	2430
15	2415	33	2433
18	2418	36	2436



1.2.2 Identification of all used EUTs

The EUT identity consists of numerical and letter characters, the letter character indicates the test sample, and the following two numerical characters indicate the software version of the test sample.

EUT Identity	Hardware Version	Software Version
A01	G1-MB-V4	N/A

1.3 Test Standards and Results

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

No.	Identity	Document Title
1	47 CFR Part 15 (10-1-15 Edition)	Radio Frequency Devices

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

No.	Section	Description	Test Date	Result
1	15.203	Antenna Requirement	N.A	<u>PASS</u>
2	15.247(b)	Peak Output Power	Oct 31, 2016	<u>PASS</u>
3	15.247(a)	Bandwidth	Oct 31, 2016	<u>PASS</u>
4	15.247(d)	Conducted Spurious Emission and Band Edge	Oct 31, 2016	<u>PASS</u>
5	15.247(d)	Restricted Frequency Bands	Nov 10, 2016	<u>PASS</u>
6	15.207	Conducted Emission	Nov 10, 2016	<u>PASS</u>
7	15.209 ,15.247(d)	Radiated Emission	Nov 10, 2016	<u>PASS</u>
8	15.247(e)	Power spectral density (PSD)	Oct 31, 2016	<u>PASS</u>

The tests were performed according to the method of measurements prescribed in ANSI C63.10-2013.

1.3.1 Test Environment Conditions

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

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

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.

2.1.2 Result: Compliant

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 exceed 1 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) 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:

Please reference ANNEX A (1.5).

2.2.3 Test procedure

The measured output power was calculated by the reading of the spectrum analyzer and calibration. Following is the test procedure for Peak Output Power test on the spectrum analyzer:

a) Set analyzer center frequency to channel center frequency.



- b) Set the RBW to 1MHz
- c) Set VBW to 3MHz
- d) Set span to 3MHz
- e) Sweep time to auto couple.
- f) Detector = peak.
- g) Trace mode = max hold.
- h) Allow trace to fully stabilize.
- i) Use peak marker function to determine the peak amplitude level.

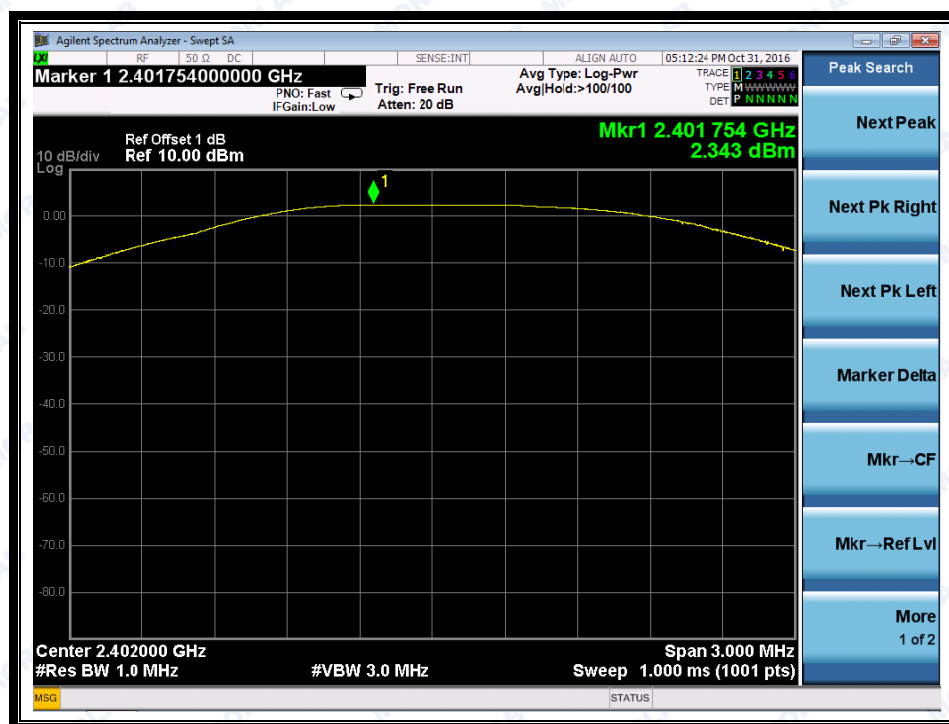
2.2.4 Test Result

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

A. Test Verdict:

Channel	Frequency (MHz)	Measured Output Peak Power		Refer to Plot	Limit		Verdict
		dBm	W		dBm	W	
3	2402	2.34	0.0017	Plot A	30	1	PASS
18	2418	2.29	0.0017	Plot B			PASS
36	2436	2.27	0.0017	Plot C			PASS

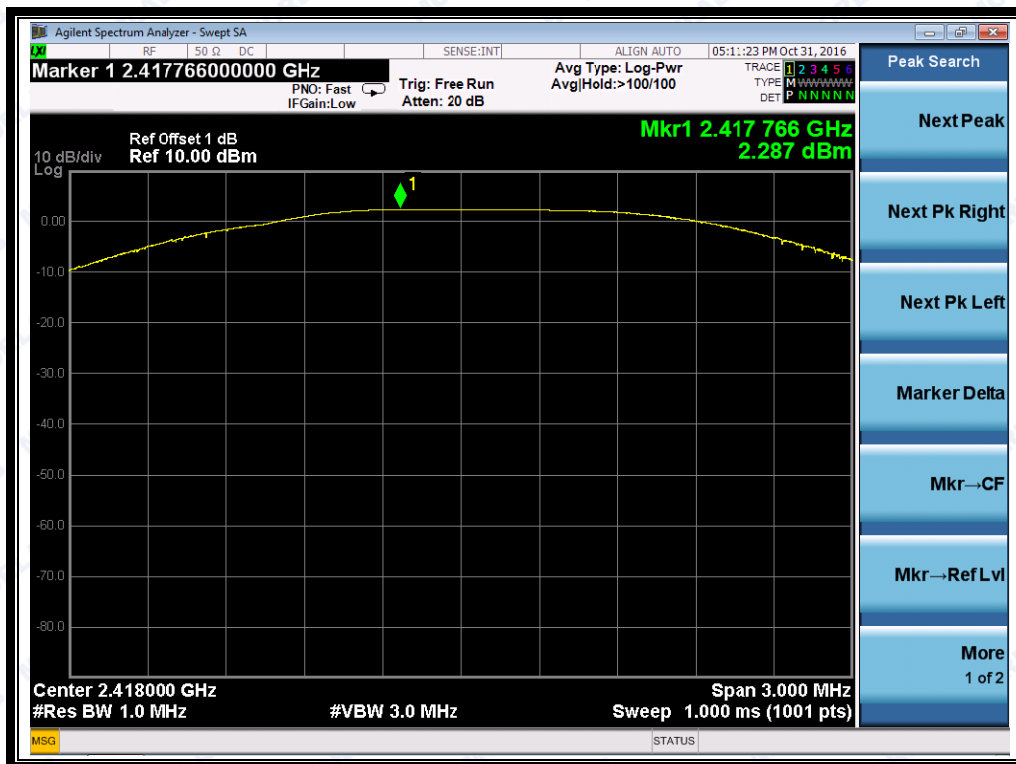
B. Test Plots:



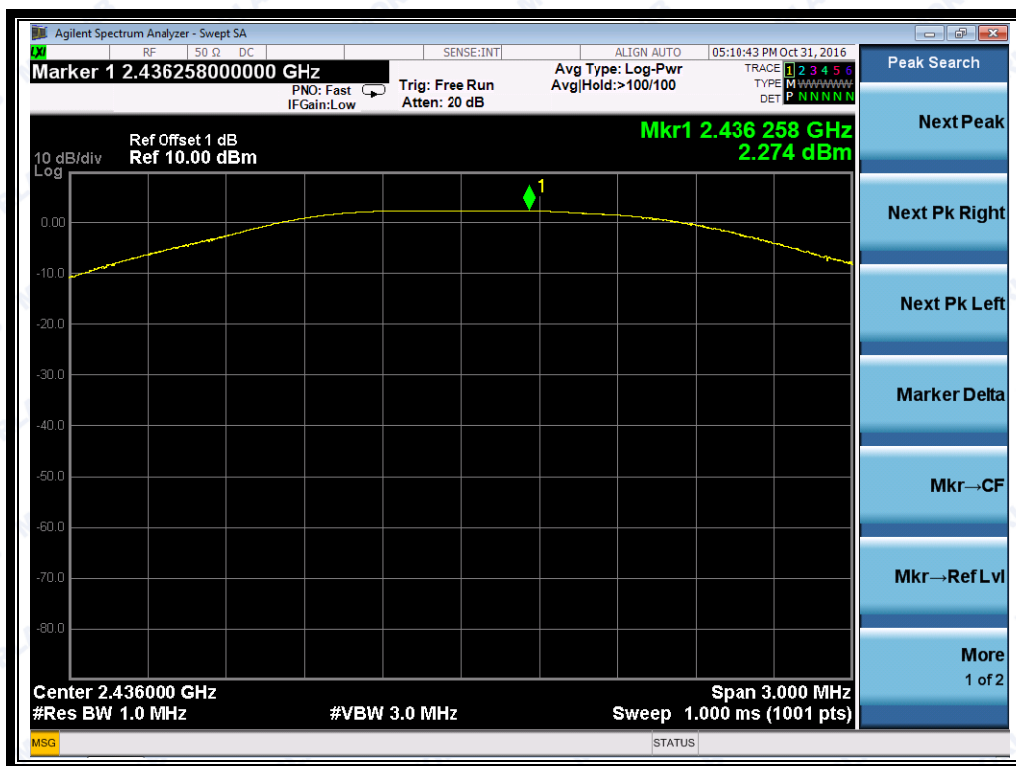
(Plot A: Channel 3: 2402MHz)



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(Plot B: Channel 18: 2418MHz)



(Plot C: Channel 36: 2436MHz)

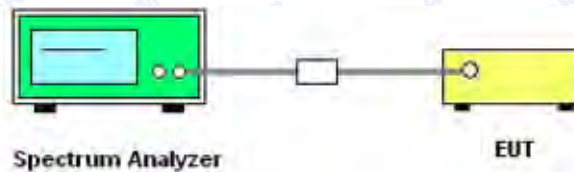
2.3 6dB Bandwidth

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 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.

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:

Please reference ANNEX A(1.5).

2.3.3 Test procedure

The steps for the first option are as follows:

- (1) Set analyzer center frequency to channel center frequency.
 - a) Set RBW = 100 kHz.
 - b) Set the VBW=300 kHz.
 - c) Detector = peak.
 - d) Trace mode = max hold.
 - e) Sweep = auto couple
 - f) Allow the trace to stabilize.
 - g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

(2) The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described in 11.8.1 (i.e., RBW = 100 kHz, VBW $\geq 3 \times$ RBW, and peak detector with maximum hold) is implemented by the instrumentation function. When using this capability, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that



2.3.4 Test Result

A. Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Refer to Plot	Limits(kHz)	Result
3	2402	0.6849	Plot A	≥500	PASS
18	2418	0.6772	Plot B	≥500	PASS
36	2436	0.6835	Plot C	≥500	PASS

Agilent Spectrum Analyzer - Occupied BW

RF 50 Ω DC SENSE:INT ALIGN AUTO 05:07:19 PM Oct 31, 2016

Ref Value 15.00 dBm Center Freq: 2.402000000 GHz Radio Std: None
 Trig: Free Run Avg/Hold: >10/10
 #FGain: Low #Atten: 10 dB Radio Device: BTS

10 dB/div Ref 15.00 dBm

Center 2.402 GHz Span 5 MHz
 #Res BW 100 kHz #VBW 300 kHz Sweep 1 ms

Occupied Bandwidth		Total Power	
1.4838 MHz		9.73 dBm	

Transmit Freq Error		OBW Power	
37.410 kHz		99.00 %	
x dB Bandwidth		-6.00 dB	

Trace/Detector

Clear Write

Average

Max Hold

Min Hold

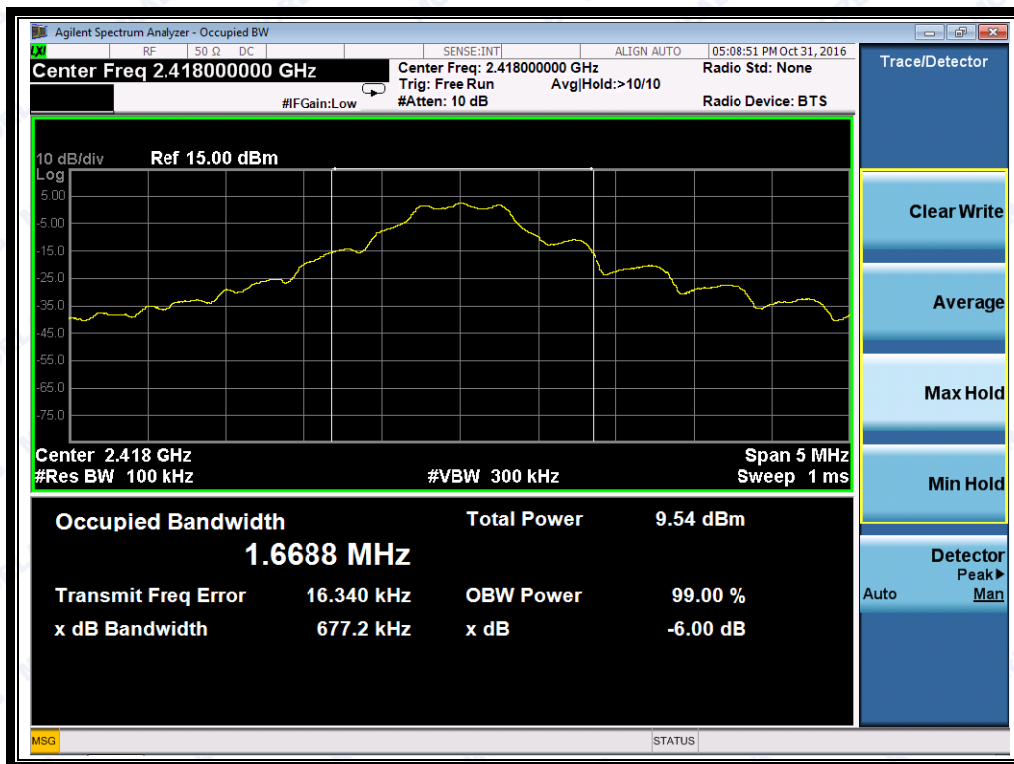
Detector Peak ▶
 Auto Man

MSG STATUS

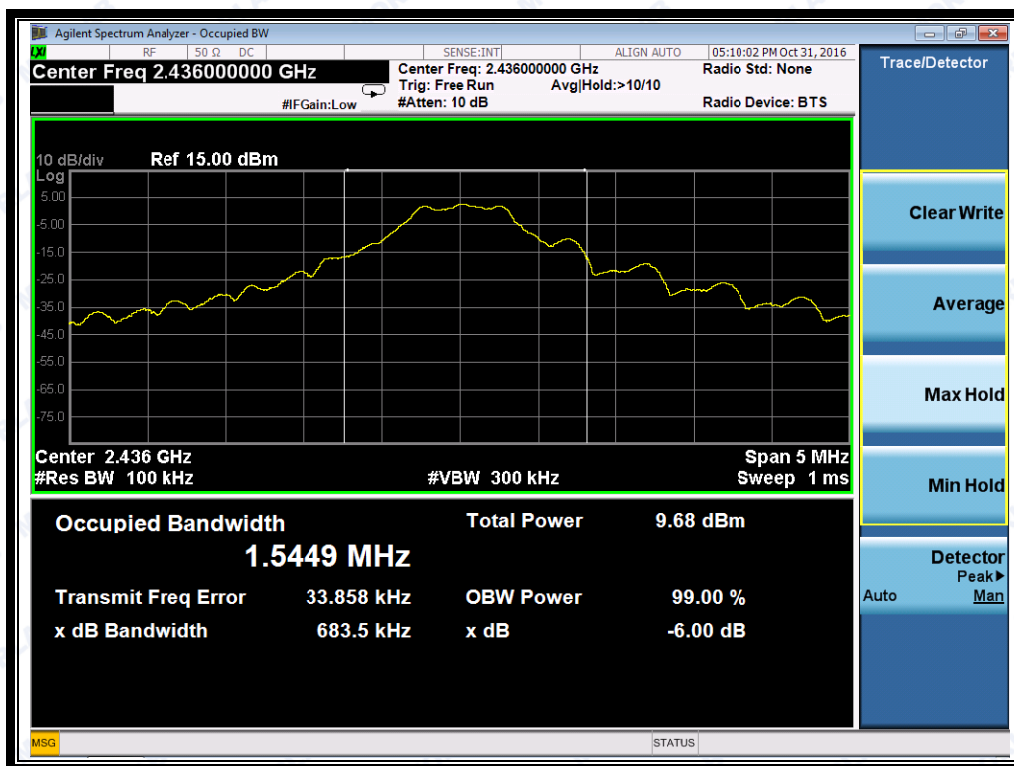
(Plot A: Channel 3: 2402MHz)



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(Plot B: Channel 18: 2418 MHz)



(Plot C: Channel 36: 2436MHz)

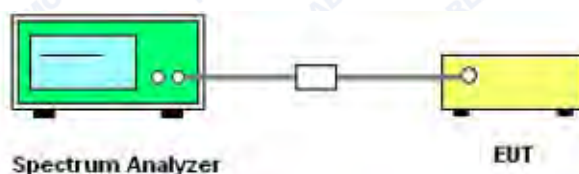
2.4 Conducted Spurious Emissions and Band Edge

2.4.1 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.

2.4.2 Test Description

A. Test Set:



The EUT 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.

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:

Please reference ANNEX A (1.5).

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:

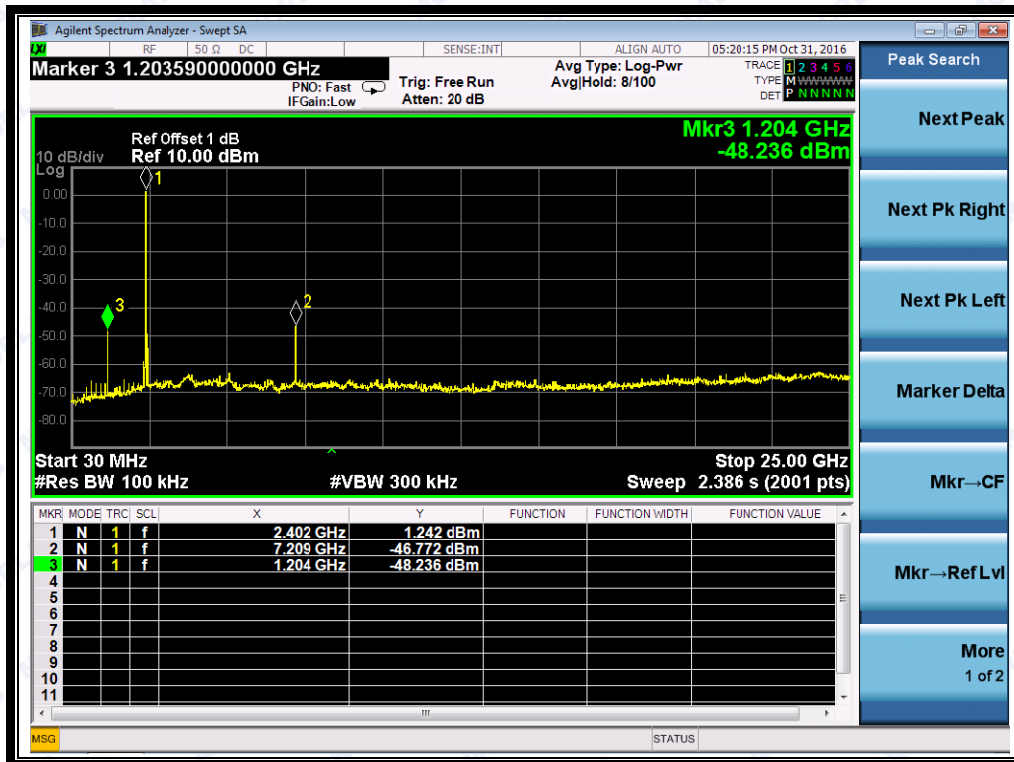
Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Refer to Plot	Limit (dBm)		Verdict
				Carrier Level	Calculated -20dBc Limit	
3	2402	-46.77	Plot A.1	1.24	-18.76	PASS
18	2418	-47.45	Plot B.1	2.25	-17.75	PASS
36	2436	-47.91	Plot C.1	2.19	-17.81	PASS

B. Test Plots:

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



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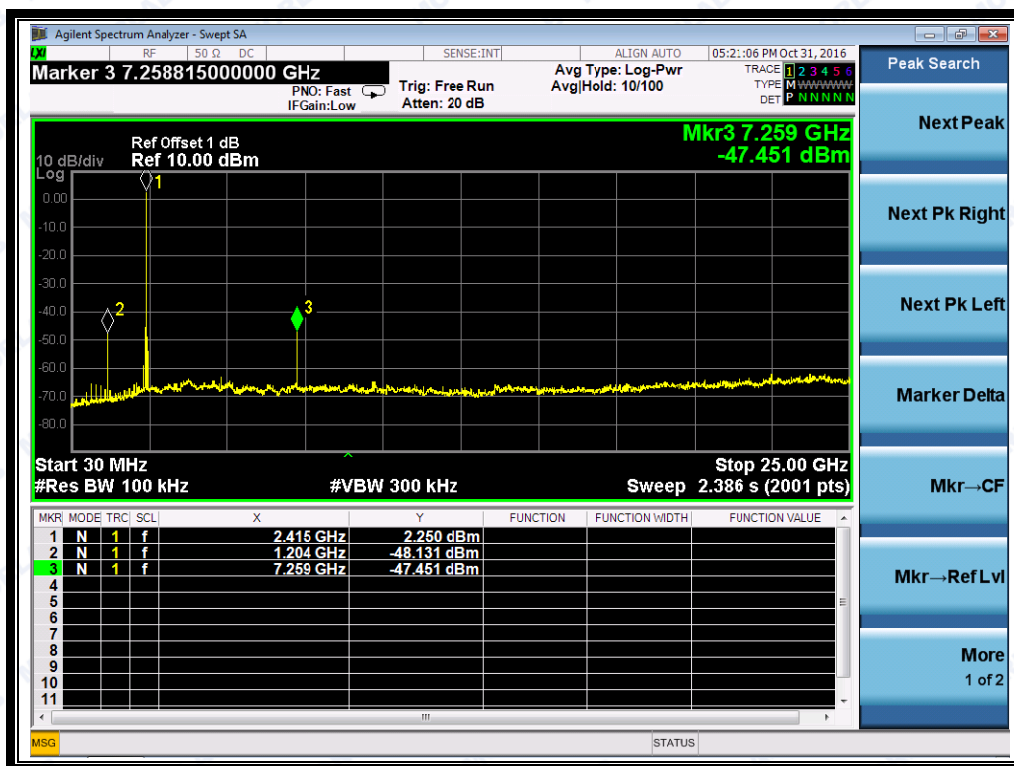
(Plot A.1: Channel = 3, 30MHz to 25GHz)



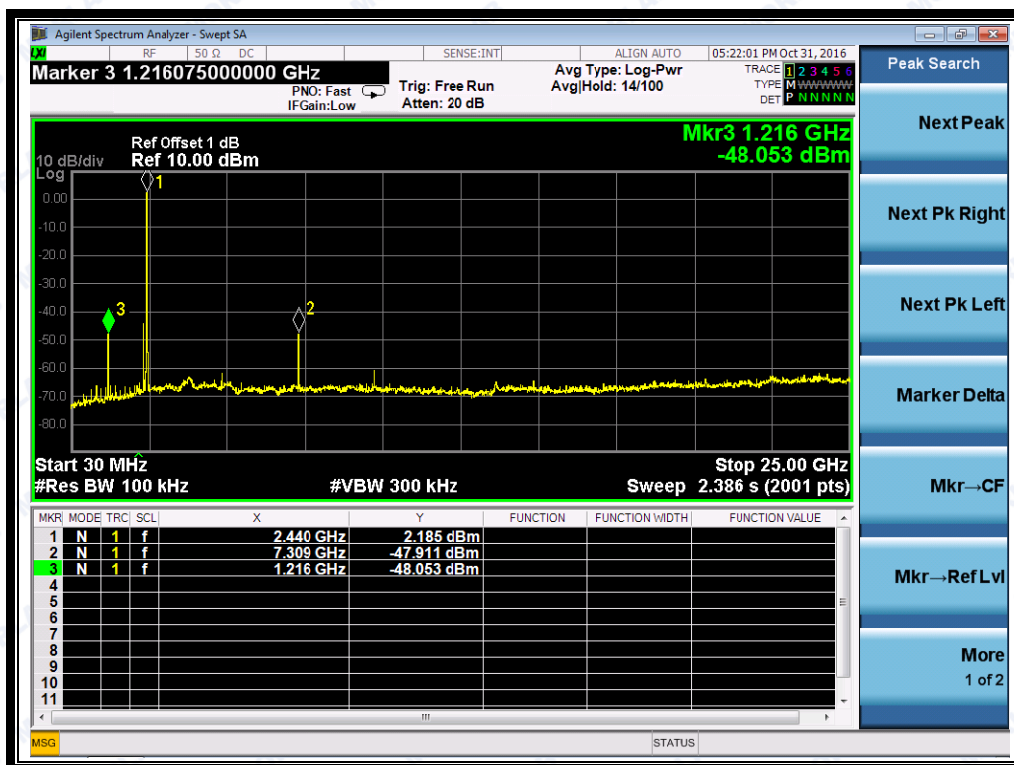
(Band Edge@ Channel = 3)



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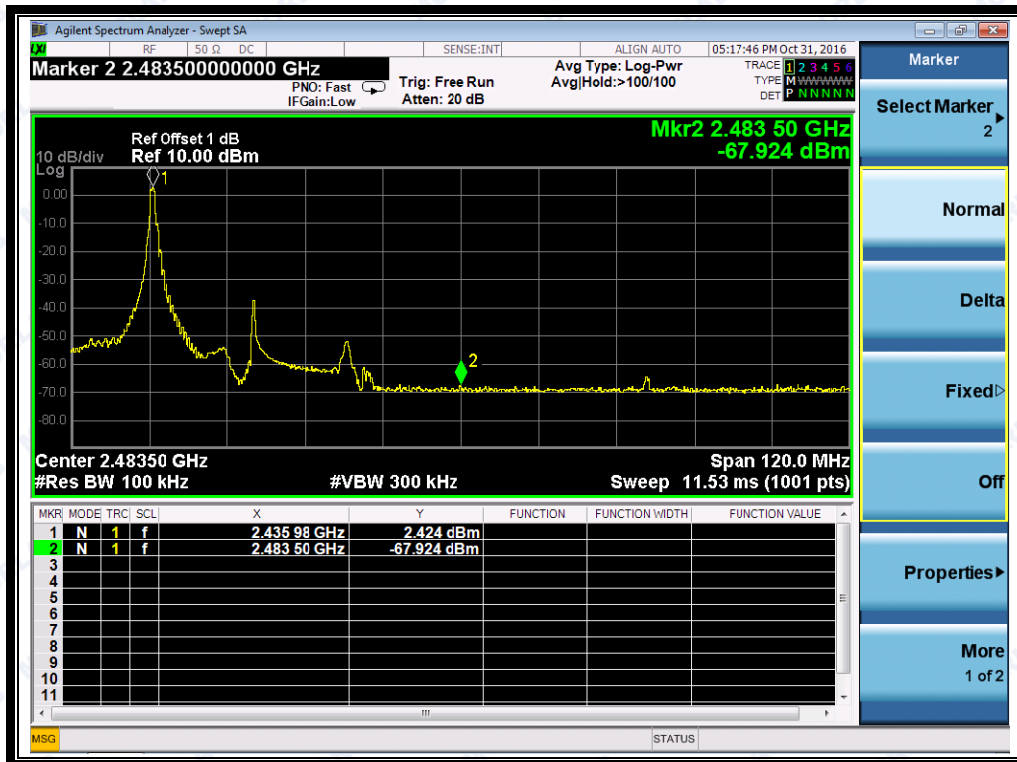
(Plot B.1: Channel = 18, 30MHz to 25GHz)



(Plot C.1: Channel = 36, 30MHz to 25GHz)



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(Band Edge@ Channel = 36)

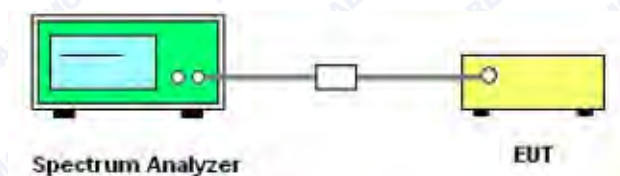
2.5 Power spectral density (PSD)

2.5.1 Requirement

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm 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.

2.5.2 Test Description

A. Test Set:



The EUT 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.

B. Equipments List:

Please reference ANNEX A (1.5).

2.5.3 Test procedure

The measured power spectral density was calculated by the reading of the spectrum analyzer and calibration. Following is the test procedure for PSD test:

- Set analyzer center frequency to channel center frequency.
- Set the span to 3MHz
- Set the RBW to 3 kHz
- Set the VBW to 10KHz
- 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 within the RBW.

2.5.4 Test Result

The lowest, middle and highest channels are tested.

A. Test Verdict:



Spectral power density (dBm/3kHz)					
Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)	Refer to Plot	Limit (dBm/3kHz)	Verdict
3	2402	-11.64	Plot A	8	PASS
18	2418	-11.15	Plot B	8	PASS
36	2436	-11.18	Plot C	8	PASS
Measurement uncertainty: ± 1.3 dB					

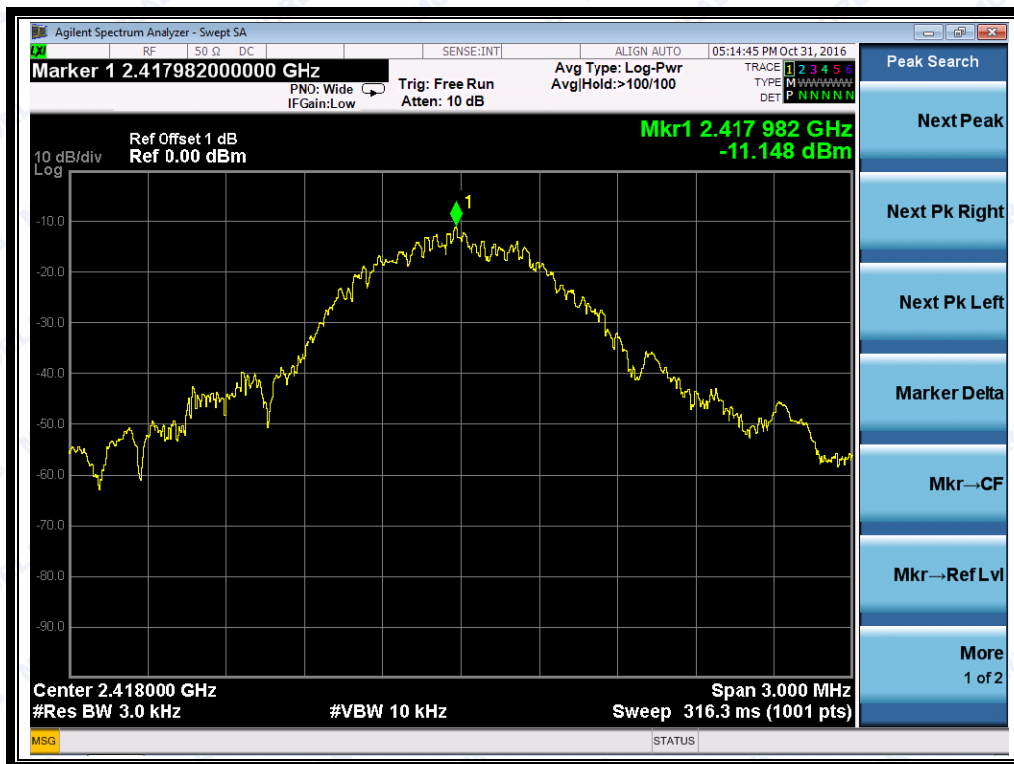
B. Test Plots:



(Plot A: Channel = 3)



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(Plot B: Channel = 18)



(Plot C: Channel = 36)

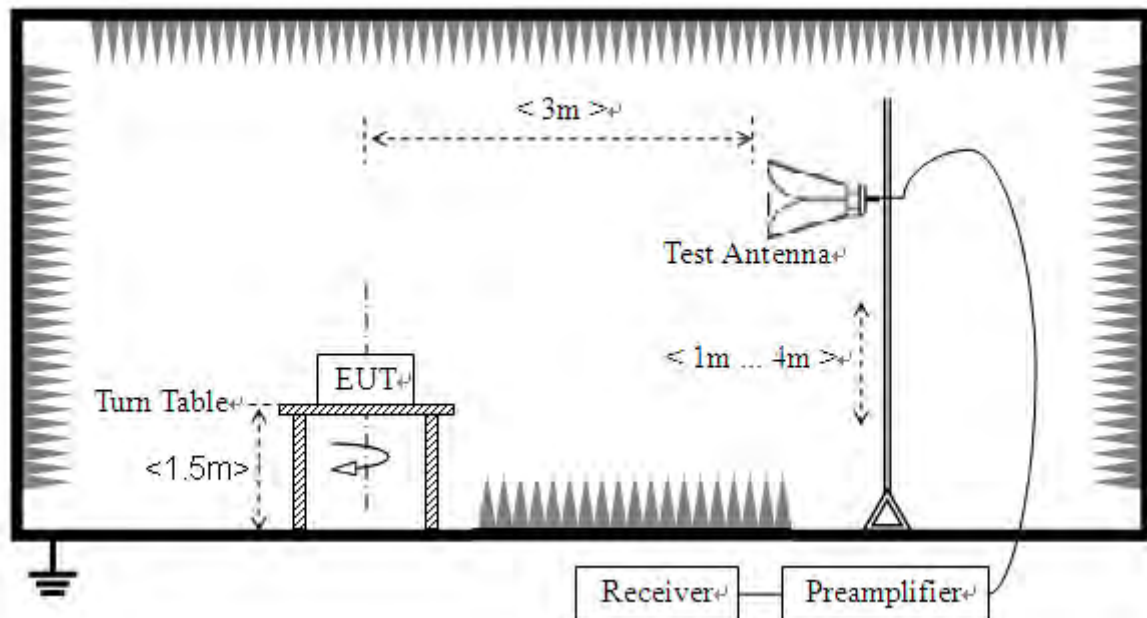
2.6 Restricted Frequency Bands

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

2.6.2 Test Description

A. Test Setup



The EUT 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:

Please reference ANNEX A(1.5).



2.6.3 Test Result

The lowest and highest channels are tested to verify the Restricted Frequency Bands.

The measurement results are obtained as below:

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

A_T : Total correction Factor except Antenna

U_R : Receiver Reading

G_{preamp} : Preamplifier Gain

A_{Factor} : Antenna Factor at 3m

Note: Restricted Frequency Bands were performed when antenna was at vertical and horizontal polarity, and only the worse test condition (vertical) was recorded in this test report.

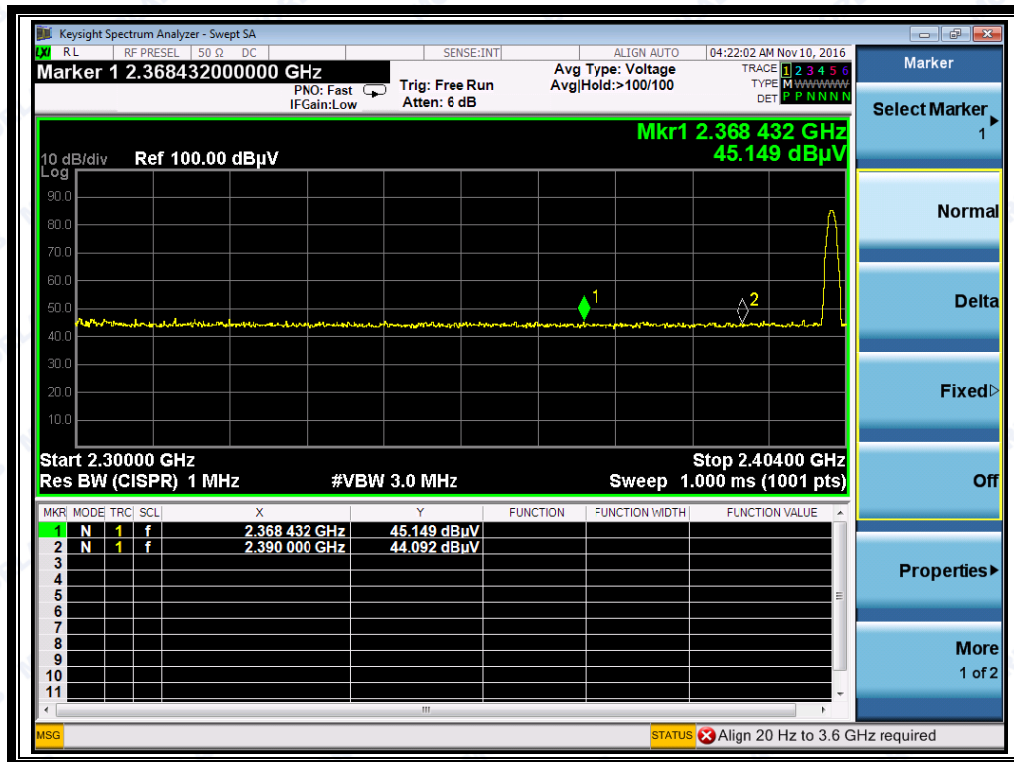
A. Test Verdict:

Channel	Frequency (MHz)	Detector	Receiver Reading U_R (dBuV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dB μ V/m)	Limit (dB μ V/m)	Verdict
		PK/ AV						
3	2368.43	PK	45.15	-33.63	32.56	44.08	74	Pass
3	2385.80	AV	32.72	-33.63	32.56	31.65	54	Pass
36	2486.48	PK	45.19	-33.18	32.5	44.51	74	Pass
36	2488.20	AV	32.46	-33.18	32.5	31.78	54	Pass

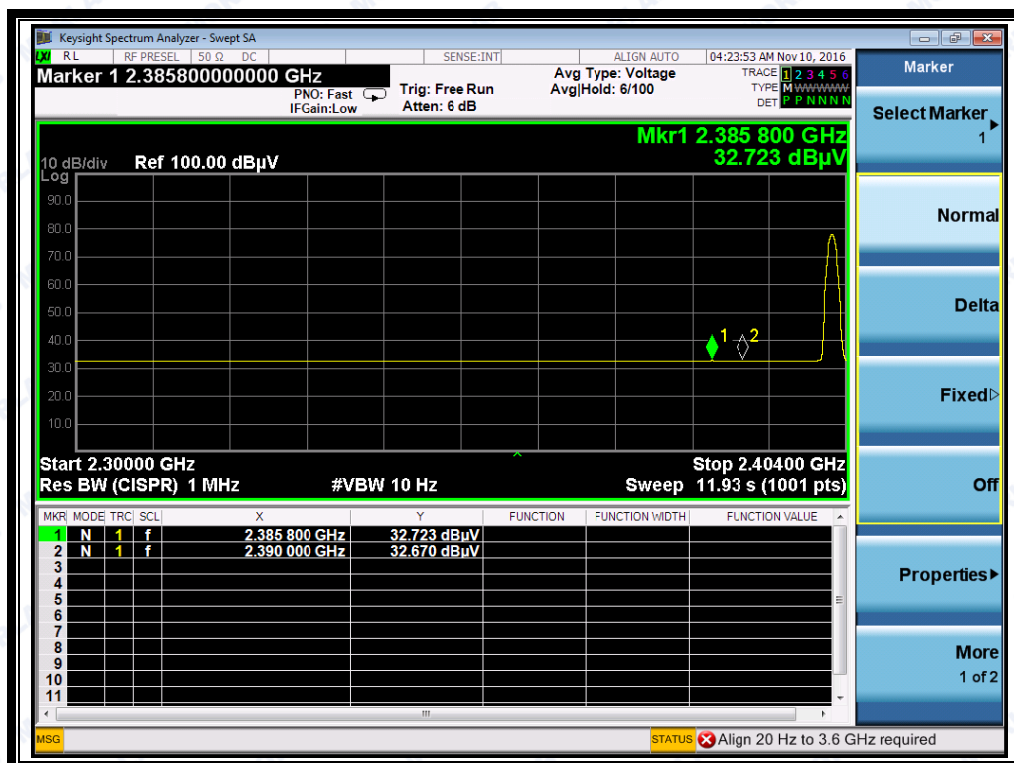
B. Test Plots:



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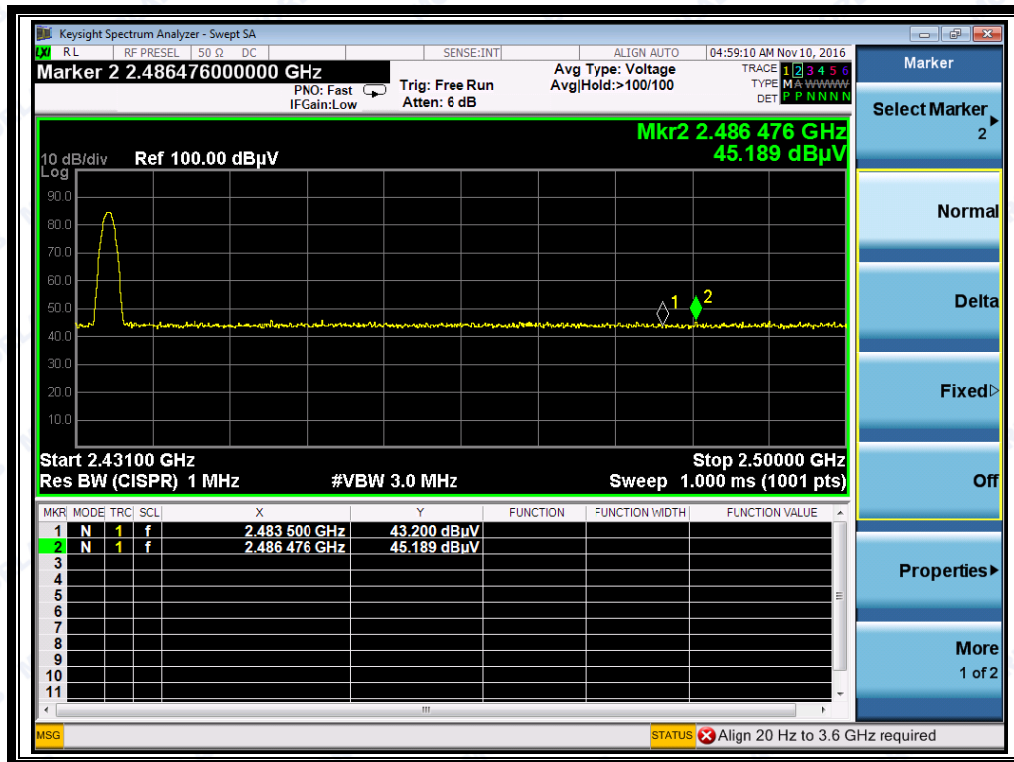
(Plot A1: Channel = 3 PEAK)



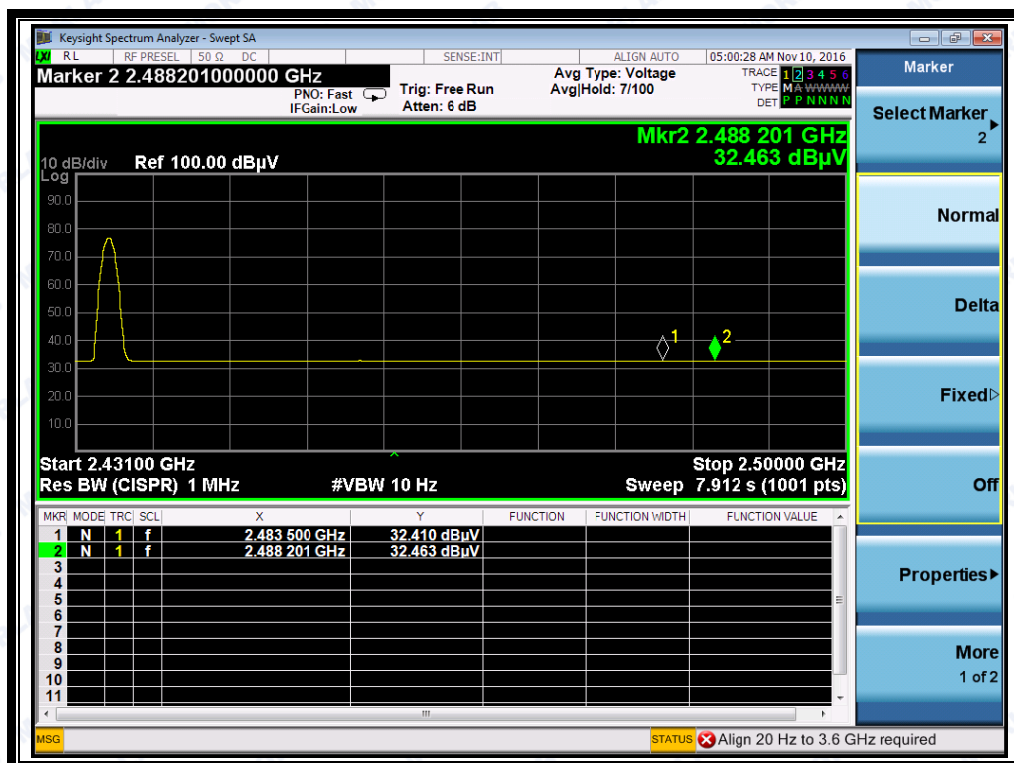
(Plot A2: Channel = 3 AVG)



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(Plot B1: Channel = 36 PEAK)



(Plot B2: Channel = 36 AVG)

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 50 μ H/50 Ω line impedance stabilization network (LISN).

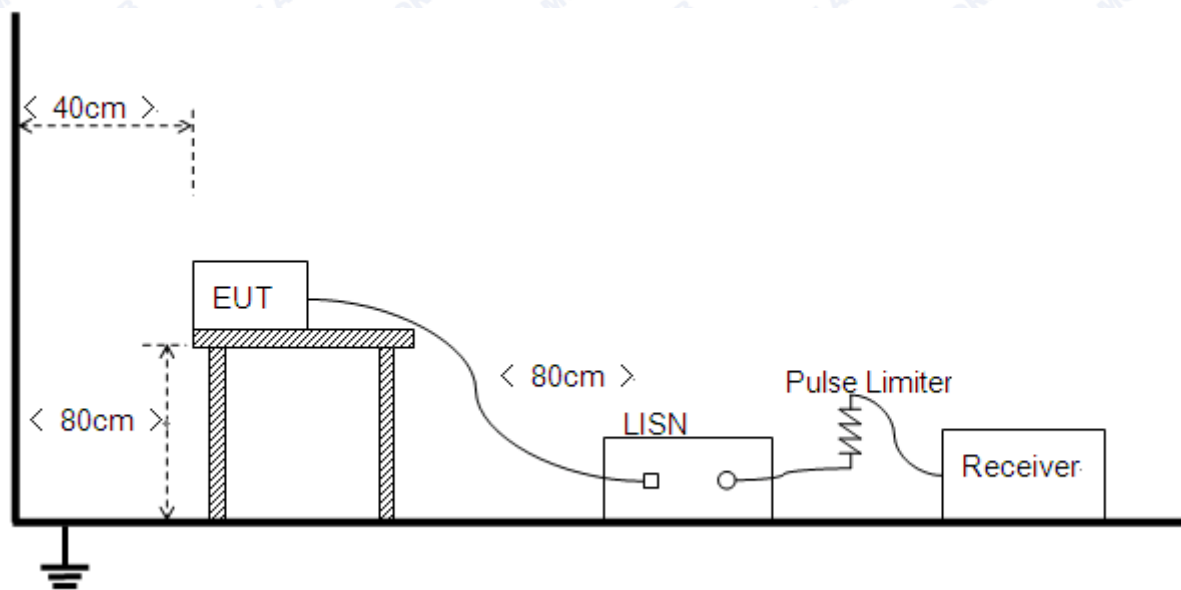
Frequency range (MHz)	Conducted Limit (dB μ V)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50

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 C63.10: 2013.

B. Equipments List:

Please reference ANNEX A(1.5).



2.7.3 Test Result

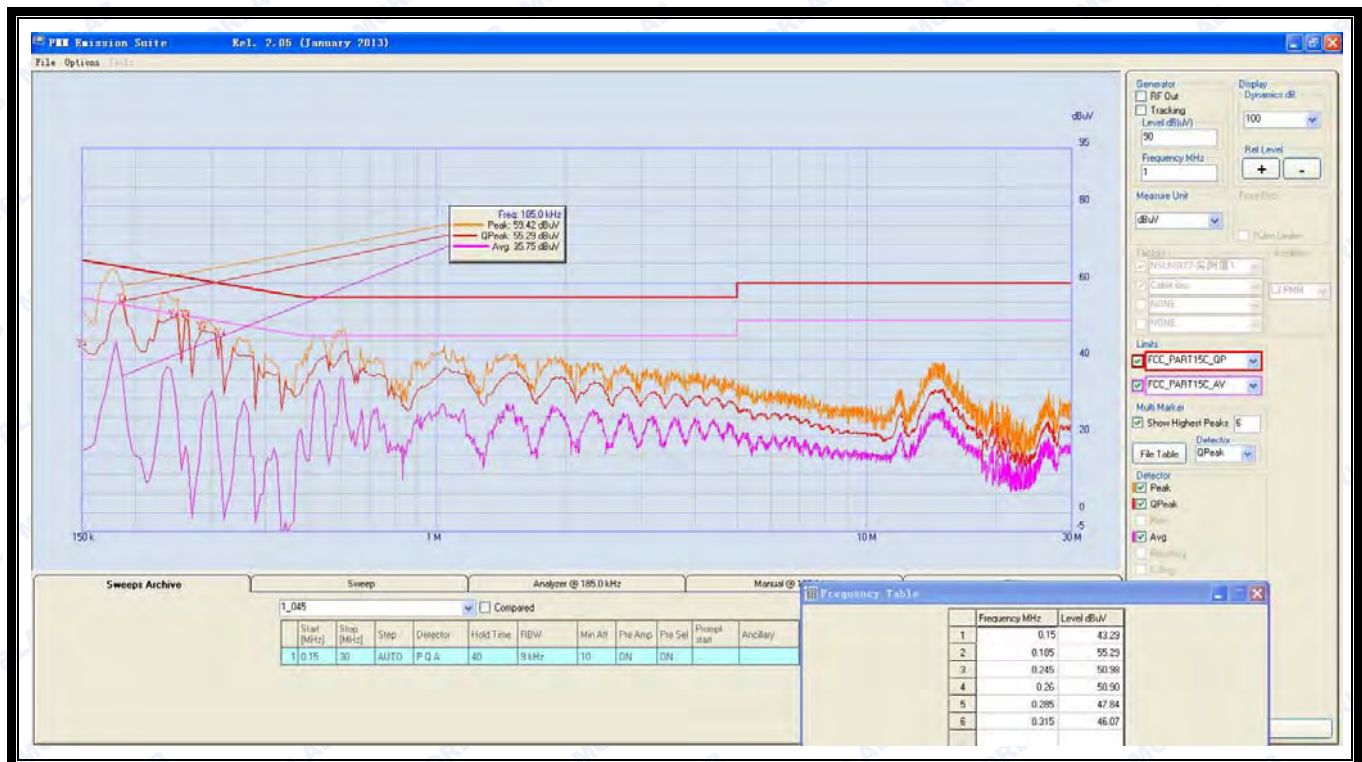
The maximum conducted interference is searched using Peak (PK), if the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT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

A. Test setup:

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

Note: The test voltage is AC 120V/60Hz.

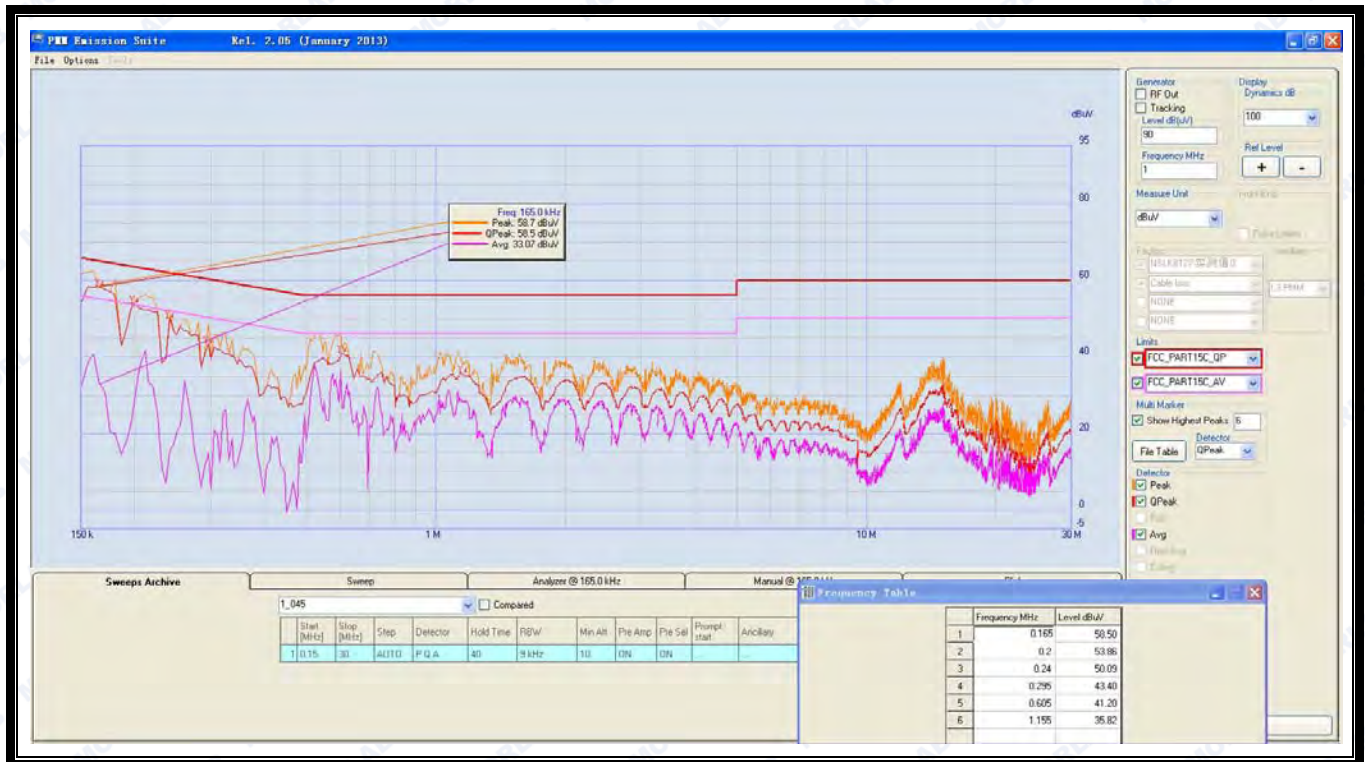
B. Test Plots:



(Plot A: L Phase)



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(Plot B: N Phase)



2.8 Radiated Emission

2.8.1 Requirement

According to FCC section 15.247(d), 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 ($\mu\text{V/m}$)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

Note:

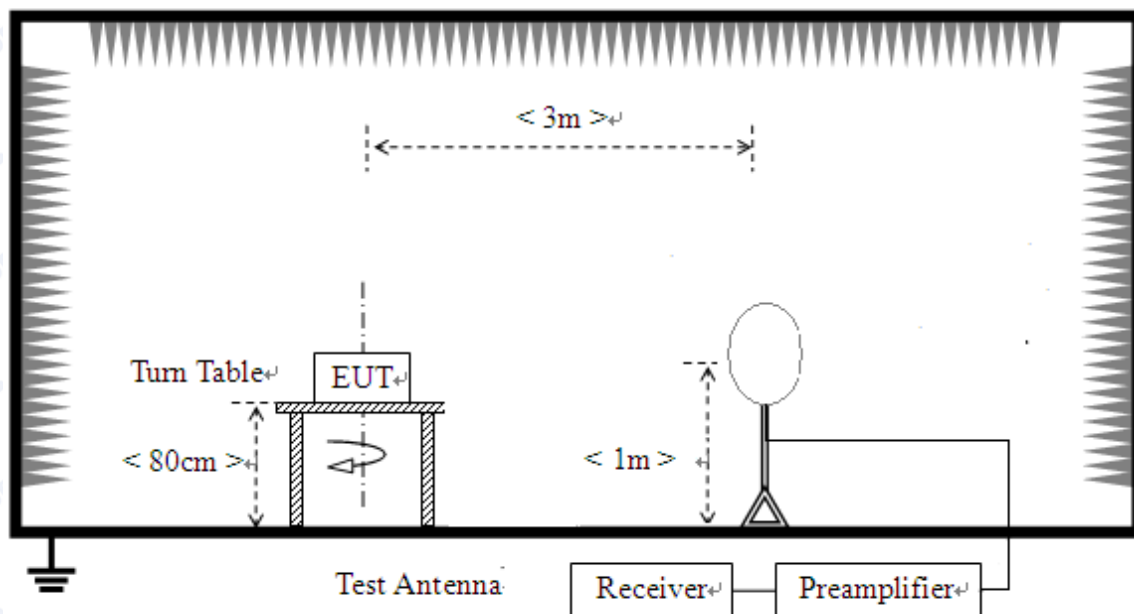
1. For Above 1000MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.
2. For above 1000MHz, limit field strength 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)

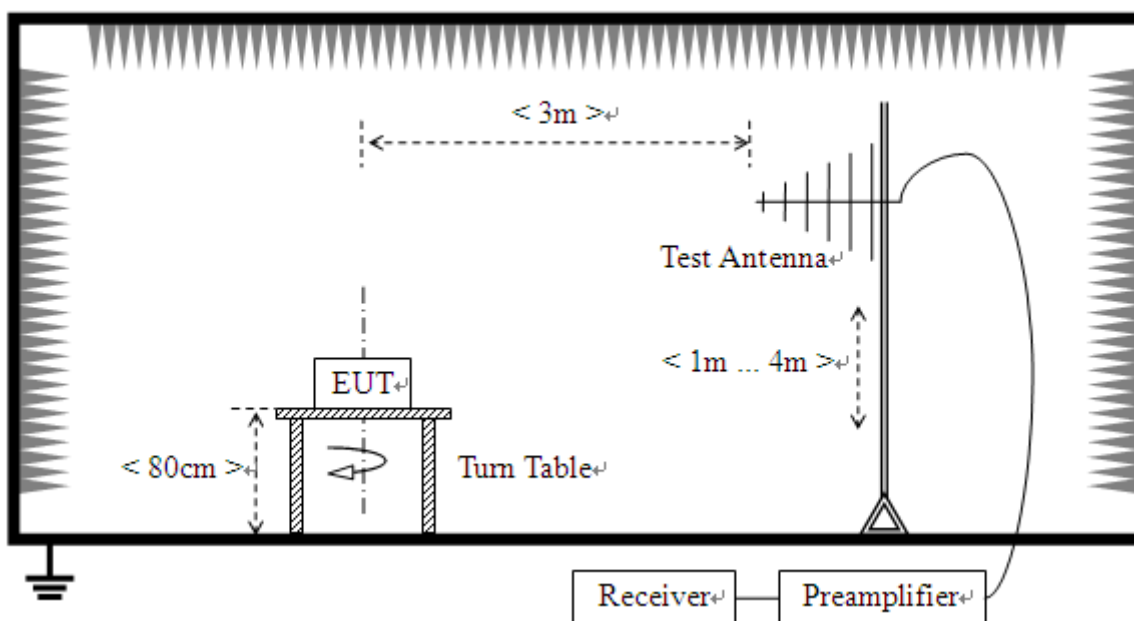
2.8.2 Test Description

A. Test Setup:

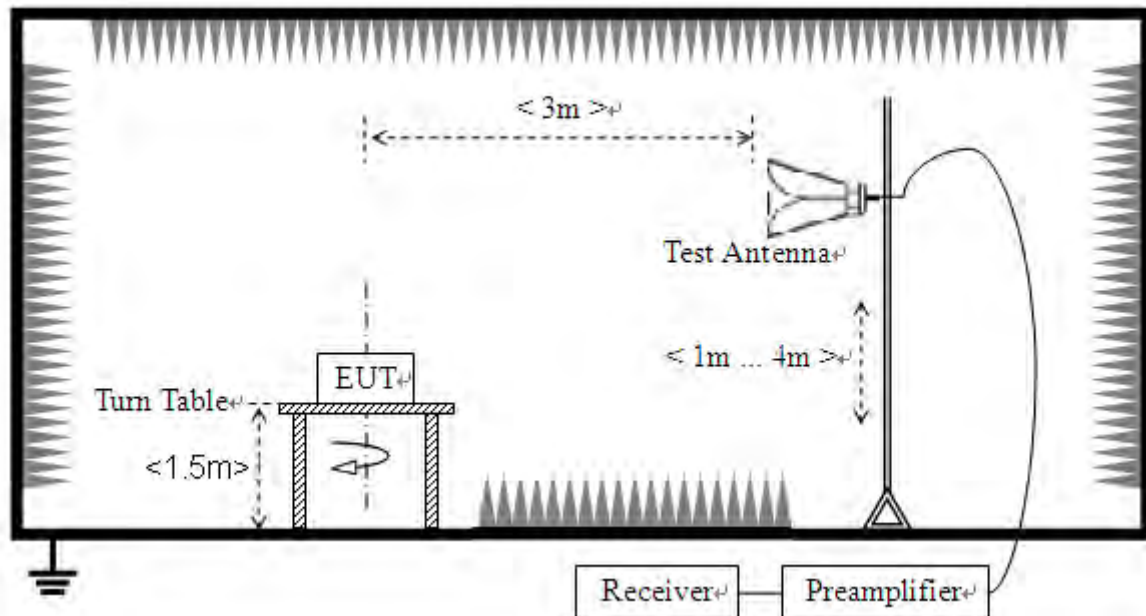
- 1) For radiated emissions from 9kHz to 30MHz



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



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 C63.10:2013. For radiated emissions below or equal to 1GHz, The EUT was set-up on insulator 80cm above the Ground Plane, For radiated emissions above 1GHz, The EUT was set-up on insulator 150cm above the Ground Plane. The set-up and test methods were according to ANSI C63.10:2013.

The EUT 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:

- 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.
- In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) and Horn Test Antenna (above 1GHz) are used. Place the test antenna at 3m away from area of the EUT, while keeping the test antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The test antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final test antenna elevation shall be that which maximizes the emissions. The test antenna elevation for maximum emissions



shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane. The emission levels at both horizontal and vertical polarizations should be tested.

B. Equipments List:

Please reference ANNEX A(1.5).

2.8.3 Test Result

According to ANSI C63.10, 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:

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

A_T : Total correction Factor except Antenna

U_R : Receiver Reading

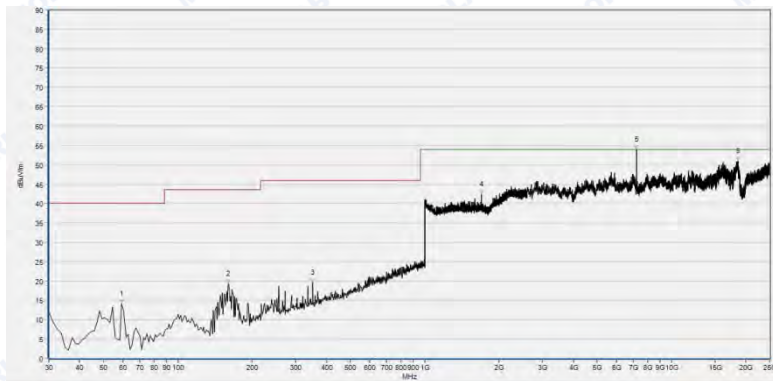
G_{preamp} : Preamplifier Gain

A_{Factor} : Antenna Factor at 3m

During the test, the total correction Factor A_T 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 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 reported.

**A. Test Plots for the Whole Measurement Frequency Range:****Plots for Channel = 3**

Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
59.136	14.05	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
159.900	19.33	N.A	N.A	N.A	43.50	N.A	Horizontal	PASS
351.715	19.65	N.A	N.A	N.A	46.00	N.A	Horizontal	PASS
1699.800	42.39	N.A	N.A	74.0	N.A	54.00	Horizontal	PASS
7223.900	54.18	52.81	50.92	74.0	N.A	54.00	Horizontal	PASS
18567.994	50.95	N.A	N.A	74.0	N.A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 25GHz)



Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
59.136	19.13	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
230.313	14.33	N.A	N.A	N.A	46.00	N.A	Vertical	PASS
796.045	25.45	N.A	N.A	N.A	46.00	N.A	Vertical	PASS
2155.662	45.07	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
7223.900	54.54	52.89	51.00	74.0	N.A	54.0	Vertical	PASS
18547.627	51.36	N.A	N.A	74.0	N.A	54.0	Vertical	PASS

(Antenna Vertical, 30MHz to 25GHz)



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Plot for Channel = 18



Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
49.424	13.02	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
99.199	11.83	N.A	N.A	N.A	43.50	N.A	Horizontal	PASS
2258.103	44.05	N.A	N.A	74.0	N.A	54.00	Horizontal	PASS
7296.708	52.14	N.A	N.A	74.0	N.A	54.00	Horizontal	PASS
11749.009	49.31	N.A	N.A	74.0	N.A	54.00	Horizontal	PASS
18572.068	52.17	N.A	N.A	74.0	N.A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 25GHz)



Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
59.136	23.02	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
581.164	20.52	N.A	N.A	N.A	46.00	N.A	Vertical	PASS
2978.833	45.67	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
4889.289	47.99	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
7333.370	51.72	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
18547.627	51.41	N.A	N.A	74.0	N.A	54.0	Vertical	PASS

(Antenna Vertical, 30MHz to 25GHz)



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Plot for Channel = 36



Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
59.136	14.22	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
335.932	17.06	N.A	N.A	N.A	46.00	N.A	Horizontal	PASS
1413.605	40.39	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
2954.392	45.34	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
7333.370	51.34	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
18376.541	50.87	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS

(Antenna Horizontal, 30MHz to 25GHz)



Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
59.136	20.59	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
592.090	20.54	N.A	N.A	N.A	46.00	N.A	Vertical	PASS
1938.615	42.67	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
4522.677	45.88	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
7333.370	51.51	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
18531.333	51.21	N.A	N.A	74.0	N.A	54.0	Vertical	PASS

(Antenna Vertical, 30MHz to 25GHz)



ANNEX A GENERAL INFORMATION

1.1 Identification of the Responsible Testing Laboratory

Company Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Department:	Morlab Laboratory
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China
Responsible Test Lab Manager:	Mr. Su Feng
Telephone:	+86 755 36698555
Facsimile:	+86 755 36698525

1.2 Identification of the Responsible Testing Location

Name:	Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China

1.3 Facilities and Accreditations

Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L3572.

All measurement facilities used to collect the measurement data are located at FL.1, Building A, FeiYang Science Park, Block 67, BaoAn District, Shenzhen, 518101 P. R. China. The test site is constructed in conformance with the requirements of ANSI C63.10-2013 and CISPR Publication 22; the FCC registration number is 695796.

1.4 Maximum measurement uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for test performed on the EUT as specified in CISPR 16-1-2:

Measurements	Frequency	Uncertainty
Conducted emissions	9KHz~30MHz	2.44dB
Radiated emissions	9KHz~30MHz	2.44dB
	30MHz~200MHz	2.93dB
	200MHz~1000MHz	2.95dB
	1GHz~18GHz	2.26dB
	18GHz~40GHz	1.94dB



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This uncertainty represent an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$

1.5 Test Equipments Utilized

1.5.1 Conducted Test Equipments

Conducted Test Equipment						
No.	Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Cal. Due
1	Spectrum Analyzer	MY45101810	E4407B	Agilent	2016.03.02	2017.03.01
2	Power Splitter	NW521	1506A	Weinschel	2016.03.02	2017.03.01
3	Attenuator 1	(n.a.)	10dB	Resnet	2016.03.02	2017.03.01
4	Attenuator 2	(n.a.)	3dB	Resnet	2016.03.02	2017.03.01
5	EXA Signal Analyzer	MY51440152	N9010A	Agilent	2016.03.02	2017.03.01
6	RF cable (30MHz-26GHz)	CB01	RF01	Morlab	N/A	N/A
7	Coaxial cable	CB02	RF02	Morlab	N/A	N/A
8	SMA connector	CN01	RF03	HUBER-SUHNER	N/A	N/A

1.5.2 Conducted Emission Test Equipments

Conducted Emission Test Equipments						
No.	Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Cal. Due
1	Receiver	US44210471	E7405A	Agilent	2016.03.02	2017.03.01
2	LISN	812744	NSLK 8127	Schwarzbeck	2016.03.02	2017.03.01
3	Service Supplier	100448	CMU200	R&S	2016.03.02	2017.03.01
4	Pulse Limiter (20dB)	9391	VTSD 9561-D	Schwarzbeck	2016.03.02	2017.03.01
5	Coaxial cable(BNC) (30MHz-26GHz)	CB01	EMC01	Morlab	N/A	N/A

1.5.3 Auxiliary Test Equipment

Auxiliary Test Equipment						
No.	Equipment Name	Model No.	Brand Name	Manufacturer	Cal.Date	Cal.Due Date
1	Computer	T430i	Think Pad	Lenovo	N.A	N.A
2	AC Adapter	GSCU2000S01 2V24G	GSP	N.A	N.A	N.A

Note: AC adapter rated input: \sim 100-240V, 50/60Hz, 800mA max; rated output: \equiv 12V, 2000mA.



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1.5.4 Radiated Test Equipments

Radiated Test Equipments						
No.	Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Cal.Due Date
1	Receiver	US44210471	E7405A	Agilent	2016.03.02	2017.03.01
2	Test Antenna - Bi-Log	9163-274	9m*6m*6m	Albatross	2016.03.02	2017.03.01
3	Test Antenna - Horn	9120D-963	VULB 9163	Schwarzbeck	2016.03.02	2017.03.01
4	Test Antenna - Horn	71688	BBHA 9120D	Schwarzbeck	2016.03.02	2017.03.01
5	Test Antenna - Loop	1519-022	HL050S7	R&S	2016.03.02	2017.03.01
6	Reject Filter	(n.a.)	BRM50702	Micro-Tronics	2016.03.02	2017.03.01
7	Coaxial cable (N male) (30MHz-26GHz)	CB02	EMC02	Morlab	N/A	N/A
8	Coaxial cable (N male) (30MHz-26GHz)	CB03	EMC03	Morlab	N/A	N/A
9	1-18GHz pre-Amplifier	MA02	TS-PR18	Rohde&Schwarz	2016.03.02	2017.03.01
10	18-26.5GHz pre-Amplifier	MA03	TS-PR18	Rohde&Schwarz	2016.03.02	2017.03.01

1.5.5 Climate Chamber

Climate Chamber						
No.	Equipment Name	Serial No.	Type	Manufacturer	Cal.Date	Cal.Due Date
1	Climate Chamber	2004012	HL4003T	Yinhe	2016.03.02	2017.03.01

1.5.6 Vibration Table

Vibration Table						
No.	Equipment Name	Serial No.	Type	Manufacturer	Cal.Date	Cal.Due Date
1	Vibration Table	N/A	ACT2000-S015L	CMI-COM	2016.03.02	2017.03.01

1.5.7 Anechoic Chamber

Anechoic Chamber						
No.	Equipment Name	Serial No.	Type	Manufacturer	Cal.Date	Cal.Due Date
1	Anechoic Chamber	N/A	9m*6m*6m	Changning	2016.03.02	2017.03.01

***** END OF REPORT *****