REPORT No.: SZ17040158W03

FCC RF TEST REPORT

APPLICANT	:	VR Technology(shenzhen)Limited
PRODUCT NAME	:	3wand
MODEL NAME	:	3wand G2
TRADE NAME	:	N/A
BRAND NAME	:	3Glasses
FCC ID	:	2AKA6-G2
STANDARD(S)	:	47 CFR Part 15 Subpart C
ISSUE DATE	:	2017-07-31

SHENZHEN MORLAB COMMUNICATIONS TECHNOLOGY Co., Ltd.

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Change History		
Issue	Date	Reason for change
1.0	2017-07-31	First edition

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 G2
Brand Name	3Glasses
HW Version	G2-V5.1
SW Version	V4-7
Test Standards	47 CFR Part 15 Subpart C
Test Date	2017-05-18 to 2017-07-20
Test Result	PASS

Tested by : Li Jing Zong

Li Jingzong (Test Engineer)

Approved by : Qiu Xiaojun

Qiu Xiaojun (Supervisor)

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 G2
Frequency Range:	2405MHz – 2475MHz
Channel Numbe:	8
Modulation Type:	GFSK
Antenna Type:	Monopole Antenna
Antenna Gain:	2 dBi

NOTE:

The EUT is a 3wand, it operating at 2.4GHz ISM band; The lowest, middle, highest channel numbers of the EUT used and tested in this report are separately 1 (2405MHz), 5 (2450MHz) and 8 (2475MHz).

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 Table for Carrier Frequency

Frequency Band	Channel No.	Frequency (MHz)
2405~2475MHz	**1**	**2405**
	2	2410
	3	2425
	4	2430
	5	**2450**
	6	2455
	7	2470
	8	**2475**

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	G2-V5.1	V4-7

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	**PASS**
2	15.247(b)	Peak Output Power	May 18, 2017	**PASS**
3	15.247(a)	Bandwidth	May 18, 2017	**PASS**
4	15.247(d)	Conducted Spurious Emission and Band Edge	May 22, 2017	**PASS**
5	15.247(d)	Restricted Frequency Bands	Jul 20, 2017	**PASS**
6	15.207	Conducted Emission	Jul 20, 2017	**PASS**
7	15.209 ,15.247(d)	Radiated Emission	Jul 19, 2017	**PASS**
8	15.247(e)	Power spectral density (PSD)	May 18, 2017	**PASS**

The tests were performed according to the method of measurements prescribed in ANSIC63.10-2013 and KDB558074 D01 v04 (04/05/2017).

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

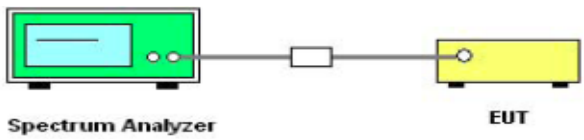
2.2.1 Requirement

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) which is powered by the adapter 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 refer to 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 to1MHz

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.

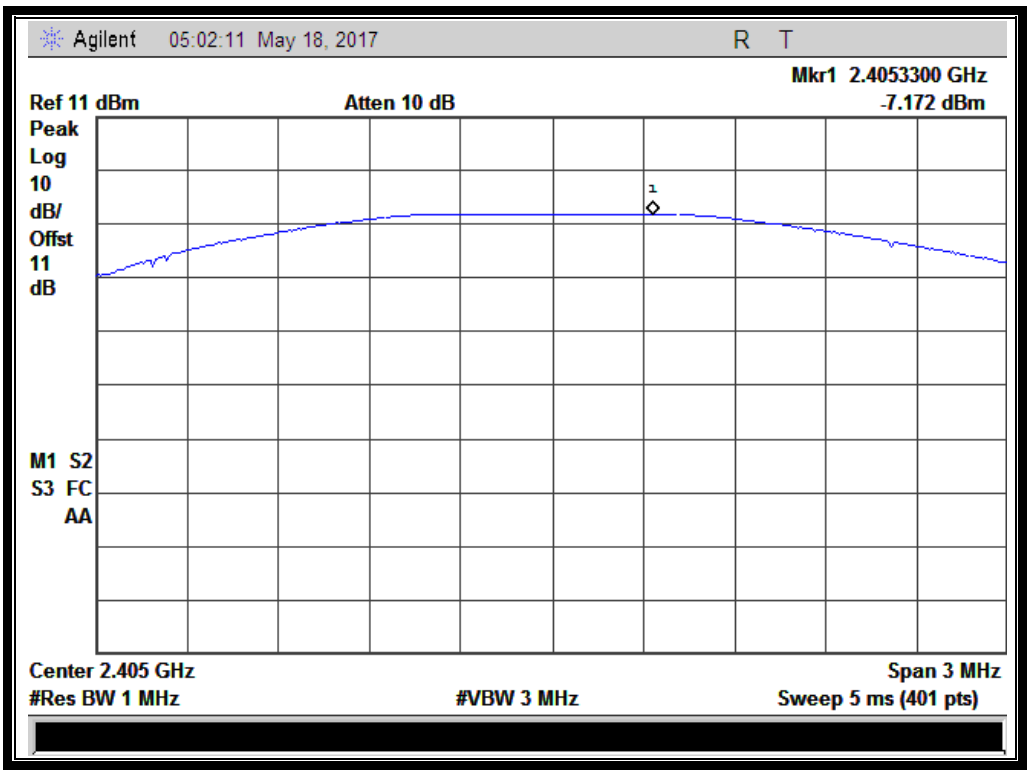
2.2.4 Test Result

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

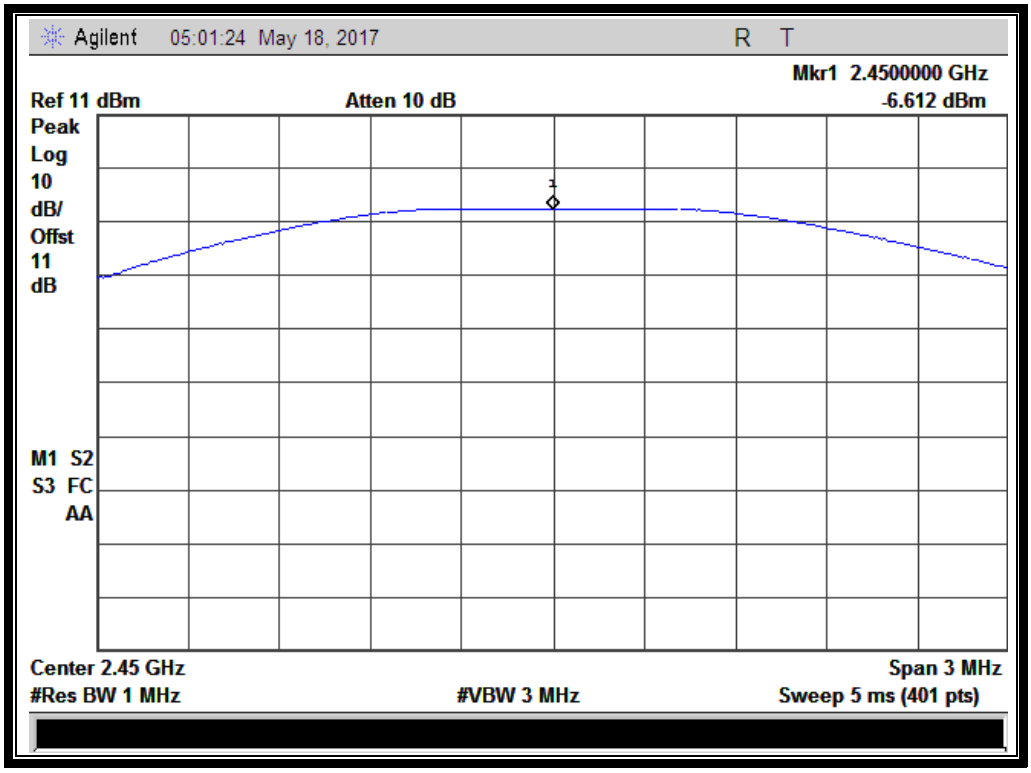
A. Test Verdict:

Channel	Frequency (MHz)	Measured Output Peak Power		Refer to Plot	Limit		Verdict
		dBm	W		dBm	W	
1	2405	-7.17	0.00019	Plot A	30	1	PASS
5	2450	-6.61	0.00022	Plot B			PASS
8	2475	-6.00	0.00025	Plot C			PASS

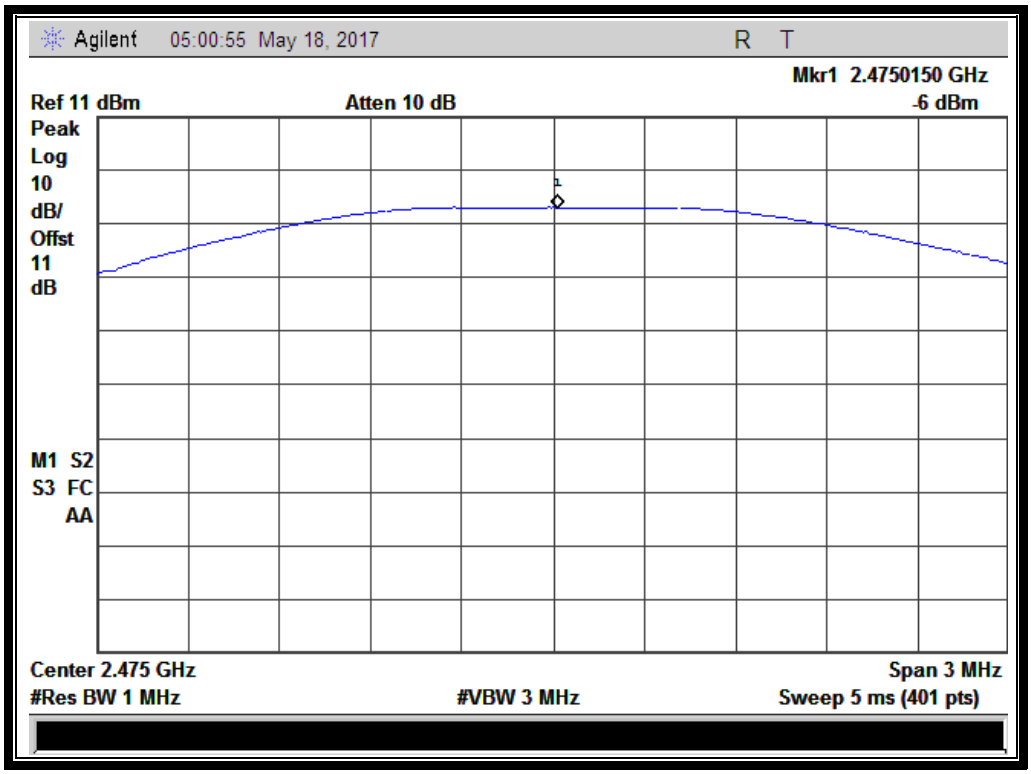
B. Test Plots:



(Plot A: Channel 1: 2405MHz)



(Plot B: Channel 5: 2450MHz)



(Plot C: Channel 8: 2475MHz)

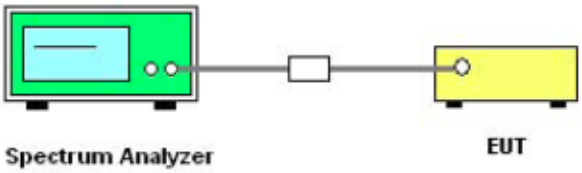
2.3 6dB Bandwidth

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 which is powered by the adapter, 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 ≥ 3 × 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 might be ≥6 dB.

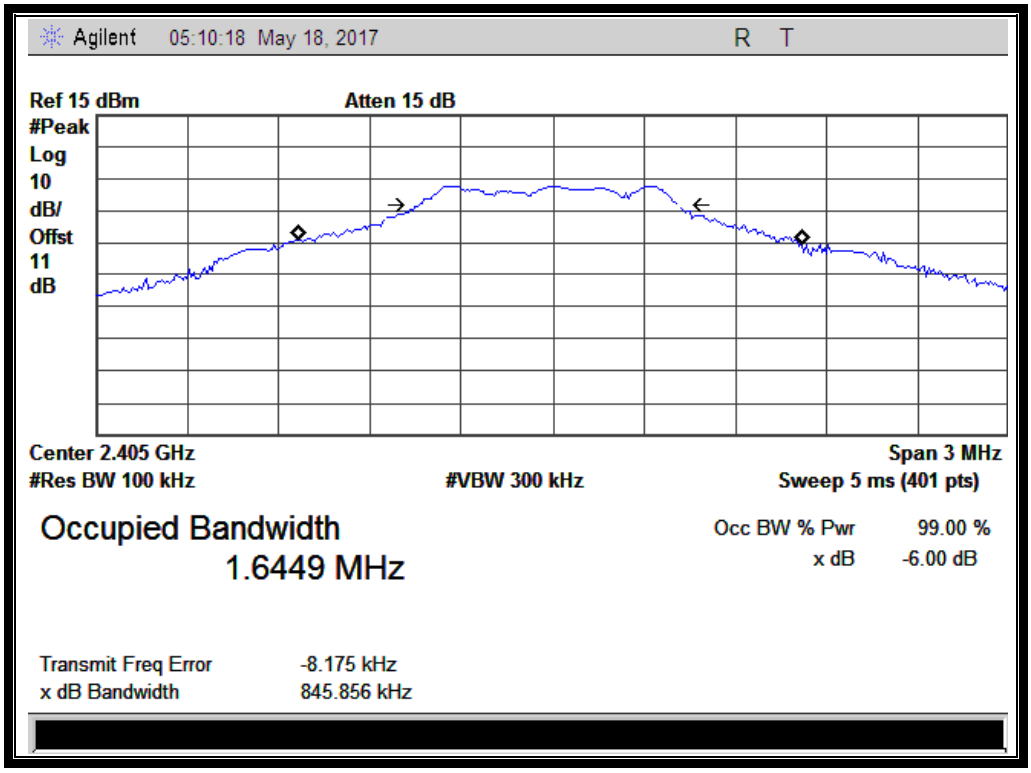
2.3.4 Test Result

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

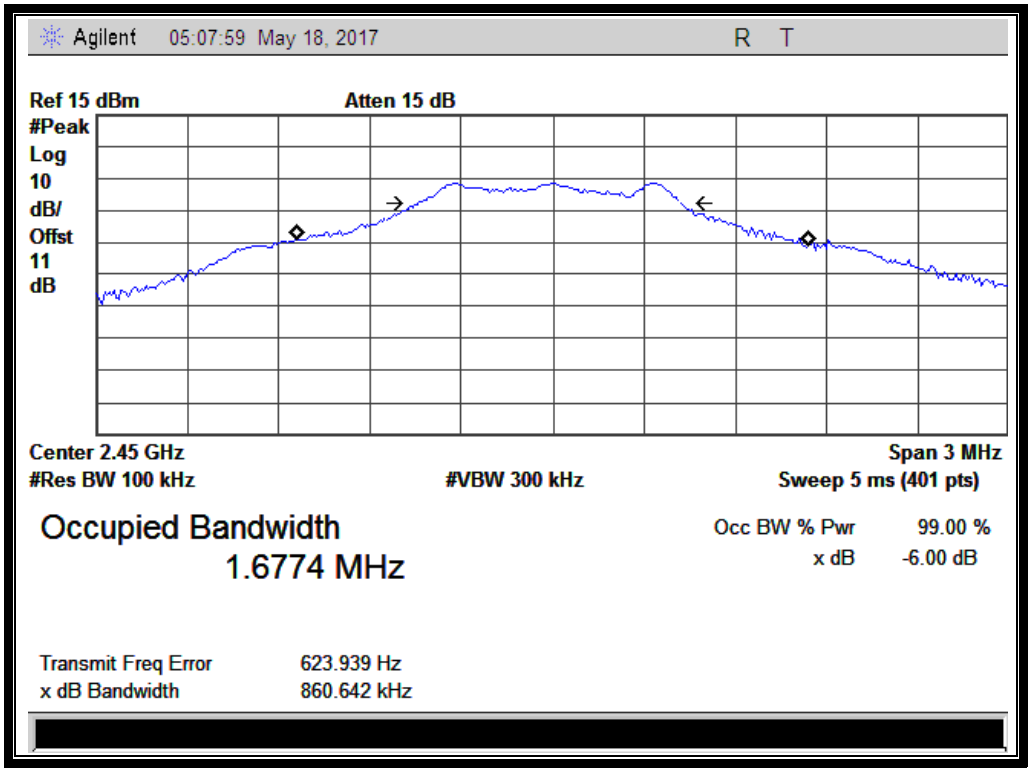
A. Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Refer to Plot	Limits(kHz)	Result
1	2405	0.8459	Plot A	≥500	PASS
5	2450	0.8606	Plot B	≥500	PASS
8	2475	0.8533	Plot C	≥500	PASS

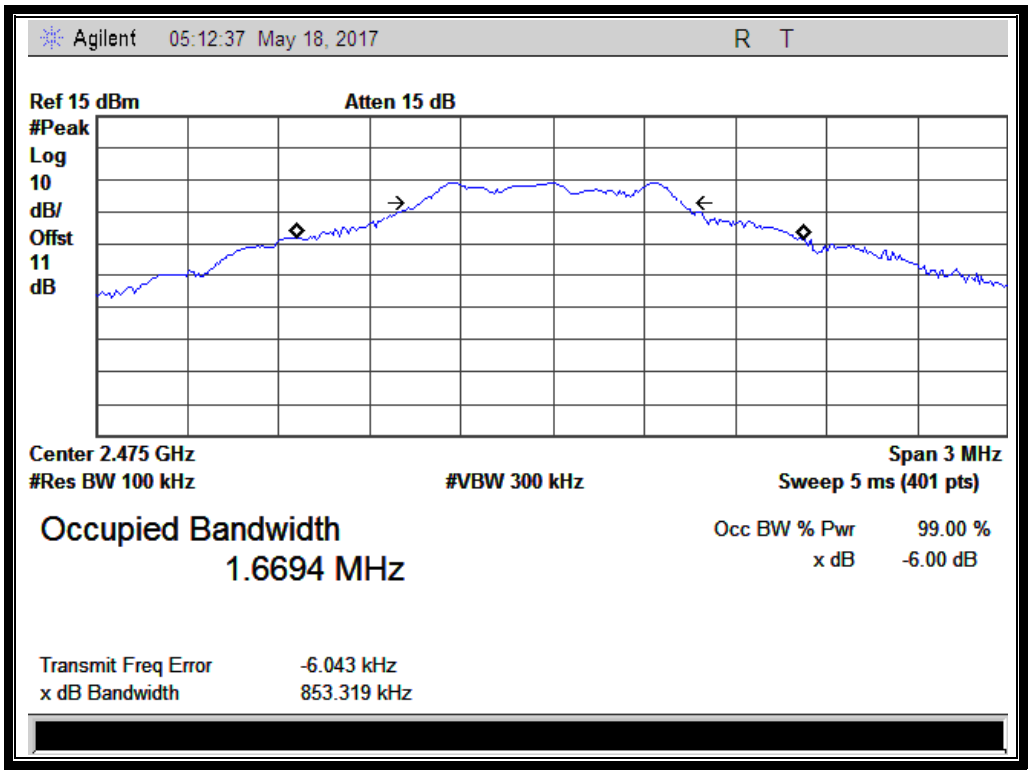
B. Test Plots:



(Plot A: Channel 1: 2405MHz)



(Plot B: Channel 5: 2450 MHz)



(Plot C: Channel 8: 2475MHz)

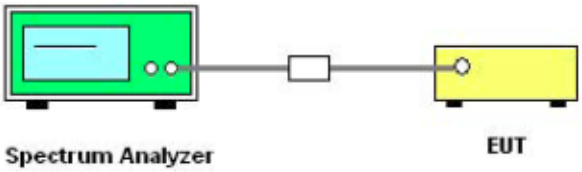
2.4 Conducted Spurious Emissions and Band Edge

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 which is powered by the adapter, 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

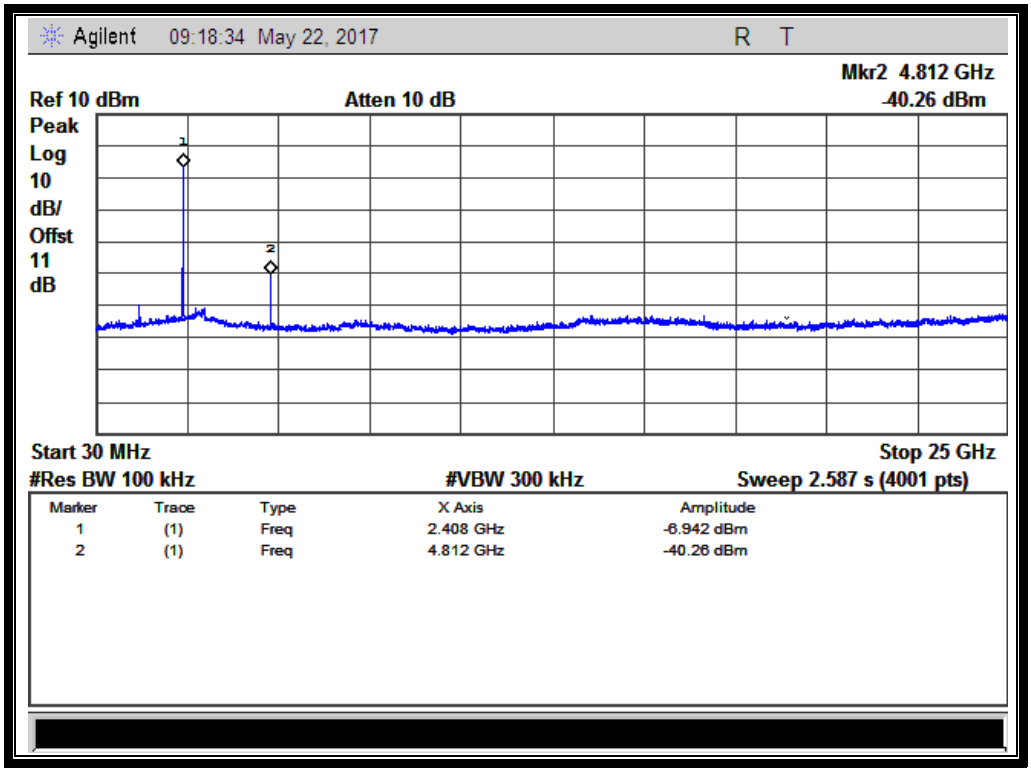
The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the spurious emissions.

A. Test Verdict:

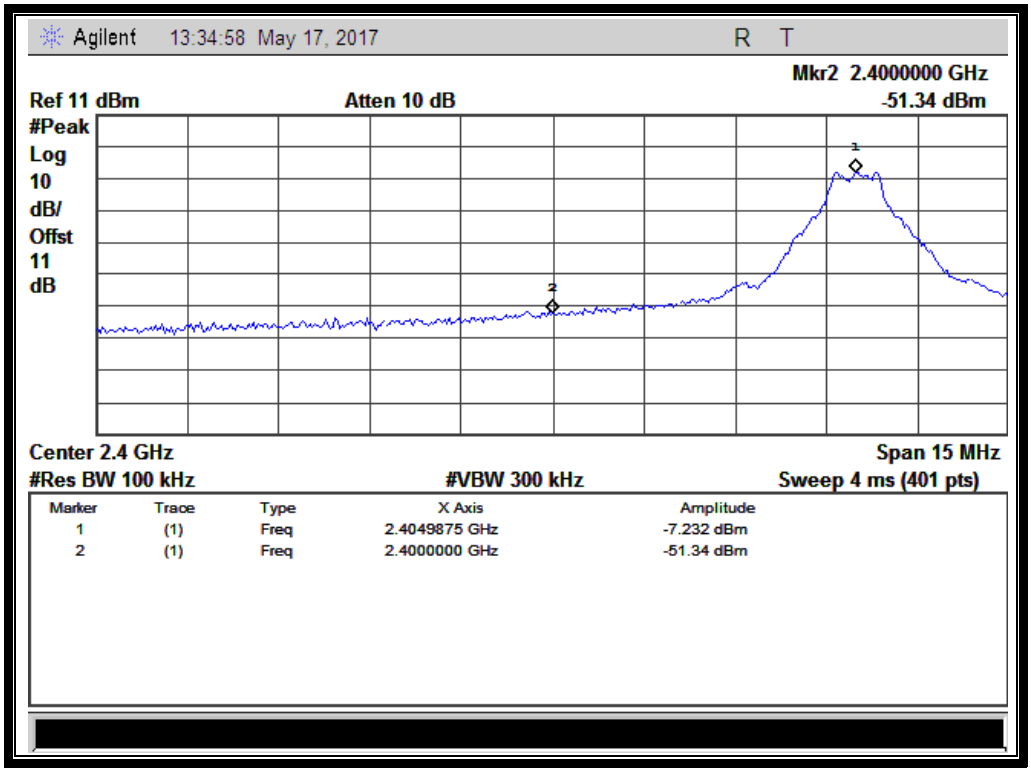
Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Refer to Plot	Limit (dBm)		Verdict
				Carrier Level	Calculated -20dBc Limit	
1	2405	-40.26	Plot A.1	-6.94	-26.94	PASS
5	2450	-37.36	Plot B.1	-6.18	-26.18	PASS
8	2475	-39.38	Plot C.1	-5.60	-25.60	PASS

B. Test Plots:

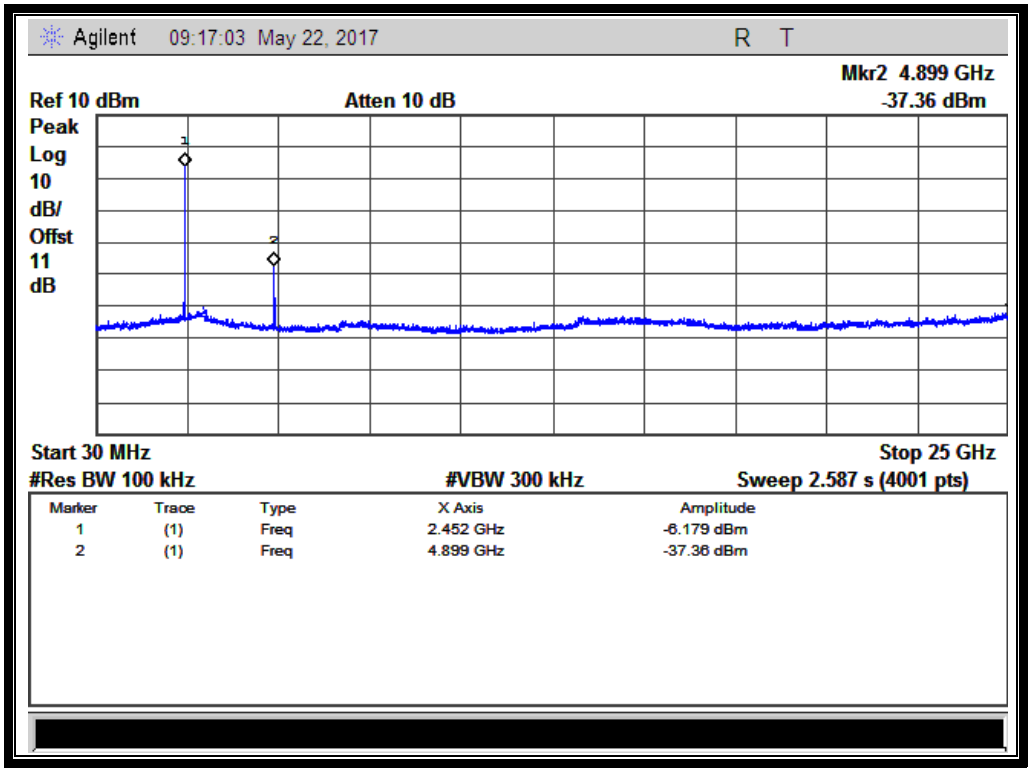
Note: the power of the Module transmitting frequency should be ignored.



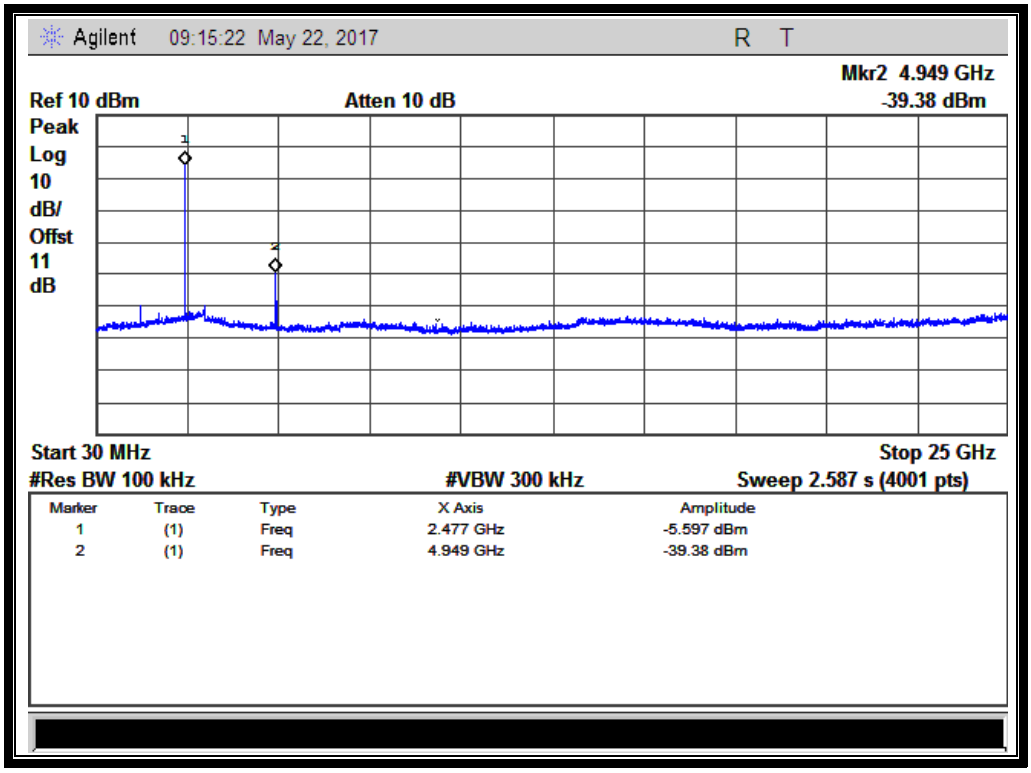
(Plot A.1: Channel = 1, 30MHz to 25GHz)



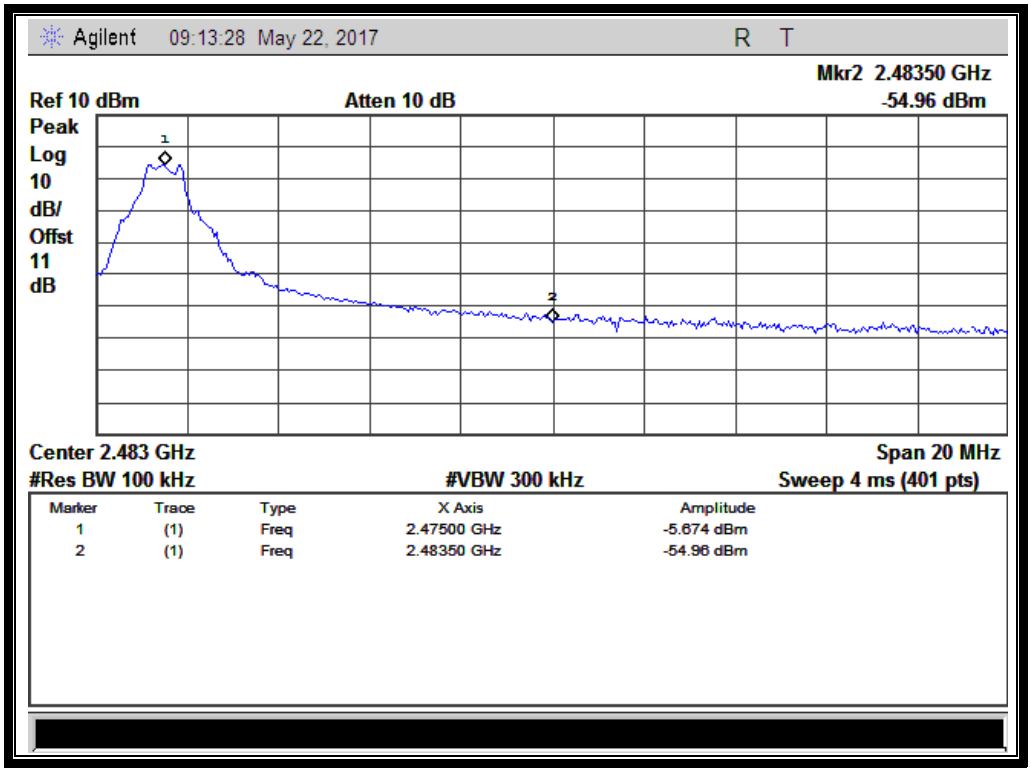
(Band Edge@ Channel = 1)



(Plot B.1: Channel = 5, 30MHz to 25GHz)



(Plot C.1: Channel = 8, 30MHz to 25GHz)



(Band Edge@ Channel = 8)

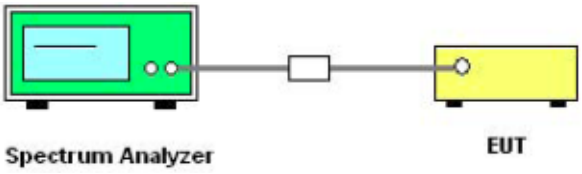
2.5 Power spectral density (PSD)

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 which is powered by the adapter, 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:

a) Set analyzer center frequency to channel center frequency.
b) Set the span to 3MHz
c) Set the RBW to 3 kHz
d) Set the VBW to 10KHz
e) Detector = peak.
f) Sweep time = auto couple.
g) Trace mode = max hold.
h) Allow trace to fully stabilize.
i) Use the peak marker function to determine the maximum amplitude level within the RBW.

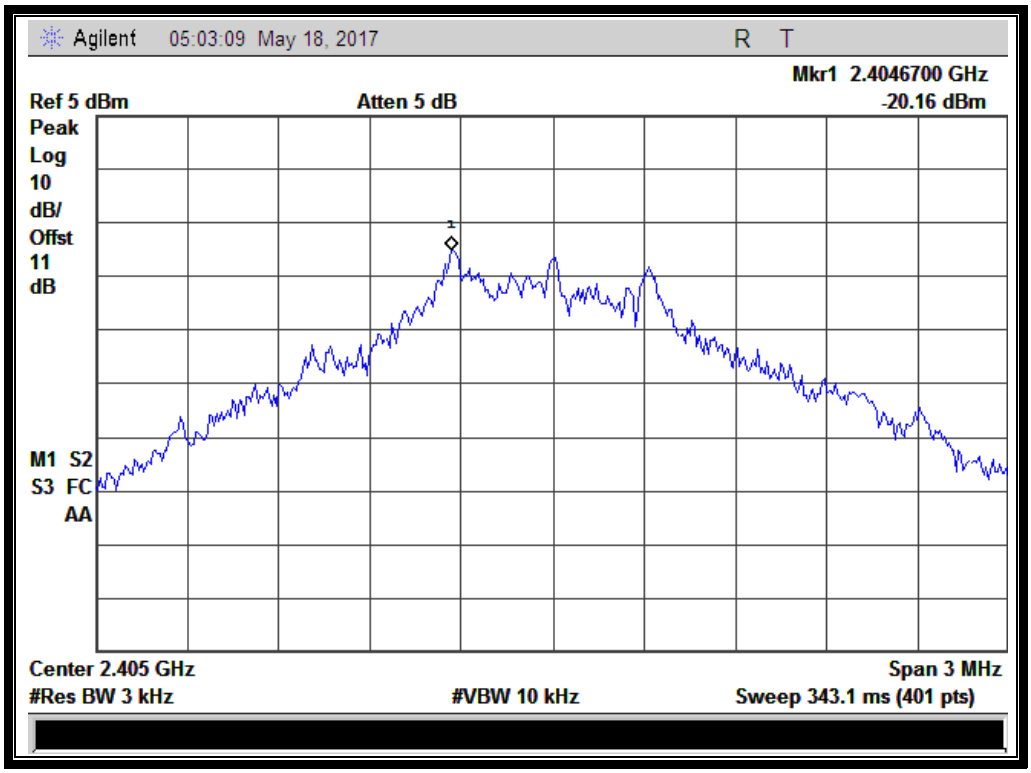
2.5.4 Test Result

The lowest, middle and highest channels are tested.

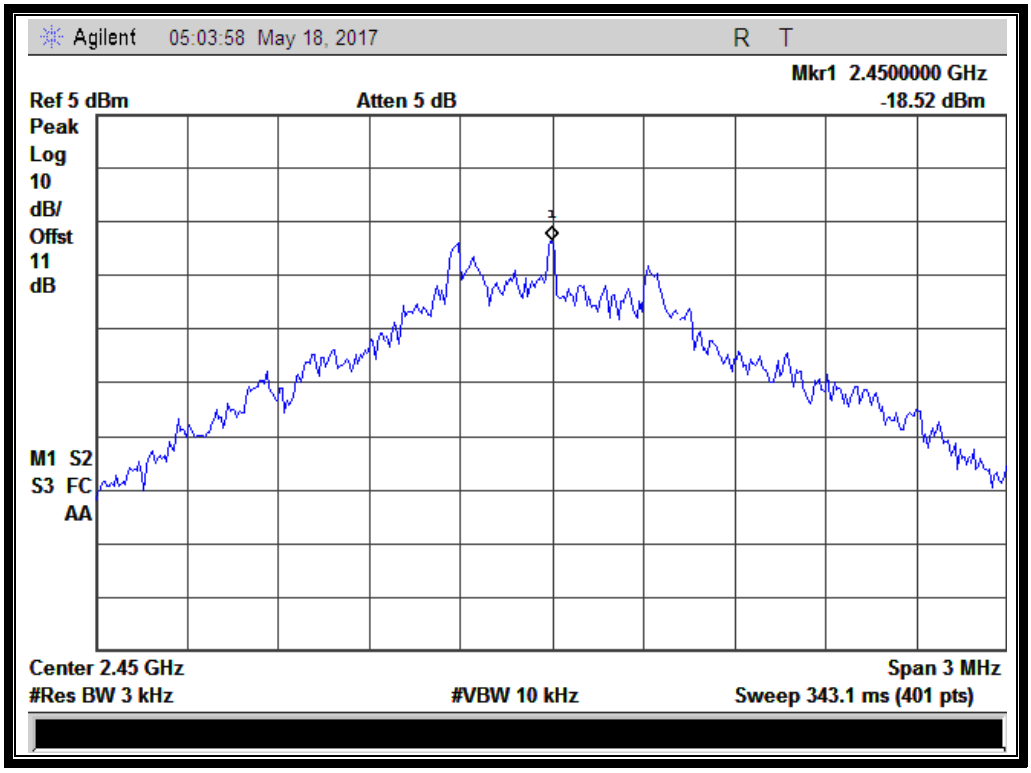
A. Test Verdict:

Spectral power density (dBm/3kHz)					
Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)	Refer to Plot	Limit (dBm/3kHz)	Verdict
1	2405	-20.16	Plot A	8	PASS
5	2450	-18.52	Plot B	8	PASS
8	2475	-18.88	Plot C	8	PASS
Measurement uncertainty: ±1.3dB					

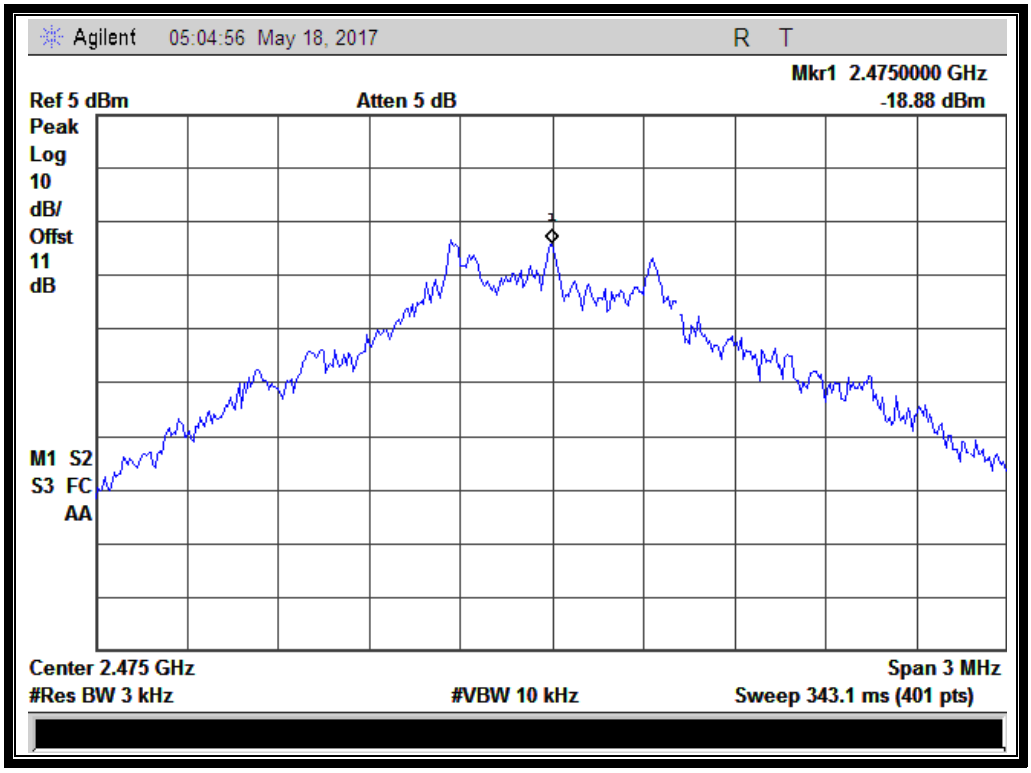
B. Test Plots:



(Plot A: Channel = 1)



(Plot B: Channel = 5)



(Plot C: Channel = 8)

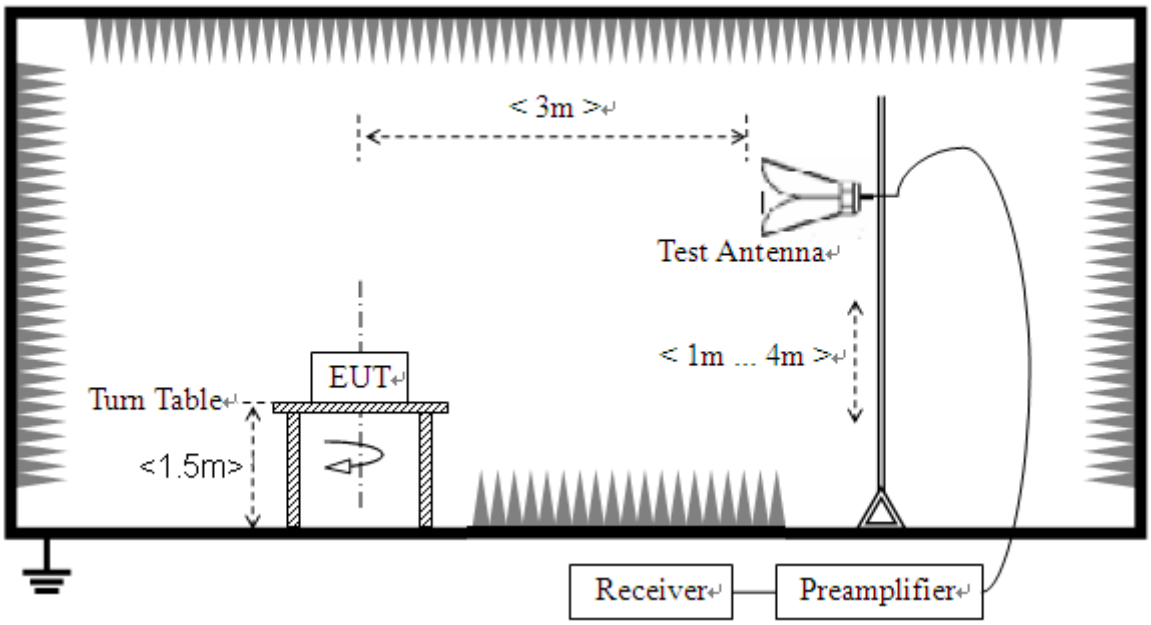
2.6 Restricted Frequency Bands

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.

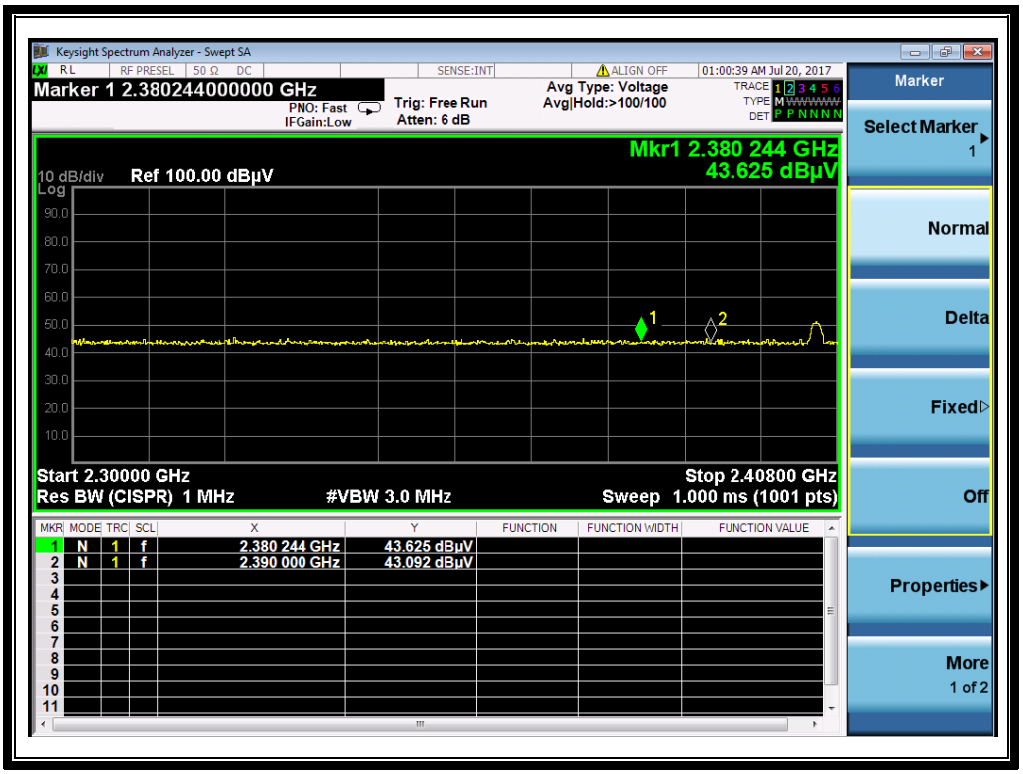
The measurement results are obtained as below:
E [dBμV/m] $=U_R + A_T + A_{Factor}$ [dB]; $A_T = L_{Cable\ loss}$ [dB]-G_{preamp} [dB]
A_T: Total correction Factor except Antenna
U_R: Receiver Reading
G_{preamp}: Preamplifier Gain
A_{Factor}: Antenna Factor at 3m

Note: 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.

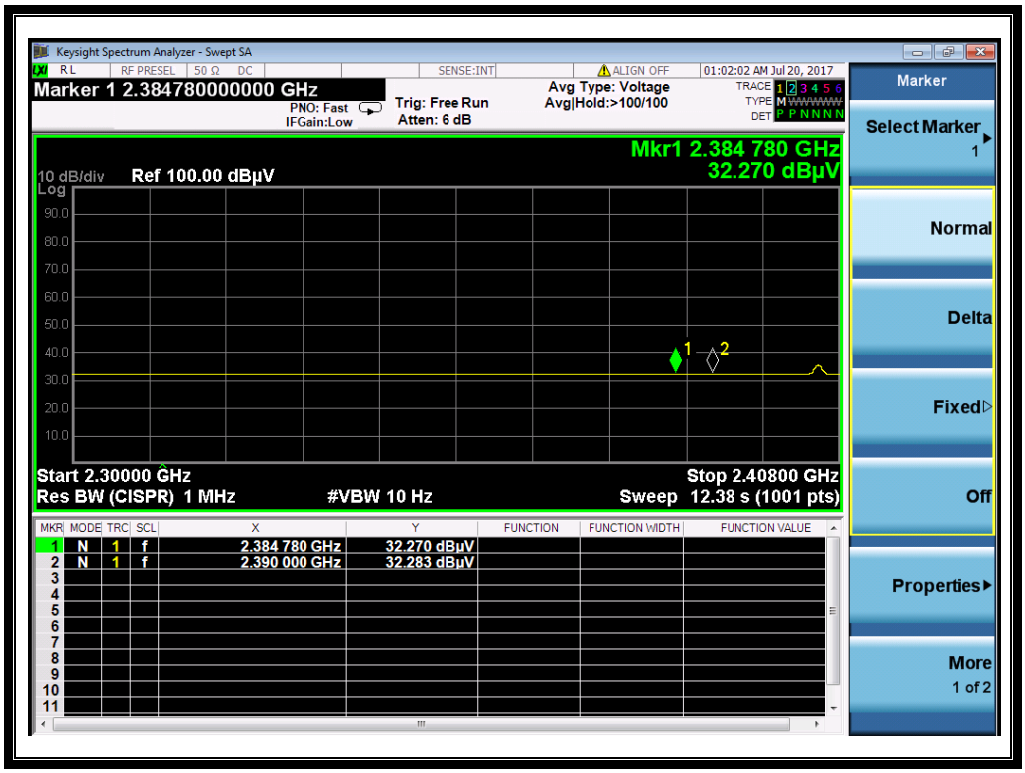
A. Test Verdict:

Channel	Frequency (MHz)	Detector PK/ AV	Receiver Reading U_R (dBuV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
1	2380.24	PK	43.63	-33.63	32.56	42.56	74	Pass
1	2384.78	AV	32.27	-33.63	32.56	31.20	54	Pass
8	2486.95	PK	45.32	-33.18	32.5	44.64	74	Pass
8	2484.68	AV	32.13	-33.18	32.5	31.45	54	Pass

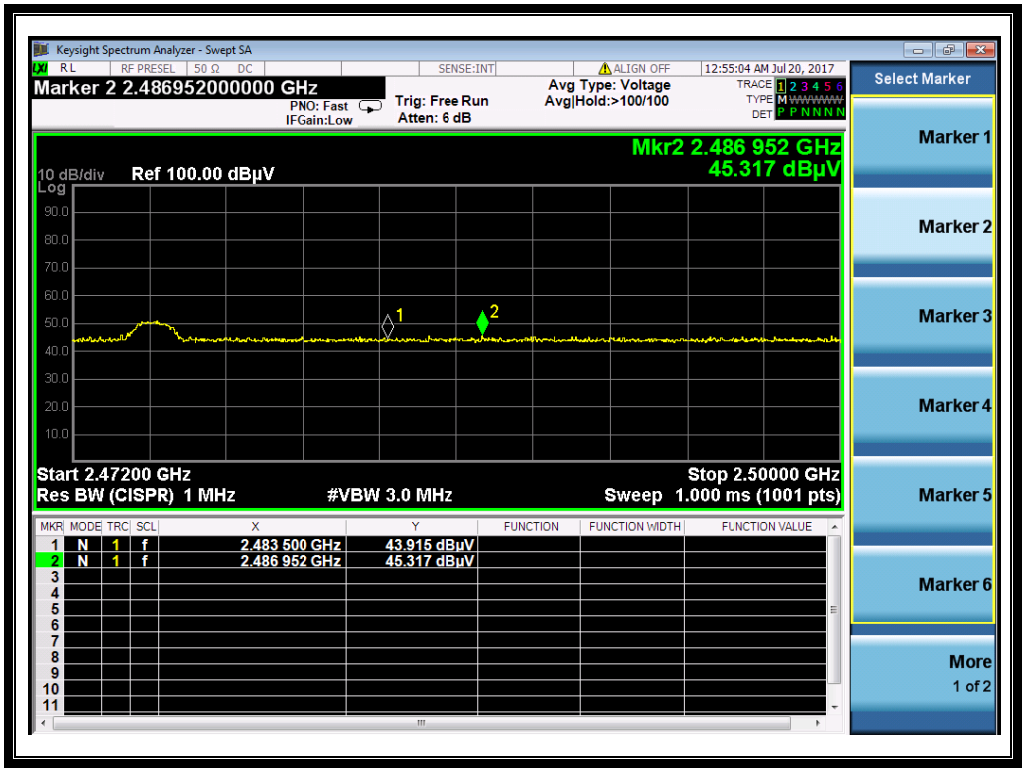
B. Test Plots:



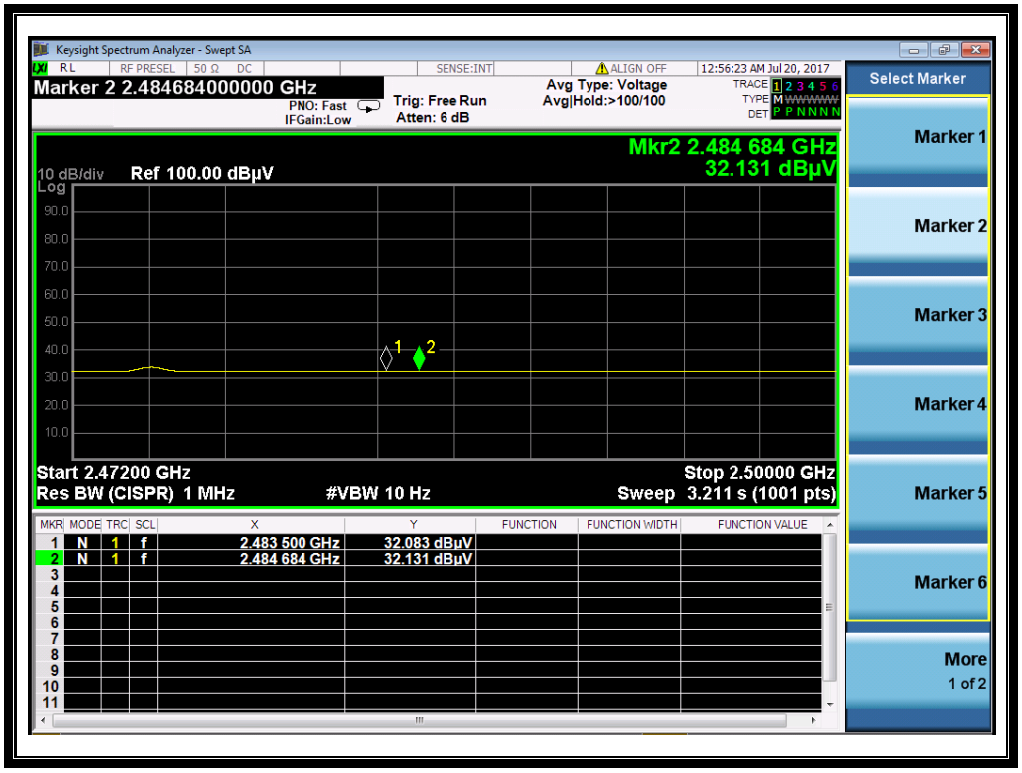
(Plot A1: Channel = 1 PEAK)



(Plot A2: Channel = 1 AVG)



(Plot C1: Channel = 8 PEAK)



(Plot C2: Channel = 8 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 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

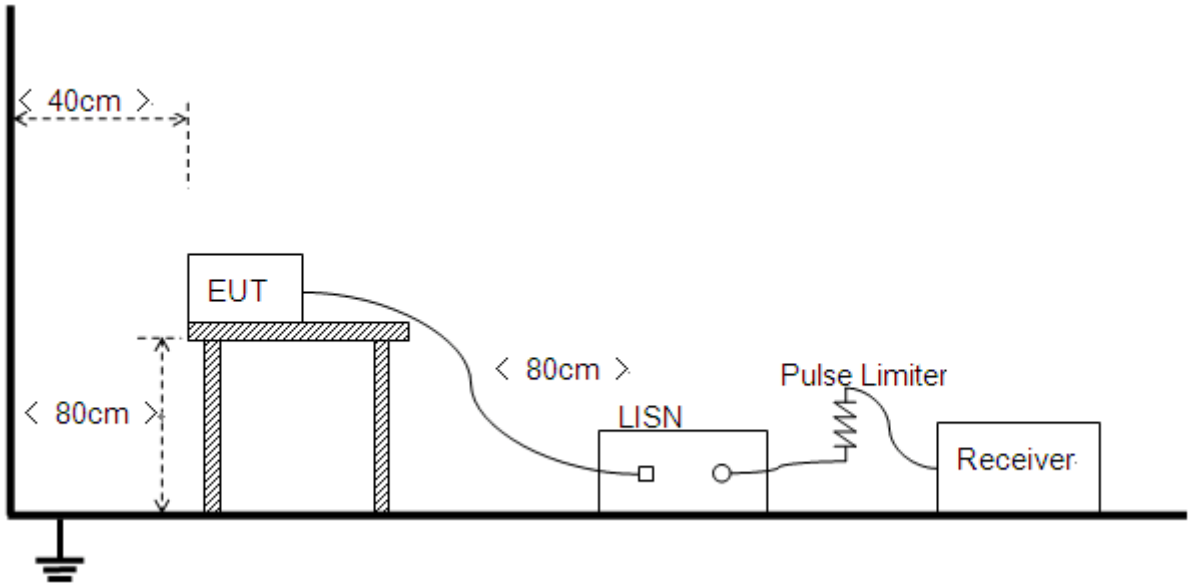
NOTE:

(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 C63.10: 2013.

B. Equipments List:

Please reference ANNEX A(1.5).

2.7.3 Test Result

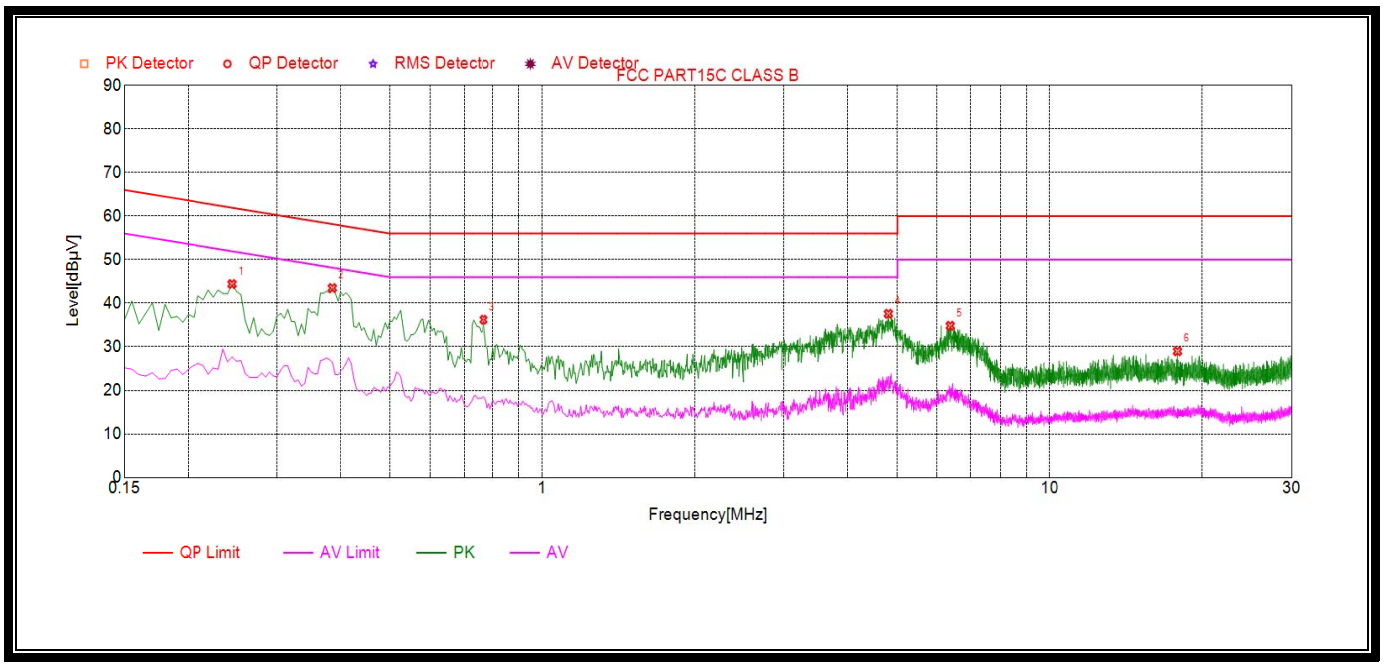
The maximum conducted interference is searched using Peak (PK), if the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT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

A. Test setup:

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

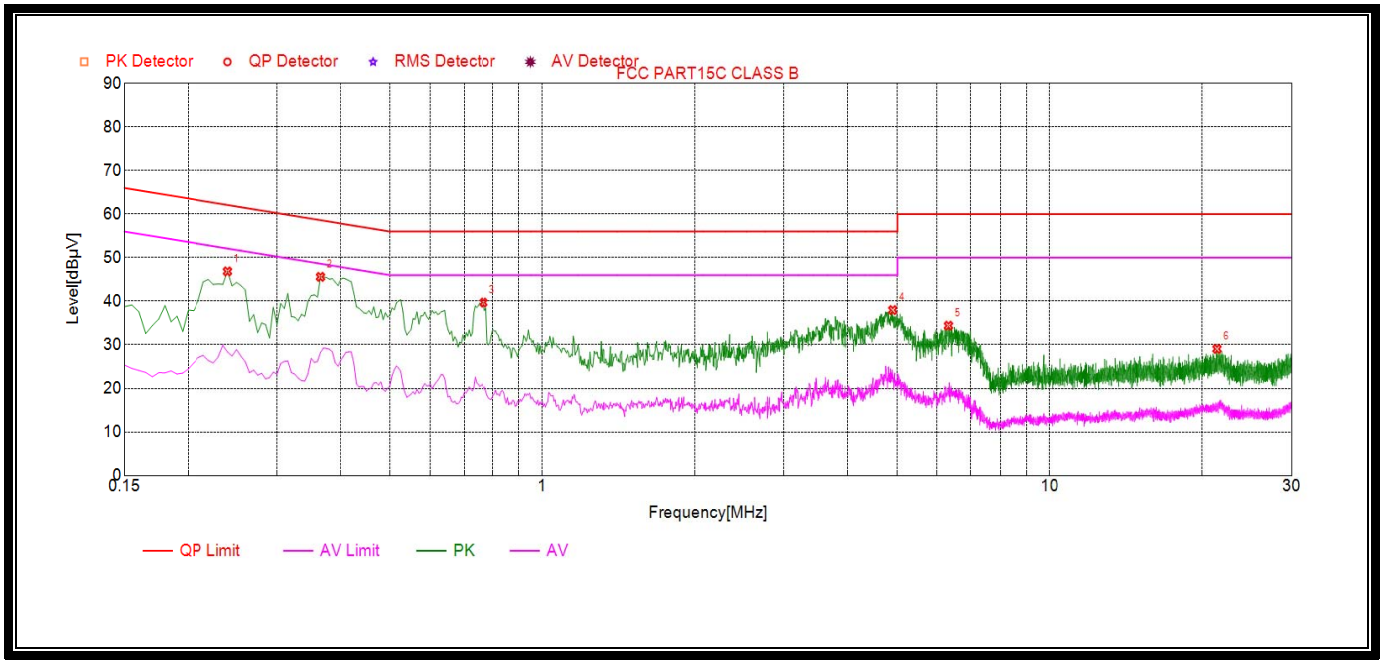
Note: The test voltage is AC 120V/60Hz.

B. Test Plots:



(Plot A: L Phase)

NO.	Fre. (MHz)	Emission Level (dBµV)			Limit (dBµV)		Power-line	Verdict
		Peak	Quai-peak	Average	Quai-peak	Average		
1	0.2450	44.40	N/A	N/A	63.29	53.29	Line	PASS
2	0.3850	43.49	N/A	N/A	59.29	49.29		PASS
3	0.7650	36.22	N/A	N/A	56.00	46.00		PASS
4	4.8000	37.58	N/A	N/A	56.00	46.00		PASS
5	6.3850	34.83	N/A	N/A	60.00	50.00		PASS
6	17.8150	28.96	N/A	N/A	60.00	50.00		PASS



(Plot B: N Phase)

NO.	Fre. (MHz)	Emission Level (dBµV)			Limit (dBµV)		Power-line	Verdict
		Peak	Quai-peak	Average	Quai-peak	Average		
1	0.2400	46.85	N/A	N/A	63.43	53.43	Line	PASS
2	0.3650	45.60	N/A	N/A	59.86	49.86		PASS
3	0.7650	39.70	N/A	N/A	56	46		PASS
4	4.8950	37.97	N/A	N/A	56	46		PASS
5	6.3350	34.39	N/A	N/A	60	50		PASS
6	21.4300	29.05	N/A	N/A	60	50		PASS

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 (μV/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:

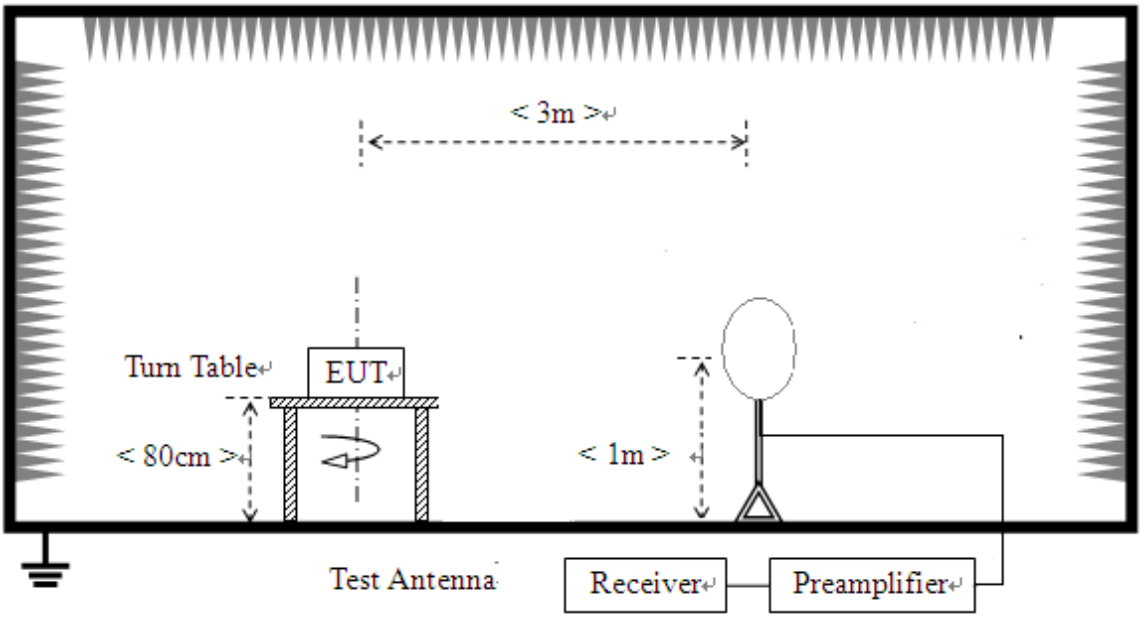
1. For Above 1000MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.
2. For above 1000MHz, limit field strength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

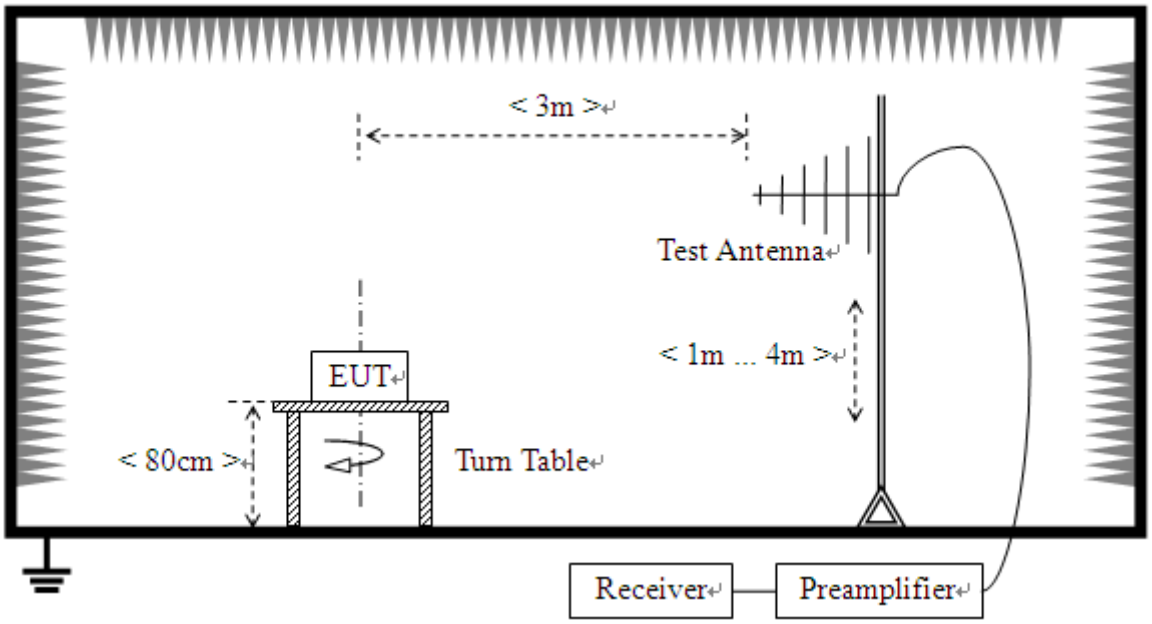
2.8.2 Test Description

A. Test Setup:

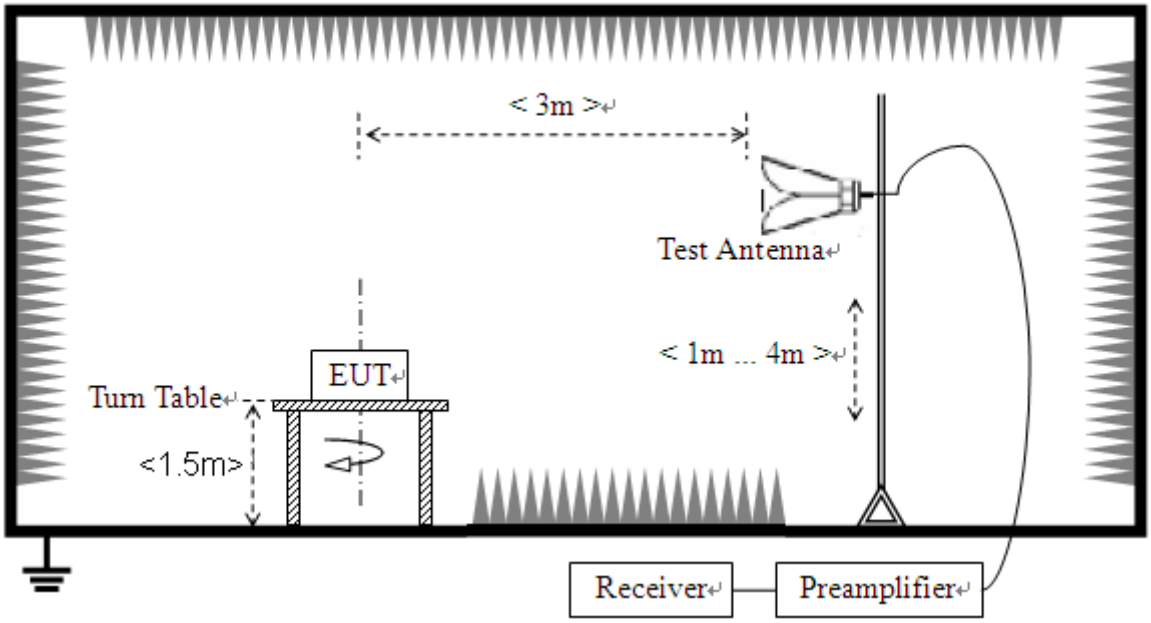
1) For radiated emissions from 9kHz to 30MHz



2) For radiated emissions from 30MHz to1GHz



3) For radiated emissions above 1GHz



The RF absorbing material used on the reference ground plane and on the turntable have a maximum height (thickness) of 30 cm (12 in) and have a minimum-rated attenuation of 20 dB at all frequencies from 1 GHz to 18 GHz. Test site have a minimum area of the ground plane covered with RF absorbing material as specified in Figure 6 of ANSI C63.4: 2014.

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:

(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. 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 [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

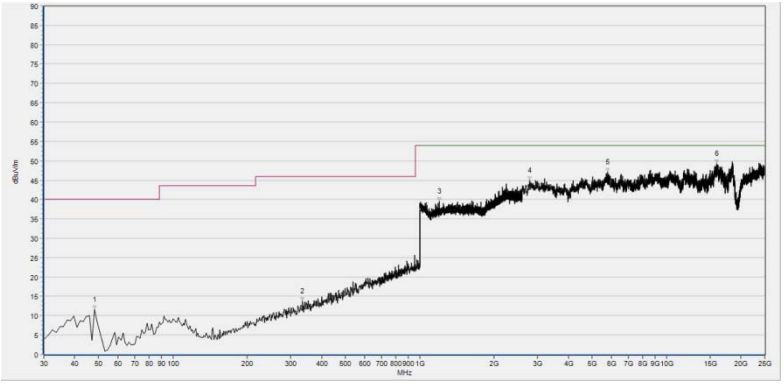
During the test, the total correction Factor A_T and A_{Factor} were built in test software.

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.

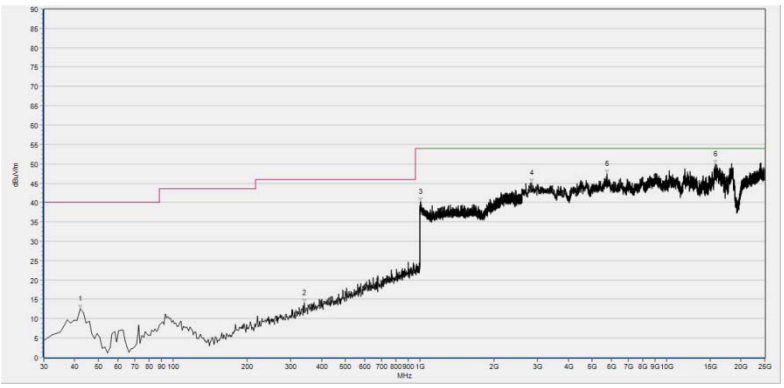
A. Test Plots for the Whole Measurement Frequency Range:

Plots for Channel = 1



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
48.210	11.61	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
334.718	13.69	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1199.120	39.48	N/A	N/A	74.0	N/A	54.00	Horizontal	PASS
2787.380	44.89	N/A	N/A	74.0	N/A	54.00	Horizontal	PASS
5756.938	47.02	N/A	N/A	74.0	N/A	54.00	Horizontal	PASS
15924.314	49.25	N/A	N/A	74.0	N/A	54.00	Horizontal	PASS

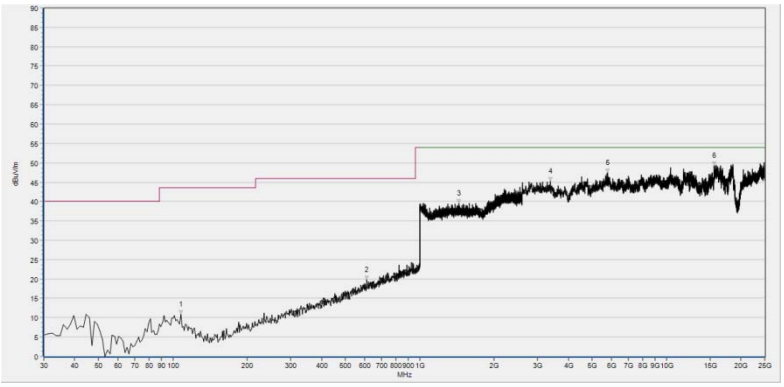
(Antenna Horizontal, 30MHz to 25GHz)



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
42.140	12.52	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
340.788	14.16	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1006.403	40.25	N/A	N/A	74.0	N/A	54.0	Vertical	PASS
2840.335	45.16	N/A	N/A	74.0	N/A	54.0	Vertical	PASS
5748.791	47.45	N/A	N/A	74.0	N/A	54.0	Vertical	PASS
15769.522	49.98	N/A	N/A	74.0	N/A	54.0	Vertical	PASS

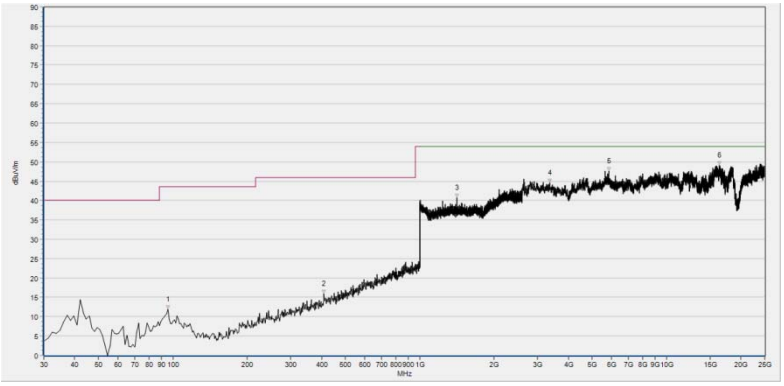
(Antenna Vertical, 30MHz to 25GHz)

Plot for Channel = 5



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
107.697	10.82	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
610.300	19.82	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1441.136	39.51	N/A	N/A	74.0	N/A	54.00	Horizontal	PASS
3378.032	45.24	N/A	N/A	74.0	N/A	54.00	Horizontal	PASS
5761.011	47.37	N/A	N/A	74.0	N/A	54.00	Horizontal	PASS
15610.656	49.23	N/A	N/A	74.0	N/A	54.00	Horizontal	PASS

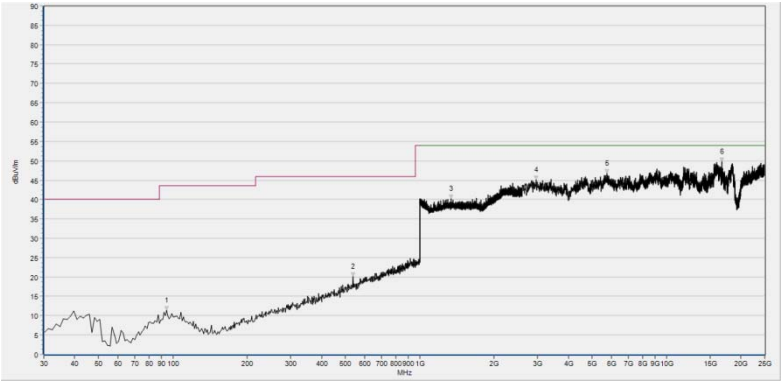
(Antenna Horizontal, 30MHz to 25GHz)



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
95.557	11.95	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
408.773	15.90	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1417.447	40.70	N/A	N/A	74.0	N/A	54.0	Vertical	PASS
3365.812	44.64	N/A	N/A	74.0	N/A	54.0	Vertical	PASS
5826.187	47.52	N/A	N/A	74.0	N/A	54.0	Vertical	PASS
16388.689	49.15	N/A	N/A	74.0	N/A	54.0	Vertical	PASS

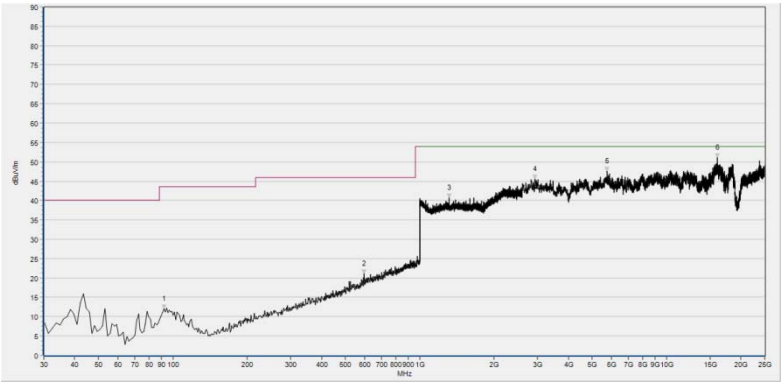
(Antenna Vertical, 30MHz to 25GHz)

Plot for Channel = 8



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
94.343	11.45	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
535.031	20.08	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1338.695	40.15	N/A	N/A	74.0	N/A	54.0	Horizontal	PASS
2958.465	45.16	N/A	N/A	74.0	N/A	54.0	Horizontal	PASS
5728.423	46.75	N/A	N/A	74.0	N/A	54.0	Horizontal	PASS
16783.815	49.79	N/A	N/A	74.0	N/A	54.0	Horizontal	PASS

(Antenna Horizontal, 30MHz to 25GHz)



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
91.915	12.12	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
595.732	21.14	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1314.366	40.68	N/A	N/A	74.0	N/A	54.0	Vertical	PASS
2934.024	45.52	N/A	N/A	74.0	N/A	54.0	Vertical	PASS
5748.791	47.61	N/A	N/A	74.0	N/A	54.0	Vertical	PASS
16107.620	51.06	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:

Test items	Uncertainty
Peak Output Power	±2.22dB
Power spectral density (PSD)	±2.22dB
Bandwidth	±5%
Conducted Spurious Emission	±2.77 dB
Restricted Frequency Bands	±5%
Radiated Emission	±2.95dB
Conducted Emission	±2.44dB

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	2016.06.02	2017.06.01
2	Power Splitter	NW521	1506A	Weinschel	2016.06.02	2017.06.01
3	Attenuator 1	(N/A.)	10dB	Resnet	2016.06.02	2017.06.01
4	Attenuator 2	(N/A.)	3dB	Resnet	2016.06.02	2017.06.01
5	EXA Signal Analzyer	MY53470836	N9010A	Agilent	2016.12.07	2017.12.06
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

Conducted Test Equipment						
No.	**Equipment Name**	**Serial No.**	**Type**	**Manufacturer**	**Cal. Date**	**Cal. Due**
1	Spectrum Analyzer	MY45101810	E4407B	Agilent	2017.05.24	2018.05.23
2	Power Splitter	NW521	1506A	Weinschel	2017.05.24	2018.05.23
3	Attenuator 1	(N/A.)	10dB	Resnet	2017.05.24	2018.05.23
4	Attenuator 2	(N/A.)	3dB	Resnet	2017.05.24	2018.05.23
5	EXA Signal Analzyer	MY53470836	N9010A	Agilent	2016.12.07	2017.12.06
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	2016.06.02	2017.06.01
2	LISN	812744	NSLK 8127	Schwarzbeck	2016.06.02	2017.06.01
3	Service Supplier	100448	CMU200	R&S	2016.06.02	2017.06.01
4	Pulse Limiter (20dB)	9391	VTSD 9561-D	Schwarzbeck	2016.06.02	2017.06.01
5	Coaxial cable(BNC) (30MHz-26GHz)	CB01	EMC01	Morlab	N/A	N/A

Conducted Emission Test Equipments						
No.	**Equipment Name**	**Serial No.**	**Type**	**Manufacturer**	**Cal. Date**	**Cal. Due**
1	Receiver	US44210471	E7405A	Agilent	2017.05.24	2018.05.23
2	LISN	812744	NSLK 8127	Schwarzbeck	2017.05.24	2018.05.23
3	Service Supplier	100448	CMU200	R&S	2017.05.24	2018.05.23
4	Pulse Limiter (20dB)	9391	VTSD 9561-D	Schwarzbeck	2017.05.24	2018.05.23
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

1.5.4 Radiated Test Equipments

Radiated Test Equipments						
No.	**Equipment Name**	**Serial No.**	**Type**	**Manufacturer**	**Cal. Date**	**Cal.Due Date**
1	System Simulator	GB45360846	8960-E5515C	Agilent	2017.05.17	2018.05.16
2	Receiver	MY54130016	N9038A	Agilent	2017.05.17	2018.05.16
3	Test Antenna - Bi-Log	N/A	VULB9163	Schwarzbeck	2016.12.09	2017.12.08
4	Test Antenna - Horn	9170C-531	BBHA9170	Schwarzbeck	2017.07.05	2018.07.04
5	Test Antenna - Loop	1519-022	FMZB1519	Schwarzbeck	2017.07.05	2018.07.04
6	Test Antenna - Horn	71688	BBHA 9120D	Schwarzbeck	2017.07.05	2018.07.04
7	Coaxial cable (N male) (9KHz-30MHz)	CB04	EMC04	Morlab	N/A	N/A
8	Coaxial cable (N male) (30MHz-26GHz)	CB02	EMC02	Morlab	N/A	N/A
9	Coaxial cable(N male) (30MHz-26GHz)	CB03	EMC03	Morlab	N/A	N/A
10	1-18GHz pre-Amplifier	MA02	TS-PR18	Rohde& Schwarz	2017.05.17	2018.05.16
11	18-26.5GHz pre-Amplifier	MA03	TS-PR18	Rohde& Schwarz	2017.05.17	2018.05.16

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	2017.01.11	2018.01.10

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	2017.01.11	2018.01.10

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	2017.01.11	2018.01.10

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