REPORT No.: SZ16080189W01A

FCC RF TEST REPORT

APPLICANT	:	Pycom Ltd
PRODUCT NAME	:	WiPy
MODEL NAME	:	WiPy2.0r
TRADE NAME	:	WiPy
BRAND NAME	:	Pycom
FCC ID	:	2AJMTWIPY2R
STANDARD(S)	:	47 CFR Part 15 Subpart C
ISSUE DATE	:	2016-10-09

SHENZHEN MORLAB COMMUNICATIONS TECHNOLOGY Co., Ltd.

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DIRECTORY

TEST REPORT DECLARATION 4

1. TECHNICAL INFORMATION 5

1.1 APPLICANT INFORMATION 5
1.2 EQUIPMENT UNDER TEST (EUT) DESCRIPTION 5
1.2.1 IDENTIFICATION OF ALL USED EUTS 5
1.3 TEST STANDARDS AND RESULTS 6
1.3.1 TEST ENVIRONMENT CONDITIONS 6

2. 47 CFR PART 15C REQUIREMENTS 7

2.1 ANTENNA REQUIREMENT 7
2.1.1 APPLICABLE STANDARD 7
2.1.2 RESULT: COMPLIANT 7
2.2 PEAK OUTPUT POWER 7
2.2.1 REQUIREMENT 7
2.2.2 TEST DESCRIPTION 7
2.2.3 TEST RESULT 8
2.3 6DB BANDWIDTH 11
2.3.1 REQUIREMENT 11
2.3.2 TEST DESCRIPTION 11
2.3.3 TEST RESULT 11
2.4 CONDUCTED SPURIOUS EMISSIONS AND BAND EDGE 14
2.4.1 REQUIREMENT 14
2.4.2 TEST DESCRIPTION 14
2.4.3 TEST RESULT 14
2.5 POWER SPECTRAL DENSITY (PSD) 18
2.5.1 REQUIREMENT 18
2.5.2 TEST DESCRIPTION 18
2.5.3 TEST RESULT 18
2.6 RESTRICTED FREQUENCY BANDS 21
2.6.1 REQUIREMENT 21
2.6.2 TEST DESCRIPTION 21
2.6.3 TEST RESULT 22

2.7 CONDUCTED EMISSION 25
2.7.1 REQUIREMENT 25
2.7.2 TEST DESCRIPTION 25
2.7.3 TEST RESULT 26
2.8 RADIATED EMISSION 28
2.8.1 REQUIREMENT 28
2.8.2 TEST DESCRIPTION 29
2.8.3 TEST RESULT 31

ANNEX A GENERAL INFORMATION 35

Change History		
Issue	Date	Reason for change
1.0	2016-10-09	First edition

TEST REPORT DECLARATION

Applicant	Pycom Ltd
Applicant Address	Registered Office 57 Avenue Road Cranleigh, Surrey GU6 7LJ UK
Manufacturer	In-Tech Electronics Ltd
Manufacturer Address	2/F Rhythm Home,119 Shazui Road, Futian, Shenzhen, Guangdong, P.R.China
Product Name	WiPy
Model Name	WiPy2.0r
Brand Name	Pycom
HW Version	2.0r
SW Version	1.0
Test Standards	47 CFR Part 15 Subpart C
Test Date	2016-09-20 to 2016-10-09
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:	Pycom Ltd
Address:	Registered Office 57 Avenue Road Cranleigh, Surrey GU6 7LJ UK

1.2 Equipment under Test (EUT) Description

Brand Name:	Pycom
Trade Name:	WiPy
Model Name:	WiPy2.0r
Frequency Range:	The frequency range used is 2402MHz - 2480MHz (40 channels, at intervals of 2MHz);
Modulation Type:	GFSK
Bluetooth Version:	BT4.0(BLE)
Antenna Type:	Ceramic Antenna
Antenna Gain:	-0.5 dBi

NOTE:

The EUT is a WiPy, it contain Bluetooth 4.0(BLE) operating at 2.4GHz ISM band; the frequencies allocated for the Bluetooth 4.0(BLE) is F(MHz)=2402+2*n (0<=n<=39). The lowest, middle, highest channel numbers of the Bluetooth EUT used and tested in this report are separately 0 (2402MHz), 19 (2440MHz) and 39 (2480MHz).

1. The EUT connected to the serial port of the computer with a serial communication cable, and then use the dedicated software to control the EUT into the test mode.
3. For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

1.2.1 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
01	2.0r	1.0

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	Sep 22, 2016	**PASS**
3	15.247(a)	Bandwidth	Sep 22, 2016	**PASS**
4	15.247(d)	Conducted Spurious Emission and Band Edge	Sep 22, 2016	**PASS**
5	15.247(d)	Restricted Frequency Bands	Oct 09, 2016	**PASS**
6	15.207	Conducted Emission	Sep 22, 2016	**PASS**
7	15.209 ,15.247(d)	Radiated Emission	Sep 22, 2016	**PASS**
8	15.247(e)	Power spectral density (PSD)	Sep 22, 2016	**PASS**

The tests of Conducted Emission and Radiated Emission 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

A. 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.

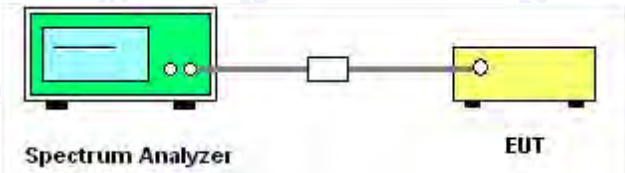
f) Detector = peak.

g) Trace mode = max hold.

h) Allow trace to fully stabilize.

i) Use peak marker function to determine the peak amplitude level.

B. 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.

C. Equipments List:

Please reference ANNEX A (1.5).

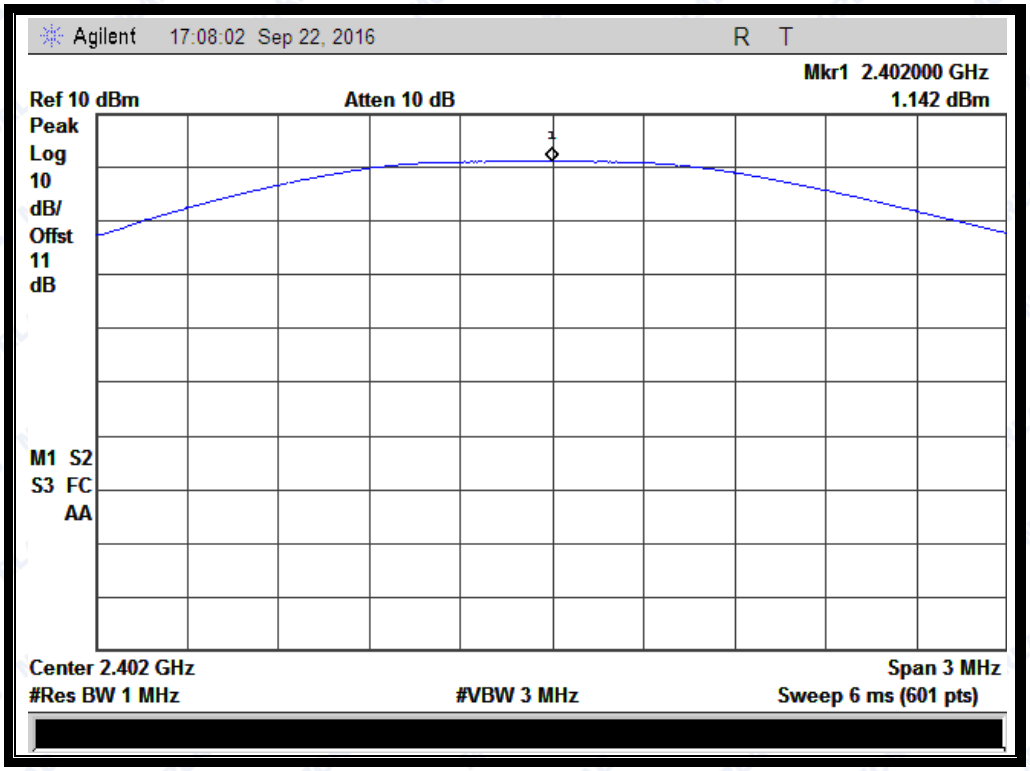
2.2.3 Test Result

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

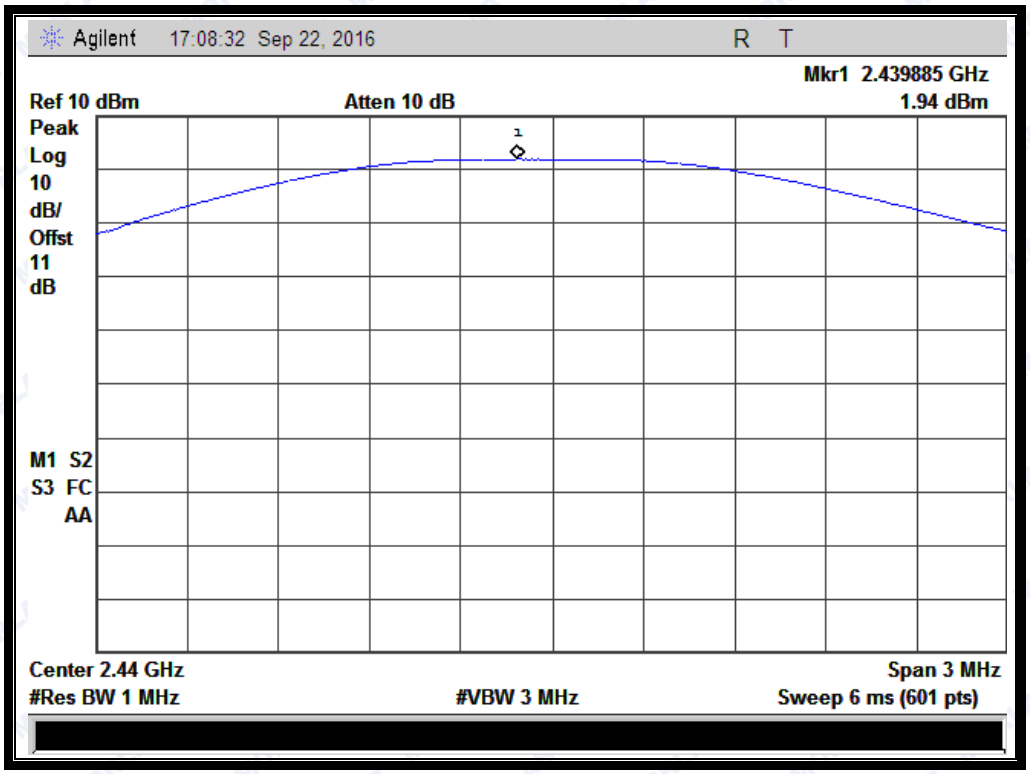
A. Test Verdict:

Channel	Frequency (MHz)	Measured Output Peak Power		Refer to Plot	Limit		Verdict
		dBm	W		dBm	W	
0	2402	1.14	0.0013	Plot A	30	1	PASS
19	2440	1.94	0.0016	Plot B			PASS
39	2480	2.87	0.0019	Plot C			PASS

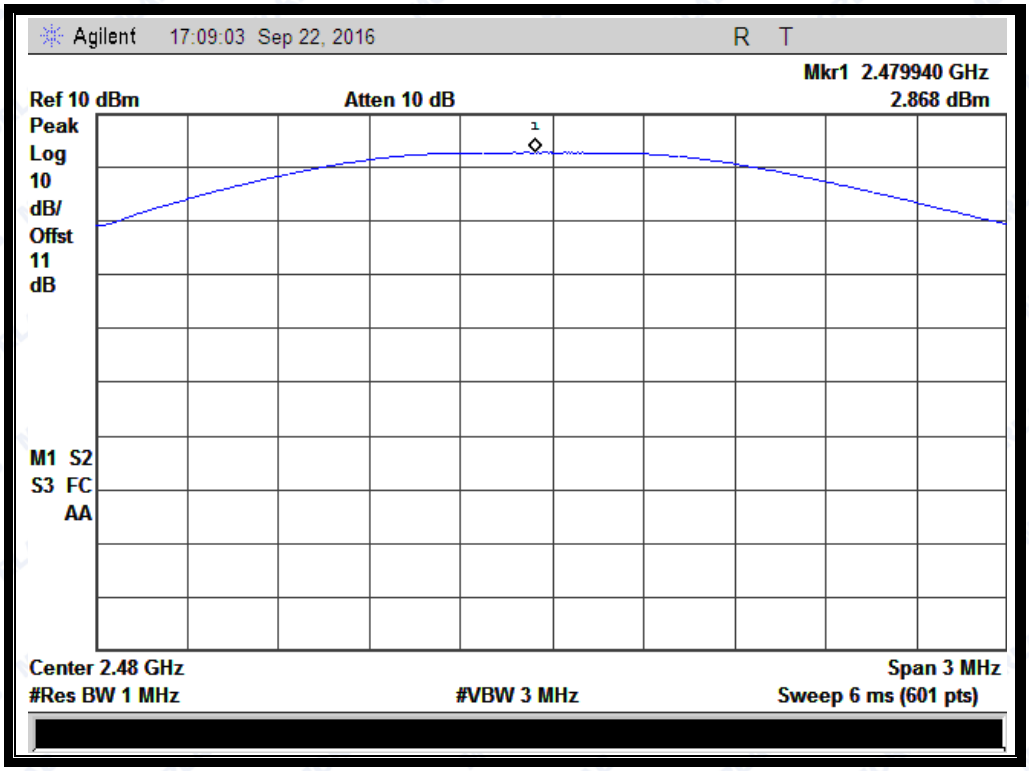
B. Test Plots:



(Plot A: Channel 0: 2402MHz)



(Plot B: Channel 19: 2440MHz)



(Plot C: Channel 39: 2480MHz)

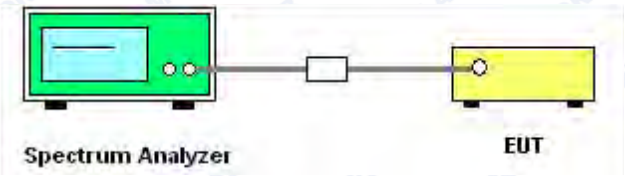
2.3 6dB Bandwidth

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 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.

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).

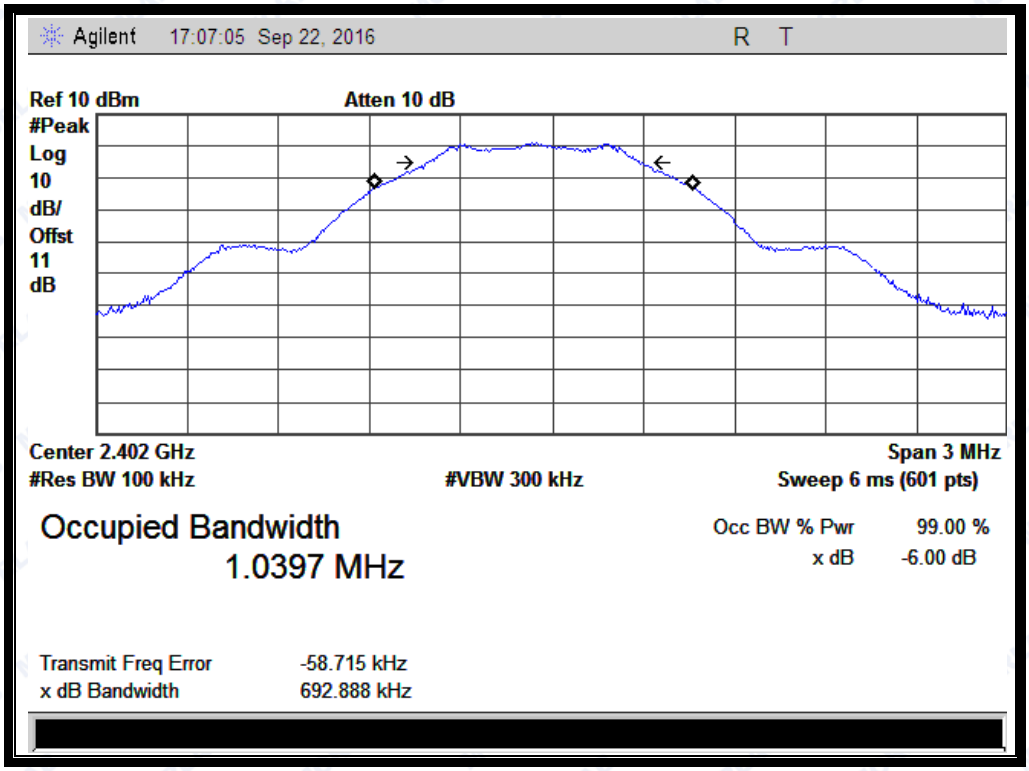
2.3.3 Test Result

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

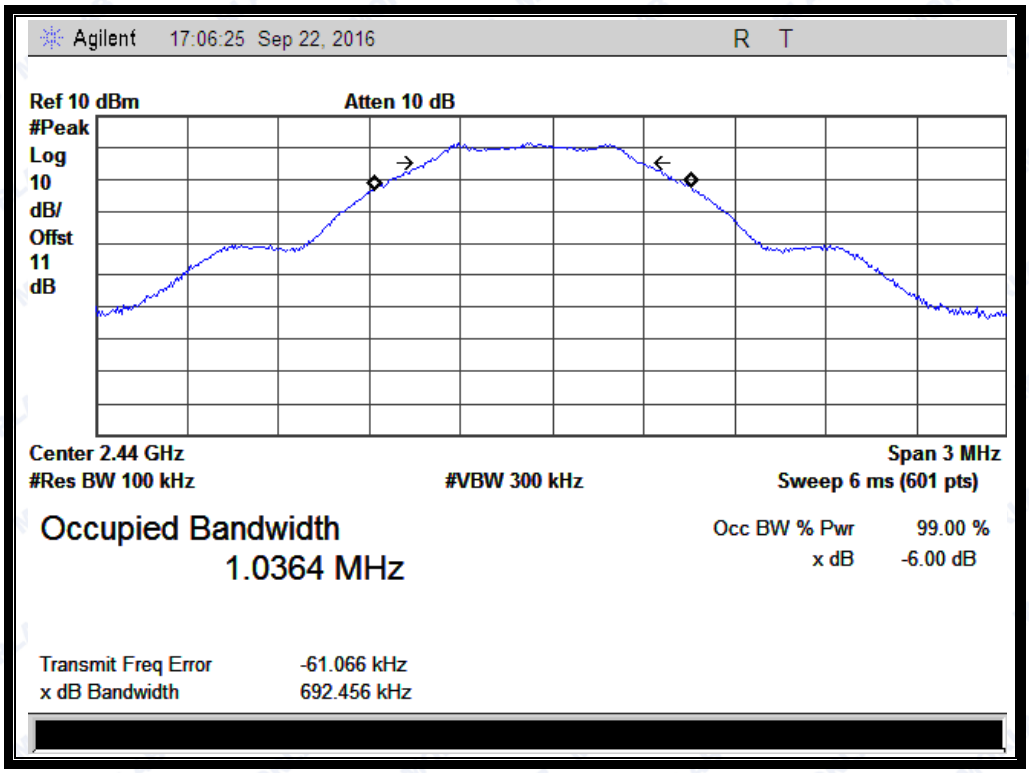
A. Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Refer to Plot	Limits(kHz)	Result
0	2402	0.6929	Plot A	≥500	PASS
19	2440	0.6925	Plot B	≥500	PASS
39	2480	0.6912	Plot C	≥500	PASS

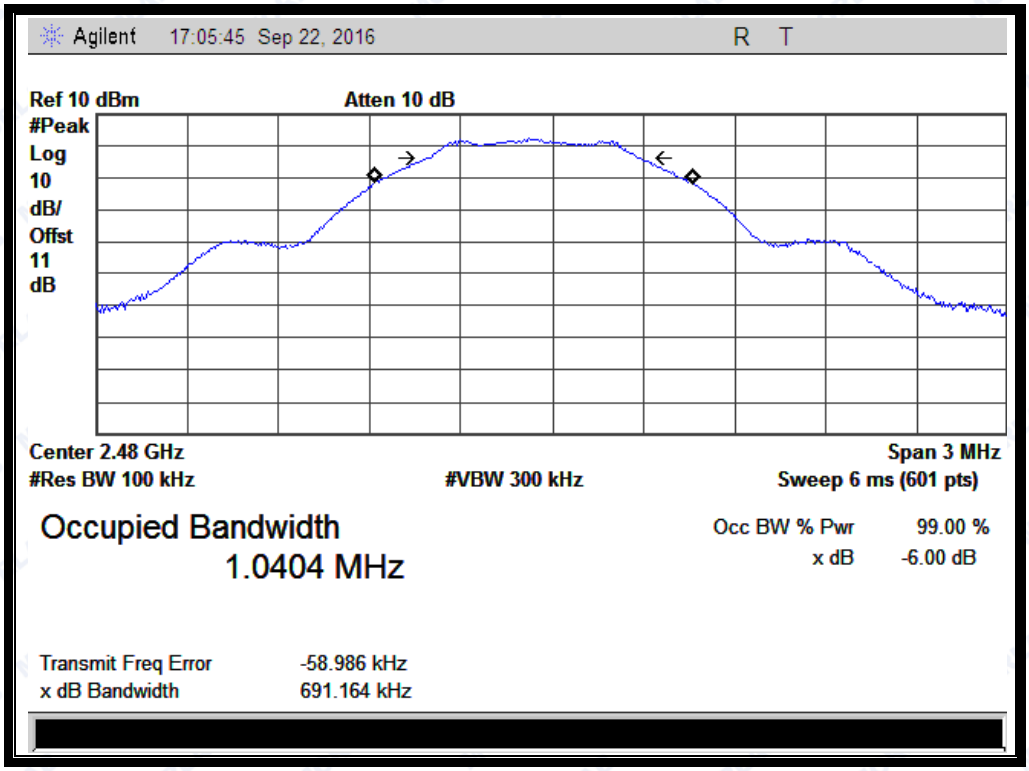
B. Test Plots:



(Plot A: Channel 0: 2402MHz)



(Plot B: Channel 19: 2440 MHz)



(Plot C: Channel 39: 2480MHz)

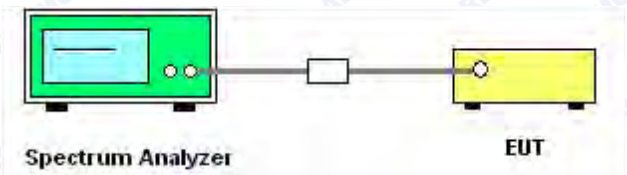
2.4 Conducted Spurious Emissions and Band Edge

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 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.

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

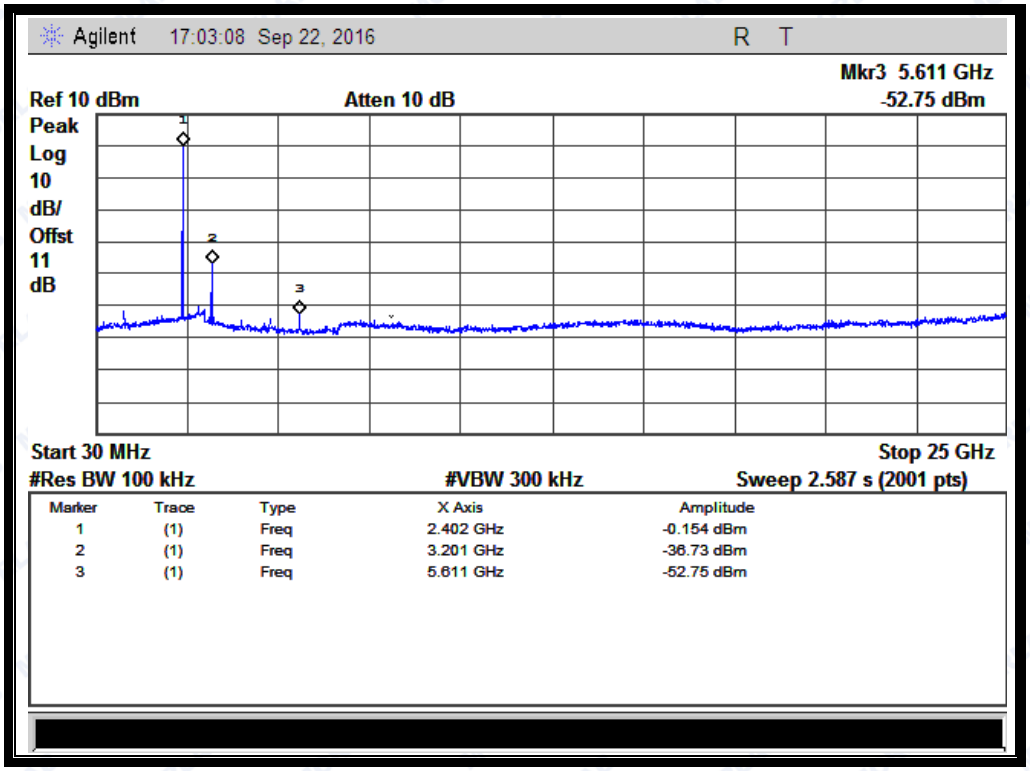
The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the spurious emissions.

A. Test Verdict:

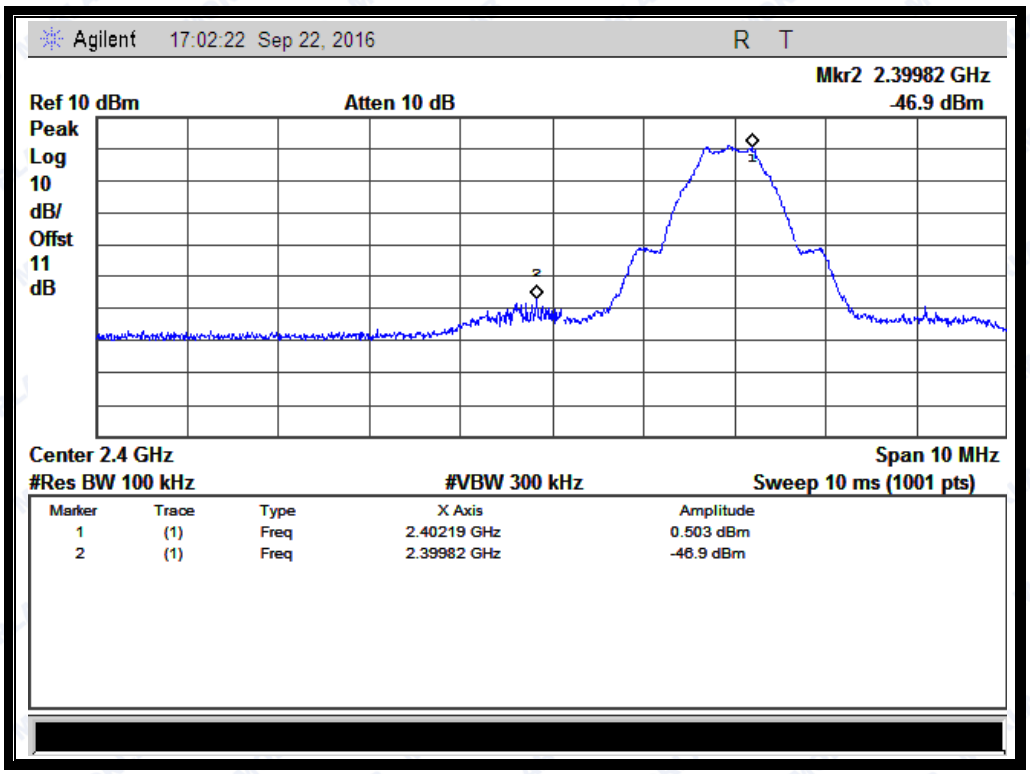
Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Refer to Plot	Limit (dBm)		Verdict
				Carrier Level	Calculated -20dBc Limit	
0	2402	-36.73	Plot A.1	-0.15	-20.15	PASS
19	2440	-38.77	Plot B.1	-0.14	-20.14	PASS
39	2480	-41.59	Plot C.1	1.21	-18.79	PASS

B. Test Plots:

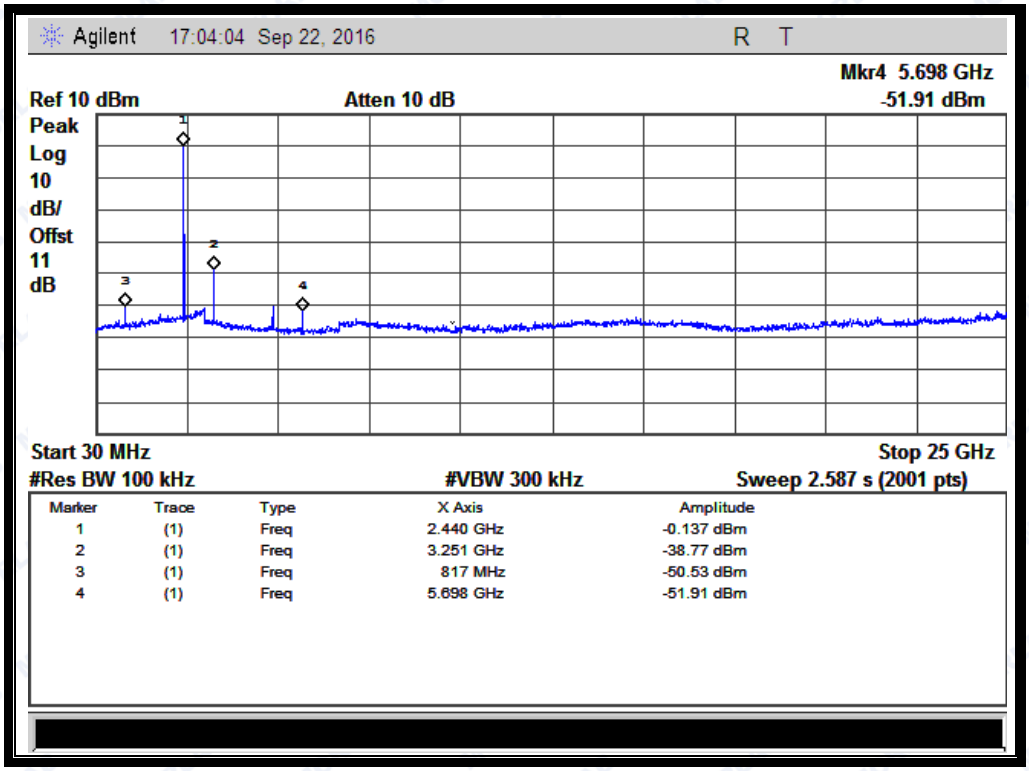
Note: the power of the EUT transmitting frequency should be ignored.



(Plot A.1: Channel = 0, 30MHz to 25GHz)

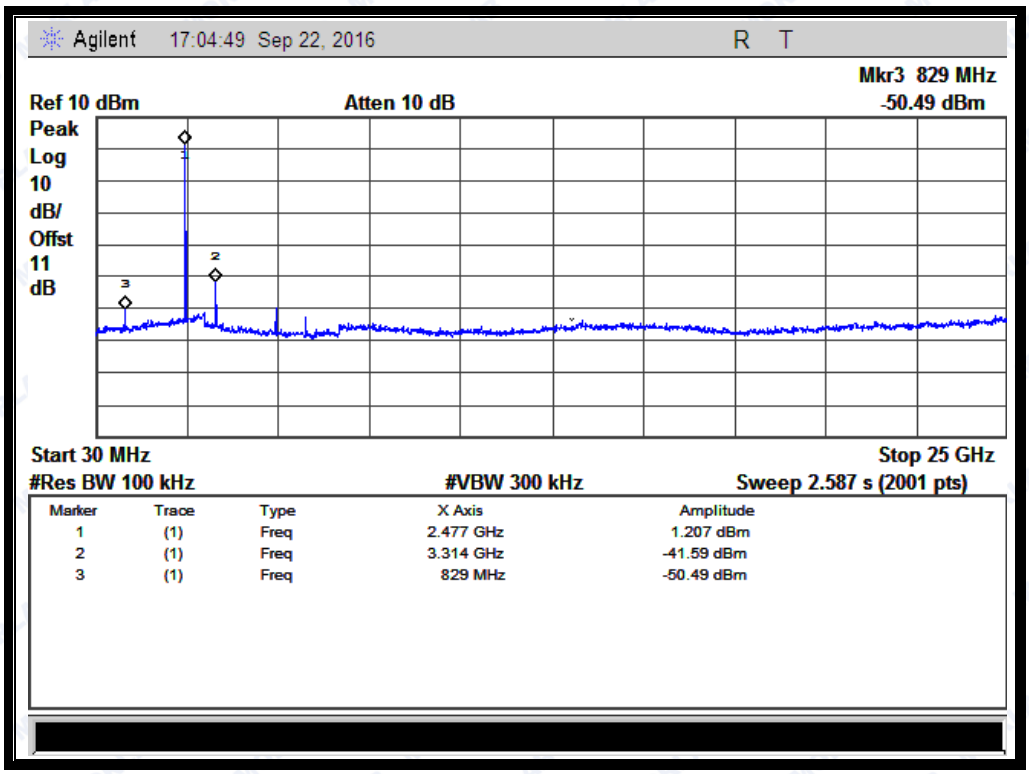


(Band Edge@ Channel = 0)



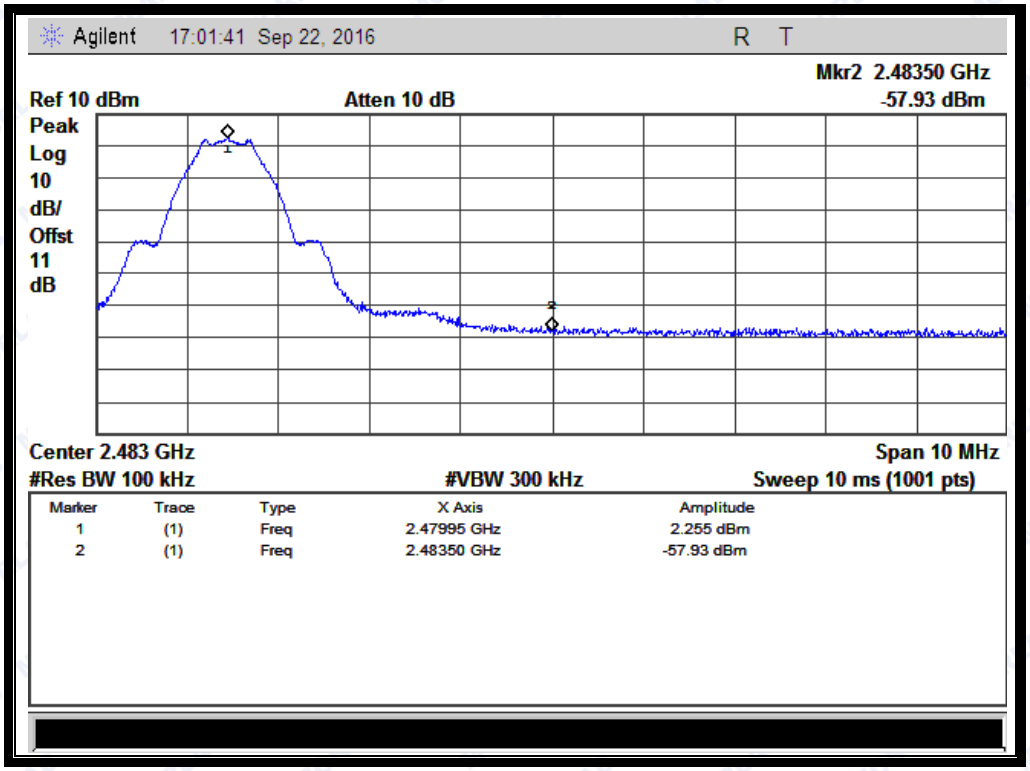
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.440 GHz	-0.137 dBm
2	(1)	Freq	3.251 GHz	-38.77 dBm
3	(1)	Freq	817 MHz	-50.53 dBm
4	(1)	Freq	5.698 GHz	-51.91 dBm

(Plot B.1: Channel = 19, 30MHz to 25GHz)



Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.477 GHz	1.207 dBm
2	(1)	Freq	3.314 GHz	-41.59 dBm
3	(1)	Freq	829 MHz	-50.49 dBm

(Plot C.1: Channel = 39, 30MHz to 25GHz)



(Band Edge@ Channel = 39)

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.

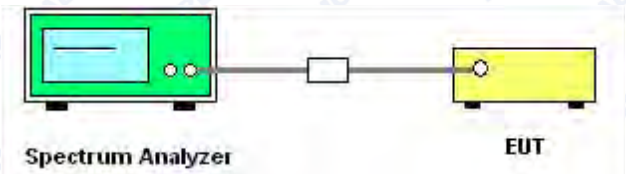
2.5.2 Test Description

A. Test 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.

B. 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 as the factor is calibrated to correct the reading.

C. Equipments List:

Please reference ANNEX A (1.5).

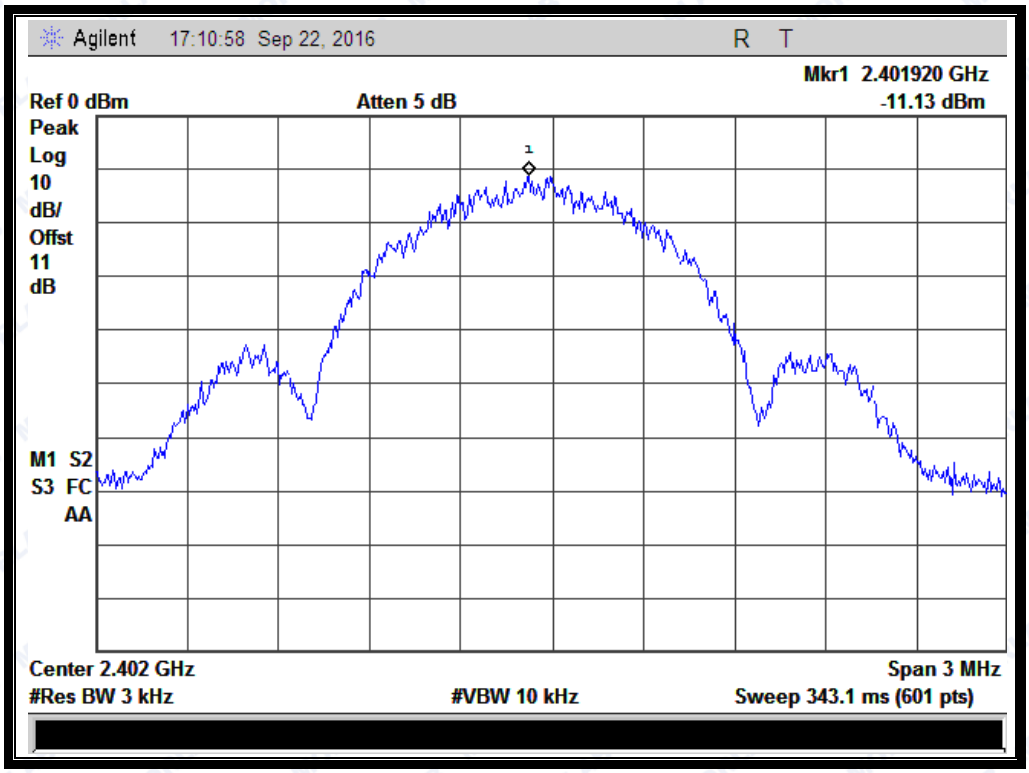
2.5.3 Test Result

The lowest, middle and highest channels are tested.

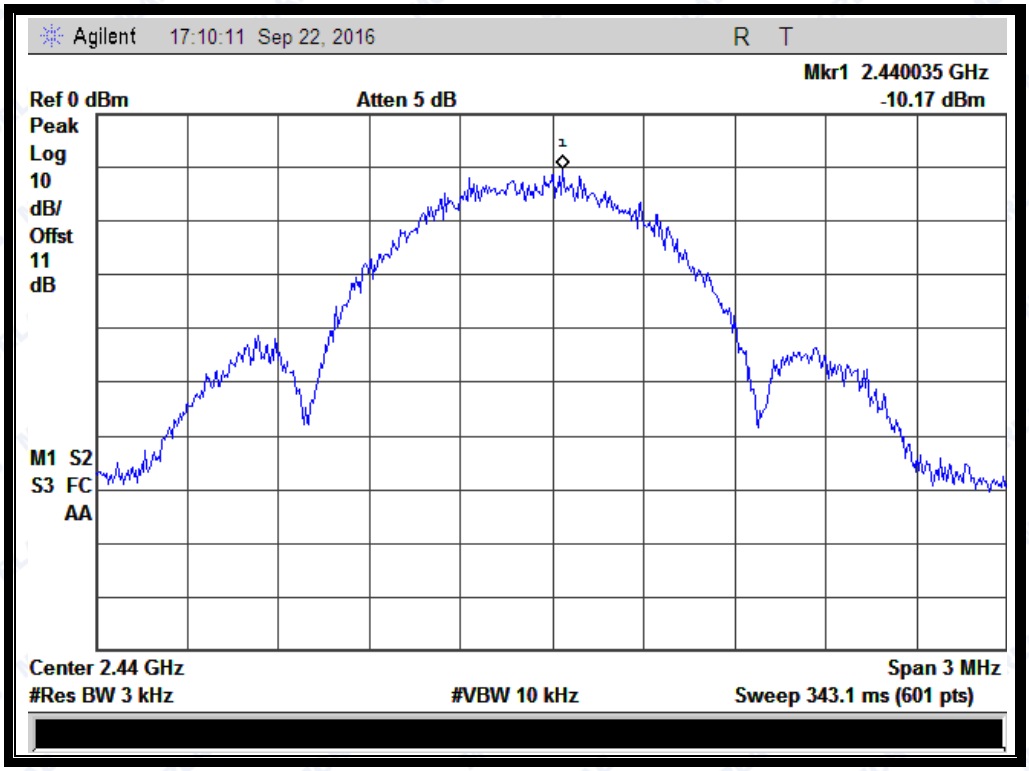
A. Test Verdict:

Spectral power density (dBm/3kHz)					
Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)	Refer to Plot	Limit (dBm/3kHz)	Verdict
0	2402	-11.13	Plot A	8	PASS
19	2440	-10.17	Plot B	8	PASS
39	2480	-8.62	Plot C	8	PASS
Measurement uncertainty: ±1.3dB					

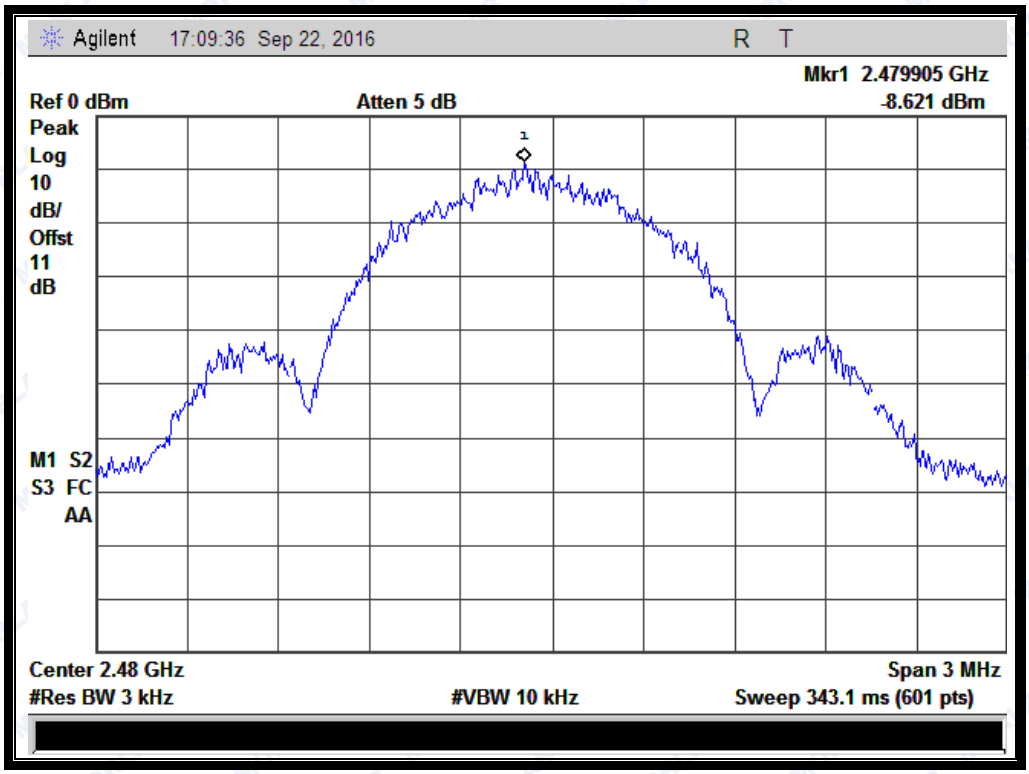
B. Test Plots:



(Plot A: Channel = 0)



(Plot B: Channel = 19)



(Plot C: Channel = 39)

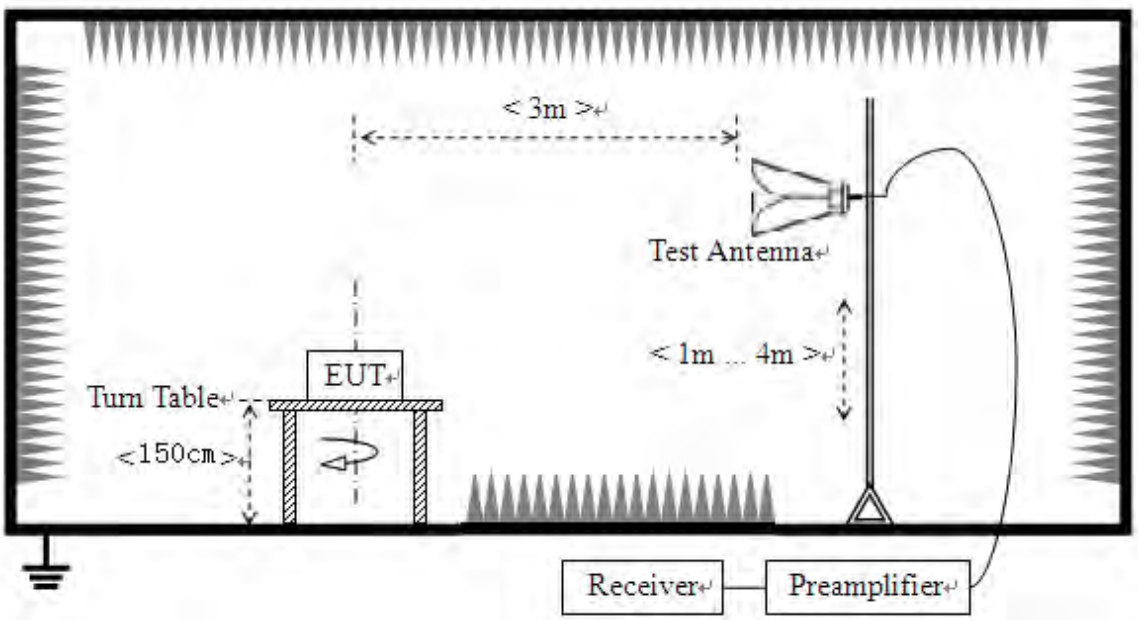
2.6 Restricted Frequency Bands

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

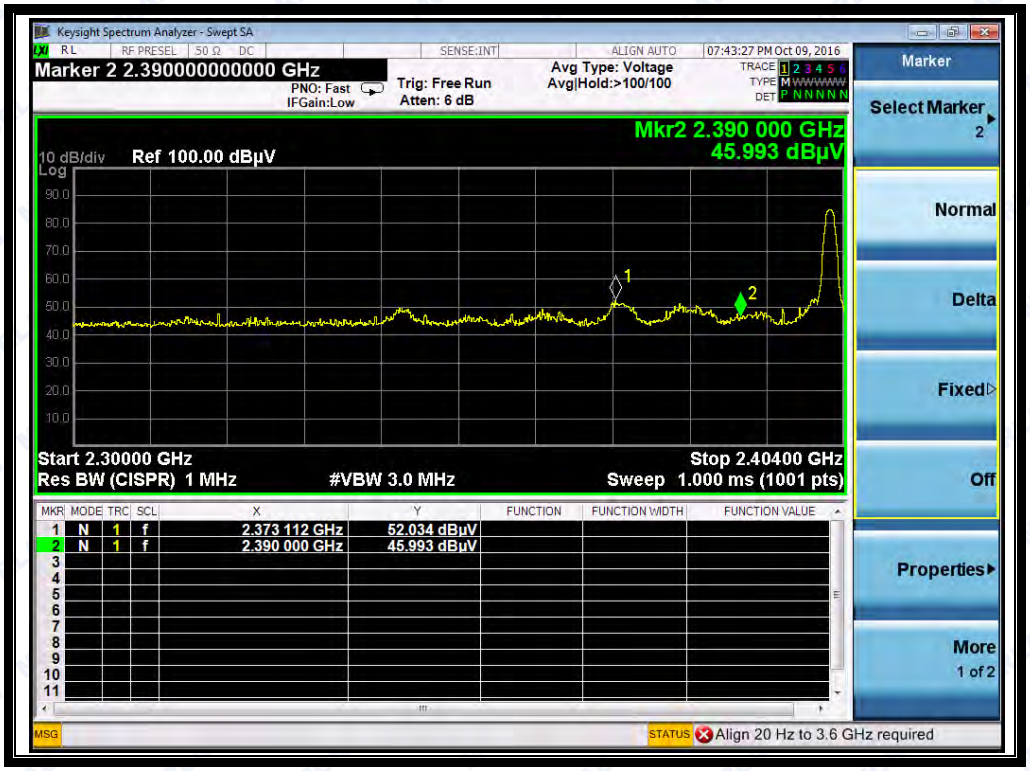
A_{Factor}: Antenna Factor at 3m

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.

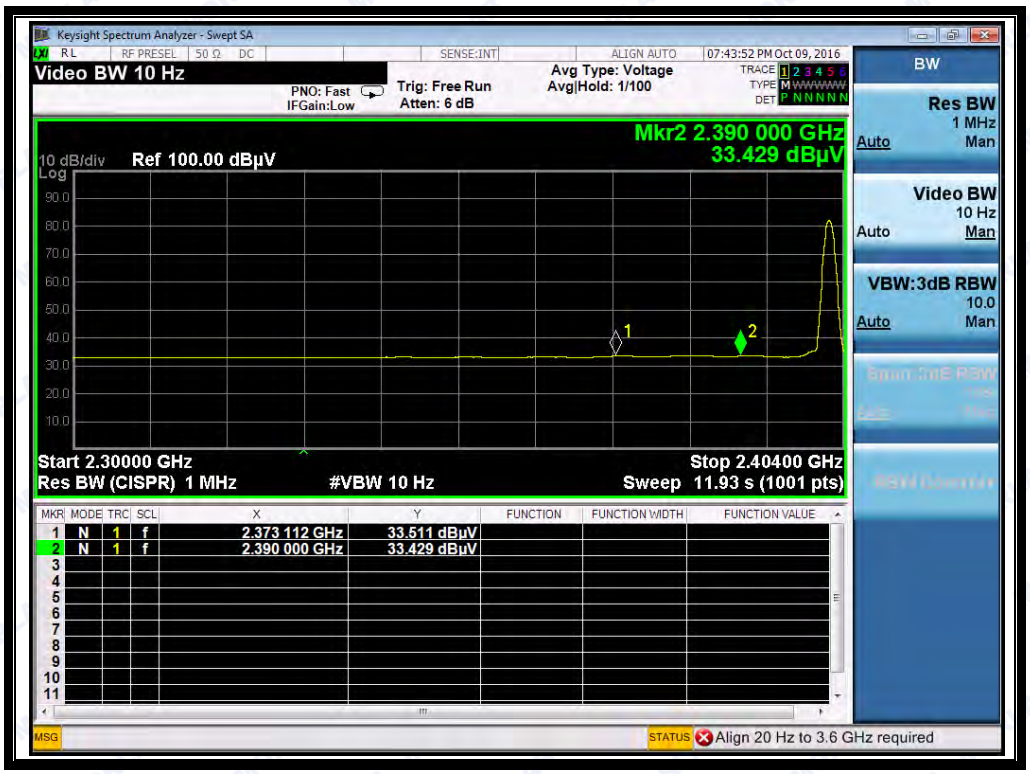
A. Test Verdict:

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
0	2390.00	PK	45.99	-33.63	32.56	44.92	74	Pass
0	2390.00	AV	33.43	-33.63	32.56	32.36	54	Pass
39	2488.60	PK	43.60	-33.18	32.5	42.92	74	Pass
39	2488.60	AV	33.18	-33.18	32.5	32.50	54	Pass

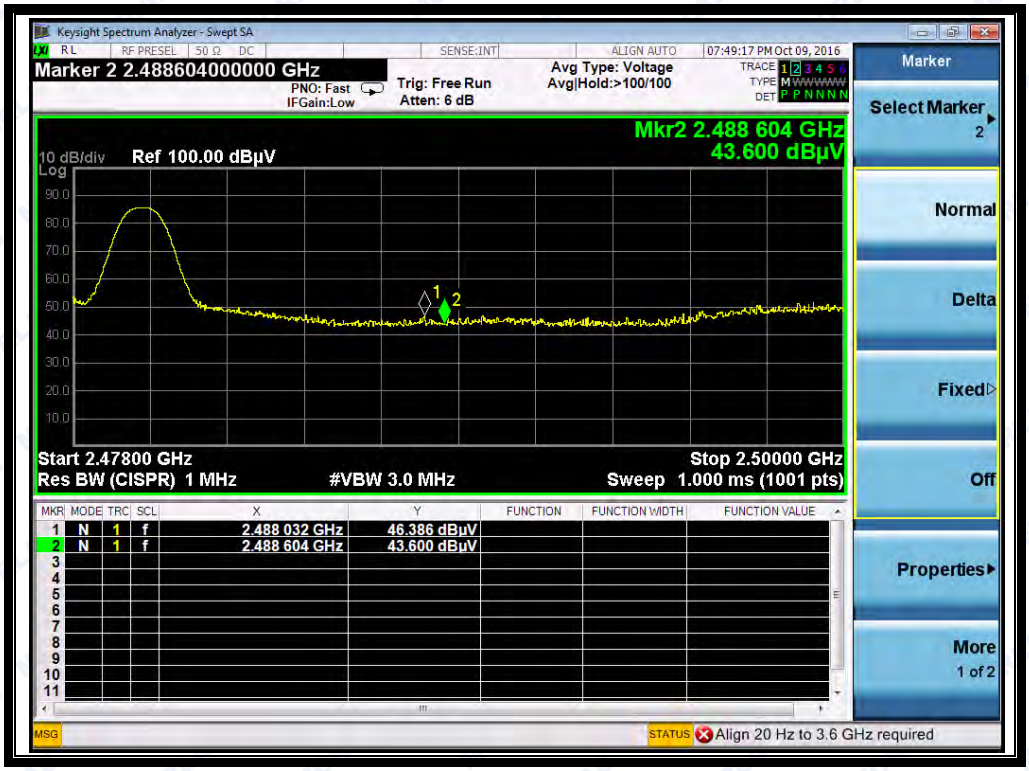
B. Test Plots:



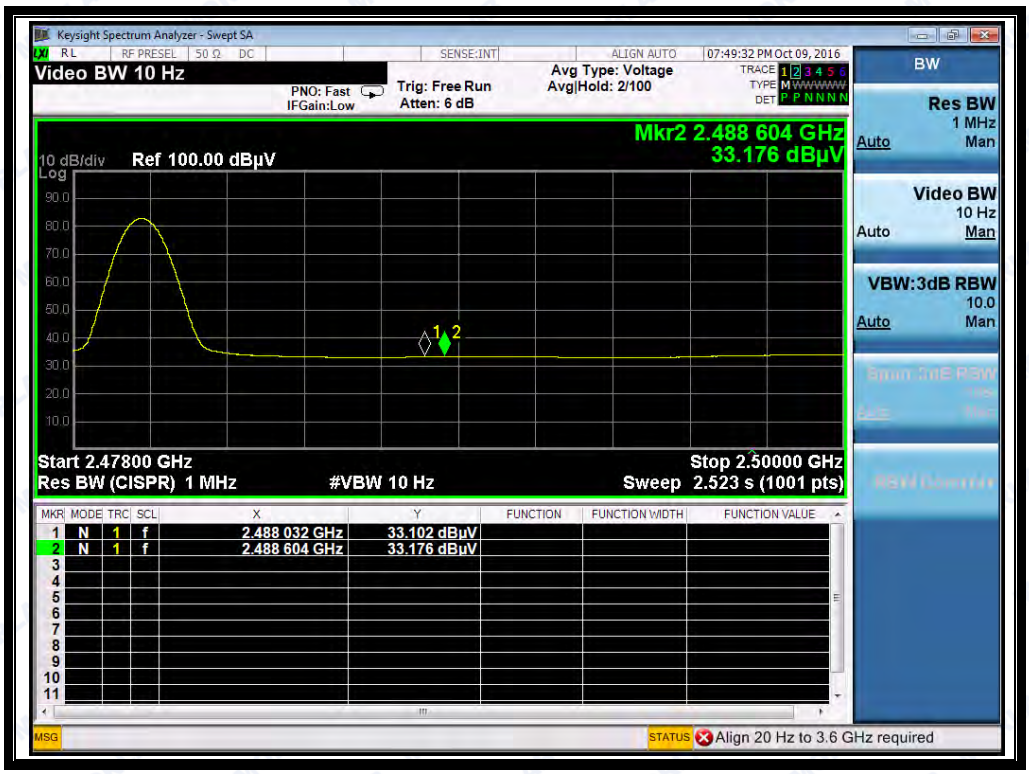
(Plot A1: Channel = 0 PEAK)



(Plot A2: Channel = 0 AVG)



(Plot B1: Channel = 39 PEAK)



(Plot B2: Channel = 39 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

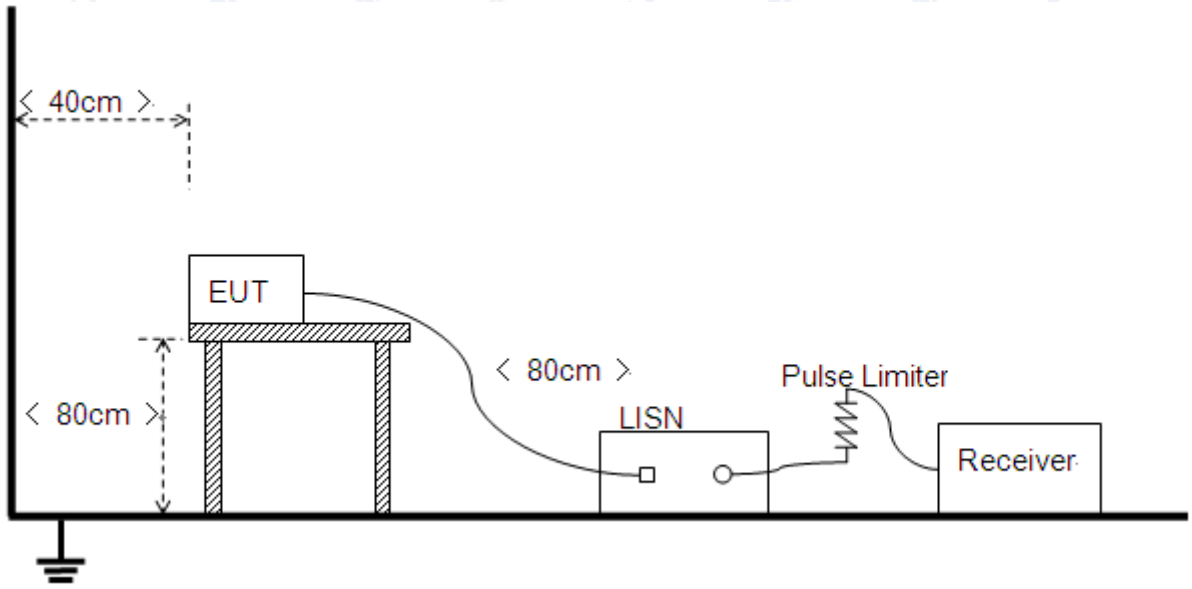
NOTE:

(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).

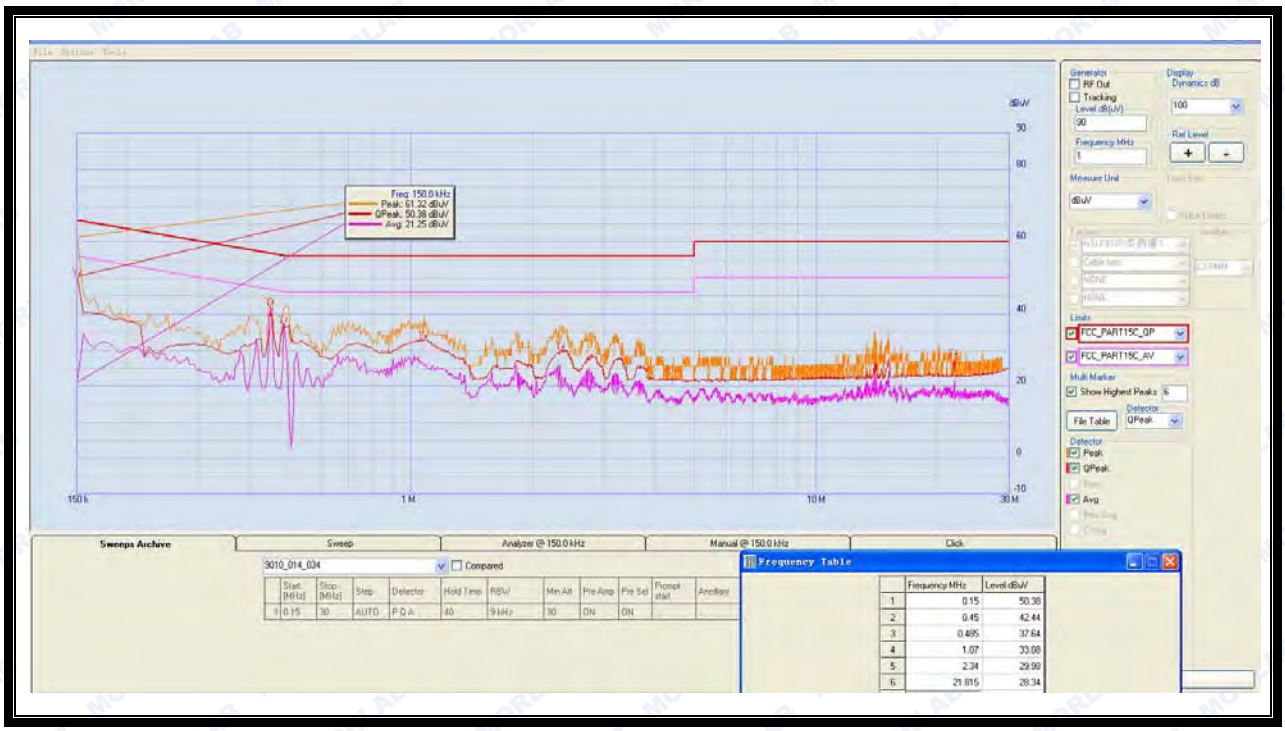
2.7.3 Test Result

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.

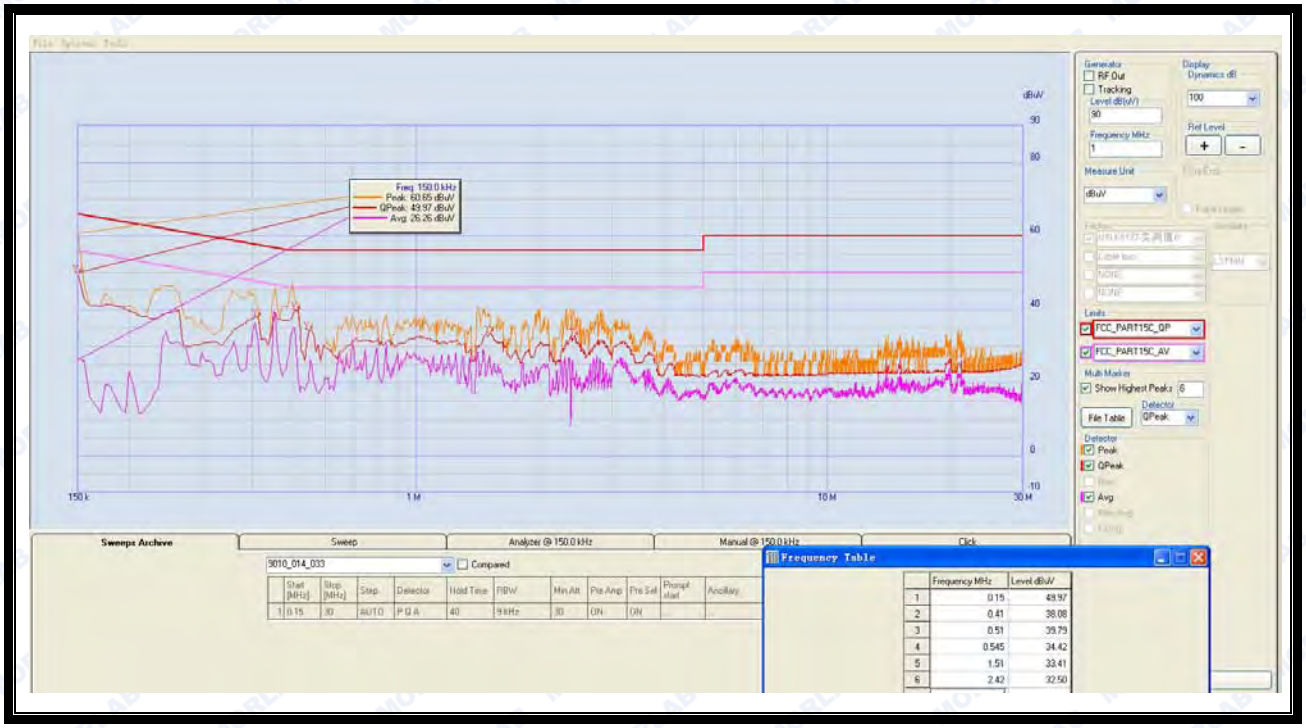
A. Test setup:

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

B. Test Plots:



(Plot A: L Phase)



(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 (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:

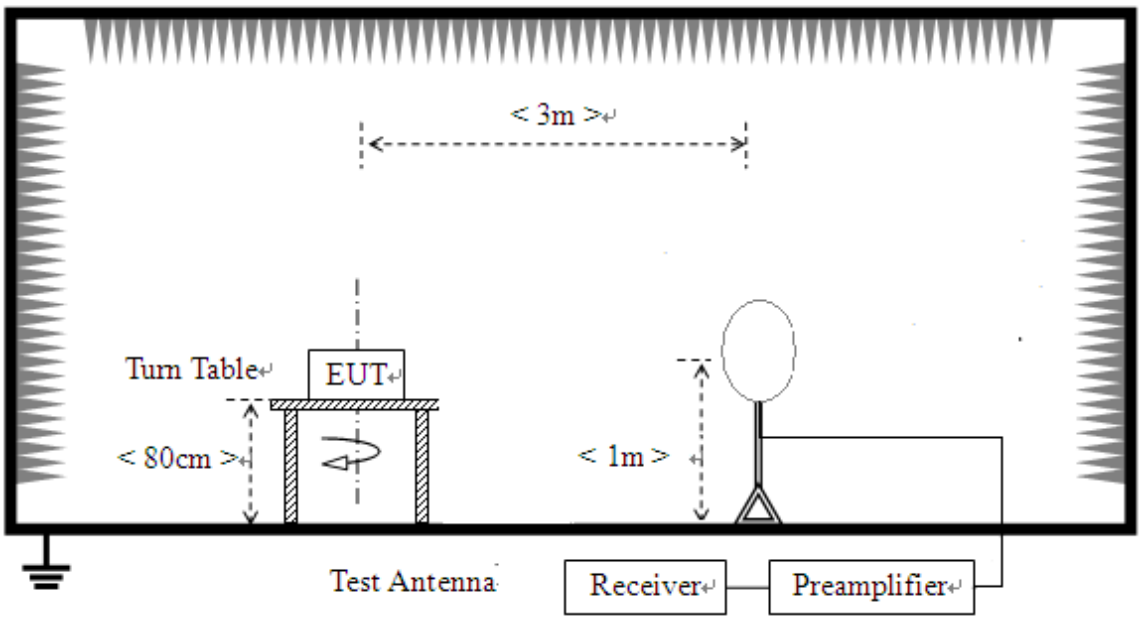
1. For Above 1000MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.
2. For above 1000MHz, limit field strength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

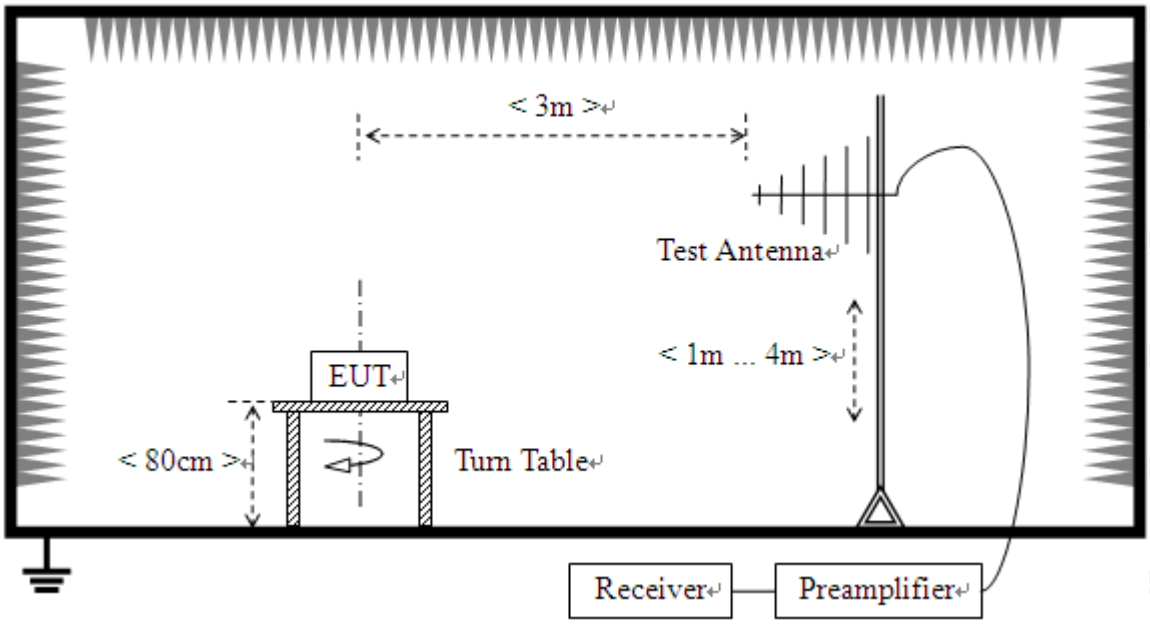
2.8.2 Test Description

A. Test Setup:

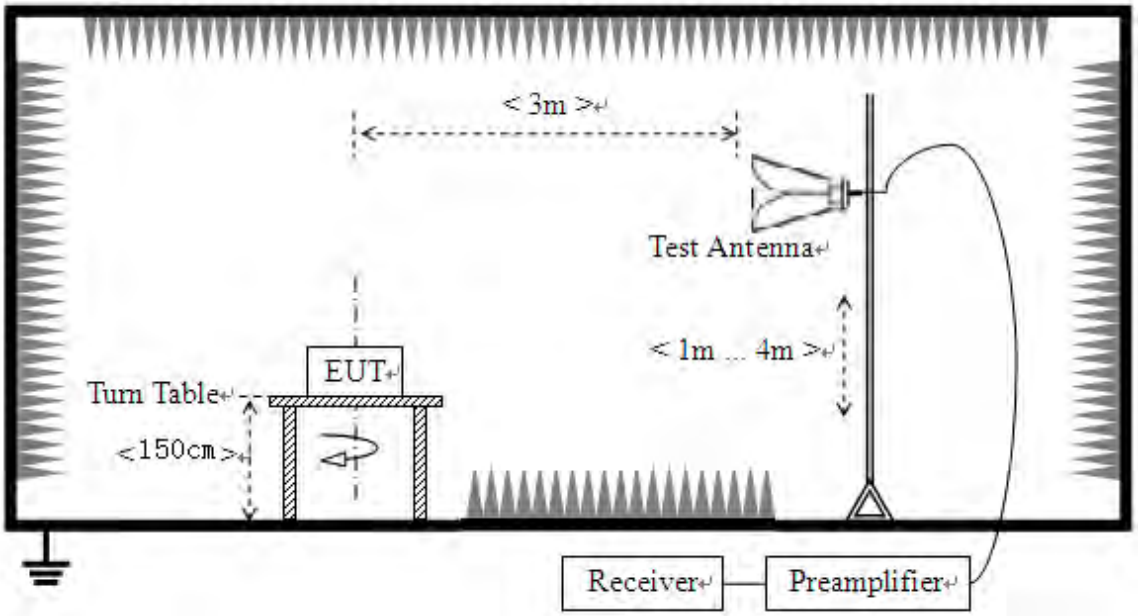
1) For radiated emissions from 9kHz to 30MHz



2) For radiated emissions from 30MHz to1GHz



3) For radiated emissions above 1GHz



The 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.

For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement 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 measurement antenna elevation shall be that which maximizes the emissions. The measurement 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 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. 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:

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

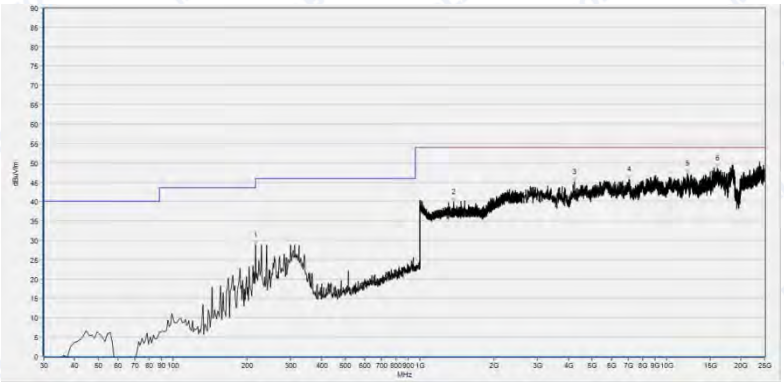
During the test, the total correction Factor A_T and A_{Factor} were built in test software.

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.

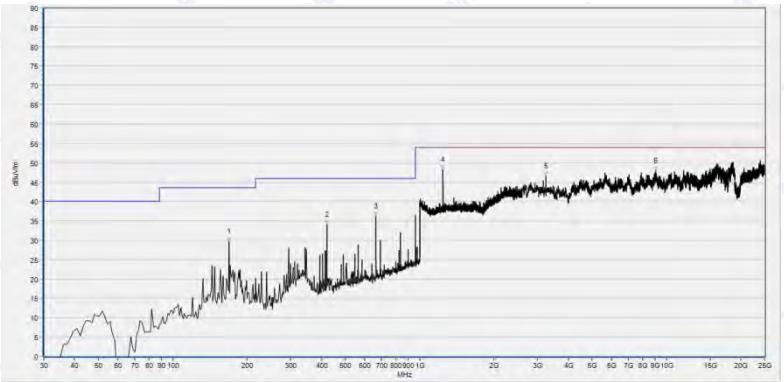
A. Test Plots for the Whole Measurement Frequency Range:

Plots for Channel = 0



Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
215.745	28.83	N.A	N.A	N.A	43.50	N.A	Horizontal	PASS
1373.910	39.96	N.A	N.A	74.0	N.A	54.00	Horizontal	PASS
4229.387	45.12	N.A	N.A	74.0	N.A	54.00	Horizontal	PASS
7060.447	45.70	N.A	N.A	74.0	N.A	54.00	Horizontal	PASS
12172.650	47.32	N.A	N.A	74.0	N.A	54.00	Horizontal	PASS
16103.546	48.55	N.A	N.A	74.0	N.A	54.00	Horizontal	PASS

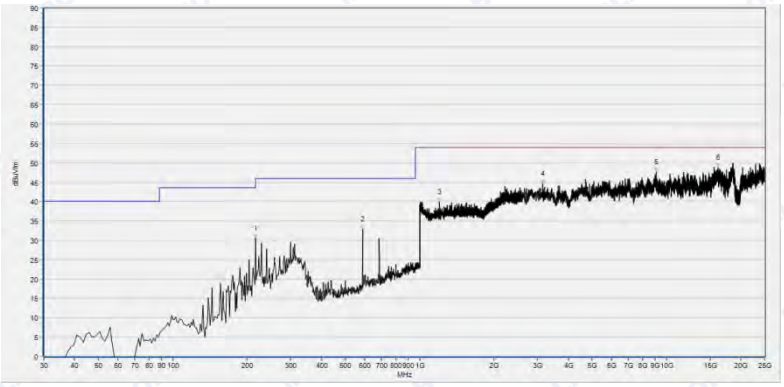
(Antenna Horizontal, 30MHz to 25GHz)



Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
168.398	29.63	N.A	N.A	N.A	43.50	N.A	Vertical	PASS
420.914	34.03	N.A	N.A	N.A	46.00	N.A	Vertical	PASS
663.717	36.18	N.A	N.A	N.A	46.00	N.A	Vertical	PASS
1241.377	48.30	N.A	N.A	74.0	N.A	54.00	Vertical	PASS
3239.534	46.61	N.A	N.A	74.0	N.A	54.00	Vertical	PASS
9011.638	47.86	N.A	N.A	74.0	N.A	54.00	Vertical	PASS

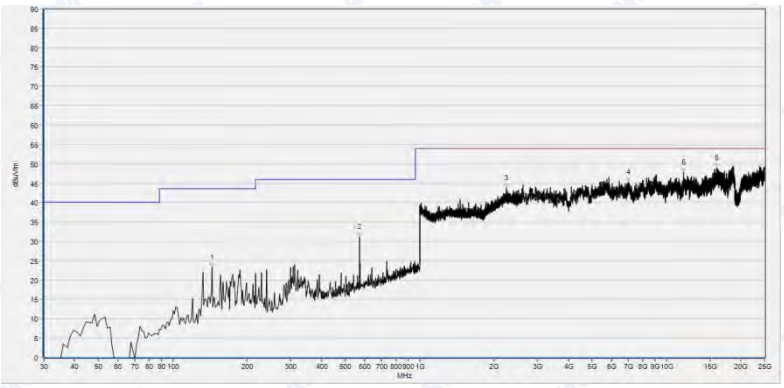
(Antenna Vertical, 30MHz to 25GHz)

Plot for Channel = 19



Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
215.745	30.53	N.A	N.A	N.A	43.50	N.A	Horizontal	PASS
586.020	32.87	N.A	N.A	N.A	46.00	N.A	Horizontal	PASS
1203.601	39.86	N.A	N.A	74.0	N.A	54.00	Horizontal	PASS
3149.918	44.54	N.A	N.A	74.0	N.A	54.00	Horizontal	PASS
9064.594	47.57	N.A	N.A	74.0	N.A	54.00	Horizontal	PASS
16180.942	48.80	N.A	N.A	74.0	N.A	54.00	Horizontal	PASS

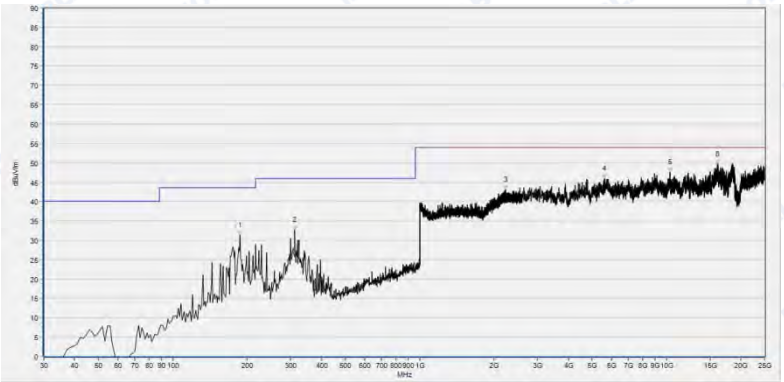
(Antenna Horizontal, 30MHz to 25GHz)



Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
144.118	23.38	N.A	N.A	N.A	43.50	N.A	Vertical	PASS
570.238	31.09	N.A	N.A	N.A	46.00	N.A	Vertical	PASS
2238.896	43.73	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
7003.419	45.18	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
11744.935	47.80	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
15985.416	48.95	N.A	N.A	74.0	N.A	54.0	Vertical	PASS

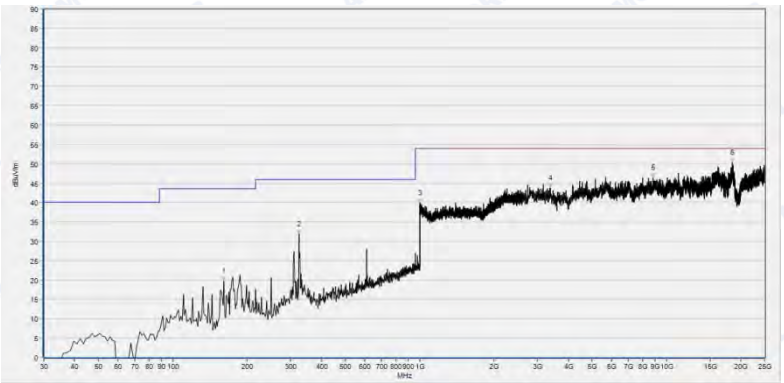
(Antenna Vertical, 30MHz to 25GHz)

Plot for Channel = 39



Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
186.608	31.40	N.A	N.A	N.A	43.50	N.A	Horizontal	PASS
311.652	32.64	N.A	N.A	N.A	46.00	N.A	Horizontal	PASS
2226.090	43.07	N.A	N.A	74.0	N.A	54.00	Horizontal	PASS
5606.219	45.86	N.A	N.A	74.0	N.A	54.00	Horizontal	PASS
10327.369	47.63	N.A	N.A	74.0	N.A	54.00	Horizontal	PASS
16034.297	49.60	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
161.114	19.72	N.A	N.A	N.A	43.50	N.A	Vertical	PASS
323.792	31.85	N.A	N.A	N.A	46.00	N.A	Vertical	PASS
1000.640	39.96	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
3382.106	43.76	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
8824.259	46.39	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
18498.745	50.28	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

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	USB Wideband Power Sensor	MY54210011	U2021XA	Agilent	2016.03.02	2017.03.01
3	EXA Signal Analzyer	MY53470838	N9010A	Agilent	2016.03.02	2017.03.01
4	RF cable	CB01	RF01	Morlab	N/A	N/A
5	Attenuator	(n.a.)	10dB	Resnet	N/A	N/A
6	SMA connector Note	CN01	RF03	HUBER-SUHNER	N/A	N/A
Note: The SMA antenna connector is soldered on the PCB board in order to perform conducted tests and this SMA antenna connector is listed in the equipment list.						

1.5.2 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	2016.03.02	2017.03.01
2	Receiver	MY54130016	N9038A	Agilent	2016.03.02	2017.03.01
3	Test Antenna - Bi-Log	N/A	VULB9163	Schwarzbeck	2016.03.02	2017.03.01
4	Test Antenna - Horn	9170C-531	BBHA9170	Schwarzbeck	2016.03.02	2017.03.01
5	Test Antenna - Loop	1519-022	FMZB1519	Schwarzbeck	2016.03.02	2017.03.01
6	Test Antenna - Horn	71688	BBHA 9120D	Schwarzbeck	2016.03.02	2017.03.01
7	Coaxial cable(N male)	CB02	EMC02	Morlab	N/A	N/A
8	Coaxial cable(N male)	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

1.5.3 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

1.5.4 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

1.5.5 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

1.5.6 Auxiliary Test Equipment

Auxiliary Test Equipment						
No.	**Equipment Name**	**Serial No.**	**Type**	**Manufacturer**	**Cal.Date**	**Cal.Due Date**
1	Computer	N.A	PU500C	Asus	N.A	N.A

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