



REPORT No.: SZ16020052W03

FCC RF TEST REPORT

APPLICANT : RM Acquisition LLC

PRODUCT NAME : Electronic Hours of Service Logging Device

MODEL NAME : ELD50-9,ELD50-6

TRADE NAME : N.A

BRAND NAME : Rand McNally

FCC ID : A4C01004A

STANDARD(S) : 47 CFR Part 15 Subpart C

ISSUE DATE : 2016-04-13



SHENZHEN MORLAB COMMUNICATIONS TECHNOLOGY Co., Ltd.

NOTE: This document is issued by MORLAB, the test report shall not be reproduced except in full without prior written permission of the company. The test results apply only to the particular sample(s) tested and to the specific tests carried out which is available on request for validation and information confirmed at our website.

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



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	10
2.3.1 REQUIREMENT	10
2.3.2 TEST DESCRIPTION	10
2.3.3 TEST RESULT	10
2.4 CONDUCTED SPURIOUS EMISSIONS AND BAND EDGE	13
2.4.1 REQUIREMENT	13
2.4.2 TEST DESCRIPTION	13
2.4.3 TEST RESULT	13
2.5 POWER SPECTRAL DENSITY (PSD)	17
2.5.1 REQUIREMENT	17
2.5.2 TEST DESCRIPTION	17
2.5.3 TEST RESULT	17
2.6 RESTRICTED FREQUENCY BANDS	20
2.6.1 REQUIREMENT	20
2.6.2 TEST DESCRIPTION	20
2.6.3 TEST RESULT	21



REPORT No.: SZ16020052W03

2.7	RADIATED EMISSION	24
2.7.1	REQUIREMENT	24
2.7.2	TEST DESCRIPTION	25
2.7.3	TEST RESULT	27
<u>ANNEX A GENERAL INFORMATION</u>		<u>31</u>

Change History		
Issue	Date	Reason for change
1.0	2016-04-13	First edition



REPORT No.: SZ16020052W03

TEST REPORT DECLARATION

Applicant	RM Acquisition LLC
Applicant Address	9855 Woods Drive, Skokie IL 60077
Manufacturer	LONGHORN AUTO LIMITED
Manufacturer Address	Gongyeyuan rd., Dalang street, Longhua , Shenzhen
Product Name	Electronic Hours of Service Logging Device
Model Name	ELD50-9,ELD50-6
Brand Name	Rand McNally
HW Version	P3
SW Version	ELD50_0.0.15
Test Standards	47 CFR Part 15 Subpart C
Test Date	2016-02-29 to 2016-03-15
Test Result	PASS

Tested by : Zou Jian
Zou Jian

Reviewed by : Yuan Ling
Yuan Ling

Approved by : Peng Huarui
Peng Huarui



1. TECHNICAL INFORMATION

Note: Provide by applicant.

1.1 Applicant Information

Company:	RM Acquisition LLC
Address:	9855 Woods Drive, Skokie IL 60077

1.2 Equipment under Test (EUT) Description

Brand Name:	Rand McNally
Trade Name:	N.A
Model Name:	ELD50-9, ELD50-6
Frequency Range:	The frequency range used is 2402MHz - 2480MHz (40 channels, at intervals of 2MHz);
Modulation Type:	GFSK
Antenna Type:	PCB Antenna
Antenna Gain:	0.9 dBi

NOTE:

The EUT is a Electronic Hours of Service Logging Device, it contain Bluetooth 4.0 LE EUT operating at 2.4GHz ISM band; the frequencies allocated for the Bluetooth 4.0 LE is $F(\text{MHz})=2402+2*n$ ($0 \leq n \leq 39$). 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). 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
A01	P3	ELD50_0.0.15



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 (10-1-13 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	Mar 11, 2016	<u>PASS</u>
3	15.247(a)	Bandwidth	Mar 11, 2016	<u>PASS</u>
4	15.247(d)	Conducted Spurious Emission and Band Edge	Mar 11, 2016	<u>PASS</u>
5	15.247(d)	Restricted Frequency Bands	Mar 14, 2016	<u>PASS</u>
6	15.209 ,15.247(d)	Radiated Emission`	Mar 14, 2016	<u>PASS</u>
7	15.247(e)	Power spectral density (PSD)	Mar 11, 2016	<u>PASS</u>

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

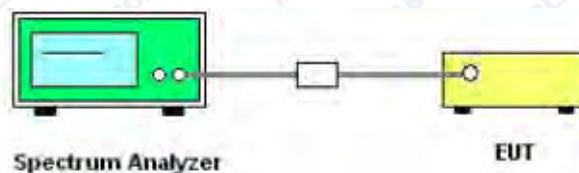
2.2.1 Requirement

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

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

A. Test Setup:



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

B. Equipments List:

Please reference ANNEX A (1.4).



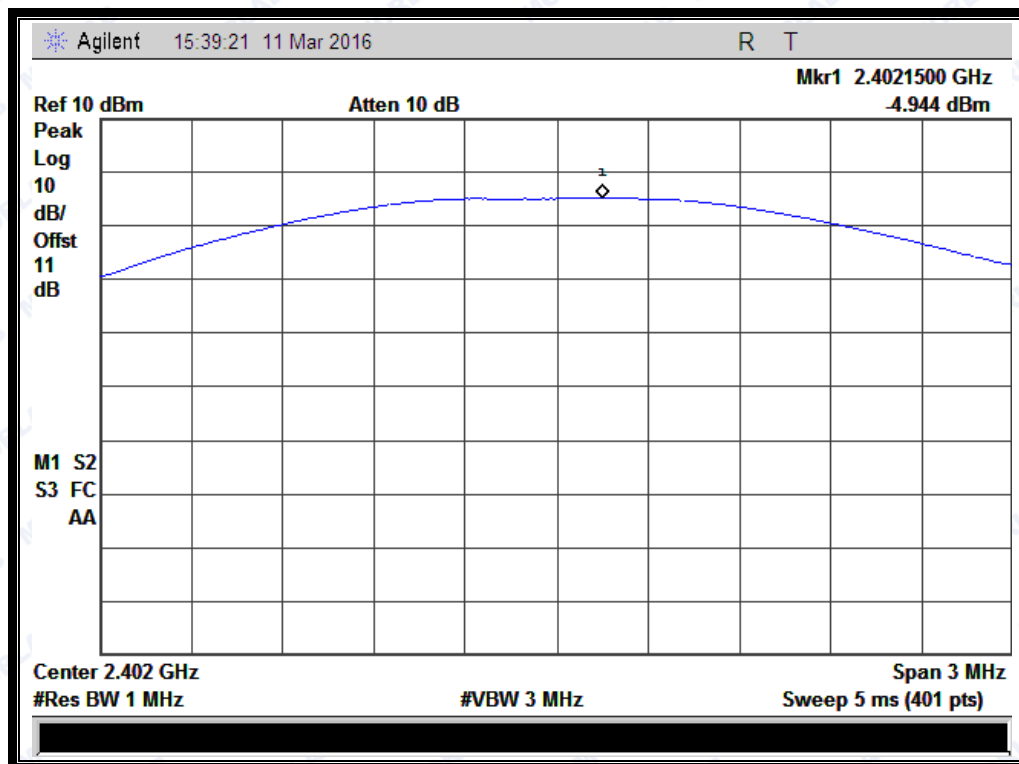
2.2.3 Test Result

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	-4.94	0.00032	Plot A	30	1	PASS
19	2440	-1.73	0.00067	Plot B			PASS
39	2480	-3.56	0.00044	Plot C			PASS

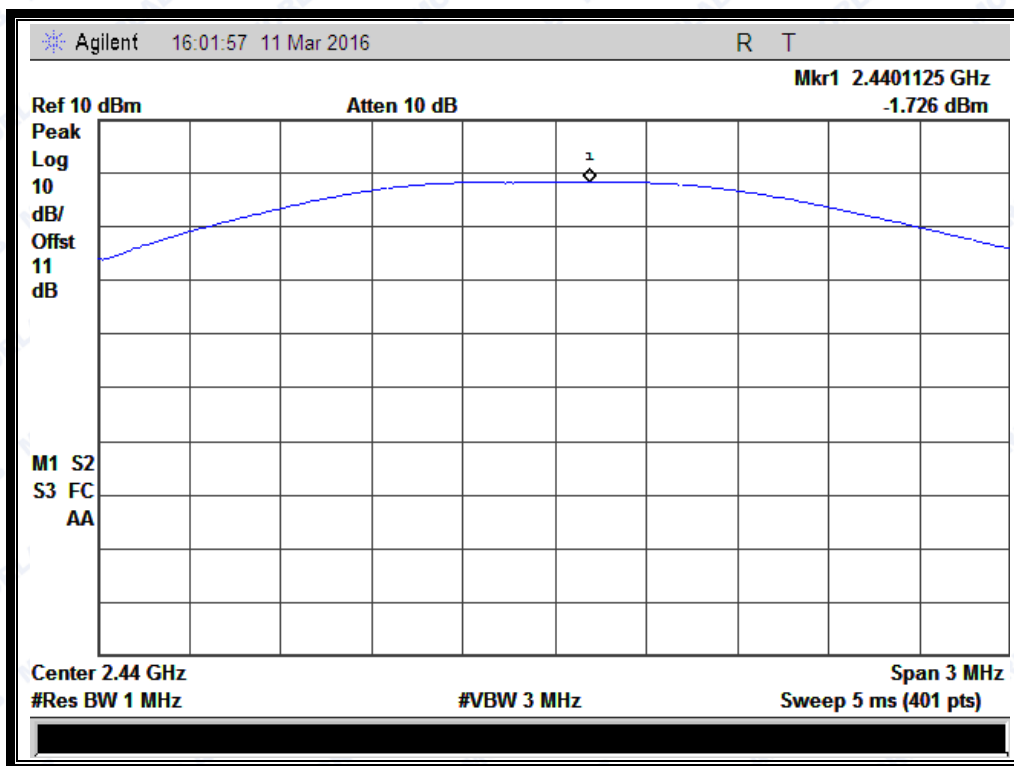
B. Test Plots:



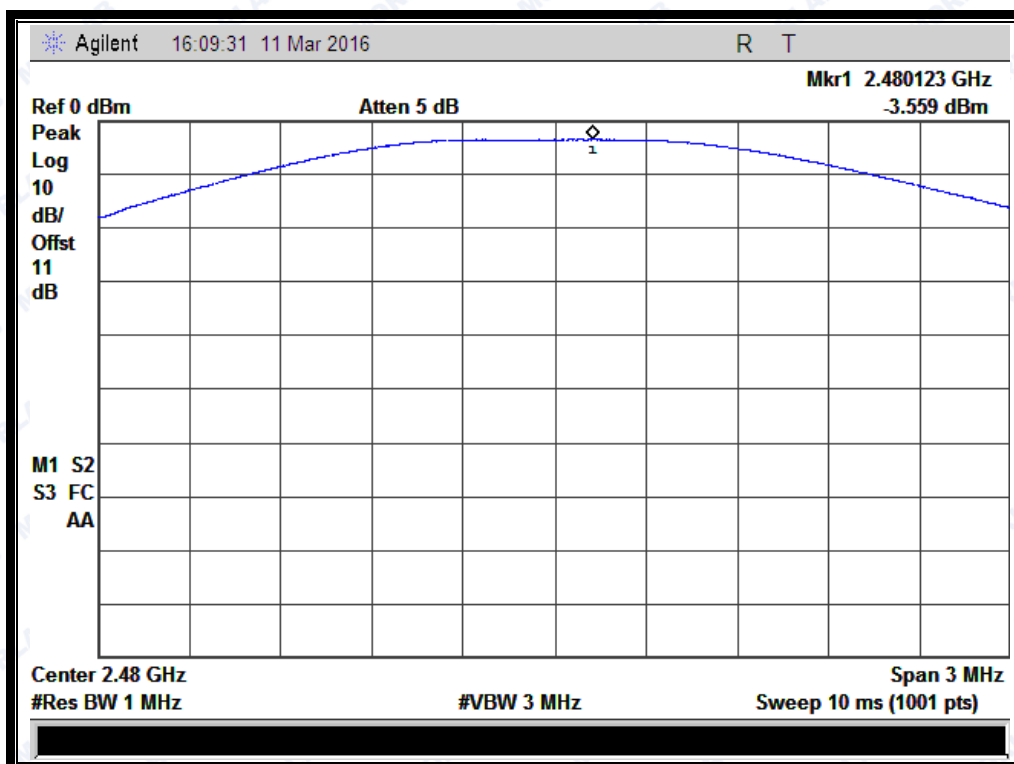
(Plot A: Channel 0: 2402MHz)



REPORT No.: SZ16020052W03



(Plot B: Channel 19: 2440MHz)



(Plot C: Channel 39: 2480MHz)

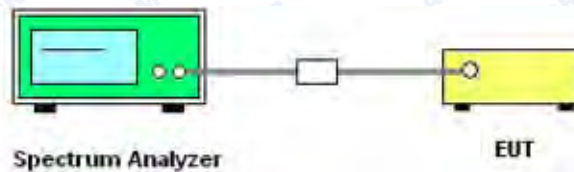
2.3 6dB Bandwidth

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(1.4).

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.

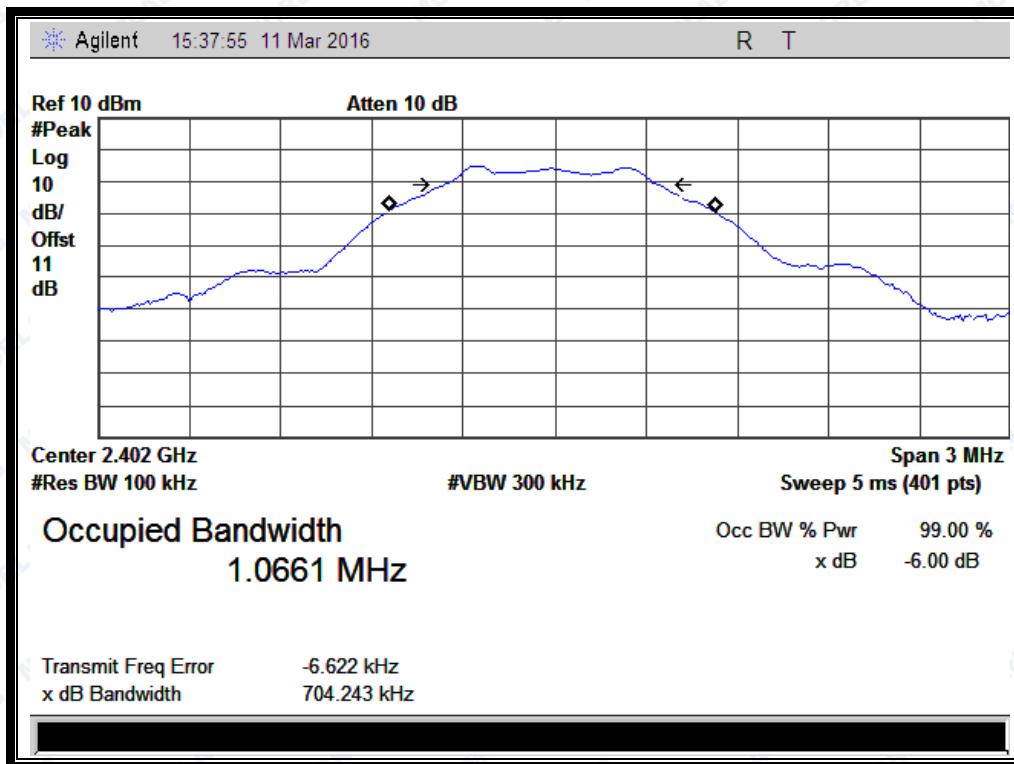
A. Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Refer to Plot	Limits(kHz)	Result
0	2402	0.7042	Plot A	≥500	PASS
19	2440	0.7049	Plot B	≥500	PASS
39	2480	0.6970	Plot C	≥500	PASS

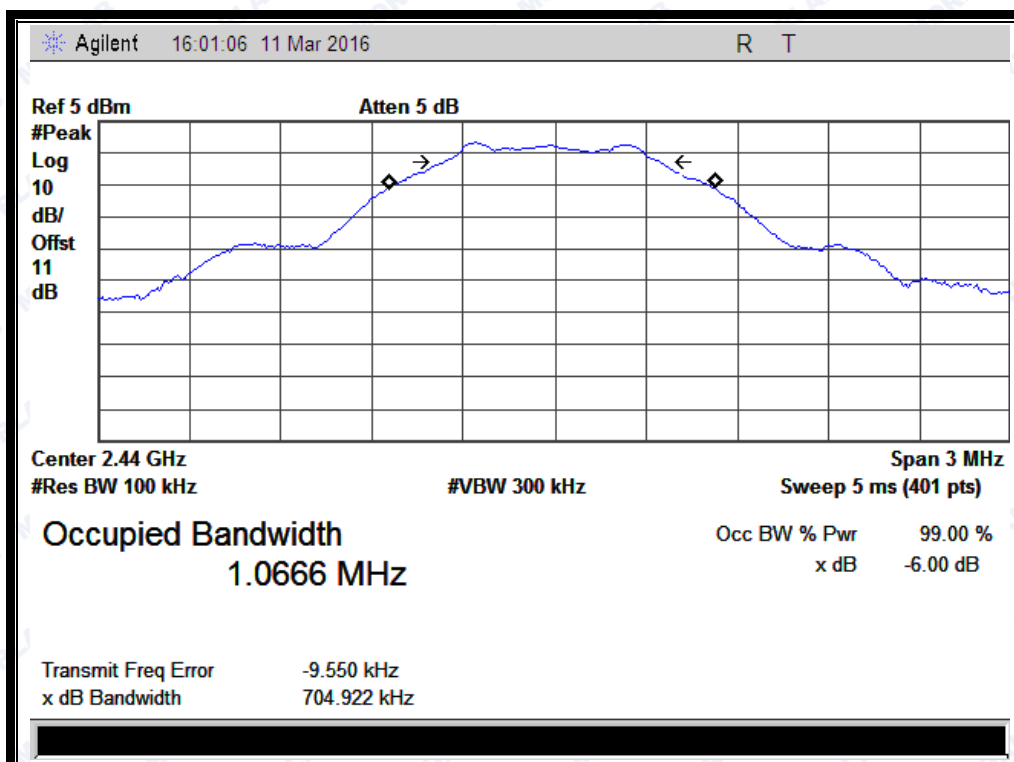
B. Test Plots:



REPORT No.: SZ16020052W03



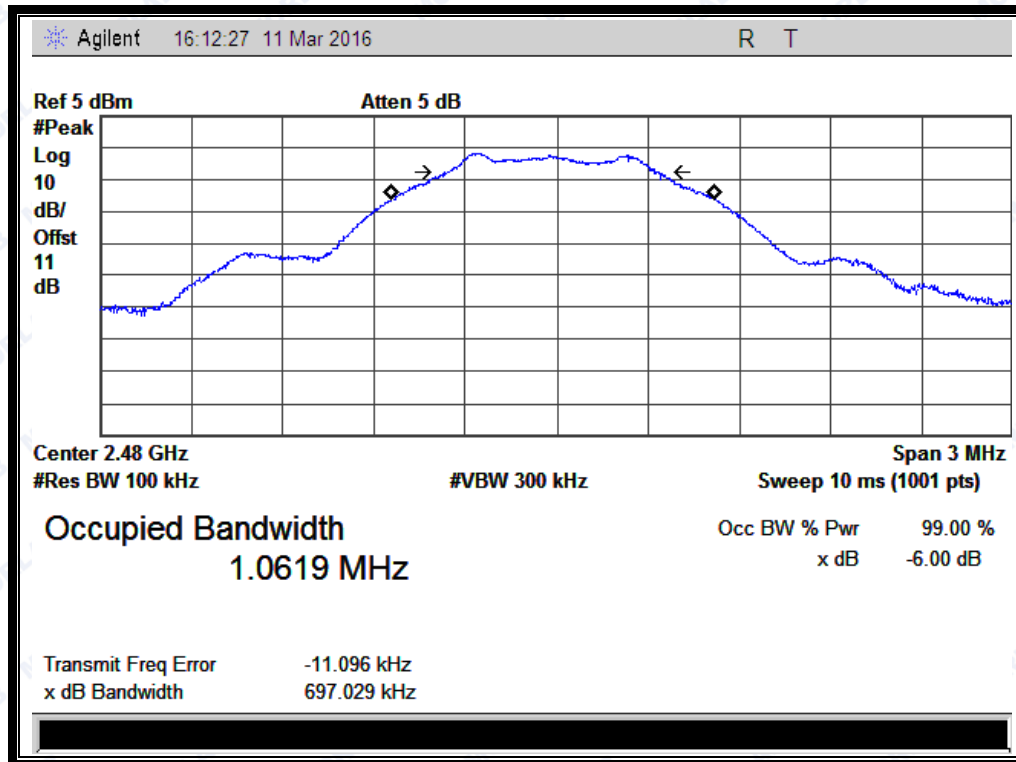
(Plot A: Channel 0: 2402MHz)



(Plot B: Channel 19: 2440 MHz)



REPORT No.: SZ16020052W03



(Plot C: Channel 39: 2480MHz)

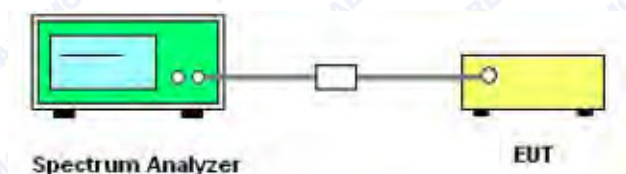
2.4 Conducted Spurious Emissions and Band Edge

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 (1.4).

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:

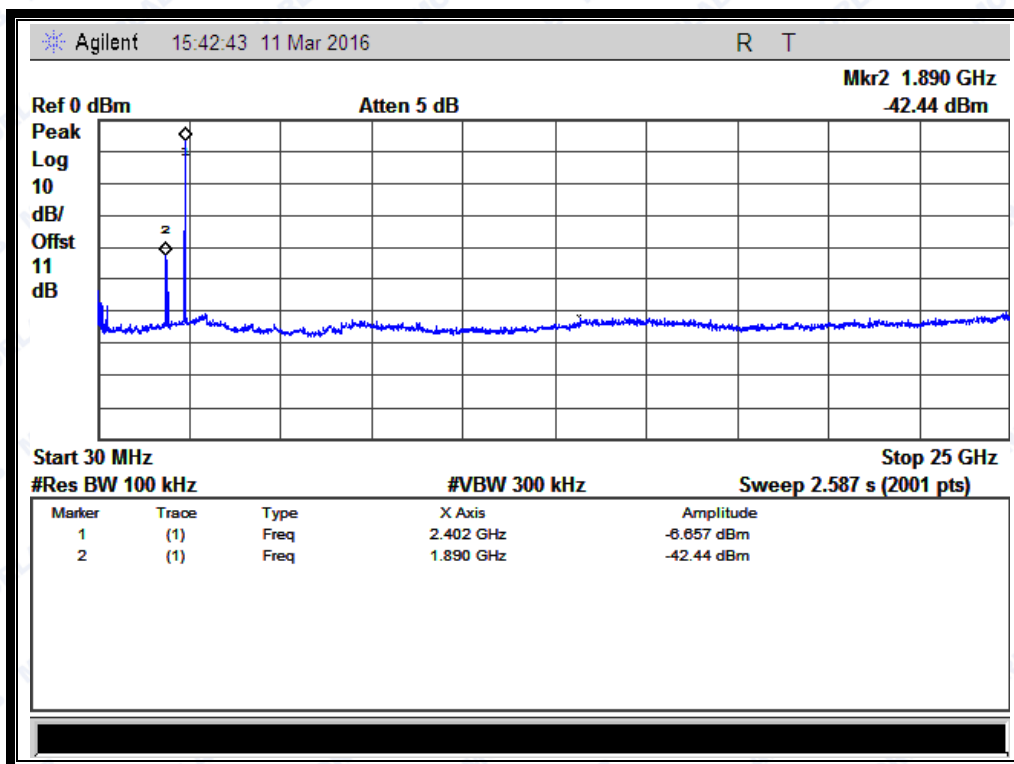
Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Refer to Plot	Limit (dBm)		Verdict
				Carrier Level	Calculated -20dBc Limit	
0	2402	-42.44	Plot A.1	-6.66	-26.66	PASS
19	2440	-50.82	Plot B.1	-6.16	-26.16	PASS
39	2480	-53.84	Plot C.1	-9.73	-29.73	PASS

B. Test Plots:

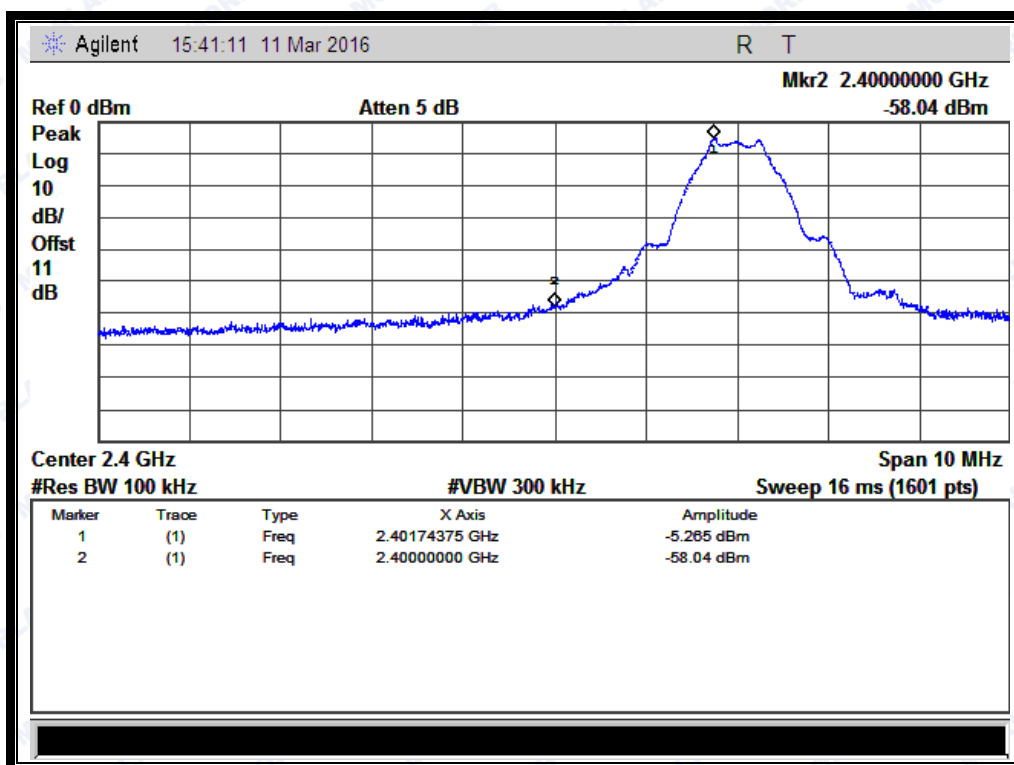
Note: the power of the EUT transmitting frequency should be ignored.



REPORT No.: SZ16020052W03



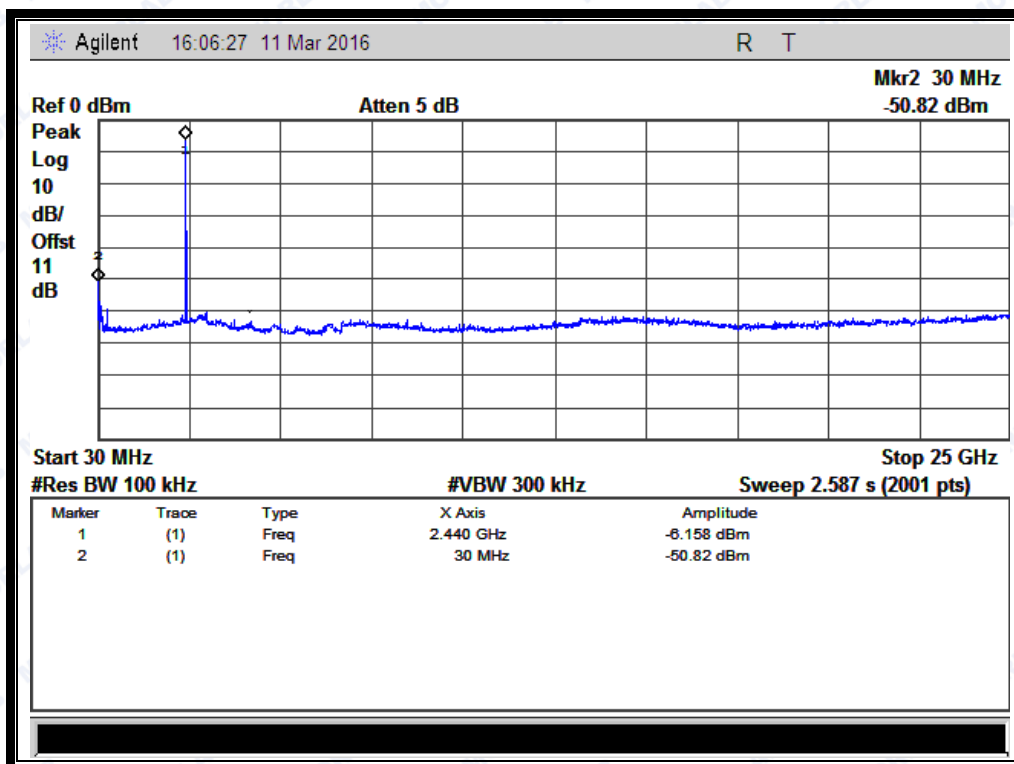
(Plot A.1: Channel = 0, 30MHz to 25GHz)



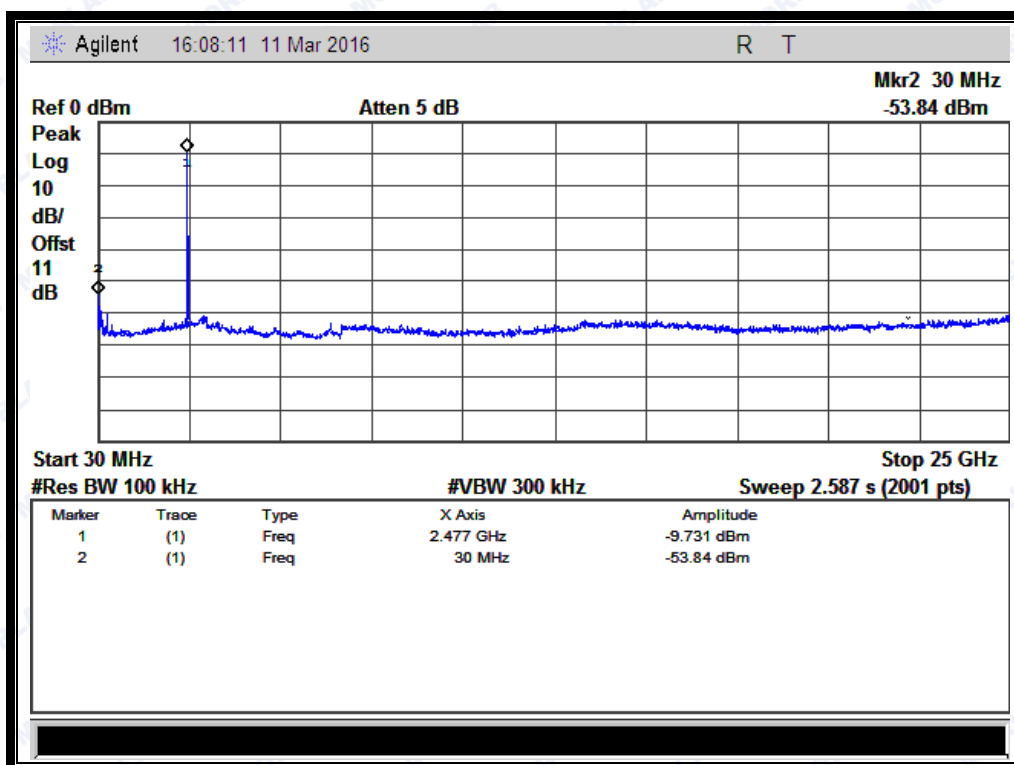
(Band Edge@ Channel = 0)



REPORT No.: SZ16020052W03



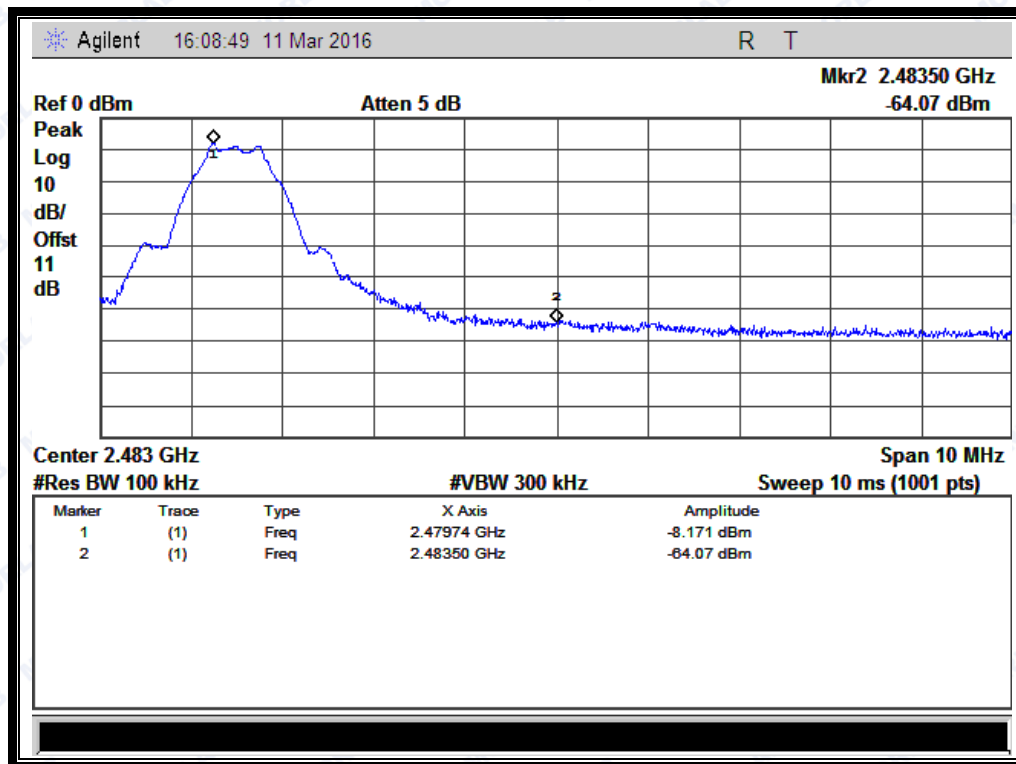
(Plot B.1: Channel = 19, 30MHz to 25GHz)



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



REPORT No.: SZ16020052W03



(Band Edge@ Channel = 39)

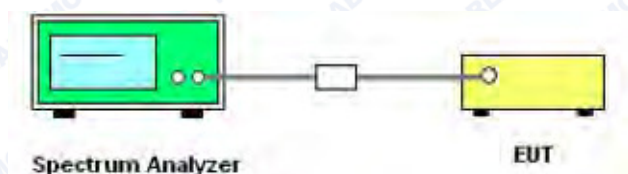
2.5 Power spectral density (PSD)

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 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.

B. Equipments List:

Please reference ANNEX A (1.4).

2.5.3 Test Result

The lowest, middle and highest channels are tested.

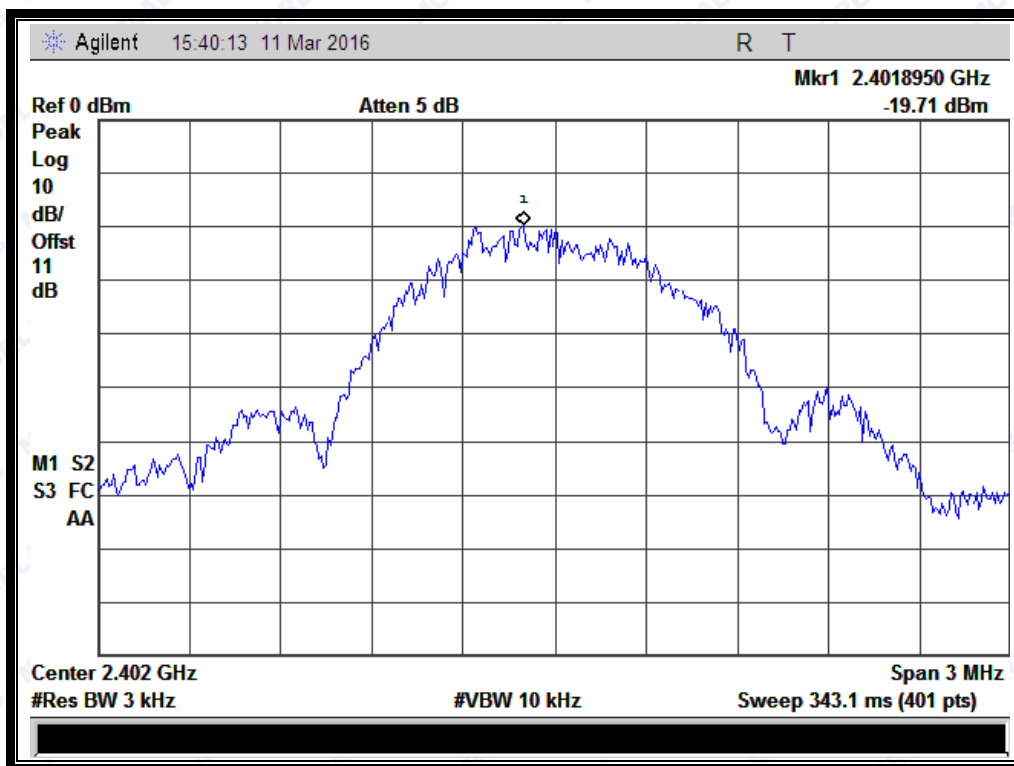
A. Test Verdict:

Spectral power density (dBm/3kHz)					
Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)	Refer to Plot	Limit (dBm/3kHz)	Verdict
0	2402	-19.71	Plot A	8	PASS
19	2440	-16.32	Plot B	8	PASS
39	2480	-18.14	Plot C	8	PASS
Measurement uncertainty: ± 1.3 dB					

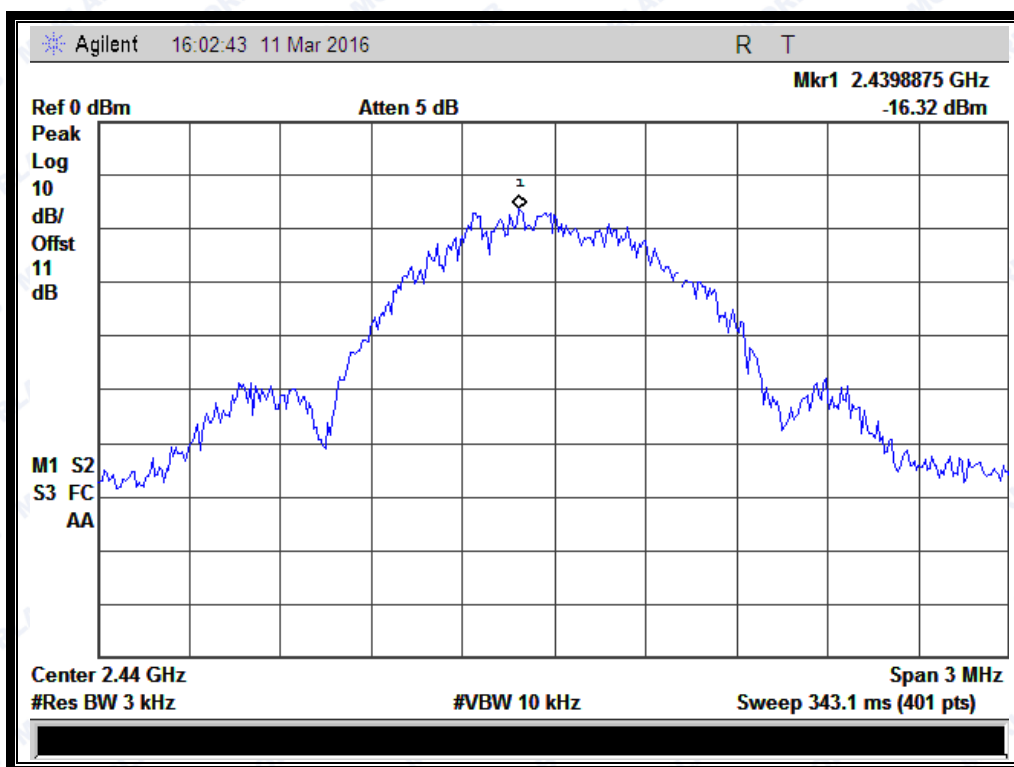
B. Test Plots:



REPORT No.: SZ16020052W03



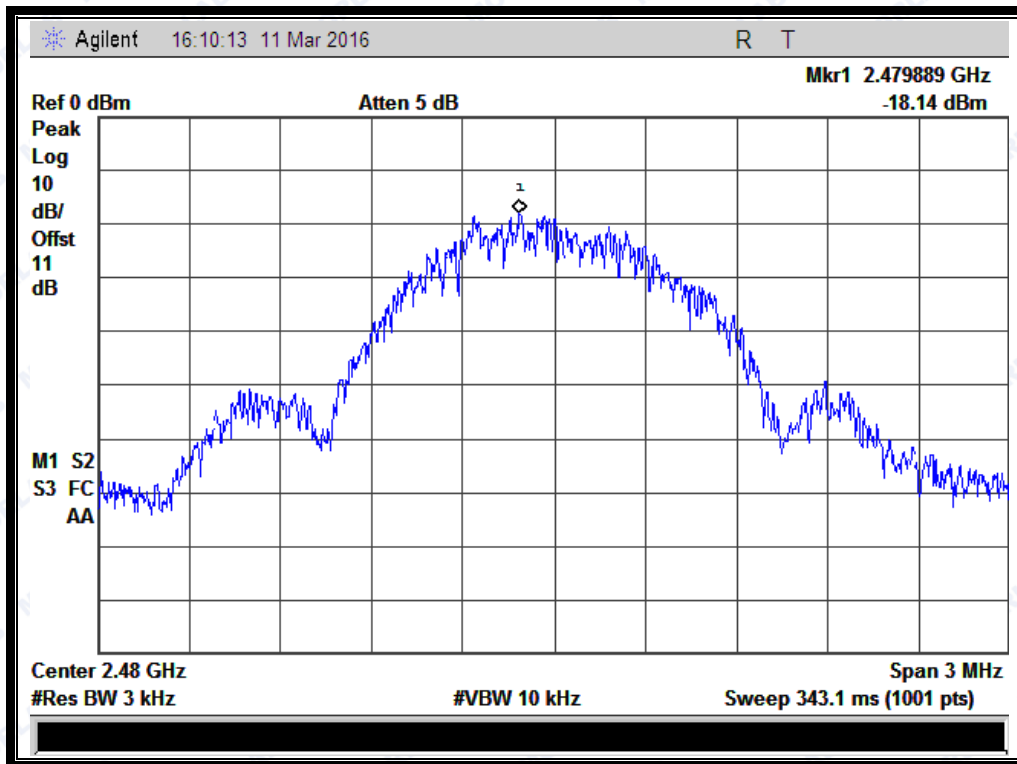
(Plot A: Channel = 0)



(Plot B: Channel = 19)



REPORT No.: SZ16020052W03



(Plot C: Channel = 39)

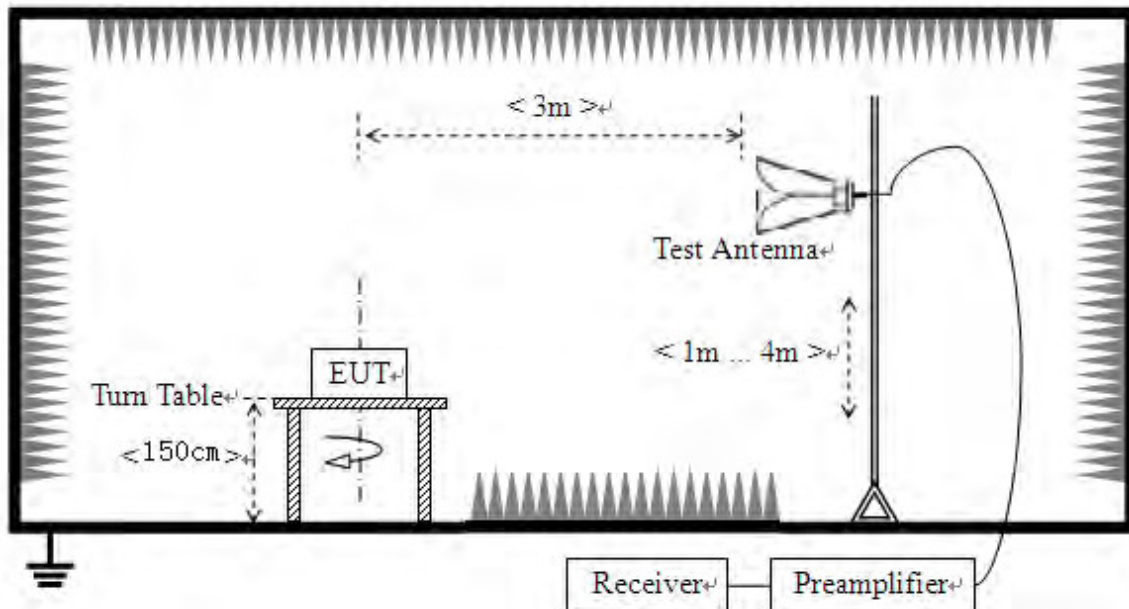
2.6 Restricted Frequency Bands

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(1.4).



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 (dBμV/m)	Limit (dBμV/m)	Verdict
		PK/ AV						
0	2382.18	PK	44.69	-33.63	32.56	43.62	74	Pass
0	2382.18	AV	33.06	-33.63	32.56	31.99	54	Pass
39	2486.14	PK	44.52	-33.18	32.5	43.84	74	Pass
39	2485.43	AV	33.08	-33.18	32.5	32.40	54	Pass

B. Test Plots:







2.7 Radiated Emission

2.7.1 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:

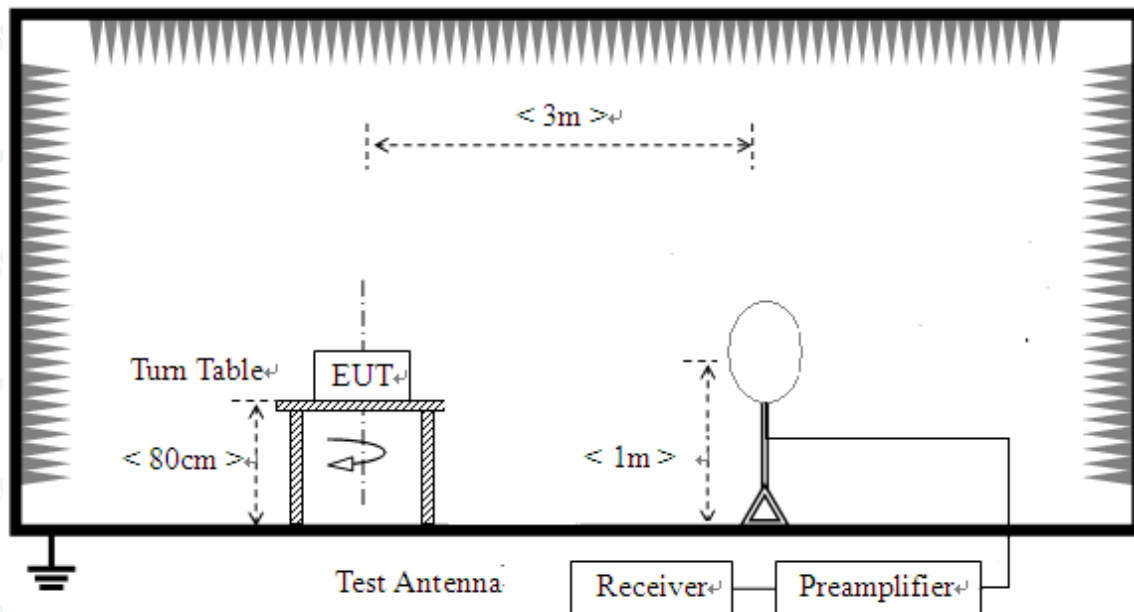
1. For Above 1000MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.
2. For above 1000MHz, limit field strength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

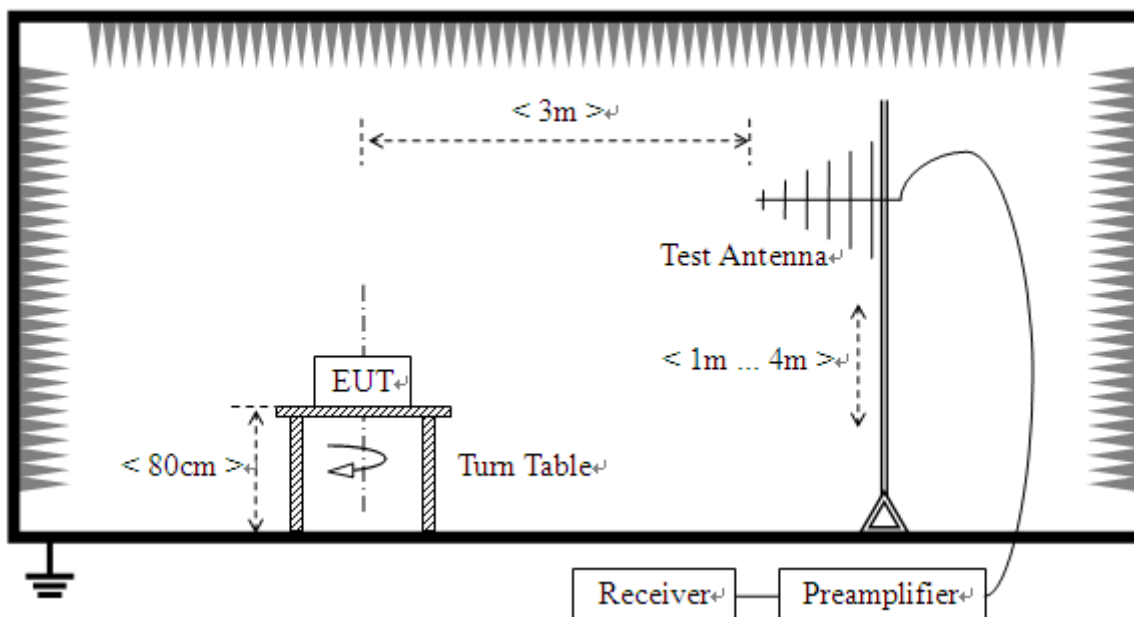
2.7.2 Test Description

A. Test Setup:

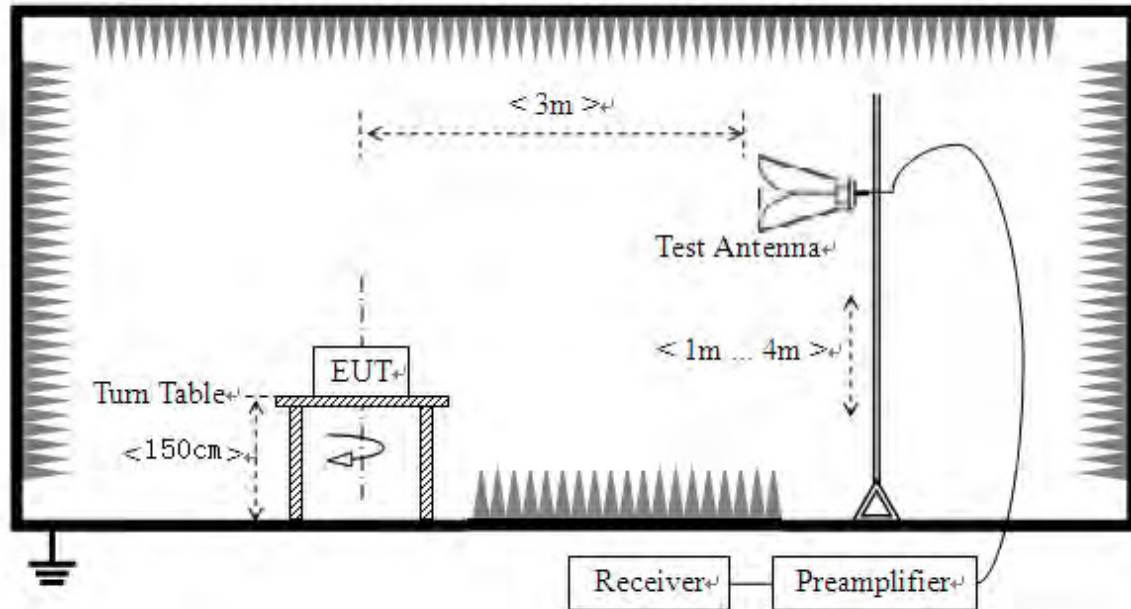
- 1) For radiated emissions from 9kHz to 30MHz



- 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.

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(1.4).

2.7.3 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

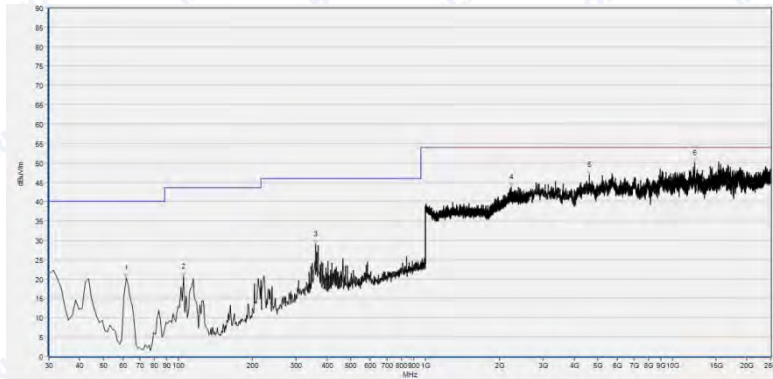
During the test, the total correction Factor A_T and A_{Factor} were built in test software.

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 = 0



Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
61.564	20.22	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
105.269	20.62	N.A	N.A	N.A	43.50	N.A	Horizontal	PASS
360.213	29.05	N.A	N.A	N.A	46.00	N.A	Horizontal	PASS
2230.572	43.67	N.A	N.A	74.0	N.A	54.00	Horizontal	PASS
4616.367	46.94	N.A	N.A	74.0	N.A	54.00	Horizontal	PASS
12307.074	49.89	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
61.564	29.25	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
114.981	23.56	N.A	N.A	N.A	43.50	N.A	Vertical	PASS
456.120	26.65	N.A	N.A	N.A	46.00	N.A	Vertical	PASS
2604.073	44.67	N.A	N.A	74.0	N.A	54.00	Vertical	PASS
5675.468	47.42	N.A	N.A	74.0	N.A	54.00	Vertical	PASS
10359.956	49.46	N.A	N.A	74.0	N.A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 25GHz)



REPORT No.: SZ16020052W03

Plot for Channel = 19



Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
61.564	19.69	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
113.767	21.44	N.A	N.A	N.A	43.50	N.A	Horizontal	PASS
220.601	23.07	N.A	N.A	N.A	46.00	N.A	Horizontal	PASS
2389.996	43.62	N.A	N.A	74.0	N.A	54.00	Horizontal	PASS
6591.999	46.83	N.A	N.A	74.0	N.A	54.00	Horizontal	PASS
12095.254	48.87	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
43.354	27.70	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
61.564	27.70	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
114.981	24.99	N.A	N.A	N.A	43.50	N.A	Vertical	PASS
360.213	24.99	N.A	N.A	N.A	46.00	N.A	Vertical	PASS
4229.387	45.43	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
14384.543	49.03	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
62.778	19.97	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
223.029	22.58	N.A	N.A	N.A	46.00	N.A	Horizontal	PASS
576.308	28.18	N.A	N.A	N.A	46.00	N.A	Horizontal	PASS
2840.335	44.55	N.A	N.A	74.0	N.A	54.00	Horizontal	PASS
4730.424	47.10	N.A	N.A	74.0	N.A	54.00	Horizontal	PASS
11830.478	48.95	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
43.354	27.71	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
61.564	28.09	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
367.497	25.24	N.A	N.A	N.A	46.00	N.A	Vertical	PASS
2624.441	45.32	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
5105.183	46.91	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
12180.797	50.27	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



REPORT No.: SZ16020052W03

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	2015.03.28	2016.03.27
2	USB Wideband Power Sensor	MY54210011	U2021XA	Agilent	2015.03.28	2016.03.27
3	EXA Signal Analyzer	MY53470838	N9010A	Agilent	2015.08.26	2016.08.25
4	RF cable	CB01	RF01	Morlab	N/A	N/A
5	Attenuator	(n.a.)	10dB	Resnet	N/A	N/A
6	SMA connector	CN01	RF03	HUBER-SUHNER	N/A	N/A

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	2015.05.07	2016.05.06
2	Receiver	MY54130016	N9038A	Agilent	2015.05.07	2016.05.06
3	Test Antenna - Bi-Log	N/A	VULB9163	Schwarzbeck	2015.05.14	2016.05.13
4	Test Antenna - Horn	9170C-531	BBHA9170	Schwarzbeck	2015.03.31	2016.03.30
5	Test Antenna - Loop	1519-022	FMZB1519	Schwarzbeck	2015.03.26	2016.03.25
6	Test Antenna - Horn	71688	BBHA 9120D	Schwarzbeck	2015.03.26	2016.03.25
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	2015.03.26	2016.03.25
10	18-26.5GHz pre-Amplifier	MA03	TS-PR18	Rohde&Schwarz	2015.03.26	2016.03.25



REPORT No.: SZ16020052W03

1.5.3 Conducted Emission Test Equipments

Conducted Emission Test Equipments

No.	Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Cal. Due
1	Receiver	595WX11007	PMM9010	Narda S.T.S/PMM	2015.05.07	2016.05.06
2	LISN	812744	NSLK 8127	Schwarzbeck	2015.06.18	2016.06.17
3	Pulse Limiter (20dB)	9391	VTSD 9561-D	Schwarzbeck	2015.05.07	2016.05.06
4	Coaxial cable(BNC)	CB01	EMC01	Morlab	N/A	N/A

1.5.4 Climate Chamber

Climate Chamber

No.	Equipment Name	Serial No.	Type	Manufacturer	Cal.Date	Cal.Due Date
1	Climate Chamber	2004012	HL4003T	Yinhe	2015.03.26	2016.03.25

1.5.5 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	2015.03.26	2016.03.25

1.5.6 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	2015.05.14	2016.05.13

1.5.7 Auxiliary Test Equipment

Auxiliary Test Equipment

No.	Equipment Name	Serial No.	Type	Manufacturer	Cal.Date	Cal.Due Date
1	Computer	N.A	N.A	Asus	N.A	N.A

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