RF TEST REPORT

Report No.: SET2019-13389

Product Name: Industrial tablet

FCC ID: 2AC6AP80B

Model No. : P80

Applicant: Shenzhen Chainway Information Technology Co.,Ltd.

Address: 9/F, Building 2, Daqian Industrial Park, Longchang Rd., District 67, Bao'an, Shenzhen, China

Dates of Testing: 09/28/2019 — 12/12/2019

Issued by: CCIC Southern Testing Co., Ltd.

Lab Location: Electronic Testing Building, No. 43 Shahe Road, Xili Street, Nanshan District, Shenzhen, Guangdong, China.

Tel: 86 755 26627338 **Fax:** 86 755 26627238

This test report consists of 34 pages in total. It may be duplicated completely for legal use with the approval of the applicant. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product endorsement by CCIC-SET. The test results in the report only apply to the tested sample. The test report shall be invalid without all the signatures of testing engineers, reviewer and approver. Any objections must be raised to CCIC-SET within 20 days since the date when the report is received. It will not be taken into consideration beyond this limit.

Test Report

Product Name ..... :	Industrial tablet
Brand Name ..... :	CHAINWAY
Trade Name ..... :	CHAINWAY
Applicant ..... :	Shenzhen Chainway Information Technology Co.,Ltd.
Applicant Address ..... :	9/F, Building 2, Daqian Industrial Park, Longchang Rd., District 67, Bao'an, Shenzhen, China
Manufacturer..... :	Shenzhen Chainway Information Technology Co.,Ltd.
Manufacturer Address ..... :	9/F, Building 2, Daqian Industrial Park, Longchang Rd., District 67, Bao'an, Shenzhen, China
Test Standards..... :	47 CFR Part 15 Subpart C：Radio Frequency Devices ANSI C63.10-2013：American National Standard for Testing Unlicensed Wireless Devices
Test Result ..... :	PASS
Tested by ..... :	Vincent 2020.01.14 Vincent, Test Engineer
Reviewed by..... :	Chris You 2020.01.14 Chris You, Senior Engineer
Approved by ..... :	Shuangwen Zhang 2020.01.14 Shuangwen Zhang, Manager

TABLE OF CONTENTS

Change History		
Issue	Date	Reason for change
1.0	2020.01.14	First edition

1. General Information

1.1. EUT Description

EUT Type	Industrial tablet	
Frequency Range	Bluetooth LE 4.0	2402MHz~2480MHz
Channel Number	Bluetooth LE 4.0	40
Bit Rate of Transmitter	Bluetooth LE 4.0	1Mbps
Modulation Type	Bluetooth LE 4.0	GFSK
Antenna Type	Internal	
Antenna Gain	1.16dBi	

Note 1: The EUT is a Industrial tablet, it contain Bluetooth 4.0 LE Module operating at 2.4GHz ISM band; the frequencies allocated for the Bluetooth 4.0 LE is F(MHz)=2402+2*n (0<=n<=39). The lowest, middle, highest channel numbers of the Bluetooth Module used and tested in this report are separately 0 (2402MHz), 19(2440MHz) and 39 (2480MHz).

Note 2: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

Note 3: The EUT was programmed to be in continuously transmitting mode and the transmit duty cycle is not less than 98%.

1.2. 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 Certification:

No.	Identity	Document Title
1	47 CFR Part 15 Subpart C 2017	Radio Frequency Devices
2	ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices

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

No.	Section in CFR 47	Description	Result
1	15.203	Antenna Requirement	PASS
2	15.247(b)	Peak Output Power	PASS
3	15.247(a)	Bandwidth	PASS
4	15.247(d)	Conducted Band Edges and Spurious Emission	PASS
5	15.247(e)	Power spectral density (PSD)	PASS
6	15.207	Conducted Emission	PASS
7	15.209 15.247(d) 15.205	Radiated Band Edges and Spurious Emission	PASS

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

40 channels are provided for Bluetooth LE 4.0

Channel	Frequency(MHz)	Channel	Frequency(MHz)
0	2402	20	2442
1	2404	21	2444
2	2406	22	2446
3	2408	23	2448
4	2410	24	2450
5	2412	25	2452
6	2414	26	2454
7	2416	27	2456
8	2418	28	2458
9	2420	29	2460
10	2422	30	2462
11	2424	31	2464
12	2426	32	2466
13	2428	33	2468

14	2430	34	2470
15	2432	35	2472
16	2434	36	2474
17	2436	37	2476
18	2438	38	2478
19	2440	39	2480

	Test Items	Modulation	Channel
Bluetooth LE 4.0	Peak Conducted Output Power Power Spectral Density 6dB Bandwidth Conducted and Spurious Emission Radiated and Spurious Emission	GFSK	0/20/39
	Band Edge	GFSK	0/39

1.3. Table for Supporting Units

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

1.4. Facilities and Accreditations

1.4.1. Facilities

CNAS-Lab Code: L1659

CCIC-SET is a third party testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L1659.

FCC-Registration No.: CN5031

CCIC Southern Testing Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Designation Number: CN5031, valid time is until December 31, 2020.

ISED Registration: 11185A-1

CCIC Southern Testing Co., Ltd. EMC Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 11185A-1 on Aug. 04, 2016, valid time is until Dec. 31, 2020.

NVLAP Lab Code: 201008-0

CCIC-SET is a third party testing organization accredited by NVLAP according to ISO/IEC 17025. The accreditation certificate number is 201008-0.

1.4.2. Test Environment Conditions

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

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

2. 47 CFR Part 15C Requirements

2.1. Antenna requirement

2.1.1. Applicable Standard

According to FCC 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

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

2.1.2. Antenna Information

Antenna Category: Internal antenna

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

Antenna General Information:

No.	EUT	Ant. Type	Gain(dBi)
1	Industrial tablet	Internal	1.16

2.1.3. Result: comply

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

2.2. Peak Output Power

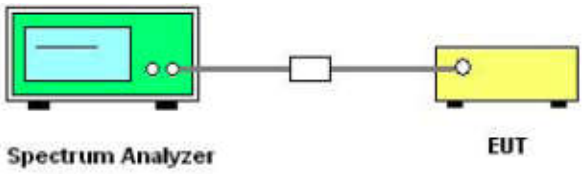
2.2.1. Limit of Peak Output Power

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. If transmitting antenna of directional gain greater than 6dBi is used, the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

2.2.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.2.3. Test Setup



2.2.4. Test Procedures

1. The testing follows the Measurement Procedure of ANSI C63.10-2013
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Use the following spectrum analyzer settings: Span = the frequency band of operation; RBW≥100KHz; VBW≥RBW; Sweep = auto; Detector function = peak; Trace = max hold.
5. Set to the maximum power setting and enable the EUT transmit continuously.
6. Measure the conducted output power and record the results in the test report.

2.2.5. Test Result

Please refer to Appendix A for detail

2.3. 6dB Bandwidth

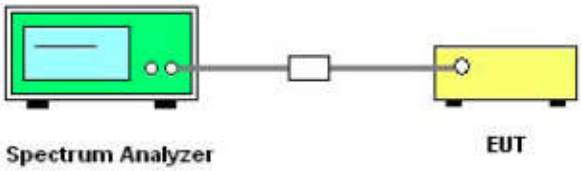
2.3.1. Limit of 6dB Bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

2.3.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.3.3. Test Setup



2.3.4. Test Procedures

1. The testing follows ANSI C63.10-2013

2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.

3. Set to the maximum power setting and enable the EUT transmit continuously.

4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6dB bandwidth must be greater than 500 kHz.

5. Measure and record the results in the test report.

2.3.5. Test Results of 6dB Bandwidth

Please refer to Appendix A for detail

2.4. Conducted Band Edges and Spurious Emissions

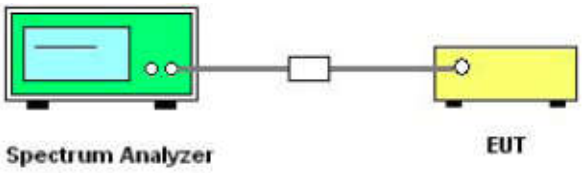
2.4.1. Limit of Conducted Band Edges and Spurious Emissions

All harmonics/spurious must be at least 20 dB down from the highest emission level within the authorized band.

2.4.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.4.3. Test Setup



2.4.4. Test Procedure

1. The testing follows ANSI C63.10-2013
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector. Unwanted Emissions measured in any 100kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d).
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

2.4.5. Test Results of Conducted Band Edges

Please refer to Appendix A for detail

2.5. Power spectral density (PSD)

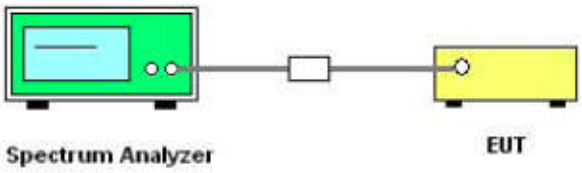
2.5.1. Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.

2.5.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.5.3. Test Setup



2.5.4. Test Procedures

1. The testing follows Measurement Procedure 10.2 Method PKPSD of ANSI C63.10-2013

2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.

3. Set to the maximum power setting and enable the EUT transmit continuously.

4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)

5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.

6. Measure and record the results in the test report.

7. The Measured power density (dBm)/ 100kHz is a reference level and used as 20dBc down limit line for Conducted Band Edges and Conducted Spurious Emission.

2.5.5. Test Results of Power spectral density

Please refer to Appendix A for detail

2.6. Radiated Band Edge and Spurious Emission

2.6.1. Limit of Radiated Band Edges and Spurious Emission

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below.

Note: Wireless charger configuration was evaluated.

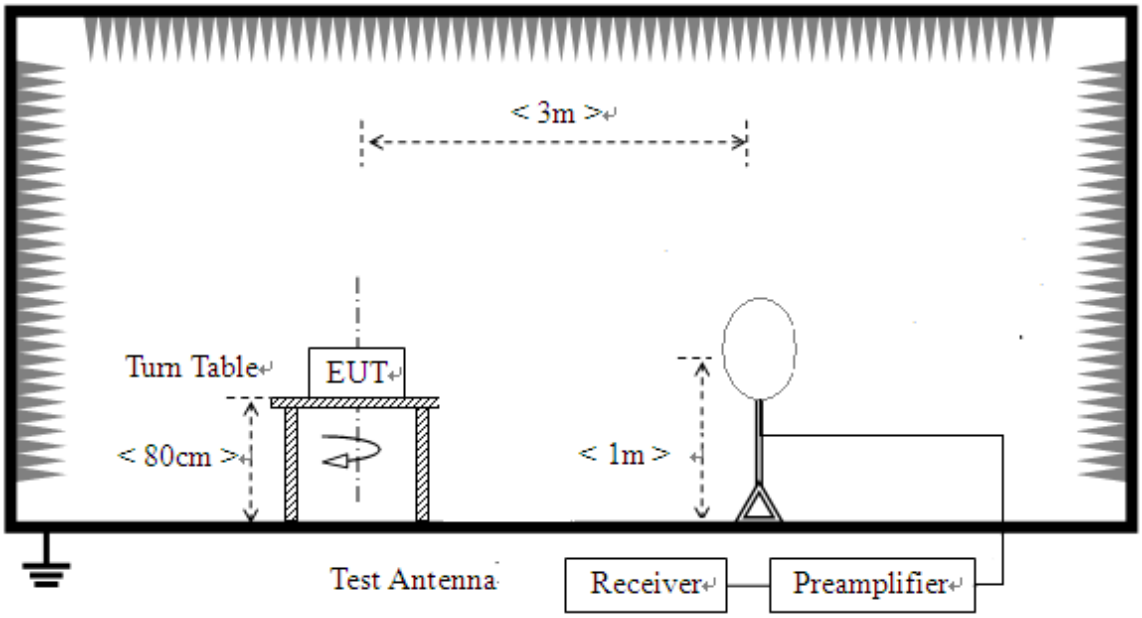
Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

2.6.2. Measuring Instruments

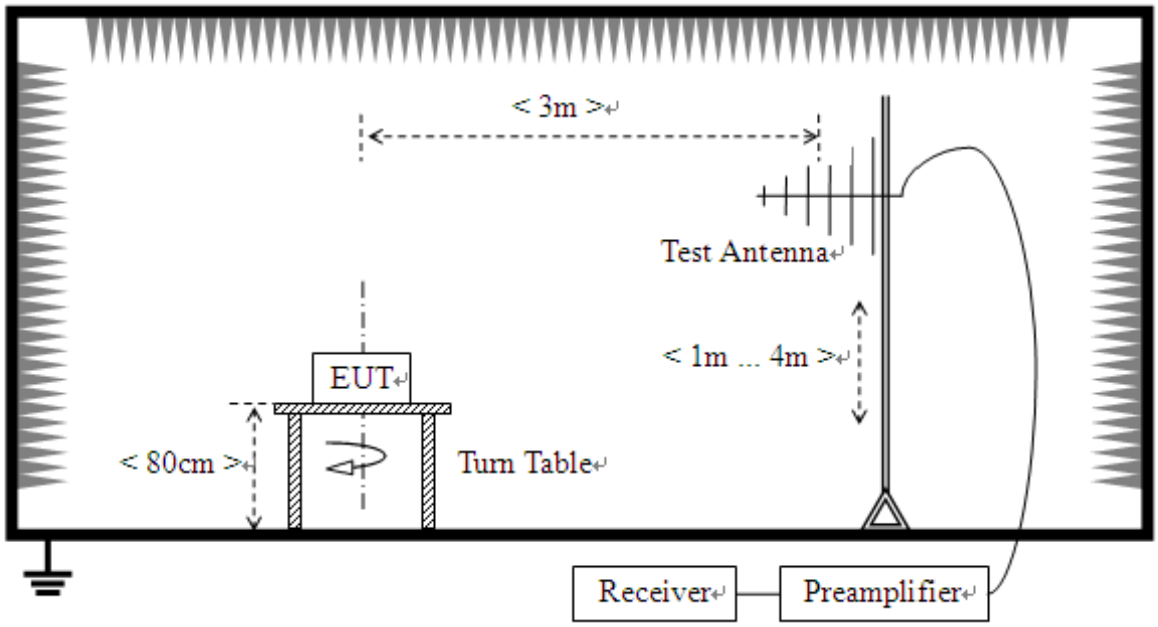
The measuring equipment is listed in the section 3 of this test report.

2.6.3. Test Setup

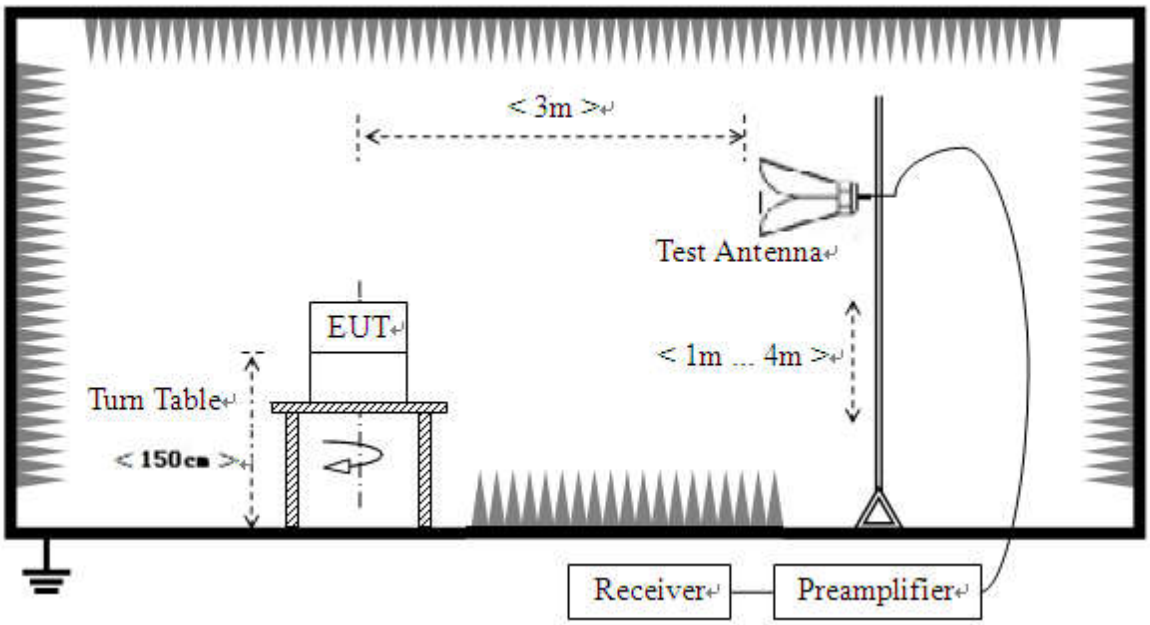
For radiated emissions from 9 KHz to 30 MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



2.6.4. Test Procedures

1. The EUT was placed on a turntable 0.8m below 1GHz and 1.5m above 1GHz above ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. Height of receiving antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

NOTE:

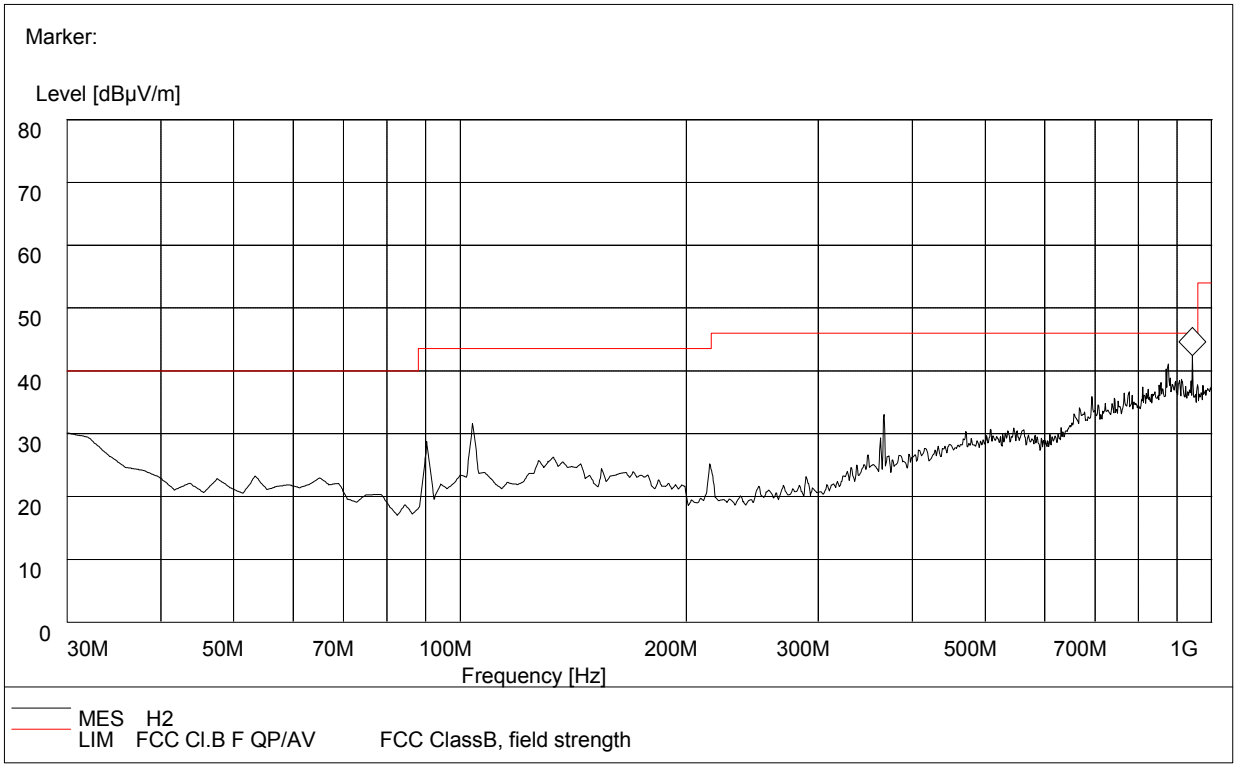
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is≥ 1/T (Duty cycle < 98%) or 10Hz(Duty cycle > 98%) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

2.6.5. Test Results of Radiated Band Edge and Spurious Emission

For 9KHz to 30MHz

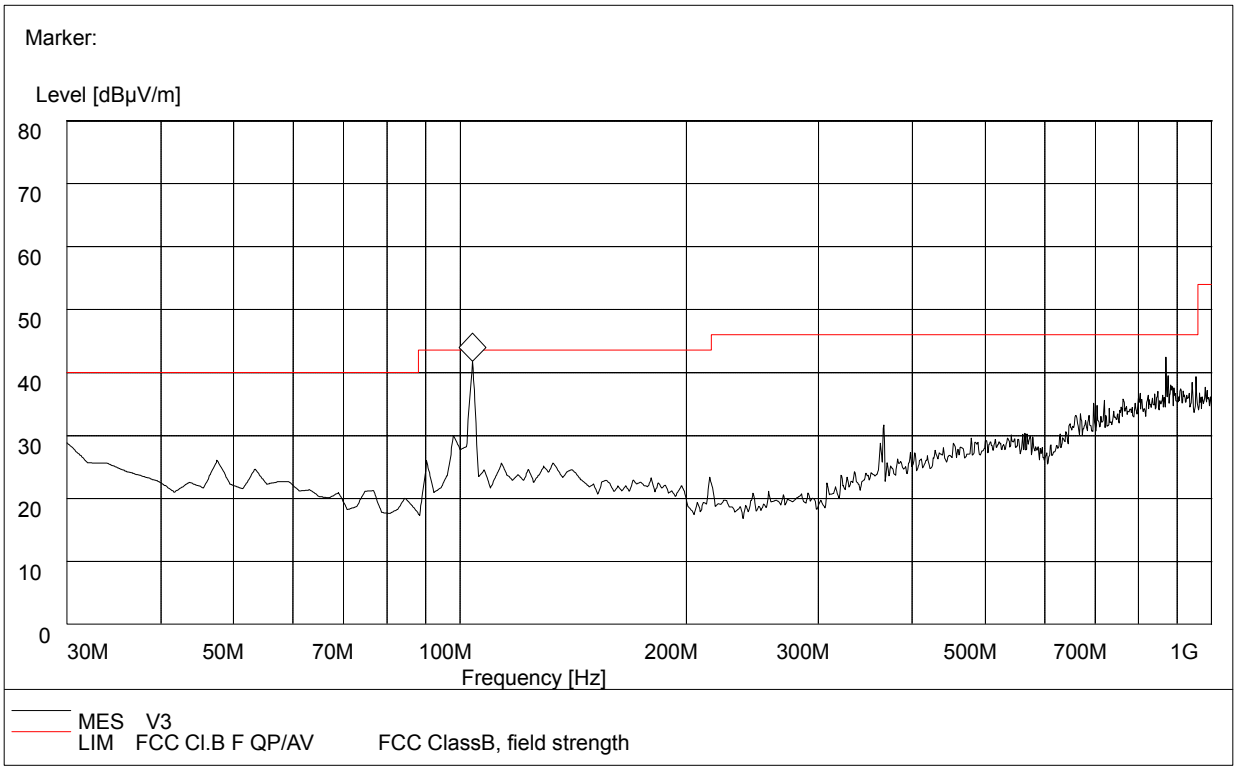
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

For 30MHz to 1000 MHz



Plot A: 30MHz to 1GHz, Antenna Horizontal

Frequency (MHz)	QuasiPeak (dB µ V/m)	Bandwidth (kHz)	Corr. Factor (dB/m)	Antenna height (cm)	Limit (dB µ V/m)	Margin	Antenna	Verdict
30	30.89	120.000	17.9	100.0	40.0	9.11	Horizontal	Pass
90.18	28.47	120.000	7.0	100.0	43.5	15.03	Horizontal	Pass
109.85	32.74	120.000	10.2	100.0	43.5	10.76	Horizontal	Pass
218.35	24.19	120.000	11.0	100.0	46.0	21.81	Horizontal	Pass
375.48	32.84	120.000	15.8	100.0	46.0	13.16	Horizontal	Pass
948.33	42.15	120.000	25.2	100.0	46.0	3.85	Horizontal	Pass



Plot B: 30MHz to 1GHz, Antenna Vertical

Frequency (MHz)	QuasiPeak (dB µ V/m)	Bandwidth (kHz)	Corr. Factor (dBµV/m)	Antenna height (cm)	Limit (dB µ V/m)	Margin	Antenna	Verdict
46.57	24.95	120.000	8.2	100.0	40.0	15.05	Vertical	Pass
103.74	41.25	120.000	10.2	100.0	43.5	2.25	Vertical	Pass
374.65	32.15	120.000	17.5	100.0	46.0	13.85	Vertical	Pass
462.95	29.84	120.000	19.3	100.0	46.0	16.16	Vertical	Pass
873.17	36.55	120.000	23.9	100.0	46.0	9.45	Vertical	Pass
934.42	42.19	120.000	25.2	100.0	46.0	3.81	Vertical	Pass

For 1GHz to 25GHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（0CH_2402MHz）												
No.	Fre. (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	2390	49.56	PK	74.00	-24.44	1.6	260	48.26	5.2	28.60	32.5	1.3
2	2390	39.44	AV	54.00	-14.56	1.6	260	38.14	5.2	28.60	32.5	1.3
3	4804	50.34	PK	74.00	-23.66	1.6	260	43.94	7.4	30.40	31.4	6.4
4	4804	40.21	AV	54.00	-13.79	1.6	260	33.81	7.4	30.40	31.4	6.4
5	7206	51.26	PK	74.00	-22.74	1.6	260	41.96	9.9	31.50	32.1	9.3
6	7206	41.37	AV	54.00	-12.63	1.6	260	32.07	9.9	31.50	32.1	9.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（0CH_2402MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	2390	48.87	PK	74.00	-25.13	1.7	180	47.57	5.2	28.60	32.5	1.3
2	2390	38.76	AV	54.00	-15.24	1.7	180	37.46	5.2	28.60	32.5	1.3
3	4804	51.36	PK	74.00	-22.64	1.7	180	44.96	7.4	30.40	31.4	6.4
4	4804	41.28	AV	54.00	-12.72	1.7	180	34.88	7.4	30.40	31.4	6.4
5	7206	51.24	PK	74.00	-22.76	1.7	180	41.94	9.9	31.50	32.1	9.3
6	7206	40.92	AV	54.00	-13.08	1.7	180	31.62	9.9	31.50	32.1	9.3

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（19CH_2440MHz）												
No.	Fre. (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	4880	46.35	PK	74.00	-27.65	1.6	120	39.95	6.7	31.20	31.5	6.4
2	4880	35.98	AV	54.00	-18.02	1.6	120	29.58	6.7	31.20	31.5	6.4
3	7320	51.24	PK	74.00	-22.76	1.6	120	44.84	6.7	31.20	31.5	6.4
4	7320	41.05	AV	54.00	-12.95	1.6	120	34.65	6.7	31.20	31.5	6.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（19CH_2440MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	4880	50.64	PK	74.00	-23.36	1.6	250	44.24	6.7	31.20	31.5	6.4
2	4880	40.40	AV	54.00	-13.6	1.6	250	34	6.7	31.20	31.5	6.4
3	7320	51.48	PK	74.00	-22.52	1.6	250	45.08	6.7	31.20	31.5	6.4
4	7320	41.19	AV	54.00	-12.81	1.6	250	34.79	6.7	31.20	31.5	6.4

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（39CH_2480MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	2483.5	48.36	PK	74.00	-25.64	1.6	240	44.96	5.7	29.50	31.8	3.4
2	2483.5	38.14	AV	54.00	-15.86	1.6	240	34.74	5.7	29.50	31.8	3.4
3	4960	50.37	PK	74.00	-23.63	1.6	240	44.82	7	30.05	31.5	5.55
4	4960	40.19	AV	54.00	-13.81	1.6	240	34.64	7	30.05	31.5	5.55
5	7440	52.36	PK	74.00	-21.64	1.6	240	37.16	16	31.20	32	15.2
6	7440	42.11	AV	54.00	-11.89	1.6	240	26.91	16	31.20	32	15.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（39CH_2480MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	2483.5	47.65	PK	74.00	-26.35	1.8	240	44.25	5.7	29.50	31.8	3.4
2	2483.5	37.50	AV	54.00	-16.5	1.8	240	34.1	5.7	29.50	31.8	3.4
3	4960	51.34	PK	74.00	-22.66	1.8	240	45.79	7	30.05	31.5	5.55
4	4960	40.62	AV	54.00	-13.38	1.8	240	35.07	7	30.05	31.5	5.55
5	7440	52.62	PK	74.00	-21.38	1.8	240	37.42	16	31.20	32	15.2
6	7440	42.27	AV	54.00	-11.73	1.8	240	27.07	16	31.20	32	15.2

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
   - Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level - Limit value
5. " * ": Fundamental frequency.

2.7. Conducted Emission

2.7.1. Limit of Conducted Emission

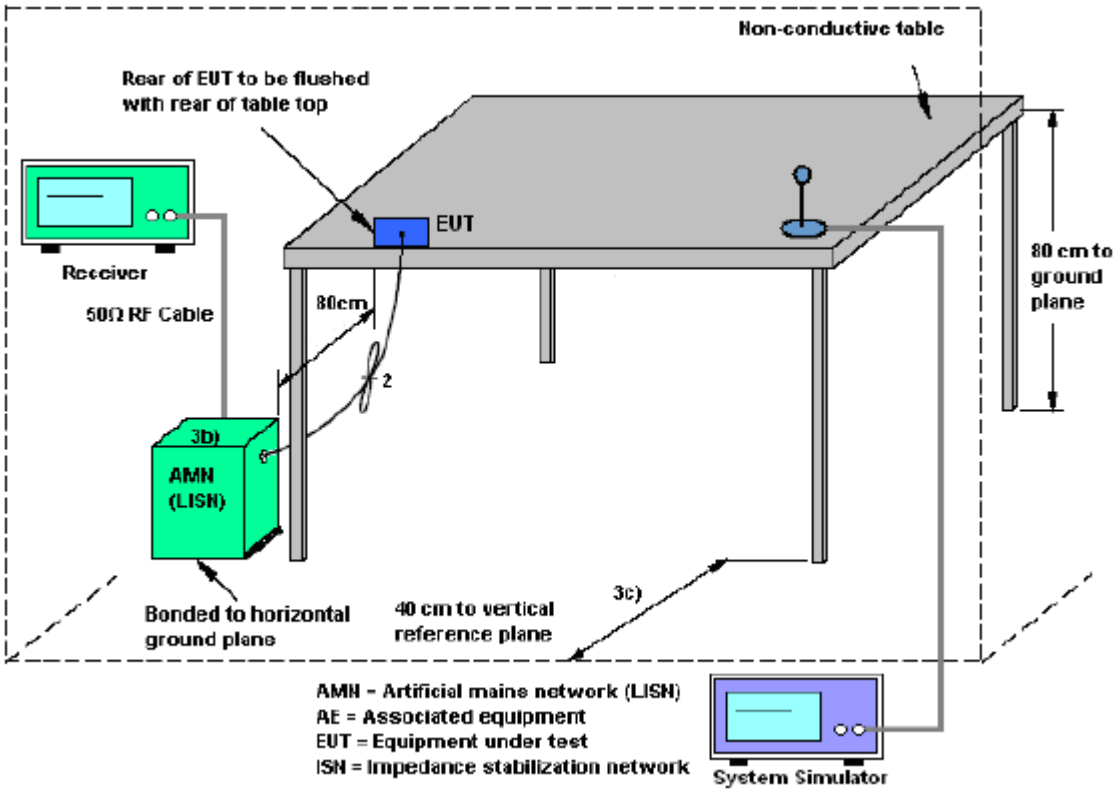
For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

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

2.7.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.7.3. Test Setup

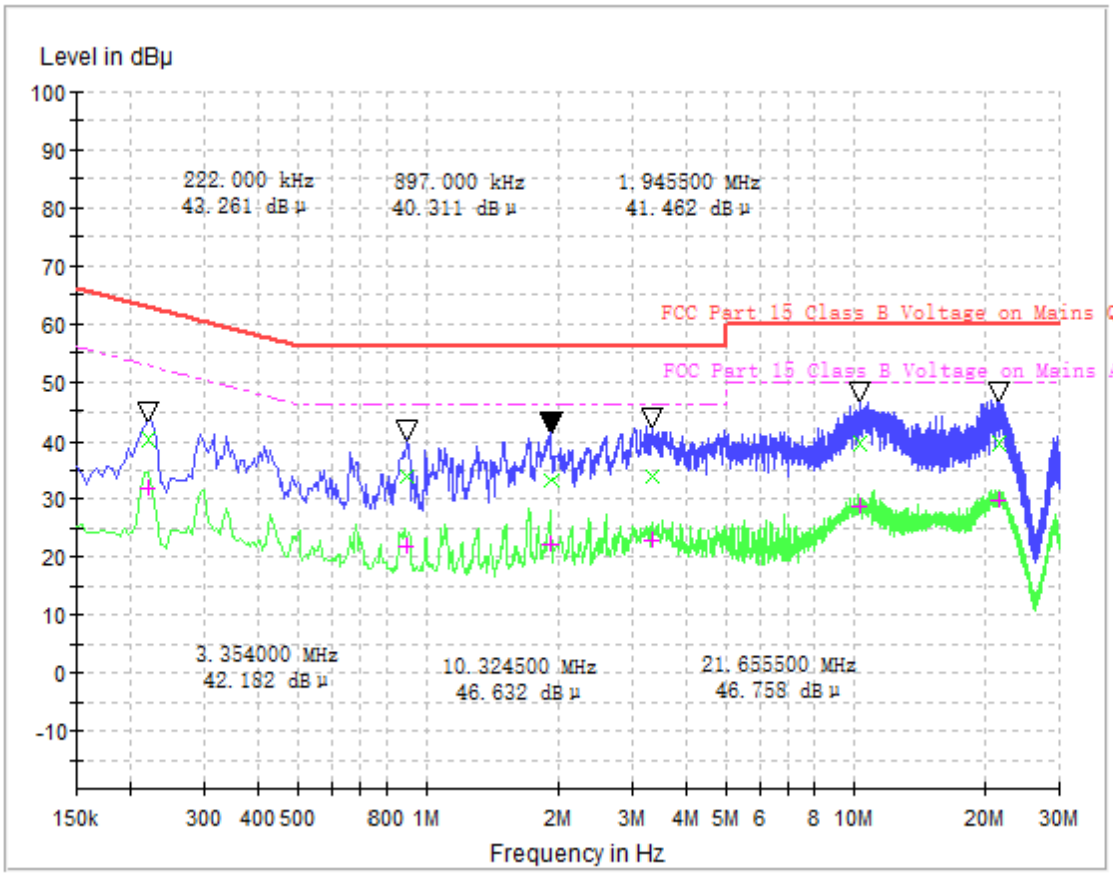


2.7.4. Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

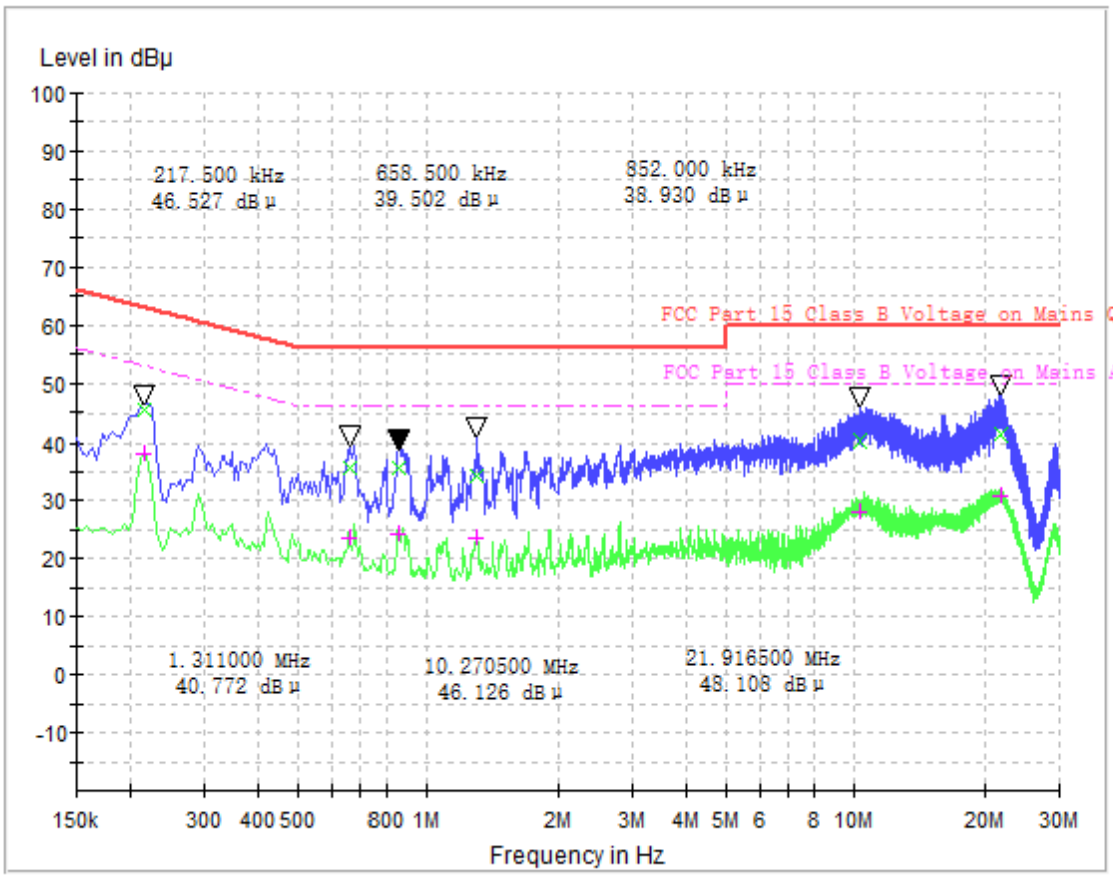
2.7.5. Test Result

The EUT configuration of the emission tests is Bluetooth Link + USB Cable (Charging from Adapter)



(Plot A: L Phase)

Frequency (MHz)	QuasiPeak (dB µ V)	CAverage (dB µ V)	Cabel Loss (dB)	Corr. (dB)	Margin - QPK	Limit - QPK	Margin - AV	Limit - AV (dB µ V)
0.222000	40.26	32.04	0.1	10.1	22.48	62.7	20.70	52.7
0.897000	33.81	21.78	0.1	10.1	22.19	56.0	24.22	46.0
1.945500	33.27	22.13	0.6	10.6	22.73	56.0	23.87	46.0
3.354000	34.11	22.73	0.6	10.6	21.89	56.0	23.27	46.0
10.324500	39.63	28.91	0.6	10.6	20.37	60.0	21.09	50.0
21.655500	39.63	29.65	0.7	10.7	20.37	60.0	20.35	50.0



(Plot B: N Phase)

Frequency (MHz)	QuasiPeak (dB µ V)	CAverage (dB µ V)	Cabel Loss (dB)	Corr. (dB)	Margin - QPK	Limit - QPK	Margin - AV	Limit - AV (dB µ V)
0.217500	45.21	38.24	0.1	10.1	17.70	62.9	14.67	52.9
0.658500	35.84	23.63	0.1	10.1	20.16	56.0	22.37	46.0
0.852000	35.55	24.13	0.1	10.1	20.45	56.0	21.87	46.0
1.311000	34.43	23.60	0.1	10.1	21.57	56.0	22.40	46.0
10.270500	40.27	27.95	0.2	10.2	19.73	60.0	22.05	50.0
21.916500	41.13	30.70	0.2	10.2	18.87	60.0	19.30	50.0

Test Result: PASS

Note: Correction factor=Cabel loss+ attenuation factor

attenuation factor=10dB

3. List of measuring equipment

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	EMI TEST RECEIVER	R&S	ESIB7	A0501375	2019.07.30	2020.07.29
2	Power Meter	R&S	NRP-Z31	102872	2019.05.05	2020.05.04
3	TURNTABLE	ETS	2088	2149	N/A	N/A
4	ANTENNA MAST	ETS	2075	2346	N/A	N/A
5	EMI TEST Software	R&S	ESK1	N/A	N/A	N/A
6	Horn antenna (18GHz~26.5GHz)	AR	AT4002A	305753	2017.11.10	2020.11.09
7	Amplifer	MILMEGA	80RF1000-250	A140901925	2017.10.09	2020.10.08
8	JS amplifer	AR	25S1G4AM1	A0304248	2017.10.09	2020.10.08
9	High pass filter	Compliance Direction systems	BSU-6	34202	2019.11.10	2020.11.09
10	Horn Antenna	AR	AT4002A	305753	2017.07.12	2020.07.11
11	Horn Antenna	AR	AT4510	325306	2018.07.14	2020.07.13
12	ULTRA-BROADBAND ANTENNA	R&S	HL562	A0304224	2017.07.14	2020.07.13
13	Passive Loop Antenna	R&S	HFH2-Z2	100047	2019.04.26	2022.04.25
14	Temperature chamber	Dongguan gaoda instrument CO.LTD	GD-7005-100	130130101	2019.04.22	2020.04.21
15	Spectrum Analyzer	KEYSIGHT	N9030A	A160702554	2019.06.05	2020.06.04
16	Power Supply	R&S	NGMO1	101037	2019.08.03	2020.08.02
17	EMI TEST RECEIVER	KEYSIGHT	ESIB26	A0304218	2019.05.20	2020.05.19
18	LISN	R&S	ESH2-Z5	A0304221	2019.04.30	2020.04.29
19	Cable	MATCHING PAD	W7	/	2019.01.02	2020.01.01

4. Uncertainty of Evaluation

Uncertainty of Conducted Emission Measurement (150KHz~30MHz)

Measuring Uncertainty for a level of confidence of 95%(U=2Uc(y))	2.6dB

Uncertainty of Radiated Emission Measurement (30MHz~1GHz)

Measuring Uncertainty for a level of confidence of 95%(U=2Uc(y))	2.4dB

Uncertainty of Radiated Emission Measurement (1GHz~40GHz)

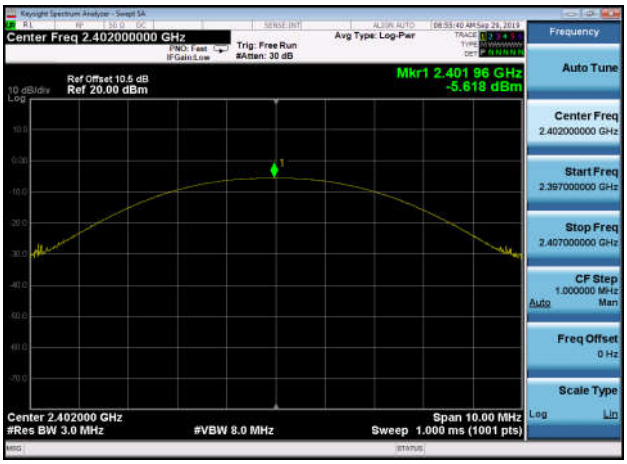
Measuring Uncertainty for a level of confidence of 95%(U=2Uc(y))	2.8dB

Appendix A

Peak Output Power
Test Result and Data

Test Frequency	Power(dBm)	Limit(dBm)	Result
2402	-5.618	30	Pass
2440	-6.369		Pass
2480	-7.898		Pass

Output Power：2402MHz



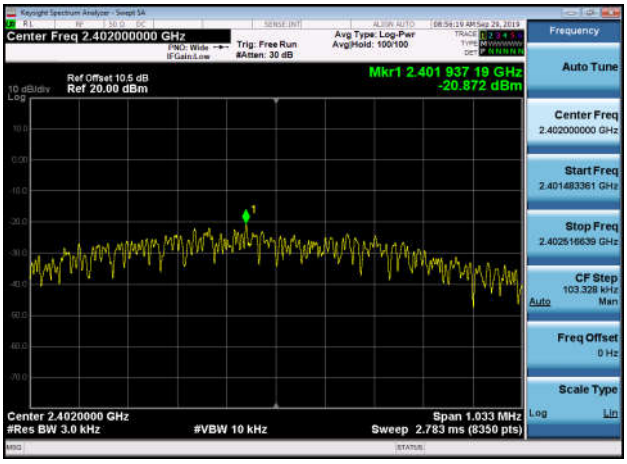
Output Power：2440MHz

Output Power：2480MHz

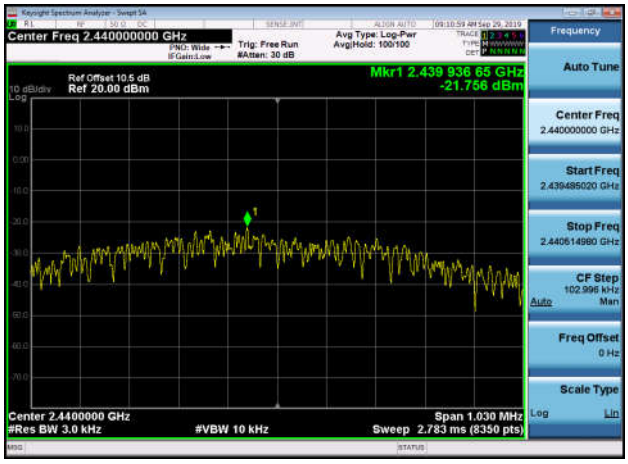
Power Spectral Density
Test Result and Data

Test Frequency	PSD(dBm/3KHz)	Limit(dBm/3KHz)	Result
2402	-20.872	8	Pass
2440	-21.756		Pass
2480	-23.266		Pass

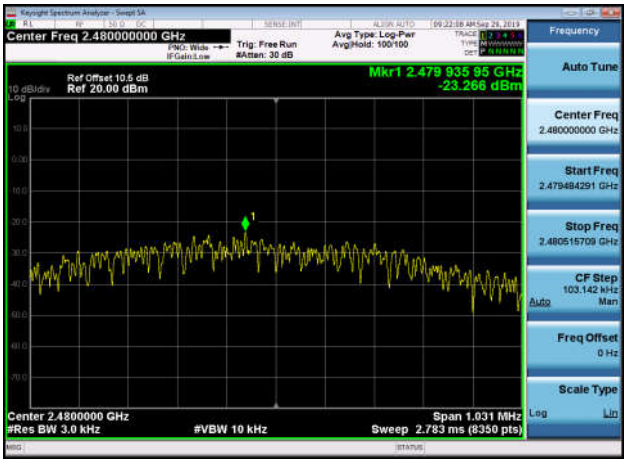
Power spectral density：2402MHz



Power spectral density：2440MHz



Power spectral density：2480MHz



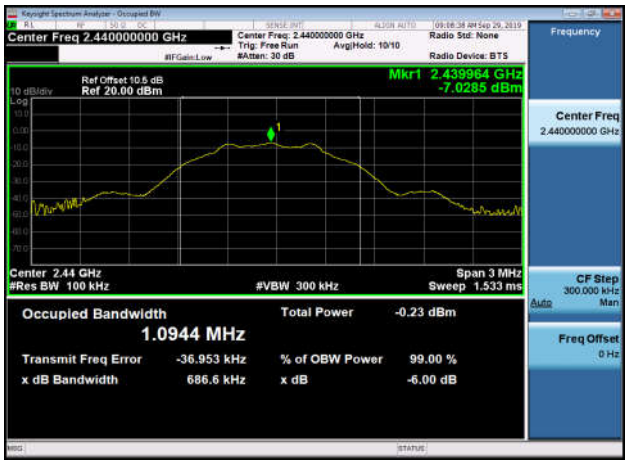
6dB Band Width

Test Result and Data

Test Frequency	6dB Occupy Bandwidth(Khz)	Min Limit(kHz)	Result
2402	688.9	500	Pass
2440	686.6		Pass
2480	687.6		Pass

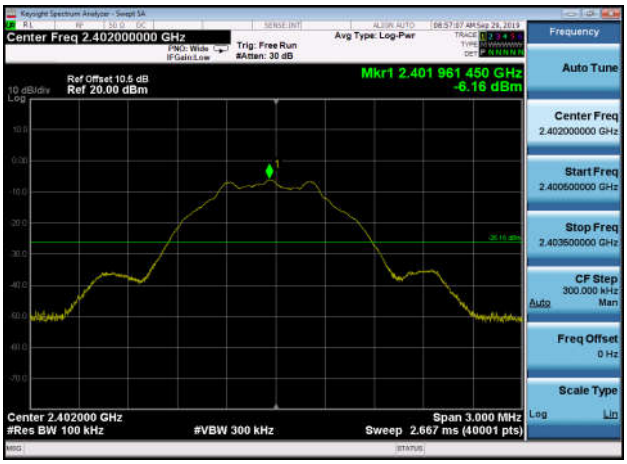
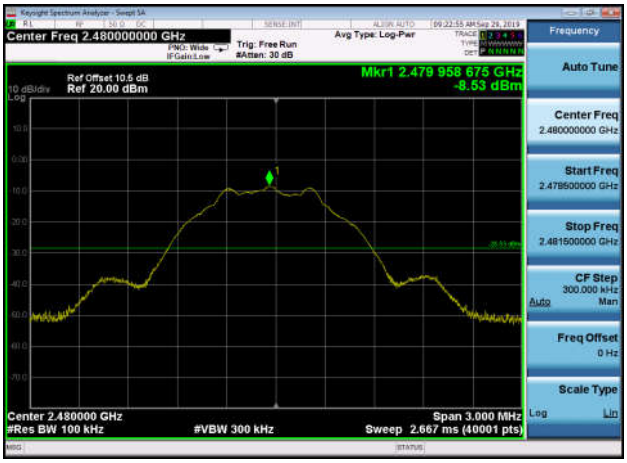
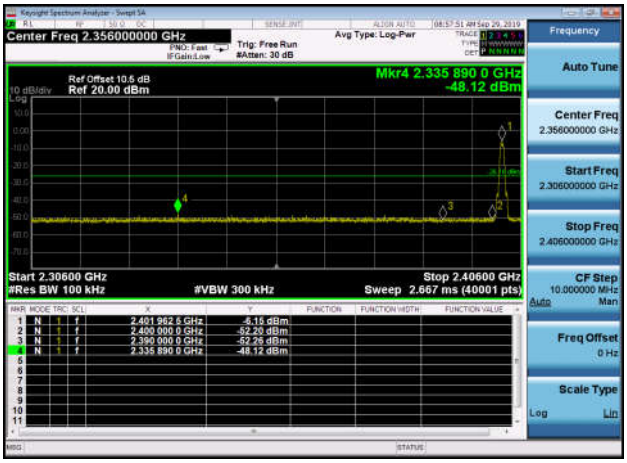
6dB Bandwidth：2402MHz

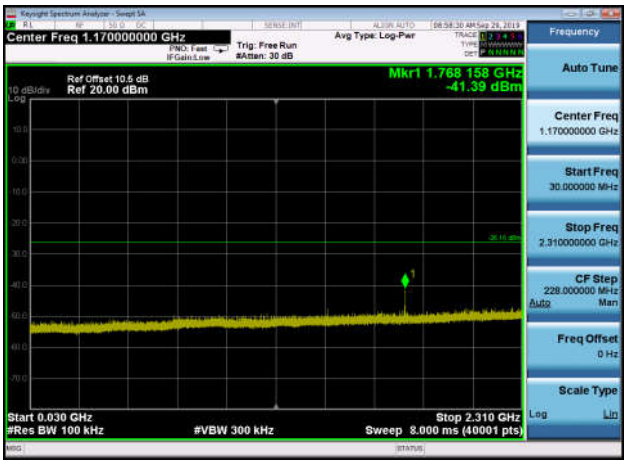
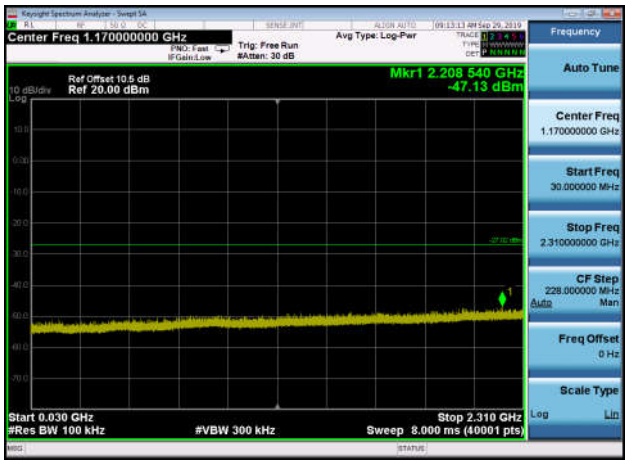
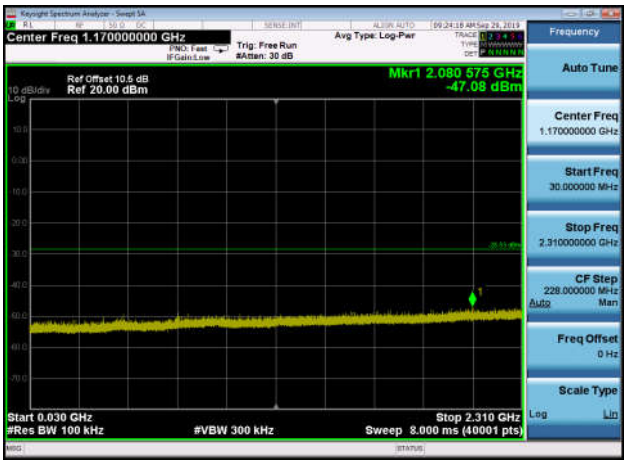
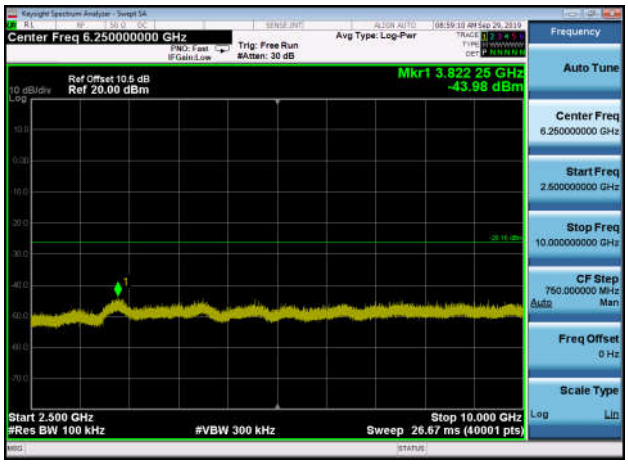
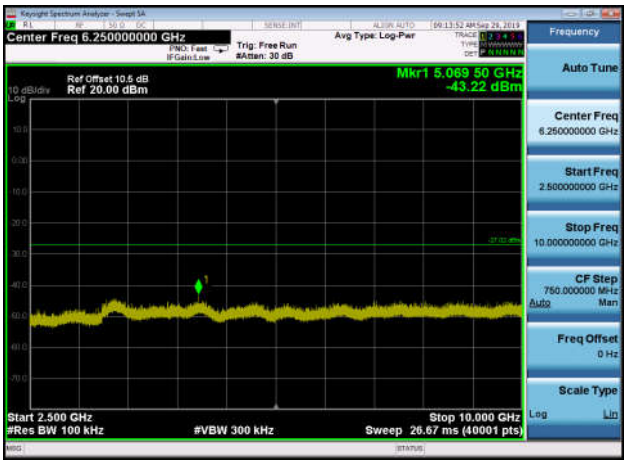
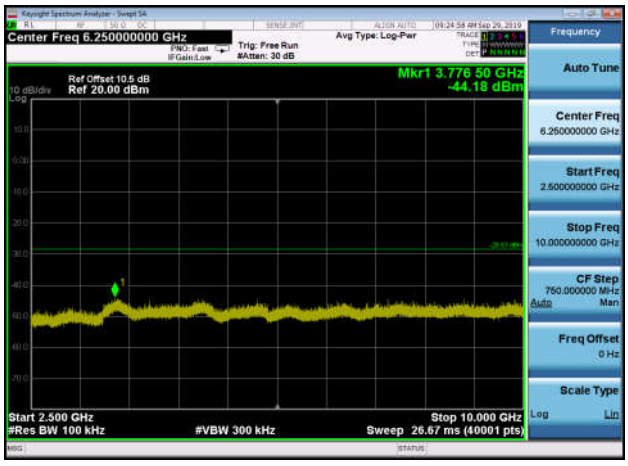
6dB Bandwidth：2440MHz

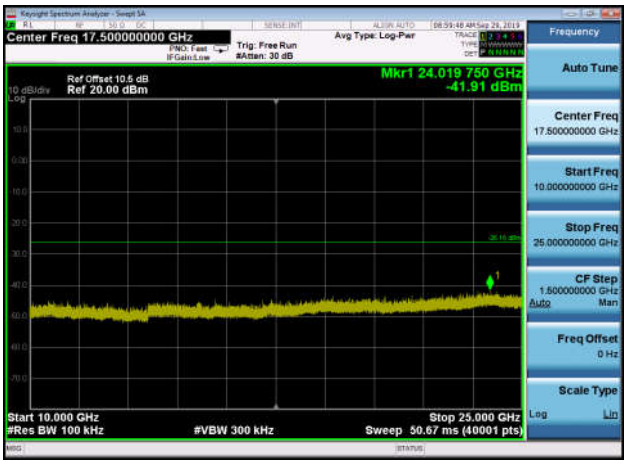
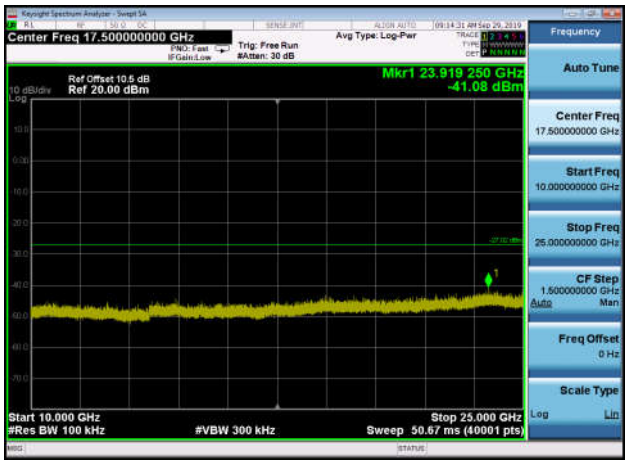
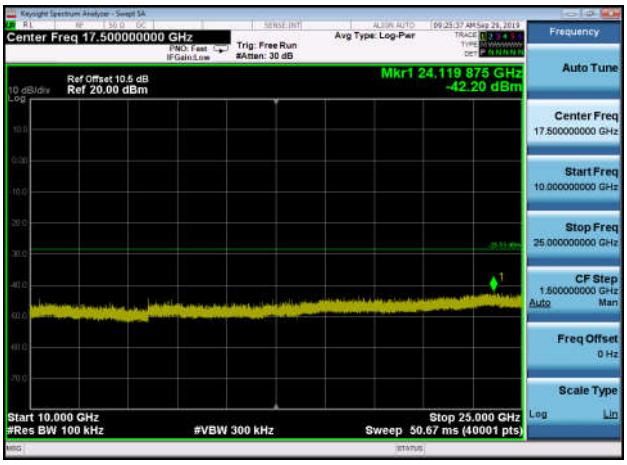


6dB Bandwidth：2480MHz

Conducted Band Edges and Spurious Emissions
Test Result and Data

,Plot ,1Transmitter Spurious Emission ：2402,Reference Level	,Plot ,1Transmitter Spurious Emission ：2440,Reference Level
	
,Plot ,1Transmitter Spurious Emission ：2480,Reference Level	,Plot ,2Conducted Emission：2402 ,Band Edge
	
,Plot ,2Conducted Emission：2440 ,Band Edge	,Plot ,2Conducted Emission：2480 ,Band Edge
	

,Plot ,3Transmitter Spurious Emission ： 2402,30MHz~2310MHz	,Plot ,3Transmitter Spurious Emission ： 2440,30MHz~2310MHz
	
,Plot ,3Transmitter Spurious Emission ： 2480,30MHz~2310MHz	,Plot ,4Transmitter Spurious Emission ： 2402,2500MHz~10000MHz
	
,Plot ,4Transmitter Spurious Emission ： 2440,2500MHz~10000MHz	,Plot ,4Transmitter Spurious Emission ： 2480,2500MHz~10000MHz
	

,Plot ,5Transmitter Spurious Emission ：2402,10000MHz~25000MHz	,Plot ,5Transmitter Spurious Emission ：2440,10000MHz~25000MHz
	
,Plot ,5Transmitter Spurious Emission ：2480,10000MHz~25000MHz	
	

** END OF REPORT **