FCC Test Report

Client Name	:	**Shenzhenshi Xinhainuo Dianzi Keji Youxian Gongsi**
Client Address	:	**Xixiangjiedao Gushu Nanchangdiyigongyequ 1dong 305 Baoanqu Shenzhen Guangdong China**
Product Name	:	**H4K**
Report Date	:	**Nov. 17, 2022**

Shenzhen Anbotek Compliance Laboratory Limited

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TEST REPORT

Applicant	:	Shenzhenshi Xinhainuo Dianzi Keji Youxian Gongsi
Manufacturer	:	Shenzhenshi Xinhainuo Dianzi Keji Youxian Gongsi
Product Name	:	H4K
Model No.	:	H4K, H4K PRO, H4K MAX, H4K MINI, H4K PLUS, H8K, H8K PRO, H8K MAX, H8K MINI, H8K PLUS, H5K, H5K PRO, H5K MAX, H5K MINI, H5K PLUS, H6K, H6K PRO, H6K MAX, H6K MINI, H6K PLUS
Trade Mark	:	N.A.
Rating(s)	:	Input:5V⎓ 500mA Max
Test Standard(s)	:	**FCC Part15 Subpart C, Section 15.247**
Test Method(s)	:	**ANSI C63.10: 2020, KDB 558074 D01 15.247 Meas Guidance v05r02**

The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen Anbotek Compliance Laboratory Limited is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the FCC Part 15 Subpart C requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited.

Date of Receipt	Oct. 08, 2022
Date of Test	Oct. 08~Nov. 09, 2022
Prepared by	(Ella Liang)
Approved & Authorized Signer	(Kingkong Jin)

Revision History

Report Version	Description	Issued Date
R00	Original Issue.	Nov. 17, 2022

1. General Information

1.1. Client Information

Applicant	:	Shenzhenshi Xinhainuo Dianzi Keji Youxian Gongsi
Address	:	Xixiangjiedao Gushu Nanchangdiyigongyequ 1dong 305 Baoanqu Shenzhen Guangdong China
Manufacturer	:	Shenzhenshi Xinhainuo Dianzi Keji Youxian Gongsi
Address	:	Xixiangjiedao Gushu Nanchangdiyigongyequ 1dong 305 Baoanqu Shenzhen Guangdong China
Factory	:	Shenzhenshi Xinhainuo Dianzi Keji Youxian Gongsi
Address	:	Xixiangjiedao Gushu Nanchangdiyigongyequ 1dong 305 Baoanqu Shenzhen Guangdong China

1.2. Description of Device (EUT)

Product Name	:	H4K
Model No.	:	H4K, H4K PRO, H4K MAX, H4K MINI, H4K PLUS, H8K, H8K PRO, H8K MAX, H8K MINI, H8K PLUS, H5K, H5K PRO, H5K MAX, H5K MINI, H5K PLUS, H6K, H6K PRO, H6K MAX, H6K MINI, H6K PLUS (Note: All samples are the same except the model number and appearance color, so we prepare "H4K" for test only.)
Trade Mark	:	N/A
Test Power Supply	:	AC 120V, 60Hz for Adapter
Test Sample No.	:	1-2-1(Normal Sample), 1-2-2(Engineering Sample)
Adapter	:	N/A
RF Specification		
Operation Mode	:	☒802.11b ☒802.11g ☒802.11n(HT20) ☐802.11n(HT40)
Operation Frequency	:	2412~2462MHz
Number of Channel	:	11 Channel for 20MHz bandwidth (2412~2462MHz)
Modulation Type	:	☒ 802.11b: DSSS (CCK, DQPSK, DBPSK) ☒ 802.11g: OFDM (BPSK, QPSK, 16QAM, 64QAM) ☒ 802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM)
Antenna Type	:	PIFA antenna
Antenna Gain(Peak)	:	3.85dBi (Provided by customer)
Remark: 1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.		

1.3. Auxiliary Equipment Used During Test

Description	Rating(s)
--	--

1.4. Description of Test Configuration

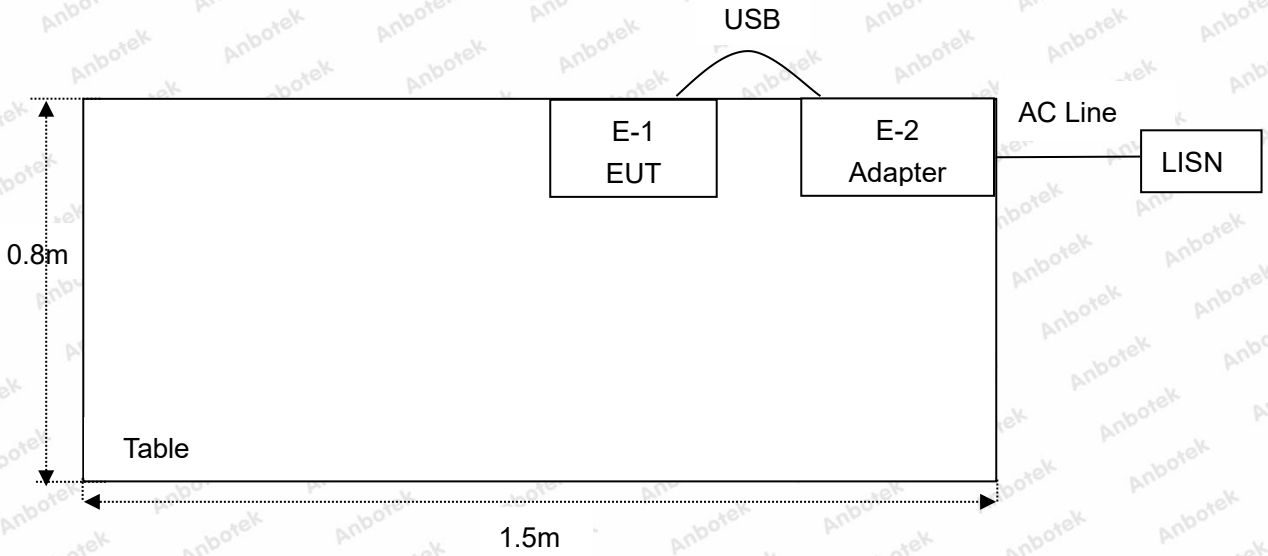
Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
01	**2412**	04	2427	07	2442	10	2457
02	2417	05	2432	08	2447	**11**	**2462**
03	2422	**06**	**2437**	09	2452		

Note:

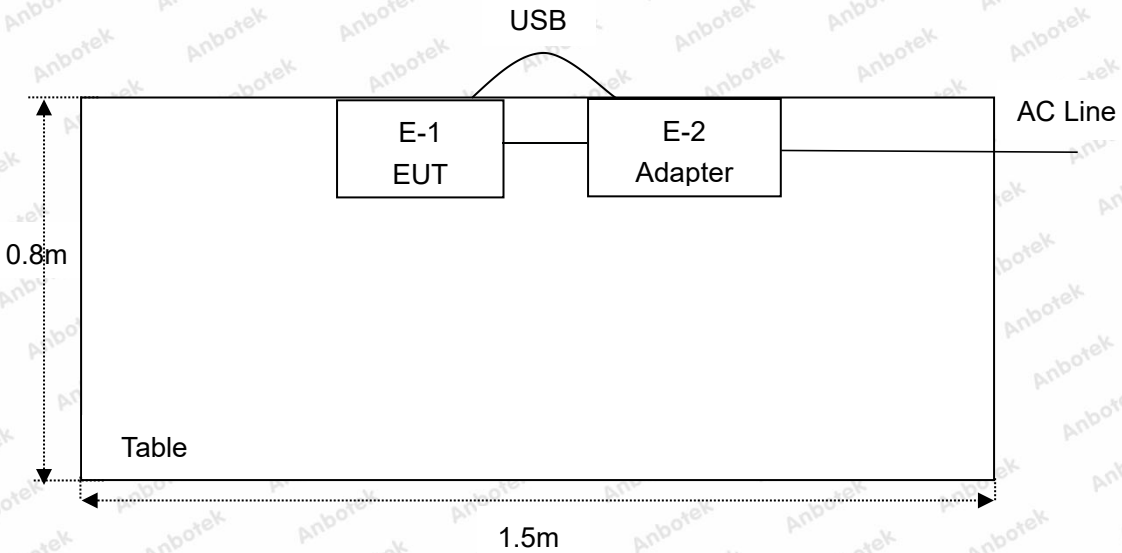
1. The engineering test program was provided and the EUT was programmed to be in continuously transmitting mode.
2. For 802.11b, 802.11g, and 802.11n(HT20) modes were test with channel 1, 6, 11.

1.5. Description Of Test Setup

CE



RE



1.6. Test Equipment List

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	L.I.S.N. Artificial Mains Network	Schwarzbeck	NSLK 8127	8127386	Sept. 7, 2022	1 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESPI	101604	Sept. 7, 2022	1 Year
3.	Spectrum Analysis	Keysight	N9020A	MY53100616	Jun. 10, 2022	1 Year
4.	Preamplifier	SKET Electronic	BK1G18G30 D	KD17503	Oct. 23, 2022	1 Year
5.	Pre-amplifier	EMtrace	RP01A	50017	Sept. 7, 2022	1 Year
6.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Oct. 24, 2022	2 Year
7.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	01417	Sept. 25, 2021	2 Year
8.	Loop Antenna	Schwarzbeck	FMZB1519B	00053	Nov. 02, 2020	2 Year
9.	Test Software	Ferrari Technology	EZ-EMC	N/A	N/A	N/A
10.	Switch box	Meike	/	/	Nov. 10, 2021	1 Year
11.	Power Sensor box	Meike	/	/	Oct. 23, 2022	1 Year
12.	MXG RF Vector Signal Generator	Agilent	N5182A	MY47420822	Feb. 28, 2022	1 Year
13.	Signal Generator	Agilent	E4425B	GB39340038	Oct. 23, 2022	1 Year
14.	DC Power Supply	Longwei	TPR-6420D	020215240	N/A	N/A

1.7. Measurement Uncertainty

Item	Uncertainty
AC Conducted Emissions	3.4 dB
Radiation Emission (Below 1GHz)	5.10 dB(Polarize: V)
	4.52 dB(Polarize: H)
Radiation Emission (Above 1GHz)	4.46 dB(Polarize: H)
	4.92 dB(Polarize: V)
RF output power, conducted	0.74 dB
Conduction unwanted spurious emission	1.69dB
Occupied Bandwidth	193Hz

1.8. Description of Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

FCC-Registration No.: 184111

Shenzhen Anbotek Compliance Laboratory Limited, 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. Registration No. 184111.

ISED-Registration No.: 8058A

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (ISED) Innovation, Science and Economic Development Canada. The acceptance letter from the ISED is maintained in our files. Registration 8058A.

Test Location

Shenzhen Anbotek Compliance Laboratory Limited.

1/F, Building D, Sogood Science and Technology Park, Sanwei community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.518102

2. Summary of Test Results

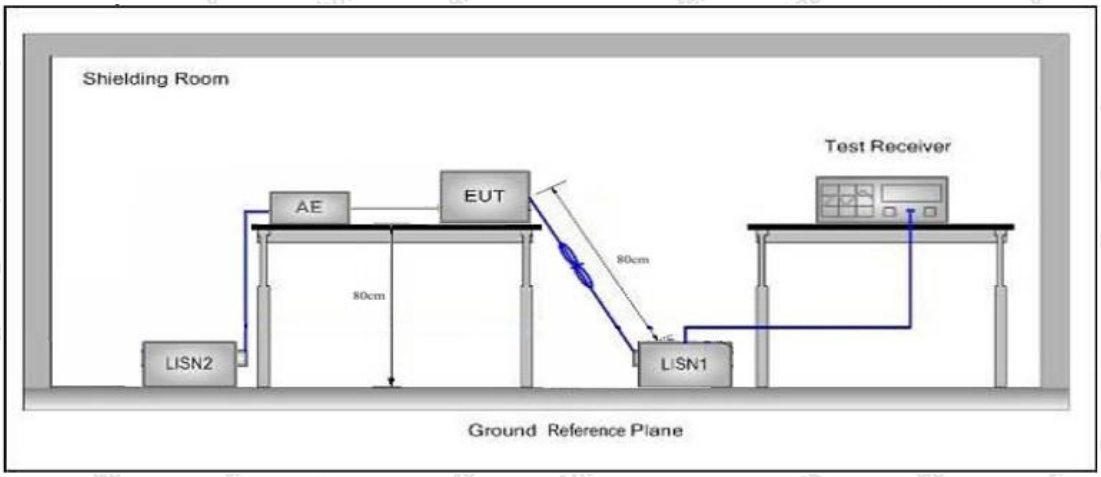
Standard Section	Test Item	Result
15.203/15.247(c)	Antenna Requirement	PASS
15.207	Conducted Emission	PASS
15.205/15.209	Spurious Emission	PASS
15.247(b)(3)	Conducted Peak Output Power	PASS
15.247(a)(2)	6dB Occupied Bandwidth	PASS
15.247(e)	Power Spectral Density	PASS
15.247(d)	Band Edge	PASS
Remark: "N/A" is an abbreviation for Not Applicable.		

3. Conducted Emission Test

3.1. Test Standard and Limit

Test Standard	FCC Part15 Section 15.207		
Test Limit	Frequency	Maximum RF Line Voltage (dBuV)	
		Quasi-peak Level	Average Level
	150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
	500kHz~5MHz	56	46
	5MHz~30MHz	60	50
Remark: (1) *Decreasing linearly with logarithm of the frequency. (2) The lower limit shall apply at the transition frequency.			

3.2. Test Setup



3.3. Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC ANSI C63.10: 2020 on Conducted Emission Measurement.

The bandwidth of test receiver (ESCI) set at 9kHz.

The frequency range from 150kHz to 30MHz is checked.

3.4. Test Data

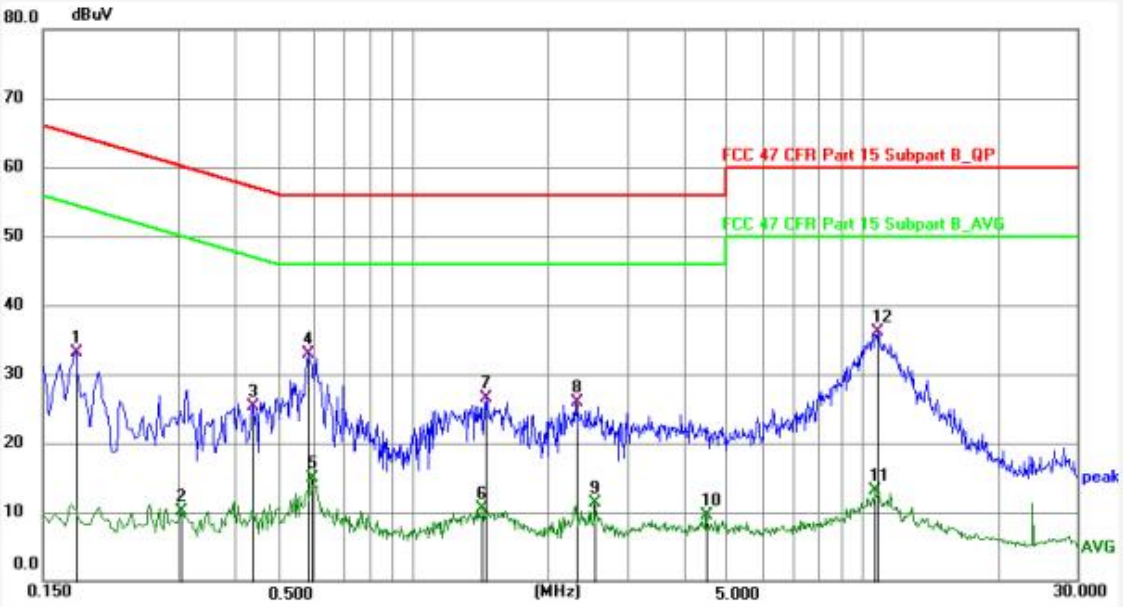
During the test, pre-scan all modes, only the worst case is recorded in the report.

AC conducted emission pre-test at both at AC 120V/60Hz and AC 240V/60Hz modes, recorded worst case AC 120V/60Hz.

Please to see the following pages.

Conducted Emission Test Data

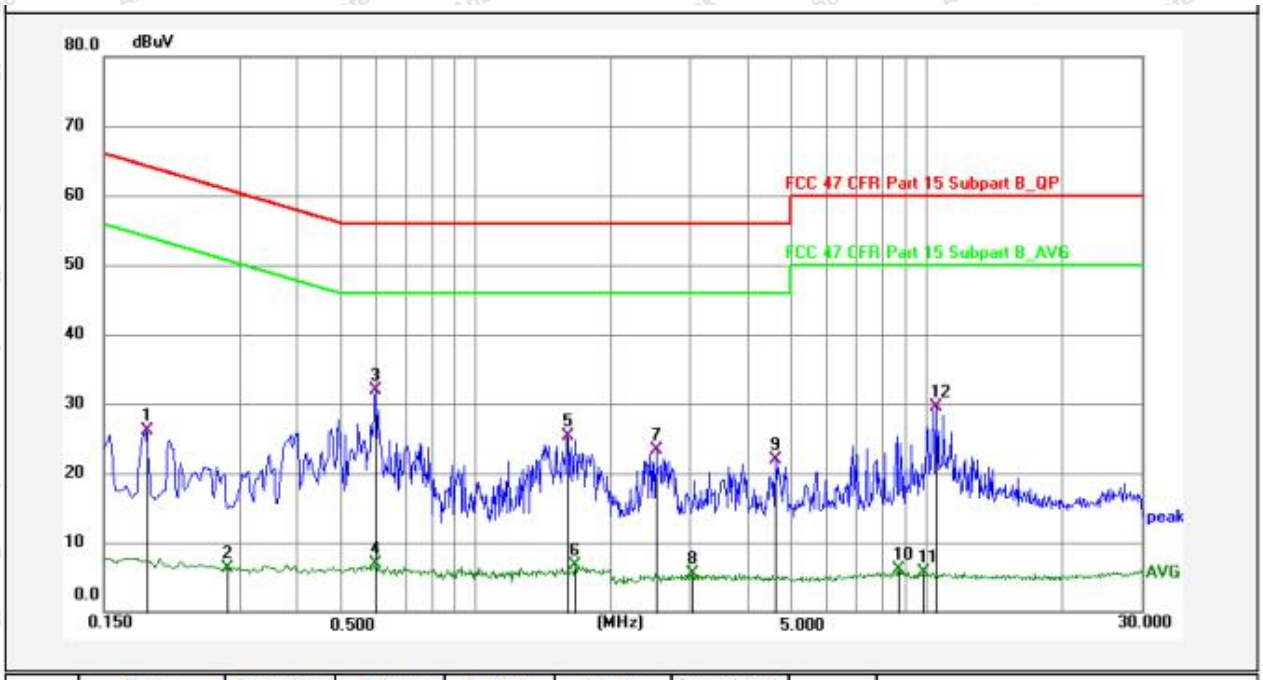
Test Site: 1# Shielded Room
Operating Condition: 802.11b 2462MHz
Test Specification: AC 120V, 60Hz for Adapter
Comment: Live Line
Temp.(℃)/Hum.(%RH): 25.6℃/54%RH



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.1770	32.28	0.89	33.17	64.63	-31.46	QP	
2	0.3030	9.09	0.92	10.01	50.16	-40.15	AVG	
3	0.4380	24.51	0.87	25.38	57.10	-31.72	QP	
4	0.5820	32.10	0.89	32.99	56.00	-23.01	QP	
5	0.5910	14.00	0.89	14.89	46.00	-31.11	AVG	
6	1.4325	9.50	0.94	10.44	46.00	-35.56	AVG	
7	1.4550	25.49	0.94	26.43	56.00	-29.57	QP	
8	2.3055	25.01	0.94	25.95	56.00	-30.05	QP	
9	2.5395	10.42	0.93	11.35	46.00	-34.65	AVG	
10	4.4970	8.49	0.96	9.45	46.00	-36.55	AVG	
11	10.6889	12.17	1.02	13.19	50.00	-36.81	AVG	
12	10.8015	35.09	1.02	36.11	60.00	-23.89	QP	

Conducted Emission Test Data

Test Site:	1# Shielded Room
Operating Condition:	802.11b 2462MHz
Test Specification:	AC 120V, 60Hz for Adapter
Comment:	Neutral Line
Temp.(℃)/Hum.(%RH):	25.6℃/54%RH



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.1860	25.38	0.80	26.18	64.21	-38.03	QP	
2	0.2805	5.54	0.83	6.37	50.80	-44.43	AVG	
3	0.6000	31.05	0.85	31.90	56.00	-24.10	QP	
4	0.6000	6.00	0.85	6.85	46.00	-39.15	AVG	
5	1.5990	24.51	0.88	25.39	56.00	-30.61	QP	
6	1.6665	5.74	0.88	6.62	46.00	-39.38	AVG	
7	2.5170	22.31	0.92	23.23	56.00	-32.77	QP	
8	3.0255	4.55	0.94	5.49	46.00	-40.51	AVG	
9	4.6275	20.98	0.98	21.96	56.00	-34.04	QP	
10	8.6909	5.03	1.02	6.05	50.00	-43.95	AVG	
11	9.9105	4.78	1.00	5.78	50.00	-44.22	AVG	
12	10.5135	28.42	1.00	29.42	60.00	-30.58	QP	

4. Radiation Spurious Emission and Band Edge

4.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.209 and 15.205				
Test Limit	Frequency (MHz)	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz~0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz~88MHz	100	40.0	Quasi-peak	3
	88MHz~216MHz	150	43.5	Quasi-peak	3
	216MHz~960MHz	200	46.0	Quasi-peak	3
	960MHz~1000MHz	500	54.0	Quasi-peak	3
	Above 1000MHz	500	54.0	Average	3
		-	74.0	Peak	3

Remark:
(1)The lower limit shall apply at the transition frequency.
(2) 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

4.2. Test Setup

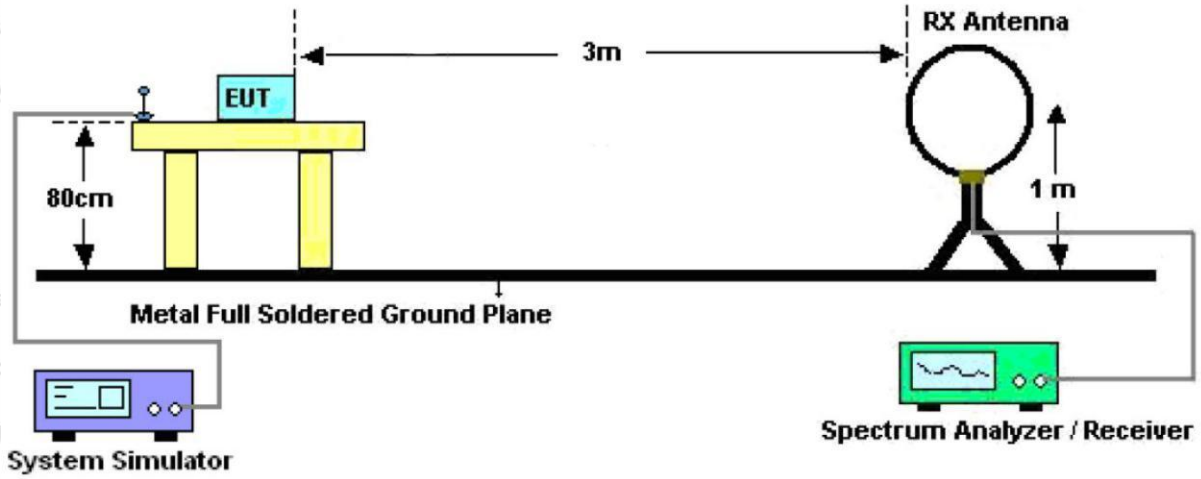


Figure 1. Below 30MHz

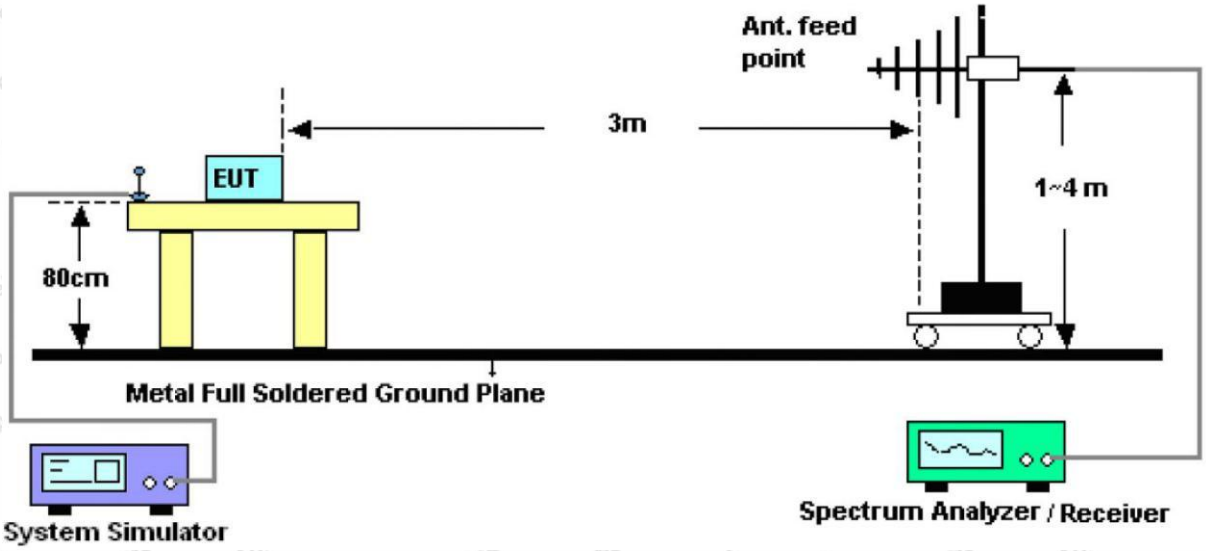


Figure 2. 30MHz to 1GHz

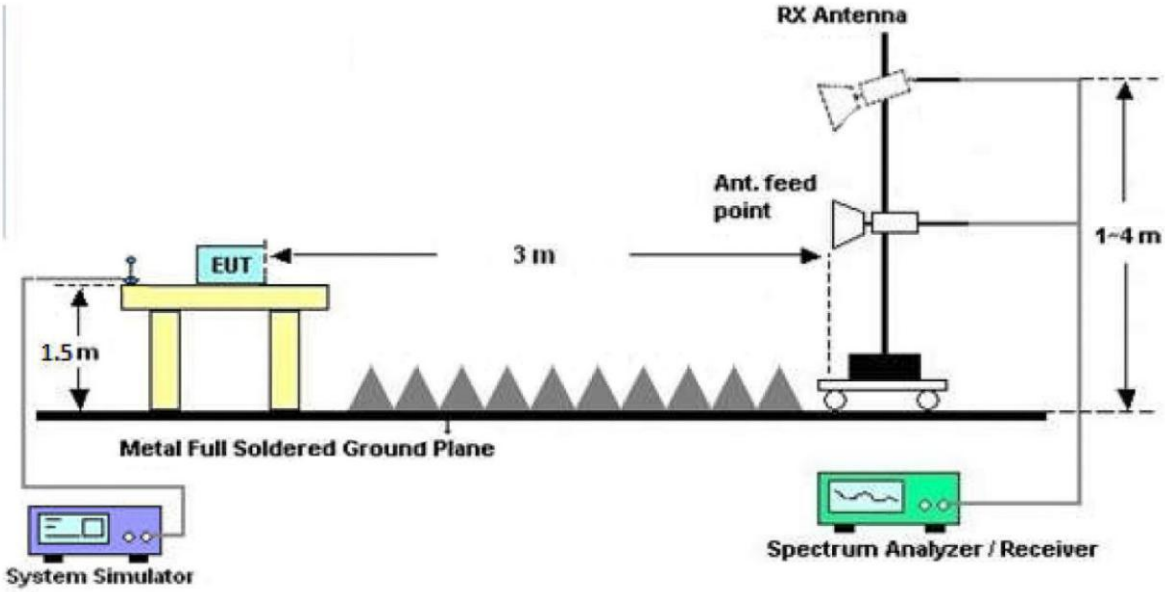


Figure 3. Above 1 GHz

4.3. Test Procedure

For below 1GHz: The EUT is placed on a turntable, which is 0.8m above the ground plane.
For above 1GHz: The EUT is placed on a turntable, which is 1.5m above the ground plane.
The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Rotated the EUT through three orthogonal axes to determine the maximum emissions, both horizontal and vertical polarization of the antenna are set on test. The EUT is tested in 9*6*6 Chamber. The device is evaluated in xyz orientation.

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.

For 9kHz to 150kHz, Set the spectrum analyzer as:
RBW = 200Hz, VBW =1kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For 150kHz to 30MHz, Set the spectrum analyzer as:
RBW = 9KHz, VBW =30kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For 30MHz to 1000MHz, Set the spectrum analyzer as:
RBW = 100kHz, VBW =300kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.
.
For above 1GHz,Set the spectrum analyzer as:
RBW =1MHz, VBW =1MHz, Detector= Peak, Trace mode= Max hold, Sweep- auto couple.
For average measurement:
–VBW=10Hz, When duty cycle is no less than 98 percent
–VBW ⩾ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation, so refer to this clause 5.4 duty cycle.

4.4. Test Data

PASS

During the test, Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the X-axis is the worst case.

The test results of 9kHz-30MHz was attenuated more than 20dB below the permissible limits, so the results don't record in the report.

During the test, pre-scan all modes, only the worst case is recorded in the report.

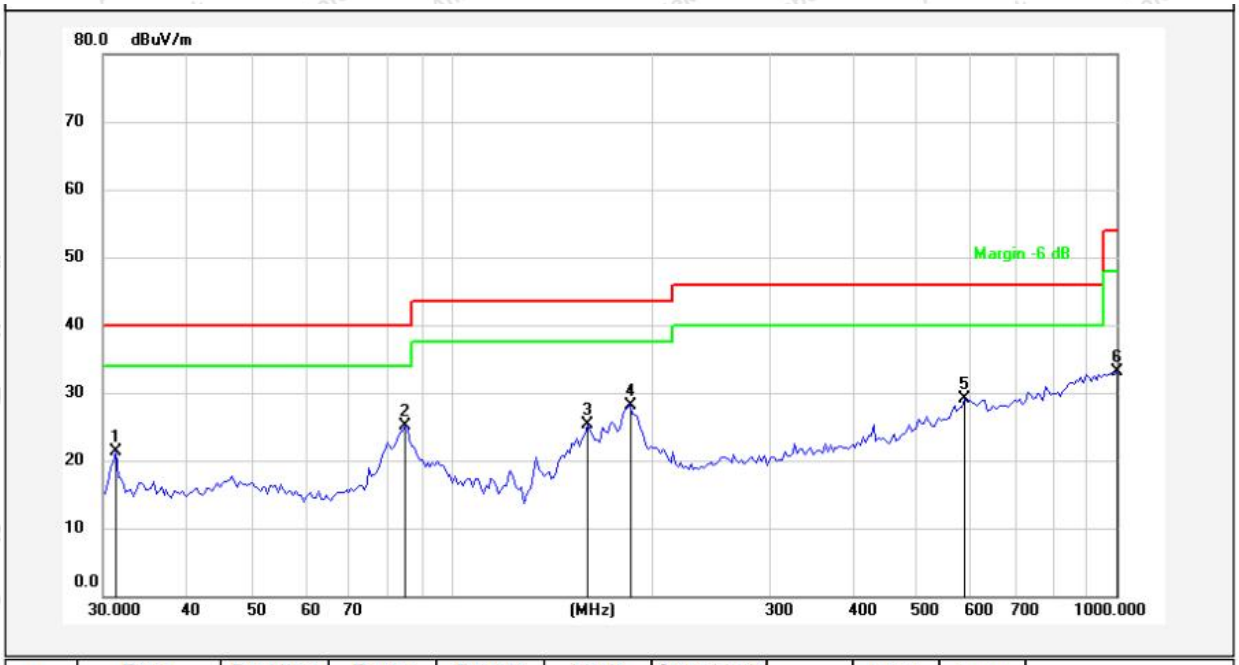
Test Results (30~1000MHz)

Test Mode: 802.11b 2462MHz

Power Source: AC 120V, 60Hz for adapter

Polarization: Horizontal

Temp.(℃)/Hum.(%RH): 25.2℃/55%RH



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	31.3442	37.16	-15.87	21.29	40.00	-18.71	QP			
2	85.1486	41.10	-15.96	25.14	40.00	-14.86	QP			
3	160.0648	40.85	-15.55	25.30	43.50	-18.20	QP			
4	185.7882	42.46	-14.38	28.08	43.50	-15.42	QP			
5	590.9737	30.78	-1.62	29.16	46.00	-16.84	QP			
6	1000.0000	26.88	6.32	33.20	54.00	-20.80	QP			

Test Results (30~1000MHz)

Test Mode: 802.11b 2462MHz

Power Source: AC 120V, 60Hz for adapter

Polarization: Vertical

Temp.(℃)/Hum.(%RH): 25.2℃/55%RH

No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	34.5173	43.70	-15.12	28.58	40.00	-11.42	QP			
2	46.5030	38.34	-14.35	23.99	40.00	-16.01	QP			
3	57.8977	39.73	-15.79	23.94	40.00	-16.06	QP			
4	82.2146	51.57	-16.36	35.21	40.00	-4.79	QP			
5	161.4742	47.60	-15.51	32.09	43.50	-11.41	QP			
6	622.8900	30.45	-1.61	28.84	46.00	-17.16	QP			

Test Results (Above 1000MHz)

Test Mode: 802.11b Mode			Test channel: Lowest			
Peak value:						
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4824.00	27.21	15.31	42.52	74.00	-31.48	Vertical
7236.00	28.94	18.06	47.00	74.00	-27.00	Vertical
9648.00	28.48	23.77	52.25	74.00	-21.75	Vertical
12060.00	*			74.00		Vertical
14472.00	*			74.00		Vertical
4824.00	26.74	15.31	42.05	74.00	-31.95	Horizontal
7236.00	28.75	18.06	46.81	74.00	-27.19	Horizontal
9648.00	27.66	23.77	51.43	74.00	-22.57	Horizontal
12060.00	*			74.00		Horizontal
14472.00	*			74.00		Horizontal
Average value:						
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4824.00	19.23	15.31	34.54	54.00	-19.46	Vertical
7236.00	20.72	18.06	38.78	54.00	-15.22	Vertical
9648.00	20.38	23.77	44.15	54.00	-9.85	Vertical
12060.00	*			54.00		Vertical
14472.00	*			54.00		Vertical
4824.00	19.25	15.31	34.56	54.00	-19.44	Horizontal
7236.00	21.32	18.06	39.38	54.00	-14.62	Horizontal
9648.00	19.40	23.77	43.17	54.00	-10.83	Horizontal
12060.00	*			54.00		Horizontal
14472.00	*			54.00		Horizontal

Test Results (Above 1000MHz)

Test Mode: 802.11b Mode				Test channel: Middle		
Peak value:						
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4874.00	27.16	15.41	42.57	74.00	-31.43	Vertical
7311.00	27.29	18.01	45.30	74.00	-28.70	Vertical
9748.00	28.42	23.79	52.21	74.00	-21.79	Vertical
12185.00	*			74.00		Vertical
14622.00	*			74.00		Vertical
4874.00	26.54	15.41	41.95	74.00	-32.05	Horizontal
7311.00	27.67	18.01	45.68	74.00	-28.32	Horizontal
9748.00	27.96	23.79	51.75	74.00	-22.25	Horizontal
12185.00	*			74.00		Horizontal
14622.00	*			74.00		Horizontal
Average value:						
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4874.00	17.98	15.41	33.39	54.00	-20.61	Vertical
7311.00	18.19	18.01	36.20	54.00	-17.80	Vertical
9748.00	18.67	23.79	42.46	54.00	-11.54	Vertical
12185.00	*			54.00		Vertical
14622.00	*			54.00		Vertical
4874.00	17.64	15.41	33.05	54.00	-20.95	Horizontal
7311.00	17.75	18.01	35.76	54.00	-18.24	Horizontal
9748.00	18.67	23.79	42.46	54.00	-11.54	Horizontal
12185.00	*			54.00		Horizontal
14622.00	*			54.00		Horizontal

Test Results (Above 1000MHz)

Test Mode: 802.11b Mode				Test channel: Highest		
Peak value:						
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4924.00	27.02	15.51	42.53	74.00	-31.47	Vertical
7386.00	27.23	17.97	45.20	74.00	-28.80	Vertical
9848.00	27.86	23.82	51.68	74.00	-22.32	Vertical
12310.00	*			74.00		Vertical
14772.00	*			74.00		Vertical
4924.00	27.20	15.51	42.71	74.00	-31.29	Horizontal
7386.00	28.02	17.97	45.99	74.00	-28.01	Horizontal
9848.00	28.46	23.82	52.28	74.00	-21.72	Horizontal
12310.00	*			74.00		Horizontal
14772.00	*			74.00		Horizontal
Average value:						
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4924.00	17.81	15.51	33.32	54.00	-20.68	Vertical
7386.00	17.63	17.97	35.60	54.00	-18.40	Vertical
9848.00	19.11	23.82	42.93	54.00	-11.07	Vertical
12310.00	*			54.00		Vertical
14772.00	*			54.00		Vertical
4924.00	17.45	15.51	32.96	54.00	-21.04	Horizontal
7386.00	18.13	17.97	36.10	54.00	-17.90	Horizontal
9848.00	18.90	23.82	42.72	54.00	-11.28	Horizontal
12310.00	*			54.00		Horizontal
14772.00	*			54.00		Horizontal

Remark:

1. During the test, pre-scan the 802.11b,g,n(HT20) mode, and found the 802.11bmode is worse case , the report only record this mode.
2. Result=Reading + Factor
3. “*”, means this data is the too weak instrument of signal is unable to test.

Radiated Band Edge:

Test Mode: 802.11b Mode				Test channel: Lowest		
Peak value:						
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2310.00	38.04	9.58	47.62	74.00	-26.38	Horizontal
2390.00	40.53	9.73	50.26	74.00	-23.74	Horizontal
2310.00	39.30	9.58	48.88	74.00	-25.12	Vertical
2390.00	46.12	9.73	55.85	74.00	-18.15	Vertical
Average value:						
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2310.00	28.66	9.58	38.24	54.00	-15.76	Horizontal
2390.00	35.85	9.73	45.58	54.00	-8.42	Horizontal
2310.00	30.03	9.58	39.61	54.00	-14.39	Vertical
2390.00	38.18	9.73	47.91	54.00	-6.09	Vertical

Test Mode: 802.11b Mode				Test channel: Highest		
Peak value:						
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	46.22	9.91	56.13	74.00	-17.87	Horizontal
2500.00	40.15	9.94	50.09	74.00	-23.91	Horizontal
2483.50	46.58	9.91	56.49	74.00	-17.51	Vertical
2500.00	39.79	9.94	49.73	74.00	-24.28	Vertical
Average value:						
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	37.38	9.91	47.29	54.00	-6.71	Horizontal
2500.00	29.17	9.94	39.11	54.00	-14.89	Horizontal
2483.50	38.90	9.91	48.81	54.00	-5.19	Vertical
2500.00	29.63	9.94	39.57	54.00	-14.43	Vertical

Remark: 1. Result=Reading + Factor

Radiated Band Edge:

Test Mode: 802.11g Mode				Test channel: Lowest		
Peak value:						
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2310.00	36.84	9.58	46.42	74.00	-27.58	Horizontal
2390.00	40.47	9.73	50.20	74.00	-23.80	Horizontal
2310.00	38.78	9.58	48.36	74.00	-25.64	Vertical
2390.00	42.43	9.73	52.16	74.00	-21.84	Vertical
Average value:						
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2310.00	29.08	9.58	38.66	54.00	-15.34	Horizontal
2390.00	35.31	9.73	45.04	54.00	-8.96	Horizontal
2310.00	30.04	9.58	39.62	54.00	-14.39	Vertical
2390.00	35.82	9.73	45.55	54.00	-8.45	Vertical

Test Mode: 802.11g Mode				Test channel: Highest		
Peak value:						
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	46.22	9.91	56.13	74.00	-17.87	Horizontal
2500.00	40.08	9.94	50.02	74.00	-23.98	Horizontal
2483.50	46.34	9.91	56.25	74.00	-17.75	Vertical
2500.00	39.70	9.94	49.64	74.00	-24.36	Vertical
Average value:						
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	35.55	9.91	45.46	54.00	-8.54	Horizontal
2500.00	28.27	9.94	38.21	54.00	-15.79	Horizontal
2483.50	37.85	9.91	47.76	54.00	-6.24	Vertical
2500.00	29.16	9.94	39.10	54.00	-14.90	Vertical

Remark: 1. Result=Reading + Factor

Radiated Band Edge:

Test Mode: 802.11n (HT20) Mode				Test channel: Lowest		
Peak value:						
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2310.00	34.84	9.58	44.42	74.00	-29.58	Horizontal
2390.00	38.47	9.73	48.20	74.00	-25.80	Horizontal
2310.00	37.78	9.58	47.36	74.00	-26.64	Vertical
2390.00	40.43	9.73	50.16	74.00	-23.84	Vertical
Average value:						
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2310.00	27.76	9.58	37.34	54.00	-16.66	Horizontal
2390.00	33.08	9.73	42.81	54.00	-11.19	Horizontal
2310.00	27.65	9.58	37.23	54.00	-16.78	Vertical
2390.00	33.82	9.73	43.55	54.00	-10.45	Vertical

Test Mode: 802.11n (HT20) Mode				Test channel: Highest		
Peak value:						
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	43.99	9.91	53.90	74.00	-20.10	Horizontal
2500.00	38.15	9.94	48.09	74.00	-25.91	Horizontal
2483.50	45.58	9.91	55.49	74.00	-18.51	Vertical
2500.00	39.79	9.94	49.73	74.00	-24.28	Vertical
Average value:						
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	33.53	9.91	43.44	54.00	-10.56	Horizontal
2500.00	28.42	9.94	38.36	54.00	-15.64	Horizontal
2483.50	34.67	9.91	44.58	54.00	-9.42	Vertical
2500.00	29.30	9.94	39.24	54.00	-14.76	Vertical

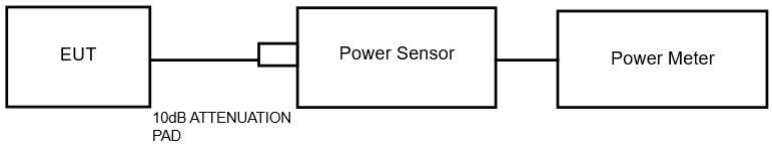
Remark: 1. Result=Reading + Factor

5. Maximum Peak Output Power Test

5.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247 (b)(3)
Test Limit	1W (30dBm)

5.2. Test Setup



5.3. Test Procedure

1. The Transmitter output (antenna port) was connected to the power meter.

2. Turn on the EUT and power meter and then record the power value.

3. Repeat above procedures on all channels needed to be tested.

Note: The cable loss and attenuator loss were offset into measure device as amplitude offset.

5.4. Test Data

Pass

Please refer to Clause 5 of the Appendix Test Data.

Additional test for duty cycle.

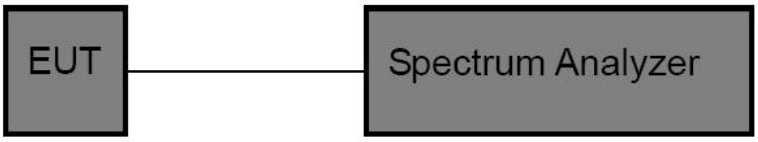
Please refer to Clause 4 of the Appendix Test Data.

6. 6DB Occupy Bandwidth Test

6.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247 (a)(2)
Test Limit	≥500kHz

6.2. Test Setup



6.3. Test Procedure

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as:

   RBW= 100kHz, VBW≥3*RBW

   Detector= Peak

   Trace mode= Max hold.

   Sweep- auto couple.
4. Mark the peak frequency and –6dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

6.4. Test Data

Pass

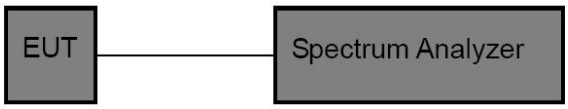
Please refer to Clause 1 of the Appendix Test Data.

7. Power Spectral Density Test

7.1. Test Standard and Limit

Test Standard	FCC Part15 C Section
Test Limit	8dBm/3KHz

7.2. Test Setup



7.3. Test Procedure

1. Place the EUT on the table and set it in transmitting mode. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set the spectrum analyzer as RBW = 3kHz, VBW = 10kHz, Span = 1.5xDTS BW
3. Record the max. reading.
4. Repeat the above procedure until the measurements for all frequencies are completed.

7.4. Test Data

Pass

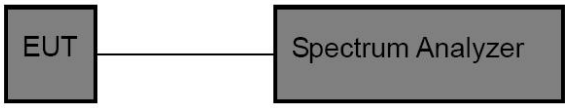
Please refer to Clause 6 of the Appendix Test Data.

8. 100kHz Bandwidth of Frequency Band Edge Requirement

8.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247 (d)
Test Limit	In any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in 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 in15.209(a).

8.2. Test Setup



8.3. Test Procedure

Using the following spectrum analyzer setting:

1. Set the RBW = 100KHz.
2. Set the VBW = 300KHz.
3. Sweep time = auto couple.
4. Detector function = peak.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.

8.4. Test Data

Pass

Please refer to Clause 3 & Clause 7 of the Appendix Test Data.

9. Antenna Requirement

9.1. Test Standard and Requirement

Test Standard	FCC Part15 Section 15.203 /247(c)
Requirement	1) 15.203 requirement: 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, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. 2) 15.247(c) (1)(i) requirement: Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

9.2. Antenna Connected Construction

The antenna is a PIFA antenna which permanently attached, and the best case gain of the antenna is 3.85dBi It complies with the standard requirement.

APPENDIX I -- TEST SETUP PHOTOGRAPH

Please refer to separated files Appendix I -- Test Setup Photograph

APPENDIX II -- EXTERNAL PHOTOGRAPH

Please refer to separated files Appendix II -- External Photograph

APPENDIX III -- INTERNAL PHOTOGRAPH

Please refer to separated files Appendix III -- Internal Photograph

---------- End of Report ----------