FCC TEST REPORT
FCC ID:2AO8RNI-1921

Report Number:	**ZKT-2230213L0664E**
Date of Test:	Feb. 12, 2023 to Feb. 22, 2023
Date of issue:	Feb. 22, 2023
Total number of pages:	46
Test Result:	PASS
Testing Laboratory:	**Shenzhen ZKT Technology Co., Ltd.**
Address:	1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue, Fuhai Street, Bao'an District, Shenzhen, China
Applicant's name:	**Netvue Technologies Co.,Ltd.**
Address:	Room A501-502, Academy of Aerospace Technology, 10 Kejinan Road, Nanshan District, Shenzhen, China, 518057
Manufacturer's name:	**Netvue Technologies Co.,Ltd.**
Address:	Room A501-502, Academy of Aerospace Technology, 10 Kejinan Road, Nanshan District, Shenzhen, China, 518057
Test specification:	
Standard:	FCC CFR Title 47 Part 15 Subpart C Section 15.247 ANSI C63.10:2013
Test procedure:	/
Non-standard test method:	N/A
Test Report Form No:	TRF-EL-110_V0
Test Report Form(s) Originator:	ZKT Testing
Master TRF:	Dated: 2020-01-06

This device described above has been tested by ZKT, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.
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Product name:	**Vigil 3**
Trademark:	**Netvue**
Model/Type reference:	NI-1921
Serial model No.:	NI-1920, NI-1922, NI-1923, NI-1924, NI-1925, NI-1926, NI-1927, NI-1928, NI-1929
Ratings:	Input:110-240V~ 50/60Hz Output：DC 12V/1A

Testing procedure and testing location:

Testing Laboratory.....:	**Shenzhen ZKT Technology Co., Ltd.**
Address.....:	1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue, Fuhai Street, Bao'an District, Shenzhen, China
Tested by (name + signature).....:	Alen He
Reviewer (name + signature).....:	Joe Liu
Approved (name + signature).....:	Lake Xie

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1. VERSION

Report No.	Version	Description	Approved
ZKT-230213L0664E	Rev.01	Initial issue of report	Feb. 22, 2023

2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.247) , Subpart C			
Standard Section	Test Item	Result	Remark
FCC part 15.203/15.247 (c)	Antenna requirement	PASS	
FCC part 15.207	AC Power Line Conducted Emission	PASS	
FCC part 15.247 (b)(3)	Conducted Peak Output Power	PASS	
FCC part 15.247 (a)(2)	Channel Bandwidth& 99% OCB	PASS	
FCC part 15.247 (e)	Power Spectral Density	PASS	
FCC part 15.247(d)	Band Edge	PASS	
FCC part 15.205/15.209	Spurious Emission	PASS	

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

2.1 TEST FACILITY

Shenzhen ZKT Technology Co., Ltd.
Add. : 1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue, Fuhai Street, Bao'an District, Shenzhen, China

FCC Test Firm Registration Number: 692225
Designation Number: CN1299
IC Registered No.: 27033
CAB identifier: CN0110

2.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement y ± U，where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2，providing a level of confidence of approximately 95 %。

No.	Item	Uncertainty
1	3m camber Radiated spurious emission(9KHz-30MHz)	U=4.5dB
2	3m camber Radiated spurious emission(30MHz-1GHz)	U=4.8dB
3	3m chamber Radiated spurious emission(1GHz-6GHz)	U=4.9dB
4	3m chamber Radiated spurious emission(6GHz-40GHz)	U=5.0dB
5	Conducted disturbance	U=3.2dB
6	RF Band Edge	U=1.68dB
7	RF power conducted	U=1.86dB
8	RF conducted Spurious Emission	U=2.2dB
9	RF Occupied Bandwidth	U=1.8dB
10	RF Power Spectral Density	U=1.75dB
11	humidity uncertainty	U=5.3%
12	Temperature uncertainty	U=0.59℃

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Product Name:	Vigil 3
Model No.:	NI-1921
Serial No.:	NI-1920, NI-1922, NI-1923, NI-1924, NI-1925, NI-1926, NI-1927, NI-1928, NI-1929
Difference:	All the same except the model number .
Hardware Version:	M14IPA-MB
Software Version:	4724511741
Sample(s) Status:	Engineer sample
Channel numbers:	802.11b/802.11g /802.11n(HT20):11
Channel separation:	5MHz
Modulation technology:	802.11b: Direct Sequence Spread Spectrum(DSSS) 802.11g/802.11n(H20): Orthogonal Frequency Division Multiplexing(OFDM)
Antenna Type:	External Antenna
Antenna gain:	3.34 dBi
Power supply:	AC 120V/60Hz

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2412MHz	4	2427MHz	7	2442MHz	10	2457MHz
2	2417MHz	5	2432MHz	8	2447MHz	11	2462MHz
3	2422MHz	6	2437MHz	9	2452MHz		

Note:
In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Test channel	**Frequency (MHz)**	
	802.11b/802.11g/802.11n(HT20)	
Lowest channel	2412MHz	
Middle channel	2437MHz	
Highest channel	2462MHz	

3.2 DESCRIPTION OF TEST MODES

Transmitting mode	Keep the EUT in continuously transmitting mode
Remark: During the test, the duty cycle >98%, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.	

We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:

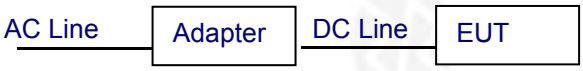
Pre-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.

Mode	802.11b	802.11g	802.11n (HT20)			
Data rate	1Mbps	6Mbps	6.5Mbps			

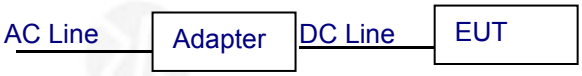
Test Software	Realtek Test Tool
Power level setup	<13dBm

3.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

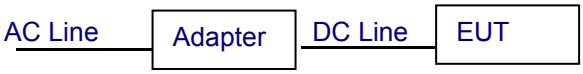
Conducted Emission



Radiated Emission



Conducted Spurious



3.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	Vigil 3	Netvue	NI-1921	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note

Note:

(1) The support equipment was authorized by Declaration of Confirmation.

(2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

3.5EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Spectrum Analyzer (9kHz-26.5GHz)	KEYSIGHT	9020A	MY55370835	Oct. 28, 2022	Oct. 27, 2023
2	Spectrum Analyzer (10kHz-39.9GHz)	R&S	FSQ	100363	Oct. 28, 2022	Oct. 27, 2023
3	EMI Test Receiver (9kHz-7GHz)	R&S	ESCI7	101169	Oct. 28, 2022	Oct. 27, 2023
4	Bilog Antenna (30MHz-1500MHz)	Schwarzbeck	VULB9168	N/A	Nov. 02, 2022	Nov. 01, 2023
5	Horn Antenna (1GHz-18GHz)	Agilent	AH-118	071145	Nov. 01, 2022	Oct. 31, 2023
6	Horn Antenna (15GHz-40GHz)	A.H.System	SAS-574	588	Oct. 28, 2022	Oct. 27, 2023
7	Loop Antenna	TESEQ	HLA6121	58357	Nov. 01, 2022	Oct. 31, 2023
8	Amplifier (30-1000MHz)	EM Electronics	EM330 Amplifier	060747	Nov. 15, 2022	Nov. 14, 2023
9	Amplifier (1GHz-26.5GHz)	Agilent	8449B	3008A00315	Oct. 28, 2022	Oct. 27, 2023
10	Amplifier (500MHz-40GHz)	全聚达	DLE-161	097	Oct. 28, 2022	Oct. 27, 2023
11	Test Cable	N/A	R-01	N/A	Oct. 28, 2022	Oct. 27, 2023
12	Test Cable	N/A	R-02	N/A	Oct. 28, 2022	Oct. 27, 2023
13	Test Cable	N/A	R-03	N/A	Oct. 28, 2022	Oct. 27, 2023
14	Test Cable	N/A	RF-01	N/A	Oct. 28, 2022	Oct. 27, 2023
15	Test Cable	N/A	RF-02	N/A	Oct. 28, 2022	Oct. 27, 2023
16	Test Cable	N/A	RF-03	N/A	Oct. 28, 2022	Oct. 27, 2023
17	ESG Signal Generator	Agilent	E4421B	N/A	Oct. 21, 2022	Oct. 20, 2023
18	Sgnal Generator	Agilent	N5182A	N/A	Oct. 21, 2022	Oct. 20, 2023
19	Magnetic Field Probe Tester	Narda	ELT-400	0-0344	Nov. 15, 2022	Nov. 14, 2023
20	Wideband Radio Communication Test	R&S	CMW500	106504	Oct. 28, 2022	Oct. 27, 2023
21	MWRF Power Meter Test system	MW	MW100-RPCB	N/A	Oct. 21, 2022	Oct. 20, 2023
22	D.C. Power Supply	LongWei	TPR-6405D	N/A	\	\
23	EMC Software	Frad	EZ-EMC	Ver.EMC-CON 3A1.1	\	\
24	RF Software	MW	MTS8310	V2.0.0.0	\	\
25	Turntable	MF	MF-7802BS	N/A	\	\
26	Antenna tower	MF	MF-7802BS	N/A	\	\

Conduction Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	LISN	R&S	ENV216	101471	Oct. 28, 2022	Oct. 27, 2023
2	LISN	CYBERTEK	EM5040A	E1850400149	Oct. 28, 2022	Oct. 27, 2023
3	Test Cable	N/A	C01	N/A	Oct. 28, 2022	Oct. 27, 2023
4	Test Cable	N/A	C02	N/A	Oct. 28, 2022	Oct. 27, 2023
5	EMI Test Receiver	R&S	ESRP3	101946	Oct. 28, 2022	Oct. 27, 2023
6	Absorbing Clamp	DZ	ZN23201	N/A	Oct. 28, 2022	Oct. 27, 2023

4. EMC EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

Test Requirement:	FCC Part15 C Section 15.207
Test Method:	ANSI C63.10:2013
Test Frequency Range:	150KHz to 30MHz
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto

4.1.1 POWER LINE CONDUCTED EMISSION Limits

FREQUENCY (MHz)	Limit (dBuV)		Standard
	Quasi-peak	Average	
0.15 -0.5	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	56.00	46.00	FCC
5.0 -30.0	60.00	50.00	FCC

Note:

(1) *Decreases with the logarithm of the frequency.

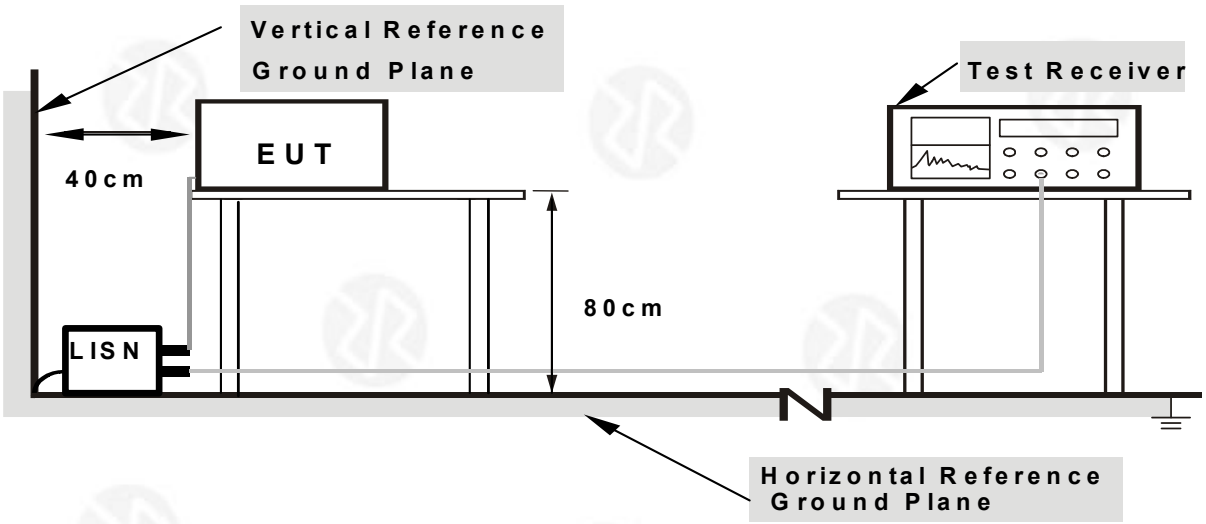
4.1.2 TEST PROCEDURE

a. The EUT was placed 0.1 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.1.3 DEVIATION FROM TEST STANDARD

No deviation

4.1.4 TEST SETUP



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

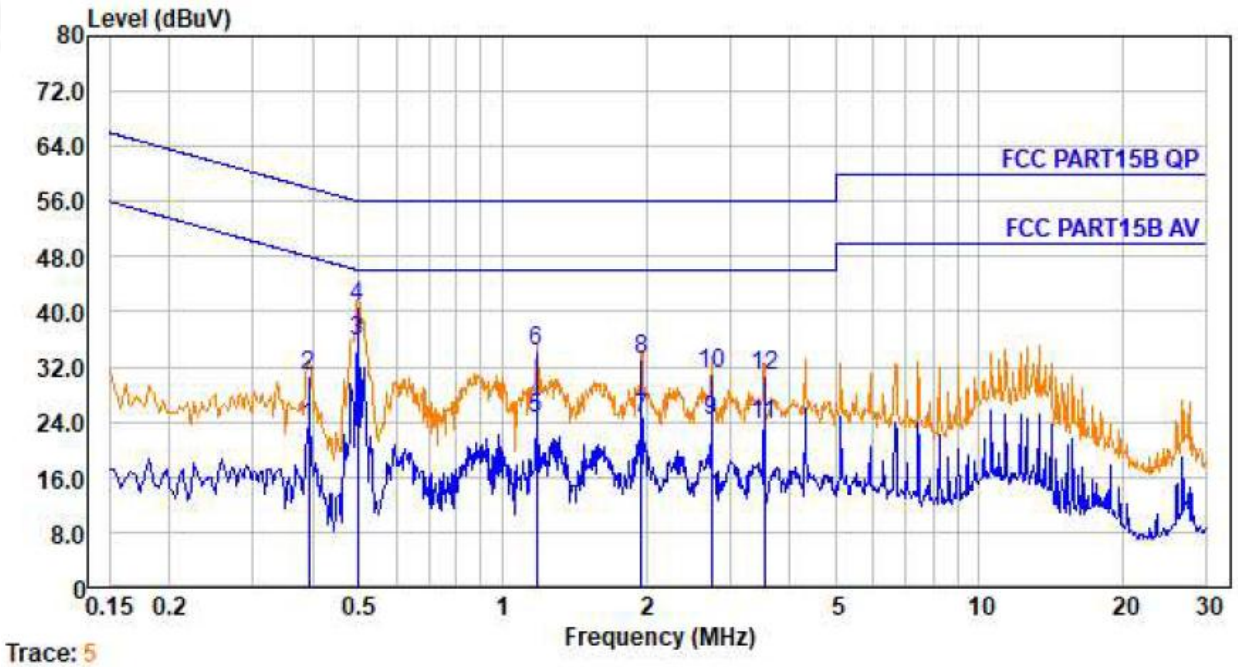
4.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

We pretest AC 120V and AC 230V, the worst voltage was AC 120V and the data recording in the report.

4.1.6 TEST RESULT

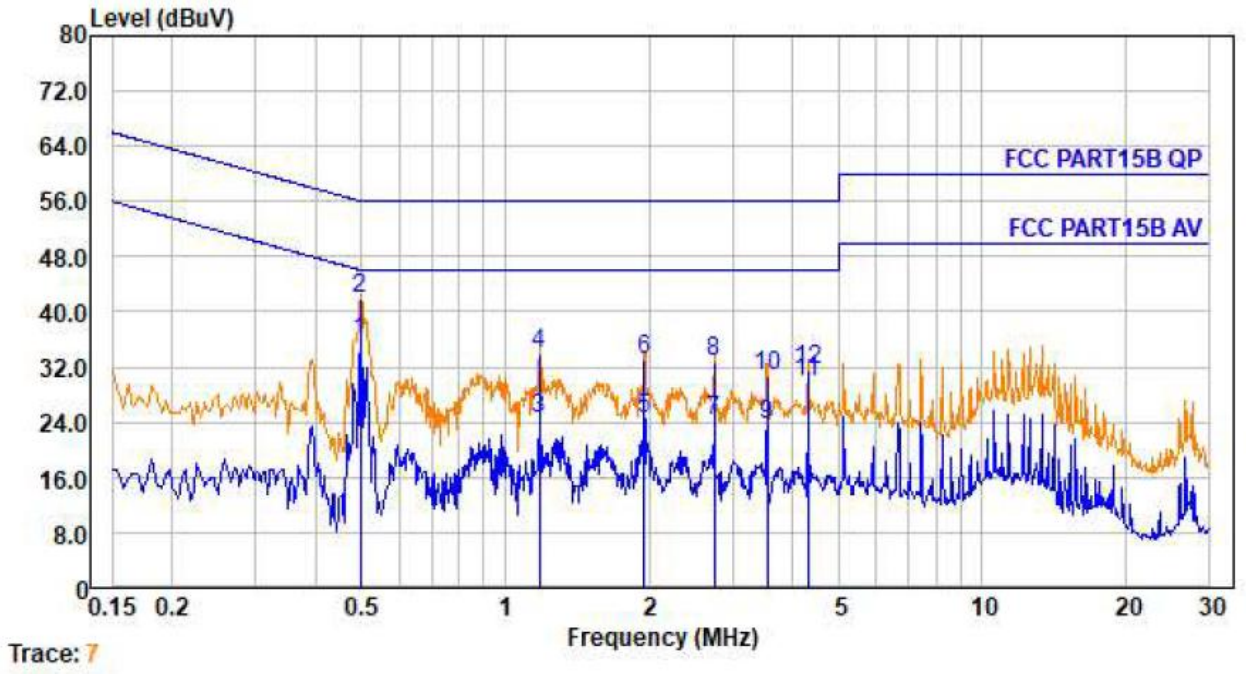
Temperature :	26℃	Relative Humidity:	54%
Pressure :	101kPa	Phase :	L
Test Voltage :	AC 120V/60Hz		



No.	Freq MHz	Cable Loss dB	LISN Factor dB/m	Receiver Reading dBuV	Emission Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark
1.	0.393	0.01	9.57	13.75	23.33	47.99	-24.66	Average
2.	0.393	0.01	9.57	21.20	30.78	57.99	-27.21	QP
3.	0.497	0.01	9.57	26.20	35.78	46.05	-10.27	Average
4.	0.497	0.01	9.57	31.24	40.82	56.05	-15.23	QP
5.	1.178	0.03	9.58	14.79	24.40	46.00	-21.60	Average
6.	1.178	0.03	9.58	24.72	34.33	56.00	-21.67	QP
7.	1.959	0.04	9.58	14.85	24.47	46.00	-21.53	Average
8.	1.959	0.04	9.58	23.45	33.07	56.00	-22.93	QP
9.	2.750	0.06	9.59	14.58	24.23	46.00	-21.77	Average
10.	2.750	0.06	9.59	21.24	30.89	56.00	-25.11	QP
11.	3.547	0.06	9.61	13.94	23.61	46.00	-22.39	Average
12.	3.547	0.06	9.61	21.15	30.82	56.00	-25.18	QP

Notes:
1.An initial pre-scan was performed on the line and neutral lines with peak detector.
2.Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3.Mesurement Level = Reading level + Correct Factor

Temperature :	26℃	Relative Humidity:	54%
Pressure :	101kPa	Phase :	N
Test Voltage :	AC 120V/60Hz		



No.	Freq MHz	Cable Loss dB	LISN Factor dB/m	Receiver Reading dBuV	Emission Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark
1.	0.497	0.01	9.58	26.20	35.79	46.05	-10.26	Average
2.	0.497	0.01	9.58	32.24	41.83	56.05	-14.22	QP
3.	1.178	0.03	9.58	14.79	24.40	46.00	-21.60	Average
4.	1.178	0.03	9.58	24.27	33.88	56.00	-22.12	QP
5.	1.959	0.04	9.58	14.85	24.47	46.00	-21.53	Average
6.	1.959	0.04	9.58	23.45	33.07	56.00	-22.93	QP
7.	2.750	0.06	9.60	14.58	24.24	46.00	-21.76	Average
8.	2.750	0.06	9.60	23.24	32.90	56.00	-23.10	QP
9.	3.547	0.06	9.62	13.94	23.62	46.00	-22.38	Average
10.	3.547	0.06	9.62	21.15	30.83	56.00	-25.17	QP
11.	4.315	0.07	9.64	20.14	29.85	46.00	-16.15	Average
12.	4.315	0.07	9.64	21.73	31.44	56.00	-24.56	QP

Notes:
1.An initial pre-scan was performed on the line and neutral lines with peak detector.
2.Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3.Mesurement Level = Reading level + Correct Factor

4.2 RADIATED EMISSION MEASUREMENT

Test Requirement:	FCC Part15 C Section 15.209
Test Method:	ANSI C63.10:2013
Test Frequency Range:	9kHz to 25GHz
Test site:	Measurement Distance: 3m
Receiver setup:	

Frequency	Detector	RBW	VBW	Value
9KHz-150KHz	Quasi-peak	200Hz	600Hz	Quasi-peak
150KHz-30MHz	Quasi-peak	9KHz	30KHz	Quasi-peak
30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
	Peak	1MHz	10Hz	Average

4.2.1 RADIATED EMISSION LIMITS

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
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

LIMITS OF RADIATED EMISSION MEASUREMENT

FREQUENCY (MHz)	Limit (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

(1) The limit for radiated test was performed according to FCC PART 15C.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

4.2.2 TEST PROCEDURE

Below 1GHz test procedure as below:

a. The EUT was placed on the top of a rotating table 0.1 meters above the ground at a 3 meter semi-anechoiccamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of avariable-height antenna tower.

c. The antenna height 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.
d. 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 (for the test frequency of below 30MHz, the antenna was tuned to heights 1meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dBmargin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Above 1GHz test procedure as below:

g. Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 meter to 1.5 meter(Above 18GHz the distance is 1 meter and table is 1.5 meter).
h. Test the EUT in the lowest channel ,the middle channel ,the Highest channel

Note:

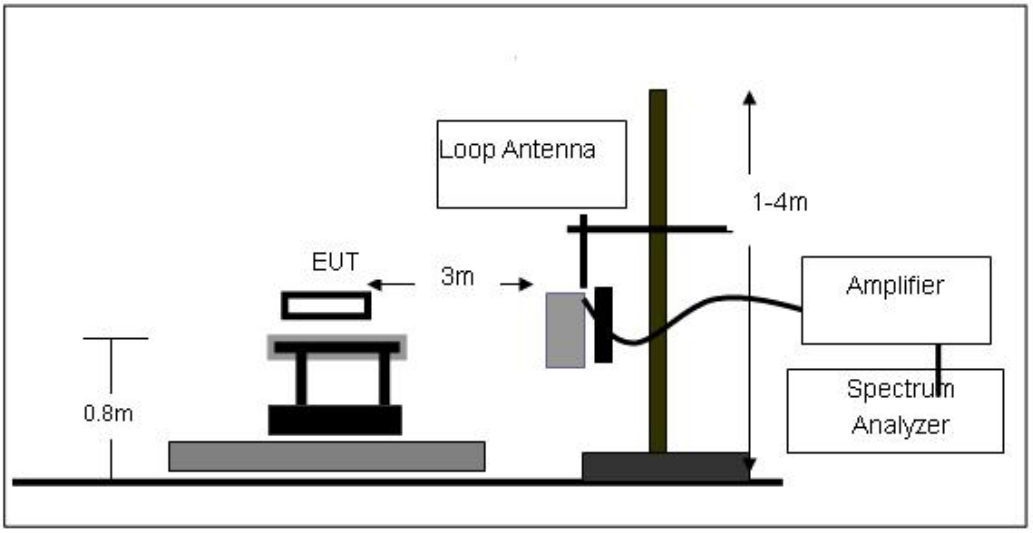
Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

4.2.3 DEVIATION FROM TEST STANDARD

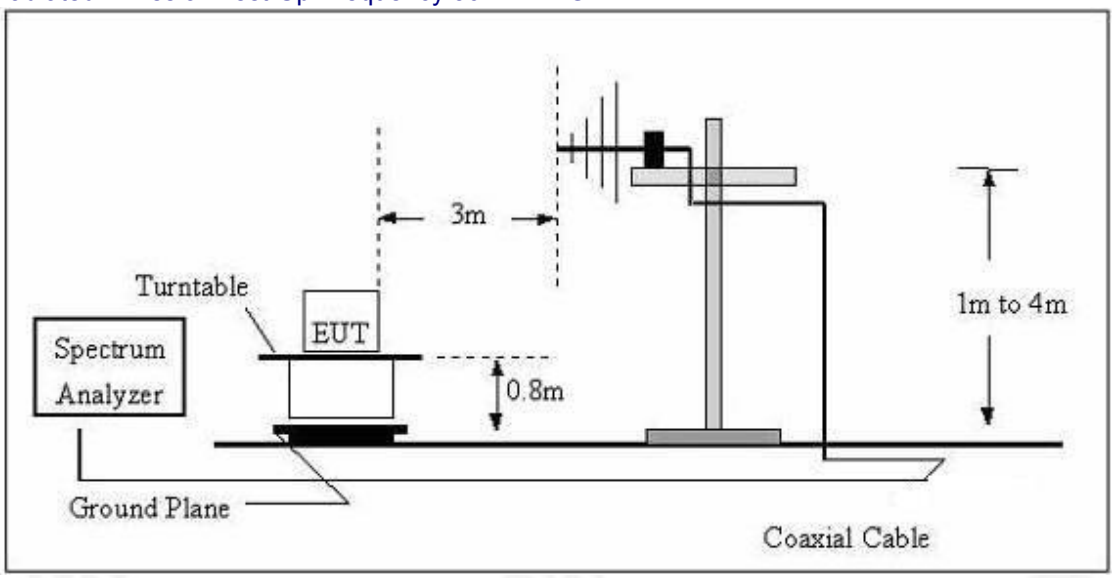
No deviation

4.2.4 TEST SETUP

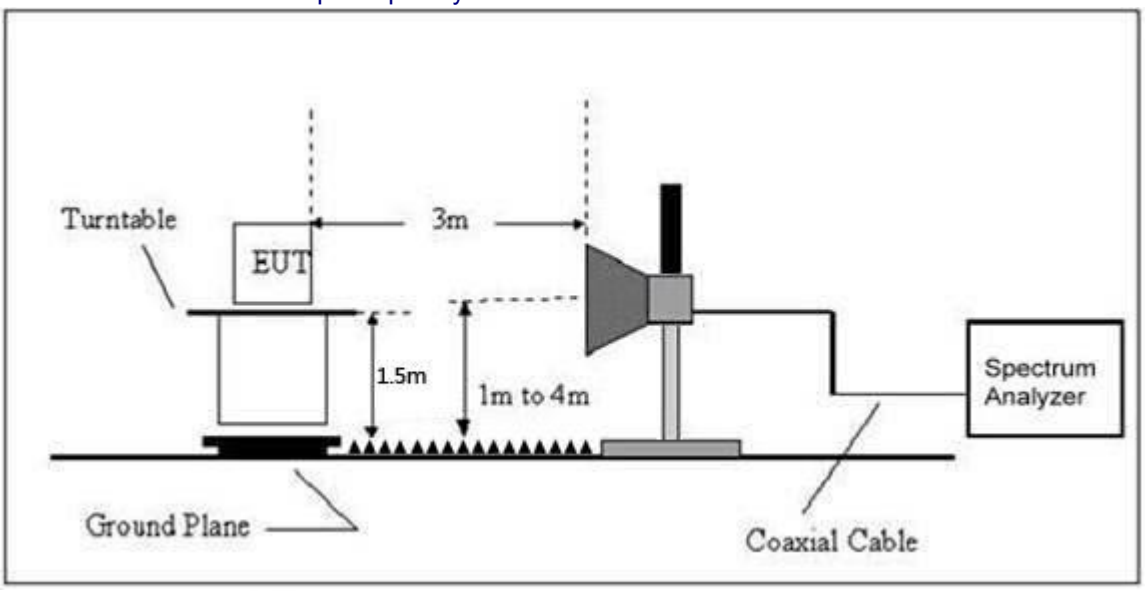
（A）Radiated Emission Test-Up Frequency Below 30MHz



（B）Radiated Emission Test-Up Frequency 30MHz~1GHz



（C）Radiated Emission Test-Up Frequency Above 1GHz



4.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

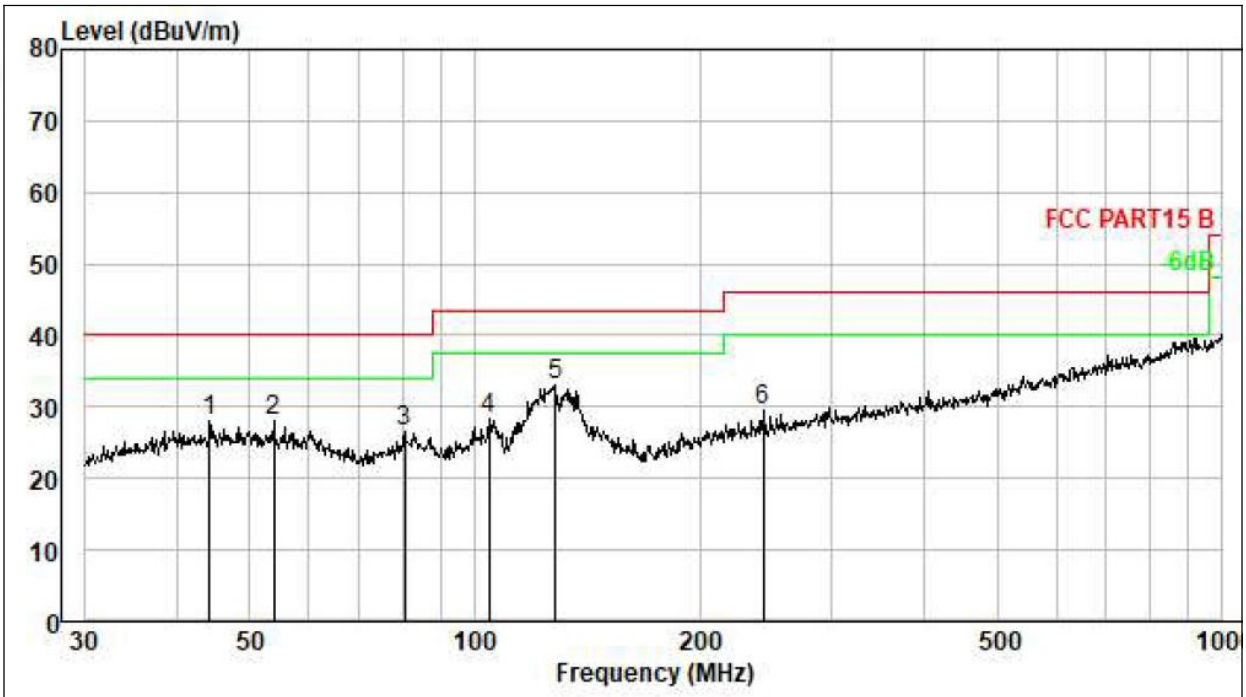
4.2.6 TEST RESULTS

Between 9KHz – 30MHz

The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and according to 15.31(o) & RSS-Gen 6.13, the test result no need to reported.

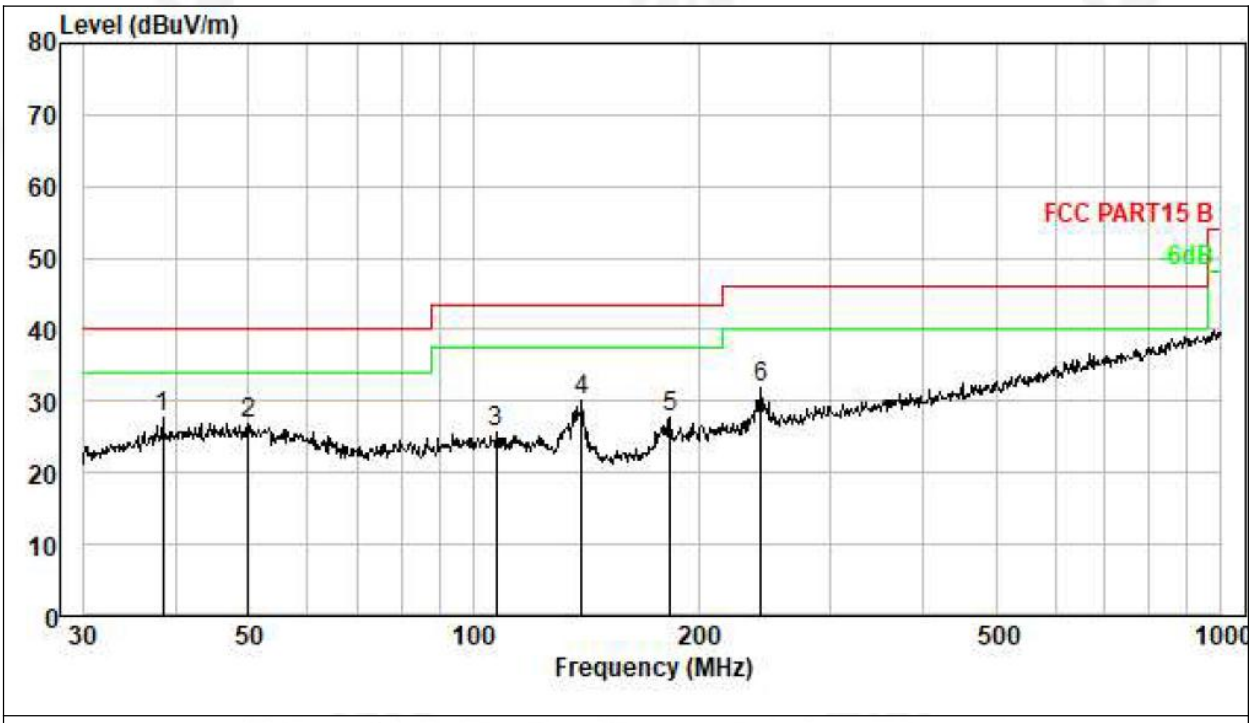
Between 30MHz – 1GHz

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101 kPa	Polarization:	Horizontal
Test Voltage:	AC 120V/60Hz		



No.	Freq MHz	Cable Loss dB	ANT Factor dB/m	Receiver Reading dBµV	Preamp Gain dB	Emission Level dBµV/m	Limit dBµV/m	Over Limit dB	Remark
1	44.120	0.38	12.59	14.95	0.00	27.92	40.00	-12.08	QP
2	53.882	0.46	12.29	15.36	0.00	28.11	40.00	-11.89	QP
3	80.644	0.61	9.71	16.11	0.00	26.43	40.00	-13.57	QP
4	104.536	0.71	11.15	16.35	0.00	28.21	43.50	-15.29	QP
5	128.113	0.82	9.32	22.96	0.00	33.10	43.50	-10.40	QP
6	243.377	1.17	12.80	15.46	0.00	29.43	46.00	-16.57	QP

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101kPa	Polarization:	Vertical
Test Voltage:	AC 120V/60Hz		



No.	Freq MHz	Cable Loss dB	ANT Factor dB/m	Receiver Reading dBµV	Preamp Gain dB	Emission Level dBµV/m	Limit dBµV/m	Over Limit dB	Remark
1	38.346	0.33	12.07	15.23	0.00	27.63	40.00	-12.37	QP
2	49.881	0.43	12.70	13.74	0.00	26.87	40.00	-13.13	QP
3	107.134	0.73	11.17	13.92	0.00	25.82	43.50	-17.68	QP
4	139.361	0.87	8.54	20.56	0.00	29.97	43.50	-13.53	QP
5	183.201	1.01	10.22	16.54	0.00	27.77	43.50	-15.73	QP
6	242.525	1.16	12.78	17.94	0.00	31.88	46.00	-14.12	QP

Remarks:
1.Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2.The emission levels of other frequencies are very lower than the limit and not show in test report.
3.The test data shows only the worst case 802.11b mode

1GHz~25GHz

ANT1- 802.11b

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel:2412MHz									
V	4824.00	49.99	30.55	5.77	24.66	49.87	74.00	-24.13	PK
V	4824.00	40.06	30.55	5.77	24.66	39.94	54.00	-14.06	AV
V	7236.00	47.55	30.33	6.32	24.55	48.09	74.00	-25.91	PK
V	7236.00	41.45	30.33	6.32	24.55	41.99	54.00	-12.01	AV
V	9648.00	48.22	30.85	7.45	24.69	49.51	74.00	-24.49	PK
V	9648.00	40.18	30.85	7.45	24.69	41.47	54.00	-12.53	AV
V	12060.00	48.52	31.02	8.99	25.57	52.06	74.00	-21.94	PK
V	12060.00	38.58	31.02	8.99	25.57	42.12	54.00	-11.88	AV
H	4824.00	51.18	30.55	5.77	24.66	51.06	74.00	-22.94	PK
H	4824.00	40.91	30.55	5.77	24.66	40.79	54.00	-13.21	AV
H	7236.00	50.11	30.33	6.32	24.55	50.65	74.00	-23.35	PK
H	7236.00	40.85	30.33	6.32	24.55	41.39	54.00	-12.61	AV
H	9648.00	49.94	30.85	7.45	24.69	51.23	74.00	-22.77	PK
H	9648.00	41.41	30.85	7.45	24.69	42.70	54.00	-11.30	AV
H	12060.00	50.55	31.02	8.99	25.57	54.09	74.00	-19.91	PK
H	12060.00	39.89	31.02	8.99	25.57	43.43	54.00	-10.57	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Middle Channel:2437MHz									
V	4874.00	50.67	30.55	5.77	24.66	50.55	74.00	-23.45	PK
V	4874.00	40.50	30.55	5.77	24.66	40.38	54.00	-13.62	AV
V	7311.00	48.05	30.33	6.32	24.55	48.59	74.00	-25.41	PK
V	7311.00	40.97	30.33	6.32	24.55	41.51	54.00	-12.49	AV
V	9748.00	48.08	30.85	7.45	24.69	49.37	74.00	-24.63	PK
V	9748.00	40.76	30.85	7.45	24.69	42.05	54.00	-11.95	AV
V	12185.00	48.12	31.02	8.99	25.57	51.66	74.00	-22.34	PK
V	12185.00	38.85	31.02	8.99	25.57	42.39	54.00	-11.61	AV
H	4874.00	50.72	30.55	5.77	24.66	50.60	74.00	-23.40	PK
H	4874.00	41.06	30.55	5.77	24.66	40.94	54.00	-13.06	AV
H	7311.00	50.47	30.33	6.32	24.55	51.01	74.00	-22.99	PK
H	7311.00	41.05	30.33	6.32	24.55	41.59	54.00	-12.41	AV
H	9748.00	50.41	30.85	7.45	24.69	51.70	74.00	-22.30	PK
H	9748.00	41.60	30.85	7.45	24.69	42.89	54.00	-11.11	AV
H	12185.00	50.16	31.02	8.99	25.57	53.70	74.00	-20.30	PK
H	12185.00	40.05	31.02	8.99	25.57	43.59	54.00	-10.41	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
High Channel:2462MHz									
V	4924.00	50.47	30.55	5.77	24.66	50.35	74.00	-23.65	PK
V	4924.00	40.30	30.55	5.77	24.66	40.18	54.00	-13.82	AV
V	7386.00	47.95	30.33	6.32	24.55	48.49	74.00	-25.51	PK
V	7386.00	40.92	30.33	6.32	24.55	41.46	54.00	-12.54	AV
V	9848.00	48.37	30.85	7.45	24.69	49.66	74.00	-24.34	PK
V	9848.00	40.77	30.85	7.45	24.69	42.06	54.00	-11.94	AV
V	12310.00	48.28	31.02	8.99	25.57	51.82	74.00	-22.18	PK
V	12310.00	38.25	31.02	8.99	25.57	41.79	54.00	-12.21	AV
H	4924.00	50.85	30.55	5.77	24.66	50.73	74.00	-23.27	PK
H	4924.00	41.67	30.55	5.77	24.66	41.55	54.00	-12.45	AV
H	7386.00	50.03	30.33	6.32	24.55	50.57	74.00	-23.43	PK
H	7386.00	41.82	30.33	6.32	24.55	42.36	54.00	-11.64	AV
H	9848.00	49.79	30.85	7.45	24.69	51.08	74.00	-22.92	PK
H	9848.00	40.79	30.85	7.45	24.69	42.08	54.00	-11.92	AV
H	12310.00	49.80	31.02	8.99	25.57	53.34	74.00	-20.66	PK
H	12310.00	39.89	31.02	8.99	25.57	43.43	54.00	-10.57	AV

Remark:
1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,
Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
4. We test all the mode and recorded the worst mode in the report.

5.RADIATED BAND EMISSIONMEASUREMENT

5.1 TEST REQUIREMENT:

Test Requirement:	FCC Part15 C Section 15.209 and 15.205
Test Method:	ANSI C63.10: 2013
Test Frequency Range:	All of the restrict bands were tested, only the worst band's (2310MHz to 2500MHz) data was showed.
Test site:	Measurement Distance: 3m
Receiver setup:	See below

Frequency	Detector	RBW	VBW	Value
Above 1GHz	Peak	1MHz	3MHz	Peak
	Average	1MHz	3MHz	Average

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

(1) The limit for radiated test was performed according to FCC PART 15C.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

5.2 TEST PROCEDURE

Above 1GHz test procedure as below:

a. 1. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna height 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.

d. 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 rota table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dBmargin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

g. Test the EUT in the lowest channel, the Highest channel

Note:

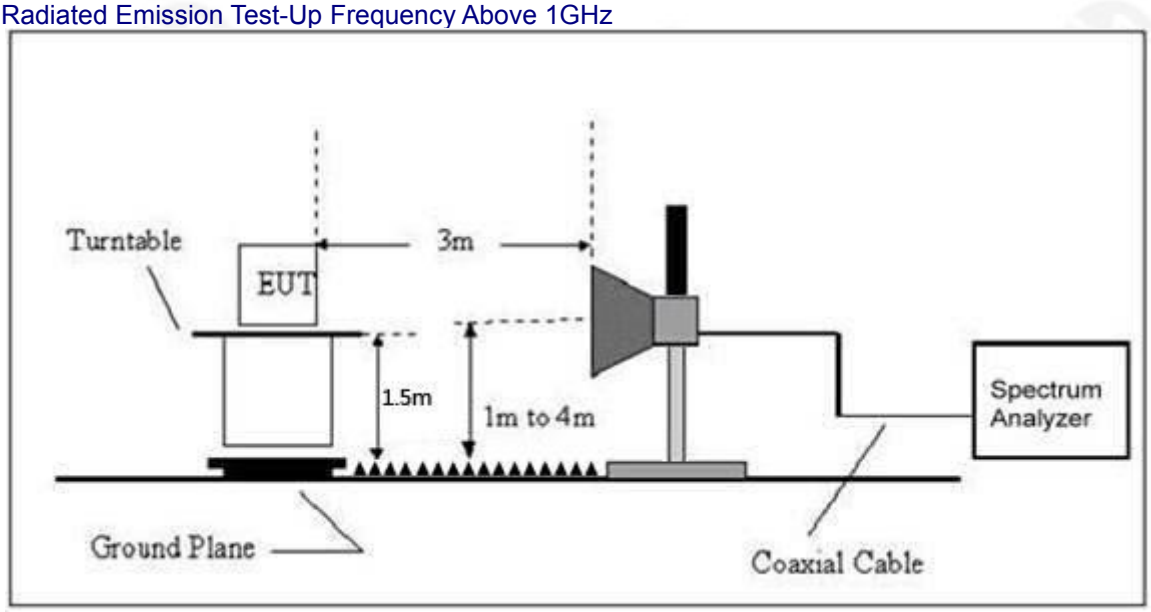
Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

5.3 DEVIATION FROM TEST STANDARD

No deviation

5.4 TEST SETUP

Radiated Emission Test-Up Frequency Above 1GHz



5.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

5.6 TEST RESULT

	Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission level (dBuV/m)	Limit (dBuV/m)	Detector Type	Result
802.11b	Low Channel 2412MHz									
	H	2390.00	54.06	30.22	4.85	23.98	52.67	74.00	PK	PASS
	H	2390.00	46.10	30.22	4.85	23.98	44.71	54.00	AV	PASS
	H	2400.00	54.78	30.22	4.85	23.98	53.39	74.00	PK	PASS
	H	2400.00	44.61	30.22	4.85	23.98	43.22	54.00	AV	PASS
	V	2390.00	55.59	30.22	4.85	23.98	54.20	74.00	PK	PASS
	V	2390.00	45.07	30.22	4.85	23.98	43.68	54.00	AV	PASS
	V	2400.00	55.71	30.22	4.85	23.98	54.32	74.00	PK	PASS
	V	2400.00	46.65	30.22	4.85	23.98	45.26	54.00	AV	PASS
	High Channel 2462MHz									
	H	2483.50	53.03	30.22	4.85	23.98	51.64	74.00	PK	PASS
	H	2483.50	44.83	30.22	4.85	23.98	43.44	54.00	AV	PASS
	H	2500.00	56.37	30.22	4.85	23.98	54.98	74.00	PK	PASS
	H	2500.00	44.96	30.22	4.85	23.98	43.57	54.00	AV	PASS
	V	2483.50	55.50	30.22	4.85	23.98	54.11	74.00	PK	PASS
	V	2483.50	45.42	30.22	4.85	23.98	44.03	54.00	AV	PASS
	V	2500.00	55.03	30.22	4.85	23.98	53.64	74.00	PK	PASS
	V	2500.00	45.38	30.22	4.85	23.98	43.99	54.00	AV	PASS
802.11g	Low Channel 2412MHz									
	H	2390.00	53.69	30.22	4.85	23.98	52.30	74.00	PK	PASS
	H	2390.00	44.22	30.22	4.85	23.98	42.83	54.00	AV	PASS
	H	2400.00	56.47	30.22	4.85	23.98	55.08	74.00	PK	PASS
	H	2400.00	46.62	30.22	4.85	23.98	45.23	54.00	AV	PASS

	V	2390.00	52.14	30.22	4.85	23.98	50.75	74.00	PK	PASS
	V	2390.00	46.77	30.22	4.85	23.98	45.38	54.00	AV	PASS
	V	2400.00	57.05	30.22	4.85	23.98	55.66	74.00	PK	PASS
	V	2400.00	46.82	30.22	4.85	23.98	45.43	54.00	AV	PASS
	High Channel 2462MHz									
	H	2483.50	53.31	30.22	4.85	23.98	51.92	74.00	PK	PASS
	H	2483.50	45.69	30.22	4.85	23.98	44.30	54.00	AV	PASS
	H	2500.00	54.59	30.22	4.85	23.98	53.20	74.00	PK	PASS
	H	2500.00	46.93	30.22	4.85	23.98	45.54	54.00	AV	PASS
	V	2483.50	52.87	30.22	4.85	23.98	51.48	74.00	PK	PASS
	V	2483.50	46.22	30.22	4.85	23.98	44.83	54.00	AV	PASS
	V	2500.00	54.18	30.22	4.85	23.98	52.79	74.00	PK	PASS
	V	2500.00	45.06	30.22	4.85	23.98	43.67	54.00	AV	PASS
802.11n20	Low Channel 2412MHz									
	H	2390.00	53.93	30.22	4.85	23.98	52.54	74.00	PK	PASS
	H	2390.00	46.46	30.22	4.85	23.98	45.07	54.00	AV	PASS
	H	2400.00	54.40	30.22	4.85	23.98	53.01	74.00	PK	PASS
	H	2400.00	47.90	30.22	4.85	23.98	46.51	54.00	AV	PASS
	V	2390.00	56.18	30.22	4.85	23.98	54.79	74.00	PK	PASS
	V	2390.00	47.04	30.22	4.85	23.98	45.65	54.00	AV	PASS
	V	2400.00	54.75	30.22	4.85	23.98	53.36	74.00	PK	PASS
	V	2400.00	45.90	30.22	4.85	23.98	44.51	54.00	AV	PASS
	High Channel 2462MHz									
	H	2483.50	56.12	30.22	4.85	23.98	54.73	74.00	PK	PASS
	H	2483.50	46.62	30.22	4.85	23.98	45.23	54.00	AV	PASS
	H	2500.00	57.31	30.22	4.85	23.98	55.92	74.00	PK	PASS
	H	2500.00	45.14	30.22	4.85	23.98	43.75	54.00	AV	PASS
	V	2483.50	52.96	30.22	4.85	23.98	51.57	74.00	PK	PASS
	V	2483.50	44.24	30.22	4.85	23.98	42.85	54.00	AV	PASS
	V	2500.00	55.15	30.22	4.85	23.98	53.76	74.00	PK	PASS
	V	2500.00	48.35	30.22	4.85	23.98	46.96	54.00	AV	PASS

Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier, Margin= Emission Level - Limit

6.POWER SPECTRAL DENSITY TEST

Test Requirement:	FCC Part15 C Section 15.247 (e)
Test Method:	KDB558074 D0115.247 Meas Guidancev05r02

6.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247	Power Spectral Density	8dBm/3kHz	2400-2483.5	PASS

6.2 TEST PROCEDURE

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS bandwidth.
3. Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
4. Set the VBW ≥ 3 x RBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level within the RBW.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

6.3 DEVIATION FROM STANDARD

No deviation.

6.4 TEST SETUP

6.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.1 Unless otherwise a special operating condition is specified in the follows during the testing.

6.6 TEST RESULT

Temperature :	26℃	Relative Humidity :	54%
Pressure :	101kPa	Test Voltage :	AC 120V
Test Mode :	TX b Mode		

Frequency	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
2412 MHz	-7.80	8	PASS
2437 MHz	-7.71	8	PASS
2462 MHz	-8.71	8	PASS

CH01

CH06


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.437000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 6 dB
#Avg Type: RMS
Avg|Hold:>10/10
08:48:58 AM Feb 20, 2023
Frequency
Ref Offset 4.71 dB
10 dB/div
Ref 0.71 dBm
Log
Mkr1 2.437 549 GHz
-7.706 dBm
-9.29
-19.3
-29.3
-39.3
-49.3
-59.3
-69.3
-79.3
-89.3
Center 2.437000 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 19.59 MHz
Sweep 2.066 s (1001 pts)
Auto Tune
Center Freq
2.437000000 GHz
Start Freq
2.427203522 GHz
Stop Freq
2.446796478 GHz
CF Step
1.959296 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin
MSG
STATUS

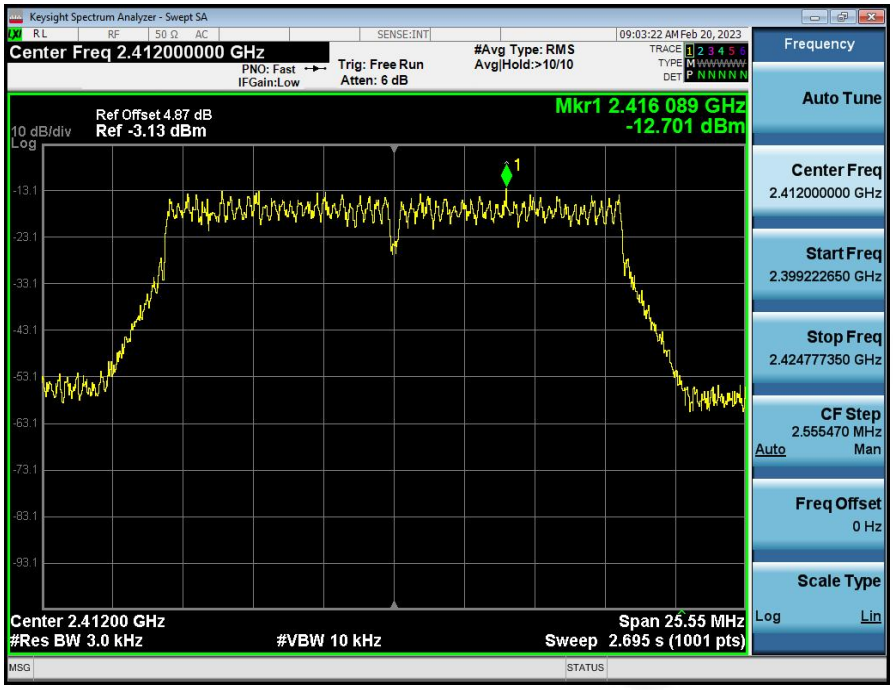
CH11


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.462000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 8 dB
#Avg Type: RMS
Avg|Hold:>10/10
08:55:56 AM Feb 20, 2023
Frequency
Ref Offset 4.73 dB
10 dB/div
Ref 1.73 dBm
Log
Mkr1 2.462 709 GHz
-8.707 dBm
-8.27
-18.3
-28.3
-38.3
-48.3
-58.3
-68.3
-78.3
-88.3
Center 2.462000 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 19.68 MHz
Sweep 2.076 s (1001 pts)
Auto Tune
Center Freq
2.462000000 GHz
Start Freq
2.452157981 GHz
Stop Freq
2.471842019 GHz
CF Step
1.968404 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin
MSG
STATUS

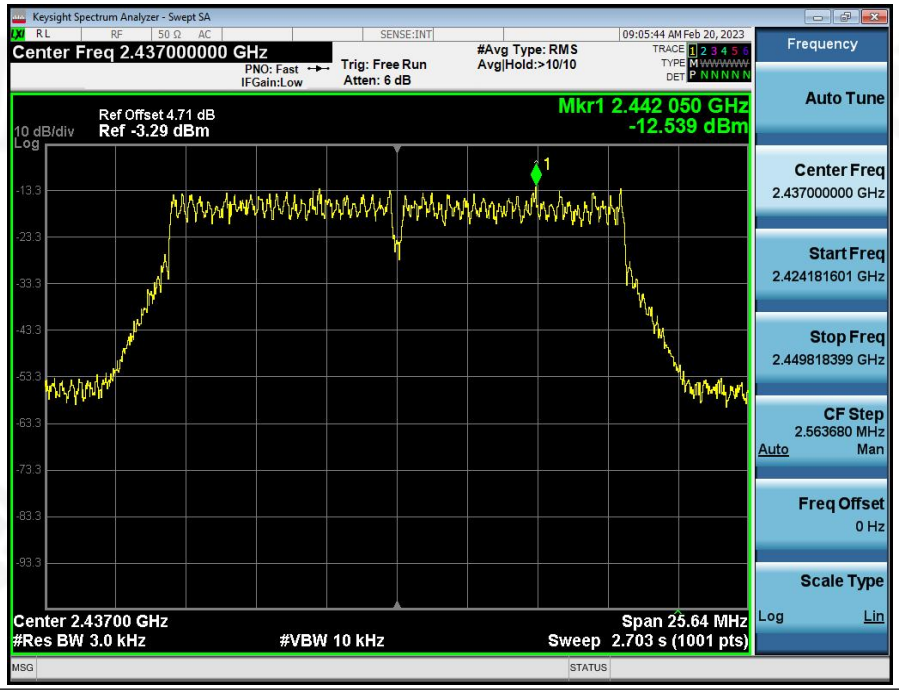
Temperature：	26℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage：	AC 120V
Test Mode ：	TX g Mode		

Frequency	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
2412 MHz	-12.70	8	PASS
2437 MHz	-12.54	8	PASS
2462 MHz	-13.33	8	PASS

CH01



CH06


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.437000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 6 dB
#Avg Type: RMS
Avg|Hold:>10/10
09:05:44 AM Feb 20, 2023
Ref Offset 4.71 dB
10 dB/div
Log
Ref -3.29 dBm
Mkr1 2.442 050 GHz
-12.539 dBm
Center 2.43700 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 25.64 MHz
Sweep 2.703 s (1001 pts)
Frequency
Auto Tune
Center Freq
2.437000000 GHz
Start Freq
2.424181601 GHz
Stop Freq
2.449818399 GHz
CF Step
2.563680 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin

CH11

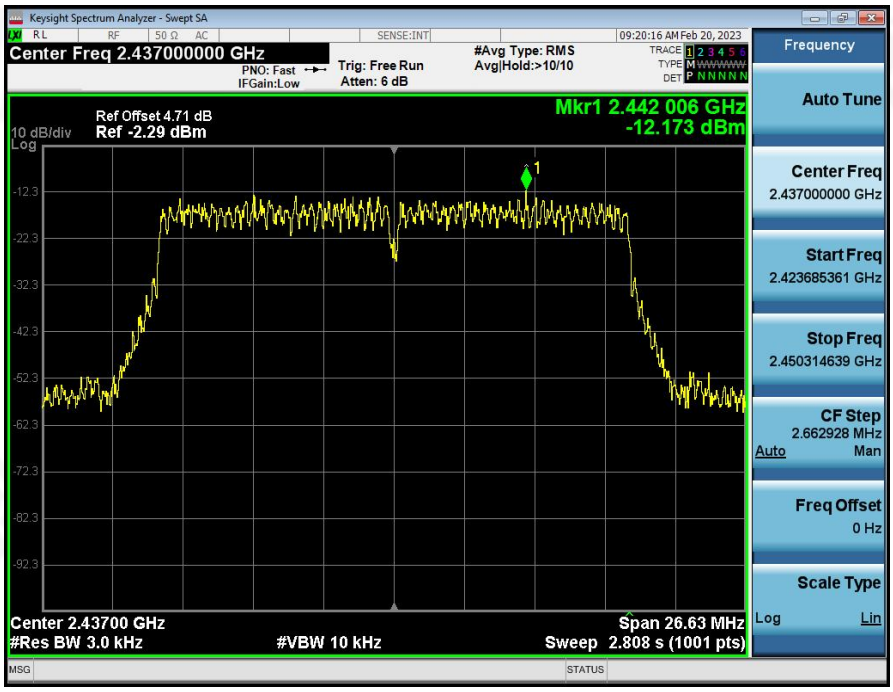

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.462000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 6 dB
#Avg Type: RMS
Avg|Hold:>10/10
09:08:05 AM Feb 20, 2023
Ref Offset 4.73 dB
10 dB/div
Log
Ref -3.27 dBm
Mkr1 2.465 137 GHz
-13.330 dBm
Center 2.46200 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 25.50 MHz
Sweep 2.689 s (1001 pts)
Frequency
Auto Tune
Center Freq
2.462000000 GHz
Start Freq
2.449249404 GHz
Stop Freq
2.474750596 GHz
CF Step
2.550119 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin

Temperature：	26℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage：	AC 120V
Test Mode ：	TX n Mode(20M)		

Frequency	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
2412 MHz	-12.44	8	PASS
2437 MHz	-12.17	8	PASS
2462 MHz	-12.31	8	PASS

CH01

CH06


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.437000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 6 dB
#Avg Type: RMS
Avg|Hold:>10/10
09:20:16 AM Feb 20, 2023
Frequency
Ref Offset 4.71 dB
10 dB/div
Ref -2.29 dBm
Mkr1 2.442 006 GHz
-12.173 dBm
Auto Tune
Center Freq
2.437000000 GHz
Start Freq
2.423685361 GHz
Stop Freq
2.450314639 GHz
CF Step
2.662928 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin
Center 2.43700 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 26.63 MHz
Sweep 2.808 s (1001 pts)

CH11


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.462000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 6 dB
#Avg Type: RMS
Avg|Hold:>10/10
09:27:27 AM Feb 20, 2023
Frequency
Ref Offset 4.73 dB
10 dB/div
Ref -2.27 dBm
Mkr1 2.469 467 GHz
-12.306 dBm
Auto Tune
Center Freq
2.462000000 GHz
Start Freq
2.448665305 GHz
Stop Freq
2.475334695 GHz
CF Step
2.666939 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin
Center 2.46200 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 26.67 MHz
Sweep 2.812 s (1001 pts)