

Test Report

FCC ID:2AXDQ-ONESCREEENTL6

Report Number..... : ZKT-210826L4492E-2-1

Date of Test..... Mar. 11 to Apr. 02, 2022

Date of issue : Apr. 02, 2022

Total number of pages 31

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 : **NZS Inc.**

Address : 8168 Miramar Road, San Diego, CA 92126

Manufacturer's name : **Heyuan lianteng industrial co., LTD**

Address : Yc-ah13, longling fourth road, longling industrial park, yuancheng district, heyuan city

Test specification:

Standard..... : FCC CFR Title 47 Part 15 Subpart C Section 15.407
ANSI C63.10:2013
KDB 789033 D02 v01r02
RSS-247 Issue 2: February 2017
RSS-Gen Issue 5: April 2018

Test procedure..... : /

Non-standard test method : N/A

Test Report Form No. : TRF-EL-113_V0

Test Report Form(s) Originator : ZKT Testing

Master TRF : Dated: 2021-09-08

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.

This report shall not be reproduced except in full, without the written approval of ZKT, this document may be altered or revised by ZKT, personal only, and shall be noted in the revision of the document.

Product name..... : Interactive Touch Screen / Interactive Flat Panel

Trademark : OneScreen

Model/Type reference : OneScreen TL6,
OneScreen * (*stands for 0-9, or A-Z, or a-z, or blank)

Ratings..... : AC100-240V,50/60Hz

Testing procedure and testing location:

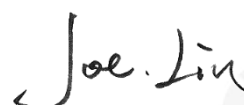
Testing Laboratory: Shenzhen ZKT Technology Co., Ltd.

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



Table of Contents

Page

2.SUMMARY OF TEST RESULTS	5
2.1 TEST FACILITY	6
2.2 MEASUREMENT UNCERTAINTY	6
3.1 GENERAL INFORMATION	7
3.1 GENERAL DESCRIPTION OF EUT	7
3.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED	9
3.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)	9
3.5 EQUIPMENTS LIST FOR ALL TEST ITEMS	10
4.EMC EMISSION TEST	11
4.1 RADIATED EMISSION MEASUREMENT	11
4.1.1 APPLICABLE STANDARD	11
4.1.2 CONFORMANCE LIMIT	11
4.1.3 MEASURING INSTRUMENTS	11
4.1.4 TEST CONFIGURATION	12
4.1.5 TEST PROCEDURE	13
4.1.6 TEST RESULT	14
5.MAXIMUM CONDUCTED OUTPUT POWER	21
5.1 APPLIED PROCEDURES / LIMIT	21
5.2 TEST PROCEDURE	21
5.3 DEVIATION FROM STANDARD	22
5.4 TEST SETUP	22
5.5 EUT OPERATION CONDITIONS	22
5.6 TEST RESULTS	23
6.OUT OF BAND EMISSIONS	25
6.1 APPLICABLE STANDARD	25
6.2 TEST PROCEDURE	25
6.3 DEVIATION FROM STANDARD	25
6.4 TEST SETUP	25
6.5 EUT OPERATION CONDITIONS	26
6.6 TEST RESULTS	26
7. TEST SETUP PHOTO	31
8. EUT CONSTRUCTIONAL DETAILS	31

1. VERSION

Report No.	Version	Description	Approved
ZKT-210826L4492E-2-1	Rev.01-1	Initial issue of report	Apr. 02, 2022

2.SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.407) , Subpart E			
Standard Section	Test Item	Judgment	Remark
15.209(a), 15.407 (b)(1) 15.407 (b)(4) 15.407 (b)(8)	Spurious Radiated Emissions	PASS	
15.407 (a)(1) 15.407 (a)(3)	Maximum Conducted Output Power	PASS	
15.407(b)(1) 15.407(b)(4)	Band Edge	PASS	

NOTE:

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

2.1 1TEST 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

2.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, 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	te	ncertainty
1	3m chamber Radiated spurious emission(30MHz-1GHz)	U=4.3dB
2	3m chamber Radiated spurious emiss on(1GHz-18GHz)	U 4.5dB
3	3m chamber Radiated spurious emission(18GHz-40GHz)	U=3 34dB
4	Conducted Adjacent channel power	U=1.3 dB
	Conducted output power uncertainty Above 1G	U=1.576dB
6	Conducted output power uncertainty below 1G	U=1.28dB
7	humidity uncertainty	U=5.3%
8	Temperature uncertainty	U=0.59℃
9	Radiated disturbance(30MHz-1000MHz)	U=4.8dB
10	Radiated disturbance(1GHz-6GHz)	U=4.9dB
11	Radiated disturbance(1GHz-18GHz)	U=5.0dB

3.1 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	Interactive Touch Screen / Interactive Flat Panel	
Trade Name	OneScreen	
Model Name	OneScreen TL6, OneScreen * (*stands for 0-9, or A-Z, or a-z, or blank)	
Model Difference	All the same except colour and model name.	
Product Description	IEEE 802.11 WLAN Mode Supported	☒ 802.11a/n (20MHz channel bandwidth) ☒ 802.11n (40MHz channel bandwidth) ☒ 802.11ac(80MHz channel bandwidth)
	Data Rate	802.11a: 6,9,12,18,24,36,48,54Mbps; 802.11n(HT20/HT40):MCS0-MCS15; 802.11ac(VHT80):NSS1, MCS0-MCS9
	Modulation	OFDM with BPSK/QPSK/16QAM/64QAM/256QAM for 802.11a/n/ac;
	Operating Frequency Range	☒ 5745-5825 MHz for 802.11a/n(HT20); 5755-5795 MHz for 802.11n(HT40); 5775MHz for 802.11 ac80;
	Number of Channels	5 channels for 802.11 a20/n20 in the 5745-5825MHz band 2 channels for 802.11 n40/ in the 5755-5795 MHz band ; 1 channels for 802.11 ac80 in the 5775MHz band ;
Channel List	Please refer to the Note 2.	
Power	AC 100-240V 50/60Hz	
hardware version	HV1.0	
Software version	SV1.0	
Serial number	N/A	
Connecting I/O Port(s)	Please refer to the User's Manual	

Note:

For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

Frequency and Channel list for 802.11a/n(20 MHz) band IV (5745-5825MHz):

802.11a/n(20 MHz) Carrier Frequency Channel							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	153	5765	157	5785	161	5805
165	5825	-	-	-	-	-	-

Frequency and Channel list for 802.11n(40MHz) band IV (5755-5795MHz):

802.11n/ac 40MHz Carrier Frequency Channel					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
151	5755	159	5795	-	-

802.11ac 80MHz Carrier Frequency Channel	
Channel	Frequency (MHz)
155	5775

Tx Antenna

Antenna	Antenna Type	Antenna Gain(dBi)
Antenna 1	FPCB antenna	1.0

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.	
Pre-test the EUT in continuous transmitting mode with setup as stand-alone in only antenna1 transmits,only antenna2 transmits, found the worst case is antenna1 transmit and report the data	

Pretest Mode	Description
Mode 1	802.11a /n 20 CH149/ CH157/ CH 165
Mode 2	802.11n 40 CH 151 / CH 159
Mode 3	802.11 ac80 CH 155
Mode 4	Link Mode

Conducted Emission	
Final Test Mode	Description
Mode 5	Link Mode

Additional Instructions

Test Software	Special test command provided by manufacturer
Power level setup	Default

For Radiated Emission	
Final Test Mode	Description
Mode 1	802.11a /n 20 CH149/ CH157/ CH 165
Mode 2	802.11n 40 CH 151 / CH 159
Mode 3	802.11 ac80 CH 155
Mode 4	Link Mode

Note:

(1) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported.

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	Interactive Touch Screen / Interactive Flat Panel	OneScreen	OneScreen TL6	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.

3.5 EQUIPMENTS 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	MY45109572	Sep. 22, 2021	Sep. 21, 2022
2	Spectrum Analyzer (1GHz-40GHz)	Agilent	E4446A	100363	Sep. 22, 2021	Sep. 21, 2022
3	Test Receiver (9kHz-7GHz)	R&S	ESC17	101169	Sep. 22, 2021	Sep. 21, 2022
4	Bilog Antenna (30MHz-1400MHz)	Schwarzbeck	VULB9168	00877	Sep. 22, 2021	Sep. 21, 2022
5	Horn Antenna (1GHz-18GHz)	SCHWARZBEC K	BBHA9120D	1541	Sep. 22, 2021	Sep. 21, 2022
6	Horn Antenna (18GHz-40GHz)	A.H. System	SAS-574	588	Sep. 22, 2021	Sep. 21, 2022
7	Amplifier (30-1000MHz)	EM Electronics	EM330 Amplifier	N/A	Sep. 22, 2021	Sep. 21, 2022
8	Amplifier (1GHz-40GHz)	全聚达	DLE-161	097	Sep. 22, 2021	Sep. 21, 2022
9	Loop Antenna (9KHz-30MHz)	SCHWARZBEC K	FMZB1519B	014	Sep. 22, 2021	Sep. 21, 2022
10	RF cables1 (9kHz-30MHz)	N/A	9kHz-30MHz	N/A	Sep. 22, 2021	Sep. 21, 2022
11	RF cables2 (30MHz-1GHz)	N/A	30MHz-1GHz	N/A	Sep. 22, 2021	Sep. 21, 2022
12	RF cables3 (1GHz-40GHz)	N/A	1GHz-40GHz	N/A	Sep. 22, 2021	Sep. 21, 2022
13	CMW500 Test	R&S	CMW500	106504	Sep. 22, 2021	Sep. 21, 2022
14	ESG Signal Generator	Agilent	E4421B	GB40051203	Sep. 22, 2021	Sep. 21, 2022
15	Signal Generator	Agilent	N5182A	MY47420215	Sep. 22, 2021	Sep. 21, 2022
16	D.C. Power Supply	LongWei	TPR-6405D	\	\	\
17	Software	Frad	EZ-EMC	FA-03A2 RE	\	\

Conduction Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	LISN	R&S	ENV216	101471	Sep. 22, 2021	Sep. 21, 2022
2	LISN	CYBERTEK	EM5040A	E1850400149	Sep. 22, 2021	Sep. 21, 2022
3	Test Cable	N/A	C01	N/A	Sep. 22, 2021	Sep. 21, 2022
4	Test Cable	N/A	C02	N/A	Sep. 22, 2021	Sep. 21, 2022
5	EMI Test Receiver	R&S	ESRP3	101946	Sep. 22, 2021	Sep. 21, 2022
6	Absorbing Clamp	DZ	ZN23201	N/A	Sep. 22, 2021	Sep. 21, 2022

4.EMC EMISSION TEST

4.1 RADIATED EMISSION MEASUREMENT

4.1.1 APPLICABLE STANDARD

According to FCC Part 15.407(d) and 15.209

4.1.2 CONFORMANCE LIMIT

According to FCC Part 15.407(b)(7): radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).
According to FCC Part 15.205, Restricted bands

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
10.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(2)
13.36-13.41			

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Restricted Frequency(MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Measurement Distance
0.009~0.490	2400/F(KHz)	20 log (uV/m)	300
0.490~1.705	2400/F(KHz)	20 log (uV/m)	30
1.705~30.0	30	29.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

Limits of Radiated Emission Measurement(Above 1000MHz)

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

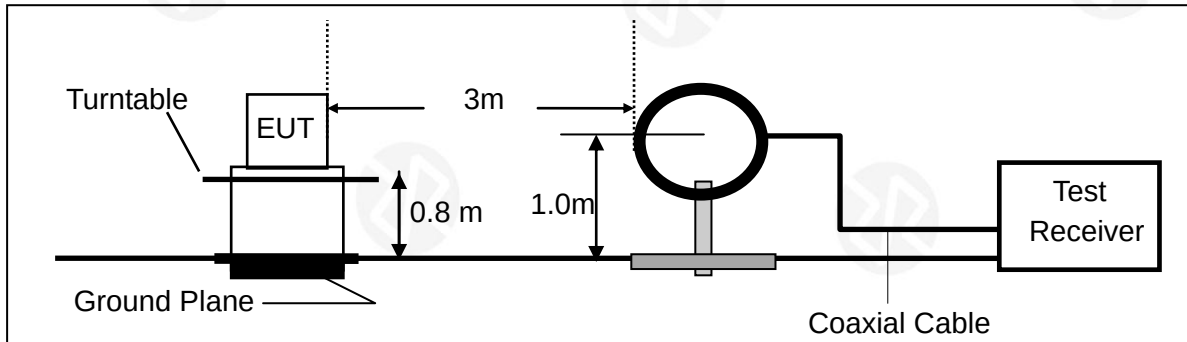
Remark :1. Emission level in dBuV/m=20 log (uV/m)
2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
3. Distance extrapolation factor =40log(Specific distance/ test distance)(dB);
Limit line=Specific limits(dBuV) + distance extrapolation factor.

4.1.3 MEASURING INSTRUMENTS

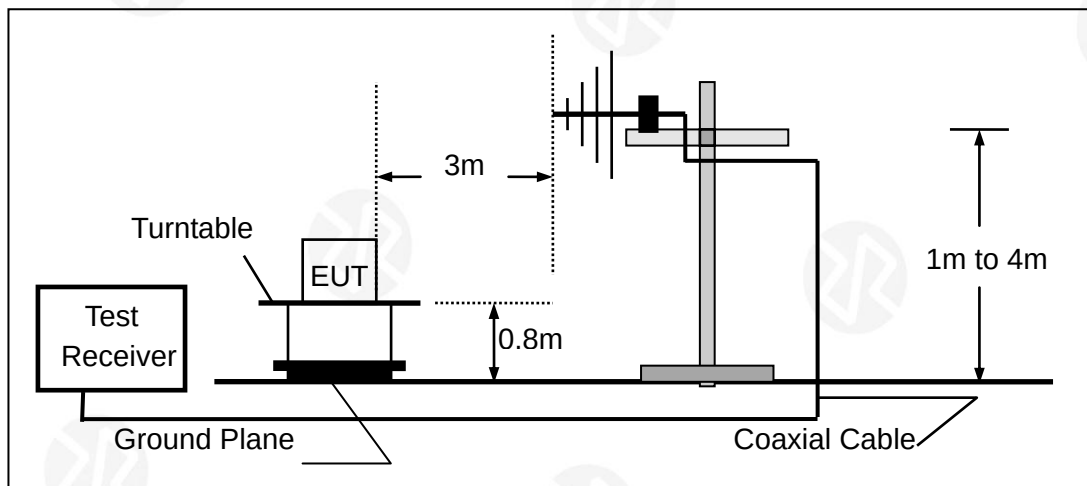
The Measuring equipment is listed in the section 6.3 of this test report.

4.1.4 TEST CONFIGURATION

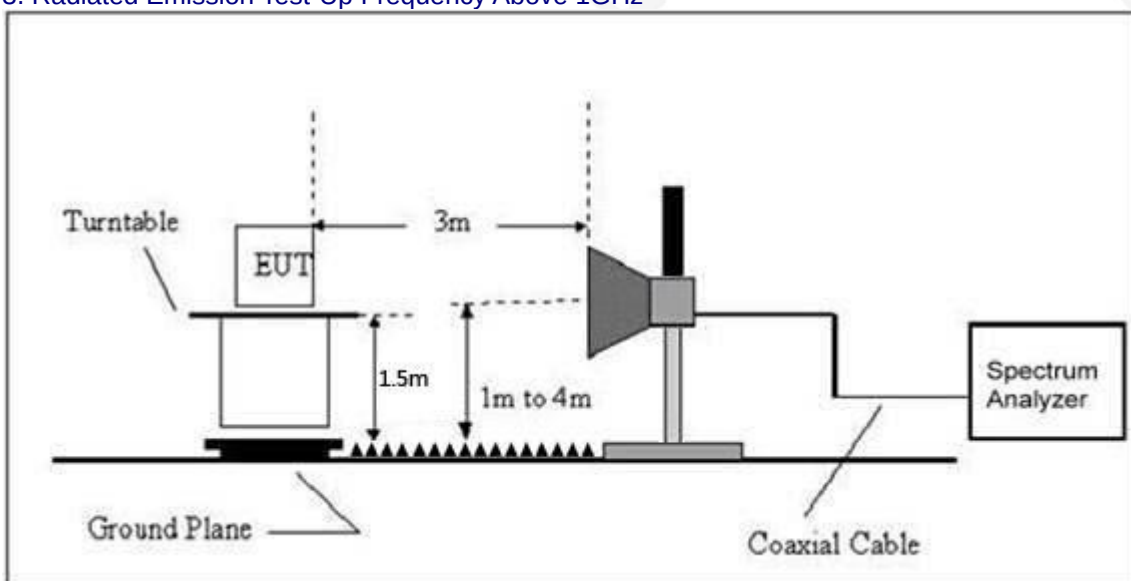
1. For radiated emissions below 30MHz



2. For radiated emissions from 30MHz to 1000MHz



3. Radiated Emission Test-Up Frequency Above 1GHz



4.1.5 TEST PROCEDURE

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10-2013. The test distance is 3m. The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 and CAN/CSA-CEI/IEC CISPR 22.

This test is required for any spurious emission that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT.

Use the following spectrum analyzer settings:

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

- The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- The EUT was placed on the top of a rotating table 0.8 m for below 1GHz and 1.5m for above 1GHz the ground at a 3 meter. The table was rotated 360 degrees to determine the position of the highest radiation.
- The height of the equipment or of the substitution antenna shall be 0.8 m for below 1GHz and 1.5m for above 1GHz; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

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

During the radiated emission test, the Spectrum Analyzer was set with the following configurations:

Frequency Band (MHz)	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	QP	120 kHz	300 kHz
Above 1000	Peak	1 MHz	1 MHz
	Average	1 MHz	10 Hz

Note: for the frequency ranges below 30 MHz, a narrower RBW is used for these ranges but the measured value should add a RBW correction factor (RBWCF) where $RBWCF [dB] = 10 \cdot \lg(100 [kHz] / \text{narrower RBW} [kHz])$. , the narrower RBW is 1 kHz and RBWCF is 20 dB for the frequency 9 kHz to 150 kHz, and the narrower RBW is 10 kHz and RBWCF is 10 dB for the frequency 150 kHz to 30 MHz.

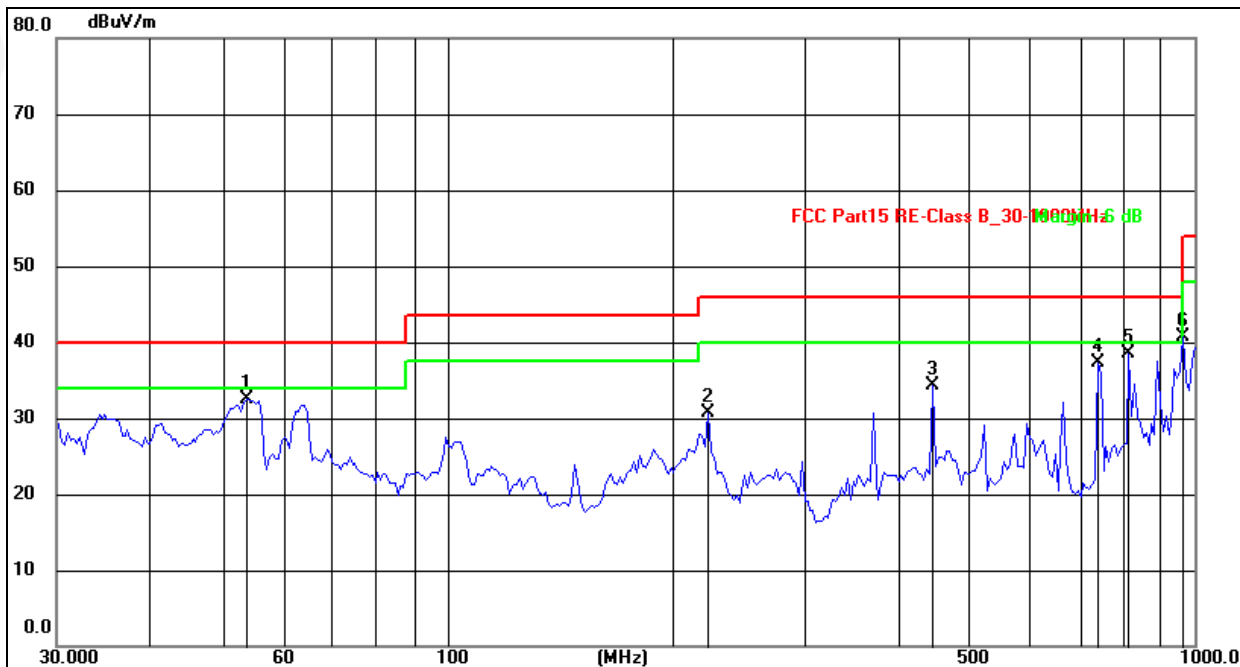
4.1.6 TEST RESULT

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.

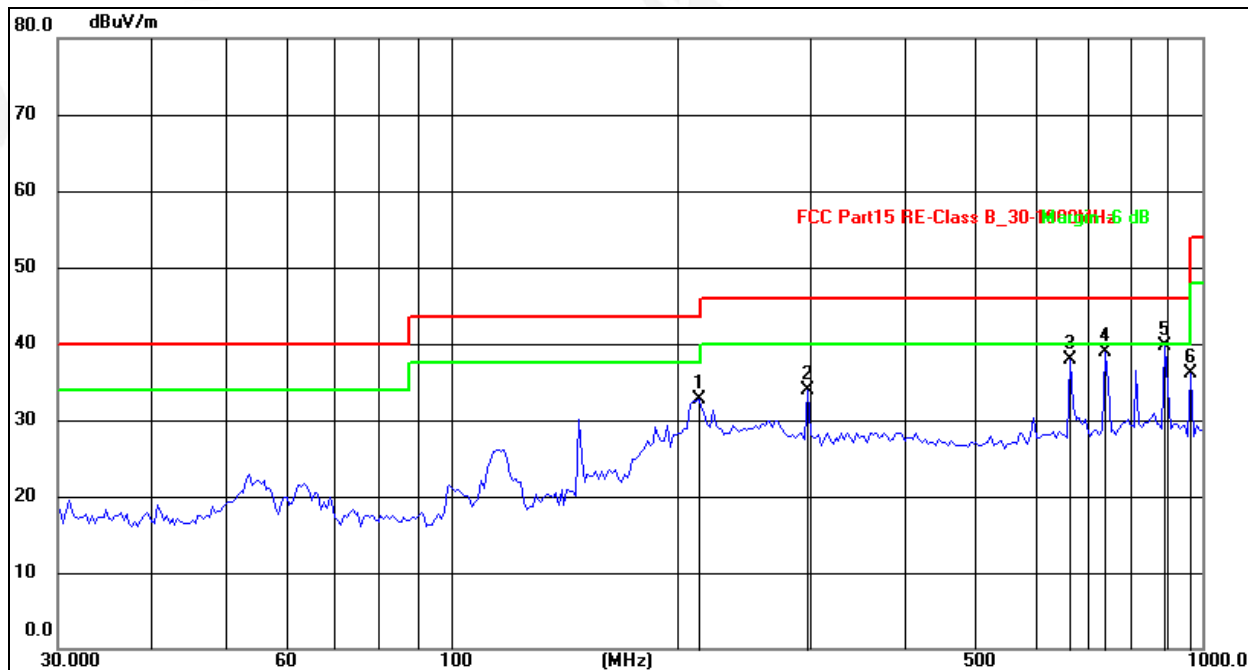
Between 30MHz – 1GHz

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



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	53.9763	50.16	-17.71	32.45	40.00	-7.55	QP
2	223.3412	52.31	-21.60	30.71	46.00	-15.29	QP
3	446.4139	49.77	-15.43	34.34	46.00	-11.66	QP
4	742.2586	45.25	-7.93	37.32	46.00	-8.68	QP
5	817.3994	43.64	-5.09	38.55	46.00	-7.45	QP
6	965.5420	43.06	-2.40	40.66	54.00	-13.34	QP

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



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	213.7633	51.97	-19.24	32.73	43.50	-10.77	QP
2	298.2681	52.71	-18.73	33.98	46.00	-12.02	QP
3	668.1422	47.39	-9.39	38.00	46.00	-8.00	QP
4	742.2586	47.68	-8.81	38.87	46.00	-7.13	QP
5	892.2907	48.65	-8.99	39.66	46.00	-6.34	QP
6	965.5420	43.78	-7.61	36.17	54.00	-17.83	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 802.11a mode

Temperature :	26℃	Relative Humidity :	54%
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX (5.8G) -- 802.11 a		

802.11a

Polar (H/V)	Frequency	Meter Reading	Pre-ampl ifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detect r Type
	(M z)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/ m)	(dB)	
Low Channel:5745MHz									
V	11490.00	52.17	30.55	5.77	24.66	52.05	74.00	-21.95	PK
V	11490.00	42.03	30.55	5.77	24.66	41.91	54.00	-12.09	AV
V	17235.00	50.26	30.33	6.32	24.55	50.80	74.00	-23.20	PK
V	17235.00	42.74	30.33	6.32	24.55	43.28	54.00	-10.72	AV
V	22980.00	50.76	30.85	7.45	24.69	52.05	74.00	-21.95	PK
V	22980.00	42.64	30.85	7.45	24.69	43.93	54.00	-10.07	AV
V	28725.00	50.86	31.02	8.99	25.57	54.40	74.00	-19.60	PK
V	28725.00	42.64	31.02	8.99	25.57	46.18	54.00	-7.82	AV
H	11490.00	52.51	30.55	5.77	24.66	52.39	74.00	-21.61	PK
H	11490.00	42.36	30.55	5.77	24.66	42.24	54.00	-11.76	AV
H	17235.00	51.15	30.33	6.32	24.55	51.69	74.00	-22.31	PK
H	17235.00	42.41	30.33	6.32	24.55	42.95	54.00	-11.05	AV
H	22980.00	51.15	30.85	7.45	24.69	52.44	74.00	-21.56	PK
H	22980.00	42.41	30.85	7.45	24.69	43.70	54.00	-10.30	AV
H	28725.00	51.15	31.02	8.99	25.57	54.69	74.00	-19.31	PK
H	28725.00	41.41	31.02	8.99	25.57	44.95	54.00	-9.05	AV

Polar (H/V)	Frequency	Meter Reading	Pre-ampl ifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detect or Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/ m)	(dB)	
Middle Channel:5785MHz									
V	11570.00	51.30	30.55	5.77	24.66	51.18	74.00	-22.82	PK
V	11570.00	42.19	30.55	5.77	24.66	42.07	54.00	-11.93	AV
V	17355.00	49.83	30.33	6.32	24.55	50.37	74.00	-23.63	PK
V	17355.00	41.87	30.33	6.32	24.55	42.41	54.00	-11.59	AV
V	23140.00	49.90	30.85	7.45	24.69	51.19	74.00	-22.81	PK
V	23140.00	41.87	30.85	7.45	24.69	43.16	54.00	-10.84	AV
V	28925.00	49.80	31.02	8.99	25.57	53.34	74.00	-20.66	PK
V	28925.00	41.87	31.02	8.99	25.57	45.41	54.00	-8.59	AV
H	11570.00	52.66	30.55	5.77	24.66	52.54	74.00	-21.46	PK
H	11570.00	42.22	30.55	5.77	24.66	42.10	54.00	-11.90	AV
H	17355.00	53.37	30.33	6.32	24.55	53.91	74.00	-20.09	PK
H	17355.00	42.00	30.33	6.32	24.55	42.54	54.00	-11.46	AV
H	23140.00	53.37	30.85	7.45	24.69	54.66	74.00	-19.34	PK
H	23140.00	42.00	30.85	7.45	24.69	43.29	54.00	-10.71	AV
H	28925.00	53.87	31.02	8.99	25.57	57.41	74.00	-16.59	PK
H	28925.00	42.00	31.02	8.99	25.57	45.54	54.00	-8.46	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-ampli fier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/ m)	Margin (dB)	Detect or Type
High Channel:5825MHz									
V	11650.00	50.92	30.55	5.77	24.66	50.80	74.00	-23.20	PK
V	11650.00	42.46	30.55	5.77	24.66	42.34	54.00	-11.66	AV
V	17475.00	53.43	30.33	6.32	24.55	53.97	74.00	-20.03	PK
V	17475.00	42.78	30.33	6.32	24.55	43.32	54.00	-10.68	AV
V	23300.00	53.43	30.85	7.45	24.69	54.72	74.00	-19.28	PK
V	23300.00	43.27	30.85	7.45	24.69	44.56	54.00	-9.44	AV
V	29125.00	53.43	31.02	8.99	25.57	56.97	74.00	-17.03	PK
V	29125.00	42.67	31.02	8.99	25.57	46.21	54.00	-7.79	AV
H	11650.00	51.01	30.55	5.77	24.66	50.89	74.00	-23.11	PK
H	11650.00	42.68	30.55	5.77	24.66	42.56	54.00	-11.44	AV
H	17475.00	52.60	30.33	6.32	24.55	53.14	74.00	-20.86	PK
H	17475.00	42.94	30.33	6.32	24.55	43.48	54.00	-10.52	AV
H	23300.00	53.20	30.85	7.45	24.69	54.49	74.00	-19.51	PK
H	23300.00	43.04	30.85	7.45	24.69	44.33	54.00	-9.67	AV
H	29125.00	53.10	31.02	8.99	25.57	56.64	74.00	-17.36	PK
H	29125.00	43.04	31.02	8.99	25.57	46.58	54.00	-7.42	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.

802.11n20

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-ampl ifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/ m)	Margin (dB)	Detect or Type
Low Channel:5745MHz									
V	11490.00	52.63	30.55	5.77	24.66	52.51	74.00	-21.49	PK
V	11490.00	42.49	30.55	5.77	24.66	42.37	54.00	-11.63	AV
V	17235.00	50.72	30.33	6.32	24.55	51.26	74.00	-22.74	PK
V	17235.00	43.20	30.33	6.32	24.55	43.74	54.00	-10.26	AV
V	22980.00	51.22	30.85	7.45	24.69	52.51	74.00	-21.49	PK
V	22980.00	43.10	30.85	7.45	24.69	44.39	54.00	-9.61	AV
V	28725.00	51.32	31.02	8.99	25.57	54.86	74.00	-19.14	PK
V	28725.00	43.10	31.02	8.99	25.57	46.64	54.00	-7.36	AV
H	11490.00	52.97	30.55	5.77	24.66	52.85	74.00	-21.15	PK
H	11490.00	42.82	30.55	5.77	24.66	42.70	54.00	-11.30	AV
H	17235.00	51.61	30.33	6.32	24.55	52.15	74.00	-21.85	PK
H	17235.00	42.87	30.33	6.32	24.55	43.41	54.00	-10.59	AV
H	22980.00	51.61	30.85	7.45	24.69	52.90	74.00	-21.10	PK
H	22980.00	42.87	30.85	7.45	24.69	44.16	54.00	-9.84	AV
H	28725.00	51.61	31.02	8.99	25.57	55.15	74.00	-18.85	PK
H	28725.00	41.87	31.02	8.99	25.57	45.41	54.00	-8.59	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-ampl ifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/ m)	Margin (dB)	Detect or Type
Middle Channel:5785MHz									
V	11570.00	51.35	30.55	5.77	24.66	51.23	74.00	-22.77	PK
V	11570.00	42.24	30.55	5.77	24.66	42.12	54.00	-11.88	AV
V	17355.00	49.88	30.33	6.32	24.55	50.42	74.00	-23.58	PK
V	17355.00	41.92	30.33	6.32	24.55	42.46	54.00	-11.54	AV
V	23140.00	49.95	30.85	7.45	24.69	51.24	74.00	-22.76	PK
V	23140.00	41.92	30.85	7.45	24.69	43.21	54.00	-10.79	AV
V	28925.00	49.85	31.02	8.99	25.57	53.39	74.00	-20.61	PK
V	28925.00	41.92	31.02	8.99	25.57	45.46	54.00	-8.54	AV
H	11570.00	52.71	30.55	5.77	24.66	52.59	74.00	-21.41	PK
H	11570.00	42.27	30.55	5.77	24.66	42.15	54.00	-11.85	AV
H	17355.00	53.42	30.33	6.32	24.55	53.96	74.00	-20.04	PK
H	17355.00	42.05	30.33	6.32	24.55	42.59	54.00	-11.41	AV
H	23140.00	53.42	30.85	7.45	24.69	54.71	74.00	-19.29	PK
H	23140.00	42.05	30.85	7.45	24.69	43.34	54.00	-10.66	AV
H	28925.00	53.92	31.02	8.99	25.57	57.46	74.00	-16.54	PK
H	28925.00	42.05	31.02	8.99	25.57	45.59	54.00	-8.41	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-ampli fier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/ m)	Margin (dB)	Detect or Type
High Channel:5825MHz									
V	11650.00	50.75	30.55	5.77	24.66	50.63	74.00	-23.37	PK
V	11650.00	42.29	30.55	5.77	24.66	42.17	54.00	-11.83	AV
V	17475.00	53.26	30.33	6.32	24.55	53.80	74.00	-20.20	PK
V	17475.00	42.61	30.33	6.32	24.55	43.15	54.00	-10.85	AV
V	23300.00	53.26	30.85	7.45	24.69	54.55	74.00	-19.45	PK

V	23300.00	43.10	30.85	7.45	24.69	44.39	54.00	-9.61	AV
V	29125.00	53.26	31.02	8.99	25.57	56.80	74.00	-17.20	PK
V	29125.00	42.50	31.02	8.99	25.57	46.04	54.00	-7.96	AV
H	11650.00	50.84	30.55	5.77	24.66	50.72	74.00	-23.28	PK
H	11650.00	42.51	30.55	5.77	24.66	42.39	54.00	-11.61	AV
H	17475.00	52.43	30.33	6.32	24.55	52.97	74.00	-21.03	PK
H	17475.00	42.77	30.33	6.32	24.55	43.31	54.00	-10.69	AV
H	23300.00	53.03	30.85	7.45	24.69	54.32	74.00	-19.68	PK
H	23300.00	42.87	30.85	7.45	24.69	44.16	54.00	-9.84	AV
H	29125.00	52.93	31.02	8.99	25.57	56.47	74.00	-17.53	PK
H	29125.00	42.87	31.02	8.99	25.57	46.41	54.00	-7.59	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.

802.11ac80

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)	Detect or Type
Low Channel:5745MHz									
V	11550.00	51.60	30.55	5.77	24.66	51.48	74.00	-22.52	PK
V	11550.00	41.46	30.55	5.77	24.66	41.34	54.00	-12.66	AV
V	17325.00	49.69	30.33	6.32	24.55	50.23	74.00	-23.77	PK
V	17325.00	42.17	30.33	6.32	24.55	42.71	54.00	-11.29	AV
V	23100.00	50.19	30.85	7.45	24.69	51.48	74.00	-22.52	PK
V	23100.00	42.07	30.85	7.45	24.69	43.36	54.00	-10.64	AV
V	28875.00	50.29	31.02	8.99	25.57	53.83	74.00	-20.17	PK
V	28725.00	42.07	31.02	8.99	25.57	45.61	54.00	-8.39	AV
H	11550.00	51.94	30.55	5.77	24.66	51.82	74.00	-22.18	PK
H	11550.00	41.79	30.55	5.77	24.66	41.67	54.00	-12.33	AV
H	17325.00	50.58	30.33	6.32	24.55	51.12	74.00	-22.88	PK
H	17325.00	41.84	30.33	6.32	24.55	42.38	54.00	-11.62	AV
H	23100.00	50.58	30.85	7.45	24.69	51.87	74.00	-22.13	PK
H	23100.00	41.84	30.85	7.45	24.69	43.13	54.00	-10.87	AV
H	28875.00	50.58	31.02	8.99	25.57	54.12	74.00	-19.88	PK
H	28725.00	40.84	31.02	8.99	25.57	44.38	54.00	-9.62	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.

5. MAXIMUM CONDUCTED OUTPUT POWER

5.1 PPLIED PROCEDURES / LIMIT

According to FCC §15.407

The maximum conducted output power should not exceed:

Frequency Band(MHz)	Limit
5150~5250	250mW
5725~5850	1W

5.2 TEST PROCEDURE

The EUT was directly connected to the Power meter

1. Device Configuration

If possible, configure or modify the operation of the EUT so that it transmits continuously at its maximum power control level (see section II.B.).

a) The intent is to test at 100 percent duty cycle; however a small reduction in duty cycle (to no lower than 98 percent) is permitted if required by the EUT for amplitude control purposes. Manufacturers are expected to provide software to the test lab to permit such continuous operation.

b) If continuous transmission (or at least 98 percent duty cycle) cannot be achieved due to hardware limitations (e.g., overheating), the EUT shall be operated at its maximum power control level with the transmit duration as long as possible and the duty cycle as high as possible.

2. Measurement using a Spectrum Analyzer or EMI Receiver (SA)

Measurement of maximum conducted output power using a spectrum analyzer requires integrating the spectrum across a frequency span that encompasses, at a minimum, either the EBW or the 99-percent occupied bandwidth of the signal.¹ However, the EBW must be used to determine bandwidth dependent limits on maximum conducted output power in accordance with § 15.407(a).

a) The test method shall be selected as follows: (i) Method SA-1 or SA-1 Alternative (averaging with the EUT transmitting at full power throughout each sweep) shall be applied if either of the following conditions can be satisfied:

- The EUT transmits continuously (or with a duty cycle ≥ 98 percent).
- Sweep triggering or gating can be implemented in a way that the device transmits at the maximum power control level throughout the duration of each of the instrument sweeps to be averaged. This condition can generally be achieved by triggering the instrument's sweep if the duration of the sweep (with the analyzer configured as in Method SA-1, below) is equal to or shorter than the duration T of each transmission from the EUT and if those transmissions exhibit full power throughout their durations.

(ii) Method SA-2 or SA-2 Alternative (averaging across on and off times of the EUT transmissions, followed by duty cycle correction) shall be applied if the conditions of (i) cannot be achieved and the transmissions exhibit a constant duty cycle during the measurement duration. Duty cycle will be considered to be constant if variations are less than ± 2 percent.

(iii) Method SA-3 (RMS detection with max hold) or SA-3 Alternative (reduced VBW with max hold) shall be applied if the conditions of (i) and (ii) cannot be achieved.

b) Method SA-1 (trace averaging with the EUT transmitting at full power throughout each sweep): (i) Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal.

(ii) Set RBW = 1 MHz.

(iii) Set VBW ≥ 3 MHz.

(iv) Number of points in sweep ≥ 2 Span / RBW. (This ensures that bin-to-bin spacing is $\leq$ RBW/2, so that narrowband signals are not lost between frequency bins.)

(v) Sweep time = auto.

(vi) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.

(vii) If transmit duty cycle < 98 percent, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle ≥ 98 percent, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to "free run".

(viii) Trace average at least 100 traces in power averaging (i.e., RMS) mode.

(ix) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument's band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum

5.3 DEVIATION FROM STANDARD

No deviation.

5.4 TEST SETUP



5.5 EUT OPERATION CONDITIONS

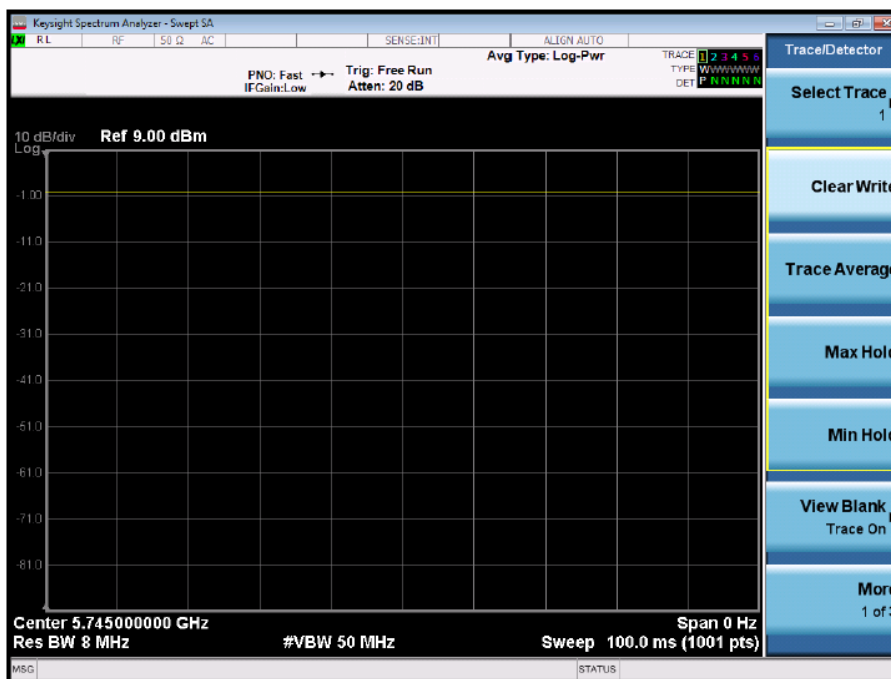
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

5.6 TEST RESULTS

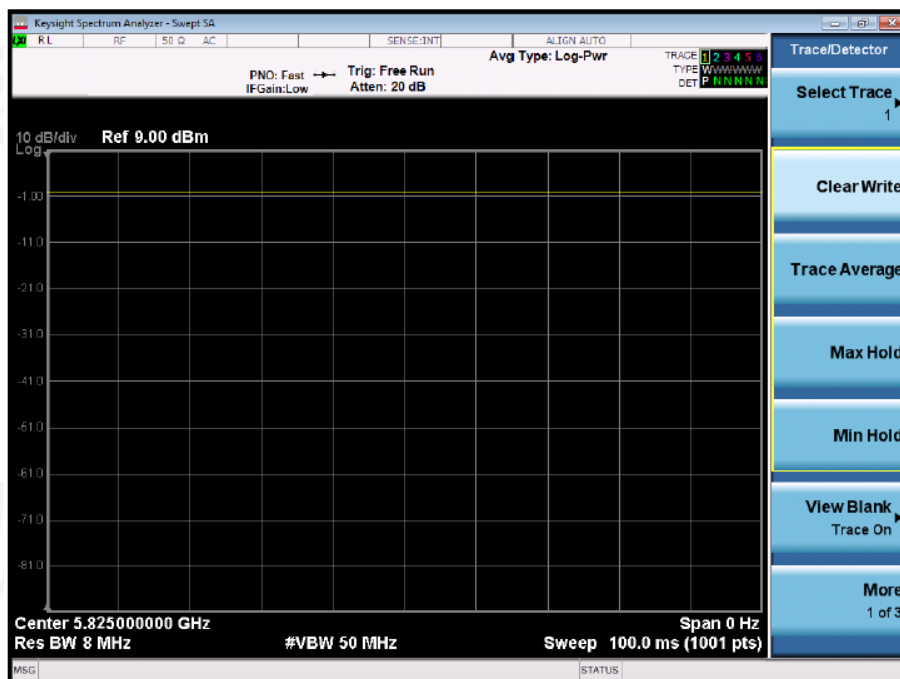
Temperature :	26 ℃	Relative Humidity :	54%
Pressure :	1012 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX (5G) Mode Frequency Band IV (5725-5825MHz)		

Test Channel	Frequency	Maximum output power.	LIMIT	Result
	(MHz)	(dBm)	dBm	
TX 802.11a Mode				
CH 149	5745	10.14	30	Pass
CH 157	5785	10.28	30	Pass
CH 165	5825	10.35	30	Pass
TX 802.11 n20M Mode				
CH 149	5745	9.37	30	Pass
CH 157	5785	9.60	30	Pass
CH 165	5825	9.64	30	Pass
TX 802.11 n40M Mode				
CH 151	5755	8.72	30	Pass
CH 159	5795	9.20	30	Pass
TX 802.11 AC80M Mode				
CH 155	5775	7.88	30	Pass

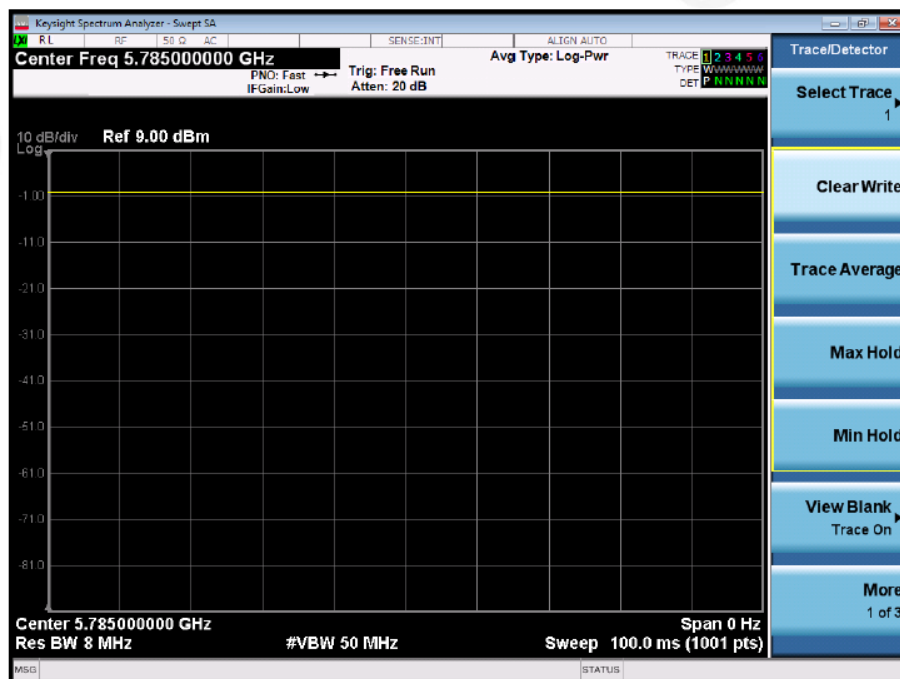
Duty Cycly:



Ton	Tp	Duty cycly(%)	Duty factor(dB)
100.00	100.00	100.00%	0.00



Ton	Tp	Duty cyclcy(%)	Duty factor(dB)
100.00	100.00	100.00%	0.00



Ton	Tp	Duty cyclcy(%)	Duty factor(dB)
100.00	100.00	100.00%	0.00

6.OUT OF BAND EMISSIONS

6.1 APPLICABLE STANDARD

According to FCC §15.407(b)

Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

(2) For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of -27 dBm/MHz.

6.2 TEST PROCEDURE

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW of spectrum analyzer to 1 MHz with a convenient frequency span.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

6.3 DEVIATION FROM STANDARD

No deviation.

6.4 TEST SETUP



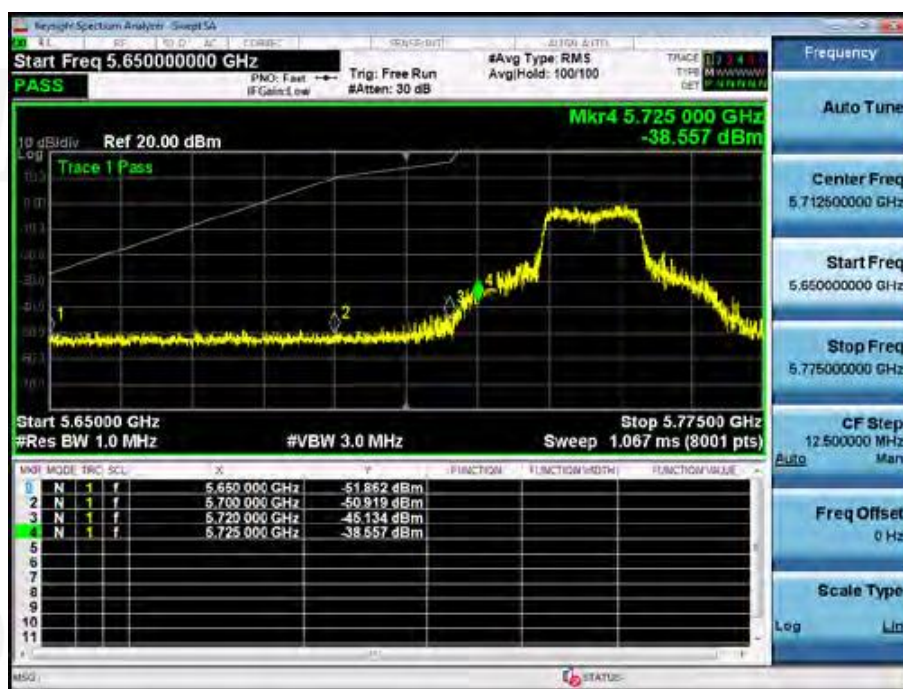
6.5 EUT OPERATION CONDITIONS

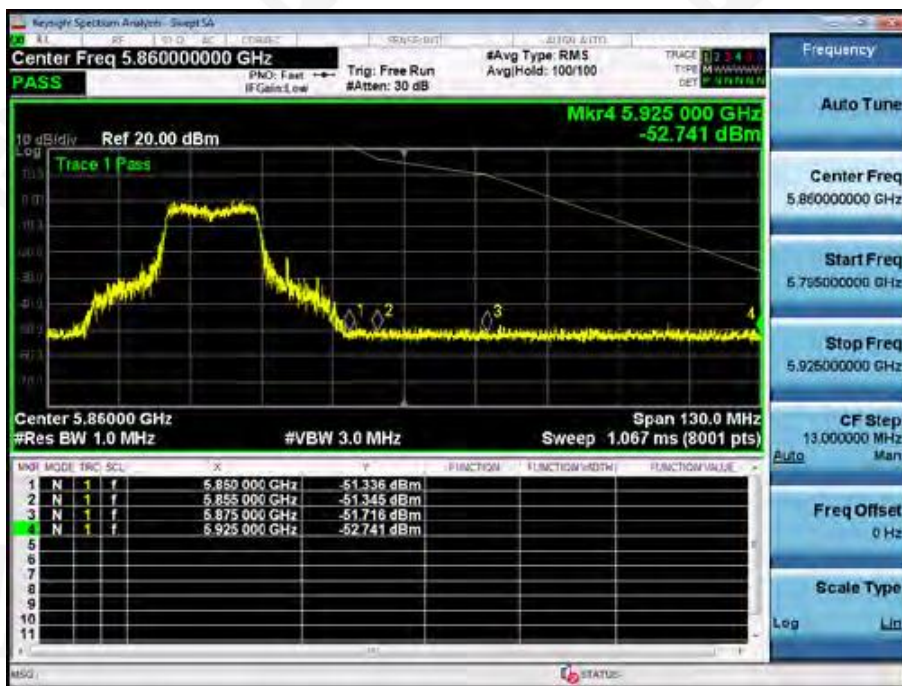
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

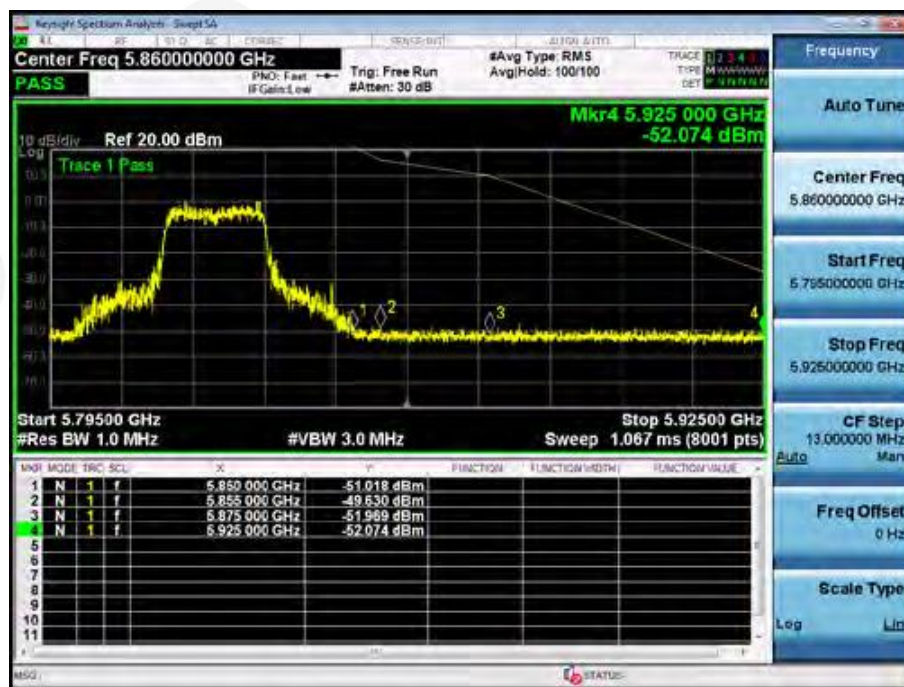
6.6 TEST RESULTS

Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1012 hPa	Test Voltage :	AC 120V/60Hz

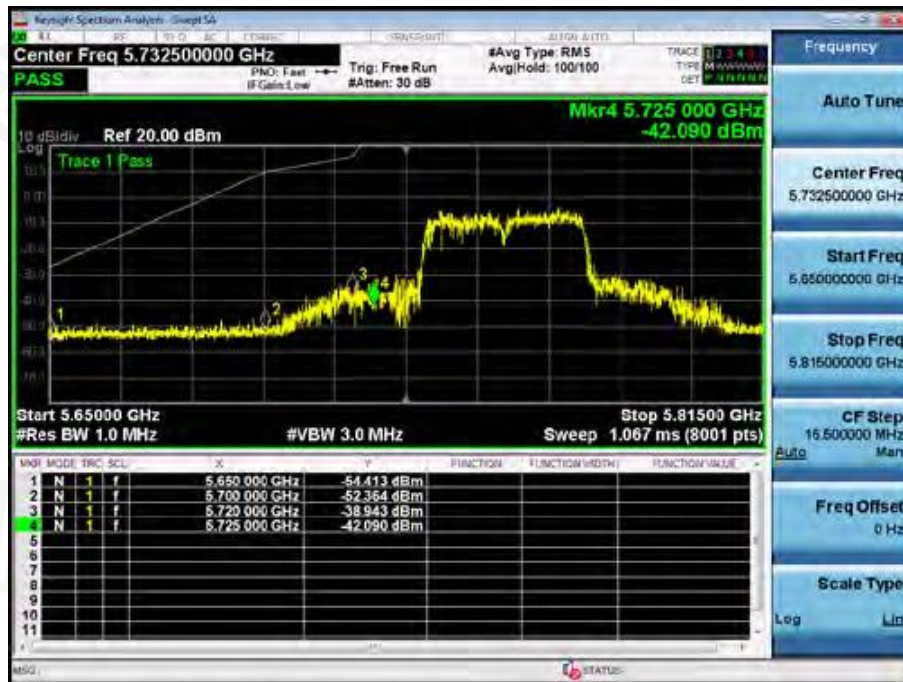
Out of Band edge
or the frequency band 5.725-5.850GHz (802.11a)



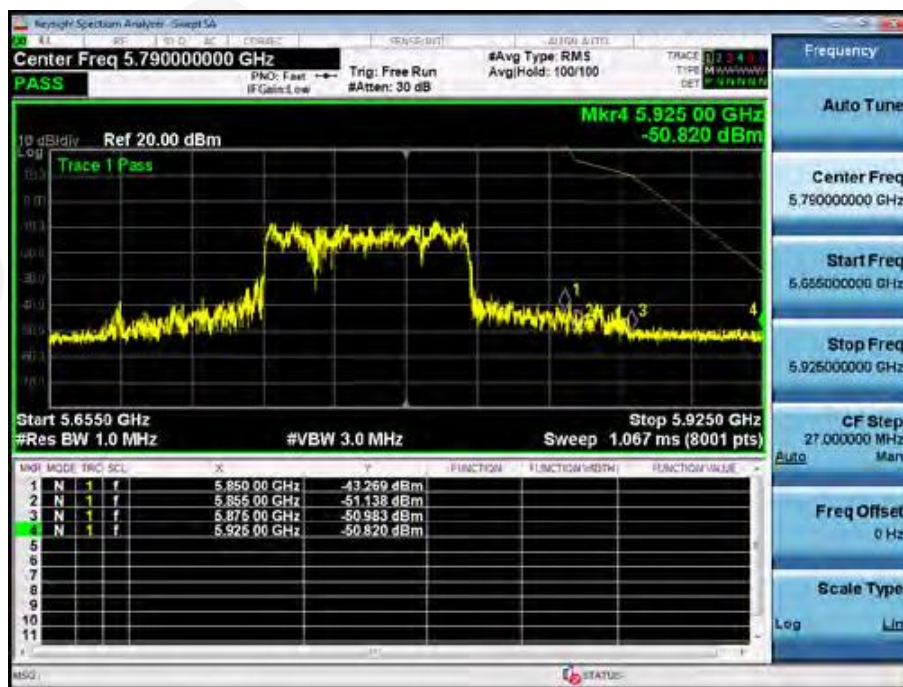




For the frequency band 5.725-5.850GHz (802.11n40)



For the frequency band 5.725-5.850GHz (802.11ac80)



7. TEST SETUP PHOTO

Reference to the appendix I for details.

8. EUT CONSTRUCTIONAL DETAILS

Reference to the appendix II for details.

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