



FCC Part 15C Test Report

FCC ID: 2A48K-RT88

Applicant: ZHANJIANG LUTUO TECHNOLOGY LIMITED COMPANY

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Manufacturer: ZHANJIANG LUTUO TECHNOLOGY LIMITED COMPANY

Address: Room 1910, Caifuhui Financial Center, No. 27 Leshan Road, Economic and Technological Development Zone, Zhanjiang, guangdong, China

EUT: Portable vehicle smart screen

Trade Mark: N/A

Model Number: RT88, 8.8Carplay, Carplay-LKSXlow, 8.8Carplay-us, 8.8Newcarplay-us, 8.8Carplay-uk, 8.8Newcarplay-uk, 8.8Carplay-de, 8.8Newcarplay-de, CP-RT-88-GM, RT1025, RT70, RT88HD, RT1025HD, RT88New, Carplay-BaomaEVO, Carplay-mbntg4, Carplay-C11, Carplay-mbntg5, Carplay-GLC, Carplay-BMN, Carplay-B-57NBT, Carplay-MiniNBT-US, Q5UQ5U, Carplay-BaomaCIC, Q5UA6A7C, Q5LQ5L, Q5UC6, Carplay-A/CLA/GLA13, Q5UB91, Q5UB92, Q5UQ3, Q5UA8, Q78.3B9, Carplay-B-i3NBT, Carplay-B-57CIC, Carplay-34F30NBT, Carplay-E11

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Date of Report: Feb. 28, 2022

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Applicable Standards: FCC PART 15 C 15.407
ANSI C63.10:2013

Test Result: Pass

Report Number: DL-20220228025E

Prepared (Test Engineer): Pxing Huang

Reviewer (Supervisor): Jack Bu

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This test report is based on a single evaluation of one sample of above mentioned products. It is not permitted to be duplicated in extracts without written approval of Shenzhen DL Testing Technology Co., Ltd.



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1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.407) , Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	N/A	
15.407(b), 15.209	Radiated Spurious Emission	PASS	
15.407 (b)	Band Edge Emission	PASS	
15.407 (a)	Average Output Power	PASS	
15.407 (a)	Power Spectral Density	PASS	
15.403(i) 15.407(e)	6dB bandwidth and 99%dB Bandwidth	PASS	
15.407(g)	Frequency Stability	PASS	
15.407(c)	Transmission in case of Absence of Information	PASS	
15.203	Antenna Requirement	PASS	

NOTE:

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

1.1 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.	Item	Uncertainty
1	Conducted Emission Test	$\pm 2.56\text{dB}$
2	RF power,conducted	$\pm 0.42\text{dB}$
3	Spurious emissions,conducted	$\pm 2.76\text{dB}$
4	All emissions,radiated(<1G)	$\pm 3.65\text{dB}$
5	All emissions,radiated(>1G)	$\pm 4.89\text{dB}$
6	Temperature	$\pm 0.5^{\circ}\text{C}$
7	Humidity	$\pm 2\%$



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product Name:	Portable vehicle smart screen
Trademark	N/A
Model No.:	RT88, 8.8Carplay, Carplay-LKSXlow, 8.8Carplay-us, 8.8Newcarplay-us, 8.8Carplay-uk, 8.8Newcarplay-uk, 8.8Carplay-de, 8.8Newcarplay-de, CP-RT-88-GM, RT1025, RT70, RT88HD, RT1025HD, RT88New, Carplay-BaomaEVO, Carplay-mbntg4, Carplay-C11, Carplay-mbntg5, Carplay-GLC, Carplay-BMN, Carplay-B-57NBT, Carplay-MiniNBT-US, Q5UQ5U, Carplay-BaomaCIC, Q5UA6A7C, Q5LQ5L, Q5UC6, Carplay-A/CLA/GLA13, Q5UB91, Q5UB92, Q5UQ3, Q5UA8, Q78.3B9, Carplay-B-i3NBT, Carplay-B-57CIC, Carplay-34F30NBT, Carplay-E11
Model Difference	All samples are the same except the model name and outlook color, so we prepare "RT88" for test only.
Operation Frequency:	5745-5825MHz(802.11a/n/ac(HT20)) 5755-5795MHz(802.11n/ac(HT40)) 5775MHz (802.11ac(HT80))
Channel numbers:	See channel list
Channel separation:	20MHz
Modulation technology:	64QAM, 16QAM, QPSK, BPSK for OFDM
Rate of Transmitter	802.11a: 6Mbps, 9Mbps, 12Mbps, 18Mbps, 24Mbps, 36Mbps, 48Mbps, 54Mbps 802.11n: Up to 500Mbps
Antenna Type:	Internal antenna
Antenna gain:	3dBi
Power supply:	DC 12V

Note:

- 1.For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
- 2.The EUT's all information provided by client.



2. Channel List

Channel List for 802.11a/n(HT20)/ac(HT20)			
Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	161	5805
153	5765	165	5825
157	5785		

Channel List for 802.11n(HT40)/ac(HT40)			
Channel	Frequency (MHz)	Channel	Frequency (MHz)
151	5755	159	5795

Channel List for 802.11ac(HT80)			
Channel	Frequency (MHz)	Channel	Frequency (MHz)
155	5775	/	/



2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Description		
Pretest Mode	Channel	Band 4
Mode 1	802.11a/n/acHT20	CH149, CH157, CH165
Mode 2	802.11n/acHT40	CH151, CH159
Mode 3	802.11acHT80	CH155
Mode 4	Other	Link Mode

For Radiated Emission		
Pretest Mode	Channel	Band 4
Mode 1	802.11a/n/acHT20	CH149, CH157, CH165
Mode 2	802.11n/acHT40	CH151, CH159
Mode 3	802.11acHT80	CH155
Mode 4	Other	Link Mode

Note: 1. The measurements are performed at the highest, middle, lowest available channels.
2. 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.



2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated Spurious Emission Test



2.4 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	Model/Type No.	Series No.	Note
E-1	Portable vehicle smart screen	RT88	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note

Note:

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

2.5 TABLE OF PARAMETERS OF TEST SOFTWARE SETTING

During testing, channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the end product.

Max output power Setting				
Test software Version	Test program: AXDN-0002.0			
Mode	802.11a	802.11n HT20	802.11n HT40	802.11ac HT20/HT40/HT80
Data Rate	6Mbps	MSC0	MSC0	MSC0
Power Setting of Software	60	60	66	66



2.6 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation test, Band-edge test and 6db bandwidth test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Spectrum Analyzer (9kHz-26.5GHz)	Agilent	E4408B	MY50140780	Nov. 06, 2021	Nov. 05, 2022
2	Test Receiver (9kHz-7GHz)	R&S	ESRP7	101393	Nov. 06, 2021	Nov. 05, 2022
3	Bilog Antenna (30MHz-1GHz)	R&S	VULB9162	00306	Nov. 06, 2021	Nov. 05, 2022
4	Horn Antenna (1GHz-18GHz)	Schwarzbeck	BBHA9120D	02139	Nov. 06, 2021	Nov. 05, 2022
5	Horn Antenna (18GHz-40GHz)	A.H. Systems	SAS-574	588	Nov. 06, 2021	Nov. 05, 2022
6	Amplifier (9KHz-6GHz)	Schwarzbeck	BBV9743B	00153	Nov. 06, 2021	Nov. 05, 2022
7	Amplifier (1GHz-18GHz)	EMEC	EM01G8GA	00270	Nov. 06, 2021	Nov. 05, 2022
8	Amplifier (18GHz-40GHz)	Quanjuda	DLE-161	97	Nov. 06, 2021	Nov. 05, 2022
9	Loop Antenna (9KHz-30MHz)	Schwarzbeck	FMZB1519B	00014	Nov. 06, 2021	Nov. 05, 2022
10	RF cables1 (9kHz-1GHz)	ChengYu	966	004	Nov. 06, 2021	Nov. 05, 2022
11	RF cables2 (1GHz-40GHz)	ChengYu	966	003	Nov. 06, 2021	Nov. 05, 2022
12	Antenna connector	Florida RF Labs	N/A	RF 01#	Nov. 06, 2021	Nov. 05, 2022
13	Power probe	KEYSIGHT	U2021XA	MY55210018	Nov. 06, 2021	Nov. 05, 2022
14	Signal Analyzer 9kHz-26.5GHz	Agilent	N9020A	MY55370280	Nov. 06, 2021	Nov. 05, 2022
15	Test Receiver 20kHz-40GHz	R&S	ESU 40	100376	Nov. 06, 2021	Nov. 05, 2022
16	D.C. Power Supply	LongWei	PS-305D	010964729	Nov. 06, 2021	Nov. 05, 2022

Conduction Test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	843 Shielded Room	ChengYu	843 Room	843	Nov. 25, 2019	Nov. 24, 2022
2	EMI Receiver	R&S	ESR	101421	Nov. 06, 2021	Nov. 05, 2022
3	LISN	R&S	ENV216	102417	Nov. 06, 2021	Nov. 05, 2022
4	843 Cable 1#	ChengYu	CE Cable	001	Nov. 06, 2021	Nov. 05, 2022

Other

Item	Name	Manufacturer	Model	Software version
1	EMC Conduction Test System	FALA	EZ_EMCC	EMC-CON 3A1.1
2	EMC radiation test system	FALA	EZ_EMCC	FA-03A2
3	RF test system	MAIWEI	MTS8310	2.0.0.0
4	RF communication test system	MAIWEI	MTS8200	2.0.0.0



3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

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

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.1.2 TEST PROCEDURE

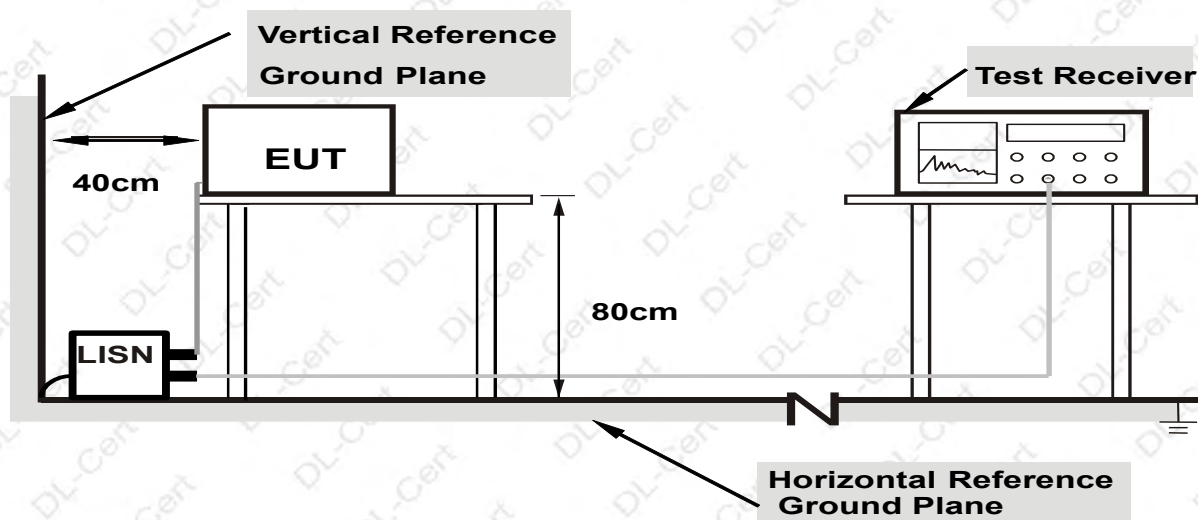
- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- 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.

3.1.3 DEVIATION FROM TEST STANDARD

No deviation



3.1.4 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

3.1.5 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.

3.1.6 TEST RESULTS

The EUT is powered by DC, no requirements for this item.

**3.2 RADIATED EMISSION MEASUREMENT****3.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)**

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.

For transmitters operating in the 5.725-5.825 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 EIRP of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of -27 dBm/MHz.

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 (Above 1000MHz)

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).

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	25GHz
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



3.2.2 TEST PROCEDURE

Below 1GHz test procedure as below:

- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- 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.
- 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 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- 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 10dB margin 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:

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

Note:

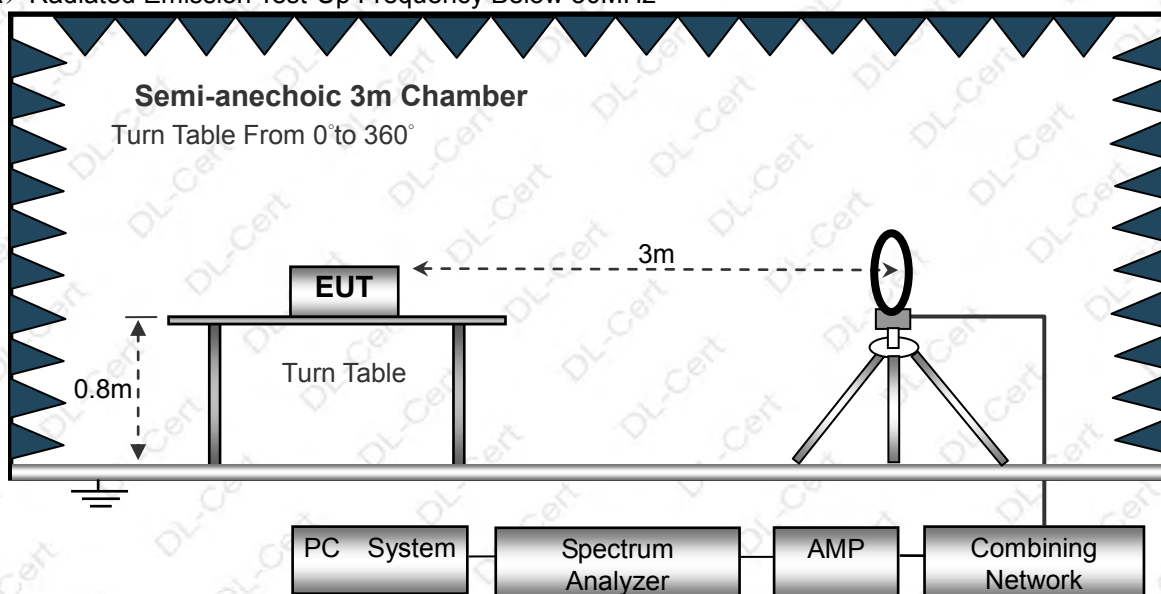
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

3.2.3 DEVIATION FROM TEST STANDARD

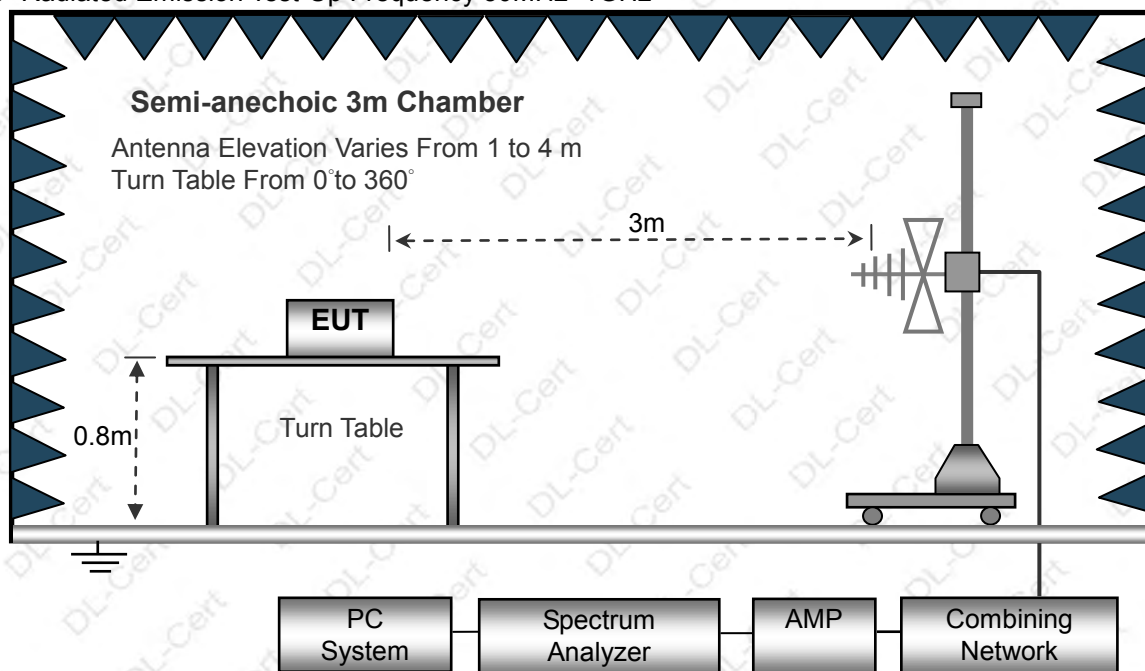
No deviation

3.2.4 TEST SETUP

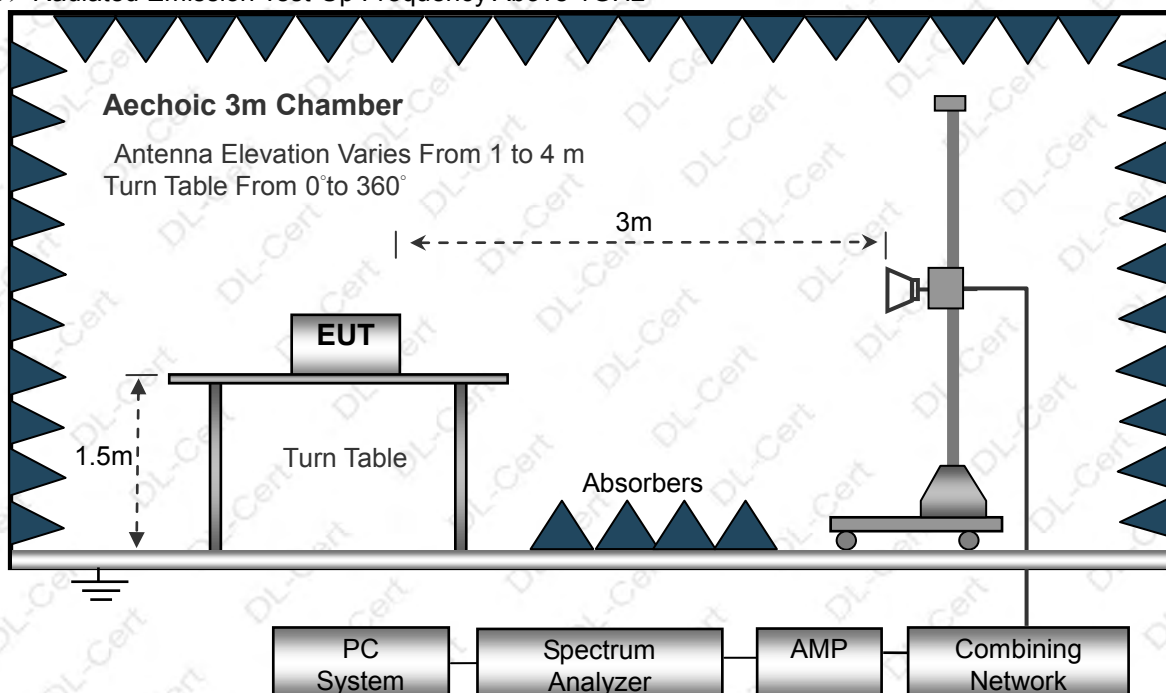
(A) Radiated Emission Test-Up Frequency Below 30MHz



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



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



3.2.5 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.

**3.2.6 TEST RESULTS (Between 9KHz – 30 MHz)**

Temperature:	20℃	Relative Humidity:	48%
Pressure:	1010 hPa	Test Voltage :	DC 12V
Test Mode :	Mode 4	Polarization :	--

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

NOTE:

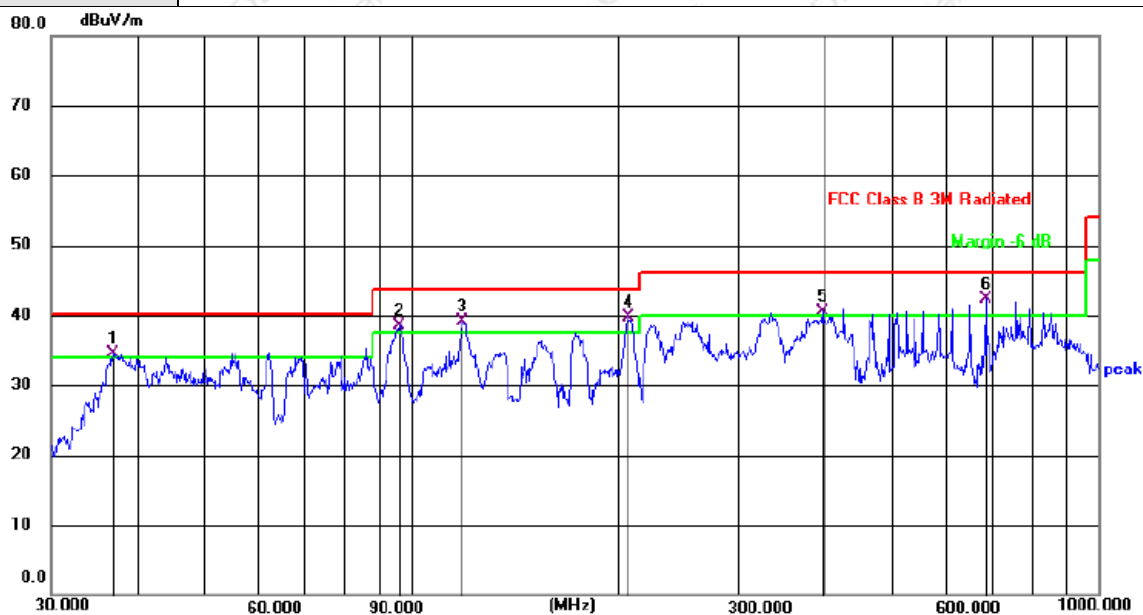
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor = $40 \log(\text{specific distance/test distance})$ (dB);

Limit line = specific limits(dBuV) + distance extrapolation factor.

**3.2.7 TEST RESULTS (Between 30MHz – 1GHz)**

Temperature:	26℃	Relative Humidity:	54%
Pressure:	1010 hPa	Polarization :	Horizontal
Test Voltage :	DC 12V		
Test Mode :	Mode 4		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1	!	36.8952	47.45	-12.90	34.55	40.00	5.45	QP
2	!	96.4360	53.79	-15.29	38.50	43.50	5.00	QP
3	!	119.0177	54.79	-15.70	39.09	43.50	4.41	QP
4	!	207.1225	52.73	-13.08	39.65	43.50	3.85	QP
5	!	396.2412	49.89	-9.36	40.53	46.00	5.47	QP
6	*	684.7453	46.30	-4.09	42.21	46.00	3.79	QP

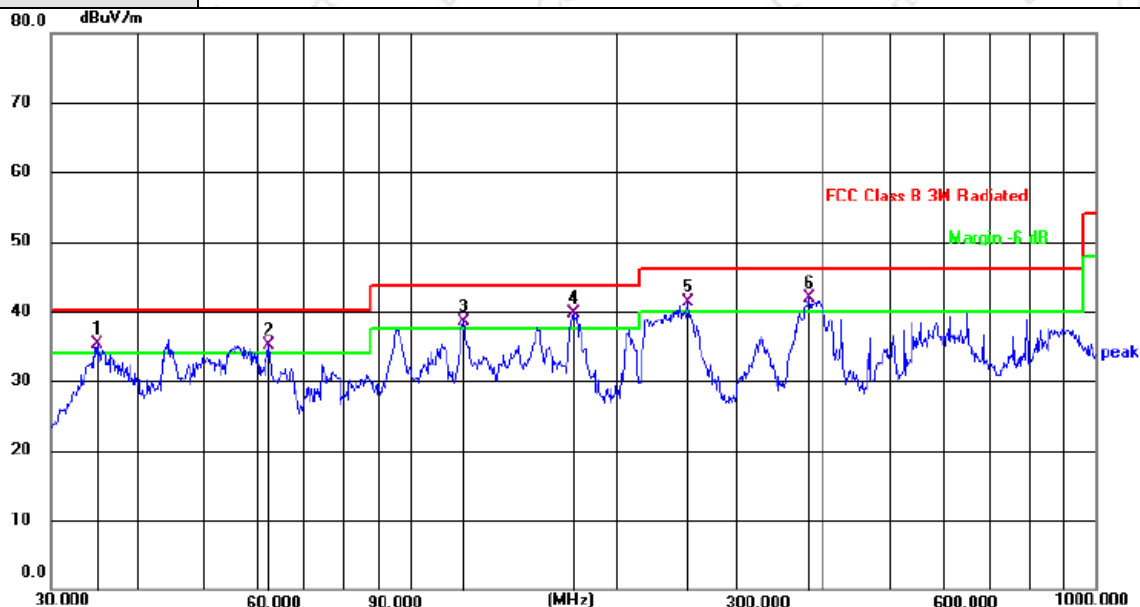
Remark:

Correct Factor = Cable loss + Antenna factor – Preamplifier;

Level = Reading Level + Correct Factor; Margin = Limit – Level;



Temperature:	26℃	Relative Humidity:	54%
Pressure:	1010 hPa	Polarization :	Vertical
test voltage :	DC 12V		
Test Mode :	Mode 4		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB/m	Over dB	Detector
1	!	35.1276	49.07	-13.68	35.39	40.00	4.61	QP
2	!	62.2128	47.83	-12.64	35.19	40.00	4.81	QP
3	!	119.8555	54.00	-15.54	38.46	43.50	5.04	QP
4	*	173.8135	54.65	-14.88	39.77	43.50	3.73	QP
5	!	254.7281	52.07	-10.83	41.24	46.00	4.76	QP
6	!	382.5878	50.36	-8.54	41.82	46.00	4.18	QP

Remark:

Correct Factor = Cable loss + Antenna factor – Preamplifier;

Level = Reading Level + Correct Factor; Margin = Limit – Level;

**3.2.8 TEST RESULTS (1ghz~40ghZ)**

802.11a band 4

Polar (H/V)	Frequency	Meter Reading	Pre- amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
operation frequency:5745									
V	11490	53.63	49.05	15.3	37.39	57.27	68.2	-10.93	PK
V	11490	41.37	49.05	15.3	37.39	45.01	68.2	-23.19	AV
V	17235	51.08	49.16	15.27	40.45	57.64	68.2	-10.56	PK
V	17235	43.69	49.16	15.27	40.45	50.25	68.2	-17.95	AV
H	11490	50.66	49.05	15.3	37.39	54.3	68.2	-13.90	PK
H	11490	45.58	49.05	15.3	37.39	49.22	68.2	-18.98	AV
H	17235	50.96	49.16	15.27	40.45	57.52	68.2	-10.68	PK
H	17235	43.52	49.16	15.27	40.45	50.08	68.2	-18.12	AV
operation frequency:5785									
V	11570	51.08	49.09	15.34	37.42	54.75	68.2	-13.45	PK
V	11570	45.36	49.09	15.34	37.42	49.03	68.2	-19.17	AV
V	17355	50.87	49.18	15.29	40.47	57.45	68.2	-10.75	PK
V	17355	43.35	49.18	15.29	40.47	49.93	68.2	-18.27	AV
H	11570	50.47	49.09	15.34	37.42	54.14	68.2	-14.06	PK
H	11570	45.56	49.09	15.34	37.42	49.23	68.2	-18.97	AV
H	17355	48.63	49.18	15.29	40.47	55.21	68.2	-12.99	PK
H	17355	43.22	49.18	15.29	40.47	49.8	68.2	-18.40	AV
operation frequency:5825									
V	11650	52.56	49.11	15.37	37.46	56.28	68.2	-11.92	PK
V	11650	45.57	49.11	15.37	37.46	49.29	68.2	-18.91	AV
V	17475	49.63	49.21	15.34	40.51	56.27	68.2	-11.93	PK
V	17475	43.57	49.21	15.34	40.51	50.21	68.2	-17.99	AV
H	11650	57.24	49.11	15.37	31.31	54.81	68.2	-13.39	PK
H	11650	51.47	49.11	15.37	31.31	49.04	68.2	-19.16	AV
H	17475	49.96	49.21	15.34	40.51	56.6	68.2	-11.60	PK
H	17475	42.52	49.21	15.34	40.51	49.16	68.2	-19.04	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.									



802.11n HT20

Polar (H/V)	Frequency	Meter Reading	Pre- amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
operation frequency:5745									
V	11490	49.18	49.05	15.3	37.39	52.82	68.2	-15.38	PK
V	11490	45.63	49.05	15.3	37.39	49.27	68.2	-18.93	AV
V	17235	48.24	49.16	15.27	40.45	54.8	68.2	-13.40	PK
V	17235	43.53	49.16	15.27	40.45	50.09	68.2	-18.11	AV
H	11490	49.35	49.05	15.3	37.39	52.99	68.2	-15.21	PK
H	11490	45.44	49.05	15.3	37.39	49.08	68.2	-19.12	AV
H	17235	48.19	49.16	15.27	40.45	54.75	68.2	-13.45	PK
H	17235	44.52	49.16	15.27	40.45	51.08	68.2	-17.12	AV
operation frequency:5785									
V	11570	52.38	49.09	15.34	37.42	56.05	68.2	-12.15	PK
V	11570	44.47	49.09	15.34	37.42	48.14	68.2	-20.06	AV
V	17355	49.27	49.18	15.29	40.47	55.85	68.2	-12.35	PK
V	17355	43.63	49.18	15.29	40.47	50.21	68.2	-17.99	AV
H	11570	49.33	49.09	15.34	37.42	53	68.2	-15.20	PK
H	11570	43.57	49.09	15.34	37.42	47.24	68.2	-20.96	AV
H	17355	49.36	49.18	15.29	40.47	55.94	68.2	-12.26	PK
H	17355	43.19	49.18	15.29	40.47	49.77	68.2	-18.43	AV
operation frequency:5825									
V	11650	51.33	49.11	15.37	37.46	55.05	68.2	-13.15	PK
V	11650	44.74	49.11	15.37	37.46	48.46	68.2	-19.74	AV
V	17475	48.36	49.21	15.34	40.51	55	68.2	-13.20	PK
V	17475	43.52	49.21	15.34	40.51	50.16	68.2	-18.04	AV
H	11650	57.19	49.11	15.37	31.31	54.76	68.2	-13.44	PK
H	11650	44.63	49.11	15.37	31.31	42.2	68.2	-26.00	AV
H	17475	49.38	49.21	15.34	40.51	56.02	68.2	-12.18	PK
H	17475	44.52	49.21	15.34	40.51	51.16	68.2	-17.04	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.



802.11n HT40

Polar (H/V)	Frequency	Meter Reading	Pre- amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
operation frequency:5755									
V	11510	49.29	49.07	15.33	37.41	52.96	68.2	-15.24	PK
V	11510	45.11	49.07	15.33	37.41	48.78	68.2	-19.42	AV
V	17265	49.13	49.17	15.28	40.46	55.7	68.2	-12.50	PK
V	17265	43.58	49.17	15.28	40.46	50.15	68.2	-18.05	AV
H	11510	48.21	49.07	15.33	37.41	51.88	68.2	-16.32	PK
H	11510	45.41	49.07	15.33	37.41	49.08	68.2	-19.12	AV
H	17265	49.52	49.17	15.28	40.46	56.09	68.2	-12.11	PK
H	17265	44.55	49.17	15.28	40.46	51.12	68.2	-17.08	AV
operation frequency:5795									
V	11590	49.41	49.11	15.37	37.46	53.13	68.2	-15.07	PK
V	11590	44.56	49.11	15.37	37.46	48.28	68.2	-19.92	AV
V	17385	48.33	49.21	15.34	40.51	54.97	68.2	-13.23	PK
V	17385	43.56	49.21	15.34	40.51	50.2	68.2	-18.00	AV
H	11590	57.38	49.11	15.37	31.31	54.95	68.2	-13.25	PK
H	11590	44.41	49.11	15.37	31.31	41.98	68.2	-26.22	AV
H	17385	48.18	49.21	15.34	40.51	54.82	68.2	-13.38	PK
H	17385	44.63	49.21	15.34	40.51	51.27	68.2	-16.93	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.



802.11ac HT20

Polar (H/V)	Frequency	Meter Reading	Pre- amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
operation frequency:5745									
V	11490	49.35	49.05	15.3	37.39	52.99	68.2	-15.21	PK
V	11490	45.51	49.05	15.3	37.39	49.15	68.2	-19.05	AV
V	17235	48.39	49.16	15.27	40.45	54.95	68.2	-13.25	PK
V	17235	43.52	49.16	15.27	40.45	50.08	68.2	-18.12	AV
H	11490	48.39	49.05	15.3	37.39	52.03	68.2	-16.17	PK
H	11490	45.47	49.05	15.3	37.39	49.11	68.2	-19.09	AV
H	17235	48.29	49.16	15.27	40.45	54.85	68.2	-13.35	PK
H	17235	44.22	49.16	15.27	40.45	50.78	68.2	-17.42	AV
operation frequency:5785									
V	11570	48.35	49.09	15.34	37.42	52.02	68.2	-16.18	PK
V	11570	44.86	49.09	15.34	37.42	48.53	68.2	-19.67	AV
V	17355	49.52	49.18	15.29	40.47	56.1	68.2	-12.10	PK
V	17355	43.11	49.18	15.29	40.47	49.69	68.2	-18.51	AV
H	11570	49.63	49.09	15.34	37.42	53.3	68.2	-14.90	PK
H	11570	43.47	49.09	15.34	37.42	47.14	68.2	-21.06	AV
H	17355	49.16	49.18	15.29	40.47	55.74	68.2	-12.46	PK
H	17355	43.52	49.18	15.29	40.47	50.1	68.2	-18.10	AV
operation frequency:5825									
V	11650	49.18	49.11	15.37	37.46	52.9	68.2	-15.30	PK
V	11650	44.33	49.11	15.37	37.46	48.05	68.2	-20.15	AV
V	17475	48.53	49.21	15.34	40.51	55.17	68.2	-13.03	PK
V	17475	43.55	49.21	15.34	40.51	50.19	68.2	-18.01	AV
H	11650	57.19	49.11	15.37	31.31	54.76	68.2	-13.44	PK
H	11650	44.59	49.11	15.37	31.31	42.16	68.2	-26.04	AV
H	17475	48.29	49.21	15.34	40.51	54.93	68.2	-13.27	PK
H	17475	44.36	49.21	15.34	40.51	51	68.2	-17.20	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.



802.11ac HT40

Polar (H/V)	Frequency	Meter Reading	Pre- amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
operation frequency:5755									
V	11510	49.45	49.07	15.33	37.41	53.12	68.2	-15.08	PK
V	11510	45.25	49.07	15.33	37.41	48.92	68.2	-19.28	AV
V	17265	48.22	49.17	15.28	40.46	54.79	68.2	-13.41	PK
V	17265	43.63	49.17	15.28	40.46	50.2	68.2	-18.00	AV
H	11510	48.36	49.07	15.33	37.41	52.03	68.2	-16.17	PK
H	11510	45.14	49.07	15.33	37.41	48.81	68.2	-19.39	AV
H	17265	48.56	49.17	15.28	40.46	55.13	68.2	-13.07	PK
H	17265	44.28	49.17	15.28	40.46	50.85	68.2	-17.35	AV
operation frequency:5795									
V	11590	49.56	49.11	15.37	37.46	53.28	68.2	-14.92	PK
V	11590	44.38	49.11	15.37	37.46	48.1	68.2	-20.10	AV
V	17385	48.18	49.21	15.34	40.51	54.82	68.2	-13.38	PK
V	17385	43.63	49.21	15.34	40.51	50.27	68.2	-17.93	AV
H	11590	57.45	49.11	15.37	31.31	55.02	68.2	-13.18	PK
H	11590	44.88	49.11	15.37	31.31	42.45	68.2	-25.75	AV
H	17385	48.63	49.21	15.34	40.51	55.27	68.2	-12.93	PK
H	17385	44.55	49.21	15.34	40.51	51.19	68.2	-17.01	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.

802.11ac HT80

Polar (H/V)	Frequency	Meter Reading	Pre- amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
operation frequency:5775									
V	11550	48.18	49.07	15.33	37.41	51.85	68.2	-16.35	PK
V	11550	45.36	49.07	15.33	37.41	49.03	68.2	-19.17	AV
V	17325	49.18	49.17	15.28	40.46	55.75	68.2	-12.45	PK
V	17325	43.63	49.17	15.28	40.46	50.2	68.2	-18.00	AV
H	11550	48.45	49.07	15.33	37.41	52.12	68.2	-16.08	PK
H	11550	45.52	49.07	15.33	37.41	49.19	68.2	-19.01	AV
H	17325	48.63	49.17	15.28	40.46	55.2	68.2	-13.00	PK
H	17325	44.53	49.17	15.28	40.46	51.1	68.2	-17.10	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.

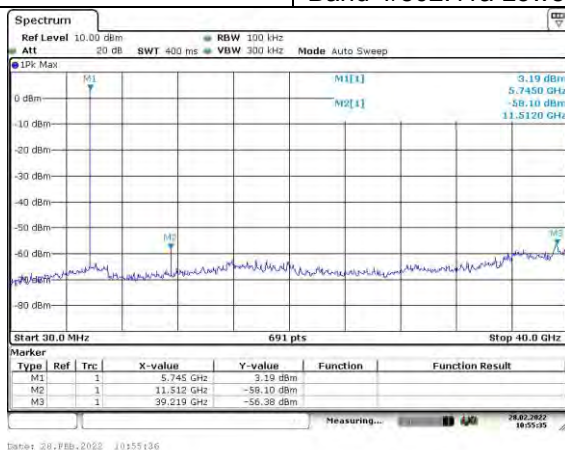


For Conducted

During the test, pre-scan the all modulation, the modulation below were found to have the worst test results, as reflected in the report.

Test channel:

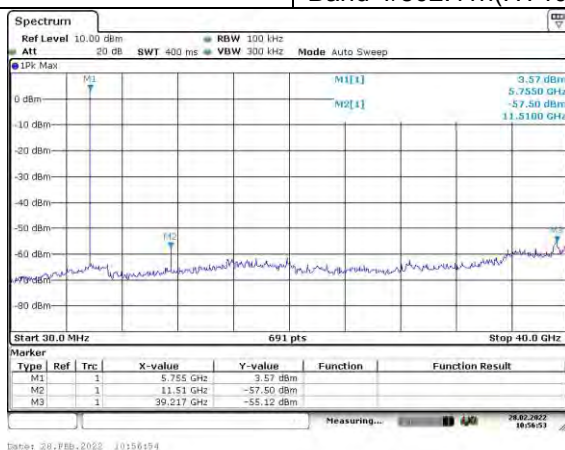
Band 4/802.11a Lowest channel



0.03Hz~40GHz

Test channel:

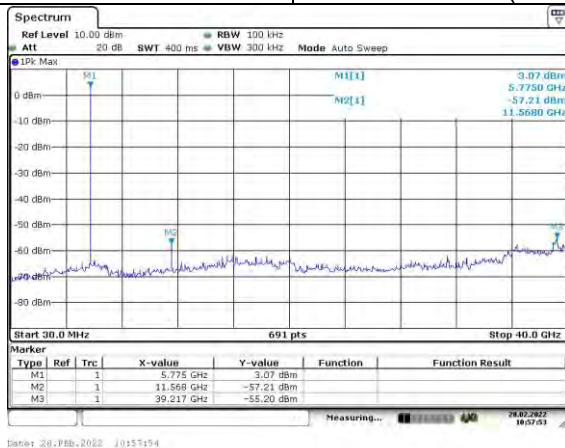
Band 4/802.11n(HT40) Lowest channel



0.03GHz~40GHz

Test channel:

Band 4/802.11ac(HT80)



0.03GHz~40GHz



3.3 RADIATED BAND EMISSION MEASUREMENT

3.3.1 TEST REQUIREMENT:

FCC Part15 C Section 15.209 and 15.407

(4) 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.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	5725MHz
Stop Frequency	5850MHz
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

3.3.2 TEST PROCEDURE

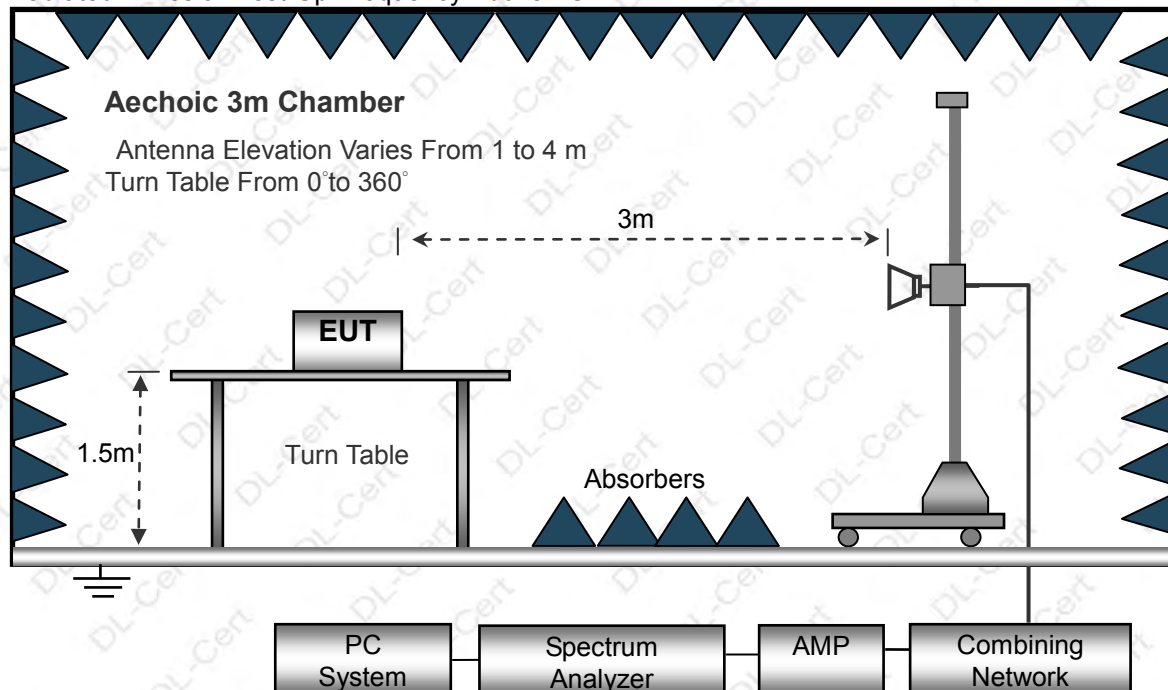
Test method: FCC KDB 789033 G)& Parts 15.407(b)(4) & 15.209(a)

3.3.3 DEVIATION FROM TEST STANDARD

No deviation

3.3.4 TEST SETUP

Radiated Emission Test-Up Frequency Above 1GHz



3.3.5 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.

**3.3.6 TEST RESULT**

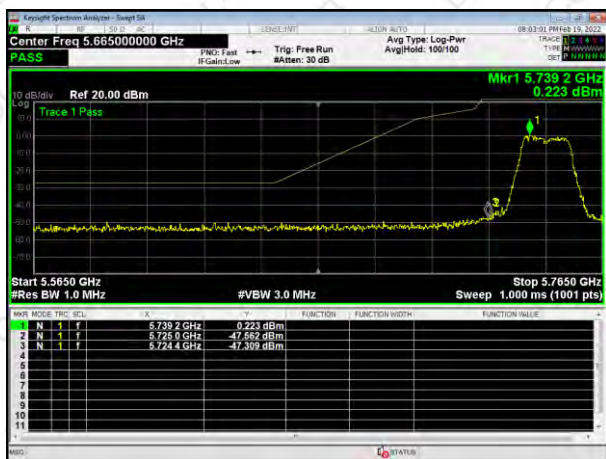
Modulation	Test Frequency (MHz)	Max Level Frequency (MHz)	Max Level (dBμV/m)	EIRP (dBm)	Limit (dBm)	Result
802.11a	5745	5728.98	58.31	-36.89	-27	Pass
	5825	5847.78	57.57	-37.63	-27	Pass
802.11n(HT20)	5745	5728.89	56.55	-38.65	-27	Pass
	5825	5848.29	57.74	-37.46	-27	Pass
802.11n(HT40)	5755	5730.08	56.26	-38.94	-27	Pass
	5795	5847.22	56.01	-39.19	-27	Pass
802.11ac(HT20)	5745	5729.86	56.67	-38.53	-27	Pass
	5825	5848.01	57.53	-37.67	-27	Pass
802.11ac(HT40)	5755	5728.28	56.58	-38.62	-27	Pass
	5795	5847.07	55.24	-39.96	-27	Pass
802.11ac(HT80)	5775	5727.66	55.68	-39.52	-27	Pass
		5848.07	54.32	-40.88	-27	Pass

Remark: 1. According to KDB 789033 D02 section H) d) (iii), for measurement above 1000MHz@3m distance, the limit of EIRP is calculated as follows: $EIRP[dBm] = E[dB\mu V/m] - 95.2$



For Conducted

802.11a



5745MHz



5825MHz

802.11n HT20



5745MHz



5825MHz

802.11n HT40



5755MHz



5795MHz



802.11ac HT20



5745MHz



5825MHz

802.11ac HT40



5755MHz



5795MHz

802.11ac HT80



5775MHz



4. AVERAGE OUTPUT POWER

4.1 APPLIED PROCEDURES / LIMIT

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

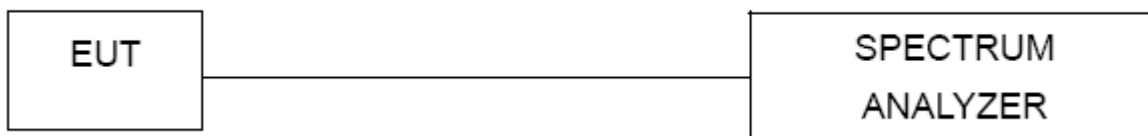
4.1.1 TEST PROCEDURE

- The EUT was directly connected to the power meter and antenna output port as show in the block diagram below,
- Measure the duty cycle D of the transmitter output signal as described in 11.6.
Set span to at least 1.5 times the OBW.
Set RBW = 1% to 5% of the OBW, not to exceed 1 MHz.
Set VBW $\geq [3 \times \text{RBW}]$.
Number of points in sweep $\geq [2 \times \text{span} / \text{RBW}]$. (This gives bin-to-bin spacing $\leq \text{RBW} / 2$, so that narrowband signals are not lost between frequency bins.)
Sweep time = auto.
Detector = RMS (i.e., power averaging), if available. Otherwise, use the sample detector mode.
Do not use sweep triggering. Allow the sweep to “free run.”
Trace average at least 100 traces in power averaging (rms) mode; however, the number of traces to be averaged shall be increased above 100 as needed such that the average accurately represents the true average over the ON and OFF periods of the transmitter.
Compute power by integrating the spectrum across the OBW of the signal using the instrument’s band power measurement function with band limits set equal to the OBW band edges. If the instrument does not have a band power function, then sum the spectrum levels (in power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.
Add $[10 \log (1 / D)]$, where D is the duty cycle, to the measured power to compute the average power during the actual transmission times (because the measurement represents an average over both the ON and OFF times of the transmission). For example, add $[10 \log (1/0.25)] = 6 \text{ dB}$ if the duty cycle is 25%.

4.1.2 DEVIATION FROM STANDARD

No deviation.

4.1.3 TEST SETUP



4.1.4 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.

**4.1.5 TEST RESULTS**

Temperature:	25 °C	Relative Humidity:	60%
Pressure:	1012 hPa	Test Voltage :	DC 12V

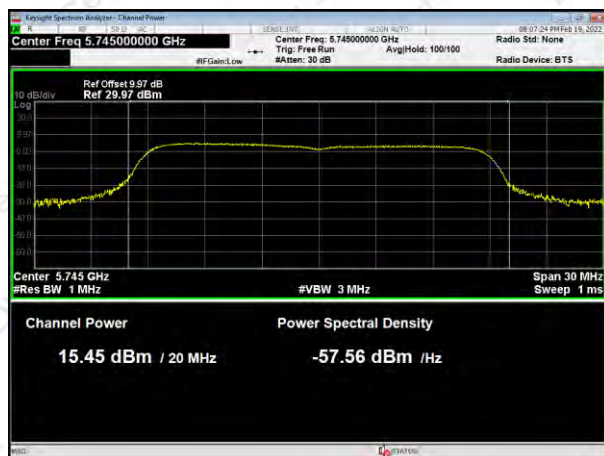
Band	Mode	Test Channel	Read Level (dBm)	Duty Fator (dB)	Total Output Power(dB)	LIMIT (dBm)
Band 4	802.11a	Low	12.914	0.13	13.044	30
		Moddle	14.001	0.13	14.131	30
		High	13.957	0.13	14.087	30
	802.11n HT20	Low	15.453	0.13	15.583	30
		Moddle	16.604	0.13	16.734	30
		High	16.611	0.13	16.741	30
	802.11n HT40	Low	14.129	0.26	14.389	30
		High	14.951	0.26	15.211	30
	802.11ac HT20	Low	15.161	0.14	15.301	30
		Moddle	16.407	0.14	16.547	30
		High	16.723	0.14	16.863	30
	802.11ac HT40	Low	14.236	0.27	14.506	30
		High	15.107	0.27	15.377	30
	802.11ac HT80	/	13.638	0.51	14.148	30



802.11a



802.11n HT20



5745MHz



5745MHz



5785MHz



5785MHz



5825MHz

5825MHz



802.11n HT40



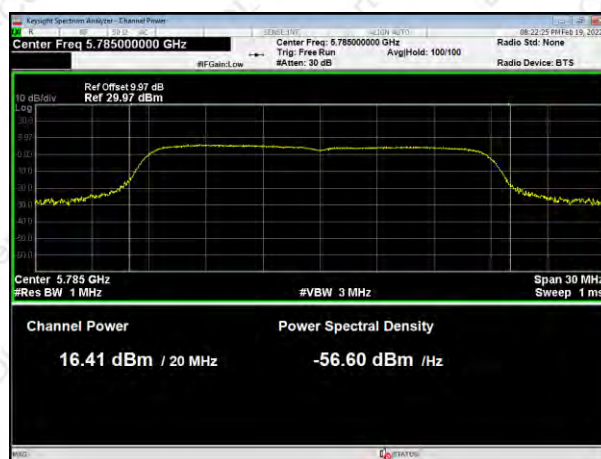
802.11ac HT20



5755MHz



5745MHz



5795MHz



5785MHz

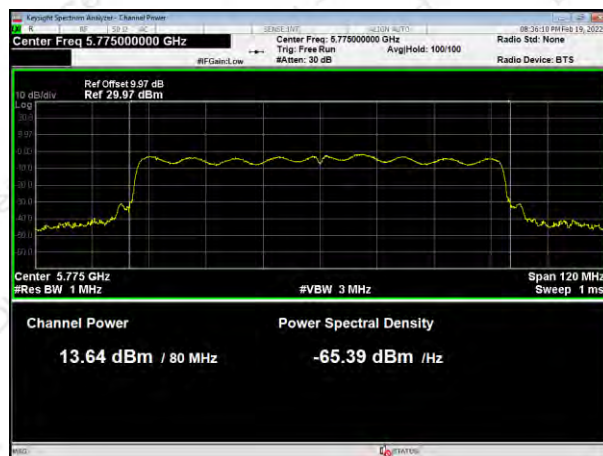
5825MHz



802.11ac HT40



802.11ac HT80



5755MHz



5775MHz

5795MHz



5. POWER SPECTRAL DENSITY TEST

5.1 APPLIED PROCEDURES / LIMIT

In addition, the maximum power spectral density shall not exceed 30 dBm in any 500 kHz band.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	= the frequency band of operation
RB	RBW $\geq$ 510KHz for band 4
VB	VBW $\geq$ 3RBW
Detector	Average
Trace	Max Hold
Sweep Time	Auto

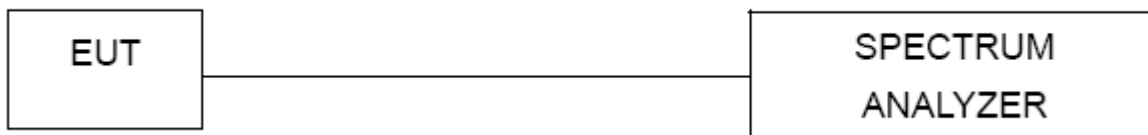
5.1.1 TEST PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows FCC KDB 789033 D02.
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to Spectrum.
4. For U-NII1, U-NII-2A, U-NII-2C Band:
Set RBW=1MHz, VBW=3MHz, where span is enough to capture the entire bandwidth, Sweep time = Auto (601 pts), detector = sample, traces 100 sweeps of video averaging. (SA-2 with the omission of procedure x, the integration with 26dB EBW bandwidth)
For U-NII-3 Band:
Set RBW=510 kHz, VBW=3*RBW, where span is enough to capture the entire bandwidth, Sweep time = Auto (601 pts), detector = sample, traces 100 sweeps of video averaging. (SA-2 with the omission of procedure x, the integration with 26dB EBW bandwidth)
5. Use the cursor on spectrum to peak search the highest level of trace
6. Record the max. reading and add 10 log(1/duty cycle).
we test all antennas, the antenna 1 was worst mode and the data recording in the report.
7. Duty factor Reference is made to the test results in Section 7.1.5.

5.1.2 DEVIATION FROM STANDARD

No deviation.

5.1.3 TEST SETUP



5.1.4 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.

**5.1.5 TEST RESULTS**

	Mode	Test Channel	Reading Level (dBm)	Duty factor (dB)	PSD (dBm/500kHz)	Limit (dBm)	Result
Band4	802.11a	Low	-0.16	0.13	-0.03	30.00	PASS
		Moddle	0.711	0.13	0.841	30.00	PASS
		High	0.71	0.13	0.84	30.00	PASS
	802.11n20	Low	2.285	0.13	2.415	30.00	PASS
		Moddle	3.087	0.13	3.217	30.00	PASS
		High	2.987	0.13	3.117	30.00	PASS
	802.11n40	Low	-1.899	0.26	-1.639	30.00	PASS
		High	-0.368	0.26	-0.108	30.00	PASS
	802.11ac20	Low	1.818	0.14	1.958	30.00	PASS
		Moddle	3.021	0.14	3.161	30.00	PASS
		High	3.166	0.14	3.306	30.00	PASS
	802.11ac40	Low	-1.928	0.27	-1.658	30.00	PASS
		High	-0.502	0.27	-0.232	30.00	PASS
	802.11ac80	/	-4.315	0.51	-3.805	30.00	PASS



802.11a



802.11n HT20



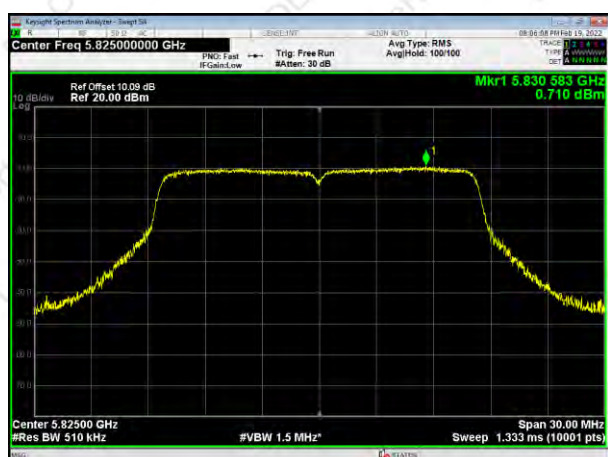
5745MHz



5745MHz



5785MHz



5785MHz



5825MHz

5825MHz



802.11n HT40



802.11ac HT20



5755MHz



5745MHz



5795MHz



5785MHz

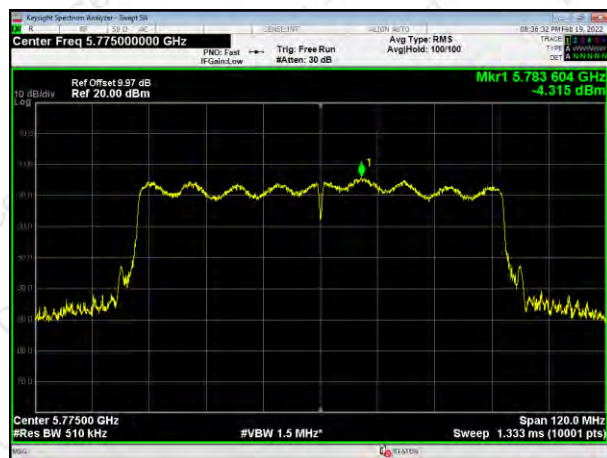
5825MHz



802.11ac HT40



802.11ac HT80



5755MHz



5775MHz

5795MHz



6. 6DB&99% BANDWIDTH TEST

6.1 APPLIED PROCEDURES / LIMIT

There is no limit bandwidth for U-NII-1, U-NII-2-A and U-NII-2-C.

The minimum of 6dB Bandwidth measurement is 0.5 MHz for U-NII-3

6.1.1 TEST PROCEDURE

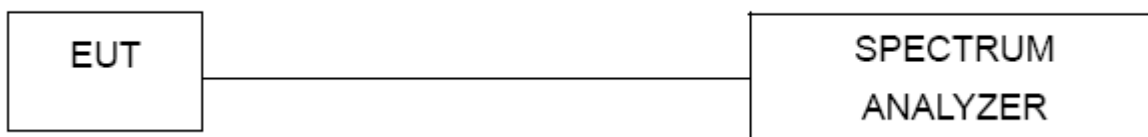
6dB Bandwidth	
Spectrum Parameters	Setting
RBW	100KHz
VBW	300KHz
Span	30MHz(20MHz Bandwidth mode) 60MHz(40MHz Bandwidth mode) 120MHz(80MHz Bandwidth mode)
Sweep Time	Auto
Detector	Peak
Trace Mode	Max Hold

99% Occupied Bandwidth	
Spectrum Parameters	Setting
RBW	1% to 5% of the OBW
VBW	Approximately three times the RBW
Span	between 1.5 times and 5.0 times the OBW
Sweep Time	Auto
Detector	Peak
Trace Mode	Max Hold

6.1.2 DEVIATION FROM STANDARD

No deviation.

6.1.3 TEST SETUP



6.1.4 EUT OPERATION 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.

6.1.5 TEST RESULTS

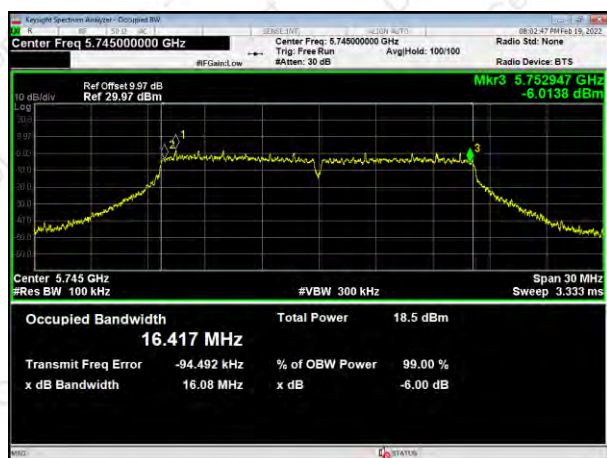


		Test Channel	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	6dB Bandwidth Limit (MHz)	Result
Band 4	802.11a	Low	16.08	16.538	>0.5	Pass
		Middle	15.91	16.485	>0.5	Pass
		High	16.06	16.457	>0.5	Pass
	802.11n HT20	Low	16.05	17.686	>0.5	Pass
		Middle	16.66	17.637	>0.5	Pass
		High	16.42	17.638	>0.5	Pass
	802.11n HT40	Low	36.32	36.661	>0.5	Pass
		High	35.62	36.606	>0.5	Pass
	802.11ac HT20	Low	15.97	17.680	>0.5	Pass
		Middle	16.91	17.667	>0.5	Pass
		High	16.88	17.670	>0.5	Pass
	802.11ac HT40	Low	36.31	36.630	>0.5	Pass
		High	35.72	36.565	>0.5	Pass
	802.11ac HT80	/	75.15	75.676	>0.5	Pass



6dB Bandwidth

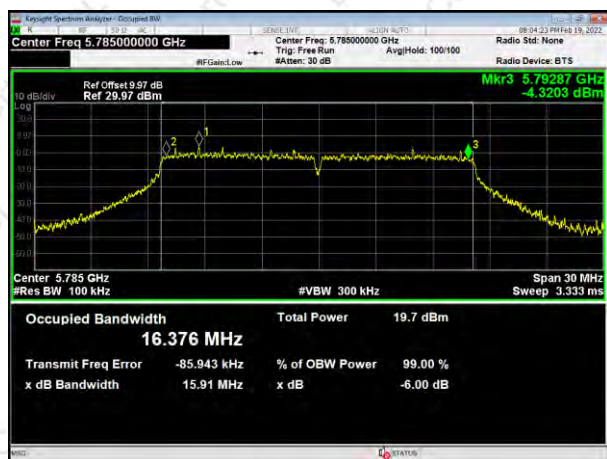
802.11a



802.11n HT20



5745MHz



5745MHz



5785MHz



5785MHz



5825MHz

5825MHz



802.11n HT40



802.11ac HT20



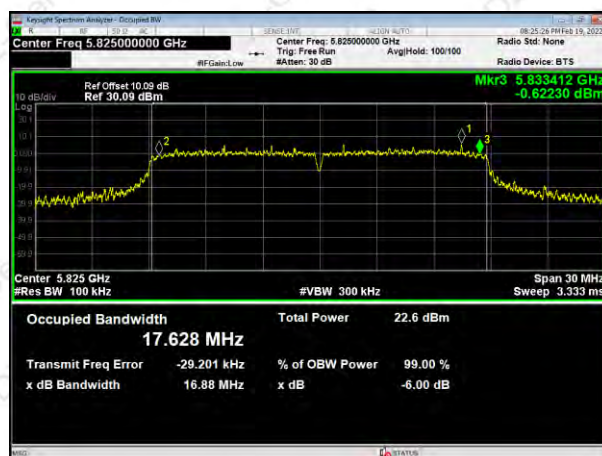
5755MHz



5745MHz



5795MHz



5785MHz

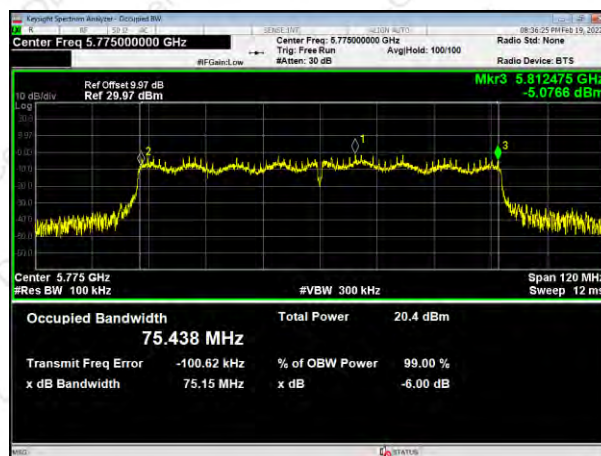
5825MHz



802.11ac HT40



802.11ac HT80



5755MHz



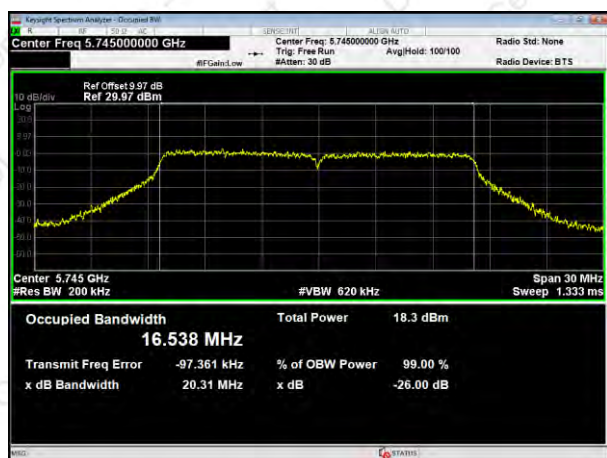
5775MHz

5795MHz



99% Bandwidth

802.11a



802.11n HT20



5745MHz



5745MHz



5785MHz



5785MHz



5825MHz

5825MHz



802.11n HT40



802.11ac HT20



5755MHz



5745MHz



5795MHz



5785MHz

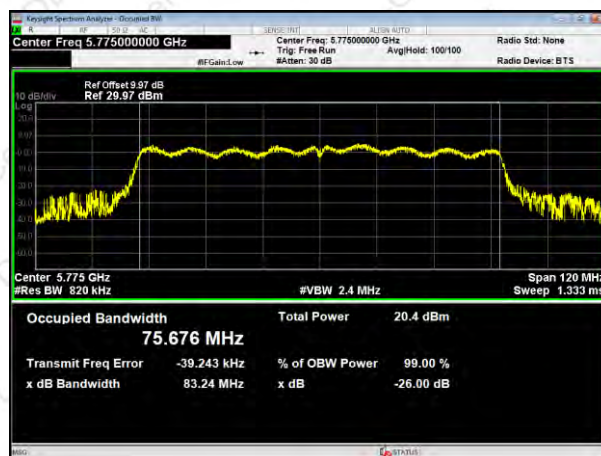
5825MHz



802.11ac HT40



802.11ac HT80



5755MHz



5775MHz

5795MHz



7. DUTY CYCLE TEST SIGNAL

7.1 APPLIED PROCEDURES / LIMIT

Pre-analysis Check: While conducting average power measurement, duty cycle of each mode shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle. All duty cycle is pre-scanned, and result as obtained below shows only the most representative ones where duty cycle is conducted as the given transmission with given virtual operation that expresses the percentage.

7.1.1 TEST PROCEDURE

1. Set RBW = 1 MHz.
2. Set the video bandwidth (VBW) $\geq$ RBW.
3. Detector = Peak.
4. Sweep = auto couple.
5. Allow the trace to stabilize.
6. Span=0

7.1.2 DEVIATION FROM STANDARD

No deviation.

7.1.3 TEST SETUP



7.1.4 EUT OPERATION 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.



7.1.5 TEST RESULTS

Operation Mode		Duty Cycle(%)	Duty Fator (dB) $10 * \log (1/ \text{Duty cycle})$
Band 4	802.11a	97.1	0.13
	802.11n(HT20)	97	0.13
	802.11n(HT40)	94.16	0.26
	802.11ac(HT20)	96.91	0.14
	802.11ac(HT40)	94.05	0.27
	802.11ac(HT80)	88.88	0.51



802.11a



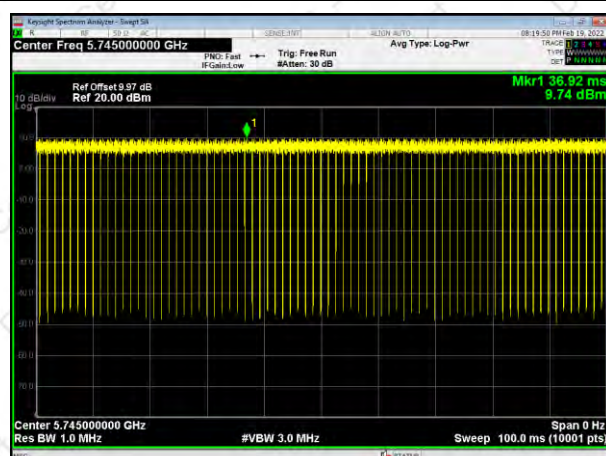
802.11n HT20



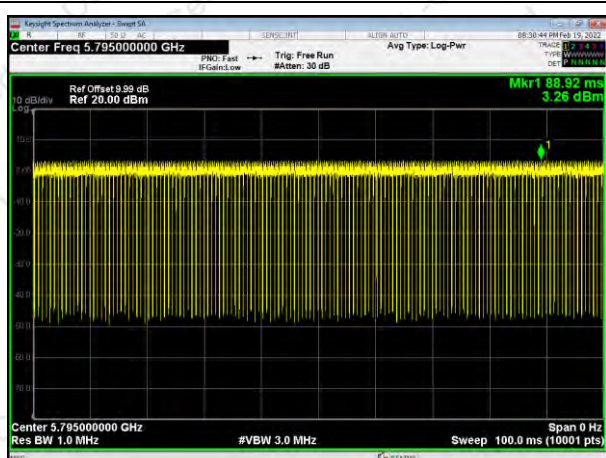
802.11n HT40



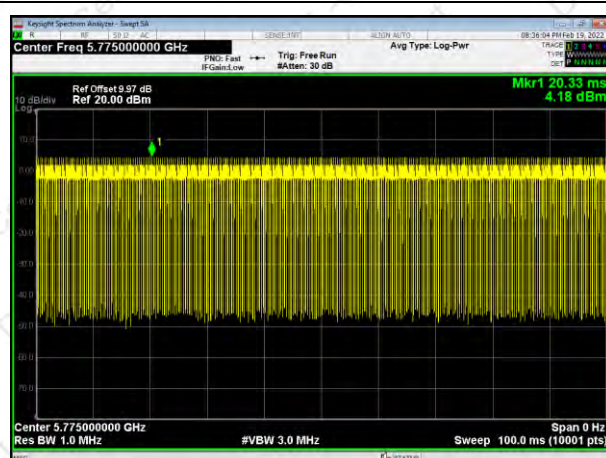
802.11ac HT20



802.11ac HT40



802.11ac HT80





8. FREQUENCY STABILITY

8.1 APPLIED PROCEDURES / LIMIT

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

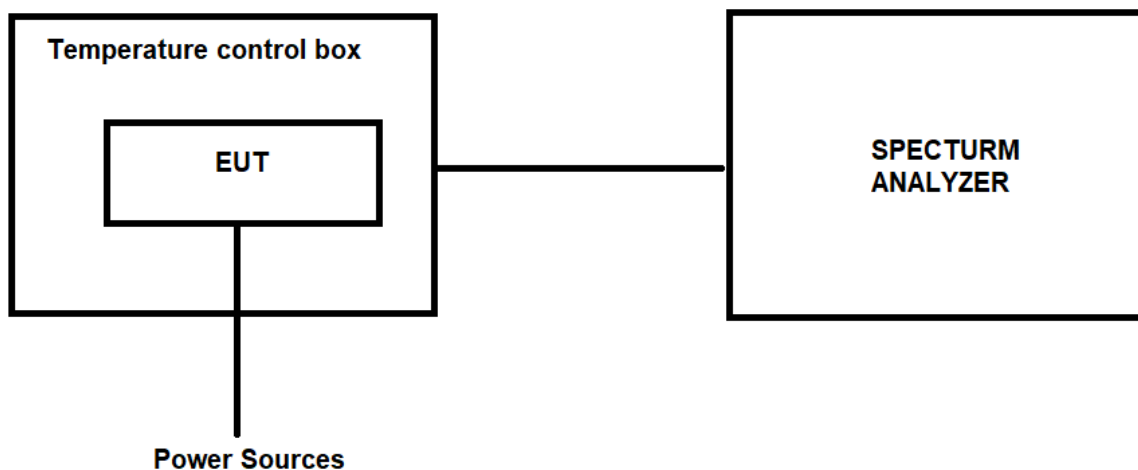
8.1.1 TEST PROCEDURE

1. The EUT was placed inside temperature chamber and powered and powered by nominal DC voltage.
2. Set EUT as normal operation.
3. Turn the EUT on and couple its output to spectrum.
4. Turn the EUT off and set the chamber to the highest temperature specified.
5. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT and measure the operating frequency.
6. Repeat step with the temperature chamber set to the lowest temperature.

8.1.2 DEVIATION FROM STANDARD

No deviation.

8.1.3 TEST SETUP



8.1.4 EUT OPERATION 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.



8.1.5 TEST RESULTS

Test Voltage	Test Temp.	Measured Frequency (MHz)	Spectrum Frequency (MHz)			Δ Frequency (MHz)		
			802.11a	802.11n HT20	802.11ac HT20	802.11a	802.11n HT20	802.11ac HT20
13.2V	-20℃	5745	5745.0358	5745.0314	5745.0388	-0.0358	-0.0314	-0.0388
		5785	5785.0352	5785.0352	5785.0374	-0.0352	-0.0352	-0.0374
		5825	5825.0314	5825.0314	5825.0365	-0.0314	-0.0314	-0.0365
10.8V		5745	5745.0284	5745.0267	5745.0248	-0.0284	-0.0267	-0.0248
		5785	5785.0333	5785.0347	5785.0356	-0.0333	-0.0347	-0.0356
		5825	5825.0464	5825.0425	5825.0478	-0.0464	-0.0425	-0.0478
12V	25℃	5745	5745.0327	5745.0339	5745.0363	-0.0327	-0.0339	-0.0363
		5785	5785.0436	5785.0447	5785.0485	-0.0436	-0.0447	-0.0485
		5825	5825.0214	5825.0241	5825.0214	-0.0214	-0.0241	-0.0214
13.2V	50℃	5745	5745.0622	5745.0629	5745.0663	-0.0622	-0.0629	-0.0663
		5785	5785.0456	5785.0458	5785.0455	-0.0456	-0.0458	-0.0455
		5825	5825.0685	5825.0666	5825.0659	-0.0685	-0.0666	-0.0659
10.8V	50℃	5745	5745.0417	5745.0447	5745.0487	-0.0417	-0.0447	-0.0487
		5785	5785.0252	5785.0263	5785.0263	-0.0252	-0.0263	-0.0263
		5825	5825.0769	5825.0757	5825.0714	-0.0769	-0.0757	-0.0714

Test Voltage	Test Temp.	Measured Frequency (MHz)	Spectrum Frequency (MHz)		Δ Frequency (MHz)	
			802.11n HT40	802.11ac HT40	802.11n HT40	802.11ac HT40
13.2V	-20℃	5755	5755.0514	5755.0552	-0.0514	-0.0552
		5795	5795.0656	5795.0665	-0.0656	-0.0665
10.8V		5755	5755.0241	5755.0647	-0.0241	-0.0647
		5795	5795.0488	5795.0414	-0.0488	-0.0414
12V	25℃	5755	5755.0263	5755.0222	-0.0263	-0.0222
		5795	5795.0558	5795.0538	-0.0558	-0.0538
13.2V	50℃	5755	5755.0467	5755.0448	-0.0467	-0.0448
		5795	5795.0324	5795.0335	-0.0324	-0.0335
10.8V	50℃	5755	5755.0333	5755.0327	-0.0333	-0.0327
		5795	5795.0417	5795.0463	-0.0417	-0.0463



Test Voltage	Test Temp.	Measured Frequency (MHz)	Spectrum Frequency (MHz)	Δ Frequency (MHz)
			802.11ac HT80	802.11ac HT80
13.2V	-20°C	5775	5775.0157	-0.0157
10.8V		5775	5775.0363	-0.0363
12V	25°C	5775	5775.0428	-0.0428
13.2V	50°C	5775	5775.0211	-0.0211
10.8V	50°C	5775	5775.0596	-0.0596



9. TRANSMISSION IN THE ABSENCE OF DATA

9.1 STANDARD REQUIREMENT

According to §15.407(c)

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization a description of how this requirement is met.

9.2 TEST RESULT

No non-compliance noted:
Refer to the theory of operation.

10. ANTENNA REQUIREMENT

10.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

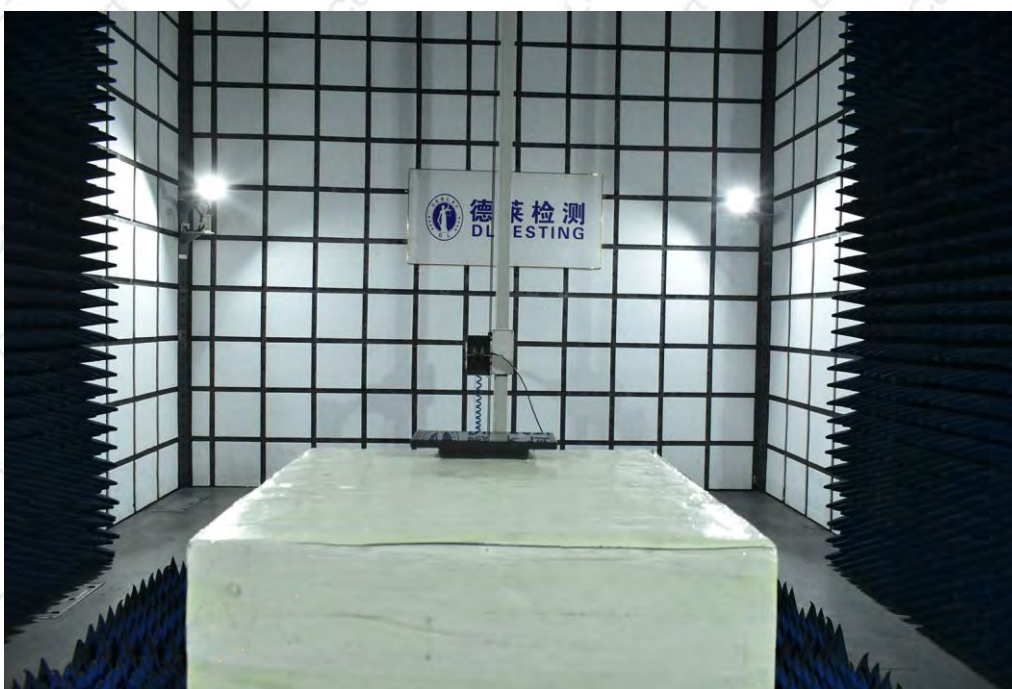
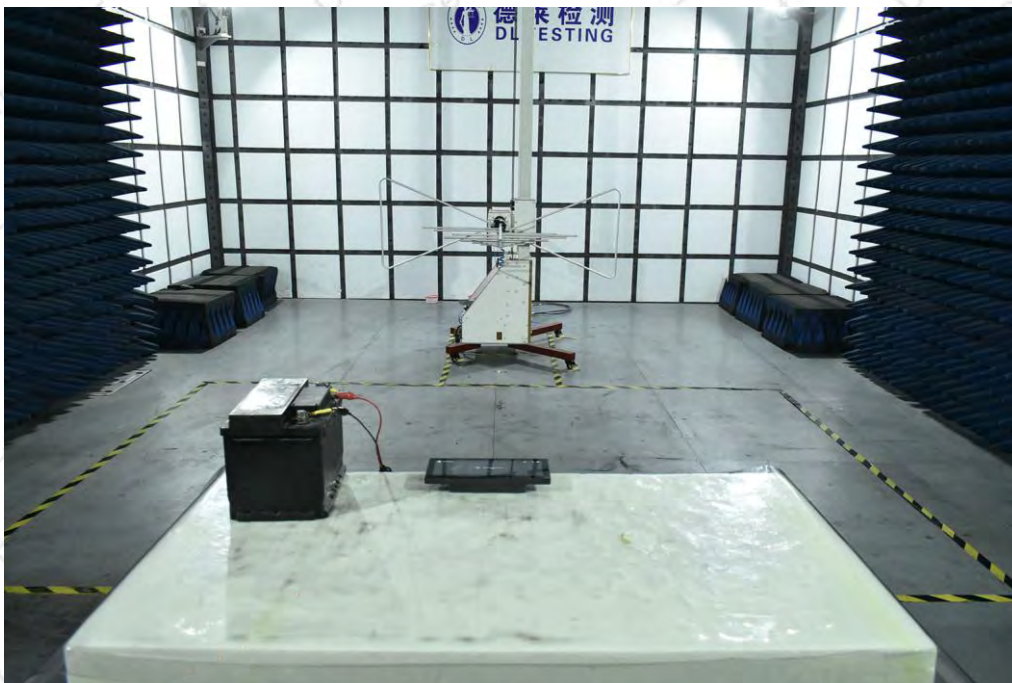
10.2 EUT ANTENNA

The EUT antenna is internal antenna, It comply with the standard requirement.



11. TEST SEUUP PHOTO

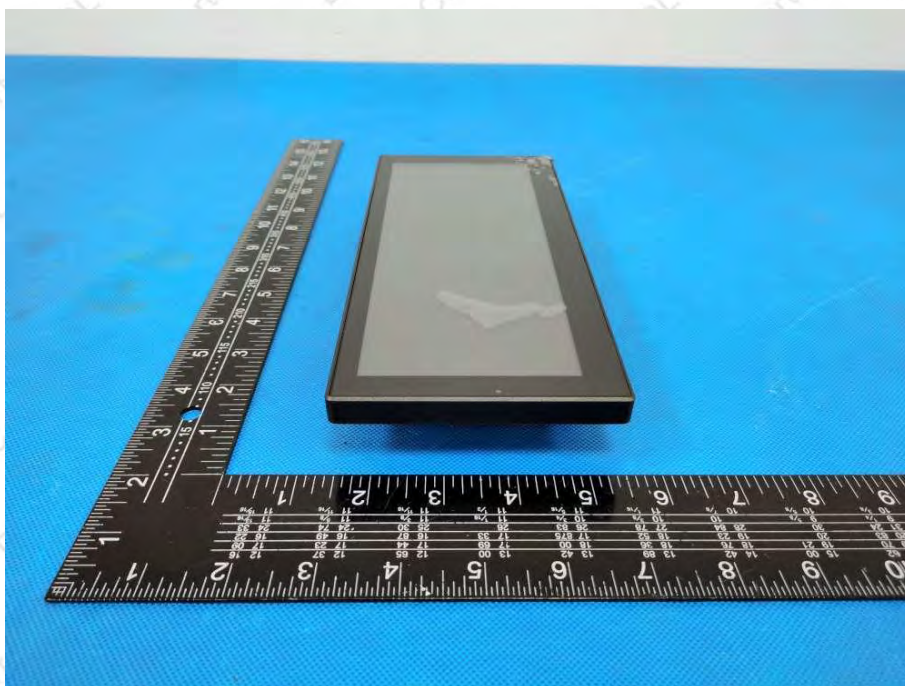
Radiated Measurement Photos

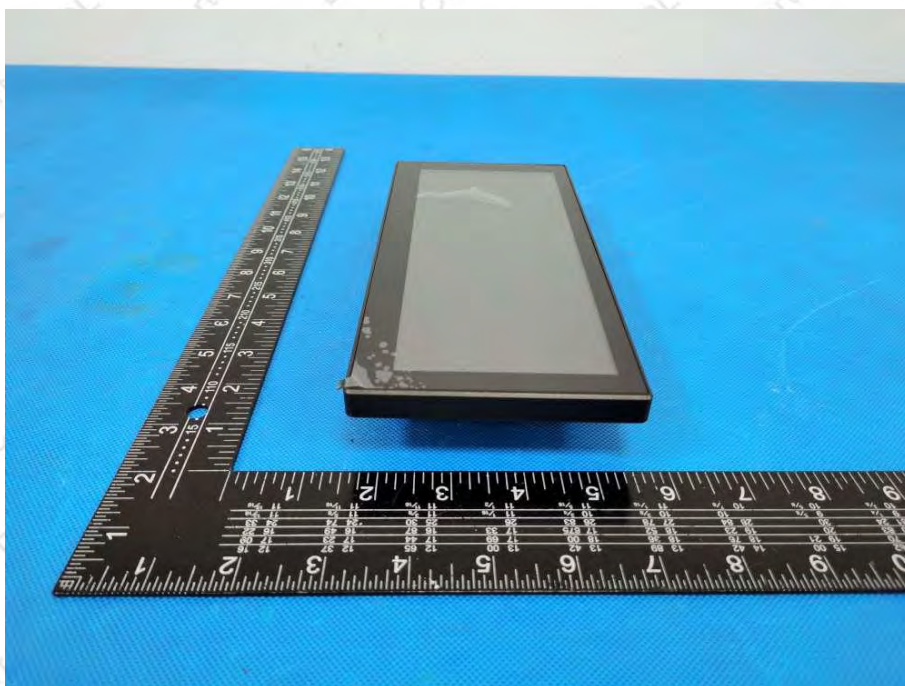


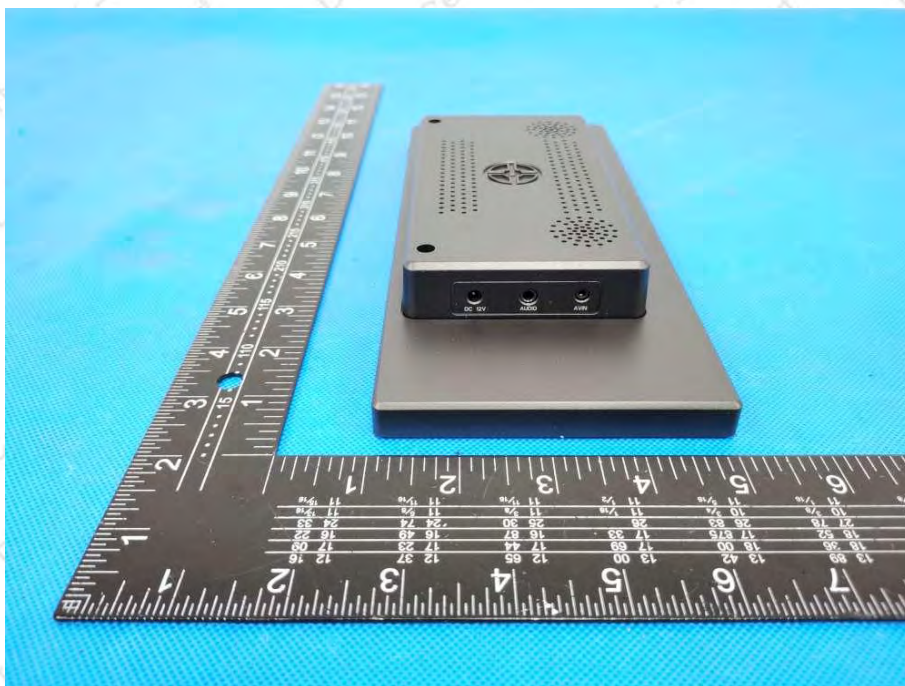
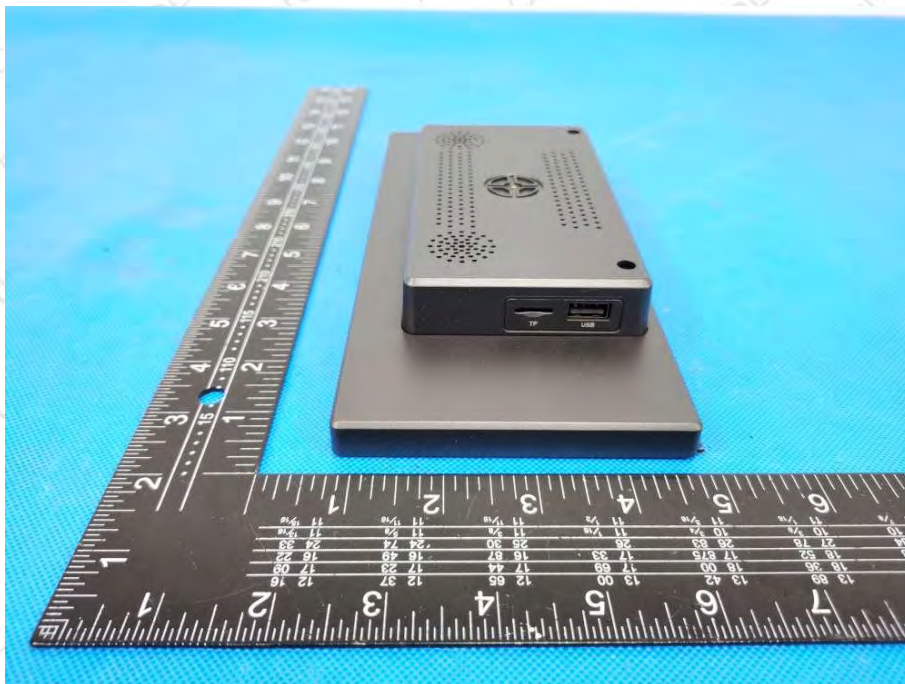


12. EUT PHOTO



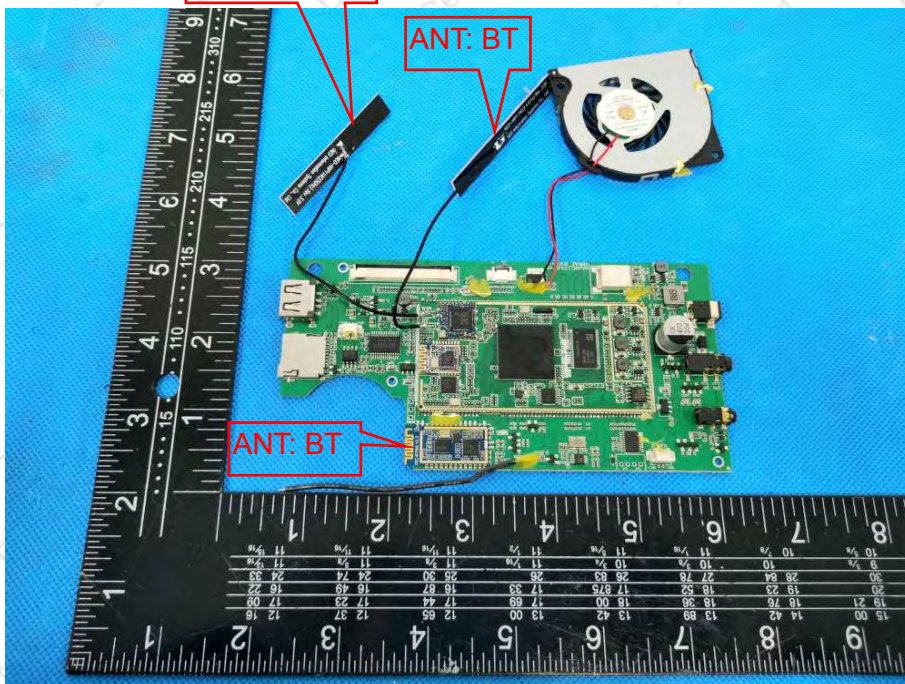


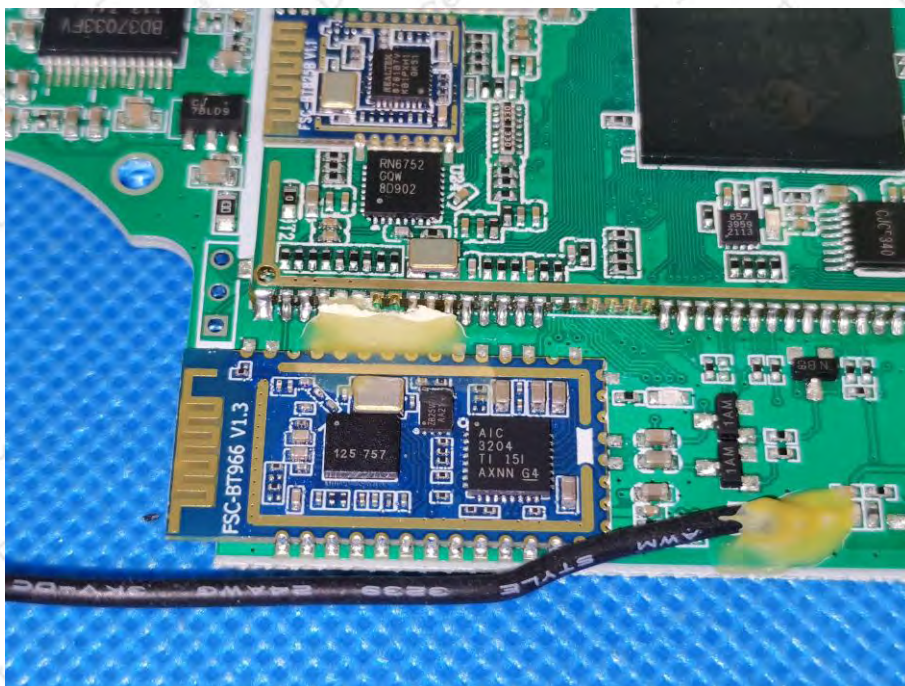
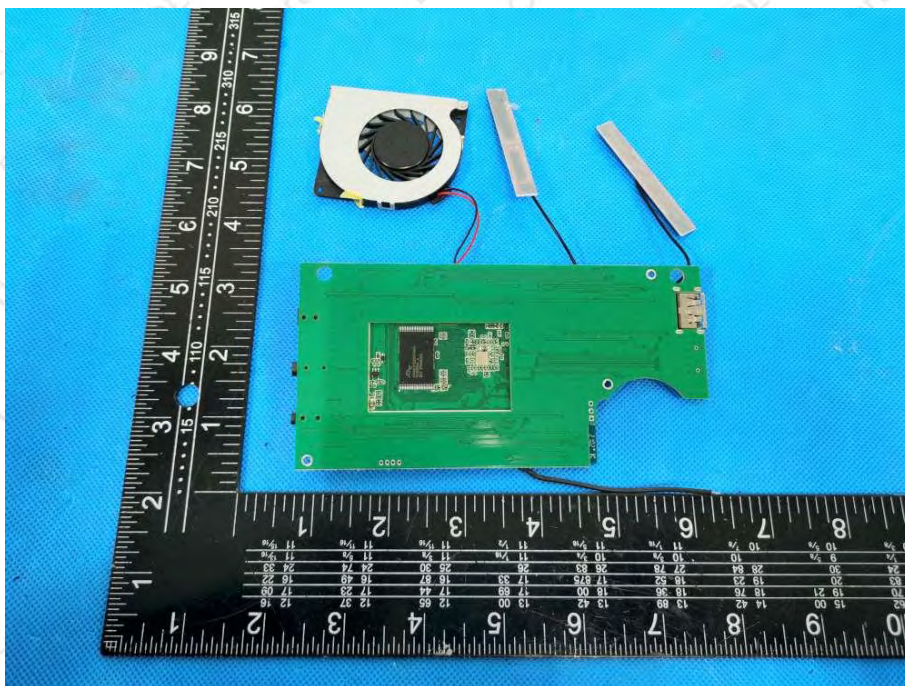


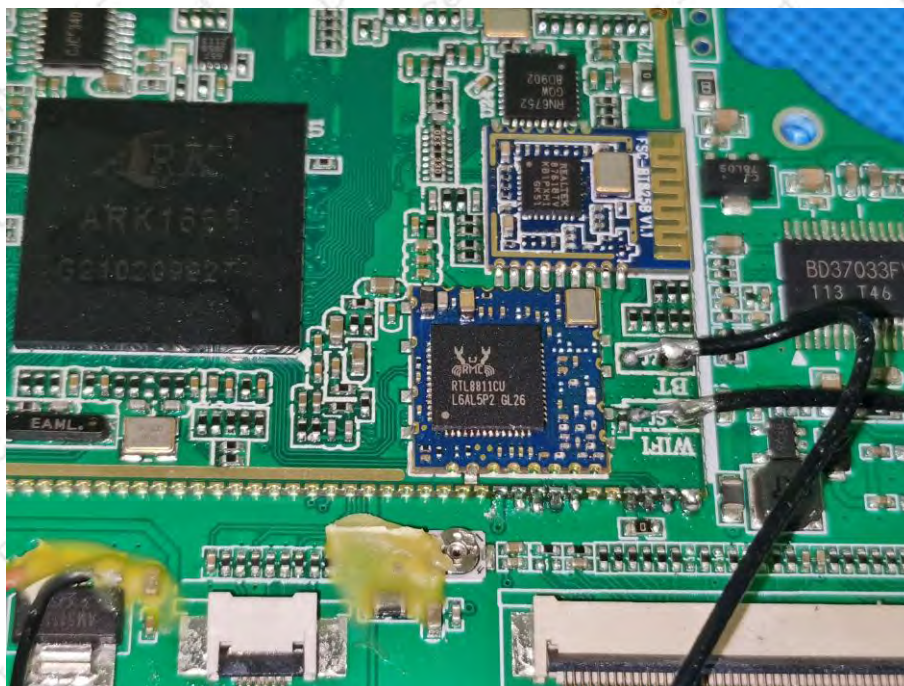
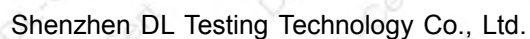




ANT: WiFi
2.4G+5.8G







Test Report

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Web: www.dl-cert.com

Email: service@dl-cert.com

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