

FCC TEST REPORT

FCC ID: 2A9JR-DGNS-GH

Report Number..... : ZKT-220920L7015-01

Date of Test..... : Aug. 25, 2022 -- Nov. 25, 2022

Date of issue : Nov. 25, 2022

Total number of pages : 67

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 : Shanghai Cross Stars Cultural Technology LLC., Co.

Address : Floor 3, building 7, block chain ecological Valley, Jing'an District, Shanghai, P.R.China

Manufacturer's name : Shanghai Cross Stars Cultural Technology LLC., Co.

Address : Floor 3, building 7, block chain ecological Valley, Jing'an District, Shanghai, P.R.China

Test specification:

Standard : FCC CFR Title 47 Part 15 Subpart C Section 15.247
ANSI C63.10:2013

Test procedure..... : KDB558074 D0115.247 Meas Guidance v 05r02

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..... : RTK Position Ground Device

Trademark : N/A

Model/Type reference : DGNS-GH

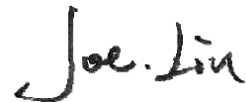
Ratings..... : DC20-28V/30W or DC14.8V 6700mAh,99.16Wh(supplied via built-in battery)

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-220920L7015-01	Rev.01	Initial issue of report	Nov. 25, 2022

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

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.	Item	Uncertainty
1	Conducted Emission Test	$\pm 1.38\text{dB}$
2	RF power conducted	$\pm 0.16\text{dB}$
3	Spurious emissions conducted	$\pm 0.21\text{dB}$
4	All emissions radiated(<1G)	$\pm 4.68\text{dB}$
5	All emissions radiated(>1G)	$\pm 4.89\text{dB}$
6	Temperature	$\pm 0.5^{\circ}\text{C}$
7	Humidity	$\pm 2\%$

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Product Name:	RTK Position Ground Device
Model No.:	DGNS-GH
Hardware Version:	HW11
Software Version:	V2.0.4
Sample(s) Status:	Engineer sample
Frequency range:	802.11b/802.11g /802.11n(HT20): 2412MHz -2462MHz 802.11n(HT40): 2422MHz -2452MHz
Channel numbers:	802.11b/802.11g /802.11n(HT20):11 802.11n(HT40):7
Channel separation:	5MHz
Modulation technology:	802.11b: Direct Sequence Spread Spectrum(DSSS) 802.11g/802.11n(H20)/802.11n(HT40): Orthogonal Frequency Division Multiplexing(OFDM)
Antenna Type:	glue stick antenna
Antenna gain:	4.47dBi
Power supply:	DC20-28V/30W or DC14.8V 6700mAh,99.16Wh(supplied via built-in battery)

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

Note:

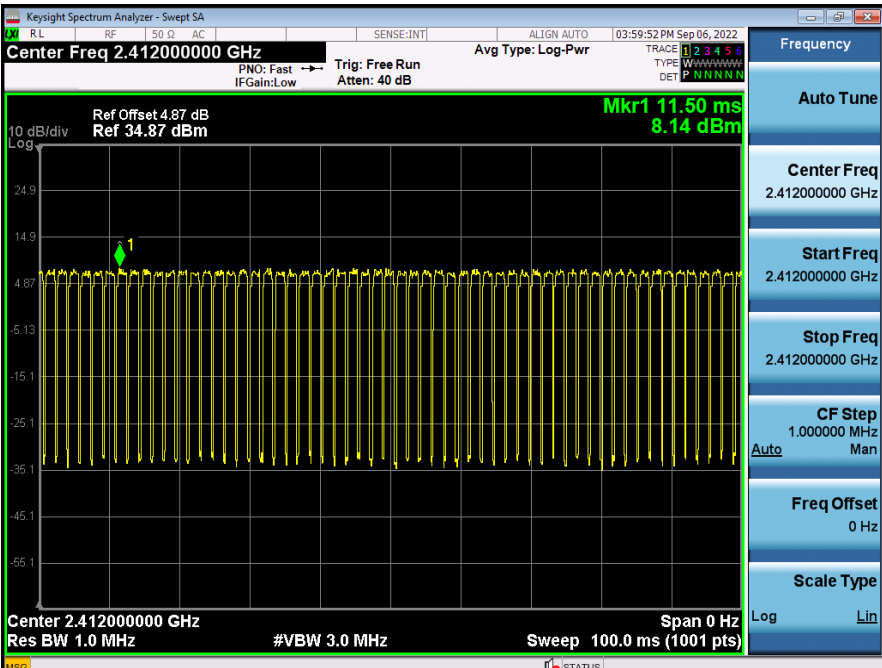
In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

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

Test channel	Frequency (MHz)
	802.11n(HT40)

Lowest channel	2422MHz
Middle channel	2437MHz
Highest channel	2452MHz

3.2 DESCRIPTION OF TEST MODES

Transmitting mode	Keep the EUT in continuously transmitting mode
Remark: During the test, the duty cycle is 92.87%, 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:

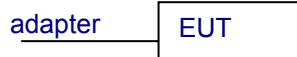
Pre-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.

Mode	802.11b	802.11g	802.11n (HT20)	802.11n (HT40)
Data rate	11Mbps	54Mbps	MCS7	MCS7

Test Software	SecureCRT
Power level setup	<30dBm

3.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

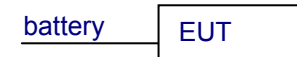
Conducted Emission



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
1	AC-DC adapter	/	Output DC24V	/	/
2	/	/	/	/	/

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. 18, 2022	Oct. 17, 2023
2	Spectrum Analyzer (1GHz-40GHz)	R&S	FSQ	100363	Oct. 17, 2022	Oct. 16, 2023
3	EMI Test Receiver (9kHz-7GHz)	R&S	ESCI7	101169	Oct. 18, 2022	Oct. 17, 2023
4	Bilog Antenna (30MHz-1500MHz)	Schwarzbeck	VULB9168	N/A	Oct. 17, 2022	Oct. 16, 2023
5	Horn Antenna (1GHz-18GHz)	Agilent	AH-118	071145	Oct. 17, 2022	Oct. 16, 2023
6	Loop Antenna	TESEQ	HLA6121	58357	Oct. 17, 2022	Oct. 16, 2023
7	Amplifier (30-1000MHz)	EM Electronics	EM330 Amplifier	060747	Oct. 17, 2022	Oct. 16, 2023
8	Amplifier (1GHz-26.5GHz)	Agilent	8449B	3008A00315	Oct. 18, 2022	Oct. 17, 2023
9	RF cables1 (9kHz-30MHz)	N/A	9kHz-30MHz	N/A	Oct. 18, 2022	Oct. 17, 2023
10	RF cables2 (30MHz-1GHz)	N/A	30MHz-1GHz	N/A	Oct. 18, 2022	Oct. 17, 2023
11	RF cables3 (1GHz-40GHz)	N/A	1GHz-40GHz	N/A	Oct. 18, 2022	Oct. 17, 2023
12	ESG Signal Generator	Agilent	E4421B	N/A	Oct. 18, 2022	Oct. 17, 2023
13	Signal Generator	Agilent	N5182A	N/A	Oct. 22, 2022	Oct. 21, 2023
14	Magnetic Field Probe Tester	Narda	ELT-400	0-0344	Oct. 17, 2022	Oct. 16, 2023
15	MWRF Power Meter Test system	MW	MW100-RPCB	N/A	Oct. 22, 2022	Oct. 21, 2023
16	Power sensor	KEYSIGHT	U2002H	MY51190005	Oct. 22, 2022	Oct. 21, 2023
17	D.C. Power Supply	LongWei	TPR-6405D	N/A	\	\
18	EMC Software	Frad	EZ-EMC	Ver.EMC-CON 3A1.1	\	\
19	RF Software	MW	MTS8310	V2.0.0.0	\	\
20	Turntable	MF	MF-7802BS	N/A	\	\
21	Antenna tower	MF	MF-7802BS	N/A	\	\

Conduction Test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	LISN	R&S	ENV216	101471	Oct. 22, 2022	Oct. 21, 2023
2	LISN	CYBERTEK	EM5040A	E1850400149	Oct. 22, 2022	Oct. 21, 2023
3	Test Cable	N/A	C01	N/A	Oct. 18, 2022	Oct. 17, 2023
4	Test Cable	N/A	C02	N/A	Oct. 18, 2022	Oct. 17, 2023
5	EMI Test Receiver	R&S	ESCI3	101393	Oct. 17, 2022	Oct. 16, 2023
6	EMC Software	Frad	EZ-EMC	Ver.EMC-CON 3A1.1	\	\

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.

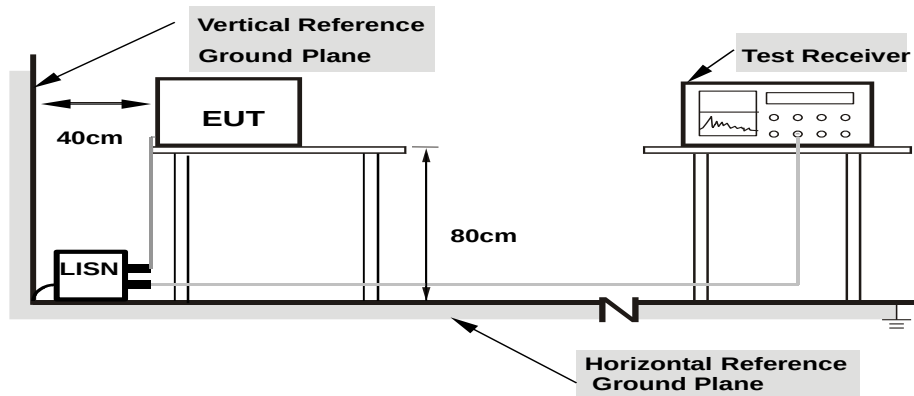
4.1.2 TEST PROCEDURE

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system; a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10:2013.
2. Support equipment, if needed, was placed as per ANSI C63.10:2013
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10:2013.
4. The adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5. All support equipments received AC power from a second LISN, if any.
6. The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.e.
8. 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

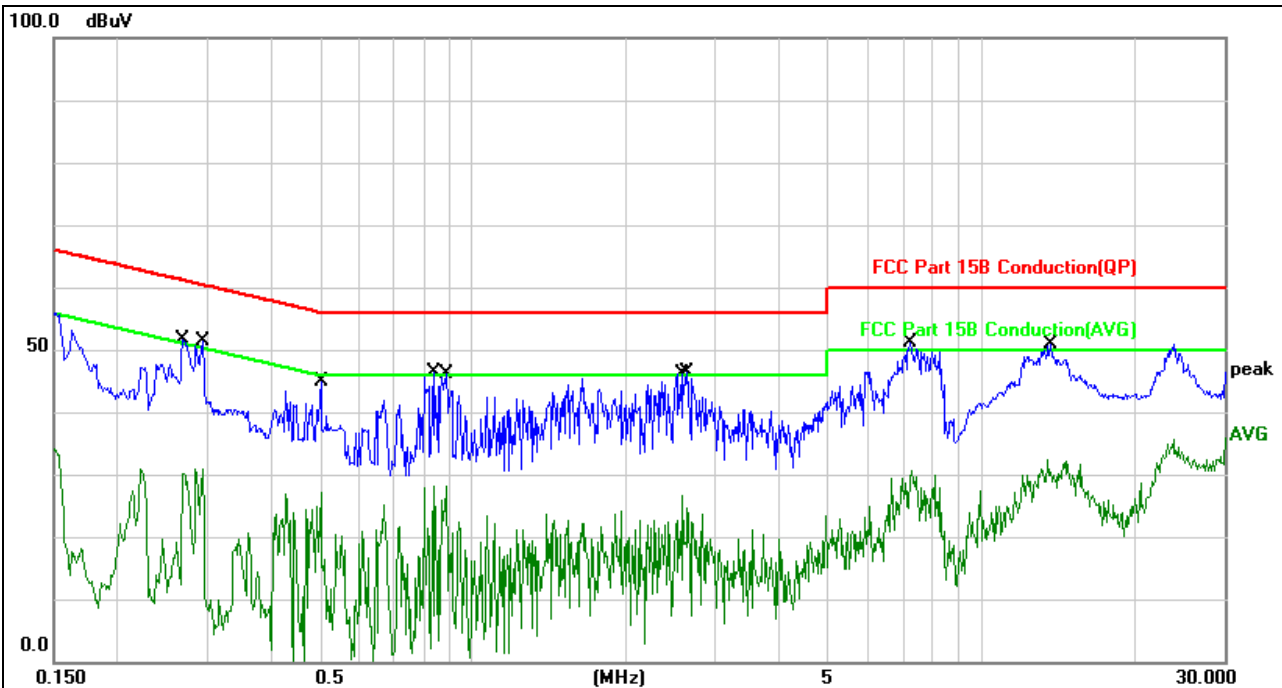
4.1.5 EUT OPERATING CONDITIONS

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 240V, the worst voltage was AC 120V and the data recording in the report.

4.1.6 TEST RESULT

Temperature :	26°C	Relative Humidity:	54%
Pressure :	101kPa	Phase	L
Test Voltage :	AC120V(DC24V)	Mode:	n(HT20) 2462MHz

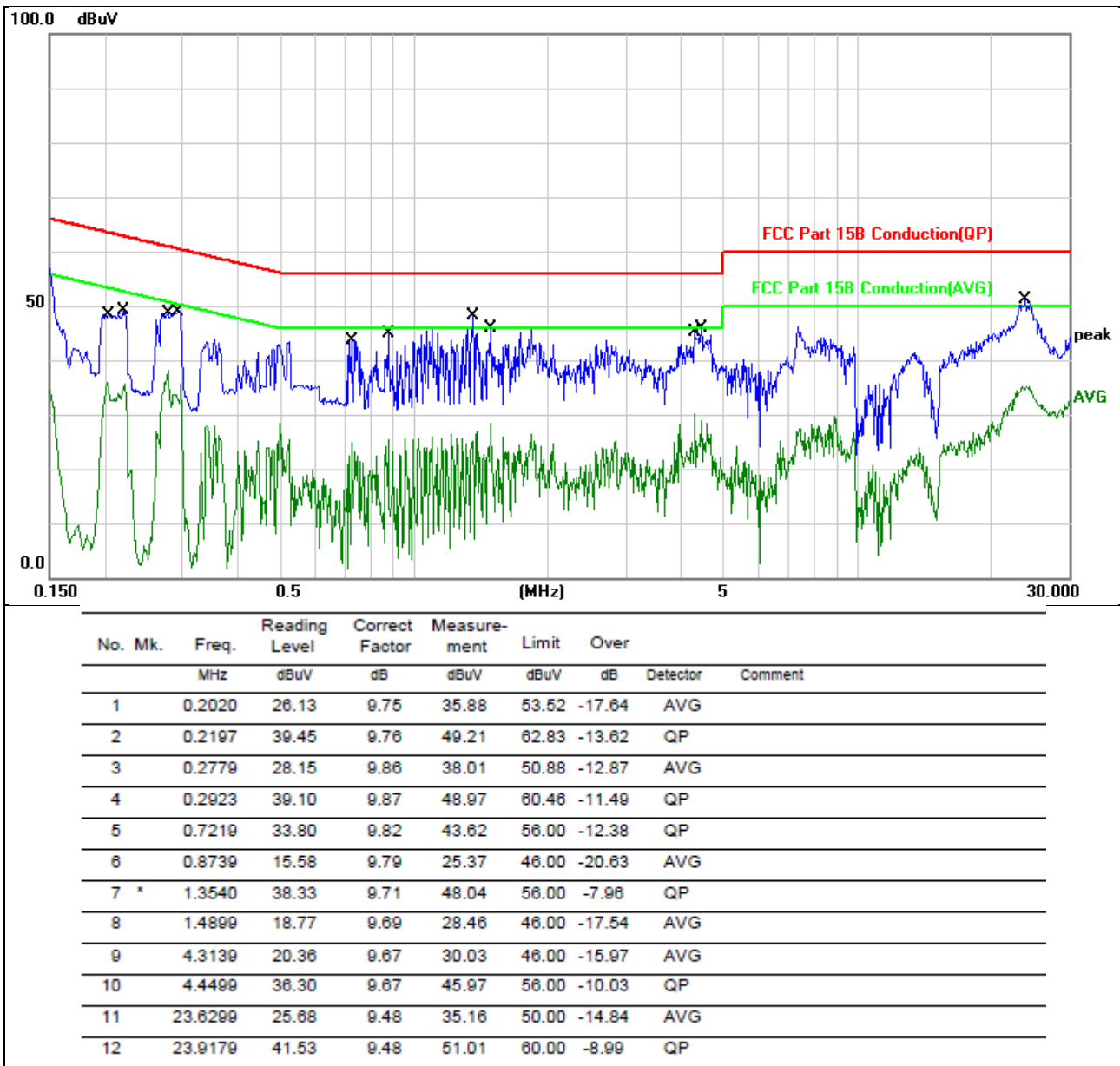


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.2700	41.69	9.81	51.50	61.12	-9.62	QP	
2		0.2940	20.98	9.87	30.85	50.41	-19.56	AVG	
3		0.5020	34.96	9.85	44.81	56.00	-11.19	QP	
4		0.5020	17.32	9.85	27.17	46.00	-18.83	AVG	
5		0.8380	36.48	9.80	46.28	56.00	-9.72	QP	
6		0.8860	18.46	9.78	28.24	46.00	-17.76	AVG	
7		2.5820	16.91	9.72	26.63	46.00	-19.37	AVG	
8		2.6380	36.55	9.71	46.26	56.00	-9.74	QP	
9	*	7.2259	41.55	9.61	51.16	60.00	-8.84	QP	
10		7.3259	21.12	9.61	30.73	50.00	-19.27	AVG	
11		13.5499	22.60	9.73	32.33	50.00	-17.67	AVG	
12		13.6459	41.09	9.73	50.82	60.00	-9.18	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. Measurement Level = Reading level + Correct Factor

Temperature :	26°C	Relative Humidity:	54%
Pressure :	101kPa	Phase :	N
Test Voltage :	AC120V(DC24V)	Mode:	n(HT20) 2462MHz



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. Measurement 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	120KHz	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-anechoic chamber. 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 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 (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.
- 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 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:

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

Note:

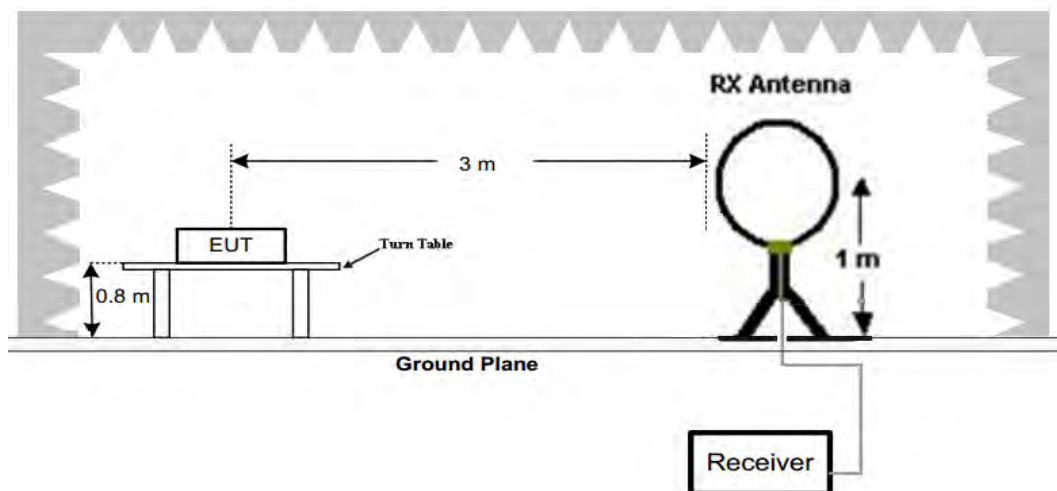
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

4.2.3 DEVIATION FROM TEST STANDARD

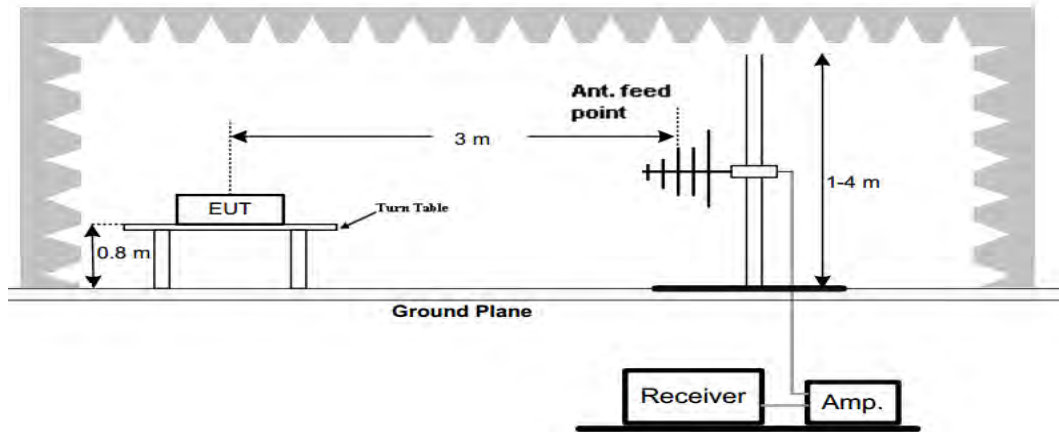
No deviation

4.2.4 TEST SETUP

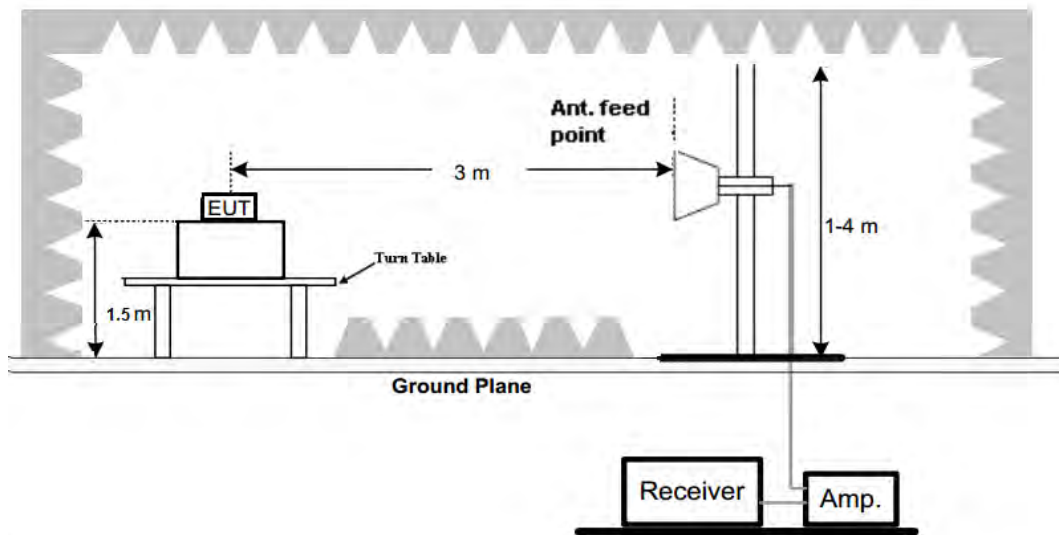
(A) Radiated Emission Test-Up Frequency Below 30MHz



(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.

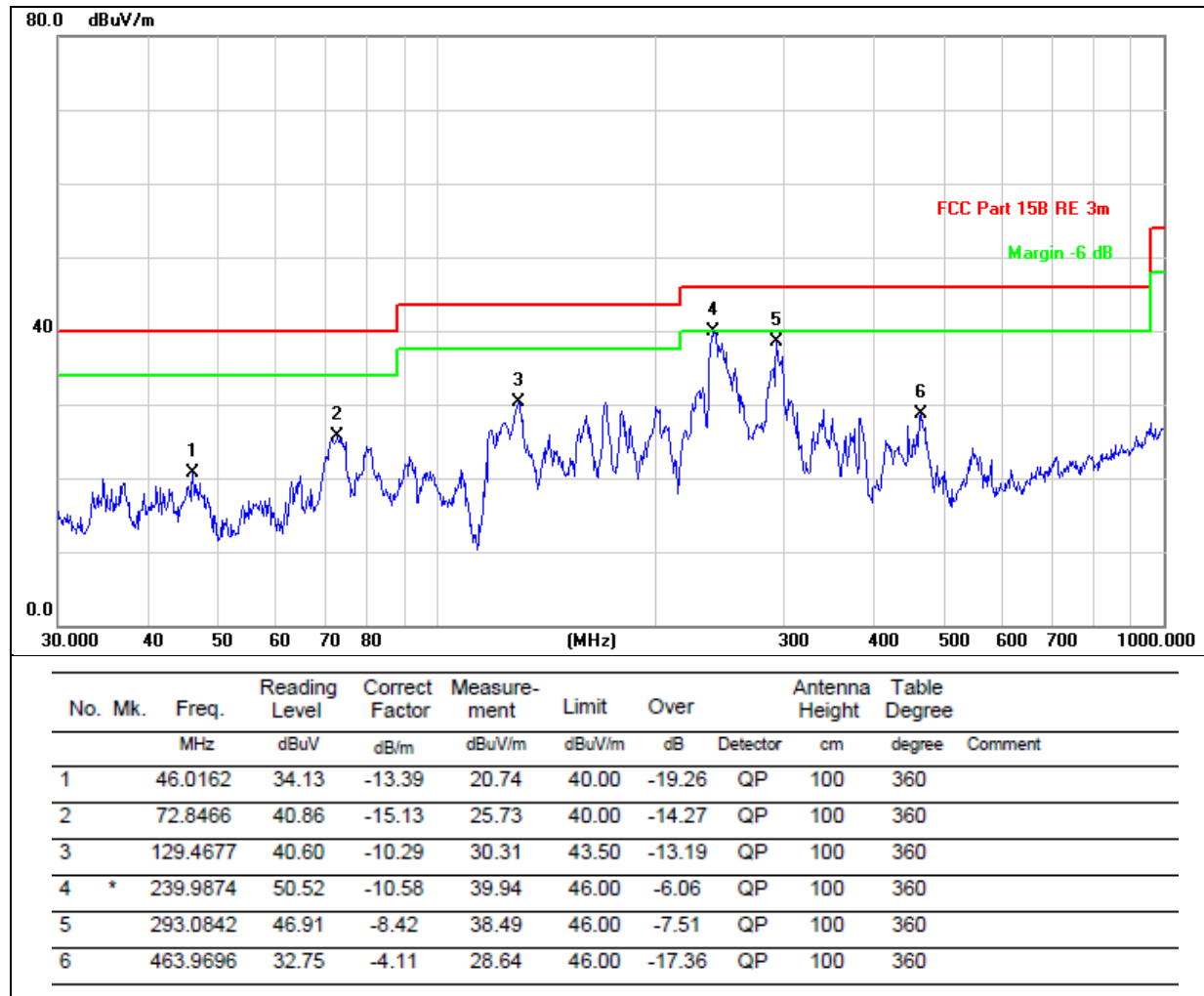
4.2.6 TEST RESULTS

Between 9KHz – 30MHz

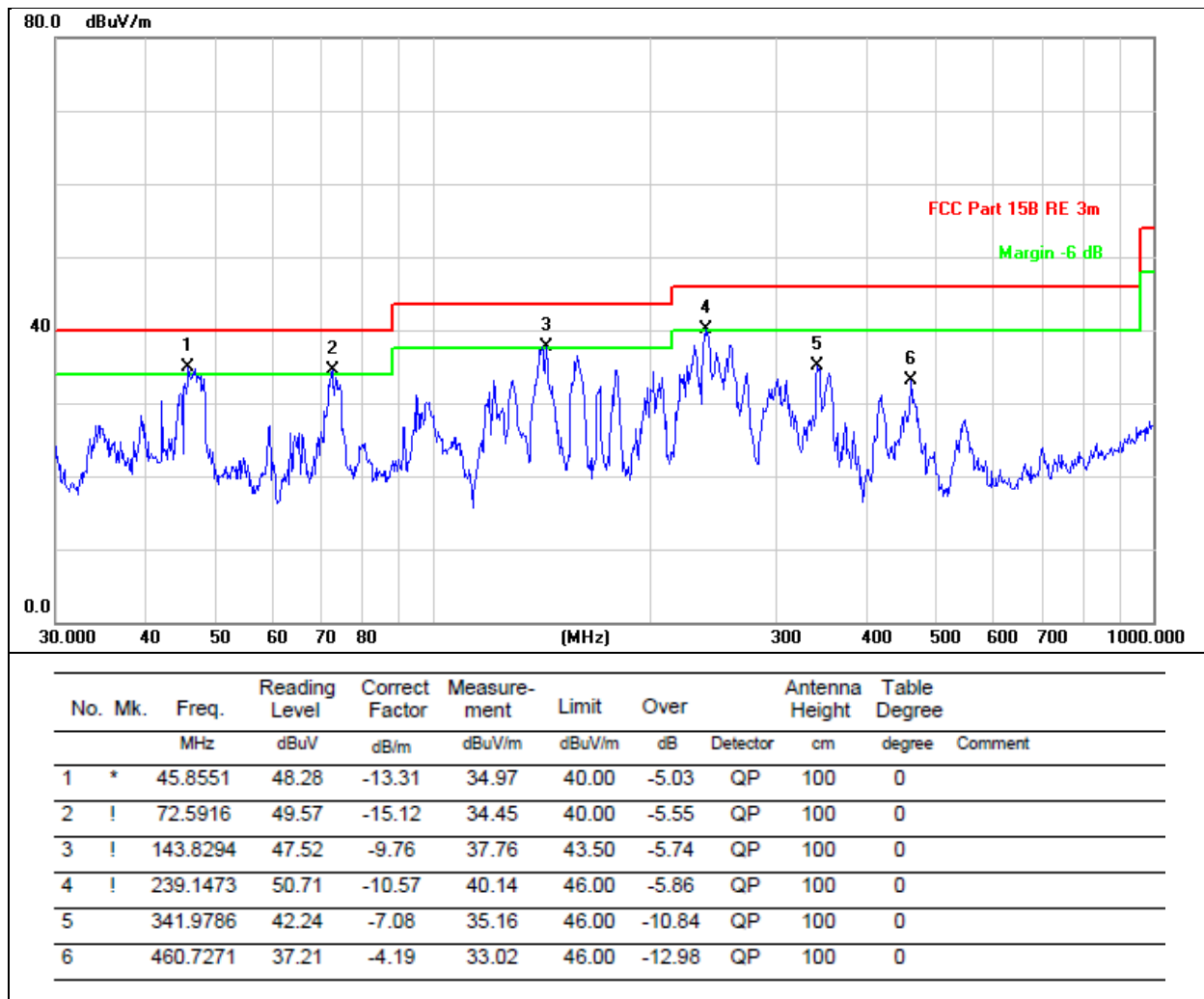
The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and according to 15.31(o) & RSS-Gen 6.13, the test result no need to reported.

Between 30MHz – 1GHz

Temperature:	26°C	Relative Humidity:	54%
Pressure:	101 kPa	Polarization:	Horizontal
Test Voltage:	DC14.8V	Mode:	n(HT20) 2462MHz



Temperature:	26°C	Relative Humidity:	54%
Pressure:	101kPa	Polarization:	Vertical
Test Voltage:	DC14.8V	Mode:	n(HT20) 2462MHz



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.

1GHz~25GHz

802.11b

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)	
Low Channel:2412MHz									
V	4824	47.11	30.55	5.77	24.66	46.99	74.00	-27.01	PK
V	4824	36.18	30.55	5.77	24.66	36.06	54.00	-17.94	AV
V	7236	46.27	30.33	6.32	24.55	46.81	74.00	-27.19	PK
V	7236	34.71	30.33	6.32	24.55	35.25	54.00	-18.75	AV
V	9648	47.18	30.85	7.45	24.69	48.47	74.00	-25.53	PK
V	9648	32.91	30.85	7.45	24.69	34.20	54.00	-19.80	AV
H	4824	46.82	30.55	5.77	24.66	46.70	74.00	-27.30	PK
H	4824	35.67	30.55	5.77	24.66	35.55	54.00	-18.45	AV
H	7236	47.55	30.33	6.32	24.55	48.09	74.00	-25.91	PK
H	7236	33.63	30.33	6.32	24.55	34.17	54.00	-19.83	AV
H	9648	47.40	30.85	7.45	24.69	48.69	74.00	-25.31	PK
H	9648	33.07	30.85	7.45	24.69	34.36	54.00	-19.64	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:2437MHz									
V	4874	47.61	30.55	5.77	24.66	47.49	74.00	-26.51	PK
V	4874	35.49	30.55	5.77	24.66	35.37	54.00	-18.63	AV
V	7311	47.74	30.33	6.32	24.55	48.28	74.00	-25.72	PK
V	7311	33.22	30.33	6.32	24.55	33.76	54.00	-20.24	AV
V	9748	47.72	30.85	7.45	24.69	49.01	74.00	-24.99	PK
V	9748	34.94	30.85	7.45	24.69	36.23	54.00	-17.77	AV
H	4874	48.51	30.55	5.77	24.66	48.39	74.00	-25.61	PK
H	4874	35.94	30.55	5.77	24.66	35.82	54.00	-18.18	AV
H	7311	47.52	30.33	6.32	24.55	48.06	74.00	-25.94	PK
H	7311	33.72	30.33	6.32	24.55	34.26	54.00	-19.74	AV
H	9748	46.47	30.85	7.45	24.69	47.76	74.00	-26.24	PK
H	9748	34.49	30.85	7.45	24.69	35.78	54.00	-18.22	AV

Polar (H/V)	Frequency	Meter Reading	Pre-ampli fier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detect or Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/ m)	(dB)	
High Channel:2462MHz									
V	4924	46.22	30.55	5.77	24.66	46.10	74.00	-27.90	PK
V	4924	36.63	30.55	5.77	24.66	36.51	54.00	-17.49	AV
V	7386	47.26	30.33	6.32	24.55	47.80	74.00	-26.20	PK
V	7386	34.98	30.33	6.32	24.55	35.52	54.00	-18.48	AV
V	9848	46.97	30.85	7.45	24.69	48.26	74.00	-25.74	PK
V	9848	33.41	30.85	7.45	24.69	34.70	54.00	-19.30	AV
H	4924	46.68	30.55	5.77	24.66	46.56	74.00	-27.44	PK
H	4924	36.33	30.55	5.77	24.66	36.21	54.00	-17.79	AV
H	7386	47.32	30.33	6.32	24.55	47.86	74.00	-26.14	PK
H	7386	33.89	30.33	6.32	24.55	34.43	54.00	-19.57	AV
H	9848	44.81	30.85	7.45	24.69	46.10	74.00	-27.90	PK
H	9848	32.56	30.85	7.45	24.69	33.85	54.00	-20.15	AV

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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)	
Low Channel:2412MHz									
V	4824	48.18	30.55	5.77	24.66	48.06	74.00	-25.94	PK
V	4824	37.25	30.55	5.77	24.66	37.13	54.00	-16.87	AV
V	7236	45.94	30.33	6.32	24.55	46.48	74.00	-27.52	PK
V	7236	33.49	30.33	6.32	24.55	34.03	54.00	-19.97	AV
V	9648	45.70	30.85	7.45	24.69	46.99	74.00	-27.01	PK
V	9648	33.39	30.85	7.45	24.69	34.68	54.00	-19.32	AV
H	4824	47.76	30.55	5.77	24.66	47.64	74.00	-26.36	PK
H	4824	36.51	30.55	5.77	24.66	36.39	54.00	-17.61	AV
H	7236	47.58	30.33	6.32	24.55	48.12	74.00	-25.88	PK
H	7236	33.88	30.33	6.32	24.55	34.42	54.00	-19.58	AV
H	9648	47.55	30.85	7.45	24.69	48.84	74.00	-25.16	PK
H	9648	32.69	30.85	7.45	24.69	33.98	54.00	-20.02	AV

Polar (H/V)	Frequency	Meter Reading	Pre-amp lifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detect or Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/ m)	(dB)	
Middle Channel:2437MHz									
V	4874	45.85	30.55	5.77	24.66	45.73	74.00	-28.27	PK
V	4874	35.24	30.55	5.77	24.66	35.12	54.00	-18.88	AV
V	7311	46.62	30.33	6.32	24.55	47.16	74.00	-26.84	PK
V	7311	35.66	30.33	6.32	24.55	36.20	54.00	-17.80	AV
V	9748	47.21	30.85	7.45	24.69	48.50	74.00	-25.50	PK
V	9748	34.31	30.85	7.45	24.69	35.60	54.00	-18.40	AV
H	4874	47.56	30.55	5.77	24.66	47.44	74.00	-26.56	PK
H	4874	36.56	30.55	5.77	24.66	36.44	54.00	-17.56	AV
H	7311	46.08	30.33	6.32	24.55	46.62	74.00	-27.38	PK
H	7311	34.55	30.33	6.32	24.55	35.09	54.00	-18.91	AV
H	9748	46.08	30.85	7.45	24.69	47.37	74.00	-26.63	PK
H	9748	34.36	30.85	7.45	24.69	35.65	54.00	-18.35	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)	
High Channel:2462MHz									
V	4924	47.30	30.55	5.77	24.66	47.18	74.00	-26.82	PK
V	4924	36.77	30.55	5.77	24.66	36.65	54.00	-17.35	AV
V	7386	46.87	30.33	6.32	24.55	47.41	74.00	-26.59	PK
V	7386	34.31	30.33	6.32	24.55	34.85	54.00	-19.15	AV
V	9848	45.68	30.85	7.45	24.69	46.97	74.00	-27.03	PK
V	9848	35.15	30.85	7.45	24.69	36.44	54.00	-17.56	AV
H	4924	48.01	30.55	5.77	24.66	47.89	74.00	-26.11	PK
H	4924	35.57	30.55	5.77	24.66	35.45	54.00	-18.55	AV
H	7386	47.45	30.33	6.32	24.55	47.99	74.00	-26.01	PK
H	7386	34.28	30.33	6.32	24.55	34.82	54.00	-19.18	AV
H	9848	47.00	30.85	7.45	24.69	48.29	74.00	-25.71	PK
H	9848	34.08	30.85	7.45	24.69	35.37	54.00	-18.63	AV

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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)	
Low Channel:2412MHz									
V	4824	47.74	30.55	5.77	24.66	47.62	74.00	-26.38	PK
V	4824	36.75	30.55	5.77	24.66	36.63	54.00	-17.37	AV
V	7236	46.96	30.33	6.32	24.55	47.50	74.00	-26.50	PK
V	7236	33.46	30.33	6.32	24.55	34.00	54.00	-20.00	AV
V	9648	45.55	30.85	7.45	24.69	46.84	74.00	-27.16	PK
V	9648	33.99	30.85	7.45	24.69	35.28	54.00	-18.72	AV
H	4824	48.07	30.55	5.77	24.66	47.95	74.00	-26.05	PK
H	4824	35.35	30.55	5.77	24.66	35.23	54.00	-18.77	AV
H	7236	47.58	30.33	6.32	24.55	48.12	74.00	-25.88	PK
H	7236	34.06	30.33	6.32	24.55	34.60	54.00	-19.40	AV
H	9648	47.02	30.85	7.45	24.69	48.31	74.00	-25.69	PK
H	9648	34.03	30.85	7.45	24.69	35.32	54.00	-18.68	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:2437MHz									
V	4874	48.20	30.55	5.77	24.66	48.08	74.00	-25.92	PK
V	4874	38.15	30.55	5.77	24.66	38.03	54.00	-15.97	AV
V	7311	46.39	30.33	6.32	24.55	46.93	74.00	-27.07	PK
V	7311	33.33	30.33	6.32	24.55	33.87	54.00	-20.13	AV
V	9748	46.47	30.85	7.45	24.69	47.76	74.00	-26.24	PK
V	9748	34.34	30.85	7.45	24.69	35.63	54.00	-18.37	AV
H	4874	46.85	30.55	5.77	24.66	46.73	74.00	-27.27	PK
H	4874	35.95	30.55	5.77	24.66	35.83	54.00	-18.17	AV
H	7311	45.86	30.33	6.32	24.55	46.40	74.00	-27.60	PK
H	7311	35.10	30.33	6.32	24.55	35.64	54.00	-18.36	AV
H	9748	47.22	30.85	7.45	24.69	48.51	74.00	-25.49	PK
H	9748	32.40	30.85	7.45	24.69	33.69	54.00	-20.31	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)	
High Channel:2462MHz									
V	4924	47.26	30.55	5.77	24.66	47.14	74.00	-26.86	PK
V	4924	37.62	30.55	5.77	24.66	37.50	54.00	-16.50	AV
V	7386	46.40	30.33	6.32	24.55	46.94	74.00	-27.06	PK
V	7386	33.74	30.33	6.32	24.55	34.28	54.00	-19.72	AV
V	9848	45.54	30.85	7.45	24.69	46.83	74.00	-27.17	PK
V	9848	32.81	30.85	7.45	24.69	34.10	54.00	-19.90	AV
H	4924	47.95	30.55	5.77	24.66	47.83	74.00	-26.17	PK
H	4924	37.42	30.55	5.77	24.66	37.30	54.00	-16.70	AV
H	7386	46.28	30.33	6.32	24.55	46.82	74.00	-27.18	PK
H	7386	34.61	30.33	6.32	24.55	35.15	54.00	-18.85	AV
H	9848	46.08	30.85	7.45	24.69	47.37	74.00	-26.63	PK
H	9848	34.71	30.85	7.45	24.69	36.00	54.00	-18.00	AV

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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)	
Low Channel:2422MHz									
V	4844	48.13	30.55	5.77	24.66	48.01	74.00	-25.99	PK
V	4844	36.92	30.55	5.77	24.66	36.80	54.00	-17.20	AV
V	7266	46.74	30.33	6.32	24.55	47.28	74.00	-26.72	PK
V	7266	35.05	30.33	6.32	24.55	35.59	54.00	-18.41	AV
V	9688	46.08	30.85	7.45	24.69	47.37	74.00	-26.63	PK
V	9688	35.18	30.85	7.45	24.69	36.47	54.00	-17.53	AV
H	4844	47.23	30.55	5.77	24.66	47.11	74.00	-26.89	PK
H	4844	37.30	30.55	5.77	24.66	37.18	54.00	-16.82	AV
H	7266	46.93	30.33	6.32	24.55	47.47	74.00	-26.53	PK
H	7266	35.07	30.33	6.32	24.55	35.61	54.00	-18.39	AV
H	9688	45.84	30.85	7.45	24.69	47.13	74.00	-26.87	PK
H	9688	34.11	30.85	7.45	24.69	35.40	54.00	-18.60	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:2437MHz									
V	4874	46.28	30.55	5.77	24.66	46.16	74.00	-27.84	PK
V	4874	37.96	30.55	5.77	24.66	37.84	54.00	-16.16	AV
V	7311	47.13	30.33	6.32	24.55	47.67	74.00	-26.33	PK
V	7311	34.48	30.33	6.32	24.55	35.02	54.00	-18.98	AV
V	9748	46.10	30.85	7.45	24.69	47.39	74.00	-26.61	PK
V	9748	33.55	30.85	7.45	24.69	34.84	54.00	-19.16	AV
H	4874	48.51	30.55	5.77	24.66	48.39	74.00	-25.61	PK
H	4874	35.24	30.55	5.77	24.66	35.12	54.00	-18.88	AV
H	7311	46.77	30.33	6.32	24.55	47.31	74.00	-26.69	PK
H	7311	33.36	30.33	6.32	24.55	33.90	54.00	-20.10	AV
H	9748	47.65	30.85	7.45	24.69	48.94	74.00	-25.06	PK
H	9748	32.89	30.85	7.45	24.69	34.18	54.00	-19.82	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)	
High Channel:2452MHz									
V	4904	46.50	30.55	5.77	24.66	46.38	74.00	-27.62	PK
V	4904	36.81	30.55	5.77	24.66	36.69	54.00	-17.31	AV
V	7356	46.40	30.33	6.32	24.55	46.94	74.00	-27.06	PK
V	7356	33.40	30.33	6.32	24.55	33.94	54.00	-20.06	AV
V	9808	45.72	30.85	7.45	24.69	47.01	74.00	-26.99	PK
V	9808	32.63	30.85	7.45	24.69	33.92	54.00	-20.08	AV
H	4904	47.68	30.55	5.77	24.66	47.56	74.00	-26.44	PK
H	4904	37.37	30.55	5.77	24.66	37.25	54.00	-16.75	AV
H	7356	47.73	30.33	6.32	24.55	48.27	74.00	-25.73	PK
H	7356	32.91	30.33	6.32	24.55	33.45	54.00	-20.55	AV
H	9808	47.74	30.85	7.45	24.69	49.03	74.00	-24.97	PK
H	9808	32.56	30.85	7.45	24.69	33.85	54.00	-20.15	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. RADIATED BAND EMISSION MEASUREMENT**5.1 TEST REQUIREMENT:**

Test Requirement:	FCC Part 15 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:	Frequency	Detector	RBW	VBW	Value
	Above	Peak	1MHz	3MHz	Peak
	1GHz	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 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.
- g. Test the EUT in the lowest channel, the Highest channel

Note:

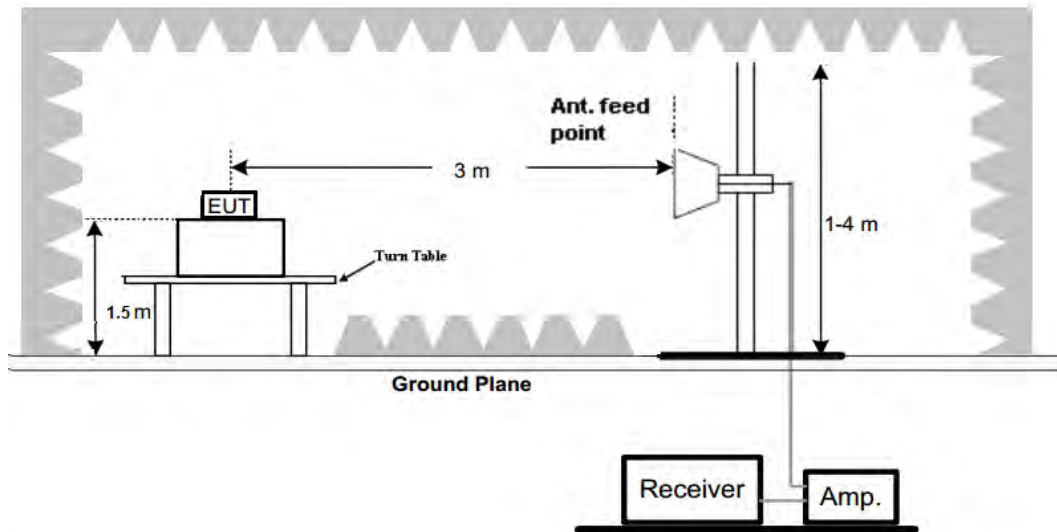
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

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

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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)	Margin (dBuV/m)	Detect or Type	Result
Low Channel 2412MHz										
H	2390.00	51.49	30.22	4.85	23.98	50.10	74	-23.90	PK	PASS
H	2390.00	38.81	30.22	4.85	23.98	37.42	54	-16.58	AV	PASS
H	2400.00	54.36	30.22	4.85	23.98	52.97	74	-21.03	PK	PASS
H	2400.00	36.36	30.22	4.85	23.98	34.97	54	-19.03	AV	PASS
V	2390.00	51.58	30.22	4.85	23.98	50.19	74	-23.81	PK	PASS
V	2390.00	37.24	30.22	4.85	23.98	35.85	54	-18.15	AV	PASS
V	2400.00	52.24	30.22	4.85	23.98	50.85	74	-23.15	PK	PASS
V	2400.00	38.88	30.22	4.85	23.98	37.49	54	-16.51	AV	PASS
High Channel 2462MHz										
H	2483.50	53.25	30.22	4.85	23.98	51.86	74	-22.14	PK	PASS
H	2483.50	37.51	30.22	4.85	23.98	36.12	54	-17.88	AV	PASS
H	2500.00	51.98	30.22	4.85	23.98	50.59	74	-23.41	PK	PASS
H	2500.00	38.48	30.22	4.85	23.98	37.09	54	-16.91	AV	PASS
V	2483.50	53.45	30.22	4.85	23.98	52.06	74	-21.94	PK	PASS
V	2483.50	39.85	30.22	4.85	23.98	38.46	54	-15.54	AV	PASS
V	2500.00	52.50	30.22	4.85	23.98	51.11	74	-22.89	PK	PASS
V	2500.00	39.03	30.22	4.85	23.98	37.64	54	-16.36	AV	PASS

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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)	Margin (dBuV/m)	Detect or Type	Result
Low Channel 2412MHz										
H	2390.00	53.36	30.22	4.85	23.98	51.97	74	-22.03	PK	PASS
H	2390.00	38.59	30.22	4.85	23.98	37.20	54	-16.80	AV	PASS
H	2400.00	52.21	30.22	4.85	23.98	50.82	74	-23.18	PK	PASS
H	2400.00	38.04	30.22	4.85	23.98	36.65	54	-17.35	AV	PASS
V	2390.00	52.10	30.22	4.85	23.98	50.71	74	-23.29	PK	PASS
V	2390.00	39.91	30.22	4.85	23.98	38.52	54	-15.48	AV	PASS
V	2400.00	51.88	30.22	4.85	23.98	50.49	74	-23.51	PK	PASS
V	2400.00	37.72	30.22	4.85	23.98	36.33	54	-17.67	AV	PASS
High Channel 2462MHz										
H	2483.50	53.52	30.22	4.85	23.98	52.13	74	-21.87	PK	PASS
H	2483.50	39.30	30.22	4.85	23.98	37.91	54	-16.09	AV	PASS
H	2500.00	54.73	30.22	4.85	23.98	53.34	74	-20.66	PK	PASS
H	2500.00	36.94	30.22	4.85	23.98	35.55	54	-18.45	AV	PASS
V	2483.50	52.01	30.22	4.85	23.98	50.62	74	-23.38	PK	PASS
V	2483.50	37.95	30.22	4.85	23.98	36.56	54	-17.44	AV	PASS
V	2500.00	52.28	30.22	4.85	23.98	50.89	74	-23.11	PK	PASS
V	2500.00	36.58	30.22	4.85	23.98	35.19	54	-18.81	AV	PASS

802.11n(HT20)

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)	Margin (dBuV/m)	Detect or Type	Result
Low Channel 2412MHz										
H	2390.00	52.36	30.22	4.85	23.98	50.97	74	-23.03	PK	PASS
H	2390.00	39.42	30.22	4.85	23.98	38.03	54	-15.97	AV	PASS
H	2400.00	52.22	30.22	4.85	23.98	50.83	74	-23.17	PK	PASS
H	2400.00	38.31	30.22	4.85	23.98	36.92	54	-17.08	AV	PASS
V	2390.00	52.57	30.22	4.85	23.98	51.18	74	-22.82	PK	PASS

V	2390.00	38.23	30.22	4.85	23.98	36.84	54	-17.16	AV	PASS
V	2400.00	53.51	30.22	4.85	23.98	52.12	74	-21.88	PK	PASS
V	2400.00	37.37	30.22	4.85	23.98	35.98	54	-18.02	AV	PASS
High Channel 2462MHz										
H	2483.50	53.59	30.22	4.85	23.98	52.20	74	-21.80	PK	PASS
H	2483.50	38.07	30.22	4.85	23.98	36.68	54	-17.32	AV	PASS
H	2500.00	52.65	30.22	4.85	23.98	51.26	74	-22.74	PK	PASS
H	2500.00	37.54	30.22	4.85	23.98	36.15	54	-17.85	AV	PASS
V	2483.50	52.39	30.22	4.85	23.98	51.00	74	-23.00	PK	PASS
V	2483.50	39.32	30.22	4.85	23.98	37.93	54	-16.07	AV	PASS
V	2500.00	53.78	30.22	4.85	23.98	52.39	74	-21.61	PK	PASS
V	2500.00	37.44	30.22	4.85	23.98	36.05	54	-17.95	AV	PASS

802.11n(HT40)

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)	Margin (dBuV/m)	Detect or Type	Result
Low Channel 2422MHz										
H	2390.00	52.47	30.22	4.85	23.98	51.08	74	-22.92	PK	PASS
H	2390.00	38.67	30.22	4.85	23.98	37.28	54	-16.72	AV	PASS
H	2400.00	51.89	30.22	4.85	23.98	50.50	74	-23.50	PK	PASS
H	2400.00	37.32	30.22	4.85	23.98	35.93	54	-18.07	AV	PASS
V	2390.00	53.21	30.22	4.85	23.98	51.82	74	-22.18	PK	PASS
V	2390.00	38.31	30.22	4.85	23.98	36.92	54	-17.08	AV	PASS
V	2400.00	52.18	30.22	4.85	23.98	50.79	74	-23.21	PK	PASS
V	2400.00	38.25	30.22	4.85	23.98	36.86	54	-17.14	AV	PASS
High Channel 2452MHz										
H	2483.50	51.88	30.22	4.85	23.98	50.49	74	-23.51	PK	PASS
H	2483.50	38.87	30.22	4.85	23.98	37.48	54	-16.52	AV	PASS
H	2500.00	52.88	30.22	4.85	23.98	51.49	74	-22.51	PK	PASS
H	2500.00	38.91	30.22	4.85	23.98	37.52	54	-16.48	AV	PASS
V	2483.50	52.63	30.22	4.85	23.98	51.24	74	-22.76	PK	PASS
V	2483.50	37.53	30.22	4.85	23.98	36.14	54	-17.86	AV	PASS
V	2500.00	54.70	30.22	4.85	23.98	53.31	74	-20.69	PK	PASS
V	2500.00	37.82	30.22	4.85	23.98	36.43	54	-17.57	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 Guidance v 05r02

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: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
4. Set the VBW $\geq 3 \times \text{RBW}$.
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



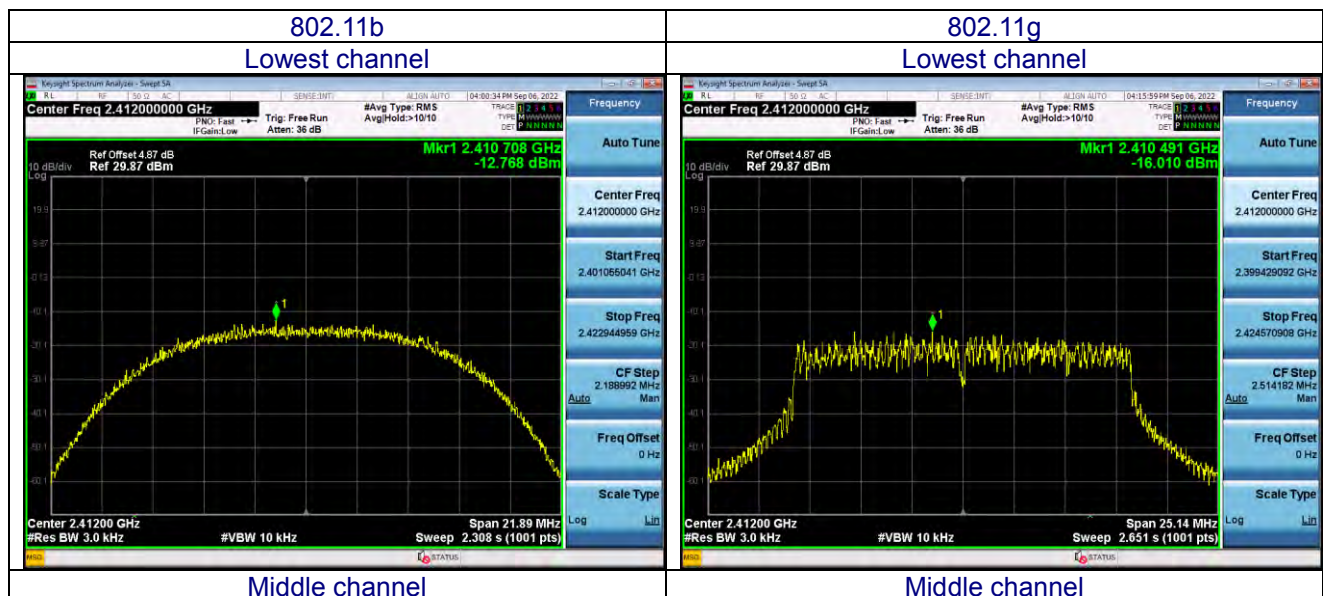
6.5 EUT OPERATION CONDITIONS

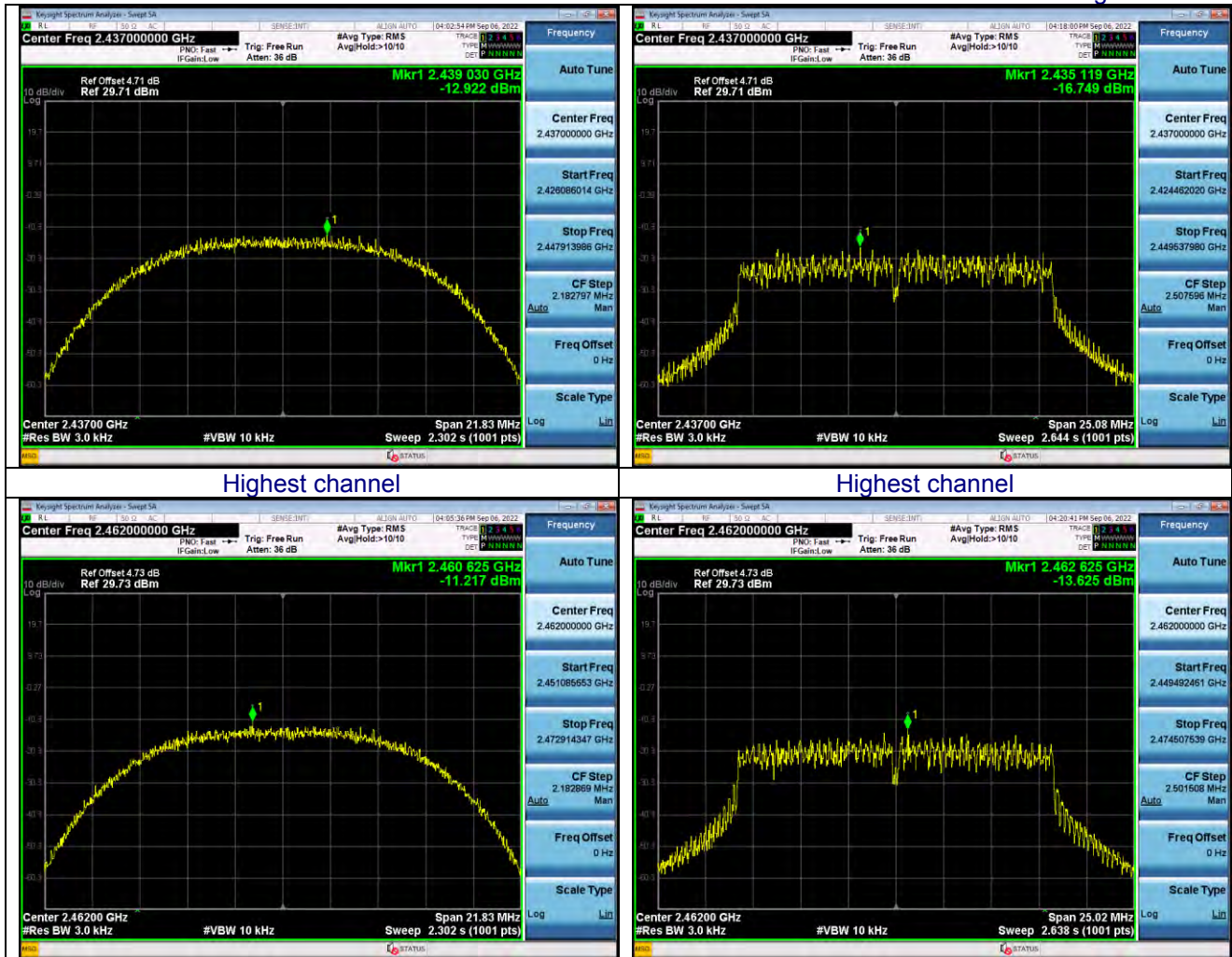
The EUT tested system was configured as the statements of 2.1 Unless otherwise a special operating condition is specified in the follows during the testing.

6.6 TEST RESULT

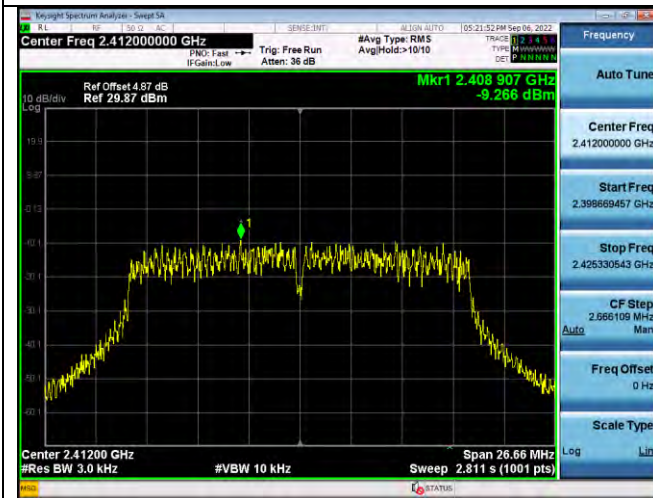
Temperature :	26°C	Relative Humidity :	54%
Pressure :	101kPa	Test Voltage :	DC24V

Test mode	Test channel	Power Spectral Density (dBm/3kHz)	Limit:	Result
802.11b	Lowest	-12.768	8dBm/3kHz	PASS
	Middle	-12.922		
	Highest	-11.217		
802.11g	Lowest	-16.010	8dBm/3kHz	PASS
	Middle	-16.749		
	Highest	-13.625		
802.11n(HT20)	Lowest	-9.266	8dBm/3kHz	PASS
	Middle	-14.261		
	Highest	-15.370		
802.11n(HT40)	Lowest	-12.826	8dBm/3kHz	PASS
	Middle	-20.853		
	Highest	-19.215		

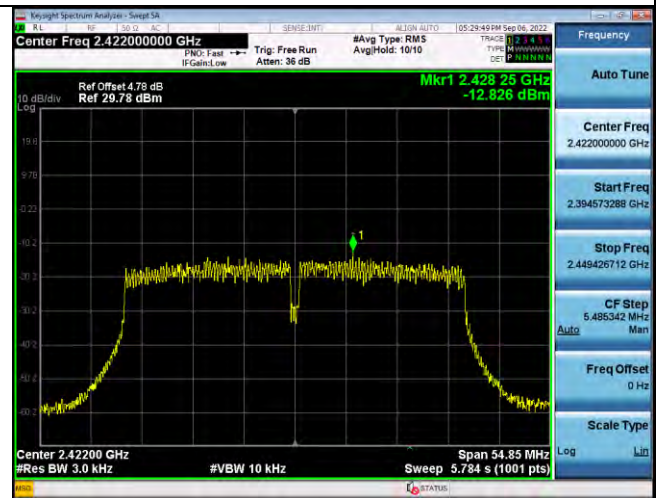




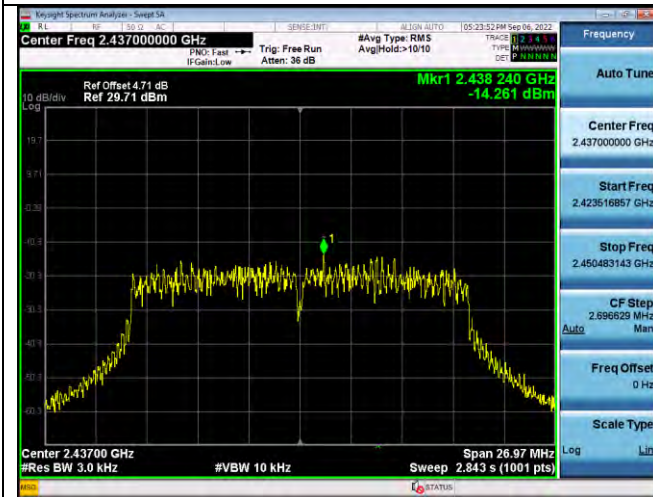
802.11n(HT20)
Lowest channel



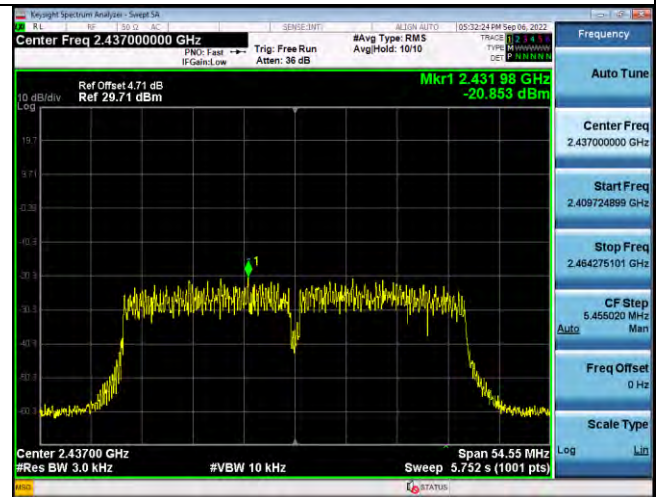
802.11n(HT40)
Lowest channel



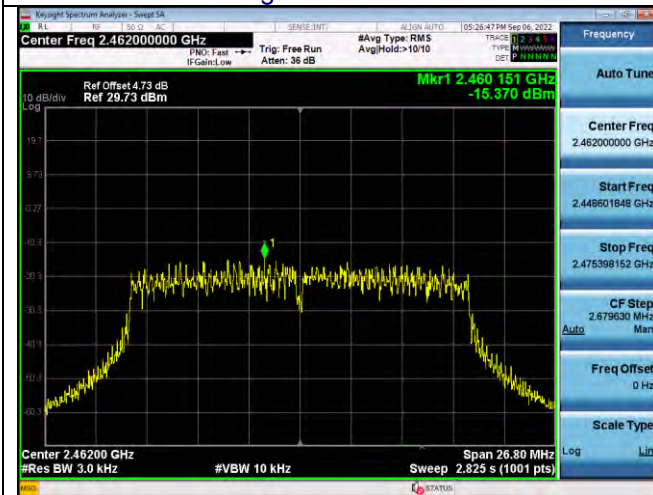
Middle channel



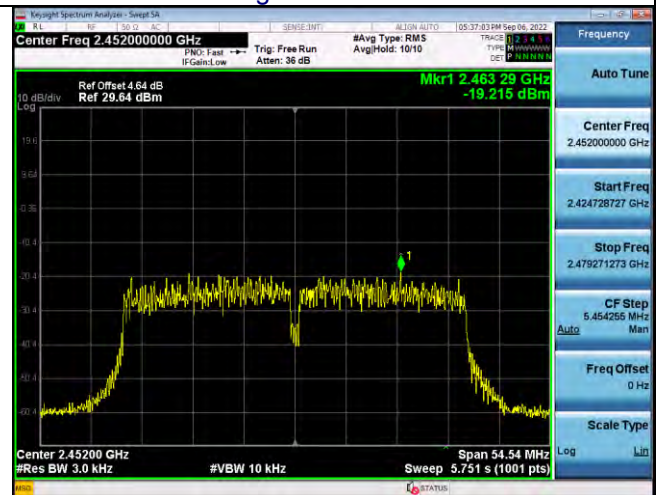
Middle channel



Highest channel



Highest channel



7. CHANNEL BANDWIDTH

Test Requirement:	FCC Part15 C Section 15.247 (a)(2)
Test Method:	KDB558074 D0115.247 Meas Guidance v05r02

7.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(2)	Bandwidth	$\geq 500\text{KHz}$ (6dB bandwidth)	2400-2483.5	PASS

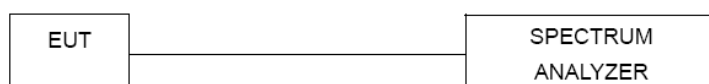
7.2 TEST PROCEDURE

1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) $\geq 3 \times \text{RBW}$.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

7.3 DEVIATION FROM STANDARD

No deviation.

7.4 TEST SETUP



7.5 EUT OPERATION CONDITIONS

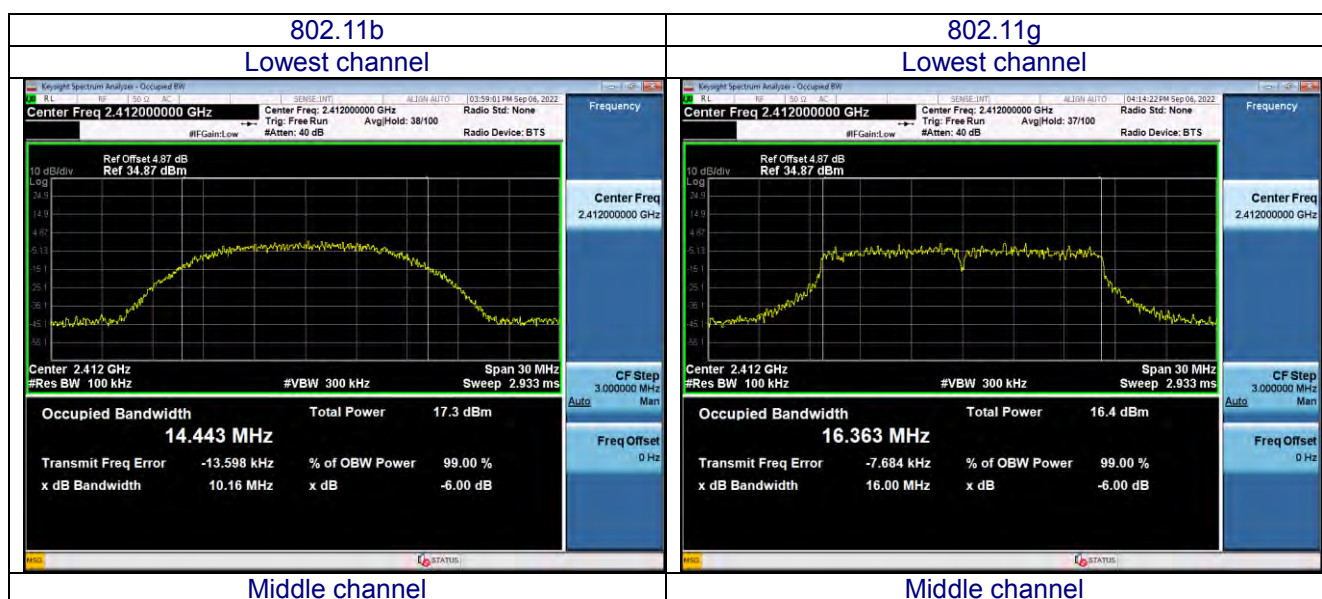
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

7.6 TEST RESULT

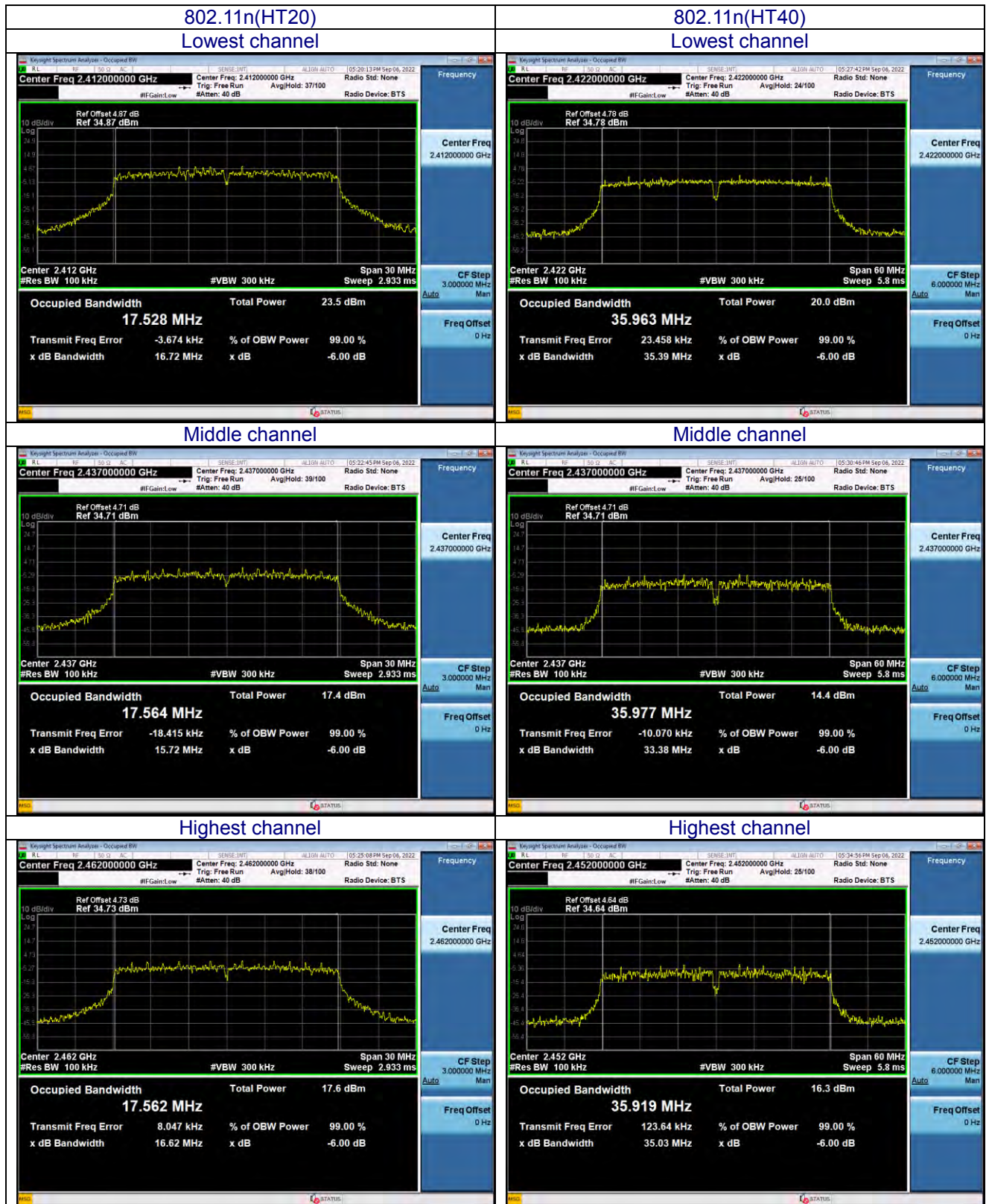
Temperature :	26°C	Relative Humidity :	54%
Pressure :	101kPa	Test Voltage :	DC24V
Test Mode :	TX Mode		

Test mode	Test channel	6dB Emission Bandwidth (MHz)	Limit:	Test Result:
802.11b	Lowest	10.16	>500kHz	PASS
	Middle	10.65		
	Highest	10.87		
802.11g	Lowest	16.00	>500kHz	PASS
	Middle	16.31		
	Highest	15.97		
802.11n(HT20)	Lowest	16.72	>500kHz	PASS
	Middle	15.72		
	Highest	16.62		
802.11n(HT40)	Lowest	35.39	>500kHz	PASS
	Middle	33.38		
	Highest	35.03		

Test plot as follows:







8. OUTPUT POWER TEST

Test Requirement:	FCC Part15 C Section 15.247 (b)(3)
Test Method:	KDB558074 D0115.247 Meas Guidance v05r02

8.1 APPLIED PROCEDURES/LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(3)	Peak Output Power	1 watt or 30dBm	2400-2483.5	PASS

8.2 TEST PROCEDURE

- a. The EUT was directly connected to the Power meter

8.3 DEVIATION FROM STANDARD

No deviation.

8.4 TEST SETUP



8.5 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.

8.6 TEST RESULT

Temperature :	26℃	Relative Humidity :	54%
Pressure :	101kPa	Test Voltage :	DC24V

Condition NVNT	Modulation	Frequency (MHz)	Conducted Power(dBm)	limit(dBm)	Result
NVNT	802.11b	2412.00	15.52	30	Pass
NVNT	802.11b	2437.00	16.22	30	Pass
NVNT	802.11b	2462.00	16.99	30	Pass
NVNT	802.11g	2412.00	15.79	30	Pass
NVNT	802.11g	2437.00	15.94	30	Pass
NVNT	802.11g	2462.00	15.40	30	Pass
NVNT	802.11n(HT20)	2412.00	16.30	30	Pass
NVNT	802.11n(HT20)	2437.00	17.21	30	Pass
NVNT	802.11n(HT20)	2462.00	17.35	30	Pass
NVNT	802.11n(HT40)	2422.00	13.77	30	Pass
NVNT	802.11n(HT40)	2437.00	14.11	30	Pass
NVNT	802.11n(HT40)	2452.00	14.81	30	Pass

9. CONDUCTED BAND EDGE AND SPURIOUS EMISSION

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	KDB558074 D0115.247 Meas Guidance v05r02

9.1 APPLICABLE STANDARD

in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, In addition, radiated emissions which fall in the restricted bands, as defined in§15.205(a), must also comply with the radiated emission limits specified in15.209(a).

9.2 TEST PROCEDURE

Using the following spectrum analyzer setting:

- A) Set the RBW = 100KHz.
- B) Set the VBW = 300KHz.
- C) Sweep time = auto couple.
- D) Detector function = peak.
- E) Trace mode = max hold.
- F) Allow trace to fully stabilize.

9.3 DEVIATION FROM STANDARD

No deviation.

9.4 TEST SETUP



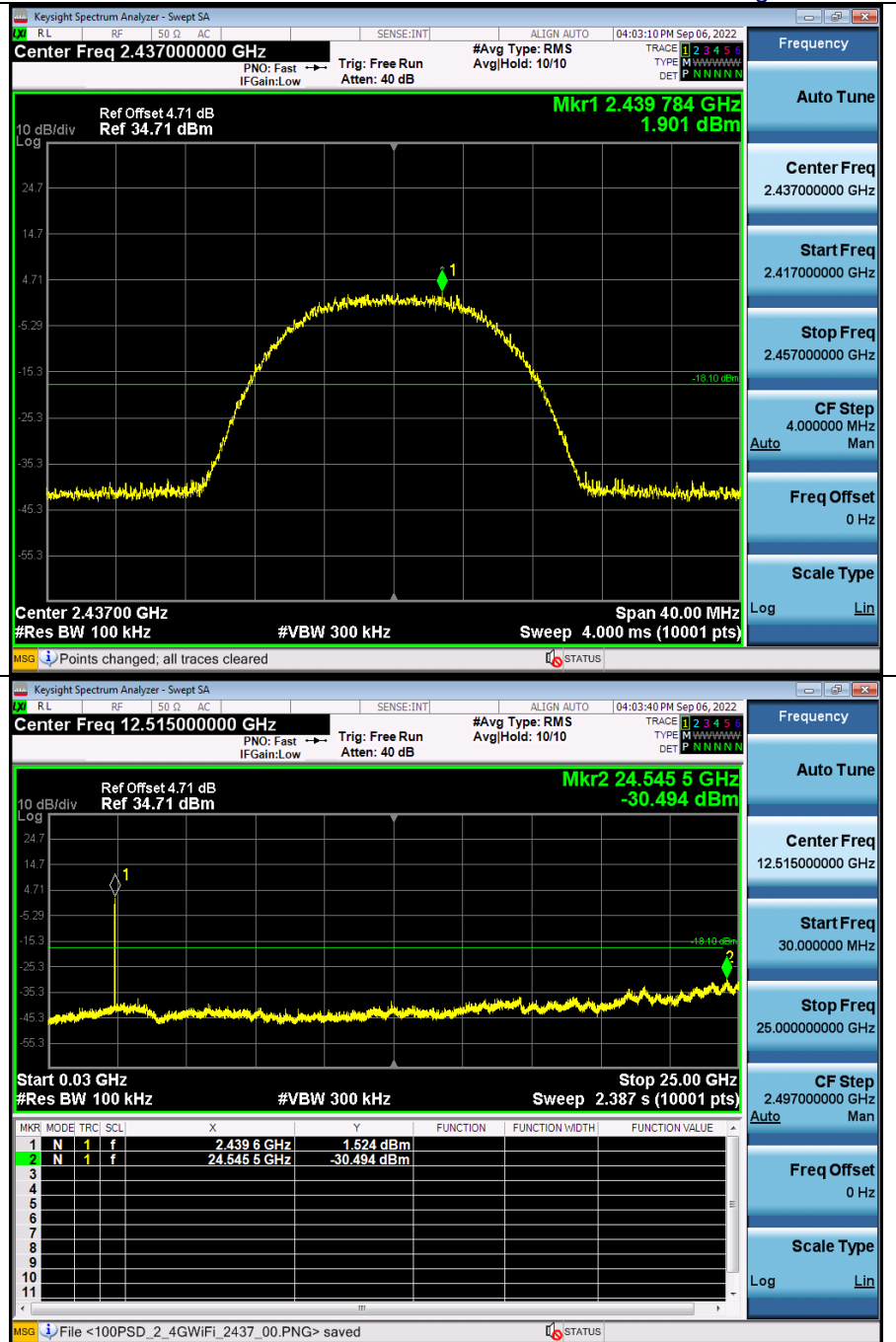
9.5 EUT OPERATION CONDITIONS

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.

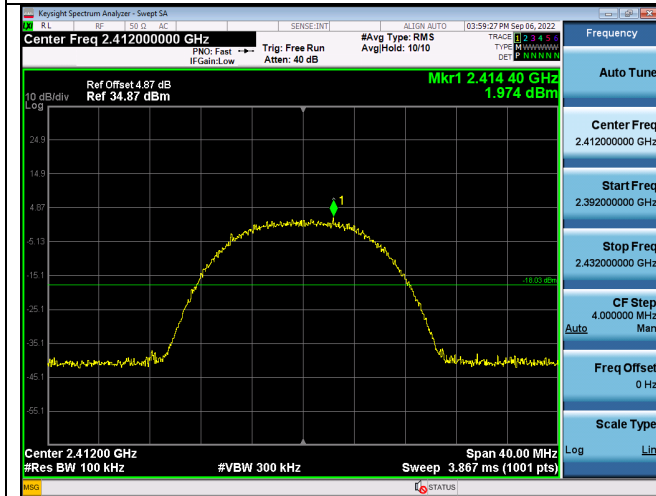
9.6 TEST RESULTS

Test plot as follows:

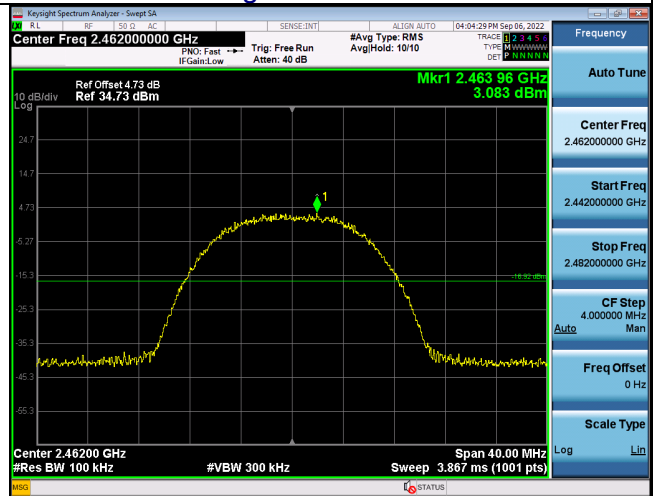
Middle Channel



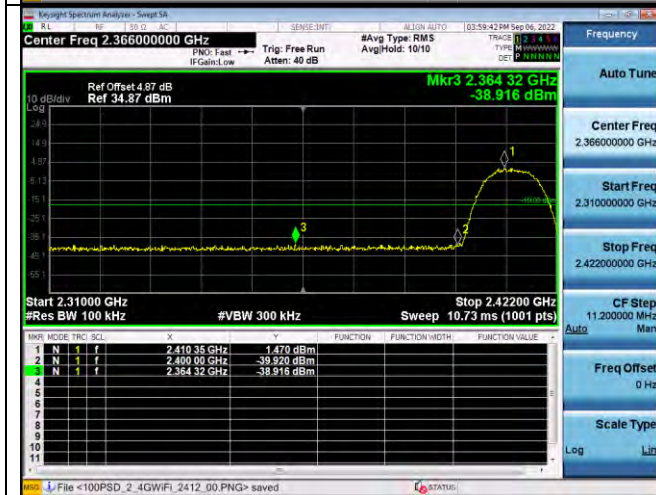
Lowest Channel



Highest Channel



Left Band Edge



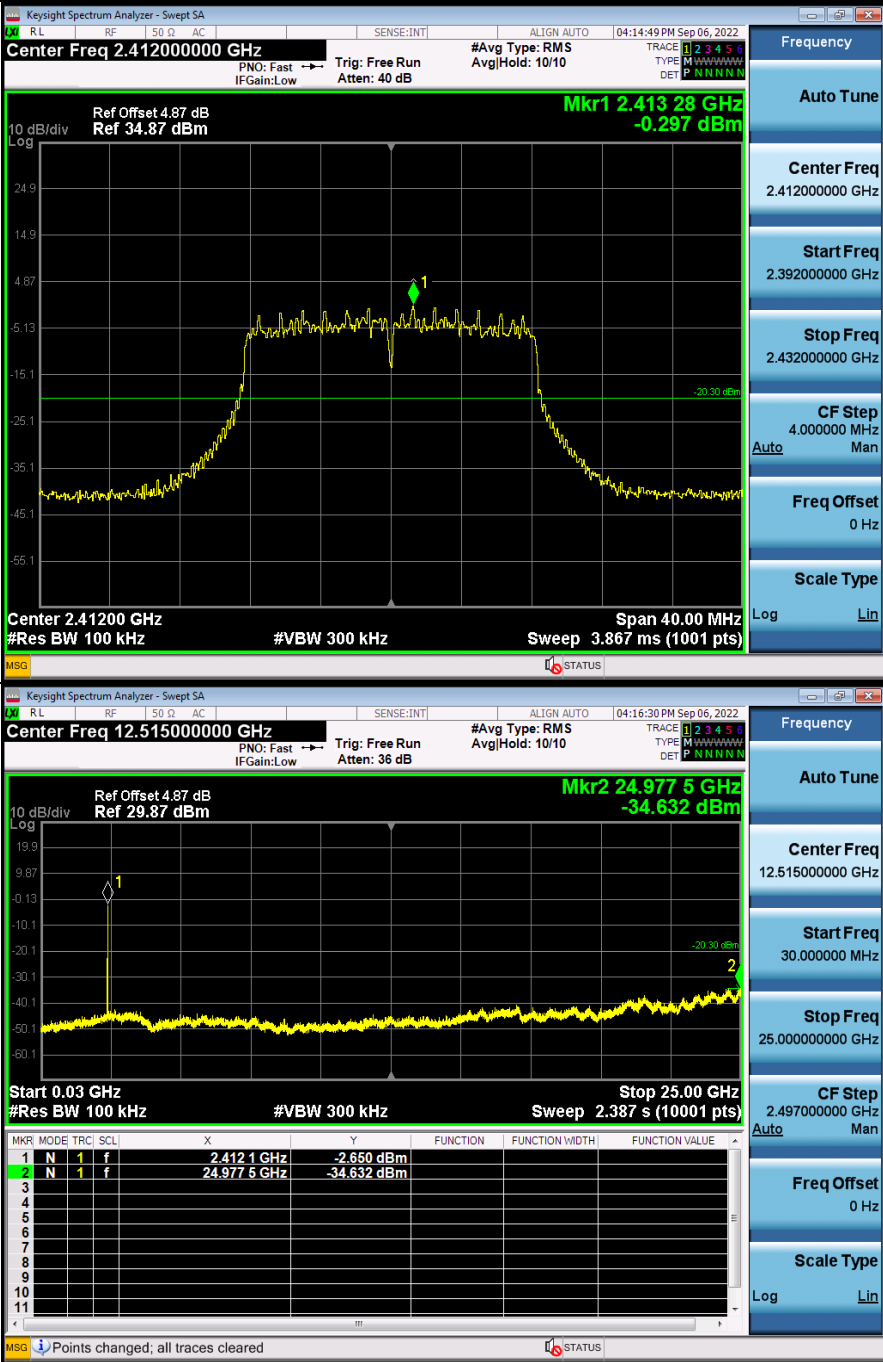
Right Band Edge



802.11g Modulation

Spurious emission

Low Channel



Screenshot 1: Frequency Spectrum at 2.437 GHz

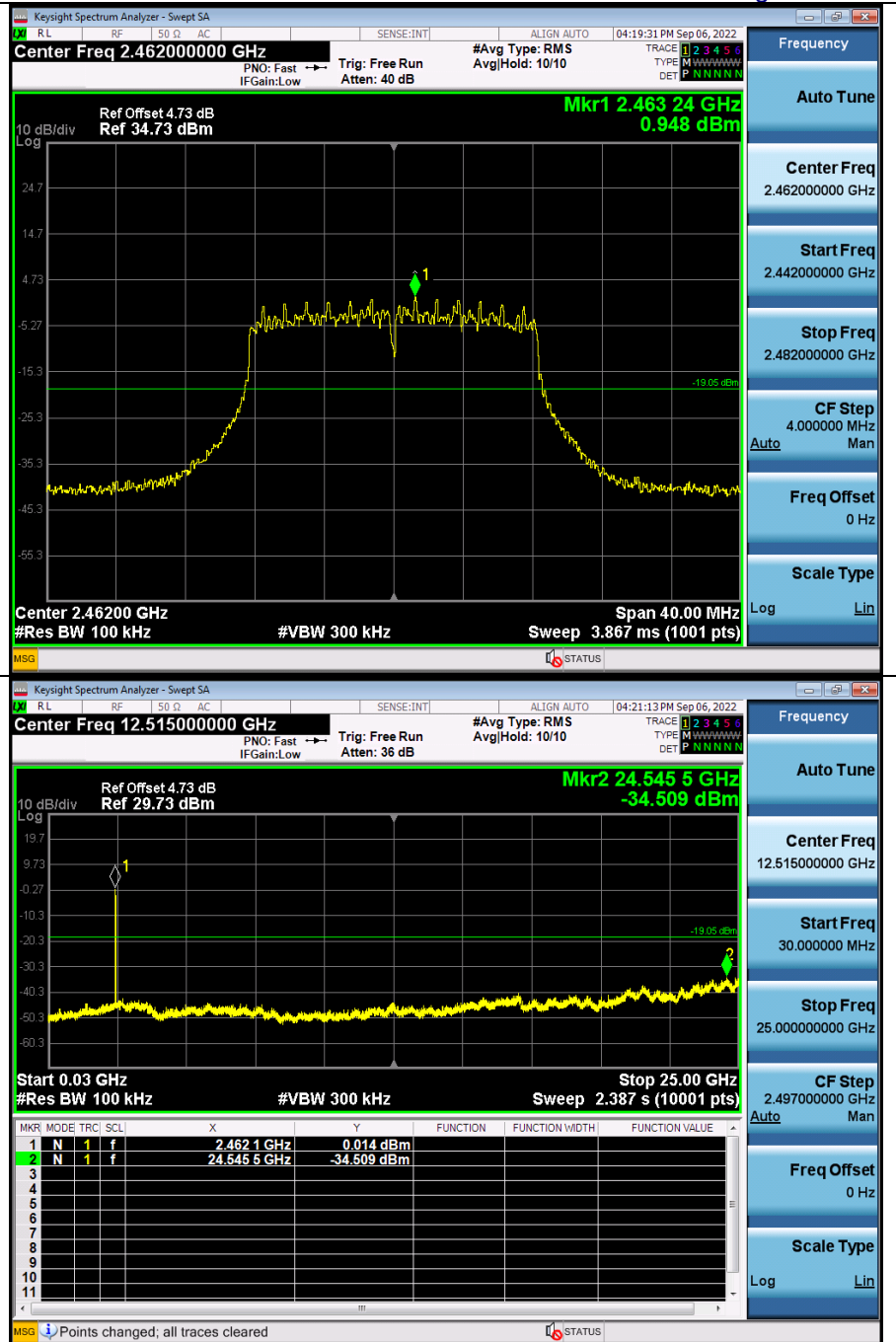
- Center Freq: 2.437000000 GHz
- #Res BW: 300 kHz
- Span: 40.00 MHz
- Sweep: 4.000 ms (10001 pts)
- Ref Offset: 4.71 dB
- Ref: 34.71 dBm
- Mkr1: 2.438 252 GHz, -1.566 dBm
- Trig: Free Run
- Atten: 40 dB
- PNO: Fast
- IFGain: Low
- ALIGN: AUTO
- DATE: 04:18:15 PM Sep 06, 2022

Screenshot 2: Frequency Spectrum at 12.515 GHz

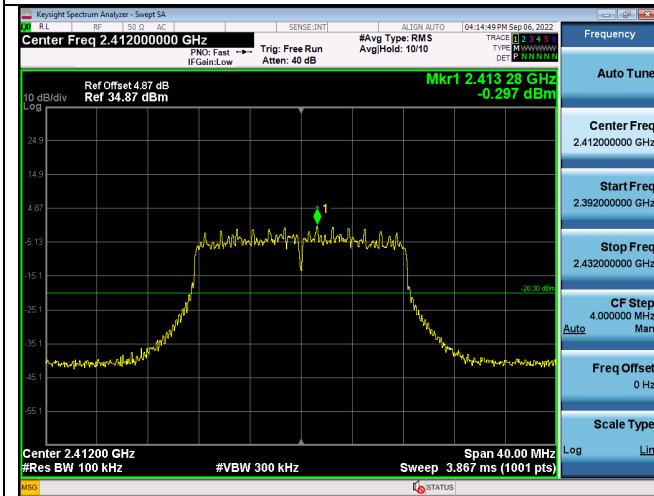
- Center Freq: 12.515000000 GHz
- #Res BW: 100 kHz
- Span: 25.00 GHz
- Sweep: 2.387 s (10001 pts)
- Ref Offset: 4.71 dB
- Ref: 34.71 dBm
- Mkr2: 24.882 6 GHz, -29.181 dBm
- Trig: Free Run
- Atten: 40 dB
- PNO: Fast
- IFGain: Low
- ALIGN: AUTO
- DATE: 04:18:45 PM Sep 06, 2022

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.432 1 GHz	-2.584 dBm			
2	N	1	f	24.882 6 GHz	-29.181 dBm			

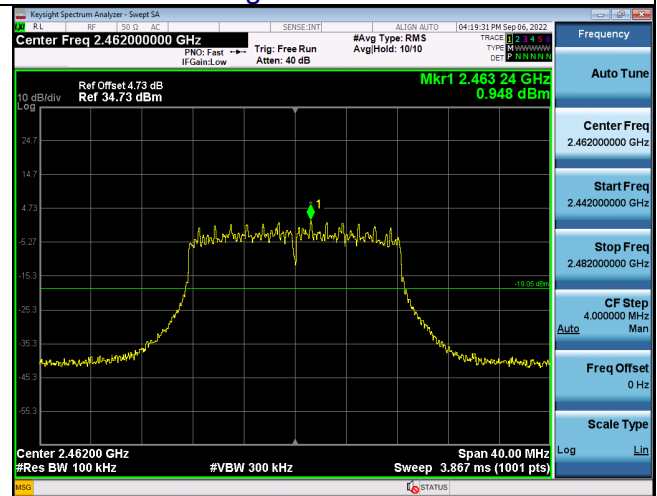
High Channel



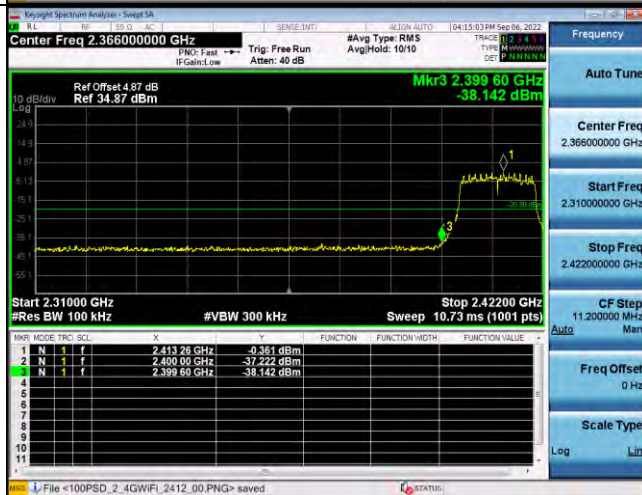
Lowest Channel



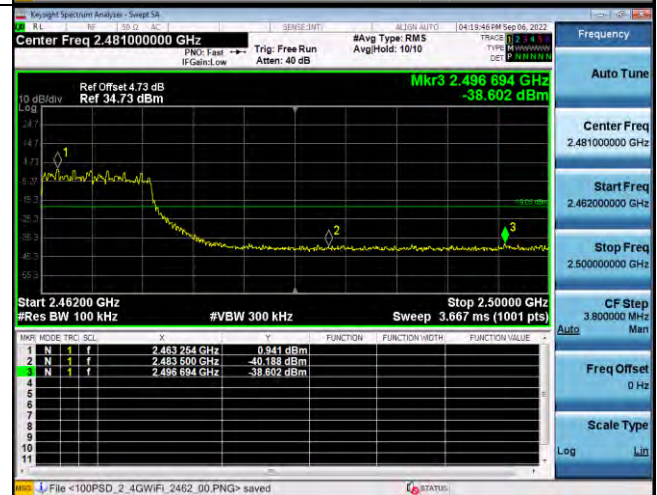
Highest Channel



Left Band Edge



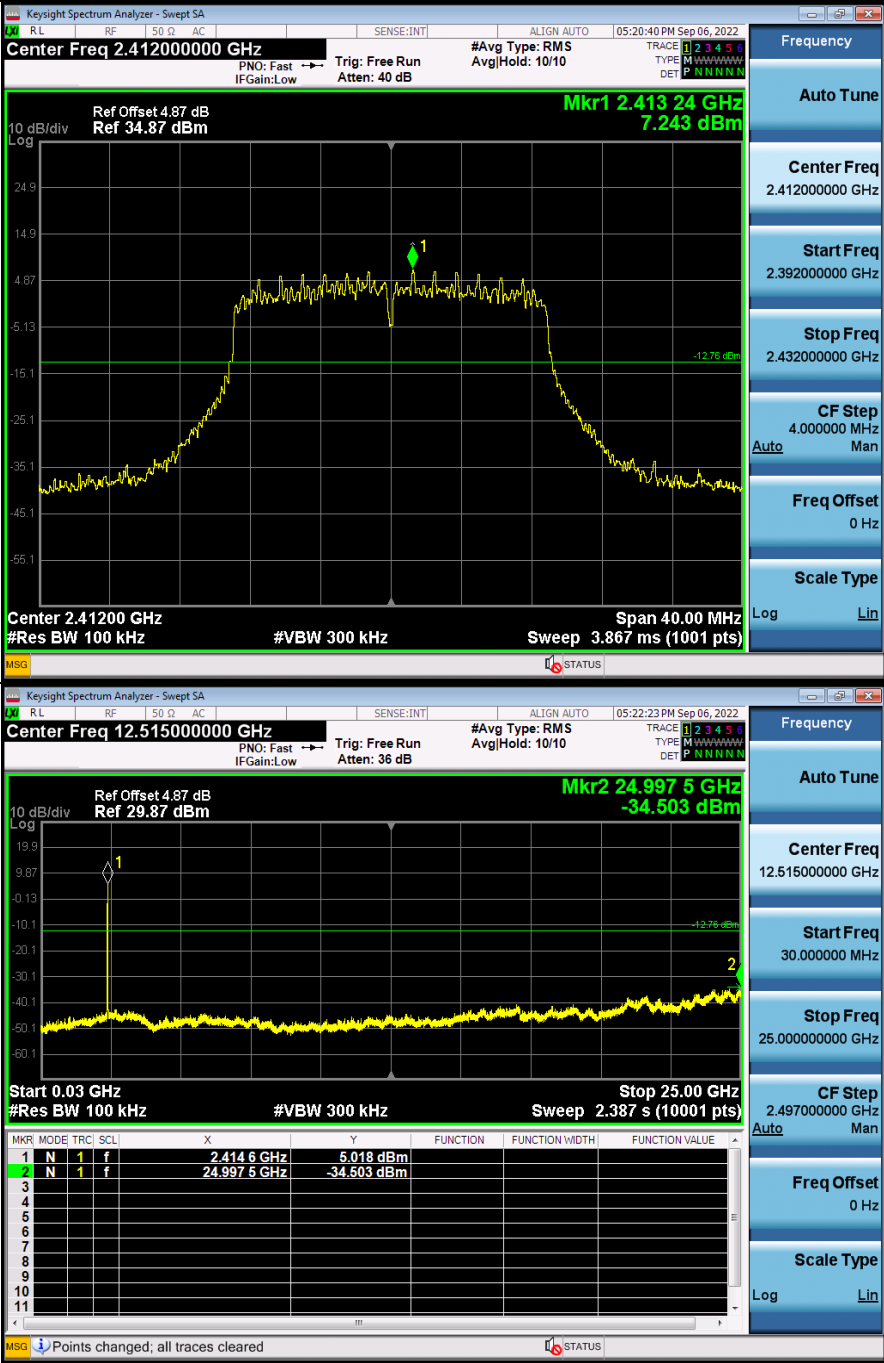
Right Band Edge



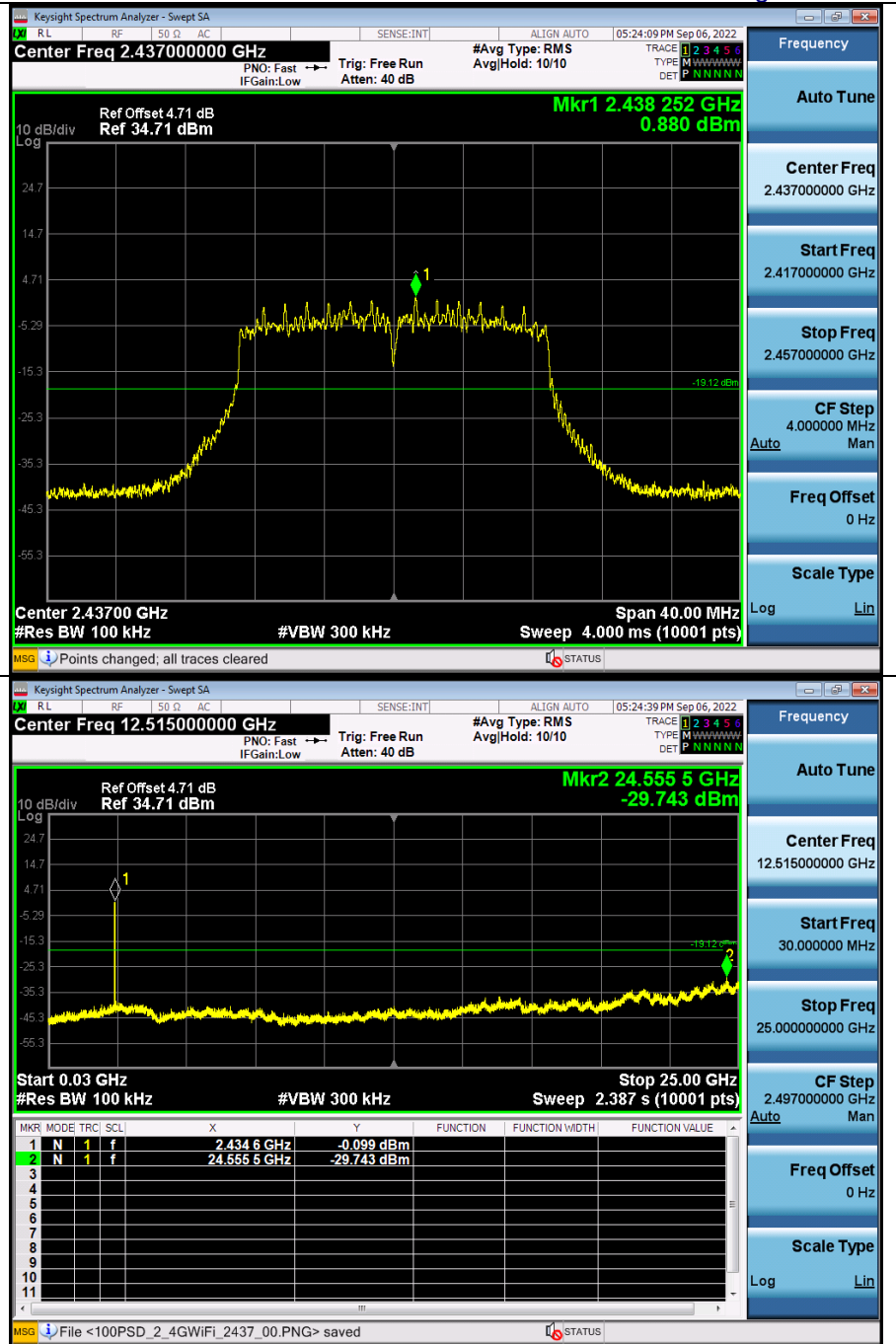
802.11n20 Modulation

Spurious emission

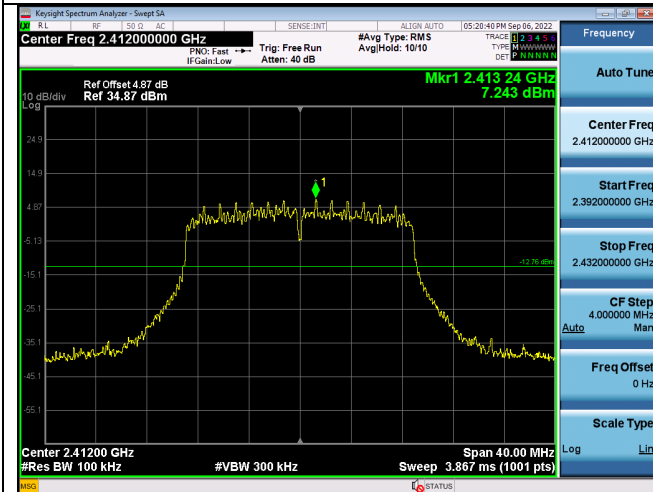
Low Channel



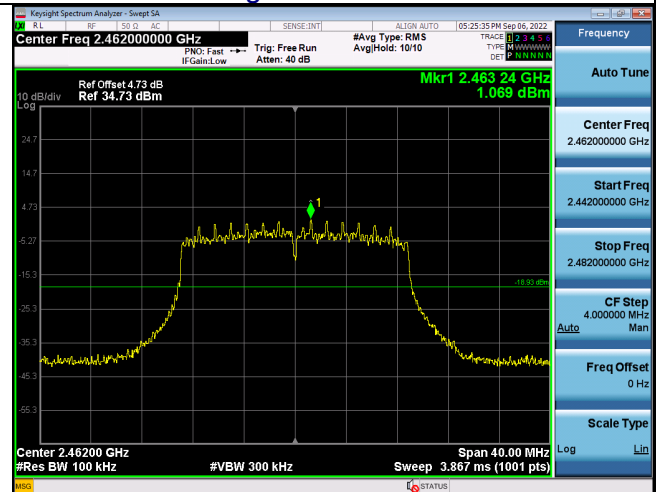
Middle Channel



Lowest Channel



Highest Channel



Left Band Edge



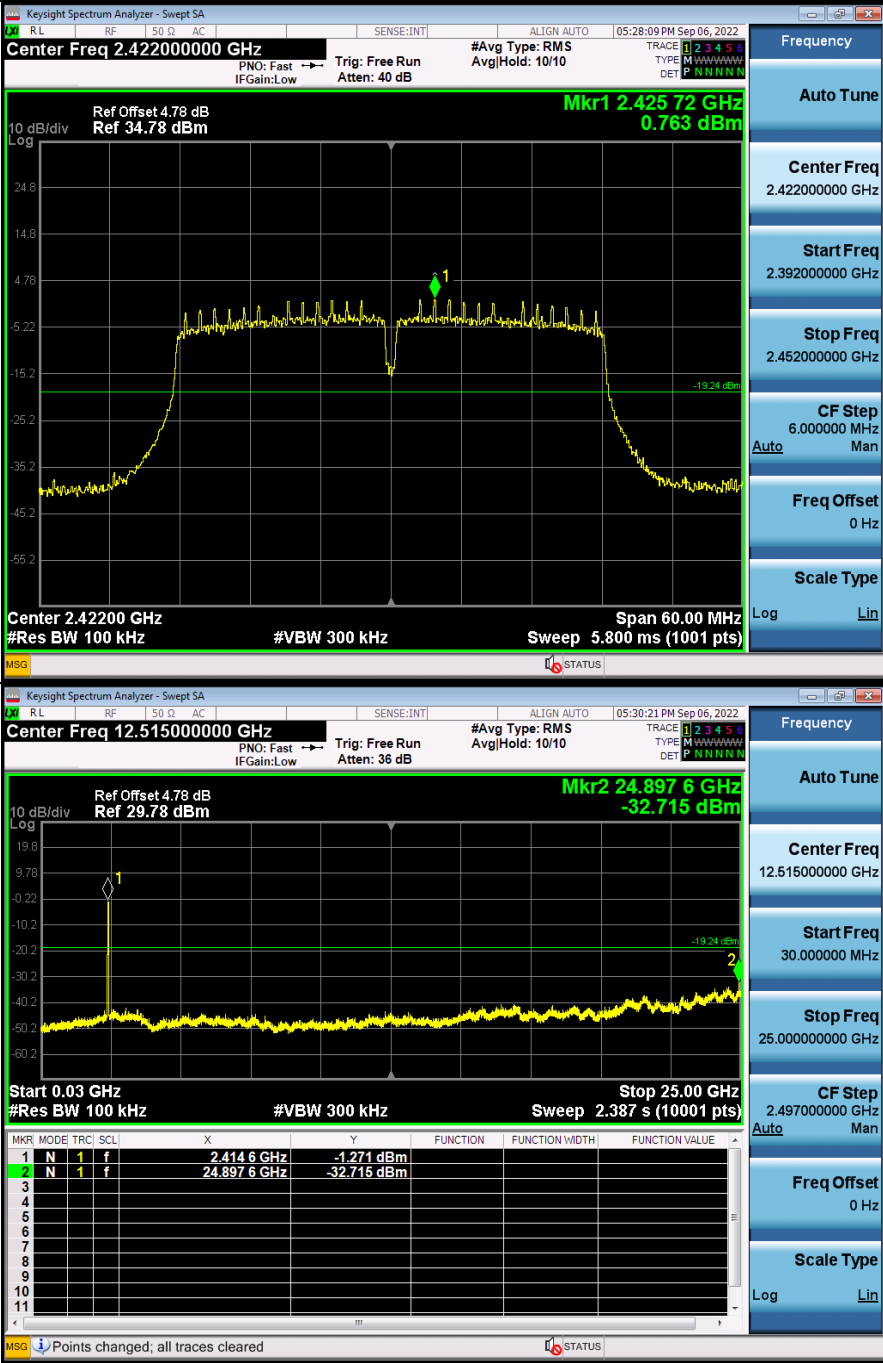
Right Band Edge



802.11n40 Modulation

Spurious emission

Low Channel



Keysight Spectrum Analyzer - Swept SA

R L RF S0 Q AC SENSE:INT ALIGN:AUTO 05:32:40 PM Sep 06, 2022

Center Freq 2.43700000 GHz PNO: Fast IFGain:Low Trig: Free Run Atten: 40 dB #Avg Type: RMS Avg/Hold: 10/10 TRACE 1 2 3 4 5 TYPE M W W W W W W W DET P N N N N N N

Ref Offset 4.71 dB Ref 34.71 dBm **Mkr1 2.440 738 GHz -3.878 dBm**

10 dB/div Log

Center 2.43700 GHz #Res BW 100 kHz #VBW 300 kHz Span 60.00 MHz Sweep 6.000 ms (10001 pts)

MSO Points changed; all traces cleared STATUS

Keysight Spectrum Analyzer - Swept SA

R L RF S0 Q AC SENSE:INT ALIGN:AUTO 05:33:10 PM Sep 06, 2022

Center Freq 12.51500000 GHz PNO: Fast IFGain:Low Trig: Free Run Atten: 40 dB #Avg Type: RMS Avg/Hold: 10/10 TRACE 1 2 3 4 5 TYPE M W W W W W W W DET P N N N N N N

Ref Offset 4.71 dB Ref 34.71 dBm **Mkr2 24.545 5 GHz -30.561 dBm**

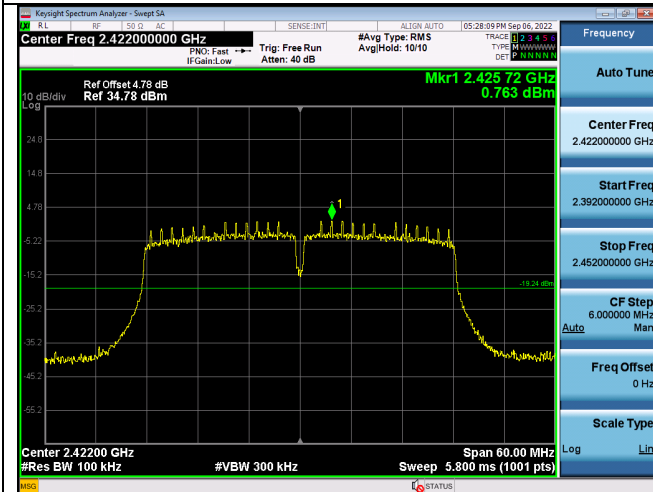
10 dB/div Log

Start 0.03 GHz Stop 25.00 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.387 s (10001 pts)

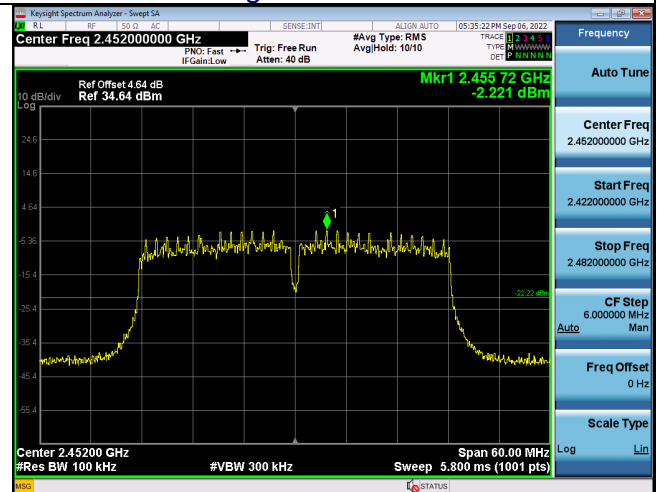
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.442 1 GHz	-4.560 dBm			
2	N	1	f	24.545 5 GHz	-30.561 dBm			
3								
4								
5								
6								
7								
8								
9								
10								
11								

MSO File <100PSD_2_4GWifi_2437_00.PNG> saved STATUS

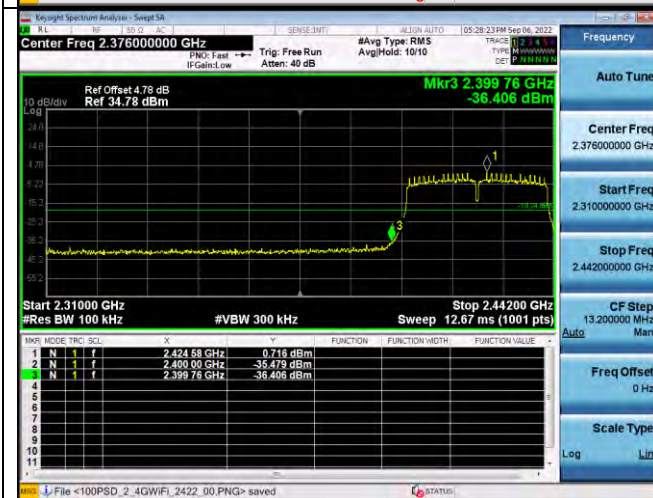
Lowest Channel



Highest Channel



Left Band Edge



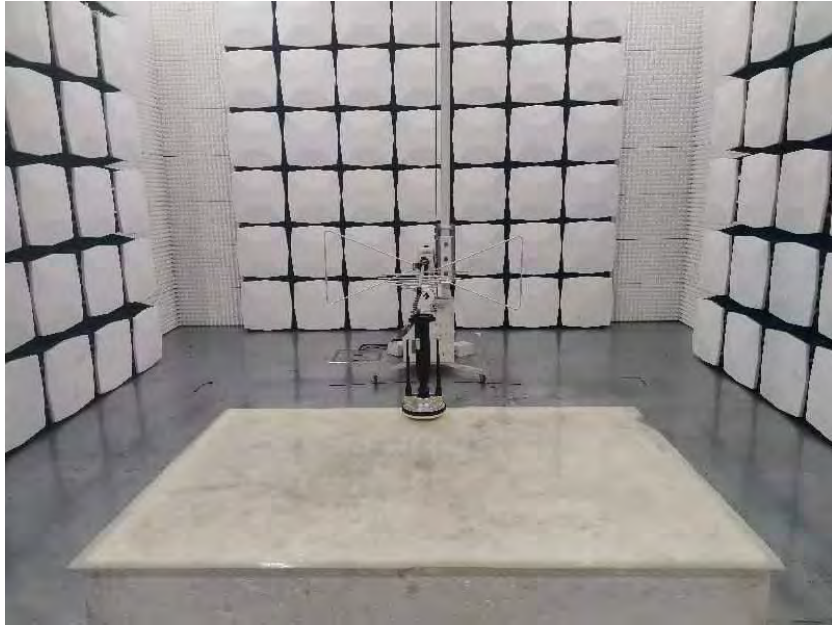
Right Band Edge



10. ANTENNA REQUIREMENT

Standard requirement:	FCC Part15 C Section 15.203 /247(c)
For intentional device, according to FCC 47 CFR Section 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. And according to FCC 47 CFR Section 15.247, if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi. Refer to statement below for compliance. The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed. Antenna Connected Construction The antenna used in this product are glue stick antenna, and the best case gain of the antenna is antenna port 1: 4.47dBi	
EUT Antenna: 2.4G&5GWIFI ANT 	

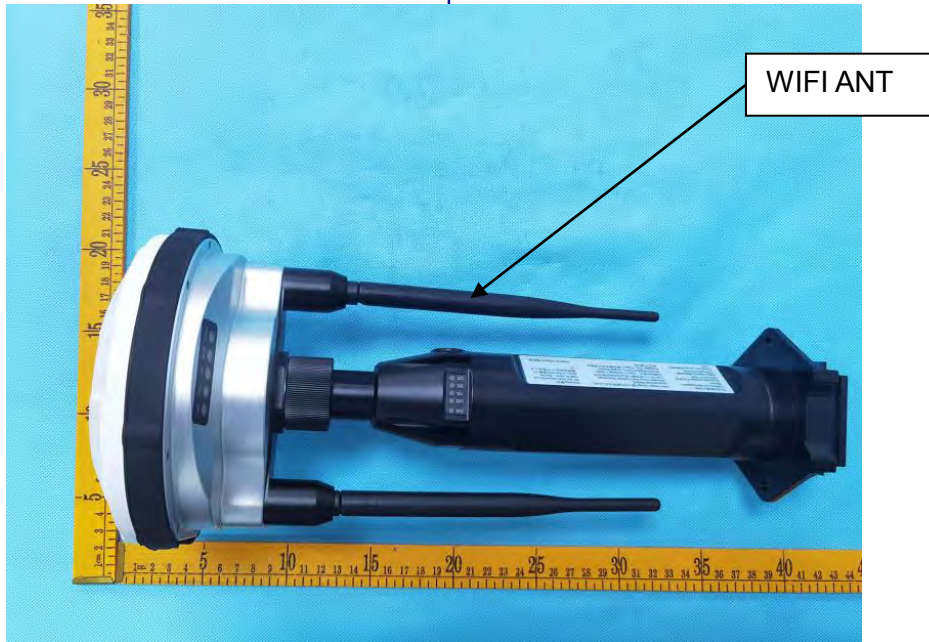
11. TEST SETUP PHOTO





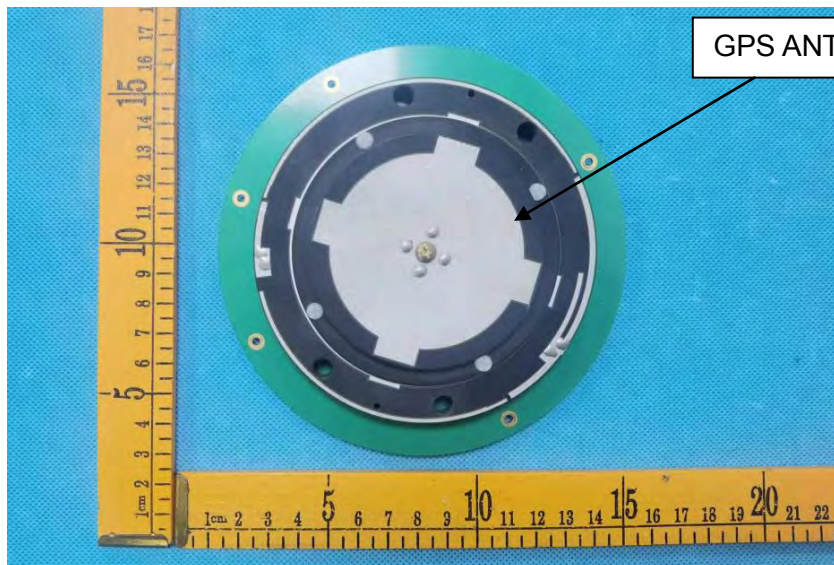
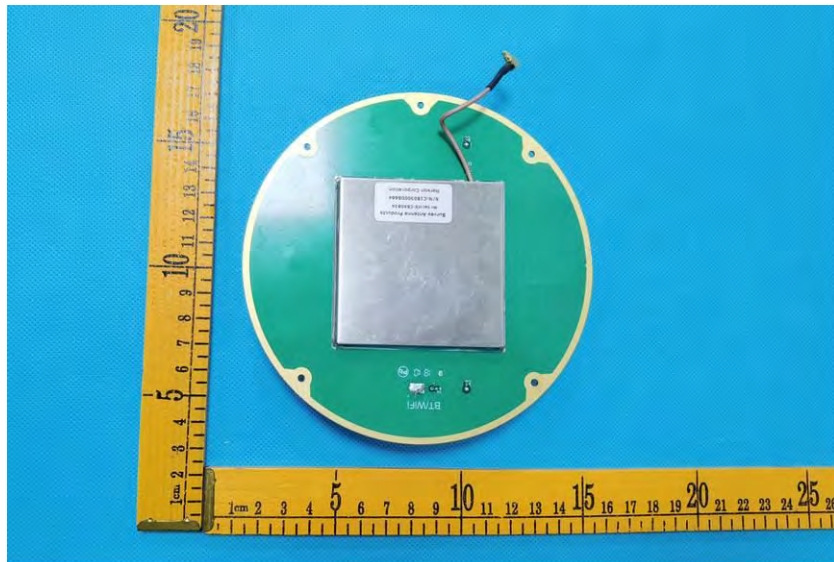
12. EUT CONSTRUCTIONAL DETAILS

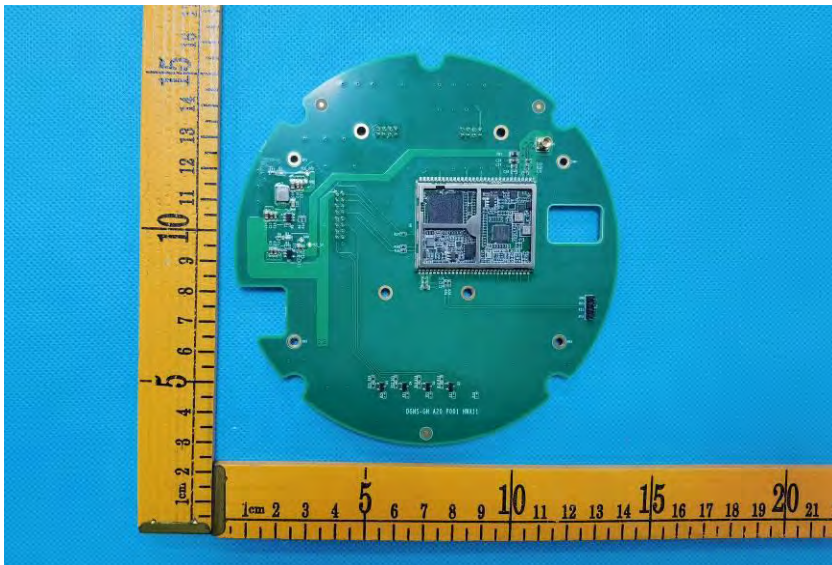
External photos

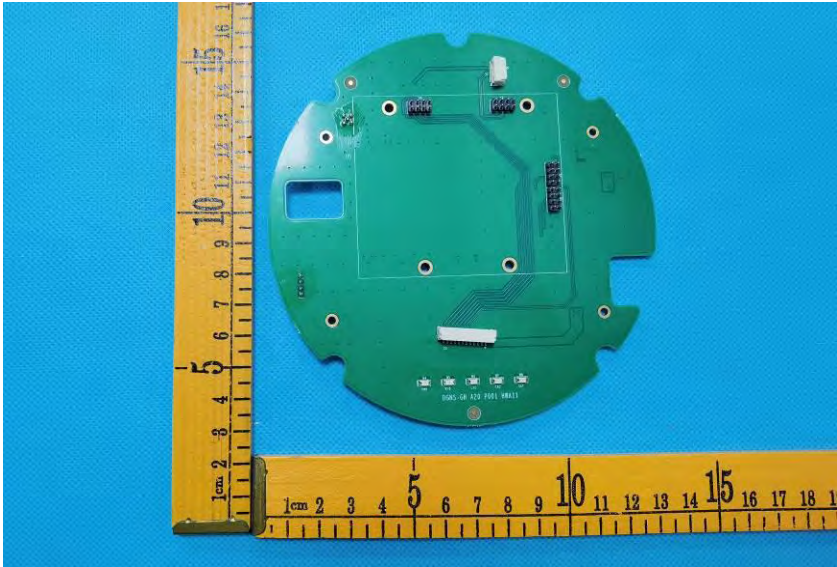
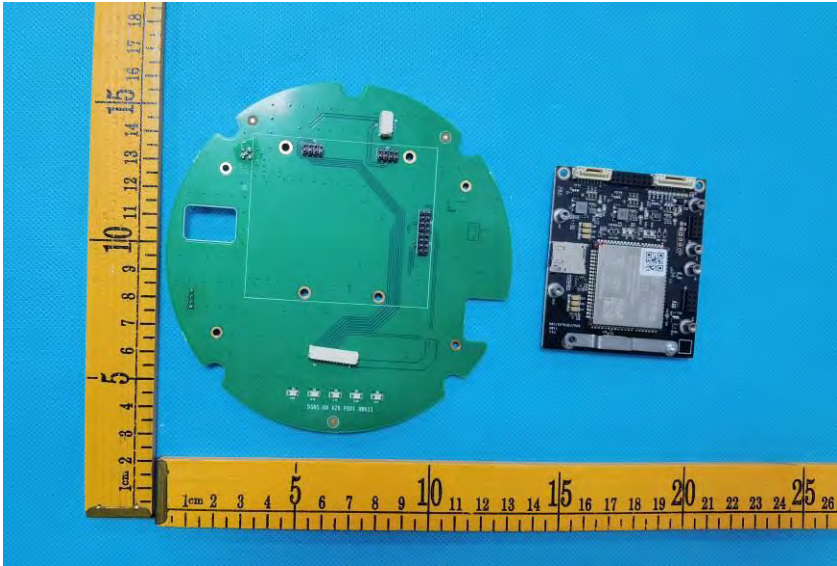
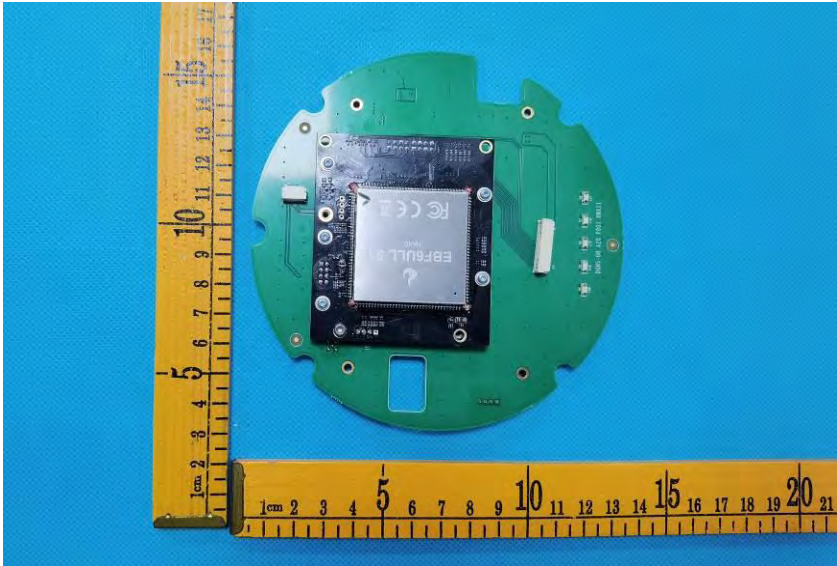


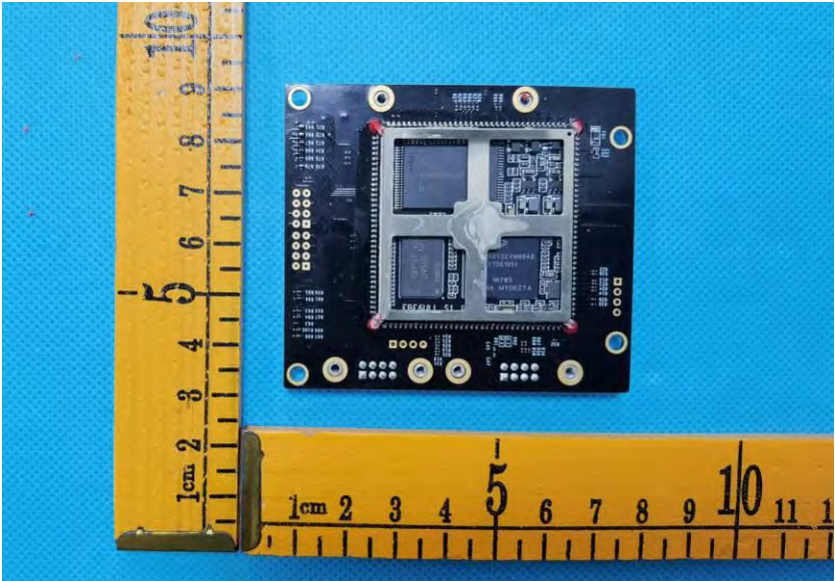
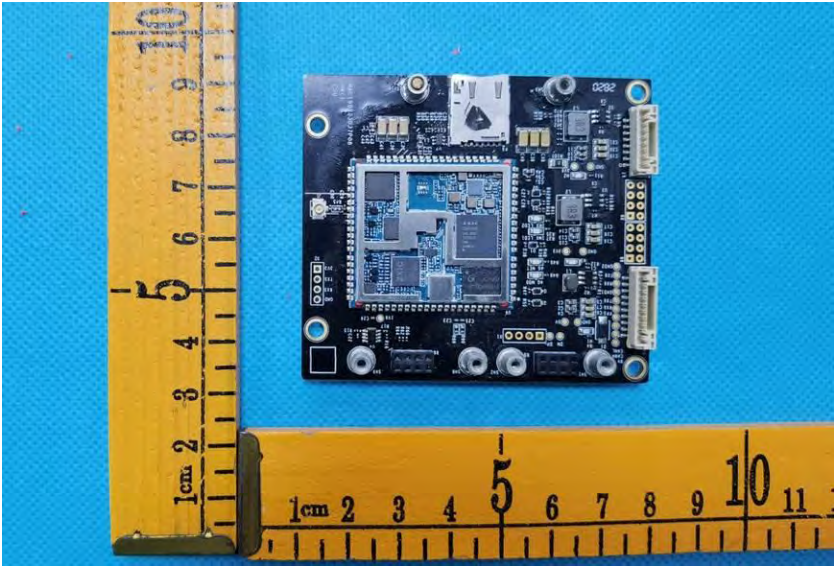
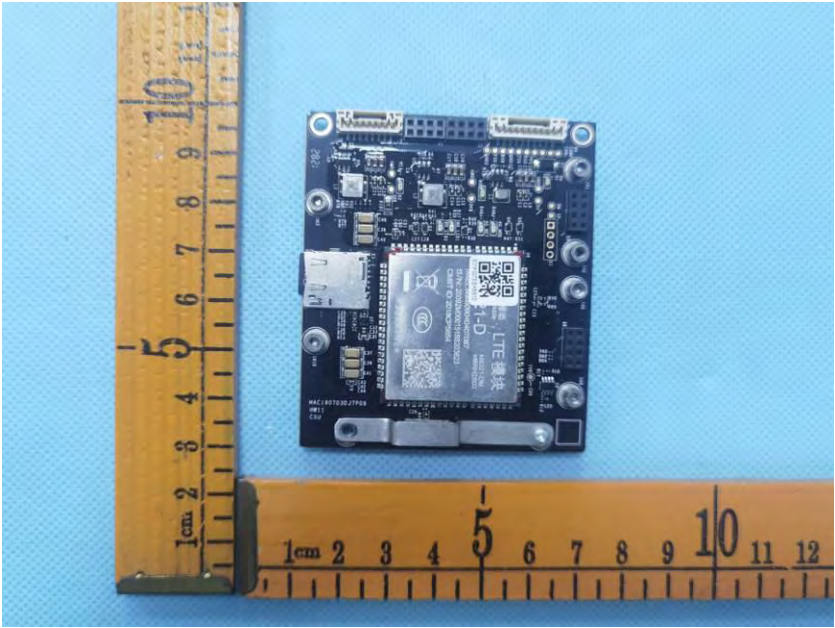


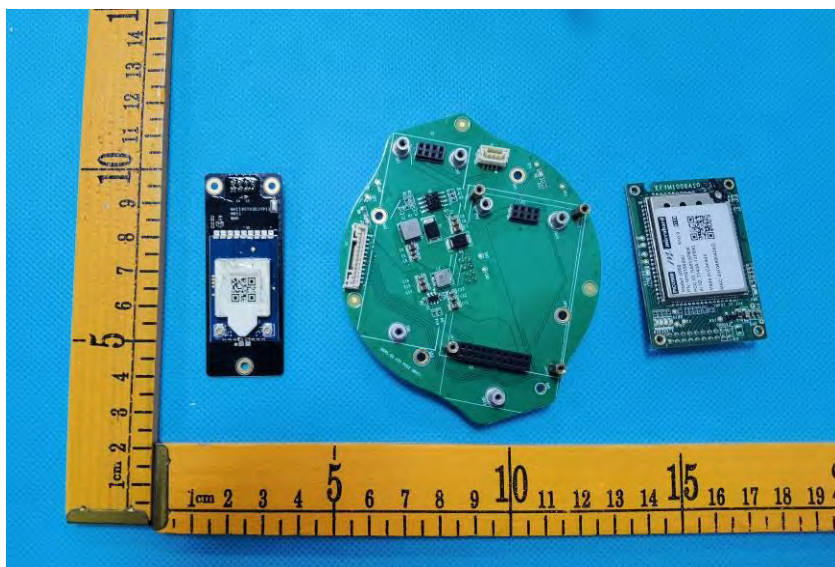
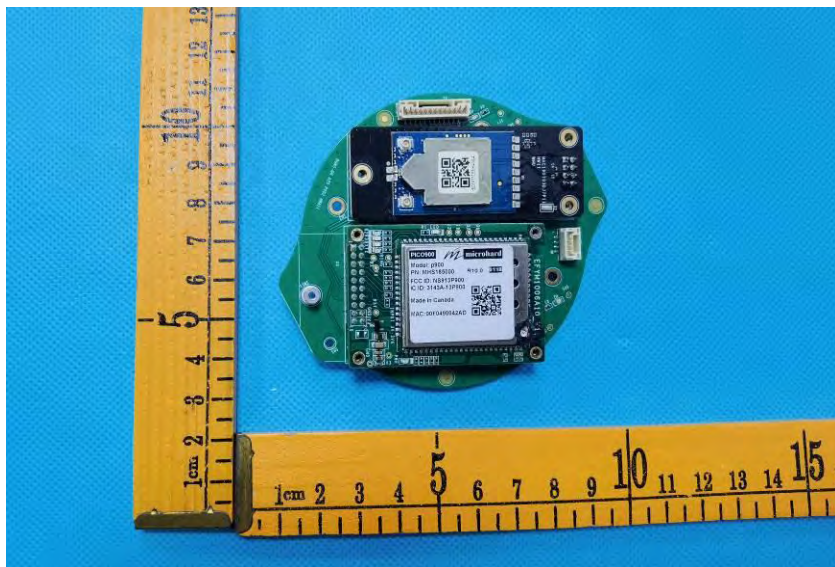
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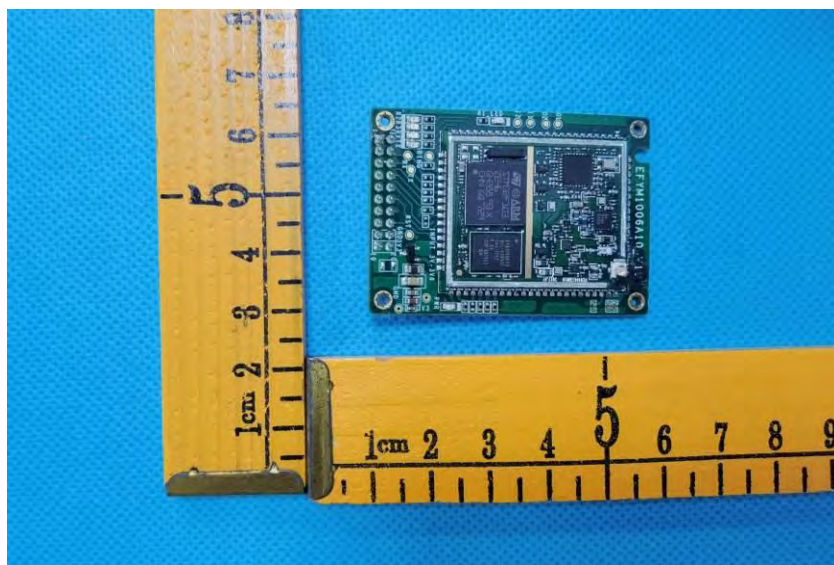
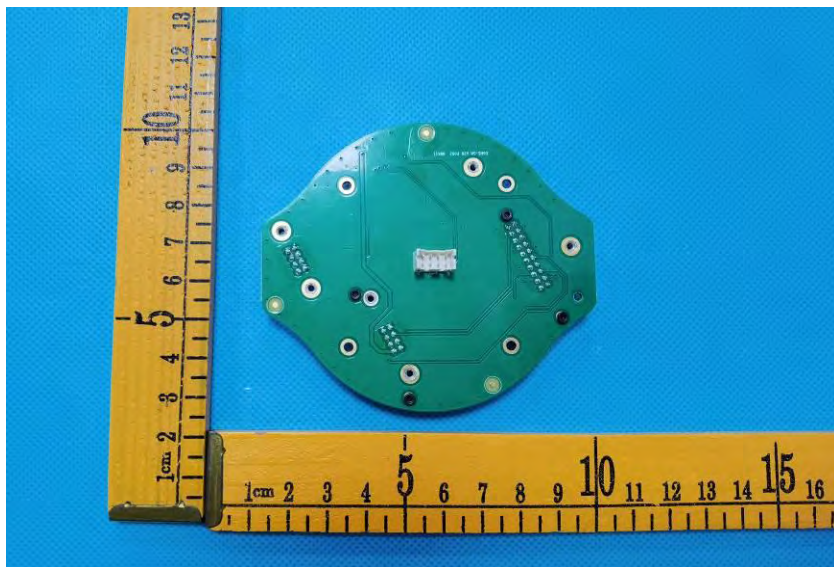
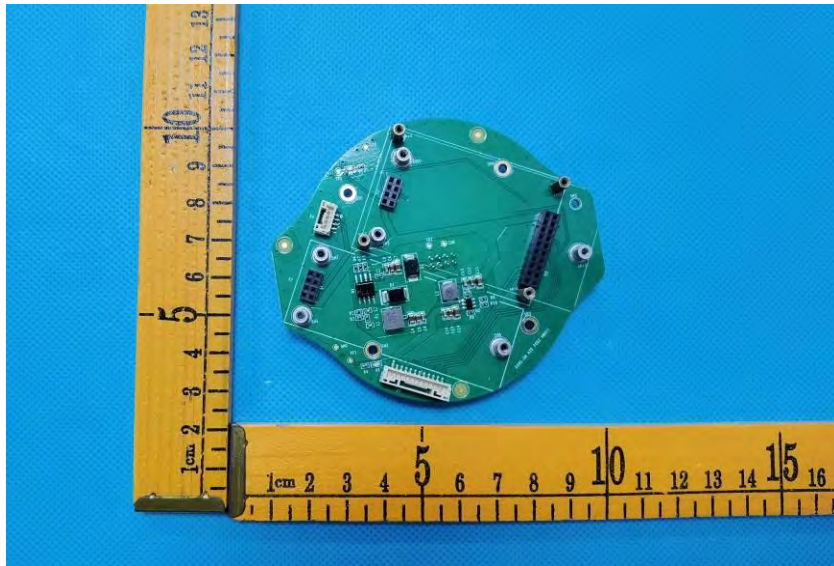


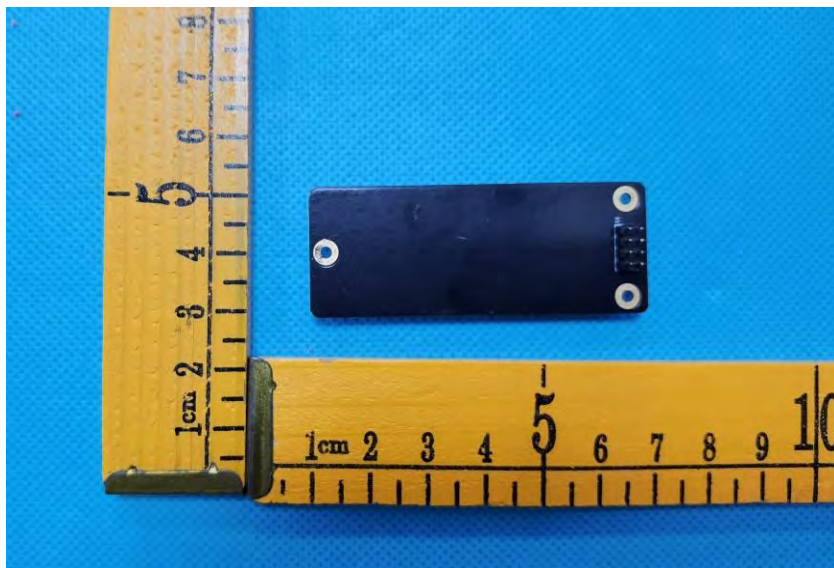
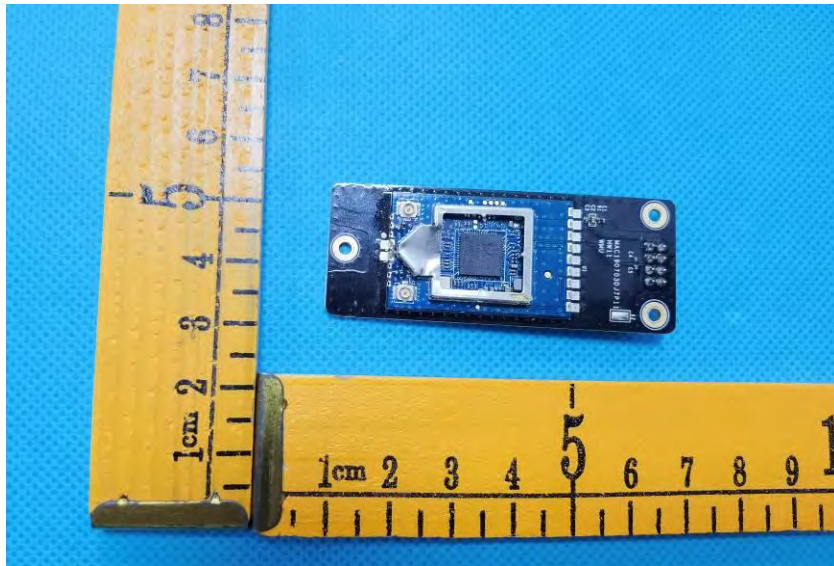
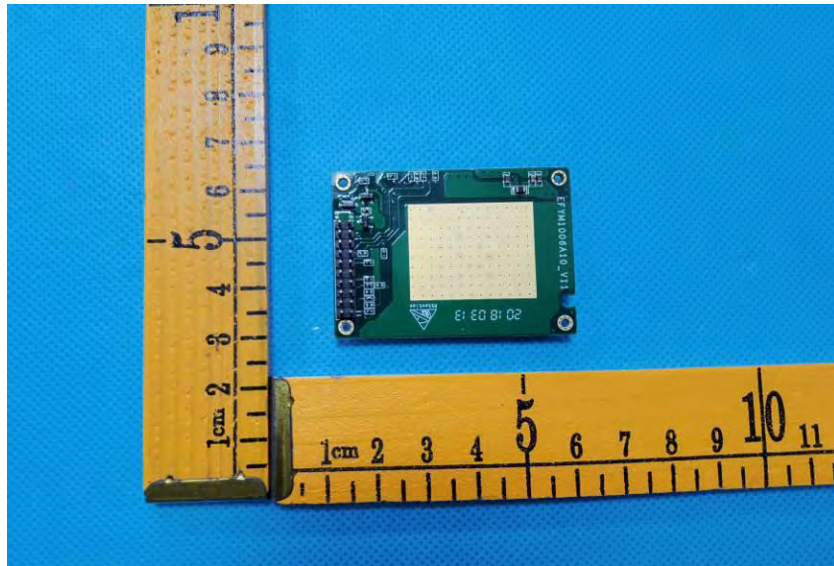












***** END OF REPORT *****