

Groupe SEB

RF TEST REPORT

Report Type:

FCC Part 15.247 RF report

Model:

PU2840

REPORT NUMBER:

220700655HZH-002

ISSUE DATE:

October 12, 2022

DOCUMENT CONTROL NUMBER:

TTRF15.247-03_V1 © 2018 Intertek



Applicant: Groupe SEB
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France

Manufacturer: Groupe SEB
ZI Montplaisir, Rue du Champ de Courses 38780 Pont- Evêque,
France

Factory: Ningbo Teller Intelligent Technology Co., Ltd.
Industrial Park, Simen, Yuyao, Zhejiang, China

PRODUCT NAME: Air purifier

TYPE/MODEL: PU2840

FCC ID: 2AGS8-2310N9181

SUMMARY:

The equipment complies with the requirements according to the following standard(s) or Specification:

47CFR Part 15 (2020): Radio Frequency Devices (Subpart C)

ANSI C63.10 (2013): American National Standard of Procedures for Compliance Testing of
Unlicensed Wireless Devices

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TEST REPORT

Content

REVISION HISTORY	5
MEASUREMENT RESULT SUMMARY	6
1 GENERAL INFORMATION	7
1.1 DESCRIPTION OF EQUIPMENT UNDER TEST (EUT)	7
1.2 TECHNICAL SPECIFICATION	7
1.3 ANTENNA INFORMATION	8
1.4 DESCRIPTION OF TEST FACILITY	9
2 TEST SPECIFICATIONS	10
2.1 STANDARDS OR SPECIFICATION	10
2.2 MODE OF OPERATION DURING THE TEST	10
2.3 TEST SOFTWARE LIST	11
2.4 TEST PERIPHERALS LIST	11
2.5 TEST ENVIRONMENT CONDITION	11
2.6 INSTRUMENT LIST	12
2.7 MEASUREMENT UNCERTAINTY	13
3 MINIMUM 6DB BANDWIDTH	14
3.1 LIMIT	14
3.2 MEASUREMENT PROCEDURE	14
3.3 TEST CONFIGURATION	14
3.4 TEST RESULTS OF MINIMUM 6DB BANDWIDTH	14
4 MAXIMUM CONDUCTED OUTPUT POWER AND E.I.R.P.	15
4.1 LIMIT	15
4.2 MEASUREMENT PROCEDURE	15
4.3 TEST CONFIGURATION	16
4.4 TEST RESULTS OF MAXIMUM CONDUCTED OUTPUT POWER	16
5 POWER SPECTRUM DENSITY	17
5.1 LIMIT	17
5.2 MEASUREMENT PROCEDURE	17
5.3 TEST CONFIGURATION	18
5.4 TEST RESULTS OF POWER SPECTRUM DENSITY	18
6 EMISSION OUTSIDE THE FREQUENCY BAND	19
6.1 LIMIT	19
6.2 MEASUREMENT PROCEDURE	19
6.3 TEST CONFIGURATION	20
6.4 THE RESULTS OF EMISSION OUTSIDE THE FREQUENCY BAND	20
7 RADIATED EMISSIONS IN RESTRICTED FREQUENCY BANDS	21
7.1 LIMIT	21
7.2 MEASUREMENT PROCEDURE	21
7.3 TEST CONFIGURATION	23
7.4 TEST RESULTS OF RADIATED EMISSIONS	25
8 POWER LINE CONDUCTED EMISSION	29
8.1 LIMIT	29
8.2 TEST CONFIGURATION	29
8.3 MEASUREMENT PROCEDURE	30

TEST REPORT

8.4	TEST RESULTS OF POWER LINE CONDUCTED EMISSION.....	31
9	OCCUPIED BANDWIDTH	33
9.1	LIMIT	33
9.2	MEASUREMENT PROCEDURE	33
9.3	TEST CONFIGURATION	33
9.4	THE RESULTS OF OCCUPIED BANDWIDTH.....	33
10	ANTENNA REQUIREMENT.....	34
	APPENDIX A: TEST RESULTS	35
	DTS BANDWIDTH	35
	<i>Test Data</i>	35
	<i>Test Plots</i>	36
	OCCUPIED CHANNEL BANDWIDTH.....	38
	<i>Test Data</i>	38
	<i>Test Plots</i>	39
	MAXIMUM CONDUCTED OUTPUT POWER AND E.I.R.P	41
	<i>Test Data</i>	41
	<i>Test Plots</i>	42
	MAXIMUM POWER SPECTRUM DENSITY.....	44
	<i>Test Data</i>	44
	<i>Test Plots</i>	45
	BAND EDGE MEASUREMENTS	47
	<i>Test Data</i>	47
	<i>Test Plots</i>	47
	CONDUCTED SPURIOUS EMISSION.....	49
	<i>Test Data</i>	49
	<i>Test Plots</i>	50
	DUTY CYCLE.....	55
	<i>Test Data</i>	55
	<i>Test Plots</i>	55
	EMISSIONS IN RESTRICTED BANDS.....	57
	<i>Test Data</i>	57
	<i>Test Plots</i>	58

Revision History

Report No.	Version	Description	Issued Date
220700655HZH-002	Rev. 01	Initial issue of report	October 12, 2022

Measurement result summary

TEST ITEM	FCC REFERENCE	RESULT
Minimum 6dB Bandwidth	15.247(a)(2)	Pass
Maximum conducted output power and e.i.r.p.	15.247(b)(3)	Pass
Power spectrum density	15.247(e)	Pass
Emission outside the frequency band	15.247(d)	Pass
Radiated Emissions in restricted frequency bands	15.247(d), 15.205&15.209	Pass
Power line conducted emission	15.207(a)	Pass
Occupied bandwidth	-	Tested
Antenna requirement	15.203	Pass

Notes: 1: NA =Not Applicable

1 GENERAL INFORMATION

1.1 Description of Equipment Under Test (EUT)

Product name:	Air purifier
Type/Model/PMN/HVIN:	PU2840
Description of EUT:	The EUT covered in the report is air purifier, WIFI and Bluetooth module WBR3 is incorporated in models for wireless control. Therefore, the test was performed on this model.
Rating:	For unit: DC 24V, 1,5A For adaptor: input: 100-240V~, 50/60Hz, Max.1.0 A output: DC 24V, 1,5A, 36,0W, Class II
Category of EUT:	Class B
Brand name:	/
EUT type:	☐ Tabletop ☒ Floor standing
Software Version:	/
Hardware Version:	/
Sample Identification No.:	0220611-22
Sample received date:	August 6, 2022
Date of test:	August 6, 2022, to September 16, 2022

1.2 Technical Specification

Frequency Band:	2400MHz ~ 2483.5MHz
Support Standards:	IEEE 802.11b, IEEE 802.11g, IEEE 802.11n(HT20)
Type of Modulation:	IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g: OFDM (64-QAM, 16-QAM, QPSK, BPSK) IEEE 802.11n(HT20): OFDM (64-QAM, 16-QAM, QPSK, BPSK)
Channel Number:	11 Channels for 802.11b, 802.11g and 802.11n(HT20)
Data Rate:	IEEE 802.11b: Up to 11Mbps IEEE 802.11g: Up to 54Mbps IEEE 802.11n(HT20): Up to MCS7
Channel Separation:	5 MHz
Antenna:	PCB Antenna, 2.54dBi Gain

1.3 Antenna information

Mode	Tx/Rx Function	Beamforming function	CDD function	Directional gain (dBi)
802.11b	1Tx/1Rx	NO	NO	-
802.11g	1Tx/1Rx	NO	NO	-
802.11n(HT20)	1Tx/1Rx	NO	NO	-

TEST REPORT

1.4 Description of Test Facility

Name:	Intertek Testing Services Shanghai
Address:	Building 86, No. 1198 Qinzhou Road (North), Shanghai 200233, P.R. China
Telephone:	86 21 61278200
Telefax:	86 21 54262353

The test facility is recognized, certified, or accredited by these organizations:	CNAS Accreditation Lab Registration No. CNAS L0139
	FCC Accredited Lab Designation Number: CN0175
	IC Registration Lab CAB identifier.: CN0014
	VCCI Registration Lab Registration No.: R-14243, G-10845, C-14723, T-12252
	A2LA Accreditation Lab Certificate Number: 3309.02

2 TEST SPECIFICATIONS

2.1 Standards or specification

47CFR Part 15 (2020)

ANSI C63.10 (2013)

KDB 558074 (v05r02)

2.2 Mode of operation during the test

While testing transmitting mode of EUT, the internal modulation and continuously transmission was applied.

Software name	Manufacturer	Version	Supplied by
MPtool	-	-	applicant

The lowest, middle and highest channel were tested as representatives.

Frequency Band (MHz)	Mode	Lowest (MHz)	Middle (MHz)	Highest (MHz)
2412-2462	802.11b	2412	2437	2462
	802.11g	2412	2437	2462
	802.11n(HT20)	2412	2437	2462

Data rate and Power setting:

The pre-scan for the conducted power with all rates in each modulation and bands was used, and the worst case was found and used in all test cases. After this pre-scan, we choose the following table of the data rate as the worst case.

Frequency Band (MHz)	Mode	Worst case data rate	Power Setting
2412-2462	802.11b	1Mbps	Default
	802.11g	6Mbps	Default
	802.11n(HT20)	MCS0	Default

The EUT will use two types antenna, and there have the following test mode:

Radiated test mode:

Mode 1: EUT transmitted signal with internal antenna;

Conducted test mode:

Mode 2: EUT transmitted signal from PCBA RF port connected to SPA directly;

We have verified all test modes, and list all the results in this report.

2.3 Test software list

Test Items	Software	Manufacturer	Version
Conducted emission	ESxS-K1	R&S	V2.1.0
Radiated emission	ES-K1	R&S	V1.71

2.4 Test peripherals list

Item No.	Name	Brand and Model	Description
1	Laptop computer	DELL 5480	100-240V AC, 50/60Hz

2.5 Test environment condition:

Test items	Temperature	Humidity
Minimum 6dB Bandwidth	20°C	49%RH
Maximum conducted output power and e.i.r.p.		
Power spectrum density		
Emission outside the frequency band		
Occupied bandwidth		
Radiated Emissions in restricted frequency bands	22°C	51%RH
Power line conducted emission	21°C	52%RH

2.6 Instrument list

Conducted Emission					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☒	Test Receiver	R&S	ESR7	EC 6194	2022-12-09
☒	A.M.N.	R&S	ESH2-Z5	EC 3119	2022-11-09
☒	Attenuator	Weinschel	68-6-44	EC 3043-9	2023-02-08
☒	Shielded room	Zhongyu	-	EC 2838	2023-01-11
Radiated Emission					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☒	Test Receiver	R&S	ESIB 26	EC 3045	2022-10-19
☒	Bilog Antenna	TESEQ	CBL 6112B	EC 6411	2022-11-05
☒	Pre-amplifier	tonscend	tap01018050	EC 6432-1	2022-12-26
☒	Horn antenna	tonscend	bha9120d	EC 6432-2	2023-01-09
☒	Horn antenna	ETS	3117	EC 4792-1	2023-03-27
☒	Horn antenna	TOYO	HAP18-26W	EC 4792-3	2023-07-08
☒	Pre-amplifier	R&S	AFS42-00101800 -25-S-42	EC 5262	2023-09-07
☒	Semi-anechoic chamber	Albatross project	-	EC 3048	2023-08-21
RF test					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☒	PXA Signal Analyzer	Keysight	N9030A	EC 5338	2023-03-14
☒	Power sensor	Agilent	U2021XA	EC 5338-1	2023-03-14
☒	Vector Signal Generator	Agilent	N5182B	EC 5175	2023-03-14
☒	MXG Analog Signal Generator	Agilent	N5181A	EC 5338-2	2023-03-14
☒	Test Receiver	R&S	ESCI 7	EC 4501	2022-12-09
☒	Climate chamber	GWS	MT3065	EC 6021	2023-03-06
☒	Spectrum Analyzer	Keysight	N9030b	EC 6078	2023-09-07
☒	Universal Radio Communication Tester	R&S	CMW500	EC 6209	2023-01-20
☒	Signal generator	Agilent	N5182A	EC 6172	2023-08-18
☒	Signal generator	Agilent	N5181A	EC 6171	2023-08-18
Additional instrument					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☒	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 3442	2023-01-03
☒	Pressure meter	YM3	Shanghai Mengde	EC 3320	2022-10-21

2.7 Measurement uncertainty

The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Test item	Measurement uncertainty
Maximum peak output power	$\pm 0.74\text{dB}$
Minimum 6dB bandwidth	
Powe spectrum density	
Emission outside the frequency band	
Occupied bandwidth	
Radiated Emissions in restricted frequency bands below 1GHz	$\pm 4.90\text{dB}$
Radiated Emissions in restricted frequency bands above 1GHz	$\pm 5.02\text{dB}$
Emission outside the frequency band	$\pm 2.89\text{dB}$
Power line conducted emission	$\pm 3.19\text{dB}$

3 Minimum 6dB bandwidth

Test result: Pass

3.1 Limit

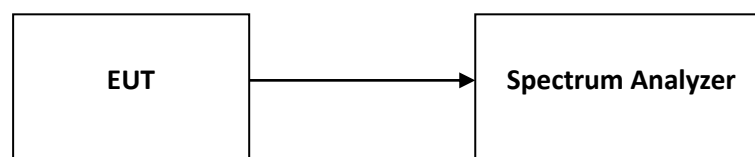
For systems using digital modulation techniques that may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz and 5725 - 5850 MHz bands, the minimum 6 dB bandwidth shall be at least 500 kHz.

3.2 Measurement Procedure

The EUT was tested according to Subclause 11.8 of ANSI C63.10.

- a) Set RBW = 100 kHz.
- b) Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.
- g) 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.

3.3 Test Configuration



3.4 Test Results of Minimum 6dB bandwidth

Please refer to Appendix A

TEST REPORT

4 Maximum conducted output power and e.i.r.p.

Test result: Pass

4.1 Limit

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 W. (The e.i.r.p. shall not exceed 4 W)

If the transmitting antenna of directional gain greater than 6dBi is used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi. If there have a beam forming type, the limit should be the minimum of 30dBm and 30+ (6 –antenna gain-beam forming gain).

4.2 Measurement Procedure

The EUT was tested according to Subclause 11.9.2.2 of ANSI C63.10.

- a) Measure the duty cycle, x , of the transmitter output signal as described in Section 6.0.
- b) Set span to at least $1.5 \times \text{OBW}$.
- c) Set RBW = 1 % to 5 % of the OBW, not to exceed 1 MHz.
- d) Set VBW $\geq 3 \times \text{RBW}$.
- e) 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.)
- f) Sweep time = auto.
- g) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
- h) Do not use sweep triggering. Allow the sweep to “free run”.
- i) Trace average at least 100 traces in power averaging (i.e., 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.
- j) 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, sum the spectrum levels (in power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.
- k) Add $10 \log (1/x)$, where x is the duty cycle, to the measured power in order 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 %.

4.3 Test Configuration



4.4 Test Results of Maximum conducted output power

Please refer to Appendix A

5 Power spectrum density

Test result: Pass

5.1 Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.

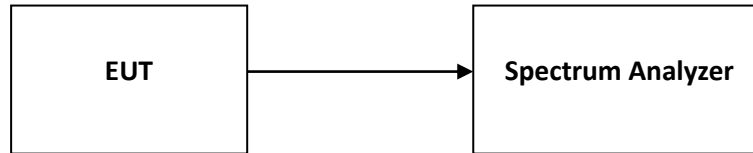
If the transmitting antenna of directional gain greater than 6dBi is used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi. If there have a beam forming type, the limit should be the minimum of 8dBm/MHz and $8 + (6 - \text{antenna gain} - \text{beam forming gain})$.

5.2 Measurement Procedure

The EUT was tested according to Subclause 11.10 of ANSI C63.10.

This procedure is applicable when the EUT cannot be configured to transmit continuously (i.e., duty cycle < 98 %), and when sweep triggering/signal gating cannot be used to measure only when the EUT is transmitting at its maximum power control level, and when the transmission duty cycle is constant (i.e., duty cycle variations are less than $\pm 2\%$):

- a) Measure the duty cycle (x) of the transmitter output signal as described in Section 6.0.
- b) Set instrument center frequency to DTS channel center frequency.
- c) Set span to at least $1.5 \times \text{OBW}$.
- d) Set RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- e) Set VBW $\geq 3 \times \text{RBW}$.
- f) Detector = power averaging (RMS) or sample detector (when RMS not available).
- g) Ensure that the number of measurement points in the sweep $\geq 2 \times \text{span}/\text{RBW}$.
- h) Sweep time = auto couple.
- i) Do not use sweep triggering. Allow sweep to "free run".
- j) Employ trace averaging (RMS) mode over a minimum of 100 traces.
- k) Use the peak marker function to determine the maximum amplitude level.
- l) Add $10 \log(1/x)$, where x is the duty cycle measured in step (a), to the measured PSD to compute the average PSD during the actual transmission time.
- m) If resultant value exceeds the limit, then reduce RBW (no less than 3 kHz) and repeat (note that this may require zooming in on the emission of interest and reducing the span in order to meet the minimum measurement point requirement as the RBW is reduced).

TEST REPORT**5.3 Test Configuration****5.4 Test Results of Power spectrum density**

Please refer to Appendix A

6 Emission outside the frequency band

Test result: Pass

6.1 Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 30 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

6.2 Measurement Procedure

The EUT was tested according to Subclause 11.11 of ANSI C63.10.

Reference level measurement

Establish a reference level by using the following procedure:

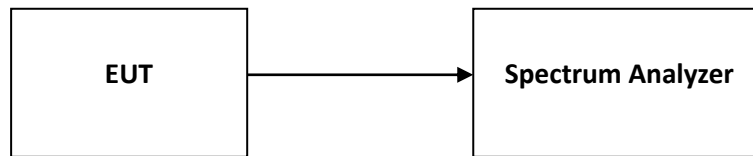
- a) Set instrument center frequency to DTS channel center frequency.
- b) Set the span to ≥ 1.5 times the DTS bandwidth.
- c) Set the RBW = 100 kHz.
- d) Set the VBW $\geq 3 \times$ RBW.
- e) Detector = peak.
- f) Sweep time = auto couple.
- g) Trace mode = max hold.
- h) Allow trace to fully stabilize.
- i) Use the peak marker function to determine the maximum PSD level.

Emission level measurement

- a) Set the center frequency and span to encompass frequency range to be measured.
- b) Set the RBW = 100 kHz.
- c) Set the VBW $\geq 3 \times$ RBW.
- d) Detector = peak.
- e) Sweep time = auto couple.
- f) Trace mode = max hold.
- g) Allow trace to fully stabilize.
- h) Use the peak marker function to determine the maximum amplitude level.

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements specified in 11.1 a) or 11.1 b). Report the three highest emissions relative to the limit.

6.3 Test Configuration



6.4 The results of Emission outside the frequency band

Please refer to Appendix A

7 Radiated Emissions in restricted frequency bands

Test result: Pass

7.1 Limit

The radiated emissions which fall in the restricted bands, must also comply with the radiated emission limits specified showed as below:

Frequencies (MHz)	Field Strength (microvolts/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

7.2 Measurement Procedure

The EUT was tested according to Subclause 11.12 of ANSI C63.10.

For Radiated emission below 30MHz:

- The EUT was placed on the top of a rotating turntable 0.1 meters above the ground at a 3 meter chamber room. The turntable 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.
- Both X and Y axes of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

NOTE:

- The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

For Radiated emission above 30MHz:

- The EUT was placed on the top of a rotating turntable 0.1 meters (for 30MHz ~ 1GHz) / 1.5 meters

TEST REPORT

(for above 1GHz) above the ground at 3 meter chamber room for test. The turntable was rotated 360 degrees to determine the position of the highest radiation.

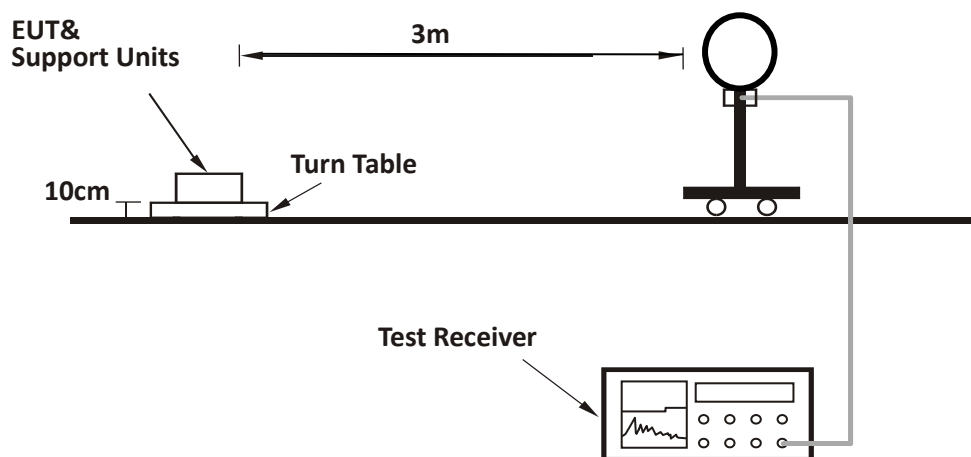
- b) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c) The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical 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 rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e) The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f) The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

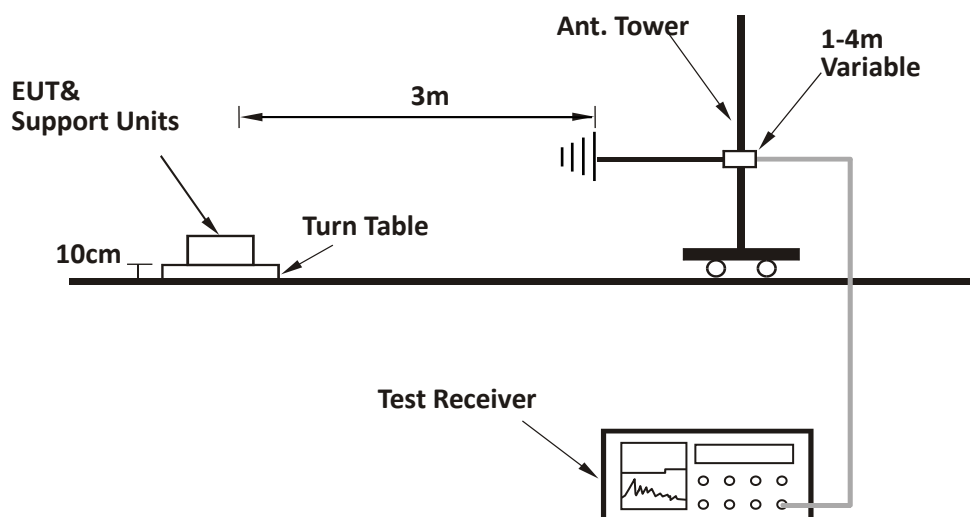
- 1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
- 2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
- 3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is $\geq 1/T$ (Duty cycle < 98%) or $3 \times \text{RBW}$ (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.
- 4. All modes of operation were investigated and the worst-case emissions are reported

7.3 Test Configuration

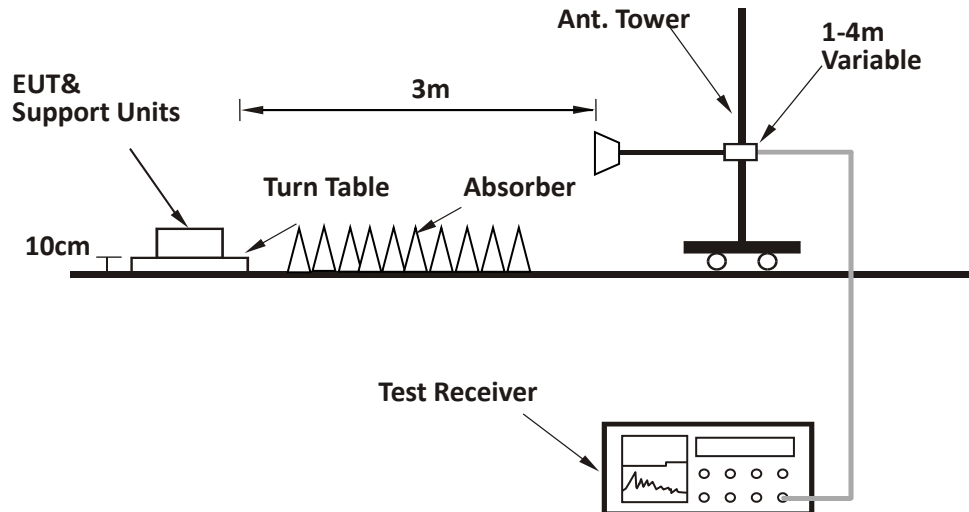
For Radiated emission below 30MHz:



For Radiated emission 30MHz to 1GHz:



For Radiated emission above 1GHz:

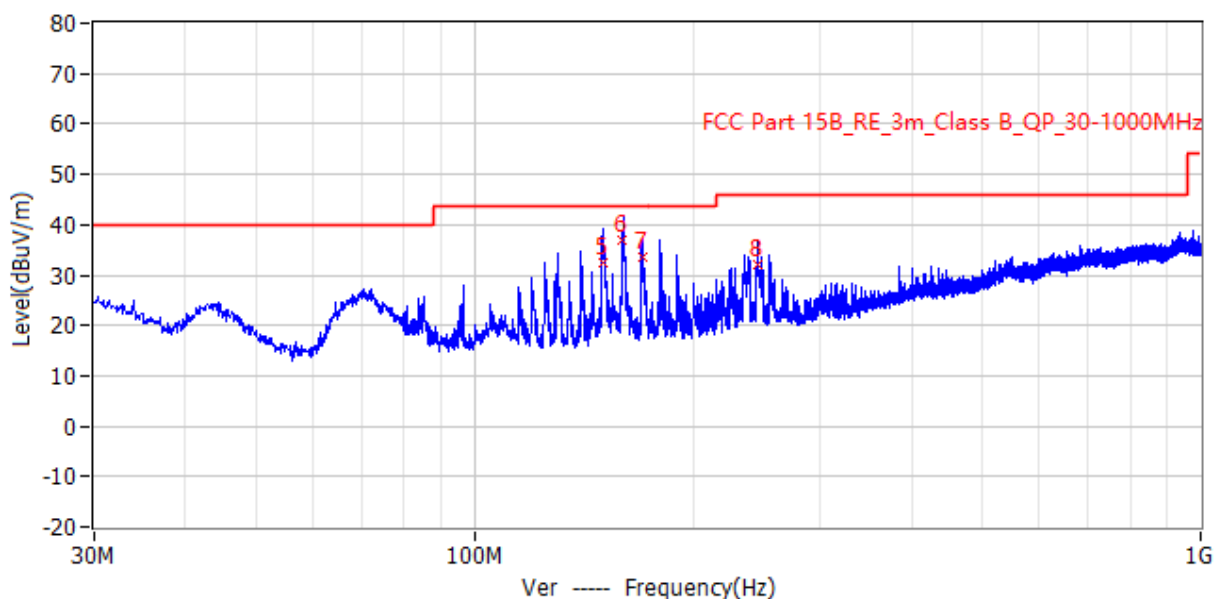
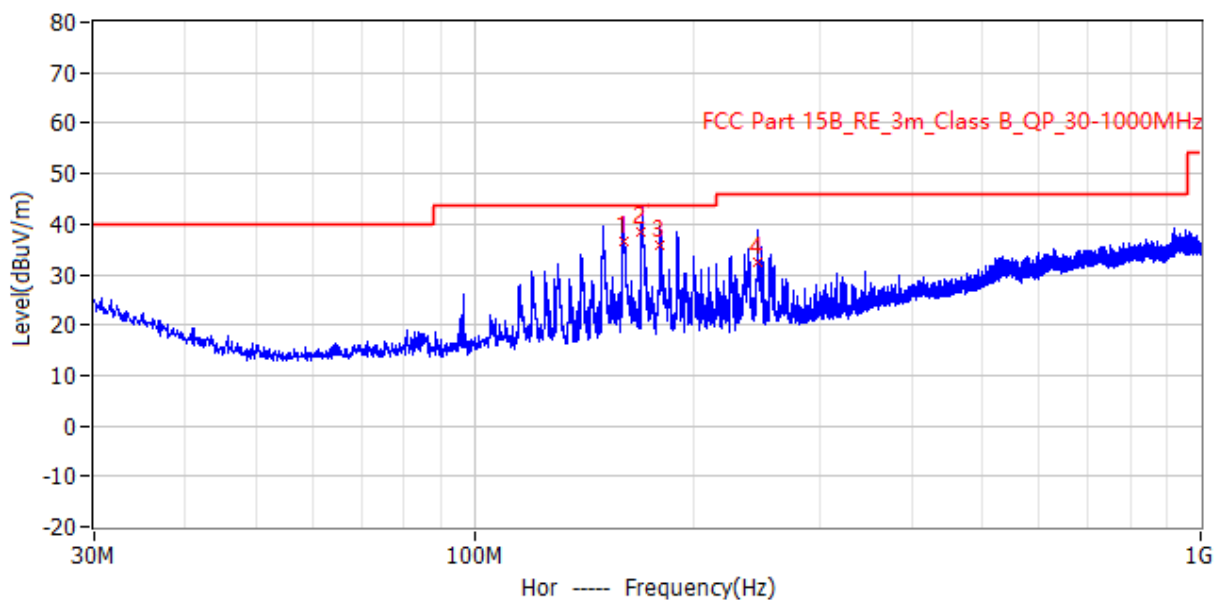


7.4 Test Results of Radiated Emissions

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

We test all models, and the worst waveform from 30MHz to 1000MHz is listed as below:

30M~1GHz:



Test data:

Antenna Polarization	Frequency (MHz)	Corrected Reading (dBuV/m)	Original Receiver Reading dBuV	Correct Factor (dB/m)	Limit (dBuV/m)	Margin (dB/m)	Detector
H	160.38	36.70	25.80	10.90	43.50	6.80	QP
	170.00	38.60	28.30	10.30	43.50	4.90	QP
	180.39	35.80	25.00	10.80	43.50	7.70	QP
	245.15	32.30	19.10	13.20	46.00	13.70	QP
V	150.53	32.40	22.10	10.30	43.50	11.10	QP
	160.18	36.90	26.00	10.90	43.50	6.60	QP
	170.46	33.60	23.20	10.40	43.50	9.90	QP
	245.18	32.10	18.90	13.20	46.00	13.90	QP

Remark:

1. Correct Factor = Antenna Factor + Cable Loss (+ Amplifier, for higher than 1GHz), the value was added to Original Receiver Reading by the software automatically.
2. Measured Level = Original Receiver Reading + Correct Factor
3. Margin= Limit - Measured Level
4. If the PK Corrected Reading is lower than AV limit, the AV test can be elided.

Example: Assuming Antenna Factor = 30.20dB/m, Cable Loss = 2.00dB,
Gain of Preamplifier = 32.00dB, Original Receiver Reading = 10.00dBuV,
Limit = 40.00dBuV/m.
Then Correct Factor = 30.20 + 2.00 – 32.00 = 0.20dB/m;
Corrected Reading = 10dBuV + 0.20dB/m = 10.20dBuV/m;
Margin = 40.00dBuV/m - 10.20dBuV/m = 29.80dB.

TEST REPORT

Test data:

The emission was conducted from 1GHz to 25GHz

We test all models and the worst result above 1GHz is listed as below.

802.11b

CH	Antenna	Frequency (MHz)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	Detector
L	H	2390.00	40.80	74.00	33.20	PK
	V	2390.00	41.10	74.00	32.90	PK
	H	4824.00	37.30	74.00	36.70	PK
	V	4824.00	37.40	74.00	36.60	PK
M	H	4874.00	38.20	74.00	35.80	PK
	V	4874.00	38.60	74.00	35.40	PK
H	H	2483.50	39.10	74.00	34.90	PK
	V	2483.50	38.60	74.00	35.40	PK
	H	4824.00	36.10	74.00	37.90	PK
	V	4824.00	36.90	74.00	37.10	PK

802.11g

CH	Antenna	Frequency (MHz)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	Detector
L	H	2390.00	37.20	74.00	36.80	PK
	V	2390.00	37.20	74.00	36.80	PK
	H	4824.00	36.40	74.00	37.60	PK
	V	4824.00	35.90	74.00	38.10	PK
M	H	4874.00	35.30	74.00	38.70	PK
	V	4874.00	38.20	74.00	35.80	PK
H	H	2483.50	36.80	74.00	37.20	PK
	V	2483.50	36.40	74.00	37.60	PK
	H	4824.00	37.30	74.00	36.70	PK
	V	4824.00	37.70	74.00	36.30	PK

TEST REPORT

802.11n(HT20)

CH	Antenna	Frequency (MHz)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	Detector
L	H	2390.00	36.20	74.00	37.80	PK
	V	2390.00	35.40	74.00	38.60	PK
	H	4824.00	34.40	74.00	39.60	PK
	V	4824.00	34.70	74.00	39.30	PK
M	H	4874.00	34.90	74.00	39.10	PK
	V	4874.00	32.90	74.00	41.10	PK
H	H	2483.50	35.80	74.00	38.20	PK
	V	2483.50	37.10	74.00	36.90	PK
	H	4824.00	35.50	74.00	38.50	PK
	V	4824.00	35.10	74.00	38.90	PK

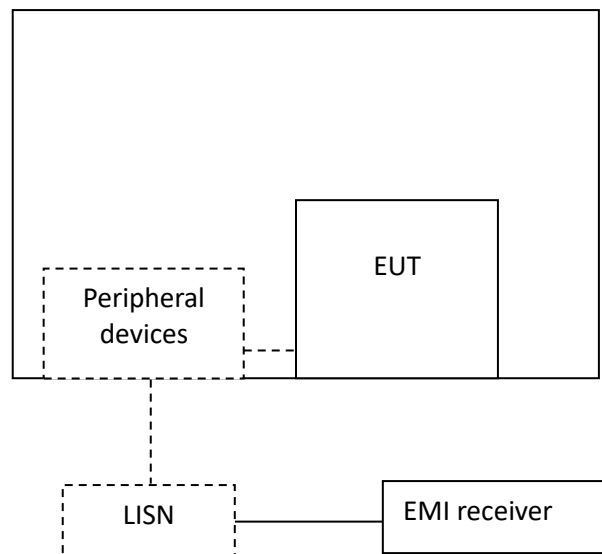
8 Power line conducted emission

Test result: Pass

8.1 Limit

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	QP	AV
0.15-0.5	66 to 56*	56 to 46 *
0.5-5	56	46
5-30	60	50
* Decreases with the logarithm of the frequency.		

8.2 Test Configuration



TEST REPORT**8.3 Measurement Procedure**

Measured levels of ac power-line conducted emission shall be the emission voltages from the voltage probe, where permitted, or across the 50 Ω LISN port (to which the EUT is connected), where permitted, terminated into a 50 Ω measuring instrument. All emission voltage and current measurements shall be made on each current-carrying conductor at the plug end of the EUT power cord by the use of mating plugs and receptacles on the LISN, if used. Equipment shall be tested with power cords that are normally supplied or recommended by the manufacturer and that have electrical and shielding characteristics that are the same as those cords normally supplied or recommended by the manufacturer. For those measurements using a LISN, the 50 Ω measuring port is terminated by a measuring instrument having 50 Ω input impedance. All other ports are terminated in 50 Ω loads.

Tabletop devices shall be placed on a platform of nominal size 1 m by 1.5 m, raised 80 cm above the reference ground plane. The vertical conducting plane or wall of an RF-shielded (screened) room shall be located 40 cm to the rear of the EUT. Floor-standing devices shall be placed either directly on the reference ground-plane or on insulating material as described in ANSI C63.4. All other surfaces of tabletop or floor-standing EUTs shall be at least 80 cm from any other grounded conducting surface, including the case or cases of one or more LISNs.

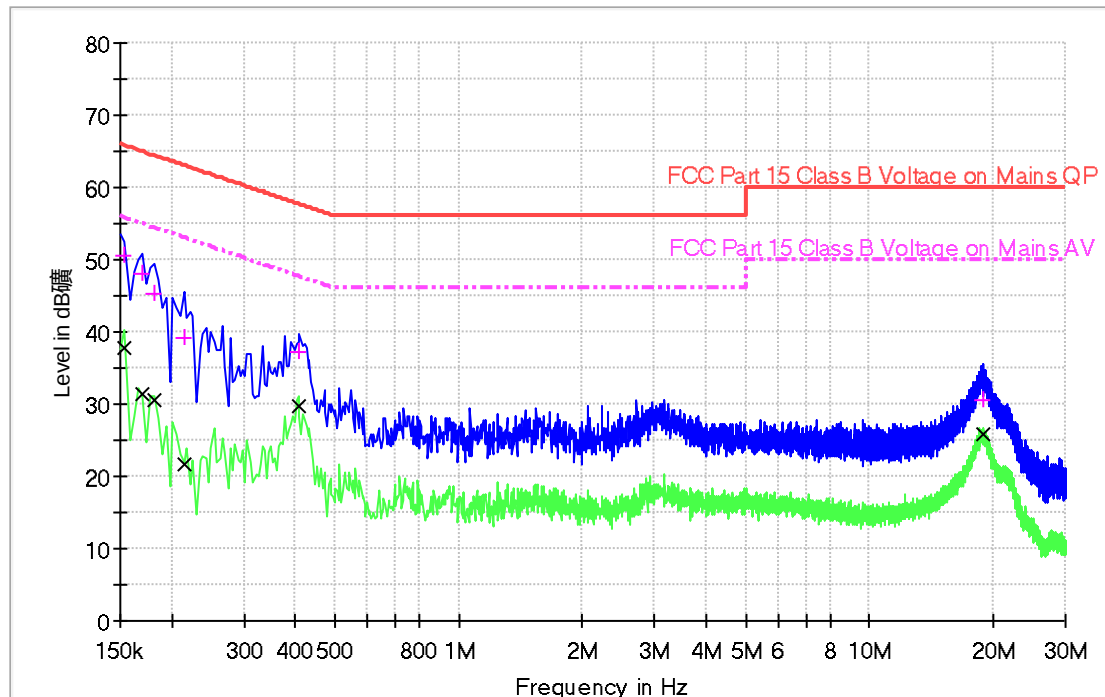
The bandwidth of the test receiver is set at 9 kHz.

TEST REPORT

8.4 Test Results of Power line conducted emission

Test Curve:

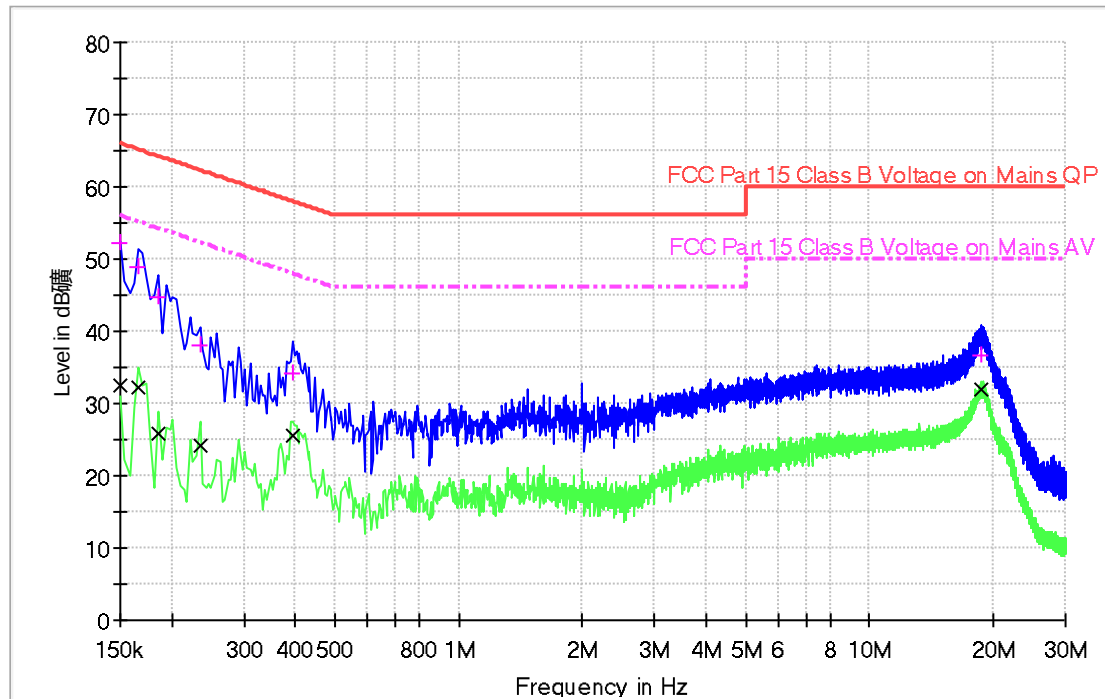
L Line
FCC Part15 ClassB



Test Data:

Frequency (MHz)	QuasiPeak (dBμV)	Margin - QPK (dB)	Limit - QPK (dBμV)	CAverage (dBμV)	Margin - AV (dB)	Limit - AV (dBμV)
0.15	50.44	15.34	65.78	37.85	17.93	55.78
0.17	47.95	17.01	64.96	31.44	23.52	54.96
0.18	45.15	19.24	64.39	30.69	23.71	54.39
0.21	39.23	23.82	63.05	21.78	31.27	53.05
0.40	37.36	20.37	57.73	29.70	18.03	47.73
18.81	30.68	29.32	60.00	25.93	24.07	50.00

N Line
FCC Part15 ClassB



Test Data:

Frequency (MHz)	QuasiPeak (dBμV)	Margin - QPK (dB)	Limit - QPK (dBμV)	CAverage (dBμV)	Margin - CAV (dB)	Limit - CAV (dBμV)
0.15	52.29	13.71	66.00	32.50	23.50	56.00
0.16	48.90	16.26	65.16	32.31	22.85	55.16
0.18	44.77	19.44	64.21	25.84	28.37	54.21
0.23	38.18	24.12	62.31	24.15	28.16	52.31
0.39	34.03	23.95	57.98	25.49	22.49	47.98
18.69	36.74	23.26	60.00	32.03	17.97	50.00

Remark: 1. Correct Factor = LISN Factor + Cable Loss, the value was added to Original Receiver Reading by the software automatically.

2. Corrected Reading = Original Receiver Reading + Correct Factor

3. Margin = Limit - Corrected Reading

4. If the PK Corrected Reading is lower than AV limit, the AV test can be elided.

9 Occupied Bandwidth

Test result: Pass

9.1 Limit

None

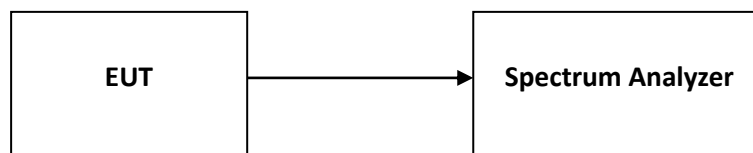
9.2 Measurement Procedure

The occupied bandwidth per RSS-Gen Issue 4 Clause 6.6 was measured using the Spectrum Analyzer.

The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.

The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) shall be approximately 3x RBW.

9.3 Test Configuration



9.4 The results of Occupied Bandwidth

Please refer to Appendix A

10 Antenna requirement

Requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

Result:

EUT uses permanently attached antenna to the intentional radiator, so it can comply with the provisions of this section.

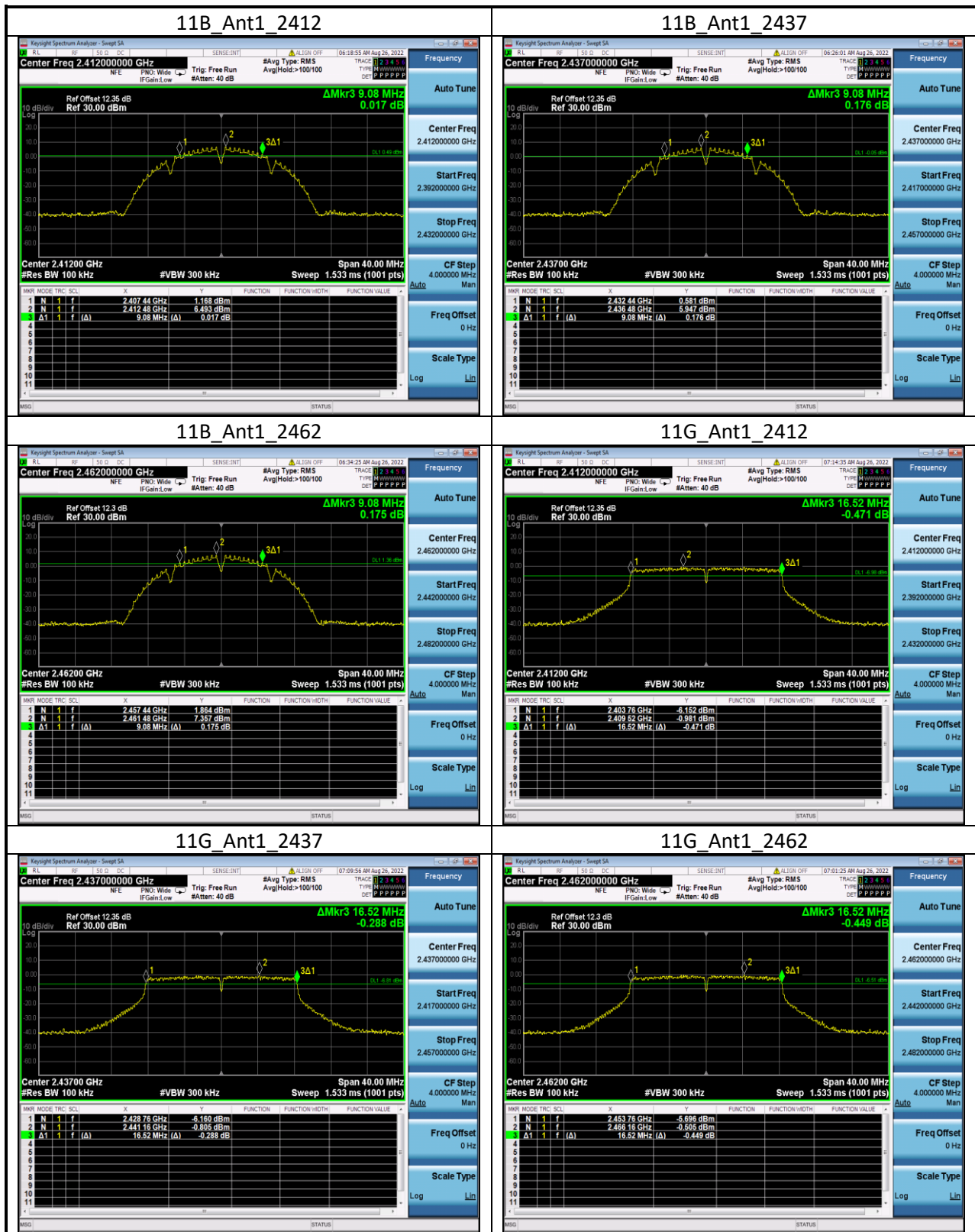
Appendix A: Test results

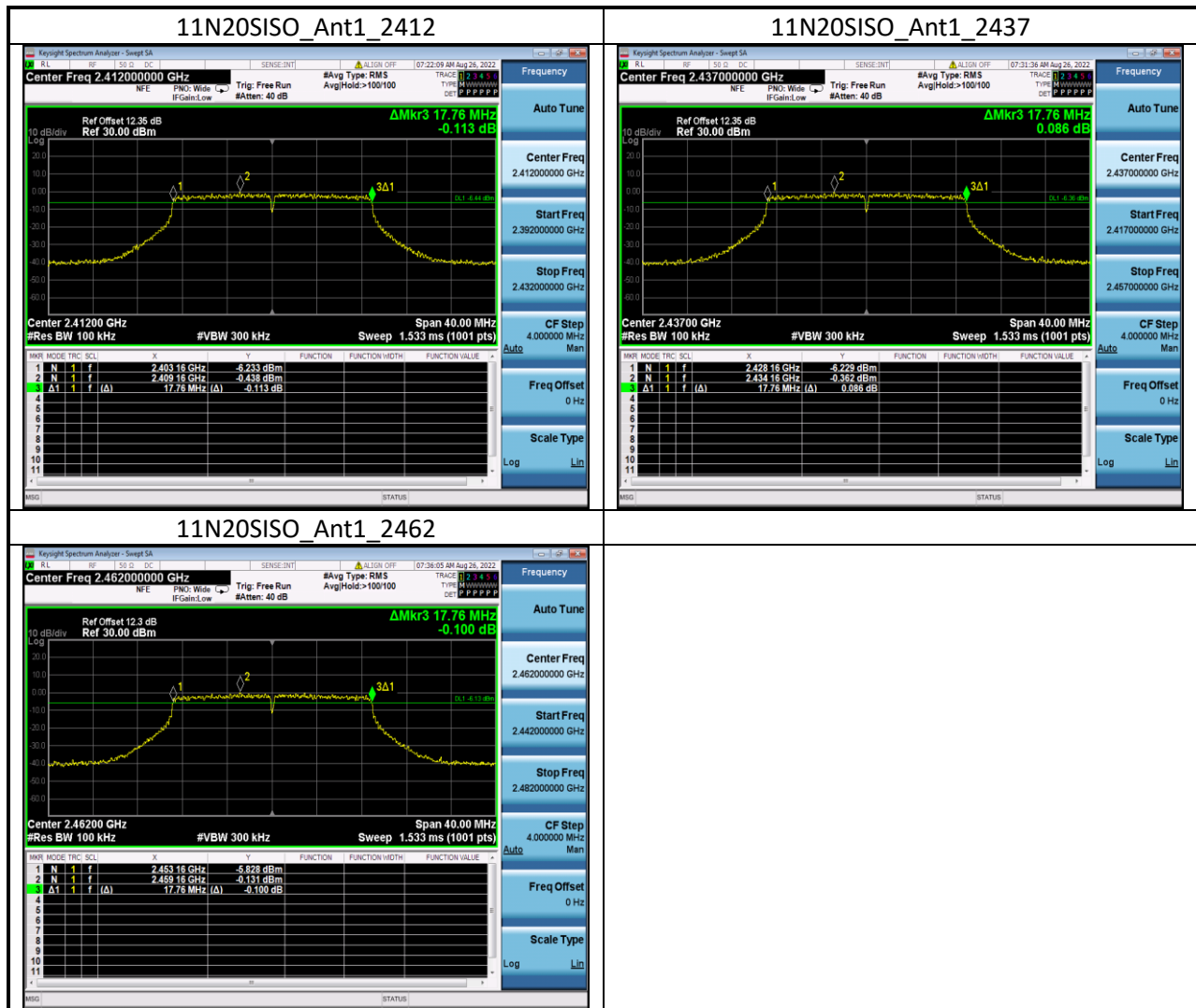
DTS Bandwidth

Test Data

TestMode	Antenna	Frequency [MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit [MHz]	Verdict
11B	Ant1	2412	9.080	2407.440	2416.520	0.5	PASS
		2437	9.080	2432.440	2441.520	0.5	PASS
		2462	9.080	2457.440	2466.520	0.5	PASS
11G	Ant1	2412	16.520	2403.760	2420.280	0.5	PASS
		2437	16.520	2428.760	2445.280	0.5	PASS
		2462	16.520	2453.760	2470.280	0.5	PASS
11N20SISO	Ant1	2412	17.760	2403.160	2420.920	0.5	PASS
		2437	17.760	2428.160	2445.920	0.5	PASS
		2462	17.760	2453.160	2470.920	0.5	PASS

Test Plots



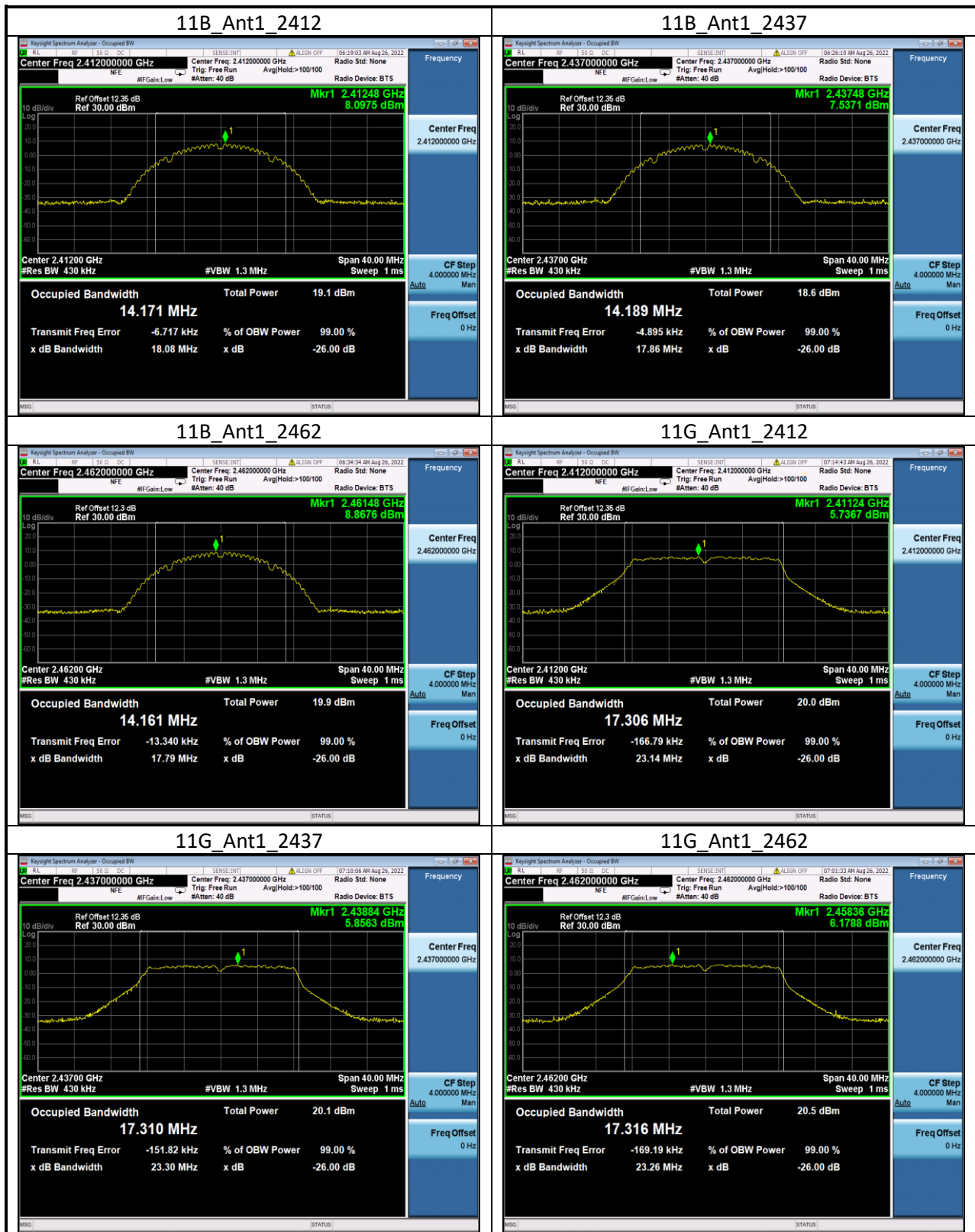


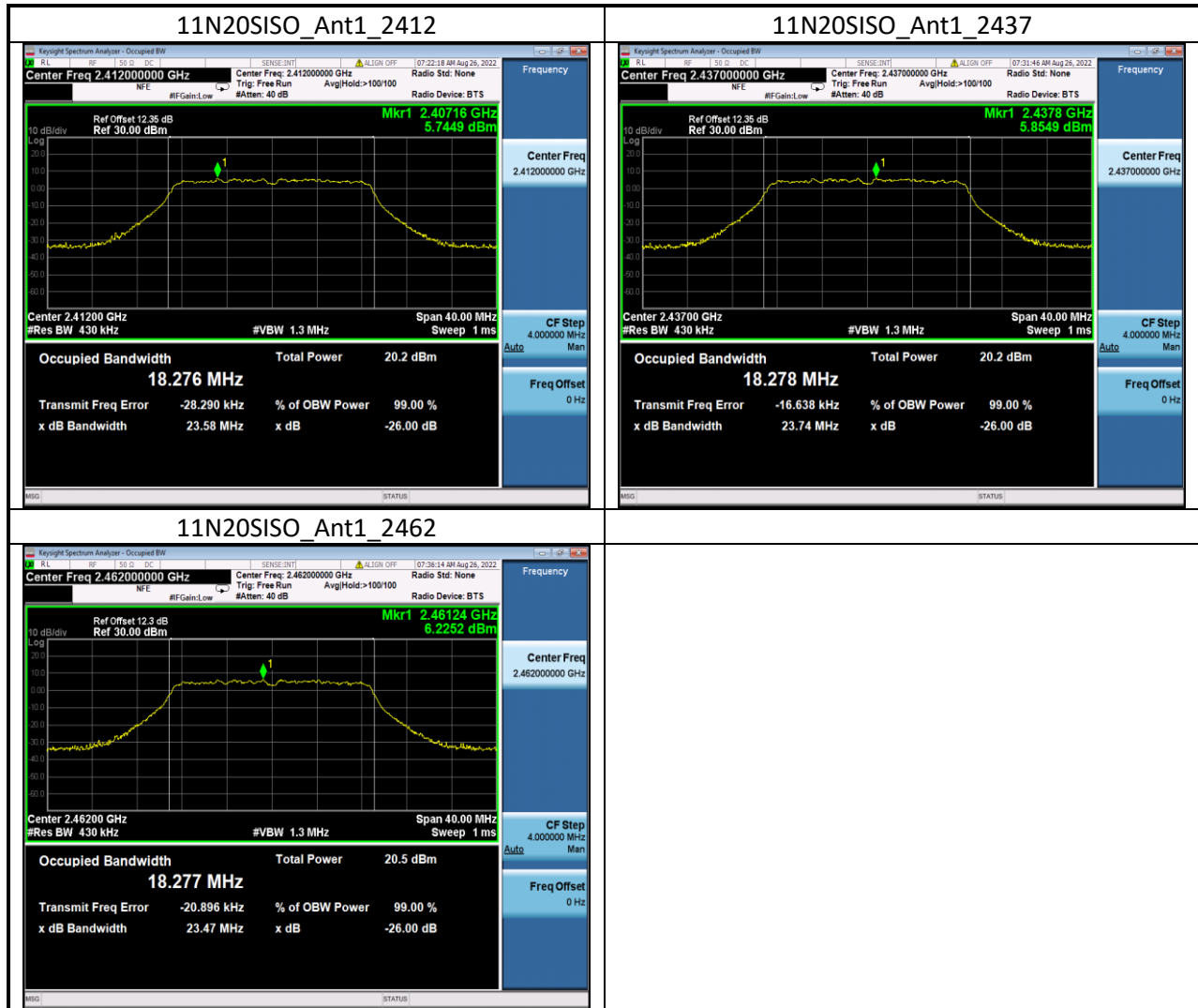
Occupied Channel Bandwidth

Test Data

TestMode	Antenna	Channel Frequency [MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit [MHz]	Verdict
11B	Ant1	2412	14.168	2404.910	2419.078	---	---
		2437	14.186	2429.902	2444.088	---	---
		2462	14.157	2454.908	2469.065	---	---
11G	Ant1	2412	17.301	2403.185	2420.486	---	---
		2437	17.299	2428.202	2445.501	---	---
		2462	17.284	2453.206	2470.490	---	---
11N20SISO	Ant1	2412	18.274	2402.836	2421.110	---	---
		2437	18.268	2427.855	2446.123	---	---
		2462	18.269	2452.848	2471.117	---	---

Test Plots



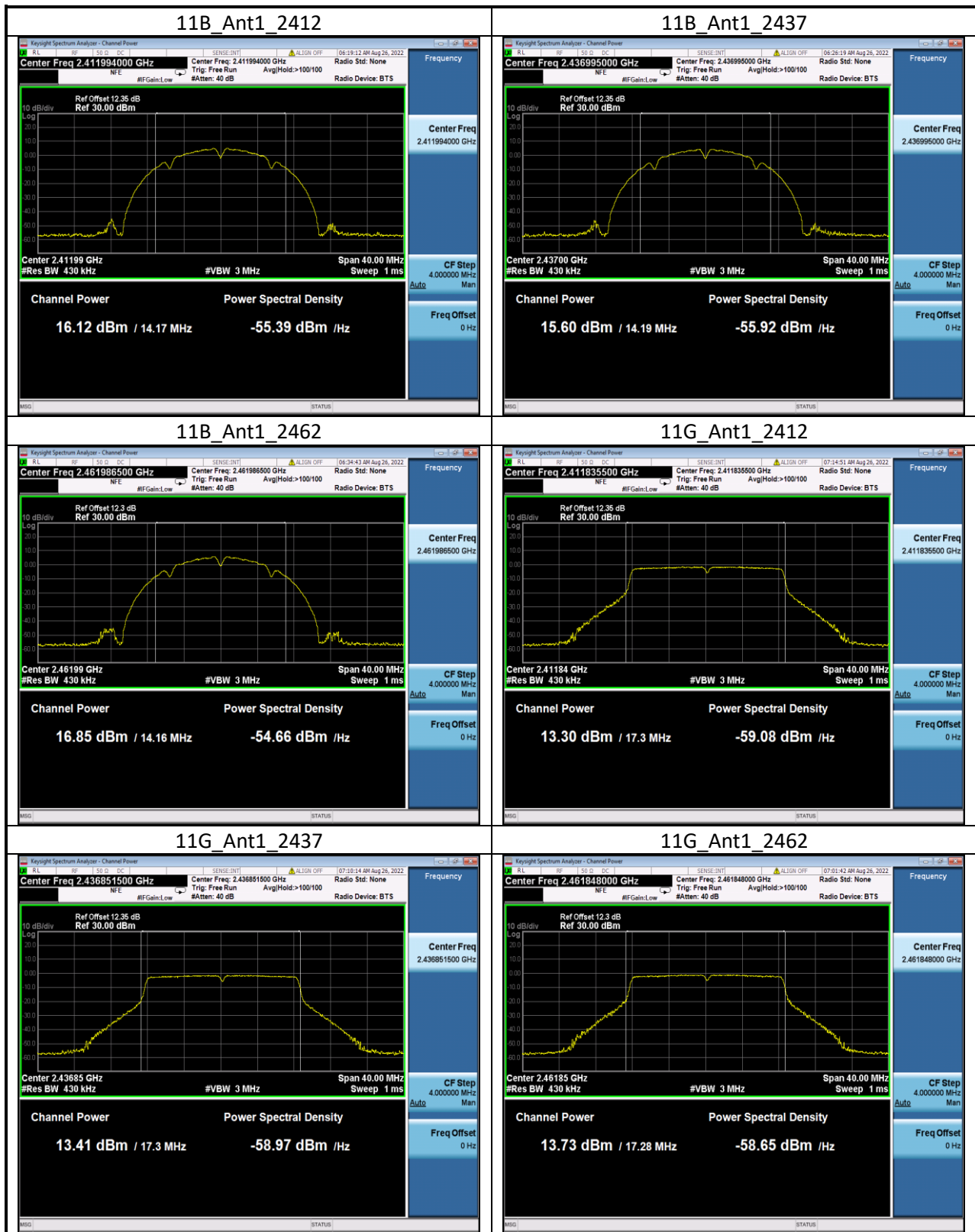


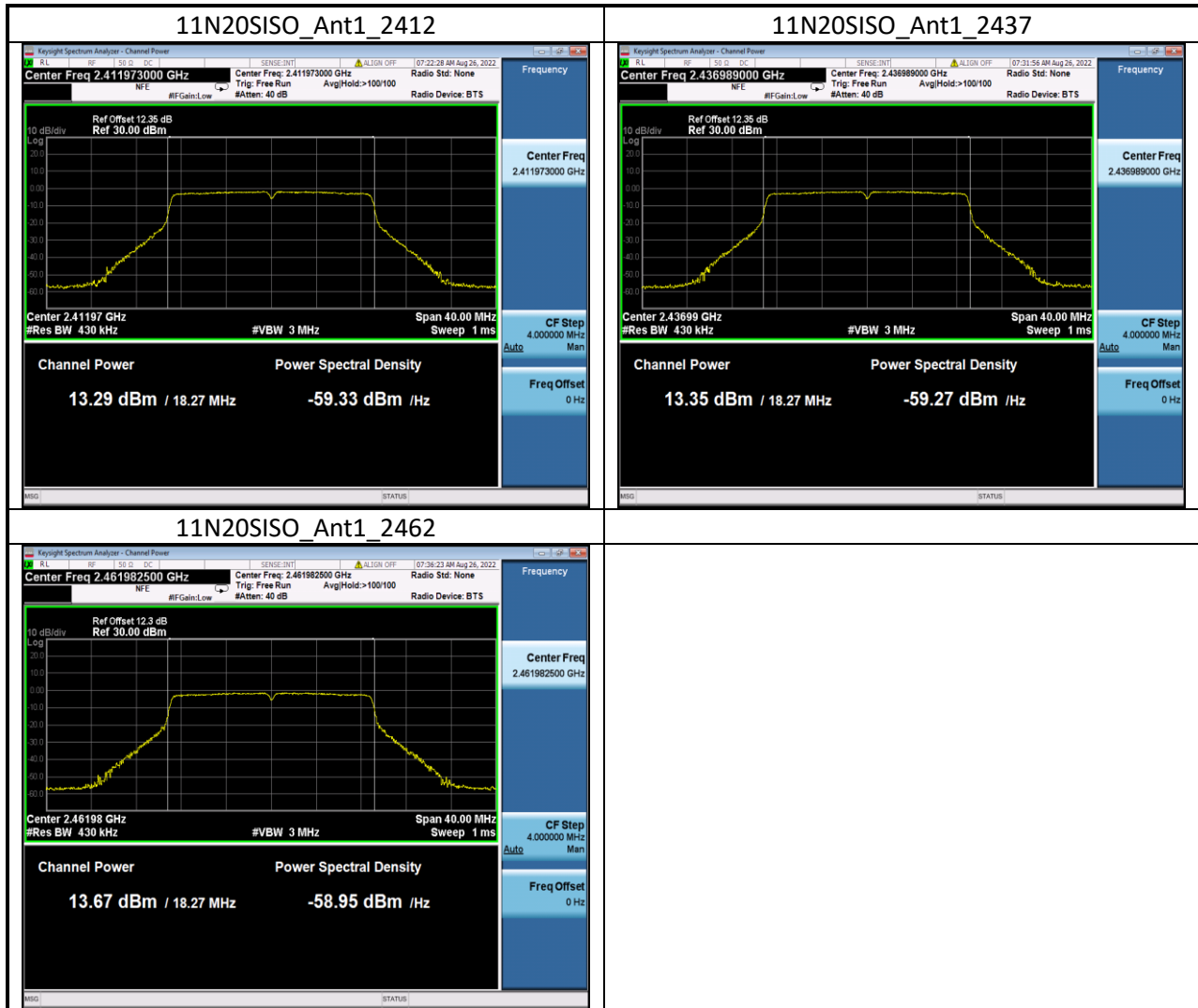
Maximum conducted output power and e.i.r.p

Test Data

TestMode	Antenna	Frequency [MHz]	Peak Power[dBm]	Conducted Limit[dBm]	EIRP [dBm]	EIRP Limit[dBm]	Verdict
11B	Ant1	2412	16.13	≤30.00	18.67	≤36.00	PASS
		2437	15.60	≤30.00	18.14	≤36.00	PASS
		2462	16.86	≤30.00	19.40	≤36.00	PASS
11G	Ant1	2412	13.31	≤30.00	15.85	≤36.00	PASS
		2437	13.42	≤30.00	15.96	≤36.00	PASS
		2462	13.75	≤30.00	16.29	≤36.00	PASS
11N20SIS O	Ant1	2412	13.28	≤30.00	15.82	≤36.00	PASS
		2437	13.35	≤30.00	15.89	≤36.00	PASS
		2462	13.66	≤30.00	16.20	≤36.00	PASS

Test Plots





Maximum power spectrum density

Test Data

TestMode	Antenna	Frequency [MHz]	Result [dBm/3-100kHz]	Limit [dBm/3kHz]	Verdict
11B	Ant1	2412	-16.12	≤8.00	PASS
		2437	-15.22	≤8.00	PASS
		2462	-14.85	≤8.00	PASS
11G	Ant1	2412	-19.25	≤8.00	PASS
		2437	-18.99	≤8.00	PASS
		2462	-18.76	≤8.00	PASS
11N20SISO	Ant1	2412	-19.89	≤8.00	PASS
		2437	-19.65	≤8.00	PASS
		2462	-19.19	≤8.00	PASS

Test Plots

