



RF MEASUREMENT REPORT

FCC ID: HD5-EDA5S0

Applicant: Honeywell International Inc
Honeywell Safety and Productivity Solutions

Application Type: Certification

Product: Mobile Computer

Model No.: EDA5S-0

Brand Name: Honeywell

FCC Classification: Digital Transmission System (DTS)

FCC Rule Part(s): Part 15 Subpart C (Section 15.247)

Test Date: December 15 ~ 29, 2021

Reviewed By:

Jame Yuan

Approved By:

Robin Wu



The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.10-2013. Test results reported herein relate only to the item(s) tested.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Shenzhen) Co., Ltd.

Revision History

Report No.	Version	Description	Issue Date	Note
2111RSU063-U3	Rev. 01	Initial Report	12-30-2021	Valid

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1. General Information

1.1. Applicant

Honeywell International Inc
Honeywell Safety and Productivity Solutions
9680 Old Bailes Road, Fort Mill, SC 29707 United States

1.2. Manufacturer

Honeywell International Inc
Honeywell Safety and Productivity Solutions
9680 Old Bales Road, Fort Mill, SC 29707 United States

1.3. Testing Facility

☒	Test Site – MRT Suzhou Laboratory Laboratory Location (Suzhou - Wuzhong) D8 Building, No.2 Tian’edang Rd., Wuzhong Economic Development Zone, Suzhou, China Laboratory Location (Suzhou - SIP) 4b Building, Liando U Valley, No.200 Xingpu Rd., Shengpu Town, Suzhou Industrial Park, China Laboratory Accreditations A2LA: 3628.01 CNAS: L10551 FCC: CN1166 ISED: CN0001 VCCI: ☐ R-20025 ☐ G-20034 ☐ C-20020 ☐ T-20020 ☐ R-20141 ☐ G-20134 ☐ C-20103 ☐ T-20104
☒	Test Site – MRT Shenzhen Laboratory Laboratory Location (Shenzhen) 1G, Building A, Junxiangda Building, Zhongshanyuan Road West, Nanshan District, Shenzhen, China Laboratory Accreditations A2LA: 3628.02 CNAS: L10551 FCC: CN1284 ISED: CN0105
☐	Test Site – MRT Taiwan Laboratory Laboratory Location (Taiwan) No. 38, Fuxing 2nd Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.) Laboratory Accreditations TAF: L3261-190725 FCC: 291082, TW3261 ISED: TW3261

1.4. Product Information

Product Name	Mobile Computer
Model No.	EDA5S-0
Serial No.	Conducted Sample: 21294B506A Radiated Sample: 21294B4E4A
Wi-Fi Specification	802.11a/b/g/n/ac
Bluetooth Specification	v5.0 dual mode
NFC Specification	Active, 13.56MHz
Antenna Information	Refer to section 1.5
Working Voltage	3.85Vdc
Accessories	
Adapter	Model No.: ADS-12B-06 05010E Input Power: 100 - 240V ~ 50/60Hz, Max. 0.3A Output Power: 5VDC 2.0A
Rechargeable Li-ion Battery	Model No.: BAT-EDA5S Capacitance: 3060mAh 11.78Wh Rated Voltage: 3.85V
Remark: The information of EUT was provided by the manufacturer, and the accuracy of the information shall be the responsibility of the manufacturer.	

1.5. Radio Specification

Frequency Range	802.11b/g/n-HT20: 2412 ~ 2462MHz
Channel Number	802.11b/g/n-HT20: 11
Type of Modulation	802.11b: DSSS 802.11g/n: OFDM
Data Rate	802.11b: 1/2/5.5/11Mbps 802.11g: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 300Mbps
Antenna Type	FPC Antenna
Antenna Gain	1.78dBi

Note: For other features of this EUT, test report will be issued separately.

1.6. Working Frequencies

802.11b/g/n-HT20

Channel	Frequency	Channel	Frequency	Channel	Frequency
01	2412 MHz	02	2417 MHz	03	2422 MHz
04	2427 MHz	05	2432 MHz	06	2437 MHz
07	2442 MHz	08	2447 MHz	09	2452 MHz
10	2457 MHz	11	2462 MHz	--	--

2. Test Configuration

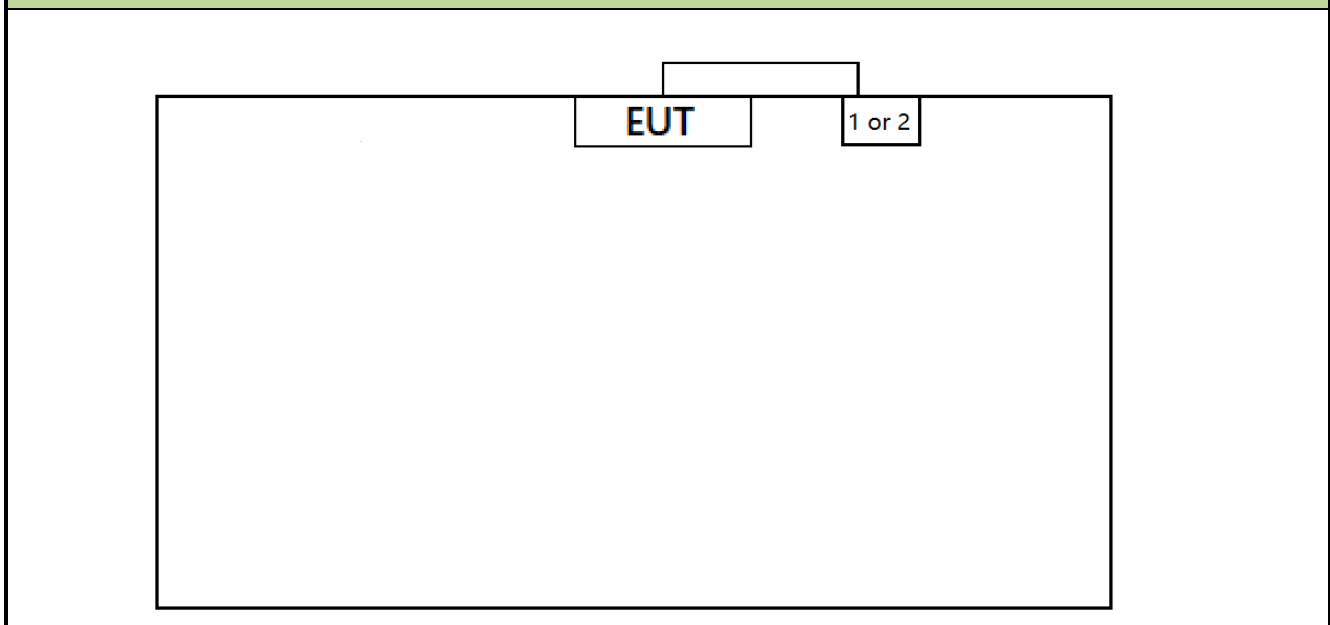
2.1. Test Mode

Mode 1: Transmit by 802.11b (1Mbps)
Mode 2: Transmit by 802.11g (24Mbps)
Mode 3: Transmit by 802.11n-HT20 (MCS7)

2.2. Test System Connection Diagram

The device was tested per the guidance ANSI C63.10: 2013 was used to reference the appropriate EUT setup for radiated emissions testing and AC line conducted testing.

Connection Diagram – Radiated Emission testing & AC Conducted Emissions



Cable Type		Cable Description
A	LAN Cable	Non shielded, > 10m
B	LAN Cable	Non shielded, 3.0m

2.3. Test System Details

Product		Manufacturer	Model No.
1	Adapter	Shenzhen Honor Electronic Co., Ltd	ADS-12B-06 05010E
2	Notebook	Lenovo	E431

2.4. Test Software

The test utility software used during testing was “QRCT”, and the version was 3.0.268.0..

2.5. Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 15.247
- KDB 558074 D01v05r02
- ANSI C63.10-2013

2.6. Test Environment Condition

Ambient Temperature	15 ~ 35°C
Relative Humidity	20 ~ 75%RH

3. Antenna Requirements

Excerpt from §15.203 of the FCC Rules/Regulations:

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can 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.”

- The antenna of the device is **permanently attached**.
- There are no provisions for connection to an external antenna.

Conclusion:

The unit complies with the requirement of §15.203.

4. Measuring Instrument

Instrument	Manufacturer	Model No.	Asset No.	Cali. Interval	Cali. Due Date	Test Site
Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06292	1 year	2022/10/20	NS-AC1
Anechoic Chamber	BOOMWAVE	NS-AC1	MRTSUE06496	1 year	2022/7/24	NS-AC1
Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06572	1 year	2022/3/14	NS-AC1
TRILOG Antenna	Schwarzbeck	VULB 9162	MRTSUE06573	1 year	2022/6/29	NS-AC1
Loop Antenna	Schwarzbeck	FMZB 1519 B	MRTSUE06937	1 year	2022/3/9	SIP-AC1
Preamplifier	Schwarzbeck	BBV 9718	MRTSUE06574	1 year	2022/7/12	NS-AC1
EMI Test Receiver	R&S	ESR3	MRTSUE06575	1 year	2022/6/27	NS-AC1
Thermohygrometer	DELI	NO.8813	MRTSUE06588	1 year	2022/6/30	NS-AC1
Preamplifier	EMCI	EMC184045SE	MRTSUE06641	1 year	2022/1/14	NS-AC1
Signal Analyzer	Agilent	N9010A	MRTSUE06195	1 year	2022/3/17	NS-AC1/NS-TR2
Signal Analyzer	Keysight	N9020A	MRTSUE10065	1 year	2022/6/17	NS-AC1/NS-TR2
Shielding Room	BOOMWAVE	NS-SR2	MRTSUE06551	/	/	NS-SR2
EMI Test Receiver	R&S	ESL3	MRTSUE06576	1 year	2022/6/27	NS-SR2
Two-Line V-Network	R&S	ENV216	MRTSUE06577	1 year	2022/7/4	NS-SR2
Two-Line V-Network	R&S	ENV216	MRTSUE06578	1 year	2022/7/4	NS-SR2
ISN	R&S	ENY81	MRTSUE06579	1 year	2022/7/4	NS-SR2
ISN	R&S	ENY81-CA6	MRTSUE06580	1 year	2022/6/15	NS-SR2
Thermohygrometer	DELI	NO.8813	MRTSUE06587	1 year	2022/6/30	NS-SR2
USB Power Sensor	Keysight	U2021XA	MRTSUE06581	1 year	2022/8/15	NS-TR2
Thermohygrometer	DELI	NO.8813	MRTSUE06783	1 year	2022/5/9	NS-TR2
Temperature Chamber	OUKE	OK-TH-100C	MRTSUE06899	1 year	2022/11/1	NS-TR2

Software	Version	Function
EMI Software	V3	EMI Test Software

Note: Test site (NS-AC1 & NS-SR2 & NS-TR2) belong to MRT Shenzhen Laboratory, Test site (SIP-AC1) belong to MRT Suzhou Laboratory.

5. Measurement Uncertainty

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

AC Conducted Emission Measurement
Measurement Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$): 9kHz~150kHz: 3.74dB 150kHz~30MHz: 3.44dB
Radiated Disturbance
Measurement Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$): Horizontal: 30MHz~300MHz: 5.04dB 300MHz~1GHz: 4.95dB 1GHz~40GHz: 6.40dB Vertical: 30MHz~300MHz: 5.24dB 300MHz~1GHz: 6.03dB 1GHz~40GHz: 6.40dB
Spurious Emissions, Conducted
Measuring Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$): 0.78dB
Output Power
Measuring Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$): 1.13dB
Power Spectrum Density
Measuring Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$): 1.15dB
Occupied Bandwidth
Measuring Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$): 0.28%

6. Test Result

6.1. Summary

FCC Section(s)	Test Description	Test Condition	Verdict
15.247(a)(2)	6dB Bandwidth	Conducted	Pass
15.247(b)(3)	Output Power		Pass
15.247(e)	Power Spectral Density		Pass
15.247(d)	Band Edge / Out-of-Band Emissions		Pass
15.205 15.209	General Field Strength (Restricted Bands and Radiated Emission)	Radiated	Pass
15.207	AC Conducted Emissions 150kHz - 30MHz	Line Conducted	Pass

Remark:

1. The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.
2. For radiated emission tests, every axis (X, Y, Z) was also verified. The test results shown in the following sections represent the worst-case emissions.

6.2. 6dB Bandwidth

6.2.1. Test Limit

The minimum 6dB bandwidth shall be at least 500 kHz.

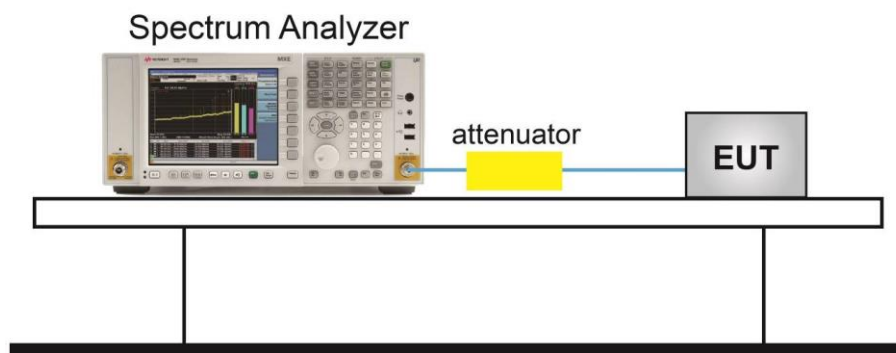
6.2.2. Test Procedure used

ANSI C63.10 - 2013 - Section 11.8

6.2.3. Test Setting

1. The Spectrum's automatic bandwidth measurement capability was used to perform the 6dB bandwidth measurement. The "X" dB bandwidth parameter was set to $X = 6$. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. Set RBW = 100 kHz
3. $VBW \geq 3 \times RBW$
4. Detector = Peak
5. Trace mode = Max hold
6. Sweep = Auto couple
7. Allow the trace to stabilize

6.2.4. Test Setup



6.2.5. Test Result

Refer to Appendix A.2.

6.3. Output Power

6.3.1. Test Limit

The maximum output power shall be less 1 Watt (30dBm).

The conducted output power limit specified in paragraph FCC Part 15.247(b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs FCC Part 15.247(b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

6.3.2. Test Procedure Used

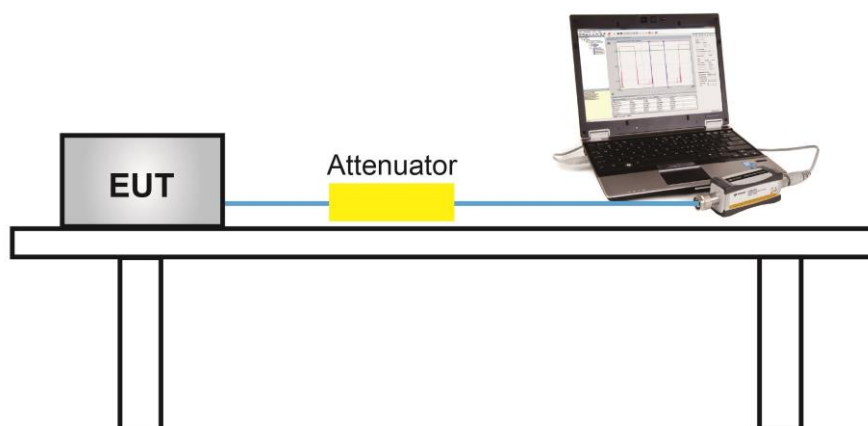
ANSI C63.10 - 2013 - Section 11.9.2.3.2

6.3.3. Test Setting

Average Power Measurement

Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter.

6.3.4. Test Setup



6.3.5. Test Result

Refer to Appendix A.3.

6.4. Power Spectral Density

6.4.1. Test Limit

The maximum permissible power spectral density is 8dBm in any 3 kHz band.

The same method of determining the conducted output power shall be used to determine the power spectral density.

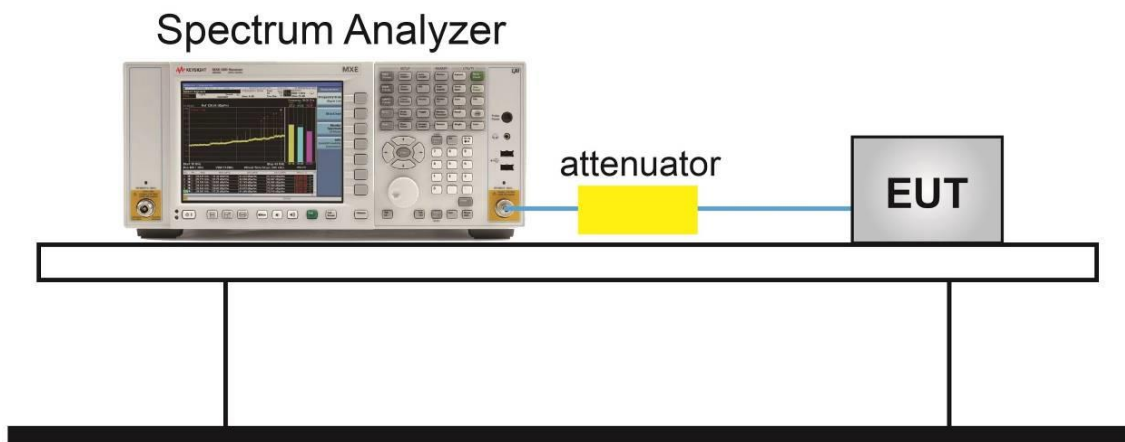
6.4.2. Test Procedure Used

ANSI C63.10 - 2013 - Section 11.10.5

6.4.3. Test Setting

1. Measure the duty cycle (x) of the transmitter output signal.
2. Set instrument center frequency to DTS channel center frequency.
3. Set span to at least 1.5 times the OBW.
4. RBW = 10 kHz.
5. VBW = 30 kHz.
6. Detector = RMS.
7. Ensure that the number of measurement points in the sweep $\geq 2 \times \text{span}/\text{RBW}$.
8. Sweep time = auto couple.
9. Don't use sweep triggering. Allow sweep to "free run".
10. Employ trace averaging (RMS) mode over a minimum of 100 traces.
11. Use the peak marker function to determine the maximum amplitude level.
12. 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. If measured value exceeds requirement specified by regulatory agency, then reduce RBW (but no less than 3 kHz) and repeat (note that this may require zooming in on the emission of interest and reducing the span to meet the minimum measurement point requirement as the RBW is reduced).

6.4.4. Test Setup



6.4.5. Test Result

Refer to Appendix A.4.

6.5. Conducted Band Edge and Out-of-Band Emissions

6.5.1. Test Limit

The limit for out-of-band spurious emissions at the band edge is 20dB below the fundamental emission level, as determined from the in-band power measurement of the DTS channel performed in a 100 kHz bandwidth per the PSD procedure.

6.5.2. Test Procedure Used

ANSI C63.10-2013 - Section 11.11

6.5.3. Test Setting

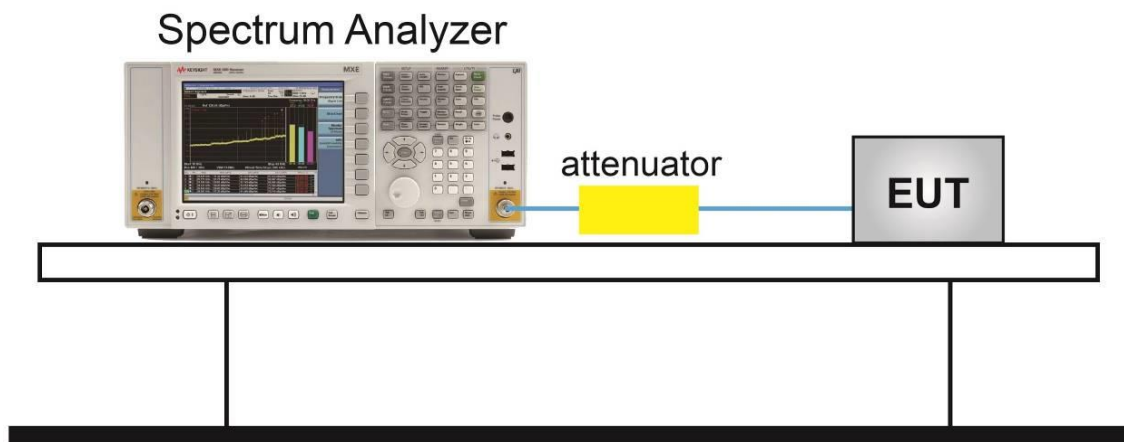
Reference level measurement

1. Set instrument center frequency to DTS channel center frequency
2. Set the span to ≥ 1.5 times the DTS bandwidth
3. Set the RBW = 100 kHz
4. Set the VBW $\geq 3 \times$ RBW
5. Detector = peak
6. Sweep time = auto couple
7. Trace mode = max hold
8. Allow trace to fully stabilize

Emission level measurement

1. Set the center frequency and span to encompass frequency range to be measured
2. RBW = 100kHz
3. VBW = 300kHz
4. Detector = Peak
5. Trace mode = max hold
6. Sweep time = auto couple
7. The trace was allowed to stabilize

6.5.4. Test Setup



6.5.5. Test Result

Refer to Appendix A.5.

6.6. Radiated Spurious Emission

6.6.1. Test Limit

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table per Section 15.209.

FCC Part 15 Subpart C Paragraph 15.209		
Frequency [MHz]	Field Strength [uV/m]	Measured Distance [Meters]
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 - 30	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

6.6.2. Test Procedure Used

ANSI C63.10 - 2013 - Section 11.11 & 11.12

ANSI C63.10 - 2013 - Section 6.3 (General Requirements)

ANSI C63.10 - 2013 - Section 6.4 (Standard test method below 30MHz)

ANSI C63.10 - 2013 - Section 6.5 (Standard test method above 30MHz to 1GHz)

ANSI C63.10 - 2013 - Section 6.6 (Standard test method above 1GHz)

6.6.3. Test Setting

Table 1 - RBW as a function of frequency

Frequency	RBW
9 ~ 150 kHz	200 ~ 300 Hz
0.15 ~ 30 MHz	9 ~ 10 kHz
30 ~ 1000 MHz	100 ~ 120 kHz
> 1000MHz	1MHz

Quasi-Peak Measurements below 1GHz

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. Span was set greater than 1MHz
3. RBW = as specified in Table 1
4. Detector = CISPR quasi-peak
5. Sweep time = auto couple
6. Trace was allowed to stabilize

Peak Measurements above 1GHz

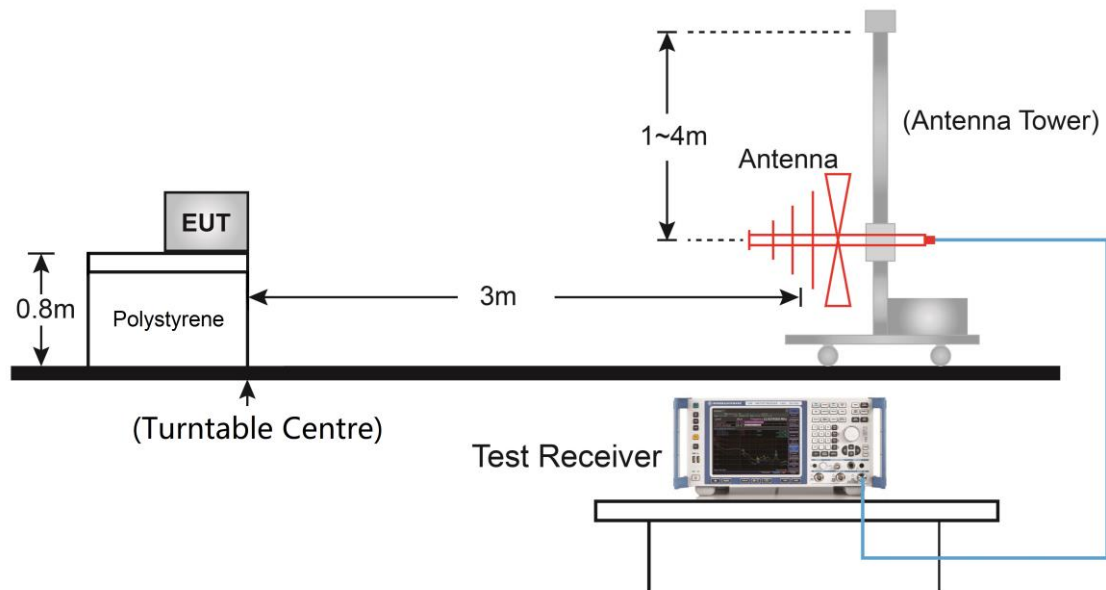
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

Average Measurements above 1GHz (Method VB)

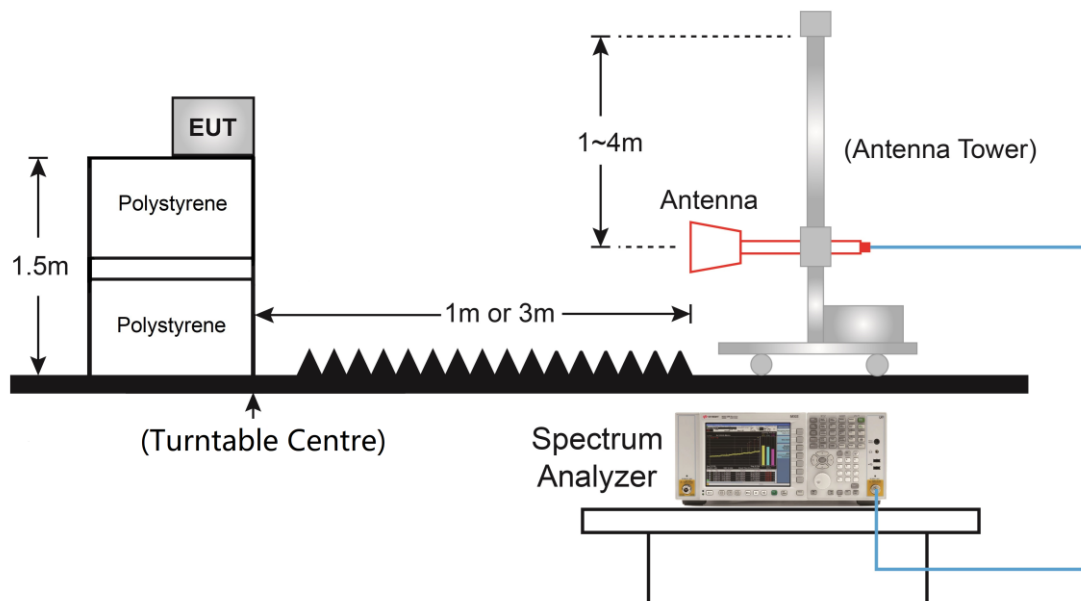
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW; If the EUT is configured to transmit with duty cycle $\geq 98\%$, set VBW = 10 Hz.
If the EUT duty cycle is $< 98\%$, set VBW $\geq 1/T$. T is the minimum transmission duration.
4. Detector = Peak
5. Sweep time = auto
6. Trace mode = max hold
7. Trace was allowed to stabilize

6.6.4. Test Setup

Below 1GHz Test Setup:



Above 1GHz Test Setup:



6.6.5. Test Result

Refer to Appendix A.6.

6.7. Radiated Restricted Band Edge

6.7.1. Test Limit

For 15.205 requirement:

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a) of FCC part 15, must also comply with the radiated emission limits specified in Section 15.209(a).

Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (GHz)
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)
13.36 - 13.41	--	--	--

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47CFR must not exceed the limits shown in Table per Section 15.209.

FCC Part 15 Subpart C Paragraph 15.209		
Frequency [MHz]	Field Strength [uV/m]	Measured Distance [Meters]
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 - 30	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

6.7.2. Test Procedure Used

ANSI C63.10-2013 Section 6.3

ANSI C63.10-2013 Section 6.6

ANSI C63.10-2013 Section 11.13

6.7.3. Test Setting

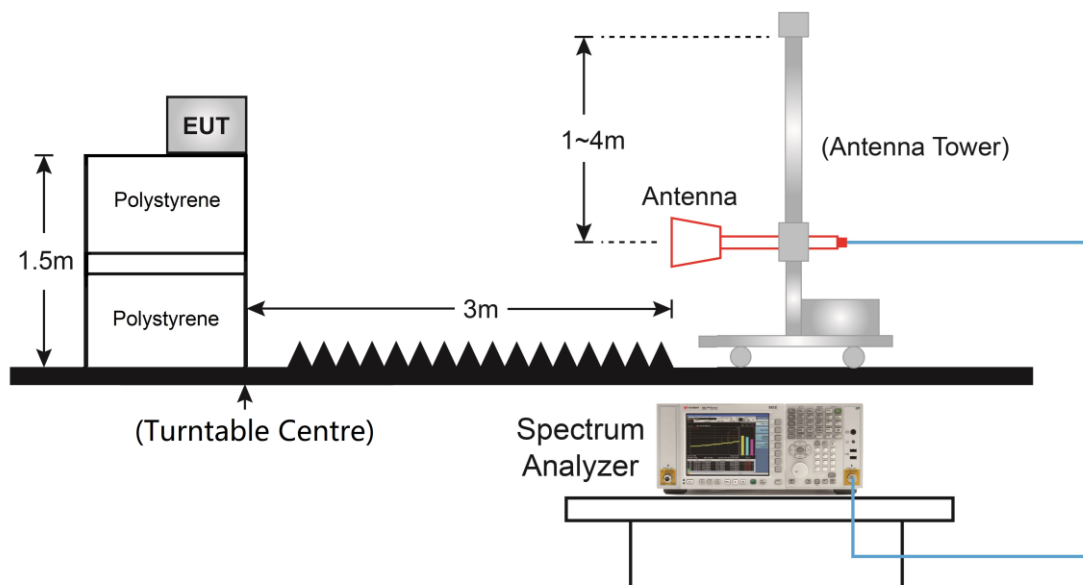
Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

Average Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW $\geq 1/T$
4. As an alternative, the instrument may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB domain). Some instruments require linear display mode in order to accomplish this. Others have a setting for Average-VBW Type, which can be set to "Voltage" regardless of the display mode
5. Detector = Peak
6. Sweep time = auto
7. Trace mode = max hold
8. Allow max hold to run for at least 50 times (1/duty cycle) traces

6.7.4. Test Setup



6.7.5. Test Result

Refer to Appendix A.7.

6.8. AC Conducted Emissions

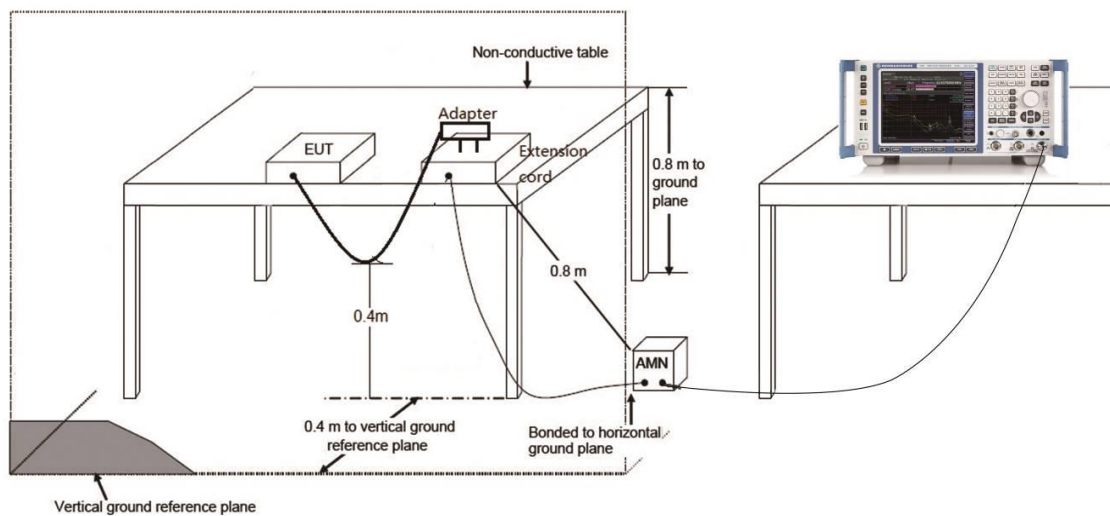
6.8.1. Test Limit

FCC Part 15 Subpart C Paragraph 15.207 Limits		
Frequency (MHz)	QP (dBuV)	AV (dBuV)
0.15 - 0.50	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50

Note 1: The lower limit shall apply at the transition frequencies.

Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

6.8.2. Test Setup

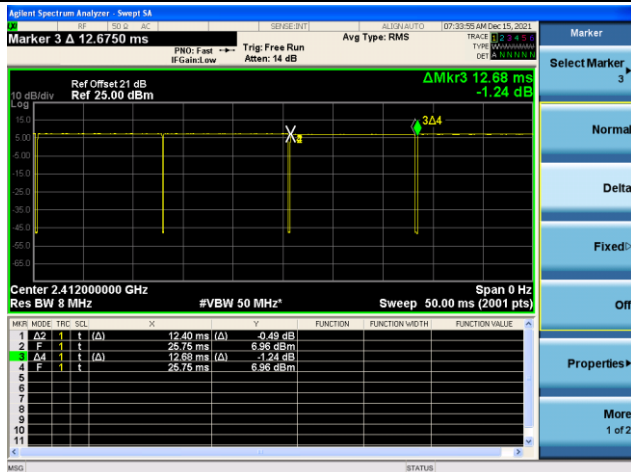
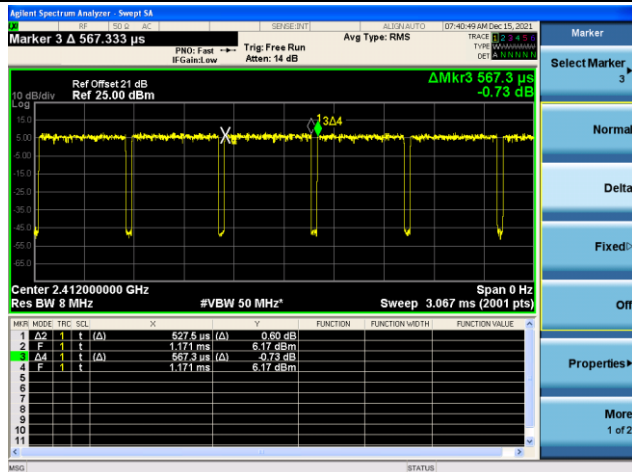
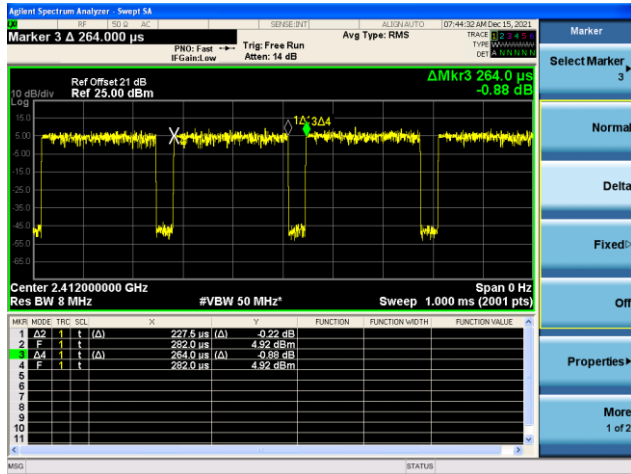


6.8.3. Test Result

Refer to Appendix A.8.

Appendix A – Test Result

A.1 Duty Cycle Test Result

Test Mode	Duty Cycle
802.11b	97.79%
802.11g	92.98%
802.11n-HT20	86.17%
Duty Cycle (T = Transmission Duration)	
802.11b (T = 12.40ms)	802.11g (T = 527.5us)
 Agilent Spectrum Analyzer - Sweep 54 Marker 3 Δ 12.6750 ms Ref Offset 21 dB Ref 25.00 dBm ΔMkr3 12.68 ms -1.24 dB Center 2.412000000 GHz Res BW 8 MHz #VBW 50 MHz* Sweep 50.00 ms (2001 pts) Marker 3 Δ 12.6750 ms Normal Delta Fixed Properties More 1 of 2	 Agilent Spectrum Analyzer - Sweep 54 Marker 3 Δ 567.333 μs Ref Offset 21 dB Ref 25.00 dBm ΔMkr3 567.3 μs -0.73 dB Center 2.412000000 GHz Res BW 8 MHz #VBW 50 MHz* Sweep 3.067 ms (2001 pts) Marker 3 Δ 567.333 μs Normal Delta Fixed Properties More 1 of 2
802.11n-HT20 (T = 227.5us)	
 Agilent Spectrum Analyzer - Sweep 54 Marker 3 Δ 264.000 μs Ref Offset 21 dB Ref 25.00 dBm ΔMkr3 264.0 μs -0.88 dB Center 2.412000000 GHz Res BW 8 MHz #VBW 50 MHz* Sweep 1.000 ms (2001 pts) Marker 3 Δ 264.000 μs Normal Delta Fixed Properties More 1 of 2	

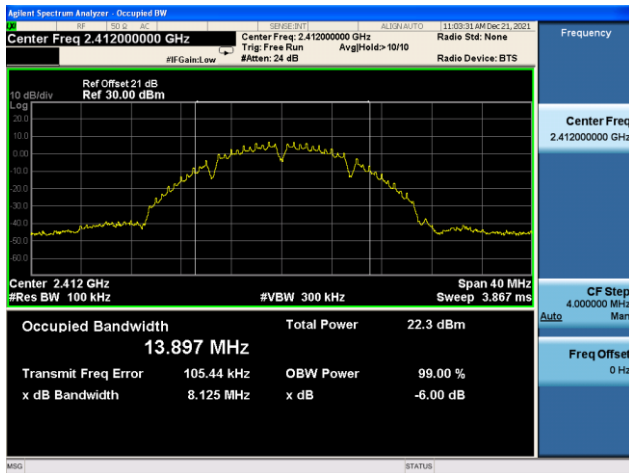
A.2 6dB Bandwidth Test Result

Test Site	NS-TR2	Test Engineer	Summer Tang
Test Date	2021/12/21		

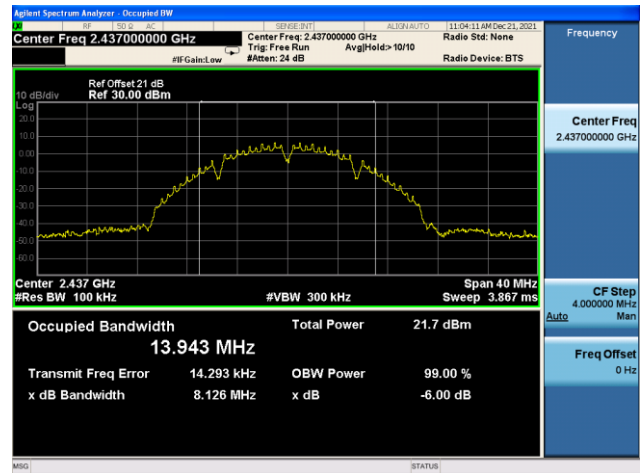
Test Mode	Data Rate / MCS	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)
11b	1Mbps	01	2412	8.125	≥ 0.5
11b	1Mbps	06	2437	8.126	≥ 0.5
11b	1Mbps	11	2462	8.115	≥ 0.5
11g	6Mbps	01	2412	16.37	≥ 0.5
11g	6Mbps	06	2437	16.39	≥ 0.5
11g	6Mbps	11	2462	16.11	≥ 0.5
11n-HT20	MCS0	01	2412	17.75	≥ 0.5
11n-HT20	MCS0	06	2437	17.74	≥ 0.5
11n-HT20	MCS0	11	2462	17.70	≥ 0.5

802.11b 6dB Bandwidth

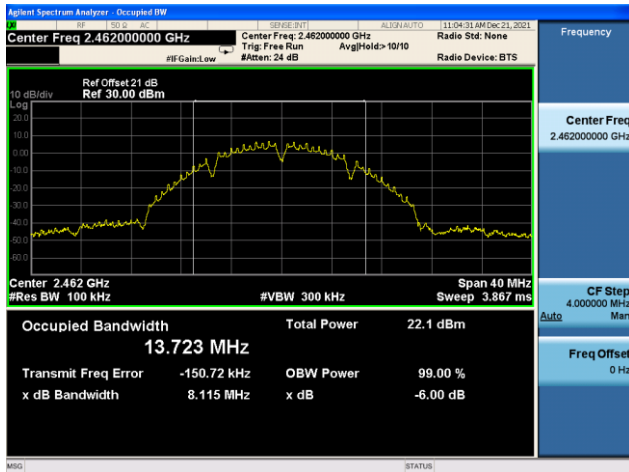
Channel 01 (2412MHz)

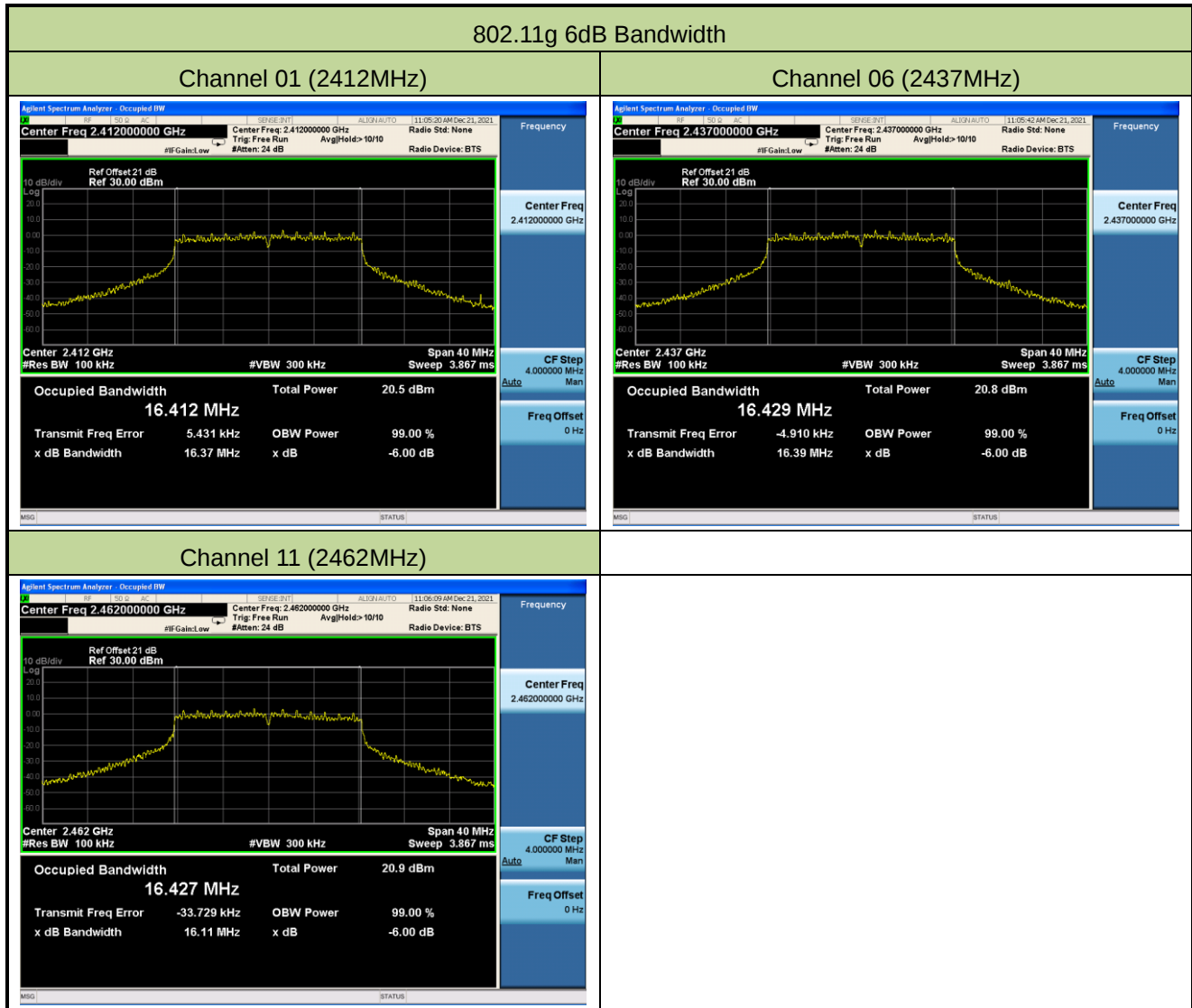


Channel 06 (2437MHz)



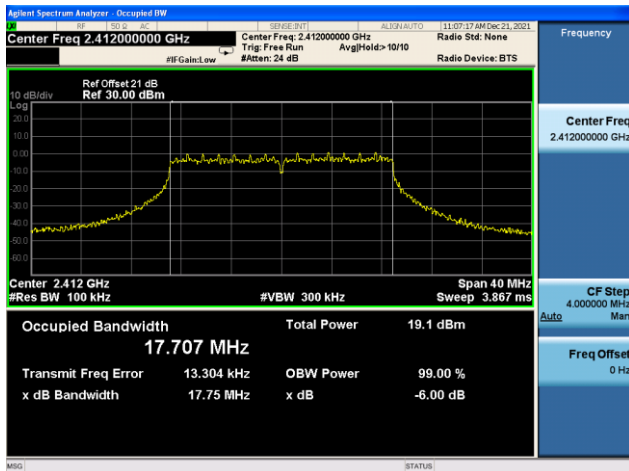
Channel 11 (2462MHz)



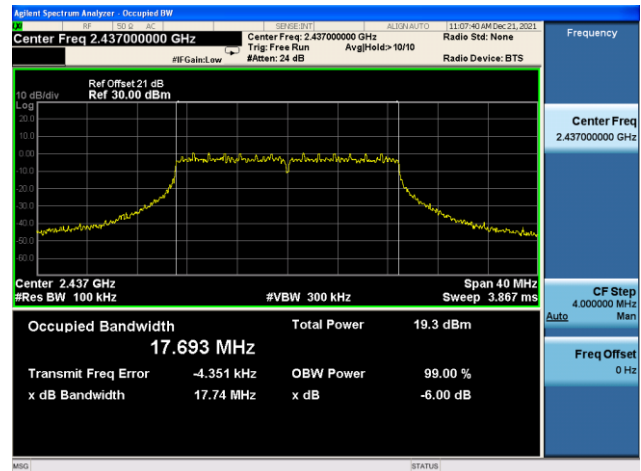


802.11n-HT20 6dB Bandwidth

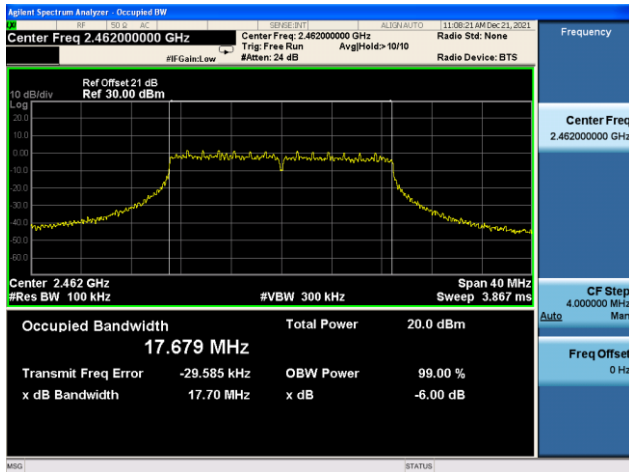
Channel 01 (2412MHz)



Channel 06 (2437MHz)



Channel 11 (2462MHz)



A.3 Output Power Test Result

Power output test was verified over all data rates of each mode shown as below, and then choose the maximum power output (gray marker) for final test of each channel.

Test Mode	Bandwidth (MHz)	Channel No.	Frequency (MHz)	Data Rate / MCS	Average Power (dBm)
802.11b	20	1	2412	1Mbps	9.68
				5.5Mbps	9.65
				11Mbps	9.63
802.11g	20	1	2412	6Mbps	9.03
				24Mbps	9.56
				54Mbps	9.23
802.11n	20	1	2412	MCS0	8.93
				MCS3	8.86
				MCS7	9.33

Test Site	NS-TR2	Test Engineer	Summer Tang
Test Date	2021/12/16		

Test Result of Peak Output Power

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Peak Power (dBm)	Limit (dBm)
11b	1Mbps	01	2412	17.08	≤ 30.00
11b	1Mbps	06	2437	17.11	≤ 30.00
11b	1Mbps	11	2462	17.26	≤ 30.00
11g	24Mbps	01	2412	18.71	≤ 30.00
11g	24Mbps	06	2437	19.20	≤ 30.00
11g	24Mbps	11	2462	19.51	≤ 30.00
11n-HT20	MCS7	01	2412	21.10	≤ 30.00
11n-HT20	MCS7	06	2437	21.62	≤ 30.00
11n-HT20	MCS7	11	2462	21.43	≤ 30.00

Test Result of Average Output Power (Reporting Only)

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Average Power (dBm)	Limit (dBm)
11b	1Mbps	01	2412	14.98	≤ 30.00
11b	1Mbps	06	2437	14.78	≤ 30.00
11b	1Mbps	11	2462	15.15	≤ 30.00
11g	24Mbps	01	2412	12.86	≤ 30.00
11g	24Mbps	06	2437	12.88	≤ 30.00
11g	24Mbps	11	2462	13.14	≤ 30.00
11n-HT20	MCS7	01	2412	11.76	≤ 30.00
11n-HT20	MCS7	06	2437	11.98	≤ 30.00
11n-HT20	MCS7	11	2462	12.19	≤ 30.00

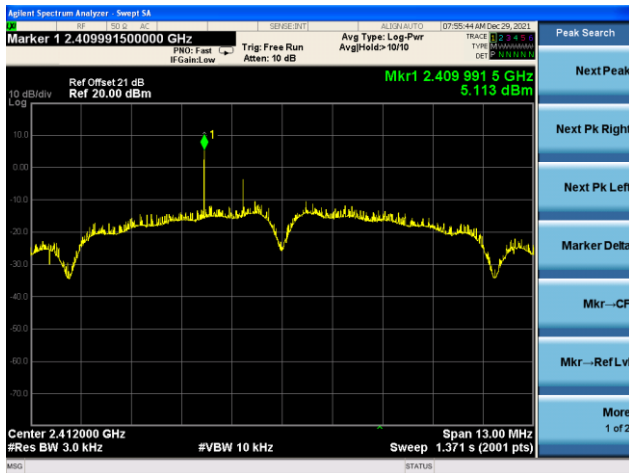
A.4 Power Spectral Density Test Result

Test Site	NS-TR2	Test Engineer	Summer Tang
Test Date	2021/12/29		

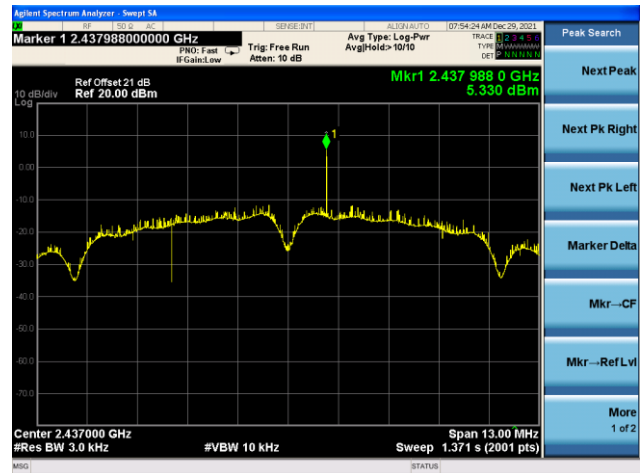
Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	PKPSD (dBm / 3kHz)	Limit (dBm / 3kHz)	Result
11b	1Mbps	01	2412	5.11	≤ 8.00	Pass
11b	1Mbps	06	2437	5.33	≤ 8.00	Pass
11b	1Mbps	11	2462	5.80	≤ 8.00	Pass
11g	24Mbps	01	2412	-12.75	≤ 8.00	Pass
11g	24Mbps	06	2437	-12.04	≤ 8.00	Pass
11g	24Mbps	11	2462	-12.18	≤ 8.00	Pass
11n-HT20	MCS7	01	2412	-14.97	≤ 8.00	Pass
11n-HT20	MCS7	06	2437	-14.55	≤ 8.00	Pass
11n-HT20	MCS7	11	2462	-13.25	≤ 8.00	Pass

802.11b - PKPSD

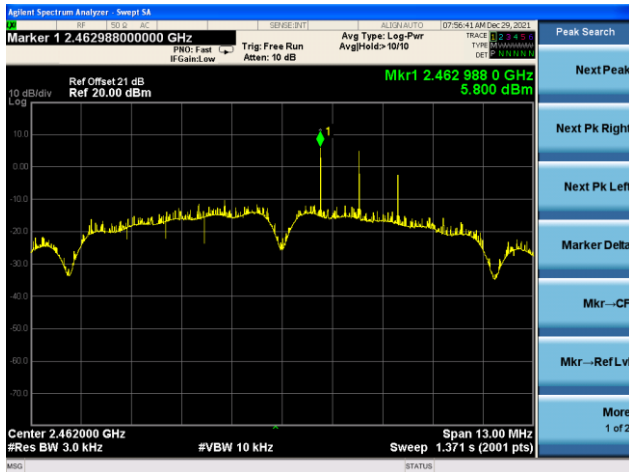
Channel 01 (2412MHz)



Channel 06 (2437MHz)

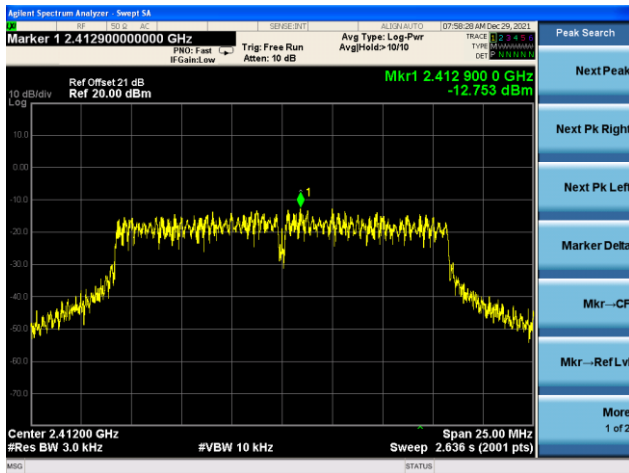


Channel 11 (2462MHz)

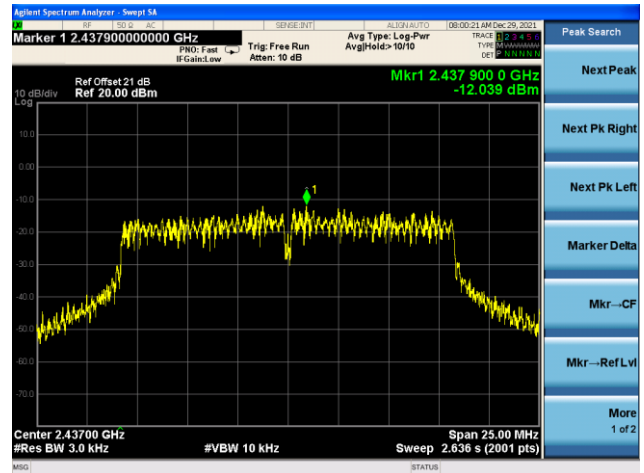


802.11g - PKPSD

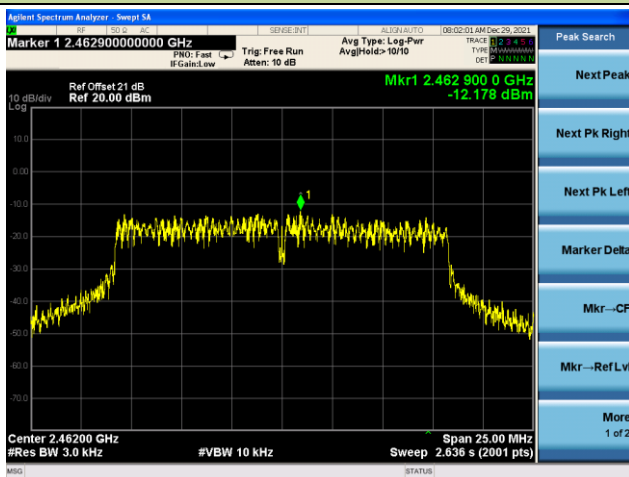
Channel 01 (2412MHz)



Channel 06 (2437MHz)

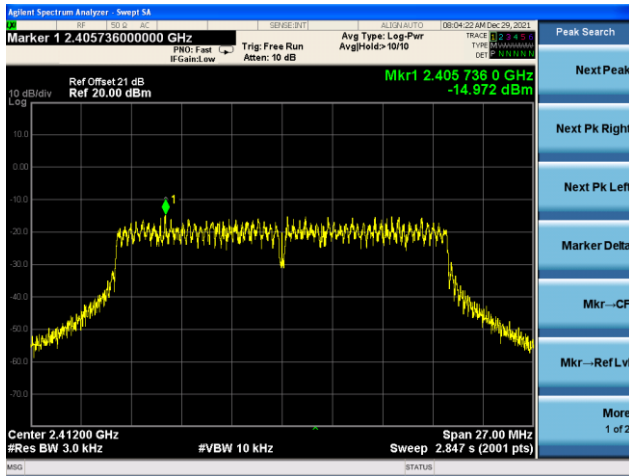


Channel 11 (2462MHz)

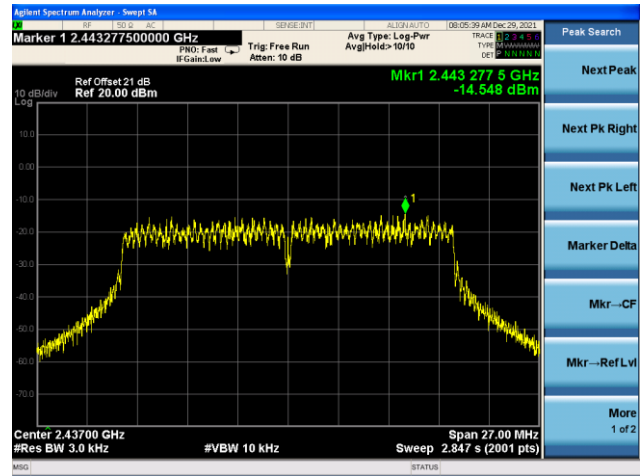


802.11n-HT20 - PKPSD

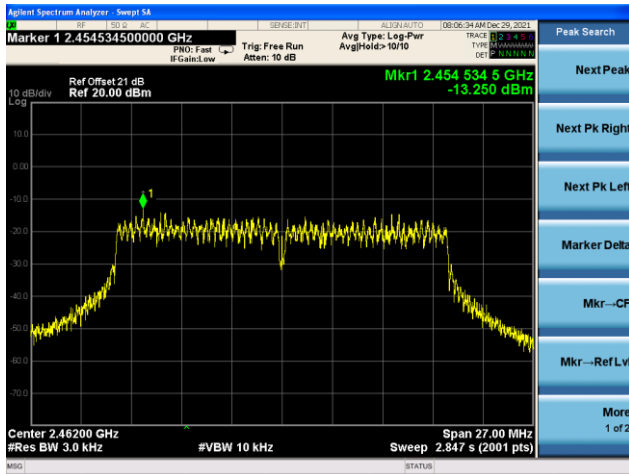
Channel 01 (2412MHz)



Channel 06 (2437MHz)



Channel 11 (2462MHz)



A.5 Conducted Band Edge and Out-of-Band Emissions Test Result

Test Site	NS-TR2	Test Engineer	Summer Tang
Test Date	2021/12/21~2021/12/22		

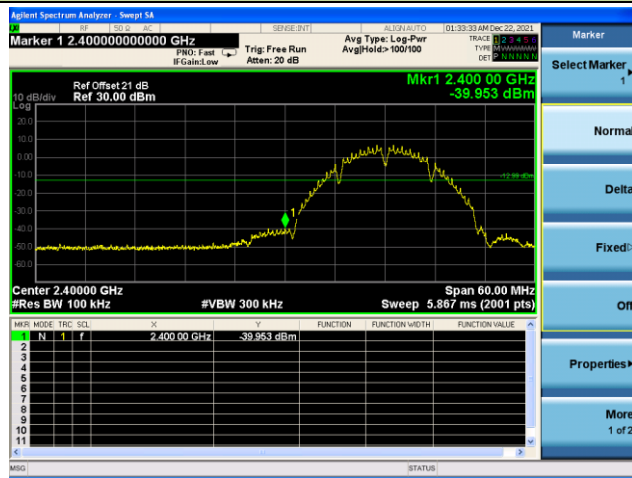
Test Mode	Data Rate / MCS	Channel No.	Frequency (MHz)	Limit
11b	1Mbps	01	2412	20dBc
11b	1Mbps	06	2437	20dBc
11b	1Mbps	11	2462	20dBc
11g	6Mbps	01	2412	20dBc
11g	6Mbps	06	2437	20dBc
11g	6Mbps	11	2462	20dBc
11n-HT20	MCS0	01	2412	20dBc
11n-HT20	MCS0	06	2437	20dBc
11n-HT20	MCS0	11	2462	20dBc



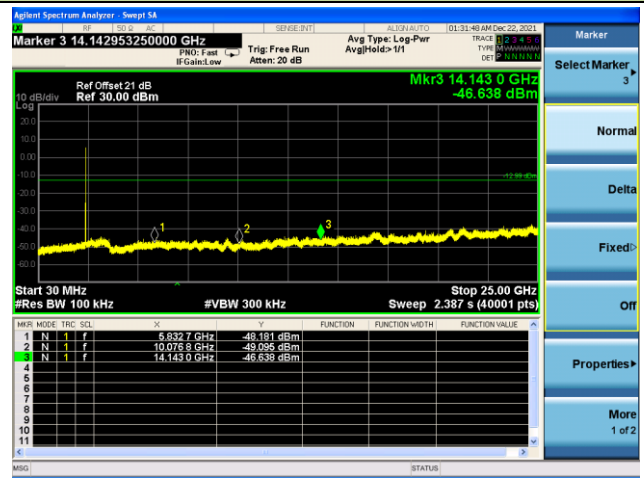
802.11b Out-of-Band Emissions

Channel 01 (2412MHz)

Low Band Edge

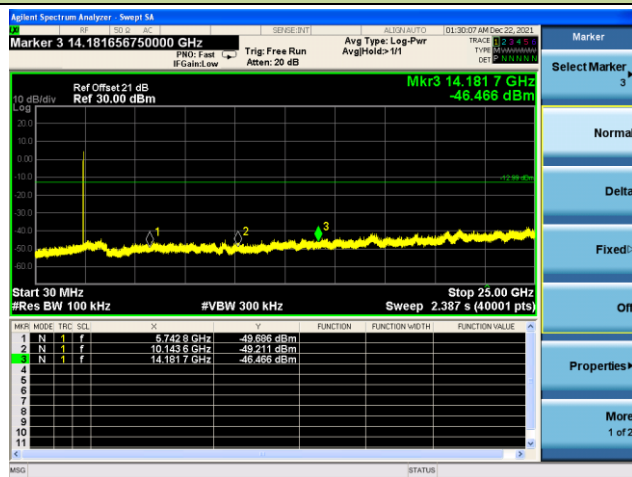


Spurious Emission



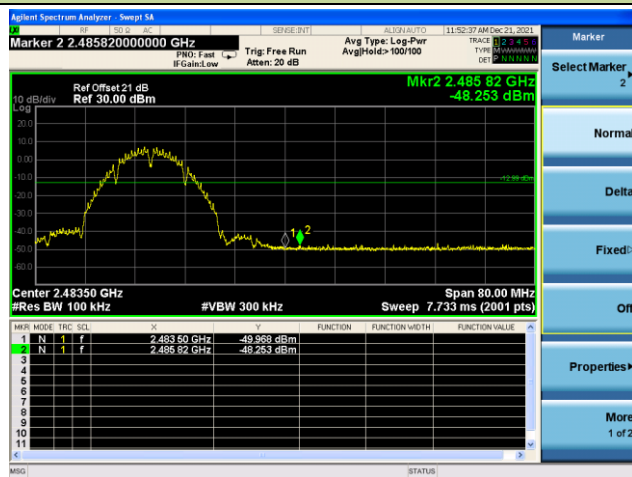
Channel 06 (2437MHz)

Spurious Emission

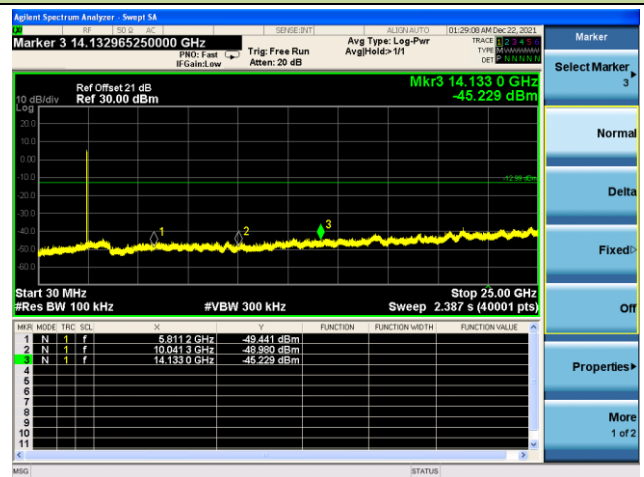


Channel 11 (2462MHz)

High Band Edge



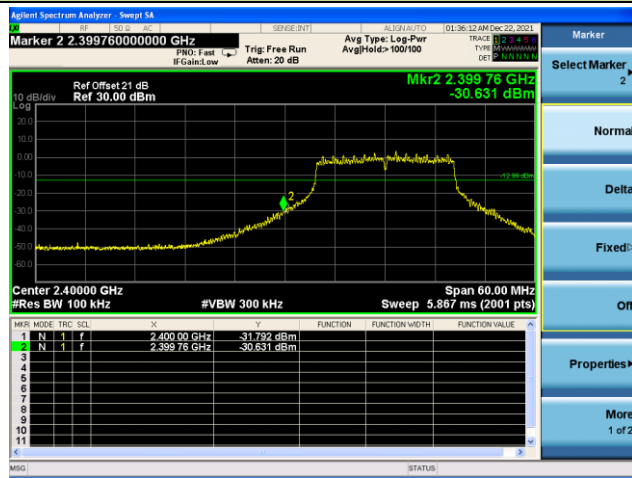
Spurious Emission



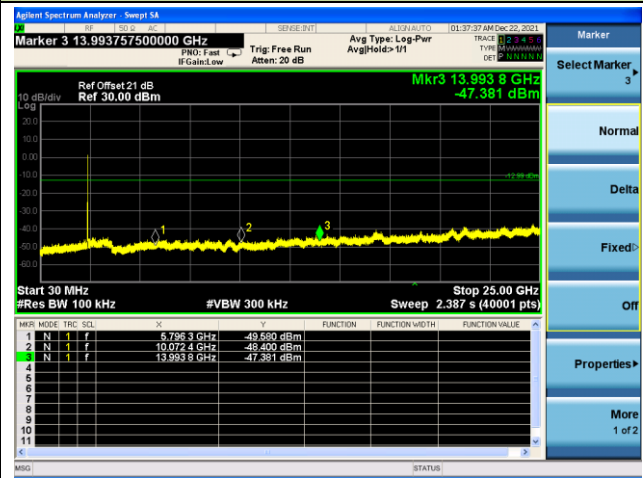
802.11g Out-of-Band Emissions

Channel 01 (2412MHz)

Low Band Edge

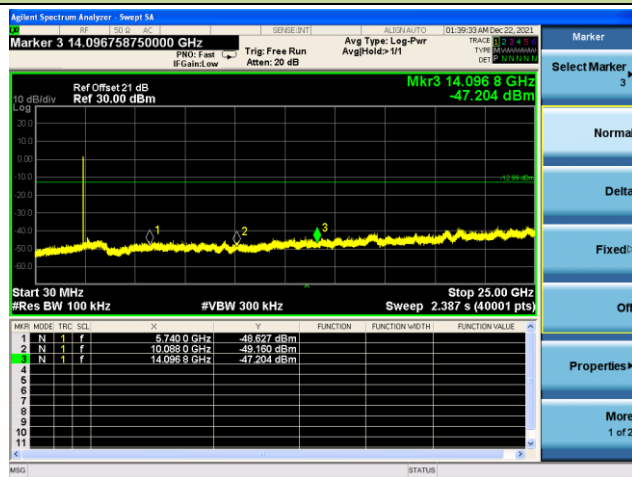


Spurious Emission



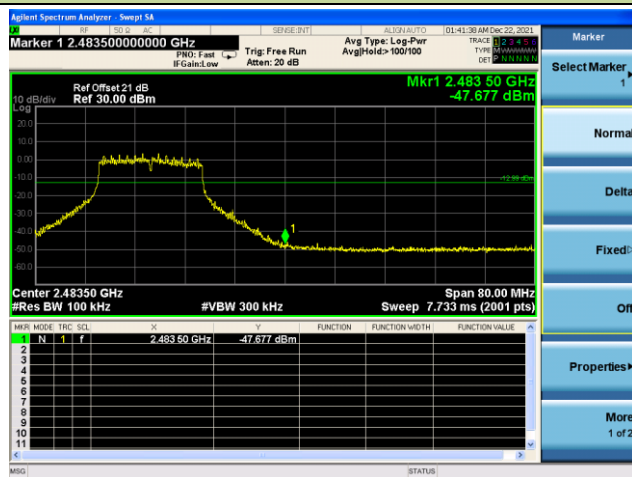
Channel 06 (2437MHz)

Spurious Emission

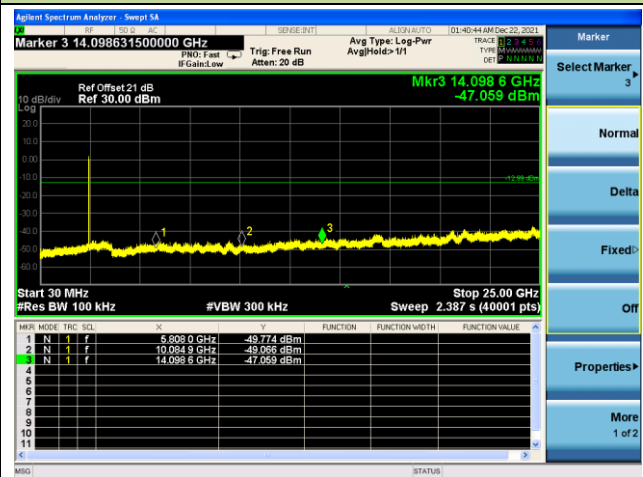


Channel 11 (2462MHz)

High Band Edge



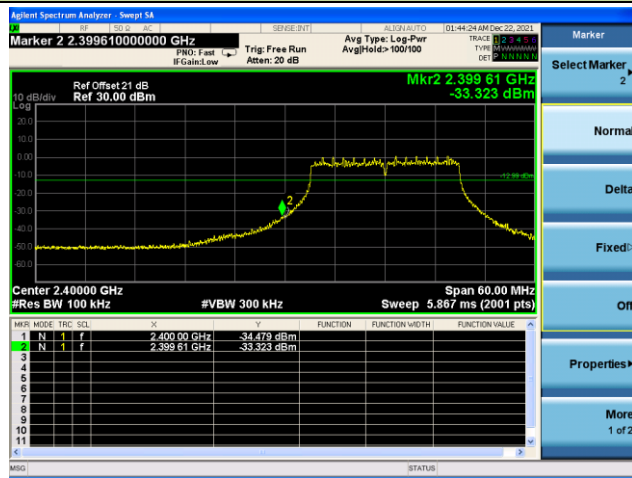
Spurious Emission



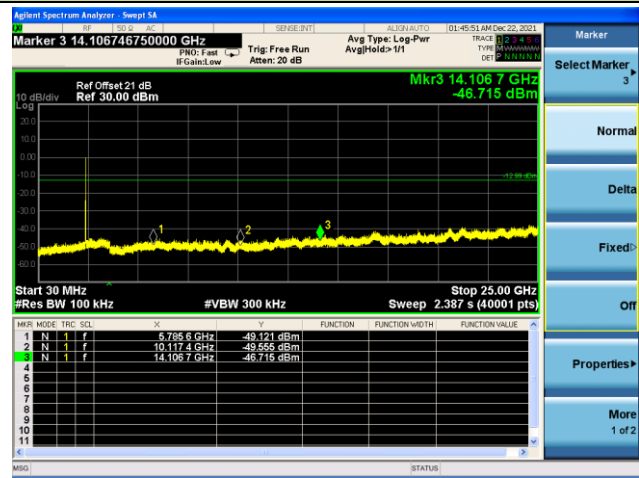
802.11n-HT20 Out-of-Band Emissions

Channel 01 (2412MHz)

Low Band Edge

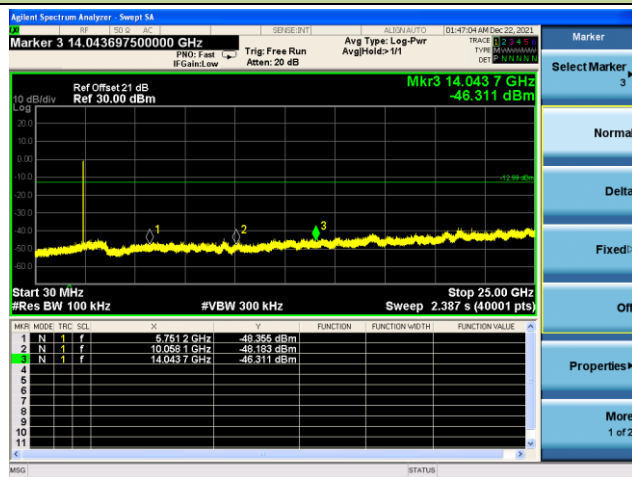


Spurious Emission



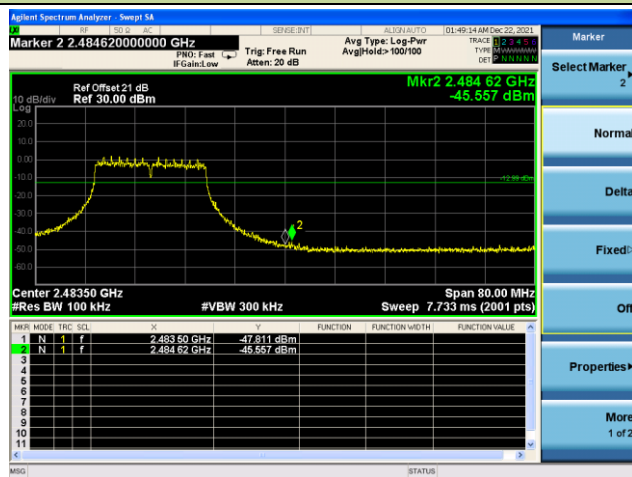
Channel 06 (2437MHz)

Spurious Emission

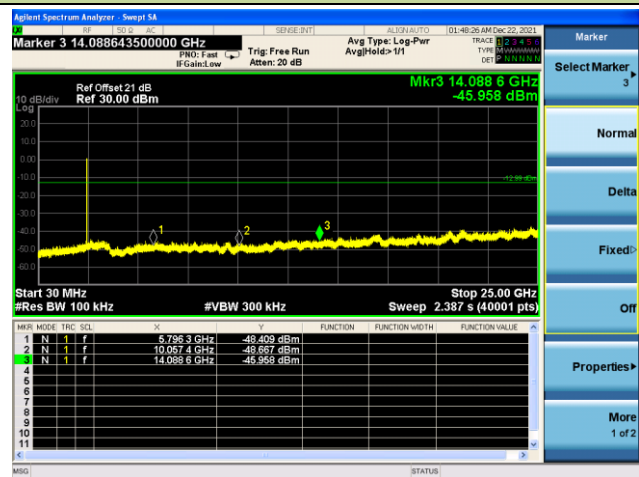


Channel 11 (2462MHz)

High Band Edge



Spurious Emission



A.6 Radiated Spurious Emission Test Result

Test Site	NS-AC1	Test Engineer	Dillon Diao
Test Date	2021/12/22	Test Mode:	802.11b
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Test Channel	Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
01	7604.5	32.9	9.0	41.9	74.0	-32.1	Peak	Horizontal
	8403.5	33.2	10.1	43.3	74.0	-30.7	Peak	Horizontal
	11004.5	33.7	14.9	48.6	74.0	-25.4	Peak	Horizontal
	7400.5	33.1	9.3	42.4	74.0	-31.6	Peak	Vertical
	8480.0	33.8	10.8	44.6	74.0	-29.4	Peak	Vertical
	11081.0	33.1	15.2	48.3	74.0	-25.7	Peak	Vertical
06	7332.5	32.9	9.1	42.0	74.0	-32.0	Peak	Horizontal
	8446.0	34.2	10.4	44.6	74.0	-29.4	Peak	Horizontal
	11327.5	30.0	14.9	44.9	74.0	-29.1	Peak	Horizontal
	7307.0	32.9	9.0	41.9	74.0	-32.1	Peak	Vertical
	8225.0	33.3	9.5	42.8	74.0	-31.2	Peak	Vertical
	11599.5	31.6	15.8	47.4	74.0	-26.6	Peak	Vertical
11	7664.0	33.0	8.8	41.8	74.0	-32.2	Peak	Horizontal
	8420.5	33.9	10.2	44.1	74.0	-29.9	Peak	Horizontal
	11064.0	33.3	15.1	48.4	74.0	-25.6	Peak	Horizontal
	7613.0	33.8	8.8	42.6	74.0	-31.4	Peak	Vertical
	8463.0	33.8	10.6	44.4	74.0	-29.6	Peak	Vertical
	11480.5	31.9	15.5	47.4	74.0	-26.6	Peak	Vertical

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Test Site	NS-AC1	Test Engineer	Dillon Diao
Test Date	2021/12/22	Test Mode:	802.11g
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Test Channel	Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
01	7460.0	33.0	9.3	42.3	74.0	-31.7	Peak	Horizontal
	8471.5	33.3	10.7	44.0	74.0	-30.0	Peak	Horizontal
	11625.0	31.9	16.3	48.2	74.0	-25.8	Peak	Horizontal
	7460.0	32.8	9.3	42.1	74.0	-31.9	Peak	Vertical
	8157.0	34.5	9.4	43.9	74.0	-30.1	Peak	Vertical
	11106.5	32.4	15.3	47.7	74.0	-26.3	Peak	Vertical
06	7545.0	33.7	8.9	42.6	74.0	-31.4	Peak	Horizontal
	8225.0	34.6	9.5	44.1	74.0	-29.9	Peak	Horizontal
	11642.0	31.8	15.9	47.7	74.0	-26.3	Peak	Horizontal
	7519.5	33.1	9.3	42.4	74.0	-31.6	Peak	Vertical
	8327.0	33.6	9.7	43.3	74.0	-30.7	Peak	Vertical
	10809.0	33.0	14.7	47.7	74.0	-26.3	Peak	Vertical
11	7638.5	33.2	8.8	42.0	74.0	-32.0	Peak	Horizontal
	8157.0	34.3	9.4	43.7	74.0	-30.3	Peak	Horizontal
	11480.5	32.2	15.5	47.7	74.0	-26.3	Peak	Horizontal
	7732.0	35.3	8.7	44.0	74.0	-30.0	Peak	Vertical
	8148.5	34.5	9.4	43.9	74.0	-30.1	Peak	Vertical
	10953.5	33.2	14.7	47.9	74.0	-26.1	Peak	Vertical

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Test Site	NS-AC1	Test Engineer	Dillon Diao
Test Date	2021/12/22	Test Mode	802.11n-HT20
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Test Channel	Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
01	7681.0	33.4	8.8	42.2	74.0	-31.8	Peak	Horizontal
	8446.0	33.3	10.4	43.7	74.0	-30.3	Peak	Horizontal
	11055.5	32.9	15.0	47.9	74.0	-26.1	Peak	Horizontal
	7511.0	32.5	9.4	41.9	74.0	-32.1	Peak	Vertical
	8199.5	35.1	9.1	44.2	74.0	-29.8	Peak	Vertical
	11803.5	32.4	14.9	47.3	74.0	-26.7	Peak	Vertical
06	7528.0	32.9	9.2	42.1	74.0	-31.9	Peak	Horizontal
	8089.0	35.7	9.4	45.1	74.0	-28.9	Peak	Horizontal
	11064.0	33.2	15.1	48.3	74.0	-25.7	Peak	Horizontal
	7502.5	31.4	9.2	40.6	74.0	-33.4	Peak	Vertical
	8352.5	33.0	10.0	43.0	74.0	-31.0	Peak	Vertical
	10775.0	32.3	14.4	46.7	74.0	-27.3	Peak	Vertical
11	7451.5	33.1	9.3	42.4	74.0	-31.6	Peak	Horizontal
	8165.5	34.3	9.2	43.5	74.0	-30.5	Peak	Horizontal
	11149.0	32.4	15.5	47.9	74.0	-26.1	Peak	Horizontal
	7460.0	32.6	9.3	41.9	74.0	-32.1	Peak	Vertical
	8148.5	35.1	9.4	44.5	74.0	-29.5	Peak	Vertical
	11072.5	32.5	15.2	47.7	74.0	-26.3	Peak	Vertical

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)