



MEASUREMENT REPORT

FCC PART 15.247/ SRD 905.6~926MHz

FCC ID: 2APPT-2960
Applicant: Airthings ASA
Application Type: Certification
Product: View Plus / View Pollution / View Radon
Model No.: 2960 / 2980 / 2989
Brand Name: Airthings
FCC Classification: FCC Part 15 Spread Spectrum Transmitter (FHSS)
FCC Rule Part(s): Part 15 Subpart C (Section 15.247)
Test Procedure(s): ANSI C63.10-2013
Test Date: March 09 ~ April 30, 2021

Reviewed By: *Sherry Jiang*

Sherry Jiang

Approved By:

Robin Wu

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
2103RSU015-U3	Rev. 01	Initial Report	06-08-2021	Valid

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1. General Information

1.1. Applicant

Airthings ASA

Wergelandsveien 7, 0167 Oslo, Norway

1.2. Manufacturer

Airthings ASA

Wergelandsveien 7, 0167 Oslo, Norway

1.3. Test Facility

<input type="checkbox"/>	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
<input checked="" type="checkbox"/>	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
<input type="checkbox"/>	Test Site – MRT Taiwan Laboratory
	Laboratory Location (Taiwan) No. 38, Fuxing 2 nd Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)
	Laboratory Accreditations
	TAF: L3261-190725 FCC: 291082, TW3261 ISED: TW3261

2. PRODUCT INFORMATION

2.1. Equipment Description

Product Name	View Plus / View Pollution / View Radon
Model No.	2960 / 2980 / 2989
Brand Name	Airthings
Test Device Label No.	CERT 12 (Radiated Sample) CERT 8 (Conducted Sample)
Operating Temp.	4 ~ 40°C
Rated Input	5VDC (USB cable) or batteries
Bluetooth Version	v5.1 Single mode
SRD Radio	Various bands in the 865-928MHz range (region dependent)
Remark: The differences between the three products (models) are: View Plus: Sensors for PM2.5, Radon, CO2, VOC, Temp, Humidity, Air Pressure, Noise, Light View Pollution: Sensors for PM2.5, Temp, Humidity, Light View Radon: Sensors for Radon, Temp, Humidity, Light The RF characteristics are the same, so we chose View Plus for testing.	

2.2. Product Specification Subjective to this Report

Operating Frequency	905.6~926MHz
Type of modulation	FSK
Channel Number	52
Antenna Type	PCB Antenna
Antenna Gain	5dBi

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

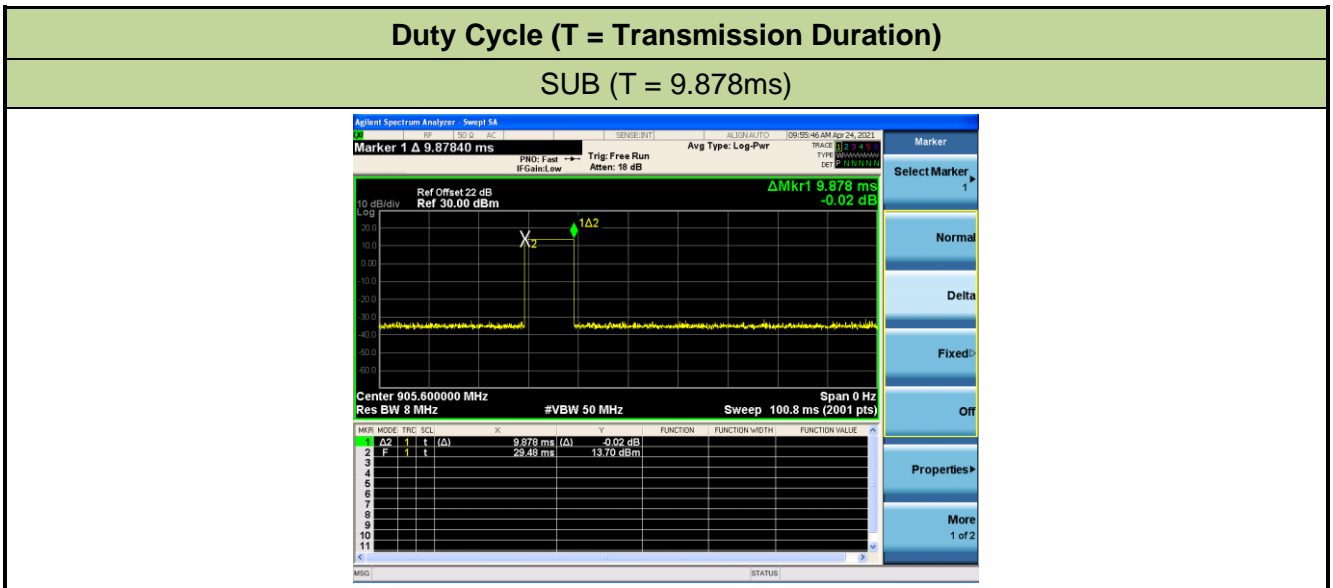
2.3. Working Frequencies

Channel	Frequency	Channel	Frequency	Channel	Frequency
01	905.600 MHz	02	906.000 MHz	03	906.400 MHz
04	906.800 MHz	05	907.200 MHz	06	907.600 MHz
07	908.000 MHz	08	908.400 MHz	09	908.800 MHz
10	909.200 MHz	11	909.600 MHz	12	910.000 MHz
13	910.400 MHz	14	910.800 MHz	15	911.200 MHz
16	911.600 MHz	17	912.000 MHz	18	912.400 MHz
19	912.800 MHz	20	913.200 MHz	21	913.600 MHz
22	914.000 MHz	23	914.400 MHz	24	914.800 MHz
25	915.200 MHz	26	915.600 MHz	27	916.000 MHz
28	916.400 MHz	29	916.800 MHz	30	917.200 MHz
31	917.600 MHz	32	918.000 MHz	33	918.400 MHz
34	918.800 MHz	35	919.200 MHz	36	919.600 MHz
37	920.000 MHz	38	920.400 MHz	39	920.800 MHz
40	921.200 MHz	41	921.600 MHz	42	922.000 MHz
43	922.400 MHz	44	922.800 MHz	45	923.200 MHz
46	923.600 MHz	47	924.000 MHz	48	924.400 MHz
49	924.800 MHz	50	925.200 MHz	51	925.600 MHz
52	926.000 MHz	--	--	--	--

2.4. Duty Cycle

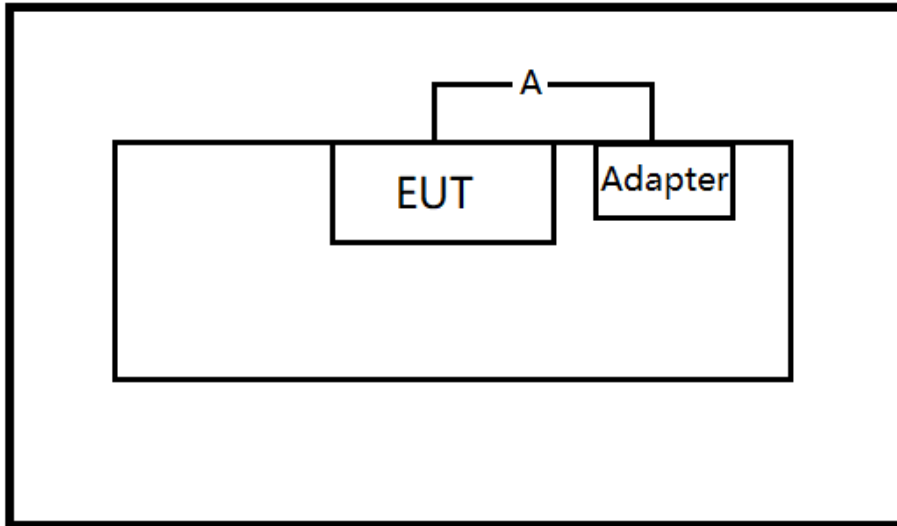
The maximum achievable duty cycle was determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz. The RBW and VBW were both greater than 50/T, where T is the minimum transmission duration, and the number of sweep points across T was greater than 100. The duty cycles are as follows:

Test Mode	Duty Cycle
SUB	9.88%



2.5. Description of Test Configuration

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



Cable Type		Cable Description
A	USB Cable	Non-shielding, 1.8m

Note 1: The test utility software used during testing was “Putty”. The Power setting is default.

Note 2: This adapter (M/N: CYSK10-050200) is provided by test lab, the EUT will be sold without adapter.

2.6. EMI Suppression Device(s) / Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

2.7. 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. TEST EQUIPMENT CALIBRATION DATE

Conducted Emission (NS-SR2)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESL3	MRTSUE06576	1 year	2021/07/09
ENV216-LV-NETZNACHB	R&S	ENV216	MRTSUE06577	1 year	2021/07/09
ENV216-LV-NETZNACHB	R&S	ENV216	MRTSUE06578	1 year	2021/07/09
Temperature/Humidity Meter	deli	NO.8813	MRTSUE06587	1 year	2021/07/08
Shielding Anechoic Chamber	BOOMWAVE	SR2	MRTSUE06551	5 years	2024/06/04

Radiated Emission (NS-AC1)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cal. Due Date
EMI Test Receiver	R&S	ESR3	MRTSUE06575	1 year	2021/07/09
EXA Signal Analyzer	Keysight	N9010A	MRTSUE06195	1 year	2022/03/17
Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06292	1 year	2021/10/24
Broad-Band Horn Antenna	Schwarzbeck	9120D	MRTSUE06572	1 year	2021/07/03
Bilog Period Antenna	Schwarzbeck	VULB 9162	MRTSUE06573	1 year	2021/07/03
Preamplifier	Schwarzbeck	BBV 9721	MRTSUE06121	1 year	2022/06/10
Broadband Coaxial Preamplifier	Schwarzbeck	BBV 9718	MRTSUE06574	1 year	2021/07/13
Anechoic Chamber	BOOMWAVE	AC1	MRTSUE06496	1 year	2021/07/25
Temperature/Humidity Meter	deli	NO.8813	MRTSUE06588	1 year	2021/07/08

Conducted Test Equipment (NS-TR2)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
electronic hygrothermograph	DELI	No.8813	MRTSUE06783	1 year	2022/05/09
USB wideband power sensor	Keysight	U2021XA	MRTSUE06581	1 year	2021/08/20
EXA Signal Analyzer	Keysight	N9010A	MRTSUE06195	1 year	2022/03/17

Software	Version	Function
EMI Software	V3	EMI Test Software

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
Occupied Bandwidth
Measuring Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$): 0.28%

6. TEST RESULT

6.1. Summary

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
15.247(a)(1) (i)	20dB Bandwidth	No Limit	Conducted	Pass	Section 6.2
15.247(b)(2)	Peak Transmitter Output Power	1 watt (30 dBm) for systems employing at least 50 hopping channels.		Pass	Section 6.3
15.247(a)(1)	Channel Separation	The minimum permissible channel separation for this system is 25KHz or the 20dB BW, whichever is greater.		Pass	Section 6.4
15.247(a)(1)(i)	Number of Channels	> 50 Channels		Pass	Section 6.5
15.247(a)(1)(i)	Time of Occupancy	The maximum permissible time of occupancy is 400ms within a period of 20s.		Pass	Section 6.6
15.247(d)	Band Edge / Out-of-Band Emissions	Conducted \geq 20dBc		Pass	Section 6.7 Section 6.8
15.247(d)	General Field Strength (Radiated Emission)	Emissions in restricted bands must meet the radiated limits detailed in 15.209	Radiated	Pass	Section 6.9
15.207	AC Conducted Emissions 150kHz - 30MHz	< FCC 15.207 limits >	Line Conducted	Pass	Section 6.10

Notes:

- 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.

6.2. 20dB Bandwidth Measurement

6.2.1. Test Limit

N/A

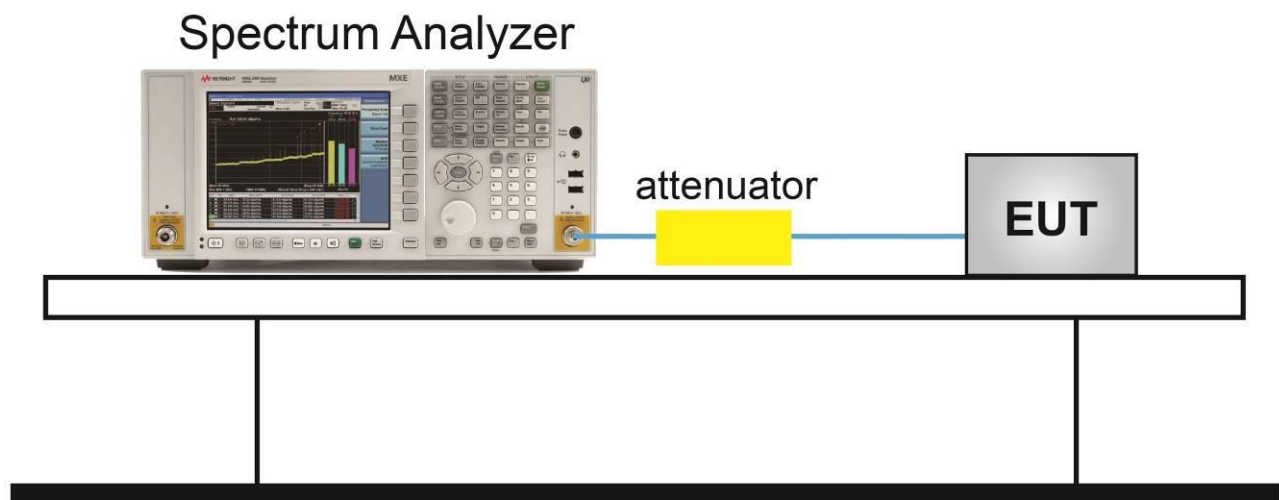
6.2.2. Test Procedure Used

ANSI C63.10-2013 - Section 6.9.2

6.2.3. Test Setting

1. Set RBW \geq 1% to 5% of the OBW
2. VBW = Approximately three times RBW
3. Span = Approximately 2 to 5 times the OBW, centered on a hopping channel
4. Detector = Peak
5. Trace mode = Max hold
6. Sweep = Auto couple
7. Allow the trace to stabilize
8. 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 20 dB relative to the maximum level measured in the fundamental emission.

6.2.4. Test Setup



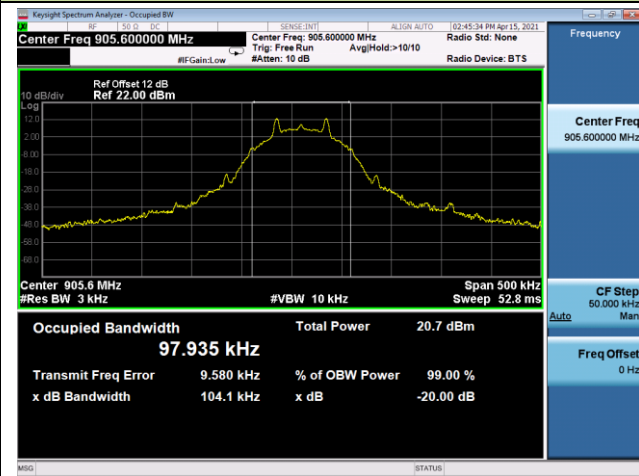
6.2.5. Test Result

Product	View Plus	Test Engineer	Flag Yang
Test Site	NS-TR2	Test Date	2021/04/15

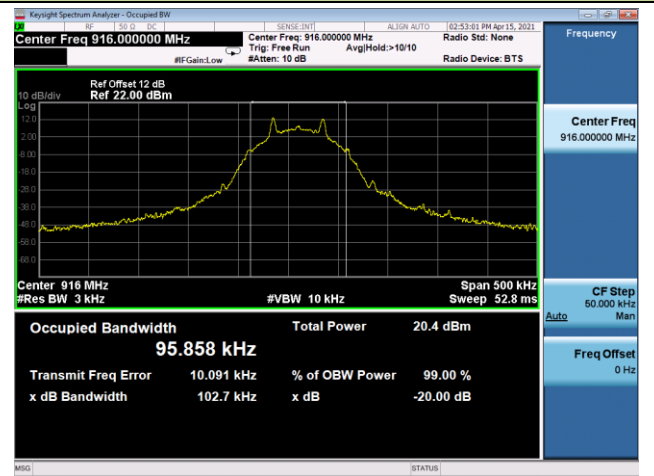
Test Mode	Channel No.	Frequency (MHz)	20dB Bandwidth (kHz)	Result
SUB	01	905.6	104.1	Pass
SUB	27	916.0	102.7	Pass
SUB	52	926.0	102.8	Pass

SUB 20dB Bandwidth

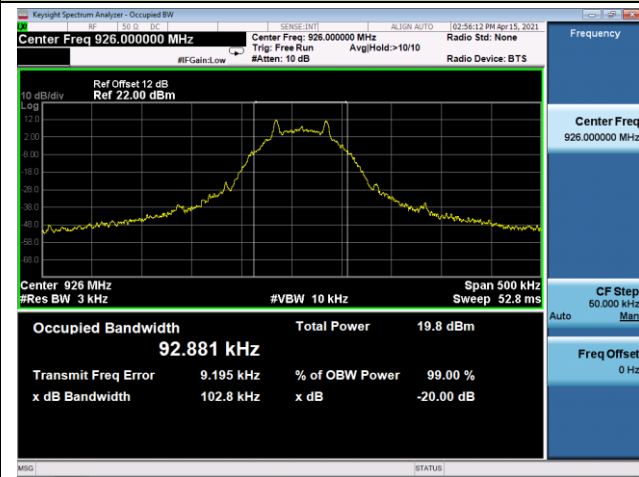
Channel 01 (905.6 MHz)



Channel 27 (916.0 MHz)



Channel 52 (926.0 MHz)



6.3. Output Power Measurement

6.3.1. Test Limit

For frequency hopping systems operating in the 902-928 MHz band: 1 watt (30 dBm) for systems employing at least 50 hopping channels.

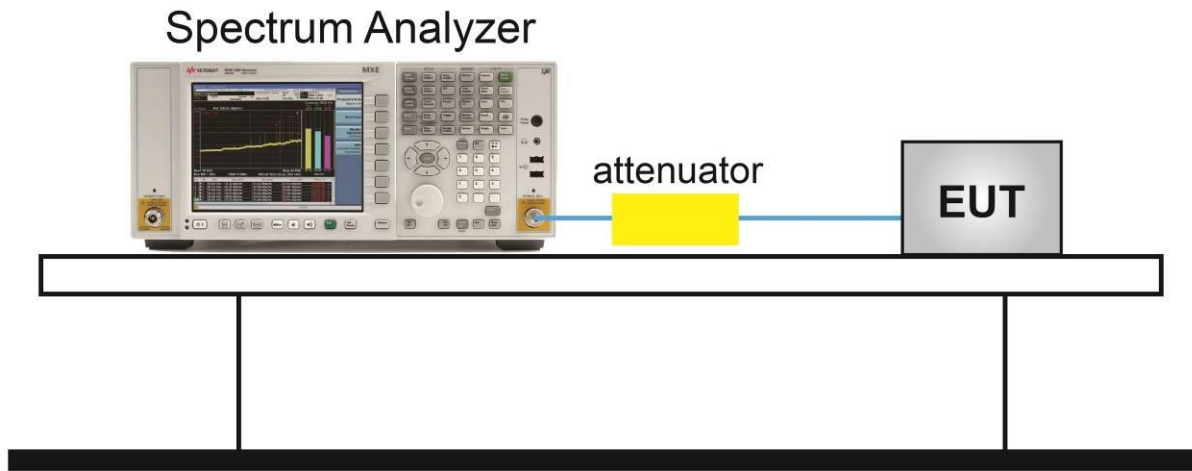
6.3.2. Test Procedure Used

ANSI C63.10-2013 - Section 7.8.5

6.3.3. Test Setting

1. Set RBW \geq the 20 dB bandwidth of the emission being measured.
2. VBW \geq RBW
3. Span = approximately five times the 20dB bandwidth, centered on a hopping channel
4. Detector = Peak
5. Trace mode = Max hold
6. Sweep = Auto couple
7. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power (don't forget added the external attenuation and cable loss)

6.3.4. Test Setup



6.3.5. Test Result

Product	View Plus	Test Engineer	Flag Yang
Test Site	NS-TR2	Test Date	2021/04/15

Test Mode	Channel No.	Frequency (MHz)	Peak Power (dBm)	Power Limit (dBm)
SUB	01	905.6	13.50	≤ 30.00
SUB	27	916.0	13.37	≤ 30.00
SUB	52	926.0	13.28	≤ 30.00

SUB Output Power

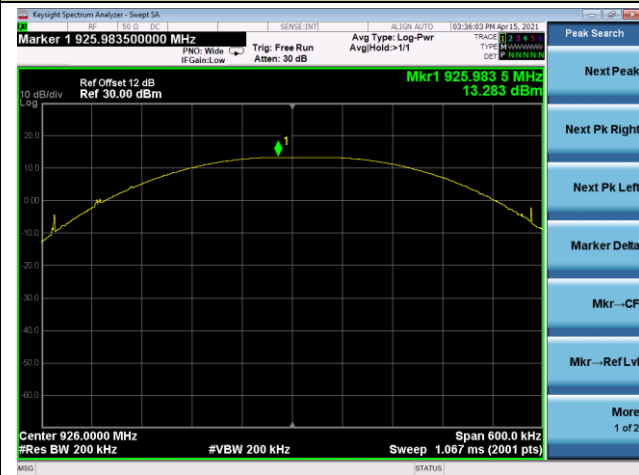
Channel 01 (905.6 MHz)



Channel 27 (916.0 MHz)



Channel 52 (926.0 MHz)



6.4. Carrier Frequency Separation Measurement

6.4.1. Test Limit

The minimum permissible channel separation for this system is 25KHz or the 20dB BW, whichever is greater.

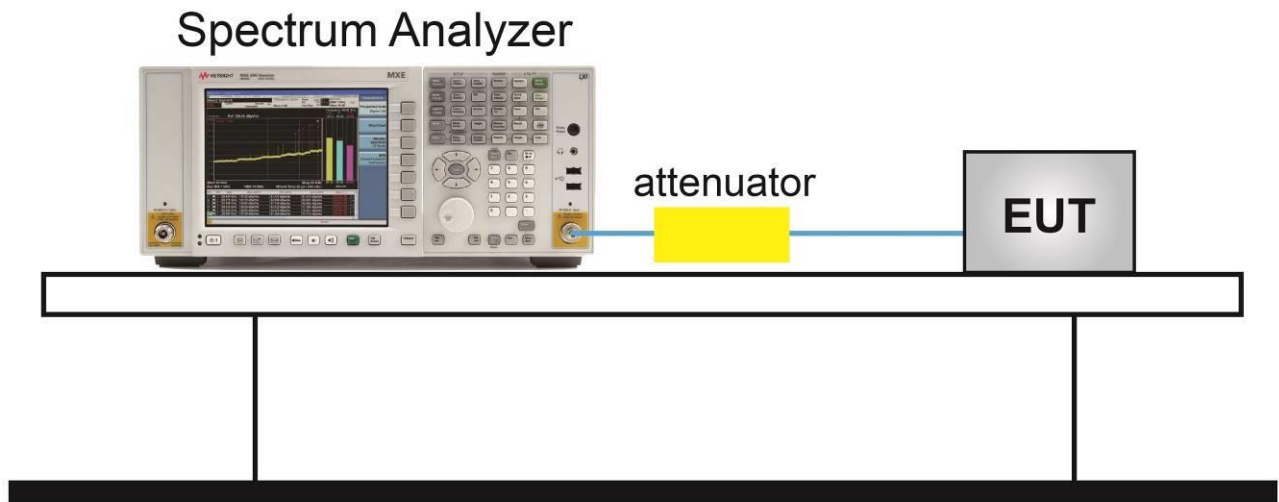
6.4.2. Test Procedure Used

ANSI C63.10-2013 - Section 7.8.2

6.4.3. Test Setting

1. Span = Wide enough to capture the peaks of two adjacent channels.
2. Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel.
3. VBW \geq RBW
4. Sweep time = Auto couple
5. Detector = Peak
6. Trace mode = Max hold
7. Allowed the trace to stabilize
8. Use the marker-delta function to determine the separation between the peaks of the adjacent channels.

6.4.4. Test Setup



6.4.5. Test Result

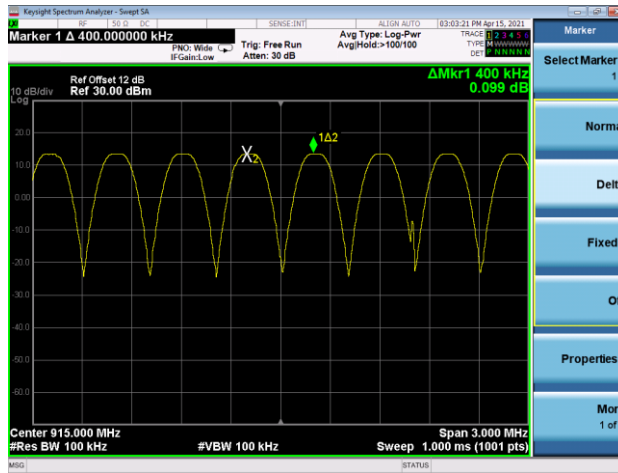
Product	View Plus	Test Engineer	Flag Yang
Test Site	NS-TR2	Test Date	2021/04/15

Test Mode	Channel No.	Frequency (MHz)	Carrier Frequency Separation (kHz)	Limit (kHz)	Result
SUB	25	915.2	400	≥ 104.1	Pass

Note: The Limit is the value of the 20dB BW.

SUB Carrier Frequency Separation

Channel Separation



6.5. Number of Hopping Channels Measurement

6.5.1. Test Limit

This frequency hopping system must employ a minimum of 50 hopping channels.

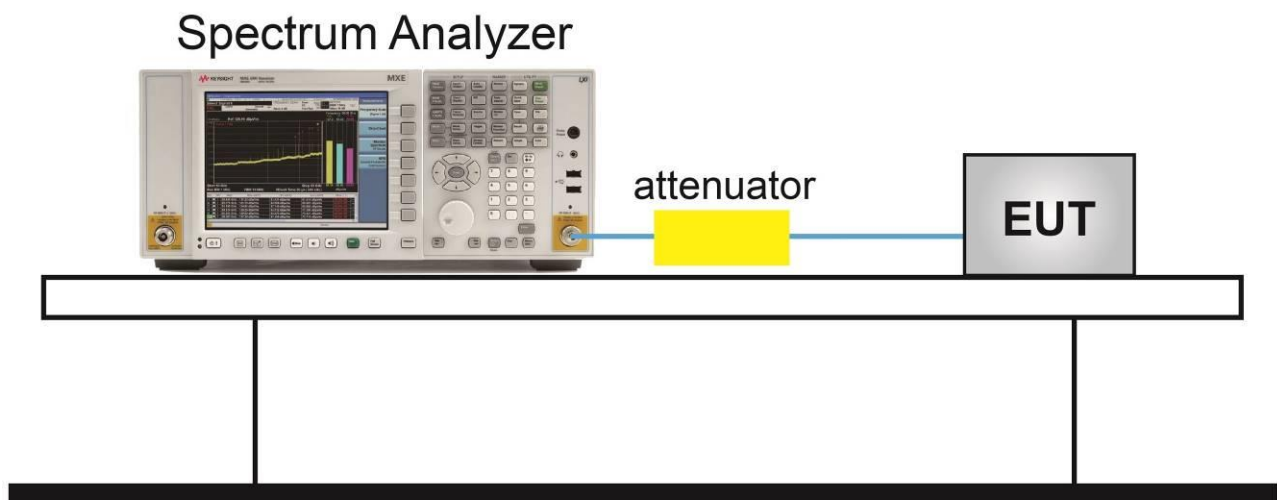
6.5.2. Test Procedure Used

ANSI C63.10-2013 - Section 7.8.3

6.5.3. Test Setting

1. Span = The frequency band of operation. Depending on the number of channels the device supports, it may be necessary to divide the frequency range of operation across multiple spans, to allow the individual channels to be clearly seen.
2. RBW: To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.
3. VBW \geq RBW
4. Sweep time = Auto couple
5. Detector = Peak
6. Trace mode = Max hold
7. Allow the trace to stabilize

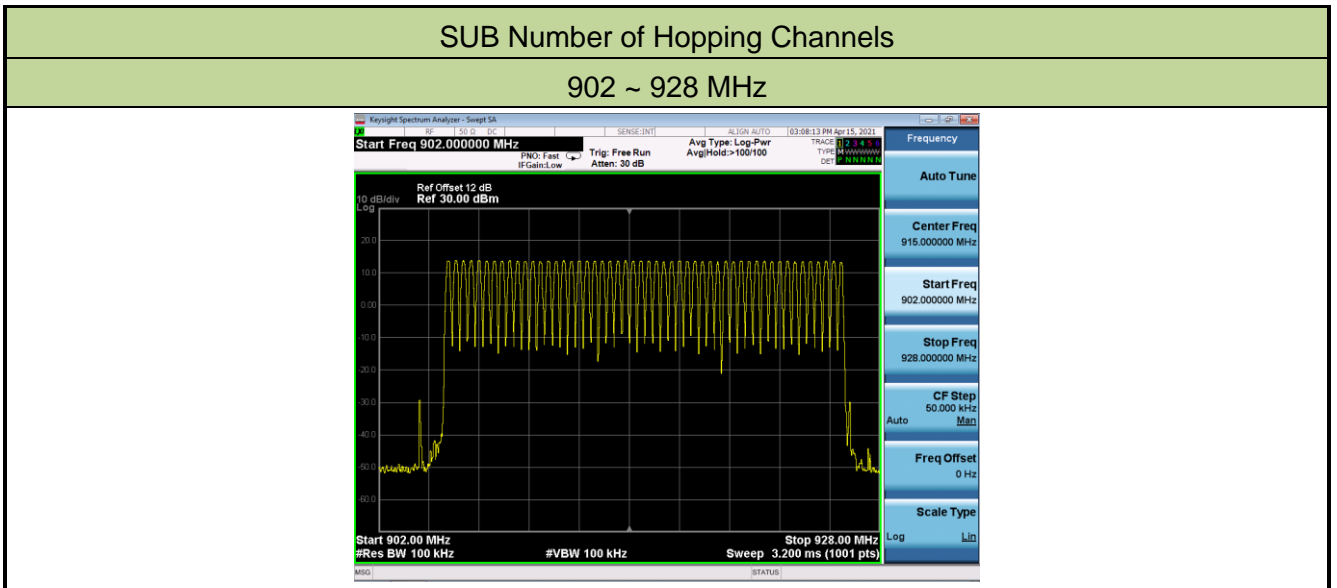
6.5.4. Test Setup



6.5.5. Test Result

Product	View Plus	Test Engineer	Flag Yang
Test Site	NS-TR2	Test Date	2021/04/15

Test Mode (Hopping)	Channel Numbers	Frequency (MHz)	Limit (Hopping Channels)	Result
SUB	52	902 ~ 928	≥ 50	Pass



6.6. Time of Occupancy Measurement

6.6.1. Test Limit

The maximum permissible time of occupancy is 400ms within a period of 20s.

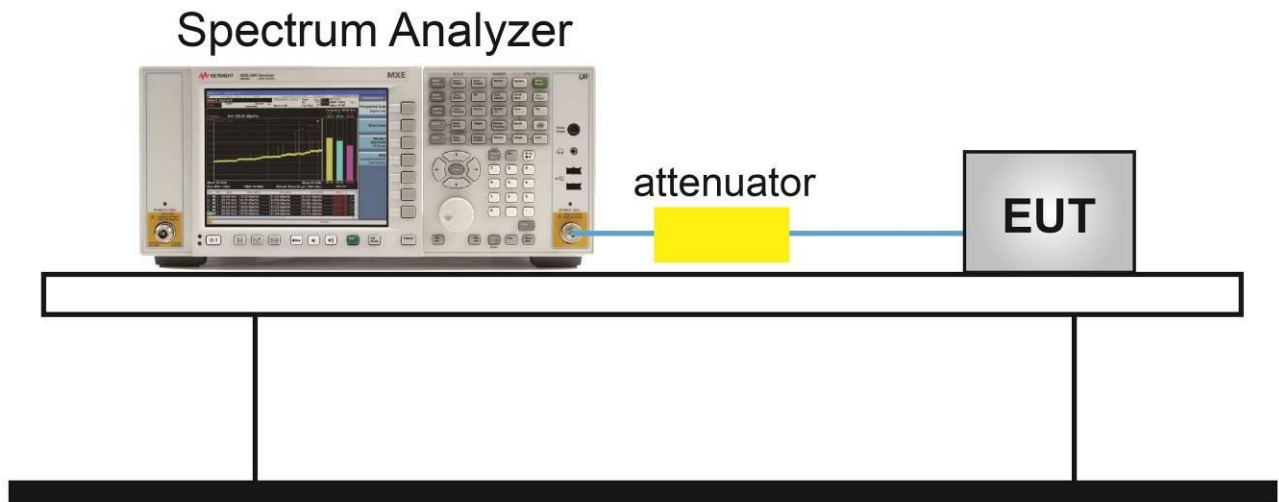
6.6.2. Test Procedure Used

ANSI C63.10-2013 - Section 7.8.4

6.6.3. Test Setting

1. Span = Zero span, centered on a hopping channel.
2. RBW shall be \leq channel spacing and where possible RBW should be set $\gg 1 / T$, where T is the expected dwell time per channel.
3. VBW \geq RBW
4. Sweep time = As necessary to capture the entire dwell time per hopping channel
5. Detector = Peak
6. Trace mode = Free run
7. Use the marker-delta function to determine the transmit time per hop. If this value varies with different modes of operation (data rate, modulation format, number of hopping channels, etc.), then repeat this test for each variation in transmit time. An oscilloscope may be used instead of a spectrum analyzer. The EUT shall show compliance with the appropriate regulatory limit for the number of hopping channels. A plot of the data shall be included in the test report.

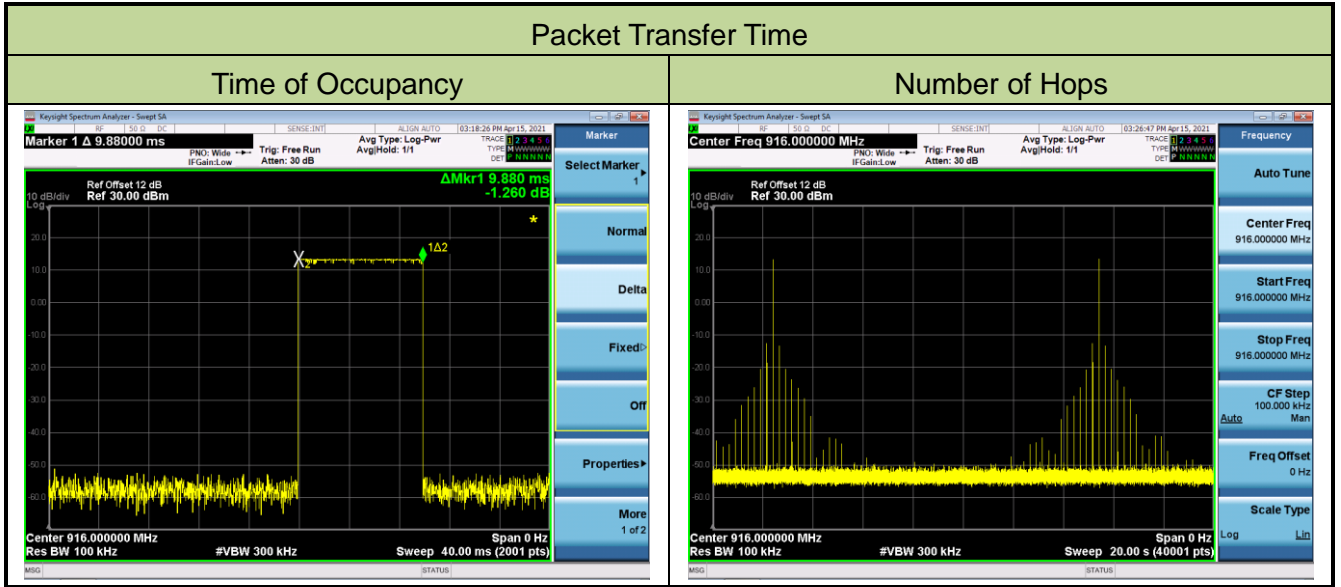
6.6.4. Test Setup



6.6.5. Test Result

Product	View Plus	Test Engineer	Flag Yang
Test Site	NS-TR2	Test Date	2021/04/15

Test Mode	Channel No.	Frequency (MHz)	Hops Over Occupancy Time (Hops)	Packet Transfer Time (ms)	Time of Occupancy (ms)	Limit (ms)	Result
SUB	27	916.0	2	9.880	19.760	≤ 400	Pass



6.7. Band-edge Compliance Measurement

6.7.1. Test Limit

The maximum permissible emission level is 20dBc. Any emissions were lying outside of the emission bandwidth and in authorized band edges to a field strength limit specified in Section 15.209 of the Title 47 CFR.

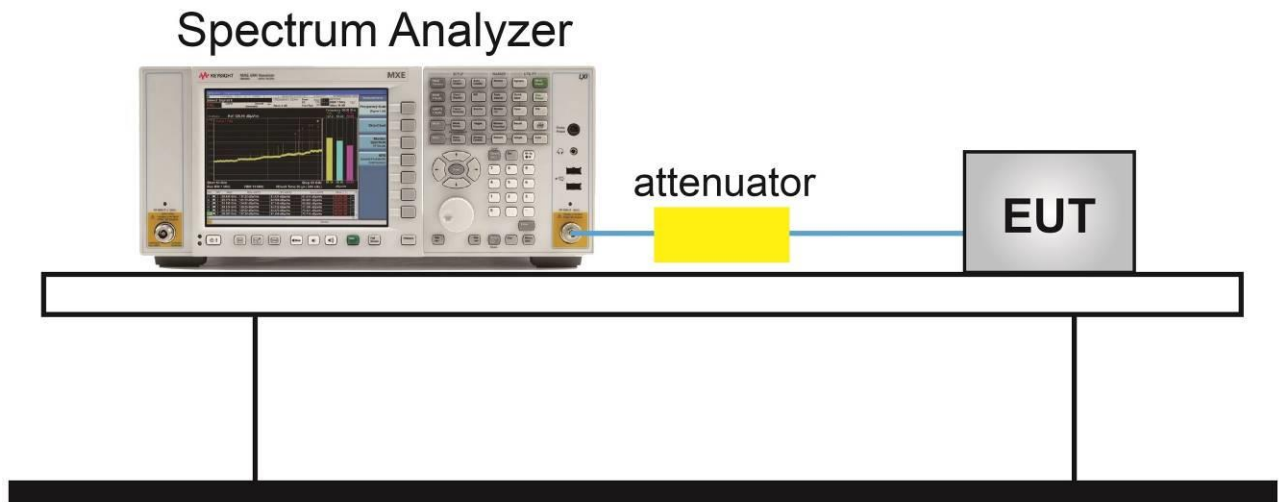
6.7.2. Test Procedure Used

ANSI C63.10-2013 - Section 6.10.4

6.7.3. Test Setting

1. Span = Wide enough to capture the peak level of the emission operating on the channel closest to the band edge, as well as any modulation products which fall outside of the authorized band of operation.
2. RBW = 100kHz
3. VBW = 300kHz
4. Detector = Peak
5. Sweep time = Auto couple
6. Trace mode = Max hold
7. Allow the trace to stabilize. Set the marker on the emission at the band edge, or on the highest modulation product outside of the band, if this level is greater than that at the band edge. Enable the marker-delta function, then use the marker-to-peak function to move the marker to the peak of the in-band emission.

6.7.4. Test Setup



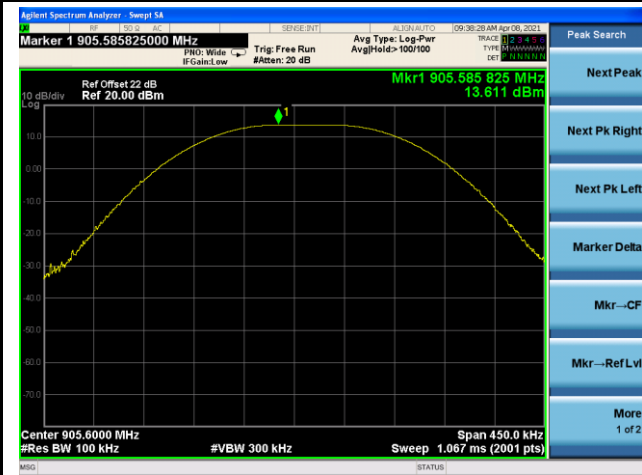
6.7.5. Test Result

Product	View Plus	Test Engineer	Flag Yang
Test Site	NS-TR2	Test Date	2021/04/15

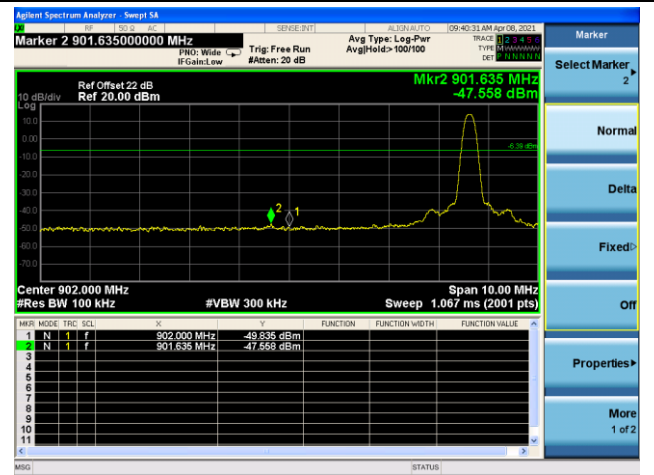
Test Mode	Channel No.	Frequency (MHz)	Limit	Result
SUB	01	905.6	20dBc	Pass
SUB	52	926.0	20dBc	Pass

Band-edge Compliance

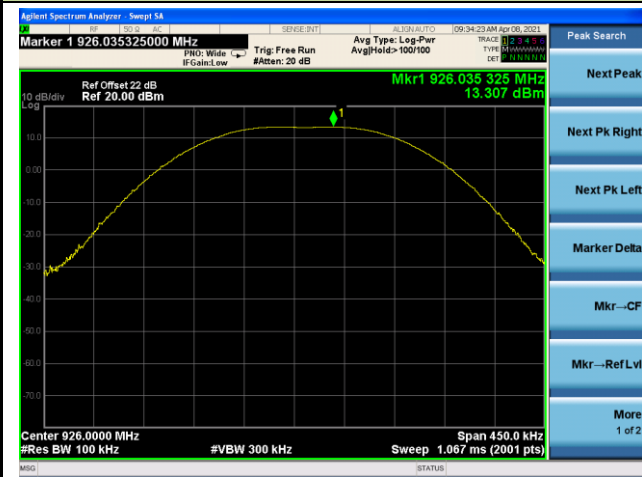
SUB - Channel 01 (905.6 MHz)



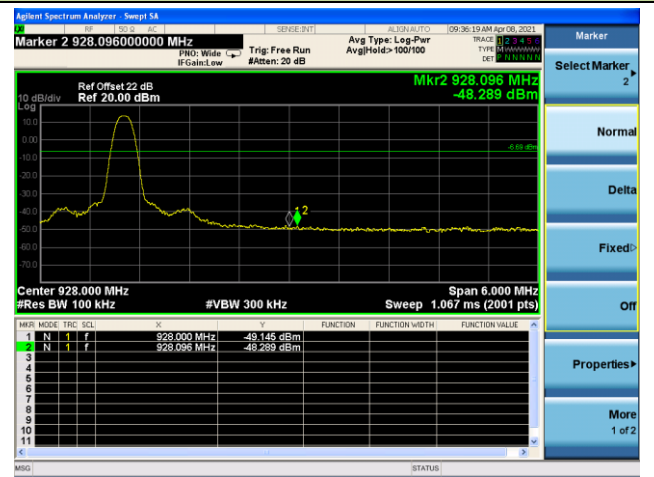
SUB - Channel 01 (905.6 MHz)



SUB - Channel 52 (926.0 MHz)

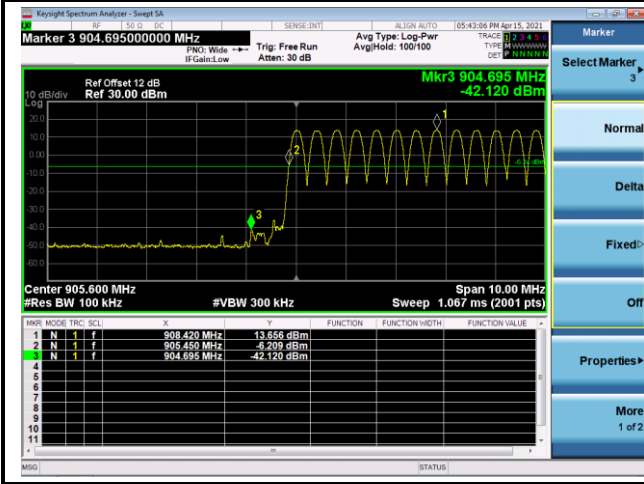


SUB - Channel 52 (926.0 MHz)

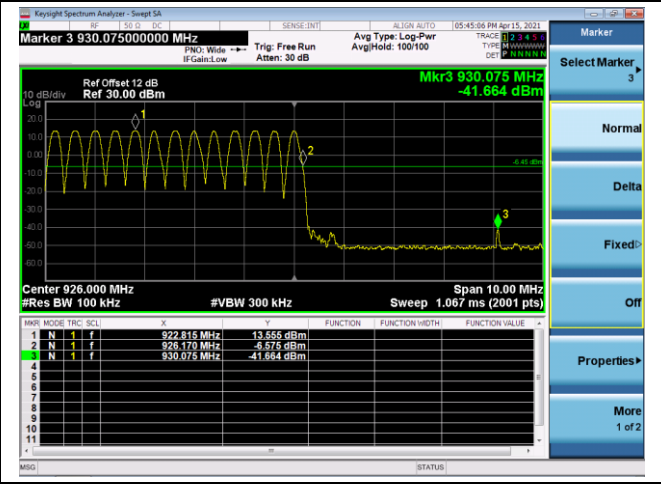


Operation Frequency Range of 20dB Bandwidth within Hopping Mode

SUB - Channel 01 (905.6 MHz)



SUB - Channel 52 (926.0 MHz)



6.8. Conducted Spurious Emissions Measurement

6.8.1. Test Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

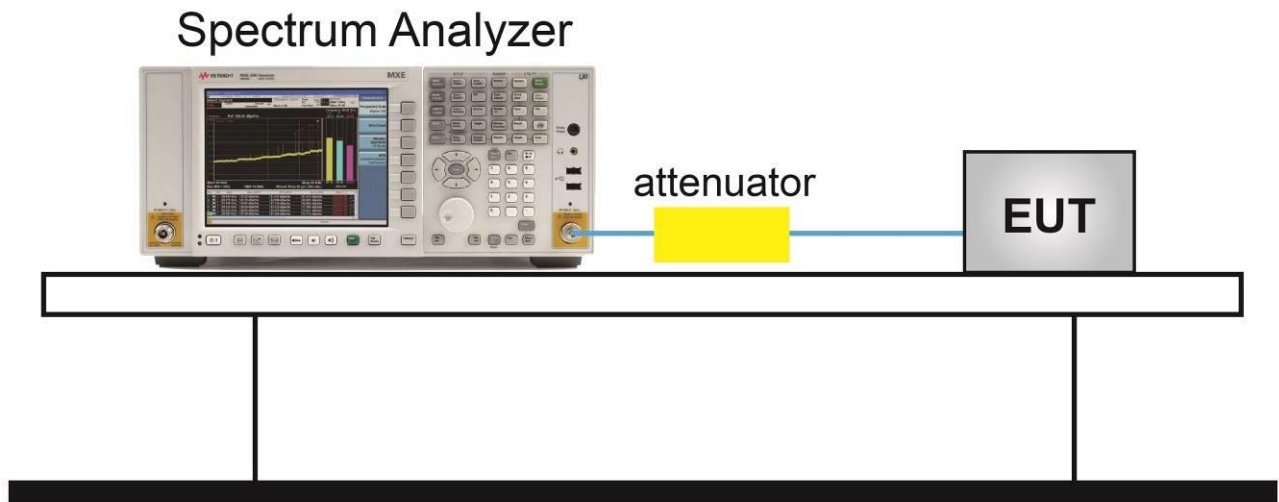
6.8.2. Test Procedure Used

ANSI C63.10-2013 - Section 7.8.8

6.8.3. Test Setting

1. Span = Wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.
2. RBW = 100kHz
3. VBW = 300kHz
4. Detector = Peak
5. Sweep time = Auto couple
6. Trace mode = Max hold
7. Trace was allowed to stabilize
8. Set the marker on the peak of any spurious emission recorded. The level displayed must comply with the limit specified in this section.

6.8.4. Test Setup

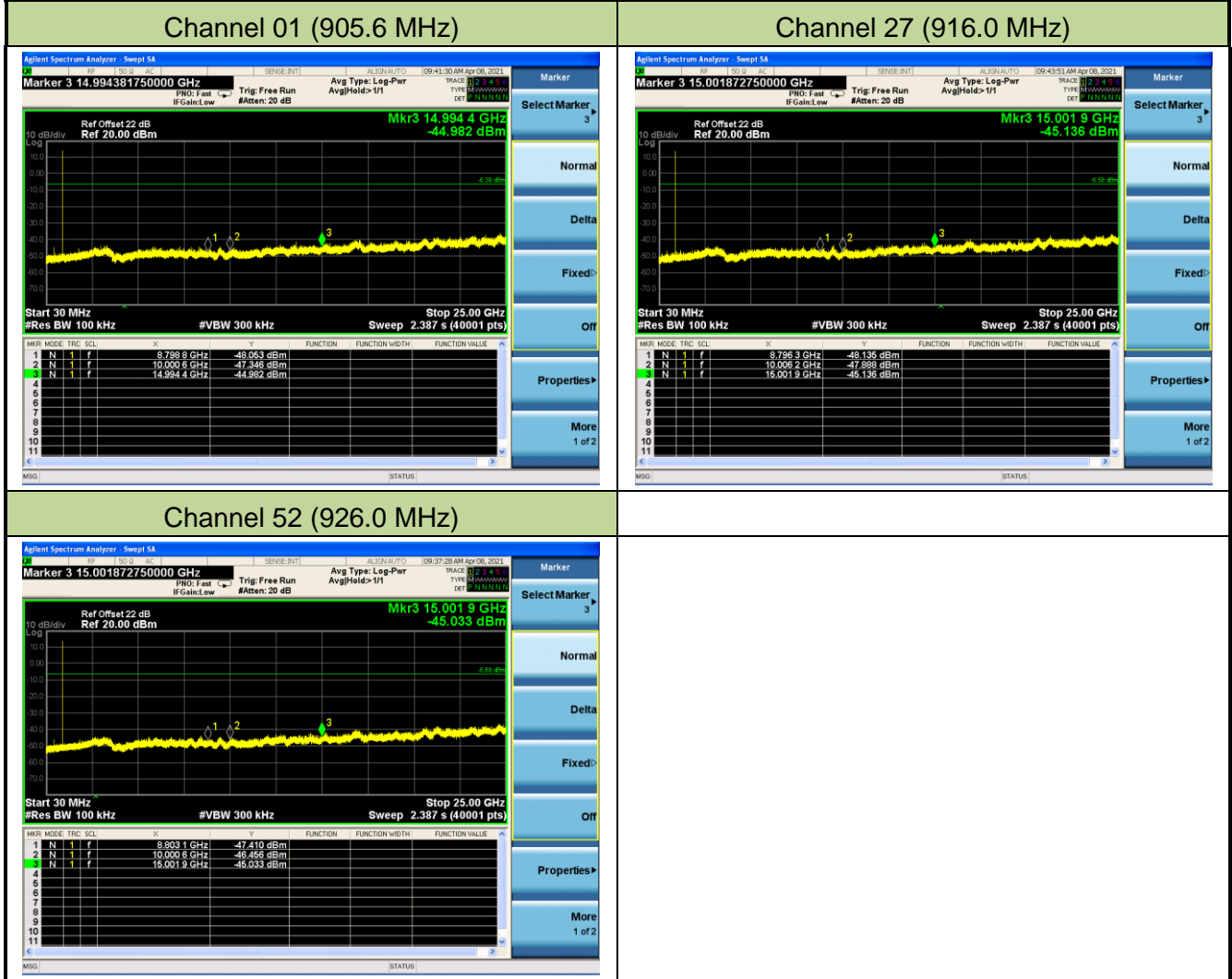


6.8.5. Test Result

Product	View Plus	Test Engineer	Flag Yang
Test Site	NS-TR2	Test Date	2021/04/15

Test Mode	Channel No.	Frequency (MHz)	Limit (MHz)	Result
SUB	01	905.6	20dBc	Pass
SUB	27	916.0	20dBc	Pass
SUB	52	926.0	20dBc	Pass

SUB Conducted Spurious Emissions



6.9. Radiated Spurious Emission Measurement

6.9.1. 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 ($\mu\text{V}/\text{m}$)	Measured Distance (m)
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

6.9.2. Test Procedure Used

ANSI C63.10-2013 - Section 6.3 & 6.4 & 6.5 & 6.6

6.9.3. 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
> 1000 MHz	1 MHz

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

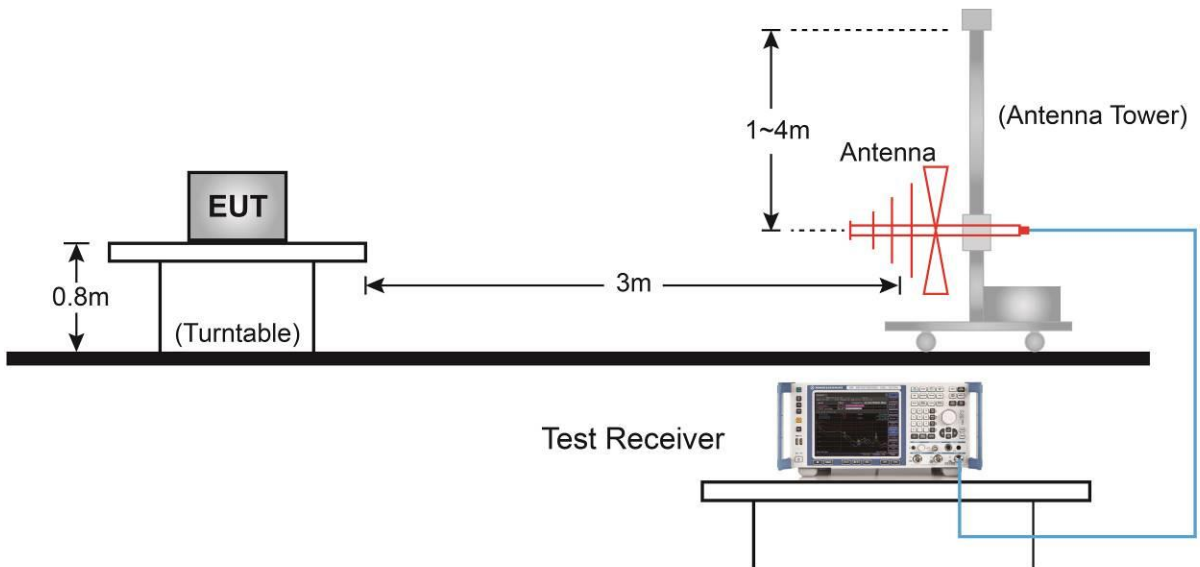
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = Peak
5. Sweep time = Auto couple
6. Trace mode = Max hold
7. Trace was allowed to stabilize

Average Measurements above 1GHz (Method VB)

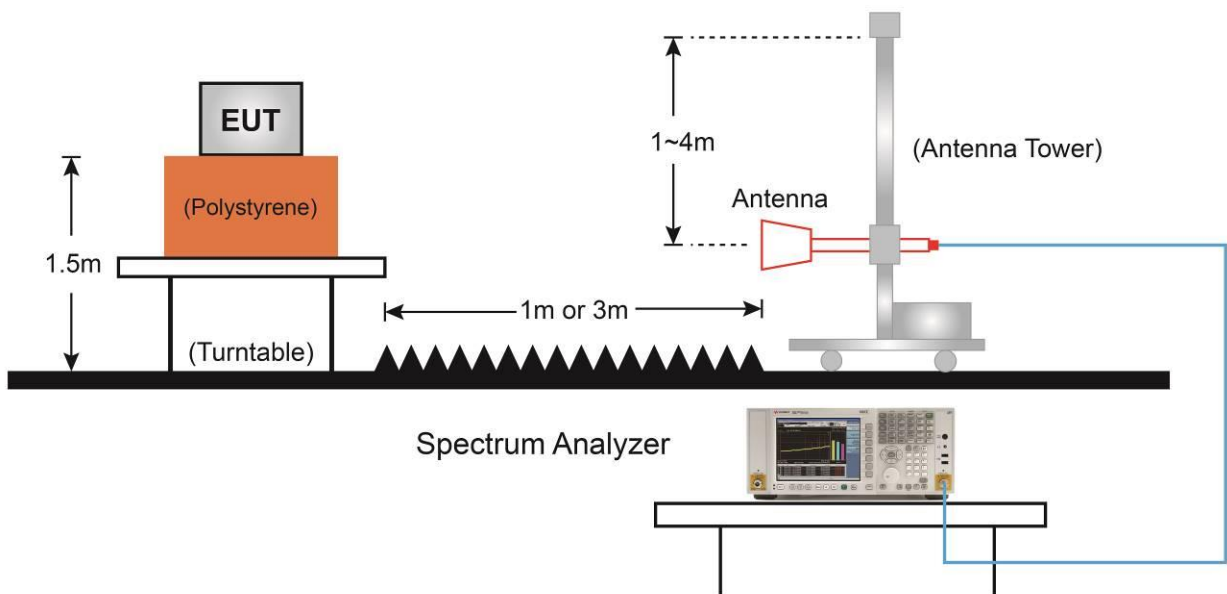
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW; If the EUT is configured to transmit with duty cycle $\geq 98\%$, set VBW = 10Hz
If the EUT duty cycle is $< 98\%$, set VBW $\geq 1/T$. T is the minimum transmission duration
4. Detector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

6.9.4. Test Setup

Below 1GHz Test Setup:



Above 1GHz Test Setup:



6.9.5. Test Result

Product	View	Test Engineer	Antony Yang
Test Site	NS-AC1	Test Date	2021/04/03
Test Mode	SUB	Test Channel	01
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.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor or Duty Cycle Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	1807.5	66.9	-4.4	62.5	74.0	-11.5	Peak	Horizontal
	1807.5	66.9	-24.5	42.4	54.0	-11.6	Average	Horizontal
	2717.0	64.0	-2.0	62.0	74.0	-12.0	Peak	Horizontal
	2717.0	64.0	-22.1	41.9	54.0	-12.1	Average	Horizontal
	4527.5	50.9	2.3	53.2	74.0	-20.8	Peak	Horizontal
	4527.5	50.9	-17.8	33.1	54.0	-20.9	Average	Horizontal
	1807.5	69.6	-4.4	65.2	74.0	-8.8	Peak	Vertical
	1807.5	69.6	-24.5	45.1	54.0	-8.9	Average	Vertical
	4527.5	53.0	2.3	55.3	74.0	-18.7	Peak	Vertical
	4527.5	53.0	-17.8	35.2	54.0	-18.8	Average	Vertical
	6338.0	51.6	5.8	57.4	74.0	-16.6	Peak	Vertical
	6338.0	51.6	-14.3	37.3	54.0	-16.7	Average	Vertical

Note 1: Duty Cycle Factor for Average Measure.

Duty Cycle Factor = $20 * \log_{10}(1/\text{Duty Cycle}) = 20.1$

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

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

Product	View	Test Engineer	Antony Yang
Test Site	NS-AC1	Test Date	2021/04/03
Test Mode	SUB	Test Channel	27
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.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	1833.0	65.8	-4.3	61.5	74.0	-12.5	Peak	Horizontal
	1833.0	65.8	-24.4	41.4	54.0	-12.6	Average	Horizontal
	2751.0	63.7	-2.1	61.6	74.0	-12.4	Peak	Horizontal
	2751.0	63.7	-22.2	41.5	54.0	-12.5	Average	Horizontal
	4578.5	51.2	2.6	53.8	74.0	-20.2	Peak	Horizontal
	4578.5	51.2	-17.5	33.7	54.0	-20.3	Average	Horizontal
	1833.0	69.5	-4.3	65.2	74.0	-8.8	Peak	Vertical
	1833.0	69.5	-24.4	45.1	54.0	-8.9	Average	Vertical
	2751.0	59.4	-2.1	57.3	74.0	-16.7	Peak	Vertical
	2751.0	59.4	-22.2	37.2	54.0	-16.8	Average	Vertical
	6406.0	52.9	6.1	59.0	74.0	-15.0	Peak	Vertical
	6406.0	52.9	-14.0	38.9	54.0	-15.1	Average	Vertical

Note 1: Duty Cycle Factor for Average Measure.

Duty Cycle Factor = $20 * \log_{10}(1/\text{Duty Cycle}) = 20.1$

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

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

Product	View	Test Engineer	Antony Yang
Test Site	NS-AC1	Test Date	2021/04/03
Test Mode	SUB	Test Channel	52
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.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	1850.0	65.3	-4.2	61.1	74.0	-12.9	Peak	Horizontal
	1850.0	65.3	-24.3	41.0	54.0	-13.0	Peak	Horizontal
	2776.5	60.6	-2.2	58.4	74.0	-15.6	Peak	Horizontal
	2776.5	60.6	-22.3	38.3	54.0	-15.7	Peak	Horizontal
	4629.5	50.8	2.7	53.5	74.0	-20.5	Peak	Horizontal
	4629.5	50.8	-17.4	33.4	54.0	-20.6	Peak	Horizontal
	1850.0	70.5	-4.2	66.3	74.0	-7.7	Peak	Horizontal
	1850.0	70.5	-24.3	46.2	54.0	-7.8	Peak	Horizontal
	2776.5	60.2	-2.2	58.0	74.0	-16.0	Peak	Vertical
	2776.5	60.2	-22.3	37.9	54.0	-16.1	Peak	Vertical
	6482.5	52.6	6.6	59.2	74.0	-14.8	Peak	Vertical
	6482.5	52.6	-13.5	39.1	54.0	-14.9	Peak	Vertical

Note 1: Duty Cycle Factor for Average Measure.

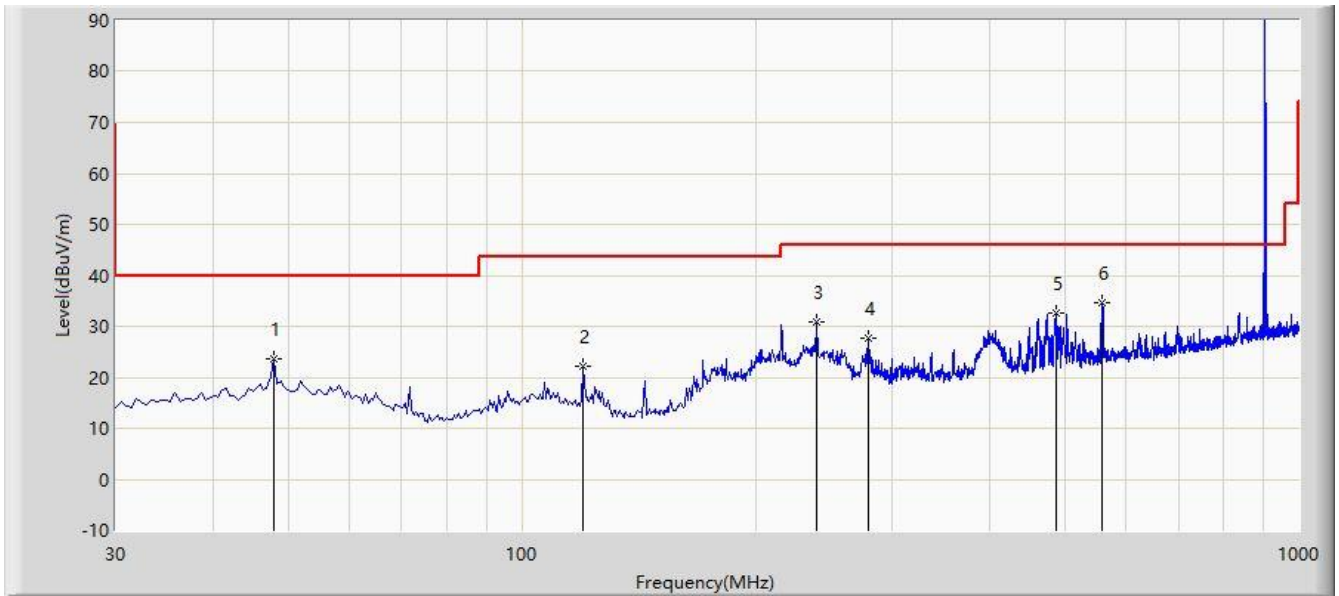
Duty Cycle Factor = $20 * \log_{10}(1/\text{Duty Cycle}) = 20.1$

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

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

The Result of Radiated Emission below 1GHz:

Site: NS-AC1	Time: 2021/04/13
Limit: FCC_Part 15.209_RE(3m)	Engineer: Antony Yang
Probe: NS-AC1_VULB9162	Polarity: Horizontal
EUT: View	Power: AC 120V/60Hz

The Worst Case


No	Flag	Mark	Frequency (MHz)	Measure Level (dBµV/m)	Reading Level (dBµV)	Margin (dB)	Limit (dBµV/m)	Factor (dB)	Type
1			47.945	23.686	4.468	-16.314	40.000	19.219	PK
2		*	119.725	22.268	6.265	-21.232	43.500	16.002	PK
3			240.005	30.804	12.921	-15.196	46.000	17.883	PK
4			279.775	27.666	9.026	-18.334	46.000	18.639	PK
5			486.385	32.624	10.324	-13.376	46.000	22.300	PK
6			557.680	34.694	10.761	-11.306	46.000	23.933	PK

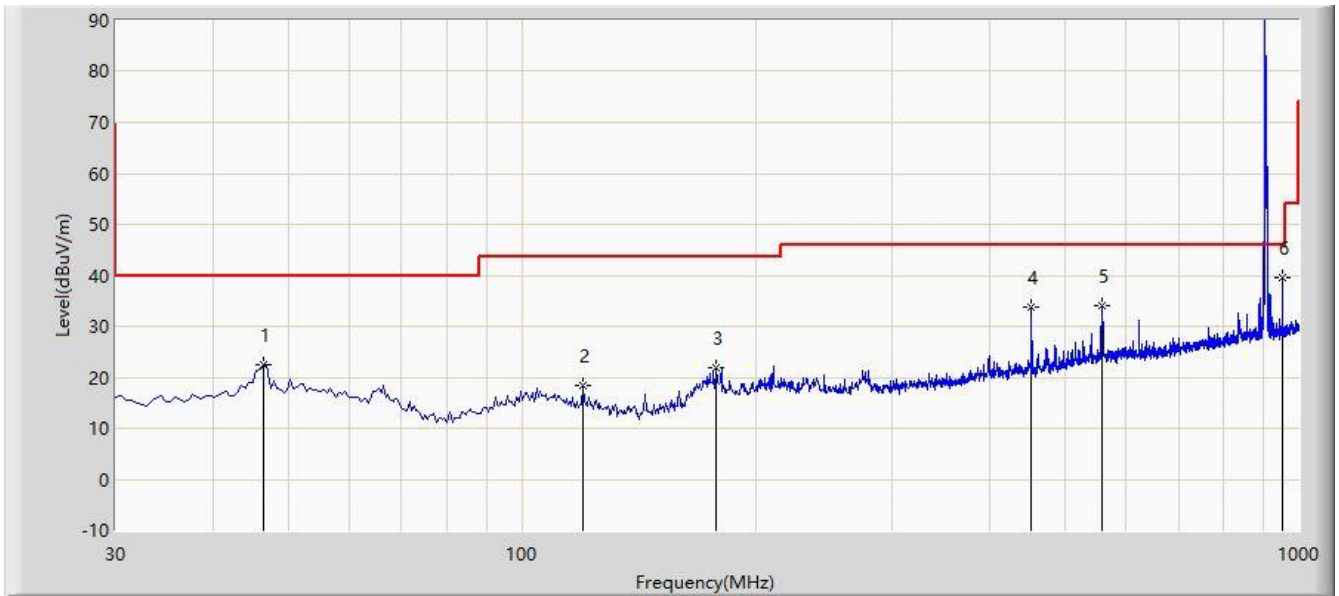
Note 1: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Note 2: The amplitude of radiated emissions (frequency range from 9kHz to 30MHz and 18GHz to 25GHz) is that proximity to ambient noise, which also are attenuated more than 20 dB below the permissible value.

Therefore, the data is not presented in the report.

Site: NS-AC1	Time: 2021/04/13
Limit: FCC_Part 15.209_RE(3m)	Engineer: Antony Yang
Probe: NS-AC1_VULB9162	Polarity: Vertical
EUT: View	Power: AC 120V/60Hz

The Worst Case


No	Flag	Mark	Frequency (MHz)	Measure Level (dBµV/m)	Reading Level (dBµV)	Margin (dB)	Limit (dBµV/m)	Factor (dB)	Type
1			46.490	22.581	3.515	-17.419	40.000	19.066	PK
2			119.725	18.304	2.301	-25.196	43.500	16.002	PK
3		*	177.925	21.777	6.197	-21.723	43.500	15.580	PK
4			452.920	33.735	11.686	-12.265	46.000	22.049	PK
5			557.195	34.020	10.097	-11.980	46.000	23.923	PK
6			953.925	39.630	10.440	-6.370	46.000	29.190	PK

Note 1: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Note 2: The amplitude of radiated emissions (frequency range from 9kHz to 30MHz and 18GHz to 25GHz) is that proximity to ambient noise, which also are attenuated more than 20 dB below the permissible value.

Therefore, the data is not presented in the report.

6.10. AC Conducted Emissions Measurement

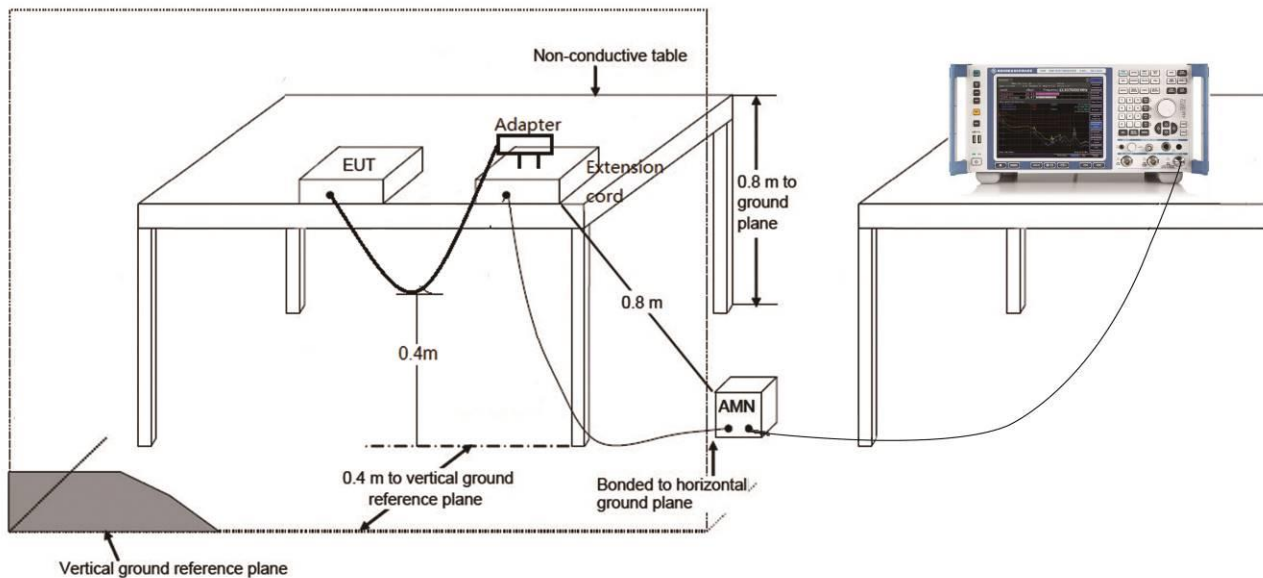
6.10.1. Test Limit

FCC Part 15 Subpart C Paragraph 15.207 Limits		
Frequency (MHz)	QP (dB μ V)	Average (dB μ V)
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.

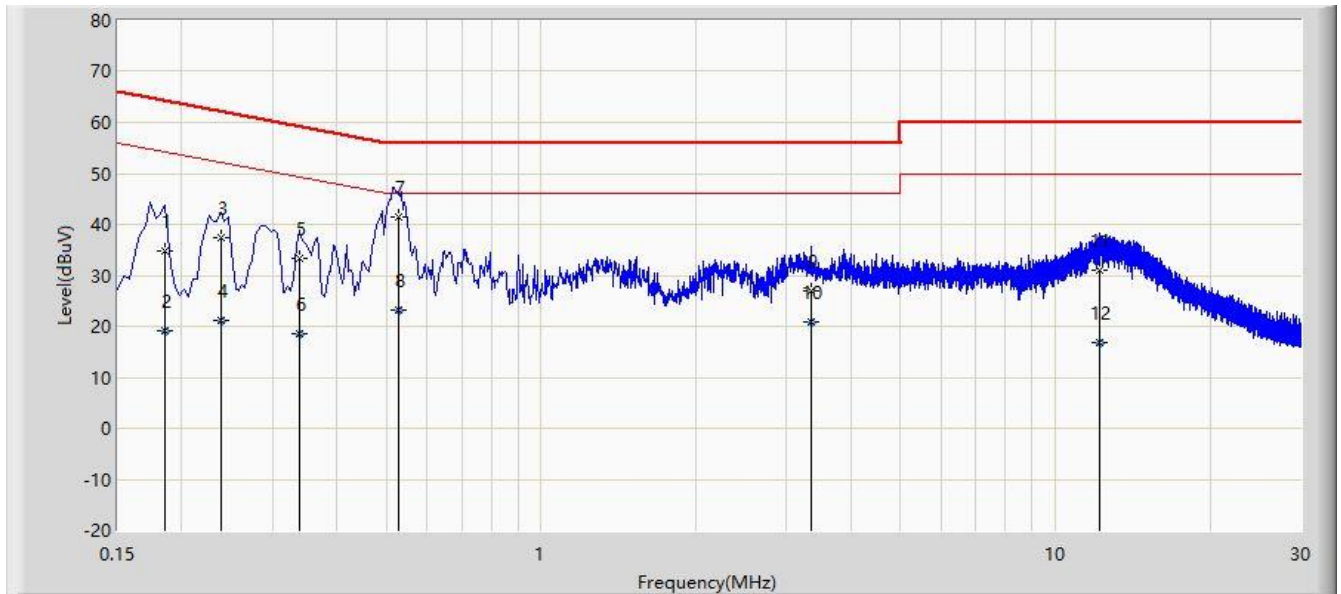
Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

6.10.2. Test Setup



6.10.3. Test Result

Site: NS-SR2	Time: 2021/03/31
Limit: FCC_Part15.207_CE_AC Power	Engineer: Flag Yang
Probe: ENV216_102493_Filter Off_0.15~30MHz	Polarity: Line
EUT: View Pollution	Power: AC 120V/60Hz
The Worst Case	

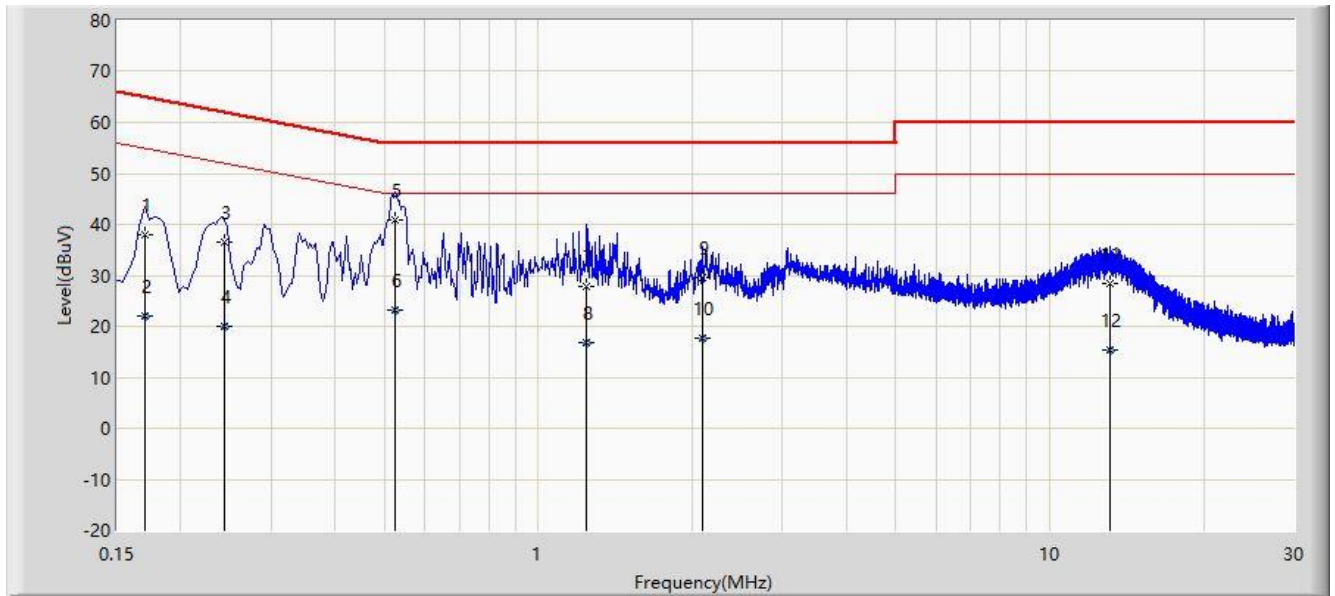


No	Flag	Mark	Frequency (MHz)	Measure Level (dB μ V)	Reading Level (dB μ V)	Margin (dB)	Limit (dB μ V)	Factor (dB)	Type
1			0.186	34.713	25.172	-29.501	64.213	9.540	QP
2			0.186	19.019	9.479	-35.194	54.213	9.540	AV
3		*	0.238	37.265	27.722	-24.900	62.166	9.544	QP
4			0.238	21.175	11.631	-30.991	52.166	9.544	AV
5			0.338	33.189	23.631	-26.063	59.252	9.559	QP
6			0.338	18.434	8.875	-30.819	49.252	9.559	AV
7			0.527	41.336	31.772	-14.664	56.000	9.564	QP
8			0.527	23.234	13.670	-22.766	46.000	9.564	AV
9			3.350	27.052	17.383	-28.948	56.000	9.669	QP
10			3.350	20.781	11.113	-25.219	46.000	9.669	AV
11			12.222	30.935	21.115	-29.065	60.000	9.820	QP
12			12.222	16.695	6.876	-33.305	50.000	9.820	AV

Note: Measure Level (dB μ V) = Reading Level (dB μ V) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB)

Site: NS-SR2	Time: 2021/03/31
Limit: FCC_Part15.207_CE_AC Power	Engineer: Flag Yang
Probe: ENV216_102493_Filter Off_0.15~30MHz	Polarity: Neutral
EUT: View Pollution	Power: AC 120V/60Hz

The Worst Case


No	Flag	Mark	Frequency (MHz)	Measure Level (dB μ V)	Reading Level (dB μ V)	Margin (dB)	Limit (dB μ V)	Factor (dB)	Type
1			0.170	37.973	28.432	-26.988	64.960	9.540	QP
2			0.170	22.063	12.523	-32.897	54.960	9.540	AV
3		*	0.244	36.382	26.838	-25.593	61.975	9.544	QP
4			0.244	20.117	10.573	-31.858	51.975	9.544	AV
5			0.526	40.950	31.379	-15.050	56.000	9.571	QP
6			0.526	23.099	13.528	-22.901	46.000	9.571	AV
7			1.242	27.822	18.217	-28.178	56.000	9.606	QP
8			1.242	16.773	7.168	-29.227	46.000	9.606	AV
9			2.094	29.457	19.814	-26.543	56.000	9.643	QP
10			2.094	17.623	7.980	-28.377	46.000	9.643	AV
11			13.138	28.538	18.668	-31.462	60.000	9.870	QP
12			13.138	15.474	5.604	-34.526	50.000	9.870	AV

Note: Measure Level (dB μ V) = Reading Level (dB μ V) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB)

7. CONCLUSION

The data collected relate only the item(s) tested and show that the device is compliance with Part 15C of the FCC rules.

The End

Appendix A - Test Setup Photograph

Refer to "2103RSU015-UT" file.

Appendix B - EUT Photograph

Refer to "2103RSU015-UE" file.