

# MEASUREMENT REPORT

## FCC PART 15.247 / RSS-247

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**FCC ID:** BRWSPMAR8020T  
**IC:** 6157A-SPMAR8020T  
**Applicant:** Horizon Hobby LLC

**Application Type:** Certification  
**Product:** Receiver  
**Model No.:** AR8020T  
**Brand Name:** Spektrum  
**FCC Classification:** Digital Transmission System (DTS)  
**FCC Rule Part(s):** Part15 Subpart C (Section 15.247)  
**ISED Rule(s):** RSS-247 Issue 2, RSS-GEN Issue 5  
**Test Procedure(s):** ANSI C63.10-2013, KDB 558074 D01v05  
**Test Date:** June 04 ~ September 28, 2020

Reviewed By:

*Sunny Sun*

( Sunny Sun )

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 (Suzhou) Co., Ltd.

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### Revision History

Report No.	Version	Description	Issue Date	Note
2005RSU059-U1	Rev. 01	Initial Report	09-28-2020	Valid

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## General Information

<b>Applicant:</b>	Horizon Hobby LLC
<b>Applicant Address:</b>	2904 Research Rd., Champaign IL 61821
<b>Manufacturer:</b>	Horizon Hobby LLC
<b>Manufacturer Address:</b>	2904 Research Rd., Champaign IL 61821
<b>Test Site:</b>	MRT Technology (Suzhou) Co., Ltd
<b>Test Site Address:</b>	D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China

## Test Facility / Accreditations

Measurements were performed at MRT Laboratory located in Tian'edang Rd., Suzhou, China.

- MRT facility is an FCC accredited testing laboratory (MRT Designation No. CN1166) on the FCC website.
- MRT facility is an ISED recognized testing laboratory (MRT Reg. No. CN0001) on the ISED website.
- MRT facility is a VCCI registered (R-20025, G-20034, C-20020, T-20020) test laboratory with the site description on file at VCCI Council.
- MRT Lab is accredited to ISO 17025 by the A2LA under the A2LA Program (Cert. No. 3628.01) and CNAS under the CNAS Program (Cert. No. L10551) in EMC, Safety, Radio, Telecommunications and SAR testing.

## 1. INTRODUCTION

### 1.1. Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Innovation, Science and Economic Development Canada and Certification and Engineering Bureau.

### 1.2. MRT Test Location

The map below shows the location of the MRT LABORATORY, its proximity to the Taihu Lake. These measurement tests were conducted at the MRT Technology (Suzhou) Co., Ltd. Facility located at D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China. The measurement facility compliant with the test site requirements specified in ANSI C63.4-2014.



## 2. PRODUCT INFORMATION

### 2.1. Feature of Equipment under Test

Product Name:	Receiver
Model No.:	AR8020T
Brand Name:	Spektrum
Operating Frequency:	2404~2476MHz
Channel Number:	23
Type of modulation:	GFSK
Identification Number:	01

### 2.2. Antenna Information

Antenna	Antenna A	Antenna B
Antenna Type	Monopole Antenna	Monopole Antenna
Model	SPM-ELASY-000068	SPM-ELASY-000067
Manufacturer	Hirose	Hirose
MAX. Antenna Gain	1.5dBi	1.5dBi

Note: This device only supports SISO mode, and two antennas of this device cannot transmit simultaneously.

### 2.3. Working Frequencies for this Report

Channel	Frequency	Channel	Frequency
00	2404 MHz	12	2442 MHz
01	2412 MHz	13	2446 MHz
02	2411 MHz	14	2450 MHz
03	2414 MHz	15	2452 MHz
04	2417 MHz	16	2456 MHz
05	2420 MHz	17	2459 MHz
06	2424 MHz	18	2463 MHz
07	2427 MHz	19	2466 MHz
08	2430 MHz	20	2469 MHz
09	2433 MHz	21	2473 MHz
10	2437 MHz	22	2476 MHz
11	2440 MHz	--	--

## 2.4. Test Mode

Test Mode	Mode 1: Transmit by Ant A
	Mode 1: Transmit by Ant B

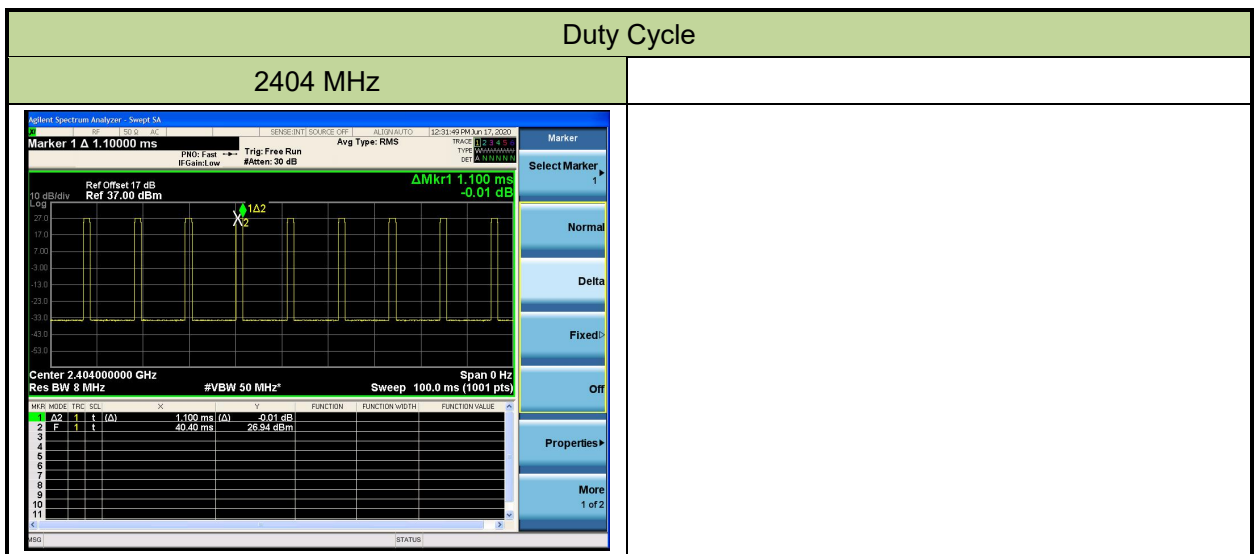
## 2.5. Duty Cycle

The maximum achievable duty cycles was determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz, Sweep time = 100ms. The duty cycles are as follows:

Time On (ms)	One Period (ms)	Duty Cycle (%)	Duty Cycle Factor (dB)
9.9	100	9.9	-20.1

Note:

1. Duty Cycle Factor =  $20 \cdot \log(\text{Duty Cycle})$
2. Time On (ms) =  $1.1 \cdot 9 \text{ (ms)} = 9.9 \text{ (ms)}$ .



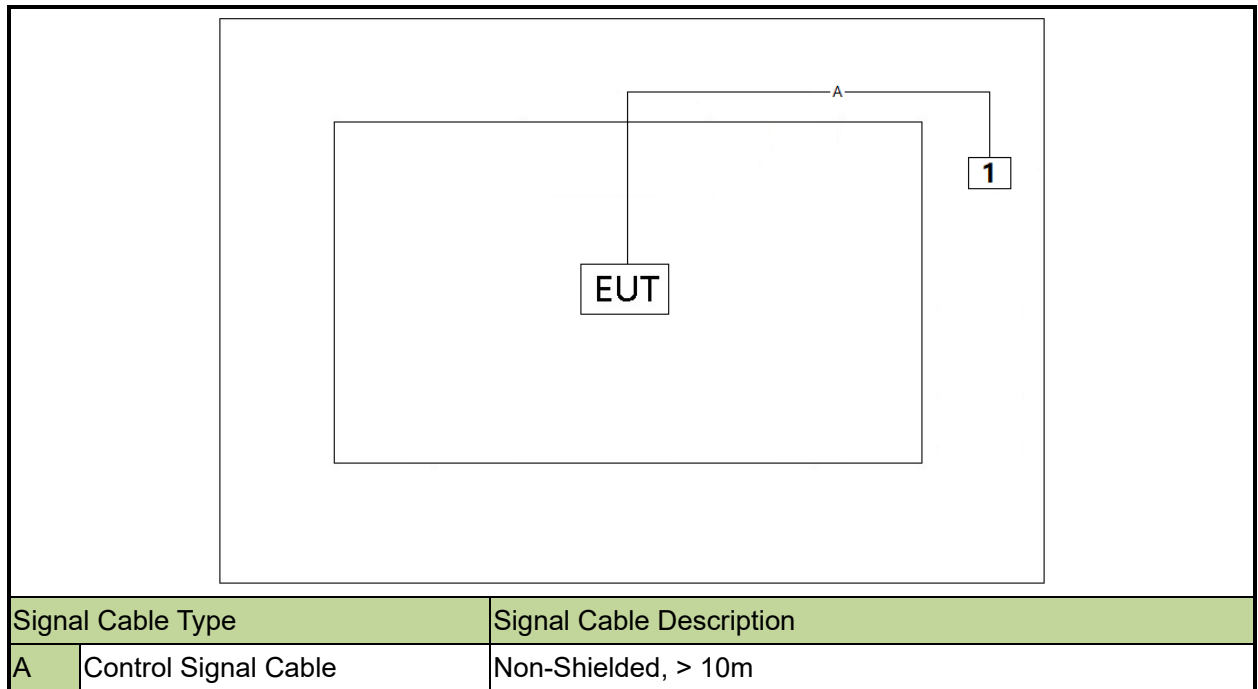
## 2.6. Description of Test Software

The test utility software used during testing was “RF Compliance Mode Setup”, and the version was 4.1.



## 2.7. Description of Test Configuration

The ANSI C63.10: 2013 was used to reference the appropriate EUT setup for testing.



## 2.8. Test System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product	Manufacturer	Model No.
1	Notebook	Lenovo
		E495

### 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:**

This device complies with the requirement of §15.203.

#### 4. TEST EQUIPMENT CALIBRATION DATE

##### Conducted Emissions - SR2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR3	MRTSUE06185	1 year	2021/01/18
Two-Line V-Network	R&S	ENV 216	MRTSUE06002	1 year	2020/06/13
				1 year	2021/06/11
Two-Line V-Network	R&S	ENV 216	MRTSUE06003	1 year	2020/06/13
				1 year	2021/06/11
Thermal Hygrometer	testo	608-H1	MRTSUE06403	1 year	2020/08/08
				1 year	2021/07/26

##### Radiated Emissions - AC1

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2021/01/18
PXA Signal Analyzer	Keysight	9030B	MRTSUE06395	1 year	2020/09/03
				1 year	2021/08/30
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2020/11/10
Bilog Period Antenna	Schwarzbeck	VULB 9168	MRTSUE06172	1 year	2021/04/03
Broad Band Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06023	1 year	2020/10/13
Broad Band Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06597	1 year	2020/12/17
Microwave System Amplifier	Agilent	83017A	MRTSUE06076	1 year	2020/11/15
Preamplifier	Schwarzbeck	BBV 9721	MRTSUE06121	1 year	2020/06/11
				1 year	2021/06/11
Thermal Hygrometer	testo	608-H1	MRTSUE06403	1 year	2020/08/08
				1 year	2021/07/26
Anechoic Chamber	TDK	Chamber-AC1	MRTSUE06212	1 year	2021/04/30

## Radiated Emission - AC2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
MXE EMI Receiver	Keysight	N9038A	MRTSUE06125	1 year	2020/08/01
				1 year	2021/07/02
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2020/11/10
Bilog Period Antenna	Schwarzbeck	VULB 9162	MRTSUE06022	1 year	2020/10/13
Horn Antenna	Schwarzbeck	BBHA9120D	MRTSUE06171	1 year	2020/10/27
Broad Band Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06597	1 year	2020/12/17
Broadband Coaxial Preamplifier	Schwarzbeck	BBV 9718	MRTSUE06176	1 year	2020/11/15
Preamplifier	Schwarzbeck	BBV 9721	MRTSUE06121	1 year	2020/06/11
				1 year	2021/06/11
Temperature/Humidity Meter	Minggao	ETH529	MRTSUE06170	1 year	2020/12/15
Anechoic Chamber	RIKEN	Chamber-AC2	MRTSUE06213	1 year	2021/04/30

## Conducted Test Equipment - TR3

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EXA Signal Analyzer	Agilent	N9020A	MRTSUE06106	1 year	2021/04/14
PXA Signal Analyzer	Keysight	9030B	MRTSUE06395	1 year	2020/09/03
				1 year	2021/08/30
EXA Signal Analyzer	Keysight	N9010B	MRTSUE06607	1 year	2021/01/08
Signal Analyzer	R&S	FSV40	MRTSUE06218	1 year	2021/04/14
Power Meter	Agilent	U2021XA	MRTSUE06030	1 year	2020/11/18
Temperature & Humidity Chamber	BAOYT	BYH-150CL	MRTSUE06051	1 year	2020/11/07
Thermal Hygrometer	testo	608-H1	MRTSUE06401	1 year	2020/08/08
				1 year	2021/07/26

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  $k = 2$ .

<b>AC Conducted Emission Measurement</b>
Measurement Uncertainty for a Level of Confidence of 95% ( $U=2Uc(y)$ ): 9kHz~150kHz: 3.74dB 150kHz~30MHz: 3.44dB
<b>Radiated Disturbance</b>
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
<b>Spurious Emissions, Conducted</b>
Measurement Uncertainty for a Level of Confidence of 95% ( $U=2Uc(y)$ ): 0.78dB
<b>Output Power</b>
Measurement Uncertainty for a Level of Confidence of 95% ( $U=2Uc(y)$ ): 1.13dB
<b>Power Spectrum Density</b>
Measurement Uncertainty for a Level of Confidence of 95% ( $U=2Uc(y)$ ): 1.15dB
<b>Occupied Bandwidth</b>
Measurement Uncertainty for a Level of Confidence of 95% ( $U=2Uc(y)$ ): 0.28%

## 6. TEST RESULT

### 6.1. Summary

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
15.247(a)(2)	RSS-247 [5.2]	6dB Bandwidth	$\geq 500\text{kHz}$	Conducted	Pass	Section 6.2
N/A	RSS-Gen [6.7]	99% Bandwidth	N/A		Pass	
15.247(b)(3)	RSS-247 [5.4(d)]	Output Power	$\leq 1\text{Watt}$ & $\text{EIRP} \leq 4\text{Watt}$		Pass	Section 6.3
15.247(e)	RSS-247 [5.2]	Power Spectral Density	$\leq 8\text{dBm} / 3\text{kHz}$		Pass	Section 6.4
15.247(d)	RSS-247 [5.5]	Band Edge / Out-of-Band Emissions	20dBc (Peak)		Pass	Section 6.5
15.205 15.209	RSS-247 [5.5]	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209	Radiated	Pass	Section 6.6 & 6.7
15.207	RSS-Gen [8.8]	AC Conducted Emissions 150kHz - 30MHz	< FCC 15.207 limits	Line Conducted	N/A	Section 6.8

#### Notes:

- 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) All modes of operation and data rates were investigated. For radiated emission test, every axis (X, Y, Z) was also verified. The test results shown in the following sections represent the worst-case emissions.

## **6.2. Occupied Bandwidth Measurement**

### **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 (6dB bandwidth)

ANSI C63.10-2013 - Section 6.9.3 (99% bandwidth)

### **6.2.3. Test Setting**

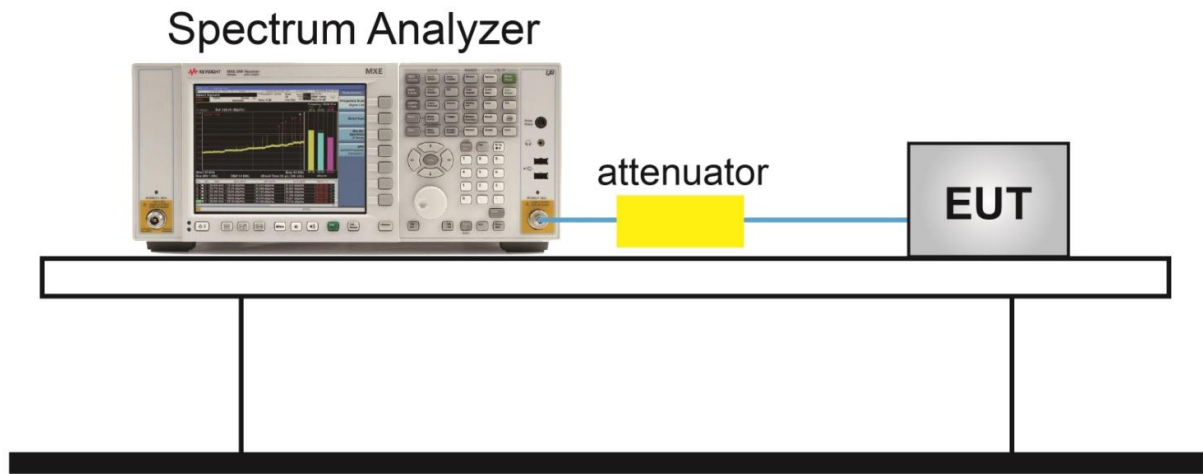
#### **For 6dB bandwidth**

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 was allowed to stabilize

#### **For 99% bandwidth**

1. Span = 1.5 times to 5 times the OBW
2. Set RBW = 1% to 5% the OBW
3.  $VBW \geq 3 \times RBW$
4. Detector = Peak
5. Trace mode = Max hold
6. Sweep = Auto couple
7. Allow the trace was allowed to stabilize

### 6.2.4. Test Setup





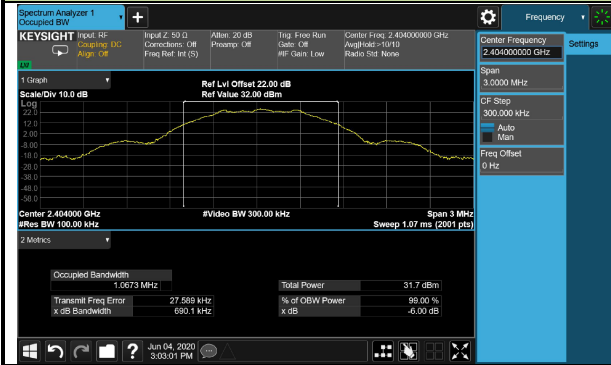
**6.2.5. Test Result**

Product	Receiver	Temperature	25°C
Test Engineer	Dandy Li	Relative Humidity	52%
Test Site	SR2	Test Date	2020/06/04 ~ 2020/09/28

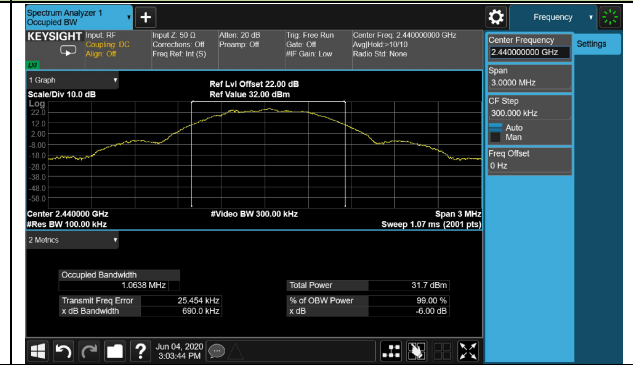
Test Mode	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	99% Bandwidth (MHz)	Result
Ant A	00	2404	0.690	≥ 0.5	1.052	Pass
	11	2440	0.690	≥ 0.5	1.065	Pass
	22	2476	0.659	≥ 0.5	1.054	Pass
Ant B	00	2404	0.691	≥ 0.5	1.052	Pass
	11	2440	0.675	≥ 0.5	1.061	Pass
	22	2476	0.669	≥ 0.5	1.047	Pass

## 6dB Bandwidth - Ant A

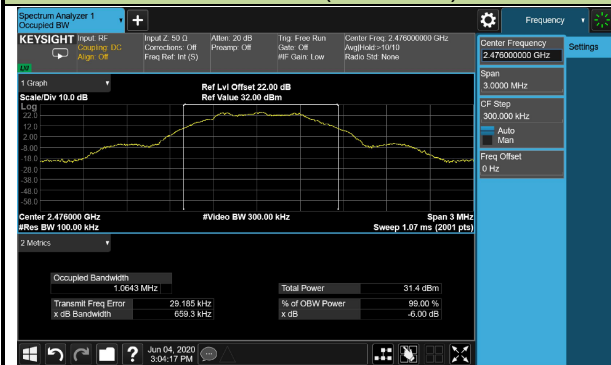
## Channel 00 (2404MHz)



## Channel 11 (2440MHz)

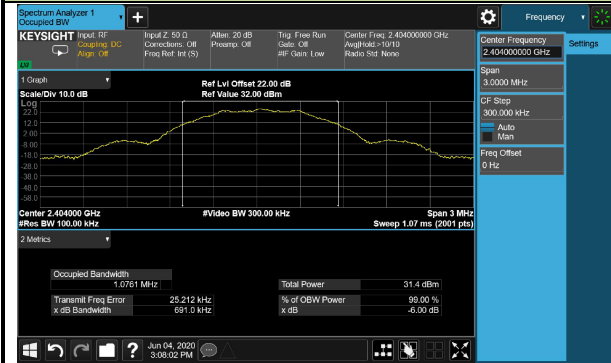


## Channel 22 (2476MHz)

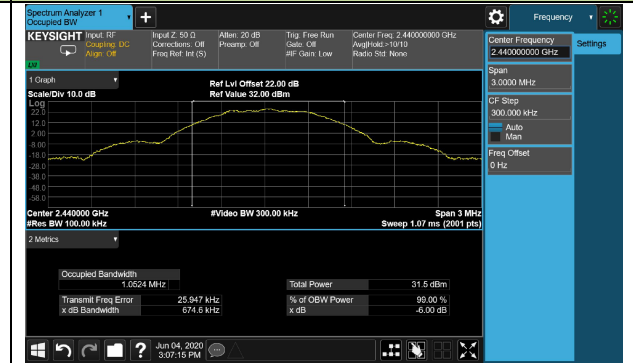


## 6dB Bandwidth - Ant B

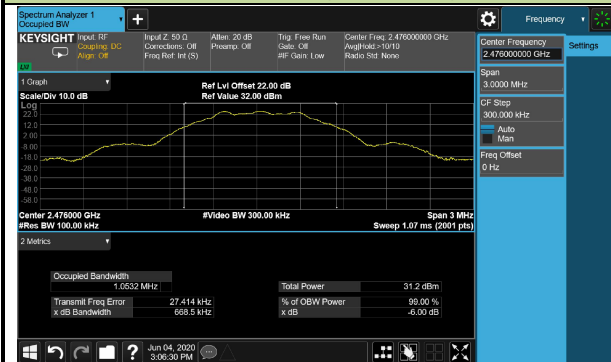
## Channel 00 (2404MHz)



## Channel 11 (2440MHz)



## Channel 22 (2476MHz)



99% Bandwidth - Ant A

Channel 00 (2404MHz)



Channel 11 (2440MHz)



Channel 22 (2476MHz)

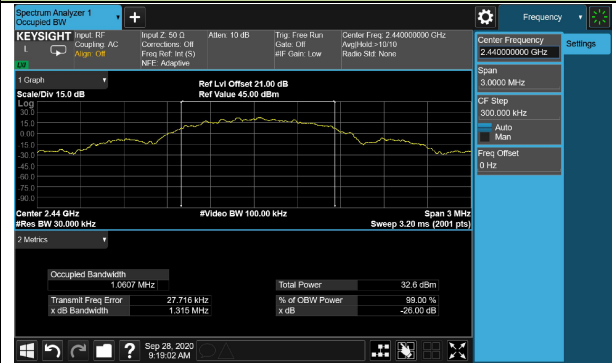


99% Bandwidth - Ant B

Channel 00 (2404MHz)



Channel 11 (2440MHz)



Channel 22 (2476MHz)



### **6.3. Output Power Measurement**

#### **6.3.1. Test Limit**

The maximum conducted output power shall not exceed 1 Watt (30dBm) and the E.I.R.P shall not exceed 4 Watt (36.02dBm).

#### **6.3.2. Test Procedure Used**

ANSI C63.10 - Section 11.9.1.3

ANSI C63.10 - Section 11.9.2.3.2

#### **6.3.3. Test Setting**

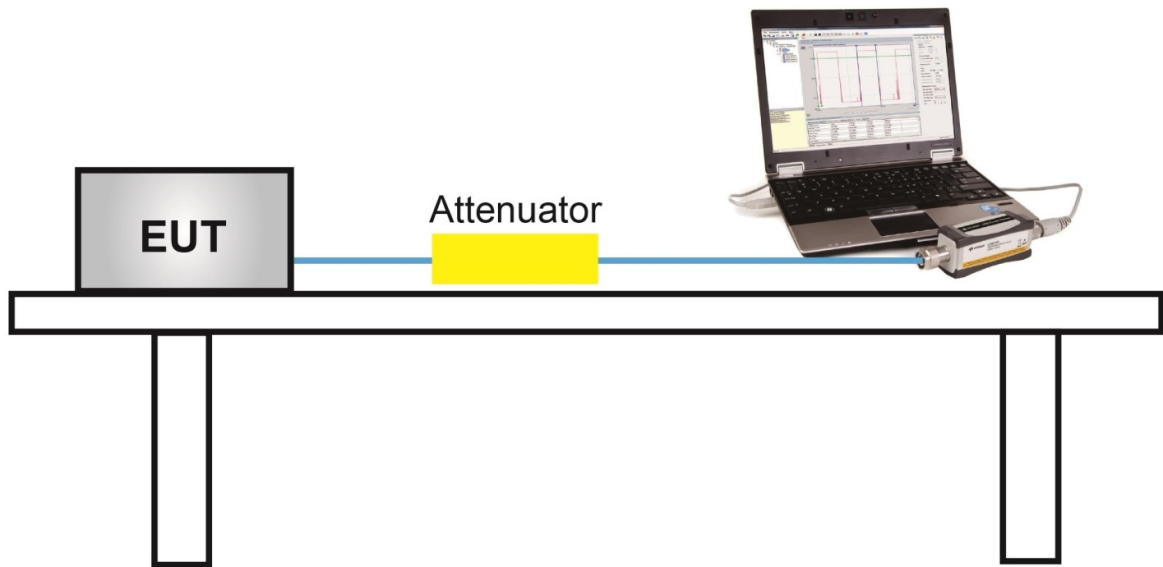
##### **PKPM1 Peak-reading power meter method**

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall utilize a fast-responding diode detector.

##### **Method AVGPM-G (Measurement using a gated RF average-reading power meter)**

Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since this measurement is made only during the ON time of the transmitter, no duty cycle correction is required.

### 6.3.4. Test Setup



### 6.3.5. Test Result of Output Power

Product	Receiver	Temperature	25°C
Test Engineer	Dandy Li	Relative Humidity	52%
Test Site	TR3	Test Date	2020/06/04

Test Mode	Channel No.	Frequency (MHz)	Average Power (dBm)	Limit (dBm)	E.I.R.P (dBm)	E.I.R.P Limit (dBm)	Result
Ant A	00	2404	25.06	≤ 30.00	26.56	≤ 36.00	Pass
	11	2440	25.06	≤ 30.00	26.56	≤ 36.00	Pass
	22	2476	24.99	≤ 30.00	26.49	≤ 36.00	Pass
Ant B	00	2404	24.68	≤ 30.00	26.18	≤ 36.00	Pass
	11	2440	24.63	≤ 30.00	26.13	≤ 36.00	Pass
	22	2476	24.50	≤ 30.00	26.00	≤ 36.00	Pass

Note: E.I.R.P (dBm) = Average Power (dBm) + Antenna Gain (dBi), Antenna Gain (dBi) = 1.5 dBi.

## **6.4. Power Spectral Density Measurement**

### **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.

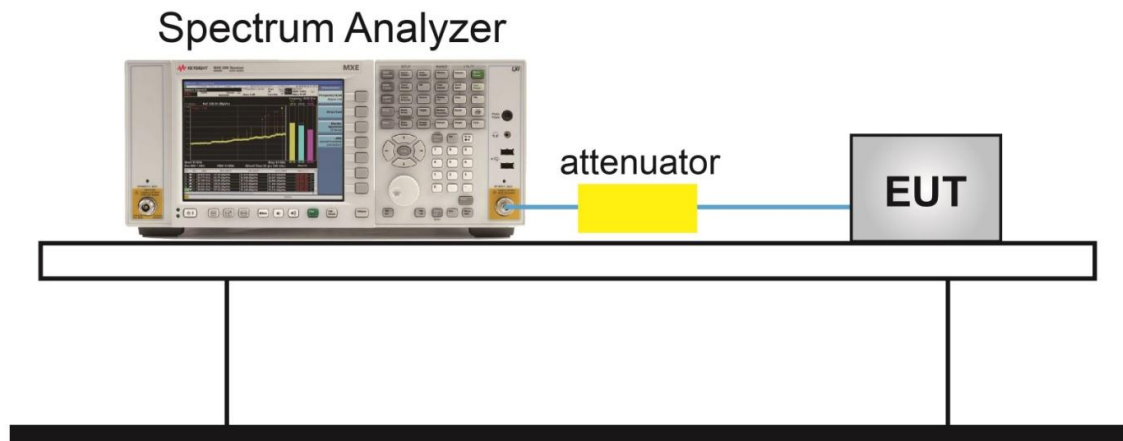
### **6.4.2. Test Procedure Used**

ANSI C63.10 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.

#### 6.4.4. Test Setup

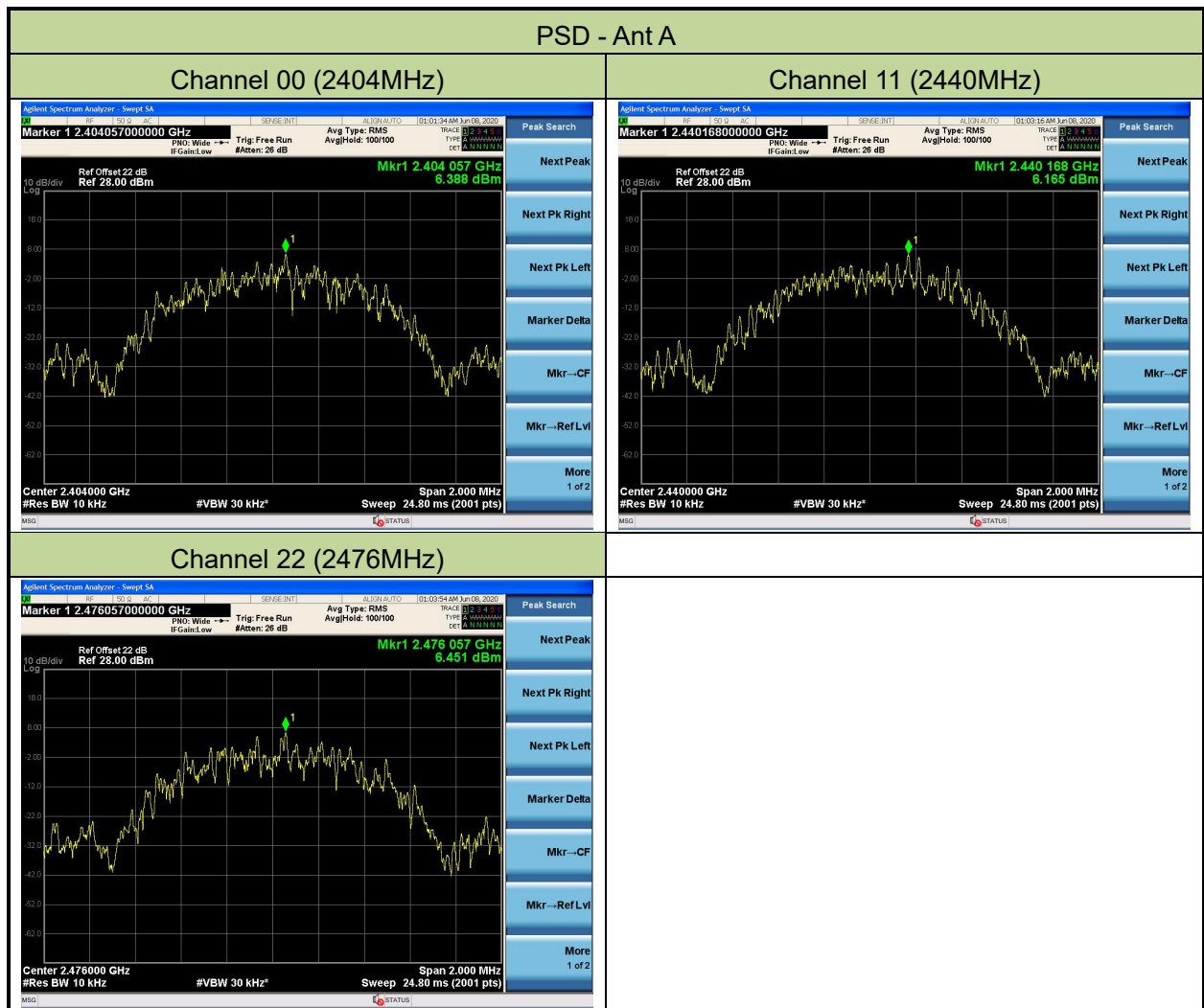


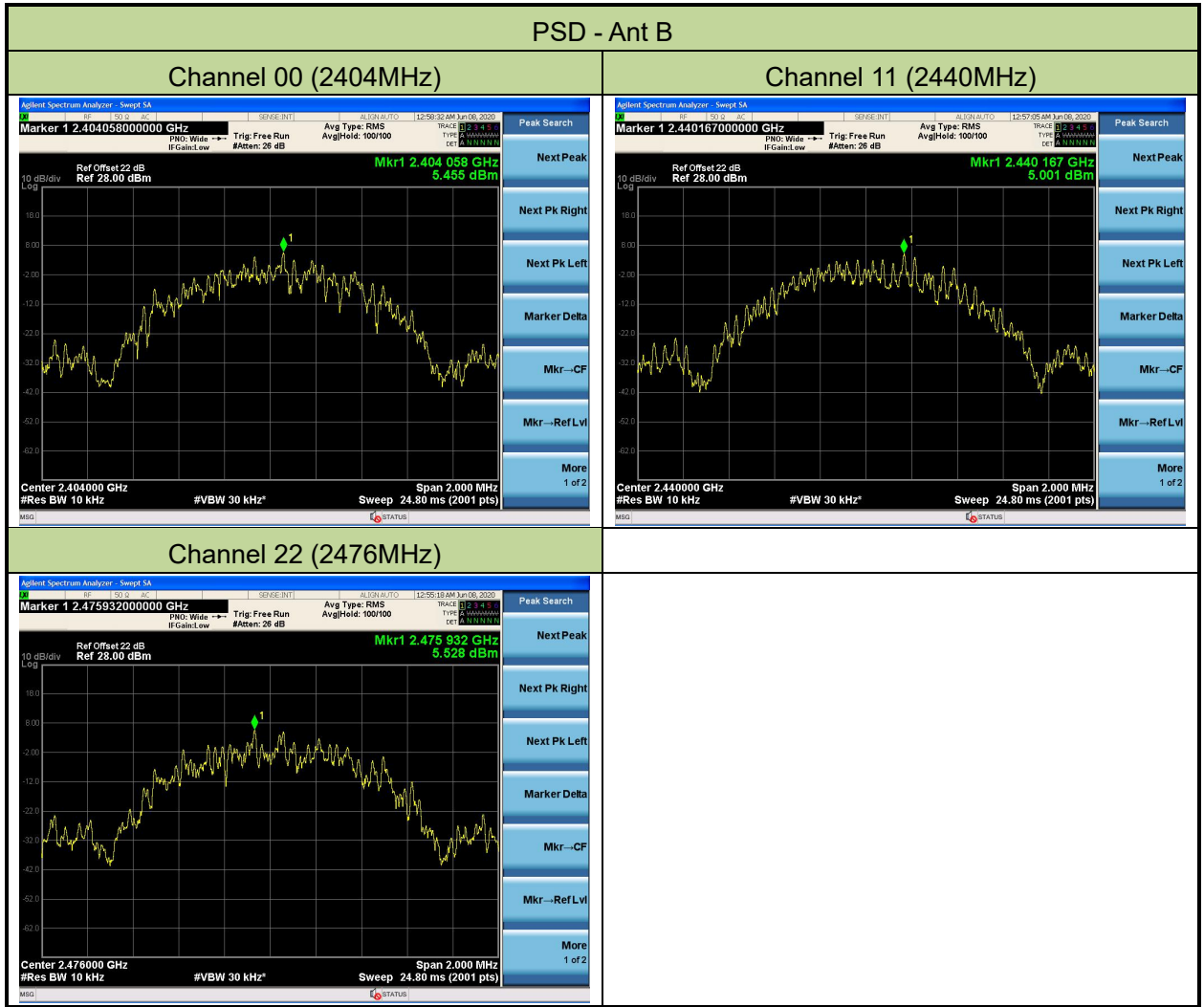


### 6.4.5. Test Result

Product	Receiver	Temperature	25°C
Test Engineer	Dandy Li	Relative Humidity	52%
Test Site	TR3	Test Date	2020/06/08

Test Mode	Channel No.	Frequency (MHz)	PSD Result (dBm / 10kHz)	Limit (dBm / 3kHz)	Result
Ant A	00	2404	6.39	≤ 8.00	Pass
	11	2440	6.17	≤ 8.00	Pass
	22	2476	6.45	≤ 8.00	Pass
Ant B	00	2404	5.46	≤ 8.00	Pass
	11	2440	5.00	≤ 8.00	Pass
	22	2476	5.53	≤ 8.00	Pass





## **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 30dB 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 - Section 11.11

### **6.5.3. Test Setting**

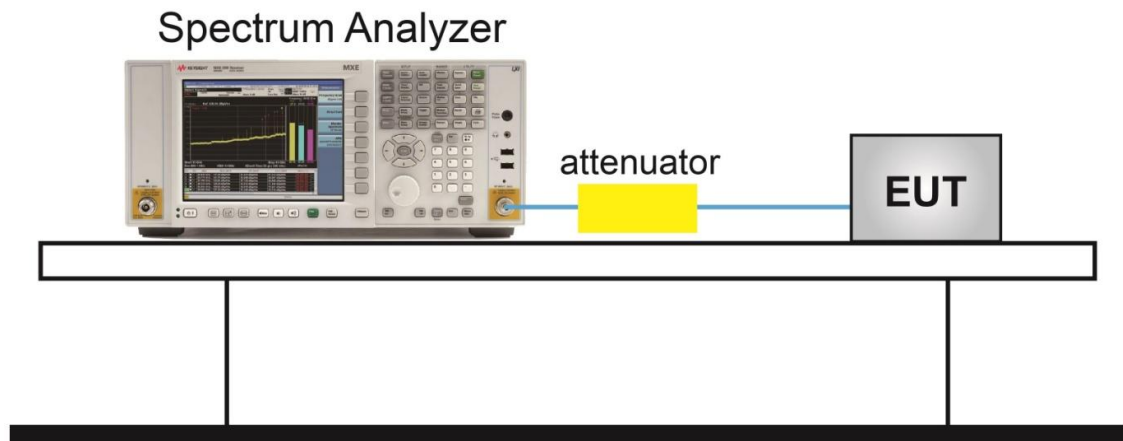
#### **Reference level measurement**

1. Set instrument center frequency to DTS channel center frequency
2. Set the span to  $\geq 1.5$  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

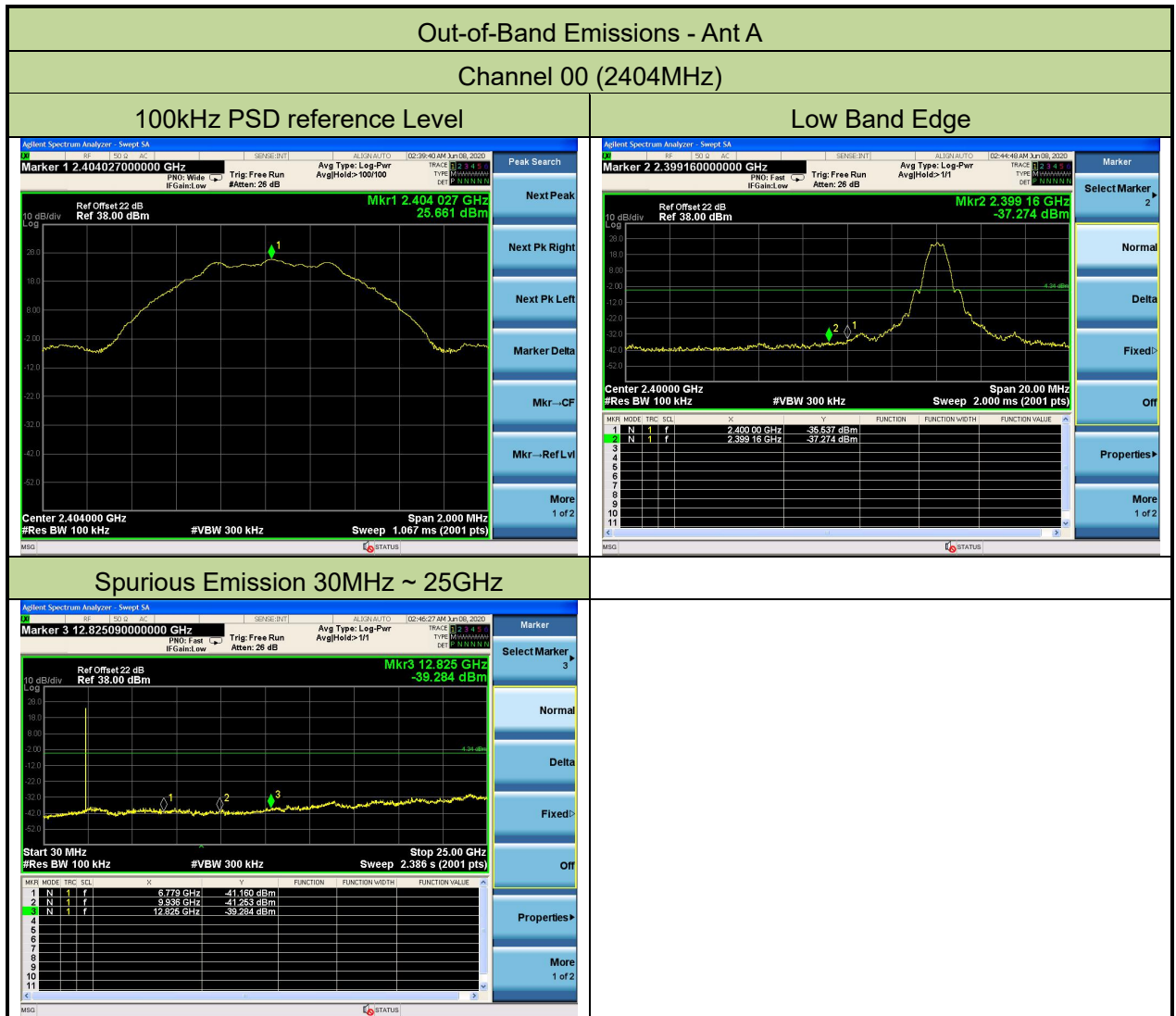


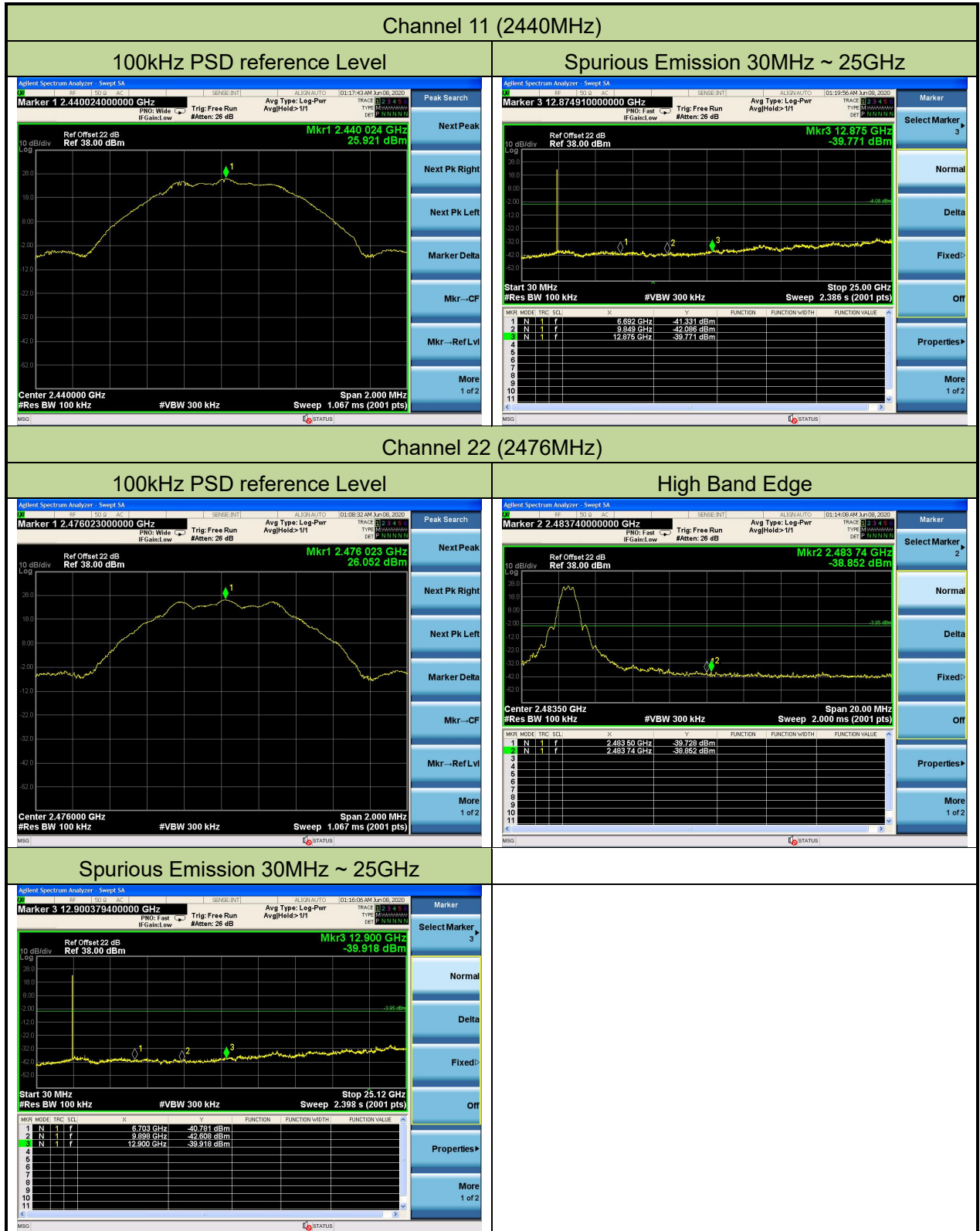
### 6.5.5. Test Result

Product	Receiver	Temperature	25°C
Test Engineer	Dandy Li	Relative Humidity	52%
Test Site	TR3	Test Date	2020/06/08

Test Mode	Channel No.	Frequency (MHz)	Limit (dBm)	Result
Ant A	00	2404	-4.34	Pass
	11	2440	-4.08	Pass
	22	2476	-3.95	Pass
Ant B	00	2404	-4.70	Pass
	11	2440	-4.51	Pass
	22	2476	-4.56	Pass

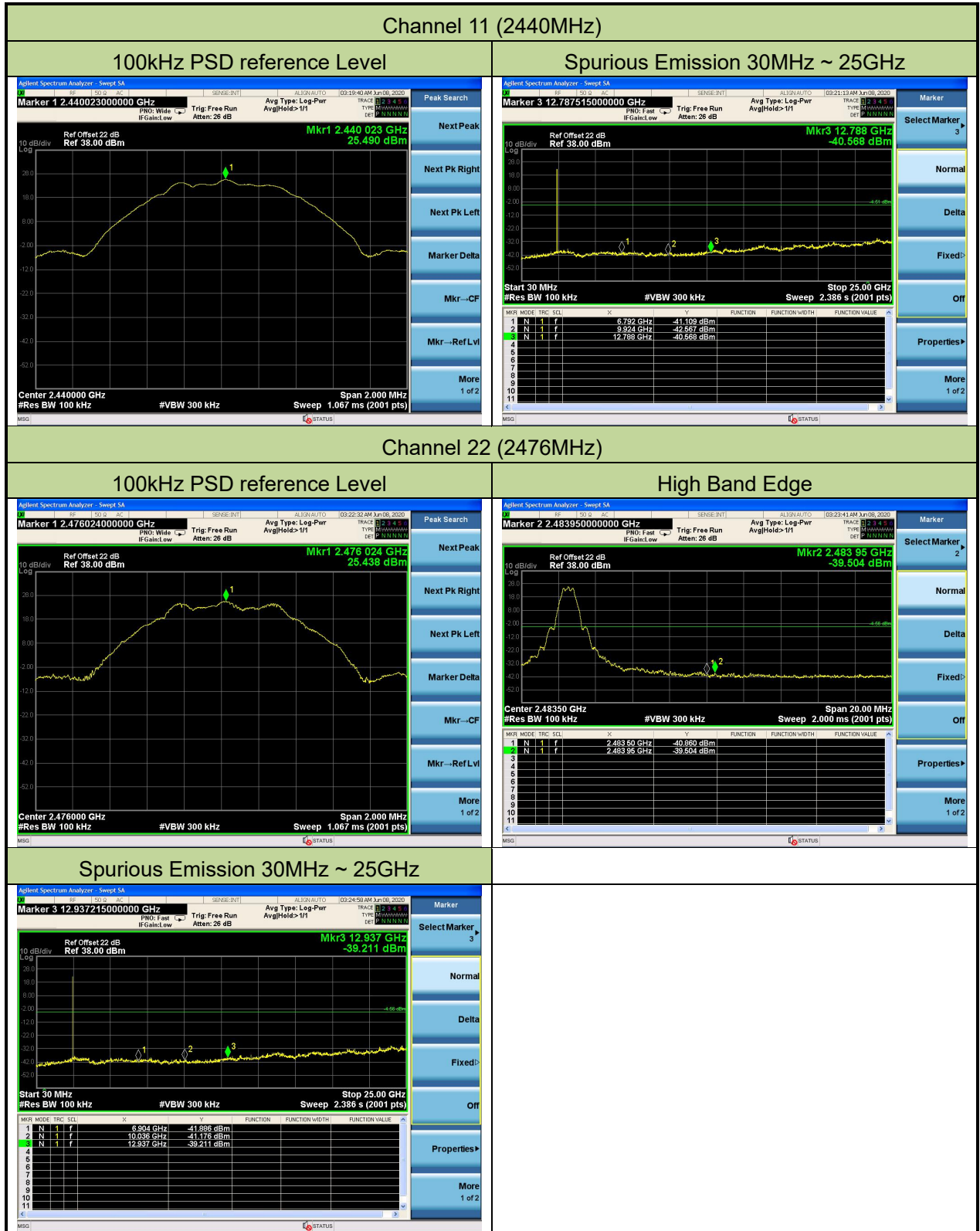
Note: The limit is 30dB below the fundamental emission level.











## 6.6. Radiated Spurious Emission Measurement

### 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 [ $\mu\text{V}/\text{m}$ ]	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

All out of band emissions appearing in a restricted band as specified in Section 8.10 of the RSS-Gen must not exceed the limits shown in Table per Section 8.9.

RSS-Gen Section 8.9			
Frequency (MHz)	Field Strength ( $\mu\text{V}/\text{m}$ )	Magnetic Field Strength (H-Field) ( $\mu\text{A}/\text{m}$ )	Measured Distance (m)
0.009 - 0.490	--	6.37/F (F in kHz)	300
0.490 - 1.705	--	6.37/F (F in kHz)	30
1.705 - 30	--	0.08	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 Section 6.3 (General Requirements)

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

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

ANSI C63.10 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

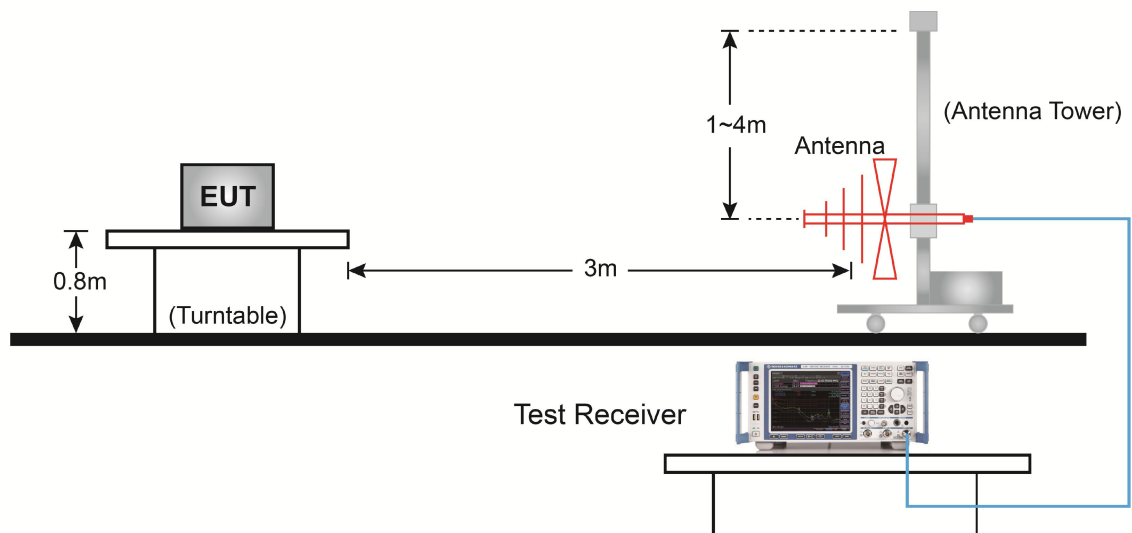
5. Sweep time = auto

6. Trace mode = max hold

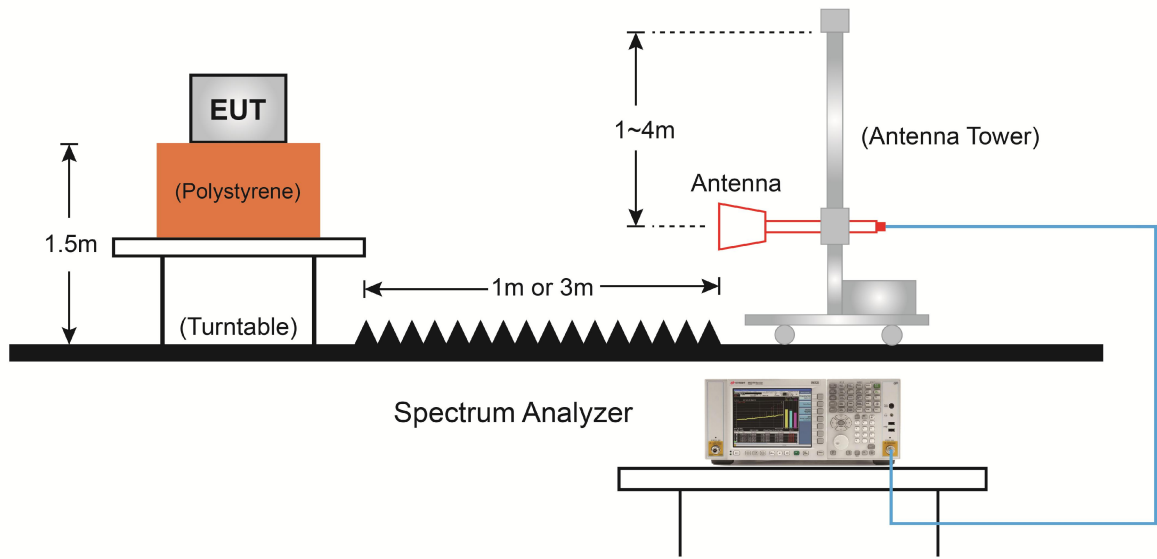
7. Trace was allowed to stabilize

**6.6.4. Test Setup**

**Below 1GHz Test Setup:**



Above 1GHz Test Setup:



### 6.6.5. Test Result

Product	Receiver	Temperature	25°C
Test Engineer	Dandy Li	Relative Humidity	54%
Test Site	AC2	Test Date	2020/06/15
Test Mode	Ant A	Test Channel:	00
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)	Duty Cycle Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4808.0	56.6	0.2	N/A	56.8	74.0	-17.2	PK	Horizontal
	4808.0	56.6	0.2	-20.1	36.7	54.0	-17.3	AV	Horizontal
*	7213.5	59.0	8.2	N/A	67.2	84.6	-17.4	PK	Horizontal
*	9619.0	62.5	10.8	N/A	73.3	84.6	-11.3	PK	Horizontal
	12016.0	50.4	15.3	N/A	65.7	74.0	-8.3	PK	Horizontal
	12016.0	50.4	15.3	-20.1	45.6	54.0	-8.4	AV	Horizontal
	4808.0	57.5	0.2	N/A	57.7	74.0	-16.3	PK	Vertical
	4808.0	57.5	0.2	-20.1	37.6	54.0	-16.4	AV	Vertical
*	7213.5	54.3	8.2	N/A	62.5	84.6	-22.1	PK	Vertical
*	9619.0	57.4	10.8	N/A	68.2	84.6	-16.4	PK	Vertical
	12024.5	47.8	15.4	N/A	63.2	74.0	-10.8	PK	Vertical
	12024.5	47.8	15.4	-20.1	43.1	54.0	-10.9	AV	Vertical

Note 1: "\*" is not in restricted band, its limit is 30dBc of the fundamental emission level (114.6dBμV/m) or 15.209 which is higher.

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

Average Measure Level = Peak Measure Level + Duty Cycle Factor

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre\_Amplifier Gain (dB)

Product	Receiver	Temperature	25°C
Test Engineer	Dandy Li	Relative Humidity	54%
Test Site	AC2	Test Date	2020/06/15
Test Mode	Ant A	Test Channel:	11
Remark	1. Average measurement was not performed if peak level lower than average limit. So the margin was calculated using the average limit for emissions fall within the restricted bands. 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)	Duty Cycle Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4876.0	60.3	-0.4	N/A	59.9	74.0	-14.1	PK	Horizontal
	4876.0	60.3	-0.4	-20.1	39.8	54.0	-14.2	AV	Horizontal
	7315.5	61.1	8.2	N/A	69.3	74.0	-4.7	PK	Horizontal
	7315.5	61.1	8.2	-20.1	49.2	54.0	-4.8	AV	Horizontal
*	9755.0	56.9	10.8	N/A	67.7	87.0	-19.3	PK	Horizontal
*	14642.5	50.0	20.1	N/A	70.1	87.0	-16.9	PK	Horizontal
	4884.5	60.6	-0.2	N/A	60.4	74.0	-13.6	PK	Vertical
	4884.5	60.6	-0.2	-20.1	40.3	54.0	-13.7	AV	Vertical
	7315.5	49.0	8.2	N/A	57.2	74.0	-16.8	PK	Vertical
	7315.5	49.0	8.2	-20.1	37.1	54.0	-16.9	AV	Vertical
*	9755.0	51.9	10.8	N/A	62.7	87.0	-24.3	PK	Vertical
*	14642.5	46.2	20.1	N/A	66.3	87.0	-20.7	PK	Vertical

Note 1: "\*" is not in restricted band, its limit is 30dBc of the fundamental emission level (117.0dBμV/m) or 15.209 which is higher.

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

Average Measure Level = Peak Measure Level + Duty Cycle Factor

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre\_Amplifier Gain (dB)

Product	Receiver	Temperature	25°C
Test Engineer	Dandy Li	Relative Humidity	54%
Test Site	AC2	Test Date	2020/06/15
Test Mode	Ant A	Test Channel:	22
Remark	<p>1. Average measurement was not performed if peak level lower than average limit. So the margin was calculated using the average limit for emissions fall within the restricted bands.</p> <p>2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.</p>		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Duty Cycle Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4952.5	61.8	-0.1	N/A	61.7	74.0	-12.3	PK	Horizontal
	4952.5	61.8	-0.1	-20.1	41.6	54.0	-12.4	AV	Horizontal
	7426.0	61.2	8.1	N/A	69.3	74.0	-4.7	PK	Horizontal
	7426.0	61.2	8.1	-20.1	49.2	54.0	-4.8	AV	Horizontal
*	9899.5	53.5	11.1	N/A	64.6	86.8	-22.2	PK	Horizontal
*	14855.0	50.8	19.2	N/A	70.0	86.8	-16.8	PK	Horizontal
	4952.5	61.9	-0.1	N/A	61.8	74.0	-12.2	PK	Vertical
	4952.5	61.9	-0.1	-20.1	41.7	54.0	-12.3	AV	Vertical
	7426.0	51.3	8.1	N/A	59.4	74.0	-14.6	PK	Vertical
	7426.0	51.3	8.1	-20.1	39.3	54.0	-14.7	AV	Vertical
*	9908.0	52.5	11.1	N/A	63.6	86.8	-23.2	PK	Vertical
*	14855.0	48.0	19.2	N/A	67.2	86.8	-19.6	PK	Vertical

Note 1: "\*" is not in restricted band, its limit is 30dBc of the fundamental emission level (116.8dBμV/m) or 15.209 which is higher.

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

Average Measure Level = Peak Measure Level + Duty Cycle Factor

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre\_Amplifier Gain (dB)



Product	Receiver	Temperature	25°C
Test Engineer	Dandy Li	Relative Humidity	54%
Test Site	AC2	Test Date	2020/06/15
Test Mode	Ant B	Test Channel:	00
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)	Duty Cycle Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4808.0	62.0	0.2	N/A	62.2	74.0	-11.8	PK	Horizontal
	4808.0	62.0	0.2	-20.1	42.1	54.0	-11.9	AV	Horizontal
*	7213.5	52.2	8.2	N/A	60.4	86.2	-25.8	PK	Horizontal
*	9619.0	52.6	10.8	N/A	63.4	86.2	-22.8	PK	Horizontal
	12016.0	41.6	15.3	N/A	56.9	74.0	-17.1	PK	Horizontal
	12016.0	41.6	15.3	-20.1	36.8	54.0	-17.2	AV	Horizontal
	4808.0	64.2	0.2	N/A	64.4	74.0	-9.6	PK	Vertical
	4808.0	64.2	0.2	-20.1	44.3	54.0	-9.7	AV	Vertical
*	7213.5	49.4	8.2	N/A	57.6	86.2	-28.6	PK	Vertical
*	9619.0	47.5	10.8	N/A	58.3	86.2	-27.9	PK	Vertical
	12024.5	38.6	15.4	N/A	54.0	74.0	-20.0	PK	Vertical
	12024.5	38.6	15.4	-20.1	33.9	54.0	-20.1	AV	Vertical

Note 1: "\*" is not in restricted band, its limit is 30dBc of the fundamental emission level (116.2dBμV/m) or 15.209 which is higher.

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

Average Measure Level = Peak Measure Level + Duty Cycle Factor

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre\_Amplifier Gain (dB)

Product	Receiver	Temperature	25°C
Test Engineer	Dandy Li	Relative Humidity	54%
Test Site	AC2	Test Date	2020/06/15
Test Mode	Ant B	Test Channel:	11
Remark	1. Average measurement was not performed if peak level lower than average limit. So the margin was calculated using the average limit for emissions fall within the restricted bands. 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)	Duty Cycle Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4876.0	62.6	-0.4	N/A	62.2	74.0	-11.8	PK	Horizontal
	4876.0	62.6	-0.4	-20.1	42.1	54.0	-11.9	AV	Horizontal
	7315.5	55.7	8.2	N/A	63.9	74.0	-10.1	PK	Horizontal
	7315.5	55.7	8.2	-20.1	43.8	54.0	-10.2	AV	Horizontal
*	9755.0	44.0	10.8	N/A	54.8	85.9	-31.1	PK	Horizontal
*	14634.0	43.8	20.0	N/A	63.8	85.9	-22.1	PK	Horizontal
	4876.0	64.5	-0.4	N/A	64.1	74.0	-9.9	PK	Vertical
	4876.0	64.5	-0.4	-20.1	44.0	54.0	-10.0	AV	Vertical
	7324.0	46.9	8.3	N/A	55.2	74.0	-18.8	PK	Vertical
	7324.0	46.9	8.3	-20.1	35.1	54.0	-18.9	AV	Vertical
*	9755.0	42.0	10.8	N/A	52.8	85.9	-33.1	PK	Vertical
*	14642.5	41.8	20.1	N/A	61.9	85.9	-24.0	PK	Vertical

Note 1: "\*" is not in restricted band, its limit is 30dBc of the fundamental emission level (115.9dBμV/m) or 15.209 which is higher.

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

Average Measure Level = Peak Measure Level + Duty Cycle Factor

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre\_Amplifier Gain (dB)

Product	Receiver	Temperature	25°C
Test Engineer	Dandy Li	Relative Humidity	54%
Test Site	AC2	Test Date	2020/06/15
Test Mode	Ant B	Test Channel:	22
Remark	1. Average measurement was not performed if peak level lower than average limit. So the margin was calculated using the average limit for emissions fall within the restricted bands. 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)	Duty Cycle Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4952.5	62.4	-0.1	N/A	62.3	74.0	-11.7	PK	Horizontal
	4952.5	62.4	-0.1	-20.1	42.2	54.0	-11.8	AV	Horizontal
	7426.0	59.6	8.1	N/A	67.7	74.0	-6.3	PK	Horizontal
	7426.0	59.6	8.1	-20.1	47.6	54.0	-6.4	AV	Horizontal
*	9899.5	56.3	11.1	N/A	67.4	84.5	-17.1	PK	Horizontal
*	14855.0	45.7	19.2	N/A	64.9	84.5	-19.6	PK	Horizontal
	4952.5	63.0	-0.1	N/A	62.9	74.0	-11.1	PK	Vertical
	4952.5	63.0	-0.1	-20.1	42.8	54.0	-11.2	AV	Vertical
	7426.0	50.5	8.1	N/A	58.6	74.0	-15.4	PK	Vertical
	7426.0	50.5	8.1	-20.1	38.5	54.0	-15.5	AV	Vertical
*	9908.0	51.6	11.1	N/A	62.7	84.5	-21.8	PK	Vertical
*	14855.0	43.5	19.2	N/A	62.7	84.5	-21.8	PK	Vertical

Note 1: "\*" is not in restricted band, its limit is 30dBc of the fundamental emission level (114.5dBμV/m) or 15.209 which is higher.

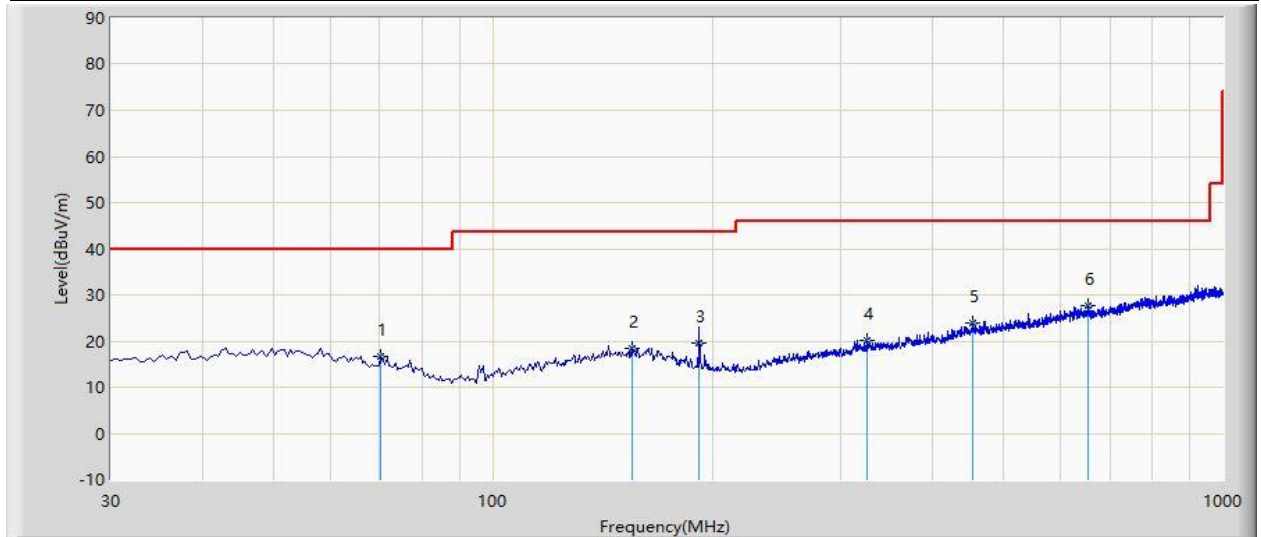
Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Average Measure Level = Peak Measure Level + Duty Cycle Factor

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre\_Amplifier Gain (dB)

**The Worst Case of Radiated Emission below 1GHz:**

Site: AC2	Time: 2020/06/14
Limit: FCC_Part15.209_RE(3m)	Engineer: Dandy Li
Probe: AC2_VULB9162_0.03-7GHz	Polarity: Horizontal
EUT: Receiver	Power: By Battery
<b>Test Mode:</b> Transmit by Channel 11 at frequency 2440MHz - Ant A	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			70.255	16.652	4.479	-23.348	40.000	12.173	QP
2			155.130	18.500	3.904	-25.000	43.500	14.596	QP
3			191.990	19.684	8.150	-23.816	43.500	11.534	QP
4			325.850	20.006	4.304	-25.994	46.000	15.702	QP
5			453.405	23.988	5.056	-22.012	46.000	18.931	QP
6		*	654.680	27.558	4.988	-18.442	46.000	22.570	QP

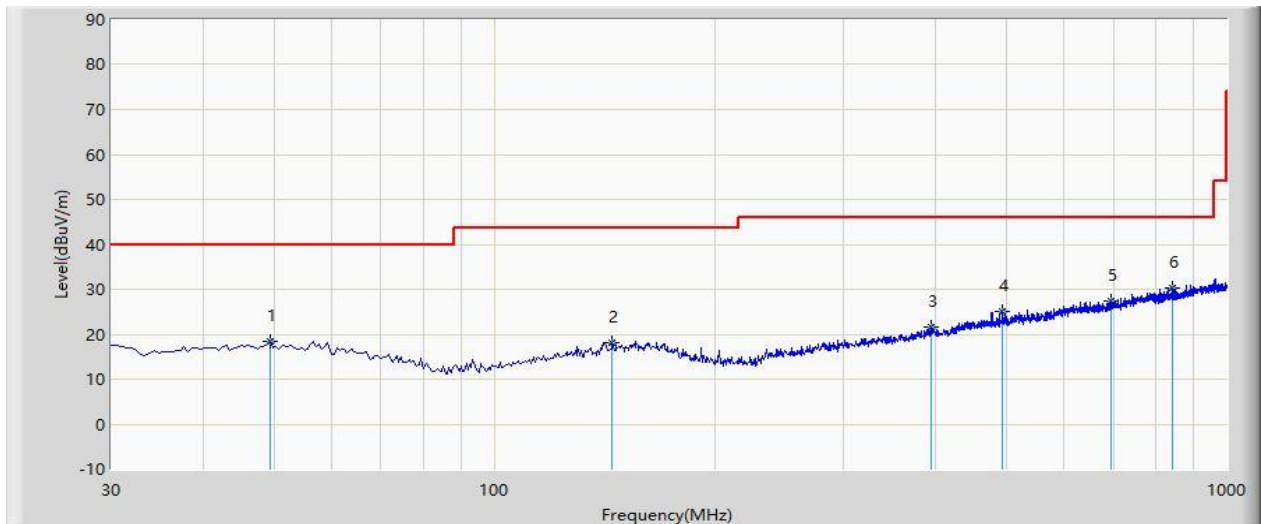
Note 1: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB)

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: AC2	Time: 2020/06/14
Limit: FCC_Part15.209_RE(3m)	Engineer: Dandy Li
Probe: AC2_VULB9162_0.03-7GHz	Polarity: Vertical
EUT: Receiver	Power: By Battery
<b>Test Mode:</b> Transmit by Channel 11 at frequency 2440MHz - Ant A	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			49.400	18.343	3.881	-21.657	40.000	14.462	QP
2			144.945	18.182	4.088	-25.318	43.500	14.094	QP
3			394.235	21.616	4.409	-24.384	46.000	17.207	QP
4			494.145	24.973	5.434	-21.027	46.000	19.538	QP
5			696.390	27.429	4.273	-18.571	46.000	23.156	QP
6		*	842.860	30.275	5.096	-15.725	46.000	25.179	QP

Note 1: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + 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.

## 6.7. Radiated Restricted Band Edge Measurement

### 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
<sup>1</sup> 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	( <sup>2</sup> )
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

**For RSS-Gen Section 8.10 requirement:**

Radiated emissions which fall in the restricted bands, as defined in Section 8.10 of RSS-Gen, must also comply with the radiated emission limits specified in Section 8.9.

Frequency (MHz)	Frequency (MHz)	Frequency (GHz)
0.090 - 0.110	149.9 - 150.05	9.0 - 9.2
0.495 - 0.505	156.52475 - 156.52525	9.3 - 9.5
2.1735 - 2.1905	156.7 - 156.9	10.6 - 12.7
3.020 - 3.026	162.0125 - 167.17	13.25 - 13.4
4.125 - 4.128	167.72 - 173.2	14.47 - 14.5
4.17725 - 4.17775	240 - 285	15.35 - 16.2
4.20725 - 4.20775	322 - 335.4	17.7 - 21.4
5.677 - 5.683	399.9 - 410	22.01 - 23.12
6.215 - 6.218	608 - 614	23.6 - 24.0
6.26775 - 6.26825	960 - 1427	31.2 - 31.8
6.31175 - 6.31225	1435 - 1626.5	36.43 - 36.5
8.291 - 8.294	1645.5 - 1646.5	Above 38.6
8.362 - 8.366	1660 - 1710	--
8.37625 - 8.38675	1718.8 - 1722.2	
8.41425 - 8.41475	2200 - 2300	
12.29 - 12.293	2310 - 2390	
12.51975 - 12.52025	2483.5 - 2500	
12.57675 - 12.57725	2655 - 2900	
13.36 - 13.41	3260 - 3267	
16.42 - 16.423	3332 - 3339	
16.69475 - 16.69525	3345.8 - 3358	
16.80425 - 16.80475	3500 - 4400	
25.5 - 25.67	4500 - 5150	
37.5 - 38.25	5350 - 5460	
73 - 74.6	7250 - 7750	
74.8 - 75.2	8025 - 8500	
108 - 138		



All out of band emissions appearing in a restricted band as specified in Section 8.10 of the RSS-Gen must not exceed the limits shown in Table per Section 8.9.

RSS-Gen Section 8.9			
Frequency (MHz)	Field Strength ( $\mu\text{V}/\text{m}$ )	Magnetic Field Strength (H-Field) ( $\mu\text{A}/\text{m}$ )	Measured Distance (m)
0.009 - 0.490	--	6.37/F (F in kHz)	300
0.490 - 1.705	--	6.37/F (F in kHz)	30
1.705 - 30	--	0.08	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 Section 6.3 (General Requirements)

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

#### 6.7.3. Test Setting

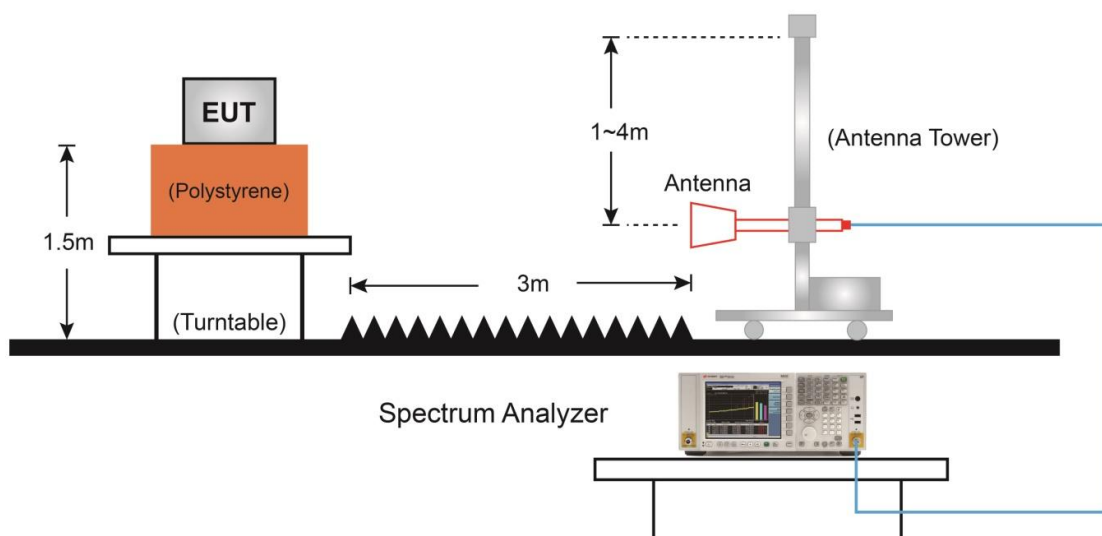
##### Peak Field Strength Measurements

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

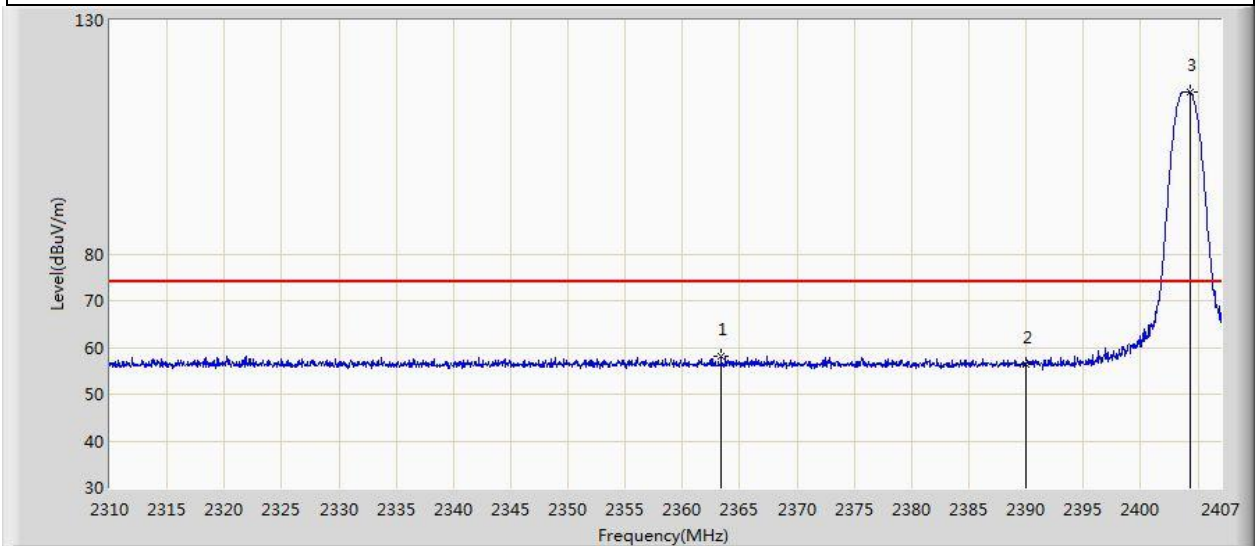
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW  $\geq 1/T$
4. De As an alternative, the instrument may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB 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

Site: AC2	Time: 2020/06/05 - 20:37
Limit: FCC_Part15.209_RE(3m)	Engineer: Dandy Li
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Receiver	Power: By Battery
Test Mode: Transmit by Channel 00 at frequency 2404MHz - Ant A	



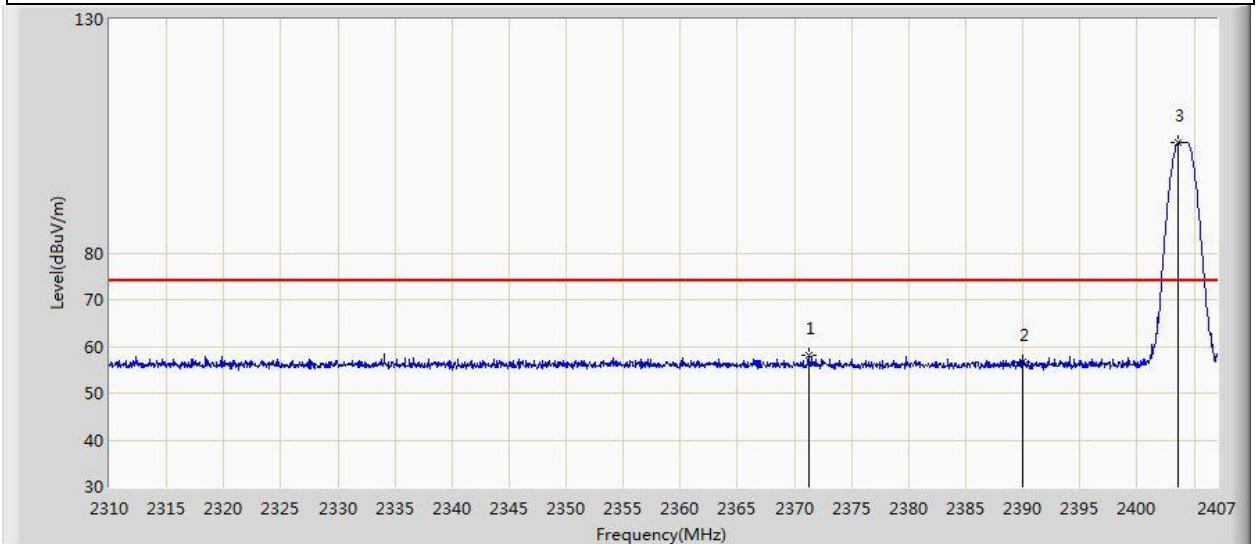
No	Mark	Frequency (MHz)	Reading Level (dBuV)	Factor (dB)	Duty Cycle Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Type
1		2363.350	28.710	29.437	N/A	58.147	74.000	-15.853	PK
		2363.350	28.710	29.437	-20.1	38.047	54.000	-15.953	AV
2		2390.000	27.188	29.296	N/A	56.483	74.000	-17.517	PK
		2390.000	27.188	29.296	-20.1	36.383	54.000	-17.617	AV
3	*	2404.284	85.356	29.273	N/A	114.629	N/A	N/A	PK

Note: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB)

Average Measure Level = Peak Measure Level + Duty Cycle Factor

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

Site: AC2	Time: 2020/06/05 - 21:22
Limit: FCC_Part15.209_RE(3m)	Engineer: Dandy Li
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Receiver	Power: By Battery
Test Mode: Transmit by Channel 00 at frequency 2404MHz - Ant A	



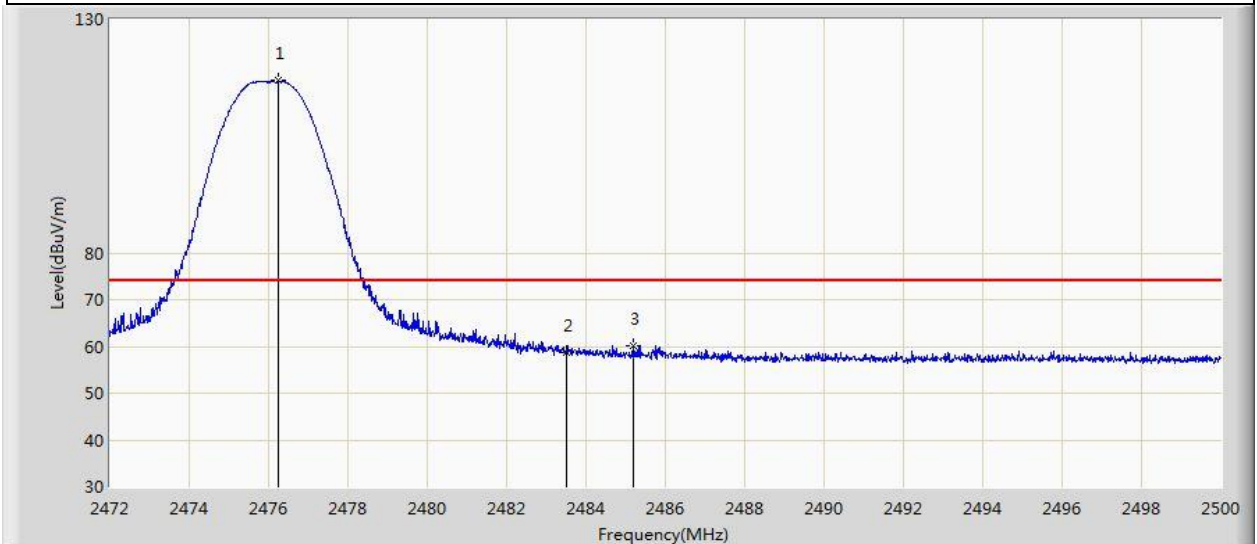
No	Mark	Frequency (MHz)	Reading Level (dBuV)	Factor (dB)	Duty Cycle Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Type
1		2371.207	28.737	29.368	N/A	58.105	74.000	-15.853	PK
		2371.207	28.737	29.368	-20.1	38.005	54.000	-15.995	AV
2		2390.000	27.464	29.296	N/A	56.759	74.000	-17.517	PK
		2390.000	27.464	29.296	-20.1	36.659	54.000	-17.341	AV
3	*	2403.654	74.358	29.274	N/A	103.632	N/A	N/A	PK

Note: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB)

Average Measure Level = Peak Measure Level + Duty Cycle Factor

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

Site: AC2	Time: 2020/06/05 - 21:33
Limit: FCC_Part15.209_RE(3m)	Engineer: Dandy Li
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Receiver	Power: By Battery
Test Mode: Transmit by Channel 22 at frequency 2476MHz - Ant A	



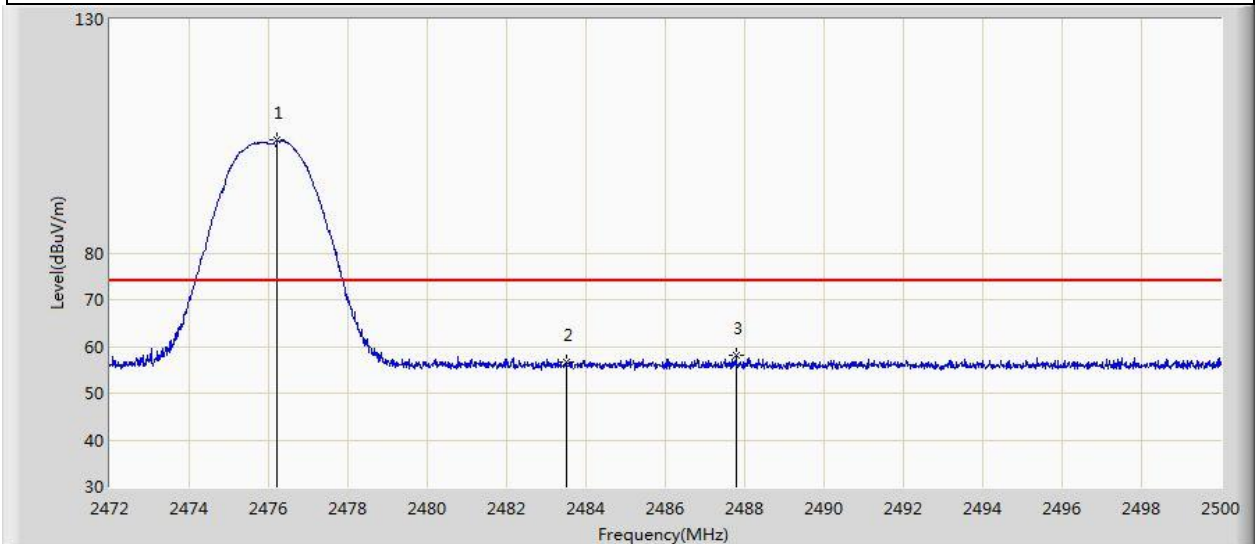
No	Mark	Frequency (MHz)	Reading Level (dBuV)	Factor (dB)	Duty Cycle Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Type
1	*	2476.256	87.681	29.133	N/A	116.814	N/A	N/A	PK
2		2483.500	29.657	29.143	N/A	58.800	74.000	-15.200	PK
		2483.500	29.657	29.143	-20.1	38.700	54.000	-15.300	AV
3		2485.188	31.026	29.146	N/A	60.172	74.000	-13.828	PK
		2485.188	31.026	29.146	-20.1	40.072	54.000	-13.928	AV

Note: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB)

Average Measure Level = Peak Measure Level + Duty Cycle Factor

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

Site: AC2	Time: 2020/06/05 - 21:47
Limit: FCC_Part15.209_RE(3m)	Engineer: Dandy Li
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Receiver	Power: By Battery
Test Mode: Transmit by Channel 22 at frequency 2476MHz - Ant A	



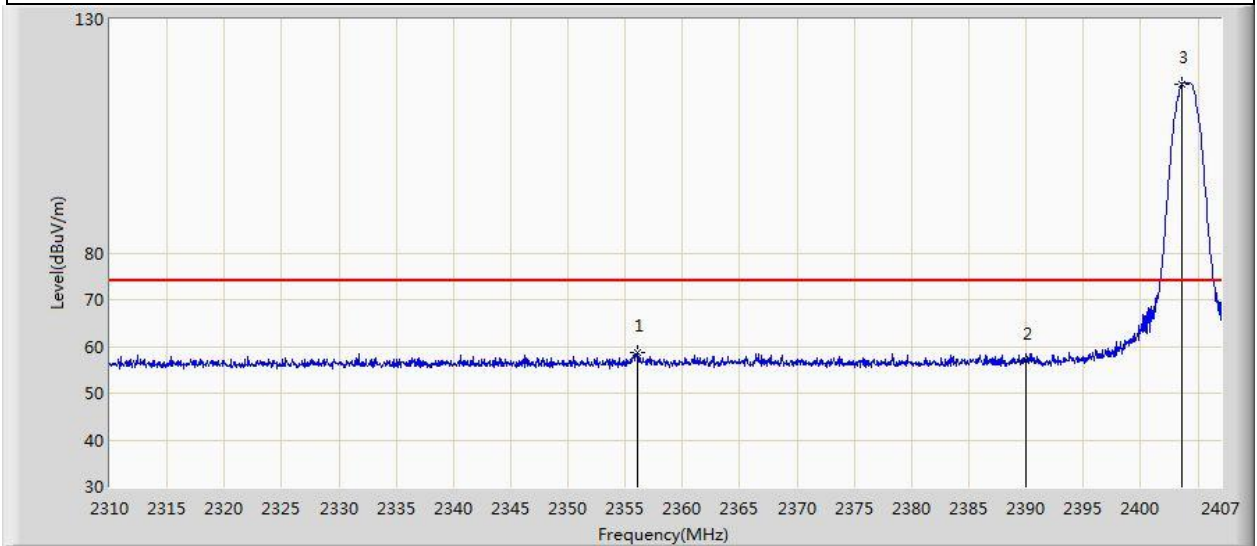
No	Mark	Frequency (MHz)	Reading Level (dBuV)	Factor (dB)	Duty Cycle Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Type
1	*	2476.228	74.927	29.133	N/A	104.060	N/A	N/A	PK
2		2483.500	27.551	29.143	N/A	56.694	74.000	-17.306	PK
		2483.500	27.551	29.143	-20.1	36.594	54.000	-17.406	AV
3		2487.778	28.912	29.148	N/A	58.060	74.000	-15.940	PK
		2487.778	28.912	29.148	-20.1	37.960	54.000	-16.040	AV

Note: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB)

Average Measure Level = Peak Measure Level + Duty Cycle Factor

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

Site: AC2	Time: 2020/06/05 - 21:52
Limit: FCC_Part15.209_RE(3m)	Engineer: Dandy Li
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Receiver	Power: By Battery
Test Mode: Transmit by Channel 00 at frequency 2404MHz - Ant B	



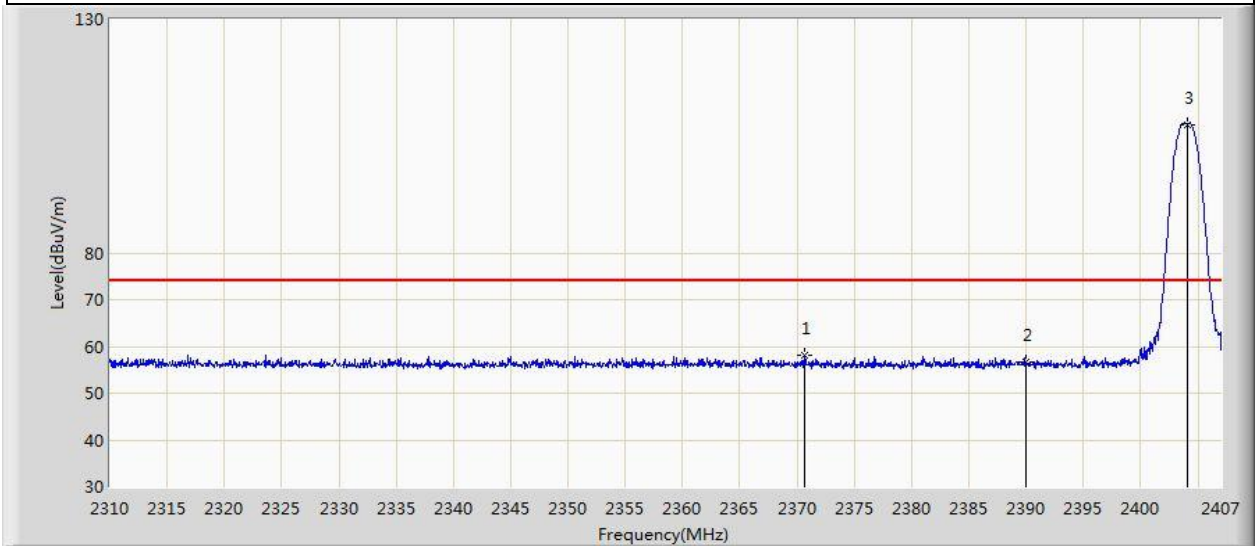
No	Mark	Frequency (MHz)	Reading Level (dBuV)	Factor (dB)	Duty Cycle Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Type
1		2356.124	29.402	29.433	N/A	58.836	74.000	-15.164	PK
		2356.124	29.402	29.433	-20.1	38.736	54.000	-15.264	AV
2		2390.000	27.788	29.296	N/A	57.083	74.000	-16.917	PK
		2390.000	27.788	29.296	-20.1	36.983	54.000	-17.017	AV
3	*	2403.605	86.957	29.274	N/A	116.231	N/A	N/A	PK

Note: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB)

Average Measure Level = Peak Measure Level + Duty Cycle Factor

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

Site: AC2	Time: 2020/06/05 - 21:56
Limit: FCC_Part15.209_RE(3m)	Engineer: Dandy Li
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Receiver	Power: By Battery
Test Mode: Transmit by Channel 00 at frequency 2404MHz - Ant B	



No	Mark	Frequency (MHz)	Reading Level (dBuV)	Factor (dB)	Duty Cycle Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Type
1		2370.674	28.603	29.373	N/A	57.975	74.000	-16.025	PK
		2370.674	28.603	29.373	-20.1	37.875	54.000	-16.125	AV
2		2390.000	27.306	29.296	N/A	56.601	74.000	-17.399	PK
		2390.000	27.306	29.296	-20.1	36.501	54.000	-17.499	AV
3	*	2404.090	78.077	29.273	N/A	107.350	N/A	N/A	PK

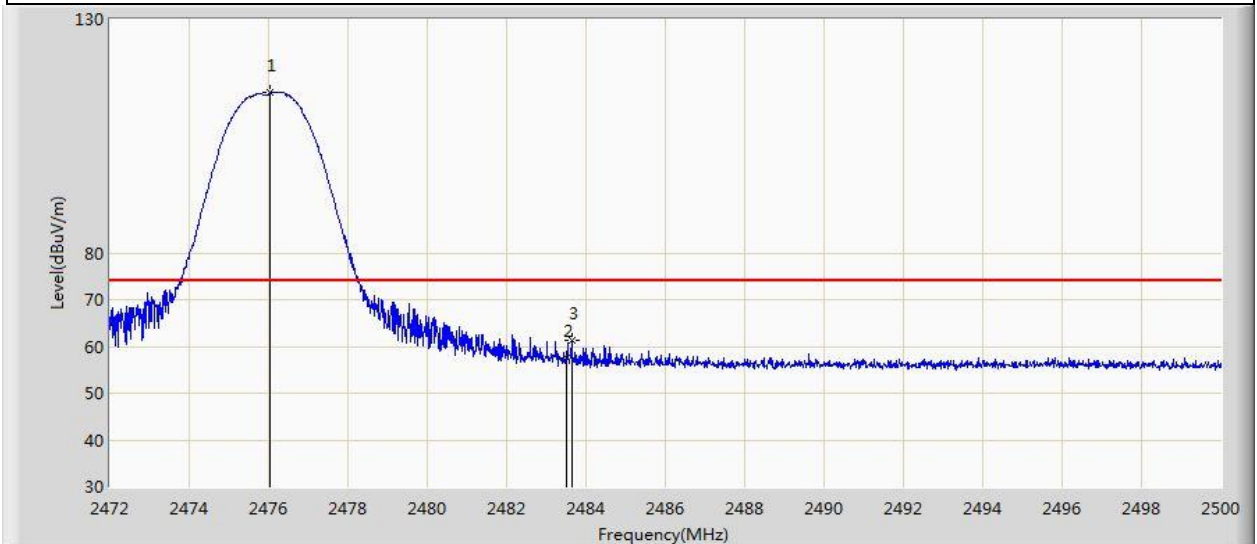
Note: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB)

Average Measure Level = Peak Measure Level + Duty Cycle Factor

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



Site: AC2	Time: 2020/06/05 - 22:04
Limit: FCC_Part15.209_RE(3m)	Engineer: Dandy Li
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Receiver	Power: By Battery
Test Mode: Transmit by Channel 22 at frequency 2476MHz - Ant B	



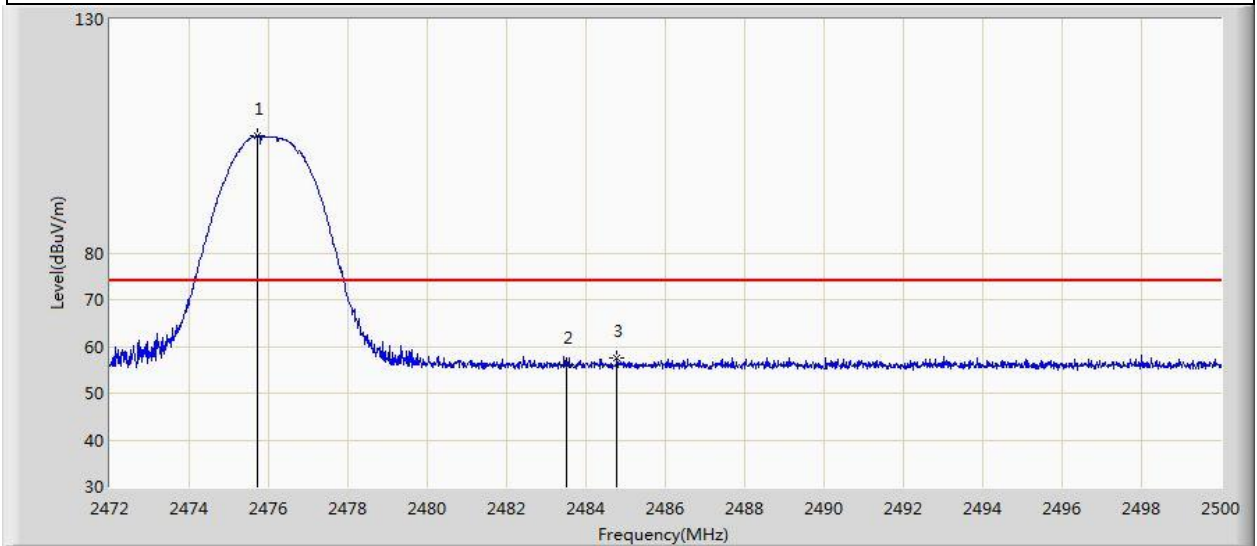
No	Mark	Frequency (MHz)	Reading Level (dBuV)	Factor (dB)	Duty Cycle Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Type
1	*	2476.032	85.322	29.133	N/A	114.455	N/A	N/A	PK
2		2483.500	28.338	29.143	N/A	57.481	74.000	-16.519	PK
		2483.500	28.338	29.143	-20.1	37.381	54.000	-16.619	AV
3		2483.634	32.131	29.144	N/A	61.275	74.000	-12.725	PK
		2483.634	32.131	29.144	-20.1	41.175	54.000	-12.825	AV

Note: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB)

Average Measure Level = Peak Measure Level + Duty Cycle Factor

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

Site: AC2	Time: 2020/06/05 - 22:07
Limit: FCC_Part15.209_RE(3m)	Engineer: Dandy Li
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Receiver	Power: By Battery
Test Mode: Transmit by Channel 22 at frequency 2476MHz - Ant B	



No	Mark	Frequency (MHz)	Reading Level (dBuV)	Factor (dB)	Duty Cycle Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Type
1	*	2475.724	75.874	29.133	N/A	105.007	N/A	N/A	PK
2		2483.500	26.917	29.143	N/A	56.060	74.000	-17.940	PK
		2483.500	26.917	29.143	-20.1	35.960	54.000	-18.040	AV
3		2484.782	28.400	29.145	N/A	57.545	74.000	-16.455	PK
		2484.782	28.400	29.145	-20.1	37.445	54.000	-16.555	AV

Note: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB)

Average Measure Level = Peak Measure Level + Duty Cycle Factor

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

## 6.8. AC Conducted Emissions Measurement

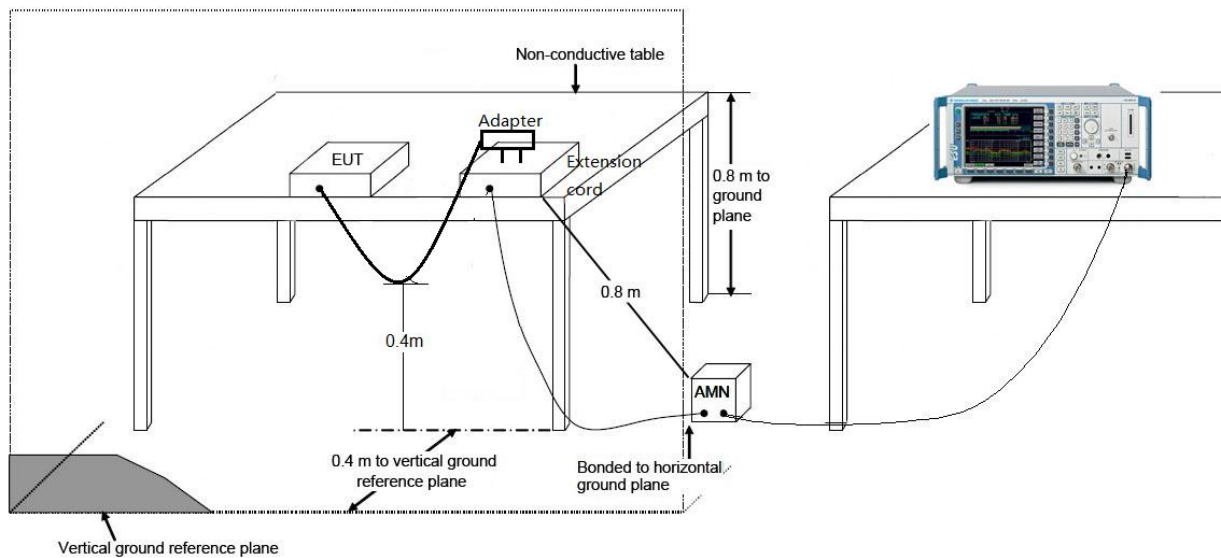
### 6.8.1. Test Limit

FCC Part 15 Subpart C Paragraph 15.207 / RSS-Gen Issue 5 Section 8.8 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

The EUT is powered by battery, so this test item is not applicable.

## 7. CONCLUSION

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

————— The End —————

## **Appendix A - Test Setup Photograph**

Refer to "2005RSU059-UT" file.

## **Appendix B - EUT Photograph**

Refer to "2005RSU059-UE" file.