



RF MEASUREMENT REPORT

FCC ID: DD4- SV7MW
Applicant: Shure Incorporated
Product: Wireless Stereo Microphone
Model No.: SV7MW
Trademark: 
FCC Classification: Digital Transmission System (DTS)
FCC Rule Part(s): Part 15 Subpart C (Section 15.247)
Result: Complies
Received Date: 2024-07-19
Test Date: 2024-07-22 ~ 2024-08-26

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 (Suzhou) Co., Ltd.

Revision History

Report No.	Version	Description	Issue Date	Note
2407RSU040-U2	V01	Initial Report	2024-09-20	Invalid
2407RSU040-U2	V02	Update Instrument Information	2024-09-29	Invalid
2407RSU040-U2	V03	Update one typo	2024-12-11	Valid

CONTENTS

Description	Page
1. General Information	5
1.1. Applicant	5
1.2. Manufacturer	5
1.3. Testing Facility	5
1.4. Product Information.....	6
1.5. Radio Specification under Test	6
1.6. Working Frequencies	7
2. Test Configuration	9
2.1. Test Mode.....	9
2.2. Test System Connection Diagram.....	9
2.3. Test Software	9
2.4. Applied Standards.....	10
2.5. Test Environment Condition	10
3. Antenna Requirements	11
4. Measuring Instrument	12
5. Decision Rules and Measurement Uncertainty	14
5.1. Decision Rules	14
5.2. Measurement Uncertainty	14
6. Test Result.....	15
6.1. Summary	15
6.2. 6dB Bandwidth Measurement.....	16
6.2.1. Test Limit	16
6.2.2. Test Procedure	16
6.2.3. Test Setting	16
6.2.4. Test Setup	16
6.2.5. Test Result	16
6.3. Output Power Measurement	17
6.3.1. Test Limit	17
6.3.2. Test Procedure	17
6.3.3. Test Setting	17
6.3.4. Test Setup	17
6.3.5. Test Result	17
6.4. Power Spectral Density Measurement	18
6.4.1. Test Limit	18
6.4.2. Test Procedure	18

6.4.3.	Test Setting	18
6.4.4.	Test Setup	18
6.4.5.	Test Result	18
6.5.	Conducted Band Edge and Out-of-Band Emissions Measurement	19
6.5.1.	Test Limit	19
6.5.2.	Test Procedure	19
6.5.3.	Test Settintg	19
6.5.4.	Test Setup	19
6.5.5.	Test Result	20
6.6.	Radiated Spurious Emission Measurement.....	21
6.6.1.	Test Limit	21
6.6.2.	Test Procedure	21
6.6.3.	Test Setting	21
6.6.4.	Test Setup	23
6.6.5.	Test Result	24
6.7.	Radiated Restricted Band Edge Measurement	25
6.7.1.	Test Limit	25
6.7.2.	Test Procedure	26
6.7.3.	Test Setting	26
6.7.4.	Test Setup	27
6.7.5.	Test Result	28
6.8.	AC Conducted Emissions Measurement	29
6.8.1.	Test Limit	29
6.8.2.	Test Setup	29
6.8.3.	Test Result	29
Appendix A - Test Result.....		30
A.1	Duty Cycle Test Result	30
A.2	6dB Bandwidth Test Result	31
A.3	Output Power Test Result	35
A.4	Power Spectral Density Test Result	37
A.5	Conducted Band Edge and Out-of-Band Emissions Test Result.....	41
A.6	Radiated Spurious Emission Test Result.....	49
A.7	Radiated Restricted Band Edge Test Result.....	55
A.8	AC Conducted Emissions Test Result	87
Appendix B - Test Setup Photograph		91
Appendix C - EUT Photograph		92

1. General Information

1.1. Applicant

Shure Incorporated

5800 West Touhy Avenue, Niles, IL 60714-4608, USA

1.2. Manufacturer

Shure Incorporated

5800 West Touhy Avenue, Niles, IL 60714-4608, USA

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 Location (Suzhou - Wujiang)			
	Building 1, No.1 Xingdong Road, Wujiang, Suzhou, Jiangsu, People’s Republic of 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: 3261			
	FCC: 291082, TW3261		ISED: TW3261	

1.4. Product Information

Product Name	Wireless Stereo Microphone
Model No.	SV7MW
Serial No.	Conducted Measurement: 7261 Radiated Measurement: 6830
Wireless Specification	Bluetooth V5.4 single mode & Proprietary Mode
Antenna Information	Refer to Section 1.5
Power Type	Li-ion battery
Accessory	
Note: 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 under Test

Bluetooth Frequency	BLE 1Mbps: 2402 ~ 2480MHz BLE 2Mbps: 2404 ~ 2478MHz Proprietary Mode-1Mbps: 2402 ~ 2480MHz Proprietary Mode 2Mbps: 2404 ~ 2478MHz
Channel Number	BLE 1Mbps: 40 BLE 2Mbps: 37 Proprietary Mode 1Mbps: 3 Proprietary Mode 2Mbps: 24
Type of modulation	GFSK
Data Rate	1Mbps & 2Mbps
Antenna Type	Dipole Antenna
Antenna Gain	2.20dBi

1.6. Working Frequencies

BLE-1Mbps & 2Mbps

RF Channel	Frequency	Channel Index	Data Rate 1Mbps	Data Rate 2Mbps	RF Channel	Frequency	Channel Index	Data Rate 1Mbps	Data Rate 2Mbps
0	2402	37	√		20	2442	18	√	√
1	2404	0	√	√	21	2444	19	√	√
2	2406	1	√	√	22	2446	20	√	√
3	2408	2	√	√	23	2448	21	√	√
4	2410	3	√	√	24	2450	22	√	√
5	2412	4	√	√	25	2452	23	√	√
6	2414	5	√	√	26	2454	24	√	√
7	2416	6	√	√	27	2456	25	√	√
8	2418	7	√	√	28	2458	26	√	√
9	2420	8	√	√	29	2460	27	√	√
10	2422	9	√	√	30	2462	28	√	√
11	2424	10	√	√	31	2464	29	√	√
12	2426	38	√		32	2466	30	√	√
13	2428	11	√	√	33	2468	31	√	√
14	2430	12	√	√	34	2470	32	√	√
15	2432	13	√	√	35	2472	33	√	√
16	2434	14	√	√	36	2474	34	√	√
17	2436	15	√	√	37	2476	35	√	√
18	2438	16	√	√	38	2478	36	√	√
19	2440	17	√	√	39	2480	39	√	

Note: Only BLE 1Mbps use the three advertising channels (2402 / 2426 / 2480 MHz) during the connection establishment.

Proprietary Mode 1Mbps

Channel	Frequency	Channel	Frequency	Channel	Frequency
00	2402 MHz	01	2426 MHz	02	2480 MHz

Proprietary Mode 2Mbps

Channel	Frequency	Channel	Frequency	Channel	Frequency
01	2404 MHz	02	2408 MHz	03	2411 MHz
04	2414 MHz	05	2417 MHz	06	2420 MHz
07	2423 MHz	08	2429 MHz	09	2432 MHz
10	2435 MHz	11	2438 MHz	12	2441 MHz
13	2444 MHz	14	2447 MHz	15	2450 MHz
16	2453 MHz	17	2456 MHz	18	2459 MHz
19	2462 MHz	20	2465 MHz	21	2468 MHz
21	2471 MHz	23	2474 MHz	24	2478 MHz

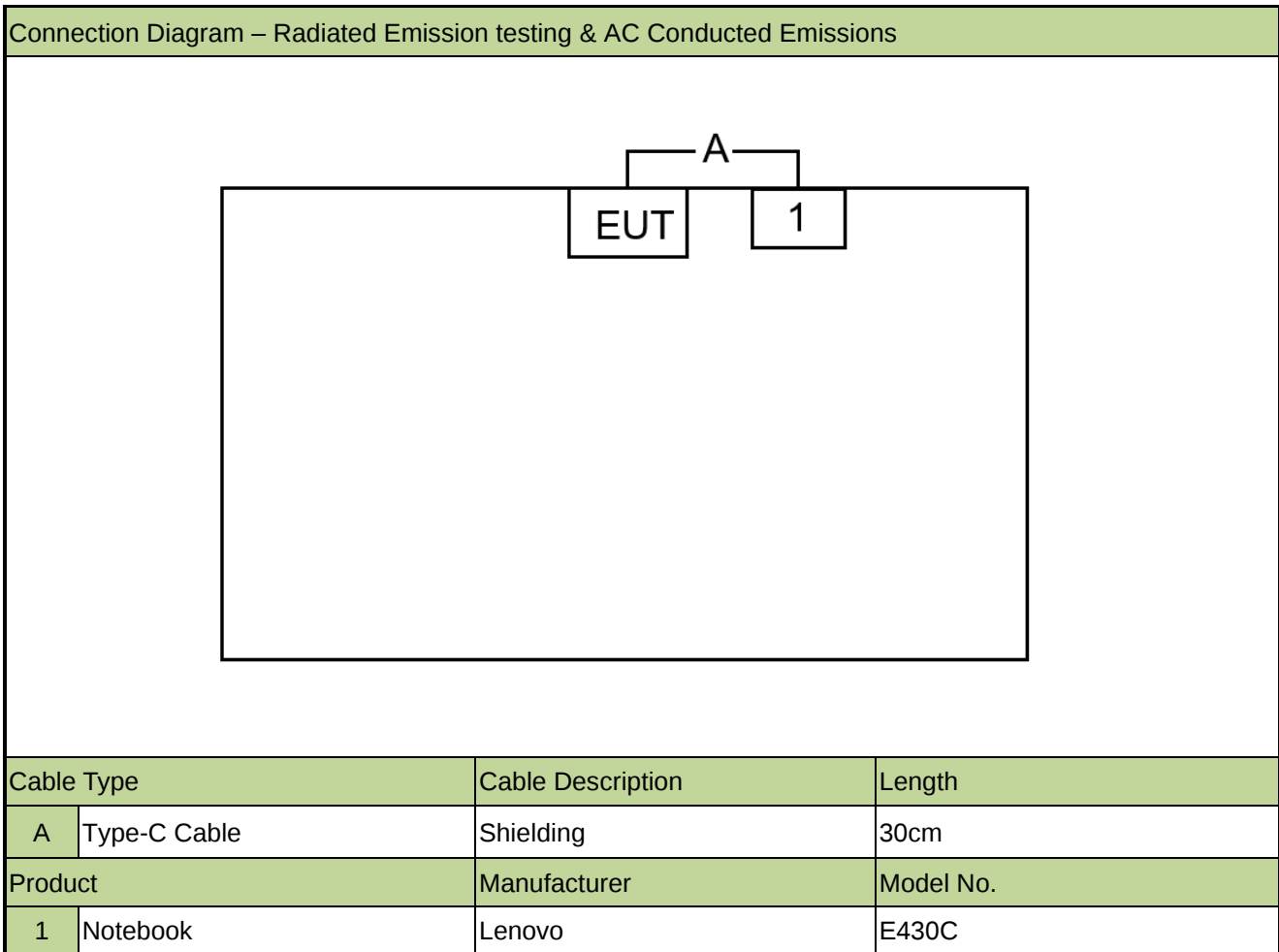
2. Test Configuration

2.1. Test Mode

Mode 1: Transmit by BLE-1Mbps
Mode 2: Transmit by BLE-2Mbps
Mode 3: Transmit by Proprietary Mode 1Mbps
Mode 4: Transmit by Proprietary Mode 2Mbps

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.



2.3. Test Software

The test utility software used during testing was “Shure Control”, and the version was 2.5.

2.4. 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

2.5. 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
Thermohygrometer	testo	608-H1	MRTSUE06402	1 year	2025-05-12	WZ-SR5
USB Power Sensor	Keysight	U2021XA	MRTSUE06446	1 year	2025-05-08	WZ-SR5
Shielding Room	HUAMING	WZ-SR5	MRTSUE06442	N/A	N/A	WZ-SR5
Signal Analyzer	Keysight	N9010B	MRTSUE06457	1 year	2025-05-08	WZ-SR5
Signal Analyzer	Keysight	N9010B	MRTSUE06558	1 year	2025-05-20	WZ-SR5
Attenuator	MVE	MVE2213	MRTSUE11074	1 year	2025-06-05	WZ-SR5
Attenuator	MVE	MVE2213	MRTSUE11075	1 year	2025-06-05	WZ-SR5
Attenuator	MVE	MVE2213	MRTSUE11077	1 year	2025-06-05	WZ-SR5
Shielding Room	MIX-BEP	WZ-SR2	MRTSUE06215	5 years	2026-12-20	WZ-SR2
Thermohygrometer	testo	608-H1	MRTSUE06404	1 year	2025-05-12	WZ-SR2
Current Probe	FCC	F-52	MRTSUE06494	1 year	2025-04-10	WZ-SR2
Two-Line V-Network	R&S	ENV216	MRTSUE06002	1 year	2025-05-08	WZ-SR2
EMI Test Receiver	R&S	ESR3	MRTSUE06909	1 year	2024-09-27	WZ-SR2
TRILOG Antenna	Schwarzbeck	VULB 9162	MRTSUE06022	1 year	2025-04-17	WZ-AC2
EMI Test Receiver	Agilent	N9038A	MRTSUE06125	1 year	2025-05-08	WZ-AC2
Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06171	1 year	2024-10-11	WZ-AC2
Preamplifier	Schwarzbeck	BBV 9718	MRTSUE06176	1 year	2025-05-06	WZ-AC2
Anechoic Chamber	RIKEN	WZ-AC2	MRTSUE06213	1 year	2025-04-18	WZ-AC2
Thermohygrometer	testo	608-H1	MRTSUE11263	1 year	2024-11-07	WZ-AC2
TRILOG Broad Band Antenna	Schwarzbeck	VULB 9163	MRTSUE07097	1 year	2025-04-24	WJ-AC2
Preamplifier	EMCI	EMC118A45SE	MRTSUE07102	1 year	2025-04-11	WJ-AC2
Preamplifier	EMCI	EMC184045SE	MRTSUE07103	1 year	2025-04-14	WJ-AC2
Horn Antenna	EMCI	DRH18-E	MRTSUE07105	1 year	2025-05-12	WJ-AC2
Anechoic Chamber	TDK	WJ-AC2	MRTSUE07117	1 year	2025-05-14	WJ-AC2
Thermohygrometer	testo	608-H1	MRTSUE11315	1 year	2025-06-24	WJ-AC2
Thermohygrometer	testo	608-H1	MRTSUE11332	1 year	2025-06-24	WJ-AC2
Horn Antenna	ETS	3117	MRTSUE06257	1 year	2024-09-23	WJ-AC1
Preamplifier	EMCI	EMC001330	MRTSUE06643	1 year	2025-05-14	WJ-AC1
Microwave Broadband Preamplifier	Schwarzbeck	BBV 9718 D	MRTSUE07084	1 year	2024-12-04	WJ-AC1
TRILOG Broad Band Antenna	Schwarzbeck	VULB 9163	MRTSUE07096	1 year	2025-04-24	WJ-AC1
TRILOG Broad Band Antenna	Schwarzbeck	VULB 9163	MRTSUE07099	1 year	2025-04-24	WJ-AC1

EMI Test Receiver	R&S	ESR3	MRTSUE07110	1 year	2025-04-24	WJ-AC1
Anechoic Chamber	TDK	WJ-AC1	MRTSUE07115	1 year	2025-05-17	WJ-AC1
Broadband Preamplifier	Schwarzbeck	BBV 9745	MRTSUE07180	1 year	2025-06-05	WJ-AC1
Broadband Preamplifier	Schwarzbeck	BBV 9745	MRTSUE07181	1 year	2025-06-05	WJ-AC1
Thermohygrometer	testo	608-H1	MRTSUE11314	1 year	2025-06-24	WJ-AC1
Thermohygrometer	testo	608-H1	MRTSUE11333	1 year	2025-06-24	WJ-AC1

Software	Version	Function
e3	230711	RE & CE
Controller_MF 7802	2.03C	RE Antenna & Turntable
Controller_MF 7802	1.02	RE Antenna & Turntable
BenchVue Power Meter	2018.1	Power

5. Decision Rules and Measurement Uncertainty

5.1. Decision Rules

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4: 2012 Clause 8.2.
(Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

5.2. 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
The maximum measurement uncertainty is evaluated as: 9kHz~150kHz: 3.58dB 150kHz~30MHz: 3.20dB
Radiated Emission Measurement
The maximum measurement uncertainty is evaluated as: Coaxial: 9kHz~30MHz: 2.61dB Coplanar: 9kHz~30MHz: 2.62dB Horizontal: 30MHz~200MHz: 3.79dB 200MHz~1GHz: 3.91dB 1GHz~40GHz: 4.99dB Vertical: 30MHz~200MHz: 4.06dB 200MHz~1GHz: 5.21dB 1GHz~40GHz: 4.90dB
Spurious Emissions, Conducted
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 2.2dB
Output Power
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 1.4dB
Power Spectrum Density
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 2.2dB
Occupied Bandwidth
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 2.7%

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

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. 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. 6dB Bandwidth Measurement

6.2.1. Test Limit

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

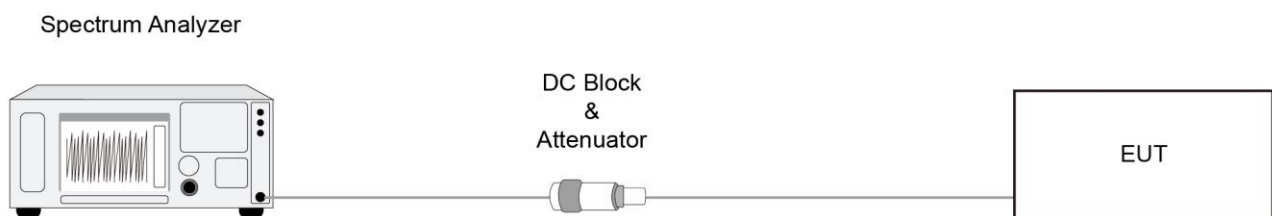
6.2.2. Test Procedure

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 Measurement

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

ANSI C63.10 - 2013 - Section 11.9.1.3

ANSI C63.10 - 2013 - Section 11.9.2.3.2

6.3.3. Test Setting

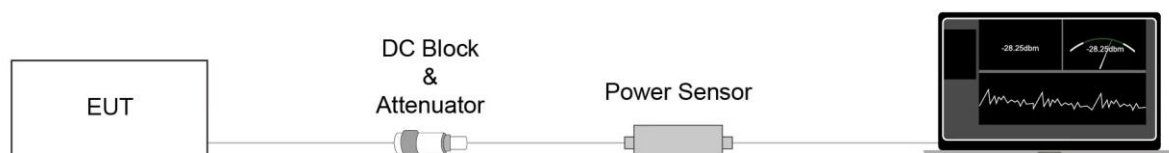
Method PKPM1 (Peak Power Measurement of Signals with DTS BW $\leq$ 50MHz)

Peak 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 pulse sensor employs a VBW = 50MHz so this method was only used for signals whose DTS bandwidth was less than or equal to 50MHz.

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 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.

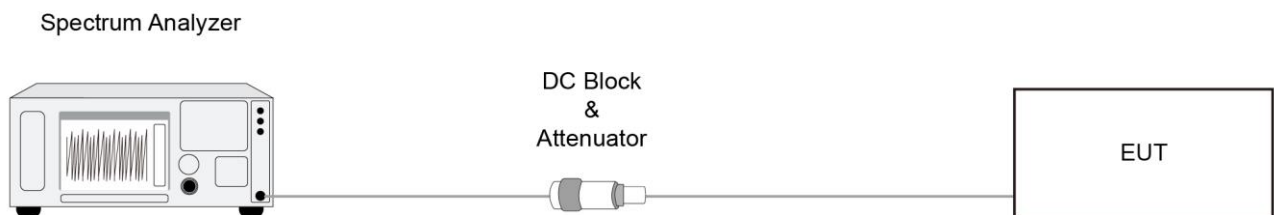
6.4.2. Test Procedure

ANSI C63.10-2013 Section 11.10.2

6.4.3. Test Setting

1. Analyzer was set to the center frequency of the DTS channel under investigation
2. Span = 1.5 times the DTS channel bandwidth
3. RBW = 3kHz
4. VBW = 10kHz
5. Detector = peak
6. Sweep time = auto couple
7. Trace mode = max hold
8. Trace was allowed to stabilize

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 Measurement

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

ANSI C63.10-2013 - Section 11.11

6.5.3. Test Setting

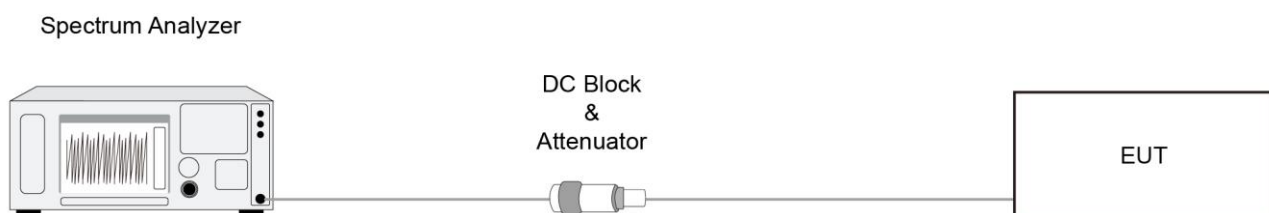
Reference level measurement

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 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 [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

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

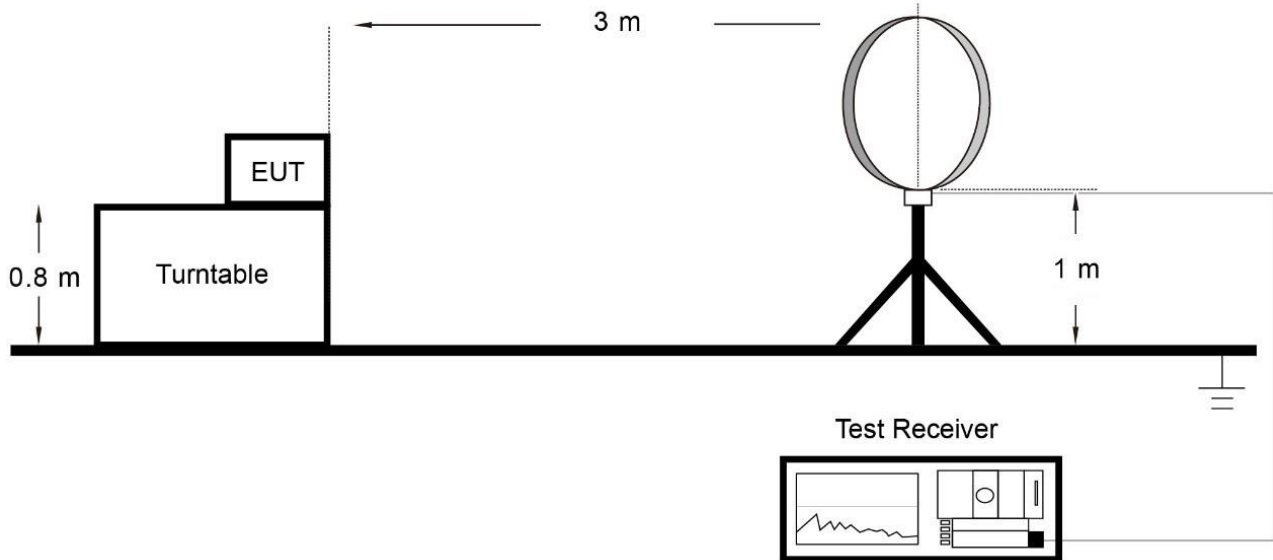
Average Measurements above 1GHz (Method VB)

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 = 10Hz

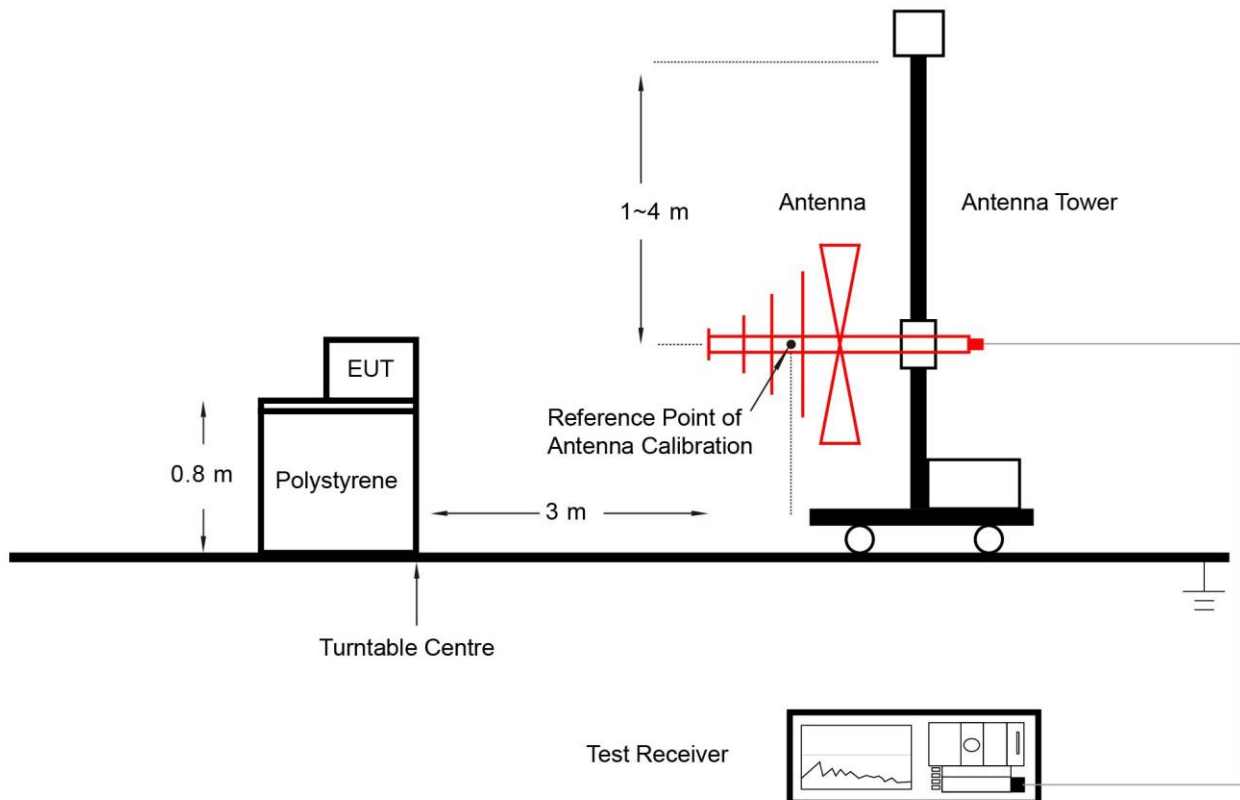
If the EUT duty cycle is $< 98\%$, set $\text{VBW} \geq 1/T$. T is the minimum transmission duration.
4. As an alternative, the instrument may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB domain). Some instruments require 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. Trace was allowed to stabilize

6.6.4. Test Setup

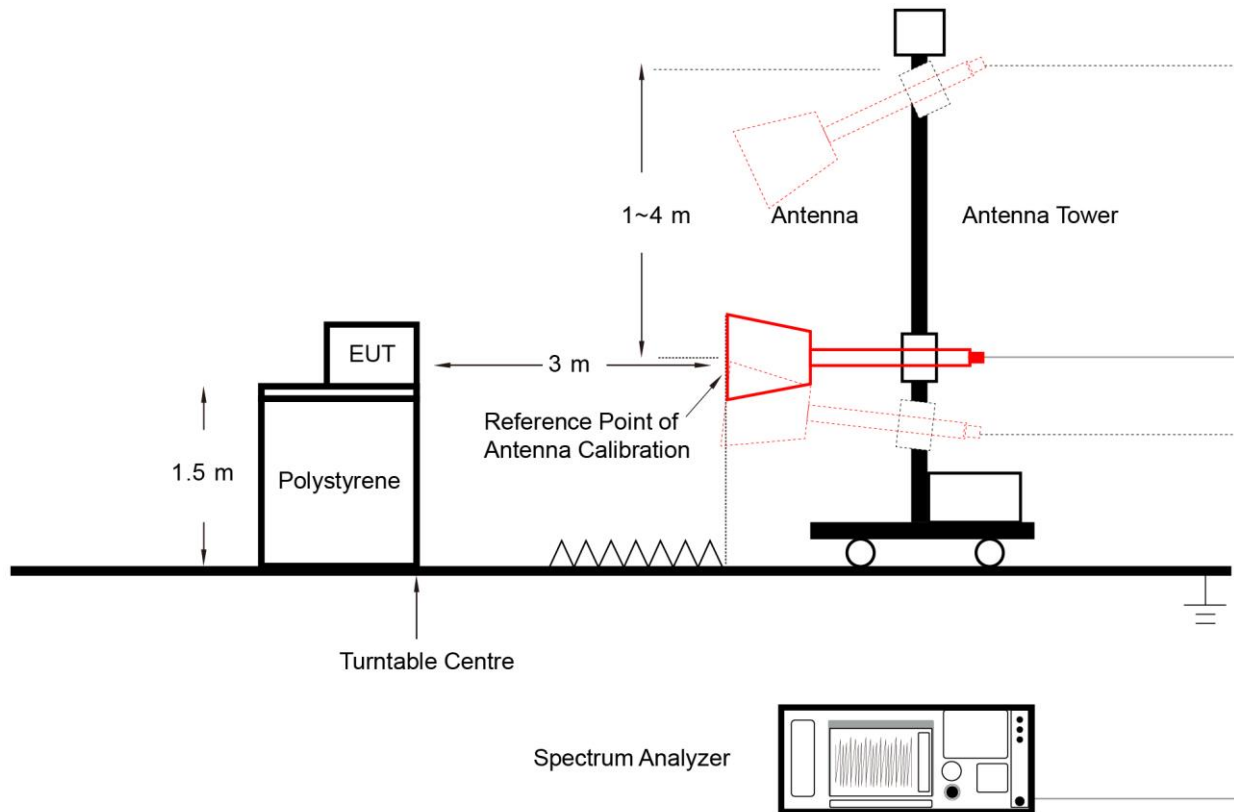
Below 30MHz Test Setup:



Below 1GHz Test Setup:



Above 1GHz Test Setup:



6.6.5. Test Result

Refer to Appendix A.6.

6.7. Radiated Restricted Band Edge 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
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

ANSI C63.10-2013 Section 6.3 & 6.6 & 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

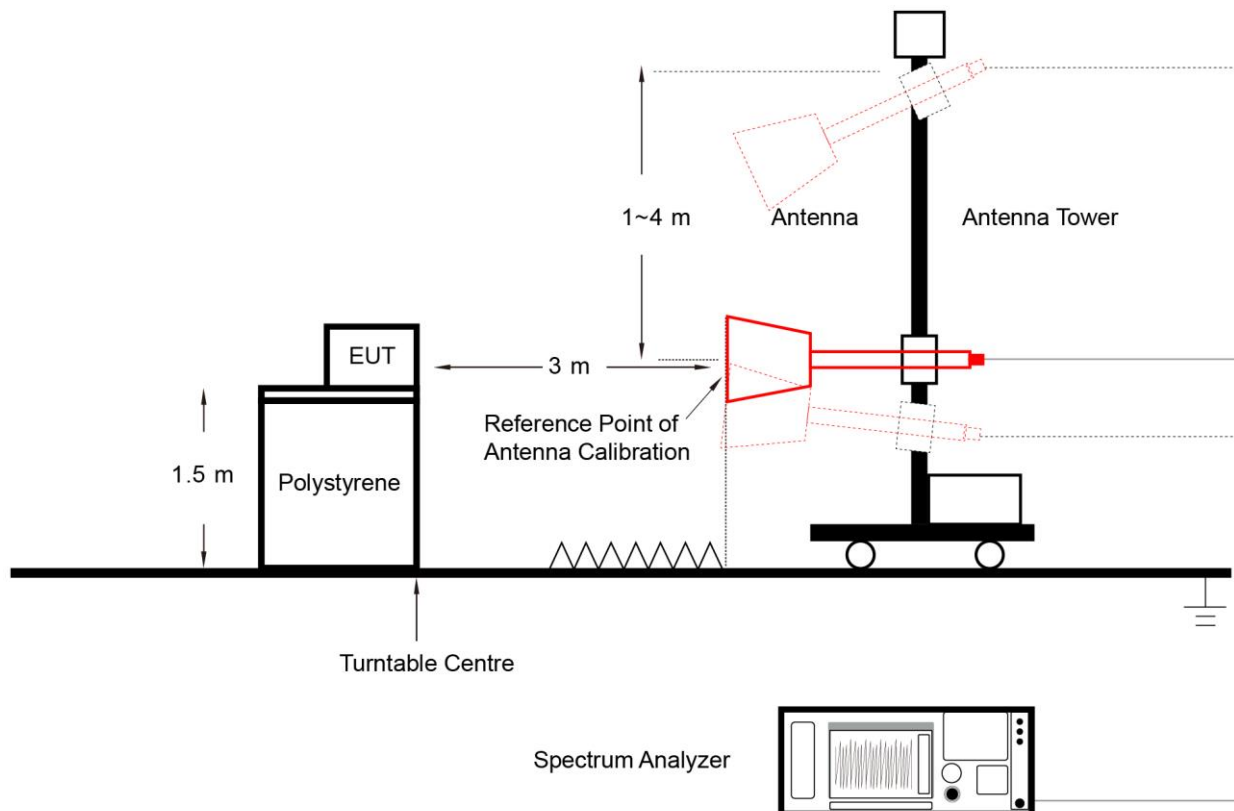
Average Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW; 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. 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 Measurement

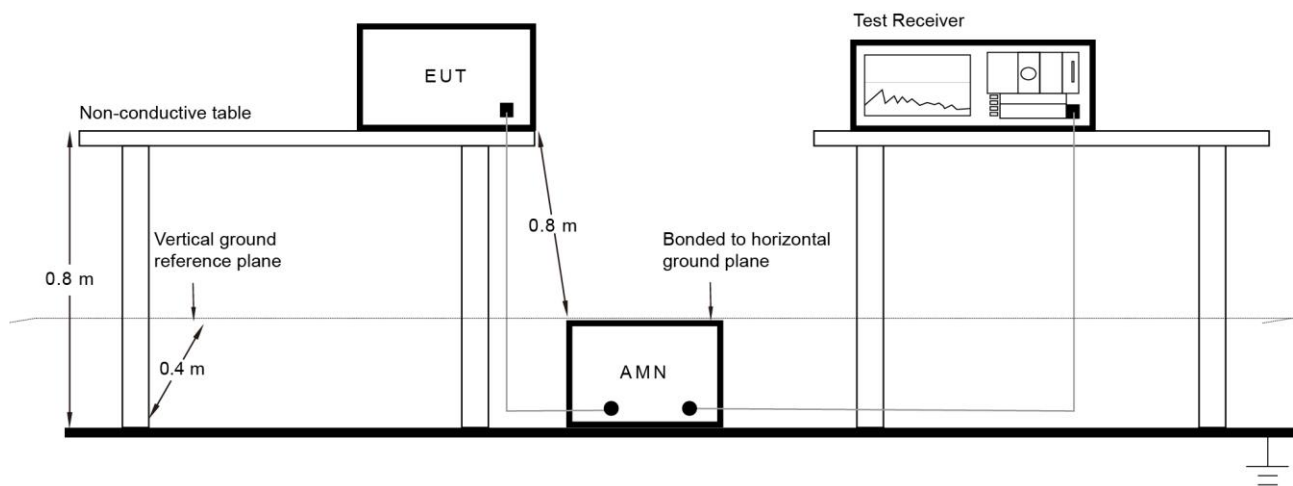
6.8.1. Test Limit

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



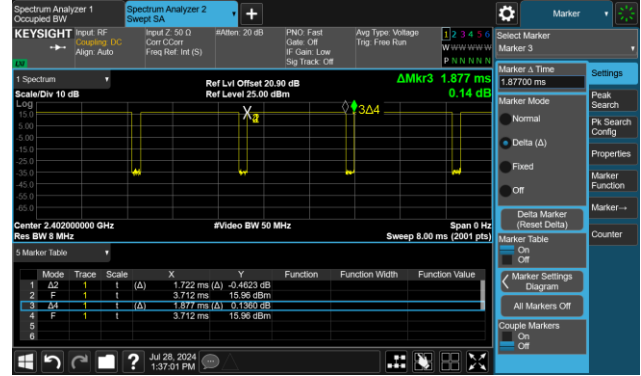
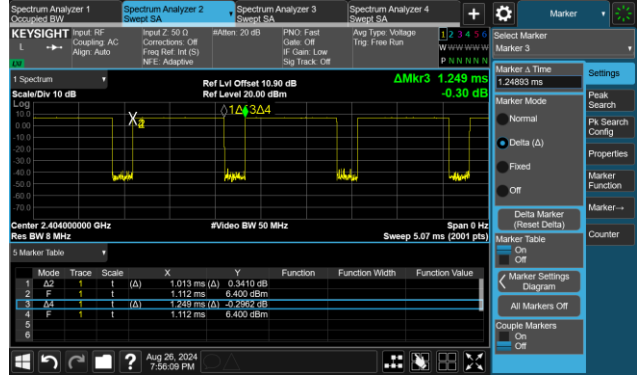
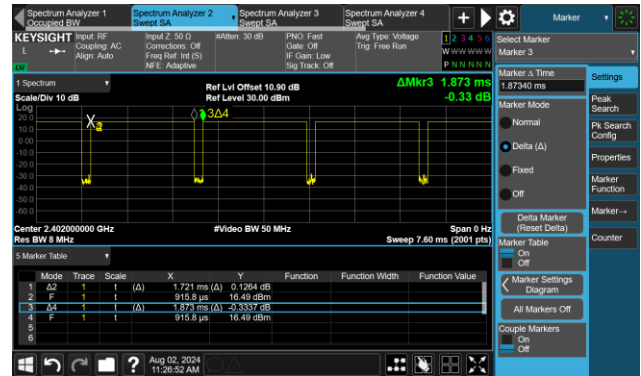
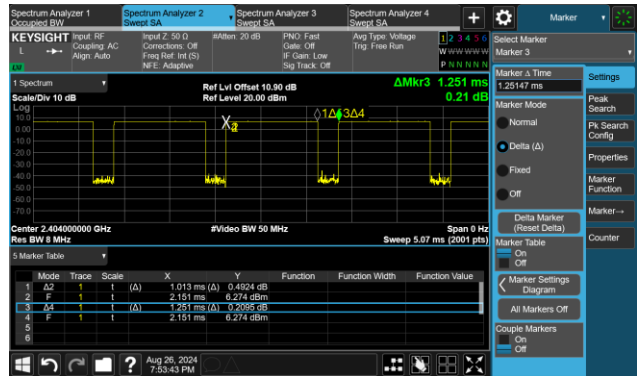
6.8.3. Test Result

Refer to Appendix A.8.

Appendix A - Test Result

A.1 Duty Cycle Test Result

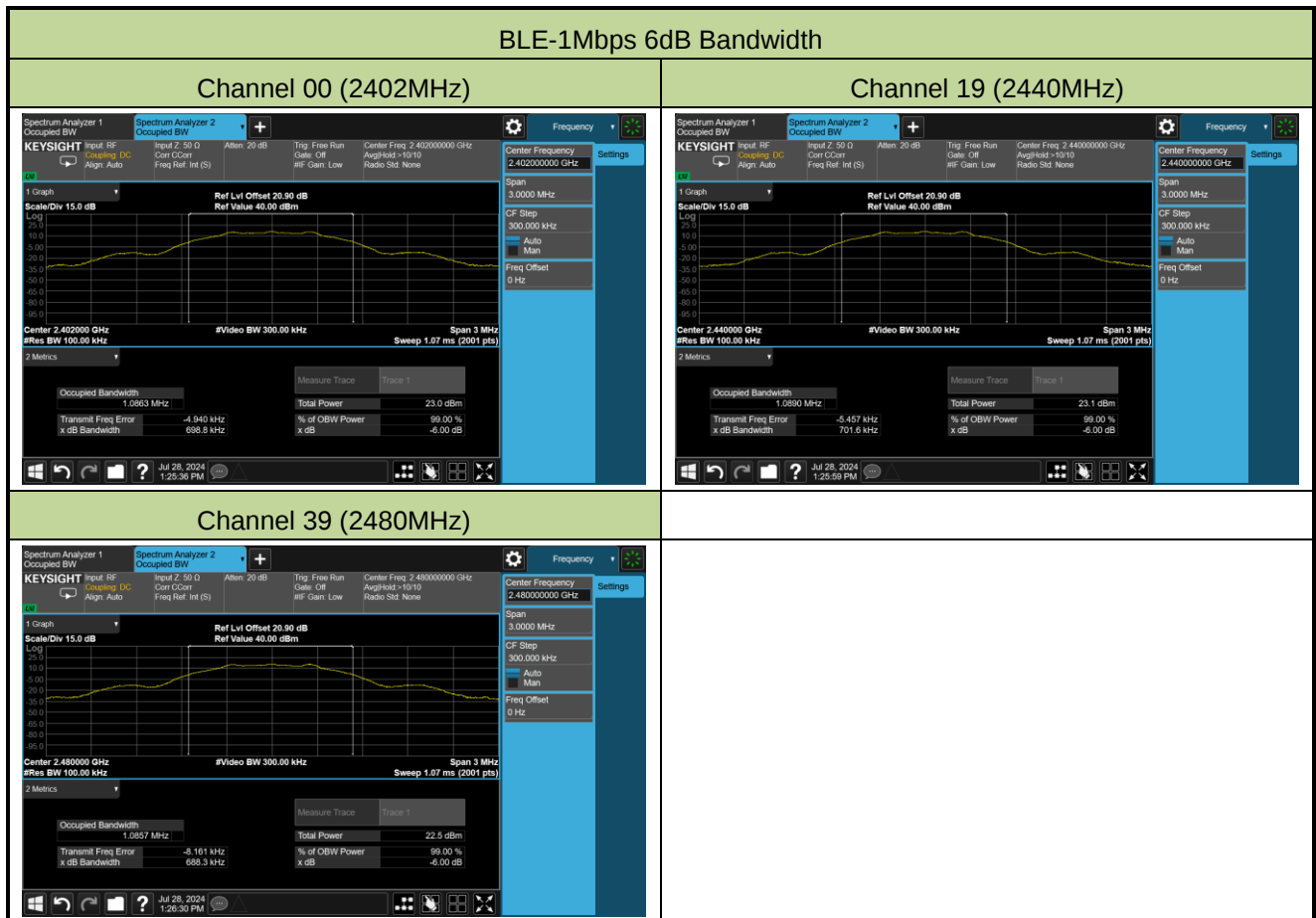
Test Site	WZ-SR5	Test Engineer	Lynn Yang
Test Date	2024-07-28, 2024-08-26		

Test Mode	Duty Cycle
BLE-1Mbps	91.74%
BLE-2Mbps	81.10%
Proprietary Mode 1Mbps	91.88%
Proprietary Mode 2Mbps	80.98%
Duty Cycle (T = Transmission Duration)	
BLE-1Mbps (T = 1.722ms)	BLE-2Mbps (T = 1.249ms)
	
Proprietary-1Mbps (T = 1.721ms)	Proprietary-2Mbps (T = 1.251ms)
	

A.2 6dB Bandwidth Test Result

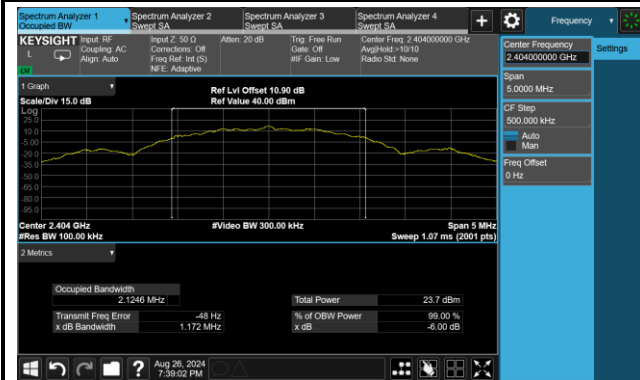
Test Site	WZ-SR5	Test Engineer	Lynn Yang
Test Date	2024-07-28, 2024-08-26	Test Item	6dB Bandwidth

Test Mode	Data Rate	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)
BLE	1Mbps	00	2402	0.6988	≥ 0.5
BLE	1Mbps	19	2440	0.7016	≥ 0.5
BLE	1Mbps	39	2480	0.6883	≥ 0.5
BLE	2Mbps	01	2404	1.1720	≥ 0.5
BLE	2Mbps	19	2440	1.1500	≥ 0.5
BLE	2Mbps	38	2478	1.1600	≥ 0.5

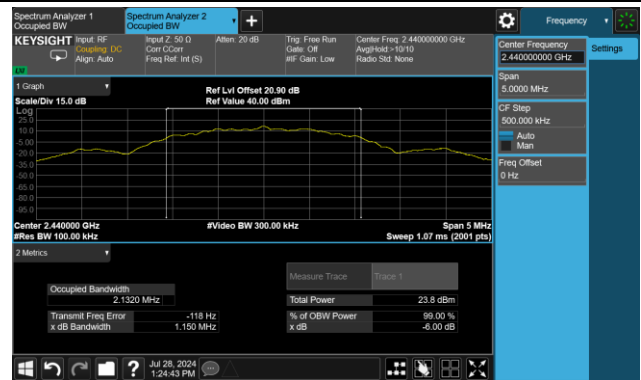


BLE-2Mbps 6dB Bandwidth

Channel 01 (2404MHz)



Channel 19 (2440MHz)

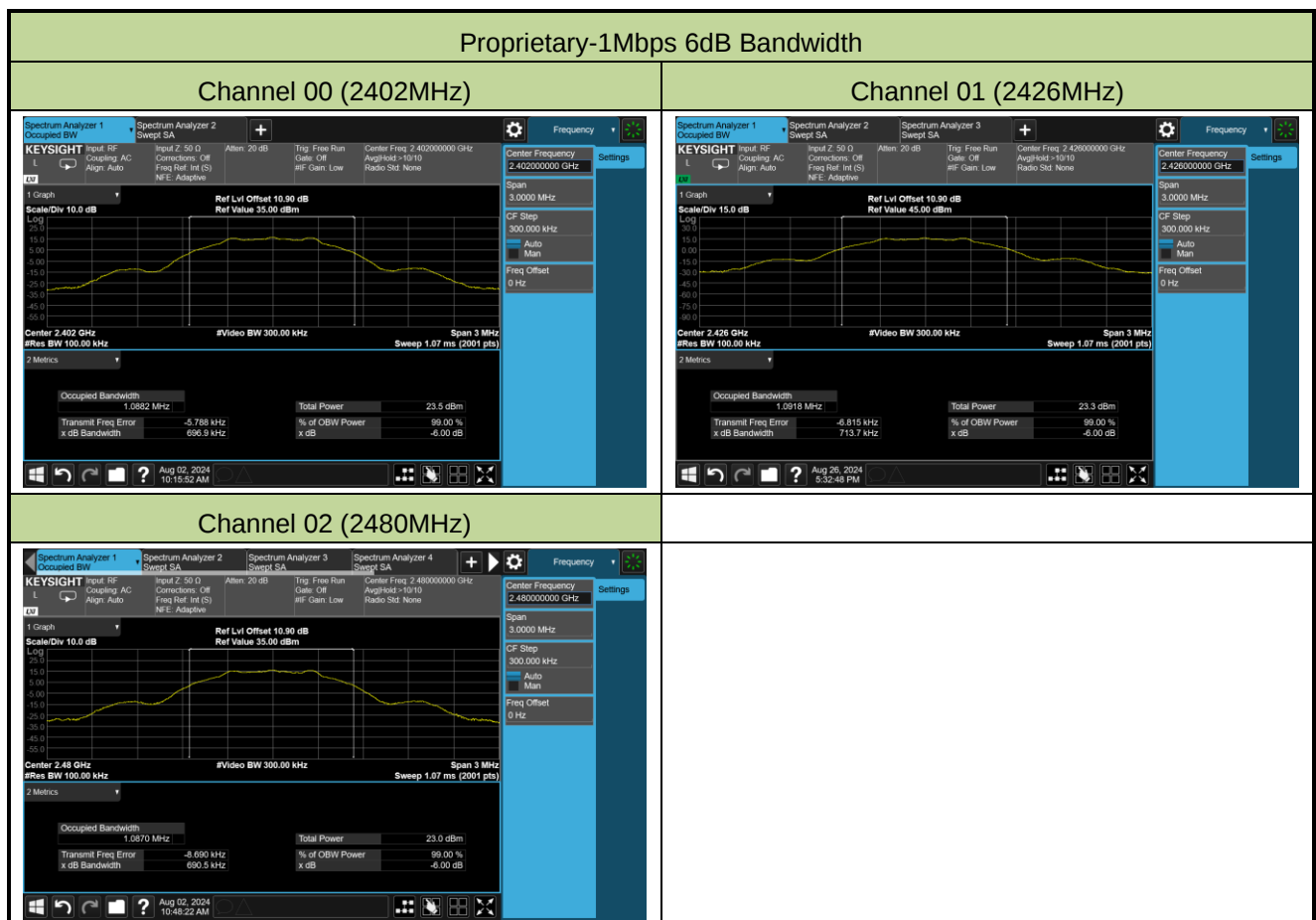


Channel 38 (2478MHz)



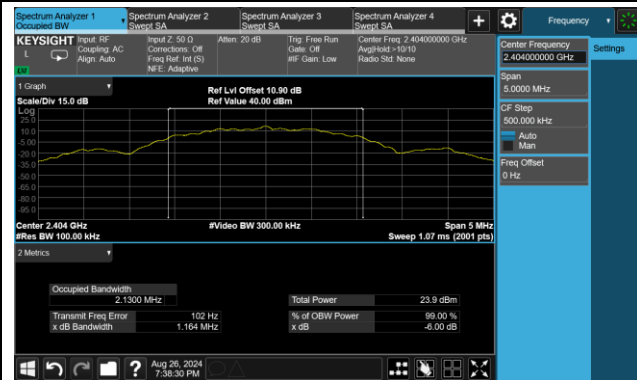
Test Site	WZ-SR5	Test Engineer	Lynn Yang
Test Date	2024-08-02, 2024-08-26	Test Item	6dB Bandwidth

Test Mode	Data Rate	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)
Proprietary	1Mbps	00	2402	0.6969	≥ 0.5
Proprietary	1Mbps	01	2426	0.7137	≥ 0.5
Proprietary	1Mbps	02	2480	0.6905	≥ 0.5
Proprietary	2Mbps	01	2404	1.1640	≥ 0.5
Proprietary	2Mbps	13	2444	1.1580	≥ 0.5
Proprietary	2Mbps	24	2478	1.1620	≥ 0.5

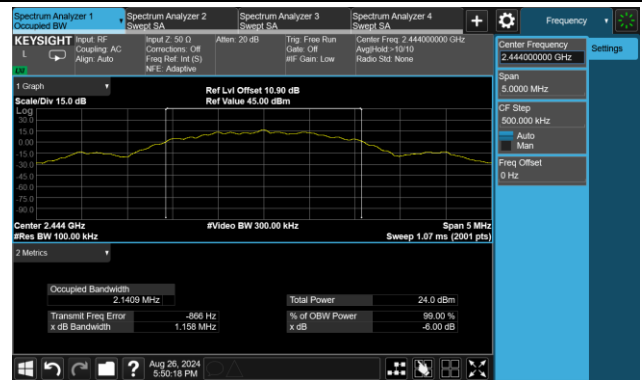


Proprietary-2Mbps 6dB Bandwidth

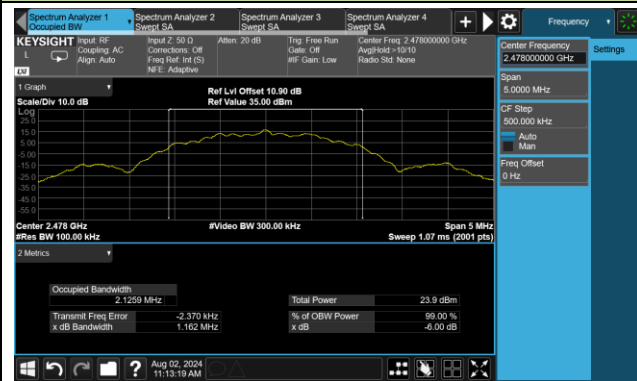
Channel 01 (2404MHz)



Channel 13 (2444MHz)



Channel 38 (2478MHz)



A.3 Output Power Test Result

Test Site	WZ-SR5	Test Engineer	Lynn Yang
Test Date	2024-07-28		

Test Result of Peak Output Power

Test Mode	Data Rate	Channel No.	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Result
BLE	1Mbps	00	2402	16.26	≤ 30.00	Pass
BLE	1Mbps	19	2440	16.42	≤ 30.00	Pass
BLE	1Mbps	39	2480	16.25	≤ 30.00	Pass
BLE	2Mbps	00	2402	16.22	≤ 30.00	Pass
BLE	2Mbps	19	2440	16.45	≤ 30.00	Pass
BLE	2Mbps	38	2478	16.19	≤ 30.00	Pass

Test Result of Average Output Power (Reporting Only)

Test Mode	Data Rate	Channel No.	Frequency (MHz)	Average Power (dBm)	Limit (dBm)	Result
BLE	1Mbps	00	2402	16.14	≤ 30.00	Pass
BLE	1Mbps	19	2440	16.24	≤ 30.00	Pass
BLE	1Mbps	39	2480	16.18	≤ 30.00	Pass
BLE	2Mbps	00	2402	16.15	≤ 30.00	Pass
BLE	2Mbps	19	2440	16.39	≤ 30.00	Pass
BLE	2Mbps	38	2478	16.06	≤ 30.00	Pass

Test Site	WZ-SR5	Test Engineer	Lynn Yang
Test Date	2024-08-02		

Test Result of Peak Output Power

Test Mode	Data Rate	Channel No.	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Result
Proprietary	1Mbps	00	2402	16.16	≤ 30.00	Pass
Proprietary	1Mbps	19	2440	16.49	≤ 30.00	Pass
Proprietary	1Mbps	39	2480	16.31	≤ 30.00	Pass
Proprietary	2Mbps	00	2402	16.17	≤ 30.00	Pass
Proprietary	2Mbps	19	2440	16.29	≤ 30.00	Pass
Proprietary	2Mbps	38	2478	16.15	≤ 30.00	Pass

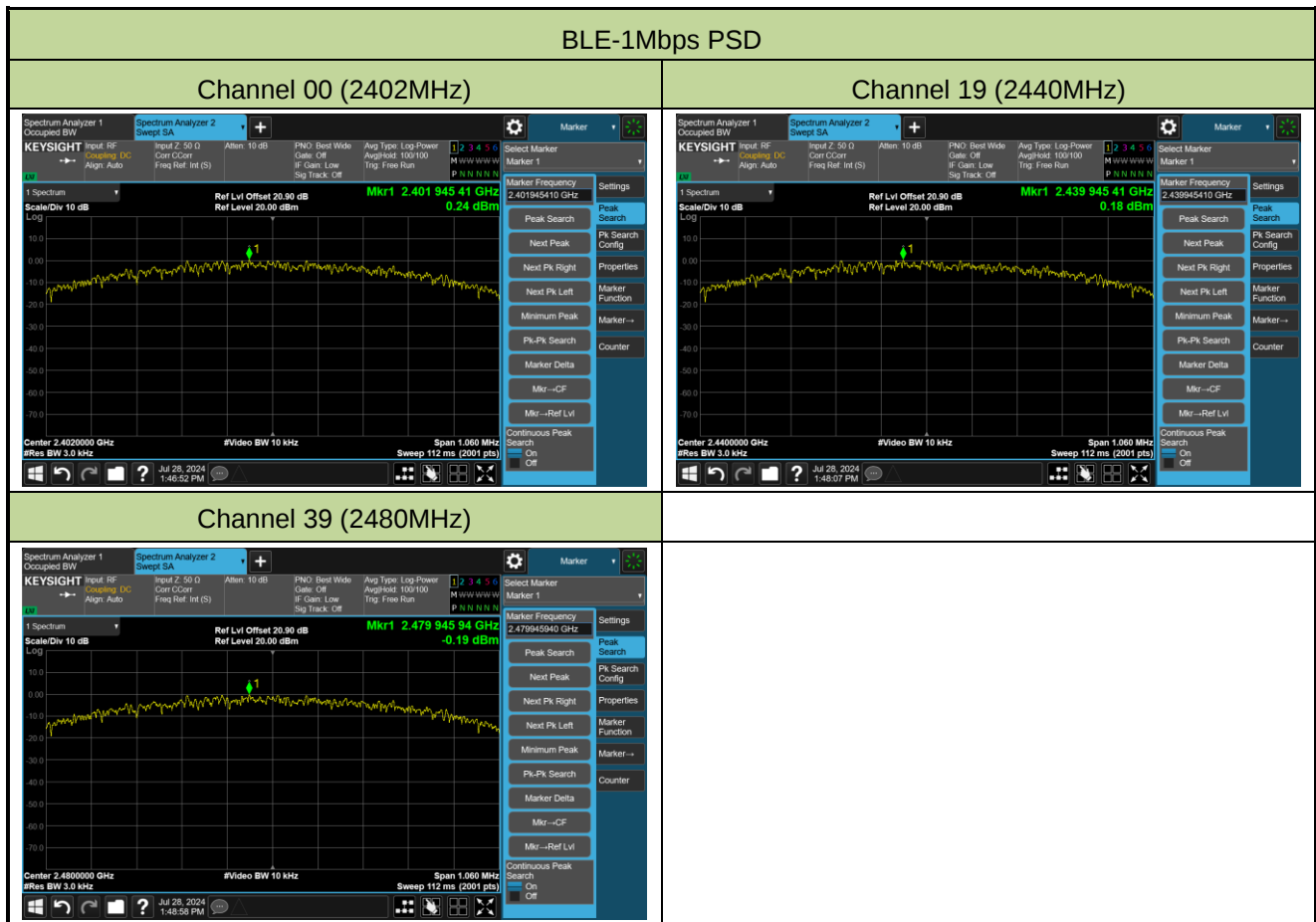
Test Result of Average Output Power (Reporting Only)

Test Mode	Data Rate	Channel No.	Frequency (MHz)	Average Power (dBm)	Limit (dBm)	Result
Proprietary	1Mbps	00	2402	16.13	≤ 30.00	Pass
Proprietary	1Mbps	19	2440	16.35	≤ 30.00	Pass
Proprietary	1Mbps	39	2480	16.28	≤ 30.00	Pass
Proprietary	2Mbps	00	2402	16.09	≤ 30.00	Pass
Proprietary	2Mbps	19	2440	16.18	≤ 30.00	Pass
Proprietary	2Mbps	38	2478	16.08	≤ 30.00	Pass

A.4 Power Spectral Density Test Result

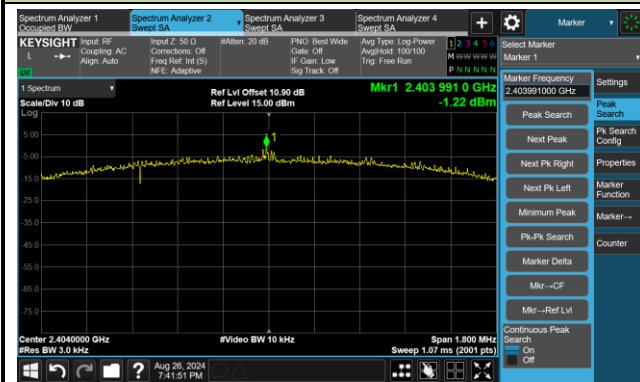
Test Site	WZ-SR5	Test Engineer	Lynn Yang
Test Date	2024-07-28, 2024-08-26		

Test Mode	Data Rate	Channel No.	Frequency (MHz)	PSD Result (dBm / 3kHz)	Limit (dBm / 3kHz)	Result
BLE	1Mbps	00	2402	0.24	≤ 8.00	Pass
BLE	1Mbps	19	2440	0.18	≤ 8.00	Pass
BLE	1Mbps	39	2480	-0.19	≤ 8.00	Pass
BLE	2Mbps	01	2404	-1.22	≤ 8.00	Pass
BLE	2Mbps	19	2440	-1.39	≤ 8.00	Pass
BLE	2Mbps	38	2478	-1.33	≤ 8.00	Pass

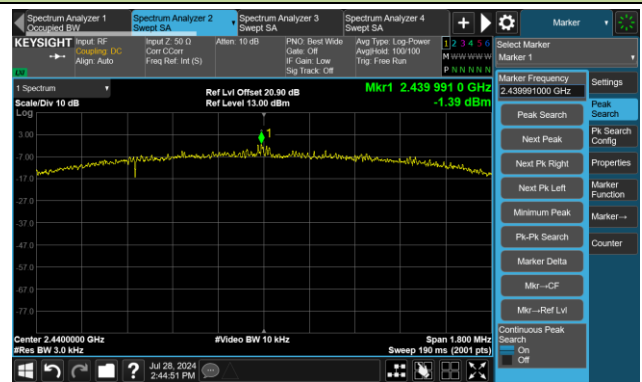


BLE-2Mbps PSD

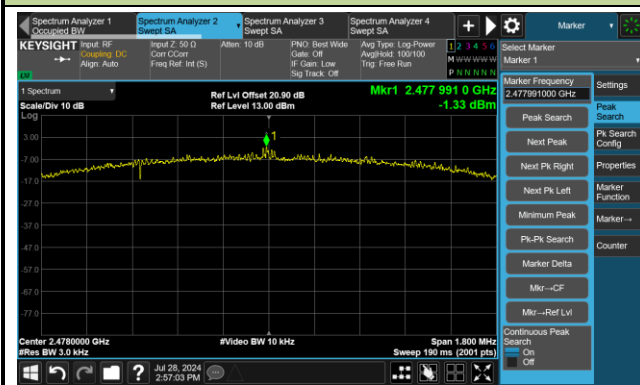
Channel 01 (2404MHz)



Channel 19 (2440MHz)

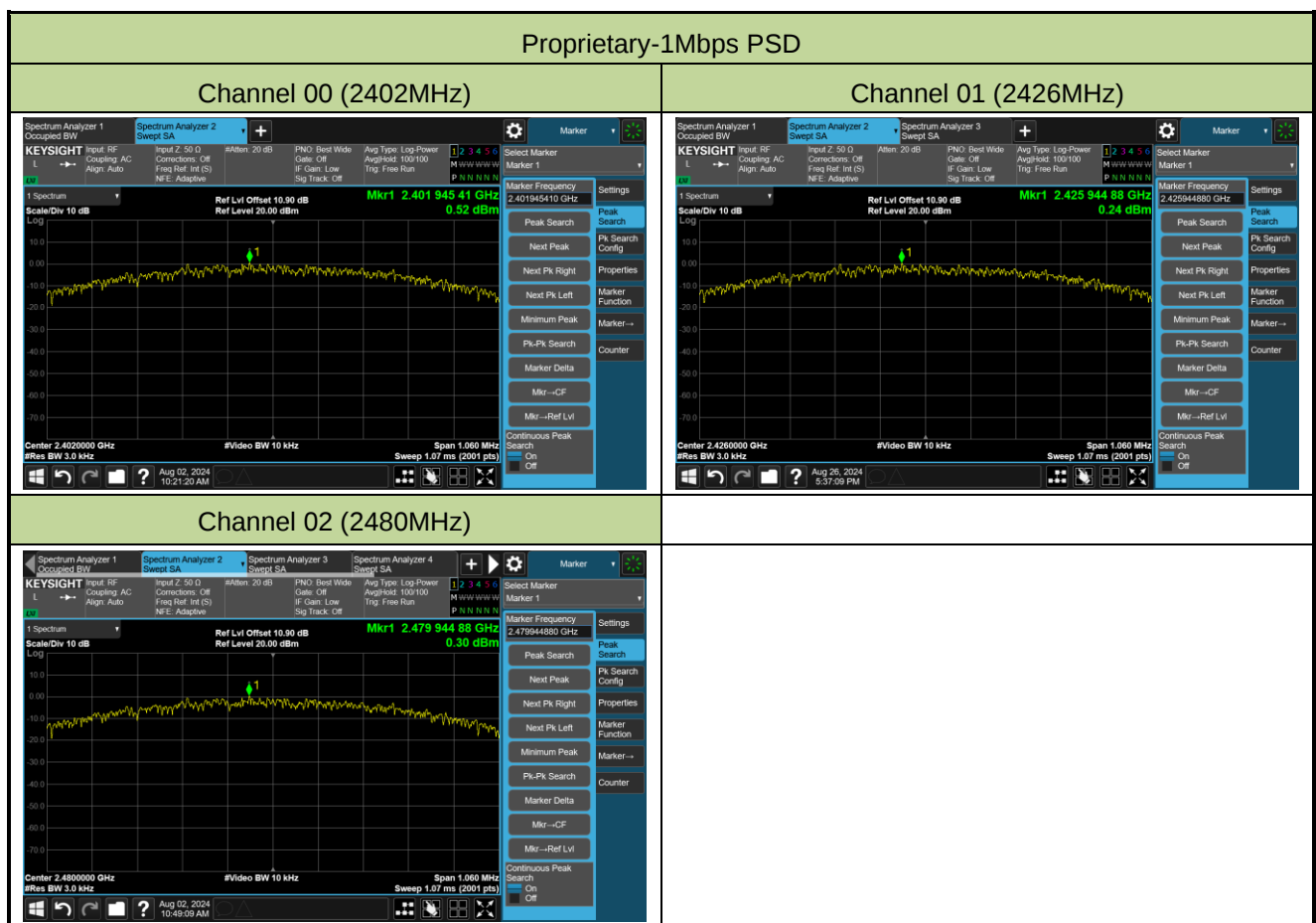


Channel 38 (2478MHz)



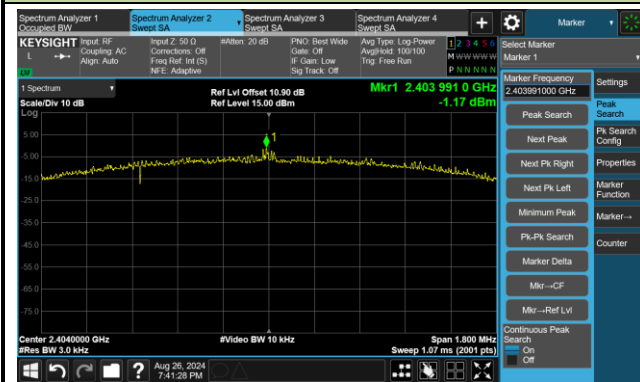
Test Site	WZ-SR5	Test Engineer	Lynn Yang
Test Date	2024-08-02, 2024-08-26		

Test Mode	Data Rate	Channel No.	Frequency (MHz)	PSD Result (dBm / 3kHz)	Limit (dBm / 3kHz)	Result
Proprietary	1Mbps	00	2402	0.52	≤ 8.00	Pass
Proprietary	1Mbps	01	2426	0.24	≤ 8.00	Pass
Proprietary	1Mbps	02	2480	0.30	≤ 8.00	Pass
Proprietary	2Mbps	01	2404	-1.17	≤ 8.00	Pass
Proprietary	2Mbps	13	2444	-0.93	≤ 8.00	Pass
Proprietary	2Mbps	24	2478	-1.18	≤ 8.00	Pass



Proprietary-2Mbps PSD

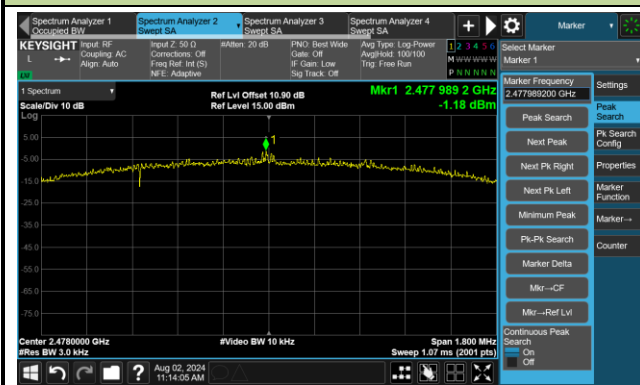
Channel 01 (2404MHz)



Channel 13 (2444MHz)



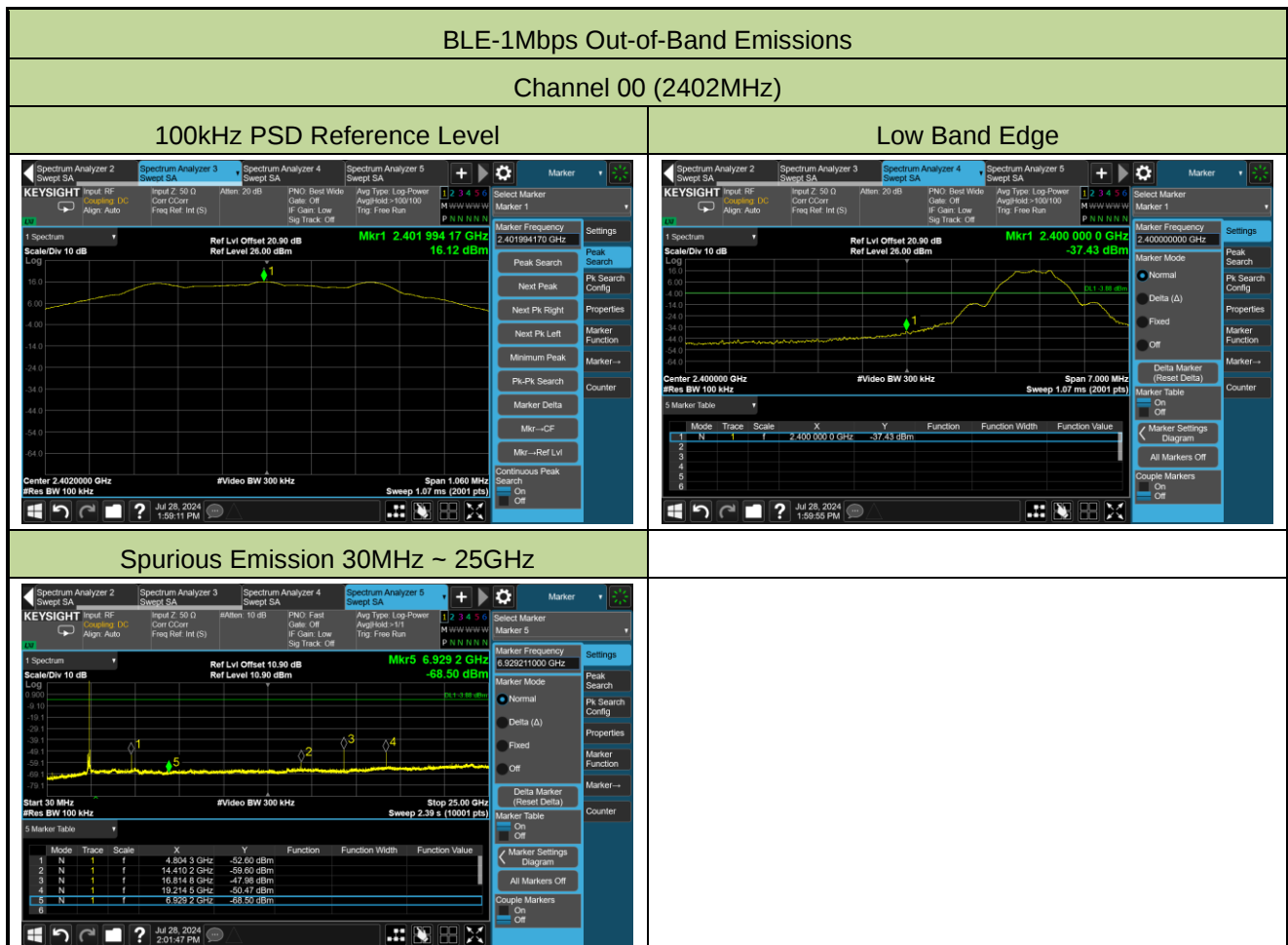
Channel 24 (2478MHz)



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

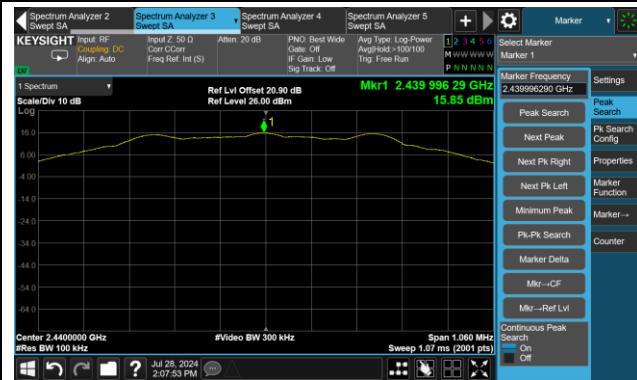
Test Site	WZ-SR5	Test Engineer	Lynn Yang
Test Date	2024-07-28, 2024-08-26		

Test Mode	Data Rate / Mbps	Channel No.	Frequency (MHz)	Limit (dBc)	Result
BLE	1	00	2402	20	Pass
BLE	1	19	2440	20	Pass
BLE	1	39	2480	20	Pass
BLE	2	01	2404	20	Pass
BLE	2	19	2440	20	Pass
BLE	2	38	2478	20	Pass

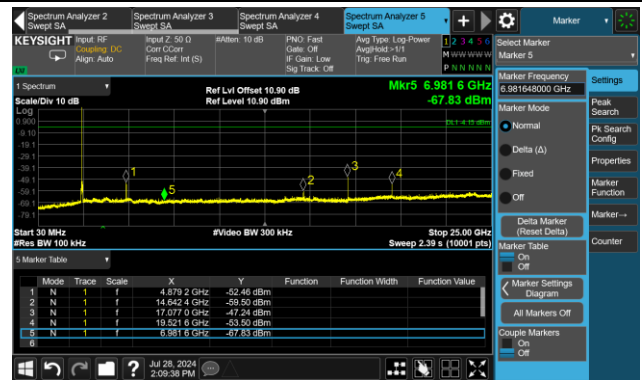


Channel 19 (2440MHz)

100kHz PSD Reference Level

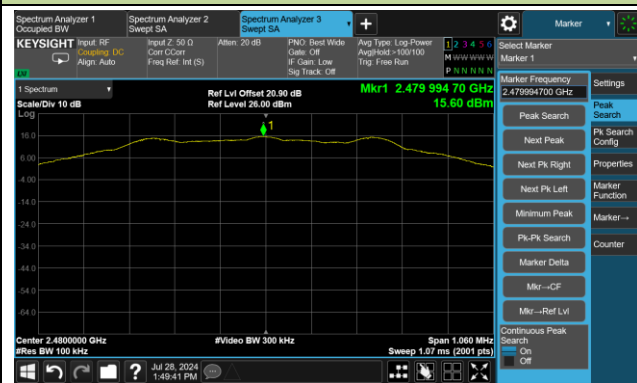


Spurious Emission 30MHz ~ 25GHz

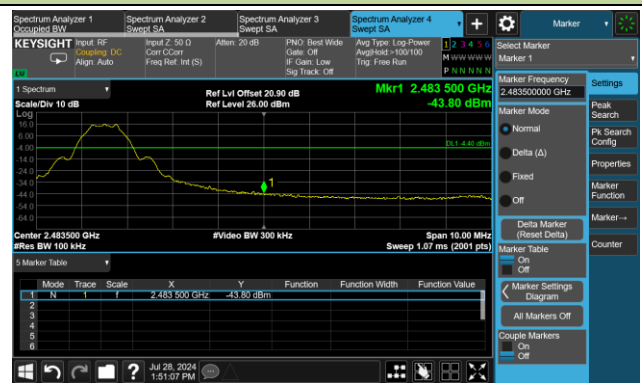


Channel 39 (2480MHz)

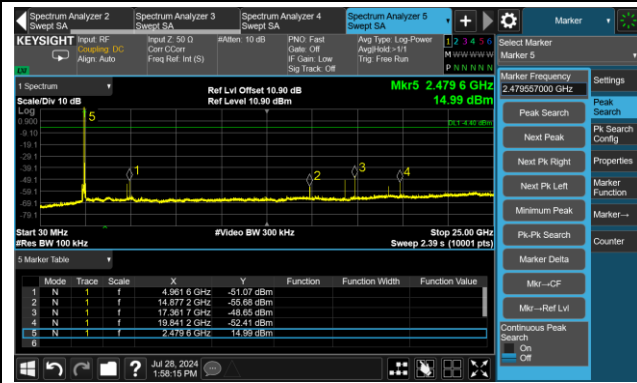
100kHz PSD Reference Level



High Band Edge



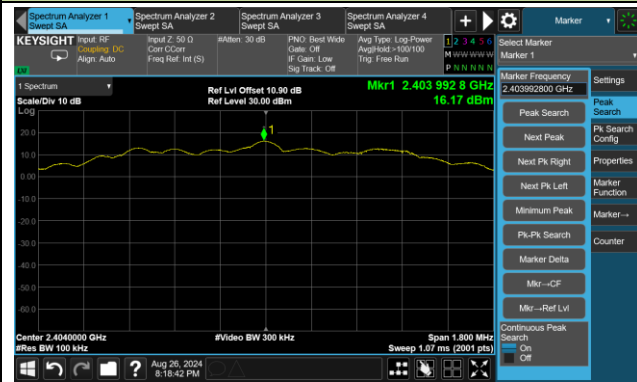
Spurious Emission 30MHz ~ 25GHz



BLE-2Mbps Out-of-Band Emissions

Channel 01 (2404MHz)

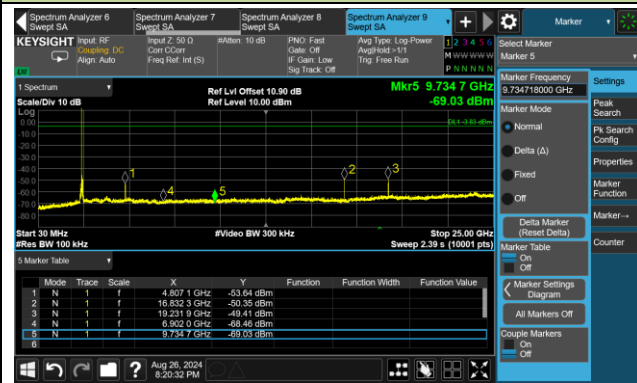
100kHz PSD Reference Level



Low Band Edge

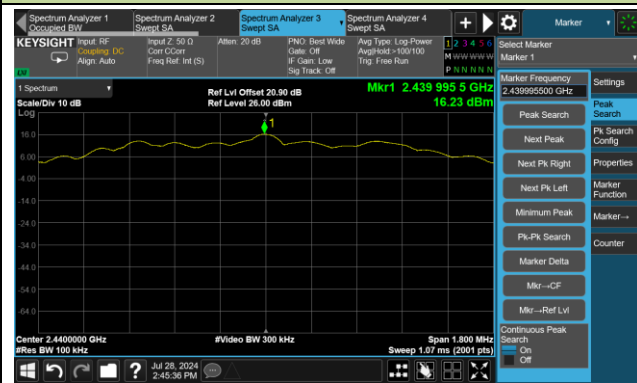


Spurious Emission 30MHz ~ 25GHz

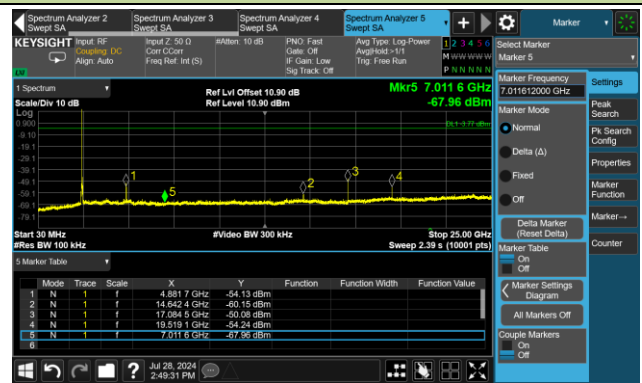


Channel 19 (2440MHz)

100kHz PSD Reference Level

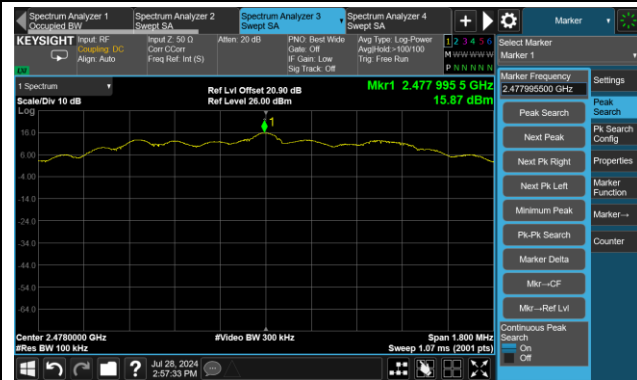


Spurious Emission 30MHz ~ 25GHz

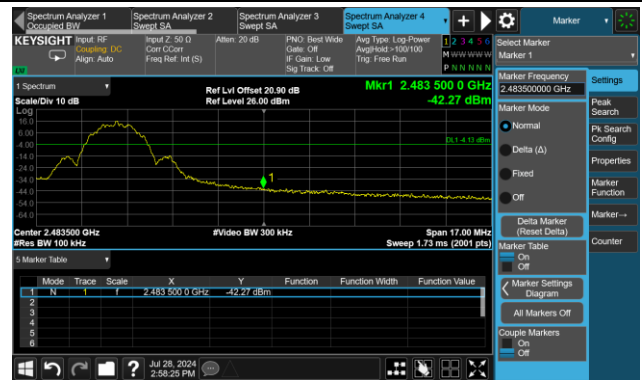


Channel 38 (2478MHz)

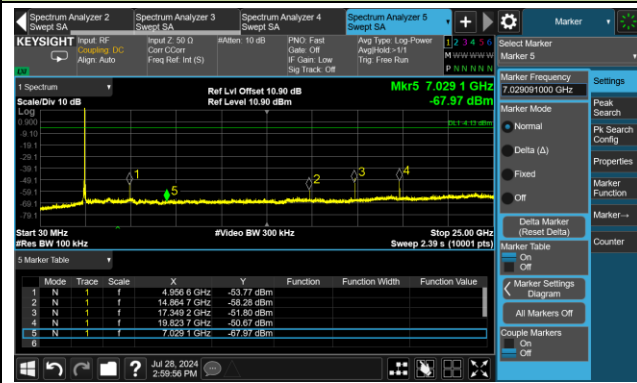
100kHz PSD Reference Level



High Band Edge

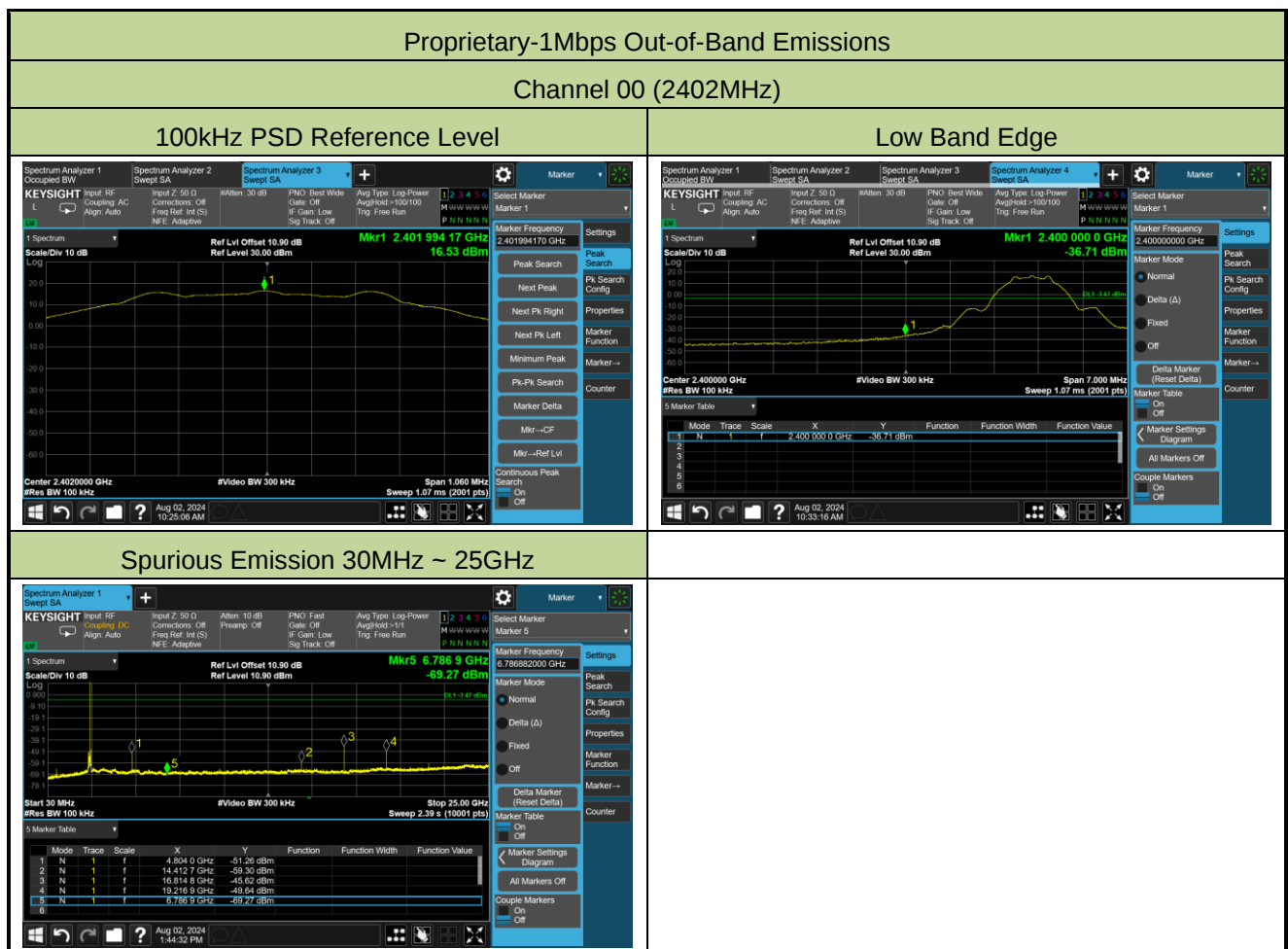


Spurious Emission 30MHz ~ 25GHz



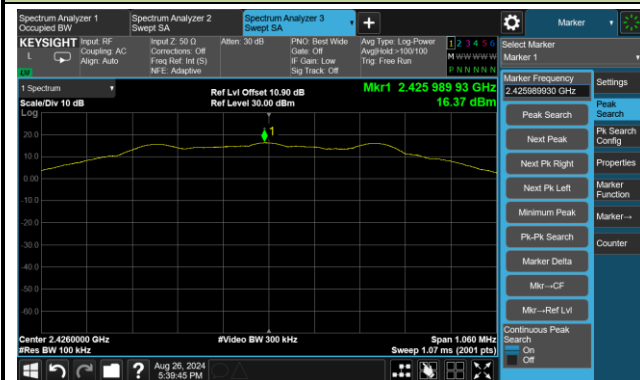
Test Site	WZ-SR5	Test Engineer	Lynn Yang
Test Date	2024-08-02, 2024-08-29		

Test Mode	Data Rate / Mbps	Channel No.	Frequency (MHz)	Limit (dBc)	Result
Proprietary	1	00	2402	20	Pass
Proprietary	1	01	2426	20	Pass
Proprietary	1	02	2480	20	Pass
Proprietary	2	01	2404	20	Pass
Proprietary	2	13	2444	20	Pass
Proprietary	2	24	2478	20	Pass

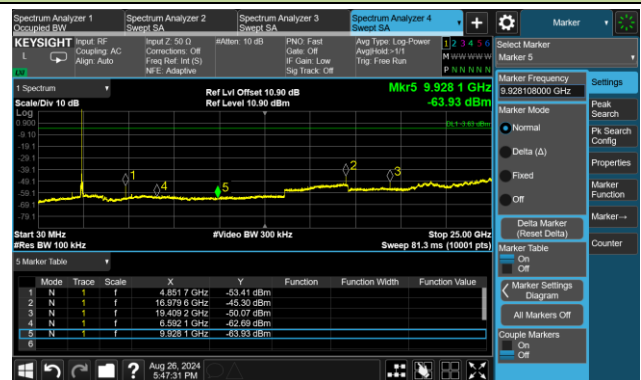


Channel 01 (2426MHz)

100kHz PSD Reference Level

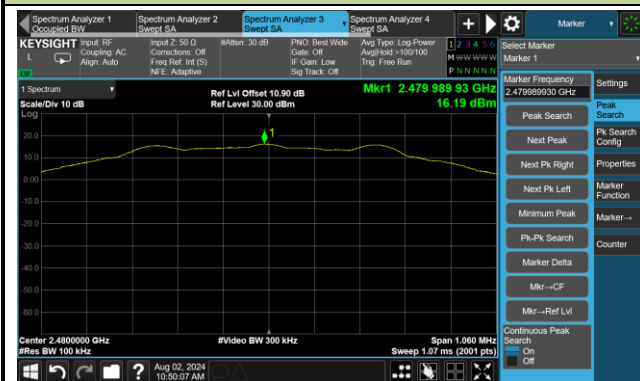


Spurious Emission 30MHz ~ 25GHz



Channel 02 (2480MHz)

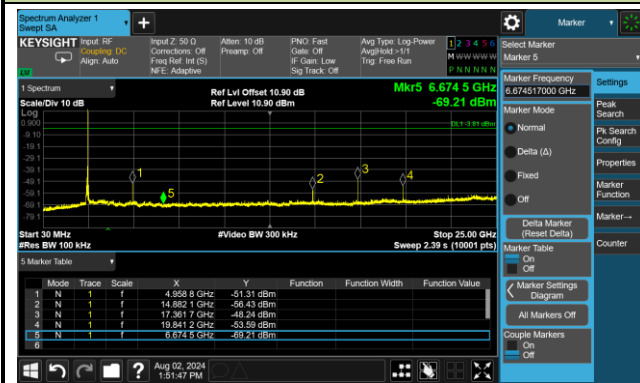
100kHz PSD Reference Level



High Band Edge



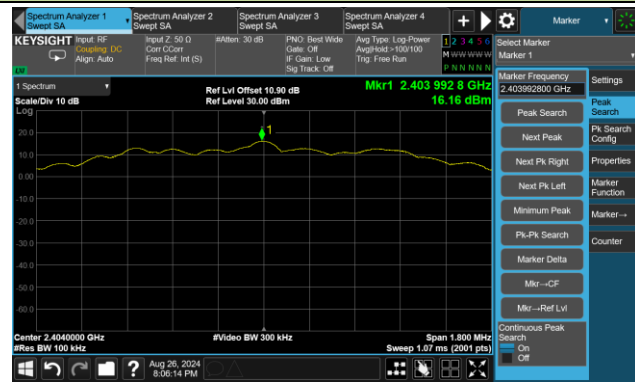
Spurious Emission 30MHz ~ 25GHz



Proprietary-2Mbps Out-of-Band Emissions

Channel 01 (2404MHz)

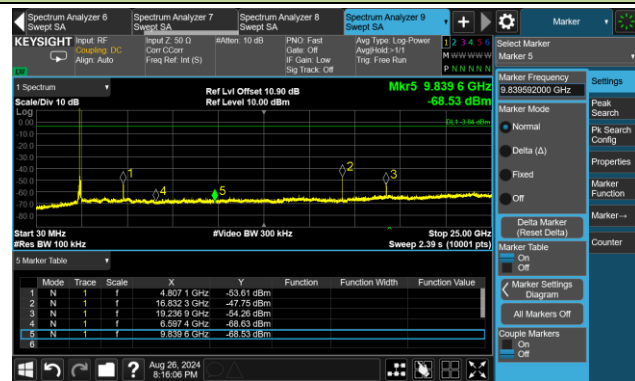
100kHz PSD Reference Level



Low Band Edge

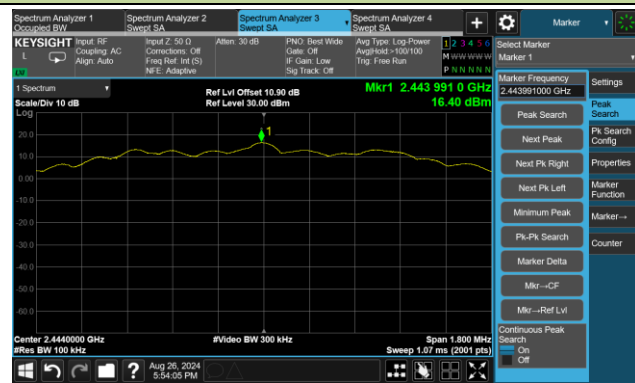


Spurious Emission 30MHz ~ 25GHz



Channel 13 (2444MHz)

100kHz PSD Reference Level



Spurious Emission 30MHz ~ 25GHz

