RF MEASUREMENT REPORT

FCC ID:	VW3FAST5697
Applicant:	SAGEMCOM BROADBAND SAS
Product:	Giga Hub 2.0
Model No.:	FAST5697
Brand Name:	SAGEMCOM
FCC Classification:	Digital Transmission System (DTS)
FCC Rule Part(s):	Part 15 Subpart C (Section 15.247)
Result:	Complies
Received Date:	2025-03-19
Test Date:	2025-04-18 ~ 2025-05-13

Reviewed By: Sunny Sun

Approved By: Robin Wu

ACCREDITED
TESTING LABORATORY
CERTIFICATE #3628.01

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
R25S1048034-U201	V01	Initial Report	2025-06-03	Valid

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1. General Information

1.1. Applicant

SAGEMCOM BROADBAND SAS
4 ALLEE DES MESSAGERIES
92271 BOIS-COLOMBES CEDEX - FRANCE

1.2. Manufacturer

SAGEMCOM BROADBAND SAS
4 ALLEE DES MESSAGERIES
92271 BOIS-COLOMBES CEDEX - FRANCE

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	Giga Hub 2.0
Model No.	FAST5697
EUT Identification No.	20250506Sample#01
Bluetooth Specification	Bluetooth_LE 1M
Zigbee Specification	802.15.4
Z-Wave Specification	902 ~ 928MHz
Wi-Fi Specification	802.11a/b/g/n/ac/ax/be
Antenna Information	Refer to section 1.7
Working Voltage	By Adapter
Operating Environment	Indoor Use
Accessories	
Adapter #1	Model: ADS-65HI-12A-2 12060E-L Input: 100-127V ~ 50/60Hz 1.5A Output: 12V=5.0A
Adapter #2	Model: NBS42G120500M2 Input: 100-127V ~ 50/60Hz 1.5A Output: 12V=5.0A
Adapter #3	Model: NBS60E120500M2 Input: 100-120V ~ 50/60Hz 1.5A Output: 12V=5.0A
Adapter #4	Model: MS-Z5000R120-060C0-P Input: 100-127V ~ 50/60Hz 1.5A Output: 12V=5.0A
Adapter #5	Model: ADS-60HI-12-2 12060E-L Input: 100-127V ~ 50/60Hz 1.5A Output: 12V=5.0A

Remarks:

1. The information of EUT was provided by the manufacturer, and the accuracy of the information shall be the responsibility of the manufacturer.
2. For this report, we select AC Adapter #1 for testing.

1.5. Radio Specification under Test

Bluetooth Frequency	2402 ~ 2480MHz
Channel Number	40
Type of modulation	GFSK
Data Rate	1Mbps
Antenna Type	Dipole Antenna
Antenna Gain	4.07 dBi

1.6. Working Frequencies

Channel	Frequency	Channel	Frequency	Channel	Frequency
00	2402 MHz	01	2404 MHz	02	2406 MHz
03	2408 MHz	04	2410 MHz	05	2412 MHz
06	2414 MHz	07	2416 MHz	08	2418 MHz
09	2420 MHz	10	2422 MHz	11	2424 MHz
12	2426 MHz	13	2428 MHz	14	2430 MHz
15	2432 MHz	16	2434 MHz	17	2436 MHz
18	2438 MHz	19	2440 MHz	20	2442 MHz
21	2444 MHz	22	2446 MHz	23	2448 MHz
24	2450 MHz	25	2452 MHz	26	2454 MHz
27	2456 MHz	28	2458 MHz	29	2460 MHz
30	2462 MHz	31	2464 MHz	32	2466 MHz
33	2468 MHz	34	2470 MHz	35	2472 MHz
36	2474 MHz	37	2476 MHz	38	2478 MHz
39	2480 MHz	--	--	--	--

2. Test Configuration

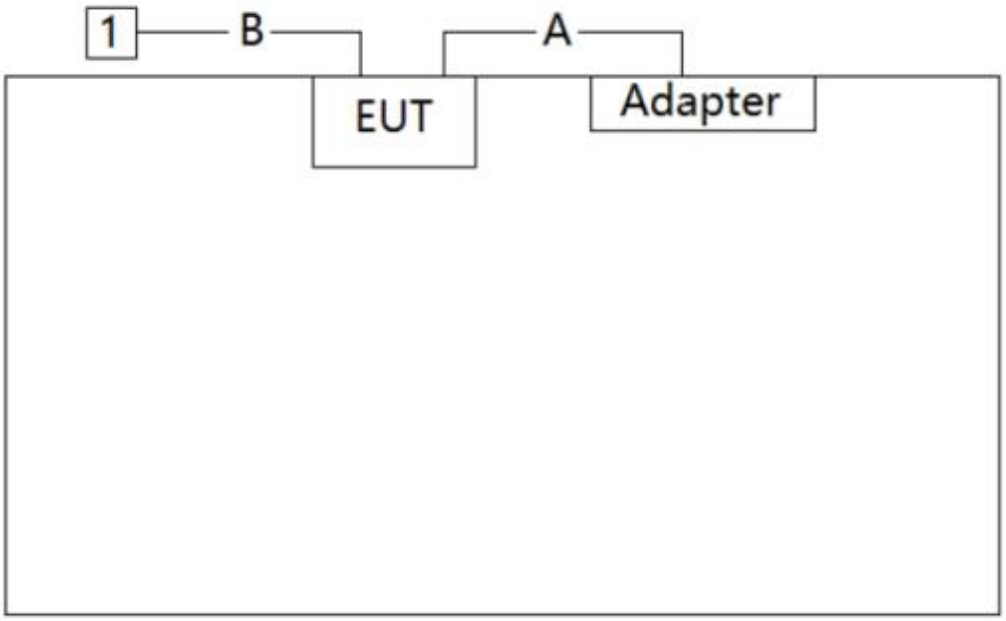
2.1. Test Mode

Mode 1: Transmit by BLE-1Mbps

2.2. Test System Connection Diagram

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

Connection Diagram



Cable Type		Cable Description	Length
A	Power Cable	Non shielded	2.0m
B	LAN Cable	Non shielded	> 10m
Product		**Manufacturer**	**Model No.**
1	Notebook	ThinkPad	E14 Gen5

2.3. Test Software

The test utility software used during testing was “Putty” and commands were provided by the manufacturer.

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
EMI Test Receiver	R&S	ESR3	MRTSUE06185	1 year	2025-12-05	SIP-AC1
Thermohygrometer	testo	608-H1	MRTSUE06616	1 year	2025-10-16	SIP-AC1
Active Loop Antenna	Schwarzbeck	FMZB 1519-60 D	MRTSUE07075	1 year	2025-11-19	SIP-AC1
TRILOG Antenna	Schwarzbeck	VULB 9168	MRTSUE06645	1 year	2025-07-05	SIP-AC1
Anechoic Chamber	RIKEN	SIP-AC1	MRTSUE06554	1 year	2025-12-19	SIP-AC1
Signal Analyzer	Keysight	N9010B	MRTSUE06559	1 year	2025-05-08 2026-04-26	SIP-AC3
Thermohygrometer	testo	608-H1	MRTSUE06619	1 year	2025-10-16	SIP-AC3
Preamplifier	EMCI	EMC012645SE	MRTSUE06642	1 year	2026-01-05	SIP-AC3
Horn Antenna	R&S	HF907	MRTSUE06611	1 year	2025-07-07	SIP-AC3
Preamplifier	EMCI	EMC184045SE	MRTSUE06602	1 year	2025-10-08	SIP-AC3
Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06599	1 year	2025-09-08	SIP-AC3
Anechoic Chamber	RIKEN	SIP-AC3	MRTSUE06782	1 year	2025-12-19	SIP-AC3
Two-Line V-Network	R&S	ENV216	MRTSUE06003	1 year	2025-05-08 2026-04-29	SIP-SR2
EMI Test Receiver	R&S	ESR3	MRTSUE06612	1 year	2025-05-08 2026-04-29	SIP-SR2
Four-Line V-Network	R&S	ENV432	MRTSUE06614	1 year	2025-10-13	SIP-SR2
Thermohygrometer	testo	608-H1	MRTSUE06621	1 year	2025-10-29	SIP-SR2
Shielding Room	MIX-BEP	SIP-SR2	MRTSUE06949	5 years	2029-10-13	SIP-SR2
USB Power Sensor	Keysight	U2021XA	MRTSUE06596	1 year	2025-07-23	SIP-TR1
Signal Analyzer	Keysight	N9010B	MRTSUE07036	1 year	2026-01-21	SIP-TR1
Thermohygrometer	testo	608-H1	MRTSUE11022	1 year	2025-10-16	SIP-TR1

Software	Version	Function
e3	230711	EMI Test Software
Agilent Power Analyzer/Agilent Power Panel	V R03.09.00	Power
Controller_MF 7802BS	1.02	RE Antenna & Turntable

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: 2.35dB Coplanar: 9kHz~30MHz: 2.37dB Horizontal: 30MHz~200MHz: 3.47dB 200MHz~1GHz: 4.17dB 1GHz~40GHz: 4.97dB Vertical: 30MHz~200MHz: 4.07dB 200MHz~1GHz: 5.28dB 1GHz~40GHz: 4.84dB
Spurious Emissions, Conducted
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 2.5dB
Output Power
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 1.5dB
Power Spectrum Density
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 2.5dB
Occupied Bandwidth
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 3.2%

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

Note:

1. The analyzer plots shown in this section were captured using a correction table to account for cable and attenuator losses in the system connecting the EUT to the analyzer across relevant frequencies.

6.2. 6dB Bandwidth Measurement

6.2.1. Test Limit

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

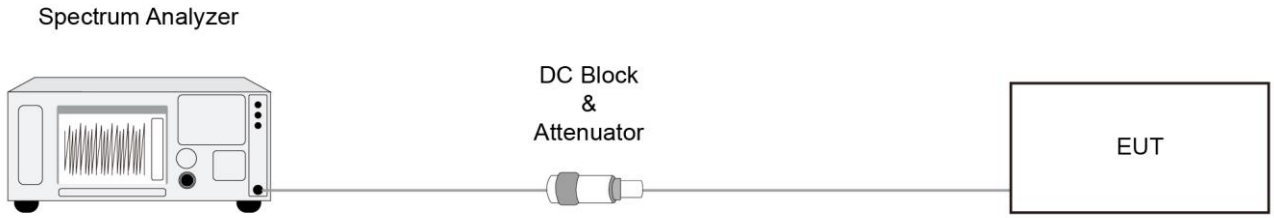
6.2.2. Test Procedure

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 ≥ 3 × 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

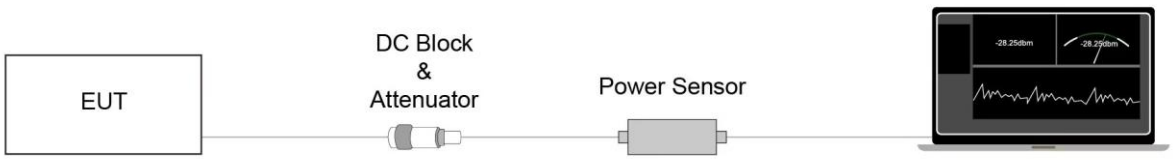
Method PKPM1 (Peak Power Measurement of Signals with DTS BW ≤ 50MHz)

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.

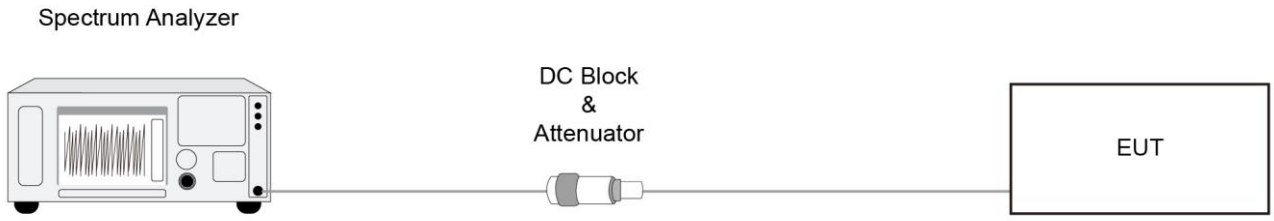
6.4.2. Test Procedure

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 20dB below the fundamental emission level, as determined from the in-band power measurement of the DTS channel performed in a 100 kHz bandwidth per the PSD procedure.

6.5.2. Test Procedure

ANSI C63.10-2013 - Section 11.11

6.5.3. Test Settitng

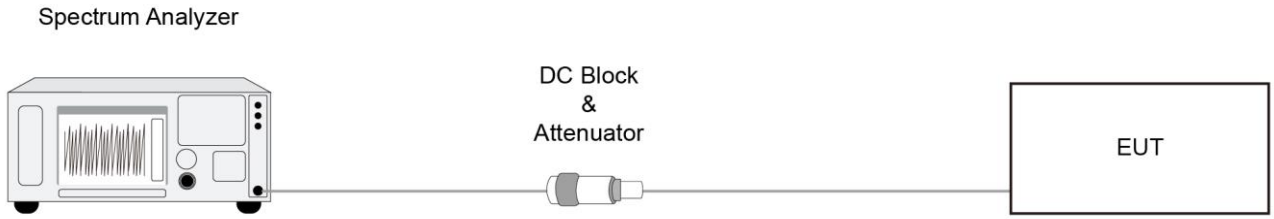
Reference level measurement

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 ≥ 3 x 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 [μV/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

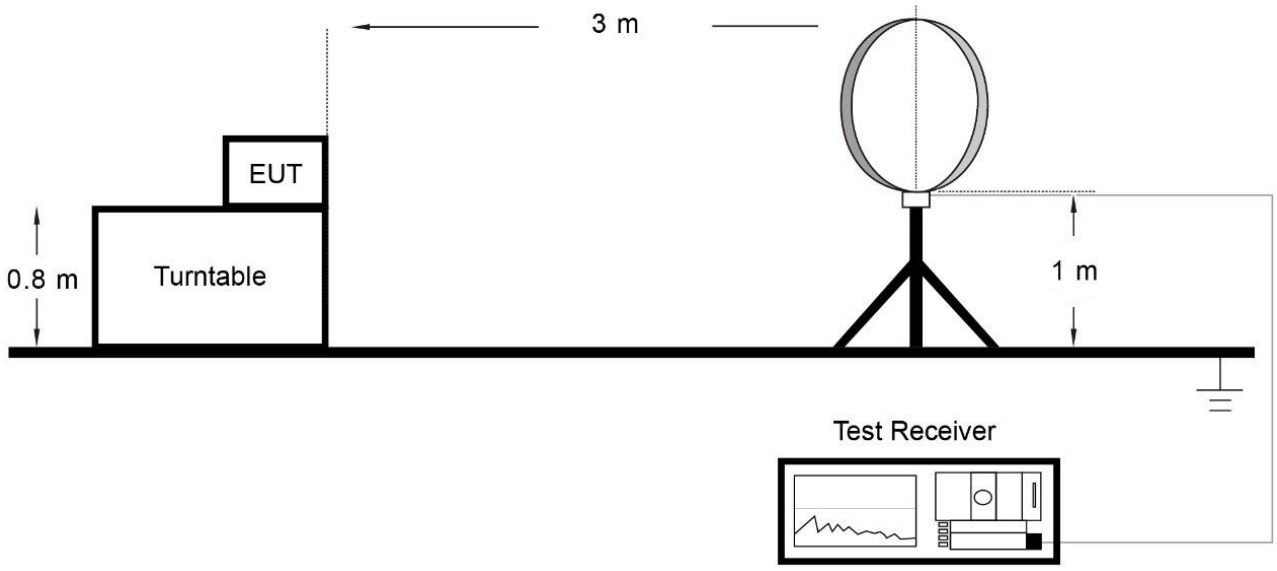
Average Measurements above 1GHz (Method VB)

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 ≥ 98%, set VBW = 10Hz

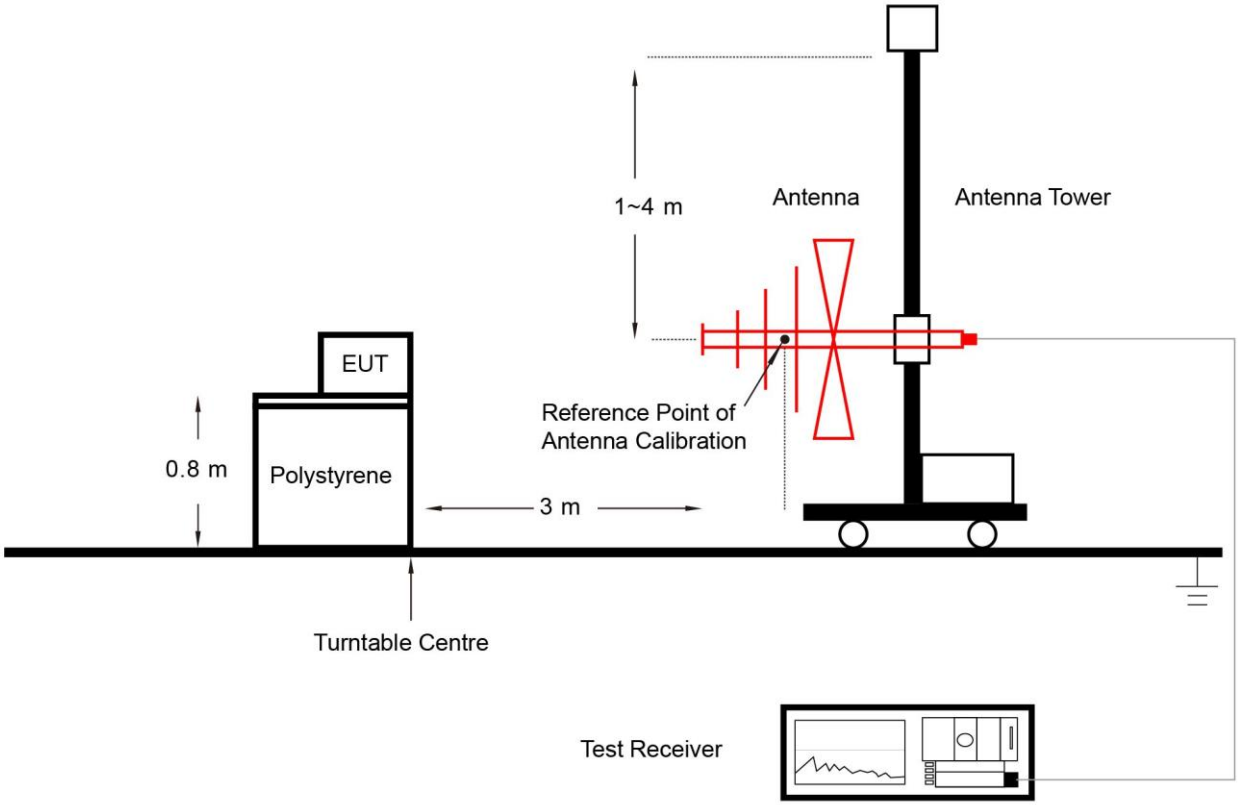
   If the EUT duty cycle is < 98%, set VBW ≥ 1/T. T is the minimum transmission duration.
4. As an alternative, the instrument may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB domain). Some instruments require linear display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

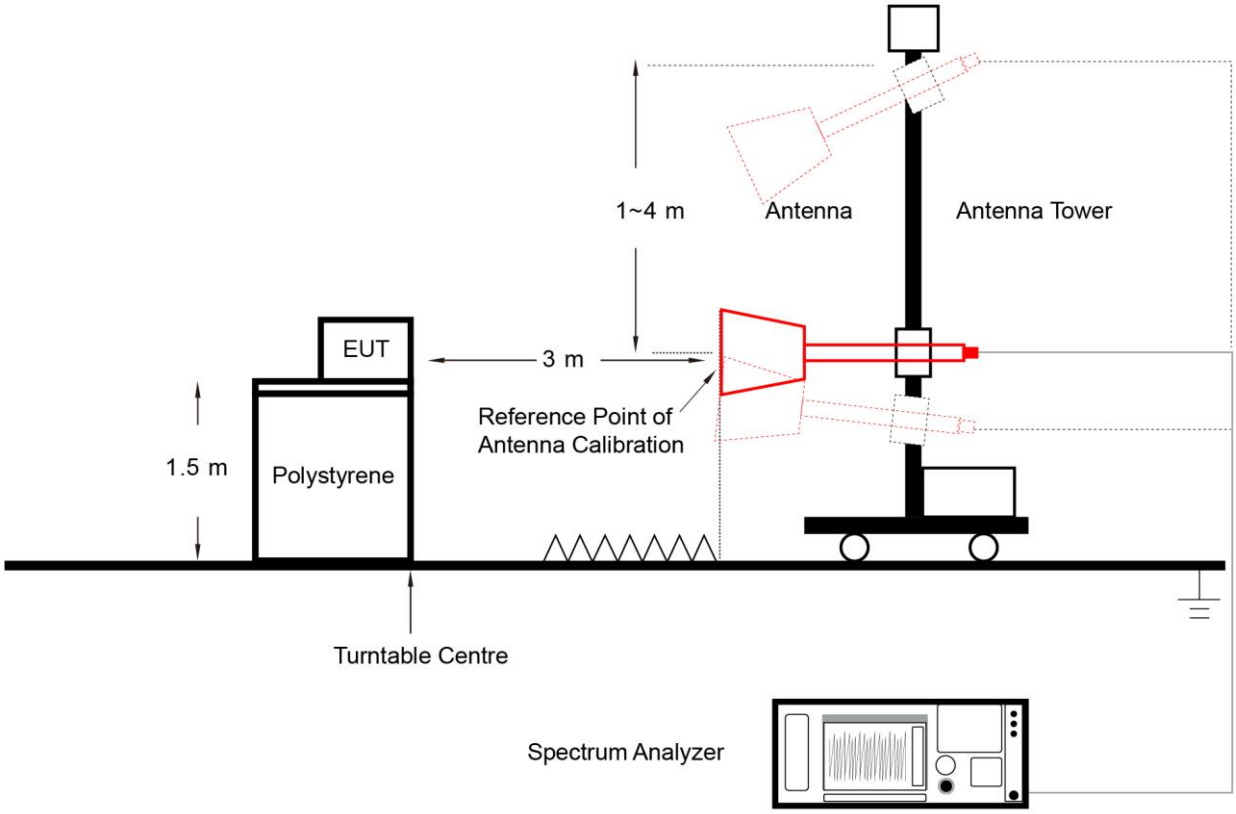
Below 30MHz Test Setup:



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 [μV/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

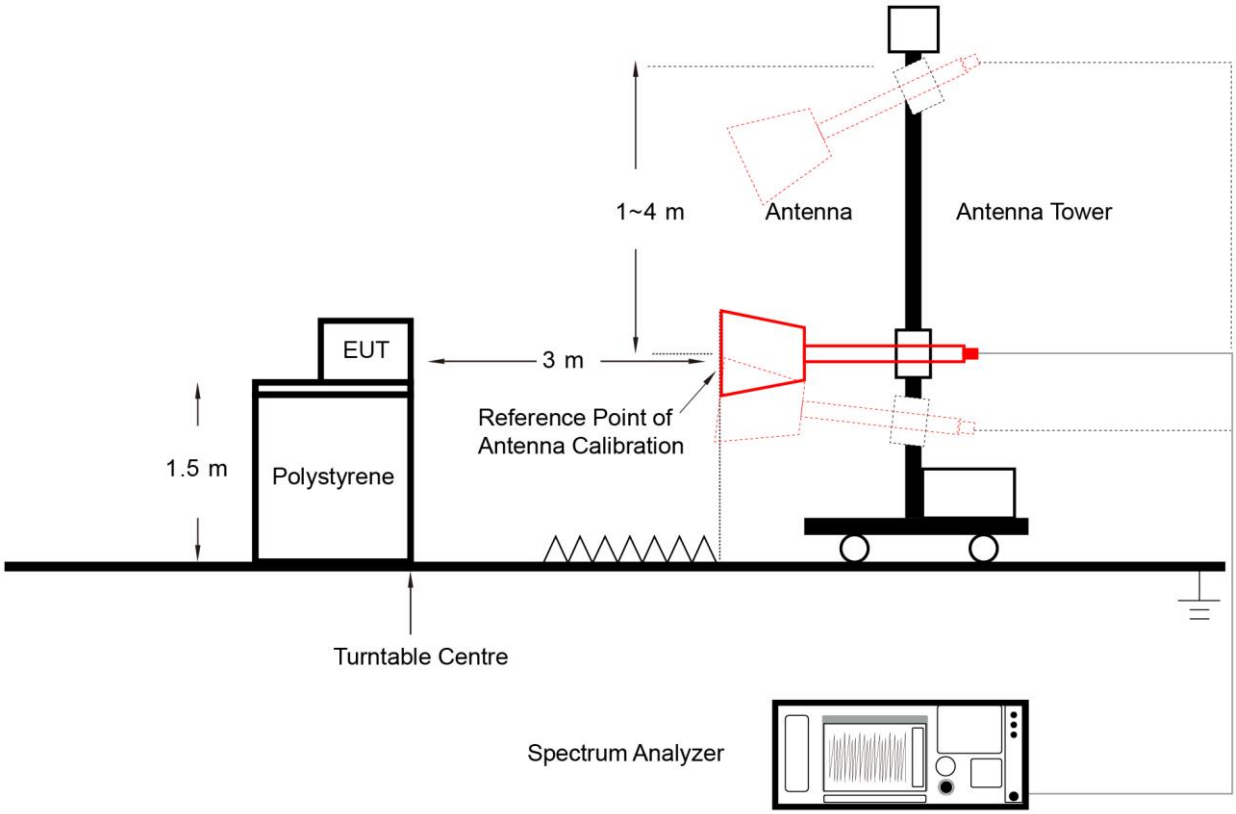
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

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 ≥ 98%, set VBW = 10 Hz.

   If the EUT duty cycle is < 98%, set VBW ≥ 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

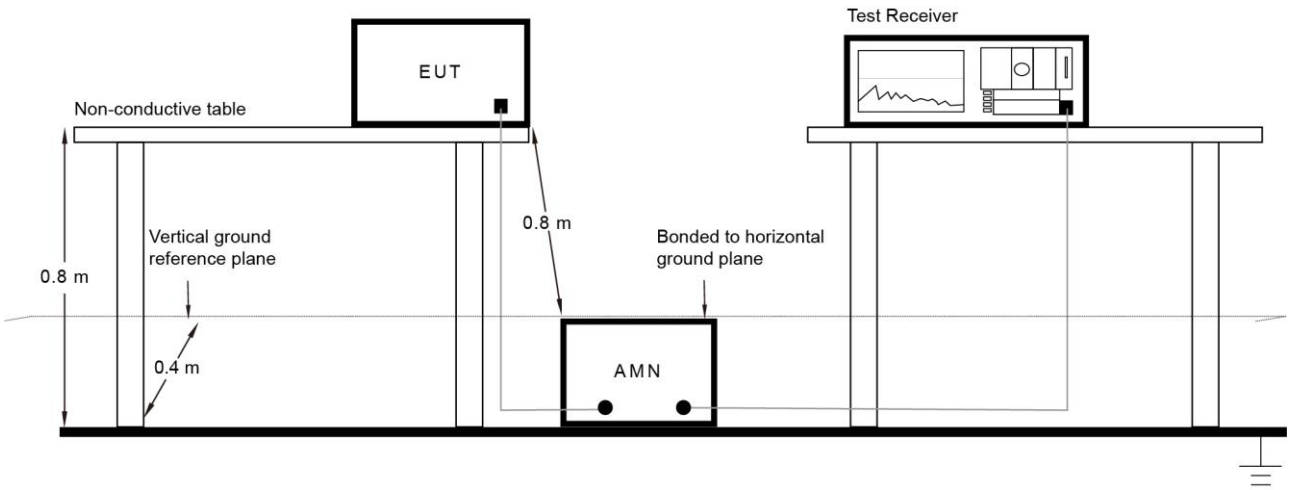
Refer to Appendix A.7.

6.8. AC Conducted Emissions Measurement

6.8.1. Test Limit

FCC Part 15 Subpart C Paragraph 15.207 Limits		
Frequency (MHz)	QP (dBμV)	AV (dBμV)
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

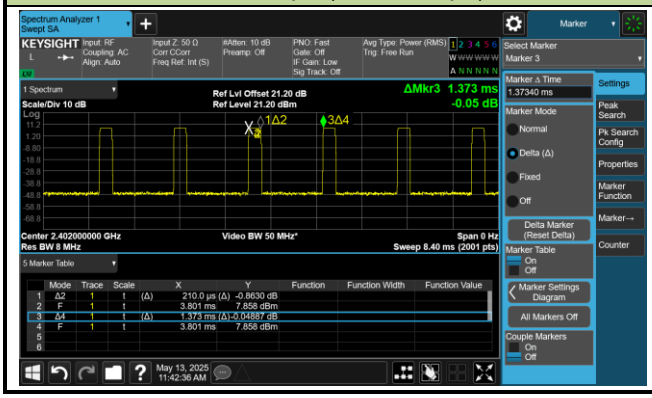
Refer to Appendix A.8.

Appendix A - Test Result

A.1 Duty Cycle Test Result

Test Site	SIP-TR1	Test Engineer	Ryan Wang
Test Date	2025-05-13		

Test Mode	Duty Cycle
BLE-1Mbps	15.29%
Duty Cycle (T = Transmission Duration)	
BLE-1Mbps (T = 210.0μs)	



A.2 6dB Bandwidth Test Result

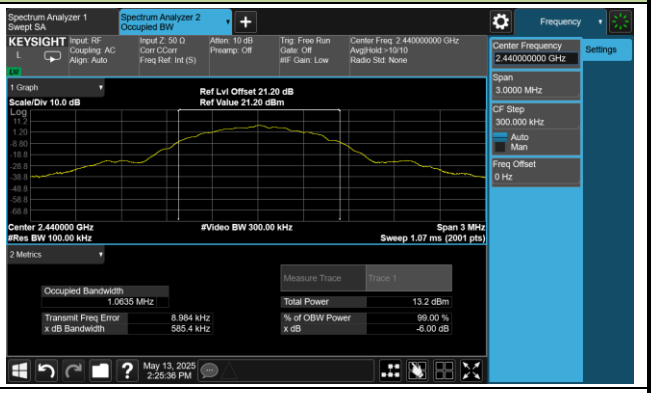
Test Site	SIP-TR1	Test Engineer	Ryan Wang
Test Date	2025-05-13		

Test Mode	Data Rate	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)
BLE	1Mbps	00	2402	0.5845	≥ 0.5
BLE	1Mbps	19	2440	0.5854	≥ 0.5
BLE	1Mbps	39	2480	0.5824	≥ 0.5

BLE-1Mbps 6dB Bandwidth

Channel 00 (2402MHz)

Channel 19 (2440MHz)



Channel 39 (2480MHz)

A.3 Output Power Test Result

Test Site	SIP-TR1	Test Engineer	Ryan Wang
Test Date	2025-05-13		

Test Result of Peak Output Power

Test Mode	Data Rate	Channel No.	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Result
BLE	1Mbps	00	2402	5.16	≤ 30.00	Pass
BLE	1Mbps	19	2440	7.23	≤ 30.00	Pass
BLE	1Mbps	39	2480	3.71	≤ 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	4.47	≤ 30.00	Pass
BLE	1Mbps	19	2440	6.74	≤ 30.00	Pass
BLE	1Mbps	39	2480	2.78	≤ 30.00	Pass

A.4 Power Spectral Density Test Result

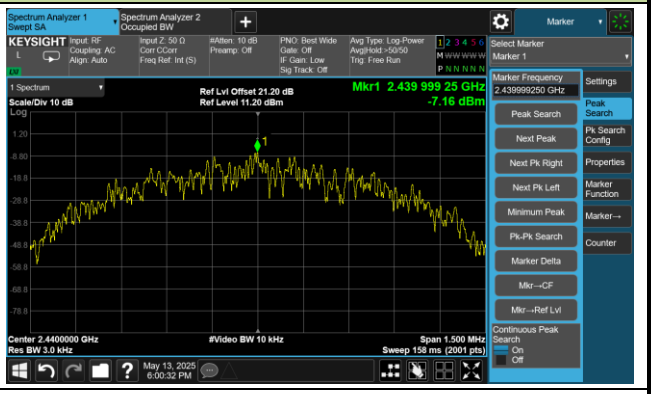
Test Site	SIP-TR1	Test Engineer	Ryan Wang
Test Date	2025-05-13		

Test Mode	Data Rate	Channel No.	Frequency (MHz)	PSD Result (dBm / 3kHz)	Limit (dBm / 3kHz)	Result
BLE	1Mbps	00	2402	-9.69	≤ 8.00	Pass
BLE	1Mbps	19	2440	-7.16	≤ 8.00	Pass
BLE	1Mbps	39	2480	-11.13	≤ 8.00	Pass

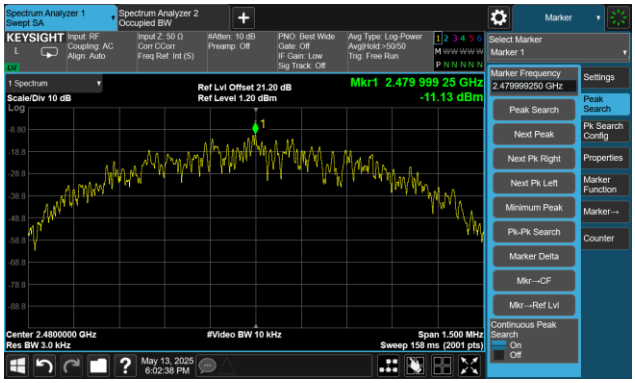
BLE-1Mbps PSD

Channel 00 (2402MHz)

Channel 19 (2440MHz)



Channel 39 (2480MHz)



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

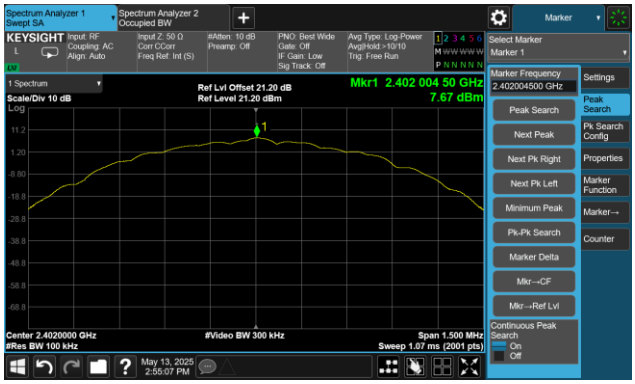
Test Site	SIP-TR1	Test Engineer	Ryan Wang
Test Date	2025-05-13		

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

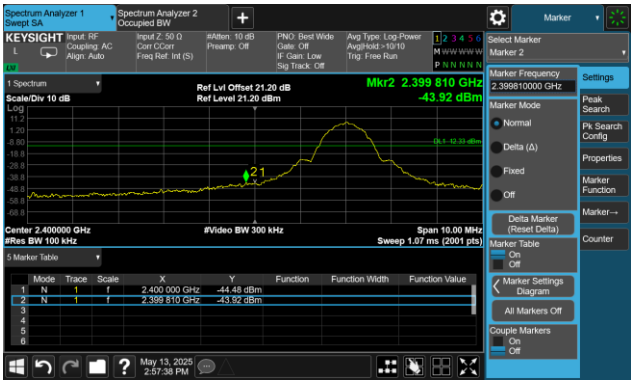
BLE-1Mbps Out-of-Band Emissions

Channel 00 (2402MHz)

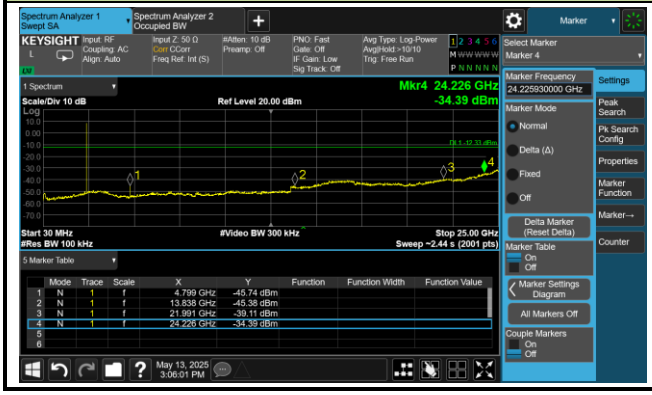
100kHz PSD Reference Level

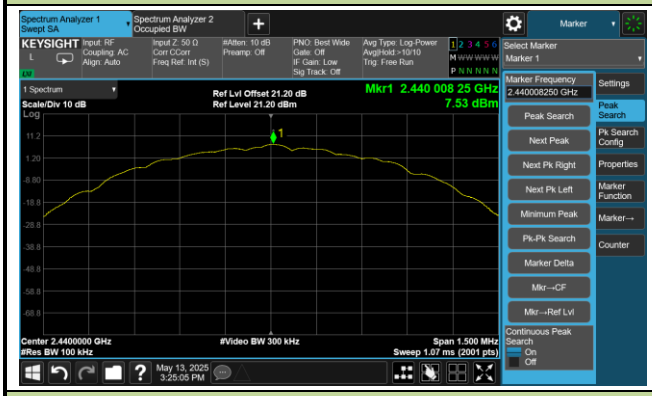
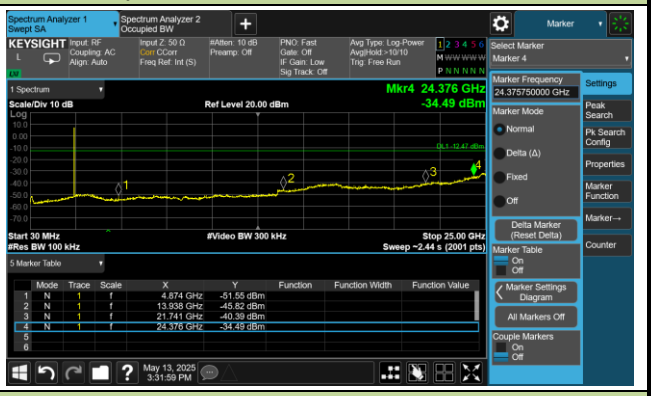
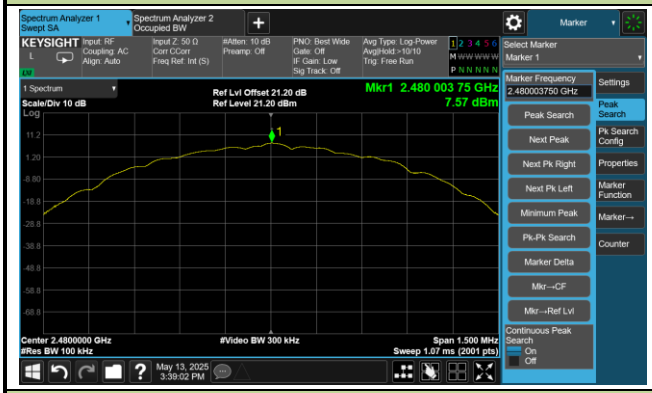
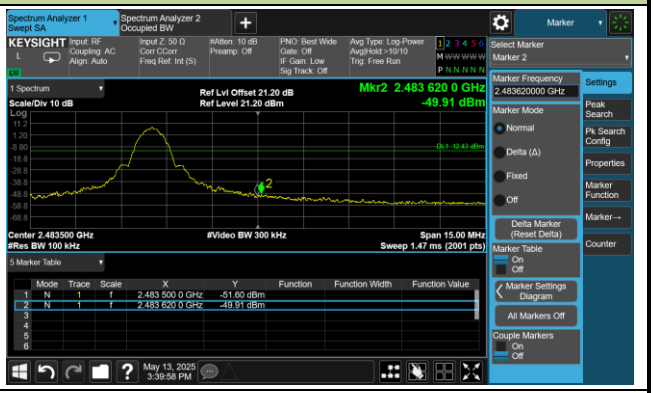


Low Band Edge



Spurious Emission 30MHz ~ 25GHz



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	

A.6 Radiated Spurious Emission Test Result

Test Site	SIP-AC3	Test Engineer	Justin Guo
Test Date	2025-05-12	Test Mode	BLE-1Mbps
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

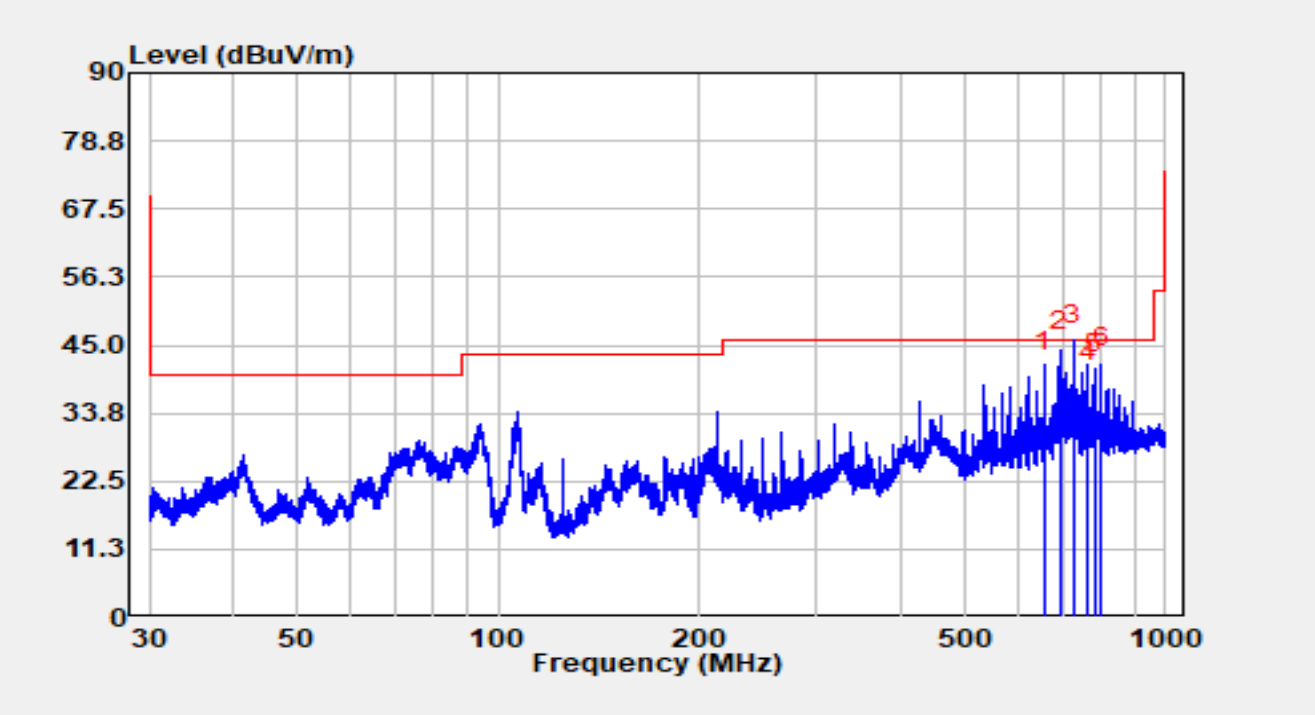
Test Channel	Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
00	4804.60	57.05	-3.81	53.24	74.00	-20.76	Peak	Horizontal
	4804.60	52.63	-3.81	48.82	54.00	-5.18	Average	Horizontal
	8065.20	47.28	-1.73	45.55	74.00	-28.45	Peak	Horizontal
	12371.30	46.07	0.91	46.98	74.00	-27.02	Peak	Horizontal
	4804.60	58.97	-3.81	55.16	74.00	-18.84	Peak	Vertical
	4804.60	55.47	-3.81	51.66	54.00	-2.34	Average	Vertical
	8085.60	47.27	-1.80	45.47	74.00	-28.53	Peak	Vertical
	11686.20	46.47	0.23	46.70	74.00	-27.30	Peak	Vertical
19	4881.10	61.03	-3.66	57.37	74.00	-16.63	Peak	Horizontal
	4881.10	57.51	-3.66	53.85	54.00	-0.15	Average	Horizontal
	7318.90	53.55	-3.18	50.37	74.00	-23.63	Peak	Horizontal
	12359.40	45.93	0.86	46.79	74.00	-27.21	Peak	Horizontal
	4879.40	61.33	-3.66	57.67	74.00	-16.33	Peak	Vertical
	4879.40	56.84	-3.66	53.18	54.00	-0.82	Average	Vertical
	7318.90	52.88	-3.18	49.70	74.00	-24.30	Peak	Vertical
	11699.80	46.42	0.28	46.70	74.00	-27.30	Peak	Vertical
39	4961.00	50.45	-3.90	46.55	74.00	-27.45	Peak	Horizontal
	7606.20	47.56	-2.39	45.17	74.00	-28.83	Peak	Horizontal
	12231.90	45.82	0.60	46.42	74.00	-27.58	Peak	Horizontal
	4904.90	48.52	-3.68	44.84	74.00	-29.16	Peak	Vertical
	8298.10	46.84	-1.55	45.29	74.00	-28.71	Peak	Vertical
	12167.30	46.31	0.19	46.50	74.00	-27.50	Peak	Vertical

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

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

The Result of Radiated Emission below 1GHz:

Site	SIP-AC1	Test Date	2025-05-12
Temperature	21.7 °C	Humidity	51.3 %
Limit	FCC_Part 15.209_RSE(3m)	Test Engineer	Justin Guo
Factor	VULB 9168_00998	Polarity	Horizontal
EUT	Giga Hub 2.0	Test Voltage	AC 120V/60Hz
Test Mode	Transmit by BLE_1M at 2440MHz		

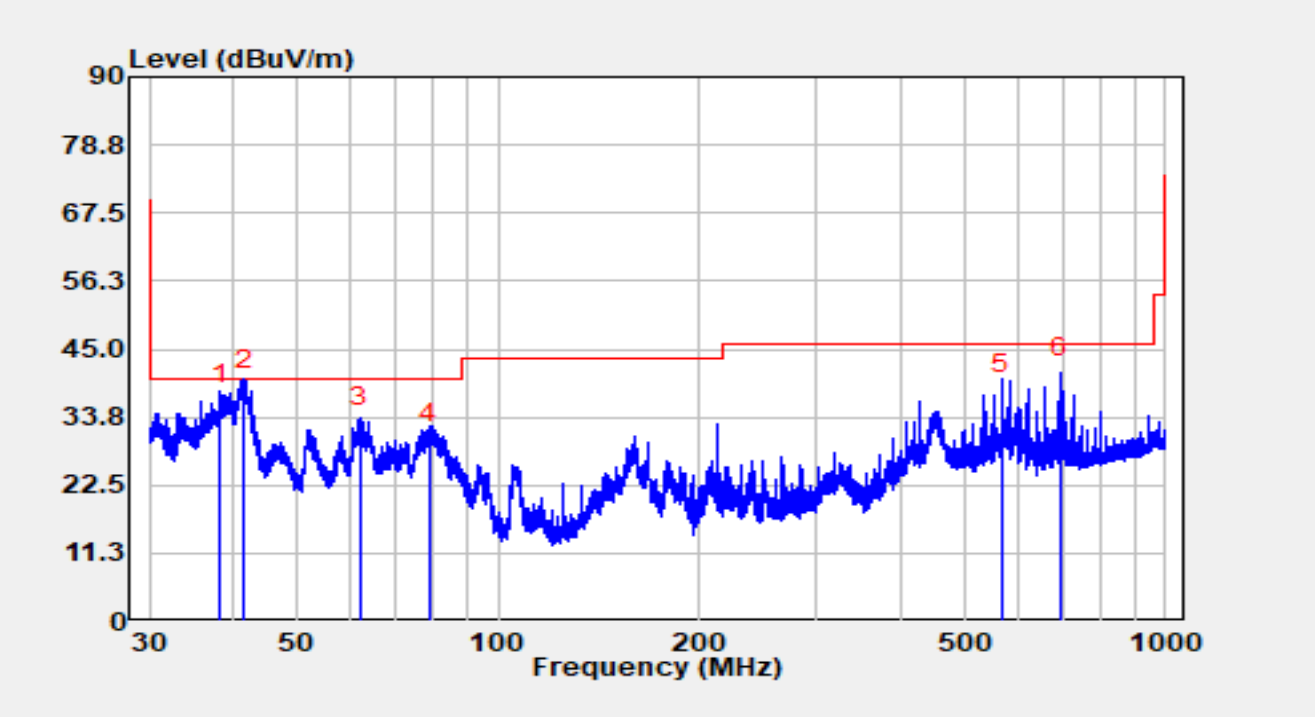


No	Mark	Frequency (MHz)	Reading (dBμV)	C.F (dB/m)	Measurement (dBμV/m)	Margin (dB)	Limit (dBμV/m)	Detector
1		657.682	14.63	26.09	40.72	-5.28	46.00	QP
2		693.687	16.79	27.15	43.94	-2.06	46.00	QP
3	*	728.847	17.50	27.40	44.90	-1.10	46.00	QP
4		764.179	11.20	27.79	38.99	-7.01	46.00	QP
5		782.620	12.10	28.20	40.30	-5.70	46.00	QP
6		800.101	13.13	28.17	41.30	-4.70	46.00	QP

Notes:

1. " * ", means this data is the worst emission level.
2. C.F (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB).
3. Measurement (dBμV/m) = Reading (dBμV) + C.F (dB/m).
4. 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	SIP-AC1	Test Date	2025-05-12
Temperature	21.7 °C	Humidity	51.3 %
Limit	FCC_Part 15.209_RSE(3m)	Test Engineer	Justin Guo
Factor	VULB 9168_00998	Polarity	Vertical
EUT	Giga Hub 2.0	Test Voltage	AC 120V/60Hz
Test Mode	Transmit by BLE_1M at 2440MHz		



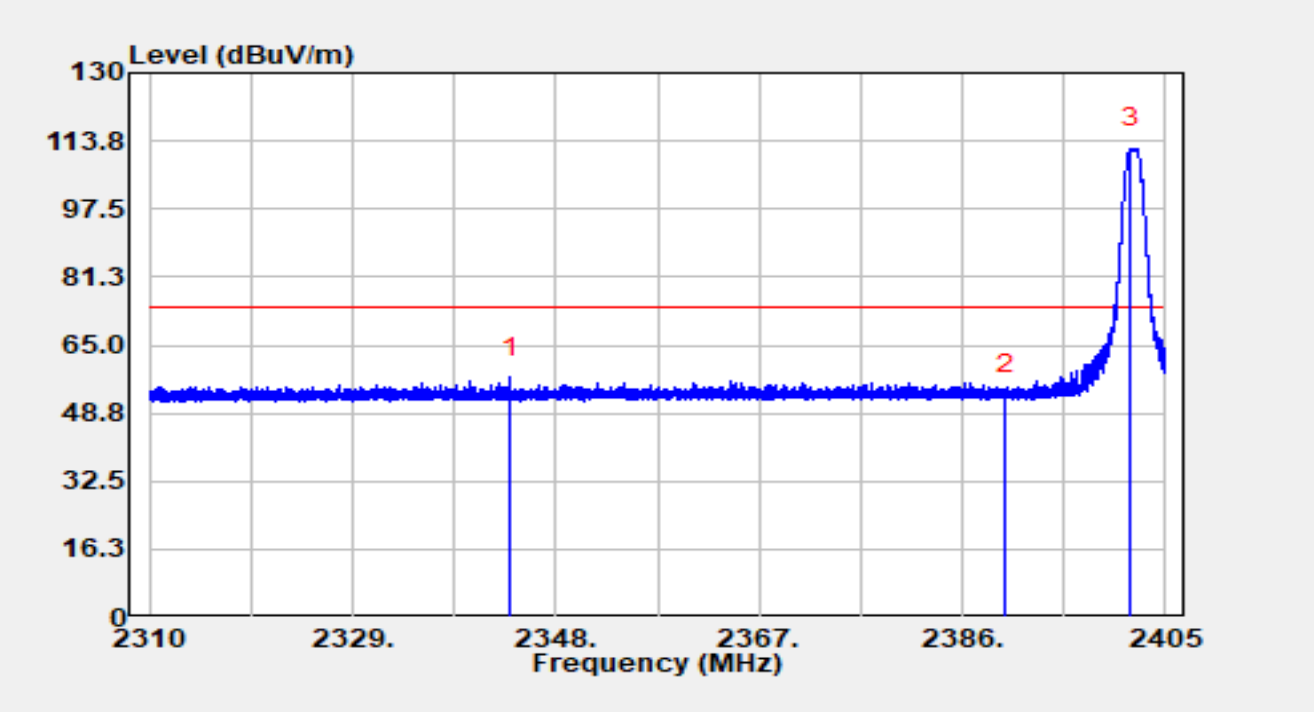
No	Mark	Frequency (MHz)	Reading (dBμV)	C.F (dB/m)	Measurement (dBμV/m)	Margin (dB)	Limit (dBμV/m)	Detector
1		38.252	18.23	17.49	35.72	-4.28	40.00	QP
2	*	41.611	20.43	17.71	38.14	-1.86	40.00	QP
3		61.930	14.35	17.63	31.98	-8.02	40.00	QP
4		78.882	15.20	14.11	29.31	-10.69	40.00	QP
5		568.812	13.46	24.22	37.68	-8.32	46.00	QP
6		693.687	13.02	27.15	40.17	-5.83	46.00	QP

Notes:

1. " * ", means this data is the worst emission level.
2. C.F (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB).
3. Measurement (dBμV/m) = Reading (dBμV) + C.F (dB/m).
4.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.

A.7 Radiated Restricted Band Edge Test Result

Site	SIP-AC3	Test Date	2025-05-12
Temperature	22.5 °C	Humidity	47.1 %
Limit	FCC_Part 15_Band Edge(3m)	Test Engineer	Justin Guo
Factor	HF907_102861	Polarity	Horizontal
EUT	Giga Hub 2.0	Test Voltage	AC 120V/60Hz
Test Mode	Transmit by BLE_1M at 2402MHz		

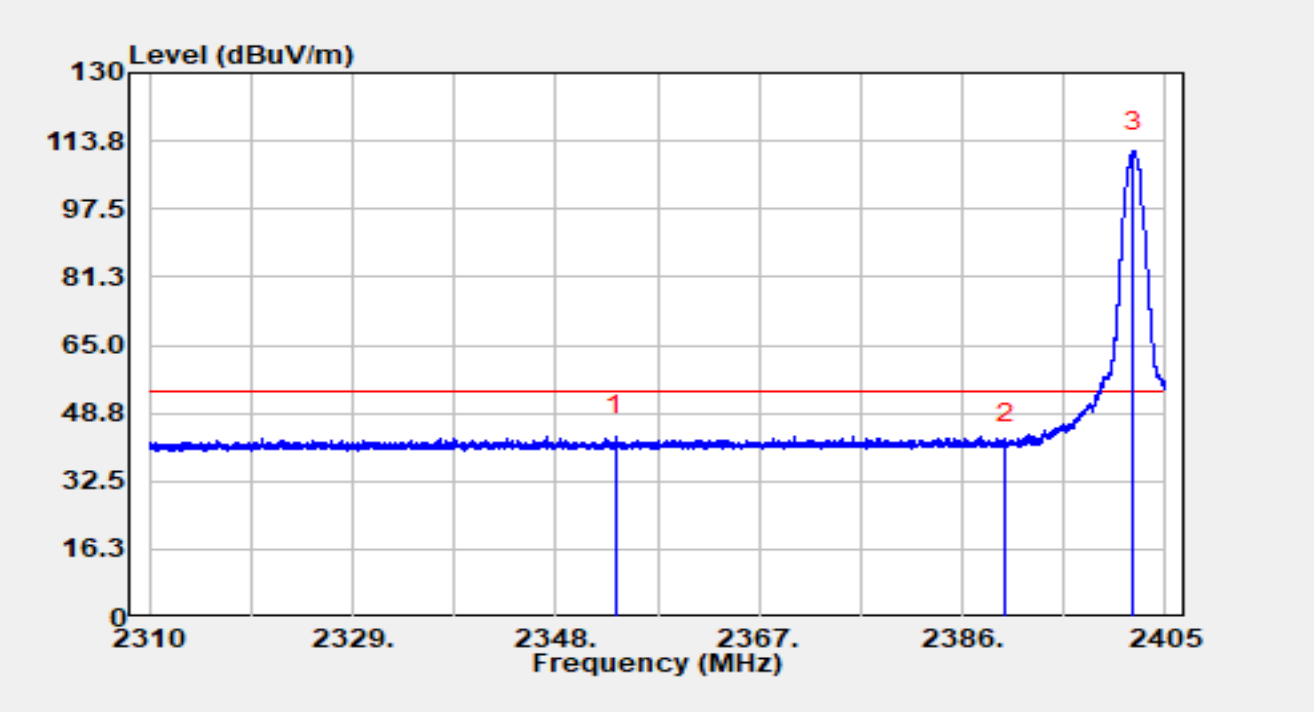


No	Mark	Frequency (MHz)	Reading (dBµV)	C.F (dB/m)	Measurement (dBµV/m)	Margin (dB)	Limit (dBµV/m)	Detector
1	*	2343.792	24.78	32.55	57.33	-16.67	74.00	Peak
2		2390.000	20.50	32.69	53.19	-20.81	74.00	Peak
3		2401.751	79.22	32.74	111.95	N/A	N/A	Peak

Notes:

1. " * ", means this data is the worst emission level.
2. C.F (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB).
3. Measurement (dBµV/m) = Reading (dBµV) + C.F (dB/m).

Site	SIP-AC3	Test Date	2025-05-12
Temperature	22.5 °C	Humidity	47.1 %
Limit	FCC_Part 15_Band Edge(3m)	Test Engineer	Justin Guo
Factor	HF907_102861	Polarity	Horizontal
EUT	Giga Hub 2.0	Test Voltage	AC 120V/60Hz
Test Mode	Transmit by BLE_1M at 2402MHz		

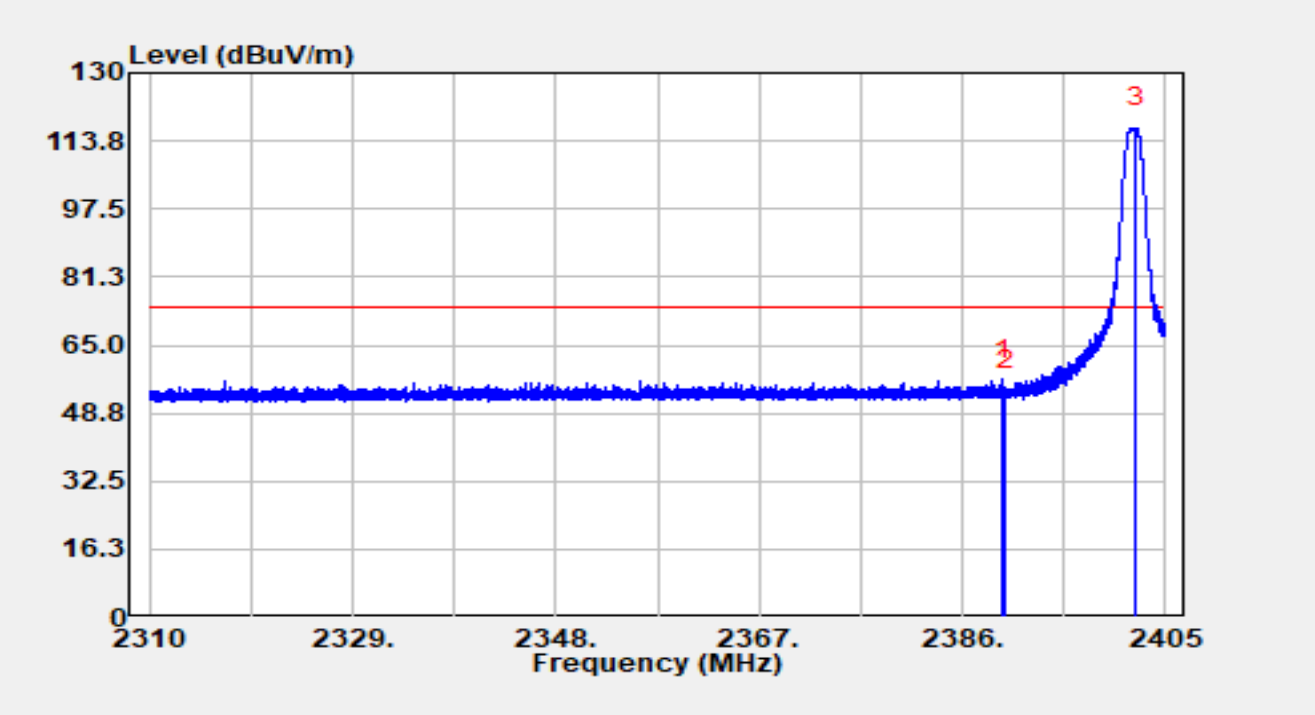


No	Mark	Frequency (MHz)	Reading (dBμV)	C.F (dB/m)	Measurement (dBμV/m)	Margin (dB)	Limit (dBμV/m)	Detector
1	*	2353.558	10.68	32.59	43.27	-10.73	54.00	Average
2		2390.000	8.70	32.69	41.39	-12.61	54.00	Average
3		2402.045	78.48	32.74	111.21	N/A	N/A	Average

Notes:

1. " * ", means this data is the worst emission level.
2. C.F (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB).
3. Measurement (dBμV/m) = Reading (dBμV) + C.F (dB/m).

Site	SIP-AC3	Test Date	2025-05-12
Temperature	22.5 °C	Humidity	47.1 %
Limit	FCC_Part 15_Band Edge(3m)	Test Engineer	Justin Guo
Factor	HF907_102861	Polarity	Vertical
EUT	Giga Hub 2.0	Test Voltage	AC 120V/60Hz
Test Mode	Transmit by BLE_1M at 2402MHz		

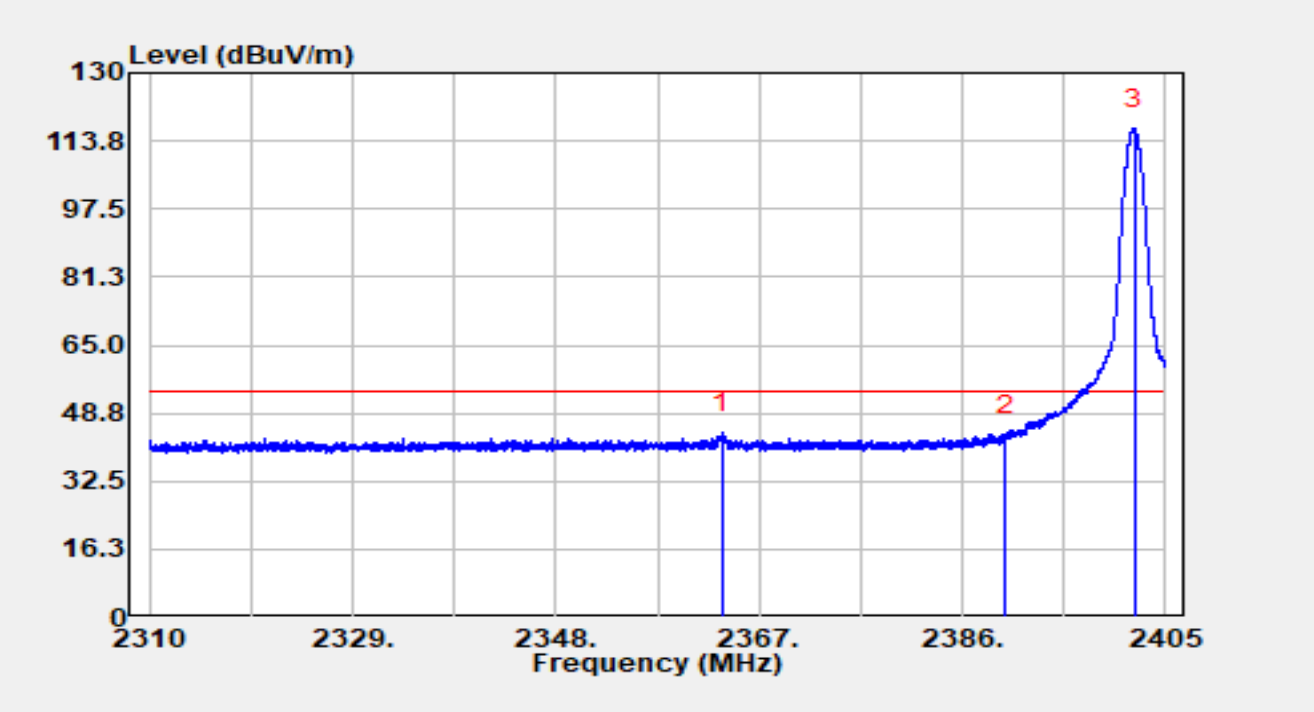


No	Mark	Frequency (MHz)	Reading (dBµV)	C.F (dB/m)	Measurement (dBµV/m)	Margin (dB)	Limit (dBµV/m)	Detector
1	*	2389.733	24.13	32.69	56.82	-17.18	74.00	Peak
2		2390.000	21.31	32.69	54.00	-20.00	74.00	Peak
3		2402.245	84.22	32.74	116.95	N/A	N/A	Peak

Notes:

1. " * ", means this data is the worst emission level.
2. C.F (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB).
3. Measurement (dBµV/m) = Reading (dBµV) + C.F (dB/m).

Site	SIP-AC3	Test Date	2025-05-12
Temperature	22.5 °C	Humidity	47.1 %
Limit	FCC_Part 15_Band Edge(3m)	Test Engineer	Justin Guo
Factor	HF907_102861	Polarity	Vertical
EUT	Giga Hub 2.0	Test Voltage	AC 120V/60Hz
Test Mode	Transmit by BLE_1M at 2402MHz		

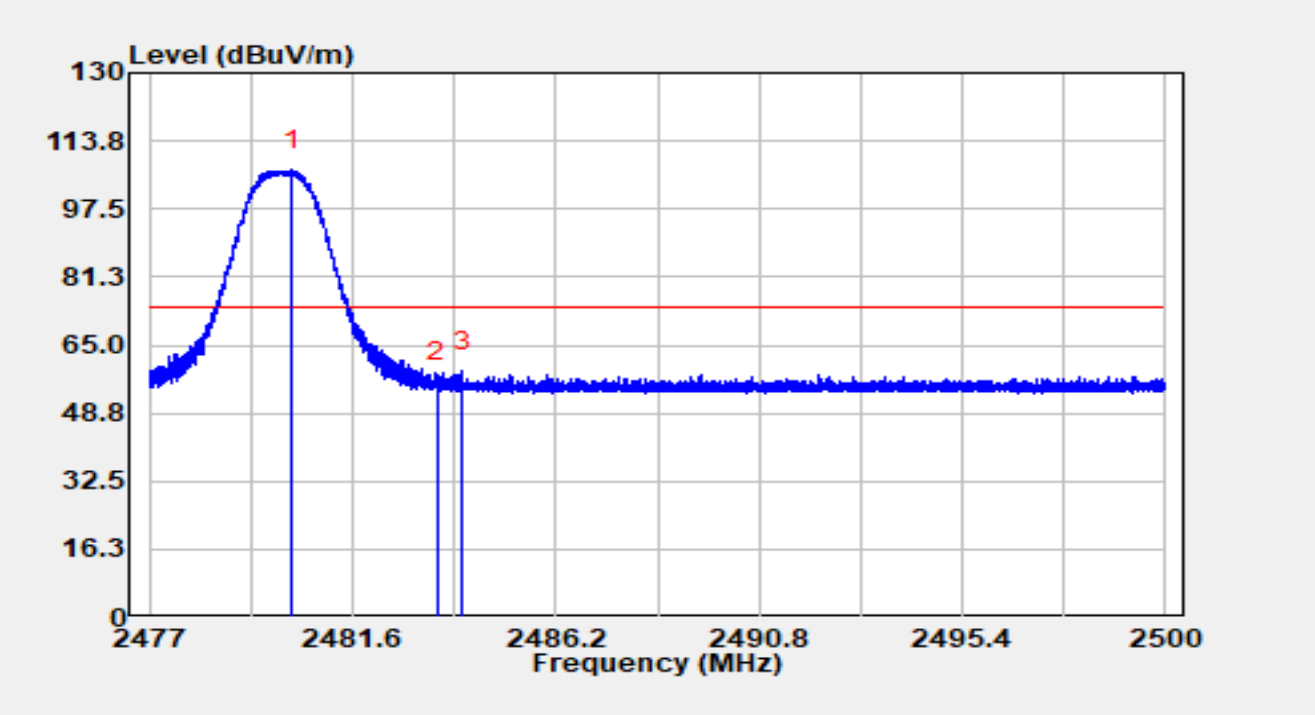


No	Mark	Frequency (MHz)	Reading (dBµV)	C.F (dB/m)	Measurement (dBµV/m)	Margin (dB)	Limit (dBµV/m)	Detector
1	*	2363.542	11.34	32.62	43.96	-10.04	54.00	Average
2		2390.000	10.78	32.69	43.47	-10.53	54.00	Average
3		2402.083	83.95	32.74	116.68	N/A	N/A	Average

Notes:

1. " * ", means this data is the worst emission level.
2. C.F (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB).
3. Measurement (dBµV/m) = Reading (dBµV) + C.F (dB/m).

Site	SIP-AC3	Test Date	2025-05-12
Temperature	22.5 °C	Humidity	47.1 %
Limit	FCC_Part 15_Band Edge(3m)	Test Engineer	Justin Guo
Factor	HF907_102861	Polarity	Horizontal
EUT	Giga Hub 2.0	Test Voltage	AC 120V/60Hz
Test Mode	Transmit by BLE_1M at 2480MHz		

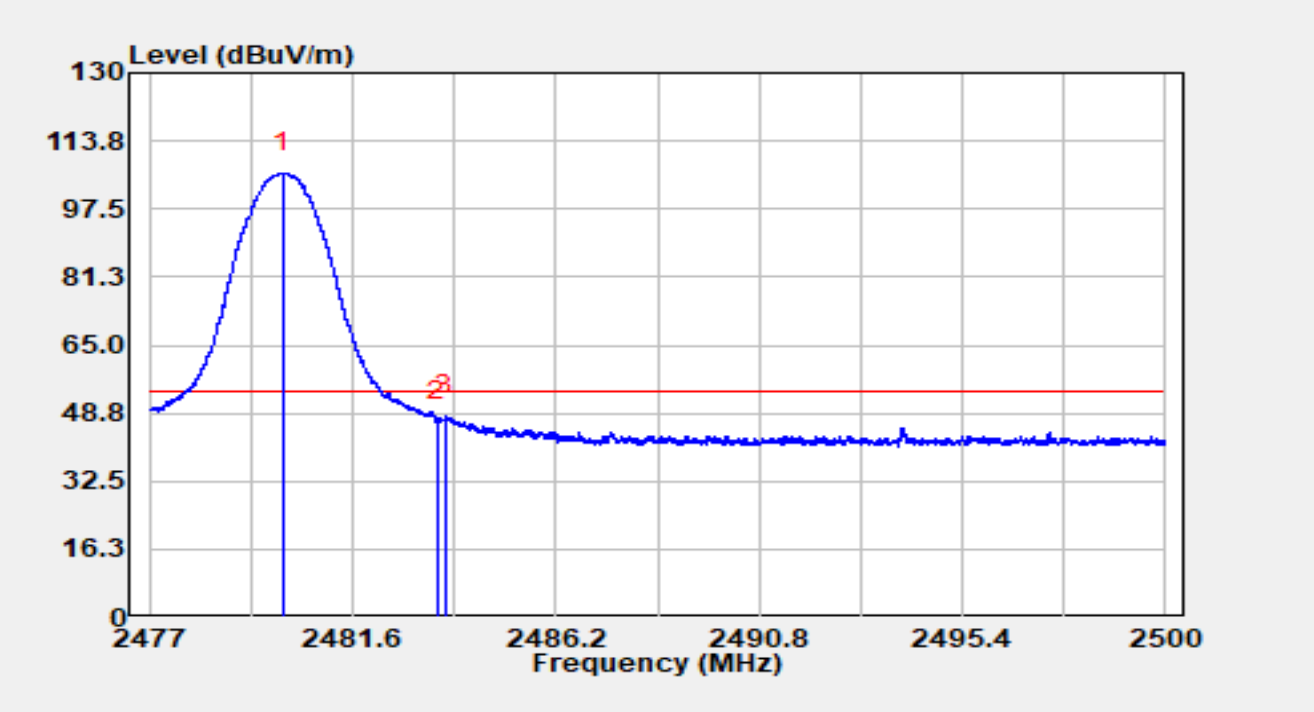


No	Mark	Frequency (MHz)	Reading (dBμV)	C.F (dB/m)	Measurement (dBμV/m)	Margin (dB)	Limit (dBμV/m)	Detector
1		2480.220	73.64	33.11	106.76	N/A	N/A	Peak
2		2483.500	22.89	33.13	56.02	-17.98	74.00	Peak
3	*	2484.098	25.68	33.13	58.82	-15.18	74.00	Peak

Notes:

1. " * ", means this data is the worst emission level.
2. C.F (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB).
3. Measurement (dBμV/m) = Reading (dBμV) + C.F (dB/m).

Site	SIP-AC3	Test Date	2025-05-12
Temperature	22.5 °C	Humidity	47.1 %
Limit	FCC_Part 15_Band Edge(3m)	Test Engineer	Justin Guo
Factor	HF907_102861	Polarity	Horizontal
EUT	Giga Hub 2.0	Test Voltage	AC 120V/60Hz
Test Mode	Transmit by BLE_1M at 2480MHz		

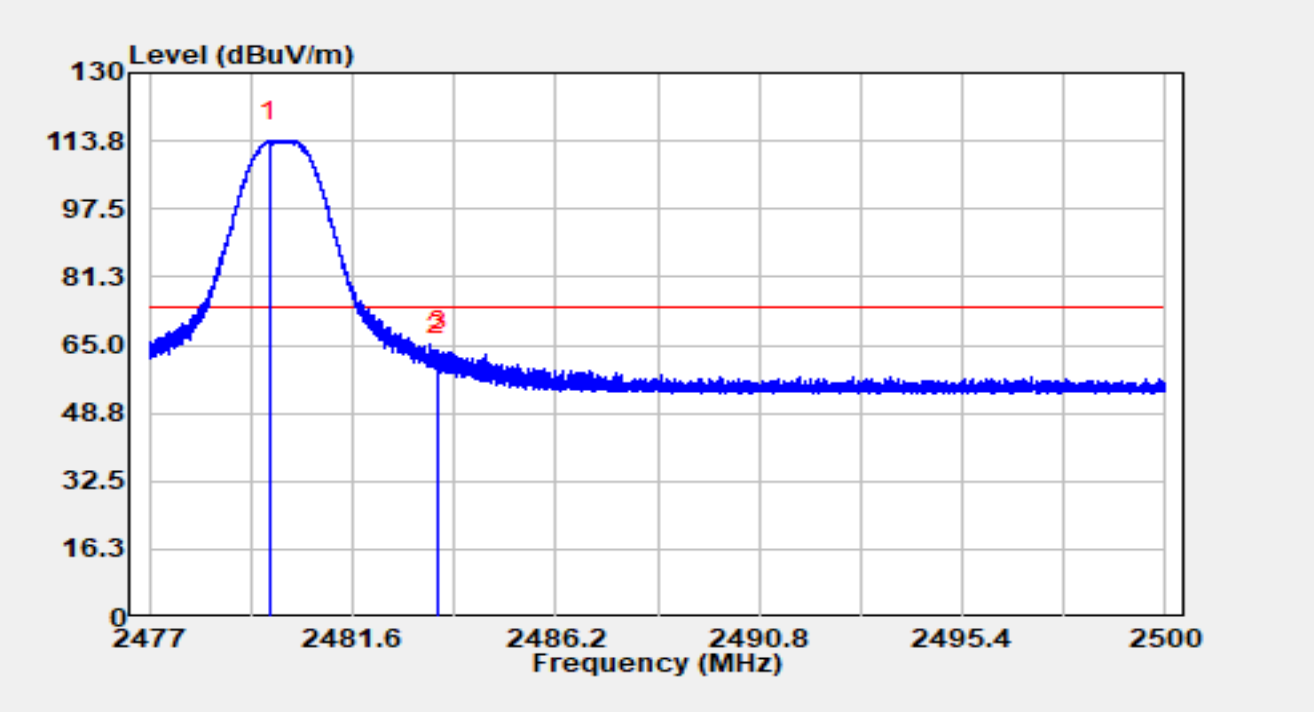


No	Mark	Frequency (MHz)	Reading (dBμV)	C.F (dB/m)	Measurement (dBμV/m)	Margin (dB)	Limit (dBμV/m)	Detector
1		2480.027	72.99	33.11	106.10	N/A	N/A	Average
2		2483.500	13.78	33.13	46.91	-7.09	54.00	Average
3	*	2483.705	15.04	33.13	48.17	-5.83	54.00	Average

Notes:

1. " * ", means this data is the worst emission level.
2. C.F (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB).
3. Measurement (dBμV/m) = Reading (dBμV) + C.F (dB/m).

Site	SIP-AC3	Test Date	2025-05-12
Temperature	22.5 °C	Humidity	47.1 %
Limit	FCC_Part 15_Band Edge(3m)	Test Engineer	Justin Guo
Factor	HF907_102861	Polarity	Vertical
EUT	Giga Hub 2.0	Test Voltage	AC 120V/60Hz
Test Mode	Transmit by BLE_1M at 2480MHz		

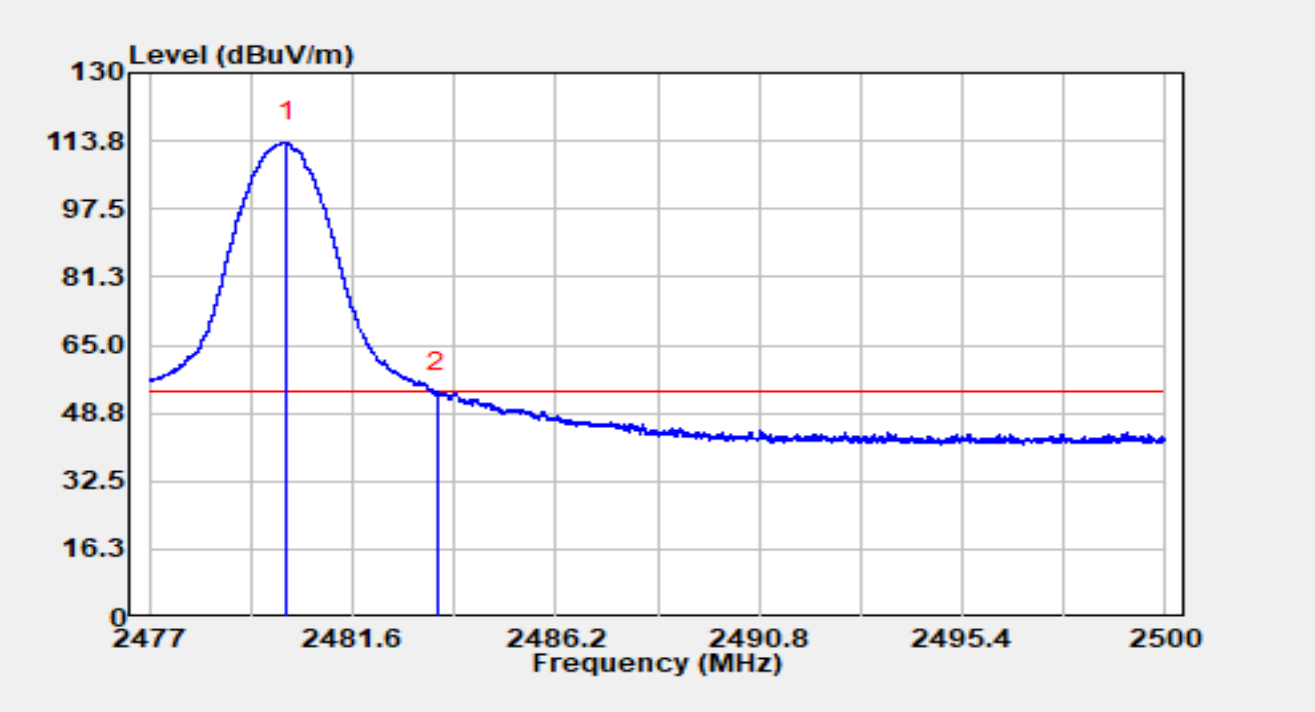


No	Mark	Frequency (MHz)	Reading (dBμV)	C.F (dB/m)	Measurement (dBμV/m)	Margin (dB)	Limit (dBμV/m)	Detector
1		2479.728	80.69	33.11	113.80	N/A	N/A	Peak
2		2483.500	29.19	33.13	62.32	-11.68	74.00	Peak
3	*	2483.539	30.54	33.13	63.67	-10.33	74.00	Peak

Notes:

1. " * ", means this data is the worst emission level.
2. C.F (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB).
3. Measurement (dBμV/m) = Reading (dBμV) + C.F (dB/m).

Site	SIP-AC3	Test Date	2025-05-12
Temperature	22.5 °C	Humidity	47.1 %
Limit	FCC_Part 15_Band Edge(3m)	Test Engineer	Justin Guo
Factor	HF907_102861	Polarity	Vertical
EUT	Giga Hub 2.0	Test Voltage	AC 120V/60Hz
Test Mode	Transmit by BLE_1M at 2480MHz		



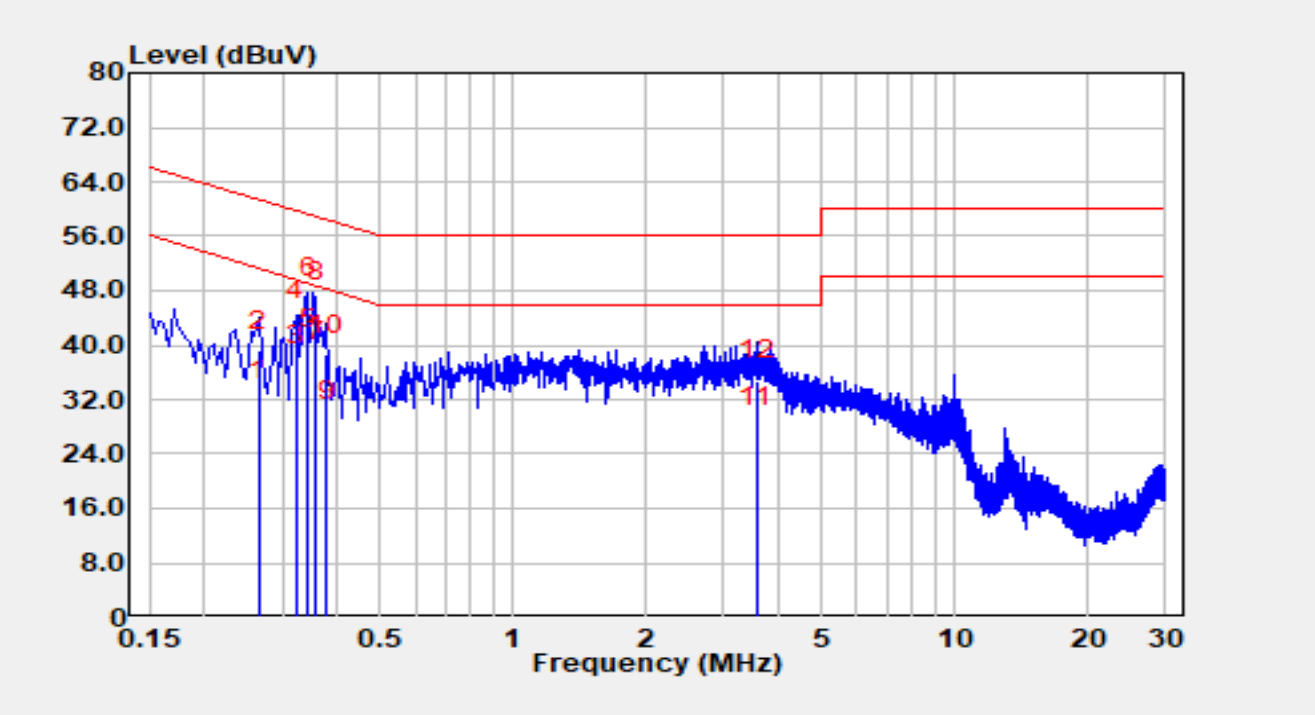
No	Mark	Frequency (MHz)	Reading (dBμV)	C.F (dB/m)	Measurement (dBμV/m)	Margin (dB)	Limit (dBμV/m)	Detector
1		2480.100	80.29	33.11	113.40	N/A	N/A	Average
2	*	2483.500	20.73	33.13	53.86	-0.14	54.00	Average

Notes:

1. " * ", means this data is the worst emission level.
2. C.F (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB).
3. Measurement (dBμV/m) = Reading (dBμV) + C.F (dB/m).

A.8 AC Conducted Emissions Test Result

Site	SIP-SR2	Test Date	2025-04-18
Temperature	24.9 °C	Humidity	51.1 %
Limit	FCC Part 15.207_CE_Mains	Test Engineer	Henry Wang
Factor	ENV216_101684_C	Polarity	Line
EUT	Giga Hub 2.0	Test Voltage	AC 120V/60Hz
Test Mode	Transmit by BLE_1M at 2440MHz		

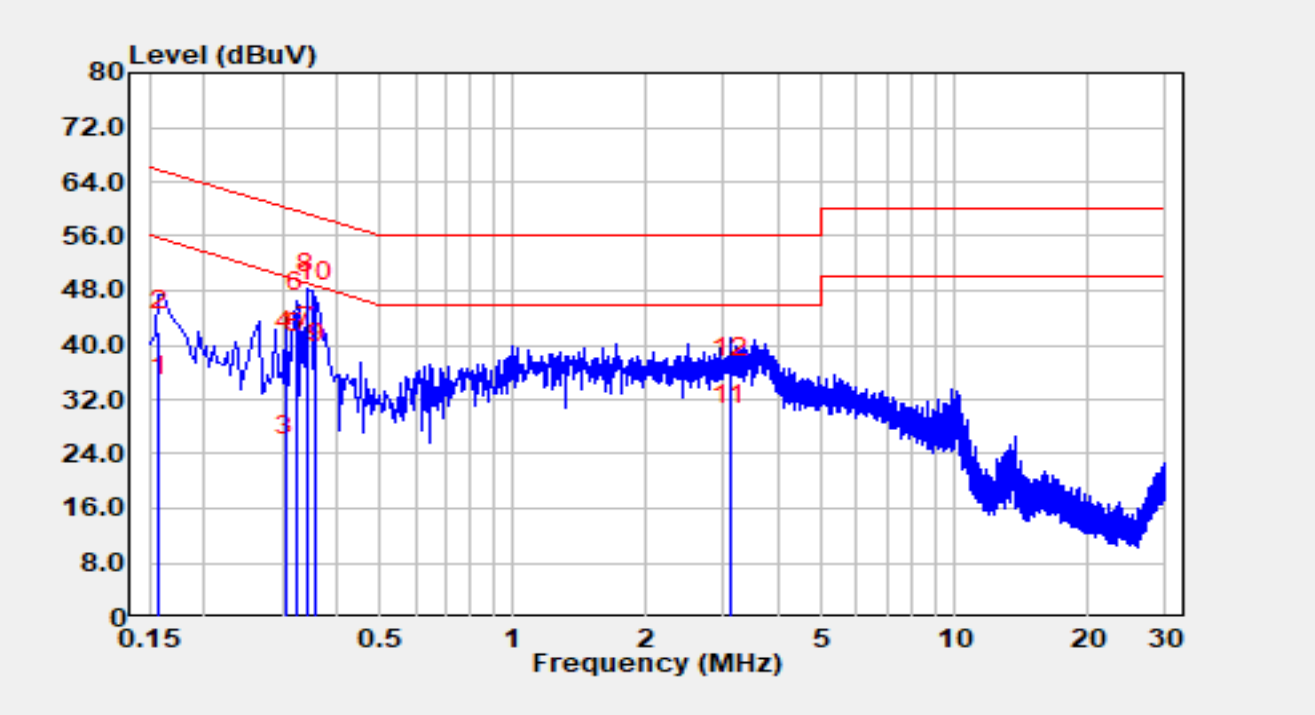


No	Mark	Frequency (MHz)	Reading (dBµV)	C.F (dB)	Measurement (dBµV)	Margin (dB)	Limit (dBµV)	Detector
1		0.266	22.21	9.72	31.93	-19.31	51.24	Average
2		0.266	29.45	9.72	39.17	-22.07	61.24	QP
3		0.322	27.13	9.74	36.87	-12.78	49.65	Average
4		0.322	34.02	9.74	43.76	-15.89	59.65	QP
5	*	0.342	29.68	9.74	39.41	-9.74	49.15	Average
6		0.342	37.13	9.74	46.86	-12.29	59.15	QP
7		0.358	27.75	9.73	37.48	-11.30	48.78	Average
8		0.358	36.50	9.73	46.23	-12.54	58.78	QP
9		0.378	18.95	9.74	28.69	-19.63	48.32	Average
10		0.378	28.79	9.74	38.53	-19.79	58.32	QP
11		3.562	18.13	9.85	27.98	-18.02	46.00	Average
12		3.562	24.91	9.85	34.76	-21.24	56.00	QP

Notes:

1. " * ", means this data is the worst emission level.
2. C.F (dB) = LISN Factor (dB) + Cable Loss (dB).
3. Measurement (dBμV) = Reading (dBμV) + C.F (dB).

Site	SIP-SR2	Test Date	2025-04-18
Temperature	24.9 °C	Humidity	51.1 %
Limit	FCC Part 15.207_CE_Mains	Test Engineer	Henry Wang
Factor	ENV216_101684_C	Polarity	Neutral
EUT	Giga Hub 2.0	Test Voltage	AC 120V/60Hz
Test Mode	Transmit by BLE_1M at 2440MHz		



No	Mark	Frequency (MHz)	Reading (dBµV)	C.F (dB)	Measurement (dBµV)	Margin (dB)	Limit (dBµV)	Detector
1		0.158	22.85	9.68	32.53	-23.03	55.57	Average
2		0.158	32.39	9.68	42.07	-23.50	65.57	QP
3		0.306	13.85	9.75	23.61	-26.47	50.08	Average
4		0.306	29.44	9.75	39.19	-20.89	60.08	QP
5		0.322	29.09	9.76	38.85	-10.81	49.66	Average
6		0.322	35.08	9.76	44.83	-14.82	59.66	QP
7	*	0.342	29.93	9.76	39.68	-9.47	49.16	Average
8		0.342	37.69	9.76	47.45	-11.71	59.16	QP
9		0.358	27.40	9.75	37.15	-11.62	48.77	Average
10		0.358	36.51	9.75	46.26	-12.52	58.77	QP
11		3.090	18.34	9.82	28.16	-17.84	46.00	Average
12		3.090	25.29	9.82	35.10	-20.90	56.00	QP

Notes:

1. " * ", means this data is the worst emission level.
2. C.F (dB) = LISN Factor (dB) + Cable Loss (dB).
3. Measurement (dBμV) = Reading (dBμV) + C.F (dB).

Appendix B - Test Setup Photograph

Refer to “R25S1048034-UT” file.

Appendix C - EUT Photograph

Refer to “R25S1048034-UE” file.

The End