

# Top Victory Electronics(Taiwan) Co. Ltd.

# TEST REPORT

**Model:**  
HUB1001\*\*\*\*

**REPORT NUMBER**  
221100105THC-001

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# Radio Spectrum TEST REPORT

<b>Applicant:</b>	<b>Top Victory Electronics(Taiwan) Co. Ltd. 9F.,No. 230, Liancheng Rd., Zhonghe Dist., New Taipei City 23553, Taiwan</b>
<b>Product:</b>	<b>Home Monitoring Platform</b>
<b>Model No.:</b>	<b>HUB1001****</b>
<b>Brand Name:</b>	<b>NOMO</b>
<b>FCC ID:</b>	<b>ARS-HUB1001</b>
<b>Test Method/ Standard:</b>	<b>47 CFR FCC Part 15.247 &amp; ANSI C63.10 2013 KDB 558074 D01 v05r02</b>
<b>Test By:</b>	<b>Intertek Testing Services Taiwan Ltd., Hsinchu Laboratory No. 11, Lane 275, Ko-Nan 1 Street, Chia-Tung Li, Shiang-Shan District, Hsinchu City, Taiwan</b>



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**TEST REPORT****Revision History**

<b>Report No.</b>	<b>Issue Date</b>	<b>Revision Summary</b>
221100105THC-001	Dec. 29, 2022	Original report

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### Summary of Test Data

Test Requirement	Applicable Rule (Section 15.247)	Result
Minimum 6 dB Bandwidth	15.247(a)(2)	Pass
Maximum Peak Conducted Output Power	15.247(b)(3)	Pass
Power Spectral Density	15.247(e)	Pass
Emissions In Non-Restricted Frequency Bands	15.247(d)	Pass
Emissions In Restricted Frequency Bands (Radiated emission measurements)	15.247(d), 15.205, 15.209	Pass
Emission On The Band Edge	15.247(d), 15.205	Pass
AC Power Line Conducted Emission	15.207	Pass
Antenna Requirement	15.203	Pass

Note: Please note that the test results with statement of conformity, the decision rules which are based on: Safety Testing: the specification, standard or IEC Guide 115.

Other Testing: the specification, standard and not taking into account the measurement uncertainty.

## 1. General Information

### 1.1 Identification of the EUT

<b>Product:</b>	Home Monitoring Platform
<b>Model No.:</b>	HUB1001R-01
<b>Operating Frequency:</b>	2402 MHz ~ 2480 MHz
<b>Channel Number:</b>	40 channels
<b>Frequency of Each Channel:</b>	2402+2 k, k=0 ~ 39
<b>Rated Power:</b>	DC 5V from adapter
<b>Power Cord:</b>	N/A
<b>Sample receiving date:</b>	2022/11/07
<b>Sample condition:</b>	Workable
<b>Test Date(s):</b>	2022/12/06 ~ 2022/12/16

### 1.2 Adapter information

The EUT will be supplied with a power supply from below list:

No.	Model no.	Specification
Adapter	S030ABU0500400	I/P: 100-240V~ 50/60Hz 1.0A O/P: 5.0Vdc 4.0A

### 1.3 Additional information about the EUT

The customer confirmed HUB1001\*\*\*\* is a series model to HUB1001R-01 (EUT).  
The "\*" can be any alphanumeric character including blank, for marketing differences.

For more detail features, please refer to user's Manual.

## 1.4 Antenna description

### Antenna 0(AUDIO)

Antenna Gain : 3.42 dBi  
 Antenna Type : Printed Antenna  
 Connector Type : Fixed

### Antenna 1(VIDEO)

Antenna Gain : 3.42 dBi  
 Antenna Type : Printed Antenna  
 Connector Type : Fixed

## 1.5 Operation mode

TX mode: Connected to Notebook via USB Cable, executing "EspRFTTestTool\_v2.8\_Manual" to select different frequency.

### Chain 0

Mode	Channel	Frequency (MHz)	Signal on time(ms)	Signal on & off time(ms)	Duty cycle	Duty Cycle factor
BLE 1M	19	2440	2.1	2.503	0.839	0.762

## 1.6 Peripherals equipment

Peripherals	Model No.	Serial No.	Data cable
Notebook PC	HP	HP Probook 440 G3	USB shielded cable 1.5m
Fixture	TEXAS INSTRUMENTS	LAUNCHXL-CC1310	Mini USB 0.3m



## 2. Minimum 6 dB Bandwidth

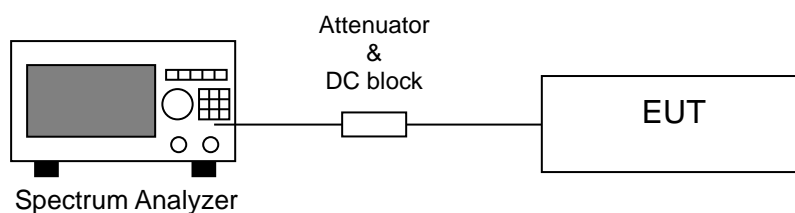
### 2.1 Instrument Setting

Spectrum Parameter	Setting
Detector	Peak
RBW	100kHz
VBW	$\geq 3 \times \text{RBW}$
Sweep	Auto couple
Trace	Allow the trace to stabilize.
Span	Between two times and five times the occupied bandwidth
Attenuation	Auto

### 2.2 Test Procedure

Step 1	The transmitter output was connected to the spectrum analyzer.
Step 2	Test was performed accordance with ANSI C63.10.
Step 3	Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

### 2.3 Test Diagram



### 2.4 Limit

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

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**2.5 Test Results**

Temperature (°C) :	19
Relative Humidity (%) :	59
Test date :	2022/12/14

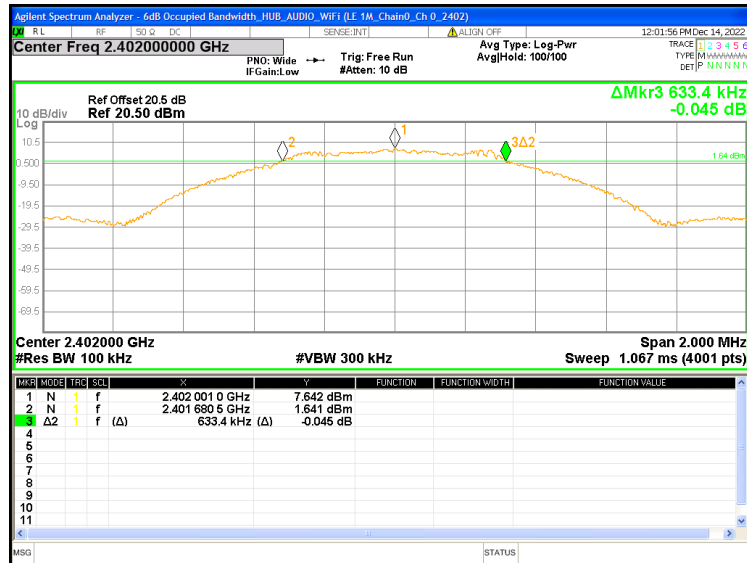
**Chain 0**

Mode	Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Result
BLE 1M	0	2402	0.633	>0.5	Pass
	19	2440	0.629	>0.5	Pass
	39	2480	0.638	>0.5	Pass

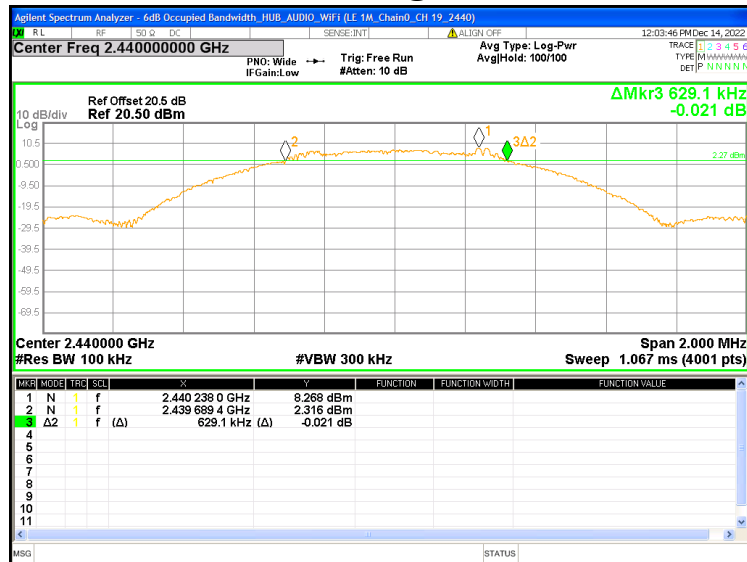
**Chain 1**

Mode	Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Result
BLE 1M	0	2402	0.625	>0.5	Pass
	19	2440	0.643	>0.5	Pass
	39	2480	0.642	>0.5	Pass

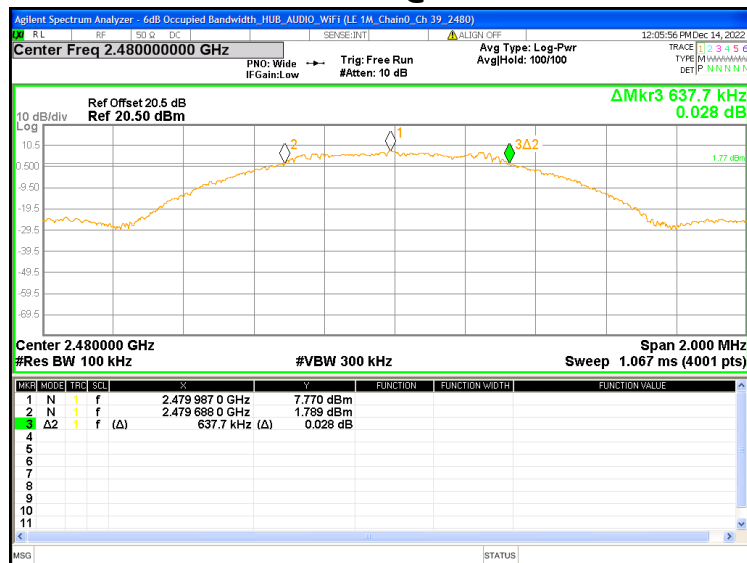
## Chain0 : 6dB Bandwidth @ LE 1M Mode Ch 0



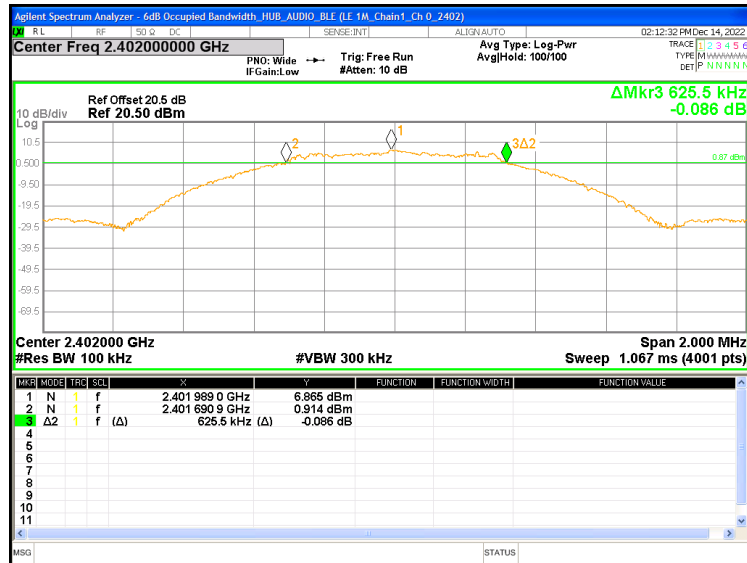
## Chain0 : 6dB Bandwidth @ LE 1M Mode Ch 19



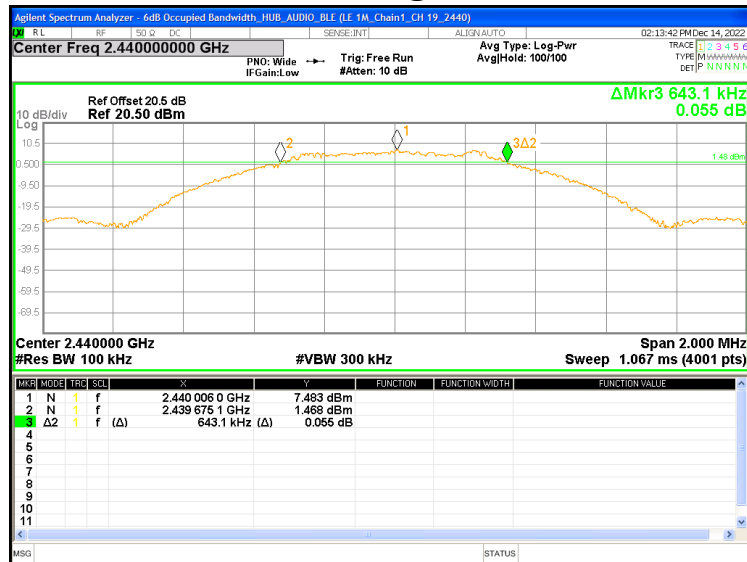
## Chain0 : 6dB Bandwidth @ LE 1M Mode Ch 39



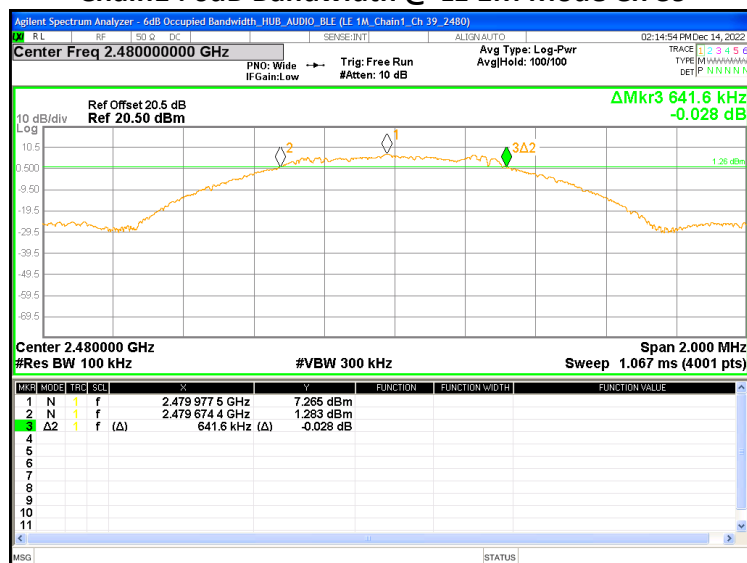
## Chain1 : 6dB Bandwidth @ LE 1M Mode Ch 0



## Chain1 : 6dB Bandwidth @ LE 1M Mode Ch 19



## Chain1 : 6dB Bandwidth @ LE 1M Mode Ch 39



### 3. Maximum Peak Conducted Output Power

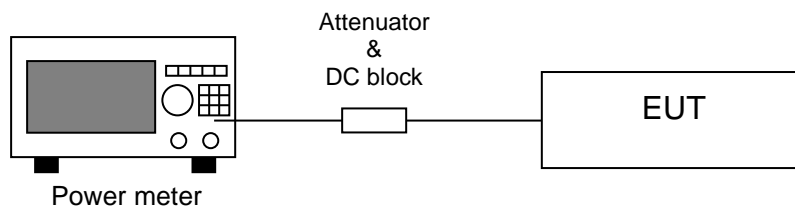
#### 3.1 Instrument Setting

Power Meter Parameter	Setting
Bandwidth	65MHz bandwidth is greater than the EUT emission bandwidth
Detector	Peak & Average

#### 3.2 Test Procedure

The preferred methodology is to use integrated average power measurements, as described in 11.9.2 and 11.13.3 of ANSI C63.10. The peak integrated band power methods of 11.9.1.2 and 11.13.3.2 of ANSI C63.10 are not applicable for FCC compliance testing purposes.

#### 3.3 Test Diagram



#### 3.4 Limit

For systems using digital modulation in the 2400-2483.5 MHz: 1 Watt (30dBm)

### 3.5 Test Results

Temperature (°C) :	19
Relative Humidity (%) :	59
Test date :	2022/12/14

Mode	Channel	Frequency (MHz)	Output Power (dBm)				Output Power (mW)				Total Power (dBm)				Limit (dBm)	Margin (dB)
			Chain 0		Chain 1		Chain 0		Chain 1		AV		PK			
			AV	PK	AV	PK	AV	PK	AV	PK	0+1(mW)	0+1(dBm)	0+1(mW)	0+1(dBm)		
BLE	0	2402	2.70	3.70	8.30	8.60	1.86	2.34	6.76	7.24	8.62	9.36	9.59	9.82	30.00	-20.18
	19	2440	3.50	4.30	8.50	8.90	2.24	2.69	7.08	7.76	9.32	9.69	10.45	10.19	30.00	-19.81
	39	2480	5.50	6.10	8.40	8.70	3.55	4.07	6.92	7.41	10.47	10.20	11.49	10.60	30.00	-19.40

## 4. Power Spectral Density

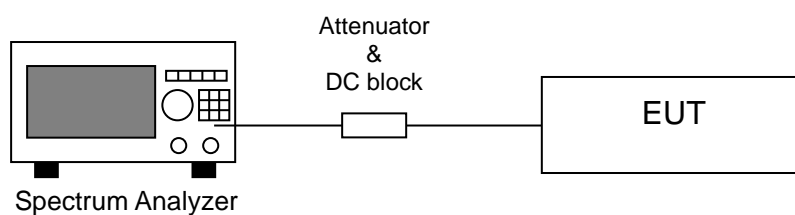
### 4.1 Instrument Setting

Spectrum Function	Setting
Detector	Peak
RBW	$\geq 3$ kHz
VBW	$\geq 3 \times$ RBW
Sweep	Auto couple
Trace	Max hold
Span	1.5 times x 6dB bandwidth
Attenuation	Auto

### 4.2 Test Procedure

Step 1	Test procedure refer to subclause 11.10 of ANSI C63.10.
Step 2	Using the maximum conducted output power in the fundamental emission demonstrates compliance. The EUT must be configured to transmit continuously at full power over the measurement duration.
Step 3	Use the peak marker function to determine the maximum amplitude level within the RBW.

### 4.3 Test Diagram



### 4.4 Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission

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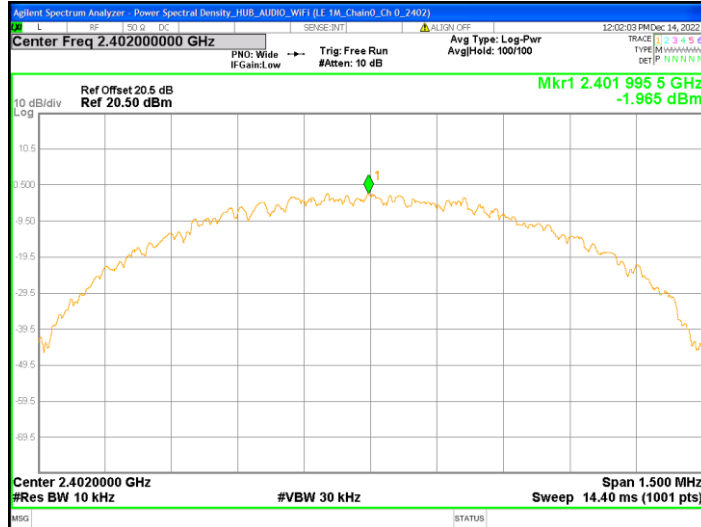
**4.5 Test Results**

Temperature (°C) :	19
Relative Humidity (%) :	59
Test date :	2022/12/14

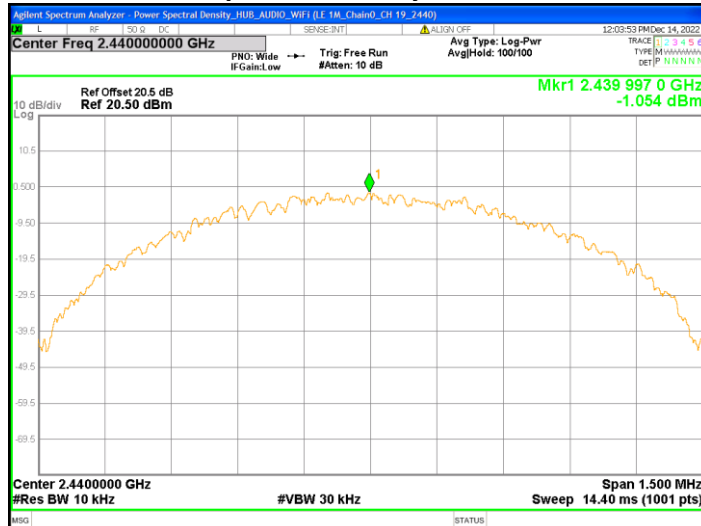
Mode	Channel	Frequency (MHz)	PSD (dBm)		Total PSD		Limit (dBm)	Margin (dB)
			chain0	chain1	mW	dBm		
BLE	0	2402	-1.965	-2.483	1.20	0.79	8	-7.206
	19	2440	-1.054	-2.026	1.41	1.50	8	-6.503
	39	2480	-1.540	-2.270	1.29	1.12	8	-6.879



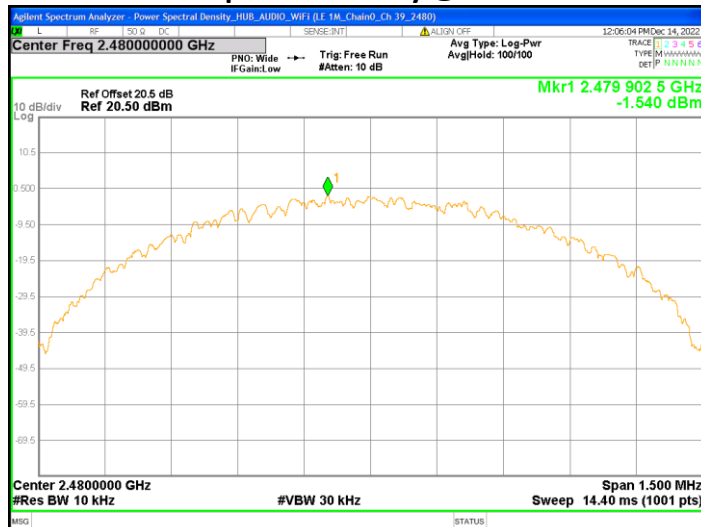
### Chain0 : Power Spectral Density @ LE 1M Mode Ch 0



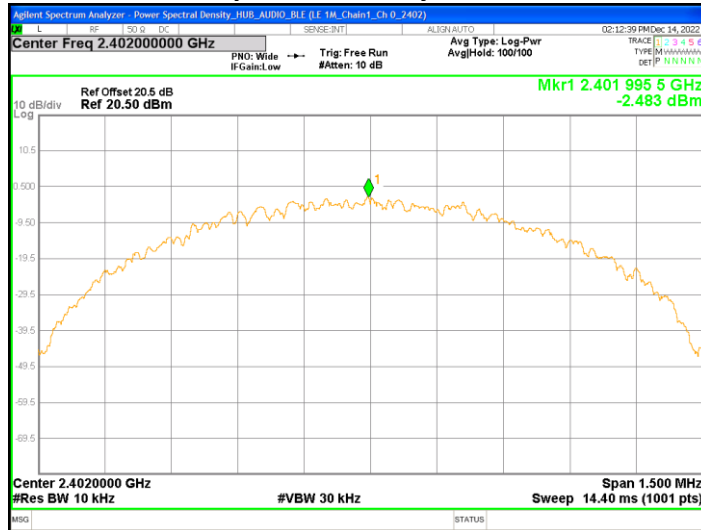
### Chain0 : Power Spectral Density @ LE 1M Mode Ch 19



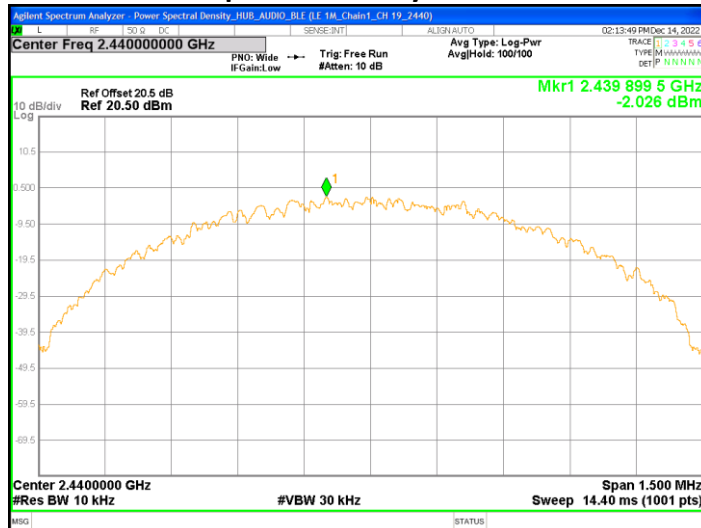
### Chain0 : Power Spectral Density @ LE 1M Mode Ch 39



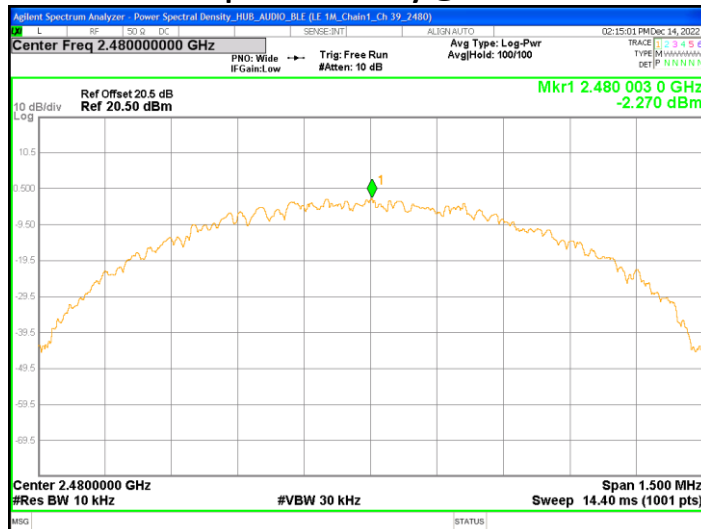
### Chain1 : Power Spectral Density @ LE 1M Mode Ch 0



### Chain1 : Power Spectral Density @ LE 1M Mode Ch 19



### Chain1 : Power Spectral Density @ LE 1M Mode Ch 39



## 5. Emissions in Non-Restricted Frequency Bands

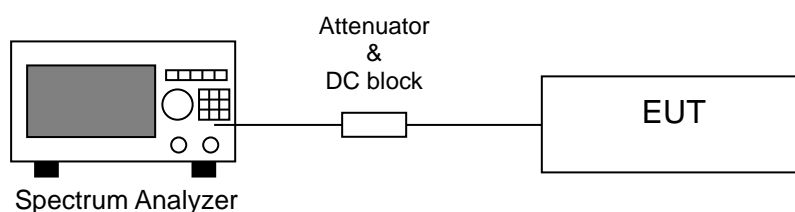
### 5.1 Instruments Setting

Spectrum Function	Setting (Reference Level)	Setting (Emission Level)
Detector	Peak	Peak
RBW	$\geq 100$ kHz	$\geq 100$ kHz
VBW	$\geq 3 \times$ RBW	$\geq 3 \times$ RBW
Sweep	Auto couple	Auto couple
Trace	Max hold	Max hold
Span	$\geq 1.5$ time 6dB bandwidth	
Attenuation	Auto	Auto

### 5.2 Test Procedure

- Step 1 The procedure was used in antenna-port conducted and connected to the spectrum analyzer.
- Step 2 Set instrument center frequency to center frequency.
- Step 3 Use the parameter configured in subclause 11.11 of ANSI C63.10 to measure.
- Step 4 Use the peak marker function to determine the maximum amplitude level.

### 5.3 Test Diagram



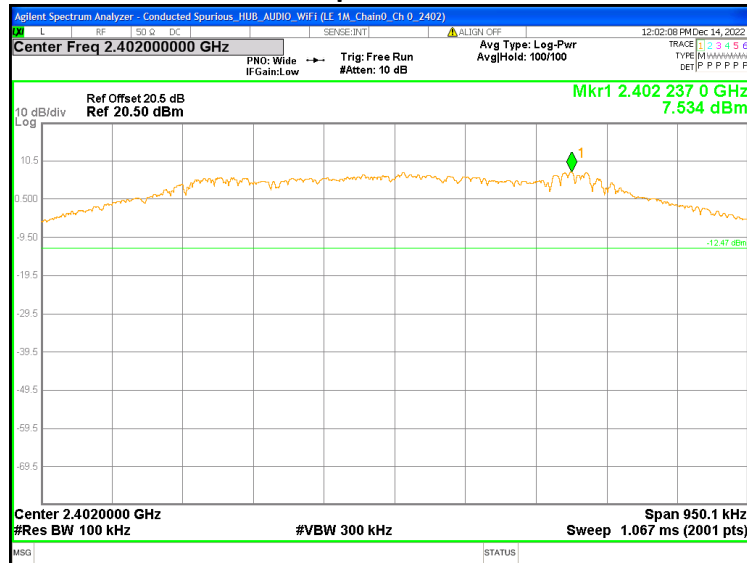
### 5.4 Limit

The peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz

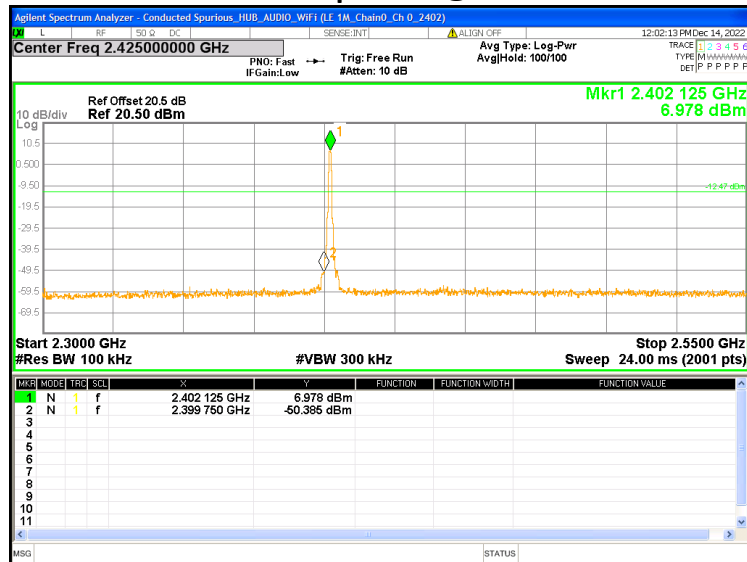
### 5.5 Test Results

Temperature (°C) :	19
Relative Humidity (%) :	59
Test date :	2022/12/14

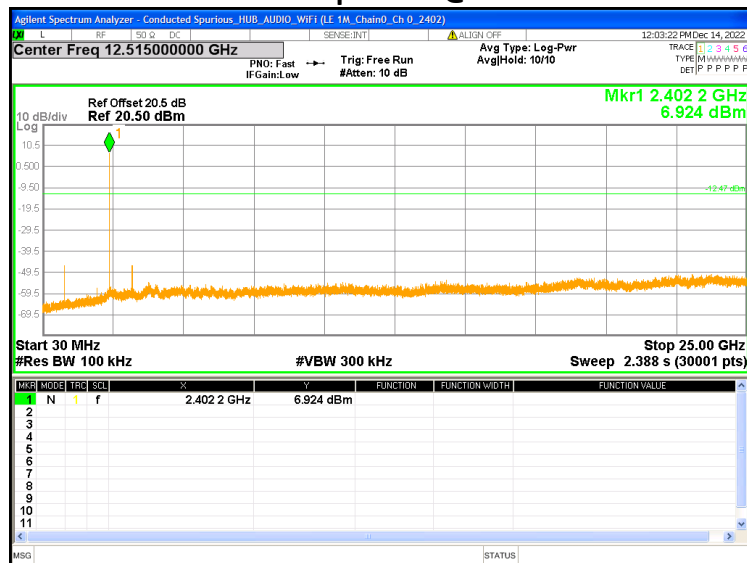
## Chain0 : Conducted Spurious @ LE 1M Mode Ch 0



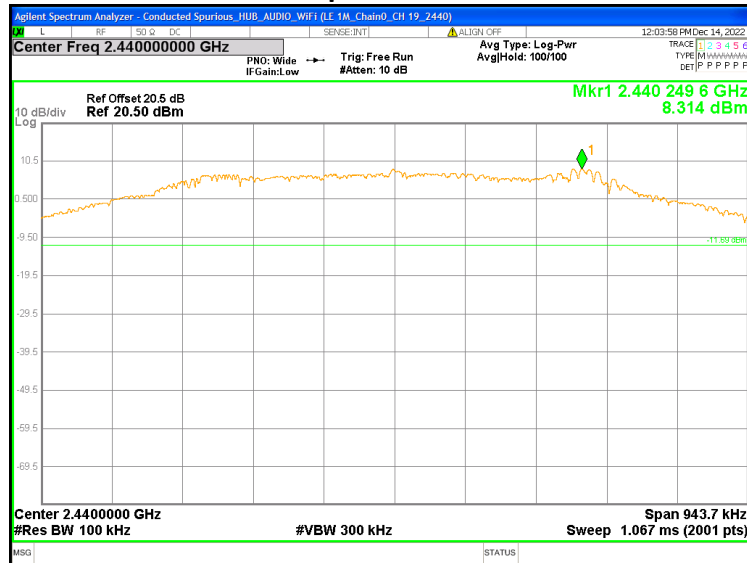
## Chain0 : Conducted Spurious @ LE 1M Mode Ch 0



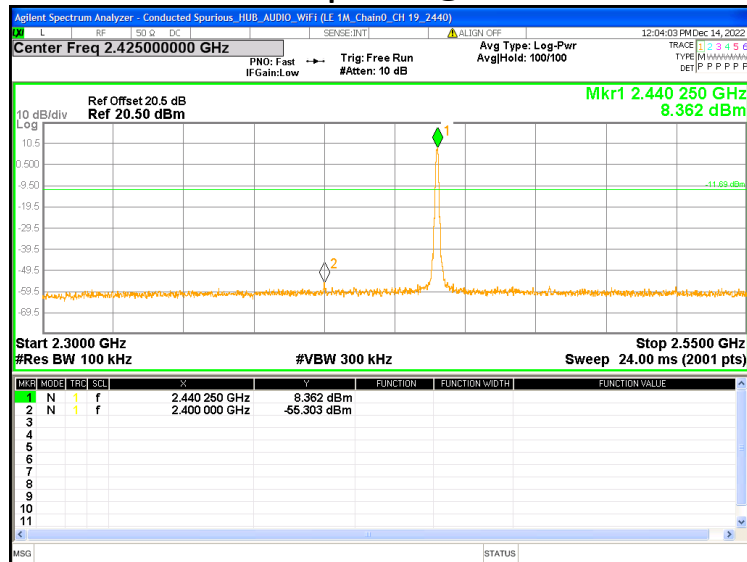
## Chain0 : Conducted Spurious @ LE 1M Mode Ch 0



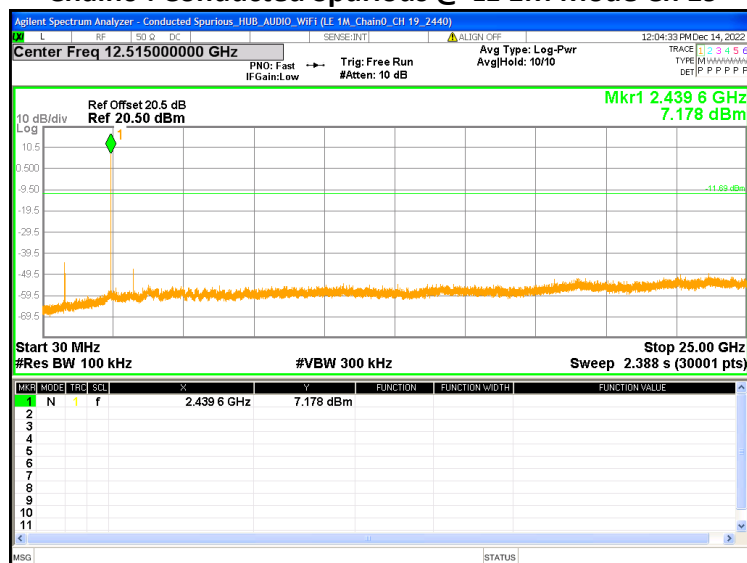
## Chain0 : Conducted Spurious @ LE 1M Mode Ch 19



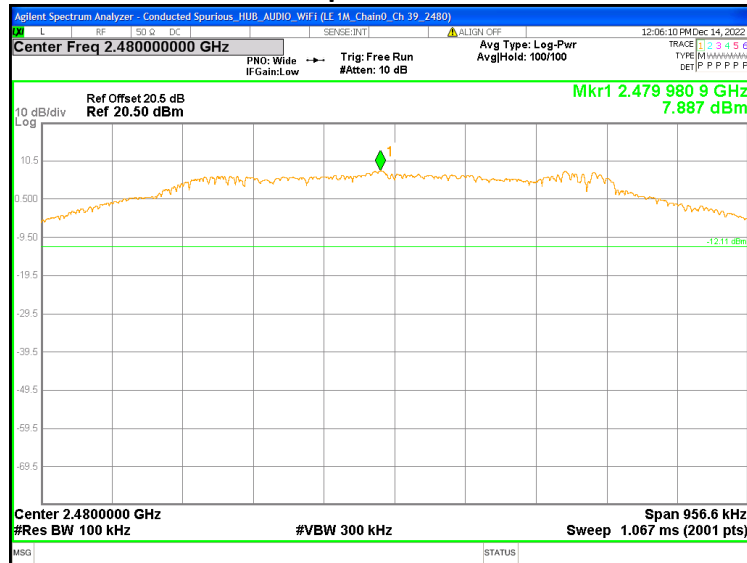
## Chain0 : Conducted Spurious @ LE 1M Mode Ch 19



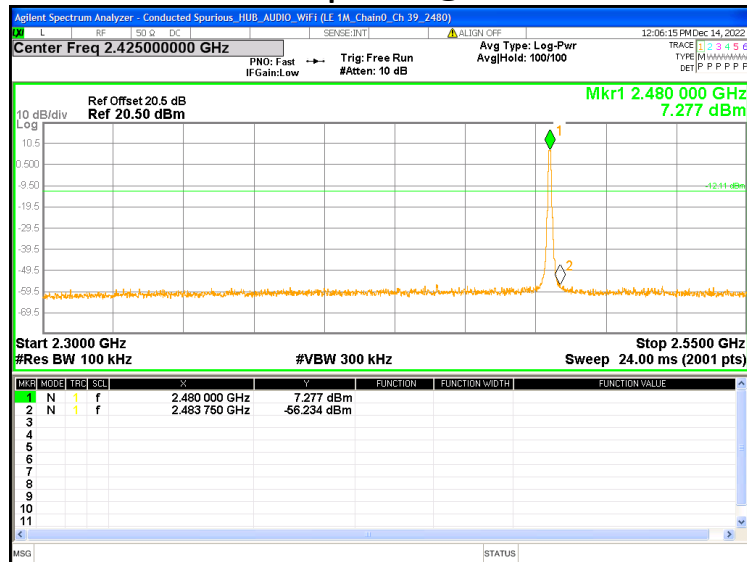
## Chain0 : Conducted Spurious @ LE 1M Mode Ch 19



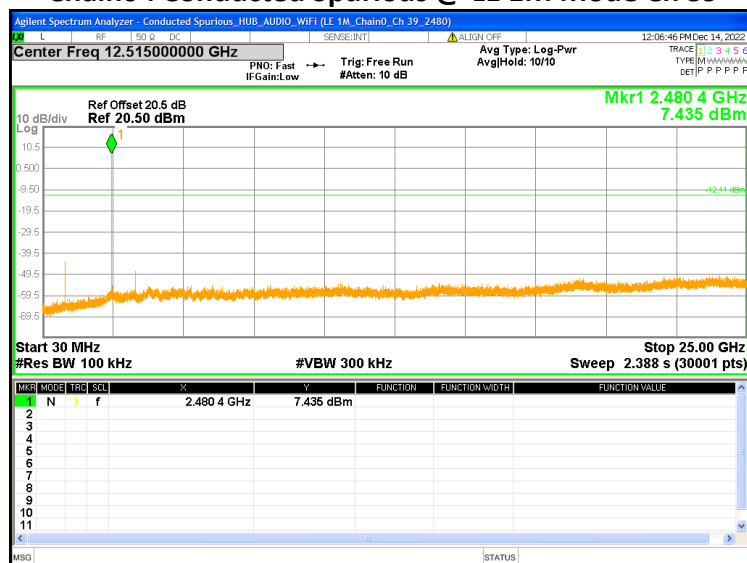
## Chain0 : Conducted Spurious @ LE 1M Mode Ch 39



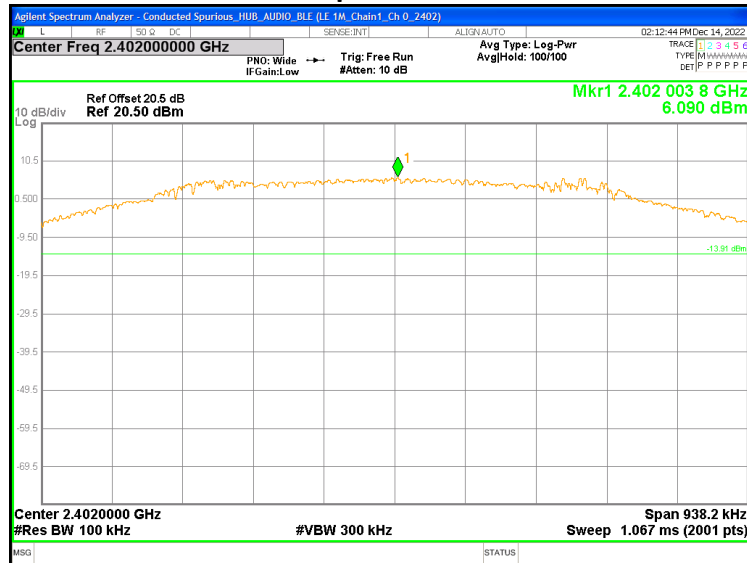
## Chain0 : Conducted Spurious @ LE 1M Mode Ch 39



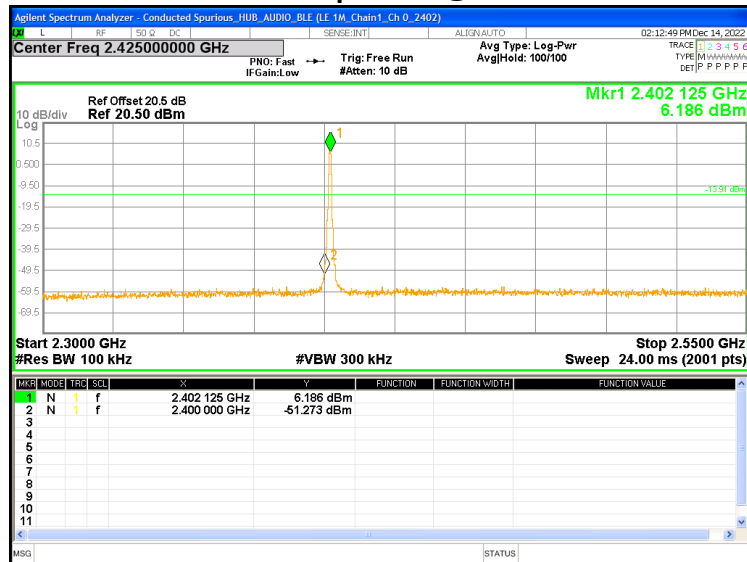
## Chain0 : Conducted Spurious @ LE 1M Mode Ch 39



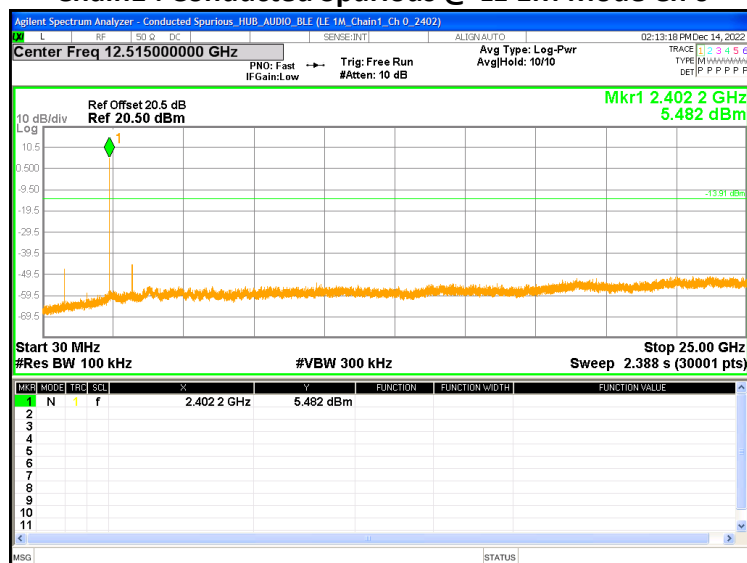
## Chain1 : Conducted Spurious @ LE 1M Mode Ch 0



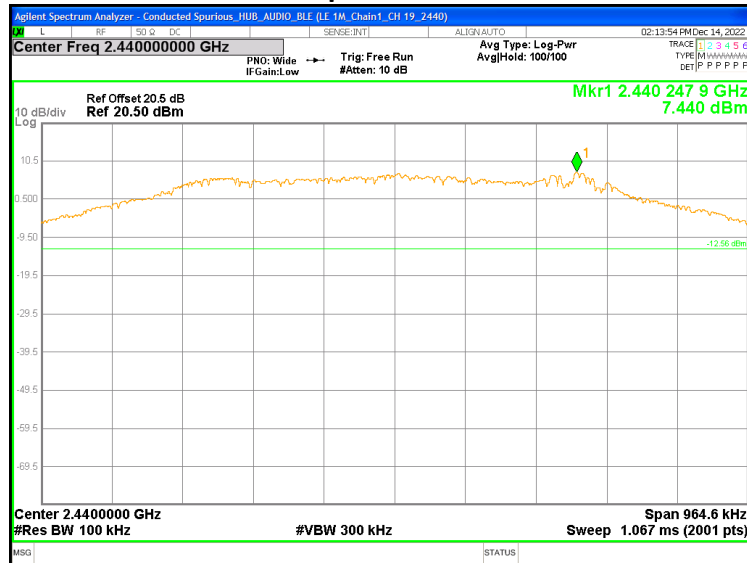
## Chain1 : Conducted Spurious @ LE 1M Mode Ch 0



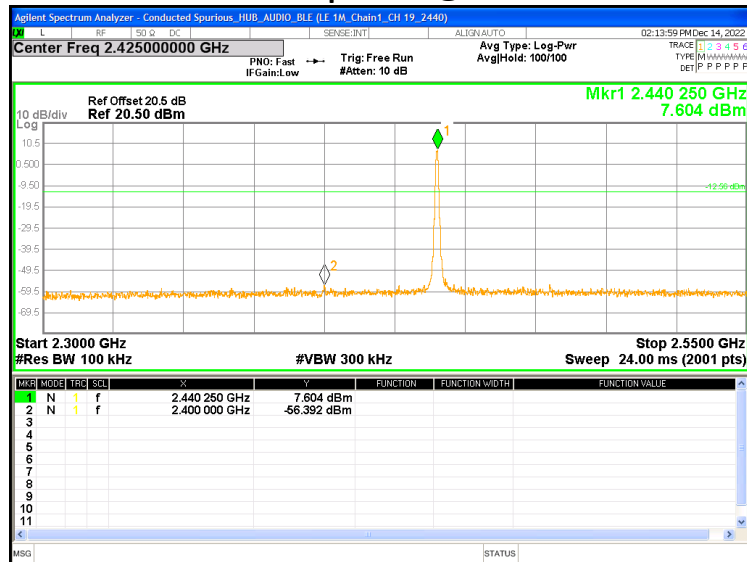
## Chain1 : Conducted Spurious @ LE 1M Mode Ch 0



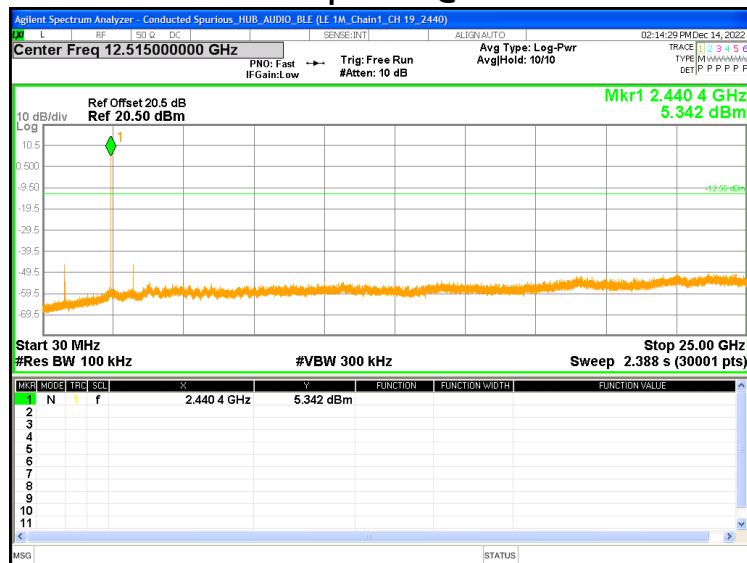
## Chain1 : Conducted Spurious @ LE 1M Mode Ch 19



## Chain1 : Conducted Spurious @ LE 1M Mode Ch 19

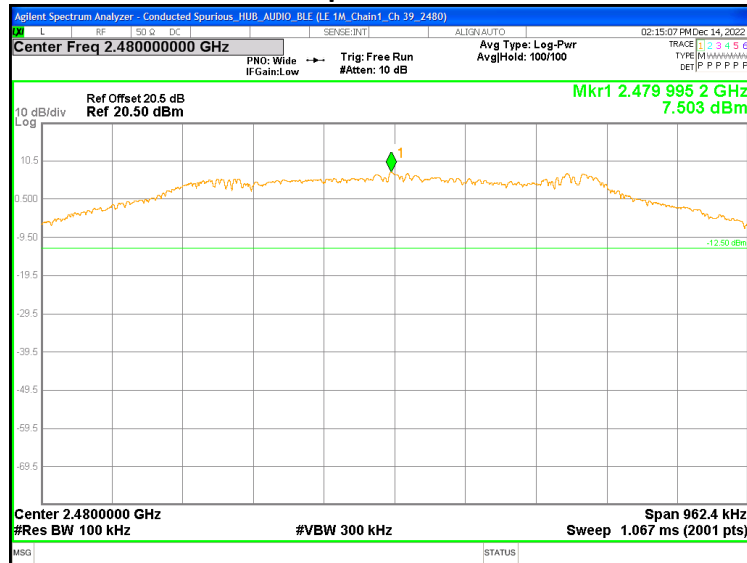


## Chain1 : Conducted Spurious @ LE 1M Mode Ch 19

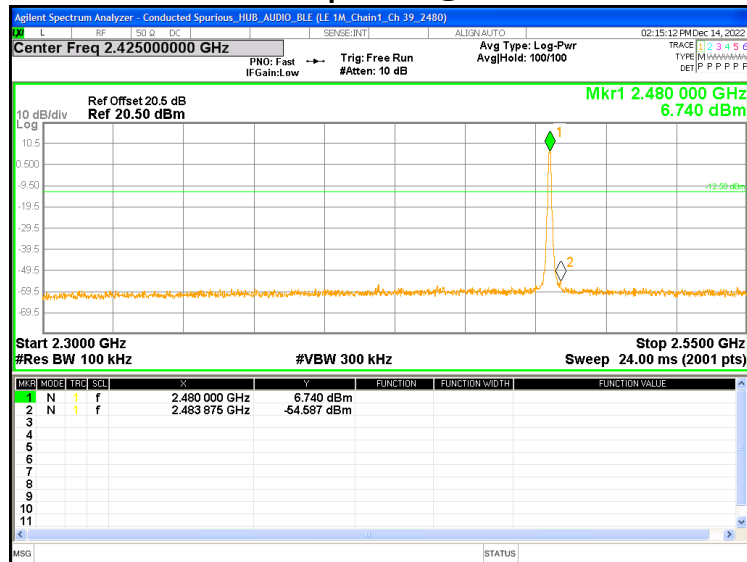




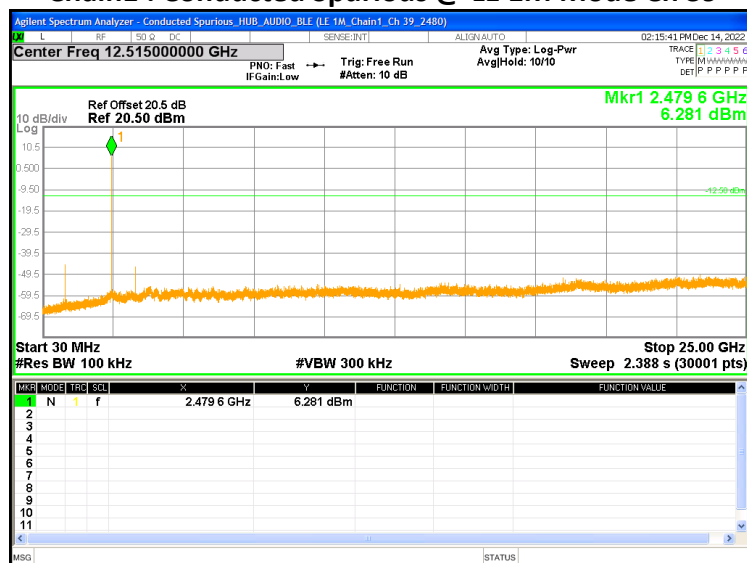
## Chain1 : Conducted Spurious @ LE 1M Mode Ch 39



## Chain1 : Conducted Spurious @ LE 1M Mode Ch 39



## Chain1 : Conducted Spurious @ LE 1M Mode Ch 39



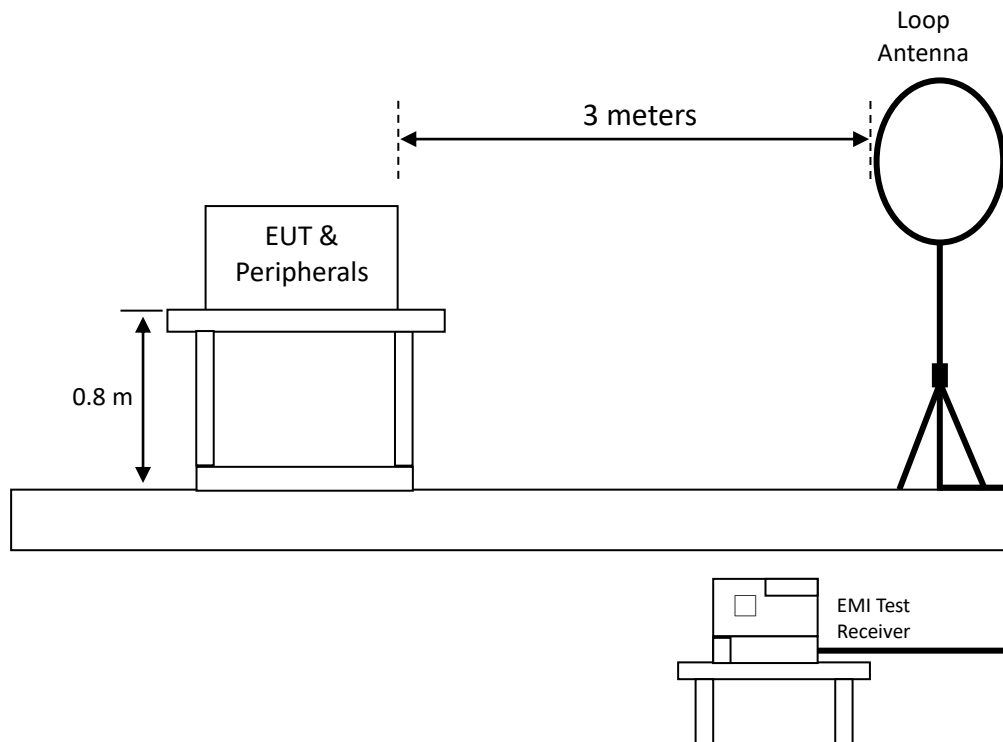
## 6. Emissions in Restricted Frequency Bands (Radiated emission measurements)

### 6.1 Instrument Setting

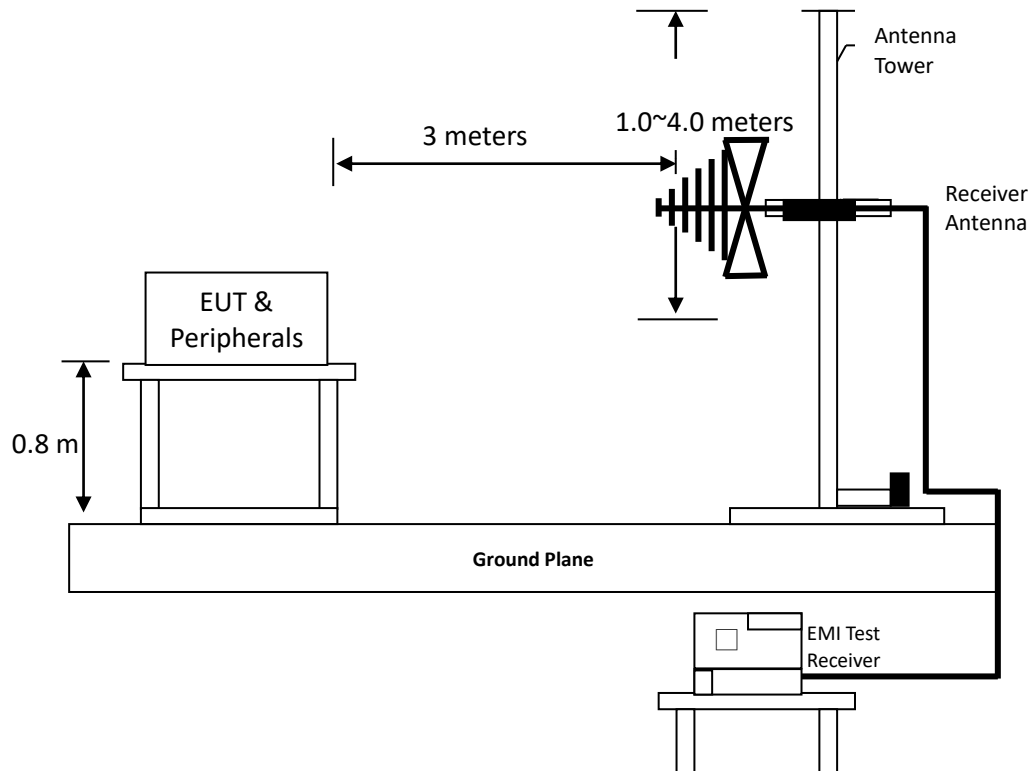
Receiver Function	Setting (Below 1GHz)	Setting (Above 1GHz)
Detector	QP	Peak and Average
RBW	9-150 kHz ; 200-300 Hz 0.15-30 MHz; 9-10 kHz 30-1000 MHz; 100-120 kHz	1MHz
VBW	$\geq 3 \times \text{RBW}$	3MHz & 1/T Minimum VBW
Sweep	Auto couple	Auto couple
Start Frequency	9 kHz	1GHz
Stop Frequency	1 GHz	Tenth harmonic
Attenuation	Auto	Auto

### 6.2 Test setup & procedure

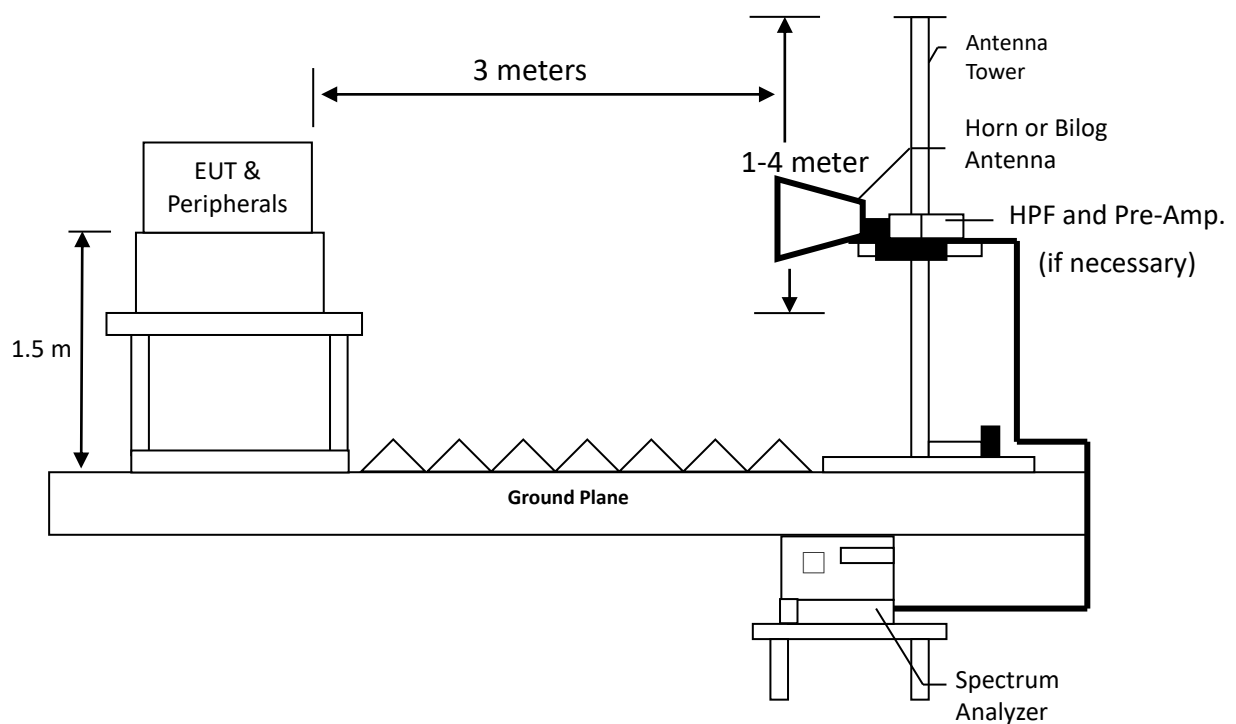
Radiated emission from 9kHz to 30MHz uses Loop Antenna:



## Radiated emission below 1GHz using Bilog Antenna



## Radiated emission above 1GHz using Horn Antenna



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Radiated emissions were investigated cover the frequency range from 30MHz to 1000MHz using a receiver RBW of 120kHz record QP reading, and the frequency over 1GHz using a spectrum analyzer RBW of 1MHz and 10Hz VBW record Average reading. (15.209 paragraph), the Peak reading (1 MHz RBW/ 3 MHz VBW) recorded also on the report.

The EUT for testing is arranged on a turntable. If some peripherals apply to the EUT, the peripherals will be connected to EUT and the whole system. During the test, all cables were arranged to produce worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meters and down to 1 meter.

The measurement for radiated emission will be done at the distance of three meters unless the signal level is too low to measure at that distance. In the case of the reading under noise floor, a pre-amplifier is used and/or the test is conducted at a closer distance. And then all readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance.

**6.3 Limit**

Frequency(MHz)	Field Strength(uV/m)	Measurement distance(m)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark:

1. In the above table, the tighter limit applies at the band edges.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system

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**6.4 Test Result**

**6.4.1 Measurement results: frequencies 9kHz to 30MHz**

Temperature (°C) :	18
Relative Humidity (%) :	61
Test date :	2022/12/13

The test was performed on EUT under continuously transmitting mode. The worst case occurred at BLE 1M Ch 0.

Antenna Polarity	Frequency (MHz)	Detector	Correction Factor (dB/m)	Reading (dBμV)	Corrected Reading (dBμV/m)	Limit @ 3 m (dBμV/m)	Margin (dB)
Perpendicular	0.399	AV	18.71	24.86	43.57	95.58	-52.01
Perpendicular	1.149	QP	19.10	17.63	36.73	66.40	-29.67
Perpendicular	2.558	QP	19.09	14.21	33.30	69.54	-36.24
Perpendicular	4.088	QP	19.37	12.56	31.93	69.54	-37.61
Perpendicular	5.647	QP	19.78	11.97	31.75	69.54	-37.79
Perpendicular	7.897	QP	20.42	11.28	31.70	69.54	-37.84

Remark: Corr. Factor = Antenna Factor + Cable Loss

**TEST REPORT**

Antenna Polarity	Frequency (MHz)	Detector	Correction Factor (dB/m)	Reading (dBμV)	Corrected Reading (dBμV/m)	Limit @ 3 m (dBμV/m)	Margin (dB)
Parallel	0.699	QP	18.92	17.73	36.65	70.71	-34.06
Parallel	1.269	QP	19.10	17.00	36.10	65.53	-29.43
Parallel	3.968	QP	19.33	12.85	32.18	69.54	-37.36
Parallel	11.885	QP	21.13	10.88	32.01	69.54	-37.53
Parallel	16.894	QP	21.39	14.95	36.34	69.54	-33.20
Parallel	22.982	QP	21.77	9.92	31.69	69.54	-37.85

Remark: Corr. Factor = Antenna Factor + Cable Loss

Antenna Polarity	Frequency (MHz)	Detector	Correction Factor (dB/m)	Reading (dBμV)	Corrected Reading (dBμV/m)	Limit @ 3 m (dBμV/m)	Margin (dB)
Ground-parallel	1.209	QP	19.10	17.43	36.53	65.96	-29.43
Ground-parallel	1.958	QP	19.10	13.74	32.84	69.54	-36.70
Ground-parallel	3.998	QP	19.34	12.30	31.64	69.54	-37.90
Ground-parallel	9.366	QP	20.84	10.44	31.28	69.54	-38.26
Ground-parallel	11.945	QP	21.13	10.11	31.24	69.54	-38.30
Ground-parallel	18.603	QP	21.48	9.36	30.84	69.54	-38.70

Remark: Corr. Factor = Antenna Factor + Cable Loss

**TEST REPORT**

**6.4.2 Measurement results: frequencies below 1 GHz**

Temperature (°C) :	18
Relative Humidity (%) :	61
Test date :	2022/12/13

The test was performed on EUT under continuously transmitting mode. The worst case occurred at BLE 1M Ch 0.

Antenna Polarity (H/V)	Frequency (MHz)	Spectrum Analyzer Detector	Correction Factor (dB/m)	Reading (dBμV)	Corrected Reading (dBμV/m)	Limit @ 3 m (dBμV/m)	Margin (dB)
Horizontal	162.89	QP	19.63	5.83	25.46	43.50	-18.04
Horizontal	320.03	QP	22.41	9.13	31.54	46.00	-14.46
Horizontal	480.08	QP	26.18	2.49	28.67	46.00	-17.33
Horizontal	640.13	QP	29.40	6.26	35.66	46.00	-10.34
Horizontal	721.61	QP	29.88	3.97	33.85	46.00	-12.15
Horizontal	853.53	QP	32.24	0.85	33.09	46.00	-12.91

Remark: Corr. Factor = Antenna Factor + Cable Loss

Antenna Polarity (H/V)	Frequency (MHz)	Spectrum Analyzer Detector	Correction Factor (dB/m)	Reading (dBμV)	Corrected Reading (dBμV/m)	Limit @ 3 m (dBμV/m)	Margin (dB)
Vertical	74.62	QP	13.44	20.63	34.07	40.00	-5.93
Vertical	132.82	QP	22.85	2.15	25.00	43.50	-18.50
Vertical	320.03	QP	22.41	6.89	29.30	46.00	-16.70
Vertical	519.85	QP	26.82	2.92	29.74	46.00	-16.26
Vertical	644.01	QP	29.56	2.89	32.45	46.00	-13.55
Vertical	914.64	QP	32.78	1.19	33.97	46.00	-12.03

Remark: Corr. Factor = Antenna Factor + Cable Loss

**TEST REPORT**

**6.4.3 Measurement results: frequency above 1GHz to 25GHz**

Temperature (°C) :	24
Relative Humidity (%) :	57
Test date :	2022/12/6

Mode	Frequency (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Correction Factor (dB/m)	Reading (dBμV)	Corrected Reading (dBμV/m)	Limit @ 3 m (dBμV/m)	Margin (dB)
BLE 1M Ch 0 Chain 0+1	3202.6	PK	H	-13.49	63.89	50.40	74	-23.60
	4804	PK	H	-7.45	59.99	52.54	74	-21.46
	3202.6	PK	V	-13.49	63.56	50.07	74	-23.93
	4804	PK	V	-7.45	58.19	50.74	74	-23.26
BLE 1M Ch 19 Chain 0+1	3253.3	PK	H	-13.50	61.64	48.14	74	-25.86
	4880	PK	H	-6.95	60.20	53.25	74	-20.75
	3253.3	PK	V	-13.50	63.95	50.45	74	-23.55
	4880	PK	V	-6.95	59.20	52.25	74	-21.75
BLE 1M Ch 39 Chain 0+1	3306.6	PK	H	-13.86	61.76	47.90	74	-26.10
	4960	PK	H	-6.85	63.81	56.96	74	-17.04
	4960	AV	H	-6.85	59.11	52.26	54	-1.74
	3306.6	PK	V	-13.86	64.67	50.81	74	-23.19
	4960	PK	V	-6.85	60.01	53.16	74	-20.84

Remark: Correction Factor = Antenna Factor + Cable Loss + High Pass Filter Loss - Pre\_Amplifier Gain



## 7. Emission on Band Edge

### 7.1 Instrument Setting

Spectrum Function	Setting
Detector	Peak and Average
RBW	1MHz
VBW	3MHz & 1/T Minimum VBW
Sweep	Auto couple
Restrict bands	2310 MHz ~ 2390 MHz 2483.5 MHz ~ 2500 MHz
Attenuation	Auto

### 7.2 Test Procedure

The test procedure is the same as Emissions in Restricted Frequency Bands (Radiated emission measurements).

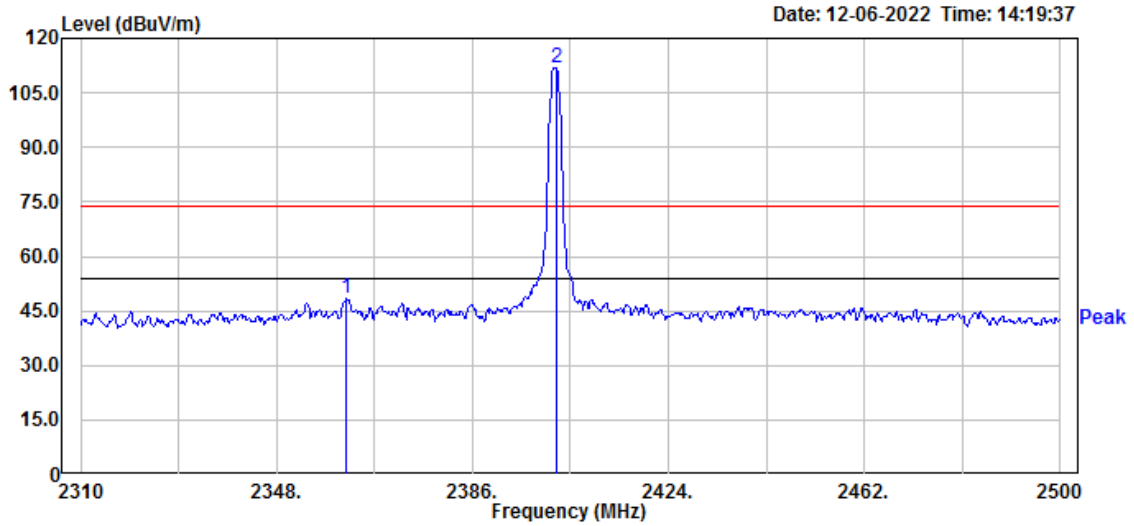
### 7.3 Test Results

Temperature (°C) :	24
Relative Humidity (%) :	57
Test date :	2022/12/6

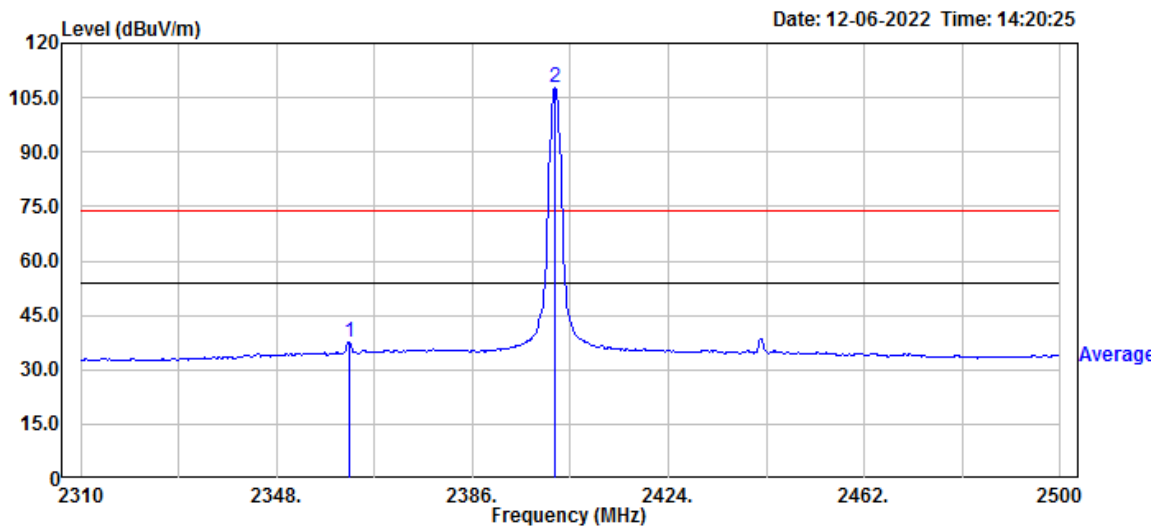
Mode	Frequency (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Correction Factor (dB/m)	Reading (dBμV)	Corrected Reading (dBμV/m)	Limit @ 3 m (dBμV/m)	Margin (dB)	Restricted band (MHz)
BLE 1M Chain 0+1	2361.49	PK	H	34.39	13.88	48.27	74	-25.73	2310~2390
	2362.06	AV	H	34.38	3.38	37.76	54	-16.24	
	2483.50	PK	H	34.58	14.53	49.11	74	-24.89	2483.5~2500
	2483.50	AV	H	34.58	5.48	40.06	54	-13.94	

Remark: Correction Factor = Antenna Factor + Cable Loss

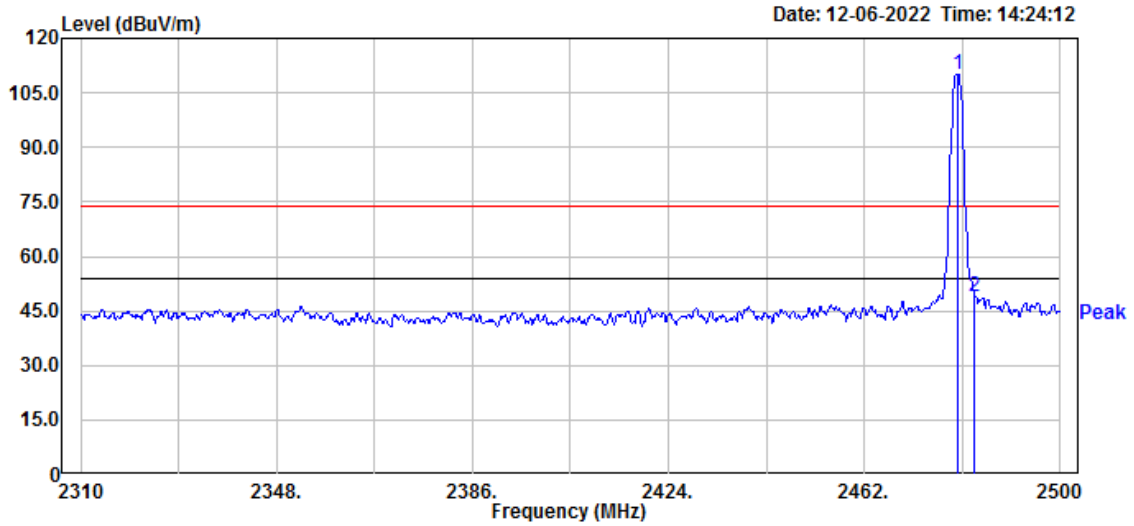
### Chain0+1 : Restricted Band Bandedge @ LE 1M Mode Ch0 PK



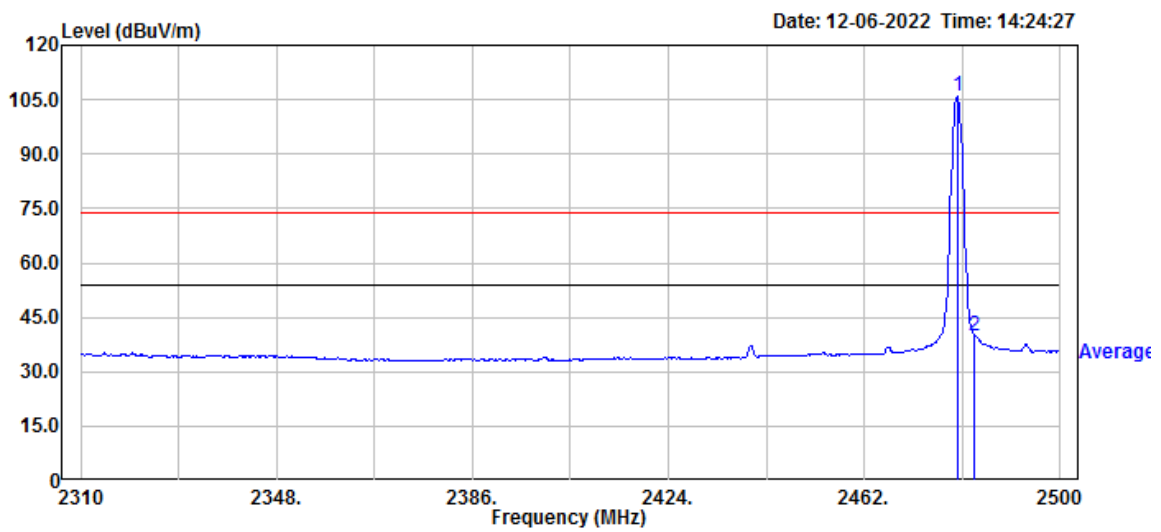
### Chain0+1 : Restricted Band Bandedge @ LE 1M Mode Ch0 AV



### Chain0+1 : Restricted Band Bandedge @ LE 1M Mode Ch39 PK



### Chain0+1 : Restricted Band Bandedge @ LE 1M Mode Ch39 AV



## 8. AC Power Line Conducted Emission

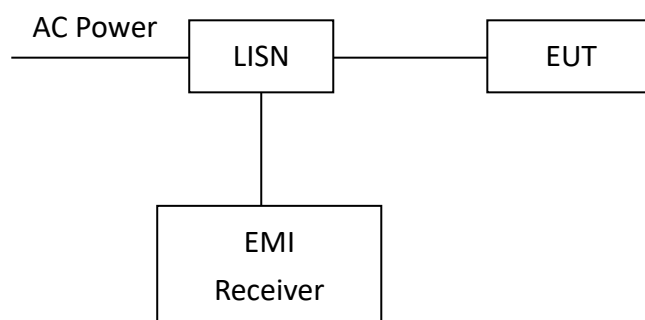
### 8.1 Measuring instrument setting

Receiver Function	Setting
Detector	QP
Start frequency	0.15MHz
Stop frequency	30MHz
IF bandwidth	9 kHz
Attenuation	10dB

### 8.2 Test Procedure

Step 1	Configure the EUT according to ANSI C63.10:2013. The EUT or host of EHT has to be placed 0.4 meter far from the conducting wall of the shielding room and at least 80 centimeters from any other grounded conducting surface.
Step 2	Connect EUT or host of EUT to the power mains through a line impedance stabilization network.
Step 3	All the companion devices are connected to the other LISN. The LISN should provide 50Uh/50ohms coupling impedance.
Step 4	The frequency range from 150 kHz to 30MHz was searched.
Step 5	Set the test-receiver system to peak detector and specified bandwidth with maximum hold mode.
Step 6	The measurement has to be done between each power line and ground at the power terminal.

### 8.3 Test Diagram

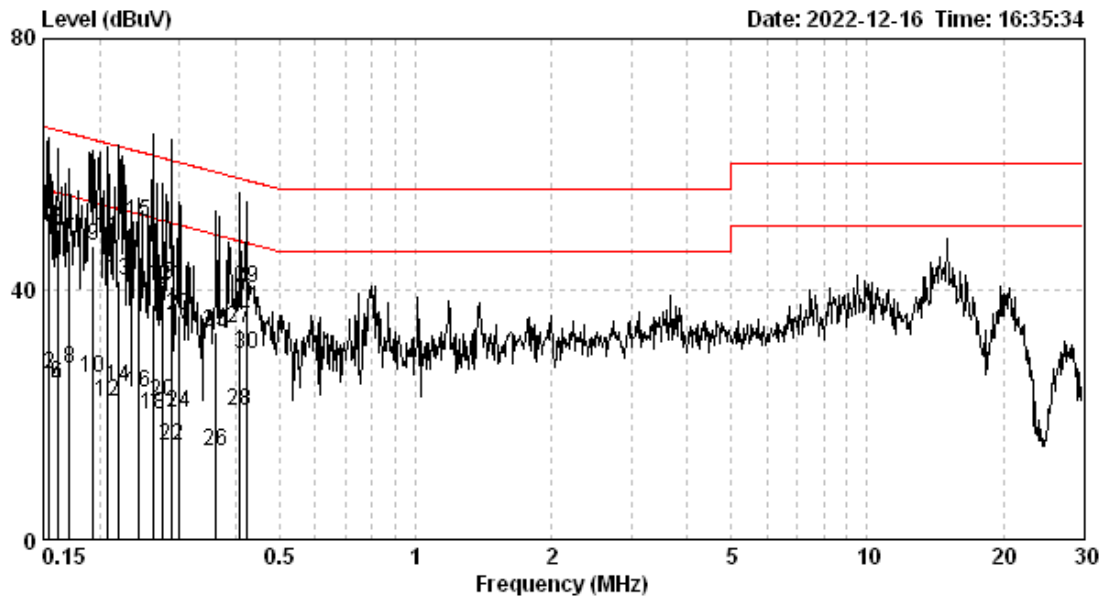


**8.4 Limit**

Frequency (MHz)	Conducted Limit (dBuV)	
	Q.P.	Ave.
0.15~0.50	66 – 56	56 – 46
0.50~5.00	56	46
5.00~30.0	60	50

## TEST REPORT

### 8.5 Test Results



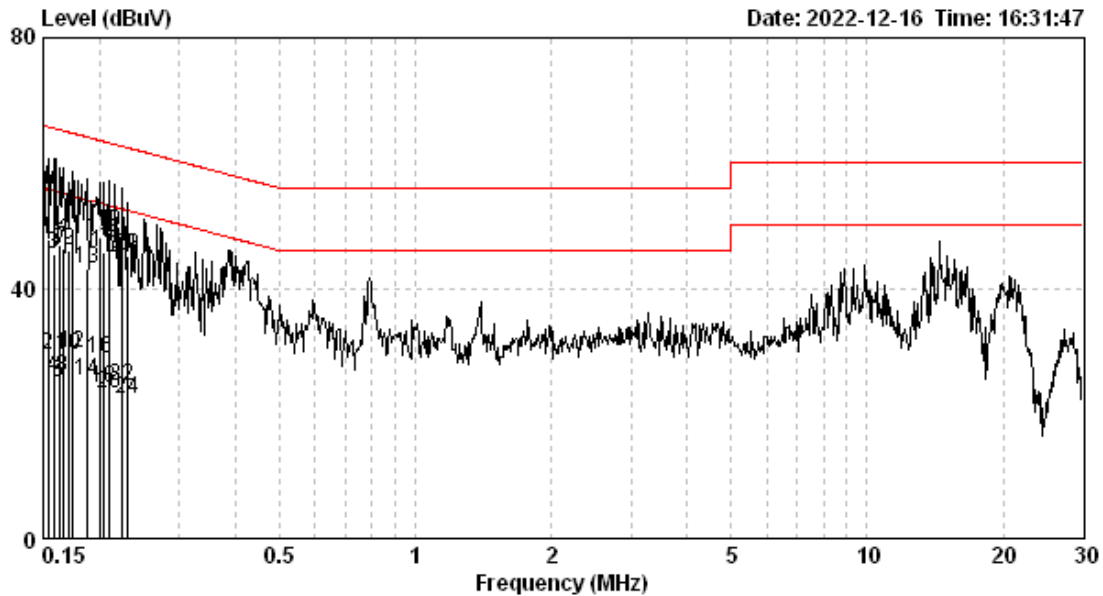
Test voltage : 120Vac, 60Hz  
 Temp. / R.H. : 20 °C / 66 %RH  
 Atmospheric pressure : 1008 hPa

Phase	Frequency (MHz)	Corr. Factor (dB)	Reading QP (dBuV)	Level QP (dBuV)	Limit QP (dBuV)	Reading AV (dBuV)	Level AV (dBuV)	Limit AV (dBuV)	Margin (dB) QP	AV
LINE	0.155	0.08	52.03	52.11	65.74	26.30	26.38	55.74	-13.63	-29.36
LINE	0.162	0.08	49.10	49.18	65.38	24.78	24.86	55.38	-16.20	-30.52
LINE	0.171	0.08	47.73	47.81	64.90	27.15	27.23	54.90	-17.09	-27.67
LINE	0.193	0.08	46.76	46.84	63.89	25.67	25.75	53.89	-17.05	-28.14
LINE	0.208	0.08	47.87	47.95	63.27	21.98	22.06	53.27	-15.32	-31.21
LINE	0.221	0.08	41.38	41.46	62.79	24.17	24.25	52.79	-21.33	-28.53
LINE	0.243	0.08	50.71	50.79	62.00	23.39	23.48	52.00	-11.20	-28.52
LINE	0.263	0.08	37.37	37.46	61.34	19.77	19.86	51.34	-23.88	-31.48
LINE	0.276	0.08	40.56	40.65	60.94	21.78	21.87	50.94	-20.29	-29.07
LINE	0.289	0.09	40.40	40.49	60.54	14.77	14.86	50.54	-20.06	-35.68
LINE	0.299	0.09	35.79	35.88	60.28	20.21	20.29	50.28	-24.40	-29.99
LINE	0.361	0.09	33.01	33.10	58.69	14.00	14.09	48.69	-25.59	-34.61
LINE	0.408	0.09	33.63	33.72	57.68	20.49	20.58	47.68	-23.96	-27.10
LINE	0.421	0.09	39.98	40.07	57.42	29.52	29.61	47.42	-17.35	-17.81

Remark:

1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)
2. Level (dBuV) = Corr. Factor (dB) + Reading (dBuV)
3. Margin (dB) = Level (dBuV) – Limit (dBuV)

## TEST REPORT



Test voltage :120Vac, 60Hz  
 Temp./ R.H. :20 °C / 66 %RH  
 Atmospheric pressure :1008 hPa

Phase	Frequency (MHz)	Corr. Factor (dB)	Reading QP (dBuV)	Level QP (dBuV)	Limit QP (dBuV)	Reading AV (dBuV)	Level AV (dBuV)	Limit AV (dBuV)	Margin (dB) QP	AV
NEUTRAL	0.154	0.08	47.67	47.75	65.78	29.20	29.28	55.78	-18.03	-26.50
NEUTRAL	0.158	0.08	45.25	45.33	65.56	25.65	25.73	55.56	-20.23	-29.83
NEUTRAL	0.162	0.08	46.68	46.76	65.34	24.94	25.02	55.34	-18.58	-30.32
NEUTRAL	0.166	0.08	46.16	46.24	65.16	25.63	25.71	55.16	-18.92	-29.46
NEUTRAL	0.171	0.08	45.88	45.96	64.90	29.20	29.28	54.90	-18.94	-25.62
NEUTRAL	0.175	0.08	47.77	47.85	64.72	29.64	29.72	54.72	-16.87	-25.01
NEUTRAL	0.187	0.08	42.87	42.95	64.15	25.07	25.15	54.15	-21.20	-29.00
NEUTRAL	0.200	0.08	48.00	48.08	63.62	28.70	28.78	53.62	-15.55	-24.84
NEUTRAL	0.205	0.08	45.62	45.70	63.40	24.04	24.12	53.40	-17.71	-29.29
NEUTRAL	0.211	0.08	48.87	48.95	63.18	23.17	23.25	53.18	-14.23	-29.93
NEUTRAL	0.223	0.08	44.77	44.85	62.70	24.10	24.18	52.70	-17.84	-28.52
NEUTRAL	0.230	0.08	45.02	45.10	62.44	22.30	22.38	52.44	-17.33	-30.06

Remark:

1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)
2. Level (dBuV) = Corr. Factor (dB) + Reading (dBuV)
3. Margin (dB) = Level (dBuV) – Limit (dBuV)

**Appendix A: Test equipment list**

Test Equipment/ Test site	Brand	Model No.	Serial No.	Calibration Date	Next Calibration Date
EMI Test Receiver	Rohde & Schwarz	ESR7	101822	2022/08/09	2023/08/08
Signal Analyzer	Agilent	N9030A	MY51380492	2022/08/09	2023/08/08
Active Loop Antenna	SCHWARZBECK MESS-ELEKTRONIC	FMZB1519	1519-067	2022/04/13	2023/04/12
Bilog Hybrid Antenna	ETC	MCTD 2786B	BLB17J04019 & JB-5-019	2022/10/04	2023/10/03
Horn Antenna	SHWARZBECK	BBHA 9120 D	9120D-456	2022/01/21	2023/01/20
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170159	2020/08/20	2023/08/19
Broadband Amplifier	SGH	SGH118(45dB)	20220105-1	2022/01/07	2023/01/06
Pre-amplifier	SGH	SGH184	20201124-1	2022/11/11	2023/11/10
Power Meter	Anritsu	ML2495A	0844001	2022/07/04	2023/07/03
Power Sensor	Anritsu	MA2491A	031543	2022/03/07	2023/03/06
966-2(A) Cable	SUHNER	SMA / EX 100	N/A	2022/03/04	2023/03/03
966-2(B) Cable	SUHNER	SUCOFLEX 104P	CB0005	2022/03/04	2023/03/03
966-2 Cable	SUHNER	SUCOFLEX 104P	9403/4P	2022/11/25	2023/11/24
966-2_3m Semi-Anechoic Chamber	966_2	CEM-966_2	N/A	2022/01/14	2023/01/13
Hight Pass Filter	Reactel	7HS-3G/18G-S11	N/A	2022/05/25	2023/05/24
20dB Attenuator	Mini-Circuits	BW-S20W5+	N/A	2022/05/25	2023/05/24
Test software	Audix	e3	V9	NCR	NCR

Note: No Calibration Required (NCR).



**TEST REPORT**

Test Equipment/ Test site	Brand	Model No.	Serial No.	Calibration Date	Next Calibration Date
EMI Test Receiver	R&S	ESR7	101232	2022/02/07	2023/02/06
LISN	R&S	ESH3-Z5	835239/023	2022/07/26	2023/07/25
CON-3 Cable	SUHNER	SUCOFLEX 106	27222 /6	2022/01/12	2023/01/11
Test software	Audix	e3	V4.20040112L	NCR	NCR

Note: No Calibration Required (NCR).

**Appendix B: Measurement Uncertainty**

This uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level using a coverage factor of k=2.

Item	Uncertainty
Vertically polarized radiated disturbances from 30MHz~1GHz in a semi-anechoic chamber at a distance of 3m	5.16 dB
Horizontally polarized radiated disturbances from 30MHz~1GHz in a semi-anechoic chamber at a distance of 3m	5.02 dB
Radiated disturbances from 1GHz~18GHz in a semi-anechoic chamber at a distance of 3m	5.17 dB
Vertically polarized Radiated disturbances from 18GHz~26.5GHz in a semi-anechoic chamber at a distance of 1m	2.39 dB
Horizontally polarized Radiated disturbances from 18GHz~26.5GHz in a semi-anechoic chamber at a distance of 1m	2.39 dB
Radiated disturbances from 9kHz~30MHz in a semi-anechoic chamber at a distance of 3m	3.70 dB
Emission on the Band Edge Test	4.32 dB
Occupied Bandwidth	7.78 %
Maximum Peak Conducted Output Power	0.44 dB
Power Spectral Density	1.27 dB
Emissions In Non-Restricted Frequency Bands	1.27 dB
AC Power Line Conducted Emission	3.08 dB