



■ Report No.: DDT-RE23071315-2E02

■ Issued Date: Nov. 20, 2023

## FCC AND ISCED CERTIFICATION TEST REPORT

### FOR

|                      |   |                                                                                                                                                                                                                                                                                                          |
|----------------------|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Applicant            | : | Harman International Industries, Inc.                                                                                                                                                                                                                                                                    |
| Address              | : | 8500 Balboa Boulevard, Northridge, CA 91329,<br>UNITED STATES                                                                                                                                                                                                                                            |
| Equipment under Test | : | 3.1CH Soundbar with Wireless Subwoofer                                                                                                                                                                                                                                                                   |
| FCC Model No.        | : | CINEMA SB550, CINEMA SB551, CINEMA SB552,<br>CINEMA SB553, CINEMA SB554, CINEMA SB555,<br>CINEMA SB556, CINEMA SB557, CINEMA SB558,<br>CINEMA SB559, CINEMA SB560, CINEMA SB561,<br>CINEMA SB562, CINEMA SB563, CINEMA SB564,<br>CINEMA SB565, CINEMA SB566, CINEMA SB567,<br>CINEMA SB568, CINEMA SB569 |
| IC Model No.         | : | CINEMA SB550                                                                                                                                                                                                                                                                                             |
| Trade Mark           | : | JBL                                                                                                                                                                                                                                                                                                      |
| FCC ID               | : | APIJBLSB550                                                                                                                                                                                                                                                                                              |
| IC                   | : | 6132A-JBLSB550                                                                                                                                                                                                                                                                                           |
| HVIN                 | : | JBLSB550                                                                                                                                                                                                                                                                                                 |
| Manufacturer         | : | Harman International Industries, Inc.                                                                                                                                                                                                                                                                    |
| Address              | : | 8500 Balboa Boulevard, Northridge, CA 91329,<br>UNITED STATES                                                                                                                                                                                                                                            |

**Issued By: Guangdong Dongdian Testing Service Co., Ltd.**

**Add.:** Unit 2, Building 1, No. 17, Zongbu 2nd Road, Songshan Lake Park,  
Dongguan, Guangdong, China, 523808

**Tel.:** +86-0769-38826678, **E-mail:** ddt@dgddt.com, <http://www.dgddt.com>

# REPORT

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## Test Report Declare

|                             |   |                                                                                                                                                                                                                                                                                        |
|-----------------------------|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Applicant</b>            | : | Harman International Industries, Inc.                                                                                                                                                                                                                                                  |
| <b>Address</b>              | : | 8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES                                                                                                                                                                                                                             |
| <b>Equipment under Test</b> | : | 3.1CH Soundbar with Wireless Subwoofer                                                                                                                                                                                                                                                 |
| <b>FCC Model No.</b>        | : | CINEMA SB550, CINEMA SB551, CINEMA SB552, CINEMA SB553, CINEMA SB554, CINEMA SB555, CINEMA SB556, CINEMA SB557, CINEMA SB558, CINEMA SB559, CINEMA SB560, CINEMA SB561, CINEMA SB562, CINEMA SB563, CINEMA SB564, CINEMA SB565, CINEMA SB566, CINEMA SB567, CINEMA SB568, CINEMA SB569 |
| <b>IC Model No.</b>         | : | CINEMA SB550                                                                                                                                                                                                                                                                           |
| <b>Trade Mark</b>           | : | JBL                                                                                                                                                                                                                                                                                    |
| <b>Manufacturer</b>         | : | Harman International Industries, Inc.                                                                                                                                                                                                                                                  |
| <b>Address</b>              | : | 8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES                                                                                                                                                                                                                             |

### Test Standard Used:

FCC Rules and Regulations Part 15 Subpart C, RSS-210 Issue 10 December 2019.

### Test procedure used:

ANSI C63.10:2013, RSS-Gen Issue 5, Apr. 2018.

### We Declare:

The equipment described above is tested by Guangdong Dongdian Testing Service Co., Ltd. and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and Guangdong Dongdian Testing Service Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

**After test and evaluation, our opinion is that the equipment provided for test compliance with the requirement of the above FCC&ISED standards.**

|                         |                     |                      |                               |
|-------------------------|---------------------|----------------------|-------------------------------|
| <b>Report No:</b>       | DDT-RE23071315-2E02 |                      |                               |
| <b>Date of Receipt:</b> | Jul. 25, 2023       | <b>Date of Test:</b> | Jul. 25, 2023 ~ Oct. 21, 2023 |

**Prepared By:**

*Bobo Chen*

**Bobo Chen/Engineer**

**Approved By:**

*Damon Hu*

**Damon Hu/EMC Manager**

Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Guangdong Dongdian Testing Service Co., Ltd.

## Revision History

| Rev. | Revisions     | Issue Date    | Revised By |
|------|---------------|---------------|------------|
| ---  | Initial issue | Nov. 20, 2023 |            |
|      |               |               |            |

## 1. Summary of Test Results

| The EUT have been tested according to the applicable standards as referenced below. |                                                                                                                              |         |
|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|---------|
| Description of Test Item                                                            | Standard                                                                                                                     | Results |
| 20dB Bandwidth and 99% Bandwidth                                                    | FCC Part 15: 15.215<br>ANSI C63.10:2013<br>RSS-210 Issue 10<br>RSS-Gen Issue 5                                               | Pass    |
| Radiated Emission                                                                   | FCC Part 15: 15.205<br>FCC Part 15: 15.209<br>FCC Part 15: 15.249<br>ANSI C63.10:2013<br>RSS-210 Issue 10<br>RSS-Gen Issue 5 | Pass    |
| Band Edge Compliance                                                                | FCC Part 15: 15.205<br>FCC Part 15: 15.249<br>ANSI C63.10:2013<br>RSS-210 Issue 10<br>RSS-Gen Issue 5                        | Pass    |
| Power Line Conducted Emission                                                       | FCC Part 15: 15.207<br>ANSI C63.10:2013<br>RSS-Gen Issue 5                                                                   | Pass    |
| Antenna requirement                                                                 | FCC Part 15: 15.203<br>RSS-Gen Issue 5                                                                                       | Pass    |

## 2. General Test Information

### 2.1. Description of EUT

|                          |                                                                                                                                                                                                                                                                                          |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EUT Name                 | : 3.1CH Soundbar with Wireless Subwoofer                                                                                                                                                                                                                                                 |
| FCC Model No.            | : CINEMA SB550, CINEMA SB551, CINEMA SB552, CINEMA SB553, CINEMA SB554, CINEMA SB555, CINEMA SB556, CINEMA SB557, CINEMA SB558, CINEMA SB559, CINEMA SB560, CINEMA SB561, CINEMA SB562, CINEMA SB563, CINEMA SB564, CINEMA SB565, CINEMA SB566, CINEMA SB567, CINEMA SB568, CINEMA SB569 |
| IC Model No.             | : CINEMA SB550                                                                                                                                                                                                                                                                           |
| Difference of models     | : Above models are identical in schematic and structure, only the model number are different, therefore the test performed on the model CINEMA SB550.                                                                                                                                    |
| EUT function description | : Please reference user manual of this device                                                                                                                                                                                                                                            |
| Power supply             | : AC 100-240V~ 50/60Hz 25W                                                                                                                                                                                                                                                               |
| Radio Specification      | : 2.4G SRD                                                                                                                                                                                                                                                                               |
| Operation frequency      | : 2402 - 2481 MHz                                                                                                                                                                                                                                                                        |
| Modulation               | : GFSK                                                                                                                                                                                                                                                                                   |
| Antenna Gain             | : 1.70 dBi                                                                                                                                                                                                                                                                               |
| Sample Number            | : S23071315-04                                                                                                                                                                                                                                                                           |

Note 1: EUT is the abbreviation of equipment under test.

Note 2: "☑" means to be chosen or applicable; "☐" means don't to be chosen or not applicable;

This note applies to entire report.

Note 3: This report just for Soundbar.

| Channel information |                 |         |                 |         |                 |
|---------------------|-----------------|---------|-----------------|---------|-----------------|
| Channel             | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 1                   | 2402            | 15      | 2430            | 29      | 2458            |
| 2                   | 2404            | 16      | 2432            | 30      | 2460            |
| 3                   | 2406            | 17      | 2434            | 31      | 2462            |
| 4                   | 2408            | 18      | 2436            | 32      | 2464            |
| 5                   | 2410            | 19      | 2438            | 33      | 2466            |
| 6                   | 2412            | 20      | 2440            | 34      | 2468            |
| 7                   | 2414            | 21      | 2442            | 35      | 2470            |
| 8                   | 2416            | 22      | 2444            | 36      | 2472            |
| 9                   | 2418            | 23      | 2446            | 37      | 2474            |
| 10                  | 2420            | 24      | 2448            | 38      | 2476            |
| 11                  | 2422            | 25      | 2450            | 39      | 2478            |
| 12                  | 2424            | 26      | 2452            | 40      | 2480            |
| 13                  | 2426            | 27      | 2454            | 41      | 2481            |
| 14                  | 2428            | 28      | 2456            |         |                 |

## 2.2. Accessories of EUT

| Description of Accessories | Manufacturer | Model number | Serial No.                             | Other |
|----------------------------|--------------|--------------|----------------------------------------|-------|
| AC cable                   | Harman       | N/A          | Length: 1.42m, Without magnetic ring   | N/A   |
| HDMI cable                 | Harman       | N/A          | Length: 1.14m, With two magnetic rings | N/A   |
| Remote control             | Harman       | N/A          | N/A                                    | N/A   |

## 2.3. Assistant equipment used for test

| Assistant equipment | Manufacturer | Model number | Serial No. | Other |
|---------------------|--------------|--------------|------------|-------|
| N/A                 | N/A          | N/A          | N/A        | N/A   |

## 2.4. Block diagram of EUT configuration for test



Test software: EMI\_Tool\_V26\_EverestekInc\_2023\_0202.exe

The test software was used to control EUT work in Continuous Tx mode, and select test channel, wireless mode as below table.

| Tested mode, channel, information |                  |         |                 |
|-----------------------------------|------------------|---------|-----------------|
| Mode                              | Setting Tx Power | Channel | Frequency (MHz) |
| GFSK Tx mode                      | Default          | CH1     | 2402            |
|                                   | Default          | CH20    | 2440            |
|                                   | Default          | CH41    | 2481            |

## 2.5. Test environment conditions

During the measurement the environmental conditions were within the listed ranges:

|                    |            |
|--------------------|------------|
| Temperature range: | 21-25 °C   |
| Humidity range:    | 40-75%     |
| Pressure range:    | 86-106 kPa |

## 2.6. Deviations of test standard

No deviation.

## 2.7. Test laboratory

Guangdong Dongdian Testing Service Co., Ltd.

Add.: Unit 2, Building 1, No. 17, Zongbu 2nd Road, Songshan Lake Park, Dongguan, Guangdong, China, 523808

Tel.: +86-0769-38826678, <http://www.dgddt.com>, Email: [ddt@dgddt.com](mailto:ddt@dgddt.com).

CNAS Accreditation No. L6451; A2LA Accreditation Number: 3870.01

FCC Designation Number: CN1182, Test Firm Registration Number: 540522

Innovation, Science and Economic Development Canada Site Registration Number: 10288A

Conformity Assessment Body identifier: CN0048

VCCI facility registration number: C-20087, T-20088, R-20123, R-20155, G-20118

## 2.8. Measurement uncertainty

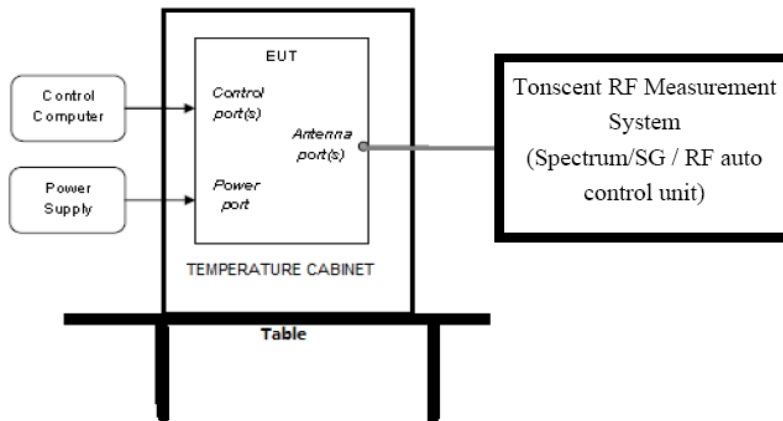
| Test Item                                                                                                                                     | Uncertainty                                            |
|-----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| Bandwidth                                                                                                                                     | 1.1%                                                   |
| Peak Output Power (Conducted) (Spectrum Analyzer)                                                                                             | 0.86 dB ( $10 \text{ MHz} \leq f < 3.6 \text{ GHz}$ ); |
|                                                                                                                                               | 1.38 dB ( $3.6 \text{ GHz} \leq f < 8 \text{ GHz}$ )   |
| Peak Output Power (Conducted) (Power Sensor)                                                                                                  | 0.74 dB                                                |
| Power Spectral Density                                                                                                                        | 0.74 dB ( $10 \text{ MHz} \leq f < 3.6 \text{ GHz}$ ); |
|                                                                                                                                               | 1.38 dB ( $3.6 \text{ GHz} \leq f < 8 \text{ GHz}$ )   |
| Frequencies Stability                                                                                                                         | $6.7 \times 10^{-8}$ (Antenna couple method)           |
|                                                                                                                                               | $5.5 \times 10^{-8}$ (Conducted method)                |
| Conducted Spurious Emissions                                                                                                                  | 0.86 dB ( $10 \text{ MHz} \leq f < 3.6 \text{ GHz}$ ); |
|                                                                                                                                               | 1.40 dB ( $3.6 \text{ GHz} \leq f < 8 \text{ GHz}$ )   |
|                                                                                                                                               | 1.66 dB ( $8 \text{ GHz} \leq f < 26.5 \text{ GHz}$ )  |
| Uncertainty for Radio Frequency (RBW < 20 kHz)                                                                                                | $3 \times 10^{-8}$                                     |
| Temperature                                                                                                                                   | 0.4 °C                                                 |
| Humidity                                                                                                                                      | 2 %                                                    |
| Uncertainty for Radiation Emission Test<br>(9 kHz – 30 MHz)                                                                                   | 3.44 dB                                                |
| Uncertainty for Radiation Emission Test<br>(30 MHz - 1 GHz)                                                                                   | 4.70 dB (Antenna Polarize: V)                          |
|                                                                                                                                               | 4.84 dB (Antenna Polarize: H)                          |
| Uncertainty for Radiation Emission Test<br>(1 GHz - 40 GHz)                                                                                   | 4.10 dB (1 - 6 GHz)                                    |
|                                                                                                                                               | 4.40 dB (6 GHz - 18 GHz)                               |
|                                                                                                                                               | 3.54 dB (18 GHz - 26 GHz)                              |
|                                                                                                                                               | 4.30 dB (26 GHz - 40 GHz)                              |
| Uncertainty for Power Line Conduction Emission Test                                                                                           | 3.32 dB (150 kHz - 30 MHz)                             |
| Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2. |                                                        |

### 3. Equipment Used During Test

| Equipment                                                                        | Manufacturer | Model No.                                        | Serial Number    | Due Date   |
|----------------------------------------------------------------------------------|--------------|--------------------------------------------------|------------------|------------|
| <input checked="" type="checkbox"/> RF Connected Test (RF Measurement System 3#) |              |                                                  |                  |            |
| SIGNAL ANALYZER                                                                  | R&S          | FSV40                                            | 101407           | 2024/07/11 |
| Wideband Radio Communication Tester                                              | R&S          | CMW500                                           | 117491           | 2024/04/26 |
| EXG Analog Signal Generator                                                      | KEYSIGHT     | N5173B                                           | MY62153058       | 2024/07/11 |
| MXG Vector Signal Generator                                                      | Agilent      | N5182A                                           | MY48180912       | 2024/04/22 |
| RF Control Unit                                                                  | Tonscend     | JS0806-2                                         | 20C8060230       | 2024/04/26 |
| TEMP&HUMI Programmable Chamber                                                   | ZHIXIANG     | ZXGDJS-150L                                      | ZX170110-A       | 2024/05/14 |
| Test Software                                                                    | Tonscend     | JS1120-3                                         | Ver.3.2.22       | N/A        |
| <input checked="" type="checkbox"/> Radiation 3#chamber                          |              |                                                  |                  |            |
| EMI TEST RECEIVER                                                                | R&S          | ESU26                                            | 100472           | 2024/04/22 |
| PSA Series Spectrum Analyzer                                                     | Agilent      | E4447A                                           | MY50180031       | 2024/04/22 |
| Active Loop Antenna                                                              | Schwarzbeck  | FMZB-1519                                        | 1519-038         | 2024/09/10 |
| Trilog Broadband Antenna                                                         | Schwarzbeck  | VULB 9163                                        | 01429            | 2024/07/11 |
| Double Ridged Horn Antenna                                                       | Schwarzbeck  | BBHA 9120 D                                      | 02468            | 2024/09/17 |
| Broad Band Horn Antenna                                                          | Schwarzbeck  | BBHA 9170                                        | 790              | 2024/04/25 |
| Pre-amplifier                                                                    | COM-POWER    | PAM-118A                                         | 18040084         | 2024/07/14 |
| Pre-amplifier                                                                    | COM-POWER    | PAM-840A                                         | 461369           | 2024/04/26 |
| RE Cable                                                                         | N/A          | W23.02 CP1-X2 + W23.09 AP1-X8+ JCT26S-NJ-NJ-1.5M | 4.5M+8M+1.5M     | 2024/04/20 |
| RF Cable                                                                         | Yuhu         | JCTB810-NJ-NJ-9M+ ZT26S-SMAJ-SMAJ-1M             | 21123964         | 2024/04/22 |
| Band Reject Filter(2400-2500 MHz)                                                | REBES        | BRM50702                                         | G555             | N/A        |
| Band Reject Filter(5150-5880 MHz)                                                | REBES        | BRM50716                                         | G392             | N/A        |
| High Pass Filter(8000-25000 MHz)                                                 | XB           | XBLBQ-GTA67                                      | 210820-2-3       | N/A        |
| Test Software                                                                    | Tonscend     | JS32-RE                                          | V 5.0.0.1        | N/A        |
| <input checked="" type="checkbox"/> Power Line Conducted Emissions Test 2#       |              |                                                  |                  |            |
| Test Receiver                                                                    | R&S          | ESCI                                             | 101032           | 2024/04/22 |
| LISN 1                                                                           | R&S          | ENV216                                           | 101170           | 2024/07/11 |
| LISN 2                                                                           | R&S          | ENV216                                           | 101209           | 2024/07/11 |
| Pulse Limiter                                                                    | R&S          | KH43101                                          | 431011801568-12# | 2024/05/04 |
| CE Cable 2                                                                       | HUBSER       | RG214-5                                          | N/A              | 2024/04/26 |
| Test software                                                                    | Audix        | E3                                               | V 6.11111b       | N/A        |

## 4. 20 dB Bandwidth and 99% Bandwidth

### 4.1. Block diagram of test setup



### 4.2. Limits

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in § 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

### 4.3. Test procedure

(1) Connect EUT's antenna output to spectrum analyzer by RF cable.

(2) Set the spectrum analyzer as follows:

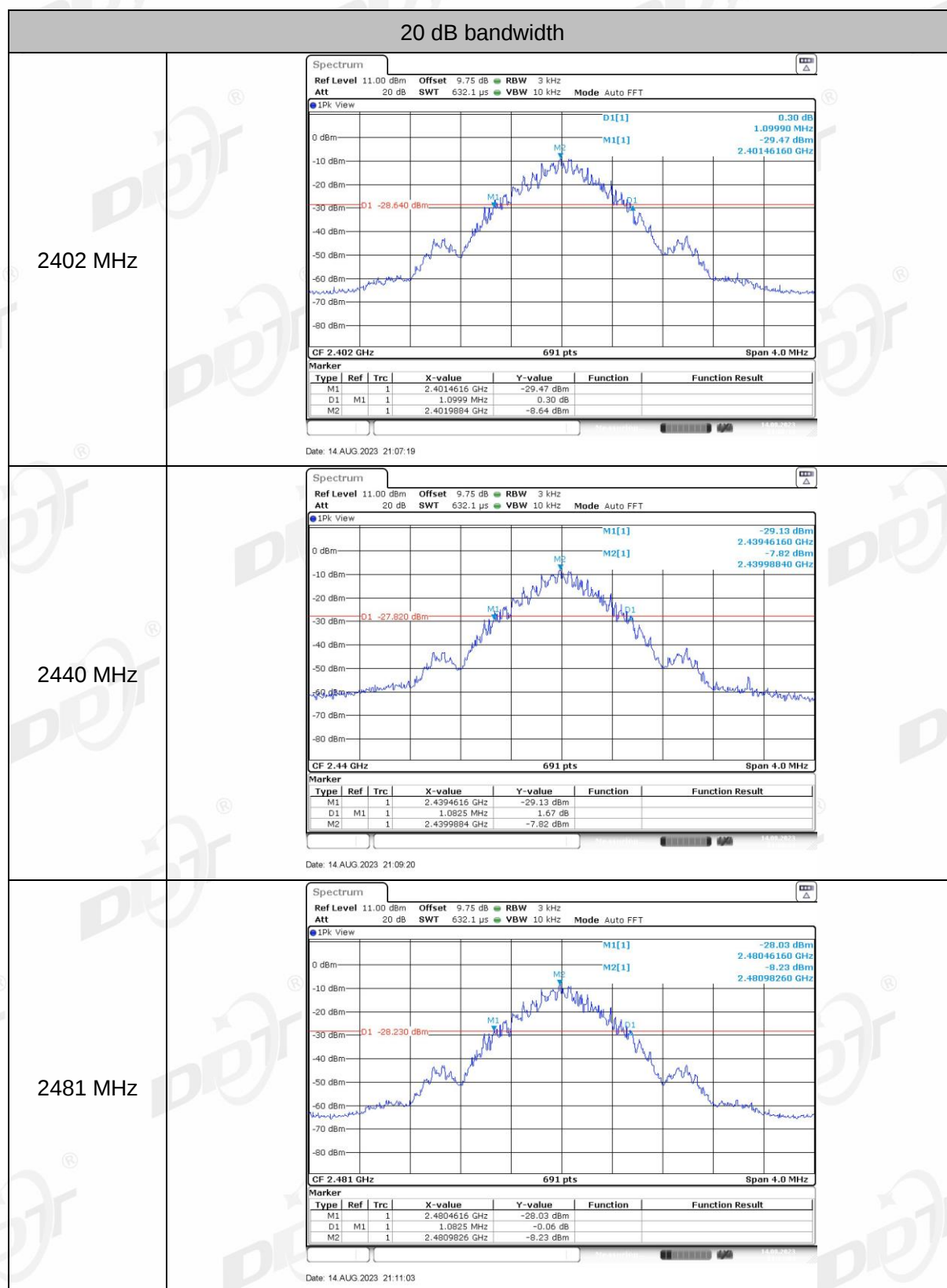
|                |                               |
|----------------|-------------------------------|
| RBW:           | 1% to 5% of the OBW           |
| VBW:           | approximately three times RBW |
| Detector Mode: | Peak                          |
| Sweep time:    | auto                          |
| Trace mode     | Max hold                      |

(3) Allow the trace to stabilize, measure the 20 dB bandwidth of signal and 99% bandwidth of signal.

### 4.4. Test result

| Mode | Freq (MHz) | 20 dB bandwidth Result (MHz) | 99% bandwidth Result (MHz) | Limit (MHz) | Conclusion |
|------|------------|------------------------------|----------------------------|-------------|------------|
| GFSK | 2402       | 1.0999                       | 0.995                      | /           | Pass       |
|      | 2440       | 1.0825                       | 0.995                      | /           | Pass       |
|      | 2481       | 1.0825                       | 0.987                      | /           | Pass       |

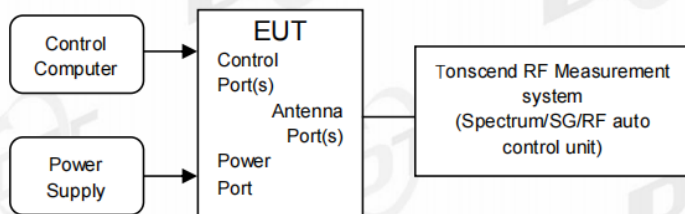
## 4.5. Original test data





## 5. Duty cycle

### 5.1. Block diagram of test setup



### 5.2. Limit

Just for Report.

### 5.3. Test procedure

- Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, The cable loss and attenuator loss have been put into spectrum analyzer as amplitude offset.  
set the Spectrum Analyzer as below:

Centre Frequency: The centre frequency of the middle hopping channel.

Resolution BW: 10 MHz.

Video BW: 10 MHz.

Span: Zero span.

Detector: Peak.

Trace Mode: Clear Write.

Sweep: Video Trigger

- When the trace is complete, measure the sending time of 1 burst and the duty cycle of 1 burst cycle.
- Calculate dwell time follow below formula:  
Duty cycle= Pulse's on time / Burst cycle

### 5.4. Test result

| Test Mode | Antenna | ON Time [ms] | Period [ms] | Duty Cycle [%] | Duty Cycle Factor[dB] |
|-----------|---------|--------------|-------------|----------------|-----------------------|
| GFSK      | Ant1    | 0.4783*2     | 9           | 10.63          | 9.74                  |

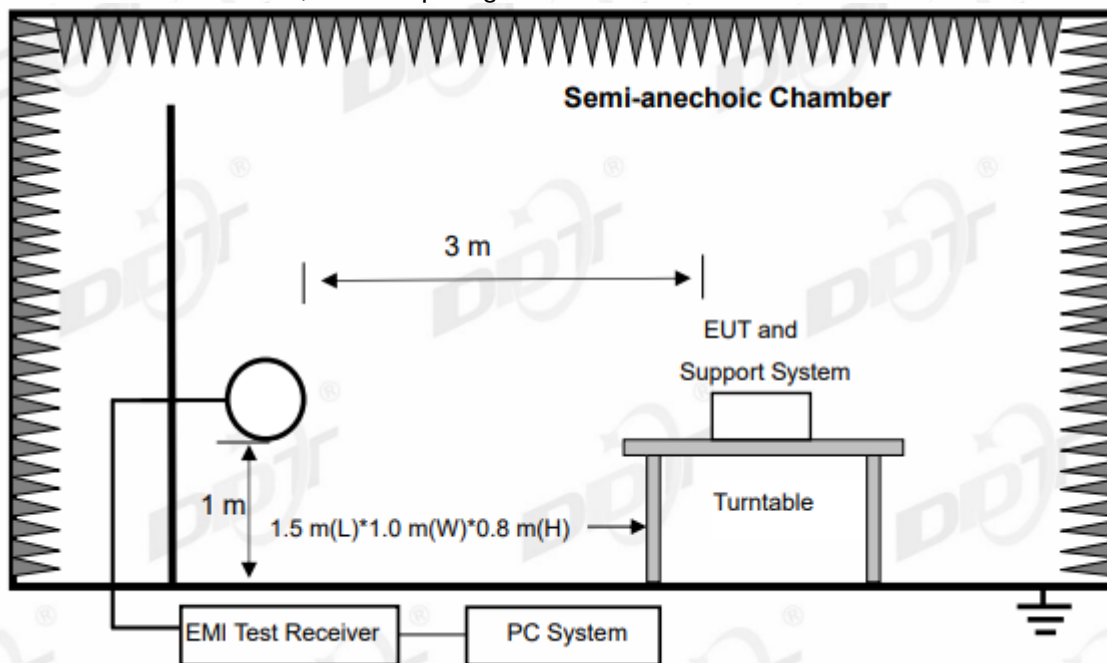
## 5.5. Test graphs



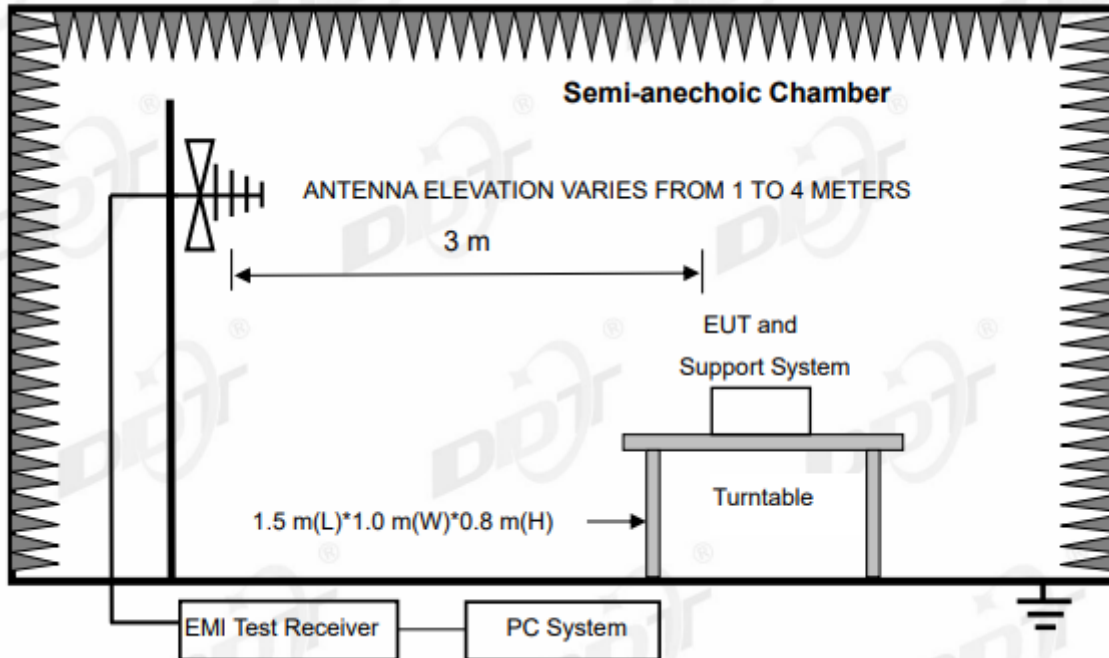
## 6. Radiated Emission

### 6.1. Block diagram of test setup

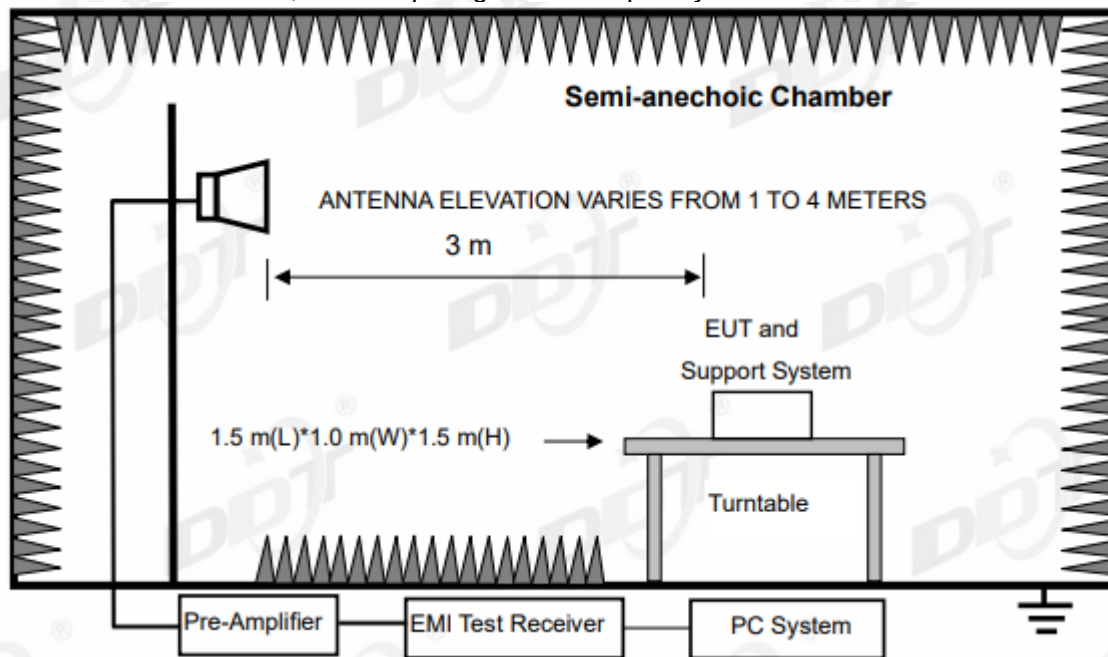
In 3 m Anechoic Chamber, test setup diagram for 9 kHz - 30 MHz:



In 3 m Anechoic Chamber, test setup diagram for 30 MHz - 1 GHz:



In 3 m Anechoic Chamber, test setup diagram for frequency above 1 GHz:



Note: For harmonic emissions test an appropriate high pass filter was inserted in the input port of AMP.

## 6.2. Limit

(1) FCC 15.205 Restricted frequency band

| MHz                      | MHz                 | MHz           | GHz              |
|--------------------------|---------------------|---------------|------------------|
| 0.090-0.110              | 16.42-16.423        | 399.9-410     | 4.5-5.15         |
| <sup>1</sup> 0.495-0.505 | 16.69475-16.69525   | 608-614       | 5.35-5.46        |
| 2.1735-2.1905            | 16.80425-16.80475   | 960-1240      | 7.25-7.75        |
| 4.125-4.128              | 25.5-25.67          | 1300-1427     | 8.025-8.5        |
| 4.1772&4.17775           | 37.5-38.25          | 1435-1626.5   | 9.0-9.2          |
| 4.2072&4.20775           | 73-74.6             | 1645.5-1646.5 | 9.3-9.5          |
| 6.215-6.218              | 74.8-75.2           | 1660-1710     | 10.6-12.7        |
| 6.26775-6.26825          | 108-121.94          | 1718.8-1722.2 | 13.25-13.4       |
| 6.31175-6.31225          | 123-138             | 2200-2300     | 14.47-14.5       |
| 8.291-8.294              | 149.9-150.05        | 2310-2390     | 15.35-16.2       |
| 8.362-8.366              | 156.52475-156.52525 | 2483.5-2500   | 17.7-21.4        |
| 8.37625-8.38675          | 156.7-156.9         | 2690-2900     | 22.01-23.12      |
| 8.41425-8.41475          | 162.0125-167.17     | 3260-3267     | 23.6-24.0        |
| 12.29-12.293             | 167.72-173.2        | 3332-3339     | 31.2-31.8        |
| 12.51975-12.52025        | 240-285             | 3345.8-3358   | 36.43-36.5       |
| 12.57675-12.57725        | 322-335.4           | 3600-4400     | ( <sup>2</sup> ) |
| 13.36-13.41              |                     |               |                  |

<sup>1</sup>Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz

<sup>2</sup>Above 38.6

## RSS-Gen section 8.10 Restricted frequency bands\*

| MHz             | MHz                 | MHz           | GHz         |
|-----------------|---------------------|---------------|-------------|
| 0.090-0.110     | 12.51975-12.52025   | 240-285       | 3.5-4.4     |
| 0.495-0.505     | 12.57675-12.57725   | 322-335.4     | 4.5-5.15    |
| 2.1735-2.1905   | 13.36-13.41         | 399.9-410     | 5.35-5.46   |
| 3.020-3.026     | 16.42-16.423        | 608-614       | 7.25-7.75   |
| 4.125-4.128     | 16.69475-16.69525   | 960-1427      | 8.025-8.5   |
| 4.1772&4.17775  | 16.80425-16.80475   | 1435-1626.5   | 9.0-9.2     |
| 4.2072&4.20775  | 25.5-25.67          | 1645.5-1646.5 | 9.3-9.5     |
| 5.677-5.683     | 37.5-38.25          | 1660-1710     | 10.6-12.7   |
| 6.215-6.218     | 73-74.6             | 1718.8-1722.2 | 13.25-13.4  |
| 6.26775-6.26825 | 74.8-75.2           | 2200-2300     | 14.47-14.5  |
| 6.31175-6.31225 | 108-138             | 2310-2390     | 15.35-16.2  |
| 8.291-8.294     | 149.9-150.05        | 2483.5-2500   | 17.7-21.4   |
| 8.362-8.366     | 156.52475-156.52525 | 2655-2900     | 22.01-23.12 |
| 8.37625-8.38675 | 156.7-156.9         | 3260-3267     | 23.6-24.0   |
| 8.41425-8.41475 | 162.0125-167.17     | 3332-3339     | 31.2-31.8   |
| 12.29-12.293    | 167.72-173.2        | 3345.8-3358   | 36.43-36.5  |
|                 |                     |               | Above 38.6  |

\* Certain frequency bands listed in table and in bands above 38.6 GHz are designated for licence-exempt applications. These frequency bands and the requirements that apply to related devices are set out in the 200 and 300 series of RSSs.

## (2) FCC 15.209 Limit &amp; RSS-Gen section 8.9 Limit

| FREQUENCY<br>MHz | DISTANCE<br>Meters | FIELD STRENGTHS LIMIT                                                     |                                   |
|------------------|--------------------|---------------------------------------------------------------------------|-----------------------------------|
|                  |                    | $\mu\text{V}/\text{m}$                                                    | $\text{dB}(\mu\text{V})/\text{m}$ |
| 0.009 ~ 0.490    | 300                | 2400/F(kHz)                                                               | 67.6-20log(F)                     |
| 0.490 ~ 1.705    | 30                 | 24000/F(kHz)                                                              | 87.6-20log(F)                     |
| 1.705 ~ 30.0     | 30                 | 30                                                                        | 29.54                             |
| 30 ~ 88          | 3                  | 100                                                                       | 40.0                              |
| 88 ~ 216         | 3                  | 150                                                                       | 43.5                              |
| 216 ~ 960        | 3                  | 200                                                                       | 46.0                              |
| 960 ~ 1000       | 3                  | 500                                                                       | 54.0                              |
| Above 1000       | 3                  | 74.0 dB( $\mu\text{V}$ )/m (Peak)<br>54.0 dB( $\mu\text{V}$ )/m (Average) |                                   |

Note: (1) The emission limits shown in the above table are based on measurements employing a CISPR QP detector except for the frequency bands 9 - 90 kHz, 110 - 490 kHz and above 1000 MHz, radiated emissions limits in these three bands are based on measurements employing an average detector.

(2) At frequencies below 30 MHz, measurement may be performed at a distance closer than that specified, and the limit at closer measurement distance can be extrapolated by below formula:

$$\text{Limit}_{3\text{m}}(\text{dBuV/m}) = \text{Limit}_{30\text{m}}(\text{dBuV/m}) + 40\text{Log}(30\text{m}/3\text{m})$$

(3) Limit for this EUT

The emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, and the emissions appearing within RSS-Gen section 8.10 Restricted frequency bands shall not exceed the limits shown in RSS-Gen section 8.9, all the other emissions shall be at least 20 dB below the fundamental emissions or comply with 15.209 limits and RSS-Gen section 8.9 limits.

### 6.3. Test Procedure

- (1) EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber for below 1G and 150 cm above the ground plane inside a fully-anechoic chamber for above 1G.
- (2) Test antenna was located 3 m from the EUT on an adjustable mast, and the antenna used as below table.

| Test frequency range | Test antenna used                              | Test antenna distance |
|----------------------|------------------------------------------------|-----------------------|
| 9 kHz - 30 MHz       | Active Loop antenna                            | 3 m                   |
| 30 MHz - 1 GHz       | Trilog Broadband Antenna                       | 3 m                   |
| 1 GHz - 18 GHz       | Double Ridged Horn Antenna<br>(1 GHz - 18 GHz) | 3 m                   |
| 18 GHz - 40 GHz      | Horn Antenna<br>(18 GHz - 40 GHz)              | 1 m                   |

According ANSI C63.10:2013 clause 6.4.6 and 6.5.3, for measurements below 30 MHz, Antenna was located 3 m from EUT, the loop antenna was positioned in three antenna orientations (parallel, perpendicular, and round-parallel), for each measurement antenna alignment, the EUT shall be rotated through 0° to 360° on a turntable, and the lowest height of the magnetic antenna shall be 1 m above the ground. For measurement above 30MHz, the trilog Broadband Antenna or Horn Antenna was located 3m from EUT, Measurements were made with the antenna positioned in both the horizontal and vertical planes of Polarization, and the measurement antenna was varied from 1 m to 4 m. in height above the reference ground plane to obtain the maximum signal strength.

(3) Below pre-scan procedure was first performed in order to find prominent frequency spectrum radiated emissions from 9 kHz to 25 GHz:

- (a) Scanning the peak frequency spectrum with the antenna specified in step (3), and the EUT was rotated 360 degree, the antenna height was varied from 1 m to 4 m (Except loop antenna, it's fixed 1 m above ground.)
- (b) Change work frequency or channel of device if practicable.
- (c) Change modulation type of device if practicable.
- (d) Change power supply range from 85% to 115% of the rated supply voltage
- (e) Rotated EUT though three orthogonal axes to determine the attitude of EUT arrangement produces highest emissions.

Spectrum frequency from 9 kHz to 25 GHz (tenth harmonic of fundamental frequency) was investigated, and no any obvious emission were detected from 18 GHz to 25 GHz, so below final test was performed with frequency range from 9 kHz to 18 GHz.

- (4) For final emissions measurements at each frequency of interest, the EUT was rotated and the antenna height was varied between 1 m and 4 m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipment and all of the interface cables were changed according to ANSI C63.10:2013 on Radiated Emission test.
- (5) The emissions from 9 kHz to 1 GHz were measured based on CISPR QP detector except for the frequency bands 9 - 90 kHz, 110 - 490 kHz, for emissions from 9 kHz - 90 kHz, 110 kHz - 490 kHz and above 1 GHz were measured based on average detector, for emissions above 1 GHz, peak emissions also be measured and need comply with Peak limit.
- (6) The emissions from 9 kHz to 1 GHz, QP or average values were measured with EMI receiver with below RBW.

| Frequency band   | RBW     |
|------------------|---------|
| 9 kHz - 150 kHz  | 200 Hz  |
| 150 kHz - 30 MHz | 9 kHz   |
| 30 MHz - 1 GHz   | 120 kHz |

- (7) For emissions above 1GHz, both Peak and Average level were measured with Spectrum Analyzer, and the RBW is set at 1 MHz, VBW is set at 3 MHz for Peak measure; According ANSI C63.10:2013 clause 4.1.4.2.2 procedure for average measure.
- (8) For portable device, X axis, Y axis, Z axis are tested, and worse setup is reported.

#### 6.4. Test result

Pass. (See below detailed test result)

All the emissions except fundamental emission from 9 kHz to 25 GHz were comply with 15.209 limits and RSS-Gen section 8.9 limits.

Note1: According exploratory test, the emission levels are 20 dB below the limit detected from 9 kHz to 30 MHz and 18 GHz to 25 GHz, so the final test was performed with frequency range from 30 MHz to 18 GHz and recorded in below.

Note2: For emissions below 1 GHz, according exploratory explorer test, when change Tx mode and channel, have no distinct influence on emissions level, so for emissions below 1 GHz, the final test was only performed with EUT working in GFSK, Tx 2402 MHz mode.

Note3: For emissions above 1 GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit.

**Field Strength of the Fundamental Signal**

| Mode | Freq. (MHz) | Reading [dBμV/m] | Cable Loss (dB) | Antenna Factor (dB/m) | AMP (dB) | Result Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Detector type | Polarization |
|------|-------------|------------------|-----------------|-----------------------|----------|-----------------------|----------------|-------------|---------------|--------------|
| GFSK | 2402.00     | 103.19           | 3.88            | 27.50                 | -40.14   | 94.43                 | 114.00         | -19.57      | Peak          | HORIZONTAL   |
| GFSK | 2402.00     | /                |                 |                       |          | 84.69                 | 94.00          | -9.31       | Average       | HORIZONTAL   |
| GFSK | 2402.00     | 108.65           | 3.88            | 27.50                 | -40.14   | 99.89                 | 114.00         | -14.11      | Peak          | VERTICAL     |
| GFSK | 2402.00     | /                |                 |                       |          | 90.15                 | 94.00          | -3.85       | Average       | VERTICAL     |
| GFSK | 2440.00     | 101.99           | 3.90            | 27.58                 | -38.26   | 95.21                 | 114.00         | -18.79      | Peak          | HORIZONTAL   |
| GFSK | 2440.00     | /                |                 |                       |          | 85.47                 | 94.00          | -8.53       | Average       | HORIZONTAL   |
| GFSK | 2440.00     | 103.72           | 3.90            | 27.58                 | -38.26   | 96.94                 | 114.00         | -17.06      | Peak          | VERTICAL     |
| GFSK | 2440.00     | /                |                 |                       |          | 87.20                 | 94.00          | -6.80       | Average       | VERTICAL     |
| GFSK | 2481.00     | 103.21           | 3.94            | 27.72                 | -40.23   | 94.64                 | 114.00         | -19.36      | Peak          | HORIZONTAL   |
| GFSK | 2481.00     | /                |                 |                       |          | 84.90                 | 94.00          | -9.10       | Average       | HORIZONTAL   |
| GFSK | 2481.00     | 108.04           | 3.94            | 27.72                 | -40.23   | 99.47                 | 114.00         | -14.53      | Peak          | VERTICAL     |
| GFSK | 2481.00     | /                |                 |                       |          | 89.73                 | 94.00          | -4.27       | Average       | VERTICAL     |

Note: Peak Result Level = Read Level + Cable loss + Antenna Factor + AMP.

Average Result Level = Peak Result Level - Duty Cycle Factor

## Radiated Emission test (below 1 GHz)

## TR-4-E-009 Radiated Emission Test Result

Test Date: 2023-07-29

Tested By: Bairong

EUT: 3.1CH Soundbar with Wireless Subwoofer

Model Number: CINEMA SB550

Test Mode: Tx mode

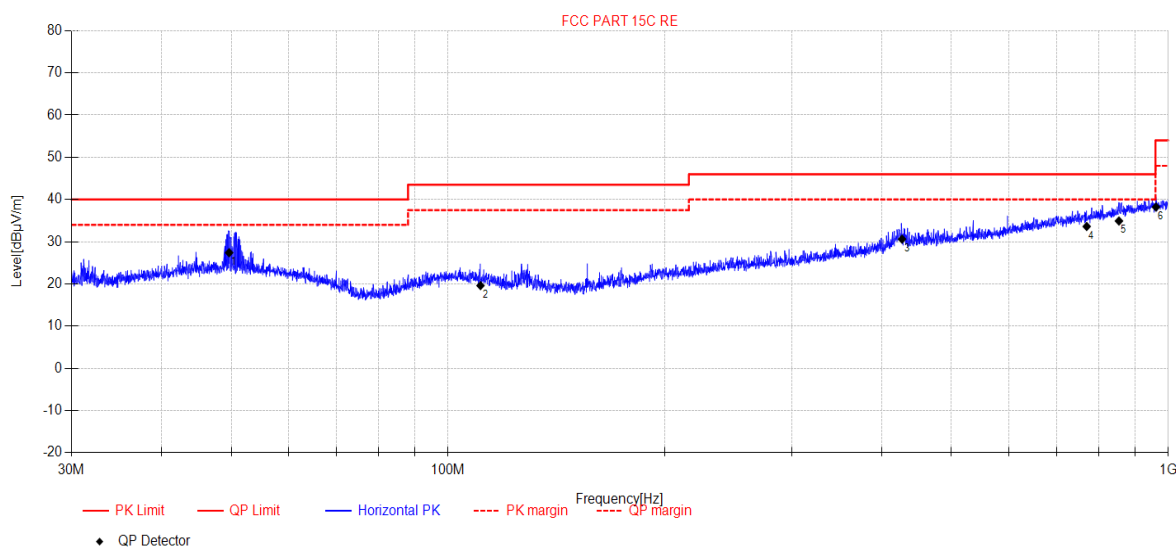
Power Supply: AC 120V/60Hz

Condition: Temp:21.7°C;Humi:64.9%

Test Site: DDT 3# Chamber

File Path: d:\ts\2023 report data\Q23071315-2E SB550\FCC BELOW 1G\20230729-201928\_H

Memo:



| Final Data List |             |                  |                     |                 |          |                 |                |             |          |            |
|-----------------|-------------|------------------|---------------------|-----------------|----------|-----------------|----------------|-------------|----------|------------|
| NO.             | Freq. [MHz] | Reading [dBμV/m] | Antenna Factor [dB] | Cable Loss [dB] | AMP [dB] | Result [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Detector | Polarity   |
| 1               | 49.67       | 9.55             | 13.13               | 4.73            | 0.00     | 27.41           | 40.00          | 12.59       | QP       | Horizontal |
| 2               | 110.93      | 4.17             | 10.31               | 5.12            | 0.00     | 19.60           | 43.50          | 23.90       | QP       | Horizontal |
| 3               | 426.89      | 8.06             | 15.80               | 6.76            | 0.00     | 30.62           | 46.00          | 15.38       | QP       | Horizontal |
| 4               | 770.41      | 4.79             | 20.91               | 7.91            | 0.00     | 33.61           | 46.00          | 12.39       | QP       | Horizontal |
| 5               | 854.05      | 4.77             | 21.98               | 8.17            | 0.00     | 34.92           | 46.00          | 11.08       | QP       | Horizontal |
| 6               | 961.50      | 6.92             | 22.73               | 8.56            | 0.00     | 38.21           | 54.00          | 15.79       | QP       | Horizontal |

Note:

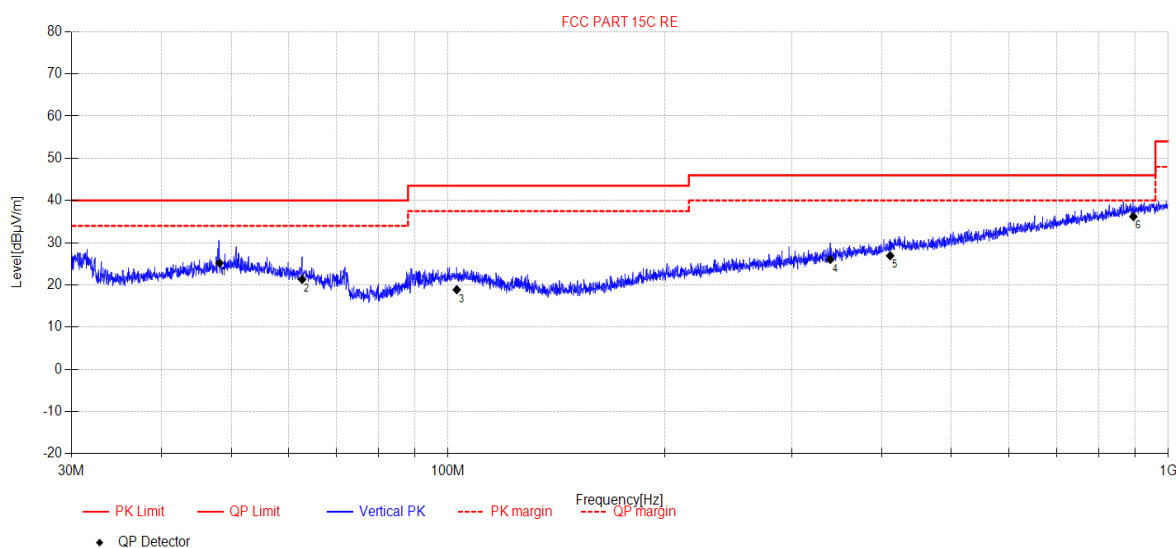
1. Result Level = Reading + Cable loss + Antenna Factor + AMP
2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

## TR-4-E-009 Radiated Emission Test Result

**Test Date:** 2023-07-29  
**EUT:** 3.1CH Soundbar with Wireless Subwoofer  
**Test Mode:** Tx mode  
**Condition:** Temp:21.7°C;Humi:64.9%  
**File Path:** d:\ts\2023 report data\Q23071315-2E SB550\FCC BELOW 1G\20230729-202014\_V

**Tested By:** Bairong  
**Model Number:** CINEMA SB550  
**Power Supply:** AC 120V/60Hz  
**Test Site:** DDT 3# Chamber

### Memo:



### Final Data List

| NO. | Freq. [MHz] | Reading [dBμV/m] | Antenna Factor [dB] | Cable Loss [dB] | AMP [dB] | Result [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Detector | Polarity |
|-----|-------------|------------------|---------------------|-----------------|----------|-----------------|----------------|-------------|----------|----------|
| 1   | 48.16       | 7.28             | 13.20               | 4.71            | 0.00     | 25.19           | 40.00          | 14.81       | QP       | Vertical |
| 2   | 62.73       | 5.36             | 11.18               | 4.77            | 0.00     | 21.31           | 40.00          | 18.69       | QP       | Vertical |
| 3   | 102.84      | 2.79             | 11.00               | 5.08            | 0.00     | 18.87           | 43.50          | 24.63       | QP       | Vertical |
| 4   | 339.42      | 5.28             | 14.38               | 6.37            | 0.00     | 26.03           | 46.00          | 19.97       | QP       | Vertical |
| 5   | 411.03      | 4.59             | 15.60               | 6.73            | 0.00     | 26.92           | 46.00          | 19.08       | QP       | Vertical |
| 6   | 894.50      | 5.47             | 22.40               | 8.32            | 0.00     | 36.19           | 46.00          | 9.81        | QP       | Vertical |

### Note:

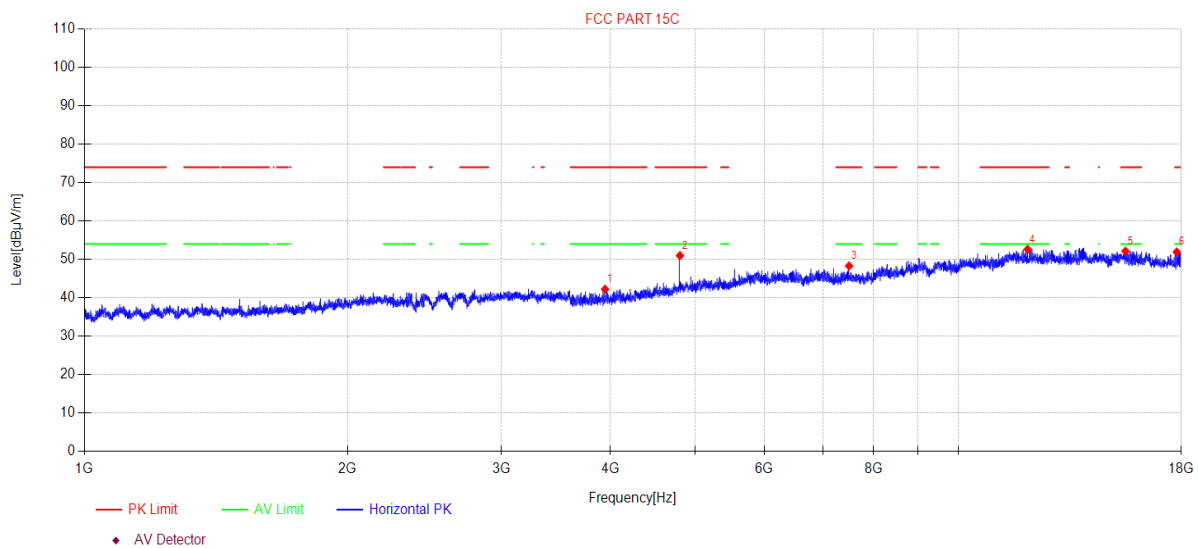
- Result Level = Reading + Cable loss + Antenna Factor + AMP
- If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
- Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

## Radiated Emission test (above 1 GHz)

## TR-4-E-009 Radiated Emission Test Result

**Test Date:** 2023-08-08 **Tested By:** Bairong  
**EUT:** 3.1CH Soundbar with Wireless Subwoofer **Model Number:** CINEMA SB550  
**Test Mode:** Tx mode **Power Supply:** AC 120V/60Hz  
**Condition:** Temp:21.7°C;Humi:64.9% **Test Site:** DDT 3# Chamber  
**File Path:** d:\ts\2023 report data\Q23071315-2E SB550\FCC ABOVE 1G\19  
**Memo:** GFSK 2402MHz

## Test Graph



| Data List |             |                  |                     |                 |          |                |                |             |          |            |
|-----------|-------------|------------------|---------------------|-----------------|----------|----------------|----------------|-------------|----------|------------|
| NO.       | Freq. [MHz] | Reading [dBμV/m] | Antenna Factor [dB] | Cable loss [dB] | AMP [dB] | Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Detector | Polarity   |
| 1         | 3942.92     | 47.17            | 30.59               | 5.84            | -41.37   | 42.23          | 74.00          | 31.77       | PK       | Horizontal |
| 2         | 4803.36     | 52.36            | 32.31               | 7.47            | -41.16   | 50.98          | 74.00          | 23.02       | PK       | Horizontal |
| 3         | 7500.47     | 45.25            | 36.40               | 7.65            | -41.00   | 48.30          | 74.00          | 25.70       | PK       | Horizontal |
| 4         | 12006.78    | 42.08            | 38.91               | 10.54           | -38.91   | 52.62          | 74.00          | 21.38       | PK       | Horizontal |
| 5         | 15537.66    | 39.90            | 38.52               | 13.79           | -40.08   | 52.13          | 74.00          | 21.87       | PK       | Horizontal |
| 6         | 17782.83    | 39.29            | 40.38               | 12.87           | -40.61   | 51.93          | 74.00          | 22.07       | PK       | Horizontal |

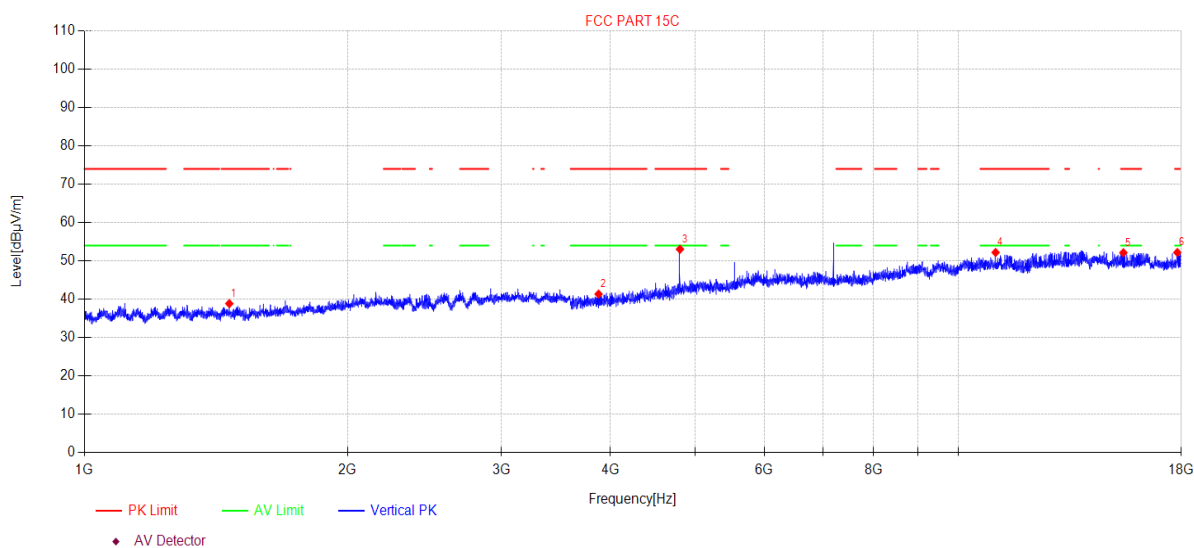
Note:

- Level = Reading + Cable loss + Antenna Factor + AMP
- If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

## TR-4-E-009 Radiated Emission Test Result

**Test Date:** 2023-08-08 **Tested By:** Bairong  
**EUT:** 3.1CH Soundbar with Wireless Subwoofer **Model Number:** CINEMA SB550  
**Test Mode:** Tx mode **Power Supply:** AC 120V/60Hz  
**Condition:** Temp:21.7°C;Humi:64.9% **Test Site:** DDT 3# Chamber  
**File Path:** d:\ts\2023 report data\Q23071315-2E SB550\FCC ABOVE 1G\20  
**Memo:** GFSK 2402MHz

### Test Graph



| Data List |             |                  |                     |                 |          |                |                |             |          |          |
|-----------|-------------|------------------|---------------------|-----------------|----------|----------------|----------------|-------------|----------|----------|
| NO.       | Freq. [MHz] | Reading [dBμV/m] | Antenna Factor [dB] | Cable loss [dB] | AMP [dB] | Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Detector | Polarity |
| 1         | 1464.89     | 47.82            | 25.57               | 4.38            | -38.90   | 38.87          | 74.00          | 35.13       | PK       | Vertical |
| 2         | 3876.26     | 46.42            | 30.45               | 5.82            | -41.33   | 41.36          | 74.00          | 32.64       | PK       | Vertical |
| 3         | 4803.36     | 54.42            | 32.31               | 7.47            | -41.16   | 53.04          | 74.00          | 20.96       | PK       | Vertical |
| 4         | 11035.10    | 43.86            | 39.10               | 9.68            | -40.44   | 52.20          | 74.00          | 21.80       | PK       | Vertical |
| 5         | 15452.57    | 40.11            | 38.65               | 13.40           | -40.02   | 52.14          | 74.00          | 21.86       | PK       | Vertical |
| 6         | 17813.69    | 39.33            | 40.60               | 12.91           | -40.63   | 52.21          | 74.00          | 21.79       | PK       | Vertical |

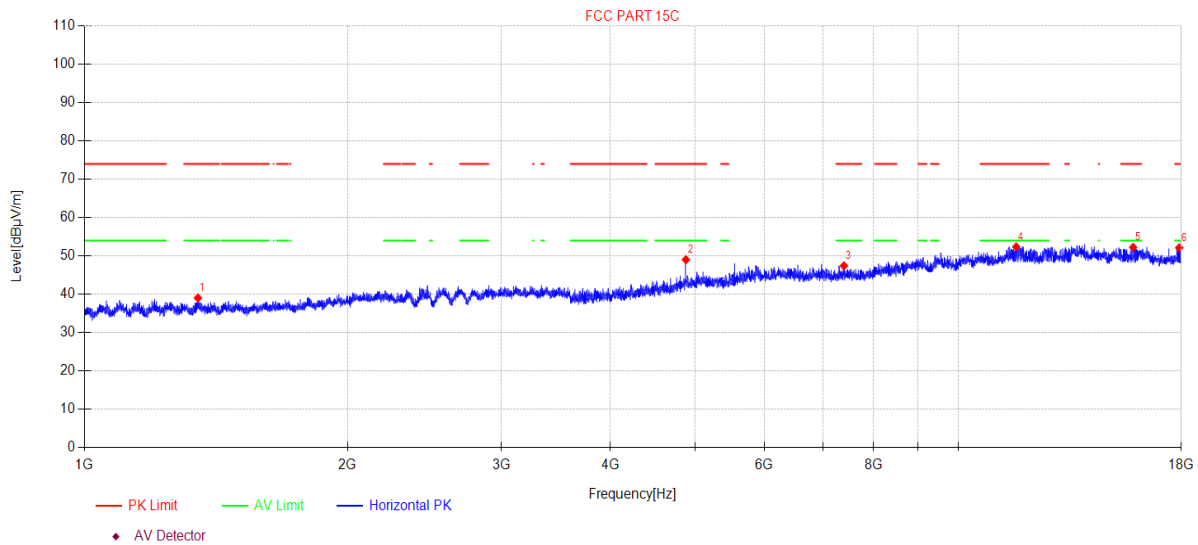
#### Note:

1. Level = Reading + Cable loss + Antenna Factor + AMP
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

## TR-4-E-009 Radiated Emission Test Result

**Test Date:** 2023-08-08 **Tested By:** Bairong  
**EUT:** 3.1CH Soundbar with Wireless Subwoofer **Model Number:** CINEMA SB550  
**Test Mode:** Tx mode **Power Supply:** AC 120V/60Hz  
**Condition:** Temp:21.7°C;Humi:64.9% **Test Site:** DDT 3# Chamber  
**File Path:** d:\ts\2023 report data\Q23071315-2E SB550\FCC ABOVE 1G\21  
**Memo:** GFSK 2440MHz

### Test Graph



| Data List |             |                  |                     |                 |          |                |                |             |          |            |
|-----------|-------------|------------------|---------------------|-----------------|----------|----------------|----------------|-------------|----------|------------|
| NO.       | Freq. [MHz] | Reading [dBμV/m] | Antenna Factor [dB] | Cable loss [dB] | AMP [dB] | Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Detector | Polarity   |
| 1         | 1348.68     | 48.14            | 25.60               | 4.02            | -38.72   | 39.04          | 74.00          | 34.96       | PK       | Horizontal |
| 2         | 4878.91     | 49.98            | 32.56               | 7.63            | -41.14   | 49.03          | 74.00          | 24.97       | PK       | Horizontal |
| 3         | 7399.28     | 44.27            | 36.50               | 7.64            | -41.00   | 47.41          | 74.00          | 26.59       | PK       | Horizontal |
| 4         | 11651.26    | 42.76            | 38.85               | 10.23           | -39.46   | 52.38          | 74.00          | 21.62       | PK       | Horizontal |
| 5         | 15855.19    | 39.19            | 38.14               | 15.22           | -40.30   | 52.25          | 74.00          | 21.75       | PK       | Horizontal |
| 6         | 17901.43    | 38.56            | 41.21               | 13.01           | -40.66   | 52.12          | 74.00          | 21.88       | PK       | Horizontal |

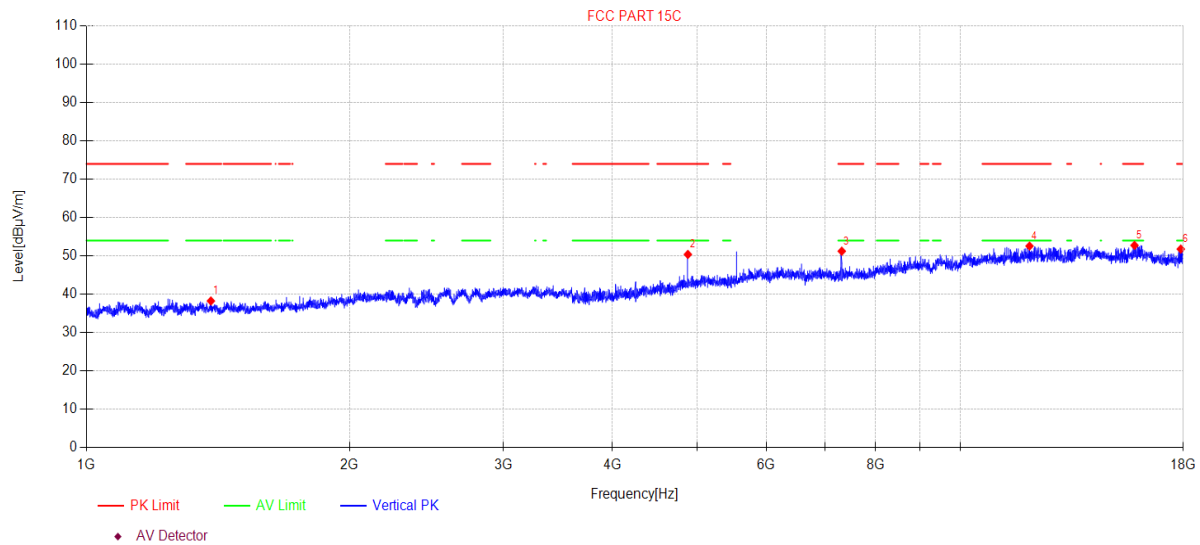
#### Note:

1. Level = Reading + Cable loss + Antenna Factor + AMP
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

## TR-4-E-009 Radiated Emission Test Result

**Test Date:** 2023-08-08 **Tested By:** Bairong  
**EUT:** 3.1CH Soundbar with Wireless Subwoofer **Model Number:** CINEMA SB550  
**Test Mode:** Tx mode **Power Supply:** AC 120V/60Hz  
**Condition:** Temp:21.7°C;Humi:64.9% **Test Site:** DDT 3# Chamber  
**File Path:** d:\ts\2023 report data\Q23071315-2E SB550\FCC ABOVE 1G\22  
**Memo:** GFSK 2440MHz

### Test Graph



| Data List |             |                  |                     |                 |          |                |                |             |          |          |
|-----------|-------------|------------------|---------------------|-----------------|----------|----------------|----------------|-------------|----------|----------|
| NO.       | Freq. [MHz] | Reading [dBμV/m] | Antenna Factor [dB] | Cable loss [dB] | AMP [dB] | Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Detector | Polarity |
| 1         | 1388.22     | 47.30            | 25.60               | 4.14            | -38.78   | 38.26          | 74.00          | 35.74       | PK       | Vertical |
| 2         | 4878.91     | 51.34            | 32.56               | 7.63            | -41.14   | 50.39          | 74.00          | 23.61       | PK       | Vertical |
| 3         | 7318.46     | 48.10            | 36.50               | 7.63            | -41.00   | 51.23          | 74.00          | 22.77       | PK       | Vertical |
| 4         | 12003.31    | 42.02            | 38.91               | 10.54           | -38.90   | 52.57          | 74.00          | 21.43       | PK       | Vertical |
| 5         | 15827.72    | 39.76            | 38.17               | 15.10           | -40.28   | 52.75          | 74.00          | 21.25       | PK       | Vertical |
| 6         | 17880.75    | 38.37            | 41.07               | 12.99           | -40.65   | 51.78          | 74.00          | 22.22       | PK       | Vertical |

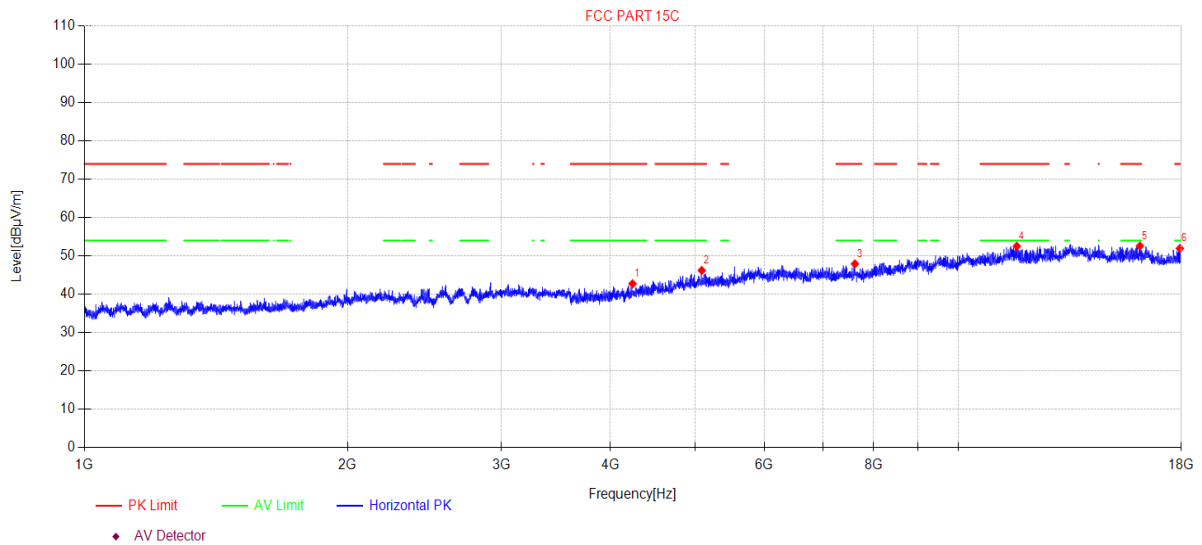
#### Note:

1. Level = Reading + Cable loss + Antenna Factor + AMP
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

## TR-4-E-009 Radiated Emission Test Result

**Test Date:** 2023-08-08 **Tested By:** Bairong  
**EUT:** 3.1CH Soundbar with Wireless Subwoofer **Model Number:** CINEMA SB550  
**Test Mode:** Tx mode **Power Supply:** AC 120V/60Hz  
**Condition:** Temp:21.7°C;Humi:64.9% **Test Site:** DDT 3# Chamber  
**File Path:** d:\ts\2023 report data\Q23071315-2E SB550\FCC ABOVE 1G\23  
**Memo:** GFSK 2481MHz

### Test Graph



| Data List |             |                  |                     |                 |          |                |                |             |          |            |
|-----------|-------------|------------------|---------------------|-----------------|----------|----------------|----------------|-------------|----------|------------|
| NO.       | Freq. [MHz] | Reading [dBμV/m] | Antenna Factor [dB] | Cable loss [dB] | AMP [dB] | Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Detector | Polarity   |
| 1         | 4238.35     | 46.56            | 31.18               | 6.33            | -41.33   | 42.74          | 74.00          | 31.26       | PK       | Horizontal |
| 2         | 5087.71     | 46.39            | 32.90               | 7.99            | -41.06   | 46.22          | 74.00          | 27.78       | PK       | Horizontal |
| 3         | 7616.24     | 44.85            | 36.43               | 7.65            | -41.00   | 47.93          | 74.00          | 26.07       | PK       | Horizontal |
| 4         | 11668.11    | 42.89            | 38.83               | 10.24           | -39.43   | 52.53          | 74.00          | 21.47       | PK       | Horizontal |
| 5         | 16141.86    | 39.90            | 37.76               | 15.32           | -40.39   | 52.59          | 74.00          | 21.41       | PK       | Horizontal |
| 6         | 17932.50    | 38.19            | 41.39               | 13.05           | -40.67   | 51.96          | 74.00          | 22.04       | PK       | Horizontal |

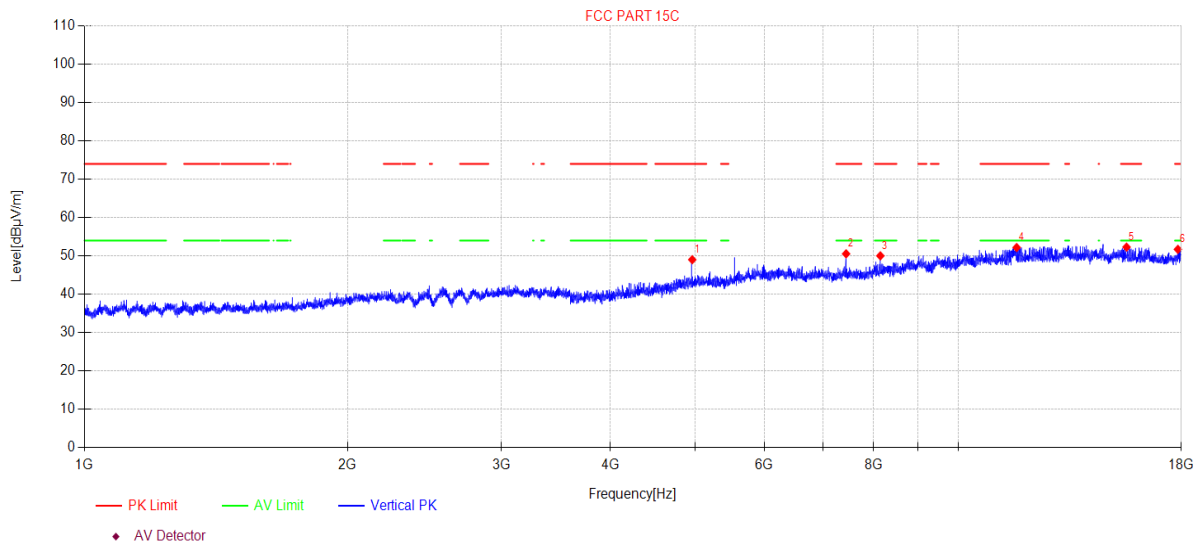
#### Note:

1. Level = Reading + Cable loss + Antenna Factor + AMP
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

## TR-4-E-009 Radiated Emission Test Result

**Test Date:** 2023-08-08 **Tested By:** Bairong  
**EUT:** 3.1CH Soundbar with Wireless Subwoofer **Model Number:** CINEMA SB550  
**Test Mode:** Tx mode **Power Supply:** AC 120V/60Hz  
**Condition:** Temp:21.7°C;Humi:64.9% **Test Site:** DDT 3# Chamber  
**File Path:** d:\ts\2023 report data\Q23071315-2E SB550\FCC ABOVE 1G\24  
**Memo:** GFSK 2481MHz

### Test Graph



| Data List |             |                  |                     |                 |          |                |                |             |          |          |
|-----------|-------------|------------------|---------------------|-----------------|----------|----------------|----------------|-------------|----------|----------|
| NO.       | Freq. [MHz] | Reading [dBμV/m] | Antenna Factor [dB] | Cable loss [dB] | AMP [dB] | Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Detector | Polarity |
| 1         | 4961.38     | 49.54            | 32.80               | 7.79            | -41.11   | 49.02          | 74.00          | 24.98       | PK       | Vertical |
| 2         | 7442.17     | 47.41            | 36.50               | 7.64            | -41.00   | 50.55          | 74.00          | 23.45       | PK       | Vertical |
| 3         | 8144.42     | 45.97            | 37.00               | 7.83            | -40.77   | 50.03          | 74.00          | 23.97       | PK       | Vertical |
| 4         | 11664.74    | 42.55            | 38.84               | 10.24           | -39.44   | 52.19          | 74.00          | 21.81       | PK       | Vertical |
| 5         | 15582.63    | 39.99            | 38.43               | 13.99           | -40.11   | 52.30          | 74.00          | 21.70       | PK       | Vertical |
| 6         | 17839.45    | 38.63            | 40.78               | 12.94           | -40.64   | 51.71          | 74.00          | 22.29       | PK       | Vertical |

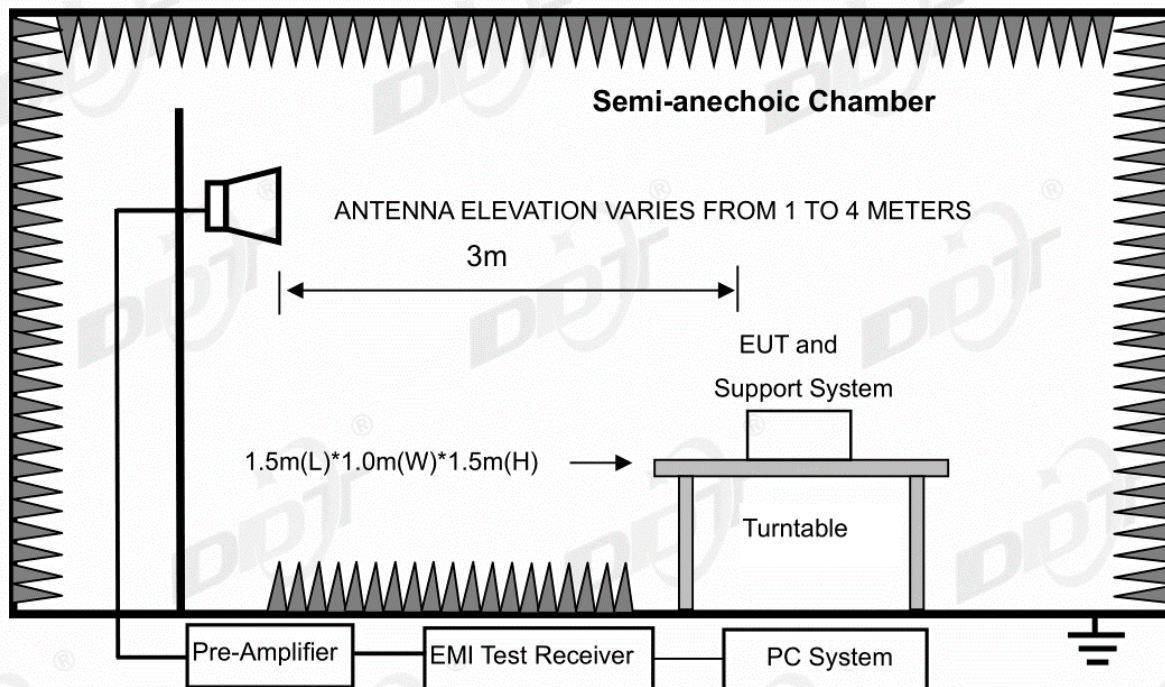
#### Note:

- Level = Reading + Cable loss + Antenna Factor + AMP
- If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

## 7. Band Edge Compliance (Radiated Method)

### 7.1. Block diagram of test setup

In 3 m Anechoic Chamber, test setup diagram for frequency above 1 GHz:



### 7.2. Limit

All restriction band should comply with 15.209 and RSS-Gen section 8.9 limits, other emission should be at least 20 dB below the fundamental.

### 7.3. Test Procedure

- Same with Radiated Emission except change investigated frequency range from 2310 MHz to 2410 MHz and 2475 MHz to 2500 MHz.

Remark: All restriction band have been tested, and only the worst case is shown in report.

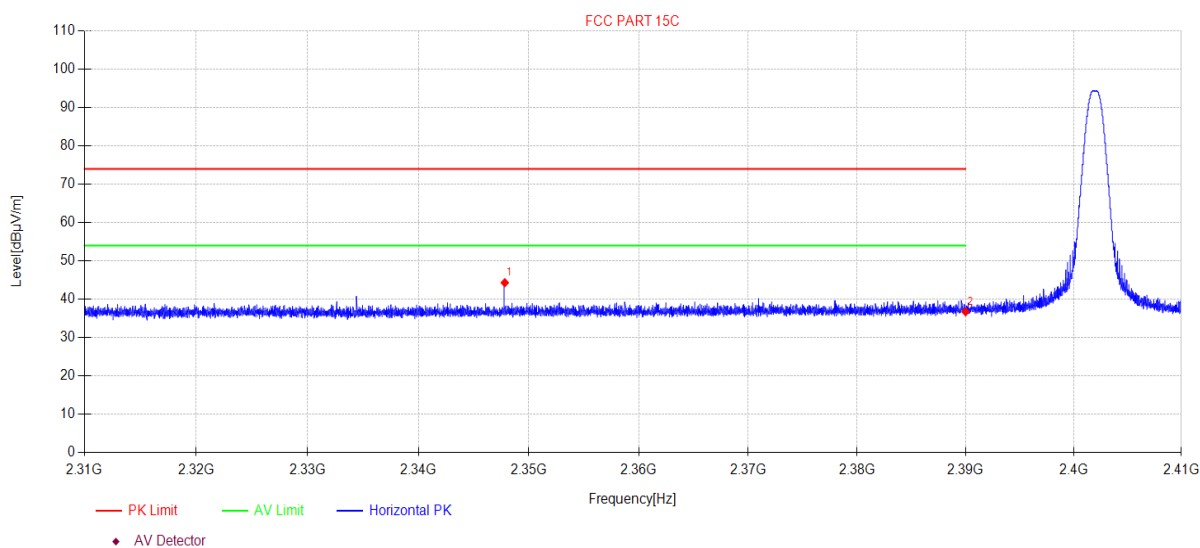
### 7.4. Test result

Pass. (See below detailed test result)

## TR-4-E-009 Radiated Emission Test Result

**Test Date:** 2023-08-08 **Tested By:** Bairong  
**EUT:** 3.1CH Soundbar with Wireless Subwoofer **Model Number:** CINEMA SB550  
**Test Mode:** Tx mode **Power Supply:** AC 120V/60Hz  
**Condition:** Temp:21.7°C;Humi:64.9% **Test Site:** DDT 3# Chamber  
**File Path:** d:\ts\2023 report data\Q23071315-2E SB550\FCC ABOVE 1G\25  
**Memo:** GFSK 2402MHz

### Test Graph



| Data List |             |                  |                     |                 |          |                |                |             |          |            |
|-----------|-------------|------------------|---------------------|-----------------|----------|----------------|----------------|-------------|----------|------------|
| NO.       | Freq. [MHz] | Reading [dBμV/m] | Antenna Factor [dB] | Cable loss [dB] | AMP [dB] | Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Detector | Polarity   |
| 1         | 2347.82     | 53.17            | 27.40               | 3.83            | -40.08   | 44.32          | 74.00          | 29.68       | PK       | Horizontal |
| 2         | 2390.00     | 45.52            | 27.48               | 3.87            | -40.13   | 36.74          | 74.00          | 37.26       | PK       | Horizontal |

| Data List |             |                     |                 |          |                |          |            |
|-----------|-------------|---------------------|-----------------|----------|----------------|----------|------------|
| NO.       | Freq. [MHz] | Antenna Factor [dB] | Cable loss [dB] | AMP [dB] | Limit [dBμV/m] | Detector | Polarity   |
| 1         | 2401.82     | 27.50               | 3.88            | -40.14   | 52.22          | AV       | Horizontal |

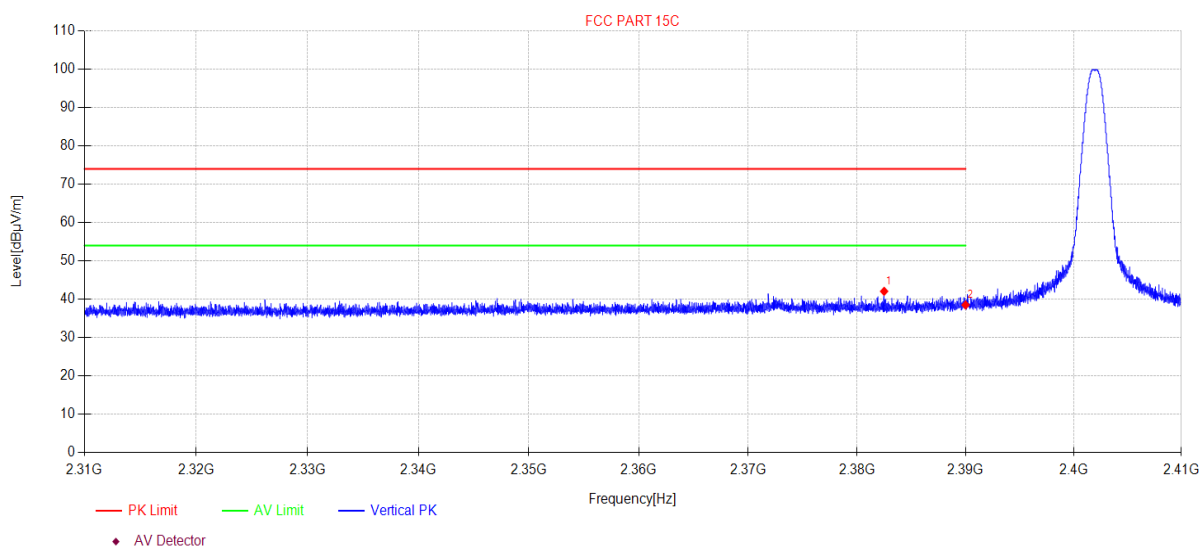
Note:

1. Level = Reading + Cable loss + Antenna Factor + AMP
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

## TR-4-E-009 Radiated Emission Test Result

**Test Date:** 2023-08-08 **Tested By:** Bairong  
**EUT:** 3.1CH Soundbar with Wireless Subwoofer **Model Number:** CINEMA SB550  
**Test Mode:** Tx mode **Power Supply:** AC 120V/60Hz  
**Condition:** Temp:21.7°C;Humi:64.9% **Test Site:** DDT 3# Chamber  
**File Path:** d:\ts\2023 report data\Q23071315-2E SB550\FCC ABOVE 1G\26  
**Memo:** GFSK 2402MHz

### Test Graph



| Data List |             |                  |                     |                 |          |                |                |             |          |          |
|-----------|-------------|------------------|---------------------|-----------------|----------|----------------|----------------|-------------|----------|----------|
| NO.       | Freq. [MHz] | Reading [dBμV/m] | Antenna Factor [dB] | Cable loss [dB] | AMP [dB] | Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Detector | Polarity |
| 1         | 2382.49     | 50.88            | 27.46               | 3.86            | -40.12   | 42.08          | 74.00          | 31.92       | PK       | Vertical |
| 2         | 2390.00     | 47.30            | 27.48               | 3.87            | -40.13   | 38.52          | 74.00          | 35.48       | PK       | Vertical |

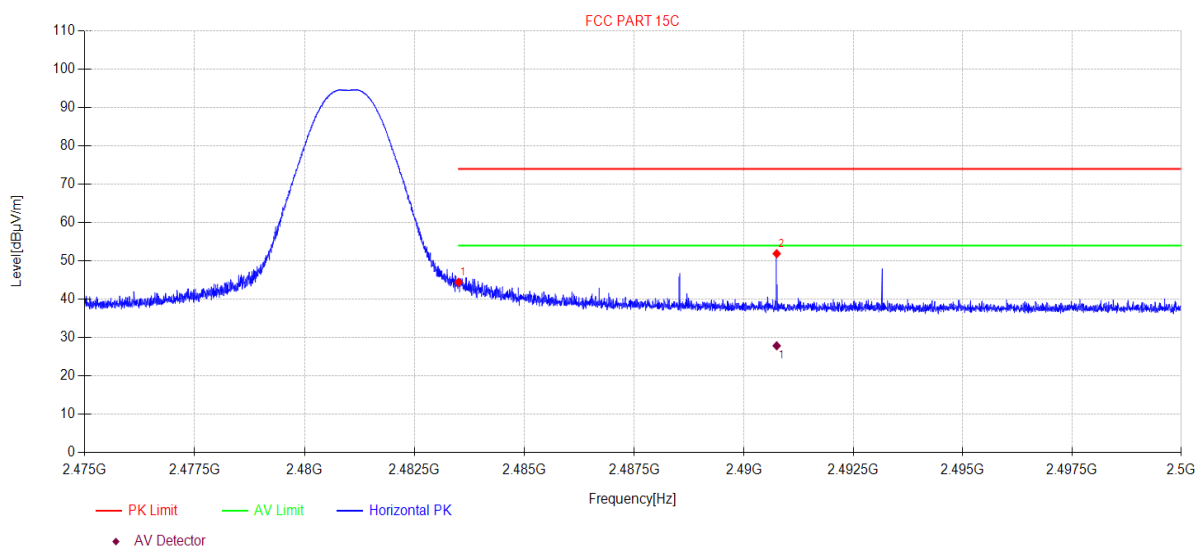
### Note:

1. Level = Reading + Cable loss + Antenna Factor + AMP
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

## TR-4-E-009 Radiated Emission Test Result

**Test Date:** 2023-08-08 **Tested By:** Bairong  
**EUT:** 3.1CH Soundbar with Wireless Subwoofer **Model Number:** CINEMA SB550  
**Test Mode:** Tx mode **Power Supply:** AC 120V/60Hz  
**Condition:** Temp:21.7°C;Humi:64.9% **Test Site:** DDT 3# Chamber  
**File Path:** d:\ts\2023 report data\Q23071315-2E SB550\FCC ABOVE 1G\27  
**Memo:** GFSK 2481MHz

### Test Graph



| Data List |             |                  |                     |                 |          |                |                |             |          |            |
|-----------|-------------|------------------|---------------------|-----------------|----------|----------------|----------------|-------------|----------|------------|
| NO.       | Freq. [MHz] | Reading [dBμV/m] | Antenna Factor [dB] | Cable loss [dB] | AMP [dB] | Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Detector | Polarity   |
| 1         | 2483.50     | 53.02            | 27.73               | 3.94            | -40.23   | 44.46          | 74.00          | 29.54       | PK       | Horizontal |
| 2         | 2490.75     | 60.43            | 27.76               | 3.94            | -40.24   | 51.89          | 74.00          | 22.11       | PK       | Horizontal |

| Data List |             |                  |                     |                 |          |                |                |             |          |            |
|-----------|-------------|------------------|---------------------|-----------------|----------|----------------|----------------|-------------|----------|------------|
| NO.       | Freq. [MHz] | Reading [dBμV/m] | Antenna Factor [dB] | Cable loss [dB] | AMP [dB] | Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Detector | Polarity   |
| 1         | 2490.75     | 36.42            | 27.76               | 3.94            | -40.24   | 27.88          | 54.00          | 26.12       | AV       | Horizontal |

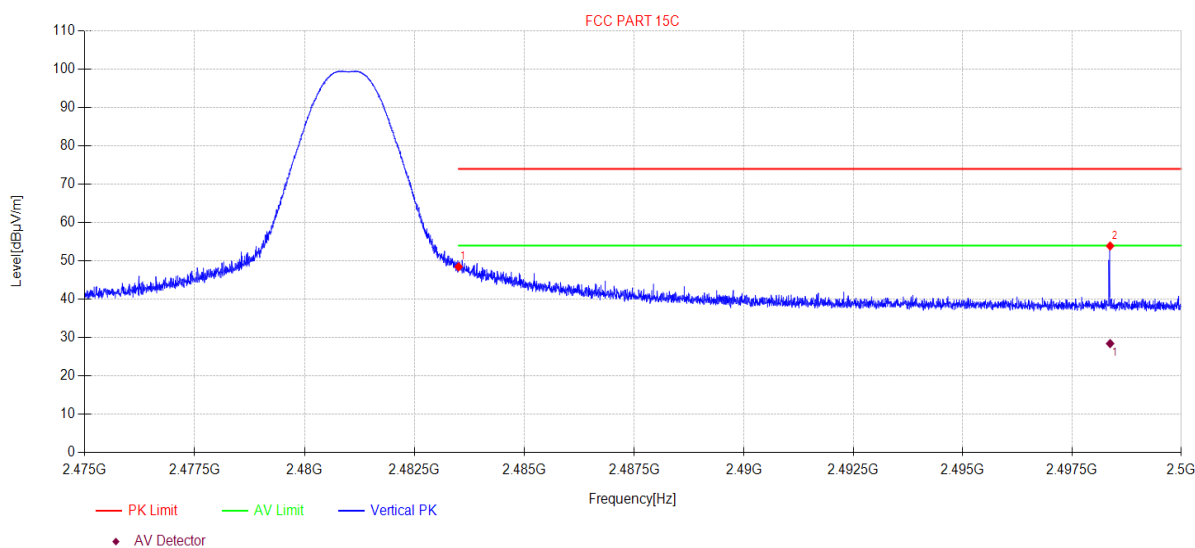
Note:

- Level = Reading + Cable loss + Antenna Factor + AMP
- If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

## TR-4-E-009 Radiated Emission Test Result

**Test Date:** 2023-08-08 **Tested By:** Bairong  
**EUT:** 3.1CH Soundbar with Wireless Subwoofer **Model Number:** CINEMA SB550  
**Test Mode:** Tx mode **Power Supply:** AC 120V/60Hz  
**Condition:** Temp:21.7°C;Humi:64.9% **Test Site:** DDT 3# Chamber  
**File Path:** d:\ts\2023 report data\Q23071315-2E SB550\FCC ABOVE 1G\28  
**Memo:** GFSK 2481MHz

### Test Graph



| Data List |             |                  |                     |                 |          |                |                |             |          |          |
|-----------|-------------|------------------|---------------------|-----------------|----------|----------------|----------------|-------------|----------|----------|
| NO.       | Freq. [MHz] | Reading [dBμV/m] | Antenna Factor [dB] | Cable loss [dB] | AMP [dB] | Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Detector | Polarity |
| 1         | 2483.50     | 57.03            | 27.73               | 3.94            | -40.23   | 48.47          | 74.00          | 25.53       | PK       | Vertical |
| 2         | 2498.37     | 62.40            | 27.79               | 3.95            | -40.25   | 53.89          | 74.00          | 20.11       | PK       | Vertical |

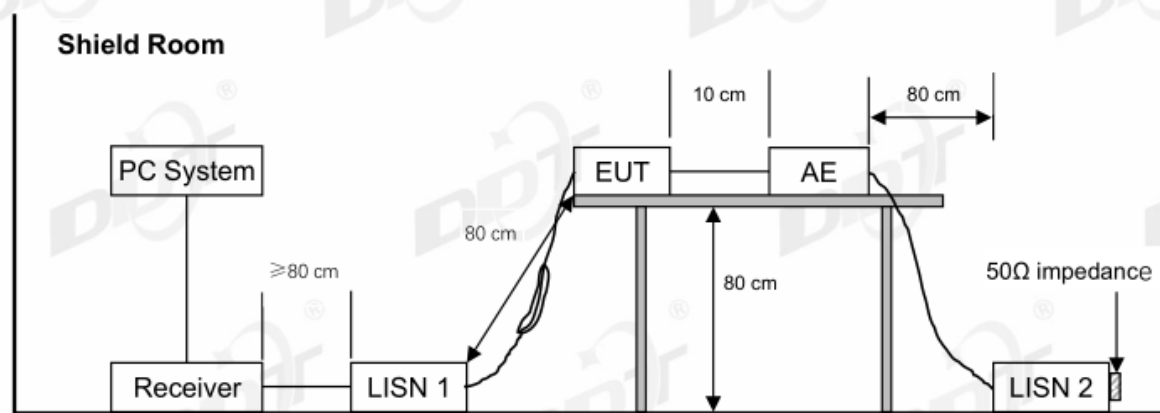
| Data List |             |                  |                     |                 |          |                |                |             |          |          |
|-----------|-------------|------------------|---------------------|-----------------|----------|----------------|----------------|-------------|----------|----------|
| NO.       | Freq. [MHz] | Reading [dBμV/m] | Antenna Factor [dB] | Cable loss [dB] | AMP [dB] | Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Detector | Polarity |
| 1         | 2498.37     | 36.97            | 27.79               | 3.95            | -40.25   | 28.46          | 54.00          | 25.54       | AV       | Vertical |

Note:

- Level = Reading + Cable loss + Antenna Factor + AMP
- If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

## 8. Power Line Conducted Emission

### 8.1. Block diagram of test setup



### 8.2. Power line conducted emission limits

| Frequency         | Quasi-Peak Level<br>dB( $\mu$ V) | Average Level<br>dB( $\mu$ V) |
|-------------------|----------------------------------|-------------------------------|
| 150 kHz ~ 500 kHz | 66 ~ 56*                         | 56 ~ 46*                      |
| 500 kHz ~ 5 MHz   | 56                               | 46                            |
| 5 MHz ~ 30 MHz    | 60                               | 50                            |

Note 1: \* Decreasing linearly with logarithm of frequency.

Note 2: The lower limit shall apply at the transition frequencies.

### 8.3. Test procedure

The EUT and Support equipment, if needed, were put placed on a non-metallic table, 80cm above the ground plane.

All support equipment power received from a second LISN.

Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.

The Receiver scanned from 150 kHz to 30 MHz for emissions in each of the test modes.

During the above scans, the emissions were maximized by cable manipulation.

The test mode(s) described in clause 2.4 were scanned during the preliminary test.

After the preliminary scan, we found the test mode producing the highest emission level.

The EUT configuration and worse cable configuration of the above highest emission levels were recorded for reference of the final test.

EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.

A scan was taken on both power lines, Neutral and Line, recording at least the six highest emissions.

Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.

The test data of the worst-case condition(s) was recorded.

The bandwidth of test receiver is set at 9 kHz.

#### 8.4. Test result

**Pass. (See below detailed test result)**

Note1: All emissions not reported below are too low against the prescribed limits.

Note2: “----” means Peak detection; “-----” means Average detection.

Note3: Pre-test AC conducted emission at both voltage AC 120V/60Hz and AC 240V/50Hz, recorded the worst case.

# TR-4-E-010 Conducted Emission Test Result

Test Site : DDT 5# Shield Room

D:\2023 report data\Q23071315-2E\FCC CE.EM6

Test Date : 2023-08-02

Tested By : Junchang Du

EUT : 3.1CH Soundbar with Wireless Subwoofer

Model Number : CINEMA SB550

Power Supply : AC 120V/60Hz

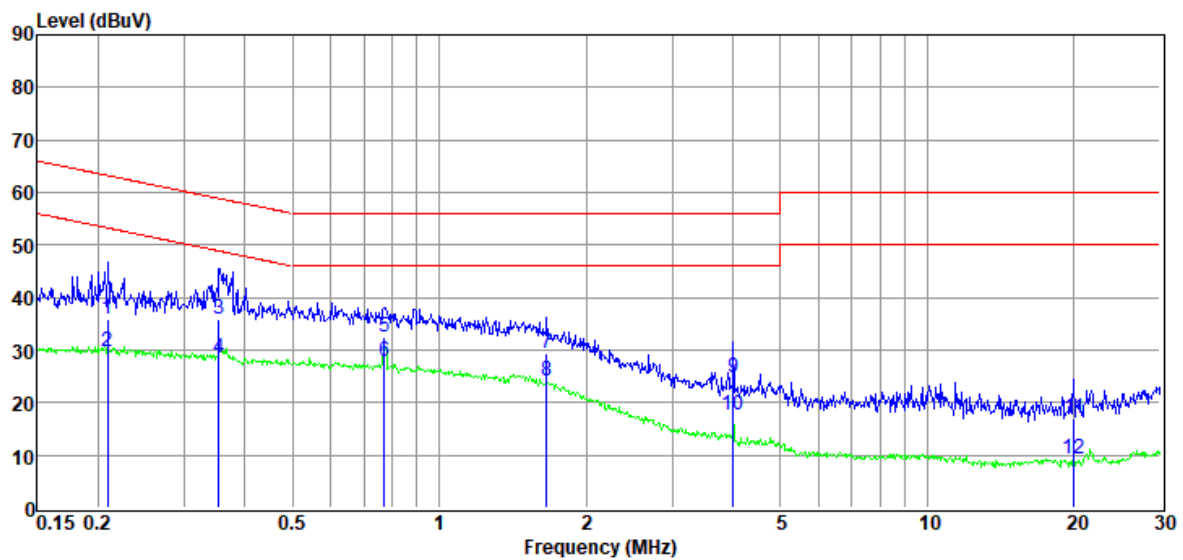
Test Mode : Tx mode

Condition : Temp:21.6°C,Humi:58.6%

LISN : 2022 ENV216 2#/LINE

Memo :

Data: 10



| Item<br>(Mark) | Freq.<br>(MHz) | Read<br>Level<br>(dBμV) | LISN<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) | Pulse<br>Limiter<br>Factor<br>(dB) | Result<br>Level<br>(dBμV) | Limit<br>Line<br>(dBμV) | Over<br>Limit<br>(dB) | Detector | Phase |
|----------------|----------------|-------------------------|------------------------|-----------------------|------------------------------------|---------------------------|-------------------------|-----------------------|----------|-------|
| 1              | 0.21           | 15.85                   | 9.80                   | 0.20                  | 10.14                              | 35.99                     | 63.23                   | -27.24                | QP       | LINE  |
| 2              | 0.21           | 9.44                    | 9.80                   | 0.20                  | 10.14                              | 29.58                     | 53.23                   | -23.65                | Average  | LINE  |
| 3              | 0.35           | 15.89                   | 9.80                   | 0.24                  | 10.09                              | 36.02                     | 58.87                   | -22.85                | QP       | LINE  |
| 4              | 0.35           | 8.40                    | 9.80                   | 0.24                  | 10.09                              | 28.53                     | 48.87                   | -20.34                | Average  | LINE  |
| 5              | 0.77           | 12.59                   | 9.77                   | 0.28                  | 9.94                               | 32.58                     | 56.00                   | -23.42                | QP       | LINE  |
| 6              | 0.77           | 7.71                    | 9.77                   | 0.28                  | 9.94                               | 27.70                     | 46.00                   | -18.30                | Average  | LINE  |
| 7              | 1.66           | 9.88                    | 9.48                   | 0.35                  | 9.77                               | 29.48                     | 56.00                   | -26.52                | QP       | LINE  |
| 8              | 1.66           | 4.66                    | 9.48                   | 0.35                  | 9.77                               | 24.26                     | 46.00                   | -21.74                | Average  | LINE  |
| 9              | 4.01           | 5.06                    | 9.30                   | 0.36                  | 9.93                               | 24.65                     | 56.00                   | -31.35                | QP       | LINE  |
| 10             | 4.01           | -2.06                   | 9.30                   | 0.36                  | 9.93                               | 17.53                     | 46.00                   | -28.47                | Average  | LINE  |
| 11             | 19.95          | -3.00                   | 9.50                   | 0.41                  | 10.05                              | 16.96                     | 60.00                   | -43.04                | QP       | LINE  |
| 12             | 19.95          | -10.69                  | 9.50                   | 0.41                  | 10.05                              | 9.27                      | 50.00                   | -40.73                | Average  | LINE  |

Note: 1. Result Level = Read Level + LISN Factor + Pulse Limiter Factor + Cable loss.

2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz).

4. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.

# TR-4-E-010 Conducted Emission Test Result

Test Site : DDT 5# Shield Room

D:\2023 report data\Q23071315-2E\FCC CE.EM6

Test Date : 2023-08-02

Tested By : Junchang Du

EUT : 3.1CH Soundbar with Wireless Subwoofer

Model Number : CINEMA SB550

Power Supply : AC 120V/60Hz

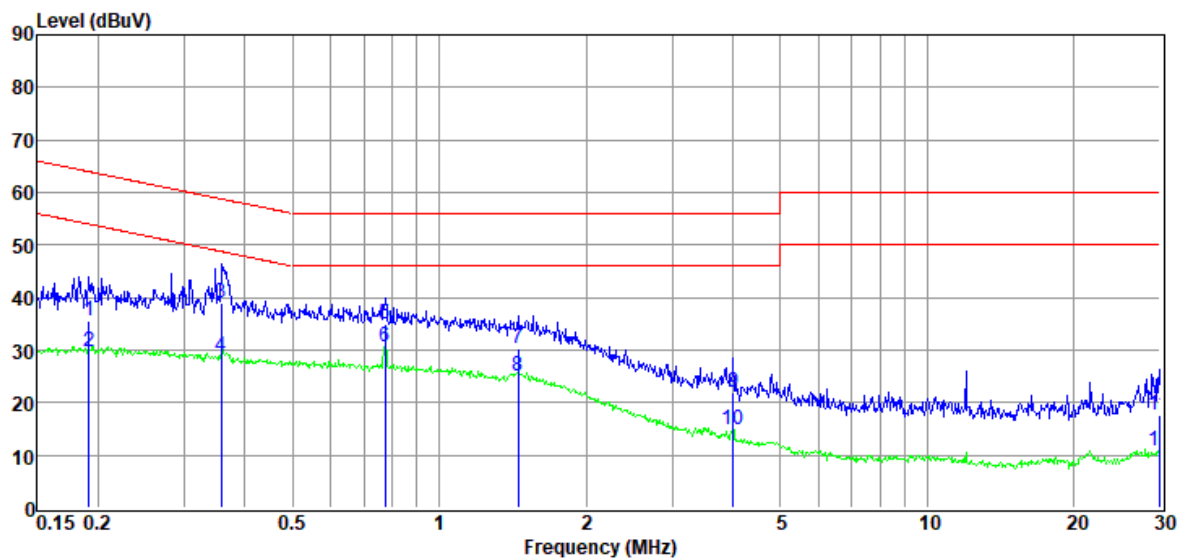
Test Mode : Tx mode

Condition : Temp:21.6°C,Humi:58.6%

LISN : 2022 ENV216 2#/NEUTRAL

Memo :

Data: 12



| Item<br>(Mark) | Freq.<br>(MHz) | Read<br>Level<br>(dBμV) | LISN<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) | Pulse<br>Limiter<br>Factor<br>(dB) | Result<br>Level<br>(dBμV) | Limit<br>Line<br>(dBμV) | Over<br>Limit<br>(dB) | Detector | Phase   |
|----------------|----------------|-------------------------|------------------------|-----------------------|------------------------------------|---------------------------|-------------------------|-----------------------|----------|---------|
| 1              | 0.19           | 15.39                   | 9.78                   | 0.19                  | 10.15                              | 35.51                     | 63.98                   | -28.47                | QP       | NEUTRAL |
| 2              | 0.19           | 9.65                    | 9.78                   | 0.19                  | 10.15                              | 29.77                     | 53.98                   | -24.21                | Average  | NEUTRAL |
| 3              | 0.36           | 18.89                   | 9.80                   | 0.24                  | 10.09                              | 39.02                     | 58.78                   | -19.76                | QP       | NEUTRAL |
| 4              | 0.36           | 8.54                    | 9.80                   | 0.24                  | 10.09                              | 28.67                     | 48.78                   | -20.11                | Average  | NEUTRAL |
| 5              | 0.78           | 14.81                   | 9.83                   | 0.28                  | 9.94                               | 34.86                     | 56.00                   | -21.14                | QP       | NEUTRAL |
| 6              | 0.78           | 10.50                   | 9.83                   | 0.28                  | 9.94                               | 30.55                     | 46.00                   | -15.45                | Average  | NEUTRAL |
| 7              | 1.45           | 10.28                   | 9.85                   | 0.35                  | 9.80                               | 30.28                     | 56.00                   | -25.72                | QP       | NEUTRAL |
| 8              | 1.45           | 4.99                    | 9.85                   | 0.35                  | 9.80                               | 24.99                     | 46.00                   | -21.01                | Average  | NEUTRAL |
| 9              | 4.01           | 1.85                    | 9.80                   | 0.36                  | 9.93                               | 21.94                     | 56.00                   | -34.06                | QP       | NEUTRAL |
| 10             | 4.01           | -5.31                   | 9.80                   | 0.36                  | 9.93                               | 14.78                     | 46.00                   | -31.22                | Average  | NEUTRAL |
| 11             | 29.84          | -2.78                   | 10.00                  | 0.42                  | 9.89                               | 17.53                     | 60.00                   | -42.47                | QP       | NEUTRAL |
| 12             | 29.84          | -9.38                   | 10.00                  | 0.42                  | 9.89                               | 10.93                     | 50.00                   | -39.07                | Average  | NEUTRAL |

Note: 1. Result Level = Read Level + LISN Factor + Pulse Limiter Factor + Cable loss.

2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz).

4. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.

## 9. Antenna Requirements

### 9.1. Limit

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

For intentional device, according to RSS-Gen issue 5 section 6.8.

The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list.

### 9.2. Result

The antenna used for this product is PCB antenna and that no antenna other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is 1.70 dBi.

## 11. Photos of the EUT

Please refer to appendix I.

**END OF REPORT**