

FCC Test Report

Product Name	Bluetooth Headset
Model No.	HSC190W

Applicant	GN Audio USA Inc.
Address	900 Chelmsfort St, Tower 2, Floor 8 , Lowell, Massachusetts, 01851 United States

Date of Receipt	Nov. 28, 2022
Issued Date	Feb. 03, 2023
Report No.	22B0954R-RFUSOTHV01-A
Report Version	V1.0



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.

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Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

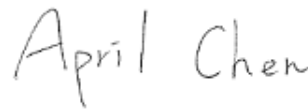
Test Report



Product Name	Bluetooth Headset
Applicant	GN Audio USA Inc.
Address	900 Chelmsfort St, Tower 2, Floor 8 , Lowell, Massachusetts, 01851 United States
Manufacturer	GN Audio A/S
Model No.	HSC190W
FCC ID.	BCE-HSC190W
EUT Rated Voltage	DC 5V by USB or DC 3.8V by Battery
EUT Test Voltage	DC 5V by USB
Trade Name	Jabra
Applicable Standard	FCC CFR Title 47 Part 15 Subpart B ANSI C63.4: 2014, ANSI C63.10: 2013
Test Result	Complied

Documented By

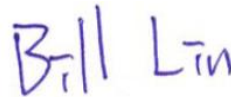
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(Senior Project Specialist / April Chen)

Tested By

:



(Senior Engineer / Bill Lin)

Approved By

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(Senior Engineer / Alan Chen)

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Appendix 1: EUT Test Photographs

Appendix 2: Product Photos-Please refer to the file: 22B0954R-Product Photos

Revision History

Report No.	Version	Description	Issued Date
22B0954R-RFUSOTHV01-A	V1.0	Initial issue of report.	Feb. 03, 2023

1. General Information

1.1. EUT Description

Product Name	Bluetooth Headset
Trade Name	Jabra
Model No.	HSC190W
FCC ID.	BCE-HSC190W
Frequency Range	2402 – 2480MHz
Number of Channels	V2.1+EDR: 79CH, V5.1: 40CH
Data Speed	1-3Mbps
Type of Modulation	V2.1+EDR: GFSK(1 Mbps) / π /4DQPSK(2 Mbps) / 8DPSK(3 Mbps) V5.1: GFSK(1 Mbps)/ (2 Mbps)
Antenna Type	PIFA
Antenna Gain	Refer to the Antenna List
Channel Control	Auto
Type C to Type C Cable	Shielded, 1.2m
Type C to USB Cable	Shielded, 1.2m
Bluetooth USB Dongle	MFR: GN Audio A/S, M/N: END050W, FCC ID: BCE-END050W
Bluetooth USB Dongle	MFR: GN Audio A/S, M/N: END060W, FCC ID: BCE-END060W
Wireless charger	MFR: GN Audio A/S, M/N: 5190004, FCC ID: BCE-5190004
Wireless charger	MFR: GN Audio A/S, M/N: WH-WI-022, FCC ID: BCE-WH-WI-022

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	GN Audio A/S	Jabra Evolve2 65 Flex	PIFA	2.66 dBi for 2400 MHz

Note: The antenna of EUT is conform to FCC 15.203.

Center Frequency of Each Channel (Bluetooth V2.1+EDR):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	01	2403	02	2404	03	2405
04	2406	05	2407	06	2408	07	2409
08	2410	09	2411	10	2412	11	2413
12	2414	13	2415	14	2416	15	2417
16	2418	17	2419	18	2420	19	2421
20	2422	21	2423	22	2424	23	2425
24	2426	25	2427	26	2428	27	2429
28	2430	29	2431	30	2432	31	2433
32	2434	33	2435	34	2436	35	2437
36	2438	37	2439	38	2440	39	2441
40	2442	41	2443	42	2444	43	2445
44	2446	45	2447	46	2448	47	2449
48	2450	49	2451	50	2452	51	2453
52	2454	53	2455	54	2456	55	2457
56	2458	57	2459	58	2460	59	2461
60	2462	61	2463	62	2464	63	2465
64	2466	65	2467	66	2468	67	2469
68	2470	69	2471	70	2472	71	2473
72	2474	73	2475	74	2476	75	2477
76	2478	77	2479	78	2480		

Center Frequency of Each Channel (Bluetooth V5.1):

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

Note:

1. The EUT is a Bluetooth Headset with a built-in Bluetooth V5.1, V2.1+EDR transceiver.
2. Regarding to the operation frequency band, the lowest, middle, and highest frequency are selected to perform the test.
3. Mono and Stereo headsets are different in the amount of the speaker only. Their Bluetooth chip and antenna is completely the same, while the duo left-hand side only holds additional beads, protection-diodes, and another speaker.
4. DEKRA has evaluated each test mode. Only the worst case is shown in the report.
5. This device is a composite device in accordance with Part 15 regulations. The function for the transmitting was measured and made a test report that the report number is 22B0954R-RFUSBT2V01-A and 22B0954R-RFUSBLEV01-A, certified under FCC ID: BCE-HSC190W.

Test Mode	Mode 1	Receive - Bluetooth-3Mbps
		Receive - BLE-2Mbps

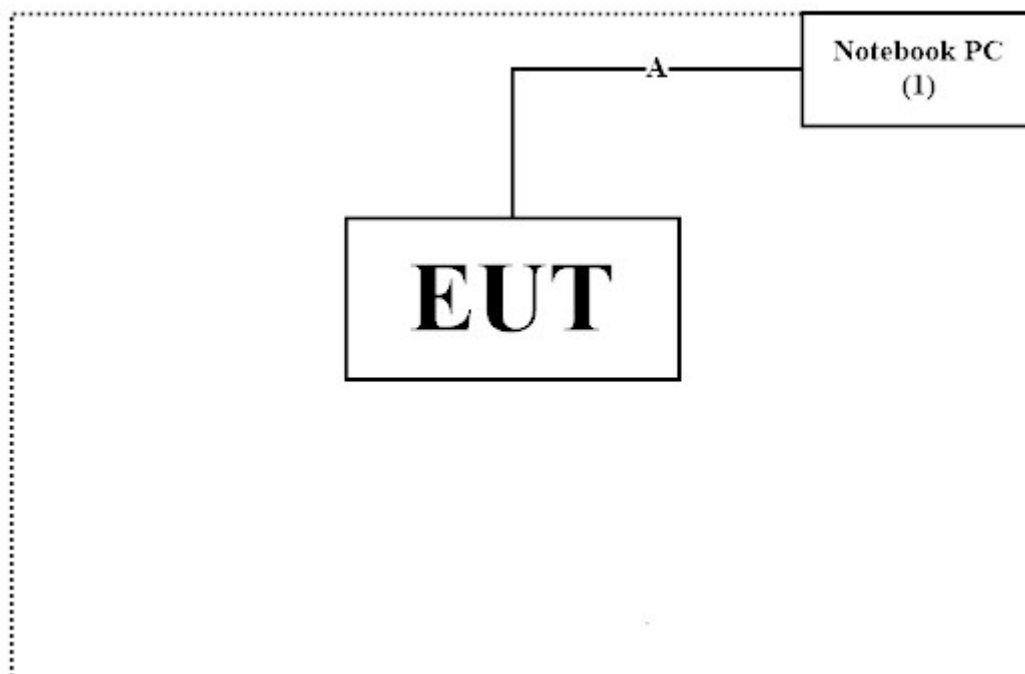
1.2. Test System Details

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

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook PC	DELL	Latitude 5580	GDZN7H2	N/A

Cable Type		Cable Description
A	Type C to USB Cable	Non-Shielded, 1.2m

1.3. Configuration of Test System



1.4. EUT Exercise Software

- (1) Setup the EUT as shown in Section 1.3.
- (2) Execute software 'Bluetest3 Ver.3.3.5' on the Notebook PC.
- (3) Configure the test mode, the test channel, and the data rate.
- (4) Press "OK" to start the continuous Transmit.
- (5) Verify that the EUT works properly.

1.5. Test Facility

Ambient conditions in the laboratory:

Performed Item	Items	Required	Actual
Conducted Emission	Temperature (°C)	10~40 °C	23.4 °C
	Humidity (%RH)	10~90 %	55.2 %
Radiated Emission	Temperature (°C)	10~40 °C	20.2 °C
	Humidity (%RH)	10~90 %	65.8 %

USA : FCC Registration Number: TW0033

Canada : CAB Identifier Number: TW3023 / Company Number: 26930

Site Description : Accredited by TAF
Accredited Number: 3023

Test Laboratory : DEKRA Testing and Certification Co., Ltd

Address : No. 5-22, Ruishukeng Linkou District, New Taipei City, 24451, Taiwan

Performed Location : No. 26, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan, R.O.C.

Phone Number : +886-3-275-7255

Fax Number : +886-3-327-8031

Email Address : info.tw@dekra.comWebsite : <http://www.dekra.com.tw>

1.6. List of Test Item and Equipment

For Conduction Measurements /HY-SR01

	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
V	EMI Test Receiver	R&S	ESR7	101601	2022/06/23	2023/06/22
V	Two-Line V-Network	R&S	ENV216	101306	2022/05/23	2023/05/22
V	Two-Line V-Network	R&S	ENV216	101307	2022/05/04	2023/05/03
V	Coaxial Cable	SUHNER	RG400_BNC	RF001	2022/05/24	2023/05/23

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked with “V” are used to measure the final test results.
3. Test Software Version : E3 210616 dekra V9.

For Conducted Measurements /HY-SR02

	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
V	Spectrum Analyzer	R&S	FSV40	101149	2022/12/06	2023/03/24
V	Peak Power Analyzer	KEYSIGHT	8990B	MY51000410	2022/08/06	2023/08/05
V	Wideband Power Sensor	KEYSIGHT	N1923A	MY56080003	2022/08/05	2023/08/04
V	Wideband Power Sensor	KEYSIGHT	N1923A	MY56080004	2022/08/05	2023/08/04

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked with “V” are used to measure the final test results.
3. Test Software Version : RF Conducted Test Tools R3 V3.0.1.14.

For Radiated Measurements /HY-CB03

	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
	Loop Antenna	AMETEK	HLA6121	49611	2022/03/18	2023/03/17
V	Bi-Log Antenna	SCHWARZBECK	VULB9168	9168-675	2021/08/11	2023/08/10
V	Horn Antenna	RF SPIN	DRH18-E	210503A18ES	2022/06/08	2023/06/07
V	Horn Antenna	Com-Power	AH-840	101100	2021/10/04	2023/10/03
V	Pre-Amplifier	SGH	0301-9	20211007-11	2022/02/22	2023/02/21
V	Pre-Amplifier	SGH	PRAMP118	20200701	2022/07/28	2023/07/27
V	Pre-Amplifier	EMCI	EMC05820SE	980310	2022/07/28	2023/07/27
	Pre-Amplifier	EMCI	EMC184045SE	980369	2022/05/12	2023/05/11
	Coaxial Cable	EMCI	EMC102-KM-KM-600	1160314		
	Coaxial Cable	EMCI	EMC102-KM-KM-7000	170242		
V	Filter	MICRO TRONICS	BRM50702	G269	2022/07/31	2023/07/30
	Filter	MICRO TRONICS	BRM50716	G196	2022/07/27	2023/07/26
V	EMI Test Receiver	R&S	ESR	102793	2022/12/05	2023/12/04
V	Spectrum Analyzer	R&S	FSV3044	101114	2022/02/11	2023/02/10
V	Coaxial Cable	SGH	SGH18	2021005-1	2022/3/18	2023/03/17
	Coaxial Cable	SGH	SGH18	202108-4		
	Coaxial Cable	SGH	HA800	GD20110223-1		
	Coaxial Cable	SGH	HA800	GD20110222-3		

Note:

1. Bi-Log Antenna and Horn Antenna(AH-840) is calibrated every two years, the other equipments are calibrated every one year.
2. The test instruments marked with “V” are used to measure the final test results.
3. Test Software Version : E3 210616 dekra V9.

1.7. Uncertainty

Uncertainties have been calculated according to the DEKRA internal document.

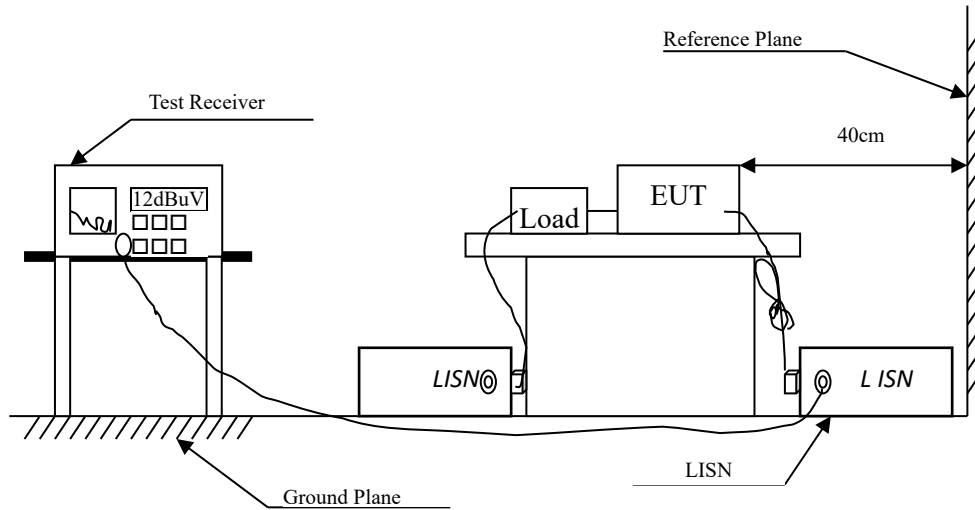
The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%.

Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

Test item	Uncertainty	
Conducted Emission	± 3.42 dB	
Radiated Emission	Under 1 GHz ± 4.06 dB	Above 1 GHz ± 3.73 dB

2. Conducted Emission

2.1. Test Setup



2.2. Limits

FCC Part 15 Subpart B Paragraph 15.107 (dBuV) Limit		
Frequency MHz	Limits	
	QP	AV
0.15 - 0.50	66-56	56-46
0.50-5.0	56	46
5.0 - 30	60	50

Remarks: In the above table, the tighter limit applies at the band edges.

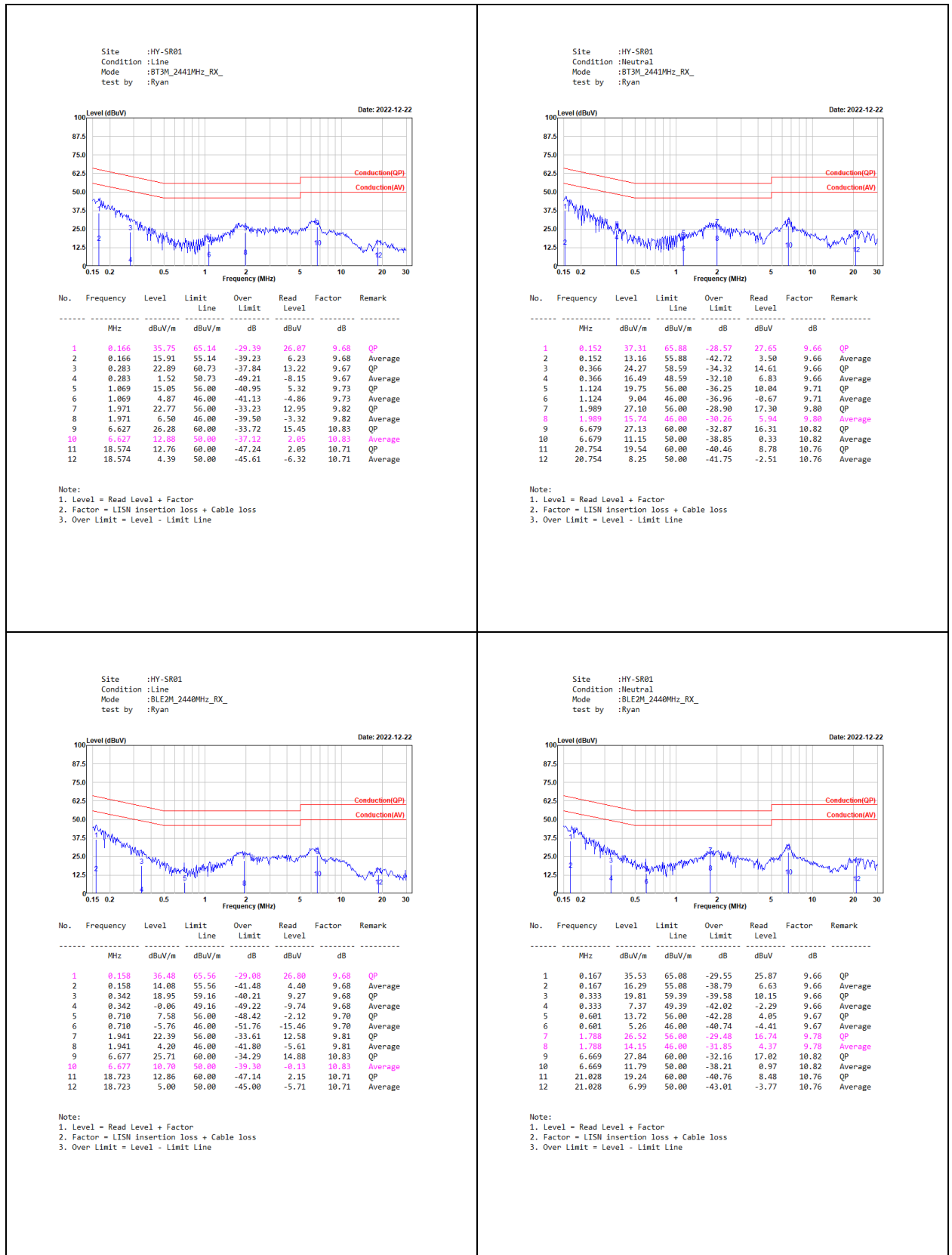
2.3. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement.

Conducted emissions were investigated over the frequency range from 0.15 MHz to 30 MHz using a receiver bandwidth of 9 kHz.

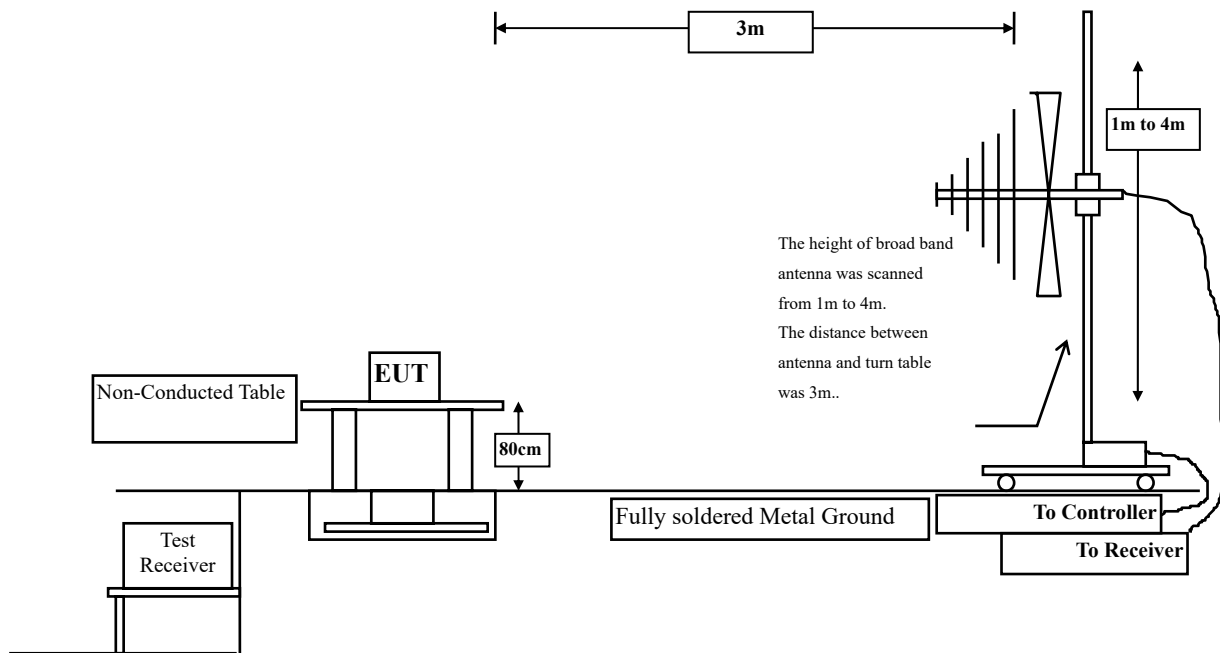
2.4. Test Result of Conducted Emission



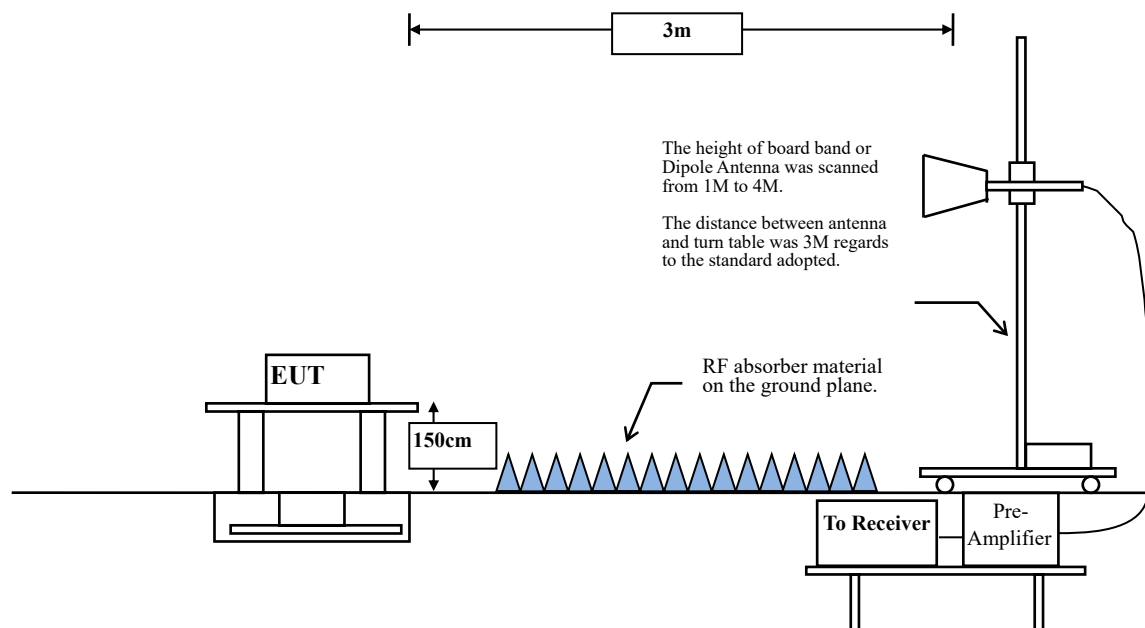
3. Radiated Emission

3.1. Test Setup

Radiated Emission Below 1 GHz



Radiated Emission Above 1 GHz



3.2. Limits

FCC Part 15 Subpart B Paragraph 15.109 Limits		
Frequency MHz	uV/m @3m	dBμV /m@3m
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Remarks :

1. RF Voltage (dBμV) = 20 log RF Voltage (uV)
2. In the Above Table, the tighter limit applies at the band edges.
3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

3.3. Test Procedure

Measuring the frequency range below 1 GHz, the EUT is placed on a turn table which is 0.8 meter above ground, when measuring the frequency range above 1 GHz, the EUT is placed on a turn table which is 1.5 meter above ground.

The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10: 2013 on radiated measurement.

The resolution bandwidth below 1 GHz setting on the field strength meter is 120 kHz and above 1 GHz is 1 MHz. Radiated emission measurements below 1 GHz are made using broadband Bilog antenna and above 1 GHz are made using Horn Antennas.

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna.

The measurement frequency range from 30 MHz – 10 th Harmonic of fundamental was investigated.

3.4. Test Result of Radiated Emission

Site :HY-CB03
Condition :3m ,Horizontal
Mode :RX_bt3M_2441MHz
TEST BY :Ashton Chiu

Date: 2022-12-15

Level (dBuV/m) vs Frequency (MHz) graph showing a single peak at 4882.000 MHz. The peak level is 38.01 dBuV/m. The limit line is 74.00 dBuV/m. The graph is labeled FCC_15.247_PK and FCC_15.247_AV.

No.	Frequency MHz	Level dBuV/m	Limit Line dBuV/m	Over Limit dB	Read Level dBuV	Factor dB	Remark
1	4882.000	38.01	74.00	-35.99	52.35	-14.34	Peak

Note:

1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

Site :HY-CB03
Condition :3m ,Vertical
Mode :RX_bt3M_2441MHz
TEST BY :Ashton Chiu

Date: 2022-12-15

Level (dBuV/m) vs Frequency (MHz) graph showing a single peak at 4882.000 MHz. The peak level is 37.98 dBuV/m. The limit line is 74.00 dBuV/m. The graph is labeled FCC_15.247_PK and FCC_15.247_AV.

No.	Frequency MHz	Level dBuV/m	Limit Line dBuV/m	Over Limit dB	Read Level dBuV	Factor dB	Remark
1	4882.000	37.98	74.00	-36.02	52.32	-14.34	Peak

Note:

1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

Site :HY-CB03
Condition :3m ,Horizontal
Mode :RX_bt3M_2441MHz
TEST BY :Ashton Chiu

Date: 2022-12-15

Level (dBuV/m) vs Frequency (MHz) graph showing multiple peaks at various frequencies. The limit line is 46.00 dBuV/m. The graph is labeled NCC 30M-1G.

No.	Frequency MHz	Level dBuV/m	Limit Line dBuV/m	Over Limit dB	Read Level dBuV	Factor dB	Remark
1	53.280	15.23	46.00	-24.77	39.58	-24.35	QP
2	152.220	21.68	43.50	-21.82	46.03	-24.35	QP
3	263.770	27.80	46.00	-18.20	53.07	-25.27	QP
4	486.870	30.33	46.00	-15.67	49.46	-19.13	QP
5	782.210	26.47	46.00	-19.53	41.40	-14.93	QP
6	839.950	27.58	46.00	-18.42	48.72	-13.14	QP

Note:

1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission under 30MHz was not included since the emission levels are very low against the limit.

Site :HY-CB03
Condition :3m ,Vertical
Mode :RX_bt3M_2441MHz
TEST BY :Ashton Chiu

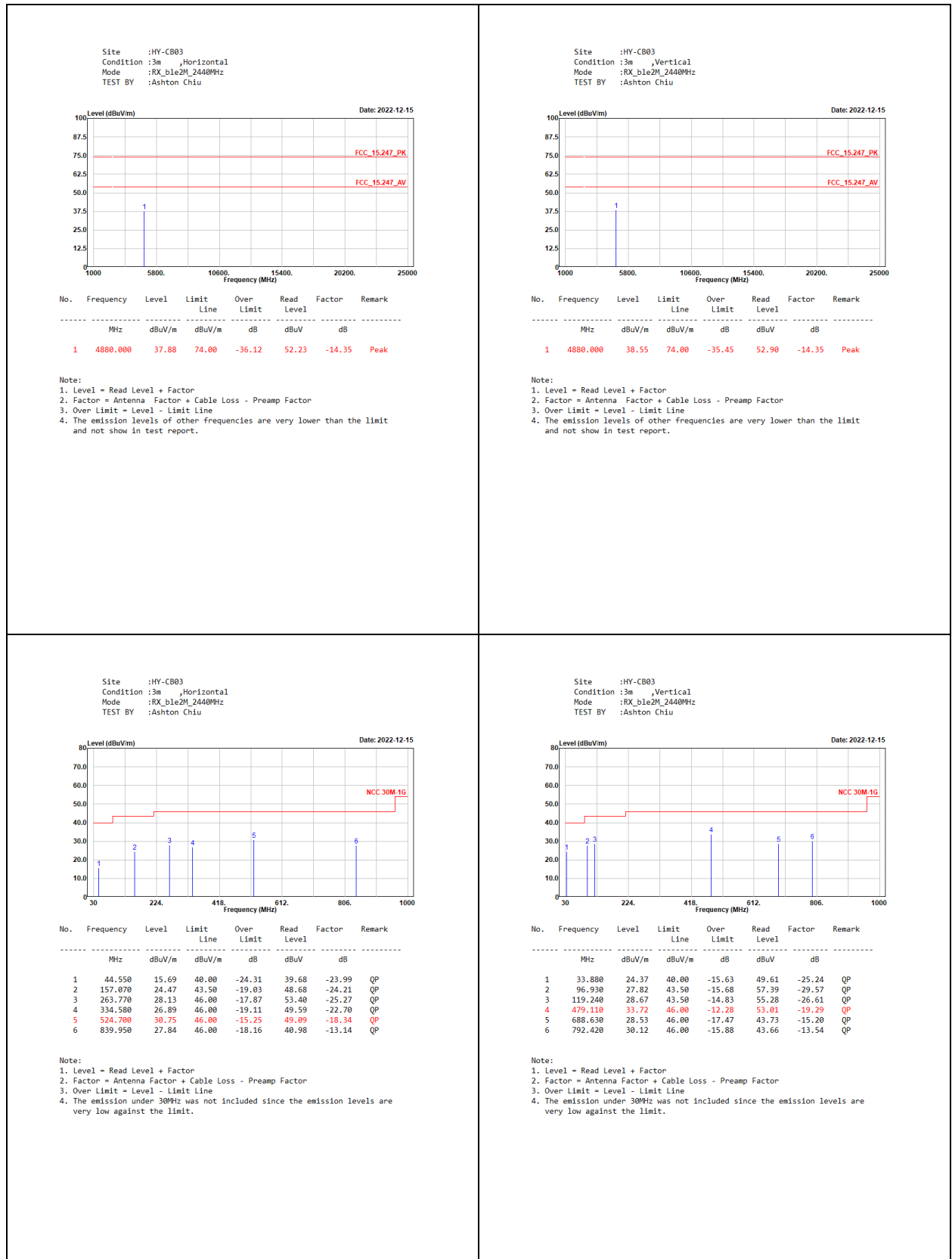
Date: 2022-12-15

Level (dBuV/m) vs Frequency (MHz) graph showing multiple peaks at various frequencies. The limit line is 46.00 dBuV/m. The graph is labeled NCC 30M-1G.

No.	Frequency MHz	Level dBuV/m	Limit Line dBuV/m	Over Limit dB	Read Level dBuV	Factor dB	Remark
1	35.820	24.95	46.00	-15.05	50.05	-25.10	QP
2	119.240	28.97	43.50	-14.53	55.58	-26.61	QP
3	215.270	22.10	43.50	-21.40	49.15	-27.05	QP
4	502.390	33.29	46.00	-12.71	51.92	-18.63	QP
5	688.630	27.24	46.00	-18.76	42.44	-15.20	QP
6	839.950	27.40	46.00	-18.60	40.54	-13.14	QP

Note:

1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission under 30MHz was not included since the emission levels are very low against the limit.



4. EMI Reduction Method During Compliance Testing

No modification was made during testing.