



Test Report

Date : 2025-01-21
No. : HMD25010001

Page 1 of 42

Applicant : HORI Co., Ltd.
640 Saedo-Cho, Tsuzuki-ku, Yokohama-shi, Kanagawa-ken 224-0054,
Japan

Supplier / Manufacturer : HORI Co., Ltd.
640 Saedo-Cho, Tsuzuki-ku, Yokohama-shi, Kanagawa-ken 224-0054,
Japan

Description of Sample(s) : Submitted sample(s) said to be
Product: Fighting Commander OCTA Pro for PS5/PS4/PC
Brand Name: HORI
Model No.: SPF-040
FCC ID: RQZSPF-2160

Date Samples Received : 2025-01-02

Date Tested : 2025-01-07 to 2025-01-16

Investigation Requested : Perform ElectroMagnetic Interference measurement in accordance
with FCC 47CFR [Codes of Federal Regulations] Part 15 and ANSI
C63.10: 2013 for FCC Certification.

Conclusions : The submitted product COMPLIED with the requirements of Federal
Communications Commission [FCC] Rules and Regulations Part 15.
The tests were performed in accordance with the standards described
above and on Section 2.2 in this Test Report.

Remarks : For additional model(s) details, see page 3

Test by : Susu


Dr.CHAN Kwok Hung, Brian
Authorized Signatory



Test Report

Date : 2025-01-21
No. : HMD25010001

Page 2 of 42

CONTENT:

Cover	Page 1 of 42
Content	Page 2 of 42
<u>1.0 General Details</u>	
1.1 Equipment Under Test [EUT] Description of EUT operation	Page 3 of 42
1.2 RF Module Details	Page 3 of 42
1.3 Antenna Details	Page 3 of 42
1.4 Date of Order	Page 3 of 42
1.5 Submitted Sample(s)	Page 3 of 42
1.6 Test Duration	Page 3 of 42
1.7 Country of Origin	Page 3 of 42
1.8 Channel List	Page 4 of 42
<u>2.0 Technical Details</u>	
2.1 Investigations Requested	Page 5 of 42
2.2 Test Standards and Results Summary	Page 6 of 42
<u>3.0 Test Results</u>	
3.1 Emission	Page 7-37 of 42
<u>Appendix A</u>	
List of Measurement Equipment	Page 38 of 42
<u>Appendix B</u>	
Photograph(s) of Product	Page 39-42 of 42

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Test Report

Date : 2025-01-21
No. : HMD25010001

Page 3 of 42

1.0 General Details

1.1 Equipment Under Test [EUT]

Description of Sample(s)

Product: Fighting Commander OCTA Pro for PS5/PS4/PC
Manufacturer: HORI Co., Ltd.
640 Saedo-Cho, Tsuzuki-ku, Yokohama-shi, Kanagawa-ken 224-0054, Japan
Brand Name: HORI
Model Number: SPF-040
Additional Model Number: SPF-040U, SPF-040E, SPF-040A, SPF-040C
Rating: 3.7Vd.c.(lithium battery*1)
5.0Vd.c. by USB port

1.1.1 Description of EUT Operation

The Equipment Under Test (EUT) is a Fighting Commander OCTA Pro for PS5/PS4/PC. It is a transceiver operating at 2403Hz~2479MHz and the RF signal was modulated by IC.

1.2 RF Module Details

Module Model Number: HJM90023B
Module FCC ID: N/A
Modulation: GFSK
Frequency Range: 2403-2479MHz

1.3 Antenna Details

Antenna Type: PCB antenna
Antenna Gain Ant 1: 2.64dBi
Antenna Gain Ant 2: 2.63dBi

1.4 Date of Order

2025-01-02

1.5 Submitted Sample(s):

1 Sample

1.6 Test Duration

2025-01-07 to 2025-01-16

1.7 Country of Origin

China

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Test Report

Date : 2025-01-21
No. : HMD25010001

Page 4 of 42

1.8 Channel List

Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2403	20	2443
1	2405	21	2445
2	2407	22	2447
3	2409	23	2449
4	2411	24	2451
5	2413	25	2453
6	2415	26	2455
7	2417	27	2457
8	2419	28	2459
9	2421	29	2461
10	2423	30	2463
11	2425	31	2465
12	2427	32	2467
13	2429	33	2469
14	2431	34	2471
15	2433	35	2473
16	2435	36	2475
17	2437	37	2477
18	2439	38	2479
19	2441		

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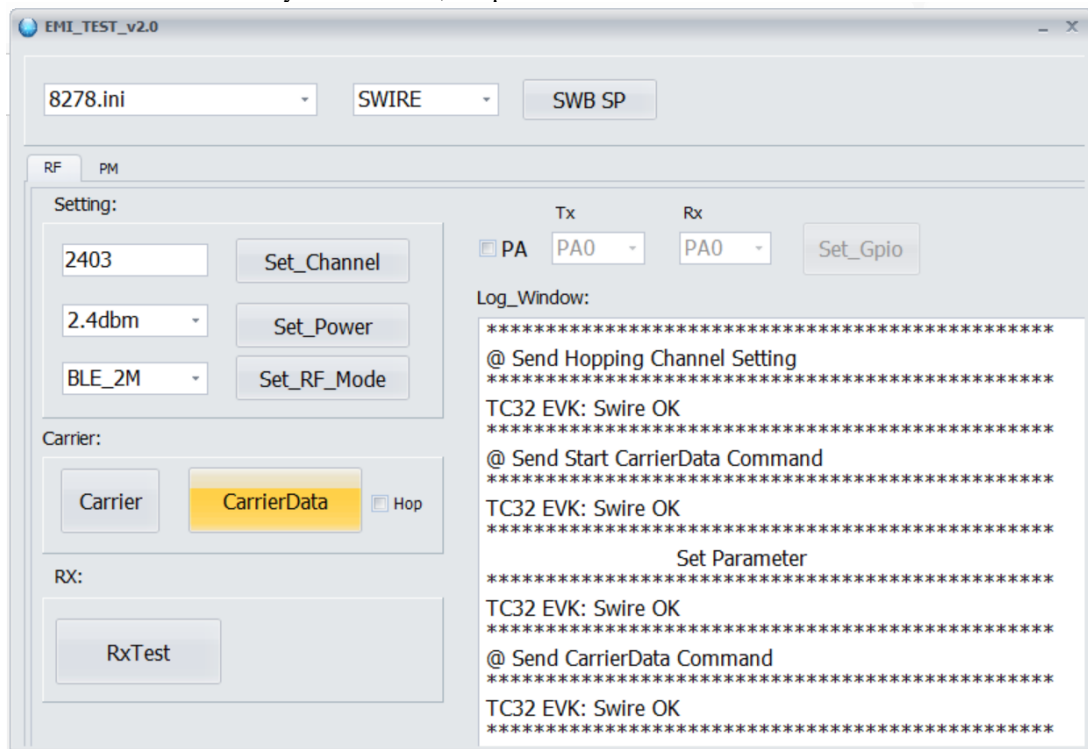
Date : 2025-01-21
No. : HMD25010001

Page 5 of 42

2.0 Technical Details

2.1 Investigations Requested

Perform Electromagnetic Interference measurements in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15 Regulations and ANSI C63.10: 2013 for FCC Certification.
The device was realized by test software, the power level selected 2.4dBm.



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Test Report

Date : 2025-01-21
No. : HMD25010001

Page 6 of 42

2.2 Test Standards and Results Summary Tables

EMISSION Results Summary						
Test Condition	Test Requirement	Test Method	Class / Severity	Test Result		
				Pass	Failed	N/A
Field Strength of Fundamental & Harmonics Emissions	FCC 47CFR 15.249	ANSI C63.10: 2013	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Radiated Emissions	FCC 47CFR 15.209 FCC 47CFR 15.205	ANSI C63.10: 2013	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
AC Mains Conducted Emissions	FCC 47CFR 15.207	ANSI C63.10: 2013	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Antenna requirement	FCC 47CFR 15.203	N/A	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20dB Emission bandwidth	FCC 47CFR 15.215(c)	ANSI C63.10: 2013	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Note: N/A - Not Applicable



Test Report

Date : 2025-01-21
No. : HMD25010001

Page 7 of 42

3.0 Test Results

3.1 Emission

3.1.1 Radiated Emissions

Ambient temperature 25°C

Relative humidity 57%

Test Requirement:	FCC 47CFR 15.249 & FCC 47CFR 15.209
Test Method:	ANSI C63.10:2013
Test Date:	2025-01-08 to 2025-01-16
Mode of Operation:	Tx mode

Test Method:

For emission measurements at or below 1 GHz, the sample was placed 0.8m above the ground plane of semi-anechoic Chamber*. For emission measurements above 1 GHz, the sample was placed 1.5m above the ground plane of semi-anechoic Chamber*. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

* Semi-Anechoic chamber located on the G/F of The Hong Kong Standards and Testing Centre Ltd. with
Registration Number: HK0001
Test Firm Registration Number: 367672

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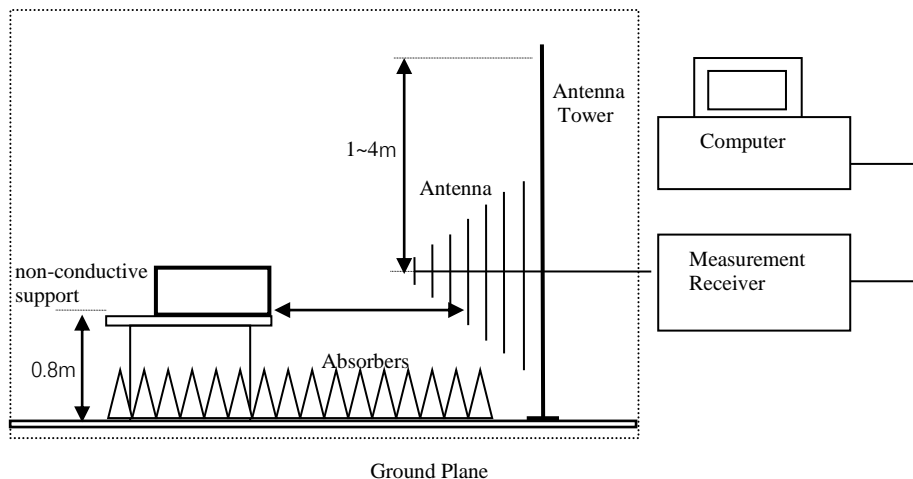
Date : 2025-01-21
No. : HMD25010001

Page 8 of 42

Spectrum Analyzer Setting:

9KHz – 30MHz (Pk & Av)	RBW: 10kHz VBW: 30kHz Sweep: Auto Span: Fully capture the emissions being measured Trace: Max. hold
30MHz – 1GHz (QP)	RBW: 120kHz VBW: 120kHz Sweep: Auto Span: Fully capture the emissions being measured Trace: Max. hold
Above 1GHz (Pk & Av) (Other than Fundamental Emissions)	RBW: 1MHz VBW: 1MHz Sweep: Auto Span: Fully capture the emissions being measured Trace: Max. hold

Test Setup:



- Absorbers placed on top of the ground plane are for measurements above 1000MHz only.
- Measurements between 30MHz to 1000MHz made with Bi-log antennas, above 1000MHz horn antennas are used.



Test Report

Date : 2025-01-21
No. : HMD25010001

Page 9 of 42

Limits for Field Strength of Fundamental & Harmonics Emissions [FCC 47CFR 15.249]:

Frequency Range of Fundamental [MHz]	Field Strength of Fundamental Emission [microvolts/meter]	Field Strength of Harmonics Emission [microvolts/meter]
902-928	50,000 [Quasi-Peak]	500 [Average]
2400-2483.5	50,000 [Average]	500 [Average]

Remarks:

No additional spurious emissions found between lowest internal used/generated frequency and 30 MHz

Calculated measurement uncertainty
(9kHz-30MHz): 2.0dB
(30MHz -1GHz): 4.9dB
(1GHz -6GHz): 4.02dB
(6GHz -26.5GHz): 4.03dB

Emissions in the vertical and horizontal polarizations have been investigated and the worst-case test results are recorded in this report.

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Test Report

Date : 2025-01-21
No. : HMD25010001

Page 10 of 42

Results of Tx mode (Ant 1;Lowest Frequency Channel-2403 MHz): Pass

Field Strength of Fundamental Emissions						
Peak Value						
Frequency MHz	Measured Level @3m dB μ V/m	Correction Factor dB μ V/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
2403.00	85.2	-4.8	80.4	10,519.6	500,000	Vertical
2403.00	92.7	-4.7	88.0	25,003.5	500,000	Horizontal

Field Strength of Fundamental Emissions						
Average Value						
Frequency MHz	Measured Level @3m dB μ V/m	Correction Factor dB μ V/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
2403.00	80.0	-4.8	75.2	5,761.0	50,000	Vertical
2403.00	87.0	-4.7	82.3	12,986.7	50,000	Horizontal

Field Strength of Harmonics Emission						
Peak Value						
Frequency MHz	Measured Level @3m dB μ V/m	Correction Factor dB μ V/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
4806.0	54.5	0.8	55.3	584.5	5,000	Vertical
4806.0	55.6	0.5	56.1	640.5	5,000	Horizontal
7209.0	48.1	7.0	55.1	569.5	5,000	Vertical
7209.0	49.7	6.5	56.2	644.9	5,000	Horizontal
9612.0	46.5	8.5	55.0	562.3	5,000	Vertical
9612.0	47.2	8.3	55.5	595.7	5,000	Horizontal
12015.0	45.2	10.9	56.1	638.3	5,000	Vertical
12015.0	45.0	10.8	55.8	616.6	5,000	Horizontal

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Test Report

Date : 2025-01-21
No. : HMD25010001

Page 11 of 42

Field Strength of Harmonics Emission						
Average Value						
Frequency MHz	Measured Level @3m dB μ V/m	Correction Factor dB μ V/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
4806.0	40.3	0.8	41.1	113.0	500	Vertical
4806.0	41.1	0.5	41.6	119.5	500	Horizontal
7209.0	34.3	7.0	41.3	116.1	500	Vertical
7209.0	35.2	6.5	41.7	121.6	500	Horizontal
9612.0	33.0	8.5	41.5	118.9	500	Vertical

Results of Tx mode (Middle Frequency Channel- 2441MHz): Pass

Field Strength of Fundamental Emissions						
Peak Value						
Frequency MHz	Measured Level @3m dB μ V/m	Correction Factor dB μ V/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
2441.00	85.0	-4.8	80.2	10,185.9	500,000	Vertical
2441.00	92.3	-4.7	87.6	23,960.7	500,000	Horizontal

Field Strength of Fundamental Emissions						
Average Value						
Frequency MHz	Measured Level @3m dB μ V/m	Correction Factor dB μ V/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
2441.00	79.5	-4.8	74.7	5,426.3	50,000	Vertical
2441.00	86.3	-4.7	81.6	11,995.0	50,000	Horizontal

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Test Report

Date : 2025-01-21

Page 12 of 42

No. : HMD25010001

Field Strength of Harmonics Emission						
Peak Value						
Frequency MHz	Measured Level @3m dB μ V/m	Correction Factor dB μ V/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
4882.0	54.3	0.8	55.1	570.2	5,000	Vertical
4882.0	56.0	0.5	56.5	668.3	5,000	Horizontal
7323.0	48.2	7.0	55.2	575.4	5,000	Vertical
7323.0	49.4	6.5	55.9	623.7	5,000	Horizontal
9764.0	46.3	8.5	54.8	549.5	5,000	Vertical
9764.0	47.1	8.3	55.4	588.8	5,000	Horizontal
12205.0	45.2	10.9	56.1	638.3	5,000	Vertical
12205.0	44.9	10.8	55.7	609.5	5,000	Horizontal

Field Strength of Harmonics Emission						
Average Value						
Frequency MHz	Measured Level @3m dB μ V/m	Correction Factor dB μ V/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
4882.0	41.0	0.8	41.8	123.3	500	Vertical
4882.0	41.1	0.5	41.6	120.2	500	Horizontal
7323.0	34.2	7.0	41.2	114.8	500	Vertical
7323.0	35.0	6.5	41.5	118.9	500	Horizontal
9764.0	33.1	8.5	41.6	120.2	500	Vertical
9764.0	32.9	8.3	41.2	114.8	500	Horizontal
12205.0	30.6	10.9	41.5	118.9	500	Vertical
12205.0	29.4	10.8	40.2	102.3	500	Horizontal

Results of Tx mode (Highest Frequency Channel – 2479MHz): Pass

Field Strength of Fundamental Emissions						
Peak Value						
Frequency MHz	Measured Level @3m dB μ V/m	Correction Factor dB μ V/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
2479.00	82.2	-4.8	77.4	7,447.3	500,000	Vertical
2479.00	89.2	-4.7	84.5	16,865.5	500,000	Horizontal

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Test Report

Date : 2025-01-21

Page 13 of 42

No. : HMD25010001

Field Strength of Fundamental Emissions						
Average Value						
Frequency MHz	Measured Level @3m dB μ V/m	Correction Factor dB μ V/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
2479.00	76.9	-4.8	72.1	4,027.2	50,000	Vertical
2479.00	83.0	-4.7	78.3	8,222.4	50,000	Horizontal

Field Strength of Harmonics Emission						
Peak Value						
Frequency MHz	Measured Level @3m dB μ V/m	Correction Factor dB μ V/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
4958.0	54.6	0.8	55.4	590.2	5,000	Vertical
4958.0	56.1	0.5	56.6	676.1	5,000	Horizontal
7437.0	48.2	7.0	55.2	575.4	5,000	Vertical
7437.0	50.0	6.5	56.5	668.3	5,000	Horizontal
9916.0	46.7	8.5	55.2	575.4	5,000	Vertical
9916.0	47.2	8.3	55.5	595.7	5,000	Horizontal
12395.0	45.1	10.9	56.0	631.0	5,000	Vertical
12395.0	45.3	10.8	56.1	638.3	5,000	Horizontal

Field Strength of Harmonics Emission						
Average Value						
Frequency MHz	Measured Level @3m dB μ V/m	Correction Factor dB μ V/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
4958.0	40.5	0.8	41.3	116.4	500	Vertical
4958.0	41.1	0.5	41.6	120.2	500	Horizontal
7437.0	34.0	7.0	41.0	112.2	500	Vertical
7437.0	35.1	6.5	41.6	120.2	500	Horizontal
9916.0	33.0	8.5	41.5	118.9	500	Vertical
9916.0	33.5	8.3	41.8	123.0	500	Horizontal
12395.0	30.1	10.9	41.0	112.2	500	Vertical
12395.0	30.3	10.8	41.1	113.5	500	Horizontal

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Test Report

Date : 2025-01-21
No. : HMD25010001

Page 14 of 42

Results of Tx mode (Ant2; Lowest Frequency Channel-2403 MHz): Pass

Field Strength of Fundamental Emissions						
Peak Value						
Frequency MHz	Measured Level @3m dB μ V/m	Correction Factor dB μ V/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
2403.00	87.1	-4.8	82.3	13,076.8	500,000	Vertical
2403.00	93.1	-4.7	88.4	26,212.0	500,000	Horizontal

Field Strength of Fundamental Emissions						
Average Value						
Frequency MHz	Measured Level @3m dB μ V/m	Correction Factor dB μ V/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
2403.00	81.3	-4.8	76.5	6,706.6	50,000	Vertical
2403.00	86.7	-4.7	82.0	12,603.8	50,000	Horizontal

Field Strength of Harmonics Emission						
Peak Value						
Frequency MHz	Measured Level @3m dB μ V/m	Correction Factor dB μ V/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
4806.0	54.2	0.8	55.0	562.3	5,000	Vertical
4806.0	55.3	0.5	55.8	616.6	5,000	Horizontal
7209.0	48.0	7.0	55.0	562.3	5,000	Vertical
7209.0	49.5	6.5	56.0	631.0	5,000	Horizontal
9612.0	46.3	8.5	54.8	549.5	5,000	Vertical
9612.0	47.1	8.3	55.4	588.8	5,000	Horizontal
12015.0	45.0	10.9	55.9	623.7	5,000	Vertical
12015.0	45.1	10.8	55.9	623.7	5,000	Horizontal

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Test Report

Date : 2025-01-21

Page 15 of 42

No. : HMD25010001

Field Strength of Harmonics Emission						
Average Value						
Frequency MHz	Measured Level @3m dB μ V/m	Correction Factor dB μ V/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
4806.0	40.4	0.8	41.2	114.8	500	Vertical
4806.0	41.0	0.5	41.5	118.9	500	Horizontal
7209.0	34.4	7.0	41.4	117.5	500	Vertical
7209.0	35.0	6.5	41.5	118.9	500	Horizontal
9612.0	32.8	8.5	41.3	116.1	500	Vertical
9612.0	32.8	8.3	41.1	113.5	500	Horizontal
12015.0	30.6	10.9	41.5	118.9	500	Vertical
12015.0	30.7	10.8	41.5	118.9	500	Horizontal

Results of Tx mode (Middle Frequency Channel- 2441MHz): Pass

Field Strength of Fundamental Emissions						
Peak Value						
Frequency MHz	Measured Level @3m dB μ V/m	Correction Factor dB μ V/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
2441.00	83.7	-4.8	78.9	8,770.0	500,000	Vertical
2441.00	91.1	-4.7	86.4	20,868.9	500,000	Horizontal

Field Strength of Fundamental Emissions						
Average Value						
Frequency MHz	Measured Level @3m dB μ V/m	Correction Factor dB μ V/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
2441.00	77.5	-4.8	72.7	4,310.2	50,000	Vertical
2441.00	85.8	-4.7	81.1	11,350.1	50,000	Horizontal

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Test Report

Date : 2025-01-21

Page 16 of 42

No. : HMD25010001

Field Strength of Harmonics Emission						
Peak Value						
Frequency MHz	Measured Level @3m dBμV/m	Correction Factor dBμV/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
4882.0	54.4	0.8	55.2	576.8	5,000	Vertical
4882.0	55.8	0.5	56.3	653.1	5,000	Horizontal
7323.0	48.3	7.0	55.3	582.1	5,000	Vertical
7323.0	50.0	6.5	56.5	668.3	5,000	Horizontal
9764.0	46.8	8.5	55.3	582.1	5,000	Vertical
9764.0	47.0	8.3	55.3	582.1	5,000	Horizontal
12205.0	45.1	10.9	56.0	631.0	5,000	Vertical
12205.0	45.0	10.8	55.8	616.6	5,000	Horizontal

Field Strength of Harmonics Emission						
Average Value						
Frequency MHz	Measured Level @3m dBμV/m	Correction Factor dBμV/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
4882.0	40.7	0.8	41.5	119.1	500	Vertical
4882.0	40.6	0.5	41.1	113.5	500	Horizontal
7323.0	34.0	7.0	41.0	112.2	500	Vertical
7323.0	35.2	6.5	41.7	121.6	500	Horizontal
9764.0	33.0	8.5	41.5	118.9	500	Vertical
9764.0	32.1	8.3	40.4	104.7	500	Horizontal
12205.0	30.8	10.9	41.7	121.6	500	Vertical
12205.0	29.4	10.8	40.2	102.3	500	Horizontal

Results of Tx mode (Highest Frequency Channel – 2479MHz): Pass

Field Strength of Fundamental Emissions						
Peak Value						
Frequency MHz	Measured Level @3m dBμV/m	Correction Factor dBμV/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
2479.00	81.3	-4.8	76.5	6,683.4	500,000	Vertical
2479.00	90.2	-4.7	85.5	18,836.5	500,000	Horizontal

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Test Report

Date : 2025-01-21

Page 17 of 42

No. : HMD25010001

Field Strength of Fundamental Emissions						
Average Value						
Frequency MHz	Measured Level @3m dB μ V/m	Correction Factor dB μ V/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
2479.00	75.6	-4.8	70.8	3,467.4	50,000	Vertical
2479.00	84.0	-4.7	79.3	9,225.7	50,000	Horizontal

Field Strength of Harmonics Emission						
Peak Value						
Frequency MHz	Measured Level @3m dB μ V/m	Correction Factor dB μ V/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
4958.0	54.7	0.8	55.5	597.0	5,000	Vertical
4958.0	55.7	0.5	56.2	645.7	5,000	Horizontal
7437.0	48.1	7.0	55.1	568.9	5,000	Vertical
7437.0	49.3	6.5	55.8	616.6	5,000	Horizontal
9916.0	46.6	8.5	55.1	568.9	5,000	Vertical
9916.0	47.4	8.3	55.7	609.5	5,000	Horizontal
12395.0	45	10.9	55.9	623.7	5,000	Vertical
12395.0	45.3	10.8	56.1	638.3	5,000	Horizontal

Field Strength of Harmonics Emission						
Average Value						
Frequency MHz	Measured Level @3m dB μ V/m	Correction Factor dB μ V/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
4958.0	40.3	0.8	41.1	113.8	500	Vertical
4958.0	41.2	0.5	41.7	121.6	500	Horizontal
7437.0	34.4	7.0	41.4	117.5	500	Vertical
7437.0	35.2	6.5	41.7	121.6	500	Horizontal
9916.0	33.1	8.5	41.6	120.2	500	Vertical
9916.0	33.2	8.3	41.5	118.9	500	Horizontal
12395.0	30.3	10.9	41.2	114.8	500	Vertical
12395.0	30.3	10.8	41.1	113.5	500	Horizontal

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Test Report

Date : 2025-01-21
No. : HMD25010001

Page 18 of 42

Radiated Emissions Measurement:

Limit :

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

Result: RF Radiated Emissions (1GHz-26GHz) (Lowest)

Ant 1

Field Strength of Band-edge Compliance						
Peak Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Limit @3m dB μ V/m	Margin dB μ V/m	E-Field Polarity
2400.0	52.9	-4.8	48.1	74.0	25.9	Vertical
2400.0	52.6	-4.7	47.9	74.0	26.1	Horizontal

Field Strength of Band-edge Compliance						
Average Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Limit @3m dB μ V/m	Margin dB μ V/m	E-Field Polarity
2400.0	42.4	-4.8	37.6	54.0	16.4	Vertical
2400.0	42.2	-4.7	37.5	54.0	16.5	Horizontal

Result: RF Radiated Emissions (1GHz-26GHz) (Highest)

Field Strength of Band-edge Compliance						
Peak Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Limit @3m dB μ V/m	Margin dB μ V/m	E-Field Polarity
2483.5	52.8	-4.8	48.0	74.0	26.0	Vertical
2483.5	50.8	-4.7	46.1	74.0	27.9	Horizontal

Field Strength of Band-edge Compliance						
Average Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Limit @3m dB μ V/m	Margin dB μ V/m	E-Field Polarity
2483.5	42.5	-4.8	37.7	54.0	16.3	Vertical
2483.5	41.2	-4.7	36.5	54.0	17.5	Horizontal

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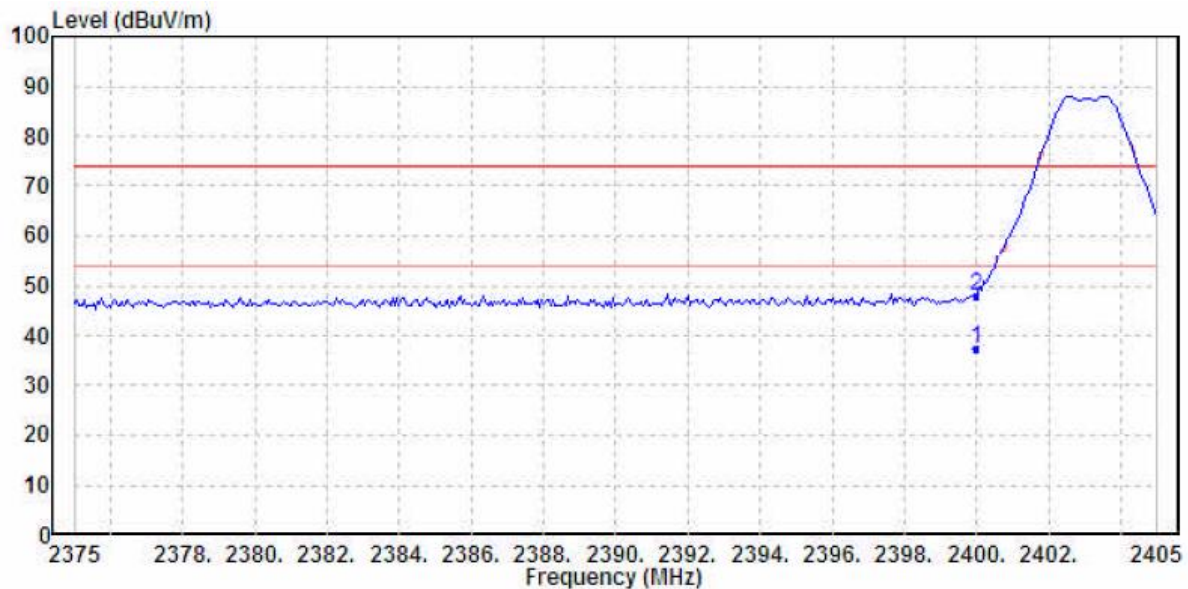
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Date : 2025-01-21
No. : HMD25010001

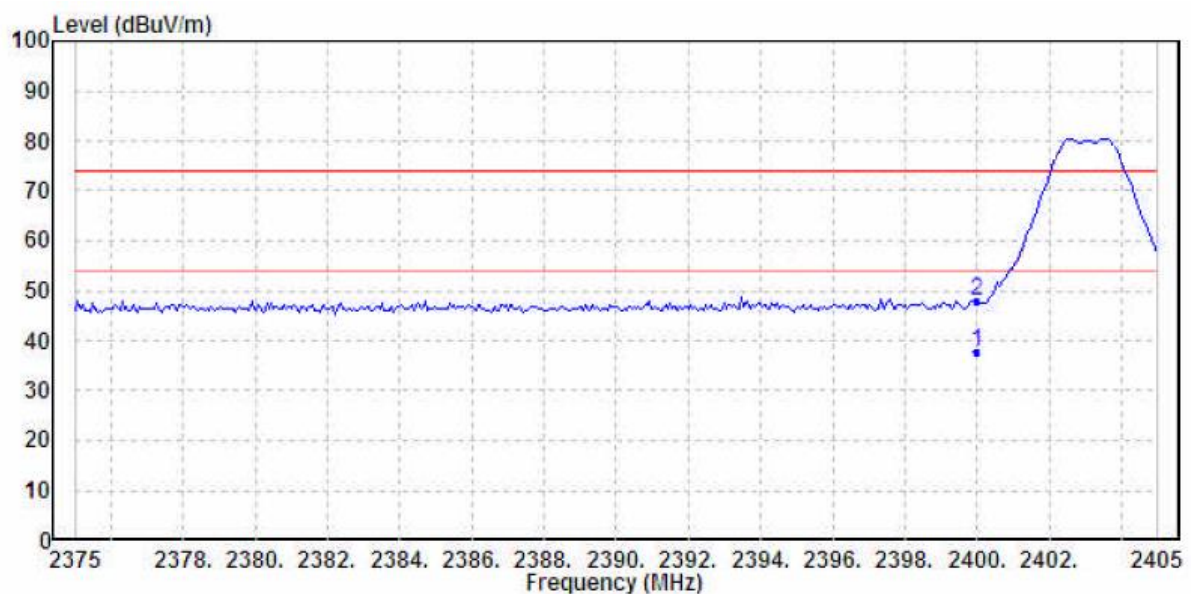
Page 19 of 42

Emissions radiated outside of the specified frequency bands (Lowest)

Horizontal



Vertical



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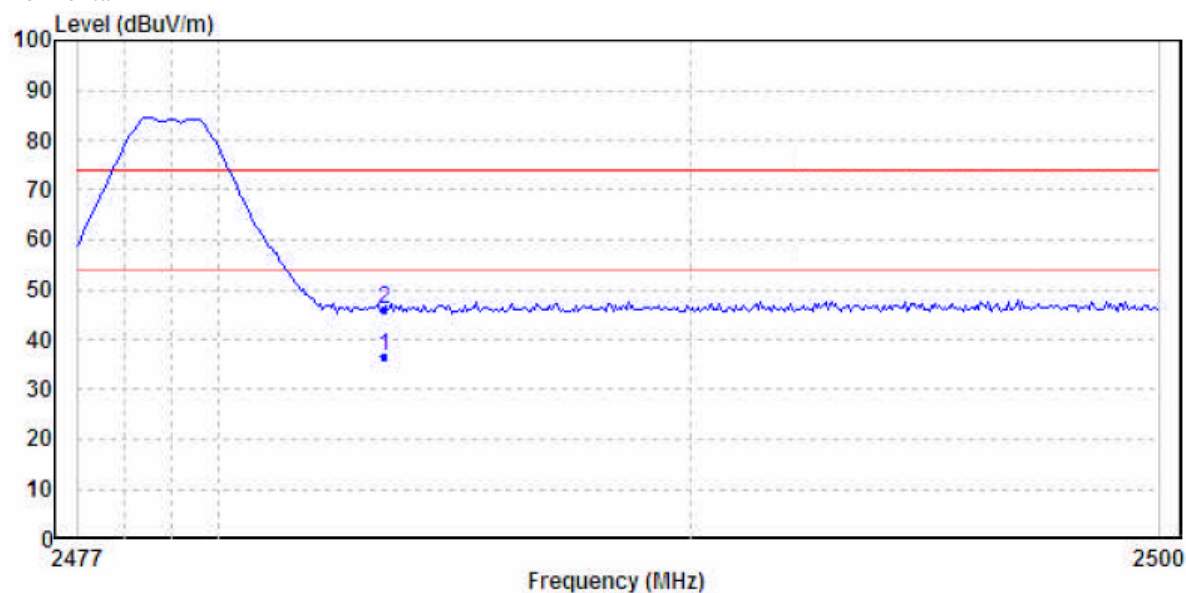
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No. : HMD25010001

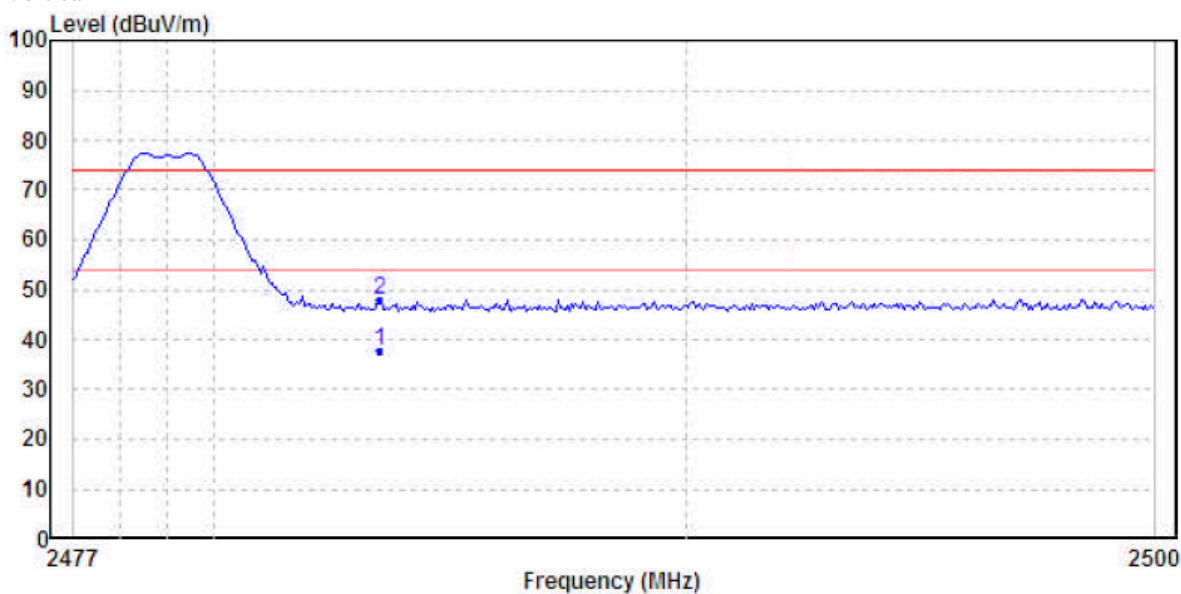
Page 20 of 42

Emissions radiated outside of the specified frequency bands (Highest)

Horizontal



Vertical



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Test Report

Date : 2025-01-21
No. : HMD25010001

Page 21 of 42

Ant 2

Field Strength of Band-edge Compliance						
Peak Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Limit @3m dB μ V/m	Margin dB μ V/m	E-Field Polarity
2400.0	52.4	-4.8	47.6	74.0	26.4	Vertical
2400.0	52.5	-4.7	47.8	74.0	26.2	Horizontal

Field Strength of Band-edge Compliance						
Average Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Limit @3m dB μ V/m	Margin dB μ V/m	E-Field Polarity
2400.0	42.0	-4.8	37.2	54.0	16.8	Vertical
2400.0	42.1	-4.7	37.4	54.0	16.6	Horizontal

Result: RF Radiated Emissions (1GHz-26GHz) (Highest)

Field Strength of Band-edge Compliance						
Peak Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Limit @3m dB μ V/m	Margin dB μ V/m	E-Field Polarity
2483.5	51.5	-4.8	46.7	74.0	27.3	Vertical
2483.5	50.8	-4.7	46.1	74.0	27.9	Horizontal

Field Strength of Band-edge Compliance						
Average Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Limit @3m dB μ V/m	Margin dB μ V/m	E-Field Polarity
2483.5	41.4	-4.8	36.6	54.0	17.4	Vertical
2483.5	41.1	-4.7	36.4	54.0	17.6	Horizontal



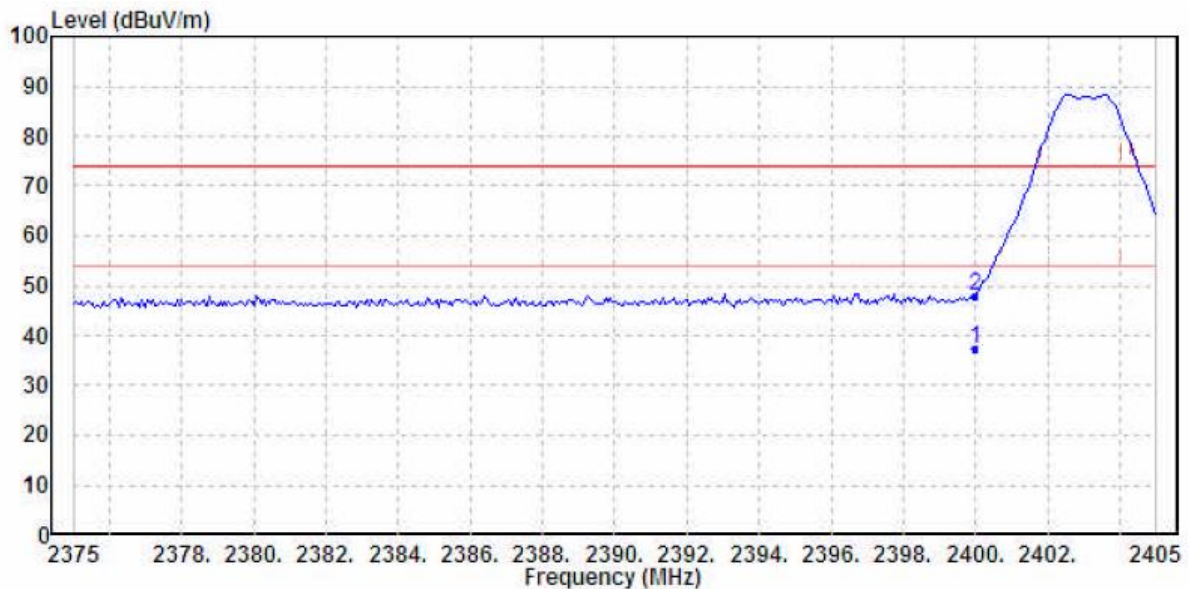
Test Report

Date : 2025-01-21
No. : HMD25010001

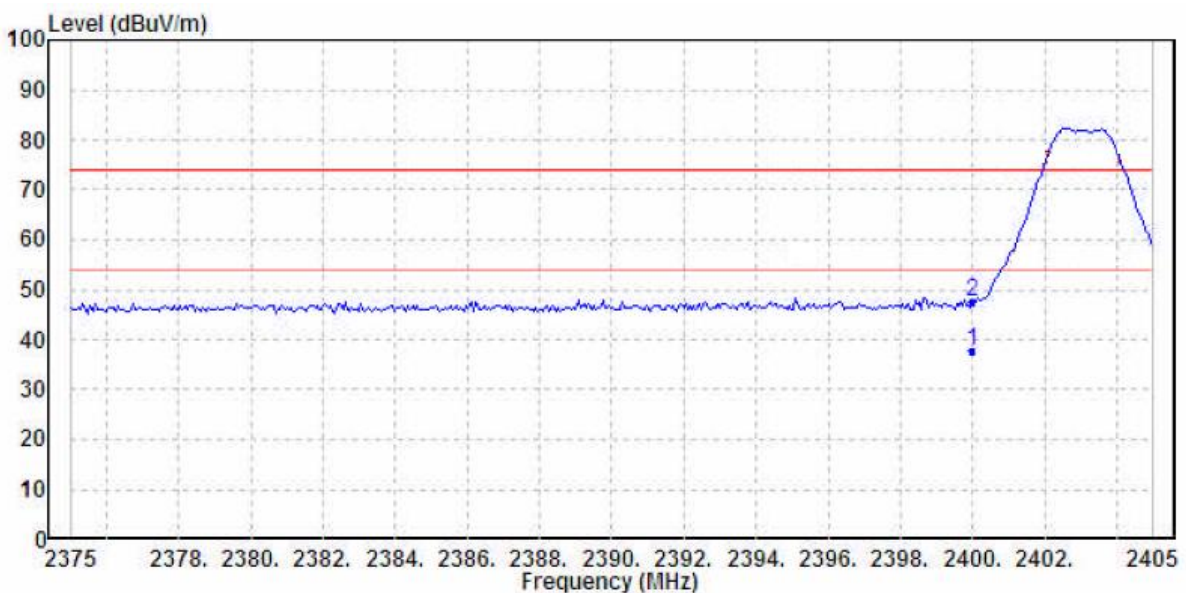
Page 22 of 42

Emissions radiated outside of the specified frequency bands (Lowest)

Horizontal



Vertical



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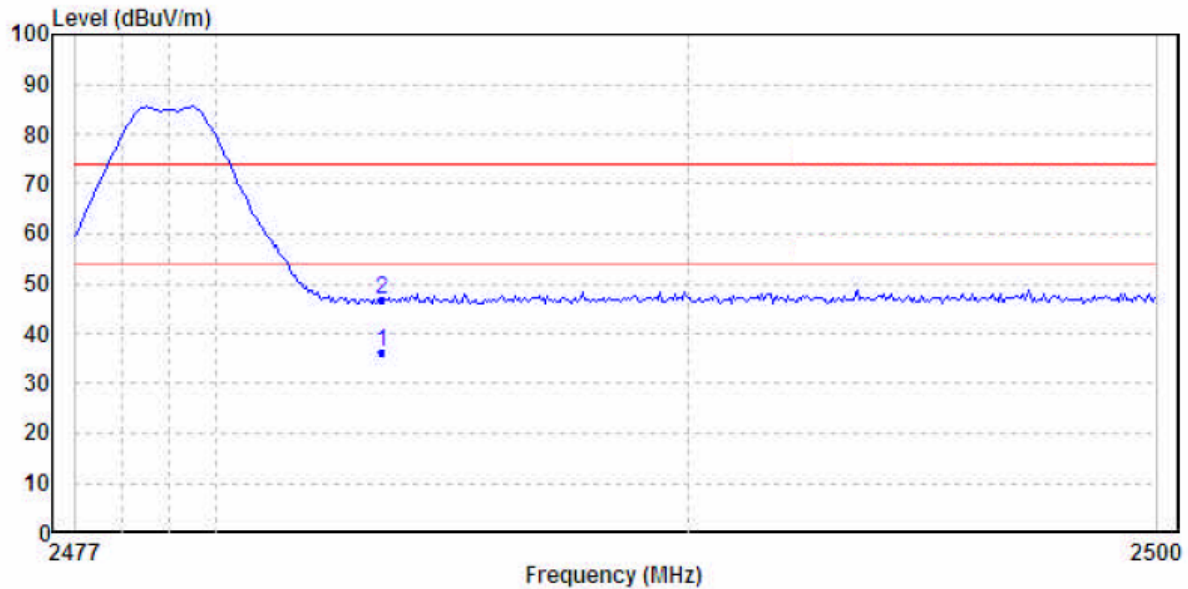
Test Report

Date : 2025-01-21
No. : HMD25010001

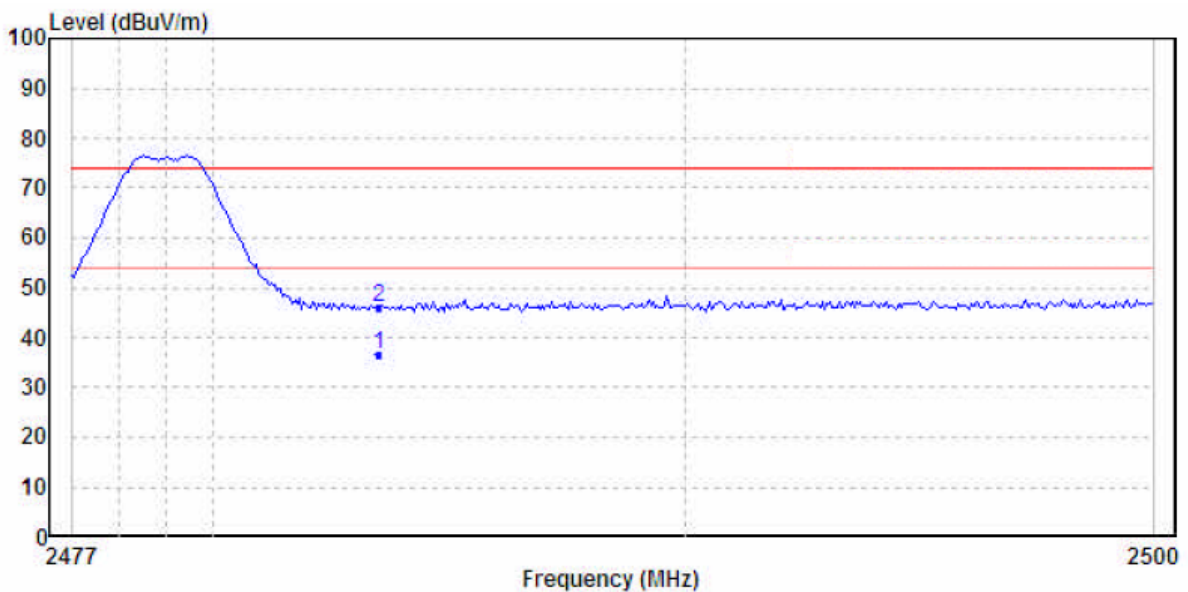
Page 23 of 42

Emissions radiated outside of the specified frequency bands (Highest)

Horizontal



Vertical



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Test Report

Date : 2025-01-21
No. : HMD25010001

Page 24 of 42

Limits for Radiated Emissions [FCC 47 CFR 15.209 Class B]:

Frequency Range [MHz]	Quasi-Peak Limits [μV/m]
0.009-0.490	2400/F (kHz)
0.490-1.705	24000/F (kHz)
1.705-30	30
30-88	100
88-216	150
216-960	200
Above960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Remarks:

Calculated measurement uncertainty (9kHz-30MHz): 2.0dB /(30MHz – 1GHz): 4.9dB

Emissions in the vertical and horizontal polarizations have been investigated and the worst-case test results are recorded in this report.

Results of TX mode (9kHz – 30MHz): PASS

Emissions detected are more than 20 dB below the FCC Limits

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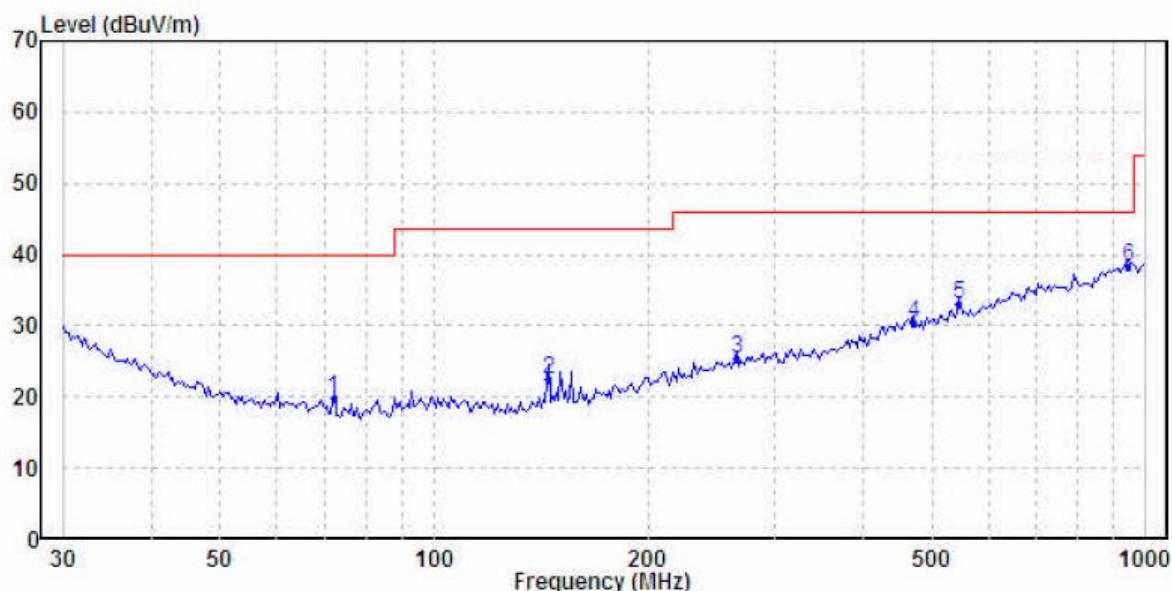
Test Report

Date : 2025-01-21
No. : HMD25010001

Page 25 of 42

Results of TX mode (30MHz – 1GHz)(2403MHz worst case): PASS

Horizontal



Ambient Temperature: 26.7C

Relative Humidity : 53.8%

Air Pressure : 100.9kPa

	Freq	Level	Limit	Over	Remark	Pol/Phase
	MHz	dBuV/m	Line	Limit		
			dBuV/m	dB		
1	72.084	19.74	40.00	-20.26	QP	Horizontal
2	144.335	22.58	43.50	-20.92	QP	Horizontal
3	265.676	25.43	46.00	-20.57	QP	Horizontal
4	472.176	30.43	46.00	-15.57	QP	Horizontal
5	547.098	32.94	46.00	-13.06	QP	Horizontal
6	945.440	38.26	46.00	-7.74	QP	Horizontal

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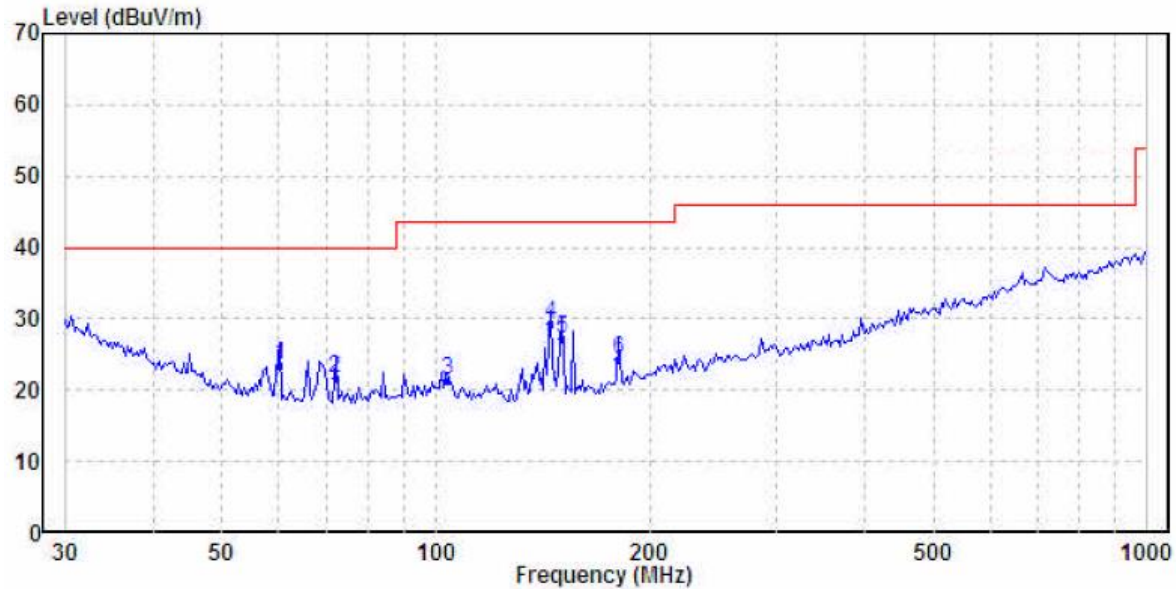
Test Report

Date : 2025-01-21
No. : HMD25010001

Page 26 of 42

Results of TX mode (30MHz – 1GHz) (2403MHz worst case): PASS

Vertical



Ambient Temperature: 26.7C

Relative Humidity : 53.8%

Air Pressure : 100.9kPa

	Freq	Level	Limit	Over	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB		
1	60.069	23.64	40.00	-16.36	QP	Vertical
2	72.084	21.75	40.00	-18.25	QP	Vertical
3	103.806	21.52	43.50	-21.98	QP	Vertical
4	144.335	29.27	43.50	-14.23	QP	Vertical
5	150.538	27.12	43.50	-16.38	QP	Vertical
6	180.649	24.32	43.50	-19.18	QP	Vertical

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Test Report

Date : 2025-01-21
No. : HMD25010001

Page 27 of 42

3.1.2 AC Mains Conducted Emissions (0.15MHz to 30MHz)

Test Requirement:	FCC 47CFR 15.207
Test Method:	ANSI C63.10:2013
Test Date:	2025-01-13
Mode of Operation:	TX mode
Test Voltage:	120V a.c. 60Hz

Ambient Temperature: 25°C	Relative Humidity: 51%	Atmospheric Pressure: 101 kPa
---------------------------	------------------------	-------------------------------

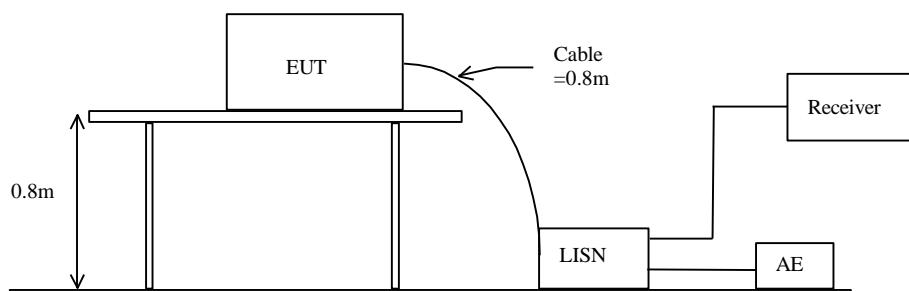
Test Method:

The test was performed in accordance with ANSI C63.10:2013, with the following: an initial measurement was performed in peak and average detection mode on the live line, any emissions recorded within 30dB of the relevant limit line were re-measured using quasi-peak and average detection on the live and neutral lines with the worst case recorded in the table of results.

Receiver Setting:

Bandw. = 9 kHz, Meas. Time= 10.0 ms, Step Width = 5.0kHz
 Detector = MaxPeak and CISPR AV

Test Setup:



Limits for Conducted Emissions (FCC 47 CFR 15.207):

Frequency Range [MHz]	Quasi-Peak Limits [dBμV]	Average [dBμV]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

* Decreases with the logarithm of the frequency.

Remarks:

Calculated measurement uncertainty (0.15MHz – 30MHz): 3.25dB

-*- Emission(s) that is far below the corresponding limit line.

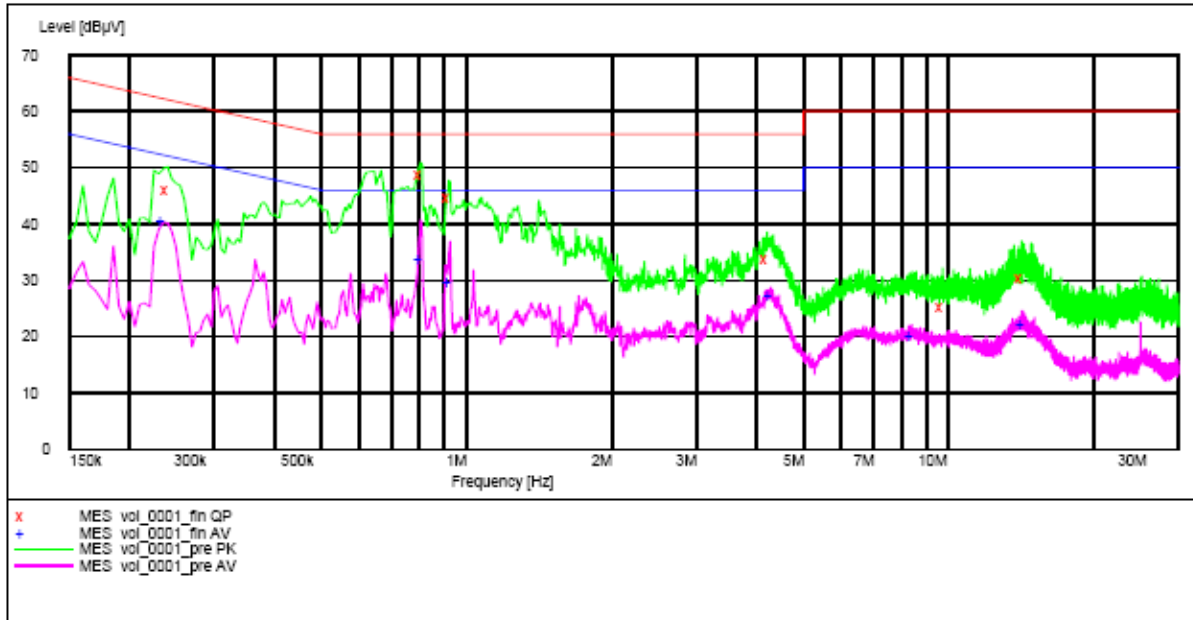
Test Report

Date : 2025-01-21
No. : HMD25010001

Page 28 of 42

Results of TX mode (L): PASS

Please refer to the following diagram for individual results.



MEASUREMENT RESULT: "vol_0001_fin QP"

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.240000	45.90	9.6	62.10	16.20	L1	GND
0.805000	48.60	9.6	56.00	7.40	L1	GND
0.920000	44.70	9.6	56.00	11.30	L1	GND
4.205000	33.60	9.6	56.00	22.40	L1	GND
9.715000	25.20	9.8	60.00	34.80	L1	GND
14.175000	30.20	9.8	60.00	29.80	L1	GND

MEASUREMENT RESULT: "vol_0001_fin AV"

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.235000	40.60	9.6	52.30	11.70	L1	GND
0.805000	33.60	9.6	46.00	12.40	L1	GND
0.925000	29.80	9.6	46.00	16.20	L1	GND
4.280000	27.40	9.6	46.00	18.60	L1	GND
8.400000	20.10	9.7	50.00	29.90	L1	GND
14.285000	22.30	9.8	50.00	27.70	L1	GND



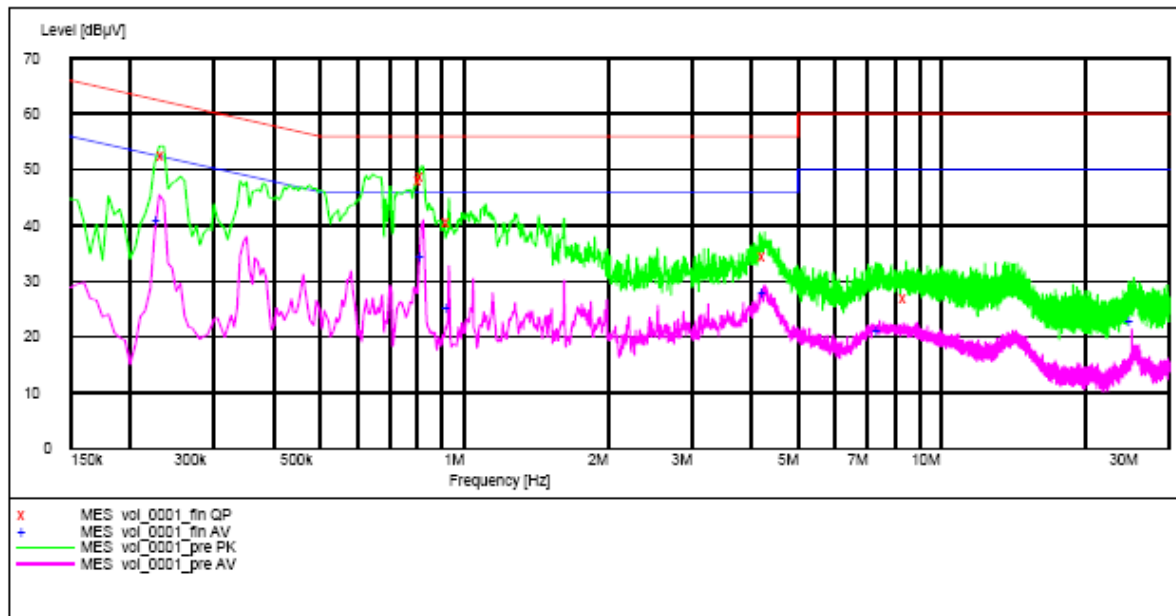
Test Report

Date : 2025-01-21
No. : HMD25010001

Page 29 of 42

Results of TX mode (N): PASS

Please refer to the following diagram for individual results.



MEASUREMENT RESULT: "vol_0001_fin QP"

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.235000	52.60	9.6	62.30	9.60	N	GND
0.815000	48.00	9.6	56.00	8.00	N	GND
0.820000	48.80	9.6	56.00	7.20	N	GND
0.930000	40.40	9.6	56.00	15.60	N	GND
4.265000	34.50	9.6	56.00	21.50	N	GND
8.425000	26.80	9.7	60.00	33.20	N	GND

MEASUREMENT RESULT: "vol_0001_fin AV"

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.230000	40.70	9.6	52.40	11.80	N	GND
0.820000	34.40	9.6	46.00	11.60	N	GND
0.930000	25.30	9.6	46.00	20.70	N	GND
4.265000	27.80	9.6	46.00	18.20	N	GND
7.420000	21.10	9.7	50.00	28.90	N	GND
25.060000	22.70	10.0	50.00	27.30	N	GND

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Test Report

Date : 2025-01-21

No. : HMD25010001

Page 30 of 42

3.1.3 Antenna Requirement

Ambient temperature 25°C

Relative humidity 57%

Test Requirements: § 15.203

Test Specification:

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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Test Results:

This is PCB antenna. There is no external antenna, the antenna1 gain =2.64dBi/ antenna 2 gain =2.63dBi. User is unable to remove or changed the Antenna.

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Test Report

Date : 2025-01-21
No. : HMD25010001

Page 31 of 42

3.1.4 20dB Bandwidth of Fundamental Emission

Ambient temperature 25°C

Relative humidity 57%

Test Requirement: FCC 47 CFR 15.249
Test Method: ANSI C63.10:2013
Test Date: 2025-01-09
Mode of Operation: Tx mode

Test Method:

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

The measurement bandwidth settings are RBW = 30 kHz
VBW = 100 kHz

Test Setup:

As Test Setup of clause 3.1.1 in this test report.

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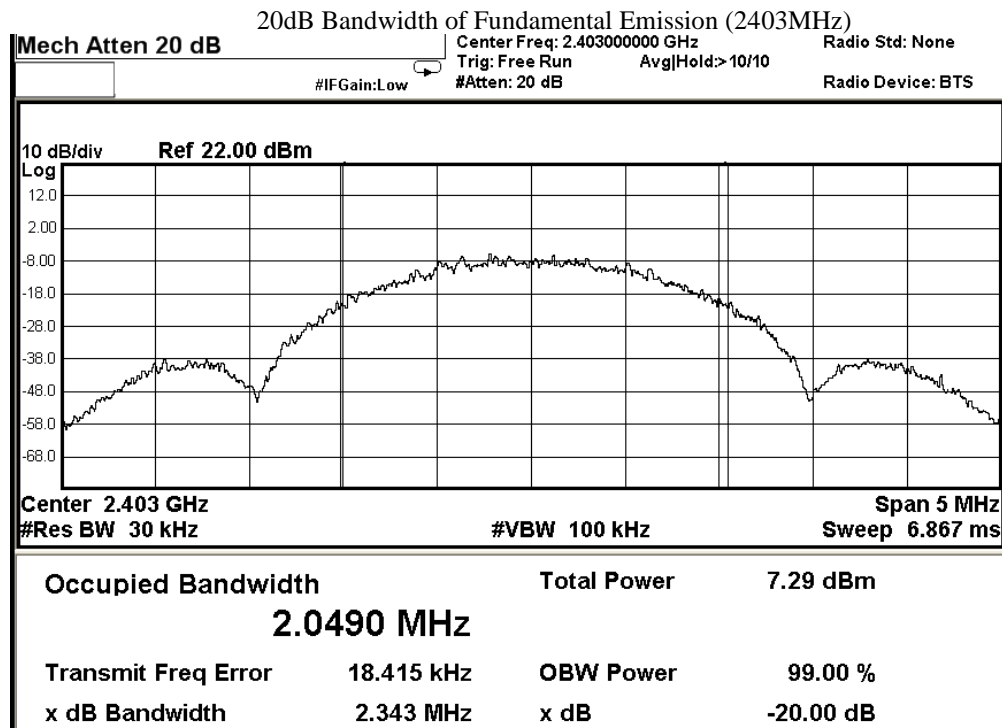
Test Report

Date : 2025-01-21
No. : HMD25010001

Page 32 of 42

Limits for 20dB Bandwidth of Fundamental Emission (Low Frequency Channel):
Ant 1

Frequency Range [MHz]	20dB Bandwidth [MHz]
2403.0	2.343



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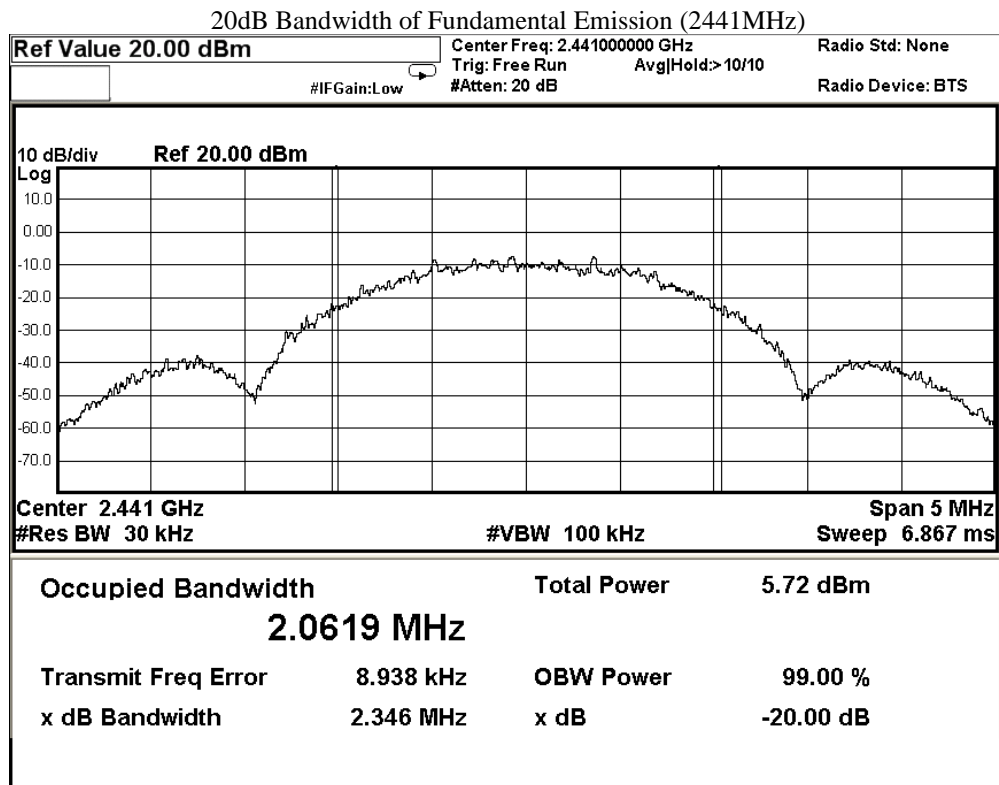
Test Report

Date : 2025-01-21
No. : HMD25010001

Page 33 of 42

Limits for 20dB Bandwidth of Fundamental Emission (Middle Frequency Channel):

Frequency Range [MHz]	20dB Bandwidth [MHz]
2441.0	2.346



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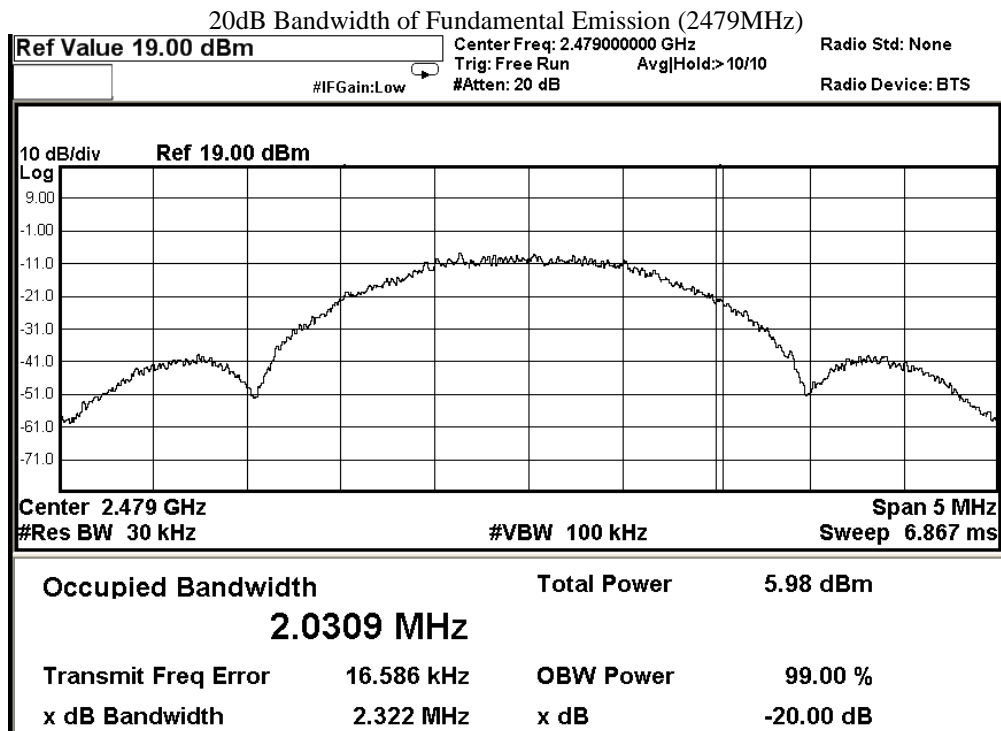
Test Report

Date : 2025-01-21
No. : HMD25010001

Page 34 of 42

Limits for 20dB Bandwidth of Fundamental Emission (High Frequency Channel):

Frequency Range [MHz]	20dB Bandwidth [MHz]
2479.0	2.322



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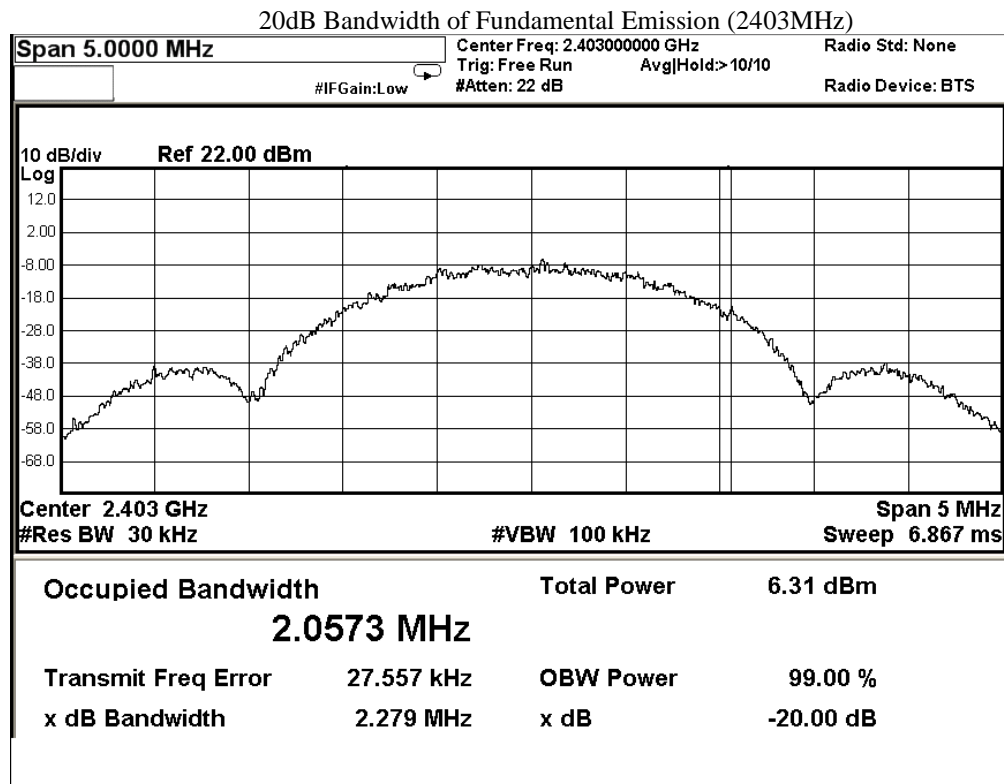
Test Report

Date : 2025-01-21
No. : HMD25010001

Page 35 of 42

Limits for 20dB Bandwidth of Fundamental Emission (Low Frequency Channel): Ant 2

Frequency Range [MHz]	20dB Bandwidth [MHz]
2403.0	2.279



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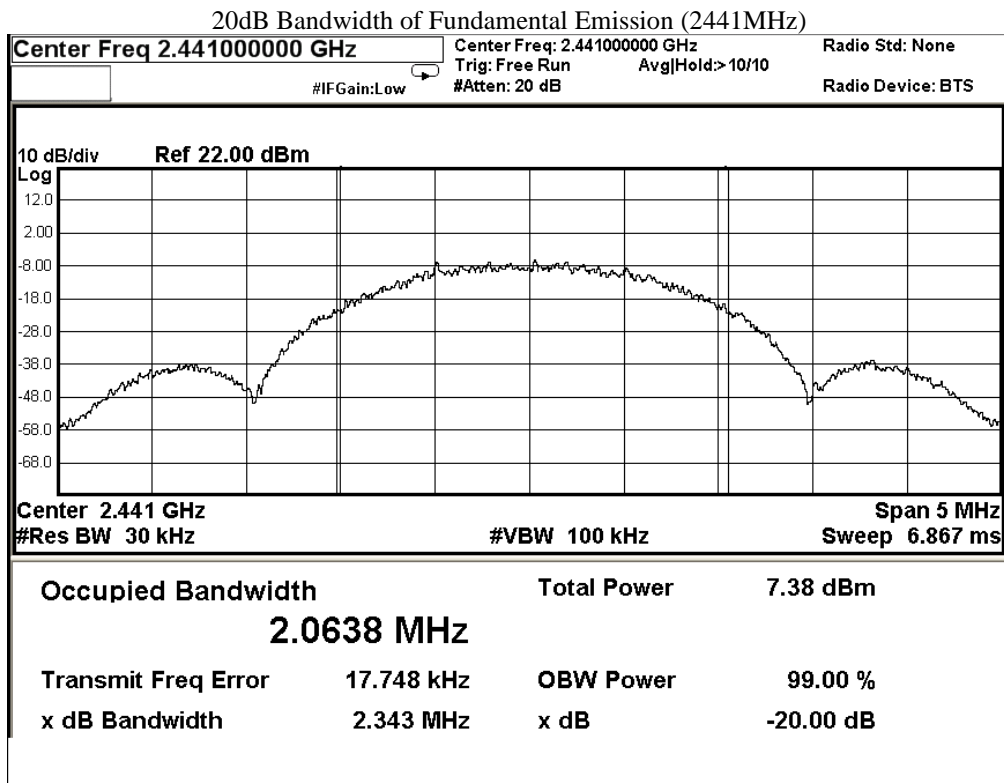
Test Report

Date : 2025-01-21
No. : HMD25010001

Page 36 of 42

Limits for 20dB Bandwidth of Fundamental Emission (Middle Frequency Channel):

Frequency Range [MHz]	20dB Bandwidth [MHz]
2441.0	2.343



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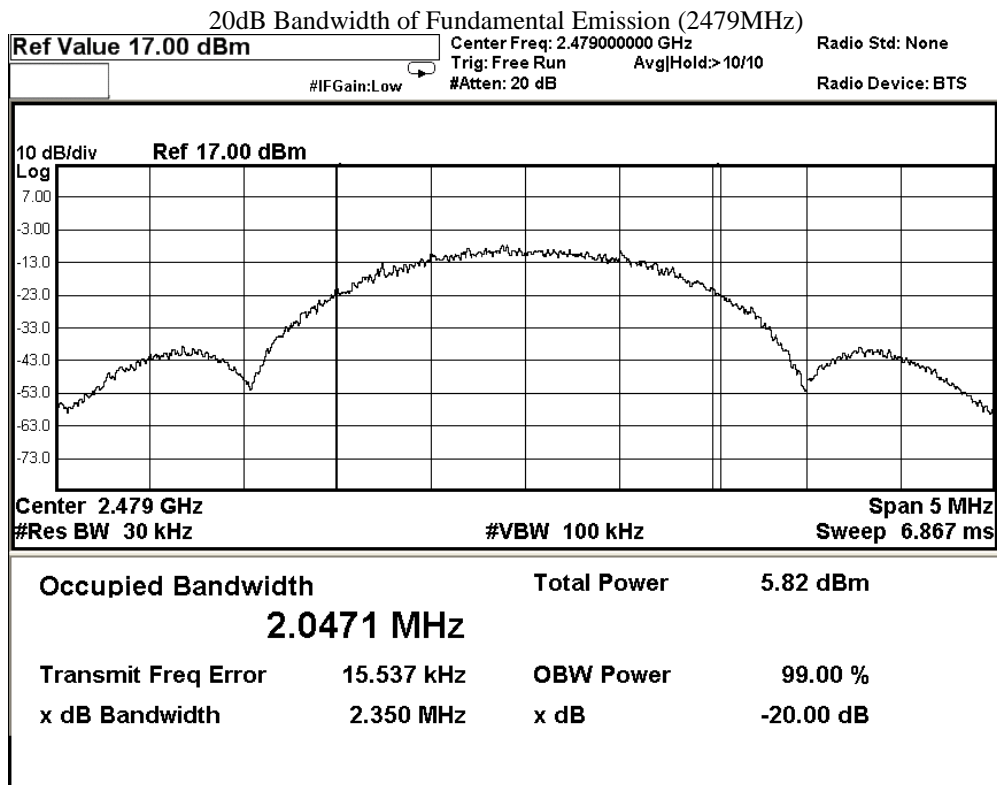
Test Report

Date : 2025-01-21
No. : HMD25010001

Page 37 of 42

Limits for 20dB Bandwidth of Fundamental Emission (High Frequency Channel):

Frequency Range [MHz]	20dB Bandwidth [MHz]
2479.0	2.350



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Test Report

Date : 2025-01-21
No. : HMD25010001

Page 38 of 42

Appendix A

List of Measurement Equipment

Radiated Emission

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM215	MULTIDEVICE CONTROLLER	EMCO	2090	00024676	N/A	N/A
EM217	ELECTRIC POWERED TURNTABLE	EMCO	2088	00029144	N/A	N/A
EM218	ANECHOIC CHAMBER	ETS-LINDGREN	FACT-3	--	2024-04-18	2029-04-18
EM356	ANTENNA POSITIONING TOWER	ETS-LINDGREN	2171B	00150346	N/A	N/A
EM293	SPECTRUM ANALYZER	AGILENT TECHNOLOGIES	N9020A	MY50510152	2023-03-21	2025-03-21
EM363	SIGNAL ANALYZER(10HZ-40GHZ)	R & S	FSV40	101231	2024-01-17	2026-01-17
EM299	BROADBAND HORN ANTENNA	ETS-LINDGREN	3115	00114120	2023-01-25	2025-01-25
EM300	PYRAMIDAL STANDARD GAIN HORN ANTENNA	ETS-LINDGREN	3160-09	00130130	2023-01-16	2025-01-16
EM301	PYRAMIDAL STANDARD GAIN HORN ANTENNA	ETS-LINDGREN	3160-10	00130988	2023-02-15	2025-02-15
EM353	LOOP ANTENNA	ETS_LINDGREN	6502	00206533	2022-09-26	2025-09-26
EM355	BICONILOG ANTENNA	ETS-LINDGREN	3143B	00094856	2022-08-26	2025-08-26
EM200	DUAL CHANNEL POWER METER	R & S	NRVD	100592	2023-08-02	2025-08-02

Line Conducted

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM232	LISN	SCHAFFNER	NNB41	04/100082	2023-05-30	2025-05-30
EM181	EMI TEST RECEIVER	R & S	ESIB7	100072	2024-04-18	2025-04-18
EM179	IMPULSE LIMITER	R & S	ESH3-Z2	357.8810.52/54	2023-03-17	2025-03-17
EM154	SHIELDING ROOM	SIEMENS MATSUSHITA COMPONENTS	N/A	803-740-057-99A	2022-02-06	2027-02-06
N/A	MEASUREMENT AND EVALUATION SOFTWARE	ROHDE & SCHWARZ	BSIB-K1	V1.20	N/A	N/A

Remarks:-

N/A Not Applicable or Not Available

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Test Report

Date : 2025-01-21
No. : HMD25010001

Page 39 of 42

Appendix B

Photographs of EUT

View of the product



View of the product



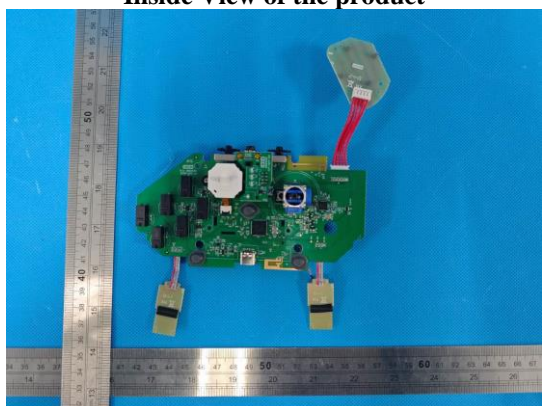
View of the product



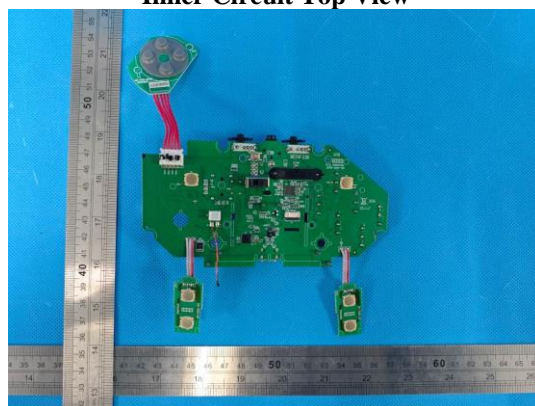
View of the product



Inside View of the product



Inner Circuit Top View



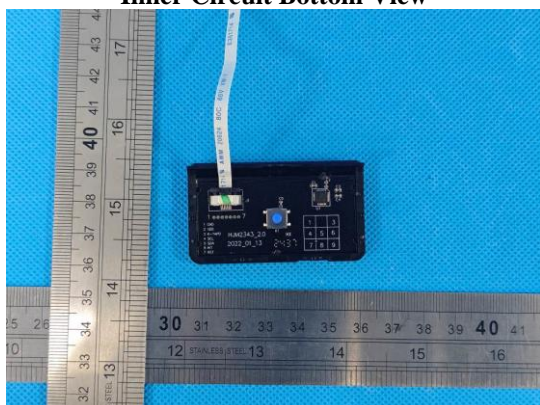
Test Report

Date : 2025-01-21
No. : HMD25010001

Page 40 of 42

Photographs of EUT

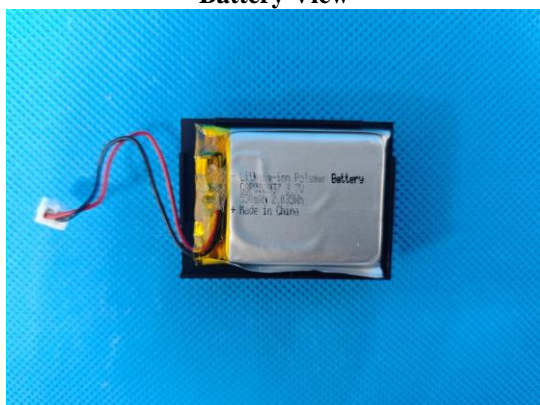
Inner Circuit Bottom View



Inner Circuit Top View



Battery View



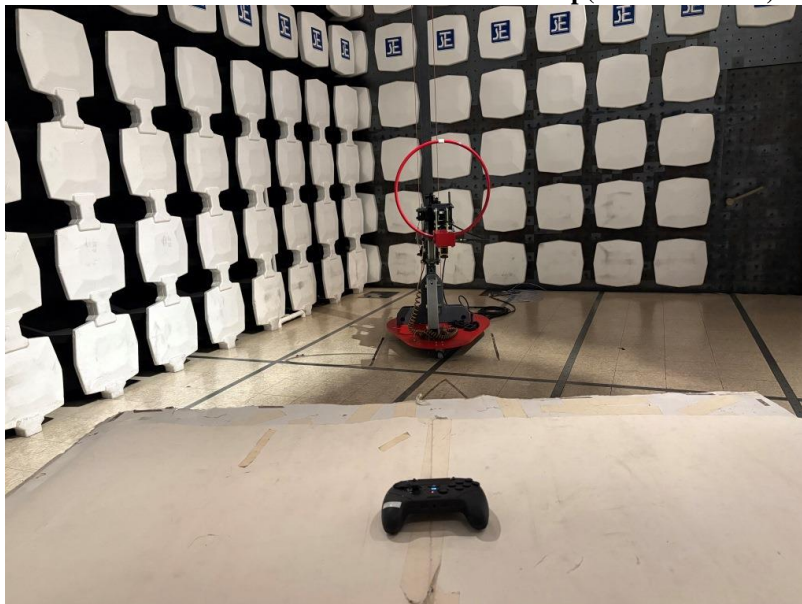
Test Report

Date : 2025-01-21
No. : HMD25010001

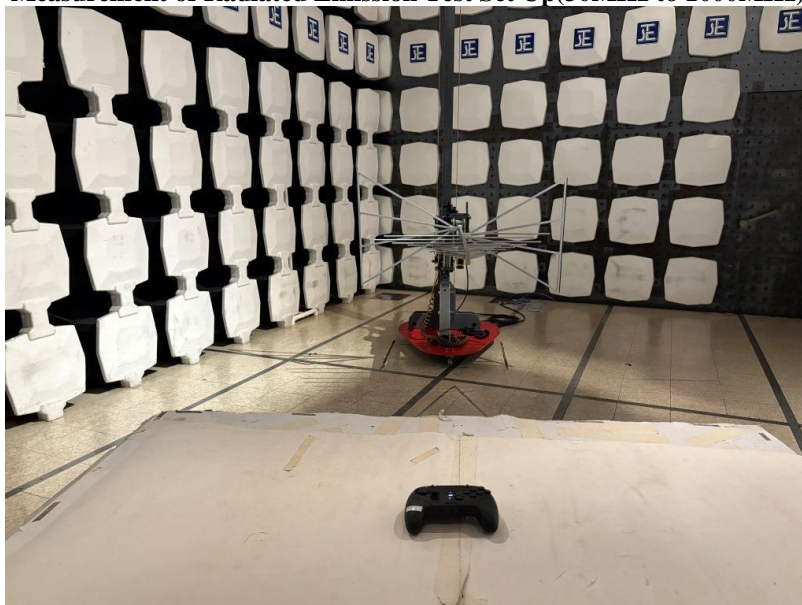
Page 41 of 42

Photographs of EUT

Measurement of Radiated Emission Test Set Up(9kHz – 30MHz)



Measurement of Radiated Emission Test Set Up(30MHz to 1000MHz)



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Date : 2025-01-21
No. : HMD25010001

Page 42 of 42

Photographs of EUT

Measurement of Radiated Emission Test Set Up(Above 1000MHz)



Measurement of Conducted Emission Test Set Up



******* End of Test Report *******

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