



Test Report

Date : 2023-11-17
No. : HMD23110011

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Applicant : RMS International (USA) Inc.
39 High Street, North Andover, Massachusetts, USA 01845

Supplier / Manufacturer : RMS International (USA) Inc.
39 High Street, North Andover, Massachusetts, USA 01845

Description of Sample(s) : Submitted sample(s) said to be
Product: Sonic Flyer
Brand Name: N/A
Model No.: US72-1292/MEN, SKU#2756219
FCC ID: 2ATYAUS72-1292

Date Samples Received : 2023-11-10

Date Tested : 2023-11-10 to 2023-11-15

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 : ---


Dr.CHAN Kwok Hung, Brian
Authorized Signatory





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1.0 General Details

1.1 Equipment Under Test [EUT] Description of Sample(s)

Product: Sonic Flyer
Manufacturer: RMS International (USA) Inc.,
39 High Street, North Andover, Massachusetts, USA 01845
Brand Name: N/A
Model Number: US72-1292/MEN, SKU#2756219
Rating: 6.0Vd.c. ("AA"size battery 1.5V*4)

1.1.1 Description of EUT Operation

The Equipment Under Test (EUT) is a Sonic Flyer. It is a transceiver operating at 2408Hz~2475MHz and the RF signal was modulated by IC.

1.2 RF Module Details

Module Model Number: N/A
Module FCC ID: N/A
Modulation: GFSK
Frequency Range: 2408-2475MHz

1.3 Antenna Details

Antenna Type: Linear antenna
Antenna Gain: 0dBi

1.4 Date of Order

2023-11-02

1.5 Submitted Sample(s):

1 Sample

1.6 Test Duration

2023-11-10 to 2023-11-15

1.7 Country of Origin

China

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1.8 Channel List

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2408	27	2435	54	2462
1	2409	28	2436	55	2463
2	2410	29	2437	56	2464
3	2411	30	2438	57	2465
4	2412	31	2439	58	2466
5	2413	32	2440	59	2467
6	2414	33	2441	60	2468
7	2415	34	2442	61	2469
8	2416	35	2443	62	2470
9	2417	36	2444	63	2471
10	2418	37	2445	64	2472
11	2419	38	2446	65	2473
12	2420	39	2447	66	2474
13	2421	40	2448	67	2475
14	2422	41	2449		
15	2423	42	2450		
16	2424	43	2451		
17	2425	44	2452		
18	2426	45	2453		
19	2427	46	2454		
20	2428	47	2455		
21	2429	48	2456		
22	2430	49	2457		
23	2431	50	2458		
24	2432	51	2459		
25	2433	52	2460		
26	2434	53	2461		

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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 EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. All testing shall be performed under maximum output power condition, and to measure its highest possible emissions level.

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	☒	☐	☐
Radiated Emissions	FCC 47CFR 15.209 FCC 47CFR 15.205	ANSI C63.10: 2013	N/A	☒	☐	☐
AC Mains Conducted Emissions	FCC 47CFR 15.207	ANSI C63.10: 2013	N/A	☐	☐	☒
Antenna requirement	FCC 47CFR 15.203	N/A	N/A	☒	☐	☐
20dB Emission bandwidth	FCC 47CFR 15.215(c)	ANSI C63.10: 2013	N/A	☒	☐	☐

Note: N/A - Not Applicable

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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:	2023-11-10 to 2023-11-14
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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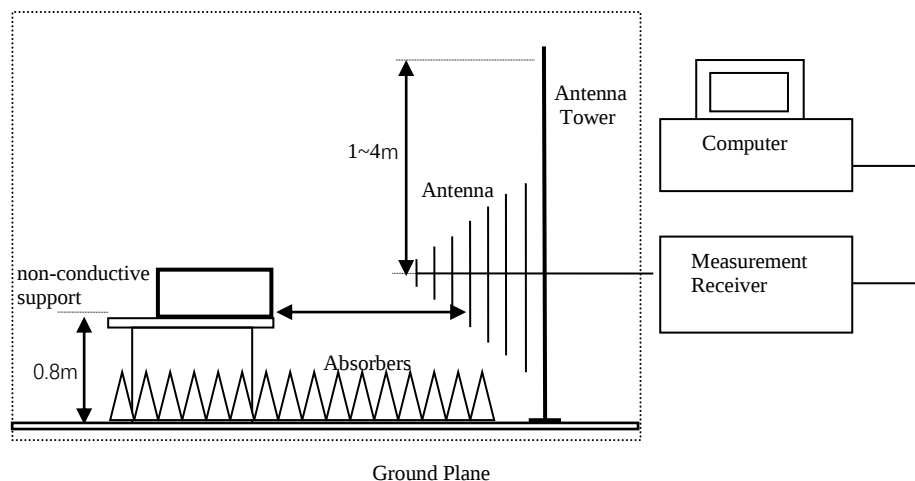
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Spectrum Analyzer Setting:

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.

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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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Results of Tx mode (Lowest Frequency Channel-2408 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
2408.00	91.4	-4.8	86.6	21,256.9	500,000	Vertical
2408.00	98.2	-4.7	93.5	47,315.1	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
2408.00	75.2	-4.8	70.4	3,322.8	50,000	Vertical
2408.00	81.5	-4.7	76.8	6,918.3	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
4816.0	54.9	0.8	55.7	609.5	5,000	Vertical
4816.0	55.1	0.5	55.6	602.6	5,000	Horizontal
7224.0	48.5	7.0	55.5	595.7	5,000	Vertical
7224.0	48.7	6.5	55.2	575.4	5,000	Horizontal
9632.0	45.8	8.5	54.3	518.8	5,000	Vertical
9632.0	45.7	8.3	54.0	501.2	5,000	Horizontal
12040.0	45.2	10.9	56.1	638.3	5,000	Vertical
12040.0	44.9	10.8	55.7	609.5	5,000	Horizontal

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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
4816.0	40.0	0.8	40.8	109.6	500	Vertical
4816.0	39.6	0.5	40.1	101.2	500	Horizontal
7224.0	33.7	7.0	40.7	108.4	500	Vertical
7224.0	33.1	6.5	39.6	95.5	500	Horizontal
9632.0	32.8	8.5	41.3	116.1	500	Vertical
9632.0	32.7	8.3	41.0	112.2	500	Horizontal
12040.0	30.9	10.9	41.8	123.0	500	Vertical
12040.0	30.8	10.8	41.6	120.2	500	Horizontal

Results of Tx mode (Middle Frequency Channel- 2440MHz): 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
2440.00	95.0	-4.8	90.2	32,508.7	500,000	Vertical
2440.00	99.2	-4.7	94.5	53,088.4	500,000	Horizontal

Field Strength of Fundamental Emissions						
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
2440.00	80.0	-4.8	75.2	5,754.4	50,000	Vertical
2440.00	84.3	-4.7	79.6	9,549.9	50,000	Horizontal

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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
4880.0	54.8	0.8	55.6	605.3	5,000	Vertical
4880.0	55.6	0.5	56.1	638.3	5,000	Horizontal
7320.0	48.9	7.0	55.9	623.7	5,000	Vertical
7320.0	48.6	6.5	55.1	568.9	5,000	Horizontal
9760.0	46.3	8.5	54.8	549.5	5,000	Vertical
9760.0	46.8	8.3	55.1	568.9	5,000	Horizontal
12200.0	44.9	10.9	55.8	616.6	5,000	Vertical
12200.0	45.3	10.8	56.1	638.3	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
4880.0	40.1	0.8	40.9	111.2	500	Vertical
4880.0	40.5	0.5	41.0	112.2	500	Horizontal
7320.0	33.6	7.0	40.6	107.2	500	Vertical
7320.0	32.9	6.5	39.4	93.3	500	Horizontal
9760.0	31.0	8.5	39.5	94.4	500	Vertical
9760.0	31.9	8.3	40.2	102.3	500	Horizontal
12200.0	30.9	10.9	41.8	123.0	500	Vertical
12200.0	30.7	10.8	41.5	118.9	500	Horizontal

Results of Tx mode (Highest Frequency Channel – 2475MHz): 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
2475.00	95.1	-4.8	90.3	32,809.5	500,000	Vertical
2475.00	99.8	-4.7	95.1	56,754.5	500,000	Horizontal

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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
2475.00	80.1	-4.8	75.3	5,821.0	50,000	Vertical
2475.00	85.3	-4.7	80.6	10,715.2	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
4950.0	54.8	0.8	55.6	603.9	5,000	Vertical
4950.0	55.8	0.5	56.3	653.1	5,000	Horizontal
7425.0	48.2	7.0	55.2	575.4	5,000	Vertical
7425.0	49.1	6.5	55.6	602.6	5,000	Horizontal
9900.0	47.0	8.5	55.5	595.7	5,000	Vertical
9900.0	47.1	8.3	55.4	588.8	5,000	Horizontal
12735.0	44.9	10.9	55.8	616.6	5,000	Vertical
12735.0	45.1	10.8	55.9	623.7	5,000	Horizontal

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
4950.0	40.1	0.8	40.9	111.2	500	Vertical
4950.0	39.6	0.5	40.1	101.2	500	Horizontal
7425.0	33.6	7.0	40.6	107.2	500	Vertical
7425.0	33.3	6.5	39.8	97.7	500	Horizontal
9900.0	31.2	8.5	39.7	96.6	500	Vertical
9900.0	31.1	8.3	39.4	93.3	500	Horizontal
12735.0	30.6	10.9	41.5	118.9	500	Vertical
12735.0	30.8	10.8	41.6	120.2	500	Horizontal

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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)

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	59.6	-4.8	54.8	74.0	19.2	Vertical
2400.0	67.6	-4.7	62.9	74.0	11.1	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	51.4	-4.8	46.6	54.0	7.5	Vertical
2400.0	54.2	-4.7	49.5	54.0	4.5	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	57.3	-4.8	52.5	74.0	21.5	Vertical
2483.5	65.3	-4.7	60.6	74.0	13.4	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	49.6	-4.8	44.8	54.0	9.2	Vertical
2483.5	51.8	-4.7	47.1	54.0	6.9	Horizontal

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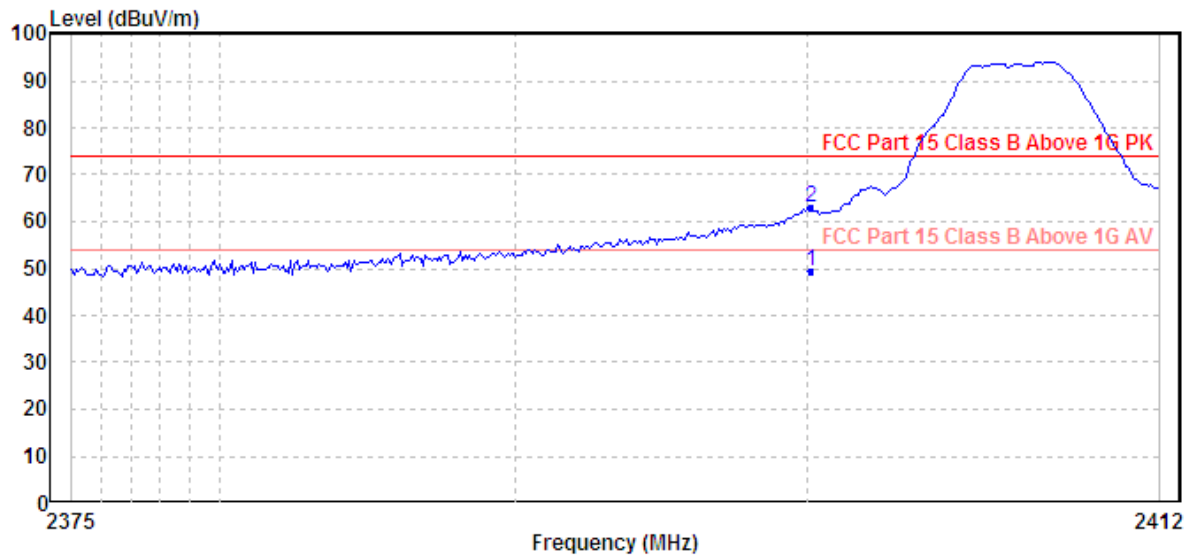
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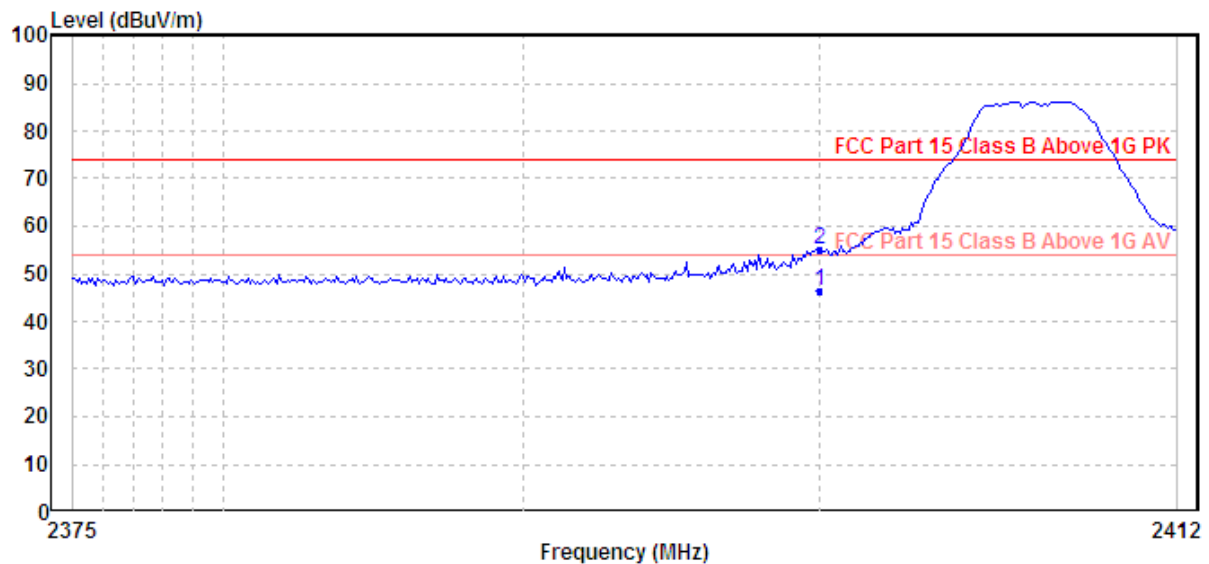
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Emissions radiated outside of the specified frequency bands (Lowest)

Horizontal



Vertical



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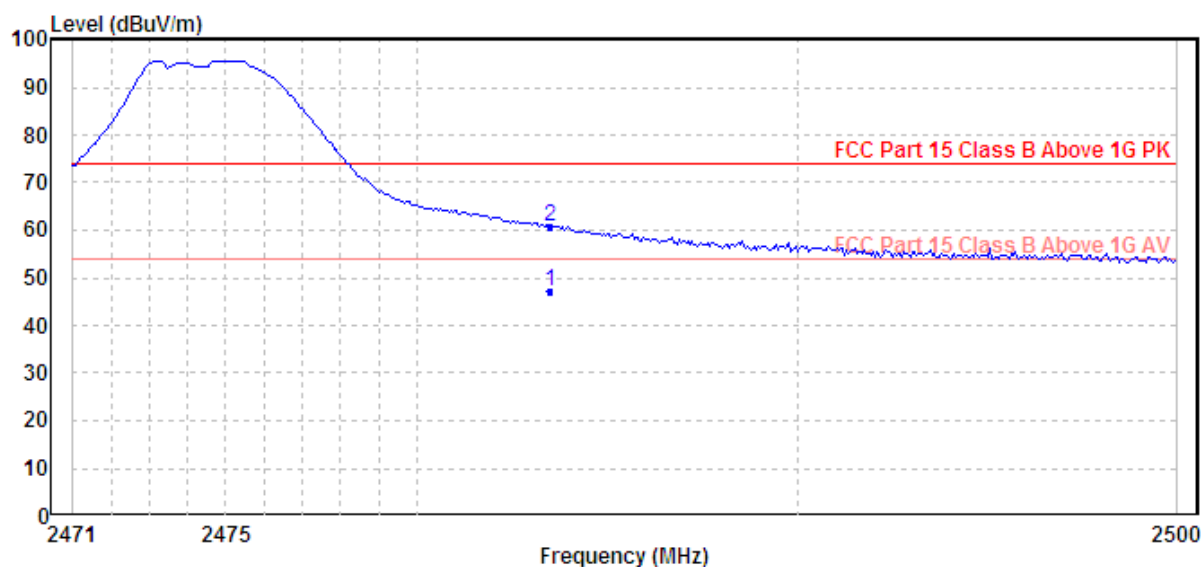
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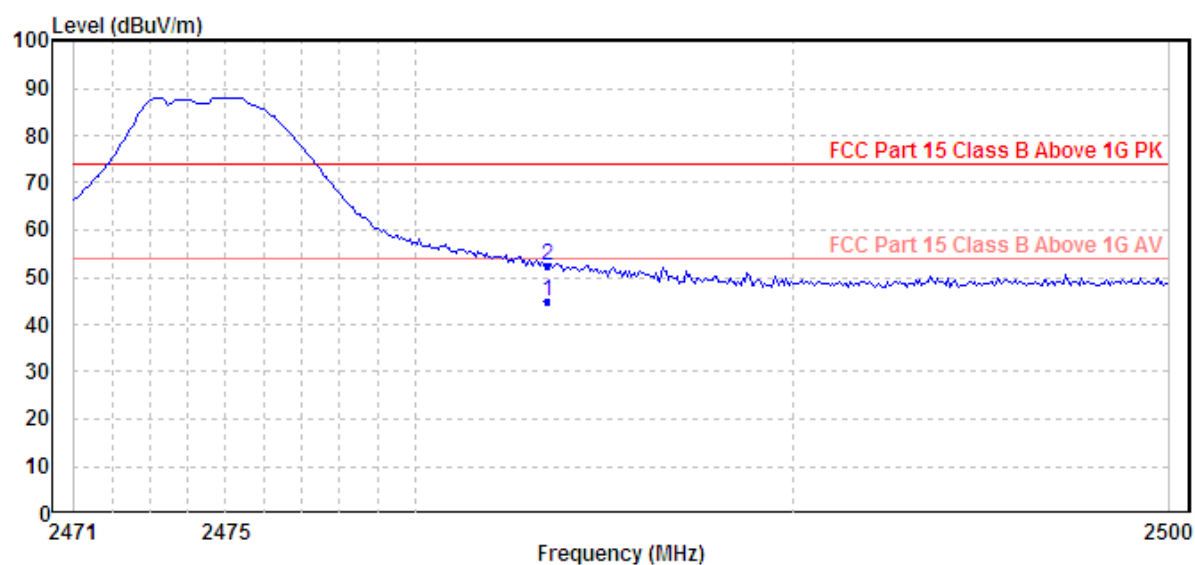
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Emissions radiated outside of the specified frequency bands (Highest)

Horizontal



Vertical



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

Frequency Range [MHz]	Quasi-Peak Limits [μ V/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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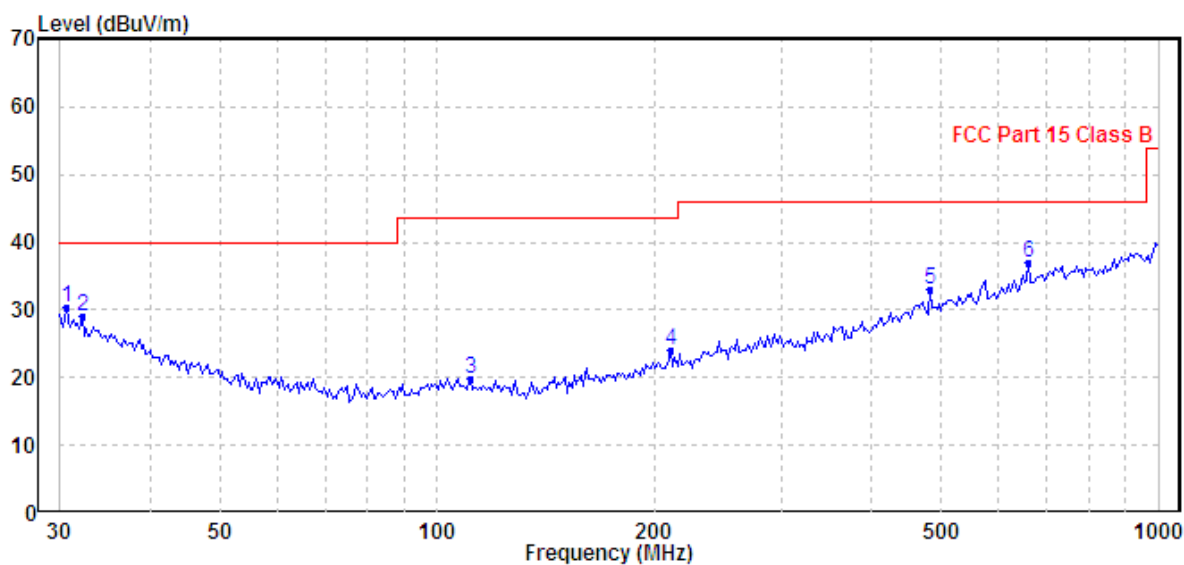
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Results of TX mode (30MHz – 1GHz)(2402MHz worst case): PASS

Horizontal



Ambient Temperature: 26.3C
Relative Humidity : 54.7%
Air Pressure : 100.9kPa

	Freq	Level	Limit	Over		
	MHz	dBuV/m	Line	Limit	Remark	Pol/Phase
1	30.638	30.50	40.00	-9.50	Peak	Horizontal
2	32.179	29.08	40.00	-10.92	Peak	Horizontal
3	111.347	19.92	43.50	-23.58	Peak	Horizontal
4	210.786	23.91	43.50	-19.59	Peak	Horizontal
5	482.216	32.91	46.00	-13.09	Peak	Horizontal
6	661.151	36.93	46.00	-9.07	Peak	Horizontal

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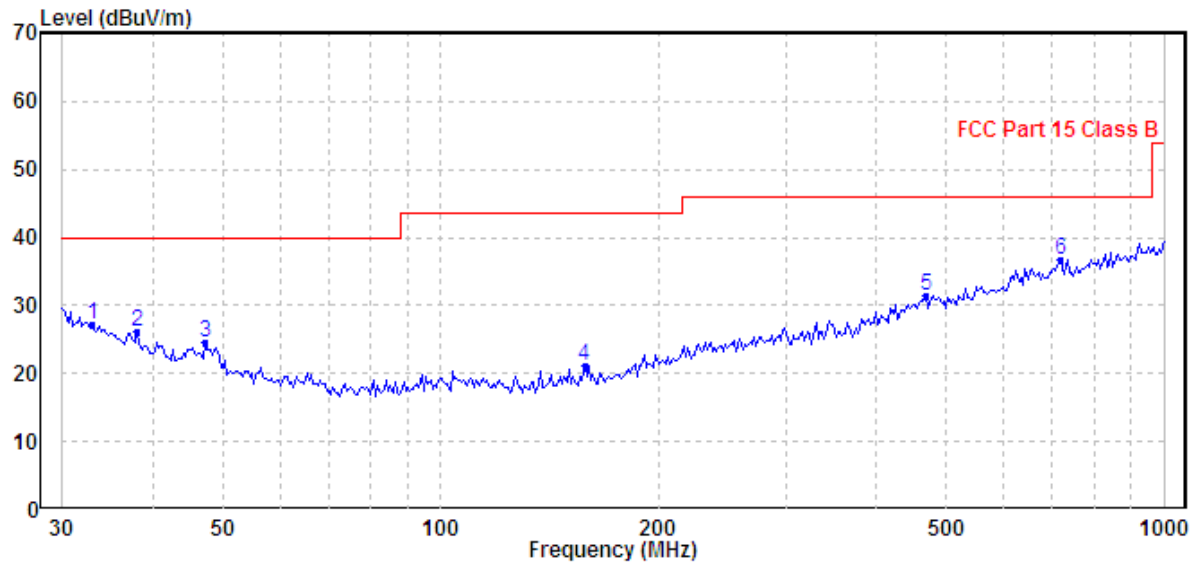
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Results of TX mode (30MHz – 1GHz) (2402MHz worst case): PASS

Vertical



Ambient Temperature: 26.3C
Relative Humidity : 54.7%
Air Pressure : 100.9kPa

	Freq	Level	Limit	Over	Remark	Pol/Phase
	MHz	dBuV/m	Line	Limit		
			dBuV/m	dB		
1	33.095	27.29	40.00	-12.71	Peak	Vertical
2	38.078	26.20	40.00	-13.80	Peak	Vertical
3	47.326	24.63	40.00	-15.37	Peak	Vertical
4	158.112	21.21	43.50	-22.29	Peak	Vertical
5	468.876	31.49	46.00	-14.51	Peak	Vertical
6	719.200	36.73	46.00	-9.27	Peak	Vertical

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3.1.2 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 Linear antenna. There is no external antenna, the antenna gain =0dBi. User is unable to remove or changed the Antenna.

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3.1.3 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: 2023-11-15
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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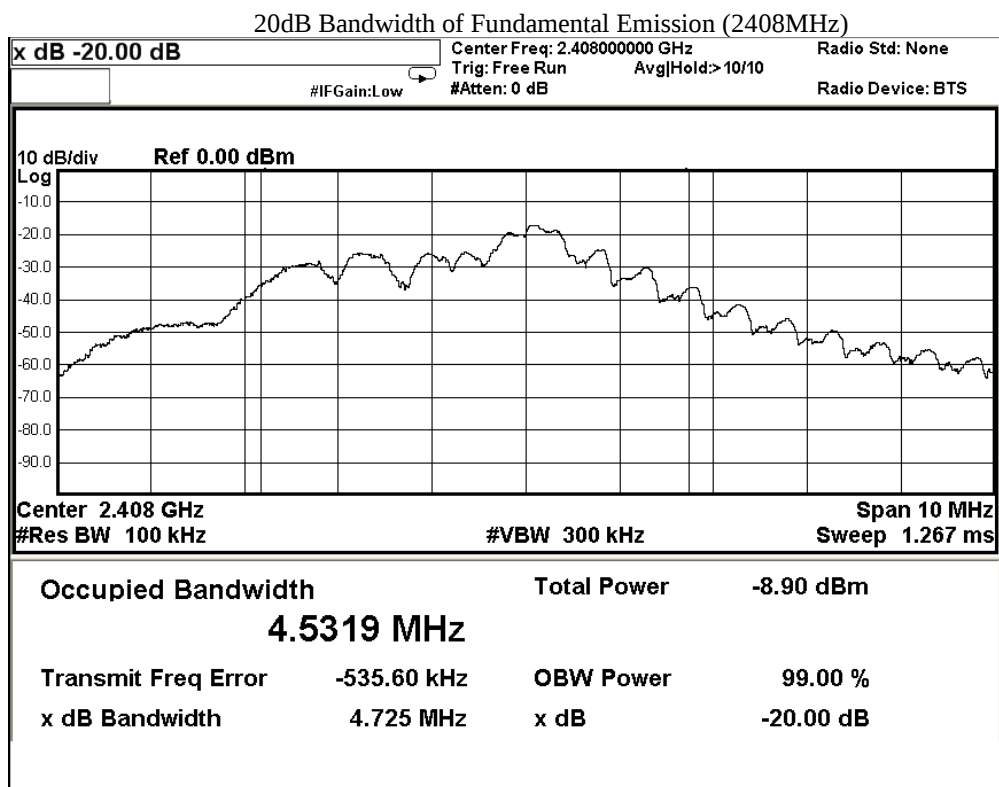
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Limits for 20dB Bandwidth of Fundamental Emission (Low Frequency Channel):

Frequency Range [MHz]	20dB Bandwidth [MHz]
2408.0	4.725



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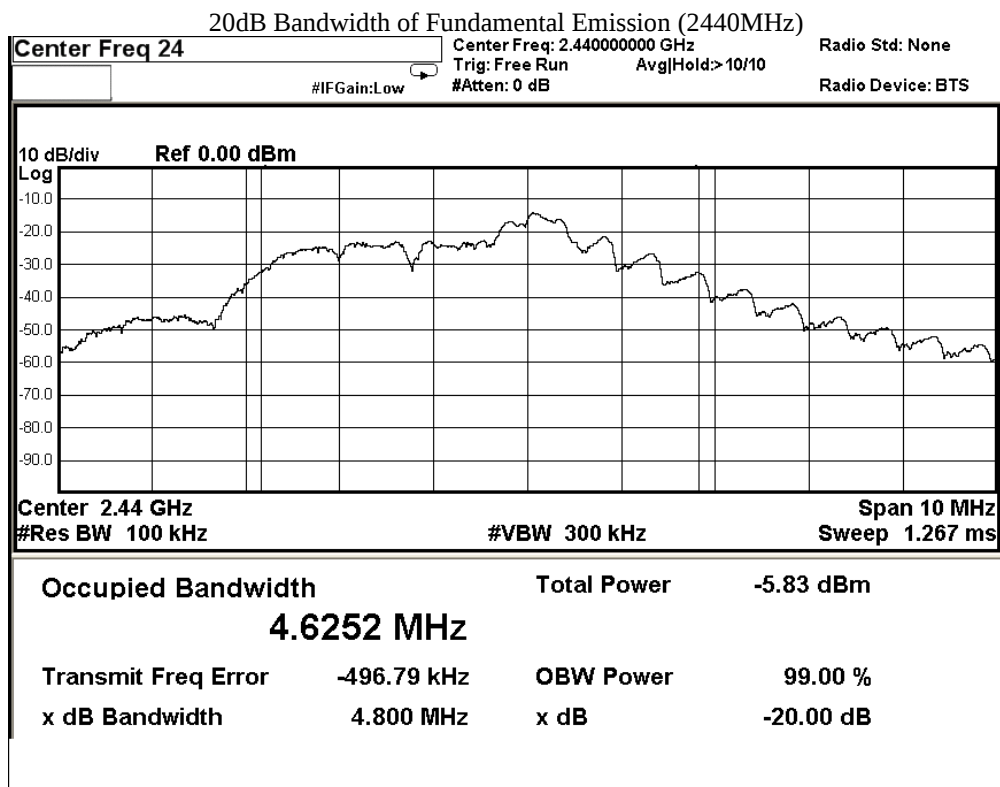
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Limits for 20dB Bandwidth of Fundamental Emission (Middle Frequency Channel):

Frequency Range [MHz]	20dB Bandwidth [MHz]
2440.0	4.800



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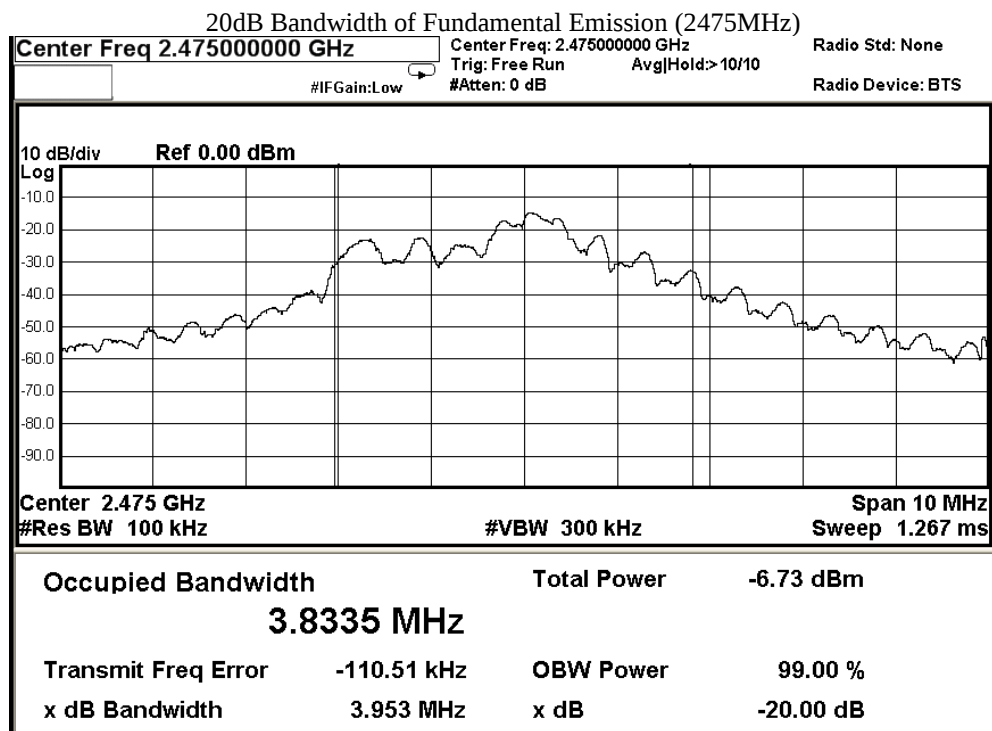
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Limits for 20dB Bandwidth of Fundamental Emission (High Frequency Channel):

Frequency Range [MHz]	20dB Bandwidth [MHz]
2475.0	3.953



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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	--	2019-04-16	2024-04-16
EM356	ANTENNA POSITIONING TOWER	ETS-LINDGREN	2171B	00150346	N/A	N/A
EM293	SPECTRUM ANALYZER	AGILENT TECHNOLOGIES	N9020A	MY50510152	2023-03-21	2024-03-21
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	2024-09-26
EM355	BICONILOG ANTENNA	ETS-LINDGREN	3143B	00094856	2022-08-26	2024-08-26
EM200	DUAL CHANNEL POWER METER	R & S	NRVD	100592	2023-08-02	2025-08-02
EM012	PRE-AMPLIFIER	HP	HP8448B	3008A00262	2022-11-08	2025-11-08
EM215	MULTIDEVICE CONTROLLER	EMCO	2090	00024676	N/A	N/A

Remarks:-

N/A Not Applicable or Not Available

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Appendix B

Photographs of EUT

View of the product



View of the product



Inside View of the product



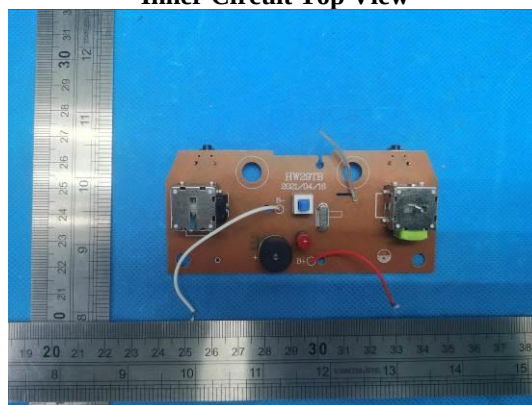
Inner Circuit Top View



Inner Circuit Bottom View



Inner Circuit Top View



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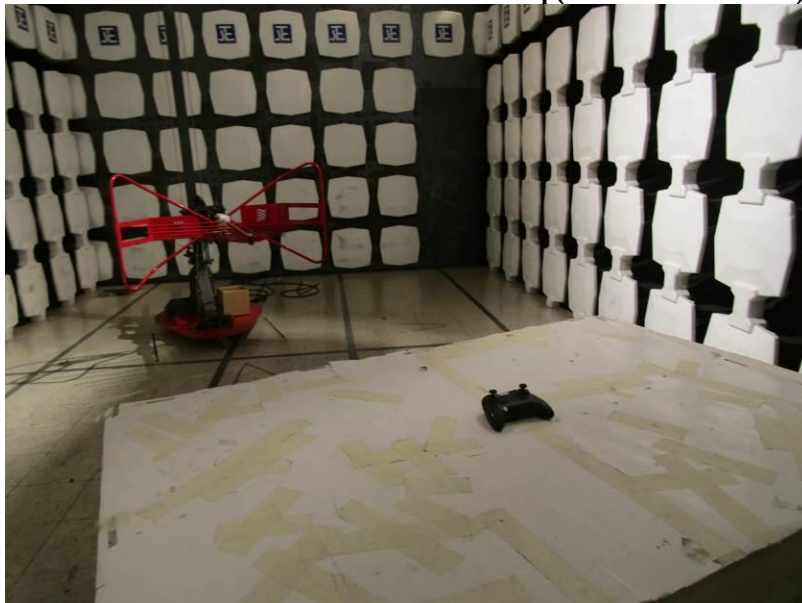
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Photographs of EUT

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



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



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Photographs of EUT

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



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

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6. When a statement of conformity to a specification or standard is provided, the ILAC-G8 Guidance document (and/or IEC Guide 115 in the electrotechnical sector) will be adopted as a decision rule for the determination of conformity unless it is inherent in the requested specification or standard, or otherwise specified in the Report.
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