Test Report

Date : 2023-12-13
No. : HMD23110003

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: Wireless Racing Wheel Apex for PS5, PS4, PC Brand Name: HORI Model No.: SPF-022 FCC ID: RQZSPF-2118A
Date Samples Received	:	2023-11-10
Date Tested	:	2023-11-10 to 2023-11-22
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

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Test Report

CONTENT:

1.0 General Details

1.1 Equipment Under Test [EUT]

Description of Sample(s)

Product:	Wireless Racing Wheel Apex 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-022
Additional model numbers:	SPF-022E, SPF-022A, SPF-022U, SPF-022C
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 Wireless Racing Wheel Apex 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:	HJM90023A
Module FCC ID:	N/A
Modulation:	GFSK
Frequency Range:	2403-2479MHz

1.3 Antenna Details

Antenna Type:	PCB antenna
Antenna Gain:	2.63dBi

1.4 Date of Order

2023-11-02

1.5 Submitted Sample(s):

1 Sample

1.6 Test Duration

2023-11-10 to 2023-11-22

1.7 Country of Origin

China

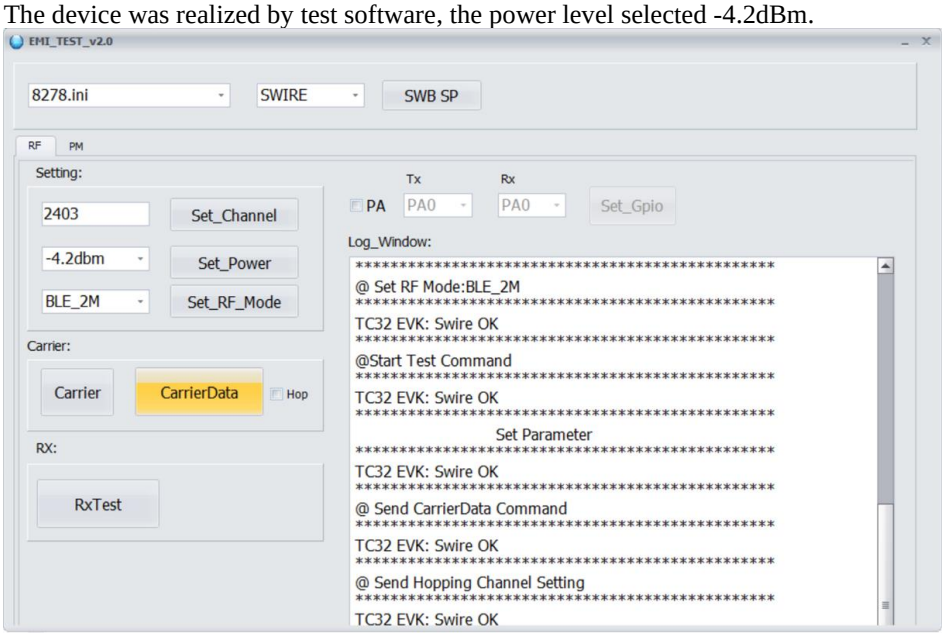
1.8 Channel List

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		

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 -4.2dBm.



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 bandwith	FCC 47CFR 15.215(c)	ANSI C63.10: 2013	N/A	☒	☐	☐

Note: N/A - Not Applicable

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 2023-11-22
Mode of Operation:	Tx mode

Test Method:

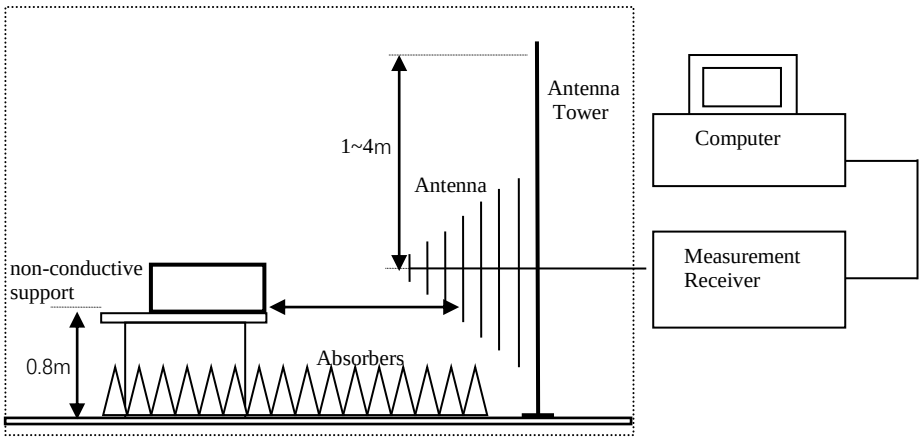
For emission measurements at or below 1 GHz, the sample was placed 0.8m above the ground plane of semi-anechoic Chamber*. For emission measurements above 1 GHz, the sample was placed 1.5m above the ground plane of semi-anechoic Chamber*. Measurements in both horizontal and vertical polarities were performed. 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

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:



Ground Plane

- 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.

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.

Results of Tx mode (Lowest Frequency Channel-2403 MHz): 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
2403.00	100.5	-4.8	95.7	60,953.7	500,000	Vertical
2403.00	103.3	-4.7	98.6	84,918.0	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
2403.00	92.2	-4.8	87.4	23,442.3	50,000	Vertical
2403.00	95.9	-4.7	91.2	36,307.8	50,000	Horizontal

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
4806.0	57.4	0.8	58.2	809.1	5,000	Vertical
4806.0	58.1	0.5	58.6	846.3	5,000	Horizontal
7209.0	49.5	7.0	56.5	669.9	5,000	Vertical
7209.0	48.9	6.5	55.4	588.2	5,000	Horizontal
9612.0	45.9	8.5	54.4	524.2	5,000	Vertical
9612.0	47.3	8.3	55.6	601.9	5,000	Horizontal
12015.0	45.3	10.9	56.2	645.7	5,000	Vertical
12015.0	45.0	10.8	55.8	613.8	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
4806.0	43.6	0.8	44.4	165.2	500	Vertical
4806.0	44.0	0.5	44.5	168.7	500	Horizontal
7209.0	35.6	7.0	42.6	135.4	500	Vertical
7209.0	34.9	6.5	41.4	117.4	500	Horizontal
9612.0	33.1	8.5	41.6	120.4	500	Vertical
9612.0	34.1	8.3	42.4	131.1	500	Horizontal
12015.0	30.3	10.9	41.2	114.3	500	Vertical
12015.0	29.9	10.8	40.7	107.8	500	Horizontal

Results of Tx mode (Middle Frequency Channel- 2441MHz): 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
2441.00	99.6	-4.8	94.8	54,701.6	500,000	Vertical
2441.00	101.7	-4.7	97.0	70,794.6	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
2441.00	91.3	-4.8	86.5	21,134.9	50,000	Vertical
2441.00	94.6	-4.7	89.9	31,260.8	50,000	Horizontal

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	57.1	0.8	57.9	787.0	5,000	Vertical
4882.0	57.9	0.5	58.4	827.0	5,000	Horizontal
7323.0	49.4	7.0	56.4	662.2	5,000	Vertical
7323.0	48.7	6.5	55.2	578.1	5,000	Horizontal
9764.0	45.4	8.5	53.9	493.2	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	44.8	10.8	55.6	601.2	5,000	Horizontal

Field Strength of Harmonics Emission Avarage 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	43.1	0.8	43.9	157.0	500	Vertical
4882.0	43.9	0.5	44.4	165.6	500	Horizontal
7323.0	35.3	7.0	42.3	129.7	500	Vertical
7323.0	34.7	6.5	41.2	115.3	500	Horizontal
9764.0	33.1	8.5	41.6	119.5	500	Vertical
9764.0	33.9	8.3	42.2	128.1	500	Horizontal
12205.0	30.1	10.9	41.0	112.6	500	Vertical
12205.0	29.5	10.8	40.3	103.2	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	103.1	-4.8	98.3	82,224.3	500,000	Vertical
2479.00	103.3	-4.7	98.6	85,015.9	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
2479.00	95.1	-4.8	90.3	32,734.1	50,000	Vertical
2479.00	95.2	-4.7	90.5	33,496.5	50,000	Horizontal

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
4958.0	57.9	0.8	58.7	858.0	5,000	Vertical
4958.0	57.7	0.5	58.2	812.8	5,000	Horizontal
7437.0	49.8	7.0	56.8	691.8	5,000	Vertical
7437.0	49.2	6.5	55.7	609.5	5,000	Horizontal
9916.0	46.1	8.5	54.6	537.0	5,000	Vertical
9916.0	47.5	8.3	55.8	616.6	5,000	Horizontal
12395.0	45.1	10.9	56.0	631.0	5,000	Vertical
12395.0	44.9	10.8	55.7	609.5	5,000	Horizontal

Field Strength of Harmonics Emission Avarage 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
4958.0	43.5	0.8	44.3	164.4	500	Vertical
4958.0	43.9	0.5	44.4	166.0	500	Horizontal
7437.0	35.0	7.0	42.0	125.9	500	Vertical
7437.0	34.9	6.5	41.4	117.5	500	Horizontal
9916.0	33.2	8.5	41.7	121.6	500	Vertical
9916.0	34.1	8.3	42.4	131.8	500	Horizontal
12395.0	30.5	10.9	41.4	117.5	500	Vertical
12395.0	29.8	10.8	40.6	107.2	500	Horizontal

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 dBµV	Correction Factor dB/m	Field Strength dBµV/m	Limit @3m dBµV/m	Margin dBµV/m	E-Field Polarity
2400.0	64.2	-4.8	59.4	74.0	14.6	Vertical
2400.0	66.7	-4.7	62.0	74.0	12.0	Horizontal

Field Strength of Band-edge Compliance Average Value						
Frequency MHz	Measured Level @3m dBµV	Correction Factor dB/m	Field Strength dBµV/m	Limit @3m dBµV/m	Margin dBµV/m	E-Field Polarity
2400.0	53.4	-4.8	48.6	54.0	5.4	Vertical
2400.0	53.3	-4.7	48.6	54.0	5.4	Horizontal

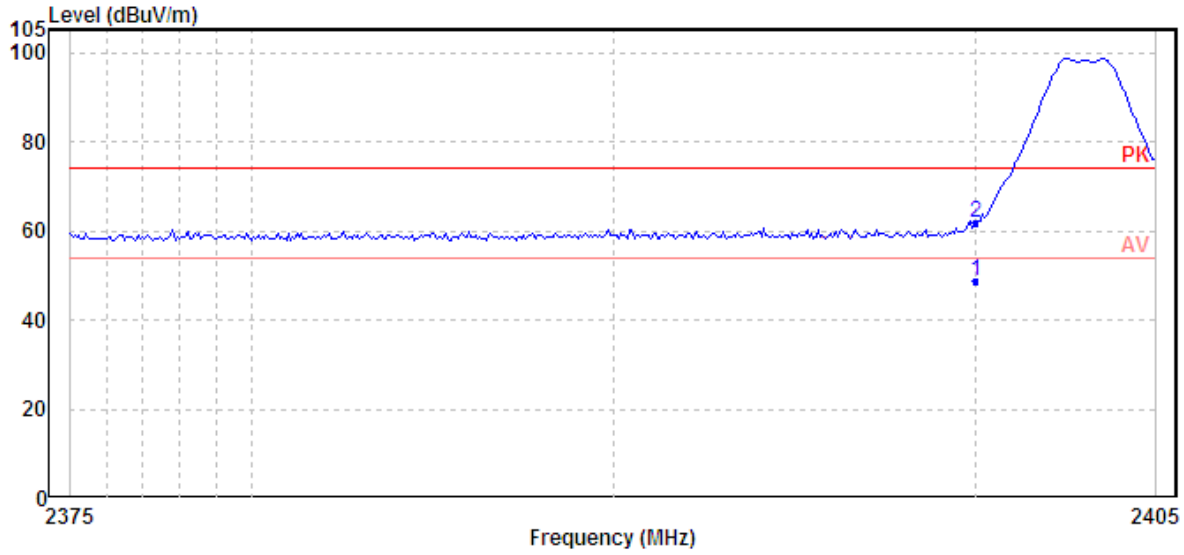
Result： RF Radiated Emissions (1GHz-26GHz) (Highest)

Field Strength of Band-edge Compliance Peak Value						
Frequency MHz	Measured Level @3m dBµV	Correction Factor dB/m	Field Strength dBµV/m	Limit @3m dBµV/m	Margin dBµV/m	E-Field Polarity
2483.5	63.5	-4.8	58.7	74.0	15.3	Vertical
2483.5	63.1	-4.7	58.4	74.0	15.6	Horizontal

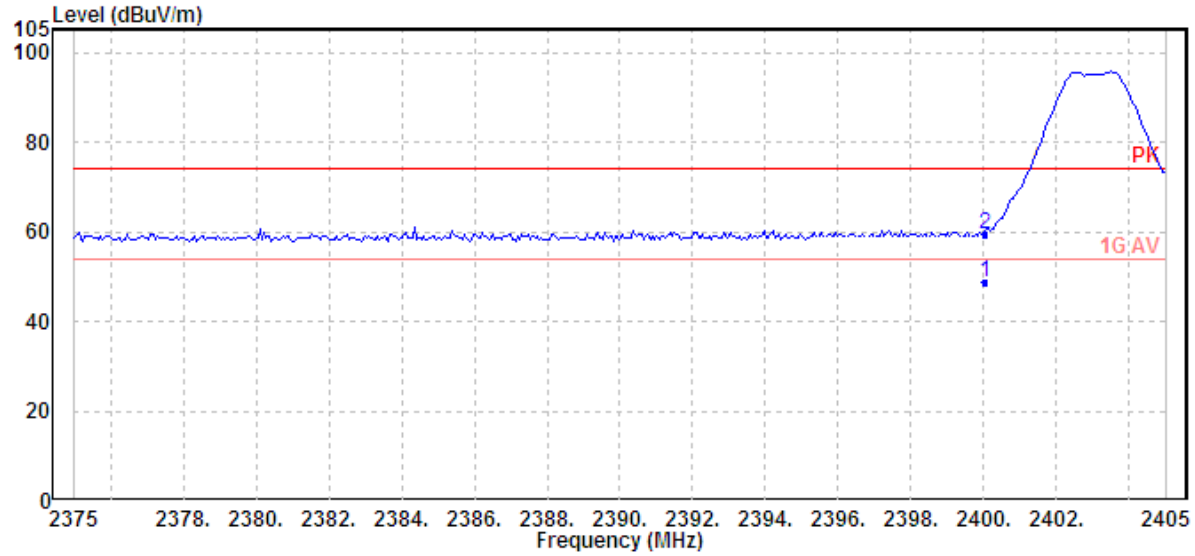
Field Strength of Band-edge Compliance Average Value						
Frequency MHz	Measured Level @3m dBµV	Correction Factor dB/m	Field Strength dBµV/m	Limit @3m dBµV/m	Margin dBµV/m	E-Field Polarity
2483.5	53.4	-4.8	48.6	54.0	5.4	Vertical
2483.5	53.5	-4.7	48.8	54.0	5.2	Horizontal

Emissions radiated outside of the specified frequency bands (Lowest)

Horizontal

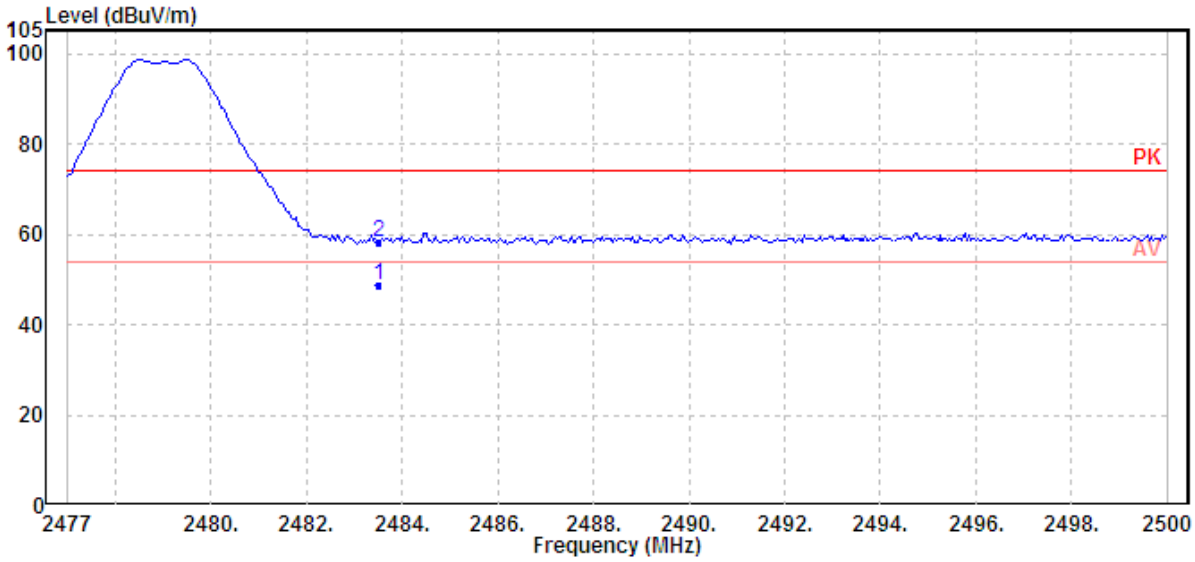


Vertical

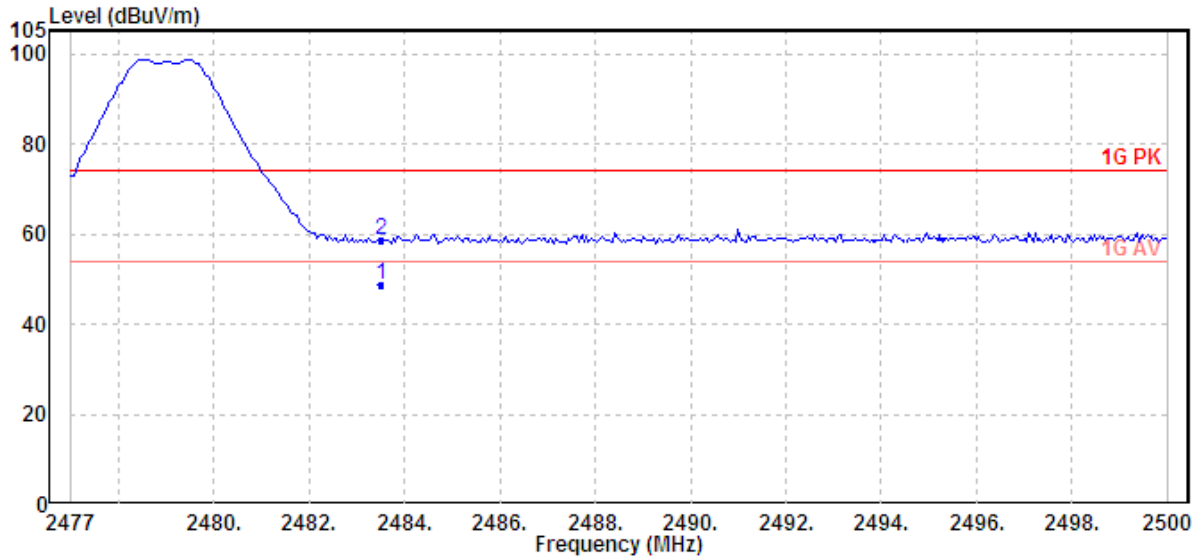


Emissions radiated outside of the specified frequency bands (Highest)

Horizontal



Vertical



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

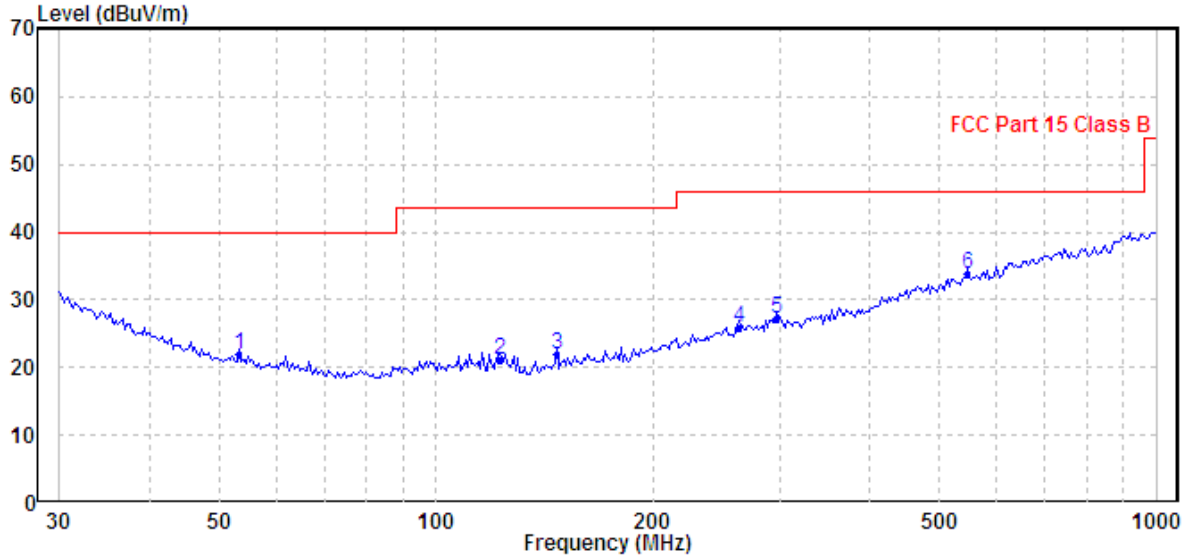
Frequency Range [MHz]	Quasi-Peak Limits [μV/m]
0.009-0.490	2400/F (kHz)
0.490-1.705	24000/F (kHz)
1.705-30	30
30-88	100
88-216	150
216-960	200
Above960	500

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

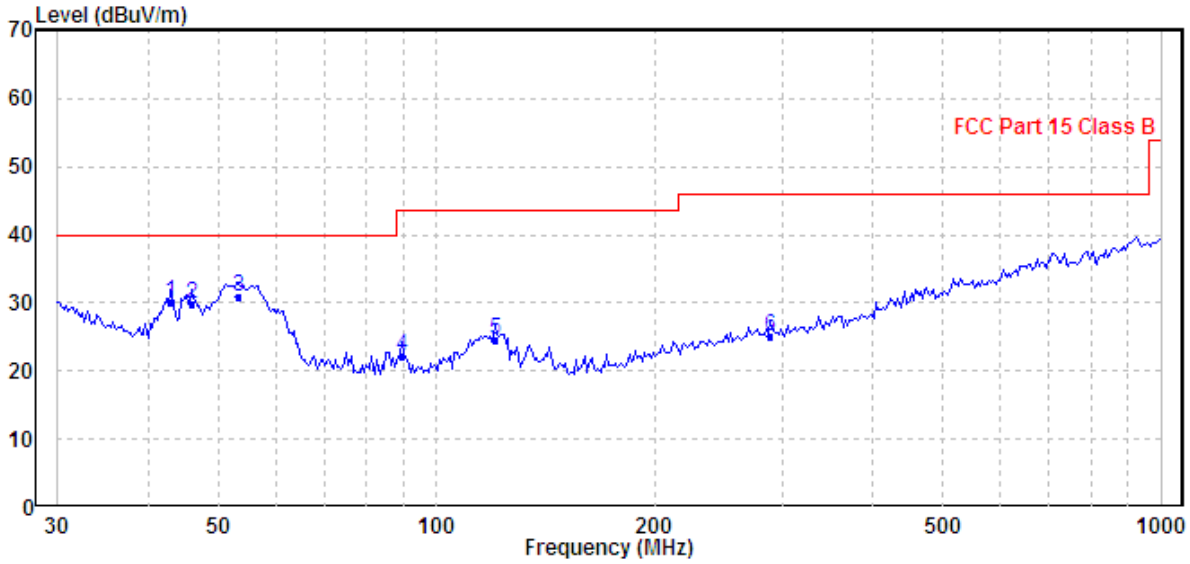
Results of TX mode (30MHz – 1GHz)(2402MHz worst case): PASS
Horizontal



Ambient Temperature: 24.5C
Relative Humidity : 51.2%
Air Pressure : 101.2kPa

	Freq	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB		
1	53.318	21.83	40.00	-18.17	QP	Horizontal
2	122.834	21.11	43.50	-22.39	QP	Horizontal
3	147.404	21.87	43.50	-21.63	QP	Horizontal
4	263.819	25.85	46.00	-20.15	QP	Horizontal
5	297.224	27.13	46.00	-18.87	QP	Horizontal
6	547.098	33.86	46.00	-12.14	QP	Horizontal

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



Ambient Temperature: 24.5C
Relative Humidity : 51.2%
Air Pressure : 101.2kPa

	Freq	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB		
1	42.900	30.00	40.00	-10.00	QP	Vertical
2	46.016	29.91	40.00	-10.09	QP	Vertical
3	53.318	30.92	40.00	-9.08	QP	Vertical
4	89.590	22.29	43.50	-21.21	QP	Vertical
5	120.277	24.66	43.50	-18.84	QP	Vertical
6	289.002	25.14	46.00	-20.86	QP	Vertical

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

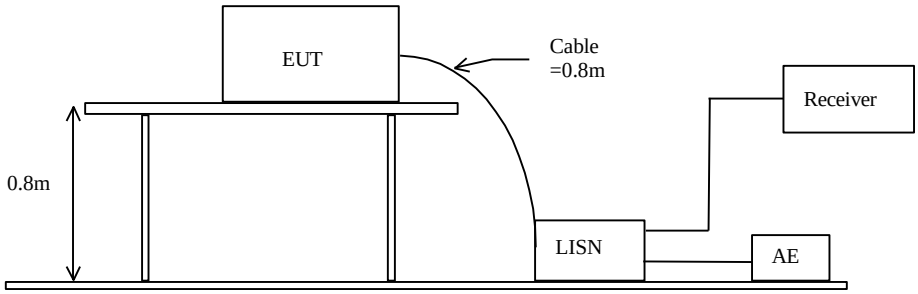
Test Requirement:	FCC 47CFR 15.207
Test Method:	ANSI C63.10:2013
Test Date:	2023-11-14
Mode of Operation:	TX mode
Test Voltage:	120Va.c. 60Hz

Ambient Temperature: 25℃ Relative Humidity: 51% Atmospheric Pressure: 101 kPa

Test Method:
The test was performed in accordance with ANSI 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:

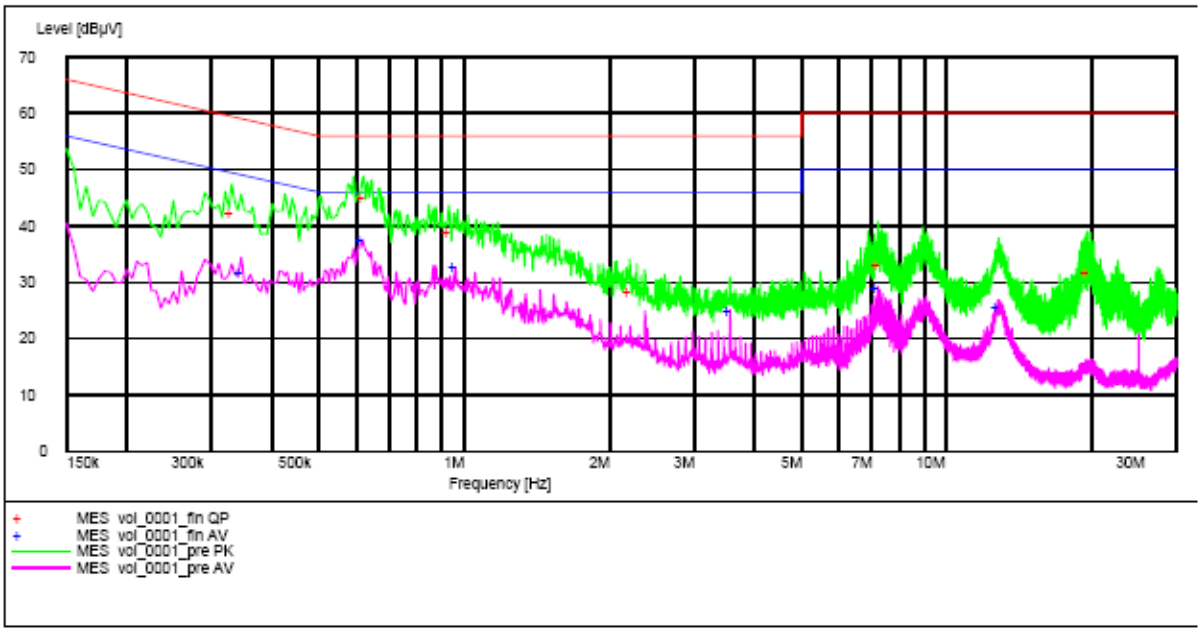


Limits for Conducted Emissions (FCC 47 CFR 15.207):

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.

Results of TX mode (L): PASS
Please refer to the following diagram for individual results.



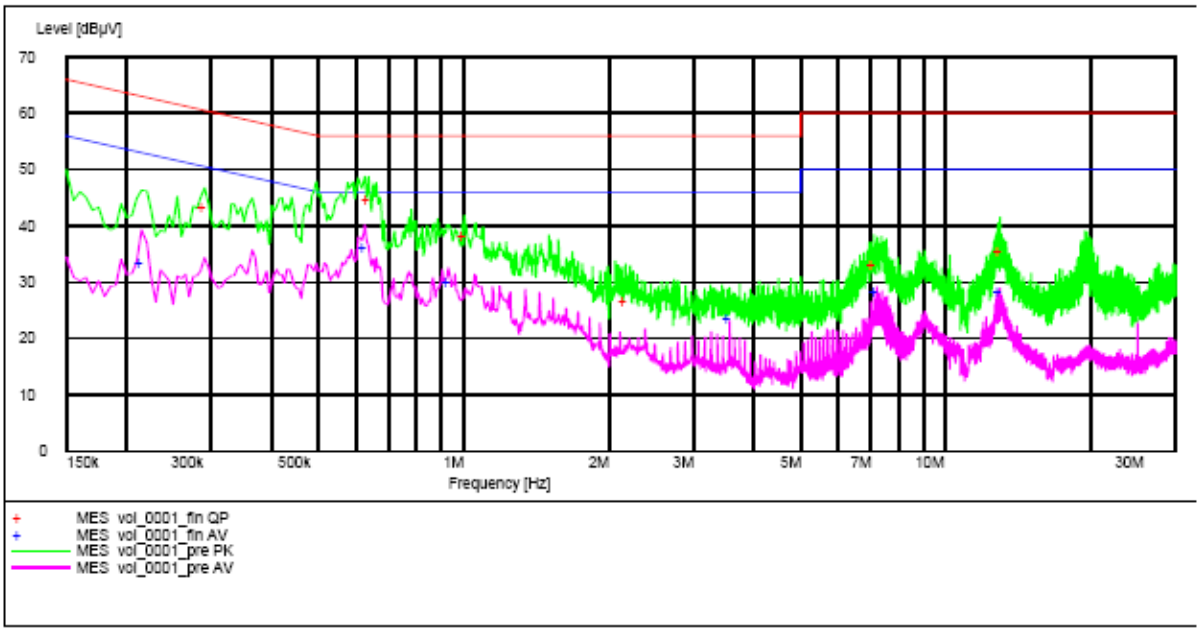
MEASUREMENT RESULT: "vol_0001_fin QP"

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.330000	42.10	9.7	60	17.3	L1	GND
0.620000	44.80	9.7	56	11.2	L1	GND
0.930000	38.90	9.7	56	17.1	L1	GND
2.205000	28.20	9.8	56	27.8	L1	GND
7.230000	32.90	9.9	60	27.1	L1	GND
19.605000	31.70	10.3	60	28.3	L1	GND

MEASUREMENT RESULT: "vol_0001_fin AV"

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.345000	31.70	9.7	49	17.4	L1	GND
0.615000	37.50	9.7	46	8.5	L1	GND
0.960000	32.60	9.7	46	13.4	L1	GND
3.560000	24.80	9.8	46	21.2	L1	GND
7.200000	28.80	9.9	50	21.2	L1	GND
12.820000	25.70	10.1	50	24.3	L1	GND

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
0.290000	43.20	9.7	61	17.3	N	GND
0.635000	44.70	9.7	56	11.3	N	GND
1.005000	38.30	9.7	56	17.7	N	GND
2.170000	26.40	9.8	56	29.6	N	GND
7.105000	32.90	9.9	60	27.1	N	GND
12.980000	35.50	10.1	60	24.5	N	GND

MEASUREMENT RESULT: "vol_0001_fin AV"

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.215000	33.50	9.7	53	19.5	N	GND
0.625000	36.20	9.7	46	9.8	N	GND
0.930000	30.10	9.7	46	15.9	N	GND
3.570000	23.50	9.8	46	22.5	N	GND
7.200000	28.30	9.9	50	21.7	N	GND
12.990000	28.40	10.1	50	21.6	N	GND

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 antenna gain =2.63dBi. User is unable to remove or changed the Antenna.

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:	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

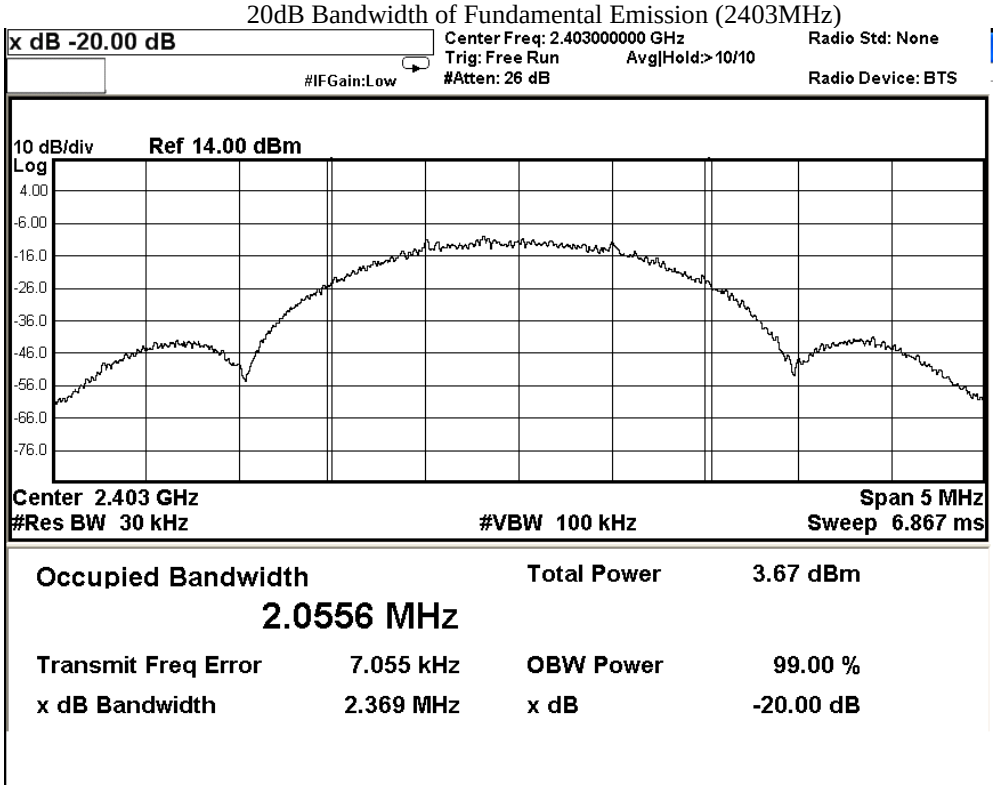
Test Setup:

As Test Setup of clause 3.1.1 in this test report.

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

Frequency Range [MHz]	20dB Bandwidth [MHz]
2403.0	2.369

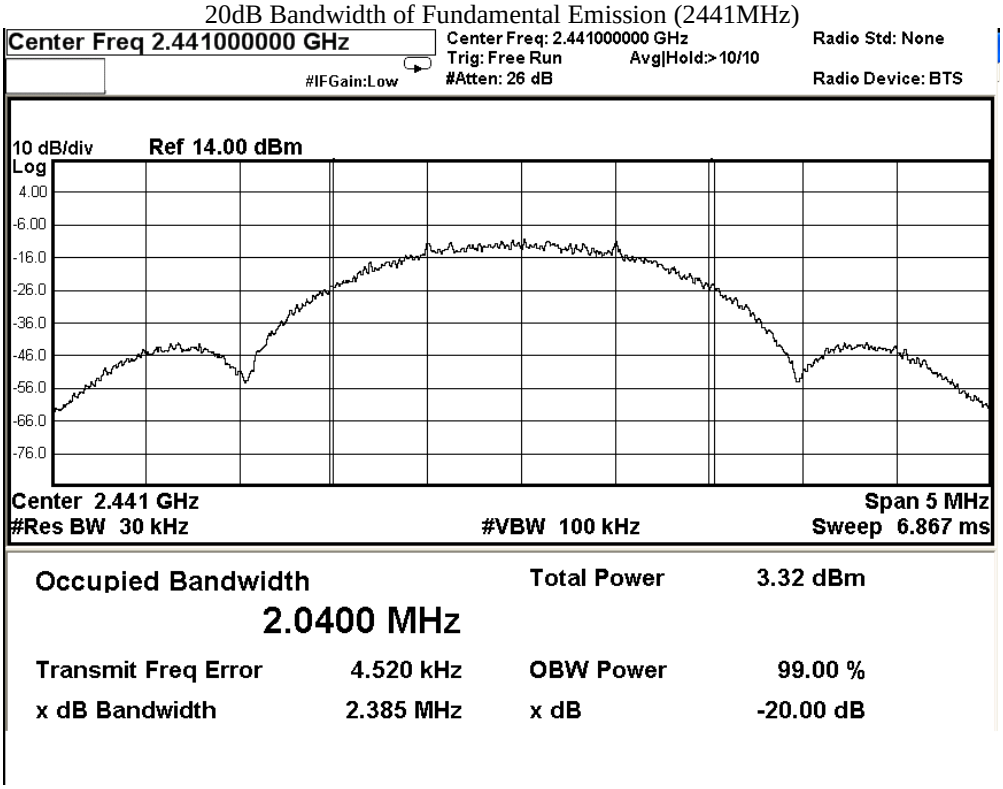
20dB Bandwidth of Fundamental Emission (2403MHz)



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

Frequency Range [MHz]	20dB Bandwidth [MHz]
2441.0	2.385

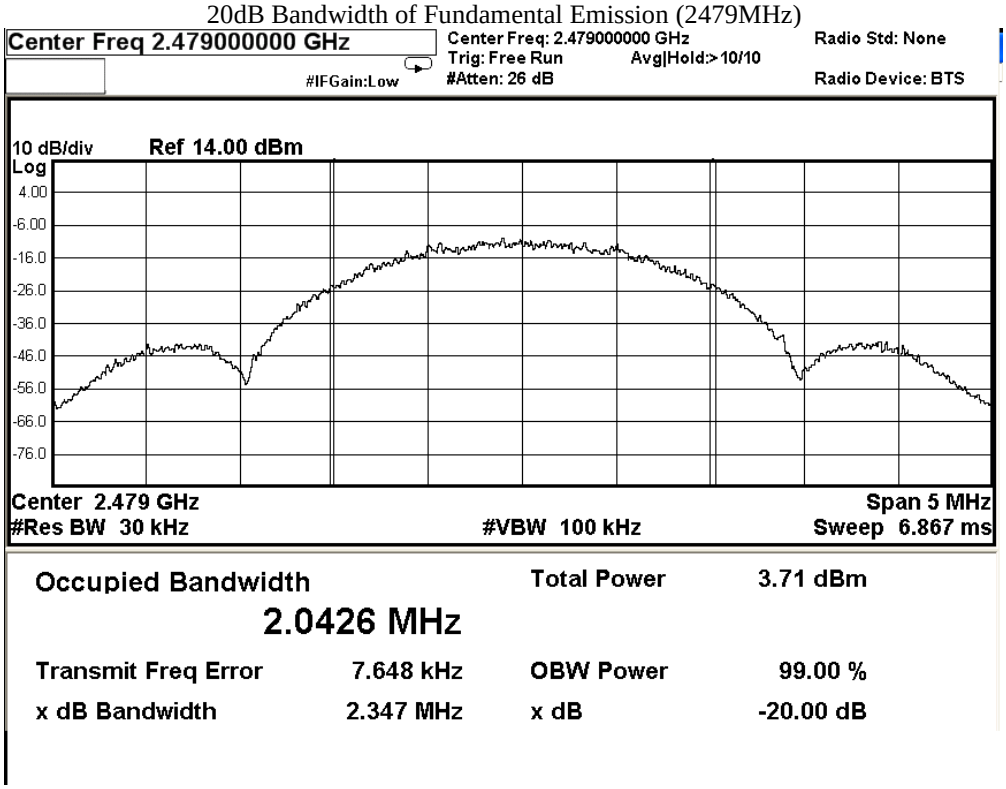
20dB Bandwidth of Fundamental Emission (2441MHz)



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

Frequency Range [MHz]	20dB Bandwidth [MHz]
2479.0	2.347

20dB Bandwidth of Fundamental Emission (2479MHz)



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

Line Conducted

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM232	LISN	SCHAFFNER	NNB41	04/100082	2023-05-30	2024-05-30
EM181	EMI TEST RECEIVER	R & S	ESIB7	100072	2023-05-22	2024-05-22
EM179	IMPULSE LIMITER	R & S	ESH3-Z2	357.8810.52/54	2023-03-17	2024-03-17
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

Appendix B

Photographs of EUT

View of the product

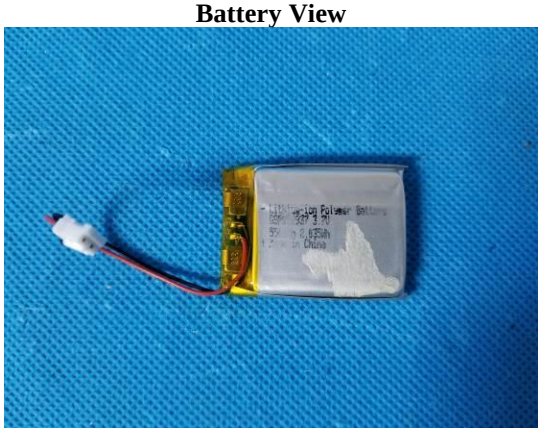
View of the product

View of the product

View of the product

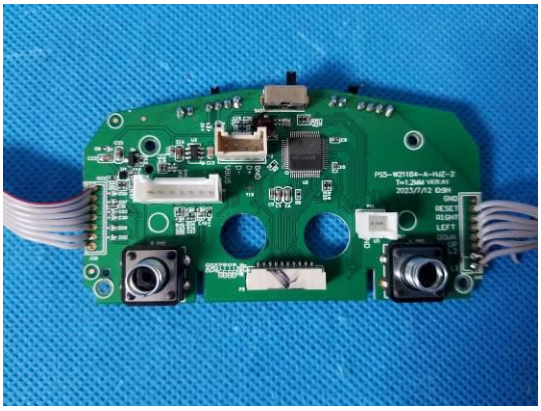
Inside View of the product

Battery View

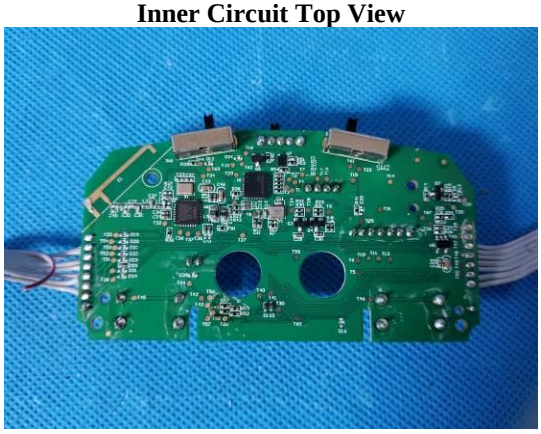


Photographs of EUT

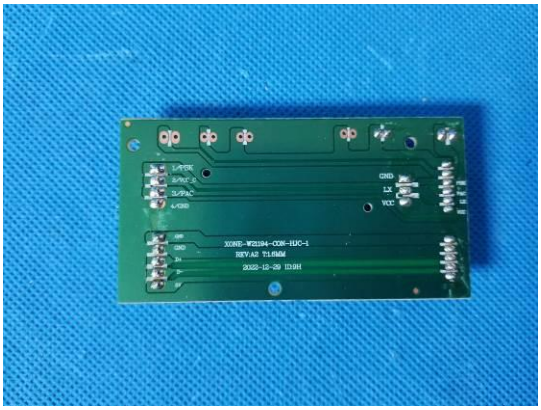
Inner Circuit Bottom View



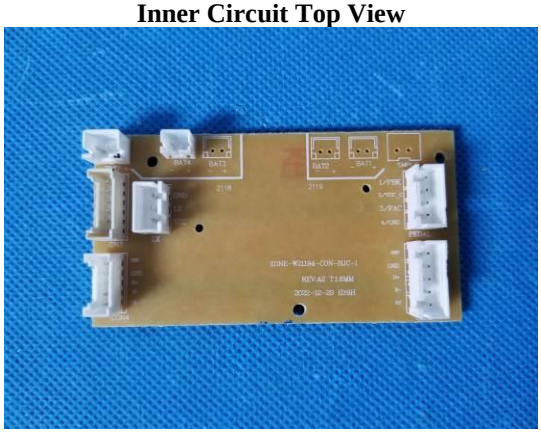
Inner Circuit Top View



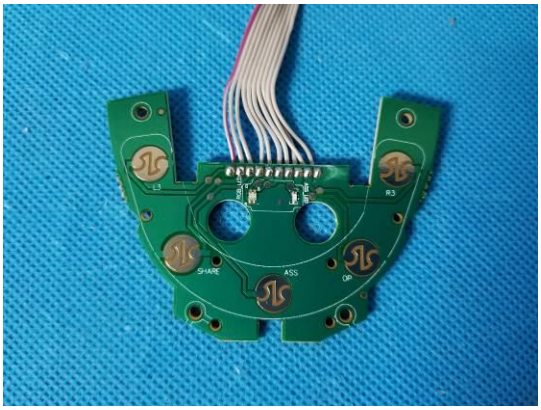
Inner Circuit Bottom View



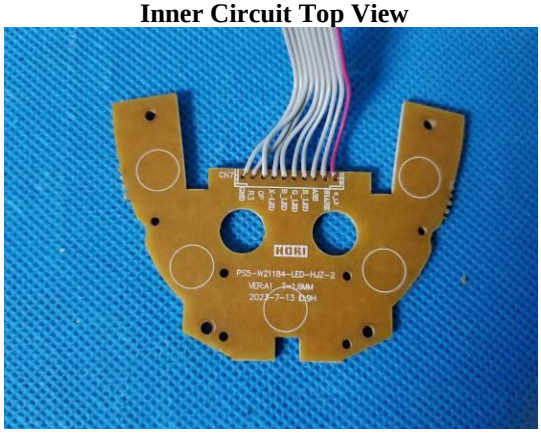
Inner Circuit Top View



Inner Circuit Bottom View

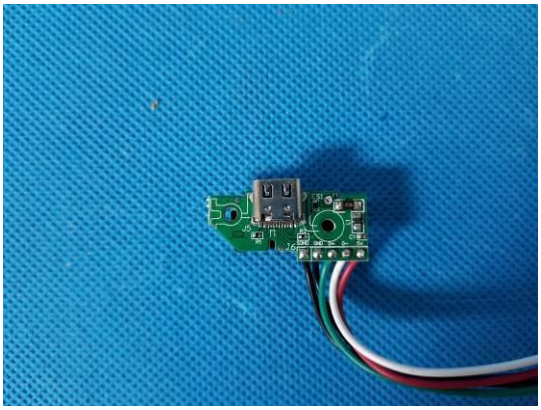


Inner Circuit Top View

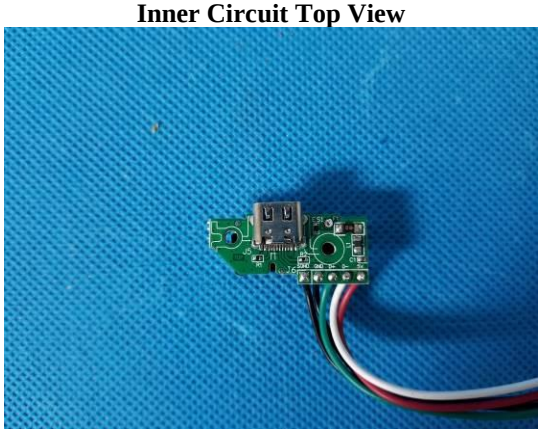


Photographs of EUT

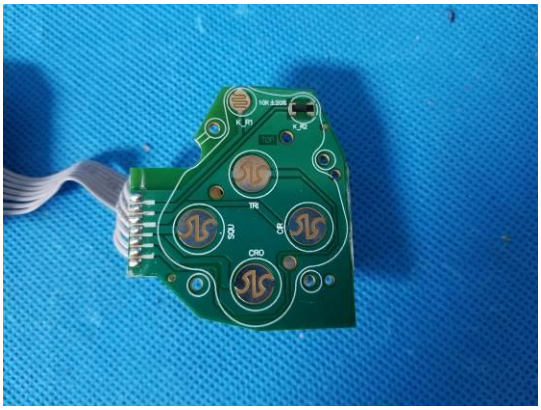
Inner Circuit Bottom View



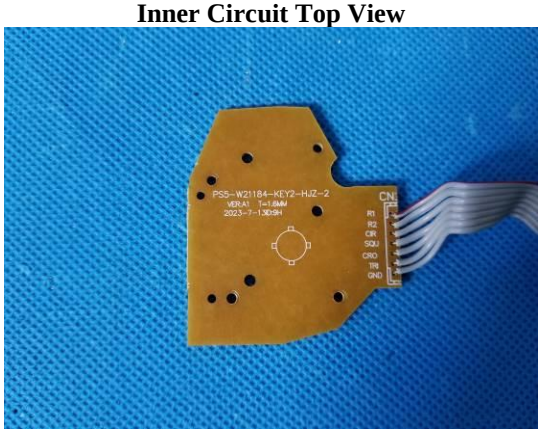
Inner Circuit Top View



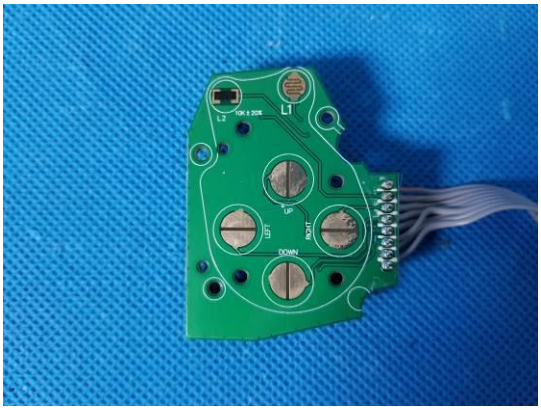
Inner Circuit Bottom View



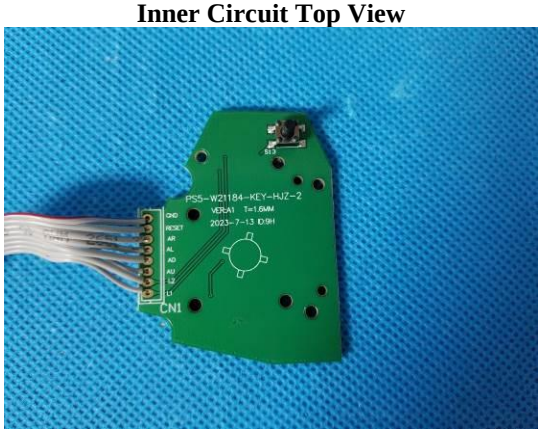
Inner Circuit Top View



Inner Circuit Bottom View

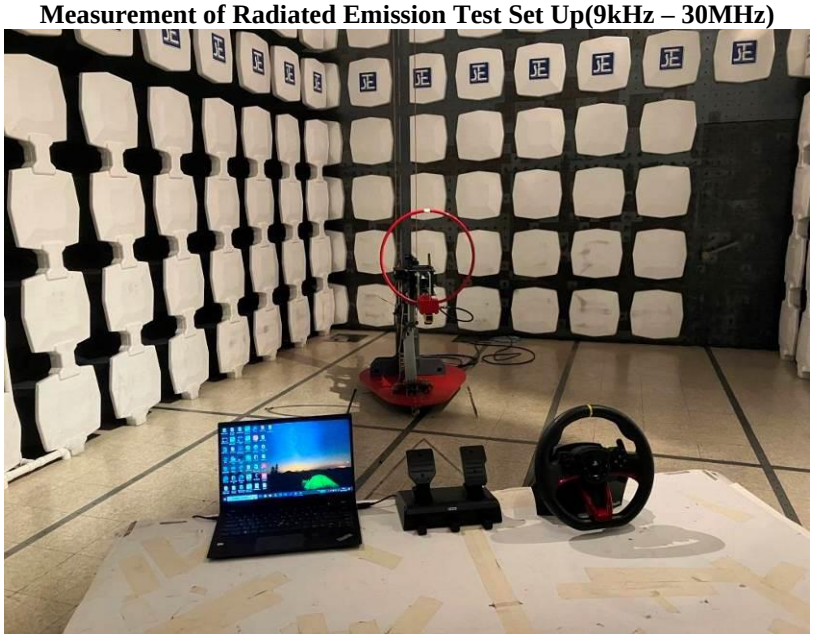


Inner Circuit Top View

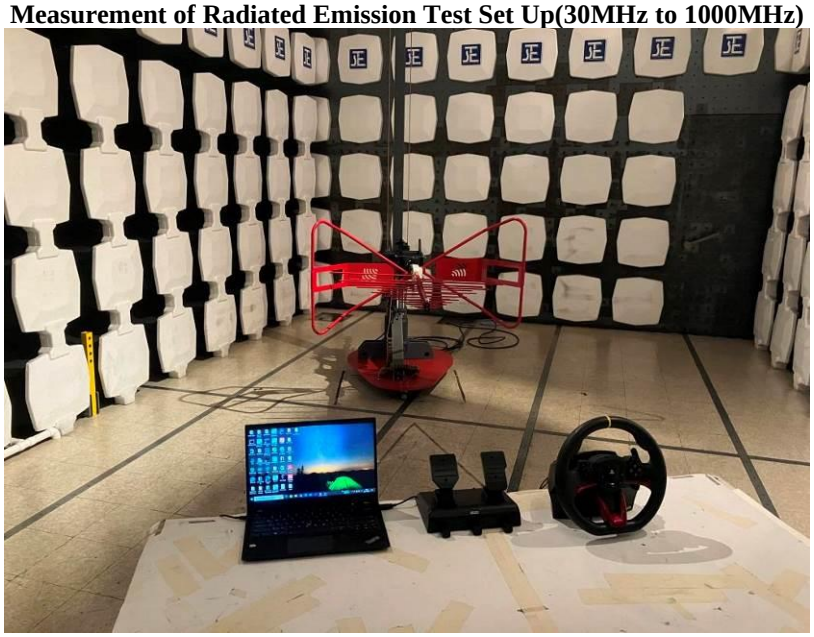


Photographs of EUT

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



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



Photographs of EUT

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

Measurement of Conducted Emission Test Set Up

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

Conditions of Issuance of Test Reports

1. All samples and goods are accepted by The Hong Kong Standards & Testing Centre Limited (the "Company") solely for testing and reporting in accordance with the following terms and conditions. The Company provides its services on the basis that such terms and conditions constitute express agreement between the Company and any person, firm or company requesting its services (the "Clients").

2. Any report issued by the Company as a result of this application for testing service (the "Report") shall be issued in confidence to the Clients and the Report will be strictly treated as such by the Company. It may not be reproduced either in its entirety or in part and it may not be used for advertising or other unauthorized purposes without the written consent of the Company. The Clients to whom the Report is issued may, however, show or send it, or a certified copy thereof prepared by the Company to his customer, supplier or other persons directly concerned. Subject to clause 3, the Company will not, without the consent of the Clients, enter into any discussion or correspondence with any third party concerning the contents of the Report, unless required by the relevant governmental authorities, laws or court orders.

3. The Company shall be at liberty to disclose the testing-related documents and/or files anytime to any third-party accreditation and/or recognition bodies for audit or other related purposes. No liabilities whatsoever shall attach to the Company's act of disclosure.

4. The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.

5. The results in Report apply only to the sample as received and do not apply to the bulk, unless the sampling has been carried out by the Company and is stated as such in the Report.

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.

7. In the event of the improper use the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.

8. Sample submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.

9. The Company will not be liable for or accept responsibility for any loss or damage howsoever arising from the use of information contained in any of its Reports or in any communication whatsoever about its said tests or investigations.

10. Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.

11. Subject to the variable length of retention time for test data and report stored hereinto as to otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of this test report for a period of three years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after the retention period. Under no circumstances shall we be liable for damages of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.

12. Issuance records of the Report are available on the internet at www.stc.group. Further enquiry of validity or verification of the Reports should be addressed to the Company.