FCC Test Report

APPLICANT	:	Positioning Universal Inc
EQUIPMENT	:	GPS TRACK
MODEL NAME	:	FT7000MW
FCC ID	:	2AHRH-FT7000MW
STANDARD	:	47 CFR Part 15 Subpart B
CLASSIFICATION	:	Certification
TEST DATE(S)	:	Feb. 12, 2022

We, Sporton International Inc. (Kunshan), would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI C63.4-2014 and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. (Kunshan), the test report shall not be reproduced except in full.

Jason Jia

Reviewed by: Jason Jia / Supervisor

Alex Wang

Approved by: Alex Wang / Manager

ACCREDITED Cert #5145.02

Sporton International Inc. (Kunshan)
No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300
People's Republic of China

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FC1D2402	Rev. 01	Initial issue of report	Mar. 07, 2022

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
-	15.107	AC Conducted Emission	< 15.107 limits	Not Applicable	-
3.1	15.109	Radiated Emission	< 15.109 limits	PASS	Under limit 5.46 dB at 530.520 MHz

Not Applicable means after assessing, test items are not necessary to carry out.

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

1. General Description

1.1. Applicant

Positioning Universal Inc
4660 La Jolla Village Drive, Suite 1100, San Diego, CA92122

1.2. Manufacturer

Positioning Universal Inc
4660 La Jolla Village Drive, Suite 1100, San Diego, CA92122

1.3. Product Feature of Equipment Under Test

Product Feature	
Equipment	GPS TRACK
Model Name	FT7000MW
FCC ID	2AHRH-FT7000MW
IMEI	Radiation: 015678004023434
EUT supports Radios application	GSM/LTE Category M1 WLAN 2.4GHz 802.11b/g/n HT20 Bluetooth LE/GPS
HW Version	P2.2
SW Version	A0.18.1

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4. Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	GSM850: 824 MHz ~ 849 MHz GSM1900: 1850MHz ~ 1910MHz LTE Band 2 : 1850 MHz ~ 1910 MHz LTE Band 4 : 1710 MHz ~ 1755 MHz LTE Band 5 : 824 MHz ~ 849 MHz LTE Band 12 : 699 MHz ~ 716 MHz LTE Band 13 : 777 MHz ~ 787 MHz LTE Band 25 : 1850 MHz ~ 1915 MHz LTE Band 26 : 814 MHz ~ 849 MHz LTE Band 66 : 1710 MHz ~ 1780 MHz LTE Band 85: 698 MHz ~ 716 MHz 802.11b/g/n: 2400 MHz ~ 2483.5 MHz Bluetooth: 2400 MHz ~ 2483.5 MHz
Rx Frequency	GSM850: 869 MHz ~ 894 MHz GSM1900: 1930 MHz ~ 1990 MHz LTE Band 2 : 1930 MHz ~ 1990 MHz LTE Band 4 : 2110 MHz ~ 2155 MHz LTE Band 5 : 869 MHz ~ 894 MHz LTE Band 12 : 729 MHz ~ 746 MHz LTE Band 13 : 746 MHz ~ 756 MHz LTE Band 25 : 1930 MHz ~ 1995 MHz LTE Band 26 : 859 MHz ~ 894 MHz LTE Band 66 : 2110 MHz~ 2180 MHz LTE Band 85: 728 MHz ~ 746 MHz 802.11b/g/n: 2400 MHz ~ 2483.5 MHz Bluetooth: 2400 MHz ~ 2483.5 MHz GPS : 1559 MHz ~ 1610 MHz
Antenna Type	WWAN : PIFA Antenna WLAN : PCB Antenna Bluetooth : PCB Antenna GPS: Chip Antenna
Type of Modulation	GPRS: GMSK EDGE(MCS 0-4): GMSK / (MCS 5-9): 8PSK LTE: QPSK / 16QAM 802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) Bluetooth LE : GFSK GPS : BPSK

1.5. Modification of EUT

No modifications are made to the EUT during all test items.

1.6. Test Location

Sporton International Inc. (Kunshan) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Test Firm	Sporton International Inc. (Kunshan)		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158 FAX : +86-512-57900958		
Test Site No.	**Sporton Site No.**	**FCC Designation No.**	**FCC Test Firm Registration No.**
	03CH02-KS	CN1257	314309

1.7. Test Software

Item	Site	Manufacturer	Name	Version
1.	03CH02-KS	AUDIX	E3	6.2009-8-24a

1.8. Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR Part 15 Subpart B
- ANSI C63.4-2014

Remark: All test items were verified and recorded according to the standards and without any deviation during the test.

2. Test Configuration of Equipment Under Test

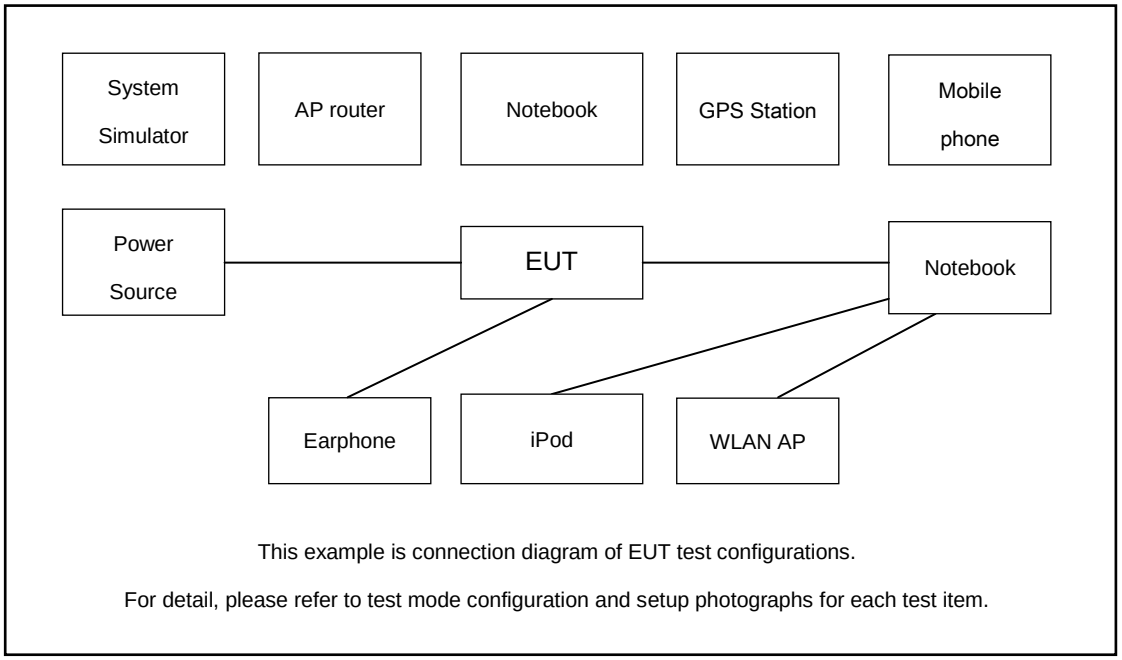
2.1. Test Mode

The EUT has been associated with peripherals pursuant to ANSI C63.4-2014 and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

Frequency range investigated: radiation emission (30MHz to the 5th harmonic of the highest frequency or to 40 GHz, whichever is lower).

Test Items	Function Type
Radiated Emissions	Mode 1: LTE Band 26 Rx(Middle CH) + Internal Antenna + Bluetooth Idle + WLAN Idle + GPS On + Run OTG Function(Micro B Connect to USB Disk) + Power From DC Adapter 12V Mode 2: LTE Band 85 Rx(Low CH) + External Antenna + Bluetooth Idle + WLAN Idle + GPS On + Run OTG Function(Micro B Connect to USB Disk) + Power From DC Adapter 24V Mode 3: LTE Band 13 Rx(Middle CH) + Internal Antenna + Bluetooth Idle + WLAN Idle + GPS On + Run OTG Function(Micro B Connect to USB Disk) + Power From DC Adapter 12V
Remark: **1.** The worst case of RE is mode 3; only the test data of this mode is reported. **2.** Pre-scanned Low/Middle/High channel, the worst channel was recorded in this report. **3.** The device supports two kinds of WWAN Antenna which are Internal Antenna (PIFA) and External Antenna.	

2.2. Connection Diagram of Test System



The EUT has been associated with peripherals pursuant to ANSI C63.4-2014 and configuration operated in a manner tended to maximize its emission characteristics in a typical application

2.3. Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	Anritsu	MT8821C/8820C	N/A	N/A	Unshielded, 1.8m
2.	Vector Signal Generator	R&S	SMBV100A	258305	N/A	N/A
3.	WLAN AP	D-link	DIR-655	KA21R655B1	N/A	Unshielded, 1.8m
4.	WLAN AP	TP-Link	TL-WDR5600	N/A	N/A	Unshielded, 1.8m
5.	Notebook	Lenovo	V130-14IKB004	N/A	N/A	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m
6.	Notebook	Lenovo	S730-13IWL	N/A	N/A	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m
7.	Hard Disk	Lenovo	F310	DoC	Shielded, 1.2m	N/A
8.	Phone	MOTO	XT1952-1	N/A	N/A	N/A
9.	WWAN Antenna	N/A	N/A	N/A	N/A	N/A
10.	GPS Antenna	N/A	N/A	N/A	N/A	N/A
11.	Adapter	N/A	N/A	N/A	N/A	N/A
12.	DC Power	GWINSTEK	PLR36-10	N/A	N/A	Unshielded,1.8m

2.4. EUT Operation Test Setup

The EUT was in GSM or LTE idle mode during the testing. The EUT was synchronized to the BCCH, and is in continuous receiving mode by setting system simulator’s paging reorganization.

At the same time, the EUT was attached to the Mobile phone via Bluetooth function or WLAN AP, and the following programs installed in the EUT were programmed during the test..

1. Turn on GPS function to make the EUT receive continuous signals from GPS station.
2. Turn on OTG function

3. Test Result

3.1. Test of Radiated Emission Measurement

3.1.1. Limit of Radiated Emission

The emissions from an unintentional radiator shall not exceed the field strength levels specified in the following table:

<Class B Limit>

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

3.1.2. Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

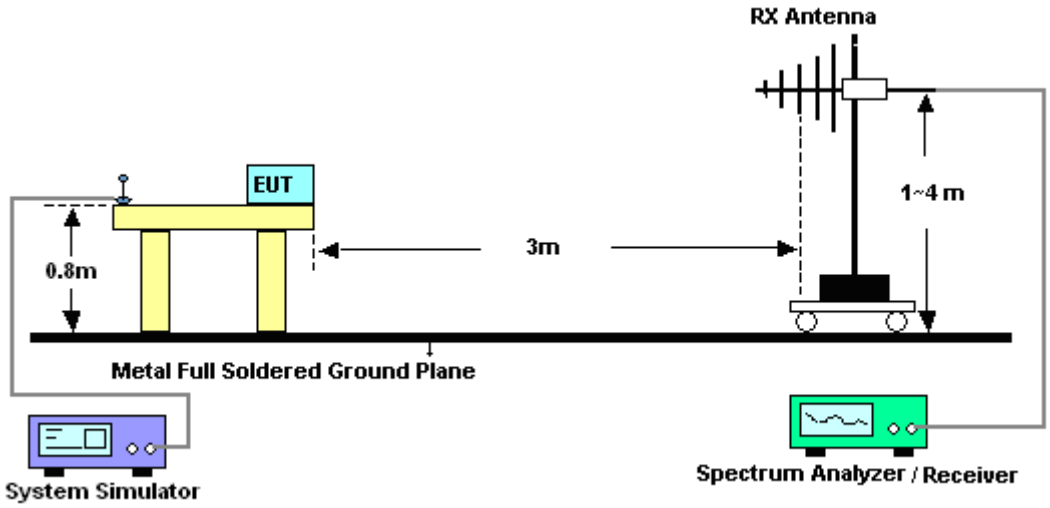
3.1.3. Test Procedures

1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna is a Bi-Log antenna and its height is adjusted between one to four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode (RBW=120kHz/VBW=300kHz for frequency below 1GHz; RBW=1MHz VBW=3MHz (Peak), RBW=1MHz/VBW=10Hz (Average) for frequency above 1GHz).
7. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, peak values of EUT will be reported. Otherwise, the emission will be repeated by using the quasi-peak method and reported.

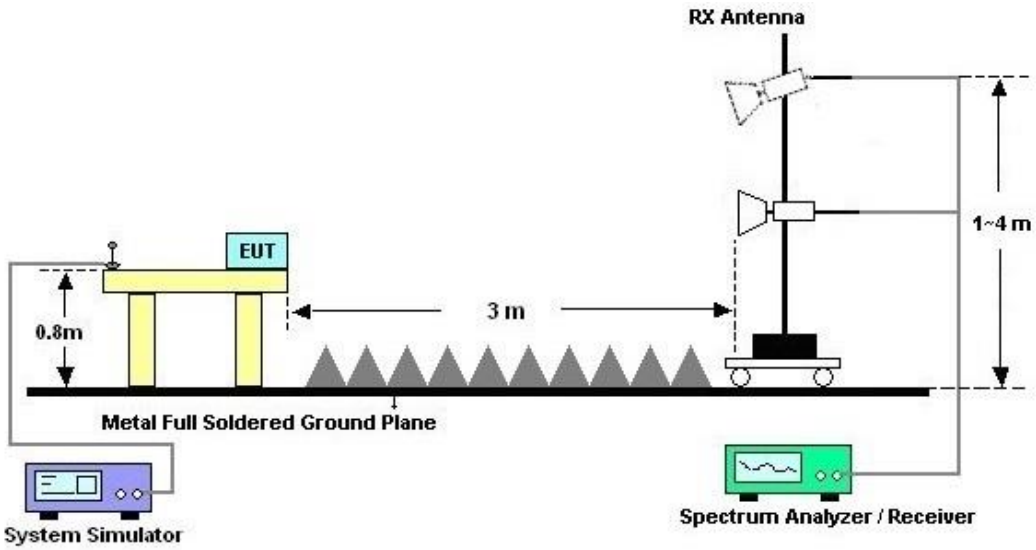
8. Emission level (dBμV/m) = 20 log Emission level (μV/m)
9. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
10. Exploratory radiated emissions testing of handheld and/or body-worn devices shall include rotation of the EUT through three orthogonal axes (X/Y/Z Plane) to determine the orientation (attitude) that maximizes the emissions.

3.1.4. Test Setup of Radiated Emission

For radiated emissions from 30MHz to 1GHz

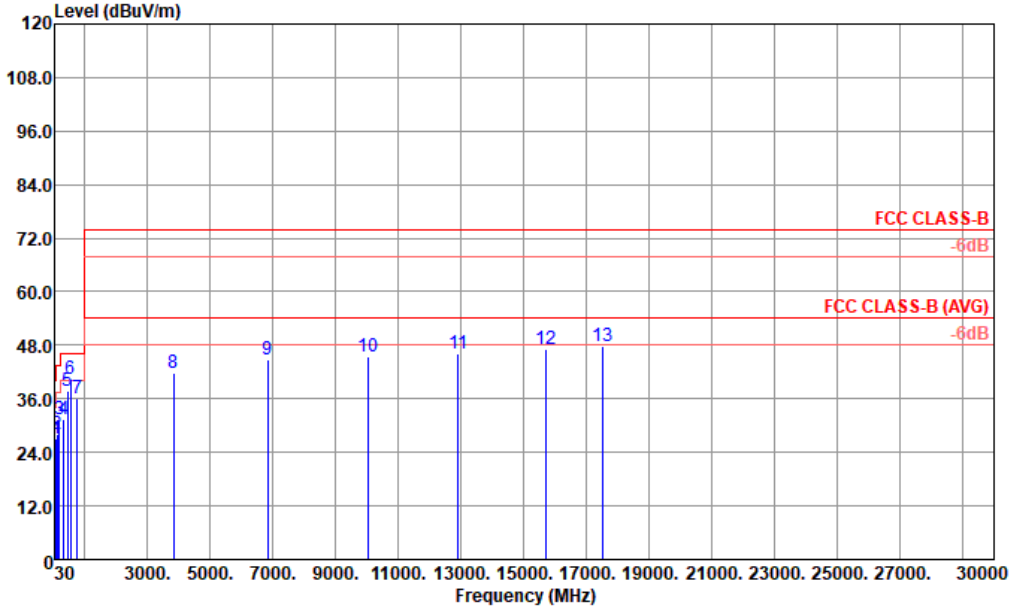


For radiated emissions above 1GHz



3.1.5. Test Result of Radiated Emission

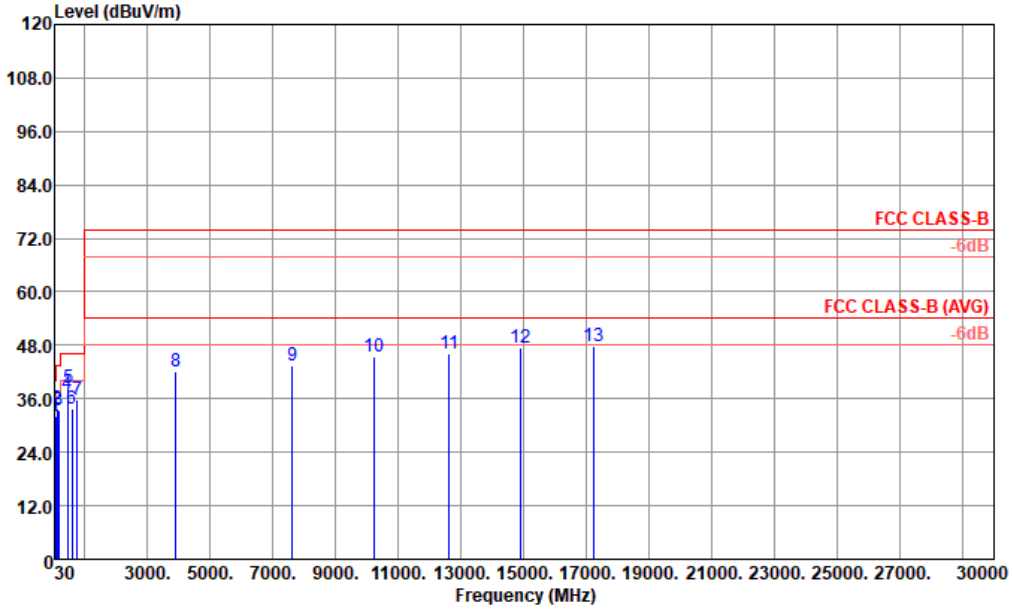
Test Engineer :	Peng Fang	**Temperature :**	21~22°C
		Relative Humidity :	41~42%
Test Distance :	3m	**Polarization :**	Horizontal
Remark :	#7 is system simulator signal which can be ignored.		



Site : 03CH02-KS
Condition : FCC CLASS-B 3m CBL 6111D 59913 HORIZONTAL

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	89.170	27.21	-16.29	43.50	43.90	14.40	1.31	32.40	---	---	Peak
2	116.330	28.06	-15.44	43.50	41.70	17.20	1.56	32.40	---	---	Peak
3	190.050	31.52	-11.98	43.50	47.31	14.60	2.01	32.40	---	---	Peak
4	331.670	31.35	-14.65	46.00	41.41	19.68	2.66	32.40	---	---	Peak
5	443.220	37.70	-8.30	46.00	44.25	22.78	3.07	32.40	---	---	Peak
6	530.520	40.54	-5.46	46.00	45.69	23.90	3.35	32.40	200	0	Peak
7	750.710	35.96			36.25	28.02	3.99	32.30	---	---	Peak
8	3822.000	41.69	-32.31	74.00	62.51	34.81	9.47	65.10	---	---	Peak
9	6831.000	44.87	-29.13	74.00	61.96	35.26	12.87	65.22	---	---	Peak
10	10027.000	45.32	-28.68	74.00	58.31	38.22	15.99	67.20	---	---	Peak
11	12917.000	45.96	-28.04	74.00	54.02	39.62	18.11	65.79	---	---	Peak
12	15688.000	47.22	-26.78	74.00	50.91	40.75	20.07	64.51	---	---	Peak
13	17507.000	47.89	-26.11	74.00	50.22	41.30	21.19	64.82	---	---	Peak

Test Engineer :	Peng Fang	Temperature :	21~22°C
		Relative Humidity :	41~42%
Test Distance :	3m	Polarization :	Vertical
Remark :	#7 is system simulator signal which can be ignored.		



Site : 03CH02-KS
Condition : FCC CLASS-B 3m CBL 6111D 59913 VERTICAL

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	68.800	32.12	-7.88	40.00	51.48	12.00	1.04	32.40	---	---	Peak
2	115.360	33.85	-9.65	43.50	47.49	17.20	1.56	32.40	---	---	Peak
3	166.770	33.35	-10.15	43.50	48.28	15.60	1.87	32.40	---	---	Peak
4	442.250	37.25	-8.75	46.00	43.87	22.72	3.06	32.40	---	---	Peak
5	480.080	38.30	-7.70	46.00	44.11	23.40	3.19	32.40	---	---	Peak
6	599.390	33.87	-12.13	46.00	37.18	25.52	3.57	32.40	---	---	Peak
7	750.710	35.64			35.93	28.02	3.99	32.30	---	---	Peak
8	3907.000	42.04	-31.96	74.00	62.72	34.95	9.59	65.22	---	---	Peak
9	7613.000	43.52	-30.48	74.00	60.30	35.88	13.77	66.43	---	---	Peak
10	10248.000	45.45	-28.55	74.00	58.01	38.39	16.13	67.08	---	---	Peak
11	12628.000	46.27	-27.73	74.00	54.46	39.67	17.95	65.81	---	---	Peak
12	14889.000	47.51	-26.49	74.00	51.72	41.19	19.41	64.81	---	---	Peak
13	17235.000	47.67	-26.33	74.00	50.19	41.25	21.10	64.87	---	---	Peak

Note:

1. Level(dBμV/m) = Read Level(dBμV) + Antenna Factor(dB/m) + Cable Loss(dB) - Preamp Factor(dB)
2. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

4. List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Test Receiver	R&S	ESR7	101403	9kHz~7GHz;Max 30dBm	Oct. 16, 2021	Feb. 12, 2022	Oct. 15, 2022	Radiation (03CH02-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55370528	10Hz-44G,MAX 30dB	Oct. 16, 2021	Feb. 12, 2022	Oct. 15, 2022	Radiation (03CH02-KS)
Bilog Antenna	TeseQ	CBL6111D	44483	30MHz-1GHz	Dec. 22, 2021	Feb. 12, 2022	Dec. 21, 2022	Radiation (03CH02-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75957	1GHz~18GHz	Oct. 30, 2021	Feb. 12, 2022	Oct. 29, 2022	Radiation (03CH02-KS)
SHF-EHF Horn	Com-power	AH-840	101070	18GHz~40GHz	Jan. 05, 2022	Feb. 12, 2022	Jan. 04, 2023	Radiation (03CH02-KS)
Amplifier	MITEQ	EM18G40GGA	060728	18~40GHz	Jan. 05, 2022	Feb. 12, 2022	Jan. 04, 2023	Radiation (03CH02-KS)
Amplifier	SONOMA	310N	187289	9KHz-1GHz	Apr. 13, 2021	Feb. 12, 2022	Apr. 12, 2022	Radiation (03CH02-KS)
Amplifier	Keysight	83017A	MY53270316	500MHz~26.5GHz	Oct. 16, 2021	Feb. 12, 2022	Oct. 15, 2022	Radiation (03CH02-KS)
AC Power Source	Chroma	61601	616010002473	N/A	NCR	Feb. 12, 2022	NCR	Radiation (03CH02-KS)
Turn Table	MF	MF7802	N/A	0~360 degree	NCR	Feb. 12, 2022	NCR	Radiation (03CH02-KS)
Antenna Mast	MF	MF7802	N/A	1 m~4 m	NCR	Feb. 12, 2022	NCR	Radiation (03CH02-KS)

NCR: No Calibration Required

5. Uncertainty of Evaluation

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.9dB**

Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.0dB**

Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.1dB**