

FCC/ISED EMI TEST REPORT

FCC ID : U8G-P1FIBER5G
Equipment : PEPWAVE / peplink Wireless Product
Brand Name : PEPWAVE / peplink
Model Name : Balance 310 Fiber 5G
BPL-310-FBR-5GD-T-PRM
BPL-310-FBR-5GH-T-PRM
Peplink Balance 310 Fiber 5G
HVIN : Balance 310 Fiber 5G
BPL-310-FBR-5GD-T-PRM
BPL-310-FBR-5GH-T-PRM
Peplink Balance 310 Fiber 5G
Applicant : PISMO LABS TECHNOLOGY LIMITED
A8, 5/F, HK Spinners Industrial Building,
Phase 6, 481 Castle Peak Road, Cheung Sha
Wan, Hong Kong
Manufacturer : PISMO LABS TECHNOLOGY LIMITED
A8, 5/F, HK Spinners Industrial Building,
Phase 6, 481 Castle Peak Road, Cheung Sha
Wan, Hong Kong
Standard : FCC 47 CFR FCC Part 15 Subpart B Class A
ISED ICES-003 Issue 7 Class A

The product was received on Jun. 21, 2021 and testing was started from Jul. 05, 2021 and completed on Jul. 16, 2021. We, Sporton International Inc. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI C63.4-2014 for FCC Part 15 Subpart B and ANSI C63.4a-2017 for ISED ICES-003 Issue 7 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. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.



Louis Wu

Approved by: Louis Wu

Sporton International Inc. EMC & Wireless Communications Laboratory

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)

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History of this test report

Report No.	Version	Description	Issued Date
FC162104	01	Initial issue of report	Oct. 01, 2021

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	15.107 ICES003 Section 6.1	AC Conducted Emission	Pass	Under limit 21.29 dB at 0.501 MHz
3.2	15.109 ICES003 Section 6.2	Radiated Emission	Pass	Under limit 8.32 dB at 215.050 MHz for Quasi-Peak

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.

Reviewed by: Lewis Ho

Report Producer: Tina Chuang

1. General Description

1.1. Product Feature of Equipment Under Test

WCDMA/LTE/5G NR, Wi-Fi 2.4GHz 802.11b/g/n, Wi-Fi 5GHz 802.11a/n/ac, and GNSS.

Product Specification subjective to this standard	
Integrated WWAN Module 1	Brand Name: THALES DIS AIS Model Name: MV31-W FCC ID: QIPMV31-W IC: 7830A-MV31V
Integrated WWAN Module 2	Brand Name: Sierra wireless Model Name: EM9191 FCC ID: N7NEM91 IC: 2417C-EM91
Sample 1	EUT with WWAN module 1 (MV31-W)
Sample 2	EUT with WWAN module 2 (EM9191)
Antenna Type	WWAN: Omni-directional Antenna WLAN: Omni-directional Antenna GPS: directional Antenna

1. The above EUT's information was declared by manufacturer. Please refer to Comments and Explanations in report summary.
2. The product will integrate the cellular module (MV31-W, EM9191). Among the 2 options, at a time only 1 cellular module will be installed), therefore the cellular module is incorporated into the host for Part 15B / ICES-003 test. Equipment authorization to integrate the cellular module will follow the FCC / ISED modular approval policy and procedures.

1.2. Modification of EUT

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

1.3. Test Location

Test Site	Sporton International Inc. EMC & Wireless Communications Laboratory
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978
Test Site No.	Sporton Site No. CO05-HY

Test Site	Sporton International Inc. Wensan Laboratory
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	Sporton Site No. 03CH10-HY (TAF Code: 3786)
Remark	The Radiated Spurious Emission test item subcontracted to Sporton International Inc. Wensan Laboratory

Test Site	Sporton International Inc. EMC & Wireless Communications Laboratory
Test Site Location	No.30-2, Dingfu Tsuen, Linkou District, New Taipei City, Taiwan 244 (R.O.C.) TEL: +886-2-2603-5367 / +886-2-2601-1640 FAX: +886-2-2601-1695
Test Site No.	Sporton Site No. OS04-LK

FCC designation No.: TW1093 and TW1132 and TW1095

ISED Registration No.: 4086B and 4086H and 4086C



1.4. Applicable Standards

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

<FCC>

- ♦ FCC 47 CFR FCC Part 15 Subpart B Class A
- ♦ ANSI C63.4-2014

<ISED>

- ♦ ISED ICES-003 Issue 7 Class A
- ♦ ISED RSS-Gen Issue 5
- ♦ ANSI C63.4a-2017

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. The test results for FCC compliance, indicating that these results are deemed satisfactory evidence of compliance with Industry Canada Interference-Causing Equipment Standard ICES-003.

2. Test Configuration of Equipment Under Test

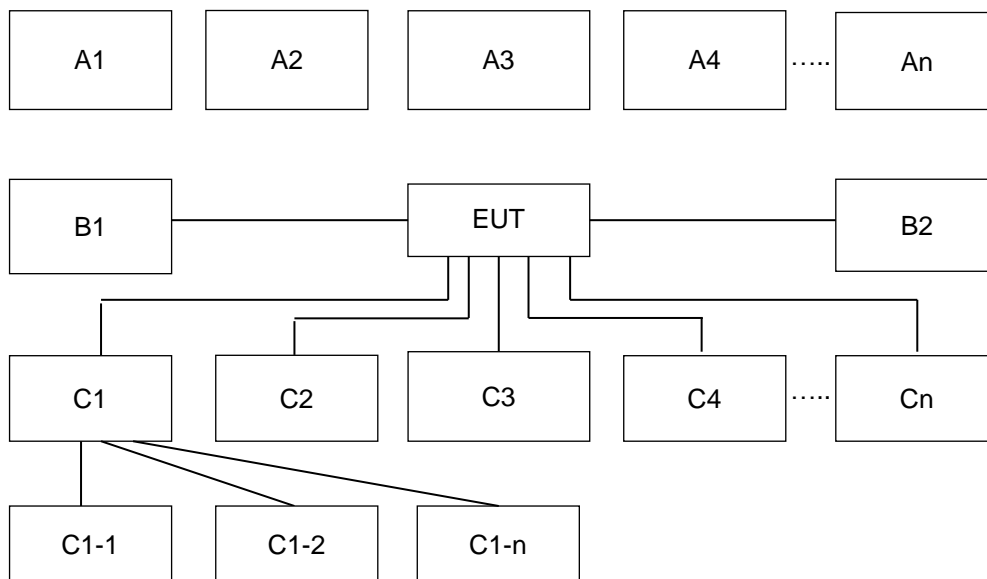
2.1. Test Mode

The EUT has been associated with peripherals pursuant to ANSI C63.4-2014 for FCC Part 15 Subpart B and ANSI C63.4a-2017 for ISED ICES-003 Issue 7 configuration operated in a manner tended to maximize its emission characteristics in a typical application.

Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (30MHz to the 5th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

Test Items	Function Type
AC Conducted Emission	<p>Mode 1 :LTE Band 13 Idle + USB Dongle (Electricity only) + LAN Link + WAN Link + Fiber Link + Adapter + WLAN (2.4 GHz) Link + Cellular (SIM A) for Sample 2</p> <p>Mode 2: LTE Band 5 Idle + USB Dongle (Electricity only) + LAN Link + WAN Link + Fiber Link + Adapter + WLAN (5 GHz) Link + Cellular (SIM B) for Sample 2</p> <p>Mode 3: LTE Band 12 Idle + USB Dongle (Electricity only) + LAN Link + WAN Link + Fiber Link + Adapter + WLAN (2.4 GHz) Idle+ Cellular (SIM A) for Sample 2</p> <p>Mode 4: 5G NR n5 Idle + USB Dongle (Electricity only) + LAN Link + WAN Link+ Fiber Link + Adapter + WLAN (5 GHz) Idle + Cellular (SIM A) for Sample 2</p> <p>Mode 5: LTE Band 13 Idle + USB Dongle (Electricity only) + LAN Link + WAN Link + Fiber Link + Adapter + WLAN (2.4 GHz) Link + Cellular (SIM A) for Sample 1</p>
Radiated Emissions	<p>Mode 1: LTE Band 13 Idle + USB Dongle (Electricity only) + LAN Link + WAN Link + Fiber Link + Adapter + WLAN (2.4 GHz) Link + Cellular (SIM A) for Sample 2</p> <p>Mode 2: LTE Band 5 Idle + USB Dongle (Electricity only) + LAN Link + WAN Link + Fiber Link + Adapter + WLAN (5 GHz) Link + Cellular (SIM B) for Sample 2</p> <p>Mode 3: LTE Band 12 Idle + USB Dongle (Electricity only) + LAN Link + WAN Link + Fiber Link + Adapter + WLAN (2.4 GHz) Idle+ Cellular (SIM A) for Sample 2</p> <p>Mode 4: 5G NR n5 Idle + USB Dongle (Electricity only) + LAN Link + WAN Link+ Fiber Link + Adapter + WLAN (5 GHz) Idle + Cellular (SIM A) for Sample 2</p> <p>Mode 5: LTE Band 12 Idle + USB Dongle (Electricity only) + LAN Link + WAN Link + Fiber Link + Adapter + WLAN (2.4 GHz) Idle + Cellular (SIM A) for Sample 1</p>
Remark: <ol style="list-style-type: none"> 1. The worst case of AC is mode 1; only the test data of this mode was reported. 2. The worst case of RE is mode 3; only the test data of this mode was reported. 3. For radiation emission after pre-scanned the cellular band between 30MHz ~ 960MHz (WCDMA Band V/LTE Band 5/12/13/14/17/26); only the worst case for cellular band test data of this mode was reported. 	

2.2. Connection Diagram of Test System



Conduction Test Setup									
No.	Wireless Station	Connection Type	Test Mode						
			1	2	3	4	5	-	-
A1	System Simulator	LTE/5G NR	X	X	X	X	X	-	-
A2	Notebook	WiFi	X	X	-	-	X	-	-
No.	Power Source	Connection Type	1	2	3	4	5	-	-
B1	AC : 120V/60Hz	AC Power Cable	X	X	X	X	X	-	-
No.	Setup Peripherals	Connection Type	1	2	3	4	5	-	-
C1	Notebook	RJ-45 Cable	X	X	X	X	X	-	-
C2	Notebook	RJ-45 Cable	X	X	X	X	X	-	-
C3	Fiber Cable*2	N/A	X	X	X	X	X	-	-
C4	USB Dongle	I/O interface without cable	X	X	X	X	X	-	-

Radiation Test Setup									
No.	Wireless Station	Connection Type	Test Mode						
			1	2	3	4	5	-	-
A1	System Simulator	LTE/5G NR	X	X	X	X	X	-	-
A2	Notebook	WiFi	X	X	-	-	-	-	-
No.	Power Source	Connection Type	1	2	3	4	5	-	-
B1	AC : 120V/60Hz	AC Power Cable	X	X	X	X	X	-	-
No.	Setup Peripherals	Connection Type	1	2	3	4	5	-	-
C1	Notebook	RJ-45 Cable	X	X	X	X	X	-	-
C2	Notebook	RJ-45 Cable	X	X	X	X	X	-	-
C3	Fiber Cable*2	N/A	X	X	X	X	X	-	-
C4	USB Dongle	I/O interface without cable	X	X	X	X	X	-	-

2.3. Support Unit used in test configuration and system

Item	Equipment	Brand Name	Model Name	FCC ID	Data Cable	Power Cord
1.	5G Wireless Test Platform	Anritsu	MT80000A	N/A	N/A	Unshielded, 1.8m
2.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8m
3.	System Simulator	Anritsu	MT8821C	N/A	N/A	Unshielded, 1.8m
4.	Notebook	Dell	Latitude 3400	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
5.	Notebook	Dell	Latitude5480	FCC DoC	N/A	AC I/P : Unshielded, 1.2m DC O/P : Shielded, 1.8m
6.	Notebook	Dell	Latitude5310	FCC DoC	N/A	AC I/P : Unshielded, 1.2m DC O/P : Shielded, 1.8m
7.	Dongle	Kingston	DTSE9 16GB	N/A	N/A	N/A
8.	USB Dongle	SanDisk	SDCZ600	FCC DoC	N/A	N/A

2.4. EUT Operation Test Setup

The EUT was in LTE/5G NR idle mode during the test. The EUT was synchronized with the BCCH, and had been continuous receiving mode by setting paging reorganization of the system simulator.

The following programs installed in the EUT were programmed during the test:

1. EUT links with Notebook and executes ping.
2. EUT links with Notebook and executes ping via RJ-45, LAN Port and WAN Port

3. Test Result

3.1. Test of AC Conducted Emission Measurement

3.1.1. Limits of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

<Class A>

Frequency of emission (MHz)	Conducted limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	79	66
0.5-30	73	60

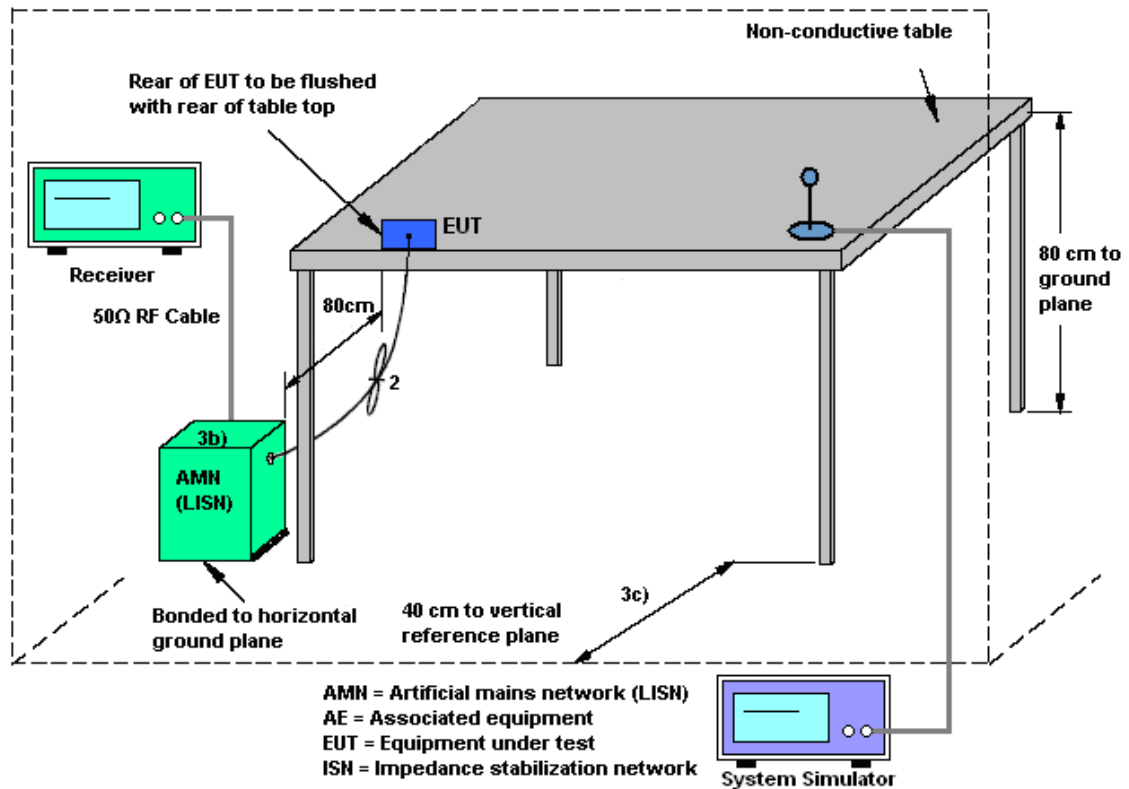
3.1.2. Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.1.3. Test Procedure

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN shall be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

3.1.4. Test Setup



3.1.5. Test Result of AC Conducted Emission

Please refer to Appendix A.

3.2. Test of Radiated Emission Measurement

3.2.1. Limit of Radiated Emission

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

<For FCC Class A>

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 - 88	90	10
88 - 216	150	10
216 - 960	210	10
Above 960	300	10

Remark:

- A disclaimer from test lab., based on the FCC Part 15.31(f)(1) standard applicability, the results which are consents by manufacturer, are extrapolated to the specified 10m distance using an extrapolation factor of 20 dB/decade, an Aux factor corrected for the test result tested at 3m distance, and which are declared by manufacturer, are not impacted by near field effect due to the characteristic of EUT, when measurement between frequency 30MHz to 1GHz.
- Follows the 15.109 (g) (2), measurements above 1000 MHz may be performed at the distance specified in the CISPR 22 publications is extrapolated to the new measurement distance using an inverse linear distance extrapolation factor (20 dB/decade).

<For ICES-003 Class A>

Frequency range (MHz)	Class A (3m) Quasi-peak (dB μ V/m)	Class A (10m) Quasi-peak (dB μ V/m)	Class B (3m) Quasi-peak (dB μ V/m)	Class B (10m) Quasi-peak (dB μ V/m)
30-88	50.0	40.0	40.0	30.0
88-216	54.0	43.5	43.5	33.1
216-230	56.9	46.4	46.0	35.6
230-960	57.0	47.0	47.0	37.0
960-1000	60.0	49.5	54.0	43.5

Note: The more stringent limit applies at transition frequencies.

Frequency range (GHz)	Class A (3m) Average (dB μ V/m)	Class A (3m) Peak (dB μ V/m)	Class B (3m) Average (dB μ V/m)	Class B (3m) Peak (dB μ V/m)
1 – F _M	60	80	54	74

Note: The highest measurement frequency (F_M).

3.2.2. Measuring Instruments

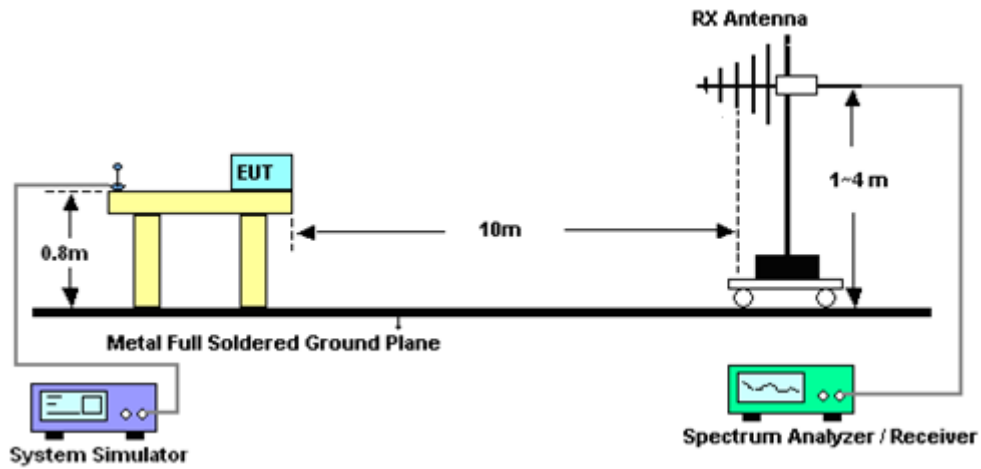
Refer a test equipment and calibration data table in this test report.

3.2.3. Test Procedures

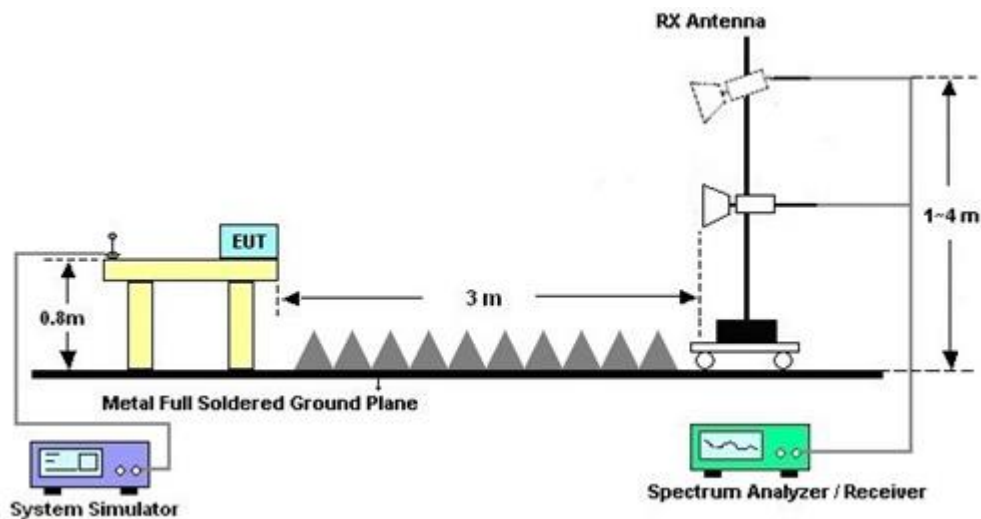
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 10 meters (30M~1G) and 3 meters (1G~ 13G) from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the 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=120 kHz/VBW=300 kHz for frequency below 1 GHz; RBW=1 MHz VBW=3 MHz (Peak), RBW=1 MHz/VBW=10 Hz (Average) for frequency above 1 GHz).
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 (dB μ V/m) = 20 log Emission level (μ V/m)
9. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

3.2.4. Test Setup of Radiated Emission

For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.2.5. Test Result of Radiated Emission

Please refer to Appendix B.



4. List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Jul. 05, 2021~ Jul. 16, 2021	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	9kHz~3.6GHz	Nov. 30, 2020	Jul. 05, 2021~ Jul. 16, 2021	Nov. 29, 2021	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34913912	N/A	Nov. 18, 2020	Jul. 05, 2021~ Jul. 16, 2021	Nov. 17, 2021	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Dec. 01, 2020	Jul. 05, 2021~ Jul. 16, 2021	Nov. 30, 2021	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100081	9kHz~30MHz	Nov. 16, 2020	Jul. 05, 2021~ Jul. 16, 2021	Nov. 15, 2021	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	Jul. 05, 2021~ Jul. 16, 2021	N/A	Conduction (CO05-HY)
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100851	N/A	Feb. 25, 2021	Jul. 05, 2021~ Jul. 16, 2021	Feb. 24, 2022	Conduction (CO05-HY)
LISN Cable	MVE	RG-400	260260	N/A	Dec. 31, 2020	Jul. 05, 2021~ Jul. 16, 2021	Dec. 30, 2021	Conduction (CO05-HY)
Amplifier	Agilent	8447D	2944A07468	10 kHz ~ 1.3GHz	Dec. 01, 2020	Jul. 15, 2021	Nov. 30, 2021	Radiation (OS04-LK)
Spectrum Analyzer	R&S	FSP 7	838858/037	9 kHz ~ 7 GHz	May 26, 2021	Jul. 15, 2021	May 25, 2022	Radiation (OS04-LK)
Test Receiver	R&S	ESCS 30	838251/003	9 kHz ~ 2.75 GHz	Aug. 12, 2020	Jul. 15, 2021	Aug. 11, 2021	Radiation (OS04-LK)
Bilog Antenna with 5dB Attenuator	TESEQ & EMCi	CBL6112D & N-6-05	35377 & AT-N0518	30 MHz ~ 2 GHz	Jul. 03, 2021	Jul. 15, 2021	Jul. 02, 2022	Radiation (OS04-LK)
Turn Table	EMCO	2080	9711-2021	0 ~ 360 degree	NCR	Jul. 15, 2021	NCR	Radiation (OS04-LK)
Antenna Mast	EMCO	2075	9711-2115	1 m ~ 4 m	NCR	Jul. 15, 2021	NCR	Radiation (OS04-LK)
RF Cable-R10m	Woken	CFD400NL-L W	CB011	30 MHz ~ 1 GHz	Dec. 10, 2020	Jul. 15, 2021	Dec. 09, 2021	Radiation (OS04-LK)
Software	Audix	E3	Version:4	-	NCR	Jul. 15, 2021	NCR	Radiation (OS04-LK)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-02114	1GHz~18GHz	Aug. 04, 2020	Jul. 14, 2021	Aug. 03, 2021	Radiation (03CH10-HY)
Preamplifier	Jet-Power	JAP00101800-30-10P	160118550004	1GHz~18GHz	Mar. 01, 2021	Jul. 14, 2021	Feb. 28, 2022	Radiation (03CH10-HY)
Spectrum Analyzer	Keysight	N9010A	MY53470118	10Hz~44GHz	Jan. 15, 2021	Jul. 14, 2021	Jan. 14, 2022	Radiation (03CH10-HY)
Controller	EMEC	EM 1000	N/A	Control Turn table & Ant Mast	N/A	Jul. 14, 2021	N/A	Radiation (03CH10-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1~4m	N/A	Jul. 14, 2021	N/A	Radiation (03CH10-HY)
Turn Table	EMEC	TT 2200	N/A	0~360 Degree	N/A	Jul. 14, 2021	N/A	Radiation (03CH10-HY)
Software	Audix	E3 6.2009-8-24	RK-001042	N/A	N/A	Jul. 14, 2021	N/A	Radiation (03CH10-HY)
EMI Test Receiver	Agilent	N9038A(MXE)	MY53290045	20MHz~8.4GHz	Jan. 13, 2021	Jul. 14, 2021	Jan. 12, 2022	Radiation (03CH10-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104 / 102	MY11692/4PE, MY11693/4PE, MY2855/2	30MHz~1GHz	Nov. 06, 2020	Jul. 14, 2021	Nov. 05, 2021	Radiation (03CH10-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104 / 102	MY11692/4PE, MY11693/4PE, MY2855/2	1GHz~18GHz	Nov. 06, 2020	Jul. 14, 2021	Nov. 05, 2021	Radiation (03CH10-HY)

5. Uncertainty of Evaluation

Uncertainty of Conducted Emission Measurement (150 kHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.3 dB
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	4.81 dB
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Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	6.4dB
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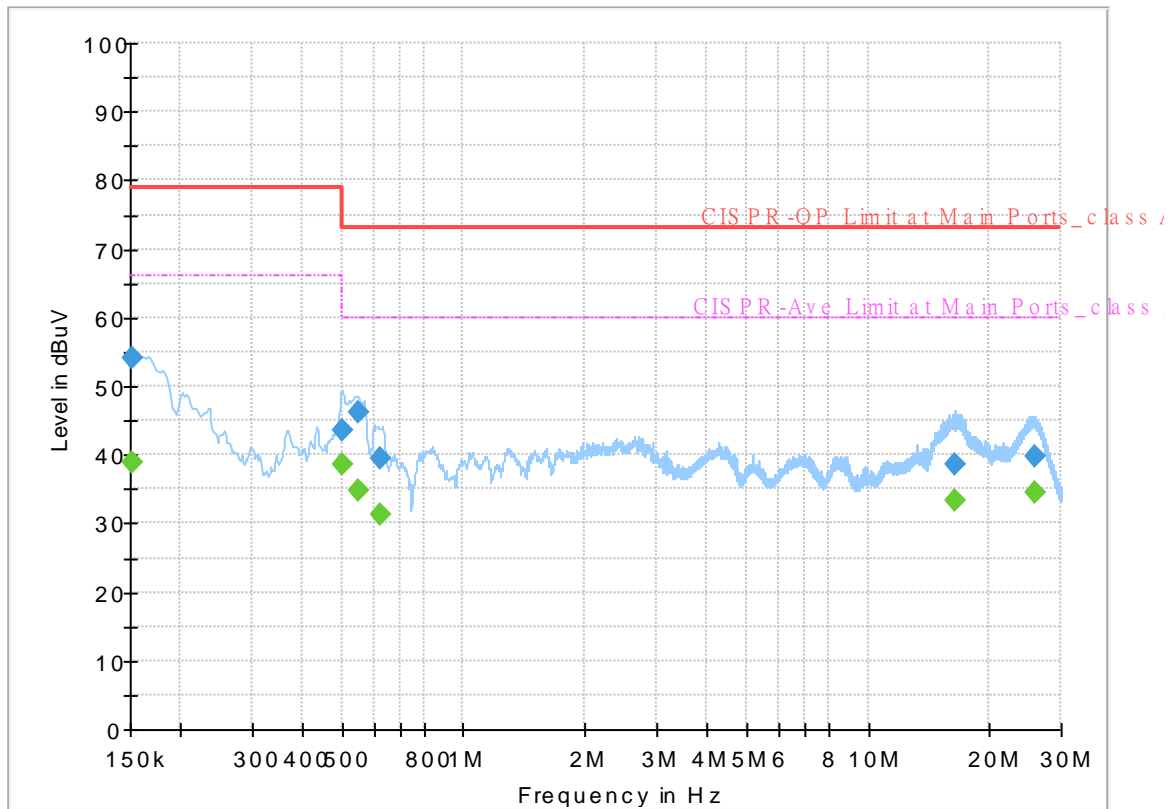
Appendix A. AC Conducted Emission Test Results

Test Engineer :	Tom Lee	Temperature :	23~26°C
		Relative Humidity :	40~50%

EUT Information

Report NO : 162104
Test Mode : Mode 1
Test Voltage : 120Vac/60Hz
Phase : Line

Full Spectrum



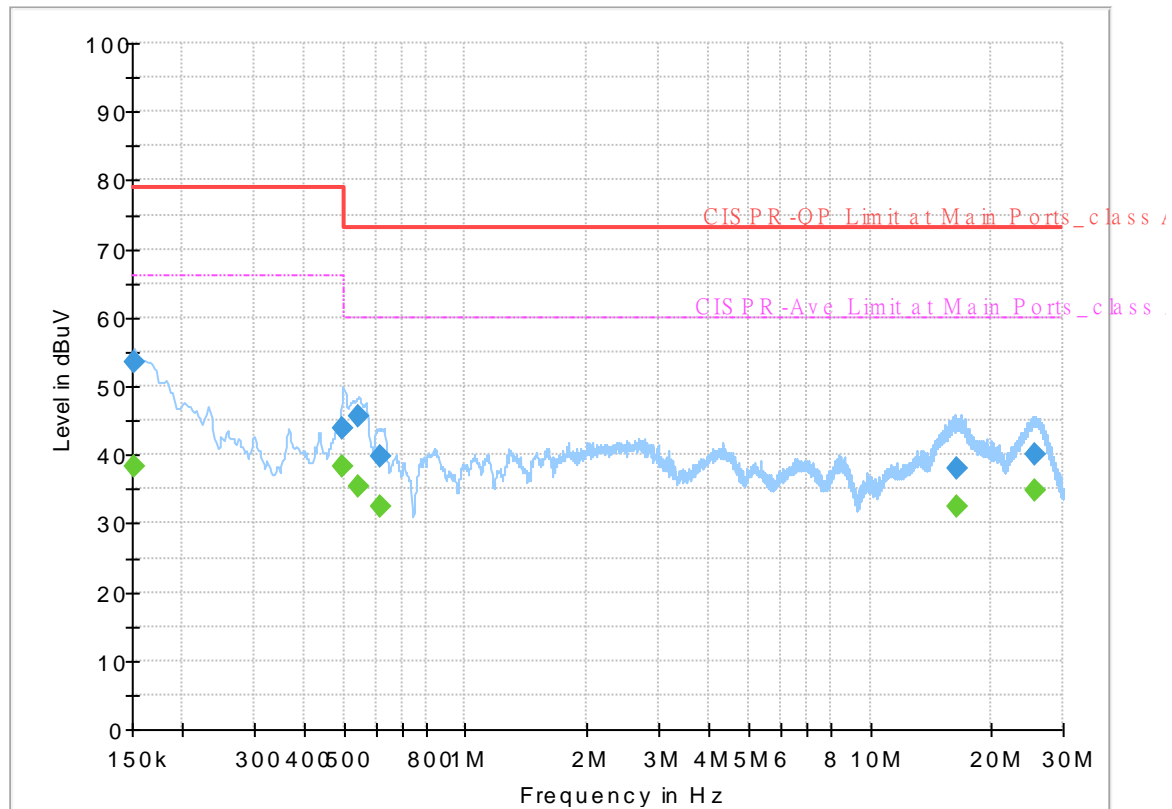
Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.152250	---	38.78	66.00	27.22	L1	OFF	19.6
0.152250	53.99	---	79.00	25.01	L1	OFF	19.6
0.501000	---	38.71	60.00	21.29	L1	OFF	19.7
0.501000	43.58	---	73.00	29.42	L1	OFF	19.7
0.548250	---	34.89	60.00	25.11	L1	OFF	19.8
0.548250	46.08	---	73.00	26.92	L1	OFF	19.8
0.620250	---	31.35	60.00	28.65	L1	OFF	19.8
0.620250	39.45	---	73.00	33.55	L1	OFF	19.8
16.370250	---	33.38	60.00	26.62	L1	OFF	20.3
16.370250	38.73	---	73.00	34.27	L1	OFF	20.3
25.766250	---	34.61	60.00	25.39	L1	OFF	20.6
25.766250	39.66	---	73.00	33.34	L1	OFF	20.6

EUT Information

Report NO : 162104
Test Mode : Mode 1
Test Voltage : 120Vac/60Hz
Phase : Neutral

Full Spectrum



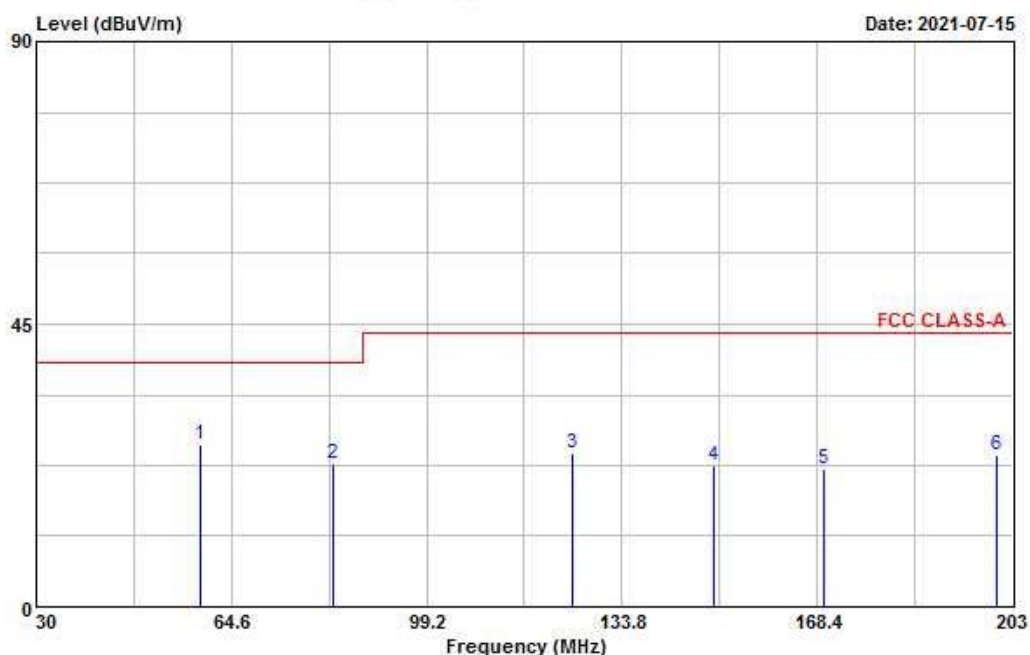
Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.152250	---	38.38	66.00	27.62	N	OFF	19.6
0.152250	53.56	---	79.00	25.44	N	OFF	19.6
0.498750	---	38.34	66.00	27.66	N	OFF	19.7
0.498750	43.80	---	79.00	35.20	N	OFF	19.7
0.546000	---	35.23	60.00	24.77	N	OFF	19.8
0.546000	45.62	---	73.00	27.38	N	OFF	19.8
0.613500	---	32.36	60.00	27.64	N	OFF	19.9
0.613500	39.87	---	73.00	33.13	N	OFF	19.9
16.480500	---	32.53	60.00	27.47	N	OFF	20.4
16.480500	37.92	---	73.00	35.08	N	OFF	20.4
25.669500	---	34.92	60.00	25.08	N	OFF	20.8
25.669500	39.99	---	73.00	33.01	N	OFF	20.8

Appendix B. Radiated Emission Test Result

<For FCC>

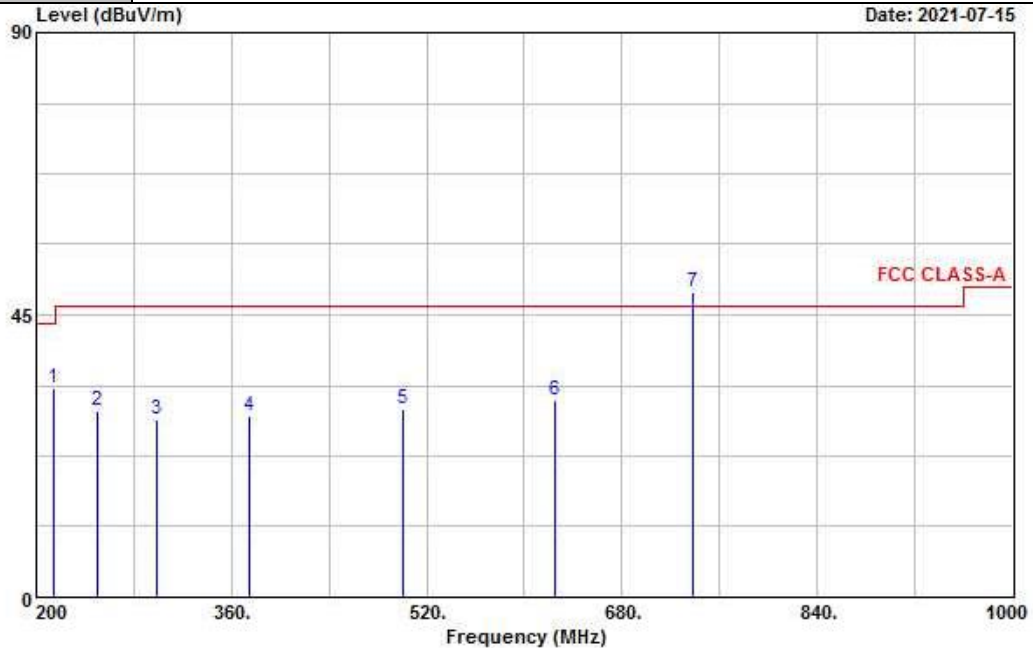
Test Engineer :	Giant Chen	Temperature :	21~26°C
		Relative Humidity :	51~57%
Test Distance :	10m	Polarization :	Horizontal



Site : OS04-LK
 Condition : FCC CLASS-A 10m HORIZONTAL
 Project : 162104
 Power : 120VAC/60Hz
 Mode : Mode 3

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Table Pos	Ant Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		deg	cm
1	59.060	25.77	-13.23	39.00	40.58	11.53	27.52	1.18	Peak	---	---
2	82.590	22.76	-16.24	39.00	36.20	12.60	27.42	1.38	Peak	---	---
3	124.980	24.31	-19.19	43.50	32.72	17.19	27.25	1.65	Peak	---	---
4	150.060	22.58	-20.92	43.50	32.10	15.80	27.13	1.81	Peak	---	---
5	169.610	21.96	-21.54	43.50	32.11	14.94	27.02	1.93	Peak	---	---
6	200.060	24.25	-19.25	43.50	34.34	14.62	26.85	2.14	Peak	---	---

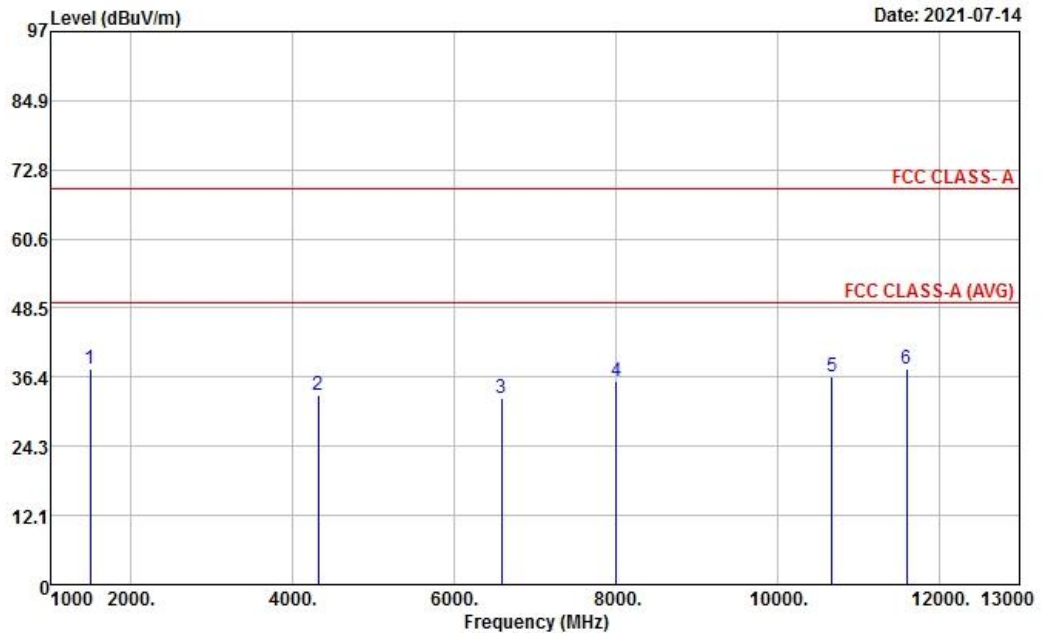
Test Engineer :	Giant Chen	Temperature :	21~26°C
		Relative Humidity :	51~57%
Test Distance :	10m	Polarization :	Horizontal
Remark :	#7 is system simulator signal which can be ignored.		



Site : OS04-LK
 Condition : FCC CLASS-A 10m HORIZONTAL
 Project : 162104
 Power : 120VAC/60Hz
 Mode : Mode 3

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Preamp Factor	Cable Loss	Table Pos	Ant Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	deg	cm
1	214.450	33.33	-10.17	43.50	43.60	14.29	26.79	2.23 Peak	134 400
2	249.600	29.60	-16.80	46.40	36.22	17.57	26.64	2.45 Peak	---
3	298.400	28.36	-18.04	46.40	34.11	18.46	26.70	2.49 Peak	---
4	374.400	28.87	-17.53	46.40	33.04	20.11	27.24	2.96 Peak	---
5	500.000	30.02	-16.38	46.40	31.82	22.64	27.93	3.49 Peak	---
6	624.800	31.33	-15.07	46.40	31.10	24.23	28.08	4.08 Peak	---
7	737.500	48.60			47.15	24.79	27.98	4.64 Peak	---

Test Engineer :	Donny Tang	Temperature :	23.2~24.1°C
		Relative Humidity :	60.2~61.4%
Test Distance :	3m	Polarization :	Horizontal

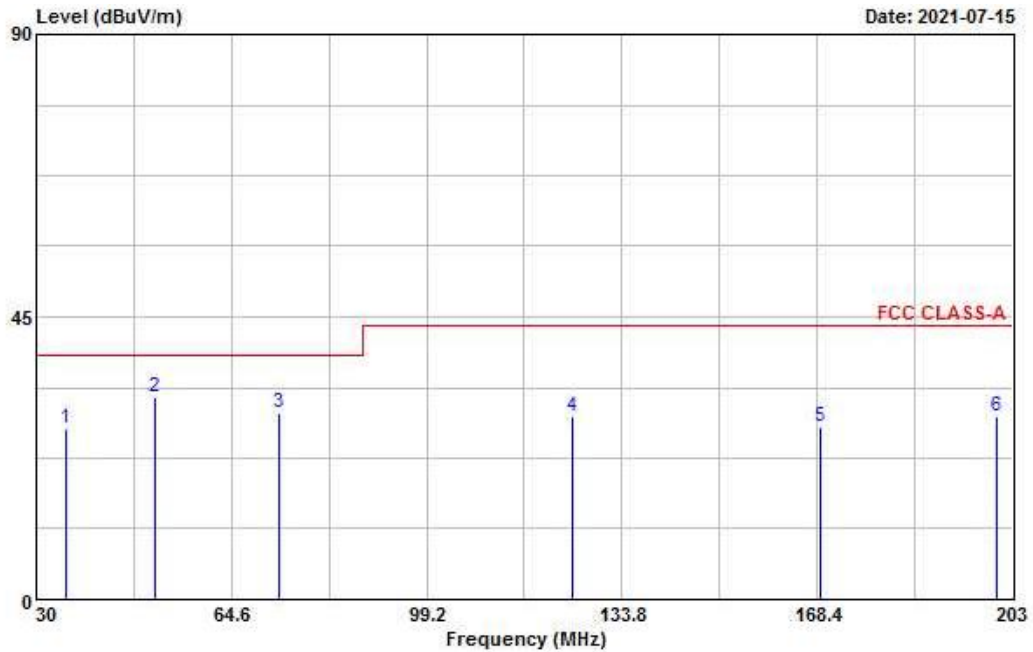


Site : 03CH10-HY
 Condition : FCC CLASS- A 3m HORN 9120D-HF HORIZONTAL
 Project : 162104
 Power : 120Vac/60Hz
 Mode : 3

Frequency	Level	Distance extrapolation	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak
		Factor	Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Average
(MHz)	(dBuV/m)	(dB)	(dB)	(dBuV/m)	(dBuV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)
1492	37.95	10.45	-31.59	69.54	77.04	25.25	4.49	58.38	-	-	P
4312	33.16	10.45	-36.38	69.54	64.23	29.95	7.88	58.45	-	-	P
6582	32.59	10.45	-36.95	69.54	58.29	34.26	10.01	59.52	-	-	P
8002	35.66	10.45	-33.88	69.54	57.61	37	10.78	59.28	-	-	P
10676	36.48	10.45	-33.06	69.54	54.18	39.5	12.6	59.35	-	-	P
11604	37.76	10.45	-31.78	69.54	54.29	39.48	13.22	58.88	100	0	P



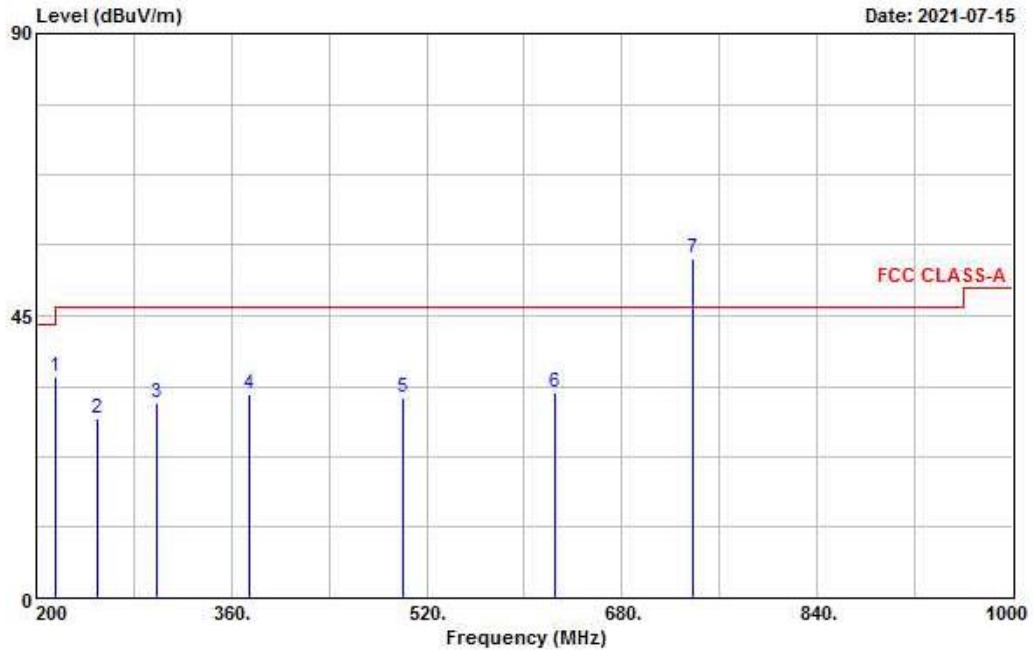
Test Engineer :	Giant Chen	Temperature :	21~26°C
		Relative Humidity :	51~57%
Test Distance :	10m	Polarization :	Vertical



Site : OS04-LK
 Condition : FCC CLASS-A 10m VERTICAL
 Project : 162104
 Power : 120VAC/60Hz
 Mode : Mode 3

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamplifier Factor	Cable Loss	Remark	Table Pos	Ant Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		deg	cm
1	35.360	27.13	-11.87	39.00	33.26	20.42	27.56	1.01	Peak	---	---
2	51.110	32.35	-6.65	39.00	45.83	12.96	27.52	1.08	Peak	---	---
3	73.080	29.86	-9.14	39.00	44.43	11.58	27.46	1.31	Peak	---	---
4	124.980	29.15	-14.35	43.50	37.56	17.19	27.25	1.65	Peak	---	---
5	169.090	27.45	-16.05	43.50	37.61	14.94	27.02	1.92	Peak	---	---
6	200.060	29.29	-14.21	43.50	39.38	14.62	26.85	2.14	Peak	---	---

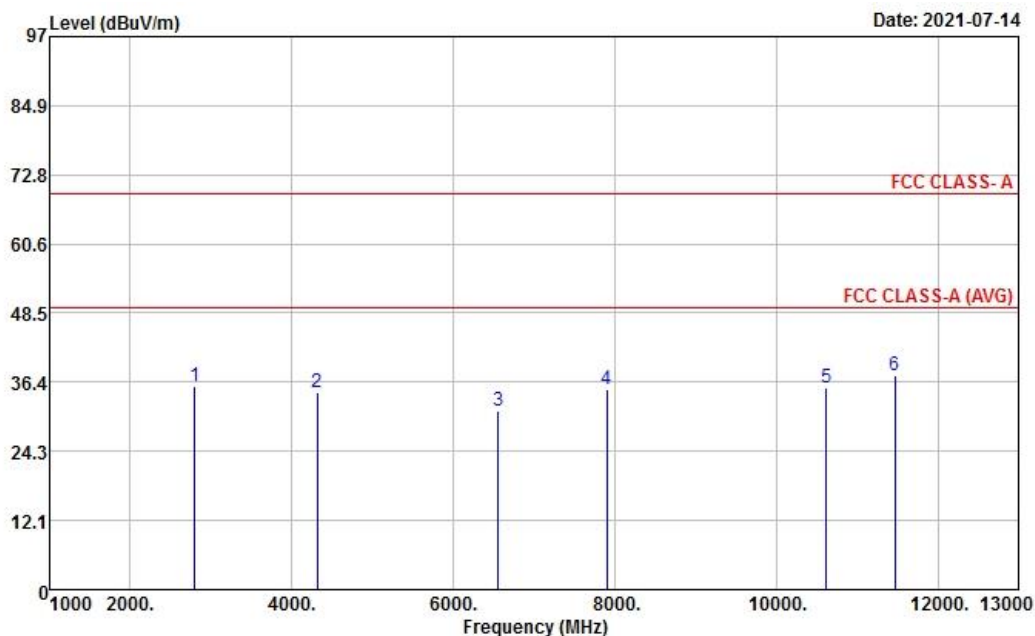
Test Engineer :	Giant Chen	Temperature :	21~26°C
		Relative Humidity :	51~57%
Test Distance :	10m	Polarization :	Vertical
Remark :	#7 is system simulator signal which can be ignored.		



Site : OS04-LK
 Condition : FCC CLASS-A 10m VERTICAL
 Project : 162104
 Power : 120VAC/60Hz
 Mode : Mode 3

	Freq	Level	Over	Limit	ReadAntenna	Preamp	Cable		Table	Ant
	MHz	dBuV/m	Limit	Line	Level	Factor	Factor	Loss	Pos	Pos
			dB	dBuV/m	dBuV	dB/m	dB	dB	deg	cm
1	215.050	35.18	-8.32	43.50	45.50	14.23	26.79	2.24	QP	164
2	249.600	28.71	-17.69	46.40	35.33	17.57	26.64	2.45	Peak	---
3	298.400	31.24	-15.16	46.40	36.99	18.46	26.70	2.49	Peak	---
4	374.400	32.40	-14.00	46.40	36.57	20.11	27.24	2.96	Peak	---
5	500.000	31.93	-14.47	46.40	33.73	22.64	27.93	3.49	Peak	---
6	624.800	32.71	-13.69	46.40	32.48	24.23	28.08	4.08	Peak	---
7	737.500	54.21			52.76	24.79	27.98	4.64	Peak	---

Test Engineer :	Donny Tang	Temperature :	22.5~23.9°C
		Relative Humidity :	60.9~61.4%
Test Distance :	3m	Polarization :	Vertical

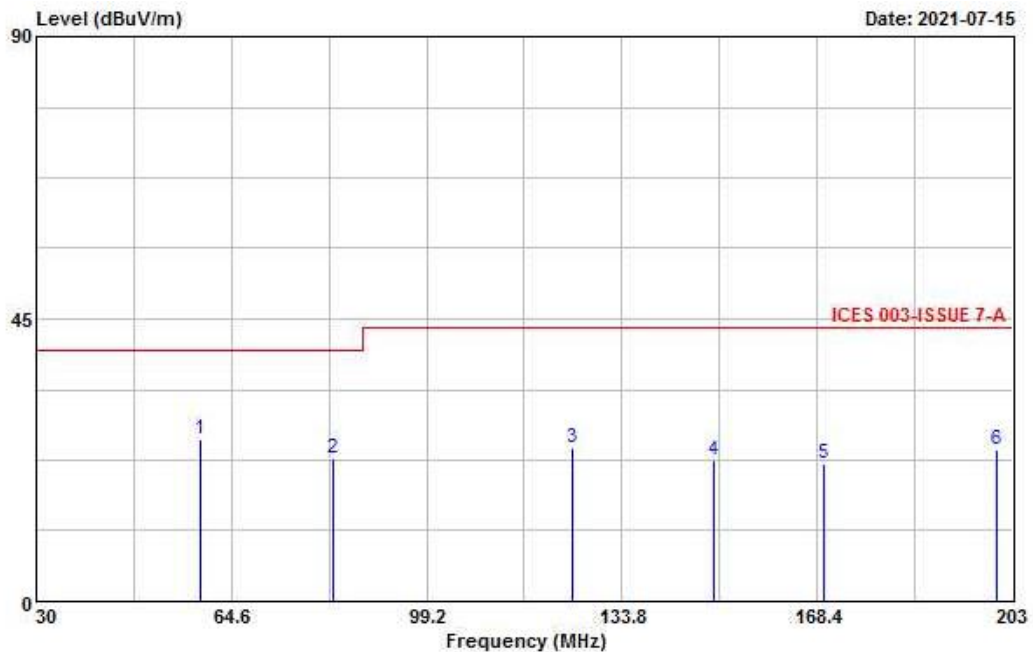


Site : 03CH10-HY
 Condition : FCC CLASS- A 3m HORN 9120D-HF VERTICAL
 Project : 162104
 Power : 120Vac/60Hz
 Mode : 3

Frequency	Level	Distance extrapolation	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak
		Factor	Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Average
(MHz)	(dBuV/m)	(dB)	(dB)	(dBuV/m)	(dBuV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)
2800	35.61	10.45	-33.93	69.54	69.84	27.9	6.42	58.1	-	-	P
4312	34.66	10.45	-34.88	69.54	65.73	29.95	7.88	58.45	-	-	P
6554	31.27	10.45	-38.27	69.54	57.02	34.21	10	59.51	-	-	P
7900	35.04	10.45	-34.5	69.54	57.44	36.6	10.82	59.37	-	-	P
10620	35.48	10.45	-34.06	69.54	53.33	39.5	12.57	59.47	-	-	P
11468	37.5	10.45	-32.04	69.54	53.77	39.67	13.13	58.62	100	0	P

<For ICES-003>

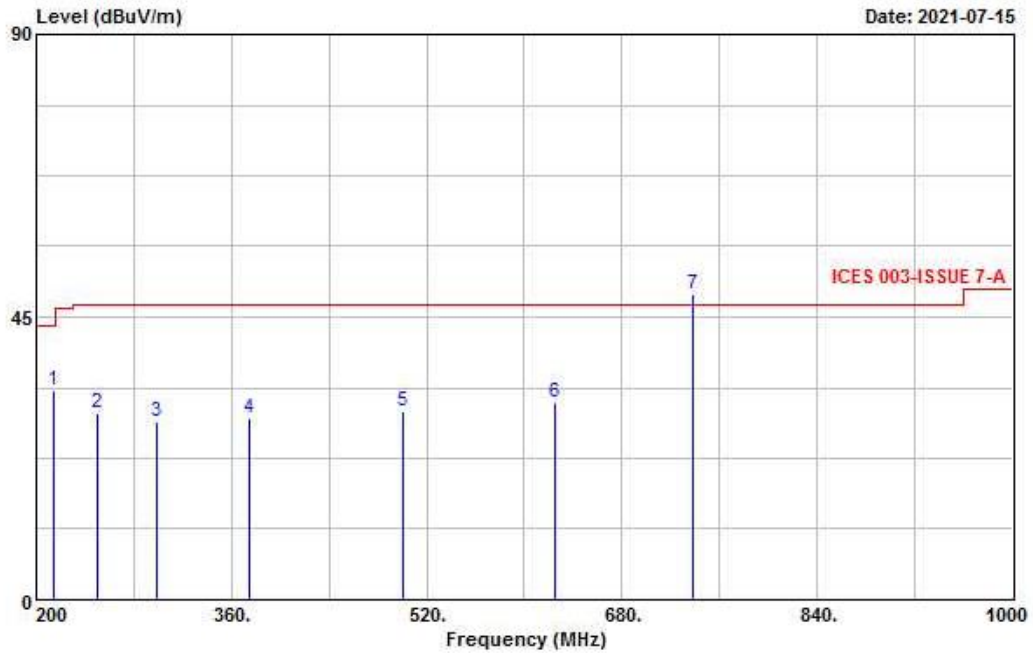
Test Engineer :	Giant Chen	Temperature :	21~26°C
		Relative Humidity :	51~57%
Test Distance :	10m	Polarization :	Horizontal



Site : OS04-LK
 Condition : ICES 003-ISSUE 7-A 10m HORIZONTAL
 Project : 162104
 Power : 120VAC/60Hz
 Mode : Mode 3

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Preamp Factor	Cable Loss	Remark	Table Pos	Ant Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB		deg	cm
1	59.060	25.77	-14.23	40.00	40.58	11.53	27.52	1.18 Peak	---	---
2	82.590	22.76	-17.24	40.00	36.20	12.60	27.42	1.38 Peak	---	---
3	124.980	24.31	-19.19	43.50	32.72	17.19	27.25	1.65 Peak	---	---
4	150.060	22.58	-20.92	43.50	32.10	15.80	27.13	1.81 Peak	---	---
5	169.610	21.96	-21.54	43.50	32.11	14.94	27.02	1.93 Peak	---	---
6	200.060	24.25	-19.25	43.50	34.34	14.62	26.85	2.14 Peak	---	---

Test Engineer :	Giant Chen	Temperature :	21~26°C
		Relative Humidity :	51~57%
Test Distance :	10m	Polarization :	Horizontal
Remark :	#7 is system simulator signal which can be ignored.		

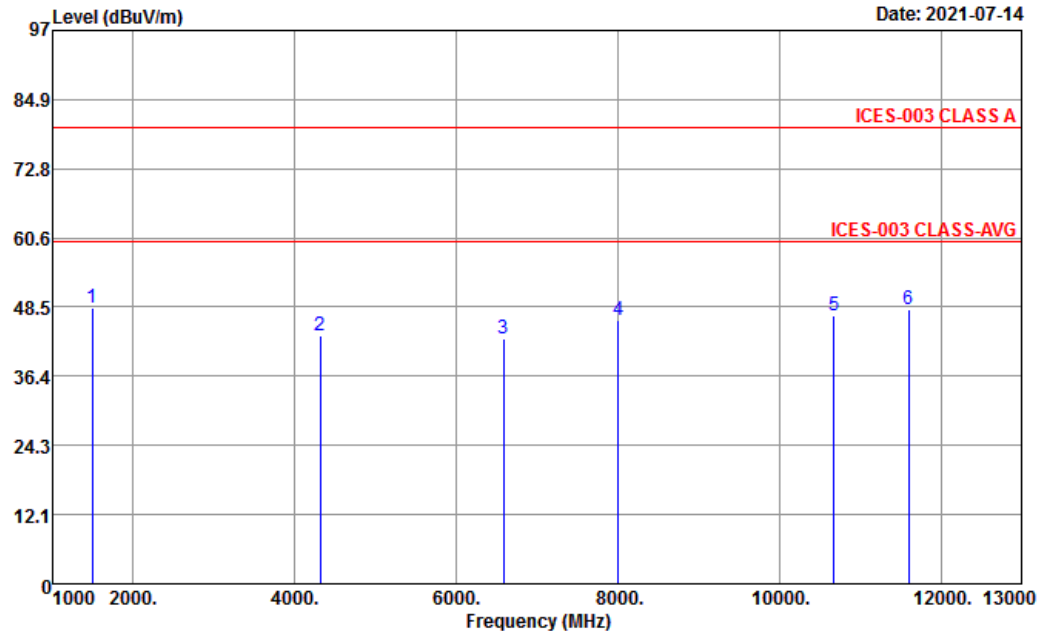


Site : OS04-LK
 Condition : ICES 003-ISSUE 7-A 10m HORIZONTAL
 Project : 162104
 Power : 120VAC/60Hz
 Mode : Mode 3

	Freq	Level	Over	Limit	Read	Antenna	Preamp	Cable	Table	Ant
	MHz	dBuV/m	Limit	Line	Level	Factor	Factor	Loss	Pos	Pos
			dB	dBuV/m	dBuV	dB/m	dB	dB	deg	cm
1	214.450	33.33	-10.17	43.50	43.60	14.29	26.79	2.23	Peak	134 400
2	249.600	29.60	-17.40	47.00	36.22	17.57	26.64	2.45	Peak	---
3	298.400	28.36	-18.64	47.00	34.11	18.46	26.70	2.49	Peak	---
4	374.400	28.87	-18.13	47.00	33.04	20.11	27.24	2.96	Peak	---
5	500.000	30.02	-16.98	47.00	31.82	22.64	27.93	3.49	Peak	---
6	624.800	31.33	-15.67	47.00	31.10	24.23	28.08	4.08	Peak	---
7 X	737.500	48.60			47.15	24.79	27.98	4.64	Peak	---



Test Engineer :	Donny Tang	Temperature :	22.5~23.9°C
		Relative Humidity :	60.9~61.4%
Test Distance :	3m	Polarization :	Horizontal

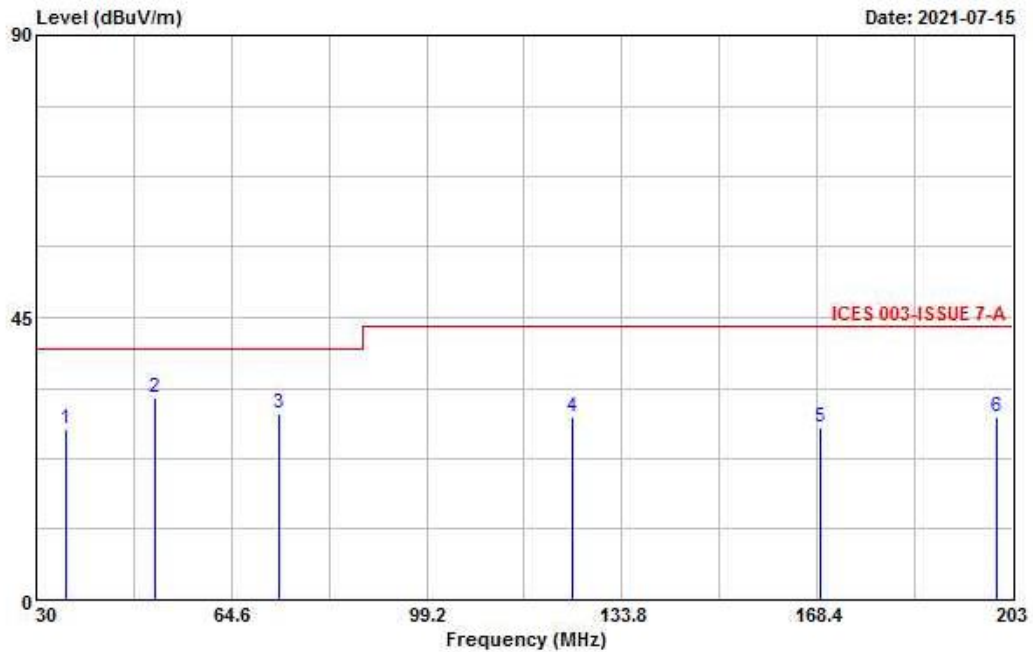


Site : 03CH10-HY
Condition : ICES-003 CLASS A 3m HORN 9120D-HF HORIZONTAL
Project : 162104
Power : 120Vac/60Hz
Mode : 3

	Freq	Level	Over Limit	Limit	Antenna Line Factor	Read Level	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dB/m	dBuV	dB	dB	cm	deg	
1	1492.00	48.40	-31.60	80.00	25.25	77.04	4.49	58.38	100	0	Peak
2	4312.00	43.61	-36.39	80.00	29.95	64.23	7.88	58.45	---	---	Peak
3	6582.00	43.04	-36.96	80.00	34.26	58.29	10.01	59.52	---	---	Peak
4	8002.00	46.11	-33.89	80.00	37.00	57.61	10.78	59.28	---	---	Peak
5	10676.00	46.93	-33.07	80.00	39.50	54.18	12.60	59.35	---	---	Peak
6	11604.00	48.11	-31.89	80.00	39.48	54.29	13.22	58.88	---	---	Peak



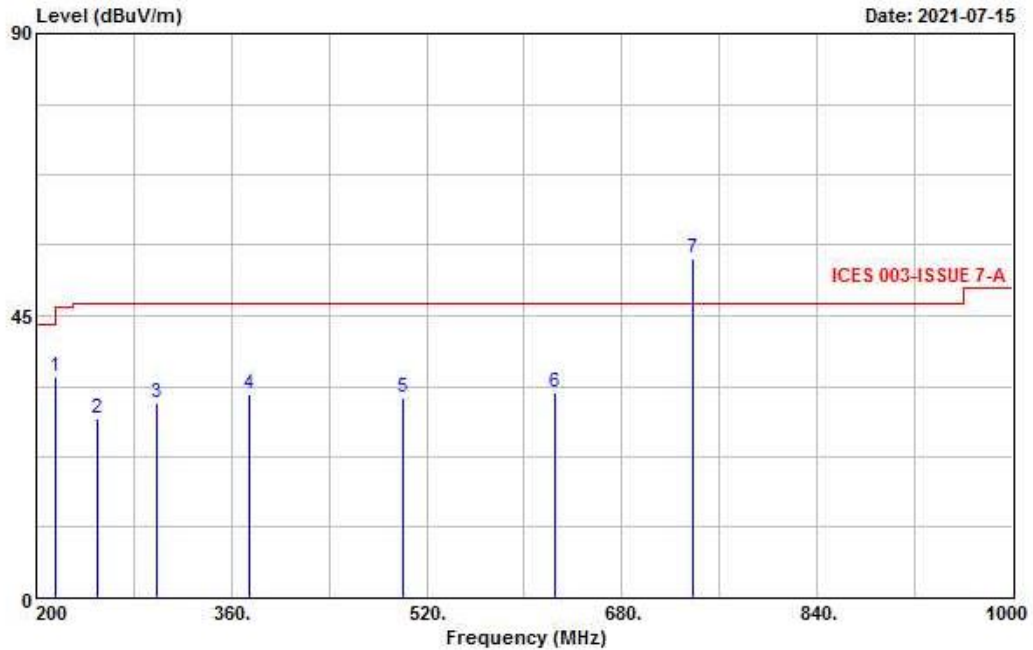
Test Engineer :	Giant Chen	Temperature :	21~26°C
		Relative Humidity :	51~57%
Test Distance :	10m	Polarization :	Vertical



Site : OS04-LK
Condition : ICES 003-ISSUE 7-A 10m VERTICAL
Project : 162104
Power : 120VAC/60Hz
Mode : Mode 3

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Preamp Factor	Cable Loss	Remark	Table Pos	Ant Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB		deg	cm
1	35.360	27.13	-12.87	40.00	33.26	20.42	27.56	1.01 Peak	---	---
2	51.110	32.35	-7.65	40.00	45.83	12.96	27.52	1.08 Peak	---	---
3	73.080	29.86	-10.14	40.00	44.43	11.58	27.46	1.31 Peak	---	---
4	124.980	29.15	-14.35	43.50	37.56	17.19	27.25	1.65 Peak	---	---
5	169.090	27.45	-16.05	43.50	37.61	14.94	27.02	1.92 Peak	---	---
6	200.060	29.29	-14.21	43.50	39.38	14.62	26.85	2.14 Peak	---	---

Test Engineer :	Giant Chen	Temperature :	21~26°C
		Relative Humidity :	51~57%
Test Distance :	10m	Polarization :	Vertical
Remark :	#7 is system simulator signal which can be ignored.		

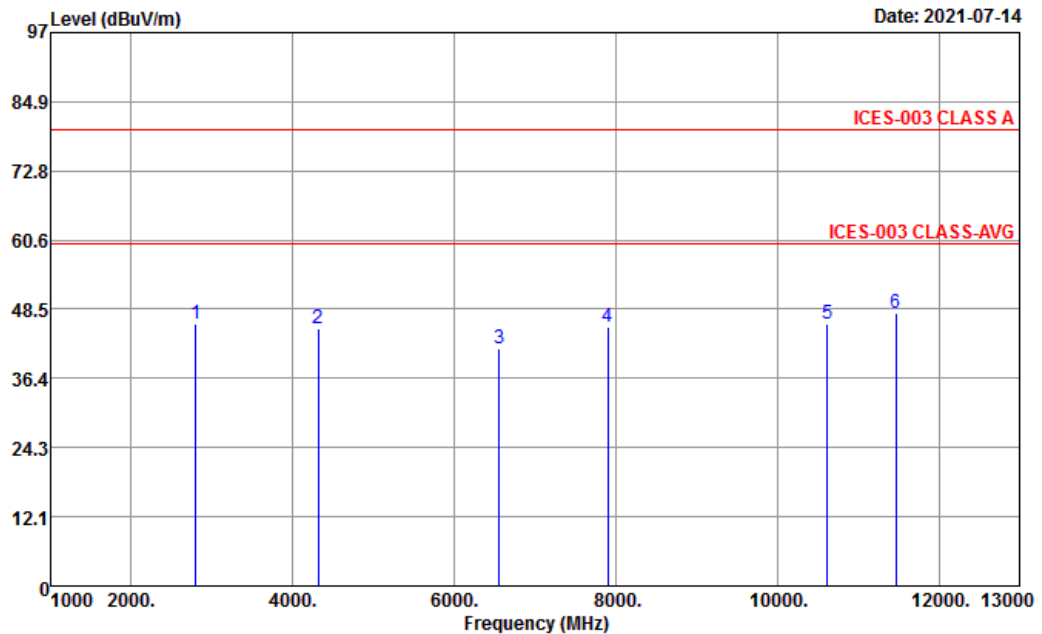


Site : OS04-LK
 Condition : ICES 003-ISSUE 7-A 10m VERTICAL
 Project : 162104
 Power : 120VAC/60Hz
 Mode : Mode 3

	Freq	Level	Over	Limit	ReadAntenna	Preamp	Cable		Table	Ant
	MHz	dBuV/m	Limit	Line	Level	Factor	Factor	Loss	Pos	Pos
			dB	dBuV/m	dBuV	dB/m	dB	dB	deg	cm
1	215.050	35.18	-8.32	43.50	45.50	14.23	26.79	2.24	QP	164
2	249.600	28.71	-18.29	47.00	35.33	17.57	26.64	2.45	Peak	---
3	298.400	31.24	-15.76	47.00	36.99	18.46	26.70	2.49	Peak	---
4	374.400	32.40	-14.60	47.00	36.57	20.11	27.24	2.96	Peak	---
5	500.000	31.93	-15.07	47.00	33.73	22.64	27.93	3.49	Peak	---
6	624.800	32.71	-14.29	47.00	32.48	24.23	28.08	4.08	Peak	---
7	737.500	54.21			52.76	24.79	27.98	4.64	Peak	---



Test Engineer :	Donny Tang	Temperature :	22.5~23.9°C
		Relative Humidity :	60.9~61.4%
Test Distance :	3m	Polarization :	Vertical



Site : 03CH10-HY
Condition : ICES-003 CLASS A 3m HORN 9120D-HF VERTICAL
Project : 162104
Power : 120Vac/60Hz
Mode : 3

	Freq	Level	Over Limit	LimitAntenna Line	Antenna Factor	Read Level	Cable Loss	Preamplifier	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dB/m	dBuV	dB	dB	cm	deg	
1	2800.00	46.06	-33.94	80.00	27.90	69.84	6.42	58.10	---	---	Peak
2	4312.00	45.11	-34.89	80.00	29.95	65.73	7.88	58.45	---	---	Peak
3	6554.00	41.72	-38.28	80.00	34.21	57.02	10.00	59.51	---	---	Peak
4	7900.00	45.49	-34.51	80.00	36.60	57.44	10.82	59.37	---	---	Peak
5	10620.00	45.93	-34.07	80.00	39.50	53.33	12.57	59.47	---	---	Peak
6	11468.00	47.95	-32.05	80.00	39.67	53.77	13.13	58.62	100	0	Peak