RF SPOT CHECK EVALUATION

FCC ID	:	**PKRISGM3100**
Equipment	:	**M3100**
Model Name	:	**M3100**
Applicant	:	**Inseego Corp. 9710 Scranton Road Suite 200, San Diego, CA 92121**
Standard	:	**47 CFR Part 2, 22(H), 24(E), 27, 30, 96 FCC Part 15 Subpart C §15.247 FCC Part 15 Subpart E §15.407**

The product was received on May 05, 2022 and testing was performed from Jun. 01, 2022 to Jun. 20, 2022. We, Sporton International Inc. Wensan Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures 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 from Sporton International Inc. Wensan Laboratory, the test report shall not be reproduced except in full.

Louis Wu

Approved by: Louis Wu

Sporton International Inc. Wensan Laboratory
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

TABLE OF CONTENTS

History of this test report

Version	Description	Issued Date
01	Initial issue of report	Jul. 07, 2022

1. Introduction Section

FCC ID: PKRISGM3000A (parent model) and FCC ID: PKRISGM3100 (variant model) use the same identical internal printed circuit board layouts, while the variant model depopulates some LTE and NR band related components, details are available in the operational description. Based on their similarity, the FCC Part 15C (equipment class: DTS) and FCC Part 15E (equipment class: NII) and FCC Part 22, 24, 27, 30, 96 (equipment class: PCE, 5GM, CBE) reuse the original model's result and do spot-check, following the FCC KDB 484596 D01 v01. The spot check data in this report is used to justify the data reuse

The applicant should take full responsibility that the test data as referenced in this report represent compliance for this FCC ID: PKRISGM3100.

2. Model Difference Information

PKRISGM3000A and PKRISGM3100 use the identical internal printed circuit board layout, and the difference in the components population:

- PKRISGM3100: 4G-LTE Bands B29, B30, B71 related components are depopulated.
- PKRISGM3100: 5G FR1 Bands n7, n29, n30, n41, n70, n71 related components are depopulated.

The detail of similarity and difference is illustrated in the operational description, and based on the information spot check on conducted power and emission was performed for ensure compliance

3. Spot Check Verification Data Section

Conducted power test and radiated spurious emission test configurations were selected from the worst cases identified in the parent model and tested to demonstrate the test data from original model remains representative for the variant model.

Summary for power and RSE spot check for each rule entry and technology is listed as below:

Test Item	Mode	PKRISGM3000A Parent Worst Result	PKRISGM3100 Variant Check Result	Difference (dB)
Conducted Power (dBm)	WLAN 2.4GHz	20.91	20.81	0.10
	WLAN 5GHz	17.71	17.67	0.04
	WWAN WCDMA Band II	23.98	23.97	0.01
	WWAN WCDMA Band IV	23.97	23.93	0.04
	WWAN WCDMA Band V	23.81	23.76	0.05
	WWAN LTE Band 2	24.29	24.27	0.02
	WWAN LTE Band 4	24.22	24.15	0.07
	WWAN LTE Band 5	23.83	23.76	0.07
	WWAN LTE Band 7	23.69	23.63	0.06
	WWAN LTE Band 12	23.86	23.82	0.04
	WWAN LTE Band 13	23.70	23.66	0.04
	WWAN LTE Band 17	23.85	23.80	0.05
	WWAN LTE Band 48	20.97	20.95	0.02
	WWAN LTE Band 66	24.25	24.22	0.03
	WWAN NR n2	24.41	24.17	0.24
	WWAN NR n5	23.73	23.56	0.17
	WWAN NR n66	24.49	24.31	0.18
	WWAN NR n48	21.49	21.45	0.04
	WWAN NR n48 MIMO	16.99	16.94	0.05
	WWAN NR n77	25.59	25.55	0.04
	WWAN NR n77 MIMO	24.49	24.31	0.18
EIRP Power (dBm)	WWAN NR n260	30.33	30.05	0.28
	WWAN NR n261	32.03	32.10	0.07

Test Item	Mode	ANT	PKRISGM3000A Parent Worst Result	PKRISGM3100 Variant Check Result	Difference (dB)
Radiated Spurious Emission (dBuV/m)	WLAN 2.4GHz	0+1	52.05	51.29	0.76
	WLAN 5GHz	0+1	52.47	52.35	0.12
Radiated Spurious Emission (dBm)	WWAN WCDMA Band II	0	-41.21	-41.91	0.70
	WWAN WCDMA Band IV	0	-41.28	-42.32	1.04
	WWAN WCDMA Band V	0	-45.33	-46.35	1.02
	WWAN LTE Band 2	0	-40.83	-42.37	1.54
	WWAN LTE Band 5	0	-45.39	-45.82	0.43
	WWAN LTE Band 7	0	-24.92	-26.92	2.00
	WWAN LTE Band 12	0	-45.01	-47.6	2.59
	WWAN LTE Band 13	0	-21.62	-23.02	1.40
	WWAN LTE Band 48	4	N/A*	N/A*	N/A*
	WWAN LTE Band 66	0	-41.03	-42.47	1.44
	WWAN NR n2	0	-41.25	-42.07	0.82
	WWAN NR n5/n26	0	-39.55	-46.91	7.36
	WWAN NR n66	0	-35.21	-39.96	4.75
	WWAN NR n48 SISO	4	N/A*	N/A*	N/A*
	WWAN NR n48 MIMO	4+6	N/A*	N/A*	N/A*
	WWAN NR n77	4	-24.03	-30.31	6.28
	WWAN NR n77 MIMO	4+6	-24.72	-29.94	5.22
	WWAN NR n260	M0	-19.14	-19.08	-0.06
	WWAN NR n261	M0	-25.59	-25.72	0.13

Note*: The Part 96 Band 48/n48 radiated test not included in this test report is performed by other test lab, Sporton USA in Milpitas.

Conclusion:

Radiated spurious emission test against the variant model based on the worst-case condition from the original model was performed in this filing to demonstrate the test data from original model remains representative for the variant model.

The spot check emission level is not degraded more than 3dB, and the margin to the limit is greater than 1.5dB, data referencing is justified according to the guidance in the KDB inquiry

4. List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Preamplifier	COM-POWER	PAM-103	18020201	1MHz-1000MHz	Jan. 03, 2022	Jun. 01, 2022~ Jun. 20, 2022	Jan. 02, 2023	Radiation (03CH19-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N-06	55608 & 09	30MHz~1GHz	Oct. 17, 2021	Jun. 01, 2022~ Jun. 20, 2022	Oct. 16, 2022	Radiation (03CH19-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	02360	1GHz~18GHz	Nov. 02, 2021	Jun. 01, 2022~ Jun. 20, 2022	Nov. 01, 2022	Radiation (03CH19-HY)
Amplifier	EMCI	EMC118A45SE	980792	1GHz-18GHz	Nov. 15, 2021	Jun. 01, 2022~ Jun. 20, 2022	Nov. 14, 2022	Radiation (03CH19-HY)
Spectrum Analyzer	Keysight	N9010B	MY60241055	9kHz~30GHz	Jul. 12, 2021	Jun. 01, 2022~ Jun. 20, 2022	Jul. 11, 2022	Radiation (03CH19-HY)
Controller	EMEC	EM 1000	N/A	Control Turn table & Ant Mast	N/A	Jun. 01, 2022~ Jun. 20, 2022	N/A	Radiation (03CH19-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1~4m	N/A	Jun. 01, 2022~ Jun. 20, 2022	N/A	Radiation (03CH19-HY)
Turn Table	EMEC	TT 2200	N/A	0~360 Degree	N/A	Jun. 01, 2022~ Jun. 20, 2022	N/A	Radiation (03CH19-HY)
Software	Audix	E3 6.2009-8-24	RK-002155	N/A	N/A	Jun. 01, 2022~ Jun. 20, 2022	N/A	Radiation (03CH19-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30MHz~40GHz	Feb. 21, 2022	Jun. 01, 2022~ Jun. 20, 2022	Feb. 20, 2023	Radiation (03CH19-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	00991	18GHz~40GHz	May 14, 2022	Jun. 01, 2022~ Jun. 20, 2022	May 13, 2023	Radiation (03CH18-HY)
Spectrum Analyzer	Rohde & Schwarz	FSV3044	101010	10Hz~44GHz	Nov. 24, 2021	Jun. 01, 2022~ Jun. 20, 2022	Nov. 23, 2022	Radiation (03CH18-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	801589/2	9kHz~40GHz	Nov. 30, 2021	Jun. 01, 2022~ Jun. 20, 2022	Nov. 29, 2022	Radiation (03CH18-HY)
Turn Table	EMEC	N/A	N/A	Phi/Theta 0~360 Degree	N/A	Jun. 01, 2022~ Jun. 20, 2022	N/A	Radiation (03CH18-HY)
Controller	EMEC	EM 1000	N/A	Control Turn table	N/A	Jun. 01, 2022~ Jun. 20, 2022	N/A	Radiation (03CH18-HY)
Spectrum Analyzer	Rohde & Schwarz	FSV30	103738	9kHz to 30GHz	May 26, 2022	Jun. 01, 2022~ Jun. 20, 2022	May 25, 2023	Radiation (03CH18-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	801607/2	9kHz~40GHz	Dec. 30, 2021	Jun. 01, 2022~ Jun. 20, 2022	Dec. 29, 2022	Radiation (03CH18-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	801589/2	9kHz~40GHz	Nov. 30, 2021	Jun. 01, 2022~ Jun. 20, 2022	Nov. 29, 2022	Radiation (03CH18-HY)

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
*Harmonic Mixer	Rohde & Schwarz	RPG FS-Z60	100986	40GHz to 60GHz	Apr. 09, 2021	Jun. 01, 2022~ Jun. 20, 2022	Apr. 08, 2024	Radiation (03CH18-HY)
*Harmonic Mixer	Rohde & Schwarz	FS-Z90	101811	60GHz to 90GHz	Nov. 16, 2021	Jun. 01, 2022~ Jun. 20, 2022	Nov. 15, 2024	Radiation (03CH18-HY)
*Harmonic Mixer	Rohde & Schwarz	RPG FS-Z140	101128	90GHz to 140GHz	Oct. 26, 2020	Jun. 01, 2022~ Jun. 20, 2022	Oct. 25, 2023	Radiation (03CH18-HY)
*Harmonic Mixer	Rohde & Schwarz	RPG FS-Z220	101014	140GHz to 220GHz	Dec. 06, 2021	Jun. 01, 2022~ Jun. 20, 2022	Dec. 05, 2024	Radiation (03CH18-HY)
Antenna	Quinstar	QWH-UPRR00	QWH-UPRR00-01	40-60 GHz	Jul. 06, 2021	Jun. 01, 2022~ Jun. 20, 2022	N/A (Note 3)	Radiation (03CH18-HY)
Antenna	Quinstar	QWH-EPRR00	1372000000	60-90 GHz	Jul. 06, 2021	Jun. 01, 2022~ Jun. 20, 2022	N/A (Note 3)	Radiation (03CH18-HY)
Antenna	Quinstar	QWH-FPRR00	1011500008	90-140 GHz	Jul. 06, 2021	Jun. 01, 2022~ Jun. 20, 2022	N/A (Note 3)	Radiation (03CH18-HY)
Antenna	Quinstar	QWH-GPRR00	QWH-GPRR00-01	140-220 GHz	Jul. 06, 2021	Jun. 01, 2022~ Jun. 20, 2022	N/A (Note 3)	Radiation (03CH18-HY)

Note 1: (*) Equipment manufacturer's Calibration Certificate.

Note 2: The Standard Gain Horn Antennas are calibrated by the ISO 17025 accredited test lab MWM Lab (http://en.mwmlab.com/about), a sub unit of Belarussian State University of Informatics and Radio electronics which is accredited by the Belarusian State Centre for Accreditation (BSCA). BSCA is the National accreditation body of the Republic of Belarus and an associated member of the International Laboratory Accreditation Cooperation (ILAC).

Note 3: The standard gain horn's critical dimensions is verified on an annual basis within the equipment specification according to KDB 842590 D01 v01r02 clause 2)a)2)iii).

5. Reference detail Section

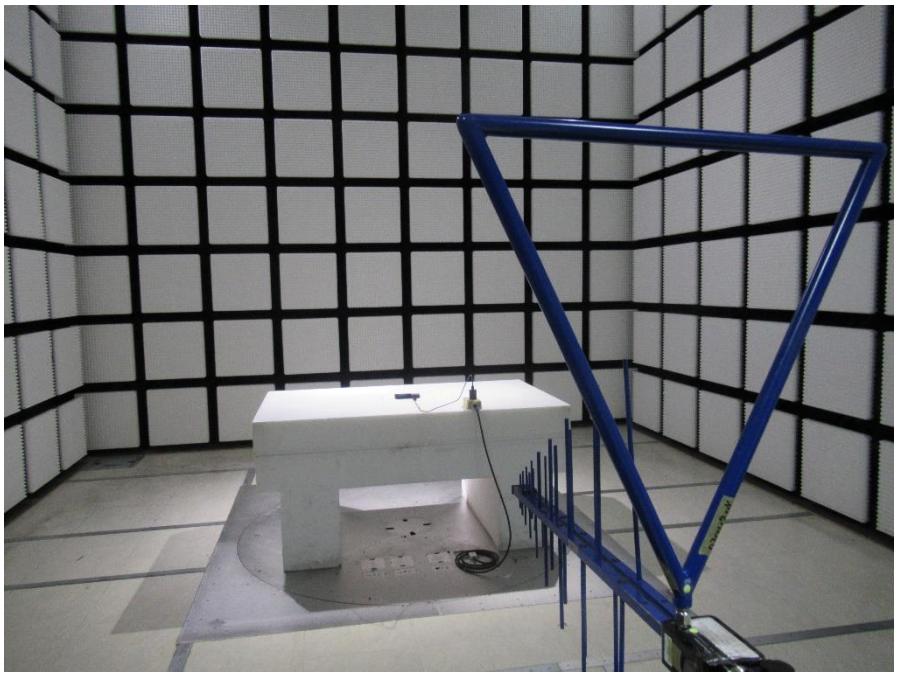
Rule Part	Equipment Class	Wireless Technology	Frequency Band (MHz)	Reference FCC ID (Parent)	Type Grant/ Permissive Change	Reference Title	FCC ID Filling (Variant)
15C	DTS	Wi-Fi	2400~2483.5	PKR ISGM3000A	Original Grant	FR1D2414A	PKR ISGM3100
15E	NII	Wi-Fi	5150~5250 5725~5850	PKR ISGM3000A	Original Grant	FR1D2414B FR1D2414C	PKR ISGM3100
22, 24, 27, 30. 96	PCE CBE 5GM	WCDMA	Band II, IV, V	PKR ISGM3000A	Original Grant	FG1D2414A	PKR ISGM3100
		LTE	2/4/5/7/ 12/13/17/48/66 ULCA 5B/48C /66B/66C	PKR ISGM3000A	Original Grant	FG1D2414B FG1D2414H FG1D2414M FG1D2414O	PKR ISGM3100
		NR	n2/n5/n48 /n66/n77 /n260/n261	PKR ISGM3000A	Original Grant	FG1D2414C FG1D2414H FG1D2414L FG1D2414N FG1D2414P	PKR ISGM3100

————THE END————

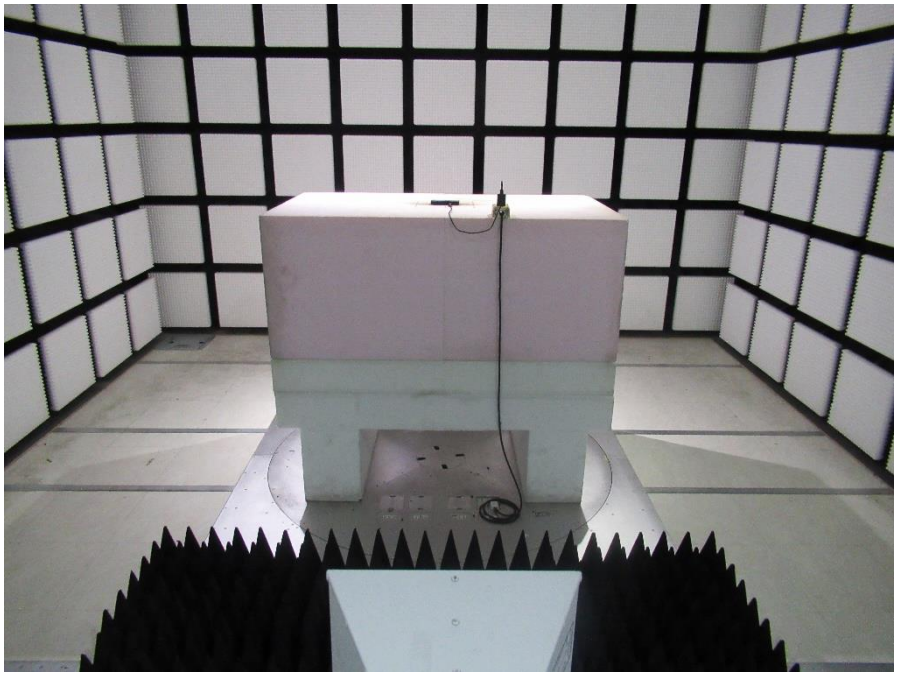
Radiated spurious Emission Setup Plots

X Plane

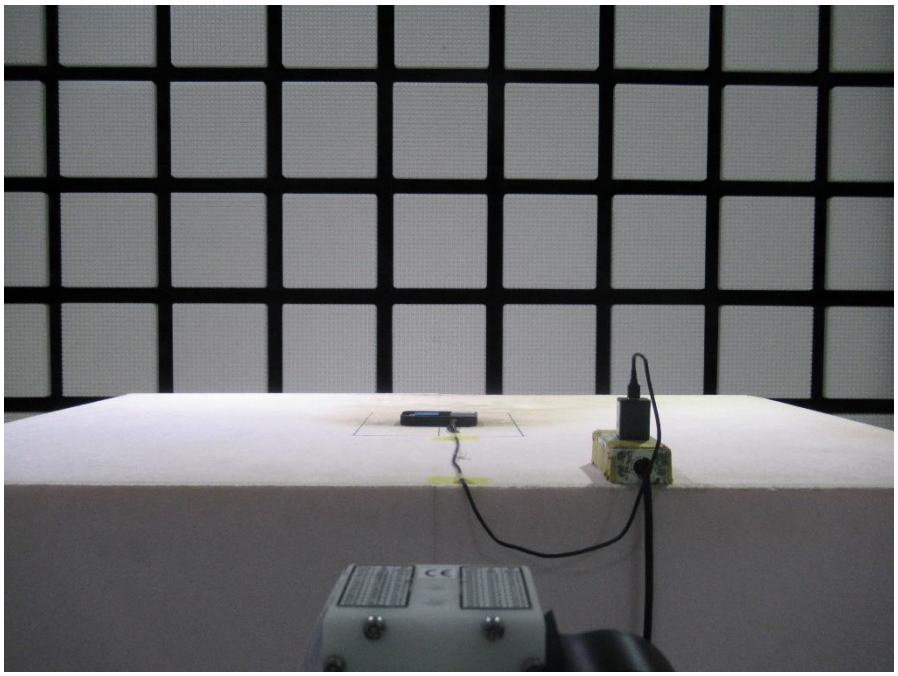
LF



HF



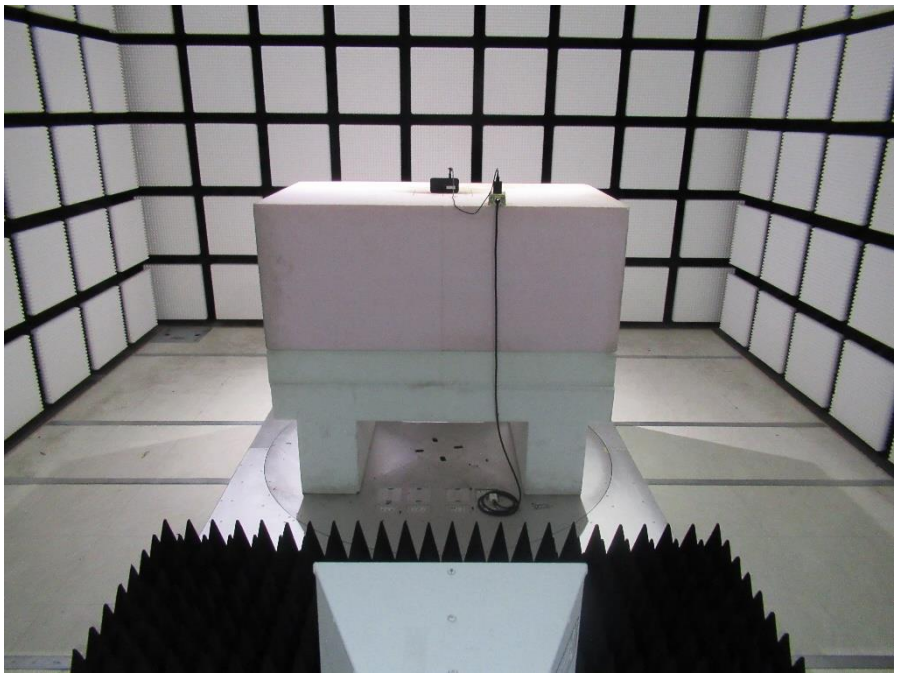
SHF



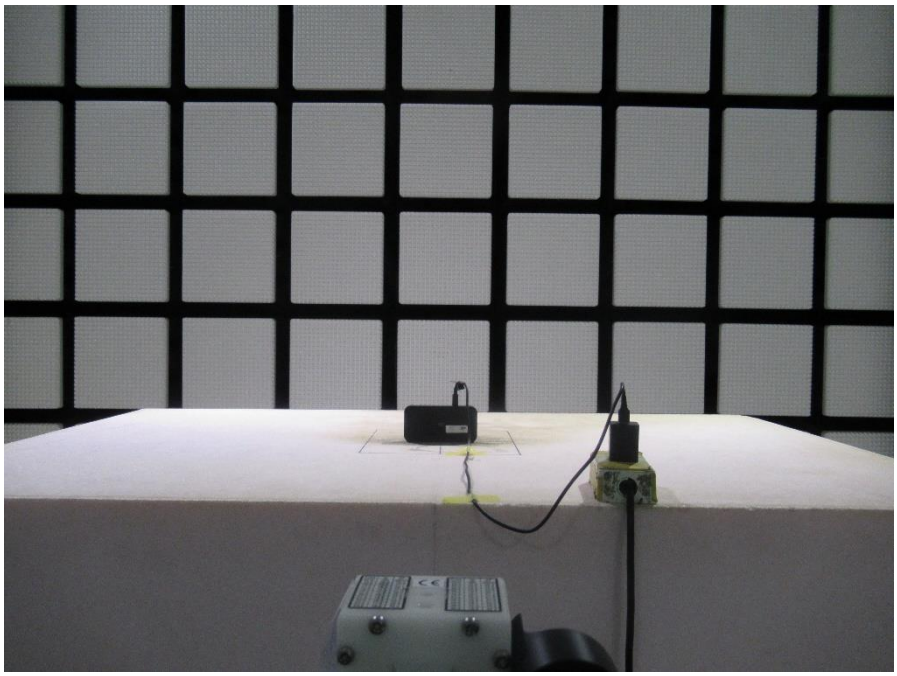
Y Plane

LF

HF



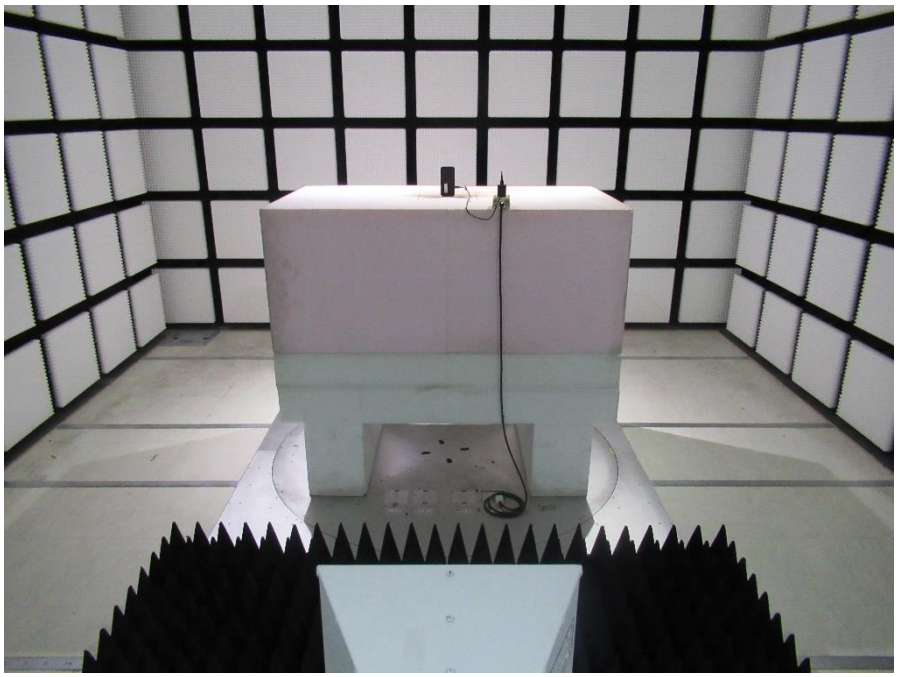
SHF



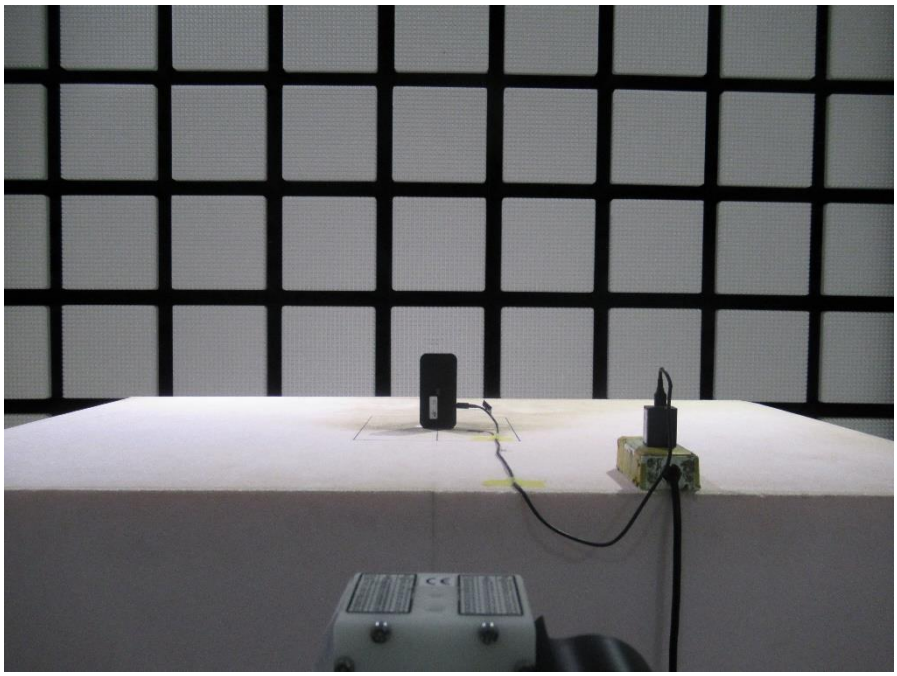
Z Plane

LF

HF



SHF



END of this report