



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.

Approved by: Louis Wu

Sporton International Inc. Wensan Laboratory

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History of this test report

| Version | Description | Issued Date |
|----------------|-------------------------|--------------------|
| 01 | Initial issue of report | Jul. 07, 2022 |
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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 | SCHWARZBE CK | 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 | SCHWARZBE CK | 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

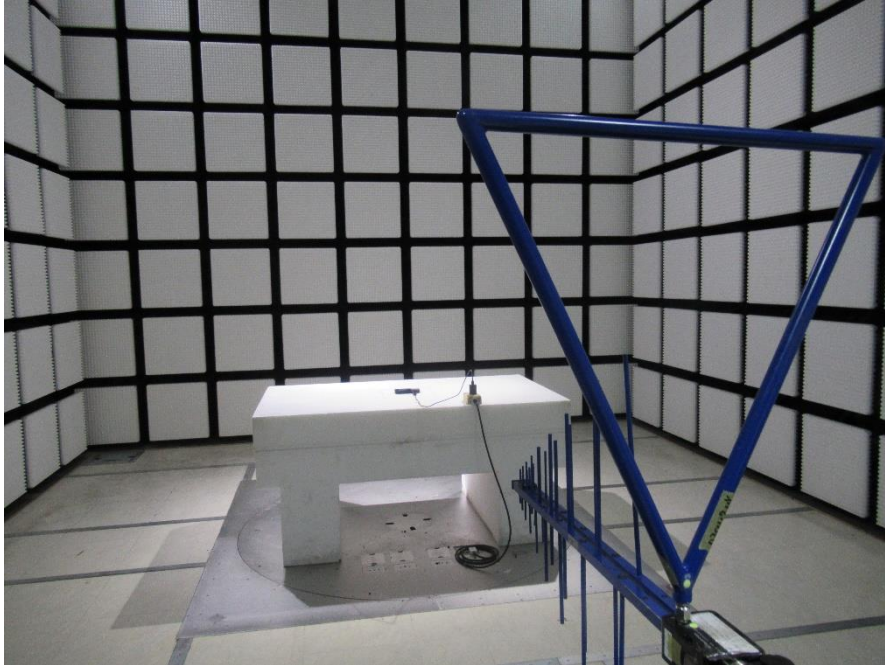
| Rule Part | Equipment Class | Wireless Technology | Frequency Band (MHz) | Reference FCC ID (Parent) | Type Grant/ Permissive Change | Reference Title | FCC ID Filling (Variant) |
|-----------------------|-------------------|---------------------|---|---------------------------|-------------------------------|---|--------------------------|
| 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————

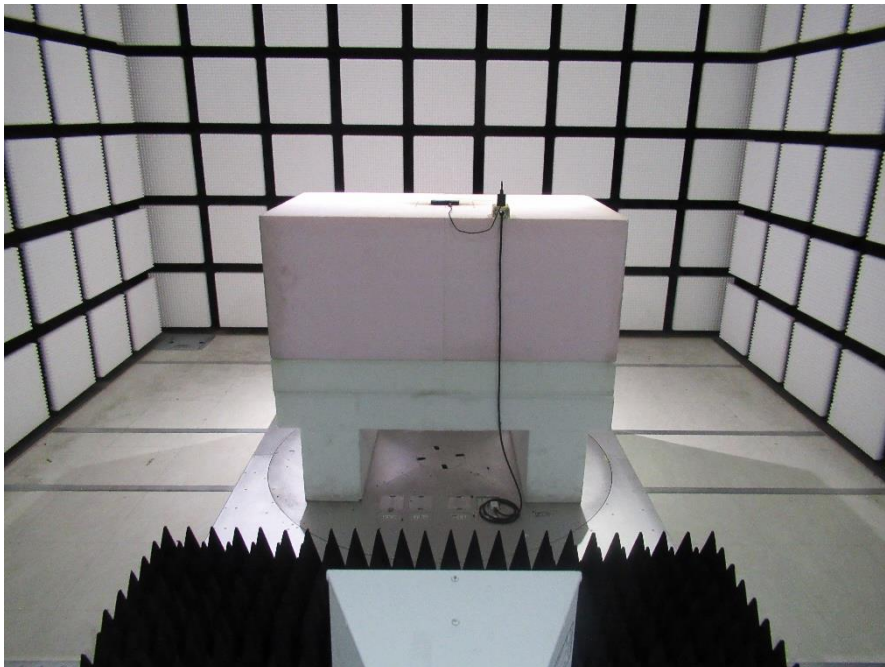
Radiated spurious Emission Setup Plots

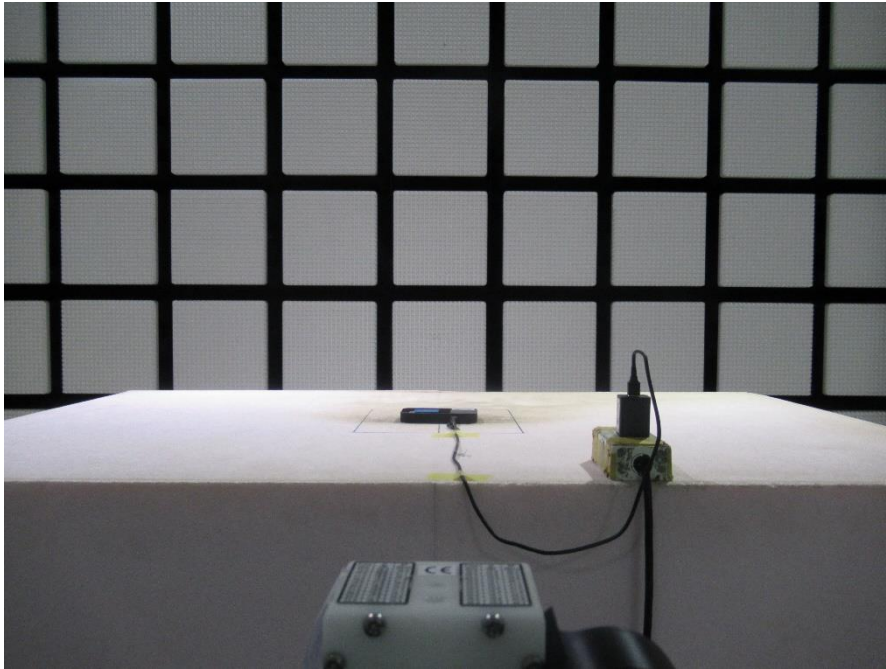
X Plane

LF



HF



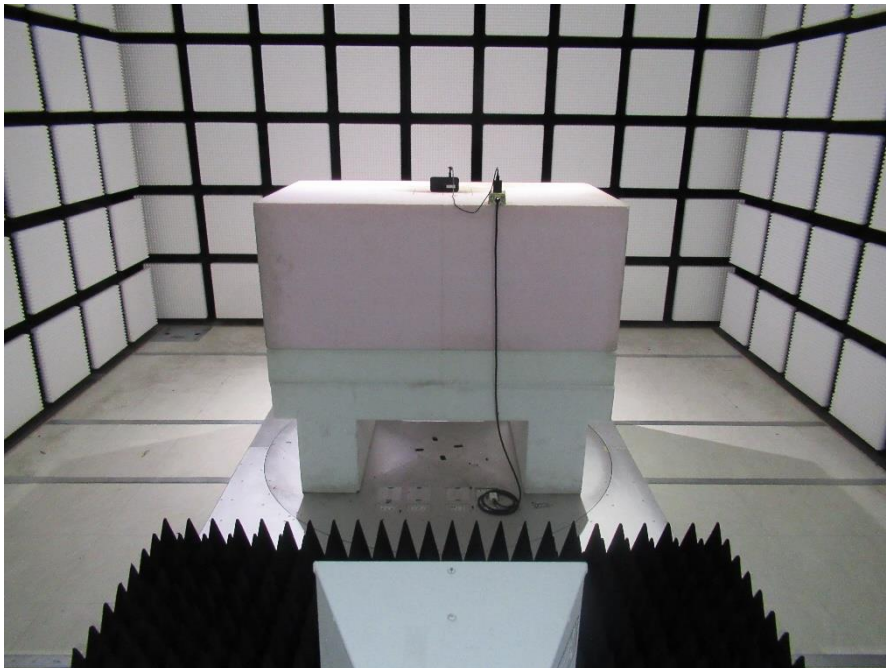
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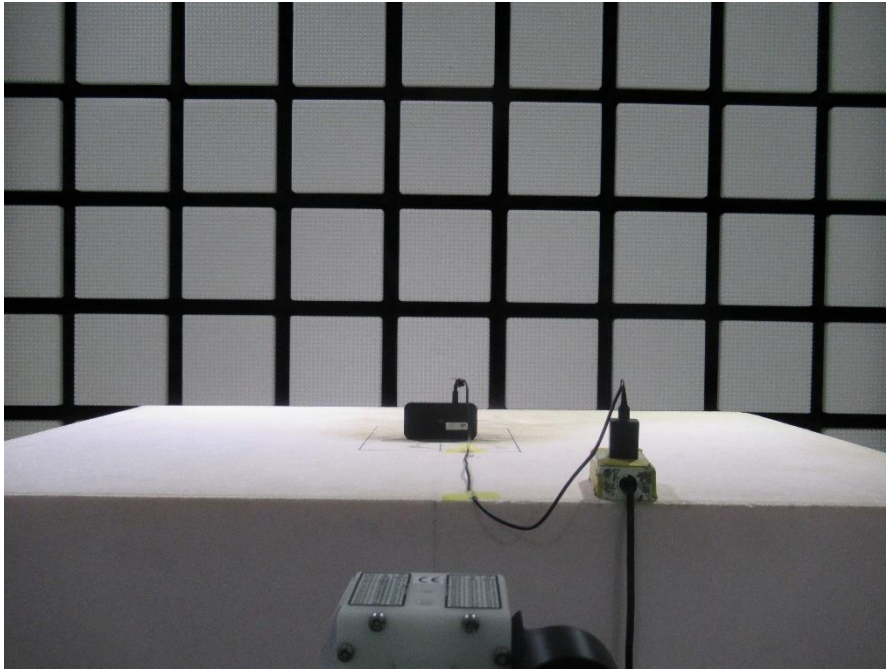
Y Plane

LF



HF



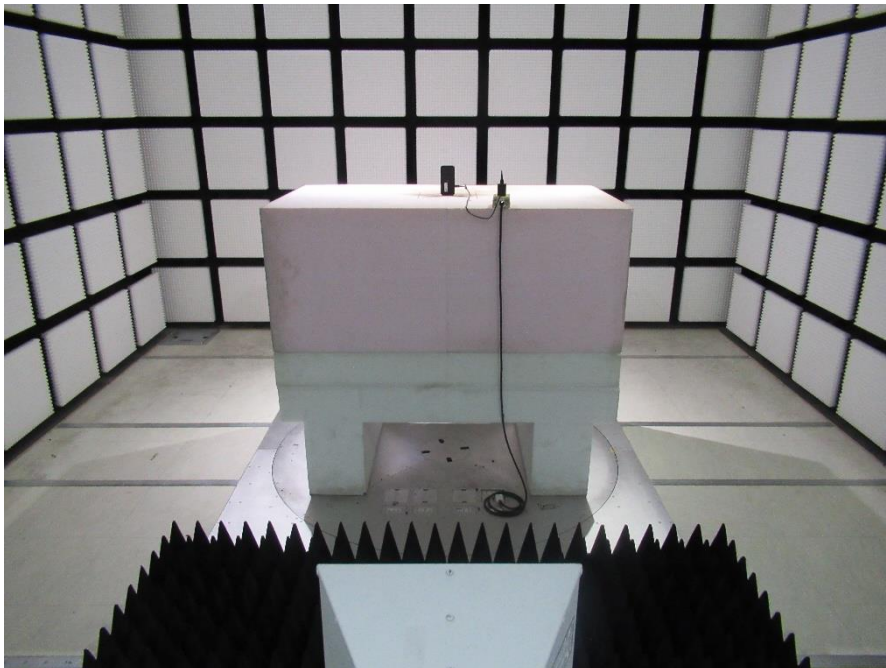
SHF

Z Plane

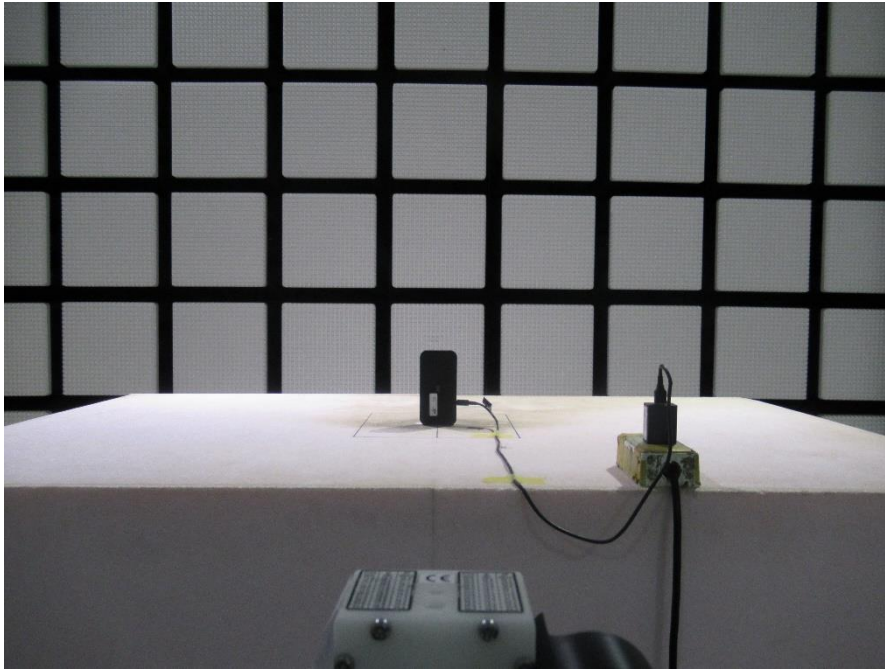
LF



HF



SHF



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