

# PEGATRON 和碩聯合科技

## Internal Antenna measurement data for AOS SKU2

2024-10-8



# Antenna Vendor Info

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- ❖ Antenna Vendor : INPAQ
- ❖ Test Date:2024/10/8
- ❖ Test Engineer : INPAQ Andy
- ❖ Model:GPSLTEWISUNM7WS-B6-00

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# Antenna in Single Socket

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- Schematic diagram for AOS SKU2



# Antenna in Single Socket

- Antenna placement and antenna type

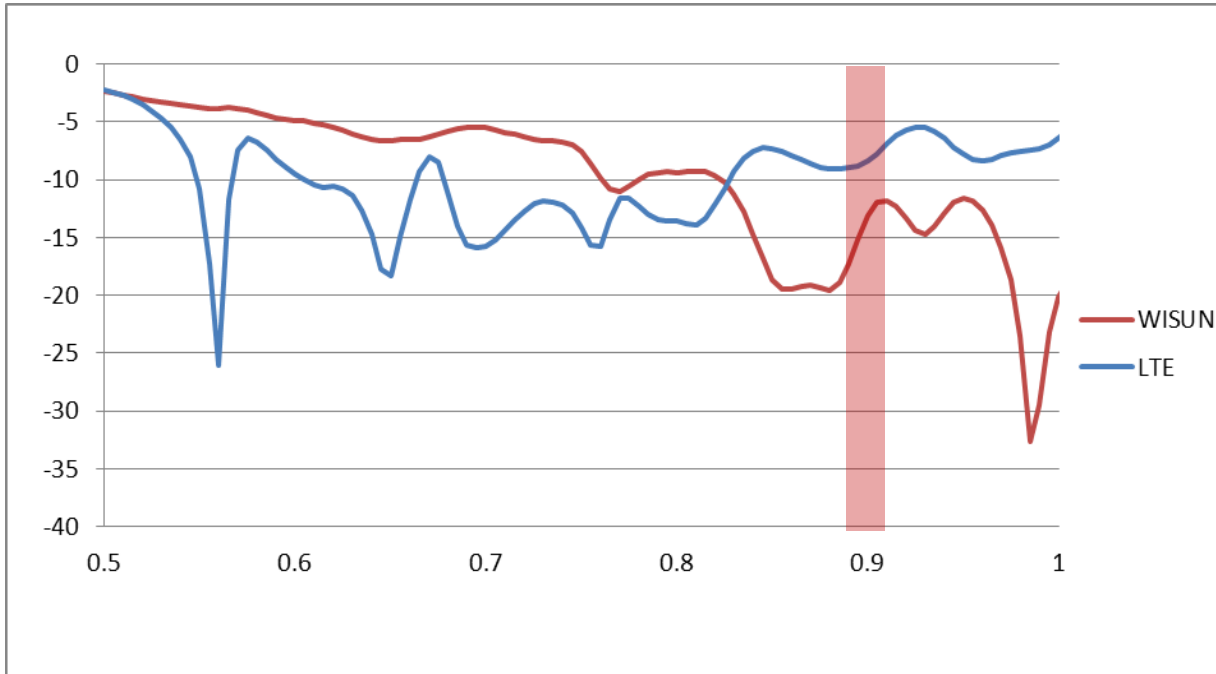


**WISUN**

| Antenna | Type | Material |
|---------|------|----------|
| WISUN   | PIFA | PCB      |

# Antenna in Single Socket

- Return loss & Efficiency in Single Socket condition



|                 | Return loss(dB) |
|-----------------|-----------------|
| Frequency (MHz) | WiSUN           |
| 902             | -12.01          |
| 915             | -12.34          |
| 928             | -14.69          |

|                 | Efficiency(dB) |
|-----------------|----------------|
| Frequency (MHz) | WiSUN          |
| 902             | 50.3%          |
| 915             | 51.6%          |
| 928             | 50.7%          |

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# Measurement data

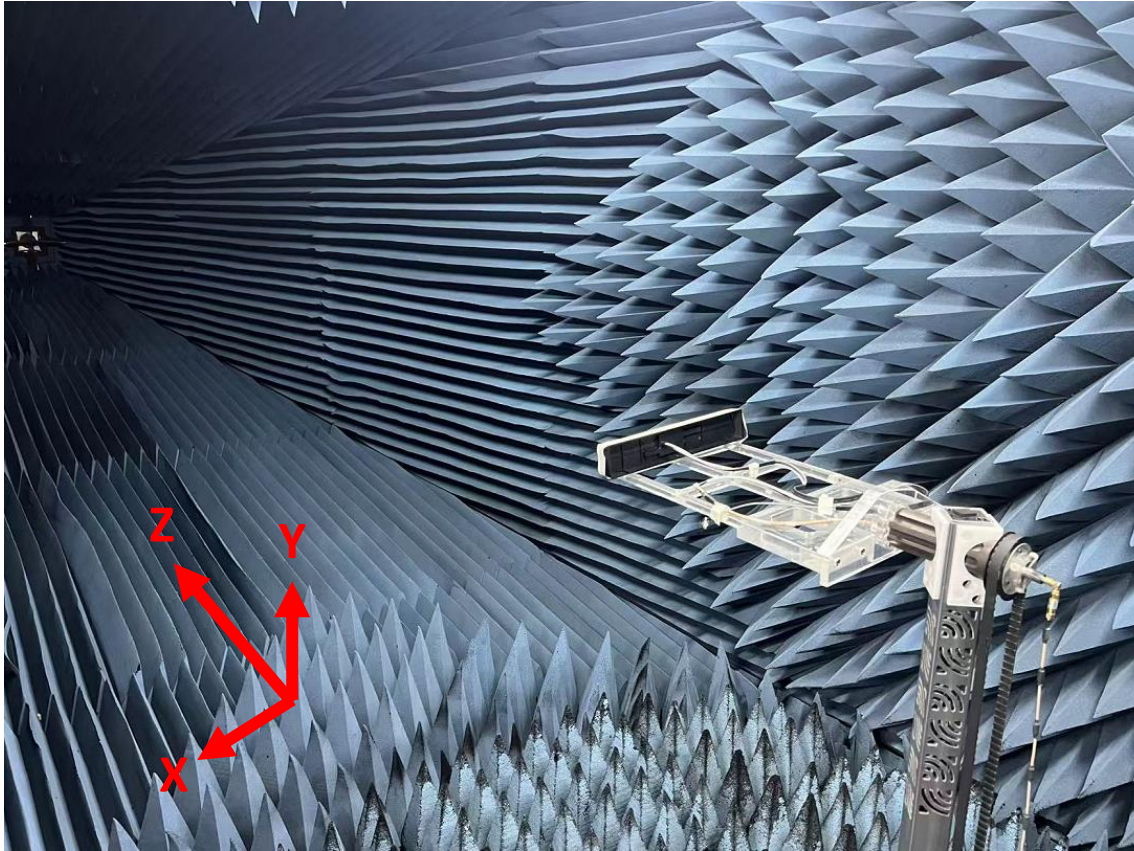
- Measurement Method



|      | XY    | YZ     | XZ     |
|------|-------|--------|--------|
| 0°   | Right | Top    | Top    |
| 90°  | Back  | Back   | Right  |
| 180° | Left  | Bottom | Bottom |
| 270° | Front | Front  | Left   |

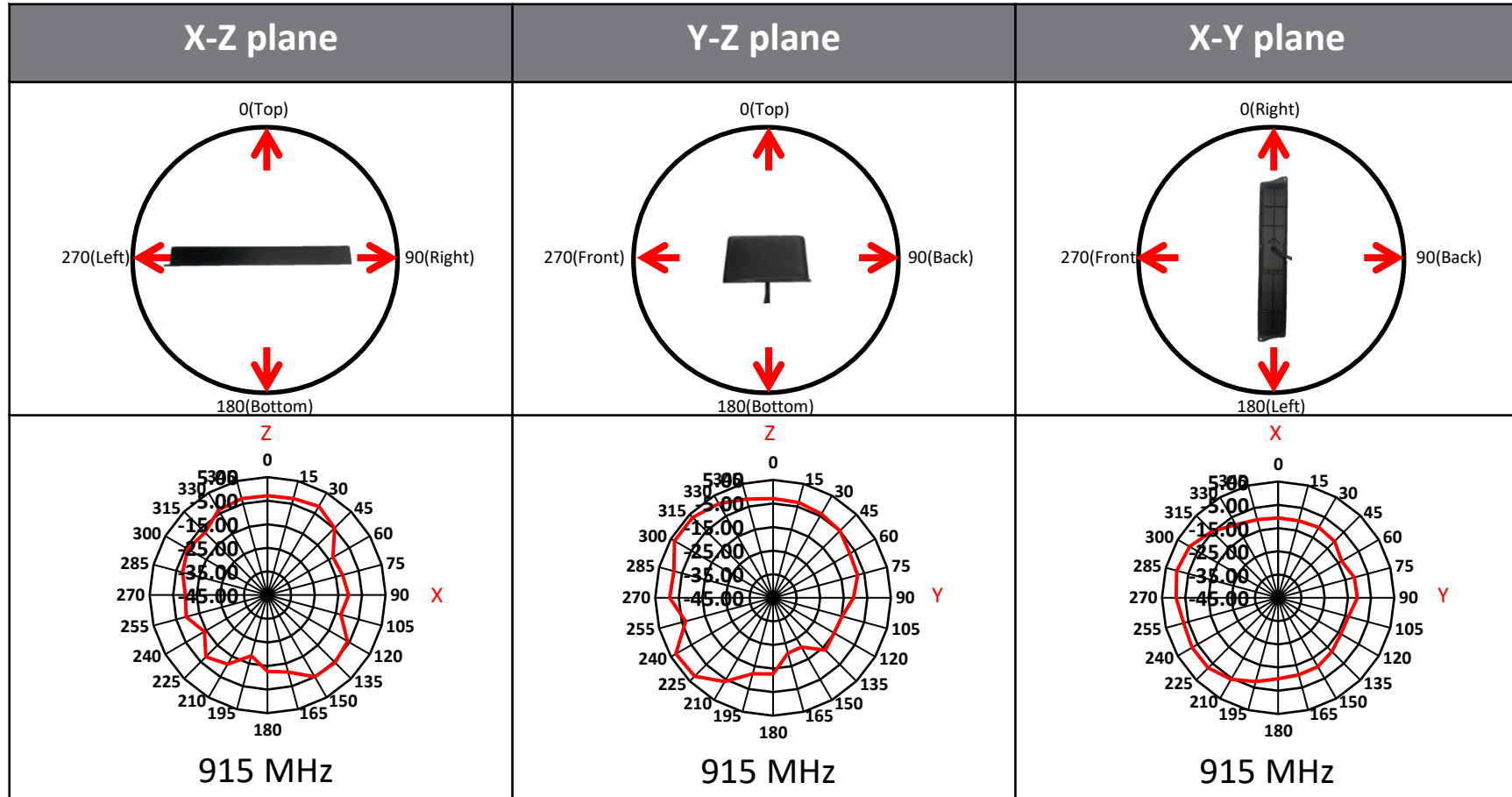
# Measurement data

- Measurement Method



# Measurement data

- Radiation pattern(WSIUN)



# Measurement data

- Gain table: WiSun

| Frequency (MHz) | XZ plane        |                 |                    | YZ plane        |                 |                    | XY plane        |                 |                    | 3D            |                    |                |
|-----------------|-----------------|-----------------|--------------------|-----------------|-----------------|--------------------|-----------------|-----------------|--------------------|---------------|--------------------|----------------|
|                 | Peak Gain (dBi) | Min. Gain (dBi) | Average Gain (dBi) | Peak Gain (dBi) | Min. Gain (dBi) | Average Gain (dBi) | Peak Gain (dBi) | Min. Gain (dBi) | Average Gain (dBi) | E-total (dBi) | 3D Min. Gain (dBi) | Efficiency (%) |
| 902             | -1.72           | -19.73          | -9.36              | 3.07            | -21.33          | -6.45              | 0.12            | -14.95          | -8.44              | 3.32          | -27.71             | 50.3%          |
| 915             | -1.57           | -18.36          | -8.27              | 3.29            | -20.85          | -6.37              | 0.26            | -13.80          | -8.06              | 3.54          | -26.30             | 51.6%          |
| 922             | -1.63           | -18.52          | -8.82              | 3.10            | -20.27          | -6.69              | 0.23            | -14.72          | -8.35              | 3.18          | -27.12             | 51.4%          |
| 928             | -1.68           | -18.98          | -9.11              | 3.04            | -21.39          | -6.84              | 0.06            | -15.06          | -8.61              | 3.27          | -27.67             | 50.7%          |

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# Applicable test methods

## Applicable test methods

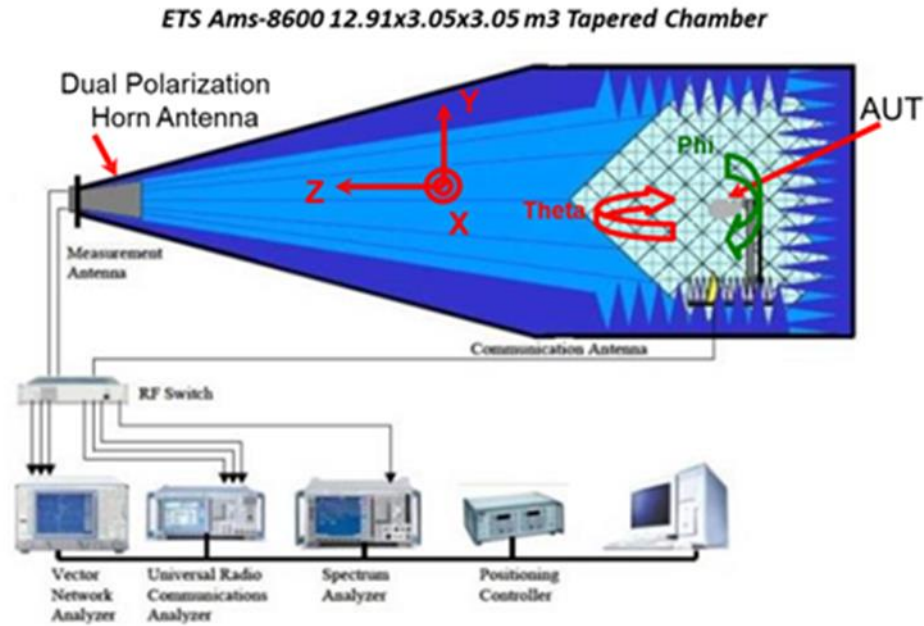
ETS-Lindgren AMS-8600 system is 3D fully anechoic chamber, it is applied to the “Conical Cut test method”, the detail description is described as below.

The Conical Cut method requires the ability of the Measurement Antenna to be physically rotated in the theta plane (overhead) of the EUT for implementations using a single Measurement Antenna, Eleven conical cuts are required to capture data at every 15 degrees from the EUT, with the top (0 degrees) and bottom (180 degrees) cuts not being measured. Typically, the EUT will remain affixed to a turntable during the entire measurement process. The Measurement Antenna will be positioned at a starting theta angle. The EUT will then be rotated around the full 360 degrees of phi rotation. The Measurement Antenna will then be positioned at the next theta angle, and the process repeated.

|         |                | $\theta$ -Axis     | $\Phi$ -Axis      |
|---------|----------------|--------------------|-------------------|
| Passive | Step size      | 15°~165° step: 15° | 0°~345° step: 15° |
|         | N / M (Points) | 12                 | 24                |

# Test & System Description

- Typical Setup for ETS-Lindgren AMS-8600:



*Figure 1: System diagram for test system including compact-size tapered anechoic chamber and optional test instrumentation*

# Equipment list

| ID#  | Device   | Type/Model                           | Serial#                | Manufacturer    | Cal Date   | Cal. Due Date |
|------|--|--------------------------------------|------------------------|-----------------|------------|---------------|
| 0135 | Anechoic Chamber   | FACT3                                | 5720                   | ETS-Lindgren    | 2024-02-14 | 2025-02-14    |
| 0136 | Turn Table   | ETS                                  |                        | ETS-Lindgren    | N/A        | N/A           |
| 0147 | Switch & Positioning systems                                     | EMC Center                           | 00159757               | ETS-Lindgren    | N/A        | N/A           |
| 0530 | Measurement SW   | EMC32,v10.40.10                      | 100623                 | Rohde & Schwarz | N/A        | N/A           |
| 1033 | Boresight antenna mast   | BAM 4.0-P                            | P/278/2890.01          | Maturo          | N/A        | N/A           |
| 1076 | Spectrum Analyzer  | FSW43                                | 101847                 | Rohde & Schwarz | 2024-05-02 | 2025-02-24    |
| 0993 | Biconical antenna 30MHz-1GHz                                     | UBAA9115 +<br>BBVU9135 +<br>DGA9552N | 0286 + CH 9044         | Schwarzbeck     | 2024-05-03 | 2025-05-03    |
| 0325 | Horn antenna   | 3117                                 | 00157734               | ETS-Lindgren    | 2024-01-07 | 2025-01-7     |
| 0141 | Horn antenna + Amplifier + HPF6.4                                | 3117                                 | 00157736               | ETS-Lindgren    | 2024-02-14 | 2025-02-14    |
| 0334 | Double-Ridged Waveguide Horn with Pre-Amplifier 18 GHz to 40 GHz | 3116C+PA                             | 00169308bis + 00196308 | ETS-Lindgren    | 2024-05-27 | 2025-05-27    |
| 0859 | Cable 2.5m – 30MHz to 18 GHz                                     | 0500990992500KE                      | 19.23.395              | Radial          | 2024-02-13 | 2026-03-30    |
| 0206 | Cable 1.2m – 18 to 40 GHz  | UFA147A-0-0480-200200                | MFR60637-59609-072     | Micro-coax      | 2024-07-26 | 2026-04-14    |
| 0263 | Cable 1m – 1GHz to 18GHz   | UFA147A                              |                        | Utilflex        | 2024-07-25 | 2026-03-30    |
| 0369 | Cable 2m – 26.5GHz to 40GHz                                      | 794-9191-2000A                       | E00327                 | Atem            | 2024-07-26 | 2026-03-30    |
| 0371 | Cable 1m 30 MHz – 18GHz  | UFB311A-0-0590-50U50U                | MFR 64637-59609-060    | Micro-coax      | 2024-07-25 | 2026-03-30    |
| 1099 | Cable7m DC-18 GHz  | 0501051057000GX                      | 19.35.850              | Radial          | 2024-07-26 | 2026-09-03    |
| 0809 | Cable7m – 18GHz to 40GHz   | R286304009                           |                        | Radial          | 2024-07-25 | 2026-04-14    |
| 1098 | Cable 1.5m – DC-18GHz  | CBL-1.5M-SMSM+                       | 202879                 | Mini-Circuits   | 2024-07-26 | 2026-07-17    |
| 0797 | Temp & Humidity Logger   | RA12E-TH-RAS                         | RA12-D0EB1A            | Avtech          | 2023-09-28 | 2025-05-26    |