MSSS-2571
Antenna Check Sheet

Revision History:

Version	Date	Change Description
1.0	2026/01/22	New Release
2.0	2026/05/20	Add Test information, Test method, Test software.
3.0	2026/06/04	Correct Antenna Type

Contents

Antenna Specification

Ant	Antenna Brand	Antenna. model	Antenna type	Antenna Gain (dBi)	Frequency Range (MHz)	Connector type	Cable length (cm)	Cable Loss	Remark
A1-ZWave	HONGBO	module-ZWave	PIFA	2.9	862.5~926.3	I-pex	5	0	antenna gain with cable loss
A2-BT	HONGBO	module-BT	PIFA	3.5	2400~2500	I-pex	5	0	antenna gain with cable loss

Test information:

Test Condition	Test Engineer	Test Date
Radiated	Eric	2025.12.30.
Band(MHz)	Test Frequency(MHz)	
2400-2500	2400/2450/2500	
862.5~926.3	862.5/890/900/926.3	
Testing Location		
Address: No. 113, Sec. 1, Jiafeng 11th Rd., Zhubei City, Hsinchu County 302049, Taiwan (R.O.C.)		

Instrument	Manufacturer	Model NO.	Cali.Due Date	Calibrated Until
ENA Network Analyzer	Keysight	E5071C	2025/10/18	2026/10/17
Test Chamber	ETS-Lindgren	AMS-8923	2025/10/18	2026/10/17

Test Method:

23 measuring probe antennas are fixed on a circular ring at equal angular intervals, while the device under test (DUT) is placed on a horizontal turntable at the center of the ring. During testing, the turntable rotates along the azimuth axis. For each azimuth-elevation angle combination (θ, φ), the RF switch matrix sequentially connects each of the 23 probes (or conducts parallel measurements). A vector network analyzer (VNA) measures and records the S21 data (complex numbers, including magnitude and phase) corresponding to each probe. Therefore, for each sampling point on the spherical surface, 23 sets of near-field data from 23 probes at different fixed spatial positions are obtained.

Depending on the size and frequency of the device under test (DUT), set appropriate sampling intervals for θ and φ to meet the near-field sampling density requirements. Integrate and process the sampled near-field data to perform far-field calculation, and then consolidate the far-field values for each θ and φ angle. This allows for a comprehensive characterization of the DUT's far-field radiation performance**.**

Test Software:

NPAC Spherical Measurement,AMS-8923-142-G

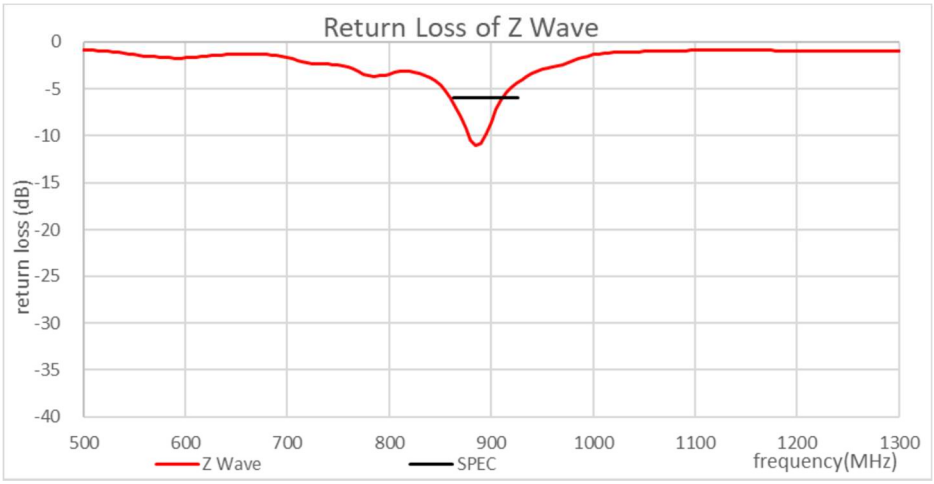
Test Procedure:

Place the device under test (DUT) at the center of a laser-aligned ring and secure it on a low-dielectric-constant foam turntable. Connect the RF cables from the vector network analyzer (VNA) into the anechoic chamber. Then, run the EM-Pro. Spherical Near-Field Antenna Measurement System to record the electric field amplitude and phase corresponding to each θ and φ angle, thereby completing the three-dimensional sampling that encloses the entire DUT.

Test Result:

Return Loss

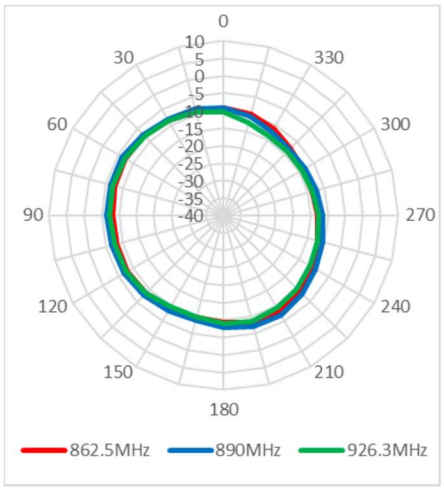
Ant 1 : Z-Wave Antenna

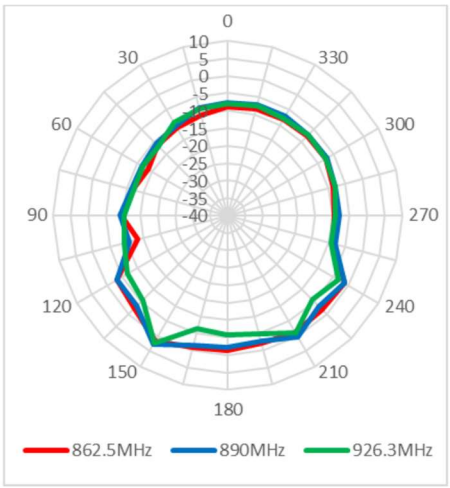


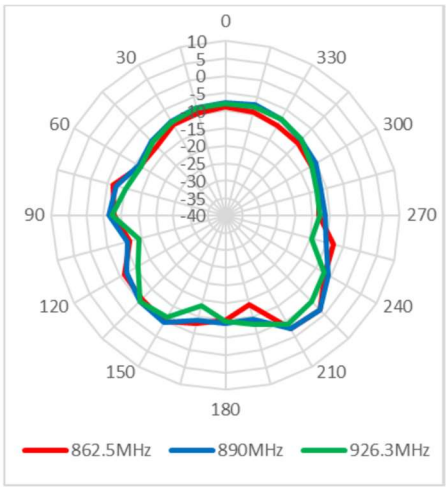
Ant 2 : BT Antenna

2D Radiation Patterns:

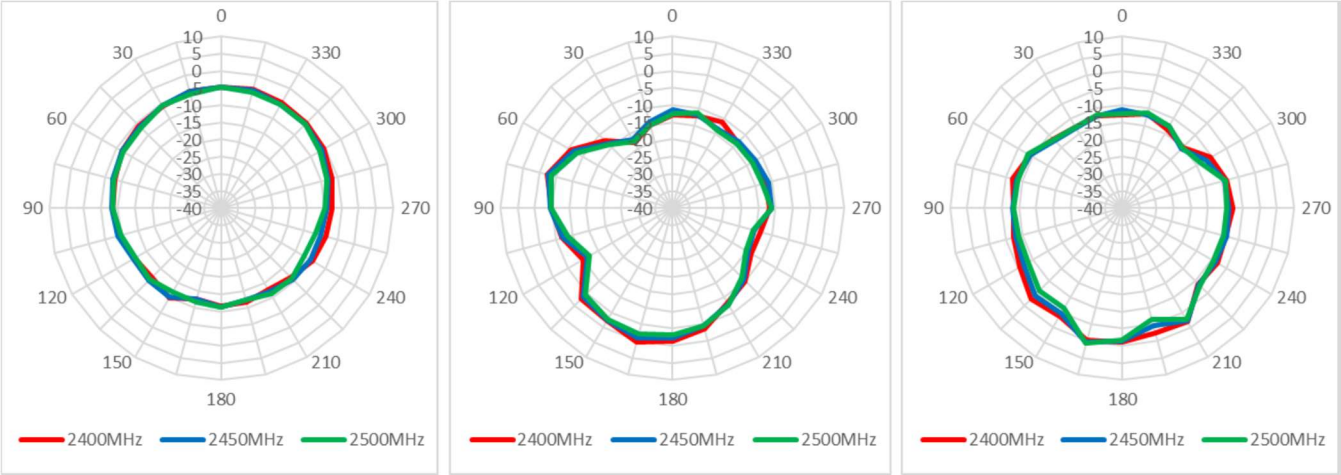
Ant 1 : Z-Wave Antenna







Ant 2: BT Antenna



Antenna Gain Table:

Frequency(MHz)	Ant 1(dBi)
862.5	1.5
890	2.7
910	2.9
926.3	2.2

Frequency(MHz)	Ant 2(dBi)
2400	3.5
2450	2.9
2500	2.2

Antenna Vendor information:

Antenna Vendor : Hongbo wireless communication technology co., ltd.
Test date: 2025/12/29
Test Engineer: Eric
Address of test site: No. 113, Sec. 1, Jiafeng 11th Rd., Zhubei City, Hsinchu County 302049, Taiwan (R.O.C.)