

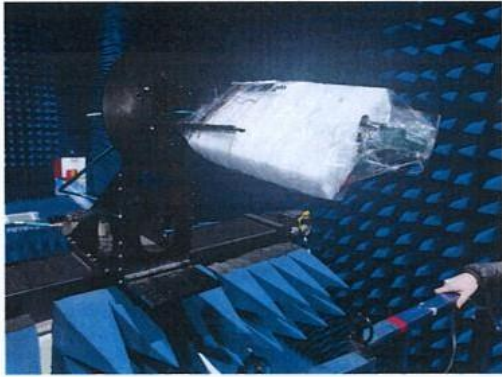
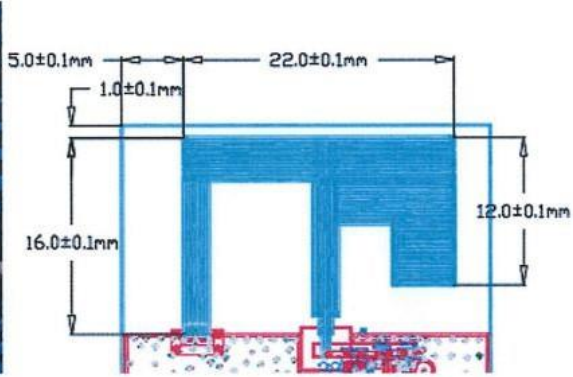
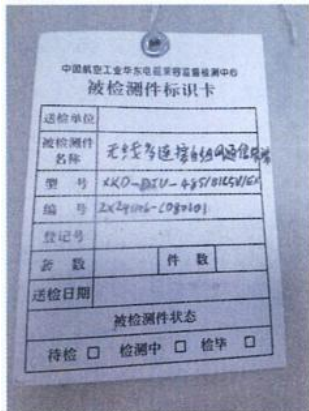
Antenna Specification

1. Basic Information of the Antenna

Antenna Type:	Built-in Antenna(Inverted-F Antenna)
Manufacturer:	Shanghai Fengtang Communication Technology Co., Ltd
Model:	ZX241106-C080101
Operating Frequency Band:	2.4GHz ISM band
Wireless Standard:	2.4G Private Protocol
Data Transfer Rate:	1Mbps
Antenna Interface:	Built-in On-board Antenna
Frequency range	Receiving frequency: 2.4GHz~2.5GHz Transmitting frequency: 2.4GHz~2.5GHz
VSWR	<2.0
Input Impedance	50(Ω)
Antenna Gain	> 4.5

2. Description of Antenna Under Test Status

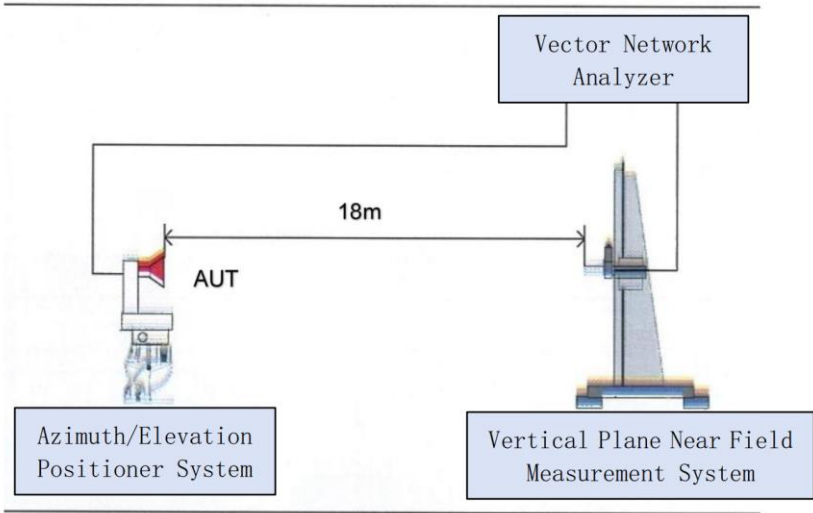
Antenna Characteristics	
Antenna type	inverted F antenna
Receive/Distribute	send and receive on a common basis
Frequency Range	Receiving frequency: 2.40GHz~2.50GHz Transmission frequency: 2.40GHz~2.50GHz
Polarization Mode	vertical polarization
Scanning Characteristics	/
Test Tooling	non-metallic
Active/Passive	passive
Maximum line size of antenna mouth surface	22mm
Characterization of the antenna under test	

 	
AUT Installation(Vertical Installation)	
	
AUT Appearance	AUT Identification

3. Testing Conditions and Results

3.1 Radiation Pattern

Name of the Antenna Under Test		Model/Designation/Specification		Serial Number	
Multiple connected self-organizing network communication modules		XKD-DTU-485/B1C5V/ EX		ZXZ41106-C080101	
Test Date	2025. 02. 26~2025. 02. 28	Temperature (° C)	20. 2~21. 5	Relative humidity (%)	51. 2~52. 4
Main Test Instruments					
Serial No.	Name Title	Model and Manufacturer		No.	validity date
1	Vector Network Analyzer	Agilent N5230A		MY48100345	2025. 06. 12

2	Vertical Plane Near Field Measurement System	NSI Corporation NSI-300V-18*18	KX201403030 00843-001	2026. 06. 19
3	Azimuth/Elevation Positioner System	NSI Corporation NSI-SC-5660	KX201403030 00843-002	2026. 06. 20
4	AUT Extension Table	NSI Corporation NSI-SC-5624x	KX201403030 00843-003	2026. 06. 20
Test Configuration Schematic				
 The diagram illustrates the Far Field Test Configuration. It shows a Vector Network Analyzer (VNA) connected via cables to two measurement systems. On the left is the Azimuth/Elevation Positioner System, which holds the AUT (Antenna Under Test). On the right is the Vertical Plane Near Field Measurement System. A horizontal dimension line between the AUT and the measurement system is labeled '18m', indicating the distance for the far-field test.				
Far Field Test Configuration				

Test Requirements (Provided by the Customer)			
Frequency		Test Requirements	Notes
2. 402GHz、2. 404GHz、2. 444GHz、2. 480GHz		1. Test the vertical and horizontal installation azimuth planes of the AUT. 2. The azimuth plane beam pointing is within the range of $\pm 180^{\circ}$.	Only test data is provided, without compliance assessment.
Test Results			
Frequency	Test Results	Compliance with Test Requirements	Notes
2. 402GHz (AUT Vertical Installation Azimuth Plane)	Figure3. 1-1, Table3. 1-1	/	/
2. 404GHz (AUT Vertical Installation Azimuth Plane)	Figure3. 1-1, Table3. 1-2	/	/

2.444GHz (AUT Vertical Installation Azimuth Plane)	Figure3.1-1, Table3.1-3	/	/
2.480GHz (AUT Vertical Installation Azimuth Plane)	Figure3.1-1, Table3.1-4	/	/
2.402GHz (AUT Horizontal Installation Azimuth Plane)	Figure3.1-2, Table3.1-5	/	/
2.404GHz (AUT Horizontal Installation Azimuth Plane)	Figure3.1-2, Table3.1-6	/	/
2.444GHz (AUT Horizontal Installation Azimuth Plane)	Figure3.1-2, Table3.1-7	/	/
2.480GHz (AUT Horizontal Installation Azimuth Plane)	Figure3.1-2, Table3.1-8	/	/

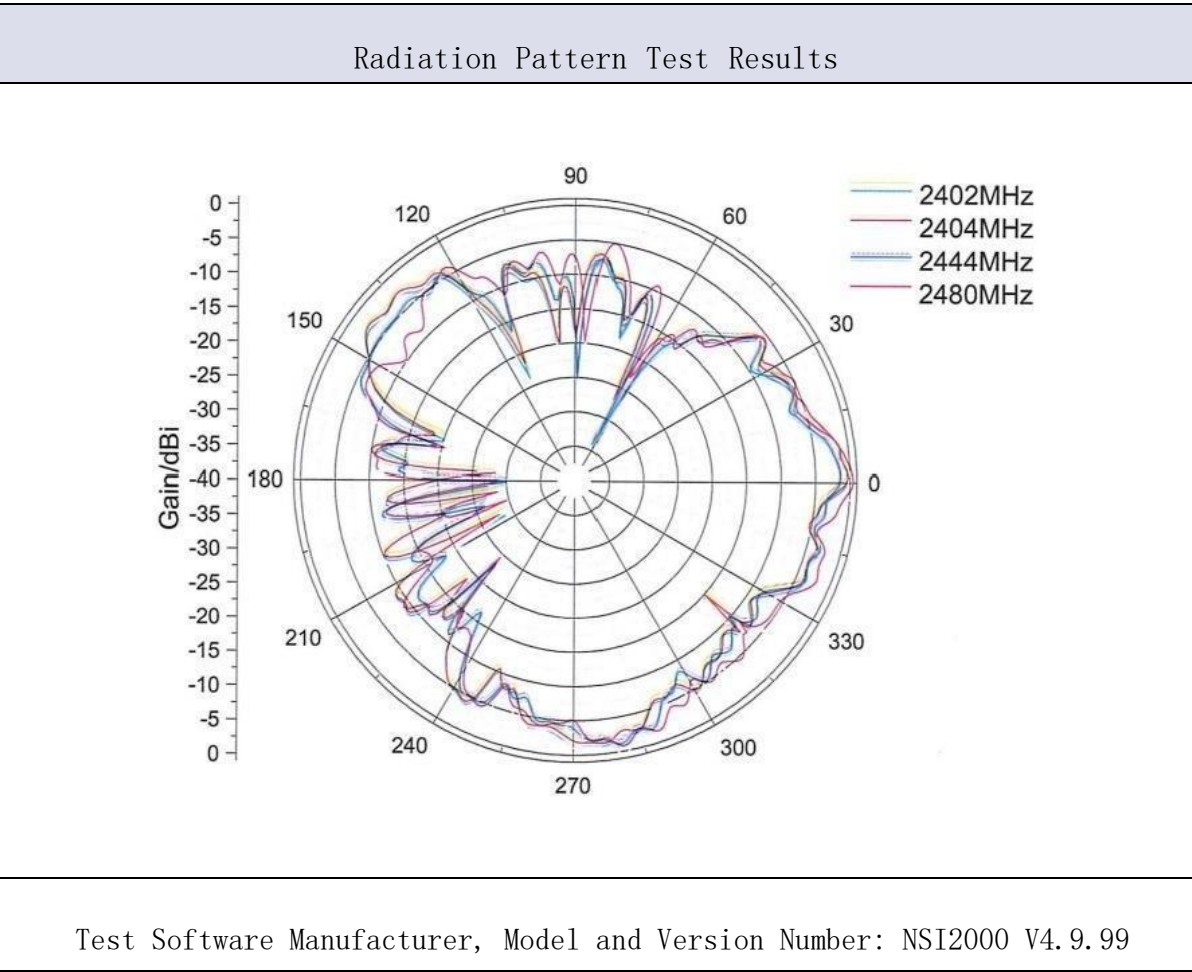


Figure3.1-1 Multiple connected self-organizing network communication modules
Radiation Pattern Test Curve(AUT Vertical Installation Azimuth Plane2.402GHz
2.404GHz、2.444GHz、2.480GHz)

Radiation Pattern Test Results			
Table3.3-1 Multiple connected self-organizing network communication modules Radiation Pattern Test Data(AUT Vertical Installation Azimuth Plane2.402GHz)			
Angle(deg)	Amplitude(dBi)	Angle(deg)	Amplitude(dBi)
-180	-28.437	10	-4.09
-170	-15.503	20	-5.954
-160	-13.204	30	-9.096
-150	-15.51	40	-10.096
-140	-8.811	50	-12.734
-130	-14.839	60	-20.185
-120	-4.409	70	-14.504
-110	-8.154	80	-9.91
-100	-2.838	90	-18.053
-90	-0.888	100	-11.394
-80	-1.885	110	-10.11
-70	-5.212	120	-9.965
-60	-4.025	130	-4.666
-50	-7.172	140	-3.809
-40	-6.607	150	-5.333
-30	-6.064	160	-11.951
-20	-3.595	170	-13.221
-10	-4.451	180	-26.129
0	-0.314		
Test Software Manufacturer, Model and Version Number: NSI2000 V4.9.99			

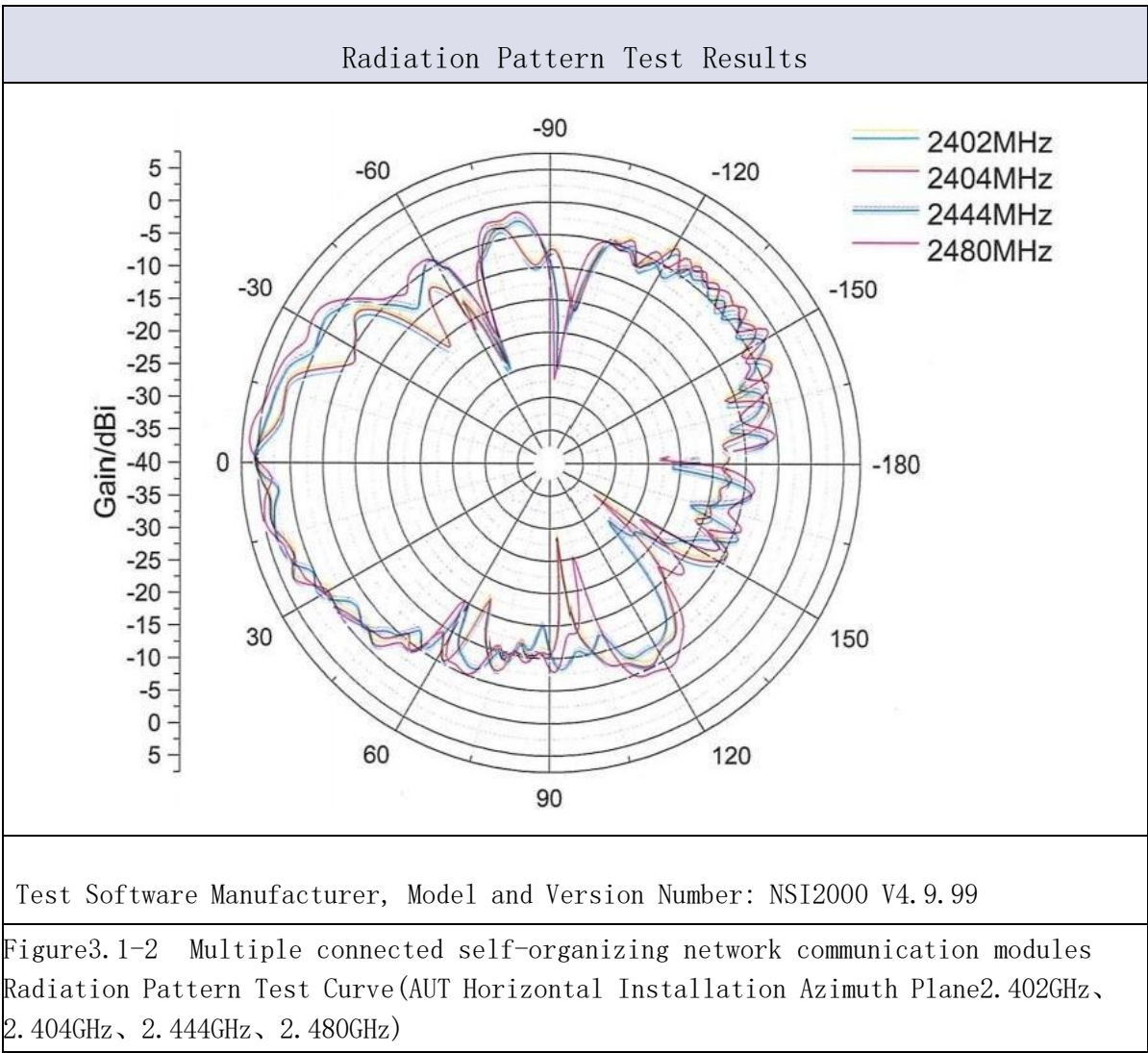
Radiation Pattern Test Results			
Table3.3-2 Multiple connected self-organizing network communication modules Radiation Pattern Test Data(AUT Vertical Installation Azimuth Plane2.404GHz)			
Angle(deg)	Amplitude(dBi)	Angle(deg)	Amplitude(dBi)
-180	-28.418	10	-3.947
-170	-15.41	20	-5.761
-160	-13.182	30	-8.77
-150	-15.568	40	-10.434
-140	-8.618	50	-12.76
-130	-14.643	60	-20.089
-120	-4.18	70	-14.322
-110	-8.32	80	-9.293
-100	-2.782	90	-17.557
-90	-0.89	100	-10.946
-80	-1.935	110	-9.88
-70	-5.019	120	-9.621
-60	-3.943	130	-4.544
-50	-6.699	140	-3.865
-40	-6.386	150	-5.329
-30	-5.851	160	-11.275
-20	-3.568	170	-13.751
-10	-4.377	180	-25.638
0	-0.333		
Test Software Manufacturer, Model and Version Number: NSI2000 V4.9.99			

Radiation Pattern Test Results			
Table3.3-3 Multiple connected self-organizing network communication modules Radiation Pattern Test Data(AUT Vertical Installation Azimuth Plane2.444GHz)			
Angle(deg)	Amplitude(dBi)	Angle(deg)	Amplitude(dBi)
-180	-8.256	10	-4.053
-170	-9.221	20	-6.476
-160	-8.245	30	-6.565

-150	-5.666	40	-7.221
-140	-5.17	50	-7.245
-130	-5.586	60	-3.867
-120	-8.493	70	-3.716
-110	-12.339	80	-1.355
-100	-17.752	90	-4.175
-90	-11.632	100	-6.142
-80	-23.833	110	-9.796
-70	-17.101	120	-8.565
-60	-11.538	130	-14.259
-50	-11.104	140	-30.744
-40	-6.179	150	-14.215
-30	-7.312	160	-9.01
-20	-4.808	170	-14.033
-10	-3.23	180	-8.631
0	-0.697		
Test Software Manufacturer, Model and Version Number: NSI2000 V4.9.99			

Radiation Pattern Test Results			
Table3.3-4 Multiple connected self-organizing network communication modules Radiation Pattern Test Data(AUT Vertical Installation Azimuth Plane2.448GHz)			
Angle(deg)	Amplitude(dBi)	Angle(deg)	Amplitude(dBi)
-180	-8.089	10	-1.683
-170	-11.57	20	-5.526
-160	-5.733	30	-4.203
-150	-5.866	40	-5.43
-140	-8.514	50	-4.386
-130	-8.28	60	-2.083
-120	-8.263	70	-1.902
-110	-15.837	80	0.268
-100	-12.295	90	-3.29

-90	-12.89	100	-5.924
-80	-24.012	110	-8.046
-70	-15.851	120	-9.874
-60	-10.079	130	-15.738
-50	-14.833	140	-23.938
-40	-7.826	150	-15.466
-30	-5.325	160	-6.027
-20	-3.412	170	-8.063
-10	-3.932	180	-7.518
0	0.263		
Test Software Manufacturer, Model and Version Number: NSI2000 V4.9.99			



Radiation Pattern Test Results			
Table3.1-5 Multiple connected self-organizing network communication modules Radiation Pattern Test Data(AUT Horizontal Installation Azimuth Plane2.402GHz)			
Angle(deg)	Amplitude(dBi)	Angle(deg)	Amplitude(dBi)
-180	-12.664	10	3.624
-170	-6.316	20	1.909
-160	-4.36	30	0.028
-150	-3.543	40	-1.522
-140	-5.15	50	-2.802
-130	-3.379	60	-6.492
-120	-5.232	70	-10.511
-110	-5.708	80	-10.978
-100	-16.96	90	-9.798
-90	-8.924	100	-11.353
-80	-5.307	110	-6.265
-70	-8.455	120	-6.037
-60	-17.448	130	-12.082
-50	-14.648	140	-24.703
-40	-5.519	150	-9.095
-30	-5.514	160	-13.693
-20	-1.358	170	-12.806
-10	1.577	180	-12.629
0	5.324		
Test Software Manufacturer, Model and Version Number: NSI2000 V4.9.99			

Radiation Pattern Test Results			
Table3.1-6 Multiple connected self-organizing network communication modules Radiation Pattern Test Data(AUT Horizontal Installation Azimuth Plane2.404GHz)			
Angle(deg)	Amplitude(dBi)	Angle(deg)	Amplitude(dBi)
-180	-12.506	10	3.824
-170	-6.361	20	2.132

-160	-4.33	30	0.159
-150	-3.437	40	-1.189
-140	-4.945	50	-2.753
-130	-3.34	60	-6.158
-120	-4.799	70	-10.25
-110	-5.188	80	-11.036
-100	-17.511	90	-9.694
-90	-8.672	100	-10.965
-80	-5.277	110	-6.104
-70	-8.345	120	-5.952
-60	-17.661	130	-12.01
-50	-14.763	140	-25.962
-40	-5.164	150	-8.824
-30	-5.361	160	-13.727
-20	-1.134	170	-12.865
-10	1.737	180	-12.472
0	5.474		
Test Software Manufacturer, Model and Version Number: NSI2000 V4.9.99			

Radiation Pattern Test Results			
Table3.1-7 Multiple connected self-organizing network communication modules Radiation Pattern Test Data(AUT Horizontal Installation Azimuth Plane2.444GHz)			
Angle(deg)	Amplitude(dBi)	Angle(deg)	Amplitude(dBi)
-180	-14.012	10	3.164
-170	-10.403	20	3.152
-160	-9.097	30	1.065
-150	-3.24	40	-1.733
-140	-5.062	50	-5.209
-130	-4.313	60	-14.524
-120	-6.277	70	-5.889
-110	-5.542	80	-10.824

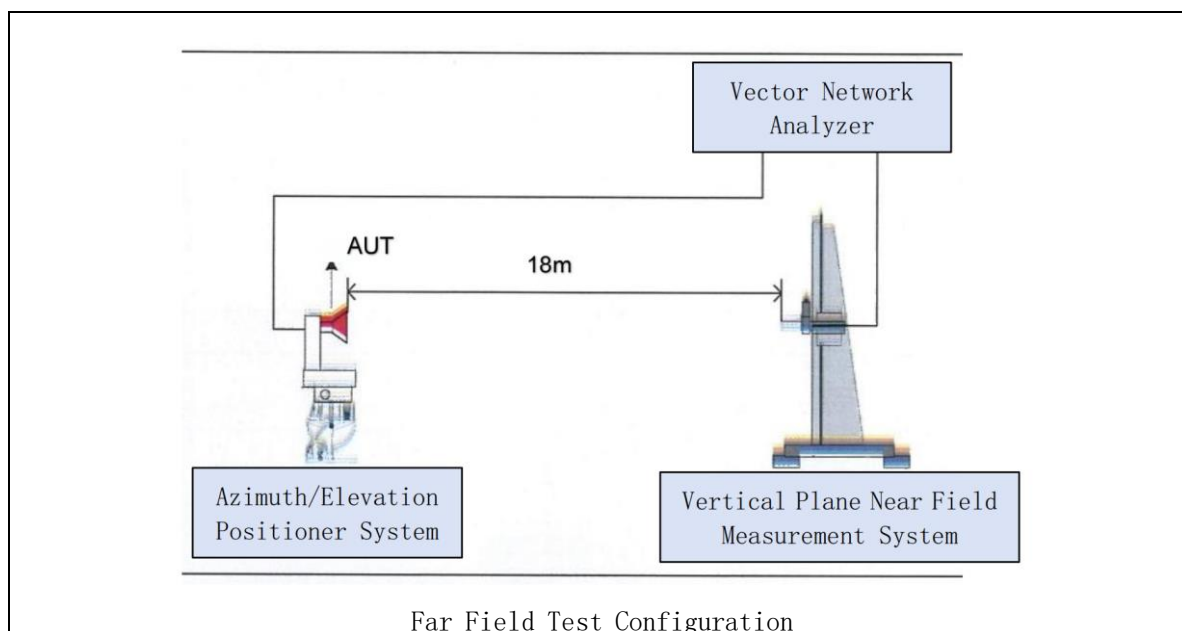
-100	-14.697	90	-10.167
-90	-8.737	100	-9.762
-80	-3.698	110	-8.108
-70	-10.726	120	-7.31
-60	-4.705	130	-17.101
-50	-8.926	140	-22.909
-40	-2.171	150	-15.227
-30	0.509	160	-13.43
-20	2.497	170	-8.694
-10	3.724	180	-17.032
0	5.324		
Test Software Manufacturer, Model and Version Number: NSI2000 V4.9.99			

Radiation Pattern Test Results			
Table3.1-8 Multiple connected self-organizing network communication modules Radiation Pattern Test Data(AUT Horizontal Installation Azimuth Plane2.480GHz)			
Angle(deg)	Amplitude(dBi)	Angle(deg)	Amplitude(dBi)
-180	-17.208	10	4.711
-170	-10.184	20	3.03
-160	-6.762	30	0.841
-150	-1.64	40	-0.573
-140	-3.375	50	-4.744
-130	-3.196	60	-9.801
-120	-5.149	70	-4.666
-110	-6.625	80	-9.413
-100	-10.751	90	-7.047
-90	-10.661	100	-15.532
-80	-2.829	110	-4.447
-70	-9.567	120	-2.819
-60	-5.457	130	-9.236
-50	-6.266	140	-13.531

-40	-2.449	150	-10.806
-30	2.077	160	-9.373
-20	3.383	170	-8.243
-10	4.874	180	-21.769
0	5.344		
Test Software Manufacturer, Model and Version Number: NSI2000 V4.9.99			

3.2 Gain

Name of the Antenna Under Test		Model/Designation/Specification		Serial Number	
Multiple connected self-organizing network communication modules		XKD-DTU-485/B1C5V/ EX		ZXZ41106-C080101	
Test Date	2025. 02. 26~2025. 02. 28	Temperature (° C)	20. 2~21. 5	Relative humidity (%)	51. 2~52. 4
Main Test Instruments					
Serial No.	Name Title	Model and Manufacturer		No.	validity date
1	Vector Network Analyzer	Agilent N5230A		MY48100345	2025. 06. 12
2	Vertical Plane Near Field Measurement System	NSI Corporation NSI-300V-18*18		KX201403030 00843-001	2026. 06. 19
3	Azimuth/Elevation Positioner System	NSI Corporation NSI-SC-5660		KX201403030 00843-002	2026. 06. 20
4	AUT Extension Table	NSI Corporation NSI-SC-5624x		KX201403030 00843-003	2026. 06. 20
Test Configuration Schematic					



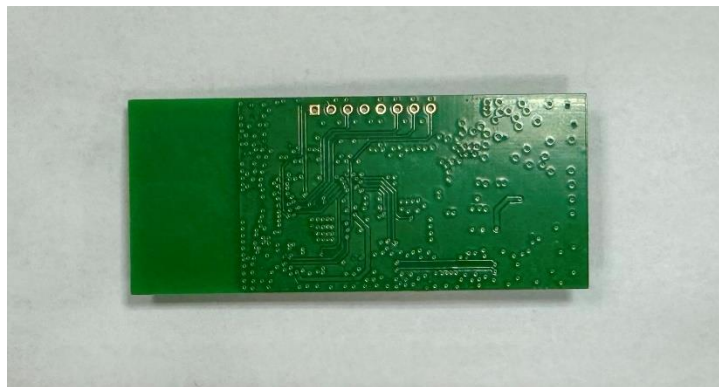
Test Requirements(Provided by the customer)			
Frequency	Test Requirements	Notes	
2. 402GHz、2. 404GHz、2. 444GHz、2. 480GHz	/	Only test data is provided, without compliance assessment.	
Test Results			
Frequency	Test Results	Compliance with Test Requirements	Angle(deg)
2. 402GHz (AUT Vertical Installation Azimuth Plane)	-0. 296dBi	/	-1
2. 404GHz (AUT Vertical Installation Azimuth Plane)	-0. 237dBi	/	-1
2. 444GHz (AUT Vertical Installation Azimuth Plane)	-0. 687dBi	/	-1
2. 480GHz (AUT Vertical Installation Azimuth Plane)	0. 519 dBi	/	-1
2. 402GHz (AUT Horizontal Installation Azimuth Plane)	5. 324dBi	/	0
2. 404GHz (AUT Horizontal Installation Azimuth Plane)	5. 474dBi	/	0
2. 444GHz (AUT Horizontal Installation Azimuth Plane)	5. 329dBi	/	-1
2. 480GHz (AUT Horizontal Installation Azimuth Plane)	6. 279dBi	/	-4

4. Antenna Photo or Engineering Drawing

Antenna Physical Photo:

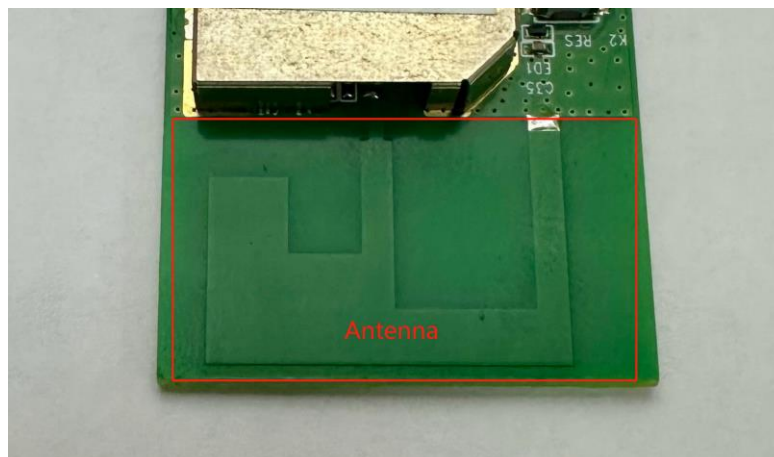


Front View



Back View

Antenna Engineering Diagram:



5. Environmental Adaptability Test

Test Items	Conditions	Test Results	Remarks
High Temperature Test	85℃	2 hours	None
Low Temperature Test	-40℃	2 hours	None