



Shenzhen XingtongWieress Technology Co.,Ltd

FOR

ForQuanzhou Baolutong Technology Co.,Ltd.

Product Confirmation Letter

Part No. :

Model :XT-X999-LTE(M)

Specification No. :2024-12-11-V1.0

Client	
Approved	

Approved by	Checked by	Designed by
XUGENG	HUANJJ	WUYANLONG

Project:999--NA		Author: HUANG	File Name: 999-APP-RA
Date: 2024-12-11			
TEST:	Language:	Check: XIE	
A	English		
Address: 3rd Floor, Building A1, Qianglong East Industrial Zone, Jiuwei, Xixiang, Bao'an District, Shenzhen			
Phone: 0755-27850514 Fax: 0755-27850514			

1 Technical Summary

This report summarizes the electrical results of the proposed antenna to support the 999-NA program. We test the antenna with the latest version handset. And it seems to be acceptable.

2 General Description

2.1 Components/Part revisions

VSWR: Voltage Standing Wave Rate.

3 Electrical Performance

3.1 Set-up

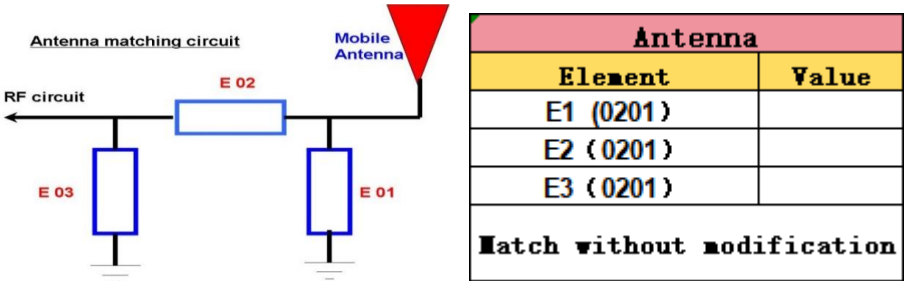
3.1.1 VSWR

VSWR measurements (S21) were performed using an Agilent 8753D Network Analyzer and the previously described test fixture. Coaxial chokes were used to mitigate surface currents on the outside of the cabling. The testing was performed in free space.

3.1.2 Gain & Radiation Patterns

The gain of the antenna was measured in the XingTong’s anechoic chamber. Coaxial chokes on the feed cable were used to mitigate surface currents. The chamber provides less than -30 dB reflectivity from 600 MHz through 3 GHz and an 18” diameter spherical quiet zone. The measurement results are calibrated using both dipole and leaky wave horn standards.

3.1.3 Matching Circuit Description



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3.2 Measurement Data

3.2.1 LTE-OTA:

Antenna efficiency gain value

680-960MHz-2D

Frequency ID	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Frequency (MHz)	680.0	700.0	720.0	740.0	760.0	780.0	800.0	820.0	840.0	860.0	880.0	900.0	920.0	940.0	960.0
Efficiency (dBi)	-5.54	-5.52	-5.65	-6.01	-5.83	-5.52	-5.06	-4.63	-4.63	-4.63	-3.60	-3.30	-3.82	-4.27	-4.94
Gain (dBi)	-3.50	0.19	-0.09	-0.58	-0.33	-3.32	-2.60	-2.10	-1.76	-1.73	-1.15	-1.02	-1.73	-2.16	-2.61
Efficiency (%)	27.90	28.06	27.23	25.06	26.10	28.07	31.17	34.46	34.40	34.44	43.70	46.80	41.54	37.45	32.04
Directivity (dB)	5.73	5.70	5.56	5.43	5.51	2.20	2.47	2.53	2.87	2.90	2.44	2.28	2.08	2.11	2.33
Peak Gain Position (Theta)	135.00	135.00	135.00	135.00	135.00	60.00	75.00	90.00	90.00	90.00	90.00	90.00	90.00	75.00	75.00
Peak Gain Position (Phi)	210.00	195.00	210.00	210.00	195.00	195.00	225.00	240.00	225.00	225.00	210.00	210.00	210.00	90.00	90.00
Efficiency ThetaPol (%)	20.69	21.03	20.18	18.49	19.02	26.05	28.28	30.63	30.46	29.92	39.04	42.44	37.43	33.46	28.41
Efficiency PhiPol (%)	7.22	7.03	7.05	6.58	7.07	2.02	2.89	3.83	3.94	4.51	4.65	4.36	4.11	3.99	3.63
Upper Hem. Efficiency (%)	14.26	14.63	14.43	13.39	13.85	13.79	15.37	16.29	16.58	16.86	21.45	23.18	20.89	18.68	15.48
Lower Hem. Efficiency (%)	13.64	13.43	12.80	11.67	12.24	14.28	15.80	18.16	17.82	17.57	22.25	23.62	20.66	18.77	16.56

1700-1980MHz-2D

Frequency ID	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Frequency (MHz)	1700.0	1720.0	1740.0	1760.0	1780.0	1800.0	1820.0	1840.0	1860.0	1880.0	1900.0	1920.0	1940.0	1960.0	1980.0
Efficiency (dBi)	-3.48	-3.45	-3.22	-3.21	-3.18	-3.02	-3.21	-3.51	-3.02	-2.96	-3.06	-2.72	-2.75	-2.73	-2.63
Gain (dBi)	2.19	2.15	2.17	1.98	1.94	1.95	1.55	1.24	1.51	1.55	1.53	1.78	1.55	1.62	1.64
Efficiency (%)	44.87	45.19	47.60	47.75	48.09	49.91	47.74	44.60	49.87	50.60	49.49	53.48	53.09	53.35	54.58
Directivity (dB)	5.67	5.60	5.39	5.19	5.12	4.97	4.76	4.74	4.53	4.51	4.59	4.50	4.30	4.35	4.27
Peak Gain Position (Theta)	120.00	120.00	120.00	120.00	135.00	135.00	120.00	120.00	135.00	135.00	135.00	135.00	135.00	135.00	135.00
Peak Gain Position (Phi)	240.00	240.00	240.00	225.00	270.00	270.00	210.00	210.00	330.00	330.00	330.00	330.00	330.00	330.00	330.00
Efficiency ThetaPol (%)	37.12	37.49	39.60	40.08	40.99	42.69	40.35	37.49	42.08	42.42	41.27	43.95	42.90	43.06	44.18
Efficiency PhiPol (%)	7.75	7.69	8.01	7.67	7.10	7.22	7.38	7.11	7.79	8.18	8.22	9.53	10.19	10.29	10.40
Upper Hem. Efficiency (%)	7.35	7.11	8.17	8.55	8.66	9.88	11.07	11.12	12.99	13.90	13.94	15.92	17.21	18.19	19.14
Lower Hem. Efficiency (%)	37.51	38.08	39.44	39.20	39.42	40.02	36.66	33.48	36.88	36.70	35.54	37.56	35.87	35.16	35.45

2000-2180MHz-2D

Frequency ID	31	32	33	34	35	36	37	38	39	40
Frequency (MHz)	2000.0	2020.0	2040.0	2060.0	2080.0	2100.0	2120.0	2140.0	2160.0	2180.0
Efficiency (dBi)	-2.66	-2.72	-2.61	-2.85	-2.96	-2.82	-3.17	-3.13	-2.66	-2.87
Gain (dBi)	1.38	1.25	1.08	0.52	0.39	0.45	0.14	0.54	1.30	1.21
Efficiency (%)	54.16	53.51	54.82	51.89	50.60	52.27	48.25	48.62	54.14	51.66
Directivity (dB)	4.04	3.96	3.69	3.37	3.34	3.27	3.30	3.67	3.96	4.08
Peak Gain Position (Theta)	135.00	135.00	135.00	135.00	120.00	120.00	135.00	135.00	120.00	120.00
Peak Gain Position (Phi)	330.00	330.00	330.00	330.00	240.00	240.00	300.00	315.00	270.00	255.00
Efficiency ThetaPol (%)	43.92	43.80	45.25	43.34	42.62	44.22	40.95	41.95	47.26	45.45
Efficiency PhiPol (%)	10.24	9.70	9.58	8.55	7.98	8.06	7.30	6.67	6.88	6.21
Upper Hem. Efficiency (%)	19.47	19.79	20.63	19.65	19.40	20.65	19.08	18.86	20.95	19.95
Lower Hem. Efficiency (%)	34.69	33.72	34.19	32.24	31.20	31.62	29.16	29.76	33.20	31.70

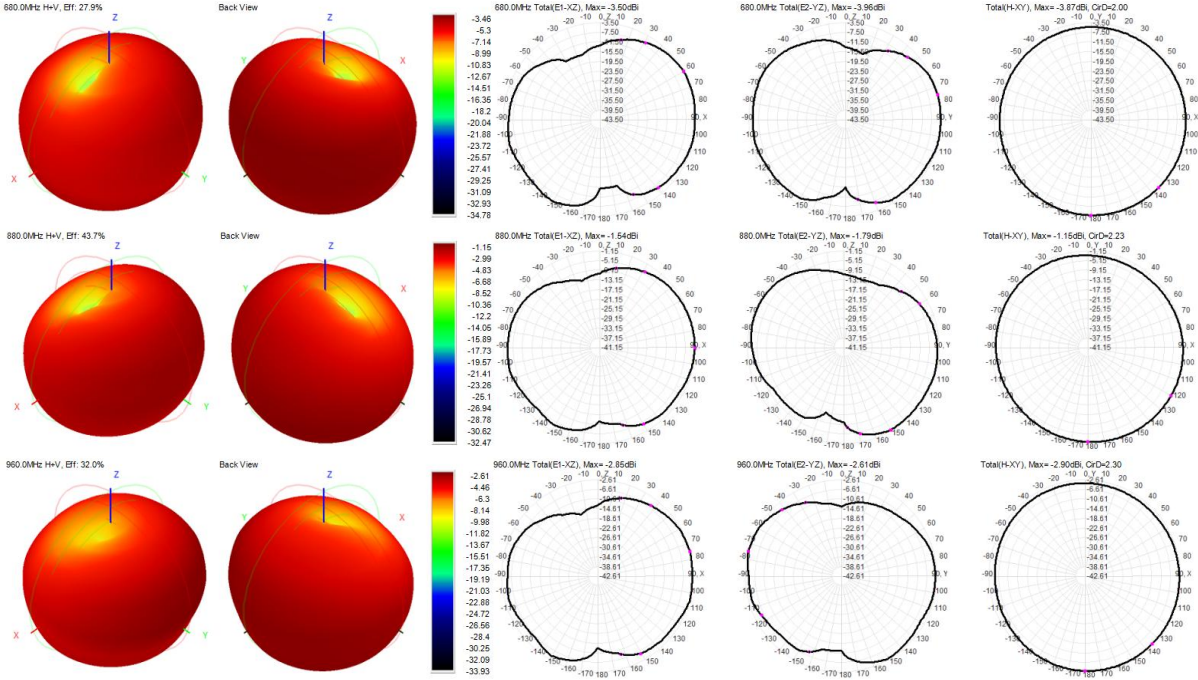
2300-2700MHz-2D

Frequency ID	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57
Frequency (MHz)	2300.0	2320.0	2340.0	2360.0	2380.0	2400.0	2500.0	2520.0	2540.0	2560.0	2580.0	2600.0	2620.0	2640.0	2660.0	2680.0	2700.0
Efficiency (dBi)	-3.26	-3.43	-3.23	-2.94	-3.20	-2.88	-3.13	-2.83	-2.59	-2.88	-2.68	-2.60	-2.88	-2.88	-2.66	-2.88	-2.81
Gain (dBi)	1.37	1.15	1.09	1.34	0.97	1.10	1.30	1.55	1.61	1.57	1.88	1.60	0.94	0.72	0.92	1.04	1.24
Efficiency (%)	47.24	45.38	47.50	50.76	47.86	51.52	48.61	52.11	55.02	51.52	53.93	54.95	51.49	51.49	54.21	51.47	52.39
Directivity (dB)	4.63	4.58	4.32	4.28	4.17	3.98	4.43	4.38	4.20	4.45	4.56	4.20	3.82	3.60	3.58	3.93	4.04
Peak Gain Position (Theta)	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	150.00	150.00	150.00
Peak Gain Position (Phi)	240.00	240.00	240.00	255.00	240.00	255.00	240.00	240.00	240.00	240.00	240.00	240.00	240.00	240.00	75.00	75.00	75.00
Efficiency ThetaPol (%)	40.84	38.95	40.53	43.05	40.38	43.29	37.72	40.32	42.25	39.02	40.70	41.50	39.13	38.91	40.73	38.70	38.94
Efficiency PhiPol (%)	6.40	6.42	6.97	7.71	7.48	8.23	10.88	11.79	12.77	12.50	13.23	13.45	12.36	12.58	13.48	12.77	13.44
Upper Hem. Efficiency (%)	22.58	22.78	24.91	27.57	26.46	28.77	25.47	27.40	29.36	27.72	29.37	30.20	28.52	28.82	30.78	29.39	29.98
Lower Hem. Efficiency (%)	24.66	22.59	22.59	23.19	21.40	22.75	23.13	24.71	25.66	23.81	24.56	24.75	22.97	22.68	23.43	22.09	22.41

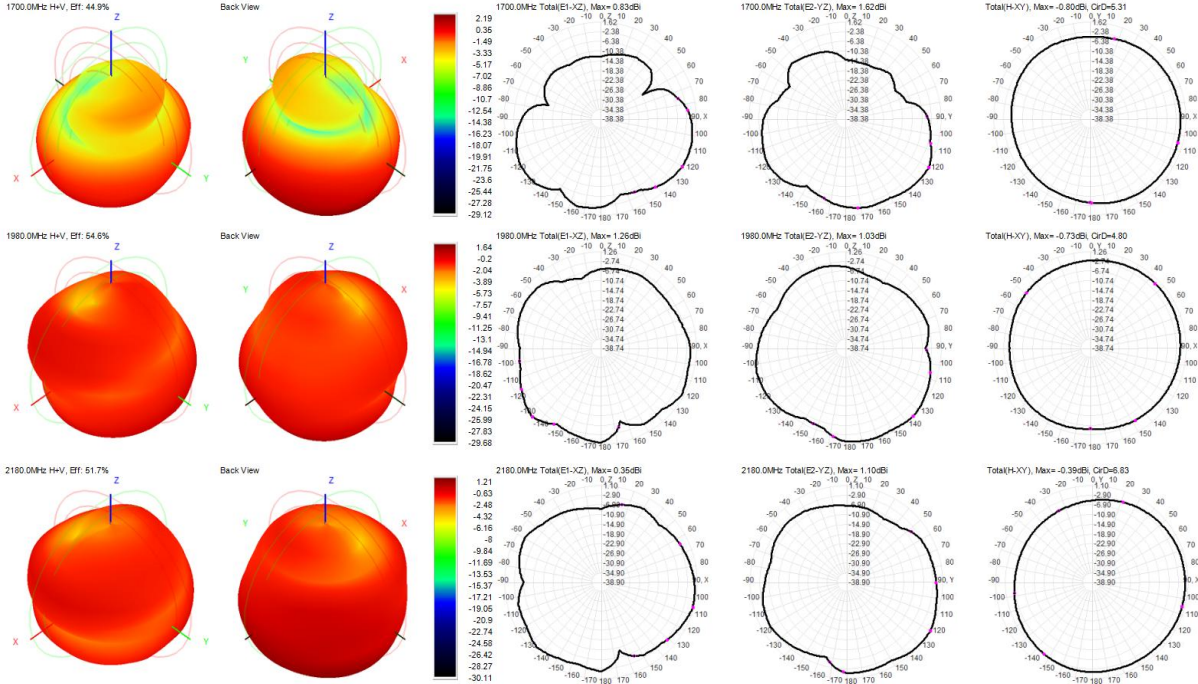
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Antenna Pattern

680-960MHz-3D

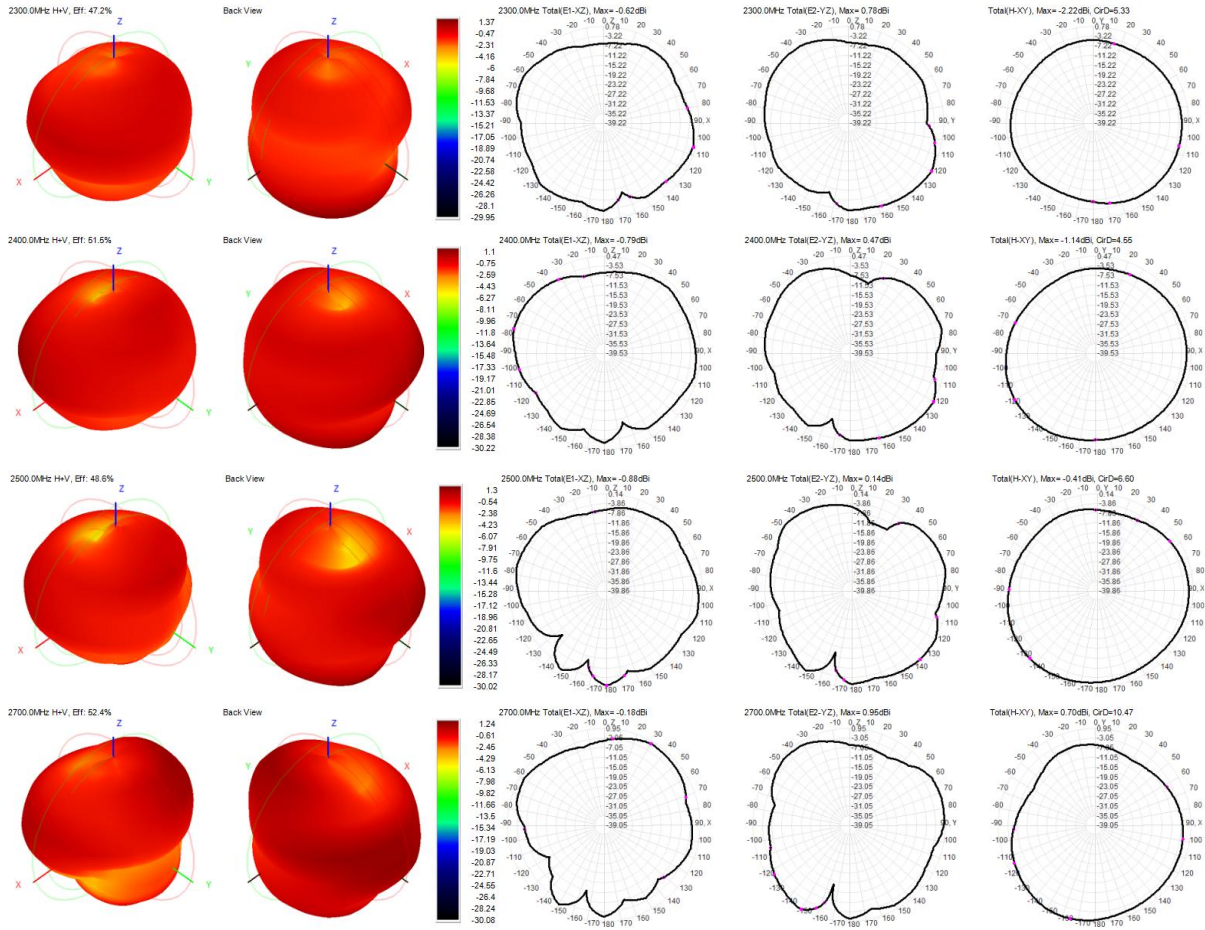


1700-2180MHz-3D



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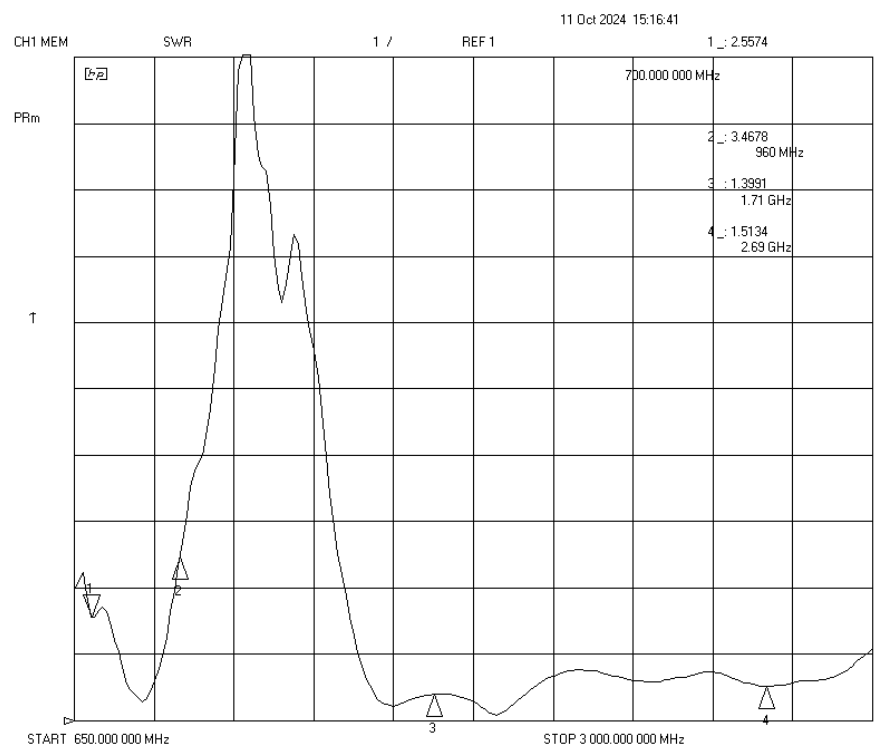
2300-2700MHz-3D



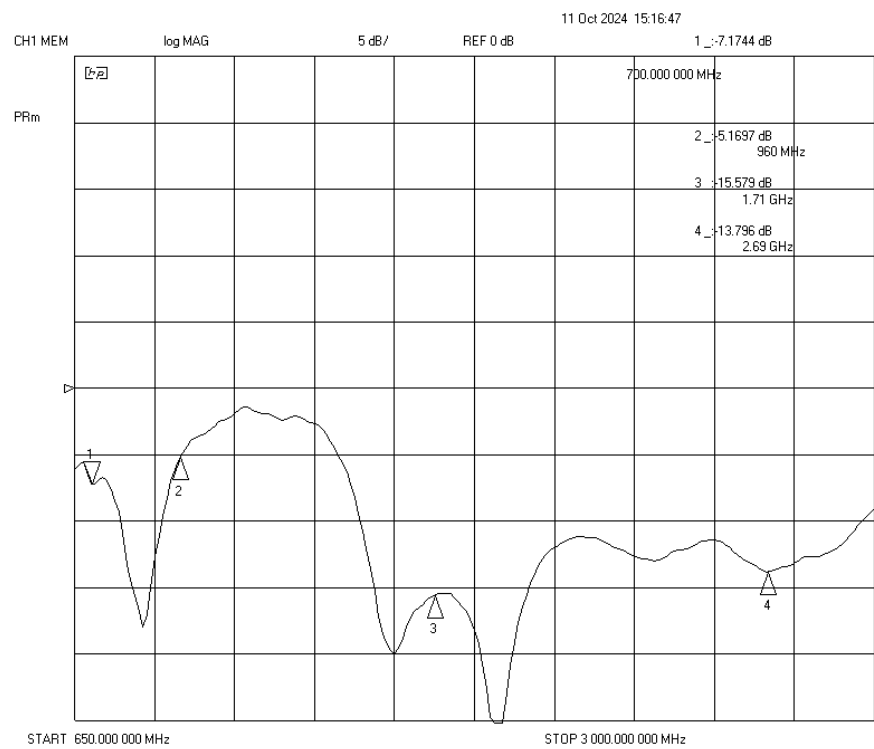
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4 Plots

4.1 VSWR (S11) LTE



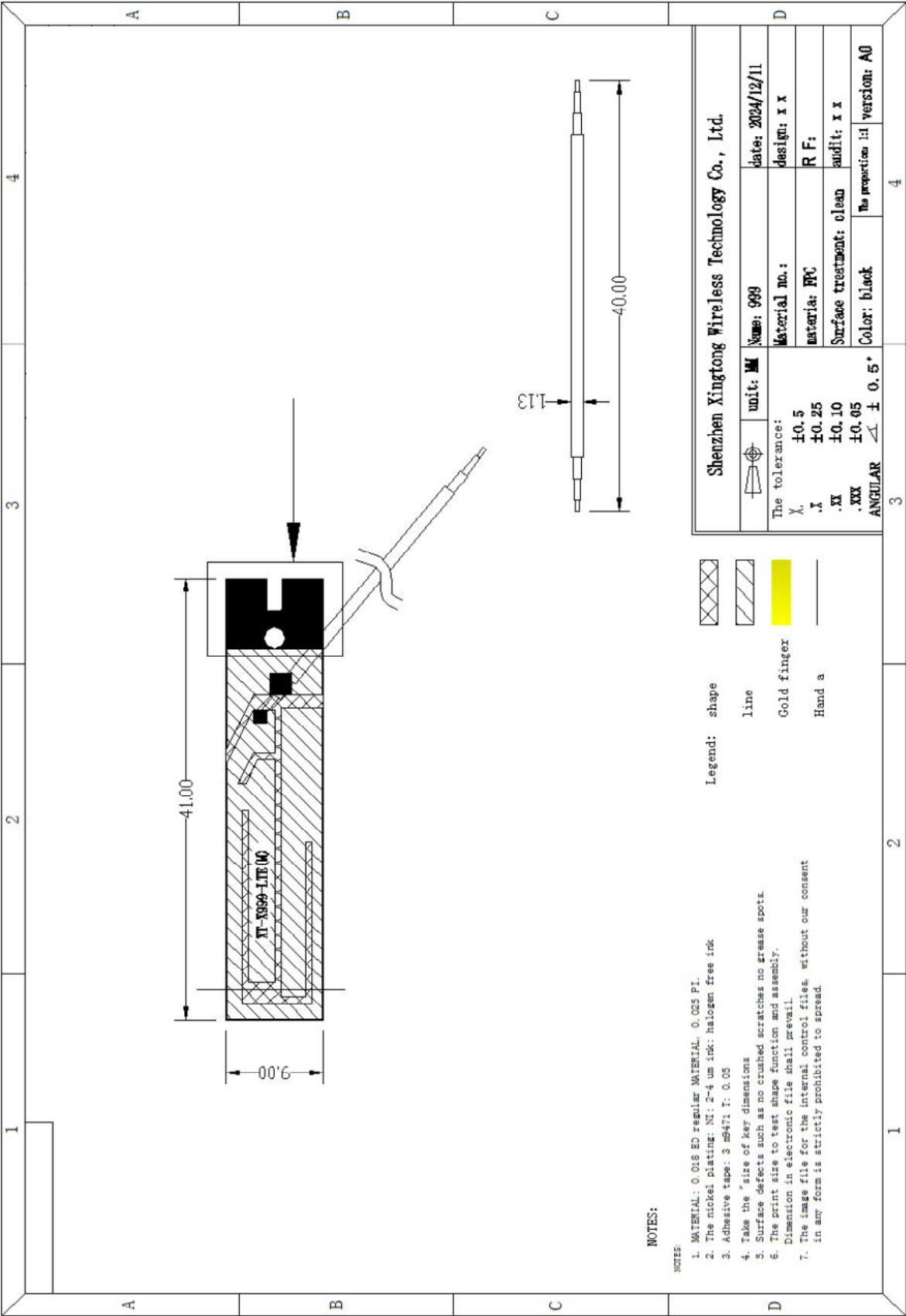
4.2 LOG MAG (S11) LTE



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5 Mechanical drawing

LTE



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6 Reliability tests

6.1 Test content

No	Test items	test method	defining principle
1	Salt water spray test	Spray the solution with salt concentration of 5% for 48HR	There should be no defects such as discoloration, deformation, or detachment, and the corrosion area should not be too large
2	Operational Temperature	-40℃~+65℃	
3	Storage Temperature	-50℃~+85℃	
4	Humidity	40%~95%	

6.2 Test results

NO	Number of samples	Test time	experimental result	notes
1	50	24hour	OK	Technical level is level 9 Corrosion<0.4mm
2	50	24hour	OK	Technical level is level 9 Corrosion<0.4mm

7 Conclusion



Note: The environmental treatment of the entire machine is based on the antenna report as the final decision.

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