



Product Specification

Customer Name: Shenzhen Hanfeng Electronics Co., Ltd

Project Name: 2.4G Copper tube antenna

Product Spec:

REV: ZK-2.4G-1.13-IPEX1-72

2.4G Copper tube antenna, L=72mm, IPEX-1

Date: 2026.05.13

drawing	check	approved
Huang Yongjun	Wang Yumei	Jiang Zhenhua



Customer Approve

check	approved	approval



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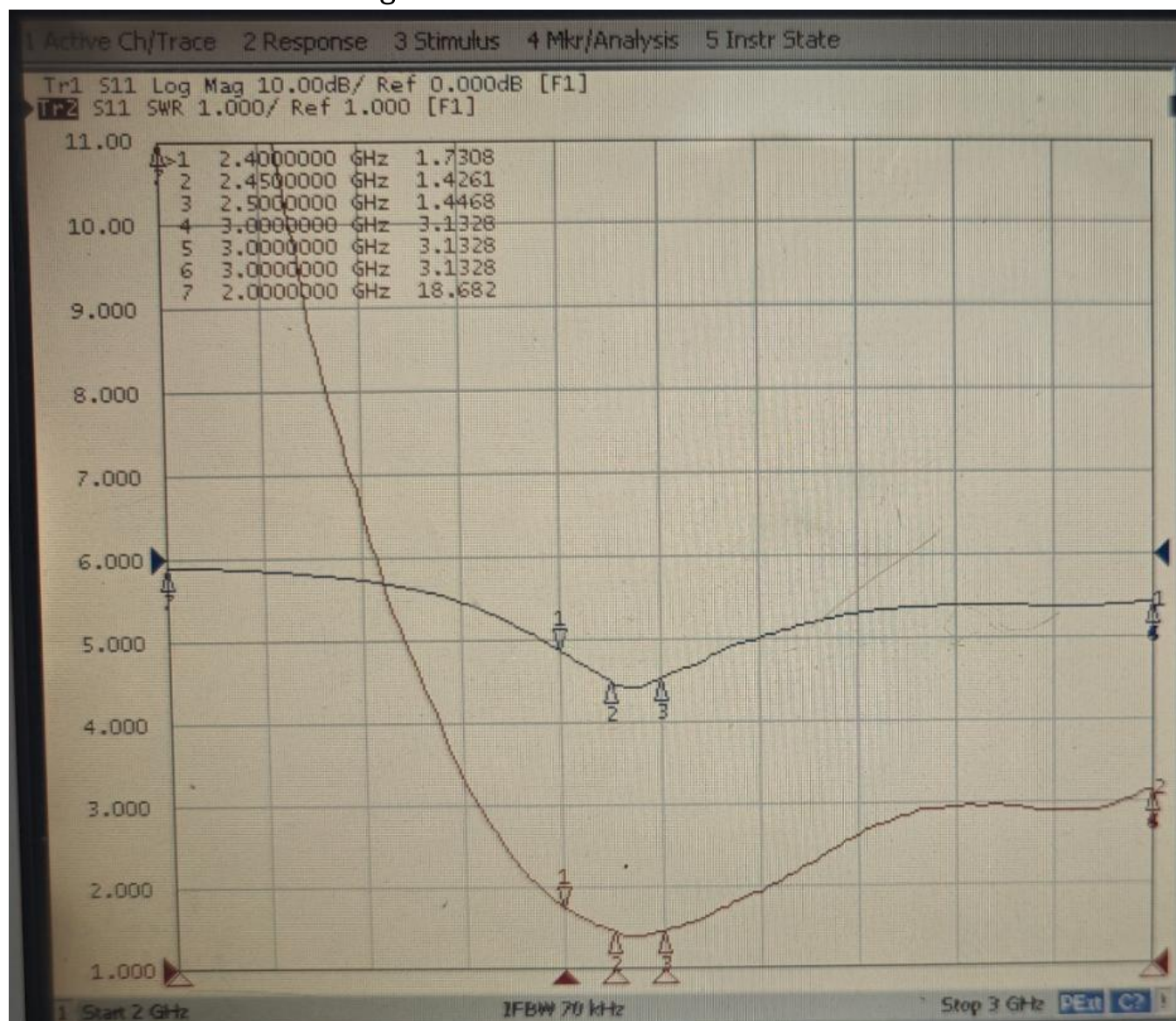


Electrical Performance Index

Electrical Specifications	
frequency range	2400-2480MHz
VSWR	≤ 2.0
GAIN	≤ 2.99 DBI
Radiation	OMNI
Polarizatin	LINEAR
Input Impedance	50 Ω
Mechanical Specifications	
Input connector	IPEX-1
Antenna materia	copper tube
Working Temperature	-30℃~+80℃
Working Humidity	40~85%

Test report

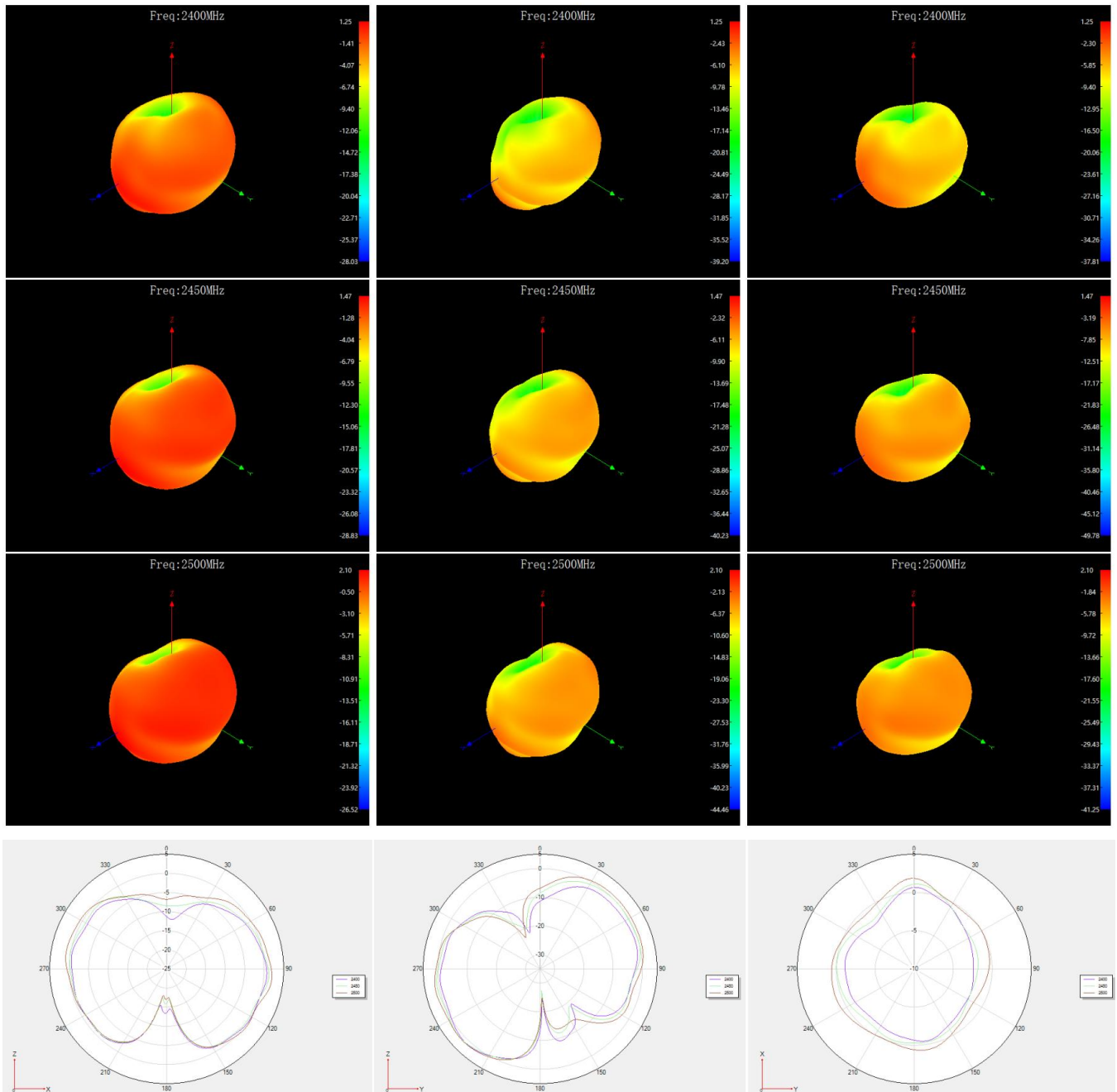
1. Antenna in wave diagram



2. antenna effeciency

Frequency/Mhz	Efficiency / %	MaxGain/dBi
2400	56.36	1.25
2410	55.21	1.98
2420	62.81	2.18
2430	67.14	1.88
2440	73.28	2.99
2450	65.16	1.47
2460	63.97	2.13
2470	61.24	1.81
2480	65.77	2.1
2490	66.53	2.38
2500	63.83	2.1

3. Antenna pattern



Testing Equipment and Principle

1. testing facility

Network Analyzers :

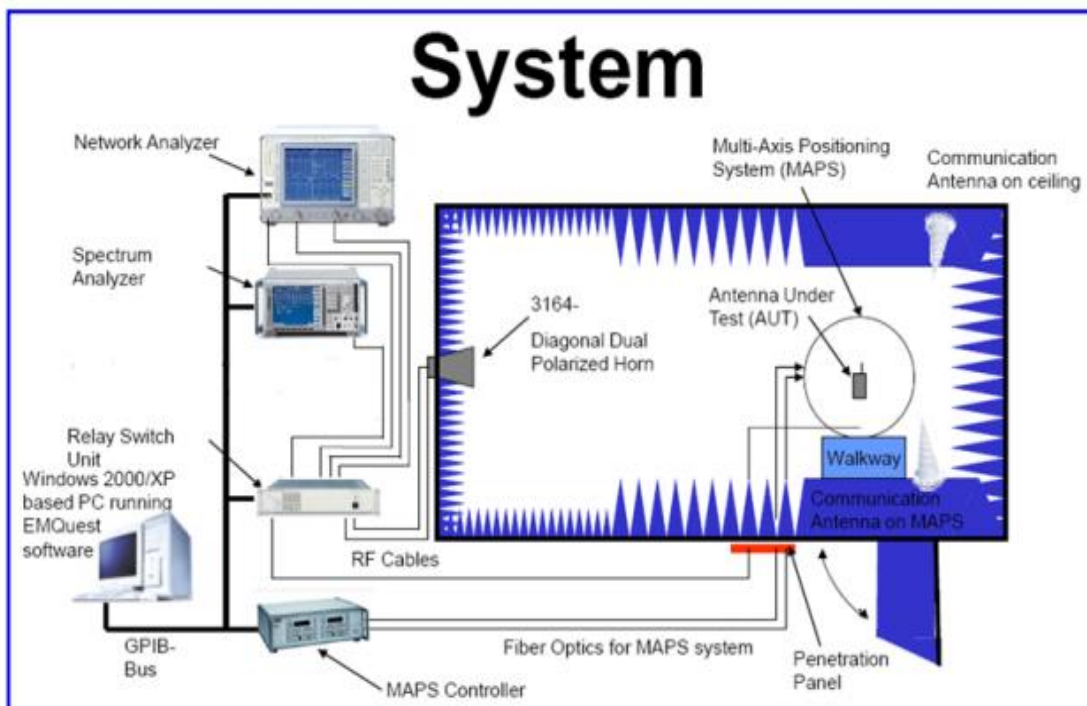
Agilent 8753D 5071B

Communications Test Set:

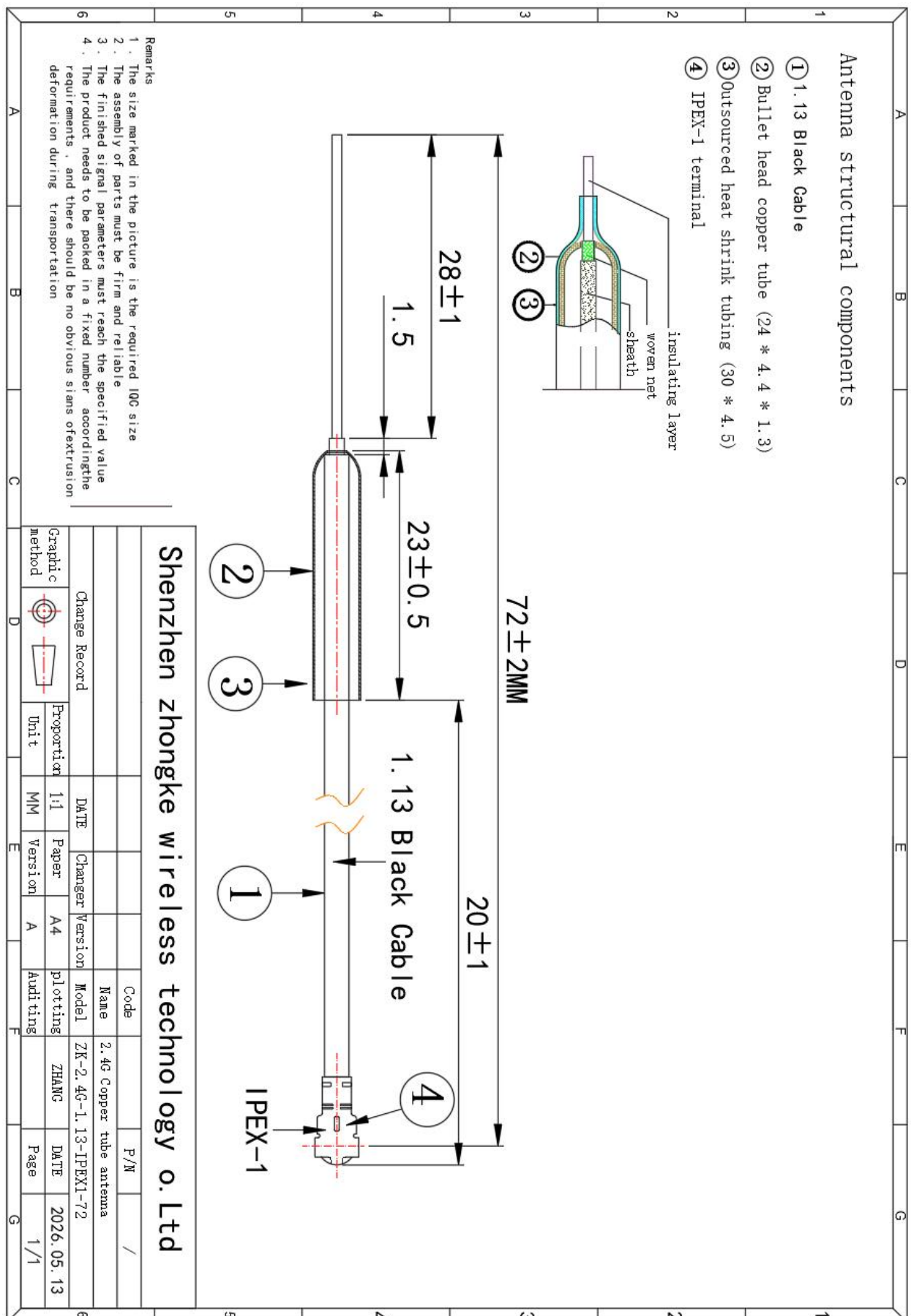
Agilent E5515C

3D Chamber Test System:

2. The test principle:



Product Drawing





Reliability test report

test item; test project		test method	ask	bear fruit
C1	V. S. W. R.	Design net analyzer parameters for testing	Directive DUT specification	pass
M1	antenna gain	Design the parameters of the antenna dark chamber for testing	Directive DUT specification	pass
M2	Vibration	GB / T2423.48-2008 Amplitude: 0.03 inch (1.5mm); Freq: 20 to 80 to 20 Hz 3 directions; 2 hours for each direction	1. No Visual Damage 2. Frequency Tol. $\leq 5\%$	pass
M6	Random Drop	GB / T2423.8-1995 Single: Height: 1.0 Meter; 3 directions; 1 time for each direction	1. No parts separated, fracture 2. Frequency Tol. $\leq 5\%$	pass
E3	Dimension	Inspection of dimension, color, material, package, surface process.	Directive DUT specification	pass
E4	Temperature and Humidity Chamber	GB / T 2423.3-2006 Temp: 80°C / 12 H; -40°C / 12H RH: $\geq 90\%$; Time: 24H 温度 80°C	After 2 Hours Recovery 1. No Visual Damage 2. Frequency Tol. $\leq 5\%$	pass
E5	Thermal Shock	GB / T 2423.22 - 2008 - 40°C (30 minutes) to + 80°C (30 minutes); Cycles: 24-40°C	After 2 Hours Recovery 1. No Visual Damage 2. Frequency Tol. $\leq 5\%$ 频率偏移 $\leq 5\%$	pass
R1	Aging test	GB / T 2423.2-2008 Temp: 80°C; Time: 24 hours	After 2 Hours Recovery 1. No Visual Damage 2. Frequency Tol. $\leq 5\%$	pass
M1	RoHS	With Reference to IEC 62321: 2008 with flow chart	Directive RoHS 2015/863/EU	pass

packing specifications

Product name / specification:

1、 labeling requirement

Purchase order number	*****
material code	*****
Product name specification	*****
Quantity	*****
remarks	*****

Purchase order number	*****
material code	*****
Product name specification	*****
Quantity	*****
remarks	*****

2、 The packing requirements

job description :

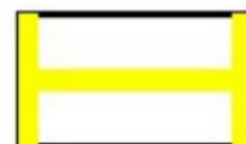
1). inner packing:

Product___PCS in a small bag

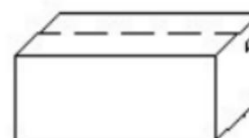


2). external packing:

Determine the quantity / box according to the actual quantity



carton



3、 matters need attention:

- Whether to add a partition board, pearl cotton;
- Attachment of labels, such as ROHS;