

Bei Si
Sample acknowledgment
Parts Approval Sheet

Supplier:	<u>NQI</u>	Parts Name:	<u>BT-R Antenna</u>
Type/Spec:	<u>ES1</u>	Parts NO:	<u>NQI-ES1-BT-R-FB-V9</u>
Brand:	<u>NQI</u>	Quantity:	<u>JS-11300286</u>
Send out Date:	<u>2023/11/29</u>	Document No:	<u>NQI-RD-SPEC-20231119</u>
Approve Date:	<u></u>	Version:	<u>V9</u>

Supplier		Customer	
Approved By	Prepared By	Engineering Dept	Quality Dept

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A. Samples and instructions



(Electrical Specifications)		
frequency	range	(2400-2500)MHz
(Frequency range)		
characteristic impedance	50 ohm	
(impedance)		
voltage standing-wave ratio	≤ 3	
(VSWR)		
Peak gain	1.01dBi	
(Gain)		
Polarized form	level	
(Polarization)		
radiation direction	omnidirectional	
(Radiation direction)		
Connection Mode Description		
connector	/	
(connector)		
Cable specifications	/	
(Cable specifications)		
Working/Storage temperature		
working temperature	$-30^{\circ}\text{C} \sim 65^{\circ}\text{C}$	
(Working temperature)		
storage temperature	$-30^{\circ}\text{C} \sim 75^{\circ}\text{C}$	
(Storage temperature)		

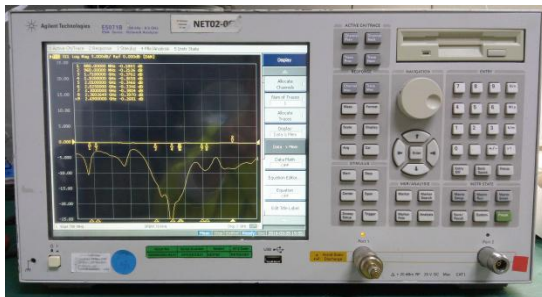
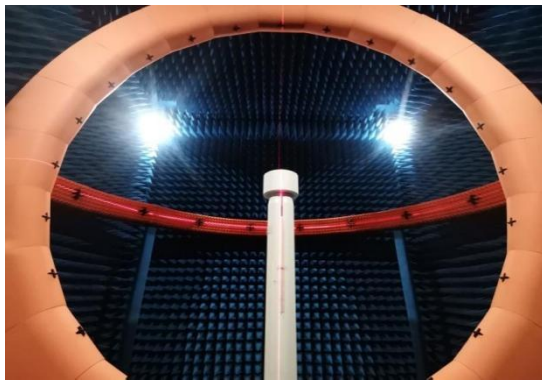
Assembly



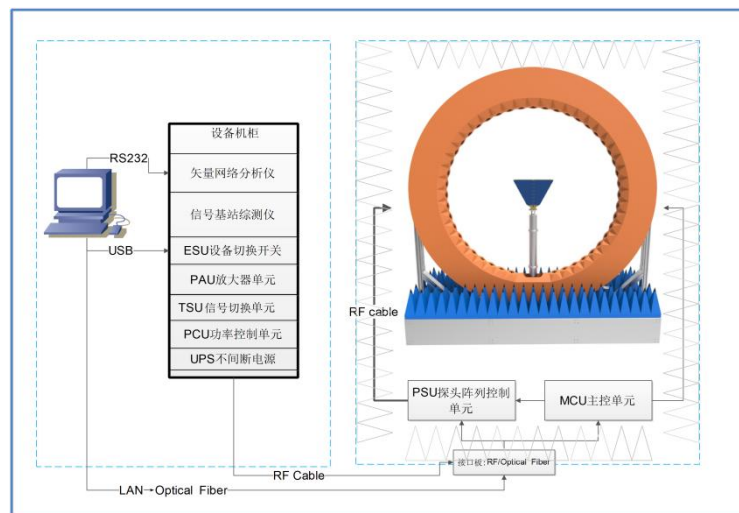


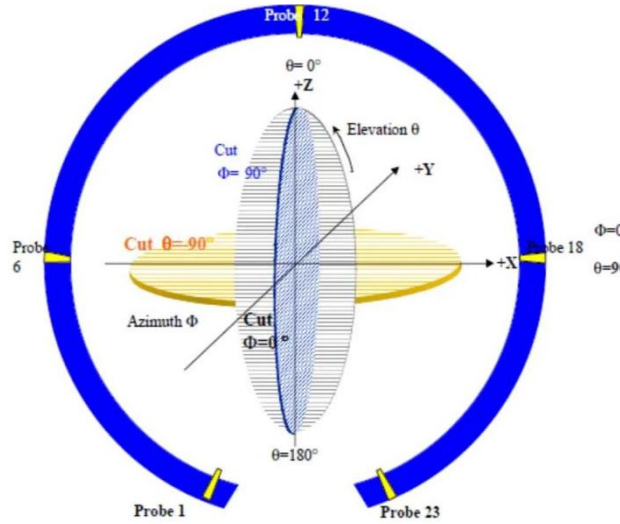
B. Test the equipment and the items:

(Class)	(Test item)	(Equipment)
1. S parameter	1. return loss (RL) 2. standing-wave ratio (VSWR) 3.The original Smith (Smith chart)	Net points (VNA) : Agilent E5071B R&S ZVB8 Protek A333
2. Coupling test (Coupling testing)	1. transmitting power (MAX Power) 2. receiving sensitivity (MIN Sens)	1.2G/3G Tester: Agilent 8960 2.The coupling box: TESCOM TC-5060A 3. 3D Chamber: ETS 3D Chamber (5x3x3)
3. 3D passive test (Passive Test)	1.efficiency (Effeciency) 2. gain (Gain) 3.radiation pattern (Radiation pattern)	1. 3D Chamber: TEM24 3D Chamber (5x5x5) ETS 3D Chamber (5x3x3) 2. 网分 (VNA) : Agilent E5071B R&S ZVB8
4.3D Active Test (Active Test)	1. 3D power (TRP) 2.3D sensitivity (TIS) 3.throughput rate (Throughput rate)	1. 3D Chamber: TEM24 3D Chamber (5x5x5) ETS 3D Chamber (5x3x3) 2.2G/3G Tester: Agilent 8960 3.4G Tester: MT8820C/CMW500 4.WIFI/BT/NB-iot Tester: CMW500 5. 5G Tester: SP9500-CTS 6.Head: HEAD-P10 (FACE-P10)

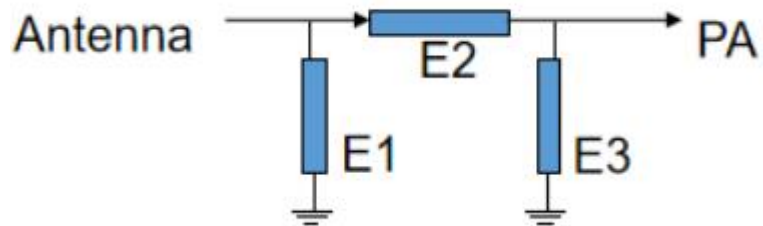


C.Dark room (chamber) connection and coordinates:





D.Antenna matching network (Antenna matching network) :



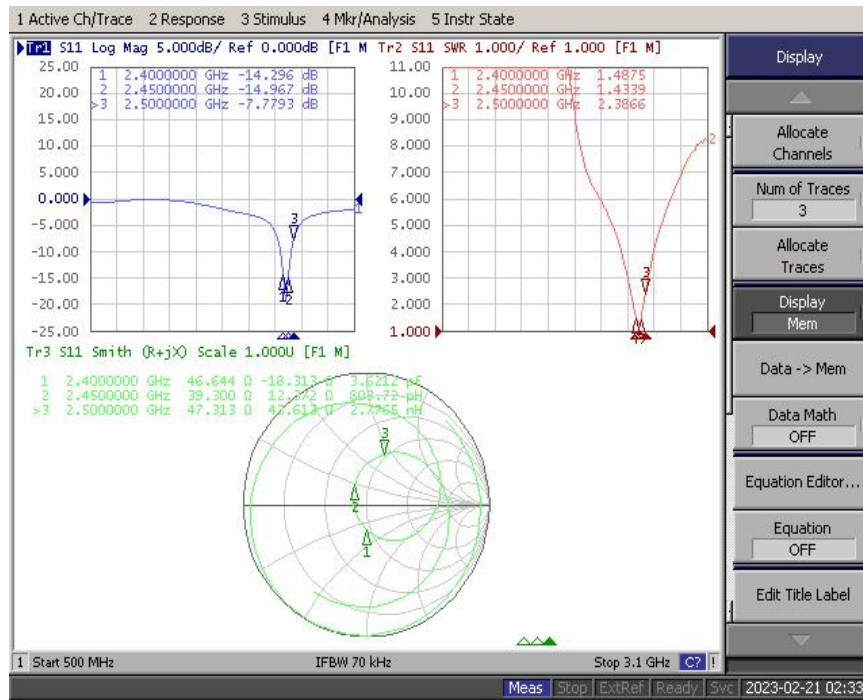
R	Element	(Value)
	E1	NC
	E2	3.3NH
	E3	NC



E. Electrical performance test data of the antenna :

E. 1. Antenna passive parameter

E.1.1. Antenna echo loss / standing wave ratio / Smith circle plot (RL/VSWR/Smith Chant)



E. 1. 2. Antenna efficiency / gain (Effeciency/Gain) free space

Frequency	Efficiency	MAXGain
MHz	%	dB
2400	29.6	1.01
2410	30.29	0.8
2420	31.16	0.86
2430	29.12	0.46
2440	29	0.31
2450	27.78	-0.1
2460	26.82	-0.43
2470	25.49	-0.86
2480	24	-1.37
2490	23.71	-1.61
2500	22.48	-1.88

headform

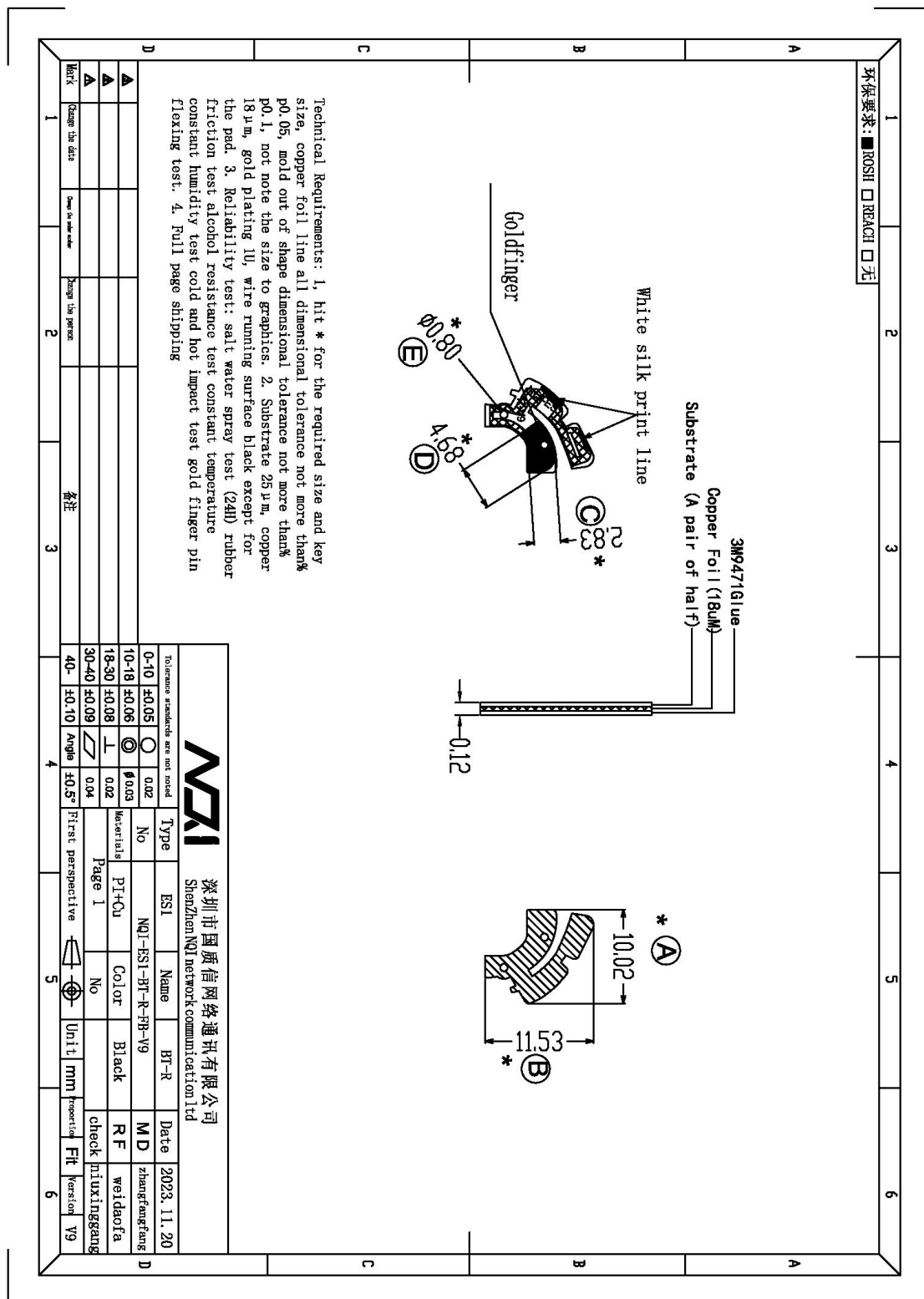
Frequency	Efficiency	MAXGain
MHz	%	dB
2400	10.77	-3.25
2410	9.47	-3.43
2420	9.63	-3.56
2430	8.11	-4.07
2440	8.2	-4.18
2450	7.55	-4.66
2460	7.56	-5.05
2470	7.04	-5.23
2480	6.6	-5.45
2490	6.55	-5.75
2500	5.92	-5.94

E. 2Antenna active parameters

E. 2.1 TRP/TIS

	#	Type	Band	Channel	5# Total	6# Total	8# Total
NQi Head model	1	TRP	BLUETOOTH	0	0.06	1.63	0.63
	2	TRP	BLUETOOTH	39	1.54	2.46	2
	3	TRP	BLUETOOTH	78	1.83	2.3	3.03
	4	TIS (EIRP)	BLUETOOTH	0	-81.3	-84.46	-83.63
	5	TIS (EIRP)	BLUETOOTH	39	-82.54	-84.32	-84.06
	6	TIS (EIRP)	BLUETOOTH	78	-85.48	-85	-86.04
	#	Type	Band	Channel	5# Total	6# Total	8# Total
baseus Head model	1	TRP	BLUETOOTH	0	-3.95	-5.57	-4.39
	2	TRP	BLUETOOTH	39	-2.85	-4.28	-3.51
	3	TRP	BLUETOOTH	78	-3.11	-4.55	-4.55
	4	TIS (EIRP)	BLUETOOTH	0	-80.59	-80.05	-81.67
	5	TIS (EIRP)	BLUETOOTH	39	-81.81	-81.13	-82.54
	6	TIS (EIRP)	BLUETOOTH	78	-82.12	-81.45	-82.51
	#	Type	Band	Channel	5# Total	6# Total	8# Total
NQi free space	1	TRP	BLUETOOTH	0	5.42	4.94	3.96
	2	TRP	BLUETOOTH	39	7.33	7.19	6.34
	3	TRP	BLUETOOTH	78	8.53	8.15	8.55
	4	TIS (EIRP)	BLUETOOTH	0	-86.77	-87.65	-86.75

F. Antenna structure drawing:



G. Antenna packaging drawings:

Packing instruction book									
Stage name: PCS inspection package		Product number: B51		Effective time: 2025.11.23		Version: A			
Product name: BT-R		No: /		Page number: 1		Page total: 1 page			
Typography		Materials:							
		NO	PART NUMBER	PART NAME	QTY	VENDOR	NOTE		
		1	/	/	/	/	/		
		Use tool's and equipment:							
		Finger Gloves							
		Operation Steps							
		1: Check the appearance of the products that there is mold, scratches, copper leakage, poor printing and other undesirable phenomena							
		2: Key dimension inspection (see engineering drawing)							
		3: The products arranged in PE bag according to the rule if it is found to be defective, remove the defective product;							
		4: Mass output goods to be packed, affixed to the outer box label, in full location requirements consistent.							
Points to note:		1: It is forbidden to have crease, fracture, copper leakage, poor gold plating and serious size problems during appearance detection; 2: The material number and quantity corresponding to each product shall be indicated;							
Made:	He Ping	checked:		hejian	Approved		Yang Xiaoyin		



H.Key dimension inspection report:

Dimension inspection report									
customer)	Bei Si		Project		ES1				
材质 (material)	FPC		Environmental protection		☒				
			Non-environmentally friendly		☐				
外观检查项目 (Appearance Inspection Items)	☐ 漏漆 (Paint leakage)		☐ 断线 (Off line)		☐ 短路 (Short)				
	☐ 划伤 (Scratch)		☐ 脏污 (Dirt)		☐ 开裂 (cracking)				
	不良数 (Number of bad) :		0		☐		轻微 (Slight)		☐
			严重 (Serious)		☐		致命 (Deadly)		☐
外观判定结果 (Appearance judgment result) : 合格 (ok) ☒ 不合格 (NG) ☐									
Functional or dimensional inspection records									
NO	检查序号 (Serial number)	尺寸公差 (Size tolerance)	检查结果 (Result)					检测仪器 (Equipment)	判定 (determine)
			1	2	3	4	5		
FPC	A	10.02±0.2	10.03	10.04	10.05	10.01	10.02	DN	OK
	B	11.53±0.2	11.54	11.55	11.56	11.52	11.51	DN	OK
	C	2.83±0.2	2.84	2.85	2.86	2.82	2.81	DN	OK
	D	4.68±0.2	4.69	4.7	4.71	4.67	4.66	DN	OK
	E	0.8±0.05	0.8	0.8	0.8	0.8	0.8	DN	OK
	总体判定: 合格 (ok) ☒ 不合格 (NG) ☐			不合格处理方式 (Treatment of nonconforming products) :					
			返工 (rework) ☐ 特采使用 (For the temporary use) ☐						
计量仪器代号说明 (Description of measuring instrument code) : 投影仪 (Projector)-PP 塞规 (Plug gauge)-PG 高度规 (Height gauge)-HG 角度规 (Angle gauge)-AG 游标卡尺 (Vernier caliper)-N 数显卡尺 (Digital caliper)-DN 外径千分尺 (Outside micrometer)-M									



I.Environment and reliability test:

I.1.Salt spray test report

ShenZhen NQI network communication ltd

Salt spray test report

Product name	BT-R antenna	Sample Q'ty	2PCS	Test date	2023/11/28						
Customer	Bei Si	Part/No.	NQI-BS1-BT-R-F8-V9	Product spec.	FPC						
Test time	≤8H ≤12H ≤24H ≤48H ≤72H										
Test Item	Salt spray test										
Test Requirement											
Condition items		Setting		Reference							
Concentration of salt solution		5±1%		GB/T10125-1997							
PH of salt solution		6.5-7.2									
Test room Temperature		35±2℃									
Salt solution barrel temperature		35±2℃									
Saturated air barrel temperature		47±1℃									
Test room relative humidity		85±2%RH									
Pressure of compressed air		1.00±0.01MPa/CMP									
Sample place angle		15-30°									
Collected volume of salt spray		1.0-2.0ml (80cm²/H)									
Result of measurement											
1. Test diagram & test method											
Pre-test sample		Sample after test		Result determination							
				合格 不合格 特采							

Controlled form: NQI-ST-01

Producer: zhangfangfang

Checked: weidaofa

Approval:

niuxinggang



I.2.Cryogenic storage test

ShenZhen NQI network communication ltd			
Cryogenic storage test report			
Report date of November 25, 2023		Report no: 20231125-1	
Product name	BT-R antenna	No	NQI-BS1-BT-R-FB-V9
PART NAME ATION		CUSTOMER P/N	
Customers	Bei Si	Number of tests	2PCS
CUSTOMER		CHECK QTY	
Test criteria	Enterprise standards	Test time	2023/11/22 2023/11/25
TEST STANDARD		THE TEST OF TIME	
一. Test conditions/methods The samples were stored at $-40 \pm 3^{\circ}\text{C}$ for 48 hours and at room temperature for 2 hours.			
二. Criteria After the test, to meet the following requirements, that is, qualified; 1.FPC appearance no discoloration, foaming, ink off, deformation, viscosity unchanged; 2.Voltage standing wave ratio (VSWR) test qualified			
三. Test results Description of test results 1.The overall appearance of the sample is good, FPC appearance no discoloration, blistering, coating off, deformation; 2.The test waveform is consistent with the seal sample.			
FINAL RESULT	PASS	REJECT	
Inspector	Lo Wing-sau	check	Chen Yicai
INSPECTOR		CHECKED BY	

The form number: WI-QC-036/B01/A0

I.3.Test photos

IV. Test photos				
1.Pre-test sample		2. Test photos		
3. Test diagram		4.Graphic representation of the post-test samples		
五. The test involves equipment information				
Serial number	The name of the device	Specifications and models	Calibration date	Time for next calibration
1	He constant temperature and humidity	LK-1506	2023.1.26	2024.1.25

End of report