Customer : LG

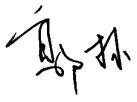
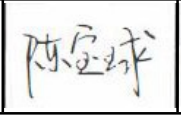
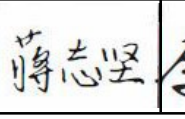
Approval No.		ISSUE	2.0

Specifications for Approval

Product Name	:	16Z90Q ANTENNA , ASSY
Vendor Model Name	:	LUXSHARE-ICT
Customer Part No.	:	EAA65976801
Vendor P/N	:	L1LRF008-CS-H

Condition : 1. _____
2. _____
3. _____
4. _____

The product above is approved.

	Category	Checked	Reviewed	Agreed	Approved
LG MC Approval	Name				
	Signature				
Vendor Approval	Category	Designed	Checked	Agreed	Approved
	Name	郭林	陈宝球	蒋志坚	李坤松
	Signature				

Vendor Name :LUXSHARE-ICT

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XianMao Road, Economic Development Zone, Bo zhou City, Anhui Province, 236800, China
Building A, West Sanyo New Industrial Zone, oyster I, Shajing Street, Baoan District, S henzhen,China

History of Revision

Revision	Date	Item	Contents of Revision Change	Basis
ISSUE 1.0	2022.03.14		Initial Release	NA
ISSUE 2.0	2022.11.25		Add performance data	

SPECIFICATION

Test items

1) Apperance and structure check

Check item	Judgement
Visual Inspection	The shape, structure, and color should be consistent with the limit sample and related specifications
Standard	These defects should not be allowed such as damage, correosion, sink, scratches, etc.

2) Dimension Check : Measuring improtant dimensions

Dimensions should meet the requirements of the acknowledgment

3) Mate / Unmating Force : mate connector with a suitable gauge at rate of 25±3 mm/min.

measure force when gauge reaches surface of connector.

mating Force	unmating Force
30N (or 3000g) Max	5 ~ 20 N (or 500g ~ 2000g) 3 ~ 20 N (or 300g ~ 2000g) Final 30 Cycles

4) Disintegration : Parts are allowed to be chiseled, not inserted, dirty etc.

soldering state of PCB like cold welding, less welding, over welding are not allowed. The length of the parts should be suitable.

and parts can not be touched each other.

5) Tape adhesion : Double Sided tape should be not sliped

should be satisfied standard specification.

6) VSWR

Test equipment : Network Analyzer equipment

Frequency(unit MHz)	MAIN	AUX
VSWR	2.000-2.300GHz＞4 2.600-3.400GHz＜6 5.800-6.000GHz＜5	1.500-1.800GHz＞6 2.350-2.800GHz＜6 5.100-6.000GHz＜6

SPECIFICATION

Test items

7) Gain

Test equipment : Network Analyzer equipment

Frquency(MHZ)	Efficiency(%)
2400	>30
2450	>30
2500	>30
5150	>30

8) Thermal Shock

Condition	Temperature : 85℃ (30min), -40℃ (30min) 10 Cycles. Being Placed 2 Hours
Judgement	Product's mechanism and VSWR should be OK.

9) High Temperature

Condition	Temperature : 80℃, 96H, Being Placed 2 Hours.
Judgement	Product's mechanism and VSWR should be OK.

10) Low Temperature

Condition	Temperature : -20℃, 96H, Being Placed 2 Hours.
Judgement	Product's mechanism and VSWR should be OK.

SPECIFICATION

Test items

12) High Temperature and humidity test

Condition	Temperature : 40℃, Humidity : 90 – 95% 96H, Being Placed 2 Hours.
Judgement	Product's mechanism and VSWR should be OK.

13) Virbration Test

Condition	Class V3 [0.27 Grms, 10-500Hz, 50min, Per 3 axes (X,Y,Z)]
Judgement	Product's mechanism and VSWR should be OK.

14) Drop Test

Condition	Height : 100cm to Iron Plate (Thickness : 5mm or more) one edge/Three corners/six faces are once total : 10 times
Judgement	there should be no crack and or damage parts.

	Main			Aux		
Frequency (MHz)	Peak gain (dBi)	Efficiency (dB)	Efficiency (%)	Peak gain (dBi)	Efficiency (dB)	Efficiency (%)
2400	6.3298	-2.9922	50.2088	0.9119	-9.1282	12.2229
2450	5.7031	-4.1167	38.7552	1.5722	-7.1289	19.3689
2500	2.7066	-6.6312	21.7211	3.4903	-5.1072	30.852
5150	-1.4674	-9.222	11.9618	2.2777	-6.1498	24.267
5400	3.4326	-5.9354	25.4954	4.4876	-5.0209	31.4707
5850	3.3018	-6.6153	21.8009	5.7593	-4.0076	39.7408
5925	2.8908	-7.4796	17.8666	4.7433	-4.8034	33.0871
6525	3.4086	-5.0845	31.0134	1.3063	-7.5834	17.4447
7125	-4.9461	-12.5375	5.5751	-1.6495	-10.2889	9.3564

Regulatory WLAN Antenna Information

1.Storage Condition:

Temperature	-40 to +70℃
Humidity	20 to 65 %RH

2. Operating Condition:

Temperature	-40 to +70℃
Humidity	10 to 85%RH

3.Electrical Specification:

Those specifications were specially defined for **LG 16Z90R** WIFI model, and all characteristics were measured under the model's handset testing jig.

3-1. Frequency Band:

Frequency Band	MHz
WIFI/BT	2400~2500&5100~5800&5925~7125

TOLERANCE(UNLESS SPECIFIED)	
*X	±0.5
*X.X	±0.25
*X.XX	±0.10
*X.XXX	±0.05
UNITS:	mm

CUSTOMER P/N: XXXXXXXXXXX

APPD:

CHKD:

DRAW: JACK

LUXSHARE-ICT

TITLE: 16Z90R ANTENNA, ASSY

PART NO: LILRF013-CS-H

SCALE	SHEET	SIZE	REV
1:1	1/1	A4	X2

3-2. Impedance

50 ohm nominal

3-3. Matching circuit

None

3-4.VSWR

4-4.1 Measuring Method

1.A 50Ω coaxial cable is connected to the antenna. Then this cable is connected to a network analyzer to measure the VSWR

2.Keeping this jig away from metal at least 20cm

4-4.2 Measurement frequency points and VSWR value

VSWR	Frequency (Unit MHz)	Spec	Open
Main Antenna	2400	≤3.5	1.2
	2500	≤3.5	2.4
	5150	≤4.0	1.9
	7125	≤4.0	3.5
	Judgement	ok	
Aux Antenna	2400	≤3.5	1.7
	2500	≤3.5	1.8
	5150	≤4.5	2.4
	7125	≤4.5	3.0
	Judgement	ok	

TOLERANCE(UNLESS SPECIFIED)		CUSTOMER P/N: XXXXXXXXXXX	LUXSHARE-ICT			
*X	±0.5					
*X.X	±0.25					
*X.XX	±0.10	APPD:	TITLE: 16Z90R ANTENNA, ASSY			
*X.XXX	±0.05					
UNITS:	mm	CHKD:	PART NO: LILRF013-CS-H			
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				1:1	1/1	A4	X2

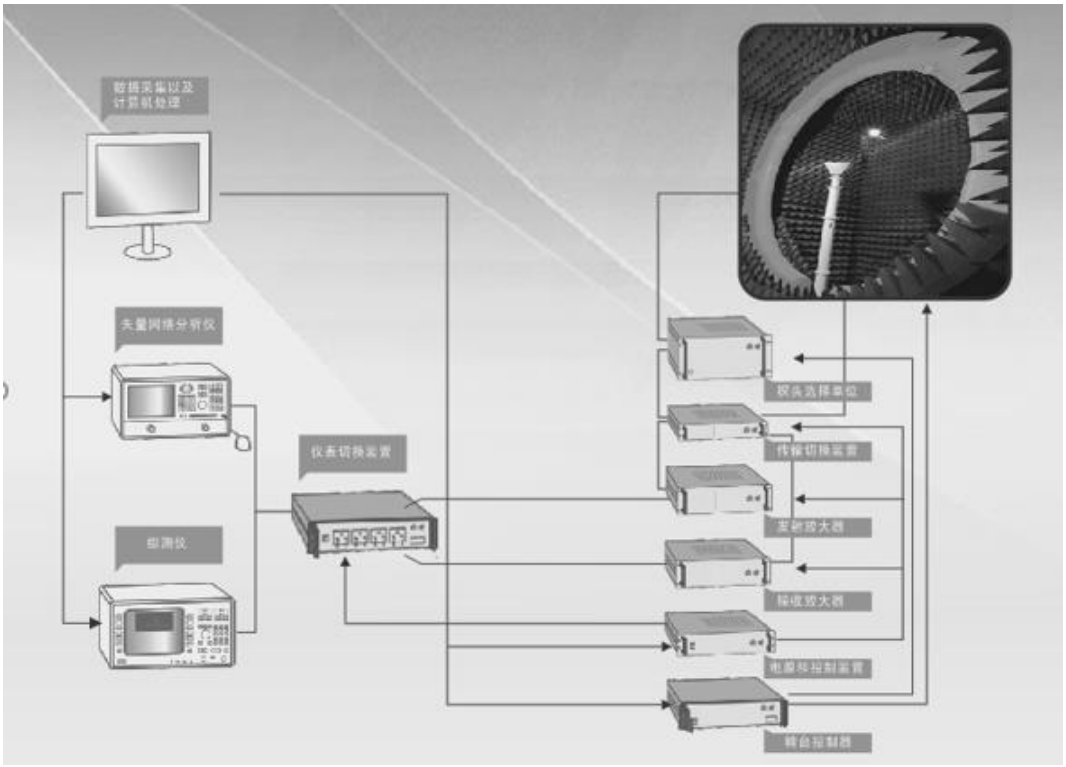
3-5. Efficiency and Gain

3-5.1 Measure method

1. Using a low loss coaxial cable to link a standard handset jig
2. Fixed this handset jig on chamber's rotator plane
3. Linking jig into network analyzer port and using a probing horn antenna to collect data.
4. Using another standard gain horn antenna to calibrated those data

3-5.2 Chamber definition

1. Test setup



2.Equipment list

Number	Device	Type/Model	Serial	Manufacturer	Cal. Date	Cal. Due Date
1	EMT24 Chamber	EM-testing	1603000653	EMT	2021/9/30	2023/12/31
2	Turntable control box	EM-testing	1603000653	EMT	2022/11/1	2022/12/31
3	Turntable control computer	EM-testing	1603000653	EMT	2022/11/1	2022/12/31
4	Tx/rx RF power and its control unit	EM-testing	1603000653	EMT	N/A	N/A
5	Probe switch array	EM-testing	1603000653	EMT	N/A	N/A
6	Test system host	EM-testing	1603000653	EMT	N/A	N/A
7	Network analyzer	E5071C	1603000653	EMT	2021/12/31	2022/12/31
8	RF line TX	EM-testing	1603000653	EMT	N/A	N/A
9	RF line RX	EM-testing	1603000653	EMT	N/A	N/A
10	UPS uninterruptible power supply	Castle	1603000653	EMT	N/A	N/A
11	24 Probe Antenna	EM-testing	1603000653	EMT	2022/11/1	2023/12/31
12	Cable 3m 400MHz~8.5GHz	EM-testing	1603000653	EMT	2021/9/30	2023/12/31

TOLERANCE(UNLESS SPECIFIED)		CUSTOMER P/N: XXXXXXXXXXX	LUXSHARE-ICT				
*X	±0.5						
*X.X	±0.25	APPD:	TITLE: 16Z90R ANTENNA, ASSY				
*X.XX	±0.10						
*X.XXX	±0.05	CHKD:	PART NO: LILRF013-CS-H				
UNITS:	mm						
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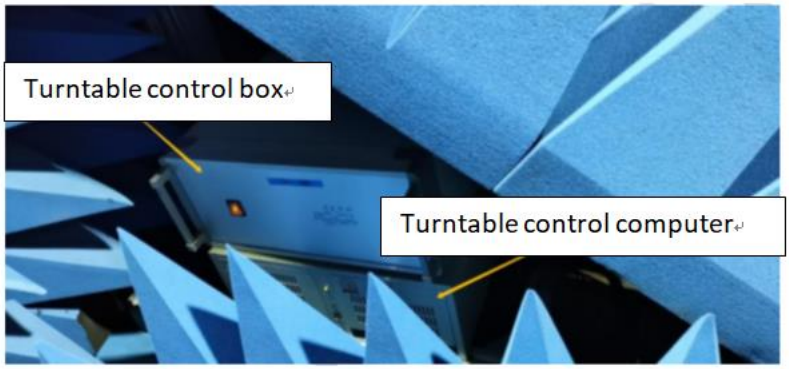
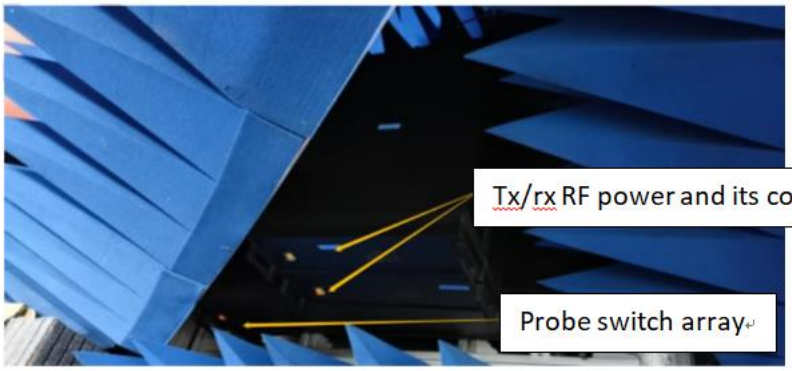
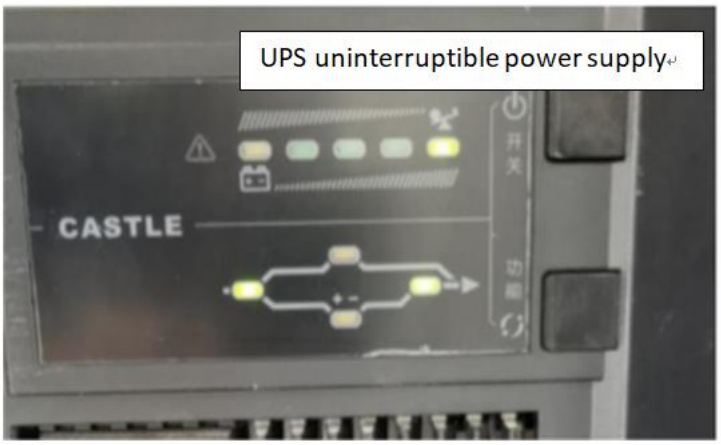
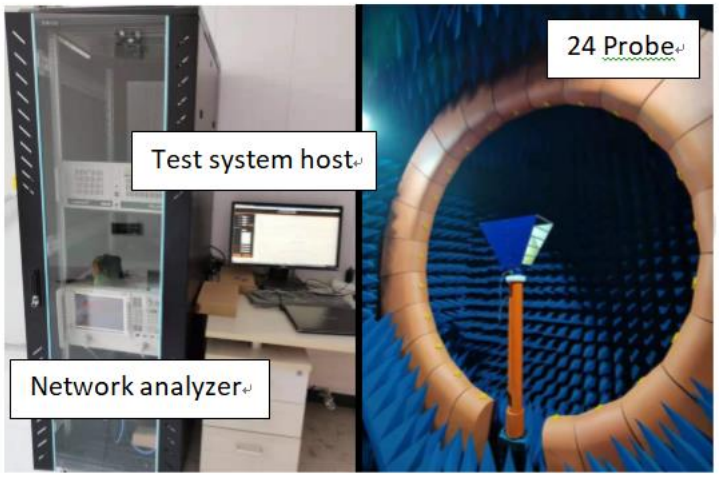
				1:1	1/1	A4	X2

3.Setup photo









TOLERANCE(UNLESS SPECIFIED)		CUSTOMER P/N: XXXXXXXXXXX	LUXSHARE-ICT			
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*X.X	±0.25	APPD:	TITLE: 16Z90R ANTENNA, ASSY			
*X.XX	±0.10					
*X.XXX	±0.05	CHKD:	PART NO: LILRF013-CS-H			
UNITS:	mm					
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				1:1	1/1	A4	X2

3-5.3 Efficiency and Gain

Antenna gain is marked (dBi)and is based on STANDARD HORN antenna. The data shows Peak Gain and Average Gain.

3-5.3-1 Electrical specification

Frequency (MHz)	Average Efficiency(%)
2400~2500	>30
5100~5825	>30

3-5.3-2 Efficiency and Gain Test Data

Frequency(MHz)	Main Antenna		
	Peak Gain(dBi)	Efficiency(dB)	Efficiency(%)
2400	4.0	-4.0	39.6
2450	4.1	-3.7	42.7
2500	4.3	-4.9	32.7
5150	3.0	-4.5	35.7
5400	2.6	-4.4	36.0
5850	4.2	-4.6	34.9
5925	4.4	-4.7	34.2
6525	2.3	-4.4	36.7
7125	2.5	-4.8	33.1

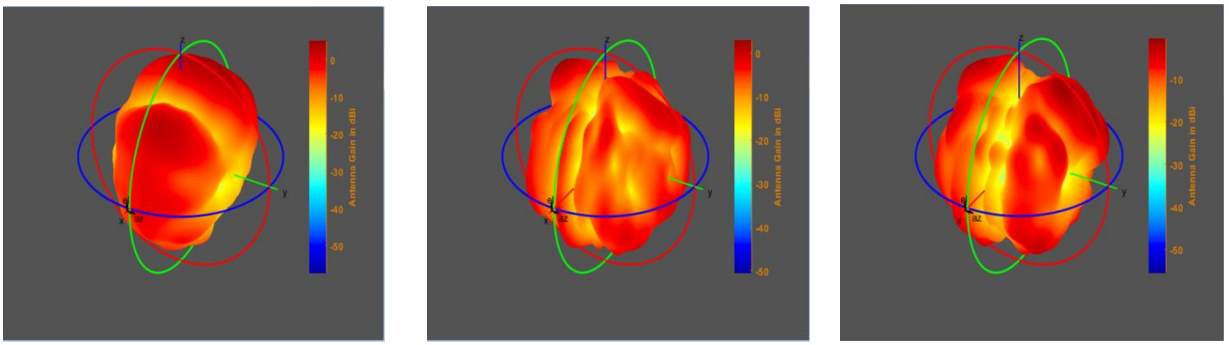
Frequency(MHz)	Aux Antenna		
	Peak Gain(dBi)	Efficiency(dB)	Efficiency(%)
2400	2.6	-3.6	43.2
2450	2.2	-3.4	46.1
2500	2.4	-4.4	36.3
5150	3.6	-4.7	34.2
5400	4.4	-4.8	33.0
5850	4.0	-4.7	34.0
5925	4.3	-4.6	34.6
6525	2.6	-4.9	32.2
7125	3.2	-4.7	34.1

TOLERANCE(UNLESS SPECIFIED)	
*X	±0.5
*X.X	±0.25
*X.XX	±0.10
*X.XXX	±0.05
UNITS:	mm

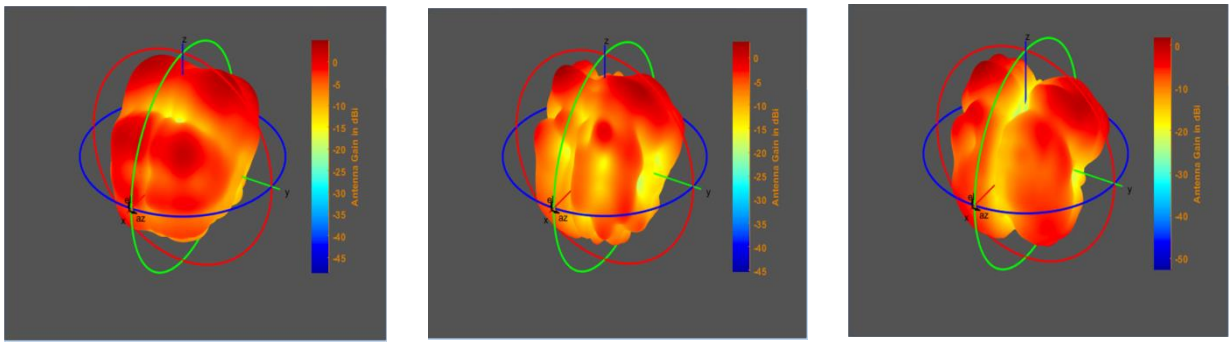
CUSTOMER P/N: XXXXXXXXXXX	LUXSHARE-ICT				
APPD:	TITLE: 16Z90R ANTENNA, ASSY				
CHKD:	PART NO: LILRF013-CS-H				
DRAW: JACK		SCALE	SHEET	SIZE	REV
		1:1	1/1	A4	X2

3-5. 3-3 Antenna 3D Radiation Pattern

Main Antenna



AUX Antenna



TOLERANCE(UNLESS SPECIFIED)		CUSTOMER P/N: XXXXXXXXXXX	LUXSHARE-ICT			
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*X.X	±0.25					
*X.XX	±0.10	APPD:	TITLE: 16Z90R ANTENNA, ASSY			
*X.XXX	±0.05					
UNITS:	mm	CHKD:	PART NO: LILRF013-CS-H			
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				1:1	1/1	A4	X2