

客戶名稱 : LG 17Z90Q  
CUSTOMER

Document No.: \_\_\_\_\_

Approval Sheet Rev.:   A0  

Spec. Rev. :           

# 承認書

## APPROVAL SHEET

產品品名/Product Model  
No. :

WA-P-LELE-04-011

客戶料號/Customer No. :

EAA65976901

發行日期/ Issue Date :

2021/08/30

承認日期/ Approved Date :

Approved by customer: (signing or stamping here)



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# WA-P-LELE-04-011 Specification

## 1. Explanation of part number :

WA    -    P    -    LELE    -    04    -    011  
 (1)        (2)        (3)        (4)        (5)

(1) Product Type : Wireless Antenna

(2) PCB: PCB

(3) Frequency : 2400~2500MHz&5100~5800MHz&5925~7125MHz

(4) Coaxial Cable Type : With  $\phi$  0.81 Main Black / AUX Gray

(5) Suffix : 011

## 2. Storage Condition:

Temperature                      -40 to +70°C  
 Humidity                              20 to 65 %RH

## 3. Operating Condition:

Temperature                      -40 to +70°C  
 Humidity                              10 to 85 %RH

## 4. Electrical Specification :

*Those specifications were specially defined for LG 17Z90Q WIFI model, and all characteristics were measured under the model's handset testing jig .*

### 4-1. Frequency Band:

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

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DESIGNED BY : 胡志清	APPROVED BY : 徐克文		
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## 4-2. Impedance

50 ohm nominal

## 4-3. Matching circuit

None

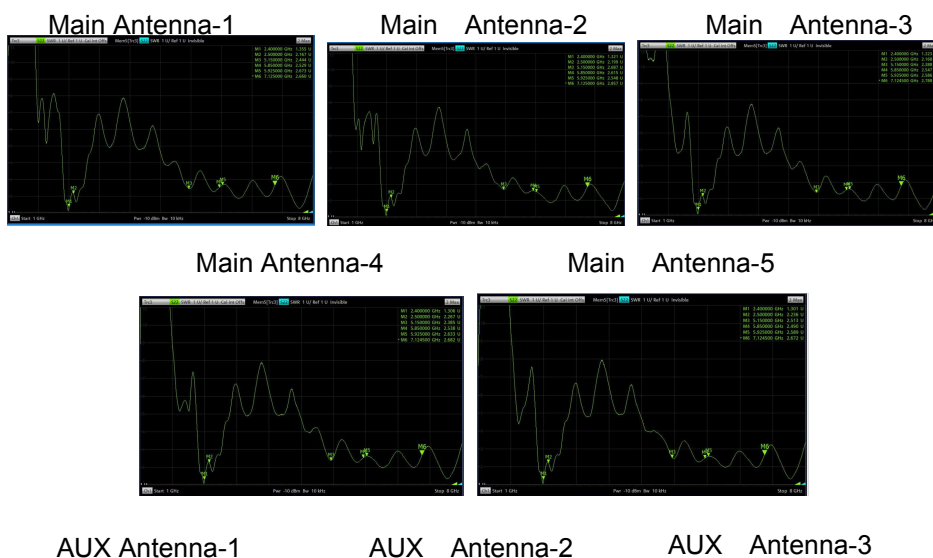
## 4-4. VSWR

### 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	1	2	3	4	5
Main Antenna	2400	≤3.5	1.3	1.3	1.3	1.3	1.3
	2500	≤3.5	2.1	2.1	2.1	2.2	2.2
	5150	≤4.0	2.4	2.6	2.3	2.3	2.5
	7125	≤4.0	2.6	2.8	2.7	2.6	2.6
	Judgement			ok	ok	ok	ok
Aux Antenna	2400	≤3.5	2.0	2.2	2.0	2.0	2.0
	2500	≤3.5	1.6	1.6	1.7	1.8	1.7
	5150	≤4.5	2.6	2.6	2.6	2.5	2.6
	7125	≤4.5	2.3	2.2	2.2	2.2	2.3
	Judgement			ok	ok	ok	ok



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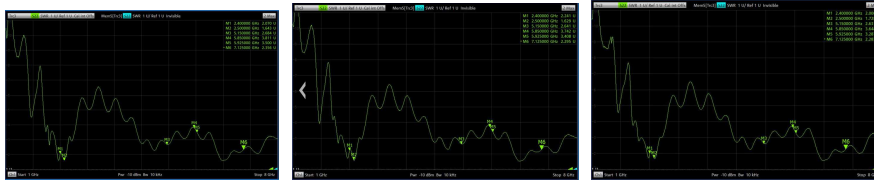
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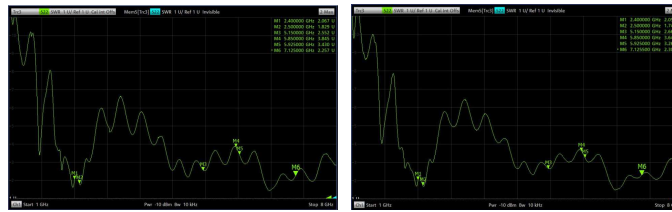
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AUX Antenna-4

AUX Antenna-5

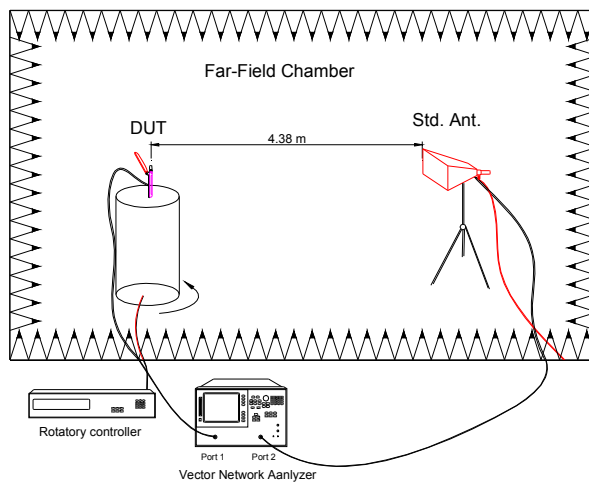


## 4-5. Efficiency and Gain

### 4-5.1 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

### 4-5.2 Chamber definition



1. An anechoic chamber (8mx4mx3.5m) which satisfied far-field condition was applied to avoid multi-path effect
2. The quite room region is 40cmx40cmx40cm at the center of rotator
3. The distance between DUT and standard antenna is 4.38 m
4. Probing antenna (9120D horn antenna) and standard gain horn antenna (BBHA9120 LPF 700MHz ~6GHz)

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### 4-5.3 Efficiency and Gain

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

#### 4-5-3-1 Electrical specification

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

#### 4-5.3-2 Efficiency and Gain Test Data

Frequency(MHz)	Main Antenna-1			Main Antenna-2			Main Antenna-3		
	Peak Gain (dBi)	Efficiency (dBi)	Efficiency(%)	Peak Gain (dBi)	Efficiency (dBi)	Efficiency(%)	Peak Gain (dBi)	Efficiency (dBi)	Efficiency(%)
2400	2.2	-5.0	31.3	2.0	-5.1	31.2	2.3	-4.9	32.4
2450	3.0	-4.7	33.7	2.9	-4.8	33.4	3.1	-4.8	33.4
2500	2.7	-5.1	31.1	2.6	-4.8	32.9	2.6	-4.7	33.5
5150	4.1	-4.2	38.3	4.3	-4.0	39.4	4.3	-4.1	38.9
5400	4.0	-4.1	39.0	4.1	-4.2	38.4	3.8	-3.8	41.3
5850	3.7	-4.1	38.9	3.7	-4.3	37.1	3.7	-4.2	37.8
5925	3.5	-4.3	37.0	3.7	-4.2	38.1	3.4	-4.7	34.2
6525	2.7	-4.6	34.6	2.6	-4.6	35.0	2.9	-4.6	34.9
7125	2.5	-4.8	33.2	2.6	-4.7	33.7	2.5	-4.9	32.2
Frequency(MHz)	Main Antenna-4			Main Antenna-5					
	Peak Gain (dBi)	Efficiency (dBi)	Efficiency(%)	Peak Gain (dBi)	Efficiency (dBi)	Efficiency(%)			
2400	2.2	-4.9	32.1	2.1	-5.0	31.8			
2450	2.9	-4.8	33.4	2.8	-4.7	34.1			
2500	2.6	-4.8	32.8	3.6	-4.7	33.5			
5150	4.1	-4.1	38.7	3.8	-4.3	37.4			
5400	3.8	-4.1	38.9	3.9	-4.2	38.4			
5850	3.5	-4.4	36.5	3.6	-4.5	35.6			
5925	3.1	-4.5	35.7	3.3	-4.7	34.1			
6525	2.9	-4.9	32.0	2.7	-4.7	33.9			
7125	2.3	-4.7	33.6	2.5	-4.6	34.8			

Frequency(MHz)	AUX Antenna-1			AUX Antenna-2			AUX Antenna-3		
	Peak Gain (dBi)	Efficiency (dBi)	Efficiency(%)	Peak Gain (dBi)	Efficiency (dBi)	Efficiency(%)	Peak Gain (dBi)	Efficiency (dBi)	Efficiency(%)
2400	1.1	-4.8	32.8	1.2	-5.0	31.6	1.3	-4.9	32.5
2450	1.6	-4.6	34.8	1.5	-4.9	32.4	1.7	-4.9	32.6
2500	1.5	-4.7	33.7	1.6	-4.7	33.8	1.4	-5.1	31.0
5150	3.8	-5.0	31.7	3.5	-4.8	33.3	3.5	-5.0	31.6
5400	3.7	-4.7	34.1	3.7	-4.7	33.9	3.7	-4.9	32.6
5850	3.3	-4.7	33.7	3.2	-4.6	34.4	3.3	-4.7	33.7
5925	3.2	-4.9	32.4	2.3	-5.0	31.8	3.3	-4.9	32.6
6525	2.5	-4.9	32.6	2.4	-4.9	32.2	2.7	-5.0	31.3
7125	2.1	-5.2	30.4	2.2	-4.7	33.7	2.2	-4.8	32.8
Frequency(MHz)	AUX Antenna-4			AUX Antenna-5					
	Peak Gain (dBi)	Efficiency (dBi)	Efficiency(%)	Peak Gain (dBi)	Efficiency (dBi)	Efficiency(%)			
2400	1.2	-5.0	31.7	1.3	-5.1	30.8			
2450	1.5	-4.9	32.5	1.5	-4.9	32.5			
2500	1.3	-4.8	33.4	1.3	-5.0	31.8			
5150	3.8	-5.0	31.7	3.7	-4.8	32.8			
5400	3.5	-4.8	32.8	3.6	-4.7	33.7			
5850	3.5	-4.7	34.1	3.4	-4.7	33.8			
5925	3.0	-4.8	33.2	3.1	-4.7	33.5			
6525	2.4	-4.8	32.9	2.6	-4.9	32.1			
7125	2.3	-5.2	30.2	2.3	-5.1	31.2			

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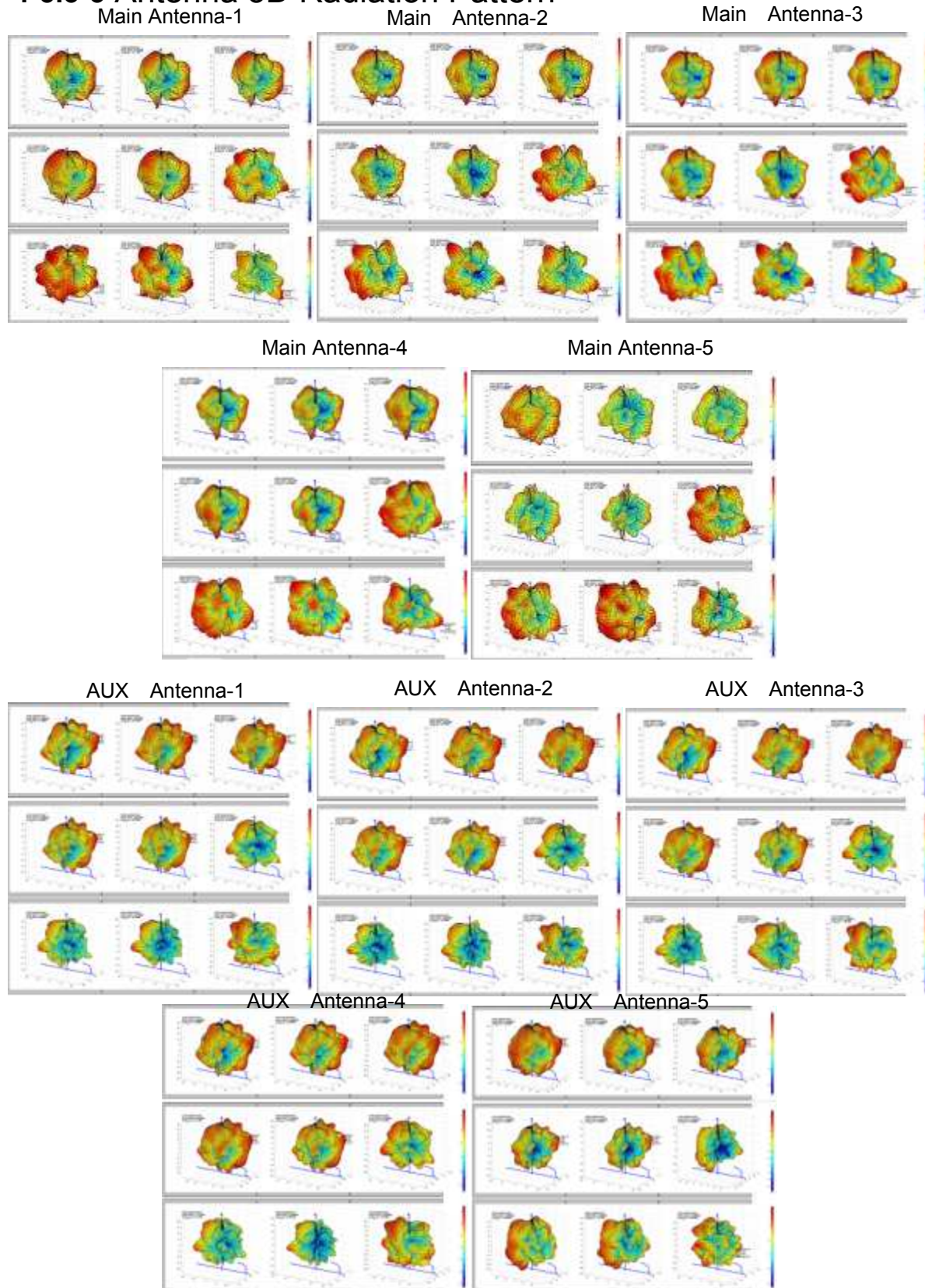
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### 4-5.3-3 Antenna 3D Radiation Pattern



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Material list :

Item	Description	Material	Quantity
1	PCB AUX	FR4 40x6mm,T0.4mm	1
2	PCB MAIN	FR4 40x6mm,T0.4mm	1
3	Acetate tape	Acetate tape 21x7mm, T0.12mm	2
4	Shrink Tube	Shrink Tube black, $\phi$ 1.5 x10mm	1
5	Cable black	Cable 0.81 black	1
6	Cable gray	Cable 0.81 gray	1
7	Connector	I-PEX MHF 4L for 0.81, 20572	2
8	TAP	3M467 39*5MM	2
9	Clamp	Clamp 0.81 5mm	2

### 6. UL File No:

ITEM	DESCRIPTION	SUPPLIER	UL File No
1	PCB	HA0129	E202191
2	CABLE	HA0008	E318898
		HA0053	E464731

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