



No. I23Z60031-SEM01

for

TCL Communication Ltd.

LINKHUB

Model Name: HH63AF

Hardware Version: PIO

Software Version: HH63A_00_02.00_03

FCC ID: 2ACCJB195

Issued Date: 2023-1-18

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of CTTL.

Test Laboratory:

CTTL, Telecommunication Technology Labs, Academy of Telecommunication Research, MIIT

No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China 100191.

Tel:+86(0)10-62304633-2512,Fax:+86(0)10-62304633-2504

Email: ctl_terminals@caict.ac.cn, website: www.caict.ac.cn



No.I23Z60031-SEM01

REPORT HISTORY

Report Number	Revision	Issue Date	Description
I23Z60031-SEM01	Rev.0	2023-1-18	Initial creation of test report



CONTENTS

1. TEST LABORATORY	4
1.1. TESTING LOCATION	4
1.2. TESTING ENVIRONMENT	4
1.3. PROJECT DATA	4
1.4. SIGNATURE.....	4
2. CLIENT INFORMATION.....	5
2.1. APPLICANT INFORMATION.....	5
2.2. MANUFACTURER INFORMATION.....	5
3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE)	6
3.1. ABOUT EUT	6
3.2. INTERNAL IDENTIFICATION OF EUT	6
3.3. INTERNAL IDENTIFICATION OF AE	6
4. REFERENCE DOCUMENTS.....	7
4.1. REFERENCE DOCUMENTS FOR TESTING.....	7
5. RF EXPOSURE LIMIT	7
6. CLASSIFICATION	7
7. TEST RESULTS	8
7.1. THE MAXIMUM ANTENNA GAIN.....	8
7.2. THE MAXIMUM RATED POWER LIMITS	9
7.3. OUTPUT POWER INTO ANTENNA & RF EXPOSURE VALUE AT DISTANCE 20CM	10
8. SIMULTANEOUS TRANSMISSION.....	10



1. Test Laboratory

1.1. Testing Location

Company Name: CTTL
Address: No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China
100191.
Postal Code: 100191
Telephone: 00861062304633
Fax: 00861062304793

1.2. Testing Environment

Normal Temperature: 15-35°C
Relative Humidity: 20-75%

1.3. Project data

Project Leader: Lin Hao
Testing Start Date: 2023-1-18
Testing End Date: 2023-1-18

1.4. Signature

Lin Hao

(Prepared this test report)

Qi Dianyuan

(Reviewed this test report)

Lu Bingsong

Deputy Director of the laboratory
(Approved this test report)



2. Client Information

2.1. Applicant Information

Company Name:	TCL Communication Ltd.
Address /Post:	5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong
Contact:	nianxiang.jiang
Email:	nianxiang.jiang@tcl.com
Telephone:	+86 755 36611621
Fax:	+86 755 3661 2000-81722

2.2. Manufacturer Information

Company Name:	TCL Communication Ltd.
Address /Post:	5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong
Contact:	nianxiang.jiang
Email:	nianxiang.jiang@tcl.com
Telephone:	+86 755 36611621
Fax:	+86 755 3661 2000-81722



3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

Description	LINKHUB
Model name	HH63AF
Operation mode	WCDMA B2/4/5,LTE Band 2/4/5/7/66,WIFI2.4G/5G

3.2. Internal Identification of EUT

EUT ID*	IMEI	HW Version	SW Version
EUT1	/	PIO	HH63A_00_02.00_03

*EUT ID: is used to identify the test sample in the lab internally.

3.3. Internal Identification of AE

AE ID*	Description	SN
AE1	/	/

*AE ID: is used to identify the test sample in the lab internally.



4. Reference Documents

4.1. Reference Documents for testing

The following documents listed in this section are referred for testing.

ANSI C95.1–1999: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.

KDB 447498 D01 General RF Exposure Guidance v06: Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies

Canadian RSS-102: Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)

Standard for uncontrolled environment requires the RF-exposure value in W/m² unit, therefore the MPE limit value determined in mW/cm² unit, should be multiplied by 10 to have the required unit. The MPE limits are the same like on FCC § 1.1301 at table 1.

5. RF Exposure Limit

Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f²)*	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

f = frequency in MHz *Plane-wave equivalent power density

$$\text{Friis transmission formula: } P_d = \frac{P_{out} * G}{4 * \pi * r^2}$$

where

P_d = power density (mW/cm²)

P_{out} = output power to antenna (mW)

G = gain of antenna (linear scale)

r = distance between antenna and observation point (cm)

6. Classification

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. So, this device is classified as Mobile Device.



7. Test Results

7.1. The maximum antenna gain

The maximum gain for each frequency band is:

Frequency band	Antenna	Antenna gain
WCDMA1900	0	2.8
WDCMA1700	0	3.1
WCDMA850	0	2.3
WCDMA1900	3	2
WDCMA1700	3	1.8
WCDMA850	3	0.1
LTE B2	0	2.8
LTE B4	0	3.1
LTE B5	0	2.3
LTE B7	1	0.74
LTE B66	0	3.1
LTE B2	3	2
LTE B4	3	1.8
LTE B5	3	0.1
LTE B7	2	3.22
LTE B66	3	1.8
WIFI2.4G	1	0.58
WIFI2.4G	2	1.91
WIFI2.4G	MIMO	1.91
WIFI5G	1	-1.2
WIFI5G	2	2.89
WIFI5G	MIMO	2.89
WCDMA1900	5	2.9
WDCMA1700	5	3.3
WCDMA850	5	3.2
LTE B2	5	2.9
LTE B4	5	3.5
LTE B5	5	3.3
LTE B66	5	3.5
WCDMA1900	6	2.9
WDCMA1700	6	3.3
WCDMA850	6	3.2
LTE B2	6	2.9
LTE B4	6	3.5
LTE B5	6	3.3
LTE B66	6	3.5



7.2. The maximum rated power limits

Maximum peak output power for antenna:

Frequency band	Antenna	Maximum Rated Power (dBm)
WCDMA1900	0	25
WDCMA1700	0	25
WCDMA850	0	25
WCDMA1900	3	25
WDCMA1700	3	25
WCDMA850	3	25
LTE B2	0	24
LTE B4	0	24
LTE B5	0	24
LTE B7	1	24
LTE B66	0	24
LTE B2	3	24
LTE B4	3	24
LTE B5	3	24
LTE B7	2	24
LTE B66	3	24
WIFI2.4G	1	18.5
WIFI2.4G	2	18.5
WIFI2.4G	MIMO	18
WIFI5G	1	15
WIFI5G	2	15
WIFI5G	MIMO	18
WCDMA1900	5	25
WDCMA1700	5	25
WCDMA850	5	25
LTE B2	5	24
LTE B4	5	24
LTE B5	5	24
LTE B66	5	24
WCDMA1900	6	25
WDCMA1700	6	25
WCDMA850	6	25
LTE B2	6	24
LTE B4	6	24
LTE B5	6	24
LTE B66	6	24



7.3. Output Power Into Antenna & RF Exposure value at distance 20cm

The worst cases conducted output power for every frequency band is:

According to above test result, the device complies with the exposure requirements.

Frequency band	Antenna	Maximum Rated Power (dBm)	Maximum Rated Power (mW)	Antenna gain	d	Calculation	Limit
					(cm)	(mW/cm ²)	(mW/cm ²)
WCDMA1900	0	25	316.228	2.8	20	0.120	1.000
WDCMA1700	0	25	316.228	3.1	20	0.129	1.000
WCDMA850	0	25	316.228	2.3	20	0.107	0.558
WCDMA1900	3	25	316.228	2	20	0.100	1.000
WDCMA1700	3	25	316.228	1.8	20	0.095	1.000
WCDMA850	3	25	316.228	0.1	20	0.064	0.558
LTE B2	0	24	251.189	2.8	20	0.095	1.000
LTE B4	0	24	251.189	3.1	20	0.102	1.000
LTE B5	0	24	251.189	2.3	20	0.085	0.558
LTE B7	1	24	251.189	0.74	20	0.059	1.000
LTE B66	0	24	251.189	3.1	20	0.102	1.000
LTE B2	3	24	251.189	2	20	0.079	1.000
LTE B4	3	24	251.189	1.8	20	0.076	1.000
LTE B5	3	24	251.189	0.1	20	0.051	0.558
LTE B7	2	24	251.189	3.22	20	0.105	1.000
LTE B66	3	24	251.189	1.8	20	0.076	1.000
WIFI2.4G	1	18.5	70.795	0.58	20	0.016	1.000
WIFI2.4G	2	18.5	70.795	1.91	20	0.022	1.000
WIFI2.4G	MIMO	18	63.096	1.91	20	0.019	1.000
WIFI5G	1	15	31.623	-1.2	20	0.005	1.000
WIFI5G	2	15	31.623	2.89	20	0.012	1.000
WIFI5G	MIMO	18	63.096	2.89	20	0.024	1.000
WCDMA1900	5	25	316.228	2.9	20	0.123	1.000
WDCMA1700	5	25	316.228	3.3	20	0.135	1.000
WCDMA850	5	25	316.228	3.2	20	0.132	0.558
LTE B2	5	24	251.189	2.9	20	0.097	1.000
LTE B4	5	24	251.189	3.5	20	0.112	1.000
LTE B5	5	24	251.189	3.3	20	0.107	0.558
LTE B66	5	24	251.189	3.5	20	0.112	1.000
WCDMA1900	6	25	316.228	2.9	20	0.123	1.000
WDCMA1700	6	25	316.228	3.3	20	0.135	1.000
WCDMA850	6	25	316.228	3.2	20	0.132	0.558
LTE B2	6	24	251.189	2.9	20	0.097	1.000
LTE B4	6	24	251.189	3.5	20	0.112	1.000
LTE B5	6	24	251.189	3.3	20	0.107	0.558
LTE B66	6	24	251.189	3.5	20	0.112	1.000

8. Simultaneous Transmission

The Summation of Exposure Ratio value = Main Antenna(Calculation/Limit)+
WIFI Antenna(Calculation/Limit)

Table 8.1: The Simultaneous Transmission for TER

High SAR value	Main Antenna (V/m)		WIFI Antenna (V/m)		SUM	Limited
	Calculation	Limit	Calculation	Limit		
	0.135 WCDMA1700 (ANT5/6)	1	0.024 WIFI5G (MIMO)	1		

END OF REPORT