



No. I20Z60442-SEM01

for

TCL Communication Ltd.

HUB42

FCC ID: 2ACCJB120

Hardware Version: PIO

Software Version: HH42NK_V1.1.0B06

Model Name: HH42NK

Issued Date: 2020-5-11



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:

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REPORT HISTORY

Report Number	Revision	Issue Date	Description
I20Z60442-SEM01	Rev.0	2020-4-30	Initial creation of test report
I20Z60442-SEM01	Rev.1	2020-5-9	Add the MPE ratio values on section 7.3
I20Z60442-SEM01	Rev.2	2020-5-11	Update the calculation and limit values on section 7.3



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1. Test Laboratory

1.1. Testing Location

Company Name: CTTL(Shouxiang)
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Beijing, P. R. China100191
Postal Code: 100191
Telephone: 00861062304633
Fax: 00861062304793

1.2. Testing Environment

Normal Temperature: 15-25°C
Relative Humidity: 20-75%

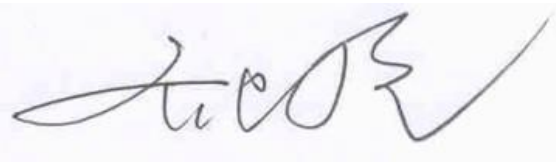
1.3. Project data

Project Leader: Lin Hao
Testing Start Date: 2020-4-11
Testing End Date: 2020-4-11

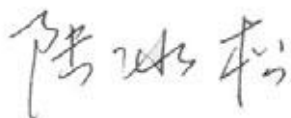
1.4. Signature



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.
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Email:	zhizhou.gong@tcl.com
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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:	Gong Zhizhou
Email:	zhizhou.gong@tcl.com
Telephone:	0086-755-36611722
Fax:	0086-755-36612000-81722

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

3.1. About EUT

Description	HUB42
Model name	HH42NK
Operation mode	GSM850/900/1800/1900,WCDMA850/900/1700/1900/2100, LTE Band2/3/4/5/7/8/12/13/17/28/66, Wi-Fi2.4G

3.2. Internal Identification of EUT

EUT ID*	IMEI	HW Version	SW Version
EUT1	/	PIO	HH42NK_V1.1.0B06

*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.

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

Canadian RSS-102 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 antenna1 gain for each frequency band is:

Frequency band	Antenna gain (dBi)
GSM850	1.13
PCS1900	4.2
W850	1.13
W1700	4.6
W1900	4.2
LTE B2	4.2
LTE B4	4.6
LTE B5	1.13
LTE B7	3.46
LTE B12	-0.9
LTE B13	0.72
LTE B17	-0.9
LTE B66	4.6

The maximum antenna5 gain for each frequency band is:

Frequency band	Antenna gain (dBi)
GSM850	1.38
PCS1900	2.6
W850	1.38
W1700	3.37
W1900	2.6
LTE B2	2.6
LTE B4	3.37
LTE B5	1.38
LTE B7	3.09
LTE B12	-1.19
LTE B13	0.25
LTE B17	-1.19
LTE B66	3.37



The maximum antenna3 gain for each frequency band is:

Frequency band	Antenna gain (dBi)
WiFi 2.4G	0

The maximum ant 3&ant4(MIMO) gain for each frequency band is:

Frequency band	Antenna gain (dBi)
WiFi 2.4G	0

7.2. The maximum rated power limits

Maximum Average power for antenna1:

Frequency band	Maximum Rated Power (dBm)
GSM850	33
PCS1900	32
W850	25
W1700	25
W1900	25
LTE B2	25.7
LTE B4	25.7
LTE B5	25.7
LTE B7	25.7
LTE B12	25.7
LTE B13	25.7
LTE B17	25.7
LTE B66	25.7

Maximum Average power for antenna5:

Frequency band	Maximum Rated Power (dBm)
GSM850	33
PCS1900	32
W850	25
W1700	25
W1900	25
LTE B2	25.7
LTE B4	25.7
LTE B5	25.7
LTE B7	25.7



LTE B12	25.7
LTE B13	25.7
LTE B17	25.7
LTE B66	25.7

Maximum Average power for antenna3:

Frequency band	Maximum Rated Power (dBm)
WiFi 2.4G	19

Maximum Average power for ant3&ant4(MIMO):

Frequency band	Maximum Rated Power (dBm)
WiFi 2.4G	18.8

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

ANT1

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

Frequency band	Maximum Rated Power (dBm)	Maximum Rated Power (mW)	Antenna gain	d (cm)	Calculation (mW/cm ²)	Limit (mW/cm ²)	Calculation	MPE ratio
GSM850	33	1995.262	1.3	20	0.515	0.558	PASS	0.924
PCS1900	32	1584.893	2.6	20	0.830	1.000	PASS	0.830
W850	25	316.228	1.3	20	0.082	0.558	PASS	0.146
W1700	25	316.228	2.9	20	0.182	1.000	PASS	0.182
W1900	25	316.228	2.6	20	0.166	1.000	PASS	0.166
LTE B2	25.7	371.535	2.6	20	0.195	1.000	PASS	0.195
LTE B4	25.7	371.535	2.9	20	0.213	1.000	PASS	0.213
LTE B5	25.7	371.535	1.3	20	0.096	0.558	PASS	0.172
LTE B7	25.7	371.535	2.2	20	0.164	1.000	PASS	0.164
LTE B12	25.7	371.535	0.8	20	0.060	0.472	PASS	0.127
LTE B13	25.7	371.535	1.2	20	0.087	0.521	PASS	0.167
LTE B17	25.7	371.535	0.8	20	0.060	0.473	PASS	0.127
LTE B66	25.7	371.535	2.9	20	0.213	1.000	PASS	0.213

ANT5

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

Frequency band	Maximum Rated Power (dBm)	Maximum Rated Power (mW)	Antenna gain	d (cm)	Calculation (mW/cm ²)	Limit (mW/cm ²)	Calculation	MPE ratio
GSM850	33	1995.262	1.4	20	0.546	0.558	PASS	0.978
PCS1900	32	1584.893	1.8	20	0.574	1.000	PASS	0.574
W850	25	316.228	1.4	20	0.086	0.558	PASS	0.155
W1700	25	316.228	2.2	20	0.137	1.000	PASS	0.137
W1900	25	316.228	1.8	20	0.115	1.000	PASS	0.115
LTE B2	25.7	371.535	1.8	20	0.135	1.000	PASS	0.135
LTE B4	25.7	371.535	2.2	20	0.161	1.000	PASS	0.161
LTE B5	25.7	371.535	1.4	20	0.102	0.558	PASS	0.182
LTE B7	25.7	371.535	2.0	20	0.151	1.000	PASS	0.151
LTE B12	25.7	371.535	0.8	20	0.056	0.472	PASS	0.119
LTE B13	25.7	371.535	1.1	20	0.078	0.521	PASS	0.150
LTE B17	25.7	371.535	0.8	20	0.056	0.473	PASS	0.119
LTE B66	25.7	371.535	2.2	20	0.161	1.000	PASS	0.161

ANT3

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

Frequency band	Maximum Rated Power (dBm)	Maximum Rated Power (mW)	Antenna gain	d (cm)	Calculation (mW/cm ²)	Limit (mW/cm ²)	Calculation	MPE ratio
WiFi	19	79.433	1.0	20	0.016	1.000	PASS	0.016

ANT3&ANT4 (MIMO)

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

Frequency band	Maximum Rated Power (dBm)	Maximum Rated Power (mW)	Antenna gain	d (cm)	Calculation (mW/cm ²)	Limit (mW/cm ²)	Calculation	MPE ratio
WiFi	18.8	75.858	1.0	20	0.015	1.000	PASS	0.015

The sum of MPE ratio

	Main ANT	WiFi	SUM
Highest MPE ratio values	0.978	0.016	0.994

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

*****END OF REPORT*****