

FCC TEST REPORT

For

LINKHUB

Model Number: HH41NH

FCC ID: 2ACCJB092

Report Number : WT178002942

Test Laboratory	:	Shenzhen Academy of Metrology and Quality Inspection National Digital Electronic Product Testing Center
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TEST REPORT DECLARATION

Applicant : TCL Communication Ltd
Address : 5F, C-Tower, No.232, Liangjing Road, Zhangjiang High-tech Park, Pudong, Shanghai, China
Manufacturer : TCL Communication Ltd
Address : 5F, C-Tower, No.232, Liangjing Road, Zhangjiang High-tech Park, Pudong, Shanghai, China
EUT Description : LINKHUB
Model No : HH41NH
Trade mark : Alcatel
Serial Number : /
FCC ID : 2ACCJB092

Test Standards:

FCC Part 2.1091 (2016)

The EUT described above is tested by Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory to determine the maximum emissions from the EUT. Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory is assumed full responsibility for the accuracy of the test results.

The test report is valid for above tested sample only and shall not be reproduced in part without written approval of the laboratory.

Project Engineer:	 (Chen Silin 陈司林)	Date:	<u>Jun.19, 2017</u>
Checked by:	 (Lin Yixiang 林奕翔)	Date:	<u>Jun.19, 2017</u>
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1. TEST RESULTS SUMMARY

Table 1 Test Results Summary

Test Items	Test Results
RF Exposure	Pass

Remark: "N/A" means "Not applicable."

2. GENERAL INFORMATION

2.1. Report information

This report is not a certificate of quality; it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that SMQ approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that SMQ in any way guarantees the later performance of the product/equipment.

The sample/s mentioned in this report is/are supplied by Applicant, SMQ therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture or any information supplied.

Additional copies of the report are available to the Applicant at an additional fee. No third part can obtain a copy of this report through SMQ, unless the applicant has authorized SMQ in writing to do so.

2.2. Laboratory Accreditation and Relationship to Customer

The testing report were performed by the Shenzhen Academy of Metrology and The testing report were performed by the Shenzhen Academy of Metrology and quality Inspection EMC Laboratory (Guangdong EMC compliance testing center), in their facilities located at NETC Building, No.4 Tongfa Rd., Xili, Nanshan, Shenzhen, China. At the time of testing, Laboratory is accredited by the following organizations:

China National Accreditation Service for Conformity Assessment (CNAS) accredits the Laboratory for conformance to FCC standards, EMC international standards and EN standards. The Registration Number is CNAS L0579.

The Laboratory is listed in the United States of American Federal Communications Commission (FCC), and the registration number are 446246 806614 994606(semi anechoic chamber).

The Laboratory is registered to perform emission tests with Industry Canada (IC), and the registration number is 11177A-1 11177A-2.

TUV Rhineland accredits the Laboratory for conformance to IEC and EN standards, the registration number is E2024086Z02.

3. PRODUCT DESCRIPTION

3.1.EUT Description

Table 2 Specification of the Equipment under Test

Product Type:	LINKHUB
Hardware Version:	V2.0
Software Version :	HH41V_00_02.00_04
FCC ID:	2ACCJB092
Frequency:	WiFi:2412MHz~2462MHz; GSM850: TX 824MHz~849MHz RX 869MHz~894MHz PCS1900: TX 1850MHZ~1910MHz RX 1930MHz~1990MHz WCDMA 850: TX 824MHz~849MHz RX 869MHz~894MHz WCDMA 1700: TX: 1710MHz~1755MHz RX 2110MHz~2155MHz WCDMA 1900: TX 1850MHZ~1910MHz RX 1930MHz~1990MHz LTE Band 2: TX 1850MHZ~1910MHz RX 1930MHz~1990MHz LTE Band 4: TX: 1710MHz~1755MHz RX 2110MHz~2155MHz LTE Band 5: TX 824MHz~849MHz RX 869MHz~894MHz LTE Band 7: TX 2500MHz~2570MHz RX 2620MHz~2690MHz LTE Band 12: TX 698 ~ 716 MHz RX 728 ~ 746MHz LTE Band 13: TX 777 ~ 787 MHz RX 746 ~ 756MHz LTE Band 17: TX 704 ~ 716 MHz RX 734 ~ 746MHz
Type(s) of Modulation:	DSSS (DBPSK, DQPSK, CCK) for 802.11b OFDM (BPSK, QPSK, 16QAM, 64QAM) for 802.11a/g/n OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) for 802.11ac Bluetooth : GFSK, pi/4-DQPSK, 8DPSK GSM850/PCS1900 :GMSK 8PSK WCDMA:QPSK LTE:QPSK, 16QAM
Antenna Type:	2G/3G/4G : Fixed External antenna WiFi PIFA antenna 1.5dBi 698MHz~800MHz: 0.5dBi 824MHz~849MHz: 0.5dBi 1710MHz~1755MHz: 1.0dBi 1850MHZ~1910MHZ: 1.0dBi

	2500MHz~2570MHz: 1.5dBi
Operating voltage:	120V AC Adapter; 4.5V (Low)/5.0V (Nominal)/ 5.5V (Max)

Remark: /

4. RF EXPOSURE

4.1.LIMIT FOR MAXIMUM PERMISSIBLE EXPOSURE(MPE)

This product can be classified as mobile device, so the 20cm separation distance warning is required. In this section, the power density at 20cm location is calculated to examine if it is lower than the limit.

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minutes)
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f)	30
30–300	27.5	0.073	0.2	30
300–1500	/	/	†/1500	30
1500–100,000	/	/	1.0	30

4.2.MPE Calculation Method

Power Density: $Pd(\text{Mw/cm}^2) = P \cdot G / 4\pi d^2$

P=Peak RF output power (mW)

G=EUT Antenna numeric gain (numeric)

Pi=3.14

d=Separation distance between radiator and human body (cm)

4.3.CALCULATED RESULT

GSM850:

P=32.58 (4TX slot power:16.29dBm max:43mW)

G=0.5dBi (numeric:1.12)

d=20cm

$Pd = 43 \cdot 1.12 / 4 \cdot 3.14 \cdot 400 = 0.01 < 850/1500$

PCS1900

P=30.27 (4TX slot power:15.135dBm max:33mW)

G=1dBi (numeric:1.26)

d=20cm

$Pd = 33 \cdot 1.26 / 4 \cdot 3.14 \cdot 400 = 0.008 < 1$

WCDMA Band 5:

P=22.78 (max:188mW)

G=0.5dBi (numeric:1.12)

d=20cm

$Pd = 188 \cdot 1.12 / 4 \cdot 3.14 \cdot 400 = 0.042 < 850/1500$

WCDMA Band 2

P=22.35 (max:172mW)

G=1dBi (numeric:1.26)

d=20cm

$P_d = 172 * 1.26 / 4 * 3.14 * 400 = 0.043 < 1$

WCDMA Band 4

P=22.75 (max:188mW)

G=1dBi (numeric:1.26)

d=20cm

$P_d = 188 * 1.26 / 4 * 3.14 * 400 = 0.047 < 1$

LTE Band 2

P=23.42 (max:220mW)

G=1dBi (numeric:1.26)

d=20cm

$P_d = 220 * 1.26 / 4 * 3.14 * 400 = 0.055 < 1$

LTE Band 4

P=22.88 (max:194mW)

G=1dBi (numeric:1.26)

d=20cm

$P_d = 220 * 1.26 / 4 * 3.14 * 400 = 0.049 < 1$

LTE Band 5

P=23.17 (max:194mW)

G=0.5dBi (numeric:1.12)

d=20cm

$P_d = 207 * 1.12 / 4 * 3.14 * 400 = 0.046 < 850 / 1500$

LTE Band 7

P=23.34 (max:216mW)

G=1.5dBi (numeric:1.41)

d=20cm

$P_d = 216 * 1.41 / 4 * 3.14 * 400 = 0.061 < 1$

LTE Band 12

P=23.33 (max:215mW)

G=0.5dBi (numeric:1.12)

d=20cm

$P_d = 215 * 1.12 / 4 * 3.14 * 400 = 0.048 < 707.5 / 1500$

LTE Band 13

P=22.64 (max:184mW)

G=0.5dBi (numeric:1.12)

d=20cm

$P_d = 184 * 1.12 / 4 * 3.14 * 400 = 0.041 < 782 / 1500$

LTE Band 17

P=22.81 (max:191mW)

G=0.5dBi (numeric:1.12)

d=20cm

$P_d = 191 * 1.12 / 4 * 3.14 * 400 = 0.043 < 710 / 1500$

WLAN 802.11b
P=18.50dBm (max: 71mW)
G=1.5dBi (numeric:1.41)
d=20cm
 $P_d = 71 \cdot 1.59 / 4 \cdot 3.14 \cdot 400 = 0.02 < 1$

WLAN 802.11g
P=16.53dBm (max: 45mW)
G=1.5dBi (numeric:1.41)
d=20cm
 $P_d = 45 \cdot 1.59 / 4 \cdot 3.14 \cdot 400 = 0.014 < 1$

WLAN 802.11n HT20
P=18.88dBm (max: 45mW)
 $G = 10 \log[(10^{1.5/20} + 10^{1.5/20})^2 / 3] = 2.75 \text{ dBi}$ (numeric:1.88)
d=20cm
 $P_d = 77 \cdot 1.88 / 4 \cdot 3.14 \cdot 400 = 0.029 < 1$

WLAN 802.11n HT40
P=17.65dBm (max: 58mW)
 $G = 10 \log[(10^{1.5/20} + 10^{1.5/20})^2 / 3] = 2.75 \text{ dBi}$ (numeric:1.88)
d=20cm
 $P_d = 58 \cdot 1.88 / 4 \cdot 3.14 \cdot 400 = 0.022 < 1$

GSM+WCDMA+LTE+WLAN:
 $0.01 + 0.047 + 0.061 + 0.029 = 0.147$