

FCC TEST REPORT

For

LINKHUB

Model Number: HH41NH

FCC ID: 2ACCJB106

Report Number : WT188005741

Test Laboratory : Shenzhen Academy of Metrology and Quality Inspection

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TEST REPORT DECLARATION

Applicant : TCL Communication Ltd
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Manufacturer : TCL Communication Ltd
Address : 7/F, Block F4, TCL International E City Zhong Shan Yuan Road, Nanshan District Shenzhen, China
EUT Description : LINKHUB
Model No : HH41NH
Trade mark : Alcatel
Serial Number : /
FCC ID : 2ACCJB106

Test Standards:

FCC Part 2.1091 (2017)

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>Oct.17, 2018</u>
Checked by:	 _____ (Lin Yixiang 林奕翔)	Date:	<u>Oct.17, 2018</u>
Approved by:	 _____ (Lin Bin 林斌)	Date:	<u>Oct.17, 2018</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 Accredited Testing Laboratory of FCC with Designation number CN1165 and Site registration number 582918.

The Laboratory is registered to perform emission tests with Innovation, Science and Economic Development (ISED), and the registration number is 11177A.

3. PRODUCT DESCRIPTION

3.1.EUT Description

Table 2 Specification of the Equipment under Test

Product Type:	LINKHUB
Hardware Version:	V04
Software Version :	HH41_00_02.00_13
FCC ID:	2ACCJB106
Frequency:	<p>GSM850: TX 824MHz~849MHz RX 869MHz~894MHz</p> <p>PCS1900: TX 1850MHz~1910MHz RX 1930MHz~1990MHz</p> <p>WCDMA 850: TX 824MHz~849MHz RX 869MHz~894MHz</p> <p>WCDMA 1700: TX: 1710MHz~1755MHz RX 2110MHz~2155MHz</p> <p>WCDMA 1900: TX 1850MHz~1910MHz RX 1930MHz~1990MHz</p> <p>LTE Band 2: TX 1850MHz~1910MHz RX 1930MHz~1990MHz</p> <p>LTE Band 4: TX: 1710MHz~1755MHz RX 2110MHz~2155MHz</p> <p>LTE Band 5: TX 824MHz~849MHz RX 869MHz~894MHz</p> <p>LTE Band 7: TX 2500MHz~2570MHz RX 2620MHz~2690MHz</p> <p>LTE Band 12: TX 698 ~ 716 MHz RX 728 ~ 746MHz</p> <p>LTE Band 13: TX 777 ~ 787 MHz RX 746 ~ 756MHz</p> <p>LTE Band 17: TX 704 ~ 716 MHz RX 734 ~ 746MHz</p> <p>LTE Band 66: TX: 1710MHz~1780MHz RX 2110MHz~2200MHz</p>
Type(s) of Modulation:	<p>DSSS (DBPSK, DQPSK, CCK) for 802.11b</p> <p>OFDM (BPSK, QPSK, 16QAM, 64QAM) for 802.11a/g/n</p> <p>OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) for 802.11ac</p> <p>Bluetooth : GFSK, pi/4-DQPSK, 8DPSK</p> <p>GSM850/PCS1900 :GMSK 8PSK</p> <p>WCDMA:QPSK</p> <p>LTE:QPSK, 16QAM</p>
Antenna Type:	<p>2G/3G/4G : Fixed External antenna WiFi PIFA antenna 1.5dBi</p> <p>698MHz~800MHz: 0.5dBi</p> <p>824MHz~849MHz: 0.5dBi</p> <p>1710MHz~1780MHz: 1.0dBi</p>

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

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 (1 Tx slot average power:32.58, all 8 slot, duty cycle:1/8 max:226mW)

G=0.5dBi (numeric:1.12)

d=20cm

$Pd=226 \cdot 1.12 / 4 \cdot 3.14 \cdot 400 = 0.050 < 850 / 1500$

PCS1900

P=30.27 (1 Tx slot average power:30.27, all 8 slot, duty cycle:1/8 max:133mW)

G=1dBi (numeric:1.26)

d=20cm

$Pd=133 \cdot 1.26 / 4 \cdot 3.14 \cdot 400 = 0.033 < 1$

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

WCDMA Band 4
P=22.75 (max:188mW)
G=1dBi (numeric:1.26)
d=20cm
 $Pd=188*1.26/4*3.14*400=0.047<1$

LTE Band 2
P=23.42 (max:220mW)
G=1dBi (numeric:1.26)
d=20cm
 $Pd=220*1.26/4*3.14*400=0.055<1$

LTE Band 4
P=22.88 (max:194mW)
G=1dBi (numeric:1.26)
d=20cm
 $Pd=194*1.26/4*3.14*400=0.049<1$

LTE Band 5
P=23.17 (max:194mW)
G=0.5dBi (numeric:1.12)
d=20cm
 $Pd=194*1.12/4*3.14*400=0.046<850/1500$

LTE Band 7
P=23.34 (max:216mW)
G=1.5dBi (numeric:1.41)
d=20cm
 $Pd=216*1.41/4*3.14*400=0.061<1$

LTE Band 12
P=23.33 (max:215mW)
G=0.5dBi (numeric:1.12)
d=20cm
 $Pd=215*1.12/4*3.14*400=0.048<707.5/1500$

LTE Band 13
P=22.64 (max:184mW)
G=0.5dBi (numeric:1.12)
d=20cm
 $Pd=184*1.12/4*3.14*400=0.041<782/1500$

LTE Band 17
P=22.81 (max:191mW)
G=0.5dBi (numeric:1.12)
d=20cm
 $Pd=191*1.12/4*3.14*400=0.043<710/1500$

WLAN 802.11b
P=18.50dBm (max: 70mW)
G=1.5dBi (numeric:1.41)
d=20cm
 $P_d=70*1.41/4*3.14*400=0.02<1$

WLAN 802.11g
P=16.31dBm (max: 43mW)
G=1.5dBi (numeric:1.41)
d=20cm
 $P_d=43*1.41/4*3.14*400=0.012<1$

WLAN 802.11n HT20
P=18.65dBm (max: 73mW)
G=1.5dBi (numeric:1.41)
d=20cm
 $P_d=73*1.41/4*3.14*400=0.02<1$

WLAN 802.11n HT40
P=17.65dBm (max: 57mW)
G=1.5dBi (numeric:1.41)
d=20cm
 $P_d=57*1.41/4*3.14*400=0.016<1$

GSM+WIFI=0.05+0.02=0.07<1
WCDMA+WIFI=0.047+0.02=0.067<1
LTE+WIFI=0.061+0.02=0.081<1