



TEST REPORT

No. I17Z60942-EMC01

for

TCL Communication Ltd.

UMTS/GSM Smart phone

Model Name: 4047A

FCC ID: 2ACCJB093

with

Hardware Version: PIO

Software Version: V1.0

Issued Date: 2017-07-18



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.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

Test Laboratory:

CTTL, Telecommunication Technology Labs, CAICT

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



REPORT HISTORY

Report Number	Revision	Description	Issue Date
I17Z60942-EMC01	Rev.0	1 st edition	2017-07-18

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 USED DURING THE TEST	6
3.3. INTERNAL IDENTIFICATION OF AE USED DURING THE TEST.....	6
3.4. EUT SET-UPS	6
4. REFERENCE DOCUMENTS.....	7
4.1. REFERENCE DOCUMENTS FOR TESTING.....	7
5. LABORATORY ENVIRONMENT.....	8
6. SUMMARY OF TEST RESULTS.....	9
7. TEST EQUIPMENTS UTILIZED.....	10
ANNEX A: MEASUREMENT RESULTS	11

1. Test Laboratory

1.1. Testing Location

Location BDA: CTTL(kangding Road)

Address: No. A18, Kangding Road, Yizhuang, Beijing,
P. R. China 100176

CTTL(huayuan North Road)

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

1.2. Testing Environment

Normal Temperature: 15-35℃

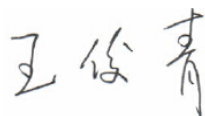
Relative Humidity: 20-75%

1.3. Project data

Testing Start Date: 2017-05-10

Testing End Date: 2017-05-16

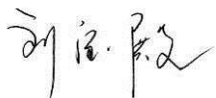
1.4. Signature



Wang Junqing
(Prepared this test report)



Zhang Ying
(Reviewed this test report)



Liu Baodian
Deputy Director of the laboratory
(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name: TCL Communication Ltd.
Address /Post: 5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park,
Pudong Area Shanghai, P.R. China. 201203
City: Shanghai
Postal Code: 201203
Country: P. R. China
Contact Person: Gong Zhizhou
Contact Email: zhizhou.gong@tcl.com
Telephone: 0086-21-31363544
Fax: 0086-21-61460602

2.2. Manufacturer Information

Company Name: TCL Communication Ltd.
Address /Post: 5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park,
Pudong Area Shanghai, P.R. China. 201203
City: Shanghai
Postal Code: 201203
Country: P. R. China
Contact Person: Gong Zhizhou
Contact Email: zhizhou.gong@tcl.com
Telephone: 0086-21-31363544
Fax: 0086-21-61460602

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

3.1. About EUT

Description	UMTS/GSM Smart phone
Model Name	4047A
FCC ID	2ACCJB093
Extreme vol. Limits	3.6VDC to 4.35VDC (nominal: 3.8VDC)

Note: Components list, please refer to documents of the manufacturer; it is also included in the original test record of CTTL, Telecommunication Technology Labs, Academy of Telecommunication Research, MIIT.

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
EUT4	014910000200992	PIO	V1.0

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

3.3. Internal Identification of AE used during the test

AE ID*	Description	SN	Remarks
AE3	battery	/	/
AE4	Travel charger	/	16TCT-CH-1381

AE3

Model	CAB2000071C7
Manufacturer	VEKEN
Capacitance	2000mAh
Nominal voltage	3.8V

AE4

Model	CBA0066AGAC5
Manufacturer	PUAN
Length of cable	/

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

Note: The USB cables are shielded.

3.4. EUT set-ups

EUT set-up No.	Combination of EUT and AE	Remarks
Set.4	EUT4 + AE3 + AE4	Charger

Note: The UMTS/GSM Smart phone 4047A manufactured by TCL Communication Ltd. is a variant model based on 4047G for conformance test. According to the declaration of changes, no test needs to be performed, all results are cited from the initial model. The report number for initial model is I17Z60619-EMC01.

4. Reference Documents

4.1. Reference Documents for testing

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

Reference	Title	Version
FCC Part 15, Subpart B	Radio frequency devices - Unintentional Radiators	2015 Edition
ANSI C63.4	American National Standard for Methods of Measurement of Radio- Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2014

Note: The test methods have no deviation with standards.

5. LABORATORY ENVIRONMENT

Semi-anechoic chamber SAC-2 (10 meters×6.7meters×6.1meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 35 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 2MΩ
Ground system resistance	< 1 Ω
Normalised site attenuation (NSA)	< ±4 dB, 3 m distance, from 30 to 1000 MHz
Site voltage standing-wave ratio (S_{VSWR})	Between 0 and 6 dB, from 1GHz to 18GHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 3000 MHz

Shielded room did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. = 20 %, Max. = 75 %
Shielding effectiveness	0.014MHz-1MHz, >60dB; 1MHz—1000MHz, >90dB.
Electrical insulation	> 2 MΩ
Ground system resistance	< 4 Ω

6. SUMMARY OF TEST RESULTS

Abbreviations used in this clause:		
Verdict Column	P	Pass
	NA	Not applicable
	F	Fail

Items	Test Name	Clause in FCC rules	Section in this report	Verdict	Test Location
1	Radiated Emission	15.109(a)	B.1	P	BDA
2	Conducted Emission	15.107(a)	B.2	P	huayuan North Road

7. Test Equipments Utilized

NO.	Description	TYPE	SERIES NUMBER	MANUFACTURE	CAL DUE DATE	CALIBRATI ON INTERVAL
1	Test Receiver	ESU26	100376	R&S	2017-11-30	1 year
2	Test Receiver	ESCI	100766	R&S	2018-04-06	1 year
3	Universal Radio Communication Tester	CMW500	127406	R&S	2018-02-19	1 year
5	LISN	ESH2-Z5	829991/012	R&S	2018-04-10	1 year
6	EMI Antenna	VULB 9163	9163-514	Schwarzbeck	2017-11-24	3 years
7	EMI Antenna	3117	00139065	ETS-Lindgren	2017-09-21	3 years

Test Item	Test Software and Version	Software Vendor	Test operator
Radiated Continuous Emission	EMC32 V9.01	R&S	Yang Fei
Conducted Emission	EMC32 V8.52.0	R&S	Dong Enran

ANNEX A: MEASUREMENT RESULTS

A.1 Radiated Emission

Reference

FCC: CFR Part 15.109(a).

A.1.1 Method of measurement

The field strength of radiated emissions from the unintentional radiator (charging mode of MS) at distances of 3 meters (for 30MHz-1GHz) and 3 meters (for above 1GHz) is tested. Tested in accordance with the procedures of ANSI C63.4 – 2014, section 8.3.

The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3/10 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

A.1.2 EUT Operating Mode:

The MS is operating in the charging mode. During the test MS is connected to a charger in the case of charging mode.

Note: I/O information: Printer – USB, Mouse – PS/2, Keyboard – USB.

A.1.3 Measurement Limit

Frequency range (MHz)	Field strength limit ($\mu\text{V/m}$)		
	Quasi-peak	Average	Peak
30-88	100		
88-216	150		
216-960	200		
960-1000	500		
>1000		500	5000

Note: the above limit is for 3 meters test distance. 10 meters' limit is got by converting.

A.1.4 Test Condition

Frequency range (MHz)	RBW/VBW	Sweep Time (s)	Detector
30-1000	120kHz (IF Bandwidth)	5	Peak/Quasi-peak
Above 1000	1MHz/1MHz	15	Peak, Average

A.1.5 Measurement Results

A "reference path loss" is established and the A_{Rpl} is the attenuation of "reference path loss". It includes the antenna factor of receive antenna and the path loss.

The measurement results are obtained as described below:

$$\text{Result} = P_{\text{Mea}} + A_{\text{Rpl}} = P_{\text{Mea}} + G_A + G_{\text{PL}}$$

Where

G_A : Antenna factor of receive antenna

G_{PL} : Path Loss

P_{Mea} : Measurement result on receiver.

Measurement uncertainty (worst case): 30MHz-1GHz: 4.86dB, 1GHz-18GHz: 5.26dB, $k=2$.

Measurement results for Set.4:

Charging Mode/Average detector

Frequency(MHz)	Result(dB μ V/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea} (dB μ V)	Polarity
17806.500	41.5	-23.0	41.0	23.5	54.0
17805.000	41.4	-23.1	41.0	23.5	54.0
17805.750	41.4	-23.1	41.0	23.5	54.0
17801.250	41.4	-23.1	41.0	23.5	54.0
17800.500	41.4	-23.1	41.0	23.5	54.0
17810.250	41.4	-23.0	41.0	23.4	54.0

Charging Mode/Peak detector

Frequency(MHz)	Result(dB μ V/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea} (dB μ V)	Polarity
17064.750	53.1	-25.5	41.3	37.2	74.0
17799.000	52.8	-23.2	41.0	35.0	74.0
17750.250	52.7	-24.0	41.0	35.6	74.0
17822.250	52.5	-23.2	40.9	34.7	74.0
17808.000	52.5	-23.0	41.0	34.5	74.0
17744.250	52.5	-24.1	41.0	35.5	74.0

Sample calculation: Peak detector, 17064.750MHz

$$\text{Result} = P_{\text{Mea}} 37.2\text{dB}\mu\text{V}) + G_A (41.3\text{dB/m}) + G_{\text{PL}}(-25.5 \text{ dB}) = 53.1\text{dB}\mu\text{V/m}$$

Charging Mode, Set.4

RE 30MHz-1GHz

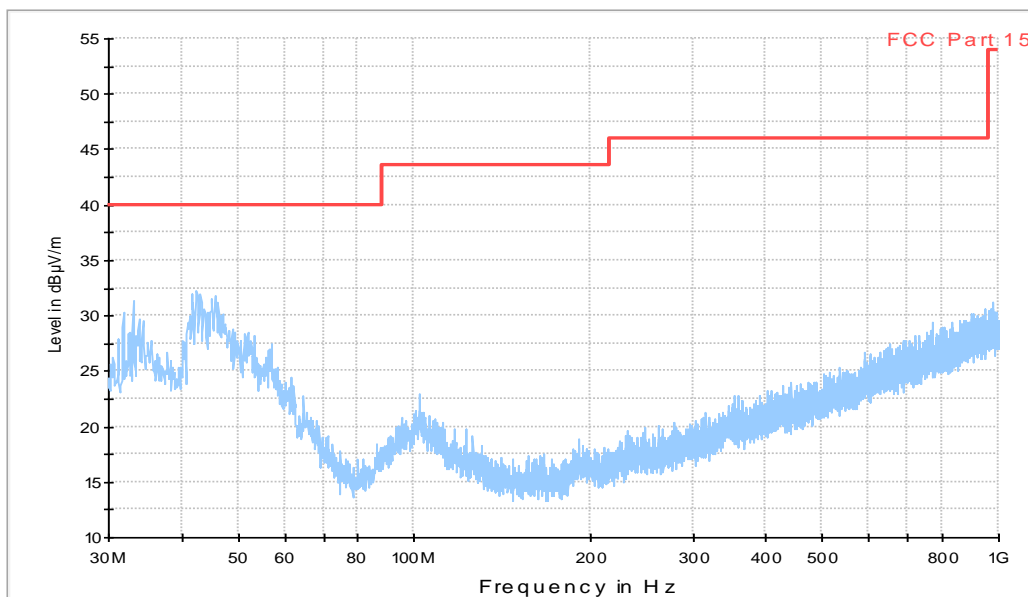


Figure A.1 Radiated Emission from 30MHz to 1GHz

RE - 1GHz-3GHz

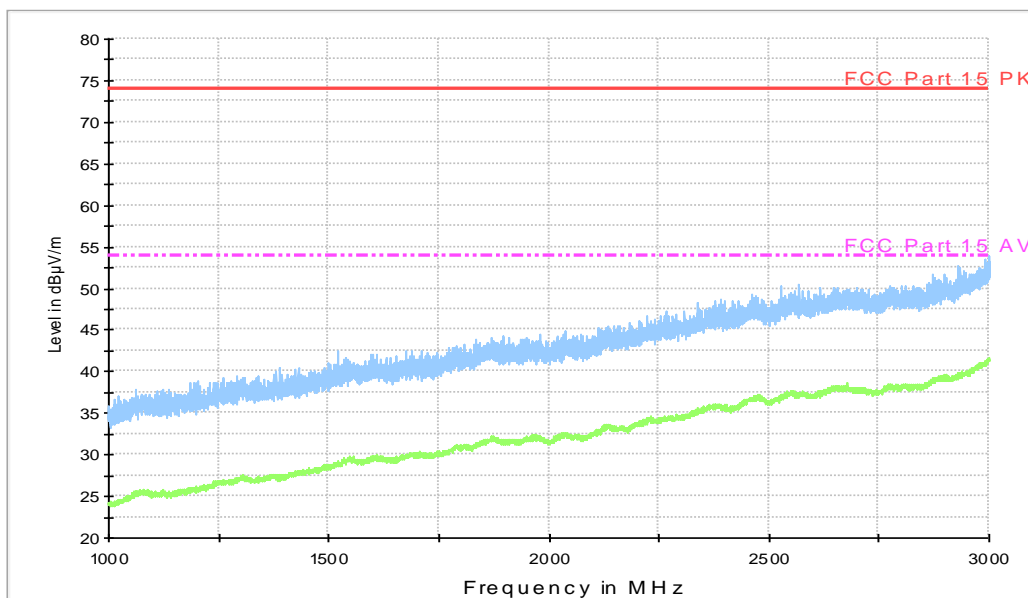


Figure A.2 Radiated Emission from 1GHz to 3GHz

15b RE - 3GHz-18GHz

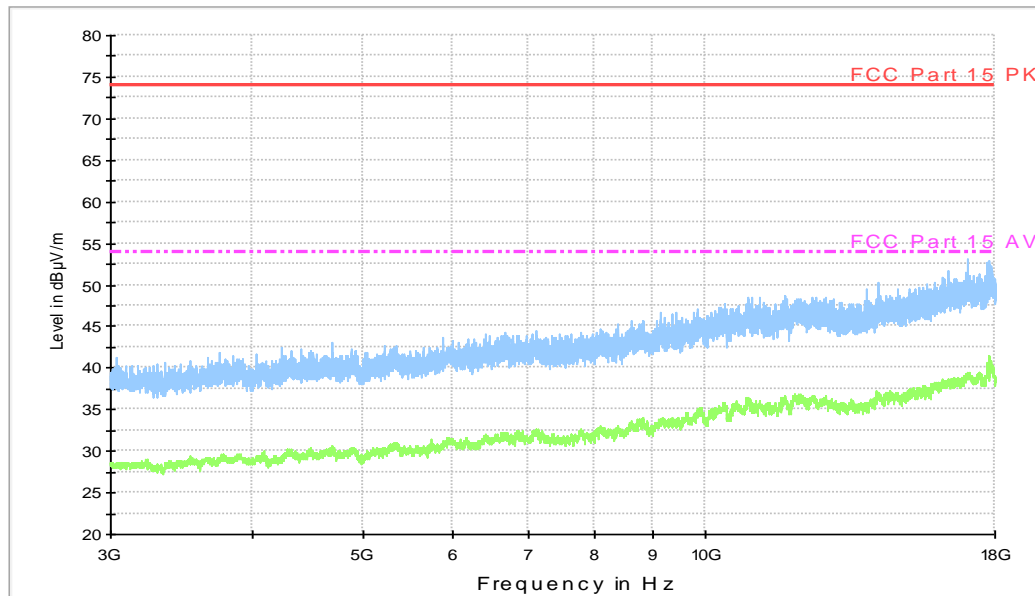


Figure A.3 Radiated Emission from 3GHz to 18GHz

A.2 Conducted Emission

Reference

FCC: CFR Part 15.107(a).

A.2.1 Method of measurement

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits. Tested in accordance with the procedures of ANSI C63.4 – 2014, section 7.3.

A.2.2 EUT Operating Mode

The MS is operating in the charging mode. During the test MS is connected to a charger in the case of charging mode.

A.2.3 Measurement Limit

Frequency of emission (MHz)	Conducted limit (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50
*Decreases with the logarithm of the frequency		

A.2.4 Test Condition in charging mode

Voltage (V)	Frequency (Hz)
120	60

RBW/IF bandwidth	Sweep Time(s)
9kHz	1

A.2.5 Measurement Results

Measurement uncertainty: $U= 4.08\text{dB}$, $k=2$.

Charging Mode, Set.4

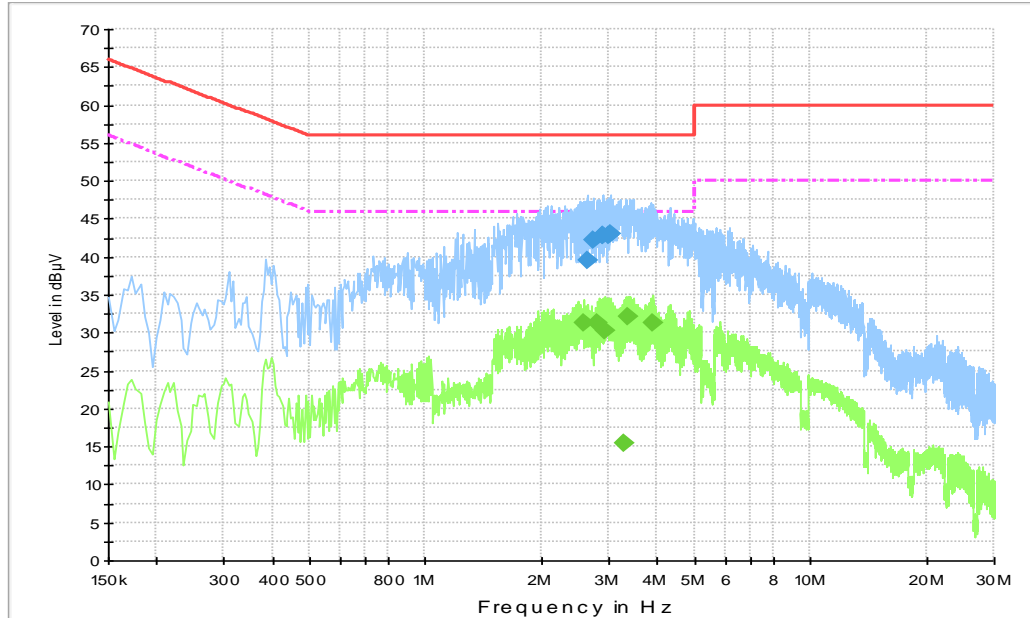


Figure A.4 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
2.625000	39.4	L1	10.3	16.6	56.0
2.733000	42.2	L1	10.3	13.8	56.0
2.877000	42.9	L1	10.3	13.1	56.0
2.895000	42.9	L1	10.3	13.1	56.0
2.985000	42.9	L1	10.3	13.1	56.0
3.034500	42.9	L1	10.3	13.1	56.0


Final Result 2

Frequency (MHz)	CAverage (dBμV)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
2.584500	31.3	L1	10.3	14.7	46.0
2.809500	31.2	L1	10.3	14.8	46.0
2.926500	30.3	L1	10.3	15.7	46.0
3.277500	15.4	L1	10.3	30.6	46.0
3.345000	32.0	L1	10.3	14.0	46.0
3.916500	31.4	L1	10.3	14.6	46.0

ANNEX D: Persons involved in this testing

Test items	Persons
Radiated Continuous Emission	Yang Fei
Conducted Emission	Dong Enran

ANNEX E: Accreditation Certificate

<p>United States Department of Commerce National Institute of Standards and Technology</p>  <hr style="border: 1px solid black;"/> <p>Certificate of Accreditation to ISO/IEC 17025:2005</p> <hr style="border: 1px solid black;"/>	
<p>NVLAP LAB CODE: 600118-0</p>	
<p>Telecommunication Technology Labs, CAICT Beijing China</p>	
<p><i>is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:</i></p>	
<p>Electromagnetic Compatibility & Telecommunications</p>	
<p><i>This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).</i></p>	
<hr style="border: 1px solid black;"/> <p>2016-09-29 through 2017-09-30 <i>Effective Dates</i></p>	 <div style="display: flex; align-items: center; justify-content: center;"><div style="margin-left: 10px;"><hr style="border: 1px solid black;"/><p><i>For the National Voluntary Laboratory Accreditation Program</i></p></div></div>

END OF REPORT