



TEST REPORT

No. I23Z60839-EMC01

for

TCL Communication Ltd.

GSM/UMTS/LTE/NR Mobile phone

Model Name: T609L

FCC ID: 2ACCJH168

with

Hardware Version: 04

Software Version: WES0

Issued Date: 2023-05-26

Note:

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Test Laboratory:

CTTL-Telecommunication Technology Labs, CAICT

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I23Z60839-EMC01	Rev.0	1 st edition	2023-05-26

Note: the latest revision of the test report supersedes all previous version.



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1. Test Laboratory

1.1. Testing Location

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°C

Relative Humidity: 20-75%

1.3. Project data

Testing Start Date: 2023-05-24

Testing End Date: 2023-05-25

1.4. Signature



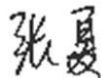
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2. Client Information

2.1. Applicant Information

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2.2. Manufacturer Information

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

3.1. About EUT

Description	GSM/UMTS/LTE/NR Mobile phone
Model Name	T609L
FCC ID:	2ACCJH168

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

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
UT27a	016447000001870	04	WES0

*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
AE1	Battery
AE2	Charger1
AE3	Charger2
AE4	USB Cable1
AE5	USB Cable2
AE6	USB Cable3
AE7	USB Cable4

AE1

Model	TLp048D7(CAC4850007C7)
Manufacturer	VEKEN
Capacity	Typ5000mAh
Nominal Voltage	3.85V

AE2

Model	QC13US(CBA0064BGTC5)
Manufacturer	PUAN
Length of cable	/

AE3

Model	QC13US(CBA0064BGTC1)
Manufacturer	BYD
Length of cable	/

AE4

Model	CDA0000198C1
Manufacturer	JUWEI
Length of cable	/

AE5

Model	CDA0000198C2
Manufacturer	SHENGHUA
Length of cable	/

AE6

Model CDA0000201C2
 Manufacturer SHENGHUA
 Length of cable /

AE7

Model CDA0000202C1
 Manufacturer JUWEI
 Length of cable /

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

3.4. EUT set-ups

EUT set-up No.	Combination of EUT and AE	Remarks
Set.1	EUT1+ AE1+AE2+AE4/5/6/7	Charger1+NR n5 idle

Note:

Equipment Under Test (EUT) is a model of GSM/UMTS/LTE mobile phone with integrated antenna.

It supports

GSM Band	GSM 850/900/1800/1900
UMTS Band	FDD Band I(W2100) /FDD Band II(W1900) /FDD Band IV(W1700)/FDD Band V(W850)/FDD Band VIII(W900)
LTE Band	FDD 2/4/5/7/12/13/25/26/66/71, TDD 41/48
NR Band	n2/5/12/25/41/66/71/77

It has MP3, Camera, USB memory, Bluetooth 5.1, Wi-Fi (802.11a/b/g/n/ac, 802.11n supports 20MHz and 40MHz bandwidth,802.11ac supports 20MHz , 40MHz and 80MHz bandwidth) functions.

The device contains receivers which tune and operate between 30MHz-960MHz in the following bands: GSM 850, WCDMA850, LTE Band 5/12/13/71, NR band n5/n71. All licensed band receivers that tune in the range of 30MHz-960MHz are investigated. Only the worst-case emissions are reported.

NOTE: The model T609L is a variant model based on T609DL, according to the declaration of changes, the following test items and test modes were performed:

Test Item	Mode or Feature	EUT Set-up
Radiated Continuous Emission	Charging mode	Set.1

Only the worst-case emissions are reported.

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	2019
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-1 (10 meters×6.7meters×6.1meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. = 15 %, Max. = 75 %
Shielding effectiveness	0.014MHz-1MHz, >60dB; 1MHz - 1000MHz, >90dB.
Electrical insulation	> 2 MΩ
Ground system resistance	< 4 Ω
Normalised site attenuation (NSA)	< ±4 dB, 3m distance
Site voltage standing-wave ratio (S_{VSWR})	Between 0 and 6 dB, from 1GHz to 6GHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 6000 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	CTTL(huayuan North Road)
2	Conducted Emission	15.107(a)	B.2	P	CTTL(huayuan North Road)



7. Test Equipments Utilized

NO.	Description	TYPE	SERIES NUMBER	MANUFACTURE	CAL DUE DATE	CALIBRATION INTERVAL
1	Test Receiver	ESW44	103144	R&S	2023-10-25	1 year
2	EMI Antenna	VULB 9163	01223	SCHWARZBECK	2023-07-25	1 year
3	EMI Antenna	3115	00167250	ETS-Lindgren	2023-06-20	1 year
4	LISN	ENV216	101200	R&S	2023-06-29	1 year
5	Test Receiver	ESCI 7	100344	R&S	2024-02-21	1 Year
6	Software	EMC32	/	R&S	/	/

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 (USB mode of MS and charging mode of MS) at distances of 3 meters 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 USB mode and charging mode. During the test MS is connected to a PC via a USB cable in the case of USB mode and is connected to a charger in the case of charging mode.

The EUT was tested while operating in licensed band Rx mode. All licensed band receivers that tune in the range of 30MHz-960MHz, as listed in section 3.4, are investigated. Only the worst case emissions are reported.

All equipment is placed on the test table top and arranged in a typical configuration in accordance with ANSI C63.4-2014 and manipulated to obtain worst case emissions.

The model of the PC is M4000E-17, and the serial number of the PC is M706GWXD. The software is used to let the PC keep on copying data to MS, reading and erasing the data after copy action was finished.

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

A.1.3 Measurement Limit

Frequency range (MHz)	Field strength limit ($\mu\text{V}/\text{m}$)		
	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/3MHz	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): $U = 5.54 \text{ dB}$, $k=2$.

Measurement results for Set.1:

Charging Mode/Average detector

Frequency (MHz)	Measurement Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
17331.220	40.80	-29.70	43.36	27.14	54.00	13.20	H
17764.720	40.70	-29.63	45.95	24.37	54.00	13.30	V
17369.980	40.70	-29.97	43.36	27.31	54.00	13.30	V
17967.700	40.60	-29.06	46.66	23.00	54.00	13.40	H
17961.580	40.50	-29.06	46.66	22.90	54.00	13.50	H
17899.700	40.50	-29.53	45.95	24.08	54.00	13.50	H

Charging Mode/Peak detector

Frequency (MHz)	Measurement Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
17837.140	51.70	-29.68	45.95	35.42	74.00	22.30	H
17229.220	51.40	-29.57	43.36	37.61	74.00	22.60	V
17799.400	50.80	-29.89	45.95	34.73	74.00	23.20	H
17351.620	50.80	-29.97	43.36	37.41	74.00	23.20	H
17323.060	50.80	-29.70	43.36	37.14	74.00	23.20	H
17992.520	50.70	-29.06	46.66	33.10	74.00	23.30	V

Measurement results for Set.1:

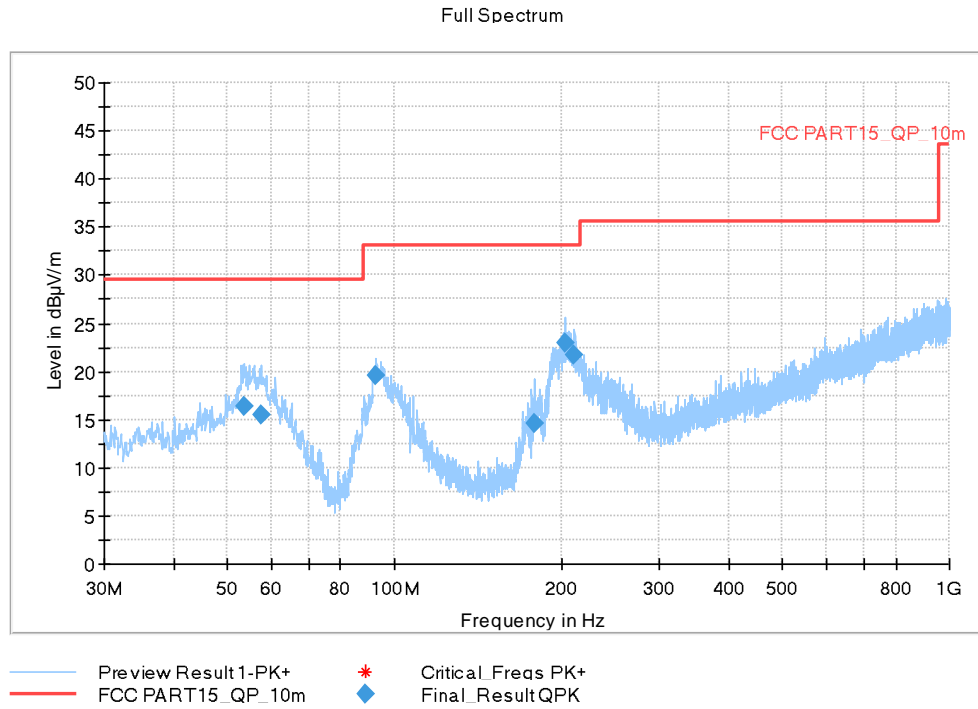


Fig A.1 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
53.474000	16.43	29.54	13.11	120.000	100.0	V	315.0	-11.1
57.548000	15.55	29.54	13.99	120.000	275.0	V	315.0	-11.5
92.759000	19.58	33.06	13.48	120.000	125.0	V	-31.0	-13.7
178.507000	14.58	33.06	18.48	120.000	125.0	V	60.0	-14.1
203.727000	23.00	33.06	10.06	120.000	125.0	V	46.0	-12.0
211.196000	21.64	33.06	11.42	120.000	125.0	V	46.0	-12.1

Full Spectrum

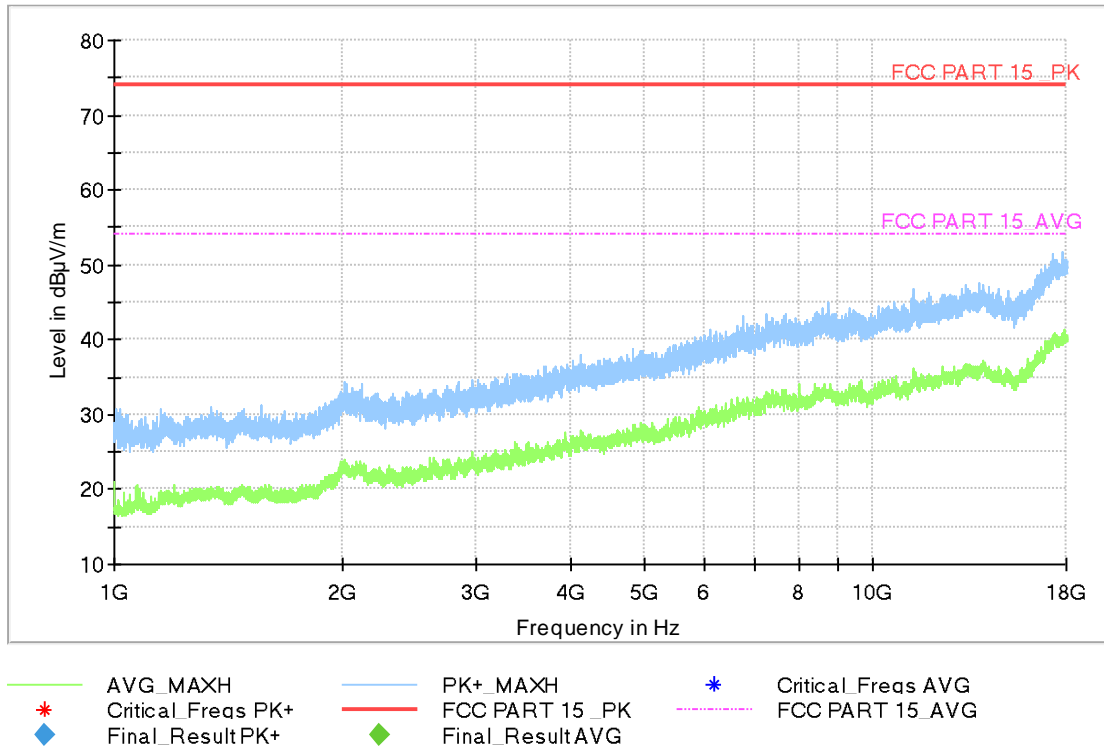


Fig A.2 Radiated Emission from 1GHz to 18GHz

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