



Report No.: ZR/2020/3002705-01
Page: 1 of 20

TEST REPORT

Application No.: ZR/2020/30027
Applicant: TCL Communication Ltd.
Address of Applicant: 5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong
Manufacturer: TCL Communication Ltd.
Address of Manufacturer: 5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong
EUT Name: LTE/UMTS/GSM mobile phone
Model No.: 5029A
Trade mark: alcatel
FCC ID: 2ACCJH119
Standard(s) : 47 CFR Part 15, Subpart B
Date of Receipt: 2020/3/19
Date of Test: 2020/3/20 to 2020/4/4
Date of Issue: 2021/5/24

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Derek Yang
Wireless Laboratory Manager



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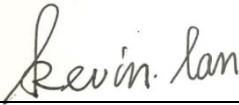
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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2020/4/17		Original
02		2021/5/24	Kevin.Lan	1. Add test site Information 2. Modify data conversion error of antenna height 3. Update equipment list

Authorized for issue by:	
Prepared By	 (Kevin.Lan) /Engineer
Checked By	 (David Chen) /Reviewer

2 Test Summary

Emission Part				
Item	Standard	Method	Requirement	Result
Conducted Emissions at Mains Terminals (150kHz-30MHz)	47 CFR Part 15, Subpart B	ANSI C63.4:2014	Class B	Pass
Radiated Emissions (30MHz-1GHz)	47 CFR Part 15, Subpart B	ANSI C63.4:2014	Class B	Pass
Radiated Emissions (above 1GHz)	47 CFR Part 15, Subpart B	ANSI C63.4:2014	Class B	Pass

Internal Source	Upper Frequency
Below 1.705MHz	30MHz
1.705MHz to 108MHz	1GHz
108MHz to 500MHz	2GHz
500MHz to 1GHz	5GHz
Above 1GHz	5th harmonic of the highest frequency or 40GHz, whichever is lower



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4 General Information

4.1 Description of Support Units

Description	Manufacturer	Model No.	Inventory No.
Router	NETGEAR	R6020	No.XA1401
Computer	Lenovo	L480	No.XA1402
Mouse	A4TECH	OP-520NU USB	No.XA1403

	No.	P/N	Remark	Comment
Adaptor	1	CBA0059AGAC7	UC13US;Chenyang 5V2A Charger	-
	2	CBA0059AGAC5	UC13US ;PUAN 5V2A Charger	
USB cable	1	CDA0000024C8	PUAN	-
	2	CDA0000024C2	JUWEI	
Headset	1	CCB0046A10C1	JUWEI	-
	2	CCB0046A10C4	MEIHAO	-
	3	CCB0049A10C1	JUWEI	-
	4	CCB0049A10C4	MEIHAO	-
	5	CCB0046A15C1	JUWEI	CCB0046A15C1 Same with CCB0046A10C1, only remove alcatel logo
	6	CCB0046A15C4	MEIHAO	CCB0046A15C4 Same with CCB0046A10C4, only remove alcatel logo
	7	CCB0049A12C1	JUWEI	CCB CCB0049A12C1 Same with CCB0049A10C1, only remove alcatel logo
	8	CCB0049A12C4	MEIHAO	CCB CCB0049A12C4 Same with CCB0049A10C4, only remove alcatel logo
Battery	1	CAC3860024C1	TLp038D1; BYD	-
	2	CAC3860025C7	TLp038D7; VEKEN;	

4.2 Test modes

Pretest these modes to find the worst case and show the worse data in the test items:	e: Transfer data between the EUT and the PC+USB cable1 f: Transfer data between the EUT and the PC+USB cable2 g: Telecom Idle+BT+WLAN +GPS Rx+playing MP4 (SD card) +earphone1+battery+Cable(worst)+adapter1 h: Telecom Idle+BT+WLAN +GPS Rx+playing MP4 (SD card) +earphone1+battery+Cable(worst)+adapter2 i: Telecom Idle+BT+WLAN +GPS Rx+camera (Front) +earphone+battery+Cable(worst)+Cable(worst)+adapter(Worst)
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	j: Telecom Idle+BT+WLAN +GPS Rx+camera (Back) +earphone+battery+Cable(worst)+adapter(Worst) k: GSM 850+BT+WLAN +GPS Rx+FM+earphone+battery+Cable(worst)+adapter(Worst) l: GSM 1900+BT+WLAN +GPS Rx+ FM+earphone+battery+Cable(worst)+adapter(Worst) m: WCDMA Band II+BT+WLAN +GPS Rx+ FM+earphone+battery+Cable(worst)+adapter(Worst) n: WCDMA Band IV+BT+WLAN +GPS Rx+ FM+earphone+battery+Cable(worst)+adapter(Worst) o: WCDMA Band V+BT+WLAN +GPS Rx+ FM+earphone+battery+Cable(worst)+adapter(Worst) p: LTE band 2+BT+WLAN +GPS Rx+ FM+earphone+battery+Cable(worst)+adapter(Worst) q: LTE band 4+BT+WLAN +GPS Rx+ FM+earphone(worst)+battery(worst)+Cable(worst)+adapter(Worst) r: LTE band 5+BT+WLAN +GPS Rx+ FM+earphone(worst)+battery(worst)+Cable(worst)+adapter(Worst) s: LTE band 7+BT+WLAN +GPS Rx+ FM+earphone(worst)+battery(worst)+Cable(worst)+adapter(Worst) t: LTE band 13+BT+WLAN +GPS Rx+ FM+earphone(worst)+battery(worst)+Cable(worst)+adapter(Worst) u: LTE band 17+BT+WLAN +GPS Rx+ FM+earphone(worst)+battery(worst)+Cable(worst)+adapter(Worst) v: LTE band 66+BT+WLAN +GPS Rx+ FM+earphone(worst)+battery(worst)+Cable(worst)+adapter(Worst)
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4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Conduction Emission	± 3.0dB (150kHz to 30MHz)
		± 4.8dB (Below 1GHz)
2	Radiated Emission	± 4.8dB (1GHz to 6GHz)
		± 4.5dB (6GHz to 18GHz)
		± 5.02dB (Above 18GHz)

4.4 Test Location

Lab A:

Company:	SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch
Address:	No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China
Post code:	518057



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Lab B:

Company:	SGS-CSTC STANDARDS TECHNICAL SERVICES (XI 'AN) CO., LTD.
Address:	1/F, Unit D, Building 1, Kanghong Orange Technology Park, No.137, Keyuan 3rd Road, Fengdong New City, Xi'an, Shaanxi China
Post code:	710086
Test engineer:	Ben Huang

Remark: All tests were performed at Lab B.

4.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

Lab A:

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- **VCCI**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

- **FCC –Designation Number: CN1178**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

- **Innovation, Science and Economic Development Canada**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

Lab B:

- **A2LA (Certificate No. 4854.01)**

SGS-CSTC STANDARDS TECHNICAL SERVICES (XI 'AN) CO., LTD. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4854.01.

- **FCC –Designation Number: CN1271.**

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

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5 Equipment List

CE Test System					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Shielding Room	Brilliant-emc	N/A	XAW03-35-01	2019-09-11	2022-09-10
Test receiver	ROHDE&SCHWARZ	ESR	XAW01-08-01	2019-09-07	2020-09-06
Artificial network	ROHDE&SCHWARZ	ENV216	XAW01-04-01	2019-07-16	2020-07-15
Temperature and humidity meter	MingGao	TH101B	XAW01-01-01	2019-12-06	2020-12-05
Measurement Software	Tonscend	TS+ CE V2.5	XAW02-05-02	NCR	NCR
5G UXM	Keysight	E7515B	XAW01-19-01	2019-08-17	2020-08-16
Radio communication analyzer	ROHDE&SCHWARZ	CMW 500	XAW01-03-02	2019-06-27	2020-06-26

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RE Test System					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Semi-Anechoic Chamber	Brilliant-emc	N/A	XAW03-35-01	2019-09-11	2022-09-10
MXA signal analyzer	Keysight	N9020A	XAW01-06-01	2019-06-27	2020-06-26
Test receiver	ROHDE&SCHWARZ	ESR	XAW01-08-01	2019-09-07	2020-09-06
Receiving antenna (30MHz-3GHz)	Schwarzbeck	VULB 9163	XAW01-09-01	2019-10-13	2021-10-12
Receiving antenna (1GHz~18GHz)	Schwarzbeck	BBHA 9120D	XAW01-09-02	2019-10-13	2021-10-12
Receiving antenna (15GHz~40GHz)	Schwarzbeck	BBHA 9170	XAW01-09-03	2019-10-13	2021-10-12
Directional antenna rack controller	Max-Full	MF-7802BS	XAW03-03-01	NCR	NCR
High-speed antenna rack controller	Max-Full	MF-7802	XAW03-04-01	NCR	NCR
Filter bank	Tonscend	JS0806-F	XAW03-05-01	NCR	NCR
Filter bank	Tonscend	JS0806s	XAW03-05-02	NCR	NCR
Amplifier	Tonscend	TAP00903040	XAW01-41-01	2019-11-18	2020-11-17
Amplifier	Tonscend	TAP01018048	XAW01-41-02	2019-11-18	2020-11-17
Amplifier	Tonscend	TAP18040048	XAW01-41-03	2019-12-03	2020-12-02
Amplifier	Shanghai Steed	YX28980930	XAW01-41-06	2019-11-18	2020-11-17
Temperature and humidity meter	MingGao	TH101B	XAW01-01-01	2019-12-06	2020-12-05
Measurement Software	Tonscend	TS+ RSE V3.0.0.2	XAW02-05-01	NCR	NCR
5G UXM	Keysight	E7515B	XAW01-19-01	2019-08-17	2020-08-16
Radio communication analyzer	ROHDE&SCHWARZ	CMW 500	XAW01-03-02	2019-06-27	2020-06-26

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6 Emission Test Results

6.1 Conducted Emissions at Mains Terminals (150kHz-30MHz)

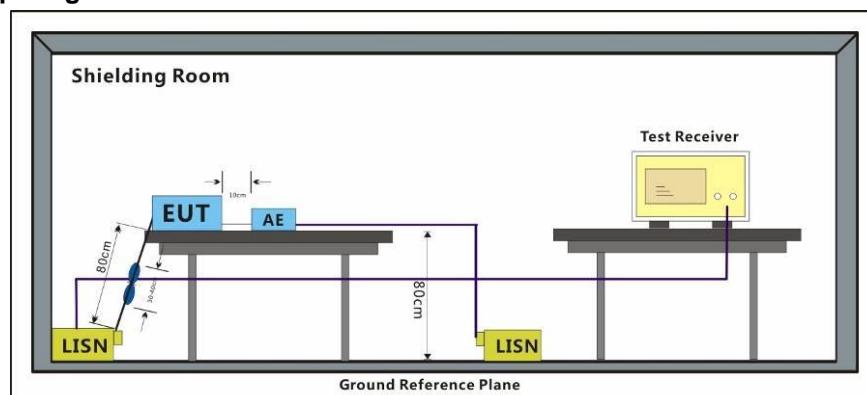
Test Requirement:	47 CFR Part 15, Subpart B
Test Method:	ANSI C63.4:2014
Frequency Range:	150kHz to 30MHz
Limit:	
0.15M-0.5MHz	66dB(μV)-56dB(μV) quasi-peak, 56dB(μV)-46dB(μV) average
0.5M-5MHz	56dB(μV) quasi-peak, 46dB(μV) average
5M-30MHz	60dB(μV) quasi-peak, 50dB(μV) average
Detector:	Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz

6.1.1 E.U.T. Operation

Operating Environment:

Temperature:	20.3 °C	Humidity:	58.1 % RH	Atmospheric Pressure:	1005 mbar
The worst case for final test:	e: Transfer data between the EUT and the PC+USB cable1				
	g: Telecom Idle+BT+WLAN +GPS Rx+playing MP4 (SD card) +earphone1+battery+Cable1+adapter1				
	h: Telecom Idle+BT+WLAN +GPS Rx+playing MP4 (SD card) +earphone1+battery+Cable1+adapter2				
	i: Telecom Idle+BT+WLAN +GPS Rx+camera (Front) +earphone+battery+Cable1+Cable1+adapter2				
	j: Telecom Idle+BT+WLAN +GPS Rx+camera (Back) +earphone+battery+Cable1+adapter2				

6.1.2 Test Setup Diagram



6.1.3 Measurement Data

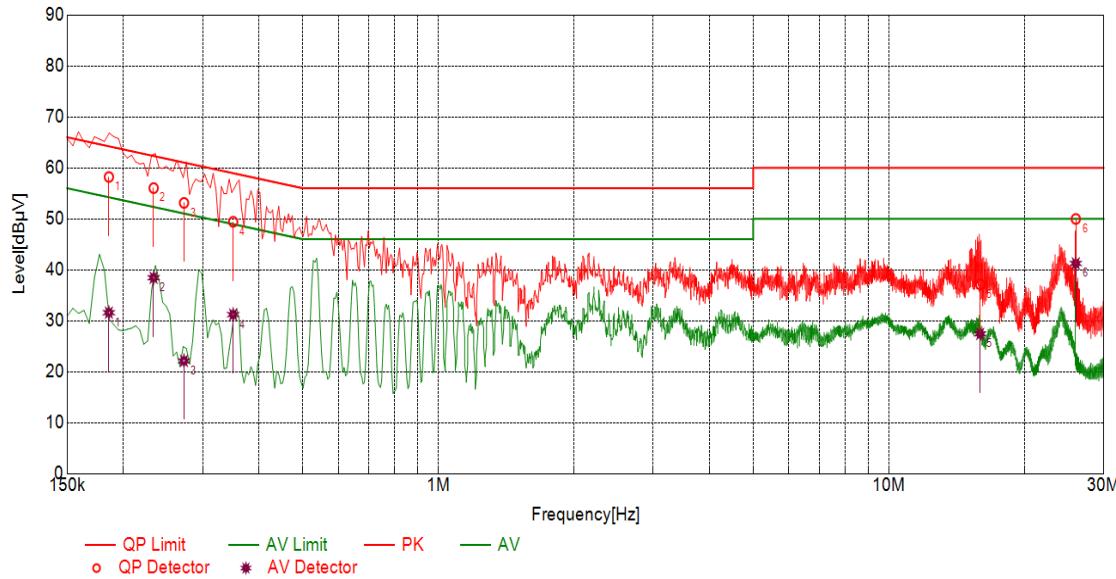
An initial pre-scan was performed with peak detector. Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected.



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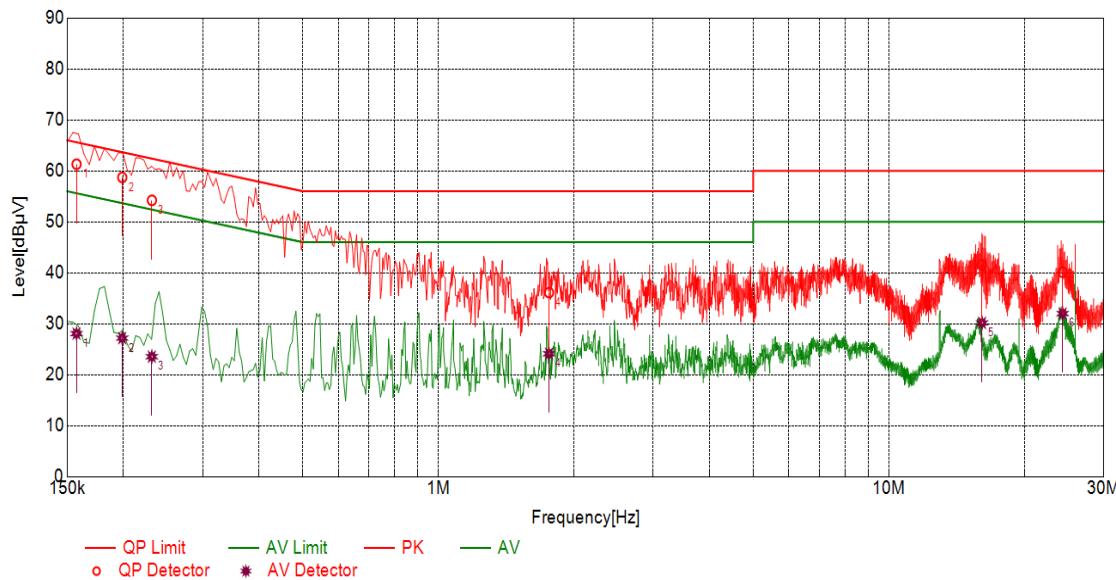


Final Data List									
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBμV]	QP Limit [dBμV]	QP Margin [dB]	AV Value [dBμV]	AV Limit [dBμV]	AV Margin [dB]	Type
1	0.1857	10.10	58.21	64.22	6.01	31.58	54.22	22.64	N
2	0.2334	10.10	56.03	62.33	6.30	38.43	52.33	13.90	N
3	0.2726	10.10	53.12	61.04	7.92	22.12	51.04	28.92	N
4	0.3505	10.10	49.42	58.95	9.53	31.21	48.95	17.74	N
5	15.9518	10.11	37.12	60.00	22.88	27.42	50.00	22.58	N
6	26.0006	10.11	49.97	60.00	10.03	41.24	50.00	8.76	N

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Mode:e; Line:Neutral Line

**Final Data List**

NO.	Freq. [MHz]	Factor [dB]	QP Value [dBμV]	QP Limit [dBμV]	QP Margin [dB]	AV Value [dBμV]	AV Limit [dBμV]	AV Margin [dB]	Type
1	0.1574	10.10	61.31	65.60	4.29	28.06	55.60	27.54	L
2	0.1988	10.10	58.71	63.66	4.95	27.17	53.66	26.49	L
3	0.2313	10.10	54.22	62.40	8.18	23.54	52.40	28.86	L
4	1.7611	10.10	36.12	56.00	19.88	24.12	46.00	21.88	L
5	16.1039	10.11	41.56	60.00	18.44	30.16	50.00	19.84	L
6	24.3157	10.11	40.11	60.00	19.89	32.00	50.00	18.00	L

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6.2 Radiated Emissions (30MHz-1GHz)

Test Requirement: 47 CFR Part 15, Subpart B

Test Method: ANSI C63.4:2014

Frequency Range: 30MHz to 1GHz

Measurement Distance: 3m

Limit:

30MHz -88MHz 40.0(dB μ V/m) quasi-peak

88MHz-216MHz 43.5(dB μ V/m) quasi-peak

216MHz-960MHz 46.0(dB μ V/m) quasi-peak

960MHz-1000MHz 54.0(dB μ V/m) quasi-peak

Detector: Peak for pre-scan (120kHz resolution bandwidth) 30M to1000MHz

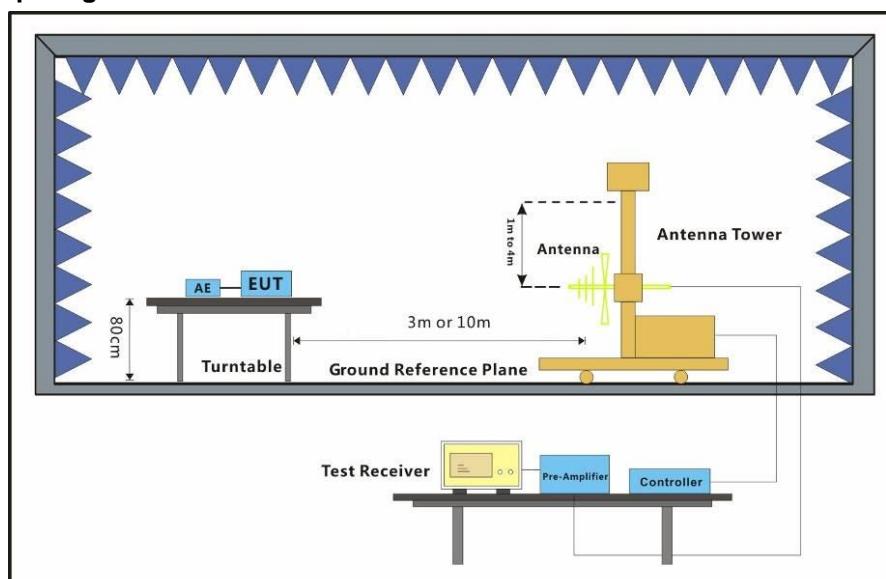
6.2.1 E.U.T. Operation

Operating Environment:

Temperature: 25.4 °C Humidity: 51 % RH Atmospheric Pressure: 1005 mbar

The worst case f: Transfer data between the EUT and the PC+USB cable2
for final test: h: Telecom Idle+BT+WLAN +GPS Rx+playing MP4 (SD card)
+earphone1+battery+ Cable1+adapter2

6.2.2 Test Setup Diagram



6.2.3 Measurement Data

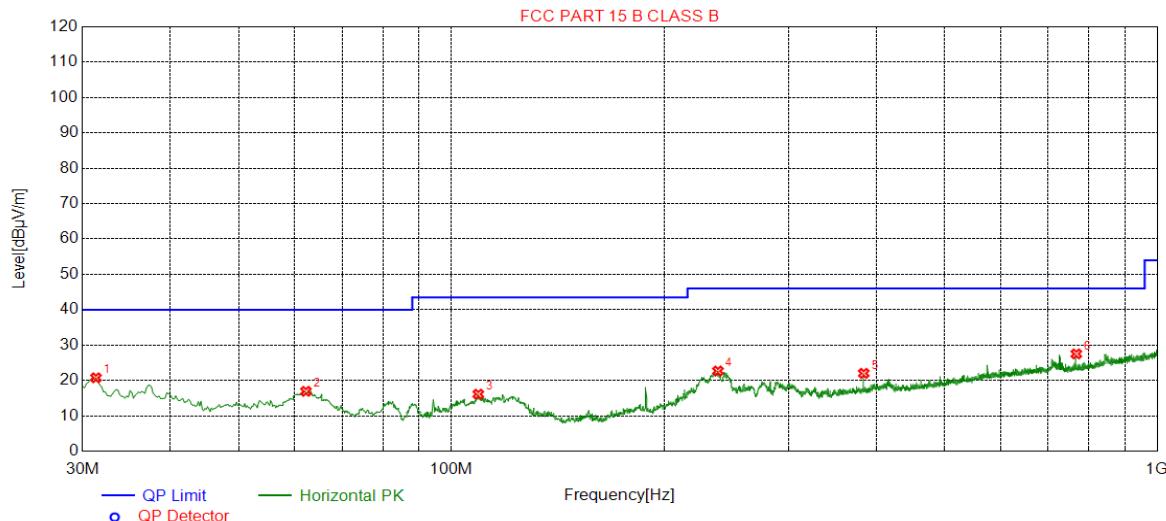
An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities.



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Mode:f; Polarization:Horizontal



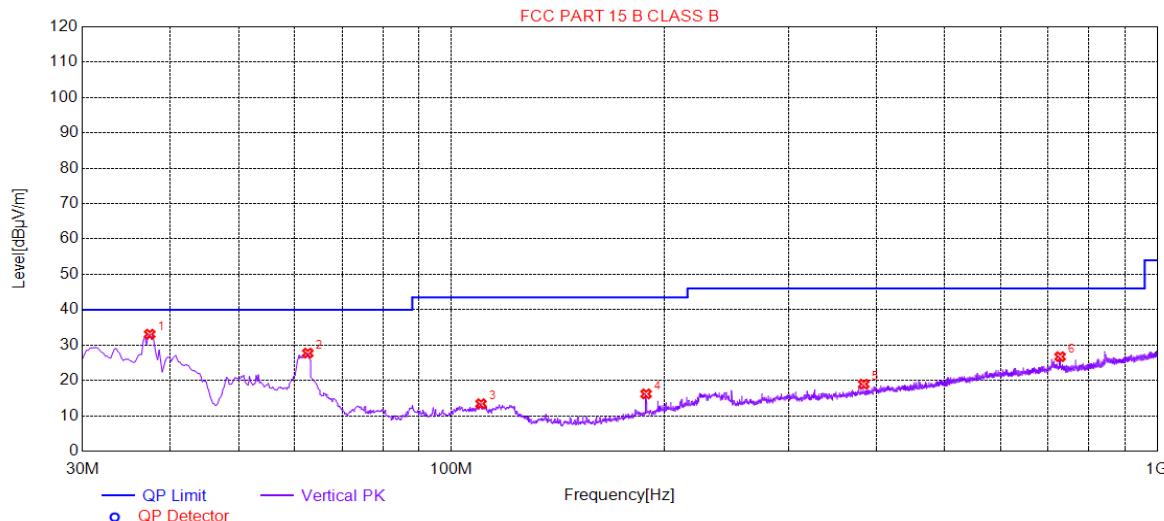
Suspected List

NO.	Freq. [MHz]	Level [dB μ V/m]	Factor [dB]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	31.3583	20.75	-30.05	40.00	19.25	247	276	Horizontal
2	62.2104	16.93	-32.43	40.00	23.07	154	168	Horizontal
3	109.1678	16.12	-32.00	43.50	27.38	118	232	Horizontal
4	238.5917	22.67	-30.12	46.00	23.33	226	233	Horizontal
5	383.9268	22.01	-25.95	46.00	23.99	106	31	Horizontal
6	768.1236	27.51	-18.13	46.00	18.49	150	25	Horizontal

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Mode:f; Polarization:Vertical



Suspected List								
NO.	Freq. [MHz]	Level [dB μ V/m]	Factor [dB]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	37.3735	33.08	-29.19	40.00	6.92	223	327	Vertical
2	62.5985	27.73	-32.53	40.00	12.27	233	286	Vertical
3	110.1380	13.42	-32.02	43.50	30.08	219	223	Vertical
4	188.7237	16.20	-32.38	43.50	27.30	226	17	Vertical
5	383.9268	18.96	-25.95	46.00	27.04	224	57	Vertical
6	728.5397	26.72	-18.84	46.00	19.28	283	19	Vertical

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6.3 Radiated Emissions (above 1GHz)

Test Requirement: 47 CFR Part 15, Subpart B

Test Method: ANSI C63.4:2014

Frequency Range: Above 1GHz

Measurement Distance: 3m

Limit:

Above 1GHz 74(dB μ V/m) peak, 54(dB μ V/m) average

Detector: Peak for pre-scan (1000kHz resolution bandwidth) 1000M to 18000MHz

6.3.1 E.U.T. Operation

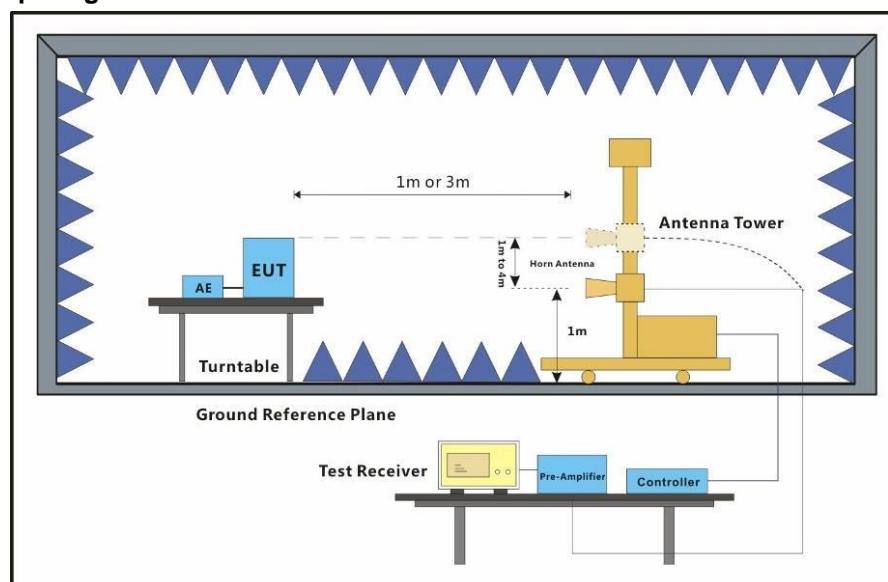
Operating Environment:

Temperature: 23.3 °C Humidity: 56.2 % RH Atmospheric Pressure: 1005 mbar

The worst case e: Transfer data between the EUT and the PC+USB cable1

for final test: j: Telecom Idle+BT+WLAN +GPS Rx+camera (Back) +earphone+battery+Cable1+adapter2

6.3.2 Test Setup Diagram



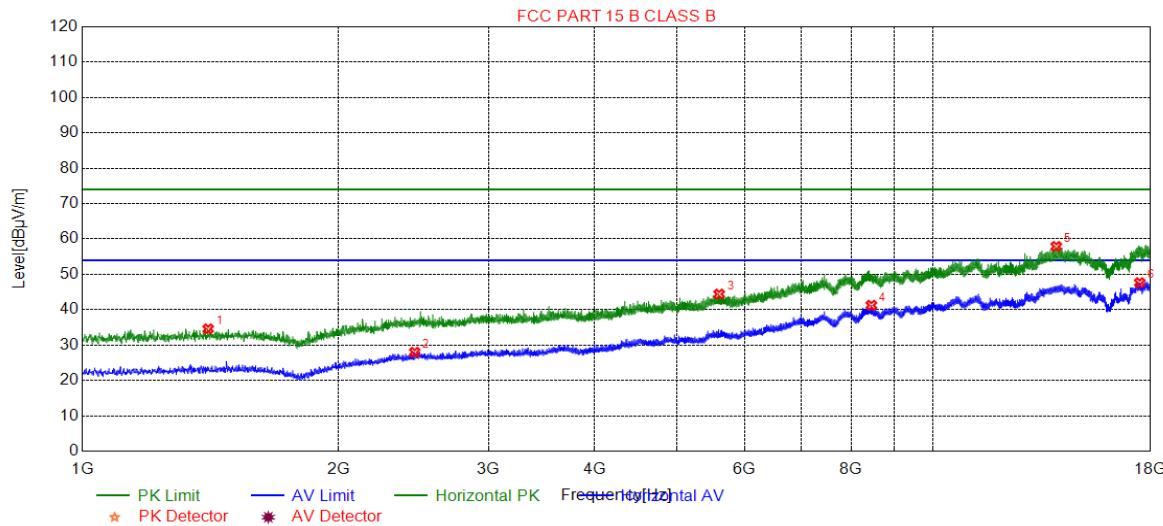
6.3.3 Measurement Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Average measurements were conducted based on the peak sweep graph. The EUT was measured by Horn antenna with 2 orthogonal polarities.

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Mode:e; Polarization:Horizontal



Suspected List								
NO.	Freq. [MHz]	Level [dB μ V/m]	Factor [dB]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1405.4703	34.59	-30.30	74.00	39.41	167	90	Horizontal
2	2457.8229	27.99	-26.12	54.00	26.01	233	204	Horizontal
3	5601.2801	44.42	-15.86	74.00	29.58	139	241	Horizontal
4	8454.8727	41.26	-7.68	54.00	12.74	193	53	Horizontal
5	13944.4472	57.89	2.20	74.00	16.11	109	90	Horizontal
6	17476.3738	47.65	1.34	54.00	6.35	127	204	Horizontal

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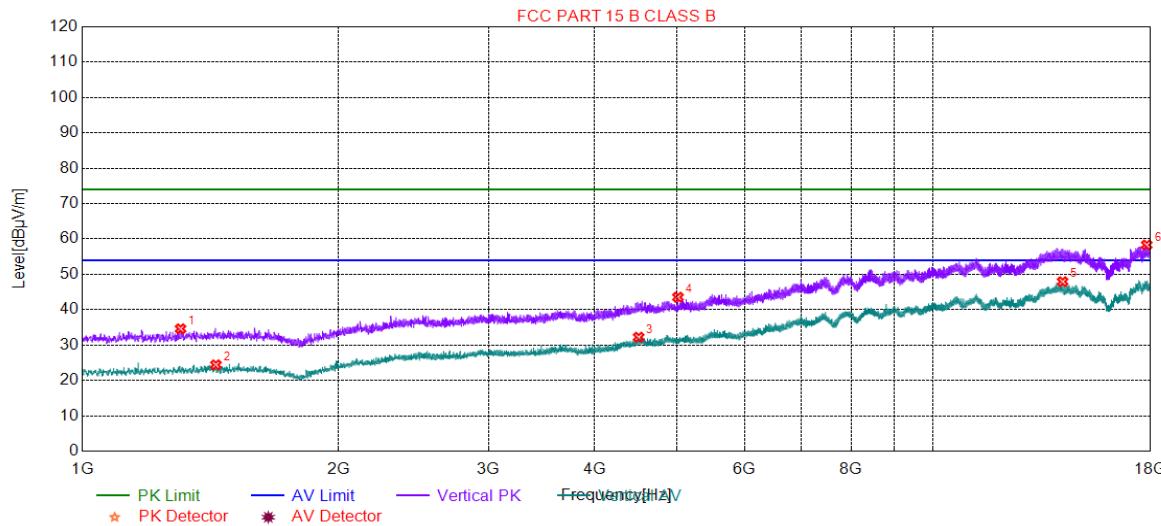
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Mode:e; Polarization:Vertical



Suspected List								
NO.	Freq. [MHz]	Level [dB μ V/m]	Factor [dB]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1304.3152	34.61	-30.74	74.00	39.39	229	45	Vertical
2	1435.2218	24.41	-30.34	54.00	29.59	233	158	Vertical
3	4504.7252	32.23	-19.28	54.00	21.77	247	232	Vertical
4	5010.5005	43.54	-17.50	74.00	30.46	288	8	Vertical
5	14185.8593	47.93	2.11	54.00	6.07	293	270	Vertical
6	17812.1406	58.31	0.62	74.00	15.69	284	120	Vertical

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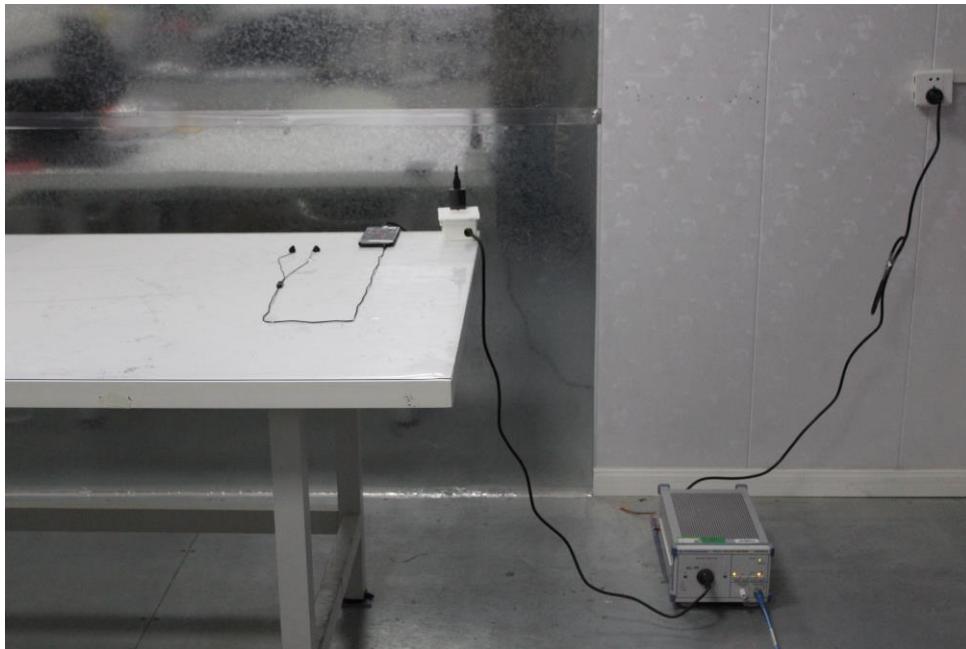
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7 Photographs

7.1 Conducted Emissions at Mains Terminals (150kHz-30MHz) Test Setup



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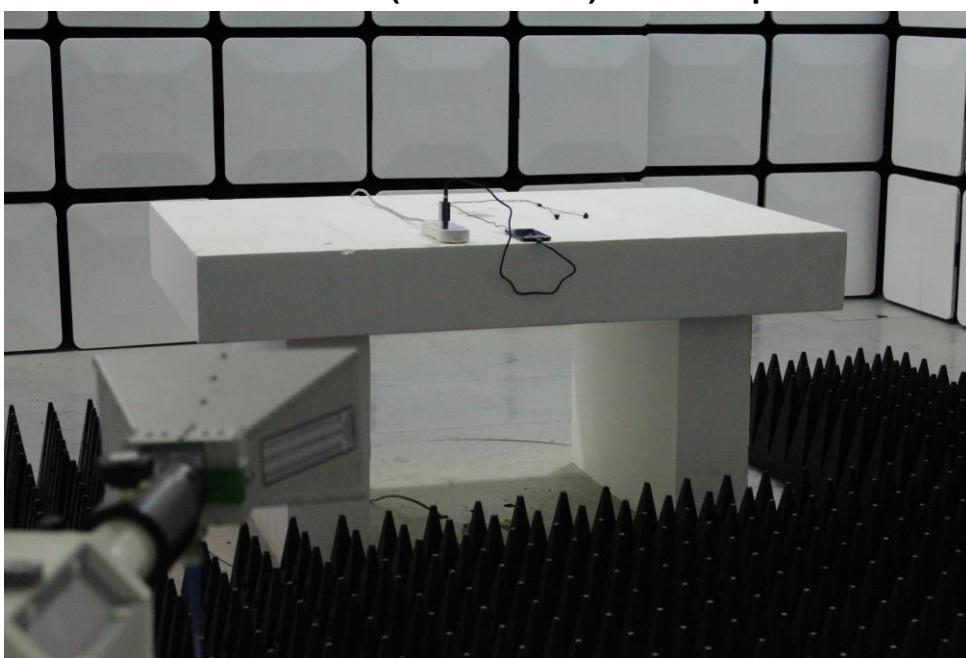
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7.2 Radiated Emissions (30MHz-1GHz) Test Setup



7.3 Radiated Emissions (Above 1GHz) Test Setup



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7.4 EUT Constructional Details (EUT Photos)

Please refer to internal and external photo.

- End of the Report -



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