TEST REPORT

Application No.:	ZR/2019/B0003
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/WCDMA/GSM mobile phone
Model No.:	5028D
Trade mark:	alcatel
Standard(s) :	47 CFR Part 15, Subpart B
Date of Receipt:	2019-11-12
Date of Test:	2019-11-13 to 2019-11-27
Date of Issue:	2021/8/16
Test Result:	**Pass***

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Derek Yang
Wireless Laboratory Manager

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Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
01		2019-11-27		Original
02		2021-6-6	James Qin	1. The test site information of lab B(XI 'AN) added in section 4.5 and 4.6 2.Modify data conversion error of antenna height 3.Update equipment list
03		2021-8-16	James Qin	1. Update Support Units. 2. Remove the information of lab A(SZ) in section 4.5 and 4.6

This report supersedes our previous report ZR/2019/B000307, issued on 2019-11-27, which is hereby deemed null and void.

Authorized for issue by:		
Prepared By		**(James Qin) / Engineer**
Checked By		**(Jim Huang) / Reviewer**

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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 Details of E.U.T.

Power supply:	DC 3.85V from internal rechargeable battery or from AC/DC adapter Model No.: UC13US AC Input: 100-240V 50/60Hz 0.5A DC Output: DC 5V 2A
Cable:	USB cable: 100cm unshielded Earphone cable: 115cm unshielded

	No.	P/N	Remark	Comment
Adaptor	1	CBA0059AGAC5	UC13US; 5.0 V,2000 mA, PUAN;	-
	2	CBA0059AGAC7	UC13US; 5.0 V,2000 mA,; CHENGYANG	
USB cable	1	CDA0000024C8	PUAN	-
	2	CDA0000024C2	JUWEI	-
Headset	1	CCB0046A10C1	JUWEI; alcatel Logo	-
	2	CCB0046A10C4	MEIHAO; alcatel Logo	-
	3	CCB0046A15C1	JUWEI	Same with CCB0046A10C1, only remove alcatel logo
	4	CCB0046A15C4	MEIHAO	Same with CCB0046A10C4, only remove alcatel logo
Battery	1	CAC3860024C1	TLp038D1; BYD	-
	2	CAC3860025C7	TLp038D7; VEKEN;	-

4.2 Description of Support Units

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

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4.3 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) 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 12+BT+WLAN +GPS Rx+ FM+earphone(worst)+battery(worst)+ Cable(worst)+adapter(Worst) u: LTE band 13+BT+WLAN +GPS Rx+ FM+earphone(worst)+battery(worst)+ Cable(worst)+adapter(Worst) v: LTE band 17+BT+WLAN +GPS Rx+ FM+earphone(worst)+battery(worst)+ Cable(worst)+adapter(Worst) w: LTE band 66+BT+WLAN +GPS Rx+ FM+earphone(worst)+battery(worst)+ Cable(worst)+adapter(Worst)

4.4 Measurement Uncertainty

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

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4.5 Test Location

Lab B:

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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.

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4.6 Test Facility

Lab B:

• A2LA (Certificate No. 4854.01)

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• FCC –Designation Number: CN1271.

4.7 Deviation from Standards

None

4.8 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	2018-12-16	2019-12-15
Measurement Software	Tonscend	TS+ CE V2.5	XAW02-05-02	NCR	NCR
Radio communication analyzer	ROHDE&SCHWARZ	CMW 500	XAW01-03-02	2019-06-27	2020-06-26

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RSE 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	2018-12-10	2019-12-09
Amplifier	Tonscend	TAP01018048	XAW01-41-02	2018-12-10	2019-12-09
Amplifier	Tonscend	TAP18040048	XAW01-41-03	2018-12-10	2019-12-09
Amplifier	Shanghai Steed	YX28980930	XAW01-41-06	2018-12-10	2019-12-09
Temperature and humidity meter	MingGao	TH101B	XAW01-01-01	2018-12-16	2019-12-15
Measurement Software	Tonscend	TS+ RSE V3.0.0.2	XAW02-05-01	NCR	NCR
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

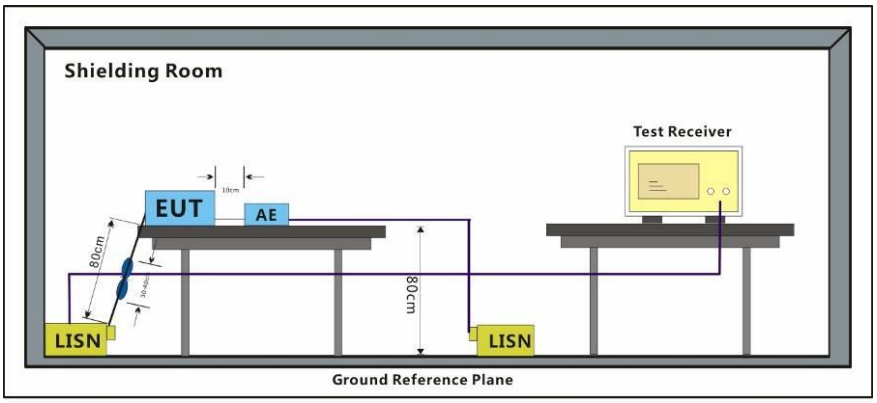
g: Telecom Idle+BT+WLAN +GPS Rx+playing MP4 (SD card) +earphone1+battery+Cable1+adapter1

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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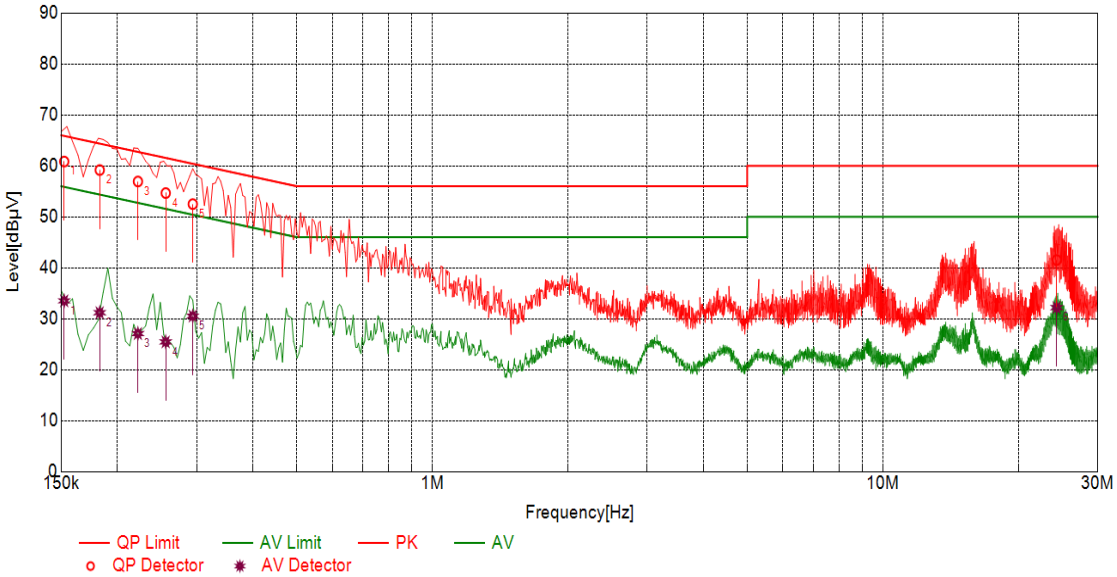
Mode:e; Line:Live Line



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	0.1524	10.10	60.85	65.87	5.02	33.51	55.87	22.36	L
2	0.1827	10.10	59.18	64.36	5.18	31.19	54.36	23.17	L
3	0.2221	10.10	56.93	62.74	5.81	27.08	52.74	25.66	L
4	0.2560	10.10	54.66	61.56	6.90	25.45	51.56	26.11	L
5	0.2940	10.10	52.50	60.41	7.91	30.52	50.41	19.89	L
6	24.3137	10.11	41.53	60.00	18.47	32.19	50.00	17.81	L

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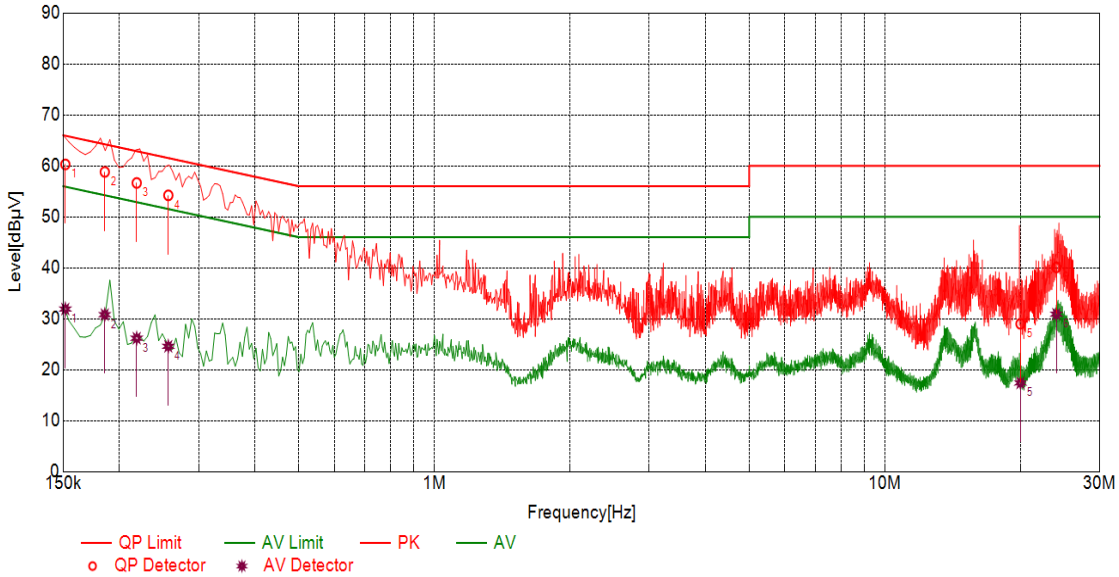
Mode:e; Line:Neutral Line



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1	0.1517	10.10	60.29	65.91	5.62	31.90	55.91	24.01	N
2	0.1856	10.10	58.81	64.23	5.42	30.80	54.23	23.43	N
3	0.2185	10.10	56.64	62.87	6.23	26.17	52.87	26.70	N
4	0.2568	10.10	54.22	61.53	7.31	24.59	51.53	26.94	N
5	19.9996	10.11	29.00	60.00	31.00	17.40	50.00	32.60	N
6	24.0210	10.11	40.07	60.00	19.93	30.90	50.00	19.10	N

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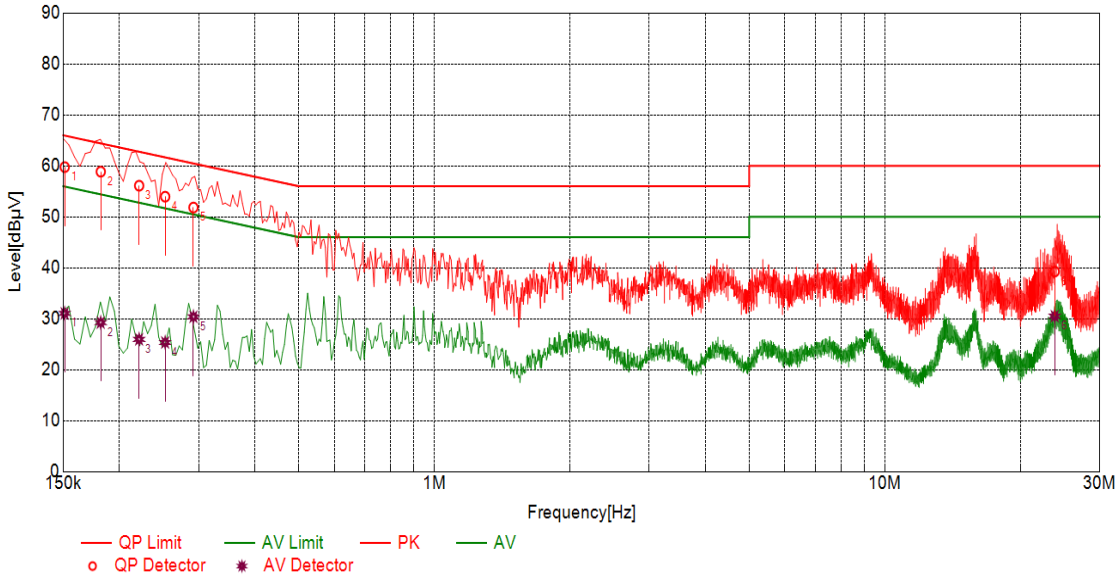

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1	0.1512	10.10	59.76	65.93	6.17	31.05	55.93	24.88	L
2	0.1818	10.10	58.86	64.40	5.54	29.24	54.40	25.16	L
3	0.2212	10.10	56.11	62.77	6.66	25.95	52.77	26.82	L
4	0.2527	10.10	53.95	61.67	7.72	25.34	51.67	26.33	L
5	0.2920	10.10	51.83	60.47	8.64	30.38	50.47	20.09	L
6	23.8218	10.11	39.27	60.00	20.73	30.50	50.00	19.50	L

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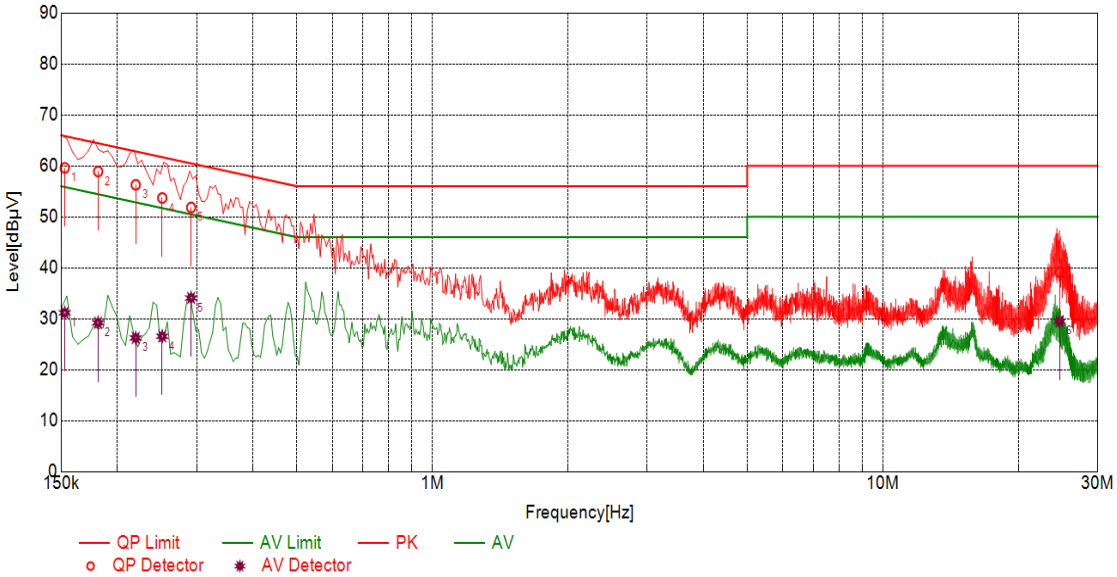

Final Data List									
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Type
1	0.1528	10.10	59.62	65.85	6.23	31.16	55.85	24.69	N
2	0.1812	10.10	58.89	64.43	5.54	29.21	54.43	25.22	N
3	0.2196	10.10	56.28	62.83	6.55	26.23	52.83	26.60	N
4	0.2515	10.10	53.70	61.71	8.01	26.56	51.71	25.15	N
5	0.2915	10.10	51.84	60.48	8.64	34.08	50.48	16.40	N
6	24.6808	10.11	39.11	60.00	20.89	29.49	50.00	20.51	N

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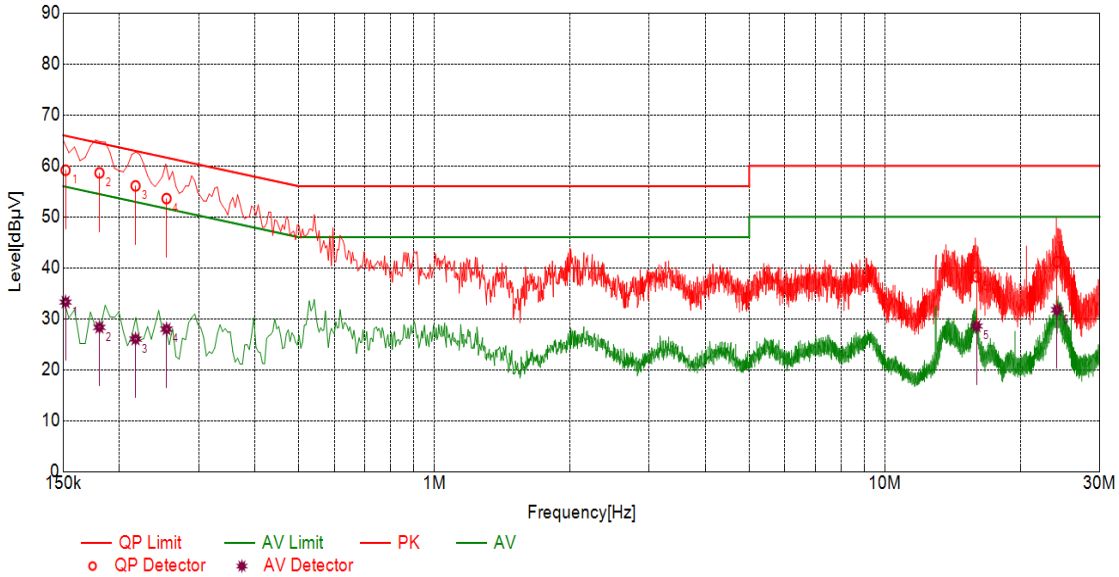

Final Data List									
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Type
1	0.1519	10.10	59.15	65.90	6.75	33.27	55.90	22.63	L
2	0.1806	10.10	58.62	64.46	5.84	28.31	54.46	26.15	L
3	0.2172	10.10	56.07	62.93	6.86	26.00	52.93	26.93	L
4	0.2545	10.10	53.58	61.61	8.03	27.96	51.61	23.65	L
5	15.9774	10.11	38.23	60.00	21.77	28.56	50.00	21.44	L
6	24.1157	10.11	41.20	60.00	18.80	31.76	50.00	18.24	L

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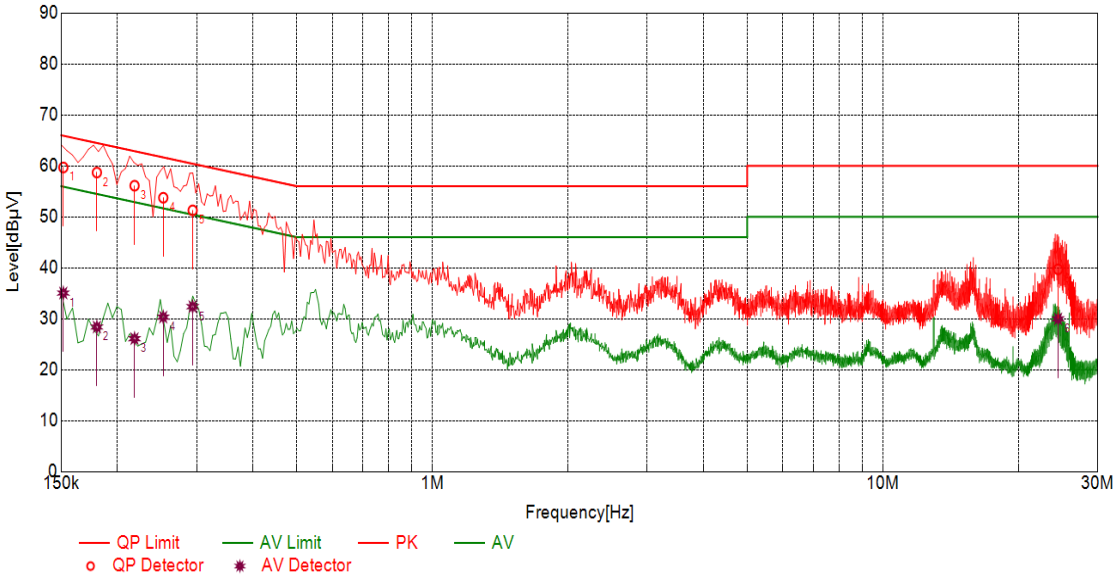
Mode:h; Line:Neutral Line



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	0.1517	10.10	59.69	65.91	6.22	35.04	55.91	20.87	N
2	0.1801	10.10	58.69	64.48	5.79	28.37	54.48	26.11	N
3	0.2183	10.10	56.11	62.88	6.77	26.09	52.88	26.79	N
4	0.2528	10.10	53.75	61.67	7.92	30.32	51.67	21.35	N
5	0.2938	10.10	51.27	60.42	9.15	32.37	50.42	18.05	N
6	24.491	10.11	39.70	60.00	20.30	29.97	50.00	20.03	N

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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(dBμV/m) quasi-peak
88MHz-216MHz	43.5(dBμV/m) quasi-peak
216MHz-960MHz	46.0(dBμV/m) quasi-peak
960MHz-1000MHz	54.0(dBμV/m) quasi-peak
Detector:	Peak for pre-scan (120kHz resolution bandwidth) 30M to1000MHz

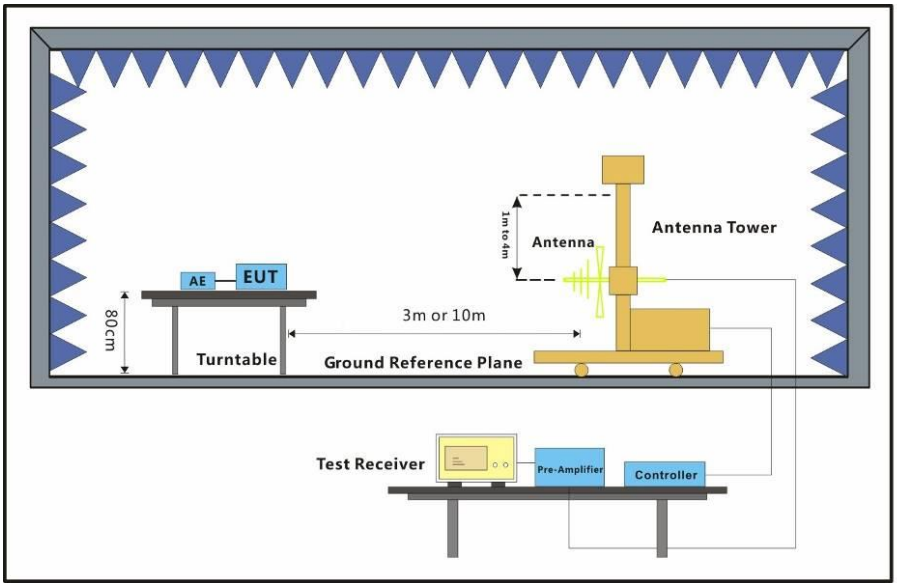
6.2.1 E.U.T. Operation

Operating Environment:

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

The worst case for final test: f: Transfer data between the EUT and the PC+USB cable2
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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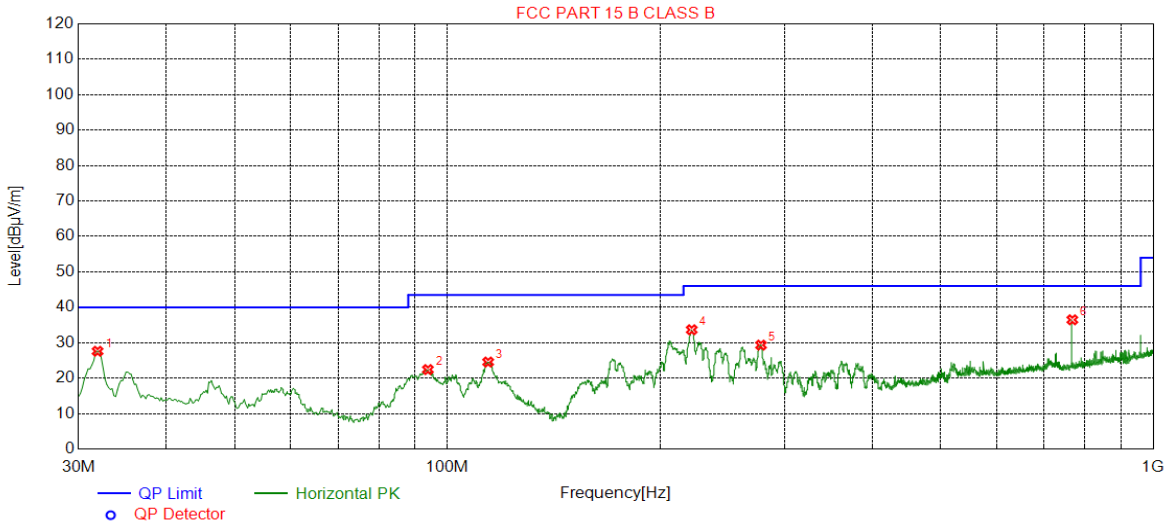
Mode:f; Polarization:Horizontal



NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	31.9404	27.59	-30.03	40.00	12.41	218	329	Horizontal
2	93.8388	22.42	-33.08	43.50	21.08	186	267	Horizontal
3	114.2128	24.55	-32.66	43.50	18.95	132	240	Horizontal
4	221.9044	33.66	-30.65	46.00	12.34	134	223	Horizontal
5	278.1756	29.33	-29.02	46.00	16.67	145	77	Horizontal
6	768.1236	36.47	-18.13	46.00	9.53	209	329	Horizontal

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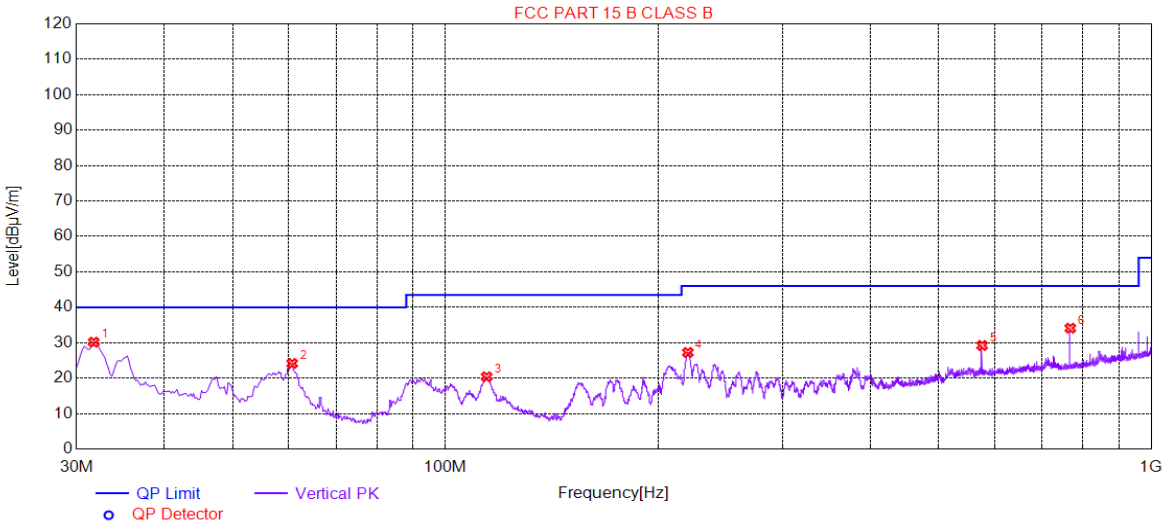
Mode:f; Polarization:Vertical



NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	31.7463	30.15	-30.04	40.00	9.85	220	343	Vertical
2	60.6581	24.16	-32.03	40.00	15.84	170	323	Vertical
3	114.4069	20.40	-32.69	43.50	23.10	213	191	Vertical
4	220.5461	27.25	-30.69	46.00	18.75	227	200	Vertical
5	576.0252	29.23	-21.31	46.00	16.77	247	346	Vertical
6	768.1236	34.11	-18.13	46.00	11.89	273	223	Vertical

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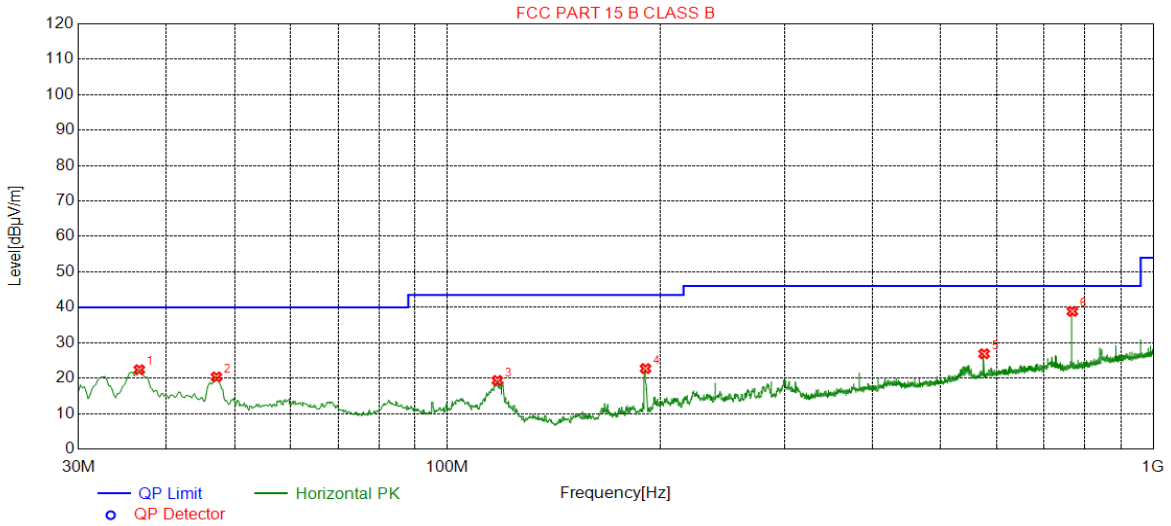
Mode:h; Polarization:Horizontal



NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	36.5973	22.38	-29.44	40.00	17.62	218	14	Horizontal
2	47.0754	20.35	-30.40	40.00	19.65	154	346	Horizontal
3	117.7055	19.35	-33.21	43.50	24.15	135	247	Horizontal
4	190.8582	22.70	-32.16	43.50	20.80	200	89	Horizontal
5	576.0252	26.89	-21.31	46.00	19.11	116	122	Horizontal
6	768.1236	38.85	-18.13	46.00	7.15	224	326	Horizontal

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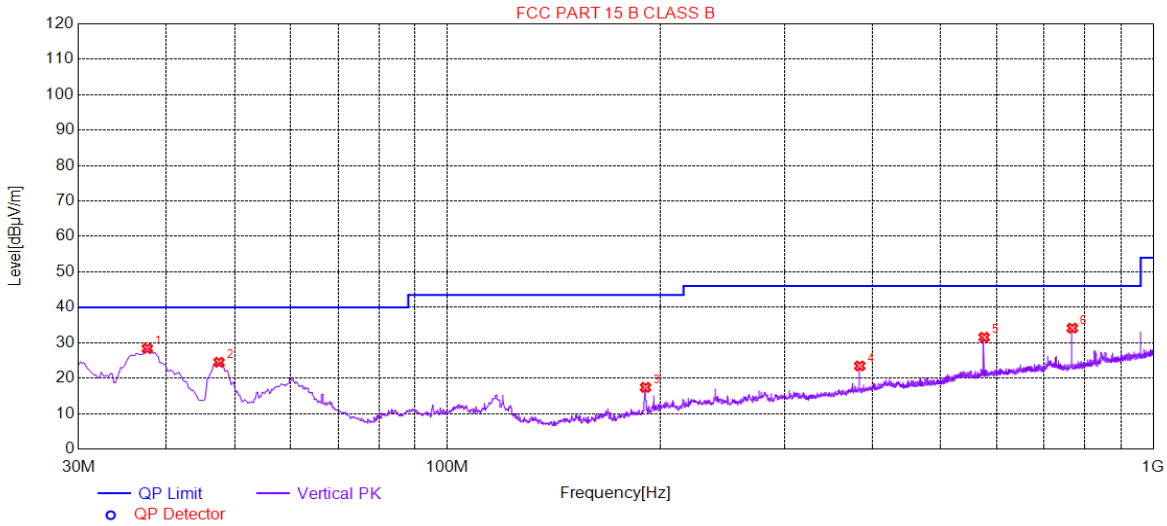
Mode:h; Polarization:Vertical



NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	37.5675	28.36	-29.13	40.00	11.64	195	317	Vertical
2	47.4635	24.49	-30.40	40.00	15.51	156	346	Vertical
3	190.8582	17.40	-32.16	43.50	26.10	177	43	Vertical
4	383.9268	23.45	-25.95	46.00	22.55	214	279	Vertical
5	576.0252	31.54	-21.31	46.00	14.46	261	2	Vertical
6	768.1236	34.13	-18.13	46.00	11.87	203	60	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(dBμV/m) peak, 54(dBμV/m) average
Detector:	Peak for pre-scan (1000kHz resolution bandwidth) 1000M to18000MHz

6.3.1 E.U.T. Operation

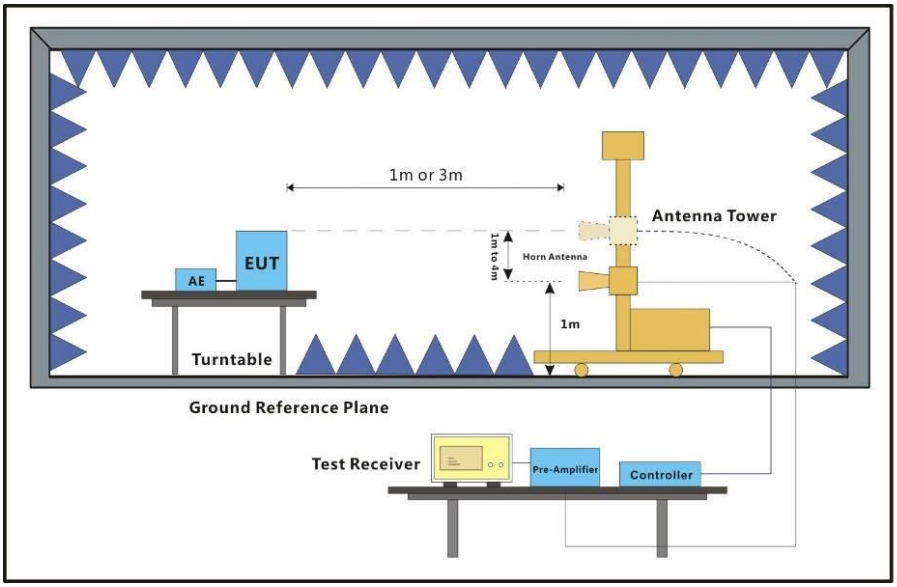
Operating Environment:

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

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

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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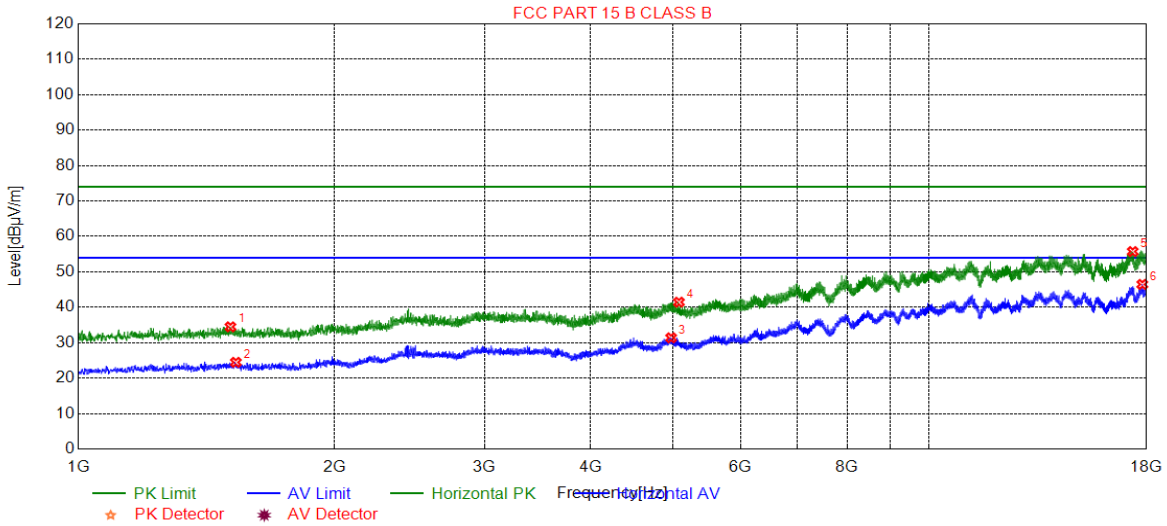
Mode:e; Polarization:Horizontal



NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1509.1755	34.48	-29.95	74.00	39.52	114	19	Horizontal
2	1531.2766	24.47	-30.06	54.00	29.53	188	68	Horizontal
3	4972.2486	31.38	-18.65	54.00	22.62	187	136	Horizontal
4	5078.5039	41.45	-19.16	74.00	32.55	217	326	Horizontal
5	17335.2668	55.73	-1.58	74.00	18.27	167	19	Horizontal
6	17792.5896	46.46	-1.67	54.00	7.54	171	189	Horizontal

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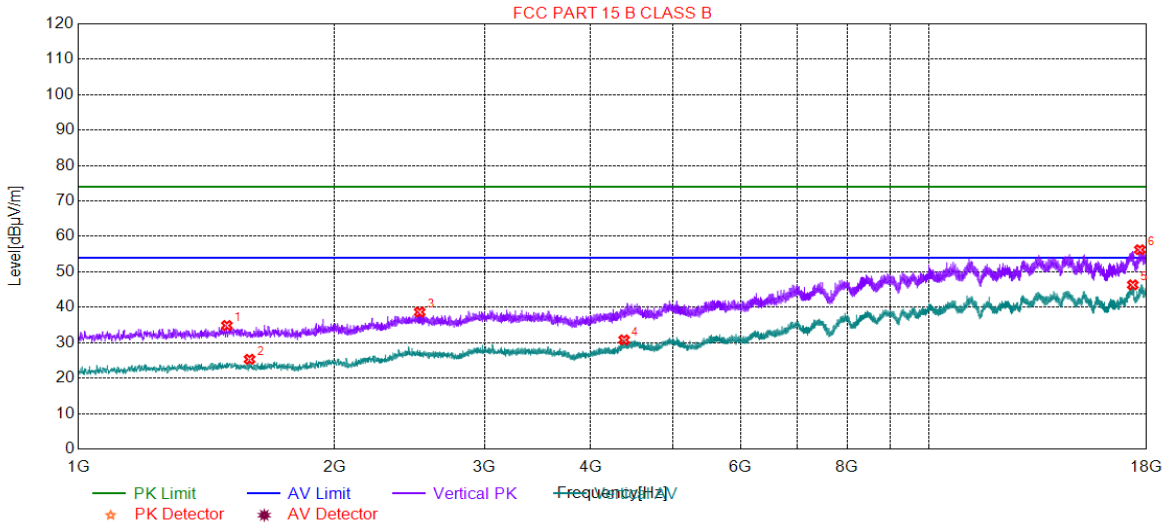
Mode:e; Polarization:Vertical



NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1494.7247	34.86	-29.94	74.00	39.14	187	227	Vertical
2	1589.0795	25.34	-30.35	54.00	28.66	233	341	Vertical
3	2518.1759	38.66	-25.89	74.00	35.34	218	227	Vertical
4	4378.0689	30.81	-21.20	54.00	23.19	255	64	Vertical
5	17337.8169	46.32	-1.58	54.00	7.68	157	123	Vertical
6	17671.8836	56.25	-1.01	74.00	17.75	234	173	Vertical

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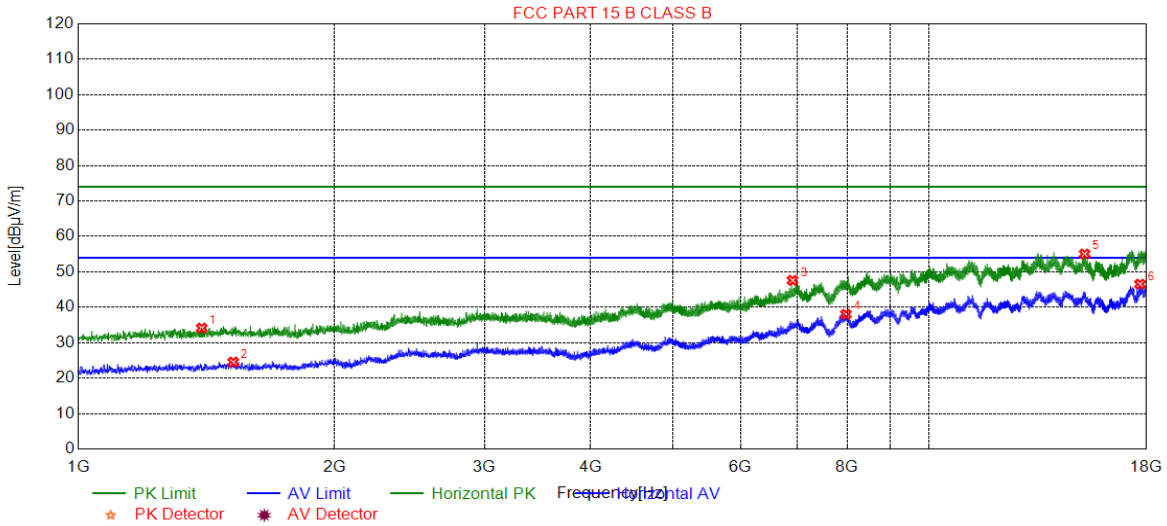
Mode:j; Polarization:Horizontal



NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1396.1198	34.13	-30.56	74.00	39.87	158	350	Horizontal
2	1520.2260	24.54	-30.01	54.00	29.46	199	80	Horizontal
3	6905.2453	47.61	-13.02	74.00	26.39	237	290	Horizontal
4	7978.8489	38.03	-10.03	54.00	15.97	191	182	Horizontal
5	15222.9111	55.05	0.25	74.00	18.95	143	350	Horizontal
6	17681.2341	46.53	-0.93	54.00	7.47	129	29	Horizontal

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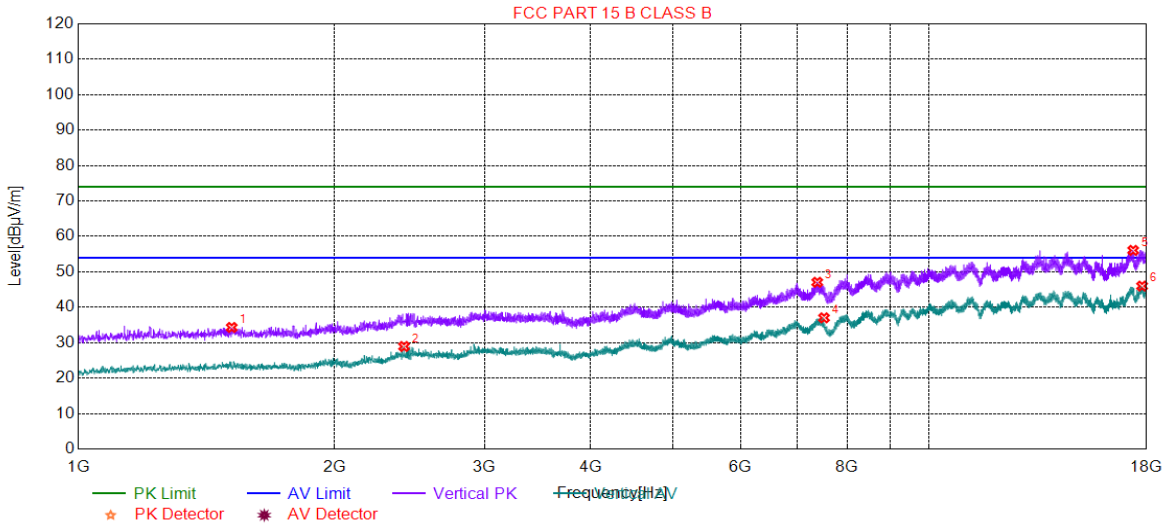
Mode:j; Polarization:Vertical



NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1514.2757	34.31	-29.98	74.00	39.69	208	271	Vertical
2	2413.6207	28.94	-25.99	54.00	25.06	175	80	Vertical
3	7382.9691	47.06	-12.00	74.00	26.94	225	24	Vertical
4	7518.9759	37.02	-12.26	54.00	16.98	169	222	Vertical
5	17357.3679	56.07	-1.65	74.00	17.93	250	24	Vertical
6	17779.8390	45.99	-1.55	54.00	8.01	231	80	Vertical

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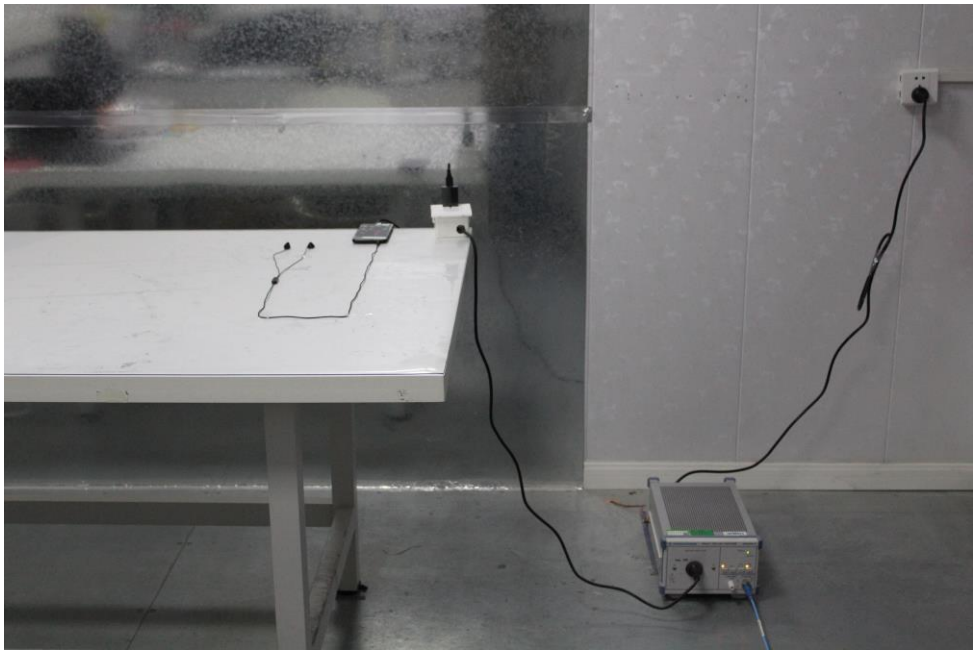
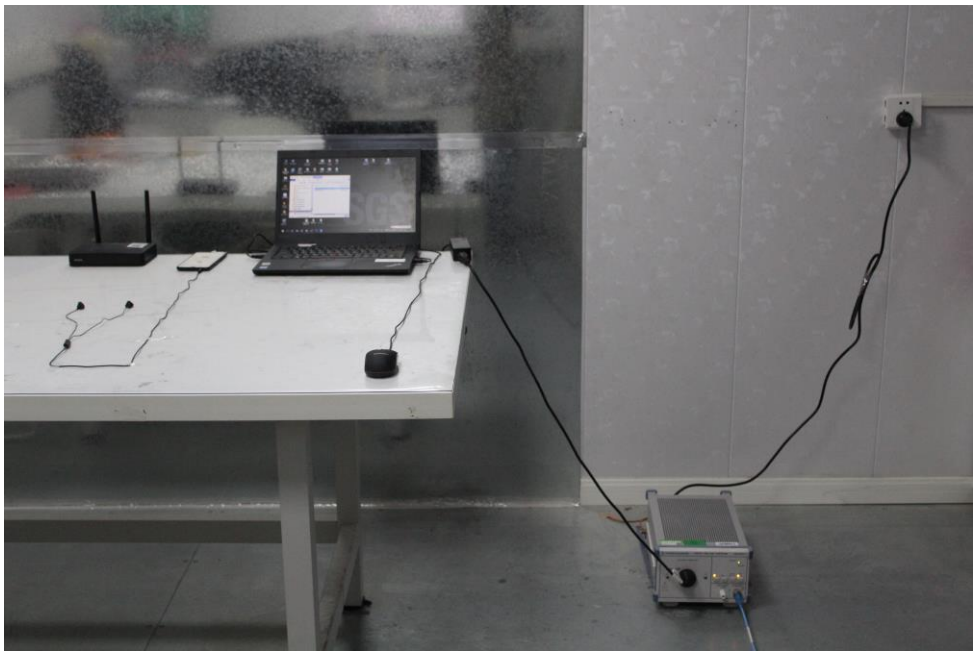
7 Photographs

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

(Test Location: SGS-CSTC STANDARDS TECHNICAL SERVICES (XI 'AN) CO., LTD.)





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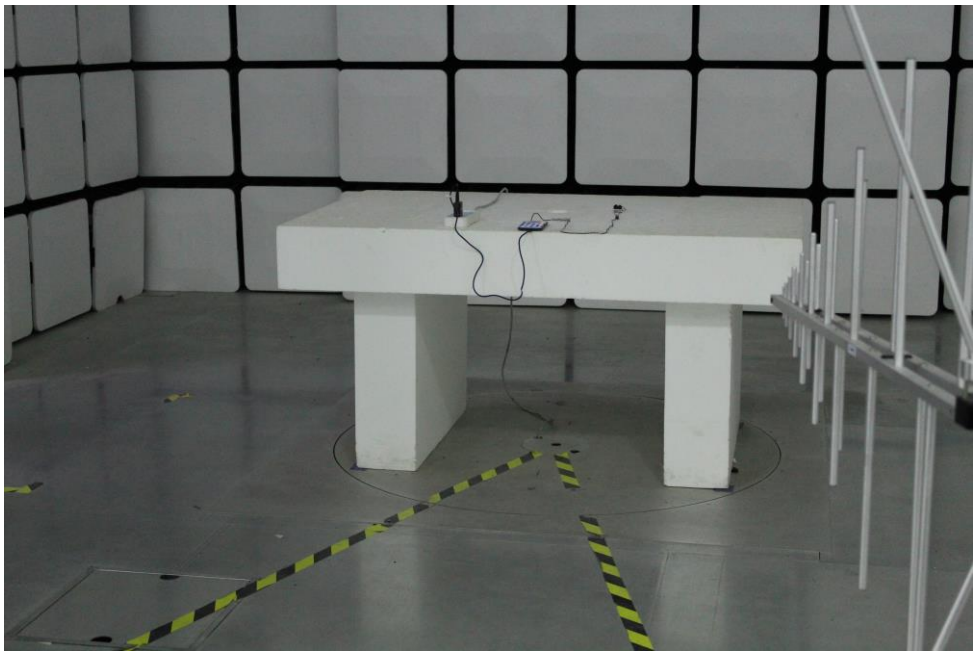
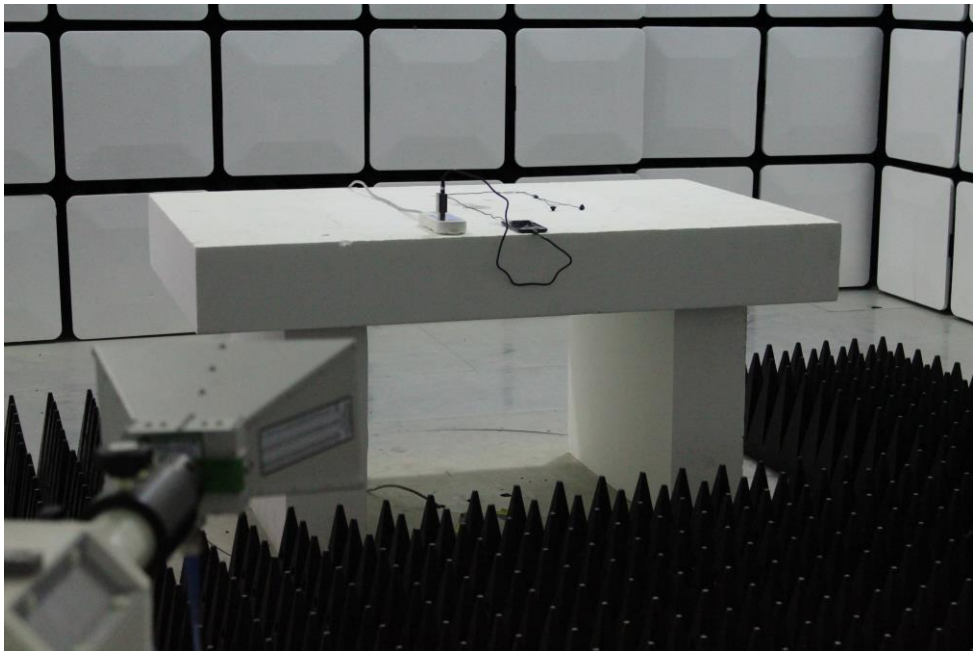
7.2 Radiated Emissions (30MHz-1GHz) Test Setup

(Test Location: SGS-CSTC STANDARDS TECHNICAL SERVICES (XI 'AN) CO., LTD.)





7.3 EUT Constructional Details (EUT Photos)

Please refer to internal and external photo.

- End of the Report -

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Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

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