



TEST REPORT

Application No.: ZR/2020/70006
Applicant: LG Electronics USA, Inc
Address of Applicant: 111 Sylvan Avenue, North Building Englewood Cliffs, NJ 07632
Manufacturer: Huaqin Telecom Technology Co., Ltd.
Address of Manufacturer: No.1 Building, No.9 Building, No.399, Keyuan Road, Zhangjiang Hi-tech Park, Shanghai, P.R. China
EUT Description: Mobile handset
Model No.: LM-K520HWM, LM-K520HM, LM-K525HWM, LM-K525HM
Trade Mark: LG
FCC ID: ZNFK520HWM
Standard(s): 47 CFR Part 15, Subpart B
Date of Receipt: 2020/7/10
Date of Test: 2020/7/10 to 2020/8/13
Date of Issue: 2020/8/13

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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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2020/8/13		Original

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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

Checked By

David Chen

David Chen
Reviewer

Test By

Daniel Wang

Daniel Wang
Project Engineer

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1 General Information

EUT Description:	Mobile handset
Model No.(EUT):	LM-K520HWM, LM-K520HM, LM-K525HWM, LM-K525HM
Trade Mark:	LG
Sample Type:	☒ Portable Device, ☐ Module
Antenna Type:	☐ External, ☒ Integrated

Battery			
Battery	ATL	BL-T51	3.87V; 3900mAh
Earphone			
Earphone	Cresyn	EAB64468444	
USB Cable			
USB Cable1	Ningbo Broad	DC15WB-G	1.0m shielded cable without core
USB Cable2	Luxshare	DC15WX-G	1.0m shielded cable without core
Adapter			
Adapter1 (US)	Phihong	MCS-V02WH	I/P: 100-240 Vac, 0.4A ,50/60HZ O/P: 5Vdc 2A
Adapter2 (US)	Aohai	MCS-V02WA2	I/P: 100-240 Vac, 0.4A ,50/60HZ O/P: 5Vdc 2A
Adapter3 (US)	Sunlin	MCS-V02WR	I/P: 100-240 Vac, 0.4A ,50/60HZ O/P: 5Vdc 2A

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Difference description:

The differences between LM-K520HWM and other models are shown in the below table:

Model		LM-K520HWM (Full approval)	LM-K520HM (Update approval)	LM-K525HWM (Updated approval)	LM-K525HM (Update approval)
Software version		different	different	different	different
Licensed Frequency	LTE	B1/B2/B3/B4/ B5/B7/B8/B12/B13/B17/B28/ B38/B66	B1/B2/B3/B4/ B5/B7/B8/B12/B13/B17/B28/ B38/B66	B1/B2/B3/B4/ B5/B7/B8/B12/B13/ B17/B28/ B38/B66	B1/B2/B3/B4/ B5/B7/B8/B12/B13/B17/B28/ B38/B66
	UMTS	B1/B2/B4/B5/ B8	B1/B2/B4/B5/ B8	B1/B2/B4/B5/ B8	B1/B2/B4/B5/ B8
	GSM	the same	the same	the same	the same
	IC	the same	the same	the same	the same
	Antenna	the same	the same	the same	the same
Unlicensed Frequency	Bluetooth	the same	the same	the same	the same
	2.4G Wi-Fi	the same	the same	the same	the same
	IC	the same	the same	the same	the same
	Antenna	the same	the same	the same	the same
Hardware	Ram / Rom	4G/64G	4G/64G	4G/128G	4G/128G
	Camera	the same	the same	the same	the same
	PCB	the same	the same	the same	the same
	USB Port	the same	the same	the same	the same
	RJ11 Port	the same	the same	the same	the same
	RJ45 Port	the same	the same	the same	the same
	NFC	Not support	Not support	Not support	Not support
	FM	Support	Support	Support	Support
Appearance	Dimension	the same	the same	the same	the same
	Color	the same	the same	the same	the same
Accessory	Battery	the same	the same	the same	the same
	External Charger	the same	the same	the same	the same
	USB label	the same	the same	the same	the same

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other	SIM card	Double SIM	Single SIM	Double SIM	Single SIM
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Remark:

According to the difference description above, only the model LM-K520HMW was fully tested, for other models were performed the Radiated Emission test for discrepancy, since the electrical circuit design, layout, components used and internal wiring were identical for all above models. With difference being on mode, appearance and color.

1.1 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Laptop	Lenovo	T430u	REF. No.SEA1800
Mouse	Lenovo	M-U0025-O	REF. No.:SEA2400
Router	NETGEAR	DGN2200	REF. No.SEA2200

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1.2 Test Location

All tests were performed at:

Company:	SGS-CSTC Standards Technical Services Co., Ltd. Xi'an Branch
Address:	Single floor D, building 1, Kanghong orange square science and technology park, No.137 keyuan 3rd road, fengdong new town, Xi 'an city, Shaanxi China
Post code:	710000
Telephone:	+86 (0) 29 6282 7885
Fax:	+86 (0) 29 6282 7885
E-mail:	ee.xian@sgs.com

No tests were sub-contracted.

1.3 Test Facility

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

• **A2LA (Certificate No. 4854.01)**

SGS-CSTC STANDARDS TECHNICAL SERVICES CO., LTD. XIAN BRANCH

is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4854.01.

Test Site No.:	SGS Xian Site No.		FCC Designation No.
	CO01-XA	03CH01-XA	CN1271

1.4 Deviation from Standards

None

1.5 Abnormalities from Standard Conditions

None

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2 Emission Test Results

2.1 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

2.1.1 E.U.T. Operation

Operating Environment:

Temperature: 18.9 °C Humidity: 55.1 % RH Atmospheric Pressure: 1000 mbar

Pretest these modes to find the worst case:	a: Transfer data between the EUT and the PC+USB cable1
	b: Transfer data between the EUT and the PC+USB cable2
	c: GSM 850 Idle+BT+WLAN+USB cable(worst)+GPS RX+playing MP4+earphone+Adaptor1
	d: WCDMA Band II Idle+BT+WLAN+USB cable(worst)+GPS RX+camera(rear)+earphone+Adaptor3
	e: WCDMA Band V Idle+BT+WLAN +USB cable(worst)+GPS RX+earphone+Adaptor(worst)
	f: LTE Band 5 Idle+BT+WLAN +USB cable(worst)+GPS RX++camera(rear)+earphone+Adaptor(worst)
	g: LTE Band 12 Idle+BT+WLAN +USB cable(worst)+GPS RX+earphone+Adaptor(worst)
	i: LTE Band 13 Idle+BT+WLAN +USB cable(worst)+GPS RX+earphone+Adaptor(worst)
	j: LTE Band 17 Idle+BT+WLAN +USB cable(worst)+GPS RX+earphone+Adaptor(worst)
	j: LTE Band 17 Idle+BT+WLAN +USB cable(worst)+GPS RX+earphone+Adaptor(worst)
The worst case for final test:	j: LTE Band 17 Idle+BT+WLAN +USB cable(worst)+GPS RX+earphone+Adaptor(worst)

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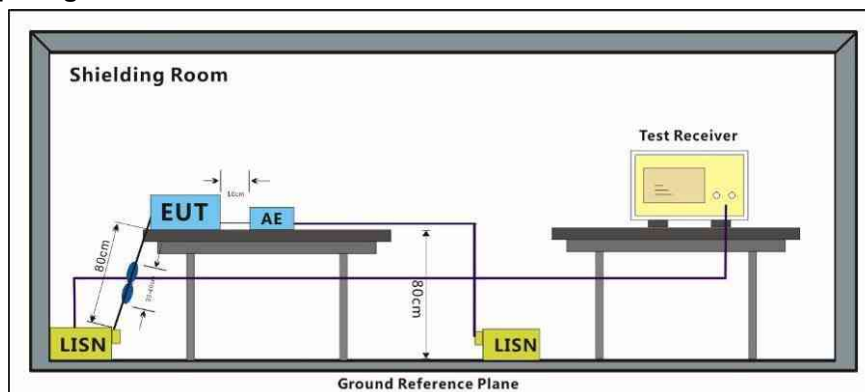
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2.1.2 Test Setup Diagram



2.1.3 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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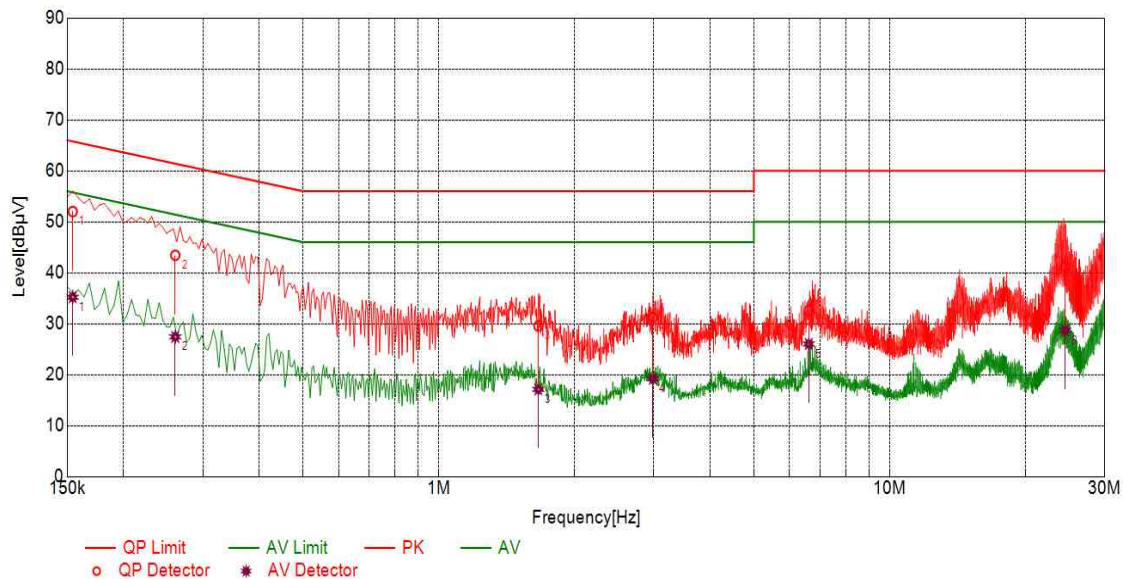
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Mode:j; Line:Live Line



Test Graph

Final Data List

NO.	Freq. [MHz]	Factor [dB]	QP Value [dBuV]	QP Limit [dBuV]	QP Margin [dB]	AV Value [dBuV]	AV Limit [dBuV]	AV Margin [dB]	Type
1	0.1543	10.10	52.02	65.76	13.74	35.20	55.76	20.56	L
2	0.2605	10.10	43.44	61.41	17.97	27.41	51.41	24.00	L
3	1.6630	10.10	29.55	56.00	26.45	17.12	46.00	28.88	L
4	2.9843	10.10	31.24	56.00	24.76	19.21	46.00	26.79	L
5	6.6191	10.10	32.60	60.00	27.40	26.02	50.00	23.98	L
6	24.5207	10.11	41.23	60.00	18.77	28.70	50.00	21.30	L

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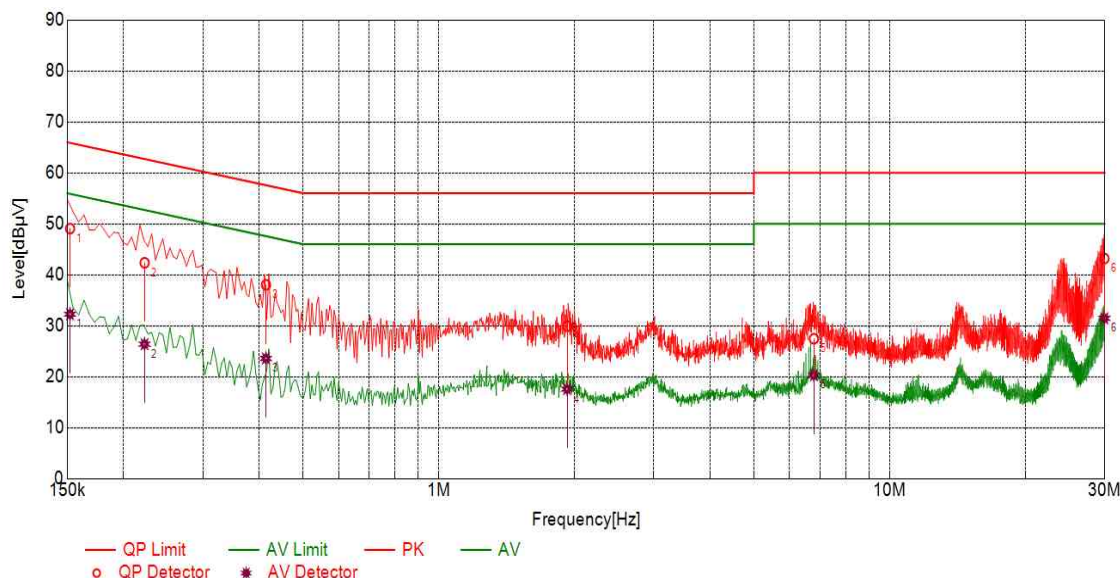
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邮编 710086 sgs.china@sgs.com

Mode:j; Line:Neutral Line



Test Graph

Final Data List

NO.	Freq. [MHz]	Factor [dB]	QP Value [dBuV]	QP Limit [dBuV]	QP Margin [dB]	AV Value [dBuV]	AV Limit [dBuV]	AV Margin [dB]	Type
1	0.1522	10.10	49.06	65.88	16.82	32.26	55.88	23.62	N
2	0.2227	10.10	42.36	62.72	20.36	26.38	52.72	26.34	N
3	0.4139	10.10	38.03	57.57	19.54	23.59	47.57	23.98	N
4	1.9268	10.10	29.93	56.00	26.07	17.56	46.00	28.44	N
5	6.7929	10.10	27.45	60.00	32.55	20.28	50.00	29.72	N
6	29.9513	10.11	43.18	60.00	16.82	31.46	50.00	18.54	N

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2.2 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

2.1.4 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 66.5 % RH Atmospheric Pressure: 1010 mbar

Pretest these modes to find the worst case:

- a: Transfer data between the EUT and the PC+USB cable1
- b: Transfer data between the EUT and the PC+USB cable2
- c: GSM 850 Idle+BT+WLAN+USB cable(worst)+GPS RX+playing MP4+earphone+Adaptor1
- d: WCDMA Band II Idle+BT+WLAN+USB cable(worst)+GPS RX+camera(rear)+earphone+Adaptor3
- e: WCDMA Band V Idle+BT+WLAN +USB cable(worst)+GPS RX+earphone+Adaptor(worst)
- f: LTE Band 5 Idle+BT+WLAN +USB cable(worst)+GPS RX++camera(rear)+earphone+Adaptor(worst)
- g: LTE Band 12 Idle+BT+WLAN +USB cable(worst)+GPS RX+earphone+Adaptor(worst)
- i: LTE Band 13 Idle+BT+WLAN +USB cable(worst)+GPS RX+earphone+Adaptor(worst)
- j: LTE Band 17 Idle+BT+WLAN +USB cable(worst)+GPS RX+earphone+Adaptor(worst)

The worst case for final test:

- a: Transfer data between the EUT and the PC+USB cable1

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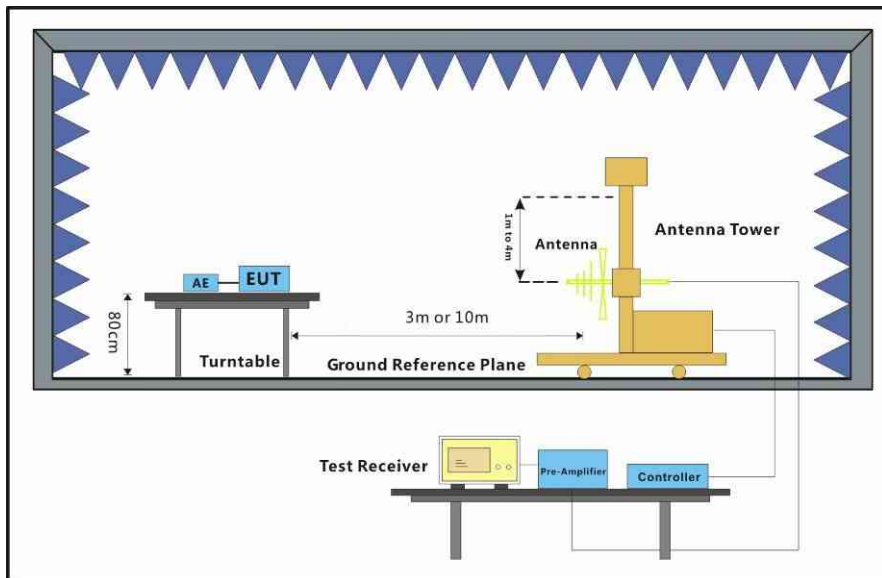
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2.1.5 Test Setup Diagram



2.1.6 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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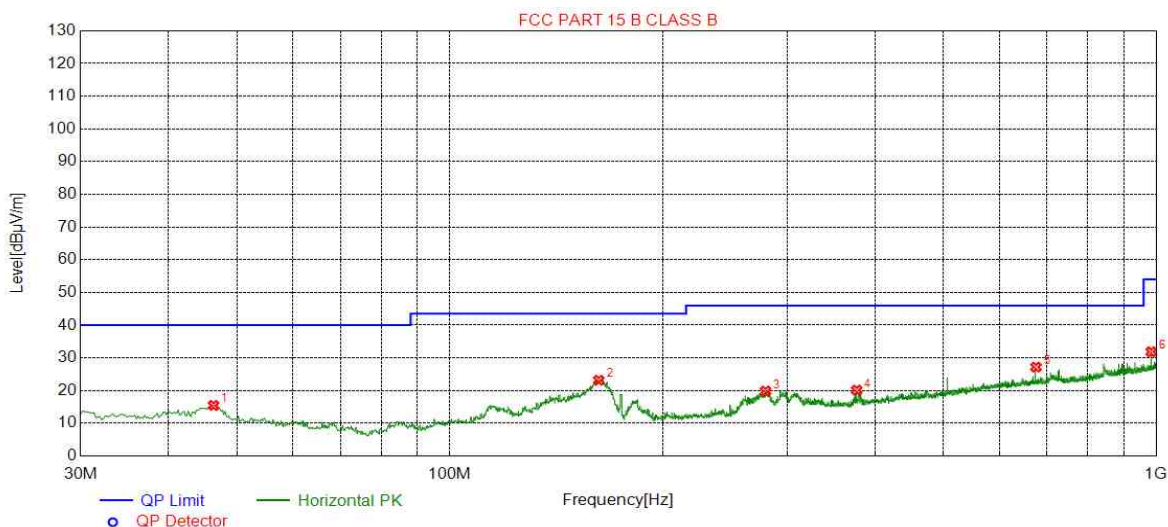
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邮编 710086 sgs.china@sgs.com

Mode:a; Polarization:Horizontal



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	46.2993	15.48	-30.41	40.00	24.52	200	84	Horizontal
2	162.528	23.18	-34.48	43.50	20.32	200	224	Horizontal
3	279.922	19.86	-28.99	46.00	26.14	100	224	Horizontal
4	376.747	20.14	-26.16	46.00	25.86	100	88	Horizontal
5	675.955	27.19	-19.76	46.00	18.81	200	238	Horizontal
6	984.088	31.88	-15.01	54.00	22.12	200	14	Horizontal

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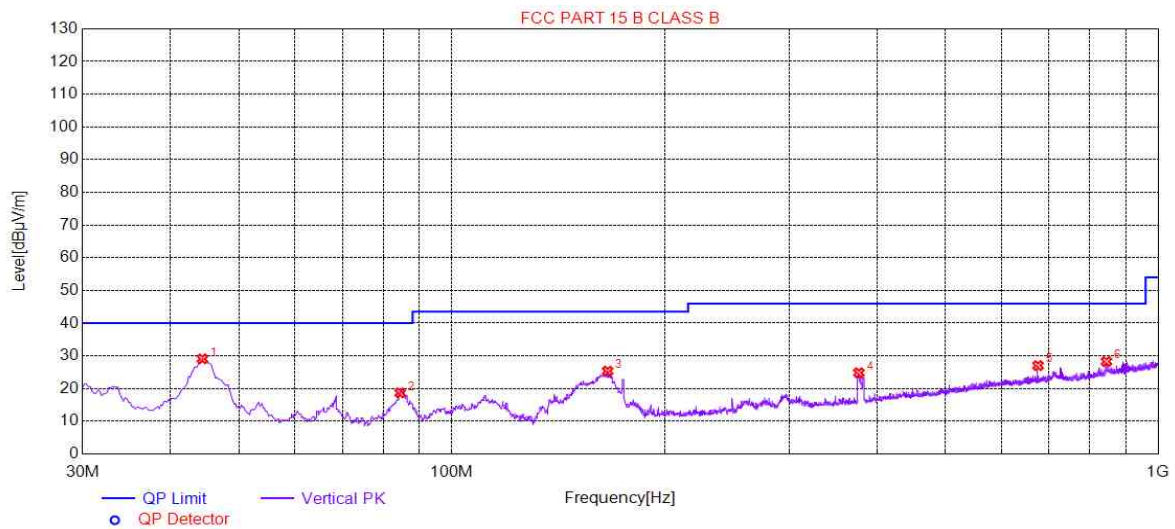
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Mode:a; Polarization:Vertical



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	44.3589	29.11	-30.16	40.00	10.89	100	291	Vertical
2	84.5249	18.69	-35.05	40.00	21.31	100	165	Vertical
3	166.215	25.36	-34.26	43.50	18.14	100	335	Vertical
4	376.941	24.85	-26.15	46.00	21.15	100	341	Vertical
5	675.955	27.04	-19.76	46.00	18.96	100	148	Vertical
6	844.963	28.28	-16.97	46.00	17.72	200	22	Vertical

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邮编 710086 sgs.china@sgs.com

2.3 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

2.1.7 E.U.T. Operation

Operating Environment:

Temperature: 21.7 °C Humidity: 56.4 % RH Atmospheric Pressure: 1010 mbar

Pretest these modes to find the worst case:

- a: Transfer data between the EUT and the PC+USB cable1
- b: Transfer data between the EUT and the PC+USB cable2
- c: GSM 850 Idle+BT+WLAN+USB cable(worst)+GPS RX+playing MP4+earphone+Adaptor1
- d: WCDMA Band II Idle+BT+WLAN+USB cable(worst)+GPS RX+camera(rear)+earphone+Adaptor3
- e: WCDMA Band V Idle+BT+WLAN +USB cable(worst)+GPS RX+earphone+Adaptor(worst)
- f: LTE Band 5 Idle+BT+WLAN +USB cable(worst)+GPS RX++camera(rear)+earphone+Adaptor(worst)
- g: LTE Band 12 Idle+BT+WLAN +USB cable(worst)+GPS RX+earphone+Adaptor(worst)
- i: LTE Band 13 Idle+BT+WLAN +USB cable(worst)+GPS RX+earphone+Adaptor(worst)
- j: LTE Band 17 Idle+BT+WLAN +USB cable(worst)+GPS RX+earphone+Adaptor(worst)

The worst case for final test: j: LTE Band 17 Idle+BT+WLAN +USB cable(worst)+GPS RX+earphone+Adaptor(worst)

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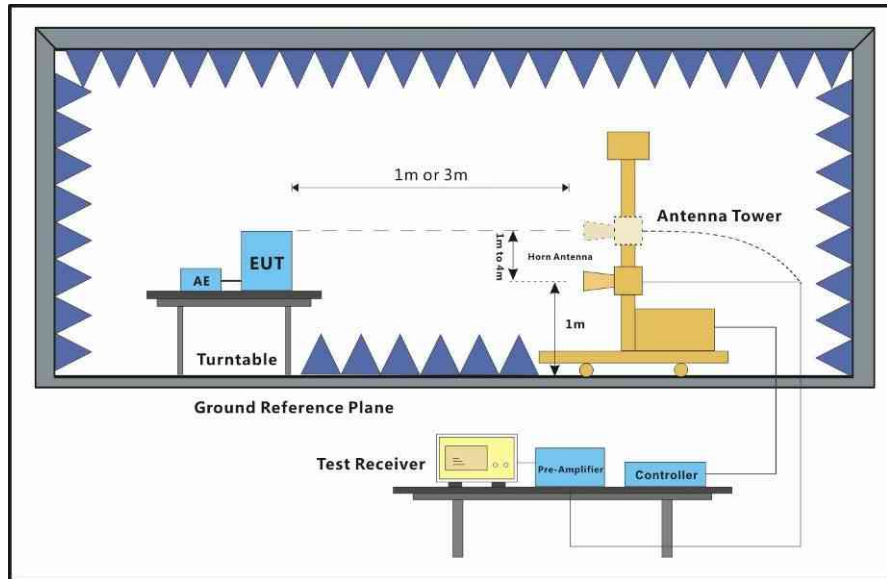
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2.1.8 Test Setup Diagram



2.1.9 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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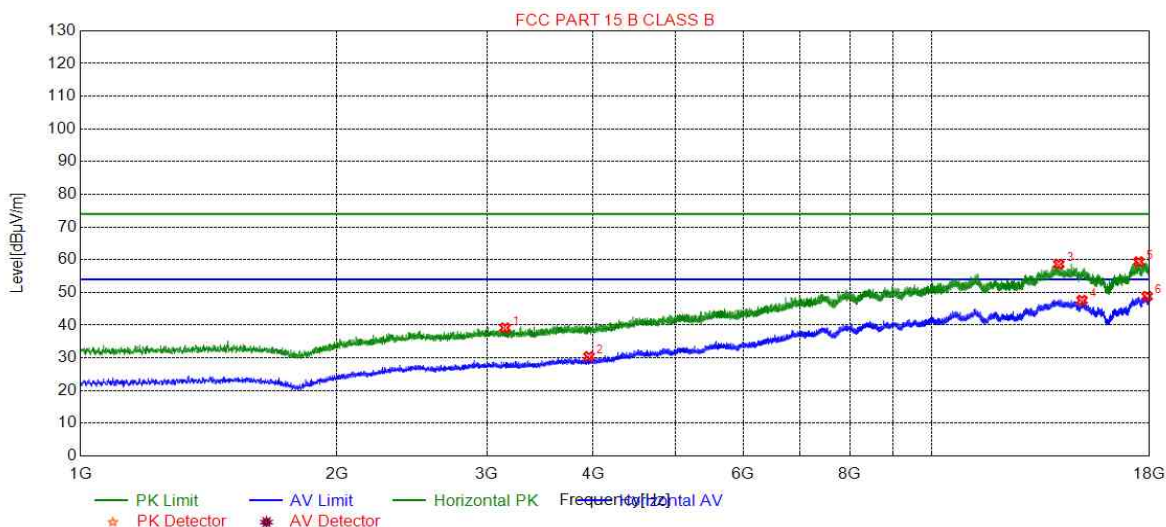
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邮编 710086 sgs.china@sgs.com

Mode:j; Polarization:Horizontal



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	3151.45	39.19	-24.22	74.00	34.81	200	5	Horizontal
2	3954.74	30.43	-21.90	54.00	23.57	200	307	Horizontal
3	14083.8	58.68	2.34	74.00	15.32	100	53	Horizontal
4	14994.2	47.63	1.79	54.00	6.37	200	344	Horizontal
5	17480.6	59.41	1.39	74.00	14.59	200	269	Horizontal
6	17881.8	48.86	0.22	54.00	5.14	200	232	Horizontal

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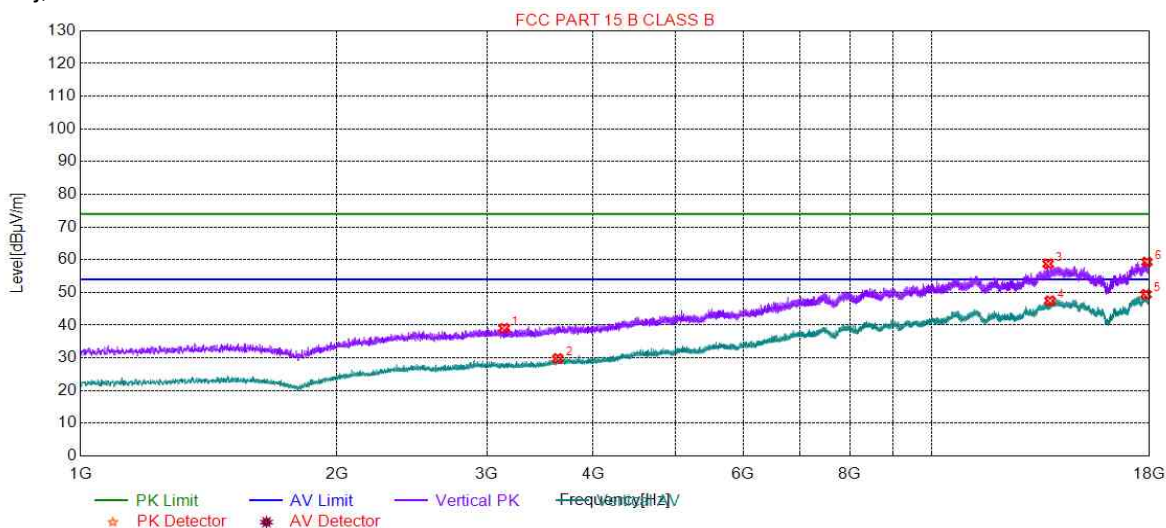
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Mode:j; Polarization:Vertical



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	3144.65	39.04	-24.23	74.00	34.96	200	344	Vertical
2	3635.13	29.83	-22.66	54.00	24.17	100	205	Vertical
3	13681.7	58.76	1.52	74.00	15.24	100	15	Vertical
4	13749.7	47.47	1.68	54.00	6.53	100	280	Vertical
5	17826.5	49.43	0.54	54.00	4.57	200	269	Vertical
6	17870.7	59.34	0.29	74.00	14.66	100	53	Vertical

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3 Equipment List

Chamber					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date	Cal.Due date
				(yyyy-mm-dd)	(yyyy-mm-dd)
Semi-Anechoic Chamber	Brilliant-emc	966	XAW03-35-01	NCR	NCR
MXA signal analyzer	Keysight	N9020A	XAW01-06-01	2020/4/2	2021/4/2
Radio communication analyzer	ROHDE&SCHWARZ	CMW 500	XAW01-03-02	2020/4/2	2021/4/2
Test receiver	ROHDE&SCHWARZ	ESR	XAW01-08-01	2019/9/7	2020/9/6
Receiving antenna	Rosenberger	VULB 9163	XAW01-09-01	2019/10/13	2021/10/12
Receiving antenna	Rosenberger	BBHA 9120D	XAW01-09-02	2019/10/13	2021/10/12
Receiving antenna	Rosenberger	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	2020/11/18
Amplifier	Tonscend	TAP01018048	XAW01-41-02	2019/11/18	2020/11/18
Amplifier	Tonscend	TAP18040048	XAW01-41-03	2019/12/3	2020/12/3
Amplifier	Brilliant-emc	YX28980930	XAW01-41-06	2019/11/18	2020/11/18
Artificial network	ROHDE&SCHWARZ	ENV216	XAW01-19-02	2019-09-16	2020-09-15

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4 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Conduction Emission	$\pm 3.4\text{dB}$ (150kHz to 30MHz)
2	Radiated Emission	$\pm 4.8\text{dB}$ (30MHz-1GHz)
		$\pm 5.2\text{dB}$ (1GHz-6GHz)
		$\pm 5.5\text{dB}$ (6GHz-18GHz)
		$\pm 5.02\text{dB}$ (18GHz-40GHz)

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5 Photographs

5.1 Test Setup Photos

Refer to Photographs of Appendix A - Photographs of Set-Up for ZR/2020/70006

5.2 EUT Constructional Details (EUT Photos)

Refer to Photographs of EUT Constructional Details

- End of the Report -

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