

Report No.: ZR/2020/7000606-01

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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-K520HMW, LM-K520HM, LM-K525HMW, LM-K525HM

Trade Mark: LG

FCC ID: ZNFK520HMW

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: 2021/8/15

Test Result: Pass*

Authorized Signature:

Simon Ling

Wireless Laboratory Manager



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sgs.china@sgs.com

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



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	Revision Record								
Version	Chapter	Date	Modifier	Remark					
01		2020/8/13		Original					
02		2021/5/26	Leah Chen	Modify data conversion error of antenna height Updated equipment list					
03		2021/8/15	Leah Chen	Updated Support Units, Test facility and Test Location					

^{*}This report supersedes our previous report ZR/2020/7000606, issued on 2020-08-13, which is hereby deemed null and void.

Authorized for issue by:	
Prepared By	(Leah Chen) / Engineer
Checked By	Daniel Wang (Daniel Wang) / Reviewer





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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



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1 General Information

EUT Description:	Mobile handset
Model No.(EUT):	LM-K520HMW, LM-K520HM, LM-K525HMW, 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-K520HMW and other models are shown in the below table:

The differences between Livi-K520		Thirty and other in	lodeis are shown i	THE BEIOW LABIC.	1
N 4.	odol	LM-K520HMW	LM-K520HM	LM-K525HMW	LM-K525HM
IVIC	odel	(Full approval)	(Update approval)	(Updated approval)	(Update approval)
Softwar	e version	different	different	different	different
Licensed	LTE	B1/B2/B3/B4/ B5/B7/B8/B12/B1 3/B17/B28/ B38/B66	B5/B7/B8/B12/B1 3/B17/B28/	B1/B2/B3/B4/ B5/B7/B8/B12/B13/ B17/B28/ B38/B66	B1/B2/B3/B4/ B5/B7/B8/B12/B1 3/B17/B28/ B38/B66
Frequency	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
	Bluetooth	the same	the same	the same	the same
Unlicensed Frequency	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
	Ram / Rom	4G/64G	4G/64G	4G/128G	4G/128G
	Camera	the same	the same	the same	the same
	РСВ	the same	the same	the same	the same
Hardware	USB Port	the same	the same	the same	the same
liaiuwaie	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
Annearance	Dimension	the same	the same	the same	the same
Appearance	Color	the same	the same	the same	the same
	Battery	the same	the same	the same	the same
Accessory	External Charger	the same	the same	the same	the same
	USB label	the same	the same	the same	the same
other	SIM card	Double SIM	Single SIM	Double SIM	Single SIM

Remark:



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

1.2 Test Location

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, Leah Chen

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 (XI 'AN) CO., LTD. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4854.01.

• FCC -Designation Number: 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(μ V)-56dB(μ V) quasi-peak, 56dB(μ V)-46dB(μ V) average

0.5M-5MHz 56dB(μ V) quasi-peak, 46dB(μ V) average 5M-30MHz 60dB(μ V) quasi-peak, 50dB(μ V) 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 a: Transfer data between the EUT and the PC+USB cable1 b: Transfer data between the EUT and the PC+USB cable2

the worst case: 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 j: LTE Band 17 Idle+BT+WLAN +USB cable(worst)+GPS

for final test: RX+earphone+Adaptor(worst)



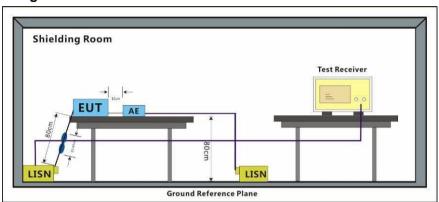
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2.1.2 Test Setup Diagram



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.

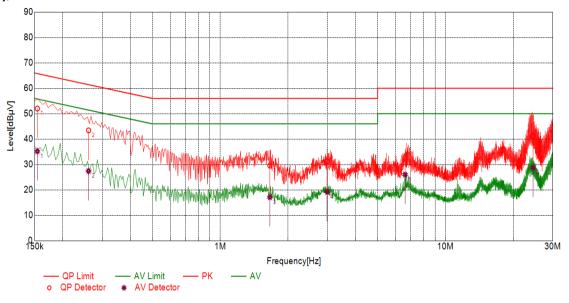




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Mode:j; Line:Live Line



Test Graph

Final	Final Data List									
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBµV]	QP Limit [dΒμV]	QP Margin [dB]	ΑV Value [dBμV]	AV Limit [dΒμV]	AV Margin [dB]	Туре	
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	

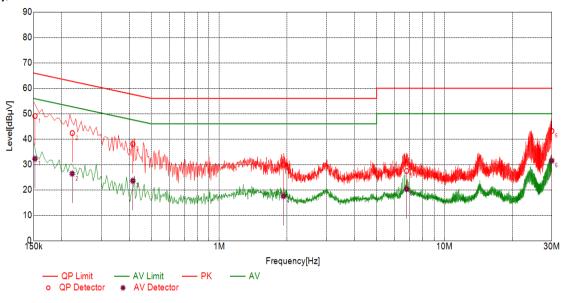




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Mode:j; Line:Neutral Line



Test Graph

Final	Final Data List									
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Value [dBµV]	ΑV Limit [dBμV]	AV Margin [dB]	Туре	
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:

 $30 \text{MHz} - 88 \text{MHz} \qquad \qquad 40.0 (\text{dB}\mu\text{V/m}) \text{ quasi-peak} \\ 88 \text{MHz} - 216 \text{MHz} \qquad \qquad 43.5 (\text{dB}\mu\text{V/m}) \text{ quasi-peak} \\ 216 \text{MHz} - 960 \text{MHz} \qquad \qquad 46.0 (\text{dB}\mu\text{V/m}) \text{ quasi-peak} \\ 960 \text{MHz} - 1000 \text{MHz} \qquad \qquad 54.0 (\text{dB}\mu\text{V/m}) \text{ quasi-peak} \\ \end{cases}$

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

2.2.1 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)

i: 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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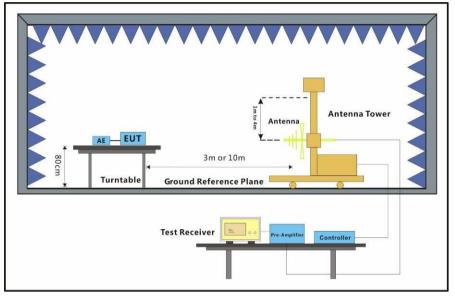
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2.2.2 Test Setup Diagram



2.2.3 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.

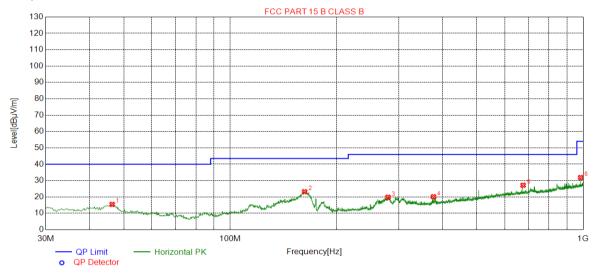




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Mode:a; Polarization:Horizontal



Suspected List

Suspe	CIEU LISI							
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	104	84	Horizontal
2	162.528	23.18	-34.48	43.50	20.32	124	224	Horizontal
3	279.922	19.86	-28.99	46.00	26.14	179	224	Horizontal
4	376.747	20.14	-26.16	46.00	25.86	185	88	Horizontal
5	675.955	27.19	-19.76	46.00	18.81	141	238	Horizontal
6	984.088	31.88	-15.01	54.00	22.12	211	14	Horizontal



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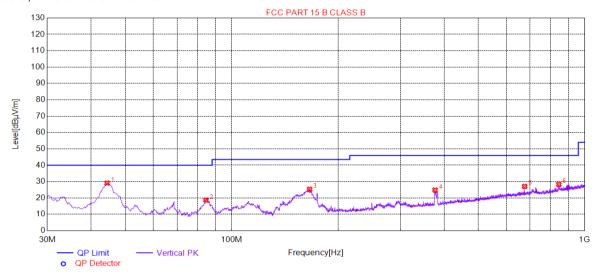
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Mode:a; Polarization:Vertical



Suspected List

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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	268	291	Vertical
2	84.5249	18.69	-35.05	40.00	21.31	262	165	Vertical
3	166.215	25.36	-34.26	43.50	18.14	232	335	Vertical
4	376.941	24.85	-26.15	46.00	21.15	238	341	Vertical
5	675.955	27.04	-19.76	46.00	18.96	158	148	Vertical
6	844.963	28.28	-16.97	46.00	17.72	264	22	Vertical



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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

2.3.1 E.U.T. Operation

Operating Environment:

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

Pretest these a: Transfer data between the EUT and the PC+USB cable1
b: Transfer data between the EUT and the PC+USB cable2
the worst case:
c: CSM 850 Idlo PT VVI ANULISB cable(worst) CBS BY IDlo)

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 j: LTE Band 17 Idle+BT+WLAN +USB cable(worst)+GPS

for final test: RX+earphone+Adaptor(worst)



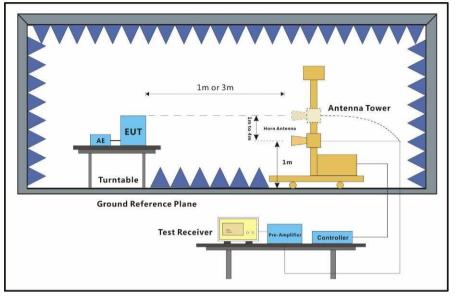
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2.3.2 Test Setup Diagram



2.3.3 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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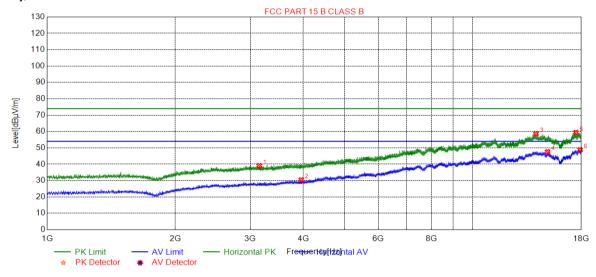
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Mode:j; Polarization:Horizontal



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	239	5	Horizontal
2	3954.74	30.43	-21.90	54.00	23.57	105	307	Horizontal
3	14083.8	58.68	2.34	74.00	15.32	229	53	Horizontal
4	14994.2	47.63	1.79	54.00	6.37	180	344	Horizontal
5	17480.6	59.41	1.39	74.00	14.59	147	269	Horizontal
6	17881.8	48.86	0.22	54.00	5.14	224	232	Horizontal



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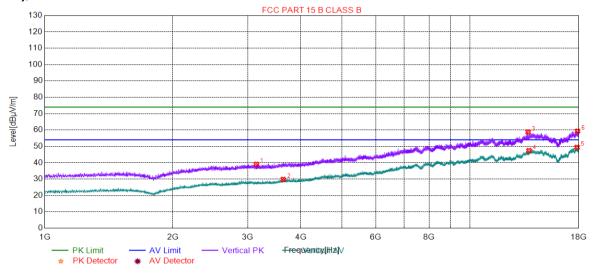
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Mode:j; Polarization:Vertical



Suspected List

- aopo	oted List							
Susp	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	158	344	Vertical
2	3635.13	29.83	-22.66	54.00	24.17	219	205	Vertical
3	13681.7	58.76	1.52	74.00	15.24	156	15	Vertical
4	13749.7	47.47	1.68	54.00	6.53	205	280	Vertical
5	17826.5	49.43	0.54	54.00	4.57	294	269	Vertical
6	17870.7	59.34	0.29	74.00	14.66	244	53	Vertical



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3 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		
Radio communication analyzer	ROHDE&SCHWARZ	CMW 500	XAW01-03-02	2020-04-02	2021-04-01		
Test receiver	ROHDE&SCHWARZ	ESR	XAW01-08-01	2019-09-07	2020-09-06		
Artificial network	ROHDE&SCHWARZ	ENV216	XAW01-04-03	2019-12-11	2020-12-10		
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		

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	2020-04-02	2021-04-01		
Radio communication analyzer	ROHDE&SCHWARZ	CMW 500	XAW01-03-02	2020-04-02	2021-04-01		
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		
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+ RE V3.0.0.2	XAW02-05-01	NCR	NCR		



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4 Measurement Uncertainty

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



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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 -

