

Report No.: AR/2020/C000206-01

Page: 1 of 21

TEST REPORT

Application No: AR/2020/C0002

Applicant: Xiaomi Communications Co., Ltd.

Address of Applicant #019, 9th Floor, Building 6, 33 Xi'ergi Middle Road, Haidian District, Beijing,

China, 100085

Manufacturer: Xiaomi Communications Co., Ltd.

Address of Manufacturer: #019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing,

China, 100085

EUT Description: Mobile Phone Model No.: M2101K9G **Trade Mark: XIAOMI** FCC ID: 2AFZZK9G

47 CFR Part 15, Subpart B Standard(s):

2020/12/21 **Date of Receipt:**

2020/12/21 to 2021/1/18 **Date of Test:**

2021/4/30 Date of Issue:

Pass* **Test Result:**

Authorized Signature:

Simon Ling

Wireless Laboratory Manager



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t (86-29) 6282 7885

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



Report No.: AR/2020/C000206-01

Page: 2 of 21

Revision Record									
Version	Chapter	Date	Modifier	Remark					
01		2021/1/19		Original					
02		2021/4/30	Leah Chen	1.Modify data conversion error of antenna height 2.Update equipment list					

^{*}This report supersedes our previous report AR/2020/C000206, issued on 2021-1-19, which is hereby deemed null and void.

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



Report No.: AR/2020/C000206-01

Page: 3 of 21

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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Report No.: AR/2020/C000206-01

Page: 4 of 21

Contents

1	GENE	RAL INFORMATION	
	1.1	DESCRIPTION OF SUPPORT UNITS	6
	1.2	TEST LOCATION	6
	1.3	TEST FACILITY	6
	1.4	DEVIATION FROM STANDARDS	6
2	EMIS	SION TEST RESULTS	7
	2.1	CONDUCTED EMISSIONS AT MAINS TERMINALS (150kHz-30MHz)	7
	2.1.1		
	2.1.2	Test Setup Diagram	
	2.1.3	Measurement Data	
	2.2	RADIATED EMISSIONS (30MHz-1GHz)	11
	2.2.1	E.U.T. Operation	11
	2.2.2	Test Setup Diagram	12
	2.2.3	Measurement Data	12
	2.3 I	RADIATED EMISSIONS (ABOVE 1GHZ)	15
	2.3.1	E.U.T. Operation	
	2.3.2	Test Setup Diagram	
	2.3.3	Measurement Data	16
3	EQUI	PMENT LIST	19
4	MEAS	SUREMENT UNCERTAINTY	20
5	РНОТ	TOGRAPHS	21
	5.1 ⁻	TEST SETUP	21
		EUT CONSTRUCTIONAL DETAILS (EUT PHOTOS)	



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Report No.: AR/2020/C000206-01

Page: 5 of 21

1 General Information

Product Name:	Mobile Phone						
Model No.(EUT):	M2101K9G						
Trade Mark:	XIAOMI						
Hardware Version:	P2						
Software Version:	MIUI 12						
	Band	Tx (MHz)	Rx (MHz)				
	GSM850	824~849	869~894				
	GSM1900	1850~1910	1930~1990				
	WCDMA Band II	1850~1910	1930~1990				
	WCDMA Band IV	1710~1755	2110~2155				
	WCDMA Band V	824~849	869~894				
	LTE Band 2	1850~1910	1930~1990				
	LTE Band 4	1710~1755	2110~2155				
	LTE Band 5	824~849	869~894				
	LTE Band 7	2500~2570	2620~2690				
	LTE Band 12	699~716	729~746				
	LTE Band 13	777~787	746~756				
	LTE Band 17	704~716	734~746				
	LTE Band 38	2570~2620	2570~2620				
	LTE Band 41	2496~2690	2496~2690				
Frequency Bands:	LTE Band 66	1710~1780	2110~2200				
r requericy barius.	LTE CA_2C	1850 ~ 1910	1930 ~1990				
	LTE CA_7C	2500~2570	2620~2690				
	LTE CA_38C	2570~2620	2570~2620				
	LTE CA 4A-7A	1710~1755	2110~2155				
	_	2500~2570	2620~2690				
	NR Band n5	824~849	869~894				
	NR Band n7	2500~2570	2620~2690				
	NR Band n38	2570~2620	2570~2620				
	NR Band n41	2496~2690	2496~2690				
	NR Band n66	1710~1780	2110~2180				
	NR Band n77	3700~3980	3700~3980				
	Wi-Fi 2.4G	2400~2483.5	2400~2483.5				
	Bluetooth	2400~2483.5	2400~2483.5				
	Wi-Fi 5G	5150~5850	5150~5850				
	GNSS*	1559~161	0				
	NFC	13.56					

^{*} GNSS = GPS + Glonass + Beidou + Galileo+SBAS EUT 1=8+128G EUT 2= 6+128G EUT3=8+256G



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Report No.: AR/2020/C000206-01

Page: 6 of 21

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	

1.2 Test Location

All tests were performed at:

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.

Test Site No.:	SG	S 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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Report No.: AR/2020/C000206-01

Page: 7 of 21

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
modes to find
the worst case:

a: Transfer data between the EUT1 and the PC+USB cable1
b: Transfer data between the EUT1 and the PC+USB cable2

c: GSM 850 Idle+ BT+ 2.4G WLAN +GPS Rx+ NFC +playing MP4+ earphone1+

EUT1+ Cable(worst)+ adapter

d: WCDMA Band V Idle+ BT+ 5G WLAN +GPS Rx+ NFC +playing MP4 + EUT1+

Cable(worst)+ adapter

e: LTE Band 5 Idle+BT+2.4G WLAN +GPS Rx+ NFC +camera (Front) + EUT1+

Cable(worst)+ adapter

f: LTE Band 12 Idle+ BT+ 5G WLAN +GPS Rx+ NFC +camera (Front) + EUT1+

Cable(worst)+ adapter

g: LTE Band 13 Idle+ BT+ 5G WLAN +GPS Rx+ NFC +camera (Back) + EUT1+

Cable(worst)+ adapter

h: LTE Band 17 Idle+ BT+2.4G WLAN +GPS Rx+ NFC+ camera (Back) + EUT1+

Cable(worst)+ adapter

i: NR Band n5 Idle+ BT+5G WLAN +GPS Rx+ NFC+ camera (Back) + EUT2+

Cable(worst)+ adapter

j: NR Band n66 Idle+ BT+5G WLAN +GPS Rx+ NFC+ playing MP4 + EUT3+

Cable(worst)+ adapter

k: WCDMA Band V Idle+ BT+ 5G WLAN +GPS Rx+ NFC +playing MP4 +

EUT1+Audio cable+earphone

The worst case d: WCDMA Band V Idle+ BT+ 5G WLAN +GPS Rx+ NFC +playing MP4 + EUT1+

for final test: Cable2+ adapter



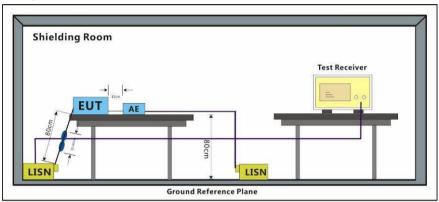
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Report No.: AR/2020/C000206-01

Page: 8 of 21

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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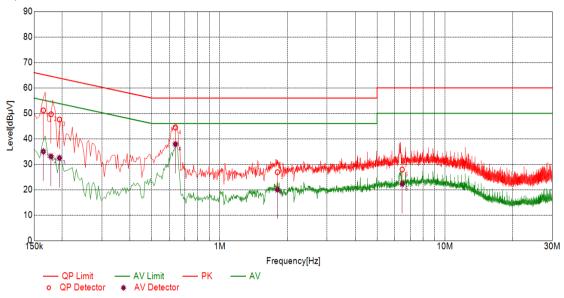
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Report No.: AR/2020/C000206-01

Page: 9 of 21

Mode:d; Line:Live Line



Test Graph

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]	
1	0.1650	10.10	51.14	65.21	14.07	35.00	55.21	20.21	
2	0.1785	10.10	49.64	64.56	14.92	33.03	54.56	21.53	
3	0.1945	10.10	47.57	63.84	16.27	32.45	53.84	21.39	
4	0.6366	10.10	44.41	56.00	11.59	37.92	46.00	8.08	
5	1.8046	10.10	26.88	56.00	29.12	20.03	46.00	25.97	
6	6.4598	10.10	27.92	60.00	32.08	22.26	50.00	27.74	



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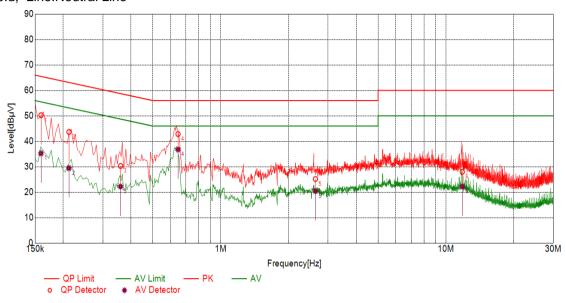
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Report No.: AR/2020/C000206-01

Page: 10 of 21

Mode:d; 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]		
1	0.1594	10.10	50.25	65.49	15.24	35.27	55.49	20.22		
2	0.2121	10.10	43.68	63.12	19.44	29.45	53.12	23.67		
3	0.3594	10.10	30.31	58.74	28.43	22.23	48.74	26.51		
4	0.6468	10.10	42.86	56.00	13.14	36.82	46.00	9.18		
5	2.6350	10.10	25.18	56.00	30.82	20.44	46.00	25.56		
6	11.8160	10.10	27.99	60.00	32.01	22.20	50.00	27.80		



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Report No.: AR/2020/C000206-01

Page: 11 of 21

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

2.2.1 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 EUT1 and the PC+USB cable1 b: Transfer data between the EUT1 and the PC+USB cable2

c: GSM 850 Idle+ BT+ 2.4G WLAN +GPS Rx+ NFC +playing MP4+ earphone1+

EUT1+ Cable(worst)+ adapter

d: WCDMA Band V Idle+ BT+ 5G WLAN +GPS Rx+ NFC +playing MP4 + EUT1+

Cable(worst)+ adapter

e: LTE Band 5 Idle+BT+2.4G WLAN +GPS Rx+ NFC +camera (Front) + EUT1+

Cable(worst)+ adapter

f: LTE Band 12 Idle+ BT+ 5G WLAN +GPS Rx+ NFC +camera (Front) + EUT1+

Cable(worst)+ adapter

q: LTE Band 13 Idle+ BT+ 5G WLAN +GPS Rx+ NFC +camera (Back) + EUT1+

Cable(worst)+ adapter

h: LTE Band 17 Idle+ BT+2.4G WLAN +GPS Rx+ NFC+ camera (Back) + EUT1+

Cable(worst)+ adapter

i: NR Band n5 Idle+ BT+5G WLAN +GPS Rx+ NFC+ camera (Back) + EUT2+

Cable(worst)+ adapter

j: NR Band n66 Idle+ BT+5G WLAN +GPS Rx+ NFC+ playing MP4 + EUT3+

Cable(worst)+ adapter

k: NR Band n38 Idle+ BT+5G WLAN +GPS Rx+ NFC+ playing MP4 + EUT1+

Cable(worst)+ adapter

I: Transfer data between the EUT2 and the PC+USB cable2

m: Transfer data between the EUT3 and the PC+USB cable2

The worst case

for final test:

b: Transfer data between the EUT1 and the PC+USB cable2



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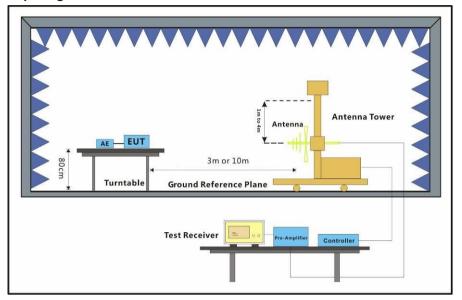
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Report No.: AR/2020/C000206-01

Page: 12 of 21

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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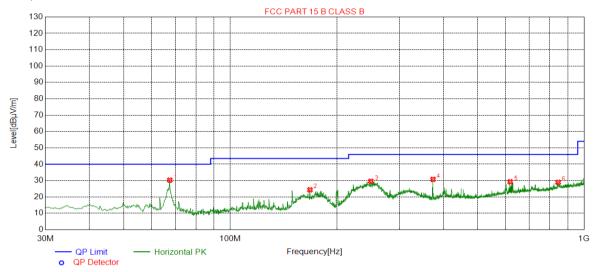
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Report No.: AR/2020/C000206-01

Page: 13 of 21

Mode:b; Polarization:Horizontal



Suspected List

Suspe	Suspected List									
NO.	Freq. [MHz]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	67.4495	30.27	40.00	9.73	191	25	Horizontal			
2	167.9616	24.38	43.50	19.12	102	51	Horizontal			
3	249.6519	29.62	46.00	16.38	158	37	Horizontal			
4	374.2248	30.78	46.00	15.22	141	19	Horizontal			
5	618.5197	29.27	46.00	16.73	130	54	Horizontal			
6	844.9630	28.97	46.00	17.03	243	151	Horizontal			



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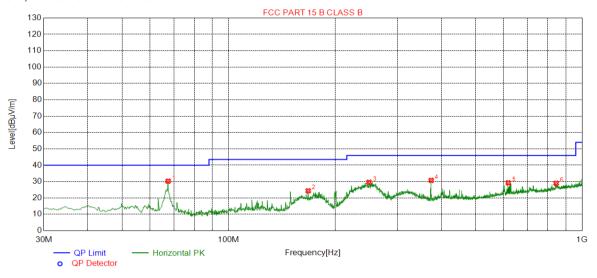
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Report No.: AR/2020/C000206-01

Page: 14 of 21

Mode:b; Polarization:Vertical



Suspected List

Gaopeo.	Suspected List							
Suspe	Suspected List							
NO.	Freq. [MHz]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	
1	67.4495	30.27	40.00	9.73	191	25	Horizontal	
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3	249.6519	29.62	46.00	16.38	158	37	Horizontal	
4	374.2248	30.78	46.00	15.22	141	19	Horizontal	
5	618.5197	29.27	46.00	16.73	130	54	Horizontal	
6	844.9630	28.97	46.00	17.03	243	151	Horizontal	



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Report No.: AR/2020/C000206-01

Page: 15 of 21

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 EUT1 and the PC+USB cable1 b: Transfer data between the EUT1 and the PC+USB cable2 the worst case:

c: GSM 850 Idle+ BT+ 2.4G WLAN +GPS Rx+ NFC +playing MP4+ earphone1+

EUT1+ Cable(worst)+ adapter

d: WCDMA Band V Idle+ BT+ 5G WLAN +GPS Rx+ NFC +playing MP4 + EUT1+

Cable(worst)+ adapter

e: LTE Band 5 Idle+BT+2.4G WLAN +GPS Rx+ NFC +camera (Front) + EUT1+

Cable(worst)+ adapter

f: LTE Band 12 Idle+ BT+ 5G WLAN +GPS Rx+ NFC +camera (Front) + EUT1+

Cable(worst)+ adapter

g: LTE Band 13 Idle+ BT+ 5G WLAN +GPS Rx+ NFC +camera (Back) + EUT1+

Cable(worst)+ adapter

h: LTE Band 17 Idle+ BT+2.4G WLAN +GPS Rx+ NFC+ camera (Back) + EUT1+

Cable(worst)+ adapter

i: NR Band n5 Idle+ BT+5G WLAN +GPS Rx+ NFC+ camera (Back) + EUT2+

Cable(worst)+ adapter

j: NR Band n66 Idle+ BT+5G WLAN +GPS Rx+ NFC+ playing MP4 + EUT3+

Cable(worst)+ adapter

k: NR Band n38 Idle+ BT+5G WLAN +GPS Rx+ NFC+ playing MP4 + EUT1+

Cable(worst)+ adapter

The worst case

e: LTE Band 5 Idle+BT+2.4G WLAN +GPS Rx+ NFC +camera (Front) + EUT1+

for final test: Cable2+ adapter



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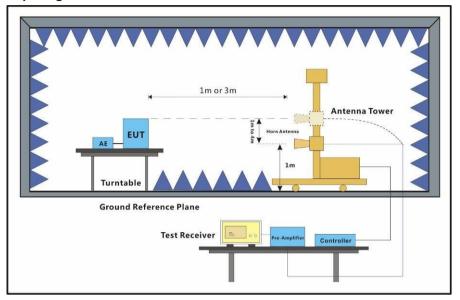
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Report No.: AR/2020/C000206-01

Page: 16 of 21

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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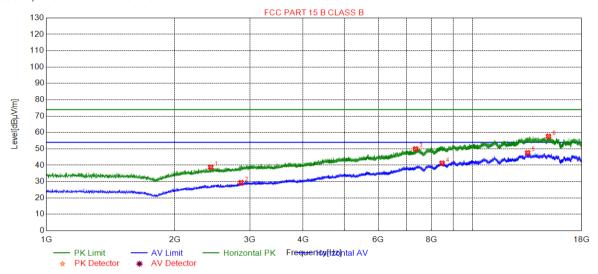
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Page: 17 of 21

Mode:e; Polarization:Horizontal



Suspected List

Suspected List								
Suspe	Suspected List							
NO.	Freq. [MHz]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	
1	2428.921	38.79	74.00	35.21	107	102	Horizontal	
2	2861.593	29.38	54.00	24.62	227	37	Horizontal	
3	7342.167	49.98	74.00	24.02	101	18	Horizontal	
4	8467.623	41.27	54.00	12.73	187	170	Horizontal	
5	13441.22	47.57	54.00	6.43	121	124	Horizontal	
6	15044.40	57.65	74.00	16.35	180	16	Horizontal	



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Page: 18 of 21

Mode:e; Polarization:Vertical



Suspected List

dopostod Elec							
Suspected List							
NO.	Freq. [MHz]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2028.551	26.57	54.00	27.43	220	16	Vertical
2	3053.702	40.46	74.00	33.54	153	193	Vertical
3	7824.991	50.63	74.00	23.37	158	80	Vertical
4	8390.269	41.88	54.00	12.12	156	188	Vertical
5	13391.06	57.02	74.00	16.98	262	63	Vertical
6	13975.04	47.10	54.00	6.90	295	210	Vertical

Remark:

1) Scan from 1GHz to 40GHz, The disturbance between 18GHz to 40GHz was very low, so only 1GHz to 18GHz test data had been displayed. The amplitude of emissions from the Eut which are attenuated more than 20dB below the limit need not be reported .



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Report No.: AR/2020/C000206-01

Page: 19 of 21

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	2020-09-11	2021-09-10	
Artificial network	ROHDE&SCHWARZ	ENV216	XAW01-04-01	2020-08-04	2021-08-03	
5G UXM	Keysight	E7515B	XAW01-19-02	2020-09-11	2021-09-10	
Temperature and humidity meter	MingGao	TH101B	XAW01-01-01	2020-11-06	2021-11-05	
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	2020-09-11	2021-09-10	
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	2020-10-26	2021-10-25	
Amplifier	Tonscend	TAP01018048	XAW01-41-02	2020-10-26	2021-10-25	
Amplifier	Tonscend	TAP18040048	XAW01-41-03	2020-10-27	2021-10-26	
Amplifier	Shanghai Steed	YX28980930	XAW01-41-06	2020-10-26	2021-10-25	
5G UXM	Keysight	E7515B	XAW01-04-01	2020-09-11	2021-09-10	
Temperature and humidity meter	MingGao	TH101B	XAW01-01-01	2020-11-06	2021-11-05	
Measurement Software	Tonscend	TS+ RE V3.0.0.2	XAW02-05-01	NCR	NCR	



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Report No.: AR/2020/C000206-01

Page: 20 of 21

4 Measurement Uncertainty

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

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Page: 21 of 21

5 Photographs

5.1 Test Setup

Refer to Appendix A JBP Setup Photos.

5.2 EUT Constructional Details (EUT Photos)

Refer to Photographs of EUT Constructional Details

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