

Report No.: XAR/2021/C001006

Page: 1 of 21

### TEST REPORT

Application No: XAR/2020/C0010

Applicant: Xiaomi Communications Co., Ltd.

Address of Applicant #019, 9th Floor, Building 6, 33 Xi'erqi 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.:** M2012K11G

Trade Mark: Xiaomi

FCC ID: 2AFZZK11G

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

**Date of Receipt:** 2021/1/31

**Date of Test:** 2021/1/31 to 2021/2/22

**Date of Issue:** 2021/2/22

Test Result: Pass\*

Authorized Signature:

Derek Yang

Derele yang

Wireless Laboratory Manager



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<sup>\*</sup> In the configuration tested, the EUT complied with the standards specified above.



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	Revision Record									
Version	Chapter	Date	Modifier	Remark						
01		2021/2/22		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 Test By

David Chen

David Chen

Reviewer

Daniel Wang Project Engineer

South



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#### 1 General Information

Product Name:	Mobile Phone										
Model No.(EUT):	M2012K11G	M2012K11G									
Trade Mark:	Xiaomi	Xiaomi									
Hardware Version:	P2.1										
Software Version:	MIUI12	MIUI12									
	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 17	704~716	734~746								
Frequency Bands:	LTE Band 38	2570~2620	2570~2620								
	LTE Band 41	2496~2690	2496~2690								
	LTE Band 66	1710~1780	2110~2200								
	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 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*	1559~1610									
	NFC										

<sup>\*</sup> GNSS = GPS + Glonass + Beidou + Galileo EUT 1=8+128G EUT2=8+256G



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#### 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:

	<del>-</del>
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:	710000

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 (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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#### 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( $\mu$ V)-56dB( $\mu$ V) quasi-peak, 56dB( $\mu$ V)-46dB( $\mu$ V) average

0.5M-5MHz 56dB( $\mu$ V) quasi-peak, 46dB( $\mu$ V) average 5M-30MHz 60dB( $\mu$ V) quasi-peak, 50dB( $\mu$ 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 EUT1 and the PC+USB cable b: Transfer data between the EUT2 and the PC+USB cable b: Transfer data between the EUT2 and the PC+USB cable

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

EUT1+ Cable+ adapter

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

EUT1+ Cable+ adapter

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

Cable+ adapter

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

Cable+ adapter

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

Cable+ adapter

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

EUT1+ Cable+ adapter

i: NR Band n5 Idle+ BT+5G WLAN +GNSS Rx+ NFC+ camera (Back) + EUT1+

Cable+ adapter

j: NR Band n77 Idle+ BT+5G WLAN +GNSS Rx+ NFC+ playing MP4 + EUT1+

Cable+ adapter

k: NR Band n77 Idle + BT+ 5G WLAN +GNSS Rx+ NFC +playing MP4 + EUT2+

Cable+ adapter

The worst case

j: NR Band n77 Idle+ BT+5G WLAN +GNSS Rx+ NFC+ playing MP4 + EUT1+

for final test: Cable+ adapter



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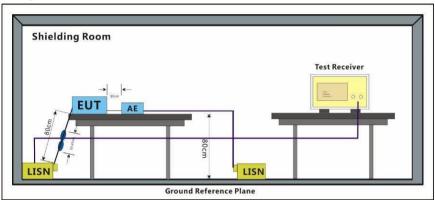
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#### 2.1.2 Test Setup Diagram



#### 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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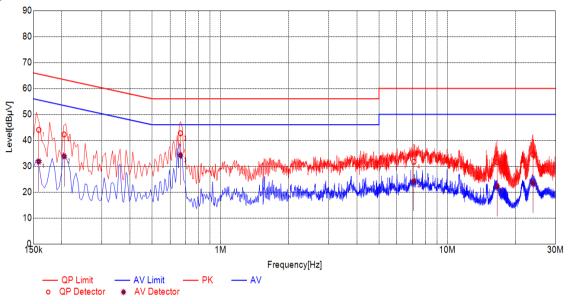
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#### Mode:j; Line:Live Line



#### **Test Graph**

Final Data List										
NO.	Freq. [MHz]	Factor [dB]	QP Value	QP Limit	QP Margin	AV Value	AV Limit	AV Margin	Туре	
1	0.1584	10.10	44.04	65.55	21.51	31.85	55.55	23.70	L	
2	0.2048	10.10	42.25	63.41	21.16	33.84	53.41	19.57	L	
3	0.6664	10.10	42.71	56.00	13.29	34.26	46.00	11.74	┙	
4	7.1232	10.10	31.69	60.00	28.31	24.29	50.00	25.71	L	
5	16.5738	10.11	31.53	60.00	28.47	22.22	50.00	27.78	L	
6	23.8166	10.11	34.52	60.00	25.48	23.50	50.00	26.50	L	



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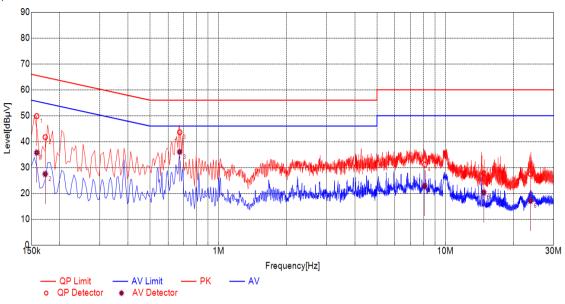
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#### Mode:j; Line:Neutral Line



#### **Test Graph**

Final	Final Data List										
NO.	Freq. [MHz]	Factor [dB]	QP Value	QP Limit	QP Margin	AV Value	AV Limit	AV Margin	Туре		
1	0.1584	10.10	49.87	65.55	15.68	35.72	55.55	19.83	N		
2	0.1726	10.10	41.70	64.84	23.14	27.47	54.84	27.37	N		
3	0.6756	10.10	43.61	56.00	12.39	36.01	46.00	9.99	N		
4	8.1180	10.10	31.10	60.00	28.90	22.85	50.00	27.15	N		
5	14.7765	10.11	27.64	60.00	32.36	20.29	50.00	29.71	N		
6	23.7240	10.11	27.51	60.00	32.49	17.07	50.00	32.93	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 MHz - 88 MHz  $40.0 (\text{dB}\mu\text{V/m})$  quasi-peak 88 MHz - 216 MHz  $43.5 (\text{dB}\mu\text{V/m})$  quasi-peak 216 MHz - 960 MHz  $46.0 (\text{dB}\mu\text{V/m})$  quasi-peak 960 MHz - 1000 MHz  $54.0 (\text{dB}\mu\text{V/m})$  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 cable
b: Transfer data between the EUT2 and the PC+USB cable

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

EUT1+ Cable+ adapter

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

EUT1+ Cable+ adapter

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

Cable+ adapter

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

Cable+ adapter

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

Cable+ adapter

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

EUT1+ Cable+ adapter

i: NR Band n5 Idle+ BT+5G WLAN +GNSS Rx+ NFC+ camera (Back) + EUT1+

Cable+ adapter

j: NR Band n77 Idle+ BT+5G WLAN +GNSS Rx+ NFC+ playing MP4 + EUT1+

Cable+ adapter

k: LTE Band 12 Idle+ BT+ 5G WLAN +GNSS Rx+ NFC + camera (Front) + EUT2+

Cable+ adapter

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

Audio Cable+ earphone

The worst case for final test:

a: Transfer data between the EUT1 and the PC+USB cable



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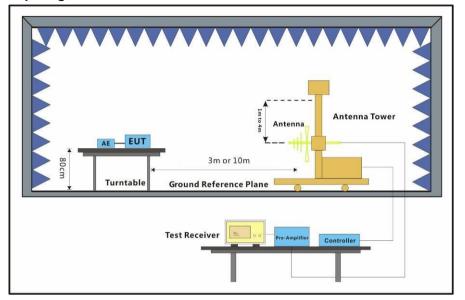
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#### 2.2.2 Test Setup Diagram



#### 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. Three orthogonal axes of X,Y,Z are tested by EUT using BiConiLog antenna with 2 orthogonal polarities, but only the worst data had been displayed



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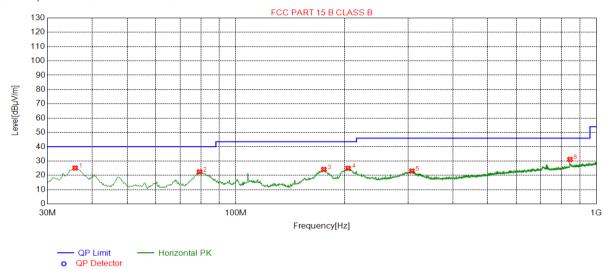
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#### Mode:a; Polarization:Horizontal



#### **Suspected List**

	Otou Liot							
Susp	ected List							
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	35.8212	25.11	-29.69	40.00	14.89	300	250	Horizontal
2	79.2859	22.44	-36.02	40.00	17.56	200	305	Horizontal
3	175.335	24.15	-33.64	43.50	19.35	200	203	Horizontal
4	204.829	24.97	-31.08	43.50	18.53	100	22	Horizontal
5	307.863	23.02	-28.04	46.00	22.98	100	72	Horizontal
6	844.963	31.11	-16.97	46.00	14.89	400	18	Horizontal



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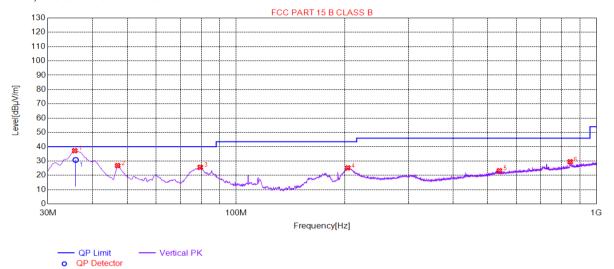
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#### Mode:a; Polarization:Vertical



**Suspected List** 

- u p - u	otou Liot							
Susp	ected List							
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	35.6271	37.23	-29.76	40.00	2.77	100	14	Vertical
2	46.8814	26.85	-30.40	40.00	13.15	100	346	Vertical
3	79.4799	25.65	-36.06	40.00	14.35	100	226	Vertical
4	204.052	25.20	-31.10	43.50	18.30	100	299	Vertical
5	538.187	23.26	-22.34	46.00	22.74	100	359	Vertical
6	845.545	29.53	-16.96	46.00	16.47	200	300	Vertical

#### **Final Data List**

Final Data List								
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	35.8301	-29.69	30.78	40.00	9.22	166.4	295.5	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 EUT1 and the PC+USB cable b: Transfer data between the EUT2 and the PC+USB cable

the worst case: c: GSM 850 Idle+ BT+ 2.4G WLAN +GNSS Rx+ NFC +playing MP4+ earphone1+

EUT1+ Cable+ adapter

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

EUT1+ Cable+ adapter

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

Cable+ adapter

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

Cable+ adapter

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

Cable+ adapter

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

EUT1+ Cable+ adapter

i: NR Band n5 Idle+ BT+5G WLAN +GNSS Rx+ NFC+ camera (Back) + EUT1+

Cable+ adapter

j: NR Band n77 Idle+ BT+5G WLAN +GNSS Rx+ NFC+ playing MP4 + EUT1+

Cable+ adapter

k: NR Band n77 Idle + BT+ 5G WLAN +GNSS Rx+ NFC +playing MP4 + EUT1+

Audio Cable+ earphone

The worst case

j: NR Band n77 Idle+ BT+5G WLAN +GNSS Rx+ NFC+ playing MP4 + EUT1+

for final test: Cable+ adapter



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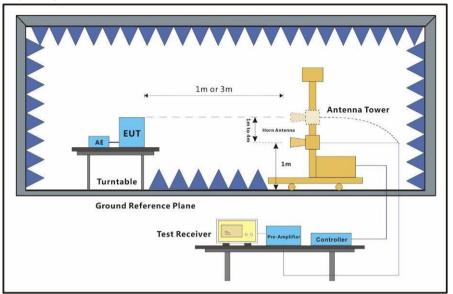
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#### 2.3.2 Test Setup Diagram



#### 2.3.3 Measurement Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. Three orthogonal axes of X,Y,Z are tested by EUT using BiConiLog antenna with 2 orthogonal polarities, but only the worst data had been displayed



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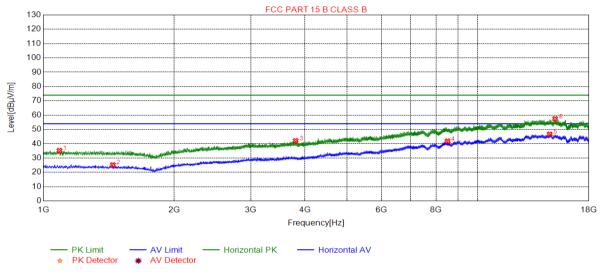
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#### Mode:j; Polarization:Horizontal



Sus	Suspected List								
S	Suspected List								
N	IO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
	1	1089.25	35.27	-30.20	74.00	38.73	100	280	Horizontal
	2	1445.42	25.22	-29.99	54.00	28.78	100	344	Horizontal
	3	3804.29	42.05	-21.15	74.00	31.95	100	193	Horizontal
	4	8505.87	41.83	-7.37	54.00	12.17	100	150	Horizontal
	5	14614.2	46.68	0.65	54.00	7.32	100	237	Horizontal
	6	15042.7	57.44	1.13	74.00	16.56	100	64	Horizontal



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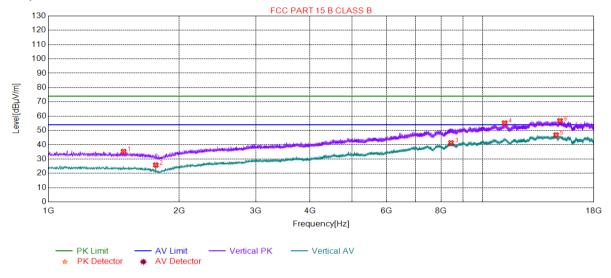
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#### Mode:j; Polarization:Vertical



#### **Suspected List**

Duspected List								
Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1489.62	35.28	-30.09	74.00	38.72	100	296	Vertical
2	1766.73	25.84	-31.78	54.00	28.16	100	274	Vertical
3	8441.27	41.33	-7.54	54.00	12.67	100	37	Vertical
4	11212.4	55.21	-3.26	74.00	18.79	100	252	Vertical
5	14724.7	46.88	0.82	54.00	7.12	100	274	Vertical
6	15037.6	56.79	1.14	74.00	17.21	100	274	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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### 3 Equipment List

Chamber							
Total Francisco and	Manager	Madalal Na	I	Cal. date	Cal.Due date		
Test Equipment	Manufacturer	Model No.	Inventory No.	(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	2020/9/7	2021/9/6		
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	2020/11/18	2021/11/18		
Amplifier	Tonscend	TAP01018048	XAW01-41-02	2020/11/18	2021/11/18		
Amplifier	Tonscend	TAP18040048	XAW01-41-03	2020/12/3	2021/12/3		
Amplifier	Brilliant-emc	YX28980930	XAW01-41-06	2020/11/18	2021/11/18		
Artificial network	ROHDE&SCHWARZ	ENV216	XAW01-19-02	2020/9/16	2021/9/15		



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### **Measurement Uncertainty**

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



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#### 5 **Photographs**

#### **Test Setup**

Refer to Appendix A JBP Setup Photos.

#### 5.2 EUT Constructional Details (EUT Photos)

Refer to Photographs of EUT Constructional Details

- End of the Report -



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