

Report No.: AR/2020/C000606

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### TEST REPORT

Application No: AR/2020/C0006

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.:** M2010J19SY

Trade Mark: Redmi

FCC ID: 2AFZZJ19SY

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

**Date of Receipt:** 2020/12/11

**Date of Test:** 2020/12/11 to 2020/12/31

2020/12/20 to 2020/12/31

**Date of Issue:** 2020/12/31

2021/1/7

Test Result: Pass\*

#### Authorized Signature:

Derek Yang

Derole 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		2021/1/7		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):	M2010J19SY							
Trade Mark:	Redmi	Redmi						
Hardware Version:	P2							
Software Version:	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					
Frequency Bands:	LTE Band 7	2500~2570	2620~2690					
	LTE Band 38	2570~2620	2570~2620					
	LTE Band 41	2496~2690	2496~2690					
	Wi-Fi 2.4G	2400~2483	2400~2483					
	Bluetooth	2400~2483	2400~2483					
	Wi-Fi 5G	5150~5850	5150~5850					
	FM	87-108						
	NFC	13.56						
	GNSS(GPS/Glonass/Bei dou/Galileo)	1559~161	0					

<sup>\*</sup>EUT 1= 4+128G EUT2=4+64G

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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:

7 iii tooto woro ponemios sa						
Company:	SGS-CSTC STANDARDS TECHNICAL SERVICES (XI 'AN) CO., LTD.					
Address:	1st Floor, Unit D, Building 1, Kanghong Orange Technology Park, No.137, Keyuan 3rd Road, Fengdong New City, Xi'an, Shaanxi, China					
Post code:	710086					

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
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+EUT1+BT+WLAN +NFC+GNSS Rx+playing MP4 (SD card)

+earphone+battery+Cable1+adapter1

d: WCDMA Band V Idle+EUT1+BT+WLAN + NFC+ GNSS Rx+playing MP4 (SD

card) +earphone+battery+ Cable1+adapter1

e: LTE Band 2 Idle+EUT1+BT+WLAN + NFC+ GNSS Rx+camera (Front)

+earphone+battery+ Cable1+adapter1

f: LTE Band 4 Idle+EUT1+BT+WLAN + NFC+GNSS Rx+camera (back)

+earphone+battery+ Cable1+adapter1

g: LTE Band 5 Idle+EUT1+BT+WLAN + NFC+ GNSS Rx +FM

+earphone+battery+ Cable1+adapter1

h: LTE Band 7 Idle+EUT1+BT+WLAN + NFC+ GNSS Rx+camera (Front)

+earphone+battery+ Cable1+adapter2

i: LTE Band 38 Idle+EUT2+BT+WLAN + NFC+GNSS Rx+camera (Front)

+earphone+battery+ Cable1+adapter2

j: LTE Band 41 Idle+EUT1+BT+WLAN + NFC+GNSS Rx+camera (Front)

+earphone+battery+ Cable1+adapter3

k: LTE Band 41 Idle+EUT1+BT+WLAN + NFC+ GNSS Rx+camera (Front)

+earphone+battery+ Cable1+adapter4

I: Transfer data between the EUT2 and the PC+USB cable1

The worst case e: LTE Band 2 Idle+EUT1+BT+WLAN + NFC+ GNSS Rx+camera (Front) for final test: +earphone+battery+ Cable1+adapter1

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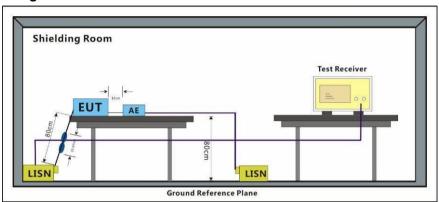
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#### 2.1.2 Test Setup Diagram



#### 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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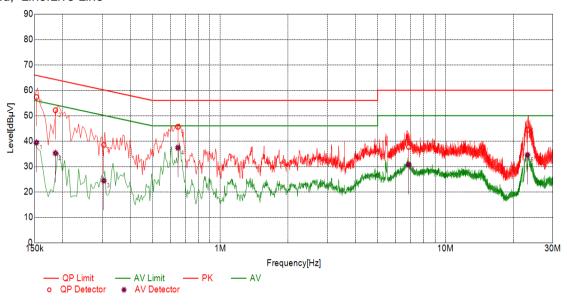
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#### Mode:d; Line:Live Line



#### **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	0.1529	10.10	57.32	65.84	8.52	39.38	55.84	16.46	L	
2	0.1857	10.10	52.14	64.22	12.08	35.24	54.22	18.98	L	
3	0.3044	10.10	38.47	60.12	21.65	24.39	50.12	25.73	L	
4	0.6494	10.10	45.62	56.00	10.38	37.37	46.00	8.63	L	
5	6.8727	10.10	37.69	60.00	22.31	30.71	50.00	19.29	L	
6	23.1499	10.11	44.38	60.00	15.62	34.54	50.00	15.46	L	

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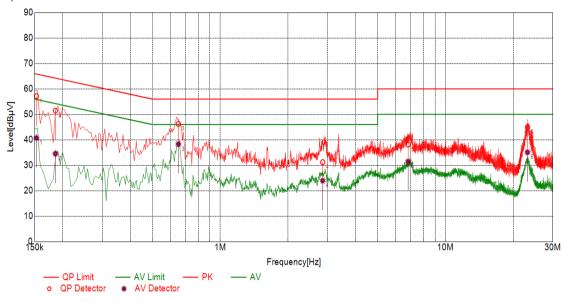
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#### Mode:d; Line:Neutral Line



#### **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	0.1529	10.10	57.11	65.84	8.73	40.70	55.84	15.14	N	
2	0.1857	10.10	51.44	64.22	12.78	34.55	54.22	19.67	N	
3	0.6527	10.10	46.23	56.00	9.77	38.31	46.00	7.69	N	
4	2.8525	10.10	31.23	56.00	24.77	23.94	46.00	22.06	N	
5	6.8304	10.10	38.13	60.00	21.87	31.43	50.00	18.57	N	
6	23.1324	10.11	44.93	60.00	15.07	35.09	50.00	14.91	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  $46.0 (\text{dB}\mu\text{V/m})$  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

#### 2.1.4 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 66.5 % 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

c: GSM 850 Idle+EUT1+BT+WLAN+NFC +GNSS Rx+playing MP4 (SD card)

+earphone+battery+Cable1+adapter1

d: WCDMA Band V Idle+EUT1+BT+WLAN + NFC +GNSS Rx+playing MP4 (SD

card) +earphone+battery+ Cable1+adapter1

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

+earphone+battery+ Cable1+adapter1

f: LTE Band 2 Idle+EUT1+BT+WLAN + NFC +GNSS Rx+camera (back)

+earphone+battery+ Cable1+adapter1

g: LTE Band 4 Idle+EUT1+BT+WLAN + NFC +GNSS Rx +FM

+earphone+battery+ Cable1+adapter1

h: LTE Band 7 Idle+EUT1+BT+WLAN + NFC +GNSS Rx+camera (Front)

+earphone+battery+ Cable1+adapter2

i: LTE Band 38 Idle+EUT1+BT+WLAN + NFC +GNSS Rx+camera (Front)

+earphone+battery+ Cable1+adapter2

j: LTE Band 41 Idle+EUT1+BT+WLAN + NFC +GNSS Rx+camera (Front)

+earphone+battery+ Cable1+adapter2

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

+earphone+battery+ Cable1+adapter3

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

+earphone+battery+ Cable1+adapter4

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

+earphone+battery+ Cable1+adapter2

n Transfer data between the EUT2 and the PC+USB cable1

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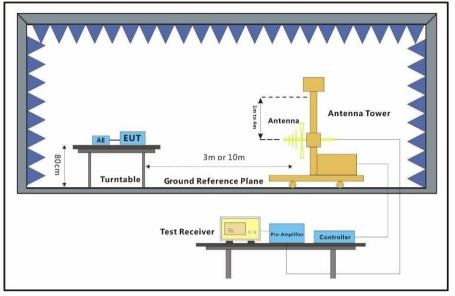


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The worst case b: Transfer data between the EUT1 and the PC+USB cable2 for final test:

#### 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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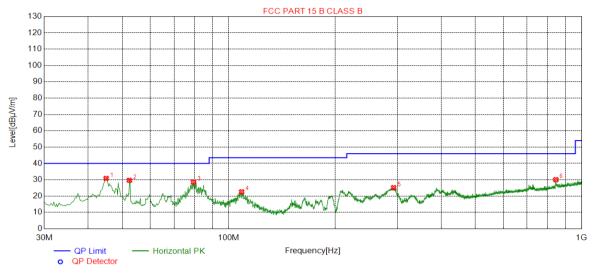
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#### Mode:b; Polarization:Horizontal



#### **Suspected List**

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity				
1	44.9410	30.84	40.00	9.16	200	215	Horizontal				
2	52.3145	29.68	40.00	10.32	200	107	Horizontal				
3	79.4799	28.58	40.00	11.42	200	313	Horizontal				
4	108.7798	22.62	43.50	20.88	200	252	Horizontal				
5	293.3107	25.16	46.00	20.84	100	62	Horizontal				
6	844.9630	30.08	46.00	15.92	100	114	Horizontal				

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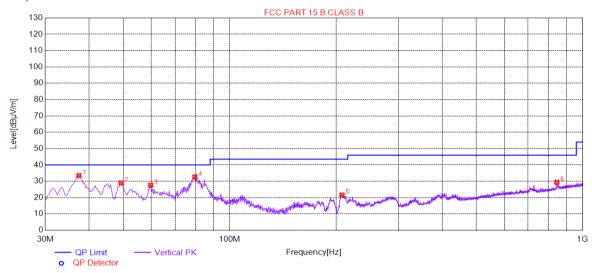
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#### Mode:b; Polarization:Vertical



#### **Suspected List**

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity				
1	37.3735	33.48	40.00	6.52	100	311	Vertical				
2	49.2098	29.00	40.00	11.00	100	303	Vertical				
3	59.6879	27.58	40.00	12.42	100	346	Vertical				
4	79.6739	32.67	40.00	7.33	100	250	Vertical				
5	208.1276	21.60	43.50	21.90	100	34	Vertical				
6	845.1570	29.36	46.00	16.64	100	177	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

#### 2.1.7 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+EUT1+BT+WLAN+NFC +GNSS Rx+playing MP4 (SD card)

+earphone+battery+Cable1+adapter1

d: WCDMA Band V Idle+EUT1+BT+WLAN + NFC +GNSS Rx+plaving MP4 (SD

card) +earphone+battery+ Cable1+adapter1

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

+earphone+battery+ Cable1+adapter1

f: LTE Band 2 Idle+EUT1+BT+WLAN + NFC +GNSS Rx+camera (back)

+earphone+battery+ Cable1+adapter1

g: LTE Band 4 Idle+EUT1+BT+WLAN + NFC +GNSS Rx +FM

+earphone+battery+ Cable1+adapter1

h: LTE Band 7 Idle+EUT1+BT+WLAN + NFC +GNSS Rx+camera (Front)

+earphone+battery+ Cable1+adapter2

i: LTE Band 38 Idle+EUT1+BT+WLAN + NFC +GNSS Rx+camera (Front)

+earphone+battery+ Cable1+adapter2

j: LTE Band 41 Idle+EUT1+BT+WLAN + NFC +GNSS Rx+camera (Front)

+earphone+battery+ Cable1+adapter2

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

+earphone+battery+ Cable1+adapter3

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

+earphone+battery+ Cable1+adapter4

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

+earphone+battery+ Cable1+adapter2

n Transfer data between the EUT2 and the PC+USB cable1

The worst case

d: WCDMA Band V Idle+EUT1+BT+WLAN + NFC +GNSS Rx+playing MP4 (SD

for final test: card) +earphone+battery+ Cable1+adapter1

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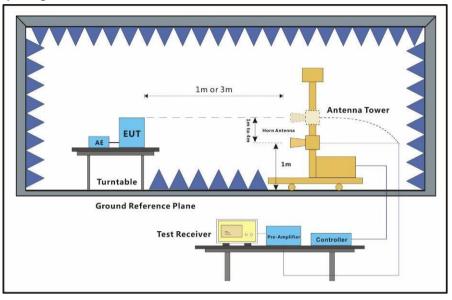
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#### 2.1.8 Test Setup Diagram



#### 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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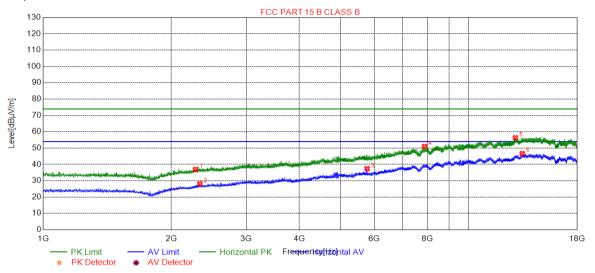
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#### Mode:d; Polarization:Horizontal



#### **Suspected List**

Suspected List							
NO.	Freq.	Level	Limit	Margin	Height	Angle	Polarity
	[MHz]	[dBµV/m]	[dBµV/m]	[dB]	[cm]	[°]	
1	2279.314	36.96	74.00	37.04	200	59	Horizontal
2	2334.566	28.13	54.00	25.87	100	301	Horizontal
3	5772.138	37.41	54.00	16.59	200	232	Horizontal
4	7872.593	51.04	74.00	22.96	100	105	Horizontal
5	12877.64	56.36	74.00	17.64	100	344	Horizontal
6	13363.86	46.69	54.00	7.31	200	124	Horizontal

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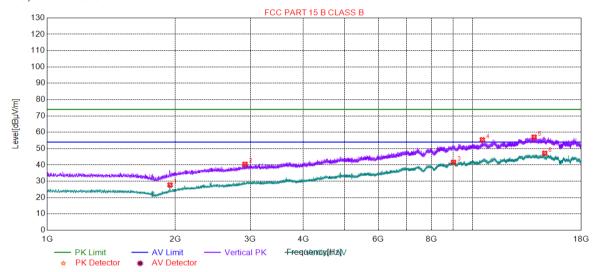
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#### Mode:d; Polarization:Vertical



#### **Suspected List**

<u>u</u>	ouspected List							
	Suspected List							
	NO.	Freq. [MHz]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
	1	1944.397	27.75	54.00	26.25	200	281	Vertical
	2	2916.845	40.43	74.00	33.57	100	38	Vertical
	3	9015.900	41.65	54.00	12.35	100	16	Vertical
	4	10537.47	55.42	74.00	18.58	100	235	Vertical
	5	13941.04	57.05	74.00	16.95	100	168	Vertical
	6	14767.28	47.18	54.00	6.82	200	346	Vertical

#### Remark:

1) Scan from 1GHz to 30GHz, The disturbance above 18GHz was very low and all noise floor. The above radiated emissions were the highest point could be found when testing, so only the above radiated emissions had been displayed

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### 3 Equipment List

Chamber					
Took Favringsont	Manufacturer	Model No.	Inventory No.	Cal. date	Cal.Due date
Test Equipment			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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### 4 Measurement Uncertainty

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

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### 5 Photographs

#### 5.1 Test Setup

Refer to Appendix A - Photographs of Set-Up for AR/2020/C0004.

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

Refer to Photographs of EUT Constructional Details

- End of the Report -

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