

TEST REPORT

APPLICANT: Nubia Technology Co., Ltd.

PRODUCT NAME: 5G Digital Mobile Phone

MODEL NAME: NX659J

BRAND NAME: REDMAGIC

FCC ID : 2AHJO-NX659J

STANDARD(S) : 47 CFR Part 15 Subpart B

RECEIPT DATE : 2020-01-17

TEST DATE : 2020-02-24 to 2020-03-04

ISSUE DATE : 2020-04-03

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	Change	e History
Version	Date	Reason for change
1.0	2020-04-03	First edition



1. Technical Information

Note: Provide by applicant

1.1. Applicant and Manufacturer Information

Applicant:	Nubia Technology Co., Ltd.		
Applicant Address:	16/F,Building 2,chongwen Park,Nanshan zhiyuan,3370 Liuxian		
	Road, Nanshan District, Shenzhen, China.		
Manufacturer:	Nubia Technology Co., Ltd.		
Manufacturer Address:	16/F,Building 2,chongwen Park,Nanshan zhiyuan,3370 Liuxian		
	Road, Nanshan District, Shenzhen, China.		

1.2. Equipment Under Test (EUT) Description

Product Name:	5G Digital Mobile Phone		
Serial No:	(N/A, marked #1 by test site)		
Hardware Version:	NX659J_V1AMB		
Software Version:	NX659J_ENCommon_V1.22		
SIM Cards	SIM 1 and SIM 2 is a chipset unit and tested as a single chipset. T		
Description:	SIM 1 is chosen for test		
Tx Frequency:	GSM850: 824 MHz ~ 849 MHz		
	GSM1900: 1850 MHz ~ 1910 MHz		
	WCDMA Band II: 1850 MHz ~ 1910 MHz		
	WCDMA Band IV: 1710 MHz ~ 1755 MHz		
	WCDMA Band V: 824 MHz ~ 849 MHz		
	LTE Band 2: 1850 MHz ~ 1910 MHz		
	LTE Band 4: 1710 MHz ~ 1755 MHz		
	LTE Band 5: 824 MHz ~ 849 MHz		
	LTE Band 7: 2500 MHz ~ 2570 MHz		
	LTE Band 12: 699 MHz ~ 716 MHz		
	LTE Band 17: 704 MHz ~ 716 MHz		
	LTE Band 18: 815 MHz ~ 830 MHz		
	LTE Band 19: 830 MHz ~ 845 MHz		
	LTE Band 26: 814MHz ~ 849 MHz		
	5G NR n41: 2496 MHz ~ 2690 MHz		
	Bluetooth 5.0: 2402 MHz ~ 2480 MHz		
	802.11 ax/b/g/n: 2412 MHz ~ 2462 MHz		
	802.11 ax/a/ac/n: 5180 MHz ~ 5240 MHz;5260 MHz ~ 5320 MHz;		
	5500 MHz ~ 5720 MHz;5745 MHz ~ 5825 MHz		





	NFC:13.56MHz				
Rx Frequency:	GSM850: 869 M				
		MHz ~ 1990 MHz			
		1930 MHz ~ 1990 MHz			
		_	110 MHz ~ 2155 MHz		
		WCDMA Band V: 869 MHz ~ 894 MHz			
		LTE Band 2: 1930 MHz ~ 1990 MHz			
	LTE Band 4: 2110 MHz ~ 2155 MHz				
	LTE Band 5: 869 MHz ~ 894 MHz				
	LTE Band 7: 2620 MHz ~ 2690 MHz				
	LTE Band 12: 729 MHz ~ 746 MHz LTE Band 17: 734 MHz ~ 746 MHz				
	LTE Band 18: 86				
	LTE Band 19: 87	_			
	LTE Band 26: 85				
	5G NR n41: 2496 MHz ~ 2690 MHz				
	Bluetooth 5.0: 2402 MHz ~ 2480 MHz				
	802.11 ax/b/g/n: 2412 MHz ~ 2462 MHz				
	802.11 ax/a/ac/n: 5180 MHz ~ 5240 MHz;5260 MHz ~ 5320 MHz;				
	5500 MHz ~ 5720 MHz;5745MHz ~ 5825MHz				
	GPS/BDS/Galileo/GLONASS:1559 MHz ~ 1610 MHz				
	GPS/Galileo:1164 MHz ~ 1215 MHz				
	NFC:13.56MHz				
Operation Band:	CDMA 800MHz	(BC 0); C	CDMA 1900MHz (BC 1)		
	ODMA COOMIL	(DO 0)	Tx: 824 ~ 849 MHz		
Francisco Donas	CDMA 800MHz	(BC 0)	Rx: 869 ~ 894 MHz		
Frequency Range:	CDMA 4000MH	· (DC 4)	Tx: 1850 ~ 1910 MHz		
	CDMA 1900MHz	2 (BC 1)	Rx: 1930 ~ 1990 MHz		
Ancillary	AC Adapter				
Equipment:	Brand Name:	N/A			
	Model No.:	CYNB	/090200-A00		
	Serial No.:	(N/A, m	narked #1 by test site)		
	Rated Input:	100-24	0V~ 50/60Hz Max. 0.5A		
	Rated Output:	12V 1.5A /9V 2A/5V 3A			
	Manufacturer:	Jiangsu Chenyang Electron Co., Ltd			
	Battery				
	Brand Name:	ATL			
	Model No.:	Li3945	T44P8h526391		
	Serial No.:	(N/A, m	narked #1 by test site)		
	Capacity:	4400m	Ah		



Rated Voltage	e: 3.87V
Charge Limit:	4.45V
Manufacturer	Dongguan Amperex Technology Limited

Note:

- The 5G Digital Mobile Phone supports GSM850MHz, 1900MHz, GPRS, EDGE, WCDMA Band II, Band IV, Band V, HSDPA, HSUPA, HSPA+, CDMA/CDMA1xRTT/EVDO Rev.0/Rev.A BC0/BC1, LTE Bands 2/4/5/7/12/17/18/19/26, 5G NR n41, WIFI, GPS/Galileo/GLONASS/BDS, NFC and Bluetooth.
- 2. The EUT is equipped with a T-Flash card slot, two SIM card slots and a Micro USB port which can be connected to ancillary equipments.
- 3. For a more detailed description, please refer to specification or user's manual supplied by the applicant and/or manufacturer.



2. Test Results

2.1. Applied Reference Documents

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart B:

No.	Identity	Document Title		
1	47 CFR Part 15	Radio Frequency Devices		

Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Test Date	Test Engineer	Result	Method determination Remark
1	15.107	Conducted Emission	2020.02.24	Huang Zhiye	PASS	No deviation
2	15.109	Radiated Emission	2020.03.04	Yang Jie	PASS	No deviation

NOTE 1: The tests were performed according to the method of measurements prescribed in ANSI C63.4-2014.

NOTE 2: Additions to, deviation, or exclusions from the method shall be judged in the "method determination" column of add, deviate or exclude from the specific method shall be explained in the "Remark" of the above table.





2.2. EUT Setup and Operating Conditions

Mode 1 : EUT + USB Cable + Adapter + Earphone + GSM idle + Camera Mode 2 : EUT + USB Cable + Earphone + WCDMA idle + PC (Transmitting Data) Mode 3 : EUT + USB Cable + Adapter + Earphone + LTE idle + GPS RX Mode 4 : EUT + USB Cable + Adapter + Earphone + CDMA idle + GLONASS RX Mode 5 : EUT + USB Cable + Adapter + Earphone + 5G NR idle + BDS RX Mode 6 : EUT + USB Cable + Adapter + Earphone + Bluetooth idle + Galileo RX Mode 7 : EUT + USB Cable + Adapter + Earphone + WIFI idle + NFC idle Conducted Emission
Mode 2 : EUT + USB Cable + Earphone + WCDMA idle + PC (Transmitting Data) Mode 3 : EUT + USB Cable + Adapter + Earphone + LTE idle + GPS RX Mode 4 : EUT + USB Cable + Adapter + Earphone + CDMA idle + GLONASS RX Mode 5 : EUT + USB Cable + Adapter + Earphone + 5G NR idle + BDS RX Mode 6 : EUT + USB Cable + Adapter + Earphone + Bluetooth idle + Galileo RX Mode 7 : EUT + USB Cable + Adapter + Earphone + WIFI idle + NFC idle Conducted Emission
Mode 3 : EUT + USB Cable + Adapter + Earphone + LTE idle + GPS RX Mode 4 : EUT + USB Cable + Adapter + Earphone + CDMA idle + GLONASS RX Mode 5 : EUT + USB Cable + Adapter + Earphone + 5G NR idle + BDS RX Mode 6 : EUT + USB Cable + Adapter + Earphone + Bluetooth idle + Galileo RX Mode 7 : EUT + USB Cable + Adapter + Earphone + WIFI idle + NFC idle Conducted Emission
Mode 4 : EUT + USB Cable + Adapter + Earphone + CDMA idle + GLONASS RX Mode 5 : EUT + USB Cable + Adapter + Earphone + 5G NR idle + BDS RX Mode 6 : EUT + USB Cable + Adapter + Earphone + Bluetooth idle + Galileo RX Mode 7 : EUT + USB Cable + Adapter + Earphone + WIFI idle + NFC idle Conducted Emission
Mode 5 : EUT + USB Cable + Adapter + Earphone + 5G NR idle + BDS RX Mode 6 : EUT + USB Cable + Adapter + Earphone+ Bluetooth idle + Galileo RX Mode 7 : EUT + USB Cable + Adapter + Earphone + WIFI idle + NFC idle Conducted Emission
Mode 6 : EUT + USB Cable + Adapter + Earphone+ Bluetooth idle + Galileo RX Mode 7 : EUT + USB Cable + Adapter + Earphone + WIFI idle + NFC idle Conducted Emission
Mode 7 : EUT + USB Cable + Adapter + Earphone + WIFI idle + NFC idle Conducted Emission
Conducted Emission
Made 4 . FLIT . LIOD Ochler . Adeuten . Fembers . COM idle . Ochsen
Mode 1 : EUT + USB Cable + Adapter + Earphone + GSM idle + Camera
Mode 2 : EUT + USB Cable + Earphone + WCDMA idle + PC (Transmitting Data)
Mode 3 : EUT + USB Cable + Adapter + Earphone + LTE idle + GPS RX
Mode 4 : EUT + USB Cable + Adapter + Earphone + CDMA idle + GLONASS RX
Mode 5 : EUT + USB Cable + Adapter + Earphone + 5G NR idle + BDS RX
Mode 6 : EUT + USB Cable + Adapter + Earphone+ Bluetooth idle + Galileo RX
Mode 7 : EUT + USB Cable + Adapter + Earphone + WIFI idle + NFC idle
Remark: The above test modes in holdface (Mode 1) were the worst cases of radiated emission test

The above test modes in boldface (Mode 1) were the worst cases of radiated emission test; only the test data of these modes was reported. The above test modes in boldface (Mode 2) were the worst cases of Conducted Emission test; only the test data of these modes was reported.

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15 - 35
Relative Humidity (%):	30 - 60
Atmospheric Pressure (kPa):	86 - 106



3. 47 CFR Part 15B Requirements

3.1. Conducted Emission

3.1.1. Requirement

According to FCC section 15.107, the radio frequency voltage that is conducted back onto the ACpower line on any frequency within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a $50\mu H/50\Omega$ line impedance stabilization network (LISN).

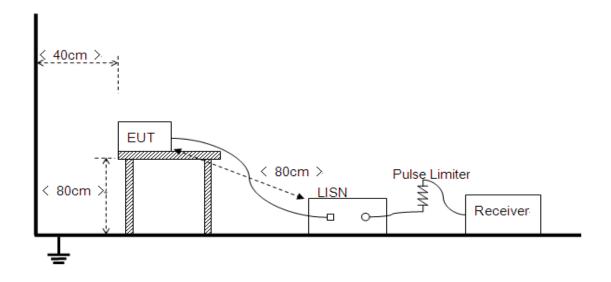
Frequency range	Conducted Limit (dBμV)		
(MHz)	Quasi-peak	Average	
0.15 - 0.50	66 to 56	56 to 46	
0.50 - 5	56	46	
5 - 30	60	50	

NOTE:

- a) The limit subjects to the Class B digital device.
- b) The lower limit shall apply at the band edges.
- c) The limit decreases linearly with the logarithm of the frequency in the range 0.15 0.50MHz.

3.1.2. Test Setup

Please refer to Annex A for the photographs of the Test Configuration.





The EUT is placed on a 0.8m high insulating table, which stands on the grounded conducting floor, and keeps 0.4m away from the grounded conducting wall. The EUT is connected to the power mains through a LISN which provides $50\Omega/50\mu H$ of coupling impedance for the measuring instrument. A Pulse Limiter is used to protect the measuring instrument. The factors of the whole test system are calibrated to correct the reading.

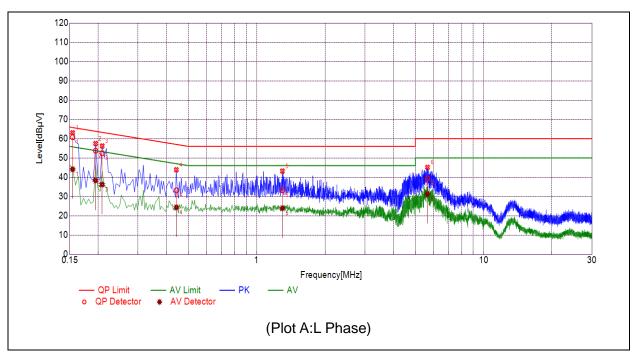
The power strip or extension cord has been investigated to make sure that the LISN integrity inma intained with respect to the impedance characteristics as prescribed in ANSI C63.4-2014 at Clause 4.3.

3.1.3. Test Result

The maximum conducted interference is searched using Peak (PK), Quasi-peak (QP) and Average (AV) detectors; the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. All test modes are considered, refer to recorded points and plots below.

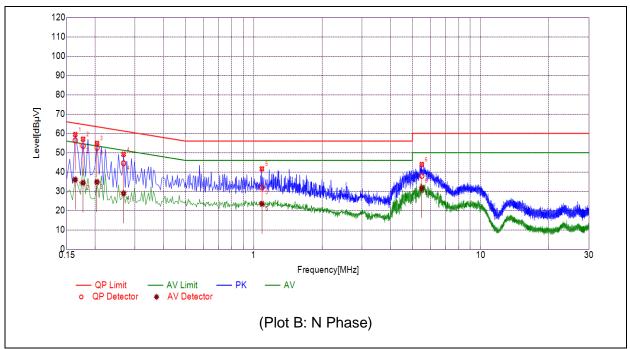


A. Test Plot and Suspicious Points:



NO.	Fre.	Emission L	evel (dBµV)	Limit (d	dΒμV)	Power-line	Verdict
NO.	(MHz)	Quai-peak	Average	Quai-peak	Average	Power-line	verdict
1	0.1544	60.77	44.13	65.76	55.76		PASS
2	0.1950	53.75	38.32	63.82	53.82	Line	PASS
3	0.2083	52.43	36.21	63.27	53.27		PASS
4	0.4426	33.22	24.38	57.01	47.01		PASS
5	1.2976	33.31	23.93	56.00	46.00		PASS
6	5.6539	39.35	31.33	60.00	50.00		PASS





NO.	Fre.	Emission Level (dBµV)		Limit (d	dΒμV)	Dower line	Verdict
NO.	(MHz)	Quai-peak	Average	Quai-peak	Average	Power-line	verdict
1	0.1634	56.35	36.00	65.29	55.29		PASS
2	0.1771	53.48	34.39	64.62	54.62		PASS
3	0.2040	52.60	34.79	63.44	53.44	Neutral	PASS
4	0.2670	44.54	28.92	61.21	51.21	Neutrai	PASS
5	1.0865	31.98	23.47	56.00	46.00		PASS
6	5.5018	37.96	31.59	60.00	50.00		PASS



3.2. Radiated Emission

3.2.1. Requirement

According to FCC section 15.109 (a), the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency	Field Strength Limitation at 3m Measurement D		
range (MHz)	(μV/m)	(dBµV/m)	
30.0 - 88.0	100	20log 100	
88.0 - 216.0	150	20log 150	
216.0 - 960.0	200	20log 200	
Above 960.0	500	20log 500	

As shown in FCC section 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector. When average radiated emission measurements are specified in this part, including emission measurements below 1000MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules.

Note:

- 1) The tighter limit shall apply at the boundary between two frequency range.
- 2) Limitation expressed in dBμV/m is calculated by 20log Emission Level(μV/m).

3.2.2. Frequency range of measurement

According to 15.33(b)(1), the frequency range of radiated measurement for the EUT is listed in the following table:

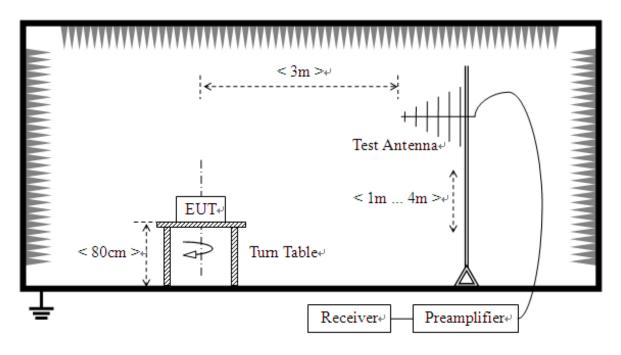
Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measure- ment range (MHz)
Below 1.705	30. 1000. 2000. 5000. 5th harmonic of the highest frequency or 40 GHz, whichever is lower.



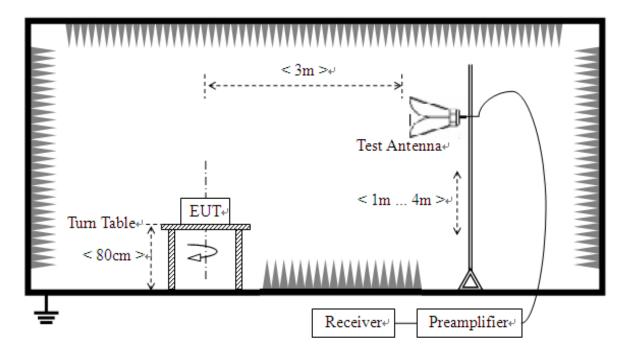


3.2.3. Test Setup

1) For radiated emissions from 30MHz to1GHz



2) For radiated emissions above 1GHz







The test is performed in a 3m Semi-Anechoic Chamber; the antenna factor, cable loss and so on of the site (factors) is calculated to correct the reading. The EUT is placed on a 0.8m high insulating Turn Table, and keeps 3m away from the Test Antenna, which is mounted onavariable-height antenna master tower.

For the test Antenna:

In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) and Horn Test Antenna (above 1GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength. The emission levels at both horizontal and vertical polarizations should be tested.

3.2.4. Test Result

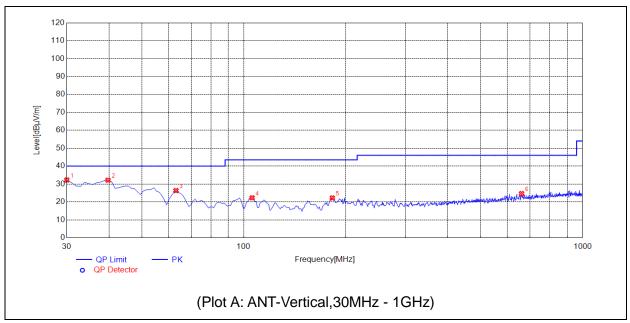
The maximum radiated emission is searched using PK, QP and AV detectors; the emission levels more than the limits, and that have narrow margins from the limits will be re-measured with AV and QP detectors. Both the vertical and the horizontal polarizations of the Test Antenna are considered to perform the tests. All test modes are considered, refer to recorded points and plots below.

The amplitude of emissions which (6GHz-30GHz) are attenuated more than 20 dB below the permissible value need not be reported.

Note: All radiated emission tests were performed in X, Y, Z axis direction, and only the worst axis test condition was recorded in this test report.

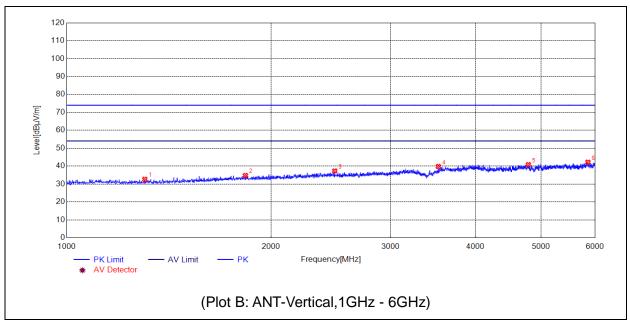






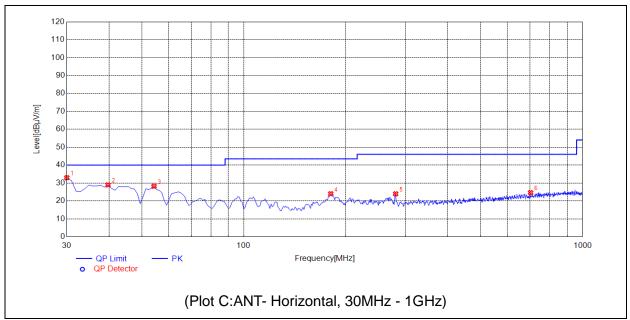
No.	Fre. MHz	Pk dBµV/m	QP dBµV/m	AV dBμV/m	Limit-PK dBµV/m	Limit-QP dBµV/m	Limit-AV dBµV/m	ANT	Verdict
1	30.0000	32.22	N.A	N.A	N.A	40.00	N.A	V	PASS
2	39.7097	32.12	N.A	N.A	N.A	40.00	N.A	V	PASS
3	63.0130	26.33	N.A	N.A	N.A	40.00	N.A	V	PASS
4	105.7357	22.29	N.A	N.A	N.A	43.50	N.A	V	PASS
5	182.4424	22.23	N.A	N.A	N.A	43.50	N.A	V	PASS
6	660.1602	24.66	N.A	N.A	N.A	46.00	N.A	V	PASS





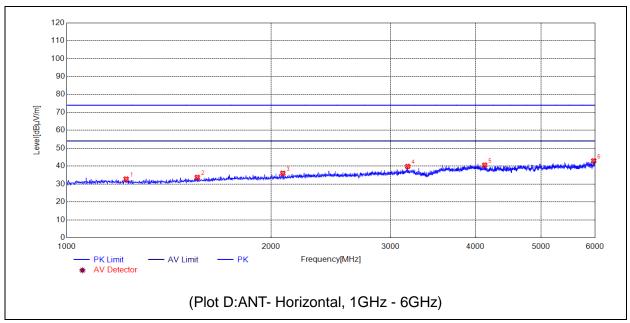
No.	Fre. MHz	Pk dBµV/m	QP dBµV/m	AV dBμV/m	Limit-PK dBµV/m	Limit-QP dBµV/m	Limit-AV dBµV/m	ANT	Verdict
1	1303.0606	32.62	N.A	N.A	74.00	N.A	54.00	V	PASS
2	1833.1666	34.76	N.A	N.A	74.00	N.A	54.00	V	PASS
3	2482.2965	37.28	N.A	N.A	74.00	N.A	54.00	V	PASS
4	3528.5057	39.78	N.A	N.A	74.00	N.A	54.00	V	PASS
5	4788.7578	40.81	N.A	N.A	74.00	N.A	54.00	V	PASS
6	5861.9724	42.17	N.A	N.A	74.00	N.A	54.00	V	PASS





No.	Fre. MHz	Pk dBµV/m	QP dBµV/m	AV dBμV/m	Limit-PK dBµV/m	Limit-QP dBµV/m	Limit-AV dBµV/m	ANT	Verdict
1	30.0000	32.95	N.A	N.A	N.A	40.00	N.A	Н	PASS
2	39.7097	28.93	N.A	N.A	N.A	40.00	N.A	Н	PASS
3	54.2743	28.20	N.A	N.A	N.A	40.00	N.A	Н	PASS
4	180.5005	23.99	N.A	N.A	N.A	43.50	N.A	Н	PASS
5	280.5105	23.98	N.A	N.A	N.A	46.00	N.A	Н	PASS
6	701.9119	24.62	N.A	N.A	N.A	46.00	N.A	Н	PASS





No.	Fre. MHz	Pk dBµV/m	QP dBµV/m	AV dBμV/m	Limit-PK dBµV/m	Limit-QP dBµV/m	Limit-AV dBµV/m	ANT	Verdict
1	1223.0446	32.77	N.A	N.A	74.00	N.A	54.00	Н	PASS
2	1557.1114	33.73	N.A	N.A	74.00	N.A	54.00	Н	PASS
3	2081.2162	36.03	N.A	N.A	74.00	N.A	54.00	Н	PASS
4	3179.4359	39.83	N.A	N.A	74.00	N.A	54.00	Н	PASS
5	4128.6257	40.55	N.A	N.A	74.00	N.A	54.00	Н	PASS
6	5976.9954	42.96	N.A	N.A	74.00	N.A	54.00	Н	PASS



Annex A Test Uncertainty

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in Measurement" (GUM) published by ISO.

Uncertainty of Conducted Emission Measurement

Measuring Uncertainty for	9kHz-150kHz	±4.1dB
a Level of Confidence of	150kHz-30MHz	±3.7dB
95%(U=2Uc(y))		

Uncertainty of Radiated Emission Measurement

Measuring Uncertainty for	30MHz-200MHz	±5.06dB
a Level of Confidence of	200MHz-1000MHz	±5.24dB
95%(U=2Uc(y))	1GHz-6GHz	±5.18dB
	6GHz-18GHz	±5.48dB





Annex B Testing Laboratory Information

1. Identification of the Responsible Testing Laboratory

Laboratory Name:	Shenzhen Morlab Communications Technology Co., Ltd.
	Morlab Laboratory
Laboratory Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang
	Road, Block 67, BaoAn District, ShenZhen, GuangDong
	Province, P. R. China
Telephone:	+86 755 36698555
Facsimile:	+86 755 36698525

2. Identification of the Responsible Testing Location

Name:	Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory
	FL.3, Building A, FeiYang Science Park, No.8 LongChang
Address:	Road, Block 67, BaoAn District, ShenZhen, GuangDong
	Province, P. R. China

3. Accreditation Certificate

AccreditedTesting	The FCC designation number is CN1192.			
Laboratory:	Test firm registration number is 226174.			
	(Shenzhen Morlab Communications Technology Co., Ltd.)			

4. Test Software Utilized

Model	Version Number	Producer	
JS32-RE	Version 2.0.2.0	Tonscend	
TS+ -[JS32-CE]	Version2.5.0.0	Tonscend	





5. Test Equipments Utilized

Description	Manufacturer	Model	Serial No.	Cal. Date	Due. Date
MXE EMI Receiver	Agilent	N9038A	MY54130016	2019.07.29	2020.07.28
Test Receiver	R&S	ESPI	101052	2019.07.29	2020.07.28
LISN	Schwarzbeck	NSLK 8127	812744	2019.03.27	2020.03.26
Pulse Limiter (20dB)	VTSD	9561D	9537	2019.03.27	2020.03.26
Test Antenna - Bi-Log	Schwarzbeck	VULB 9163	9163-519	2019.05.24	2022.05.23
Test Antenna - Horn	Schwarzbeck	BBHA 9120D	01774	2019.07.26	2022.07.25
Test Antenna - Horn	Schwarzbeck	BBHA9170	BBHA9170#7 73	2019.07.26	2022.07.25
Radiated Disturbance Preamplifier	rflight	S020180L320 3	61171/61172	2019.07.29	2020.07.28
Radiated Disturbance Preamplifier	rflight	S10M100L38 02	46732	2019.07.29	2020.07.28
Semi-Anechoic Chamber	CRT	9m*6m*6m	N/A	2020.01.06	2023.01.05
PC	Apple	N/A	C3QJJ2X2DR VD	N/A	N/A
Adapter	DELTA	A1436	N/A	N/A	N/A
earphone	N/A	N/A	EMC-01	N/A	N/A

END OF REPORT	
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