TEST REPORT

APPLICANT	:	Realme Chongqing Mobile Telecommunications Corp., Ltd.
PRODUCT NAME	:	Mobile Phone
MODEL NAME	:	RMX3513
BRAND NAME	:	realme
FCC ID	:	2AUYFRMX3513
STANDARD(S)	:	47 CFR Part 15 Subpart B
RECEIPT DATE	:	2021-11-26
TEST DATE	:	2021-12-07 to 2021-12-14
ISSUE DATE	:	2022-01-26

Edited by: Yu Xiaolin

Yu Xiaolin(Rapporteur)

Approved by: Xiao Xiong

Xiao Xiong(Supervisor)

NOTE: This document is issued by Shenzhen Morlab Communications Technology Co., Ltd., the test report shall not be reproduced except in full without prior written permission of the company. The test results apply only to the particular sample(s) tested and to the specific tests carried out which is available on request for validation and information confirmed at our website.

MORLAB

Shenzhen Morlab Communications Technology Co., Ltd.
FL1-3, Building A, FeiYang Science Park, No.8 LongChang Road,
Block67, BaoAn District, ShenZhen ,GuangDong Province, P. R. China

Tel: 86-755-36698555 Fax: 86-755-36698525
Http://www.morlab.cn E-mail: service@morlab.cn

DIRECTORY

1. Technical Information 3
1.1. Applicant and Manufacturer Information 3
1.2. Equipment Under Test (EUT) Description 3
2. Test Results 6
2.1. Applied Reference Documents 6
2.2. EUT Setup and Operating Conditions 7
3. 47 CFR Part 15B Requirements 9
3.1. Conducted Emission 9
3.2. Radiated Emission 13
Annex B Test Uncertainty 20
Annex C Testing Laboratory Information 21

Change History		
Version	Date	Reason for Change
1.0	2022-01-26	First edition

1. Technical Information

Note: Provide by applicant

1.1. Applicant and Manufacturer Information

Applicant:	Realme Chongqing Mobile Telecommunications Corp., Ltd.
Applicant Address:	No.178 Yulong Avenue, Yufengshan, Yubei District, Chongqing, China
Manufacturer:	Realme Chongqing Mobile Telecommunications Corp., Ltd.
Manufacturer Address:	No.178 Yulong Avenue, Yufengshan, Yubei District, Chongqing, China

1.2. Equipment Under Test (EUT) Description

Product Name:	Mobile Phone
EUT No.:	16#
Hardware Version:	11
Software Version:	Android 11
Tx Frequency:	GSM850: 824 MHz ~ 849 MHz GSM1900: 1850 MHz ~ 1910 MHz WCDMA Band V: 824 MHz ~ 849 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 40: 2300 MHz ~2400 MHz LTE Band 41: 2535 MHz ~ 2655 MHz Bluetooth: 2402 MHz ~ 2480 MHz 802.11b/g/n: 2412 MHz ~ 2462 MHz 802.11a/ac/n: 5150 MHz ~ 5250 MHz;5250 MHz ~ 5350 MHz; 5470 MHz ~ 5725 MHz;5745MHz ~ 5825 MHz NFC:13.56MHz
Rx Frequency:	GSM850: 869MHz ~ 894 MHz GSM1900: 1930 MHz ~ 1990 MHz WCDMA Band V: 869 MHz ~ 894 MHz LTE Band 5: 869 MHz ~ 894 MHz LTE Band 7: 2620 MHz ~ 2690 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 40: 2300 MHz ~2400 MHz LTE Band 41: 2535 MHz ~ 2655 MHz

	Bluetooth: 2402 MHz ~ 2480 MHz 802.11b/g/n: 2412 MHz ~ 2462 MHz 802.11a/ac/n: 5180 MHz ~ 5240 MHz;5260 MHz ~ 5320 MHz; 5500 MHz ~ 5700 MHz;5745MHz ~ 5825 MHz GPS/GLONASS/BeiDou/SBAS:1559 MHz ~ 1610 MHz NFC:13.56MHz	
Ancillary Equipment:	**AC Adapter 1**	
	Brand Name:	realme
	Model No.:	OP92JAUH
	Serial No.:	(N/A, marked #1 by test site)
	Rated Input:	100-240V~50/60Hz, 0.5A
	Rated Output:	5V⎓2A,9V⎓2A
	Manufacturer:	Huizhou Golden Lake Industrial Co., Ltd.
	AC Adapter 2	
	Brand Name:	realme
	Model No.:	OP92CAUH
	Serial No.:	(N/A, marked #1 by test site)
	Rated Input:	100-240V~50/60Hz, 0.5A
	Rated Output:	5V⎓2A,9V⎓2A
	Manufacturer:	Dongguan YOHOO Electronic Technology Co., Ltd.
	AC Adapter 3	
	Brand Name:	realme
	Model No.:	OP92YAUH
	Serial No.:	(N/A, marked #1 by test site)
	Rated Input:	100-240V~50/60Hz, 0.5A
	Rated Output:	5V⎓2A,9V⎓2A
	Manufacturer:	Jiangsu Chenyang Electron Co., Ltd.
	Battery 1	
	Brand Name:	realme
	Model No.:	BLP877
	Serial No.:	(N/A, marked #1 by test site)
	Capacity:	Typical: 5000mAh, Rated: 4890mAh
	Rated Voltage:	3.87V
	Charge Limit:	4.45V
	Manufacturer:	Huizhou Desay Battery Co., Ltd
	Battery 2	

	Brand Name:	realme
	Model No.:	BLP877
	Serial No.:	(N/A, marked #1 by test site)
	Capacity:	Typical: 5000mAh, Rated: 4890mAh
	Rated Voltage:	3.87V
	Charge Limit:	4.45V
	Manufacturer:	Dongguan NVT Technology Co., Ltd.
	Battery 3	
	Brand Name:	realme
	Model No.:	BLP877
	Serial No.:	(N/A, marked #1 by test site)
	Capacity:	Typical: 5000mAh, Rated: 4890mAh
	Rated Voltage:	3.87V
	Charge Limit:	4.45V
	Manufacturer:	TWS Technology (Guangzhou) Limited
	USB Cable	
	Model:	DL143
	Manufacturer:	N/A
	Earphone	
	Model:	MH156
	Manufacturer:	N/A

Note:

1. This is a variant report of original report (Report No.: SZ21110383E01, Model: RMX3511,FCC ID: 2AUYFRMX3511), based on the similarity between before, changed model name, add NFC, remove WCDMA Band 2/4, LTE Band 2/4/12/17/26/66 by hardware, the others are the same as before. We evaluated the above changes, which had no impact on the test results. The test results in this report still refer to the test results of the original test report.
2. 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	2021.12.14	Yang Lian	PASS[Note 3]	No deviation
2	15.109	Radiated Emission	2021.12.07	Lin Jiayong Wu Zhaoling	PASS[Note 3]	No deviation

Note 1: 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.

Note 2: When the test result is a critical value,we will use the measurement uncertainty give the judgment result based on the 95% confidence intervals.

Note 3: The test results of these test items in this report refer to the test report (Report No.: SZ21110383E01).

2.2. EUT Setup and Operating Conditions

Note: All of the following test modes are tested in all the test items.

Test Item	
Radiated Emission	
Mode 1 :	GSM Idle + Bluetooth Idle + 2.4G WLAN Idle + Battery + USB Cable(Charging from Adapter) + Earphone+ Adapter+ SIM Card+ GPS Rx + NFC
Mode 2 :	WCDMA Band Idle + Bluetooth Idle + 5G WLAN Idle + Battery + USB Cable(Charging from Adapter) + Earphone+ Adapter+ SIM Card +GLONASS Rx
Mode 3 :	LTE Band Idle + Bluetooth Idle + 2.4G WLAN Idle + Battery + USB Cable(Charging from Adapter) + Earphone + Adapter+ SIM Card + Beidou Rx
Mode 4 :	GSM Idle + Bluetooth Idle + 5G WLAN Idle + Battery + USB Cable(Charging from Adapter) + Earphone+ Adapter+ SIM Card+ SBAS Rx
Mode 5 :	**WCDMA Band Idle + Bluetooth Idle + 5G WLAN Idle + Battery + Earphone+ SIM Card +PC+PC Adapter(data transmission)**
Mode 6 :	LTE Band Idle + Bluetooth Idle + 2.4G WLAN Idle + Battery + USB Cable(Charging from Adapter) + Earphone+ Adapter+ SIM Card + Recording
Conducted Emission	
Mode 1 :	GSM Idle + Bluetooth Idle + 2.4G WLAN Idle + Battery + USB Cable(Charging from Adapter) + Earphone+ Adapter+ SIM Card+ GPS Rx + NFC
Mode 2 :	WCDMA Band Idle + Bluetooth Idle + 5G WLAN Idle + Battery + USB Cable(Charging from Adapter) + Earphone + Adapter+ SIM Card +GLONASS Rx
Mode 3 :	LTE Band Idle + Bluetooth Idle + 2.4G WLAN Idle + Battery + USB Cable(Charging from Adapter) + Earphone + Adapter+ SIM Card + Beidou Rx
Mode 4 :	GSM Idle + Bluetooth Idle + 5G WLAN Idle + Battery + USB Cable(Charging from Adapter) + Earphone + Adapter+ SIM Card+ SBAS Rx
Mode 5 :	WCDMA Band Idle + Bluetooth Idle + 5G WLAN Idle + Battery +Earphone + SIM Card +PC+PC Adapter(data transmission)
Mode 6 :	**LTE Band Idle + Bluetooth Idle + 2.4G WLAN Idle + Battery + USB Cable (Charging from Adapter) + Earphone + Adapter + SIM Card + Recording**
Remark: The above test mode in boldface (Mode 6) was the worst case of conducted emission test, only the test data of these modes were reported. The above test mode in boldface (Mode 5) was the worst case of radiated emission test, only the test data of these modes were 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 50μH/50Ω line impedance stabilization network (LISN).

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

NOTE:

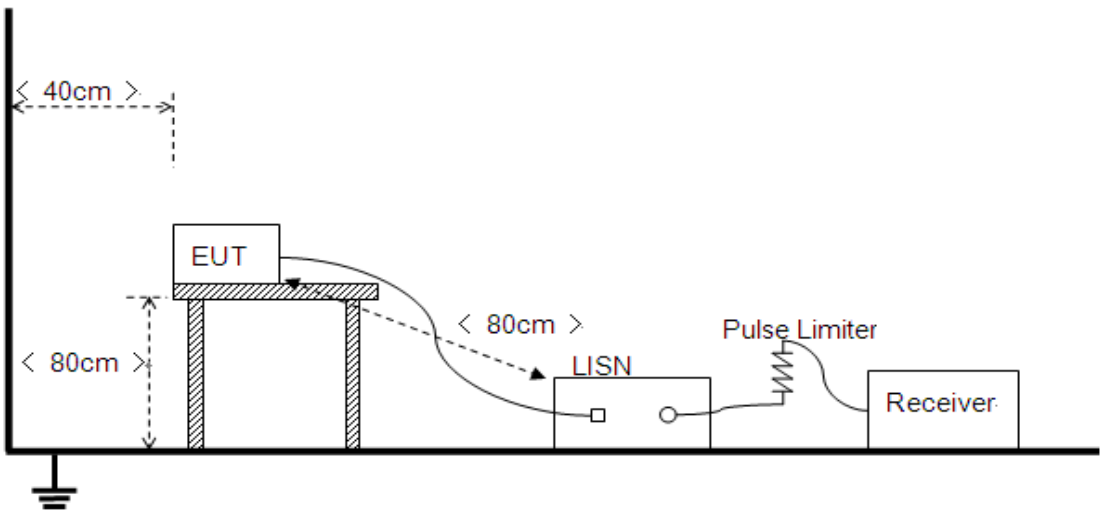
a) The limit subjects to the Class B digital device.

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.



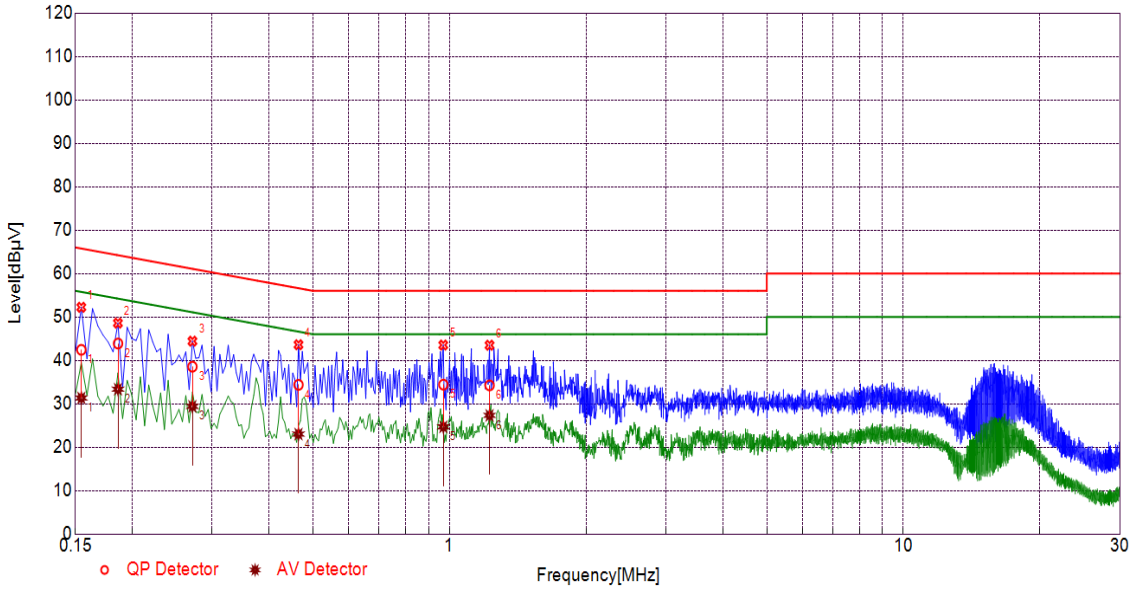
The EUT is placed on a 0.8m high insulating table, which stands on the grounded conducting floor, and keeps 0.4m away from the grounded conducting wall. The EUT is connected to the power mains through a LISN which provides 50Ω/50μH of coupling impedance for the measuring instrument. A Pulse Limiter is 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

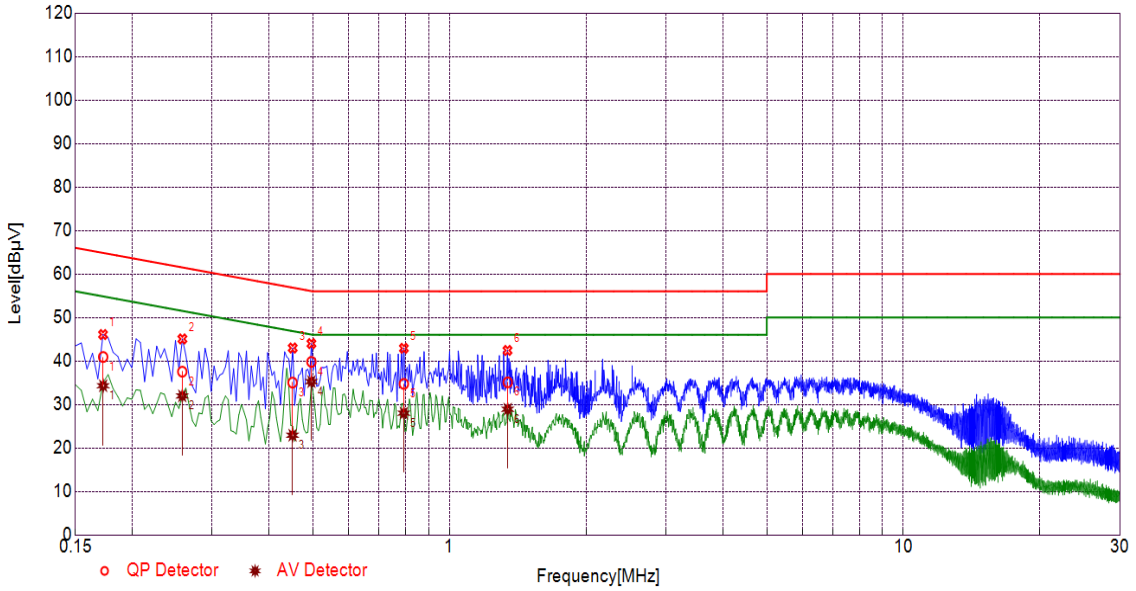
Set RBW=9 kHz, VBW=30 kHz. The maximum conducted interference is searched using Peak (PK), Quasi-peak (QP) and Average (AV) detectors; the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both 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:



(Plot A:L Phase)

NO.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.1545	42.41	31.32	65.75	55.75	Line	PASS
2	0.1861	43.87	33.35	64.21	54.21		PASS
3	0.2714	38.53	29.39	61.07	51.07		PASS
4	0.4649	34.36	23.00	56.61	46.61		PASS
5	0.9694	34.40	24.67	56.00	46.00		PASS
6	1.2254	34.23	27.31	56.00	46.00		PASS



(Plot B: N Phase)

NO.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.1726	40.91	34.29	64.83	54.83	Neutral	PASS
2	0.2578	37.53	31.95	61.50	51.50		PASS
3	0.4511	35.02	22.91	56.85	46.85		PASS
4	0.4964	39.78	35.24	56.06	46.06		PASS
5	0.7934	34.72	27.99	56.00	46.00		PASS
6	1.3437	35.07	28.89	56.00	46.00		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 Range (MHz)	Field Strength Limitation at 3m Measurement Dist	
	(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 indBμV/m is calculated by 20log Emission Level(μV/m).

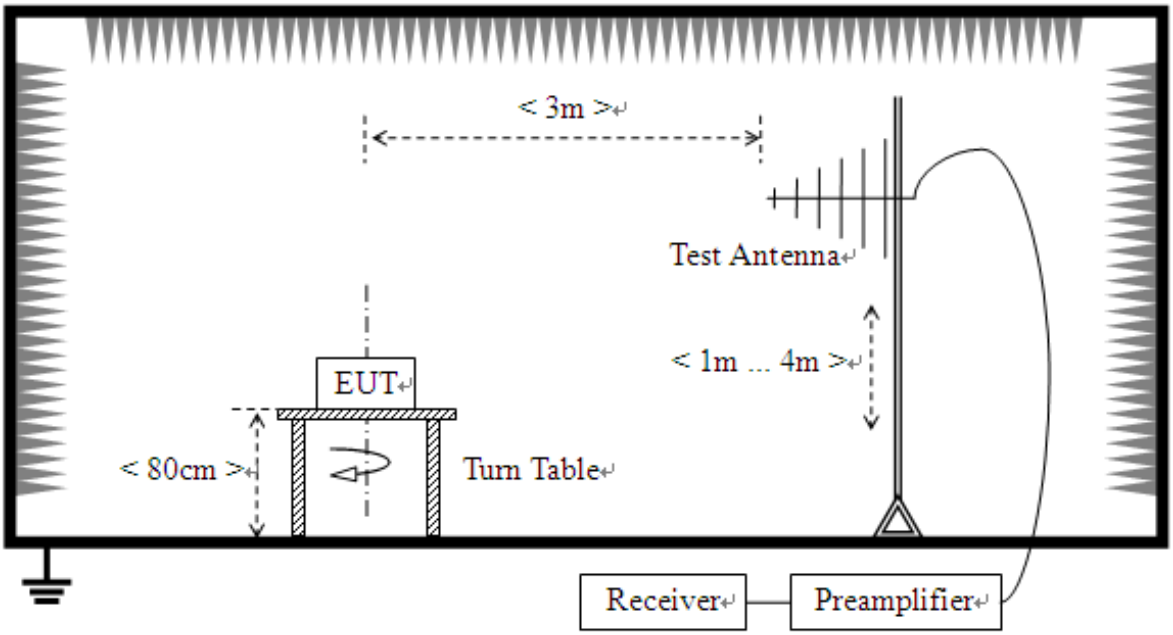
3.2.2. Frequency Range of Measurement

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

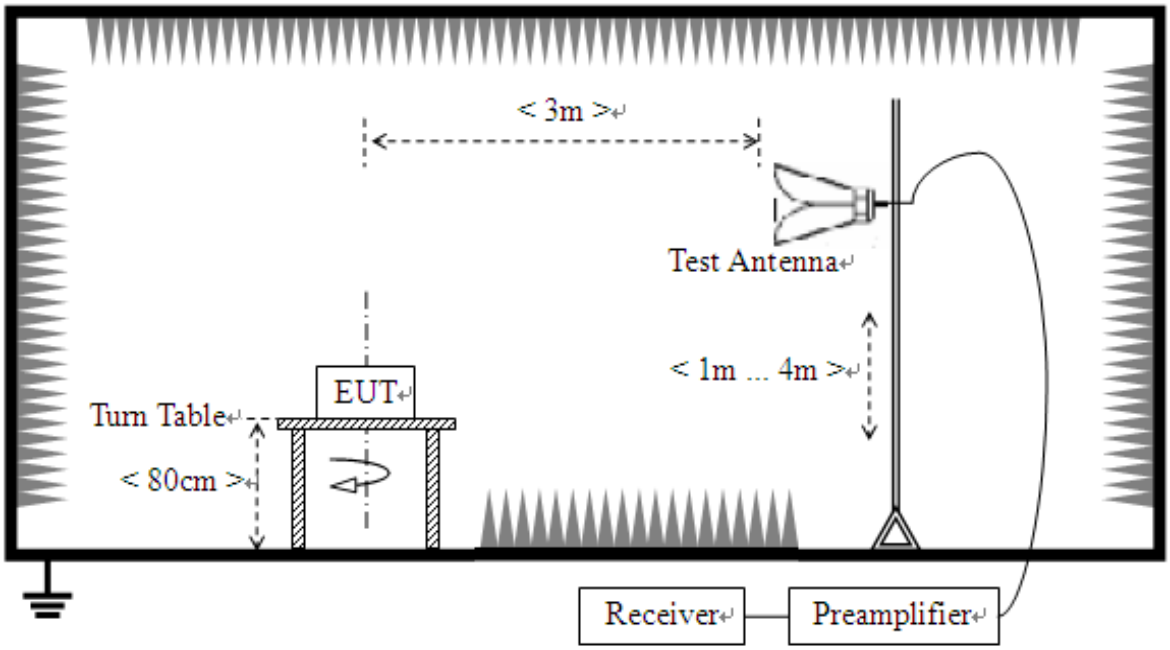
Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30.
1.705–108	1000.
108–500	2000.
500–1000	5000.
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower.

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 on variable-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.

For measurements below 1GHz the resolution bandwidth is set to 120 kHz for peak detection measurements or 120kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

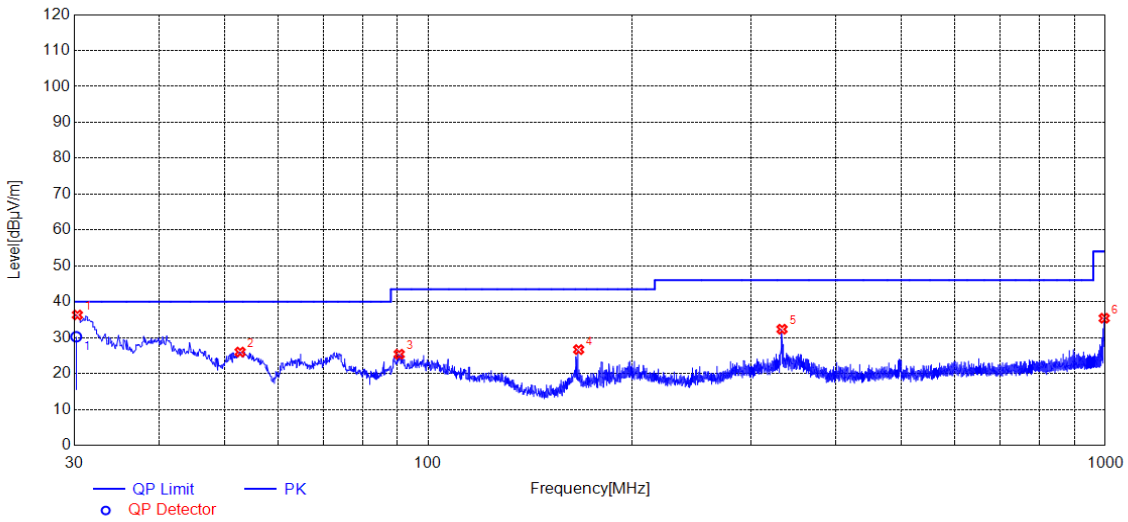
For measurements above 1GHz the resolution bandwidth is set to 1MHz, the video bandwidth is set to 3MHz for peak measurements and as applicable for average measurements.

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.

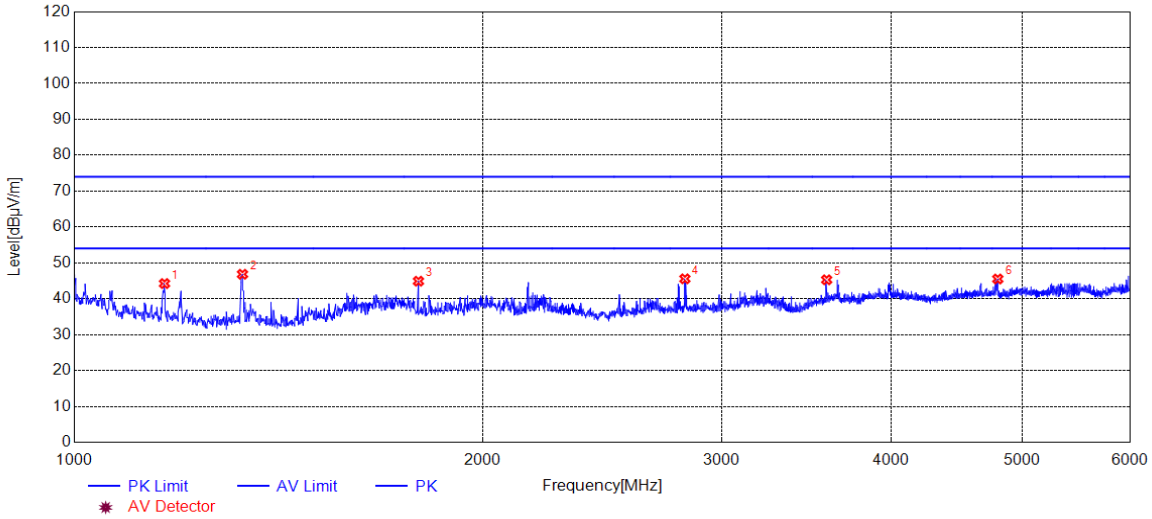
The amplitude of emissions which (6GHz-30GHz) are attenuated more than 20 dB below the permissible value need not be reported.

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.



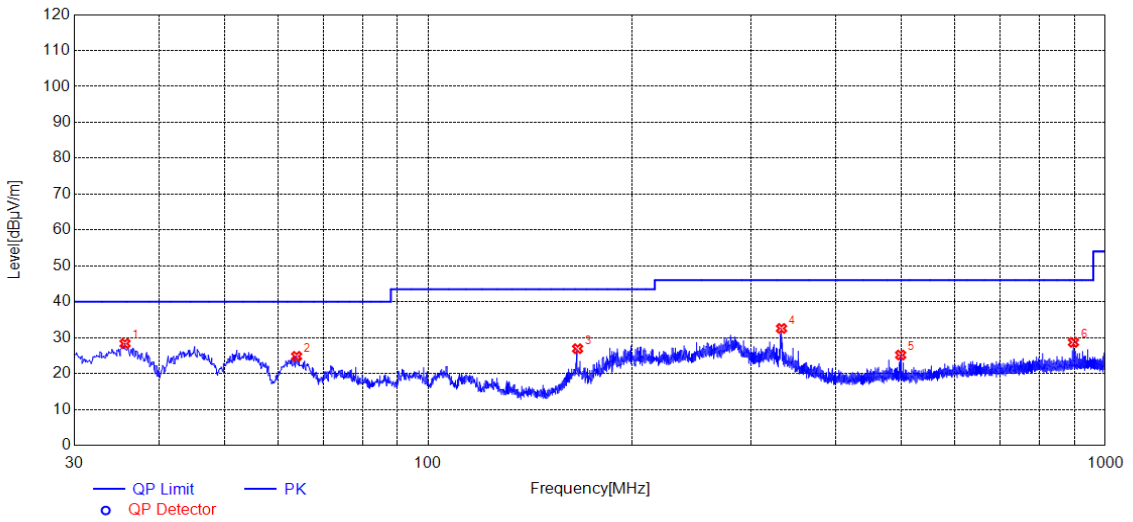
(Plot A: ANT-Vertical,30MHz - 1GHz)

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	30.2910	36.32	30.25	N.A	N.A	40.00	N.A	V	PASS
2	52.7003	25.99	N.A	N.A	N.A	40.00	N.A	V	PASS
3	90.5341	25.39	N.A	N.A	N.A	43.50	N.A	V	PASS
4	166.6867	26.67	N.A	N.A	N.A	43.50	N.A	V	PASS
5	332.9613	32.35	N.A	N.A	N.A	46.00	N.A	V	PASS
6	996.3136	35.41	N.A	N.A	N.A	54.00	N.A	V	PASS



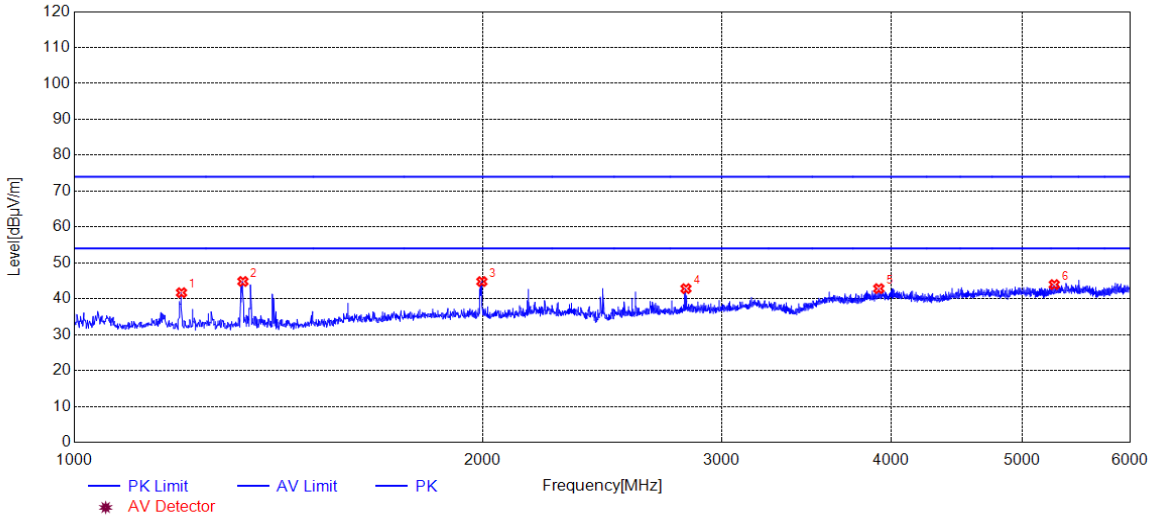
(Plot B: ANT-Vertical,1GHz - 6GHz)

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	1165.0330	44.24	N.A	N.A	74.00	N.A	54.00	V	PASS
2	1330.0660	46.83	N.A	N.A	74.00	N.A	54.00	V	PASS
3	1793.1586	44.90	N.A	N.A	74.00	N.A	54.00	V	PASS
4	2819.3639	45.56	N.A	N.A	74.00	N.A	54.00	V	PASS
5	3586.5173	45.29	N.A	N.A	74.00	N.A	54.00	V	PASS
6	4795.7592	45.51	N.A	N.A	74.00	N.A	54.00	V	PASS



(Plot C:ANT- Horizontal, 30MHz - 1GHz)

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	35.6266	28.35	N.A	N.A	N.A	40.00	N.A	H	PASS
2	63.8564	24.79	N.A	N.A	N.A	40.00	N.A	H	PASS
3	166.1046	26.92	N.A	N.A	N.A	43.50	N.A	H	PASS
4	332.3792	32.57	N.A	N.A	N.A	46.00	N.A	H	PASS
5	498.4598	25.16	N.A	N.A	N.A	46.00	N.A	H	PASS
6	897.3637	28.70	N.A	N.A	N.A	46.00	N.A	H	PASS



(Plot D:ANT- Horizontal, 1GHz - 6GHz)

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	1199.0398	41.69	N.A	N.A	74.00	N.A	54.00	H	PASS
2	1331.0662	44.82	N.A	N.A	74.00	N.A	54.00	H	PASS
3	1997.1994	44.79	N.A	N.A	74.00	N.A	54.00	H	PASS
4	2824.3649	42.82	N.A	N.A	74.00	N.A	54.00	H	PASS
5	3918.5837	42.83	N.A	N.A	74.00	N.A	54.00	H	PASS
6	5278.8558	43.95	N.A	N.A	74.00	N.A	54.00	H	PASS

Annex B 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 a Level of Confidence of 95%(U=2Uc(y))	9kHz-150kHz	±3.3dB
	150kHz-30MHz	±2.8dB

Uncertainty of Radiated Emission Measurement

Measuring Uncertainty for a Level of Confidence of 95%(U=2Uc(y))	30MHz-200MHz	±5.06dB
	200MHz-1000MHz	±5.04dB
	1GHz-6GHz	±5.18dB
	6GHz-18GHz	±5.48dB

Annex C Testing Laboratory Information

1. Identification of the Responsible Testing Laboratory

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

3. Accreditation Certificate

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

4. Test Software Utilized

Model	Version Number	Producer
TS+ -[JS32-RE]	Version 2.5.0.6	Tonscend
TS+ -[JS32-CE]	Version2.5.0.0	Tonscend

5. Test Equipments Utilized

Description	Model	Serial No.	Manufacturer	Cal. Date	Due. Date
Bi-Log Antenna	VULB 9163	9163-519	SCHWARZBECK	2019/5/24	2022/5/23
Horn Antenna	BBHA 9120D	01774	SCHWARZBECK	2019/7/26	2022/7/25
Receiver	N9038A	MY56400093	KEYSIGHT	2021/3/9	2022/3/8
Signal Analyzer	N9020A	MY56060145	Agilent	2021/7/26	2022/7/25
Horn Antenna	BBHA 9170	BBHA 9170#774	SCHWARZBECK	2019/7/26	2022/7/25
6db Attenuator	BW-N6W5+	E191001	Mini-circuits	2021/10/18	2022/10/17
Preamplifier	S020180L3203	61171/61172	LUCIX CORP.	2021/7/16	2022/7/15
Preamplifier	S10M100L3802	46732	LUCIX CORP.	2021/7/16	2022/7/15
Preamplifier	S150300L3202	71136	LUCIX CORP.	2021/7/16	2022/7/15
Receiver	ESPI	101052	R&S	2021/7/16	2022/7/15
LISN	NSLK 8127	8127449	Schwarzbeck	2021/3/9	2022/3/8
10dB Pulse Limiter	VTSD 9561-F	VTSD 9561 F-B #206	SCHWARZBECK	2021/7/21	2022/7/20

5. Ancillary Equipment Utilized

Description	Manufacturer	Model	Serial No.
PC	DELL	VOSTRO 5370	DF2DR A01 DPC
PC Adapter	DELL	LA45NM140	OKXTTW

END OF REPORT