REPORT No.: SZ18060250E01

TEST REPORT

APPLICANT	:	Entel PCS Telecomunicaciones S.A.
PRODUCT NAME	:	Smartphone
MODEL NAME	:	Smart 9
BRAND NAME	:	ÖWN
STANDARD(S)	:	47 CFR Part 15 Subpart B
TEST DATE	:	2018-06-28 to 2018-06-29
ISSUE DATE	:	2018-07-09

Tested by: Wu Zhongwen

Wu Zhongwen (Test Engineer)

Approved by: Andy Yeh

Andy Yeh(Technical Director)

MORLAB

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DIRECTORY

Change History		
Issue	**Date**	**Reason for change**
1.0	2018-07-09	First edition

1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	Entel PCS Telecomunicaciones S.A.
Applicant Address:	Costanera Sur 2760, Torre C, Piso 18, las condes,Santiago,Chile
Manufacturer:	Shenzhen Tinno Mobile Technology Corp.
Manufacturer Address:	4/F.,H-3 Building,OCT Eastern Industrial Park. NO.1 XiangShan East Road.,Nan Shan District,Shenzhen,P.R.China.

1.2. Equipment Under Test (EUT) Description

EUT Type:	Smartphone
Serial No:	(N/A, marked #1 by test site)
Hardware Version:	V1.0
Software Version:	OWN_SMART_9_8.0
Tx Frequency:	GSM850: 824 MHz ~ 849 MHz GSM1900: 1850 MHz ~ 1910 MHz WCDMA Band II: 1850MHz ~ 1910 MHz WCDMA Band IV: 1710MHz ~ 1755 MHz WCDMA Band V: 824MHz ~ 849 MHz LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 7: 2500 MHz ~ 2570 MHz Bluetooth: 2402 MHz ~ 2480 MHz 802.11b/g/n-20: 2412 MHz ~ 2462 MHz 802.11n-40: 2422 MHz ~ 2452 MHz
Rx Frequency:	GSM850: 869 MHz ~ 894 MHz GSM1900: 1930 MHz ~ 1990 MHz WCDMA Band II: 1930MHz ~ 1990 MHz WCDMA Band IV: 2110MHz ~ 2155 MHz WCDMA Band V: 869MHz ~ 894 MHz LTE Band 2: 1930MHz ~ 1990MHz LTE Band 4: 2110 MHz ~ 2115 MHz LTE Band 7: 2620 MHz ~ 2690 MHz Bluetooth: 2402 MHz ~ 2480 MHz 802.11b/g/n-20: 2412 MHz ~ 2462 MHz 802.11n-40: 2422 MHz ~ 2452 MHz

Ancillary Equipment:	**Battery**	
	Brand Name:	ÖWN
	Model No.:	N/A
	Serial No.:	(N/A, marked #1 by test site)
	Capacity:	3000mAh
	Rated Voltage:	3.85V
	Charge Limit:	4.4V
	AC Adapter 1	
	Brand Name:	ÖWN
	Model No.:	TN-050155U1
	Serial No.:	(N/A, marked #1 by test site)
	Rated Input:	～ 100-240V, 50/60Hz,0.25A
	Rated Output:	⎓5V,1.55A
	AC Adapter 2	
	Brand Name:	ÖWN
	Model No.:	TN-050155E1
	Serial No.:	(N/A, marked #1 by test site)
	Rated Input:	～ 100-240V, 50/60Hz,0.25A
	Rated Output:	⎓5V,1.55A

Note:

1. The Smartphone supports GSM850MHz, 1900MHz, GPRS, EDGE, WCDMA Band II , Band IV , Band V, LTE Band 2/4/7, Bluetooth band , WIFI (802.11b/g/n) band.

2. There are two types of adapters, they have the same internal circuit, only differ in the plug shape and model name. And the American adapter (TN-050155U1) is used in the United States, the European standard adapter (TN-050155E1) is used in Europe and Chile, only the case (TN-050155U1) is recorded in this report.

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
1	15.107	Conducted Emission	2018.06.28	Wu Zhongwen	PASS
2	15.109	Radiated Emission	2018.06.29	Wu Zhongwen	PASS

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

2.2. EUT Setup and Operating Conditions

Frequency range was investigated: Conducted emission test: from 150 KHz to 30 MHz; Radiated emission test: from 30 MHz to 6000 MHz.

Test Item	
Radiated Emission	
Mode 1	**:EUT + USB Line + PC + Battery + Earphones**
Mode 2	EUT + Adapter + Earphones
Conducted Emission	
Mode 1	**:EUT + USB Line + PC + Battery + Earphones**
Mode 2	EUT + Adapter + Earphones
Remark: The above test modes in boldface were the worst cases of conducted emission, radiated emission tests; 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 AC power 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:

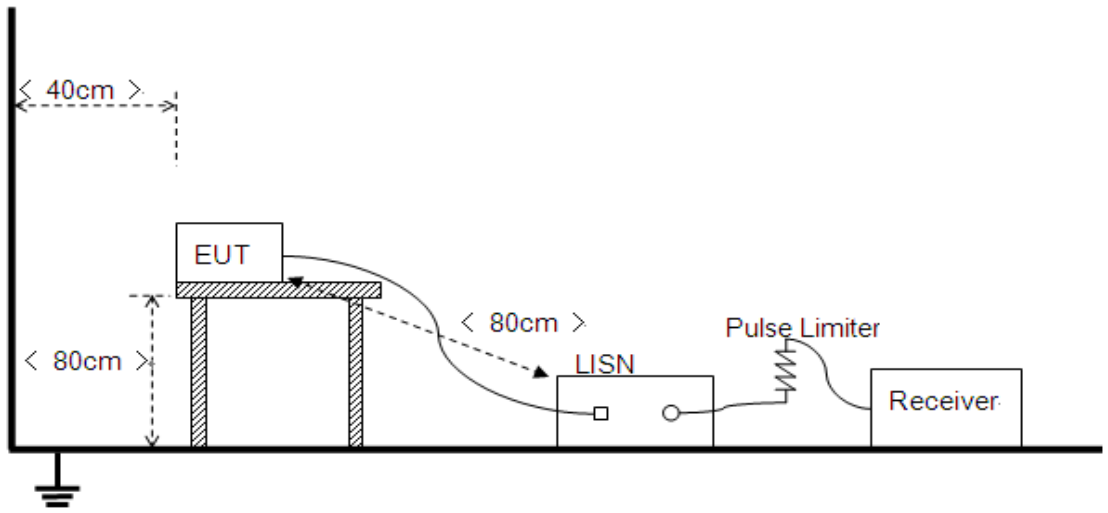
a) The limit subjects to the Class B digital device.

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.



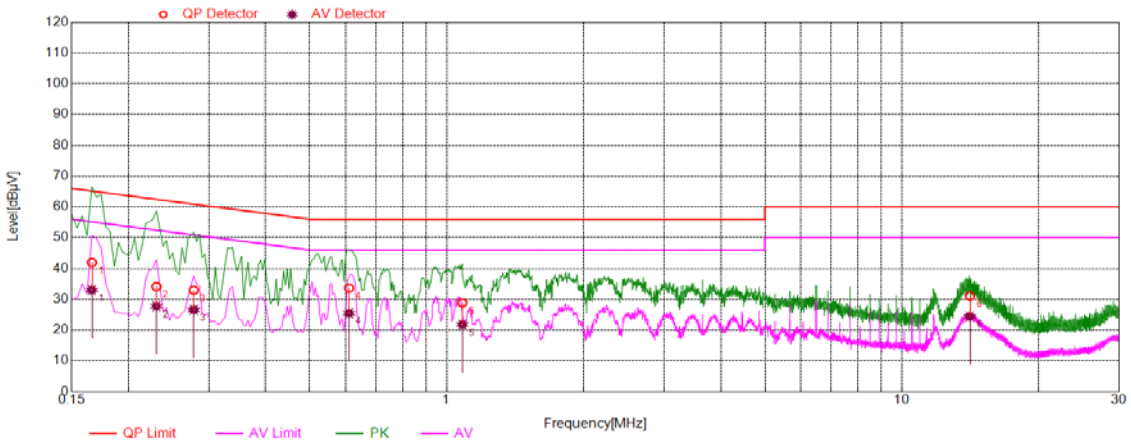
The EUT is placed on a 0.8m high insulating table, which stands on the grounded conducting floor, and keeps 0.4m away from the grounded conducting wall. The EUT is connected to the power mains through a LISN which provides 50Ω/50μH of coupling impedance for the measuring instrument. A Pulse Limiter is 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 in maintained with respect to the impedance characteristics as prescribed in ANSI C63.4-2014 at Clause 4.3.

3.1.3. Test Result

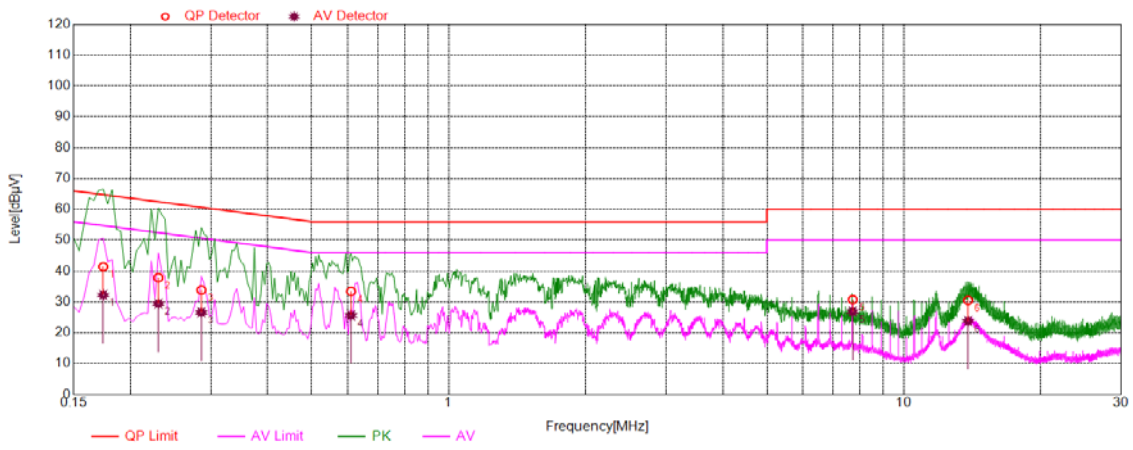
The maximum conducted interference is searched using Peak (PK), Quasi-peak (QP) and Average (AV) detectors; the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines 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:



(Plot A:L Phase)

NO.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.1659	41.91	33.01	65.16	55.16	Line	PASS
2	0.2299	34.13	27.74	62.45	52.45		PASS
3	0.2778	32.95	26.55	60.88	50.88		PASS
4	0.6097	33.63	25.47	56.00	46.00		PASS
5	1.0815	28.80	21.77	56.00	46.00		PASS
6	14.109	31.06	24.42	60.00	50.00		PASS



(Plot B: N Phase)

NO.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.1739	41.43	32.28	64.77	54.77	Neutral	PASS
2	0.2300	37.85	29.41	62.45	52.45		PASS
3	0.2858	33.86	26.59	60.64	50.64		PASS
4	0.6097	33.44	25.64	56.00	46.00		PASS
5	7.7198	30.71	26.90	60.00	50.00		PASS
6	13.840	30.50	23.79	60.00	50.00		PASS

3.2. Radiated Disturbance

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 in dBμV/m is calculated by 20log Emission Level(μV/m).

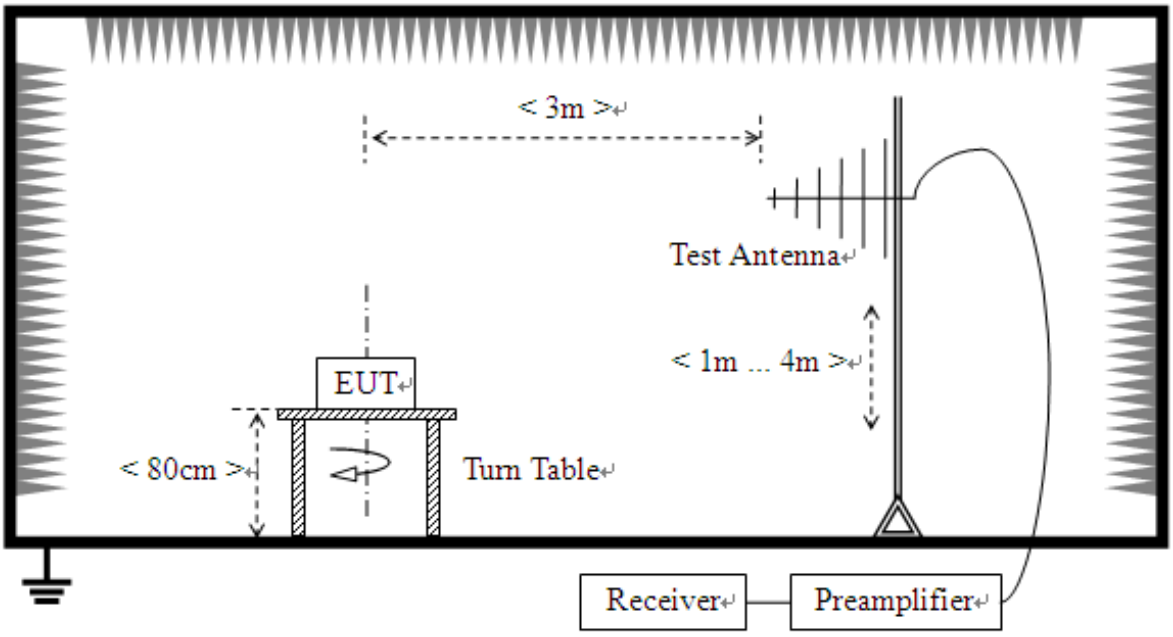
3.2.2. Frequency range of measurement

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

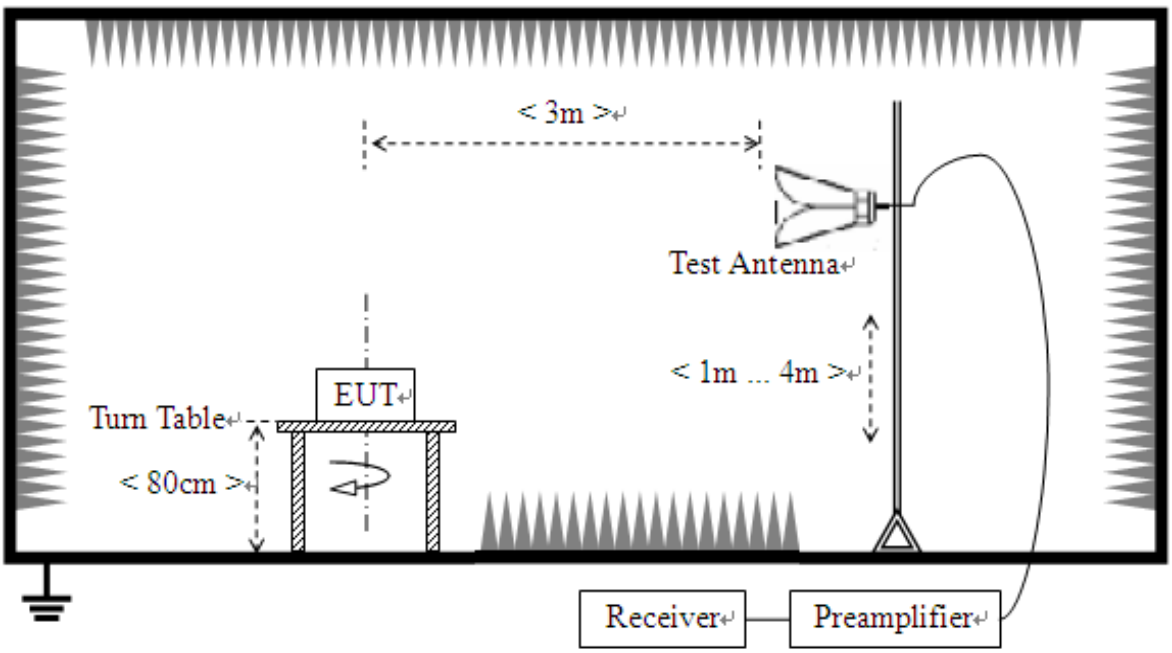
Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30.
1.705–108	1000.
108–500	2000.
500–1000	5000.
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower.

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 avariable-height antenna master tower.

For the test Antenna:

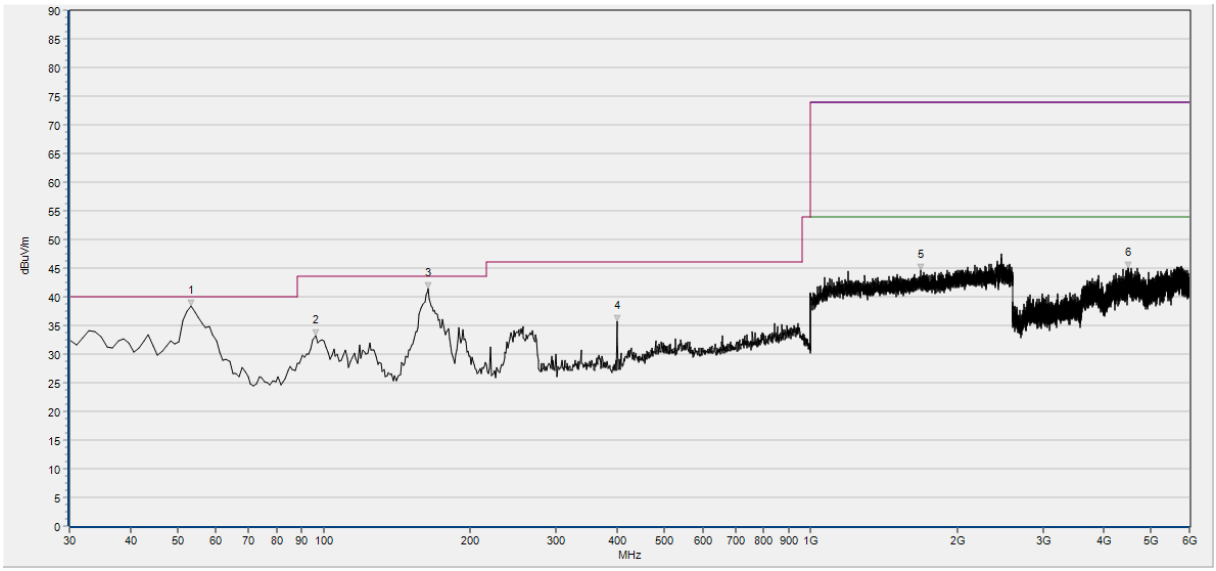
In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) and Horn Test Antenna (above 1GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength. The emission levels at both horizontal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

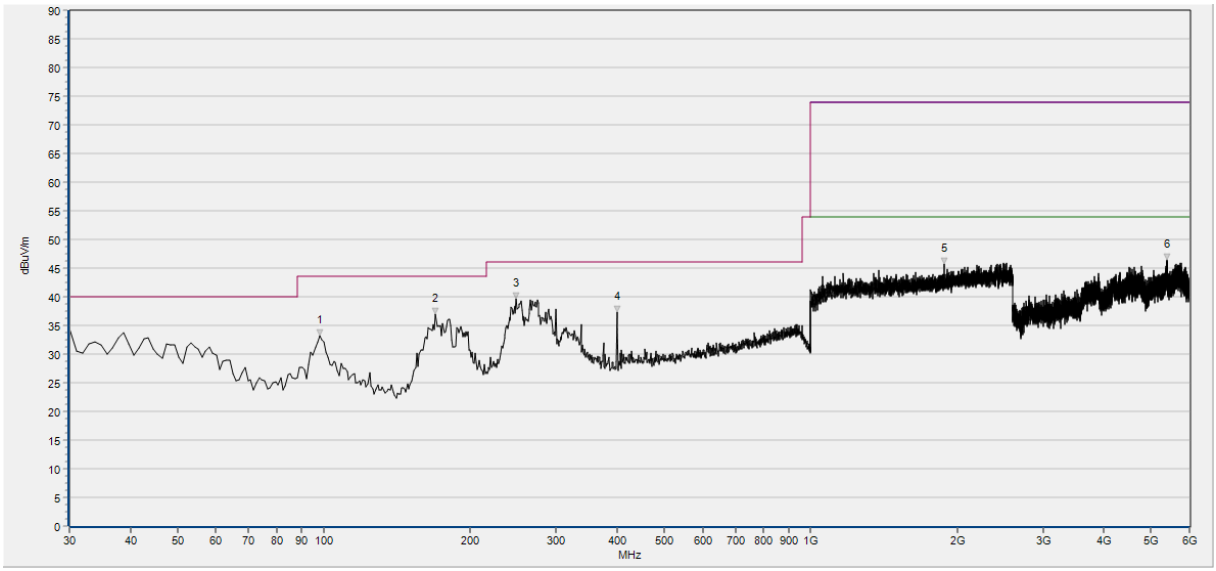
The amplitude of emissions (6GHz-12.5GHz) which are attenuated more than 20 dB below the permissible value need not be reported.

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 - 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	53.220	38.73	35.42	N.A.	N.A.	40.00	N.A.	V	PASS
2	95.960	33.21	N.A.	N.A.	N.A.	43.50	N.A.	V	PASS
3	163.860	41.47	N.A.	N.A.	N.A.	43.50	N.A.	V	PASS
4	399.570	35.73	N.A.	N.A.	N.A.	46.00	N.A.	V	PASS
5	1682.133	44.71	N.A.	N.A.	74.00	N.A.	54.00	V	PASS
6	4484.960	44.95	N.A.	N.A.	74.00	N.A.	54.00	V	PASS



(Plot B:ANT- Horizontal, 30MHz - 6GHz)

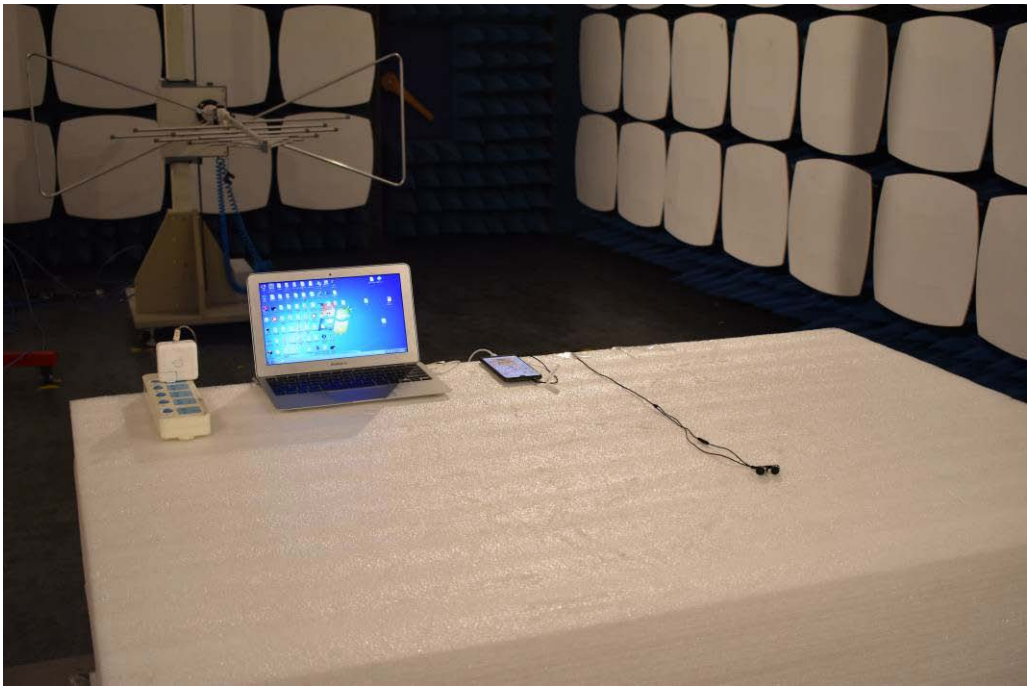
No.	Fre. MHz	Pk dBµV/m	QP dBµV/m	AV dBµV/m	Limit-PK dBµV/m	Limit-QP dBµV/m	Limit-AV dBµV/m	ANT	Verdict
1	97.900	33.25	N.A.	N.A.	N.A.	43.50	N.A.	H	PASS
2	169.680	36.92	N.A.	N.A.	N.A.	43.50	N.A.	H	PASS
3	248.250	39.62	N.A.	N.A.	N.A.	46.00	N.A.	H	PASS
4	399.570	37.29	N.A.	N.A.	N.A.	46.00	N.A.	H	PASS
5	1881.067	45.65	N.A.	N.A.	74.00	N.A.	54.00	H	PASS
6	5387.320	46.45	N.A.	N.A.	74.00	N.A.	54.00	H	PASS

Annex A Photographs of Test Setup

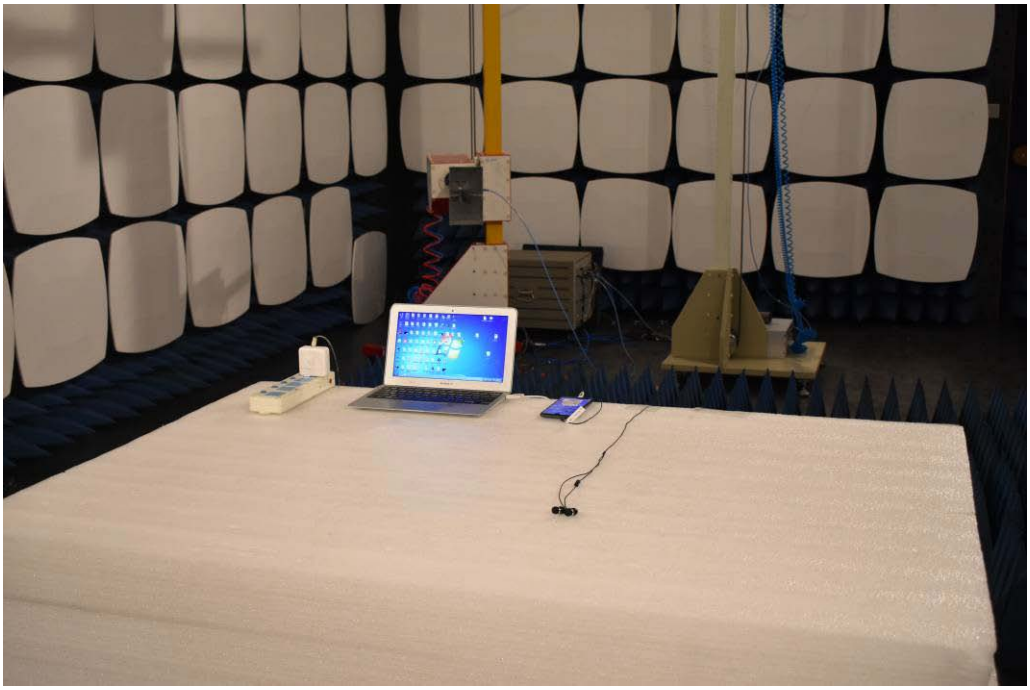
1. Mains Terminal Disturbance Voltage Measurement

2. Conducted emission main's port side view

3. Radiated Field Strength Measurement(30MHz-1GHz)



4. Radiated Field Strength Measurement(above 1GHz)



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	±4.1 dB
	150kHz-30MHz	±3.7dB

Uncertainty of Radiated Emission Measurement

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

Annex C Testing Laboratory Information

1. Identification of the Responsible Testing Laboratory

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

2. Identification of the Responsible Testing Location

Name:	Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory
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. (Shenzhen Morlab Communications Technology Co., Ltd.)

4. Test Software Utilized

Model	Version Number	Producer
MORLAB EMCR V1.2	Version 1.0	MORLAB
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	2018.05.08	2019.05.07
Receiver	KEYSIGHT	N9038A	MY56400093	2017.07.13	2018.07.12
LISN	Schwarzbeck	NSLK 8127	812744	2018.05.08	2019.05.07
Pulse Limiter (20dB)	VTSD	9561D	9537	2018.05.08	2019.05.07
Test Antenna - Bi-Log	Schwarzbeck	VULB 9163	9163-519	2018.05.08	2019.05.07
Test Antenna - Horn	Schwarzbeck	BBHA 9120D	1774	2017.09.13	2018.09.12
Semi-Anechoic Chamber	CRT	9m*6m*6m 2#	N/A	2017.01.12	2020.01.11

END OF REPORT