TEST REPORT

APPLICANT	:	Shenzhen Mindray Bio-Medical Electronics Co., Ltd.
PRODUCT NAME	:	AirSight
MODEL NAME	:	MP626WAC
BRAND NAME	:	mindray
FCC ID	:	ZLZ-TEARS
STANDARD(S)	:	47 CFR Part 15 Subpart B
RECEIPT DATE	:	2024-06-20
TEST DATE	:	2024-06-28 to 2024-07-08
ISSUE DATE	:	2024-08-28

Edited by: Chen Bilian

Chen Bilian(Rapporteur)

Approved by: Xiao Xiong

Xiao Xiong(Supervisor)

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MORLAB

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Change History		
Version	**Date**	**Reason for Change**
1.0	2024-08-28	First edition

1. Technical Information

Note: Provide by applicant

1.1. Applicant and Manufacturer Information

Applicant:	Shenzhen Mindray Bio-Medical Electronics Co., Ltd.
Applicant Address:	Mindray Building, Keji 12th Road South, High-Tech Industrial Park, Nanshan, Shenzhen, 518057, P.R. China
Manufacturer:	Shenzhen Mindray Bio-Medical Electronics Co., Ltd.
Manufacturer Address:	Mindray Building, Keji 12th Road South, High-Tech Industrial Park, Nanshan, Shenzhen, 518057, P.R. China

1.2. Equipment Under Test (EUT) Description

Product Name:	AirSight	
EUT No.:	1#, 8#	
Hardware Version:	V1.06	
Software Version:	MP626WAC_1.0.3_EQ01_SMT	
Frequency Range:	Bluetooth: 2402 MHz ~ 2480 MHz 802.11b/g/n/ax: 2412 MHz ~ 2472 MHz 802.11a/ac/n/ax: 5180 MHz ~ 5240 MHz; 5260 MHz ~ 5320 MHz; 5500 MHz ~ 5720 MHz; 5745 MHz ~ 5825 MHz 802.11ax: 5925 MHz ~ 6425 MHz; 6425 MHz ~ 6525 MHz; 6525 MHz ~ 6875 MHz; 6875 MHz ~ 7125 MHz NFC: 13.56 MHz	
Accessory:	**AC Adapter**	
	Brand Name:	N/A
	Model No.:	UES33LCPU-SPC
	Serial No.:	(N/A, marked #1 by test site)
	Rated Input:	100-240V~50/60Hz, 0.5A
	Rated Output:	5.0V⎓3.0A, 9.0V⎓3.0A, 12.0V⎓2.5A, 15.0V⎓2.2A, 20.0V⎓1.65A
	Manufacturer:	Dongguan Shilong Fuhua Electronic Co., Ltd.
	Battery	
	Brand Name:	mindray
	Model No.:	MP626
	Serial No.:	(N/A, marked #1 by test site)

	Capacity:	4500mAh
	Rated Voltage:	3.85V
	Charge Limit:	4.4V
	Manufacturer:	JIADE ENERGY TECHNOLOGY (ZHUHAI) CO LTD
	USB Cable	
	Model:	D0018180R4QMF
	Manufacturer:	HOTRON PRECISION ELECTRONIC INDUSTRIAL CO., LTD

Note:

1. 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	2024.06.28	Wang Deyong	PASS	No deviation
2	15.109	Radiated Emission	2024.07.08	Yuan Zihong	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.

Note 3: When the test result is a critical value, we will use the measurement uncertainty give the judgment result based on the 95% confidence intervals.

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 :	**EUT + Bluetooth Idle + 2.4G WLAN Idle + Battery + USB Cable + PC + Data Transmission Mode**
Mode 2 :	EUT + NFC + Battery + USB Cable + AC Adapter + NFC Card + NFC Mode
Mode 3 :	EUT + Bluetooth Idle + 5G WLAN Idle + Battery + USB Cable + AC Adapter + Play 1kHz Color Bar Video Mode
Mode 4 :	EUT + Bluetooth Idle + 6G WLAN Idle + Battery + USB Cable + AC Adapter + Rear Camera Mode
Mode 5 :	EUT + Bluetooth Idle + 2.4G WLAN Idle + Battery + USB Cable + AC Adapter + Front Camera Mode
Conducted Emission	
Mode 4 :	EUT + Bluetooth Idle + 6G WLAN Idle + Battery + USB Cable + AC Adapter + Rear Camera Mode
Mode 6 :	**EUT + Bluetooth Idle + 5G WLAN Idle + Battery + PC + PC Adapter + USB Cable + Rear Camera Mode**
Remark: The above test mode in boldface (Mode 6) was the worst case of conducted emission test, only the test data of this mode was reported. The above test mode in boldface (Mode 1) was the worst case of radiated emission test, only the test data of this mode 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:

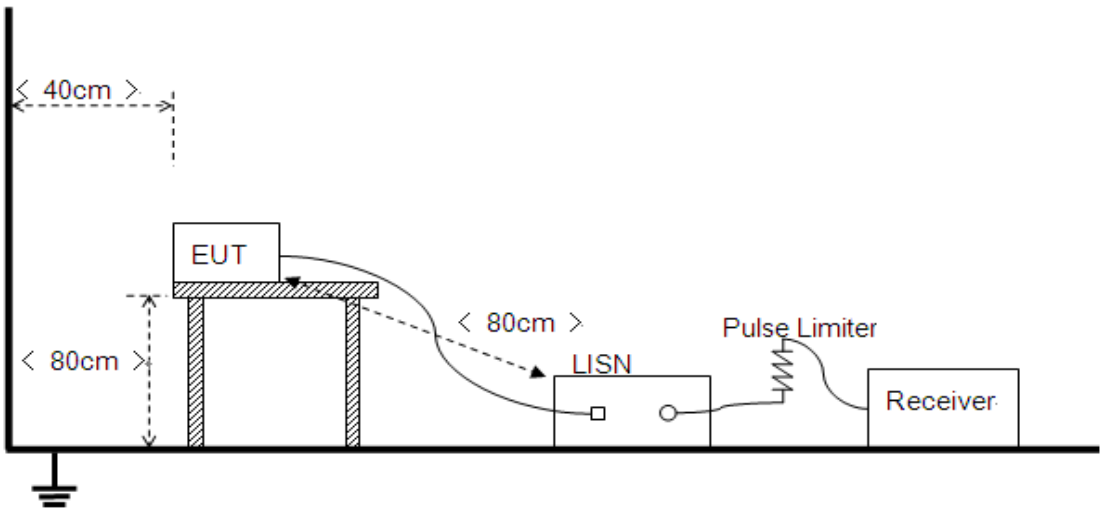
a) The limit subjects to the Class B digital device.

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 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.

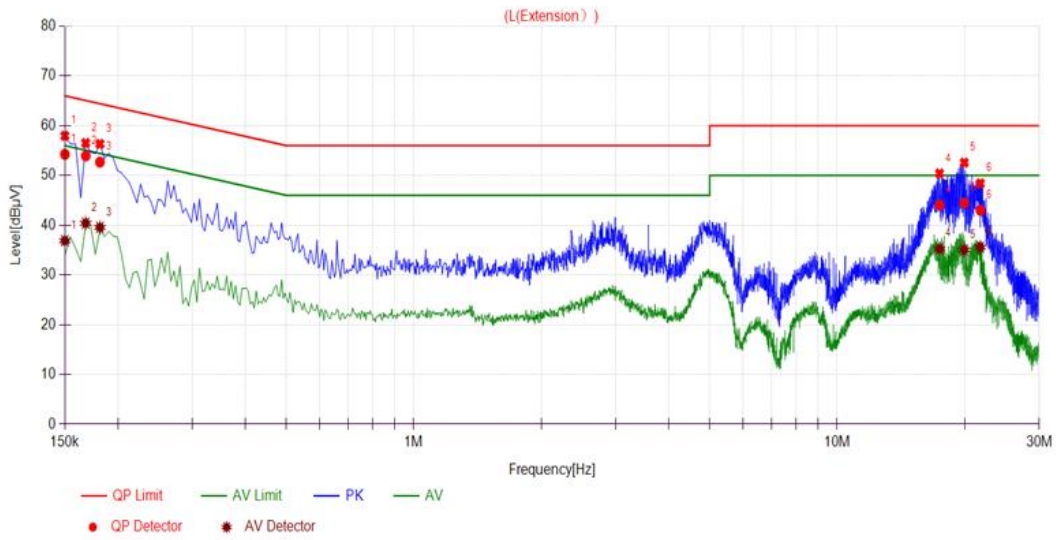
The measurement results are obtained as below:
E [dBμV] =U_R[dBμV] + $L_{Cable\ loss}$ [dB] + A_{Factor} [dB]
U_R: Receiver Reading
A_{Factor}: Voltage Division Factor of LISN
$L_{Cable\ loss}$: Correction Factor Contains Pulse Limiter and Cable

During the test, the total correction Factor $L_{Cable\ loss}$ and A_{Factor} were built in test software.

A. Test Plot and Suspicious Points:

Start of Test: 2024-06-28 15:42:37

Test Graph

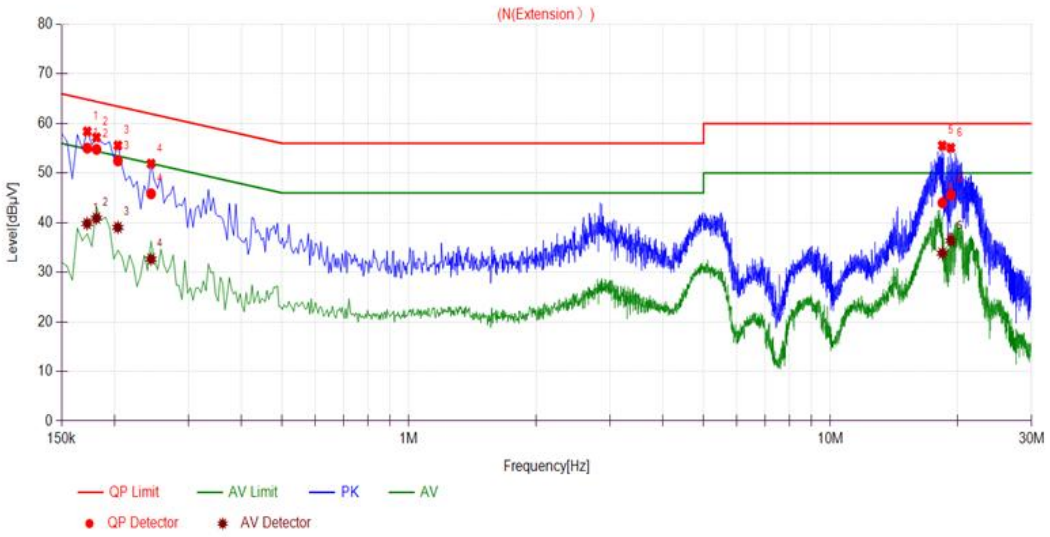


(Plot A:L Phase)

No.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quasi-peak	Average	Quasi-peak	Average		
1	0.1500	54.24	36.88	66.00	56.00	Line	PASS
2	0.1680	53.94	40.40	65.06	55.06		PASS
3	0.1815	52.68	39.55	64.42	54.42		PASS
4	17.4434	44.06	35.27	60.00	50.00		PASS
5	19.9587	44.47	35.03	60.00	50.00		PASS
6	21.7778	43.00	35.58	60.00	50.00		PASS

Start of Test: 2024-06-28 15:38:18

Test Graph



(Plot B: N Phase)

No.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quasi-peak	Average	Quasi-peak	Average		
1	0.1725	55.04	39.82	64.84	54.84	Neutral	PASS
2	0.1815	54.78	40.92	64.42	54.42		PASS
3	0.2040	52.47	39.05	63.45	53.45		PASS
4	0.2445	45.82	32.65	61.94	51.94		PASS
5	18.4250	44.01	33.86	60.00	50.00		PASS
6	19.2966	45.58	36.34	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 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).

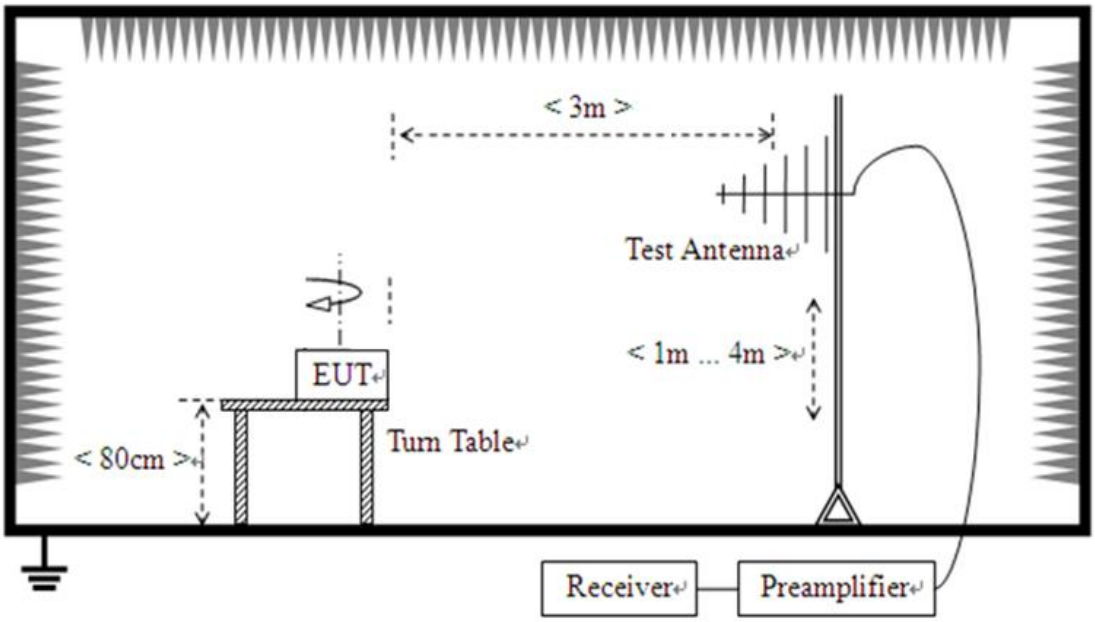
3.2.2. Frequency Range of Measurement

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

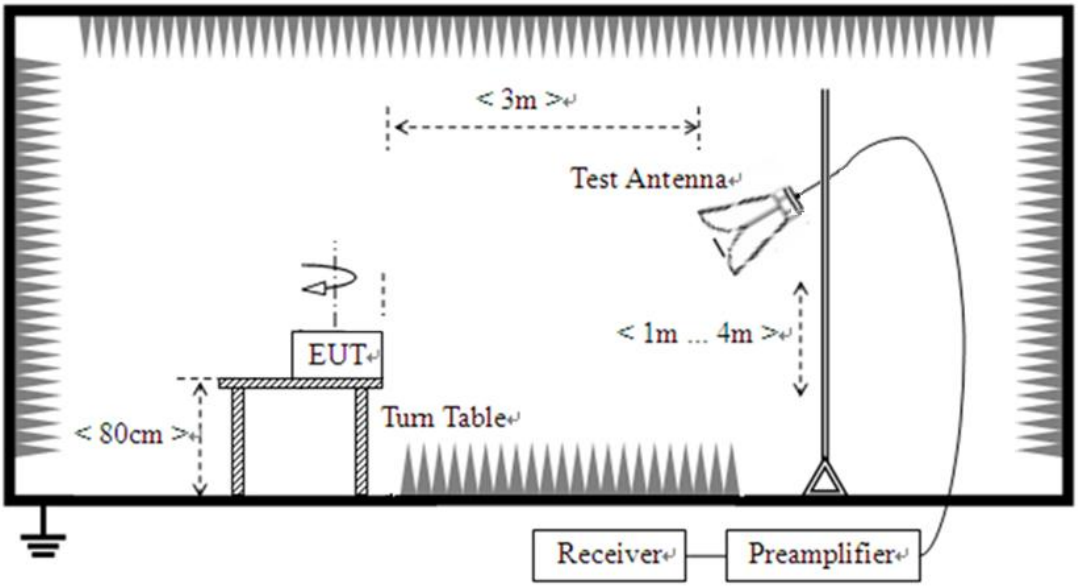
Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30.
1.705–108	1000.
108–500	2000.
500–1000	5000.
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower.

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 above 1 GHz, keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response.

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-40GHz) are attenuated more than 20 dB below the permissible value need not be reported.

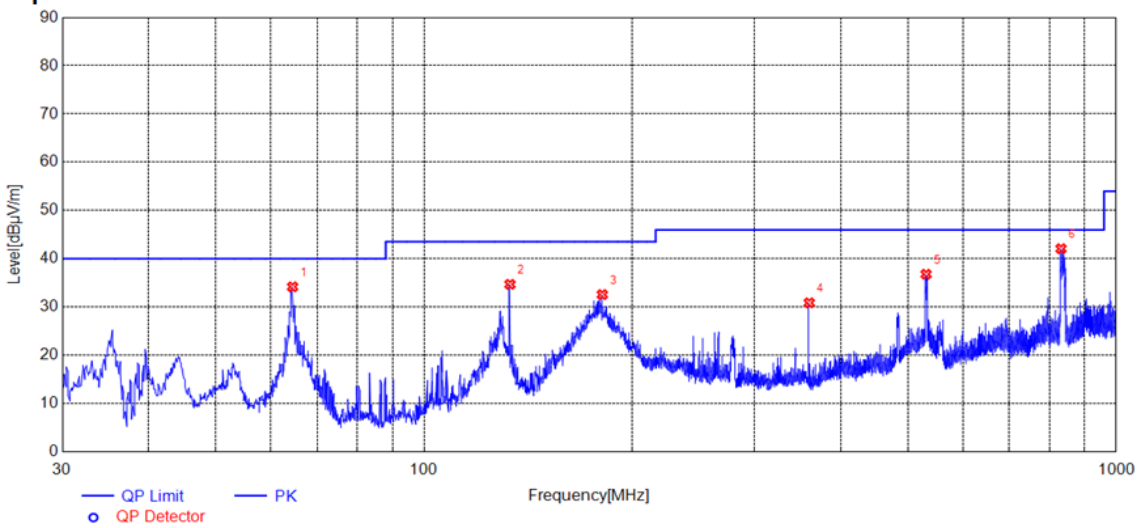
The measurement results are obtained as below:
E [dBμV/m] $=U_R$ [dBμV] + A_T[dB] + A_{Factor} [dB]; $A_T = L_{Cable\ loss}$ [dB] - G_{preamp} [dB]
A_T: Total correction Factor except Antenna
U_R: Receiver Reading
G_{preamp}: Preamplifier Gain
A_{Factor}: Antenna Factor at 3m

During the test, the total correction Factor A_T and A_{Factor} were built in test software.

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.

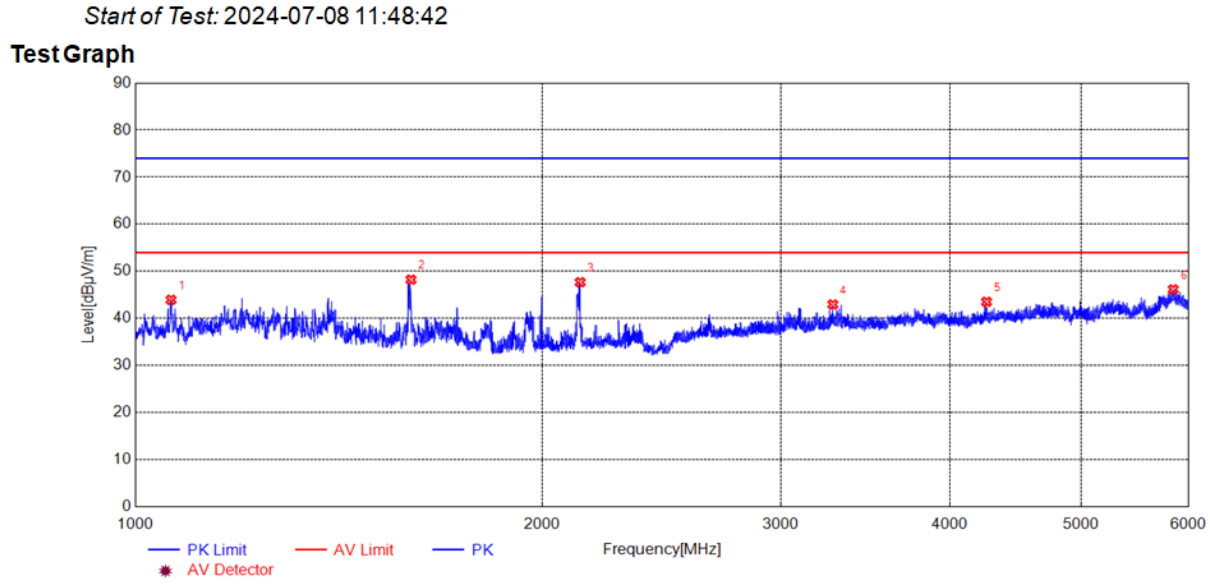
Start of Test: 2024-07-08 11:24:57

Test Graph



(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	64.5355	34.19	N.A	N.A	N.A	40.00	N.A	V	PASS
2	133.0243	34.70	N.A	N.A	N.A	43.50	N.A	V	PASS
3	180.8501	32.58	N.A	N.A	N.A	43.50	N.A	V	PASS
4	360.0270	30.87	N.A	N.A	N.A	46.00	N.A	V	PASS
5	531.0551	36.80	N.A	N.A	N.A	46.00	N.A	V	PASS
6	832.0762	42.09	N.A	N.A	N.A	46.00	N.A	V	PASS

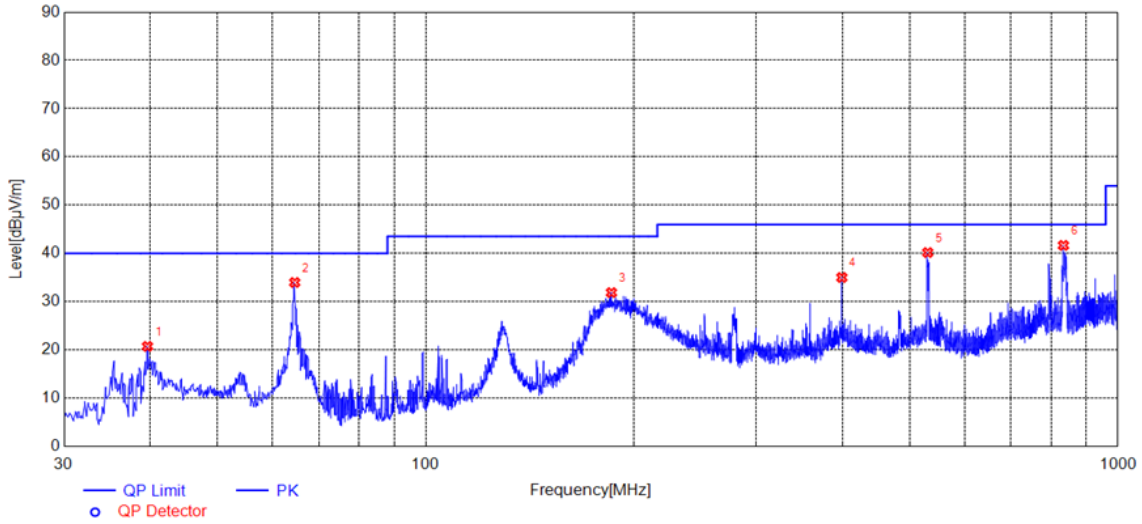


(Plot B: ANT-Vertical, 1GHz - 6GHz)

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	1063.0000	43.95	N.A	N.A	74.00	N.A	54.00	V	PASS
2	1599.0000	48.22	N.A	N.A	74.00	N.A	54.00	V	PASS
3	2132.5000	47.69	N.A	N.A	74.00	N.A	54.00	V	PASS
4	3278.0000	42.97	N.A	N.A	74.00	N.A	54.00	V	PASS
5	4258.0000	43.53	N.A	N.A	74.00	N.A	54.00	V	PASS
6	5850.5000	46.16	N.A	N.A	74.00	N.A	54.00	V	PASS

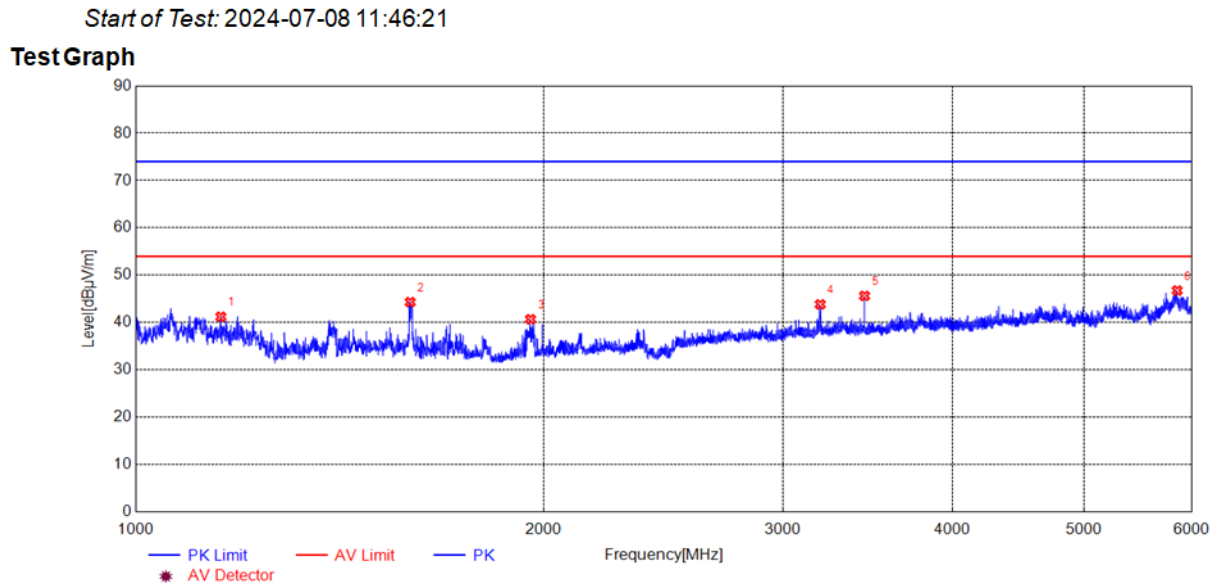
Start of Test: 2024-07-08 11:21:11

Test Graph



(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	39.6040	20.73	N.A	N.A	N.A	40.00	N.A	H	PASS
2	64.6325	33.98	N.A	N.A	N.A	40.00	N.A	H	PASS
3	185.4095	31.88	N.A	N.A	N.A	43.50	N.A	H	PASS
4	399.0249	35.01	N.A	N.A	N.A	46.00	N.A	H	PASS
5	531.0551	40.18	N.A	N.A	N.A	46.00	N.A	H	PASS
6	834.0164	41.66	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	1156.0000	41.23	N.A	N.A	74.00	N.A	54.00	H	PASS
2	1594.0000	44.32	N.A	N.A	74.00	N.A	54.00	H	PASS
3	1955.0000	40.70	N.A	N.A	74.00	N.A	54.00	H	PASS
4	3196.5000	43.85	N.A	N.A	74.00	N.A	54.00	H	PASS
5	3446.0000	45.64	N.A	N.A	74.00	N.A	54.00	H	PASS
6	5857.5000	46.77	N.A	N.A	74.00	N.A	54.00	H	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 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 B 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]	Version 2.5.0.0	Tonscend

5. Test Equipments Utilized

Description	Model	Serial No.	Manufacturer	Cal. Date	Due. Date
Bi-Log Antenna	VULB 9163	9163-519	SCHWARZBECK	2024/6/22	2025/6/21
Horn Antenna	BBHA 9120D	01774	SCHWARZBECK	2024/6/22	2025/6/21
Horn Antenna	BBHA9170	BBHA9170 #773	SCHWARZBECK	2024/6/22	2025/6/21
Receiver	N9038A	MY56400093	KEYSIGHT	2024/1/25	2025/1/24
6db Attenuator	BW-N6W5+	E191001	Mini-circuits	2023/9/19	2024/9/18
Preamplifier	S020180L3203	61171/61172	LUCIX CORP.	2024/5/30	2025/5/29

Preamplifier	S10M100L3802	46732	LUCIX CORP.	2024/5/30	2025/5/29
Preamplifier	DCLNA0118-40 C-S	DS77209	Decentest	2024/5/30	2025/5/29
RF Coaxial Cable	PE330	MRE001	Pasternack	N/A	N/A
RF Coaxial Cable	CLU18	MRE002	Pasternack	N/A	N/A
RF Coaxial Cable	CLU18	MRE003	Pasternack	N/A	N/A
RF Coaxial Cable	QA360-40-KK-0.5	22290045	Qualwave	N/A	N/A
RF Coaxial Cable	QA360-40-KKF -2	22290046	Qualwave	N/A	N/A
RF Coaxial Cable	QA500-18-NN-5	22120181	Qualwave	N/A	N/A
RF Coaxial Cable	BNC	MRE04	Qualwave	N/A	N/A
Receiver	ESPI	101052	R&S	2024/6/3	2025/6/2
LISN	NSLK 8127	8127449	Schwarzbeck	2024/2/2	2025/2/1
10dB Pulse Limiter	VTSD 9561-F	VTSD 9561 F-B #206	SCHWARZBECK	2024/5/30	2025/5/29
System Simulator	CMW500	152038	R&S	2023/9/19	2024/9/18

6. Ancillary Equipment Utilized

Description	Model	Serial No.	Manufacturer
PC	VOSTRO 5370	DF2DR A01 DPC	DELL
PC	P144G	20210357	DELL
PC Adapter	HA65NM190	N/A	DELL
NFC card	N/A	N/A	N/A

END OF REPORT