

# FCC RADIO TEST REPORT

**FCC ID: VIZUSB001**

**Product :** 2.4G Wireless receiver

**Trade Name :** N/A

**Model Name :** USB Nano-receiver

**Serial Model :** N/A

**Report No. :** UNIA2018071406FR-01

## Prepared for

Palm Max Technology Co., Ltd.

5F-5, No. 736, Zhongzheng Rd., Zhonghe Dist., New Taipei City 23511,  
New Taipei City, Taiwan

## Prepared by

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## TEST RESULT CERTIFICATION

**Applicant's name** ..... : Palm Max Technology Co., Ltd.

**Address** ..... : 5F-5, No. 736, Zhongzheng Rd., Zhonghe Dist., New Taipei City 23511, New Taipei City, Taiwan

**Manufacture's Name** ..... : Palm Max Technology Co., Ltd.

**Address** ..... : 5F-5, No. 736, Zhongzheng Rd., Zhonghe Dist., New Taipei City 23511, New Taipei City, Taiwan

**Product description**

**Product name** ..... : 2.4G Wireless receiver

**Trade Mark** ..... : N/A

**Model and/or type reference** : USB Nano-receiver

**Standards** ..... : FCC Part 15 Subpart B  
ANSI C63.4:2014

This device described above has been tested by Shenzhen United Testing Technology Co., Ltd., and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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**Date of Test** ..... :

**Date (s) of performance of tests** ..... : Jul. 12, 2018 ~ Jul. 30, 2018

**Date of Issue** ..... : Jul. 30, 2018

**Test Result** ..... : Pass

Prepared by:

*Kahn Yang*

Kahn yang/Editor

Reviewer:

*Sherwin Qian*

Sherwin Qian/Supervisor

Approved & Authorized Signer:

*Liuze*

Liuze/Manager

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## 1. TEST SUMMARY

### 1.1 TEST PROCEDURES AND RESULTS

EMC Emission			
Standard	Test Item	Limit	Result
FCC Part 15 Subpart B ANSI C63.4: 2014	Conducted Emission	Class B	PASS
	Radiated Emission	Class B	PASS

Note: 1. "N/A" denotes test is not applicable in this test report.  
2. For client's request and manual description, the test will not be executed.

### 1.2 TEST FACILITY

Test Firm : Shenzhen United Testing Technology Co., Ltd.  
Address : 2F, Annex Bldg, Jiahuangyuan Tech Park, #365 Baotian 1 Rd, Tiegang Community, Xixiang Str, Bao'an District, Shenzhen, China

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19. The testing quality system of our laboratory meets with ISO/IEC-17025 requirements, which is approved by CNAS. This approval result is accepted by MRA of APLAC.

Our test facility is recognized, certified, or accredited by the following organizations:

CNAS-LAB Code: L6494

The EMC Laboratory has been assessed and in compliance with CNAS-CL01 accreditation criteria for testing Laboratories (identical to ISO/IEC 17025:2017 General Requirements) for the Competence of testing Laboratories.

Designation Number: CN1227

Test Firm Registration Number: 674885

The EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications commission. The acceptance letter from the FCC is maintained in our files.

### 1.3 MEASUREMENT UNCERTAINTY

#### Measurement Uncertainty

Conducted Emission Expanded Uncertainty	= 2.23dB, k=2
Radiated emission expanded uncertainty(9kHz-30MHz)	= 3.08dB, k=2
Radiated emission expanded uncertainty(30MHz-1000MHz)	= 4.42dB, k=2
Radiated emission expanded uncertainty(Above 1GHz)	= 4.06dB, k=2

## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

Equipment	2.4G Wireless receiver	
Trade Mark	N/A	
Model Name	USB Nano-receiver	
Serial No.	N/A	
Model Difference	N/A	
FCC ID	VIZUSB001	
Product Description	The EUT is a 2.4G Wireless receiver.	
	Operating frequency:	N/A
	Connecting I/O port:	N/A
	Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.	
Battery	N/A	
Power Source	DC 5V from Laptop USB Port	
Adapter Model	N/A	



## 2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

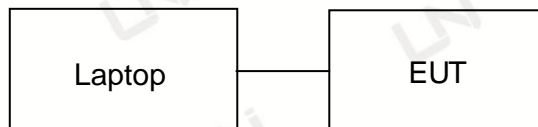
Pretest Mode	Description
Mode 1	Running

For Conducted Test	
Final Test Mode	Description
Mode 1	Running

For Radiated Test	
Final Test Mode	Description
Mode 1	Running

## 2.3 DESCRIPTION OF TEST SETUP

Operation of EUT during testing:



## 2.4 DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Note
E-1	2.4G Wireless receiver	N/A	USB Nano-receiver	EUT
E-2	Laptop	LENOVO	XiaoXin Air 12	AE

Item	Shielded Type	Ferrite Core	Length	Note

Note:

1. The support equipment was authorized by Declaration of Confirmation.
2. For detachable type I/O cable should be specified the length in cm in 『Length』 column.
3. “YES” means “shielded” “with core”, “NO” means “unshielded” “without core”.

## 2.5 MEASUREMENT INSTRUMENTS LIST

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
CONDUCTED EMISSIONS TEST					
1	AMN	Schwarzbeck	NNLK8121	8121370	2018.9.9
2	AMN	ETS	3810/2	00020199	2018.9.9
3	EMI TEST RECEIVER	Rohde&Schwarz	ESCI	101210	2018.9.9
4	AAN	TESEQ	T8-Cat6	38888	2018.9.9
RADIATED EMISSION TEST					
1	Horn Antenna	Sunol	DRH-118	A101415	2018.9.29
2	BicoNLog Antenna	Sunol	JB1 Antenna	A090215	2018.9.29
3	PREAMP	HP	8449B	3008A00160	2018.9.9
4	PREAMP	HP	8447D	2944A07999	2018.9.9
5	EMI TEST RECEIVER	Rohde&Schwarz	ESR3	101891	2018.9.9
6	VECTOR Signal Generator	Rohde&Schwarz	SMU200A	101521	2018.9.28
7	Signal Generator	Agilent	E4421B	MY4335105	2018.9.28
8	MXA Signal Analyzer	Agilent	N9020A	MY50510140	2018.9.28
9	MXA Signal Analyzer	Agilent	N9020A	MY51110104	2018.9.9
10	ANT Tower&Turn table Controller	Champro	EM 1000	60764	2018.9.28
11	Anechoic Chamber	Taihe Maorui	9m*6m*6m	966A0001	2018.9.9
12	Shielding Room	Taihe Maorui	6.4m*4m*3m	643A0001	2018.9.9
13	RF Power sensor	DARE	RPR3006W	15I00041SNO88	2019.3.14
14	RF Power sensor	DARE	RPR3006W	15I00041SNO89	2019.3.14
15	RF power divider	Anritsu	K241B	992289	2018.9.28
16	Wideband radio communication tester	Rohde&Schwarz	CMW500	154987	2018.9.28
17	Biconical antenna	Schwarzbeck	VHA 9103	91032360	2018.9.8
18	Biconical antenna	Schwarzbeck	VHA 9103	91032361	2018.9.8
19	Broadband Hybrid Antennas	Schwarzbeck	VULB9163	VULB9163#958	2018.9.8
20	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1680	2019.1.12
21	Active Receive Loop Antenna	Schwarzbeck	FMZB 1919B	00023	2018.11.02
22	Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170651	2019.03.14
23	Microwave Broadband Preamplifier	Schwarzbeck	BBV 9721	100472	2018.10.24
24	Active Loop Antenna	Com-Power	AL-130R	10160009	2019.05.10
25	Power Meter	KEYSIGHT	N1911A	MY50520168	2019.05.10



### 3. CONDUCTED EMISSIONS TEST

#### 3.1 Test Limit

Frequency (MHz)	Maximum RF Line Voltage(dBμV)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	Ave.
0.15~0.50	79	66	66~56*	56~46*
0.50~5.00	73	60	56	46
5.00~30.0	73	60	60	50

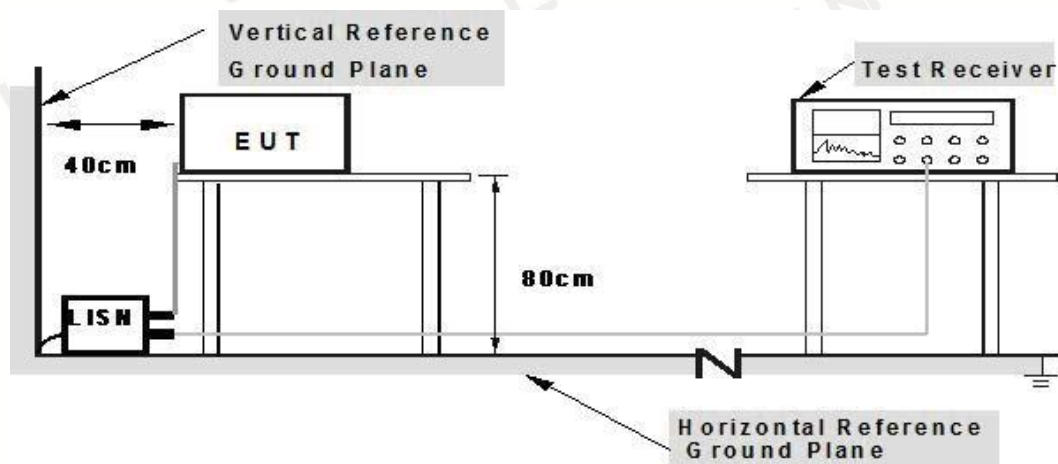
Note:

1. The tighter limit applies at the band edges.
2. The limit of " \* " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver:

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

#### 3.2 Test Setup



- Note: 1.Support units were connected to second LISN.**  
**2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes**

### 3.3 Test Procedure

1. The EUT was placed 0.4 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
2. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
3. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
4. LISN at least 80 cm from nearest part of EUT chassis.
5. For the actual test configuration, please refer to the related Item EUT Test Photos.

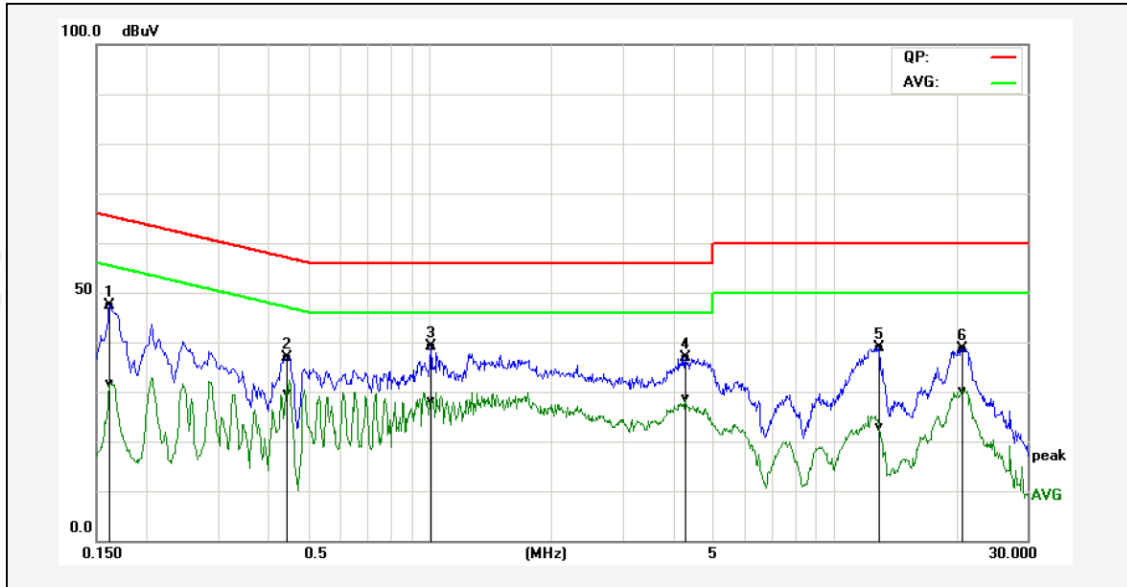
### 3.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

### 3.5 Test Result

Pass

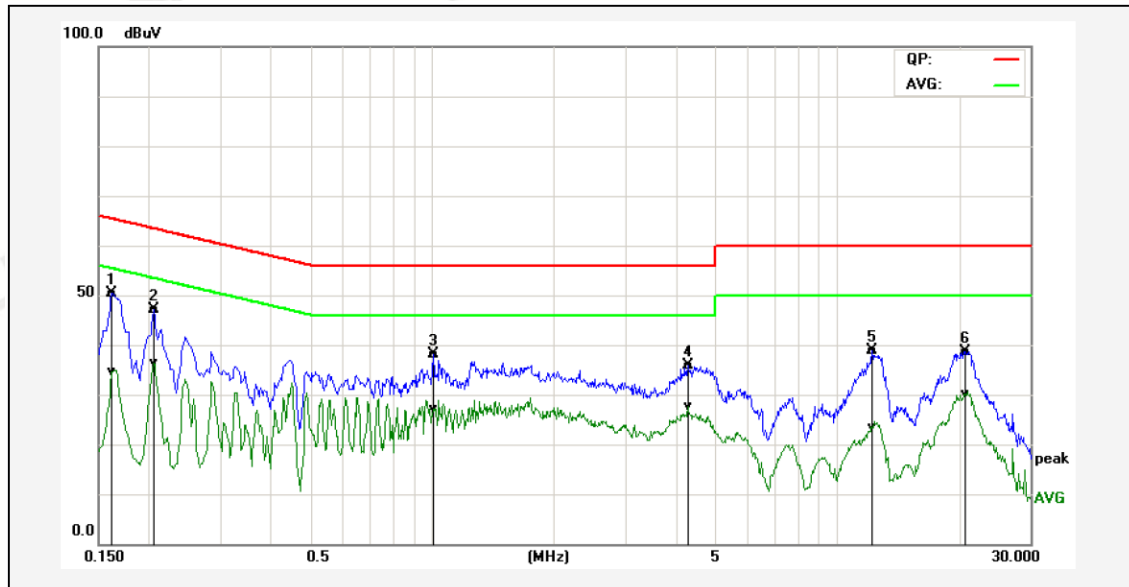
Temperature:	26°C	Relative Humidity:	40%
Test Date:	Jul. 16, 2018	Pressure:	1010hPa
Test Voltage:	DC 5V	Phase:	Line
Test Mode:	Running		



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1P	0.1620	39.00	23.15	8.49	47.49	31.64	65.36	55.36	-17.87	-23.72	Pass
2P	0.4460	27.07	19.81	9.92	36.99	29.73	56.95	46.95	-19.96	-17.22	Pass
3*	1.0100	29.09	18.21	10.03	39.12	28.24	56.00	46.00	-16.88	-17.76	Pass
4P	4.2780	26.83	18.71	10.01	36.84	28.72	56.00	46.00	-19.16	-17.28	Pass
5P	12.9260	28.68	12.80	10.20	38.88	23.00	60.00	50.00	-21.12	-27.00	Pass
6P	20.7060	28.18	19.67	10.45	38.63	30.12	60.00	50.00	-21.37	-19.88	Pass

Remark: Factor = Insertion Loss + Cable Loss, Result = Reading + Factor, Margin = Result – Limit.

Temperature:	26°C	Relative Humidity:	40%
Test Date:	Jul. 16, 2018	Pressure:	1010hPa
Test Voltage:	DC 5V	Phase:	Neutral
Test Mode:	Running		



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1*	0.1620	42.00	26.15	8.49	50.49	34.64	65.36	55.36	-14.87	-20.72	Pass
2P	0.2060	37.12	26.32	9.94	47.06	36.26	63.37	53.37	-16.31	-17.11	Pass
3P	1.0100	28.09	17.21	10.03	38.12	27.24	56.00	46.00	-17.88	-18.76	Pass
4P	4.2780	25.83	17.71	10.01	35.84	27.72	56.00	46.00	-20.16	-18.28	Pass
5P	12.2220	28.59	13.17	10.17	38.76	23.34	60.00	50.00	-21.24	-26.66	Pass
6P	20.7060	28.06	19.55	10.57	38.63	30.12	60.00	50.00	-21.37	-19.88	Pass

Remark: Factor = Insertion Loss + Cable Loss, Result = Reading + Factor, Margin = Result – Limit.

## 4. RADIATED EMISSION TEST

### 4.1 Test Limit

For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency (MHz)	Class A (at 10m)	Class B (at 3m)
	dBuV/m	dBuV/m
30-88	39.0	40.0
88-216	43.5	43.5
216-960	46.5	46.0
Above 960	49.5	54.0

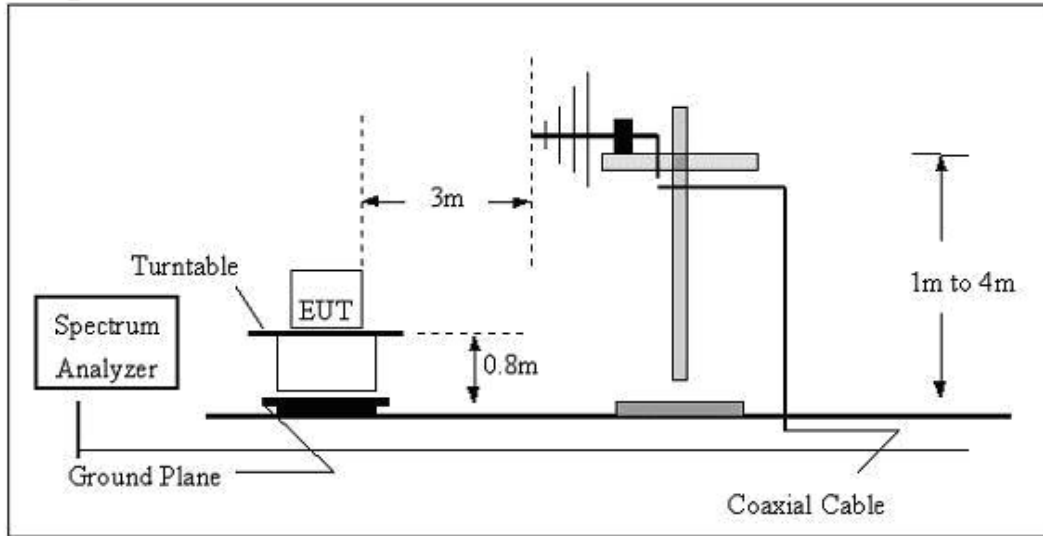
Notes:

1. The limit for radiated test was performed according to as following: FCC PART 15B / ICES-003.
2. The tighter limit applies at the band edges.
3. Emission level (dBuV/m) = 20log Emission level (uV/m).

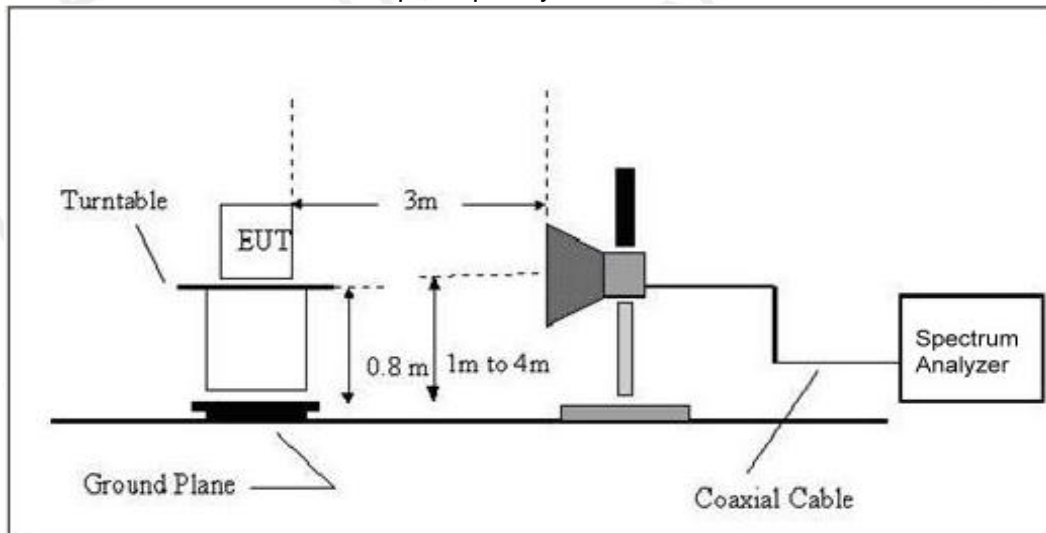


## 4.2 Test Setup

### 1. Radiated Emission Test Set-Up Frequency Below 1 GHz



### 2. Radiated Emission Test Set-Up Frequency Above 1GHz



#### 4.3 Test Procedure

1. The measuring distance of at 10 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
2. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
3. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured, above 1G Average detector mode will be instead.
5. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP(AV) Limits and then no additional QP Mode measurement performed.
6. For the actual test configuration, please refer to the related Item EUT Test Photos.

#### 4.4 EUT OPERATING CONDITIONS

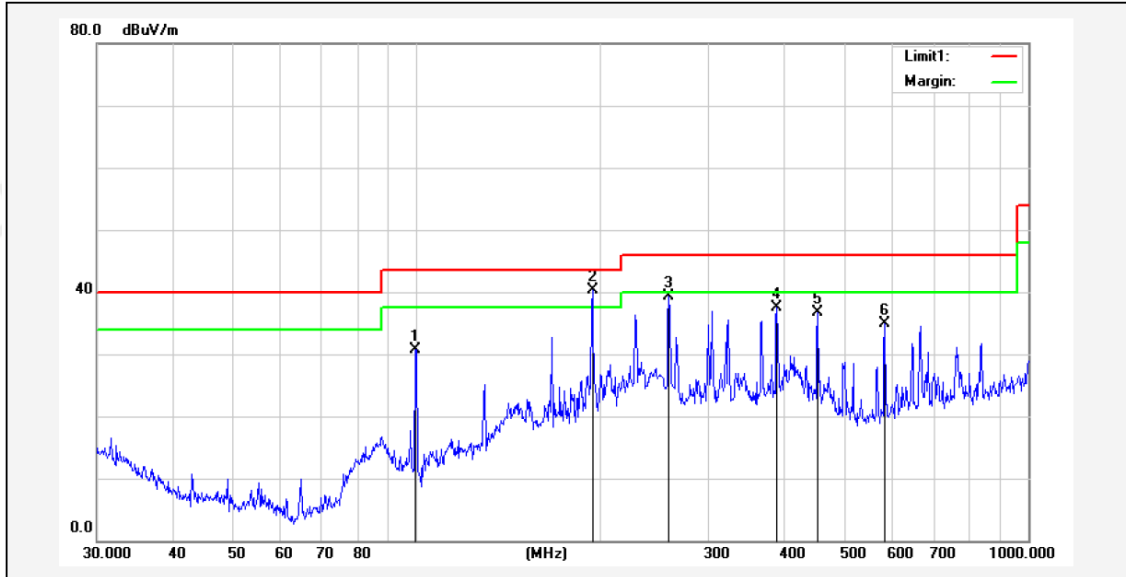
The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

#### 4.5 Test Result

Pass

### Below 1GHz Test Results:

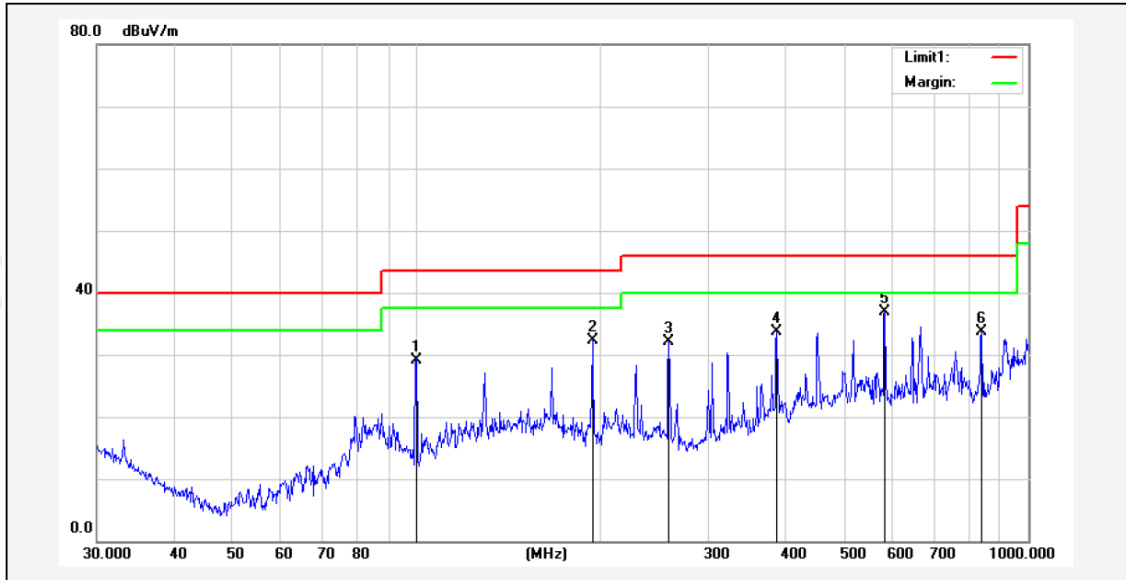
Temperature:	22°C	Relative Humidity:	38%
Test Date:	Jul. 18, 2018	Pressure:	1010hPa
Test Voltage:	DC 5V	Polarization:	Horizontal
Test Mode:	Running		



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Height (cm)	Remark
1	99.5281	47.41	-16.69	30.72	43.50	-12.78			peak
2*	193.7728	53.39	-13.08	40.31	43.50	-3.19			peak
3	258.3264	51.99	-12.73	39.26	46.00	-6.74			peak
4	387.9920	48.40	-10.87	37.53	46.00	-8.47			peak
5	452.7197	45.67	-8.95	36.72	46.00	-9.28			peak
6	582.7425	41.98	-7.06	34.92	46.00	-11.08			peak

Remark: Absolute Level = Reading Level + Factor, Margin = Absolute Level – Limit  
Factor = Ant. Factor + Cable Loss – Pre-amplifier

Temperature:	22°C	Relative Humidity:	38%
Test Date:	Jul. 18, 2018	Pressure:	1010hPa
Test Voltage:	DC 5V	Polarization:	Vertical
Test Mode:	Running		



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Height (cm)	Remark
1	99.8777	45.81	-16.61	29.20	43.50	-14.30			peak
2	193.7728	45.46	-13.08	32.38	43.50	-11.12			peak
3	258.3264	44.90	-12.73	32.17	46.00	-13.83			peak
4	387.9920	44.67	-10.87	33.80	46.00	-12.20			peak
5*	582.7425	43.95	-7.06	36.89	46.00	-9.11			peak
6	839.1818	36.91	-3.25	33.66	46.00	-12.34			peak

Remark: Absolute Level = Reading Level + Factor, Margin = Absolute Level – Limit  
Factor = Ant. Factor + Cable Loss – Pre-amplifier

### Above 1 GHz Test Results:

Temperature:	22°C	Relative Humidity:	38%
Test Date:	Jul. 18, 2018	Pressure:	1010hPa
Test Voltage:	DC 5V	Test Mode:	Running

### Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	Type
1255.62	57.23	-1.58	55.65	74	-18.35	PK
1254.58	45.63	-1.58	44.05	54	-9.95	AV
2056.44	61.37	-4.62	56.75	74	-17.25	PK
2055.86	50.19	-4.62	45.57	54	-8.43	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

### Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	Type
1255.62	56.96	-1.58	55.38	74	-18.62	PK
1254.58	46.11	-1.58	44.53	54	-9.47	AV
2056.44	60.88	-4.62	56.26	74	-17.74	PK
2055.86	50.06	-4.62	45.44	54	-8.56	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

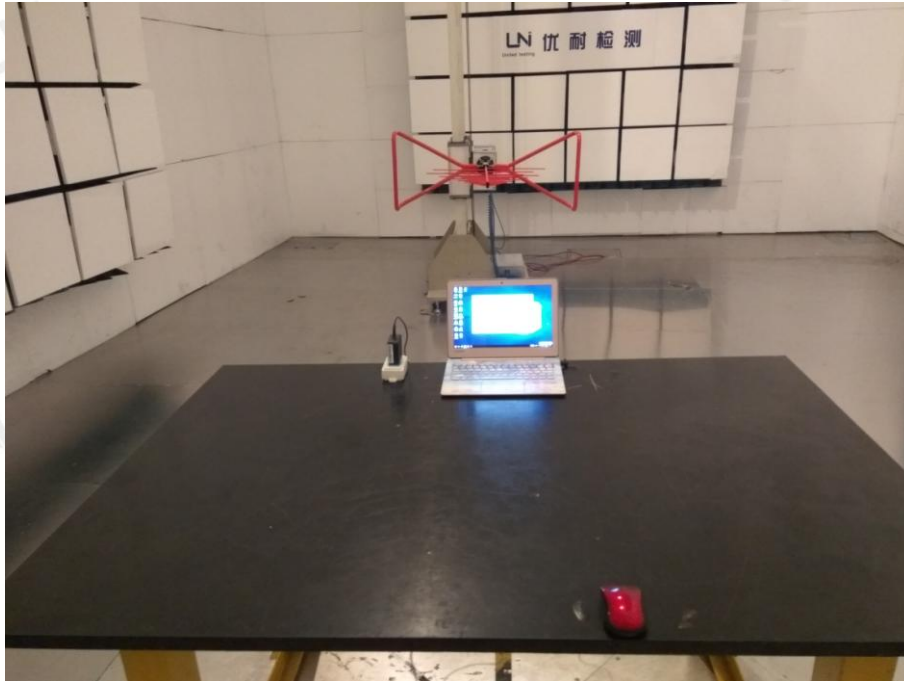
#### Remark :

- (1) Measuring frequencies from 1 GHz to the 25 GHz .
- (2) "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.
- (3) \* denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
- (4) Data of measurement within this frequency range shown "----" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for peak measurement with peak detector at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average measurement with peak detection at frequency above 1GHz.
- (6) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed. For example: Top Channel at Fundamental 73.16dBuV/m(PK Value) <93.98(AV Limit), at harmonic 53.20 dBuV/m(PK Value) <54 dBuV/m(AV Limit), the Average Detected not need to completed.
- (7) All modes of operation were investigated and the worst-case emissions are reported.



## 5 PHOTOGRAPH OF TEST

### 5.1 Radiated Emission



## 5.2 Conducted Emission



\*\*\*End of Report\*\*\*