



TEST REPORT

No. I19D00108-EMC01

For

Client : Shanghai Sunmi Technology Co.,Ltd.

Production : POS Base

Model Name : ND0A0

Brand Name: SUNMI

FCC ID: 2AH25ND0A0

Hardware Version: V1.1

Software Version: V1.0

Issued date: 2019-08-15

NOTE

1. The test results in this test report relate only to the devices specified in this report.
2. This report shall not be reproduced except in full without the written approval of East China Institute of Telecommunications
3. The measurement uncertainty is not taken into account when deciding conformity, and the results of measurement (or the average of measurement results) are directly used as the criterion for the stating conformity.

Test Laboratory:

East China Institute of Telecommunications

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Revision Version

Report Number	Revision	Date	Memo
I19D00108-EMC01	00	2019-08-15	Initial creation of test report

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1. Test Laboratory

1.1. Testing Location

Company Name: ECIT Shanghai, East China Institute of Telecommunications
Address: 7F, G Area, No. 668, Beijing East Road, Huangpu District, Shanghai,
P. R. China
Postal Code: 200001
Telephone: 86-21-63843300
Fax: 86-21-63843301
FCC registration No: 958356

1.2. Testing Environment

Normal Temperature: 15-35°C
Relative Humidity: 30-60%RH

1.3. Project data

Project Leader: Zhang Heng
Testing Start Date: 2019-07-08
Testing End Date: 2019-07-15

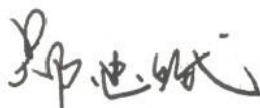
1.4. Signature



Lu Huifang
(Prepared this test report)



You Jinjun
(Reviewed this test report)



Zheng Zhongbin
(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name: Shanghai Sunmi Technology Co.,Ltd.
Address : Room 605, Block 7, KIC Plaza, No.388 Song Hu Road Yang Pu District, Shanghai, China
Telephone: /
Post Code: /

2.2. Manufacturer Information

Company Name: Shanghai Sunmi Technology Co.,Ltd.
Address : Room 605, Block 7, KIC Plaza, No.388 Song Hu Road Yang Pu District, Shanghai, China
Telephone: /
Post Code: /

3. Equipment under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

Product Name	POS Base
Model name	ND0A0
Additional Communication Function	802.11b,g,n;

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version	Date of receipt
N05	NH02D96M60007	V1.1	V1.0	2019-07-04

*EUT ID: is used to identify the test sample in the lab internally.

3.3. Internal Identification of AE used during the test

AE ID*	Description	Model	SN
AE1	Adapter	TPA-46050200VU	/
AE2	USB Cable	/	/
AE3	Smart POS system	P2	PB03D60160048
AE4	LAN Cable	/	/
AE5	Notebook PC	DELL Latitude E6510	/
AE6	Keyboard	KB212-B	CN-0Y88XT-65890-12I-005Q-A00
AE7	Mouse	MS111-P	CN-011D3V-71581-19J-1A64

*AE ID: is used to identify the test sample in the lab internally.

*The AE were provided by the lab.

4. Reference Documents

4.1 Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
FCC Part 15, Subpart B	Radio frequency devices	2019/6/21
ANSI C63.4	Method of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2014

5. Test Results

5.1 Summary of Test Results

Items	Test List	Clause in FCC rules	Verdict
1	Radiated Emission	15.109(a)	Pass
2	AC Conducted Emission	15.107(a)	Pass

5.2 Statements

The ND0A0, supporting WLAN.etc, manufactured by Shanghai Sunmi Technology Co.,Ltd. is a new product for testing. ECIT only performed test cases which identified with Pass/Fail/Inc result in section 5.1.

ECIT has verified that the compliance of the tested device specified in section 3 of this test report is successfully evaluated according to the procedure and test methods as defined in type certification requirement listed in section 4 of this test report.

6. Test Equipment Utilized

6.1 Radiated Emission Equipment list

Item	Instrument Name	Type	Serial Number	Manufacturer	Cal. Date	Cal. interval
1	Test Receiver	ESU40	100307	R&S	2019-05-10	1 year
2	Trilog Antenna	VULB9163-5 15	VULB9163-5 15	Schwarzbeck	2017-02-25	3 years
3	Double Ridged Guide	ETS-3117	00135885	ETS	2017-01-11	3 years
4	EMI Test Software	EMC32 V9.15	NA	R&S	NA	NA

6.1 AC Conducted Emission Equipment list

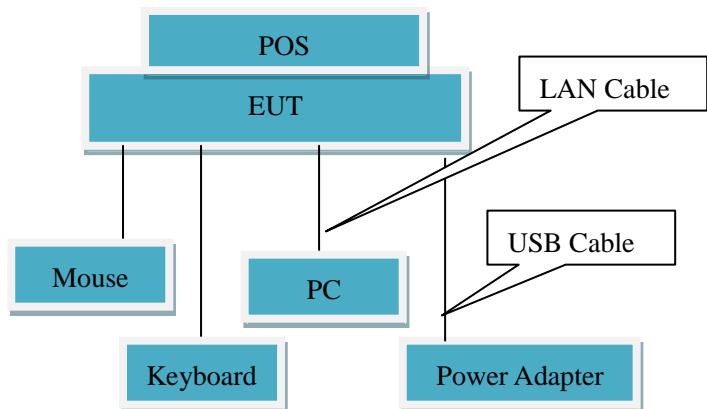
Item	Instrument Name	Type	Serial Number	Manufacturer	Cal. Date	Cal. interval
1	Test Receiver	ESCI	101235	R&S	2019-05-10	1 year
2	2-Line V-Network	ENV216	101380	R&S	2019-05-10	1 year
3	EMI Test Software	EMC32 V10.35.02	NA	R&S	NA	NA

7. System Configuration during Test

7.1 Test Mode

Test Item	Function Type
AC Conducted Emission	Mode 1: Charging mode (Full system) <Figure 1>
Radiated Emission	Mode 1: Charging mode (Full system) <Figure 1>
Remark: EUT supplies power through adapter (AE1) and USB cable (AE2), and establishes WLAN connection with smart POS system (AE3). EUT's LAN port maintains data exchange of ping command through LAN cable (AE4) and PC (AE5), and connects mouse (AE7) and keyboard (AE6).	

7.2 Connection Diagram of Test System



<Figure 1> Mode 1

8. Measurement Results

Only the worst test result was shown in this report.

8.1 Radiated Emission 30MHz-18GHz

Method of Measurement

For 30MHz -1000MHz, the EUT was placed on the top of a rotating 0.8m table above the ground at a semi-anechoic chamber. The distance between the EUT and the received antenna was 3 meters. The table was rotated 360 degree and the received antenna mounted on a variable-height antenna tower was varied from 1m to 4m to find the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna were set during the measurement. Tested in accordance with the procedures of ANSI C63.4-2014, section 8.3.

For 1000MHz -18000MHz, The maximal emission value was acquired by adjusting the antenna height, The table was rotated 360 degree to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna were set during the measurement.

Limits for Radiated Emission at a measuring distance of 3m

Frequency Range (MHz)	Quasi-Peak (dBuV/m)
30-88	40
88-216	43.5
216-960	46
Above 960	54

Frequency Range (MHz)	Peak (dBuV/m)	Average (dBuV/m)
Above 1000	74	54

Test conditions

Frequency Range (MHz)	RBW/VBW	Sweep Time (s)
30-1000	120kHz/300kHz	Auto
1000-18000	1MHz/3MHz	Auto

Uncertainty Measurement

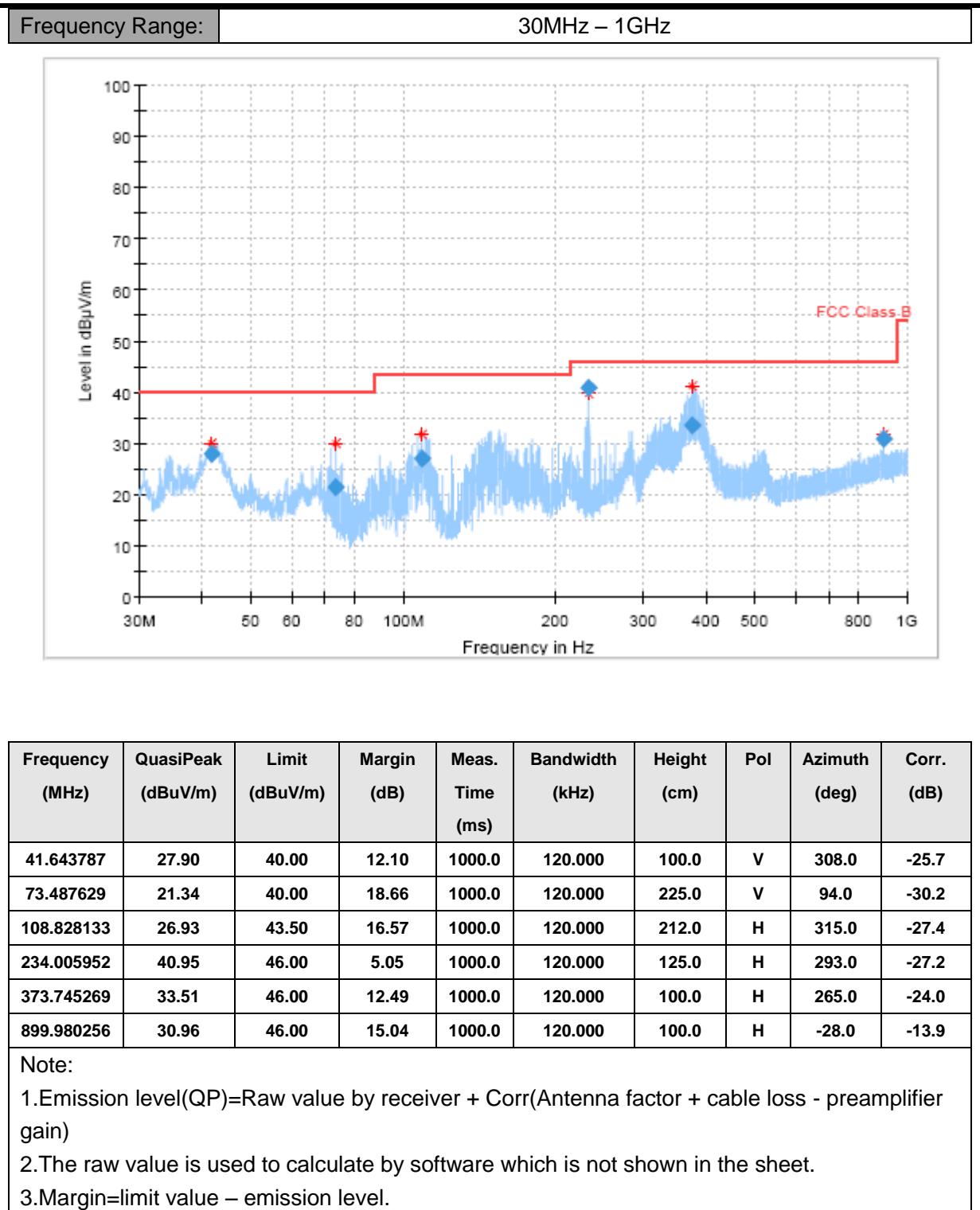
The measurement uncertainty (30MHz-1000MHz) is 4.98 dB (k=2).

The measurement uncertainty (1000MHz-18000MHz) is 5.06 dB (k=2).

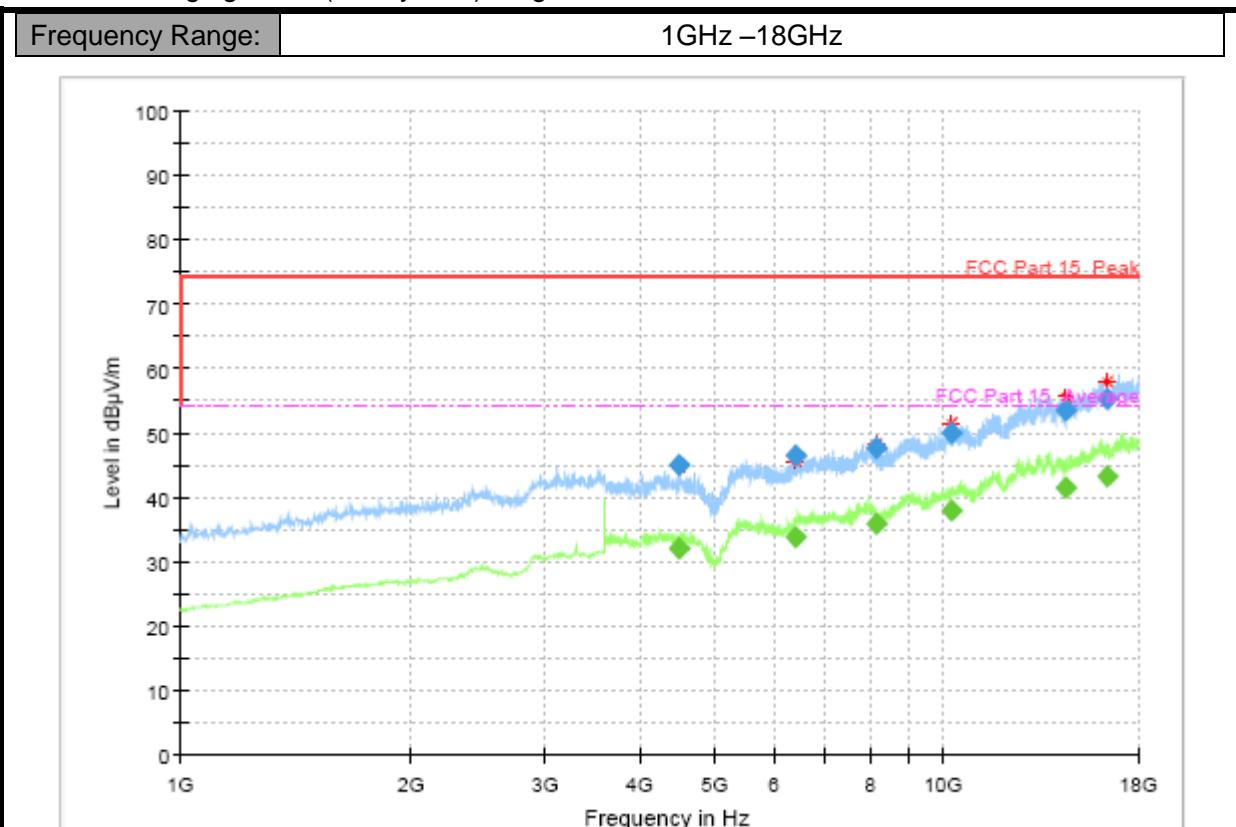
Test Results

Sweep the whole frequency band through the range from 30MHz to the 5th harmonic of the carrier, the Emissions in the frequency band 18GHz-40GHz is more than 20dB below the limit are not report.

Mode 1: Charging mode (Full system) <Figure 1>



Mode 1: Charging mode (Full system) <Figure 1>

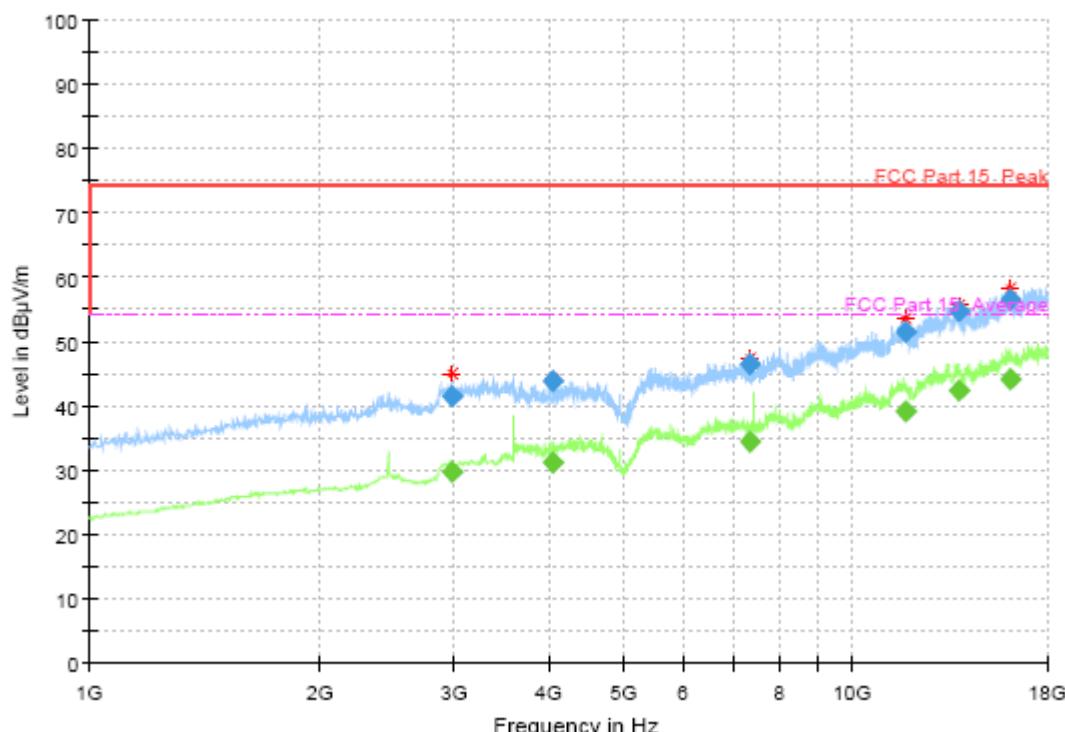


Final Result

Frequency (MHz)	MaxPeak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
4515.800000	44.87	---	74.00	29.13	100.0	1000.000	200.0	V	306.0
4515.800000	---	32.13	54.00	21.87	100.0	1000.000	200.0	V	306.0
6388.600000	46.34	---	74.00	27.66	100.0	1000.000	200.0	V	244.0
6388.600000	---	33.93	54.00	20.07	100.0	1000.000	200.0	V	244.0
8167.800000	47.79	---	74.00	26.21	100.0	1000.000	200.0	V	254.0
8167.800000	---	35.76	54.00	18.24	100.0	1000.000	200.0	V	254.0
10244.800000	---	37.87	54.00	16.13	100.0	1000.000	100.0	V	202.0
10244.800000	49.87	---	74.00	24.13	100.0	1000.000	100.0	V	202.0
14430.000000	---	41.41	54.00	12.59	100.0	1000.000	200.0	V	35.0
14430.000000	53.67	---	74.00	20.33	100.0	1000.000	200.0	V	35.0
16408.200000	55.28	---	74.00	18.72	100.0	1000.000	200.0	V	285.0
16408.200000	---	43.17	54.00	10.83	100.0	1000.000	200.0	V	285.0

Note:

1. Emission level(peak or average)=Raw value by receiver + Corr(Antenna factor+ cable loss - preamplifier gain)
2. The raw value is used to calculate by software which is not shown in the sheet.
3. Margin=limit value – emission level.



Final Result

Frequency (MHz)	MaxPeak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
2985.600000	41.55	---	74.00	32.45	100.0	1000.000	100.0	H	196.0
2985.600000	---	29.84	54.00	24.16	100.0	1000.000	100.0	H	196.0
4057.200000	---	31.12	54.00	22.88	100.0	1000.000	200.0	H	0.0
4057.200000	43.93	---	74.00	30.07	100.0	1000.000	200.0	H	0.0
7345.200000	---	34.34	54.00	19.66	100.0	1000.000	100.0	H	50.0
7345.200000	46.55	---	74.00	27.45	100.0	1000.000	100.0	H	50.0
11733.800000	---	39.17	54.00	14.83	100.0	1000.000	200.0	H	140.0
11733.800000	51.45	---	74.00	22.55	100.0	1000.000	200.0	H	140.0
13743.400000	---	42.22	54.00	11.78	100.0	1000.000	200.0	H	161.0
13743.400000	54.71	---	74.00	19.29	100.0	1000.000	200.0	H	161.0
16095.000000	56.60	---	74.00	17.40	100.0	1000.000	100.0	H	0.0
16095.000000	---	44.25	54.00	9.75	100.0	1000.000	100.0	H	0.0

Note:

1. Emission level(peak or average)=Raw value by receiver + Corr(Antenna factor+ cable loss - preamplifier gain)
2. The raw value is used to calculate by software which is not shown in the sheet.
3. Margin=limit value – emission level.

8.2 AC Conducted Emission

Method of Measurement

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies with the band 150 kHz to 30MHz shall not exceed the limits. Both lines of the power mains connected to the EUT were checked for maximum conducted interference. Tested in accordance with the procedures of ANSI C63.4-2014, section 7.3

Limit of Conducted Emission

Frequency Range (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency

Test Condition in Charging Mode

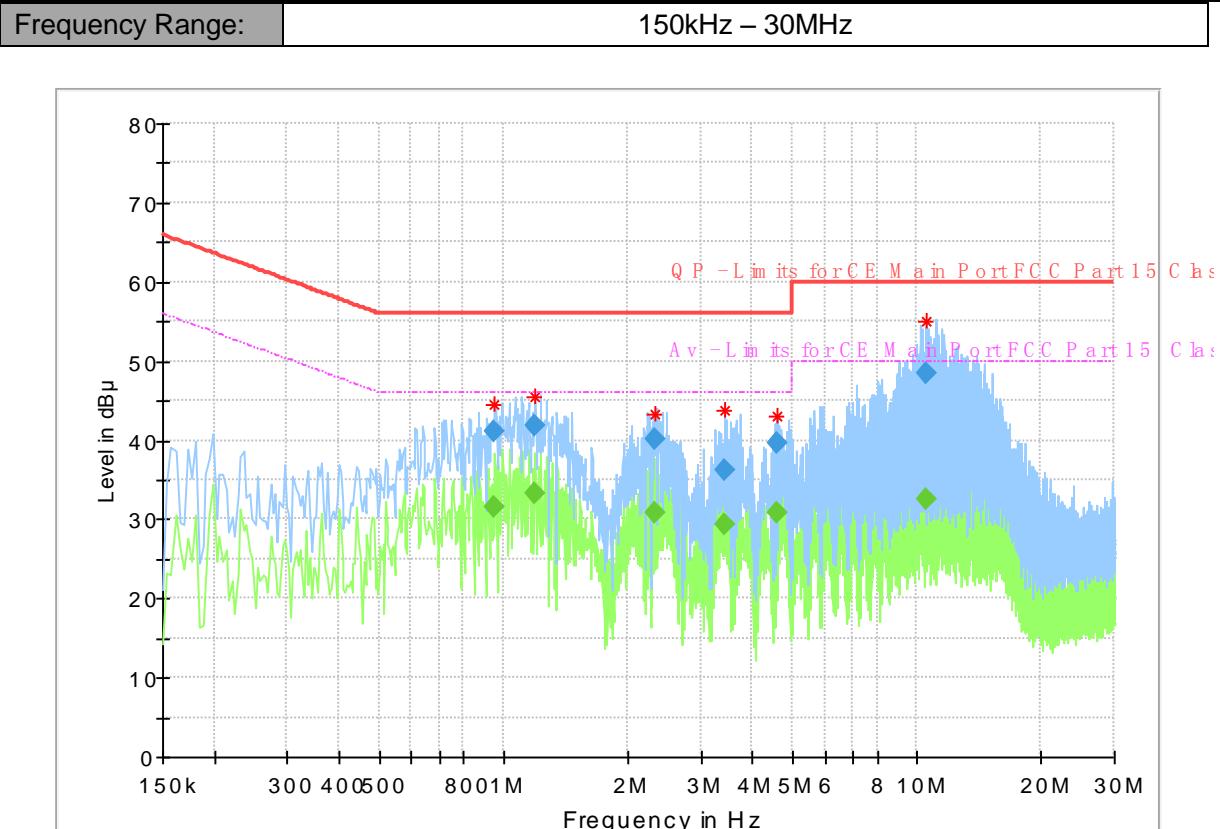
Voltage (V)	Frequency (Hz)	RBW	Sweep Time (s)
120	60	9 kHz	Auto

Uncertainty Measurement

The measurement uncertainty is 3.66dB (k=2).

Test Results

Mode 1: Charging mode (Full system) <Figure 1>



Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.952219	---	31.59	46.00	14.41	15000.	9.000	L1	ON	9.9
0.952219	41.04	---	56.00	14.96	15000.	9.000	L1	ON	9.9
1.191019	---	33.33	46.00	12.67	15000.	9.000	L1	ON	9.9
1.191019	41.79	---	56.00	14.21	15000.	9.000	L1	ON	9.9
2.329050	---	30.86	46.00	15.14	15000.	9.000	L1	ON	10.0
2.329050	40.14	---	56.00	15.86	15000.	9.000	L1	ON	10.0
3.418575	---	29.36	46.00	16.64	15000.	9.000	L1	ON	10.2
3.418575	36.24	---	56.00	19.76	15000.	9.000	L1	ON	10.2
4.590188	---	30.71	46.00	15.29	15000.	9.000	L1	ON	10.3
4.590188	39.55	---	56.00	16.45	15000.	9.000	L1	ON	10.3
10.530338	---	32.64	50.00	17.36	15000.	9.000	N	ON	10.9
10.530338	48.32	---	60.00	11.68	15000.	9.000	N	ON	10.9

Note:

1. Emission level(quasi-peak or Average peak)=Raw value by receiver + Corr(Insertion loss+ cable loss)
2. The raw value is used to calculate by software which is not shown in the sheet.
3. Margin=limit value – emission level.
4. L1 and N line is all have been tested, the result of them is synthesized in the above data diagram.

*****END OF REPORT*****