TEST REPORT

No. I18D00007-EMC01

For

Client : Shenzhen Neoway Technology Co.,Ltd.

Production: eMTC Module

Model Name : N20

Hardware Version: V1.0

Software Version: N20_EBC0CM_BZ_V001

FCC ID: PJ7-1901

Issued date: 2018-04-10

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of ECIT Shanghai.

Test Laboratory:

ECIT Shanghai, East China Institute of Telecommunications

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Revision Version

Report Number	Revision	Date	Memo
I18D00007-EMC01	00	2018-04-10	Initial creation of test report

CONTENTS

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:	489729

1.2. Testing Environment

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

1.3. Project data

Project Leader:	Yu Anlu
Testing Start Date:	2018-03-23
Testing End Date:	2018-03-30

1.4. Signature

Tong Daocheng
(Prepared this test report)

You Jinjun
(Reviewed this test report)

Zheng Zhongbin
Director of the laboratory
(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name:	Shenzhen Neoway Technology Co.,Ltd.
Address:	4F-2#,LianjianScience&IndustryPark,Huarong Road,Dalang,Longhua District, Shenzhen P.R.C.
Telephone:	18813937316
Postcode:	518109

2.2. Manufacturer Information

Company Name:	Shenzhen Neoway Technology Co.,Ltd.
Address:	4F-2#,LianjianScience&IndustryPark,Huarong Road,Dalang,Longhua District, Shenzhen P.R.C.
Telephone:	18813937316
Postcode:	518109

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

3.1. About EUT

ProductName	eMTC Module
Model name	N20
LTE Frequency Band	CATM LTE2/4/12/13

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version	Date of receipt
N06	867290030000227	V1.0	N20_EBC0CM_BZ_V001	2018-03-23

*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
CA02	Adapter	HH-05003000A	/
EA04	Antenna	/	5045831

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

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	10-1-10 Edition
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 N20, manufactured by Shenzhen Neoway 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

No.	Name	Type	Series Number	Producer	Cal. Date	Cal. interval
1	Universal Radio Communication	CMU200	123126	R&S	2017-05-11	1 Year
2	Test Receiver	ESU40	100307	R&S	2017-05-11	1 Year
3	Trilog Antenna	VULB9163	VULB9163-515	Schwarzbeck	2017-02-25	3 Year
4	Double Ridged Guide	ETS-3117	00135885	ETS	2017-01-11	3 Year
5	EMI Test Software	EMC32 V9.15	NA	R&S	NA	NA

6.2 AC Conducted Emission Equipment list

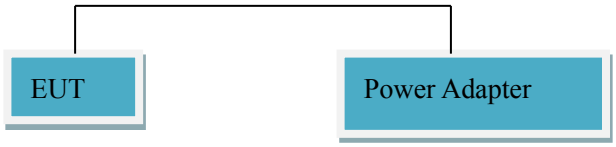
No.	Name	Type	Series Number	Producer	Cal. Date	Cal. interval
1	Universal Radio	CMU200	123123	R&S	2017-05-11	1 Year
2	Test Receiver	ESCI	101235	R&S	2017-05-11	1 Year
3	2-Line V-Network	ENV216	101380	R&S	2017-05-11	1 Year
4	EMI Test Software	EMC32 V9.15	NA	R&S	NA	NA

7. System Configuration during Test

7.1 Test Mode

Test Item	Function Type
Radiated emission	Mode 1: Charging mode <Figure 1>
AC Conducted emission	Mode 1: Charging mode <Figure 1>
Remark: 1. All test modes are performed, only the worst cases test data are recorded in this report.	

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-12.75GHz

Method of Measurement

For 30-1000MHz, the EUT was placed on the top of a rotating 0.8-m 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 1000-12750MHz, 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
1000-12750	1MHz/3MHz	Auto

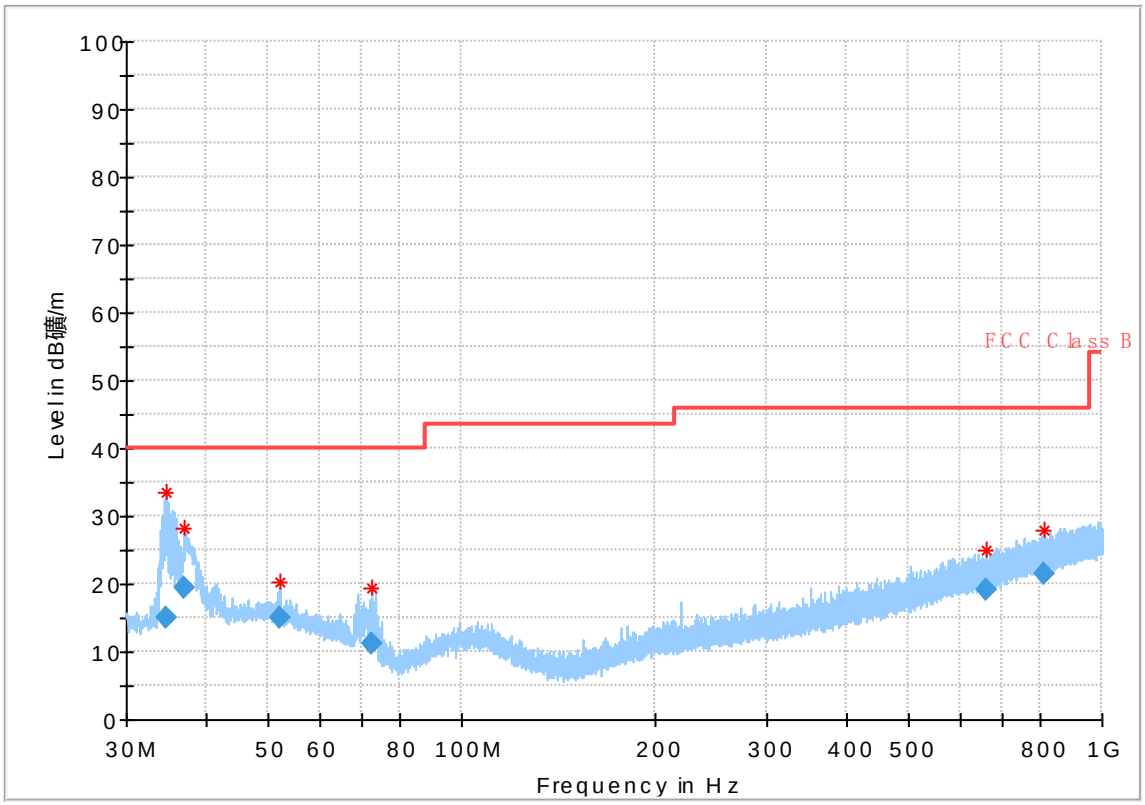
Uncertainty Measurement

The measurement uncertainty is 5.48dB (30 MHz -1000MHz) and 5.20dB（1GHz-12.75GHz）(k=2).

Test Results

Mode 1: Charging mode

Frequency Range:	30MHz – 1GHz



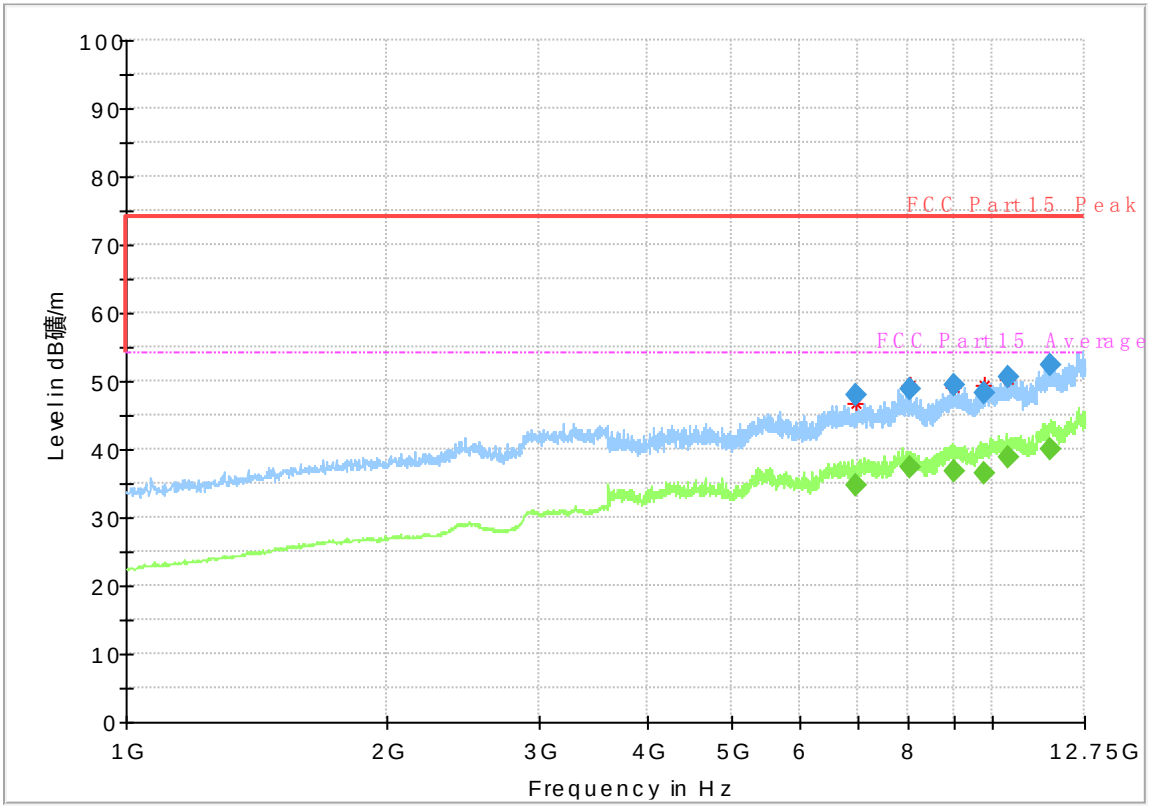
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
34.601725	14.92	40.00	25.08	1000.0	120.000	100.0	V	295.0	-22.0
37.047744	19.54	40.00	20.46	1000.0	120.000	100.0	V	309.0	-21.5
52.045293	15.00	40.00	25.00	1000.0	120.000	100.0	V	62.0	-20.5
72.381227	11.08	40.00	28.92	1000.0	120.000	124.0	V	331.0	-25.6
660.685859	18.98	46.00	27.02	1000.0	120.000	225.0	H	276.0	-13.7
811.125397	21.36	46.00	24.64	1000.0	120.000	106.0	H	203.0	-11.3

Note:

1. Emission level(QP)=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.

Mode 1: Charging mode

Frequency Range:	1GHz –12.75GHz



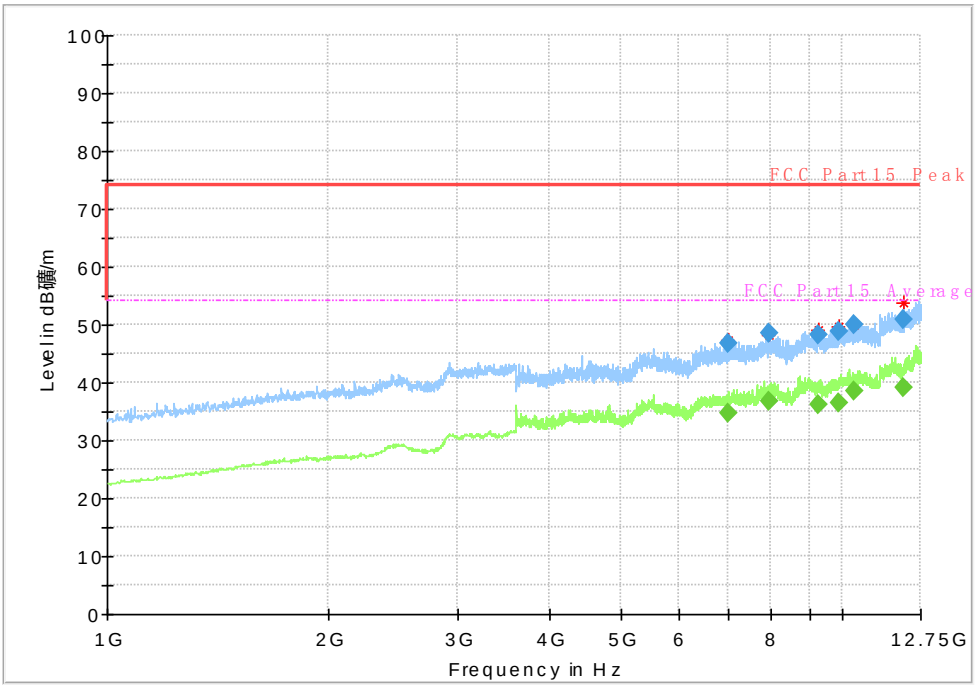
Vertical

Final Result

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/	Limit (dBµV/m)	Margin	Meas. Time	Bandwidth	Height (cm)	Pol	Azimuth	Corr. (dB)
6954.700000	---	34.76	54.00	19.24	50.0	1000.000	100.0	V	269.0	7.1
6954.700000	47.86	---	74.00	26.14	50.0	1000.000	100.0	V	269.0	7.1
8011.400000	---	37.30	54.00	16.70	50.0	1000.000	200.0	V	47.0	9.4
8011.400000	48.77	---	74.00	25.23	50.0	1000.000	200.0	V	47.0	9.4
9036.800000	---	36.62	54.00	17.38	50.0	1000.000	200.0	V	325.0	10.3
9036.800000	49.47	---	74.00	24.53	50.0	1000.000	200.0	V	325.0	10.3
9755.100000	48.31	---	74.00	25.69	50.0	1000.000	200.0	V	248.0	11.1
9755.100000	---	36.52	54.00	17.48	50.0	1000.000	200.0	V	248.0	11.1
10428.000000	50.47	---	74.00	23.53	50.0	1000.000	100.0	V	335.0	12.9
10428.000000	---	38.96	54.00	15.04	50.0	1000.000	100.0	V	335.0	12.9
11641.800000	---	40.11	54.00	13.89	50.0	1000.000	100.0	V	2.0	15.2
11641.800000	52.33	---	74.00	21.67	50.0	1000.000	100.0	V	2.0	15.2

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.



Horizontal

Final Result

Frequency (MHz)	MaxPeak (dBµV/m	Average (dBµV/m	Limit (dBµV/m	Margin (dB)	Meas. Time	Bandwidth	Height	Pol	Azimuth (deg)	Corr. (dB)
6984.100000	---	34.84	54.00	19.16	50.0	1000.000	200.0	H	0.0	7.2
6984.100000	46.71	---	74.00	27.29	50.0	1000.000	200.0	H	0.0	7.2
7951.900000	---	36.87	54.00	17.13	50.0	1000.000	200.0	H	127.0	9.1
7951.900000	48.65	---	74.00	25.35	50.0	1000.000	200.0	H	127.0	9.1
9270.250000	48.27	---	74.00	25.73	50.0	1000.000	200.0	H	172.0	10.6
9270.250000	---	36.31	54.00	17.69	50.0	1000.000	200.0	H	172.0	10.6
9853.050000	---	36.53	54.00	17.47	50.0	1000.000	200.0	H	160.0	11.2
9853.050000	48.75	---	74.00	25.25	50.0	1000.000	200.0	H	160.0	11.2
10339.500000	---	38.49	54.00	15.51	50.0	1000.000	100.0	H	164.0	12.4
10339.500000	50.07	---	74.00	23.93	50.0	1000.000	100.0	H	164.0	12.4
12077.700000	50.80	---	74.00	23.20	50.0	1000.000	100.0	H	151.0	15.1
12077.700000	---	39.07	54.00	14.93	50.0	1000.000	100.0	H	151.0	15.1

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

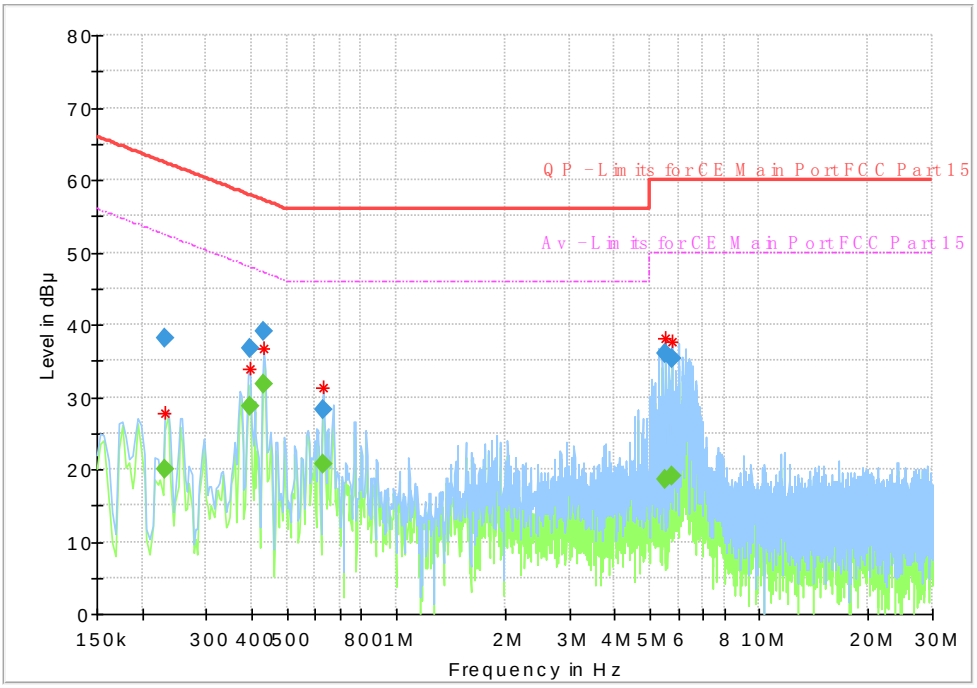
Uncertainty Measurement

The measurement uncertainty is 3.68dB (k=2).

Test Results

Mode 1: Charging mode

Frequency Range:	150kHz – 30MHz



Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.232088	---	20.07	52.37	32.30	1000.0	9.000	L1	ON	9.6
0.232088	38.09	---	62.37	24.28	1000.0	9.000	L1	ON	9.6
0.396262	---	28.73	47.93	19.20	1000.0	9.000	L1	ON	9.6
0.396262	36.77	---	57.93	21.16	1000.0	9.000	L1	ON	9.6
0.433575	---	31.71	47.18	15.47	1000.0	9.000	L1	ON	9.6
0.433575	39.02	---	57.18	18.16	1000.0	9.000	L1	ON	9.6
0.627600	---	20.78	46.00	25.22	1000.0	9.000	L1	ON	9.7
0.627600	28.16	---	56.00	27.84	1000.0	9.000	L1	ON	9.7
5.537925	---	18.60	50.00	31.40	1000.0	9.000	L1	ON	9.7
5.537925	35.98	---	60.00	24.02	1000.0	9.000	L1	ON	9.7
5.772994	---	19.12	50.00	30.88	1000.0	9.000	L1	ON	9.8
5.772994	35.23	---	60.00	24.77	1000.0	9.000	L1	ON	9.8

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**********