

APPLICATION FOR VERIFICATION
On Behalf of
NYNE MULTIMEDIA INC.

NYNE REBEL
Model No.: NYNE REBEL

FCC ID: AWA- NYNEREBEL

Prepared for : NYNE MULTIMEDIA INC.
Address : 3451 LUNAR COURT, OXNARD, California, United
States. 93030

Prepared by : Accurate Technology Co., Ltd.
Address : F1, Bldg. A&D, Changyuan New Material Port, Keyuan
Rd., Science & Industry Park, Nanshan District, Shenzhen
518057, P.R. China

Tel: +86-755-26503290
Fax: +86-755-26503396

Report No. : ATE20152368
Date of Test : Nov 4-Dec 3, 2015
Date of Report : Dec 7, 2015

TABLE OF CONTENTS

Description	Page
Test Report Declaration	
1. GENERAL INFORMATION.....	5
1.1. Description of Device (EUT).....	5
1.2. Special Accessory and Auxiliary Equipment.....	6
1.3. Description of Test Facility	6
1.4. Measurement Uncertainty.....	6
2. MEASURING DEVICE AND TEST EQUIPMENT	7
3. OPERATION OF EUT DURING TESTING	8
3.1. Operating Mode.....	8
3.2. Configuration and peripherals	8
4. TEST PROCEDURES AND RESULTS	9
5. POWER LINE CONDUCTED MEASUREMENT	10
5.1. Block Diagram of Test Setup.....	10
5.2. Power Line Conducted Emission Measurement Limits.....	10
5.3. Configuration of EUT on Measurement	10
5.4. Operating Condition of EUT	10
5.5. Test Procedure	11
5.6. Power Line Conducted Emission Measurement Results	11
6. 20DB BANDWIDTH MEASUREMENT	18
6.1. Block Diagram of Test Setup.....	18
6.2. The Requirement For Section 15.225 and 15.215(c).....	18
6.3. EUT Configuration on Measurement	18
6.4. Operating Condition of EUT	18
6.5. Test Procedure	18
6.6. Test Result	19
7. FIELD STRENGTH OF FUNDAMENTAL EMISSIONS AND SPECTRUM MASK	20
7.1. Block Diagram of Test Setup.....	20
7.2. The Requirement For Section 15.225	20
7.3. EUT Configuration on Measurement	20
7.4. Operating Condition of EUT	21
7.5. Test Procedure	21
7.6. Test Result	21
8. RADIATED EMISSION MEASUREMENT	22
8.1. Block Diagram of Test Setup	22
8.2. TEST CONFIGURATION.....	22
8.3. Radiated Emission Limit	23
8.4. EUT Configuration on Measurement	23
8.5. Operating Condition of EUT	24
8.6. Test Procedure	24
8.7. Radiated Emission Noise Measurement Result.....	24
9. FIELD STRENGTH OF FUNDAMENTAL EMISSIONS AND SPECTRUM MASK	30
9.1. Block Diagram of Test Setup.....	30
9.2. The Requirement For Section 15.225	30
9.3. EUT Configuration on Measurement	30
9.4. Operating Condition of EUT	30
9.5. Test Procedure	31
9.6. Test Result	31



10. ANTENNA REQUIREMENT.....	32
10.1. The Requirement	32
10.2. Antenna Construction	32

Test Report Declaration

Applicant : NYNE MULTIMEDIA INC.

Manufacturer : NYNE MULTIMEDIA INC.

EUT Description : NYNE REBEL

Model No. : NYNE REBEL

Trade Mark : 

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C 15.225:2015
ANSI C63.10: 2013

The device described above is tested by Accurate Technology Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C limits both radiated and conducted emissions. The measurement results are contained in this test report and Accurate Technology Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Accurate Technology Co., Ltd.

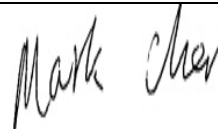
Date of Test :

Nov 4-Dec 3, 2015

Date of Report :

Dec 7, 2015

Prepared by :



(Mark Chen, Engineer)

Approved & Authorized Signer :



(Sean Liu, Manager)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT	:	NYNE REBEL
Model Number	:	NYNE REBEL
Bluetooth version	:	BT V4.1 LE BT 3.0+EDR
BT's Frequency Range	:	2402MHz-2480MHz
NFC's Frequency Range	:	13.56MHz
Number of Channels	:	40 for BT V4.1 LE 79 for BT 3.0+EDR 1 for NFC
BT's Antenna Gain	:	2dBi
BT's Antenna type	:	PCB Antenna
NFC Antenna Gain	:	0dBi
NFC Antenna type	:	PCB Antenna
Trade Name	:	N.A
Power Supply	:	AC 120V/60Hz
Adapter	:	Model: AS360-180-AD200 Input: AC100-240V; 50/60Hz 1.2A Output: DC 18V; 2A
Modulation mode	:	GFSK for BT V4.1 LE GFSK, $\pi/4$ DQPSK, 8DPSK for BT 3.0+EDR ASK for NFC
Applicant	:	NYNE MULTIMEDIA INC.
Address	:	3451 LUNAR COURT, OXNARD, California, United States. 93030
Manufacturer	:	NYNE MULTIMEDIA INC.
Address	:	3451 LUNAR COURT, OXNARD, California, United States. 93030
Date of sample received	:	Nov 4, 2015
Date of Test	:	Nov 4-Dec 3, 2015

1.2.Special Accessory and Auxiliary Equipment

N/A

1.3.Description of Test Facility

EMC Lab : Accredited by TUV Rheinland Shenzhen, May 10, 2004

Listed by FCC

The Registration Number is 253065

Listed by FCC

The Registration Number is 752051

Listed by Industry Canada

The Registration Number is 5077A-1

Listed by Industry Canada

The Registration Number is 5077A-2

Accredited by China National Accreditation Committee for Laboratories

The Certificate Registration Number is L3193

Name of Firm : Accurate Technology Co., Ltd.

Site Location : F1, Bldg. A&D, Changyuan New Material Port, Keyuan Rd., Science & Industry Park, Nanshan District, Shenzhen 518057, P.R. China

1.4.Measurement Uncertainty

Conducted emission expanded uncertainty : U=2.23dB, k=2

Power disturbance expanded uncertainty : U=2.92dB, k=2

Radiated emission expanded uncertainty : U=3.08dB, k=2
(9kHz-30MHz)

Radiated emission expanded uncertainty : U=4.42dB, k=2
(30MHz-1000MHz)

Radiated emission expanded uncertainty : U=4.06dB, k=2
(Above 1GHz)

2. MEASURING DEVICE AND TEST EQUIPMENT

Table 1: List of Test and Measurement Equipment

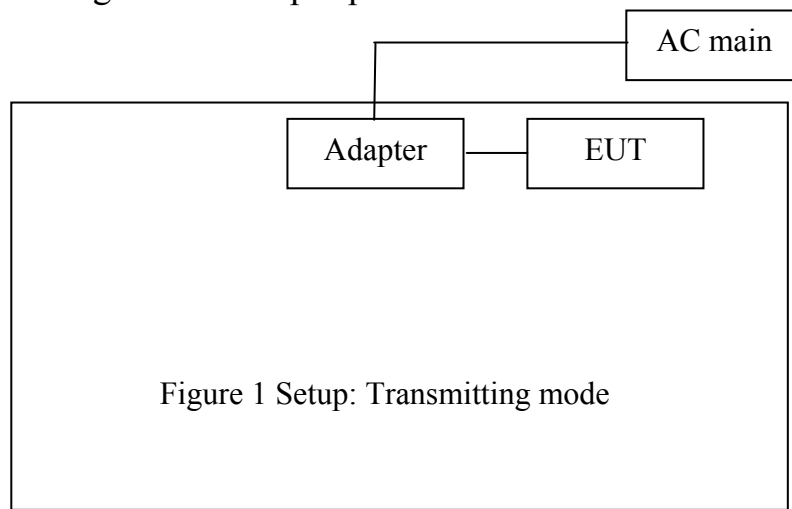
Kind of equipment	Manufacturer	Type	S/N	Calibrated dates	Calibrated until
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	Jan. 11, 2015	Jan. 10, 2016
EMI Test Receiver	Rohde&Schwarz	ESPI3	101526/003	Jan. 11, 2015	Jan. 10, 2016
Spectrum Analyzer	Agilent	E7405A	MY45115511	Jan. 11, 2015	Jan. 10, 2016
Pre-Amplifier	Rohde&Schwarz	CBLU118354 0-01	3791	Jan. 11, 2015	Jan. 10, 2016
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 15, 2015	Jan. 14, 2016
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 15, 2015	Jan. 14, 2016
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 15, 2015	Jan. 14, 2016
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	Jan. 15, 2015	Jan. 14, 2016
LISN	Rohde&Schwarz	ESH3-Z5	100305	Jan. 11, 2015	Jan. 10, 2016
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 11, 2015	Jan. 10, 2016
Highpass Filter	Wainwright Instruments	WHKX3.6/18 G-10SS	N/A	Jan. 11, 2015	Jan. 10, 2016
Band Reject Filter	Wainwright Instruments	WRCG2400/2 485-2375/2510 -60/11SS	N/A	Jan. 11, 2015	Jan. 10, 2016

3. OPERATION OF EUT DURING TESTING

3.1.Operating Mode

The mode is used: **NFC Transmitting mode**
Operate Channel: 13.56MHz

3.2.Configuration and peripherals

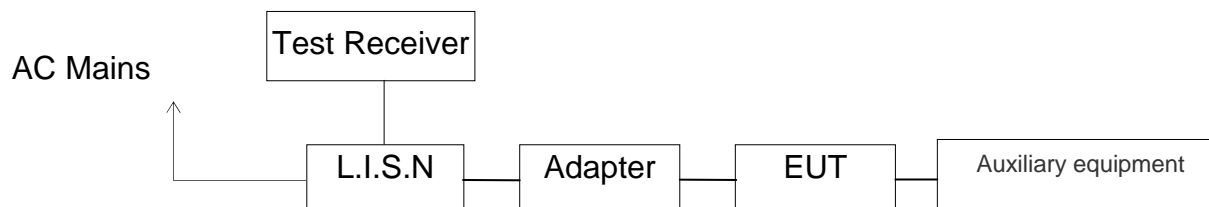


4. TEST PROCEDURES AND RESULTS

FCC Rules	Description of Test	Result
Section 15.215(c)	Emission Bandwidth	Compliant
Section 15.225	Field Strength of Fundamental Emissions and Spectrum Mask	Compliant
Section 15.225(d) Section 15.209	Radiated Spurious Emission Test	Compliant
Section 15.207	AC Power Line Conducted Emission Test	Compliant
Section 15.225(e)	Frequency Stability	Compliant
Section 15.203	Antenna Requirement	Compliant

5. POWER LINE CONDUCTED MEASUREMENT

5.1. Block Diagram of Test Setup



(EUT: NYNE REBEL)

5.2. Power Line Conducted Emission Measurement Limits

Frequency (MHz)	Limit dB(μV)	
	Quasi-peak Level	Average Level
0.15 - 0.50	66.0 – 56.0 *	56.0 – 46.0 *
0.50 - 5.00	56.0	46.0
5.00 - 30.00	60.0	50.0

NOTE1: The lower limit shall apply at the transition frequencies.
NOTE2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.

5.3. Configuration of EUT on Measurement

The following equipments are installed on Power Line Conducted Emission Measurement to meet the commission requirement and operating regulations in a manner, which tends to maximize its emission characteristics in a normal application.

5.4. Operating Condition of EUT

- 5.4.1. Setup the EUT and simulator as shown as Section 5.1.
- 5.4.2. Turn on the power of all equipment.
- 5.4.3. Let the EUT work in test mode and measure it.

5.5. Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.4: 2014 on Conducted Emission Measurement.

The bandwidth of test receiver (R & S ESCS30) is set at 9kHz.

The frequency range from 150kHz to 30MHz is checked.

5.6. Power Line Conducted Emission Measurement Results

PASS.

The frequency range from 150kHz to 30MHz is checked.

Test mode : NFC Operation(AC 120V/60Hz)

MEASUREMENT RESULT: "NYNE-008_fin"

2015-11-4 16:09

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.162000	51.10	10.4	65	14.3	QP	L1	GND
0.328000	35.70	11.1	60	23.8	QP	L1	GND
10.595000	35.10	11.9	60	24.9	QP	L1	GND

MEASUREMENT RESULT: "NYNE-008_fin2"

2015-11-4 16:09

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.162000	38.10	10.4	55	17.3	AV	L1	GND
0.332000	24.40	11.1	49	25.0	AV	L1	GND
10.595000	24.90	11.9	50	25.1	AV	L1	GND

MEASUREMENT RESULT: "NYNE-007_fin"

2015-11-4 16:06

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.156000	50.70	10.4	66	15.0	QP	N	GND
0.500000	37.20	11.5	56	18.8	QP	N	GND
11.193500	28.10	11.9	60	31.9	QP	N	GND

MEASUREMENT RESULT: "NYNE-007_fin2"

2015-11-4 16:06

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.164000	37.10	10.4	55	18.2	AV	N	GND
0.498000	23.80	11.5	46	22.2	AV	N	GND
11.193500	16.70	11.9	50	33.3	AV	N	GND

Test mode : NFC Operation(AC 240V/60Hz)

MEASUREMENT RESULT: "NYNE-009_fin"

2015-11-4 16:15								
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE	
0.164000	49.40	10.4	65	15.9	QP	L1	GND	
0.218000	44.30	10.7	63	18.6	QP	L1	GND	
0.492000	35.40	11.5	56	20.7	QP	L1	GND	

MEASUREMENT RESULT: "NYNE-009_fin2"

2015-11-4 16:15								
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE	
0.164000	40.80	10.4	55	14.5	AV	L1	GND	
0.218000	37.30	10.7	53	15.6	AV	L1	GND	
0.494000	25.70	11.5	46	20.4	AV	L1	GND	

MEASUREMENT RESULT: "NYNE-010_fin"

2015-11-4 16:17								
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE	
0.162000	47.80	10.4	65	17.6	QP	N	GND	
0.430000	38.50	11.4	57	18.8	QP	N	GND	
0.914000	36.10	11.6	56	19.9	QP	N	GND	

MEASUREMENT RESULT: "NYNE-010_fin2"

2015-11-4 16:17								
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE	
0.162000	37.90	10.4	55	17.5	AV	N	GND	
0.430000	30.50	11.4	47	16.8	AV	N	GND	
0.914000	24.30	11.6	46	21.7	AV	N	GND	

Emissions attenuated more than 20 dB below the permissible value are not reported.

The spectral diagrams are attached as below.

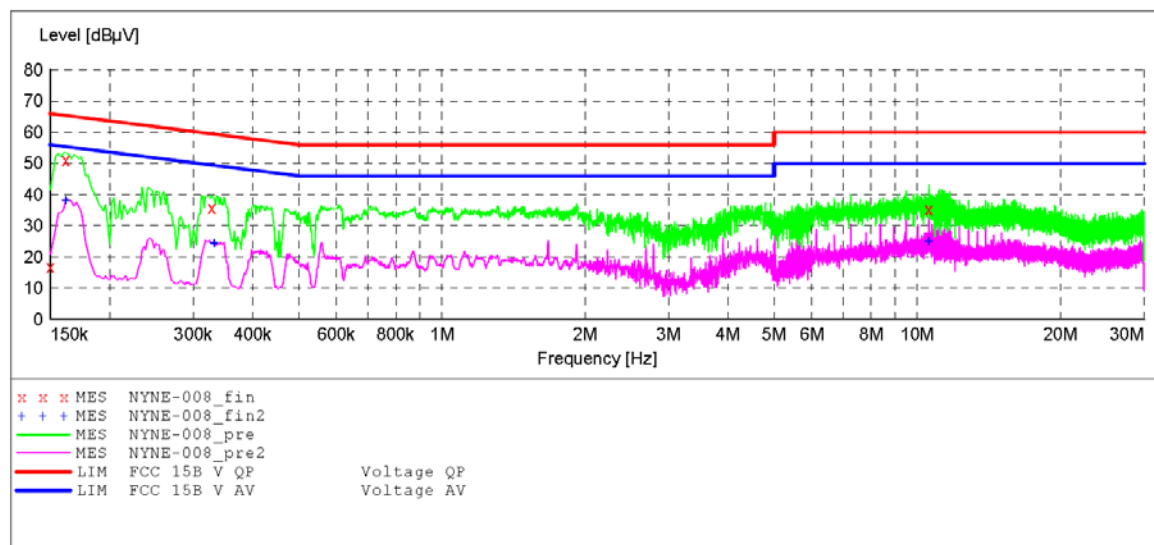
ACCURATE TECHNOLOGY CO.,LTD

CONDUCTED EMISSION STANDARD FCC PART 15B

EUT: NYNE REBEL M/N:NYNE REBEL
 Manufacturer: NYNE
 Operating Condition: NFC
 Test Site: 2#Shielding Room
 Operator: star
 Test Specification: L 120V/60Hz
 Comment: Report NO:ATE20152368
 Start of Test: 2015-11-4 / 16:07:39

SCAN TABLE: "V 150K-30MHZ fin"

Short Description: SUB STD VTERM2 1.70
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 150.0 kHz 30.0 MHz 4.5 kHz QuasiPeak 1.0 s 9 kHz LISN (ESH3-Z5)
 Average



MEASUREMENT RESULT: "NYNE-008_fin"

2015-11-4 16:09

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.162000	51.10	10.4	65	14.3	QP	L1	GND
0.328000	35.70	11.1	60	23.8	QP	L1	GND
10.595000	35.10	11.9	60	24.9	QP	L1	GND

MEASUREMENT RESULT: "NYNE-008_fin2"

2015-11-4 16:09

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.162000	38.10	10.4	55	17.3	AV	L1	GND
0.332000	24.40	11.1	49	25.0	AV	L1	GND
10.595000	24.90	11.9	50	25.1	AV	L1	GND

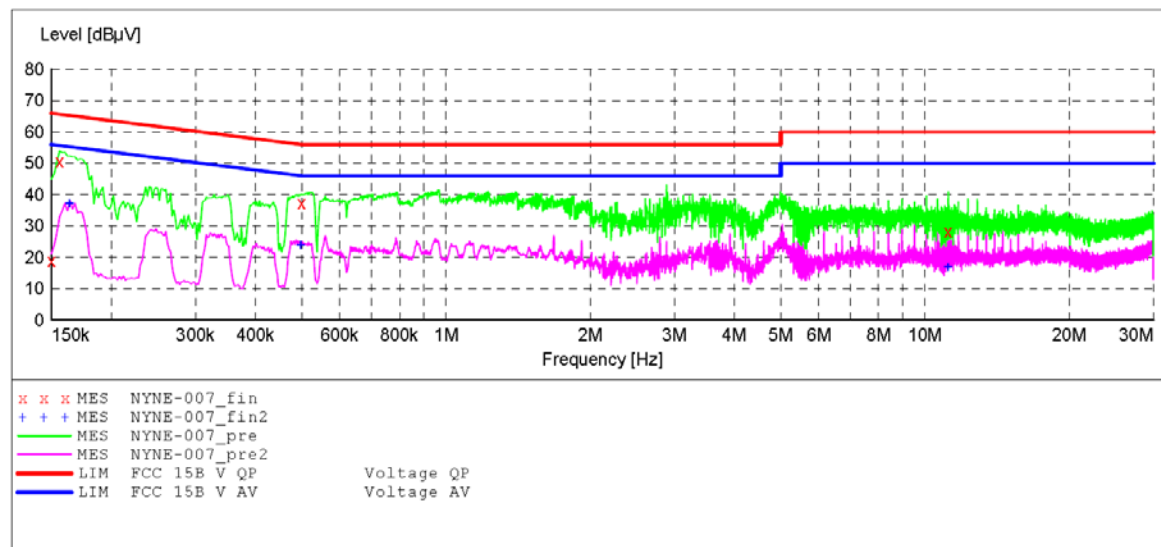
ACCURATE TECHNOLOGY CO., LTD

CONDUCTED EMISSION STANDARD FCC PART 15B

EUT: NYNE REBEL M/N: NYNE REBEL
 Manufacturer: NYNE
 Operating Condition: NFC
 Test Site: 2#Shielding Room
 Operator: star
 Test Specification: N 120V/60Hz
 Comment: Report NO: ATE20152368
 Start of Test: 2015-11-4 / 16:05:58

SCAN TABLE: "V 150K-30MHz fin"

Short Description: SUB STD VTERM2 1.70
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 150.0 kHz 30.0 MHz 4.5 kHz QuasiPeak 1.0 s 9 kHz LISN (ESH3-Z5)
 Average



MEASUREMENT RESULT: "NYNE-007_fin"

2015-11-4 16:06

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.156000	50.70	10.4	66	15.0	QP	N	GND
0.500000	37.20	11.5	56	18.8	QP	N	GND
11.193500	28.10	11.9	60	31.9	QP	N	GND

MEASUREMENT RESULT: "NYNE-007_fin2"

2015-11-4 16:06

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.164000	37.10	10.4	55	18.2	AV	N	GND
0.498000	23.80	11.5	46	22.2	AV	N	GND
11.193500	16.70	11.9	50	33.3	AV	N	GND

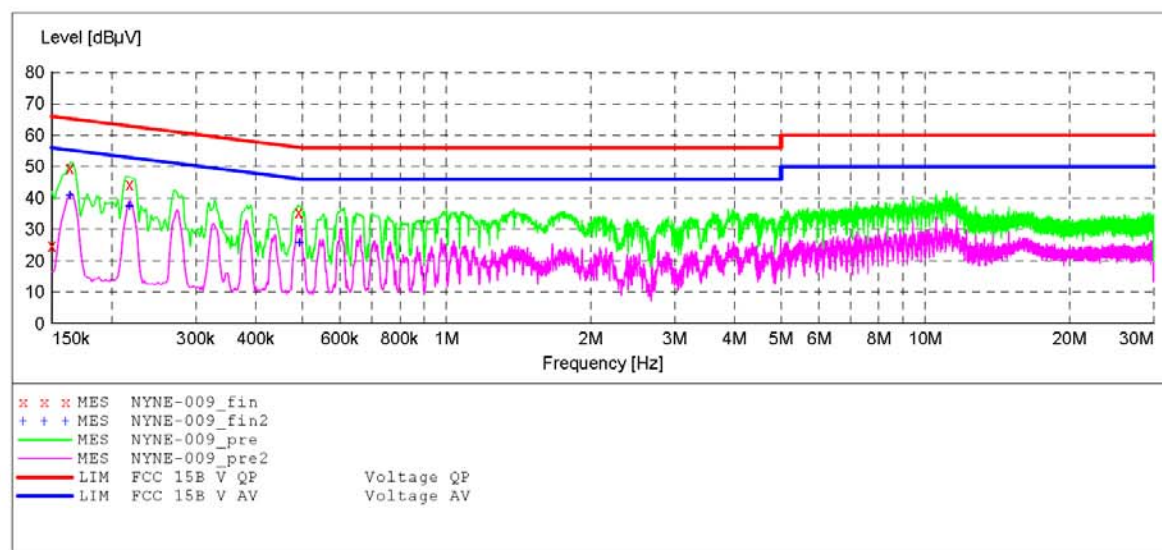
ACCURATE TECHNOLOGY CO., LTD

CONDUCTED EMISSION STANDARD FCC PART 15B

EUT: NYNE REBEL M/N: NYNE REBEL
 Manufacturer: NYNE
 Operating Condition: NFC
 Test Site: 2#Shielding Room
 Operator: star
 Test Specification: L 240V/60Hz
 Comment: Report NO: ATE20152368
 Start of Test: 2015-11-4 / 16:10:51

SCAN TABLE: "V 150K-30MHz fin"

Short Description: SUB STD VTERM2 1.70
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 150.0 kHz 30.0 MHz 4.5 kHz QuasiPeak 1.0 s 9 kHz LISN (ESH3-Z5)
 Average



MEASUREMENT RESULT: "NYNE-009_fin"

2015-11-4 16:15

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.164000	49.40	10.4	65	15.9	QP	L1	GND
0.218000	44.30	10.7	63	18.6	QP	L1	GND
0.492000	35.40	11.5	56	20.7	QP	L1	GND

MEASUREMENT RESULT: "NYNE-009_fin2"

2015-11-4 16:15

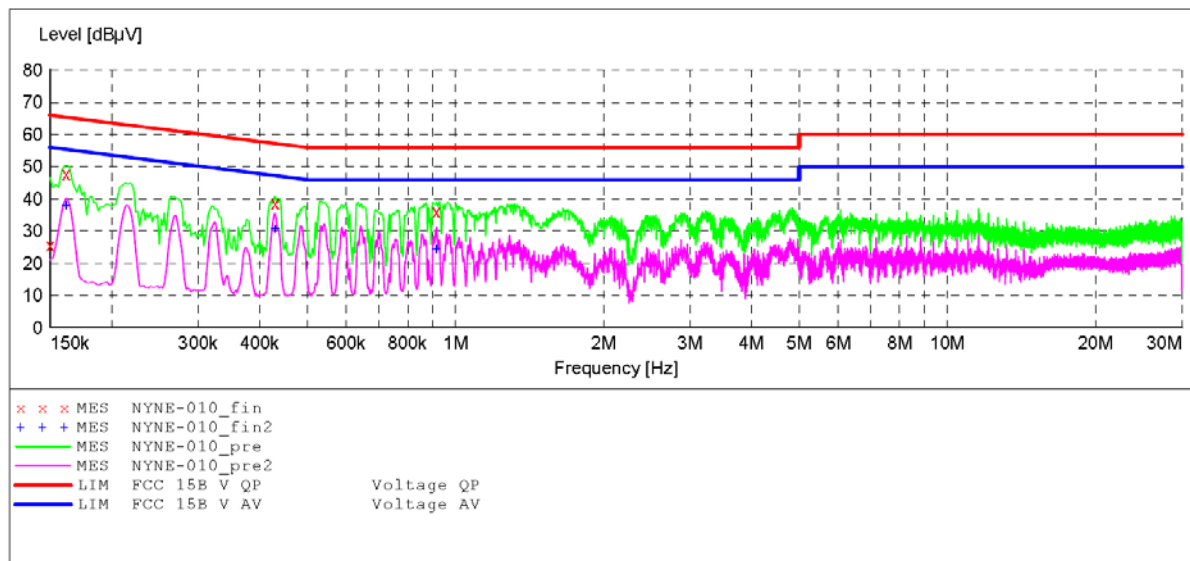
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.164000	40.80	10.4	55	14.5	AV	L1	GND
0.218000	37.30	10.7	53	15.6	AV	L1	GND
0.494000	25.70	11.5	46	20.4	AV	L1	GND

CONDUCTED EMISSION STANDARD FCC PART 15B

EUT: NYNE REBEL M/N: NYNE REBEL
 Manufacturer: NYNE
 Operating Condition: NFC
 Test Site: 2#Shielding Room
 Operator: star
 Test Specification: N 240V/60Hz
 Comment: Report NO: ATE20152368
 Start of Test: 2015-11-4 / 16:16:00

SCAN TABLE: "V 150K-30MHz fin"

Short Description: SUB STD VTERM2 1.70
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 150.0 kHz 30.0 MHz 4.5 kHz QuasiPeak 1.0 s 9 kHz LISN (ESH3-Z5)
 Average



MEASUREMENT RESULT: "NYNE-010_fin"

2015-11-4 16:17

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.162000	47.80	10.4	65	17.6	QP	N	GND
0.430000	38.50	11.4	57	18.8	QP	N	GND
0.914000	36.10	11.6	56	19.9	QP	N	GND

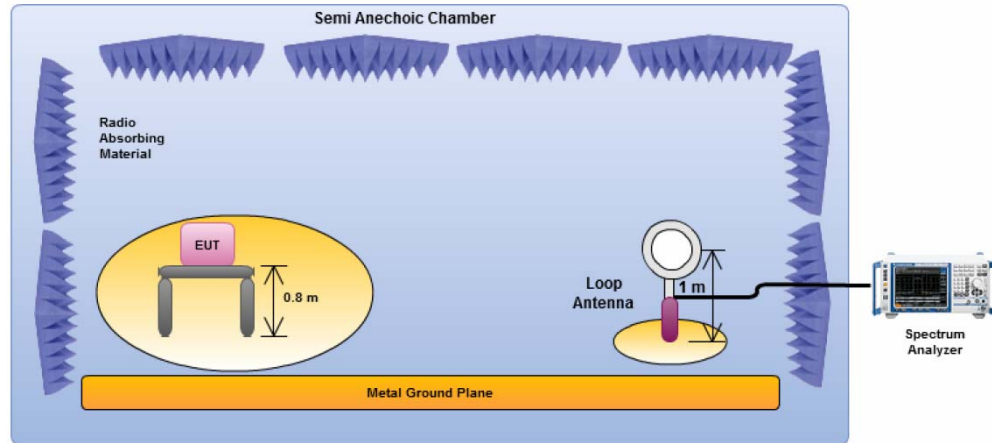
MEASUREMENT RESULT: "NYNE-010_fin2"

2015-11-4 16:17

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.162000	37.90	10.4	55	17.5	AV	N	GND
0.430000	30.50	11.4	47	16.8	AV	N	GND
0.914000	24.30	11.6	46	21.7	AV	N	GND

6. 20DB BANDWIDTH MEASUREMENT

6.1. Block Diagram of Test Setup



(EUT: NYNE REBEL)

6.2. The Requirement For Section 15.225 and 15.215(c)

Intentional radiators must be designed to ensure that the 20db bandwidth of the emissions in the specific band(13.110-14.010MHz).

6.3. EUT Configuration on Measurement

The equipment is installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

6.4. Operating Condition of EUT

6.4.1. Setup the EUT and simulator as shown as Section 6.1.

6.4.2. Turn on the power of all equipment.

6.4.3. Let the EUT work in TX modes measure it. The TX frequency is 13.56 MHz.

6.5. Test Procedure

6.5.1. The EUT is placed on a turntable, which is 0.8m above the ground plane and worked at highest radiated power.

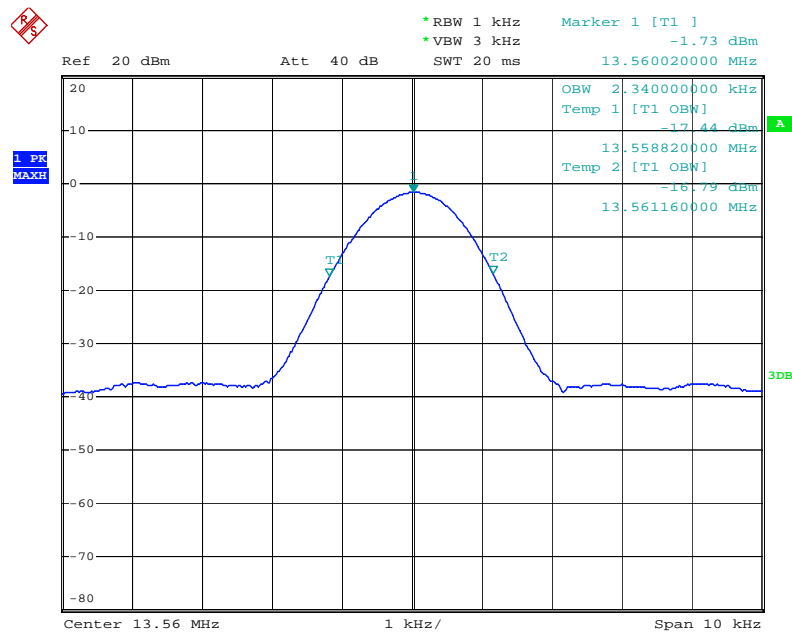
6.5.2. Set RBW of spectrum analyzer to 1 kHz and VBW to 3 kHz.

6.5.3. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

6.6. Test Result

Channel Frequency (MHz)	20dB Bandwidth (KHz)	PASS/FAIL
13.56	2.34	PASS

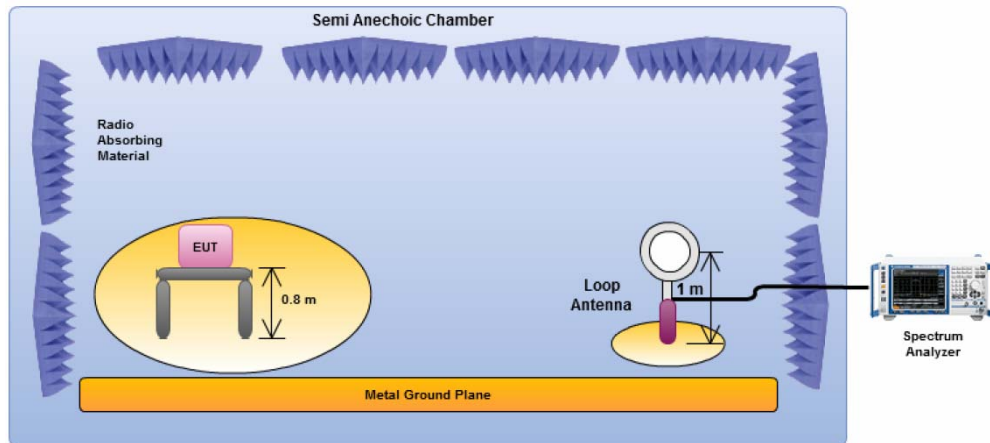
The spectrum analyzer plots are attached as below.



Date: 27.JUN.2014 10:02:16

7. FIELD STRENGTH OF FUNDAMENTAL EMISSIONS AND SPECTRUM MASK

7.1. Block Diagram of Test Setup



(EUT: NYNE REBEL)

7.2. The Requirement For Section 15.225

Field Strength of Fundamental Emissions					
Emissions	(uV/m)@30m	(dBuV/m)@30m	(dBuV/m)@10m	(dBuV/m)@3m	(dBuV/m)@1m
Fundamental	15848	84.0	103.1	124.0	143.1
Quasi peak measurement of the fundamental.					

Spectrum Mask					
Freq. of Emission (MHz)	(uV/m)@30m	(dBuV/m)@30m	(dBuV/m)@10m	(dBuV/m)@3m	(dBuV/m)@1m
1.705~13.110	30	29.5	48.6	69.5	88.6
13.110~13.410	106	40.5	59.6	80.5	99.6
13.410~13.553	334	50.5	69.6	90.5	109.6
13.553~13.567	15848	84.0	103.1	124.0	143.1
13.567~13.710	334	50.5	69.6	90.5	109.6
13.710~14.010	106	40.5	59.6	80.5	99.6
14.010~30.000	30	29.5	48.6	69.5	88.6

7.3. EUT Configuration on Measurement

The equipment is installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

7.4. Operating Condition of EUT

7.4.1. Setup the EUT and simulator as shown as Section 6.1.

7.4.2. Turn on the power of all equipment.

7.4.3. Let the EUT work in TX modes measure it. The TX frequency is 13.56 MHz.

7.5. Test Procedure

7.5.1. The EUT is placed on a turntable, which is 0.8m above the ground plane and worked at highest radiated power. EUT is set 3m away from the receiving antenna

7.5.2. Set RBW of spectrum analyzer to 10 kHz and VBW to 30 kHz.

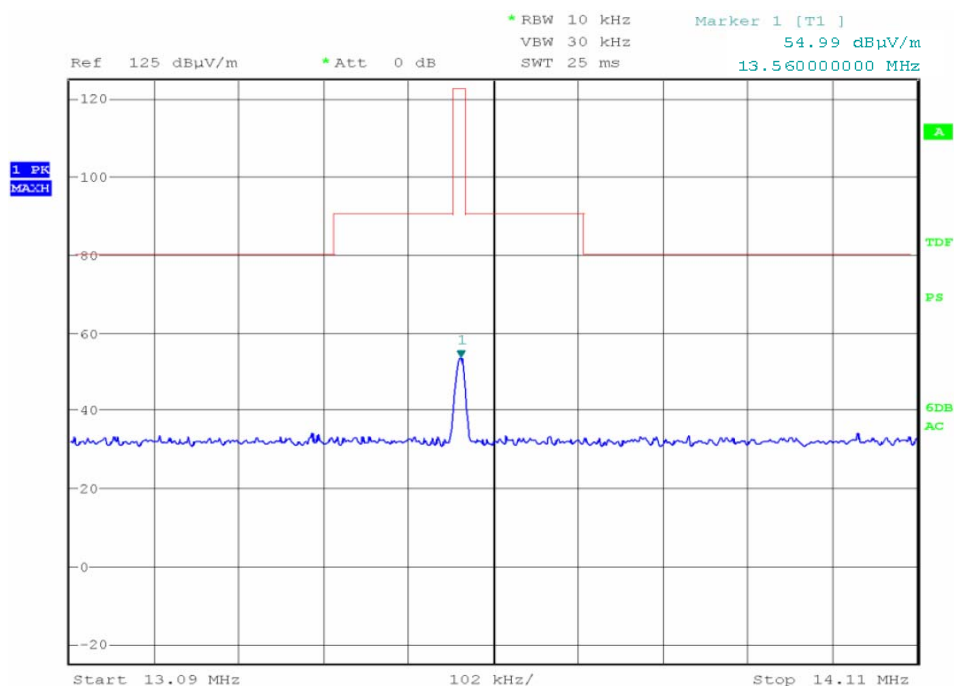
7.5.3. For radiated measurement. Loop antenna was rotated about the horizontal and vertical axis and the equipment to be measured and the test antenna shall be oriented to obtain the maximum emitted field strength level.

7.6. Test Result

Frequency(MHz)	Fundamental (dBμV/m)@3m	Polarization	Margin(dB)	Limit (dBμV/m)@3m
13.56	2.4GHz	Horizontal	-69.01	124.00
Result		Complied		

Note: Measurement worst emissions of receive antenna polarization: H(Horizontal).

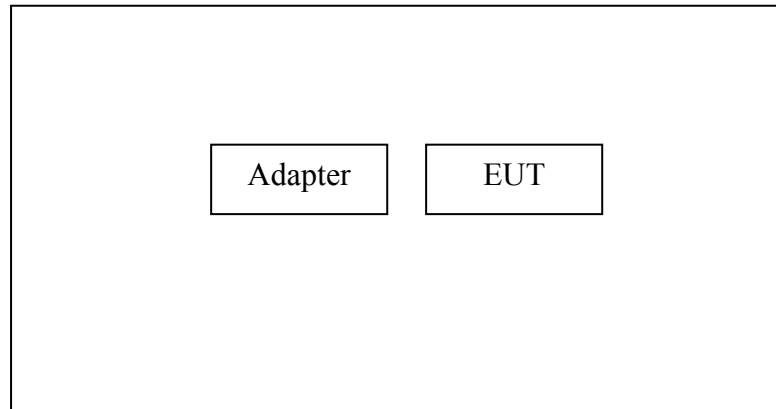
The spectrum analyzer plots are attached as below.



8. RADIATED EMISSION MEASUREMENT

8.1. Block Diagram of Test Setup

8.1.1. Block diagram of connection between the EUT and peripherals

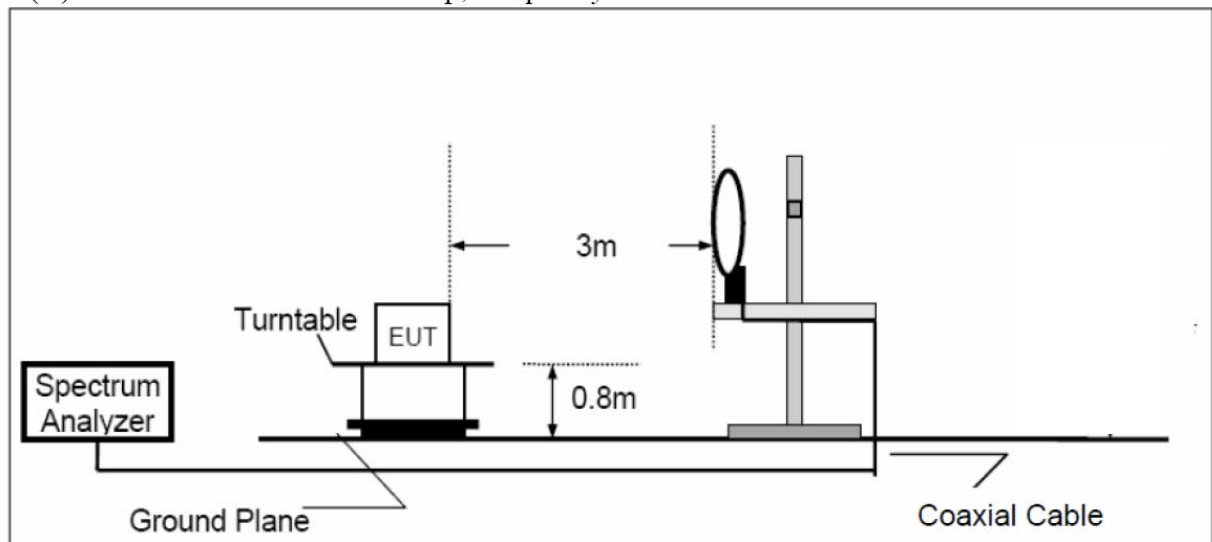


Setup: Transmitting mode

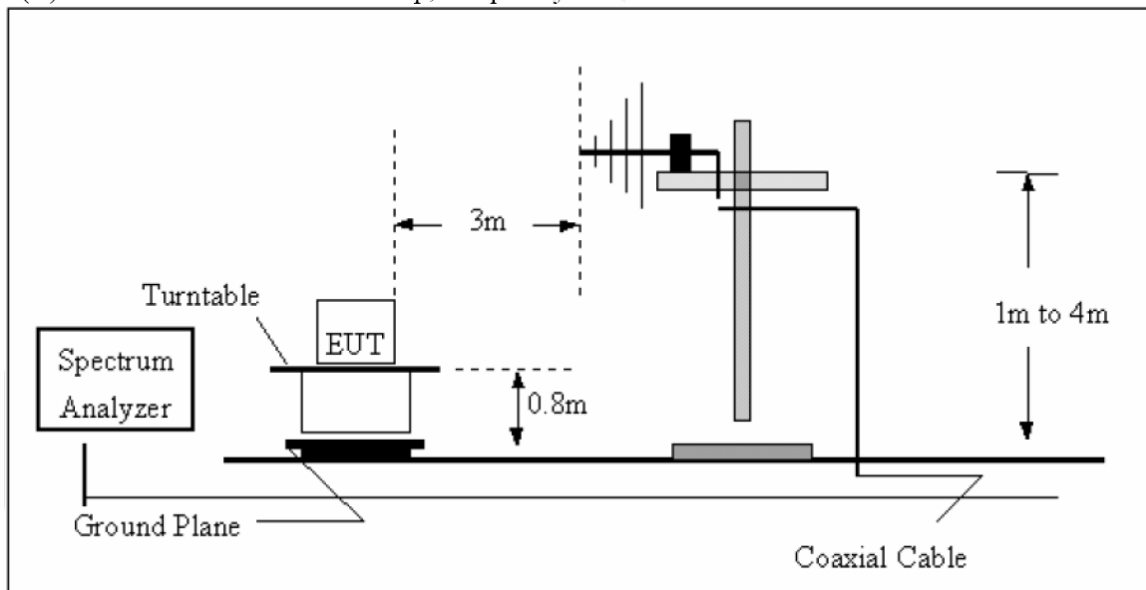
(EUT: NYNE REBEL)

8.2. TEST CONFIGURATION

(A) Radiated Emission Test Set-Up, Frequency below 30MHz



(B) Radiated Emission Test Set-Up, Frequency 30-1000MHz



8.3. Radiated Emission Limit

Transmitter Radiated Unwanted Emissions Limit			
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below 30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

8.4. EUT Configuration on Measurement

The equipment is installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

8.5. Operating Condition of EUT

8.5.1. Setup the EUT and simulator as shown as Section 8.1

8.5.2. Turn on the power of all equipment.

8.5.3. Let the EUT work in test mode and measure it.

8.6. Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground (Below 1GHz). The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bi-log antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the EUT location must be manipulated according to ANSI C63.10:2013 on radiated emission measurement. The EUT was tested in 3 orthogonal planes.

From 9kHz to 30MHz at distance 3m The EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.

From 30MHz to 1000MHz at distance 3m The measuring antenna height varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity. The measurements were performed for both vertical and horizontal antenna polarization.

The final measurement will be performed with an EMI Receiver set to Quasi Peak detector for the frequency bands 9kHz to 90kHz and 110 to 490 kHz where an average detector will be used according to Section 15.209(d)(2).

The final level, expressed in dBuV/m, is arrived at by taking the reading from the EMI receiver (Level dBuV) and adding the antenna correction factor and cable loss factor (Factor dB) to it. This result then has to be compared with the relevant FCC limit. The resolution bandwidth during the measurement is as follows:

9kHz – 150kHz: ResBW:200Hz

150kHz – 30MHz: ResBW:9kHz

The bandwidth of the EMI test receiver (R&S ESCS30) is set at 120kHz from 30MHz to 1000MHz.

8.7. Radiated Emission Noise Measurement Result

PASS.

From 9kHz to 30MHz

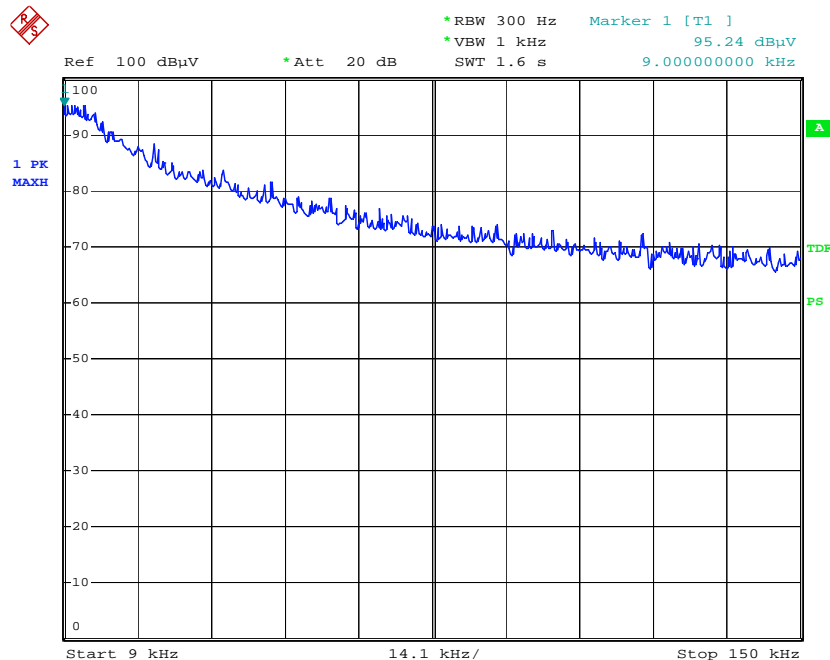
Frequency (MHz)	Maximum Reading (dBμV/m) @3m	Table Angle Degree	Antenna Height (m)	Correction Factor (dB)	Corrected Amplitude (dBμV/m) @ 3m	Limit (dBμV/m) @3m	Margin (dB)
0.009	7.37	153	1.2	87.86	95.23	128.52	-33.29
0.150	10.37	38	1.1	63.55	73.92	104.00	-30.08
17.892	12.34	213	1.3	31.92	44.26	69.5	-25.24
21.820	16.86	192	1.1	31.47	48.33	69.5	-21.17

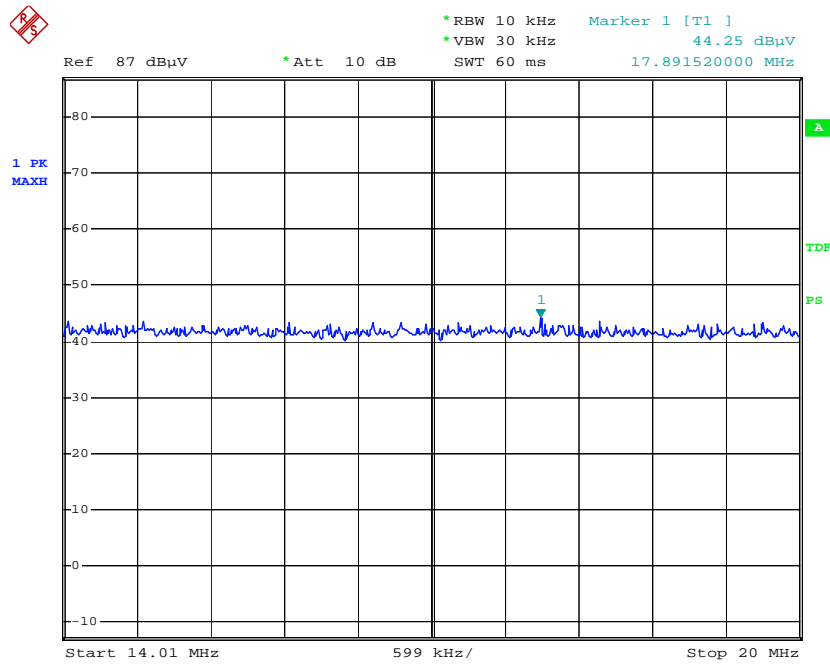
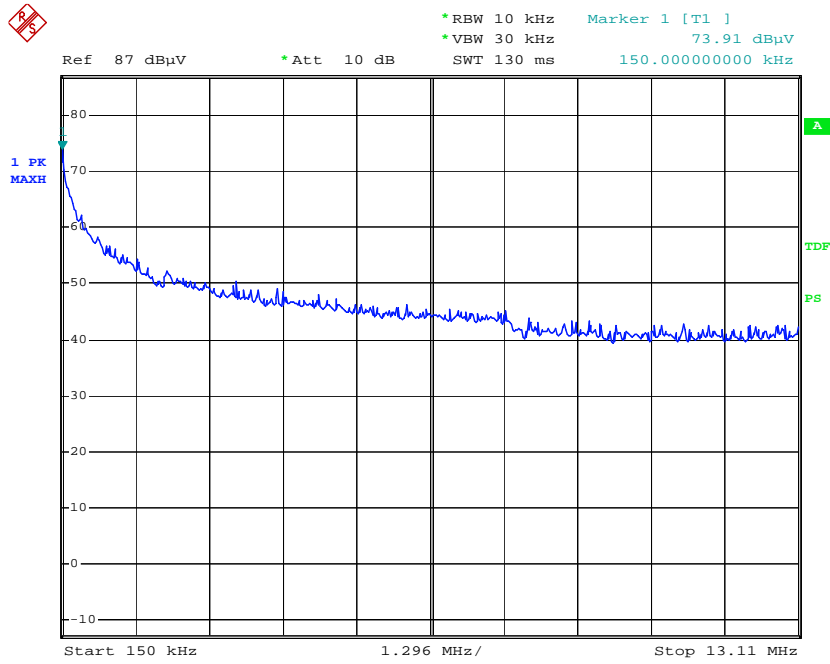
Part 15 Section 15.31(f)(2) (9kHz-30MHz)

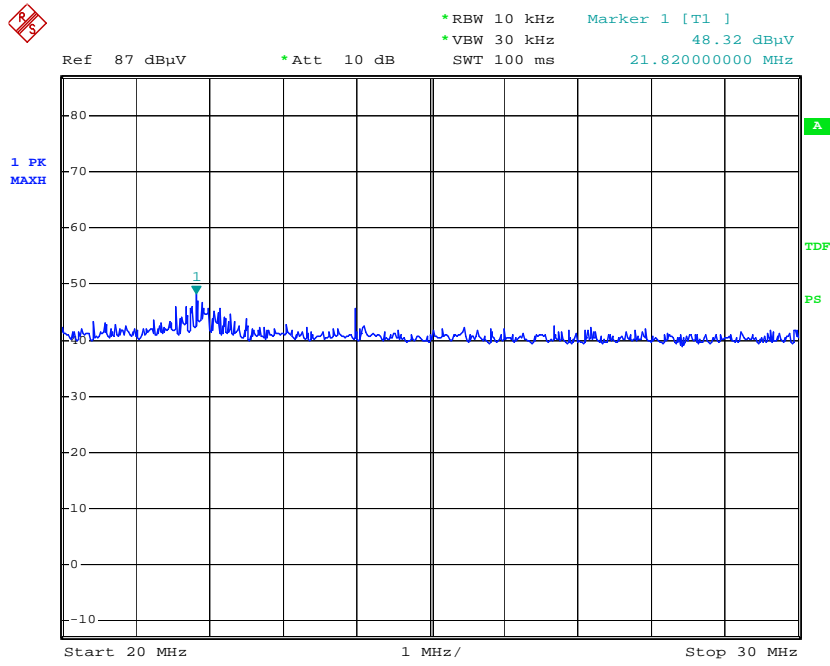
Limit at 3m=Limit at 300m+40*log(300(m)/3(m))

Limit at 3m=Limit at 30m+40*log(30(m)/3(m))

The spectrum analyzer plots are attached as below.









ACCURATE TECHNOLOGY CO., LTD.

F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 1# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: star2015 #2140
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: NYNE REBEL
Mode: NFC
Model: NYNE REBEL
Manufacturer: NYNE

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 15/11/14/
Time: 10/17/08
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20152368



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	193.8163	53.69	-19.08	34.61	43.50	-8.89	QP			
2	238.4626	54.17	-18.26	35.91	46.00	-10.09	QP			
3	282.2702	54.30	-16.65	37.65	46.00	-8.35	QP			



ACCURATE TECHNOLOGY CO., LTD.

F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 1# Chamber

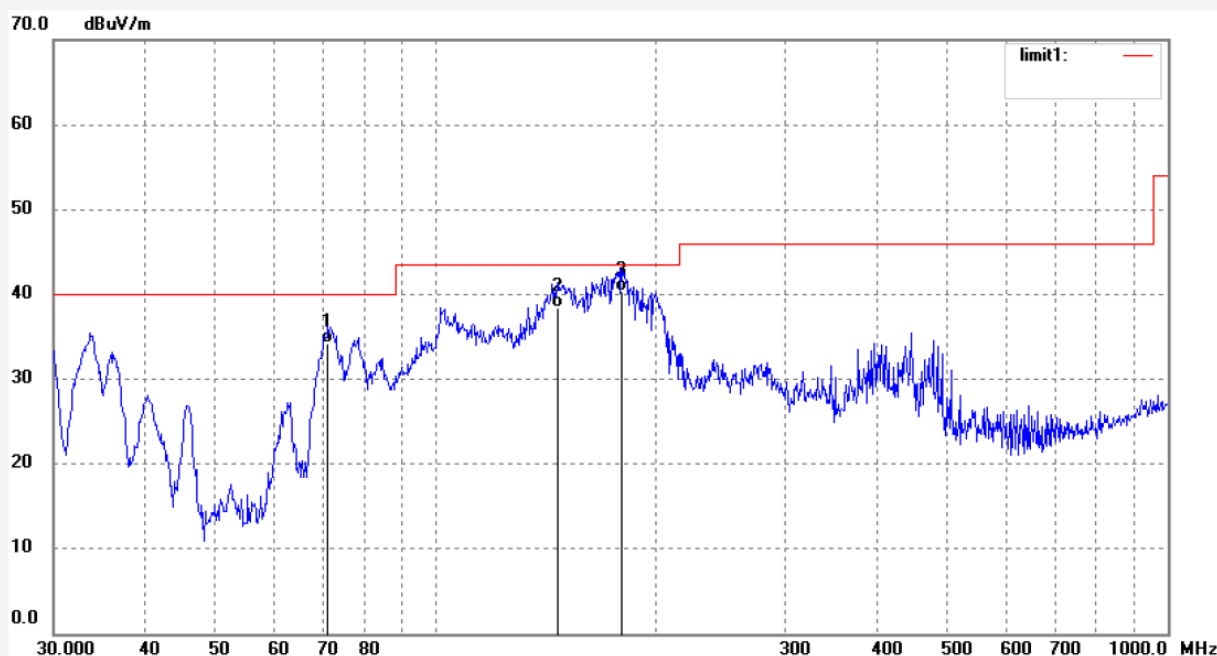
Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: star2015 #2141
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: NYNE REBEL
Mode: NFC
Model: NYNE REBEL
Manufacturer: NYNE

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 15/11/14/
Time: 10/18/36
Engineer Signature: star
Distance: 3m

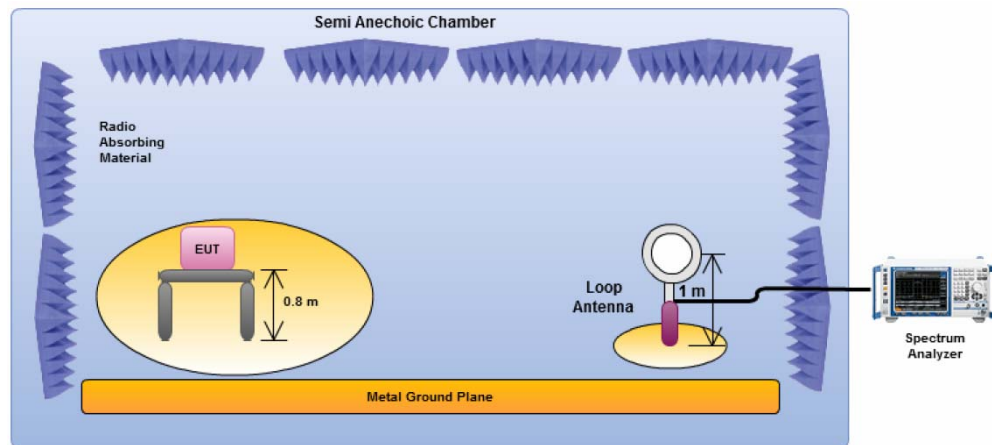
Note: Report No.:ATE20152368



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	71.2032	57.10	-22.92	34.18	40.00	-5.82	QP			
2	146.8392	60.72	-22.28	38.44	43.50	-5.06	QP			
3	179.3989	60.80	-20.38	40.42	43.50	-3.08	QP			

9. FIELD STRENGTH OF FUNDAMENTAL EMISSIONS AND SPECTRUM MASK

9.1. Block Diagram of Test Setup



(EUT: NYNE REBEL)

9.2. The Requirement For Section 15.225

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency over a temperature variation of -20 degrees to $+50$ degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery

9.3. EUT Configuration on Measurement

The equipment is installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

9.4. Operating Condition of EUT

9.4.1. Setup the EUT and simulator as shown as Section 6.1.

9.4.2. Turn on the power of all equipment.

9.4.3. Let the EUT work in TX modes measure it. The TX frequency is 13.56 MHz.

9.5. Test Procedure

9.5.1. The EUT is placed on a turntable, which is 0.8m above the ground plane and worked at highest radiated power. EUT is set 3m away from the receiving antenna

9.5.2. For radiated measurement. Loop antenna was rotated about the horizontal and vertical axis and the equipment to be measured and the test antenna shall be oriented to obtain the maximum emitted field strength level.

9.6. Test Result

Temperature Interval	Voltage	Fundamental Frequency (MHz)	Fundamental Frequency Deviation (%)	PASS/FAIL
-20 °C	120V AC	13.560202	0.001	PASS
-10 °C	120V AC	13.560225	0.002	PASS
0 °C	120V AC	13.560220	0.002	PASS
+10 °C	120V AC	13.560183	0.001	PASS
+20 °C	120V AC	13.560146	0.001	PASS
+30 °C	120V AC	13.560123	0.001	PASS
+40 °C	120V AC	13.560094	0.001	PASS
+50 °C	120V AC	13.560078	0.001	PASS
+20 °C	102V AC	13.560088	0.001	PASS
+20 °C	138V AC	13.560096	0.001	PASS

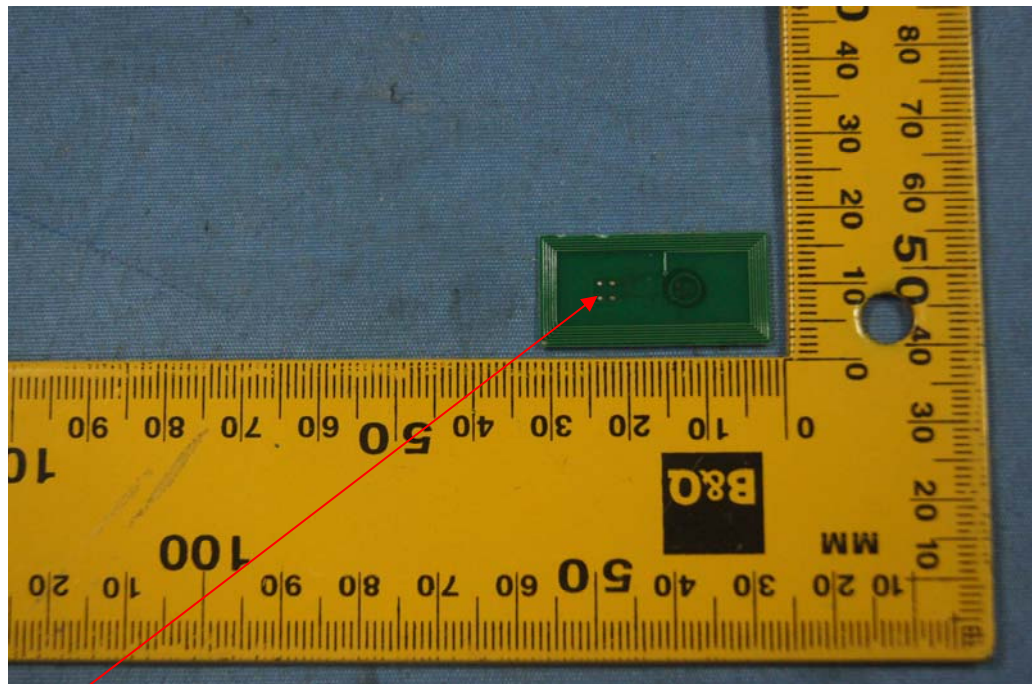
10.ANTENNA REQUIREMENT

10.1.The Requirement

According to Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

10.2.Antenna Construction

Device is equipped with PCB Antenna, which isn't displaced by other antenna. The Antenna gain of EUT is 0dBi. Therefore, the equipment complies with the antenna requirement of Section 15.203.



Antenna