

TEST REPORT

Report No.: SRTC2020-9003(F)-0021
Product Name: tracker
Model Name: CP314AT
Applicant: Yulong Computer Telecommunication Scientific
(Shenzhen) Co., Ltd
Manufacturer: Yulong Computer Telecommunication Scientific
(Shenzhen) Co., Ltd
Specification: FCC Part15B (Certification)
(2020 edition)
ANSI C63.4-2014
FCC ID: R38YLCP314AT

The State Radio_monitoring_center Testing Center (SRTC)
15th Building, No.30 Shixing Street, Shijingshan District,
Beijing, China

Tel: 86-10-57996183 Fax: 86-10-57996388

CONTENTS

1. General information	3
1.1 Notes of the test report	3
1.2 Information about the testing laboratory.....	3
1.3 Applicant's details	3
1.4 Manufacturer's details.....	3
1.5 Application details	4
1.6 Reference specification.....	4
1.7 Information of EUT	4
1.7.1 General information.....	4
1.7.2EUT details	5
1.7.3 Auxiliary equipment details.....	5
2. Test information	6
2.1 Summary of the test results	6
2.2 Test result.....	7
2.2.1Conducted Emissions-FCC Part15.107	7
2.2.2Radiated Emissions-FCC Part15.109.....	12
2.3. List of test equipments	22

1. General information

1.1 Notes of the test report

The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written permission of The State Radio_monitoring_center Testing Center (SRTC).

The test results relate only to individual items of the samples which have been tested.

1.2 Information about the testing laboratory

Company: The State Radio_monitoring_center Testing Center (SRTC)
Address: 15th Building, No.30 Shixing Street, Shijingshan District
Testing location: No.80, Zhaojiachang, BeizangCun, Daxing District, Beijing, China.
City: Beijing
Country or Region: China
Contacted person: Liu Jia
Tel: +86 10 57996183
Fax: +86 10 57996388
Email: liujiaf@srtc.org.cn

1.3 Applicant's details

Company: Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd
Address: Building B, Boton Science Park, Chaguang Road, Xili Town, Nanshan District, Shenzhen, China
City: Shenzhen
Country or Region: China
Contacted person: Emily
Tel: 15089742056
Email: zhangxuzhu@yulong.com

1.4 Manufacturer's details

Company: Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd
Address: Building B, Boton Science Park, Chaguang Road, Xili Town, Nanshan District, Shenzhen, China
City: Shenzhen
Country or Region: China
Contacted person: Emily
Tel: 15089742056
Email: zhangxuzhu@yulong.com

1.5 Application details

Date of reception of test sample: 13th Jun. 2020

Date of test: 13th Jun. 2020 to 18th Jun. 2020

1.6 Reference specification

FCC Part 15B, 2020 (Certification)

1.7 Information of EUT

1.7.1 General information

Product Name of EUT	tracker
Model of EUT	CP314AT
Marketing Name of EUT	Coolpad
FCC ID	R38YLCP314AT
Frequency Range	WCDMA Band II / WCDMA Band IV / WCDMA Band V LTE: FDD 2/ FDD 4/ FDD 5/ FDD 12/FDD 13/ FDD 25/ FDD 26/ FDD 66/ FDD 71/ TDD 41 WiFi: 2.4~2.4835GHz
Power Supply	Charger/Battery
Nominal Voltage	3.85V
Extreme Temperature	Lowest: -10°C Highest: +50°C
Extreme Voltage	Minimum: 3.6V Maximum: 4.3V
HW Version	P1
SW Version	3.18.505.P0.200514.cp314AT

1.7.2 EUT details

No.	Product Name	Model Name	IMEI
EUT	tracker	CP314AT	864156050004451

1.7.3 Auxiliary equipment details

AE (Auxiliary Equipment) 1#: Charger1

Manufacturer	Shenzhen RUIDE
Model Number	RD0501000-USBA-18MG
Input Voltage	100V-240V AC
Output Voltage	5V DC

AE (Auxiliary Equipment) 2#: Charger2

Manufacturer	SHENZHEN KOSUN
Model Number	618045
Input Voltage	100V-240V AC
Output Voltage	5V DC

AE (Auxiliary Equipment) 3#: Battery

Manufacturer	Lishen
Model Number	CPLD-432
Capacity	890(min)/910(typ)mAh
Nominal Voltage	3.85V

AE (Auxiliary Equipment) 4#: USB Cable

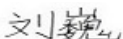
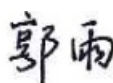
Manufacturer	Leagtech Electronics Co.,LTD
Model Number	LS-KP009

Note: This application has two Kinds of adapter. In this report, two kinds of adapters are tested.

2. Test information

2.1 Summary of the test results

No.	Test case	FCC reference	Verdict
1	Conducted emissions	15.107	Pass
2	Radiated emissions	15.109	Pass

Approved By: Liu Wei Director of the test department 	Checked By: Guo Yu Vice director of the test department 
Tested by: Mr. Lv Youyou Test engineer 	Issued date: 2020.07.16

2.2 Test result

2.2.1 Conducted Emissions-FCC Part15.107

Ambient condition:

Temperature	Relative humidity	Pressure
22.4℃	40.5%	100.8kPa

Test Setup with charger:

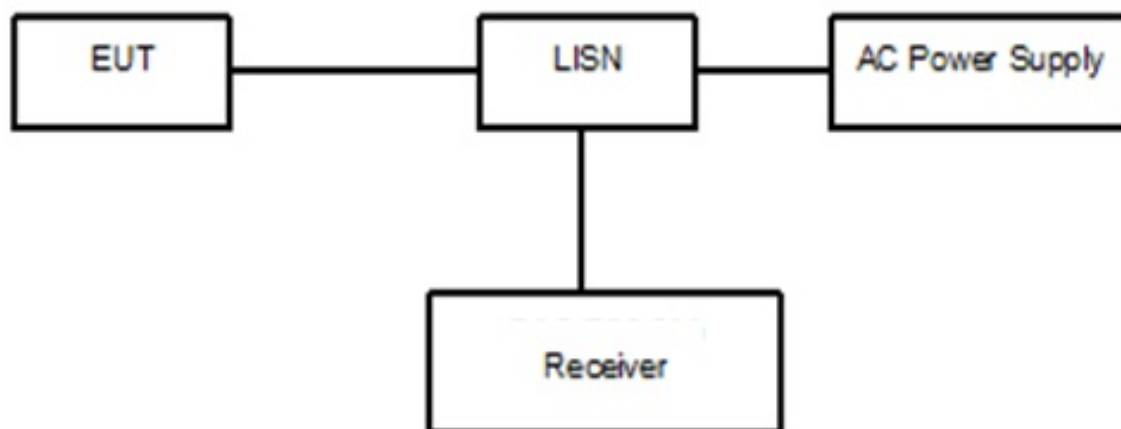


Figure 1

Test Procedure:

The EUT is placed on a non-metallic table 0.8m above the horizontal metal reference ground plane. Activate the equipment and adjust the comprehensive tester to make the equipment in different receiving modes. Preliminary measurements should be done to ensure that the data recorded in the report is the worst mode of the equipment. This report records the low channel data of WCDMA band 5 and LTE band 12. The LISN is connected to the reference ground.

The test set-up and the test methods are performed according to ANSI C63.4:2014. Then start the test software EMC32. Sweep the whole frequency band through the range from 150 KHz to 30 MHz with RBW 9kHz, VBW 30kHz. The measurement should be done for both L line and N line. During pre-test, the receiver uses both peak detector and average detector. And the final test, the receiver uses both average detector and Quasi-peak detector.

The data of cable loss has been calibrated in full testing frequency range before the testing.

A "reference path loss" Corr.(dB) is established and the $L_{\text{cable}} + \text{ATT} + \text{VDF}$ is the attenuation of "reference path loss", and including the cable loss, the attenuation of the attenuator, the voltage division factor of AMN.

The measurement results are obtained as described below:

$$P_{\text{result}} = P_{\text{mea}} + \text{Corr. (dB)}$$

Sample calculation: $(37.19 \text{ dB}\mu\text{V}) = (7.49 \text{ dB}\mu\text{V}) + (29.7 \text{ dB})$, the corresponding frequency is 0.418650MHz.

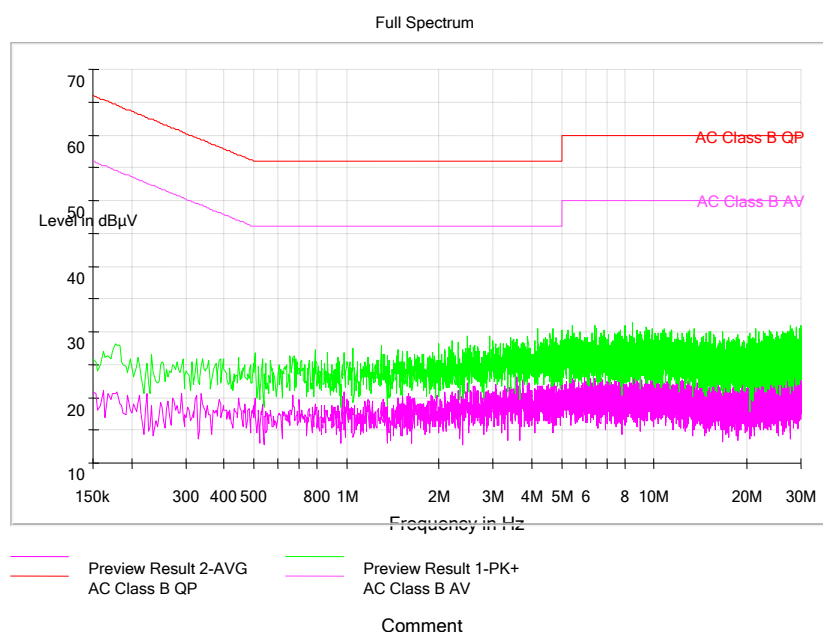
Limit:

Frequency of Emission(MHz)	Limits(dB μ V)	
	Quasi-peak	Average
0.15~0.5	66 to 56*	56 to 46*
0.5~5	56	46
5~30	60	50

Note: * Decreases with the logarithm of the frequency

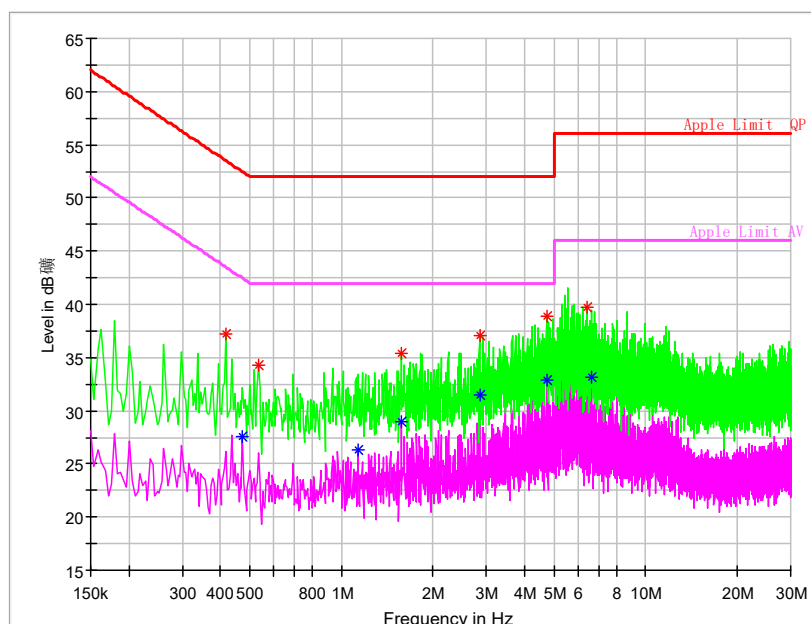
Test result:

Noise Level of the Measuring Instrument



Pic1. Conducted emission L and N Line

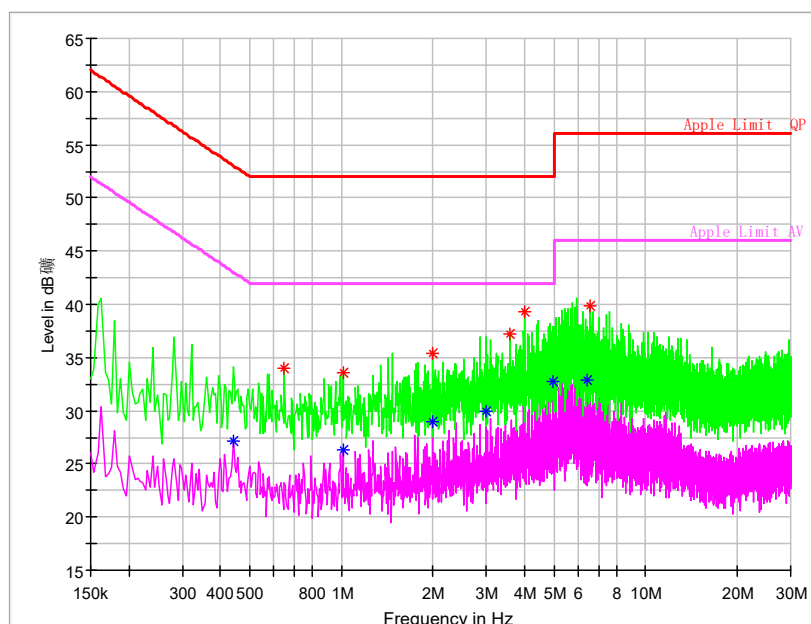
EUT+ charger1: (WCDMA Band 5)



Pic2. Conducted emission L&N Line

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	P _{mea} QuasiPeak (dBμV)	P _{mea} Average (dBμV)
0.418650	37.19	---	53.48	16.28	L1	29.7	7.49	---
0.474086	---	27.51	42.44	14.93	L1	29.7	---	-2.19
0.533786	34.29	---	52.00	17.71	L1	29.7	4.59	---
1.130786	---	26.31	42.00	15.69	L1	29.7	---	-3.39
1.570007	---	28.93	42.00	13.07	L1	29.7	---	-0.77
1.570007	35.43	---	52.00	16.57	L1	29.7	5.73	---
2.845029	37.12	---	52.00	14.88	L1	29.8	7.32	---
2.845029	---	31.42	42.00	10.58	L1	29.8	---	1.62
4.717050	38.95	---	52.00	13.05	L1	29.8	9.15	---
4.717050	---	32.87	42.00	9.13	L1	29.8	---	3.07
6.427029	39.69	---	56.00	16.31	L1	29.8	9.89	---
6.665829	---	33.22	46.00	12.78	N	29.8	---	3.42

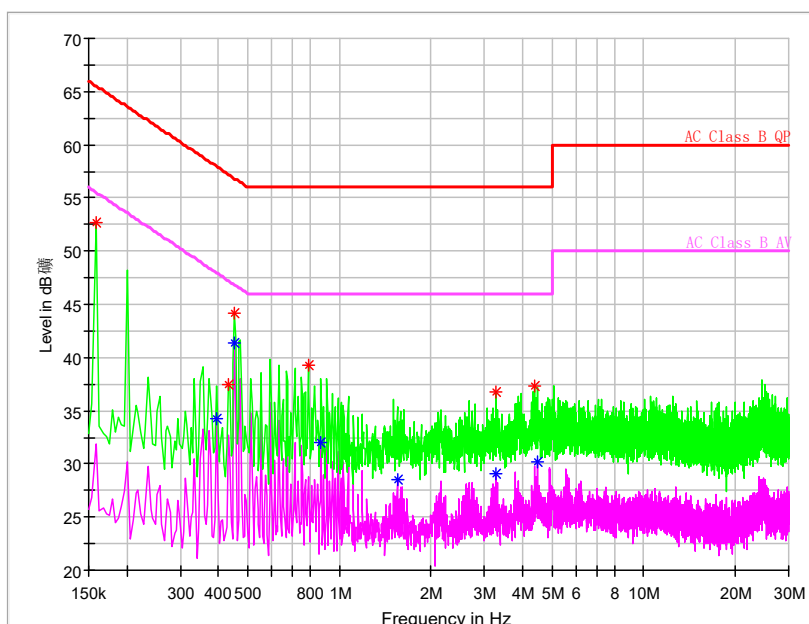
EUT+ charger1: (LTE Band 12)



Pic3. Conducted emission L&N Line

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	P _{mea} QuasiPeak	P _{mea} Average
0.439971	---	27.17	43.06	15.89	L1	29.7	---	-2.53
0.648921	33.95	---	52.00	18.05	L1	29.7	4.25	---
1.011386	33.64	---	52.00	18.36	L1	29.7	3.94	---
1.011386	---	26.37	42.00	15.63	L1	29.7	---	-3.33
1.987907	35.46	---	52.00	16.54	L1	29.7	5.76	---
1.987907	---	28.96	42.00	13.04	L1	29.7	---	-0.74
2.981486	---	29.93	42.00	12.07	L1	29.8	---	0.13
3.578486	37.14	---	52.00	14.86	L1	29.8	7.34	---
4.017707	39.33	---	52.00	12.67	L1	29.8	9.53	---
4.972907	---	32.72	42.00	9.28	L1	29.8	---	2.92
6.444086	---	32.85	46.00	13.15	L1	29.8	---	3.05
6.563486	39.90	---	56.00	16.10	N	29.8	10.1	---

EUT+ charger2:



Pic4. Conducted emission L&N Line

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	P _{mea} QuasiPeak	P _{mea} Average
0.158529	52.74	---	65.54	12.80	L1	29.7	23.0	---
0.393064	---	34.19	48.00	13.81	L1	29.7	---	4.49
0.431443	37.48	---	57.23	19.75	N	29.7	7.78	---
0.452764	---	41.40	46.82	5.42	L1	29.7	---	11.7
0.452764	44.23	---	56.82	12.60	L1	29.7	14.5	---
0.789643	39.25	---	56.00	16.75	L1	29.7	9.55	---
0.870664	---	32.02	46.00	13.98	L1	29.7	---	2.32
1.548686	---	28.46	46.00	17.54	L1	29.7	---	-1.24
3.258664	36.77	---	56.00	19.23	N	29.8	6.97	---
3.279986	---	29.10	46.00	16.90	L1	29.8	---	-0.7
4.392964	37.27	---	56.00	18.73	N	29.8	7.47	---
4.473986	---	30.22	46.00	15.78	L1	29.8	---	0.42

2.2.2 Radiated Emissions-FCC Part15.109

Ambient condition:

Temperature	Relative humidity	Pressure
22.7°C	41.2%	100.8kPa

Test Setup:

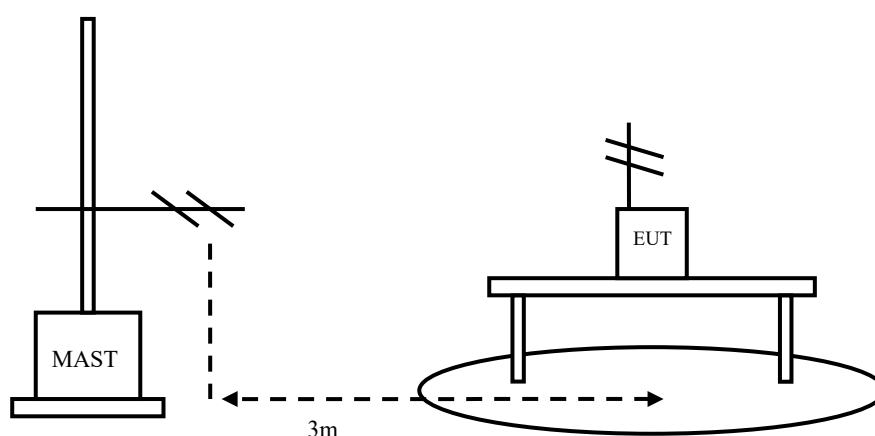


Figure 2

Test Procedure:

EUT+Charger:

The EUT should be placed on a non-metallic table 80cm above the ground plane. Activate the equipment and adjust the comprehensive tester to make the equipment in different receiving modes. Preliminary measurements should be done to ensure that the data recorded in the report is the worst mode of the equipment. This report records the low channel data of WCDMA band 5 and LTE band 12. The receive antennas shall be moved from 1 to 4 meters. The distance between EUT and receive antenna should be 3 meters.

The EUT should work in idle mode. The test set-up and the test methods are performed according to ANSI C63.4:2014.

Then start the test software EMC32. Sweep the whole frequency band through the range from 30MHz to 1GHz, using receive log period antenna VULB 9163.

During the test, the height of receive antenna shall be moved from 1 to 4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turn table shall be rotated from 0 to 360 degrees for detecting the maximum of radiated spurious signal level. The measurements shall be repeated with orthogonal polarization of the test antenna. The EUT is laid in two modes as follow:
1. put the EUT in horizontal direction; 2. put the EUT in vertical direction.

The data of cable loss and antenna factor have been calibrated in full testing frequency range before the testing. All test results are performed with max hold at the horizontal and vertical polarity.

RBW=120kHz, VBW=300kHz, when the test frequency: 30MHz<f<1GHz

RBW=1MHz, VBW=3MHz, when the test frequency: f>1GHz

A “reference path loss” is established and the A_{Rpl} is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable loss.

The measurement results are obtained as described below:

Result= $P_{mea} + A_{Rpl}$

Sample calculation: (25.78 dBμV/m) = (46.78dBμV) + (-21.0dB), the corresponding frequency is 30.388000MHz.

Limit:

Frequency of Emission(MHz)	Limits	
	Detector	Unit (dBμV/m)
30~88	Quasi-peak	40
88~216	Quasi-peak	43.5
216~960	Quasi-peak	46
960~1000	Quasi-peak	54
1000~5th harmonic of the highest frequency or 40GHz, whichever is lower	Average	54
	Peak	74

Test result:

EUT+ charger1: (WCDMA Band 5)

Frequency(MHz)	Result(dBuV/m)	A_{Rpl} (dB)	P_{mea} (dBuV)	Polarity
30.388000	25.78	-21.0	46.78	V
48.963500	21.15	-17.2	38.35	V
107.551500	26.75	-19.4	46.15	V
190.535000	24.32	-19.1	43.42	V
324.152500	27.66	-14.3	41.96	V
351.846000	25.96	-13.4	39.36	V

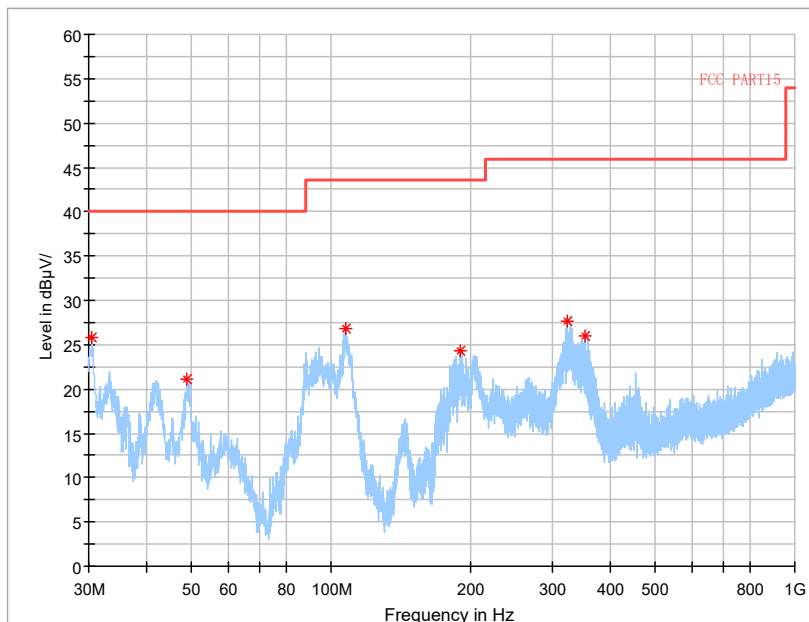
EUT+ charger1: (LTE Band 12)

Frequency(MHz)	Result(dBuV/m)	A _{Rpl} (dB)	P _{mea} (dBuV)	Polarity
30.679000	23.39	-21.0	44.39	V
85.678000	19.62	-22.0	41.62	V
87.860500	24.33	-21.3	45.63	V
207.558500	21.79	-18.1	39.89	V
348.208500	27.27	-13.5	40.77	V
353.155500	26.97	-13.3	40.27	V

EUT+ charger2:

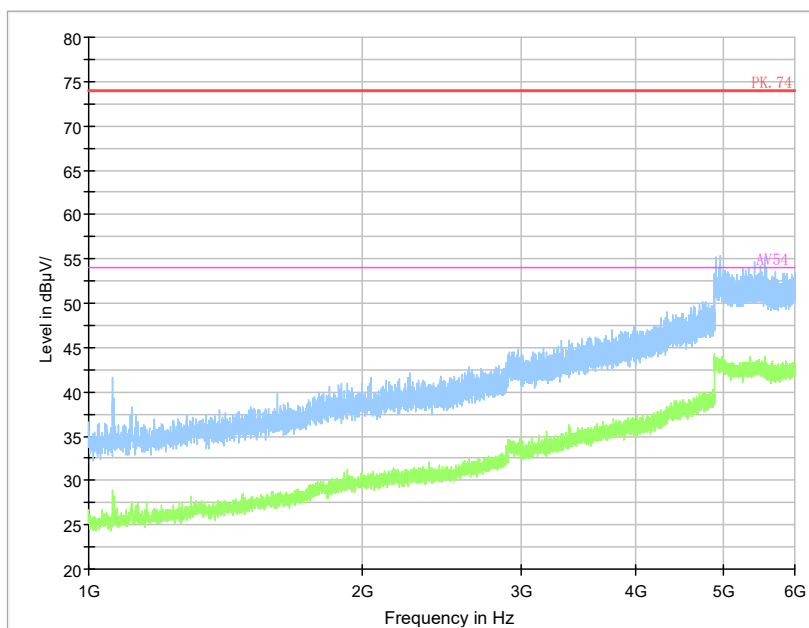
Frequency(MHz)	Result(dBuV/m)	A _{Rpl} (dB)	P _{mea} (dBuV)	Polarity
30.000000	32.67	-21.2	53.87	V
52.504000	27.82	-17.4	45.22	V
85.775000	21.44	-22.0	43.44	V
102.022500	34.49	-18.8	53.29	V
159.349500	27.03	-21.2	48.23	H
193.639000	28.83	-18.9	47.73	V

EUT+ charger1: (WCDMA Band 5)refer to Pic5,Pic6 and Pic7



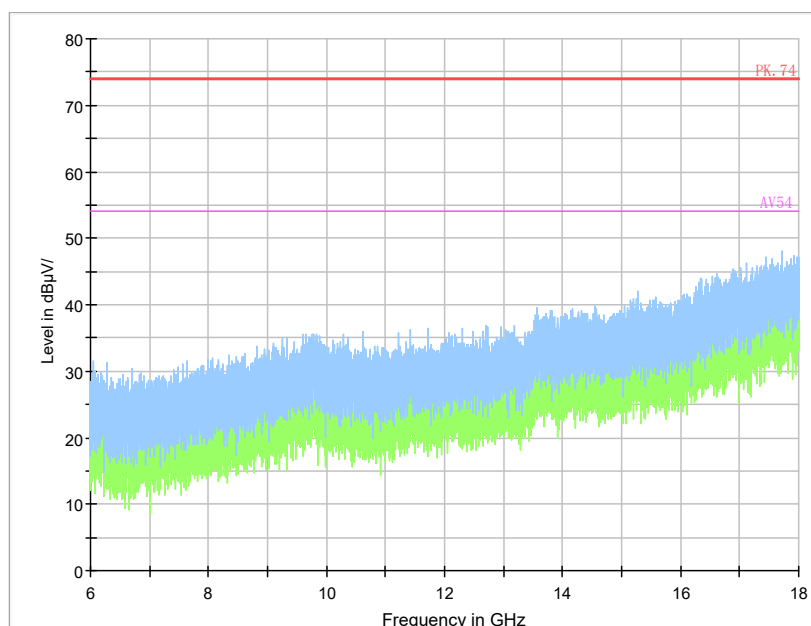
Pic5. Radiated emission (30MHz – 1GHz)

Note: The test data in the graph includes two polarizations: horizontal and vertical



Pic6. Radiated emission (1GHz –6GHz)

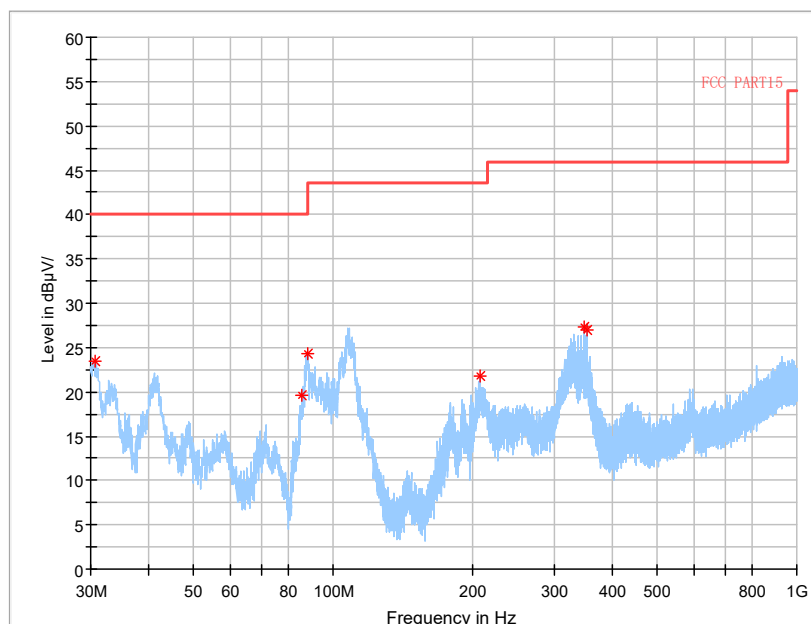
Note: The test data in the graph includes two polarizations: horizontal and vertical



Pic7. Radiated emission (6GHz –18GHz)

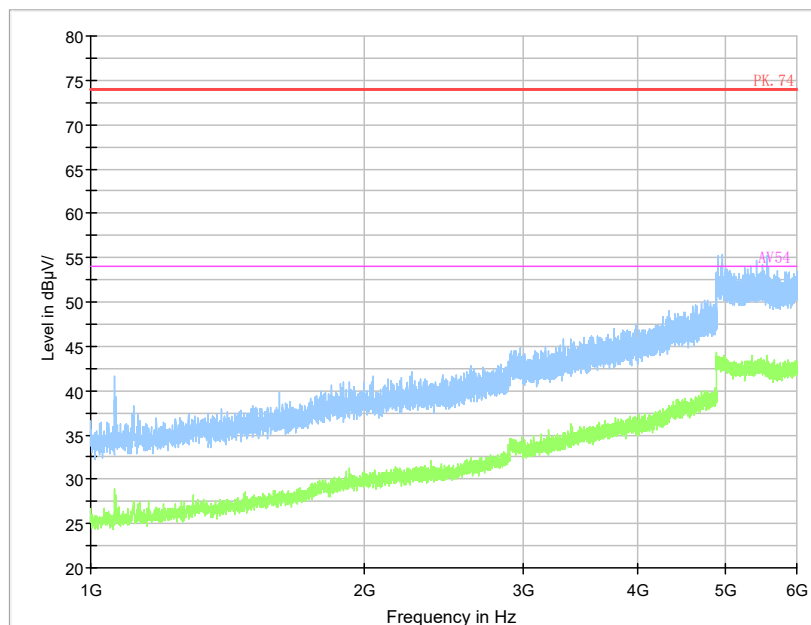
Note: The test data in the graph includes two polarizations: horizontal and vertical

EUT+ charger1: (LTE Band 12) refer to Pic8,Pic9 and Pic10



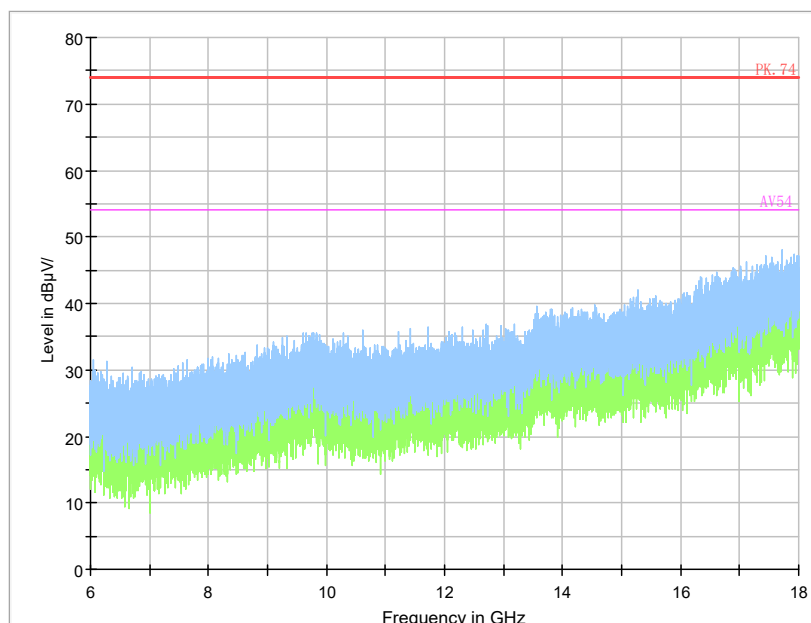
Pic8. Radiated emission (30MHz – 1GHz)

Note: The test data in the graph includes two polarizations: horizontal and vertical



Pic9. Radiated emission (1GHz –6GHz)

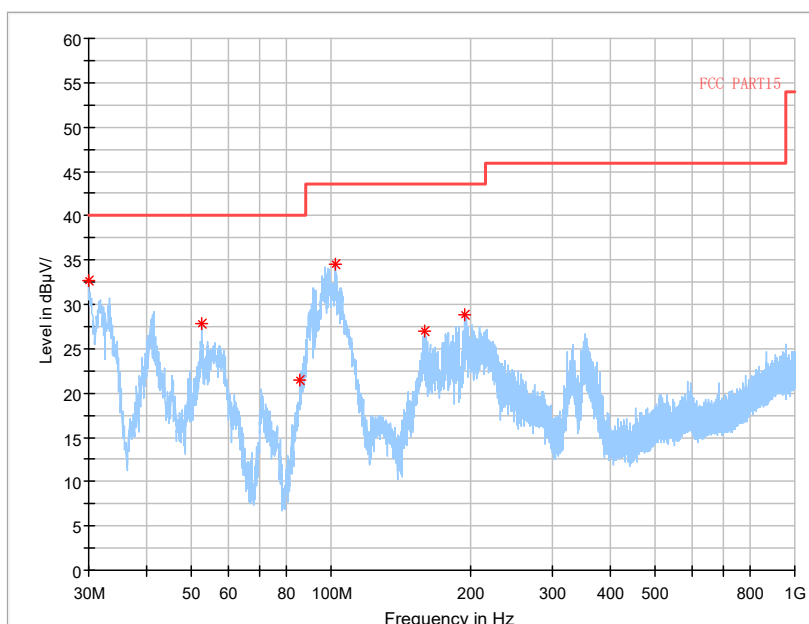
Note: The test data in the graph includes two polarizations: horizontal and vertical



Pic10. Radiated emission (6GHz –18GHz)

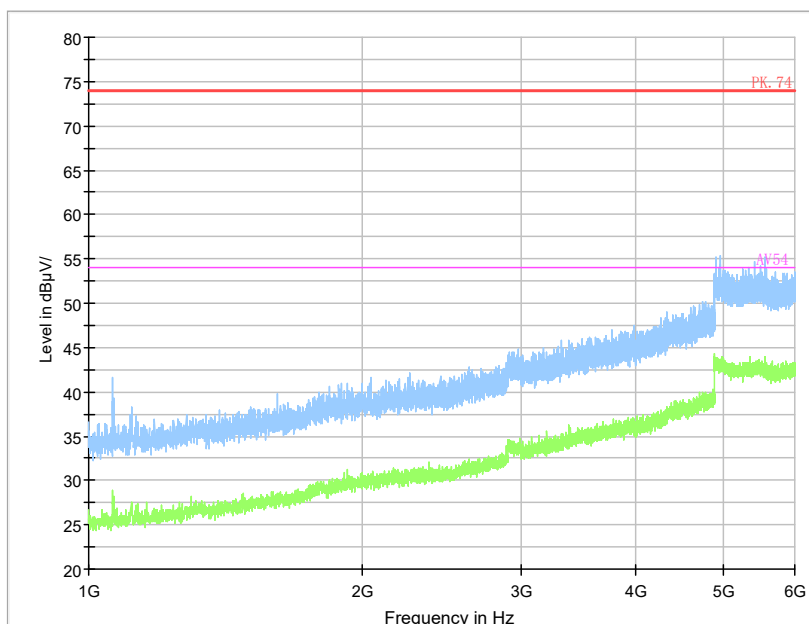
Note: The test data in the graph includes two polarizations: horizontal and vertical

EUT+ charger2: refer to Pic11,Pic12 and Pic13



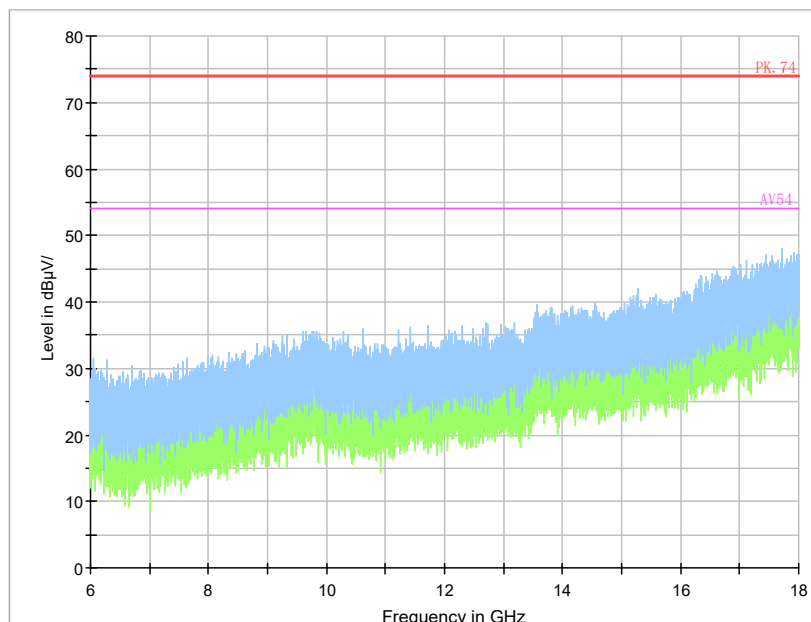
Pic11. Radiated emission (30MHz – 1GHz)

Note: The test data in the graph includes two polarizations: horizontal and vertical



Pic12. Radiated emission (1GHz –6GHz)

Note: The test data in the graph includes two polarizations: horizontal and vertical



Pic13. Radiated emission (6GHz –18GHz)

Note: The test data in the graph includes two polarizations: horizontal and vertical

2.3. List of test equipments

No.	Name/Model	Manufacturer	S/N	Calibration Due Date	Calibration Date
1	23.18m×16.88m×9.60mS emi-AnechoicChamber	FRANKONIA	-----	5th Sep. 2021	6th Sep. 2016
2	ESW EMI test receiver	R&S	101574	20th Aug. 2020	20th Aug. 2019
3	CMW500 Mobile Station Tester	R&S	160132	20th Aug. 2020	20th Aug. 2019
4	9.080m×5.255m×3.525m Shielding room	FRANKONIA	-----	5th Sep. 2021	6th Sep. 2016
5	ESR3 EMI test receiver	R&S	100280	25th Mar. 2021	25th Mar. 2020
6	VULB 9163Ultra log test antenna	R&S	867	25th Mar. 2021	25th Mar. 2019
7	ENV216 AMN	R&S	3560.6550. 12	20th Aug. 2020	20th Aug. 2019
8	HF 907 Double-Ridged Waveguide Horn Antenna	R&S	100512	15th Mar. 2021	15th Mar. 2019
9	PS2000 Turn Table	FRANKONIA	-----	-----	-----
10	MA260 Antenna Master	FRANKONIA	-----	-----	-----
11	EMC32EMI test software	R&S	-----	-----	-----

-----The end-----