



TEST REPORT

Report No.: SRTC2022-9003(F)-0044
Product Name: 4G Wireless Router
Model Name: SRQ-MF296C
Applicant: ZTE Corporation
Manufacturer: ZTE Corporation
Specification: FCC Part15B (Certification)
(2022 edition)
ANSI C63.4-2014
FCC ID: SRQ-MF296C

The State Radio_monitoring_center Testing Center (SRTC)
15th Building, No.30 Shixing Street, Shijingshan District,
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1. General information

1.1 Notes of the test report

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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
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Email: liujiaf@srtc.org.cn

1.3 Applicant's details

Company: ZTE Corporation
Address: ZTE Plaza, #55 Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China
City: Shenzhen
Country or Region: China
Contacted person: ---
Tel: ---
Email: ---

1.4 Manufacturer's details

Company: ZTE Corporation
Address: ZTE Plaza, #55 Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China
City: Shenzhen
Country or Region: China
Contacted person: ---
Tel: ---
Email: ---

1.5 Application details

Date of reception of test sample: 16th August 2022

Date of test: 19th August 2022 to 31th August 2022

1.6 Reference specification

FCC Part 15B, 2022 (Certification)

1.7 Information of EUT

1.7.1 General information

Product Name of EUT	4G Wireless Router
Model Name of EUT	MF296C
FCC ID	SRQ-MF296C
Frequency Range	GSM: GSM850 / DCS1900 WCDMA: FDD II/ FDD IV / FDD V LTE: FDD 2/ FDD 4/ FDD 5/FDD 7/ FDD 13/ FDD 28/ FDD 66/ TDD 38/TDD 40/TDD 41 WiFi: 2.4~2.4835GHz 5.15-5.25GHz 5.25-5.35GHz 5.475-5.725GHz 5.725GHz-5.85GHz
Nominal Voltage	3.3V
Extreme Temperature	Lowest: -20°C Highest: +55°C
Extreme Voltage	Minimum: 10.8V Maximum: 13.2V
HW Version	mp6A
SW Version	CR_LAMF296CV1.0.0B01

1.7.2 EUT details

No.	Product Name	Model Name	IMEI
EUT1	4G Wireless Router	MF296C	860389060007776

1.7.3 Auxiliary equipment details

AE (Auxiliary Equipment) 1#: Charger1

Manufacturer	RUIJING
Model Number	STC-A1215C55A-A
Input Voltage	100V-240V AC
Output Voltage	12V DC

AE (Auxiliary Equipment) 2#: Charger2

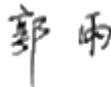
Manufacturer	BJD
Model Number	STC-A1215C55A-Z
Input Voltage	100V-240V AC
Output Voltage	12V DC

Note1: As the applicant of this model, the product has two suppliers of Charger. In this report, we have test two kinds of set-up.the first result exercised by the EUT1, charger AE1 while the second result exercised by EUT1, charger AE2.

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: Mr. Liu Wei Director of the test department 	Checked By: Mr. Guo Yu Vice director of the test department 
Tested by: Mr. Lv Youyou Test engineer 	Issued date: 2022.08.31

2.2 Test result

2.2.1 Conducted Emissions-FCC Part15.107

Ambient condition:

Temperature	Relative humidity	Pressure
23.1°C	37.8%	100.7kPa

Test Setup with charger:

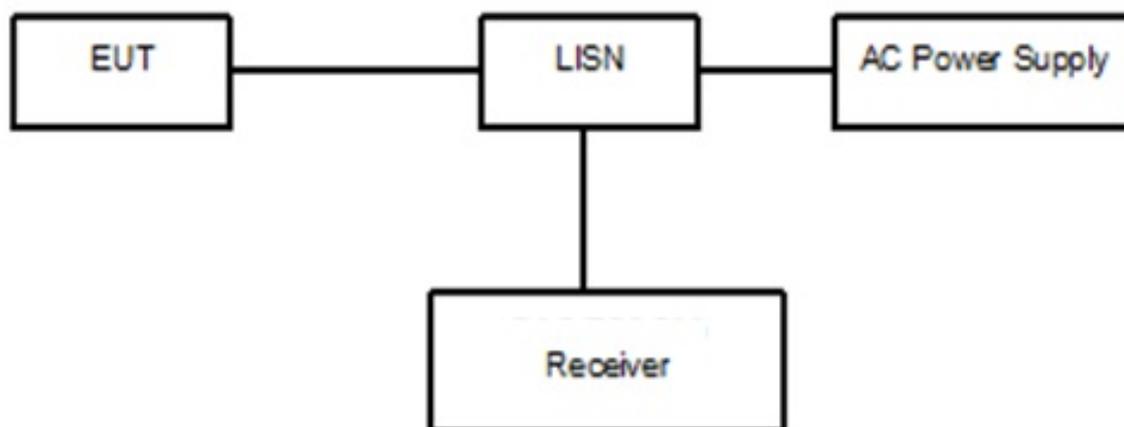


Figure 1

Test Procedure:

The EUT is placed on a non-metallic table 0.8m above the horizontal metal reference ground plane. The EUT is connected with LISN via the charger. 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 $L_{cable}+ATT+VDF$ 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:

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

Sample calculation: $(48.50dB\mu V) = (18.9 dB\mu V) + (29.6dB)$, the corresponding frequency is 0.150000MHz.

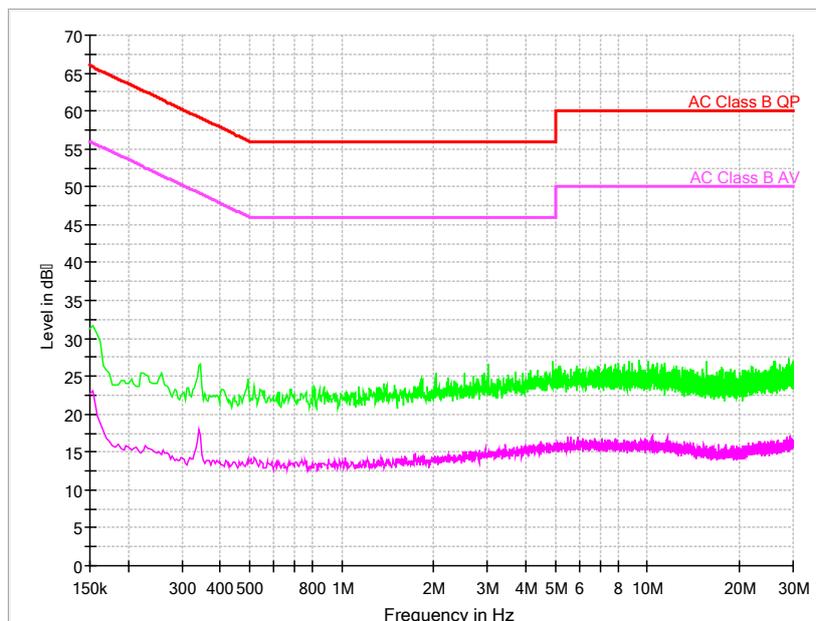
Limit:

Frequency of Emission(MHz)	Limits(dBμV)	
	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

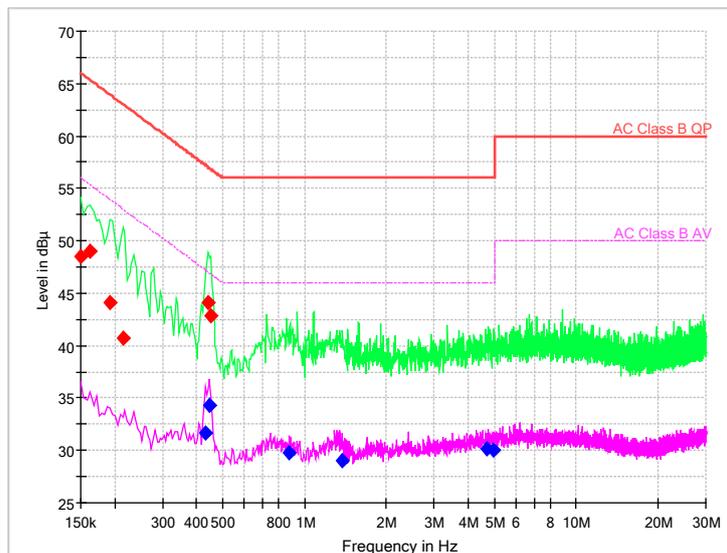
Test result:

Noise Level of the Measuring Instrument



Pic1. Conducted emission L and N Line

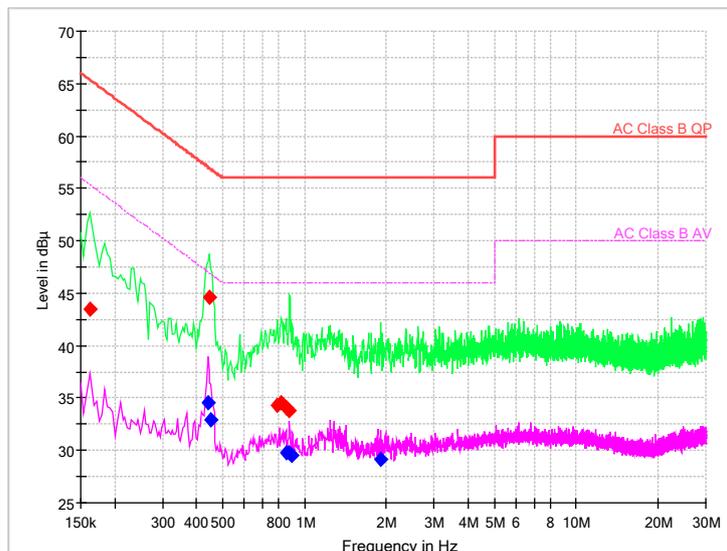
EUT1+Charger1:



Pic2. Conducted emission L&N Line Voltage: 120VAC

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P _{mea} QuasiPeak (dBµV)	P _{mea} Average (dBµV)
0.150000	48.50	---	66.00	17.50	N	29.6	18.9	---
0.162793	49.06	---	65.32	16.26	N	29.7	19.36	---
0.192643	44.07	---	63.92	19.85	N	29.7	14.37	---
0.213964	40.71	---	63.05	22.34	N	29.7	11.01	---
0.431443	---	31.60	47.23	15.62	L1	29.7	---	1.9
0.439971	44.15	---	57.06	12.91	N	29.7	14.45	---
0.444236	---	34.31	46.98	12.67	L1	29.7	---	4.61
0.452764	42.86	---	56.82	13.96	N	29.7	13.16	---
0.879193	---	29.81	46.00	16.19	N	29.7	---	0.11
1.378114	---	29.08	46.00	16.92	L1	29.8	---	-0.72
4.704257	---	30.21	46.00	15.79	L1	29.8	---	0.41
4.943057	---	30.02	46.00	15.98	L1	29.8	---	0.22

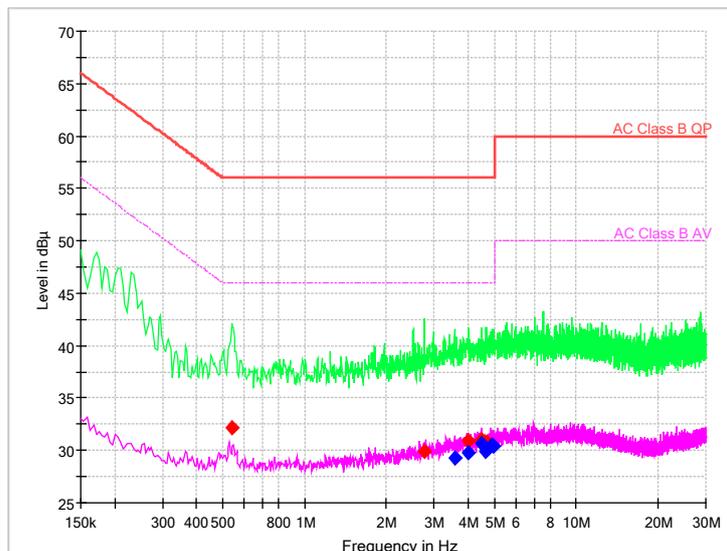
EUT1+charger1:



Pic3. Conducted emission L&N Line Voltage: 240VAC

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	P _{mea} QuasiPeak (dBμV)	P _{mea} Average (dBμV)
0.162793	43.43	---	65.32	21.89	L1	29.7	13.73	---
0.439971	---	34.53	47.06	12.53	N	29.7	---	4.83
0.444236	44.65	---	56.98	12.33	N	29.7	14.95	---
0.452764	---	32.97	46.82	13.85	N	29.7	---	3.27
0.793907	34.36	---	56.00	21.64	L1	29.7	4.66	---
0.823757	34.52	---	56.00	21.48	N	29.7	4.82	---
0.853607	34.10	---	56.00	21.90	L1	29.7	4.4	---
0.853607	---	29.78	46.00	16.22	N	29.7	---	0.08
0.879193	---	29.72	46.00	16.28	N	29.7	---	0.02
0.879193	33.77	---	56.00	22.23	L1	29.7	4.07	---
0.900514	---	29.50	46.00	16.50	N	29.7	---	-0.2
1.906886	---	29.18	46.00	16.82	L1	29.8	---	-0.62

EUT1+charger2:



Pic4. Conducted emission L&N Line Voltage: 240VAC

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P _{mea} QuasiPeak (dBµV)	P _{mea} Average (dBµV)
0.538050	32.22	---	56.00	23.78	N	29.7	-29.19	---
2.764007	29.89	---	56.00	26.11	N	29.8	---	-43.05
3.561429	---	29.28	46.00	16.72	L1	29.8	---	-46.68
3.996386	30.90	---	56.00	25.10	N	29.8	-42.38	---
4.000650	---	29.75	46.00	16.25	N	29.8	---	-33.54
4.017707	30.93	---	56.00	25.07	L1	29.8	-24.13	---
4.461193	---	30.60	46.00	15.40	L1	29.8	-23.79	---
4.478250	30.99	---	56.00	25.01	N	29.8	---	-33.08
4.661614	---	29.96	46.00	16.04	L1	29.8	-35.44	---
4.665879	30.80	---	56.00	25.20	N	29.8	---	-40.97
4.930264	---	30.56	46.00	15.44	L1	29.8	---	-43.14
4.968643	---	30.43	46.00	15.57	L1	29.8	-35.86	---

2.2.2 Radiated Emissions-FCC Part15.109

Ambient condition:

Temperature	Relative humidity	Pressure
23.1°C	37.8%	100.7kPa

Test Setup:

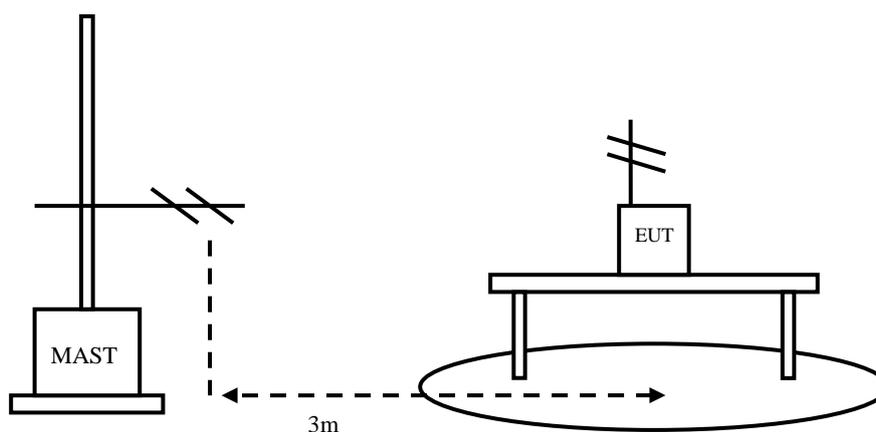


Figure 2

Test Procedure:

EUT+Charger:

The EUT should be placed on a non-metallic table 80cm above the ground plane. 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 accessories of the EUT are connected with the EUT. 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:

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

Sample calculation: $(25.07 \text{ dB}\mu\text{V/m}) = (45.47 \text{ dB}\mu\text{V}) + (-20.4\text{dB/m})$, the corresponding frequency is 33.249500MHz.

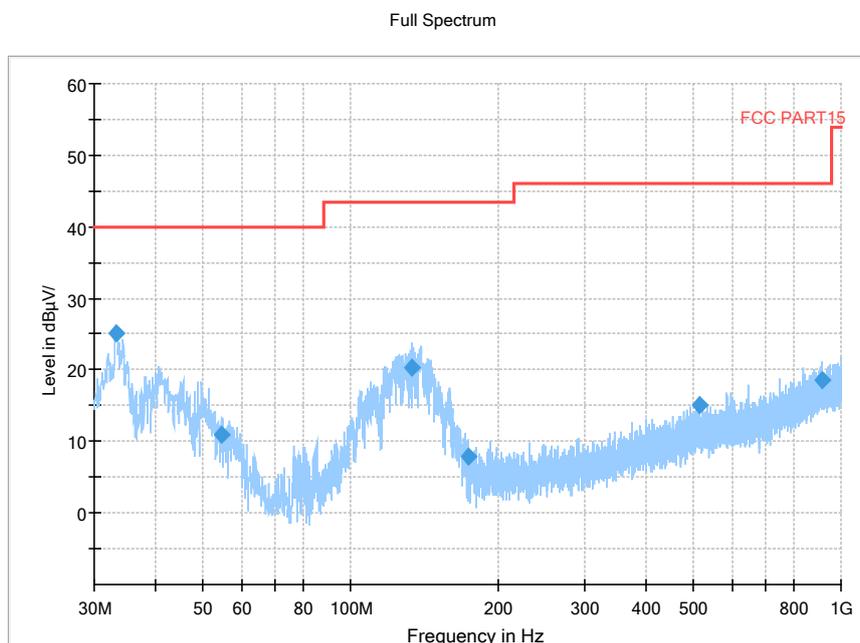
Limit:

Frequency of Emission(MHz)	Limits	
	Detector	Unit (dB μ V/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:
EUT1+charger1:

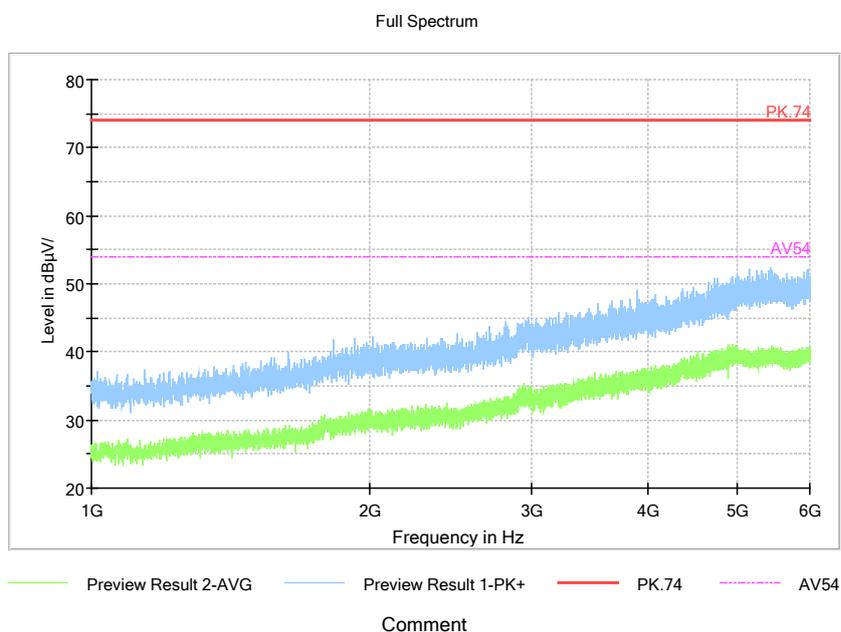
Frequency(MHz)	Result(dBuV/m)	A _{Rpl} (dB/m)	P _{mea} (dBuV)	Polarity
33.249500	25.07	-20.4	45.47	V
54.735000	10.93	-18.1	29.03	V
133.693000	20.25	-22.5	42.75	V
173.414500	7.96	-21.4	29.36	V
514.030000	14.99	-10.5	25.49	V
915.949500	18.49	-3.0	21.49	V

EUT1+Notebook: refer to Pic5 to Pic8



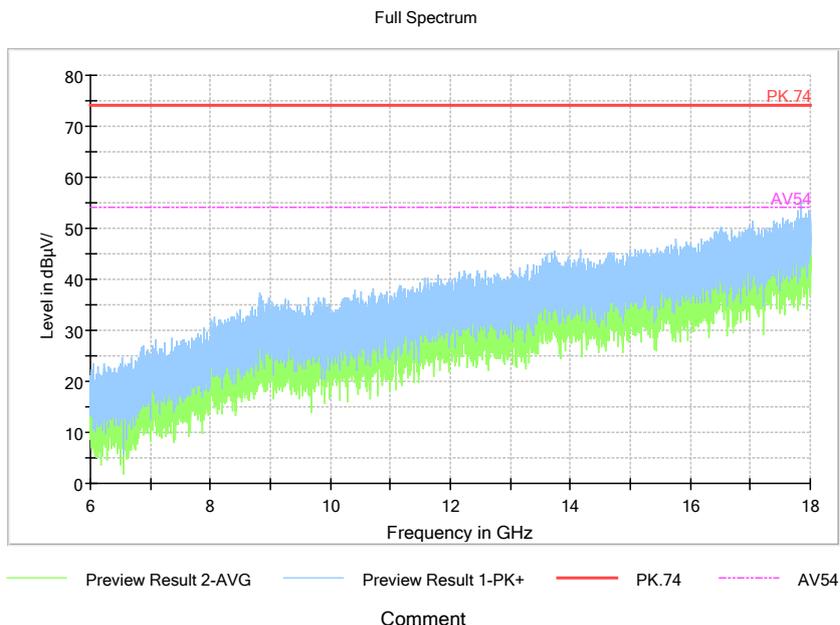
Pic5. Radiated emission (30MHz – 1GHz)

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



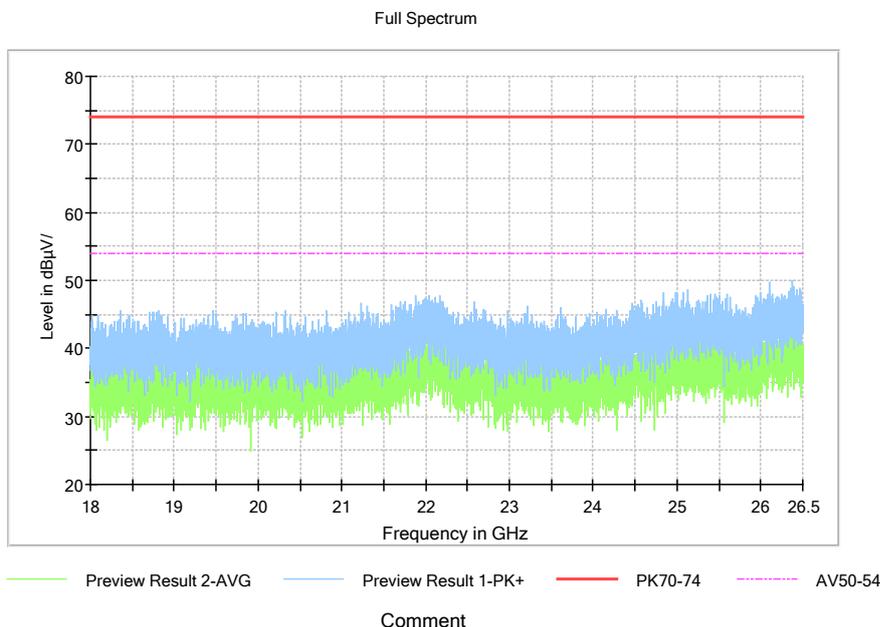
Pic6. Radiated emission (1GHz –6GHz)

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



Pic8. Radiated emission (18GHz –26GHz)

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×9.60m Semi-Anechoic Chamber	FRANKONIA	-----	2023.11.15	2018.11.16
2	ESW EMI test receiver	R&S	101574	2023.06.19	2022.06.20
3	ESR3 EMI test receiver	R&S	102361	2023.04.11	2022.04.12
4	9.080m×5.255m×3.525m Shielding room	FRANKONIA	-----	2023.09.05	2018.09.06
5	VULB 9163 Ultra log test antenna	schwarzbeck	867	2023.05.28	2021.05.29
6	HF 907 Double-Ridged Waveguide Horn Antenna	R&S	100512	2023.05.12	2021.05.13
7	SAS-574 Horn Antenna	schwarzbeck	535	2023.06.19	2021.06.20
8	ENV216 AMN	R&S	3560.6550.12	2023.06.19	2022.06.20
9	EMC32EMI test software	R&S	-----	-----	-----

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