

TEST REPORT

Report No.: SRTC2021-9003(F)-0074
Product Name: LTE CPE
Model Name: MF286C3
Applicant: ZTE CORPORATION
Manufacturer: ZTE CORPORATION
Specification: FCC Part15B (Certification)
(2021 edition)
ANSI C63.4-2014
FCC ID: SRQ-MF286C3

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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1.3 Applicant's details

Company: ZTE CORPORATION
Address: Electronic Testing Building, No. 43 Shahe Road, Xili street, Nanshan District, Guangdong, China
City: Shenzhen
Country or Region: Guangdong, China
Contacted person: Yang Hua
Tel: +86-15991791177
Email: yang.hua3@zte.com.cn

1.4 Manufacturer's details

Company: ZTE CORPORATION
Address: Electronic Testing Building, No. 43 Shahe Road, Xili street, Nanshan District, Guangdong, China
City: Shenzhen
Country or Region: Guangdong, China
Contacted person: Yang Hua
Tel: +86-15991791177
Email: yang.hua3@zte.com.cn

1.5 Application details

Date of reception of test sample: 6th Dec. 2021

Date of test: 6th Dec. 2021 to 18th Dec. 2021

1.6 Reference specification

FCC Part 15B, 2021 (Certification)

1.7 Information of EUT

1.7.1 General information

Name of EUT	LTE CPE
Model Name	MF286C3
FCC ID	SRQ-MF286C3
Frequency Range	GSM: GSM850/PCS1900 WCDMA: FDD II / FDD IV /FDD V LTE: FDD 2/ FDD 4/ FDD 5/ FDD 7 /FDD 28 WiFi: 2.4~2.4835GHz/ 5.15-5.25GHz /5.725-5.85GHz
Equipment Class	Class B
Power Supply	Charger
Rated Power Supply Voltage	12V
Extreme Temperature	Lowest: -20°C Highest: +55°C
Extreme Voltage	Minimum: 9V Maximum: 15V
HW Version	V1.0
SW Version	CR_CHLCLAROMF286C3V1.0.0B01

1.7.2 EUT details

	Product Name	Model Name	IMEI
EUT	LTE CPE	MF286C3	869290050533618

1.7.3 Auxiliary equipment details

AE (Auxiliary Equipment) 1#: Laptop

Manufacturer	Lenovo
Model Number	E40-70
S/N	MP06WE9U
Input Voltage	100V-240V AC

AE (Auxiliary Equipment) 2#: Charger

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

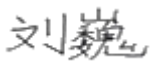
Note2: As the information described in these above tables, the relevant tests have been performed in order to verify in which supply would have the worst features. When the EUT exercised with 2# Charger is the worst feature, and record the results in the test report.

Note3: AE1# Laptop was only cooperated with this test, not for sale.

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. Liu Jian Test engineer 	Issued date: 2021.12.20

2.2 Test result

2.2.1 Conducted Emissions-FCC Part15.107

Ambient condition:

Temperature	Relative humidity	Pressure
23.6°C	41.0%	101.0kPa

Test Setup with charger:

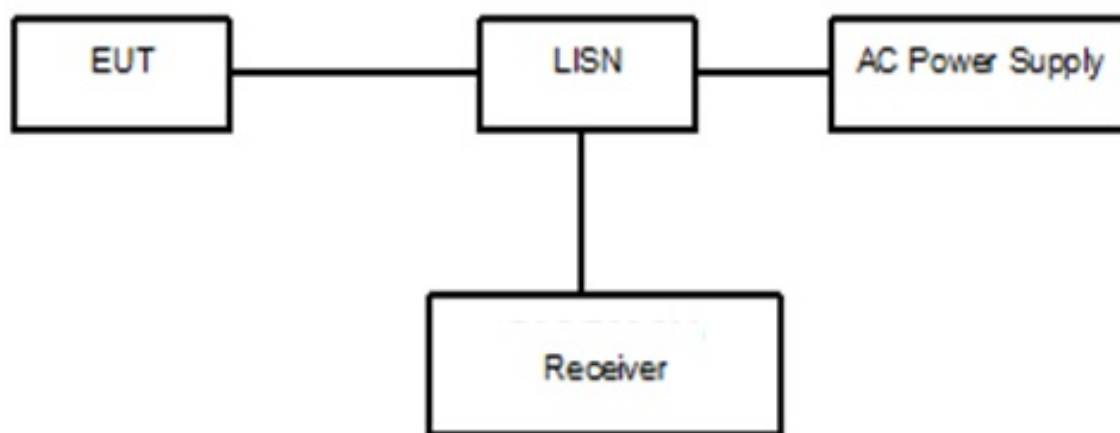


Figure 1

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 $L_{\text{cable}} + \text{ATT} + \text{VDF}$ 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: $(39.43\text{dB}\mu\text{V}) = (9.73\text{dB}\mu\text{V}) + (29.7\text{dB})$, the corresponding frequency is 0.162793MHz.

Frequency (MHz)	QuasiPeak (dB μ V)	Average (dB μ V)	Limit (dB μ V)	Margin (dB)	Line	Corr. (dB)	Pmea QuasiPeak (dB μ V)	Pmea Average (dB μ V)
0.162793	39.43	---	65.32	25.89	L1	29.7	9.73	---

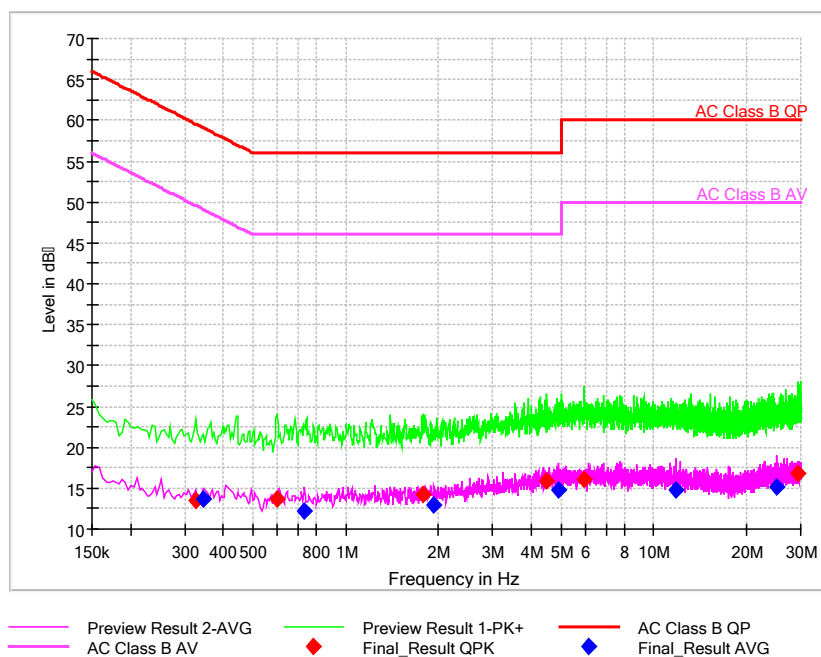
Limit:

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

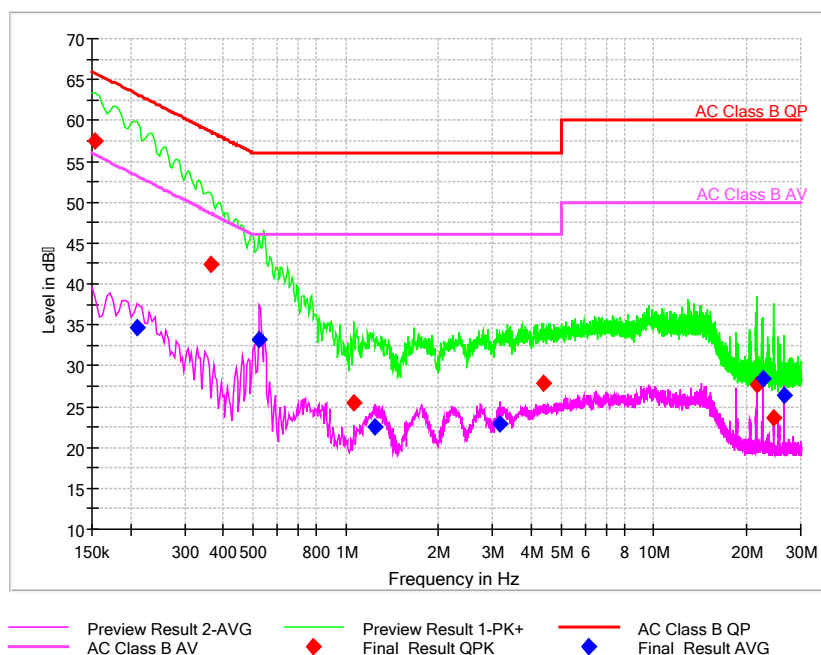
Test result:

Noise Level of the Measuring Instrument



Pic1. Conducted emission L and N Line

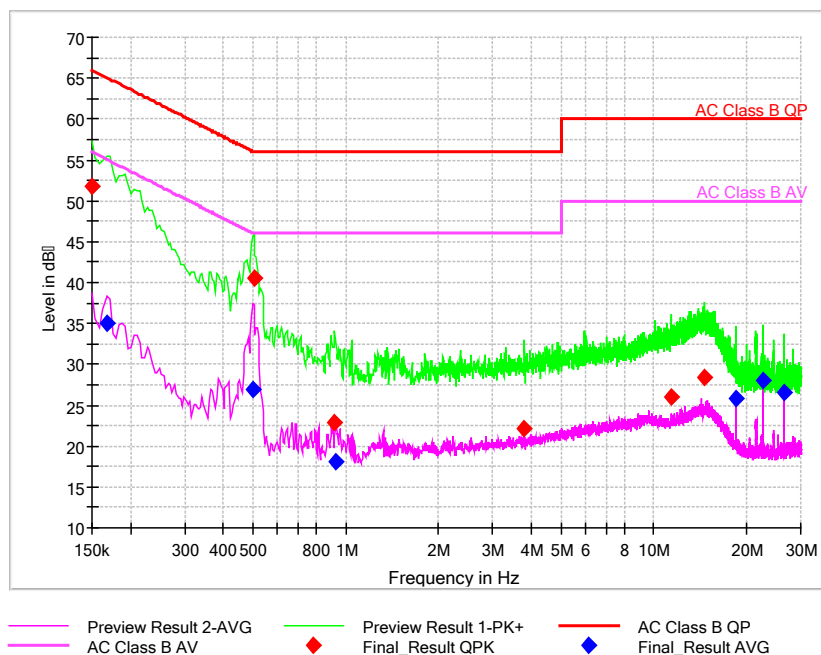
EUT + Charger: AC240V



Pic2. Conducted emission L&N Line

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	Pmea QuasiPeak (dBμV)	Pmea Average (dBμV)
0.154264	57.4	---	65.77	8.37	N	29.6	27.8	---
0.2097	---	34.69	53.22	18.52	L1	29.6	---	5.09
0.363214	42.37	---	58.66	16.29	N	29.6	12.77	---
0.525257	---	33.14	46	12.86	N	29.6	---	3.54
1.062557	25.53	---	56	30.47	N	29.7	-4.17	---
1.237393	---	22.45	46	23.55	N	29.7	---	-7.25
3.169114	---	22.82	46	23.18	N	29.7	---	-6.88
4.380171	27.88	---	56	28.12	N	29.7	-1.82	---
21.57804	27.59	---	60	32.41	L1	29.8	-2.21	---
22.52897	---	28.36	50	21.64	L1	29.8	---	-1.44
24.51613	23.69	---	60	36.31	L1	29.8	-6.11	---
26.62695	---	26.35	50	23.65	L1	29.8	---	-3.45

EUT + Charger: AC120V



Pic3. Conducted emission L&N Line

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	Pmea QuasiPeak (dBμV)	Pmea Average (dBμV)
0.15	51.85	---	66	14.15	L1	29.6	22.25	---
0.167057	---	35.02	55.11	20.08	L1	29.6	---	5.42
0.499671	---	26.95	46.01	19.05	L1	29.6	---	-2.65
0.503936	40.62	---	56	15.38	N	29.6	11.02	---
0.921836	22.8	---	56	33.2	L1	29.7	-6.9	---
0.930364	---	18.05	46	27.95	N	29.7	---	-11.65
3.804493	22.1	---	56	33.9	N	29.7	-7.6	---
11.37786	26.07	---	60	33.93	L1	29.8	-3.73	---
14.61446	28.43	---	60	31.57	L1	29.8	-1.37	---
18.43099	---	25.86	50	24.14	N	29.8	---	-3.94
22.52897	---	28.1	50	21.9	N	29.9	---	-1.8
26.62695	---	26.53	50	23.47	L1	29.8	---	-3.27

2.2.2 Radiated Emissions-FCC Part15.109

Ambient condition:

Temperature	Relative humidity	Pressure
23.1°C	40.6%	101.0kPa

Test Setup:

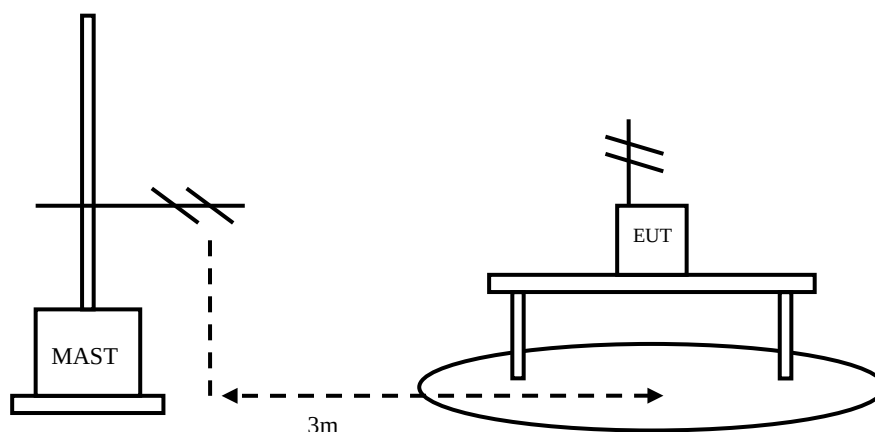


Figure 2

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 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: $30\text{MHz} < f < 1\text{GHz}$

RBW=1MHz, VBW=3MHz, when the test frequency: $f > 1\text{GHz}$

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:

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

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:

Sample calculation: $(24.61\text{dB}\mu\text{V/m}) = (36.61\text{dB}\mu\text{V}) + (-12\text{dB/m})$, the corresponding frequency is 30 MHz.

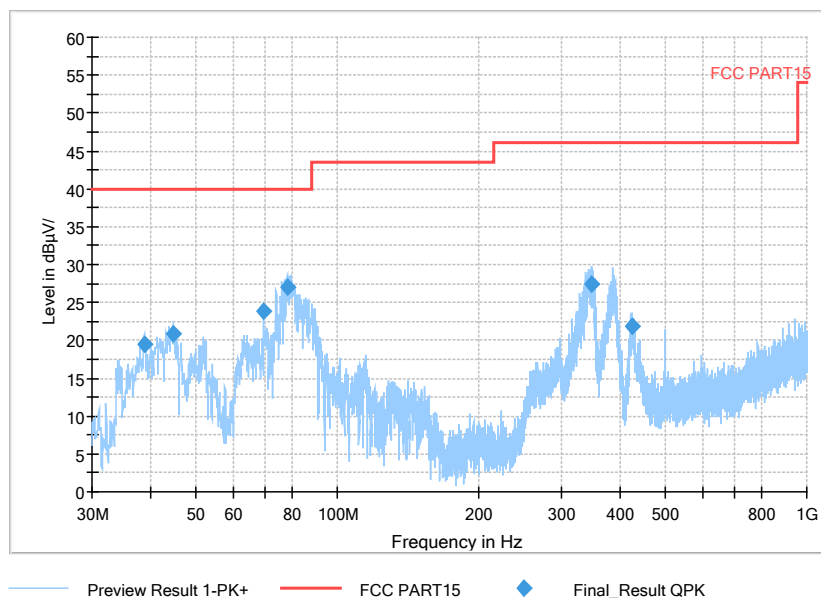
Frequency (MHz)	Result (dBμV/m)	Limit (dBμV/m)	ARpl (dB/m)	Pmea (dBμV)	Polarity
30	24.61	40.00	-12	36.61	V

EUT + Charger:

Frequency(MHz)	Result(dB μ V/m)	Limit (dB μ V/m)	ARpl (dB/m)	Pmea (dB μ V)	Polarity
38.73	19.41	40.00	-18.9	38.31	V
44.7925	20.94	40.00	-17.9	38.84	V
69.6245	23.78	40.00	-22	45.78	V
78.0635	26.95	40.00	-24	50.95	V
348.645	27.39	46.00	-14.4	41.79	V
426.1965	21.88	46.00	-12.6	34.48	V

EUT + Charger: refer to Pic4, Pic5, Pic6, Pic7, Pic8

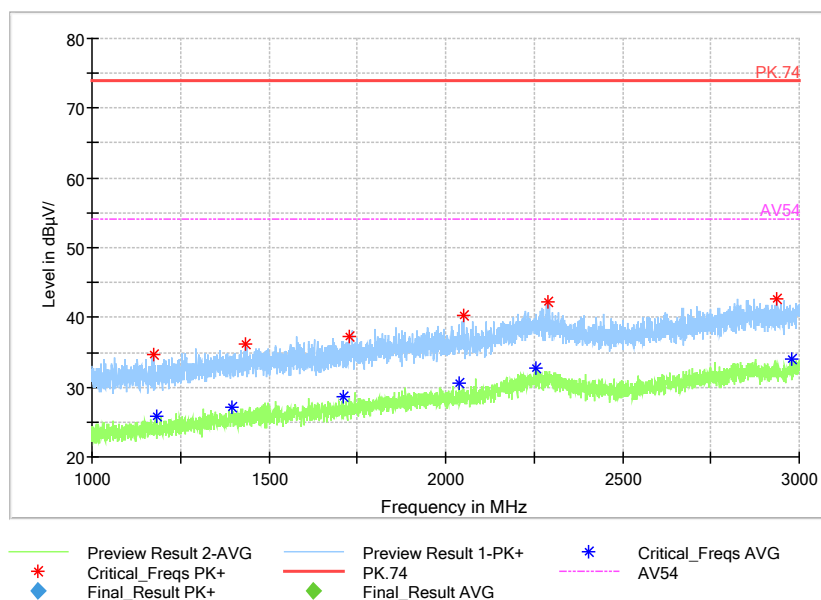
Full Spectrum



Pic4. Radiated emission(30MHz – 1GHz)

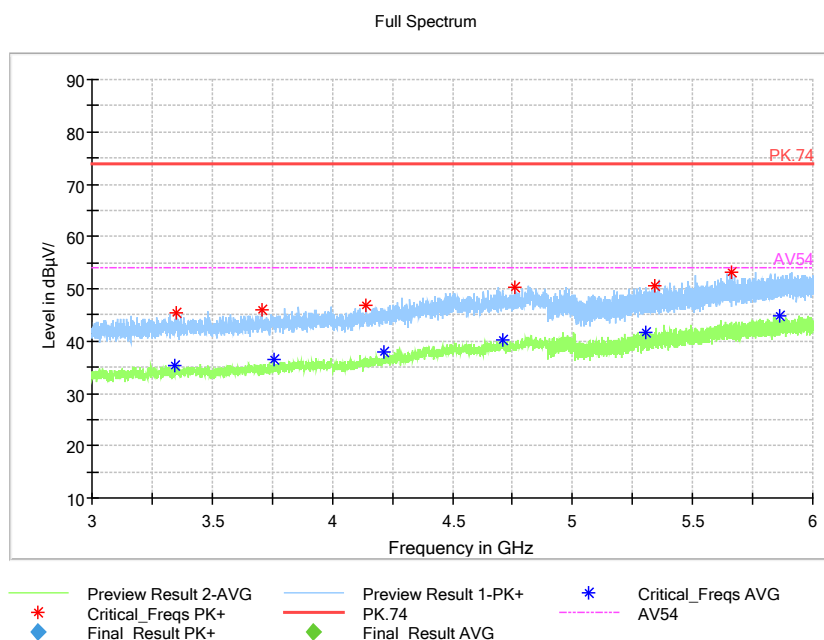
Note: The test data in the graph includes two polarizations: horizontal and vertical

Full Spectrum



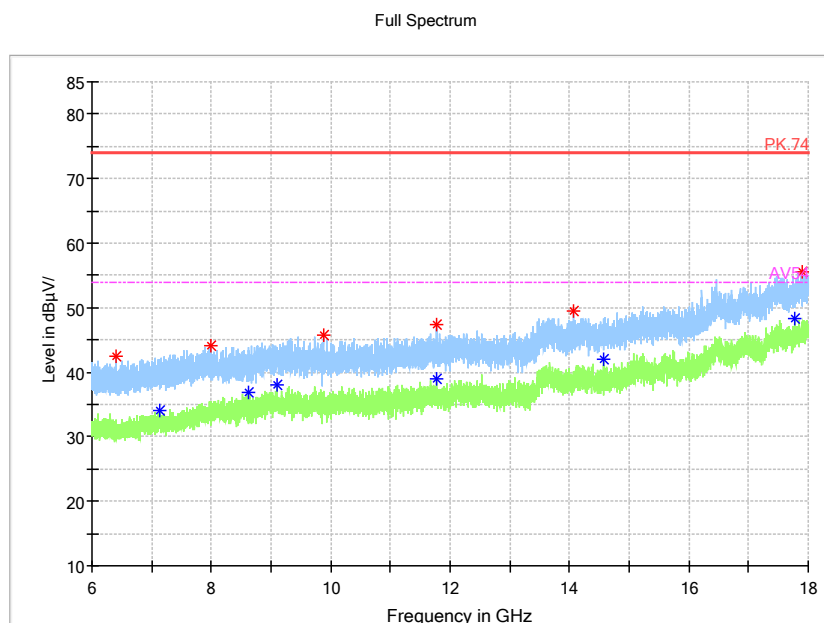
Pic5. Radiated emission (1GHz –3GHz)

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



Pic6. Radiated emission (3GHz –6GHz)

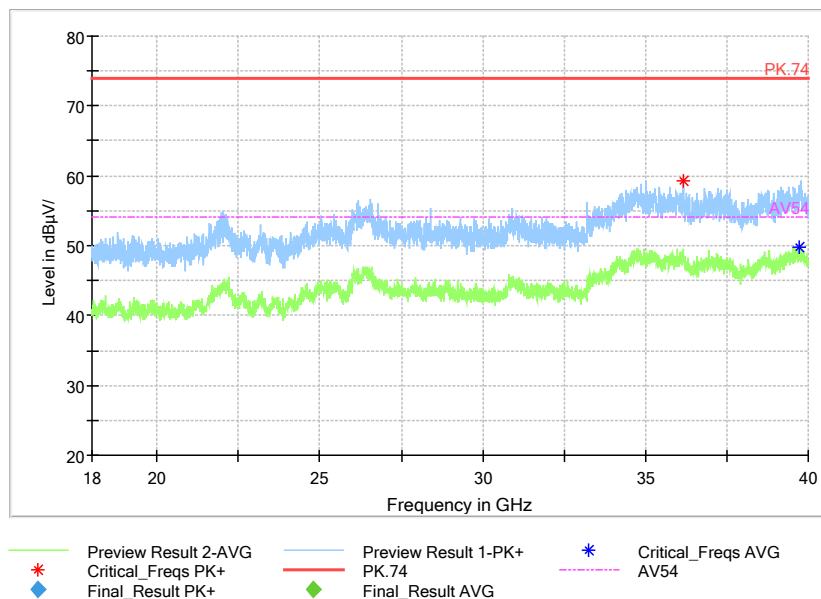
Note: The test data in the graph includes two polarizations: horizontal and vertical.



Pic7. Radiated emission (6GHz –18GHz)

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

Full Spectrum



Pic8. Radiated emission (18GHz – 40GHz)

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. 2023	6th Sep. 2018
2	ESW EMI test receiver	R&S	101574	20th June 2022	20th June 2021
3	ESR3 EMI test receiver	R&S	102361	11th Apr. 2022	11th Apr. 2021
4	9.080m×5.255m×3.525m Shielding room	FRANKONIA	-----	5th Sep. 2023	6th Sep. 2020
5	VULB 9163 Ultra log test antenna	schwarzbeck	867	28th May 2023	28th May 2021
6	HF 907 Double-Ridged Waveguide Horn Antenna	R&S	100512	13th Apr. 2023	13th Apr. 2021
7	SAS-574 Horn Antenna	schwarzbeck	535	21th Apr. 2023	21th Apr. 2021
8	ENV216 AMN	R&S	101881	20th June 2022	20th June 2021
9	EMC32EMI test software	R&S	-----	-----	-----