

TEST REPORT

Report No.: SRTC2022-9003(F)-0016
Product Name: LTE/WCDMA/GSM(GPRS) Multi-Mode Digital
Mobile Phone
Mode Name: Z2336
Applicant: ZTE Corporation
Manufacturer: ZTE Corporation
Specification: FCC Part15B (Certification)
(2022 edition)
ANSI C63.4-2014
FCC ID: SRQ-Z2336

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: 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: ZhaoYang
Tel: ---
Email: zhao.yangxa@zte.com.cn

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: ZhaoYang
Tel: ---
Email: zhao.yangxa@zte.com.cn

1.5 Application details

Date of reception of test sample: 7th April 2022

Date of test: 7th April 2022 to 25th April 2022

1.6 Reference specification

FCC Part 15B, 2022 (Certification)

1.7 Information of EUT

1.7.1 General information

Product Name of EUT	LTE/WCDMA/GSM(GPRS) Multi-Mode Digital Mobile Phone
Mode Name	Z2336
FCC ID	SRQ-Z2336
Frequency Range	GSM: GSM850 / DCS1900 WCDMA: FDD II/ FDD IV / FDD V LTE: FDD 2/ FDD 4/ FDD 5/FDD 12/ FDD 25/TDD 41/ TDD 66 Bluetooth: 2.4~2.4835GHz
Power Supply	Charger/Battery
Nominal Voltage	3.8V
Extreme Temperature	Lowest: -10°C Highest: +55°C
Extreme Voltage	Minimum: 3.6V Maximum: 4.35V
HW Version	Z2336HW1.0
SW Version	Z2336_CCV1.0.0B01

1.7.2 EUT details

No.	Product Name	Mode Name	IMEI
EUT1	LTE/WCDMA/GSM(GPRS) Multi-Mode Digital Mobile Phone	Z2336	000039485642710

1.7.3 Auxiliary equipment details

AE (Auxiliary Equipment) 1#: Charger1

Manufacturer	PUAN
Model Number	STC-A51D-Z
Input Voltage	100V-240V AC
Output Voltage	5V DC

AE (Auxiliary Equipment) 2#: Charger2

Manufacturer	RUIJING
Model Number	STC-A51D-Z
Input Voltage	100V-240V AC
Output Voltage	5V DC

AE (Auxiliary Equipment) 3#: Battery

Manufacturer	JIAD E ENERGY TECHNOLOGY (ZHUHAI)
Model Number	Li3816T43P4h604550

AE (Auxiliary Equipment) 4#: USB cable1

Manufacturer	Luxshare Precision Industry Co., Ltd.
Model Number	USB-TC20-W-100-M-L

AE (Auxiliary Equipment) 5#: USB cable2

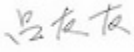
Manufacturer	King Power Electronics Co., Ltd.
Model Number	USB-TC20-W-100-M-L

Note1: As the application of this model, the product has two suppliers of Charger / two suppliers of USB cable. In this report, we have test two kinds of set-up.the first result exercised by the EUT1, charger AE1, the Battery AE3 , the USB cable AE4 while the second result exercised by EUT2 and EUT1, charger AE2, the Battery AE3 , the USB cable AE5.

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. LiuWei Director of the test department 	Checked By: Mr. GuoYu Vice director of the test department 
Tested by: Mr. Lv Youyou Test engineer 	Issued date: 2022.04.25

2.2 Test result

2.2.1 Conducted Emissions-FCC Part15.107

Ambient condition:

Temperature	Relative humidity	Pressure
25.8°C	40.4%	100.8kPa

Test Setup with charger:

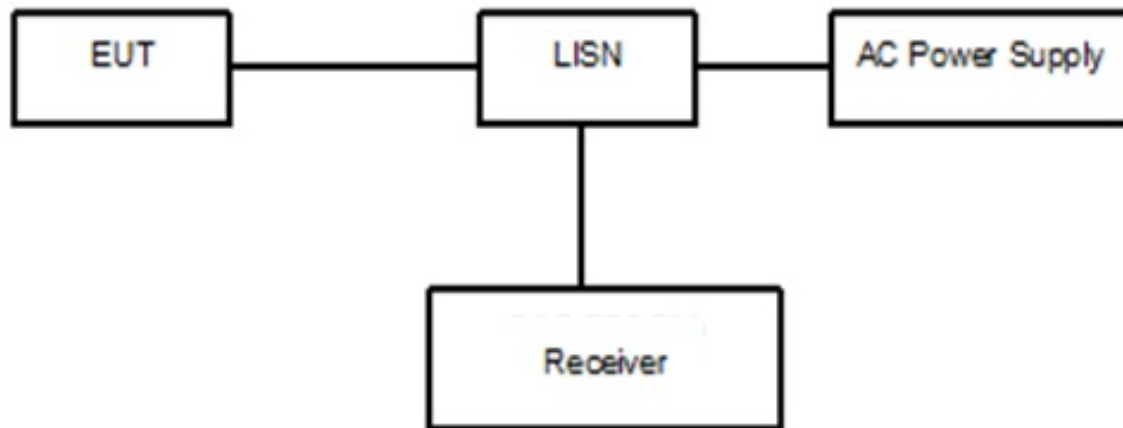


Figure 1

Test Procedure:

The EUT is placed on a non-metallic table 0.8m above the horizontal metal reference ground plane. 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: $(31.71 \text{ dB}\mu\text{V}) = (2.01 \text{ dB}\mu\text{V}) + (29.7 \text{ dB})$, the corresponding frequency is 0.159000MHz.

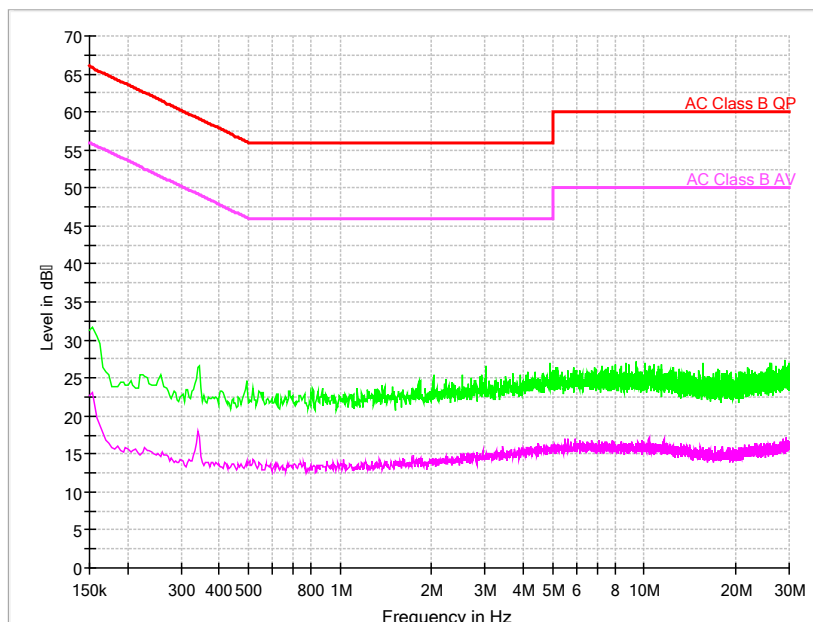
Limit:

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

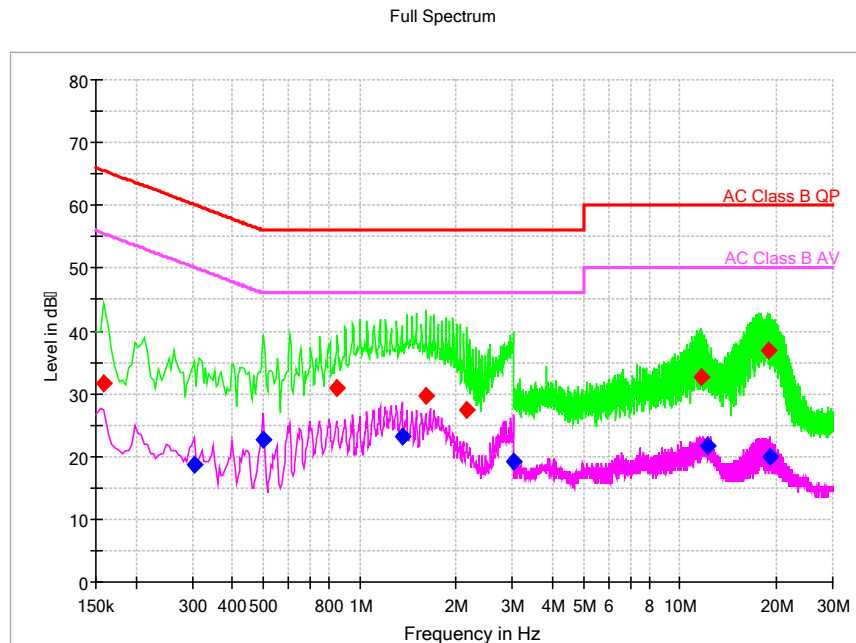
Test result:

Noise Level of the Measuring Instrument



Pic1. Conducted emission L and N Line

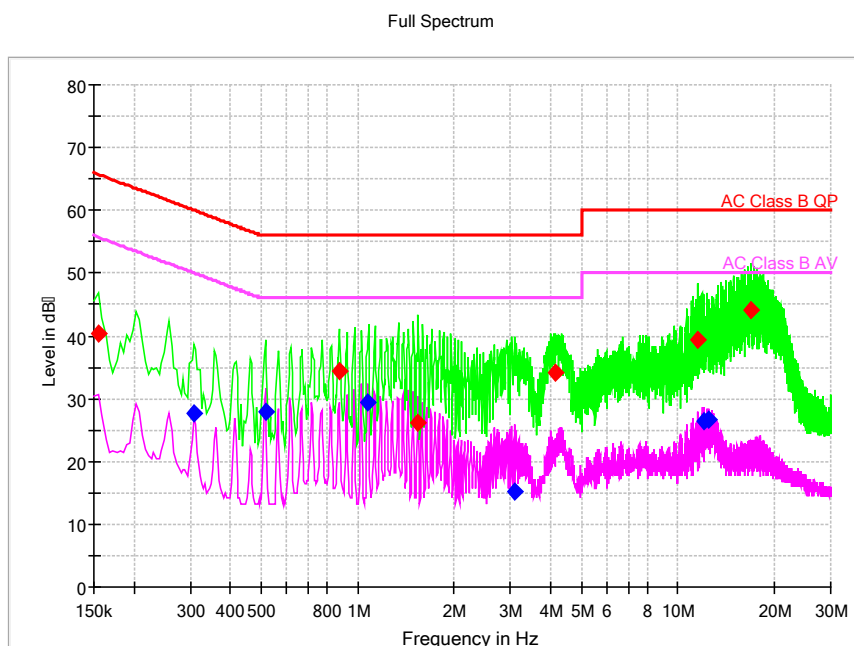
EUT1+charger1+USB Cable1:



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)
0.159000	31.71	---	65.52	33.81	L1	29.7	2.01	---
0.303000	---	18.77	50.16	31.39	L1	29.7	---	-10.93
0.501000	---	22.77	46.00	23.23	N	29.6	---	-6.83
0.852000	30.89	---	56.00	25.11	L1	29.7	1.19	---
1.356000	---	23.14	46.00	22.87	L1	29.7	---	-6.56
1.608000	29.56	---	56.00	26.44	N	29.7	-0.14	---
2.161500	27.43	---	56.00	28.57	L1	29.7	-2.27	---
3.021000	---	19.25	46.00	26.75	L1	29.7	---	-10.45
11.692500	32.53	---	60.00	27.47	L1	29.8	2.73	---
12.246000	---	21.72	50.00	28.28	L1	29.8	---	-8.08
18.838500	36.96	---	60.00	23.04	L1	29.9	7.06	---
19.230000	---	19.94	50.00	30.06	L1	29.9	---	-9.96

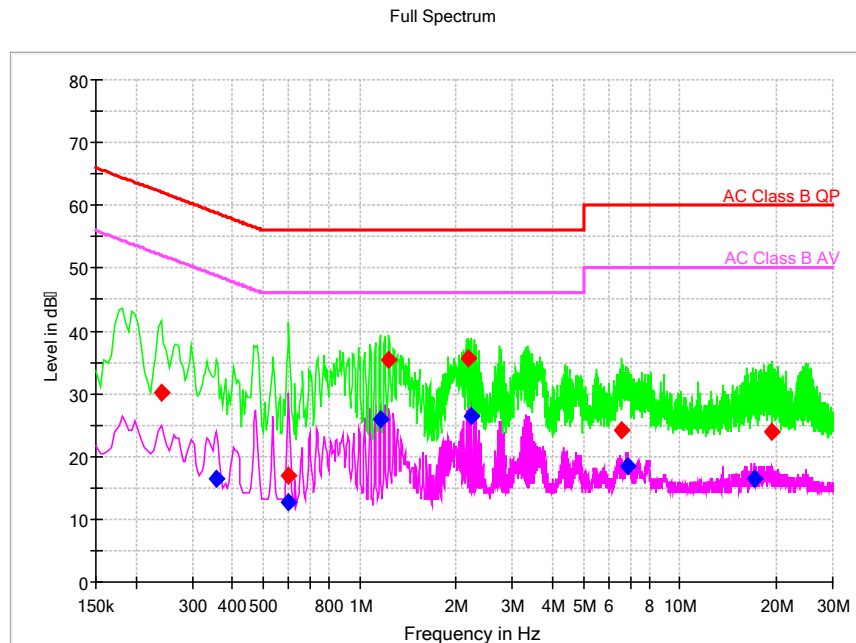
EUT1+charger1+USB Cable1:



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)
0.154500	40.32	---	65.75	25.43	L1	29.7	10.62	---
0.307500	---	27.56	50.04	22.48	L1	29.6	---	-2.04
0.514500	---	27.81	46.00	18.19	L1	29.7	---	-1.89
0.874500	34.37	---	56.00	21.63	L1	29.7	4.67	---
1.077000	---	29.36	46.00	16.64	L1	29.7	---	-0.34
1.545000	26.18	---	56.00	29.82	L1	29.7	-3.52	---
3.084000	---	15.16	46.00	30.84	L1	29.8	---	-14.64
4.132500	34.11	---	56.00	21.89	N	29.8	4.31	---
11.575500	39.45	---	60.00	20.55	L1	29.8	9.65	---
12.034500	---	26.44	50.00	23.56	L1	29.8	---	-3.36
12.444000	---	26.70	50.00	23.30	L1	29.8	---	-3.1
16.930500	44.20	---	60.00	15.80	L1	29.9	14.3	---

EUT2+charger2+USB Cable2:



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)
0.240000	30.21	---	62.10	31.88	L1	29.7	0.51	---
0.357000	---	16.35	48.80	32.45	N	29.7	---	-13.35
0.600000	---	12.72	46.00	33.28	L1	29.7	---	-16.98
0.600000	17.02	---	56.00	38.98	L1	29.7	-12.68	---
1.158000	---	25.86	46.00	20.14	L1	29.7	---	-3.84
1.234500	35.27	---	56.00	20.73	L1	29.7	5.57	---
2.188500	35.61	---	56.00	20.39	L1	29.7	5.91	---
2.233500	---	26.32	46.00	19.68	L1	29.7	---	-3.38
6.594000	24.06	---	60.00	35.94	L1	29.8	-5.74	---
6.855000	---	18.53	50.00	31.47	L1	29.8	---	-11.27
17.178000	---	16.46	50.00	33.54	L1	29.9	---	-13.44
19.338000	23.84	---	60.00	36.16	L1	29.9	-6.06	---

2.2.2 Radiated Emissions-FCC Part15.109

Ambient condition:

Temperature	Relative humidity	Pressure
26.4°C	40.1%	100.8kPa

Test Setup:

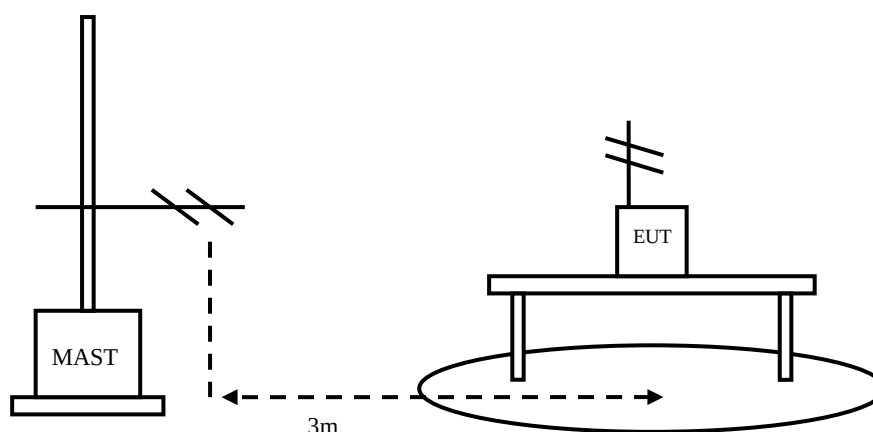


Figure 2

Test Procedure:

EUT+Charger:

The EUT should be placed on a non-metallic table 80cm above the ground plane. 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 such as headset etc. Open the following functions of EUT: Camera, flash lamp, GPS and video. 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: $f > 1\text{GHz}$

EUT+Laptop:

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 accessories of the EUT are connected with the EUT such as headset etc. The EUT was connected with a laptop via the USB cable and transferred the data by copying large files from laptop to 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.

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: $(27.62 \text{ dB}\mu\text{V/m}) = (45.12 \text{ dB}\mu\text{V}) + (-17.5 \text{ dB/m})$, the corresponding frequency is 50.185000MHz.

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:

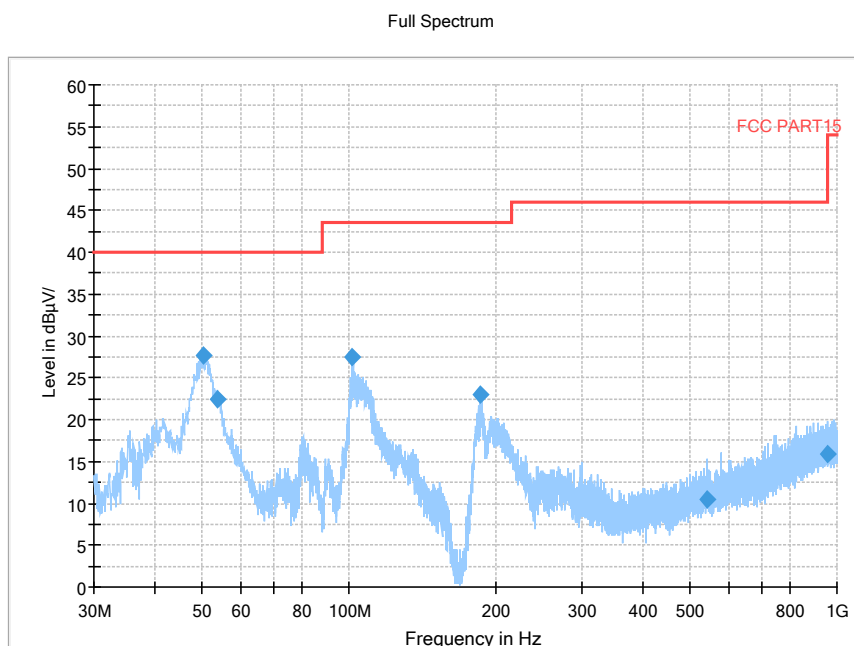
EUT1+charger1:

Frequency(MHz)	Result(dBuV/m)	A _{Rpl} (dB/m)	P _{mea} (dBuV)	Polarity
50.185000	27.62	-17.5	45.12	V
53.562000	22.37	-18.0	40.37	V
101.657000	27.48	-19.2	46.68	V
186.355000	22.92	-20.1	43.02	V
541.840500	10.41	-9.9	20.31	V
959.137000	15.91	-2.6	18.51	V

EUT1+charger2:

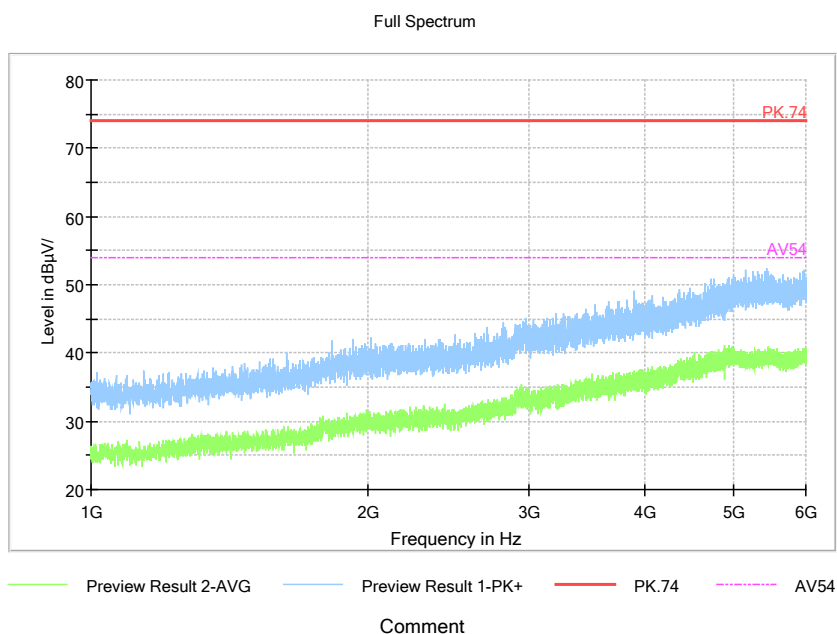
Frequency(MHz)	Result(dBuV/m)	A _{Rpl} (dB/m)	P _{mea} (dBuV)	Polarity
53.968000	23.30	-18.0	41.30	V
55.779500	27.33	-18.3	45.63	V
123.662500	18.14	-21.7	39.84	V
205.752500	30.37	-18.9	49.27	V
311.194000	17.90	-15.7	33.60	V
918.365500	16.25	-3.0	19.25	V

EUT1+charger1: refer to Pic5 to Pic8



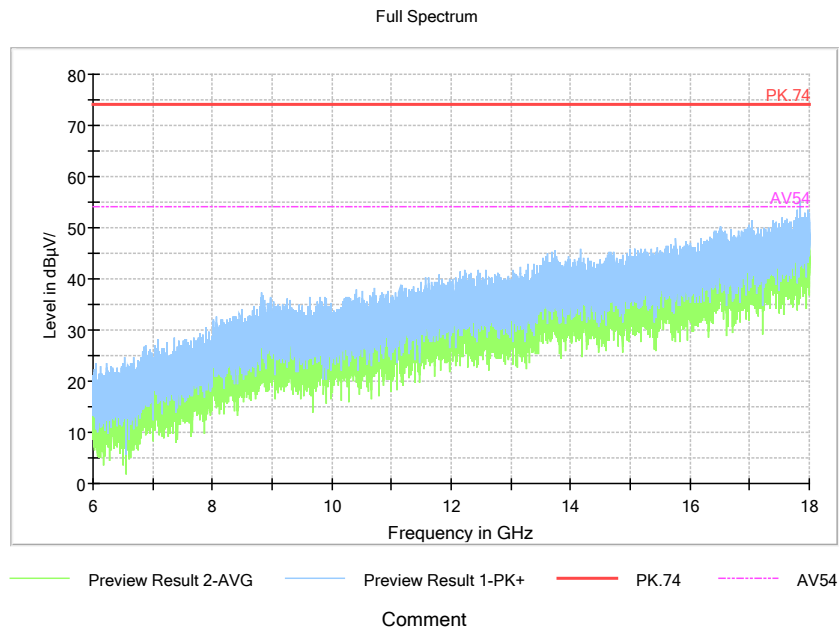
Pic5. Radiated emission (30MHz – 1GHz)

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



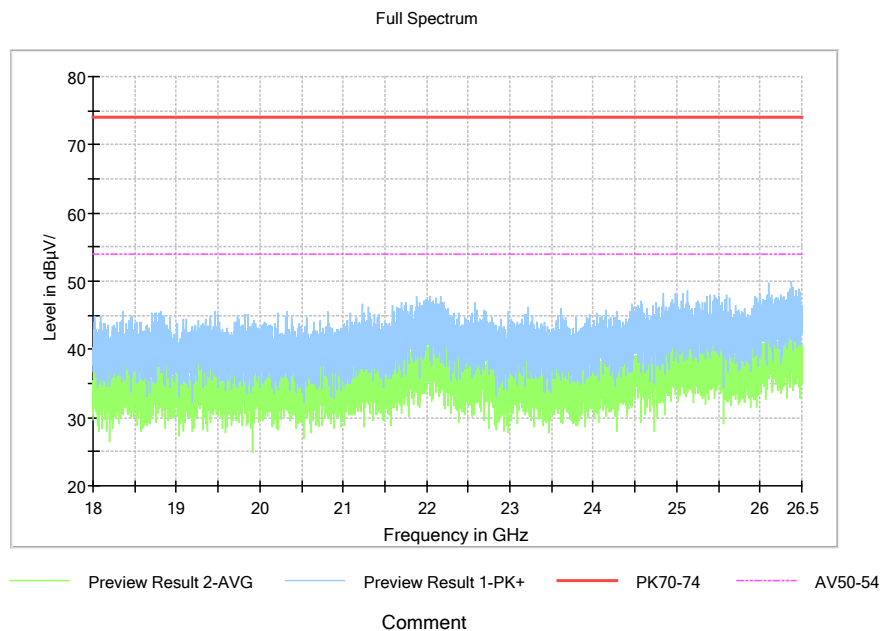
Pic6. Radiated emission (1GHz –6GHz)

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



Pic7. Radiated emission (6GHz –18GHz)

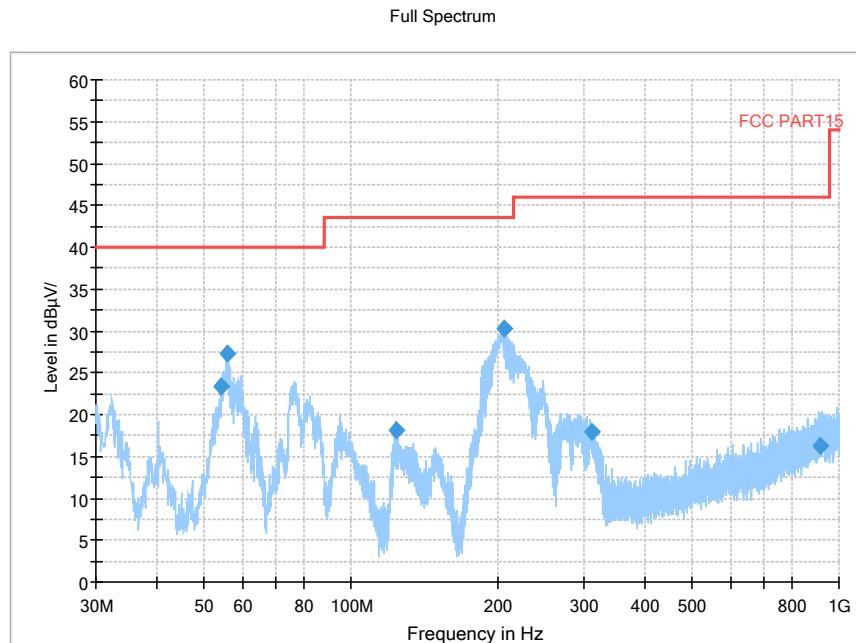
Note: The test data in the graph includes two polarizations: horizontal and vertical



Pic8. Radiated emission (18GHz –26GHz)

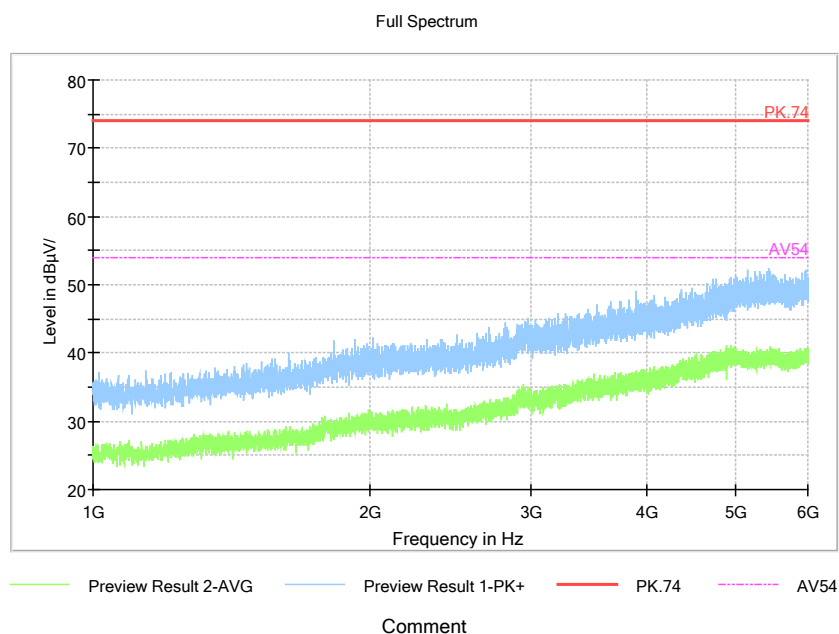
Note: The test data in the graph includes two polarizations: horizontal and vertical

EUT1+charger2: refer to Pic9 to Pic12



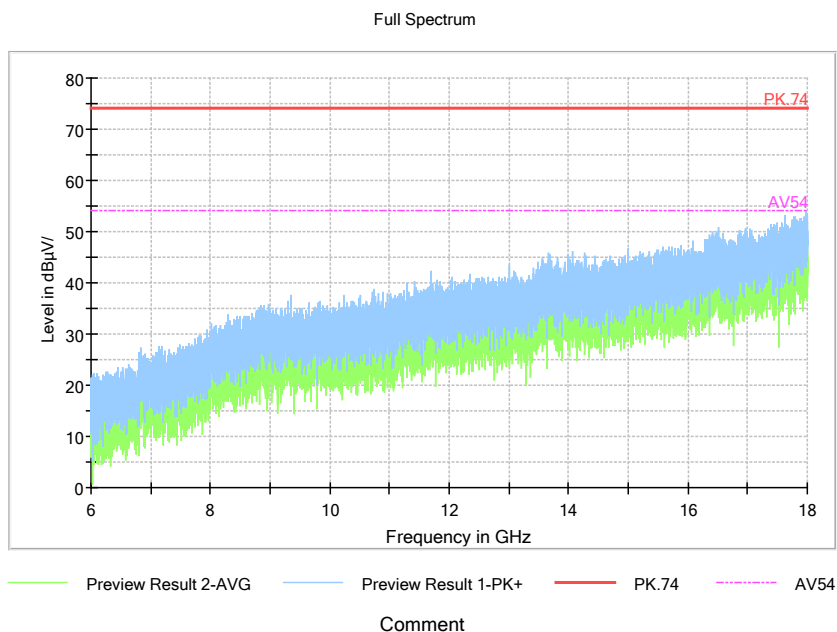
Pic9. Radiated emission (30MHz – 1GHz)

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



Pic10. Radiated emission (1GHz –6GHz)

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



Pic11. Radiated emission (6GHz –18GHz)

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



Pic12. 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×9.60mS emi-AnechoicChamber	FRANKONIA	-----	2023.09.05	2018.09.06
2	ESW EMI test receiver	R&S	101574	2022.06.19	2021.06.20
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	2022.06.19	2021.06.20
9	EMC32EMI test software	R&S	-----	-----	-----

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