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# TEST REPORT

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Report No.: SRTC2020-9003(F)-0025  
Product Name: LTE/WCDMA/GSM(GPRS) Multi-Mode Digital  
Mobile Phone  
Model Name: Z2335L  
Applicant: ZTE Corporation  
Manufacturer: ZTE Corporation  
Specification: FCC Part15B (Certification)  
(2020 edition)  
FCC ID: SRQ-Z2335L

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

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## 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 .....	7
2.2 Test result.....	8
2.2.1Conducted Emissions-FCC Part15.107 .....	8
2.2.2RadiatedEmissions-FCC Part15.109.....	13
2.3. List of test equipments .....	21

## 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,China  
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: ZTE Corporation  
Address: ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, P.R.China  
City: Shenzhen  
Country or Region: China  
Contacted person: Gong Yu  
Tel: +86-21-68895397  
Email: gongyu@zte.com.cn

### 1.4 Manufacturer's details

Company: ZTE Corporation  
Address: ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, P.R.China  
City: Shenzhen  
Country or Region: China  
Contacted person: Gong Yu  
Tel: +86-21-68895397  
Email: gongyu@zte.com.cn

## 1.5 Application details

Date of reception of test sample: 29<sup>th</sup> June 2020

Date of test: 30<sup>th</sup> June 2020 to 10<sup>th</sup> July 2020

## 1.6 Reference specification

FCC Part 15B, 2020 (Certification)

## 1.7 Information of EUT

### 1.7.1 General information

Name of EUT	LTE/WCDMA/GSM(GPRS) Multi-Mode Digital Mobile Phone
Model Name	Z2335L
FCC ID	SRQ-Z2335L
Frequency Range	GSM: GSM850/PCS1900 WCDMA: FDD II / FDD IV / FDD V LTE:FDD 2/ FDD 4/ FDD 5/ FDD 7/ FDD 12/ FDD 13/ FDD 66 Bluetooth: 2.4~2.4835GHz WiFi: 2.4~2.4835GHz
Equipment Class	Class B
Power Supply	Battery or Charger
Rated Power Supply Voltage	3.8V
Extreme Temperature	Lowest: -10°C Highest: +55°C
Extreme Voltage	Minimum: 3.6V Maximum: 4.2V
HW Version	Z2335LHW1.0
SW Version	Z2335LV1.0.0B01

### 1.7.2 EUT details

Product Name	Model Name	IMEI
LTE/WCDMA/GSM(GPRS) Multi-Mode Digital Mobile Phone	Z2335L	862741040003390

### 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#: USB Cable

Manufacturer	Shenzhen YU hong xing Development of science and technology Co., Ltd.
Model Number	USB-MU5-W-100-M

#### AE (Auxiliary Equipment) 3#: USB Cable

Manufacturer	King Power Electronics Co., Ltd
Model Number	USB-MU5-W-100-M

#### AE (Auxiliary Equipment)4#: Battery

Type	Li-Ion
Manufacturer	Jiada Energy Technolog Co.,Ltd
Model Number	Li3816T43P4h604550

#### AE (Auxiliary Equipment)5#: Battery

Type	Li-Ion
Manufacturer	Shanghai BYD Company Ltd.
Model Number	Li3816T43P4h604550

#### AE (Auxiliary Equipment) 5#: Charger

Manufacturer	Jiangxi Jian Aohai Technology Co.,Ltd
Model Number	STC-A51D-Z
S/N	/
Input Voltage	100V-240VAC 250mA
Output Voltage	5.0VDC 1000mA

AE (Auxiliary Equipment) 6#: Charger2

Manufacturer	Shenzhen Ruijing Industrial Co.,Ltd
Model Number	STC-A51D-Z
S/N	/
Input Voltage	100V-240VAC 250mA
Output Voltage	5.0VDC 1000mA

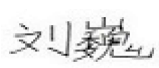
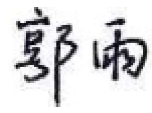
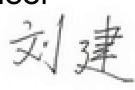
Note1: As the information described in these above tables, the relevant tests have been performed in order to verify in which supply would have the worst features. When the EUT exercised with 2# USB Cable, 4# Battery, 6# Charger is the worst feature, and record the results in the test report.

Note2: AE1# Laptop was selected by testing laboratory and 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: 2020.07.13

## 2.2 Test result

### 2.2.1 Conducted Emissions-FCC Part15.107

Ambient condition:

Temperature	Relative humidity	Pressure
24.4°C	42.6%	101.2kPa

Test Setup with laptop:

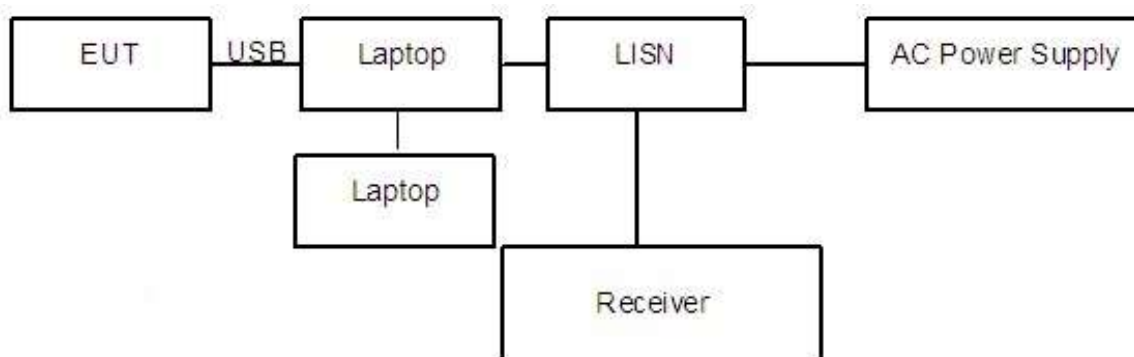


Figure 1

Test Procedure:

The EUT is placed on a non-metallic table 0.8m above the horizontal metal reference ground plane. 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 laptop's LAN port is connected with another laptop via cable. And the data transferring between two laptops is maintained.

The AC main power supply of the laptop is connected to LISN and 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.



Test Setup with charger:

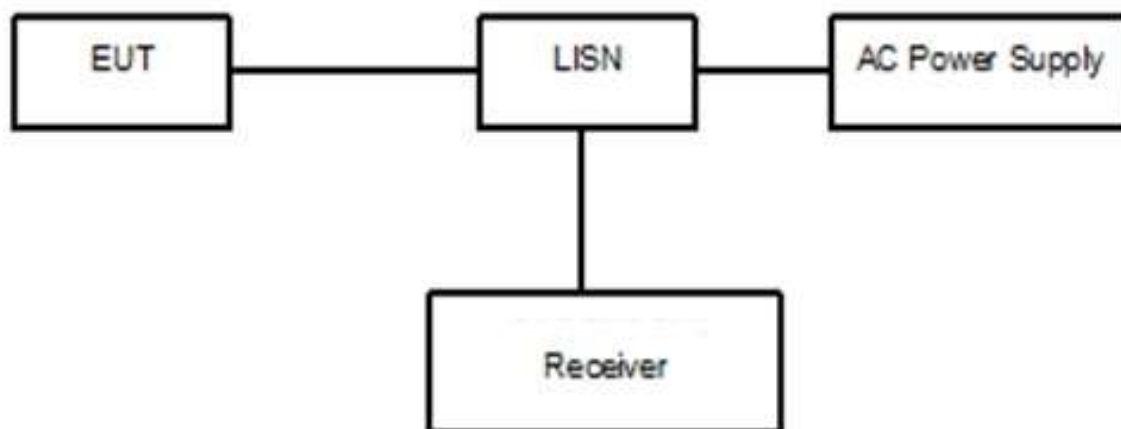


Figure 2

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 accessories of the EUT are connected with the EUT such as headset etc. Open the following functions of EUT: Camera, flash lamp, FM, 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 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:  $(35.15dB\mu V) = (5.45dB\mu V) + (29.7dB)$ , the corresponding frequency is 0.499671MHz.

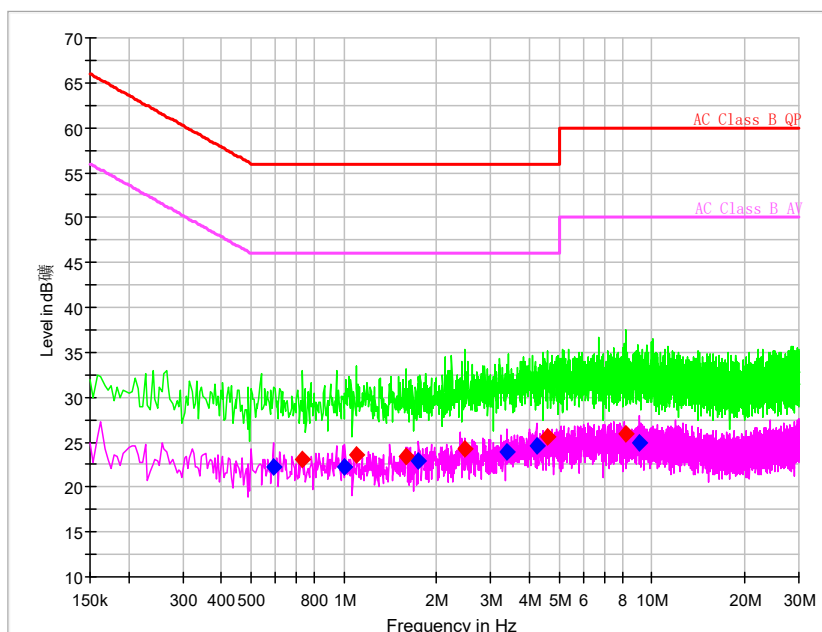
Limit:

Frequency of Emission(MHz)	Limits(dB $\mu$ 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

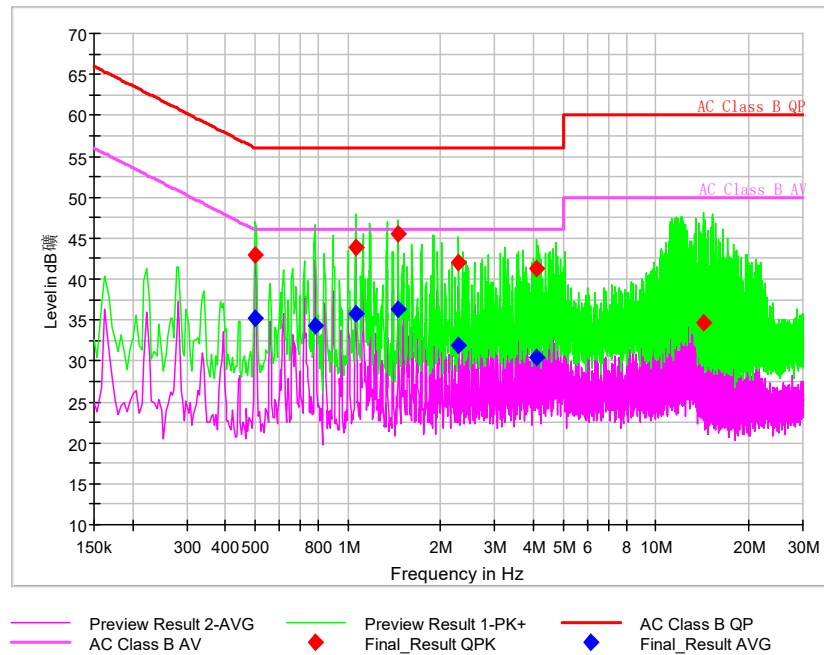
Test result:

Noise Level of the Measuring Instrument



Pic1. Conducted emission L and N Line

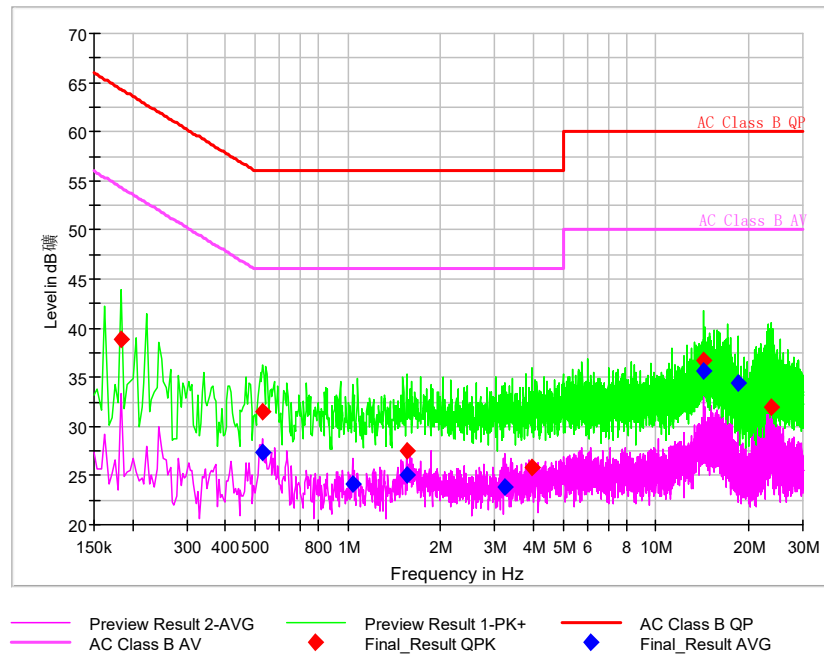
EUT + Charger:



Pic2. Conducted emission L&N Line

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	Pme a Quas	Pme a Aver
0.499671	---	35.15	46.01	10.85	L1	29.7	---	5.45
0.499671	42.87	---	56.01	13.14	L1	29.7	13.1	---
0.781114	---	34.24	46.00	11.76	L1	29.7	---	4.54
1.058293	---	35.72	46.00	10.28	L1	29.7	---	6.02
1.058293	43.95	---	56.00	12.05	N	29.7	14.2	---
1.454871	---	36.33	46.00	9.67	L1	29.7	---	6.63
1.454871	45.44	---	56.00	10.56	L1	29.7	15.7	---
2.294936	42.05	---	56.00	13.95	L1	29.8	12.2	---
2.294936	---	31.92	46.00	14.08	L1	29.8	---	2.12
4.085936	41.38	---	56.00	14.62	L1	29.8	11.5	---
4.085936	---	30.52	46.00	15.48	L1	29.8	---	0.72
14.264786	34.67	---	60.00	25.33	L1	29.9	4.77	---

EUT + Laptop:



Pic3. Conducted emission L&N Line

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	Pme a Quas	Pme a Aver
0.184114	38.93	---	64.30	25.37	L1	29.7	9.23	---
0.529521	---	27.29	46.00	18.71	L1	29.7	---	-2.41
0.529521	31.50	---	56.00	24.50	L1	29.7	1.8	---
1.032707	---	24.17	46.00	21.83	L1	29.7	---	-5.53
1.548686	27.57	---	56.00	28.43	L1	29.7	-2.13	---
1.548686	---	25.10	46.00	20.90	L1	29.7	---	-4.6
3.245871	---	23.80	46.00	22.20	L1	29.8	---	-6
3.966536	25.80	---	56.00	30.20	L1	29.8	-4	---
14.333014	36.70	---	60.00	23.30	L1	29.9	6.8	---
14.337279	---	35.69	50.00	14.31	L1	29.9	---	5.79
18.430993	---	34.39	50.00	15.61	L1	29.9	---	4.49
23.786936	31.96	---	60.00	28.04	L1	29.9	2.06	---

## 2.2.2 Radiated Emissions-FCC Part15.109

Ambient condition:

Temperature	Relative humidity	Pressure
24.5°C	42.9%	101.2kPa

Test Setup:

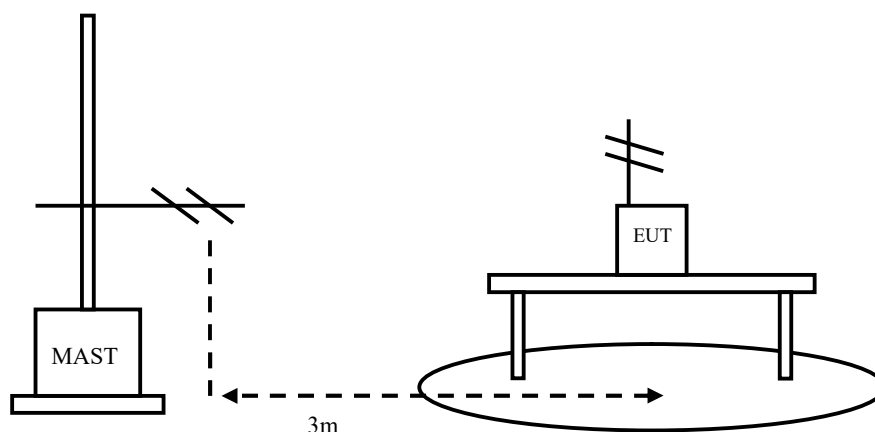


Figure 3

Test Procedure:

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.

#### 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, FM, 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>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:

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

#### Limit:

Frequency of Emission(MHz)	Limits	
	Detector	Unit (dB $\mu$ 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:

Sample calculation:  $(10.42\text{dB}\mu\text{V/m}) = (27.72\text{dB}\mu\text{V/m}) + (-17.3\text{dB})$ , the corresponding frequency is 51.1575MHz.

EUT + Laptop:

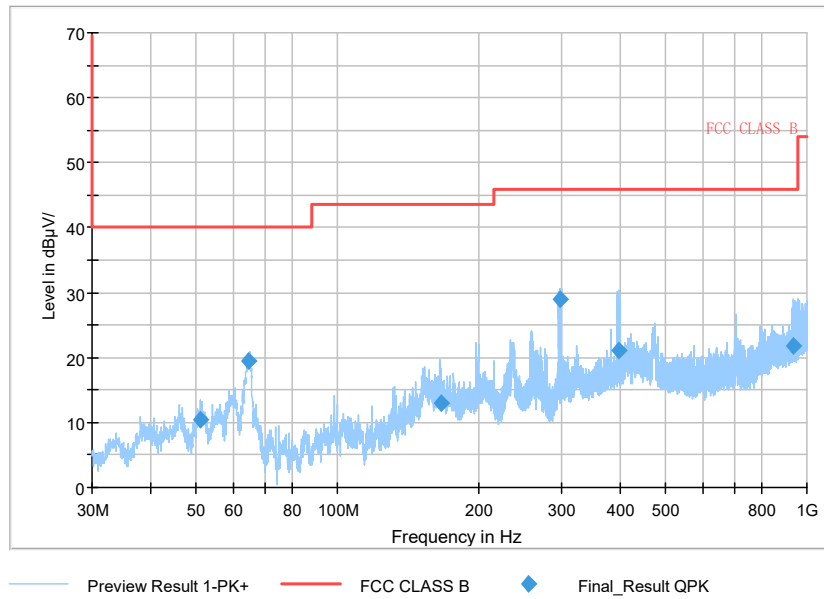
Frequency(MHz)	Result( dB $\mu$ V/m )	Limit (dB $\mu$ V/m)	ARpl (dB)	Pmea ( dB $\mu$ V/m )	Polarity
51.1575	10.42	40	-17.3	27.72	V
64.877	19.52	40	-20	39.52	V
165.8175	12.94	43.5	-20.9	33.84	V
298.527	28.99	46	-15.2	44.19	V
398.3945	21.13	46	-11.8	32.93	V
934.8555	21.74	46	-1	22.74	V

EUT + Charger:

Frequency(MHz)	Result( dB $\mu$ V/m )	Limit (dB $\mu$ V/m)	ARpl (dB)	Pmea ( dB $\mu$ V/m )	Polarity
52.478	20.3	40.00	-17.4	37.7	V
83.9145	30.91	40.00	-22.6	53.51	V
96.3305	29.28	43.50	-19.3	48.58	V
200.5205	15.85	43.50	-18.2	34.05	V
548.103	14.9	46.00	-8.0	22.9	V
938.4335	21	46.00	-1.0	22	V

EUT + Laptop: refer to Pic4, Pic5, Pic6, Pic7

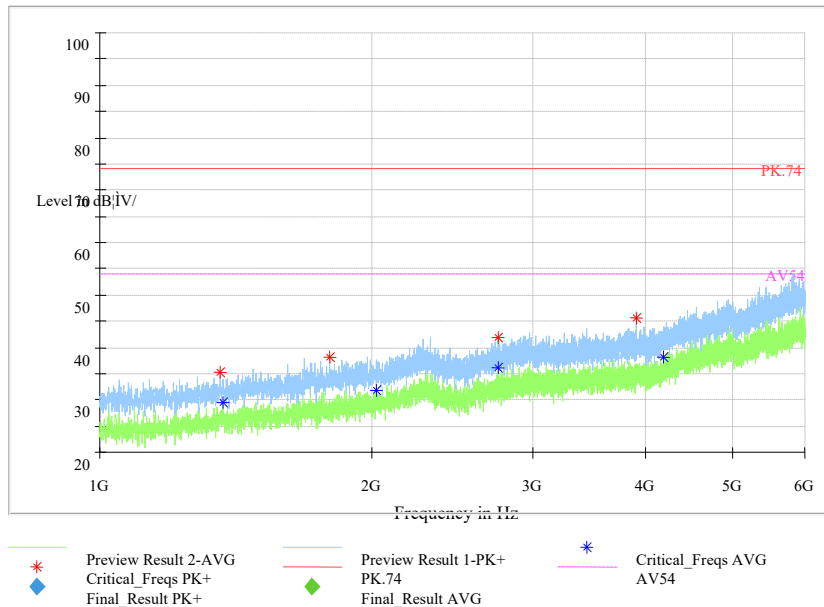
Full Spectrum



Pic4. Radiated emission(30MHz – 1GHz)

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

Full Spectrum

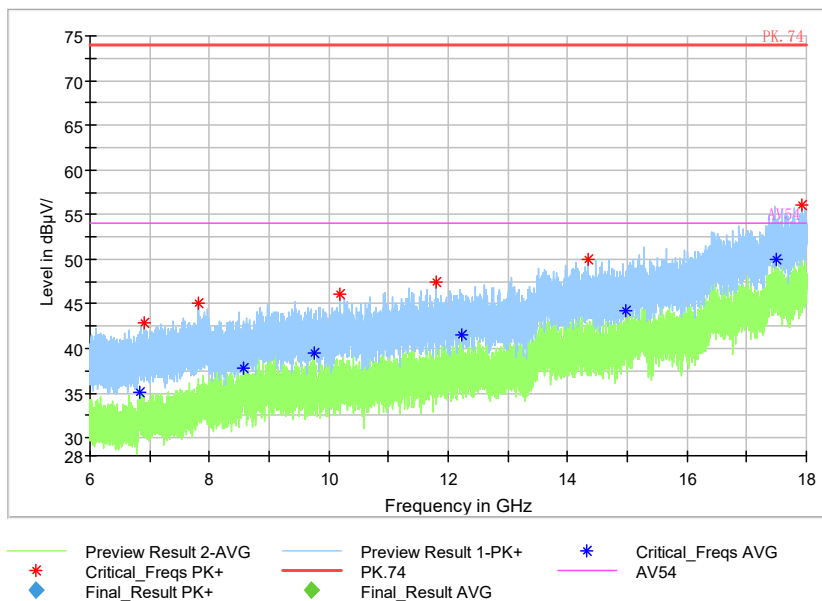


Pic5. Radiated emission (1GHz –6GHz)

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



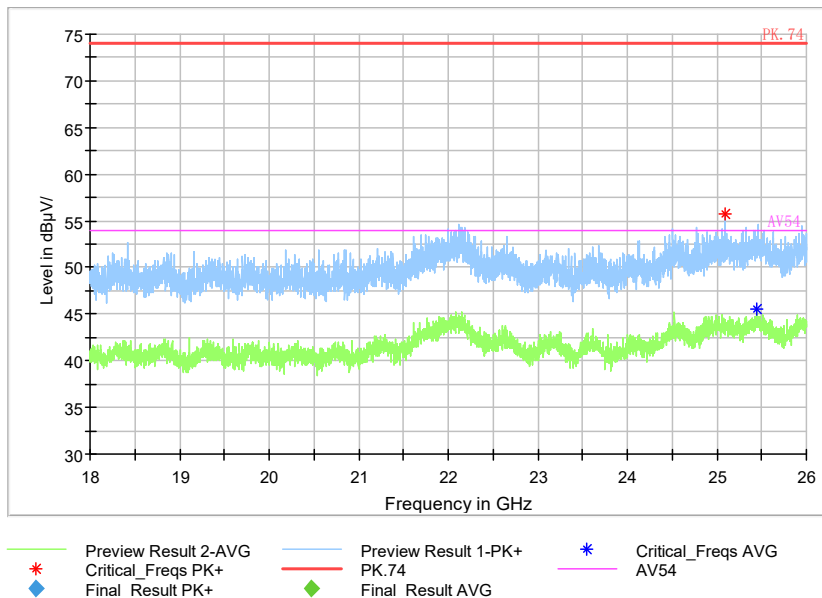
Full Spectrum



Pic6. Radiated emission (6GHz –18GHz)

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

Full Spectrum



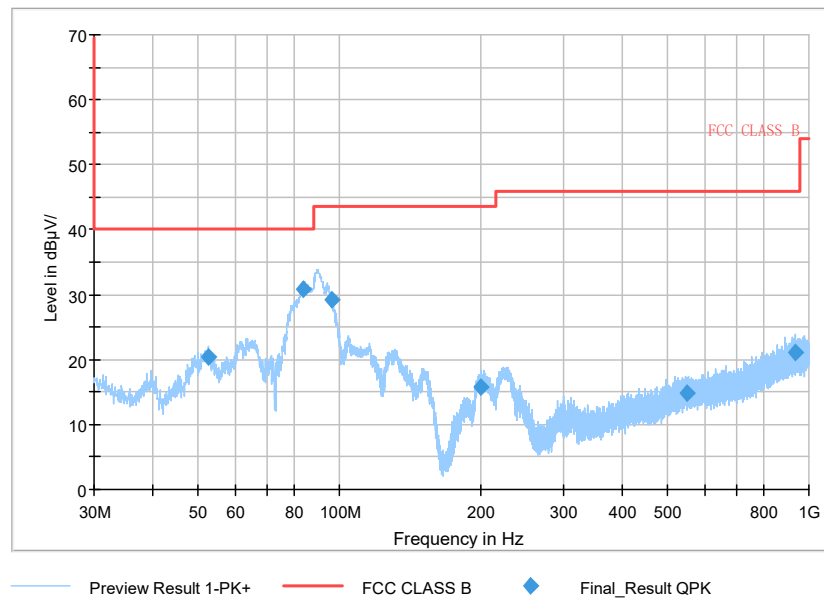
Pic7. Radiated emission (18GHz – 26GHz)

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



EUT + Charger: refer to Pic8, Pic9, Pic10, Pic11

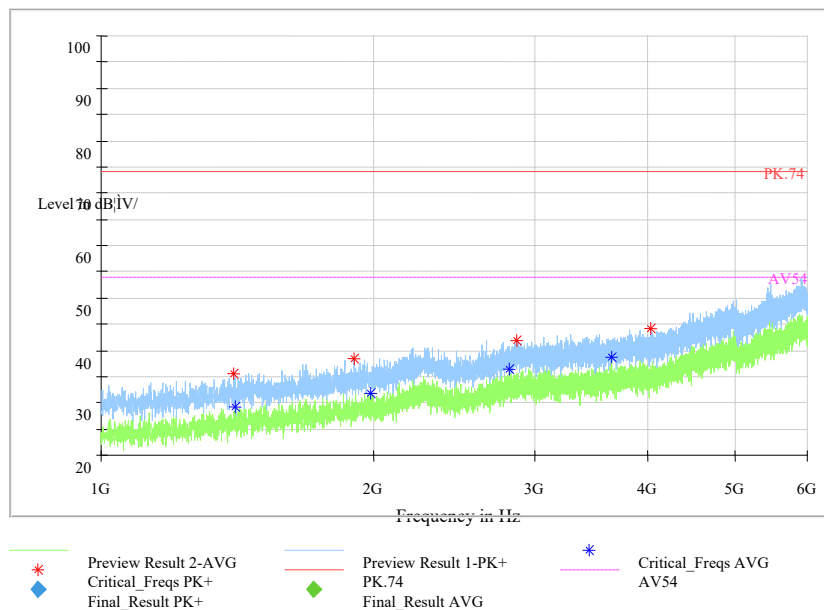
Full Spectrum



Pic8. Radiated emission(30MHz – 1GHz)

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

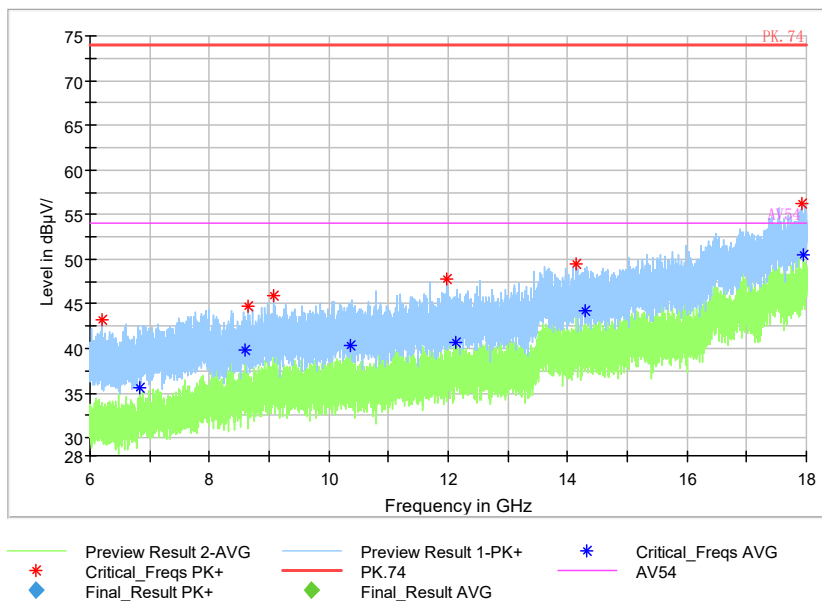
Full Spectrum



Pic9. Radiated emission (1GHz –6GHz)

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

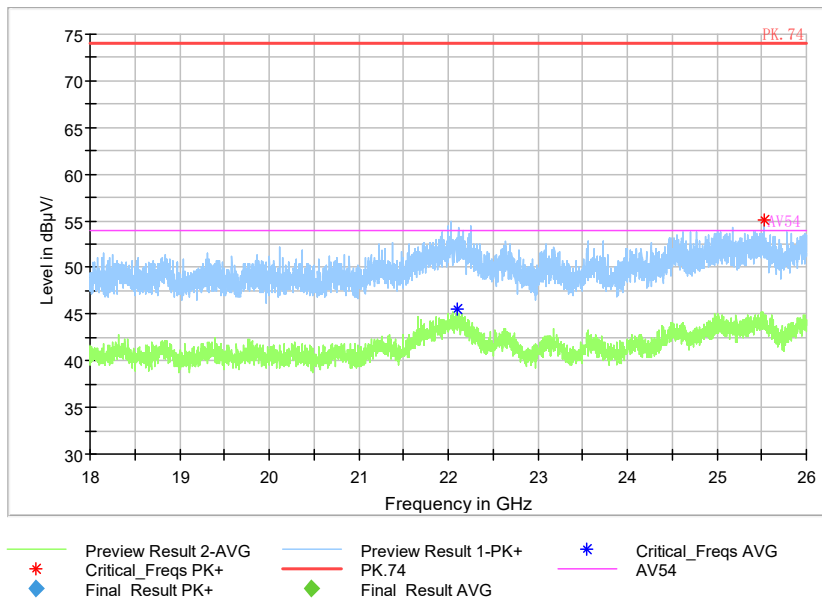
Full Spectrum



Pic10. Radiated emission (6GHz –18GHz)

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

Full Spectrum



Pic11. 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	-----	5th Sep. 2021	6th Sep. 2016
2	ESW EMI test receiver	R&S	101574	20th Aug. 2020	20th Aug. 2019
3	ESR3EMI test receiver	R&S	102361	20th Apr. 2021	20th Apr. 2020
4	9.080m×5.255m×3.525m Shielding room	FRANKONIA	-----	5th Sep. 2021	6th Sep. 2016
5	VULB 9163 Ultra log test antenna	schwarzbeck	867	25th Mar. 2021	25th Mar. 2020
6	HF 907 Double-Ridged Waveguide Horn Antenna	R&S	100512	25th Mar. 2021	25th Mar. 2020
7	ENV216 AMN	R&S	3560.6550. 12	20th Aug. 2020	20th Aug. 2019
8	EMC32EMI test software	R&S	-----	-----	-----

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