

TEST REPORT

Report No.: SRTC2022-9003(F)-0005
Product Name: LTE/WCDMA/GSM(GPRS) Multi-Mode Digital
Mobile Phone
Model Name: ZTE 7040
Applicant: ZTE Corporation
Manufacturer: ZTE Corporation
Specification: FCC Part15B (Certification)
(2021 edition)
ANSI C63.4-2014
FCC ID: SRQ-ZTEA7040

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
Fax: +86 10 57996388
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: ZhaoYang
Tel: +86-029-836337990
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: +86- 029-836337990
Email: zhao.yangxa@zte.com.cn

1.5 Application details

Date of reception of test sample: 12th January 2022

Date of test: 16th January 2022 to 20th January 2022

1.6 Reference specification

FCC Part 15B, 2021 (Certification)

1.7 Information of EUT

1.7.1 General information

Product Name of EUT	LTE/WCDMA/GSM(GPRS) Multi-Mode Digital Mobile Phone
Model name	ZTE 7040
FCC ID	SRQ-ZTEA7040
Frequency Range	LTE: FDD 28
Power Supply	Charger/Battery
Nominal Voltage	3.8V
Extreme Temperature	Lowest: -20°C Highest: +55°C
Extreme Voltage	Minimum: 3.6V Maximum: 4.2V
HW Version	ZTE A7040HW1.0
SW Version	MyOS11.0.0_A7040_TEL

1.7.2 EUT details

No.	Product Name	IMEI	Note
EUT1	LTE/WCDMA/GSM(GPRS) Multi-Mode Digital Mobile Phone	864941060003902	/

1.7.3 Auxiliary equipment details

AE (Auxiliary Equipment) 1#: Charger1

Manufacturer	Ruijing
Model Number	STC-A51030A2-Z
Input Voltage	100V-240V AC
Output Voltage	5V/9V/12V/10V DC

AE (Auxiliary Equipment) 2#: Charger2

Manufacturer	Chenyang
Model Number	STC-A51030A2-Z
Input Voltage	100V-240V AC
Output Voltage	5V/9V/12V/10V DC

AE (Auxiliary Equipment) 3#: Battery1

Manufacturer	Ningde Amperex Technology Co.,Ltd
Model Number	Li3959T44P8h956656

AE (Auxiliary Equipment) 4#: Battery2

Manufacturer	Zhongshan Tianmao Battery Co., Ltd
Model Number	Li3959T44P8h956656

AE (Auxiliary Equipment) 5#: USB Cable1

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

AE (Auxiliary Equipment) 6#: USB Cable2

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

AE (Auxiliary Equipment) 7#: Headset1

Manufacturer	Juwei electronics co., Ltd
Model Number	JWEP1036-Z01R

AE (Auxiliary Equipment) 8#: Headset2

Manufacturer	Shenzhen FDC Electronics Co.,Ltd
Model Number	DEM-66

AE (Auxiliary Equipment) 9#: Laptop

Manufacturer	Lenovo
Model Number	E470c
S/N	PF10VBX6
Input Voltage	100V-240V AC

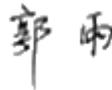
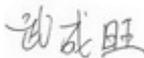
Note1: As the information described in these above tables, the relevant tests have been performed in order to verify in which supply would have the worst features. When the EUT exercised with 1# Charger1, 3# Battery2, 5# USB Cable1, 7# Headset1 is the worst feature, and record the results in the test report.

Note2: AE9# 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. Wu Chengwang 	Issued date: 2022.01.21

2.2 Test result

2.2.1 Conducted Emissions-FCC Part15.107

Ambient condition:

Temperature	Relative humidity	Pressure
18.4°C	32.3%	100.9kPa

Test Setup with charger:

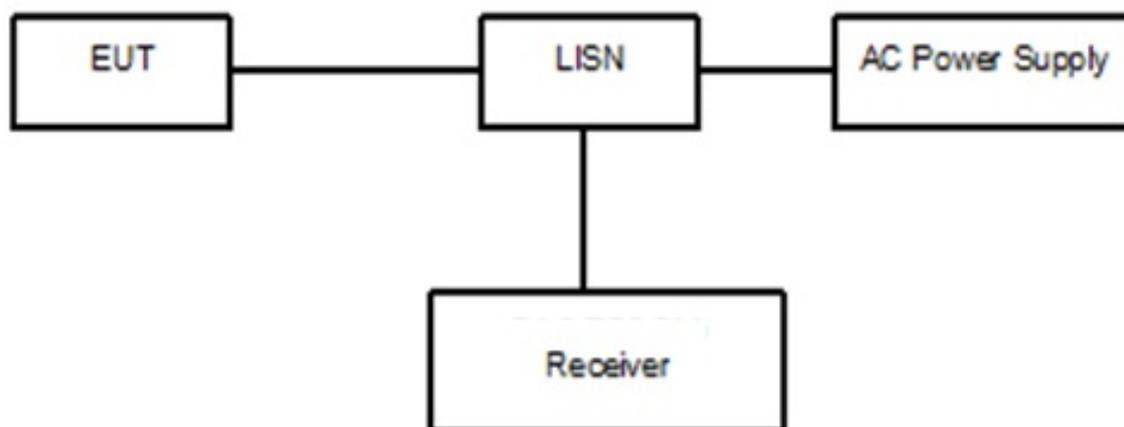


Figure 1

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 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.

Test Setup with laptop:

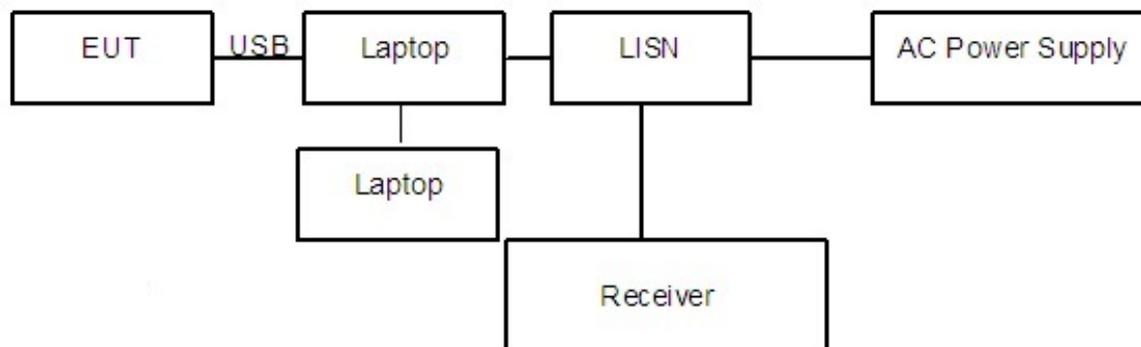


Figure 2

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. 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: $(28.82 \text{ dB}\mu\text{V}) = (-0.78 \text{ dB}\mu\text{V}) + (29.6 \text{ dB})$, the corresponding frequency is 0.167057MHz.

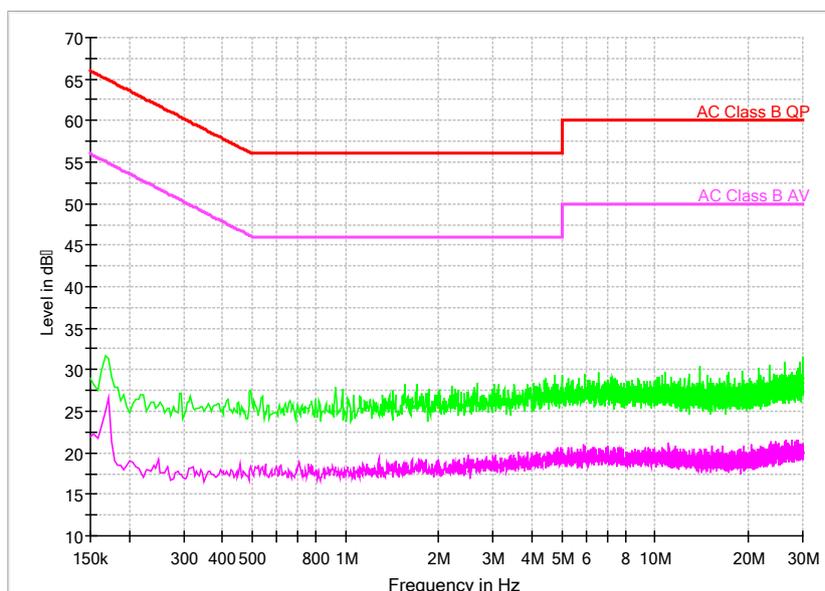
Limit:

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:

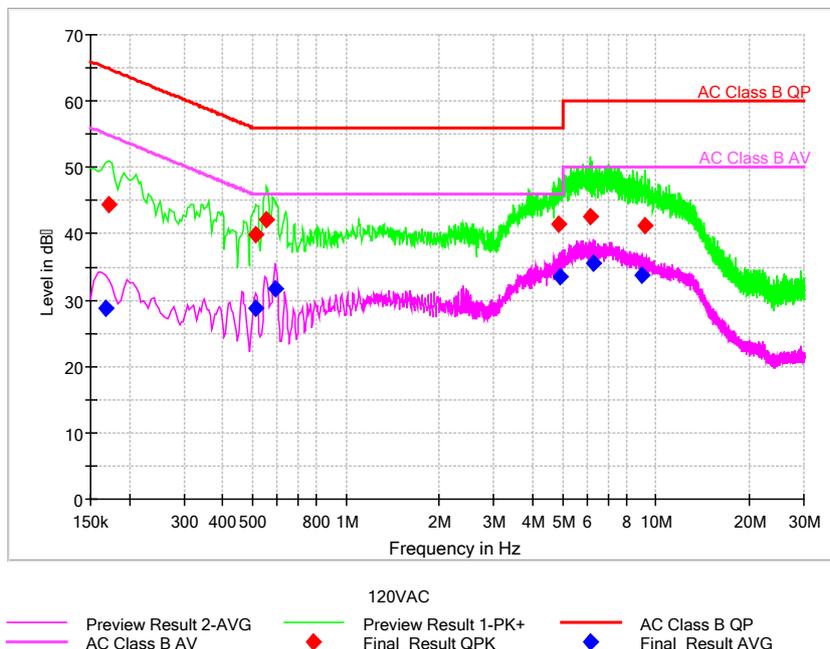
Noise Level of the Measuring Instrument



Comment

Pic1.Conducted emission L and N Line

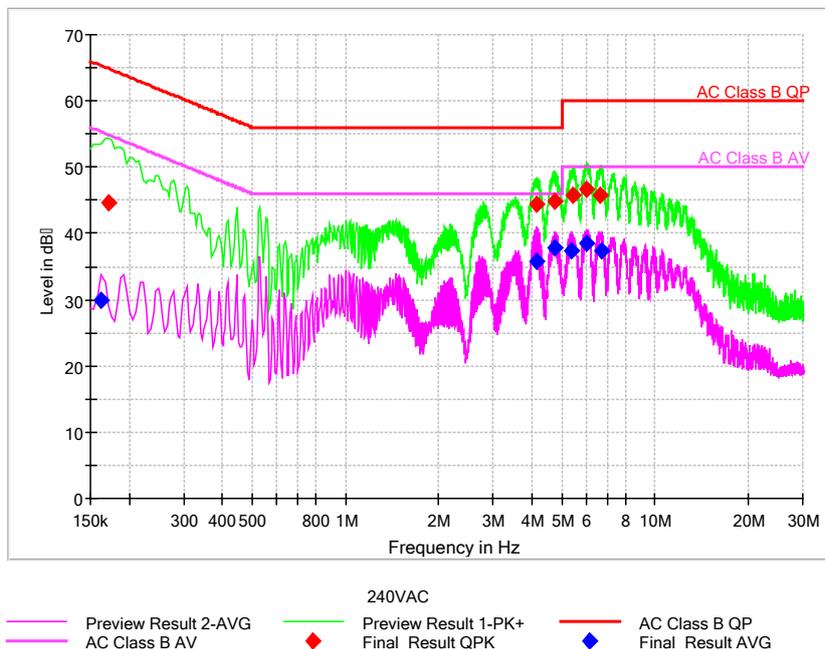
EUT + 5#AE: USB Cable1+1# AE: Charger1+3# AE: Battery1+7# AE: Headset1:



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)
0.167057	---	28.82	55.11	26.29	N	29.6	---	-0.78
0.171321	44.40	---	64.90	20.49	L1	29.6	14.8	---
0.512464	---	28.85	46.00	17.15	L1	29.6	---	-0.75
0.512464	39.94	---	56.00	16.06	L1	29.6	10.34	---
0.555107	42.22	---	56.00	13.78	N	29.6	12.62	---
0.589221	---	31.81	46.00	14.19	N	29.6	---	2.21
4.866300	41.55	---	56.00	14.45	N	29.7	11.85	---
4.883357	---	33.54	46.00	12.46	N	29.7	---	3.84
6.171171	42.54	---	60.00	17.46	N	29.7	12.84	---
6.252193	---	35.66	50.00	14.34	N	29.7	---	5.96
8.985600	---	33.81	50.00	16.19	N	29.8	---	4.01
9.211607	41.18	---	60.00	18.82	N	29.8	11.38	---

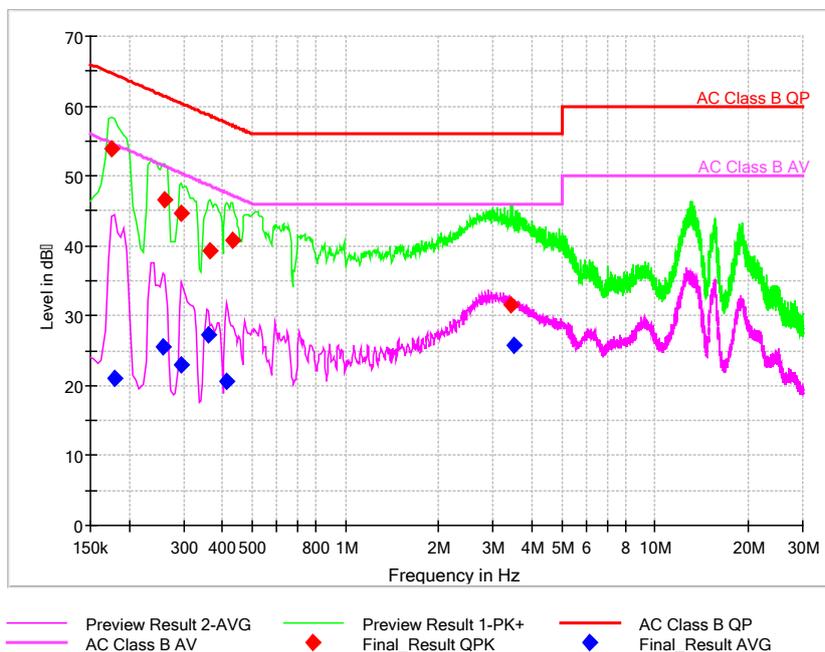
EUT + 5#AE: USB Cable1+1# AE: Charger1+3# AE: Battery1+7# AE: Headset1:



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	---	29.93	55.32	25.39	N	29.6	---	0.33
0.171321	44.73	---	64.90	20.17	L1	29.6	15.13	---
4.137107	---	35.90	46.00	10.10	N	29.7	---	6.2
4.137107	44.31	---	56.00	11.69	N	29.7	14.61	---
4.721314	44.79	---	56.00	11.21	N	29.7	15.09	---
4.751164	---	37.85	46.00	8.15	N	29.7	---	8.15
5.390807	---	37.44	50.00	12.56	N	29.7	---	7.74
5.450507	45.83	---	60.00	14.17	N	29.7	16.13	---
6.009129	---	38.59	50.00	11.41	N	29.7	---	8.89
6.034714	46.58	---	60.00	13.42	N	29.7	16.88	---
6.657300	45.79	---	60.00	14.21	N	29.7	16.09	---
6.687150	---	37.40	50.00	12.60	N	29.7	---	7.7

EUT + 5#AE: USB Cable1+9# AE: Laptop +3# AE: Battery1+7# AE: Headset1:



Pic4. Conducted emission L&N Line

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	Pmea Quasi Peak (dBμV)	Pmea Average (dBμV)
0.175586	53.81	---	64.69	10.89	L1	29.6	24.21	---
0.179850	---	21.10	54.49	33.39	N	29.6	---	-8.5
0.256607	---	25.49	51.54	26.05	L1	29.6	---	-4.11
0.260871	46.64	---	61.40	14.77	L1	29.6	17.04	---
0.294986	---	23.05	50.38	27.33	N	29.6	---	-6.55
0.294986	44.68	---	60.38	15.70	L1	29.6	15.08	---
0.358950	---	27.25	48.75	21.50	L1	29.6	---	-2.35
0.363214	39.32	---	58.66	19.33	L1	29.6	9.72	---
0.414386	---	20.65	47.56	26.91	L1	29.6	---	-8.95
0.431443	40.71	---	57.23	16.52	L1	29.6	11.11	---
3.407914	31.63	---	56.00	24.37	N	29.7	1.93	---
3.480407	---	25.81	46.00	20.19	N	29.7	---	-3.89

2.2.2 Radiated Emissions-FCC Part15.109

Ambient condition:

Temperature	Relative humidity	Pressure
17.6°C	32.2%	100.9kPa

Test Setup:

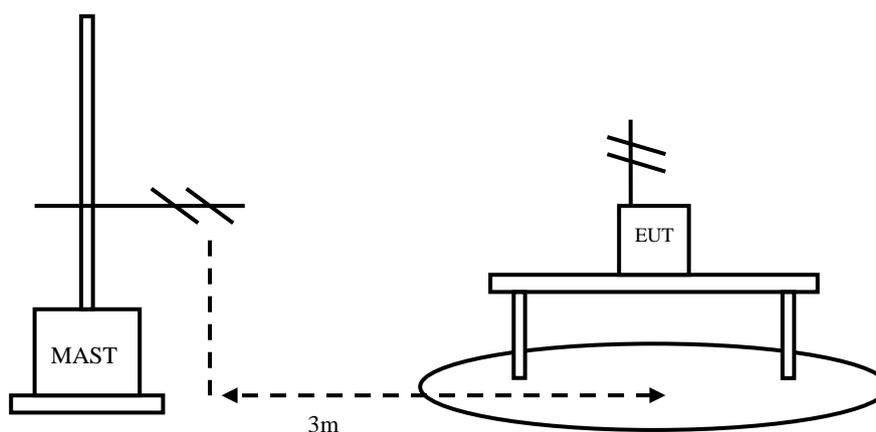


Figure 3

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: $(28.44 \text{ dB}\mu\text{V/m}) = (49.34 \text{ dB}\mu\text{V}) + (-20.9 \text{ dB/m})$, the corresponding frequency is 31.552000MHz.

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:

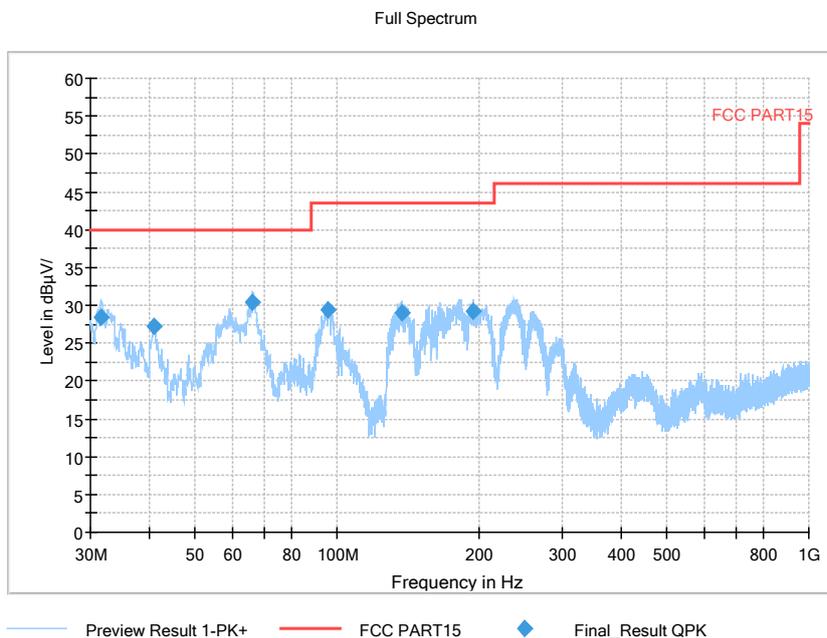
EUT + 5#AE: USB Cable1+1# AE: Charger1+3# AE: Battery1+7# AE: Headset1:

Frequency(MHz)	Result(dBuV/m)	A _{Rpl} (dB/m)	P _{mea} (dBuV)	Polarity
31.552000	28.44	-20.9	49.34	V
40.815500	27.15	-18.4	45.55	V
66.326500	30.31	-20.9	51.21	V
95.814500	29.37	-20.0	49.37	H
137.136500	29.05	-22.7	51.75	V
194.075500	29.11	-19.4	48.51	H

EUT + 5#AE: USB Cable1+9# AE: Laptop +3# AE: Battery1+7# AE: Headset1:

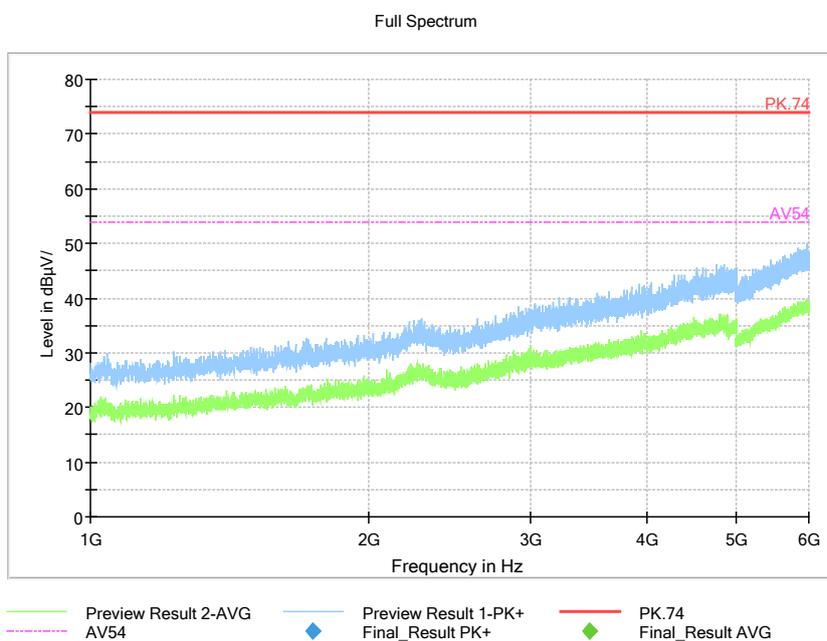
Frequency(MHz)	Result(dBuV/m)	A _{Rpl} (dB/m)	P _{mea} (dBuV)	Polarity
119.967500	24.04	-21.4	45.44	V
167.982500	31.48	-21.8	53.28	V
263.964000	30.44	-16.9	47.34	H
311.979000	29.46	-15.7	45.16	V
455.975500	30.45	-12.0	42.45	V
743.968500	28.17	-5.5	33.67	V

EUT + 5#AE: USB Cable1+1# AE: Charger1+3# AE: Battery1+7# AE: Headset1: refer to Pic5 to Pic8



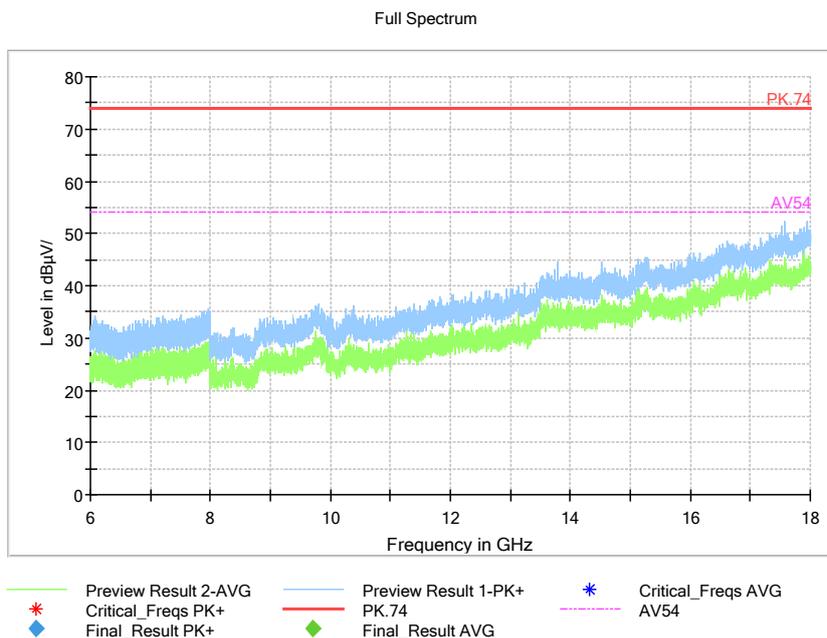
Pic5. Radiated emission (30MHz – 1GHz)

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



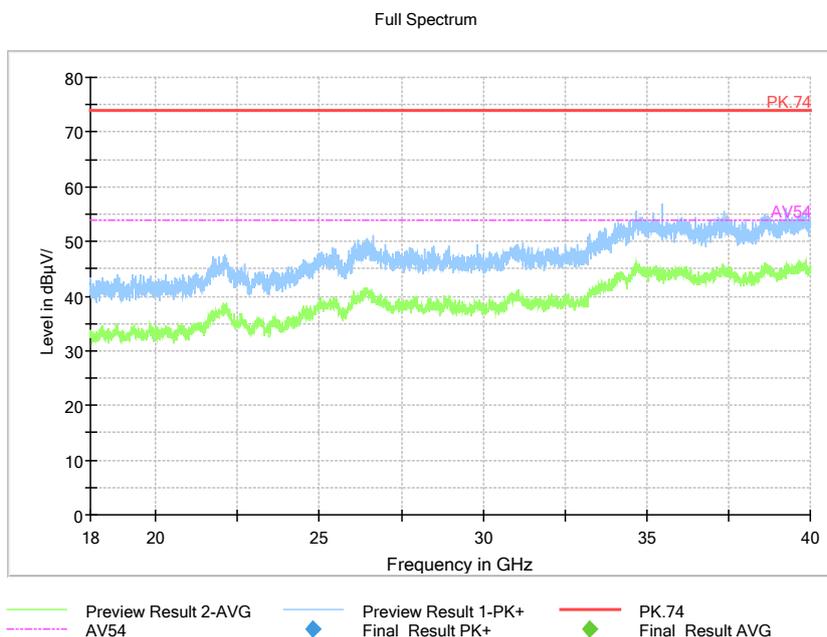
Pic6. Radiated emission (1GHz –6GHz)

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



Pic7. Radiated emission (6GHz –18GHz)

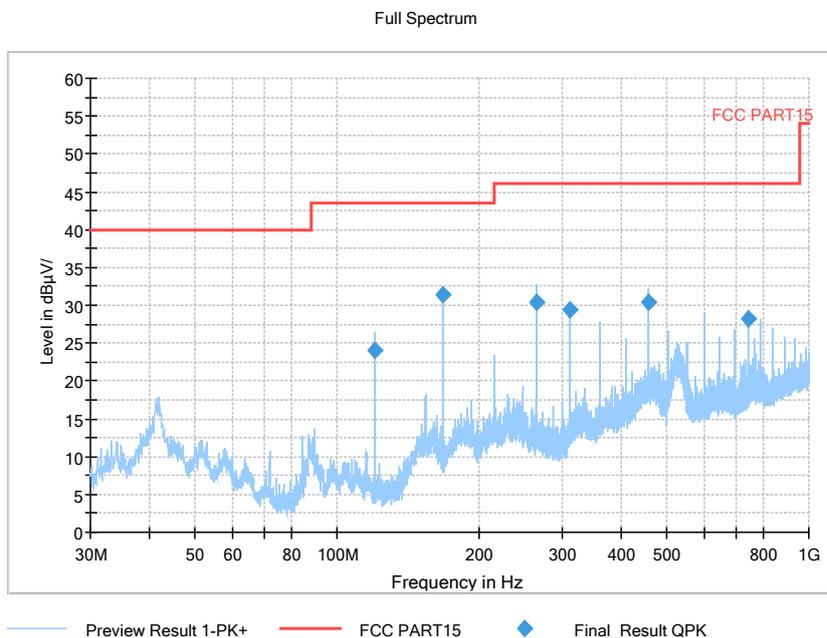
Note: The test data in the graph includes two polarizations: horizontal and vertical



Pic8. Radiated emission (18GHz –40GHz)

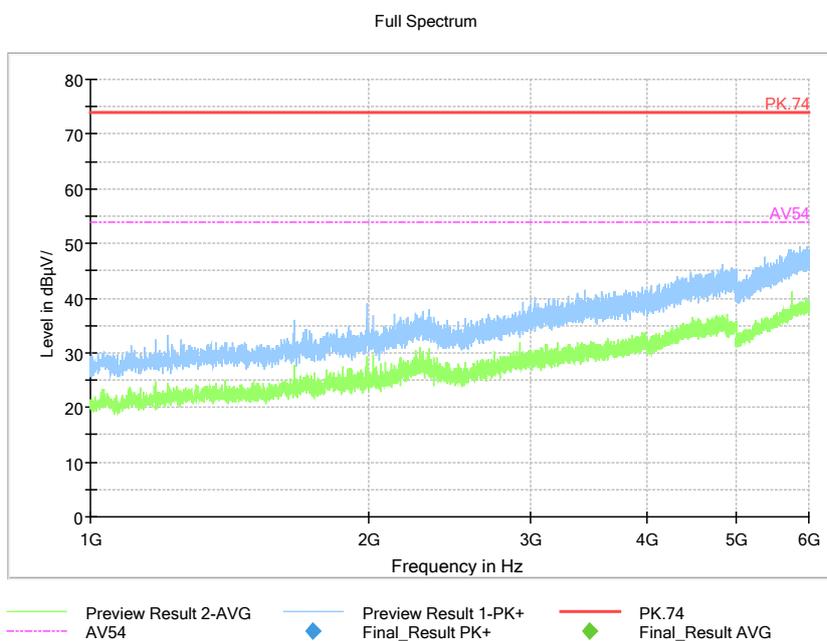
Note: The test data in the graph includes two polarizations: horizontal and vertical

EUT + 5#AE: USB Cable1+9# AE: Laptop+3# AE: Battery1+7# AE: Headset1: refer to Pic9 to Pic12



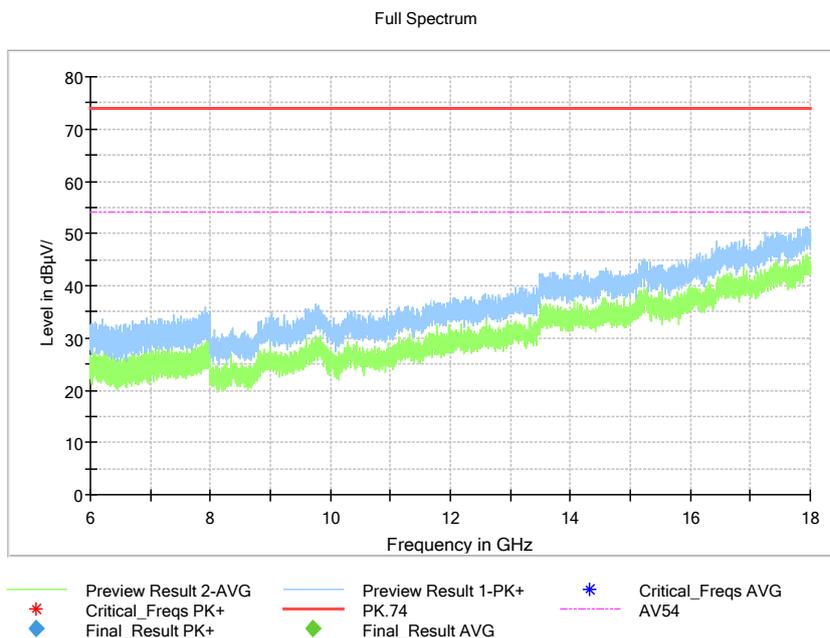
Pic9. Radiated emission (30MHz – 1GHz)

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



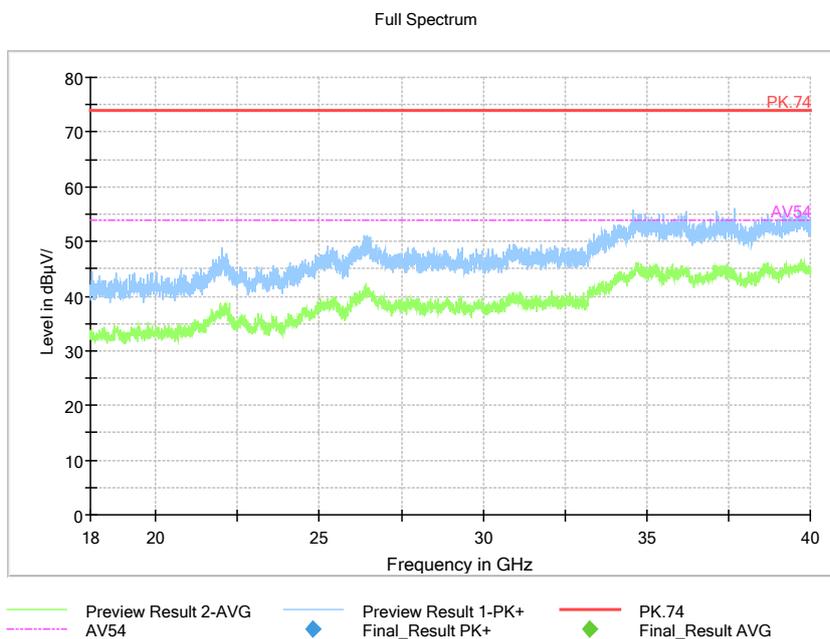
Pic10. Radiated emission (1GHz –6GHz)

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 –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	-----	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	2022.04.11	2021.04.12
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-----