
TEST REPORT

Report No.: SRTC2020-9003(F)-0049
Product Name: LTE/WCDMA/GSM(GPRS) Multi-Mode Digital
Mobile Phone
Model Name: ZTE A2121L
Applicant: ZTE CORPORATION
Manufacturer: ZTE CORPORATION
Specification: FCC Part15B (Certification)
(2019 edition)
FCC ID: SRQ-ZTEA2121L

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
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Email: liujiaf@srtc.org.cn

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: China
Contacted person: Ren Shijia
Tel: +86-13709193069
Email: ren.shijia@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: China
Contacted person: Ren Shijia
Tel: +86-13709193069
Email: ren.shijia@zte.com.cn

1.5 Application details

Date of reception of test sample: 15th October 2020

Date of test: 15th October 2020 to 29th October 2020

1.6 Reference specification

FCC Part 15B, 2019 (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	ZTE A2121L
FCC ID	SRQ-ZTEA2121L
Frequency Range	GSM: GSM850 / PCS1900 WCDMA: FDD II / FDD IV / FDD V LTE: FDD 2/ FDD 4/ FDD 5/ FDD 7/ FDD 12/ FDD 17/FDD 26/FDD 66 Bluetooth: 2.4~2.4835GHz WiFi: 2.4~2.4835GHz/5.15-5.25GHz/5.725-5.85GHz
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	zd1B
SW Version	TEL_MX_ZTE_A2121LV1.0

1.7.2EUT details

Product Name	Model Name	IMEI
LTE/WCDMA/GSM(GPRS) Multi-Mode Digital Mobile Phone	ZTE A2121L	868933050002743

1.7.3 Auxiliary equipment details

AE (Auxiliary Equipment) 1#: Laptop

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

AE (Auxiliary Equipment) 2#: USB Cable1

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

AE (Auxiliary Equipment) 3#: USB Cable2

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

AE (Auxiliary Equipment) 4#: Charger1

Manufacturer	RUIJING
Model Number	STC-A5930A1-Z
S/N	/
Input Voltage	100V-240V AC 0.5A
Output Voltage	5.0VDC 3.0A OR 9.0VDC 2.0A OR 12.0VDC 1.5A

AE (Auxiliary Equipment) 5#: Charger2

Manufacturer	CHENYANG
Model Number	STC-A5930A1-Z
S/N	/
Input Voltage	100V-240V AC 0.5A
Output Voltage	5.0VDC 3.0A OR 9.0VDC 2.0A OR 12.0VDC 1.5A

AE (Auxiliary Equipment) 6#: Headset1

Manufacturer	JUWEI ELECTRONICS CO.,LTD
Model Number	DEM-66C

AE (Auxiliary Equipment) 7#: Headset2

Manufacturer	Shen zhen FDC Electronic Co.,Ltd
Model Number	JWEP1183-Z01R

Note: The headset and charger use the same C-type USB port, which cannot be used at the same time.

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 刘巍	Checked By: Mr. Guo Yu Vice director of the test department 郭雨
Tested By: Mr. Wu Chengwang 吴成旺	Issued date: 2020.10.30

2.2 Test result

2.2.1 Conducted Emissions-FCC Part15.107

Ambient condition:

Temperature	Relative humidity	Pressure
21.1℃	40.3%	100.8kPa

Test Setup with laptop:

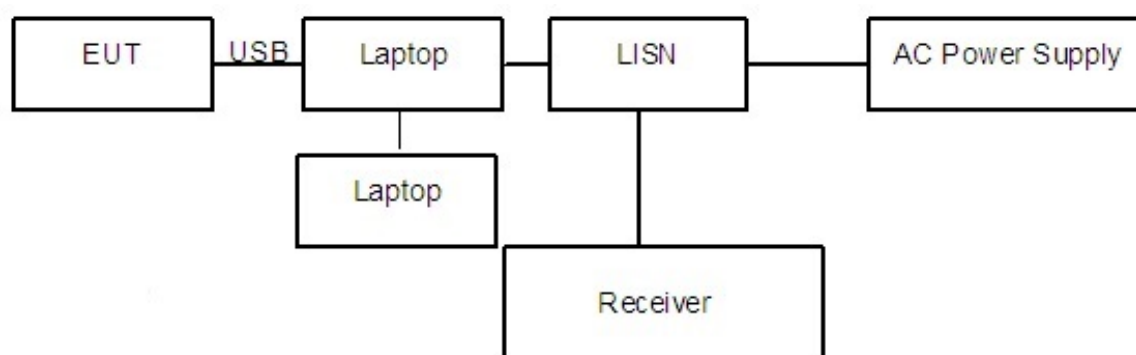


Figure 1

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:

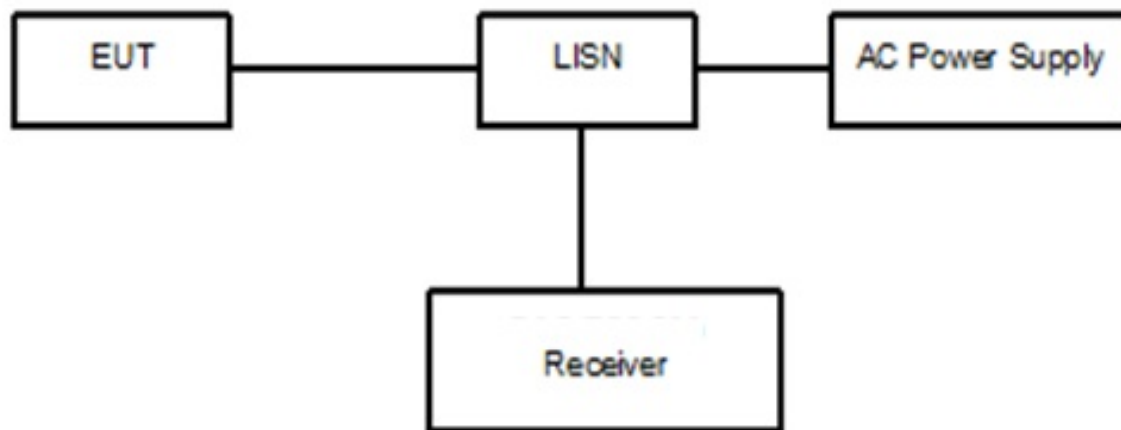


Figure 2

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, 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 $L_{\text{cable}} + \text{ATT} + \text{VDF}$ 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: $(52.41 \text{ dB}\mu\text{V}) = (22.81 \text{ dB}\mu\text{V}) + (29.6 \text{ dB})$, the corresponding frequency is 0.173320MHz.

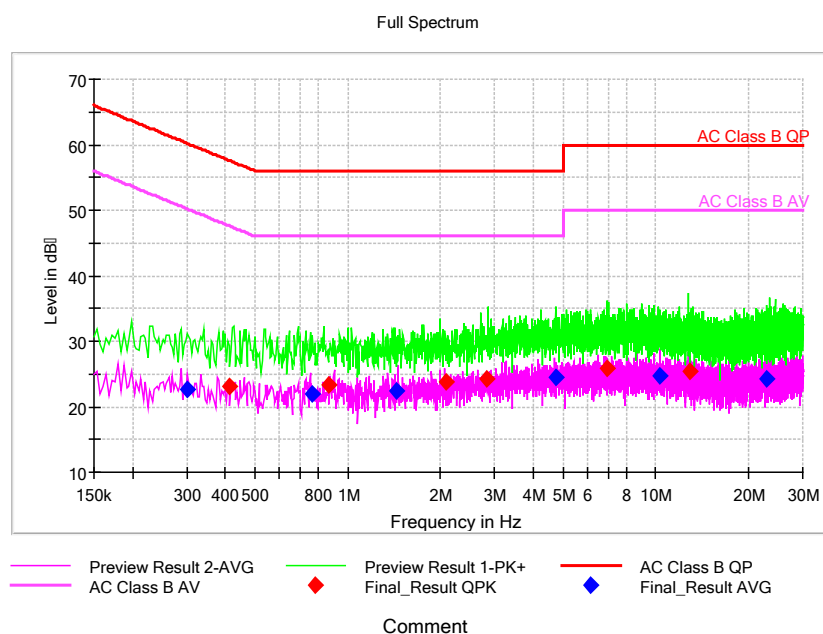
Limit:

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

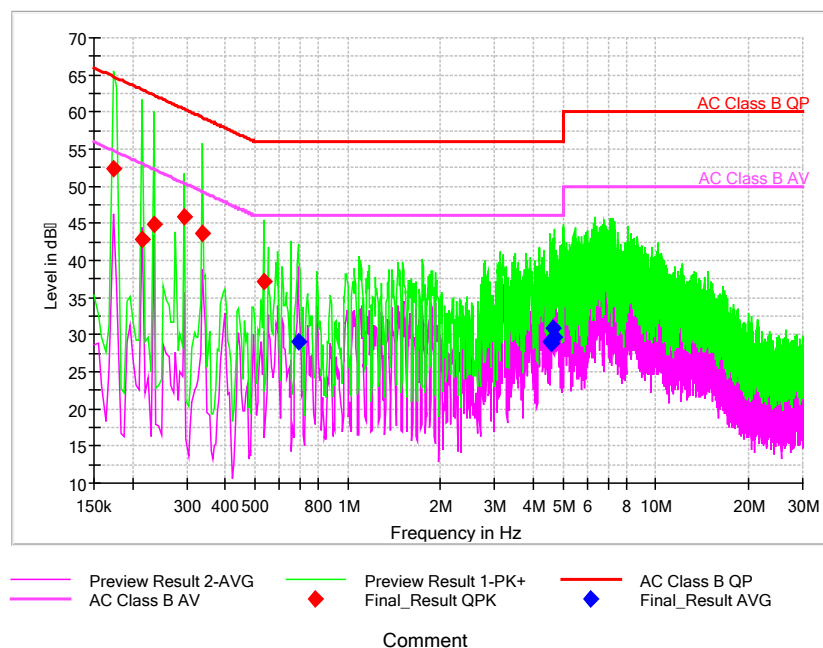
Test result:

Noise Level of the Measuring Instrument



Pic1. Conducted emission L and N Line

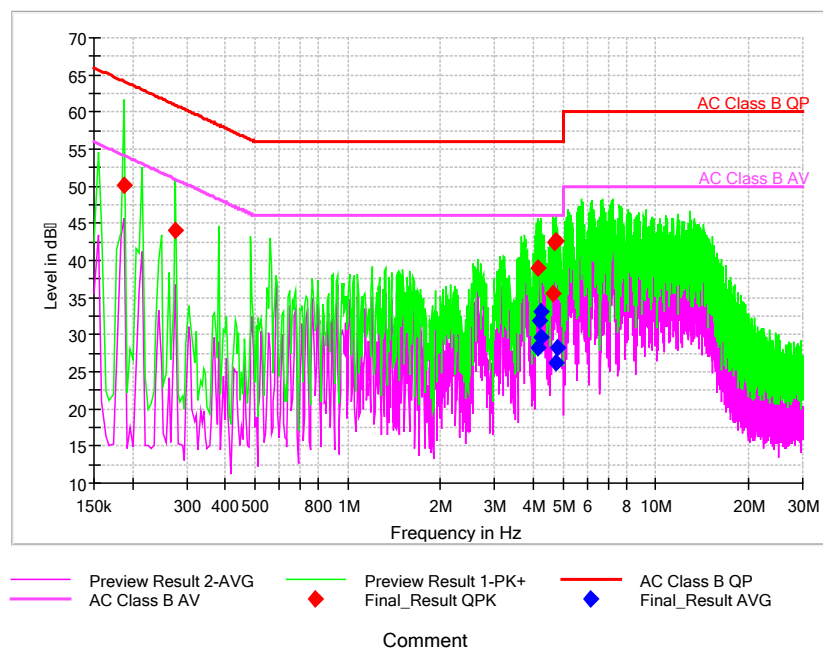
1#EUT + 2#AE: USB Cable1+4# AE: Charger1+6# AE: Headset1:



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)
0.173320	52.41	---	64.80	12.39	L1	29.6	22.81	---
0.215297	42.85	---	63.00	20.15	L1	29.6	13.25	---
0.233953	44.81	---	62.31	17.50	L1	29.6	15.21	---
0.294586	45.97	---	60.39	14.43	L1	29.6	16.37	---
0.336562	43.73	---	59.29	15.56	L1	29.6	14.13	---
0.532453	37.21	---	56.00	18.79	L1	29.6	7.61	---
0.691031	---	28.95	46.00	17.05	L1	29.6	---	-0.65
4.552875	---	28.96	46.00	17.04	L1	29.7	---	-0.74
4.562203	---	28.95	46.00	17.05	L1	29.7	---	-0.75
4.571531	---	28.89	46.00	17.11	L1	29.7	---	-0.81
4.641492	---	30.80	46.00	15.20	L1	29.7	---	1.1
4.678805	---	29.63	46.00	16.37	L1	29.7	---	-0.07

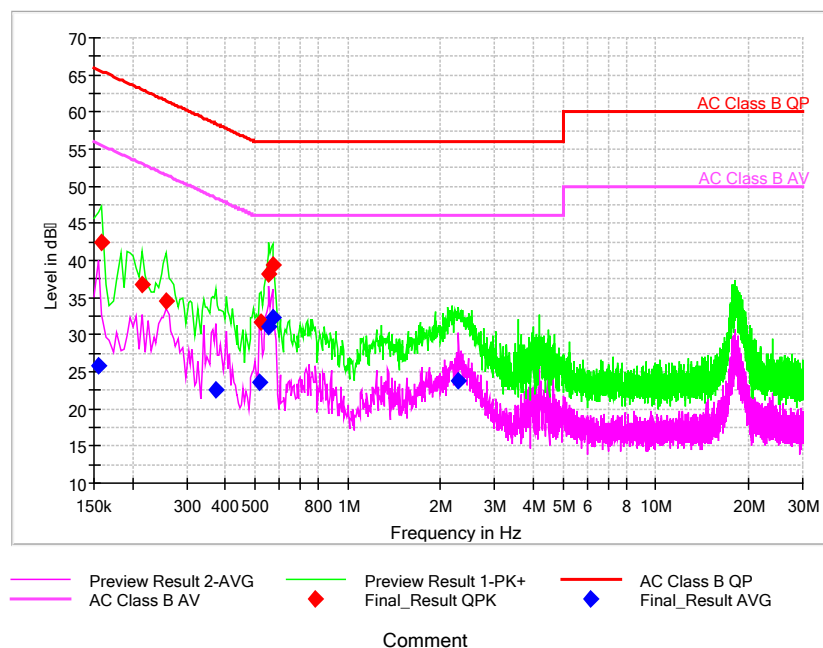
1#EUT + 3#AE: USB Cable2+5# AE: Charger2+7# AE: Headset2:



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)
0.187312	50.04	---	64.16	14.12	L1	29.6	20.44	---
0.275930	44.01	---	60.94	16.93	L1	29.6	14.41	---
4.137773	---	28.27	46.00	17.73	L1	29.7	---	-1.43
4.137773	39.02	---	56.00	16.98	L1	29.7	9.32	---
4.198406	---	31.99	46.00	14.01	L1	29.7	---	2.29
4.226391	---	29.64	46.00	16.36	L1	29.7	---	-0.06
4.235719	---	33.16	46.00	12.84	L1	29.7	---	3.46
4.627500	35.49	---	56.00	20.51	L1	29.7	5.79	---
4.702125	42.46	---	56.00	13.54	L1	29.7	12.76	---
4.725445	42.58	---	56.00	13.42	L1	29.7	12.88	---
4.730109	---	26.15	46.00	19.85	L1	29.7	---	-3.55
4.790742	---	28.28	46.00	17.72	L1	29.7	---	-1.42

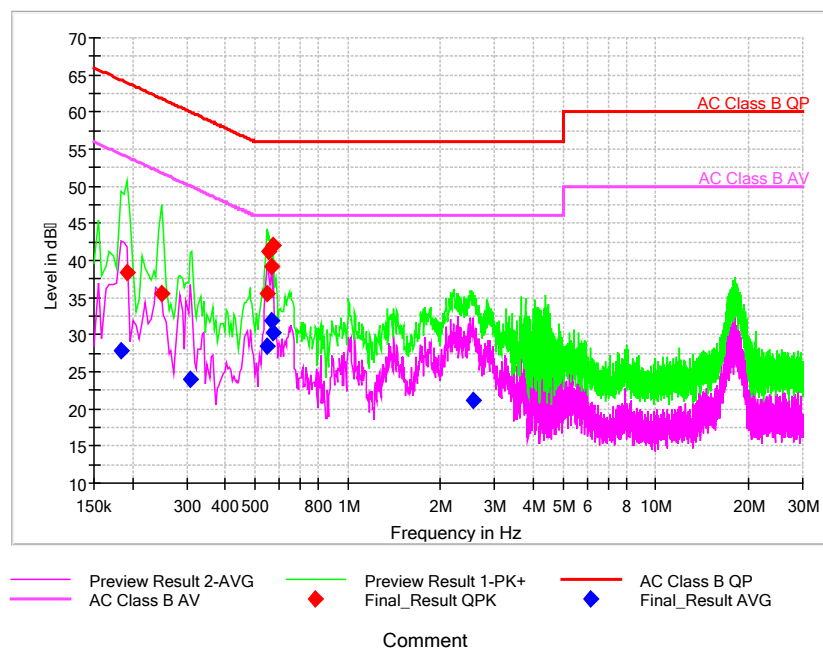
1#EUT +2#AE: USB Cable1+4# AE: Charger1+6# AE: Headset1+1# AE: Laptop:



Pic4. Conducted emission L&N Line

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	Pmea QuasiPeak (dBμV)	Pmea Average (dBμV)
0.154664	---	25.87	55.75	29.87	L1	29.6	---	-3.73
0.159328	42.48	---	65.50	23.02	L1	29.6	12.88	---
0.215297	36.85	---	63.00	26.15	L1	29.6	7.25	---
0.257273	34.43	---	61.52	27.09	N	29.6	4.83	---
0.373875	---	22.65	48.41	25.76	N	29.6	---	-6.95
0.518461	---	23.49	46.00	22.51	N	29.6	---	-6.11
0.523125	31.66	---	56.00	24.34	N	29.6	2.06	---
0.555773	38.22	---	56.00	17.78	L1	29.6	8.62	---
0.555773	---	31.06	46.00	14.94	L1	29.6	---	1.46
0.569766	39.38	---	56.00	16.62	L1	29.6	9.78	---
0.569766	---	32.33	46.00	13.67	L1	29.6	---	2.73
2.290805	---	23.88	46.00	22.13	L1	29.7	---	-5.82

1#EUT + 3#AE: USB Cable2+5# AE: Charger2+7# AE: Headset2+1# AE: Laptop:



Pic5. Conducted emission L&N Line

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	Pmea QuasiPeak (dBμV)	Pmea Average (dBμV)
0.182648	---	27.76	54.36	26.60	N	29.6	---	-1.84
0.191977	38.33	---	63.95	25.62	N	29.6	8.73	---
0.247945	35.47	---	61.83	26.36	N	29.6	5.87	---
0.308578	---	24.05	50.01	25.96	N	29.6	---	-5.55
0.546445	---	28.36	46.00	17.64	N	29.6	---	-1.24
0.546445	35.49	---	56.00	20.51	N	29.6	5.89	---
0.555773	41.22	---	56.00	14.78	N	29.6	11.62	---
0.565102	---	31.80	46.00	14.20	N	29.6	---	2.2
0.565102	39.19	---	56.00	16.81	N	29.6	9.59	---
0.574430	---	30.24	46.00	15.76	N	29.6	---	0.64
0.574430	42.11	---	56.00	13.89	N	29.6	12.51	---
2.561320	---	21.14	46.00	24.86	N	29.7	---	-8.56

2.2.2 Radiated Emissions-FCC Part15.109

Ambient condition:

Temperature	Relative humidity	Pressure
20.8°C	39.6%	100.8kPa

Test Setup:

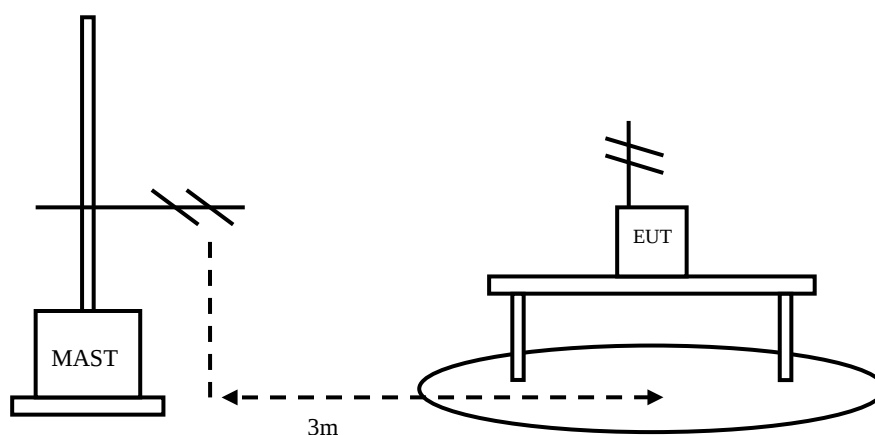


Figure 3

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

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:

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: $(35.60 \text{ dB } \mu \text{ V/m}) = (57.8 \text{ dB } \mu \text{ V/m}) + (-22.2 \text{ dB})$, the corresponding frequency is 72.580000MHz.

1#EUT + 2#AE: USB Cable1+4# AE: Charger1+6# AE: Headset1:

Frequency(MHz)	Result(dB μ V/m)	Limit (dB μ V/m)	ARpl (dB)	Pmea (dB μ V/m)	Polarity
72.580000	35.60	40.00	-22.2	57.8	V
72.597000	35.59	40.00	-22.2	57.79	V
72.603000	35.61	40.00	-22.2	57.81	V
72.622500	35.57	40.00	-22.2	57.77	V
72.626000	35.60	40.00	-22.2	57.8	V
78.560000	34.61	40.00	-23.6	58.21	V

1#EUT + 3#AE: USB Cable2+5# AE: Charger2+7# AE: Headset2:

Frequency(MHz)	Result(dB μ V/m)	Limit (dB μ V/m)	ARpl (dB)	Pmea (dB μ V/m)	Polarity
69.259000	33.09	40.00	-21.4	54.49	V
72.204000	34.46	40.00	-22.1	56.56	V
72.671000	35.17	40.00	-22.2	57.37	V
72.748500	35.21	40.00	-22.3	57.51	V
72.771500	35.24	40.00	-22.3	57.54	V
72.913500	34.68	40.00	-22.3	56.98	V

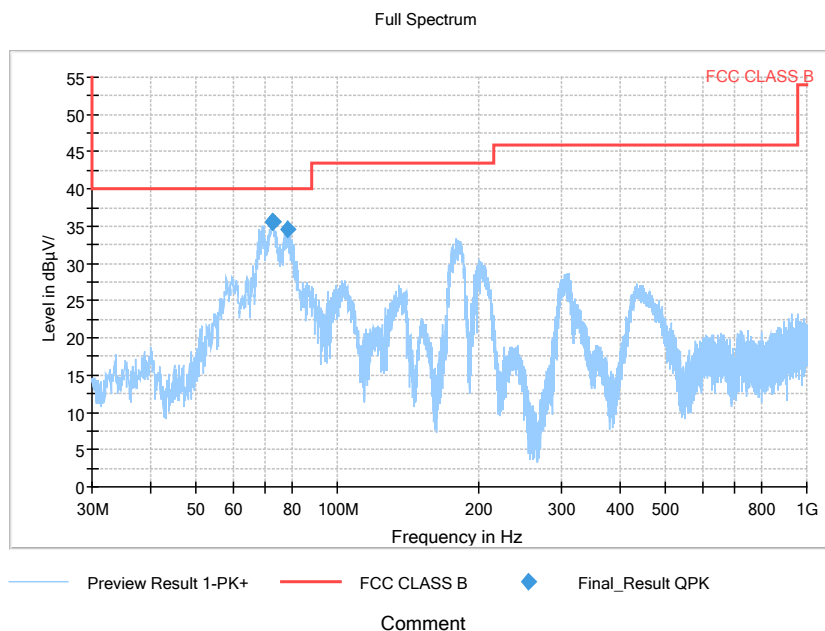
1#EUT + 2#AE: USB Cable1+4# AE: Charger1+6# AE: Headset1+1# AE: Laptop:

Frequency(MHz)	Result(dB μ V/m)	Limit (dB μ V/m)	ARpl (dB)	Pmea (dB μ V/m)	Polarity
58.232500	22.28	40.00	-18.2	40.48	V
168.002500	29.26	43.50	-20.8	50.06	V
360.014000	29.56	46.00	-13.1	42.66	V
504.010500	31.97	46.00	-9.2	41.17	V
600.000500	27.12	46.00	-6.6	33.72	V
648.007000	29.69	46.00	-6.0	35.69	V

1#EUT + 3#AE: USB Cable2+5# AE: Charger2+7# AE: Headset2+1# AE: Laptop:

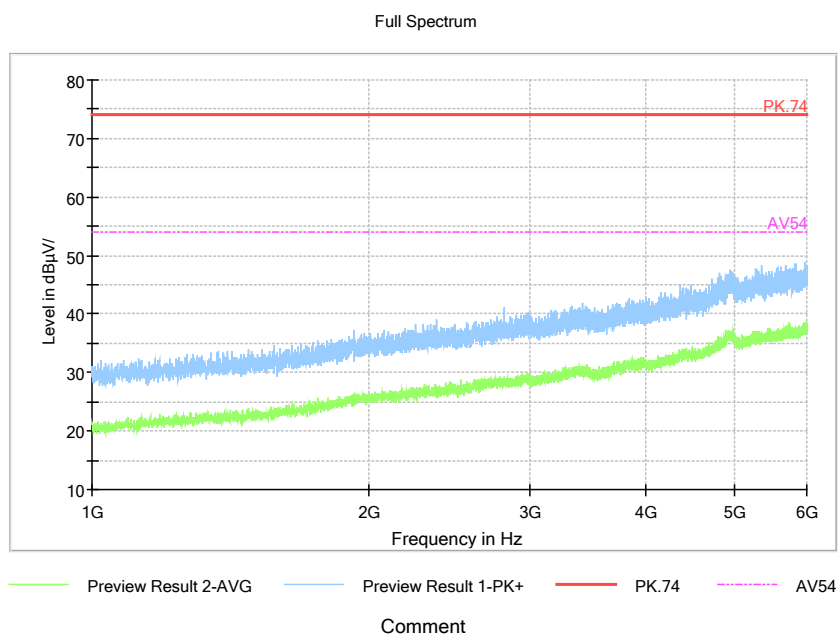
Frequency(MHz)	Result(dB μ V/m)	Limit (dB μ V/m)	ARpl (dB)	Pmea (dB μ V/m)	Polarity
58.247000	22.34	40.00	-18.2	40.54	V
58.249500	22.28	40.00	-18.2	40.48	V
168.002500	29.41	43.50	-20.8	50.21	V
360.014000	29.57	46.00	-13.1	42.67	V
504.010500	31.91	46.00	-9.2	41.11	V
648.015500	29.25	46.00	-6.0	35.25	V

1#EUT + 2#AE: USB Cable1+4# AE: Charger1+6# AE: Headset1: refer to Pic6,
Pic7, Pic8, Pic9



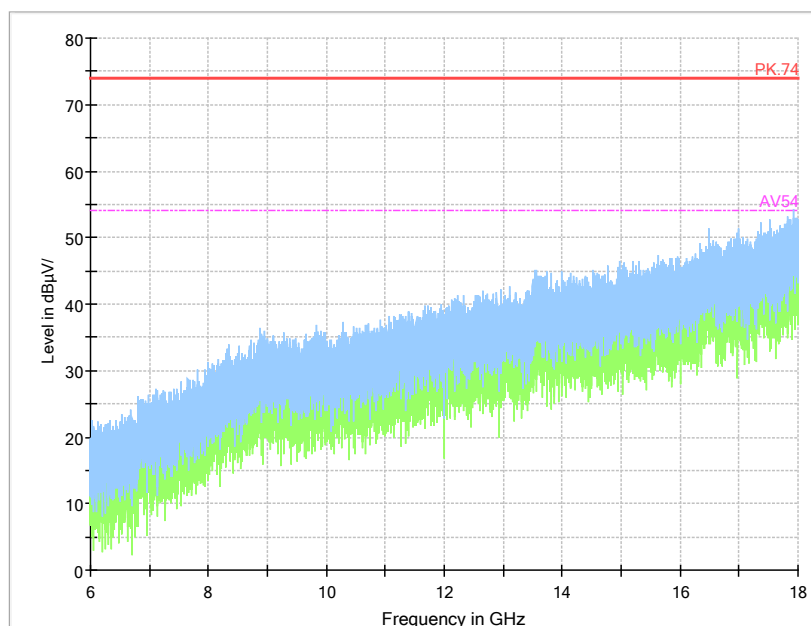
Pic6. Radiated emission(30MHz – 1GHz)

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



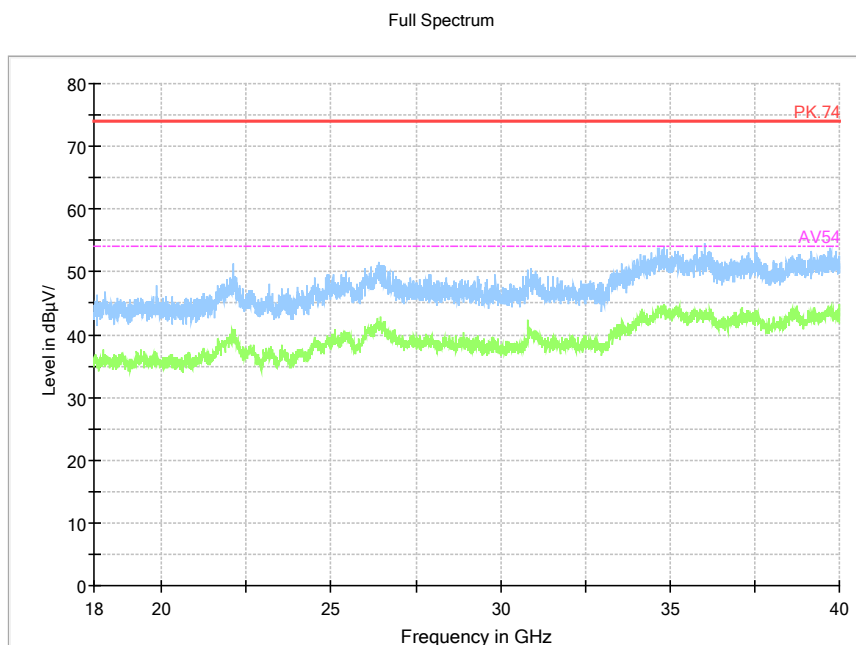
Pic7. Radiated emission (1GHz –6GHz)

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



Pic8. Radiated emission (6GHz –18GHz)

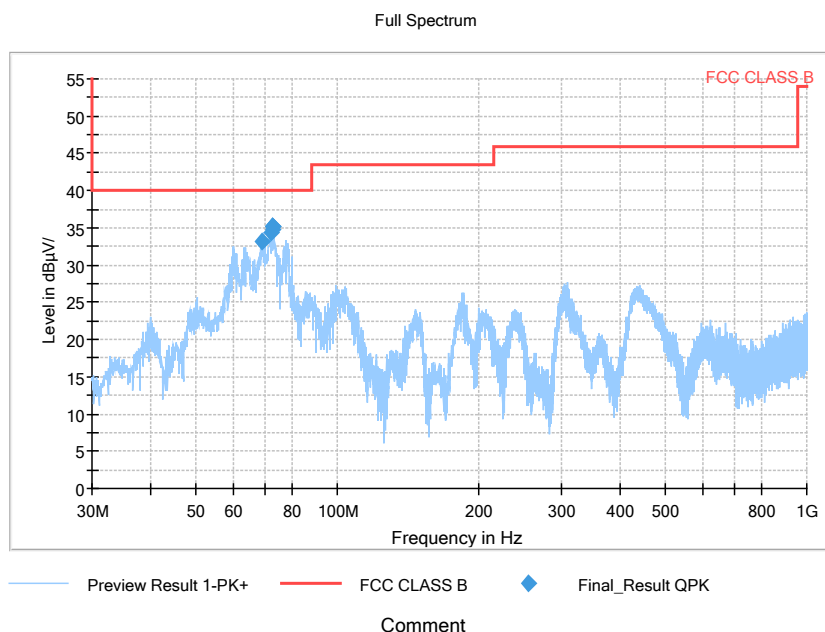
Note : The test data in the graph includes two polarizations: horizontal and vertical.



Pic9. Radiated emission (18GHz –40GHz)

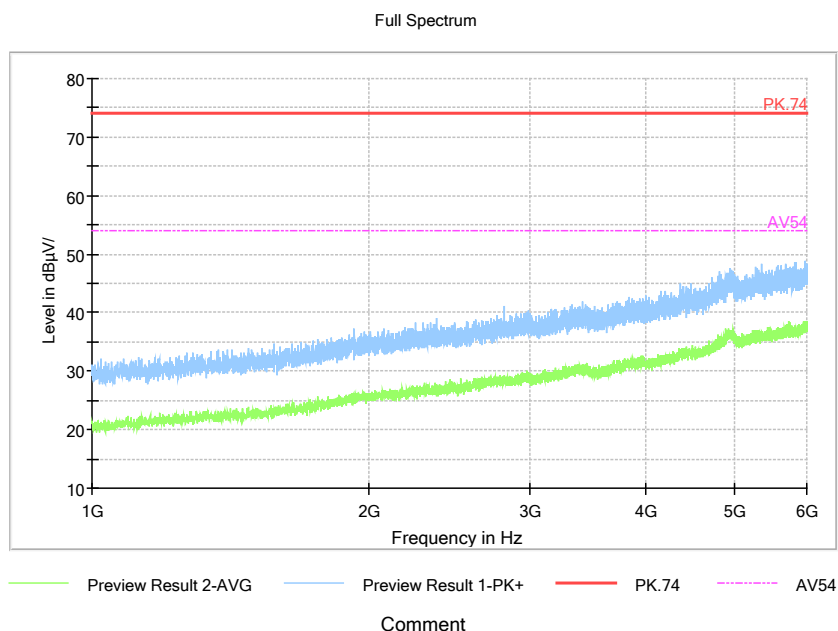
Note : The test data in the graph includes two polarizations: horizontal and vertical.

1#EUT+ 3#AE: USB Cable2+5# AE: Charger2+7# AE: Headset2: refer to Pic10, Pic11, Pic12, Pic13



Pic10. Radiated emission(30MHz – 1GHz)

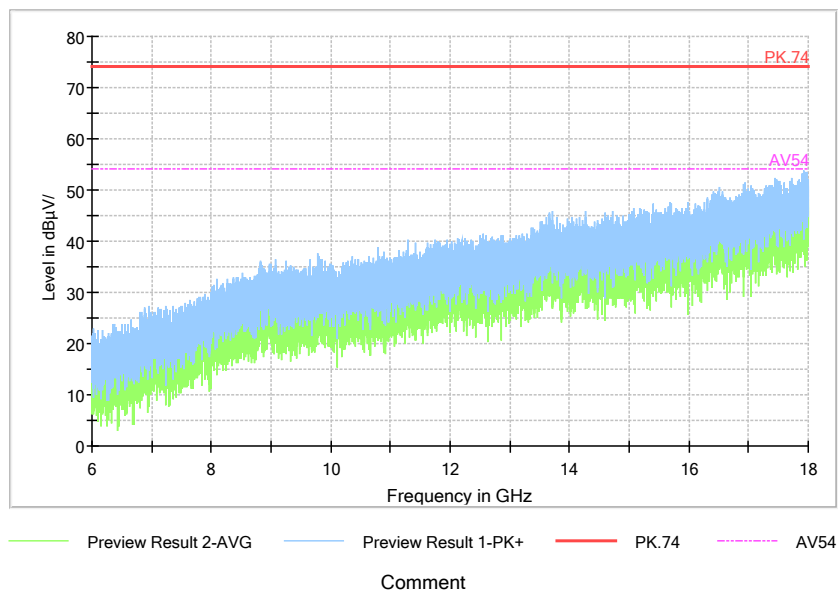
Note : The test data in the graph includes two polarizations: horizontal and vertical



Pic11. Radiated emission (1GHz –6GHz)

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

Full Spectrum

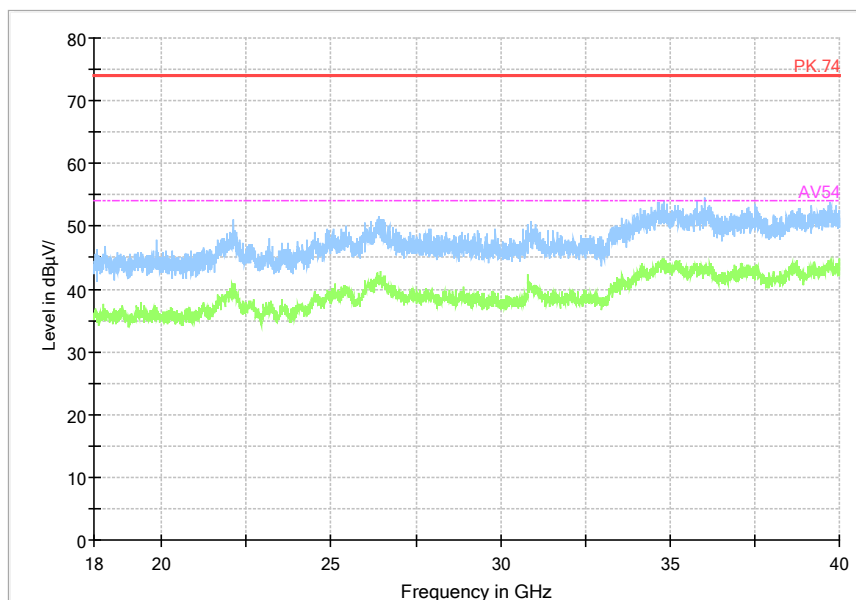


Comment

Pic12. Radiated emission (6GHz –18GHz)

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

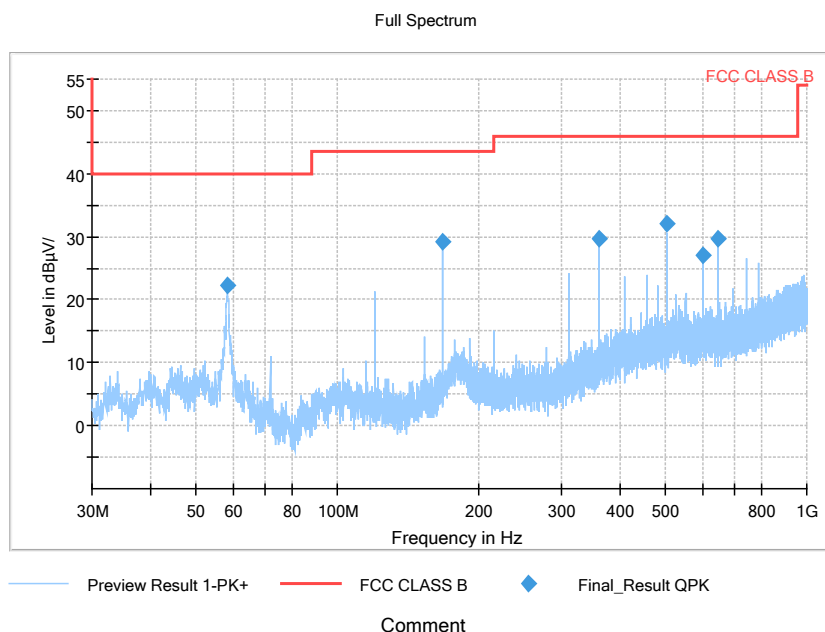
Full Spectrum



Pic3. Radiated emission (18GHz –40GHz)

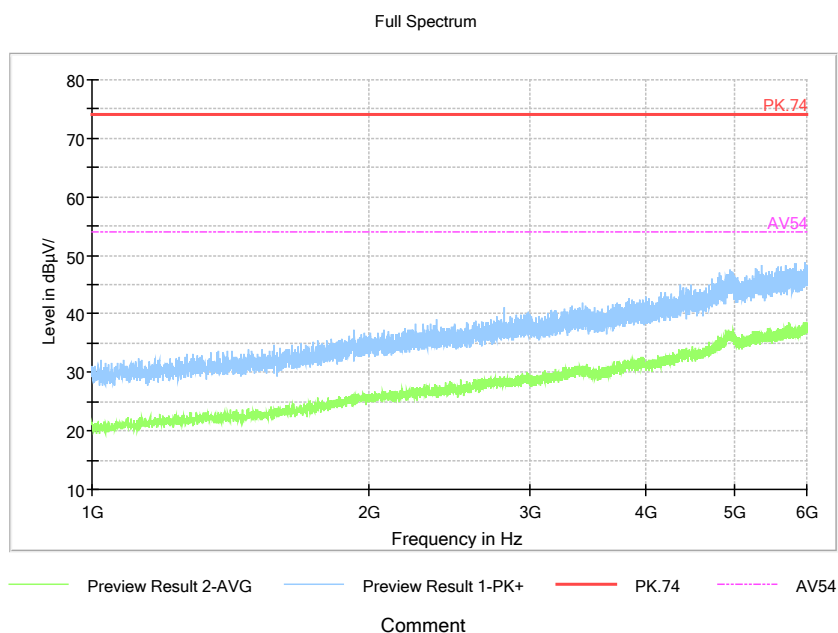
Note : The test data in the graph includes two polarizations: horizontal and vertical.

1#EUT + 2#AE: USB Cable1+4# AE: Charger1+6# AE: Headset1+1# AE: Laptop:
refer to Pic14 Pic15, Pic16, Pic17



Pic94. Radiated emission(30MHz – 1GHz)

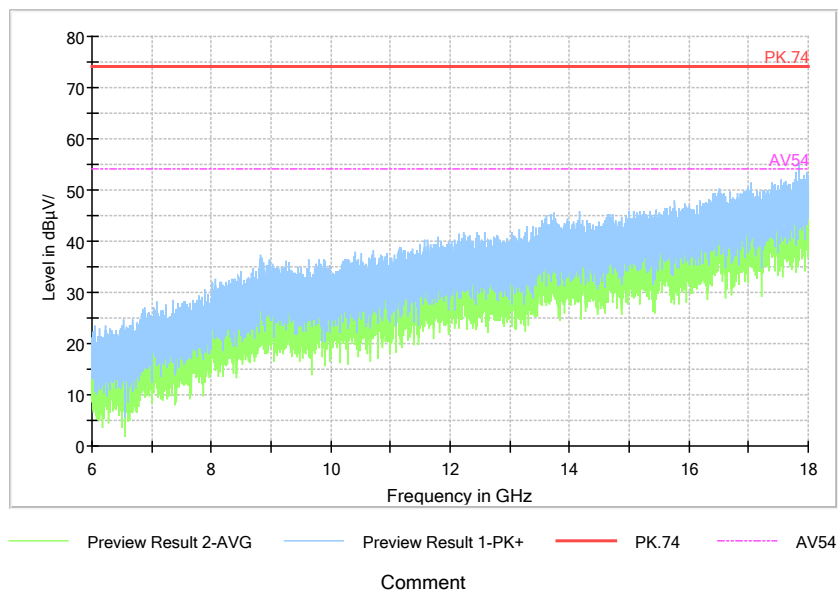
Note : The test data in the graph includes two polarizations: horizontal and vertical



Pic15. Radiated emission (1GHz –6GHz)

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

Full Spectrum

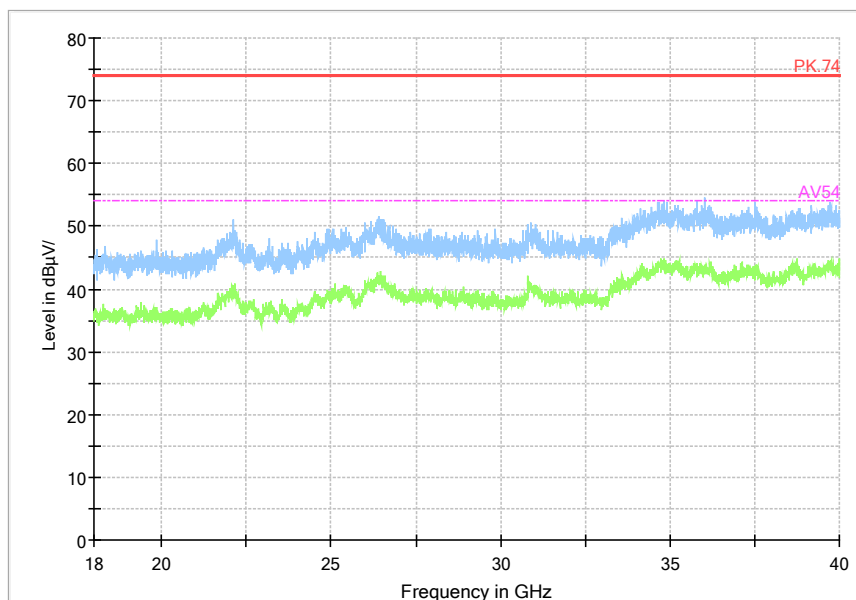


Comment

Pic16. Radiated emission (6GHz –18GHz)

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

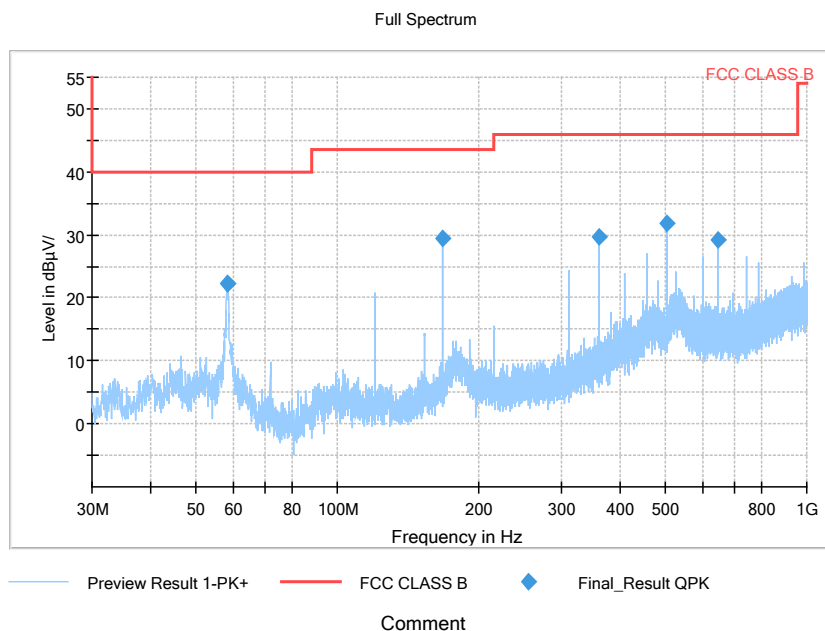
Full Spectrum



Pic17. Radiated emission (18GHz –40GHz)

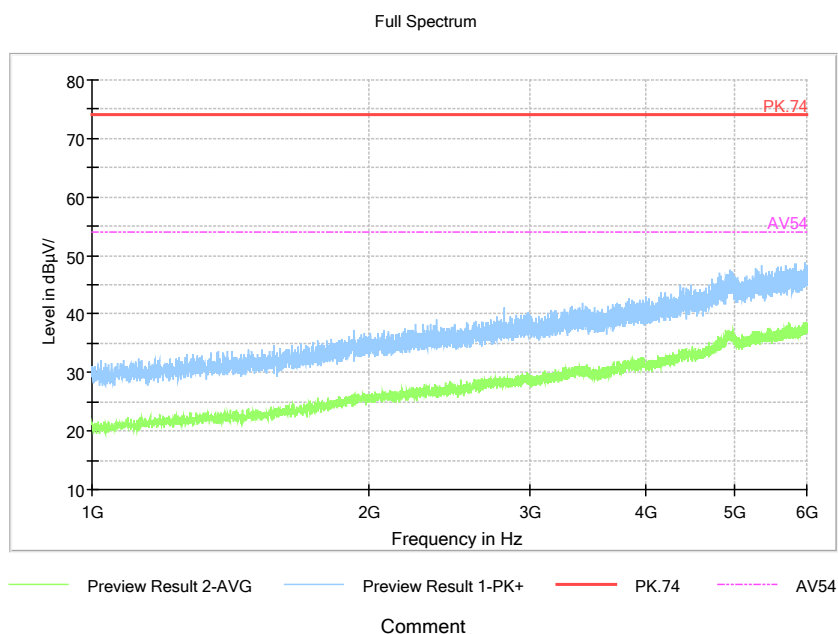
Note : The test data in the graph includes two polarizations: horizontal and vertical.

1#EUT + 3#AE: USB Cable2+5# AE: Charger2+7# AE: Headset2+1# AE: Laptop:
refer to Pic18, Pic19, Pic20, Pic21



Pic18. Radiated emission(30MHz – 1GHz)

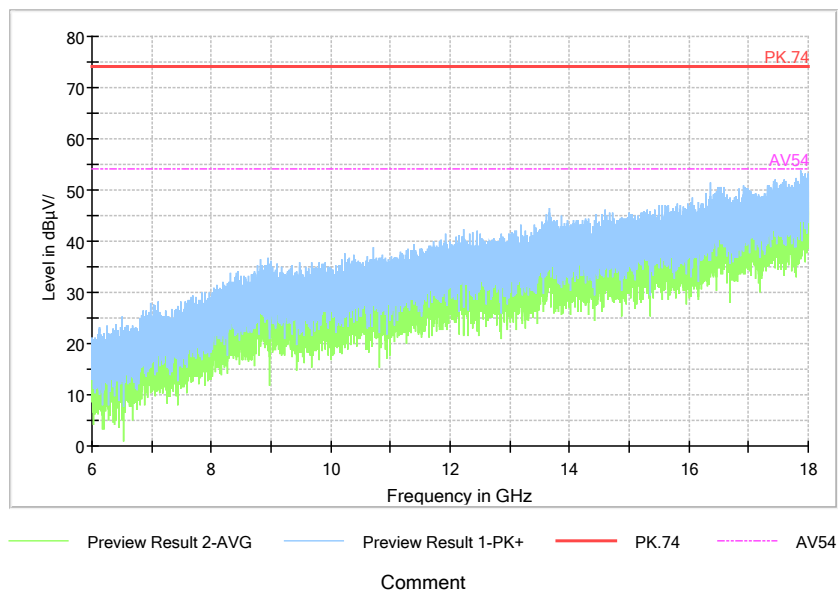
Note : The test data in the graph includes two polarizations: horizontal and vertical



Pic19. Radiated emission (1GHz –6GHz)

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

Full Spectrum

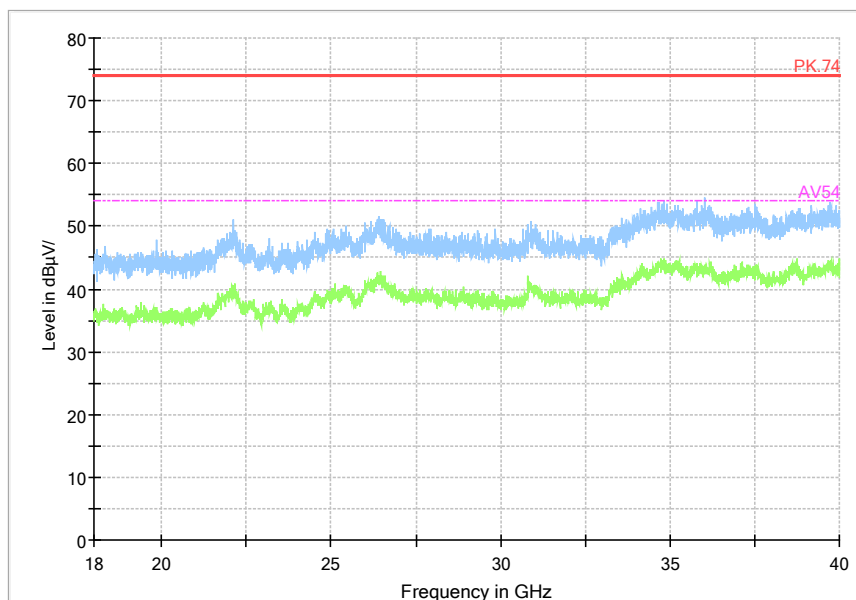


Comment

Pic20. Radiated emission (6GHz –18GHz)

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

Full Spectrum



Pic21. 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. 2021	6th Sep. 2016
2	ESW EMI test receiver	R&S	101574	20th Aug. 2021	20th Aug. 2020
3	9.080m×5.255m×3.525m Shielding room	FRANKONIA	-----	5th Sep. 2021	6th Sep. 2016
4	ESR3 EMI test receiver	R&S	100280	20th Apr. 2021	21th Apr. 2020
5	VULB 9163Ultra log test antenna	R&S	867	25th Mar. 2021	25th Mar. 2020
6	ENV216 AMN	R&S	101881	20th Aug. 2021	20th Aug. 2020
7	HF 907 Double-Ridged Waveguide Horn Antenna	R&S	100512	25th Mar. 2021	25th Mar. 2020
8	SAS-574 Horn Antenna	R&S	535	21th Apr. 2023	22th Apr.2020
9	PS2000 Turn Table	FRANKONIA	-----	-----	-----
10	MA260 Antenna Master	FRANKONIA	-----	-----	-----
11	EMC32EMI test software V10.20.01	R&S	-----	-----	-----

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