
TEST REPORT

Report No.: SRTC2020-9003(F)-0046
Product Name: LTE/WCDMA/GSM(GPRS) Multi-Mode Digital
Mobile Phone
Model Name: ZTE Blade A51
Applicant: ZTE CORPORATION
Manufacturer: ZTE CORPORATION
Specification: FCC Part15B (Certification)
(2019 edition)
FCC ID: SRQ-ZTEA51

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

Tel: 86-10-57996183 Fax: 86-10-57996388

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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: 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: 24th September 2020

Date of test: 24th September 2020 to 19th 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 Blade A51
FCC ID	SRQ-ZTEA51
Frequency Range	GSM: GSM850 / PCS1900 WCDMA: FDD II / FDD IV / FDD V LTE: FDD 2/ FDD 4/ FDD 5/ FDD 7/FDD 26/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	3.85V
Extreme Temperature	Lowest: -10°C Highest: +55°C
Extreme Voltage	Minimum: 3.4V Maximum: 4.4V
HW Version	zc7A
SW Version	TEL_MX_ZTE_Blade_A51V1.0

1.7.2EUT details

Product Name	Model Name	IMEI
LTE/WCDMA/GSM(GPRS) Multi-Mode Digital Mobile Phone	ZTE Blade A51	1#:867934050003005 2#:867934050002973

Note: As the applicant of this model, [Hisense International Co., Ltd.] declares that the product has two the suppliers of battery. Test the main and second supply equipment respectively, and record the results in the test report.

Main Supply: 1#: 867934050003005

Part Name	Model Name	supplier
battery	Li3931T44P8h806139	ZhongShan TianMao Battery Co., Ltd.

Secondary Supply: 2#: 867934050002973

Part Name	Model Name	supplier
battery	Li3931T44P8h806139	Ningbo Veken Battery Co., Ltd.

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	kingpower
Model Number	USB-TC20-W-100-M-L

AE (Auxiliary Equipment) 3#: USB Cable2

Manufacturer	luxshare
Model Number	USB-TC20-W-100-M-L

AE (Auxiliary Equipment) 4#: Charger1

Manufacturer	RUIJING
Model Number	STC-A51D-Z
S/N	/
Input Voltage	100V-240V AC 250mA
Output Voltage	5.0VDC 1000mA

AE (Auxiliary Equipment) 5#: Charger2

Manufacturer	AoHai
Model Number	STC-A51D-Z
S/N	/
Input Voltage	100V-240V AC 250mA
Output Voltage	5.0VDC 1000mA

AE (Auxiliary Equipment) 6#: Headset1

Manufacturer	JUWEI ELECTRONICS CO.,LTD
Model Number	JWEP1036-Z01R

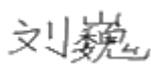
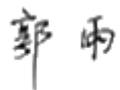
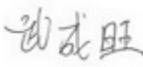
AE (Auxiliary Equipment) 7#: Headset2

Manufacturer	ShenZhen FDC Electronic Co.,Ltd
Model Number	DEM-66

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. Guo Yu Vice director of the test department 
Tested By: Mr. Wu Chengwang 	Issued date: <p style="text-align: center;">2020.10.19</p>

2.2 Test result

2.2.1 Conducted Emissions-FCC Part15.107

Ambient condition:

Temperature	Relative humidity	Pressure
21.5°C	40.2%	100.8kPa

Test Setup with laptop:

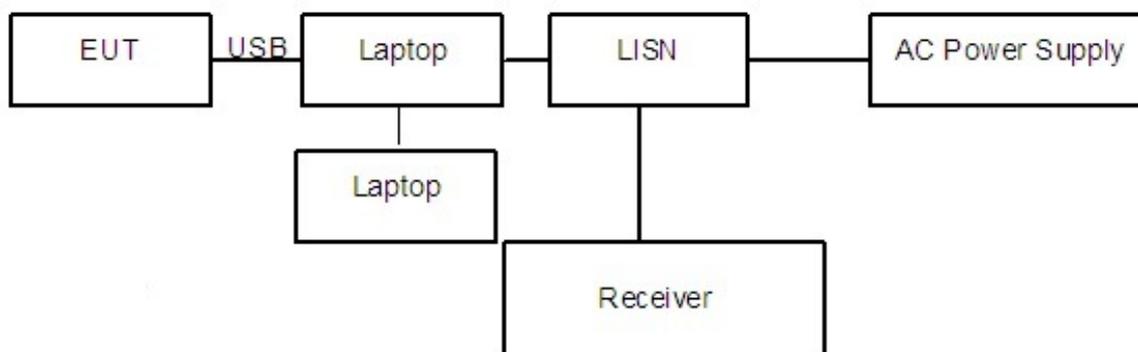


Figure 1

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:

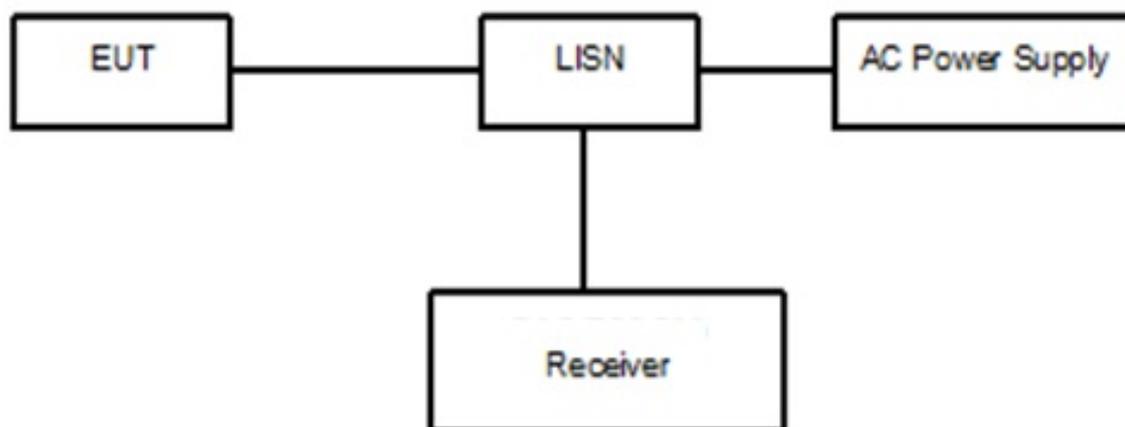


Figure 2

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, 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 $L_{\text{cable}} + \text{ATT} + \text{VDF}$ 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: $(49.56 \text{ dB}\mu\text{V}) = (19.86 \text{ dB}\mu\text{V}) + (29.7 \text{ dB})$, the corresponding frequency is 9.823266MHz.

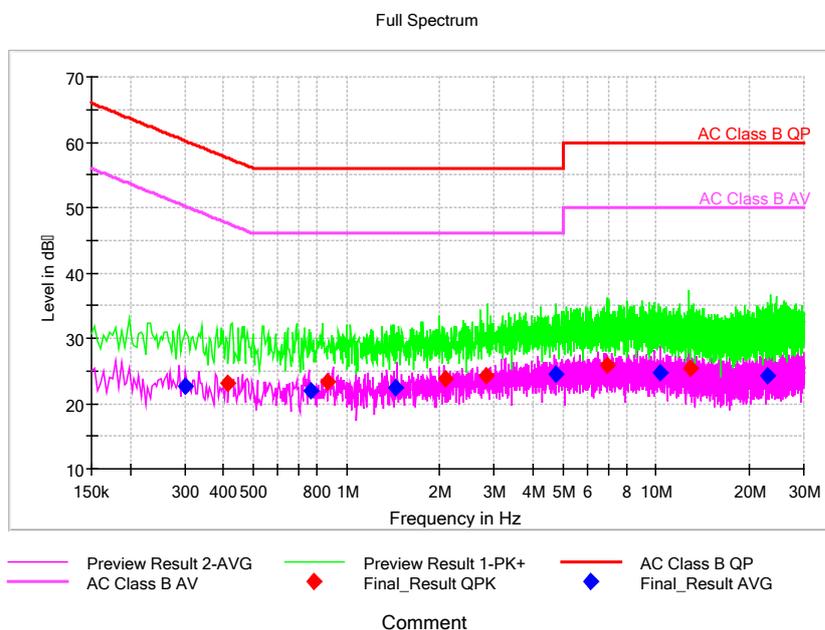
Limit:

Frequency of Emission(MHz)	Limits(dBμV)	
	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

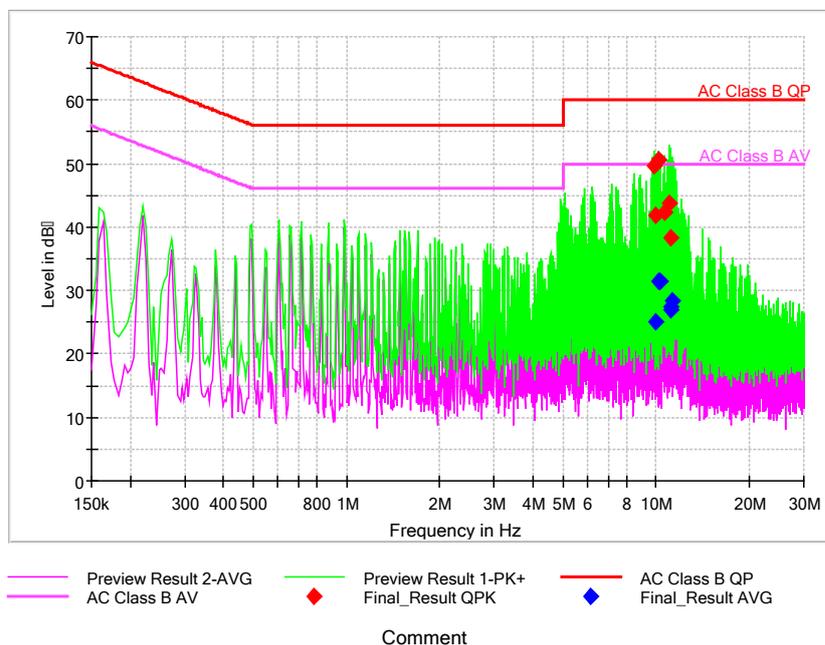
Test result:

Noise Level of the Measuring Instrument



Pic1.Conducted emission L and N Line

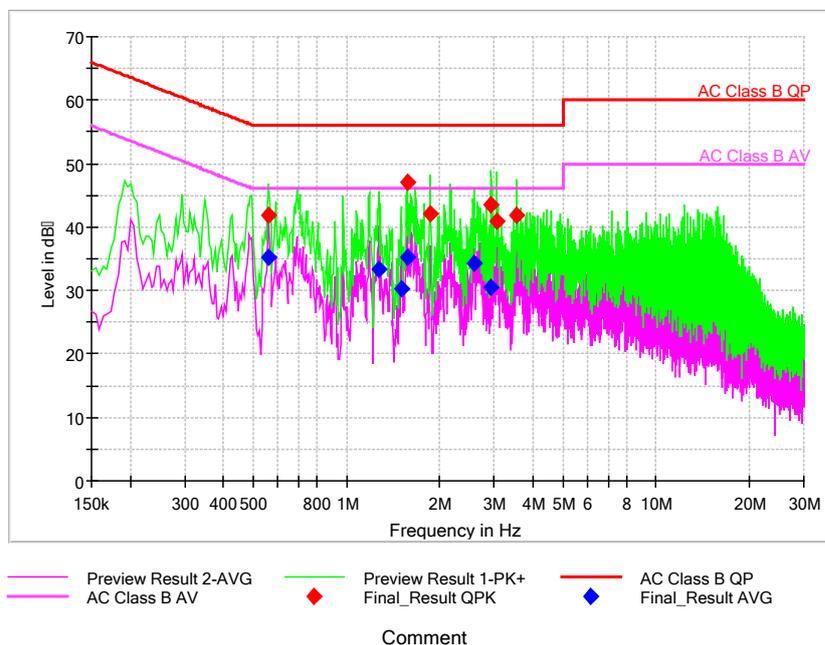
1#EUT + 2#AE: USB Cable1+4# AE: Charger1+6# AE: Headset1:



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)
9.823266	49.56	---	60.00	10.44	L1	29.7	19.86	---
9.939867	---	25.12	50.00	24.88	L1	29.7	---	-4.58
9.939867	41.91	---	60.00	18.09	L1	29.7	12.21	---
10.191727	---	31.38	50.00	18.62	L1	29.7	---	1.68
10.191727	50.51	---	60.00	9.49	L1	29.7	20.81	---
10.308328	---	31.50	50.00	18.50	L1	29.7	---	1.8
10.658133	42.31	---	60.00	17.69	L1	29.7	12.61	---
11.021930	43.65	---	60.00	16.35	L1	29.8	13.85	---
11.138531	---	26.97	50.00	23.03	L1	29.8	---	-2.83
11.138531	38.25	---	60.00	21.75	L1	29.8	8.45	---
11.199164	---	27.51	50.00	22.49	L1	29.8	---	-2.29
11.315766	---	28.49	50.00	21.51	L1	29.8	---	-1.31

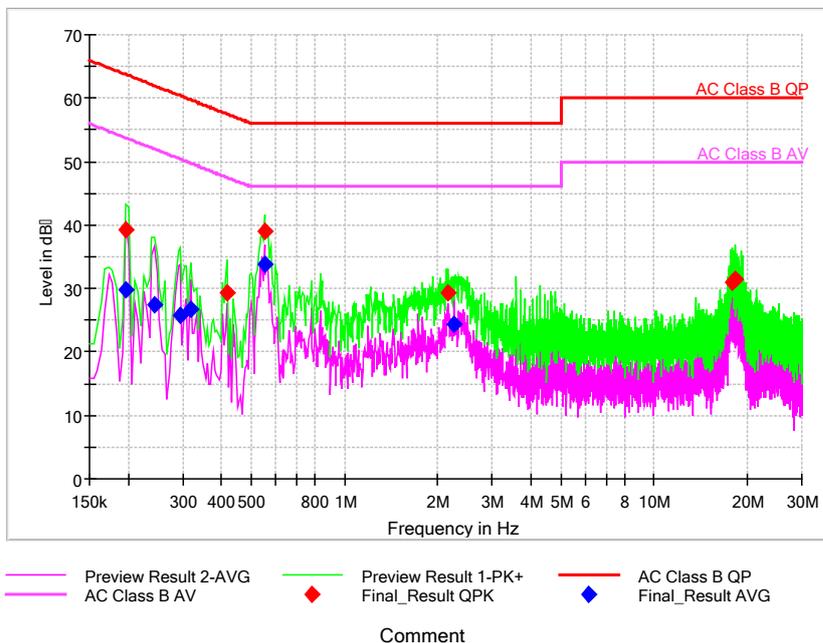
2#EUT + 3#AE: USB Cable2+5# AE: Charger2+7# AE: Headset2:



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)
0.560438	---	35.31	46.00	10.69	L1	29.6	---	5.71
0.560438	41.85	---	56.00	14.15	L1	29.6	12.25	---
1.269375	---	33.34	46.00	12.66	L1	29.7	---	3.64
1.497914	---	30.25	46.00	15.75	L1	29.7	---	0.55
1.567875	46.97	---	56.00	9.03	L1	29.7	17.27	---
1.567875	---	35.23	46.00	10.77	L1	29.7	---	5.53
1.861711	42.01	---	56.00	13.99	L1	29.7	12.31	---
2.575312	---	34.19	46.00	11.81	L1	29.7	---	4.49
2.939109	43.56	---	56.00	12.44	L1	29.7	13.86	---
2.939109	---	30.60	46.00	15.40	L1	29.7	---	0.9
3.051047	40.93	---	56.00	15.07	L1	29.7	11.23	---
3.531445	41.78	---	56.00	14.22	L1	29.7	12.08	---

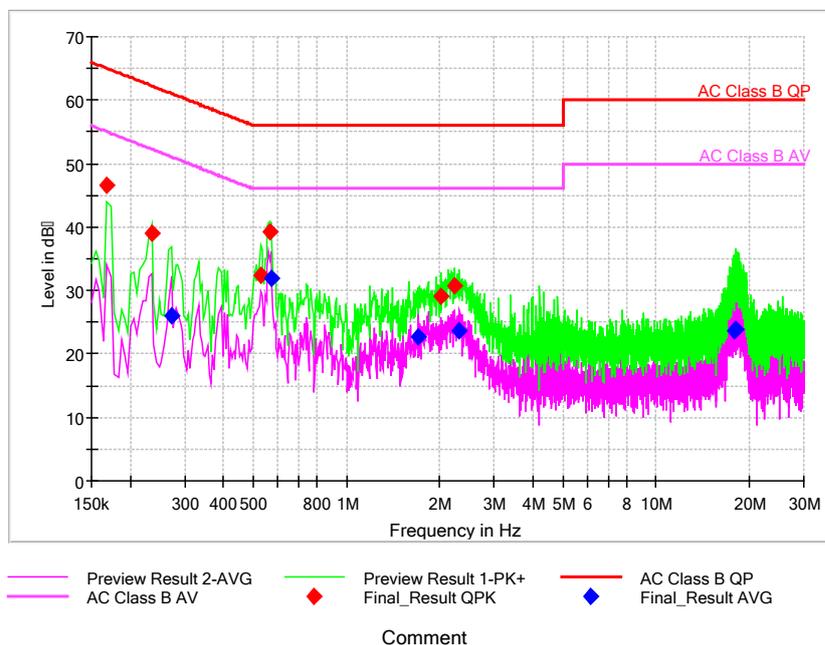
1#EUT +2#AE: USB Cable1+4# AE: Charger1+6# AE: Headset1+1# AE: Laptop:



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)
0.196641	---	29.78	53.75	23.97	L1	29.6	---	0.18
0.196641	39.36	---	63.75	24.39	L1	29.6	9.76	---
0.243281	---	27.38	51.98	24.61	L1	29.6	---	-2.22
0.294586	---	25.79	50.39	24.61	L1	29.6	---	-3.81
0.317906	---	26.76	49.76	23.00	L1	29.6	---	-2.84
0.415852	29.36	---	57.53	28.17	L1	29.6	-0.24	---
0.551109	38.95	---	56.00	17.05	L1	29.6	9.35	---
0.551109	---	33.71	46.00	12.29	L1	29.6	---	4.11
2.164875	29.22	---	56.00	26.78	L1	29.7	-0.48	---
2.258156	---	24.27	46.00	21.73	L1	29.7	---	-5.43
17.840789	30.99	---	60.00	29.01	L1	29.8	1.19	---
18.213914	31.51	---	60.00	28.49	L1	29.8	1.71	---

2#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)
0.168656	46.54	---	65.03	18.49	L1	29.6	16.94	---
0.233953	39.12	---	62.31	23.19	L1	29.6	9.52	---
0.271266	---	25.95	51.08	25.12	L1	29.6	---	-3.65
0.527789	32.51	---	56.00	23.49	L1	29.6	2.91	---
0.565102	39.19	---	56.00	16.81	L1	29.6	9.59	---
0.569766	---	31.98	46.00	14.02	L1	29.6	---	2.38
1.703133	---	22.81	46.00	23.19	L1	29.7	---	-6.89
2.010961	29.18	---	56.00	26.82	L1	29.7	-0.52	---
2.239500	30.77	---	56.00	25.23	L1	29.7	1.07	---
2.318789	---	23.71	46.00	22.29	L1	29.7	---	-5.99
17.896758	---	23.69	50.00	26.31	L1	29.8	---	-6.11
18.125297	---	23.81	50.00	26.19	L1	29.8	---	-5.99

2.2.2 Radiated Emissions-FCC Part15.109

Ambient condition:

Temperature	Relative humidity	Pressure
20.2°C	38.7%	100.8kPa

Test Setup:

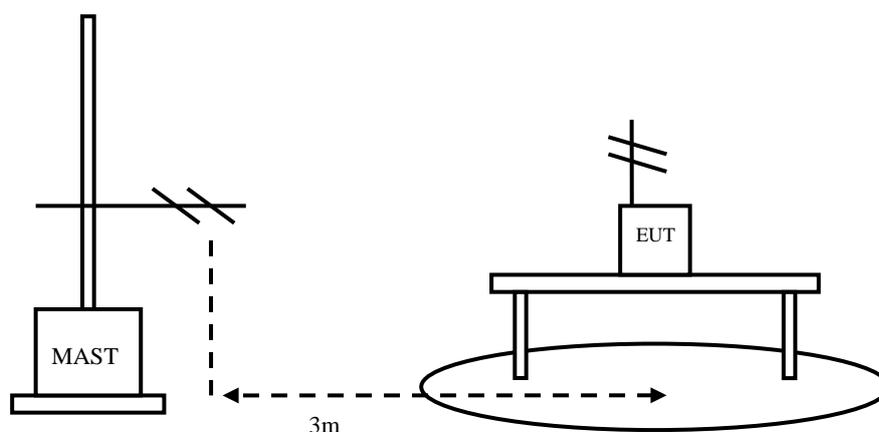


Figure 3

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, 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 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:

Sample calculation: $(32.11 \text{ dB } \mu \text{ V/m}) = (51.11 \text{ dB } \mu \text{ V/m}) + (-19.0 \text{ dB})$, the corresponding frequency is 103.512000MHz.

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
103.512000	32.11	43.50	-19.0	51.11	V
103.586000	31.91	43.50	-19.0	50.91	V
103.651500	32.10	43.50	-19.0	51.1	V
104.028500	32.17	43.50	-19.0	51.17	V
111.120500	31.58	43.50	-19.8	51.38	V
111.246500	32.09	43.50	-19.8	51.89	V

2#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
40.342000	17.17	40.00	-18.1	35.27	V
40.952000	16.96	40.00	-18.0	34.96	V
47.819500	19.73	40.00	-17.3	37.03	V
48.458500	20.45	40.00	-17.2	37.65	V
49.032000	21.25	40.00	-17.2	38.45	V
49.057500	21.13	40.00	-17.2	38.33	V

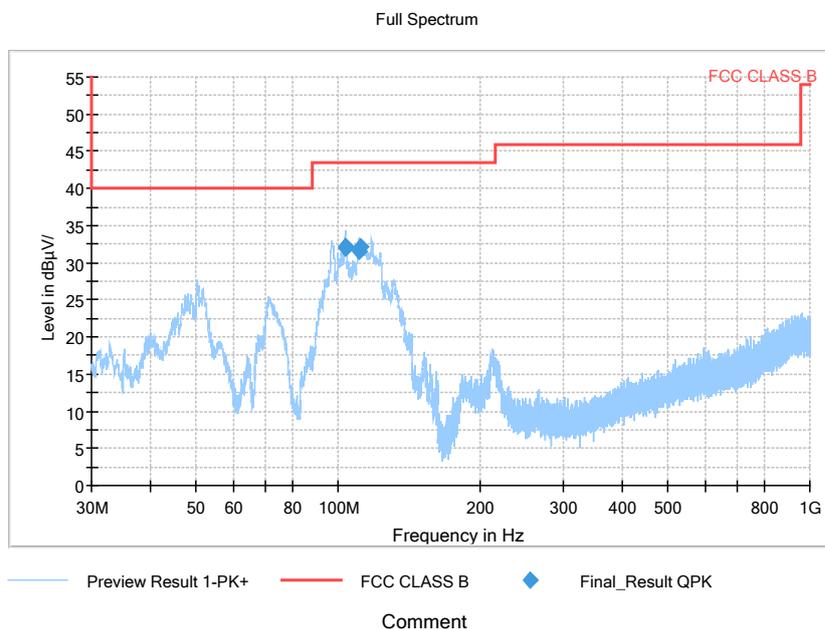
1#EUT + 2#AE: USB Cable1+4# AE: Charger1+6# AE: Headset1+1# AE: Laptop:

Frequency(MHz)	Result(dB μ V/m)	Limit (dB μ V/m)	ARpl (dB)	Pmea (dB μ V/m)	Polarity
119.987500	30.19	43.50	-20.7	50.89	V
168.002500	31.06	43.50	-20.8	51.86	V
551.985500	32.73	46.00	-7.9	40.63	V
695.982000	29.54	46.00	-5.4	34.94	V
743.997000	29.97	46.00	-4.5	34.47	V
792.012000	28.62	46.00	-3.6	32.22	V

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

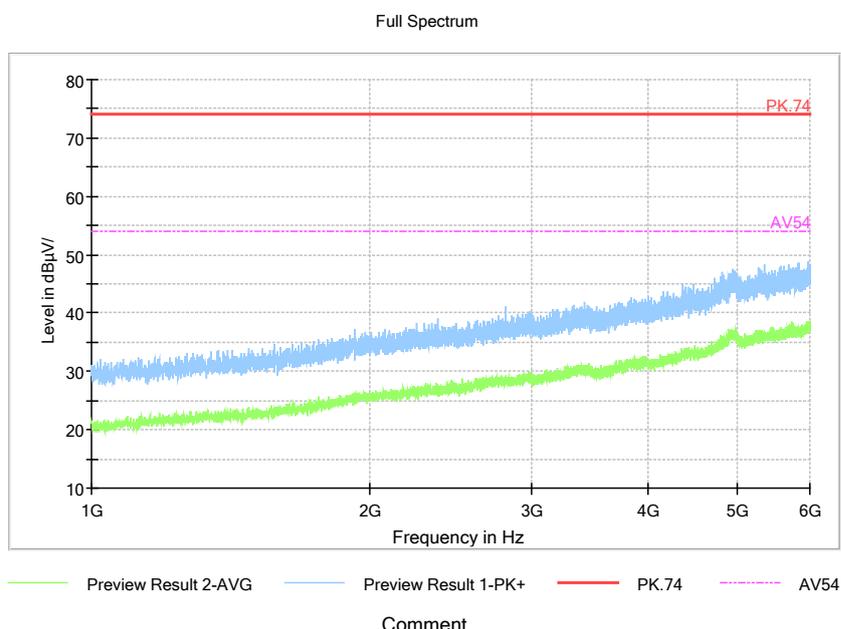
Frequency(MHz)	Result(dB μ V/m)	Limit (dB μ V/m)	ARpl (dB)	Pmea (dB μ V/m)	Polarity
119.987500	30.23	43.50	-20.7	50.93	V
168.002500	31.11	43.50	-20.8	51.91	V
551.985500	32.72	46.00	-7.9	40.62	V
695.982000	29.75	46.00	-5.4	35.15	V
743.997000	30.13	46.00	-4.5	34.63	V
792.012000	28.94	46.00	-3.6	32.54	V

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



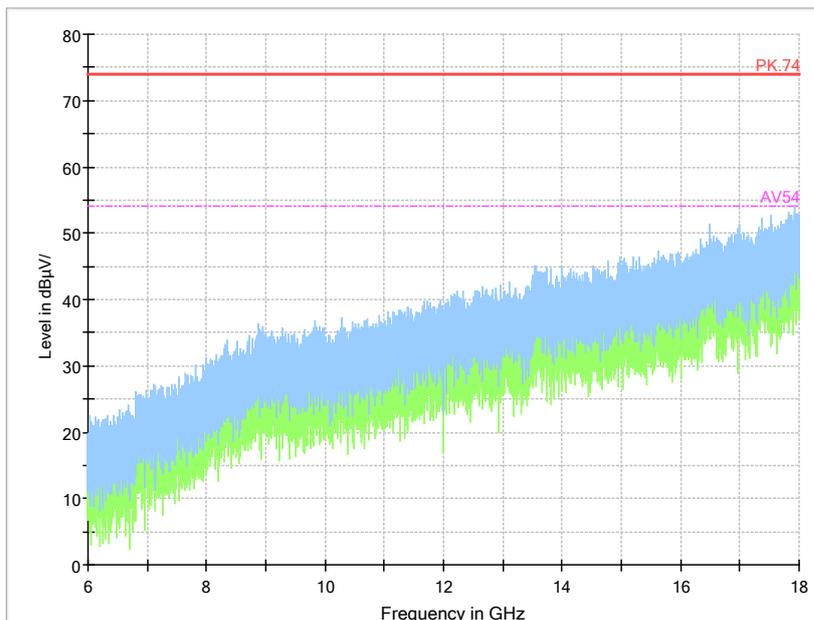
Pic6. Radiated emission(30MHz – 1GHz)

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



Pic7. Radiated emission (1GHz –6GHz)

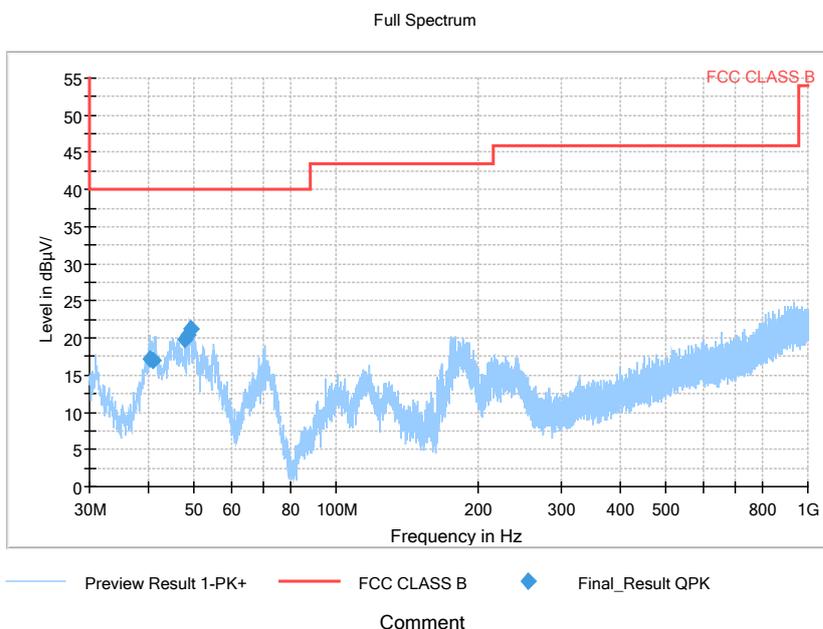
Note : The test data in the graph includes two polarizations: horizontal and vertical.



Pic8. Radiated emission (6GHz –18GHz)

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

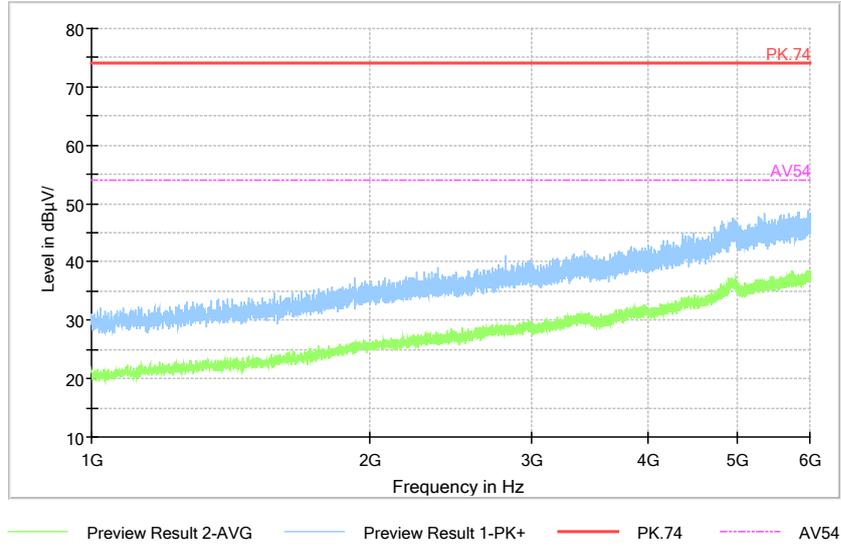
2#EUT+ 3#AE: USB Cable2+5# AE: Charger2+7# AE: Headset2: refer to Pic9, Pic10, Pic11



Pic9. Radiated emission(30MHz – 1GHz)

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

Full Spectrum

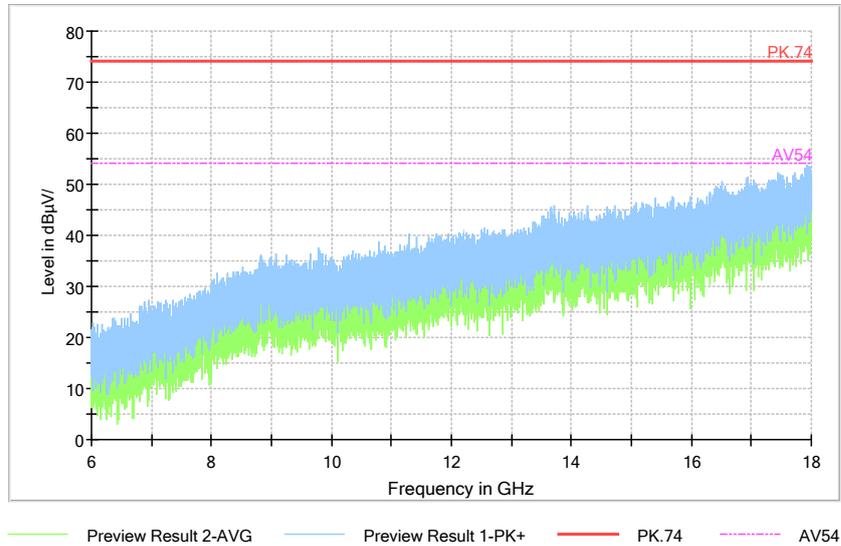


Comment

Pic10. Radiated emission (1GHz –6GHz)

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

Full Spectrum

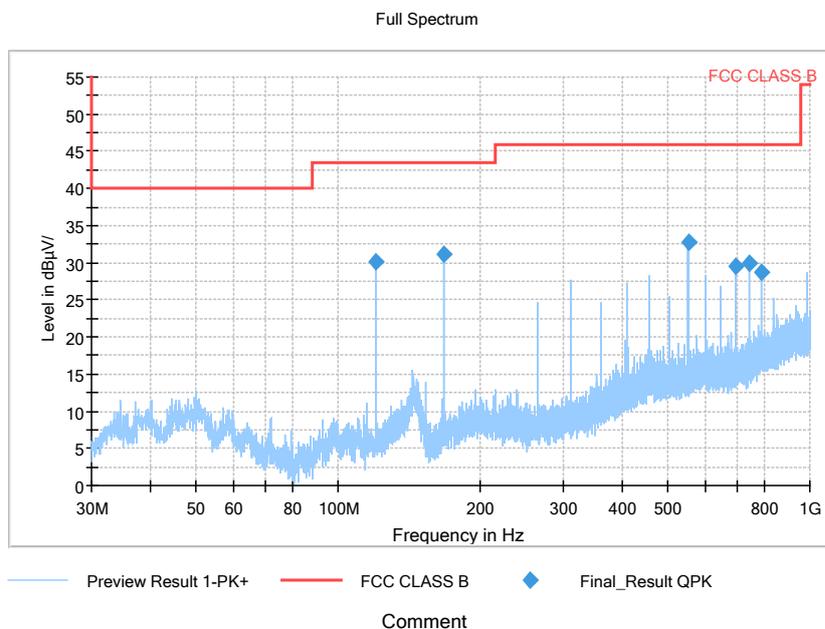


Comment

Pic11. Radiated emission (6GHz –18GHz)

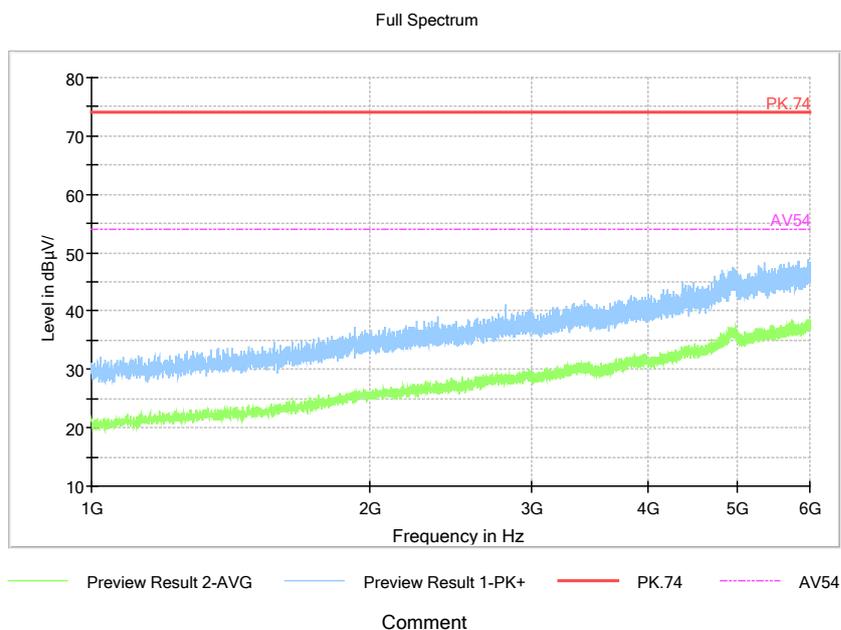
Note : The test data in the graph includes two polarizations: horizontal and vertical.

1#EUT + 2#AE: USB Cable1+4# AE: Charger1+6# AE: Headset1+1# AE: Laptop:
 refer to Pic12, Pic13, Pic14



Pic12. Radiated emission(30MHz – 1GHz)

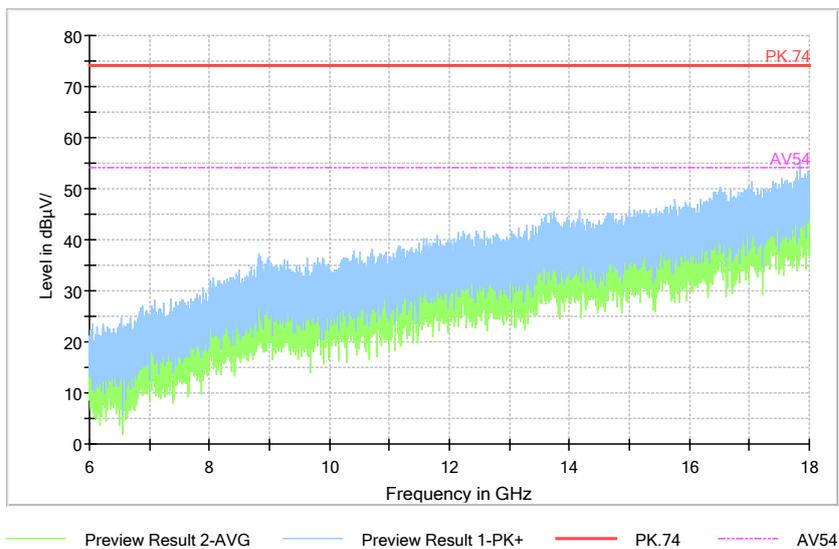
Note : The test data in the graph includes two polarizations: horizontal and vertical



Pic13. Radiated emission (1GHz –6GHz)

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

Full Spectrum



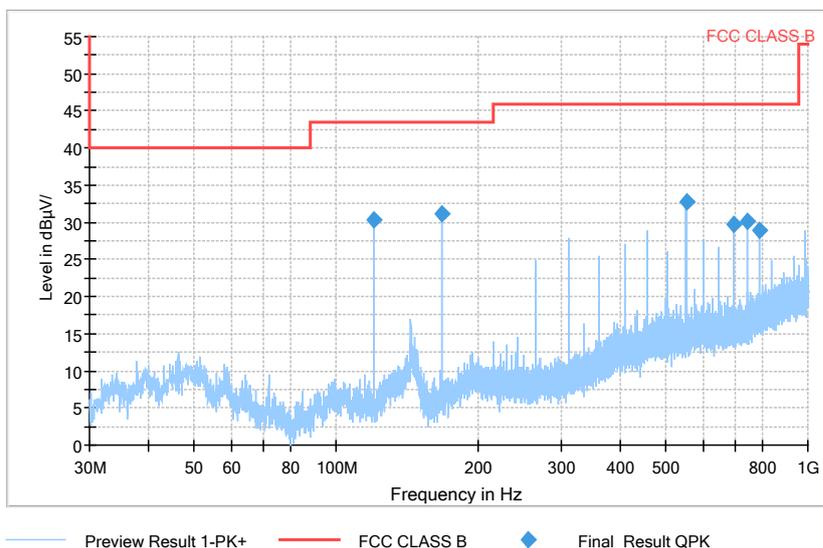
Comment

Pic14. Radiated emission (6GHz –18GHz)

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

2#EUT + 3#AE: USB Cable2+5# AE: Charger2+7# AE: Headset2+1# AE: Laptop:
refer to Pic15, Pic16, Pic17

Full Spectrum

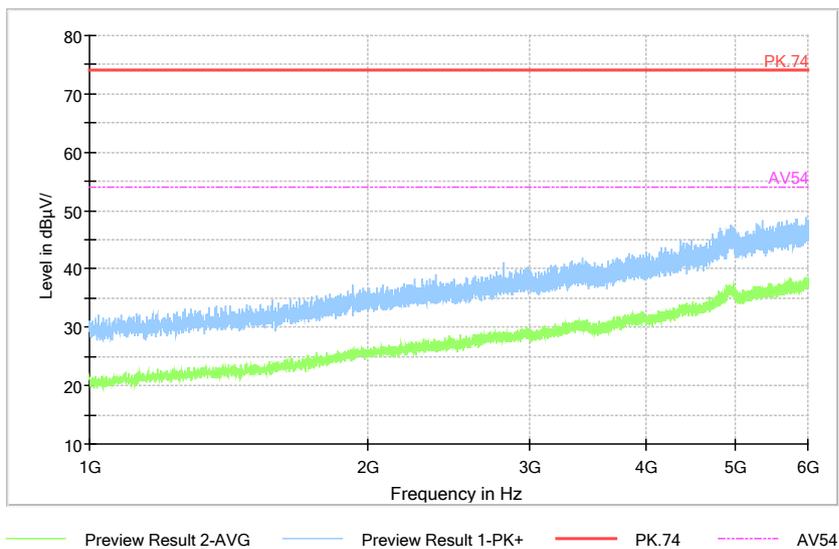


Comment

Pic15. Radiated emission(30MHz – 1GHz)

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

Full Spectrum

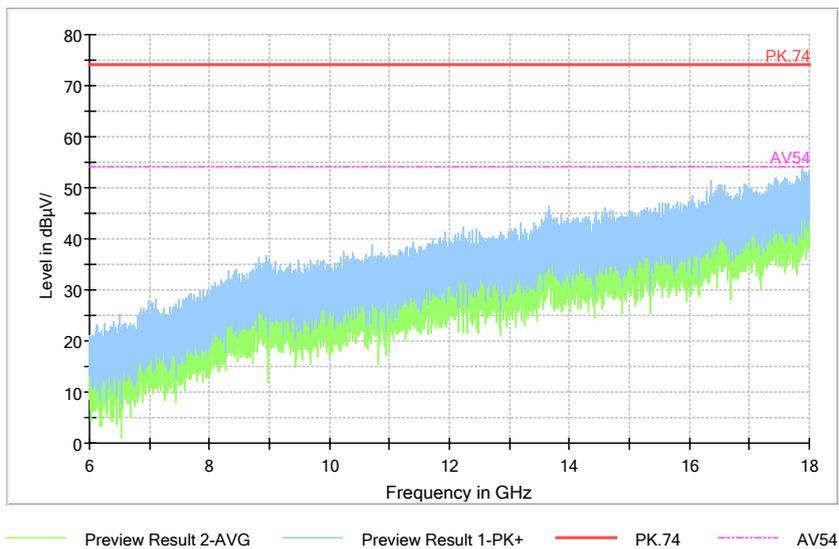


Comment

Pic16. Radiated emission (1GHz –6GHz)

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

Full Spectrum



Comment

Pic17. Radiated emission (6GHz –18GHz)

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	PS2000 Turn Table	FRANKONIA	-----	-----	-----
9	MA260 Antenna Master	FRANKONIA	-----	-----	-----
10	EMC32EMI test software	R&S	-----	-----	-----

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