The State Radio_monitoring_center Testing Center
国家无线电监测中心检测中心

Certificate Number: 5055.02

TEST REPORT

Report No.: SRTC2021-9003(F)-0036

Product Name: Smart Phone

Applicant: Sharp Corporation

Manufacturer: Sharp Corporation

Specification: FCC Part15B (Certification)
(2020 edition)
ANSI C63.4-2014

FCC ID: APYHRO00298

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

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 3
1.6 Reference specification 4
1.7 Information of EUT 4
1.7.1 General information 4
1.7.2 EUT details 5
1.7.3 Auxiliary equipment details 5
2. Test information 7
2.1 Summary of the test results 7
2.2 Test result 8
2.2.1 Conducted Emissions-FCC Part15.107 8
2.2.2 Radiated Emissions-FCC Part15.109 16
2.3. List of test equipments 27

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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:	Sharp Corporation
Address:	1 Takumi-cho, Sakai-ku, Sakai City,Osaka 590-8522,Japan
City:	Osaka
Country or Region:	Japan
Contacted person:	Mr.Masaaki Nishikawa
Tel:	+81-50-5433-4157
Email:	---

1.4 Manufacturer's details

Company:	Sharp Corporation
Address:	1 Takumi-cho, Sakai-ku, Sakai City,Osaka 590-8522,Japan
City:	Osaka
Country or Region:	Japan
Contacted person:	Mr.Masaaki Nishikawa
Tel:	+81-50-5433-4157
Email:	---

1.5 Application details

Date of reception of test sample: 30th July 2021
Date of test: 30th July 2021 to 20th August 2021

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1.6 Reference specification

FCC Part 15B, 2020 (Certification)

1.7 Information of EUT

1.7.1 General information

Product Name of EUT	Smart Phone
FCC ID	APYHRO00298
Frequency Range	GSM: GSM850 / DCS1900 WCDMA: FDD II/ FDD IV / FDD V LTE: FDD 2/ FDD 4/ FDD 5/FDD 7/ FDD 12/ FDD 17/TDD 38/ TDD 41 Bluetooth: 2.4~2.4835GHz WiFi: 2.4~2.4835GHz 5.15-5.35GHz/5.475-5.725GHz 5.725GHz-5.85GHz NFC: 13.56MHz
Power Supply	Charger/Battery
Nominal Voltage	4V
Extreme Temperature	Lowest: -10°C Highest: +55°C
Extreme Voltage	Minimum: 3.7V Maximum: 4V
HW Version	DVT(Remodeled to the equivalent of MP products)
SW Version	A705B

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1.7.2 EUT details

No.	Product Name	IMEI
EUT1	Smart Phone	1#:004401230290872/004401230325876 2#: 004401230291524/004401230326528 3#: 004401230290914/004401230325918

Note1: As the applicant of this model, [Sharp Corporation] declares that the product has three the suppliers of memory / two the suppliers of NFC.

Main Supply: 1#: 004401230290872/004401230325876

Part Name	Model Name	supplier
memory	/	Sumsung
NFC	SN110P	/

Secondary Supply: 2#: 004401230291524/004401230326528

Part Name	Model Name	supplier
memory	/	SK Hynix
NFC	SN100F	/

Third Supply: 3#: 004401230290914/004401230325918

Part Name	Model Name	supplier
memory	/	Micron
NFC	SN110P	/

1.7.3 Auxiliary equipment details

AE (Auxiliary Equipment) 1#: Charger

Manufacturer	DVE
Model Number	DSA-10PF06-05 FUS
Input Voltage	100V-240V AC
Output Voltage	5V DC

AE (Auxiliary Equipment) 2#: Battery

Manufacturer	SCUD (FUJIAN) Electrics Co., Ltd
Model Number	UBATIA307AFN2

AE (Auxiliary Equipment) 3#: USB cable

Manufacturer	Kingpower
Model Number	K201-05130-00

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AE (Auxiliary Equipment) 4#: Headset

Manufacturer	DONGGUAN AMBIAI
Model Number	AB－HI02SJ

Note1: In this report, the result exercised by the EUT1, EUT2 and EUT3, charger AE1, the Battery AE2 , the USB cable AE3 and the Headset AE4.

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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: 2021.08.27

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2.2 Test result

2.2.1 Conducted Emissions-FCC Part15.107

Ambient condition:

Temperature	Relative humidity	Pressure
27.2°C	40.4%	100.8kPa

Test Setup with charger:

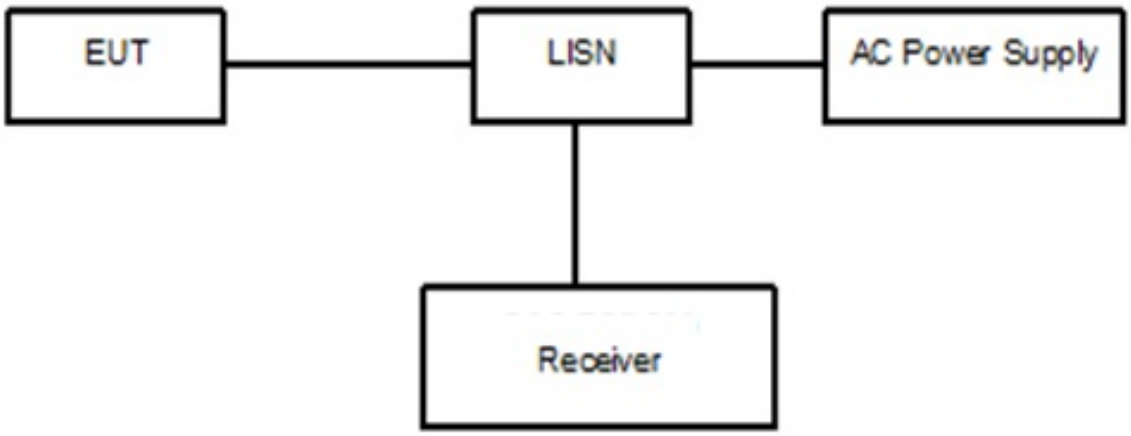

Figure 1

Test Procedure:

The EUT is placed on a non-matellic 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.

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Test Setup with laptop:

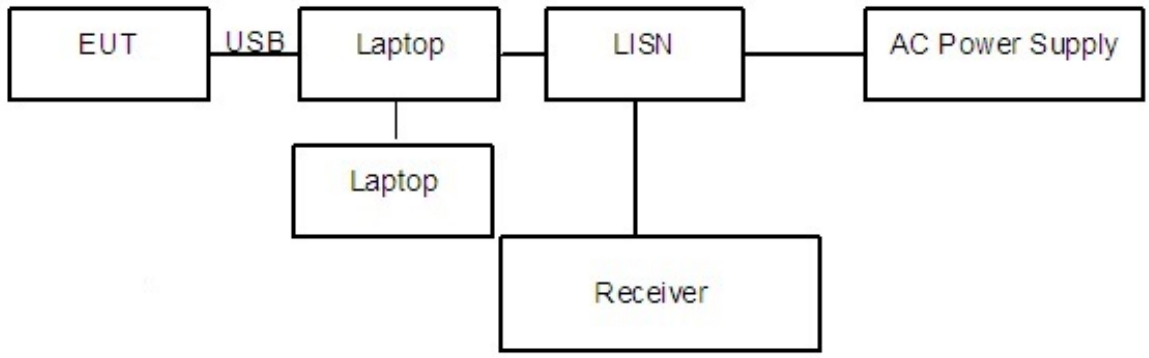

Figure 2

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 was charged. 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.

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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: (26.25dBμV) = (-3.45 dBμV) + (29.7 dB), the corresponding frequency is 0.167057MHz.

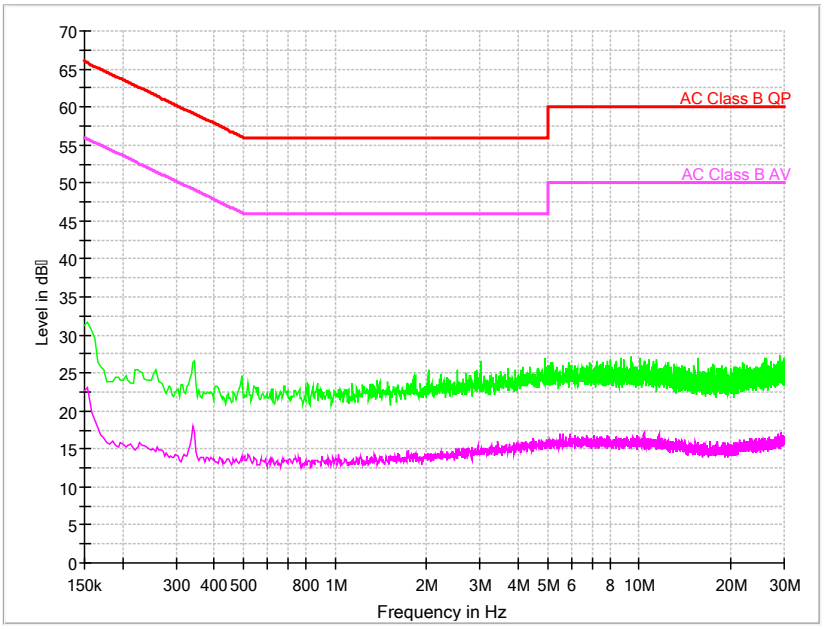
Limit:

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

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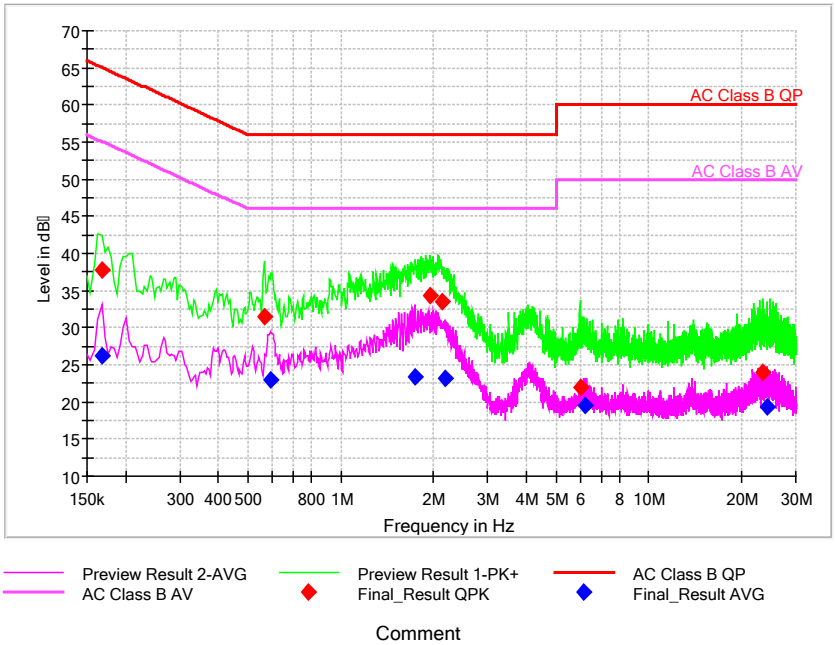
EUT1+charger:



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	---	26.25	55.11	28.85	L1	29.7	---	-3.45
0.167057	37.80	---	65.11	27.30	L1	29.7	8.1	---
0.563636	31.44	---	56.00	24.56	L1	29.7	1.74	---
0.589221	---	22.88	46.00	23.12	N	29.7	---	-6.82
1.744843	---	23.46	46.00	22.54	N	29.8	---	-6.34
1.949529	34.35	---	56.00	21.65	L1	29.8	4.55	---
2.141421	33.52	---	56.00	22.48	L1	29.8	3.72	---
2.184064	---	23.16	46.00	22.84	L1	29.8	---	-6.64
5.975014	22.03	---	60.00	37.97	L1	29.8	-7.77	---
6.188229	---	19.54	50.00	30.46	L1	29.8	---	-10.26
23.326393	23.91	---	60.00	36.09	L1	30.4	-6.49	---
24.354086	---	19.25	50.00	30.75	L1	30.5	---	-11.25

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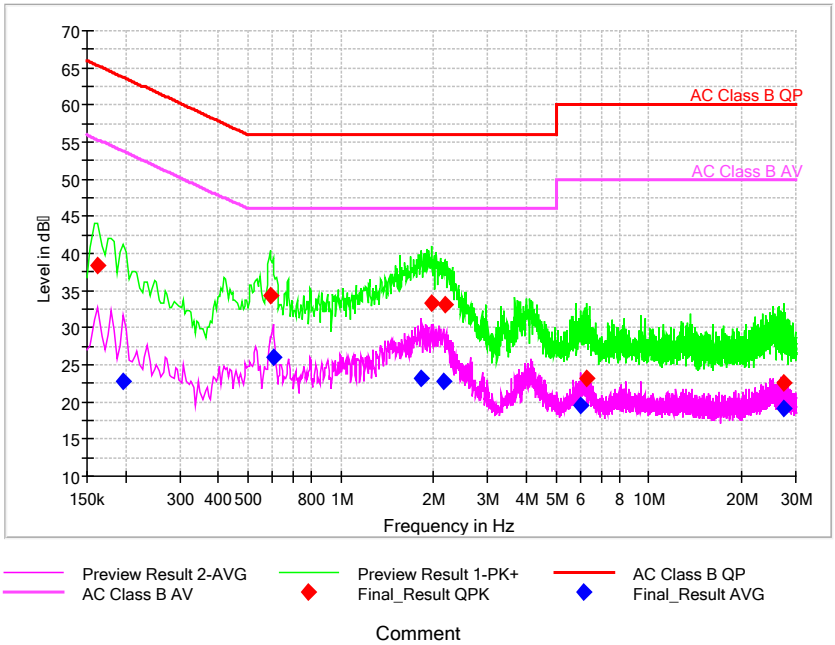
EUT1+charger:



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	38.28	---	65.32	27.04	L1	29.7	8.58	---
0.196907	---	22.79	53.74	30.95	L1	29.7	---	-6.91
0.589221	34.34	---	56.00	21.66	L1	29.7	4.64	---
0.602014	---	26.04	46.00	19.96	N	29.7	---	-3.66
1.817336	---	23.17	46.00	22.83	N	29.8	---	-6.63
1.975114	33.21	---	56.00	22.79	L1	29.8	3.41	---
2.149950	---	22.78	46.00	23.22	L1	29.8	---	-7.02
2.188329	33.07	---	56.00	22.93	L1	29.8	3.27	---
5.983543	---	19.54	50.00	30.46	L1	29.8	---	-10.26
6.290571	23.23	---	60.00	36.77	L1	29.8	-6.57	---
27.530979	---	19.13	50.00	30.87	L1	30.5	---	-11.37
27.530979	22.50	---	60.00	37.50	L1	30.5	-8	---

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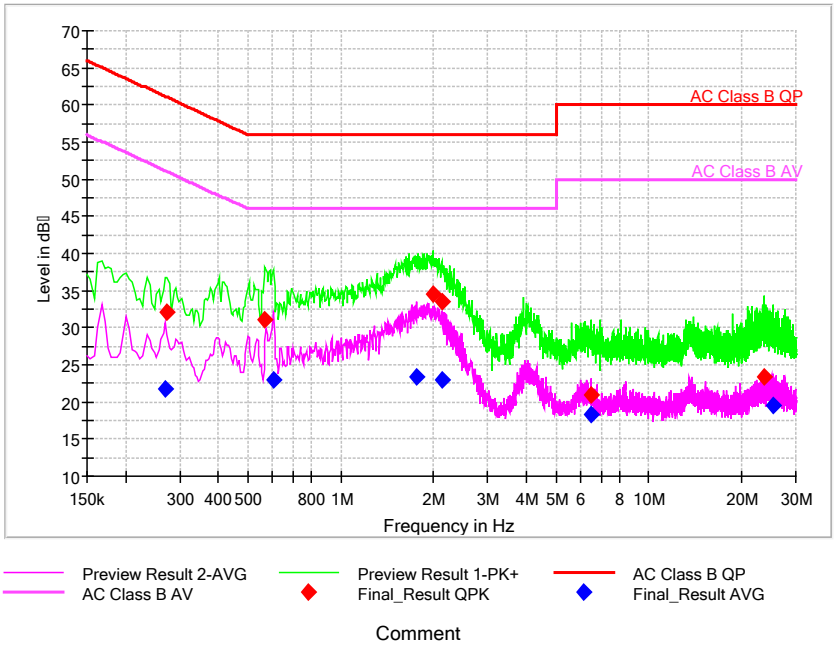
EUT2+charger:



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)
0.269400	---	21.73	51.14	29.41	L1	29.7	---	-7.97
0.273664	32.18	---	61.01	28.83	L1	29.7	2.48	---
0.567900	31.09	---	56.00	24.91	L1	29.7	1.39	---
0.602014	---	22.98	46.00	23.02	N	29.7	---	-6.72
1.766164	---	23.46	46.00	22.54	N	29.8	---	-6.34
1.987907	34.49	---	56.00	21.51	L1	29.8	4.69	---
2.124364	33.48	---	56.00	22.52	L1	29.8	3.68	---
2.128629	---	22.98	46.00	23.02	L1	29.8	---	-6.82
6.495257	20.99	---	60.00	39.01	L1	29.8	-8.81	---
6.495257	---	18.31	50.00	31.69	L1	29.8	---	-11.49
23.774143	23.39	---	60.00	36.61	L1	30.5	-7.11	---
25.351929	---	19.54	50.00	30.46	L1	30.5	---	-10.96

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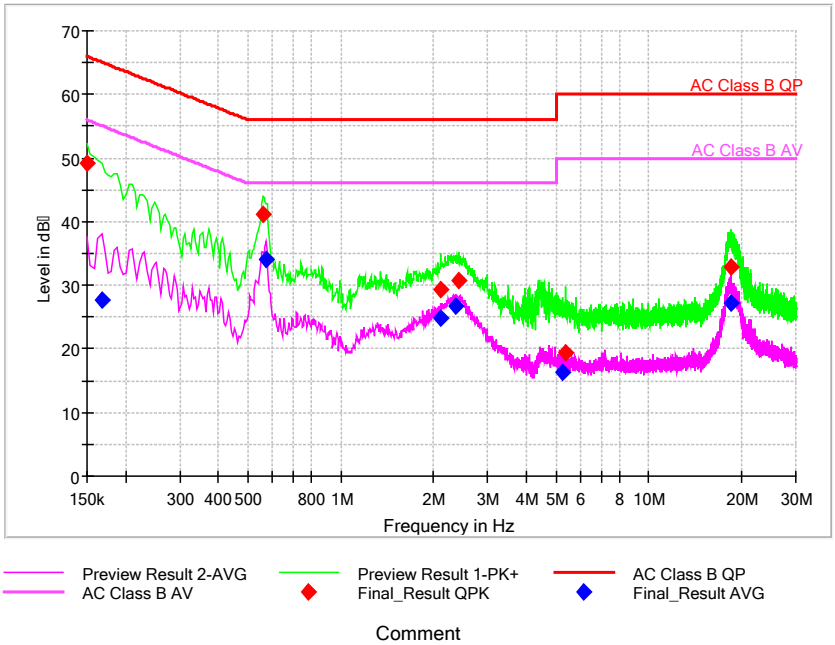
EUT1+Laptop:



Pic5. Conducted emission L&N Line

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	Pmea Quasi	Pmea Aver
0.150000	56.44	---	66.00	9.56	L1	29.7	26.9	---
0.158529	---	32.81	55.54	22.73	L1	29.7	---	3.11
0.529521	42.20	---	56.00	13.80	L1	29.7	12.5	---
0.533786	---	37.57	46.00	8.43	L1	29.7	---	7.87
2.094514	---	25.38	46.00	20.62	L1	29.8	---	-4.42
2.098779	29.52	---	56.00	26.48	L1	29.8	-0.28	---
2.465507	33.42	---	56.00	22.58	L1	29.8	3.62	---
2.482564	---	28.83	46.00	17.17	N	29.8	---	-0.97
5.233029	---	20.91	50.00	29.09	N	29.8	---	-8.89
11.693421	26.14	---	60.00	33.86	L1	29.9	-3.76	---
13.629407	---	27.05	50.00	22.95	L1	30.0	---	-2.95
13.633671	33.86	---	60.00	26.14	L1	30.0	3.86	---

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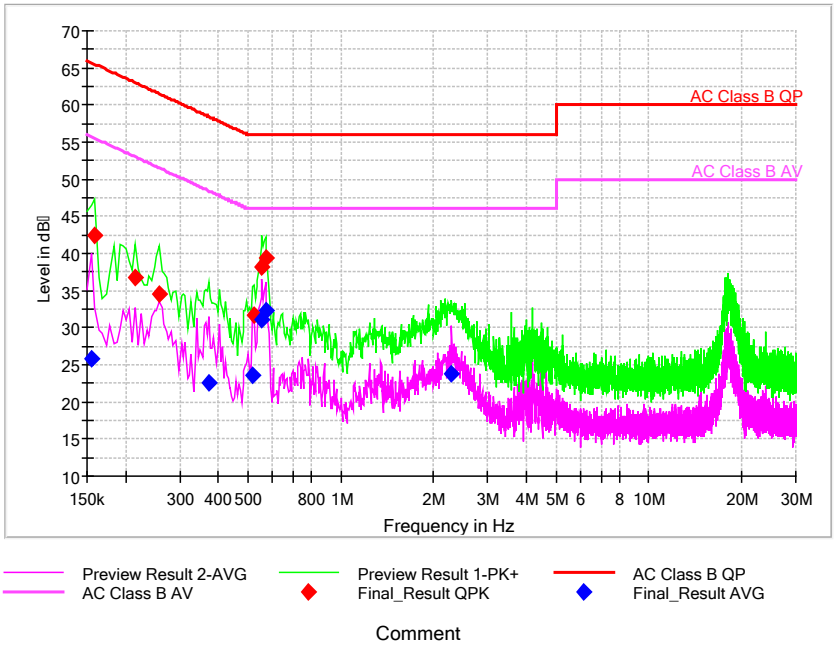
EUT3+Laptop:



Pic6. Conducted emission L&N Line

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	Pmea Quasi	Pmea Aver
0.154484	---	25.85	55.75	29.87	L1	29.6	---	-3.75
0.159428	42.44	---	65.50	23.02	L1	29.6	12.4	---
0.215327	36.85	---	63.00	26.15	L1	29.6	7.25	---
0.257233	34.46	---	61.52	27.09	N	29.6	4.86	---
0.373815	---	22.65	48.41	25.76	N	29.6	---	-6.95
0.518471	---	23.49	46.00	22.51	N	29.6	---	-6.11
0.523135	31.64	---	56.00	24.34	N	29.6	2.04	---
0.555763	38.26	---	56.00	17.78	L1	29.6	8.66	---
0.555753	---	31.02	46.00	14.94	L1	29.6	---	1.42
0.569746	39.38	---	56.00	16.62	L1	29.6	9.78	---
0.569766	---	32.35	46.00	13.67	L1	29.6	---	2.75
2.290805	---	23.88	46.00	22.13	L1	29.7	---	-5.82

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2.2.2 Radiated Emissions-FCC Part15.109

Ambient condition:

Temperature	Relative humidity	Pressure
27.4°C	40.1%	100.8kPa

Test Setup:

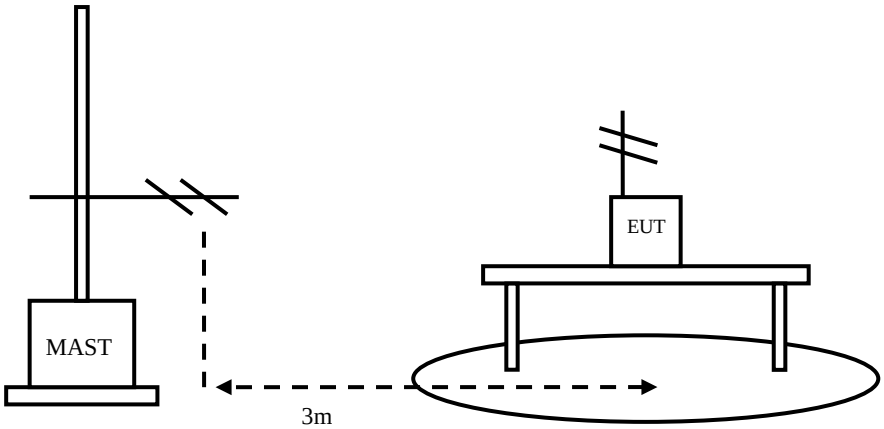

Figure 3

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 to4 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

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RBW=1MHz, VBW=3MHz, when the test frequency: f>1GHz

EUT+Laptop:
The EUT should be placed on a non-metallic table80cm 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 to4 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:
Result= $P_{mea} + A_{Rpl}$
Sample calculation: (20.27 dBμV/m) = (40.17 dBμV) + (-19.9dB/m), the corresponding frequency is 34.995500MHz.

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 Peak	54 74

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Test result:

EUT1+charger:

Frequency(MHz)	Result(dBuV/m)	A_{Rpl} (dB/m)	P_{mea} (dBuV)	Polarity
34.995500	20.27	-19.9	40.17	V
69.527500	25.70	-22.0	47.70	V
129.522000	23.62	-22.3	45.92	V
181.756500	20.30	-20.8	41.10	V
319.108500	16.52	-15.5	32.02	V
941.121000	19.20	-2.8	22.00	V

EUT2+charger:

Frequency(MHz)	Result(dBuV/m)	A_{Rpl} (dB/m)	P_{mea} (dBuV)	Polarity
35.092500	20.31	-19.9	40.21	V
69.188000	25.26	-21.8	47.06	V
129.425000	23.64	-22.3	45.94	V
181.077500	19.64	-20.9	40.54	V
318.866000	16.44	-15.5	31.94	V
912.506000	18.66	-3.1	21.76	V

EUT1+Laptop:

Frequency(MHz)	Result(dBuV/m)	A_{Rpl} (dB/m)	P_{mea} (dBuV)	Polarity
168.002000	24.15	-27.5	51.65	V
311.999000	19.63	-21.7	41.33	V
407.991000	23.18	-18.6	41.78	V
456.006000	21.74	-18.0	39.74	V
551.985000	22.86	-15.7	38.56	V
599.994000	22.21	-14.1	36.31	V

EUT3+ Laptop:

Frequency(MHz)	Result(dBuV/m)	A_{Rpl} (dB/m)	P_{mea} (dBuV)	Polarity
119.987000	30.25	-20.7	50.95	V
168.002000	31.14	-20.8	51.94	V
551.985000	32.76	-7.9	40.66	V
695.982500	29.72	-5.4	35.12	V
743.997500	30.16	-4.5	34.66	V
792.012500	28.91	-3.6	32.51	V

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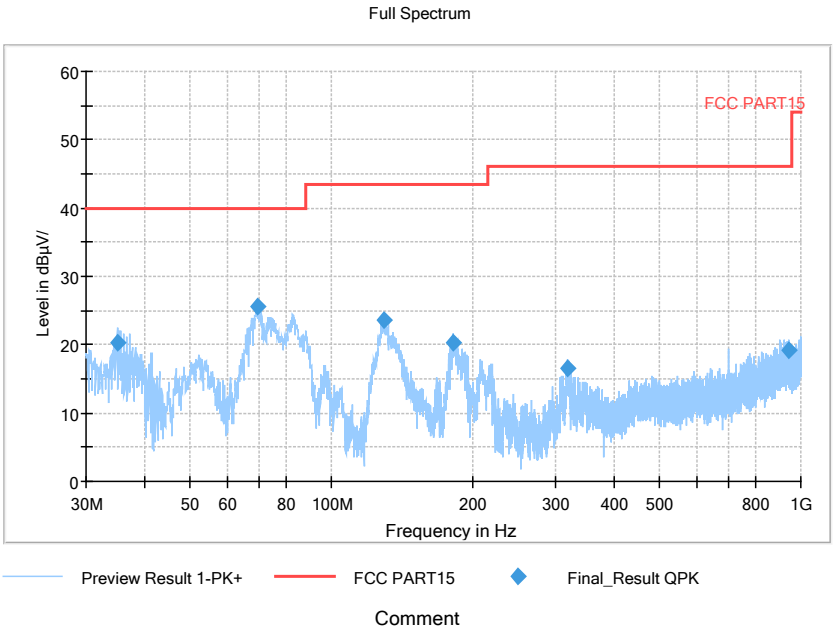
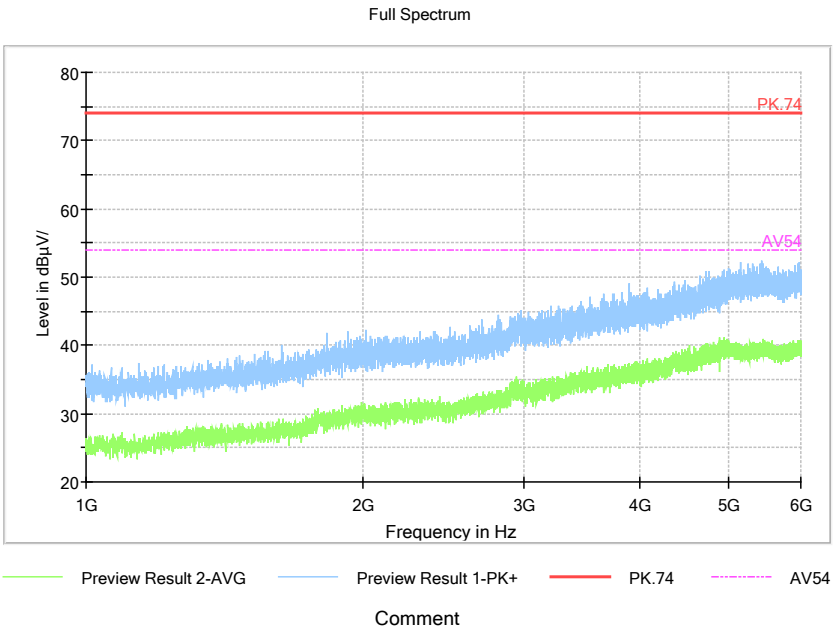
EUT1+charger: refer to Pic7 to Pic10



Pic7. Radiated emission (30MHz – 1GHz)

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



Pic8. Radiated emission (1GHz –6GHz)

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

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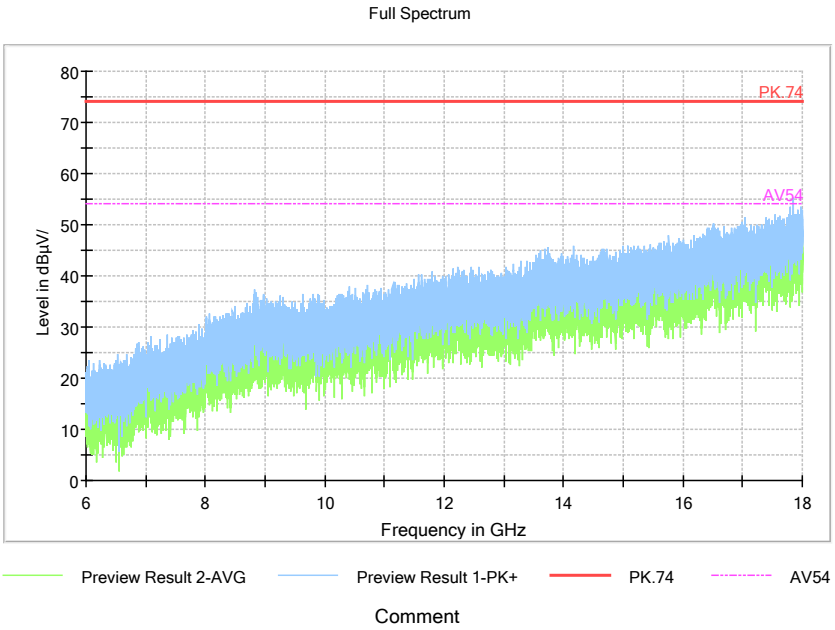
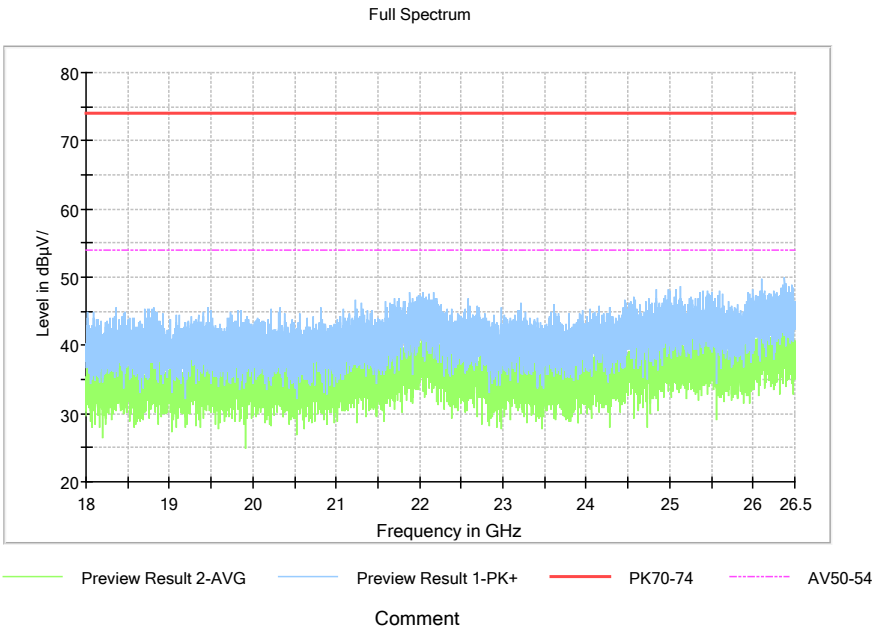


Pic9. Radiated emission (6GHz –18GHz)

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



Pic10. Radiated emission (18GHz –26GHz)

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

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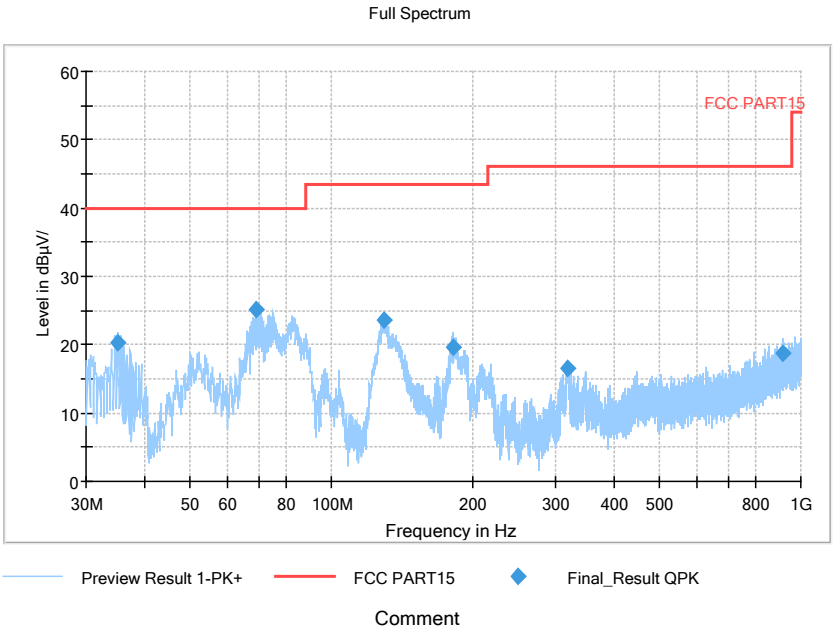
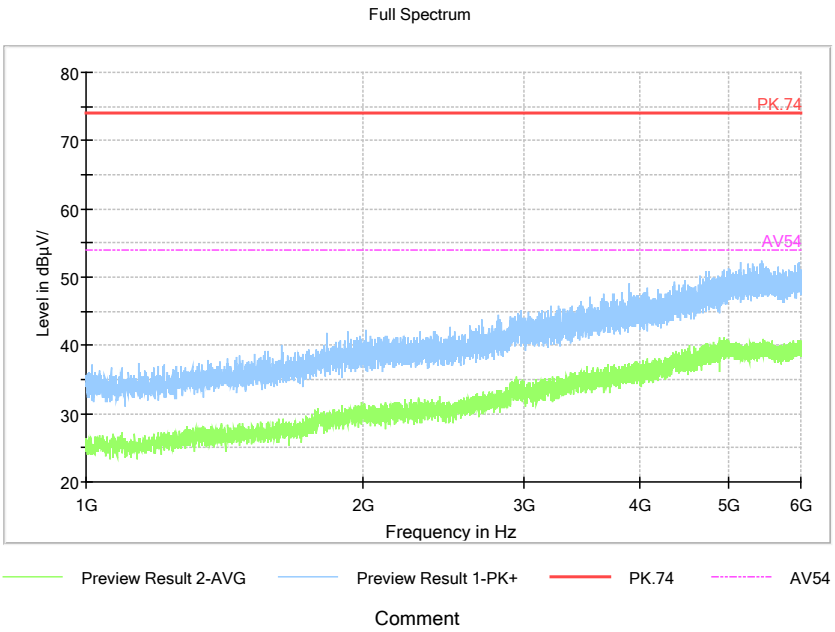
EUT2+charger: refer to Pic11 to Pic14



Pic11. Radiated emission (30MHz – 1GHz)

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



Pic12. Radiated emission (1GHz –6GHz)

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

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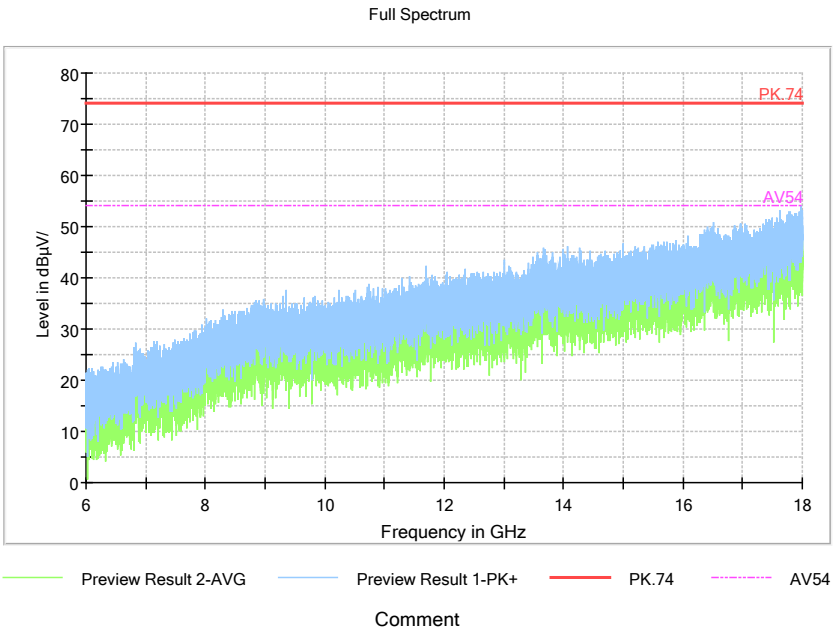
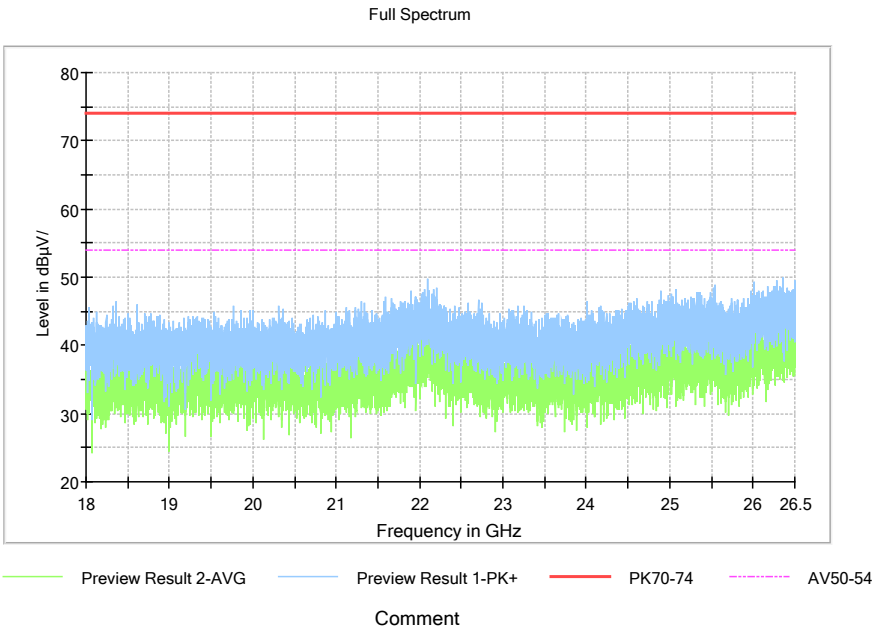


Pic13. Radiated emission (6GHz –18GHz)

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



Pic14. Radiated emission (18GHz –26GHz)

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

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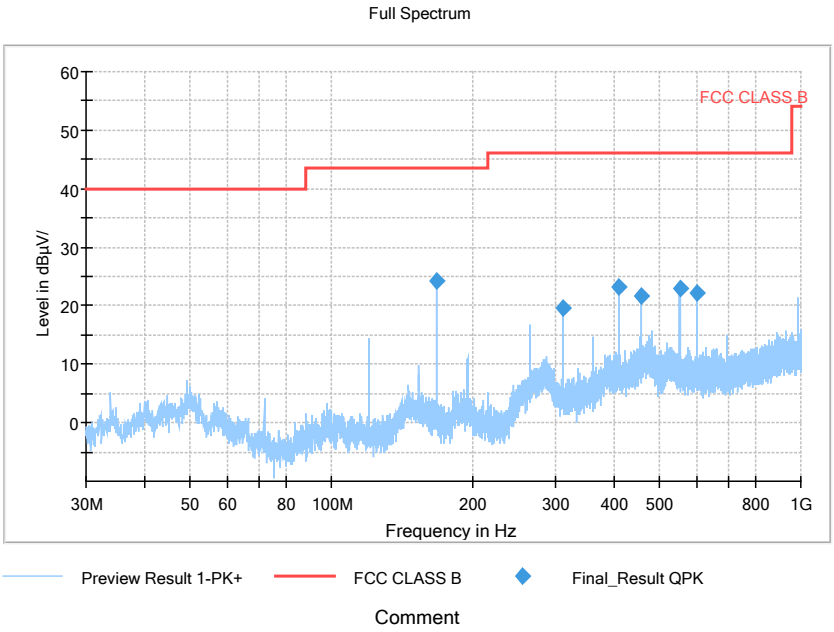
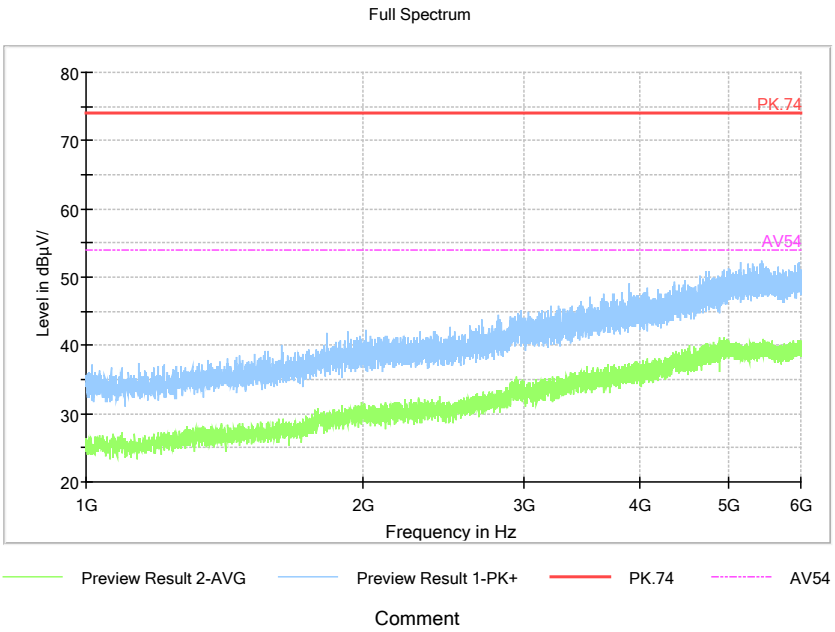
EUT1+ Laptop: refer to Pic15 to Pic18



Pic15. Radiated emission (30MHz – 1GHz)

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



Pic16. Radiated emission (1GHz –6GHz)

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

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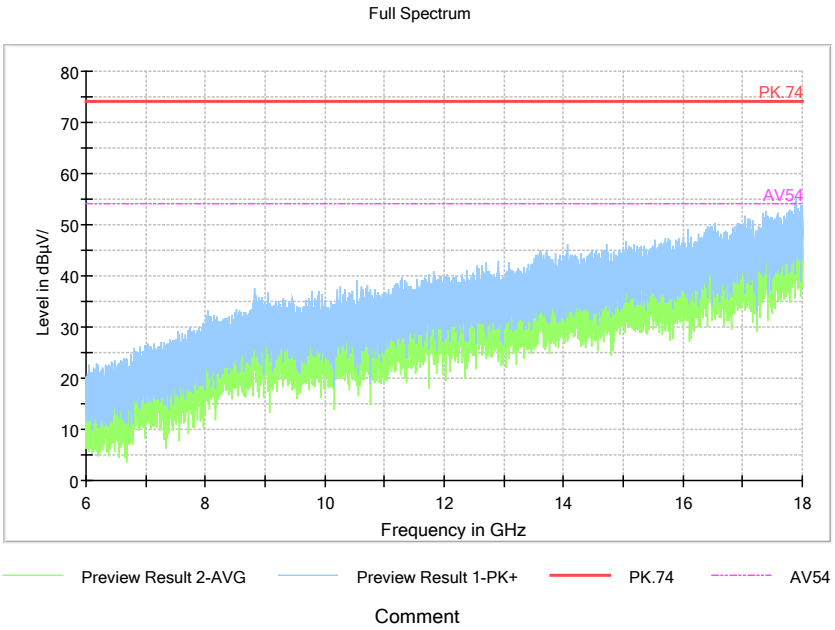
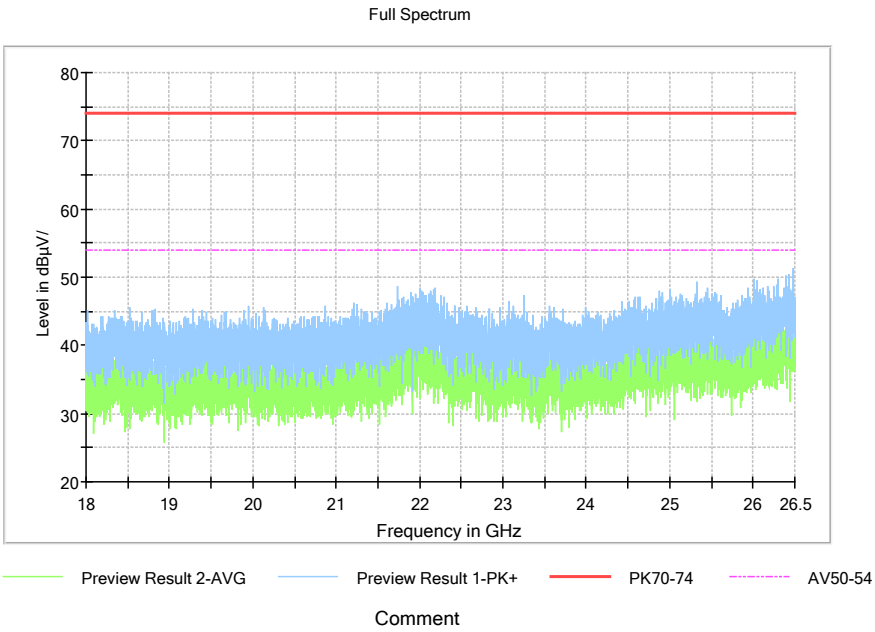


Pic17. Radiated emission (6GHz –18GHz)

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



Pic18. Radiated emission (18GHz –26GHz)

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

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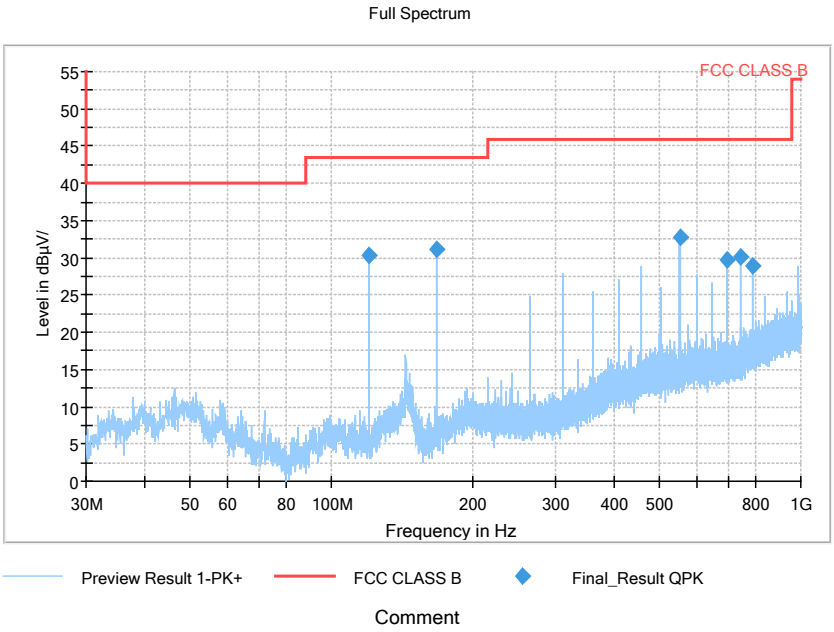
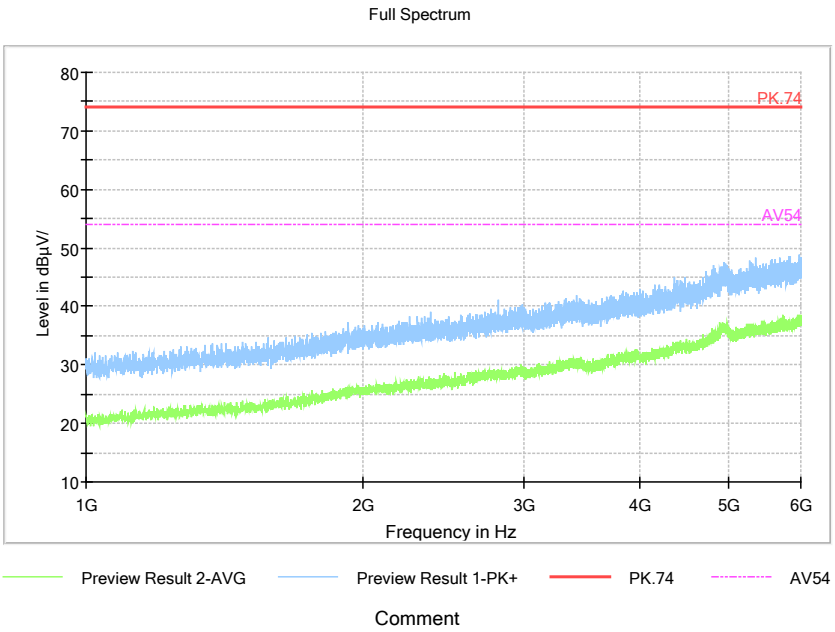
EUT3+Laptop: refer to Pic19 to Pic22



Pic19. Radiated emission (30MHz – 1GHz)

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



Pic20. Radiated emission (1GHz –6GHz)

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

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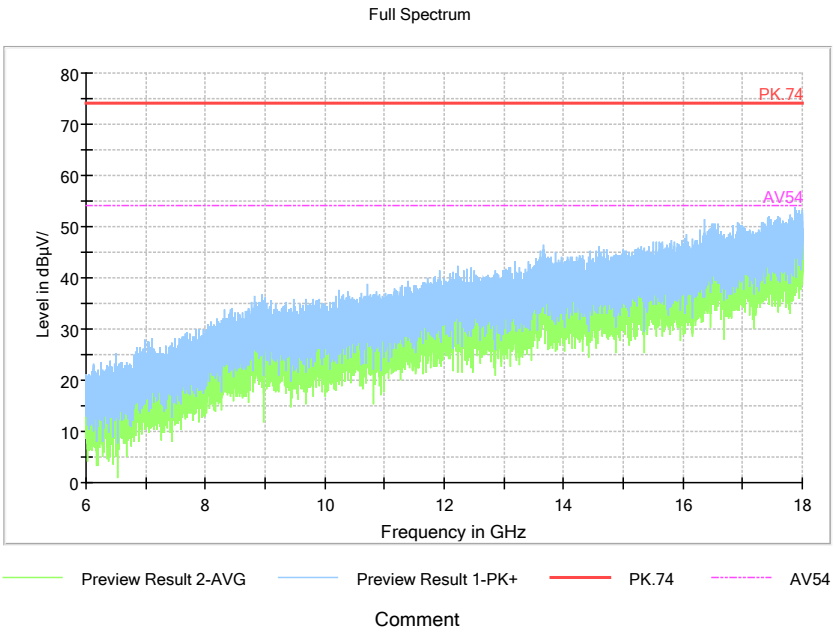
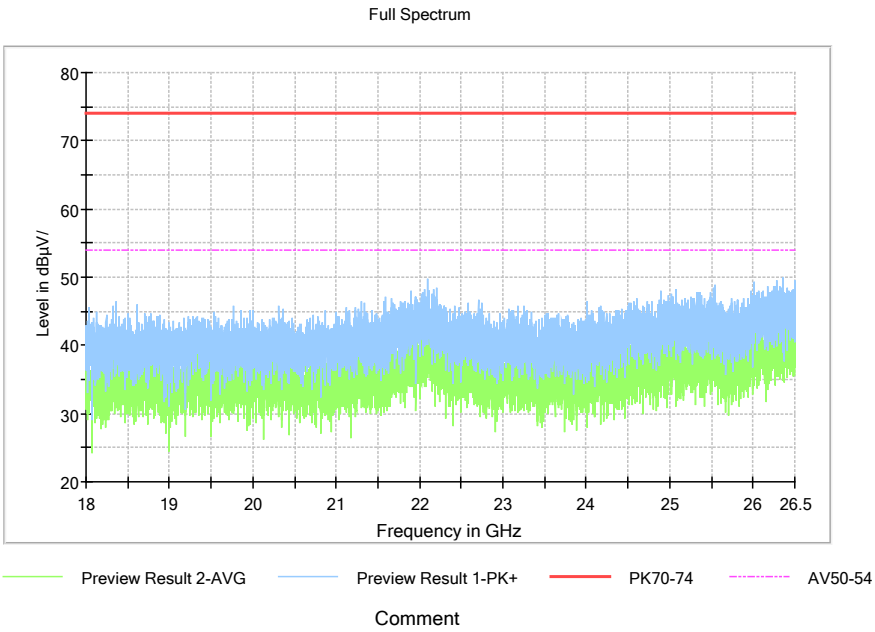


Pic21. Radiated emission (6GHz –18GHz)

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



Pic22. Radiated emission (18GHz –26GHz)

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

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2.3. List of test equipments

No.	Name/Model	Manufacturer	S/N	Calibration Due Date	Calibration Date
1	23.18m×16.88m×9.60mSemi-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	-----	-----	-----

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