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)-0037

Product Name: Smart Phone

Applicant: Sharp Corporation

Manufacturer: Sharp Corporation

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

FCC ID: APYHRO00299

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:	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: 4th August 2021
Date of test: 4th August 2021 to 27th 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	APYHRO00299
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	A6300

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1.7.2 EUT details

No.	Product Name	IMEI
EUT1	Smart Phone	1#:004401230357726/004401230387173 2#: 004401230356780/004401230386738 3#: 004401230356731/004401230386688

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#: 004401230357726/004401230387173

Part Name	Model Name	supplier
memory	/	Sumsung
NFC	SN110P	/

Secondary Supply: 2#: 004401230356780/004401230386738

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

Third Supply: 3#: 004401230356731/004401230386688

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	Panasonic
Model Number	RP-HJS150-K

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. Lv Youyou Test engineer	Issued date: 2021.08.31

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2.2 Test result

2.2.1 Conducted Emissions-FCC Part15.107

Ambient condition:

Temperature	Relative humidity	Pressure
25.8°C	40.4%	100.8kPa

Test Setup with charger:

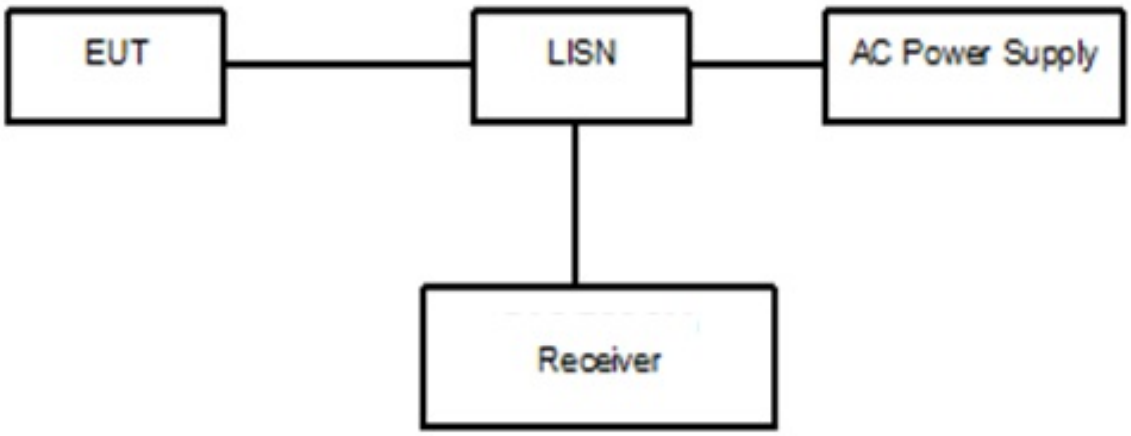

Figure 1

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:

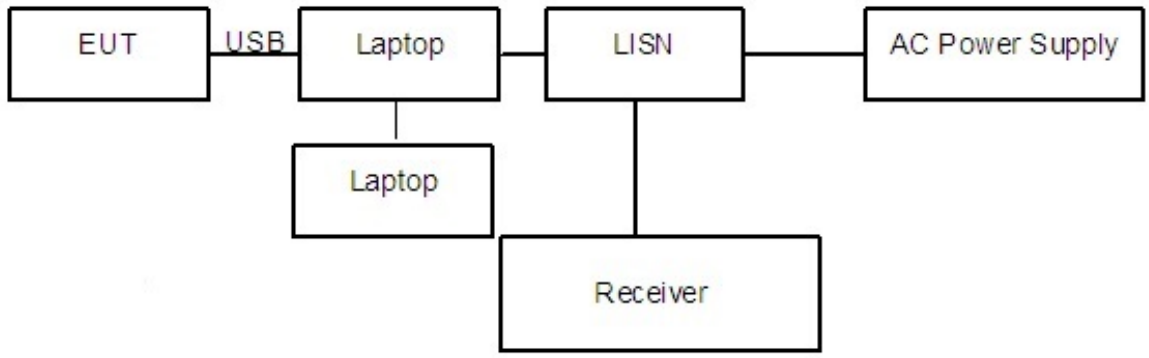

Figure 2

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: (26.17dBμV) = (-3.53 dBμV) + (29.7 dB), the corresponding frequency is 0.167057MHz.

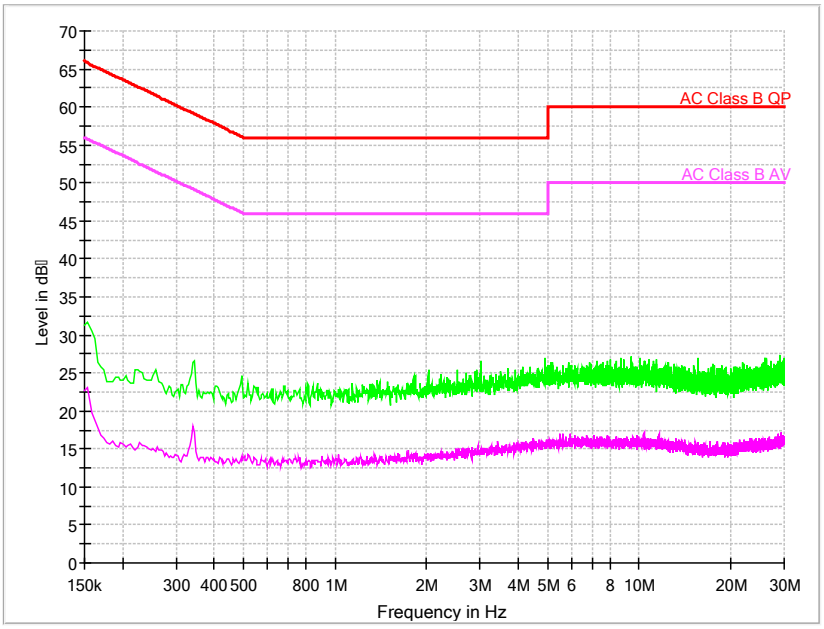
Limit:

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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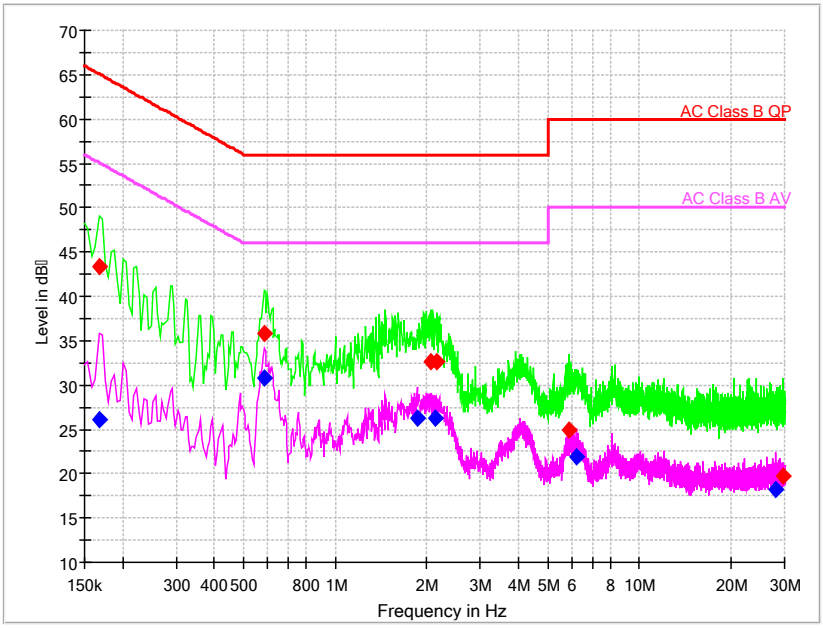
EUT1+charger:



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	---	26.17	55.11	28.94	L1	29.7	---	-3.53
0.167057	43.27	---	65.11	21.83	L1	29.7	13.57	---
0.584957	---	30.72	46.00	15.28	N	29.7	---	1.02
0.584957	35.81	---	56.00	20.19	L1	29.7	6.11	---
1.859979	---	26.23	46.00	19.77	L1	29.8	---	-3.57
2.060400	32.71	---	56.00	23.29	N	29.8	2.91	---
2.124364	---	26.21	46.00	19.79	L1	29.8	---	-3.59
2.162743	32.57	---	56.00	23.43	L1	29.8	2.77	---
5.855614	24.95	---	60.00	35.05	L1	29.8	-4.85	---
6.235136	---	21.93	50.00	28.07	L1	29.8	---	-7.87
28.059750	---	18.27	50.00	31.73	L1	30.5	---	-12.23
29.535193	19.67	---	60.00	40.33	L1	30.4	-10.73	---

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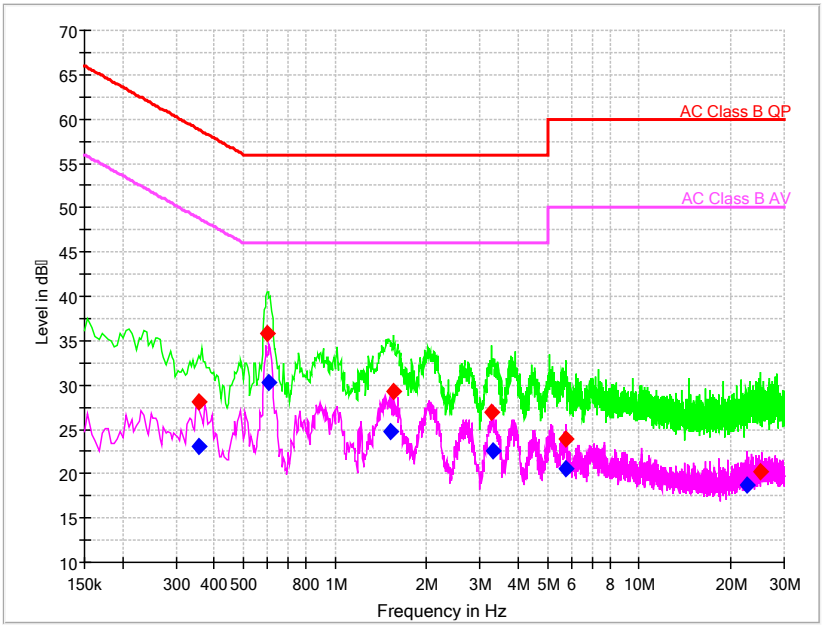
EUT1+charger:



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)
0.354686	---	23.03	48.85	25.82	L1	29.7	---	-6.67
0.354686	28.08	---	58.85	30.77	L1	29.7	-1.62	---
0.597750	35.88	---	56.00	20.12	L1	29.7	6.18	---
0.606279	---	30.22	46.00	15.78	L1	29.7	---	0.52
1.523100	---	24.67	46.00	21.33	L1	29.8	---	-5.13
1.552950	29.32	---	56.00	26.68	L1	29.8	-0.48	---
3.262929	26.95	---	56.00	29.05	L1	29.8	-2.85	---
3.318364	---	22.49	46.00	23.51	N	29.8	---	-7.31
5.740479	23.92	---	60.00	36.08	L1	29.8	-5.88	---
5.753271	---	20.64	50.00	29.36	L1	29.8	---	-9.16
22.750714	---	18.80	50.00	31.20	L1	30.4	---	-11.6
25.108864	20.14	---	60.00	39.86	L1	30.5	-10.36	---

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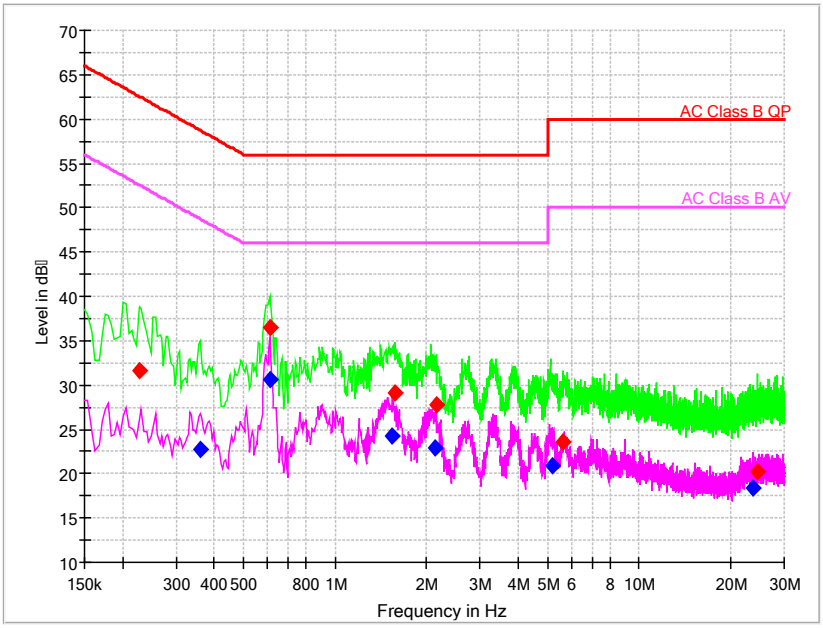
EUT2+charger:



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)
0.226757	31.67	---	62.57	30.90	L1	29.7	1.97	---
0.358950	---	22.78	48.75	25.98	N	29.7	---	-6.92
0.610543	---	30.61	46.00	15.39	L1	29.7	---	0.91
0.610543	36.55	---	56.00	19.45	L1	29.7	6.85	---
1.544421	---	24.24	46.00	21.76	L1	29.8	---	-5.56
1.570007	29.09	---	56.00	26.91	L1	29.8	-0.71	---
2.137157	---	22.86	46.00	23.14	L1	29.8	---	-6.94
2.145686	27.81	---	56.00	28.19	L1	29.8	-1.99	---
5.198914	---	20.87	50.00	29.13	L1	29.8	---	-8.93
5.638136	23.63	---	60.00	36.37	L1	29.8	-6.17	---
23.663271	---	18.33	50.00	31.67	L1	30.5	---	-12.17
24.584357	20.17	---	60.00	39.83	L1	30.5	-10.33	---

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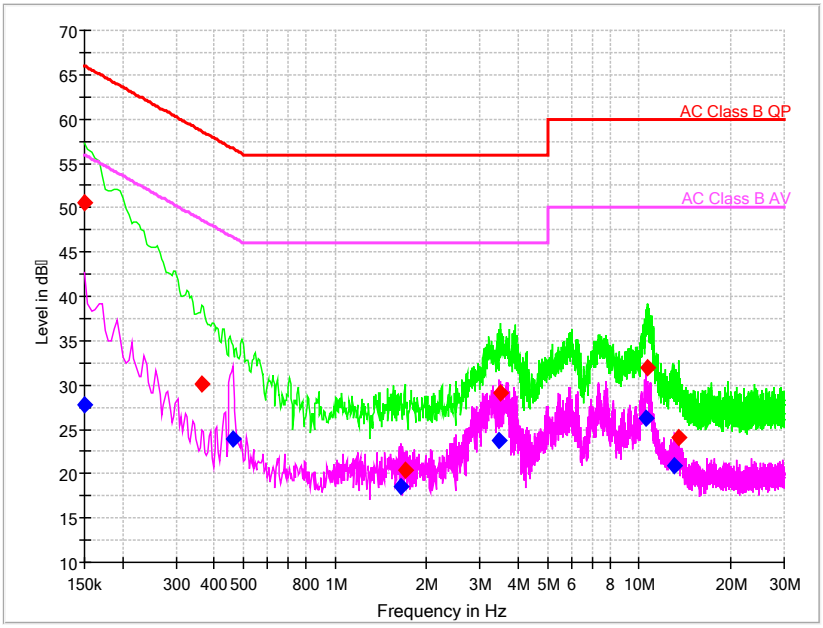
EUT1+Laptop:



Pic5. Conducted emission L&N Line

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	Pmea QuasiP	Pmea Aver
0.150000	---	27.71	56.00	28.29	L1	29.7	---	-1.99
0.150000	50.63	---	66.00	15.37	L1	29.7	20.9	---
0.363214	30.17	---	58.66	28.48	L1	29.7	0.47	---
0.461293	---	23.97	46.67	22.70	L1	29.7	---	-5.73
1.646764	---	18.55	46.00	27.45	L1	29.8	---	-11.2
1.697936	20.40	---	56.00	35.60	L1	29.8	-9.4	---
3.459086	---	23.70	46.00	22.30	L1	29.8	---	-6.1
3.484671	29.04	---	56.00	26.96	L1	29.8	-0.76	---
10.550593	---	26.18	50.00	23.82	N	29.9	---	-3.72
10.716900	31.96	---	60.00	28.04	L1	29.9	2.06	---
13.121957	---	20.88	50.00	29.12	L1	30.0	---	-9.12
13.488686	24.01	---	60.00	35.99	L1	30.0	-5.99	---

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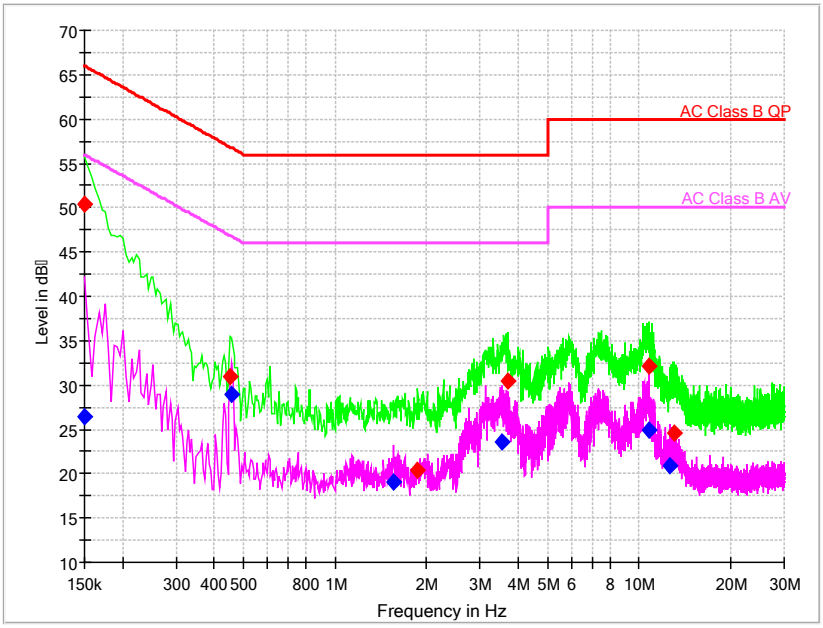
EUT3+Laptop:



Pic6. Conducted emission L&N Line

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	Pmea Quasi	Pmea Aver
0.150000	---	26.41	56.00	29.59	L1	29.7	---	-3.29
0.150000	50.43	---	66.00	15.57	L1	29.7	20.7	---
0.452764	30.97	---	56.82	25.85	L1	29.7	1.27	---
0.457029	---	28.86	46.75	17.89	L1	29.7	---	-0.84
1.557214	---	19.03	46.00	26.97	L1	29.8	---	-10.7
1.872771	20.37	---	56.00	35.63	L1	29.8	-9.43	---
3.531579	---	23.62	46.00	22.38	N	29.8	---	-6.18
3.706414	30.47	---	56.00	25.53	L1	29.8	0.67	---
10.772336	---	24.87	50.00	25.13	L1	29.9	---	-5.03
10.780864	32.13	---	60.00	27.87	L1	29.9	2.23	---
12.652886	---	20.94	50.00	29.06	L1	30.0	---	-9.06
13.096371	24.55	---	60.00	35.45	L1	30.0	-5.45	---

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2.2.2 Radiated Emissions-FCC Part15.109

Ambient condition:

Temperature	Relative humidity	Pressure
26.4°C	40.1%	100.8kPa

Test Setup:

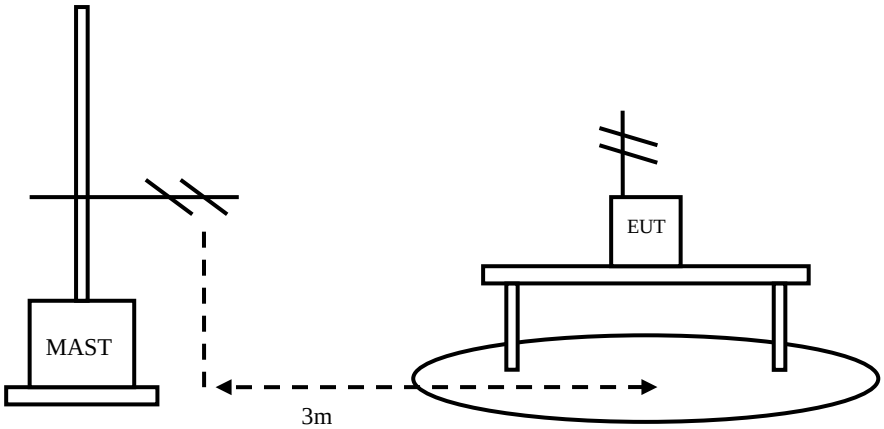

Figure 3

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: (21.78 dBμV/m) = (42.98 dBμV) + (-21.2dB/m), the corresponding frequency is 30.291000MHz.

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
30.291000	21.78	-21.2	42.98	V
54.880500	21.88	-18.2	40.08	V
162.162500	18.43	-22.0	40.43	V
183.696500	17.26	-20.5	37.76	V
387.736000	16.93	-13.4	30.33	V
958.047500	19.20	-2.6	21.80	V

EUT2+charger:

Frequency(MHz)	Result(dBuV/m)	A_{Rpl} (dB/m)	P_{mea} (dBuV)	Polarity
30.048500	16.60	-21.3	37.90	V
79.276000	19.49	-24.3	43.79	V
135.342000	14.53	-22.6	37.13	V
239.956500	16.25	-17.6	33.85	V
500.013500	16.44	-10.8	27.24	V
959.357000	19.22	-2.6	21.82	V

EUT1+Laptop:

Frequency(MHz)	Result(dBuV/m)	A_{Rpl} (dB/m)	P_{mea} (dBuV)	Polarity
53.765000	19.72	-18.0	37.72	V
59.633500	19.83	-18.8	38.63	V
157.749000	19.91	-22.2	42.11	V
272.257500	26.01	-16.7	42.71	V
359.994000	31.62	-14.1	45.72	V
759.537000	17.99	-5.3	23.29	V

EUT3+ Laptop:

Frequency(MHz)	Result(dBuV/m)	A_{Rpl} (dB/m)	P_{mea} (dBuV)	Polarity
53.668000	19.77	-18.0	37.77	V
60.070000	18.84	-18.9	37.74	V
159.398000	20.39	-22.1	42.49	V
270.366000	25.20	-16.7	41.90	V
359.994000	31.48	-14.1	45.58	V
594.152000	18.63	-8.3	26.93	V

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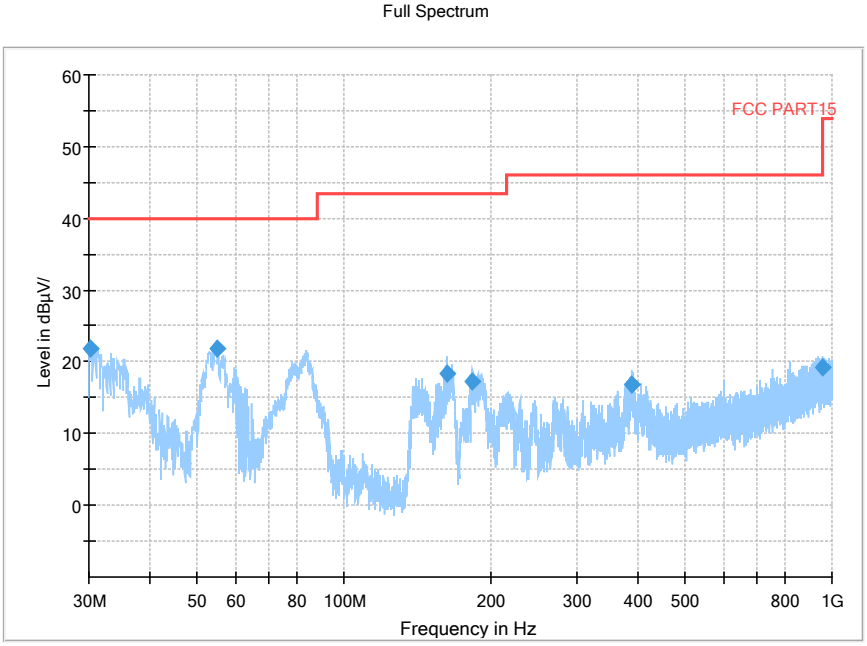
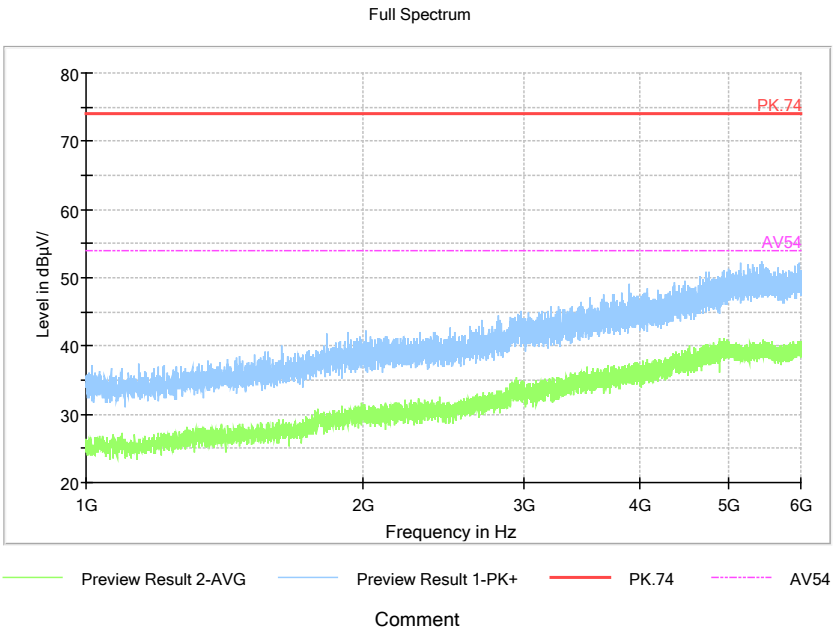
EUT1+charger: refer to Pic7 to Pic10



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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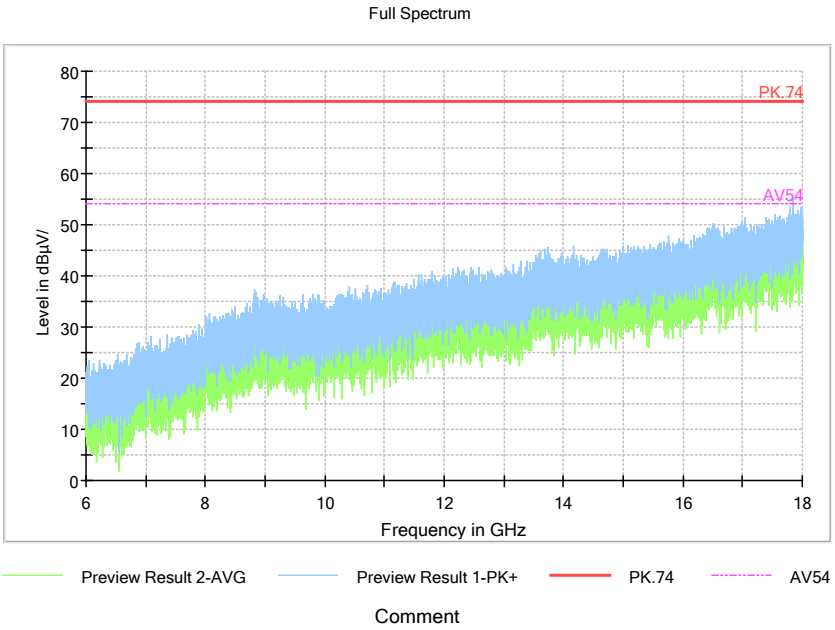
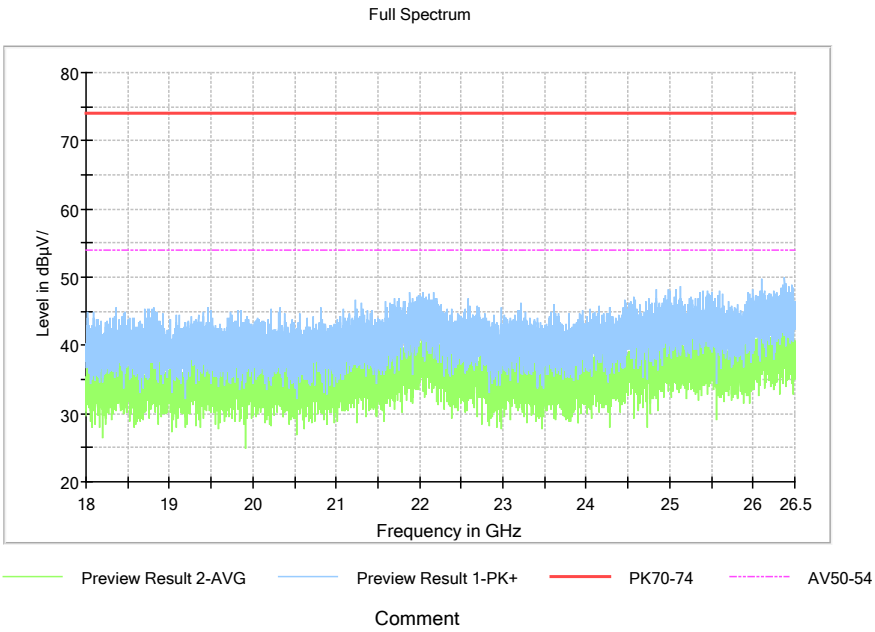


Pic9. Radiated emission (6GHz –18GHz)

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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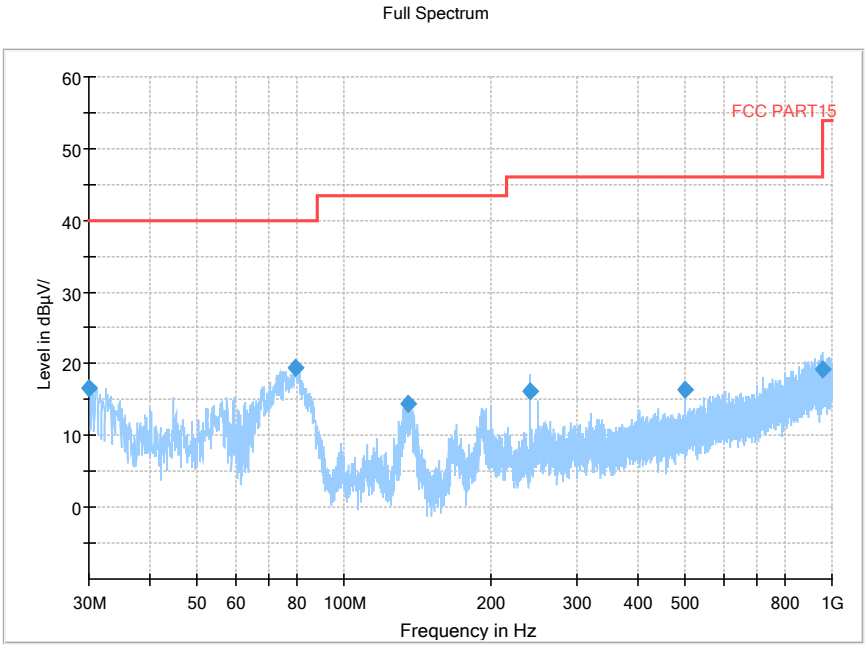
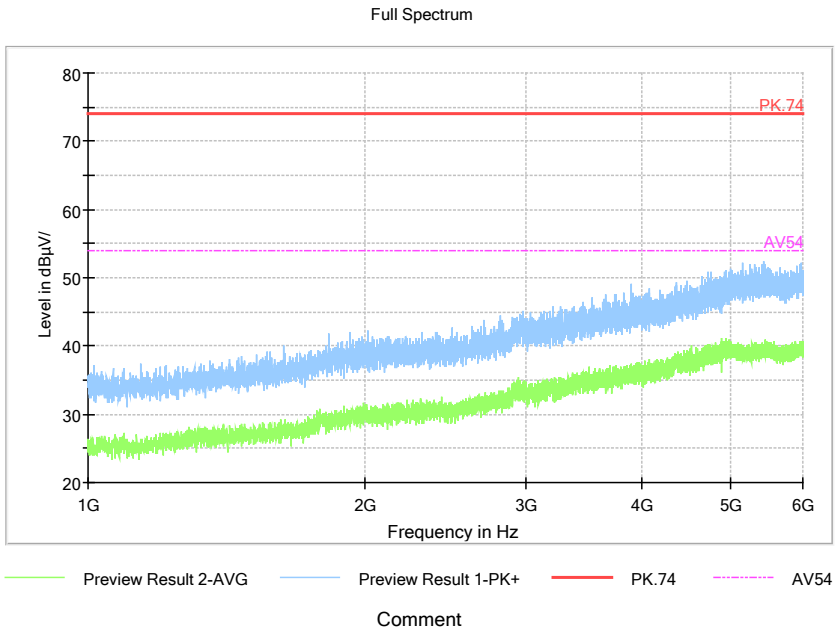
EUT2+charger: refer to Pic11 to Pic14



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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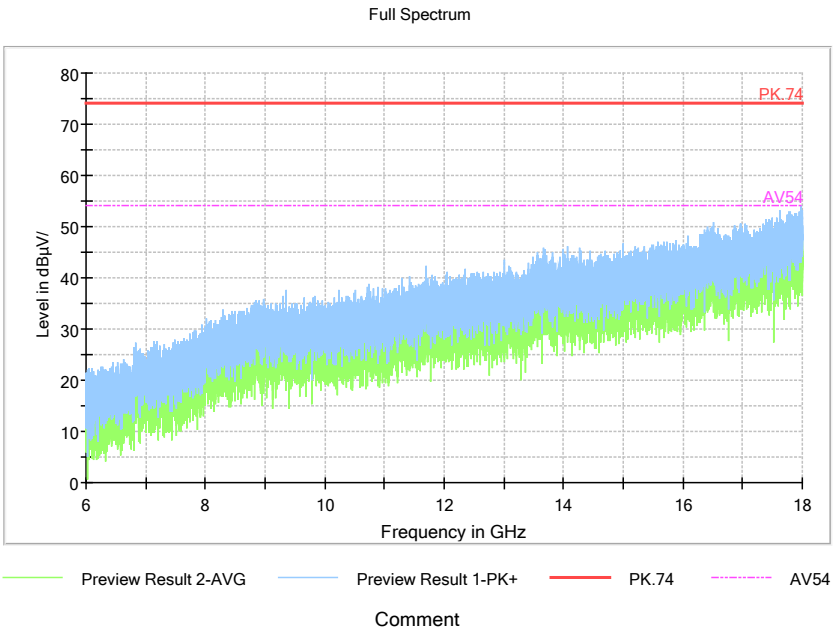
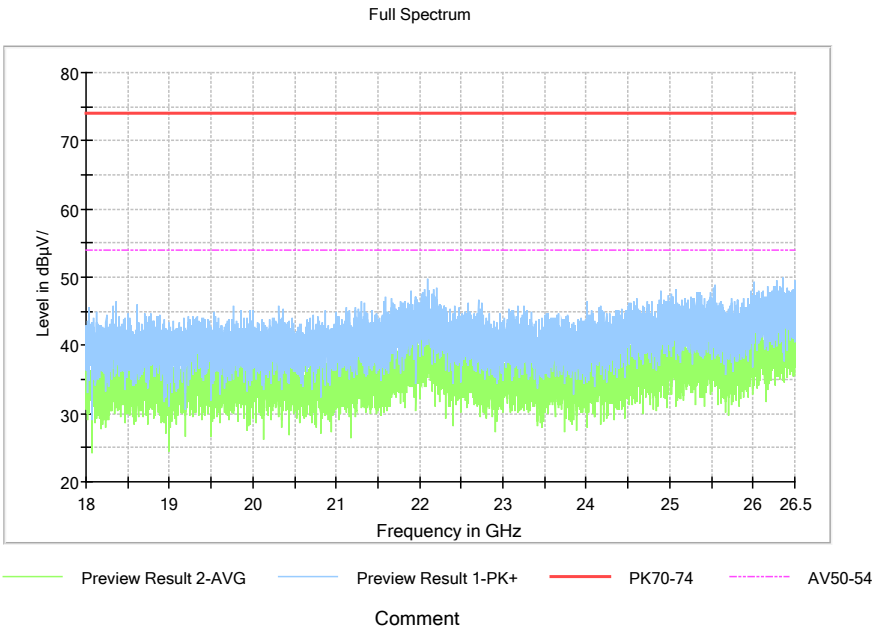


Pic13. Radiated emission (6GHz –18GHz)

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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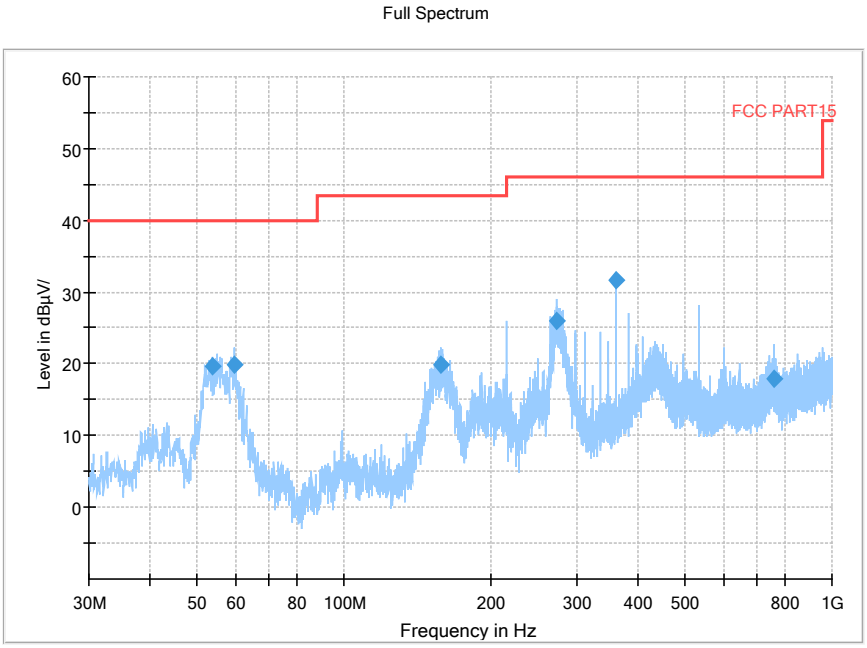
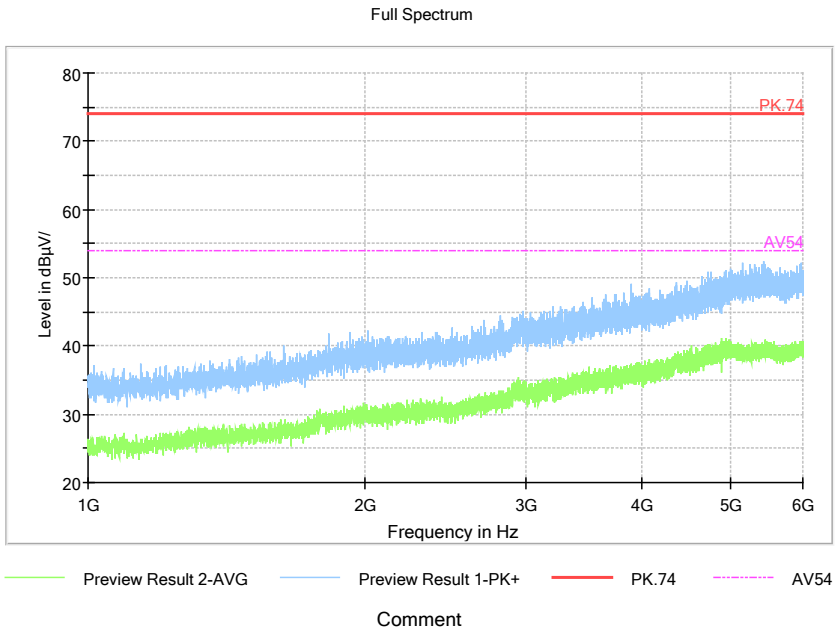
EUT1+ Laptop: refer to Pic15 to Pic18



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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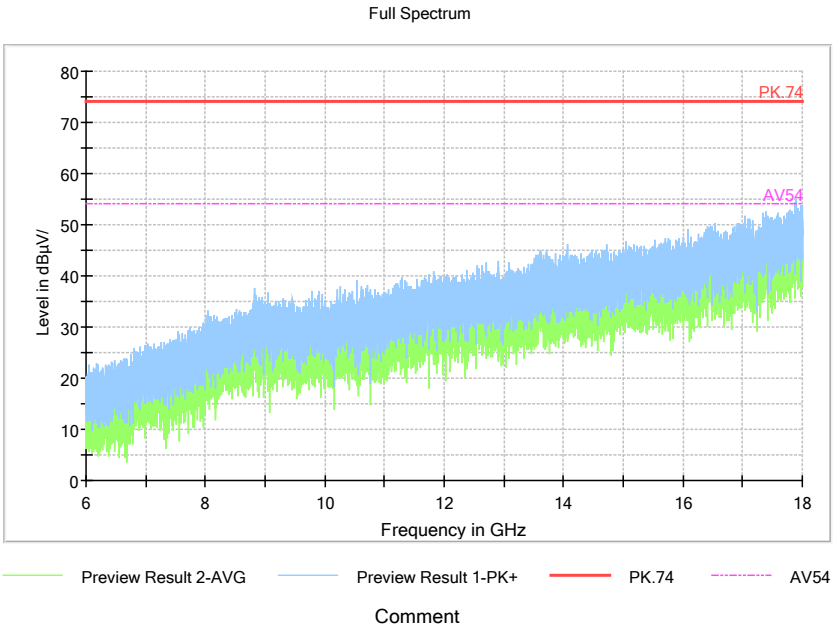
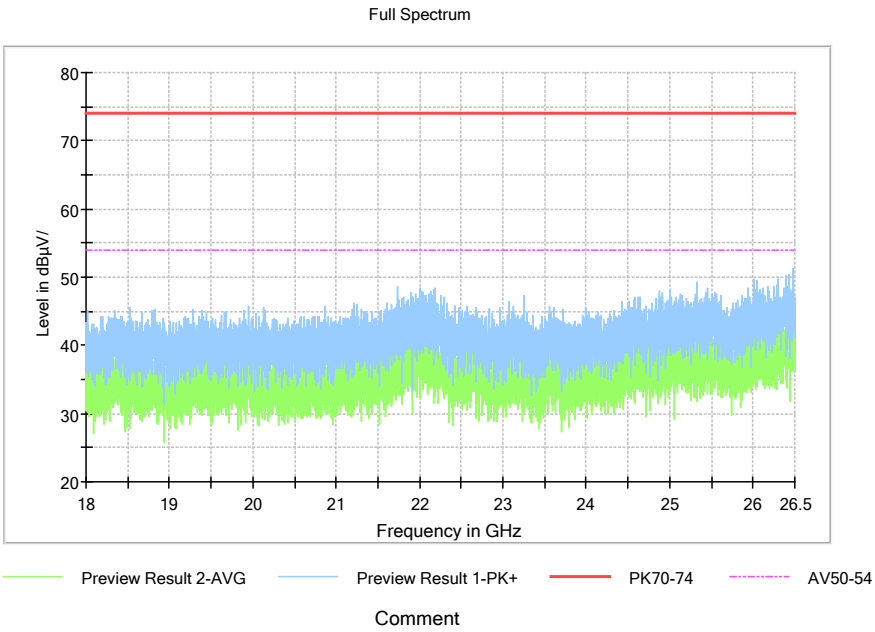


Pic17. Radiated emission (6GHz –18GHz)

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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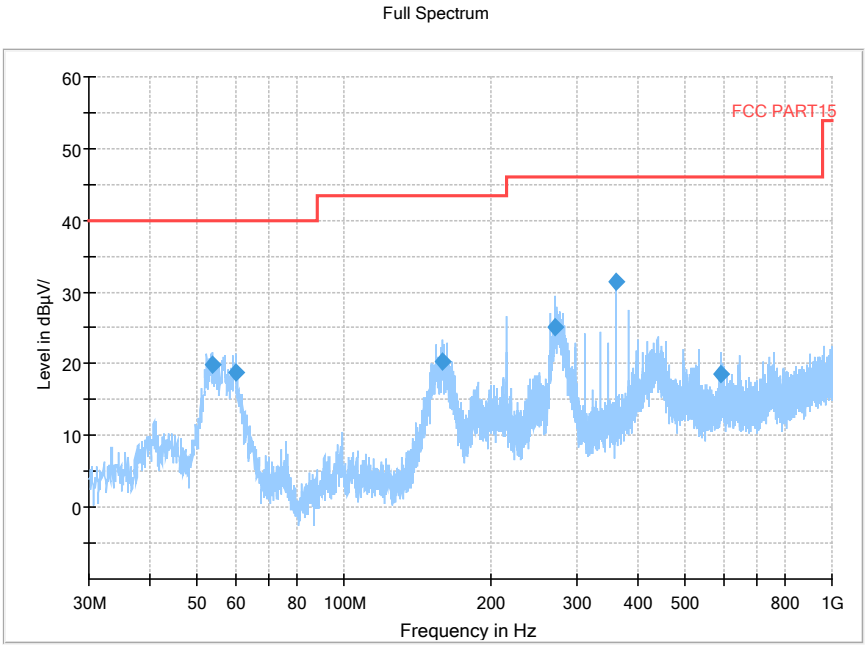
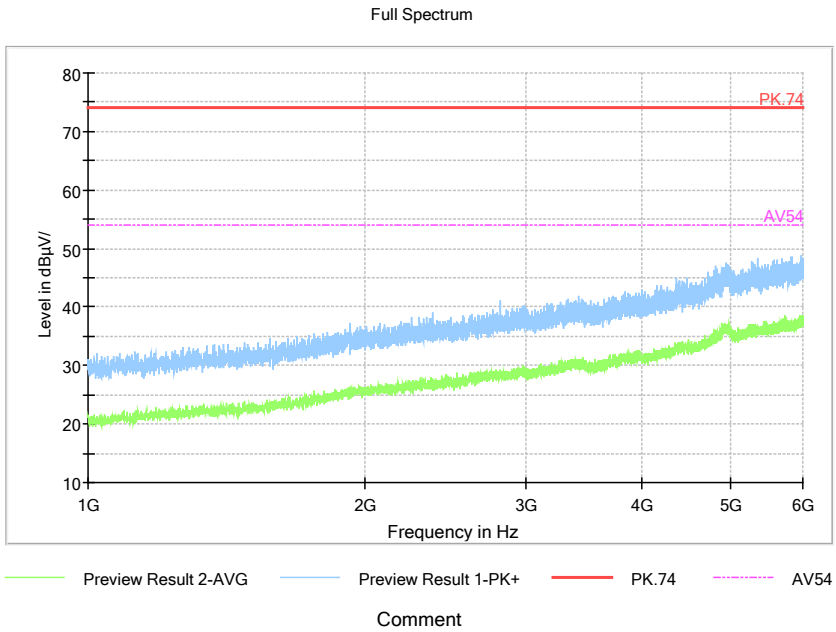
EUT3+Laptop: refer to Pic19 to Pic22



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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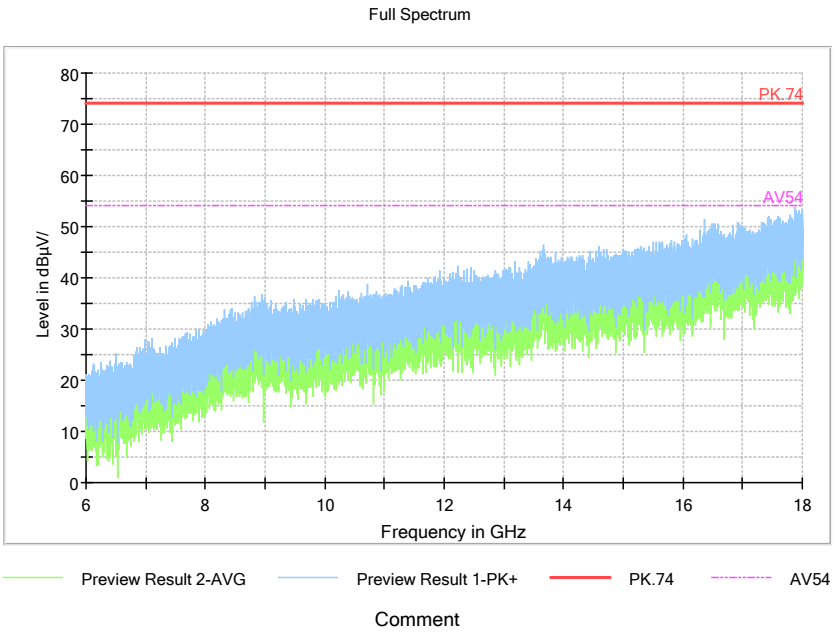
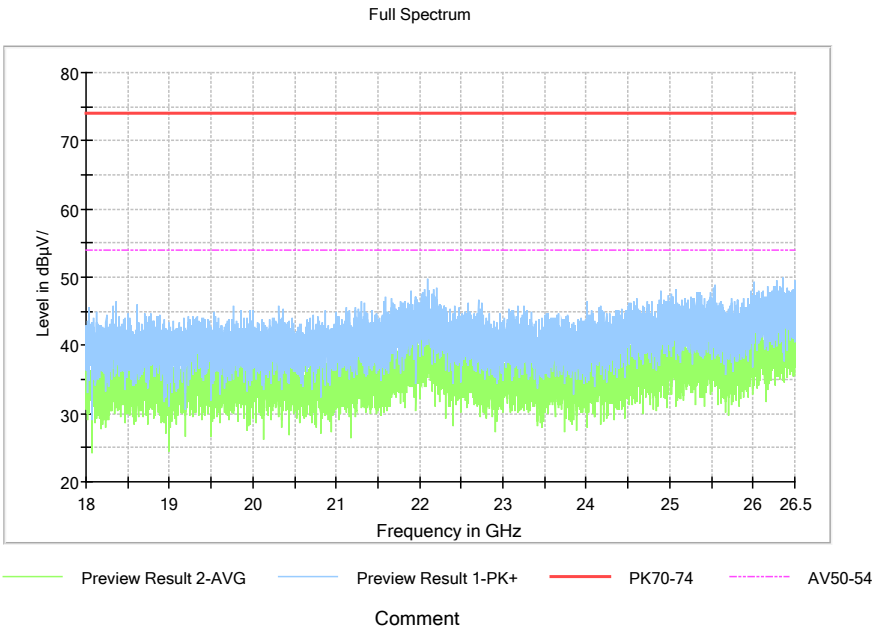


Pic21. Radiated emission (6GHz –18GHz)

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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