
TEST REPORT

Report No.: SRTC2024-9004(F)-24062805(T)
Product Name: Smart Phone
Applicant: SHARP CORPORATION
Manufacturer: SHARP CORPORATION
Specification: FCC Part 15B (Certification)
(2023 edition)
ANSI C63.4-2014
FCC ID: APYHRO00334

The State Radio_monitoring_center Testing Center (SRTC)
15th Building, No.30 Shixing Street, Shijingshan District,
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1. General information

1.1 Notes of the test report

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The test results relate only to individual items of the samples which have been tested.

1.2 Information about the testing laboratory

Company: The State Radio_monitoring_center Testing Center (SRTC)
Address: 15th Building, No.30 Shixing Street, Shijingshan District
Testing location: No.80, Zhaojiachang, BeizangCun, Daxing District, Beijing, China.
City: Beijing
Country or Region: China
Contacted person: Liu Jia
Tel: +86 10 57996183
Fax: +86 10 57996388
Email: liujiaf@srtc.org.cn

1.3 Applicant's details

Company: SHARP CORPORATION
Address: 1 Takumi-cho, Sakai-ku, Sakai City, Osaka 590-8522, Japan

1.4 Manufacturer's details

Company: SHARP CORPORATION
Address: 1 Takumi-cho, Sakai-ku, Sakai City, Osaka 590-8522, Japan

1.5 Application details

Date of reception of test sample: 1st JULY 2024

Date of test: 8th JULY 2024 to 31th JULY 2024

1.6 Reference specification

FCC Part 15B, 2023 (Certification)
ANSI C63.4-2014

1.7 Information of EUT

1.7.1 General information

Name of EUT	Smart Phone
Frequency Range	GSM: GSM850 / PCS1900 WCDMA: FDD II /FDD V LTE: FDD 2/ FDD 5/ FDD 12/ FDD 17/TDD 38/ TDD 41 Bluetooth: 2.4~2.48GHz WiFi: 2.412GHz~2.472 GHz 5.15-5.35GHz/5.47-5.725GHz 5.725GHz-5.85GHz
Equipment Class	Class B
Power Supply	Battery or Charger
HW Version	DVT
SW Version	A6240

1.7.2EUT details

Product Name	FCC ID	IMEI
Smart Phone	APYHRO00334	EUT1:004401231775228 EUT2:004401231778750 EUT3:004401231778016

1.7.3 Auxiliary equipment details

AE (Auxiliary Equipment) 1#: Laptop

Manufacturer	Lenovo
Model Number	E470c
S/N	PF10VBX6

AE (Auxiliary Equipment) 2#: battery

Manufacturer	SCUD
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Model Number	UBATIA320FN2
type	Li-Lon

AE (Auxiliary Equipment) 3#: Charger

Manufacturer	DVE
Model Number	DSA-10PF06-05 FUS

AE (Auxiliary Equipment) 4#: cable

Manufacturer	Kingpower
Model Number	K201-05130-00

AE (Auxiliary Equipment) 5#: Earphone

Manufacturer	Apple
Model Number	CFG5

multi-vender as follow

	UFS/DDR Memory	Main PCB	Ant PCB	Fingerprint FPC	KeyFPC	OLED FPC	Graphite Sheet	Fingerprint sensor	Main camera	Battery	CAB
Function	Explanation	PCB	PCB	FPC	FPC	FPC	Graphite Sheet	Only FPC is different	Only FPC is different	Only FET is different	AL+PBT
	128GB UFS + 6GB LPDDR4X										
	256GB UFS + 8GB LPDDR4X										
	Pin assign	Pin-compatible									
	Outline	Same	Same	Same	Same	Same	Same	Same	Same	Same	Same
	Performance										
	Ref No.	IC1500									
	Other										
1st source	1st : Samsung	1st : Tripod	1st : Kinwong	1st : AKM	1st : AKM	1st : AKM	1st : Kuroda	1st : RUITKB547AFSA	1st : AKM	1st : JSCJ	1st : LINK
2nd source	2nd : Micron	2nd : CMK	2nd : Multek	2nd : Long shine	2nd : Multek	2nd : Multek	2nd : Tomoike	2nd : RUITKB547AFSC	2nd : SCC	2nd : AOS	2nd : HUAMAO
3rd source	3rd : SK Hynix	(1st : Tripod)	(1st : Kinwong)	(1st : AKM)	(1st : AKM)	(1st : AKM)	(1st : Kuroda)	3rd : RUITKB547AFSD	(1st : SSC)	(1st : JSCJ)	(1st : LINK)
1st source	1st : Samsung	1st : Tripod	1st : Kinwong	1st : AKM	1st : AKM	1st : AKM	1st : Kuroda	1st : RUITKB547AFSA	1st : AKM	1st : JSCJ	1st : LINK
2nd source	2nd : Micron	2nd : CMK	2nd : Multek	2nd : Long shine	2nd : Multek	2nd : Multek	2nd : Tomoike	2nd : RUITKB547AFSC	2nd : SCC	2nd : AOS	2nd : HUAMAO

UFS/DDR Memory, there is no difference regarding the outline and functionality.
All PCBs and FPCs, there is no difference regarding the outline and pattern layout.
Graphite Sheet, there is no difference regarding the functionality.
Fingerprint sensor, there is no difference regarding the functionality.
Main camera, there is no difference regarding the functionality.
FET of battery pack, there is no difference regarding the outline and functionality.
Cabinet, there is no difference regarding the outline and material.
So the difference of manufacturer do not affect the test result.

NOTE:Sharp Corporation declares that this equipment is different on the supplier of the part above in the table.

1.7.4 Test mode

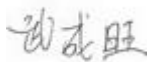
Mode No.	Description of test mode
Mode 1	Rear camera on + GSM/WCDMA/LTE/BT/WLAN/GNSS receiver
Mode 2	Front camera on + GSM/WCDMA/LTE/BT/WLAN/ GNSS receiver
Mode 3	USB copy(EUT with PC)
Mode 4	Mp4 + GSM/WCDMA/LTE/BT/WLAN/ GNSS receiver
Mode 5	Mp3 + GSM/WCDMA/LTE/BT/WLAN/GNSS receiver

Note1: As the information described, the relevant tests have been performed in order to verify in which mode would have the worst features. When the EUT1 exercised with 4# Cable, 2# Battery, 3# Charger is the worst feature, so all the tests shown in this test report are performed at this feature when the EUT working on Mode 1 and Mode 3.

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.Guoyu Vice director of the test department 
Tested By: Mr.Wu Chengwang 	Issued date: 2024.07.31

2.2 Test result

2.2.1Conducted Emissions-FCC Part15.107

Ambient condition:

Temperature	Relative humidity	Pressure
22.7°C	38.5%	100.8kPa

Test Setup with laptop:

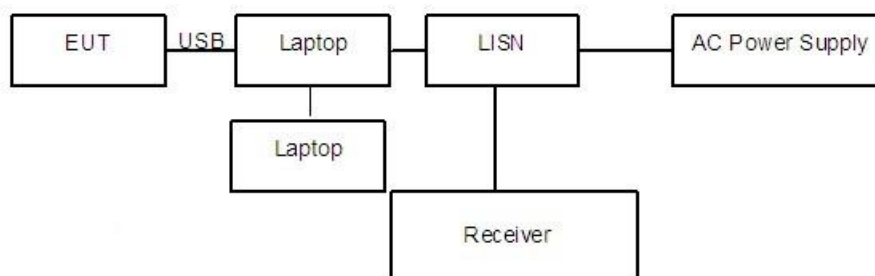


Figure 1

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:

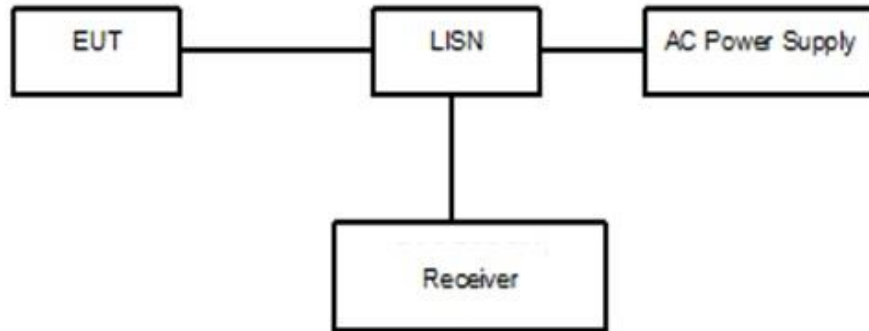


Figure 2

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: GPS, Camera 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 $L_{cable}+ATT+VDF$ 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: $(16.14 \text{ dB}\mu\text{V}) = (-13.56 \text{ dB}\mu\text{V}) + (29.7 \text{ dB})$, the corresponding frequency is 0.30351MHz.

Limit:

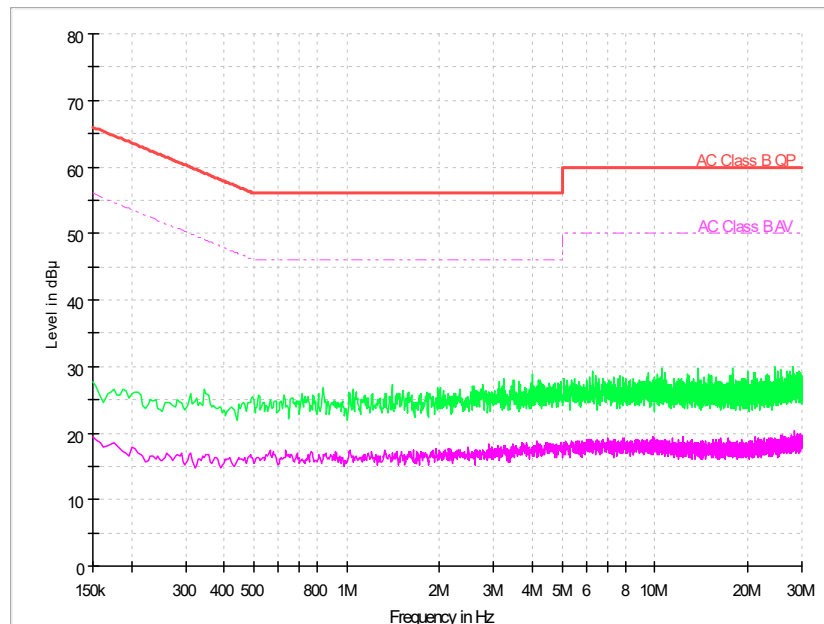
Frequency of Emission(MHz)	Limits(dB μ V)
----------------------------	--------------------

	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:

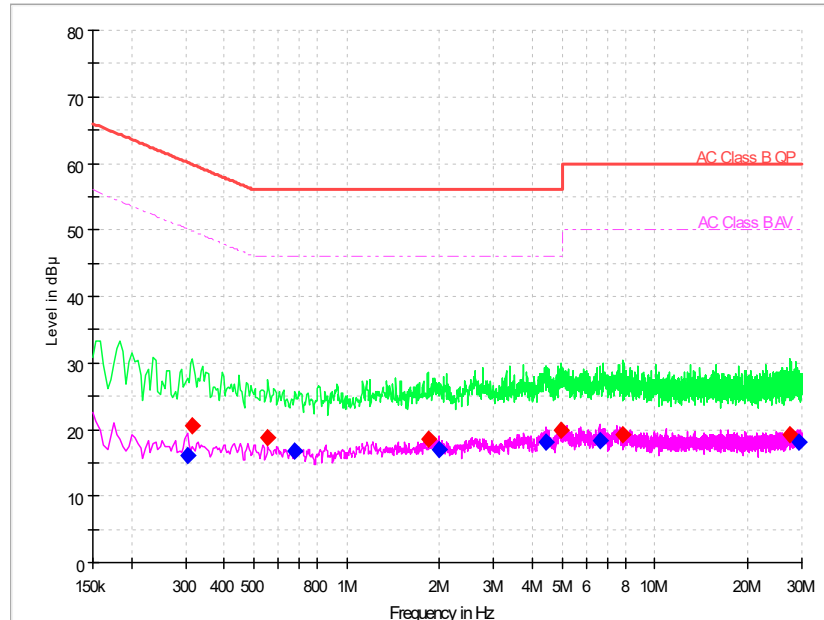
Noise Level of the Measuring Instrument



Pic1.Conducted emission L and N Line

120V AC:

EUT1 +2# Battery+4# Cable+3# Charger

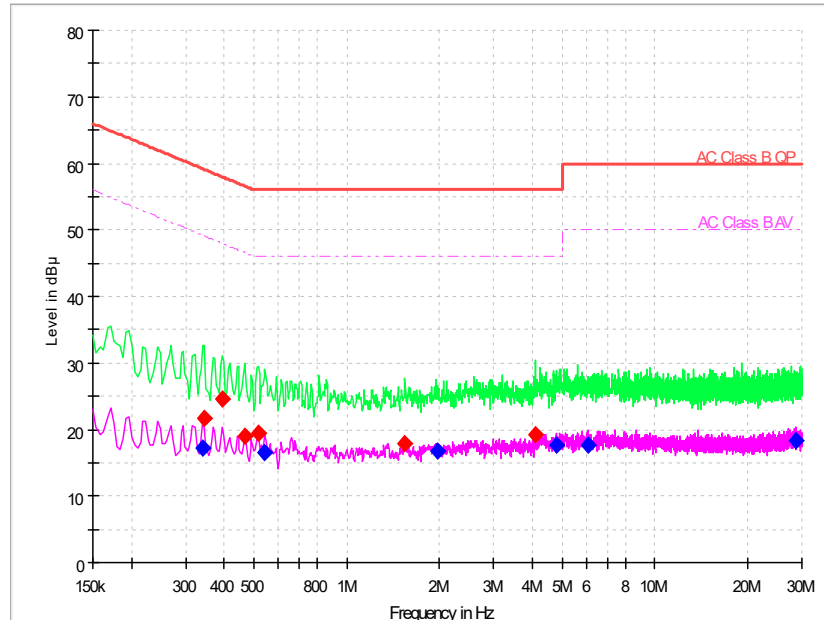


Pic2. Conducted emission L&N Line

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	Pmea QuasiPeak (dBμV)	Pmea Average (dBμV)
0.30351	---	16.14	50.15	34	N	29.7	---	-13.56
0.31631	20.48	---	59.8	39.32	L1	29.8	-9.32	---
0.55511	18.83	---	56	37.17	L1	29.8	-10.97	---
0.67877	---	16.75	46	29.25	N	29.7	---	-12.95
1.83439	18.44	---	56	37.56	L1	29.8	-11.36	---
2.0007	---	17.02	46	28.98	N	29.7	---	-12.68
4.4484	---	18.21	46	27.79	L1	29.8	---	-11.59
4.94732	19.93	---	56	36.07	L1	29.8	-9.87	---
6.61039	---	18.26	50	31.74	N	29.8	---	-11.54
7.90247	19.28	---	60	40.72	L1	29.9	-10.62	---
27.305	19.31	---	60	40.69	L1	30.1	-10.79	---
29.322	---	18.14	50	31.86	N	30.4	---	-12.26

240V AC:

EUT1 +2# Battery+4# Cable+3# Charger:

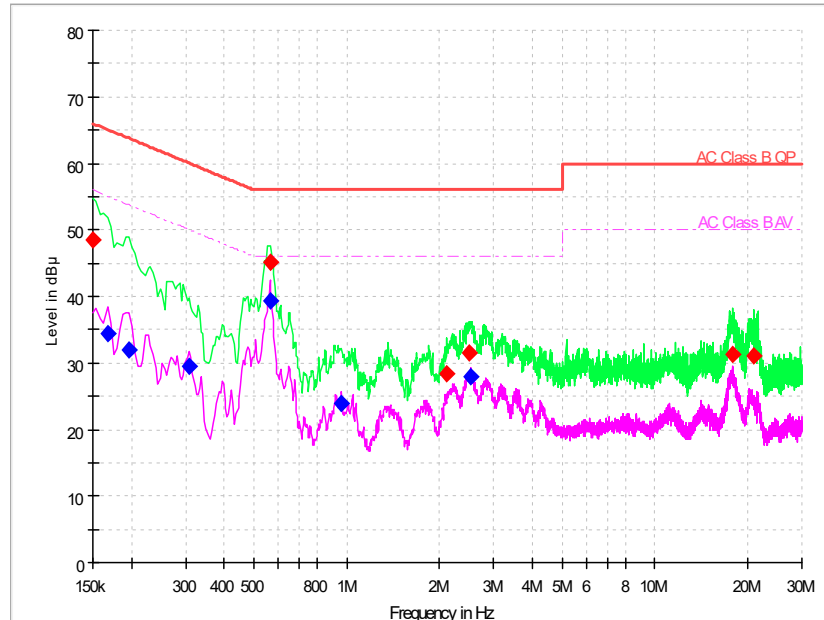


Pic3. Conducted emission L&N Line

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	Pmea QuasiPeak (dBμV)	Pmea Average (dBμV)
0.34189	---	17.13	49.16	32.03	L1	29.8	---	-12.67
0.34616	21.69	---	59.05	37.36	L1	29.8	-8.11	---
0.39306	24.69	---	58	33.31	L1	29.8	-5.11	---
0.46556	18.89	---	56.59	37.7	L1	29.8	-10.91	---
0.51673	19.4	---	56	36.6	L1	29.8	-10.4	---
0.54231	---	16.62	46	29.38	L1	29.8	---	-13.18
1.54442	17.8	---	56	38.2	L1	29.8	-12.0	---
1.96659	---	16.81	46	29.19	L1	29.8	---	-12.99
4.0902	19.3	---	56	36.7	L1	29.8	-10.5	---
4.76822	---	17.6	46	28.4	L1	29.8	---	-12.2
6.06883	---	17.69	50	32.31	L1	29.8	---	-12.11
28.6738	---	18.31	50	31.69	N	30.4	---	-12.09

EUT1 +1#laptop +2# Battery+4# Cable

:



Pic4. Conducted emission L&N Line

Frequency	QuasiPeak	Average	Limit	Margin	Line	Corr.	Pmea QuasiPeak	Pmea Average
(MHz)	(dBμV)	(dBμV)	(dBμV)	(dB)		(dB)	(dBμV)	(dBμV)
0.15	48.47	---	66	17.53	N	29.7	18.77	---
0.16706	---	34.45	55.11	20.65	L1	29.8	---	4.65
0.19691	---	32.05	53.74	21.69	L1	29.8	---	2.25
0.30778	---	29.6	50.03	20.43	L1	29.8	---	-0.2
0.56364	45.23	---	56	10.77	L1	29.8	15.43	---
0.56364	---	39.25	46	6.75	L1	29.8	---	9.45
0.96448	---	23.87	46	22.13	L1	29.8	---	-5.93
2.11157	28.38	---	56	27.62	N	29.7	-1.32	---
2.49109	31.45	---	56	24.55	N	29.7	1.75	---
2.52094	---	27.93	46	18.07	L1	29.8	---	-1.87
17.9193	31.29	---	60	28.71	N	30.1	1.19	---
20.9896	31.04	---	60	28.96	L1	30	1.04	---

2.2.2RadiatedEmissions-FCC Part15.109

Ambient condition:

Temperature	Relative humidity	Pressure
22.7°C	38.5%	100.8kPa

Test Setup:

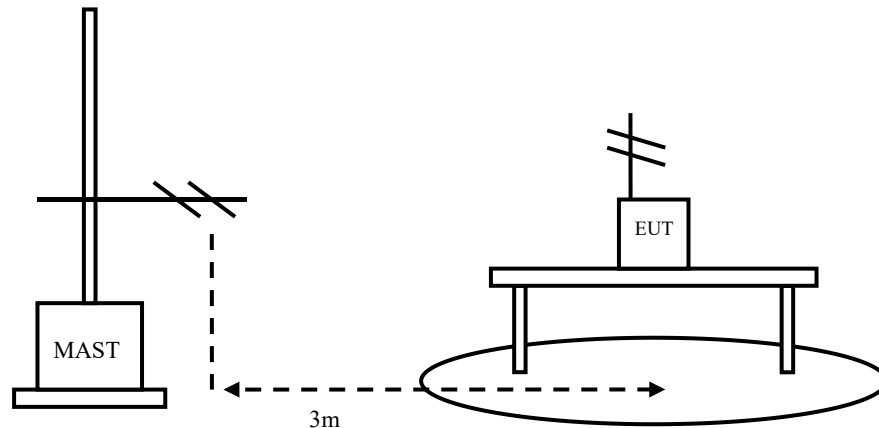


Figure 3

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: GPS, Camera 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:

$$\text{Result} = P_{\text{mea}} + A_{Rpl}$$

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 Peak	54 74

Test result:

Sample calculation: $(18.44\text{dB } \mu\text{ V/m}) = (37.24\text{dB } \mu\text{ V/m}) + (-18.8\text{dB})$, the corresponding frequency is 45.0835MHz.

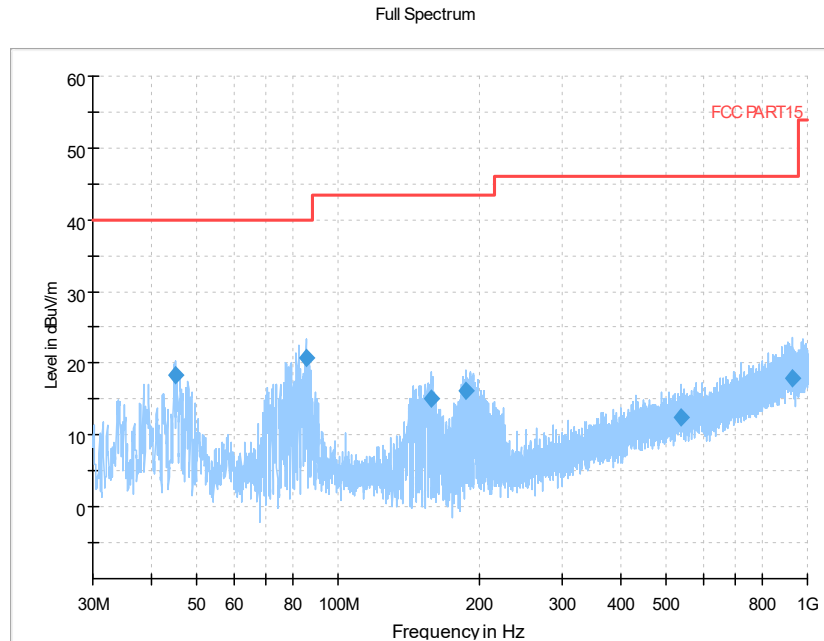
EUT1 +2# Battery+4# Cable+3# Charger:

Frequency(MHz)	Result(dB μ V/m)	Limit (dB μ V/m)	ARpl (dB)	Pmea (dB μ V/m)	Polarity
45.0835	18.44	40.00	-18.8	37.24	V
85.3385	20.78	40.00	-20.6	41.38	V
157.555	15.06	43.50	-21.8	36.86	V
187.286	16.07	43.50	-20.1	36.17	V
537.31	12.46	46.00	-10.1	22.56	V
932.1	17.87	46.00	-3.3	21.17	V

EUT1 +2# Battery+4# Cable +1#Laptop:

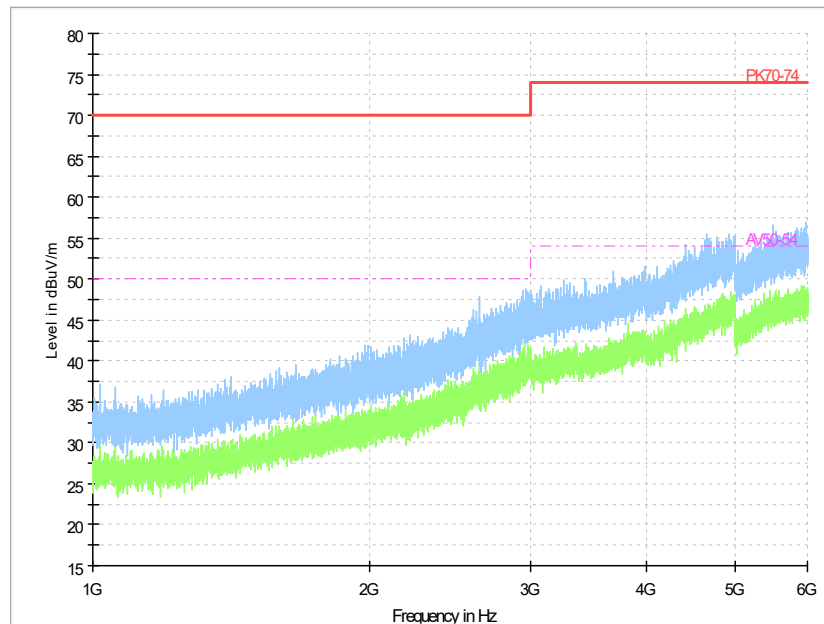
Frequency(MHz)	Result(dB μ V/m)	Limit (dB μ V/m)	ARpl (dB)	Pmea (dB μ V/m)	Polarity
33.9285	6.95	40.00	-20	26.95	V
60.2155	15.32	40.00	-19.7	35.02	V
166.576	13.09	43.50	-21.4	34.49	V
199.993	14.78	43.50	-19.3	34.08	V
436.333	22.43	46.00	-12.4	34.83	V
995.587	30.67	54.00	-2.6	33.27	V

EUT1 +2# Battery+4# Cable+3# Charger:refer to Pic5, Pic6, Pic7, Pic8



Pic5. Radiated emission(30MHz – 1GHz)

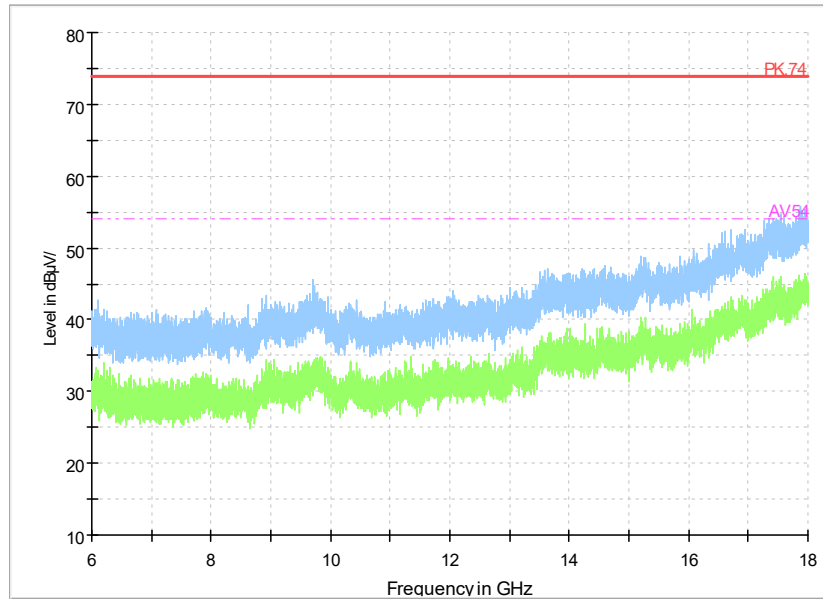
Note: The test data in the graph includes two polarizations: horizontal and vertical



Pic6. Radiated emission (1GHz –6GHz)

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

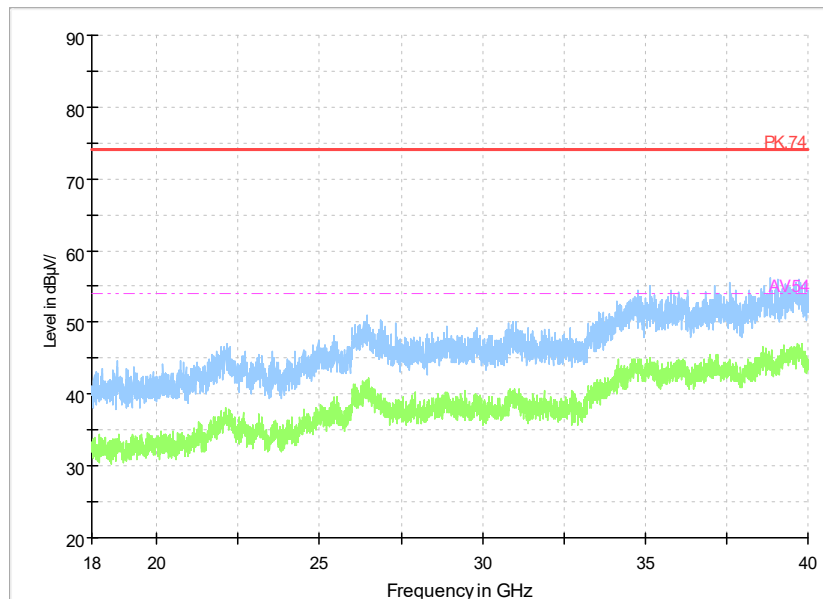
Full Spectrum



Pic7. Radiated emission (6GHz –18GHz)

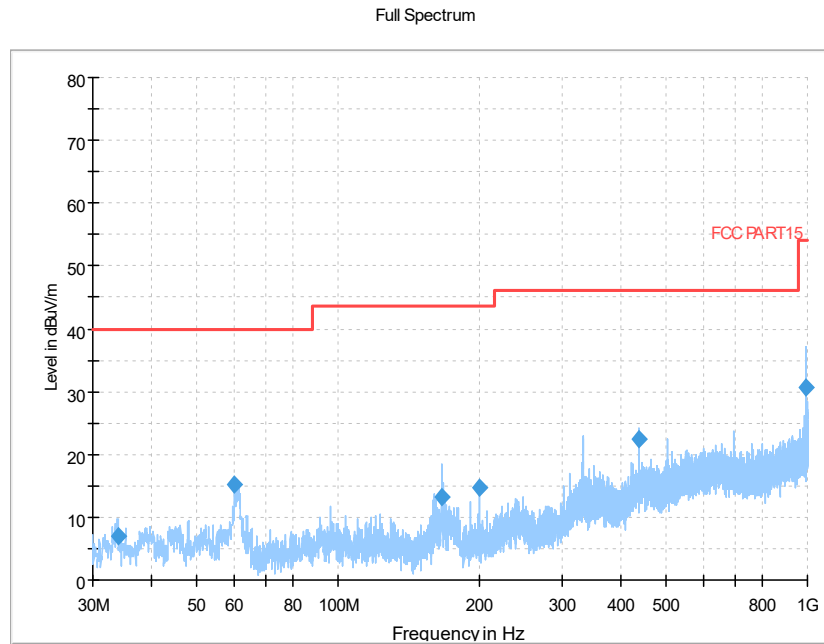
Note: The test data in the graph includes two polarizations: horizontal and vertical.

Full Spectrum



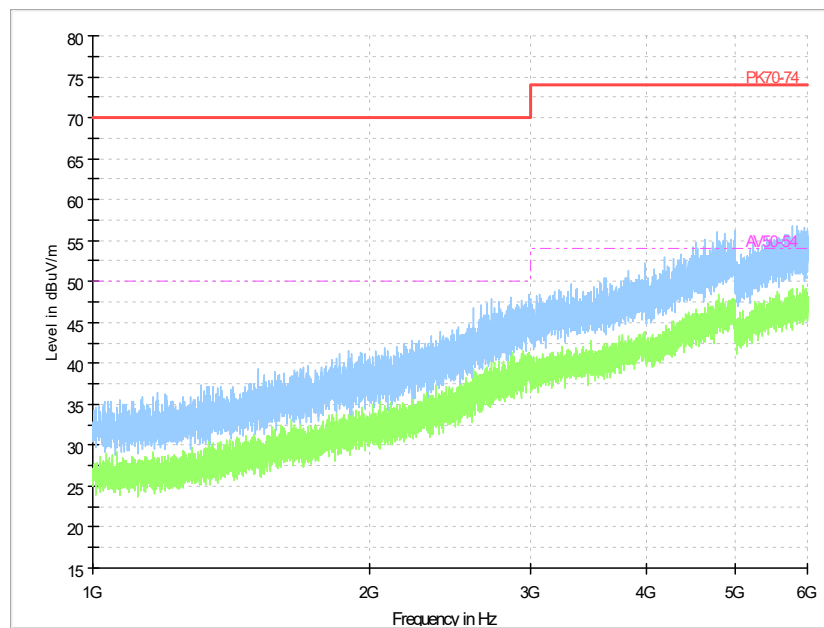
Pic8. Radiated emission (18GHz –40GHz)

Note: The test data in the graph includes two polarizations: horizontal and vertical.
EUT1 +2# Battery+4# Cable+1#Laptop: refer to Pic9, Pic10, Pic11, Pic12



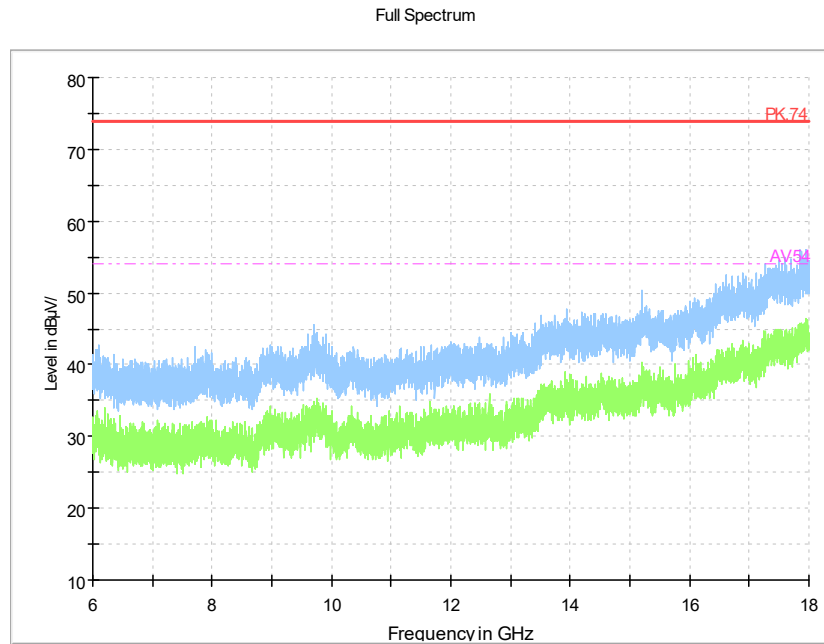
Pic9. Radiated emission (30MHz – 1GHz)

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



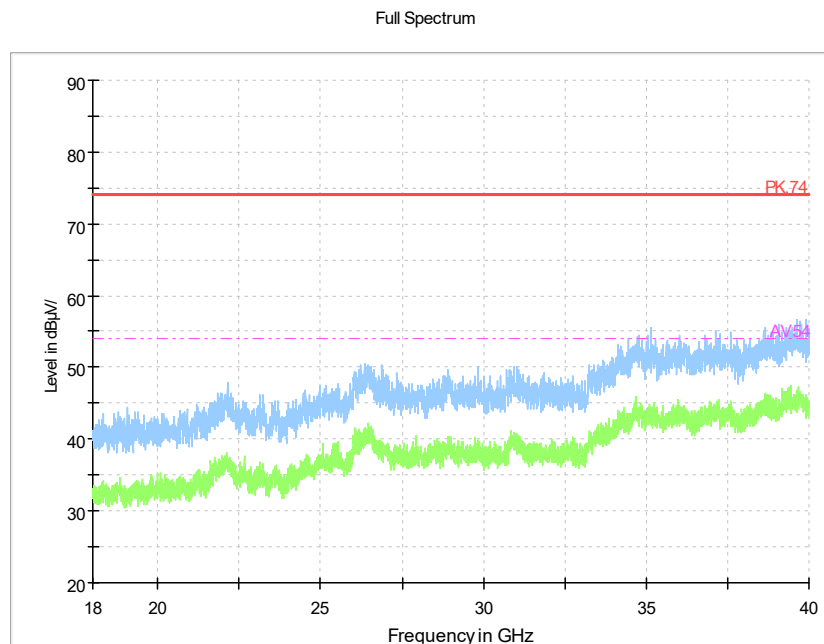
Pic10. Radiated emission (1GHz –6GHz)

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



Pic11. Radiated emission (6GHz –18GHz)

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



Pic12. Radiated emission (18GHz –40GHz)

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

2.3. List of test equipments

No.	Name/Model	Manufacturer	S/N	Calibration Due Date	Calibration Date
1	23.18m×16.88m×9.60mS emi-AnechoicChamber	FRANKONIA	-----	2028.09.05	2023.09.05
2	ESW EMI test receiver	R&S	101574	2025.03.06	2024.03.06
3	ESR3 EMI test receiver	R&S	102361	2025.03.06	2024.03.06
4	9.080m×5.255m×3.525m Shielding room	FRANKONIA	-----	2027.03.25	2022.03.25
5	VULB 9163 Ultra log test antenna	schwarzbeck	727	2025.05.28	2023.05.28
6	HF 907 Double-Ridged Waveguide Horn Antenna	R&S	100512	2025.07.20	2023.07.20
7	SAS-574 Horn Antenna	schwarzbeck	535	2025.05.12	2023.05.12
8	ENV216 AMN	R&S	101881	2025.06.21	2024.06.21
9	EMC32EMI test software	R&S	V10	-----	-----

-----The End-----