

TEST REPORT

Report No.: SRTC2021-9003(F)-0072
Product Name: Mobile phone
Applicant: Hisense International Co., Ltd.
Manufacturer: Hisense Communications Co., Ltd.
Specification: FCC Part15B (Certification)
(2021 edition)
ANSI C63.4-2014
FCC ID: 2ADOBHLTE240E

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

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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: Hisense International Co., Ltd.
Address: Floor 22, Hisense Tower, 17 Donghai Xi Road, Qingdao, 266071, China
City: Qingdao
Country or Region: China
Contacted person: Geng Ruifeng
Tel: +86-532-80877742
Email: gengruifeng@hisense.com

1.4 Manufacturer's details

Company: Hisense Communications Co., Ltd.
Address: 218 Qianwangang Road, Qingdao Economic & Technological Development Zone, Qingdao, China
City: Qingdao
Country or Region: China
Contacted person: Deng Tingting
Tel: +86- 532-55753708
Email: dengtingting@hisense.com

1.5 Application details

Date of reception of test sample: 8th December 2021

Date of test: 8th December 2021 to 20th December 2021

1.6 Reference specification

FCC Part 15B, 2021 (Certification)

1.7 Information of EUT

1.7.1 General information

Product Name of EUT	Mobile phone
Model name	HLTE240E
FCC ID	2ADOBHLTE240E
Frequency Range	GSM: GSM850 / DCS1900 WCDMA: FDD II/ FDD IV / FDD V LTE: FDD 2/ FDD 4/ FDD 5/FDD 7/ FDD 12/ FDD 26/ 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
Power Supply	Charger/Battery
Nominal Voltage	3.8V
Extreme Temperature	Lowest: -30°C Highest: +50°C
Extreme Voltage	Minimum: 3.5V Maximum: 4.35V
HW Version	FS192-MB-V0.1
SW Version	Hisense_HLTE240E_S03_01_01_MX05

1.7.2 EUT details

No.	Product Name	IMEI	Note
EUT1	Mobile phone	863504060001200	The sample with Dual card
EUT2	Mobile phone	863504060000574	The sample with Single card

1.7.3 Auxiliary equipment details

AE (Auxiliary Equipment) 1#: Charger

Manufacturer	SHENZHENTIANYIN ELECTRONICS CO., LTD.
Model Number	TPA-10Q120150UU01
Input Voltage	100V-240V AC
Output Voltage	3.6-12V DC

AE (Auxiliary Equipment) 2#: Battery

Manufacturer	Shenzhen Aerospace Electronic Co., Ltd.
Model Number	LPN385510

AE (Auxiliary Equipment) 3#: USB Cable

Manufacturer	kelinDongguan Keling Electronic Technology Co., Ltd
Model Number	KS240A

AE (Auxiliary Equipment) 4#: Headset

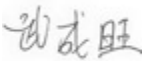
Manufacturer	kelinDongguan Keling Electronic Technology Co., Ltd
Model Number	KS232D

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

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: 2021.12.20

2.2 Test result

2.2.1 Conducted Emissions-FCC Part15.107

Ambient condition:

Temperature	Relative humidity	Pressure
22.1℃	40.3%	100.8kPa

Test Setup with charger:

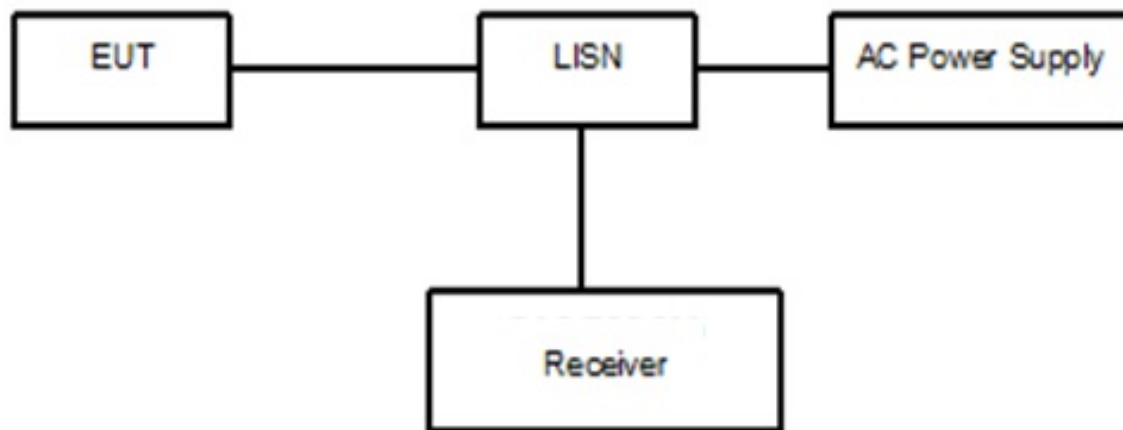


Figure 1

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.

Test Setup with laptop:

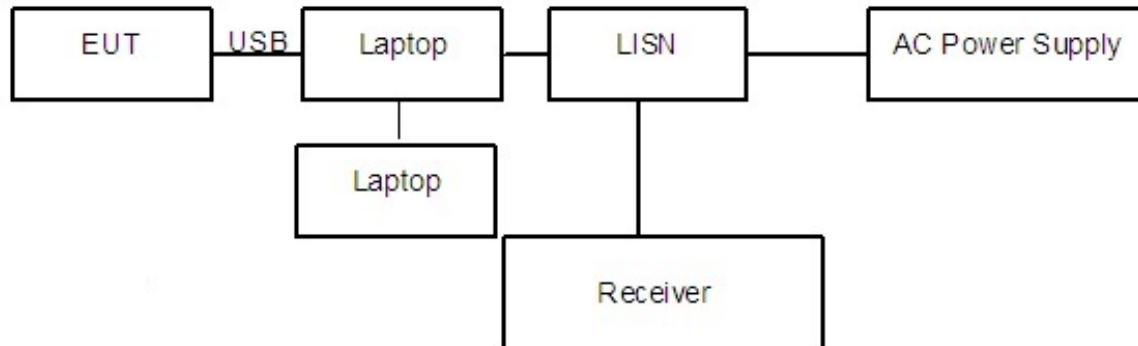


Figure 2

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 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. 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: $(34.66 \text{ dB}\mu\text{V}) = (5.06 \text{ dB}\mu\text{V}) + (29.6 \text{ dB})$, the corresponding frequency is 0.167057MHz.

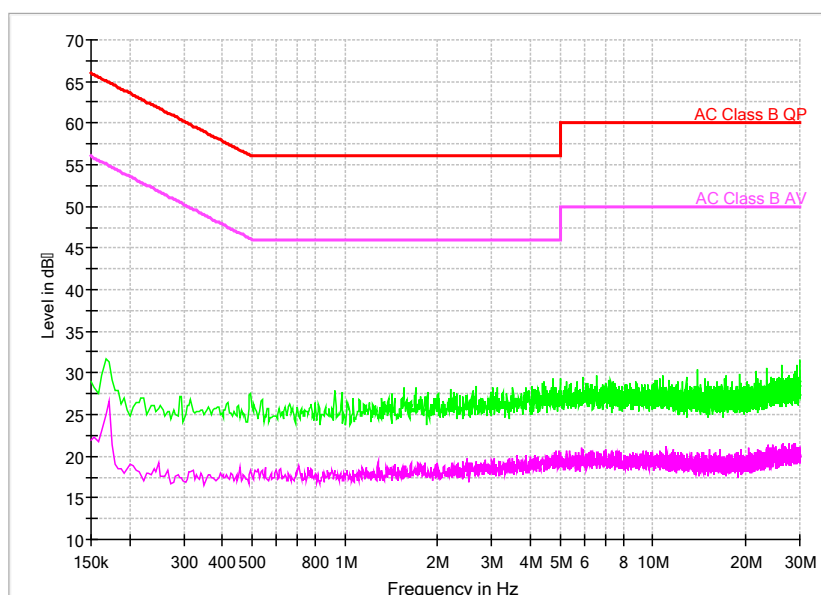
Limit:

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:

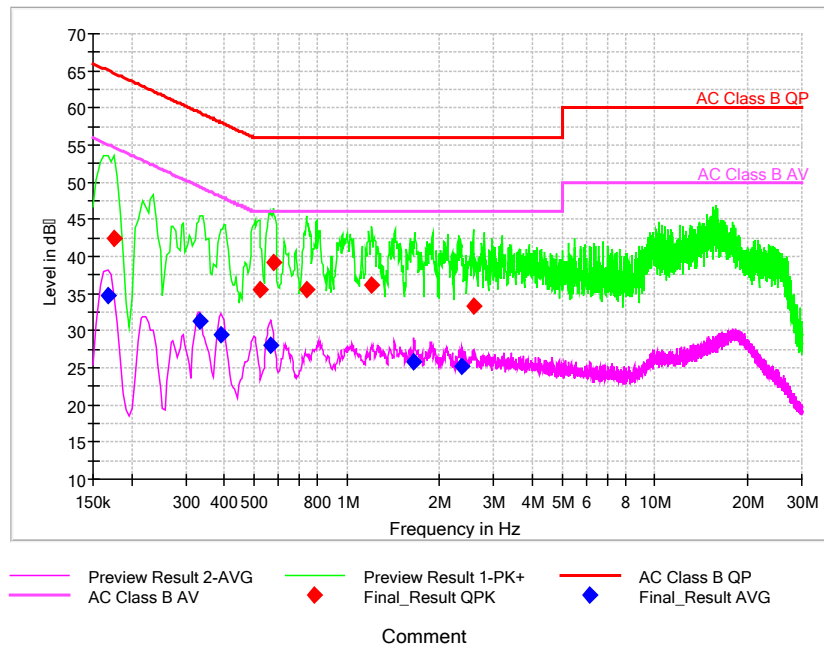
Noise Level of the Measuring Instrument



Comment

Pic1. Conducted emission L and N Line

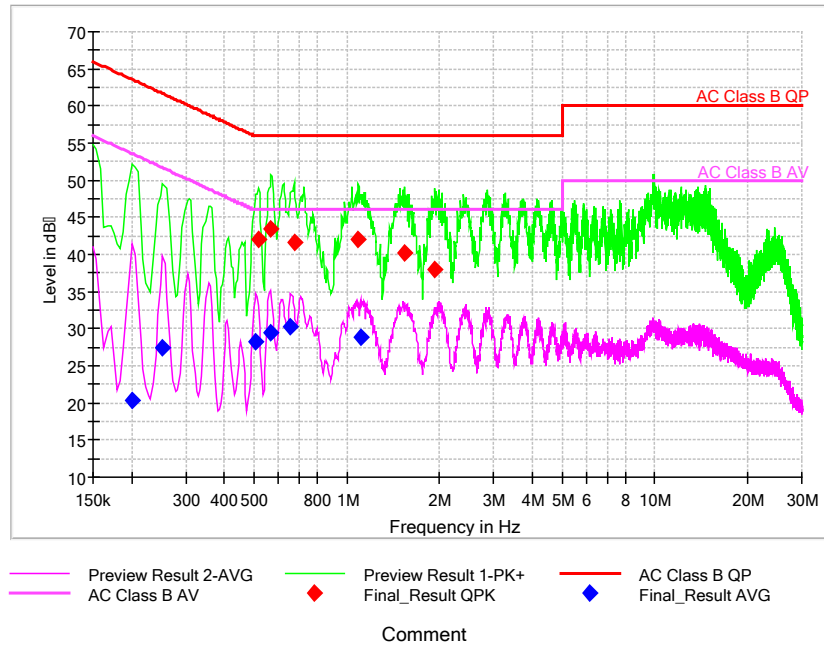
EUT1+charger:



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	---	34.66	55.11	20.44	L1	29.6	---	5.06
0.175586	42.45	---	64.69	22.24	L1	29.6	12.85	---
0.333364	---	31.26	49.37	18.11	N	29.6	---	1.66
0.388800	---	29.48	48.09	18.61	N	29.6	---	-0.12
0.520993	35.58	---	56.00	20.42	L1	29.6	5.98	---
0.567900	---	28.03	46.00	17.97	L1	29.6	---	-1.57
0.576429	39.26	---	56.00	16.74	L1	29.6	9.66	---
0.738471	35.64	---	56.00	20.36	L1	29.6	6.04	---
1.207543	36.19	---	56.00	19.81	L1	29.7	6.49	---
1.651029	---	25.80	46.00	20.20	L1	29.7	---	-3.9
2.371693	---	25.23	46.00	20.77	L1	29.7	---	-4.47
2.576379	33.29	---	56.00	22.71	L1	29.7	3.59	---

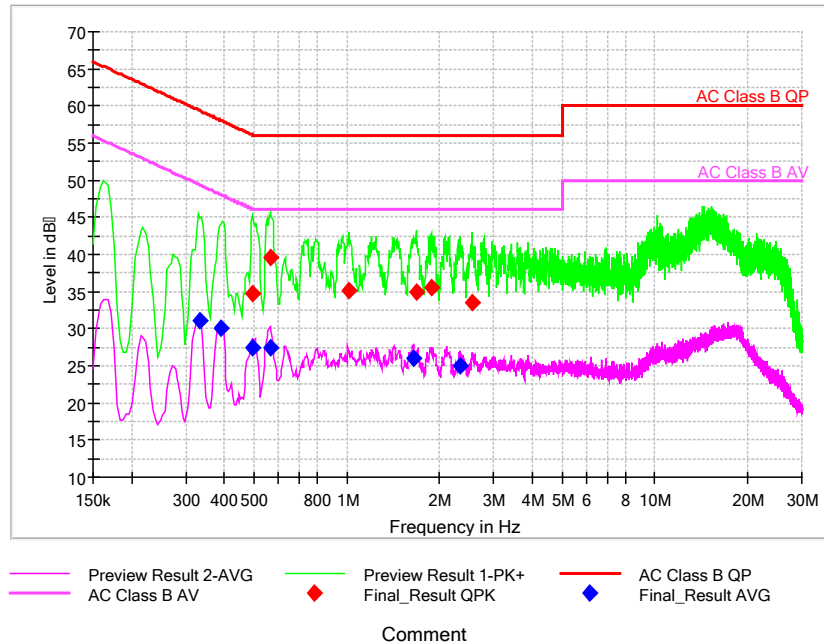
EUT1+charger:



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)
0.201171	---	20.36	53.56	33.20	L1	29.6	---	-9.24
0.252343	---	27.34	51.68	24.34	N	29.6	---	-2.26
0.508200	---	28.30	46.00	17.70	N	29.6	---	-1.3
0.516729	42.07	---	56.00	13.93	L1	29.6	12.47	---
0.567900	---	29.41	46.00	16.59	L1	29.6	---	-0.19
0.567900	43.36	---	56.00	12.64	L1	29.6	13.76	---
0.657450	---	30.29	46.00	15.71	L1	29.6	---	0.69
0.674507	41.61	---	56.00	14.39	L1	29.6	12.01	---
1.088143	41.96	---	56.00	14.04	L1	29.7	12.26	---
1.105200	---	28.93	46.00	17.07	L1	29.7	---	-0.77
1.535893	40.29	---	56.00	15.71	L1	29.7	10.59	---
1.932471	38.07	---	56.00	17.93	L1	29.7	8.37	---

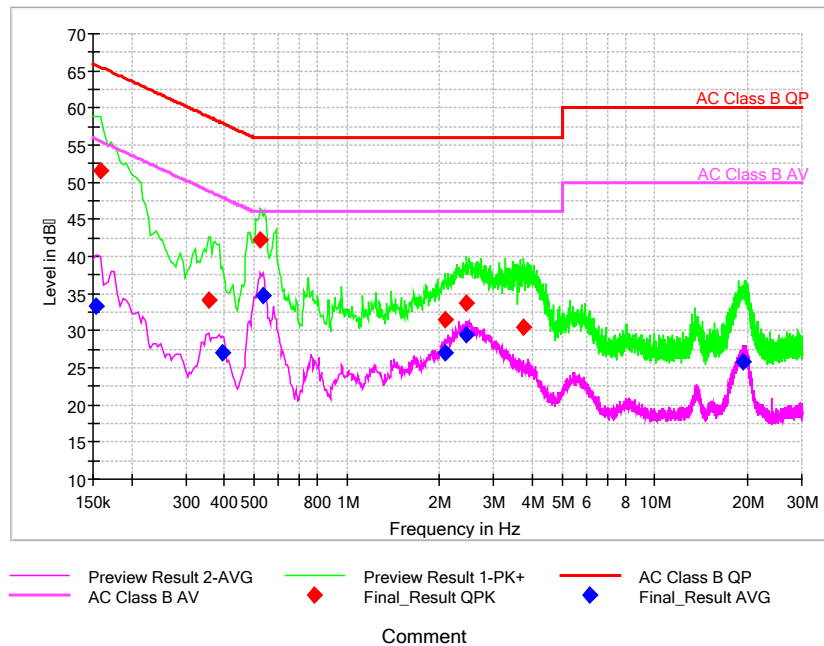
EUT2+charger:



Pic4. 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)
0.333364	---	31.00	49.37	18.37	L1	29.6	---	1.4
0.388800	---	30.02	48.09	18.07	N	29.6	---	0.42
0.495407	---	27.46	46.08	18.62	N	29.6	---	-2.14
0.495407	34.75	---	56.08	21.33	L1	29.6	5.15	---
0.563636	---	27.51	46.00	18.49	L1	29.6	---	-2.09
0.563636	39.57	---	56.00	16.43	L1	29.6	9.97	---
1.015650	35.14	---	56.00	20.86	L1	29.7	5.44	---
1.651029	---	26.03	46.00	19.97	L1	29.7	---	-3.67
1.676614	34.90	---	56.00	21.10	L1	29.7	5.2	---
1.877036	35.54	---	56.00	20.46	L1	29.7	5.84	---
2.329050	---	25.05	46.00	20.95	L1	29.7	---	-4.65
2.559321	33.46	---	56.00	22.54	L1	29.7	3.76	---

EUT1+Laptop:



Pic5. Conducted emission L&N Line

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	Pmea Quasi Peak (dBμV)	Pmea Average (dBμV)
0.154264	---	33.35	55.77	22.42	L1	29.6	---	3.75
0.158529	51.57	---	65.54	13.97	L1	29.6	21.97	---
0.354686	34.22	---	58.85	24.63	L1	29.6	4.62	---
0.393064	---	26.97	48.00	21.03	L1	29.6	---	-2.63
0.525257	42.15	---	56.00	13.85	L1	29.6	12.55	---
0.533786	---	34.81	46.00	11.19	N	29.6	---	5.21
2.090250	---	27.12	46.00	18.88	N	29.7	---	-2.58
2.090250	31.51	---	56.00	24.49	L1	29.7	1.81	---
2.448450	---	29.47	46.00	16.53	L1	29.7	---	-0.23
2.452714	33.66	---	56.00	22.34	L1	29.7	3.96	---
3.757586	30.42	---	56.00	25.58	L1	29.7	0.72	---
19.288114	---	25.85	50.00	24.15	L1	29.8	---	-3.95

2.2.2 Radiated Emissions-FCC Part15.109

Ambient condition:

Temperature	Relative humidity	Pressure
22.3°C	40.2%	100.8kPa

Test Setup:

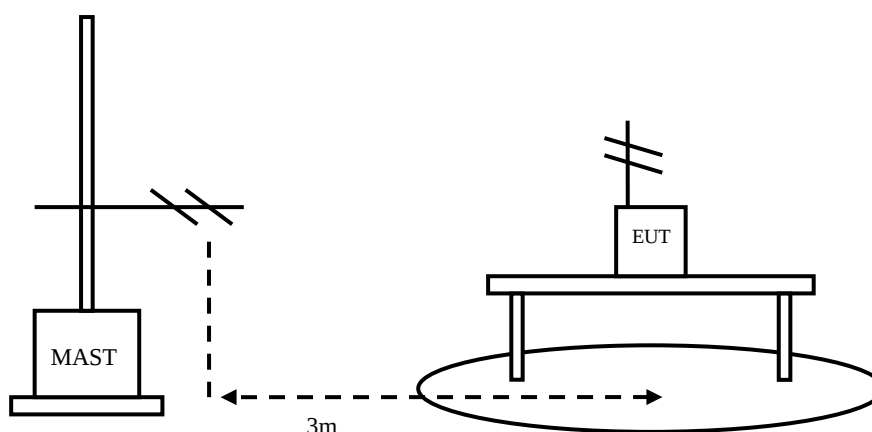


Figure 3

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 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: $f > 1\text{GHz}$

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.

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: $(17.27 \text{ dB}\mu\text{V/m}) = (38.47 \text{ dB}\mu\text{V}) + (-21.2 \text{ dB/m})$, the corresponding frequency is 30.097000MHz.

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:

EUT1+charger:

Frequency(MHz)	Result(dBuV/m)	A _{Rpl} (dB/m)	P _{mea} (dBuV)	Polarity
30.097000	17.27	-21.2	38.47	V
58.663500	16.95	-18.7	35.65	V
85.581000	15.72	-22.7	38.42	V
310.718000	21.44	-15.8	37.24	V
318.090000	23.18	-15.5	38.68	V
930.160000	19.09	-2.9	21.99	V

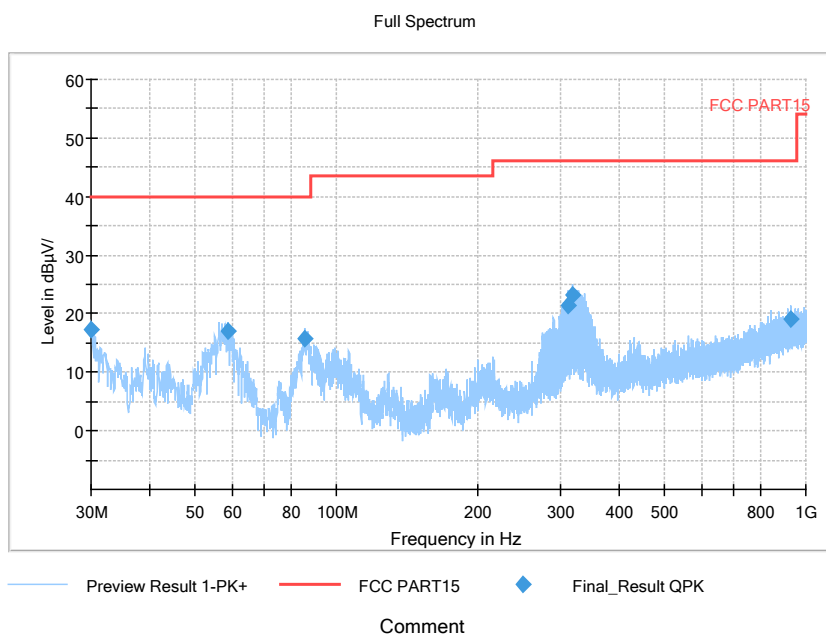
EUT2+charger:

Frequency(MHz)	Result(dBuV/m)	A _{Rpl} (dB/m)	P _{mea} (dBuV)	Polarity
30.242500	16.72	-21.2	37.92	V
58.566500	18.37	-18.6	36.97	V
85.435500	15.34	-22.7	38.04	V
310.718000	21.14	-15.8	36.94	V
321.048500	23.57	-15.4	38.97	V
935.592000	19.09	-2.8	21.89	V

EUT1+Laptop:

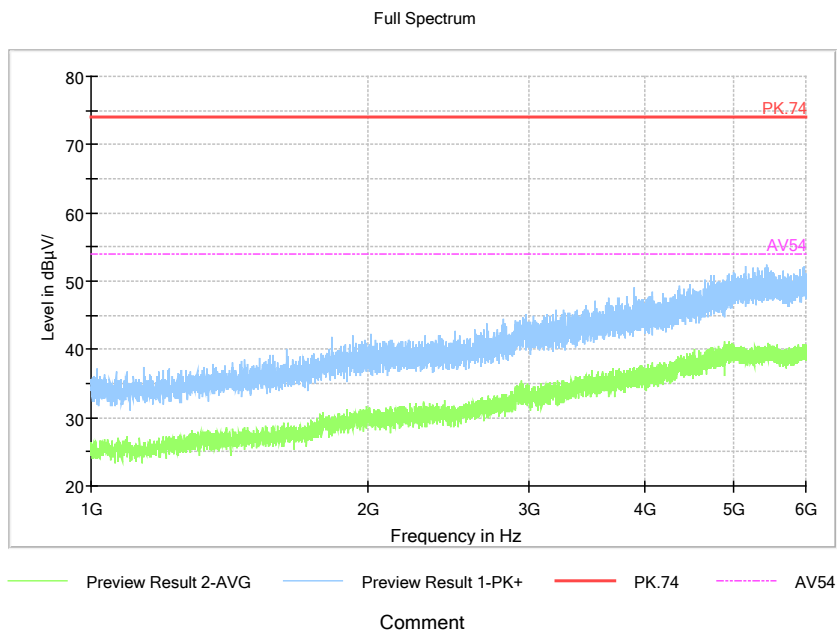
Frequency(MHz)	Result(dBuV/m)	A _{Rpl} (dB/m)	P _{mea} (dBuV)	Polarity
119.987000	30.23	-20.7	50.93	V
168.002000	31.14	-20.8	51.94	V
551.985000	32.71	-7.9	40.61	V
695.982500	29.74	-5.4	35.14	V
743.997500	30.12	-4.5	34.62	V
792.012500	28.94	-3.6	32.54	V

EUT1+charger: refer to Pic6 to Pic9



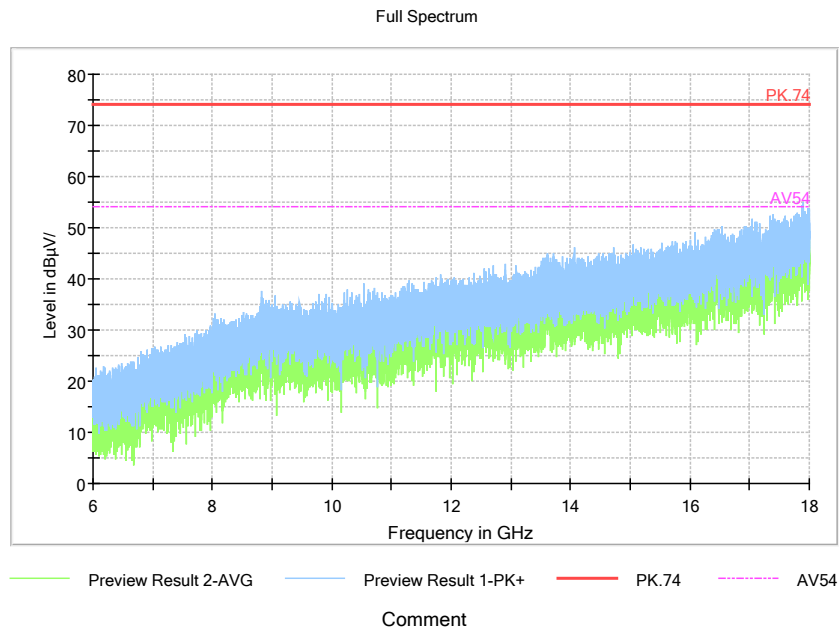
Pic6. Radiated emission (30MHz – 1GHz)

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



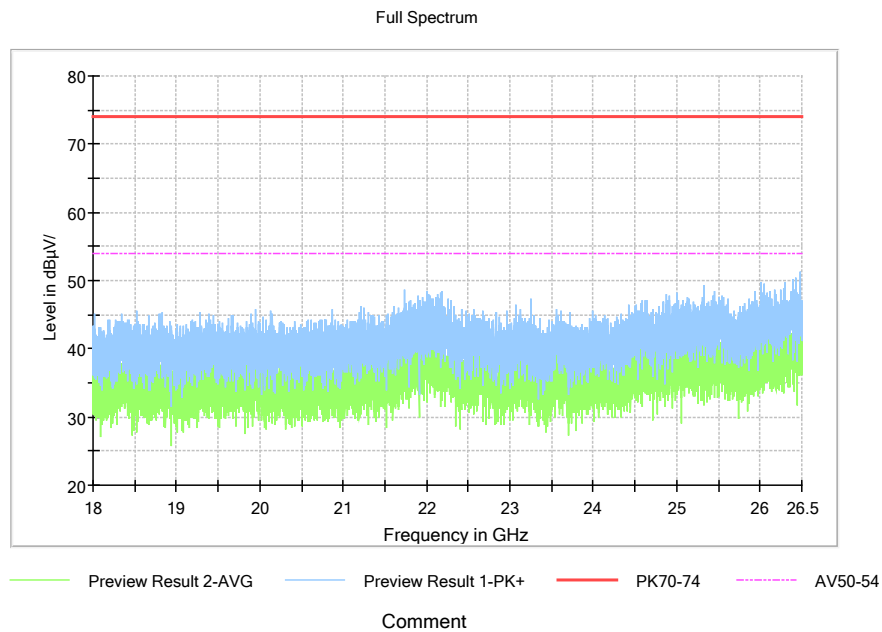
Pic7. Radiated emission (1GHz –6GHz)

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



Pic8. Radiated emission (6GHz –18GHz)

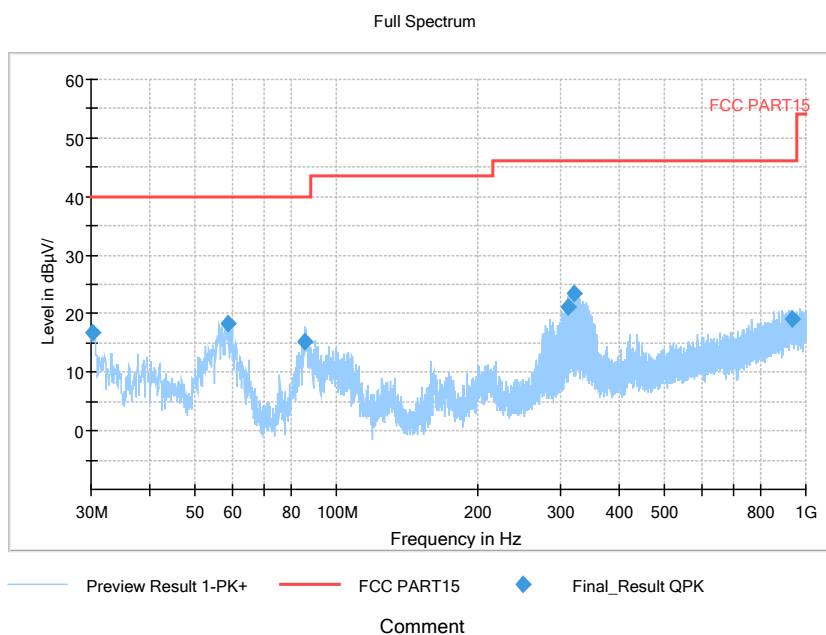
Note: The test data in the graph includes two polarizations: horizontal and vertical



Pic9. Radiated emission (18GHz –26GHz)

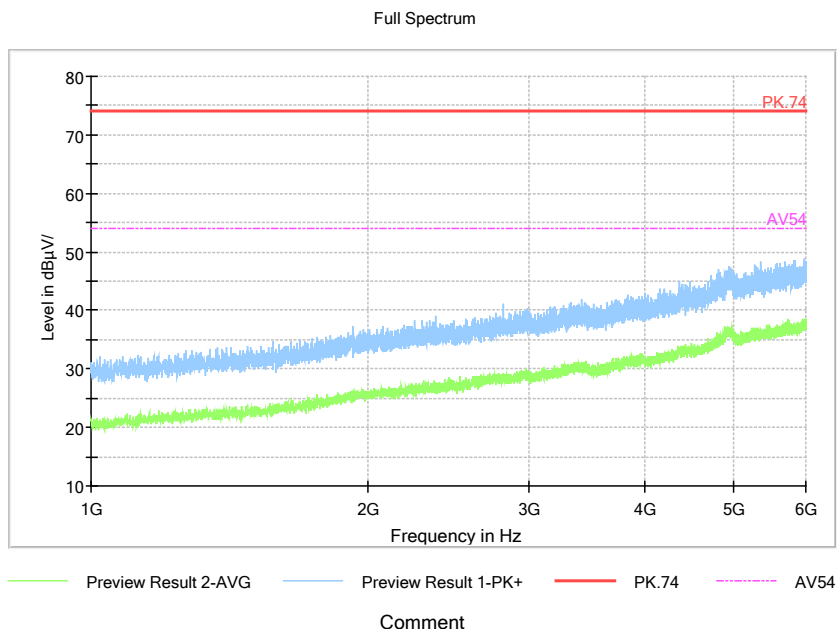
Note: The test data in the graph includes two polarizations: horizontal and vertical

EUT2+charger: refer to Pic10 to Pic13



Pic10. Radiated emission (30MHz – 1GHz)

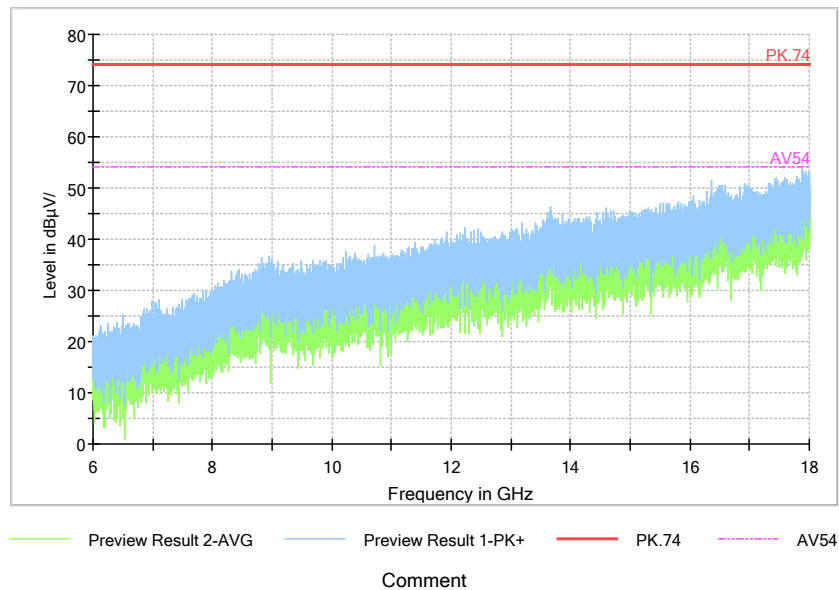
Note: The test data in the graph includes two polarizations: horizontal and vertical



Pic11. Radiated emission (1GHz –6GHz)

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

Full Spectrum

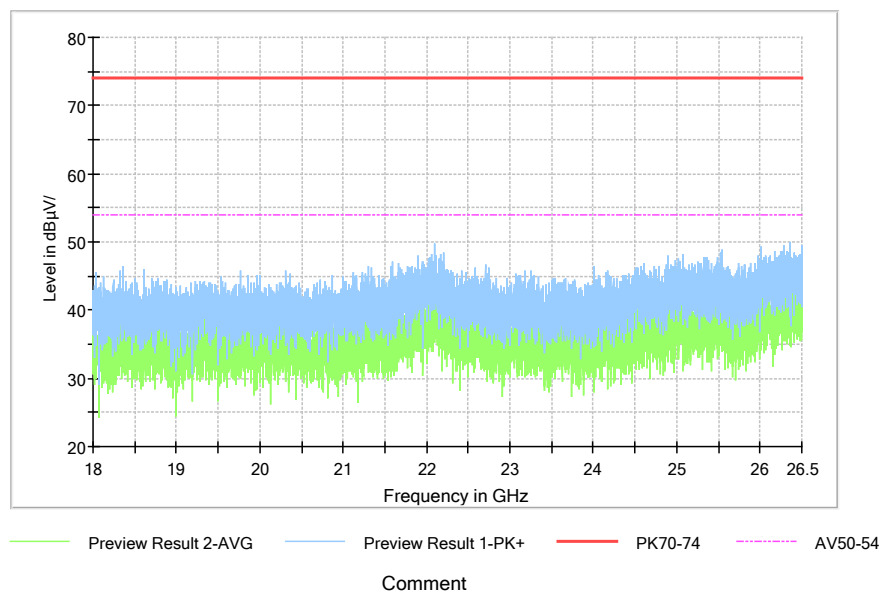


Comment

Pic12. Radiated emission (6GHz –18GHz)

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

Full Spectrum

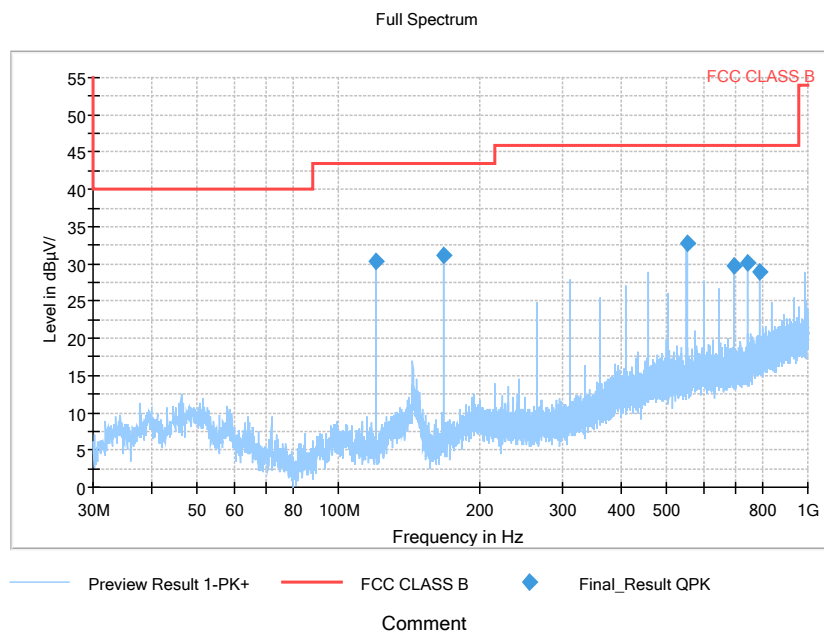


Comment

Pic13. Radiated emission (18GHz –26GHz)

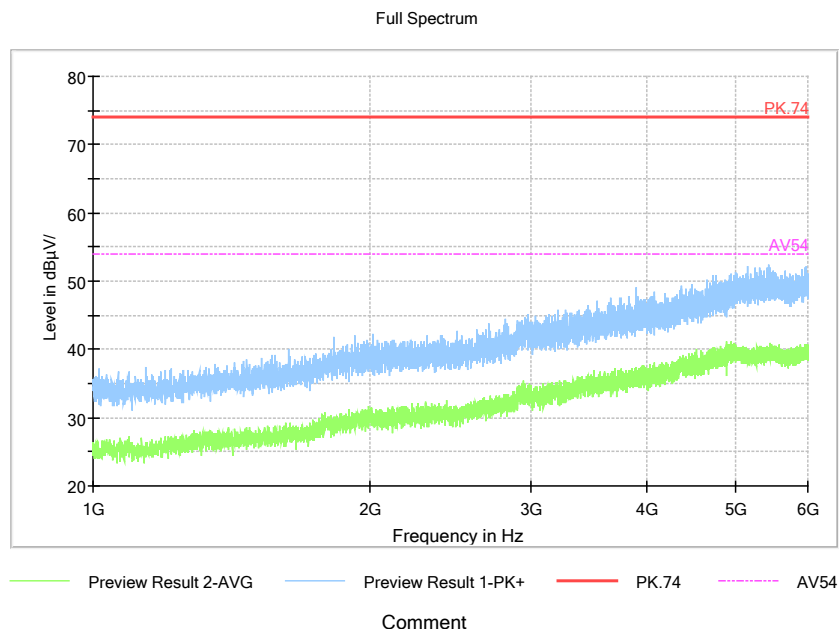
Note: The test data in the graph includes two polarizations: horizontal and vertical

EUT1+ Laptop: refer to Pic14 to Pic17



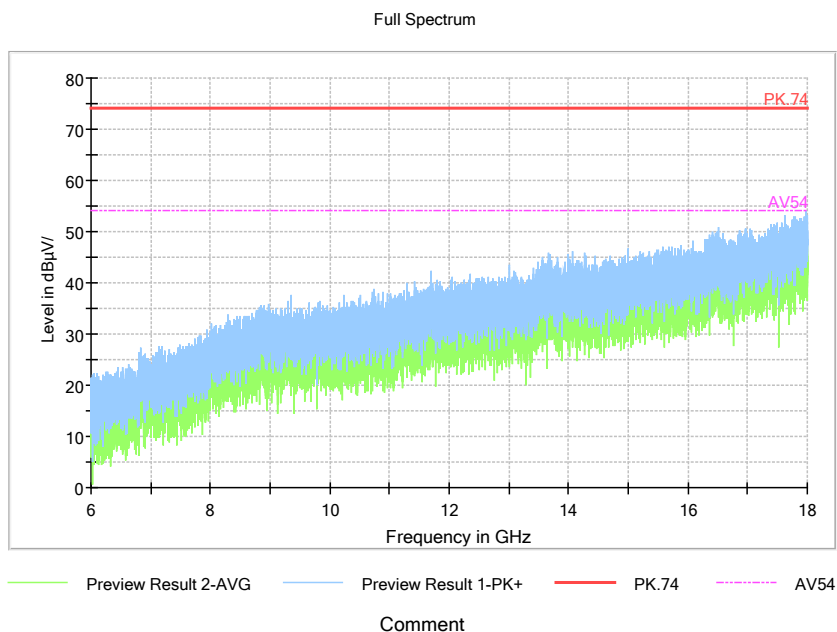
Pic14. Radiated emission (30MHz – 1GHz)

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



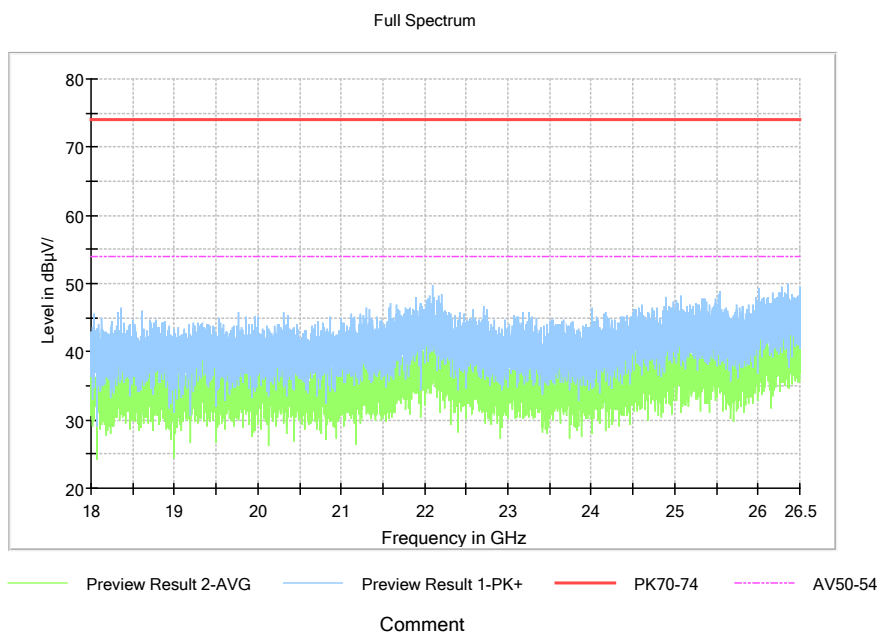
Pic15. Radiated emission (1GHz –6GHz)

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



Pic16. Radiated emission (6GHz –18GHz)

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



Pic17. Radiated emission (18GHz –26GHz)

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	-----	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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