

TEST REPORT

Report No.: SRTC2021-9003(F)-0077
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: 2ADOBHLTE236E

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 27th 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	HLTE236E
FCC ID	2ADOBHLTE236E
Frequency Range	GSM: GSM850 / DCS1900 WCDMA: FDD II/ FDD IV / FDD V LTE: FDD 2/ FDD 4/FDD 7/FDD 12/ FDD 26 Bluetooth: 2.4~2.4835GHz WiFi: 2.4~2.4835GHz
Power Supply	Charger/Battery
Nominal Voltage	3.8V
Extreme Temperature	Lowest: -30°C Highest: +50°C
Extreme Voltage	Minimum: 3.45V Maximum: 4.35V
HW Version	A563-MB-V1.0
SW Version	Hisense_HLTE236E_S03_01_01_MX05

1.7.2 EUT details

No.	Product Name	IMEI	Note
EUT1	Mobile phone	866971060001760	
EUT2	Mobile phone	866971060000424	

Note1: As the applicant of this model, [Hisense International Co., Ltd.] declares that the product has two suppliers of camera.

Main Supply : EUT1

Part Name	Model	Supplier(Brand)	Description
Camera	8M HI-846,XA-0861,4P, BTB	No. 327,DeShan Road , ChangDe Economic-Technological Development Zone, ChangDe City,HuNan, China.	Front CAM
Camera	5M GC5035,CSP, PC5401-65HD-60 3P+IR	LUZHOU Chengxiangtong technology CO.,LTD	rear CAM
Camera	2M GC02M1,CSP, TR559-H41 3P+IR, OK-23GM024-04,BTB	UZHOU Chengxiangtong technology CO.,LTD	Macro Cam

Secondary Supply: EUT2

Part Name	Model Name	supplier	Remark
Camera	8M GC08A3,COM, PC8403B-65HD-B 4P+IR, OK-23GM024-04,BTB	UZHOU Chengxiangtong technology CO.,LTD	Front CAM
Camera	5M GC5035-MCRC0, CSP,HX-M0578A-H326,OK -10GM024-04,BTB	Zone B, Blue Innovation Valley, Nanhai New Area, Weihai City, Shandong Province	rear CAM
Camera	2M GC02M1-C24YA,CSP,HX-M0235H-H411,OK-10GM024-04,BTB	Zone B, Blue Innovation Valley, Nanhai New Area, Weihai City, Shandong Province	Macro Cam

1.7.3 Auxiliary equipment details

AE (Auxiliary Equipment) 1#: Charger

Manufacturer	SHENZHENTIANYIN ELECTRONICS CO., LTD.
Model Number	TPA-46050200VU
Input Voltage	100V-240V AC
Output Voltage	5V 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	KS230A

AE (Auxiliary Equipment) 4#: Headset

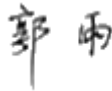
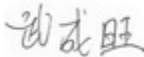
Manufacturer	kelinDongguan Keling Electronic Technology Co., Ltd
Model Number	KS232A

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: 2021.12.27

2.2 Test result

2.2.1 Conducted Emissions-FCC Part15.107

Ambient condition:

Temperature	Relative humidity	Pressure
20.5°C	40.6%	100.8kPa

Test Setup with charger:

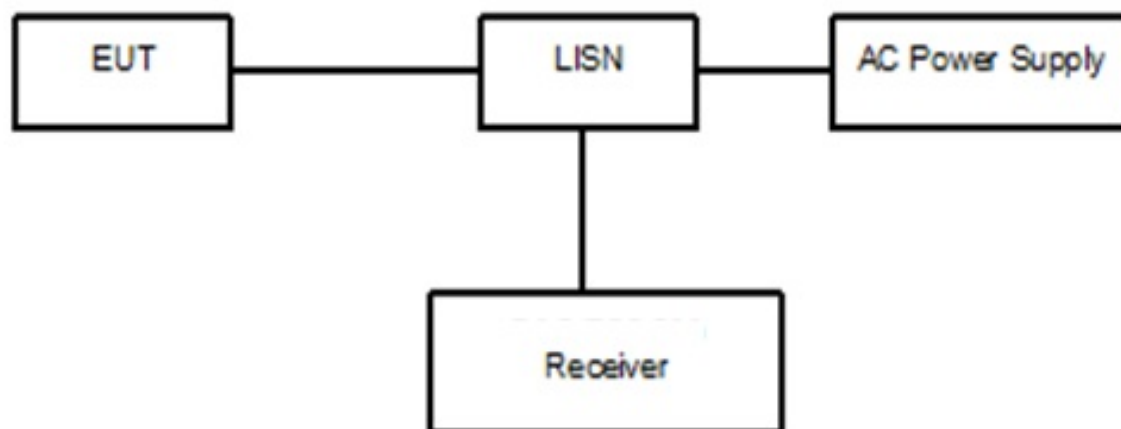


Figure 1

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:

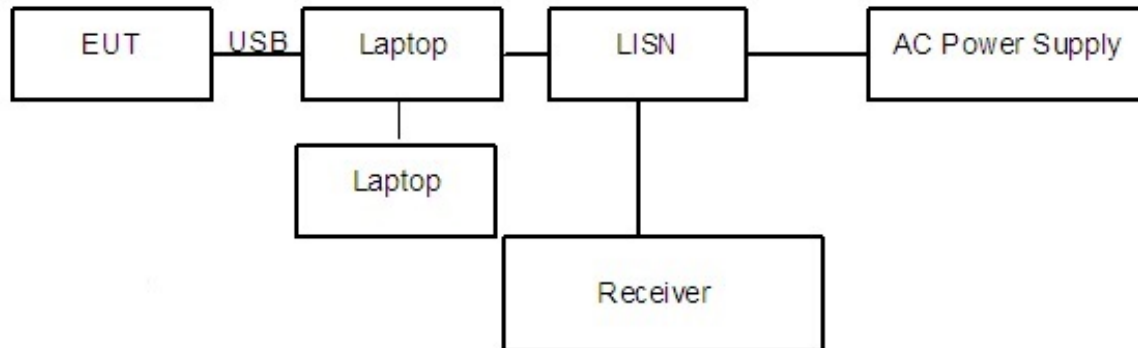


Figure 2

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: $(34.64 \text{ dB}\mu\text{V}) = (5.04 \text{ dB}\mu\text{V}) + (29.6 \text{ dB})$, the corresponding frequency is 0.154264MHz.

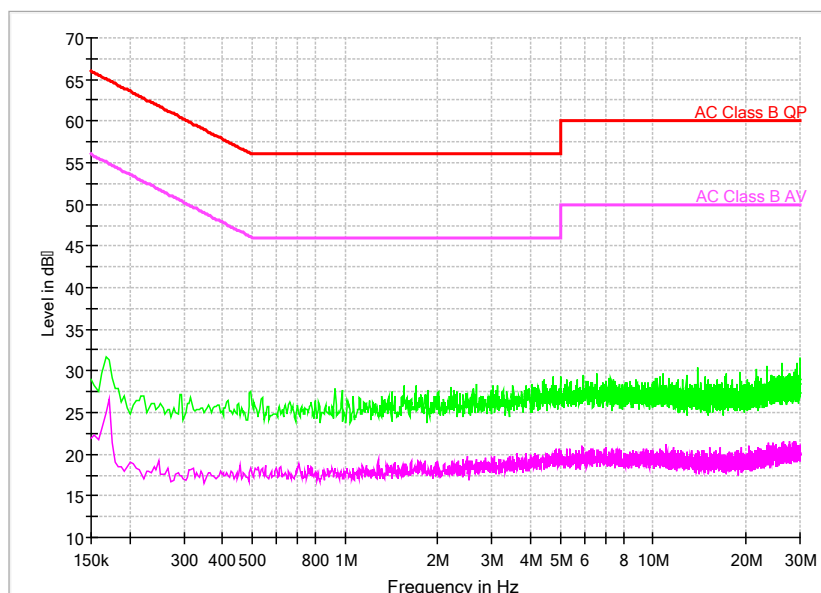
Limit:

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:

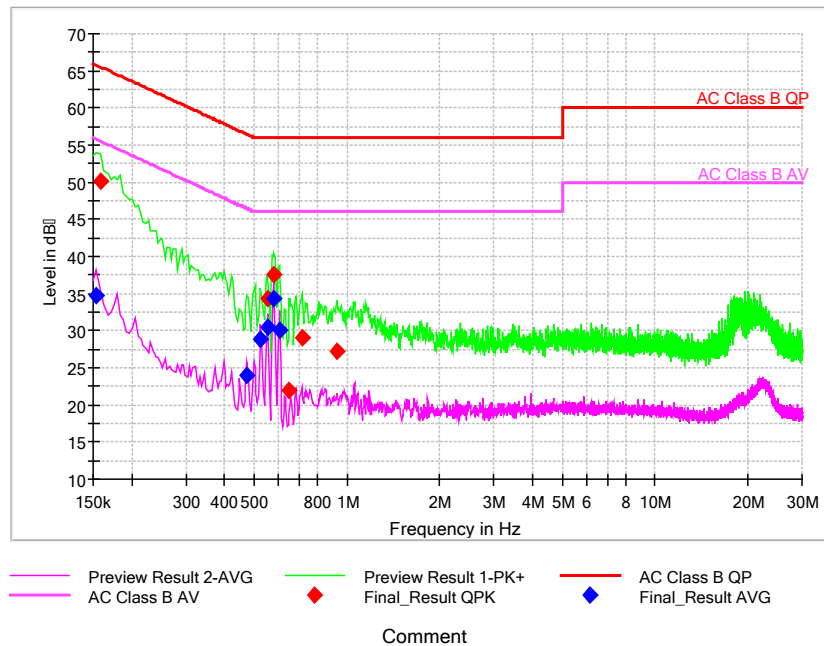
Noise Level of the Measuring Instrument



Comment

Pic1. Conducted emission L and N Line

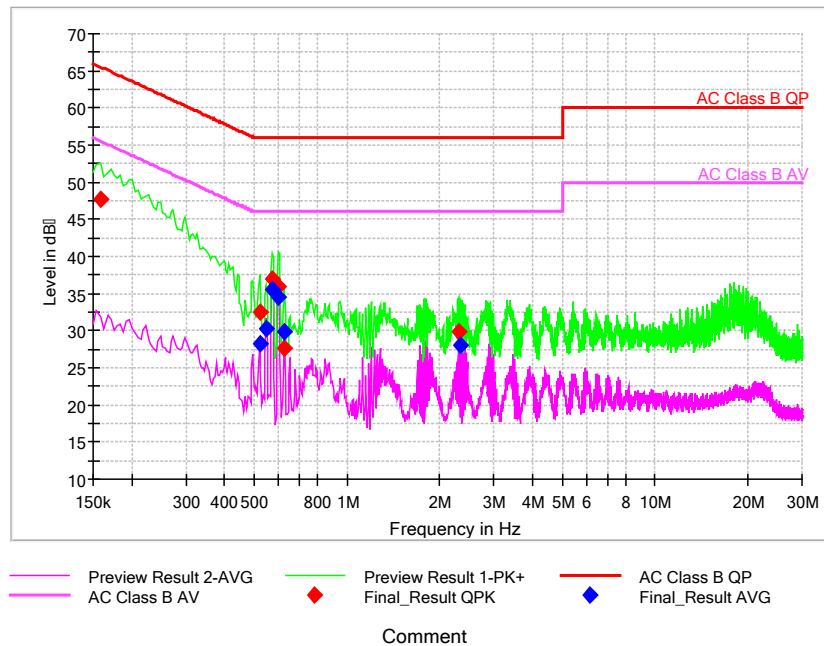
EUT1+charger:



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)
0.154264	---	34.64	55.77	21.13	L1	29.6	---	5.04
0.158529	50.12	---	65.54	15.42	L1	29.6	20.52	---
0.474086	---	24.07	46.44	22.37	L1	29.6	---	-5.53
0.525257	---	28.77	46.00	17.23	L1	29.6	---	-0.83
0.550843	---	30.39	46.00	15.61	L1	29.6	---	0.79
0.550843	34.39	---	56.00	21.61	L1	29.6	4.79	---
0.576429	---	34.42	46.00	11.58	L1	29.6	---	4.82
0.580693	37.51	---	56.00	18.49	L1	29.6	7.91	---
0.602014	---	30.10	46.00	15.90	N	29.6	---	0.5
0.648921	21.88	---	56.00	34.12	L1	29.6	-7.72	---
0.712886	28.97	---	56.00	27.03	L1	29.6	-0.63	---
0.926100	27.23	---	56.00	28.77	L1	29.7	-2.47	---

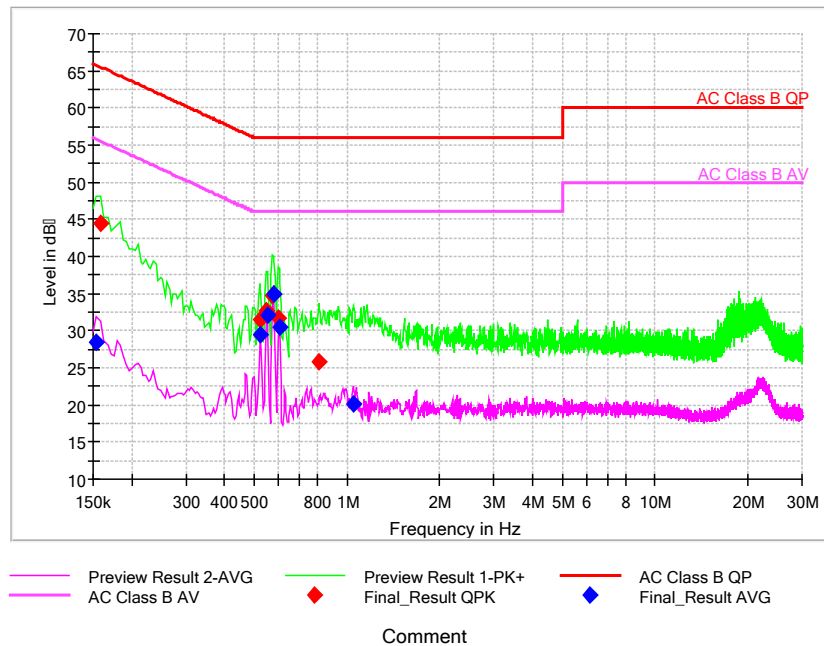
EUT1+charger:



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)
0.158529	47.77	---	65.54	17.77	L1	29.6	18.17	---
0.520993	---	28.18	46.00	17.82	L1	29.6	---	-1.42
0.520993	32.53	---	56.00	23.47	L1	29.6	2.93	---
0.546579	---	30.24	46.00	15.76	L1	29.6	---	0.64
0.572164	---	35.54	46.00	10.46	L1	29.6	---	5.94
0.572164	36.97	---	56.00	19.03	L1	29.6	7.37	---
0.597750	35.92	---	56.00	20.08	L1	29.6	6.32	---
0.597750	---	34.47	46.00	11.53	L1	29.6	---	4.87
0.623336	27.70	---	56.00	28.30	L1	29.6	-1.9	---
0.627600	---	29.96	46.00	16.04	N	29.6	---	0.36
2.299200	29.89	---	56.00	26.11	L1	29.7	0.19	---
2.324786	---	28.05	46.00	17.95	N	29.7	---	-1.65

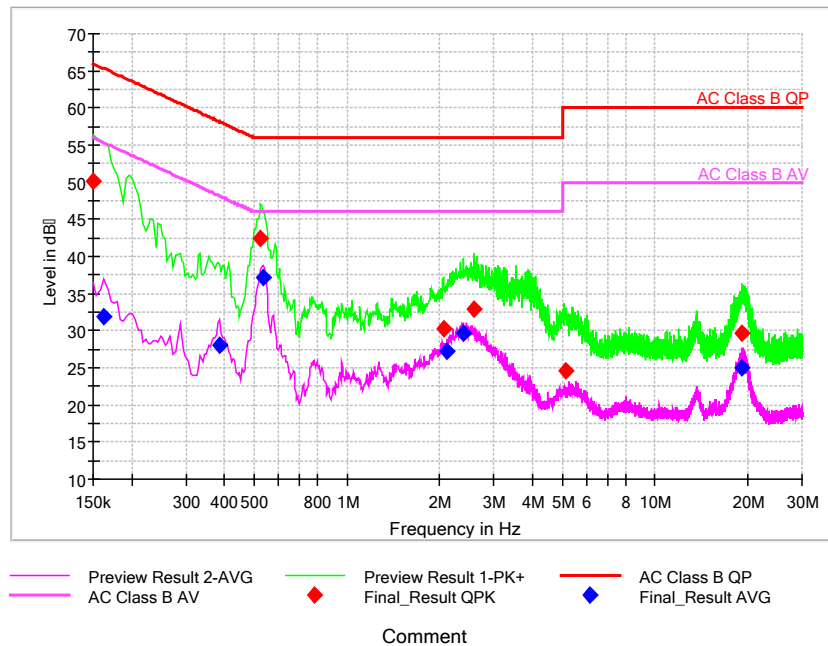
EUT2+charger:



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)
0.154264	---	28.51	55.77	27.26	L1	29.6	---	-1.09
0.158529	44.53	---	65.54	21.01	L1	29.6	14.93	---
0.520993	31.39	---	56.00	24.61	L1	29.6	1.79	---
0.525257	---	29.42	46.00	16.58	L1	29.6	---	-0.18
0.546579	32.67	---	56.00	23.33	L1	29.6	3.07	---
0.550843	---	32.10	46.00	13.90	L1	29.6	---	2.5
0.572164	34.72	---	56.00	21.28	L1	29.6	5.12	---
0.576429	---	35.00	46.00	11.00	L1	29.6	---	5.4
0.597750	31.66	---	56.00	24.34	L1	29.6	2.06	---
0.602014	---	30.56	46.00	15.44	N	29.6	---	0.96
0.810964	25.80	---	56.00	30.20	L1	29.6	-3.8	---
1.045500	---	20.22	46.00	25.78	N	29.7	---	-9.48

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)
0.150000	50.04	---	66.00	15.96	L1	29.6	20.44	---
0.162793	---	31.92	55.32	23.40	L1	29.6	---	2.32
0.384536	---	28.08	48.18	20.10	L1	29.6	---	-1.52
0.525257	42.36	---	56.00	13.64	L1	29.6	12.76	---
0.533786	---	37.25	46.00	8.75	L1	29.6	---	7.65
2.051871	30.30	---	56.00	25.70	L1	29.7	0.6	---
2.107307	---	27.31	46.00	18.69	N	29.7	---	-2.39
2.384486	---	29.60	46.00	16.40	N	29.7	---	-0.1
2.580643	32.89	---	56.00	23.11	L1	29.7	3.19	---
5.152007	24.57	---	60.00	35.43	L1	29.7	-5.13	---
19.160186	29.60	---	60.00	30.40	L1	29.8	-0.2	---
19.236943	---	25.08	50.00	24.92	L1	29.8	---	-4.72

2.2.2 Radiated Emissions-FCC Part15.109

Ambient condition:

Temperature	Relative humidity	Pressure
20.1°C	40.3%	100.8kPa

Test Setup:

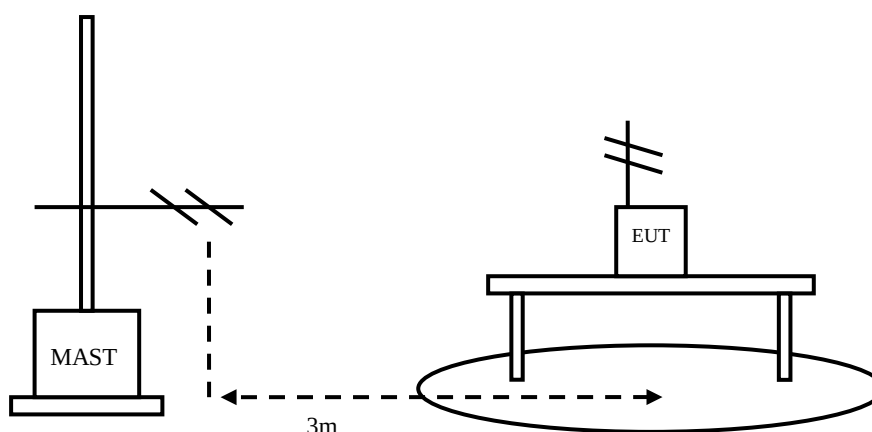


Figure 3

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: $(23.22 \text{ dB}\mu\text{V/m}) = (42.62 \text{ dB}\mu\text{V}) + (-19.4 \text{ dB/m})$, the corresponding frequency is 36.887000MHz.

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
36.887000	23.22	-19.4	42.62	V
60.943000	26.55	-19.2	45.75	V
104.738500	25.23	-19.4	44.63	V
181.126000	16.06	-20.9	36.96	V
428.233500	10.75	-12.5	23.25	V
939.860000	15.72	-2.8	18.52	V

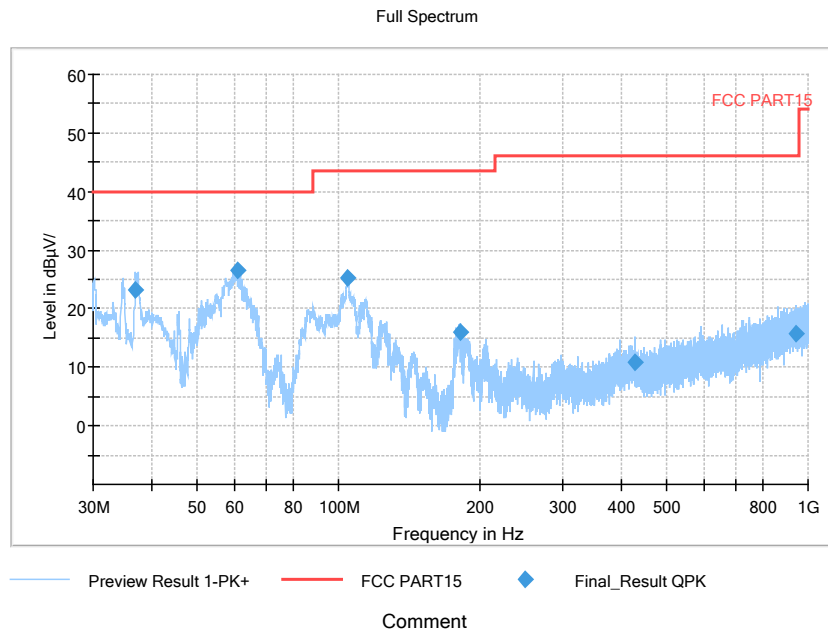
EUT2+charger:

Frequency(MHz)	Result(dBuV/m)	A _{Rpl} (dB/m)	P _{mea} (dBuV)	Polarity
33.395000	22.95	-20.4	43.35	V
61.137000	26.45	-19.2	45.65	V
104.738500	25.23	-19.4	44.63	V
179.622500	16.39	-21.1	37.49	V
550.308000	10.64	-9.7	20.34	V
934.525000	15.71	-2.8	18.51	V

EUT1+Laptop:

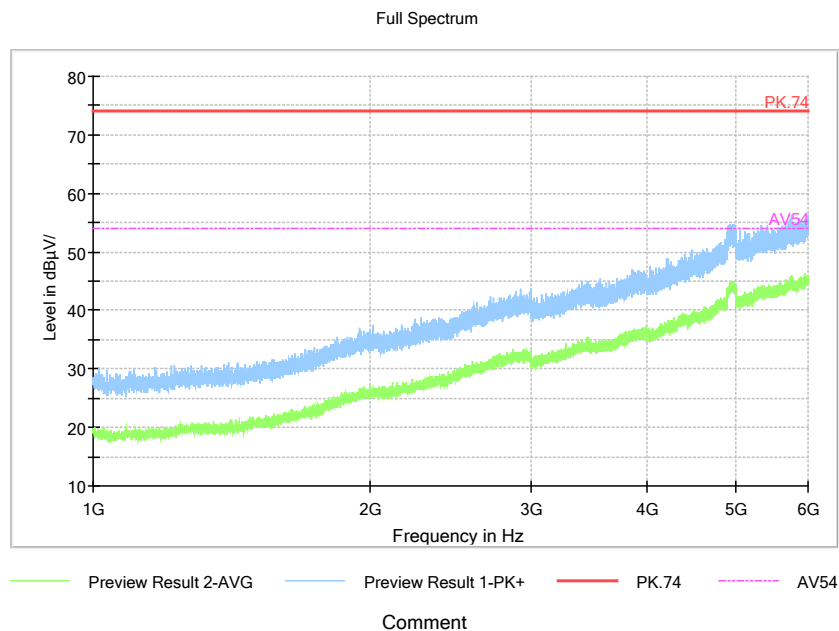
Frequency(MHz)	Result(dBuV/m)	A _{Rpl} (dB/m)	P _{mea} (dBuV)	Polarity
168.002500	24.29	-27.5	51.79	V
311.999000	19.73	-21.7	41.43	V
407.989000	23.11	-18.6	41.71	V
455.995500	21.73	-18.0	39.73	V
551.985500	22.77	-15.7	38.47	V
599.992000	22.23	-14.1	36.33	V

EUT1+charger: refer to Pic6 to Pic8



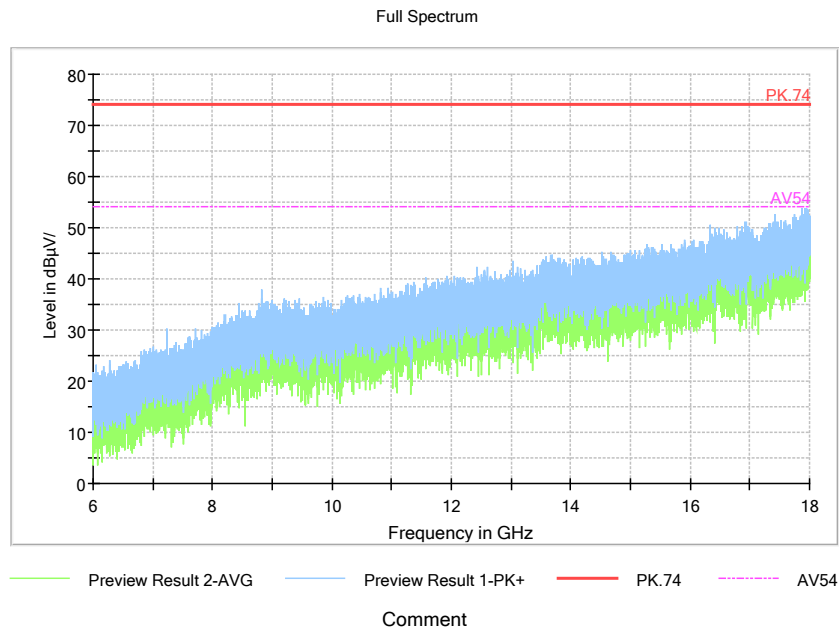
Pic6. Radiated emission (30MHz – 1GHz)

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



Pic7. Radiated emission (1GHz –6GHz)

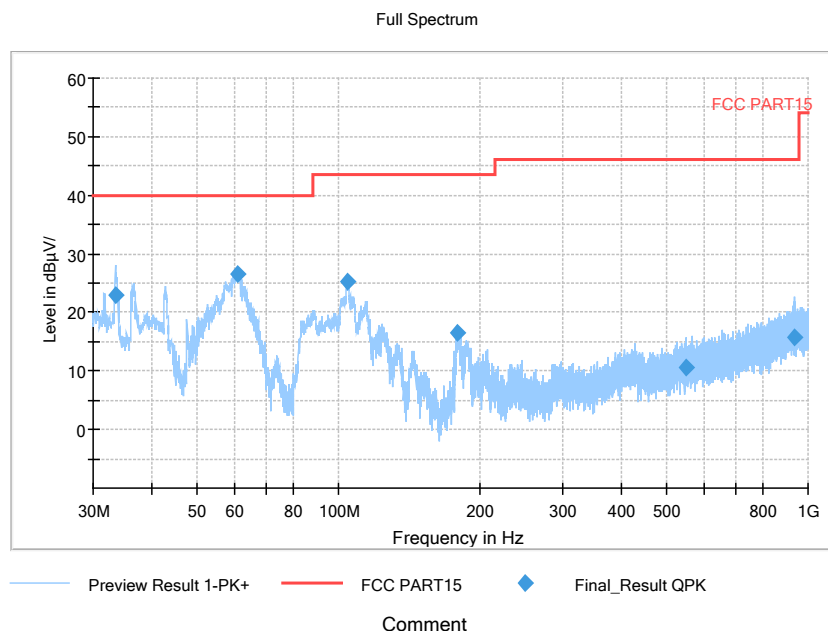
Note: The test data in the graph includes two polarizations: horizontal and vertical



Pic8. Radiated emission (6GHz –18GHz)

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

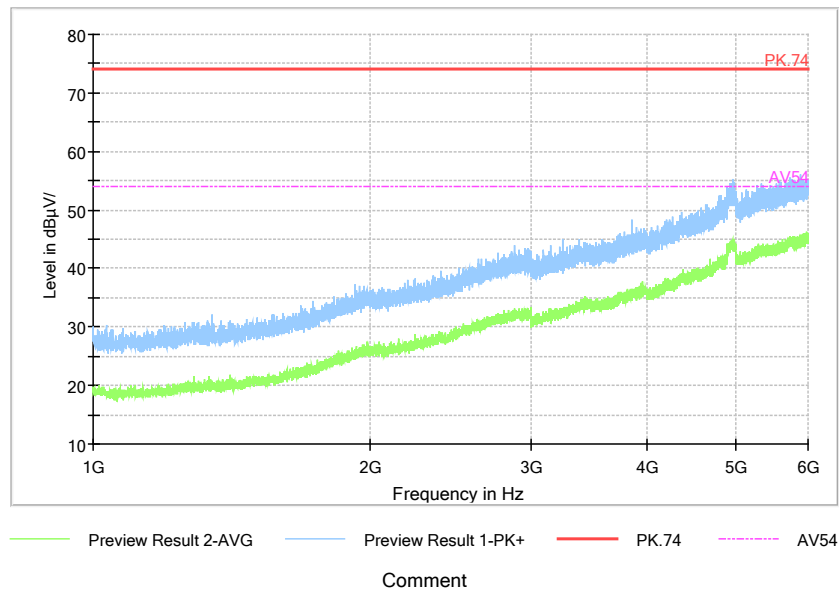
EUT2+charger: refer to Pic9 to Pic11



Pic9. Radiated emission (30MHz – 1GHz)

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

Full Spectrum

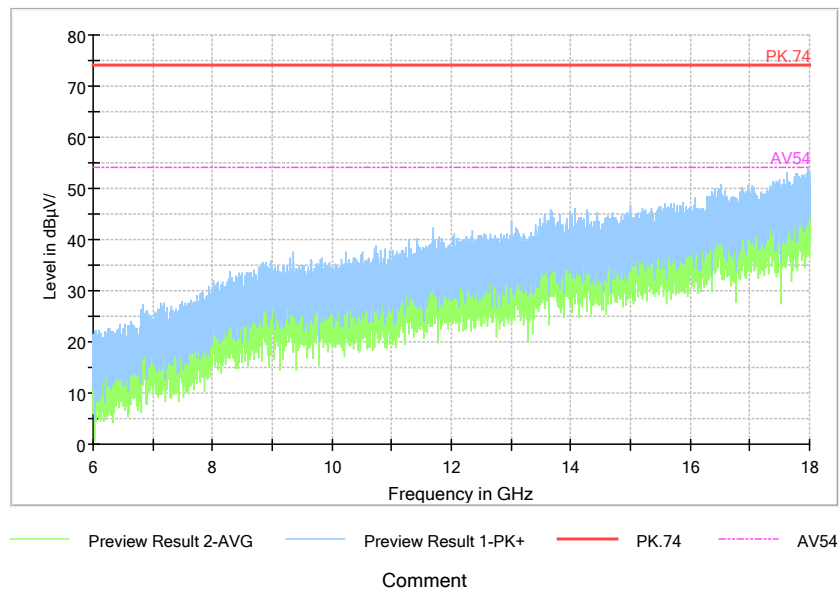


Comment

Pic10. Radiated emission (1GHz –6GHz)

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

Full Spectrum

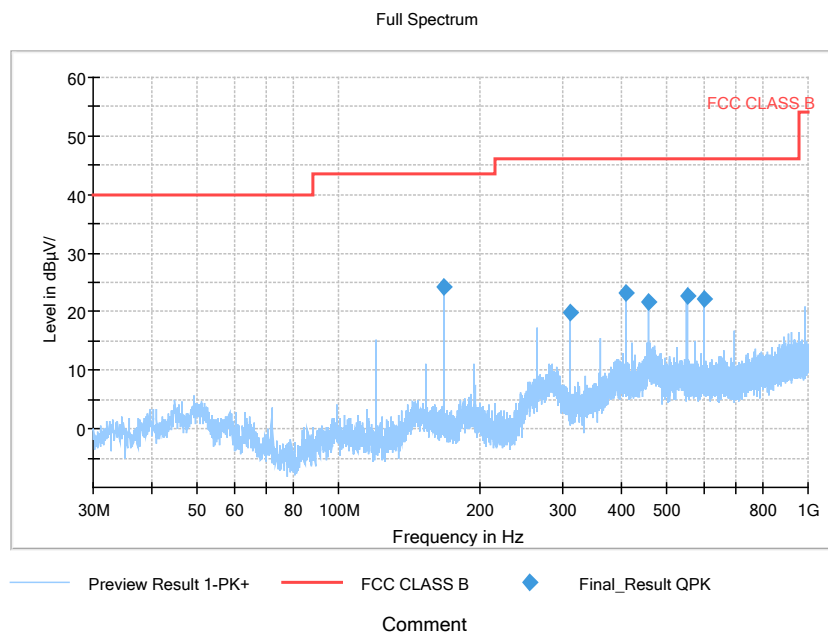


Comment

Pic11. Radiated emission (6GHz –18GHz)

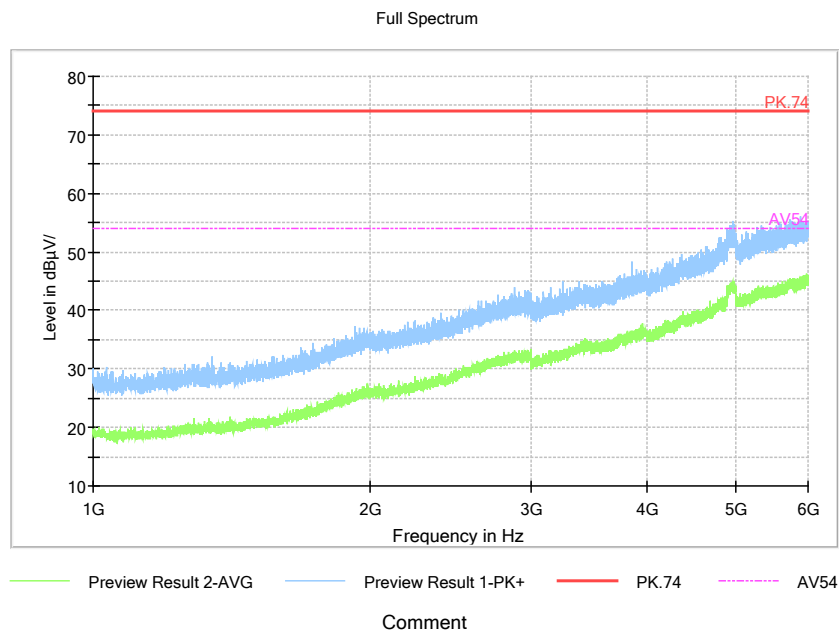
Note: The test data in the graph includes two polarizations: horizontal and vertical

EUT1+ Laptop: refer to Pic12 to Pic14



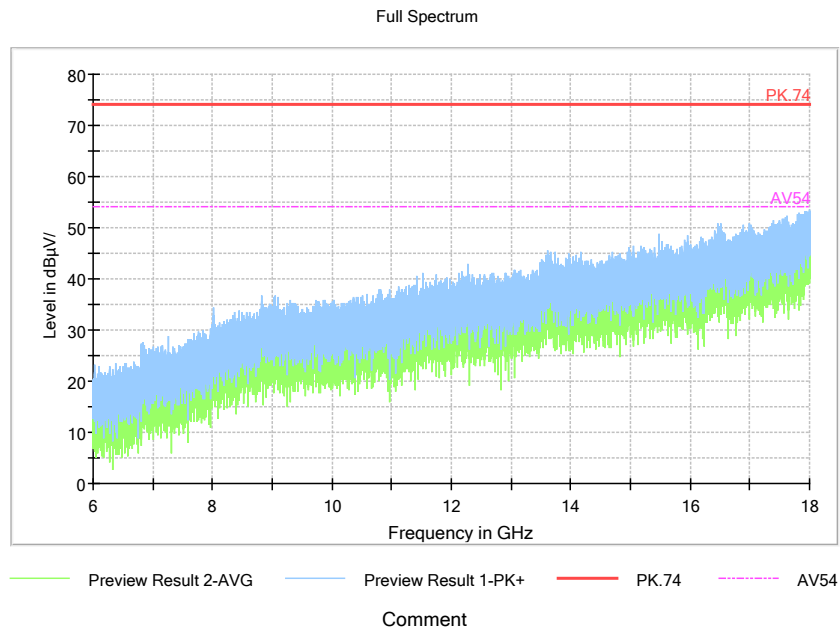
Pic12. Radiated emission (30MHz – 1GHz)

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



Pic14. 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	-----	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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