
TEST REPORT

Report No.: SRTC2020-9003(F)-0014
Product Name: Smartphone
Model Name: HLTE229E.10
Marketing Name: Hisense E40
Applicant: Hisense International Co., Ltd.
Manufacturer: Hisense Communications Co., Ltd.
Specification: FCC Part15B (Certification)
(2020 edition)
FCC ID: 2ADOBLTE229E10

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

The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written permission of The State Radio_monitoring_center Testing Center (SRTC).

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: No.218 Qianwangang Road, 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: 15th May 2020

Date of test: 15th May 2020 to 28th May 2020

1.6 Reference specification

FCC Part 15B, 2020 (Certification)

1.7 Information of EUT

1.7.1 General information

Name of EUT	Smartphone
Model Name	HLTE229E.10
FCC ID	2ADOBLTE229E10
Frequency Range	GSM: GSM850/PCS1900 WCDMA: FDD II / FDD IV / FDD V LTE:FDD 2/ FDD 4/ FDD 5/ FDD 7/FDD 12/FDD 66 Bluetooth: 2.4~2.4835GHz WiFi: 2.4~2.4835GHz
Equipment Class	Class B
Power Supply	Battery or Charger
Rated Power Supply Voltage	3.8V
Extreme Temperature	Lowest: 0°C Highest: +55°C
Extreme Voltage	Minimum: 3.5V Maximum: 4.35V
HW Version	V0.1
SW Version	Hisense_HLTE229E_10_S01_01_04

1.7.2EUT details

Product Name	Model Name	IMEI
Smartphone	HLTE229E.10	867400020316612

Note: As the applicant of this model, [Hisense International Co., Ltd.] declares that the product has two the suppliers of LCD+TP / Memory /Camera/ Battery / fingerprint. According to the results of the original report, EUT (1#) is selected as the worst case for all tests.

Main Supply: 1#

Part Name	Model	Supplier(Brand)	Description
Memory	UNMEN05GC1C31A S12T00	UNIC	eMMC5.1 Module,32GB,FBGA-1 53Ball
Memory	SU512M32Z11ND2D NP-053BT	SPETECK(SPREA DTRUM)	LPDDR4X,16Gb(512 Meg x 32 (2 channels x 16 I/O)),VFBGA-200Ball
Camera	H8B8-KS229FF	Kingcome	HI-846,CSP,S0876A
Camera	BM15907V2	CXT	GC5035,COM,PC5401-6 5HD-60
Camera	H9B13-KS230BA	Kingcome	HI1336,COB,3933C-400
Camera	BC12903V0	CXT	GC02M1B,CSP,HX-M02 07B-H201
LCD+TP	HTF065H029	HOLITECH	ICNL9911S,MLAF065W E51
fingerprint	TW-SW331B-KS230- V1	TOWO	SW331B
Battery	LPN385400A	ShenzhenAerospa ceElectronicCo.,Ltd	

Secondary Supply: 2#

Part Name	Model	Supplier(Brand)	Description
Memory	NCEMASLD-32G	FORESEE	eMMC5.1 Module,32GB,FBGA - 153Ball
Memory	SU512M32Z11ND2D NP-053BT	SPETECK(SPREA DTRUM)	LPDDR4X,16Gb(512 Meg x 32 (2 channels x 16 I/O)),VFBGA - 200Ball

Camera	TW-08GC34-KS229-V1	TOWO	GC8034,COB,S0876A
Camera	ST-CFLS051-5MB F-V1.0	Union Image co.,ltd	GC5035,COM
Camera	TW-13OV53-KS230B-V1	TOWO	OV13853,COB,50064B17
Camera	ST-CFKS230-JSBF-V1	Union Image co.,ltd	GC2375H,CSP,DL2002B10-BP
LCD+TP	EQT651WKF003G	easyquick	FT8006,MLAF065WE51X
fingerprint	FS22483BJN	HOLITECH	ICNF7332-A2
Battery	LPN385400A	Shenzhen Tianjin New Energy Technology Co., Ltd.	

1.7.3 Auxiliary equipment details

AE (Auxiliary Equipment) 1#: Laptop

Manufacturer	Lenovo
Model Number	E470c
S/N	PF10VBX6
Input Voltage	100V-240V AC

AE (Auxiliary Equipment) 2#: USB Cable

Manufacturer	kelinDongguan Keling Electronic Technology Co., Ltd
Model Number	KS230B

AE (Auxiliary Equipment)3#: Battery1

Type	Li-Lon
Manufacturer	ShenzhenAerospaceElectronicCo.,Ltd
Model Number	PLV436190
Capacity	4000mAh
Nominal Voltage	4.4V

AE (Auxiliary Equipment) 4#: Battery2

Type	Li-Lon
Manufacturer	Shenzhen Tianjin New Energy Technology Co., Ltd.
Model Number	436191P
Capacity	4000mAh
Nominal Voltage	4.4V

AE (Auxiliary Equipment) 5#: Charger

Manufacturer	SHENZHENTIANYIN ELECTRONICS CO., LTD.
Model Number	TPA-46050200UU
S/N	/
Input Voltage	100V-240VAC0.3A
Output Voltage	5.0VDC 2000mA

AE (Auxiliary Equipment) 6#: Headset

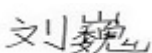
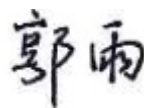
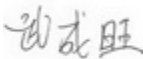
Manufacturer	kelinDongguan Keling Electronic Technology Co., Ltd
Model Number	KS230B

Note1: As the applicant of this model, [Hisense International Co., Ltd.] declares that Hisense HLTE229E.10, Hisense E40 (Marketing Name) is the variant of the initial certified product: Hisense HLTE229E. Their electrical circuit design, layout and internal wiring are identical, the differences are Motherboard frequency band and software version. All test items were retested.

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: Liu Wei Director of the test department 	Checked By: Guo Yu Vice director of the test department 
Tested By: Mr.Wu Chengwang 	Issued date: 2020.06.01

2.2 Test result

2.2.1 Conducted Emissions-FCC Part15.107

Ambient condition:

Temperature	Relative humidity	Pressure
23.6°C	38.5%	100.8kPa

Test Setup with laptop:

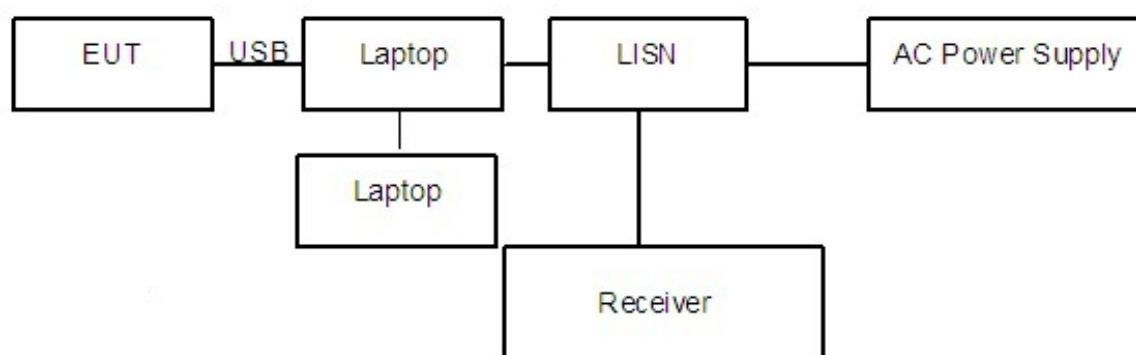


Figure 1

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:

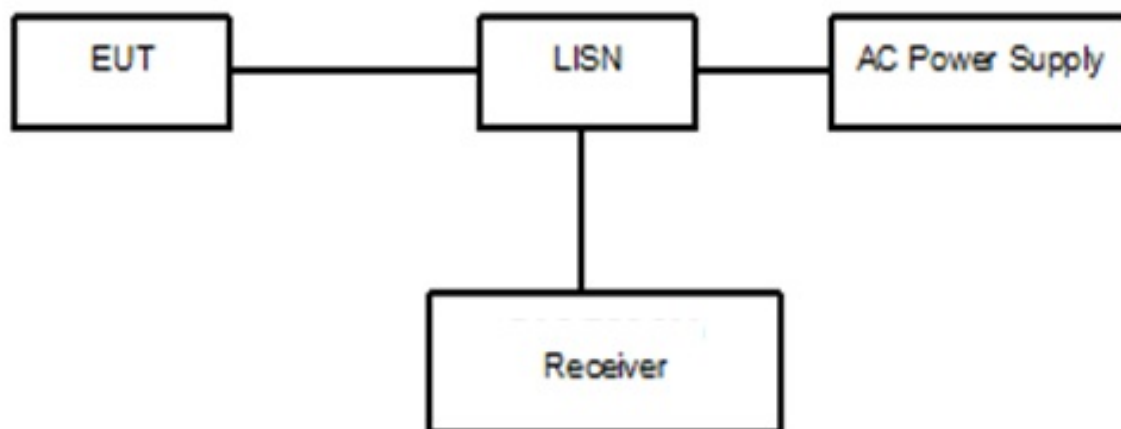


Figure 2

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: 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.

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: $(45.36\text{dB}\mu\text{V}) = (15.66\text{dB}\mu\text{V}) + (29.7\text{dB})$, the corresponding frequency is 0.16705MHz.

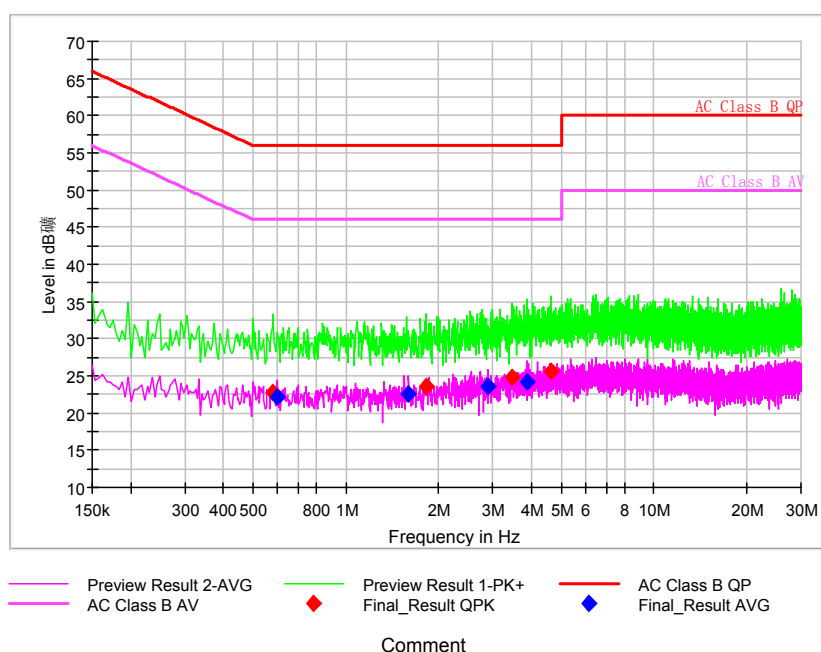
Limit:

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

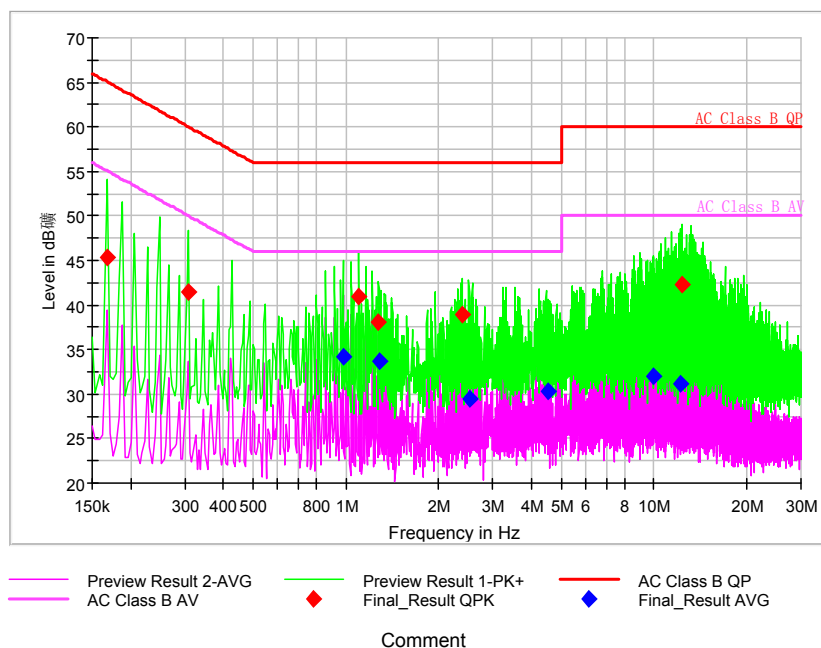
Test result:

Noise Level of the Measuring Instrument



Pic1. Conducted emission L and N Line

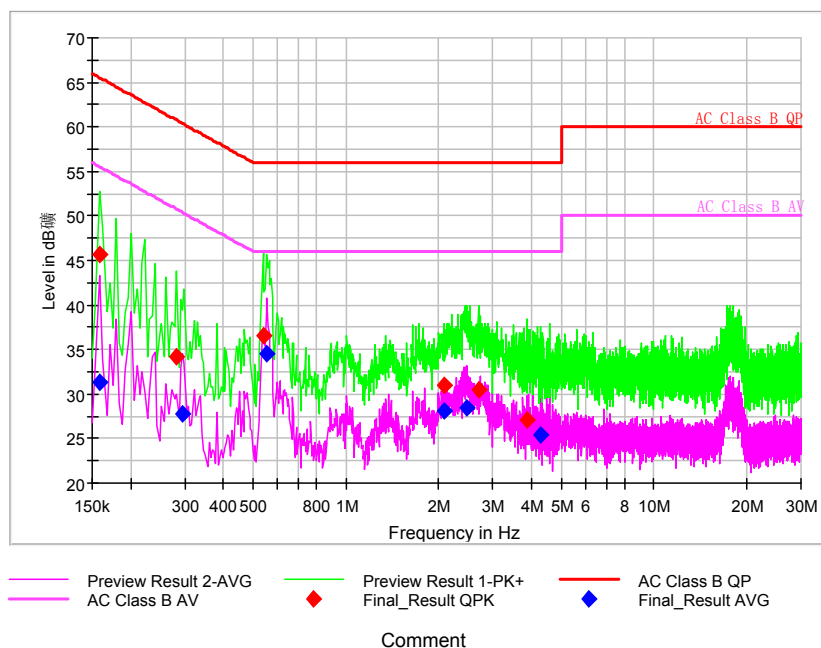
EUT + Charger:



Pic2. Conducted emission L&N Line

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dB μV)	Margin (dB)	Line	Corr. (dB)	Pmea QuasiPeak (dBμV)	Pmea Average (dBμV)
0.16705	45.36	---	65.1	19.75	L1	29.7	15.66	---
0.30777	41.46	---	60.0	18.57	L1	29.7	11.76	---
0.97727	---	34.16	46	11.84	L1	29.7	---	4.46
1.09667	40.87	---	56	15.13	L1	29.7	11.17	---
1.27577	38.12	---	56	17.88	L1	29.7	8.42	---
1.28003	---	33.68	46	12.32	L1	29.7	---	3.98
2.38875	38.95	---	56	17.05	L1	29.8	9.15	---
2.51241	---	29.5	46	16.5	L1	29.8	---	-0.3
4.52089	---	30.24	46	15.76	L1	29.8	---	0.44
10.0132	---	31.93	50	18.07	L1	29.9	---	2.03
12.1624	---	31.16	50	18.84	N	29.9	---	1.26
12.3586	42.36	---	60	17.64	N	29.9	12.46	---

EUT + Laptop:



Pic3. Conducted emission L&N Line

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	Pme a Quas	Pme a Aver
0.158529	---	31.32	55.54	24.22	L1	29.7	---	1.62
0.158529	45.63	---	65.54	19.91	L1	29.7	15.9	---
0.282193	34.11	---	60.75	26.65	L1	29.7	4.41	---
0.294986	---	27.69	50.38	22.69	L1	29.7	---	-2.01
0.53805	36.6	---	56	19.4	L1	29.7	6.9	---
0.555107	---	34.59	46	11.41	L1	29.7	---	4.89
2.081721	30.97	---	56	25.03	L1	29.8	1.17	---
2.081721	---	28.18	46	17.82	L1	29.8	---	-1.62
2.474036	---	28.51	46	17.49	L1	29.8	---	-1.29
2.68725	30.46	---	56	25.54	L1	29.8	0.66	---
3.88125	27.12	---	56	28.88	L1	29.8	-2.68	---
4.277829	---	25.32	46	20.68	N	29.8	---	-4.48

2.2.2 Radiated Emissions-FCC Part15.109

Ambient condition:

Temperature	Relative humidity	Pressure
23.9°C	38.6%	100.8kPa

Test Setup:

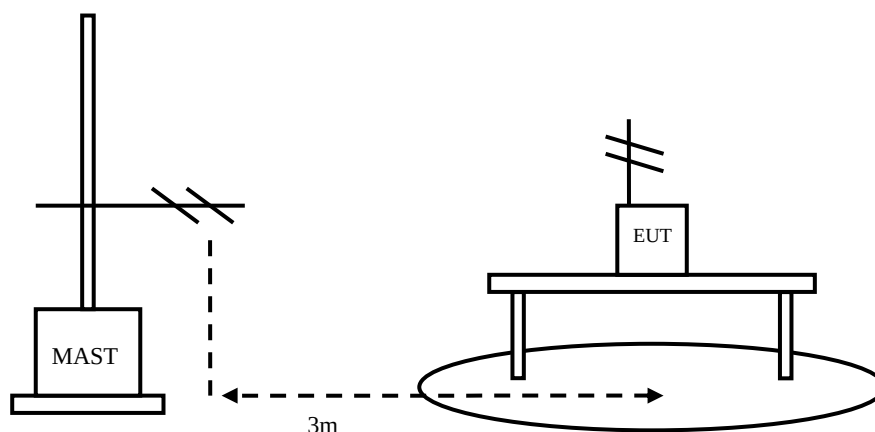


Figure 3

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: 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 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	54
	Peak	74

Test result:

Sample calculation: $(20.39\text{dB}\mu\text{V/m}) = (37.79\text{dB}\mu\text{V/m}) + (-17.4\text{dB})$, the corresponding frequency is 52.058500MHz.

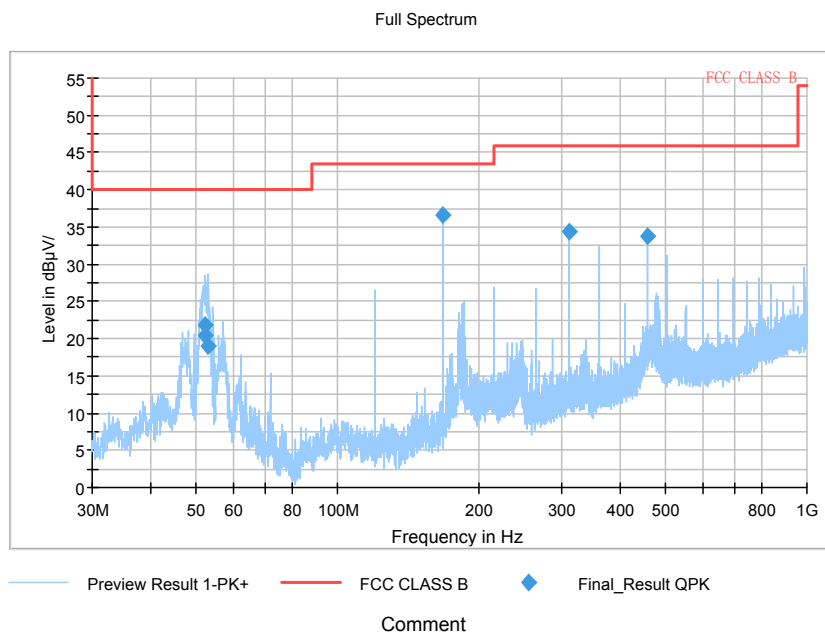
EUT + Laptop:

Frequency(MHz)	Result(dB μ V/m)	Limit (dB μ V/m)	ARpl (dB)	Pmea (dB μ V/m)	Polarity
52.058500	20.39	40.00	-17.4	37.79	V
52.104500	21.74	40.00	-17.4	39.14	V
52.834500	18.98	40.00	-17.5	36.48	V
168.002500	36.55	43.50	-20.8	57.35	V
311.999000	34.38	46.00	-14.7	49.08	V
455.995500	33.79	46.00	-10.4	44.19	V

EUT + Charger:

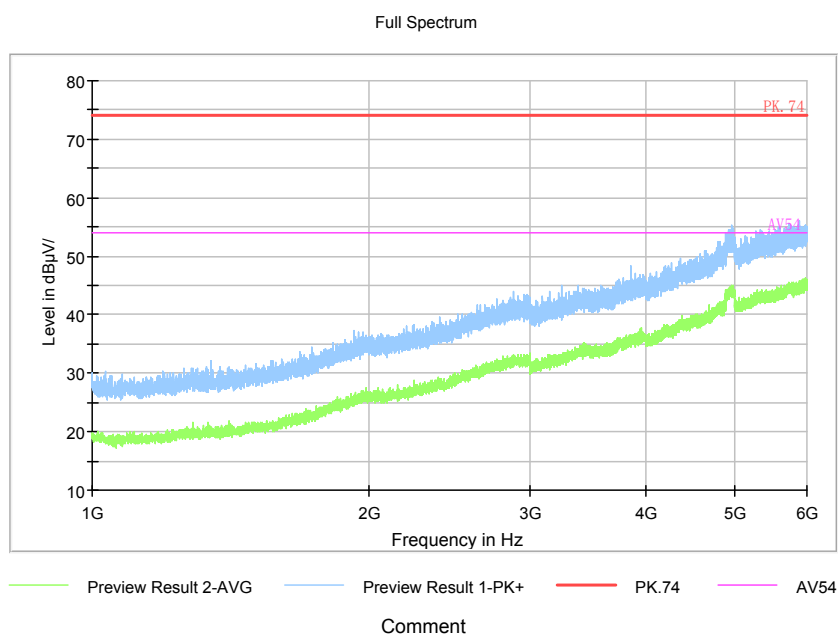
Frequency(MHz)	Result(dB μ V/m)	Limit (dB μ V/m)	ARpl (dB)	Pmea (dB μ V/m)	Polarity
57.922000	16.63	40.00	-18.1	34.73	V
58.575500	17.22	40.00	-18.2	35.42	V
83.530000	14.24	40.00	-22.7	36.94	V
84.496500	14.68	40.00	-22.4	37.08	V
84.548500	14.51	40.00	-22.4	36.91	V
84.679500	12.24	40.00	-22.3	34.54	V

EUT + Laptop:refer to Pic4,Pic5,Pic6,Pic7



Pic4. Radiated emission(30MHz – 1GHz)

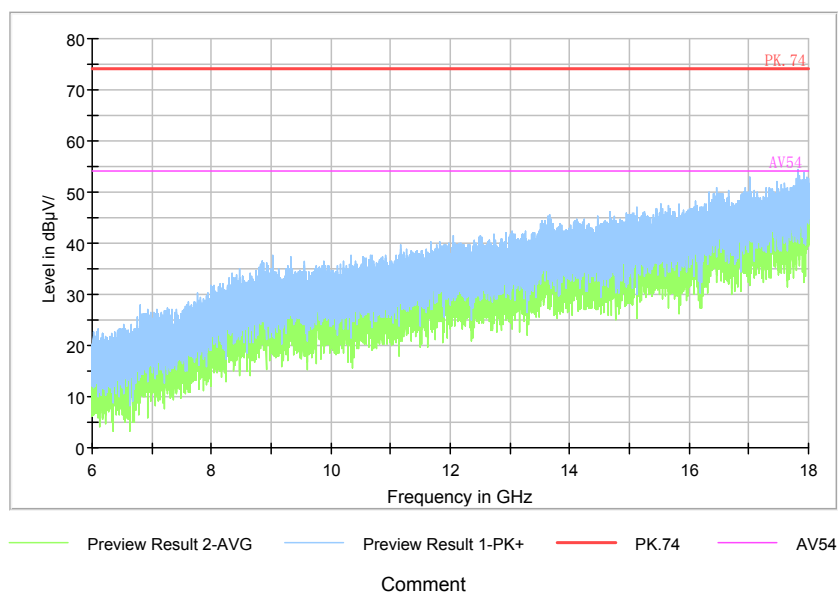
Note : The test data in the graph includes two polarizations: horizontal and vertical



Pic5. Radiated emission (1GHz –6GHz)

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

Full Spectrum

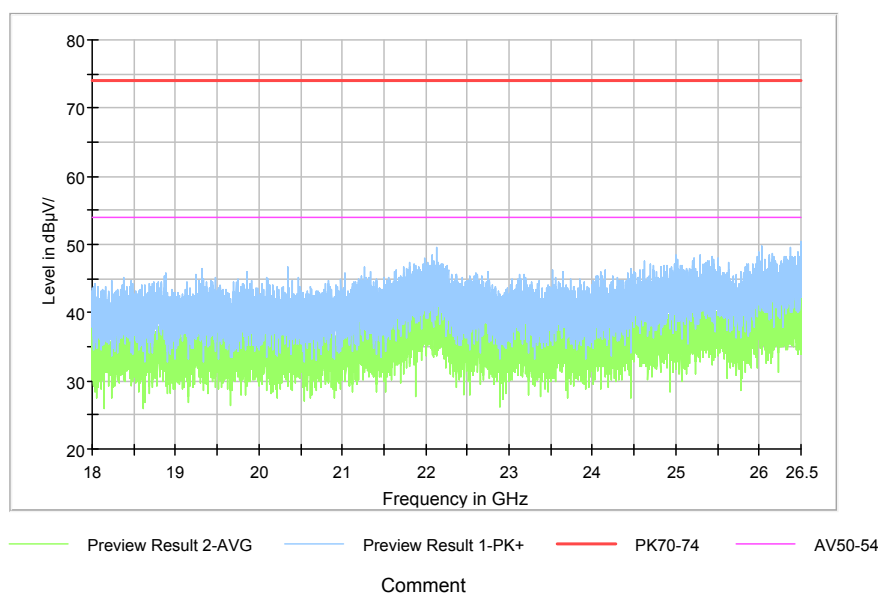


Comment

Pic6. Radiated emission (6GHz –18GHz)

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

Full Spectrum

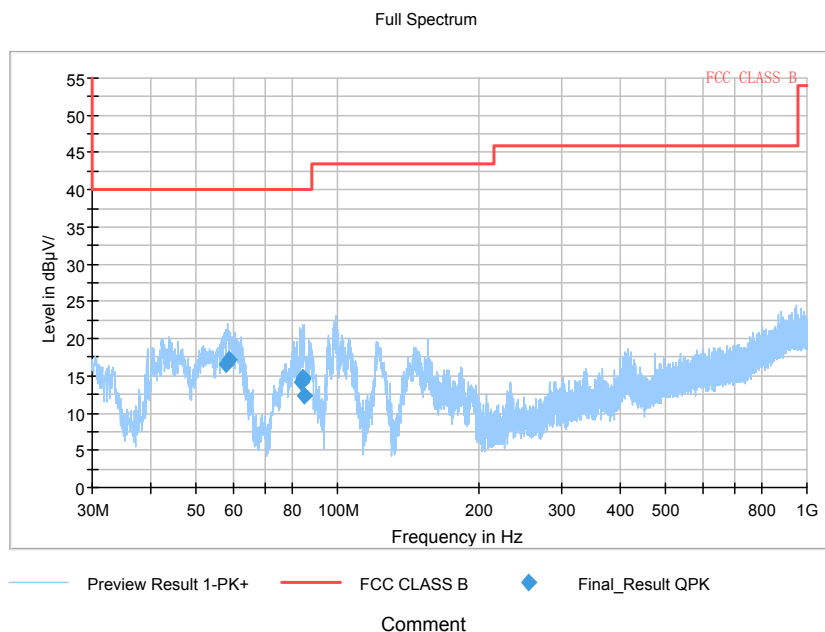


Comment

Pic7. Radiated emission (18GHz – 26GHz)

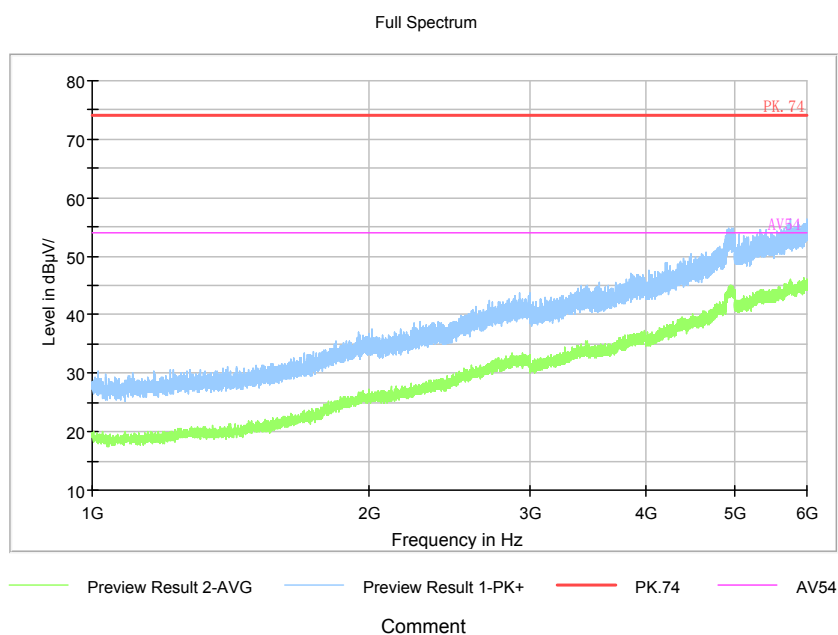
Note : The test data in the graph includes two polarizations: horizontal and vertical.

EUT + Charger: refer to Pic8,Pic9,Pic10,Pic11



Pic8. Radiated emission(30MHz – 1GHz)

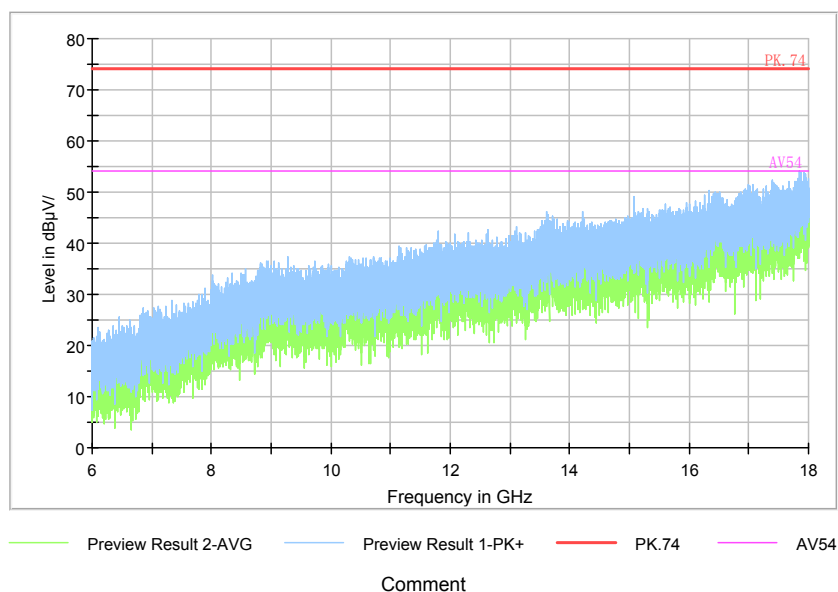
Note : The test data in the graph includes two polarizations: horizontal and vertical



Pic9. Radiated emission (1GHz –6GHz)

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

Full Spectrum

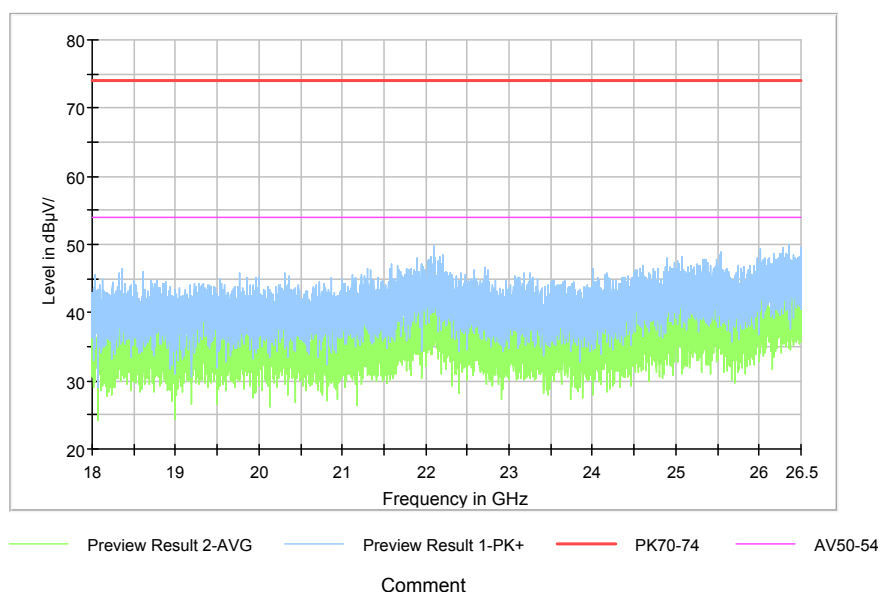


Comment

Pic10. Radiated emission (6GHz –18GHz)

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

Full Spectrum



Comment

Pic11. 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	-----	5th Sep. 2021	6th Sep. 2016
2	ESW EMI test receiver	R&S	101574	20th Aug. 2020	20th Aug. 2019
3	9.080m×5.255m×3.525m Shielding room	FRANKONIA	-----	5th Sep. 2021	6th Sep. 2016
4	ESR3EMI test receiver	R&S	102361	20th Aug. 2020	20th Aug. 2019
5	VULB 9163 Ultra log test antenna	Schwarzbeck	867	25th Mar. 2021	25th Mar. 2020
6	ENV216 AMN	R&S	3560.6550. 12	20th Aug. 2020	20th Aug. 2019
7	HF 907 Double-Ridged Waveguide Horn Antenna	R&S	100512	20th Aug. 2020	20th Aug. 2019
8	PS2000 Turn Table	FRANKONIA	-----	-----	-----
9	MA260 Antenna Master	FRANKONIA	-----	-----	-----
10	EMC32EMI test software	R&S	-----	-----	-----

-----THE END-----