

TEST REPORT

Report No.: SRTC2020-9003(F)-0071
Product Name: Smartphone
Model Name: CP3320AS2
Applicant: Yulong Computer Telecommunication Scientific
(Shenzhen) Co., Ltd
Manufacturer: Yulong Computer Telecommunication Scientific
(Shenzhen) Co., Ltd
Specification: FCC Part15B (Certification)
(2020 edition)
ANSI C63.4-2014
FCC ID: R38YLCP3320AS2

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
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1.3 Applicant's details

Company: Yulong Computer Telecommunication Scientific (Shenzhen)
Co., Ltd
Address: Floor 21, Block A, Coolpad Building, Intersection of Keyuan
Avenue and Baoshen Road, North High-Tech Industrial Park,
Nanshan District, Shenzhen, China
City: Shenzhen
Country or Region: China
Contacted person: Yentl Chen
Tel: 15927320221
Email: chenyanting@yulong.com

1.4 Manufacturer's details

Company: Yulong Computer Telecommunication Scientific (Shenzhen)
Co., Ltd
Address: Floor 21, Block A, Coolpad Building, Intersection of Keyuan
Avenue and Baoshen Road, North High-Tech Industrial Park,
Nanshan District, Shenzhen, China
City: Shenzhen
Country or Region: China
Contacted person: Yentl Chen
Tel: 15927320221
Email: chenyanting@yulong.com

1.5 Application details

Date of reception of test sample: 22th Dec. 2020

Date of test: 28th Dec. 2020 to 4th Jan. 2021

1.6 Reference specification

FCC Part 15B, 2020 (Certification)

1.7 Information of EUT

1.7.1 General information

Product Name of EUT	Smartphone
Model of EUT	CP3320AS2
FCC ID	R38YLCP3320AS2
Frequency Range	GSM Band2/Band8 WCDMA Band 2 / WCDMA Band 4 / WCDMA Band 5 LTE band 2/ LTE band 4 / LTE band 5 / LTE band 12/ LTE band 13/LTE band 25/LTE band 26/ LTE band 66/ LTE band 71 Bluetooth: 2.4~2.4835GHz WiFi: 2.4~2.4835GHz
Power Supply	Charger/Battery
Nominal Voltage	3.85V
Extreme Temperature	Lowest: -20°C Highest: +60°C
Extreme Voltage	Minimum: 3.6V Maximum: 4.4V
HW Version	P2
SW Version	CP3320AS2.201211.0S

1.7.2 EUT details

No.	Product Name	Model Name	IMEI
EUT1	Smartphone	CP3320AS2	862230050004357

1.7.3 Auxiliary equipment details

AE (Auxiliary Equipment) 1#: Charger

Manufacturer	Ruide
Model Number	RD0501000-USBA-18MG
Input Voltage	100V-240V AC
Output Voltage	5V DC

AE (Auxiliary Equipment) 2#: Charger

Manufacturer	Kosun
Model Number	618045
Input Voltage	100V-240V AC
Output Voltage	5V DC

AE (Auxiliary Equipment) 3#: Battery

Manufacturer	TianMao
Model Number	CPLD-441

AE (Auxiliary Equipment) 4#: Battery

Manufacturer	Lishen
Model Number	CPLD-441

AE (Auxiliary Equipment) 5#: USB cable

Manufacturer	Kosun
Model Number	A20016

AE (Auxiliary Equipment) 6#: USB cable

Manufacturer	Baorunlian
Model Number	8.2.63




Note1: This application has two Kinds of adapter. In this report, two kinds of adapters are tested.

Note2: In this report, there are two test modes. Mode 1 exercised by the EUT1 , charger AE1, the Battery AE3 and the Usb cable AE5 while mode 2 exercised by the EUT1 , charger AE2, the Battery AE4 and the Usb cable AE6.

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. Lv Youyou Test engineer 	Issued date: 2021.01.13

2.2 Test result

2.2.1 Conducted Emissions-FCC Part15.107

Ambient condition:

Temperature	Relative humidity	Pressure
23.2°C	41.3%	100.9kPa

Test Setup with charger:

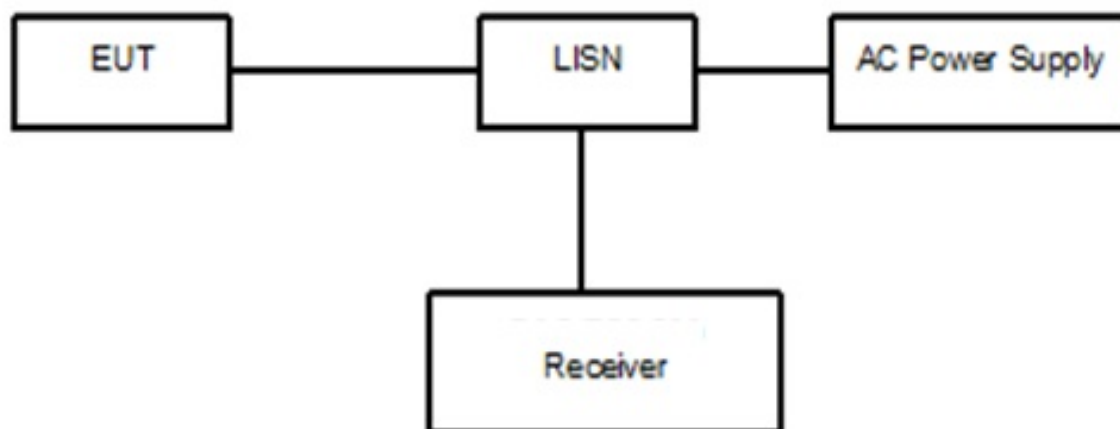


Figure 1

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 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:

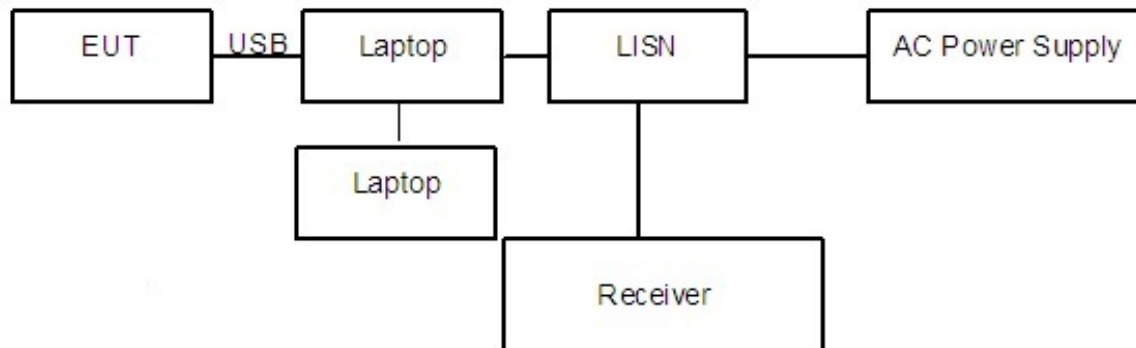


Figure 2

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 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.

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: $(49.90dB\mu V) = (20.3 dB\mu V) + (29.6 dB)$, the corresponding frequency is 0.165711MHz.

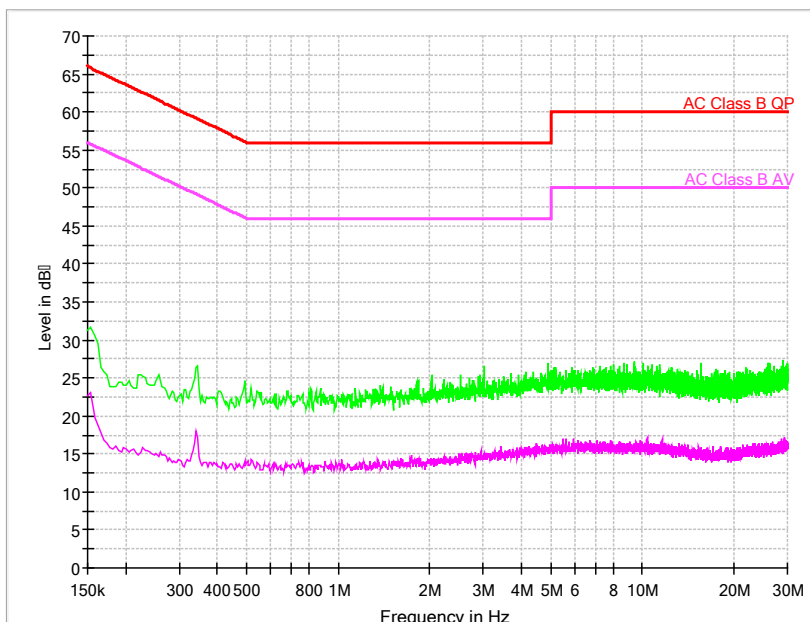
Limit:

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

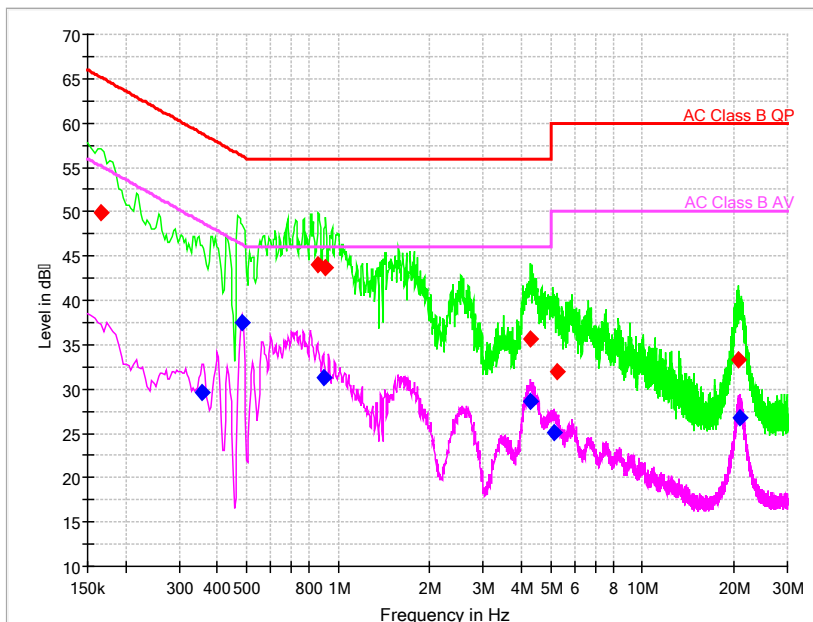
Test result:

Noise Level of the Measuring Instrument



Pic1. Conducted emission L and N Line

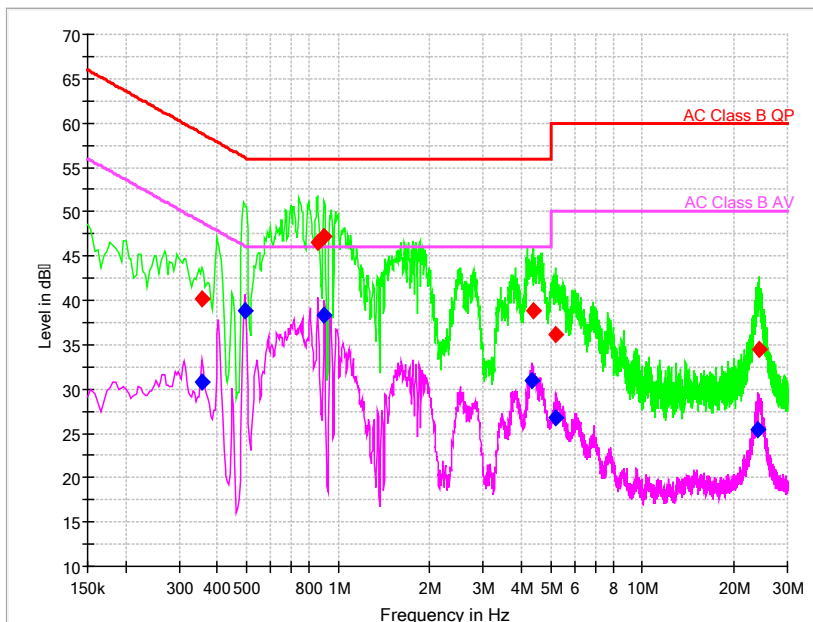
EUT1+ charger1:



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)
0.165711	49.90	---	65.17	15.27	L1	29.6	20.3	---
0.358164	---	29.61	48.77	19.16	L1	29.6	---	0.01
0.483849	---	37.51	46.27	8.76	L1	29.6	---	7.91
0.860901	44.10	---	56.00	11.90	L1	29.6	14.5	---
0.892322	---	31.35	46.00	14.65	L1	29.6	---	1.75
0.911961	43.61	---	56.00	12.39	L1	29.7	13.91	---
4.266158	35.72	---	56.00	20.28	L1	29.7	6.02	---
4.297579	---	28.59	46.00	17.41	L1	29.7	---	-1.11
5.142020	---	25.07	50.00	24.93	L1	29.7	---	-4.63
5.224500	31.98	---	60.00	28.02	L1	29.7	2.28	---
20.593322	33.27	---	60.00	26.73	L1	29.8	3.47	---
20.954664	---	26.79	50.00	23.21	N	29.8	---	-3.01

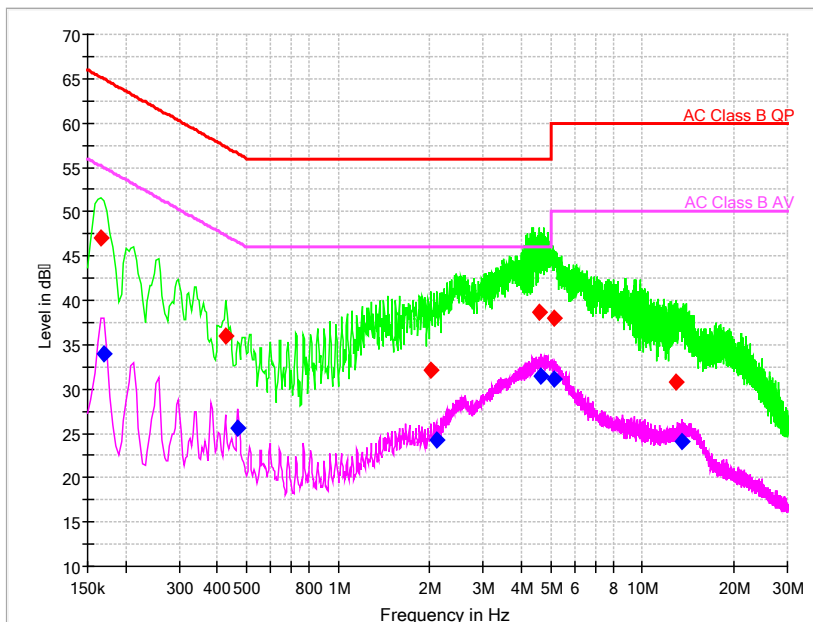
EUT1+ charger1:



Pic3. Conducted emission L&N Line Voltage: 240VAC

Frequency (MHz)	QuasiPeak (dB μ V)	Average (dB μ V)	Limit (dB μ V)	Margin (dB)	Line	Corr. (dB)	P _{mea} QuasiPeak (dB μ V)	P _{mea} Average (dB μ V)
0.358164	---	30.85	48.77	17.92	L1	29.6	---	1.25
0.358164	40.23	---	58.77	18.54	L1	29.6	10.63	---
0.491704	---	38.80	46.14	7.34	L1	29.6	---	9.2
0.853046	46.59	---	56.00	9.41	L1	29.6	16.99	---
0.900178	---	38.40	46.00	7.60	L1	29.7	---	8.7
0.900178	47.29	---	56.00	8.71	L1	29.7	17.59	---
4.329000	---	30.97	46.00	15.03	L1	29.7	---	1.27
4.364349	38.82	---	56.00	17.18	N	29.7	9.12	---
5.173441	36.11	---	60.00	23.89	L1	29.7	6.41	---
5.173441	---	26.73	50.00	23.27	L1	29.7	---	-2.97
23.884678	---	25.34	50.00	24.66	L1	29.8	---	-4.46
24.261730	34.40	---	60.00	25.60	N	29.8	4.6	---

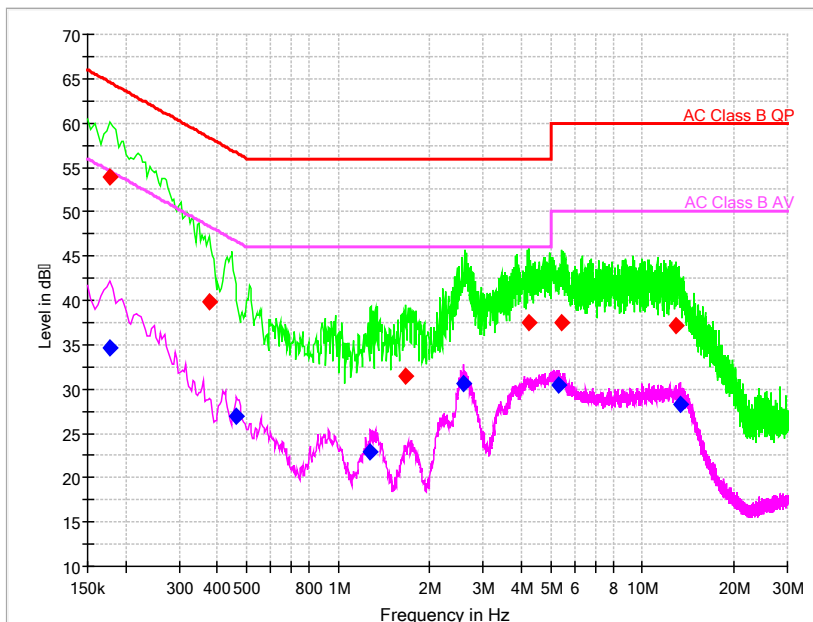
EUT1+ charger2:



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)
0.165711	46.98	---	65.17	18.19	L1	29.6	17.38	---
0.169638	---	33.96	54.98	21.02	L1	29.6	---	4.36
0.428862	36.02	---	57.28	21.25	L1	29.6	6.42	---
0.468138	---	25.55	46.55	21.00	L1	29.6	---	-4.05
2.023480	32.05	---	56.00	23.95	L1	29.7	2.35	---
2.098105	---	24.28	46.00	21.72	N	29.7	---	-5.42
4.576441	38.69	---	56.00	17.31	L1	29.7	8.99	---
4.619645	---	31.52	46.00	14.48	L1	29.7	---	1.82
5.145947	---	31.14	50.00	18.86	L1	29.7	---	1.44
5.153803	37.95	---	60.00	22.05	L1	29.7	8.25	---
12.848033	30.71	---	60.00	29.29	L1	29.8	0.91	---
13.551079	---	24.00	50.00	26.00	L1	29.8	---	-5.8

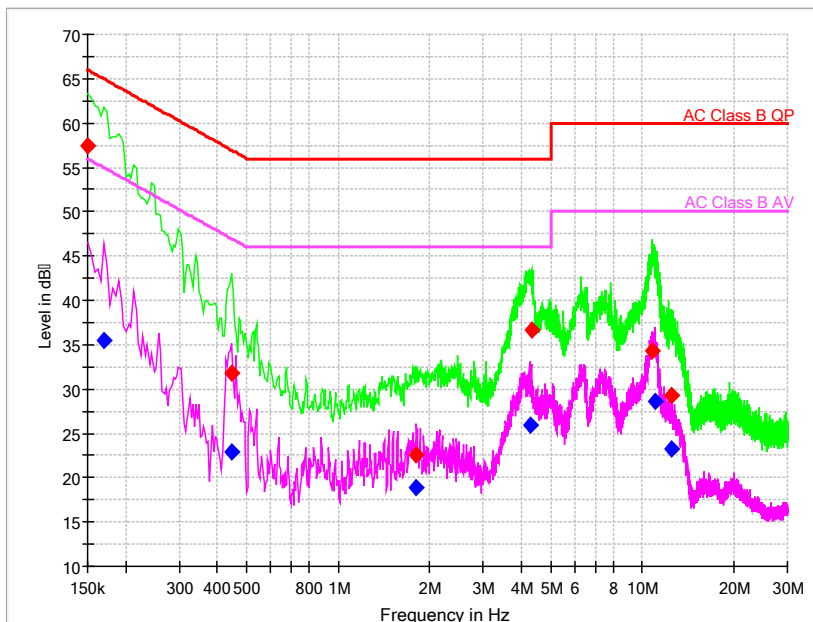
EUT1+ charger2:



Pic5. 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)
0.177493	---	34.63	54.60	19.97	L1	29.6	---	5.03
0.177493	53.88	---	64.60	10.72	L1	29.6	24.28	---
0.377803	39.80	---	58.33	18.53	L1	29.6	10.2	---
0.464211	---	26.97	46.62	19.65	L1	29.6	---	-2.63
1.277230	---	22.97	46.00	23.03	L1	29.7	---	-6.73
1.666066	31.53	---	56.00	24.47	L1	29.7	1.83	---
2.581204	---	30.67	46.00	15.33	L1	29.7	---	0.97
4.226882	37.54	---	56.00	18.46	N	29.7	7.84	---
5.287342	---	30.48	50.00	19.52	L1	29.7	---	0.78
5.440520	37.56	---	60.00	22.44	L1	29.7	7.86	---
12.844105	37.14	---	60.00	22.86	L1	29.8	7.34	---
13.295783	---	28.23	50.00	21.77	N	29.8	---	-1.57

EUT1+Laptop:



Pic6. Conducted emission L&N Line

Frequency (MHz)	QuasiPeak (dB μ V)	Average (dB μ V)	Limit (dB μ V)	Margin (dB)	Line	Corr. (dB)	PmeaQuasiPeak (dB μ V)	PmeaAverage (dB μ V)
0.150000	57.48	---	66.00	8.52	L1	29.6	27.88	---
0.169638	---	35.44	54.98	19.54	L1	29.6	---	5.84
0.444572	---	22.90	46.98	24.08	N	29.6	---	-6.7
0.444572	31.87	---	56.98	25.11	L1	29.6	2.27	---
1.807461	---	18.93	46.00	27.07	L1	29.7	---	-10.77
1.807461	22.60	---	56.00	33.40	N	29.7	-7.1	---
4.262230	---	25.85	46.00	20.15	L1	29.7	---	-3.85
4.309362	36.64	---	56.00	19.36	N	29.7	6.94	---
10.786026	34.23	---	60.00	25.77	L1	29.7	4.53	---
10.966697	---	28.60	50.00	21.40	N	29.8	---	-1.2
12.459197	29.24	---	60.00	30.76	L1	29.8	-0.56	---
12.478836	---	23.30	50.00	26.70	L1	29.8	---	-6.5

2.2.2 Radiated Emissions-FCC Part15.109

Ambient condition:

Temperature	Relative humidity	Pressure
22.8°C	41.1%	100.8kPa

Test Setup:

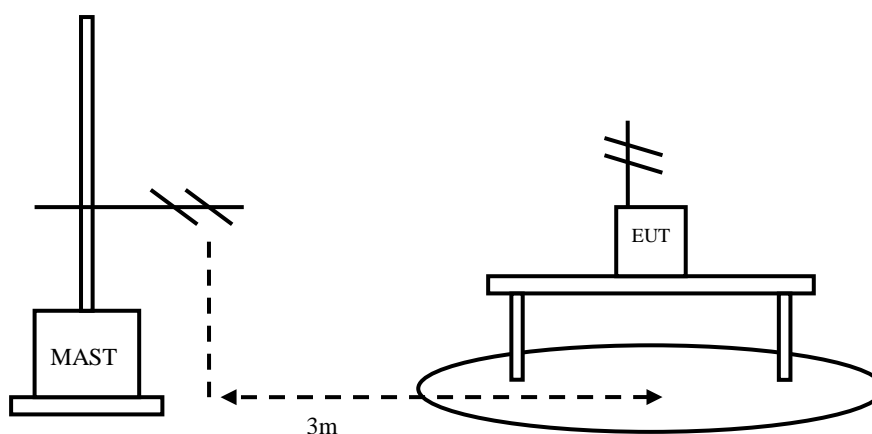


Figure 3

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 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:

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

Sample calculation: $(19.08 \text{ dB}\mu\text{V/m}) = (37.08 \text{ dB}\mu\text{V}) + (-18.0 \text{ dB/m})$, the corresponding frequency is 41.560500MHz.

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+Charger1:

Frequency(MHz)	Result(dBuV/m)	A _{Rpl} (dB/m)	P _{mea} (dBuV)	Polarity
41.560500	19.08	-18.0	37.08	V
86.636500	26.44	-21.7	48.14	V
126.524000	28.93	-21.0	49.93	V
175.830500	28.05	-20.4	48.45	V
540.440000	12.84	-8.2	21.04	V
958.723500	17.38	-0.8	18.18	V

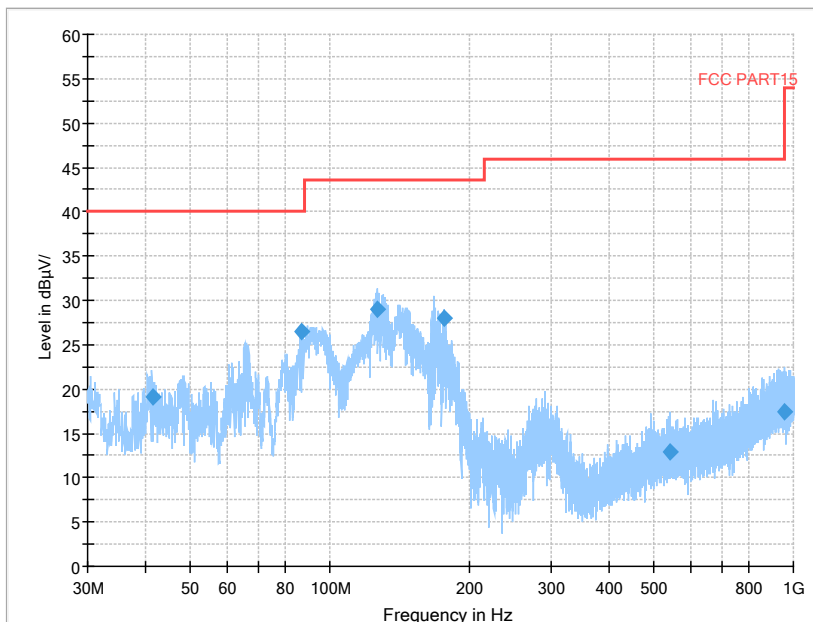
EUT1+Charger2:

Frequency(MHz)	Result(dBuV/m)	A _{Rpl} (dB/m)	P _{mea} (dBuV)	Polarity
39.184000	16.67	-18.4	35.07	V
84.553500	28.56	-22.4	50.96	V
96.484500	23.18	-19.3	42.48	V
195.491000	15.23	-18.7	33.93	V
540.967500	13.44	-8.2	21.64	V
940.513000	18.68	-1.0	19.68	V

EUT1+Laptop:

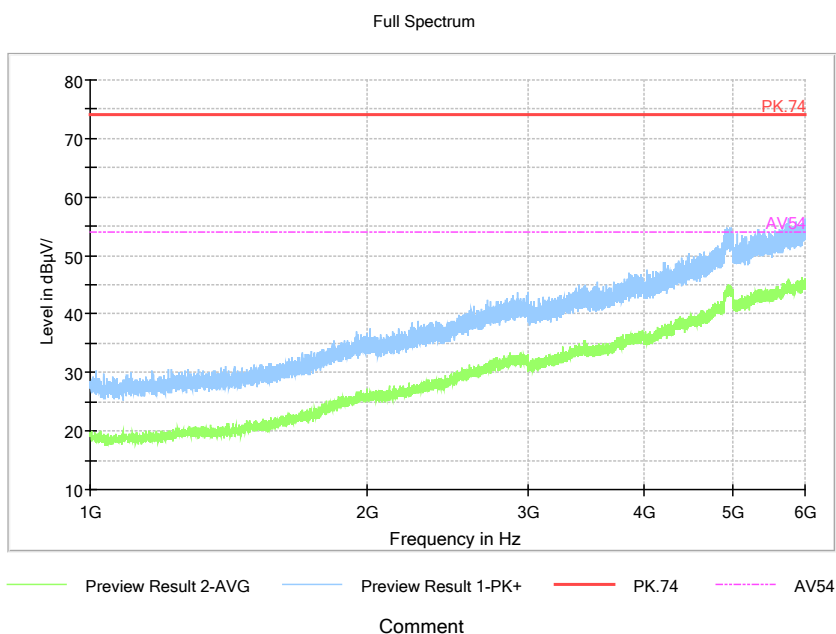
Frequency(MHz)	Result(dBuV/m)	A _{Rpl} (dB/m)	P _{mea} (dBuV)	Polarity
50.929500	7.75	-17.2	24.95	V
64.204000	35.90	-19.8	55.70	V
171.888500	39.69	-20.5	60.19	V
176.718000	40.62	-20.3	60.92	V
480.003000	36.49	-9.8	46.29	V
960.007500	24.09	-0.7	24.79	V

EUT1+ charger1: refer to Pic7, Pic8 and Pic9



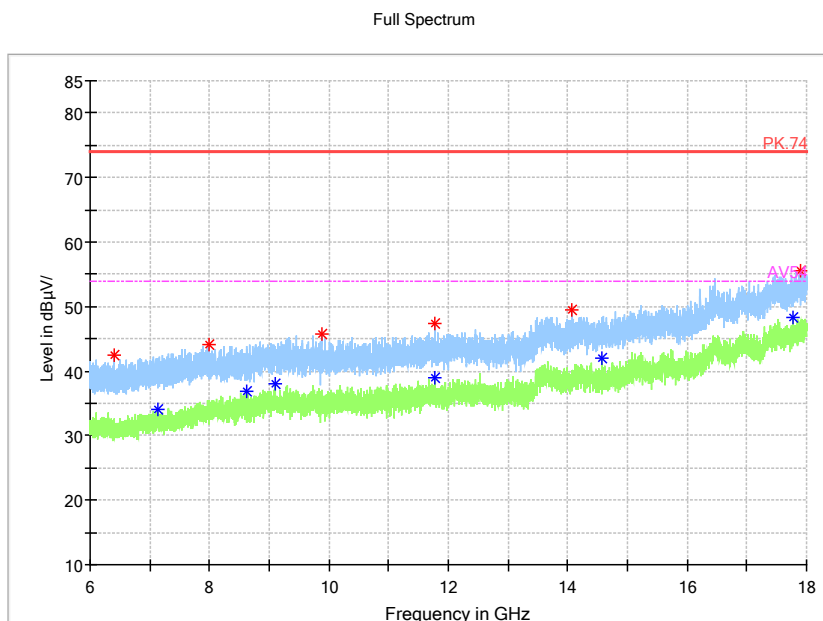
Pic7. Radiated emission (30MHz – 1GHz)

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



Pic8. Radiated emission (1GHz –6GHz)

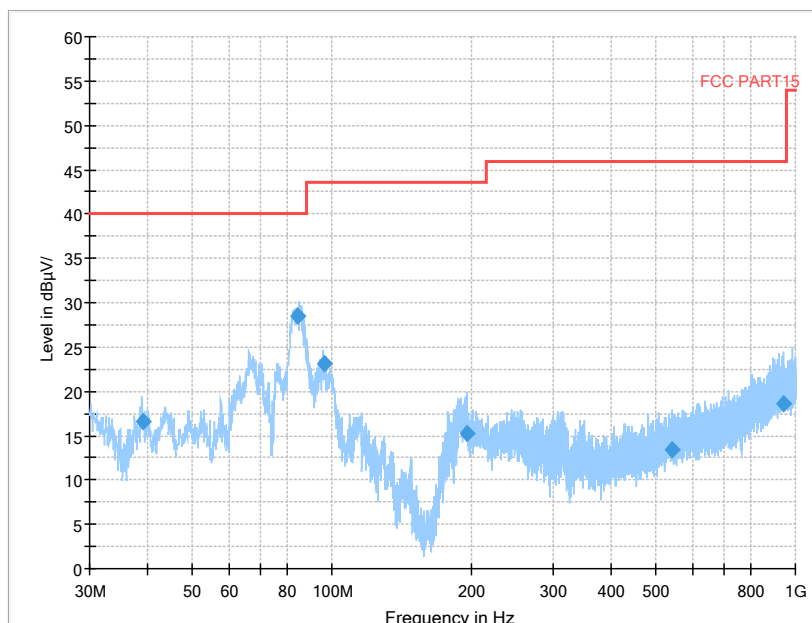
Note: The test data in the graph includes two polarizations: horizontal and vertical



Pic9. Radiated emission (6GHz –18GHz)

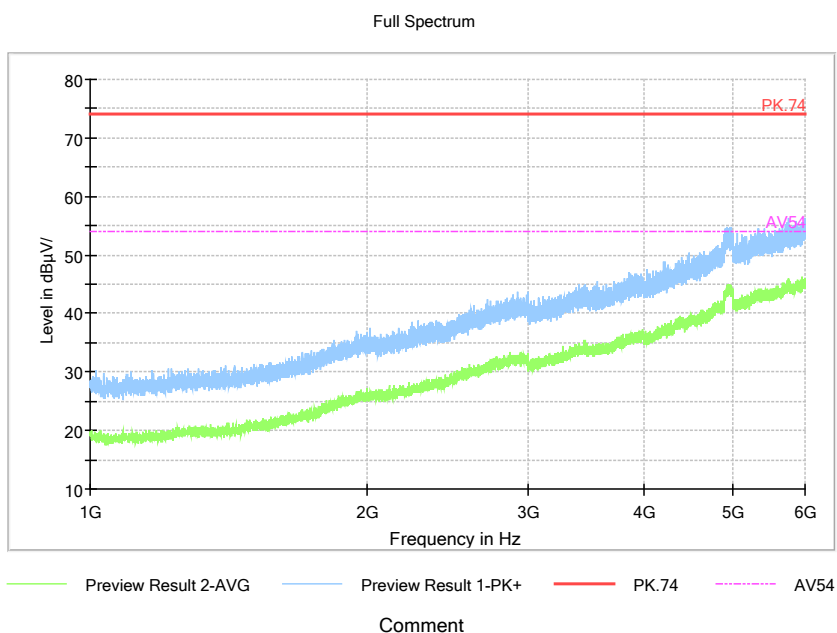
Note: The test data in the graph includes two polarizations: horizontal and vertical

EUT1+ charger2: refer to Pic10, Pic11 and Pic12



Pic10. Radiated emission (30MHz – 1GHz)

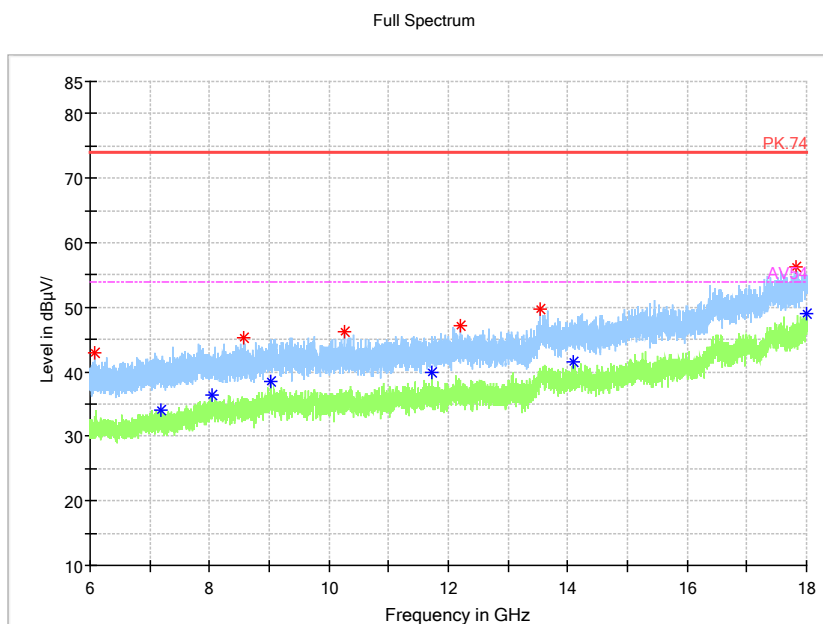
Note: The test data in the graph includes two polarizations: horizontal and vertical



Comment

Pic11. Radiated emission (1GHz –6GHz)

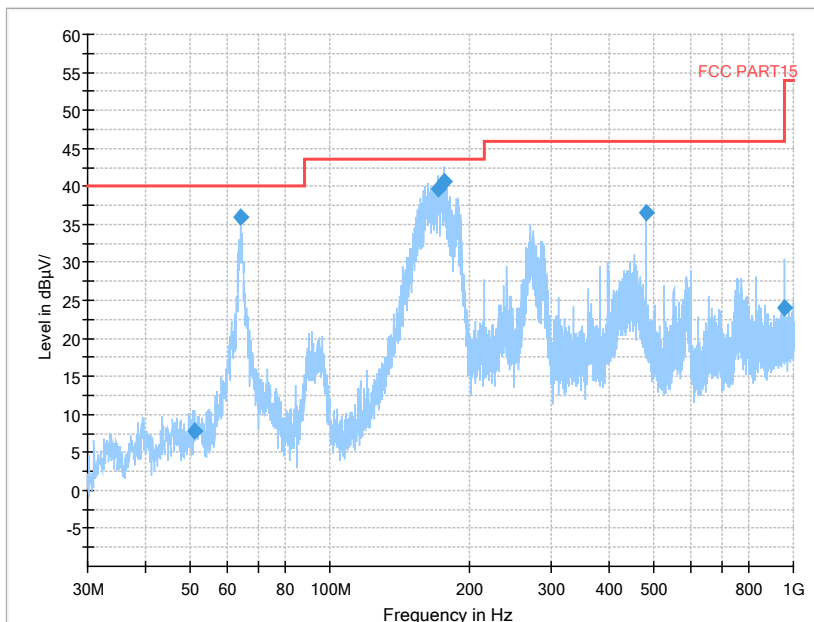
Note: The test data in the graph includes two polarizations: horizontal and vertical



Pic12. Radiated emission (6GHz –18GHz)

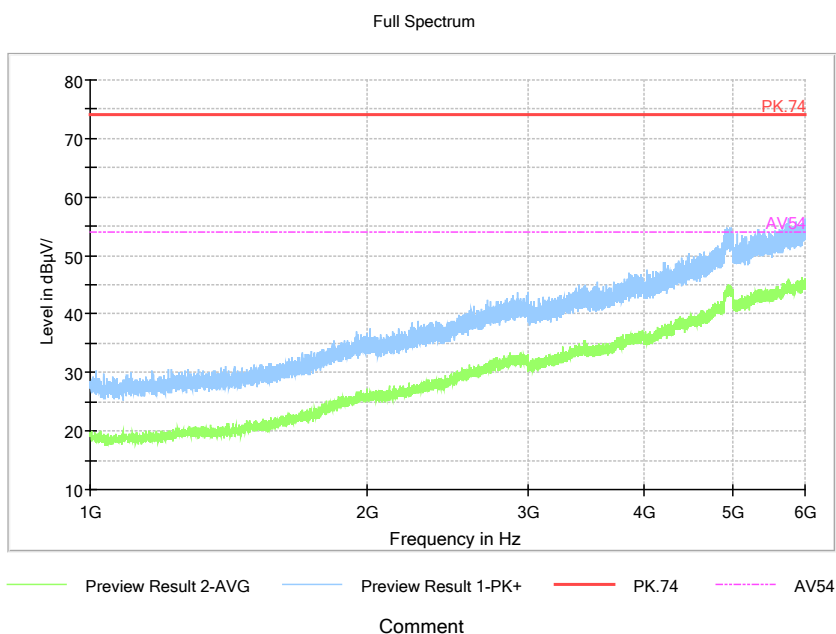
Note: The test data in the graph includes two polarizations: horizontal and vertical

EUT1+ charger2: refer to Pic13,Pic14 and Pic15



Pic13. Radiated emission (30MHz – 1GHz)

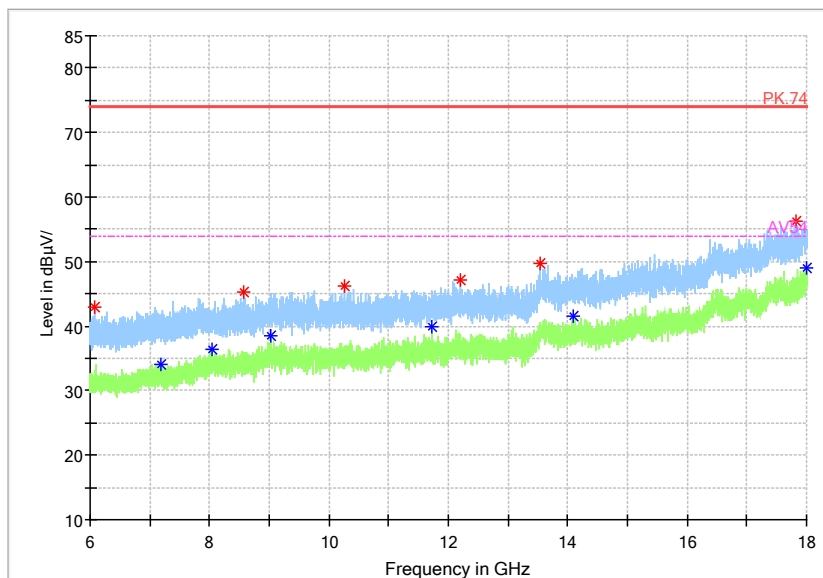
Note: The test data in the graph includes two polarizations: horizontal and vertical



Pic14. Radiated emission (1GHz –6GHz)

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

Full Spectrum



Pic15. 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	-----	5th Sep. 2021	6th Sep. 2016
2	ESW EMI test receiver	R&S	101574	20th Aug. 2021	20th Aug. 2020
3	ESR3 EMI test receiver	R&S	102361	21th Apr. 2021	21th Apr. 2020
4	9.080m×5.255m×3.525m Shielding room	FRANKONIA	-----	5th Sep. 2021	6th Sep. 2016
5	VULB 9163 Ultra log test antenna	schwarzbeck	867	25th Mar. 2021	25th Mar. 2020
6	HF 907 Double-Ridged Waveguide Horn Antenna	R&S	100512	25th Mar. 2021	25th Mar. 2020
7	SAS-574 Horn Antenna	schwarzbeck	535	20th Aug. 2021	20th Aug. 2020
8	ENV216 AMN	R&S	3560.6550. 12	20th Aug. 2021	20th Aug. 2020
9	EMC32EMI test software	R&S	-----	-----	-----

-----The end-----