
TEST REPORT

Report No.: SRTC2024-9004(F)-24040803(T)
Product Name: Battery Radio Frequency Module
Model Name: BRFM
Applicant: Yanfeng Visteon Automotive Electronics Co.,Ltd.
Manufacturer: Yanfeng Visteon Automotive Electronics Co.,Ltd.
Specification: FCC Part 15B (Certification)
(2023 edition)
ANSI C63.4-2014
FCC ID: 2BK7C-BRFM

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
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Email: liujiaf@srtc.org.cn
Designation Number: CN1267
Registration number: 239125

1.3 Applicant's details

Company: Yanfeng Visteon Automotive Electronics Co.,Ltd.
Address: 300# Minolta Road Songjiang County, Shanghai, China

1.4 Manufacturer's details

Company: Yanfeng Visteon Automotive Electronics Co.,Ltd.
Address: 300# Minolta Road Songjiang County, Shanghai, China

1.5 Application details

Date of reception of test sample: 8th April 2024
Date of test: 22th June to 28th June 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	Battery Radio Frequency Module
Model Name	BRFM
Frequency Range	2.410GHz~2.475GHz
Equipment Class	Class B
Power Supply	DC Power supply
HW Version	PWB25585A10
SW Version	ADI 2.0.4

1.7.2 EUT details

Product Name	Model Name	IMEI
BRFM	BRFM	NA

1.7.3 Auxiliary equipment details

AE (Auxiliary Equipment) 1#: DC power supply

Manufacturer	Agilent
Model Number	E3645A
S/N	MY40000739

1.7.4 Test mode

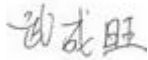
Mode No.	Description of test mode
Mode 1	2.410GHz~2.475GHz receiver

Note1: AE1# was selected by testing laboratory and was only cooperated with this test, not for sale.

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: 2024.06.28

2.2 Test result

2.2.1 Conducted Emissions-FCC Part15.107

Ambient condition:

Temperature	Relative humidity	Pressure
22.3°C	39.2%	100.8kPa

Test Setup with Power supply:

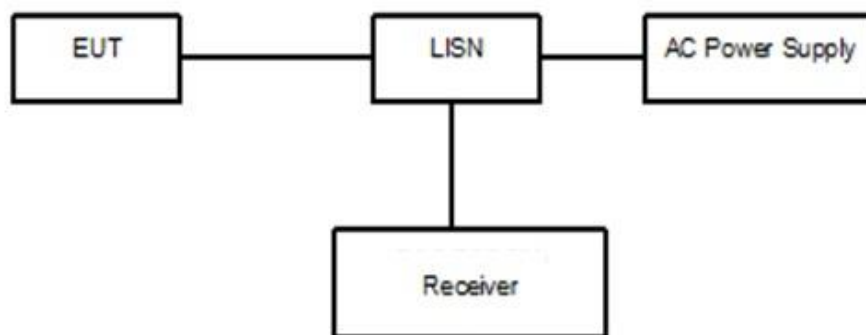


Figure 2

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 $L_{\text{cable}} + \text{ATT} + \text{VDF}$ 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: $(17.21\text{dB}\mu\text{V}) = (-12.49\text{dB}\mu\text{V}) + (29.7\text{ dB})$, the corresponding frequency is 0.75126MHz.

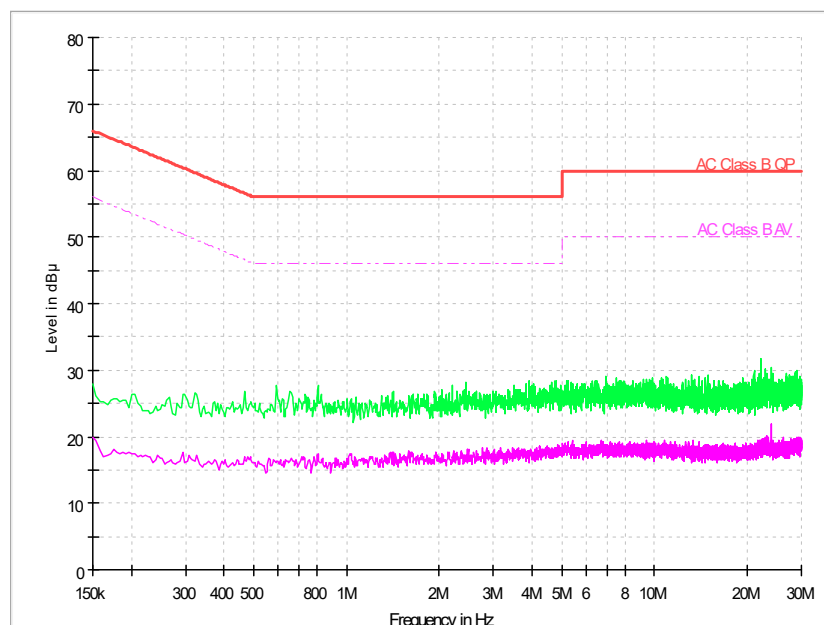
Limit:

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:

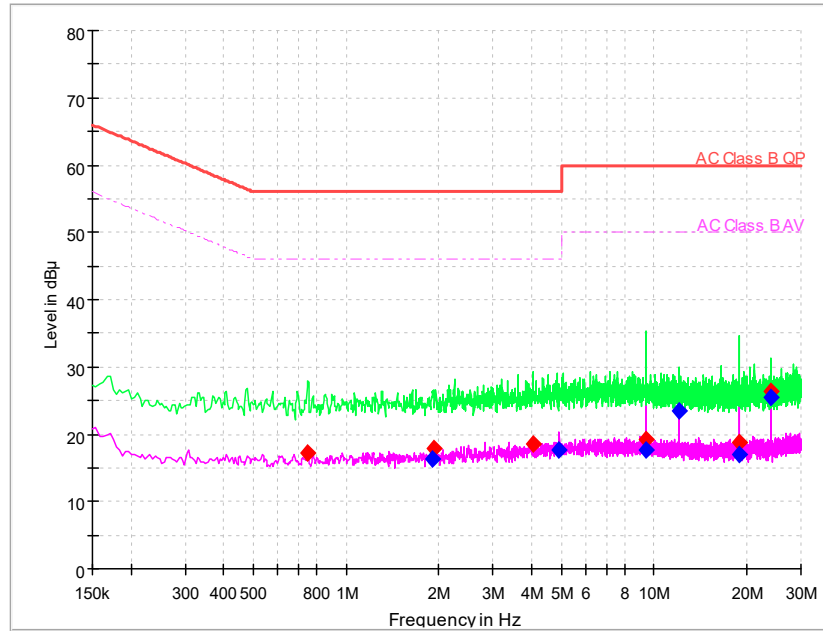
Noise Level of the Measuring Instrument



Pic1. Conducted emission L and N Line

120V AC:

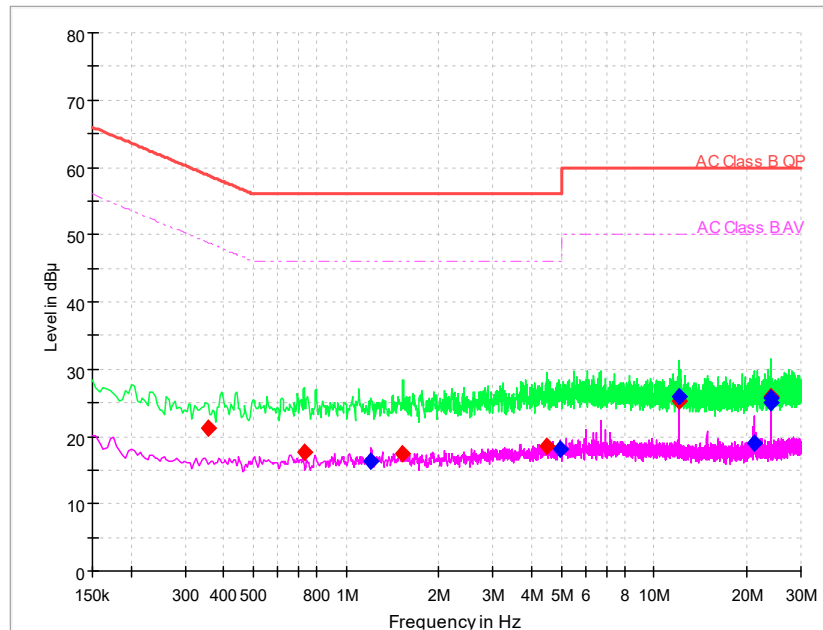
EUT +1#Power supply:



Pic2. Conducted emission L&N Line

Frequency	QuasiPeak	Average	Limit	Margin	Line	Corr.	Pmea QuasiPeak	Pmea Average
(MHz)	(dBμV)	(dBμV)	(dBμV)	(dB)		(dB)	(dBμV)	(dBμV)
0.75126	17.21	---	56	38.79	N	29.7	-12.49	---
1.90262	---	16.4	46	29.6	L1	29.8	---	-13.4
1.91968	17.85	---	56	38.15	N	29.7	-11.85	---
4.06461	18.64	---	56	37.36	N	29.7	-11.06	---
4.93026	---	17.72	46	28.28	N	29.7	---	-11.98
9.41203	---	17.76	50	32.24	L1	29.9	---	-12.14
9.41203	19.13	---	60	40.87	L1	29.9	-10.77	---
12.0388	---	23.46	50	26.54	N	29.9	---	-6.44
18.8276	18.8	---	60	41.2	L1	30	-11.2	---
18.8276	---	17.02	50	32.98	L1	30	---	-12.98
24.03	26.46	---	60	33.54	N	30.1	-3.64	---
24.03	---	25.53	50	24.47	L1	30	---	-4.47

240V AC:
EUT +1#Power supply:



Pic3. Conducted emission L&N Line

Frequency	QuasiPeak	Average	Limit	Margin	Line	Corr.	Pmea QuasiPeak	Pmea Average
(MHz)	(dBμV)	(dBμV)	(dBμV)	(dB)		(dB)	(dBμV)	(dBμV)
0.35469	21.22	---	58.85	37.63	N	29.7	-8.48	---
0.72994	17.57	---	56	38.43	L1	29.8	-12.23	---
1.20754	---	16.29	46	29.71	L1	29.8	---	-13.51
1.52736	17.42	---	56	38.58	N	29.7	-12.28	---
4.47399	18.62	---	56	37.38	L1	29.8	-11.18	---
4.95159	---	18.12	46	27.88	N	29.7	---	-11.58
12.026	25.32	---	60	34.68	L1	29.9	-4.58	---
12.0388	---	25.92	50	24.08	N	29.9	---	-3.98
21.2198	---	18.97	50	31.03	N	30.1	---	-11.13
24.03	26.01	---	60	33.99	L1	30	-3.99	---
24.03	---	25.12	50	24.88	N	30.1	---	-4.98
24.0812	---	25.59	50	24.41	L1	30	---	-4.41

2.2.2 Radiated Emissions-FCC Part15.109

Ambient condition:

Temperature	Relative humidity	Pressure
22.8°C	39.0%	100.8kPa

Test Setup:

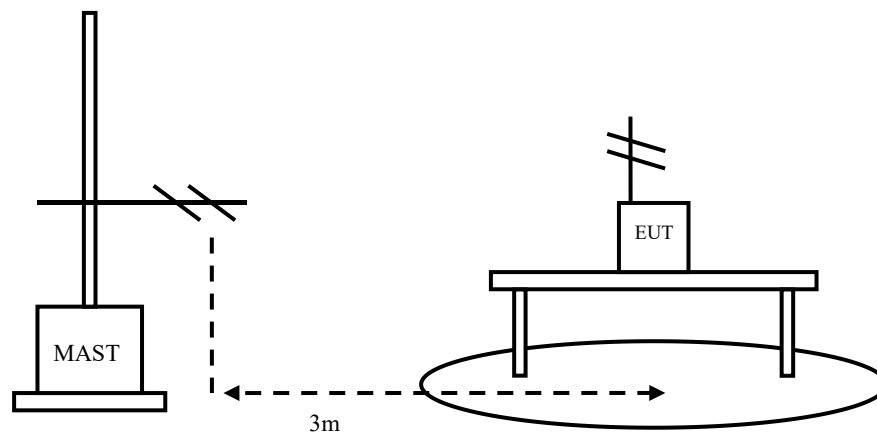


Figure 3

Test Procedure:

EUT+Power supply:

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: 30MHz<f<1GHz

RBW=1MHz, VBW=3MHz, when the test frequency: f>1GHz

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= $P_{mea} + A_{Rpl}$

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 Peak	54 74

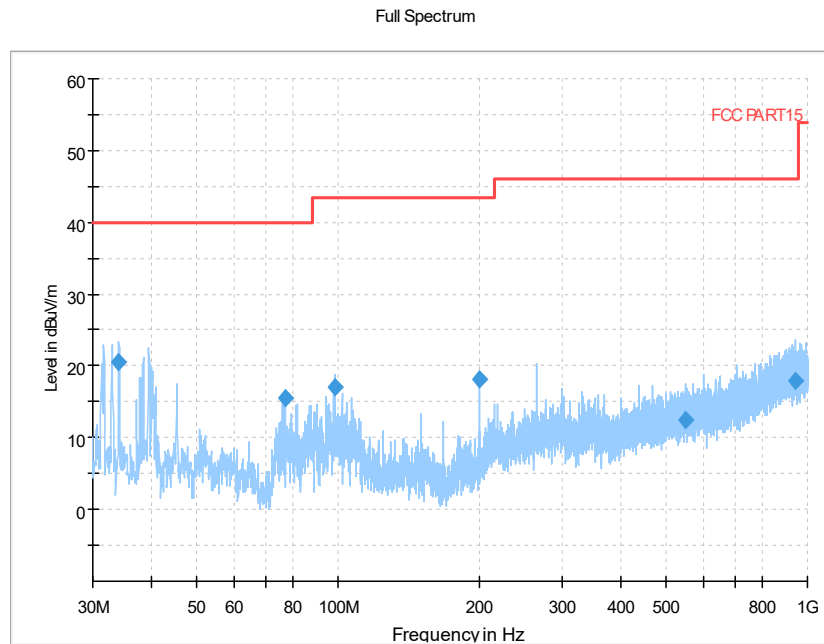
Test result:

Sample calculation: (20.49dB μ V/m) = (40.89dB μ V/m) + (-20.4dB), the corresponding frequency is 36.1225MHz.

EUT +1#Power supply:

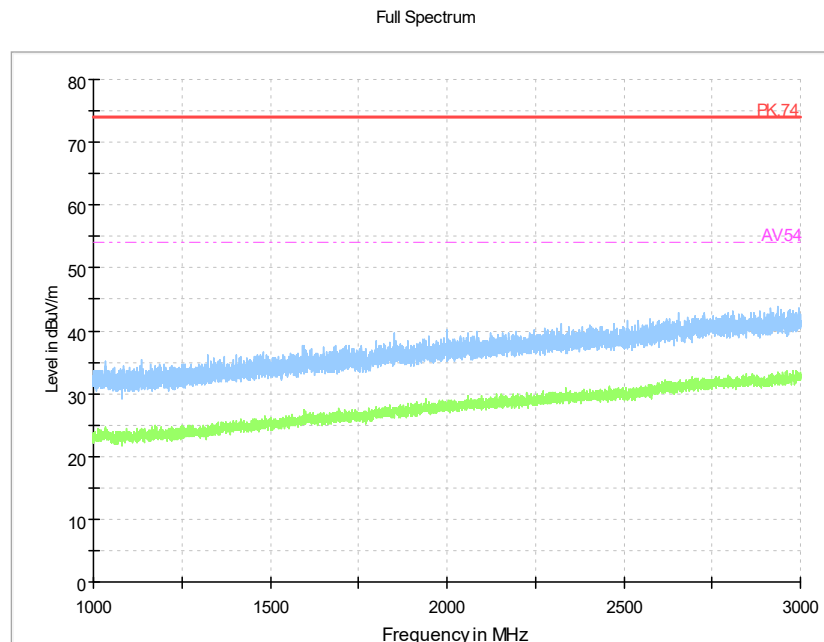
Frequency(MHz)	Result(dB μ V/m)	Limit (dB μ V/m)	ARpl (dB)	Pmea (dB μ V/m)	Polarity
34.1225	20.49	40.00	-20.4	40.89	V
77.1905	15.51	40.00	-19.7	35.21	V
98.385	17	43.50	-19.5	36.5	V
199.993	18.19	43.50	-19.7	37.89	V
551.278	12.54	46.00	-11.7	24.24	V
942.916	17.85	46.00	-5	22.85	V

EUT +1#Power supply: refer to Pic4,Pic5, Pic6, Pic7



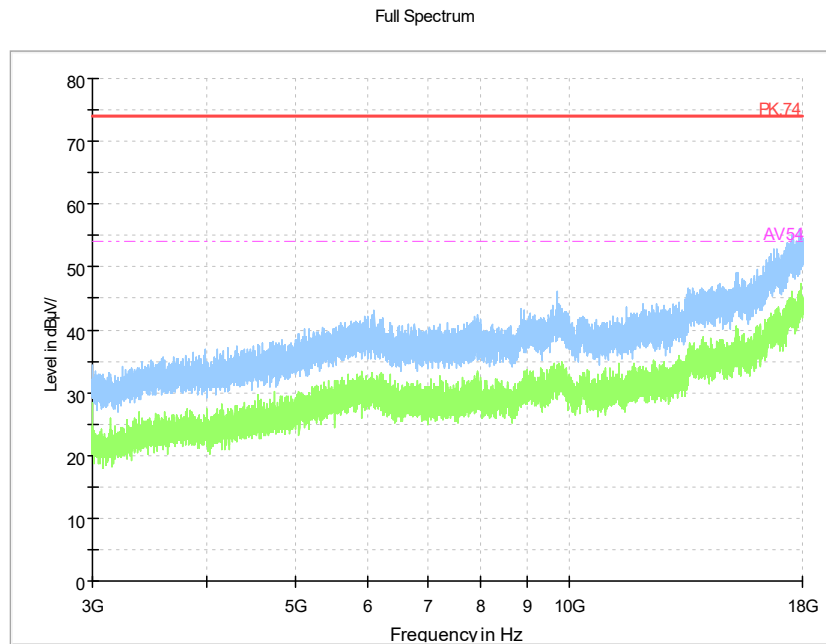
Pic4. Radiated emission(30MHz – 1GHz)

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



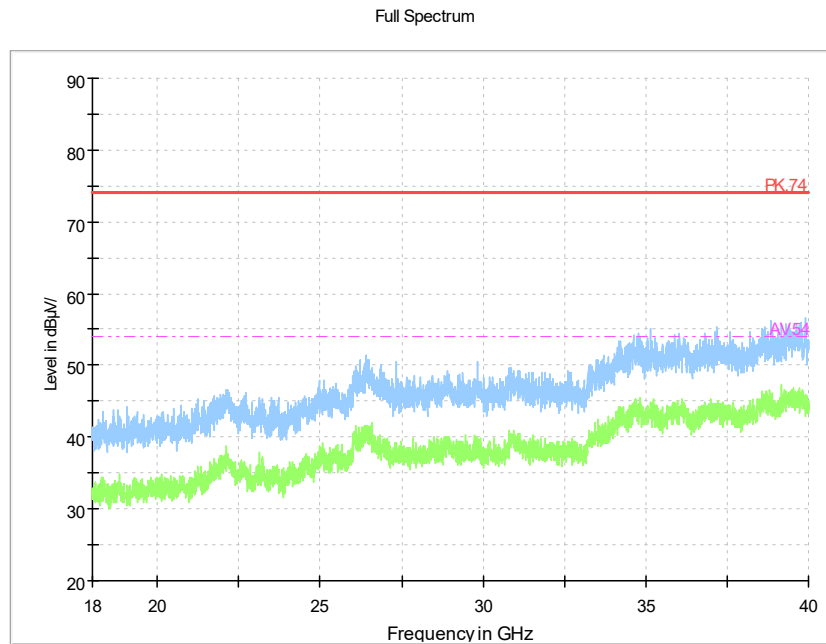
Pic5. Radiated emission (1GHz –3GHz)

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



Pic6. Radiated emission (3GHz –18GHz)

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



Pic7. 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×9.60m Semi-Anechoic Chamber	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-----