



RADIO TEST REPORT

For

Shenzhen Huafului Technology Co., Ltd

Tablet

Test Model: TAB 50

Prepared for : Shenzhen Huafului Technology Co., Ltd
Address : Unit 1401 & 1402, 14/F, Jinqi Zhigu Mansion (No. 4 Building of Chongwen Garden), Crossing of the Liuxian Street and Tangling Road, Taoyuan Street, Nanshan District, Shenzhen, P.R. China

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Date of receipt of test sample : June 25, 2023
Number of tested samples : 2
Serial number : Prototype
Date of Test : June 25, 2023 ~ July 07, 2023
Date of Report : July 10, 2023



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RADIO TEST REPORT ETSI EN 303 413 V1.2.1 (2021-04) Satellite Earth Stations and Systems (SES); Global Navigation Satellite System (GNSS) receivers; Radio equipment operating in the 1 164 MHz to 1 300 MHz and 1 559 MHz to 1 610 MHz frequency bands; Harmonised Standard for access to radio spectrum	
Report Reference No.	: LCSA062123036EK
Date of Issue	: July 10, 2023
Testing Laboratory Name	: Shenzhen LCS Compliance Testing Laboratory Ltd.
Address	: Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China
Testing Location/ Procedure	: Full application of Harmonised standards <input checked="" type="checkbox"/> Partial application of Harmonised standards <input type="checkbox"/> Other standard testing method <input type="checkbox"/>
Applicant's Name	: Shenzhen Huafurui Technology Co., Ltd
Address	: Unit 1401 & 1402, 14/F, Jinqi Zhigu Mansion (No. 4 Building of Chongwen Garden), Crossing of the Liuxian Street and Tangling Road, Taoyuan Street, Nanshan District, Shenzhen, P.R. China
Test Specification	
Standard	: ETSI EN 303 413 V1.2.1 (2021-04)
Test Report Form No.	: LCSEMC-1.0
TRF Originator	: Shenzhen LCS Compliance Testing Laboratory Ltd.
Master TRF	: Dated 2017-06
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Test Item Description	: Tablet
Trade Mark	: CUBOT
Test Model	: TAB 50
Ratings	: For AC Adapter Input: 100-240V~, 50/60Hz, 0.8A Adapter Output: 5.0V=3.0A OR 9.0V=2.0A OR 12.0V=1.5A 18.0W DC 3.85V by Rechargeable Li-ion Battery, 7500mAh
Result	: Positive

Compiled by:

Kevin Huang

Supervised by:

Cary Luo

Approved by:

Gavin Liang

Kevin Huang/ Administrator

Cary Luo/ Technique principal

Gavin Liang/ Manager



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RADIO -- TEST REPORT

Test Report No. : LCSA062123036EKJuly 10, 2023
Date of issue

Test Model..... : TAB 50

EUT..... : Tablet

Applicant..... : Shenzhen Huafurui Technology Co., Ltd

Address..... : Unit 1401 & 1402, 14/F, Jinqi Zhigu Mansion (No. 4 Building of Chongwen Garden), Crossing of the Liuxian Street and Tangling Road, Taoyuan Street, Nanshan District, Shenzhen, P.R. China

Telephone..... : /

Fax..... : /

Manufacturer..... : Shenzhen Huafurui Technology Co., Ltd

Address..... : Unit 1401 & 1402, 14/F, Jinqi Zhigu Mansion (No. 4 Building of Chongwen Garden), Crossing of the Liuxian Street and Tangling Road, Taoyuan Street, Nanshan District, Shenzhen, P.R. China

Telephone..... : /

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Factory..... : Shenzhen Huafurui Technology Co., Ltd

Address..... : Unit 1401 & 1402, 14/F, Jinqi Zhigu Mansion (No. 4 Building of Chongwen Garden), Crossing of the Liuxian Street and Tangling Road, Taoyuan Street, Nanshan District, Shenzhen, P.R. China

Telephone..... : /

Fax..... : /

Test Result**Positive**

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.



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Revision History

Report Version	Issue Date	Revision Content	Revised By
000	July 10, 2023	Initial Issue	---



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1. GENERAL INFORMATION

1.1. Product Description for Equipment Under Test (EUT)

EUT	: Tablet
Test Model	: TAB 50
Power Supply	: For AC Adapter Input: 100-240V~, 50/60Hz, 0.8A Adapter Output: 5.0V=3.0A OR 9.0V=2.0A OR 12.0V=1.5A 18.0W DC 3.85V by Rechargeable Li-ion Battery, 7500mAh
Hardware Version	: T2203G-MC-V1.1
Software Version	: CUBOT_TAB 50_P051_V01
Bluetooth	:
Frequency Range	: 2402MHz~2480MHz
Channel Number	: 79 channels for Bluetooth V5.0 (BDR/EDR) 40 channels for Bluetooth V5.0 (BT LE)
Channel Spacing	: 1MHz for Bluetooth V5.0 (BDR/EDR) 2MHz for Bluetooth V5.0 (BT LE)
Modulation Type	: GFSK, $\pi/4$ -DQPSK, 8-DPSK for Bluetooth V5.0 (BDR/EDR) GFSK for Bluetooth V5.0 (BT LE)
Bluetooth Version	: V5.0
Antenna Description	: PIFA Antenna, 0.26dBi(Max.)
WIFI(2.4G Band)	:
Frequency Range	: 2412MHz~2472MHz
Channel Spacing	: 5MHz
Channel Number	: 13 Channel for 20MHz bandwidth(2412~2472MHz) 9 channels for 40MHz bandwidth(2422~2462MHz)
Modulation Type	: 802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Antenna Description	: PIFA Antenna, 0.26dBi(Max.)
WIFI(5.2G Band)	:
Frequency Range	: 5180MHz~5240MHz
Channel Number	: 4 channels for 20MHz bandwidth(5180~5240MHz) 2 channels for 40MHz bandwidth(5190~5230MHz) 1 channels for 80MHz bandwidth(5210MHz)
Modulation Type	: 802.11a/n: OFDM (64QAM, 16QAM, QPSK, BPSK) 802.11ac: OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK)
Antenna Description	: PIFA Antenna, 0.38dBi(Max.)
WIFI(5.8G Band)	:



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Frequency Range : 5745MHz~5825MHz
Channel Number : 5 channels for 20MHz bandwidth(5745~5825MHz)
2 channels for 40MHz bandwidth(5755~5795MHz)
1 channels for 80MHz bandwidth(5775MHz)
Modulation Type : 802.11a/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
802.11ac: OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK)
Antenna Description : PIFA Antenna, 0.38dBi(Max.)

2G :

Support Band : ☒ GSM 900 (EU-Band) ☒ DCS 1800 (EU-Band)
☒ GSM 850 (U.S.-Band) ☒ PCS 1900 (U.S.-Band)

Release Version : R99

GPRS Class : Class 12

EGPRS Class : Class 12

Uplink : GSM 900: 880MHz~915MHz
DCS 1800: 1710MHz~1785MHz

Downlink : GSM 900: 925MHz~960MHz
DCS 1800: 1805MHz~1880MHz

Type Of Modulation : GMSK for GSM/GPRS; GMSK/8PSK for EGPRS

Antenna Description : PIFA Antenna
-0.71dBi (max.) For GSM 900
0.7dBi (max.) For DCS 1800

Power Class : GSM 900: Level 5, DCS 1800: Level 0
EGPRS 900: Level 8, EGPRS 1800: Level 2

3G :

Support Band : ☐ WCDMA Band II (U.S.-Band)
☐ WCDMA Band V (U.S.-Band)
☐ WCDMA Band IV (U.S.-Band)
☒ WCDMA Band I (EU-Band)
☒ WCDMA Band VIII (EU-Band)

Release Version : R8

Uplink : WCDMA Band I: 1920MHz~1980MHz
WCDMA Band VIII: 880MHz~915MHz

Downlink : WCDMA Band I: 2110MHz~2170MHz
WCDMA Band VIII: 925MHz~960MHz

Type Of Modulation : QPSK/16QAM

Antenna Description : PIFA Antenna
0.83dBi (max.) For WCDMA Band I
0.71dBi (max.) For WCDMA Band VIII

Power Class : Level 3

LTE :

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Support Band : ☒ E-UTRA Band 1(EU-Band)
☒ E-UTRA Band 3(EU-Band)
☒ E-UTRA Band 7(EU-Band)
☒ E-UTRA Band 8(EU-Band)
☒ E-UTRA Band 20(EU-Band)

LTE Release Version : R9

FDD Band : Uplink: E-UTRA Band 1: 1920MHz~1980MHz
E-UTRA Band 3: 1710MHz~1785MHz
E-UTRA Band 7: 2500MHz~2570MHz
E-UTRA Band 8: 880MHz~915MHz
E-UTRA Band 20: 832MHz~862MHz
Downlink: E-UTRA Band 1: 2110MHz~2170MHz
E-UTRA Band 3: 1805MHz~1880MHz
E-UTRA Band 7: 2620MHz~2690MHz
E-UTRA Band 8: 925MHz~960MHz
E-UTRA Band 20: 791MHz~821MHz

Type Of Modulation : QPSK/16QAM

Antenna Description : PIFA Antenna
0.83dBi (max.) For E-UTRA Band 1
0.7dBi (max.) For E-UTRA Band 3
1.16dBi (max.) For E-UTRA Band 7
-0.71dBi (max.) For E-UTRA Band 8
-1.31dBi (max.) For E-UTRA Band 20

Power Class : Class 3

GPS Receiver :

Receive Frequency : 1575.42MHz

Channel Number : 1

Antenna Description : PIFA Antenna, 0.53dBi(Max.)

GLONASS Receiver :

Receive Frequency : 1602.5625MHz

Channel Number : 1

Antenna Description : PIFA Antenna, 0.53dBi(Max.)

Galileo Receiver :

Receive Frequency : 1589.74MHz

Channel Number : 1

Antenna Description : PIFA Antenna, 0.53dBi(Max.)



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1.2. Objective

This Type approval report is prepared on behalf of **Shenzhen Huafurui Technology Co., Ltd** in accordance with ETSI EN 303 413 V1.2.1 (2021-04), Satellite Earth Stations and Systems (SES); Global Navigation Satellite System (GNSS) receivers; Radio equipment operating in the 164 MHz to 1 300 MHz and 1 559 MHz to 1 610 MHz frequency bands; Harmonised Standard for access to radio spectrum.

The objective is to determine compliance with ETSI EN 303 413 V1.2.1 (2021-04).

1.3. Related Submittal(s)/Grant(s)

No Related Submittals.

1.4. Test Methodology

All measurements contained in this report were conducted with ETSI EN 303 413 V1.2.1 (2021-04).

1.5. Description of Test Facility

NVLAP Accreditation Code is 600167-0.

FCC Designation Number is CN5024.

CAB identifier is CN0071.

CNAS Registration Number is L4595.

1.6. Support Equipment List

Manufacturer	Description	Model	Serial Number	Certificate
ShenZhen HuaJin Electronics Co., Ltd	AC Adapter	HJ-FC001K7-EU	---	CE

1.7. External I/O

I/O Port Description	Quantity	Cable
Type-C USB Port	1	USB Cable: 1.0m, unshielded
Headphone Port	1	Headphone Cable: 1.2m, unshielded





1.8. Measurement Uncertainty

Item	MU	Remark
Uncertainty for Power point Conducted Emissions Test	2.42dB	
Uncertainty for Radiation Emission test in 3m chamber (30MHz to 1GHz)	3.54dB	Polarize: V
	4.1dB	Polarize: H
Uncertainty for Radiation Emission test in 3m chamber (1GHz to 25GHz)	2.08dB	Polarize: H
	2.56dB	Polarize: V
Uncertainty for radio frequency	0.01ppm	
Uncertainty for conducted RF Power	0.65dB	
Uncertainty for temperature	0.2℃	
Uncertainty for humidity	1%	
Uncertainty for DC and low frequency voltages	0.06%	

9. Description Of Test Modes

The EUT has been tested under operating condition.

Mode 1: GPS Receiving;

Mode 2: GLONASS Receiving;

Mode 3: Galileo Receiving;

This test was performed with EUT in X, Y, Z position and the worse case was found when EUT in Y position.





2. SYSTEM TEST CONFIGURATION

2.1. Justification

The system was configured for testing in engineering mode.

2.2. EUT Exercise Software

N/A.

2.3. Special Accessories

N/A.

2.4. Block Diagram/Schematics

Please refer to the related document.

2.5. Equipment Modifications

Shenzhen LCS Compliance Testing Laboratory Ltd. has not done any modification on the EUT.

2.6. Configuration of Test Setup

Please refer to the test setup photo.





3. SUMMARY OF TEST RESULTS

RULES ETSI EN 303 413 V1.2.1 (2021-04)	DESCRIPTION OF TEST	RESULT
§ 4.2.1	Receiver blocking	Compliant
§ 4.2.2	Receiver spurious emissions	Compliant

Note: "N/A" means this test item is not applicable.





4. TEST RESULTS

4.1. Receiver blocking

4.1.1 Definition and Limit

Receiver blocking is a measure of the capability of the GUE to receive a wanted signal without exceeding a given degradation due to the presence of an unwanted input signal operating in accordance with the allocation table of the ITU Radio Regulations [i.13] in frequency bands adjacent or near-adjacent to the relevant RNSS band.

The C/N_0 metric reported by the GUE for all GNSS constellations and GNSS signals given in table 4-1 and supported by the GUE shall not degrade by more than the value given in equation (4-1) when a blocking signal is applied. The blocking signal is defined in table 4-4, with the frequencies and power levels defined in table 4-2 and/or in table 4-3 depending on the RNSS bands supported by the GUE

Equation 4-1: Maximum degradation in C/N_0

$$\Delta C/N_0 \leq 1 \text{ dB} \quad (4-1)$$

Table 4-2: Frequency bands, blocking signal test point centre frequencies and power levels for the 1 559 MHz to 1 610 MHz RNSS band

Frequency band (MHz)	Test point centre frequency (MHz)	Blocking signal power level (dBm)	Comments
1518 to 1525	1524	-65	MSS (space-to-Earth) band
1525 to 1549	1548	-95	MSS (space-to-Earth) band
1549 to 1559	1554	-105	MSS (space-to-Earth) band
1559 to 1610	GUE RNSS band under test		
1610 to 1626	1615	-105	MSS (space-to-Earth) band
1626 to 1640	1627	-85	MSS (space-to-Earth) band

Table 4-3: Frequency bands, blocking signal test point centre frequencies and power levels for the 1 164 MHz to 1 300 MHz RNSS band

Frequency band (MHz)	Test point centre frequency (MHz)	Blocking signal power level (dBm)	Comments
960 to 1164	1154	-75	AM(R)S, ARNS band
1164 to 1215	GUE RNSS band under test		
1215 to 1260	GUE RNSS band under test		
1260 to 1300	GUE RNSS band under test		
1300 to 1350	1310	-85	Radiolocation, ARNS, RNSS (Earth-to-space) band

Table 4-4: Blocking signal

Parameter	Value	Comments
Frequency	See table 4-2 and table 4-3	
Power level	See table 4-2 and table 4-3	
Bandwidth	1 MHz	See clause B.1 for details
Format	AWGN	





4.1.2 Test Procedure

- 1) Configure the GNSS signal generator to simulate the GNSS constellations and GNSS signals from table 4-1 declared as supported by the GUE, with power levels and other details as specified in clause B.2.
- 2) With the blocking signal switched off, the EUT shall be given sufficient time to acquire all simulated satellites from the declared GNSS constellations.
- 3) Record the C/N_0 value(s) reported by the EUT under the condition in step 2). Sufficient filtering shall be used to obtain stable value(s). C/N_0 may be averaged over time and across all the simulated satellites for a particular GNSS constellation and GNSS signal. However, C/N_0 shall not be averaged across different satellite signals in the same GNSS constellation or across different GNSS constellations. For a multi-GNSS constellation and/or multi-GNSS signal EUT, there shall be a separate C/N_0 value recorded for each GNSS constellation and each GNSS signal supported.
- 4) The blocking signal generator shall be configured to generate the signal defined in table 4-4, at the first test point centre frequency and signal power level as specified in table 4-2.
- 5) The blocking signal shall be switched on, and the EUT's C/N_0 value(s) recorded as in step 3). The difference(s) between this value(s) and the value(s) recorded in step 3) is the C/N_0 degradation caused by the blocking signal for this test point.
- 6) Test point Pass/Fail Criteria: If the C/N_0 degradation from step 5) does not exceed the value in equation (4-1), then this test point is set to "pass". If the C/N_0 degradation exceeds the value in equation (4-1), then this test point is set to "fail". For a multi-GNSS constellation and/or multi-GNSS signal EUT, there shall be a separate pass/fail determination for each GNSS constellation and for each GNSS signal supported. If the C/N_0 degradation exceeds the value in equation (4-1) for any supported GNSS constellation or supported GNSS signal, then this test point is set to "fail".
- 7) Step 1) through step 6) shall be repeated for all test point centre frequencies (and associated signal power level) specified in table 4-2.

4.1.3 Test Result

Environmental Conditions

Temperature/ Humidity:	22.3°C/ 52.8%	ATM Pressure:	100.9 kPa
Operator:	Nick Peng	Conclusion:	Pass

GPS Receiver

Frequency Band(MHz)	Test Point Center Frequency(MHz)	Blocking signal power level (dBm)	Test Result(dB)	Limit(dB) ($\Delta C/N_0$)
1518 to 1525	1524	-65	0.46	≤ 1
1525 to 1549	1548	-95	0.28	≤ 1
1 549 to 1 559	1554	-105	0.59	≤ 1
1 610 to 1 626	1615	-105	0.72	≤ 1
1 626 to 1 640	1627	-85	0.44	≤ 1



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GLONASS Receiver

Frequency Band(MHz)	Test Point Center Frequency(MHz)	Blocking signal power level (dBm)	Test Result(dB)	Limit(dB) ($\Delta C/N_0$)
1518 to 1525	1524	-65	0.43	≤ 1
1525 to 1549	1548	-95	0.24	≤ 1
1 549 to 1 559	1554	-105	0.55	≤ 1
1 610 to 1 626	1615	-105	0.85	≤ 1
1 626 to 1 640	1627	-85	0.61	≤ 1

Galileo Receiver

Frequency Band(MHz)	Test Point Center Frequency(MHz)	Blocking signal power level (dBm)	Test Result(dB)	Limit(dB) ($\Delta C/N_0$)
1518 to 1525	1524	-65	0.51	≤ 1
1525 to 1549	1548	-95	0.49	≤ 1
1 549 to 1 559	1554	-105	0.60	≤ 1
1 610 to 1 626	1615	-105	0.84	≤ 1
1 626 to 1 640	1627	-85	0.56	≤ 1





4.2. Receiver Spurious Emissions

4.2.1 Definition and Limit

Receiver spurious emissions are emissions at any frequency when the GUE is active.

Frequency range	Maximum power	Bandwidth
30 MHz to 1 GHz	-57 dBm	100 kHz
1 GHz to 8,3 GHz	-47 dBm	1 MHz

4.2.2 Test Procedure

Please refer to ETSI EN 303 413 V1.2.1 (2021-04) clause 5.5.3 for measurement method.

4.2.3 Test Result

Environmental Conditions

Temperature/ Humidity:	22.3°C / 52.8%	ATM Pressure:	100.9 kPa
Test Mode:	Mode 1-1575.42MHz	Operator:	Nick Peng

Test Result For Receiving Mode(Detecting Frequency Range: 30MHz~1GHz)

Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
68.37	-68.56	-57.00	-11.56	V
911.73	-67.00	-57.00	-10.00	V
164.43	-74.68	-57.00	-17.68	H
925.23	-73.94	-57.00	-16.94	H

Test Result For Receiving Mode(Detecting Frequency Range: Above 1GHz)

Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
1715.23	-70.39	-47.00	-23.39	V
3563.28	-57.60	-47.00	-10.60	H
2018.54	-72.99	-47.00	-25.99	H
3566.31	-60.81	-47.00	-13.81	V



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**Environmental Conditions**

Temperature/ Humidity:	22.3°C / 52.8%	ATM Pressure:	100.9 kPa
Test Mode:	Mode 2-1602.5625MHz	Operator:	Nick Peng

Test Result For Receiving Mode(Detecting Frequency Range: 30MHz~1GHz)

Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
68.51	-68.50	-57.00	-11.50	V
912.56	-70.96	-57.00	-13.96	V
164.58	-74.55	-57.00	-17.55	H
927.87	-76.14	-57.00	-19.14	H

Test Result For Receiving Mode(Detecting Frequency Range: Above 1GHz)

Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
1713.09	-68.14	-47.00	-21.14	V
3566.56	-54.18	-47.00	-7.18	H
2019.11	-74.56	-47.00	-27.56	H
3564.55	-60.25	-47.00	-13.25	V

Environmental Conditions

Temperature/ Humidity:	22.3°C / 52.8%	ATM Pressure:	100.9 kPa
Test Mode:	Mode 3-1589.74MHz	Operator:	Nick Peng

Test Result For Receiving Mode(Detecting Frequency Range: 30MHz~1GHz)

Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
65.63	-67.34	-57.00	-10.34	V
911.84	-67.06	-57.00	-10.06	V
166.64	-74.60	-57.00	-17.60	H
927.56	-75.00	-57.00	-18.00	H

Test Result For Receiving Mode(Detecting Frequency Range: Above 1GHz)

Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
1712.19	-70.79	-47.00	-23.79	V
3564.05	-56.68	-47.00	-9.68	H
2020.43	-74.37	-47.00	-27.37	H
3564.99	-59.77	-47.00	-12.77	V

Notes:

1. Measuring frequencies from 25MHz~10th harmonic or 26.5GHz (which is less)
2. The emissions that at least 20dB below the official limit are not reported.



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Scan code to check authenticity



5. LIST OF MEASURING EQUIPMENT

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	MXA Signal Analyzer	Agilent	N9020A	MY51250905	2022-10-29	2023-10-28
2	WIDEBAND RADIO COMMUNICATION TESTER	R&S	CMW 500	103818	2023-06-15	2024-06-14
3	MXG Vector Signal Generator	Agilent	N5182A	MY47071151	2023-06-15	2024-06-14
4	Combiner	N/A	N/A	SHWLCB2-52500S	2022-10-29	2023-10-28
5	EMI Test Software	Farad	EZ	/	N/A	N/A
6	3m Full Anechoic Chamber	MRDIANZI	FAC-3M	MR009	2021-09-25	2024-09-24
7	Positioning Controller	Max-Full	MF7802BS	MF780208586	N/A	N/A
8	By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2021-09-12	2024-09-11
9	Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1925	2021-09-05	2024-09-04
10	EMI Test Receiver	R&S	ESR 7	101181	2023-06-15	2024-06-14
11	RS SPECTRUM ANALYZER	R&S	FSP40	100503	2022-10-29	2023-10-28
12	Broadband Preamplifier	/	BP-01M18G	P190501	2023-06-15	2024-06-14





6. PHOTOGRAPHS OF TEST SETUP

Please refer to separated files Appendix D for Photographs of Test Setup_RF.

7. PHOTOGRAPHS OF THE EUT

Please refer to separated files Appendix C for Photographs of The EUT.

-----THE END OF REPORT-----

