


Prüfbericht-Nr.: Test report no.:	CN23UBM9 003	Auftrags-Nr.: Order no.:	168493036	Seite 1 von 23 Page 1 of 23
Kunden-Referenz-Nr.: Client reference no.:	N/A	Auftragsdatum: Order date:	2024-08-05	
Auftraggeber: Client:	Mavenir Systems Inc 1700 International Pkwy Suite 200, Richardson, TX 75081 USA			
Prüfgegenstand: Test item:	Remote Radio Unit			
Bezeichnung / Typ-Nr.: Identification / Type no.:	MR44MOA			
Auftrags-Inhalt: Order content:	Test Report			
Prüfgrundlage: Test specification:	47 CFR Part 24 Subpart E 47 CFR Part 27 Subpart C 47 CFR Part 2 Subpart J		RSS-133 Issue 7 July 24, 2024 RSS-139 Issue 4, October 2022 RSS-Gen Issue 5, April 2018 with Amendment 1 and Amendment 2	
Wareneingangsdatum: Date of sample receipt:	2024-07-03			
Prüfmuster-Nr.: Test sample no.:	A003591764-003			
Prüfzeitraum: Testing period:	2024-07-10 – 2024-07-31			
Ort der Prüfung: Place of testing:	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüflaboratorium: Testing laboratory:	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüfergebnis*: Test result*:	Pass			
geprüft von: tested by:	 Bell Hu	genehmigt von: authorized by:	 Lin Lin	
Datum: Date:	2024-08-29	Ausstellungsdatum: Issue date:	2024-08-29	
Stellung / Position:	Sachverständige(r)/Expert	Stellung / Position:	Sachverständige(r)/Expert	
Sonstiges / Other:	FCC ID: 2AWAS-901-00094C			
Zustand des Prüfgegenstandes bei Anlieferung: Condition of the test item at delivery:	Prüfmuster vollständig und unbeschädigt Test item complete and undamaged			
* Legende:	P(ass) = entspricht o.g. Prüfgrundlage(n)	F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
* Legend:	P(ass) = passed a.m. test specification(s)	F(ail) = failed a.m. test specification(s)	N/A = not applicable	N/T = not tested
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the above mentioned test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>				

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Anmerkungen
Remarks

- | | |
|---|--|
| 1 | <p>Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben. Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden.</p> <p><i>The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system. Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.</i></p> |
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| 3 | <p>Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben. Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt.</p> <p><i>Test clauses with remark of * are subcontracted to qualified subcontractors and described under the respective test clause in the report. Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.</i></p> |
| 4 | <p>Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnissen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. Zu weiteren Informationen bezüglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019.</p> <p><i>The decision rule for statements of conformity, based on numerical measurement results, in this test report is based on the "Zero Guard Band Rule" and "Simple Acceptance" in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report. For additional information to the resulting risk based of this decision rule please refer to ILAC G8:2019.</i></p> |

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TEST SUMMARY

5.1.1 MODULATION CHARACTERISTICS

RESULT: Pass

5.1.2 FREQUENCY STABILITY

RESULT: Pass

5.1.3 TRANSMITTER POWER

RESULT: Pass

5.1.4 PEAK TO AVERAGE POWER RATIO (PAPR)

RESULT: Pass

5.1.5 OCCUPIED BANDWIDTH AND 26DB BANDWIDTH

RESULT: Pass

5.1.6 TRANSMITTER UNWANTED EMISSIONS AT ANTENNA TERMINALS

RESULT: Pass

5.1.7 TRANSMITTER UNWANTED EMISSIONS AT ANTENNA TERMINALS – BAND EDGE

RESULT: Pass

5.1.8 RECEIVER SPURIOUS EMISSIONS

RESULT: Pass

5.1.9 FIELD STRENGTH OF SPURIOUS RADIATION

RESULT: Pass

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1 GENERAL REMARKS

1.1 COMPLEMENTARY MATERIALS

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix A: Test Results

Appendix B: Test Results of Field Strength of Spurious Radiation

Appendix C: Photographs of the Test Set-Up

1.2 TEST STANDARD(S)

Applied Rules: 47 CFR Part 24 Subpart E
47 CFR Part 27 Subpart C
47 CFR Part 2 Subpart J
RSS-133 Issue 7 July 24, 2024
RSS-139 Issue 4, October 2022
RSS-Gen Issue 5, April 2018 with Amendment 1 and Amendment 2

Test Method: ANSI C63.26-2015
KDB 971168 D01 v03r01 Power Meas License Digital Systems
KDB 662911 D01 v02r01 Multiple Transmitter Output

1.3 LIST OF DOCUMENT CHANGE

No.	Report No.	Description
1	CN23UBM9 003	First release.

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2 TEST SITES

2.1 TEST FACILITIES

TÜV Rheinland (Shenzhen) Co., Ltd.

(FCC Registration No.: 694916 & IC Registration Number: 25069)

Address: No. 362 Huanguan Road Middle, Longhua District, Shenzhen 518110, P.R. China

2.2 TEST DATE

Date of test: 2024-07-10 to 2024-07-31

2.3 LIST OF TEST AND MEASUREMENT INSTRUMENTS

Table 1: List of Test and Measurement Equipment

<input checked="" type="checkbox"/> Radio Spectrum Testing				
Description	Manufacturer	Model	Serial No.	Calibrated until (DD.MM.YYYY)
MXA Signal Analyzer	Keysight	N9020B	MY62153139	20.03.2025
Signal and spectrum analyzer	Rohde & Schwarz	FSV3030	101576	05.11.2024
MXG Vector Signal Generator	Keysight	N5182B	MY59101222	16.05.2025
MXG Vector Signal Generator	Keysight	N5182B	MY62150390	20.03.2025
Temp.&Humidity Chamber	GIANT FORCE	ITH-150-40-CP-AR	IAA1406-004	31.10.2024
<input checked="" type="checkbox"/> Unwanted Emission Testing (TS9975)				
Description	Manufacturer	Model	Serial No.	Calibrated until (DD.MM.YYYY)
EMI Test Receiver	R&S	ESR 7	102021	25.07.2025
Signal Analyzer	R&S	FSV 40	101439	25.07.2025
System Controller Interface	R&S	SCI-100	S10010038	N/A
Filterbank	R&S	Wlan	100759	25.07.2025
OSP	R&S	OSP 120	102040	N/A
Pre-amplifier	R&S	SCU08F1	08320031	25.07.2025
Amplifier	R&S	SCU-18F	180070	25.07.2025
Amplifier	R&S	SCU40A	100475	25.07.2025

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Trilog Broadband Antenna (30 MHz - 7 GHz)	Schwarzbeck	VULB 9162	193	06.08.2024
Double-Ridged Antenna (1 -18 GHz)	ETS-LINDGREN	3117	00218717	06.08.2024
Wideband Ridged Horn Antenna (18-40 GHz)	Steatite	QMS-00880	19067	27.08.2024
Active Loop Antenna	Schwarzbeck	FMZB 1513	302	06.08.2024
Test software	R&S	EMC32 (V10.60.10)	N/A	N/A
Control PC	Dell	OptiPlex 7050	36NV9P2	N/A
3m Semi-Anechoic Chamber	Albatross	SAC-3m	APC17151-SAC	22.06.2025

2.4 TRACEABILITY

All measurement equipment calibrations are traceable to NIST or where calibration is performed outside the United States, to equivalent nationally recognized standards organizations.

2.5 CALIBRATION

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

2.6 LOCATION OF ORIGINAL DATA

The original copies of all test data taken during actual testing were attached at Appendix A of this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Shenzhen) file for certification follow-up purposes.

2.7 STATUS OF FACILITY USED FOR TESTING

The TÜV Rheinland (Shenzhen) Co., Ltd. facility located at No. 362 Huanguan Road Middle, Longhua District, Shenzhen 518110, P.R. China is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

3 GENERAL PRODUCT INFORMATION

3.1 GENERAL DESCRIPTION

The EUT is an outdoor remote radio unit. It's the radio frequency (RF) part of a distributed base station. For details refer to the User Manual, Technical Description and Circuit Diagram.

3.2 RATING AND SYSTEM DETAILS

Table 2: Rating of EUT

General Information of EUT	Description
Kind of Equipment:	Remote Radio Unit
Type Designation:	MR44MOA
Trademark:	Mavenir
FCC ID:	2AWAS-901-00094C
Type of Equipment:	Cellular Network – Base Station
Operating Voltage:	DC -48V
Extreme Voltage:	DC -38.5V ~ -57.5V
Operating Temperature Range:	-40 °C - +55 °C

Table 3: Technical Specification of EUT

Characteristic	Description
Operated Modes:	LTE, NR
Operational Frequency Band(s):	Band 25; Band 66; Band n66
Operating Frequency Range:	Band 25: Downlink: 1930-1995 MHz / Uplink: 1850-1915 MHz Band 66 / n66: Downlink: 2110-2200 MHz / Uplink: 1710-1780 MHz
Testing Frequency Range:	Band 25: Downlink: 1930-1995 MHz / Uplink: 1850-1915 MHz Band 66 / n66: Downlink: 2110-2190 MHz / Uplink: 1710-1780 MHz
Type of Base Station:	Non-AAS Base Station
Rated RF Output Power:	46.0 dBm per port
Modulation Type:	QPSK, 16QAM, 64QAM, 256QAM
Antenna Ports:	4 TRX ports
Antenna Type:	External Antenna
Antenna Gain:	No dedicated antenna, Maximum allowed Gain against to ERP/EIRP limit and MPE evaluation.
Supported Channel Bandwidth:	Band 25: 20 MHz

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	Band 66: 20 MHz Band n66: 10 MHz, 25 MHz, 30 MHz
Supported Carriers	1 carrier per band
Multi-band Operation	Yes
Maximum RF Bandwidth:	Band 25: 65 MHz Band 66: 80 MHz

3.3 INDEPENDENT OPERATION MODES

The basic operation modes are:

- A. On, Transmitting
 - 1) Bottom channel (B)
 - 2) Middle channel (M)
 - 3) Top channel (T)
- B. On, Receiving
 - 1) Bottom channel (B)
 - 2) Middle channel (M)
 - 3) Top channel (T)
- C. Idle
- D. Off

3.4 NOISE GENERATING AND NOISE SUPPRESSING PARTS

Refer to the Circuit Diagram.

3.5 SUBMITTED DOCUMENTS

- User Manual
- Circuit Diagram
- Block Diagram
- Schematics
- Model Difference Letter
- Rating Label
- PCB Layout
- Photo Document
- Parts List

4 TEST SET-UP AND OPERATION MODES

4.1 PRINCIPLE OF CONFIGURATION SELECTION

Radio Spectrum: The equipment under test (EUT) was configured at its highest power output in order to measure its highest possible radiation and conducted level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 TEST OPERATION AND TEST SOFTWARE

Test operation refers to test setup in chapter 5. All testing were performed according to the procedure in KDB 971168 D01 and ANSI C63.26.

Table 4: List of Frequencies under Test for Single band operation

Operation Band	Channel Bandwidth (MHz)	Frequency (MHz)		
		B	M	T
LTE Band 25	20	1940	1962.5	1985
LTE Band 66	20	2120	2150	2180
NR Band n66	10	2115	2150	2185
NR Band n66	25	2122.5	2150	2177.5
NR Band n66	30	2125	2150	2175

Note: Only Middle channel was selected for final measurement because the frequencies of Bottom, Middle and Top channel have the same frequency and bandwidth.

Table 5: List of Frequencies under Test for Multi-band and Multi-carrier operation

Operation Band	Channel Bandwidth (MHz)	Frequency (MHz)	
		B+T'	T+B'
NR Band n66 + LTE Band 25	10+20	2115+1985	2185+1940
	25+20	2122.5+1985	2177.5+1940
NR Band n66 + LTE Band 66	30+20	2125+2180	--

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Table 6: Test Environments

Environment Parameter	Selected Values During Tests		
	Temperature (°C)	Voltage (V) DC	Relative Humidity (%)
Normal (NTNV)	23	-48	51.1%
HTHV	55 °C	-57.5	---
LTHV	-40 °C	-57.5	---
HTLV	55 °C	-38.5	---
LTLV	-40 °C	-38.5	---

4.3 SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT

Table 7: Cables used during testing

Port	Quantity	Length (m)	Type of Cable
SPF Port	1	10	Optical fiber cable

Table 8: Auxiliary Equipment used during testing

Name	Model	Manufacturer	S/N
Laptop PC	Dell P98G	DELL	P98G007
DELL EMC	PowerEdge R740 6230R	DELL	3L9PWC3
DU	LTE_L1_FDD_4_10_1_70	Mavenir	N/A
GNSS Antenna	QG2 Qulsar Grand Master	Coolshark	N/A
Power Unit	W1500-26S48M	ShenZhen DCTEC	N/A
Programmable DC power supply	ADG-L-330-75-12	Preen	N/A

4.4 COUNTERMEASURES TO ACHIEVE RADIO SPECTRUM COMPLIANCE

The test sample, which has been tested, contained the noise suppression parts as described in the Constructional Data Form or the Technical Construction File. No additional measures were employed to achieve compliance.

4.5 TEST SETUP DIAGRAM

Diagram of Measurement Equipment Configuration for Transmitter Conducted Measurement



Diagram of Measurement Configuration for Radiation Test (Below 1GHz)

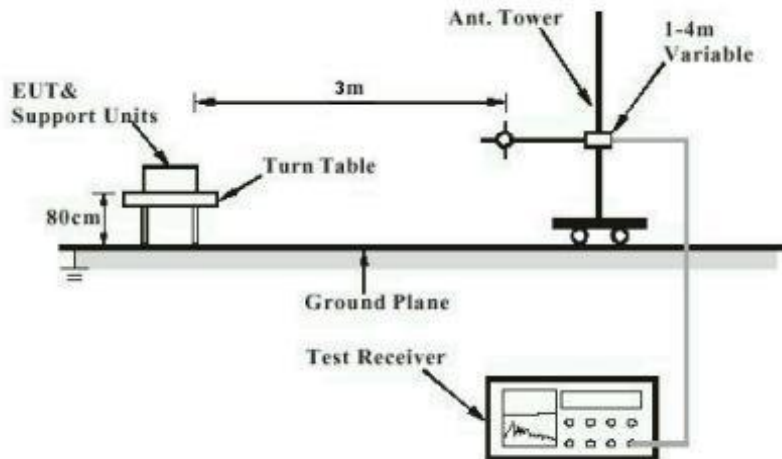
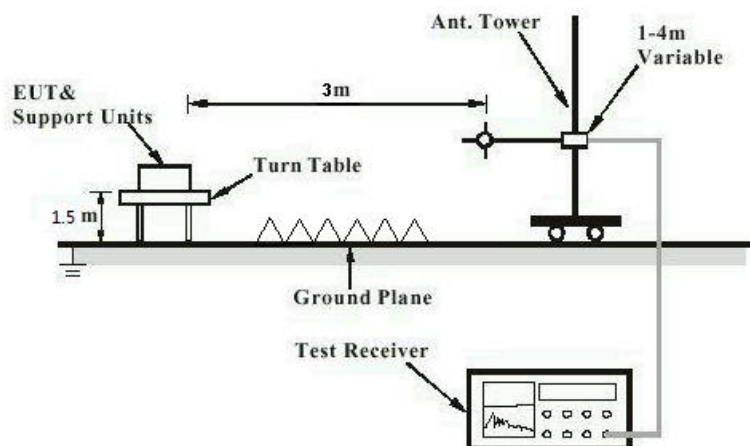


Diagram of Measurement Configuration for Radiation Test (Above 1GHz)



5 TEST RESULTS

5.1 ESSENTIAL REQUIREMENTS

5.1.1 MODULATION CHARACTERISTICS

RESULT:

Pass

Test standard	:	47 CFR Part 24 Subpart E 47 CFR Part 27 Subpart C 47 CFR Part 2 Subpart J RSS-133 Issue 7 July 24, 2024 RSS-139 Issue 4, October 2022 RSS-Gen Issue 5, April 2018 with Amendment 1 and Amendment 2
Limits	:	Section 2.1047(d) of 47 CFR Part 2 Subpart J Clause 6.2 of RSS-133 Issue 7 July 24, 2024 Clause 5.3 of RSS-139 Issue 4, October 2022 <i>The modulation used shall be digital.</i>
Test procedure	:	Clause 5.3 of ANSI C63.26-2015 Clause 3 of KDB 971168 D01 v03r01
Kind of test site	:	Shielding Room

TEST SETUP

Date of testing	:	2024-07-10 to 2024-07-31
Input voltage	:	DC -48V
Test environment	:	<input checked="" type="checkbox"/> Normal test conditions <input type="checkbox"/> Extreme test conditions
Operation mode	:	A
Ambient temperature	:	23 °C
Relative humidity	:	51.1%
Atmospheric pressure	:	101.0 kPa

Note:

The device implements digital modulation such as QPSK and higher order modulations (e.g. 16QAM, 64QAM and 256QAM), hence the EUT is deemed to comply with this requirement.

Refer to attached Appendix A for details of test results.

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5.1.2 FREQUENCY STABILITY

RESULT:

Pass

Test standard	:	47 CFR Part 24 Subpart E 47 CFR Part 27 Subpart C 47 CFR Part 2 Subpart J RSS-133 Issue 7 July 24, 2024 RSS-139 Issue 4, October 2022 RSS-Gen Issue 5, April 2018 with Amendment 1 and Amendment 2
Limits	:	Section 24.235 of 47 CFR Part 24 Subpart E Section 27.54 of 47 CFR Part 27 Subpart C Section 2.1055 of 47 CFR Part 2 Subpart J Clause 6.3 of RSS-133 Issue 7 July 24, 2024 Clause 5.4 of RSS-139 Issue 4, October 2022 <i>The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.</i> <i>The carrier frequency shall not depart from the reference frequency, in excess of ±1.0 ppm for base stations.</i> <i>The frequency stability shall be sufficient to ensure that the occupied bandwidth stays within the operating frequency block or frequency block group when tested to the temperature and supply voltage variations specified in RSS-Gen.</i>
Test procedure	:	Clause 5.6 of ANSI C63.26-2015 Clause 9 of KDB 971168 D01 v03r01 Clause 6.11 of RSS-Gen Issue 5, April 2018 with Amendment 1 and Amendment 2
Kind of test site	:	Shielding Room

TEST SETUP

Date of testing	:	2024-07-10 to 2024-07-31
Input voltage	:	DC -48V
Test environment	:	<input checked="" type="checkbox"/> Normal test conditions <input checked="" type="checkbox"/> Extreme test conditions
Operation mode	:	A
Ambient temperature	:	23 °C
Relative humidity	:	51.1%
Atmospheric pressure	:	101.0 kPa

Note:
N/A

Refer to attached Appendix A for details of test results.

5.1.3 TRANSMITTER POWER

RESULT:

Pass

Test standard	:	47 CFR Part 24 Subpart E 47 CFR Part 27 Subpart C 47 CFR Part 2 Subpart J RSS-133 Issue 7 July 24, 2024 RSS-139 Issue 4, October 2022 RSS-Gen Issue 5, April 2018 with Amendment 1 and Amendment 2
Limits	:	Section 24.232(a)(2) of 47 CFR Part 24 Subpart E Section 27.50(d)(2)(ii) of 47 CFR Part 27 Subpart C Section 2.1046 of 47 CFR Part 2 Subpart J Clause 6.4 of RSS-133 Issue 7 July 24, 2024 Clause 5.5 of RSS-139 Issue 4, October 2022 <i>FCC Limit:</i> <i>Band 25: For base stations with an emission bandwidth greater than 1 MHz are limited to 1640 watts/MHz equivalent isotropically radiated power (EIRP) with an antenna height up to 300 meters HAAT.</i> <i>Band 66: An EIRP of 1640 watts/MHz when transmitting with an emission bandwidth greater than 1 MHz. For fixed and base stations operating in the band 2110-2180 MHz with a channel bandwidth greater than 1 MHz, the maximum permissible e.i.r.p. is 62 dBm/MHz, with an antenna HAAT of up to 300 m.</i> <i>ISED Limit:</i> <i>Band 25: Non-AAS fixed station and base station, the maximum power spectral density of the equipment, measured in terms of average values, shall comply with the limits of 3280 W/MHz e.i.r.p.</i> <i>Band 66: Non-AAS fixed station and base station, the maximum power spectral density of the equipment, measured in terms of average values, shall comply with the limits of 65 dBm/MHz e.i.r.p.</i>
Test procedure	:	Clause 5.2.4.4 & 5.2.4.5 & 5.2.5.3 & 5.2.5.5 of ANSI C63.26-2015 Clause 5.2.2 & 5.4 & 5.5 & 5.6 of KDB 971168 D01 v03r01 Clause E) of KDB 662911 D01 Multiple Transmitter Output v02r01
Kind of test site	:	Shielding Room

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TEST SETUP

Date of testing	:	2024-07-10 to 2024-07-31
Input voltage	:	DC -48V
Test environment	:	<input checked="" type="checkbox"/> Normal test conditions <input type="checkbox"/> Extreme test conditions
Operation mode	:	A
Ambient temperature	:	23 °C
Relative humidity	:	51.1%
Atmospheric pressure	:	101.0 kPa

Note:

$$\text{ERP or EIRP} = P_{\text{Meas}} + G_{\text{T}}$$

Where:

ERP or EIRP: effective radiated power or equivalent isotropic radiated power, respectively (expressed in the same units as P_{Meas} , e.g. dBm or dBW)

P_{Meas} : measured transmitter output power, in dBm

G_{T} : gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP)

Refer to attached Appendix A for details of test results.

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5.1.4 PEAK TO AVERAGE POWER RATIO (PAPR)

RESULT:

Pass

Test standard	:	47 CFR Part 24 Subpart E 47 CFR Part 27 Subpart C 47 CFR Part 2 Subpart J RSS-133 Issue 7 July 24, 2024 RSS-139 Issue 4, October 2022 RSS-Gen Issue 5, April 2018 with Amendment 1 and Amendment 2
Limits	:	Section 24.232(d) of 47 CFR Part 24 Subpart E Section 27.50(d)(5) of 47 CFR Part 27 Subpart C Clause 6.4 of RSS-133 Issue 7 July 24, 2024 Clause 5.5 of RSS-139 Issue 4, October 2022 <i>the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time and shall use a signal corresponding to the highest PAPR during periods of continuous transmission.</i>
Test procedure	:	Clause 5.2.3.4 of ANSI C63.26-2015 Clause 5.7.2 of KDB 971168 D01 v03r01
Kind of test site	:	Shielding Room

TEST SETUP

Date of testing	:	2024-07-10 to 2024-07-31
Input voltage	:	DC -48V
Test environment	:	<input checked="" type="checkbox"/> Normal test conditions <input type="checkbox"/> Extreme test conditions
Operation mode	:	A
Ambient temperature	:	23 °C
Relative humidity	:	51.1%
Atmospheric pressure	:	101.0 kPa

Note:

N/A

Refer to attached Appendix A for details of test results.

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5.1.5 OCCUPIED BANDWIDTH AND 26DB BANDWIDTH

RESULT:

Pass

Test standard	:	47 CFR Part 2 Subpart J RSS-Gen Issue 5, April 2018 with Amendment 1 and Amendment 2
Test requirement	:	Section 2.1049 of 47 CFR Part 2 Subpart J Clause 6.7 of RSS-Gen Issue 5, April 2018 with Amendment 1 and Amendment 2
Limits	:	The occupied bandwidth for each E-UTRA carrier shall be less than the channel bandwidth.
Test procedure	:	Clause 5.4.3 & 5.4.4 of ANSI C63.26-2015 Clause 4.2 & 4.3 of KDB 971168 D01 v03r01 <input checked="" type="checkbox"/> Conducted measurements <input type="checkbox"/> Radiated measurements
Kind of test site	:	Shielding Room

TEST SETUP

Date of testing	:	2024-07-10 to 2024-07-31
Input voltage	:	DC -48V
Test environment	:	<input checked="" type="checkbox"/> Normal test conditions <input type="checkbox"/> Extreme test conditions
Operation mode	:	A
Ambient temperature	:	23 °C
Relative humidity	:	51.1%
Atmospheric pressure	:	101.0 kPa

Note:

N/A

Refer to attached Appendix A for details of test results.

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5.1.6 TRANSMITTER UNWANTED EMISSIONS AT ANTENNA TERMINALS

RESULT: **Pass**

Test standard	:	47 CFR Part 24 Subpart E 47 CFR Part 27 Subpart C 47 CFR Part 2 Subpart J RSS-133 Issue 7 July 24, 2024 RSS-139 Issue 4, October 2022 RSS-Gen Issue 5, April 2018 with Amendment 1 and Amendment 2
Limits	:	Section 24.238(a) of 47 CFR Part 24 Subpart E Section 27.53(h) of 47 CFR Part 27 Subpart C Section 2.1051 of 47 CFR Part 2 Subpart J Clause 6.5 of RSS-133 Issue 7 July 24, 2024 Clause 5.6 of RSS-139 Issue 4, October 2022 Clause 6.13 of RSS-Gen Issue 5, April 2018 with Amendment 1 and Amendment 2 <i>the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ dB [-13 dBm/MHz]</i>
Test procedure	:	Clause 6.13 of RSS-Gen Issue 5, April 2018 with Amendment 1 and Amendment 2 Clause 5.7 of ANSI C63.26-2015 Clause 6.1 of KDB 971168 D01 v03r01
Kind of test site	:	Shielding Room

TEST SETUP

Date of testing	:	2024-07-10 to 2024-07-31
Input voltage	:	DC -48V
Test environment	:	<input checked="" type="checkbox"/> Normal test conditions <input type="checkbox"/> Extreme test conditions
Operation mode	:	A.1
Ambient temperature	:	23 °C
Relative humidity	:	51.1%
Atmospheric pressure	:	101.0 kPa

Note:

N/A

Refer to attached Appendix A for details of test results.

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5.1.7 TRANSMITTER UNWANTED EMISSIONS AT ANTENNA TERMINALS – BAND EDGE

RESULT:

Pass

Test standard	:	47 CFR Part 24 Subpart E 47 CFR Part 27 Subpart C 47 CFR Part 2 Subpart J RSS-133 Issue 7 July 24, 2024 RSS-139 Issue 4, October 2022 RSS-Gen Issue 5, April 2018 with Amendment 1 and Amendment 2
Limits	:	Section 24.238(a) of 47 CFR Part 24 Subpart E Section 27.53(h) of 47 CFR Part 27 Subpart C Section 2.1051 of 47 CFR Part 2 Subpart J Clause 6.5 of RSS-133 Issue 7 July 24, 2024 Clause 5.6 of RSS-139 Issue 4, October 2022 Clause 6.13 of RSS-Gen Issue 5, April 2018 with Amendment 1 and Amendment 2 <i>Band 25: In the 1.0 MHz bands immediately outside and adjacent to the equipment's operating frequency block, the emission power per any 1% of the emission bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10}P(\text{watts})$.</i> <i>Band 66: -13 dBm/(1% of OB) within 1 MHz immediately outside and adjacent to the equipment's operating frequency block</i>
Test procedure	:	Clause 6.13 of RSS-Gen Issue 5, April 2018 with Amendment 1 and Amendment 2 Clause 5.7 of ANSI C63.26-2015 Clause 6.1 of KDB 971168 D01 v03r01
Kind of test site	:	Shielding Room

TEST SETUP

Date of testing	:	2024-07-10 to 2024-07-31
Input voltage	:	DC -48V
Test environment	:	<input checked="" type="checkbox"/> Normal test conditions <input type="checkbox"/> Extreme test conditions
Operation mode	:	A
Ambient temperature	:	23 °C
Relative humidity	:	51.1%
Atmospheric pressure	:	101.0 kPa

Note:

N/A

Refer to attached Appendix A for details of test results.

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5.1.8 RECEIVER SPURIOUS EMISSIONS

RESULT:

Pass

Test standard	:	RSS-133 Issue 7 July 24, 2024 RSS-Gen Issue 5, April 2018 with Amendment 1 and Amendment 2
Limits	:	Clause 6.6 of RSS-133 Issue 7 July 24, 2024 Clause 7.4 of RSS-Gen Issue 5, April 2018 with Amendment 1 and Amendment 2 <i>Band 25: The spurious emissions from the receiver at any discrete frequency, measured at the antenna port by the antenna-conducted method, shall not exceed 2 nW (-57 dBm) in the frequency range 30-1000 MHz and 5 nW (-53 dBm) above 1 GHz.</i>
Test procedure	:	Clause 7.4 of RSS-Gen Issue 5, April 2018 with Amendment 1 and Amendment 2
Kind of test site	:	Shielding Room

TEST SETUP

Date of testing	:	2024-07-10 to 2024-07-31
Input voltage	:	DC -48V
Test environment	:	<input checked="" type="checkbox"/> Normal test conditions <input type="checkbox"/> Extreme test conditions
Operation mode	:	B
Ambient temperature	:	23 °C
Relative humidity	:	51.1%
Atmospheric pressure	:	101.0 kPa

Note:

N/A

Refer to attached Appendix A for details of test results.

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5.1.9 FIELD STRENGTH OF SPURIOUS RADIATION

RESULT:

Pass

Test standard	:	47 CFR Part 24 Subpart E 47 CFR Part 27 Subpart C 47 CFR Part 2 Subpart J RSS-133 Issue 7 July 24, 2024 RSS-139 Issue 4, October 2022 RSS-Gen Issue 5, April 2018 with Amendment 1 and Amendment 2
Limits	:	Section 24.238(a) of 47 CFR Part 24 Subpart E Section 27.53(h) of 47 CFR Part 27 Subpart C Section 2.1053 of 47 CFR Part 2 Subpart J Clause 6.5 & 6.6 of RSS-133 Issue 7 July 24, 2024 Clause 5.6 of RSS-139 Issue 4, October 2022 Clause 6.13 of RSS-Gen Issue 5, April 2018 with Amendment 1 and Amendment 2 <i>the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ dB [-13 dBm/MHz]</i>
Test procedure	:	Clause 6.13 of RSS-Gen Issue 5, April 2018 with Amendment 1 and Amendment 2 Clause 5.5 of ANSI C63.26-2015 Clause 7 of KDB 971168 D01 v03r01
Kind of test site	:	Shielding Room

TEST SETUP

Date of testing	:	2024-07-10 to 2024-07-31
Input voltage	:	DC -48V
Test environment	:	<input checked="" type="checkbox"/> Normal test conditions <input type="checkbox"/> Extreme test conditions
Operation mode	:	A
Ambient temperature	:	23 °C
Relative humidity	:	51.1%
Atmospheric pressure	:	101.0 kPa

Note:

Sweep the whole frequency band through the range from 9 kHz to the 10th harmonic of the carrier, the emissions below the applicable limit are not required and not to be reported in this report. The measurement is performed for all operational modes and both antenna polarization, only the data of the worst mode is recorded in this report.

Refer to attached Appendix B for details of test results.

6 SYSTEM MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

Table 9: System Measurement Uncertainty

	Items	Extended Uncertainty
Radiated Spurious Emissions	Radiated, 9 kHz - 30 MHz	±3.97 dB
	Radiated, 30 MHz - 1 GHz	±4.17 dB
	Radiated, above 1 GHz	±4.30 dB
Remark: 95% Confidence Levels, k=2.		

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