FCC PART 15E
TEST REPORT
No.24T04Z102681-012

for

TCL Communication Ltd.

GSM/UMTS/LTE/NR Mobile phone

T513W

FCC ID:2ACCJH186

with

Hardware Version: 03

Software Version: vBCSH

Issued Date: 2025-01-13

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of CTTL.

Test Laboratory:

CTTL-Telecommunication Technology Labs, CAICT

No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China 100191.

Tel:+86(0)10-62304633-2512, Fax:+86(0)10-62304633-2504

Email: cttl_terminals@caict.ac.cn, website: www.caict.ac.cn

REPORT HISTORY

Report Number	Revision	Description	Issue Date
24T04Z102681-012	Rev.0	1st edition	2025-01-03
24T04Z102681-012	Rev.1	Update 26dB Emission Bandwidth test result of 11a、11n20	2025-01-13

Note: the latest revision of the test report supersedes all previous version.

CONTENTS

1. Test Laboratory

1.1. Introduction & Accreditation

Telecommunication Technology Labs, CAICT is an ISO/IEC 17025:2017 accredited test laboratory under American Association for Laboratory Accreditation (A2LA) with lab code 7049.01, and is also an FCC accredited test laboratory (CN1349), and ISED accredited test laboratory (CAB identifier:CN0066). The detail accreditation scope can be found on A2LA website.

1.2. Testing Location

Conducted testing Location: CTTL(Huayuan North Road)

Address: No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China100191

Radiated testing Location: CTTL(huayuan North Road)

Address: No. 52, Huayuan North Road, Haidian District, Beijing, 100191, P. R. China

1.3. Testing Environment

Normal Temperature: 15-35°C

Relative Humidity: 20-75%

1.4. Project date

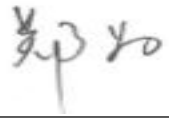
Testing Start Date: 2024-11-26

Testing End Date: 2025-01-13

1.5. Signature

Yao Xingyu

(Prepared this test report)



Zheng Wei

(Reviewed this test report)

Pang Shuai

(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name:	TCL Communication Ltd.
Address/Post:	5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong
City:	Hong Kong
Postal Code:	/
Country:	China
Contact Person:	Ting Wang
Contact Email:	ting.wang.hz@tcl.com
Telephone:	+86 752 2639091
Fax:	0086-755-36612000-81722

2.2. Manufacturer Information

Company Name:	TCL Communication Ltd.
Address/Post:	5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong
City:	Hong Kong
Postal Code:	/
Country:	China
Contact Person:	Ting Wang
Contact Email:	ting.wang.hz@tcl.com
Telephone:	+86 752 2639091
Fax:	0086-755-36612000-81722

3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

Description	GSM/UMTS/LTE/NR Mobile phone
Model name	T513W
FCC ID	2ACCJH186
WLAN Frequency Band	ISM Bands: -5150MHz~5250MHz -5250MHz~5350MHz -5470MHz~5725MHz
Type of modulation	OFDM
Antenna	Integral Antenna
Nominal Voltage	3.87V
Extreme High Voltage	4.45V
Extreme Low Voltage	3.6V

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version	Date of receipt
UT48a	016604000206871/ 016604000206889	03	vBCSH	2024-11-27
UT72a	016604000006875/ 016604000006883	03	vBCSH	2024-12-03
UT86a	016604000007077 /016604000007085	03	vBCSH	2024-12-30

*EUT ID: is used to identify the test sample in the lab internally.

UT48a is used for Conduction test, UT72a and UT86a is used for Radiation test.

3.3. Internal Identification of AE used during the test

AE ID*	Description	Model	Manufacturer	Remark
AE1	Battery1	TLp049C9(CAC4900033C9)	FENGHUA	/
AE2	Battery2	TLp049D7(CAC4900007C7)	VEKEN	/
AE3	Charger1	/	/	Provided by lab
AE4	USB Cable1	CDA0000254C1	JUWEI	/

*AE ID: is used to identify the test sample in the lab internally.

3.4. General Description

The Equipment under Test (EUT) is a model of GSM/UMTS/LTE/NR Mobile phone with integrated antenna and inbuilt battery.

It consists of normal options: travel charger, USB cable.

Manual and specifications of the EUT were provided to fulfil the test.

Samples undergoing test were selected by the client.

3.5. Interpretation of the Test Environment

For the test methods, the test environment uncertainty figures correspond to an expansion factor k=2.

Measurement Uncertainty

Parameter	Uncertainty
temperature	0.48°C
humidity	2 %
DC voltages	0.003V

4. Reference Documents

4.1. Documents supplied by applicant

EUT feature information is supplied by the applicant or manufacturer, which is the basis of testing.

4.2. Reference Documents for testing

The following documents listed in this section are referred for testing.

FCC Part15	Title 47 of the Code of Federal Regulations; Chapter I Part 15 - Radio frequency devices	2021
ANSI C63.10	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2013
UNII: KDB 789033 D02	General U-NII Test Procedures New Rules v02r01	2017-12

5. Laboratory Environment

Conducted RF performance testing is performed in shielding room.

EMC performance testing is performed in Semi-anechoic chamber.

6. Test Results

6.1. Summary of Test Results

SUMMARY OF MEASUREMENT RESULTS	Sub-clause of Part15E	Sub-clause of IC	Verdict
Maximum Output Power	15.407	/	**P**
Peak Power Spectral Density	15.407	/	**P**
26dB Emission Bandwidth	15.403	/	**P**
Radiated Unwanted Emission	15.407, 15.205, 15.209	/	**P**
AC Powerline Conducted Emission	15.107, 15.207	/	**P**
99% Occupied bandwidth	/	/	**P**
Transmit Power Control	15.407	/	**NA**

Please refer to **ANNEX A** for detail.

Terms used in Verdict column

P	Pass, The EUT complies with the essential requirements in the standard.
NM	Not measured, The test was not measured by CTTL
NA	Not Applicable, The test was not applicable
F	Fail, The EUT does not comply with the essential requirements in the standard

6.2. Statements

CTTL has evaluated the test cases as listed in section 6.1 of this report for the EUT specified in section 3 according to the standards or reference documents listed in section 4.

This report only deals with the WLAN function among the features described in section 3.

6.3. Test Conditions

For this report, all the test cases are tested under normal temperature and normal voltage, and also under norm humidity, the specific condition is shown as follows:

Temperature	26°C
Voltage	3.87V
Humidity	44%

7. Test Facilities Utilized

Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Vector Signal Analyzer	FSW67	104051	Rohde & Schwarz	1 year	2025-04-01
2	Test Receiver	ESCI	100344	R&S	1 year	2025-04-01
3	LISN	ENV216	101200	R&S	1 year	2025-05-16
4	Attenuator	10dB/2W	/	Rosenberger	/	/
5	Shielding Room	S81	/	ETS-Lindgren	/	/

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Test Receiver	ESW44	103023	R&S	1 year	2025-06-06
2	EMI Antenna	VULB 9163	01222	SCHWARZBECK	1 year	2025-09-11
3	EMI Antenna	3115	00167250	ETS-Lindgren	1 year	2025-04-11
4	EMI Antenna	3116	2663	ETS-Lindgren	1 year	2025-02-21
5	EMI Antenna	HFH2-Z2	829324/007	R&S	2 years	2026-01-04

Test Software

Test Item	Test Software and Version	Software Vendor
Radiated Continuous Emission	EMC32 V10.60.20	R&S
Conducted Emission	EMC32 V8.53.0	R&S

8. Measurement Uncertainty

8.1 Transmitter Output Power

Measurement Uncertainty: 0.387dB,k=1.96

8.2 Peak Power Spectral Density

Measurement Uncertainty: 0.705dB,k=1.96

8.3 26dB Emission Bandwidth

Measurement Uncertainty: 60.80Hz,k=1.96

8.4 Band Edges Compliance

Measurement Uncertainty : 0.62dB,k=1.96

8.5 Spurious Emissions

Conducted (k=1.96)

Frequency Range	Uncertainty(dB)
30MHz ≤ f ≤ 2GHz	1.22
2GHz ≤ f ≤3.6GHz	1.22
3.6GHz ≤ f ≤8GHz	1.22
8GHz ≤ f ≤12.75GHz	1.51
12.75GHz ≤ f ≤26GHz	1.51
26GHz ≤ f ≤40GHz	1.59

8.6 Radiated Unwanted Emission

Frequency Range	Uncertainty(dB) (k=2)
9kHz-30MHz	/
30MHz ≤ f ≤ 1GHz	4.72
1GHz ≤ f ≤18GHz	4.84
18GHz ≤ f ≤40GHz	5.12

8.7 AC Power-line Conducted Emission

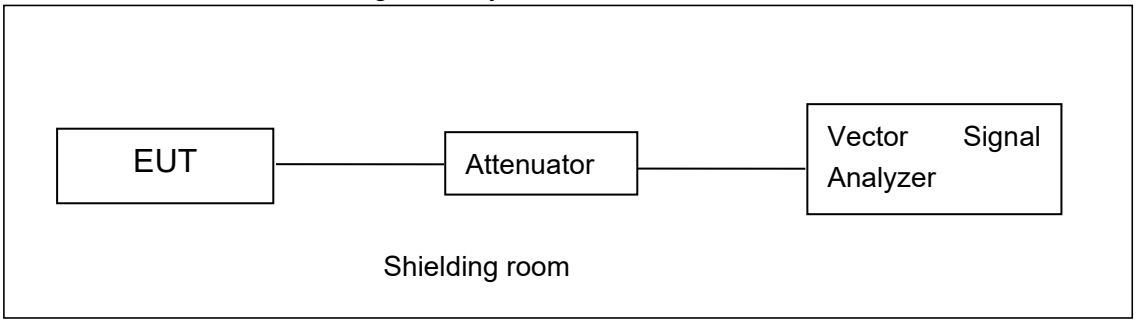
Measurement Uncertainty : 3.08dB,k=2

ANNEX A: Detailed Test Results

A.1. Measurement Method

A.1.1. Conducted Measurements

1). Connect the EUT to the test system correctly.
2). Set the EUT to the required work mode.
3). Set the EUT to the required channel.
4). Set the spectrum analyzer to start measurement.
5). Record the values. Vector Signal Analyzer



A.1.2. Radiated Emission Measurements

Measurement performed according to Clause 6.4, 6.5, 6.6 in ANSI C63.10-2013 and II.G.4, II.G.5, II.G.6 in KDB 789033.

The radiated emission test is performed in semi-anechoic chamber. The EUT was placed on a non-conductive table with 80cm above the ground plane for measurement below 1GHz and 1.5m above the ground plane for measurement above 1GHz. The measurement antenna was placed at a distance of 3 meters from the EUT. The test is carried out on both vertical and horizontal polarization and only maximization result of both polarizations is kept. During the test, the turntable is rotated from 0° to 360°and the measurement antenna is moved from 1m to 4m to get the maximization result. The maximization process was repeated with the EUT positioned in each of its three orthogonal orientations

A.2. Maximum output Power

Measurement Limit and Method:

Standard	Frequency (MHz)	Limit (dBm)
FCC CRF Part 15.407(a)	5150MHz~5250MHz	24dBm
	5250MHz~5350MHz	24dBm or 11+10logB
	5470MHz~5725MHz	24dBm or 11+10logB

Limit use the less value, and B is the 26dB bandwidth.

The measurementmethod SA-2 is made according to KDB 789033

A.2.1 Antenna Gain

Antenna gain is -2.9dBi and the value is supplied by the applicant or manufacturer.

A.2.2 Maximum output Power-Conducted

EUT ID: UT48a

Measurement Results:

802.11a mode

Mode	Frequency	Test Result (dBm)							
		Data Rate (Mbps)							
		6	9	12	18	24	36	48	54
802.11a	5180MHz	18.41							
	5200MHz	18.84							
	5240MHz	18.70							
	5260MHz	19.07							
	5280MHz	19.00							
	5320MHz	19.22							
	5500MHz	19.91							
	5580MHz	18.98							
	5700MHz	19.77							
	5720MHz	19.66							

The data rate 6Mbps is selected as worst condition, and the following cases are performed with this condition.

802.11n-HT20 mode

Mode	Frequency	Test Result (dBm)							
		Data Rate							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11n (HT20)	5180MHz	18.31							
	5200MHz	18.69							
	5240MHz	18.56							
	5260MHz	18.92							
	5280MHz	18.85							
	5320MHz	19.05							
	5500MHz	19.78							

	5580MHz	18.88							
	5700MHz	19.67							
	5720MHz	19.42							

The data rate MCS0 is selected as worst condition, and the following cases are performed with this condition.

802.11ac-VHT20 mode

Mode	Frequency	Test Result (dBm)								
		Data Rate								
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8
802.11ac (VHT20)	5180MHz	18.25								
	5200MHz	18.67								
	5240MHz	18.54								
	5260MHz	18.91								
	5280MHz	18.87								
	5320MHz	19.00								
	5500MHz	19.73								
	5580MHz	18.82								
	5700MHz	19.62								
	5720MHz	19.53								

The data rate MCS0 is selected as worst condition, and the following cases are performed with this condition.

802.11n-HT40 mode

Mode	Frequency	Test Result (dBm)							
		Data Rate							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11n (HT40)	5190MHz	16.29							
	5230MHz	16.46							
	5270MHz	16.73							
	5310MHz	16.78							
	5510MHz	17.72							
	5550MHz	17.54							
	5670MHz	17.27							
	5710MHz	17.98							

The data rate MCS0 is selected as worst condition, and the following cases are performed with this condition.

802.11ac-VHT40 mode

Mode	Frequency	Test Result (dBm)									
		Data Rate									
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8	MCS9
802.11ac (VHT40)	5190MHz	16.34									
	5230MHz	16.53									
	5270MHz	16.77									
	5310MHz	16.84									
	5510MHz	17.76									
	5550MHz	17.58									
	5670MHz	17.27									
	5710MHz	17.97									

The data rate MCS0 is selected as worst condition, and the following cases are performed with this condition.

802.11ac-VHT80 mode

Mode	Frequency	Test Result (dBm)									
		Data Rate									
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8	MCS9
802.11ac (VHT80)	5210MHz	15.50									
	5290MHz	15.91									
	5530MHz	16.58									
	5610MHz	15.61									
	5690MHz	16.21									

The data rate MCS0 is selected as worst condition, and the following cases are performed with this condition.

Maximum output Power：11a CH100

The duty cycle of all mode are 98%

Duty cycle

Conclusion: PASS

A.3. Peak Power Spectral Density (conducted)

Measurement Limit:

Standard	Frequency (MHz)	Limit (dBm/MHz)
FCC CRF Part 15.407(a)	5150MHz~5250MHz	11
	5250MHz~5350MHz	11
	5470MHz~5725MHz	11

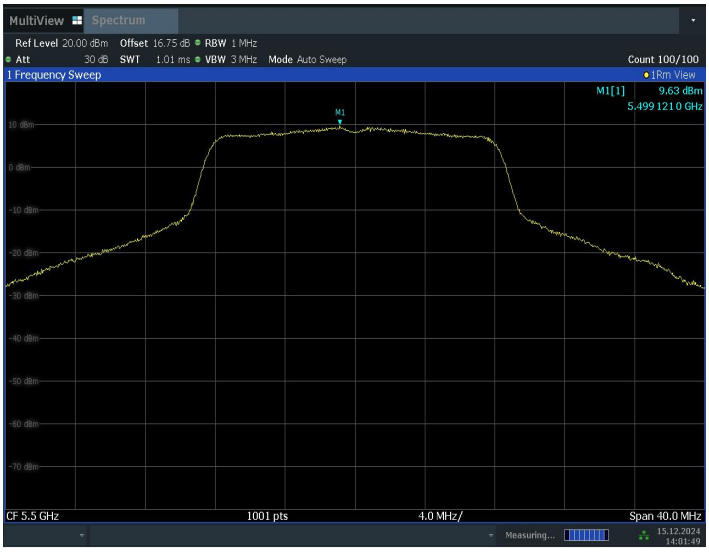
The output power measurement method Section F is made according to KDB 789033

EUT ID: UT48a

Measurement Results:

TestMode	Frequency[MHz]	Result [dBm/MHz]	Limit[dBm/MHz]	Verdict
11A	5180	7.90	≤11.00	PASS
	5200	8.26	≤11.00	PASS
	5240	8.20	≤11.00	PASS
	5260	8.58	≤11.00	PASS
	5280	8.40	≤11.00	PASS
	5320	8.83	≤11.00	PASS
	5500	9.63	≤11.00	PASS
	5580	8.37	≤11.00	PASS
	5700	9.40	≤11.00	PASS
	5720	9.07	≤11.00	PASS
11N20SISO	5180	7.52	≤11.00	PASS
	5200	7.92	≤11.00	PASS
	5240	7.73	≤11.00	PASS
	5260	8.37	≤11.00	PASS
	5280	7.93	≤11.00	PASS
	5320	8.22	≤11.00	PASS
	5500	8.87	≤11.00	PASS
	5580	8.05	≤11.00	PASS
	5700	9.09	≤11.00	PASS
	5720	8.63	≤11.00	PASS
11N40SISO	5190	2.54	≤11.00	PASS
	5230	2.75	≤11.00	PASS
	5270	3.13	≤11.00	PASS
	5310	3.07	≤11.00	PASS
	5510	4.02	≤11.00	PASS
	5550	3.85	≤11.00	PASS
	5670	3.15	≤11.00	PASS
	5710	4.14	≤11.00	PASS
11AC80SISO	5210	-1.37	≤11.00	PASS
	5290	-1.25	≤11.00	PASS
	5530	-0.50	≤11.00	PASS

	5610	-0.96	≤11.00	PASS
	5690	-0.48	≤11.00	PASS



14:01:49 15.12.2024

Peak Power Spectral Density:11a CH100

Conclusion: PASS

A.4. 26dB Emission Bandwidth (conducted)

Measurement Limit:

Standard	Limit (kHz)
FCC 47 CFR Part 15.403 (i)	/

The measurement is made according to KDB 789033

Measurement Uncertainty:

Measurement Uncertainty	60.80Hz

EUT ID: UT48a

Measurement Result:

TestMode	Frequency[MHz]	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	5180	25.40	5167.64	5193.04	---	---
	5200	24.48	5187.96	5212.44	---	---
	5240	25.00	5227.48	5252.48	---	---
	5260	25.16	5248.00	5273.16	---	---
	5280	24.52	5267.96	5292.48	---	---
	5320	24.96	5308.08	5333.04	---	---
	5500	25.96	5487.92	5513.88	---	---
	5580	25.80	5567.84	5593.64	---	---
	5700	24.92	5687.92	5712.84	---	---
	5720	25.20	5707.64	5732.84	---	---
11N20SISO	5180	26.56	5166.72	5193.28	---	---
	5200	26.20	5186.80	5213.00	---	---
	5240	26.60	5226.36	5252.96	---	---
	5260	27.12	5246.76	5273.88	---	---
	5280	25.76	5267.12	5292.88	---	---
	5320	25.84	5307.28	5333.12	---	---
	5500	28.68	5486.32	5515.00	---	---
	5580	28.64	5566.28	5594.92	---	---
	5700	28.04	5686.76	5714.80	---	---
	5720	28.88	5706.08	5734.96	---	---
11N40SISO	5190	41.36	5169.52	5210.88	---	---
	5230	42.16	5208.80	5250.96	---	---
	5270	41.68	5249.36	5291.04	---	---
	5310	41.52	5289.44	5330.96	---	---
	5510	42.08	5488.72	5530.80	---	---
	5550	42.16	5528.80	5570.96	---	---
	5670	48.88	5648.88	5697.76	---	---
	5710	42.24	5688.80	5731.04	---	---
11AC80SISO	5210	90.40	5163.76	5254.16	---	---
	5290	91.68	5243.44	5335.12	---	---

	5530	92.16	5483.92	5576.08	---	---
	5610	92.48	5563.76	5656.24	---	---
	5690	92.32	5643.12	5735.44	---	---

Test graphs as below:

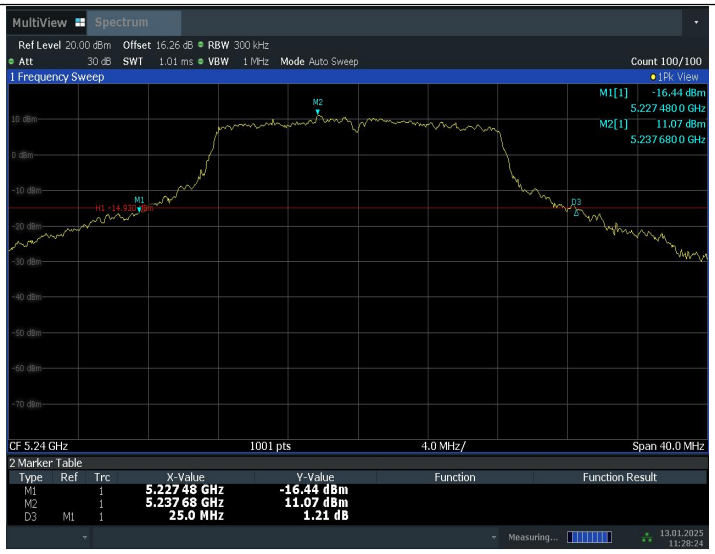
11A_5180

11:27:33 13.01.2025

11A_5200

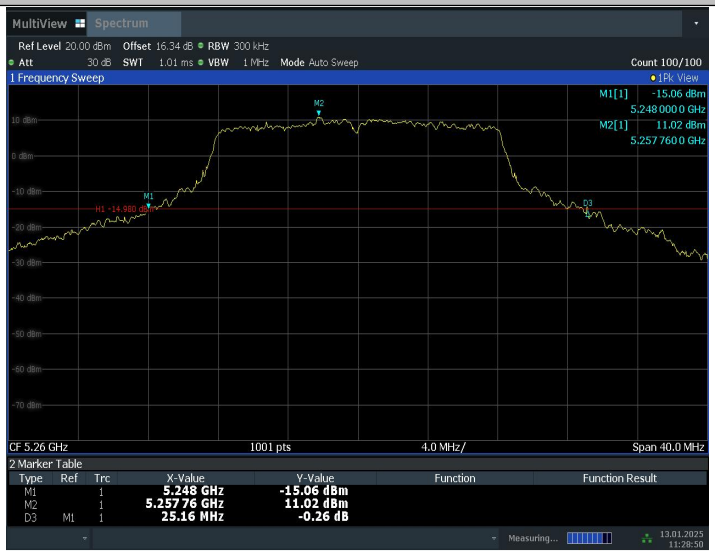
11:28:01 13.01.2025

11A_5240



11:28:24 13.01.2025

11A_5260



11:28:51 13.01.2025

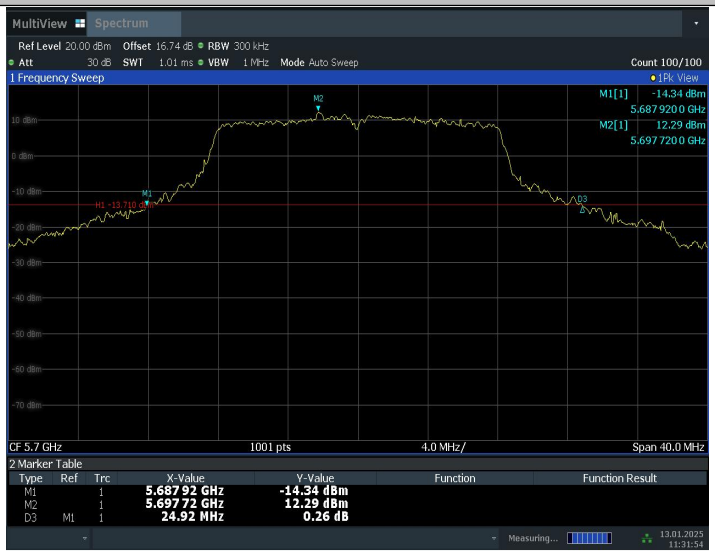
11A_5280

11:29:15 13.01.2025

11A_5320
 11:29:39 13.01.2025
11A_5500
 11:30:15 13.01.2025
11A_5580

11:30:50 13.01.2025

11A_5700



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11A_5720

11:32:18 13.01.2025

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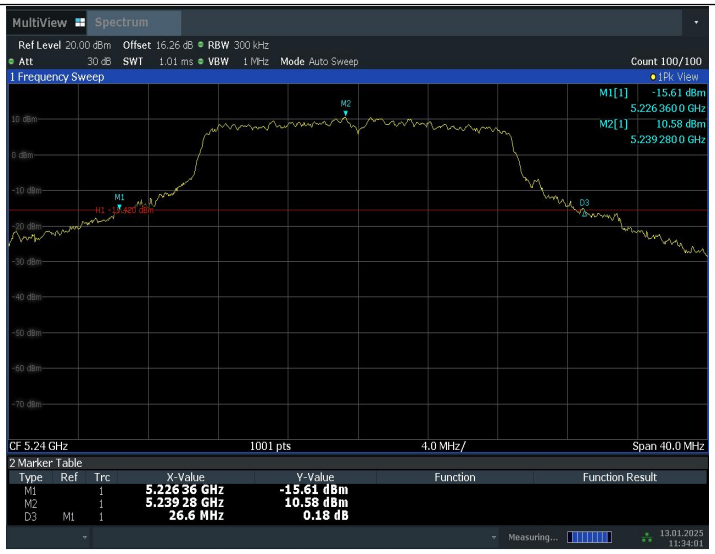
11N20SISO_5200
 11:33:33 13.01.2025
11N20SISO_5240



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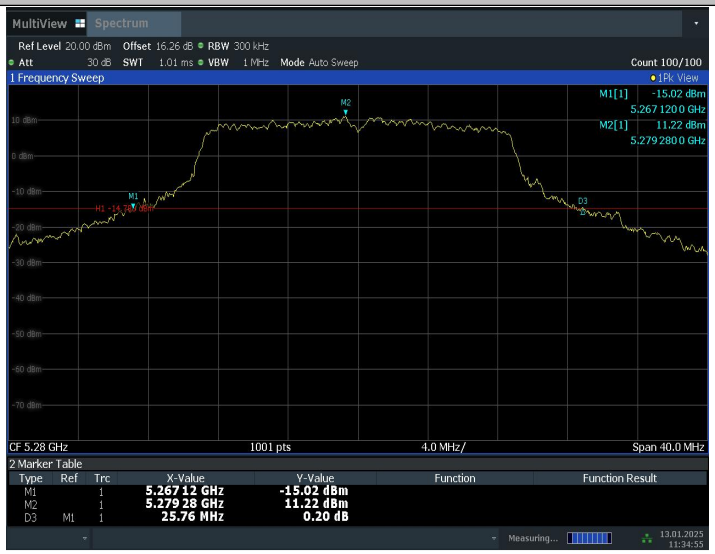
11N20SISO_5260

11:37:57 13.01.2025

11N20SISO_5280



11:34:56 13.01.2025

11N20SISO_5320
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11N20SISO_5500
 11:36:02 13.01.2025
11N20SISO_5580

11:36:28 13.01.2025

11N20SISO_5700

11:36:50 13.01.2025

11N20SISO_5720

11:37:16 13.01.2025

11N40SISO_5190

12:53:17 15.12.2024

11N40SISO_5230

12:54:24 15.12.2024

11N40SISO_5270

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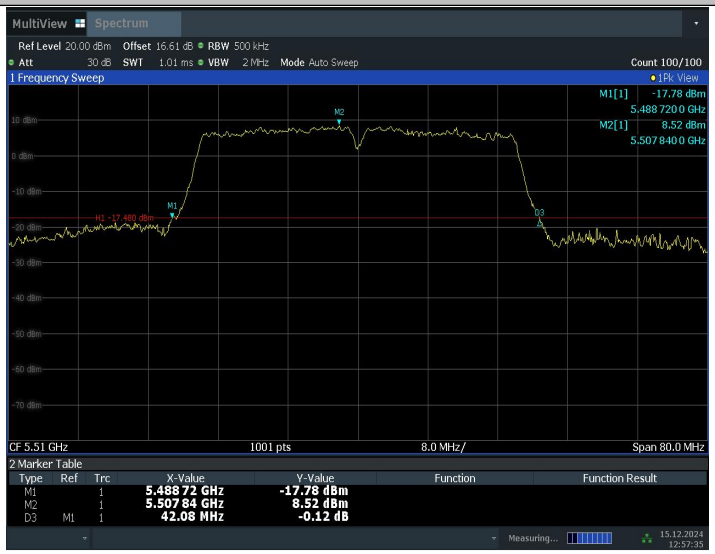
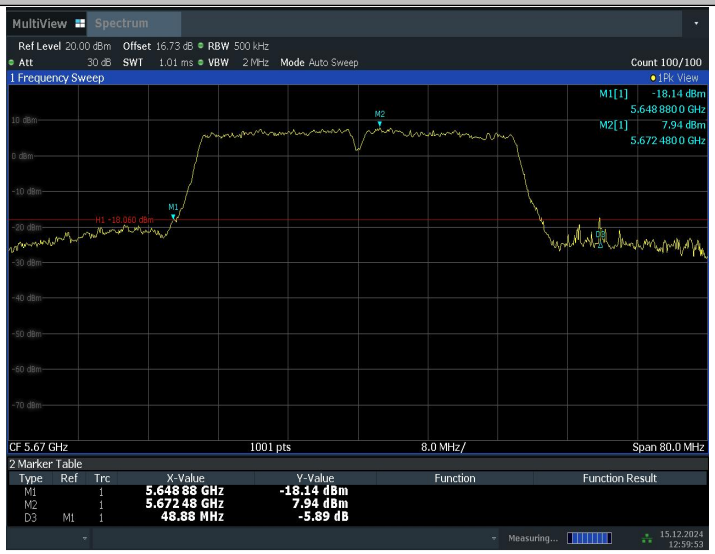
11N40SISO_5310

12:56:33 15.12.2024

11N40SISO_5510



12:57:35 15.12.2024

11N40SISO_5550
 12:58:50 15.12.2024
11N40SISO_5670
 12:59:53 15.12.2024
11N40SISO_5710

13:01:01 15.12.2024

11AC80SISO_5210

13:22:02 15.12.2024

11AC80SISO_5290

13:35:46 15.12.2024

11AC80SISO_5530
 13:37:01 15.12.2024
11AC80SISO_5610
 13:38:04 15.12.2024
11AC80SISO_5690

13:39:11 15.12.2024

Conclusion: PASS

A.5. Radiated Unwanted Emission

A.5.1 Limits

Unwanted Emissions in the unrestricted bands shall not exceed the limits that shown in 15.407:

Standard	Limit
FCC 47 CFR Part 15.407	(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz. (2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz. (3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c))

Frequency (MHz)	Field strength(μV/m)	Measurement distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30

Frequency of emission (MHz)	Field strength (uV/m)	Field strength (dBuV/m)	Measurement distance (m)
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

Note: When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor (as defined in KDB 789033 II.G.2.d).