FCC Part 15.247
RSS-247, ISSUE 4, July 24
RSS-GEN, ISSUE 5, February 2021 Amendment 2
TEST REPORT

For

Technology Solutions (UK) Ltd

Suite A, Loughborough Technology Centre, Epinal Way, Loughborough, Leicestershire, LE11 3GE, United Kingdom

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IC: 8948A-3138

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Original Report	RFID READER

Report Producer : Jojo Lu

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Revision History

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1. General Information

1.1. Product Description for Equipment under Test (EUT)

Applicant	Technology Solutions (UK) Ltd
	Suite A, Loughborough Technology Centre, Epinal Way, Loughborough, Leicestershire, LE11 3GE, United Kingdom
Brand Name	TSL
Product (Equipment)	RFID READER
Model Name/HVIN	3138-AS1-US，3138-AS2-US，3138-AX1-US，3138-AX2-US
PMN	3138
Model Discrepancy	Please refer to the difference declaration letter provided by the Applicant.
Frequency Range	902.75 ~ 927.25 MHz
Maximum Conducted Peak Output Power	DSB-ASK Mode: 29.93 dBm PR-ASK Mode: 29.97 dBm
Modulation Technique	DSB-ASK PR-ASK
Power Operation (Voltage Range)	7.2Vdc from Battery 5.2Vdc from Adapter
Received Date	2025/01/06

*All measurement and test data in this report was gathered from production sample serial number: RXZ241220075-1、RXZ241220075-2、RXZ241220075-3、RXZ241220075-4 (Assigned by BACL, New Taipei Laboratory.)

1.2. Objective

This report is prepared on behalf of ***Technology Solutions (UK) Ltd*** in accordance with Part 2, Subpart J, Part 15, Subparts A and C of the Federal Communication Commission's rules and RSS-247, Issue 4, July 24, RSS-Gen, Issue 5, February 2021 Amendment 2 of the Innovation, Science and Economic Development Canada.

1.3. Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2020+Cor. 1-2023+C63.10a-2024+Errata to C63.10a-2024, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices and KDB 558074 D01 15.247 Meas Guidance v05r02. And RSS-247, Issue 4, July 24, RSS-Gen, Issue 5, February 2021 Amendment 2 of the Innovation, Science and Economic Development Canada.

1.4. Statement

Decision Rule: No, (The test results do not include MU judgment)

1. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (New Taipei Laboratory).
2. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.
3. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.
4. The determination of the test results does not require consideration of the uncertainty of the measurement, unless the assessment is required by customer agreement, regulation or standard document specification.
5. Bay Area Compliance Laboratories Corp. (New Taipei Laboratory) is not responsible for the authenticity of the information provided by the applicant that affects the test results.

1.5. Measurement Uncertainty

Parameter		Uncertainty
AC Mains		+/- 3.02 dB
RF output power, conducted		+/- 0.57 dB
Occupied Bandwidth		+/- 0.09 %
Unwanted Emissions, conducted		+/- 1.09 dB
Emissions, radiated	9 kHz~30 MHz	+/- 3.20 dB
	30 MHz~1 GHz	+/- 3.30 dB
	1 GHz~18 GHz	+/- 5.14 dB
	18 GHz~40 GHz	+/- 4.75 dB
Temperature		+/- 0.76 °C
Humidity		+/- 0.41 %

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

1.6. Environmental Conditions

Test Site	Test Date	Temperature (℃)	Relative Humidity (%)	Test Engineer
AC Line Conducted Emissions	2025/2/20	19.9	62	Aaron
Radiation Spurious Emissions	2025/01/16~2025/9/12	18.6~25.6	57~63	Nick
Conducted Spurious Emissions	2025/6/5	26.1	52	Sean
Emission Bandwidth	2025/6/5	26.1	52	Sean
Channel Separation Test	2026/1/21	21.7	50	Sean
Time of Occupancy	2025/6/5~2025/6/6	26.1~26.9	52~53	Sean
Quantity of hopping channel	2025/6/5~2025/6/6	26.1~26.9	52~53	Sean
Maximum Output Power	2025/6/5~2025/6/6	26.1~26.9	52~53	Sean
100 kHz Bandwidth of Frequency Band Edge	2025/6/5	26.1	52	Sean

1.7. Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (New Taipei Laboratory) to collect test data is located on

☒70, Lane 169, Sec. 2, Datong Road, Xizhi Dist., New Taipei City 221, Taiwan, R.O.C.

Bay Area Compliance Laboratories Corp. (New Taipei Laboratory) is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 3732) and the FCC designation No.TW3732 under the Mutual Recognition Agreement (MRA) in FCC Test.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: TW3732.

2. System Test Configuration

2.1. Description of Test Configuration

For RFID mode, 50 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	902.75	26	915.25
2	903.25	27	915.75
3	903.75	28	916.25
4	904.25	29	916.75
5	904.75	30	917.25
6	905.25	31	917.75
7	905.75	32	918.25
8	906.25	33	918.75
9	906.75	34	919.25
10	907.25	35	919.75
11	907.75	36	920.25
12	908.25	37	920.75
13	908.75	38	921.25
14	909.25	39	921.75
15	909.75	40	922.25
16	910.25	41	922.75
17	910.75	42	923.25
18	911.25	43	923.75
19	911.75	44	924.25
20	912.25	45	924.75
21	912.75	46	925.25
22	913.25	47	925.75
23	913.75	48	926.25
24	914.25	49	926.75
25	914.75	50	927.25

Were tested with channel 1, 26 and 50.

2.2. Equipment Modifications

No modification was made to the EUT.

2.3. EUT Exercise Software

The test software was used “RF Test USB v1.8.1”

The system was configured for testing in engineering mode, which was provided by Applicant.

Test Frequency		902.75 MHz	915.25 MHz	927.25 MHz
Power Level Setting	DSB-ASK	3000	3000	3000
	PR-ASK	3000	3000	3000

2.4. Support Equipment List and Details

Description	Manufacturer	Model Number
Adapter	HANG	C13
Docking	TSL	3138-CRD-01
Phone	Datalogic	Memor 10

2.5. External Cable List and Details

Description	Manufacturer	Model Number
Micro USB	BACL	1m

2.6. Test Mode

Pre-scan

Mode 1: model (3138-AS1-US), USB Type-C handle

Mode 2: model (3138-AX1-US), USB Type-C handle

Mode 3: model (3138-AS2-US), 8 pad connector handle

Mode 4: model (3138-AX2-US), 8 pad connector handle

Worst case is the Mode 1

Mode 1: model (3138-AS1-US) for all test item, Tx Test status.

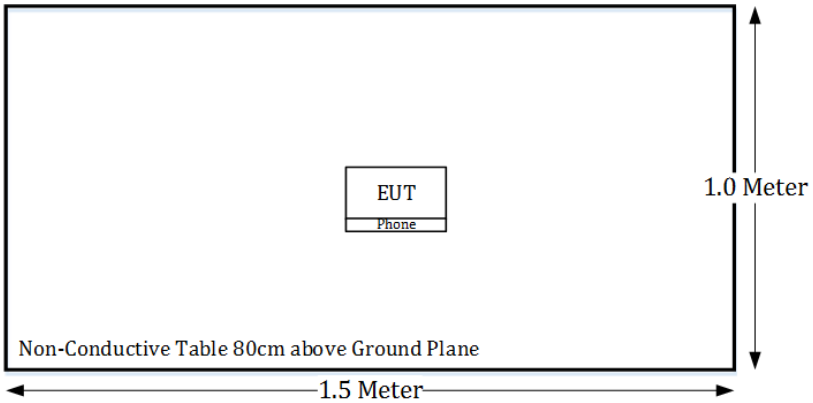
Mode 2: model (3138-AX1-US) test Below 1GHz Radiated Spurious Emissions.

2.7. Block Diagram of Test Setup

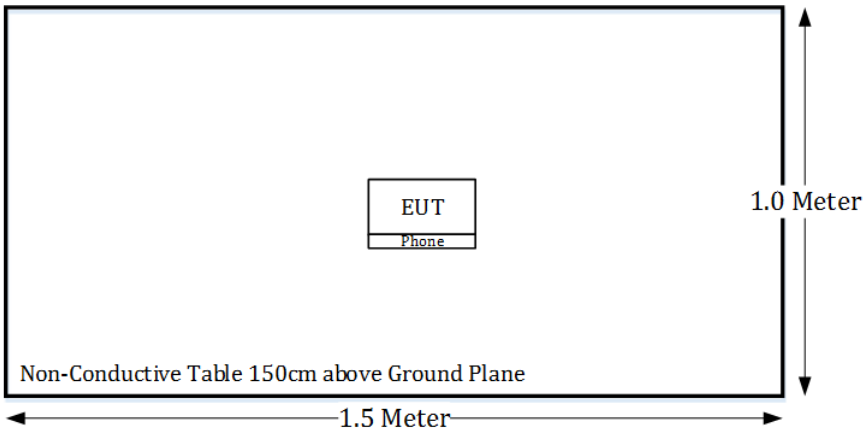
See test photographs attached in setup photos for the actual connections between EUT and support equipment.

Radiation:

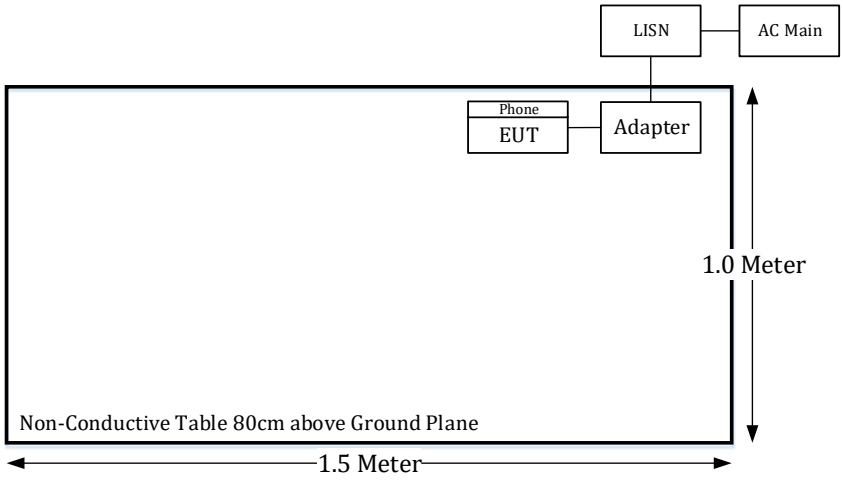
Below 1GHz:



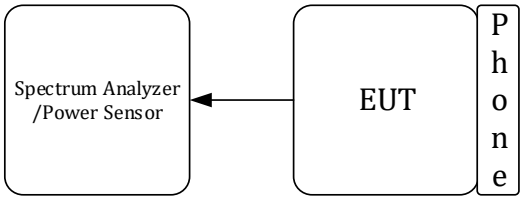
Above 1GHz:



Conduction:



Conducted:



3. Summary of Test Results

Rules	Description of Test	Results
FCC §15.203 RSS-GEN §6.8	Antenna Requirement	Compliance
FCC §15.207(a) RSS-GEN §8.8	AC Line Conducted Emissions	Compliance
FCC §15.205, §15.209, §15.247(d) RSS-247 §6.6 RSS-GEN §8.9 RSS-GEN §8.10	Spurious Emissions	Compliance
FCC §15.247(a)(1) RSS-247 §6.2.2.1 (a) RSS-GEN §6.7	Emission Bandwidth	Compliance
FCC §15.247 (a)(1) RSS-247 §6.2.1 (b)	Channel Separation Test	Compliance
FCC §15.247(a)(1)(i) RSS-247 §6.2.2.1 (b)(c)	Time of Occupancy (Dwell Time)	Compliance
FCC §15.247(a)(1)(i) RSS-247 §6.2.2.2	Quantity of hopping channel Test	Compliance
FCC §15.247(b)(2) RSS-247 §6.2.2.2	Maximum Peak Output Power	Compliance
FCC §15.247(d) RSS-247 §6.6	100 kHz Bandwidth of Frequency Band Edge	Compliance

4. Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
AC Line Conduction Room (CON-A)					
LISN	Rohde & Schwarz	ENV216	101612	2025/2/17	2026/2/17
EMI Test Receiver	Rohde & Schwarz	ESR	102759	2024/9/19	2025/9/19
RF Cable	EMEC	EM-CB5D	1	2024/6/5	2025/6/5
Software	AUDIX	E3	V9.150826k	N.C.R	N.C.R
Radiation 3M Room - Below 1GHz (966-A)					
Active Loop Antenna	ETS-Lindgren	6502	35796	2024/3/27	2025/3/27
Bilog Antenna with 6 dB Attenuator	SUNOL SCIENCES & MINI-CIRCUITS	JB6/UNAT-6+	A050115/15542_01	2025/1/16	2026/1/16
Preamplifier	Sonoma	310N	130602	2024/6/18	2025/6/18
				2025/6/17	2026/6/17
Spectrum Analyzer	Rohde & Schwarz	FSV40	101941	2024/12/25	2025/12/25
EMI Test Receiver	Rohde & Schwarz(R&S)	ESR3	102759	2024/9/19	2025/9/19
Microflex Cable	UTIFLEX	UFB197C-1-2362-70U-70U	225757-001	2024/12/20	2025/12/20
Coaxial Cable	UTIFLEX	UFB311A-Q-1440-300300	220490-006	2024/12/20	2025/12/20
Coaxial Cable	COMMATE	PEWC	8Dr	2024/12/20	2025/12/20
Cable	EMC	EMC105-SM-SM-10000	201003	2024/12/20	2025/12/20
Coaxial Cable	JUNFLON	J12J102248-00-B-5	AUG-07-15-044	2024/12/20	2025/12/20
Software	AUDIX	E3	18621a	N.C.R	N.C.R
Radiation 3M Room - Above 1GHz (966-A)					
Horn Antenna	A.H. system	SAS-571	1020	2024/5/21	2025/5/21
Preamplifier	Channel	ERA-100M-18G-01D1748	EC2300049	2024/12/12	2025/12/12
Spectrum Analyzer	Rohde & Schwarz	FSV40	101941	2024/12/25	2025/12/25
EMI Test Receiver	Rohde & Schwarz(R&S)	ESR3	102759	2024/9/19	2025/9/19
Microflex Cable	UTIFLEX	UFB197C-1-2362-70U-70U	225757-001	2024/12/20	2025/12/20
Coaxial Cable	UTIFLEX	UFB311A-Q-1440-300300	220490-006	2024/12/20	2025/12/20
Coaxial Cable	COMMATE	PEWC	8Dr	2024/12/20	2025/12/20
Cable	EMC	EMC105-SM-SM-10000	201003	2024/12/20	2025/12/20
Coaxial Cable	JUNFLON	J12J102248-00-B-5	AUG-07-15-044	2024/12/20	2025/12/20
Band-reject filter	MICRO-TRONICS	BRC50722	G014	2024/10/2	2025/10/2
Software	AUDIX	E3	18621a	N.C.R	N.C.R

Conducted Room					
Spectrum Analyzer	Rohde & Schwarz(R&S)	FSV40	101204	2024/5/30	2025/5/30
				2025/6/4	2026/6/4
Cable	UTIFLEX	UFA210A	9435	2024/10/1	2025/10/1
				2025/9/30	2026/9/30
Power Sensor	Boonton	RTP5006	11037	2024/5/21	2025/5/21
Attenuator	MCL	BW-S10W5+	1419	2025/3/6	2026/3/6

***Statement of Traceability:** BACL Corp. attests that all of the calibrations on the equipment items listed above were traceable to the SI System of Units via the R.O.C. Center for Measurement Standards of the Electronics Testing Center, Taiwan (ETC) or to another internationally recognized National Metrology Institute (NMI), and were compliant with the current Taiwan Accreditation Foundation (TAF) requirements.

5 FCC §15.203 & RSS-Gen §6.8– Antenna Requirements

5.1 Applicable Standard

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited.

According to RSS-Gen 6.8:

The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list

For expediting the testing, measurements may be performed using only the antenna with highest gain of each combination of transmitter and antenna type, with the transmitter output power set at the maximum level. However, the transmitter shall comply with the applicable requirements under all operational conditions and when in combination with any type of antenna from the list provided in the test report (and in the notice to be included in the user manual, provided below).

When measurements at the antenna port are used to determine the RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna's manufacturer.

The test report shall state the RF power, output power setting and spurious emission measurements with each antenna type that is used with the transmitter being tested.

For licence-exempt equipment with detachable antennas, the user manual shall also contain the following notice in a conspicuous location:

This radio transmitter [enter the device's ISED certification number] has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Immediately following the above notice, the manufacturer shall provide a list of all antenna types which can be used with the transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna type.

5.2 Antenna Information

Model	Type	Antenna Gain	Impedance
AQUA920S_8012_TSL_N	QSA Antenna	2.5 dBi	50Ω

Unit uses a unique coupling to the intentional radiator.

Result: Compliance

6. FCC §15.207(a) & RSS-Gen §8.8– AC Line Conducted Emissions

6.1. Applicable Standard

According to §15.207

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequencies ranges.

According to RSS-GEN §8.8

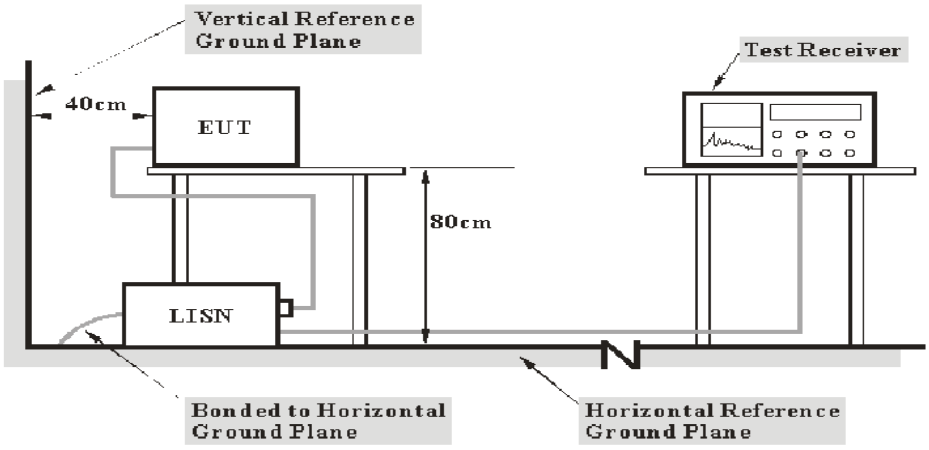
Unless stated otherwise in the applicable RSS, for radio apparatus that are designed to be connected to the public utility AC power network, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the range 150 kHz to 30 MHz shall not exceed the limits in table 4, as measured using a 50 μH / 50 Ω line impedance stabilization network. This requirement applies for the radio frequency voltage measured between each power line and the ground terminal of each AC power-line mains cable of the EUT.

For an EUT that connects to the AC power lines indirectly, through another device, the requirement for compliance with the limits in table 4 shall apply at the terminals of the AC power-line mains cable of a representative support device, while it provides power to the EUT. The lower limit applies at the boundary between the frequency ranges. The device used to power the EUT shall be representative of typical applications.

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15-0.5	66 to 56 Note 1	56 to 46 Note 1
0.5-5	56	46
5-30	60	50

Note 1: Decreases with the logarithm of the frequency.

6.2. EUT Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.10-2020+Cor. 1-2023+C63.10a-2024+Errata to C63.10a-2024 measurement procedure. The specification used was with the FCC Part 15.207 and RSS-GEN limits.

6.3. EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150kHz to 30MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations

Frequency Range	IF B/W
150kHz – 30MHz	9kHz

6.4. Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

6.5. Corrected Factor & Over Limit Calculation

The factor is calculated by adding LISN/ISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

Factor = LISN VDF + Cable Loss + Transient Limiter Attenuation

The “Over Limit” column of the following data tables indicates the degree of compliance with the applicable limit. For example, an over limit of -7 dB means the emission is 7 dB below the limit. The equation for Over Limit calculation is as follows:

Over Limit = Level – Limit Line

6.6. Test Results

Test Mode: Transmitting

Main: AC120 V, 60 Hz

(Worst case is Adapter mode)

Line

Description: **RFID,RBW:9kHz/VBW:30kHz**

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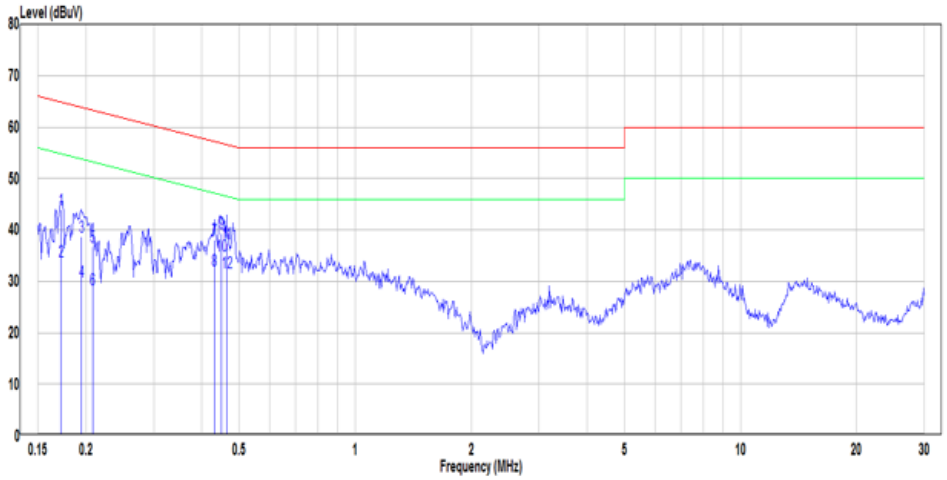

No.	Frequency (MHz)	Reading dBuV	Correct Factor(dB)	Result dBuV	Limit dBuV	Over limit (dB)	Remark	Phase
1	0.172	34.08	9.91	43.99	64.86	-20.86	QP	Line
2	0.172	23.91	9.91	33.82	54.86	-21.03	Average	Line
3	0.194	28.60	10.01	38.61	63.84	-25.24	QP	Line
4	0.194	19.95	10.01	29.96	53.84	-23.88	Average	Line
5	0.208	26.78	10.04	36.82	63.27	-26.45	QP	Line
6	0.208	18.39	10.04	28.43	53.27	-24.85	Average	Line
7	0.431	27.76	10.21	37.97	57.24	-19.28	QP	Line
8	0.431	22.02	10.21	32.23	47.24	-15.01	Average	Line
9	0.449	29.08	10.22	39.30	56.89	-17.58	QP	Line
10	0.449	24.81	10.22	35.03	46.89	-11.85	Average	Line
11	0.464	27.07	10.23	37.30	56.63	-19.32	QP	Line
12	0.464	21.54	10.23	31.77	46.63	-14.86	Average	Line

Neutral

Description: **RFID,RBW:9kHz/VBW:30kHz**

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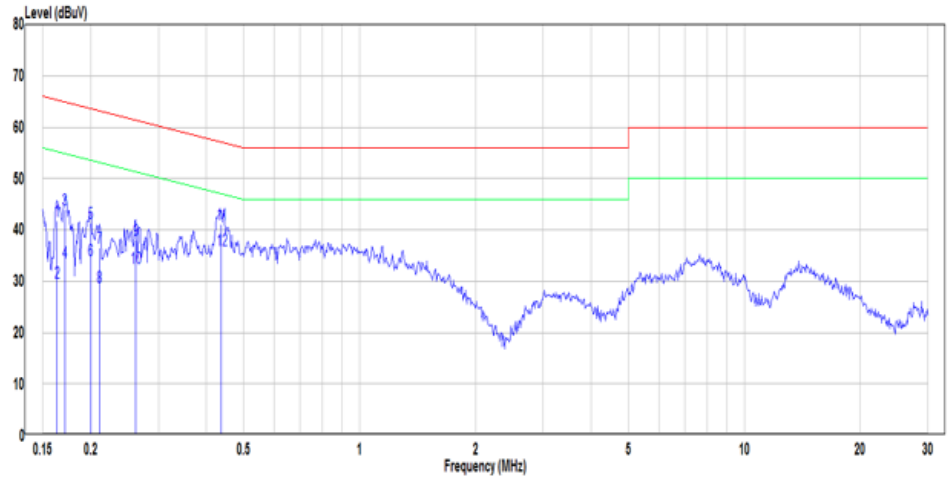


No.	Frequency (MHz)	Reading dBuV	Correct Factor(dB)	Result dBuV	Limit dBuV	Over limit (dB)	Remark	Phase
1	0.163	31.98	9.89	41.87	65.30	-23.44	QP	Neutral
2	0.163	19.93	9.89	29.82	55.30	-25.49	Average	Neutral
3	0.171	33.95	9.92	43.87	64.90	-21.03	QP	Neutral
4	0.171	23.86	9.92	33.78	54.90	-21.12	Average	Neutral
5	0.200	31.33	10.04	41.37	63.62	-22.25	QP	Neutral
6	0.200	24.06	10.04	34.10	53.62	-19.52	Average	Neutral
7	0.211	26.41	10.05	36.46	63.18	-26.72	QP	Neutral
8	0.211	18.76	10.05	28.81	53.18	-24.38	Average	Neutral
9	0.262	27.96	10.09	38.05	61.38	-23.33	QP	Neutral
10	0.262	22.52	10.09	32.61	51.38	-18.77	Average	Neutral
11	0.437	30.93	10.22	41.15	57.11	-15.96	QP	Neutral
12	0.437	25.75	10.22	35.97	47.11	-11.14	Average	Neutral

Note:

Result = Read Level + Factor

Over Limit = Result – Limit Line

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss + Attenuator

7. FCC §15.209, §15.205 , §15.247(d) & RSS-247 §6.6, RSS-GEN §8.9, §8.10 – Spurious Emissions

7.1. Applicable Standard

As per FCC §15.35(d): Unless otherwise specified, on any frequency or frequencies above 1000 MHz, the radiated emission limits are based on the use of measurement instrumentation employing an average detector function. Unless otherwise specified, measurements above 1000 MHz shall be performed using a minimum resolution bandwidth of 1MHz.

As per RSS-Gen 8.10,

Restricted frequency bands, identified in table 7, are designated primarily for safety-of-life services (distress calling and certain aeronautical activities), certain satellite downlinks, radio astronomy and some government uses. Except where otherwise indicated, the following conditions related to the restricted frequency bands apply:

(a)The transmit frequency, including fundamental components of modulation, of licence-exempt radio apparatus shall not fall within the restricted frequency bands listed in table 7 except for apparatus compliant with RSS-287, Emergency Position Indicating Radio Beacons (EPIRB), Emergency Locator Transmitters (ELT), Personal Locator Beacons (PLB), and Maritime Survivor Locator Devices (MSLD).

(b)Unwanted emissions that fall into restricted frequency bands listed in table 7 shall comply with the limits specified in table 5 and table 6.

(c)Unwanted emissions that do not fall within the restricted frequency bands listed in table 7 shall comply either with the limits specified in the applicable RSS or with those specified in table 5 and table 6.

As Per FCC §15.205(a) except as show in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 – 0.110	16.42 – 16.423	608 – 614	4. 5 – 5. 15
0.495 – 0.505	16.69475 – 16.69525	960 – 1240	5. 35 – 5. 46
2.1735 – 2.1905	16.80425 – 16.80475	1300 – 1427	7.25 – 7.75
4.125 – 4.128	25.5 – 25.67	1435 – 1626.5	8.025 – 8.5
4.17725 – 4.17775	37.5 – 38.25	1645.5 – 1646.5	9.0 – 9.2
4.20725 – 4.20775	73 – 74.6	1660 – 1710	9.3 – 9.5
6.215 – 6.218	74.8 – 75.2	1718.8 – 1722.2	10.6 – 12.7
6.26775 – 6.26825	108 – 121.94	2200 – 2300	13.25 – 13.4
6.31175 – 6.31225	123 – 138	2310 – 2390	14.47 – 14.5
8.291 – 8.294	149.9 – 150.05	2483.5 – 2500	15.35 – 16.2
8.362 – 8.366	156.52475 – 156.52525	2690 – 2900	17.7 – 21.4
8.37625 – 8.38675	156.7 – 156.9	3260 – 3267	22.01 – 23.12
8.41425 – 8.41475	162.0125 –167.17	3.332 – 3.339	23.6 – 24.0
12.29 – 12.293	167.72 – 173.2	3 3458 – 3 358	31.2 – 31.8
12.51975 – 12.52025	240 – 285	3.600 – 4.400	36.43 – 36.5
12.57675 – 12.57725	322 – 335.4		Above 38.6
13.36 – 13.41	399.9 – 410		

As per FCC §15.209(a): Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (micro volts/meter)	Measurement Distance (meters)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100**	3
88 - 216	150**	3
216 - 960	200**	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

As per RSS-GEN §8.9: Except where otherwise indicated in the applicable RSS, radiated emissions shall comply with the field strength limits shown in table 5 and table 6. Additionally, the level of any transmitter unwanted emission shall not exceed the level of the transmitter's fundamental emission.

Table 5 – General field strength limits at frequencies above 30 MHz	
Frequency (MHz)	**Field Strength (µV/m at 3 m)**
30 - 88	100
88 - 216	150
216 - 960	200
Above 960	500

Table 6 – General field strength limits at frequencies below 30 MHz		
Frequency (MHz)	**Field Strength (H-Field) (µA/m)**	**Measurement distance (m)**
9 - 490 kHz[Note 1]	6.37/F (F in kHz)	300
490 - 1705 kHz	63.7/F (F in kHz)	30
1.705 - 30 MHz	0.08	30

Note 1: The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.

Note 2: The limit was added 51.5dB to convert the limit from dBuA/m to dBuV/m.

According to ANSI C63.10-2020+Cor. 1-2023+C63.10a-2024+Errata to C63.10a-2024, section 5.3.3 Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field, and the emissions to be measured can be detected by the measurement equipment (see 4.3.4). Measurements shall not be performed at a distance greater than 30 m for frequencies above 30 MHz, unless it can be further demonstrated that measurements at a distance of 30 m or less are impractical. Measurements from

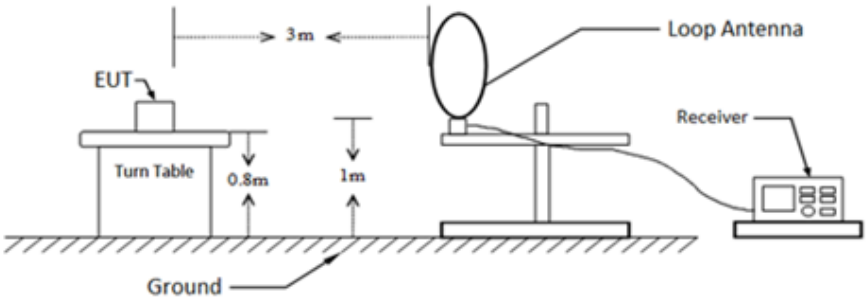
18 GHz to 40 GHz are typically made at distances significantly less than 3 m from the EUT. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade of distance (inverse of linear distance for field-strength measurements or inverse of linear distance-squared for power-density measurements).

As per FCC §15.247 (d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. 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).

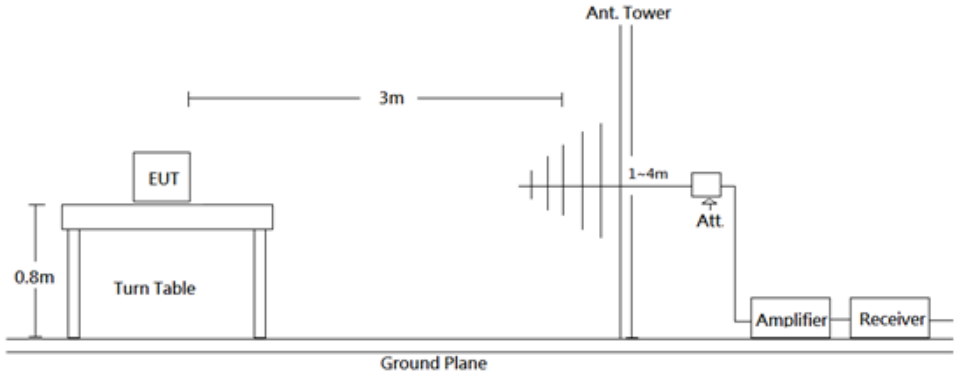
As per RSS-247 6.6,
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum device, digitally modulated device, or hybrid system is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power – based on either an RF conducted or a radiated measurement – provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 6.3.2, the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

7.2. EUT Setup

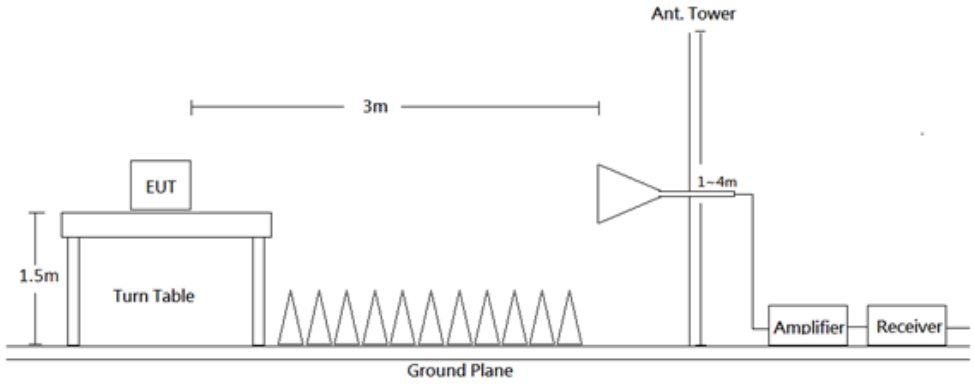
9kHz-30MHz:



30MHz-1GHz:



1-18 GHz:



Radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.10-2020+Cor. 1-2023+C63.10a-2024+Errata to C63.10a-2024. The specification used was the FCC Part 15.209 and FCC 15.247 Limits.

7.3. EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 9 kHz to 18 GHz. During the radiated emission test, the EMI test receiver was set with the following configurations measurement method 6.3 in ANSI C63.10.

Frequency Range	RBW	Video B/W	IF B/W	Measurement method	Detector
9 kHz - 150 kHz	300 Hz	1 kHz	200 Hz	QP/AV	QP/AV
150 kHz - 30 MHz	10 kHz	30 kHz	9 kHz	QP/AV	QP/AV
30-1000 MHz	100 kHz	300 kHz	/	PK	PK
	/	/	120 kHz	QP	QP
Above 1 GHz	Pre-scan :				
	1 MHz	3 MHz	/	PK	PK
	1 MHz	1 kHz	/	Ave	PK
	Final measurement for emission identified during pre-scan :				
	1 MHz	3 MHz	/	PK	PK
	1 MHz	10 Hz	/	Ave	PK

If the maximized peak measured value complies with under the QP/Average limit more than 6dB, then it is unnecessary to perform an QP/Average measurement.

7.4. Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in Quasi-peak and average detector mode from 9 kHz to 30 MHz, Quasi-peak detector mode from 30 MHz to 1 GHz and PK and average detector modes for frequencies above 1 GHz.

7.5. Corrected Factor & Margin Calculation

The Correct Factor is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7 dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

Margin = Level – Limit

7.6. Test Results

Test Mode: Transmitting

(Pre-scan with three orthogonal axis, and worse case as X axis.)

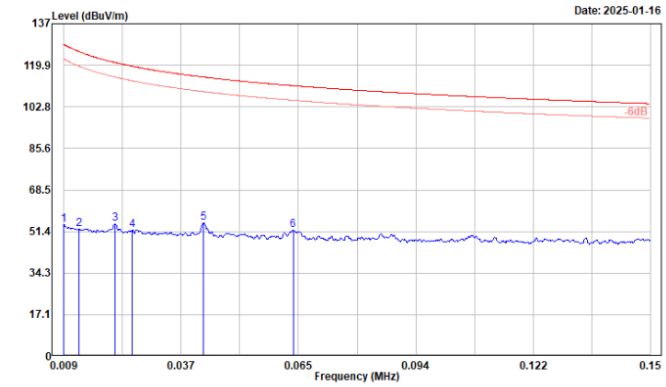
9kHz-30MHz:

(Worst case is Mode 1)

(Worst case is DSB-ASK mode, Middle channel)

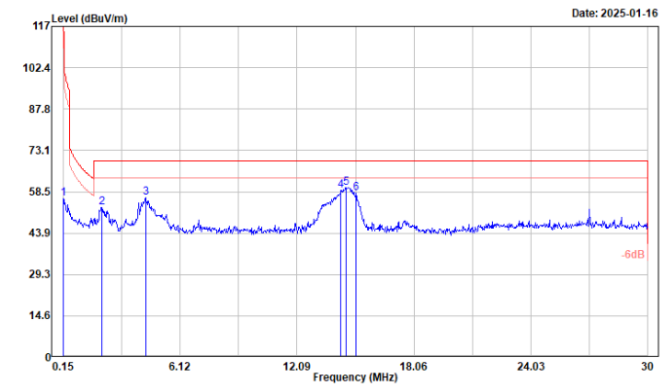
(Pre-scan using three directional polarities, worst case as parallel.)

9kHz-150kHz



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
0.009	36.43	17.81	54.24	128.52	-74.28	100	0	Average
0.013	36.57	15.92	52.49	125.55	-73.06	100	0	Average
0.021	39.65	14.91	54.56	120.99	-66.43	100	0	Average
0.026	37.80	14.34	52.14	119.47	-67.33	100	0	Average
0.043	42.10	12.84	54.94	115.02	-60.08	100	0	Average
0.064	40.29	11.68	51.97	111.46	-59.49	100	0	Average

150kHz-30MHz



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
0.150	44.65	11.37	56.02	104.08	-48.06	100	360	Average
2.120	42.37	10.70	53.07	69.54	-16.47	100	360	QP
4.359	45.77	10.63	56.40	69.54	-13.14	100	360	QP
14.329	47.37	11.57	58.94	69.54	-10.60	100	360	QP
14.597	48.44	11.58	60.02	69.54	-9.52	100	360	QP
15.105	46.50	11.59	58.09	69.54	-11.45	100	360	QP

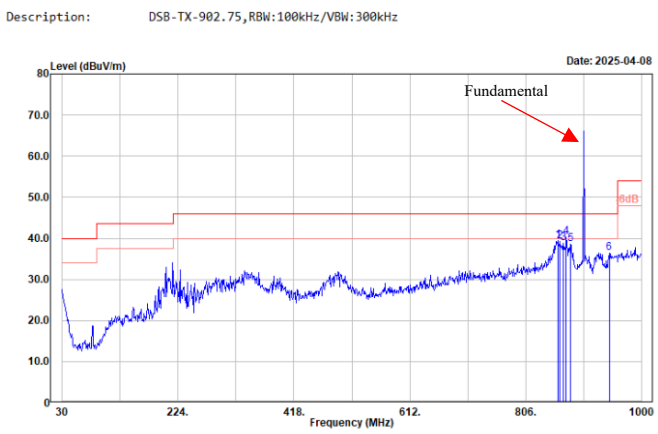
30MHz-1GHz:

(worst case is DSB-ASK mode)

Mode 1

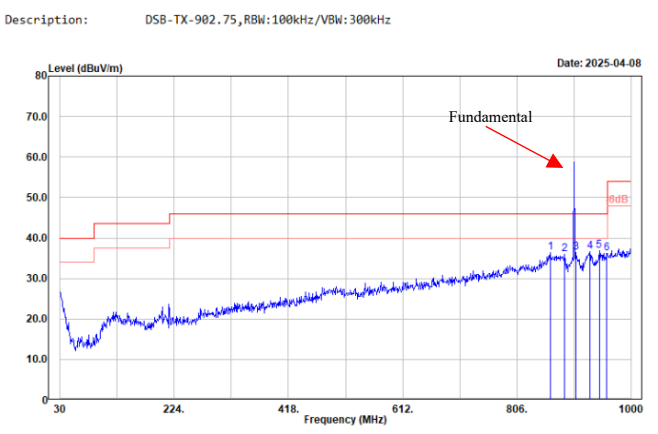
Low channel

Horizontal



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
859.350	35.44	4.07	39.51	46.00	-6.49	100	355	QP
862.260	35.07	4.12	39.19	46.00	-6.81	100	18	QP
869.050	34.73	4.14	38.87	46.00	-7.13	100	352	QP
873.900	36.13	4.20	40.33	46.00	-5.67	100	337	QP
880.690	34.00	4.51	38.51	46.00	-7.49	100	357	QP
945.680	30.54	5.94	36.48	46.00	-9.52	100	344	QP

Vertical

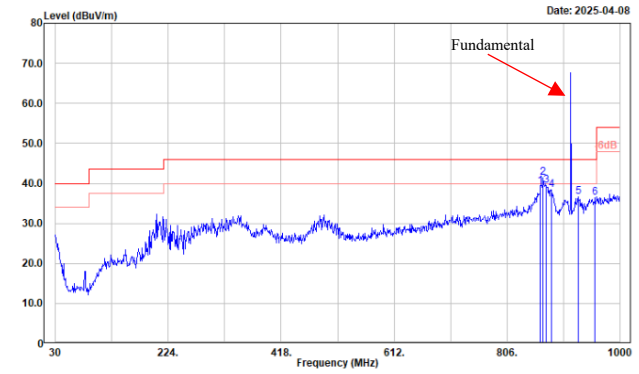


Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
862.260	32.31	4.12	36.43	46.00	-9.57	100	2	QP
887.480	31.26	4.76	36.02	46.00	-9.98	100	24	QP
905.910	31.28	5.07	36.35	46.00	-9.65	100	216	QP
930.160	30.76	5.88	36.64	46.00	-9.36	100	133	QP
945.680	30.82	5.94	36.76	46.00	-9.24	100	47	QP
958.290	30.14	6.16	36.30	46.00	-9.70	100	28	QP

Middle channel

Horizontal

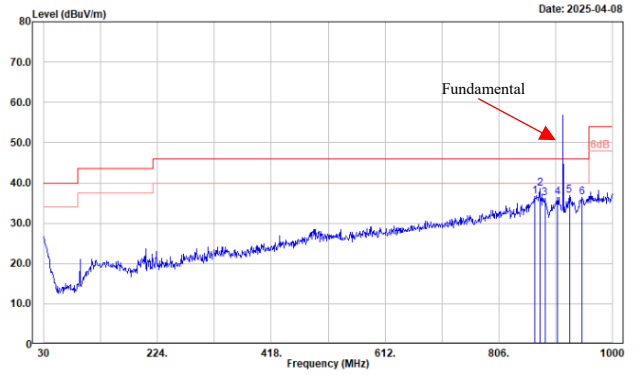
Description: DSB-TX-915.25,RBW:100kHz/VBW:300kHz



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
863.230	35.13	4.12	39.25	46.00	-6.75	100	2	QP
868.080	37.28	4.15	41.43	46.00	-4.57	100	360	QP
873.900	35.26	4.20	39.46	46.00	-6.54	100	5	QP
882.630	33.75	4.58	38.33	46.00	-7.67	100	358	QP
928.220	30.76	5.79	36.55	46.00	-9.45	100	123	QP
957.320	30.29	6.14	36.43	46.00	-9.57	100	57	QP

Vertical

Description: DSB-TX-915.25,RBW:100kHz/VBW:300kHz

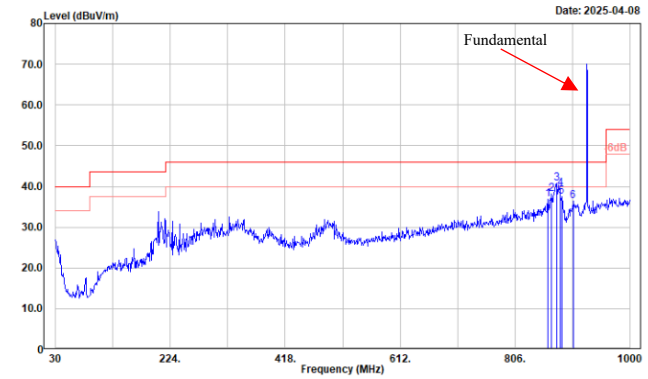


Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
867.110	32.57	4.15	36.72	46.00	-9.28	100	314	QP
875.840	34.36	4.26	38.62	46.00	-7.38	100	340	QP
884.570	31.55	4.65	36.20	46.00	-9.80	100	23	QP
905.910	31.32	5.07	36.39	46.00	-9.61	100	4	QP
926.280	31.23	5.68	36.91	46.00	-9.09	100	71	QP
947.620	30.60	5.92	36.52	46.00	-9.48	100	284	QP

High channel

Horizontal

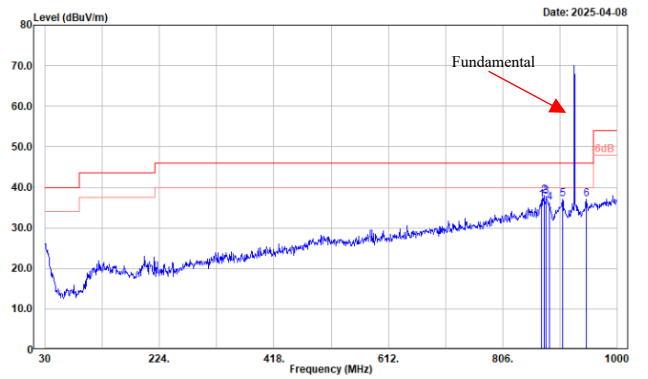
Description: DSB-TX-927.25,RBW:100kHz/VBW:300kHz



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
861.290	32.73	4.10	36.83	46.00	-9.17	100	280	QP
868.080	34.11	4.15	38.26	46.00	-7.74	100	0	QP
876.810	36.49	4.31	40.80	46.00	-5.20	100	17	QP
881.660	34.96	4.55	39.51	46.00	-6.49	100	20	QP
884.570	32.85	4.65	37.50	46.00	-8.50	100	354	QP
903.970	31.33	5.03	36.36	46.00	-9.64	100	95	QP

Vertical

Description: DSB-TX-927.25,RBW:100kHz/VBW:300kHz

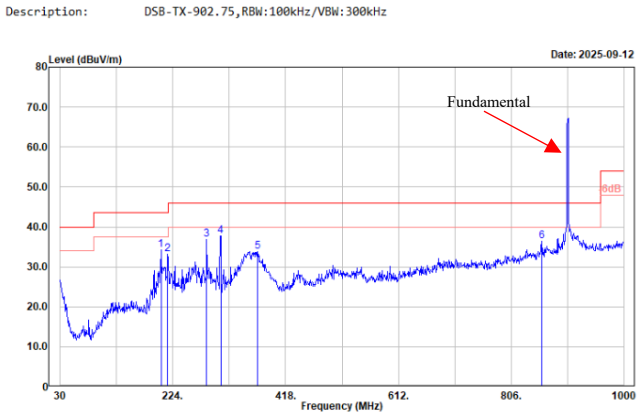


Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
871.960	32.73	4.17	36.90	46.00	-9.10	100	306	QP
875.840	33.69	4.26	37.95	46.00	-8.05	100	360	QP
879.720	33.20	4.48	37.68	46.00	-8.32	100	336	QP
885.540	31.42	4.69	36.11	46.00	-9.89	100	275	QP
907.850	32.02	5.09	37.11	46.00	-8.89	100	165	QP
947.620	31.09	5.92	37.01	46.00	-8.99	100	161	QP

Mode 2

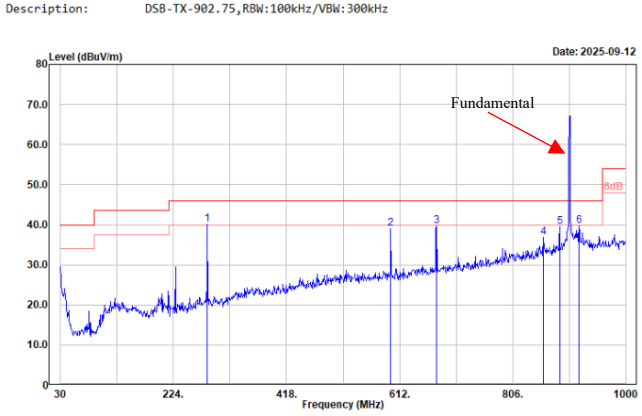
Low channel

Horizontal



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
203.630	44.87	-10.65	34.22	43.50	-9.28	100	179	QP
215.270	44.80	-11.57	33.23	43.50	-10.27	100	195	QP
282.200	45.19	-8.39	36.80	46.00	-9.20	100	305	QP
306.450	45.88	-8.09	37.79	46.00	-8.21	100	45	QP
369.500	40.54	-6.70	33.84	46.00	-12.16	100	149	QP
858.380	32.33	4.05	36.38	46.00	-9.62	100	14	QP

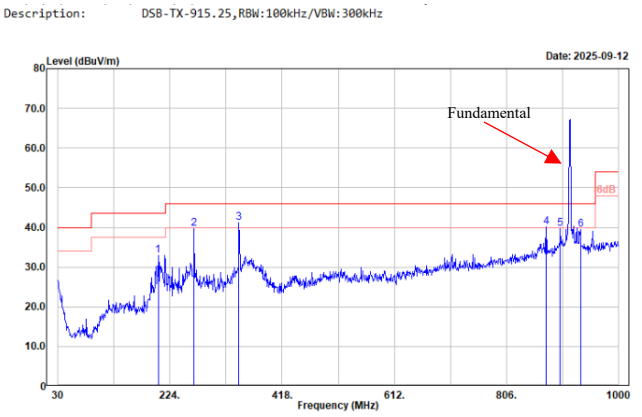
Vertical



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
282.200	48.52	-8.39	40.13	46.00	-5.87	100	325	QP
596.480	40.73	-1.69	39.04	46.00	-6.96	100	119	QP
675.050	39.67	-0.06	39.61	46.00	-6.39	100	226	QP
858.380	32.75	4.05	36.80	46.00	-9.20	100	302	QP
886.510	34.79	4.72	39.51	46.00	-6.49	100	268	QP
919.490	34.20	5.44	39.64	46.00	-6.36	100	249	QP

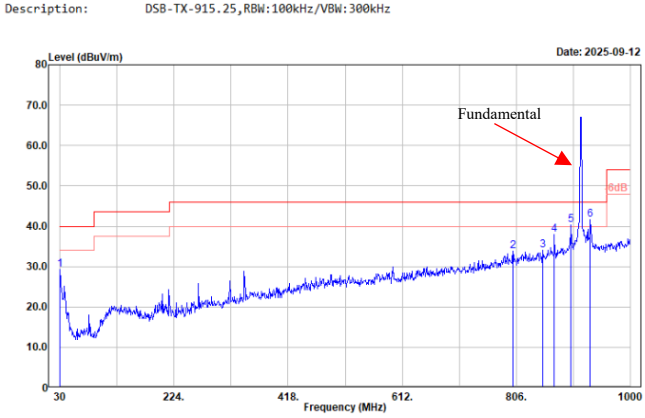
Middle channel

Horizontal



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
203.630	43.60	-10.65	32.95	43.50	-10.55	100	175	QP
265.710	48.76	-9.00	39.76	46.00	-6.24	100	48	QP
343.310	48.66	-7.38	41.28	46.00	-4.72	100	0	QP
874.870	35.87	4.21	40.08	46.00	-5.92	100	18	QP
899.120	34.81	4.91	39.72	46.00	-6.28	100	282	QP
934.040	33.42	6.00	39.42	46.00	-6.58	100	22	QP

Vertical

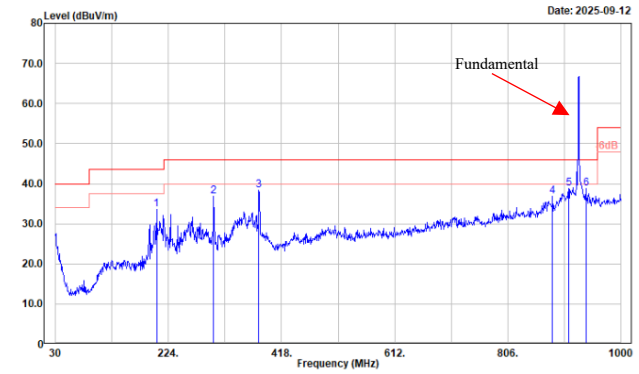


Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
30.000	31.49	-2.28	29.21	40.00	-10.79	100	115	QP
800.180	30.91	2.90	33.81	46.00	-12.19	100	123	QP
851.590	30.14	3.95	34.09	46.00	-11.91	100	84	QP
870.990	33.88	4.15	38.03	46.00	-7.97	100	300	QP
899.120	35.51	4.91	40.42	46.00	-5.58	100	250	QP
932.100	35.77	5.94	41.71	46.00	-4.29	100	319	QP

High channel

Horizontal

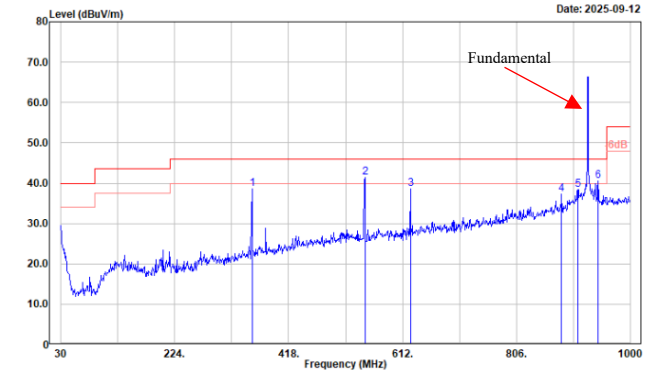
Description: DSB-TX-927.25,RBW:100kHz/VBW:300kHz



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
203.630	44.34	-10.65	33.69	43.50	-9.81	100	166	QP
301.600	44.95	-8.11	36.84	46.00	-9.16	100	51	QP
379.200	44.83	-6.38	38.45	46.00	-7.55	100	16	QP
882.630	32.23	4.58	36.81	46.00	-9.19	100	39	QP
910.760	33.71	5.15	38.86	46.00	-7.14	100	292	QP
939.860	32.85	5.88	38.73	46.00	-7.27	100	342	QP

Vertical

Description: DSB-TX-927.25,RBW:100kHz/VBW:300kHz



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
355.920	45.79	-7.13	38.66	46.00	-7.34	100	216	QP
547.980	44.24	-2.79	41.45	46.00	-4.55	100	41	QP
625.580	39.83	-1.28	38.55	46.00	-7.45	100	99	QP
882.630	32.61	4.58	37.19	46.00	-8.81	100	342	QP
910.760	33.19	5.15	38.34	46.00	-7.66	100	1	QP
944.710	34.54	5.93	40.47	46.00	-5.53	100	331	QP

Level = Reading + Factor.

Margin = Level – Limit.

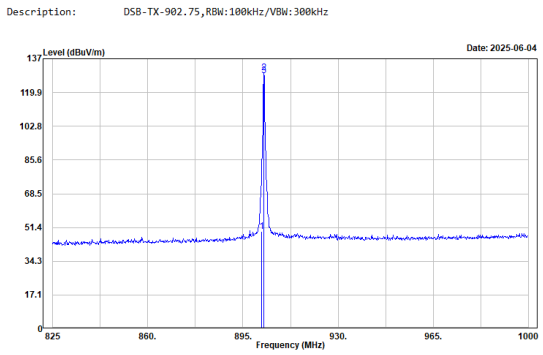
Factor = Antenna Factor + Cable Loss – Amplifier Gain.

Band-Edge:

DBS-ASK mode

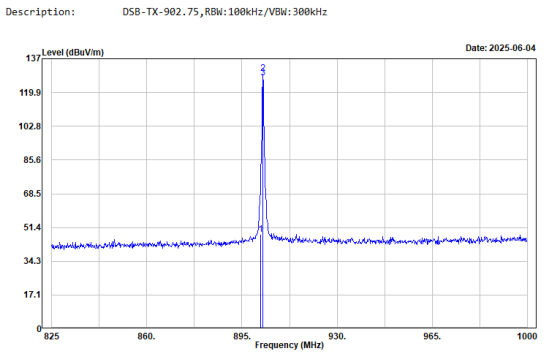
Low channel

Horizontal



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
902.000	44.24	4.97	49.21	108.30	-59.09	163	12	QP
902.750	125.01	4.99	130.00			163	12	Peak
902.750	123.31	4.99	128.30			163	12	QP

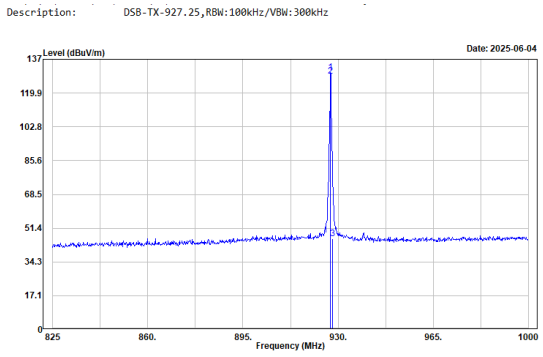
Vertical



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
902.000	42.91	4.97	47.88	107.50	-59.62	123	325	QP
902.750	124.43	4.99	129.42			123	325	Peak
902.750	122.51	4.99	127.50			123	325	QP

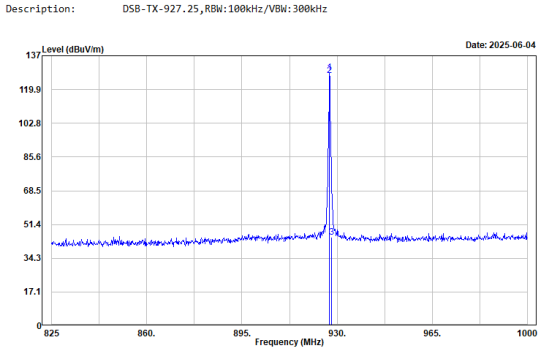
High channel

Horizontal



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
927.250	124.46	5.73	130.19			150	7	Peak
927.250	122.79	5.73	128.52			150	7	QP
928.000	40.36	5.78	46.14	108.52	-62.38	150	7	QP

Vertical

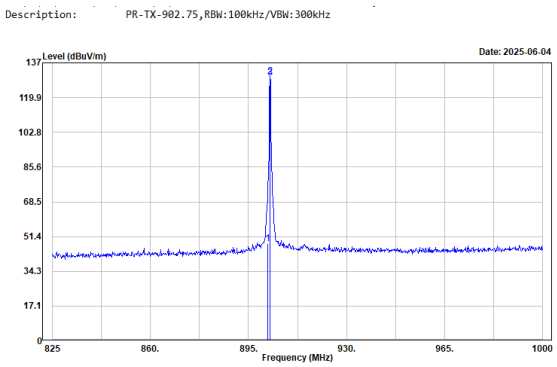


Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
927.250	122.91	5.73	128.64			122	5	Peak
927.250	121.40	5.73	127.13			122	5	QP
928.000	39.31	5.78	45.09	107.13	-62.04	122	5	QP

PR-ASK mode

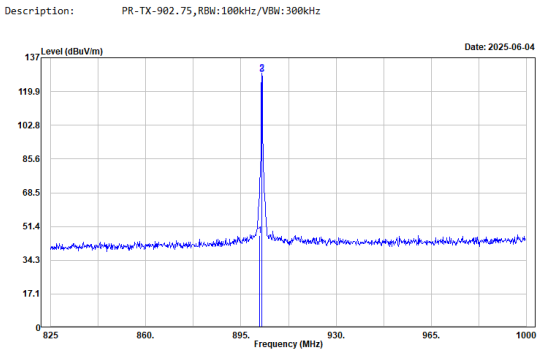
Low channel

Horizontal



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
902.000	43.06	4.97	48.03	109.57	-61.54	159	5	QP
902.750	125.28	4.99	130.27			159	5	Peak
902.750	124.58	4.99	129.57			159	5	QP

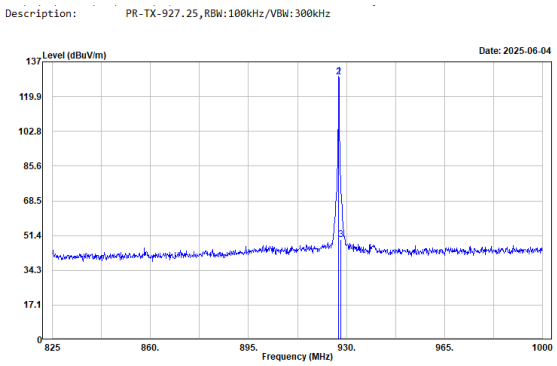
Vertical



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
902.000	41.81	4.97	46.78	108.64	-61.86	109	342	QP
902.750	124.14	4.99	129.13			109	342	Peak
902.750	123.65	4.99	128.64			109	342	QP

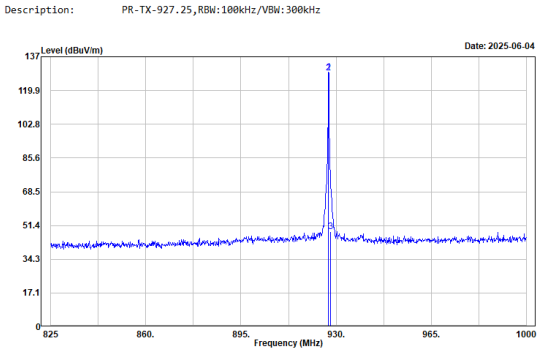
High channel

Horizontal



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
927.250	124.13	5.73	129.86			146	1	Peak
927.250	123.68	5.73	129.41			146	1	QP
928.000	43.51	5.78	49.29	109.41	-60.12	146	1	QP

Vertical



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
927.250	123.42	5.73	129.15			114	331	Peak
927.250	122.96	5.73	128.69			114	331	QP
928.000	42.57	5.78	48.35	108.69	-60.34	114	331	QP

Level = Reading + Factor.

Margin = Level – Limit.

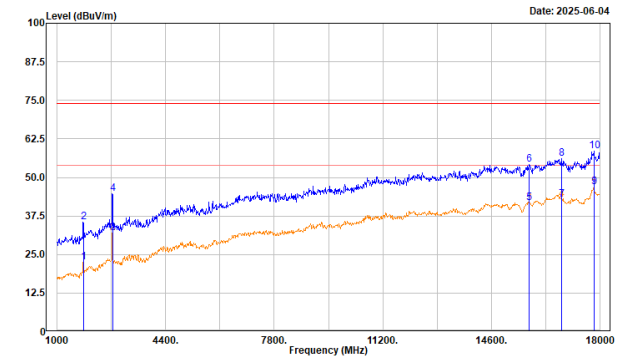
Factor = Antenna Factor + Cable Loss – Amplifier Gain.

1GHz-18GHz:

(DSB-ASK mode, worst case is Middle channel)

Horizontal

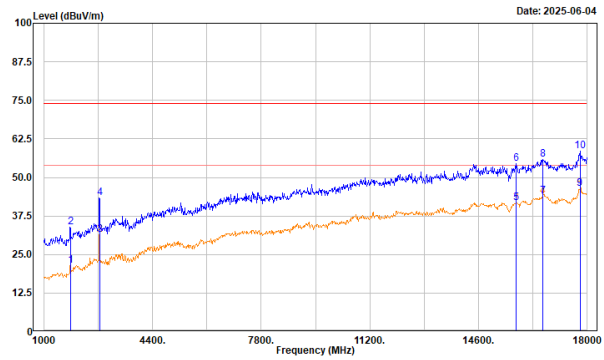
Description: DSB-TX-915.25,Peak RBW:1MHz/VBW:3MHz,Avg RBW:1MHz/VBW:1kHz



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
1830.500	35.83	-13.25	22.58	54.00	-31.42	191	227	Average
1830.500	48.87	-13.25	35.62	74.00	-38.38	191	227	Peak
2745.750	41.58	-9.55	32.03	54.00	-21.97	164	167	Average
2745.750	54.13	-9.55	44.58	74.00	-29.42	164	167	Peak
15790.000	32.35	9.45	41.80	54.00	-12.20	150	354	Average
15790.000	44.70	9.45	54.15	74.00	-19.85	150	354	Peak
16793.000	30.80	12.09	42.89	54.00	-11.11	150	149	Average
16793.000	43.94	12.09	56.03	74.00	-17.97	150	149	Peak
17813.000	33.01	13.79	46.80	54.00	-7.20	150	64	Average
17813.000	44.75	13.79	58.54	74.00	-15.46	150	64	Peak

Vertical

Description: DSB-TX-915.25,Peak RBW:1MHz/VBW:3MHz,Avg RBW:1MHz/VBW:1kHz

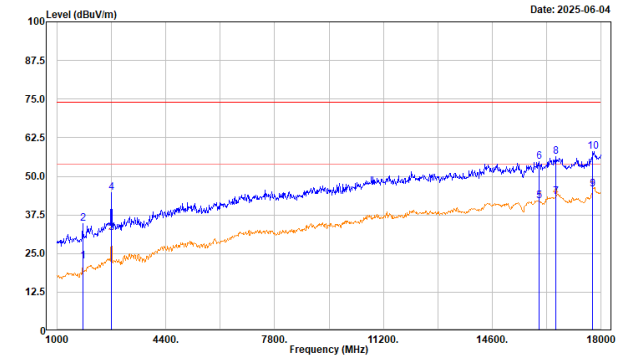


Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
1830.500	34.62	-13.25	21.37	54.00	-32.63	143	243	Average
1830.500	47.20	-13.25	33.95	74.00	-40.05	143	243	Peak
2745.750	41.08	-9.55	31.53	54.00	-22.47	128	321	Average
2745.750	53.02	-9.55	43.47	74.00	-30.53	128	321	Peak
15773.000	32.30	9.36	41.66	54.00	-12.34	150	10	Average
15773.000	45.24	9.36	54.60	74.00	-19.40	150	10	Peak
16606.000	31.62	12.33	43.95	54.00	-10.05	150	89	Average
16606.000	43.47	12.33	55.80	74.00	-18.20	150	89	Peak
17779.000	32.68	13.65	46.33	54.00	-7.67	150	147	Average
17779.000	44.99	13.65	58.64	74.00	-15.36	150	147	Peak

(PR-ASK mode, worst case is Low channel)

Horizontal

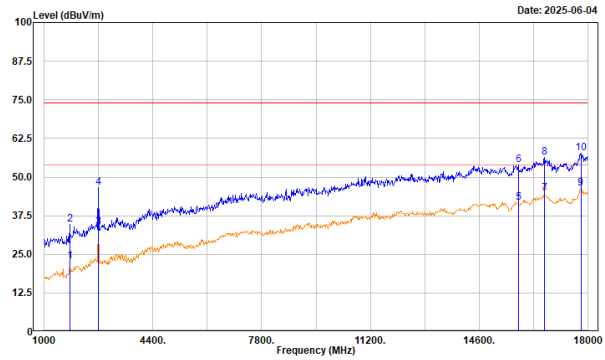
Description: PR-TX-902.75,Peak RBW:1MHz/VBW:3MHz,Avg RBW:1MHz/VBW:1kHz



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
1805.500	36.15	-13.57	22.58	54.00	-31.42	162	239	Average
1805.500	48.33	-13.57	34.76	74.00	-39.24	162	239	Peak
2708.250	41.19	-9.36	31.83	54.00	-22.17	271	248	Average
2708.250	54.07	-9.36	44.71	74.00	-29.29	271	248	Peak
16062.000	31.59	10.47	42.06	54.00	-11.94	150	123	Average
16062.000	44.28	10.47	54.75	74.00	-19.25	150	123	Peak
16589.000	31.06	12.30	43.36	54.00	-10.64	150	56	Average
16589.000	43.95	12.30	56.25	74.00	-17.75	150	56	Peak
17745.000	32.33	13.52	45.85	54.00	-8.15	150	315	Average
17745.000	44.48	13.52	58.00	74.00	-16.00	150	315	Peak

Vertical

Description: PR-TX-902.75,Peak RBW:1MHz/VBW:3MHz,Avg RBW:1MHz/VBW:1kHz



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
1805.500	36.21	-13.57	22.64	54.00	-31.36	144	270	Average
1805.500	48.33	-13.57	34.76	74.00	-39.24	144	270	Peak
2708.250	43.36	-9.36	34.00	54.00	-20.00	194	166	Average
2708.250	55.98	-9.36	46.62	74.00	-27.38	194	166	Peak
15824.000	32.05	9.55	41.60	54.00	-12.40	150	8	Average
15824.000	44.33	9.55	53.88	74.00	-20.12	150	8	Peak
16640.000	32.34	12.35	44.69	54.00	-9.31	150	212	Average
16640.000	43.92	12.35	56.27	74.00	-17.73	150	212	Peak
17779.000	32.69	13.65	46.34	54.00	-7.66	150	336	Average
17779.000	44.13	13.65	57.78	74.00	-16.22	150	336	Peak

Level = Reading + Factor.

Margin = Level – Limit.

Factor = Antenna Factor + Cable Loss – Amplifier Gain.

Above 1GHz

DSB-ASK Mode

Low channel

Horizontal

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
1805.500	36.04	-13.57	22.47	54.00	-31.53	163	236	Average
1805.500	48.88	-13.57	35.31	74.00	-38.69	163	236	Peak
2708.250	36.84	-9.36	27.48	54.00	-26.52	174	139	Average
2708.250	53.67	-9.36	44.31	74.00	-29.69	174	139	Peak
15926.000	31.62	9.86	41.48	54.00	-12.52	150	46	Average
15926.000	44.61	9.86	54.47	74.00	-19.53	150	46	Peak
16708.000	31.53	12.37	43.90	54.00	-10.10	150	188	Average
16708.000	44.47	12.37	56.84	74.00	-17.16	150	188	Peak
17779.000	32.49	13.65	46.14	54.00	-7.86	150	300	Average
17779.000	43.64	13.65	57.29	74.00	-16.71	150	300	Peak

Vertical

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
1805.500	35.89	-13.57	22.32	54.00	-31.68	121	280	Average
1805.500	47.77	-13.57	34.20	74.00	-39.80	121	280	Peak
2708.250	43.09	-9.36	33.73	54.00	-20.27	193	168	Average
2708.250	55.54	-9.36	46.18	74.00	-27.82	193	168	Peak
15467.000	32.12	9.14	41.26	54.00	-12.74	150	12	Average
15467.000	45.25	9.14	54.39	74.00	-19.61	150	12	Peak
16674.000	31.87	12.38	44.25	54.00	-9.75	150	221	Average
16674.000	43.82	12.38	56.20	74.00	-17.80	150	221	Peak
17796.000	32.79	13.72	46.51	54.00	-7.49	150	301	Average
17796.000	44.59	13.72	58.31	74.00	-15.69	150	301	Peak

Middle channel

Horizontal

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
1830.500	35.83	-13.25	22.58	54.00	-31.42	191	227	Average
1830.500	48.87	-13.25	35.62	74.00	-38.38	191	227	Peak
2745.750	41.58	-9.55	32.03	54.00	-21.97	164	167	Average
2745.750	54.13	-9.55	44.58	74.00	-29.42	164	167	Peak
15790.000	32.35	9.45	41.80	54.00	-12.20	150	354	Average
15790.000	44.70	9.45	54.15	74.00	-19.85	150	354	Peak
16793.000	30.80	12.09	42.89	54.00	-11.11	150	149	Average
16793.000	43.94	12.09	56.03	74.00	-17.97	150	149	Peak
17813.000	33.01	13.79	46.80	54.00	-7.20	150	64	Average
17813.000	44.75	13.79	58.54	74.00	-15.46	150	64	Peak

Vertical

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
1830.500	34.62	-13.25	21.37	54.00	-32.63	143	243	Average
1830.500	47.20	-13.25	33.95	74.00	-40.05	143	243	Peak
2745.750	41.08	-9.55	31.53	54.00	-22.47	128	321	Average
2745.750	53.02	-9.55	43.47	74.00	-30.53	128	321	Peak
15773.000	32.30	9.36	41.66	54.00	-12.34	150	10	Average
15773.000	45.24	9.36	54.60	74.00	-19.40	150	10	Peak
16606.000	31.62	12.33	43.95	54.00	-10.05	150	89	Average
16606.000	43.47	12.33	55.80	74.00	-18.20	150	89	Peak
17779.000	32.68	13.65	46.33	54.00	-7.67	150	147	Average
17779.000	44.99	13.65	58.64	74.00	-15.36	150	147	Peak

High channel

Horizontal

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
1854.500	35.12	-12.98	22.14	54.00	-31.86	158	230	Average
1854.500	47.75	-12.98	34.77	74.00	-39.23	158	230	Peak
2781.750	36.72	-9.49	27.23	54.00	-26.77	179	275	Average
2781.750	55.15	-9.49	45.66	74.00	-28.34	179	275	Peak
15960.000	32.04	10.06	42.10	54.00	-11.90	150	29	Average
15960.000	44.76	10.06	54.82	74.00	-19.18	150	29	Peak
16674.000	31.92	12.38	44.30	54.00	-9.70	150	136	Average
16674.000	43.66	12.38	56.04	74.00	-17.96	150	136	Peak
17813.000	32.58	13.79	46.37	54.00	-7.63	150	301	Average
17813.000	44.25	13.79	58.04	74.00	-15.96	150	301	Peak

Vertical

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
1854.500	31.99	-12.98	19.01	54.00	-34.99	109	229	Average
1854.500	44.51	-12.98	31.53	74.00	-42.47	109	229	Peak
2781.750	42.51	-9.49	33.02	54.00	-20.98	125	345	Average
2781.750	55.26	-9.49	45.77	74.00	-28.23	125	345	Peak
16062.000	31.80	10.47	42.27	54.00	-11.73	150	111	Average
16062.000	43.71	10.47	54.18	74.00	-19.82	150	111	Peak
16623.000	31.84	12.34	44.18	54.00	-9.82	150	18	Average
16623.000	43.84	12.34	56.18	74.00	-17.82	150	18	Peak
17779.000	32.42	13.65	46.07	54.00	-7.93	150	163	Average
17779.000	43.85	13.65	57.50	74.00	-16.50	150	163	Peak

Level = Reading + Factor.

Margin = Level – Limit.

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain.

PR-ASK Mode

Low channel

Horizontal

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
1805.500	36.15	-13.57	22.58	54.00	-31.42	162	239	Average
1805.500	48.33	-13.57	34.76	74.00	-39.24	162	239	Peak
2708.250	41.19	-9.36	31.83	54.00	-22.17	271	248	Average
2708.250	54.07	-9.36	44.71	74.00	-29.29	271	248	Peak
16062.000	31.59	10.47	42.06	54.00	-11.94	150	123	Average
16062.000	44.28	10.47	54.75	74.00	-19.25	150	123	Peak
16589.000	31.06	12.30	43.36	54.00	-10.64	150	56	Average
16589.000	43.95	12.30	56.25	74.00	-17.75	150	56	Peak
17745.000	32.33	13.52	45.85	54.00	-8.15	150	315	Average
17745.000	44.48	13.52	58.00	74.00	-16.00	150	315	Peak

Vertical

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
1805.500	36.21	-13.57	22.64	54.00	-31.36	144	270	Average
1805.500	48.33	-13.57	34.76	74.00	-39.24	144	270	Peak
2708.250	43.36	-9.36	34.00	54.00	-20.00	194	166	Average
2708.250	55.98	-9.36	46.62	74.00	-27.38	194	166	Peak
15824.000	32.05	9.55	41.60	54.00	-12.40	150	8	Average
15824.000	44.33	9.55	53.88	74.00	-20.12	150	8	Peak
16640.000	32.34	12.35	44.69	54.00	-9.31	150	212	Average
16640.000	43.92	12.35	56.27	74.00	-17.73	150	212	Peak
17779.000	32.69	13.65	46.34	54.00	-7.66	150	336	Average
17779.000	44.13	13.65	57.78	74.00	-16.22	150	336	Peak

Middle channel

Horizontal

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
1830.500	36.75	-13.25	23.50	54.00	-30.50	188	222	Average
1830.500	49.71	-13.25	36.46	74.00	-37.54	188	222	Peak
2745.750	42.20	-9.55	32.65	54.00	-21.35	174	179	Average
2745.750	54.42	-9.55	44.87	74.00	-29.13	174	179	Peak
16011.000	31.73	10.32	42.05	54.00	-11.95	150	11	Average
16011.000	44.69	10.32	55.01	74.00	-18.99	150	11	Peak
16606.000	31.86	12.33	44.19	54.00	-9.81	150	256	Average
16606.000	44.41	12.33	56.74	74.00	-17.26	150	256	Peak
17779.000	32.52	13.65	46.17	54.00	-7.83	150	308	Average
17779.000	44.65	13.65	58.30	74.00	-15.70	150	308	Peak

Vertical

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
1830.500	31.64	-13.25	18.39	54.00	-35.61	146	241	Average
1830.500	44.22	-13.25	30.97	74.00	-43.03	146	241	Peak
2745.750	41.81	-9.55	32.26	54.00	-21.74	128	320	Average
2745.750	54.58	-9.55	45.03	74.00	-28.97	128	320	Peak
15739.000	32.62	9.18	41.80	54.00	-12.20	150	111	Average
15739.000	45.34	9.18	54.52	74.00	-19.48	150	111	Peak
16674.000	31.58	12.38	43.96	54.00	-10.04	150	9	Average
16674.000	43.78	12.38	56.16	74.00	-17.84	150	9	Peak
17762.000	32.36	13.59	45.95	54.00	-8.05	150	155	Average
17762.000	44.17	13.59	57.76	74.00	-16.24	150	155	Peak

High channel

Horizontal

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
1854.500	35.46	-12.98	22.48	54.00	-31.52	184	234	Average
1854.500	47.87	-12.98	34.89	74.00	-39.11	184	234	Peak
2781.750	43.33	-9.49	33.84	54.00	-20.16	185	272	Average
2781.750	55.59	-9.49	46.10	74.00	-27.90	185	272	Peak
15433.000	31.77	9.36	41.13	54.00	-12.87	150	112	Average
15433.000	44.89	9.36	54.25	74.00	-19.75	150	112	Peak
16674.000	31.67	12.38	44.05	54.00	-9.95	150	17	Average
16674.000	44.45	12.38	56.83	74.00	-17.17	150	17	Peak
17762.000	32.45	13.59	46.04	54.00	-7.96	150	350	Average
17762.000	44.51	13.59	58.10	74.00	-15.90	150	350	Peak

Vertical

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
1854.500	33.14	-12.98	20.16	54.00	-33.84	149	237	Average
1854.500	46.06	-12.98	33.08	74.00	-40.92	149	237	Peak
2781.750	42.75	-9.49	33.26	54.00	-20.74	122	344	Average
2781.750	55.09	-9.49	45.60	74.00	-28.40	122	344	Peak
16232.000	30.27	10.80	41.07	54.00	-12.93	150	13	Average
16232.000	44.18	10.80	54.98	74.00	-19.02	150	13	Peak
16606.000	31.24	12.33	43.57	54.00	-10.43	150	158	Average
16606.000	43.27	12.33	55.60	74.00	-18.40	150	158	Peak
17779.000	32.34	13.65	45.99	54.00	-8.01	150	88	Average
17779.000	44.03	13.65	57.68	74.00	-16.32	150	88	Peak

Level = Reading + Factor.

Margin = Level – Limit.

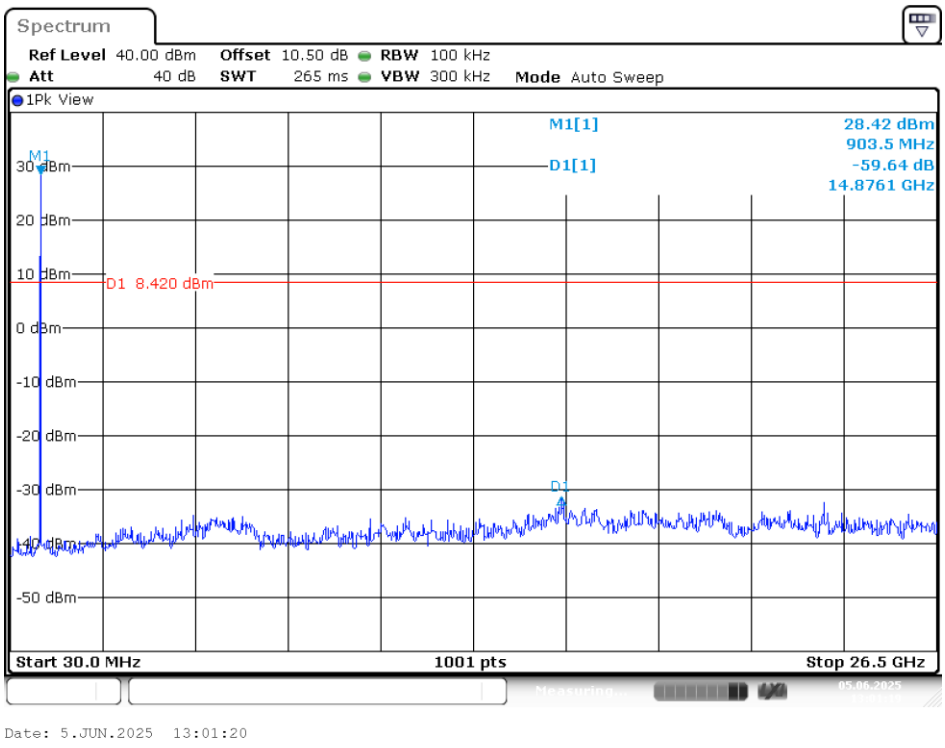
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain.

Conducted Spurious Emissions:

Channel	Frequency (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)	Result
DSB-ASK Mode				
Low	902.75	59.64	≥ 20	PASS
Mid	915.25	59.10	≥ 20	PASS
High	927.25	60.22	≥ 20	PASS
PR-ASK Mode				
Low	902.75	60.51	≥ 20	PASS
Mid	915.25	60.99	≥ 20	PASS
High	927.25	58.82	≥ 20	PASS

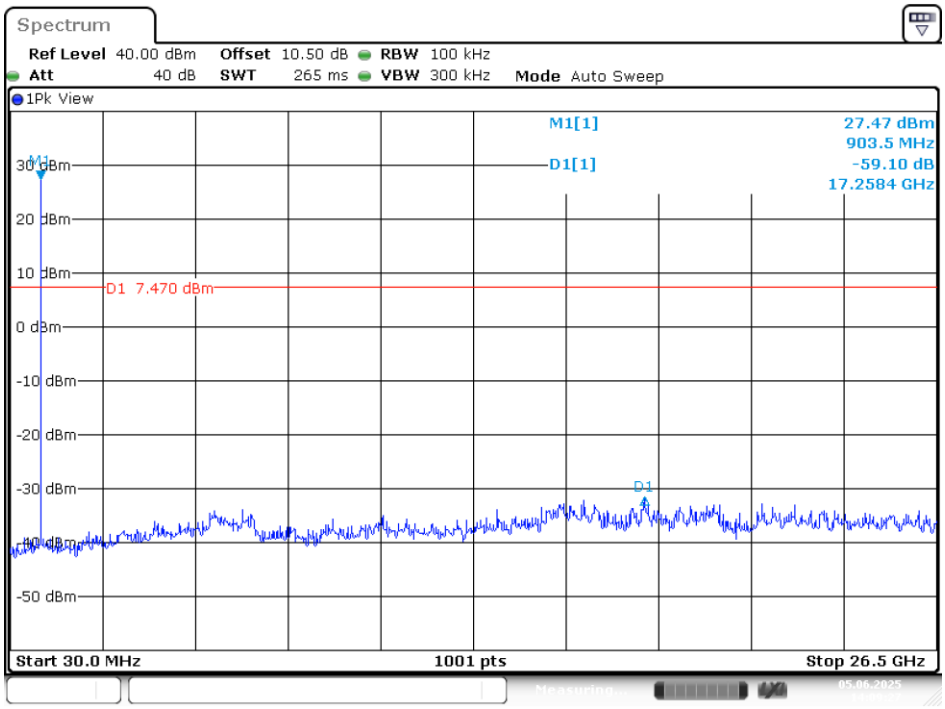
DSB-ASK

Low Channel



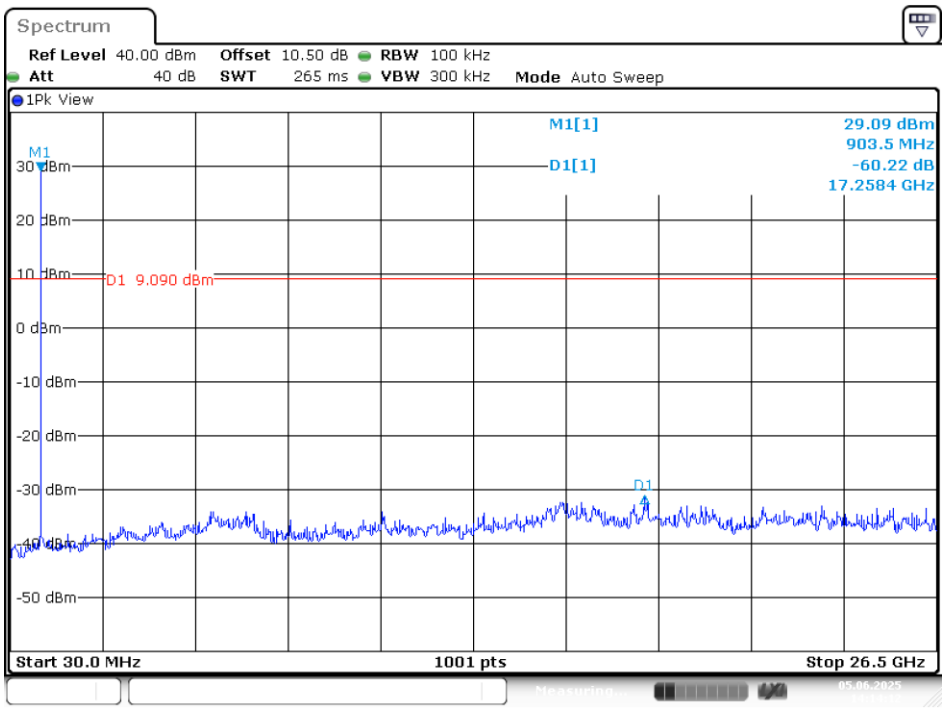
Date: 5.JUN.2025 13:01:20

Middle Channel



Date: 5.JUN.2025 14:09:28

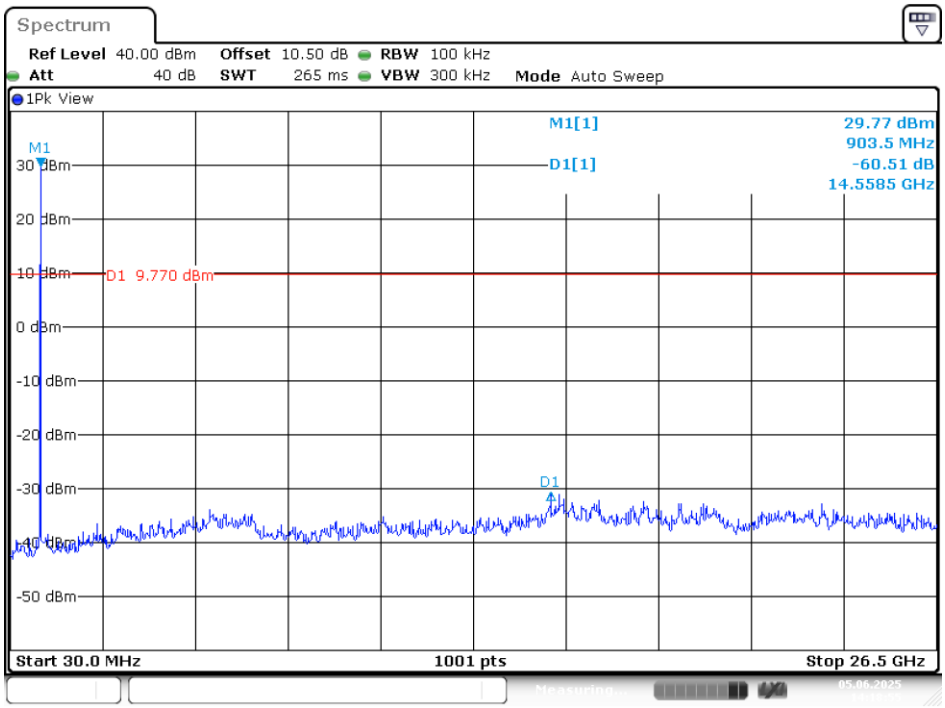
High Channel



Date: 5.JUN.2025 14:14:12

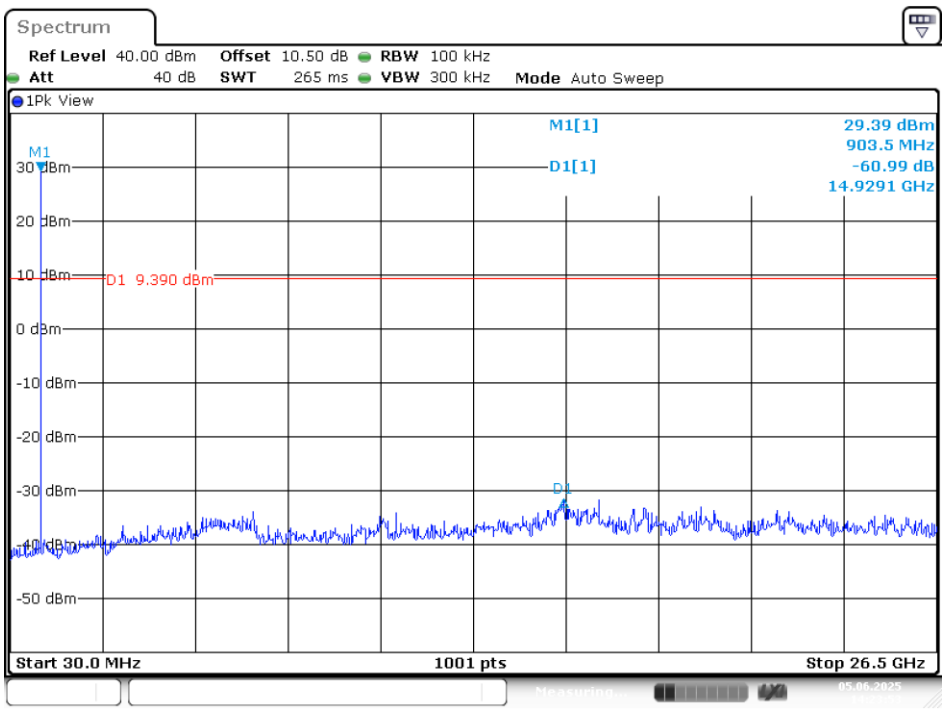
PR-ASK

Low Channel



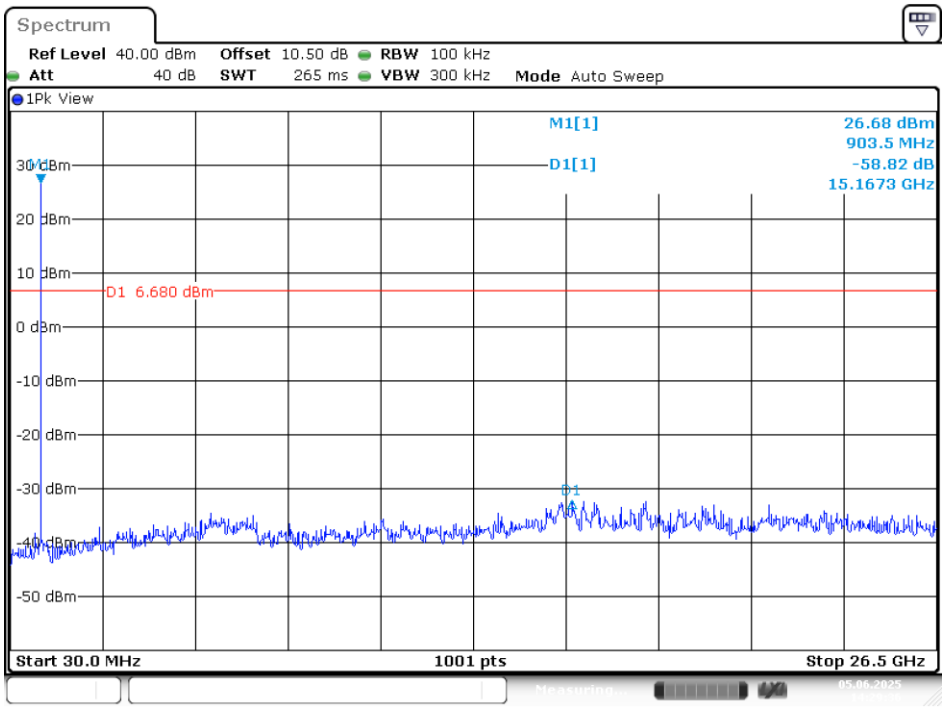
Date: 5.JUN.2025 14:18:55

Middle Channel



Date: 5.JUN.2025 14:23:53

High Channel



Date: 5.JUN.2025 14:29:36

8. FCC §15.247(a)(1) & RSS-247 §6.2.2.1(a), RSS-GEN §6.7– Emission Bandwidth

8.1. Applicable Standard

According to FCC §15.247(a) (1) the maximum 20 dB bandwidth of the hopping channel shall be presented.

According to RSS-247 §6.2.2.1(a)
The maximum 20 dB bandwidth of the hopping channel shall be 500 kHz.

According to RSS-GEN §6.7
The occupied bandwidth or the "99% emission bandwidth" is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained. The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs.

8.2. Test Procedure

According to ANSI C63.10-2020+Cor. 1-2023+C63.10a-2024+Errata to C63.10a-2024, section 6.9.2
20 dB Emission Bandwidth

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.

3 Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.

4. Repeat above procedures until all frequencies measured were complete.

According to ANSI C63.10-2020+Cor. 1-2023+C63.10a-2024+Errata to C63.10a-2024, Section 6.9.3
For the 99% emission bandwidth, the trace data points are recovered and directly summed in linear power level terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached, and that frequency recorded. The process is repeated for the highest frequency data points (starting at the highest frequency, at the right side of the span, and going down in frequency). This frequency is then recorded. The difference between the two recorded frequencies is the occupied bandwidth (or the 99% emission bandwidth).

8.3. Test Results

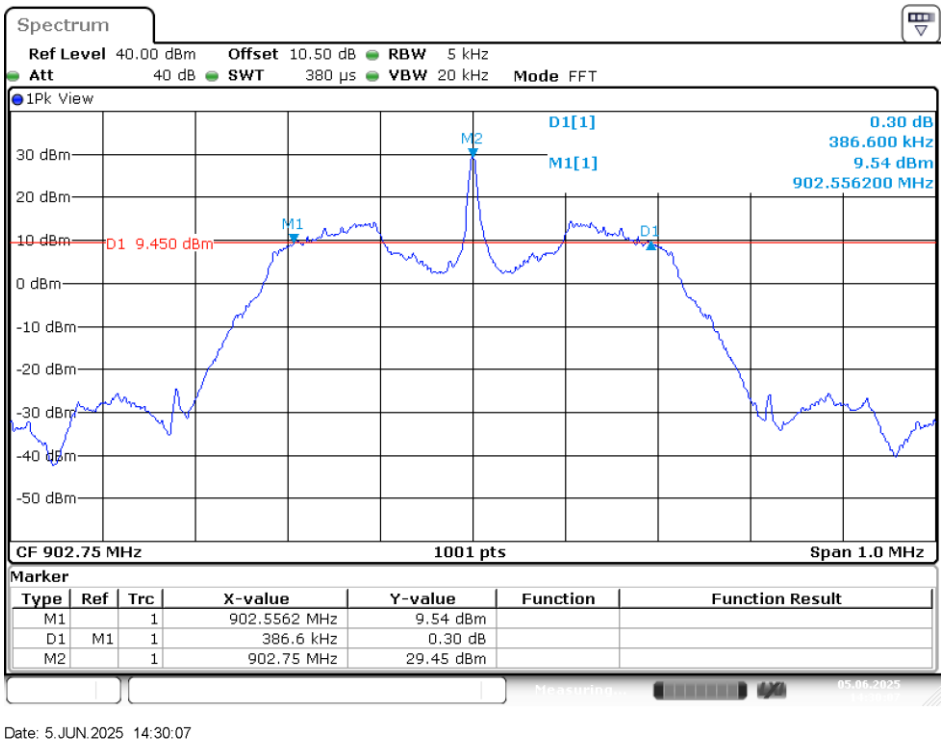
Channel	Frequency (MHz)	20 dB Bandwidth (kHz)	99% Bandwidth (kHz)	Limit (kHz)
DSB-ASK Mode				
Low	902.75	386.60	426.57	<500
Middle	915.25	354.60	424.58	<500
High	927.25	325.70	422.58	<500
PR-ASK Mode				
Low	902.75	197.80	192.81	<500
Middle	915.25	196.80	192.81	<500
High	927.25	195.80	192.81	<500

Please refer to the following plots

20 dB Emission Bandwidth

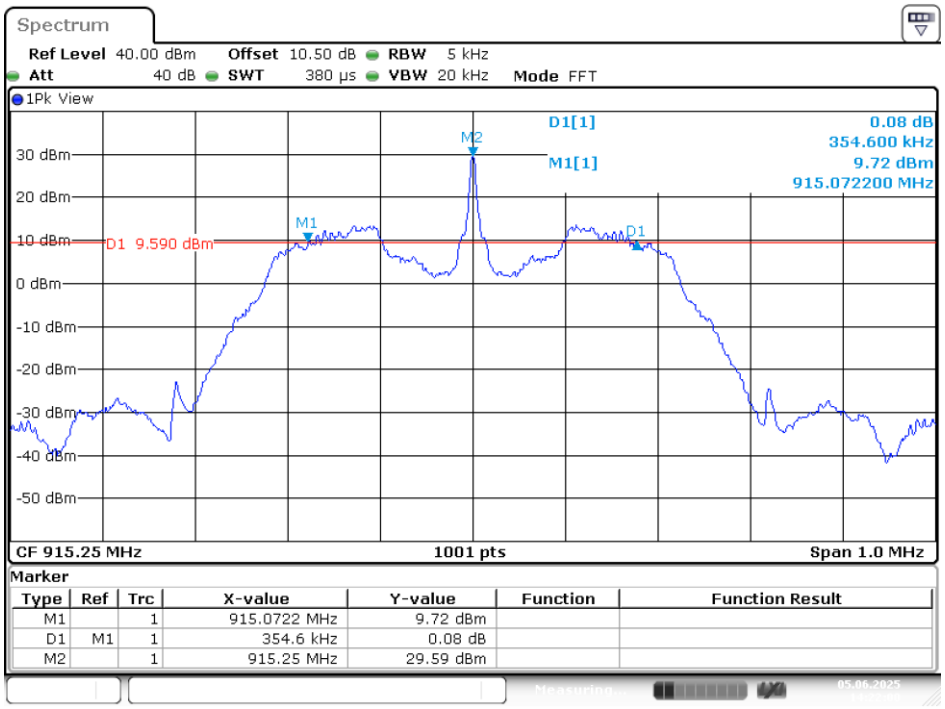
DSB-ASK

Low Channel



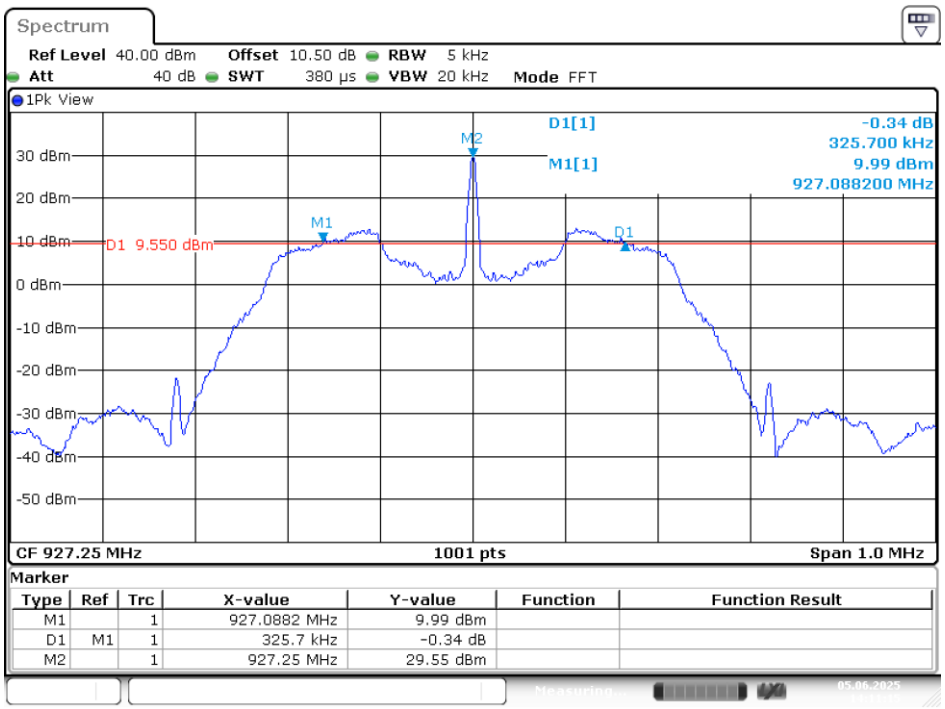
Date: 5.JUN.2025 14:30:07

Middle Channel



Date: 5.JUN.2025 14:22:00

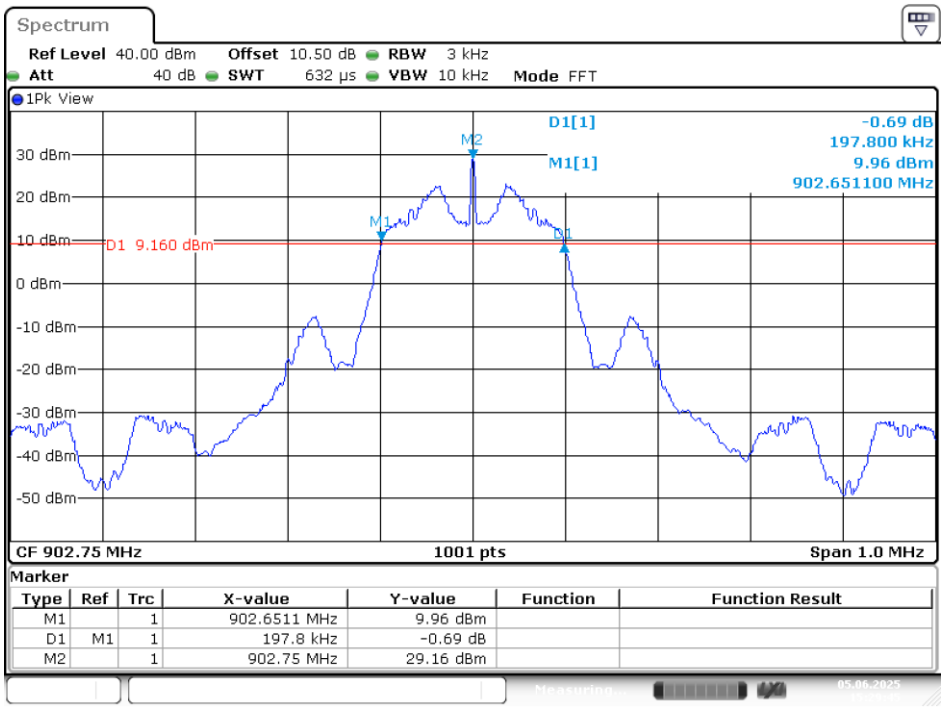
High Channel



Date: 5.JUN.2025 14:11:15

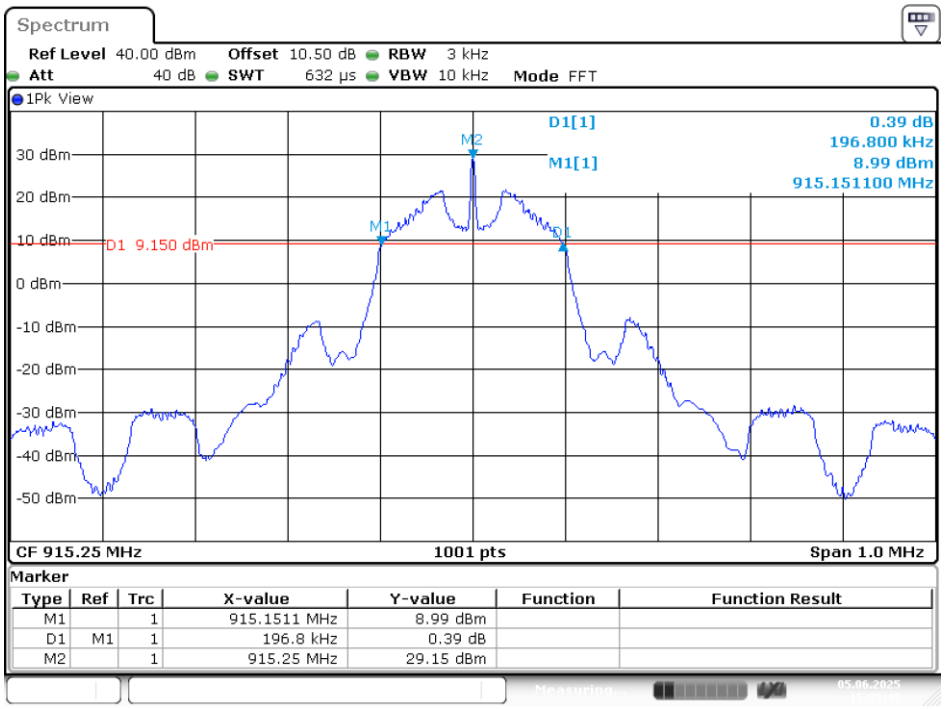
PR-ASK

Low Channel



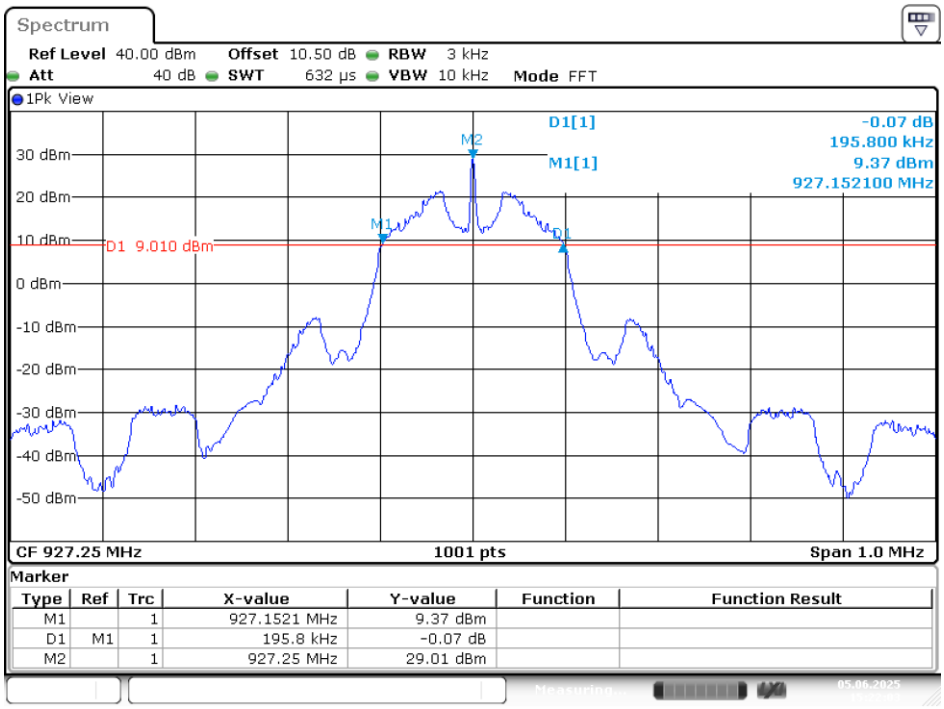
Date: 5.JUN.2025 15:29:45

Middle Channel



Date: 5.JUN.2025 15:25:41

High Channel

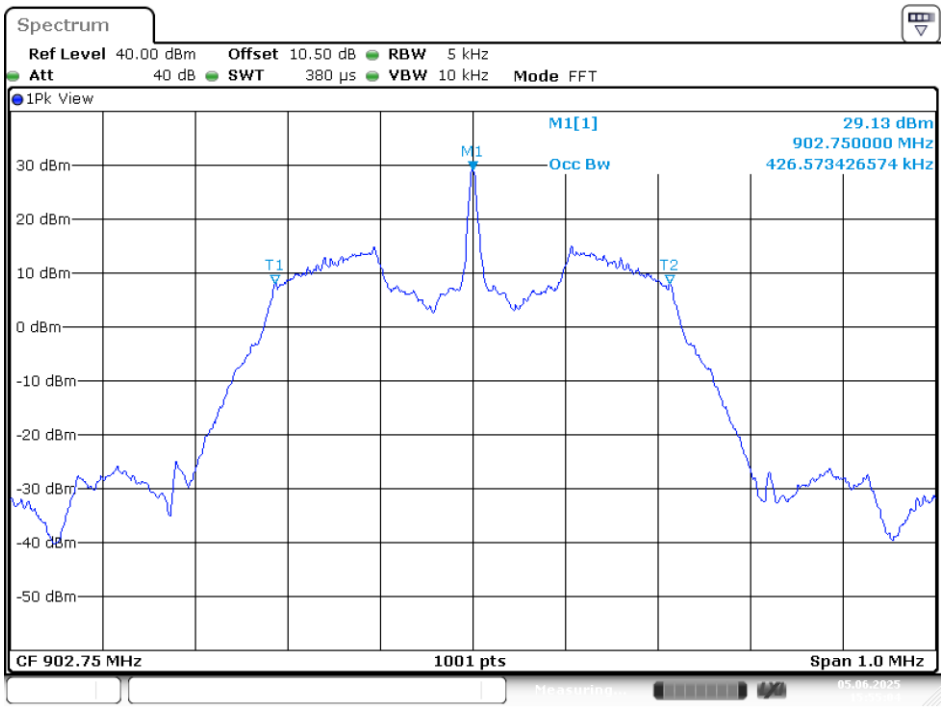


Date: 5.JUN.2025 15:22:04

99% Bandwidth

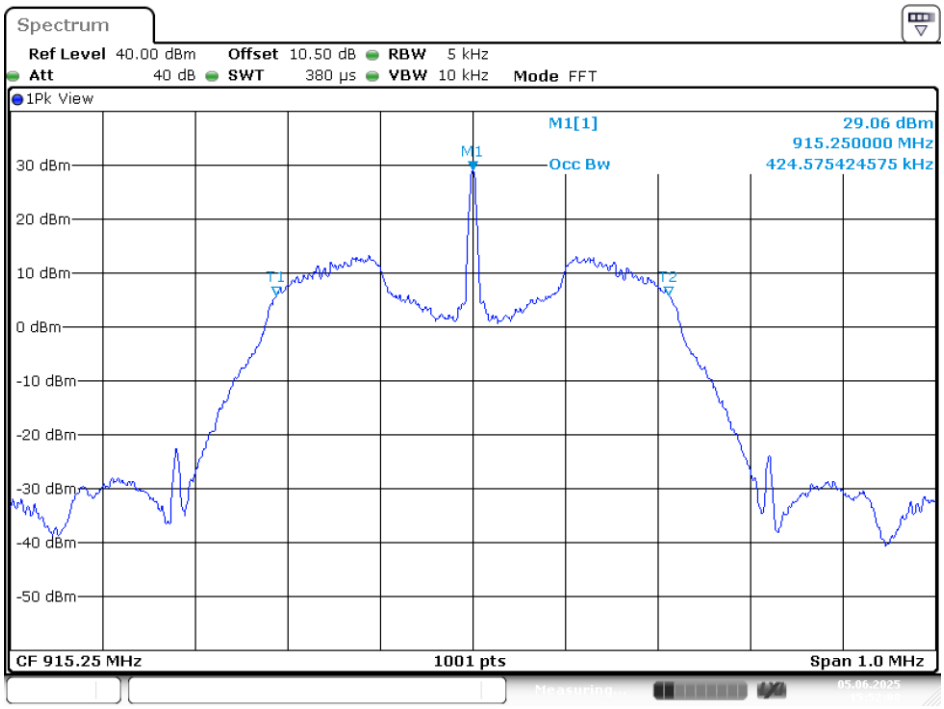
DSB-ASK

Low Channel



Date: 5.JUN.2025 15:55:04

Middle Channel



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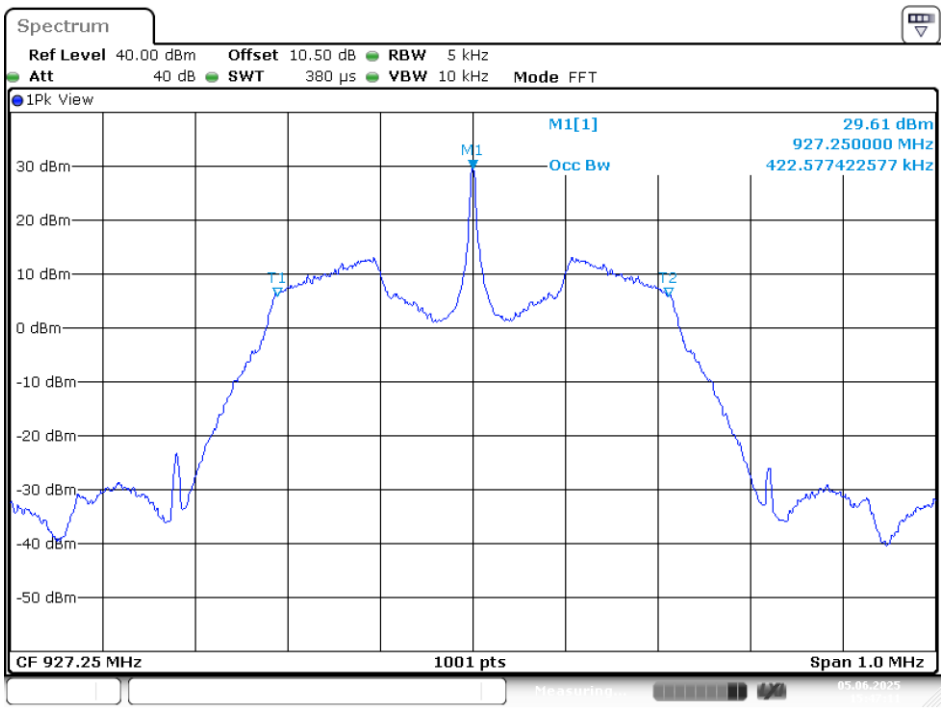
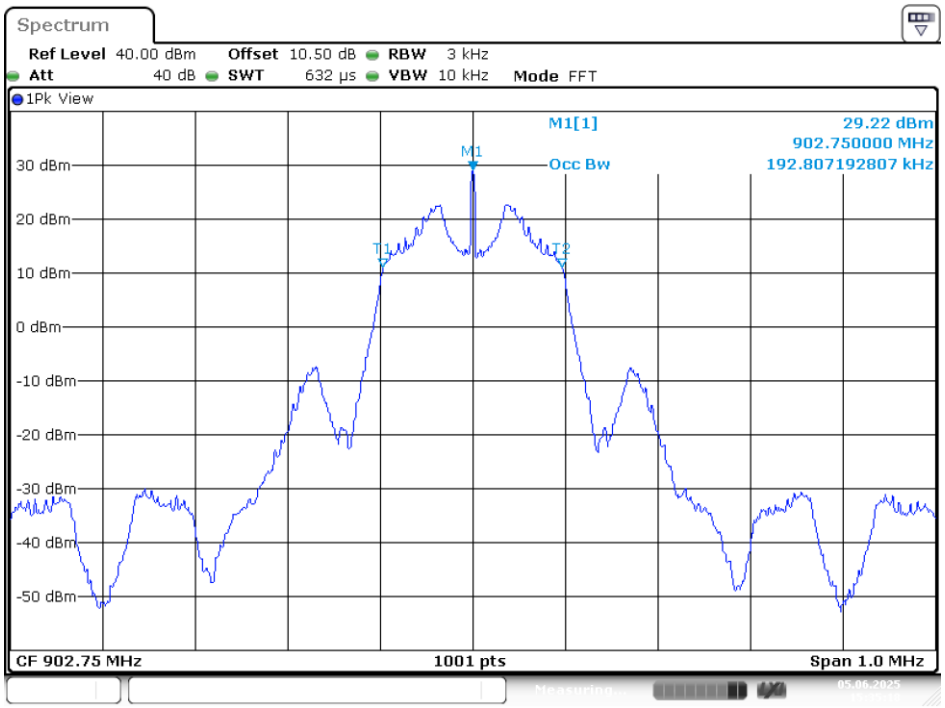
High Channel



Date: 5.JUN.2025 15:47:12

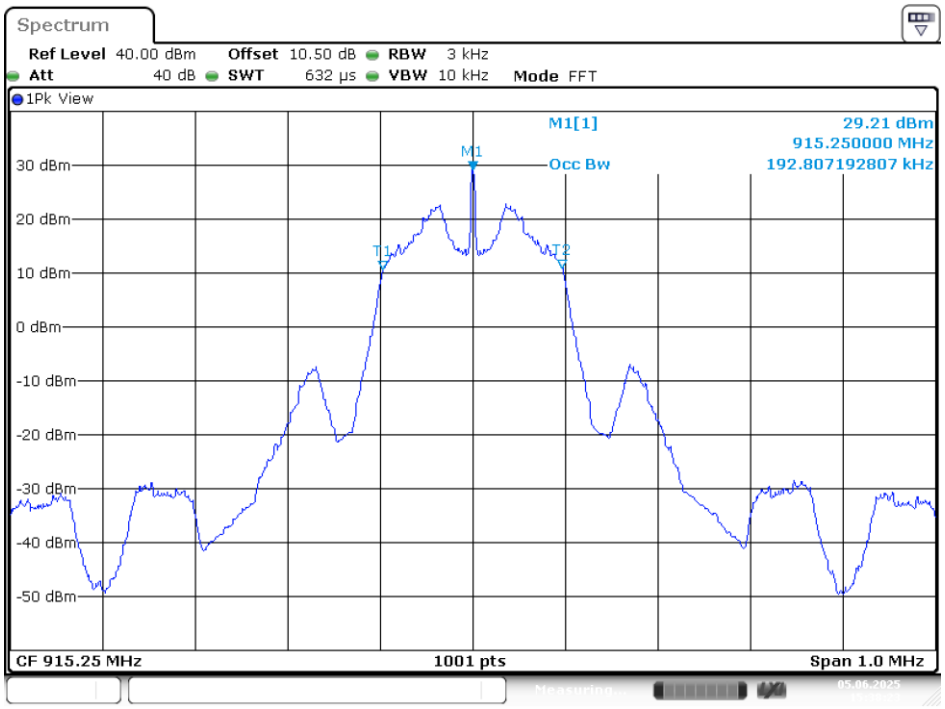
PR-ASK

Low Channel



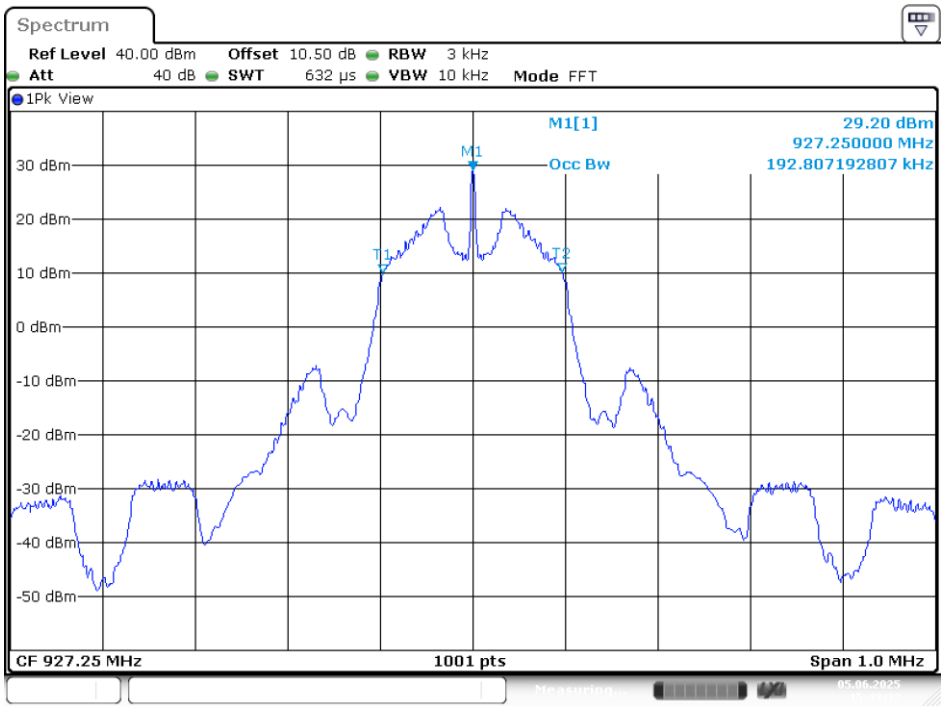
Date: 5.JUN.2025 15:35:19

Middle Channel



Date: 5.JUN.2025 15:38:23

High Channel



Date: 5.JUN.2025 15:43:32

9. FCC §15.247(a)(1) & RSS-247 §6.2.1(b) – Channel Separation Test

9.1. Applicable Standard

According to FCC §15.247(a) (1)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

According to RSS-247 §6.2.1(b)

The hopping channel carrier frequencies shall be separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

9.2. Test Procedure

According to ANSI C63.10-2020+Cor. 1-2023+C63.10a-2024+Errata to C63.10a-2024, section 7.8.2

1. Span: Wide enough to capture the peaks of two adjacent channels.
2. RBW: Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel.
3. Video (or average) bandwidth (VBW) ≥ $1/10^{th}$ the RBW.
4. Sweep: No faster than coupled (auto) time.
5. Detector function: Peak.
6. Trace: Max-hold.
7. Allow the trace to stabilize.

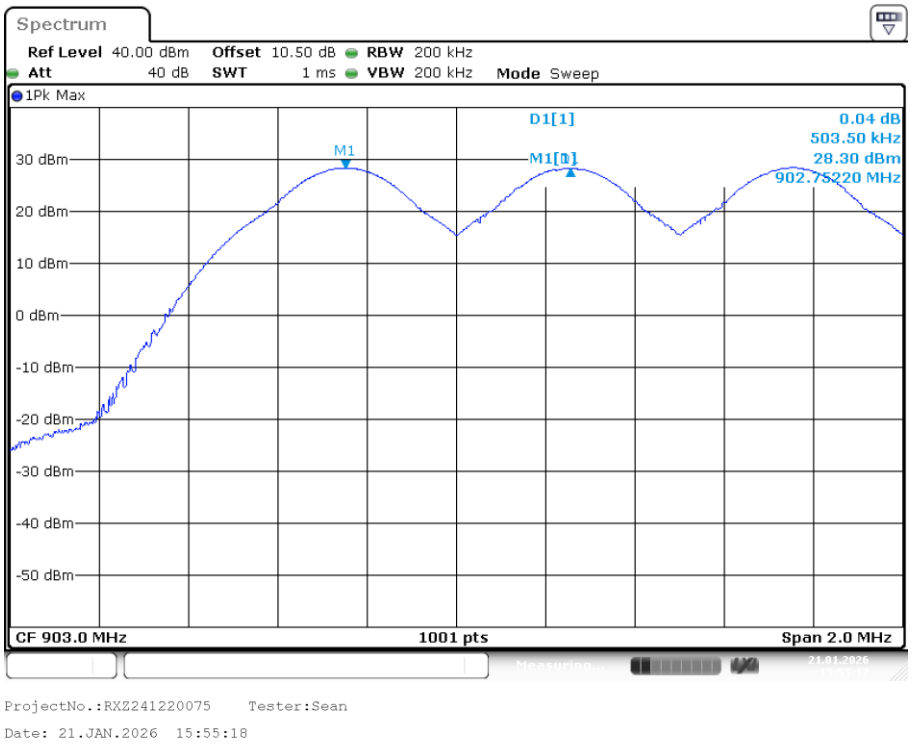
9.3. Test Results

Channel	Frequency (MHz)	Channel Separation (kHz)	20 dBc BW (kHz)	Channel Separation Limit	Result
DSB-ASK					
Low	902.75	503.50	387	25 kHz or the 20 dB bandwidth, whichever is greater	Pass
Middle	915.25	495.50	355		Pass
High	927.25	501.50	326		Pass
DSB-ASK					
Low	902.75	495.50	199	25 kHz or the 20 dB bandwidth, whichever is greater	Pass
Middle	915.25	497.50	197		Pass
High	927.25	499.50	196		Pass

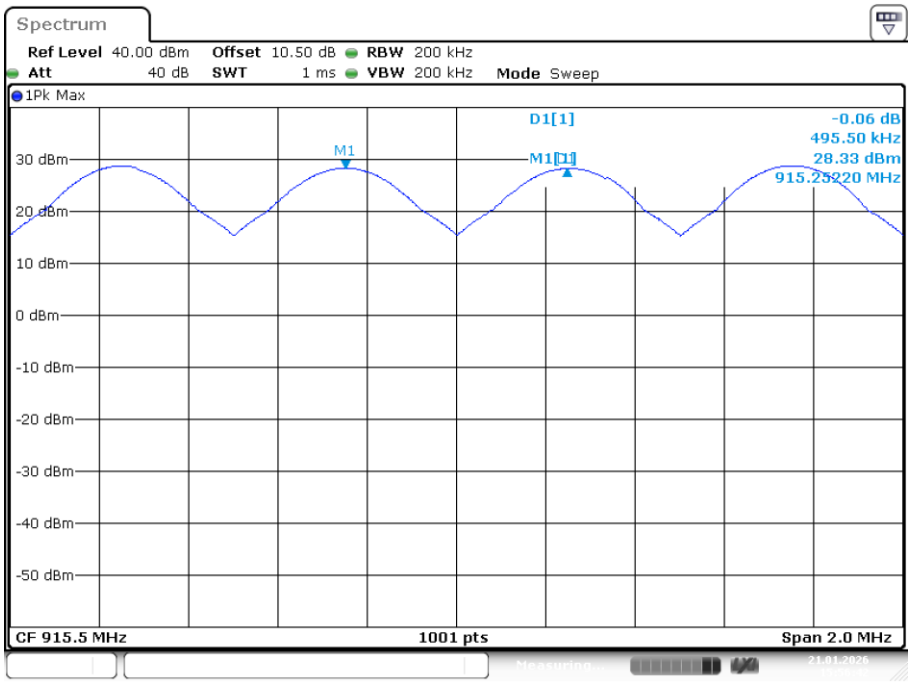
Please refer to the following plots.

DSB-ASK

Low Channel

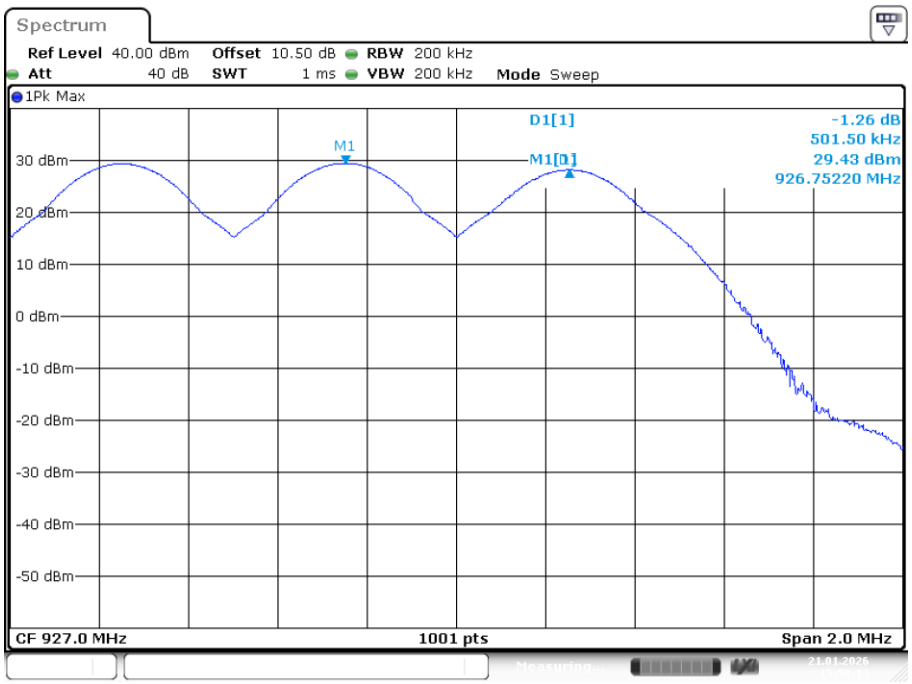


Middle Channel



ProjectNo.:RXZ241220075 Tester:Sean
Date: 21.JAN.2026 15:56:43

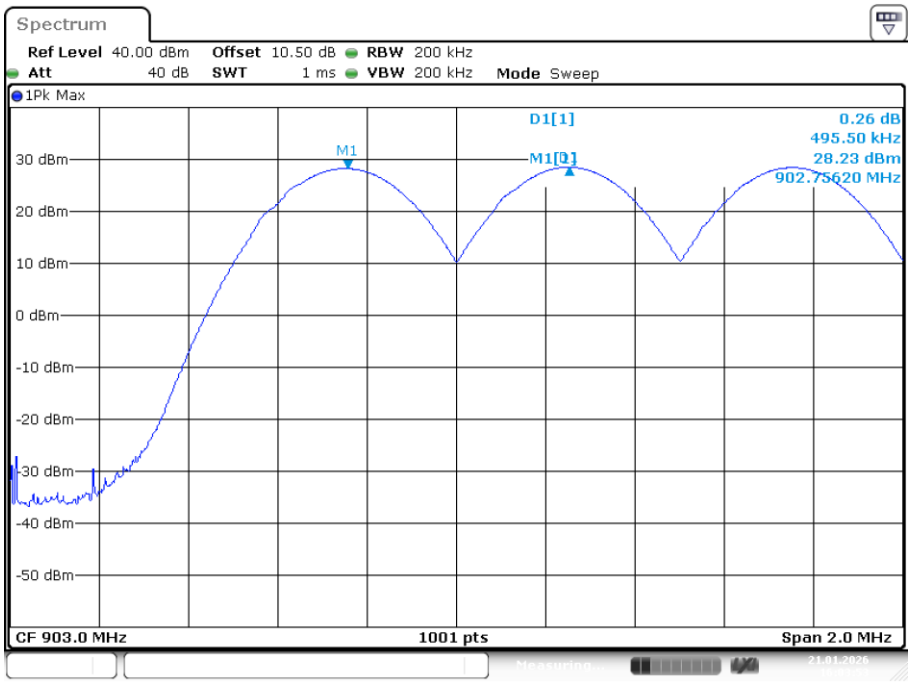
High Channel



ProjectNo.:RXZ241220075 Tester:Sean
Date: 21.JAN.2026 15:58:13

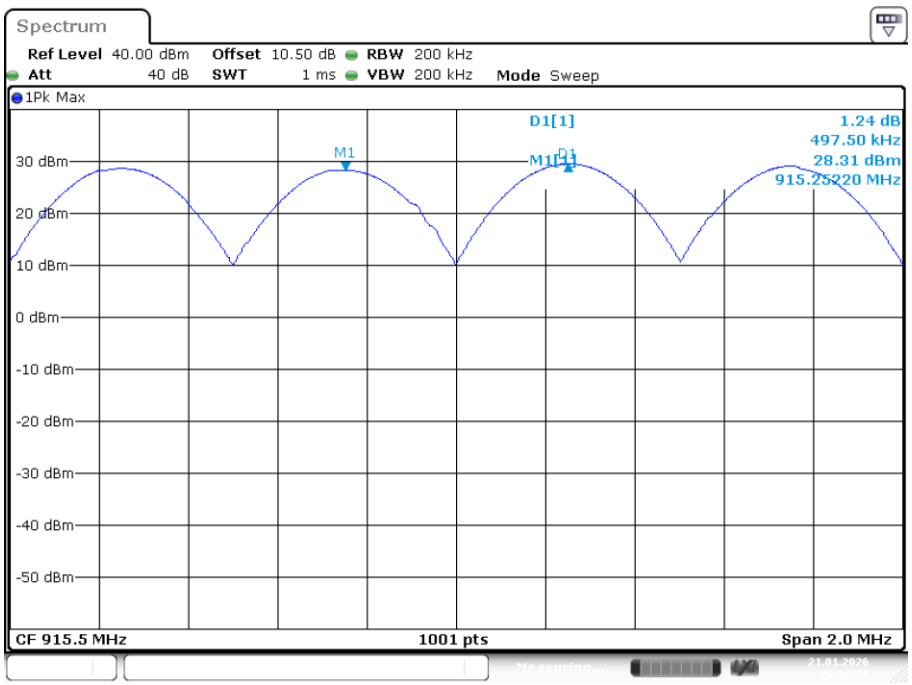
PR-ASK

Low Channel



ProjectNo.:RXZ241220075 Tester:Sean
Date: 21.JAN.2026 16:03:53

Middle Channel



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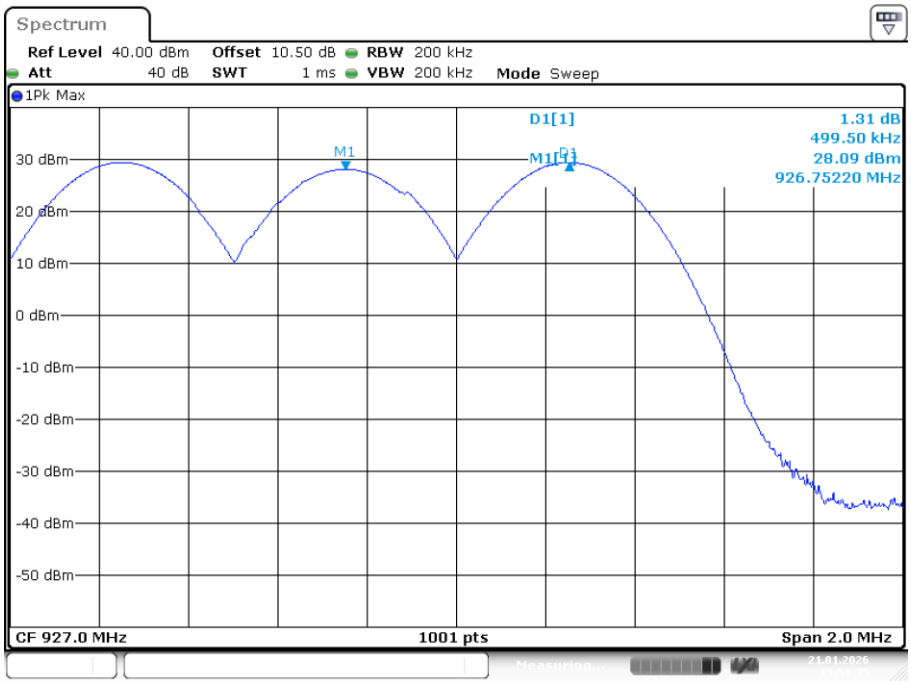
Date: 21.JAN.2026 16:00:39

High Channel



ProjectNo.:RXZ241220075 Tester:Sean

Date: 21.JAN.2026 15:59:35

10. FCC §15.247(a)(1)(i) & RSS-247 §6.2.2.1(b)(c) – Time of Occupancy (Dwell Time)

10.1. Applicable Standard

According to FCC §15.247(a) (1) (i).

For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

According to RSS-247 §6.2.2.1(b)(c).

If the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping channels and the average time of occupancy on any channel shall not be greater than 0.4 s within a 20 s period.

If the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping channels and the average time of occupancy on any channel shall not be greater than 0.4 s within a 10 s period.

10.2. Test Procedure

According to ANSI C63.10-2020+Cor. 1-2023+C63.10a-2024+Errata to C63.10a-2024, section 7.8.4

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings: Span = zero span, centered on a hopping channel RBW ≤ channel spacing and where possible RBW should be set >> 1/T, where T is the expected dwell time per channel Sweep = as necessary to capture the entire dwell time per hopping channel Detector function = peak Trace = max hold

Use the marker-delta function to determine the transmit time per hop. If this value varies with different modes of operation (data rate, modulation format, number of hopping channels, etc.), then repeat this test for each variation in transmit time.

Repeat the measurement using a longer sweep time to determine the number of hops over the period specified in the requirements. The sweep time shall be equal to, or less than, the period specified in the requirements.

Determine the number of hops over the sweep time and calculate the total number of hops in the period specified in the requirements, using the following equation:

(Number of hops in the period specified in the requirements) = (number of hops on spectrum analyzer) x (period specified in the requirements / analyzer sweep time)

The average time of occupancy is calculated from the transmit time per hop multiplied by the number of hops in the period specified. If the number of hops in a specific time varies with different modes of operation (data rate, modulation format, number of hopping channels, etc.), then repeat this test for each variation.

10.3. Test Results

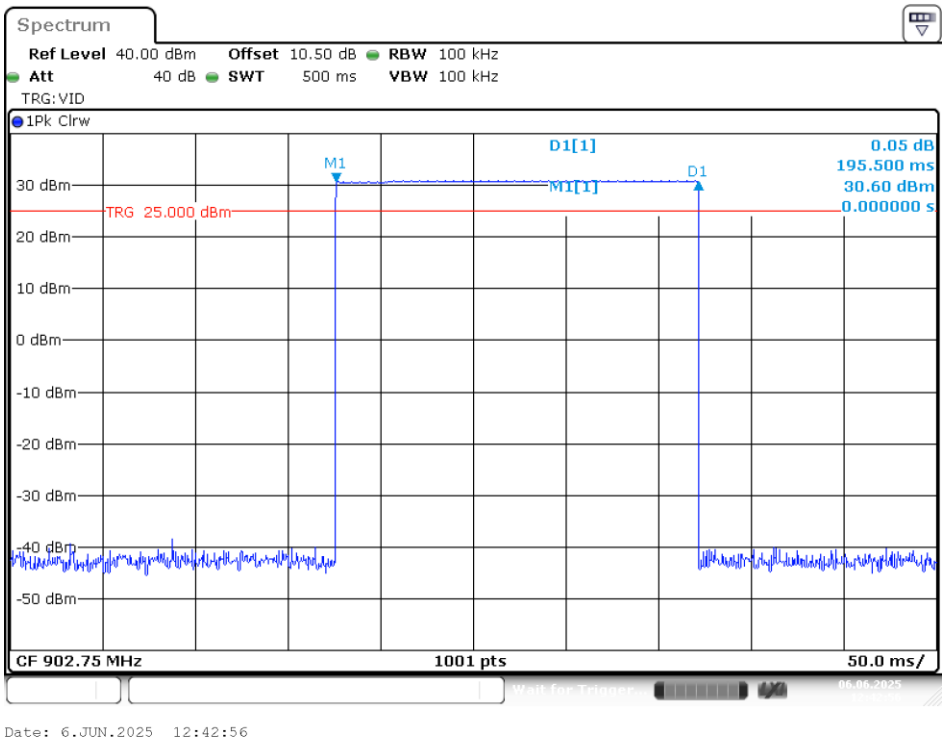
Test mode: DSB-ASK mode / 902.75~927.25MHz					
Pulse Time (ms)	**Hopping Number**	**Period Time (s)**	**Total of Dwell (ms)**	**Limit (ms)**	**Result**
195.50	1	10	195.50	<400	PASS
Test mode: PR-ASK mode / 902.75~927.25MHz					
Pulse Time (ms)	**Hopping Number**	**Period Time (s)**	**Total of Dwell (ms)**	**Limit (ms)**	**Result**
195.125	2	20	390.25	<400	PASS

Note: Total of Dwell=Pulse Time * Hopping Number

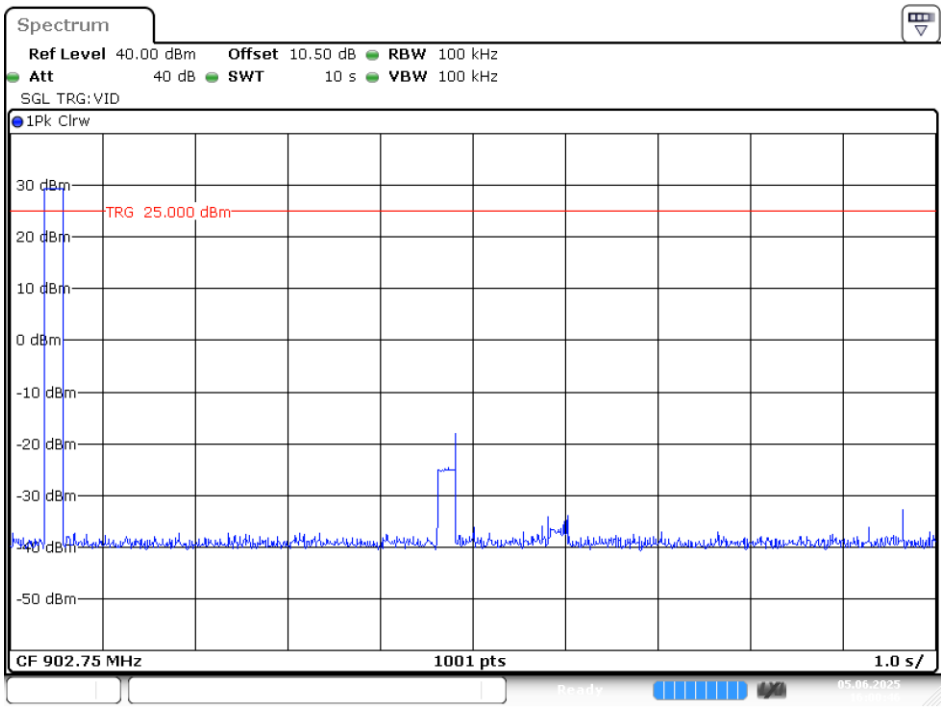
Please refer to the following plots

DSB-ASK

Pulse Width



Hopping Number



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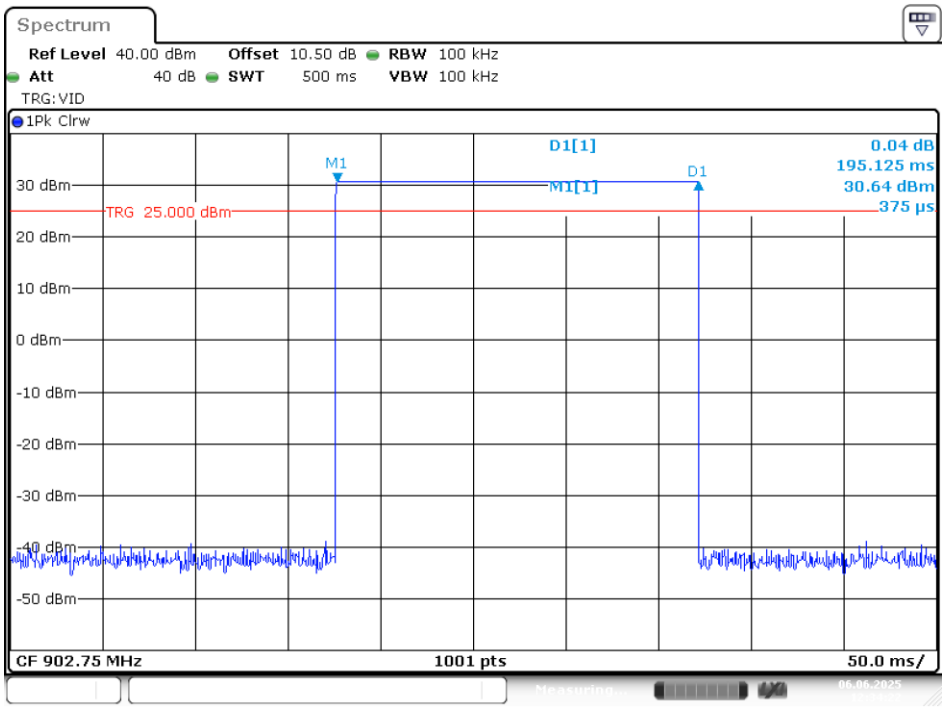
PR-ASK

Pulse Width



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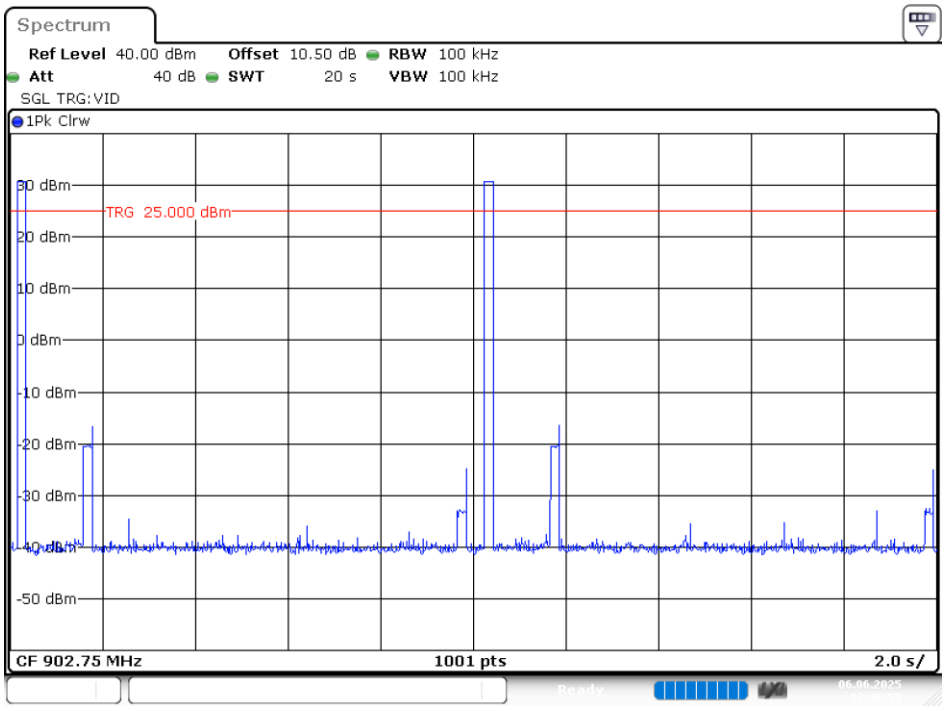
Hopping Number



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11. FCC §15.247(a)(1)(i) & RSS-247 §6.2.2.2 – Quantity of hopping channel Test

11.1. Applicable Standard

According to FCC §15.247(a) (1) (i).

For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

According to RSS-247 §6.2.2.2.

If the hopset uses 50 or more hopping channels, the maximum peak conducted output power shall not exceed 1.0 W, and the e.i.r.p. shall not exceed 4 W.

If the hopset uses less than 50 hopping channels, the maximum peak conducted output power shall not exceed 0.25 W and the e.i.r.p. shall not exceed 1 W.

11.2. Test Procedure

According to ANSI C63.10-2020+Cor. 1-2023+C63.10a-2024+Errata to C63.10a-2024, section 7.8.3

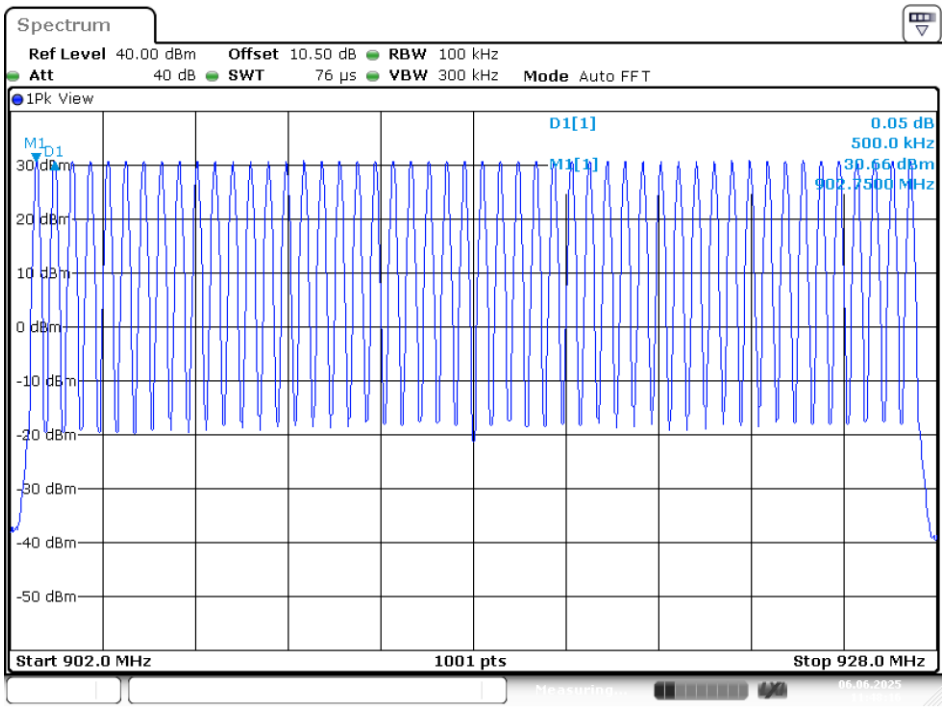
1. Span: The frequency band of operation. Depending on the number of channels the device supports, it could be necessary to divide the frequency range of operation across multiple spans, to allow the individual channels to be clearly seen.
2. RBW: To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.
3. VBW ≥ 1/10th the RBW.
4. Sweep: No faster than coupled (auto) time.
5. Detector function: Peak.
6. Trace: Max-hold.
7. Allow the trace to stabilize.

11.3. Test Results

Mode	Frequency Range (MHz)	Number of Hopping Channel (CH)	Limit (CH)	Result
DSB-ASK	902.75~927.25	50	≥ 25	Compliance
PR-ASK	902.75~927.25	50	≥ 50	Compliance

Please refer to the following plots

DSB-ASK



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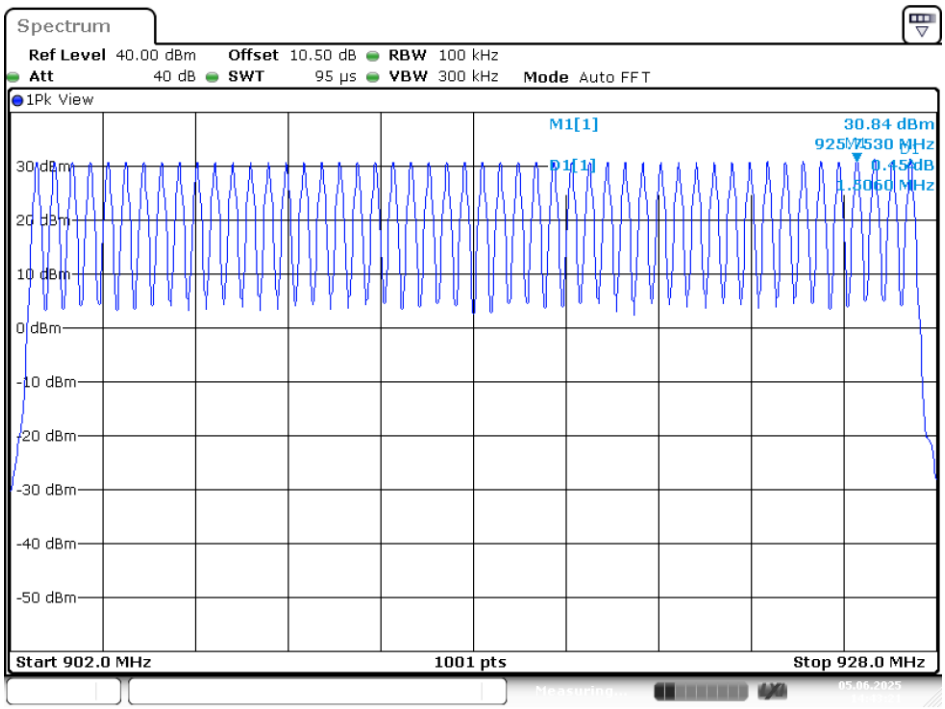
PR-ASK



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12. FCC §15.247(b)(2) & RSS-247 §6.2.2.2– Maximum Output Power

12.1. Applicable Standard

According to FCC §15.247(b) (2).

For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels, as permitted under paragraph (a)(1)(i) of this section.

According to RSS-247 §6.2.2.2.

If the hopset uses 50 or more hopping channels, the maximum peak conducted output power shall not exceed 1.0 W, and the e.i.r.p. shall not exceed 4 W.

If the hopset uses less than 50 hopping channels, the maximum peak conducted output power shall not exceed 0.25 W and the e.i.r.p. shall not exceed 1 W.

12.2. Test Procedure

According to ANSI C63.10-2020+Cor. 1-2023+C63.10a-2024+Errata to C63.10a-2024, section 7.8.5

1. Place the EUT on a bench and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to measuring equipment.

12.3. Test Results

Channel	Frequency (MHz)	Peak Conducted Output Power (dBm)	Limit (dBm)	Antenna Gain (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)
DSB-ASK Mode						
Low	902.75	29.88	30	2.5	32.38	36
Middle	915.25	29.93	30	2.5	32.43	36
High	927.25	29.83	30	2.5	32.33	36
PR-ASK Mode						
Low	902.75	29.91	30	2.5	32.41	36
Middle	915.25	29.97	30	2.5	32.47	36
High	927.25	29.89	30	2.5	32.39	36

13. FCC §15.247(d) & RSS-247 §6.6 – 100 kHz Bandwidth of Frequency Band Edge

13.1. Applicable Standard

According to FCC §15.247(d)

For FCC §15.247(d), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emissions limits specified in §15.209(a) see §15.205(c).

According to RSS-247 §6.6

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum device, digitally modulated device, or hybrid system is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power – based on either an RF conducted or a radiated measurement – provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 6.3.2, the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

13.2. Test Procedure

According to ANSI C63.10-2020+Cor. 1-2023+C63.10a-2024+Errata to C63.10a-2024, section 7.8.7.2

Band-edge measurements shall be tested both on single channels, and with the EUT hopping.

a) Set the center frequency and span to encompass frequency range to be measured.

b) Set the RBW = 100 kHz.

c) Set the VBW ≥ [3 × RBW].

d) Detector = peak.

e) Sweep time = auto couple.

f) Trace mode = max hold.

g) Allow trace to fully stabilize.

h) Use the peak marker function to determine the maximum amplitude level.

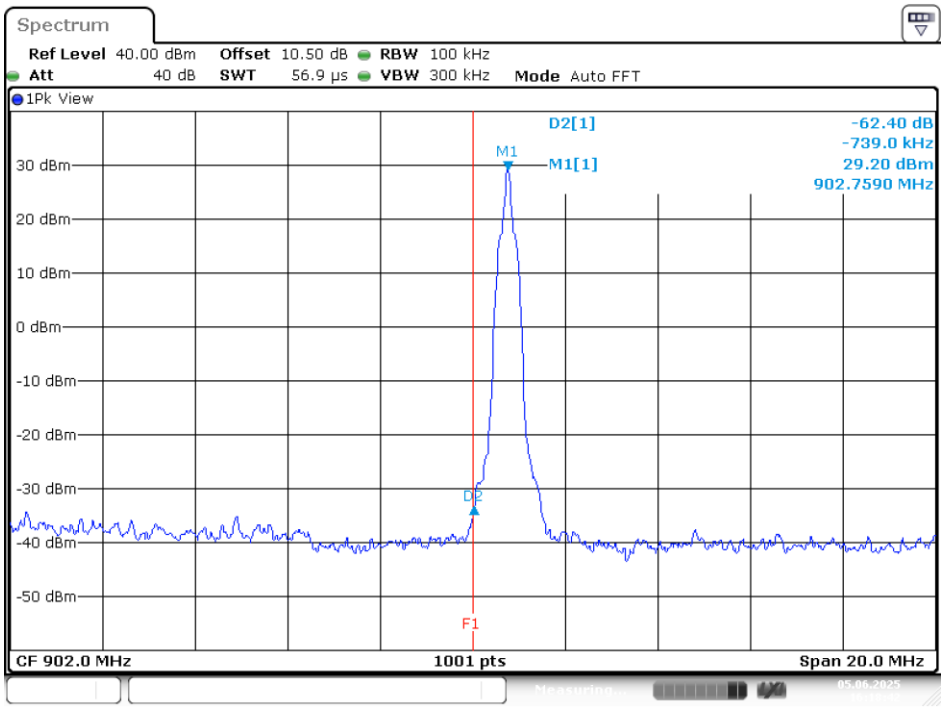
13.3. Test Results

Channel	Frequency (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)	Result
DSB-ASK Mode				
Low	902.75	62.40	≥ 20	PASS
High	927.25	62.66	≥ 20	PASS
DSB-ASK Hopping Mode				
Low	902.75	63.25	≥ 20	PASS
High	927.25	66.33	≥ 20	PASS
PR-ASK Mode				
Low	902.75	60.63	≥ 20	PASS
High	927.25	59.99	≥ 20	PASS
PR-ASK Hopping Mode				
Low	902.75	64.09	≥ 20	PASS
High	927.25	66.99	≥ 20	PASS

Please refer to the following plots.

DSB-ASK

Band Edge, CH Low



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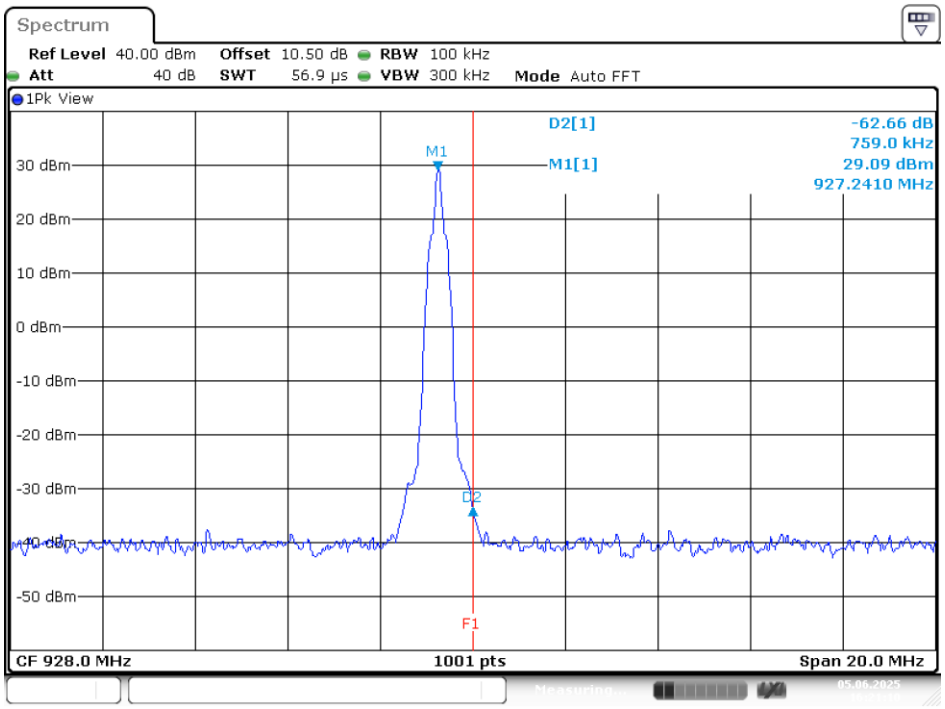
Band Edge, CH High



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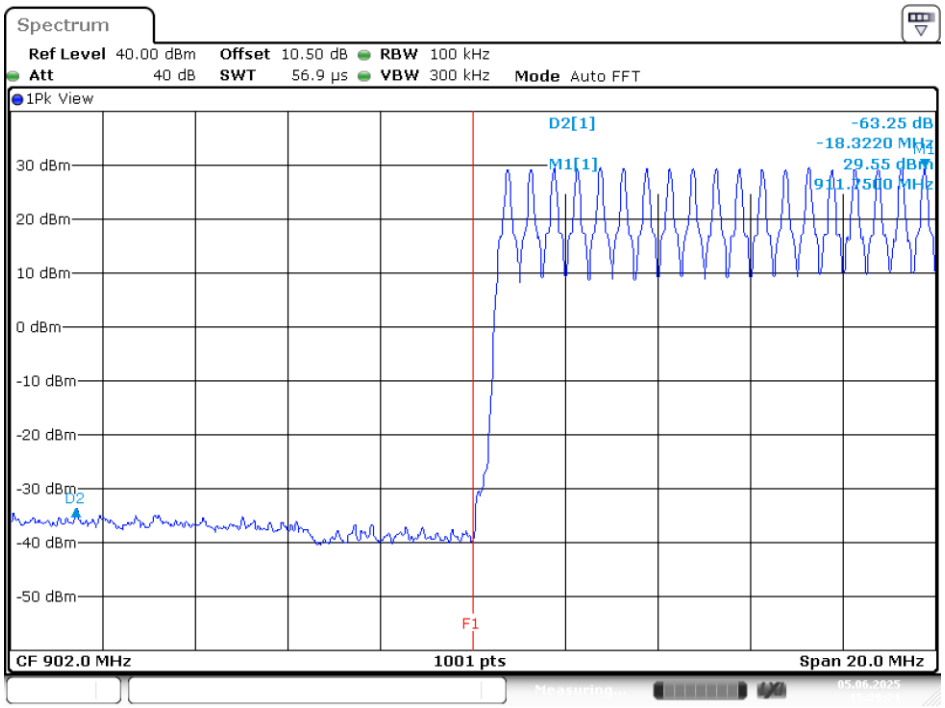
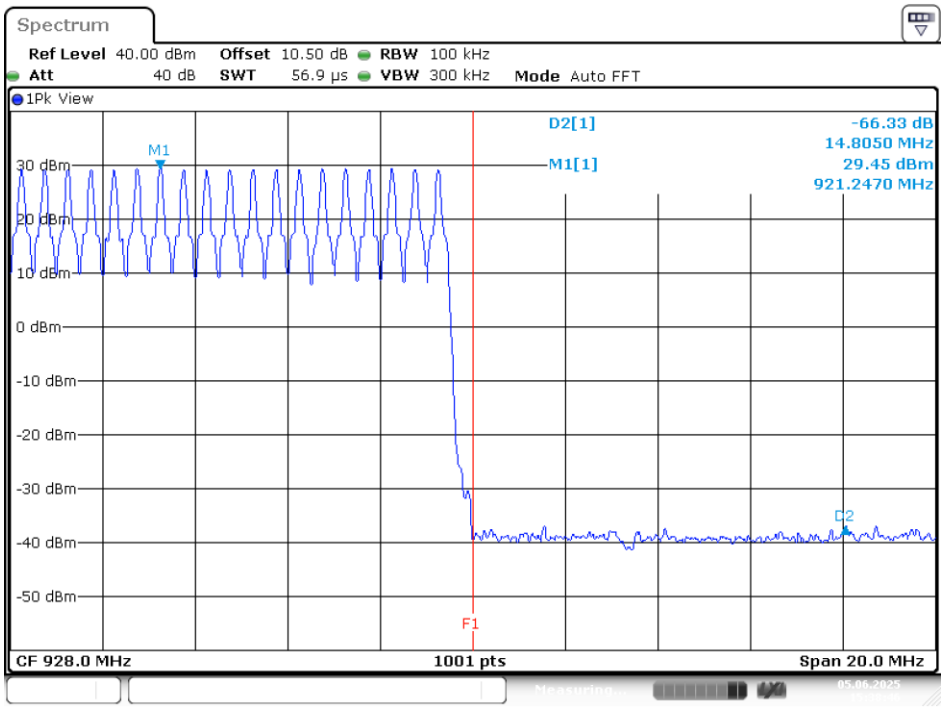
DSB-ASK Hopping Mode

Band Edge, CH Low



Date: 5.JUN.2025 15:29:22

Band Edge, CH High



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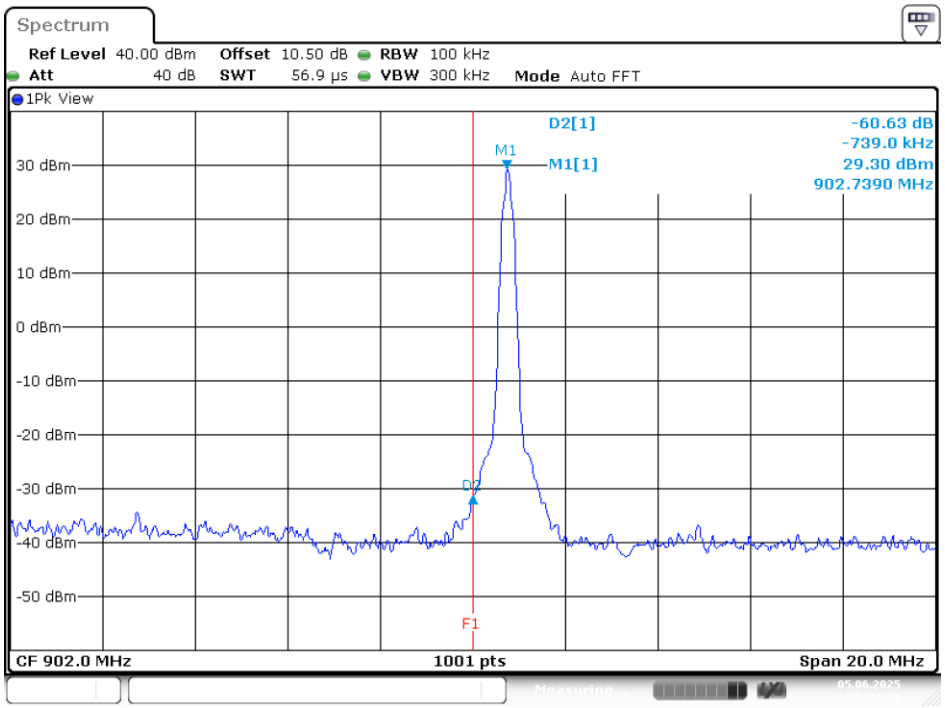
PR-ASK

Band Edge, CH Low



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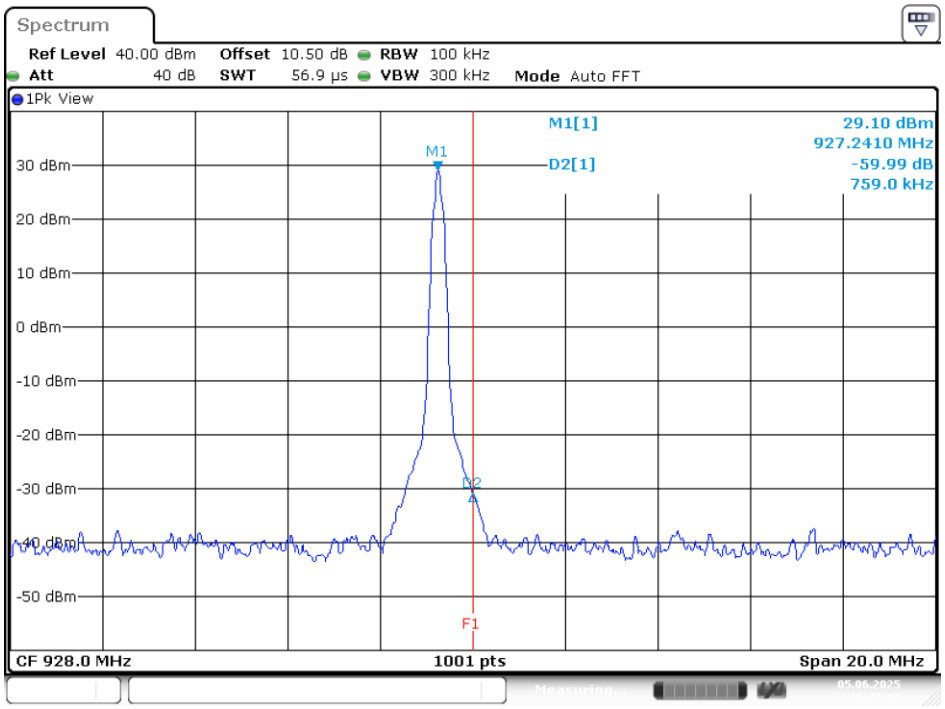
Band Edge, CH High



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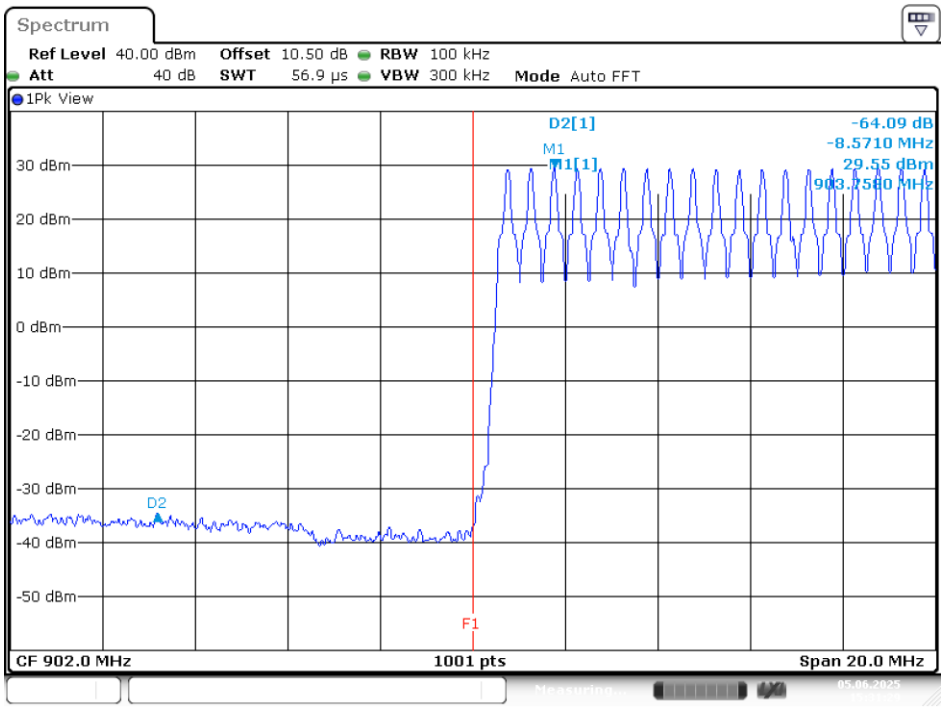
PR-ASK Hopping Mode

Band Edge, CH Low



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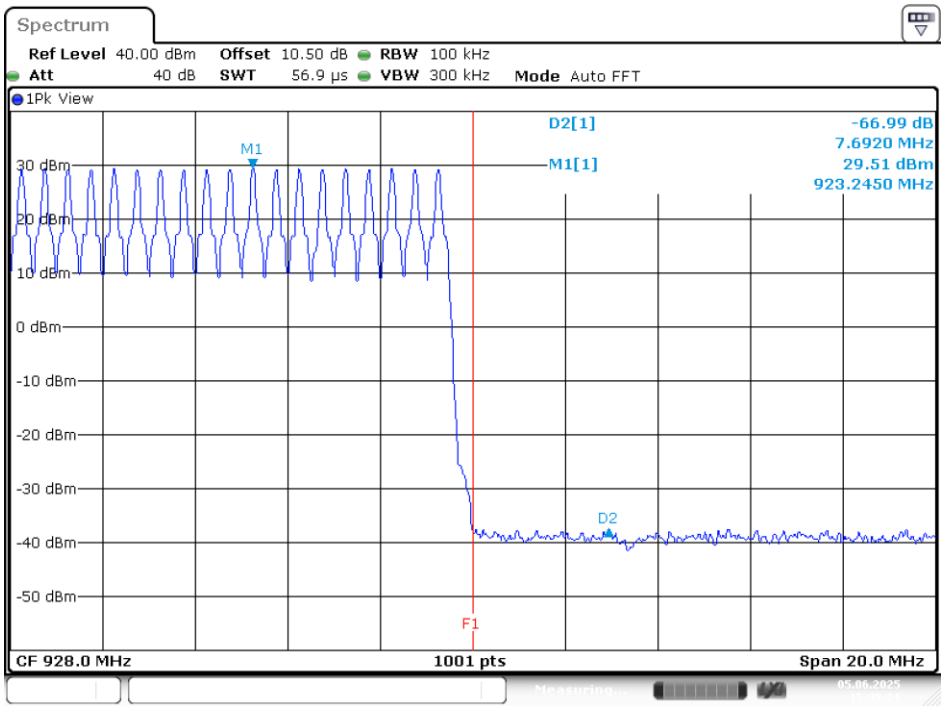
Band Edge, CH High



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