RADIO TEST REPORT

Type of assessment:
Final product testing

Applicant:
MEDHA SERVO DRIVES PRIVATE LIMITED

Product:
DATARADIO

Model:
MDR4047

Model variant(s):
MDR4243

FCC ID:
2BDAA-DATARADIO

Federal Registration Number (FRN):
0034384974

Specifications:

- FCC 47 CFR Part 90, Subpart I

Date of issue: March 10, 2026

Dinesh Dhawan	Digitally signed by Dinesh Dhawan
Tested by	Signature
Kavita Dagar	KAVITA DAGAR Digitally signed by KAVITA DAGAR
Reviewed by	Signature
Shubham Gupta	SHUBHAM Digitally signed by SHUBHAM
Issued by	Signature

Certificate #6933.01

Lab locations

Company name	**Nemko India (Test Lab) Pvt. Ltd.** Plot no 193, IMT, Sector 68, Faridabad-121004, Haryana, India

Limits of responsibility

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.
This test report has been completed in accordance with the requirements of ISO/IEC 17025. All results contained in this report are within Nemko India ISO/IEC 17025 accreditation.

The test facility is accredited by A2LA with certificate no. 6933.01

FCC Designation number IN1345.

Table of Contents

Section 1 Report summary

1.1 Test specifications

FCC 47 CFR Part 90, Subpart I	Private land mobile radio services. General technical standards

1.2 Test methods

FCC 47 CFR Part 2, Subpart J	Equipment authorization procedures

1.3 Exclusions

None

1.4 Statement of compliance

In the configuration tested, the EUT was found compliant.

Testing was performed against all relevant requirements of the test standard except as noted in section 1.3 above. Results obtained indicate that the product under test complies In full with the requirements tested. The test results relate only to the items tested.

See "Summary of test results" for full details.

1.5 Test report revision history

Table 1.5-1: Test report revision history

Revision #	Date of issue	Details of changes made to test report
FCC/2310003	January 23, 2026	Original report issued

Section 2 Engineering considerations

2.1 Modifications incorporated in the EUT for compliance

There were no modifications performed to the EUT during this assessment.

2.2 Technical judgment

None

2.3 Deviations from laboratory tests procedures

No deviations were made from laboratory procedures.

Section 3 Test conditions

3.1 Atmospheric conditions

Temperature	15 °C – 35 °C
Relative humidity	20 % – 75 %
Air pressure	86 kPa (860 mbar) – 106 kPa (1060 mbar)

When it is impracticable to carry out tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests shall be recorded and stated.

3.2 Power supply range

The normal test voltage for equipment to be connected to the mains shall be the nominal mains voltage. For the purpose of the present document, the nominal voltage shall be the declared voltage, or any of the declared voltages ±5%, for which the equipment was designed.

Section 4 Measurement uncertainty

4.1 Uncertainty of measurement

UKAS Lab 34 and TIA-603-B have been used as guidance for measurement uncertainty reasonable estimations with regards to previous experience and validation of data. Nemko Canada, Inc. follows these test methods in order to satisfy ISO/IEC 17025 requirements for estimation of uncertainty of measurement for wireless products.

Measurement uncertainty budgets for the tests are detailed below. Measurement uncertainty calculations assume a coverage factor of K = 2 with 95% certainty.

Table 4.1-1: Measurement uncertainty calculations for Radio

Test name	Measurement uncertainty, ±dB
RF Output Power	0.55
Frequency Error (Hz)	151.23
Occupied bandwidth	4.45
Conducted spurious emissions	1.13
Radiated spurious emissions	3.85

Section 5 Information provided by the applicant

5.1 Disclaimer

This section contains information provided by the applicant and has been utilized to support the test plan. Inaccurate information provided by the applicant can affect the validity of the results contained within this test report. Nemko accepts no responsibility for the information contained within this section and the impact it may have on the test plan and resulting measurements.

5.2 Applicant/Manufacture

Applicant name	MEDHA SERVO DRIVES PVT.LTD
Applicant address	P-4/5B, IDA NACHARAM, HYDERABAD, TELANGANA, 500076, INDIA
Manufacture name	MEDHA SERVO DRIVES PVT.LTD
Manufacture address	UNIT - III: PLOT NO 8/A, RAVIRYALA VILLAGE, MAHESWARAM MANDAL, RANGA REDDY DISTRICT –501359, TELANGANA, INDIA. UNIT - I: JODIMETLA CROSS ROADS, KORREMULA, GHATKESAR, HYDERABAD -500088, TELANGANA, INDIA.

5.3 EUT information

Product name	DATARADIO
Model	MDR4047
Model variant(s)	MDR4243
Trademark	MEDHA
Serial number	3052
Part number	--
Power supply requirements	DC: 24 V
Software Number	6.02.2
Hardware Number	6.02.2

5.4 Technical information

System type	☐ Mobile system
	☒ Base/Fixed point-to-point system
Frequency band	406.125 MHz –469.975 MHz
Frequency Min (MHz)	406.125
Frequency Max (MHz)	469.975
Channel numbers	406.125 (Low Channel), 435.5 (mid Channel) & 469.975 (High Channel)
RF power Max (W), Conducted	Minimum 1W (30 dBm) Maximum 10W (40 dBm)
Bandwidth & Baud Rate Support	12.5kHz – 9600 bps 25kHz – 19200 bps
Measured BW (kHz), 99% OBW	6.94 kHz
Type of modulation	Digital: FSK
Antenna information	Antenna Type: Omni Antenna-Loco motive & Omni Antenna: Base Station Manufacturer: Medha Model: MCA110-BSA-COL-440M-Bae station MCA110-LMA-WBMP-440M-LocoMotive

5.5 EUT setup details

5.5.1 Radio exercise details

Operating conditions	Data radio_CFG_SW with Docklight V2.4.5 used for testing.

5.5.2 EUT setup configuration

Table 5.5-1: EUT sub assemblies

Description	Brand name	Model, Part number, Serial number, Revision level
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--	--	--
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Table 5.5-2: EUT interface ports

Description	Qty.
Config Port (Serial to USB)	01
Data Port (Serial to USB)	01

Table 5.5-3: Support equipment

Description	Brand name	Model, Part number, Serial number, Revision level
DC Power Source	KEITHLEY	2231 A-30-3
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--	--	--
--	--	--

Table 5.5-4: Inter-connection cables

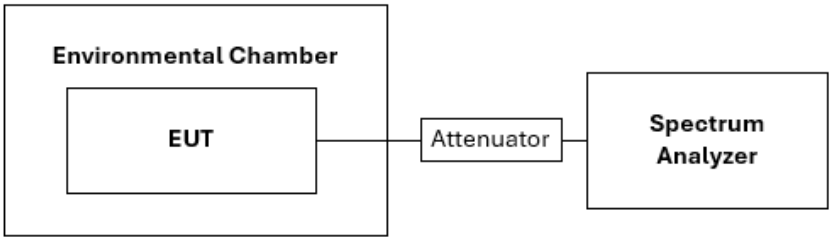
Cable description	From	To	Length (m)
Config Port (Serial to USB)	EUT	Laptop	01
Data Port (Serial to USB)	EUT	Laptop	01
TX	EUT	Antenna	01

EUT setup configuration, continued

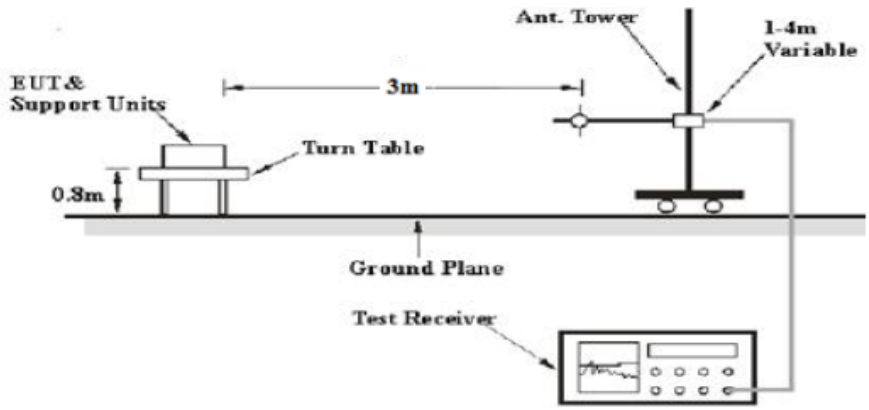
Power Measurement

Conducted Emission Measurement

Frequency Stability Measurement



For radiated emissions below 1GHz



For radiated emissions above 1GHz

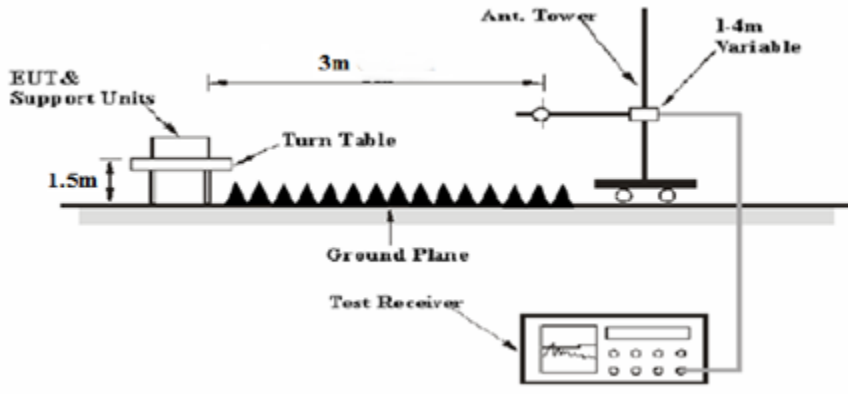


Figure 5.5-1: Radiated testing block diagram

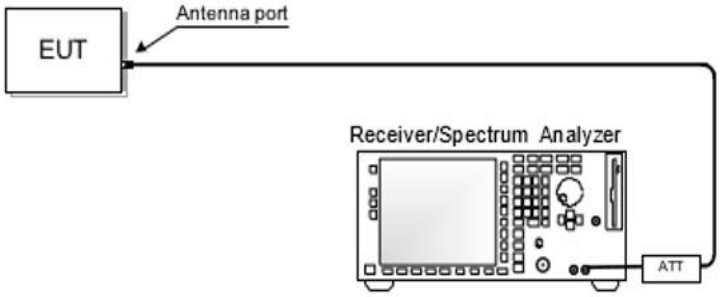


Figure 5.5-2: Antenna port testing block diagram

Section 6 Summary of test results

6.1 Testing location

Test location (s)	Plot no 193, IMT, Sector 68, Faridabad-121004, Haryana, India

6.2 Testing period

Test start date	December 11, 2025	Test end date	December 31, 2025

6.3 Sample information

Receipt date	December 9, 2024	Nemko sample ID number(s)	FCC/2310003

6.4 FCC Part 2 and 90 Subpart I test requirements results

Table 6.4-1: FCC requirements results

Part	Test description	Verdict
§2.1047	Modulation characteristics	Not applicable[1)]
§90.205(h)	Transmitter output power	Pass
§90.209(b)	Bandwidth limitations	Pass
§90.210	Spectrum mask and spurious emissions	Pass
§90.214	Transient frequency behavior	Pass
§90.213(a)	Transmitter frequency stability	Pass

Notes: 1) According to FCC § 2.1047(d), Part 22, 74, 90 there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

Section 7 Test equipment

7.1 Test equipment list

Table 7.1-1: Equipment list

Equipment	Manufacturer	Model no.	Serial no.	Next cal.
EMI Test Receiver	Rohde & Schwarz	ESR26	101720	25-Apr-2026
Trilog Broadband Antenna	Schwarz beck	VULB9162	363	24-Jan-2026
Wave Guide Antenna	ETS-LINDGREN	3117	227702	18-Feb-2026
Pre-Amplifier (1GHz to 18GHz)	ROHDE & SCHWARZ	SCU18F	10824	VOU
Spectrum Analyzer	Rohde & Schwarz	FSW50	--	12-Jul-2026
Software EMC32	Rohde & Schwarz	EMC32	--	NCR
R&S Signal Generator	Rohde & Schwarz	SMB100B	102209	05-Mar-2026
Log-Periodic Dipole Antenna	Rohde & Schwarz	HL223	100941	28-Nov-2027
Biconical Antenna	Rohde & Schwarz	HK116E	101360	28-Nov-2027
Power Sensor	Rohde & Schwarz	NRP33S	102833	24-Apr-2026
20dB Attenuator	Mini-Circuits	BW-N20W50+	--	VOU
30dB Attenuator	Mini-Circuits	BW-N30W20+	--	VOU
40dB Attenuator	Mini-Circuits	BW-N40W50+	--	VOU

Notes: NCR - no calibration required, VOU - verify on use

Section 8 Testing data

8.1 Transmitter Output Power

8.1.1 References, definitions and limits

FCC §15.205:

(h) Power and antenna height limits within 450–470 MHz.

(1) The maximum allowable station effective radiated power (ERP) is dependent upon the station's antenna HAAT and required service area and will be authorized in accordance with table below. Applicants requesting an ERP in excess of that listed in table below must submit an engineering analysis based upon generally accepted engineering practices and standards that includes coverage contours to demonstrate that the requested station parameters will not produce coverage in excess of that which the applicant requires.

(2) Applications for stations where special circumstances exist that make it necessary to deviate from the ERP and antenna heights in Table below will be submitted to the frequency coordinator accompanied by a technical analysis, based upon generally accepted engineering practices and standards, that demonstrates that the requested station parameters will not produce a signal strength in excess of 39 dBu at any point along the edge of the requested service area. The coordinator may then recommend any ERP appropriate to meet this condition.

(3) An applicant for a station with a service area radius greater than 32 km (20 mi) must justify the requested service area radius, which may be authorized only in accordance with table below, note 4. For base stations with service areas greater than 80 km, all operations 80 km or less from the base station will be on a primary basis and all operations outside of 80 km from the base station will be on a secondary basis and will be entitled to no protection from primary operations.

Table 8.1-1: Maximum ERP/Reference HAAT for a Specific Service Area Radius (FCC)

Service area radius (km):	**3**	**8**	**13**	**16**	**24**	**32**	**40[4]**	**48[4]**	**64[4]**	**80[4]**
Maximum ERP (w)[1]:	2	100	[2]500	[2]500	[2]500	[2]500	[2]500	[2]500	[2]500	[2]500
Up to reference HAAT (m)[3]:	15	15	15	27	63	125	250	410	950	2700

Notes:
[1]Maximum ERP indicated provides for a 39 dBu signal strength at the edge of the service area per FCC Report R-6602, Fig. 29 (See §73.699, Fig. 10 b).
[2]Maximum ERP of 500 watts allowed. Signal strength at the service area contour may be less than 39 dBu.
[3]When the actual antenna HAAT is greater than the reference HAAT, the allowable ERP will be reduced in accordance with the following equation:
$ERP_{allow} = ERP_{max} \times (HAAT_{ref} / HAAT_{actual})^2$.
[4]Applications for this service area radius may be granted upon specific request with justification and must include a technical demonstration that the signal strength at the edge of the service area does not exceed 39 dBu.

8.1.2 Test summary

Verdict	Pass		
Tested by	Dinesh Dhawan	Test date	December 12, 2025

8.1.3 Test Method

ANSI C63.26:2015	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services

8.1.4 Observations, settings and special notes

None

8.1.5 Test data

Table 8.1-2: Transmitter power results (dBm)

Modulation	Frequency, MHz	12.5K 9600	25K 19200	Limit, dBm
FSK at 1W	406.125	29.69	29.74	30±1
	435.500	29.86	29.58	30±1
	469.975	29.74	29.65	30±1
FSK at 10W	406.125	39.33	39.24	40±1
	435.500	39.47	39.39	40±1
	469.975	39.24	39.19	40±1

8.2 Bandwidth limitations

8.2.1 References, definitions and limits

FCC §90.209:

(b) The maximum authorized single channel bandwidth of emission corresponding to the type of emission specified in §90.207 is as follows:

(5) Unless specified elsewhere, channel spacings and bandwidths that will be authorized in the following frequency bands are given in the following table.

Table 8.2-1: Standard Channel Spacing/Bandwidth

Frequency band, MHz	Channel spacing, kHz	Authorized bandwidth[1], kHz
406–512	25/12.5/6.25	20 / 11.25 / 6

Note: [1]Operations using equipment designed to operate with a 25 kHz channel bandwidth will be authorized a 20 kHz bandwidth. Operations using equipment designed to operate with a 12.5 kHz channel bandwidth will be authorized a 11.25 kHz bandwidth. Operations using equipment designed to operate with a 6.25 kHz channel bandwidth will be authorized a 6 kHz bandwidth. All stations must operate on channels with a bandwidth of 12.5 kHz or less beginning January 1, 2013

(6)(i) Beginning January 1, 2011, no new applications for the 421–512 MHz bands will be acceptable for filing if the applicant utilizes channels with an authorized bandwidth exceeding 11.25 kHz, unless specified elsewhere or the operations meet the efficiency standards of §90.203(j)(3).

Table 8.2-2: Channel Bandwidths, Authorized Bandwidths for 450–470 MHz frequency band

Channel bandwidth, kHz	Authorized bandwidth, kHz
25.00	20.00
12.5	11.25
6.25	6

8.2.2 Test summary

Verdict	Pass		
Tested by	Dinesh Dhawan	Test date	December 12, 2025

8.2.3 Test Method

ANSI C63.26:2015	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services

8.2.4 Observations, settings and special notes

Spectrum analyser settings:

Resolution bandwidth	300 Hz
Video bandwidth	1 kHz
Frequency span	32.9 kHz
Detector mode	Peak
Trace mode	Max Hold

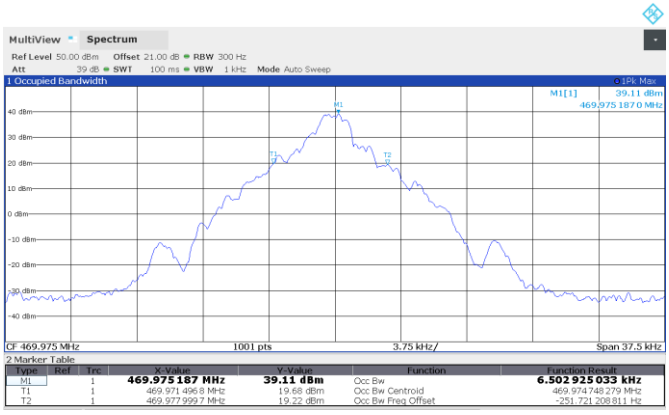
8.2.5 Test data

Table 8.2-3: 99% occupied bandwidth results_12.5kHz – 9600 baud rate

Modulation	Frequency, MHz	99% occupied bandwidth, kHz	Limit, kHz	Margin, kHz
FSK at 10W	406.125	6.03	11.25	5.22
	435.500	6.61	11.25	4.64
	469.975	6.50	11.25	4.75

99% occupied bandwidth on low channel

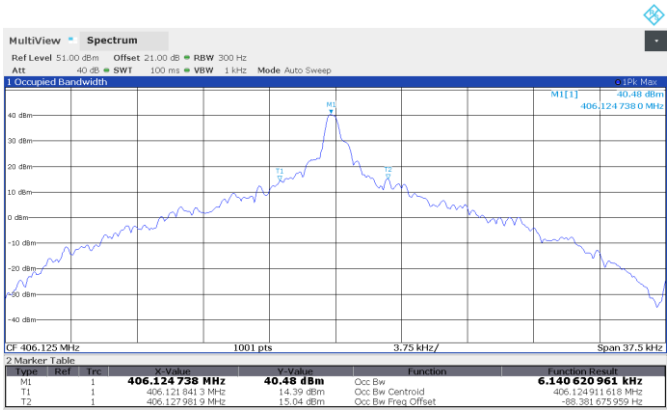
99% occupied bandwidth on mid channel



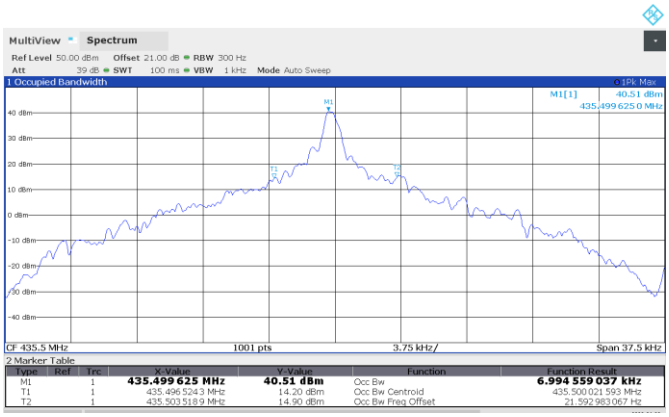
99% occupied bandwidth on high channel

Table 8.2-4: 99% occupied bandwidth results_25kHz – 19200 baud rate

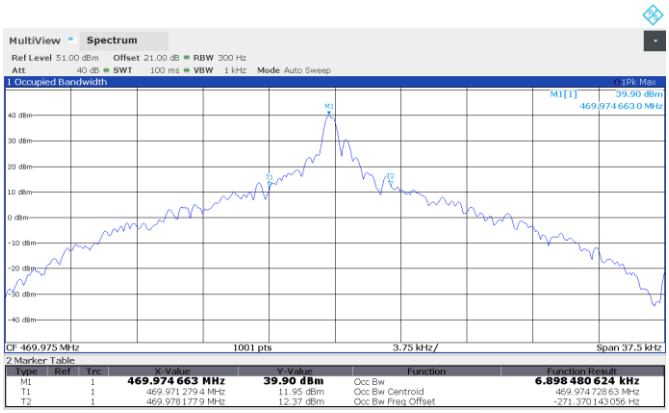
Modulation	Frequency, MHz	99% occupied bandwidth, kHz	Limit, kHz	Margin, kHz
FSK at 10W	406.125	6.14	20	13.86
	435.500	6.99	20	13.01
	469.975	6.89	20	13.11



99% occupied bandwidth on low channel



99% occupied bandwidth on mid channel



99% occupied bandwidth on high channel

8.3 Spectrum mask and spurious emissions

8.3.1 References, definitions and limits

FCC §90.210:

Except as indicated elsewhere in this part, transmitters used in the radio services governed by this part must comply with the emission masks outlined in this section. Unless otherwise stated, per paragraphs (d)(4), (e)(4), and (o) of this section, measurements of emission power can be expressed in either peak or average values provided that emission powers are expressed with the same parameters used to specify the unmodulated transmitter carrier power. For transmitters that do not produce a full power unmodulated carrier, reference to the unmodulated transmitter carrier power refers to the total power contained in the channel bandwidth. Unless indicated elsewhere in this part, the table in this section specifies the emission masks for equipment operating under this part.

Table 8.3-1: Applicable Emission Masks

Frequency band, MHz	Mask for equipment with audio low pass filter	Mask for equipment with audio low pass filter
421–512[1,2]	B, D, or E	C, D, or E

Notes: [1]Equipment designed to operate with a 25 kHz channel bandwidth must meet the requirements of Emission Mask B or C, as applicable. Equipment designed to operate with a 12.5 kHz channel bandwidth must meet the requirements of Emission Mask D, and equipment designed to operate with a 6.25 kHz channel bandwidth must meet the requirements of Emission Mask E.

[2]Equipment designed to operate on 25 kilohertz bandwidth channels must meet the requirements of either Emission Mask B or G, whichever is applicable, while equipment designed to operate on 12.5 kilohertz bandwidth channels must meet the requirements of Emission Mask D. Equipment designed to operate on 25 kilohertz bandwidth channels may alternatively meet the Adjacent Channel Power limits of §90.221.

(b) **Emission Mask B.** For transmitters that are equipped with an audio low-pass filter, the power of any emission must be attenuated below the unmodulated carrier power (P) as follows:

(1) On any frequency removed from the assigned frequency by more than 50 percent, but not more than 100 percent of the authorized bandwidth: At least 25 dB.

(2) On any frequency removed from the assigned frequency by more than 100 percent, but not more than 250 percent of the authorized bandwidth: At least 35 dB.

(3) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least 43 + 10 log (P) dB.

(c) **Emission Mask C.** For transmitters that are not equipped with an audio low-pass filter, the power of any emission must be attenuated below the unmodulated carrier output power (P) as follows:

(1) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 5 kHz, but not more than 10 kHz: At least 83 log (f_d/5) dB;

(2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 10 kHz, but not more than 250 percent of the authorized bandwidth: At least 29 log (f_d^2/11) dB or 50 dB, whichever is the lesser attenuation;

(3) On any frequency removed from the center of the authorized bandwidth by more than 250 percent of the authorized bandwidth: At least 43 + 10 log (P) dB.

(d) **Emission Mask D**—12.5 kHz channel bandwidth equipment. For transmitters designed to operate with a 12.5 kHz channel bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

(1) On any frequency from the center of the authorized bandwidth f_0 to 5.625 kHz removed from f_0: Zero dB.

(2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 5.625 kHz but no more than 12.5 kHz: At least 7.27(f_d–2.88 kHz) dB.

(3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 12.5 kHz: At least 50 + 10 log (P) dB or 70 dB, whichever is the lesser attenuation.

(4) The reference level for showing compliance with the emission mask shall be established using a resolution bandwidth sufficiently wide (usually two or three times the channel bandwidth) to capture the true peak emission of the equipment under test. In order to show compliance with the emission mask up to and including 50 kHz removed from the edge of the authorized bandwidth, adjust the resolution bandwidth to 100 Hz with the measuring instrument in a peak hold mode. A sufficient number of sweeps must be measured to insure that the emission profile is developed. If video filtering is used, its bandwidth must not be less than the instrument resolution bandwidth. For emissions beyond 50 kHz from the edge of the authorized bandwidth, see paragraph (o) of this section. If it can be shown that use of the above instrumentation settings do not accurately represent the true interference potential of the equipment under test, an alternate procedure may be used provided prior Commission approval is obtained.

References, definitions and limits, continued

FCC §90.210:

(e) **Emission Mask E**—6.25 kHz or less channel bandwidth equipment. For transmitters designed to operate with a 6.25 kHz or less bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

(1) On any frequency from the center of the authorized bandwidth f_0 to 3.0 kHz removed from f_0: Zero dB.

(2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 3.0 kHz but no more than 4.6 kHz: At least 30 + 16.67(f_d−3 kHz) or 55 + 10 log (P) or 65 dB, whichever is the lesser attenuation.

(3) On any frequency removed from the center of the authorized bandwidth by more than 4.6 kHz: At least 55 + 10 log (P) or 65 dB, whichever is the lesser attenuation.

(4) The reference level for showing compliance with the emission mask shall be established using a resolution bandwidth sufficiently wide (usually two or three times the channel bandwidth) to capture the true peak emission of the equipment under test. In order to show compliance with the emission mask up to and including 50 kHz removed from the edge of the authorized bandwidth, adjust the resolution bandwidth to 100 Hz with the measuring instrument in a peak hold mode. A sufficient number of sweeps must be measured to insure that the emission profile is developed. If video filtering is used, its bandwidth must not be less than the instrument resolution bandwidth. For emissions beyond 50 kHz from the edge of the authorized bandwidth, see paragraph (o) of this section. If it can be shown that use of the above instrumentation settings do not accurately represent the true interference potential of the equipment under test, an alternate procedure may be used provided prior Commission approval is obtained.

References, definitions and limits, continued

8.3.2 Test summary

Verdict	Pass		
Tested by	Dinesh Dhawan	Test date	January 12, 2026

8.3.3 Test Method

ANSI C63.26:2015	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services

8.3.4 Observations, settings and special notes

Spectrum analyser settings for spectrum mask:

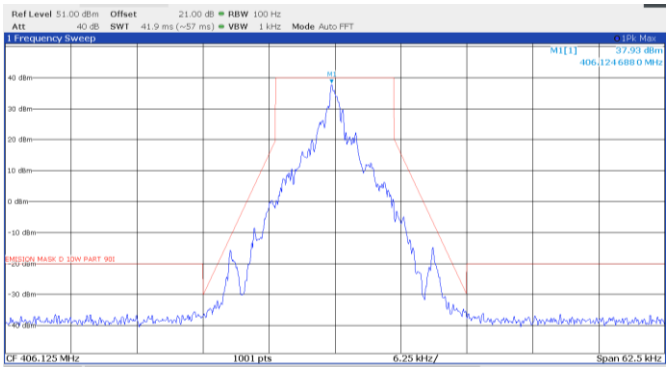
Resolution bandwidth:	100 Hz
Video bandwidth:	1 KHz
Detector mode:	Peak
Trace mode:	Max Hold

Spectrum analyser settings for spurious emissions:

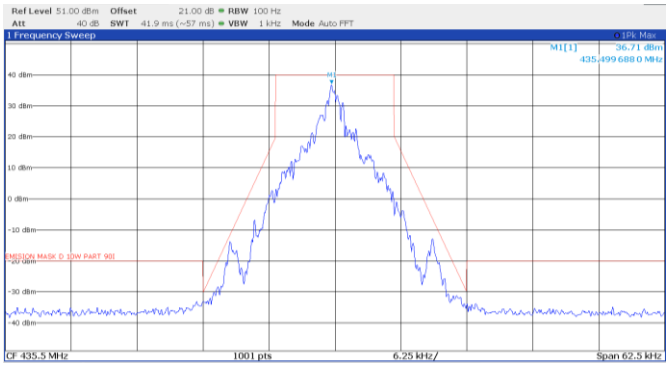
Resolution bandwidth:	100 kHz (below 1 GHz); 1 MHz (above 1 GHz)
Video bandwidth:	3XRBW
Detector mode:	Peak
Trace mode:	Max Hold

8.3.5 Test data

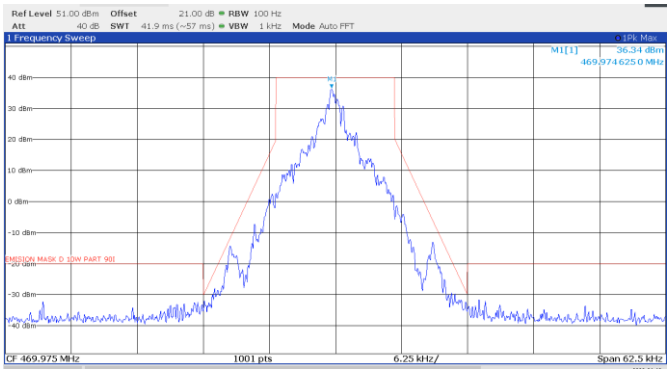
Emission Mask – 12.5kHz, Baud rate:9600



Emission Mask D for (406.125 MHz) Low channel

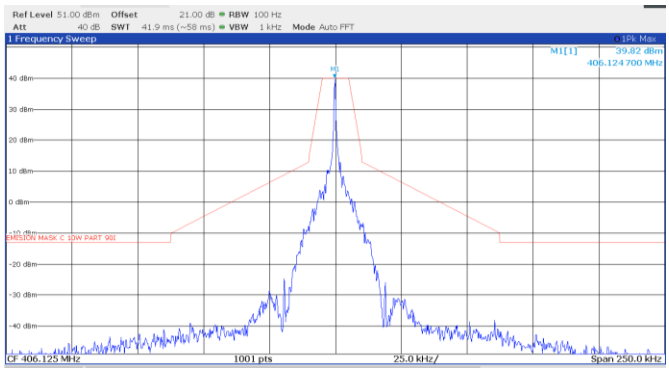


Emission Mask D for (435.5 MHz) Mid channel

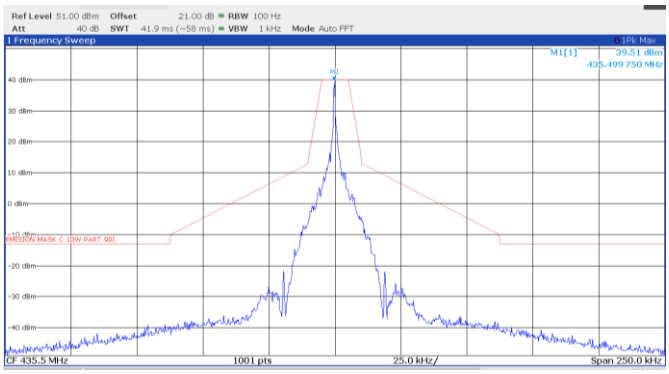


Emission Mask D for (469.975 MHz) High channel

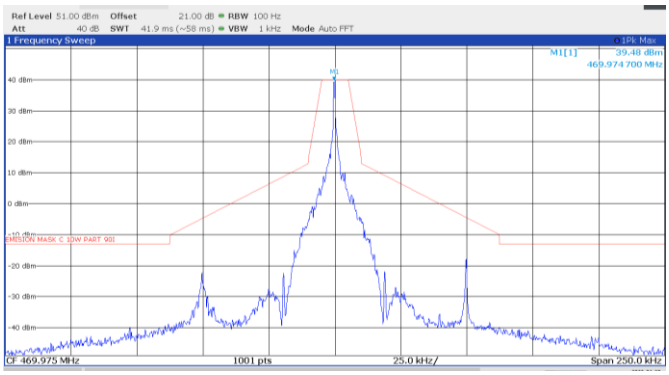
Emission Mask – 25kHz, Baud rate:19200



Emission Mask C for (406.125 MHz) Low channel

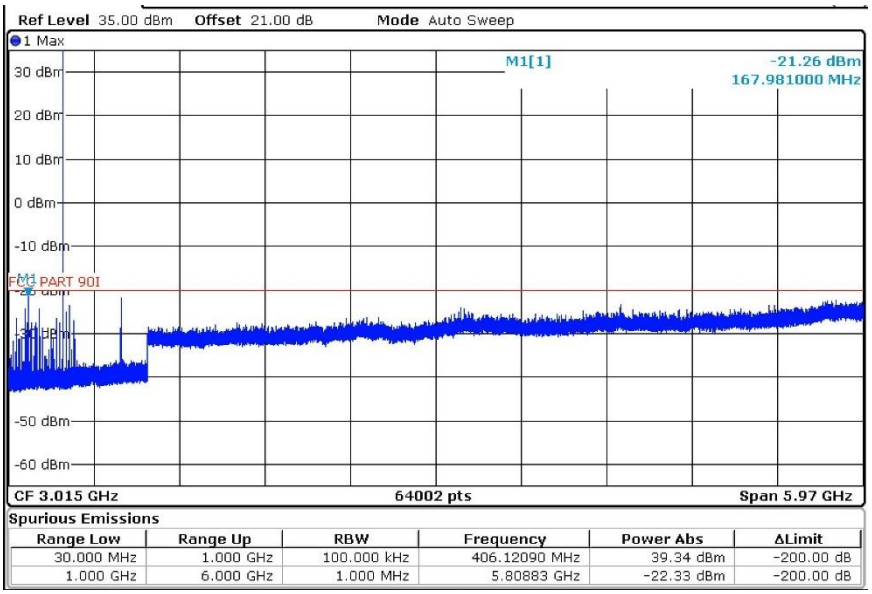


Emission Mask C for (435.5 MHz) Mid channel

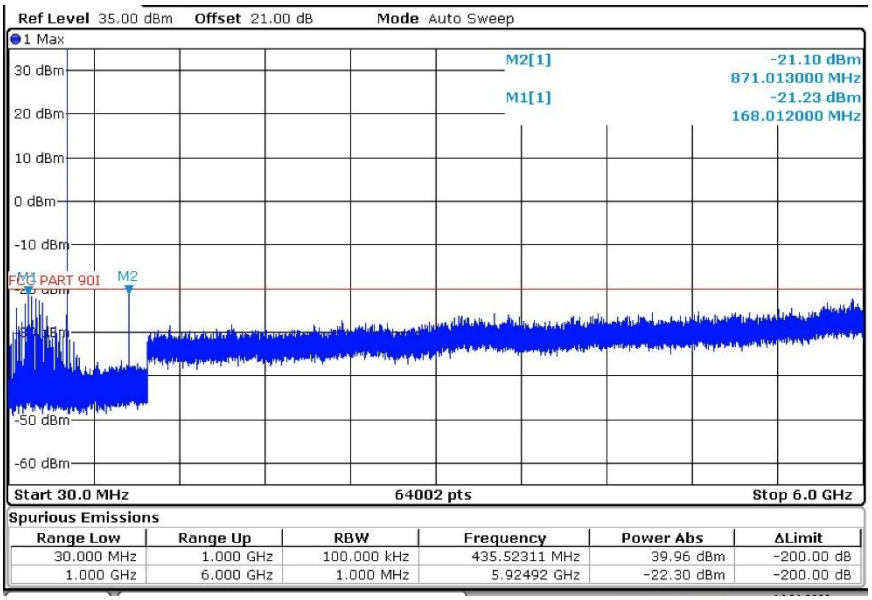


Emission Mask C for (469.975 MHz) High channel

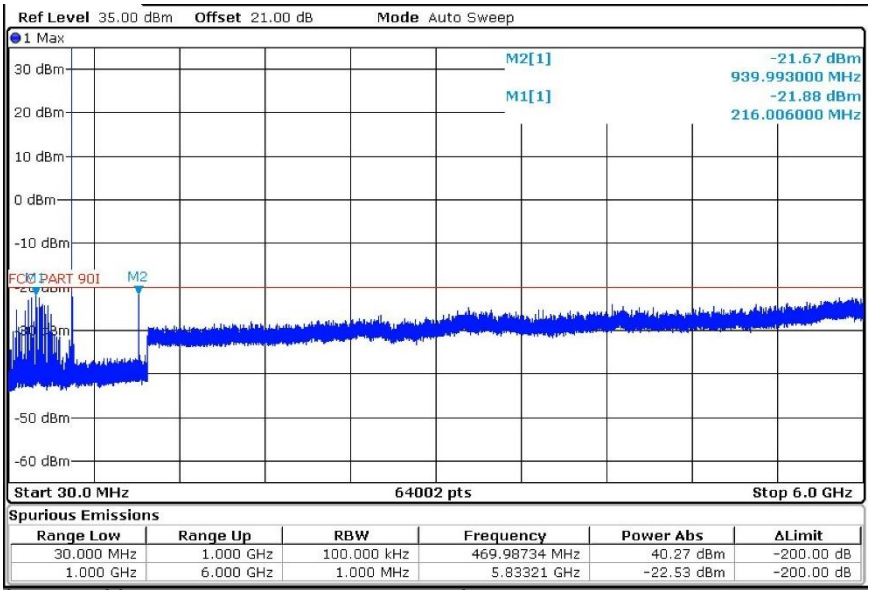
Conducted Spurious Emission



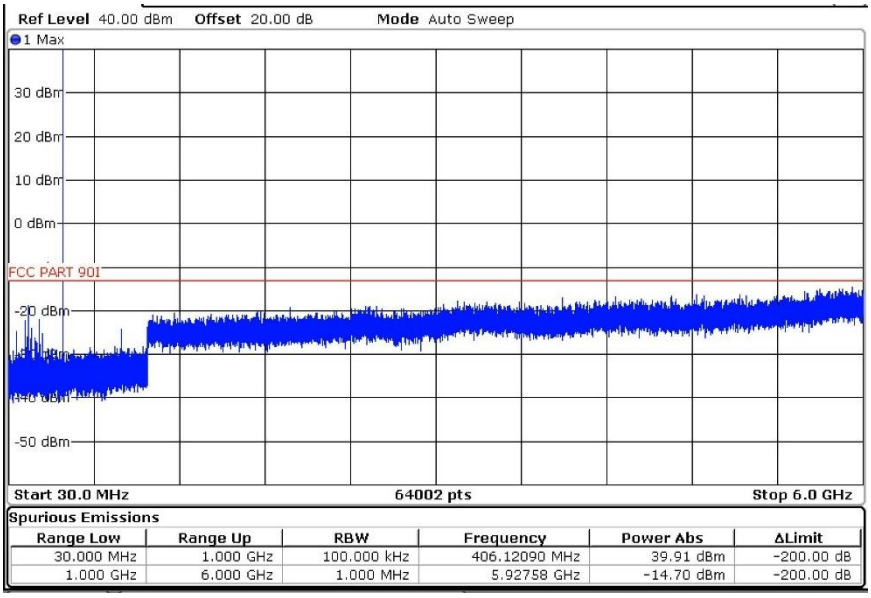
Conducted spurious emissions Low channel from 30 MHz-6GHz – 12.5kHz, Baud rate:9600



Conducted spurious emissions Mid channel from 30 MHz-6GHz – 12.5kHz, Baud rate:9600



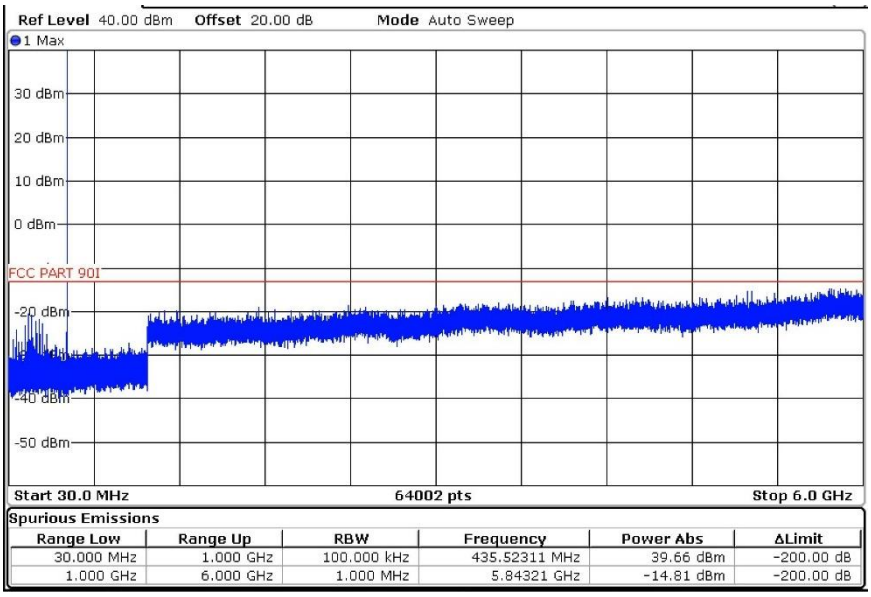
Conducted spurious emissions High channel from 30 MHz-6GHz – 12.5kHz, Baud rate:9600



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	100.000 kHz	406.12090 MHz	39.91 dBm	-200.00 dB
1.000 GHz	6.000 GHz	1.000 MHz	5.92758 GHz	-14.70 dBm	-200.00 dB

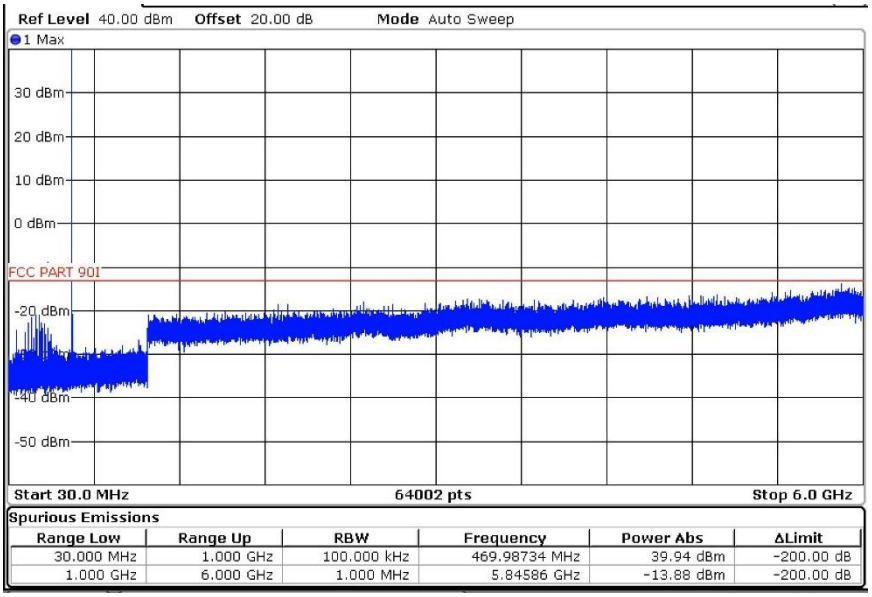
Conducted spurious emissions Low channel from 30 MHz-6GHz – 25kHz, Baud rate:19200



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	100.000 kHz	435.52311 MHz	39.66 dBm	-200.00 dB
1.000 GHz	6.000 GHz	1.000 MHz	5.84321 GHz	-14.81 dBm	-200.00 dB

Conducted spurious emissions Mid channel from 30 MHz-6GHz – 25kHz, Baud rate:19200



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	100.000 kHz	469.98734 MHz	39.94 dBm	-200.00 dB
1.000 GHz	6.000 GHz	1.000 MHz	5.84586 GHz	-13.88 dBm	-200.00 dB

Conducted spurious emissions High channel from 30 MHz-6GHz – 25kHz, Baud rate:19200

Frequency	Polarity	Rx Antenna Height	Ant input Level	Tx Ant Gain	Result - e.r.p	Limit	Margin
(MHz)		(cm)	(dBm)	(dBi)	(dBm)	(dBm)	(dB)
264.01	H	100	-30.16	3.92	-26.24	-20	6.24
311.98	H	100	-30.56	4.57	-25.99	-20	5.99
359.99	H	100	-33.37	5.06	-28.31	-20	8.31
408.64	H	100	-28.87	4.79	-24.08	-20	4.08
812.26	H	100	-27.91	5.61	-22.30	-20	2.30

Radiated spurious emissions Low channel – 12.5kHz, Baud rate:9600

Frequency	Polarity	Rx Antenna Height	Ant input Level	Tx Ant Gain	Result - e.r.p	Limit	Margin
(MHz)		(cm)	(dBm)	(dBi)	(dBm)	(dBm)	(dB)
251.98	H	100	-31.70	4.18	-27.52	-20	7.52
263.96	H	100	-25.65	3.95	-21.70	-20	1.70
267.50	H	100	-24.95	3.85	-21.10	-20	1.10
311.98	H	100	-31.13	4.57	-26.56	-20	6.56
315.47	H	100	-29.42	4.40	-25.02	-20	5.02
871.04	H	100	-30.09	5.35	-24.74	-20	4.74

Radiated spurious emissions mid channel – 12.5kHz, Baud rate:9600

Frequency	Polarity	Rx Antenna Height	Ant input Level	Tx Ant Gain	Result - e.r.p	Limit	Margin
(MHz)		(cm)	(dBm)	(dBi)	(dBm)	(dBm)	(dB)
264.01	H	100	-25.17	3.92	-21.25	-20	1.25
277.98	H	100	-26.66	4.01	-22.65	-20	2.65
301.94	H	100	-26.35	4.87	-21.48	-20	1.48
311.98	H	100	-28.29	4.57	-23.72	-20	3.72
313.97	H	100	-28.17	4.46	-23.71	-20	3.71
325.95	H	100	-28.87	4.25	-24.62	-20	4.62
472.47	H	100	-29.43	5.44	-23.99	-20	3.99

Radiated spurious emissions High channel – 12.5kHz, Baud rate:9600

Frequency	Polarity	Rx Antenna Height	Ant input Level	Tx Ant Gain	Result - e.r.p	Limit	Margin
(MHz)		(cm)	(dBm)	(dBi)	(dBm)	(dBm)	(dB)
311.98	H	100	-37.81	14.74	-23.07	-13	10.07
322.12	H	100	-35.36	14.90	-20.46	-13	7.46
408.64	V	100	-41.43	15.79	-25.64	-13	12.64
812.26	H	100	-44.43	18.50	-25.93	-13	12.93

Radiated spurious emissions Low channel – 25kHz, Baud rate:19200

Frequency	Polarity	Rx Antenna Height	Ant input Level	Tx Ant Gain	Result - e.r.p	Limit	Margin
(MHz)		(cm)	(dBm)	(dBi)	(dBm)	(dBm)	(dB)
264.01	H	100	-37.81	14.74	-23.07	-13	10.07
267.50	H	100	-35.36	14.90	-20.46	-13	7.46
315.47	H	100	-41.43	15.79	-25.64	-13	12.64
437.98	H	100	-44.43	18.50	-25.93	-13	12.93

Radiated spurious emissions Mid channel – 25kHz, Baud rate:19200

Frequency	Polarity	Rx Antenna Height	Ant input Level	Tx Ant Gain	Result - e.r.p	Limit	Margin
(MHz)		(cm)	(dBm)	(dBi)	(dBm)	(dBm)	(dB)
263.96	H	100	-34.89	14.67	-20.22	-13	7.22
277.98	H	100	-38.03	15.05	-22.98	-13	9.98
301.94	H	100	-35.26	14.93	-20.33	-13	7.33
311.98	H	100	-39.20	15.50	-23.70	-13	10.70
325.95	H	100	-40.20	16.21	-23.99	-13	10.99
939.96	H	100	-46.05	23.38	-22.67	-13	9.67

Radiated spurious emissions High channel – 25kHz, Baud rate:19200

Note:

1. Result - e.r.p (dBm) = Ant input Level (dBm) + Tx Ant Gain (dBi)
2. No major Peaks observed during 1GHz to 6GHz pre-scan.

8.4 Transient frequency behavior

8.4.1 References, definitions and limits

FCC §15.214:

Transmitters designed to operate in the 421–512 MHz frequency band must maintain transient frequencies within the maximum frequency difference limits during the time intervals indicated:

Table 8.4-1: Transient frequency behavior

Time intervals[1,2]	Maximum frequency difference[3]	Transient duration limit
Transient Frequency Behavior for Equipment Designed to Operate on 25 kHz Channels		
t_1[4]	±25.0 kHz	10.0 ms
t_2	±12.5 kHz	25.0 ms
t_3[4]	±25.0 kHz	10.0 ms
Transient Frequency Behavior for Equipment Designed to Operate on 12.5 kHz Channels		
t_1[4]	±12.5 kHz	10.0 ms
t_2	±6.25 kHz	25.0 ms
t_3[4]	±12.5 kHz	10.0 ms
Transient Frequency Behavior for Equipment Designed to Operate on 6.25 kHz Channels		
t_1[4]	±6.25 kHz	10.0 ms
t_2	±3.125 kHz	25.0 ms
t_3[4]	±6.25 kHz	10.0 ms

Notes: [1]t_{on} is the instant when a 1 kHz test signal is completely suppressed, including any capture time due to phasing.
t_1 is the time period immediately following t_{on}.
t_2 is the time period immediately following t_1.
t_3 is the time period from the instant when the transmitter is turned off until t_{off}.
t_{off} is the instant when the 1 kHz test signal starts to rise.
[2]During the time from the end of t_2 to the beginning of t_3, the frequency difference must not exceed the limits specified in §90.213.
[3]Difference between the actual transmitter frequency and the assigned transmitter frequency.
[4]If the transmitter carrier output power rating is 6 watts or less, the frequency difference during this time period may exceed the maximum frequency difference for this time period.

References, definitions and limits, continued

8.4.2 Test summary

Verdict	Pass		
Tested by	Dinesh Dhawan	Test date	December 29, 2025

8.4.3 Test Method

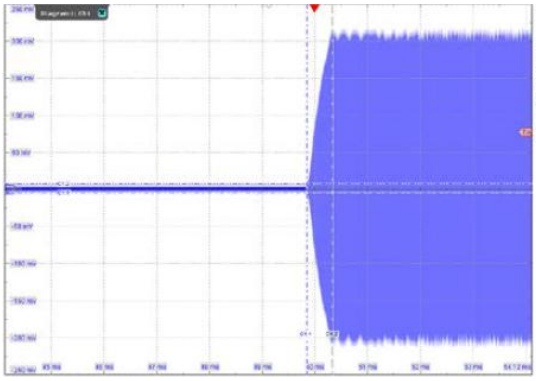
ANSI C63.26:2015	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services

8.4.4 Observations, settings and special notes

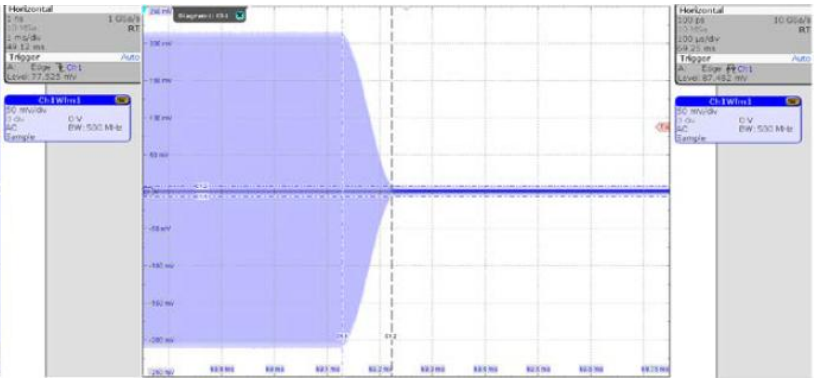
None

8.4.5 Test data

Transient frequency behavior – 12.5kHz, Baud rate:9600

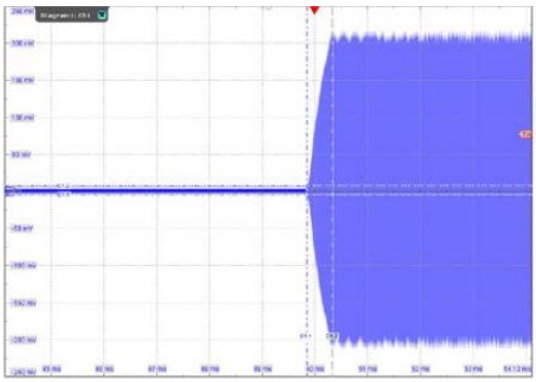


Tx ON

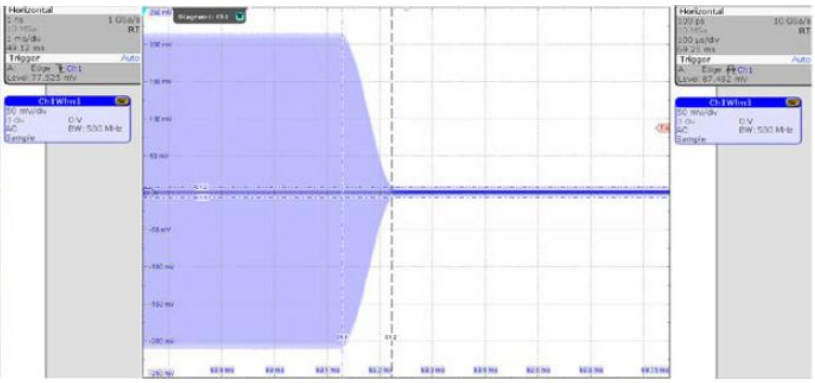


Tx OFF

Transient frequency behavior – 25kHz, Baud rate:19200



Tx ON



Tx OFF

8.5 Transmitter frequency stability

8.5.1 References, definitions and limits

FCC §90.213:

(a) Unless noted elsewhere, transmitters used in the services governed by this part must have a minimum frequency stability as specified in the following table.

Table 8.5-1: Minimum frequency stability

Frequency range (MHz)	Fixed and base stations	Mobile stations over 2 watts output power	Mobile stations 2 watts or less output power
406–470	±2.5 ppm[1]	±5 ppm[2]	±5 ppm[2]

Notes: [1]In the 421–512 MHz band, fixed and base stations with a 12.5 kHz channel bandwidth must have a frequency stability of 1.5 ppm. Fixed and base stations with a 6.25 kHz channel bandwidth must have a frequency stability of 0.5 ppm.
[2]In the 421–512 MHz band, mobile stations designed to operate with a 12.5 kHz channel bandwidth must have a frequency stability of 2.5 ppm. Mobile stations designed to operate with a 6.25 kHz channel bandwidth must have a frequency stability of 1.0 ppm.

8.5.2 Test summary

Verdict	Pass		
Tested by	Dinesh Dhawan	Test date	December 23, 2025

8.5.3 Test Method

ANSI C63.26:2015	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services

8.5.4 Observations, settings and special notes

Test was performed on supply voltage variations as per client rated, no frequency deviation was observed.

8.5.5 Test data

Table 8.5-2: Transmitter frequency stability results_ Drift, ppm (Frequency 406.125 MHZ)

Test conditions	12.5K 9600	25K 19200
+50 °C, Nominal	0.44	0.14
+40 °C, Nominal	0.44	0.30
+30 °C, Nominal	0.60	0.32
+20 °C, Nominal	0.37	0.18
+10 °C, Nominal	0.41	0.20
0 °C, Nominal	-0.38	0.30
−10 °C, Nominal	0.38	0.25
−20 °C, Nominal	0.43	0.40
−30 °C, Nominal	0.42	0.54

Table 8.5-3: Transmitter frequency stability results_ Drift, ppm (Frequency 435.500 MHZ)

Test conditions	12.5K 9600	25K 19200
+50 °C, Nominal	0.41	0.10
+40 °C, Nominal	0.41	0.04
+30 °C, Nominal	0.38	0.12
+20 °C, Nominal	0.52	0.12
+10 °C, Nominal	0.41	0.27
0 °C, Nominal	0.39	0.27
−10 °C, Nominal	0.33	0.27
−20 °C, Nominal	0.41	0.33
−30 °C, Nominal	0.42	0.54

Table 8.5-4: Transmitter frequency stability results_ Drift, ppm (Frequency 469.975 MHZ)

Test conditions	12.5K 9600	25K 19200
+50 °C, Nominal	0.50	0.12
+40 °C, Nominal	0.44	0.05
+30 °C, Nominal	0.48	0.15
+20 °C, Nominal	0.51	0.08
+10 °C, Nominal	0.43	0.17
0 °C, Nominal	0.36	0.22
−10 °C, Nominal	0.33	0.18
−20 °C, Nominal	0.42	0.28
−30 °C, Nominal	0.42	0.54

Note:
Limit ±ppm 12.5kHz: 2.5ppm
Limit ±ppm 25kHz: 5ppm

***** End of Test report*****