Report on the FCC and IC Testing of the Medela AG

Model: Magic InBra / 101046806

In accordance with FCC 47 CFR Part 15C, ISED Canada RSS-247 and ISED Canada RSS-GEN

Prepared for: Medela AG
Lättichstrasse 4b
6340 Baar
Switzerland

FCC ID: 2ATCR46806
IC: 25040-46806

Product Service

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COMMERCIAL-IN-CONFIDENCE

Date: 2025-08-28
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RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Project Management	Michael Ingerl	2025-08-28	SIGN-ID 1069646
Authorised Signatory	Martin Steindl	2025-08-28	SIGN-ID 1069774

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD Product Service document control rules.

ENGINEERING STATEMENT
The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC 47 CFR Part 15C and ISED Canada RSS-247 and ISED Canada RSS-GEN. The sample tested was found to comply with the requirements defined in the applied rules.

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Testing	Michael Ingerl	2025-08-28	SIGN-ID 1069646

Laboratory Accreditation	Laboratory recognition	ISED Canada test site registration
DAkkS Reg. No. D-PL-11321-11-02 DAkkS Reg. No. D-PL-11321-11-03	Registration No. BNetzA-CAB-16/21-15	3050A-2

EXECUTIVE SUMMARY
A sample of this product was tested and found to be compliant with FCC 47 CFR Part 15C, ISED Canada RSS-247, Issue 3 (2023-08) and ISED Canada RSS-GEN, Issue 5 (2018-04).

Trade Register Munich
HRB 85742
VAT ID No. DE129484267
Information pursuant to Section 2(1)
DL-InfoV (Germany) at
www.tuvsud.com/imprint

Managing Directors:
Wolfgang Hübl (Sprecher / CEO)
Karl Meier
Patrick van Welij

Phone: +49 9421 5682-0
Fax: +49 9421 5682-199
www.tuvsud.com/ps

Äußere Frühlingstraße 45
94315 Straubing
Germany

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1 Report Summary

1.1 Report Modification Record

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

Revision	Description of Change	Date of Issue
0	First Issue	2024-11-05
1	Added at chapter 3.4.6 Measurement plots; Added at chapter 1.4.1 the Power Setting; Added at chapter 3.5.6 Measurement plots and notes; Added at chapter 3.6.6 a Note; Added at chapter 3.8.6 Measurement results	2025-06-25
2	Added at chapter 3.1.6 a table for Test Distance information; Added at chapter 3.6.6 Antenna Gain and Conducted Power; Changed Applicant to Medela AG (Typo)	2025-08-28

Table 1

1.2 Introduction

Applicant	Medela AG
Manufacturer	Medela AG
Model Number(s)	Magic InBra / 101046806
Serial Number(s)	DVT-2-066 DVT-2-003
Hardware Version(s)	B
Software Version(s)	0.3.2
Number of Samples Tested	2
Test Specification/Issue/Date	FCC 47 CFR Part 15C, ISED Canada RSS-247, Issue 3 (2023-08) and ISED Canada RSS-GEN, Issue 5 (2018-04)
Test Plan/Issue/Date	---
Order Number	C10002717920
Date of Receipt of EUT	2024-08-26
Start of Test	2024-09-05
Finish of Test	2024-09-27
Name of Engineer(s)	Michael Ingerl
Related Document(s)	ANSI C63.10 (2013)

Product Service

1.3 Brief Summar of Results

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 15C and ISED Canada RSS-247 and ISED Canada RSS-GEN is shown below.

Section	Specification Clause	Test Description	Result	Comments/Base Standard
3.1	15.247 (d), 15.205, B.10 and 6.13	Spurious Radiated Emissions	Pass	ANSI C63.10 (2013)
3.2	15.205 N/A and 8.10	Restricted Band Edges	Pass	ANSI C63.10 (2013)
3.3	15.247 (d), B.10 and N/A	Authorised Band Edges	Pass	ANSI C63.10 (2013)
3.4	15.247 (a)(2), N/A and 6.6	Emission Bandwidth	Pass	ANSI C63.10 (2013)
3.5	15.247 (e), N/A and 6.12	Power Spectral Density	Pass	ANSI C63.10 (2013)
3.6	15.247 (b), 5.4 and 6.12	Maximum Conducted Output Power	Pass	ANSI C63.10 (2013)
3.7	RSS-Gen, 6.11	Transmitter frequency stability	Pass	---
3.8	15.203, 6.8	Antenna requirement	Pass	---

Table 2

Product Service

1.4 Basic information of EUT

1.4.1 Technical Description

The Magic InBra breast pump is a personal-use electric breast pump with Fluid Feel Technology™ and 2-Phase Expression Technology™. Mode of operation: continuous. The operating life of the Magic InBra breast pump is 500 hours. The expected operating life of the replaceable washable components is six months.

Frequency Band:	2400.0 MHz – 2483.5 MHz
Supply Voltage:	5 V, battery supplied
Supply Frequency:	DC
Number of RF-channels:	40
Channel spacing	2 MHz
Adaptive	No
FHHS	No
Type(s) of Modulation (e.g. BPSK, FSK, ASK, …)	As per Bluetooth 4.2 Low Energy Standard
Type of radio transmission / Use of frequency spectrum (e.g. DSSS, OFDM,.)	As per Bluetooth 4.2 Low Energy Standard
Number / Type of Antenna(s)	Integral Antenna
P	Default
Antenna Gain:	2402 MHz: 2.91 dBi 2440 MHz: 1.52 dBi 2480 MHz: 1.67 dBi

1.4.2 Test Configuration

Configuration	Description
5 V battery supplied	The EUT is powered via internal battery

1.4.3 Mode(s) of Operation

Mode	Description
Continuously transmitting	With DTM mode

Product Service

1.5 EUT Modification Record

The table below details modifications made to the EUT during the test programme. The modifications incorporated during each test are recorded on the appropriate test pages.

Modification State	Description of Modification still fitted to EUT	Modification Fitted By	Date Modification Fitted
0	As supplied by the customer SN: DVT-2-066	Not Applicable	Not Applicable

Table 3

Modification State	Description of Modification still fitted to EUT	Modification Fitted By	Date Modification Fitted
0	As supplied by the customer (Conducted Sample) SN: DVT-2-003	Not Applicable	Not Applicable

Table 4

1.6 Test Location

TÜV SÜD Product Service conducted the following tests at our Straubing Test Laboratory.

Test Name	Name of Engineer(s)
Spurious Radiated Emissions	Michael Ingerl
Restricted Band Edges	Michael Ingerl
Authorised Band Edges	Michael Ingerl
Emission Bandwidth	Alex Fink
Power Spectral Density	Alex Fink
Maximum Conducted Output Power	Alex Fink
Transmitter frequency stability	Alex Fink
Antenna requirement	Michael Ingerl

Table 5

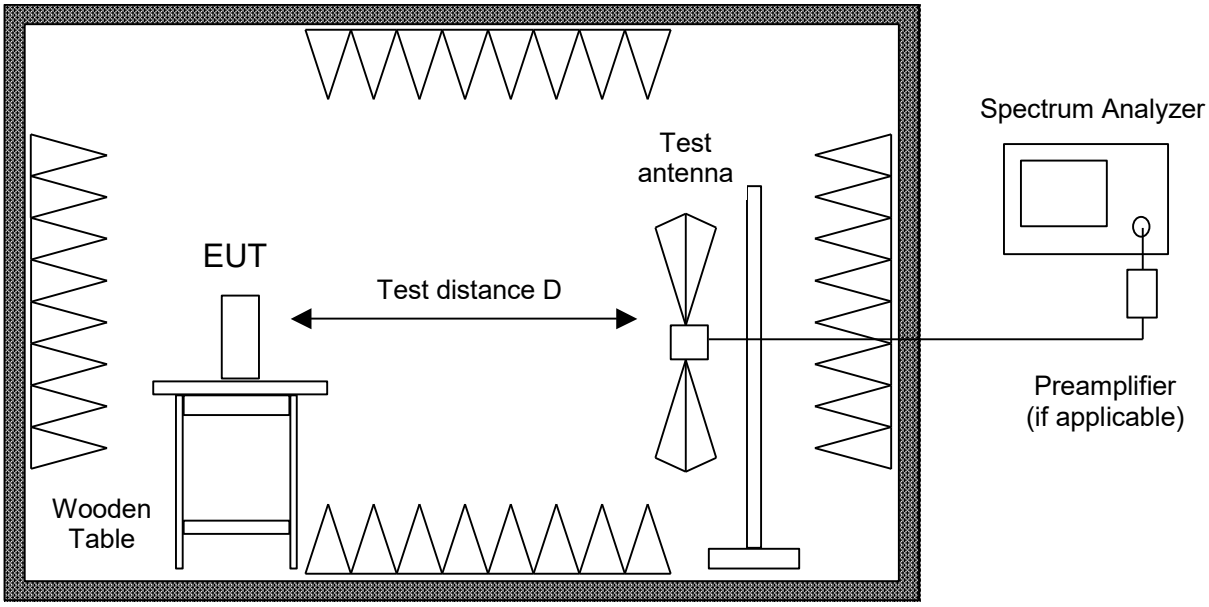
Office Address:

Äußere Frühlingstraße 45
94315 Straubing
Germany

Product Service

2 Test Setup

2.1 Radiated Emission in Fully or Semi Anechoic Room



Fully or semi anechoic room

Radiated emission in fully or semi anechoic room is measured in the frequency range from 30 MHz to the maximum frequency as specified in CFR 47 Part 15 section 15.33.

Measurements are made in both the horizontal and vertical planes of polarization using a spectrum analyzer with the detector function set to peak and resolution as well as video bandwidth set to 100 kHz (below 1 GHz) or 1 MHz (above 1 GHz).

Testing up to 1 GHz is performed with a linear polarized logarithmic periodic antenna combined with a 4:1 broadband dipole ("Trilog broadband antenna"). For testing above 1 GHz horn antennas are used.

All tests below 8.2 GHz are performed at a test distance D of 3 meters. For higher frequencies the test distance may be reduced (e.g. to 1 meter) due to the sensitivity of the measuring instrument(s) and the test results are calculated according to CFR 47 Part 15 section 15.31(f)(1) using an extrapolation factor of 20 dB/decade. If required, preamplifiers are used for the whole frequency range. Special care is taken to avoid overload, using appropriate attenuators and filters, if necessary.

If the radiated emission limits are expressed in terms of the average value of the emission there also is a peak limit corresponding to 20 dB above the maximum permitted average limit. Additionally, if pulsed operation is employed, the average field strength is determined by averaging over one complete pulse train, including blanking intervals, as specified in CFR 47 Part 15 section 15.35(c). If the pulse train exceeds 0.1 second that 0.1 second interval during which the value of the emission is at its maximum is selected for calculation. The pulse train correction is added to the peak value of the emission to get the average value.

Hand-held or body-worn devices are rotated through three orthogonal axes to determine which attitude and configuration produces the highest emission relative to the limit and therefore shall be used for final testing.

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During testing the EUT is rotated all around to find the maximum levels of emissions. Equipment and cables are placed and moved within the range of position likely to find their maximum emissions.

For final testing below 1 GHz a semi anechoic room complying with the NSA requirements of ANSI C63.4 for alternative test sites is used (see 2.2). If prescans are recorded in fully anechoic room they are indicated appropriately.

According to section 13 of KDB558074 the requirement for radiated emissions on the band edges was performed with a reduced bandwidth of 100 kHz instead of 1 MHz.

Radiated emission in the frequency range 9 kHz to 30 MHz is measured using an active loop antenna. First the whole spectrum of emission caused by the equipment is recorded at a distance of 3 meters in a fully or semi anechoic room with the detector of the spectrum analyzer or EMI receiver set to peak. This configuration is also used for recording the spectrum of intentional radiators.

Hand-held or body-worn devices are rotated through three orthogonal axes to determine which attitude and configuration produces the highest emission relative to the limit and therefore shall be used for final testing.

EUT is rotated all around to find the maximum levels of emissions. Equipment and cables are placed and moved within the range of position likely to find their maximum emissions.
If worst case emission of the EUT cannot be recorded with EUT in standard position and loop antenna in vertical polarization the EUT (or the radiating part of the EUT) is rotated by 90 degrees instead of changing the loop antenna to horizontal polarization. This procedure is selected to minimize the influence of the environment (e.g. effects caused by the floor especially with longer distances).

Final measurement is performed at a test distance D of 30 meters using an open field test site. In case the regulation requires testing at other distances, the result is extrapolated by either making measurements at an additional distance D of 10 meters to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). In cases of very low emissions measurements are performed at shorter distances and results are extrapolated to the required distance. The provisions of CFR 47 Part 15 sections 15.31(d) and (f)(2) apply. According to CFR 47 Part 15 section 15.209(d) final measurement is performed with detector function set to quasi-peak except for the frequency bands 9 to 90 kHz and 110 to 490 kHz where, for non-pulsed operation, average detector is employed.

If the radiated emission limits are expressed in terms of the average value of the emission there also is a peak limit corresponding to 20 dB above the maximum permitted average limit. Additionally, if pulsed operation is employed, the average field strength is determined by averaging over one complete pulse train, including blanking intervals, as specified in CFR 47 Part 15 section 15.35(c). If the pulse train exceeds 0.1 second that 0.1 second interval during which the value of the emission is at its maximum is selected for calculation. The pulse train correction is added to the peak value of the emission to get the average value.

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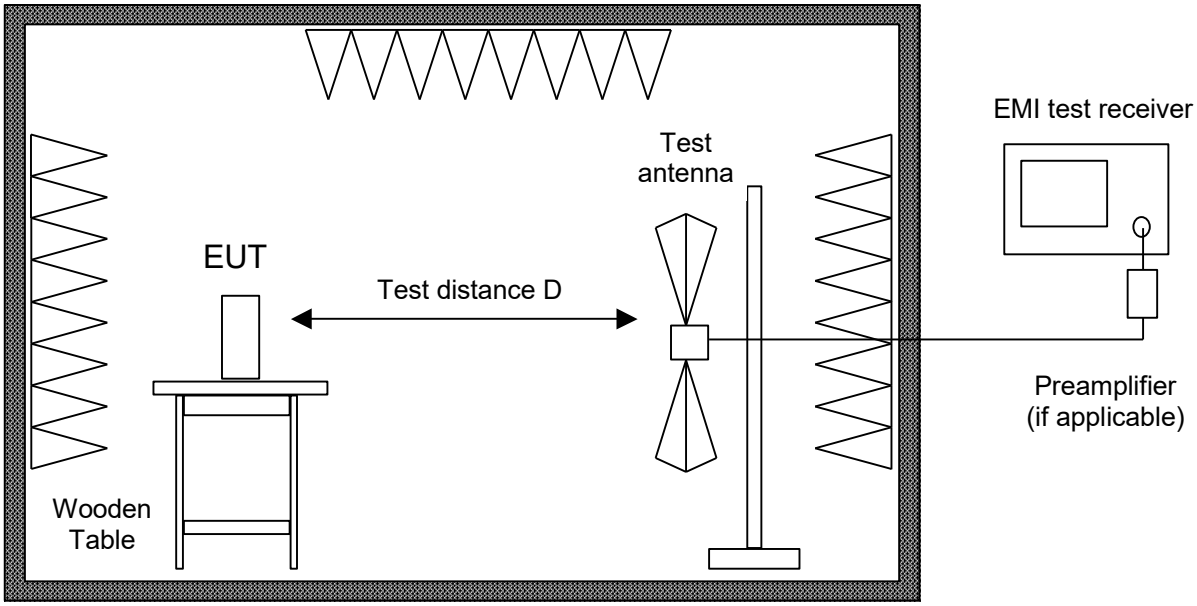
2.2 Radiated Emission at Alternative Test Site



Alternate test site (semi anechoic room)

Radiated emission in the frequency range 30 MHz to 1 GHz is measured within a semi-anechoic room with groundplane complying with the NSA requirements of ANSI C63.4 for alternative test sites. A linear polarized logarithmic periodic antenna combined with a 4:1 broadband dipole ("Trilog broadband antenna") is used. The measurement bandwidth of the test receiver is set to 120 kHz with quasi-peak detector selected.

If the radiated emission limits are expressed in terms of the average value of the emission there also is a peak limit corresponding to 20 dB above the maximum permitted average limit. Additionally, if pulsed operation is employed, the average field strength is determined by averaging over one complete pulse train, including blanking intervals, as specified in CFR 47 Part 15 section 15.35(c). If the pulse train exceeds 0.1 second that 0.1 second interval during which the value of the emission is at its maximum is selected for calculation. The pulse train correction is added to the peak value of the emission to get the average value.

Hand-held or body-worn devices are tested in the position producing the highest emission relative to the limit as verified by prescans in fully anechoic room.

If no prescan in a fully anechoic room is used first a peak scan is performed in four positions to get the whole spectrum of emission caused by EUT with the measuring antenna raised and lowered from 1 to 4 m to find table position, antenna height and antenna polarization for the maximum emission levels.
Data reduction is applied to these results to select those levels having less margin than 10 dB to or exceeding the limit using subranges and limited number of maximums. Further maximization is following.
With detector of the test receiver set to quasi-peak final measurements are performed immediately after frequency zoom (for drifting disturbances) and maximum adjustment. Equipment and cables are placed and moved within the range of position likely to find their maximum emissions.

In cases where prescans in a fully anechoic room are taken (e. g. if EUT is operating for a short time only or battery is dircharged quickly) final measurements with quasi-peak detector are performed manually at frequencies indicated by prescan with EUT rotating all around and

receiving antenna raising and lowering within 1 meter to 4 meters to find the maximum levels of emission.
Equipment and cables are placed and moved within the range of position likely to find their maximum emissions.

For measuring emissions of intentional radiators and receivers a test distance D of 3 meters is selected. Testing of unintentional radiators is performed at a distance of 10 meters. If limits specified for 3 meters shall be used for measurements performed at 10 meters distance the limits are calculated according to CFR 47 Part 15 section 15.31(d) and (f)(1) using an inverse linear-distance extrapolation factor of 20 dB/decade.

Product Service

3 Test Details

3.1 Spurious Emissions

3.1.1 Specification Reference

FCC 47 CFR Part 15C, ISED Canada RSS-247 and ISED Canada RSS-GEN

3.1.2 Equipment Under Test and Modification State

Magic InBra / 101046806, S/N: DVT-2-066 - Modification State 0
Magic InBra / 101046806 (Conducted Sample), S/N: DVT-2-003 - Modification State 0

3.1.3 Date of Test

2024-09-05 - 2024-09-27

3.1.4 Test Method

Plots for average measurements were taken in accordance with ANSI C63.10-2013 clause 4.1.4.2.3 to characterize the EUT. Where emissions were detected, final average measurements were taken in accordance with ANSI C63.10-2013 clause 4.1.4.2.2.

The plots shown are the characterization of the EUT. The limits on the plots represent the most stringent case for restricted bands, (54/74 dBuV/m) when compared to 20 dBc outside restricted bands. The limits shown have been used as a threshold to determine where further measurements are necessary. Where results are within 10 dB of the limits shown on the plots, further investigation was carried out and reported in results tables.

The following conversion can be applied to convert from dBµV/m to µV/m:
10^(Field Strength in dBµV/m/20).

3.1.5 Environmental Conditions

Ambient Temperature	23.0 °C
Relative Humidity	32.0 %

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3.1.6 Test Results

Frequency range	*Limit applied*	*Test distance*
9 kHz – 30 MHz	§15.209	10 m
30 MHz – 1 GHz	§15.209	3 m
1 GHz – 6 GHz	§15.209	3 m
6 GHz – 18 GHz	§15.209	1 m
18 GHz - 26 GHz	§15.209	3 m

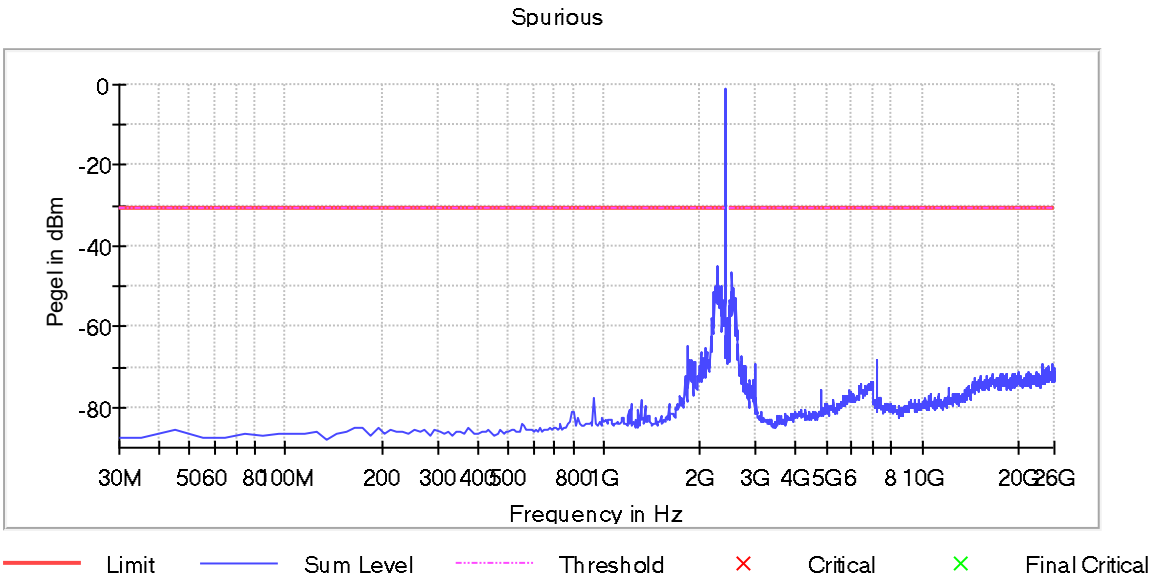
Sample calculation:

Final Value (dBµV/m) Reading Value (dBµV) + (Cable attenuation (dB)
= + Antenna Transducer (dB(1/m)))

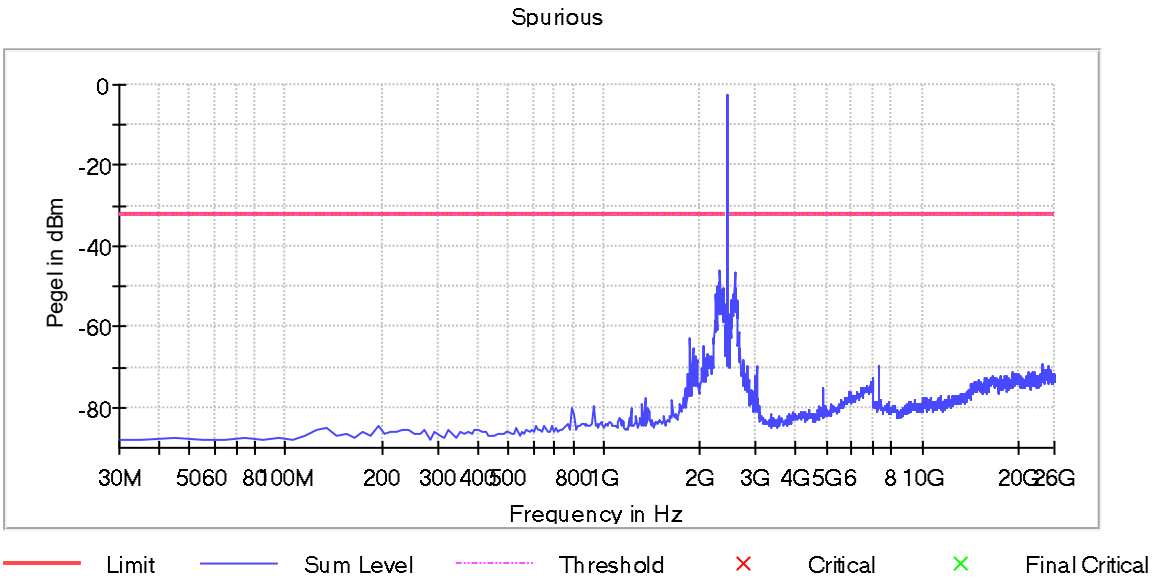
Additional correction of limit in the frequency range 9 – 490 kHz (300 m to 3 m): +80.0 dB
Additional correction of limit in the frequency range 490 kHz – 30 MHz (30 m to 3 m): +40.0 dB
Additional correction of limit in the frequency ranges above 1 GHz (3 m to 1 m): +9.54 dB

Product Service

Transmission on 2402 MHz, conducted measurement:

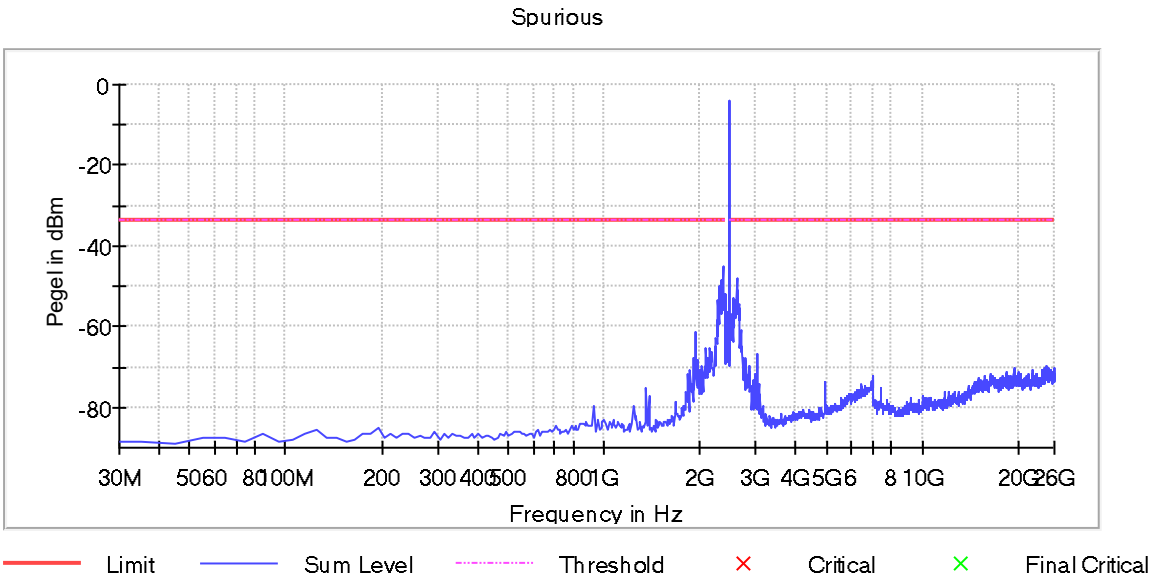


Transmission on 2440 MHz, conducted measurement:



Product Service

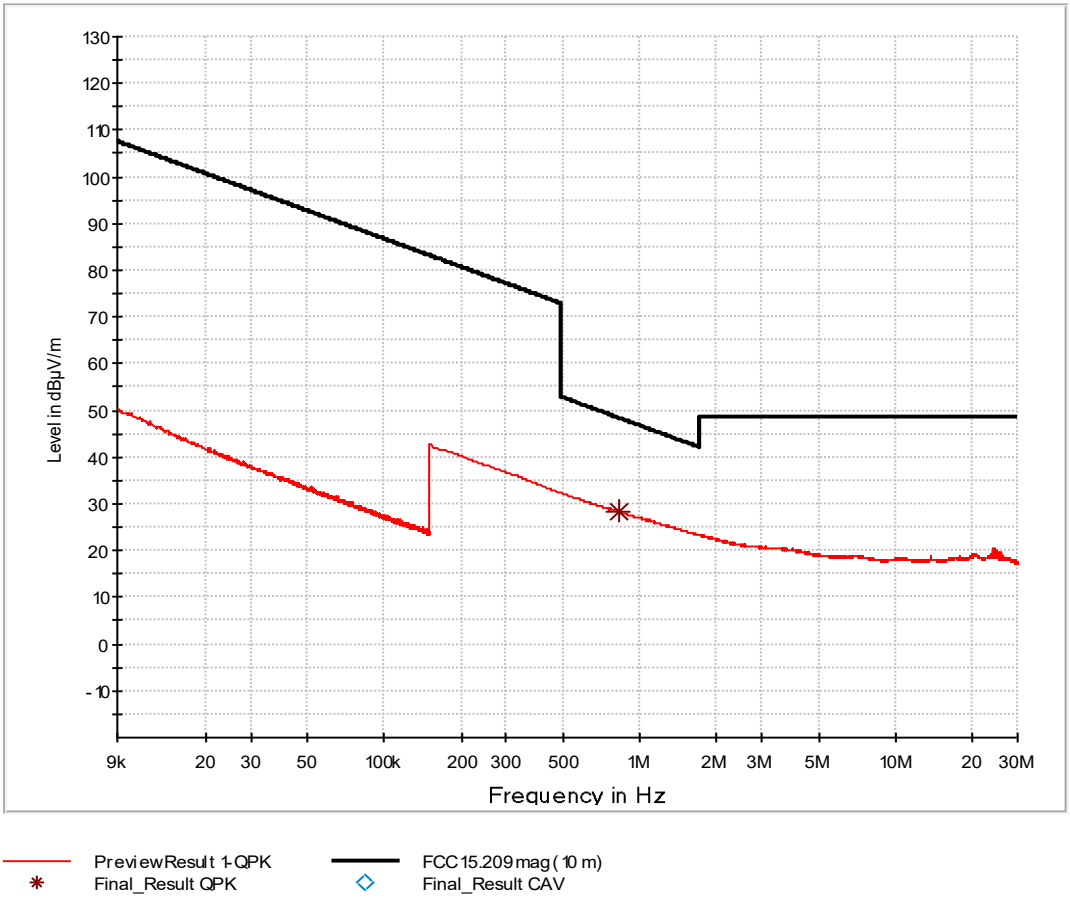
Transmission on 2480 MHz, conducted measurement:



Product Service

Transmission on 2402 MHz, radiated measurement:

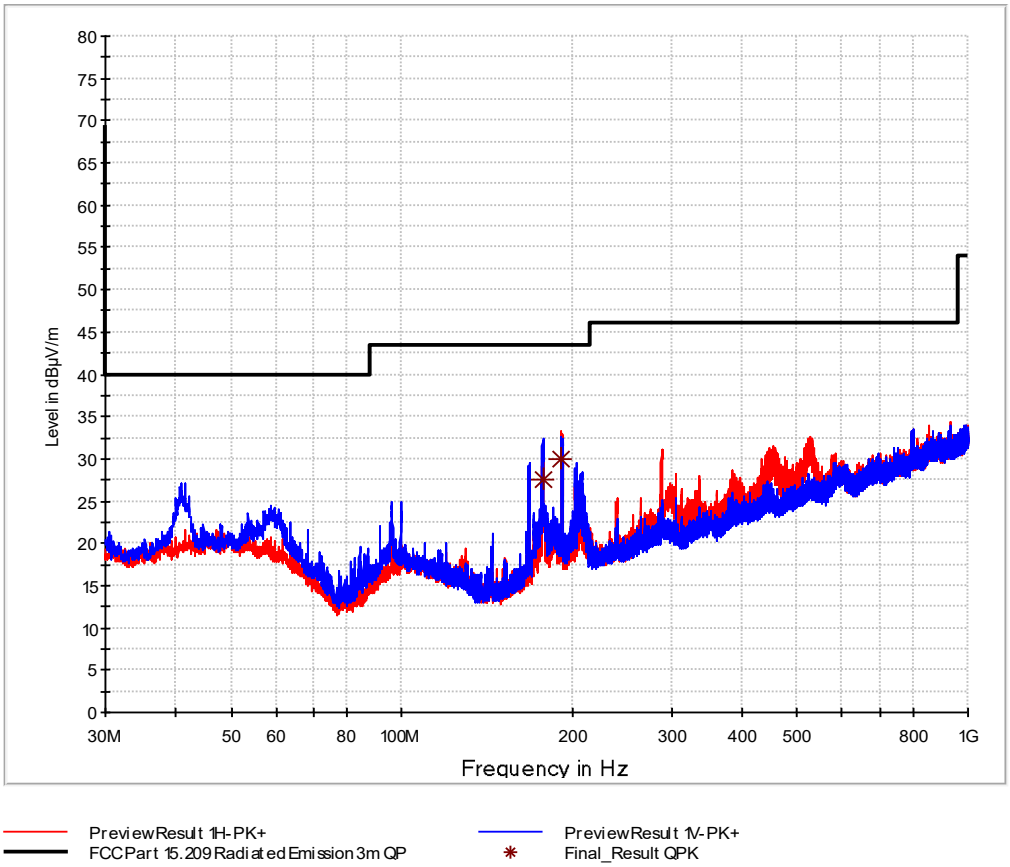
Note: Radiated only measured at Worst Case Position and Channel



Final Results 1:

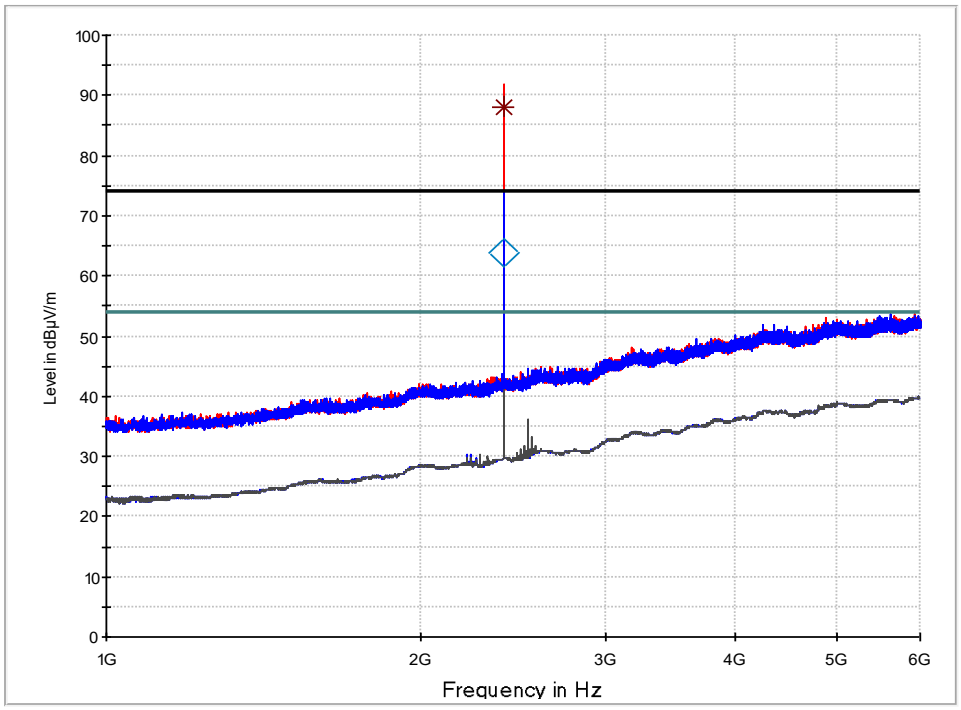
Frequency *MHz*	*QuasiPeak* *dBµV/m*	*Limit* *dBµV/m*	*Margin* *dB*	*Meas. Time* *ms*	*Bandwidth* *kHz*	*Pol*	*Azimuth* *deg*	*Corr.* *dB/m*
0.822750	28.16	48.41	20.25	1000.0	9.000	H	-20.0	19.7

Product Service



Final Results 1:

Frequency MHz	*QuasiPeak dBµV/m*	*Limit dBµV/m*	*Margin dB*	*Meas. Time ms*	*Bandwidth kHz*	*Height cm*	*Pol*	*Azimuth deg*	*Corr. dB/m*
178.020000	27.45	43.52	16.07	1000.0	120.000	105.0	V	-142.0	14.6
191.340000	29.92	43.52	13.60	1000.0	120.000	100.0	H	98.0	16.1

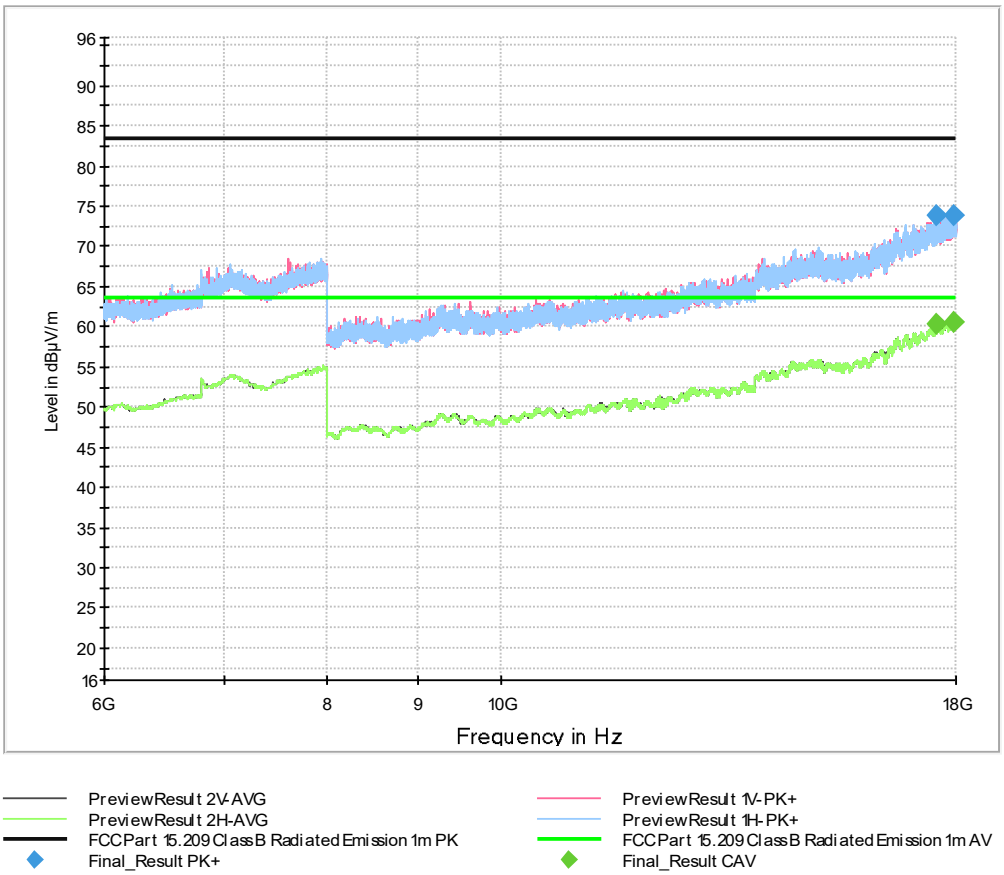


Final Results 1:

Frequency *MHz*	*MaxPeak* *dBµV/m*	*CAverage* *dBµV/m*	*Limit* *dBµV/m*	*Margin* *dB*	*Meas. Time* *ms*	*Bandwidth* *kHz*	*Height* *cm*	*Pol*	*Azimuth* *deg*	*Corr.* *dB/m*
2401.750000	88.19	---	#1	#1	1000.0	1000.000	145.0	H	-32.0	34.2
2401.750000	---	63.75	#1	#1	1000.0	1000.000	145.0	H	-32.0	34.2

#1 Intentional radiator

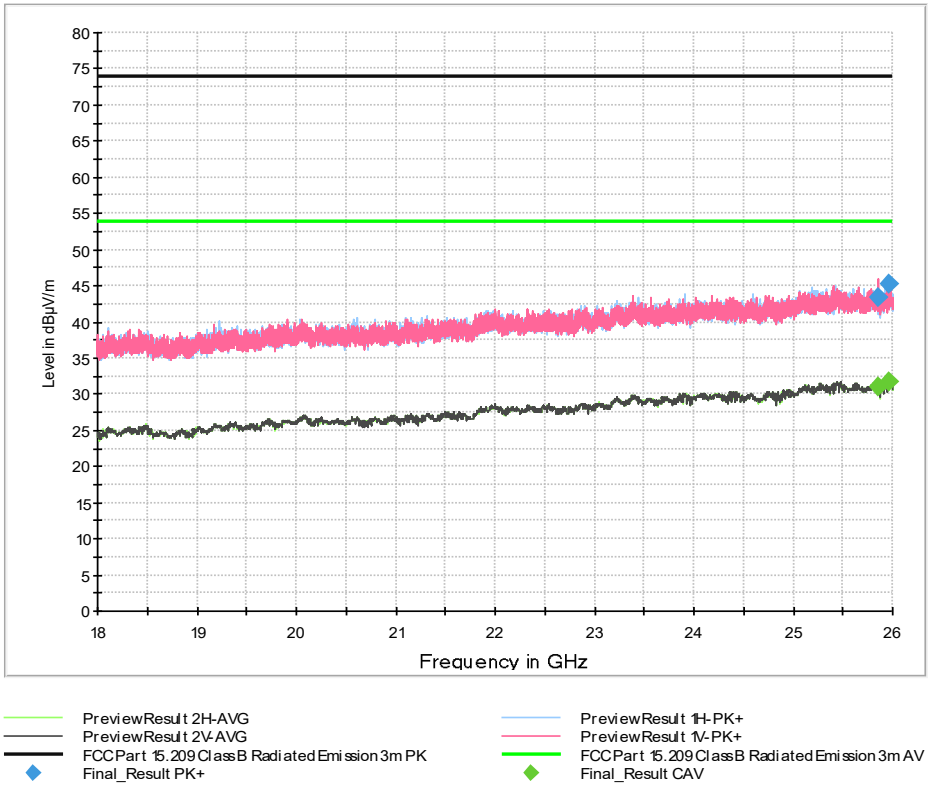
Product Service



Final Results 1:

Frequency *MHz*	*MaxPeak* *dBµV/m*	*CAverage* *dBµV/m*	*Limit* *dBµV/m*	*Margin* *dB*	*Meas. Time* *ms*	*Bandwidth* *kHz*	*Height* *cm*	*Pol*	*Azimuth* *deg*	*Corr.* *dB/m*
17559.500000	---	60.27	63.50	3.23	1000.0	1000.000	152.0	H	4.0	58.4
17559.500000	73.74	---	83.50	9.76	1000.0	1000.000	152.0	H	4.0	58.4
17936.250000	---	60.64	63.50	2.86	1000.0	1000.000	150.0	V	6.0	58.9
17936.250000	73.75	---	83.50	9.75	1000.0	1000.000	150.0	V	6.0	58.9

Product Service



Final Results 1:

Frequency *MHz*	*MaxPeak* *dBµV/m*	*CAverage* *dBµV/m*	*Limit* *dBµV/m*	*Margin* *dB*	*Meas. Time* *ms*	*Bandwidth* *kHz*	*Height* *cm*	*Pol*	*Azimuth* *deg*	*Corr.* *dB/m*
25861.250000	43.46	---	73.98	30.52	1000.0	1000.000	151.0	V	1.0	30.4
25861.250000	---	31.11	53.98	22.87	1000.0	1000.000	151.0	V	1.0	30.4
25955.250000	45.28	---	73.98	28.70	1000.0	1000.000	155.0	H	8.0	30.5
25955.250000	---	31.79	53.98	22.19	1000.0	1000.000	155.0	H	8.0	30.5

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FCC 47 CFR Part 15, Limit Clause 15.209

Frequency (MHz)	Field Strength (µV/m)	Measurement Distance (m)
0.009 to 0.490	2400/F (kHz)	300
0.490 to 1.705	24000/F (kHz)	30
1705 to 30	30	30
30 to 88	100**	3
88 to 216	150**	3
216 to 960	200**	3
Above 960	500	5

ISED Canada RSS-247

Frequency	Electric Field Strength (µV/m)	Magnetic Field Strength (H-Field) (µA/m)	Measurement Distance (m)
9 - 490 kHz	2,400/F (F in kHz)	2,400/377F (F in kHz)	300
490 - 1,705 kHz	24,000/F (F in kHz)	24,000/377F (F in kHz)	30
1,705 kHz - 30 MHz	30	N/A	30

Frequency (MHz)	Field Strength (µV/m at 3 m)
30 - 88	100
88 - 216	150
216 - 960	200
> 960	500

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3.1.7 Test Location and Test Equipment Used

Radiated Tests were carried out in cabin No.8 and conducted tests were carried out with test system TS8997.

EMI test receiver	Rohde & Schwarz	ESW44	39897	12	2025-04-30
Loop antenna	Schwarzbeck	FMZB 1519 B	44334	36	2026-06-30
TRILOG Broadband Antenna	Rohde & Schwarz	VULB 9162	20116	36	2025-01-31
Double ridged horn antenna	Rohde & Schwarz	HF907	19933	24	2025-09-30
EMC measurement software	Rohde & Schwarz	EMC32 Emission K8 - V10.60.20	19927	---	---
Semi Anechoic Room	Albatross	Cabin No. 8	19917	36	2025-07-31
Horn Antenna with preamplifier	Rohde & Schwarz	A-INFOMW LB-180400H-KF+ TS-	43661	12	2025-01-17
Spectrum and signal analyser	Rohde & Schwarz	FSV40	20219	24	2026-03-31
Switching Device	Rohde & Schwarz	OSP120 I	20248	24	2026-07-31
Switching Device	Rohde & Schwarz	OSP120 II	38807	36	2026-08-31
EMC Measurement Software	Rohde & Schwarz	EMC32 TS8997 - V10.50.00	44381	---	---

Table 6

TU - Traceability Unscheduled
O/P Mon – Output Monitored using calibrated equipment
N/A - Not Applicable

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3.2 Restricted Band Edges

3.2.1 Specification Reference

FCC 47 CFR Part 15C, ISED Canada RSS-247 and ISED Canada RSS-GEN

3.2.2 Equipment Under Test and Modification State

Magic InBra / 101046806, S/N: DVT-2-066 - Modification State 0
Magic InBra / 101046806 (Conducted Sample), S/N: DVT-2-003 - Modification State 0

3.2.3 Date of Test

2024-09-05 - 2024-09-27

3.2.4 Test Method

This test was performed in accordance with ANSI C63.10, clause 6.10.5.

Plots for average measurements were taken in accordance with ANSI C63.10 clause 4.1.4.2.3. These are shown for information purposes and were used to determine the worst case measurement point. Final average measurements were then taken in accordance with ANSI C63.10 clause 4.1.4.2.2. to obtain the measurement result recorded in the test results tables.

The following conversion can be applied to convert from dBµV/m to µV/m:
10^(Field Strength in dBµV/m/20).

3.2.5 Environmental Conditions

Ambient Temperature	23.0 °C
Relative Humidity	32.0 %

3.2.6 Test Results

Results are shown in chapter 3.1

FCC 47 CFR Part 15, Limit Clause 15.209

Frequency (MHz)	Field Strength (µV/m at 3 m)
30 to 88	100
88 to 216	150
216 to 960	200
Above 960	500

Table 7

ISED Canada RSS-GEN, Limit Clause 8.9

Frequency (MHz)	Field Strength (µV/m at 3 metres)
30-88	100
88-216	150
216-960	200
Above 960*	500

Table 8

*Unless otherwise specified, for all frequencies greater than 1 GHz, the radiated emission limits for licence-exempt radio apparatus stated in applicable RSSs (including RSS-Gen) are based on measurements using a linear average detector function having a minimum resolution bandwidth of 1 MHz. If an average limit is specified for the EUT, then the peak emission shall also be measured with instrumentation properly adjusted for such factors as pulse desensitization to ensure the peak emission is less than 20 dB above the average limit.

Product Service

3.2.7 Test Location and Test Equipment Used

Radiated Tests were carried out in cabin No.8 and conducted tests were carried out with test system TS8997.

EMI test receiver	Rohde & Schwarz	ESW44	39897	12	2025-04-30
Loop antenna	Schwarzbeck	FMZB 1519 B	44334	36	2026-06-30
TRILOG Broadband Antenna	Rohde & Schwarz	VULB 9162	20116	36	2025-01-31
Double ridged horn antenna	Rohde & Schwarz	HF907	19933	24	2025-09-30
EMC measurement software	Rohde & Schwarz	EMC32 Emission K8 - V10.60.20	19927	---	---
Semi Anechoic Room	Albatross	Cabin No. 8	19917	36	2025-07-31
Horn Antenna with preamplifier	Rohde & Schwarz	A-INFOMW LB-180400H-KF+ TS-	43661	12	2025-01-17
Spectrum and signal analyser	Rohde & Schwarz	FSV40	20219	24	2026-03-31
Switching Device	Rohde & Schwarz	OSP120 I	20248	24	2026-07-31
Switching Device	Rohde & Schwarz	OSP120 II	38807	36	2026-08-31
EMC Measurement Software	Rohde & Schwarz	EMC32 TS8997 - V10.50.00	44381	---	---

Table 9

TU - Traceability Unscheduled
O/P Mon – Output Monitored using calibrated equipment
N/A - Not Applicable

Product Service

3.3 Authorised Band Edges

3.3.1 Specification Reference

FCC 47 CFR Part 15C, ISED Canada RSS-247 and ISED Canada RSS-GEN

3.3.2 Equipment Under Test and Modification State

Magic InBra / 101046806 (Conducted Sample), S/N: DVT-2-003 - Modification State 0

3.3.3 Date of Test

2024-09-16

3.3.4 Test Method

Test according to FCC title 47 part 15 §15.247(d), KDB 558074 D01 DTS Meas Guidance v05 8.7 and ANSI C63.10-2013

3.3.5 Environmental Conditions

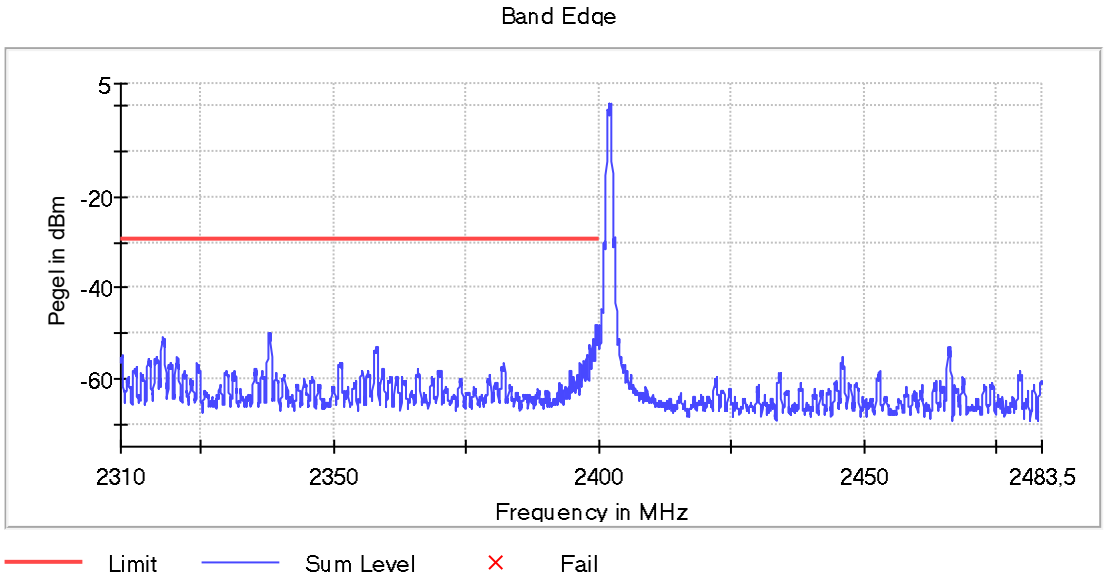
Ambient Temperature	22.0 °C
Relative Humidity	35.0 %

3.3.6 Test Results

Product Service

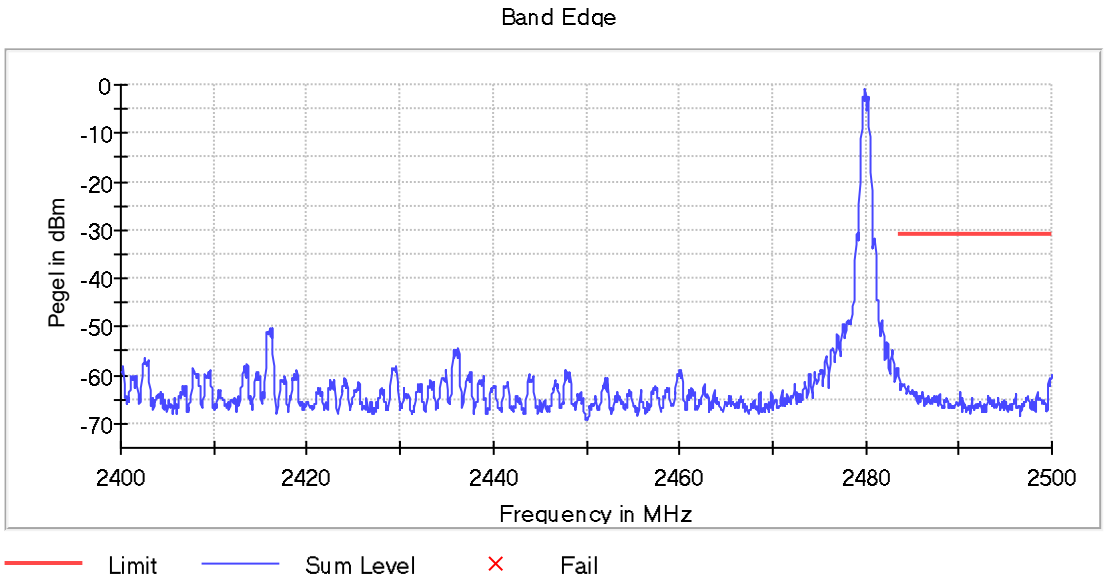
Transmission on 2402 MHz

Band Edge Low



Transmission on 2480 MHz

Band Edge High



Product Service

FCC 47 CFR Part 15, Limit Clause 15.247 (d)

20 dB below the fundamental measured in a 100 kHz bandwidth using a peak detector. If the transmitter complies with the conducted power limits, based on the use of RMS averaging over a time interval, the attenuation required shall be 30 dB below the fundamental instead of 20 dB.

3.3.7 Test Location and Test Equipment Used

Conducted test was carried out in Non-shielded room with Test system TS8997.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Spectrum and signal analyser	Rohde & Schwarz	FSV40	20219	24	2026-03-31
Switching Device	Rohde & Schwarz	OSP120 I	20248	24	2026-07-31
Switching Device	Rohde & Schwarz	OSP120 II	38807	36	2026-08-31
EMC Measurement Software	Rohde & Schwarz	EMC32 TS8997 - V10.50.00	44381	---	---

Table 10

TU - Traceability Unscheduled
O/P Mon – Output Monitored using calibrated equipment
N/A - Not Applicable

Product Service

3.4 Emission Bandwidth

3.4.1 Specification Reference

FCC 47 CFR Part 15C, ISED Canada RSS-247 and ISED Canada RSS-GEN

3.4.2 Equipment Under Test and Modification State

Magic InBra / 101046806 (Conducted Sample), S/N: DVT-2-003 - Modification State 0

3.4.3 Date of Test

2024-09-16

3.4.4 Test Method

Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 11.8.1

3.4.5 Environmental Conditions

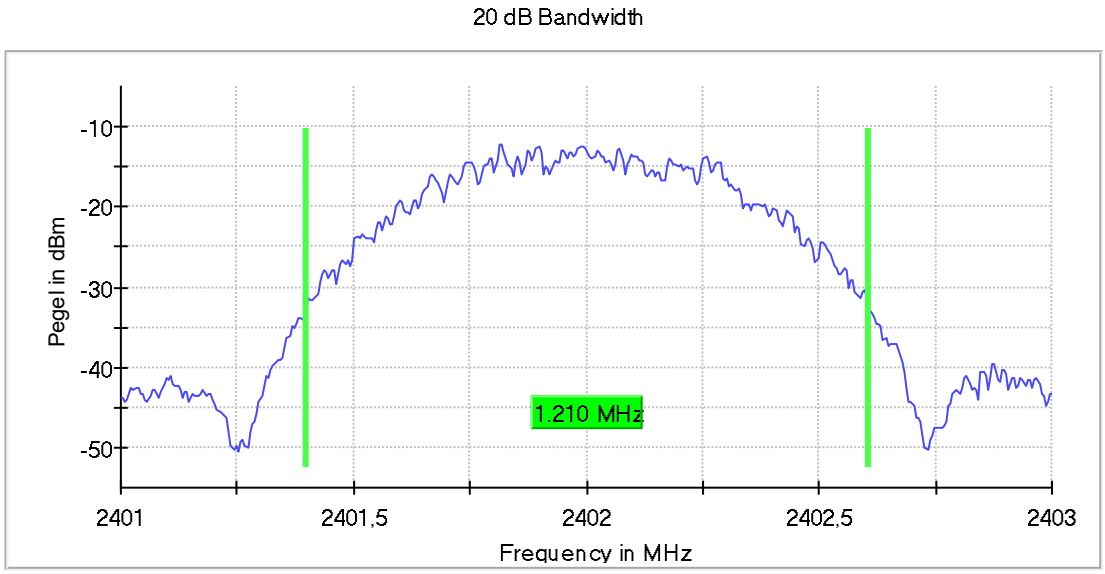
Ambient Temperature	22.0 °C
Relative Humidity	35.0 %

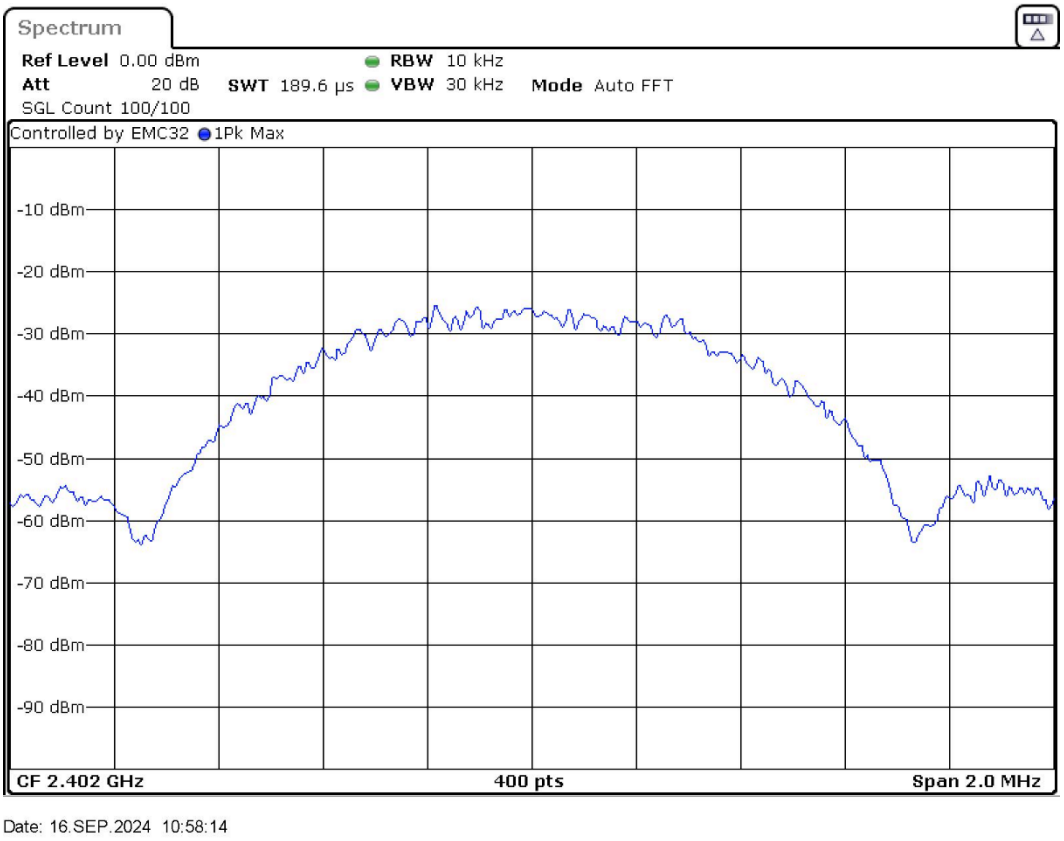
3.4.6 Test Results

Frequency (MHz)	20 dB Bandwidth (MHz)	6 dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Limit
2402	1.210	0.712	1.050	≥ 500 kHz
2440	1.220	0.732	1.055	≥ 500 kHz
2480	1.215	0.712	1.060	≥ 500 kHz

Product Service

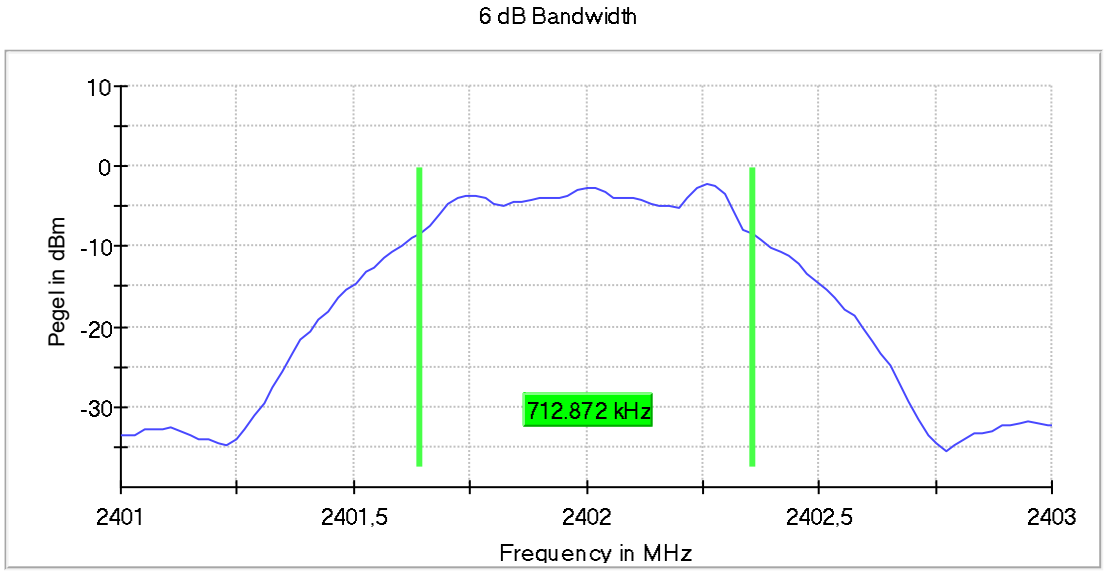
Transmission on 2402 MHz

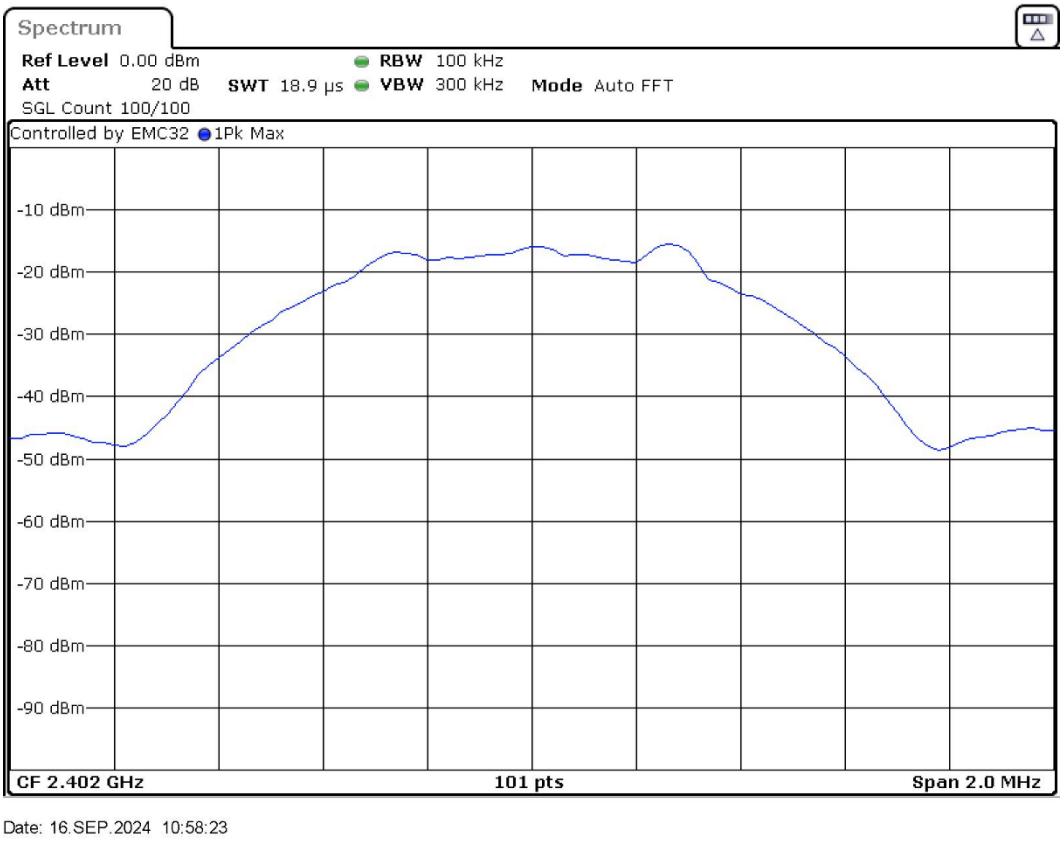




20dB-BW, 2402 MHz,

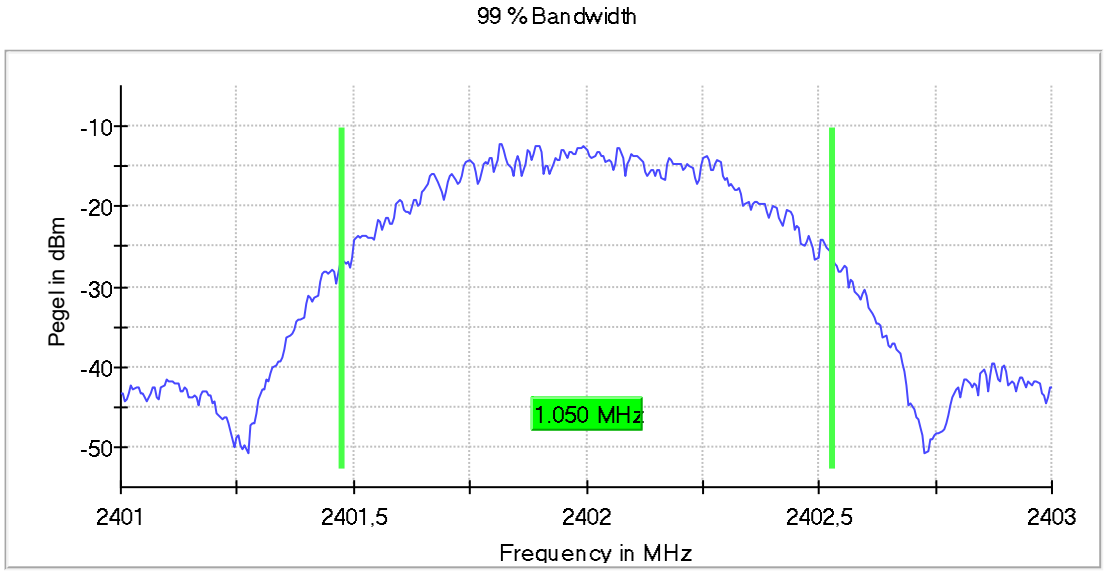
Product Service

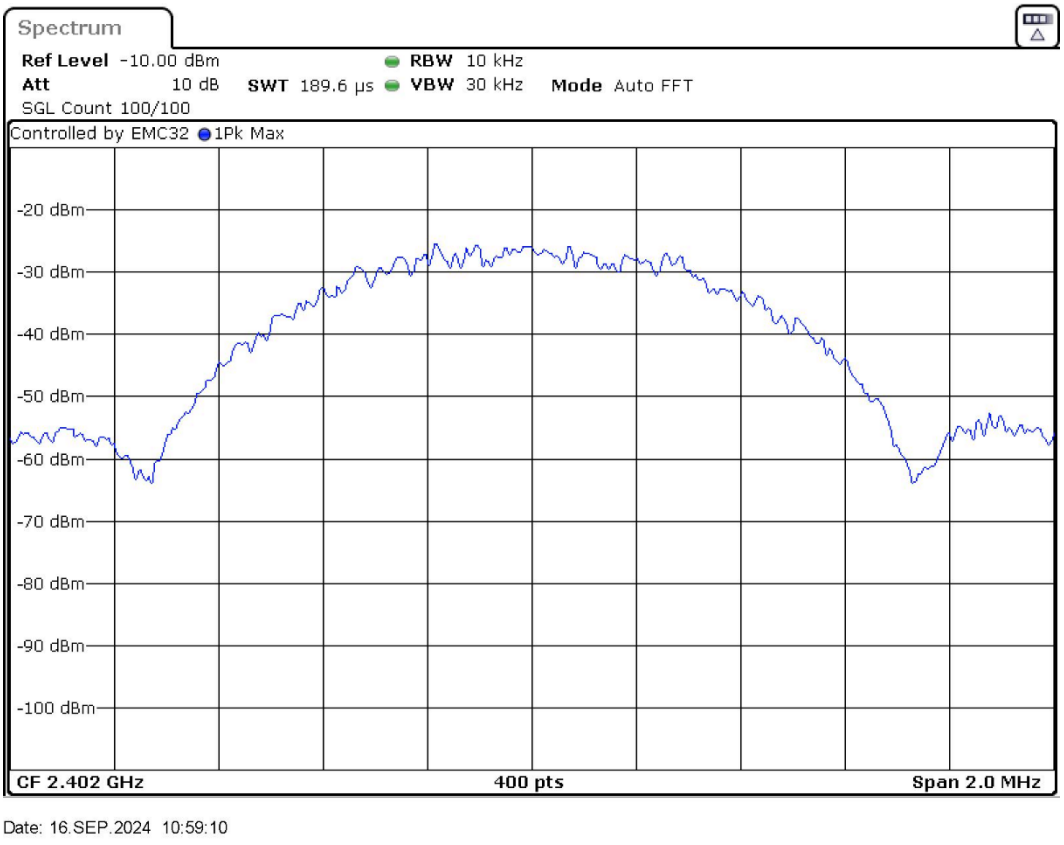




6dB-BW, 2402 MHz

Product Service

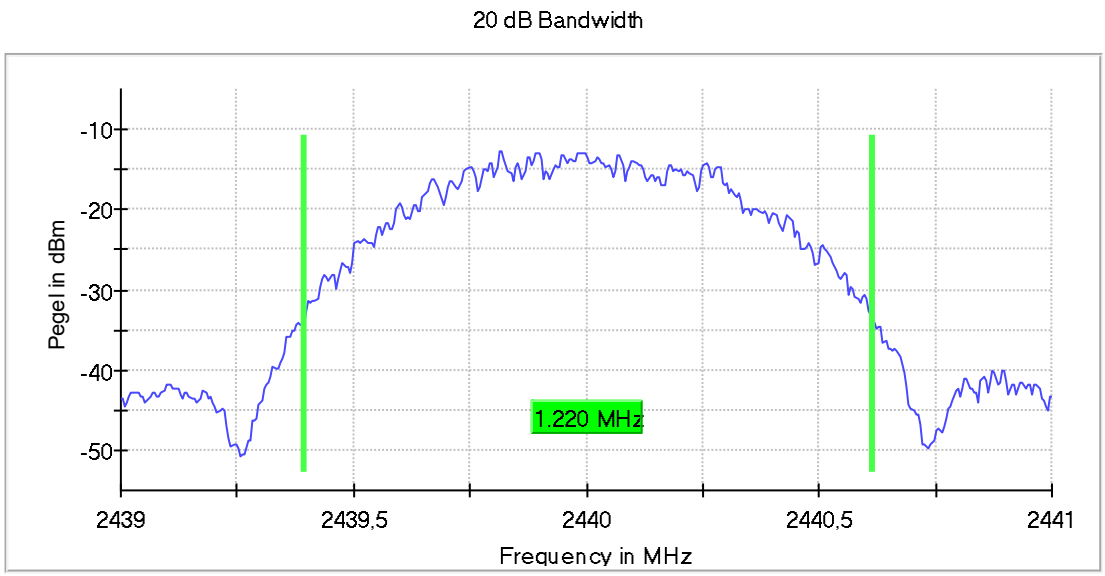


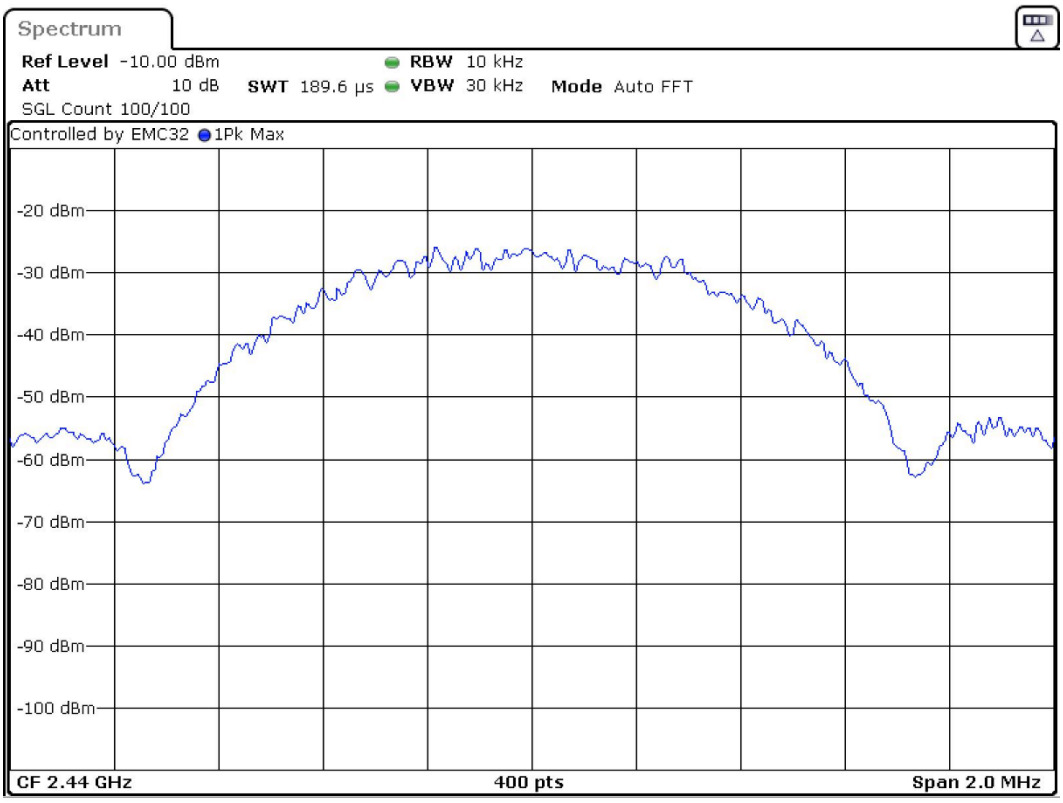


99%-BW, 2402 MHz

Product Service

Transmission on 2440 MHz

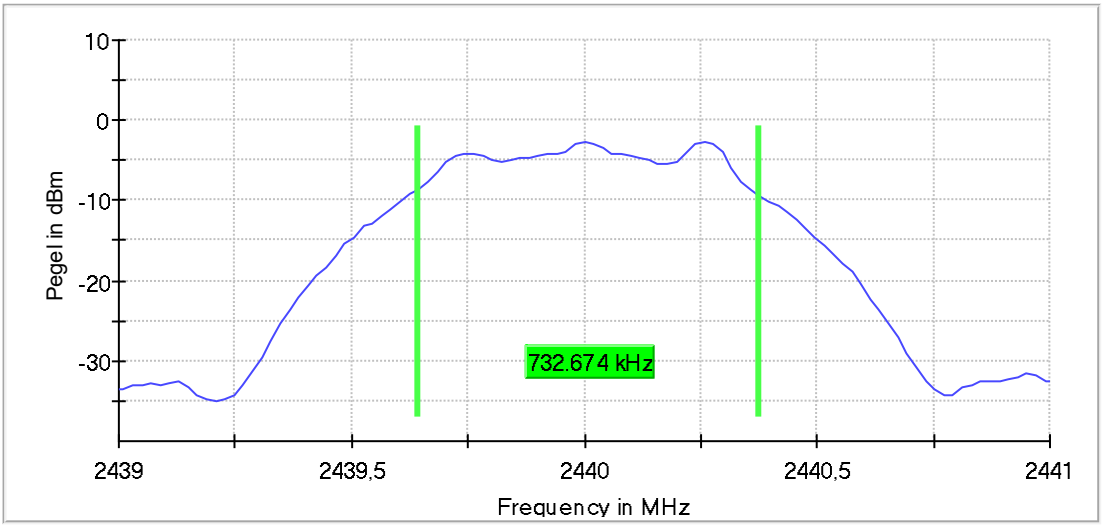




20dB-BW, 2440 MHz

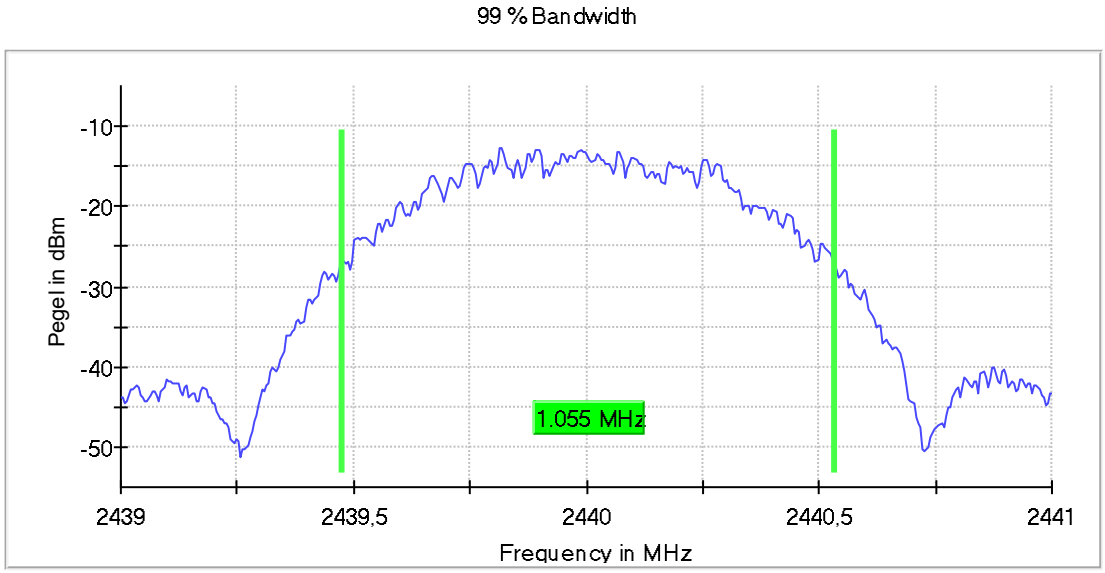
Product Service

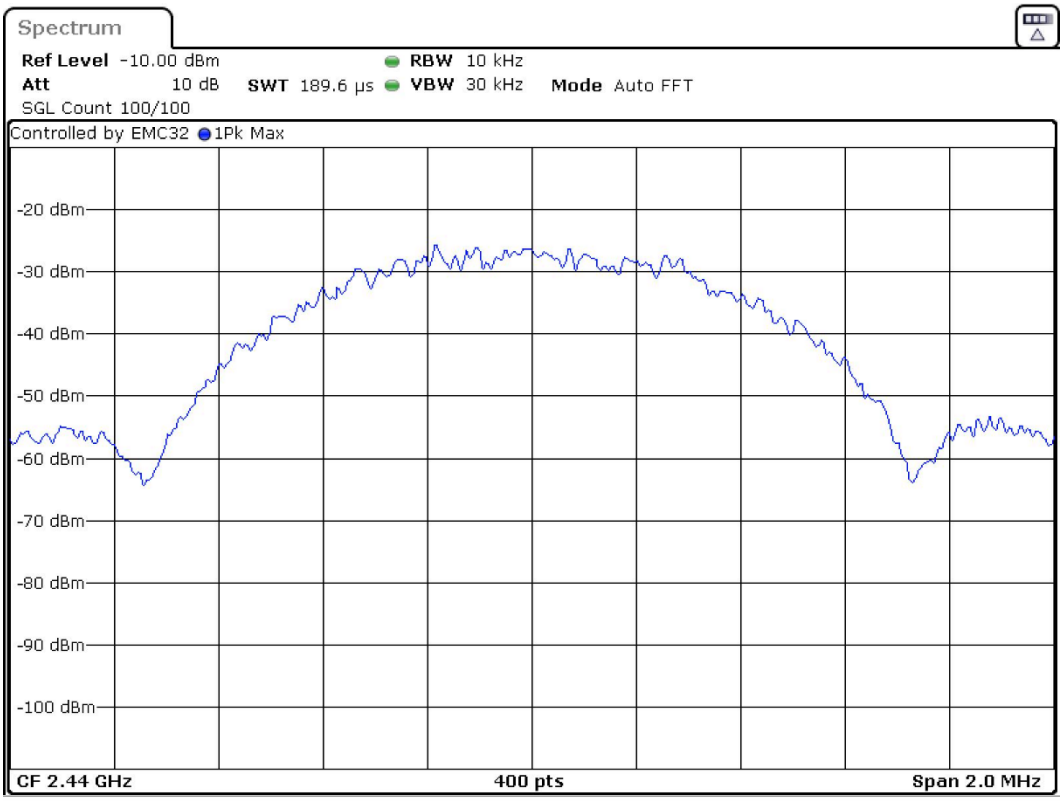
6 dB Bandwidth



6dB-BW, 2440 MHz

Product Service

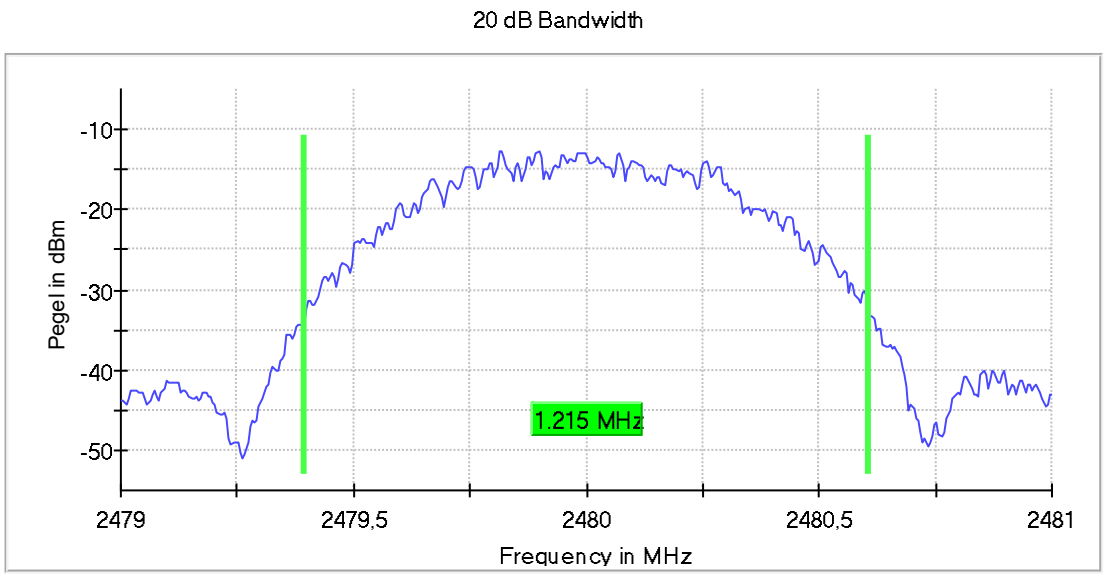


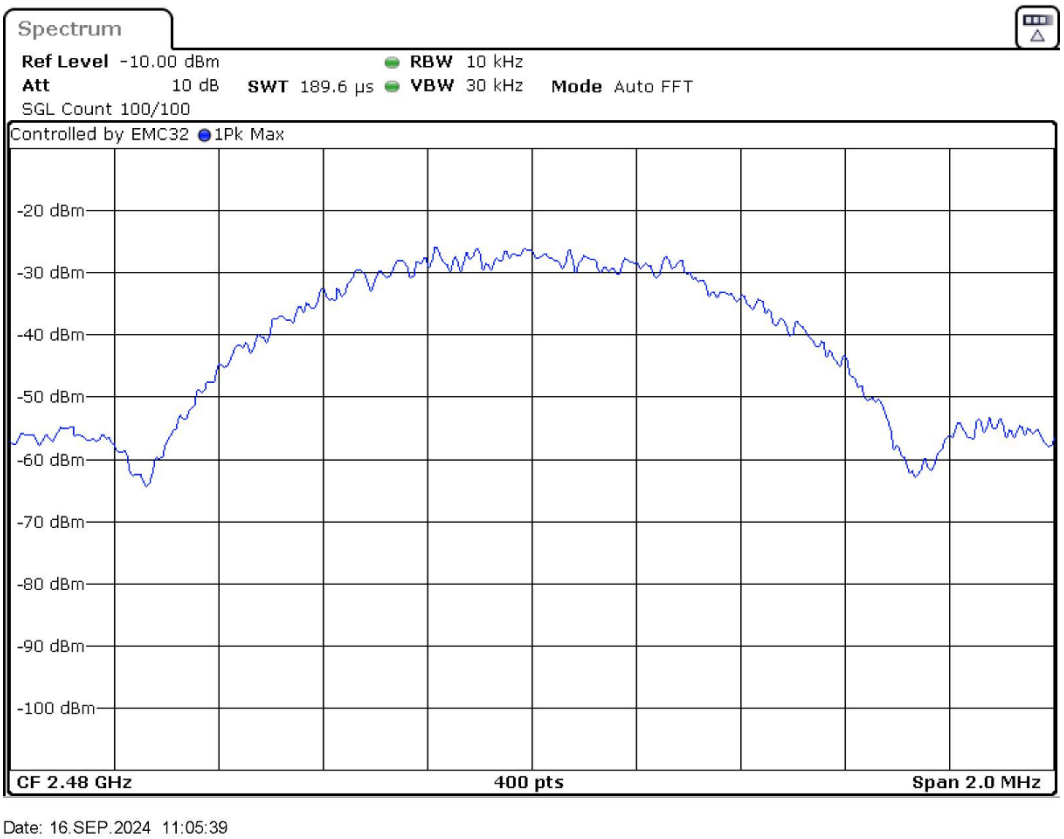


99%-BW, 2440 MHz

Product Service

Transmission on 2480 MHz

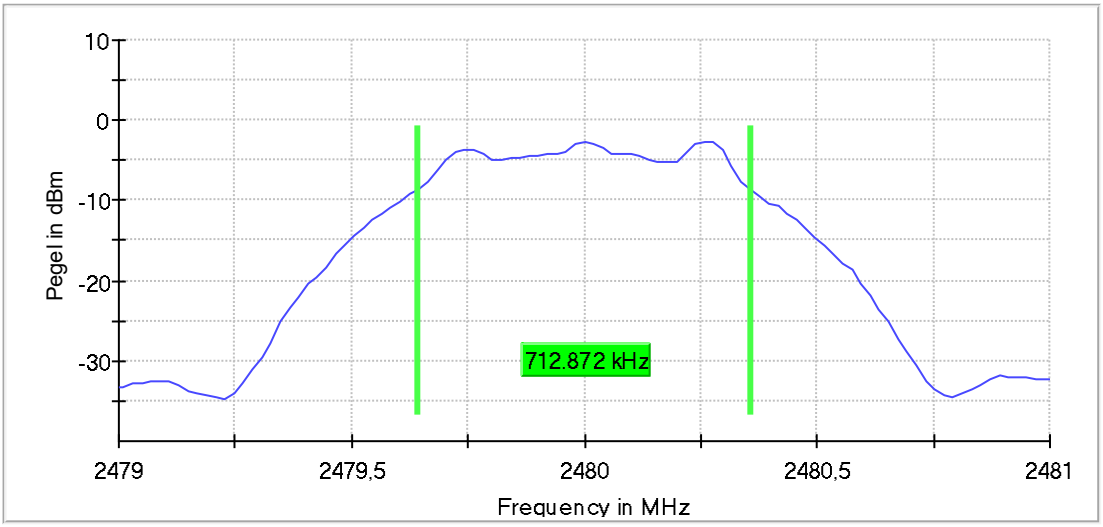




20dB-BW, 2480 MHz

Product Service

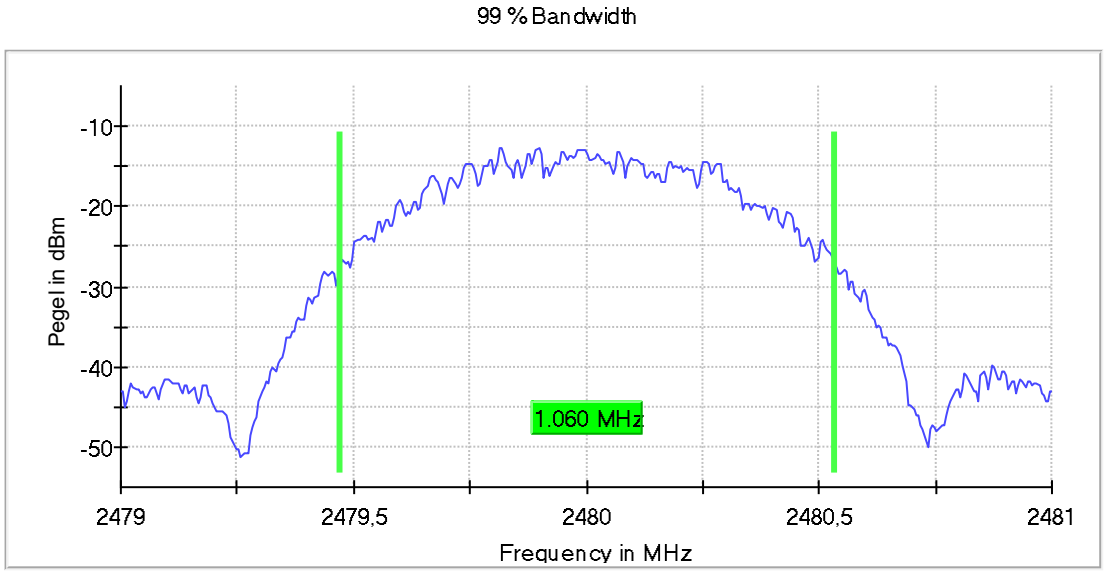
6 dB Bandwidth

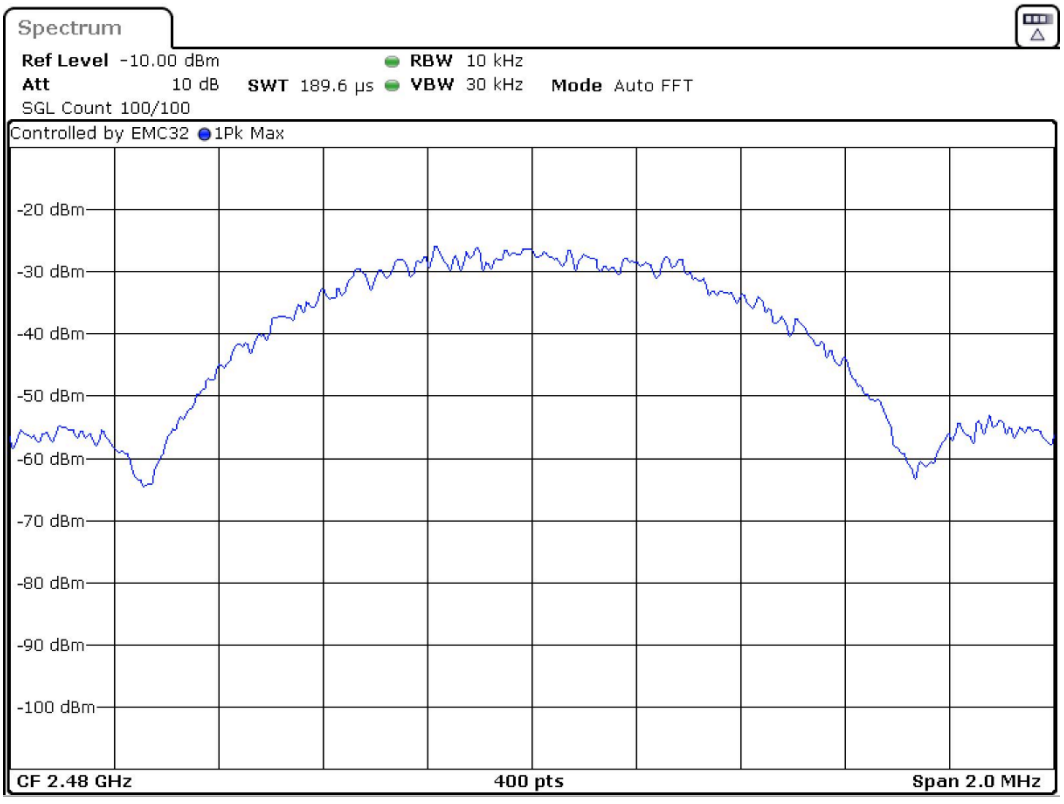


Date: 16.SEP.2024 11:05:50

6dB-BW, 2480 MHz

Product Service





99%-BW, 2480 MHz

Product Service

FCC 47 CFR Part 15, Limit Clause 15.247(a)(2) and ISED Canada RSS-247, Clause 5.2(a)

The minimum 6 dB Bandwidth shall be at least 500 kHz.

3.4.7 Test Location and Test Equipment Used

Conducted test was carried out in Non-shielded room with Test system TS8997.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Spectrum and signal analyser	Rohde & Schwarz	FSV40	20219	24	2026-03-31
Switching Device	Rohde & Schwarz	OSP120 I	20248	24	2026-07-31
Switching Device	Rohde & Schwarz	OSP120 II	38807	36	2026-08-31
EMC Measurement Software	Rohde & Schwarz	EMC32 TS8997 - V10.50.00	44381	---	---

Table 11

TU - Traceability Unscheduled
O/P Mon – Output Monitored using calibrated equipment
N/A - Not Applicable

Product Service

3.5 Power Spectral Density

3.5.1 Specification Reference

FCC 47 CFR Part 15C, ISED Canada RSS-247 and ISED Canada RSS-GEN

3.5.2 Equipment Under Test and Modification State

Magic InBra / 101046806 (Conducted Sample), S/N: DVT-2-003 - Modification State 0

3.5.3 Date of Test

2024-09-16

3.5.4 Test Method

This test was performed in accordance with ANSI C63.10, clause 11.10.2.

3.5.5 Environmental Conditions

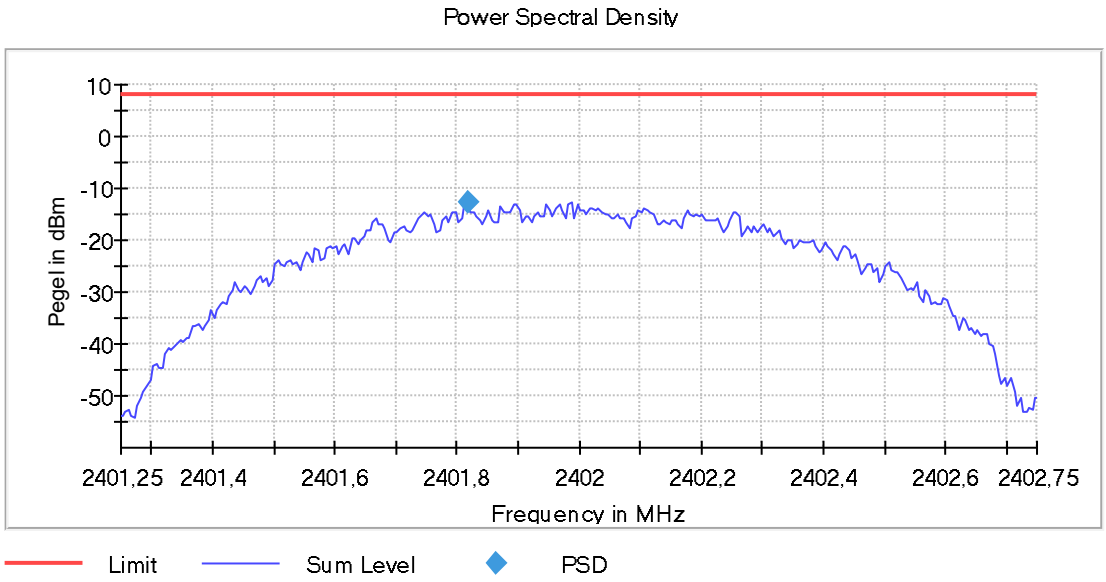
Ambient Temperature	22.0 °C
Relative Humidity	35.0 %

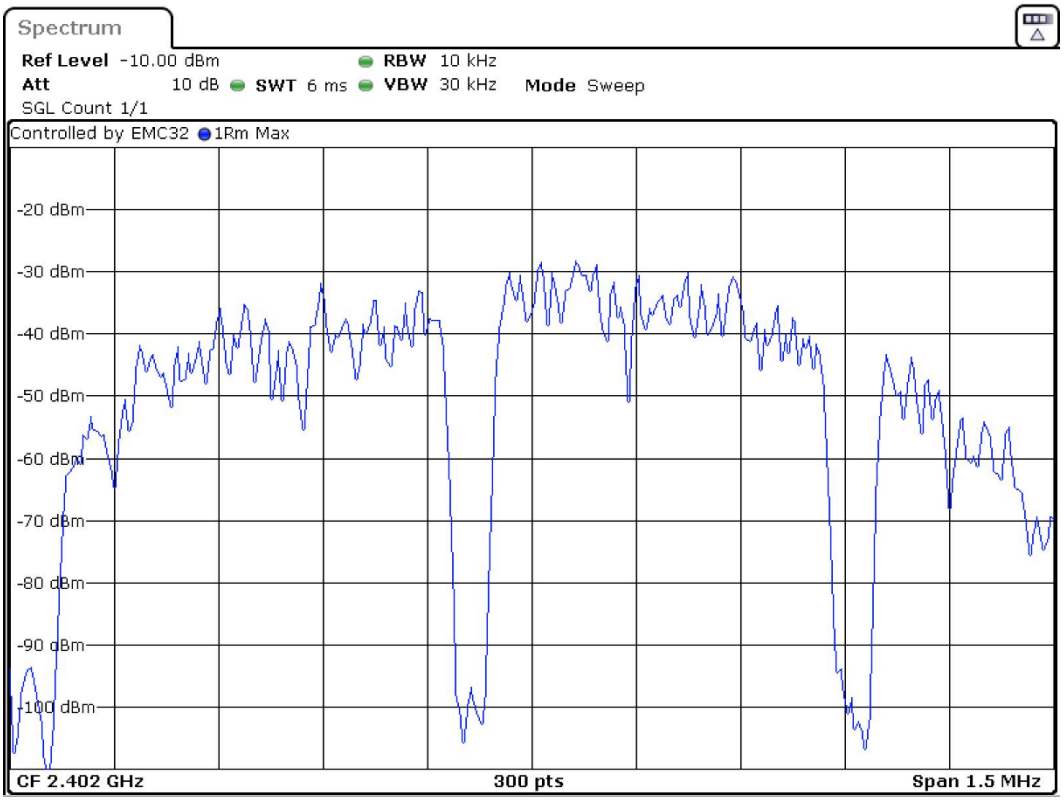
3.5.6 Test Results

Frequency (MHz)	PSD (dBm)	Limit (dBm)
2402	-12.53	8.0
2440	-13.18	8.0
2480	-12.99	8.0

Product Service

Transmission on 2402 MHz



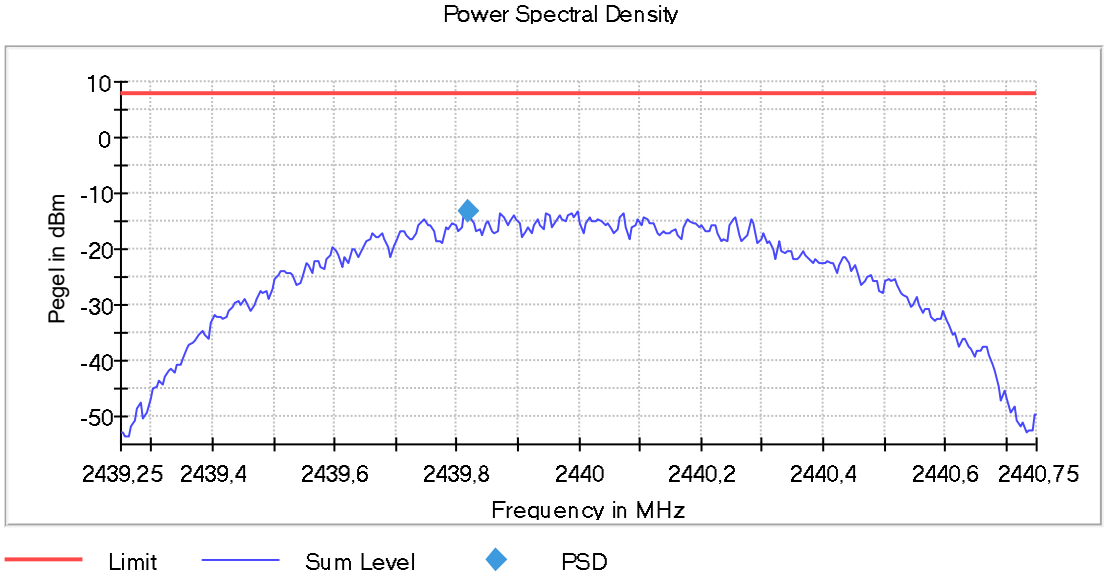


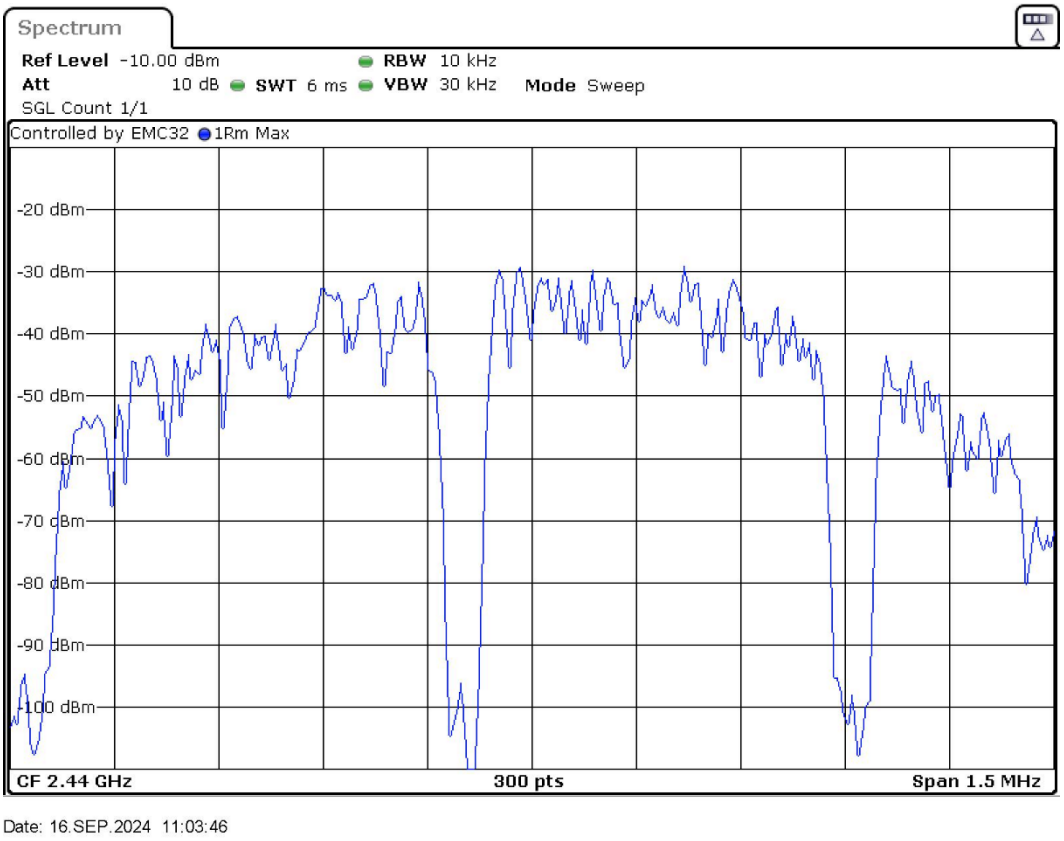
Date: 16.SEP.2024 10:58:59

Note: This plot is a raw plot from the Test system and the final plot exist of 42 plots.

Product Service

Transmission on 2440 MHz



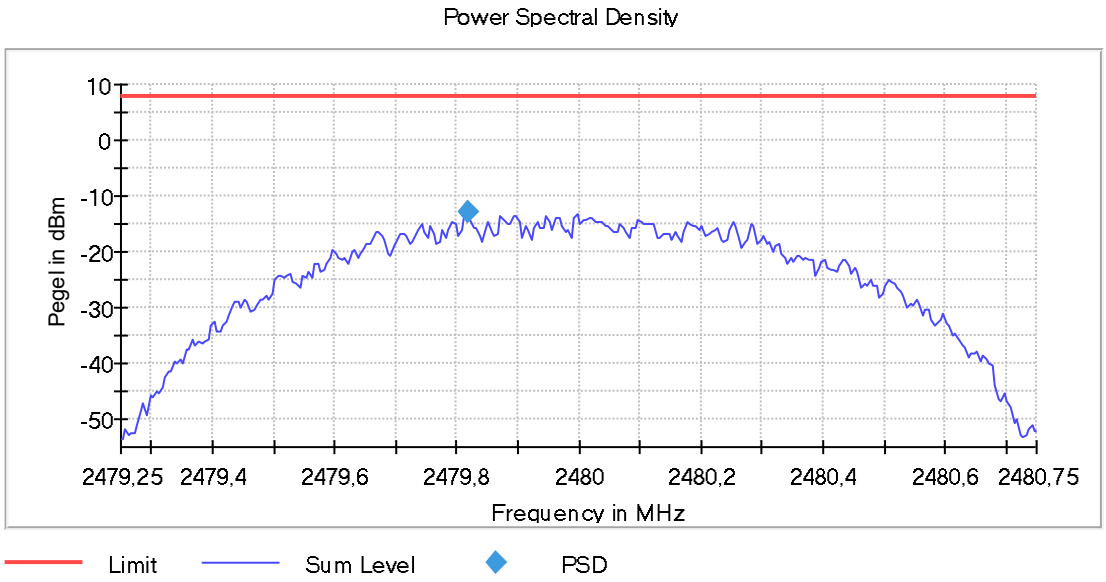


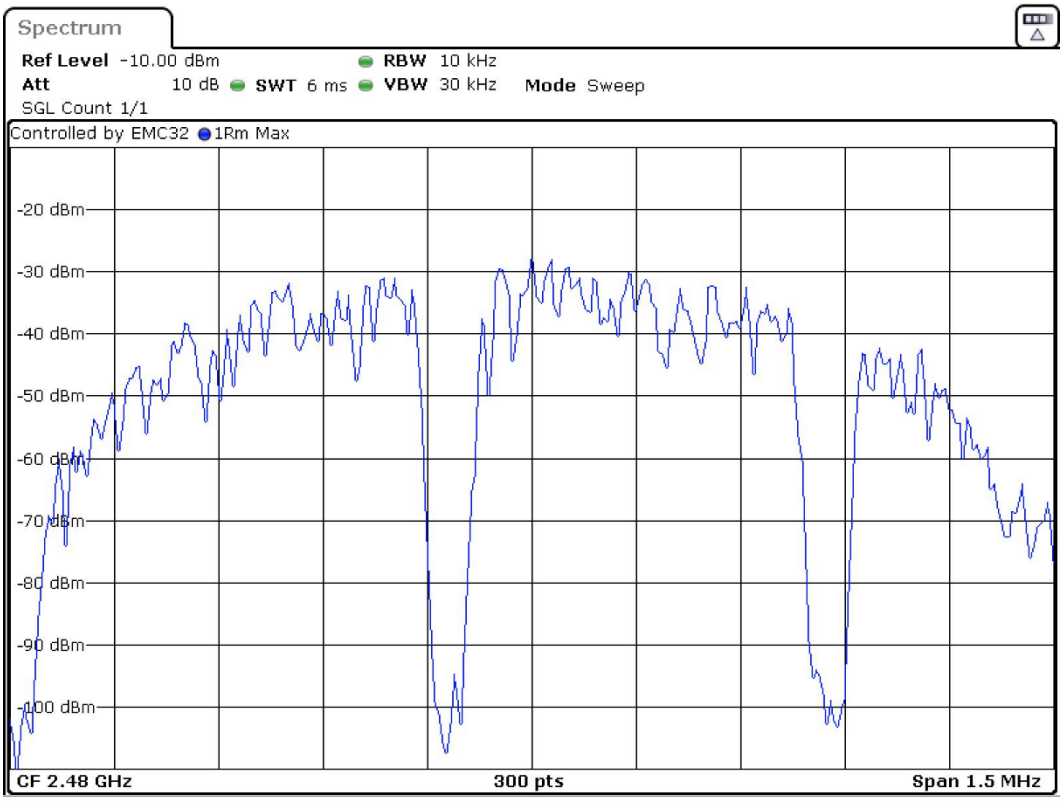
Date: 16.SEP.2024 11:03:46

Note: This plot is a raw plot from the Test system and the final plot exist of 47 plots.

Product Service

Transmission on 2480 MHz





Date: 16.SEP.2024 11:06:25

Note: This plot is a raw plot from the Test system and the final plot exist of 40 plots.

Product Service

FCC 47 CFR Part 15, Limit Clause 15.247 (e)

The power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

3.5.7 Test Location and Test Equipment Used

Conducted test was carried out in Non-shielded room with Test system TS8997.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Spectrum and signal analyser	Rohde & Schwarz	FSV40	20219	24	2026-03-31
Switching Device	Rohde & Schwarz	OSP120 I	20248	24	2026-07-31
Switching Device	Rohde & Schwarz	OSP120 II	38807	36	2026-08-31
EMC Measurement Software	Rohde & Schwarz	EMC32 TS8997 - V10.50.00	44381	---	---

Table 12

TU - Traceability Unscheduled
O/P Mon – Output Monitored using calibrated equipment
N/A - Not Applicable

Product Service

3.6 Maximum Conducted Output Power

3.6.1 Specification Reference

FCC 47 CFR Part 15C, ISED Canada RSS-210 and ISED Canada RSS-GEN

3.6.2 Equipment Under Test and Modification State

Magic InBra / 101046806 (Conducted Sample), S/N: DVT-2-003 - Modification State 0

3.6.3 Date of Test

2024-09-16

3.6.4 Test Method

This test was performed in accordance with ANSI C63.10, clause 11.9.1.1.

3.6.5 Environmental Conditions

Ambient Temperature	22.0 °C
Relative Humidity	35.0 %

Product Service

3.6.6 Test Results

Frequency (MHz)	Conducted Power (dBm)	Antenna Gain (dBi)	Peak Power EIRP (dBm)	Limit Max (dBm)
2402	-2.40	2.91	0.51	30
2440	-1.21	1.52	0.31	30
2480	-1.31	1.67	0.36	30

FCC 47 CFR Part 15, Limit Clause 15.247 (b)(3)

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt.

Product Service

3.6.7 Test Location and Test Equipment Used

Conducted test was carried out in Non-shielded room with Test system TS8997.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Switching Device	Rohde & Schwarz	OSP120 I	20248	24	2026-07-31
Switching Device	Rohde & Schwarz	OSP120 II	38807	36	2026-08-31
EMC Measurement Software	Rohde & Schwarz	EMC32 TS8997 - V10.50.00	44381	---	---

Table 13

TU - Traceability Unscheduled
O/P Mon – Output Monitored using calibrated equipment
N/A - Not Applicable

Product Service

3.7 Transmitter frequency stability

3.7.1 Specification Reference

RSS-Gen

3.7.2 Equipment Under Test and Modification State

Magic InBra / 101046806 (Conducted Sample), S/N: DVT-2-003 - Modification State 0

3.7.3 Date of Test

2024-09-16

3.7.4 Test Method

RSS-Gen, Issue 5, March 2019, chapter 6.11

3.7.5 Environmental Conditions

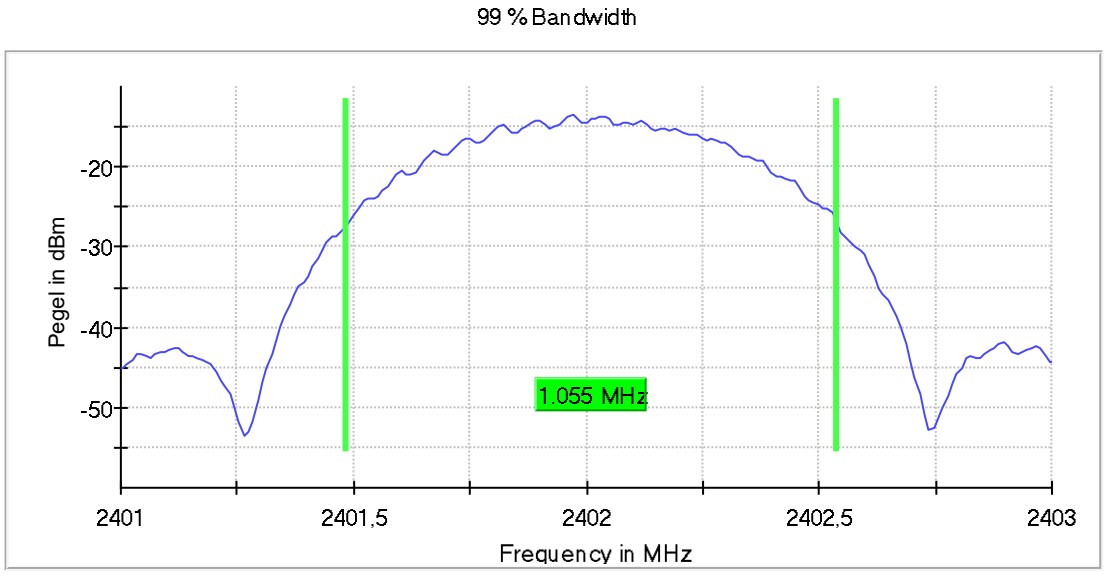
Ambient Temperature	22.0 °C
Relative Humidity	35.0 %

Product Service

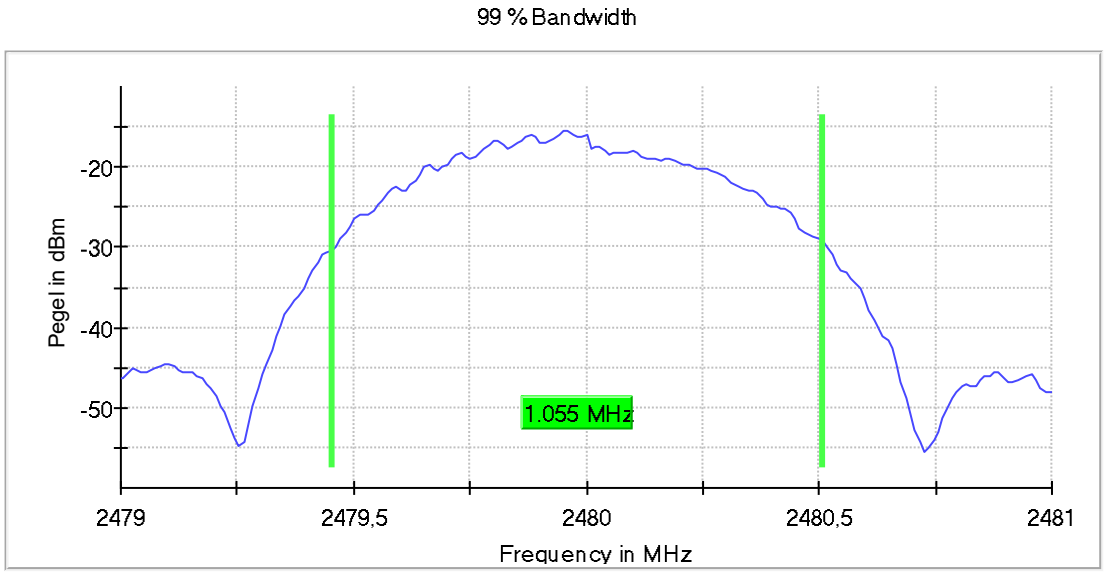
3.7.6 Test Results

Note: - Measured Frequency Error does not affect any band edge requirements.
- Measurement was performed with modulated transmitter signal

Sample screenshots:



Transmission on 2402 MHz; -20°C



Transmission on 2480 MHz; + 50°C

3.7.7 Test Location and Test Equipment Used

Product Service

Conducted test was carried out in Non-shielded room with Test system TS8997.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Spectrum and signal analyser	Rohde & Schwarz	FSV40	20219	24	2026-03-31
Switching Device	Rohde & Schwarz	OSP120 I	20248	24	2026-07-31
Switching Device	Rohde & Schwarz	OSP120 II	38807	36	2026-08-31
EMC Measurement Software	Rohde & Schwarz	EMC32 TS8997 - V10.50.00	44381	---	---
Climatic test chamber	Espec	PL-4J	38958	18	2025-01-31

Table 14

TU - Traceability Unscheduled
O/P Mon – Output Monitored using calibrated equipment
N/A - Not Applicable

Product Service

3.8 Antenna requirement

3.8.1 Specification Reference

FCC 47 CFR Part 15 C, Clauses 15.203
ISED RSS-Gen, Clauses 6.8

3.8.2 Equipment under Test and Modification State

Magic InBra / 101046806, S/N: DVT-2-066 - Modification State 0
Magic InBra / 101046806 (Conducted Sample), S/N: DVT-2-003 - Modification State 0

3.8.3 Date of Test

2024-09-05 - 2024-09-27

3.8.4 Environmental Conditions

Ambient Temperature	23 °C
Relative Humidity	32 %

3.8.5 Specification Limits

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 use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §§ 15.211, 15.213, 15.217, 15.219, 15.221, or § 15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

Product Service

3.8.6 Test Results

Frequency (MHz)	P_{Out} Radiated (dBm)	P_{Out} Conducted (dBm)	Antenna Gain (dBi)
2402	0.51	-2.40	2.91
2440	0.31	-1.21	1.52
2480	0.36	-1.31	1.67

Note: The antenna gain was calculated from the difference between the radiated measurement and the conducted measurement

P_{Out} Radiated – P_{Out} Conducted = Antenna Gain

Product Service

3.8.7 Test Location and Test Equipment

Radiated Tests were carried out in cabin No.8 and conducted tests were carried out with test system TS8997.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Double ridged horn antenna	Rohde & Schwarz	HF907	19933	24	2025-09-30
Semi Anechoic Room	Albatross	Cabin No. 8	19917	36	2025-07-31
Switching Device	Rohde & Schwarz	OSP120 I	20248	24	2026-07-31
Switching Device	Rohde & Schwarz	OSP120 II	38807	36	2026-08-31
EMC Measurement Software	Rohde & Schwarz	EMC32 TS8997 - V10.50.00	44381	---	---

Table 15

TU - Traceability Unscheduled
O/P Mon – Output Monitored using calibrated equipment
N/A - Not Applicable

Product Service

4 Measurement Uncertainty

The measurement uncertainty in the laboratory is less than or equal to the maximum measurement uncertainty according to EN 55016-4-2: 2011 + A1 + A2 + AC and CISPR16-4-2: 2011 + A1 + A2 + Cor1 (UCISPR). This normative regulation means that the measured value is also the value to be assessed in relation to the limit value.

For a 95% confidence level, the measurement uncertainties for defined systems are:

Radio Testing			
Test Name	kp	Expanded Uncertainty	Note
Occupied Bandwidth	2.0	±1.14 %	2
RF-Frequency error	1.96	±1 · 10-7	7
RF-Power, conducted carrier	2	±0.079 dB	2
RF-Power uncertainty for given BER	1.96	+0.94 dB / -1.05	7
RF power, conducted, spurious emissions	1.96	+1.4 dB / -1.6 dB	7
RF power, radiated			
25 MHz – 4 GHz	1.96	+3.6 dB / -5.2 dB	8
1 GHz – 18 GHz	1.96	+3.8 dB / -5.6 dB	8
18 GHz – 26.5 GHz	1.96	+3.4 dB / -4.5 dB	8
40 GHz – 170 GHz	1.96	+4.2 dB / -7.1 dB	8
Spectral Power Density, conducted	2.0	±0.53 dB	2
Maximum frequency deviation			
300 Hz – 6 kHz	2	±2,89 %	2
6 kHz – 25 kHz	2	±0.2 dB	2
Maximum frequency deviation for FM	2	±2,89 %	2
Adjacent channel power 25 MHz – 1 GHz	2	±2.31 %	2
Temperature	2	±0.39 K	4
(Relative) Humidity	2	±2.28 %	2
DC- and low frequency AC voltage			
DC voltage	2	±0.01 %	2
AC voltage up to 1 kHz	2	±1.2 %	2
Time	2	±0.6 %	2

Table 16

Product Service

Radio Interference Emission Testing			
Test Name	kp	Expanded Uncertainty	Note
Conducted Voltage Emission			
9 kHz to 150 kHz (50Ω/50µH AMN)	2	± 3.8 dB	1
150 kHz to 30 MHz (50Ω/50µH AMN)	2	± 3.4 dB	1
100 kHz to 200 MHz (50Ω/5µH AMN)	2	± 3.6 dB	1
Discontinuous Conducted Emission			
9 kHz to 150 kHz (50Ω/50µH AMN)	2	± 3.8 dB	1
150 kHz to 30 MHz (50Ω/50µH AMN)	2	± 3.4 dB	1
Conducted Current Emission			
9 kHz to 200 MHz	2	± 3.5 dB	1
Magnetic Fieldstrength			
9 kHz to 30 MHz (with loop antenna)	2	± 3.9 dB	1
9 kHz to 30 MHz (large-loop antenna 2 m)	2	± 3.5 dB	1
Radiated Emission			
Test distance 1 m (ALSE)			
9 kHz to 150 kHz	2	± 4.6 dB	1
150 kHz to 30 MHz	2	± 4.1 dB	1
30 MHz to 200 MHz	2	± 5.2 dB	1
200 MHz to 2 GHz	2	± 4.4 dB	1
2 GHz to 3 GHz	2	± 4.6 dB	1
Test distance 3 m			
30 MHz to 300 MHz	2	± 4.9 dB	1
300 MHz to 1 GHz	2	± 5.0 dB	1
1 GHz to 6 GHz	2	± 4.6 dB	1
Test distance 10 m			
30 MHz to 300 MHz	2	± 4.9 dB	1
300 MHz to 1 GHz	2	± 4.9 dB	1
Radio Interference Power			
30 MHz to 300 MHz	2	± 3.5 dB	1
Harmonic Current Emissions			4
Voltage Changes, Voltage Fluctuations and Flicker			4

Table 17

Product Service

Immunity Testing			
Test Name	kp	Expanded Uncertainty	Note
Electrostatic Discharges			4
Radiated RF-Field			
Pre-calibrated field level	2	+32.2 / -24.3 %	5
Dynamic feedback field level	2.05	+21.2 / -17.5 %	3
Electrical Fast Transients (EFT) / Bursts			4
Surges			4
Conducted Disturbances, induced by RF-Fields			
via CDN	2	+15.1 / -13.1 %	6
via EM clamp	2	+42.6 / -29.9 %	6
via current clamp	2	+43.9 / -30.5 %	6
Power Frequency Magnetic Field	2	+20.7 / -17.1 %	2
Pulse Magnetic Field			4
Voltage Dips, Short Interruptions and Voltage Variations			4
Oscillatory Waves		a	4
Conducted Low Frequency Disturbances			
Voltage setting	2	± 0.9 %	2
Frequency setting	2	± 0.1 %	2
Electrical Transient Transmission in Road Vehicles			4

Table 18

Note 1:
The expanded uncertainty reported according to CISPR 16-4-2:2003-11 is based on a standard uncertainty multiplied by a coverage factor of kp = 2, providing a level of confidence of p = 95.45%
Note 2:
The expanded uncertainty reported according to UKAS Lab 34 (Edition 1, 2002-08) is based on a standard uncertainty multiplied by a coverage factor of kp = 2, providing a level of confidence of p = 95.45%
Note 3:
The expanded uncertainty reported according to UKAS Lab 34 (Edition 1, 2002-08) is based on a standard uncertainty multiplied by a coverage factor of kp = 2.05, providing a level of confidence of p = 95.45%
Note 4:
It has been demonstrated that the used test equipment meets the specified requirements in the standard with at least a 95%confidence.
Note 5:
The expanded uncertainty reported according to IEC 61000-4-3 is based on a standard uncertainty multiplied by a coverage factor of kp = 2, providing a level of confidence of p = 95.45%
Note 6:
The expanded uncertainty reported according to IEC 61000-4-6 is based on a standard uncertainty multiplied by a coverage factor of kp = 2, providing a level of confidence of p = 95.45%
Note 7:
The expanded uncertainty reported according ETSI TR 100 028 V1.4.1 (all parts) to is based on a standard uncertainty multiplied by a coverage factor of kp = 1.96, providing a level of confidence of p = 95.45%

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Note 8:
The expanded uncertainty reported according to ETSI TR 102 273 V1.2.1 (all parts) is based on a standard uncertainty multiplied by a coverage factor of kp = 1.96, providing a level of confidence of p = 95.45%