R F – T E S T R E P O R T

- FCC Part 15.247, RSS-247 -

Type / Model Name : ZLX-12P-G2-US

Product Description : Powered speaker

Applicant : Bosch Security Systems, LLC

Address : 130 Perinton Parkway

Fairport; NY 14450, USA

Manufacturer : Bosch Security Systems, LLC

Address : 130 Perinton Parkway

Fairport; NY 14450, USA

Test Result according to the standards listed in clause 1 test standards:	**POSITIVE**

Test Report No. : 80168519-10 Rev_0	01. December 2023 Date of issue

Deutsche Akkreditierungsstelle
D-PL-12030-01-03
D-PL-12030-01-04

FCC-ID: ESV-ZLXG2 **IC-ID:** 1249A-ZLXG2

Contents

FCC-ID: ESV-ZLXG2 **IC-ID:** 1249A-ZLXG2

1 TEST STANDARDS

The tests were performed according to following standards:

FCC Rules and Regulations Part 15, Subpart A - General (September 2023)

Part 15, Subpart A, Section 15.31	Measurement standards
Part 15, Subpart A, Section 15.33	Frequency range of radiated measurements
Part 15, Subpart A, Section 15.35	Measurement detector functions and bandwidths

FCC Rules and Regulations Part 15, Subpart C - Intentional Radiators (September 2023)

Part 15, Subpart C, Section 15.203	Antenna requirement
Part 15, Subpart C, Section 15.204	External radio frequency power amplifiers and antenna modifications
Part 15, Subpart C, Section 15.205	Restricted bands of operation
Part 15, Subpart C, Section 15.207	Conducted limits
Part 15, Subpart C, Section 15.209	Radiated emission limits, general requirements
Part 15, Subpart C, Section 15.247	Operation within the bands 902 - 928 MHz, 2400 - 2483.5 MHz and 5725 - 5850 MHz
ANSI C63.10: 2013	Testing Unlicensed Wireless Devices
KDB 558074 D01 v05r02	Guidance for compliance measurements on DTS; FHSS and hybrid system devices operating under Section 15.247 of the FCC rules, April 2, 2019.

ISED Canada Rules and Regulations (September 2023)

RSS-Gen, Issue 5 + Amendment 1 + 2	General Requirements for Compliance of Radio Apparatus
RSS-247, Issue 3	Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices
ANSI C63.10: 2013	Testing Unlicensed Wireless Devices

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2 EQUIPMENT UNDER TEST

2.1 Information provided by the Client

Please note, we do not take any responsibility for information provided by the client or his representative which may have an influence on the validity of the test results.

2.2 Sampling

The customer is responsible for the choice of sample. Sample configuration, start-up and operation is carried out by the customer or according his/her instructions.

2.3 General Remarks

2.4 Photo documentation

Detailed photos of EUT see ATTACHMENT G.
Detailed photos of Test Setup see ATTACHMENT I.

2.5 Equipment type

Bluetooth device

2.6 Short description of the equipment under test (EUT)

The EUT is a powered speaker that outputs the amplified feeded audio signal on the built in loudspeaker.
The speaker can be operated on a pole or standing on the ground.

Number of tested samples:	1
Serial number:	095584437809000004
Firmware version:	Host: V.1.0.0 BT:V1.0.1

2.7 Variants of the EUT

ZLX G2: ZLX-12P-G2, ZLX-12P-G2-EU, ZLX-12P-G2-US.

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2.8 Operation frequency and channel plan

The operating frequency is 2400 MHz to 2483.5 MHz.

Channel plan:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	27	2429	54	2456
1	2403	28	2430	55	2457
2	2404	29	2431	56	2458
3	2405	30	2432	57	2459
4	2406	31	2433	58	2460
5	2407	32	2434	59	2461
6	2408	33	2435	60	2462
7	2409	34	2436	61	2463
8	2410	35	2437	62	2464
9	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
14	2416	41	2443	68	2470
15	2417	42	2444	69	2471
16	2418	43	2445	70	2472
17	2419	44	2446	71	2473
18	2420	45	2447	72	2474
19	2421	46	2448	73	2475
20	2422	47	2449	74	2476
21	2423	48	2450	75	2477
22	2424	49	2451	76	2478
23	2425	50	2452	77	2479
24	2426	51	2453	78	2480
25	2427	52	2454		
26	2428	53	2455		

2.9 Transmit operating modes

The EUT allows the user to select the following modes:
- TX modulated
- RX

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2.10 Antenna

The EUT has only an internal antenna, no temporary connector and no external antenna to be connected.

Type	Model	Frequency Range	Gain
Internal FPC antenna	PulseLARSEN W3921	2400-2500 MHz	+1 dBi

2.11 Power supply system utilised

Power supply voltage, V_{nom} : 120 V, 60 Hz

2.12 Peripheral devices and interface cables

The following peripheral devices and interface cables are connected during the measurements:

- UART Cable: to interface the BT-Module Model : _____
- Laptop: to set BT-Module in test modes Model : _____
- _____ Model : _____

2.1 Determination of worst case conditions for final measurement

Preliminary tests are performed in all three orthogonal axes of the EUT to locate at which position and at what setting of the EUT produce the maximum of the emissions.

For the final test the following channels and test modes are selected:

BT	Available channel	Tested channels	Modulation type	Packet Type	Data rate
802.15.1	0 to 78	0, 38, 78	GFSK	DH5	1 Mbps
802.15.1	0 to 78	0, 38, 78	π/4-DQPSK	2-DH5	2 Mbps
802.15.1	0 to 78	0, 38, 78	8-DPSK	3-DH5	3 Mbps

2.2 Test jig

No test jig is used.

2.3 Test software

The special test software Qualcomm “BlueTest 3”

FCC-ID: ESV-ZLXG2 **IC-ID:** 1249A-ZLXG2

3 TEST RESULT SUMMARY

FCC Rule Part	RSS Rule Part	Description	Result
15.207(a)	RSS-Gen, 8.8	AC power line conducted emissions	passed
15.247(a)(1)	RSS-247, 5.1(a)	20 dB EBW	Not tested*
15.247(a)(1)	RSS-247, 5.1(b)	Channel separation	Not tested*
15.247(a)(1)	RSS-247, 5.1(d)	Dwell time	Not tested*
15.247(b)(1)	RSS-247, 5.4(b)	Peak power	Not tested*
15.247(d)	RSS-247, 5.5	Spurious emissions	passed
15.247(d)	RSS-247, 5.5	Out-of-band emission, radiated	passed
15.247(d)	RSS-Gen, 8.10	Emissions in restricted bands	passed
15.247(e)	RSS-247, 5.1(d)	Hopping sequence	Not tested*
15.247(a)	RSS-247, 5.1(a)	Receiver input bandwidth	Not tested*
15.247(a)	RSS-247, 5.4(b)	Number of hopping channels	Not tested*
15.247(a)	-	Equal hopping frequency use	Not tested*
15.35(c)	RSS-Gen, 6.10	Pulsed operation	Not tested*
15.203	RSS-247, 5.4(b)	Antenna requirement	Not tested*

The mentioned RSS Rule Parts in the above table are related to:
RSS-Gen, Issue 5 + Amendment 1 + Amendment 2, March 2019
RSS-247, Issue 2, February 2017

*Not tested parts are separately tested in CSA Test Report 80168519-03.

3.1 Revision history of test report

Test report No	Rev.	Issue Date	Changes
80168519-10	0	29 November 2023	Initial test report

The test report with the highest revision number replaces the previous test reports.

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3.2 Final assessment

The equipment under test fulfills the requirements cited in clause 1 test standards.

Date of receipt of test sample	:	acc. to storage records
Testing commenced on	:	07 August 2023
Testing concluded on	:	27 November 2023

Checked by:

Jürgen Pessinger
2023.12.01 14:27:17
+01'00'

Jürgen Pessinger
Radio Team

Tested by:

Lukas Scheuermann
2023.12.01 12:41:49
+01'00'

Lukas Scheuermann
Radio Team

FCC-ID: ESV-ZLXG2 **IC-ID:** 1249A-ZLXG2

4 TEST ENVIRONMENT

4.1 Address of the test laboratory

CSA Group Bayern GmbH
Ohmstrasse 1-4
94342 STRASSKIRCHEN
GERMANY

4.2 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15 - 35 ° C
Humidity:	30 - 60 %
Atmospheric pressure:	86 - 106 kPa

4.3 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. It is noted that the expanded measurement uncertainty corresponds to the measurement results from the standard measurement uncertainty multiplied by the coverage factor k = 2. The true value is located in the corresponding interval with a probability of 95 %. The measurement uncertainty was calculated for all measurements listed in this test report on basis of the ETSI Technical Report TR 100 028 Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 1 and Part 2. The results are documented in the quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Measurement Type	Range	Confidence Level	Calculated Uncertainty
AC power line conducted emissions	0.15 MHz to 30 MHz	95%	± 3.29 dB
EBW and OBW	2400 MHz to 3000 MHz	95%	± 2.5 x 10^{-7}
Maximum peak conducted output power	2400 MHz to 3000 MHz	95%	± 0.62 dB
Power spectral density	2400 MHz to 3000 MHz	95%	± 0.62 dB
Conducted Spurious Emissions	9 kHz to 10000 MHz	95%	± 2.15 dB
Conducted Spurious Emissions	10000 MHz to 40000 MHz	95%	± 3.47 dB
Radiated Spurious Emissions	9 kHz to 30 MHz	95%	± 3.53 dB
Radiated Spurious Emissions	30 MHz to 1000 MHz	95%	± 3.71 dB
Radiated Spurious Emissions	1000 MHz to 10000 MHz	95%	± 2.34 dB
Field strength of the fundamental	100 kHz to 100 MHz	95%	± 3.53 dB

FCC-ID: ESV-ZLXG2 **IC-ID:** 1249A-ZLXG2

4.4 Conformity Decision Rule

The applied conformity decision rule is based on ILAC G8:09/2019 clause 4.2.1 Binary Statement for Simple Acceptance Rule (w = 0).
Details can be found in the procedure CSA_B_V50_29.

4.5 Measurement protocol for FCC and ISED

4.5.1 General information

CSA Group Bayern GmbH is recognized as wireless testing laboratory under the CAB identifier:

FCC: DE 0011
ISED: DE0009

4.5.2 General Standard information

The test methods used comply with ANSI C63.10 - "Testing Unlicensed Wireless Devices".

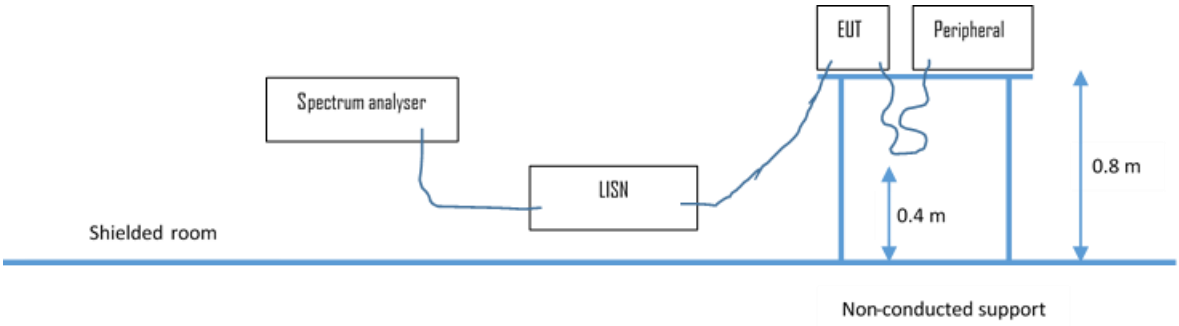
4.5.2.1 Justification

The equipment under test (EUT) is configured in a typical user arrangement in accordance with the manufacturer's instructions.

4.5.3 Details of test procedures

4.5.3.1 Conducted emission

Test setup according ANSI C63.10



The final level, expressed in dBµV, is arrived at by taking the reading directly from the Spectrum analyser. This level is compared to the limit.

To convert between dBµV and µV, the following conversions apply:

dBµV = 20(log µV)
µV = Inverse log(dBµV/20)

Conducted emissions on the 50 Hz and/or 60 Hz power interface of the EUT are measured in the frequency range of 150 kHz to 30 MHz. The measurements are performed using a receiver, which has CISPR characteristic bandwidth and quasi-peak detection and a Line Impedance Stabilization Network (LISN) with 50 Ω / 50 µH (CISPR 16) characteristics. The receiver is protected by means of an impedance matched pulse limiter connected directly to the RF input. Table top equipment is placed on a non-conducting table 80 centimetres above the floor and is positioned 40 centimetres from the vertical ground plane (wall) of the screen room. If the minimum limit margin appears to be less than 20 dB with a peak mode measurement, the emission is re-measured using a tuned receiver with quasi-peak and average detection and recorded on the data sheets.

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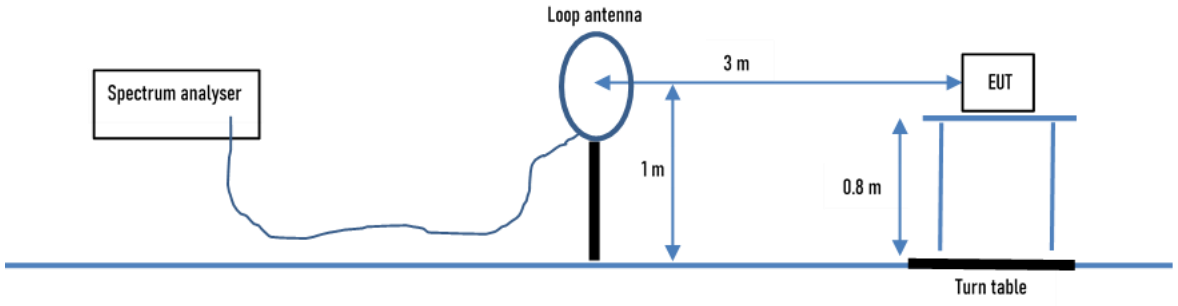
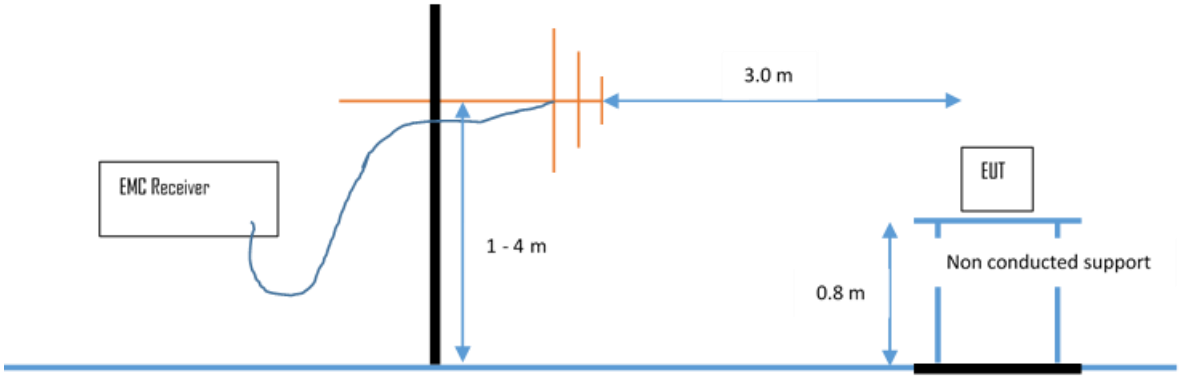
4.5.3.2 Radiated emission

4.5.3.2.1 OATS1 test site (9 kHz - 30 MHz):
Test setup according ANSI C63.10



Emissions from the EUT are measured in the frequency range of 9 MHz to 30 MHz using a tuned receiver and a calibrated loop antenna. Table top equipment is placed on a 1.0 X 1.5 m non-conducting table 80 centimetres above the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screened room located outside the test area. The antenna is positioned 3, 10 or 30 metres horizontally from the EUT and is repeated vertically. To locate maximum emissions from the test sample the antenna is varied along the site axis and the EUT is rotated 360 degrees.

4.5.3.2.2 OATS1 test site (30 MHz - 1 GHz):
Test setup according ANSI C63.10.



Spurious emissions from the EUT are measured in the frequency range of 30 MHz to 1000 MHz using a tuned receiver and appropriate broadband linearly polarised antennas. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasi-peak detection. Table top equipment is placed on a 1.0 X 1.5 m non-conducting table 80 centimetres above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screened room located outside the test area. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 metres and the EUT is rotated 360 degrees. The final level in dBµV/m is calculated by taking the reading from the EMI receiver (Level dBµV) and adding the correction factors and cable loss factor (dB). The FCC limit is subtracted from this result in order to provide the limit margin listed in the measurement protocol.

The resolution bandwidth setting:
30 MHz – 1000 MHz: RBW: 120 kHz

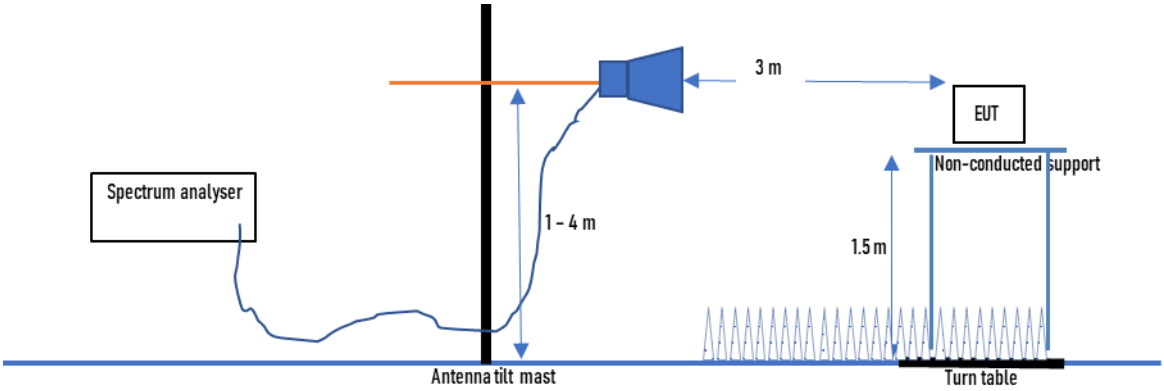
Example:

Frequency (MHz)	Level (dBµV)	+	Factor (dB)	=	Level (dBµV/m)	-	Limit (dBµV/m)	=	Delta (dB)
719.0	75.0	+	32.6	=	107.6	-	110.0	=	-2.4

FCC-ID: ESV-ZLXG2 **IC-ID:** 1249A-ZLXG2

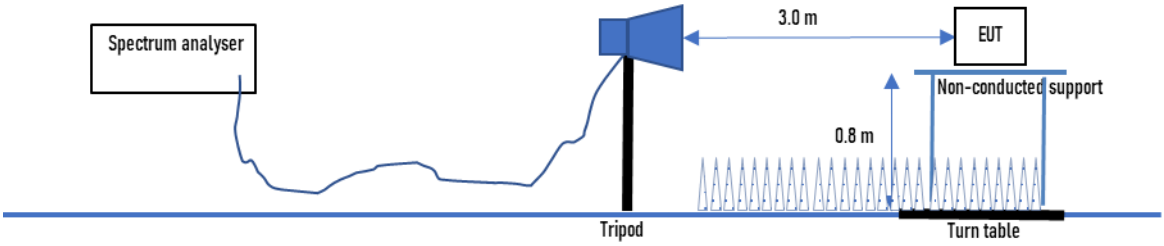
4.5.3.2.3 Anechoic chamber 1 (1000 MHz – 18000 MHz)

Test setup according ANSI C63.10.



Radiated emissions from the EUT are measured in the frequency range 1 GHz up to 18 GHz as specified in 47 CFR Part 15, Subpart A, Section 15.33, using a spectrum analyser and appropriate linearly polarized antennas. Table top equipment is placed on a non-conducting table, 1.5 metre above the ground plane. The turntable is fully covered with the appropriate absorber (Type VHP-12). Any controlling device is positioned such that it does not significantly influence the measurement results. Interconnecting cables that hang closer than 40 cm to the ground plane are folded back and forth in the center, forming a bundle 30 cm to 40 cm long. Measurements are made in in three orientations of the EUT and the horizontal and vertical polarization planes of measurement antenna in a fully anechoic room. The measurement antenna is adjusted and the EUT orientated to permit the measurement of the maximum emission from the EUT. The conditions determined as worst-case will then be used for the final measurements.

4.5.3.2.4 Anechoic chamber 1 (18 GHz – 40 GHz)



Emissions from the EUT are measured in the frequency range 18 GHz up to 40 GHz as specified in 47 CFR Part 15, Subpart A, Section 15.33, using a spectrum analyser and appropriate linearly polarized antennas. Table top equipment is placed on a non-conducting table, 0.8 metre above the ground plane. The turntable is fully covered with the appropriate absorber (Type VHP-12). Any controlling device is positioned such that it does not significantly influence the measurement results. Interconnecting cables that hang closer than 40 cm to the ground plane are folded back and forth in the center, forming a bundle 30 cm to 40 cm long. Measurements are made in in three orientations of the EUT and the horizontal and vertical polarization planes of measurement antenna in a fully anechoic room. The measurement antenna is adjusted and the EUT orientated to permit the measurement of the maximum emission from the EUT. The conditions determined as worst-case will then be used for the final measurements. Where appropriate, the test distance may be reduced in order to detect emissions under better uncertainty. The limits are adopted.

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5 TEST CONDITIONS AND RESULTS

5.1 AC power line conducted emissions

For test instruments and accessories used see section 6 Part **A 4**.

5.1.1 Description of the test location

Test location: Anechoic chamber 2

5.1.2 Photo documentation of the test set-up

See Attachment I for detailed photo documentation of the test set-up.

5.1.3 Applicable standard

According to FCC Part 15, Section 15.207(a):
Except as shown in paragraphs (b) and (c) of this Section, 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 given limits.

5.1.4 Description of Measurement

The measurements are performed following the procedures set out in ANSI C63.10 described under item 4.4.3. If the minimum limit margin appears to be less than 20 dB with a peak mode measurement, the emissions are re-measured using a tuned receiver with quasi-peak and average detection and recorded on the data sheets.

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5.1.5 Test result

Frequency range: 0.15 MHz - 30 MHz
Min. limit margin -3.7 dB

Limit according to FCC Part 15, Section 15.207(a):

Frequency of Emission (MHz)	Conducted Limit (dBµV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency

Limit according to RSS-Gen 8.8:

Frequency of Emission (MHz)	Conducted limit (dBµV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency

The requirements are **FULFILLED.**

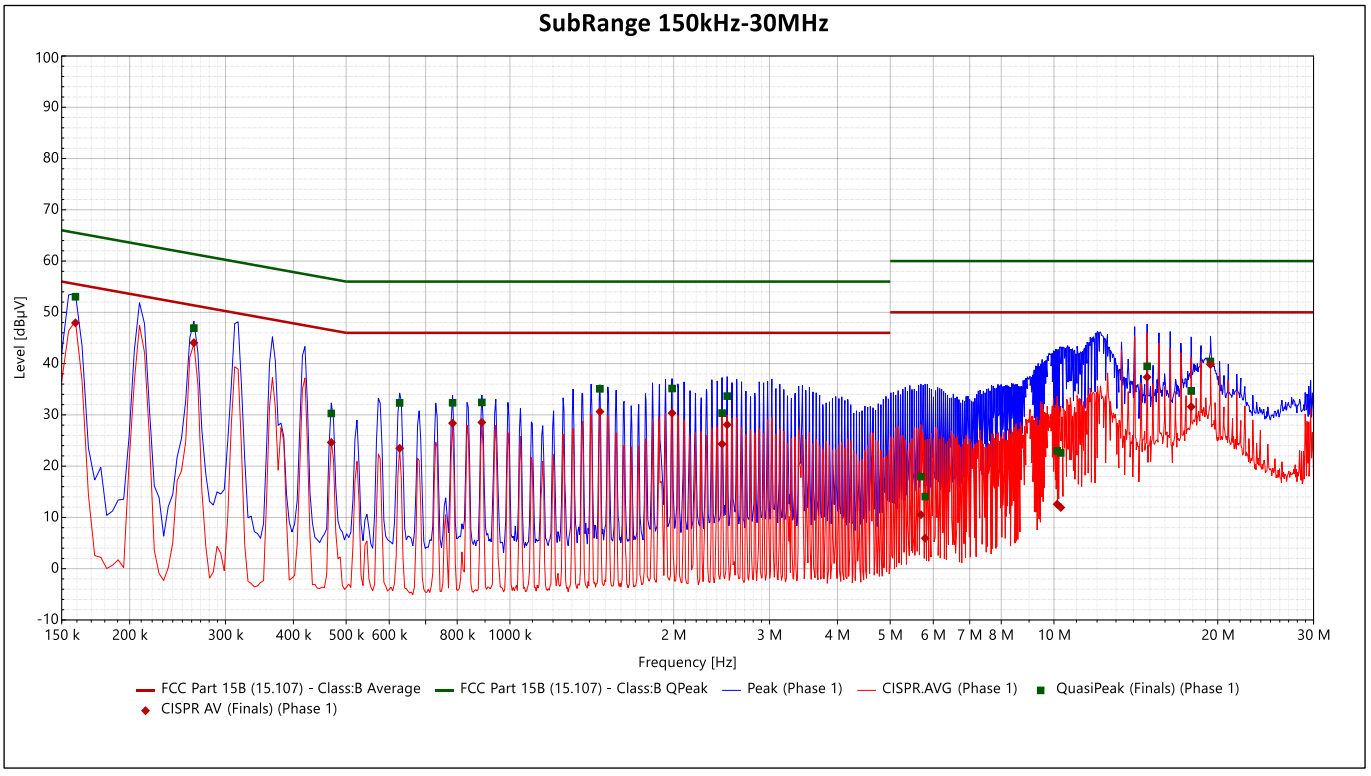
Remarks: For detailed test result please see the following test protocols

FCC-ID: ESV-ZLXG2 **IC-ID:** 1249A-ZLXG2

5.1.6 Test protocol

Test point L1 Result: passed
Operation mode: Transmission at 2.402 GHz
Remarks: -

Frequency (Hz)	QuasiPeak (dBµV)	QP Margin	QP Limit (dBµV)	CISPR AV (dBµV)	CISPR AV Margin	AV Limit (dBµV)	Line	RBW (Hz)	Meas.Time (s)	Correction (dB)
159 k	53.04	-12.476	65.516	47.951	-7.565	55.516	Phase 1	9000	1	10.106
262.5 k	46.935	-14.417	61.352	44.071	-7.281	51.352	Phase 1	9000	1	10.129
469.5 k	30.283	-26.24	56.523	24.629	-21.894	46.523	Phase 1	9000	1	10.185
627 k	32.333	-23.667	56	23.478	-22.522	46	Phase 1	9000	1	10.197
784.5 k	32.358	-23.642	56	28.376	-17.624	46	Phase 1	9000	1	10.222
888 k	32.434	-23.566	56	28.534	-17.466	46	Phase 1	9000	1	10.234
1.464 M	35.083	-20.917	56	30.642	-15.358	46	Phase 1	9000	1	10.308
1.986 M	35.151	-20.849	56	30.35	-15.65	46	Phase 1	9000	1	10.315
2.454 M	30.346	-25.654	56	24.31	-21.69	46	Phase 1	9000	1	10.361
2.508 M	33.66	-22.34	56	28.095	-17.905	46	Phase 1	9000	1	10.365
5.694 M	17.951	-42.049	60	10.525	-39.475	50	Phase 1	9000	1	10.58
5.7975 M	14.069	-45.931	60	5.93	-44.07	50	Phase 1	9000	1	10.589
10.1355 M	22.972	-37.028	60	12.579	-37.421	50	Phase 1	9000	1	10.764
10.293 M	22.584	-37.416	60	11.936	-38.064	50	Phase 1	9000	1	10.781
14.8335 M	39.467	-20.533	60	37.358	-12.642	50	Phase 1	9000	1	11.156
17.8755 M	34.66	-25.34	60	31.581	-18.419	50	Phase 1	9000	1	11.286
19.392 M	40.426	-19.574	60	39.832	-10.168	50	Phase 1	9000	1	11.373

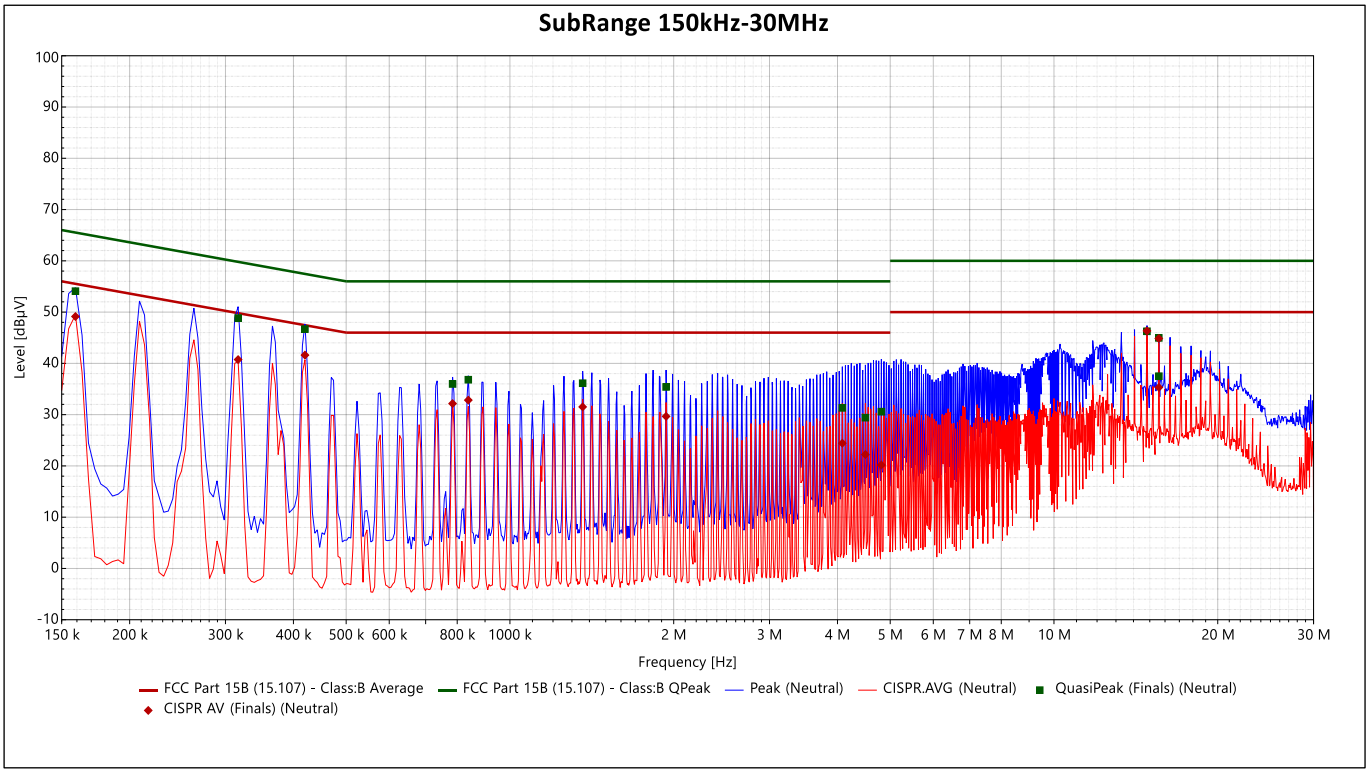


FCC-ID: ESV-ZLXG2 **IC-ID:** 1249A-ZLXG2

Test point N
Operation mode: Transmission at 2.402 GHz
Remarks: -

Result: passed

Frequency (Hz)	QuasiPeak (dBµV)	QP Margin	QP Limit (dBµV)	CISPR AV (dBµV)	CISPR AV Margin	AV Limit (dBµV)	Line	RBW (Hz)	Meas.Time (s)	Correction (dB)
159 k	54.081	-11.435	65.516	49.144	-6.372	55.516	Neutral	9000	1	10.137
316.5 k	48.84	-10.958	59.798	40.736	-9.062	49.798	Neutral	9000	1	10.182
420 k	46.686	-10.763	57.448	41.609	-5.839	47.448	Neutral	9000	1	10.202
784.5 k	35.977	-20.023	56	32.158	-13.842	46	Neutral	9000	1	10.246
838.5 k	36.807	-19.193	56	32.828	-13.172	46	Neutral	9000	1	10.249
1.3605 M	36.135	-19.865	56	31.508	-14.492	46	Neutral	9000	1	10.316
1.9365 M	35.4	-20.6	56	29.656	-16.344	46	Neutral	9000	1	10.341
4.083 M	31.322	-24.678	56	24.431	-21.569	46	Neutral	9000	1	10.489
4.5015 M	29.406	-26.594	56	22.217	-23.783	46	Neutral	9000	1	10.507
4.8165 M	30.581	-25.419	56	20.177	-25.823	46	Neutral	9000	1	10.518
14.8245 M	46.261	-13.739	60	46.33	-3.67	50	Neutral	9000	1	11.034
15.585 M	44.972	-15.028	60	44.85	-5.15	50	Neutral	9000	1	11.048
15.5895 M	37.502	-22.498	60	35.307	-14.693	50	Neutral	9000	1	11.048



FCC-ID: ESV-ZLXG2 **IC-ID:** 1249A-ZLXG2

5.2 Spurious emissions radiated

For test instruments and accessories used see section 6 Part **SER 1, SER 2, SER 3**.

5.2.1 Description of the test location

Test location: OATS 1
Test location: Anechoic chamber 1

Test distance: 3 m

5.2.2 Photo documentation of the test set-up

See Attachment I for detailed photo documentation of the test set-up.

5.2.3 Applicable standard

According to FCC Part 15, Section 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.
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)).

5.2.4 Description of Measurement

The restricted bands are measured radiated. The span of the spectrum analyser is set wide enough to capture the restricted band and measure the peak level of the emission operating on the channel closest to the band edge, as well as any modulation products which fall outside of the authorized band of operation. The restricted bands are measured falling emissions into it and the nearest restricted band are checked for emissions also the restricted band for the harmonics of the carrier.

The radiated power of the spurious emission from the EUT is measured in a test setup following the procedures set out in ANSI C63.10. If the emission level of the EUT in peak mode complies with the average limit is 20 dB lower, then testing will be stopped and peak values of the EUT will be reported, otherwise the emission will be measured in average mode again and reported.

The restricted bands are measured radiated. The span of the spectrum analyser is set wide enough to capture the restricted band and measure the peak level of the emission operating on the channel closest to the band edge, as well as any modulation products which fall outside of the authorized band of operation. The restricted bands are measured falling emissions into it and the nearest restricted band are checked for emissions also the restricted band for the harmonics of the carrier.

Measurements are performed in following order:

1) Measurement of emissions according to General Limit specified in section 15.209(a):

Test receiver settings for SER1, SER2:

9kHz-150kHz	RBW: 200 Hz	Detector: Quasi peak*	Meas. Time: 1 s,
150kHz-30MHz	RBW: 9 kHz	Detector: Quasi peak*	Meas. Time: 1 s,
30MHz-1GHz	RBW: 120 MHz	Detector: Quasi peak	Meas. Time: 1 s,

*AV Detector in the ranges 9-90kHZ and 110-490kHz

FCC-ID: ESV-ZLXG2 **IC-ID:** 1249A-ZLXG2

Spectrum analyser settings for SER3:
1GHz-26GHz RBW: 1 MHz Detector: Max. peak Trace: Max. hold Sweep: Auto

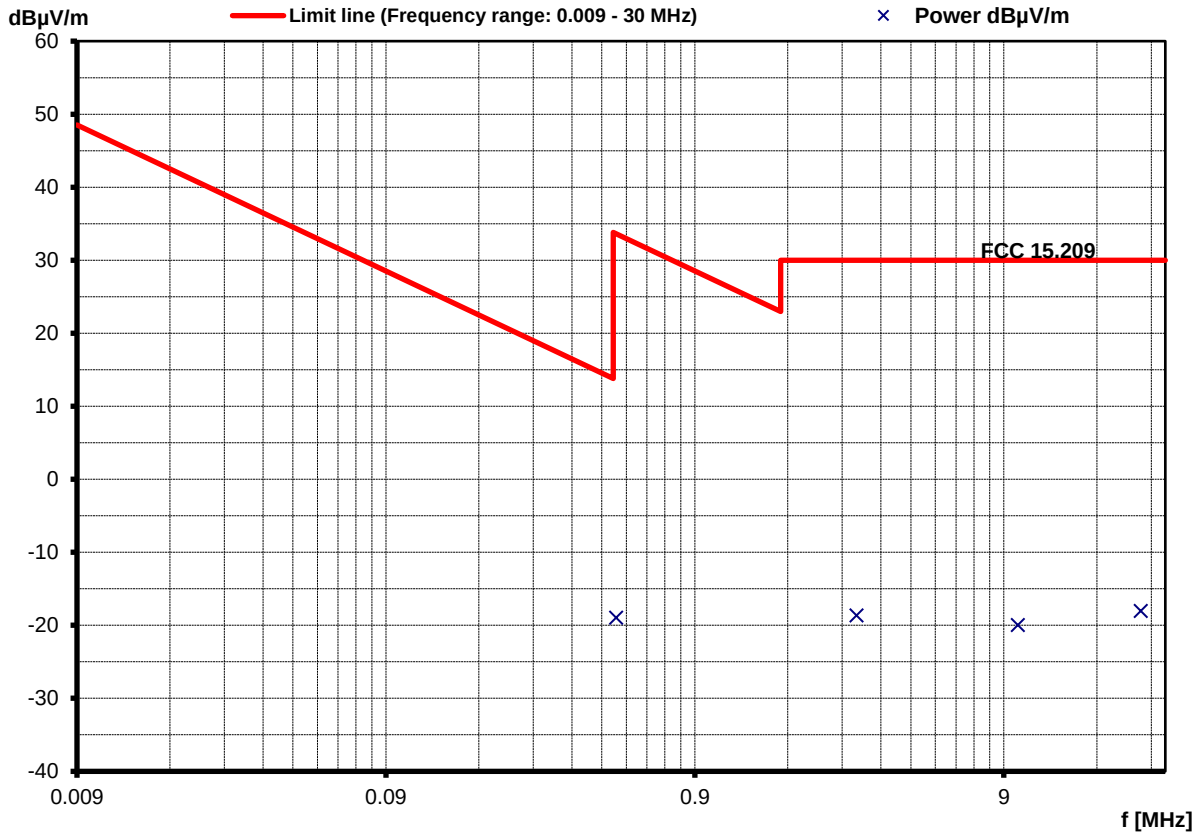
2) If emissions outside the Restricted Bands are above General Limit additional measurements of emissions according to Spurious Emissions Limit specified in section 15.247(d) are performed:

Spectrum analyser settings:
RBW: 100 kHz VBW: 300 kHz Detector: Max. peak Trace: Max. hold Sweep: Auto

5.2.5 Test result

9 kHz < f < 30 MHz:

Frequency (MHz)	Reading (dBµV)	Correction * (dB)	Field strength (dBµV/m)	Limit (dBµV/m)	Dlimit (dB)
0.010	-12.0	-59.4	-71.4	47.6	-119.0
0.100	3.7	18.3	-58.0	27.6	-85.6
0.500	4.0	17.1	-18.9	33.6	-52.5
3.000	3.5	17.9	-18.6	30.0	-48.6
10.000	3.6	16.4	-20.0	30.0	-50.0
25.000	3.7	18.3	-18.0	30.0	-48.0

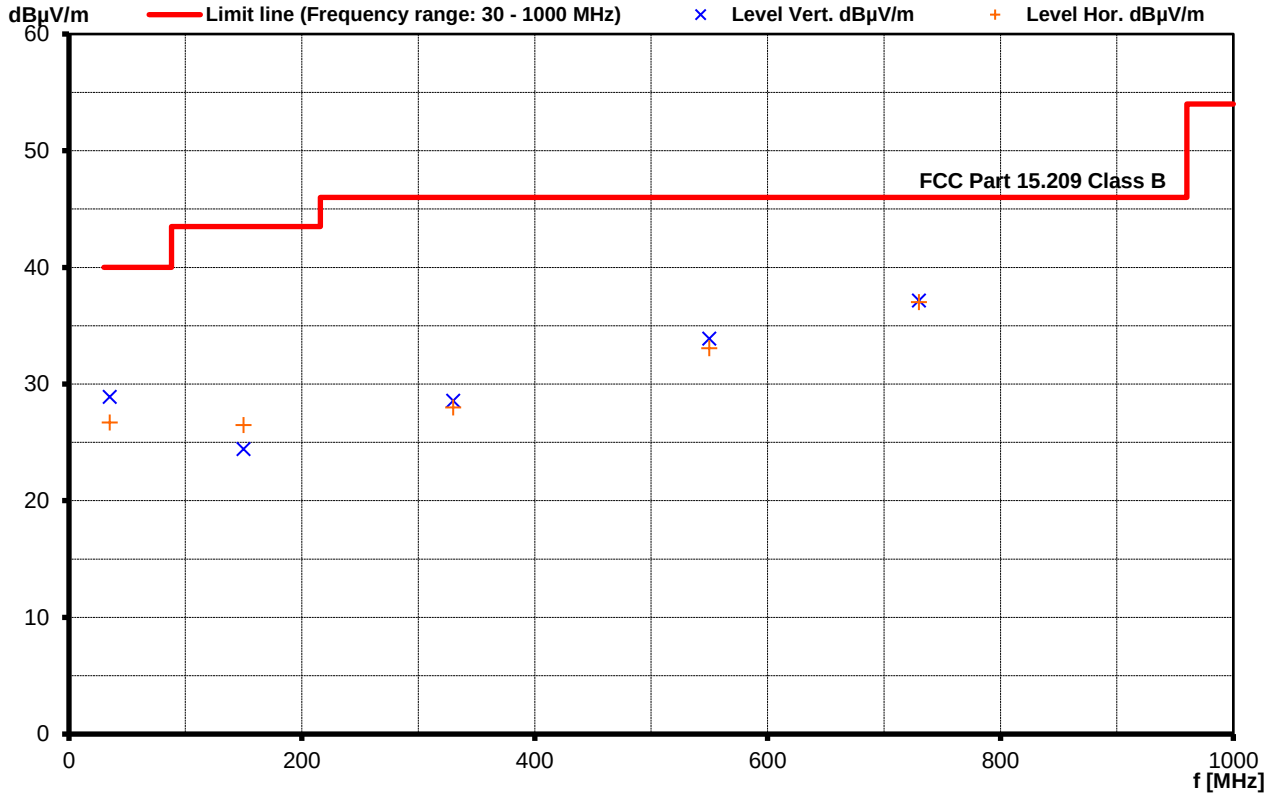


Note: No emissions detected in the frequency range below 1 GHz. The recorded values are solely noise values of the OATS.

FCC-ID: ESV-ZLXG2 **IC-ID:** 1249A-ZLXG2

30 MHz < f < 1000 MHz:

Frequency (MHz)	Reading Vert. (dBµV)	Reading Hor. (dBµV)	Correct. Vert. (dB)	Correct. Hor. (dB)	Level Vert. (dBµV/m)	Level Hor. (dBµV/m)	Limit (dBµV/m)	Dlimit (dB)
35.00	15.0	14.0	13.9	12.7	28.9	26.7	40.0	-11.1
150.00	10.5	11.7	13.9	14.8	24.4	26.5	43.5	-17.0
330.00	10.8	10.6	17.8	17.4	28.6	28.0	46.0	-17.4
550.00	9.9	9.3	24.0	23.8	33.9	33.1	46.0	-12.1
730.00	9.4	9.8	27.8	27.2	37.2	37.0	46.0	-8.8



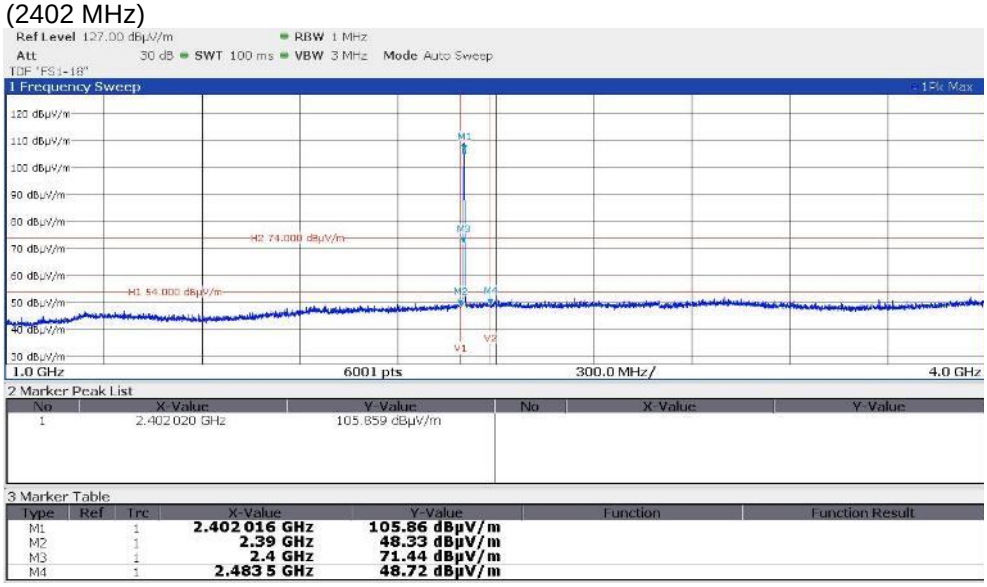
Note: No emissions detected in the frequency range below 1 GHz. The recorded values are solely noise values of the OATS.

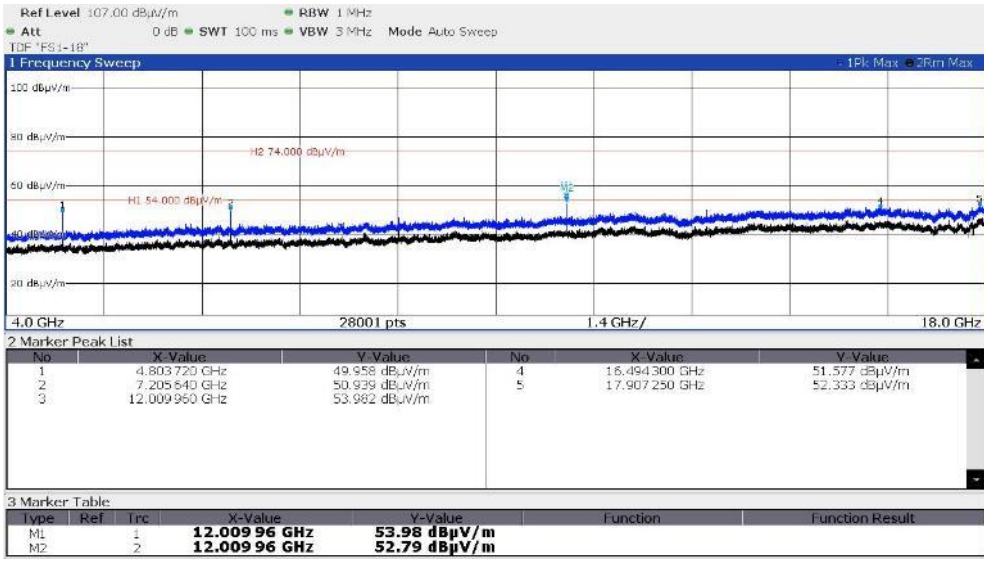
FCC-ID: ESV-ZLXG2 **IC-ID:** 1249A-ZLXG2

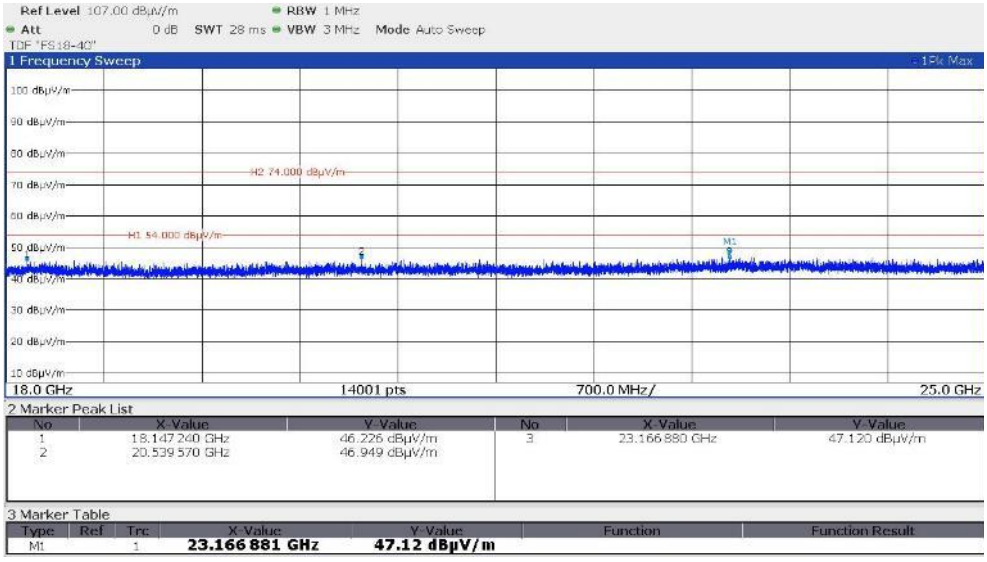
f > 1000 MHz

1) Measurement of emissions according to General Limit specified in section 15.209(a) / RSS-Gen 8.9:

BT 1 Mbps CH0 (2402 MHz)

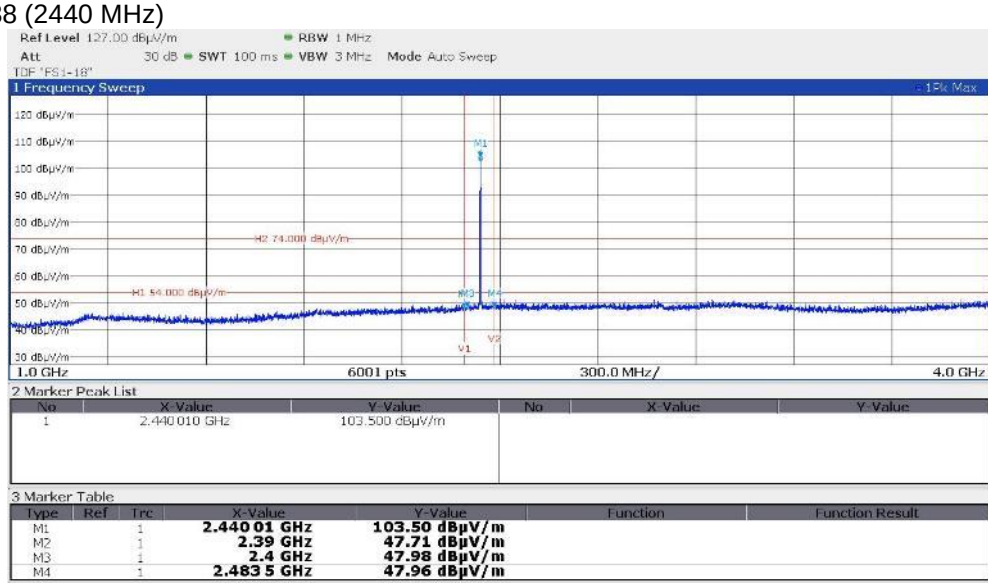


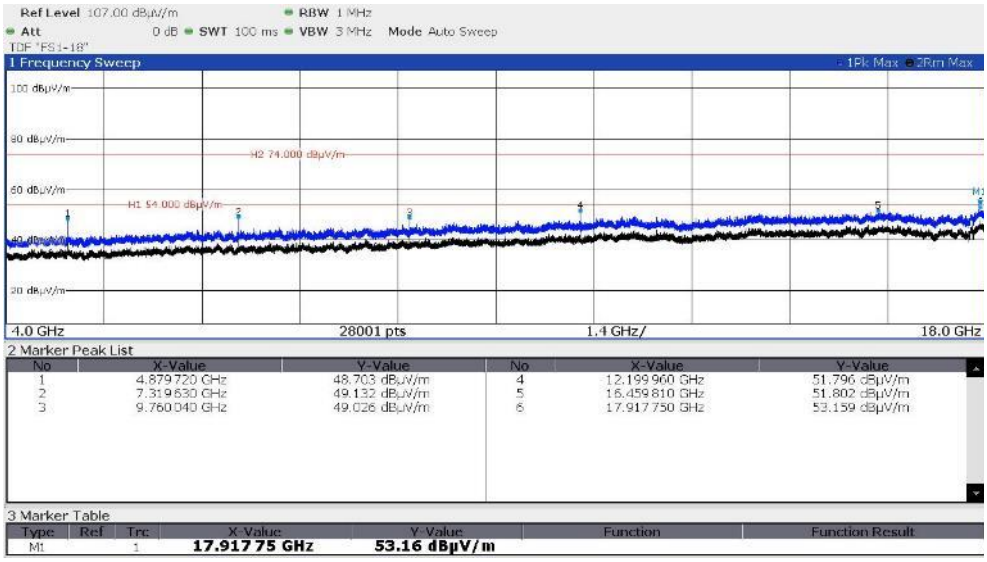


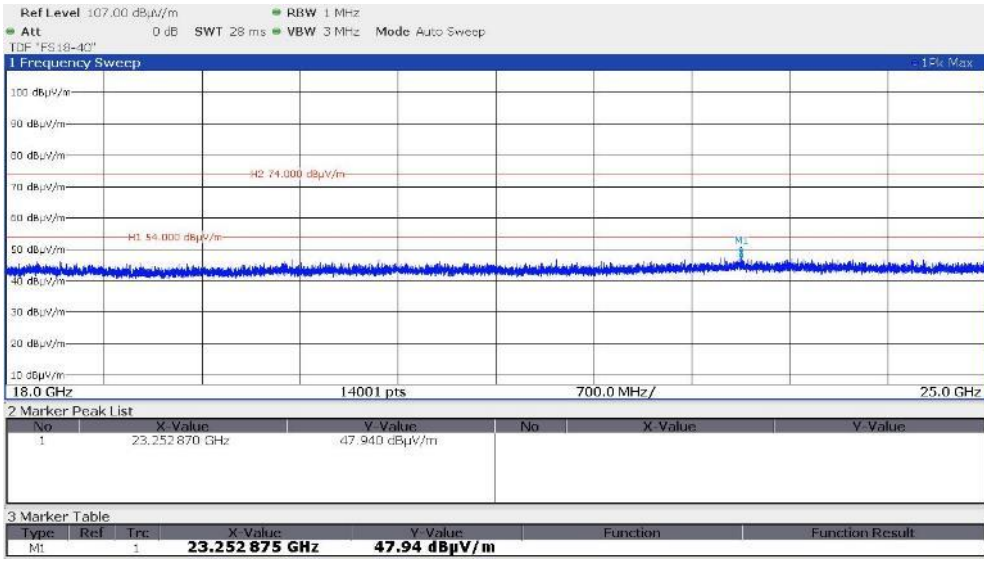


FCC-ID: ESV-ZLXG2 **IC-ID:** 1249A-ZLXG2

BT 1 Mbps CH38 (2440 MHz)

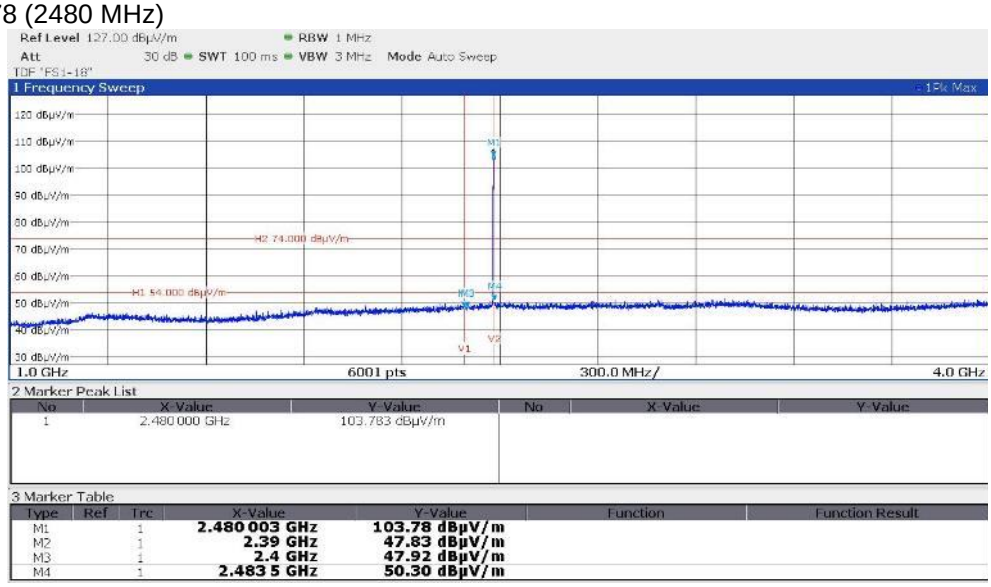


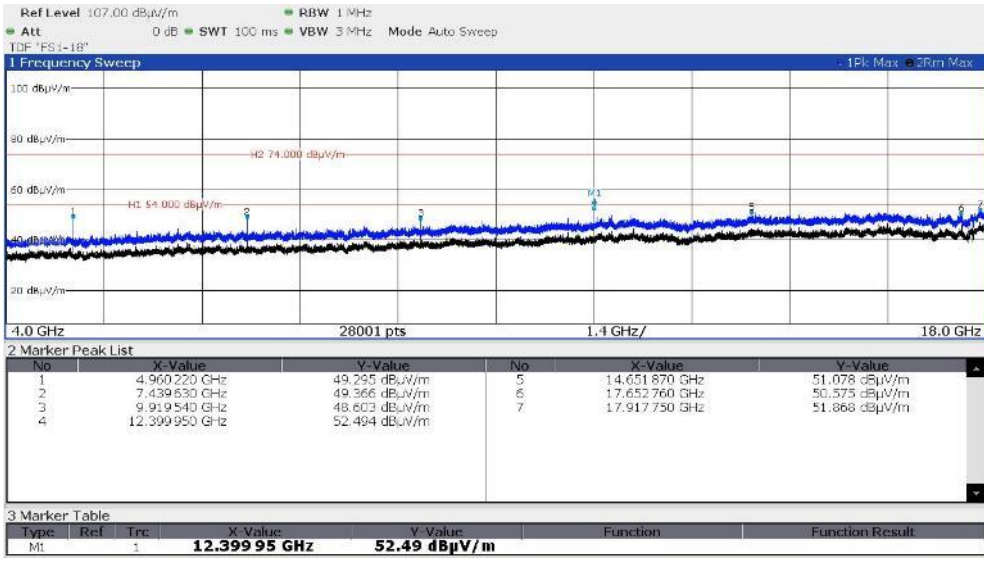


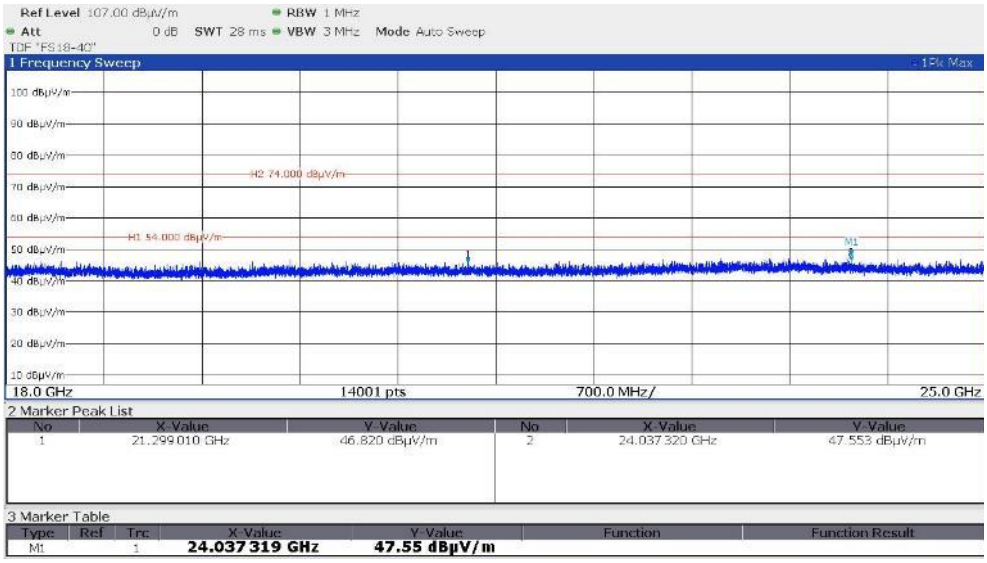


FCC-ID: ESV-ZLXG2 **IC-ID:** 1249A-ZLXG2

BT 1 Mbps CH78 (2480 MHz)

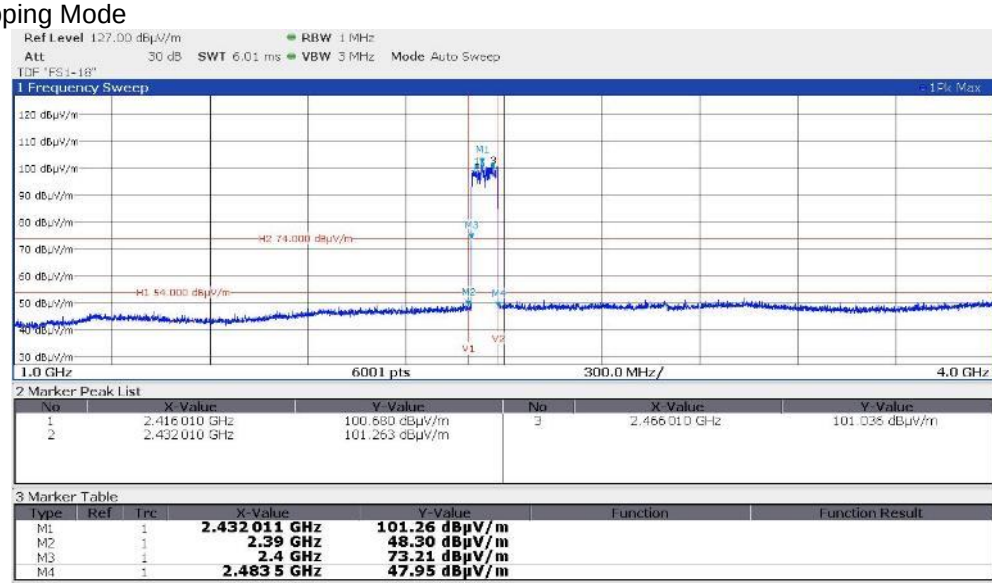






FCC-ID: ESV-ZLXG2 **IC-ID:** 1249A-ZLXG2

BT 1 Mbps Hopping Mode

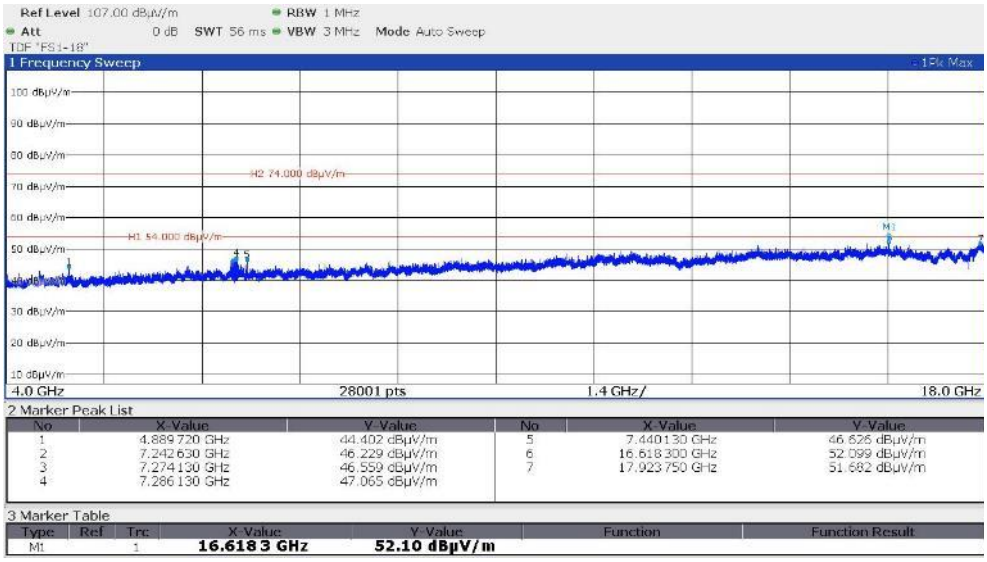


2 Marker Peak List

No	X-Value	Y-Value	No	X-Value	Y-Value
1	2.416 010 GHz	100.680 dBµV/m	3	2.466 010 GHz	101.036 dBµV/m
2	2.432 010 GHz	101.263 dBµV/m			

3 Marker Table

Type	Ref	Trc	X-Value	Y-Value	Function	Function Result
M1		1	**2.432 011 GHz**	**101.26 dBµV/m**		
M2		1	**2.39 GHz**	**48.30 dBµV/m**		
M3		1	**2.4 GHz**	**73.21 dBµV/m**		
M4		1	**2.483 5 GHz**	**47.95 dBµV/m**		

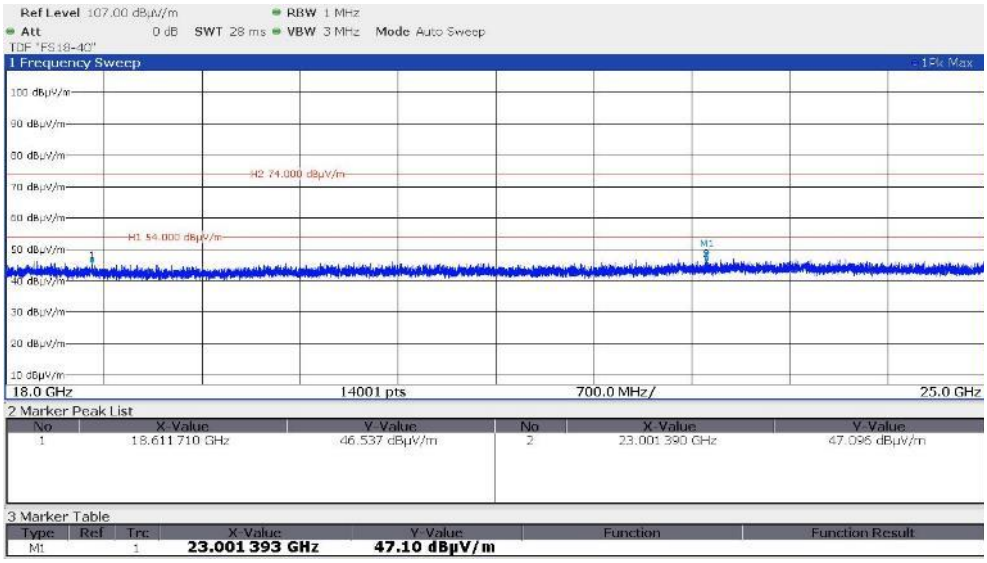


2 Marker Peak List

No	X-Value	Y-Value	No	X-Value	Y-Value
1	4.889 720 GHz	44.402 dBµV/m	5	7.440 130 GHz	46.626 dBµV/m
2	7.242 630 GHz	46.229 dBµV/m	6	16.618 300 GHz	52.099 dBµV/m
3	7.274 130 GHz	46.559 dBµV/m	7	17.923 750 GHz	51.682 dBµV/m
4	7.286 130 GHz	47.065 dBµV/m			

3 Marker Table

Type	Ref	Trc	X-Value	Y-Value	Function	Function Result
M1		1	**16.618 3 GHz**	**52.10 dBµV/m**		



2 Marker Peak List

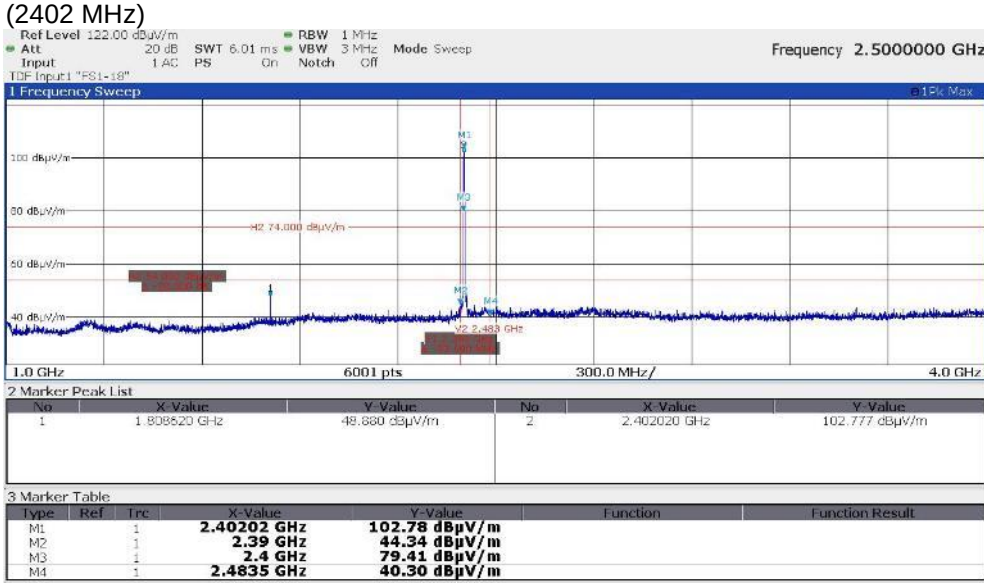
No	X-Value	Y-Value	No	X-Value	Y-Value
1	18.611 710 GHz	46.537 dBµV/m	2	23.001 390 GHz	47.096 dBµV/m

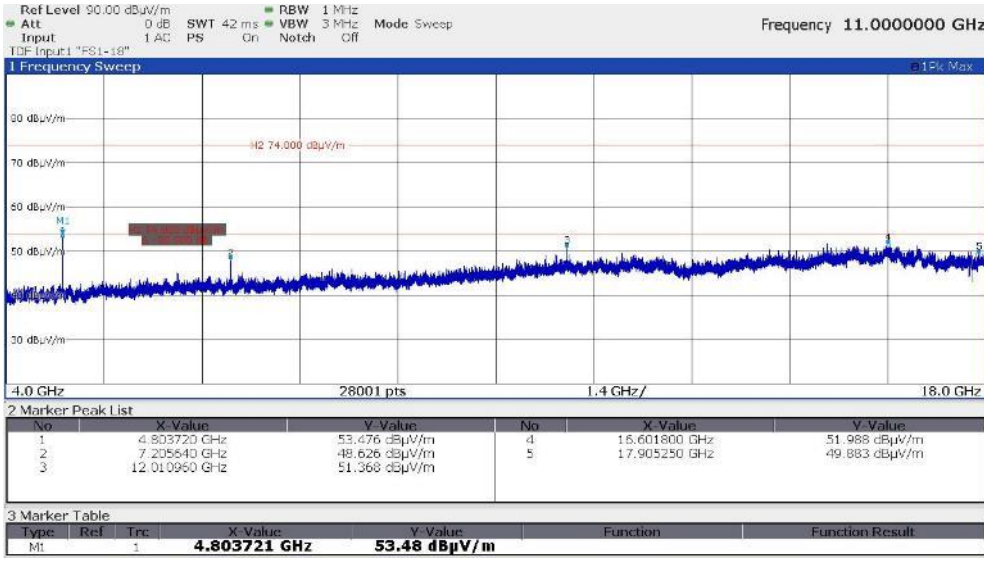
3 Marker Table

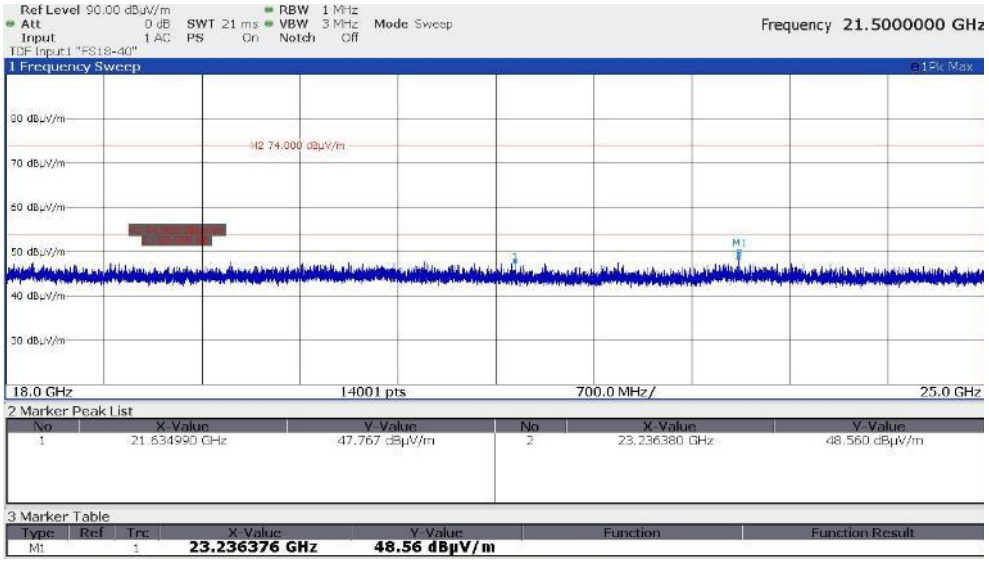
Type	Ref	Trc	X-Value	Y-Value	Function	Function Result
M1		1	**23.001 393 GHz**	**47.10 dBµV/m**		

FCC-ID: ESV-ZLXG2 **IC-ID:** 1249A-ZLXG2

BT 2 Mbps CH0 (2402 MHz)

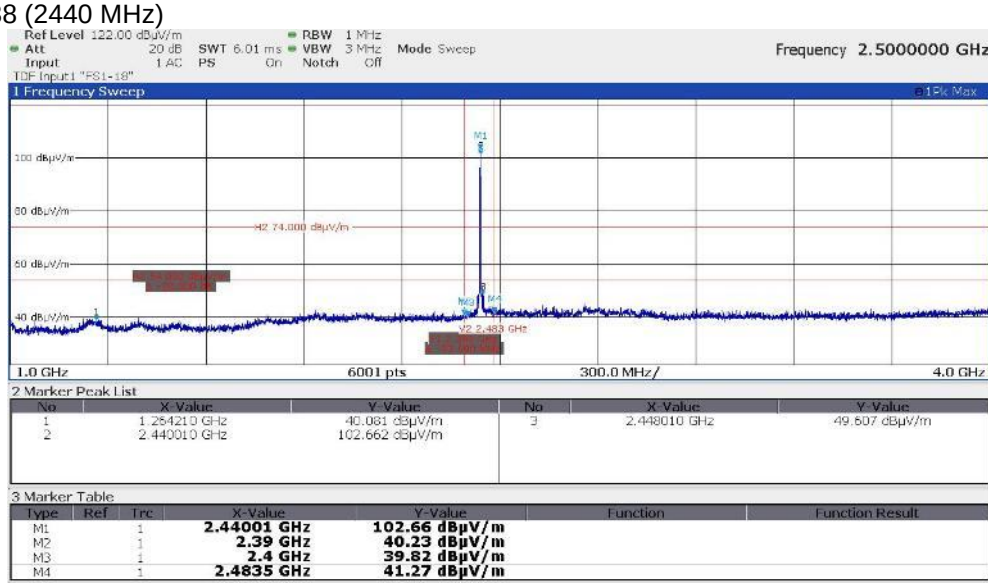


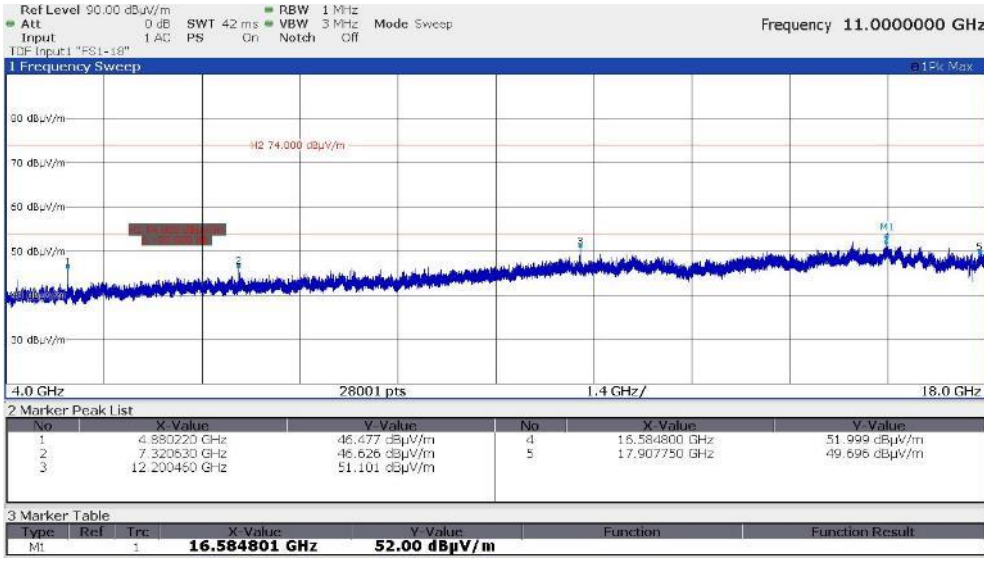


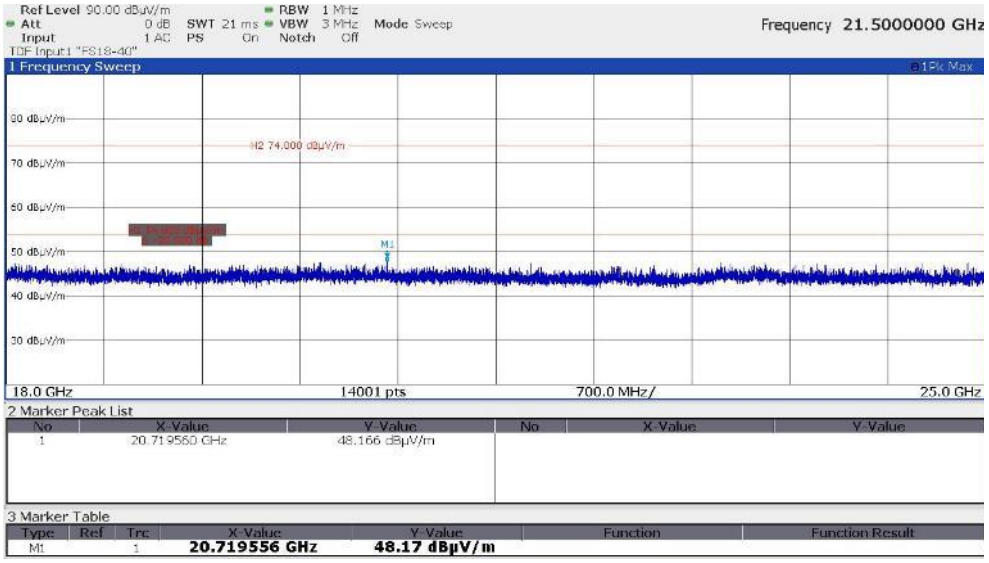


FCC-ID: ESV-ZLXG2 **IC-ID:** 1249A-ZLXG2

BT 2 Mbps CH38 (2440 MHz)

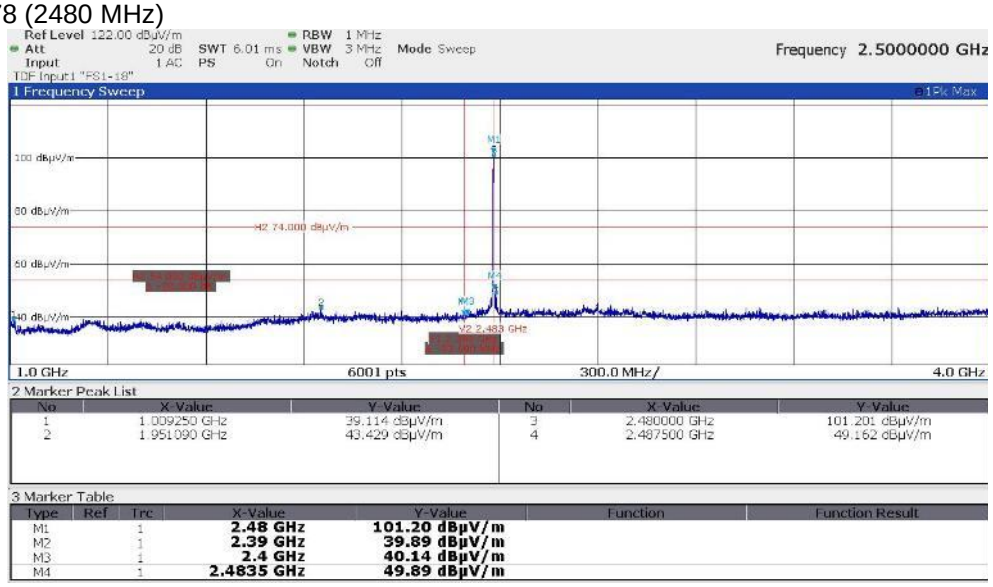


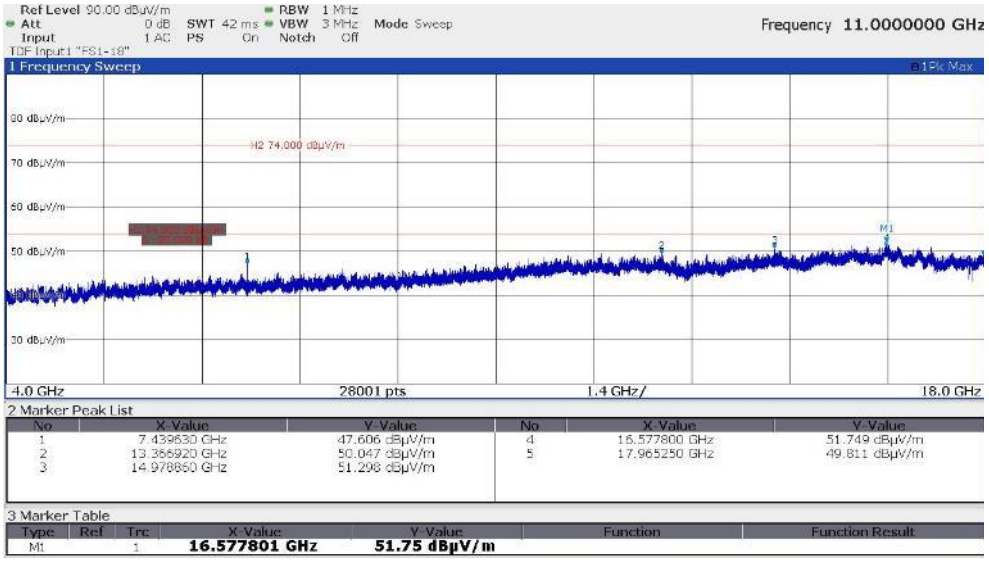


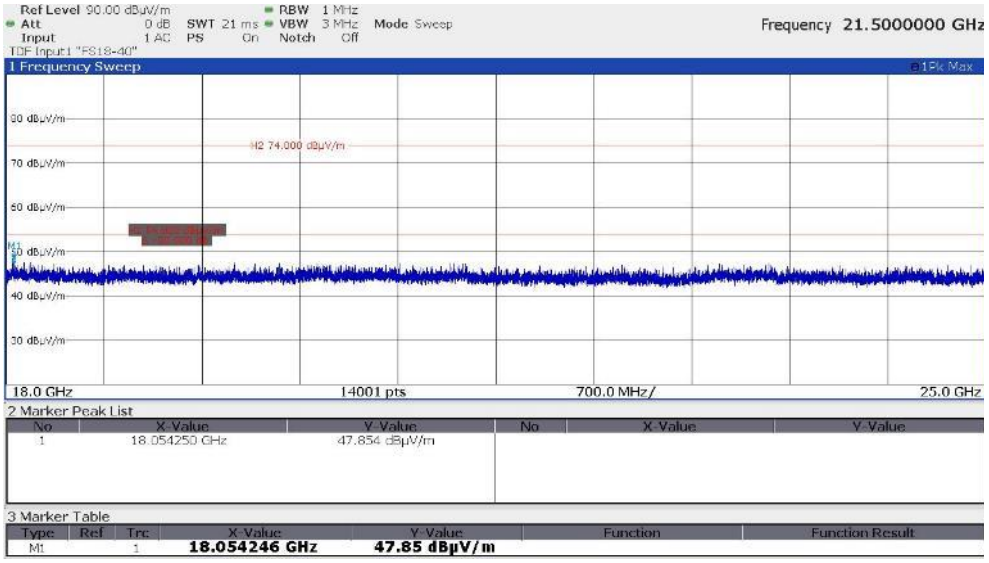


FCC-ID: ESV-ZLXG2 **IC-ID:** 1249A-ZLXG2

BT 2 Mbps CH78 (2480 MHz)

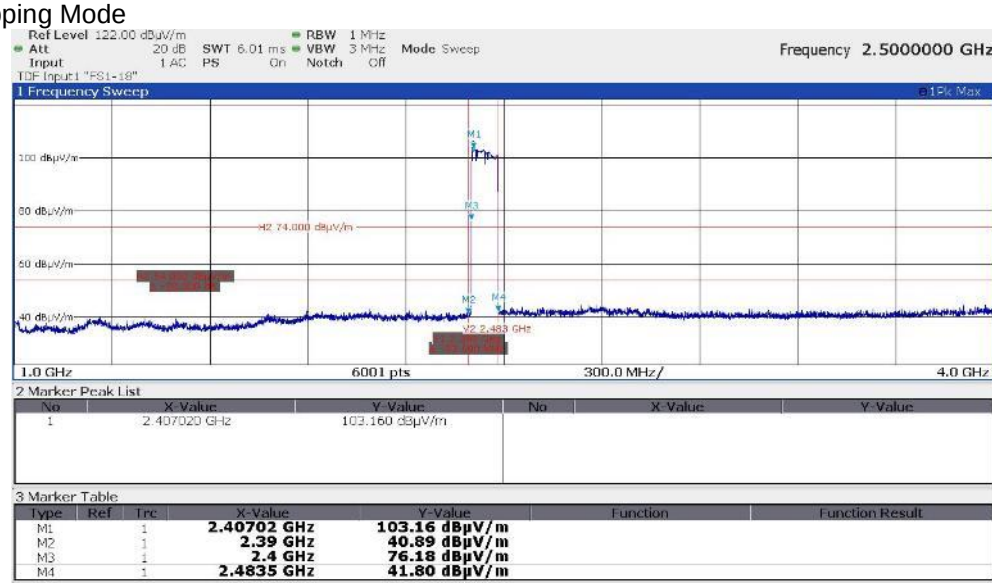


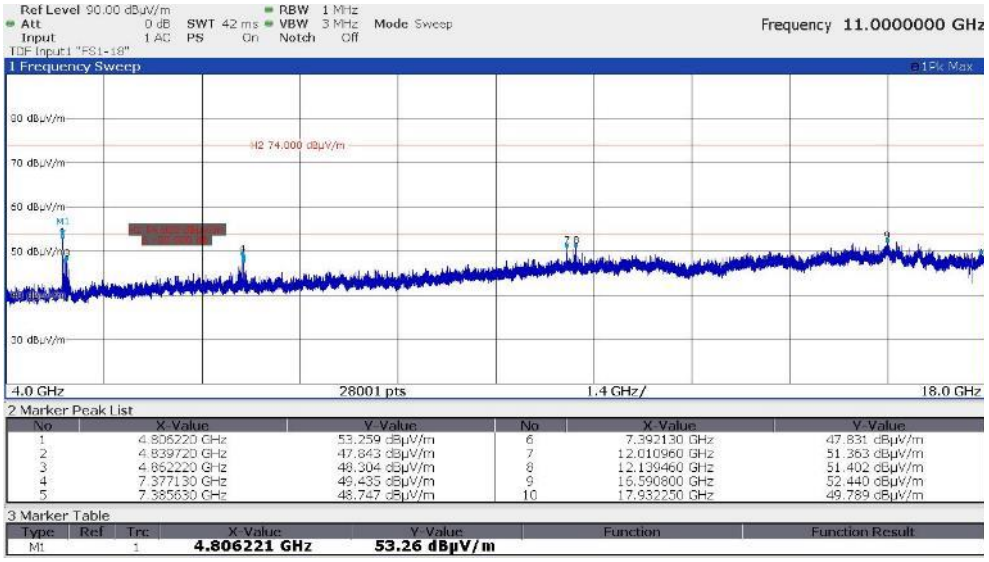


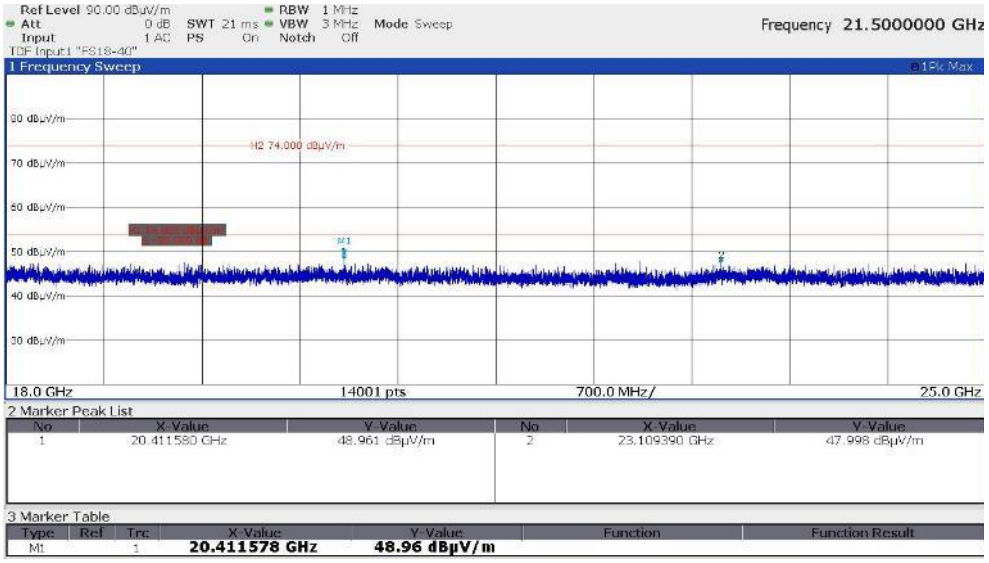


FCC-ID: ESV-ZLXG2 **IC-ID:** 1249A-ZLXG2

BT 2 Mbps Hopping Mode

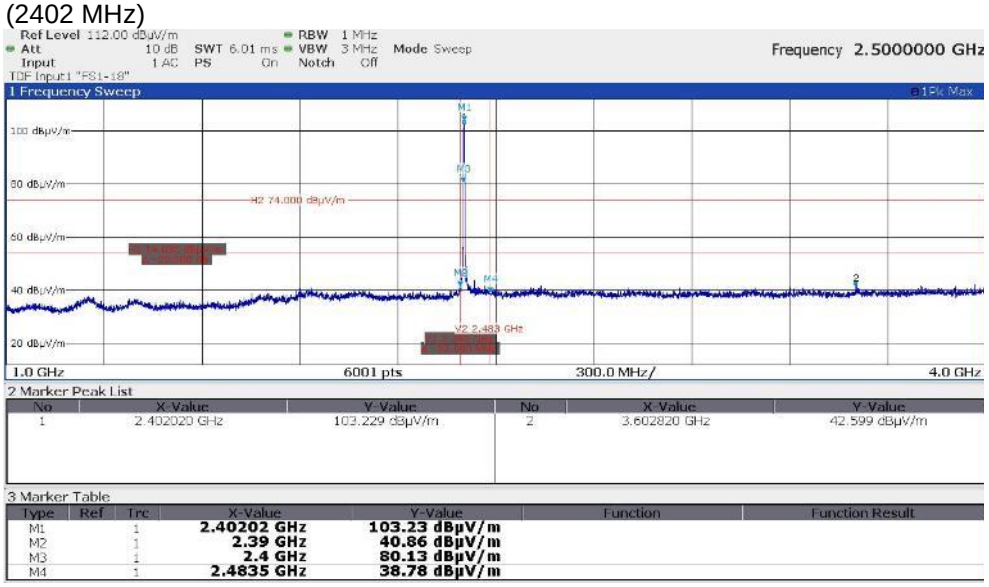


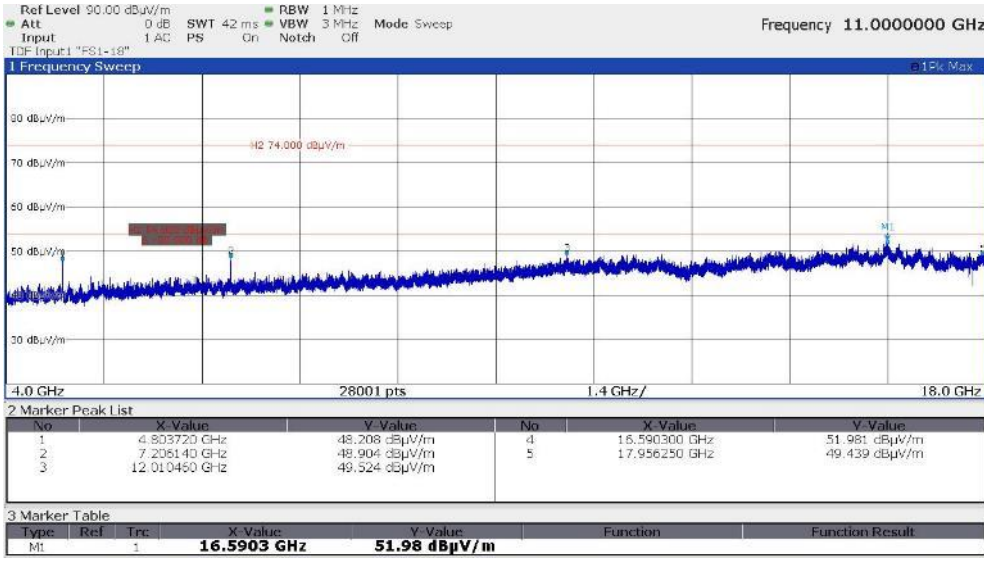


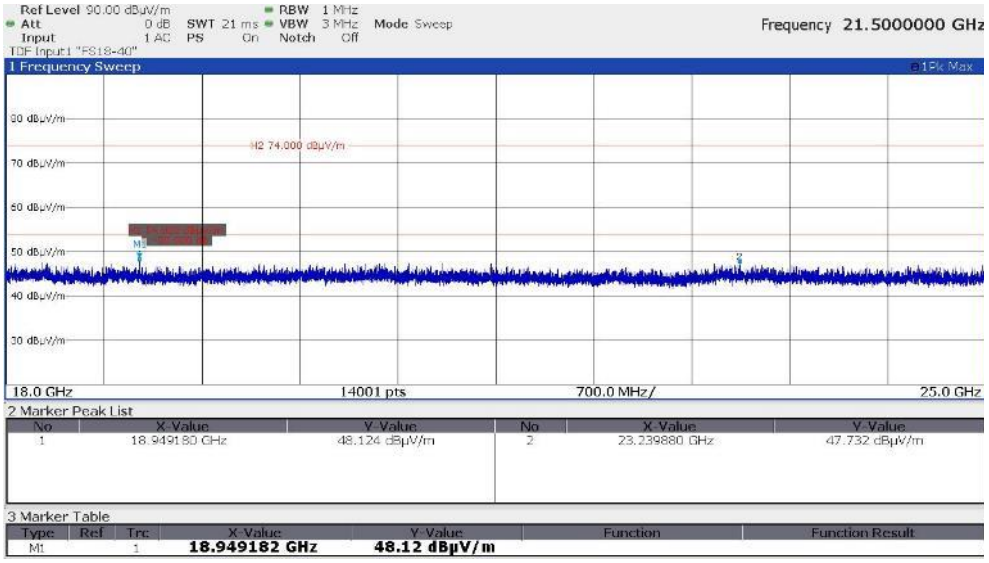


FCC-ID: ESV-ZLXG2 **IC-ID:** 1249A-ZLXG2

BT 3 Mbps CH0 (2402 MHz)

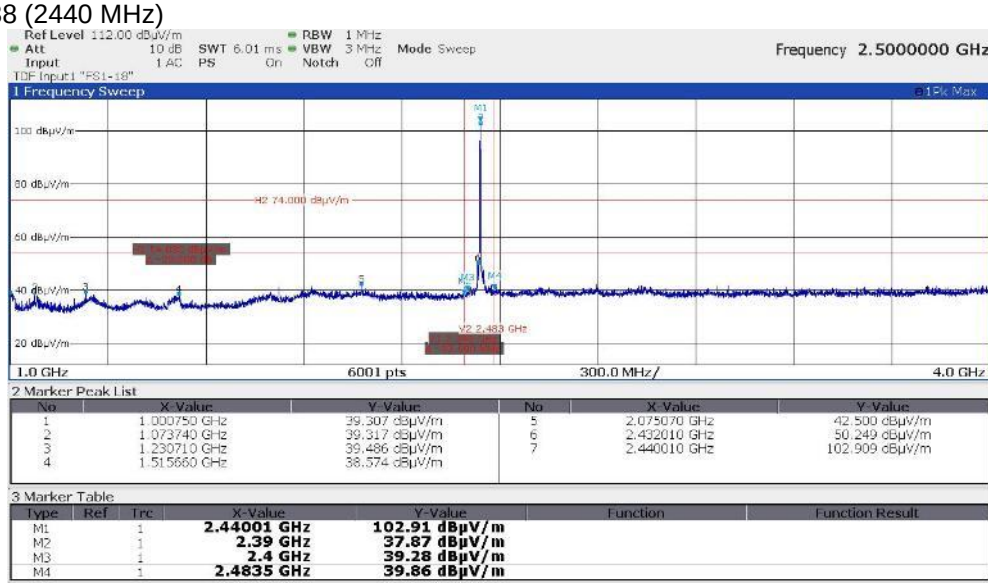


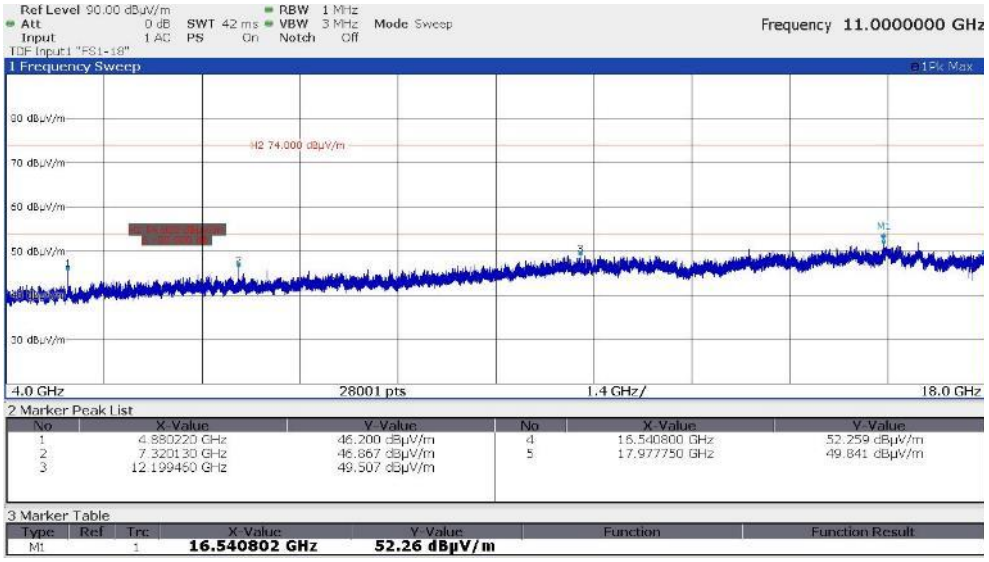


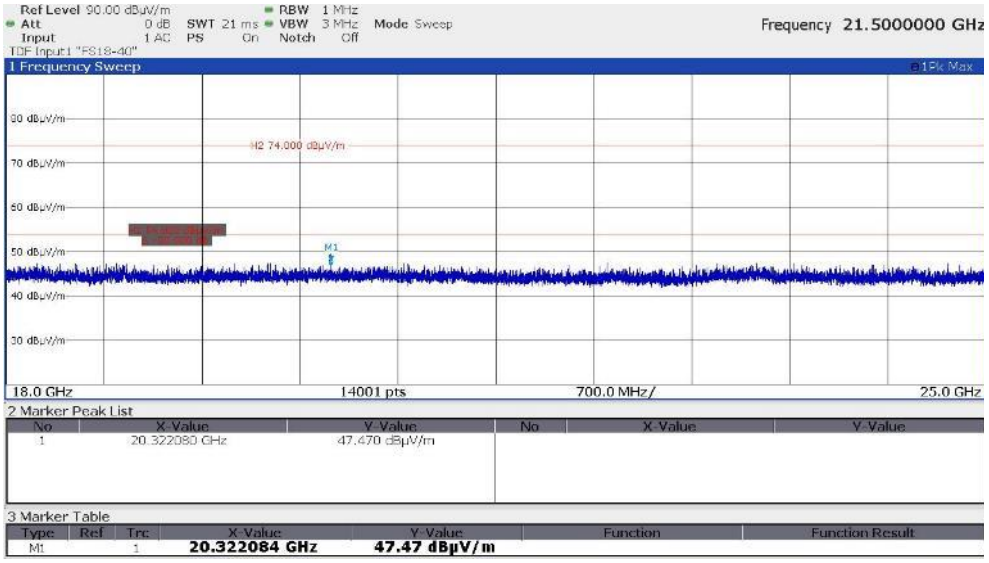


FCC-ID: ESV-ZLXG2 **IC-ID:** 1249A-ZLXG2

BT 3 Mbps CH38 (2440 MHz)

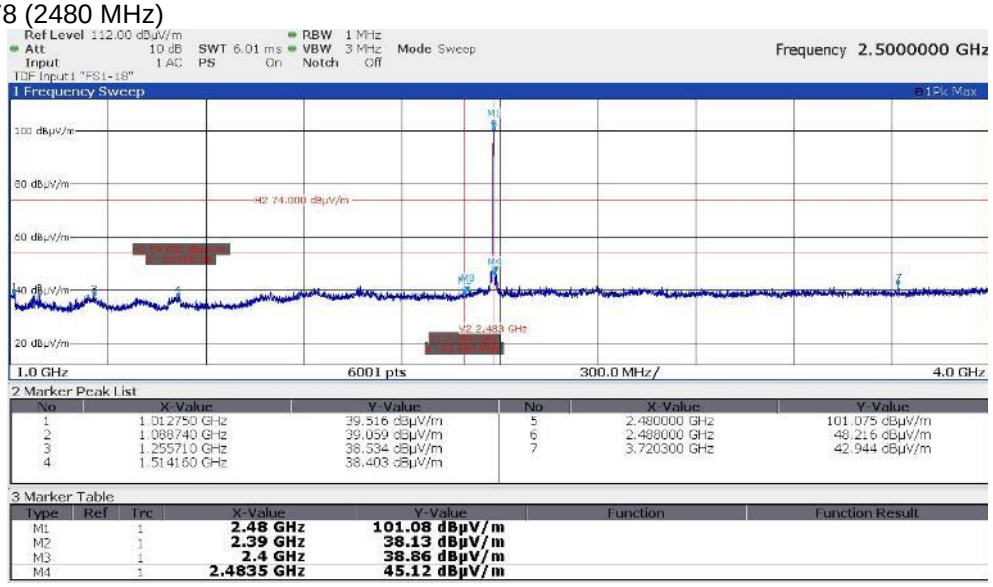


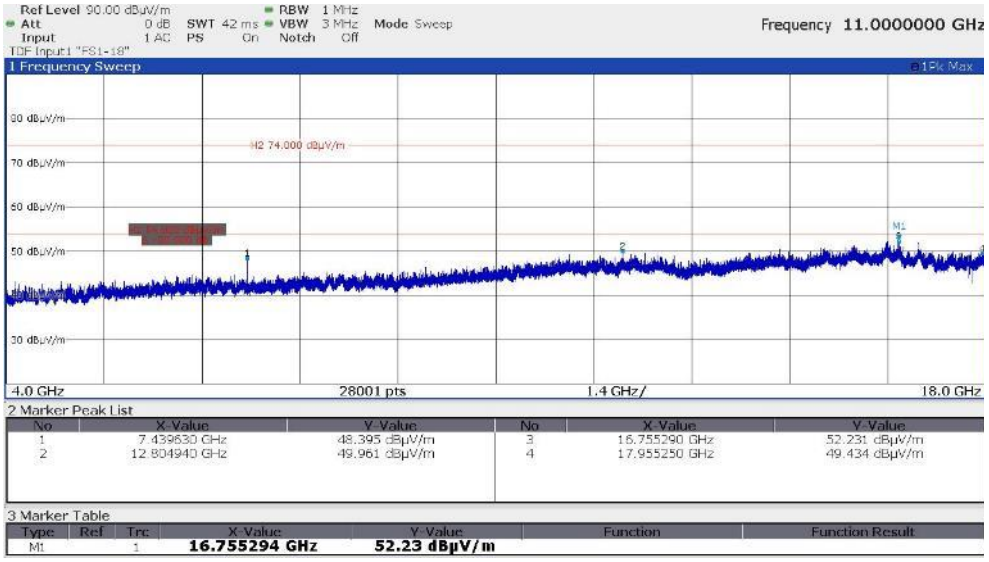


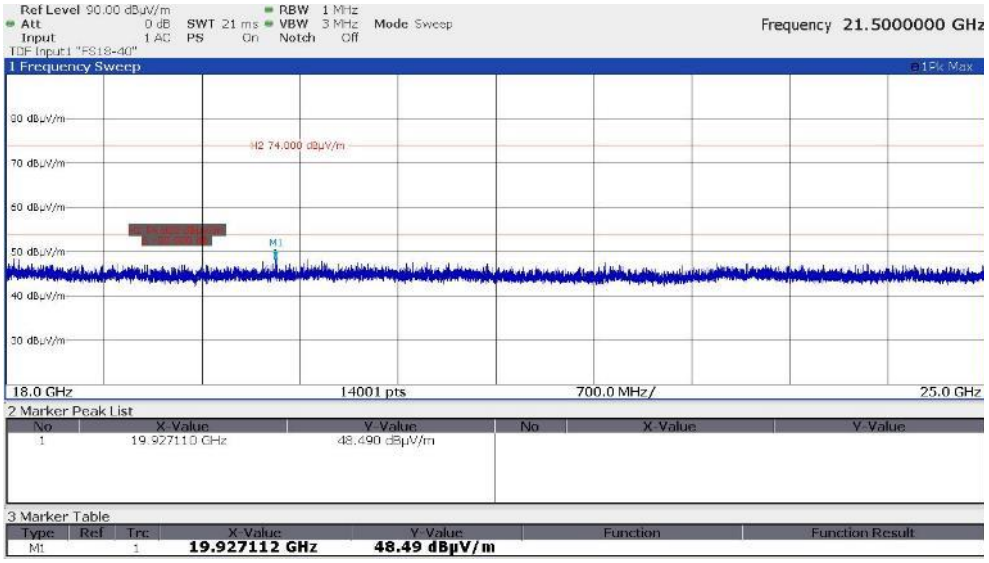


FCC-ID: ESV-ZLXG2 **IC-ID:** 1249A-ZLXG2

BT 3 Mbps CH78 (2480 MHz)

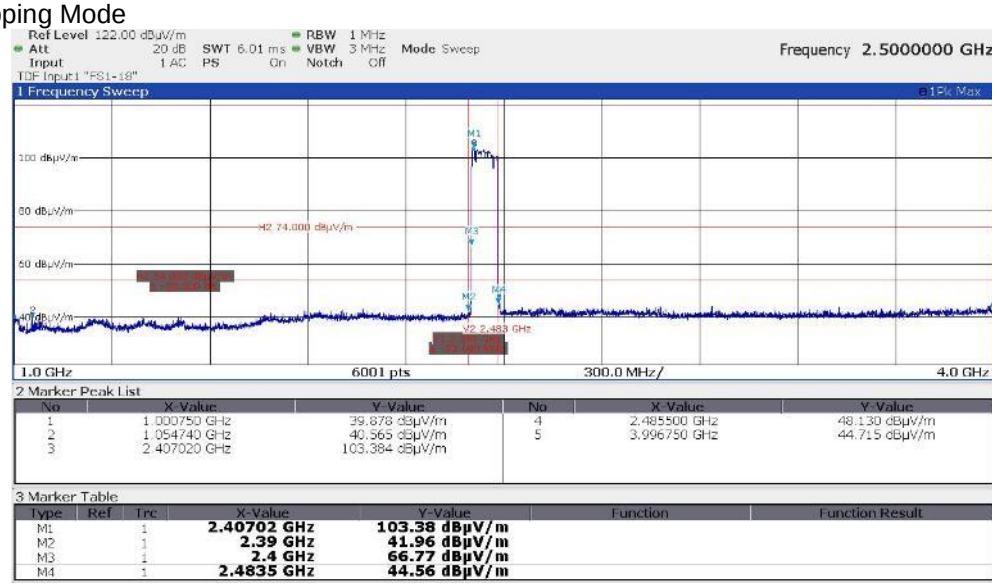


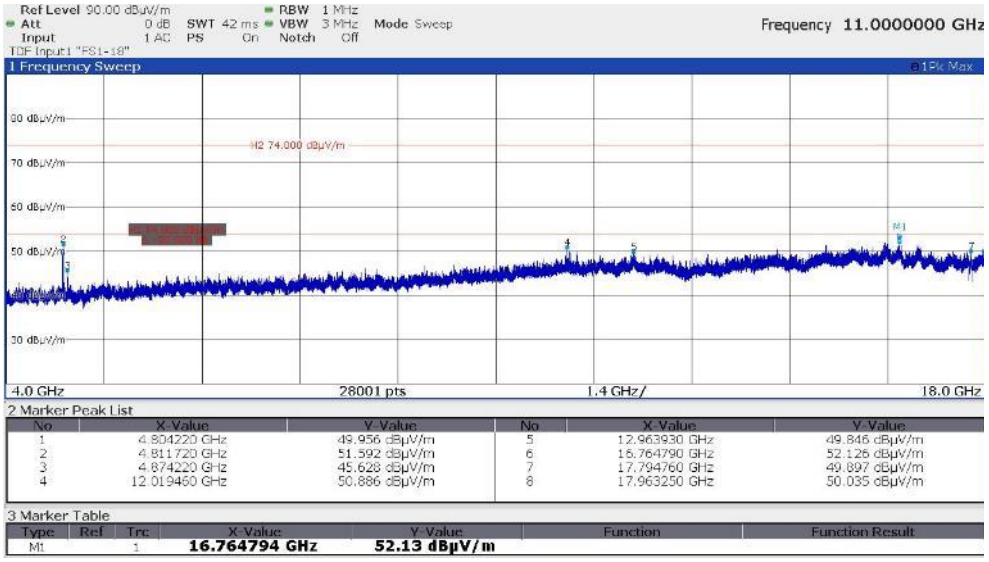


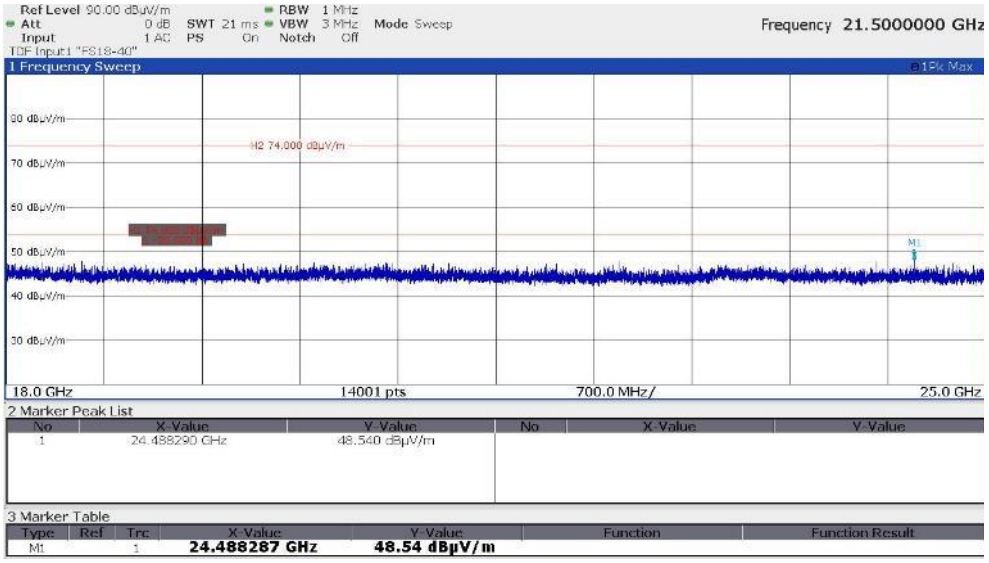


FCC-ID: ESV-ZLXG2 **IC-ID:** 1249A-ZLXG2

BT 3 Mbps Hopping Mode



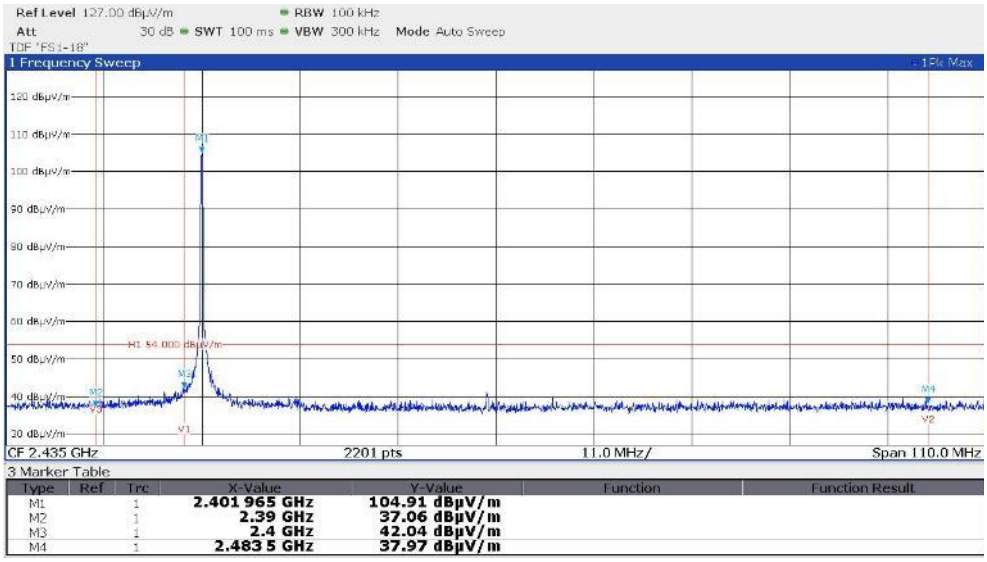




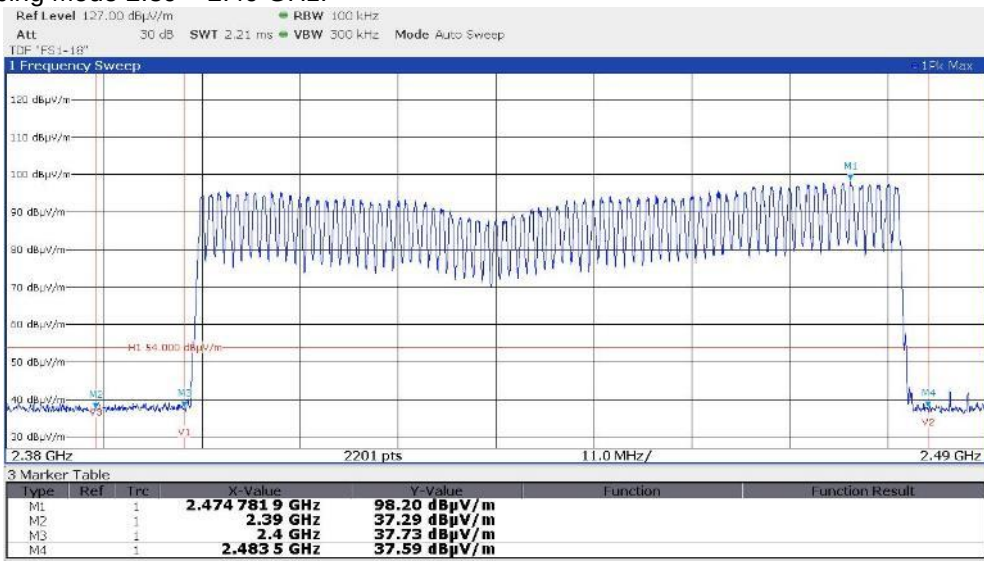
FCC-ID: ESV-ZLXG2 **IC-ID:** 1249A-ZLXG2

2) Measurements of emissions according to spurious emissions limit specified in section 15.247(d) / RSS-247 5.5:

BT 1 Mbps CH0 2.39 – 2.49 GHz:

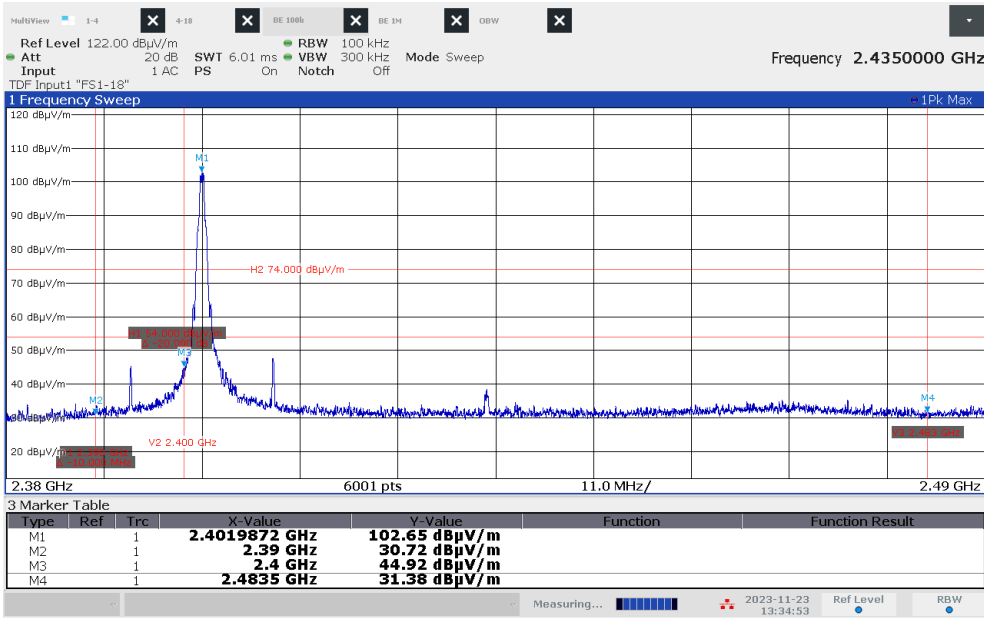


BT 1 Mbps Hopping Mode 2.39 – 2.49 GHz:



FCC-ID: ESV-ZLXG2 **IC-ID:** 1249A-ZLXG2

BT 2 Mbps CH0 2.39 – 2.49 GHz:



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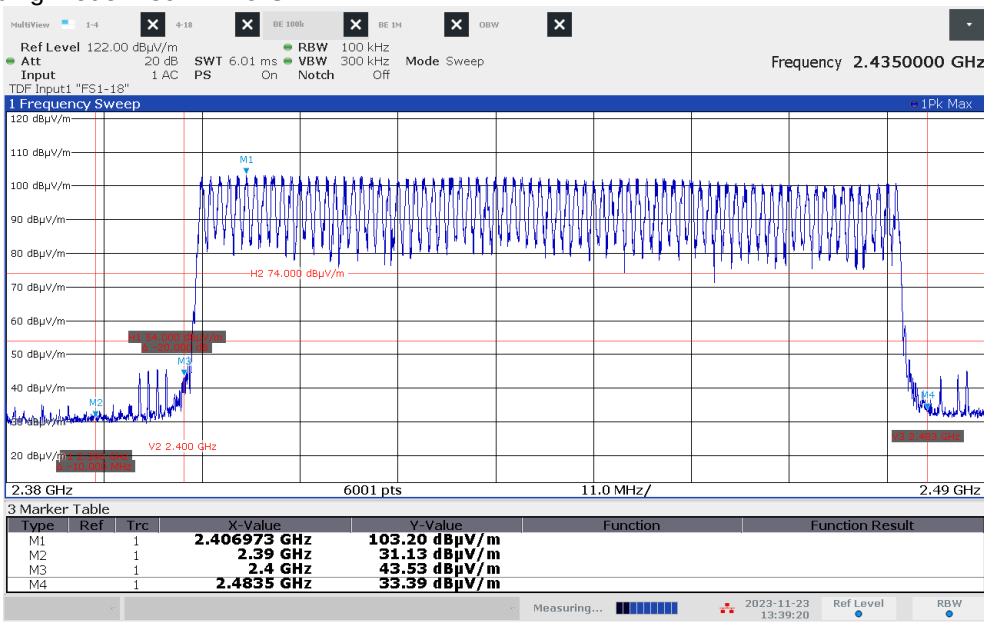
BT 2 Mbps Hopping Mode 2.39 – 2.49 GHz:



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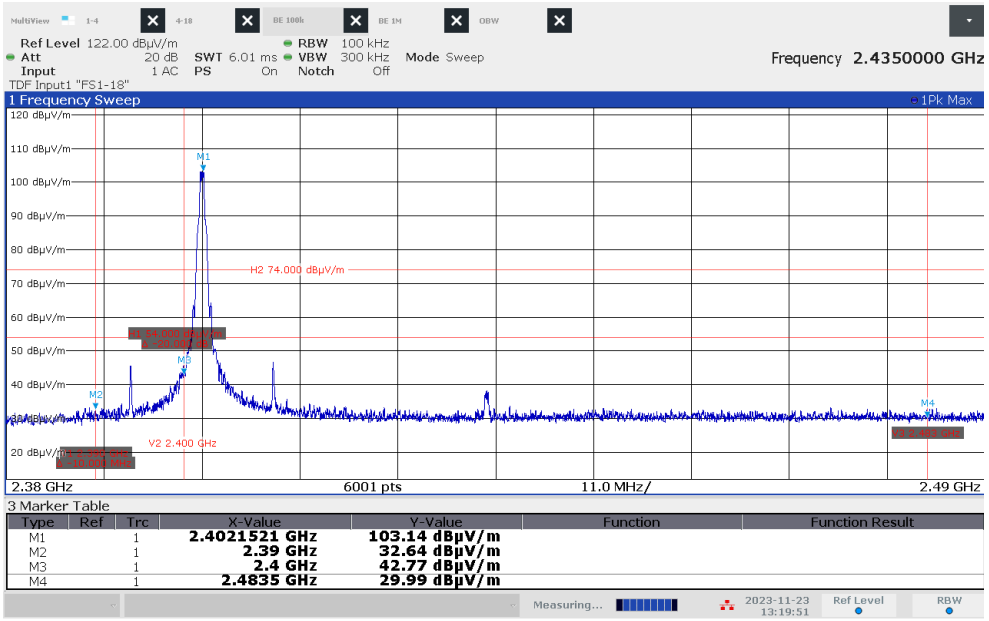
BT 3 Mbps CH0 2.39 – 2.49 GHz:

FCC-ID: ESV-ZLXG2 **IC-ID:** 1249A-ZLXG2



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FCC-ID: ESV-ZLXG2 **IC-ID:** 1249A-ZLXG2

Radiated limits according to FCC Part 15, Section 15.209 for spurious emissions which fall in restricted bands:

Frequency (MHz)	15.209 Limits (µV/m)	Measurement distance (m)
0.009 - -0.49	2400/f(kHz)	300
0.49 – 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

Radiated limits according to RSS-Gen, 8.9 for spurious emissions which fall in restricted bands:

Frequency (MHz)	RSS-Gen Limits (µA/m)	Measurement distance (m)
0.009 - -0.49	63.7/f(kHz)	300
0.49 – 1.705	63.7/f(kHz)	30
1.705 – 30.0	0.08	30

Frequency (MHz)	RSS-Gen Limits (µV/m)	Measurement distance (m)
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

Limit according to FCC Part 15, Section 15.247(d) for emissions falling not in restricted bands:

Frequency (MHz)	Spurious emission limit
Below 1000	20 dB below the highest level of the desired power
Above 1000	20 dB below the highest level of the desired power

Attenuation below the general limits specified in Section 15.209(a) is not required.

Limit according to RSS-247, 5.5 for emissions falling not in restricted bands:

Frequency (MHz)	Spurious emission limit
Below 1000	20 dB below the highest level of the desired power
Above 1000	20 dB below the highest level of the desired power

Attenuation below the general limits specified in RSS-Gen is not required.

FCC-ID: ESV-ZLXG2 **IC-ID:** 1249A-ZLXG2

Restricted bands of operation:

The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209

MHz	MHz	MHz	GHz
0.090 – 0.110	16.42 – 16.423	399.9 – 410	4.5 – 5.15
0.495 – 0.505	16.69475 – 16.69525	608 – 614	5.35 – 5.46
2.1735 – 2.1905	16.80425 – 16.80475	960 – 1240	7.25 – 7.75
4.125 – 4.128	25.5 – 25.67	1300 – 1427	8.025 – 8.5
4.17725 – 4.17775	37.5 – 38.25	1435 – 1626.5	9.0 – 9.2
4.20725 – 4.20775	73 – 74.6	1645.5 – 1646.5	9.3 – 9.5
6.215 – 6.218	74.8 – 75.2	1660 – 1710	10.6 – 12.7
6.26775 – 6.26825	108 – 121.94	1718.8 – 1722.2	13.25 – 13.4
6.31175 – 6.31225	123 – 138	2200 – 2300	14.47 – 14.5
8.291 – 8.294	149.9 – 150.05	2310 – 2390	15.35 – 16.2
8.362 – 8.366	156.52475 – 156.52525	2483.5 – 2500	17.7 – 21.4
8.37625 – 8.38675	156.7 – 156.9	2690 – 2900	22.01 – 23.12
8.41425 – 8.41475	162.0125 – 167.17	3260 – 3267	23.6 – 24.0
12.29 – 12.293	167.72 – 173.2	3332 – 3339	31.2 – 31.8
12.51975 – 12.52025	240 – 285	3345.8 – 3358	36.43 – 36.5
12.57675 – 12.57725	322 – 335.4	3600 – 4400	Above 38.6

RSS-Gen, Table 6 – Restricted Frequency Bands

MHz	MHz	MHz	GHz
0.090 - 0.110	12.57675 - 12.57725	399.9 - 410	7.250 - 7.750
0.495 - 0.505	13.36 - 13.41	608 - 614	8.025 – 8.500
2.1735 - 2.1905	16.42 - 16.423	960 - 1427	9.0 - 9.2
3.020 - 3.026	16.69475 - 16.69525	1435 - 1626.5	9.3 - 9.5
4.125 - 4.128	16.80425 - 16.80475	1645.5 - 1646.5	10.6 - 12.7
4.17725 - 4.17775	25.5 - 25.67	1660 - 1710	13.25 - 13.4
4.20725 - 4.20775	37.5 - 38.25	1718.8 - 1722.2	14.47 - 14.5
5.677 - 5.683	73 - 74.6	2200 - 2300	15.35 - 16.2
6.215 - 6.218	74.8 - 75.2	2310 - 2390	17.7 - 21.4
6.26775 - 6.26825	108 – 138	2483.5 - 2500	22.01 - 23.12
6.31175 - 6.31225	149.9 - 150.05	2655 - 2900	23.6 - 24.0
8.291 - 8.294	156.52475 - 156.52525	3260 – 3267	31.2 - 31.8
8.362 - 8.366	156.7 - 156.9	3332 - 3339	36.43 - 36.5
8.37625 - 8.38675	162.0125 - 167.17	3345.8 - 3358	Above 38.6
8.41425 - 8.41475	167.72 - 173.2	3500 - 4400	
12.29 - 12.293	240 – 285	4500 - 5150	
12.51975 - 12.52025	322 - 335.4	5350 - 5460	

The requirements are **FULFILLED.**

Remarks: The measurement was performed up to the 10th harmonic. Only the worst-case plots are listed.

FCC-ID: ESV-ZLXG2 **IC-ID:** 1249A-ZLXG2

6 USED TEST EQUIPMENT AND ACCESSORIES

All test instruments used are calibrated and verified regularly. The calibration history is available on request.

Test ID	Model Type	Equipment No.	Next Calib.	Last Calib.	Next Verif.	Last Verif.
A 4	BAT-EMC 2022.0.23.0	01-02/68-13-001				
	ESCI	02-02/03-15-001	03/07/2024	03/07/2023		
	ESH 2 - Z 5	02-02/20-05-004	13/10/2025	13/10/2022	17/10/2023	17/04/2023
	N-4000-BNC	02-02/50-05-138				
	ESH 3 - Z 2	02-02/50-05-155	09/11/2025	09/11/2022	25/01/2024	25/07/2023
	SP 103 /3.5-60	02-02/50-05-182				
SER 1	ESVS 30	02-02/03-05-006	27/07/2024	27/07/2023		
	HFH 2 - Z 2	02-02/24-05-020	01/06/2025	01/06/2022	05/09/2024	05/09/2023
	NW-2000-NB	02-02/50-05-113				
	KK-EF393/U-16N-21N20 m	02-02/50-12-018				
	KK-SD_7/8-2X21N-33,0M	02-02/50-15-028				
	50F-003 N 3 dB	02-02/50-21-010				
SER 2	ESVS 30	02-02/03-05-006	27/07/2024	27/07/2023		
	VULB 9168	02-02/24-05-005	20/04/2024	20/04/2023	03/05/2024	03/05/2023
	NW-2000-NB	02-02/50-05-113				
	KK-EF393/U-16N-21N20 m	02-02/50-12-018				
	KK-SD_7/8-2X21N-33,0M	02-02/50-15-028				
	50F-003 N 3 dB	02-02/50-21-010				
SER 3	FSW43	02-02/11-15-001	04/05/2024	04/05/2023		
	AMF-6D-01002000-22-10P	02-02/17-15-004				
	LNA-40-18004000-33-5P	02-02/17-20-002				
	3117	02-02/24-05-009	12/07/2024	12/07/2023		
	BBHA 9170	02-02/24-05-013	21/03/2026	21/03/2023	21/03/2024	21/03/2023
	BAM 4.5-P	02-02/50-17-024				
	NCD	02-02/50-17-025				
	KK-SF106-2X11N-6,5M	02-02/50-18-016				
	KMS116-GL140SE-KMS116-	02-02/50-20-026				
	BAT-EMC 2022.0.23.0	02-02/68-13-001				