



FCC RADIO TEST REPORT

FCC ID : MG3-FLZWLR
Equipment : UEI/Ecolink Z-Wave Long Range Flood Freeze Sensor
Brand Name : Ecolink
Model Name : FLZWLR-ECO
Marketing Name : Ecolink
Applicant : Universal Electronics
15147 N Scottsdale Rd Ste H300, Scottsdale, AZ
85254
Manufacturer : Universal Electronics
15147 N Scottsdale Rd Ste H300, Scottsdale, AZ
85254
Standard : FCC Part 15 Subpart C §15.247

The product was received on Feb. 24, 2026 and testing was performed from Mar. 15, 2026 to Apr. 08, 2026. We, Sporton International (USA) Inc., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval from Sporton International (USA) Inc., the test report shall not be reproduced except in full.

Approved by: Neil Kao

Sporton International (USA) Inc.
1175 Montague Expressway, Milpitas, CA 95035



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History of this test report

Report No.	Version	Description	Issue Date
FR251118001A	01	Initial issue of report	May 19, 2026

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	15.247(a)(2)	6dB Bandwidth	Pass	-
3.1	2.1049	99% Occupied Bandwidth	Pass	-
3.2	15.247(b)(3) 15.247(b)(4)	Output Power	Pass	-
3.3	15.247(e)	Power Spectral Density	Pass	-
3.4	15.247(d)	Conducted Band Edges and Spurious Emission	Pass	-
3.5	15.247(d)	Radiated Band Edges and Spurious Emission	Pass	-
-	15.207	AC Conducted Emission	Not Required	See Note
3.6	15.203	Antenna Requirement	Pass	-

Note: The power source method of the EUT is to use DC power source, and there is no other AC power port, after assessing, AC Conduction Emission test is not required.

Conformity Assessment Condition:

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacture who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
2. The measurement uncertainty please refer to each test result in the section "Measurement Uncertainty".

Disclaimer:

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.



1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature		
General Specs Zigbee-Z-wave		
Antenna Type PCB Trace Antenna		
Antenna information		
902 MHz ~ 928 MHz	Peak Gain (dBi)	-8.05

Remark: The EUT's information above is declared by manufacturer. Please refer to Disclaimer in report summary.

1.2 Modification of EUT

No modifications made to the EUT during the testing.

1.3 Testing Location

Test Site	Sporton International (USA) Inc.
Test Site Location	1175 Montague Expressway, Milpitas, CA 95035 TEL : 408 9043300
Test Site No.	Sporton Site No.
	TH01-CA, 03CH02-CA

FCC Designation No.: US1250

1.4 Applicable Standards

According to the specifications declared by the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ FCC KDB Publication No. 558074 D01 15.247 Meas Guidance v05r02
- ♦ FCC KDB 414788 D01 Radiated Test Site v01r01
- ♦ FCC Part 15 Subpart C §15.247
- ♦ ANSI C63.10-2020 + Cor.1-2023

Remark:

1. All the test items were validated and recorded in accordance with the standards without any modification during the testing.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

2 Test Configuration of Equipment Under Test

2.1 Carrier Frequency Channel

Frequency Band	Freq. (MHz)	Freq. (MHz)
902-928 MHz	912	920

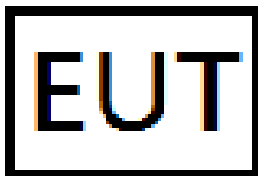
2.2 Test Mode

- a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, the measured emission level of the EUT was maximized by rotating the EUT on a turntable, adjusting the orientation of the EUT and EUT antenna in three orthogonal axis (X: flat, Y: portrait, Z: landscape), and adjusting the measurement antenna orientation, following C63.10 exploratory test procedures and only the worst case emissions were reported in this report.

The following summary table is showing all test modes to demonstrate in compliance with the standard.

Summary table of Test Cases	
Test Item	Data Rate / Modulation
Conducted Test Cases	Z-wave LR /DSSS-OQPSK
	Mode 1: Z-wave Tx _912 MHz_100kbps
	Mode 2: Z-wave Tx _920 MHz_100kbps
Remark: - For radiation spurious emission, the modulation and the data rate picked for testing are determined by the Max. RF conducted power. - The detailed Radiated test modes are shown in Appendix B.	

2.3 Connection Diagram of Test System



2.4 EUT Operation Test Setup

The RF test items, utility “Tera Term Version 5.0” was installed in laptop which was programmed in order to make the EUT get into the engineering modes to provide channel selection, power level, data rate and the application type and for continuous transmitting signals.

2.5 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example :

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 4.2 dB and 10 dB attenuator.

$$\begin{aligned}\text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)} \\ &= 4.2 + 10 = 14.2 \text{ (dB)}\end{aligned}$$

3 Test Result

3.1 6dB and 99% Bandwidth Measurement

3.1.1 Limit of 6dB and 99% Bandwidth

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

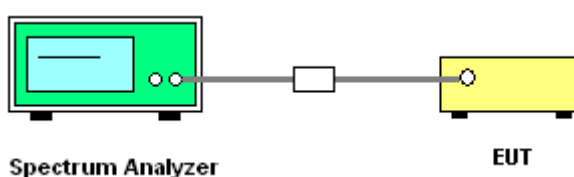
3.1.2 Measuring Instruments

Please refer to the measuring equipment list in this test report.

3.1.3 Test Procedures

1. The testing follows the ANSI C63.10 Section 6.9.3 (OBW) and 11.8.1 (6dB BW).
2. The RF output of EUT is connected to the spectrum analyzer by RF cable and attenuator. The path loss is compensated to the results for each measurement.
3. Set the maximum power setting and enable the EUT to transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 1% to 5% of the OBW but not less than 100 kHz. Set the Video bandwidth VBW $\geq 3 * RBW$. In order to make an accurate measurement. The 6dB bandwidth must be greater than 500 kHz.
5. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1-5% of the emission bandwidth, and set the Video bandwidth (VBW) $\geq 3 * RBW$.
6. Measure and record the results in the test report.

3.1.4 Test Setup



3.1.5 Test Result of 6dB Bandwidth

Please refer to Appendix A.

3.1.6 Test Result of 99% Occupied Bandwidth

Please refer to Appendix A.

3.2 Output Power Measurement

3.2.1 Limit of Output Power

For systems using digital modulation in the 2400-2483.5 MHz, the limit for output power is 30 dBm. If transmitting antenna of directional gain greater than 6 dBi is used, the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

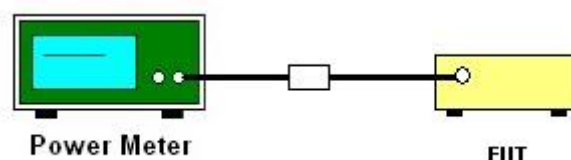
3.2.2 Measuring Instruments

Please refer to the measuring equipment list in this test report.

3.2.3 Test Procedures

1. For Average Power, the testing follows ANSI C63.10 Section 11.9.2.3.2 Method AVGPM-G
2. The RF output of EUT is connected to the power meter by RF cable and attenuator.
3. The path loss is compensated to the results for each measurement.
4. Set the maximum power setting and enable the EUT to transmit continuously.
5. Measure the conducted output power and record the results in the test report.

3.2.4 Test Setup



3.2.5 Test Result of Average Output Power

Please refer to Appendix A.

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8 dBm in any 3 kHz band at any time interval of continuous transmission.

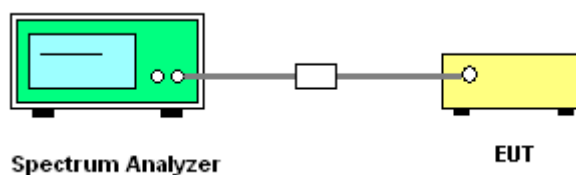
3.3.2 Measuring Instruments

Please refer to the measuring equipment list in this test report.

3.3.3 Test Procedures

1. The testing follows the ANSI C63.10 Section 11.10.2 Method PKPSD.
2. The RF output of EUT is connected to the spectrum analyzer by RF cable and attenuator. The path loss is compensated to the results for each measurement.
3. Set the maximum power setting and enable the EUT to transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth (VBW) = 10 kHz. In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6 dB BW)
5. Detector = peak, Sweep time = No faster than coupled (auto) time, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
6. Measure and record the results in the test report.
7. The Measured power density (dBm)/ 100 kHz is a reference level and is used as 20 dBc down limit line for Conducted Band Edges and Conducted Spurious Emission.

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission

All harmonics/spurious must be at least 30 dB down from the highest emission level within the authorized band.

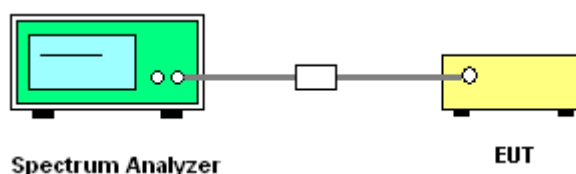
3.4.2 Measuring Instruments

Please refer to the measuring equipment list in this test report.

3.4.3 Test Procedure

1. The testing follows the ANSI C63.10 Section 11.11.3 Emission level measurement.
2. The RF output of EUT is connected to the spectrum analyzer by RF cable and attenuator. The path loss is compensated to the results for each measurement.
3. Set the maximum power setting and enable the EUT to transmit continuously.
4. Set RBW = 100 kHz, VBW = 300 kHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.4.4 Test Setup



3.4.5 Test Result of Conducted Band Edges Plots

Please refer to Appendix A.

3.4.6 Test Result of Conducted Spurious Emission Plots

Please refer to Appendix A.

3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated Band Edges and Spurious Emission

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. 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 instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the limits as below.

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

3.5.2 Measuring Instruments

Please refer to the measuring equipment list in this test report.

3.5.3 Test Procedures

1. The testing follows the ANSI C63.10 Section 11.12.1 Radiated emission measurements.
2. The EUT is arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT is placed on a turntable with 0.8 meter for frequency below 1 GHz and 1.5 meter for frequency above 1 GHz respectively above ground.
4. The EUT is set 3 meters away from the receiving antenna, which is mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. Radiated testing below 1 GHz is performed by adjusting the antenna tower from 1 m to 4 m and by rotating the turn table from 0 degree to 360 degrees to find the peak maximum hold reading. When there is no suspected emission found and the emission level is with at least 6 dB margin against QP limit line, the position is marked as “-”.
7. Radiated testing above 1 GHz is performed by adjusting the antenna tower from 1 m to 4 m and by rotating the turn table from 0 degree to 360 degrees to find the peak maximum hold reading for scanning all frequencies. When there is no suspected emission found and the harmonic emission level is with at least 6 dB margin against average limit line, the position is marked as “-”.
8. Use the following spectrum analyzer settings:
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Set RBW = 100 kHz for $f < 1$ GHz; VBW $\geq$ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW = 3 MHz for $f \geq 1$ GHz for peak measurement.
For average measurement:
Set RBW = 1 MHz, VBW = 3 MHz for $f \geq 1$ GHz for peak measurement.
For average measurement:
Applied protocol-limited duty cycle measurement method as per KDB 558074 D01 QA.3
Subtracted the Peak reading to derive the RMS average value.

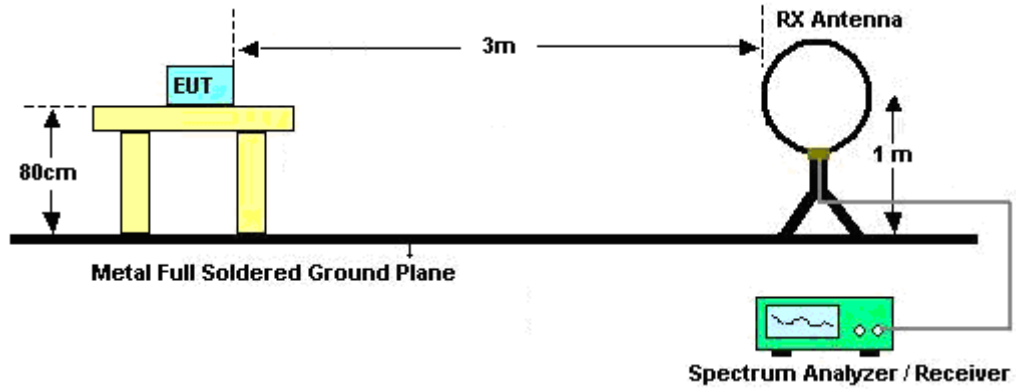
Calculation example,

Duty Cycle percentage is limited to maximum 20.9%, duty factor = $20\log(0.2009) = -13.6(\text{dB})$. Average value = Peak value (59.06dBuV/m) – 13.6 (dB) = 45.46 dBuV/m.

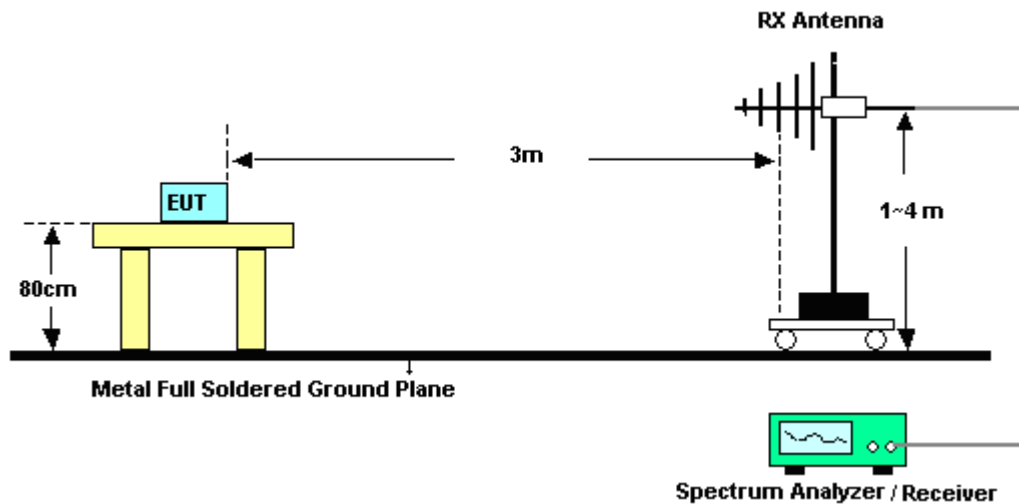
Detailed method to limit duty cycle will be addressed at the operation description from manufacturer.

3.5.4 Test Setup

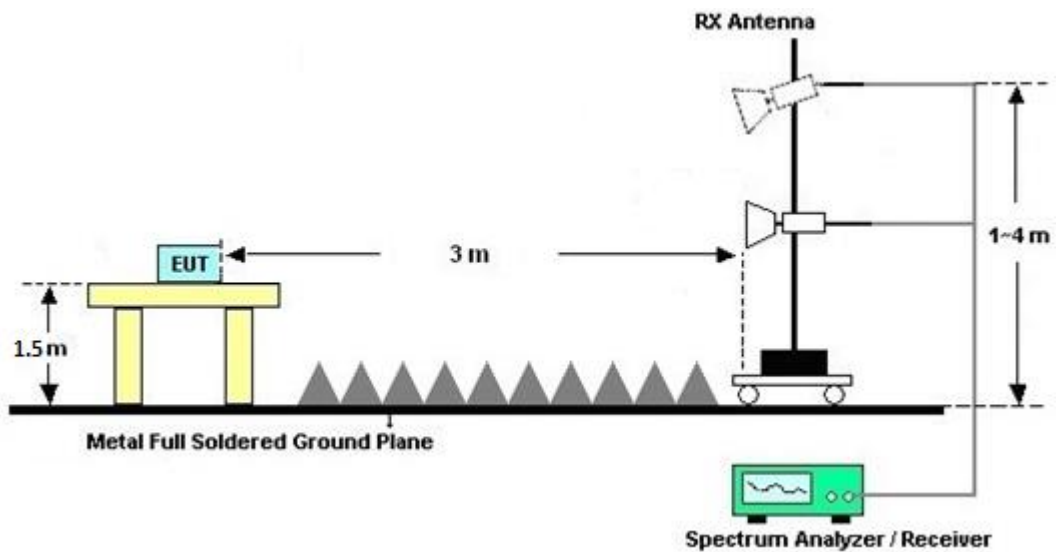
For radiated test below 30MHz



For radiated test from 30MHz to 1GHz



For radiated test above 1GHz





3.5.5 Test Results of Radiated Spurious Emissions (9 kHz ~ 30 MHz)

There is adequate comparison measurement of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result comes out very similar.

3.5.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix B.

3.5.7 Duty Cycle

Please refer to Appendix C.

3.5.8 Test Result of Radiated Spurious Emission (30 MHz ~ 10th Harmonic)

Please refer to Appendix B.



3.6 Antenna Requirements

3.6.1 Standard Applicable

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.

3.6.2 Antenna Anti-Replacement Construction

Antenna permanently attached.



4 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Hygrometer	Testo	608-H1	45141354	N/A	Aug. 08, 2025	Apr. 08, 2026	Aug. 07, 2026	Conducted (TH01-CA)
Power Sensor	Dare Instruments	RPR3006W	RPR6W-1901027	10MHz~6GHz	Apr. 17, 2025	Apr. 08, 2026	Apr. 16, 2026	Conducted (TH01-CA)
Switch Box	EM Electronics	EMSW18	SW1070902	N/A	Jun. 04, 2025	Apr. 08, 2026	Jun. 03, 2026	Conducted (TH01-CA)
Spectrum Analyzer	Rohde & Schwarz	FSV40	101545	10Hz~40GHz	Apr. 17, 2025	Apr. 08, 2026	Apr. 16, 2026	Conducted (TH01-CA)
Bilog Antenna	TESEQ	6111D	50392	30MHz~1GHz	Aug.25, 2025	Mar. 15, 2026~ Mar. 17, 2026	Aug.24, 2026	Radiation (03CH02-CA)
Loop Antenna	R&S	HFH2-Z2E	100840	9kHz~30MHz	Apr.28, 2025	Mar. 15, 2026~ Mar. 17, 2026	Apr.27,2026	Radiation (03CH02-CA)
Horn Antenna	SCHWARZBECK	BBHA 9120D	02140	1GHz~18GHz	Feb.23, 2026	Mar. 15, 2026~ Mar. 17, 2026	Feb.22,2027	Radiation (03CH02-CA)
Spectrum Analyzer	Keysight	N9010A	MY57420221	10Hz~44GHz	Aug.18, 2025	Mar. 15, 2026~ Mar. 17, 2026	Aug.17,2026	Radiation (03CH02-CA)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA9170	00841	18GHz~40GHz	Aug.08, 2025	Mar. 15, 2026~ Mar. 17, 2026	Aug.07, 2026	Radiation (03CH02-CA)
Amplifier	SONOMA	310N	372240	9kHz~1GHz	Apr.14, 2025	Mar. 15, 2026~ Mar. 17, 2026	Apr.13, 2026	Radiation (03CH02-CA)
Preamplifier	Keysight	83017A	MY53270321	1GHz~26.5GHz	Apr.14, 2025	Mar. 15, 2026~ Mar. 17, 2026	Apr.13, 2026	Radiation (03CH02-CA)
Preamplifier	E-instrument	ERA-100M-18G-56-01-A70	EC1900251	1GHz~18GHz	Apr.14, 2025	Mar. 15, 2026~ Mar. 17, 2026	Apr.13, 2026	Radiation (03CH02-CA)
Preamplifier	EMEC	EMC18G40G	060726	18G-40G	Apr.15, 2025	Mar. 15, 2026~ Mar. 17, 2026	Apr.14, 2026	Radiation (03CH02-CA)
RF Cable	HUBER+SUHNER、EMCI	SUCOFLEX 102、EMC101Y-KM-KM	805581/2、802860/2、250709	N/A	Dec.02, 2025	Mar. 15, 2026~ Mar. 17, 2026	Dec.01, 2026	Radiation (03CH02-CA)
Hygrometer	TESEO	608-H1	45142602	N/A	Aug. 08, 2025	Mar. 15, 2026~ Mar. 17, 2026	Aug. 07, 2026	Radiation (03CH02-CA)
Controller	Chaintek	EM-1000	060876	Control Turn Table & Antenna Mast	N/A	Mar. 15, 2026~ Mar. 17, 2026	N/A	Radiation (03CH02-CA)
Antenna Mast	ChainTek	MBS-520-1	N/A	1m~4m	N/A	Mar. 15, 2026~ Mar. 17, 2026	N/A	Radiation (03CH02-CA)
Turn Table	ChainTek	T-200-S-1	N/A	0~360 Degree	N/A	Mar. 15, 2026~ Mar. 17, 2026	N/A	Radiation (03CH02-CA)
Test Software	Audix E3	E3	N/A	N/A	N/A	Mar. 15, 2026~ Mar. 17, 2026	N/A	Radiation (03CH02-CA)



5 Measurement Uncertainty

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.10 dB
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Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.30 dB
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Appendix A. Test Result of Conducted Test Items

Test Engineer:	Liliana Gonzalez	Temperature:	19.2	°C
Test Date:	04/08/2026	Relative Humidity:	47.4	%

TEST RESULTS DATA
6dB and 99% Occupied Bandwidth

Mod.	Data Rate	NTX	Freq. (MHz)	99% Occupied BW (MHz)	6dB BW (MHz)	6dB BW Limit (MHz)	Pass/Fail
Z-Wave	100kbps	1	912	0.860	0.553	0.50	Pass
Z-Wave	100kbps	1	920	0.859	0.553	0.50	Pass

TEST RESULTS DATA
Average Power Table

Mod.	Data Rate	NTX	Freq. (MHz)	Average Conducted Power (dBm)	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail	Power Setting
Z-Wave	100kbps	1	912	14.27	30.00	-8.05	6.22	36.00	Pass	14
Z-Wave	100kbps	1	920	14.24	30.00	-8.05	6.19	36.00	Pass	14

TEST RESULTS DATA
Peak Power Density

Mod.	Data Rate	NTX	Freq. (MHz)	Peak PSD (dBm /100kHz)	Peak PSD (dBm /3kHz)	DG (dBi)	Peak PSD Limit (dBm /3kHz)	Pass/Fail
Z-Wave	100kbps	1	912	14.12	4.53	-8.05	8.00	Pass
Z-Wave	100kbps	1	920	14.07	4.49	-8.05	8.00	Pass

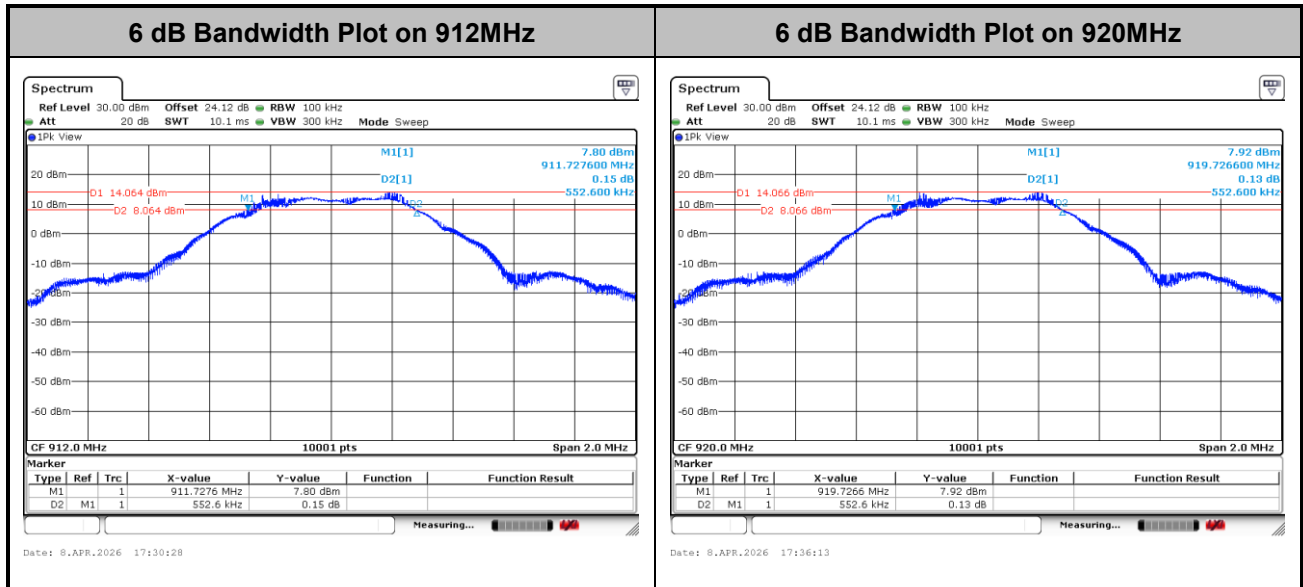
Note: PSD (dBm/ 100kHz) is a reference level used for Conducted Band Edges and Conducted Spurious Emission 30dBc limit.



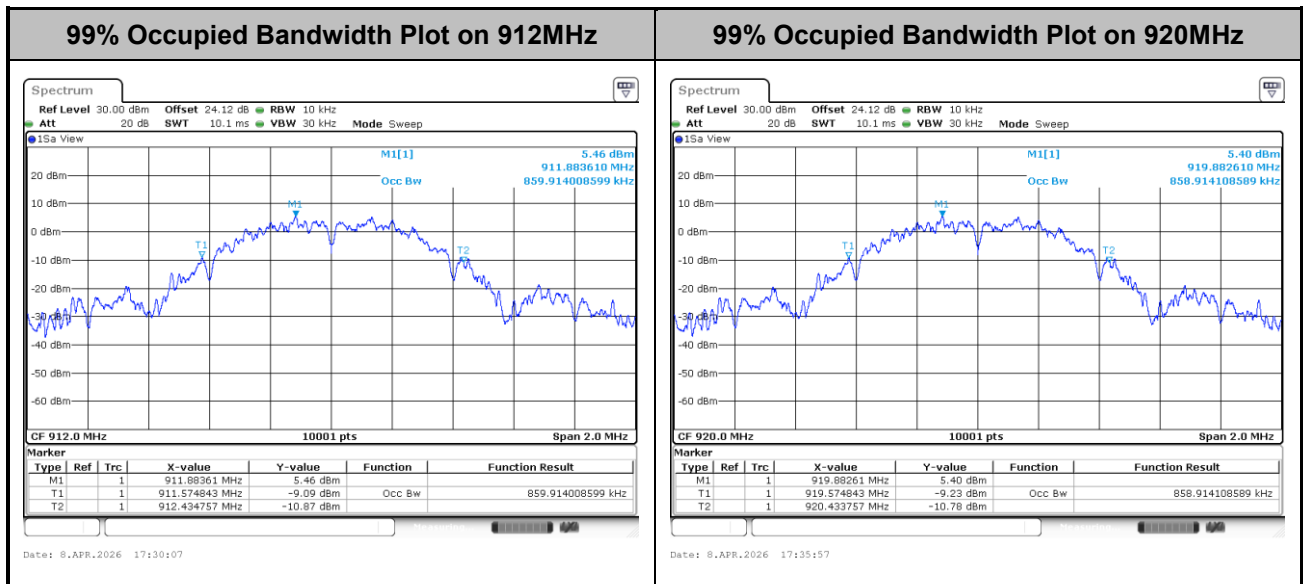
Number of TX = 1, Ant. 1 (Measured)

6dB Bandwidth

<100kpbs>

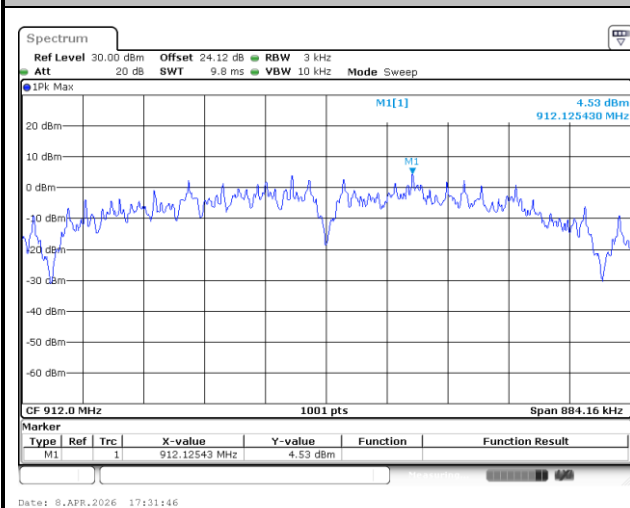
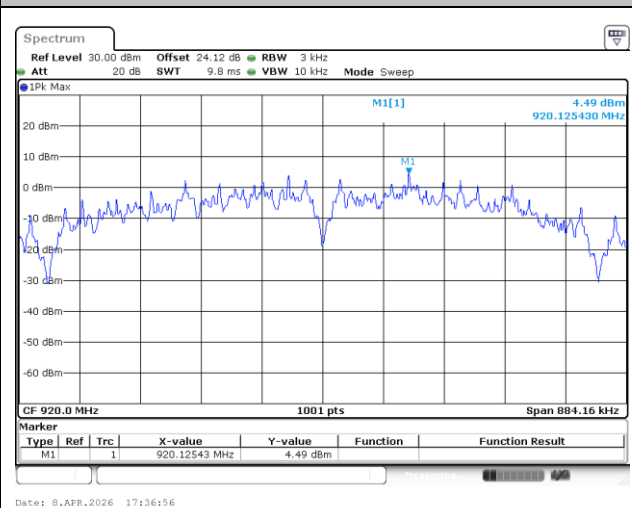
**99% Occupied Bandwidth**

<100kpbs>



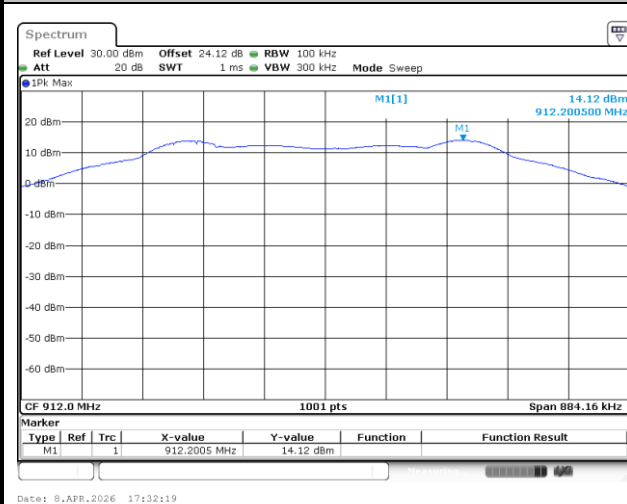
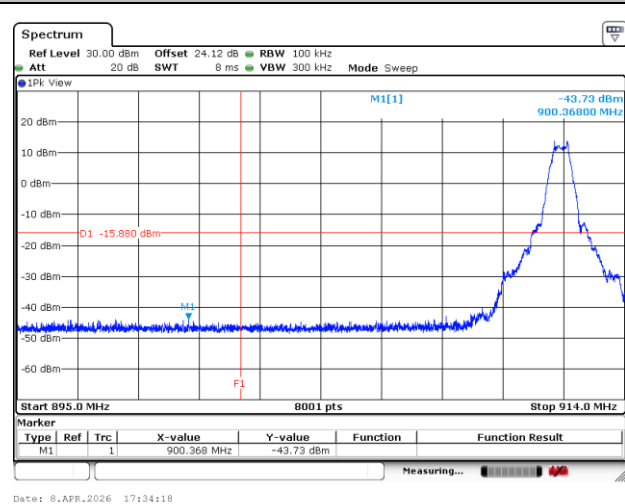
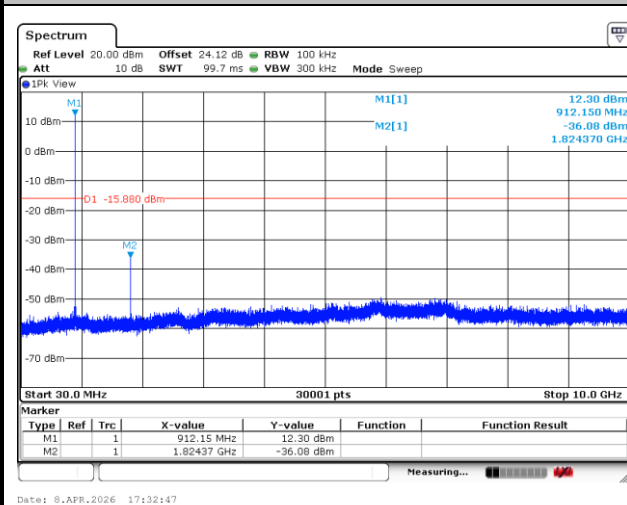
**Power Spectral Density (dBm/3kHz)**

<100kbps>

Power Density (dBm/3kHz) Plot 912MHz**Power Density (dBm/3kHz) Plot 920MHz**

**Band Edge and Conducted Spurious Emission**

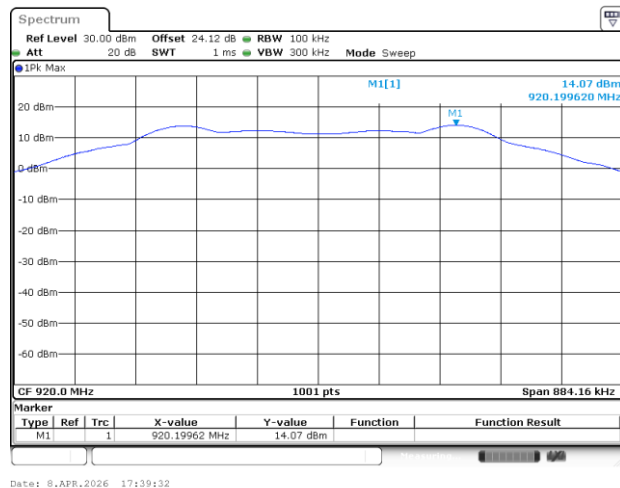
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912MHz**100kHz PSD reference Level Plot****Plot on 912MHz****Spurious Emission 30MHz~10GHz Plot**

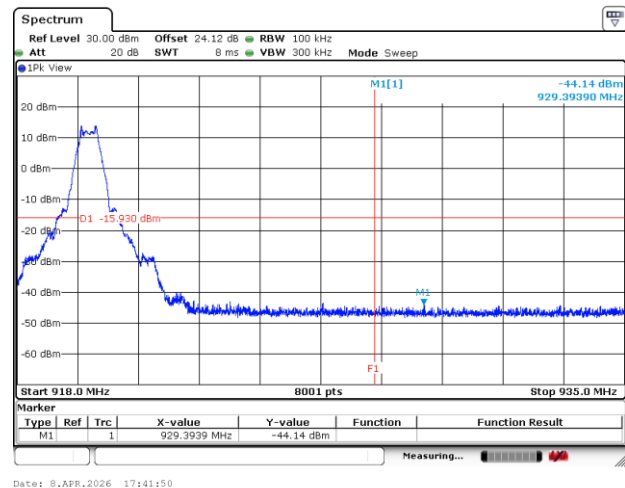


920MHz

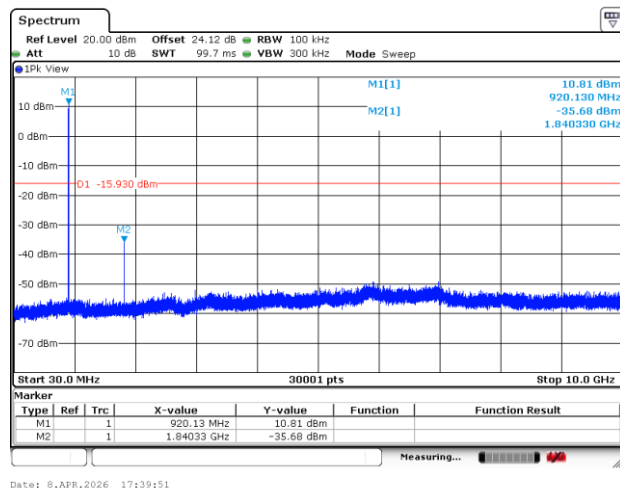
100kHz PSD reference Level Plot



Plot on 920MHz



Spurious Emission 30MHz~10GHz Plot



Appendix B. Radiated Spurious Emission Test Data

Test Engineer :	Kevin Hsu	Relative Humidity :	41.7~56.2%
		Temperature :	17.8~23.6°C

B1. Radiated Spurious Emission Test Modes

Mode	Band (MHz)	Antenna	Modulation	Channel	Frequency (MHz)	Data Rate	RU	Remark
Mode 1	902-928	SISO	Z-wave LR OQPSK	-	912.00	100kbps	-	
Mode 2	902-928	SISO	Z-wave LR OQPSK	-	920.00	100kbps	-	

B2. Summary of each worse mode

Mode	Modulation	Ch.	Freq. (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol.	Peak Avg.	Result	RU	Remark
1	Z-wave LR OQPSK	-	956.35	39.19	46.00	-6.81	H	Peak	Pass	-	LF
	Z-wave LR OQPSK	-	2736.00	45.46	54.00	-8.54	H	Avg.	Pass	-	Harmonic
2	Z-wave LR OQPSK	-	959.26	39.59	46.00	-6.41	H	Peak	Pass	-	LF
	Z-wave LR OQPSK	-	3680.00	45.08	54.00	-8.92	H	Avg.	Pass	-	Harmonic



1

Mode

Harmonic

Z-wave LR 912.00MHz

ANT

SISO

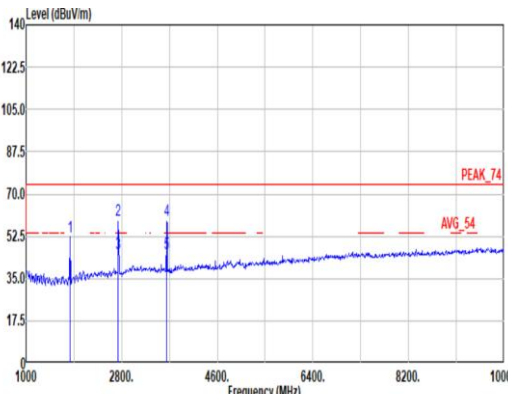
Pol.

Horizontal

Vertical

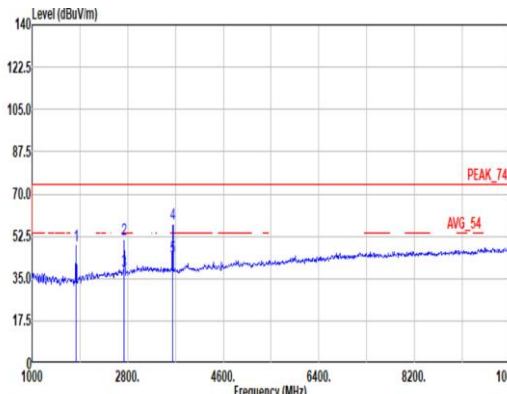
Peak

Avg



Site : 03CH02-CA
Condition: PEAK_74 3m HORN_02140_260223 HORIZONTAL

	Limit	Read	Ant	Cable	Preamp	Aux	APos	TPos	Remark
Freq	Level	Line Margin	Level Factor	Loss Factor	Factor	Factor			
MHz	dBuV/m	dB	dB	dB/m	dB	dB	dB	cm	deg
1 1824.00	52.50	74.00	-21.50	87.76	25.42	6.53	67.62	0.41	--
2 2736.00	59.06	74.00	-14.94	89.43	28.31	8.06	67.13	0.39	100 250 Peak
3 2736.00	45.46	54.00	-8.54	--	--	--	--	--	-- Average
4 3648.00	58.97	74.00	-15.03	87.07	29.72	9.03	67.16	0.31	100 235 Peak
5 3648.00	45.37	54.00	-8.63	--	--	--	--	--	-- Average



Site : 03CH02-CA
Condition: PEAK_74 3m HORN_02140_260223 VERTICAL

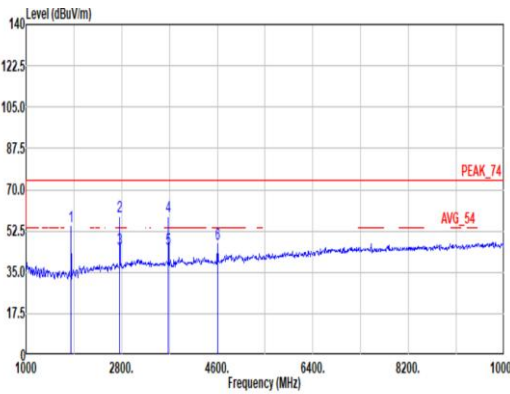
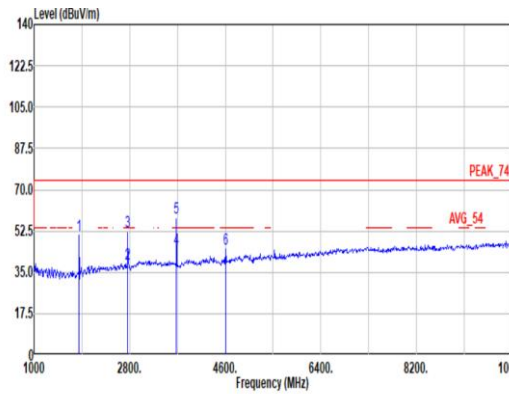
	Limit	Read	Ant	Cable	Preamp	Aux	APos	TPos	Remark
Freq	Level	Line Margin	Level Factor	Loss Factor	Factor	Factor			
MHz	dBuV/m	dB	dB	dB/m	dB	dB	dB	cm	deg
1 1824.00	48.42	74.00	-25.58	83.71	25.39	6.53	67.62	0.41	--
2 2736.00	51.51	74.00	-22.49	81.88	28.31	8.06	67.13	0.39	381 214 Peak
3 2736.00	37.91	54.00	-16.09	--	--	--	--	--	-- Average
4 3648.00	57.33	74.00	-16.67	85.40	29.75	9.03	67.16	0.31	400 200 Peak
5 3648.00	43.73	54.00	-10.27	--	--	--	--	--	-- Average



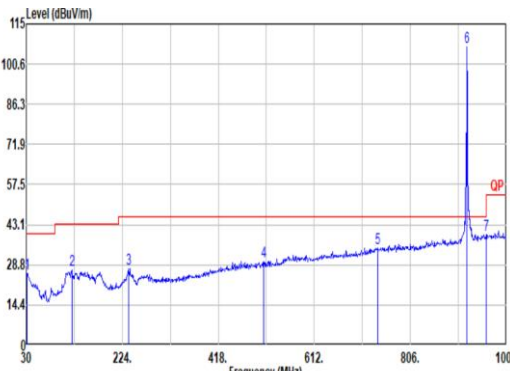
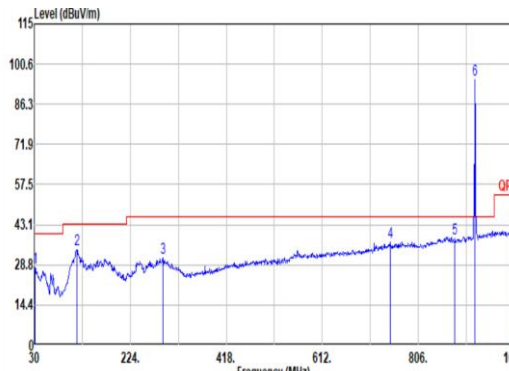
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QP/ Peak	Site : 03CH02-CA Condition: QP 3m B1LOG_50392_250025 HORIZONTAL <table><tr><th></th><th>Limit</th><th>Read</th><th>Ant</th><th>Cable</th><th>Preamp</th><th>Aux</th><th>APos</th><th>TPos</th><th>Remark</th></tr><tr><th>Freq</th><th>Level</th><th>Line</th><th>Margin</th><th>Level</th><th>Factor</th><th>Loss</th><th>Factor</th><th>Factor</th><th></th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dBuV/m</th><th>dB</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>dB</th><th>dB</th><th>cm deg</th></tr><tr><td>1</td><td>30.97</td><td>26.57</td><td>40.00</td><td>-13.43</td><td>33.93</td><td>24.15</td><td>0.88</td><td>32.46</td><td>0.07 -- -- Peak</td></tr><tr><td>2</td><td>122.15</td><td>29.98</td><td>43.50</td><td>-13.52</td><td>43.06</td><td>17.59</td><td>1.67</td><td>32.45</td><td>0.11 -- -- Peak</td></tr><tr><td>3</td><td>235.64</td><td>27.27</td><td>46.00</td><td>-18.73</td><td>40.46</td><td>16.00</td><td>2.33</td><td>32.49</td><td>0.17 -- -- Peak</td></tr><tr><td>4</td><td>501.42</td><td>29.89</td><td>46.00</td><td>-16.11</td><td>35.11</td><td>23.91</td><td>3.33</td><td>32.68</td><td>0.22 -- -- Peak</td></tr><tr><td>5</td><td>740.04</td><td>35.56</td><td>46.00</td><td>-10.44</td><td>35.66</td><td>27.99</td><td>4.08</td><td>32.54</td><td>0.37 -- -- Peak</td></tr><tr><td>6</td><td>912.00</td><td>108.47</td><td>-----</td><td>-----</td><td>106.21</td><td>28.98</td><td>4.54</td><td>31.65</td><td>0.39 -- -- Peak</td></tr><tr><td>7</td><td>956.35</td><td>39.19</td><td>46.00</td><td>-6.81</td><td>34.84</td><td>30.55</td><td>4.68</td><td>31.32</td><td>0.44 -- -- Peak</td></tr></table>		Limit	Read	Ant	Cable	Preamp	Aux	APos	TPos	Remark	Freq	Level	Line	Margin	Level	Factor	Loss	Factor	Factor		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm deg	1	30.97	26.57	40.00	-13.43	33.93	24.15	0.88	32.46	0.07 -- -- Peak	2	122.15	29.98	43.50	-13.52	43.06	17.59	1.67	32.45	0.11 -- -- Peak	3	235.64	27.27	46.00	-18.73	40.46	16.00	2.33	32.49	0.17 -- -- Peak	4	501.42	29.89	46.00	-16.11	35.11	23.91	3.33	32.68	0.22 -- -- Peak	5	740.04	35.56	46.00	-10.44	35.66	27.99	4.08	32.54	0.37 -- -- Peak	6	912.00	108.47	-----	-----	106.21	28.98	4.54	31.65	0.39 -- -- Peak	7	956.35	39.19	46.00	-6.81	34.84	30.55	4.68	31.32	0.44 -- -- Peak	Site : 03CH02-CA Condition: QP 3m B1LOG_50392_250025 VERTICAL <table><tr><th></th><th>Limit</th><th>Read</th><th>Ant</th><th>Cable</th><th>Preamp</th><th>Aux</th><th>APos</th><th>TPos</th><th>Remark</th></tr><tr><th>Freq</th><th>Level</th><th>Line</th><th>Margin</th><th>Level</th><th>Factor</th><th>Loss</th><th>Factor</th><th>Factor</th><th></th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dBuV/m</th><th>dB</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>dB</th><th>dB</th><th>cm deg</th></tr><tr><td>1</td><td>30.97</td><td>28.64</td><td>40.00</td><td>-11.36</td><td>36.00</td><td>24.15</td><td>0.88</td><td>32.46</td><td>0.07 -- -- Peak</td></tr><tr><td>2</td><td>115.36</td><td>33.07</td><td>43.50</td><td>-9.63</td><td>47.24</td><td>17.33</td><td>1.63</td><td>32.45</td><td>0.12 -- -- Peak</td></tr><tr><td>3</td><td>245.34</td><td>30.38</td><td>46.00</td><td>-15.62</td><td>42.44</td><td>17.87</td><td>2.38</td><td>32.49</td><td>0.18 -- -- Peak</td></tr><tr><td>4</td><td>487.04</td><td>30.82</td><td>46.00</td><td>-15.18</td><td>36.24</td><td>23.72</td><td>3.30</td><td>32.67</td><td>0.23 -- -- Peak</td></tr><tr><td>5</td><td>740.04</td><td>36.25</td><td>46.00</td><td>-9.75</td><td>36.35</td><td>27.99</td><td>4.08</td><td>32.54</td><td>0.37 -- -- Peak</td></tr><tr><td>6</td><td>912.00</td><td>97.26</td><td>-----</td><td>-----</td><td>95.00</td><td>28.98</td><td>4.54</td><td>31.65</td><td>0.39 -- -- Peak</td></tr><tr><td>7</td><td>971.87</td><td>41.49</td><td>54.00</td><td>-12.51</td><td>36.00</td><td>30.68</td><td>4.70</td><td>31.15</td><td>0.46 -- -- Peak</td></tr></table>		Limit	Read	Ant	Cable	Preamp	Aux	APos	TPos	Remark	Freq	Level	Line	Margin	Level	Factor	Loss	Factor	Factor		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm deg	1	30.97	28.64	40.00	-11.36	36.00	24.15	0.88	32.46	0.07 -- -- Peak	2	115.36	33.07	43.50	-9.63	47.24	17.33	1.63	32.45	0.12 -- -- Peak	3	245.34	30.38	46.00	-15.62	42.44	17.87	2.38	32.49	0.18 -- -- Peak	4	487.04	30.82	46.00	-15.18	36.24	23.72	3.30	32.67	0.23 -- -- Peak	5	740.04	36.25	46.00	-9.75	36.35	27.99	4.08	32.54	0.37 -- -- Peak	6	912.00	97.26	-----	-----	95.00	28.98	4.54	31.65	0.39 -- -- Peak	7	971.87	41.49	54.00	-12.51	36.00	30.68	4.70	31.15	0.46 -- -- Peak
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Remark: The unwanted signals can be ignored since they fall within the non-restricted band and meet the requirements of 15.247(d).



Mode	2																																																																																																																																																																																																															
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	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg																																																																																																																																																																																																						
1	1840.00	54.33	74.00	-19.67	89.39	25.51	6.57	67.55	0.41	--	--																																																																																																																																																																																																					
2	2760.00	58.44	74.00	-15.56	88.68	28.31	8.08	67.03	0.40	117	245 Peak																																																																																																																																																																																																					
3	2760.00	44.80	54.00	-9.20	--	--	--	--	--	--	-- Average																																																																																																																																																																																																					
4	3600.00	58.72	74.00	-15.28	86.59	29.82	9.09	67.08	0.30	121	308 Peak																																																																																																																																																																																																					
5	3600.00	45.08	54.00	-8.92	--	--	--	--	--	--	-- Average																																																																																																																																																																																																					
6	4600.00	47.10	74.00	-26.90	72.54	31.70	10.10	67.34	0.10	--	--																																																																																																																																																																																																					
	Limit	Read	Ant	Cable	Preamp	Aux	APos	TPos	Remark																																																																																																																																																																																																							
Freq	Level	Line	Margin	Level	Factor	Loss	Factor	Factor																																																																																																																																																																																																								
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg																																																																																																																																																																																																						
1	1840.00	50.64	74.00	-23.36	85.71	25.50	6.57	67.55	0.41	--	--																																																																																																																																																																																																					
2	2760.00	38.74	54.00	-15.26	68.94	28.35	8.08	67.03	0.40	372	219 Average																																																																																																																																																																																																					
3	2760.00	52.38	74.00	-21.62	--	--	--	--	--	--	--																																																																																																																																																																																																					
4	3600.00	44.66	54.00	-9.34	72.50	29.85	9.09	67.08	0.30	390	204 Average																																																																																																																																																																																																					
5	3600.00	58.30	74.00	-15.70	--	--	--	--	--	--	--																																																																																																																																																																																																					
6	4600.00	44.72	74.00	-29.28	70.17	31.69	10.10	67.34	0.10	--	--																																																																																																																																																																																																					

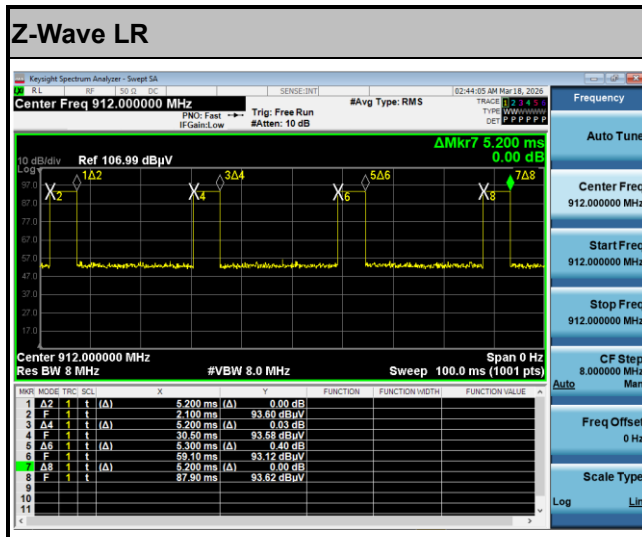


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QP/ Peak	 Site : 03CH02-CA Condition: QP 3m B1LOG_50392_250025 HORIZONTAL <table><tr><th></th><th>Limit</th><th>Read</th><th>Ant</th><th>Cable</th><th>Preamp</th><th>Aux</th><th>APos</th><th>TPos</th><th>Remark</th></tr><tr><th>Freq</th><th>Level</th><th>Line</th><th>Margin</th><th>Level</th><th>Factor</th><th>Loss</th><th>Factor</th><th>Factor</th><th></th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dBuV/m</th><th>dB</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>dB</th><th>dB</th><th>cm deg</th></tr><tr><td>1</td><td>30.97</td><td>25.65</td><td>40.00</td><td>-14.35</td><td>33.01</td><td>24.15</td><td>0.88</td><td>32.46</td><td>0.07 -- -- Peak</td></tr><tr><td>2</td><td>122.15</td><td>26.70</td><td>43.50</td><td>-16.80</td><td>39.78</td><td>17.59</td><td>1.67</td><td>32.45</td><td>0.11 -- -- Peak</td></tr><tr><td>3</td><td>236.61</td><td>27.48</td><td>46.00</td><td>-18.52</td><td>40.57</td><td>16.90</td><td>2.33</td><td>32.49</td><td>0.17 -- -- Peak</td></tr><tr><td>4</td><td>509.18</td><td>30.04</td><td>46.00</td><td>-15.96</td><td>35.16</td><td>23.98</td><td>3.36</td><td>32.68</td><td>0.22 -- -- Peak</td></tr><tr><td>5</td><td>740.04</td><td>34.06</td><td>46.00</td><td>-11.14</td><td>34.96</td><td>27.99</td><td>4.08</td><td>32.54</td><td>0.37 -- -- Peak</td></tr><tr><td>6</td><td>920.00</td><td>106.93</td><td>-----</td><td>-----</td><td>104.35</td><td>29.21</td><td>4.57</td><td>31.60</td><td>0.40 -- -- Peak</td></tr><tr><td>7</td><td>959.26</td><td>39.59</td><td>46.00</td><td>-6.41</td><td>35.10</td><td>30.66</td><td>4.68</td><td>31.29</td><td>0.44 -- -- Peak</td></tr></table>		Limit	Read	Ant	Cable	Preamp	Aux	APos	TPos	Remark	Freq	Level	Line	Margin	Level	Factor	Loss	Factor	Factor		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm deg	1	30.97	25.65	40.00	-14.35	33.01	24.15	0.88	32.46	0.07 -- -- Peak	2	122.15	26.70	43.50	-16.80	39.78	17.59	1.67	32.45	0.11 -- -- Peak	3	236.61	27.48	46.00	-18.52	40.57	16.90	2.33	32.49	0.17 -- -- Peak	4	509.18	30.04	46.00	-15.96	35.16	23.98	3.36	32.68	0.22 -- -- Peak	5	740.04	34.06	46.00	-11.14	34.96	27.99	4.08	32.54	0.37 -- -- Peak	6	920.00	106.93	-----	-----	104.35	29.21	4.57	31.60	0.40 -- -- Peak	7	959.26	39.59	46.00	-6.41	35.10	30.66	4.68	31.29	0.44 -- -- Peak	 Site : 03CH02-CA Condition: QP 3m B1LOG_50392_250025 VERTICAL <table><tr><th></th><th>Limit</th><th>Read</th><th>Ant</th><th>Cable</th><th>Preamp</th><th>Aux</th><th>APos</th><th>TPos</th><th>Remark</th></tr><tr><th>Freq</th><th>Level</th><th>Line</th><th>Margin</th><th>Level</th><th>Factor</th><th>Loss</th><th>Factor</th><th>Factor</th><th></th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dBuV/m</th><th>dB</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>dB</th><th>dB</th><th>cm deg</th></tr><tr><td>1</td><td>30.97</td><td>27.00</td><td>40.00</td><td>-12.20</td><td>35.16</td><td>24.15</td><td>0.88</td><td>32.46</td><td>0.07 -- -- Peak</td></tr><tr><td>2</td><td>116.33</td><td>34.12</td><td>43.50</td><td>-9.38</td><td>47.44</td><td>17.37</td><td>1.64</td><td>32.45</td><td>0.12 -- -- Peak</td></tr><tr><td>3</td><td>289.96</td><td>31.04</td><td>46.00</td><td>-14.96</td><td>41.67</td><td>19.14</td><td>2.58</td><td>32.52</td><td>0.17 -- -- Peak</td></tr><tr><td>4</td><td>748.77</td><td>36.76</td><td>46.00</td><td>-9.24</td><td>36.67</td><td>28.11</td><td>4.10</td><td>32.51</td><td>0.39 -- -- Peak</td></tr><tr><td>5</td><td>879.72</td><td>38.11</td><td>46.00</td><td>-7.89</td><td>36.24</td><td>28.92</td><td>4.44</td><td>31.86</td><td>0.37 -- -- Peak</td></tr><tr><td>6</td><td>920.00</td><td>95.13</td><td>-----</td><td>-----</td><td>92.55</td><td>29.21</td><td>4.57</td><td>31.60</td><td>0.40 -- -- Peak</td></tr><tr><td>7</td><td>996.12</td><td>41.28</td><td>54.00</td><td>-12.72</td><td>36.70</td><td>30.28</td><td>4.73</td><td>30.92</td><td>0.49 -- -- Peak</td></tr></table>		Limit	Read	Ant	Cable	Preamp	Aux	APos	TPos	Remark	Freq	Level	Line	Margin	Level	Factor	Loss	Factor	Factor		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm deg	1	30.97	27.00	40.00	-12.20	35.16	24.15	0.88	32.46	0.07 -- -- Peak	2	116.33	34.12	43.50	-9.38	47.44	17.37	1.64	32.45	0.12 -- -- Peak	3	289.96	31.04	46.00	-14.96	41.67	19.14	2.58	32.52	0.17 -- -- Peak	4	748.77	36.76	46.00	-9.24	36.67	28.11	4.10	32.51	0.39 -- -- Peak	5	879.72	38.11	46.00	-7.89	36.24	28.92	4.44	31.86	0.37 -- -- Peak	6	920.00	95.13	-----	-----	92.55	29.21	4.57	31.60	0.40 -- -- Peak	7	996.12	41.28	54.00	-12.72	36.70	30.28	4.73	30.92	0.49 -- -- Peak
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Remark: The unwanted signals can be ignored since they fall within the non-restricted band and meet the requirements of 15.247(d).

Appendix C. Duty Cycle Plots

Band	Duty Cycle (%)	T(us)	1/T(kHz)	VBW Setting
Z-Wave LR	20.9	-	-	-



20.09% is used to determine the duty cycle correction factor (DCCF) in this report