FCC / ISED Test Report

For:
Ezlo Inc.

Model Name:
e550-US, EzloSecure-US

Product Description:
Smart Home Controller

FCC ID: 2AIYW-E550
IC ID: 26382-E550

Applied Rules and Standards:
47 CFR Part 15.249
RSS-210 Issue 10 & RSS-Gen Issue 5

REPORT #: EMC_EZLOI-001-20001_15.249_Zwave

DATE: 2020-10-21

A2LA Accredited

IC recognized # 3462B-1

***CETECOM* Inc.**
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1 Assessment

The following device was evaluated against the applicable criteria specified in FCC rules Parts 15.249 of Title 47 of the Code of Federal Regulations and the relevant ISED Canada standard RSS-210.

No deviations were ascertained.

Company	Description	Model #
Ezlo Inc.	Smart Home Controller	e550-US, EzloSecure-US

Responsible for Testing Laboratory:

Date	Section	Name	Signature
2020-10-21	Compliance	Cindy Li (EMC Lab Manager)	Cindy Li Digitally signed by cindy.li@cetecom.com DN: CN=cindy.li@cetecom.com Reason: I have reviewed this document Location: your signing location here Date: 2020-10-22 12:47:54 Foxit Reader Version: 10.0.1

Responsible for the Report:

Date	Section	Name	Signature
2020-10-21	Compliance	Kevin Wang (Senior EMC Engineer)	kevin.wang@cetecom.com Digitally signed by: kevin.wang@cetecom.com DN: CN = kevin.wang@cetecom.com Date: 2020.10.21 11:40:47 -07'00'

2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the EMC Test Report

Company Name:	CETECOM Inc.
Department:	Compliance
Street Address:	411 Dixon Landing Road
City/Zip Code	Milpitas, CA 95035
Country	USA
Telephone:	+1 (408) 586 6200
Fax:	+1 (408) 586 6299
EMC Lab Manager:	Cindy Li
Responsible Project Leader:	Akanksha Baskaran

2.2 Identification of the Client

Client's Name:	Ezlo Inc.
Street Address:	1255 Broad St.
City/Zip Code	Clifton, NJ / 07013
Country	US

2.3 Identification of the Manufacturer

Manufacturer's Name:	Same as Client
Manufacturers Address:	----------
City/Zip Code	----------
Country	----------

3 Equipment Under Test (EUT)

3.1 EUT Specifications

Model No:	e550-US, EzloSecure-US
HW Version :	1.4
SW Version :	2.0.1.1112.7
FCC-ID :	2AIYW-E550
IC-ID:	26382-E550
FWIN:	N/A
HVIN:	e550-US, EzloSecure-US
PMN:	Ezlo Secure, Smart Home Controller, CC Compass Monitoring Hub, Connect Hub 2.0
Product Description:	e550-US, EzloSecure-US
Frequency Range / number of channels:	Nominal band: 908.42MHz
Radio Information:	Zwave: Module Name: SiLabs Module Number: EFR32ZG14
Modes of Operation:	Zwave
Antenna Information as declared:	max gain 2.1 dBi
Max. Peak Output Power:	89.89 dBµV/m @3m
Power Supply/ Rated Operating Voltage Range:	4.8V (Low) / 5.0V (Nominal) / 5.2V (Max)
Operating Temperature Range	0°C to +35°C
Other Radios included in the device:	Bluetooth Basic / EDR ; BLE ; WiFi ; Cellular ; Zigbee
Sample Revision	☐Prototype Unit; ■Production Unit; ☐Pre-Production

3.2 EUT Sample details

EUT #	Serial Number	HW Version	SW Version	Notes/Comments
1	#1	1.4	2.0.1.1112.7	Conducted Sample
2	#2	1.4	2.0.1.1112.7	Radiated Sample for Wi-Fi, Bluetooth, Zigbee, Zwave and 15B
3	#3	1.4	2.0.1.1112.7	Radiated Sample for Cellular

3.3 Accessory Equipment (AE) details

AE #	Type	Model	Manufacturer	Serial Number
1	AC/DC Adaptor	FX18U-050300C	----------	----------

3.4 Test Sample Configuration

EUT Set-up #	Combination of AE used for test set up	Comments
1	EUT#1 + AE#1	Conducted RF measurements were performed with EUT configured via customer provided commands and instructions.
2	EUT#2 + AE#1	Radiated RF measurements were performed with EUT configured via customer provided commands and instructions.
3	EUT#3 + AE#1	Radiated RF measurements were performed with EUT configured via customer provided commands and instructions.

3.5 Justification for Worst Case Mode of Operation

During the testing process, the EUT was tested with transmitter sets on 908.42MHz, and highest possible duty cycle. For radiated measurements, all data in this report shows the worst case between horizontal and vertical antenna polarizations and for all orientations of the EUT.

4 Subject of Investigation

The objective of the measurements done by CETECOM Inc. was to assess the performance of the EUT according to the relevant requirements specified in FCC rules Part 15.249 of Title 47 of the Code of Federal Regulations and Radio Standard Specification RSS-210 of ISED Canada.

This test report is to support a request for new equipment authorization under

- FCC ID: 2AIYW-E550
- IC ID: 26382-E550

5 Measurement Results Summary

Test Specification	Test Case	Temperature and Voltage Conditions	Mode	Pass	NA	NP	Result
§15.215(c)	Emission Bandwidth 20 dB Bandwidth	Nominal	Zwave	■	☐	☐	Complies
§15.249(a)	General Field Strength Limit	Nominal	Zwave	■	☐	☐	Complies
§15.249; §15.209	TX Spurious emissions-Radiated	Nominal	Zwave	■	☐	☐	Complies
§15.207(a) RSS Gen 8.8	AC Conducted Emissions	Nominal	Zwave	■	☐	☐	Complies

Note: NA= Not Applicable; NP= Not Performed.

6 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus, with 95% confidence interval (in dB delta to result), based on a coverage factor k=1.

Radiated measurement

9 kHz to 30 MHz	±2.5 dB (Magnetic Loop Antenna)
30 MHz to 1000 MHz	±2.0 dB (Biconilog Antenna)
1 GHz to 40 GHz	±2.3 dB (Horn Antenna)

Conducted measurement

150 kHz to 30 MHz	±0.7 dB (LISN)
RF conducted measurement	±0.5 dB

According to TR 102 273 a multiplicative propagation of error is assumed for RF measurement systems. For this reason the RMS method is applied to dB values and not to linear values as appropriate for additive propagation of error. Also used: http://physics.nist.gov/cuu/Uncertainty/typeb.html. The above calculated uncertainties apply to direct application of the Substitution method. The Substitution method is always used when the EUT comes closer than 3 dB to the limit.

6.1 Environmental Conditions During Testing:

The following environmental conditions were maintained during the course of testing:

- Ambient Temperature: 20-25° C
- Relative humidity: 40-60%

6.2 Dates of Testing:

09/15/2020 - 10/06/2020

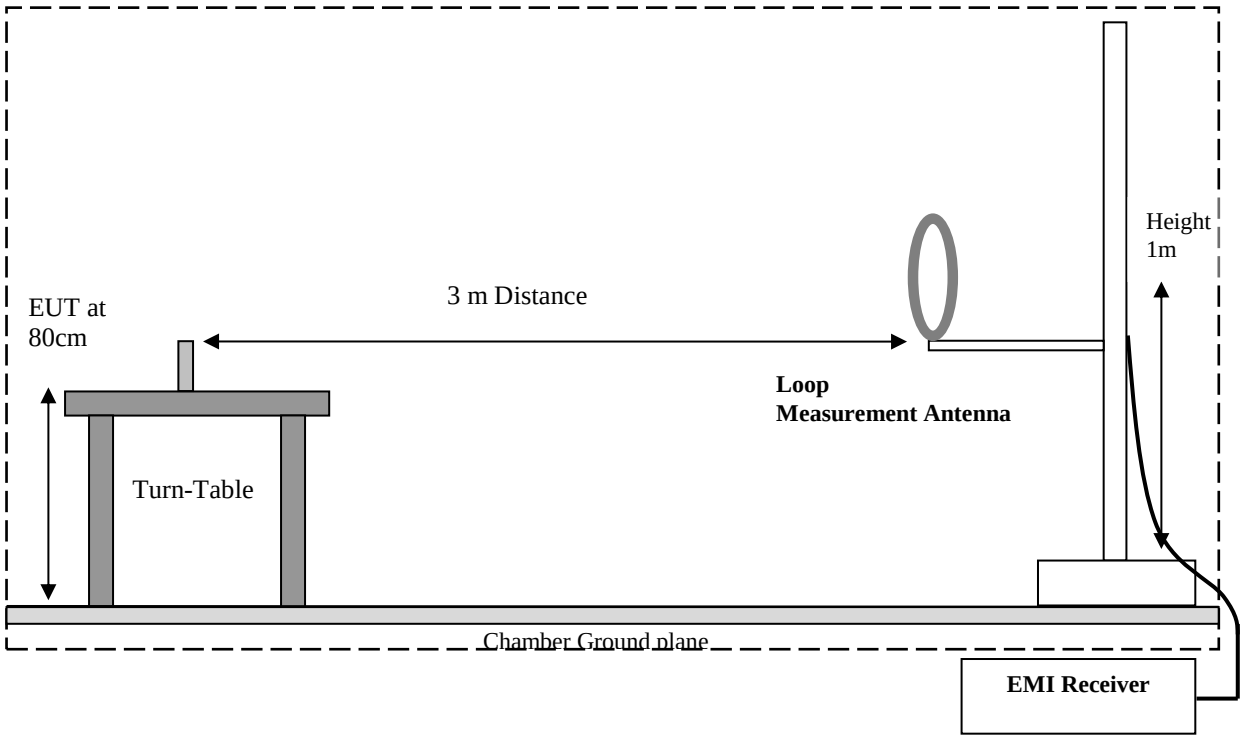
7 Measurement Procedures

7.1 Radiated Measurement

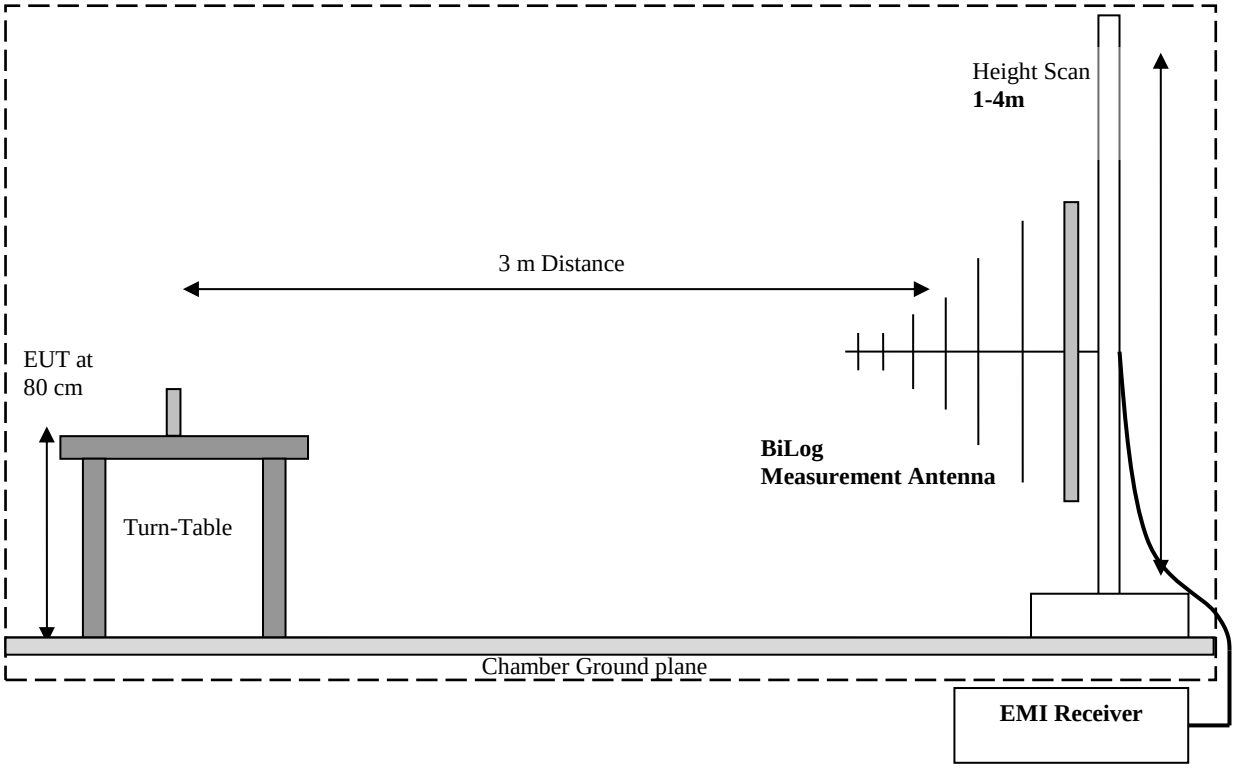
The radiated measurement is performed according to ANSI C63.10 (2013)

- The exploratory measurement is accomplished by running a matrix of 16 sweeps over the required frequency range with R&S Test-SW EMC32 for 4 positions of the turntable, two orthogonal positions of the EUT and both antenna polarizations. This procedure exceeds the requirement of the above standards to cover the 3 orthogonal axis of the EUT. A max peak detector is utilized during the exploratory measurement. The Test-SW creates an overall maximum trace for all 12 sweeps and saves the settings for each point of this trace. The maximum trace is part of the test report.
- The 10 highest emissions are selected with an automatic algorithm of EMC32 searching for peaks in the noise floor and ensuring that broadband signals are not selected multiple times.
- The maxima are then put through the final measurement and again maximized in a 90deg range of the turntable, fine search in frequency domain and height scan between 1m and 4m.
- The above procedure is repeated for all possible ways of power supply to EUT and for all supported modulations.
- In case there are no emissions above noise floor level only the maximum trace is reported as described above.
- The results are split up into up to 4 frequency ranges due to antenna bandwidth restrictions. A magnetic loop is used from 9 kHz to 30 MHz, a Biconilog antenna is used from 30 MHz to 1 GHz, and two different horn antennas are used to cover frequencies up to 40 GHz.

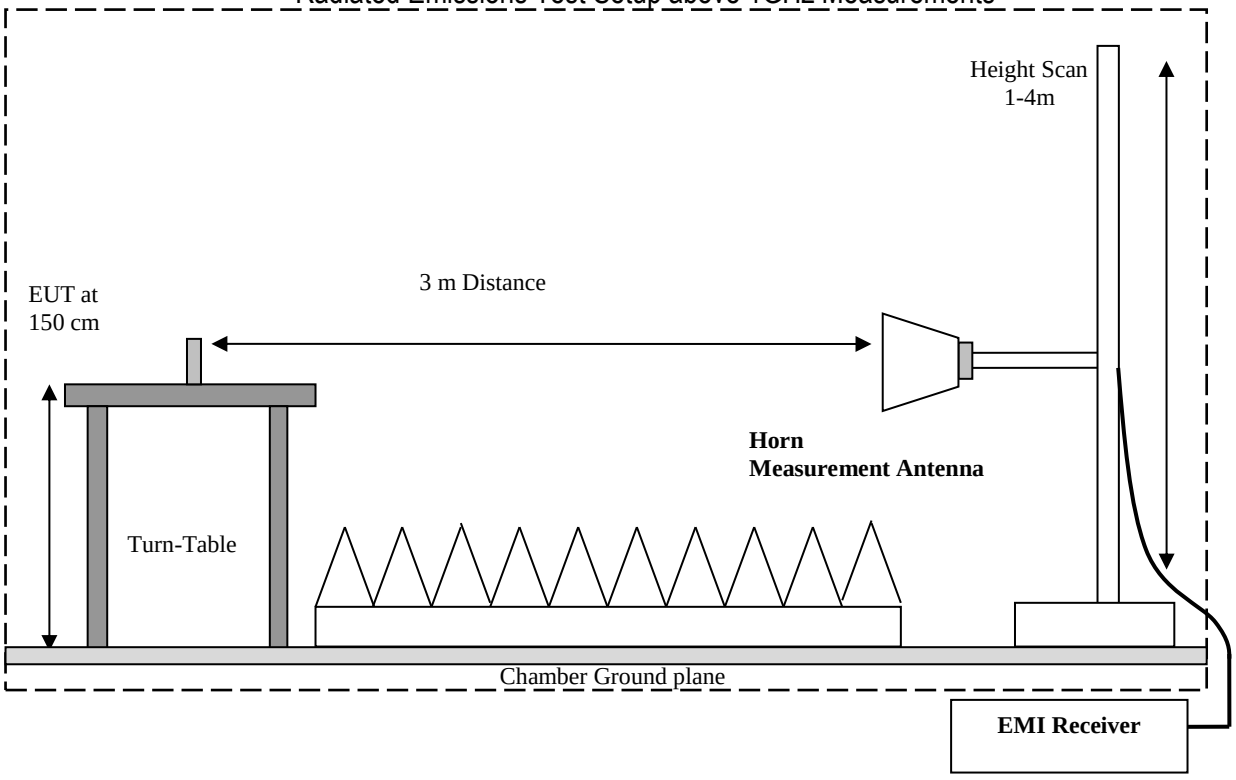
Radiated Emissions Test Setup below 30MHz Measurements



Radiated Emissions Test Setup 30MHz-1GHz Measurements



Radiated Emissions Test Setup above 1GHz Measurements



7.1.1 Sample Calculations for Field Strength Measurements

Field Strength is calculated from the Spectrum Analyzer/ Receiver readings, taking into account the following parameters:

1. Measured reading in dBµV
2. Cable Loss between the receiving antenna and SA in dB and
3. Antenna Factor in dB/m

All radiated measurement plots in this report are taken from a test SW that calculates the Field Strength based on the following equation:

FS (dBµV/m) = Measured Value on SA (dBµV) + Cable Loss (dB) + Antenna Factor (dB/m)

Example:

Frequency (MHz)	Measured SA (dBµV)	Cable Loss (dB)	Antenna Factor Correction (dB)	Field Strength Result (dBµV/m)
1000	80.5	3.5	14	98.0

7.2 Power Line Conducted Measurement Procedure

AC Power Line conducted emissions measurements performed according to: ANSI C63.4 (2014)

8 Test Result Data

8.1 General Field Strength Limit

8.1.1 Measurement according to FCC 15.249(a)

Spectrum Analyzer settings:

- RBW = 100kHz
- VBW = 300kHz
- Span ≥ 3 x RBW
- Sweep = Auto couple
- Detector function = Peak
- Trace = Max hold
- Use peak marker function to determine the peak amplitude level

8.1.2 Limits:

General Filed Strength Limit:

- FCC §15.249 (a)

(a) Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

8.1.3 Test conditions and setup:

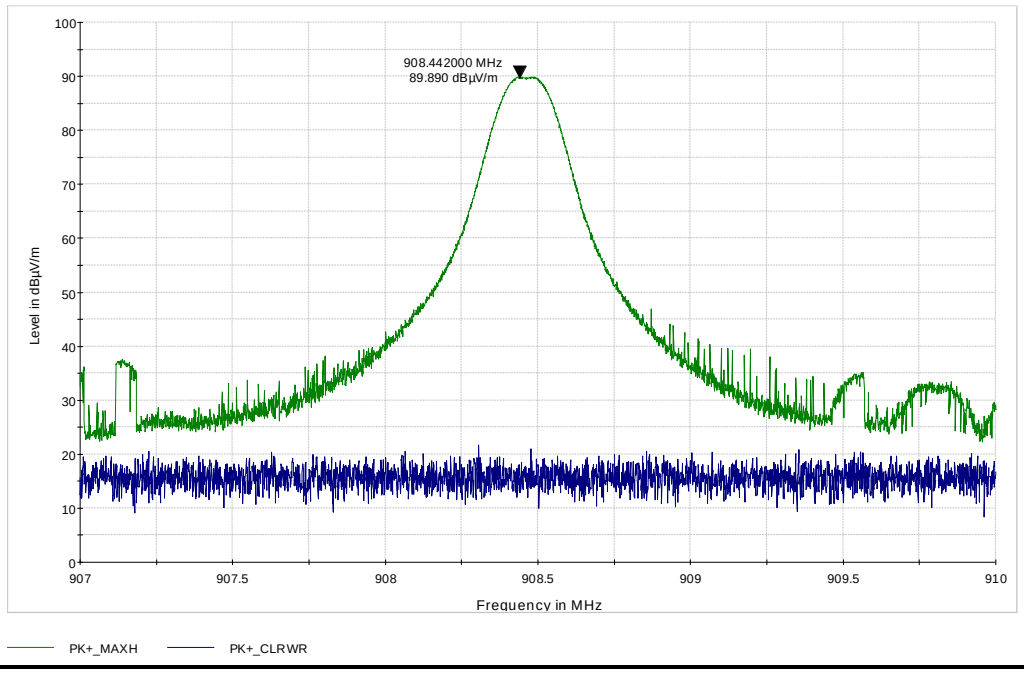
Ambient Temperature	EUT Set-Up #	EUT operating mode	Power Input	Antenna Gain
22° C	1	continuous fixed channel	120 VAC	2.1 dBi

8.1.4 Measurement result:

Plot #	Frequency (MHz)	Field Strength (dBµV/m)	Limit (dBµV/m)	Result
1	908.4	89.89	93.98	Pass

8.1.5 Measurement Plots:

Plot #1	
908.4 MHz	Modulation/Packet Type: Zwave



8.2 Emission Bandwidth 20dB

8.2.1 Measurement according to FCC 15.249

Spectrum Analyzer settings:

- Set RBW = 3 kHz
- Set the video bandwidth (VBW) ≥ 3 x RBW
- Detector = Peak
- Trace mode = Max hold
- Sweep = Auto couple
- Allow the trace to stabilize
- Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.

8.2.2 Limits:

FCC §15.215 (c)

(c) Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. In the case of intentional radiators operating under the provisions of subpart E, the emission bandwidth may span across multiple contiguous frequency bands identified in that subpart. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

8.2.3 Test conditions and setup:

Ambient Temperature	EUT Set-Up #	EUT operating mode	Power Input
22° C	1	continuous fixed channel	120 VAC

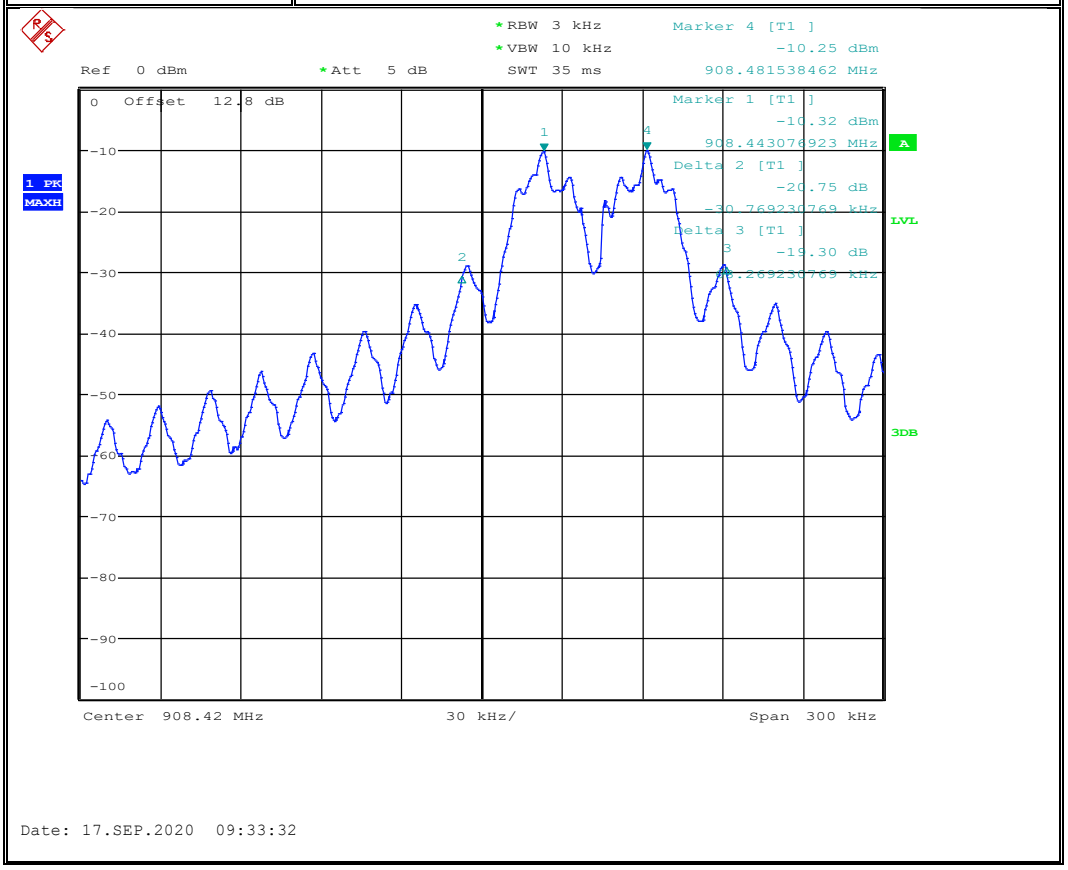
8.2.4 Measurement result:

Plot #	Frequency (MHz)	20dB Bandwidth (kHz)	Result
1	908.4	99.038	Pass

8.2.5 Measurement Plots:

Plot #1

908.4 MHz	Mode: Zwave



8.3 Radiated Transmitter Spurious Emissions and Restricted Bands

8.3.1 Measurement according to ANSI C63.10 (2013)

Spectrum Analyzer Settings:

- Frequency = 9 KHz – 30 MHz
- RBW = 9 KHz
- Detector: Peak

- Frequency = 30 MHz – 1 GHz
- Detector = Peak / Quasi-Peak
- RBW= 120 KHz (<1GHz)

- Frequency > 1 GHz
- Detector = Peak / Average
- RBW = 1 MHz

- Radiated spurious emissions shall be measured for the transmit frequencies, transmit power, and data rate for the lowest, middle and highest channel in each frequency band of operation and for the highest gain antenna for each antenna type, and using the appropriate parameters and test requirements.
- The highest (or worst-case) data rate shall be recorded for each measurement.
- For testing frequencies below 30 MHz at distance other than the specified in the standard, the limit conversion is calculated by using the FCC materials for the ANSI 63 committee issued on January, 27 1991.

8.3.2 Limits:

FCC §15.249(a)

(a) Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

FCC §15.209 & RSS-Gen 8.9

- Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency of emission (MHz)	Field strength (µV/m)	Measurement Distance (m)	Field strength @ 3m (dBµV/m)
0.009–0.490	2400/F(kHz) / ---------	300	-
0.490–1.705	24000/F(kHz) / --------	30	-
1.705–30.0	30 / (29.5)	30	-
30–88	100	3	40 dBµV/m
88–216	150	3	43.5 dBµV/m
216–960	200	3	46 dBµV/m
Above 960	500	3	54 dBµV/m

FCC §15.205 & RSS-Gen 8.10

- Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
[1]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
13.36-13.41			

- 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)).
  *PEAK LIMIT= 74 dBµV/m
  *AVG. LIMIT= 54 dBµV/m

8.3.3 Test conditions and setup:

Ambient Temperature	EUT Set-Up #	EUT operating mode	Power Input
22° C	2	continuous fixed channel	120 VAC

8.3.4 Measurement result:

Plot #	Channel #	Scan Frequency	Limit	Result
1-4	Mid	9 kHz – 10 GHz	See section 8.3.2	Pass

8.3.5 Measurement Plots:

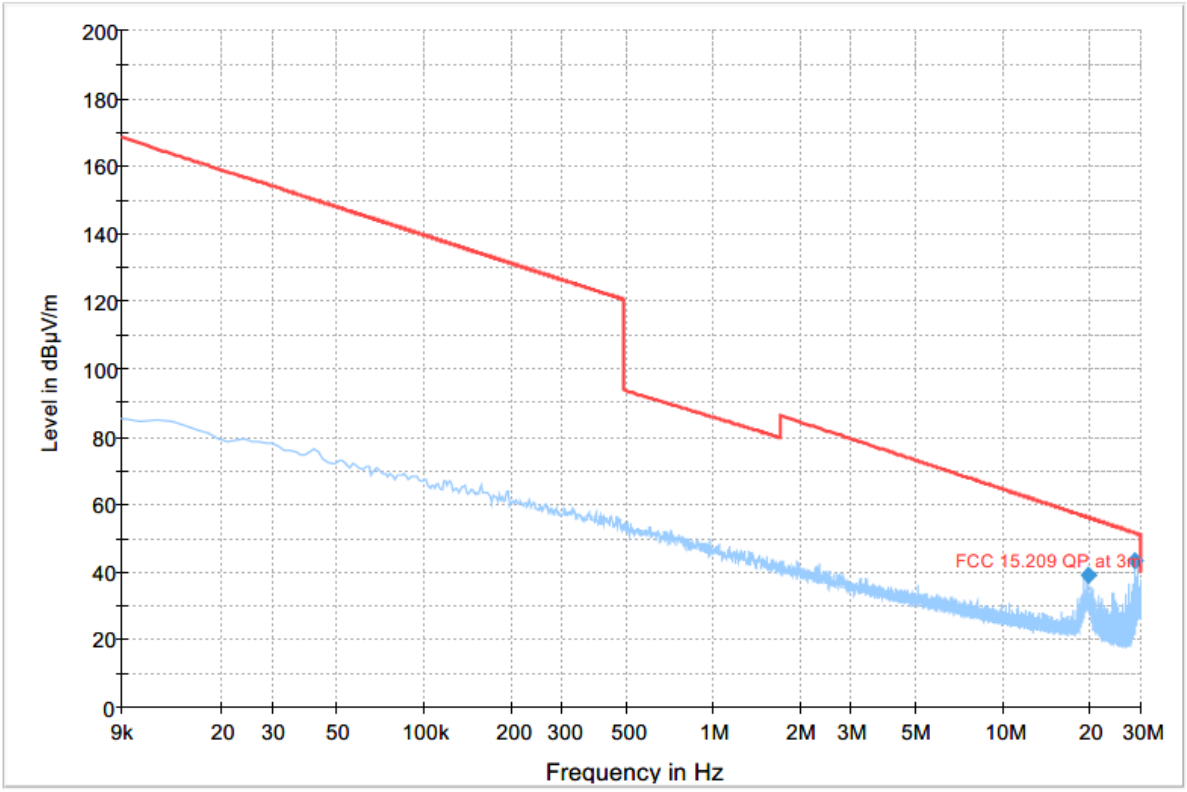
Plot #1 Radiated Emissions: 9kHz – 30MHz

Modulation: Zwave | **Channel:**

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
19.710	39.24	56.21	16.97	500.0	9.000	100.0	V	99.0	16.9	
28.686	43.16	51.59	8.43	500.0	9.000	100.0	V	111.0	16.3	

Disclaimer: Any measurement data within 2dB from the limit line is conditional PASS/FAIL due to measurement uncertainty considerations.

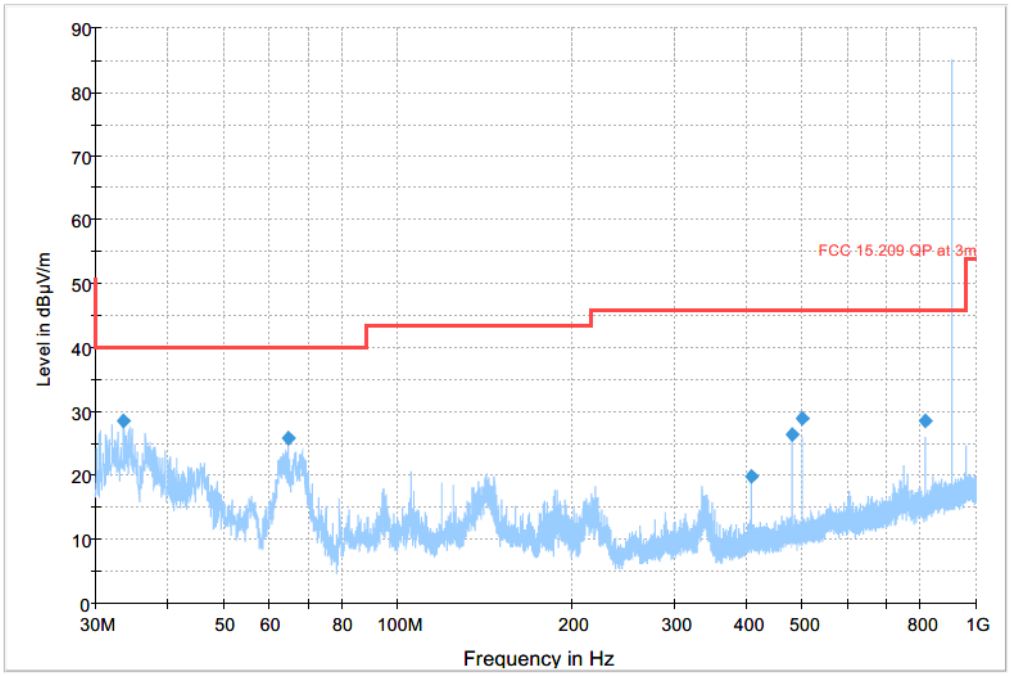


Plot # 2 Radiated Emissions: 30MHz - 1GHz

Modulation: Zwave | **Channel:**

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
33.589	28.52	40.00	11.48	500.0	120.000	100.0	V	215.0	-14.5	
64.758	25.93	40.00	14.07	500.0	120.000	151.0	V	46.0	-27.0	
407.977	19.88	46.02	26.14	500.0	120.000	210.0	V	-45.0	-17.3	
479.983	26.43	46.02	19.59	500.0	120.000	175.0	V	-14.0	-16.1	
499.997	28.97	46.02	17.05	500.0	120.000	161.0	V	85.0	-15.7	
815.991	28.61	46.02	17.41	500.0	120.000	224.0	H	86.0	-10.1	

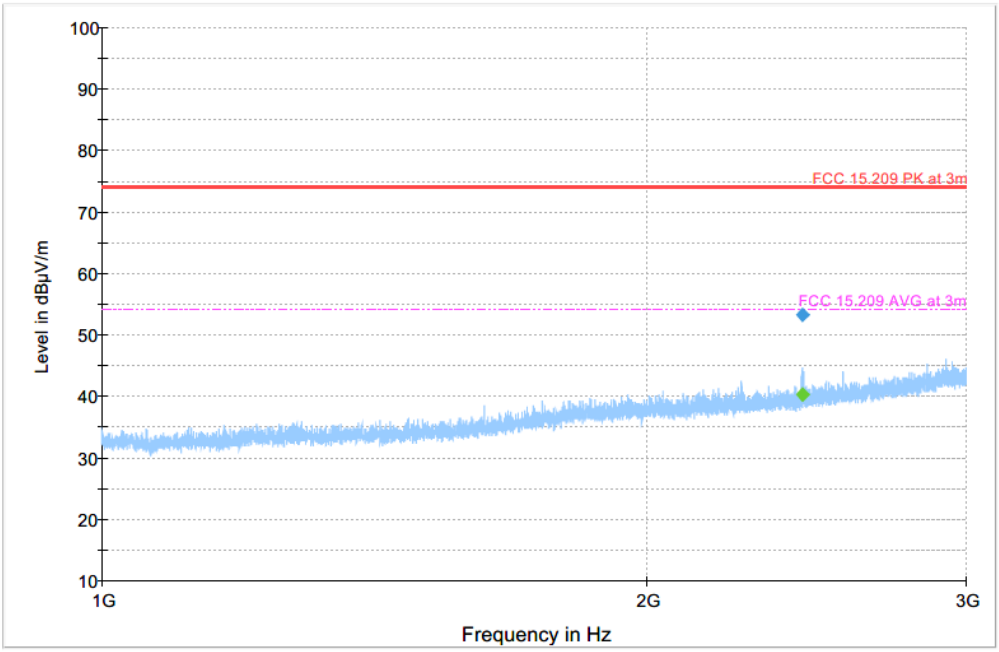


Plot # 3 Radiated Emissions: 1-3 GHz

Modulation: Zwave | **Channel:**

Final Result

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)	Comment
2435.000	---	40.31	53.98	13.67	500.0	1000.000	100.0	V	257.0	32.6	
2435.000	53.30	---	73.98	20.68	500.0	1000.000	100.0	V	257.0	32.6	

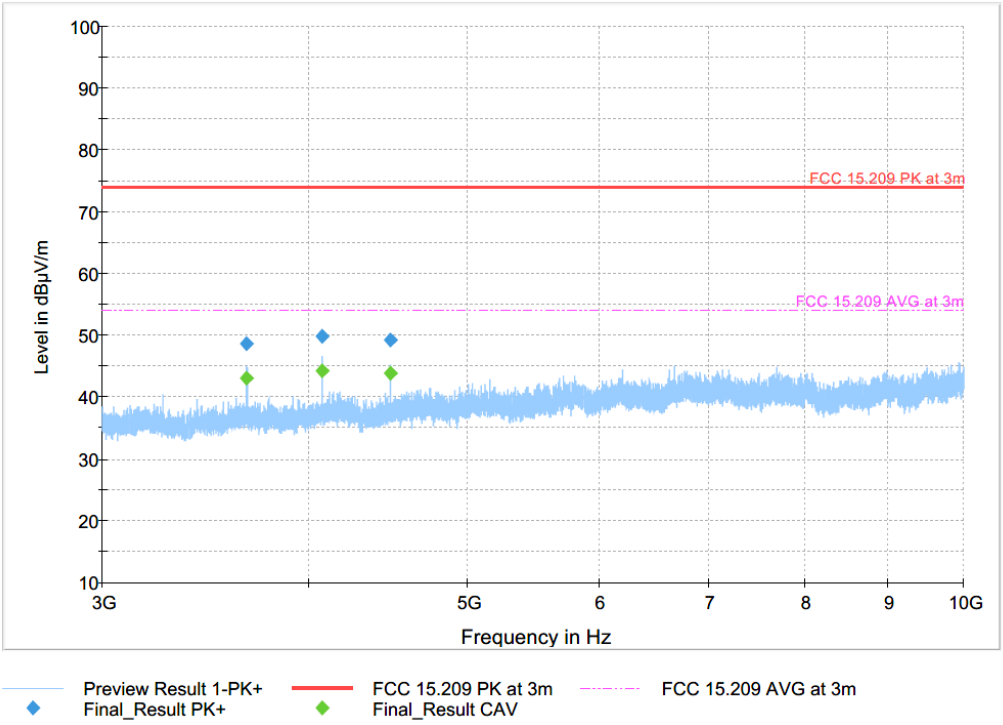


Plot # 4 Radiated Emissions: 3 - 10 GHz

Modulation: Zwave | **Channel:**

Final Result

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)	Comment
3671.883	---	43.10	53.98	10.88	500.0	1000.000	294.0	V	302.0	-6.9	
3671.883	48.67	---	73.98	25.31	500.0	1000.000	294.0	V	302.0	-6.9	
4079.983	---	44.34	53.98	9.64	500.0	1000.000	254.0	V	311.0	-5.6	
4079.983	49.79	---	73.98	24.19	500.0	1000.000	254.0	V	311.0	-5.6	
4487.967	---	43.82	53.98	10.16	500.0	1000.000	151.0	V	355.0	-5.3	
4487.967	49.24	---	73.98	24.74	500.0	1000.000	151.0	V	355.0	-5.3	

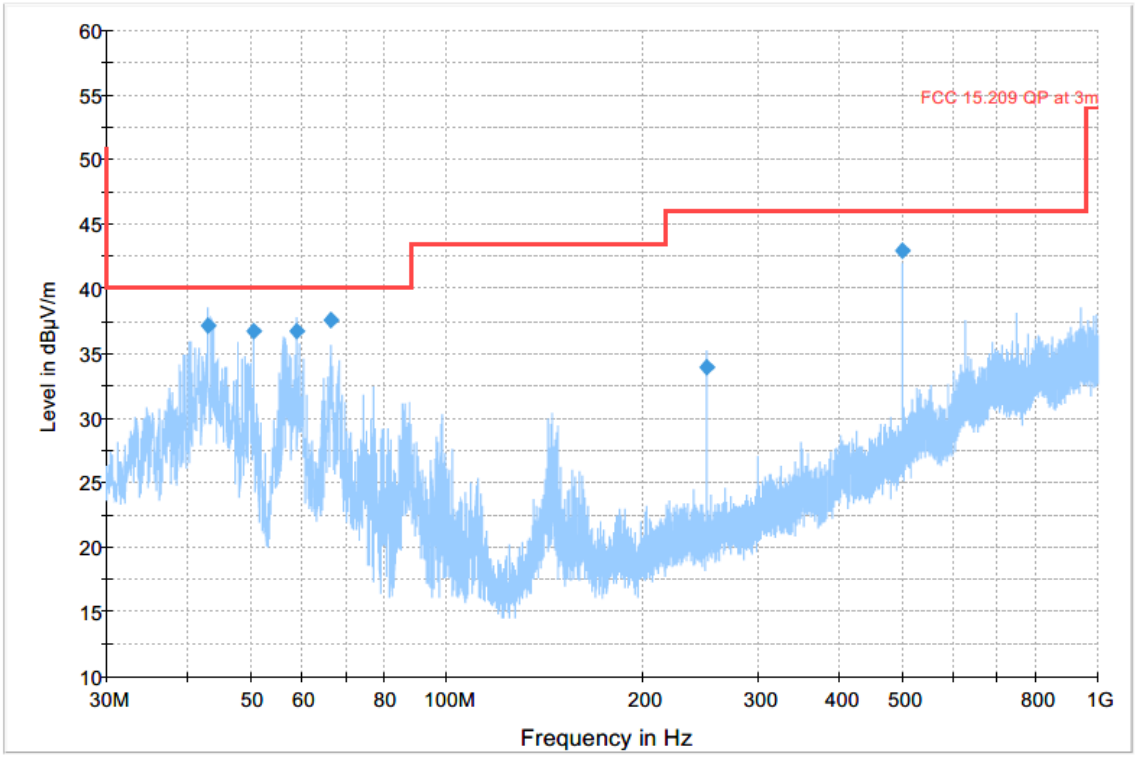


Plot #5 Radiated Emissions: 30 MHz – 1GHz		
Modulation: Zigbee	**Channel: Mid**	

Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
42.966	37.14	---	40.00	2.86	500.0	120.000	140.0	V	313.0	13.0	
50.435	36.75	---	40.00	3.25	500.0	120.000	140.0	V	31.0	10.1	
58.680	36.67	---	40.00	3.33	500.0	120.000	184.0	V	359.0	10.2	
66.278	37.53	---	40.00	2.47	500.0	120.000	198.0	V	323.0	11.2	
249.996	33.94	---	46.02	12.08	500.0	120.000	140.0	H	268.0	17.0	
500.030	42.97	---	46.02	3.05	500.0	120.000	186.0	H	289.0	23.7	

Disclaimer: Any measurement data within 2dB from the limit line is conditional PASS/FAIL due to measurement uncertainty considerations.

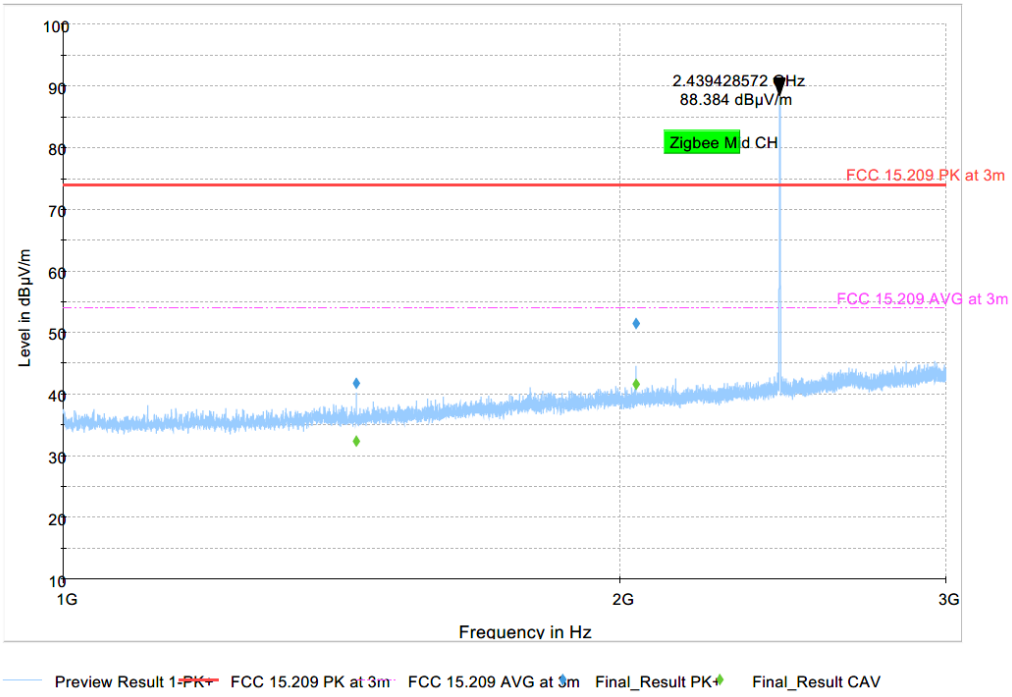


Plot #6 Radiated Emissions: 1-3 GHz

Modulation: Zigbee	Channel: Mid	

Final_Result

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)	Comment
1439.857	41.76	---	73.98	32.22	500.0	1000.000	298.0	V	87.0	5.3	
1439.857	---	32.42	53.98	21.56	500.0	1000.000	298.0	V	87.0	5.3	
2040.000	51.44	---	73.98	22.54	500.0	1000.000	153.0	V	27.0	8.2	
2040.000	---	41.55	53.98	12.43	500.0	1000.000	153.0	V	27.0	8.2	

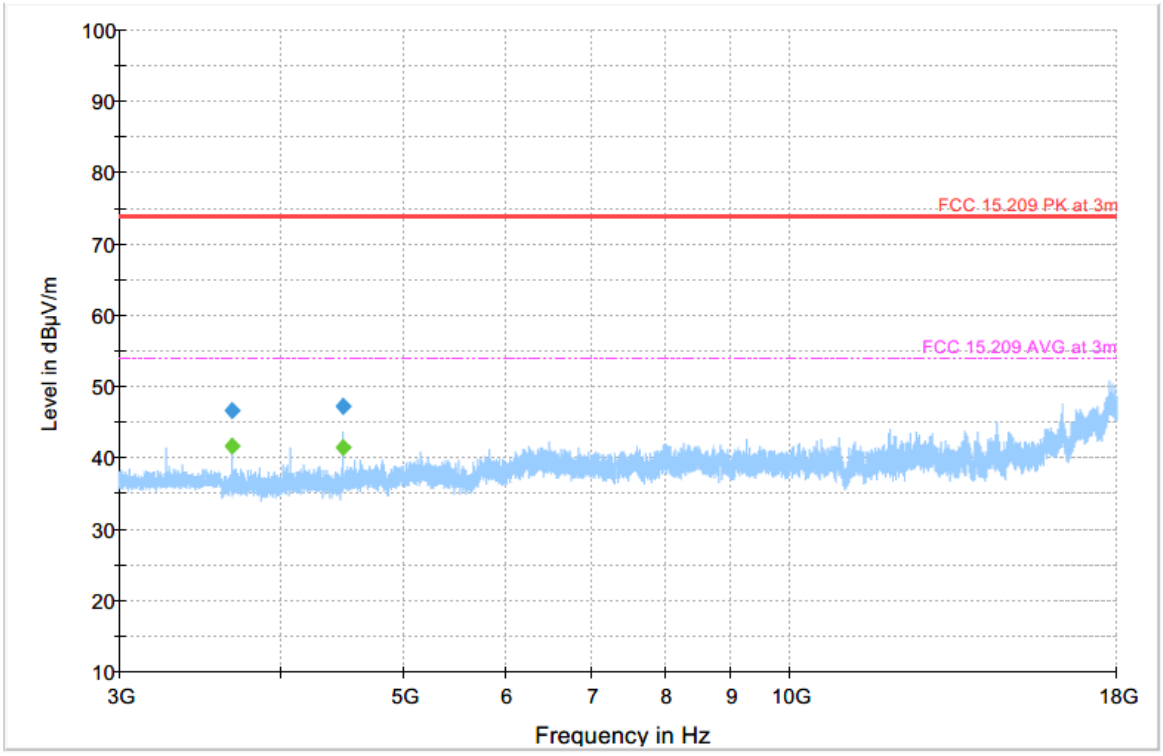


Plot #7 Radiated Emissions: 3-18 GHz

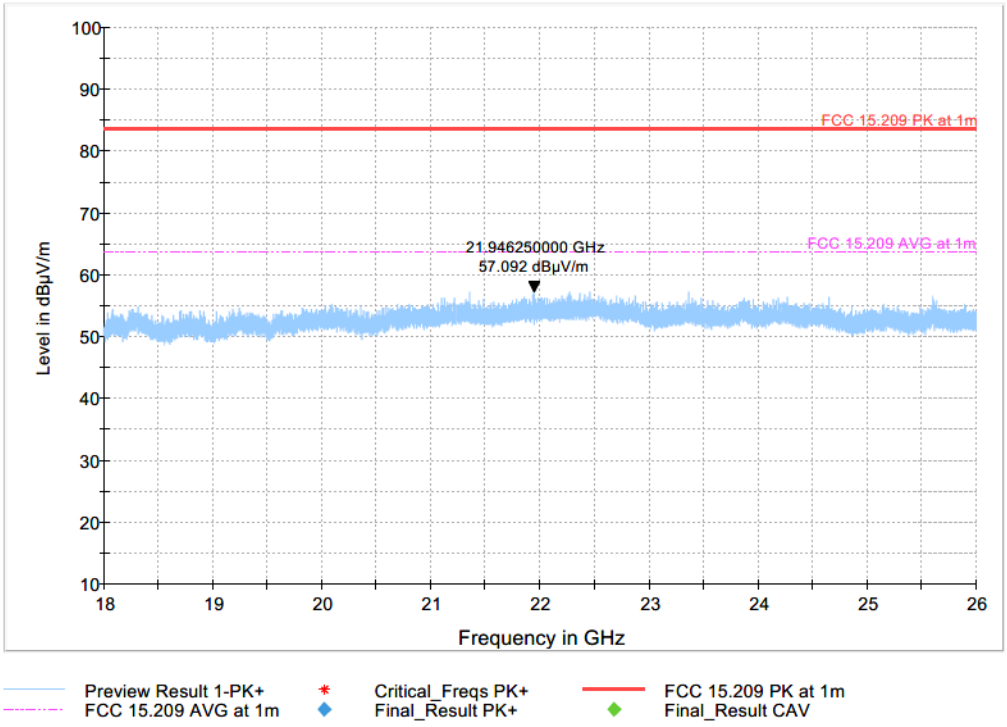
Modulation: Zigbee	Channel: Mid	

Final Result

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)	Comment
3672.000	---	41.74	53.98	12.23	500.0	1000.000	315.0	V	122.0	-6.6	
3672.000	46.67	---	73.98	27.31	500.0	1000.000	315.0	V	122.0	-6.6	
4488.000	---	41.53	53.98	12.45	500.0	1000.000	220.0	V	168.0	-5.3	
4488.000	47.16	---	73.98	26.82	500.0	1000.000	220.0	V	168.0	-5.3	



Plot #8 Radiated Emissions: 18-26 GHz		
Modulation: Zigbee	**Channel: Mid**	

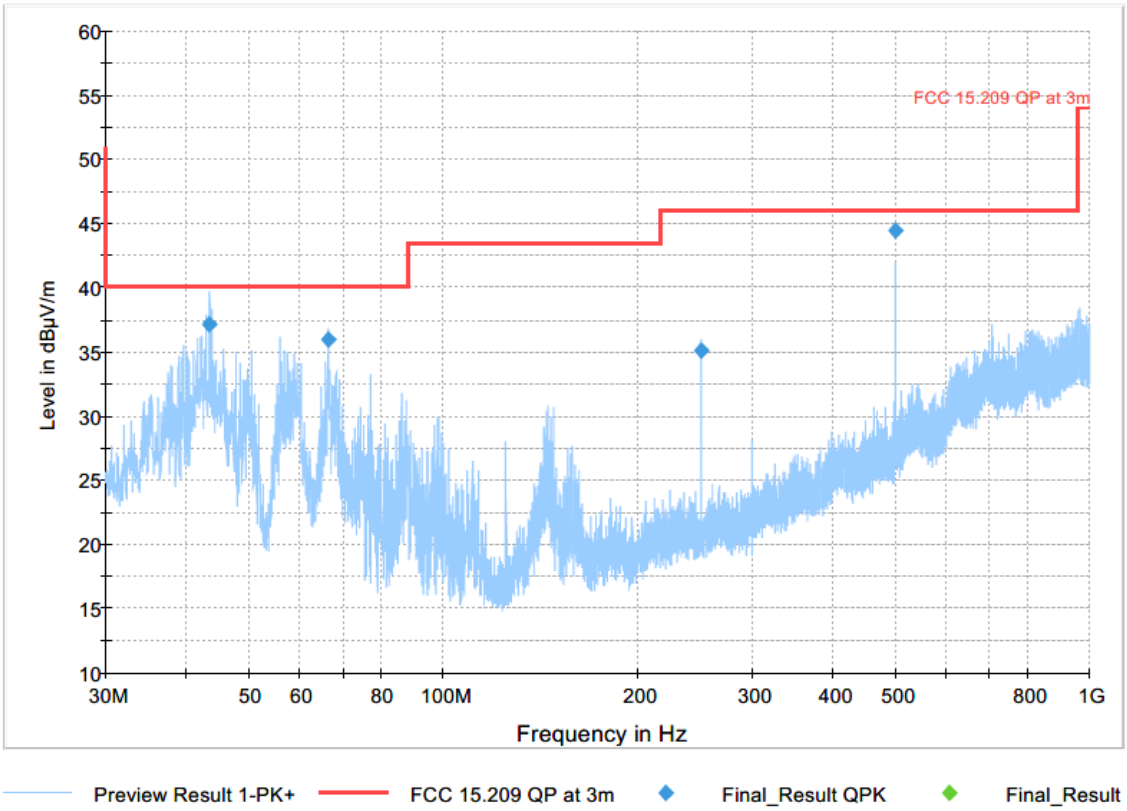


Plot #9 Radiated Emissions: 30 MHz – 1GHz		
Modulation: Zigbee	**Channel: High**	

Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
43.483	37.11	---	40.00	2.89	500.0	120.000	140.0	V	30.0	12.6	
66.246	35.93	---	40.00	4.07	500.0	120.000	174.0	V	83.0	11.2	
249.996	35.09	---	46.02	10.93	500.0	120.000	152.0	H	268.0	17.0	
500.030	44.41	---	46.02	1.61	500.0	120.000	140.0	H	154.0	23.7	

Disclaimer: Any measurement data within 2dB from the limit line is conditional PASS/FAIL due to measurement uncertainty considerations.

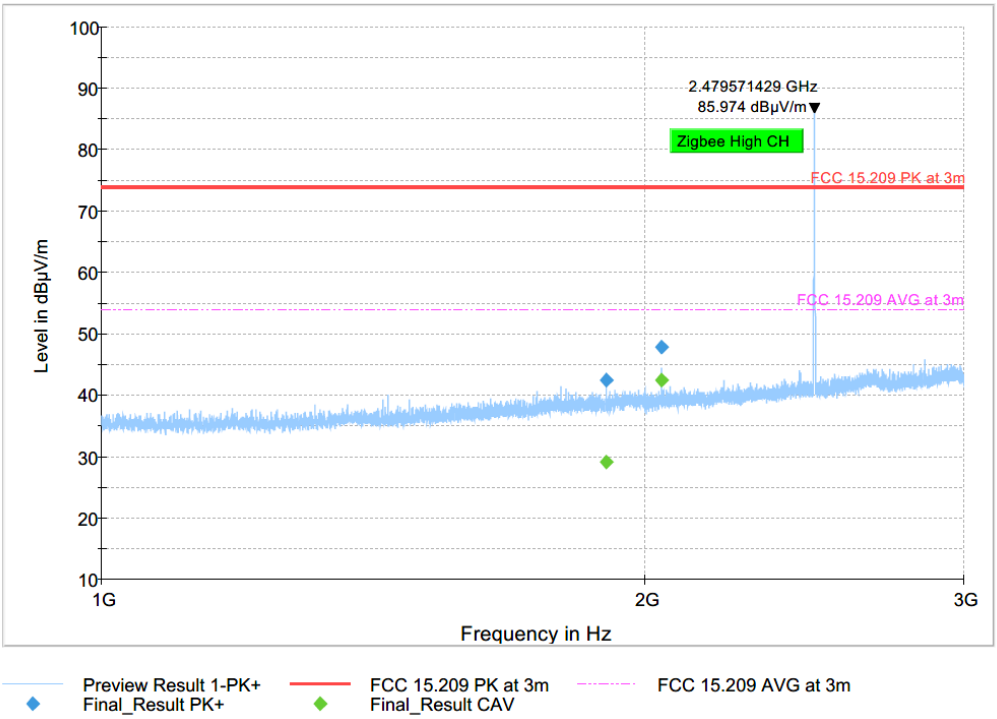


Plot # 10 Radiated Emissions: 1-3 GHz and Restricted Bands

Modulation: Zigbee	Channel: High	

Final_Result

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)	Comment
1903.143	42.36	---	73.98	31.62	500.0	1000.000	219.0	V	175.0	7.5	
1903.143	---	29.07	53.98	24.91	500.0	1000.000	219.0	V	175.0	7.5	
2040.000	47.83	---	73.98	26.15	500.0	1000.000	239.0	V	3.0	8.2	
2040.000	---	42.51	53.98	11.47	500.0	1000.000	239.0	V	3.0	8.2	

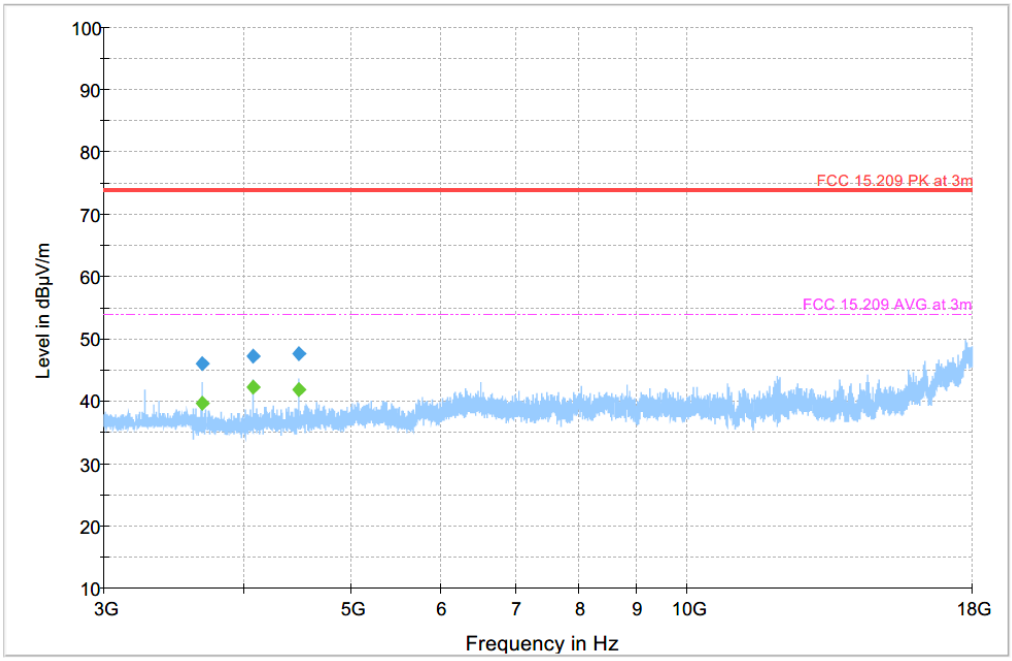


Plot #11 Radiated Emissions: 3-18 GHz

Modulation: Zigbee	Channel: High	

Final_Result

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)	Comment
3672.000	45.96	---	73.98	28.01	500.0	1000.000	232.0	V	251.0	-6.6	
3672.000	---	39.67	53.98	14.31	500.0	1000.000	232.0	V	251.0	-6.6	
4080.000	47.27	---	73.98	26.71	500.0	1000.000	315.0	V	109.0	-5.4	
4080.000	---	42.16	53.98	11.82	500.0	1000.000	315.0	V	109.0	-5.4	
4488.000	---	41.76	53.98	12.22	500.0	1000.000	275.0	V	312.0	-5.3	
4488.000	47.71	---	73.98	26.27	500.0	1000.000	275.0	V	312.0	-5.3	



8.4 AC Power Line Conducted Emissions

8.4.1 Measurement according to ANSI C63.4

Analyzer Settings:

- RBW = 9 KHz (CISPR Bandwidth)
- Detector: Peak / Average for Pre-scan
- Quasi-Peak/Average for Final Measurements

8.4.2 Limits: §15.207 & RSS-Gen 8.8

FCC §15.207(a) & RSS-Gen 8.8

- Except as shown in paragraphs (b) and (c) of this section of the CFR, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table (1), as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between frequency ranges.

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.

8.4.3 Test conditions and setup:

Ambient Temperature ©	EUT Set-Up #	EUT operating mode	Power line (L1, L2, L3, N)	Power Input
22° C	2	continuous fixed channel	Line & Neutral	110V / 60Hz

8.4.4 Measurement Result:

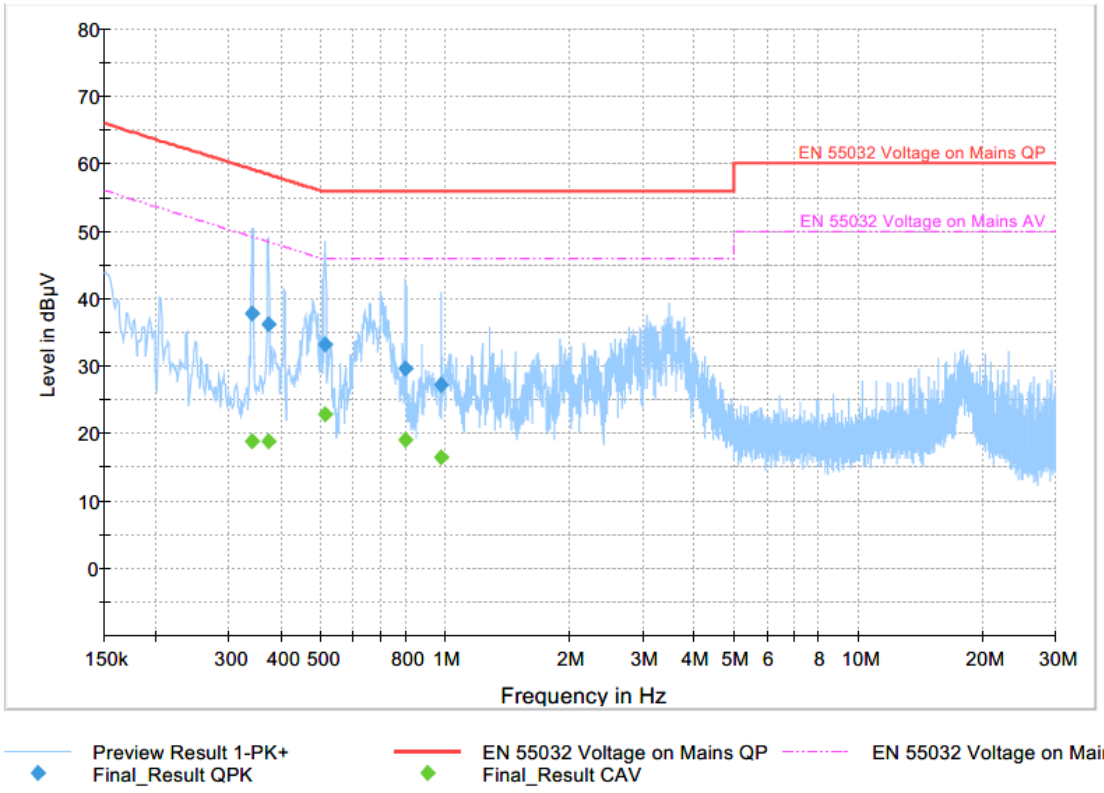
Plot #	Port	EUT Set-Up #:	EUT operating mode	Scan Frequency	Limit	Result
1	AC Mains	3	Zigbee continuous fixed channel	150 kHz – 30 MHz	See section 8.6.2	Pass

8.4.5 Measurement Plots:

Plot # 1

Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	PE	Corr. (dB)	Comment
0.342	---	18.83	49.16	30.33	500.0	9.000	L1	GND	10.0	
0.342	37.82	---	59.16	21.34	500.0	9.000	L1	GND	10.0	
0.374	---	18.94	48.41	29.47	500.0	9.000	L1	GND	10.0	
0.374	36.27	---	58.41	22.15	500.0	9.000	L1	GND	10.0	
0.514	33.21	---	56.00	22.79	500.0	9.000	N	GND	10.0	
0.514	---	22.92	46.00	23.08	500.0	9.000	N	GND	10.0	
0.805	---	19.00	46.00	27.00	500.0	9.000	N	GND	10.0	
0.805	29.57	---	56.00	26.43	500.0	9.000	N	GND	10.0	
0.979	27.27	---	56.00	28.73	500.0	9.000	L1	GND	10.1	
0.979	---	16.39	46.00	29.61	500.0	9.000	L1	GND	10.1	



9 Test setup photos

Setup photos are included in supporting file name: "EMC_EZLOI-001-20001_FCC_IC_Setup_Photos.pdf"

10 Test Equipment And Ancillaries Used For Testing

Item Name	Equipment Type	Manufacturer	Model	Serial #	Calibration Cycle	Last Calibration Date
Antenna Biconilog 3142E	Biconlog Antenna	EMCO	3142E	166067	3 years	03/12/2020
Magnetic Loop Antenna	Loop Antenna	ETS Lindgren	6507	161344	3 years	10/26/2017
Antenna Horn 3115 SN 35111	Horn Antenna	EMCO	3115	35111	3 years	04/17/2019
Antenna Horn 3116	Horn Antenna	ETS Lindgren	3116	70497	3 years	10/31/2017
Antenna Horn 3117	Horn Antenna	ETS Lindgren	3117-PA	169547	3 years	09/01/2020
FSU26	Spectrum Analyzer	R&S	FSU26	200302	3 years	7/16/2019
LISN	Line Impedance Stabilization Network	FCC	FCC-LISN-50-25-2-08	8014	3 Year	7/19/2019
Thermometer Humidity	Thermometer Humidity	Control Company	36934-164	191871994	2 Year	1/10/2019

Note:

1. Equipment used meets the measurement uncertainty requirements as required per applicable standards for 95% confidence levels.

Calibration due dates, unless defined specifically, falls on the last day of the month. Items indicated "N/A" for cal status either do not specifically require calibration or is internally characterized before use.

11 History

Date	Report Name	Changes to report	Report prepared by
2020-10-21	EMC_EZLOI-001-20001_15.249_Zwave	Initial Version	Kevin Wang

<<< The End >>>