



FCC / ISED Test Report

For:
Rivian Automotive

Brand: Rivian Automotive

Marketing Name: Autonomy Experience Module 2.0/ AXM 2.0

Model Name: AXM 2.0

Product Description: Autonomy Experience Module

FCC ID: 2AW3A-2NAT23AXM

IC: 26958-2NAT23AXM

Applied Rules and Standards:
47 CFR Part 15.247 (DTS)
RSS-247 Issue 3 (DTSS) & RSS-Gen Issue 5

REPORT #: EMC_RIVIA_058_23001_15_247_WIFI_DTS_Rev1

DATE: 2024-04-12



A2LA Accredited

IC recognized #
3462B

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1 Assessment

The following device was evaluated against the applicable criteria specified in FCC rules Parts 15.247 of Title 47 of the Code of Federal Regulations and the relevant ISED Canada standard RSS-247.

No deviations were ascertained.

Company	Description	Model #
Rivian Automotive	Autonomy Experience Module	AXM 2.0

Responsible for the Report:

2024-04-12 Compliance Art Thammanavarat
 (Senior EMC Engineer)

Date	Section	Name	Signature
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The test results of this test report relate exclusively to the test item specified in Section3.
 CETECOM Inc. USA does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of CETECOM Inc. USA.

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:	Issa Ghama
Responsible Project Leader:	Rami Saman

2.2 Identification of the Client

Client Firm/Name:	Rivian Automotive, LLC
Street Address:	607 Hansen Way
City/Zip Code	Palo Alto, CA 94304
Country	USA

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:	AXM 2.0
HW Version :	D
SW Version :	42
FCC-ID :	2AW3A-2NAT23AXM
IC:	26958--2NAT23AXM
FWIN:	N/A
HVIN:	AXM 2.0
PMN:	Autonomy Experience Module 2.0
Product Description:	Autonomy Experience Module
Frequency Range / number of channels:	Nominal band: 2400 MHz – 2483.5 MHz; Center to center: 2412 MHz (ch 1) – 2462 MHz (ch 11), 11 channels
Radio Information:	Murata FCC ID: VPYLB1TA IC: 772C-LB1TA <u>External: Wi-Fi 2.4GHz, 5GHz - UNII-1/2A,C /3</u>
Antenna Information as declared:	2.16 dBi
Max. Average Conducted Output Power:	15.34dBm
Power Supply/ Rated Operating Voltage Range:	9 VDC – 16 VDC
Operating Temperature Range	-30° to 45° C
Other Radios included in the device:	Cellular; GPS; BTLE; ANT
Sample Revision	<input checked="" type="checkbox"/> Production Unit; <input type="checkbox"/> Pre-Production
Note: The information of the EUT specifications in the table above is provided by the client.	

3.2 EUT Sample details

EUT #	Serial Number	HW Version	SW Version	Notes/Comments
1	LIP-55352 AXM2-D PEGA	D	42	Radiated and Conducted Measurements

3.3 Accessory Equipment (AE) details

AE #	Type	Part Number	Manufacturer	Serial Number
1	Camera	PT00463985 A	RIVIAN	22287A000000000017
2	Camera	PT00463985 A	RIVIAN	22287A000000000016
3	Camera	PT00463985 A	RIVIAN	22287A000000000078
4	Camera	PT00463984 A	RIVIAN	22329A000000000011
5	Camera	PT00463986 A	RIVIAN	22840A000000000028
6	Camera	PT00463986 A	RIVIAN	22840A000000000044
7	Display	PT00000503-F Rev 01	RIVIAN	22328A0010B1026427
8	Display	PT00055883-E Rev 02	RIVIAN	22213A0010B1001322
9	Display	CLUSTER DISPLAY	RIVIAN	CLUS-008
10	Internal Wi-Fi Antenna	PT00001507	RIVIAN	20268000135
11	Internal Wi-Fi Antenna	PT00001507	RIVIAN	20268000120
12	Internal Wi-Fi Antenna	PT00001507	RIVIAN	N/A
13	External Wi-Fi Antenna	PT00039250	RIVIAN	22342
14	CELL Antenna	PT00039248	RIVIAN	22223
15	Spoiler	5093407	RIVIAN	00051
16	Chiller	LM61GX1A110C	PolyScience	2108-02177
17	Laptop	20S1S97U00	ThinkPad	PF23ZGQM

3.4 Test Sample Configuration

Set-up #	EUT / AE used for set-up	Comments
1	EUT#1+AE#1~17	Radiated RF measurements were performed with EUT configured via customer provided GUE and instructions. Powered by 12 VDC Car battery

3.5 Mode of Operation details

Mode of Operation	Description of Operating modes	Additional Information
Op. 1	External Wi-Fi 802.11b MIMO + Cellular+ Internal Wi-Fi 802.11ax HE20 MIMO and Bluetooth LE Co-Transmission	External WiFi radio was configured to 802.11b High channel using special commands through command window provided by the client that will not be available to the end user Cellular was tested on Mid Channels at maximum power in a co-transmission mode Internal WiFi radio was configured to 802.11ax HE20 Low channel using special commands through command window provided by the client that will not be available to the end user Bluetooth LE radio was configured to a fixed channel transmission with highest possible duty cycle using confidential test software and scripts provided by the applicant.

3.6 Justification for Worst Case Mode of Operation

During the testing process the EUT was tested with transmitter sets on mid channels at the maximum power simultaneous transmission with Cellular LTE Band 7 + External WiFi radio 802.11b High channel and Bluetooth LE, which is the worst case of the radios supported, based on the maximum average conducted output power from the reports.

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 15.247 of Title 47 of the Code of Federal Regulations and Radio Standard Specification RSS-247 of ISED Canada.

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

- FCC ID: VPYLB2AJ
- IC: 772C-LB2AJ

Testing procedures are based on 558074 D01 15.247 Meas Guidance v05r02 – “GUIDANCE FOR COMPLIANCE MEASUREMENTS ON DIGITAL TRANSMISSION SYSTEM, FREQUENCY HOPPING SPREAD SPECTRUM SYSTEM, AND HYBRID SYSTEM DEVICES OPERATING UNDER SECTION 15.247 OF THE FCC RULES” - April 2, 2019, by the Federal Communications Commission, Office of Engineering and Technology, Laboratory Division.

5 Measurement Results Summary

Test Specification	Test Case	Temperature and Voltage Conditions	Mode	Pass	NA	NP	Result
§15.247(a)(1) RSS-247 5.2(a)	Emission Bandwidth	Nominal	802.11b,g,n,ac,ax	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	See Note 4
§15.247(e) RSS-247 5.2(b)	Power Spectral Density	Nominal	802.11b,g,n,ac,ax	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	See Note 5
§15.247(b)(1) RSS-247 5.4(d)	Maximum Conducted Output Power and EIRP	Nominal	802.11b,g,n,ac,ax	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	See Note 3,6
§15.247(d) RSS-247 5.5	Band edge compliance Unrestricted Band Edges	Nominal	802.11b,g,n,ac,ax	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	See Note 7
§15.247; 15.209; 15.205 RSS-Gen 8.9; 8.10	Band edge compliance Restricted Band Edges	Nominal	802.11b,g,n,ac,ax	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	See Note 7
§15.247(d); §15.209 RSS-Gen 6.13	TX Spurious emissions- Radiated	Nominal	802.11b,g,n,ac,ax	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Complies
§15.207(a) RSS Gen 8.8	AC Conducted Emissions	Nominal	N/A	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	See Note 1,2

Note 1: NA= Not Applicable, NP= Not Performed.

Note 2: This device does not connect to AC mains network

Note 3: Power verification testing was conducted only on highest channel power.

Note 4: Leveraged from report # TERF2310002626ER Section 9 (FCC ID: VPYLB1TA)

Note 5: Leveraged from report # TERF2310002626ER, Section 12 (FCC ID: VPYLB1TA)

Note 6: Leveraged from report # TERF2310002626ER, Section 8 (FCC ID: VPYLB1TA)

Note 7: Leveraged from report # TERF2310002626ER, Section 11 (FCC ID: VPYLB1TA J)

6 Measurement Uncertainty

6.1 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=2.

Measurement System	EMC 1	EMC 2
Conducted emissions (mains port)	1.12 dB	0.46 dB
Radiated emissions (< 30 MHz)	3.66 dB	3.88 dB
(30 MHz – 1GHz)	3.17 dB	3.34 dB
(1 GHz – 3 GHz)	5.01 dB	4.45 dB
(>3 GHz)	4.0 dB	4.79 dB

6.2 Environmental Conditions during Testing:

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

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

Deviating test conditions are indicated at individual test description where applicable.+

6.3 Date of Testing:

2023-12-11 – 2023-12-22

6.4 Decision Rule:

Cetecom advanced follows ILAC G8:2019 chapter 4.2.1 (Simple Acceptance Rule).

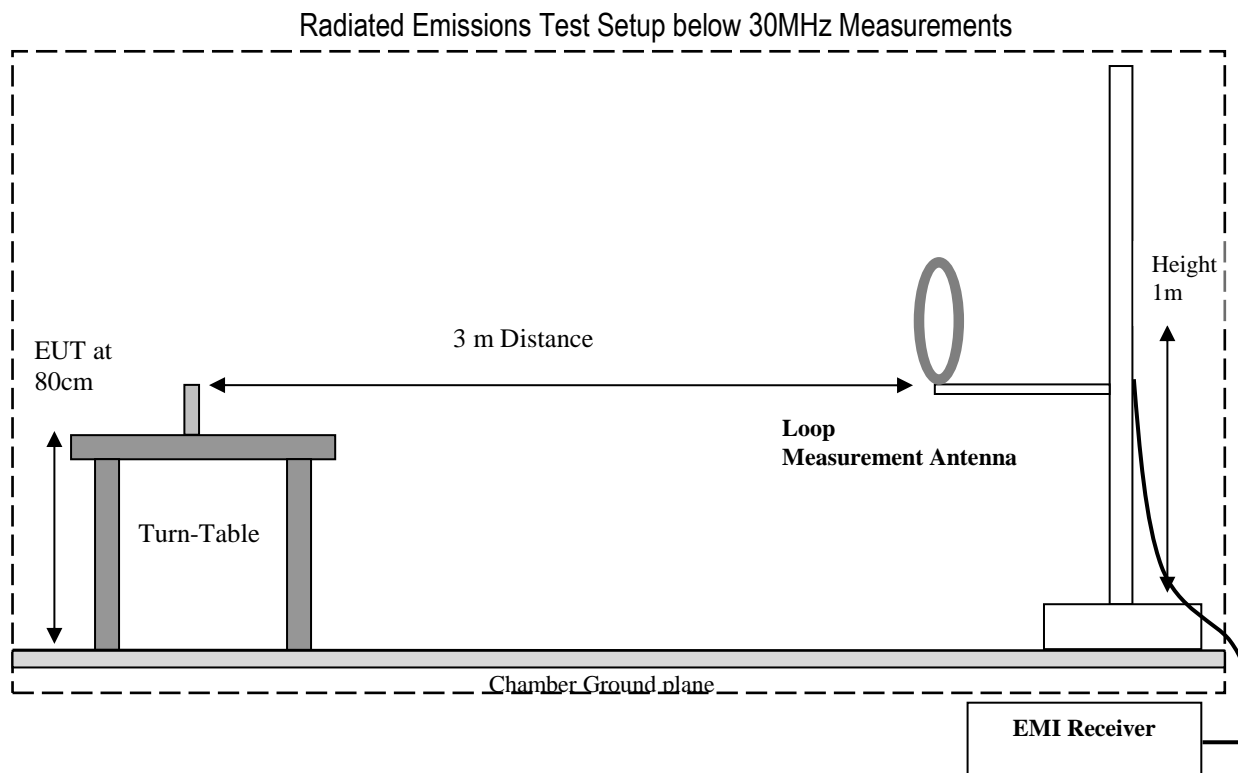
Only the measured values related to their corresponding limits will be used to decide whether the equipment under test meets the requirements of the test standards listed in chapter 3. The measurement uncertainty is mentioned in this test report, See chapter 9, but is not taken into account – neither to the limits nor to the measurement results. Measurement results with a smaller margin to the corresponding limits than the measurement uncertainty have a potential risk of more than 5% that the decision might be wrong.

7 Measurement Procedures

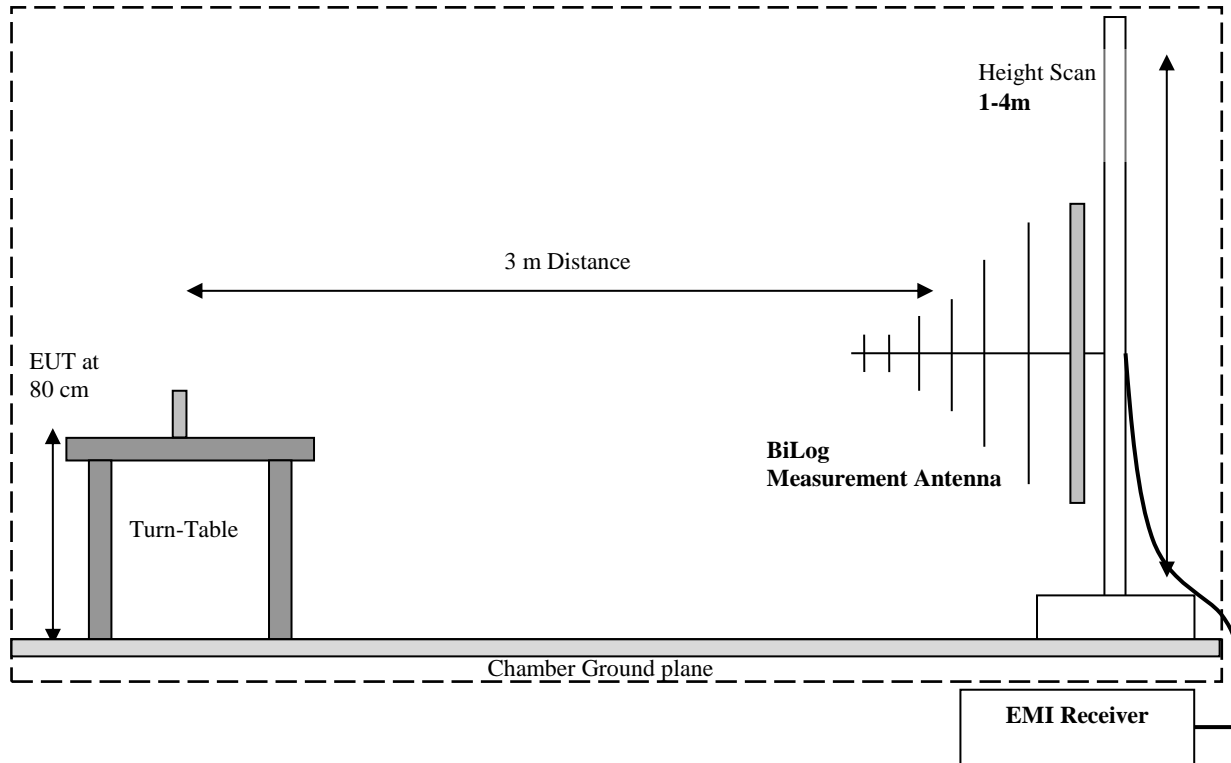
7.1 Radiated Measurement

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

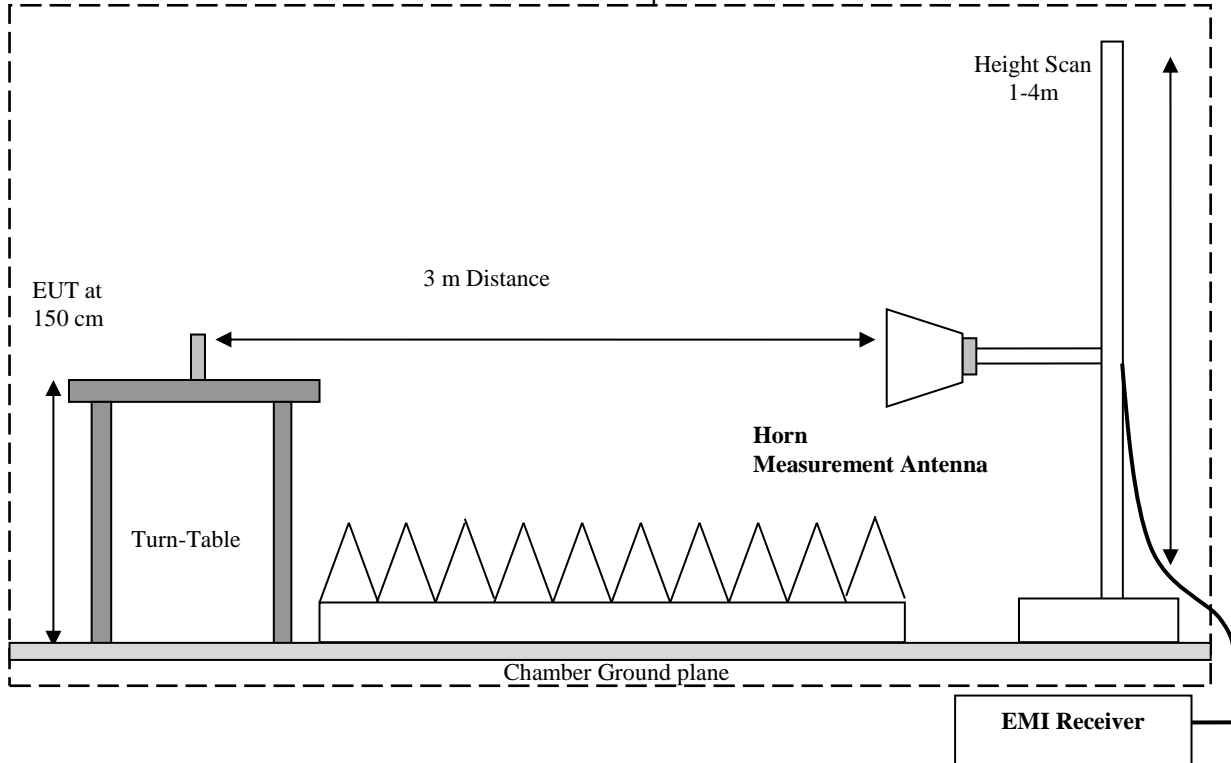
- The exploratory measurement is accomplished by running a matrix of 16 sweeps over the required frequency range with R&S Test-SW EMC32 for 4 positions of the turntable, two orthogonal positions of the EUT and both antenna polarizations. This procedure exceeds the requirement of the above standards to 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 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:

$$FS \text{ (dB}\mu\text{V/m)} = \text{Measured Value on SA (dB}\mu\text{V)} + \text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)}$$

Example:

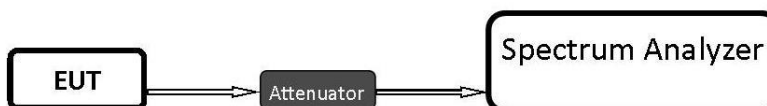
Frequency (MHz)	Measured SA (dBμV)	Cable Loss (dB)	Antenna Factor Correction (dB)	Field Strength Result (dBμV/m)
1000	80.5	3.5	14	98.0

7.2 Power Line Conducted Measurement Procedure

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

7.3 RF Conducted Measurement Procedure

Testing procedures are based on 558074 D01 15.247 Meas Guidance v05r02 – “GUIDANCE FOR COMPLIANCE MEASUREMENTS ON DIGITAL TRANSMISSION SYSTEM, FREQUENCY HOPPING SPREAD SPECTRUM SYSTEM, AND HYBRID SYSTEM DEVICES OPERATING UNDER SECTION 15.247 OF THE FCC RULES” - April 2, 2019, by the Federal Communications Commission, Office of Engineering and Technology, Laboratory Division.



- Connect the equipment as shown in the above diagram.
- Adjust the settings of the SA (Rohde-Schwarz Spectrum Analyzer) to connect the EUT at the required mode of test.
- Measurements are to be performed with the EUT set to the low, middle and high channels and for worst case modulation schemes.

8 Test Result Data

8.1 EIRP Measurement Results

SISO

Radio	Mode	Data Rate	Avg. Output Power CH 0	Avg. Output Power CH 1	Cable Loss	Ant-Gain	EIRP	Limit EIRP
			(dBm)	(dBm)				
Wi-Fi	802.11b	1	15.64		3.50	2.16	0.0269	4
		1		15.69	3.50	1.39	0.0228	4
	802.11g	6	14.86		3.50	2.16	0.0225	4
		6		14.98	3.50	1.39	0.0194	4
	802.11n HT20M	MCS0	13.88		3.50	2.16	0.0179	4
		MCS0		13.99	3.50	1.39	0.0154	4
	802.11ac VHT 20M	MCS0	13.89		3.50	2.16	0.0180	4
		MCS0		13.99	3.50	1.39	0.0154	4
	802.11ax HE20M	MCS0	13.72		3.50	2.16	0.0173	4
		MCS0		13.97	3.50	1.39	0.0153	4

MIMO

Radio	Mode	Data Rate	Avg. Output Power CH 0	Avg. Output Power CH 1	Total Avg. Output Power	Cable Loss	Ant-Gain	EIRP	Limit EIRP
			(dBm)	(dBm)					
Wi-Fi	802.11b	MCS0	15.65	16.19	18.93	3.50	1.79	0.0527	4
	802.11g	MCS0	14.41	15.18	17.82	3.50	1.79	0.0408	4
	802.11n HT20M	MCS0	13.39	14.22	16.84	3.50	1.79	0.0326	4
	802.11ac VHT 20M	MCS0	13.63	13.96	16.81	3.50	5.17	0.0705	4
	802.11ax HE20M	MCS0	13.54	14.35	16.98	3.50	5.17	0.0733	4

Note 1: Power Conducted (dBm) leveraged from test report "TERF2310002626ER" prepared by SGS Taiwan Ltd. The module Model # LBEE6ZZ1TA (FCC ID: VPYLB1TA, IC: 772C-LB1TA).

Note 2: EIRP are based on calculations from Power Conducted by adding the declared maximum gain of the utilized antenna per operational description

8.2 Maximum Conducted (Average) Output Power Verification

8.2.1 Measurement according to FCC 558074 D01 15.247 Meas Guidance v05r02

Spectrum Analyzer settings:

- RBW = 1% to 5% of the OBW, not to exceed 1 MHz
- VBW ≥ 3 x RBW
- Span = at least 1.5 times the OBW
- Sweep = Auto couple
- Detector function = RMS
- Trace = Average (at least 100 traces in power averaging (rms) mode)
- Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function with band limits set equal to the OBW band edges
- Add $[10 \log (1 / D)]$, where D is the duty cycle, to the measured power to compute the average power during the actual transmission times

8.2.2 Limits:

Maximum Output Power:

- FCC §15.247 (b)(1): 1 W
- IC RSS-247: 1 W

8.2.3 Test conditions and setup:

Ambient Temperature	EUT Set-Up #	EUT operating mode	Power Input	Antenna Gain
22.8°C	1	1	12 VDC	1.79 dBi

8.2.4 Measurement result:

Plot #	Frequency (MHz)	EUT Operating Mode	Total Average Output Power (dBm)	Cable Loss	EIRP		Limit (dBm)	Result
				(dBm)	(dBm)	(W)		
1	2462	802.11b	15.34	3.5	13.63	0.0231	30 (Avg) / 36 (EIRP)	Pass

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 §15.247

- 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. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. 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)).

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
10.495-0.505	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
22.8° C	1	1	12 VDC

8.3.4 Measurement result:

Plot #	Channel #	Scan Frequency	Lowest margin emission (dBµV/m)	Limit	Result
1-5	High*	9 kHz – 40 GHz	61.82	See section 8.2.2	Pass

***Note:** Co-Transmission was determined by the worst case combination of the following:
 Cellular LTE Band 7+ BLE+ Internal Wi-Fi 2.4GHz + External Wi-Fi 2.4GHz.

8.3.5 Measurement Plots:

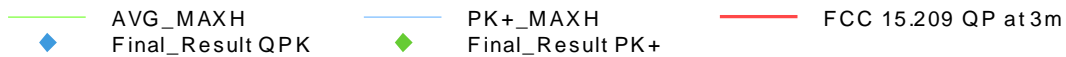
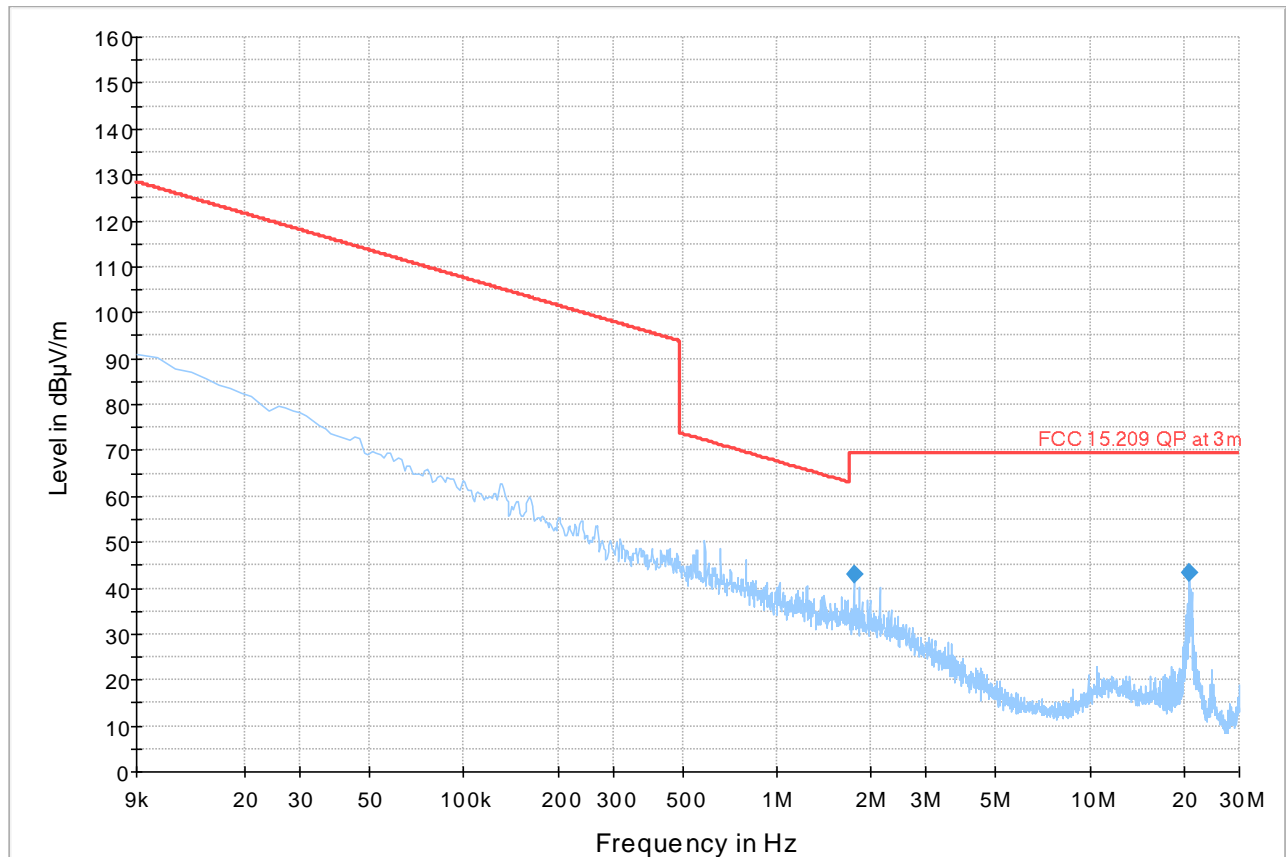
Plot # 1 Radiated Emissions: 9 KHz – 30 MHz

Tx Frequency: 2462 MHz

802.11b

Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Sig Path	Preamp (dB)	Trd Corr.	Raw Rec
1.763	42.93	---	69.50	26.57	500.0	9.000	100.0	H	75.0	14.8	0.1	-28.3	42.9	28.1
20.872	43.32	---	69.50	26.18	500.0	9.000	100.0	H	198.0	6.2	0.2	-28.0	34.0	37.2





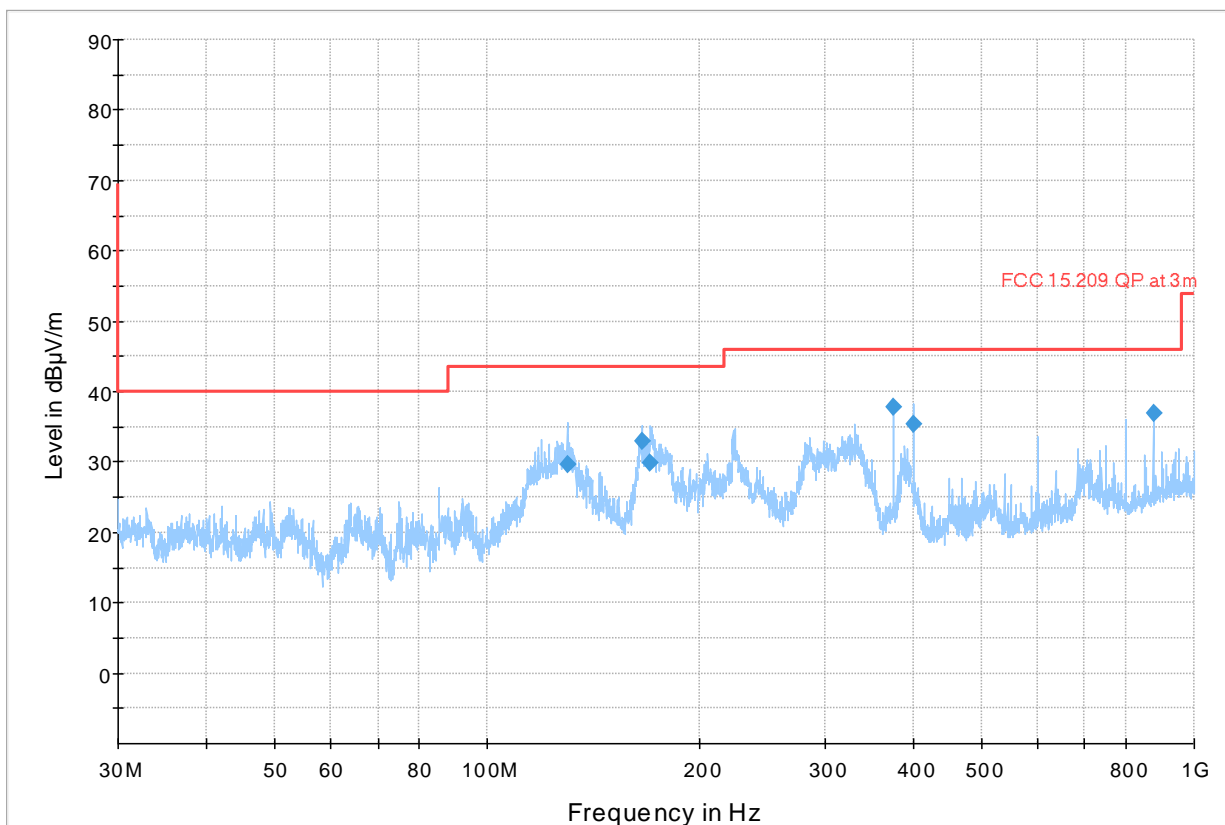
Plot # 2 Radiated Emissions: 30 MHz – 1 GHz

Tx Frequency: 2462 MHz

802.11b

Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Sig Path	Preamp (dB)	Trd Corr.	Raw Rec
129.546	29.70	---	43.50	13.80	500.0	120.000	134.0	H	322.0	-10.3	-	0.0	24.6	40.0
165.145	32.90	---	43.50	10.60	500.0	120.000	100.0	V	83.0	-10.0	-	0.0	24.6	42.9
169.971	29.97	---	43.50	13.53	500.0	120.000	241.0	H	126.0	-12.9	-	0.0	21.7	42.9
374.981	37.71	---	46.02	8.31	500.0	120.000	100.0	H	335.0	-12.3	-	0.0	21.6	50.0
399.982	35.38	---	46.02	10.64	500.0	120.000	100.0	H	29.0	-11.1	-	0.0	22.7	46.5
874.991	36.97	---	46.02	9.05	500.0	120.000	107.0	V	83.0	-3.8	-	0.0	28.5	40.8



— AVG_MAXH
◆ Final_Result QPK
 — PK+_MAXH
◆ Final_Result PK+
 — FCC 15.209 QP at 3m

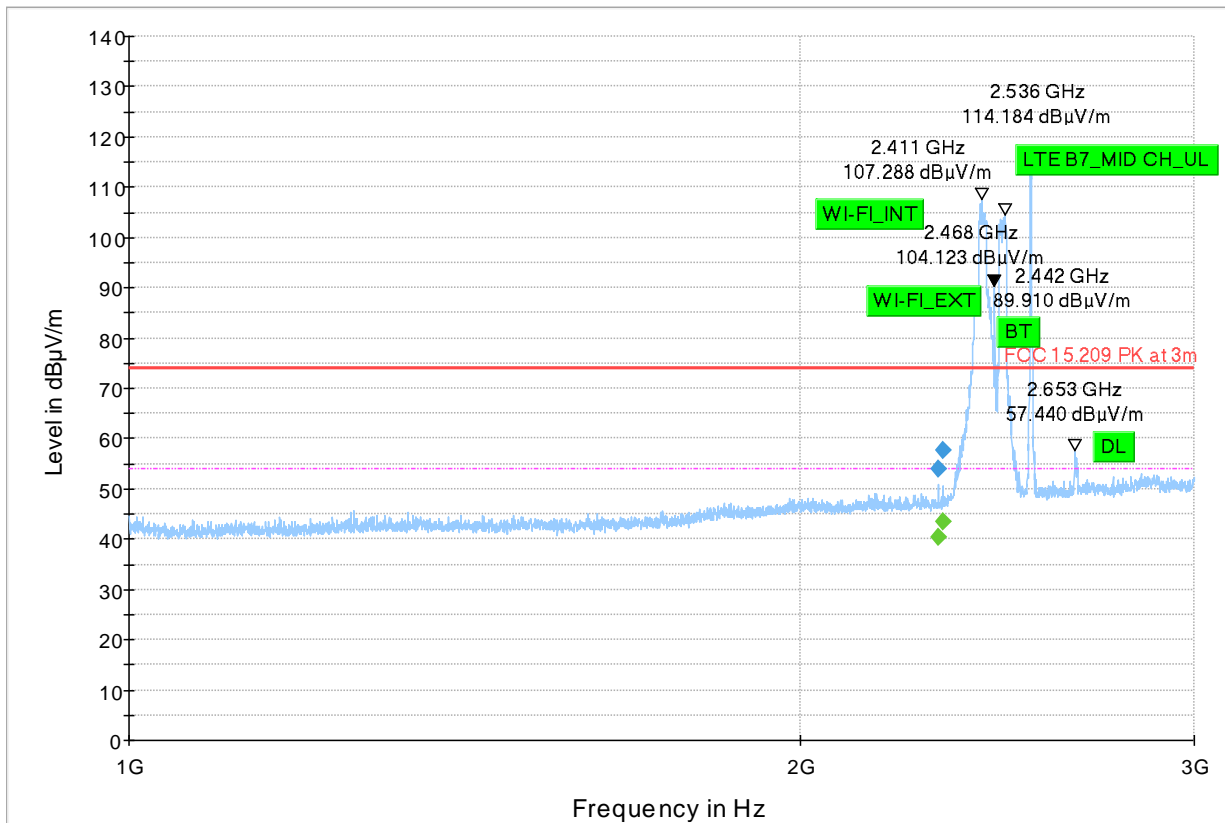
Plot # 3 Radiated Emissions: 1 – 3 GHz

Tx Frequency: 2462 MHz

802.11b

Final Result

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Sig Path	Preamp (dB)	Trd Corr.	Raw Rec
2305.571	---	40.46	53.98	13.52	500.0	1000.000	343.0	V	99.0	32.8	5.1	0.0	27.7	7.7
2305.571	53.84	---	73.98	20.14	500.0	1000.000	343.0	V	99.0	32.8	5.1	0.0	27.7	21.1
2314.000	---	43.45	53.98	10.53	500.0	1000.000	100.0	H	124.0	32.9	5.1	0.0	27.8	10.6
2314.000	57.74	---	73.98	16.24	500.0	1000.000	100.0	H	124.0	32.9	5.1	0.0	27.8	24.9



— AVG_MAXH — PK+_MAXH — FCC 15.209 PK at 3m
⋯ FCC 15.209 AVG at 3m ◆ Final_Result PK+ ◆ Final_Result CAV

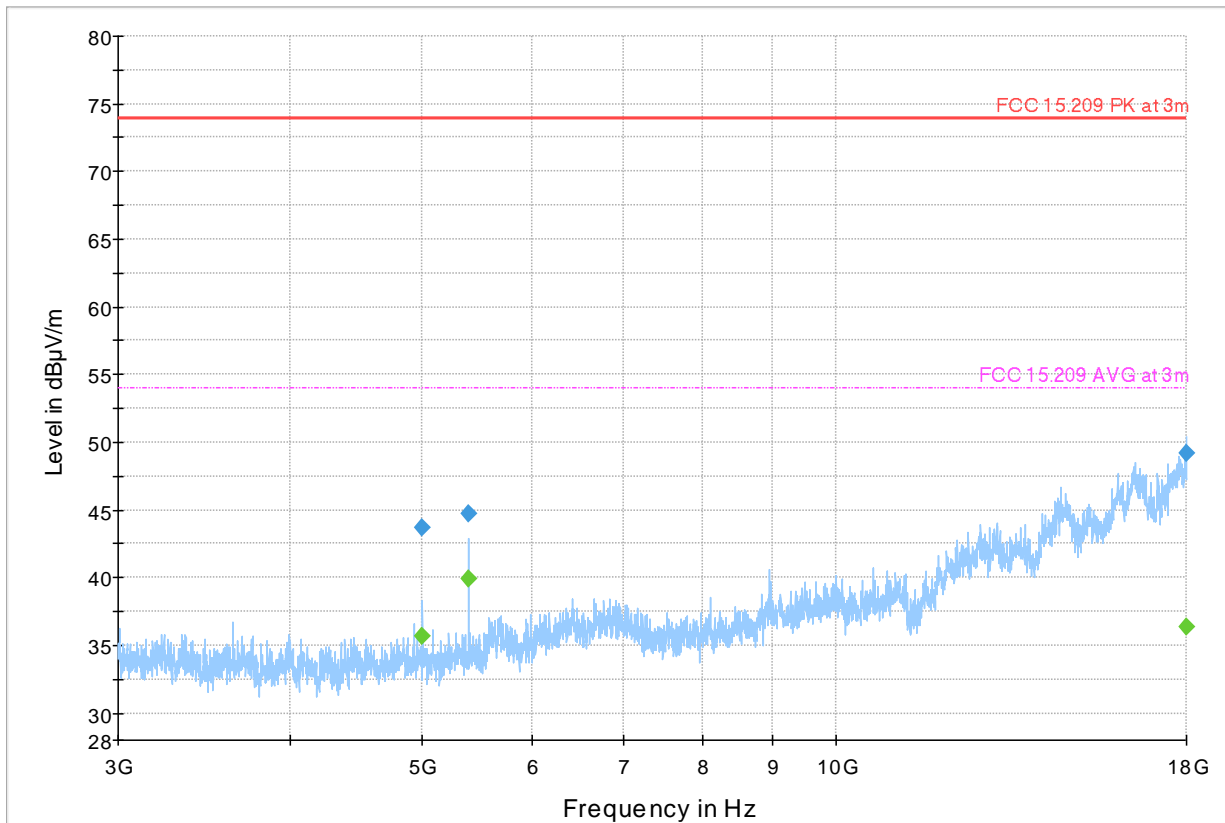
Plot # 4 Radiated Emissions: 3 – 18 GHz

Tx Frequency: 2462 MHz

802.11b

Final Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Sig Path	Preamp (dB)	Trd Corr.	Raw Rec
5000.000	43.71	---	73.98	30.27	500.0	1000.000	318.0	V	255.0	-3.7	8.0	-45.8	34.1	47.4
5000.000	---	35.66	53.98	18.32	500.0	1000.000	318.0	V	255.0	-3.7	8.0	-45.8	34.1	39.3
5400.250	44.73	---	73.98	29.25	500.0	1000.000	126.0	V	296.0	-2.8	8.2	-45.7	34.7	47.5
5400.250	---	39.87	53.98	14.11	500.0	1000.000	126.0	V	296.0	-2.8	8.2	-45.7	34.7	42.6
17999.250	---	36.40	53.98	17.58	500.0	1000.000	144.0	V	122.0	15.7	16.2	-42.2	41.7	20.7
17999.250	49.15	---	73.98	24.83	500.0	1000.000	144.0	V	122.0	15.7	16.2	-42.2	41.7	33.5



—◆ AVG_MAXH —◆ PK+_MAXH — FCC 15.209 PK at 3m
- - -◆ FCC 15.209 AVG at 3m ◆ Final_Result PK+ ◆ Final_Result CAV

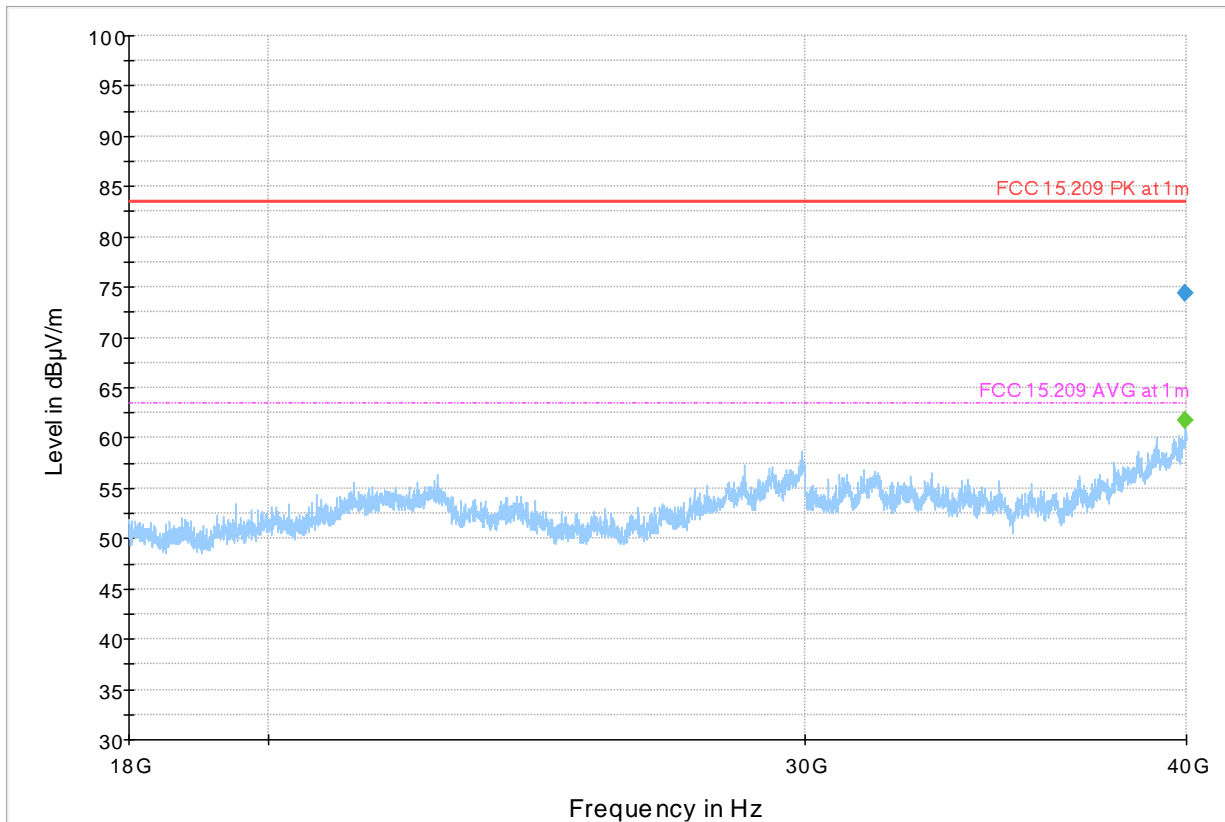
Plot # 5 Radiated Emissions: 18 – 40 GHz

Tx Frequency: 2462 MHz

802.11b

Final Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Sig Path	Preamp (dB)	Trd Corr.	Raw Rec
39970.625	---	61.82	63.50	1.68	500.0	1000.000	325.0	V	274.0	24.4	12.7	0.0	11.6	37.5
39970.625	74.35	---	83.50	9.15	500.0	1000.000	325.0	V	274.0	24.4	12.7	0.0	11.6	50.0



- AVG_MAXH
- PK+_MAXH
- FCC 15.209 PK at 1m
- FCC 15.209 AVG at 1m
- ◆ Final_Result PK+
- ◆ Final_Result CAV

9 Test setup photos

Setup photos are included in supporting file name: "EMC_RIVIA_058_23001_15_247_FCC_Setup_Photos.pdf"

10 Test Equipment and Ancillaries Used For Testing

Equipment Type	Manufacturer	Model	Serial #	Calibration Cycle	Last Calibration Date
BILOG ANTENNA	A.H. SYSTEMS	BiLA2G	569	3 YEARS	10/30/2023
HORN ANTENNA	EMCO	3115	00035111	3 YEARS	10/26/2023
HORN ANTENNA	ETS LINDGREN	3117-PA	00167061	3 YEARS	9/25/2023
HORN ANTENNA	ETS LINDGREN	3116C-PA	00166821	3 YEARS	10/26/2023
ESW.EMI TEST RECEIVER	ROHDE & SCHWARZ	ESW44	101715	3 YEARS	10/24/2023
DIGITAL THERMOMETER	Control Company	4410,90080-03	230712972	3 YEARS	10/18/2023
Software	EMC32	Version 10.50.40	-	-	-

Note: 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	Template Revision	Changes to report	Prepared by
2024-02-23	EMC_RIVIA_058_23001_15_247_WIFI_DTS	Initial Version	Art Thammanavarat
2024-04-12	EMC_RIVIA_058_23001_15_247_WIFI_DTS_Rev1	<u>Report Revised base on TCB's review.</u> 1. Sections 1: Corrected typo. And Removed report reviewer 2. Title Page, Secs 1 & 3.1: Updated Product Description. 3. Section 3.1: Updated Table. 4. Section 8.1: Added EIRP Measurement results.	Art Thammanavarat

<<< The End >>>