FCC / ISED Test Report

FOR:
Geoforce Inc.

Model Name:
Geoforce GT2

Product Description:
GNSS enabled logistics modem

FCC ID: OWA00GT2X
IC ID: 10540A-00GT2X

Applied Rules and Standards:
47 CFR Part 15.247 (DTS)
RSS-247 Issue 2 (DTSs) & RSS-Gen Issue 5

REPORT #: EMC_GEOFO-023-21001_15.247_WiFi

DATE: 2021-08-18

A2LA Accredited

IC recognized # 3462B-1

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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	Marketing Name	Model #
Geoforce Inc.	GNSS enabled logistics modem	Geoforce GT2	GT2h (OWAH86), GT2s (OWAS86), GT2c (OWAC99)

Responsible for Testing Laboratory:

Date	Section	Name	Signature
2021-08-18	Compliance	Kevin Wang (EMC Lab Manager)	kevin.wang@cetecom.com Digitally signed by: kevin.wang@cetecom.com DN: CN = kevin.wang@cetecom.com Date: 2021.08.24 12:52:10 -07'00'

Responsible for the Report:

Date	Section	Name	Signature
2021-08-18	Compliance	Yuchan Lu (Test Engineer)	Yuchan Lu Digitally signed by: Yuchan Lu DN: CN = Yuchan Lu email = Yuchan.Lu@cetecom.com C = US O = CETECOM Inc. OU = EMC Date: 2021.08.18 17:41:47 -07'00'

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 Manger:	Kevin Wang
Responsible Project Leader:	Sangeetha Sivaraman

2.2 Identification of the Client

Applicant's Name:	Geoforce Inc.
Street Address:	5830 Granite Parkway, Suite 1200
City/Zip Code	Plano, TX 75024
Country	United States

2.3 Identification of the Manufacturer

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

3 Equipment Under Test (EUT)

3.1 EUT Specifications

Marketing Name:	Geoforce GT2
Model No:	GT2h (OWAH86), GT2s (OWAS86), GT2c (OWAC99)
HW Version :	R2
SW Version :	0.4.T (Test supporting software version)
FCC-ID :	OWA00GT2X
IC-ID:	10540A-00GT2X
FWIN:	0.4.T
HVIN:	GT2h (OWAH86), GT2s (OWAS86), GT2c (OWAC99)
PMN:	Geoforce GT2
Product Description:	GNSS enabled logistics modem
Radio Technology:	UBlox u-blox NINA-W151, 802.11b/g/n FCC ID: XPYNINAW15 IC ID: 8595A-NINAW15
Frequency Range / number of channels:	Nominal band: 2400 MHz – 2483.5 MHz; 11 Channels
Type(s) of Modulation:	802.11 b/g/n
Modes of Operation:	normal operation mode
Antenna Information as declared:	max gain 3 dBi
Max. Avg Output Power:	Conducted Power 15.6 dBm
Power Supply/ Rated Operating Voltage Range:	Dedicated Battery Pack Vmin: 1.8 VDC/ Vnom: 3.6 VDC / Vmax: 3.7 VDC
Operating Temperature Range	-40 ºC to 85 ºC
Other Radios included in the device:	• Cellular-Nordic nRF9160 (FCC ID: 2ANPO00NRF9160; IC ID: 24529-NRF9160) • Bluetooth: Nordic nRF52840 SoC • GPS: u-blox ZOE-M8 • Satellite: Iridium 9603N (FCC ID: Q639603N; IC ID: 4629A-9603N
Sample Revision	☐Prototype Unit; ■Production Unit; ☐Pre-Production

3.2 EUT Sample details

EUT #	Serial Number	HW Version	SW Version	Notes/Comments
1	00092125	R2	0.4.T	WiFi Radiated Sample

3.3 Support Equipment (SE) details

SE #	Type	Model	Manufacturer	Serial Number
1	Access Point	WRT32X	LINKSYS	22C10609700450
2	Laptop	Latitude 7490	Dell	J5VPBB2

3.4 Test Sample Configuration

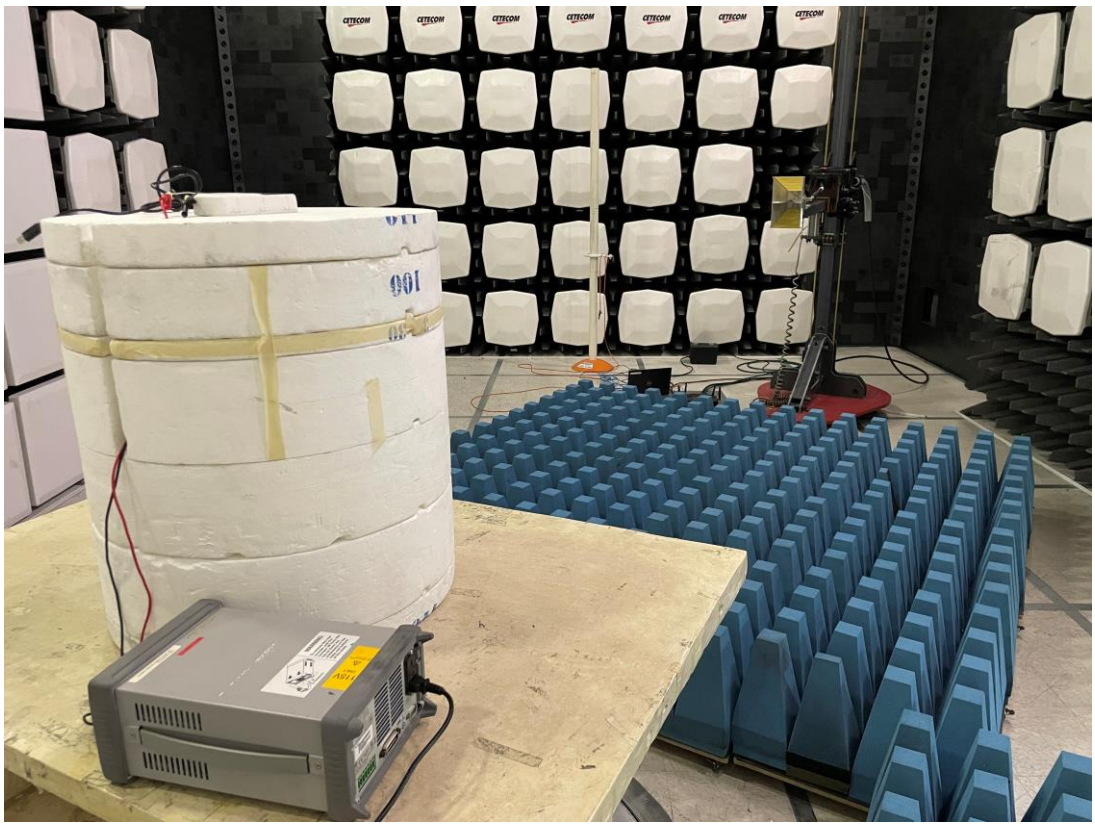
EUT Set-up #	Combination of SE used for test set up	Comments
1	EUT#1+SE#1+SE#2	The radio of the EUT was configured to a fixed channel transmission through a supported AP. Based on customer information, the Wi-Fi module will only be used to scan for access points and will never connect to them. Then Windows Command Ping was sufficient to exercising the transmission channel.

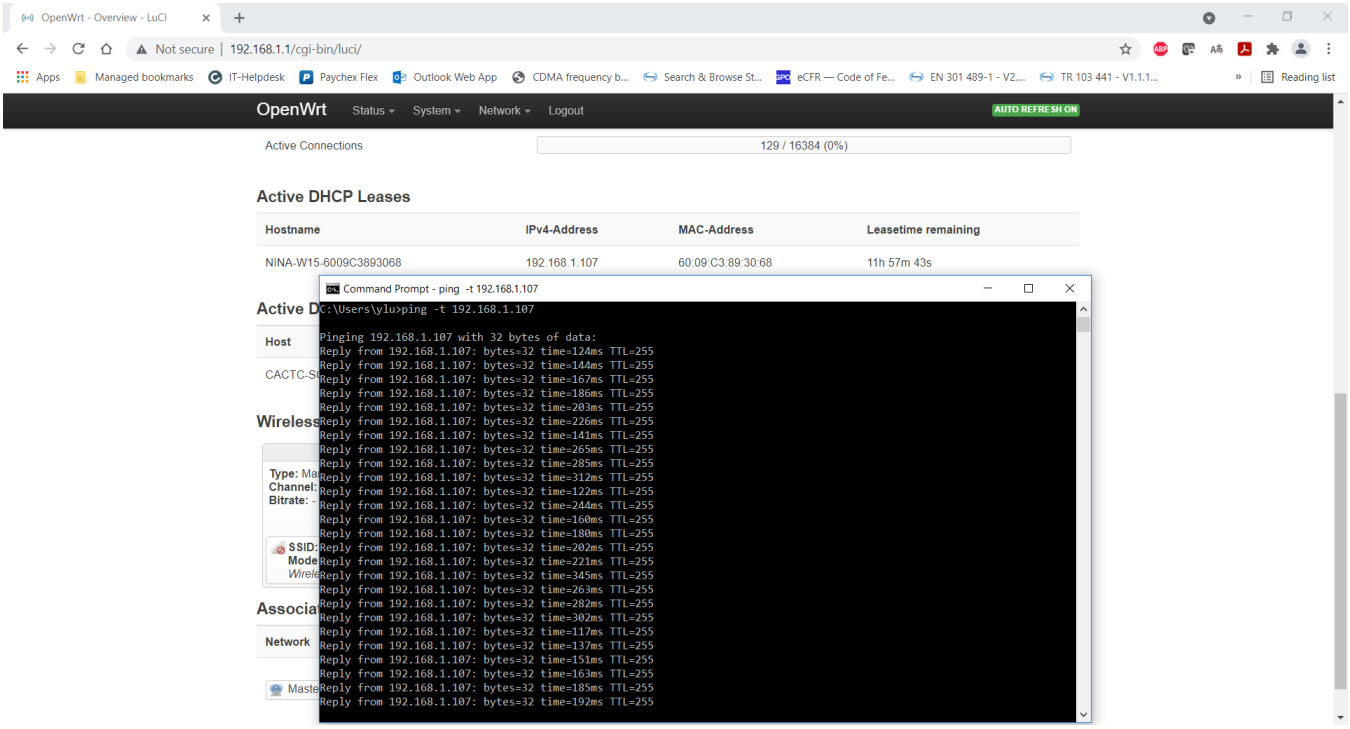
3.5 Justification for Worst Case Mode of Operation

During the testing process, the EUT was tested with transmitter sets on low, mid and high channels, 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.

Based on the Wi-Fi module test report, the worst case was 802.11g mode.

The laptop is connected with the Access Point to send Windows Command Ping to the device through WiFi.




OpenWrt - Overview - LuCI
Not secure | 192.168.1.1/cgi-bin/luci/
OpenWrt
Status
System
Network
Logout
AUTO REFRESH ON
Active Connections
129 / 16384 (0%)
Active DHCP Leases
Hostname
IPv4-Address
MAC-Address
Leasetime remaining
NINA-W15-6009C3893068
192.168.1.107
60:09:C3:89:30:68
11h 57m 43s
Command Prompt - ping -t 192.168.1.107
C:\Users\ylu>ping -t 192.168.1.107
Pinging 192.168.1.107 with 32 bytes of data:
Reply from 192.168.1.107: bytes=32 time=124ms TTL=255
Reply from 192.168.1.107: bytes=32 time=144ms TTL=255
Reply from 192.168.1.107: bytes=32 time=167ms TTL=255
Reply from 192.168.1.107: bytes=32 time=186ms TTL=255
Reply from 192.168.1.107: bytes=32 time=203ms TTL=255
Reply from 192.168.1.107: bytes=32 time=226ms TTL=255
Reply from 192.168.1.107: bytes=32 time=141ms TTL=255
Reply from 192.168.1.107: bytes=32 time=265ms TTL=255
Reply from 192.168.1.107: bytes=32 time=285ms TTL=255
Reply from 192.168.1.107: bytes=32 time=312ms TTL=255
Reply from 192.168.1.107: bytes=32 time=122ms TTL=255
Reply from 192.168.1.107: bytes=32 time=244ms TTL=255
Reply from 192.168.1.107: bytes=32 time=160ms TTL=255
Reply from 192.168.1.107: bytes=32 time=180ms TTL=255
Reply from 192.168.1.107: bytes=32 time=202ms TTL=255
Reply from 192.168.1.107: bytes=32 time=221ms TTL=255
Reply from 192.168.1.107: bytes=32 time=345ms TTL=255
Reply from 192.168.1.107: bytes=32 time=263ms TTL=255
Reply from 192.168.1.107: bytes=32 time=282ms TTL=255
Reply from 192.168.1.107: bytes=32 time=302ms TTL=255
Reply from 192.168.1.107: bytes=32 time=117ms TTL=255
Reply from 192.168.1.107: bytes=32 time=137ms TTL=255
Reply from 192.168.1.107: bytes=32 time=151ms TTL=255
Reply from 192.168.1.107: bytes=32 time=163ms TTL=255
Reply from 192.168.1.107: bytes=32 time=185ms TTL=255
Reply from 192.168.1.107: bytes=32 time=192ms TTL=255

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: OWA00GT2X
- IC ID: 10540A-00GT2X

Testing procedures are based on 558074 D01 DTS Meas Guidance v05r02 – "GUIDANCE FOR PERFORMING COMPLIANCE MEASUREMENTS ON DIGITAL TRANSMISSION SYSTEMS (DTS) OPERATING UNDER SECTION 15.247" - 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	-	☐	☐	■	Note 2
§15.247(e) RSS-247 5.2(b)	Power Spectral Density	Nominal	-	☐	☐	■	Note 2
§15.247(b)(1) RSS-247 5.4(d)	Maximum Conducted Output Power and EIRP	Nominal	-	☐	☐	■	Note 2
§15.247(d) RSS-247 5.5	Band edge compliance Unrestricted Band Edges	Nominal	-	☐	☐	■	Note 2
§15.247; 15.209; 15.205 RSS-Gen 8.9; 8.10	Band edge compliance Restricted Band Edges	Nominal	-	☐	☐	■	Note 2
§15.247(d); §15.209 RSS-Gen 6.13	TX Spurious emissions-Radiated	Nominal	802.11bg	■	☐	☐	Complies
§15.207(a) RSS Gen 8.8	AC Conducted Emissions	Nominal	-	☐	■	☐	NA

Note: NA= Not Applicable; NP= Not Performed.
Note2: Please refer to the module test report, the module FCC ID is XPYNINAW15.

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:

08/16/2021 - 08/16/2021

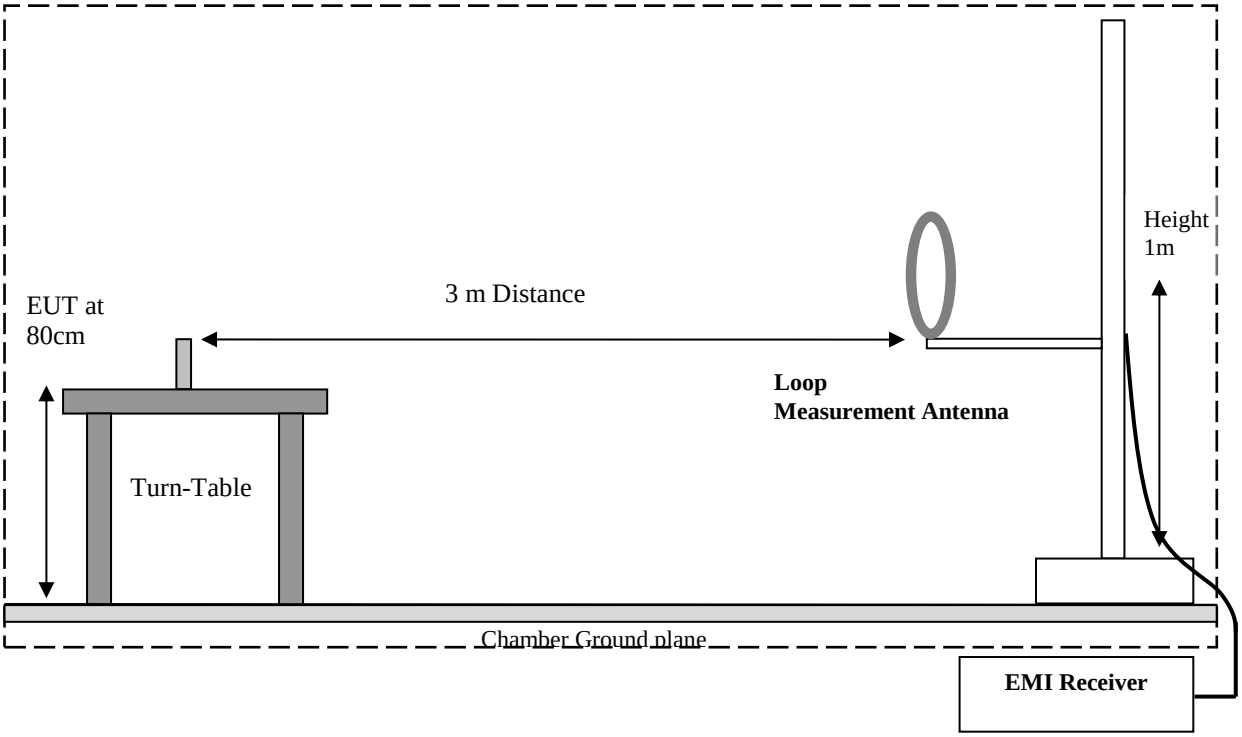
7 Measurement Procedures

7.1 Radiated Measurement

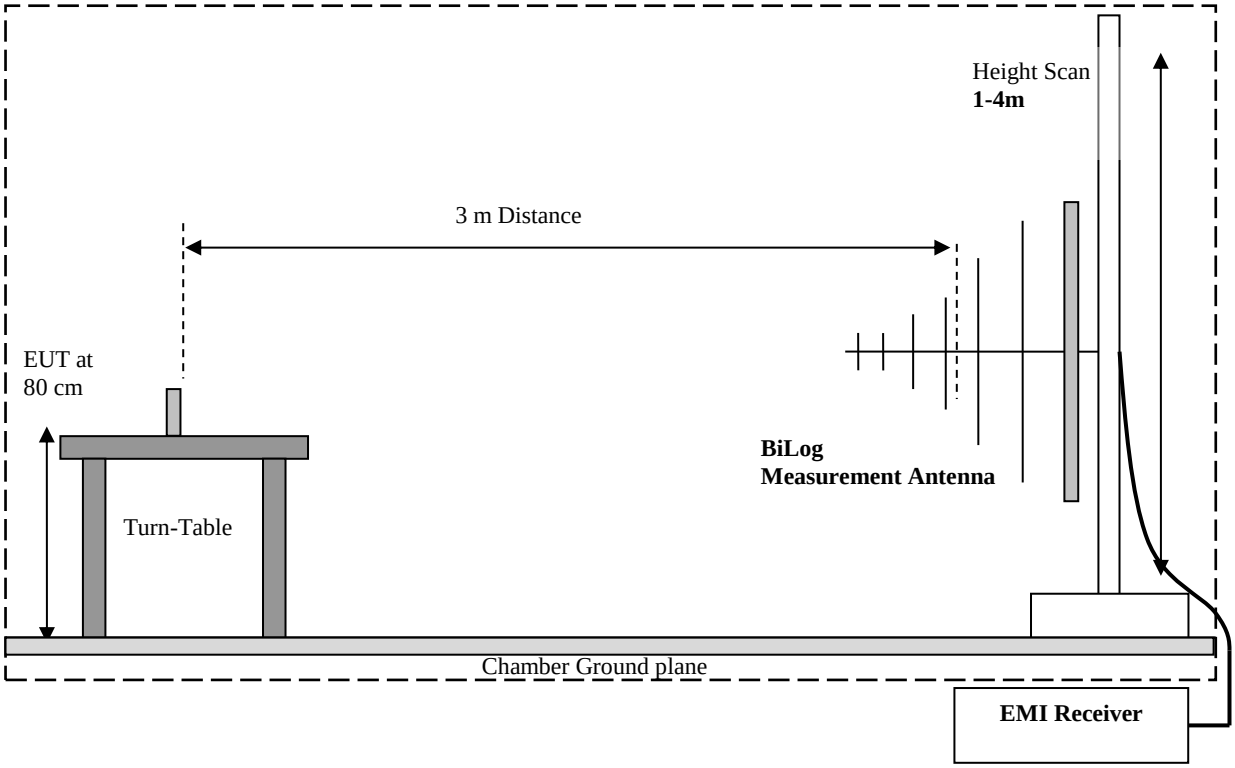
The radiated measurement is performed according to ANSI C63.10 (2013)

- 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.

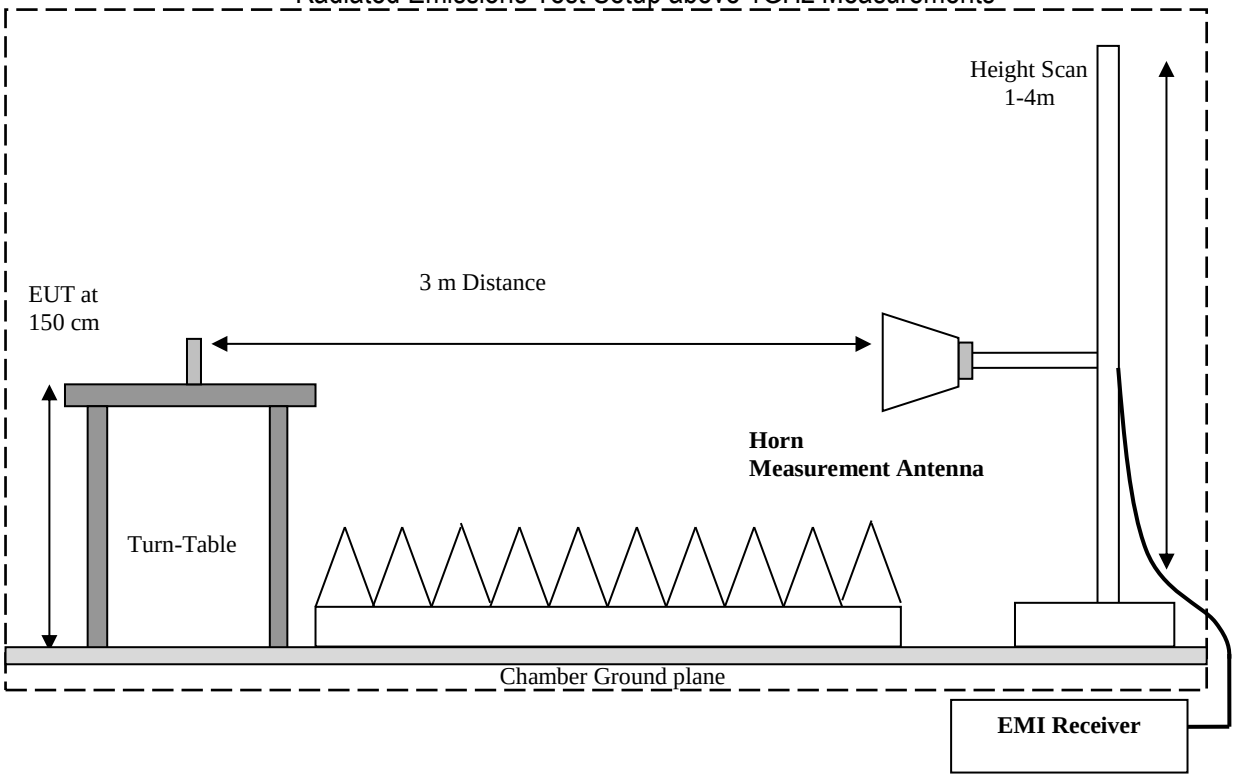
Radiated Emissions Test Setup below 30MHz Measurements



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)

7.3 RF Conducted Measurement Procedure

Testing procedures are based on 558074 D01 DTS Meas Guidance v05r02 – "GUIDANCE FOR PERFORMING COMPLIANCE MEASUREMENTS ON DIGITAL TRANSMISSION SYSTEMS (DTS) OPERATING UNDER SECTION 15.247" - 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 Radiated Transmitter Spurious Emissions and Restricted Bands

8.1.1 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 at distance other than the specified in the standard, the limit conversion is calculated by using 40 dB/decade extrapolation factor as follow: Conversion factor (CF) = 40 log (D/d) = 40 log (300m / 3m) = 80dB

8.1.2 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
[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

8.1.3 Test conditions and setup:

Ambient Temperature	EUT Set-Up #	EUT operating mode	Power Input
22° C	1	802.11g	3.6 VDC

8.1.4 Measurement result:

Plot #	Channel #	Scan Frequency	Limit	Result
1-3	Low	30 MHz – 18 GHz	See section 8.1.2	Pass
4-8	Mid	9 kHz – 26 GHz	See section 8.1.2	Pass
9-11	High	30 MHz – 18 GHz	See section 8.1.2	Pass

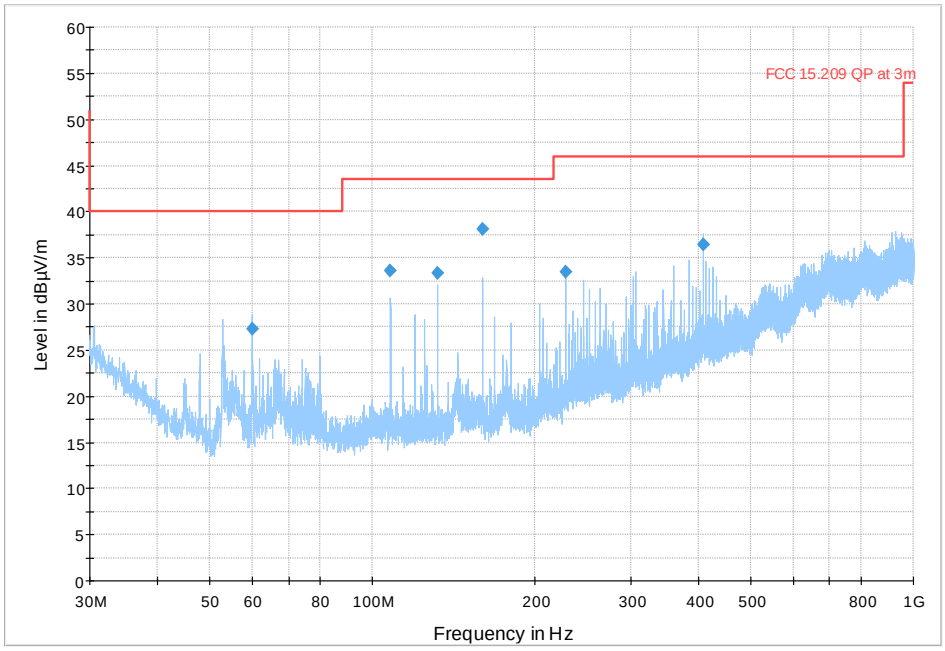
8.1.5 Measurement Plots:

Plot #1 Radiated Emissions: 30 MHz – 1GHz

Modulation: 802.11g	Channel: Low

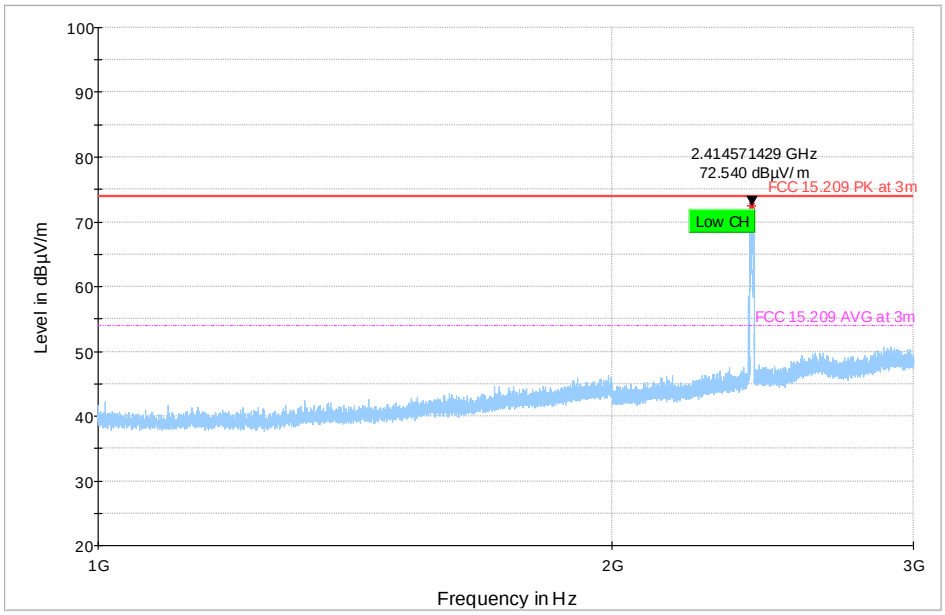
Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
59.844	27.31	40.00	12.69	500.0	120.000	211.0	V	163.0	10.2	
107.988	33.62	43.50	9.88	500.0	120.000	278.0	H	226.0	13.2	
131.979	33.39	43.50	10.11	500.0	120.000	315.0	H	232.0	13.0	
159.980	38.14	43.50	5.36	500.0	120.000	208.0	H	235.0	14.4	
228.009	33.43	46.02	12.59	500.0	120.000	238.0	H	27.0	16.3	
408.009	36.49	46.02	9.54	500.0	120.000	164.0	H	121.0	22.6	



Preview Result 2-QPK Preview Result 1-PK+ FCC 15.209 QP at 3m Final_Result Q

Plot # 2 Radiated Emissions: 1-3 GHz	
Modulation: 802.11g	**Channel: Low**



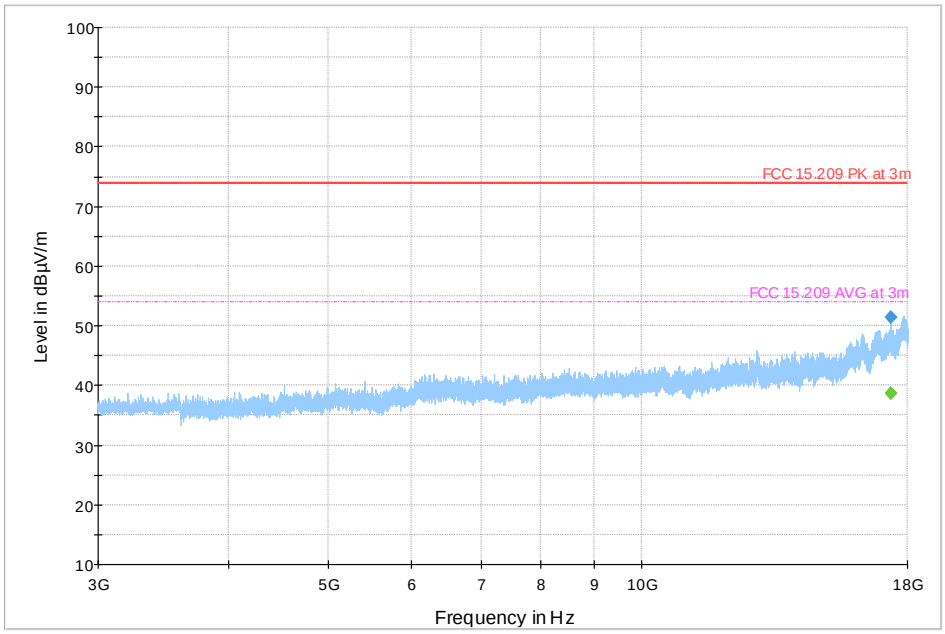
Preview Result 2-QPK
Critical_Freqs PK+
Final_Result PK+
Preview Result 1-PK+
FCC 15.209 PK at 3m
Final_Result CAV
Critical_Freqs QPK
FCC 15.209 AVG at 3m

Plot # 3 Radiated Emissions: 3-18 GHz

Modulation: 802.11g | **Channel: Low**

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
17340.500	---	38.65	53.98	15.33	500.0	1000.000	307.0	V	36.0	12.9	
17340.500	51.45	---	73.98	22.53	500.0	1000.000	307.0	V	36.0	12.9	



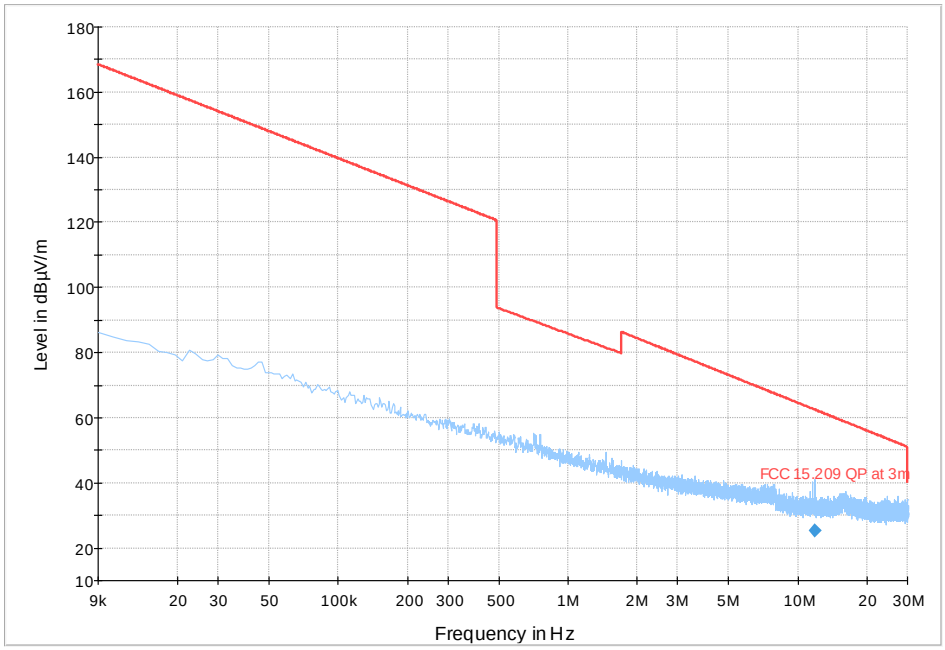
Preview Result 2-QPK
FCC 15.209 AVG at 3m
Preview Result 1-PK+
Final_Result PK+
FCC 15.209 PK at 3m
Final_Result CAV

Plot # 4 Radiated Emissions: 9 KHz – 30 MHz

Modulation: 802.11g	Channel: Mid

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
11.906	25.39	62.42	37.03	500.0	9.000	290.0	H	290.0	17.4	



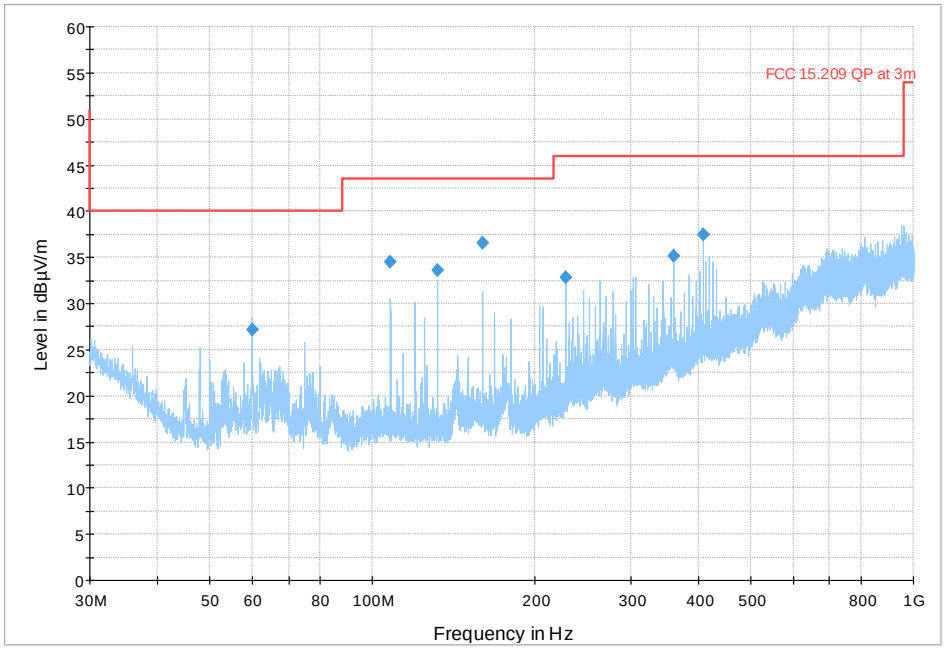
Preview Result 2-QPK Preview Result 1-PK+ FCC 15.209 QP at 3m Final_Result Q

Plot #5 Radiated Emissions: 30 MHz – 1GHz

Modulation: 802.11g	Channel: Mid

Final_Result

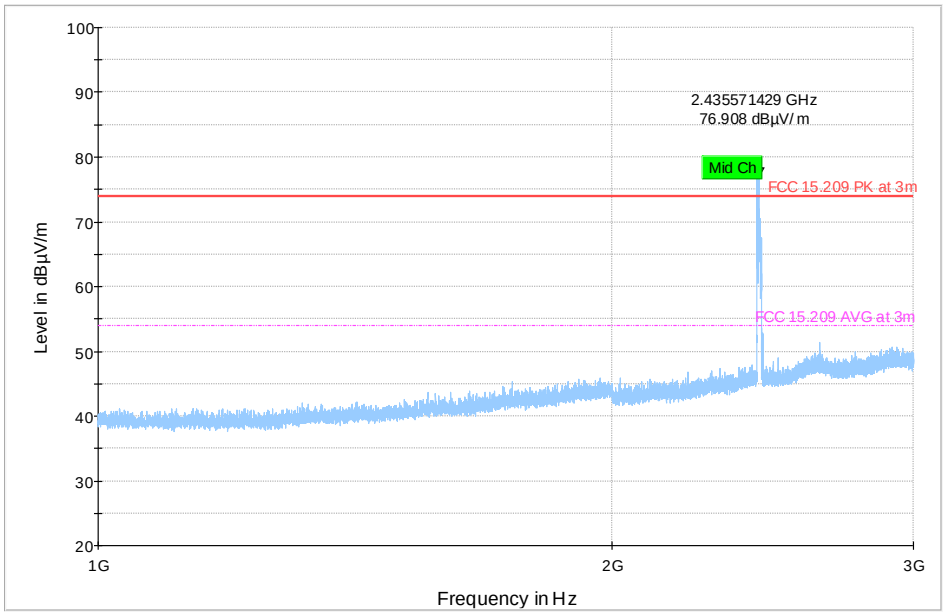
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
59.973	27.16	40.00	12.84	500.0	120.000	179.0	V	97.0	10.3	
107.988	34.47	43.50	9.03	500.0	120.000	264.0	H	75.0	13.2	
131.979	33.63	43.50	9.87	500.0	120.000	315.0	H	230.0	13.0	
159.980	36.55	43.50	6.95	500.0	120.000	227.0	H	45.0	14.4	
227.977	32.79	46.02	13.24	500.0	120.000	235.0	H	18.0	16.3	
359.994	35.21	46.02	10.81	500.0	120.000	140.0	H	51.0	20.9	
408.009	37.53	46.02	8.49	500.0	120.000	152.0	H	104.0	22.6	



Preview Result 2-QPK Preview Result 1-PK+ FCC 15.209 QP at 3m Final_Result Q

Plot #6 Radiated Emissions: 1-3 GHz

Modulation: 802.11g	Channel: Mid



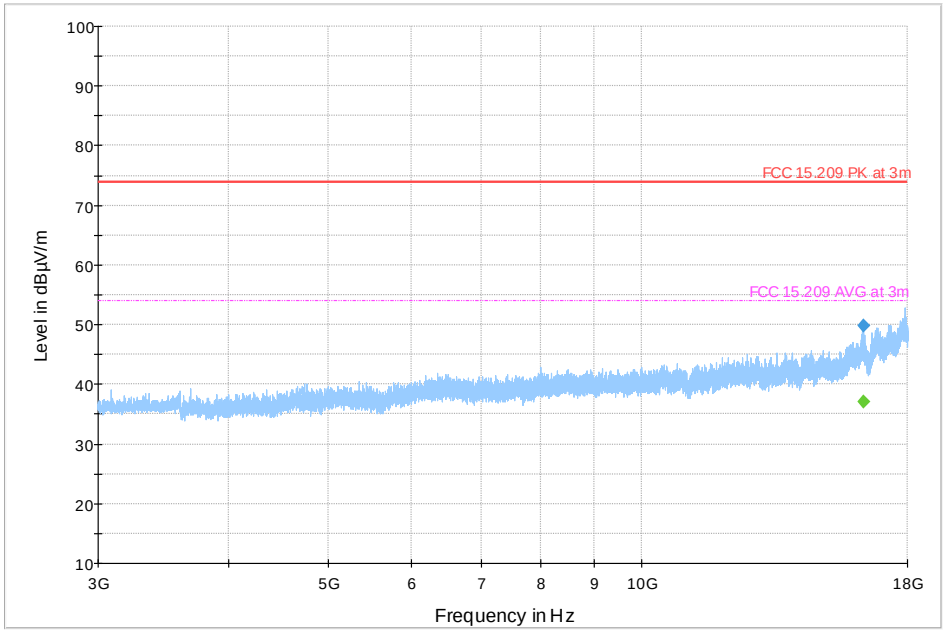
Preview Result 2-QPK
Critical_Freqs PK+
Final_Result PK+
Preview Result 1-PK+
FCC 15.209 PK at 3m
Final_Result CAV
Critical_Freqs QPK
FCC 15.209 AVG at 3m

Plot #7 Radiated Emissions: 3-18 GHz

Modulation: 802.11g | **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
16322.000	---	37.15	53.98	16.83	500.0	1000.000	315.0	V	-8.0	10.5	
16322.000	49.87	---	73.98	24.11	500.0	1000.000	315.0	V	-8.0	10.5	

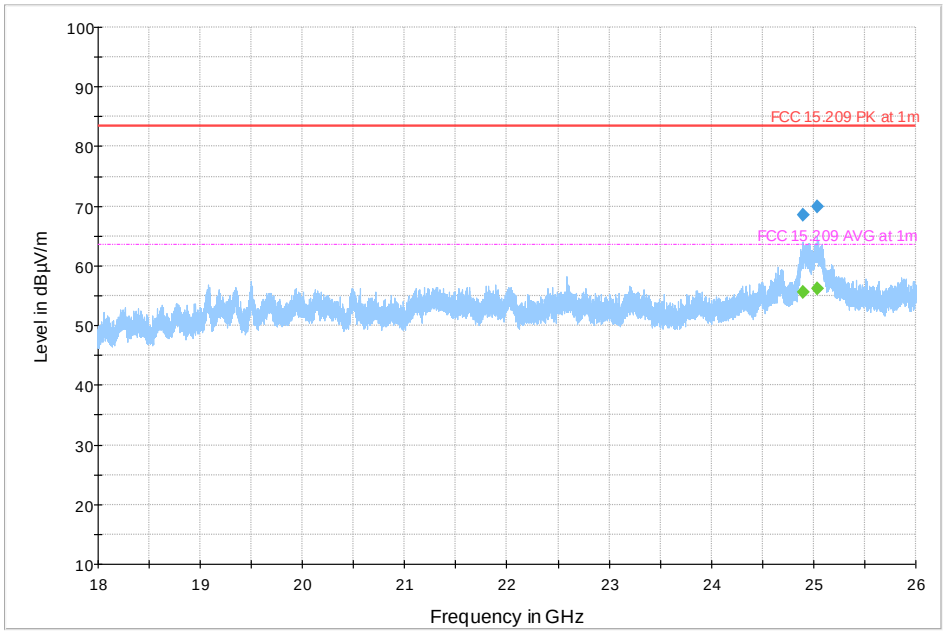


Plot #8 Radiated Emissions: 18-26 GHz

Modulation: 802.11g | **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
24898.750	68.48	---	83.50	15.02	500.0	1000.000	140.0	H	292.0	30.2	
24898.750	---	55.60	63.50	7.90	500.0	1000.000	140.0	H	292.0	30.2	
25039.000	69.92	---	83.50	13.58	500.0	1000.000	140.0	H	78.0	30.4	
25039.000	---	56.14	63.50	7.36	500.0	1000.000	140.0	H	78.0	30.4	

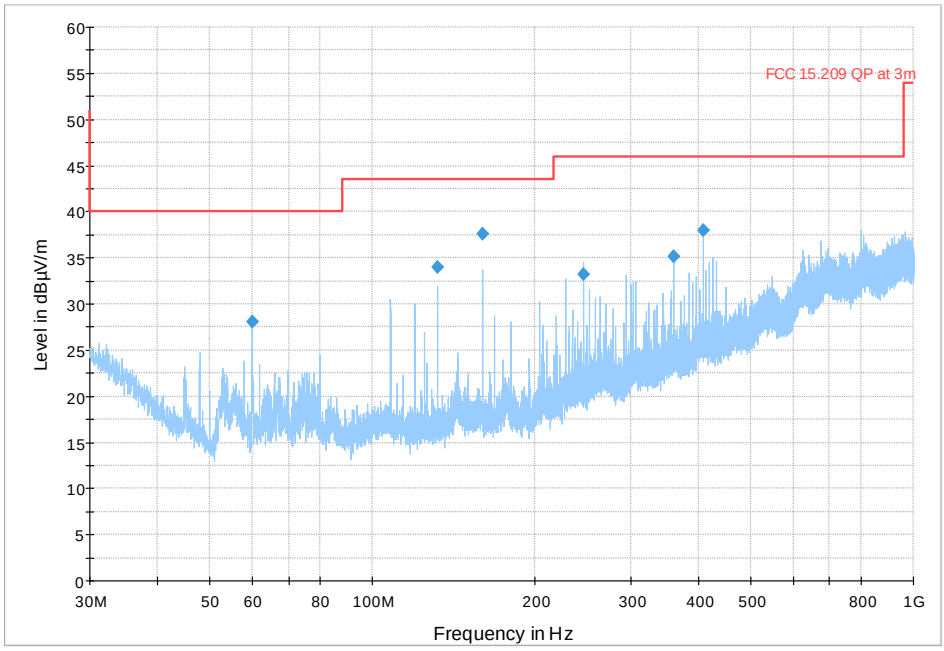


Plot # 9 Radiated Emissions: 30 MHz – 1GHz

Modulation: 802.11g	Channel: High

Final_Result

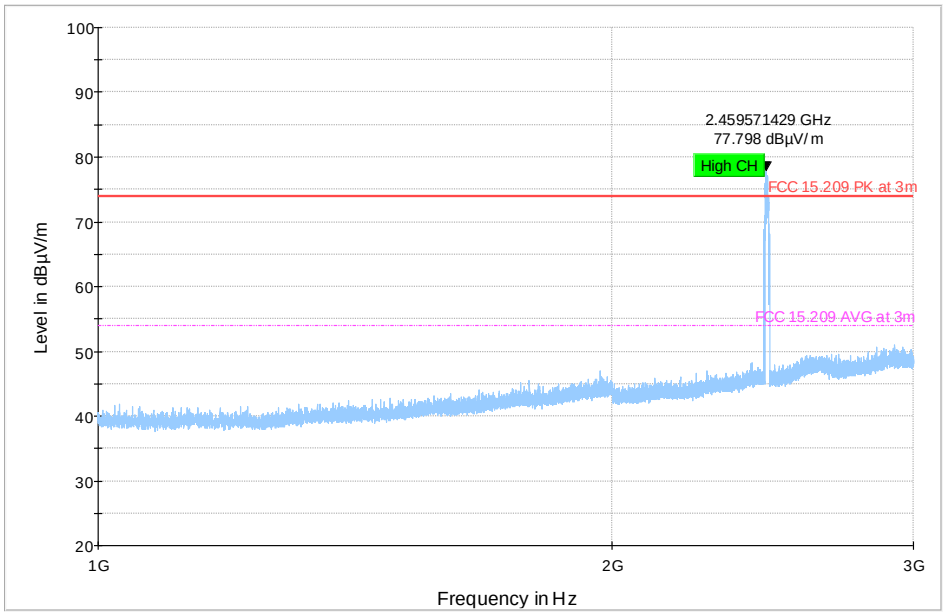
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
59.844	28.03	40.00	11.97	500.0	120.000	163.0	V	114.0	10.2	
132.012	34.00	43.50	9.50	500.0	120.000	311.0	H	229.0	13.0	
159.980	37.64	43.50	5.86	500.0	120.000	310.0	H	240.0	14.4	
245.987	33.26	46.02	12.76	500.0	120.000	164.0	H	168.0	16.8	
359.994	35.18	46.02	10.84	500.0	120.000	140.0	H	45.0	20.9	
408.009	38.04	46.02	7.98	500.0	120.000	153.0	H	107.0	22.6	



Preview Result 2-QPK Preview Result 1-PK+ FCC 15.209 QP at 3m Final_Result Q

Plot #10 Radiated Emissions: 1-3 GHz

Modulation: 802.11g	Channel: High



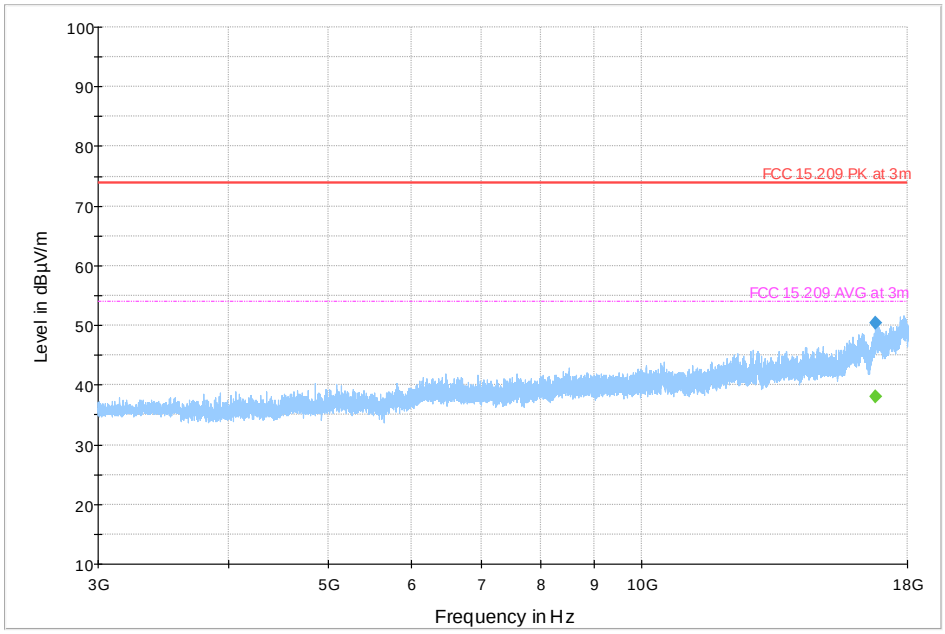
Preview Result 2-QPK
Critical_Freqs PK+
Final_Result PK+
Preview Result 1-PK+
FCC 15.209 PK at 3m
Final_Result CAV
Critical_Freqs QPK
FCC 15.209 AVG at 3m

Plot #11 Radiated Emissions: 3-18 GHz

Modulation: 802.11g | **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
16786.000	---	38.01	53.98	15.97	500.0	1000.000	315.0	H	215.0	12.2	
16786.000	50.36	---	73.98	23.62	500.0	1000.000	315.0	H	215.0	12.2	



Preview Result 2-QPK
FCC 15.209 AVG at 3m
Preview Result 1-PK+
Final_Result PK+
FCC 15.209 PK at 3m
Final_Result CAV

9 Test setup photos

Setup photos are included in supporting file name: “EMC_GEOFO-023-21001_FCC_Setup_Photos.pdf”

10 Test Equipment And Ancillaries Used For Testing

Equipment Type	Manufacturer	Model	Serial #	Calibration Cycle	Last Calibration Date
ACTIVE LOOP ANTENNA	ETS LINDGREN	6507	00161344	3 YEARS	10/30/2020
BILOG ANTENNA	ETS.LINDGREN	3142E	00166067	3 YEARS	03/12/2020
HORN ANTENNA	EMCO	3115	00035114	3 YEARS	08/10/2020
HORN ANTENNA	ETS.LINDGREN	3117	00215984	3 YEARS	01/31/2021
HORN ANTENNA	ETS.LINDGREN	3116	00070497	3 YEARS	11/23/2020
SPECTRUM ANALYZER	R&S	FSU26	200065	3 YEARS	07/16/2019
SIGNAL ANALAYZER	R&S	FSV 40	101022	3 YEARS	07/15/2019
TEST RECEIVER	R&S	ESU.EMI	100256	3 YEARS	07/16/2019
COMPACT DIGITAL BAROMETER	CONTROL COMPANY	10510-922	200236891	3 YEARS	04/13/2020
DIGITAL THRMOMETER	CONTROL COMPANY	36934-164	181230565	3 YEARS	01/10/2019

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	Report Name	Changes to report	Report prepared by
2021-08-18	EMC_GEOFO-023-21001_15.247_WiFi	Initial Version	Yuchan Lu

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