FCC / ISED & Test Report

For:

Garmin International, Inc.

Model Name:
A03804

Product Description:
Portable Wireless Transceiver

FCC ID: IPH-03804
IC ID: 1792A-03804

Applied Rules and Standards:

47 CFR Parts 22, 24, and 27
RSS: 132 Issue 3, 133 Issue 6, 139 Issue 3

REPORT #: EMC_GRAMI-080-20001_FCC_24_27

DATE: 2021-07-02

A2LA Accredited

IC recognized #
3462B-1

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1 Assessment

The following device as further described in section 3 of this report was evaluated against the applicable criteria specified in the Code of Federal Regulations Title 47 parts 22 and 24, and Industry Canada Standards RSS-GEN issue 3, RSS-132 issue 3 and RSS-133 issue 6.

No deficiencies were ascertained.

Company Name	Product Description	Model #
Garmin International Inc.	Portable wireless transceiver	A03804

Responsible for Testing Laboratory:

Date	Section	Name	Signature
2021-07-02	Compliance	Kevin Wang (EMC Lab Manager)	kevin.wang@cetecom.com Digitally signed by: kevin.wang@cetecom.com DN: CN = kevin.wang@cetecom.com Date: 2021.07.02 11:38:00 -07'00'

Responsible for the Report:

Date	Section	Name	Signature
2021-07-02	Compliance	Yuchan Lu (EMC 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: 2021.07.02 11:33:23 -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:	Kevin Wang
Responsible Project Leader:	Sangeetha Sivaraman

2.2 Identification of the Client

Client's Name:	Garmin International, Inc.
Street Address:	1200 East 151st Street
City/Zip Code	Olathe, KS 66062
Country	USA

2.3 Identification of the Manufacturer

Manufacturer's Name:	Garmin Corporation
Manufacturers Address:	No. 68, Zhangshu 2nd Rd., Xizhi Dist.,
City/Zip Code	New Taipei City 221,
Country	TAIWAN, R.O.C.

3 Equipment Under Test (EUT)

3.1 EUT Specifications

Model No	A03804
HW Version	1
SW Version	0.31
FCC-ID	IPH-03804
IC-ID:	1792A-03804
FWIN:	N/A
HVIN:	A03804
PMN:	N/A
Product Description:	Portable wireless transceiver
Transceiver Technology / Type(s) of Modulation	Module: Murata LBAD0XX1SC FCC ID: HSW-TY1SC IC ID: 4492A-TY1SC LTE Bands 2, 4, 12
Frequency Range	LTE Band 2: 1850 – 1910 MHz LTE Band 4: 1710 – 1755 MHz LTE Band 12: 699 – 716 MHz
Max. declared antenna gain	Peak Gain: • LTE Band 2: 5 dBi • LTE Band 4: 4 dBi • LTE Band 5: -0.8 dBi • LTE Band 12: -2.1 dBi
Other Radios included in the device:	GPS; WiFi; BTLE; ANT
Power Supply/ Rated Operating Voltage Range	4.5V (Low) / 5.0V (Nominal) / 5.5V (Max)
Operating Temperature Range	0°C to +60°C
Sample Revision	☐Prototype ■Production ☐ Pre-Production

3.2 EUT Sample details

EUT #	Serial Number	HW Version	SW Version	Notes/Comments
1	6K2000505	1	0.31	Conducted Sample
2	6K2000331	1	0.31	Radiated Sample

3.3 Accessory Equipment (AE) details

AE #	Type	Model	Manufacturer	Serial Number
1	USB Cable	----------	Garmin	----------

3.4 Test Sample Configuration

Set-up #	EUT / AE used for set-up	Comments
1	EUT#2 + AE#1	Radiated RF measurements were performed with EUT configured via customer provided GUE and instructions.

3.5 Mode of Operation details

Mode of Operation	Description of Operating modes	Additional Information
Op. 1	Cellular and WiFi 802.11g Co-Transmission	Cellular was tested on Low, Mid, High Channels at maximum power in a co-transmission mode WiFi radio was configured to 802.11g mode using special software provided by the client that will not be available to the end user

3.6 Justification for Worst Case Mode of Operation

During the testing process the EUT was tested with transmitter sets on low, mid and high channels at the maximum power simultaneous transmission with WiFi radio 802.11g, 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 evaluate the compliance of the EUT against the relevant requirements specified in the Code of Federal Regulations Title 47 parts 22, 24, 27 and ISED Standards RSS-132 issue 3, RSS-133 issue 6, and RSS-139 issue 3.

4.1 Dates of Testing:

11/24/2020 - 11/28/2020

4.2 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 30MHz	±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

4.3 Environmental Conditions during Testing:

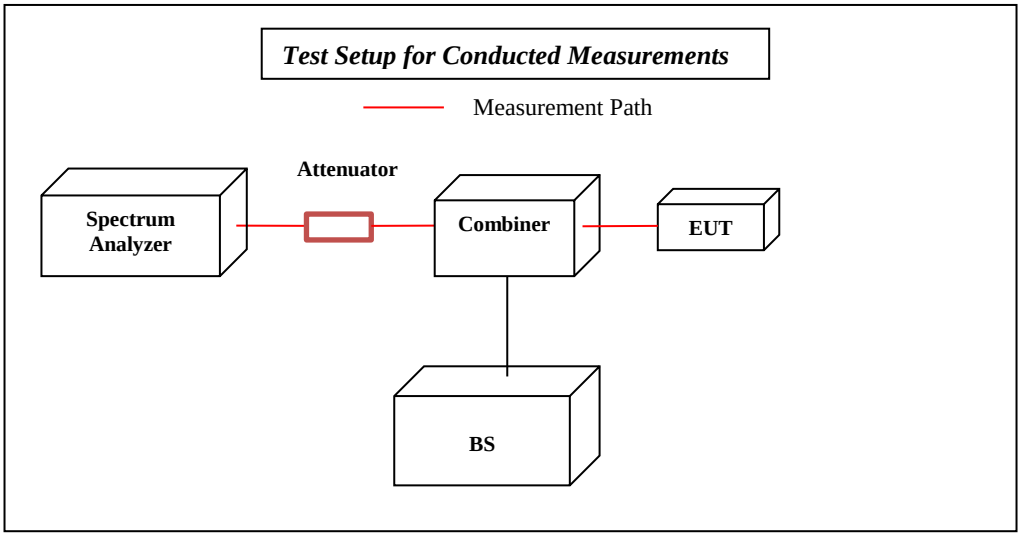
The following environmental conditions were maintained during the course of testing:

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

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

5 Measurement Procedures

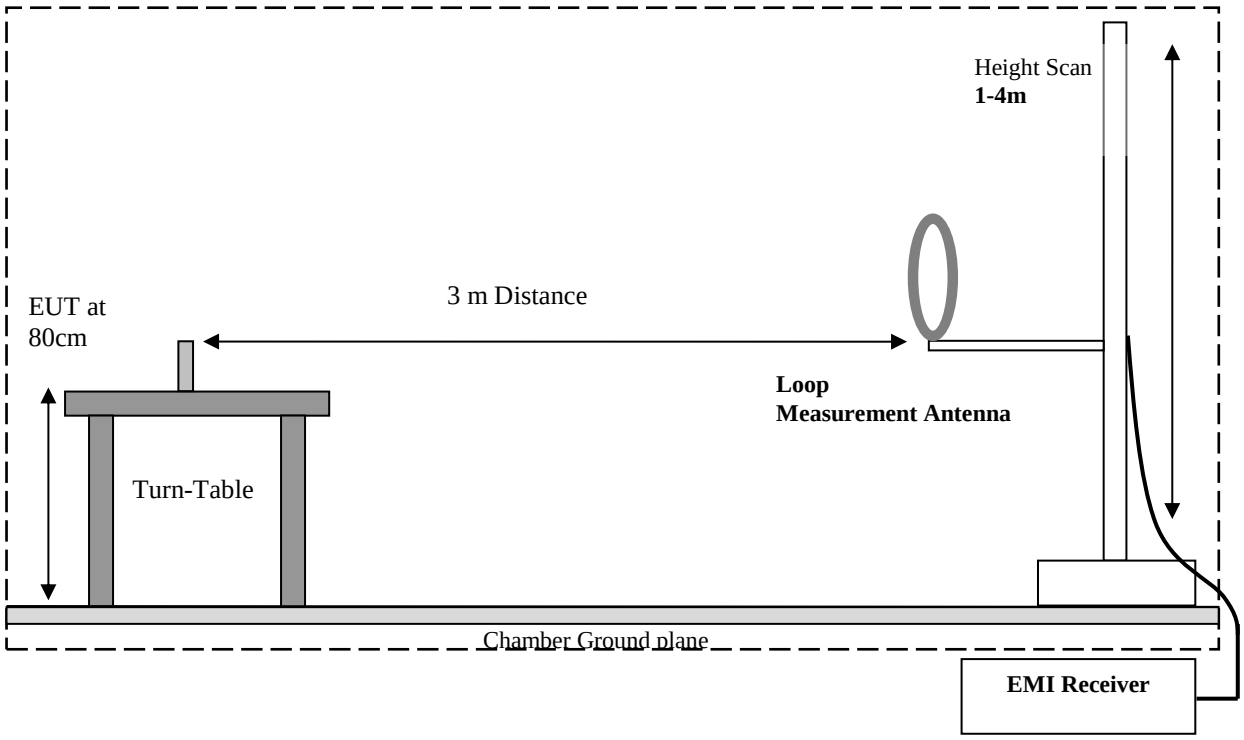
Testing is performed according to the guidelines provided in FCC publication (KDB) 971168 D01 v03r01 – "Measurement Guidance for Certification of Licensed Digital Transmitters" and according to relevant parts of ANSI/TIA-603-D-2010 as detailed below.



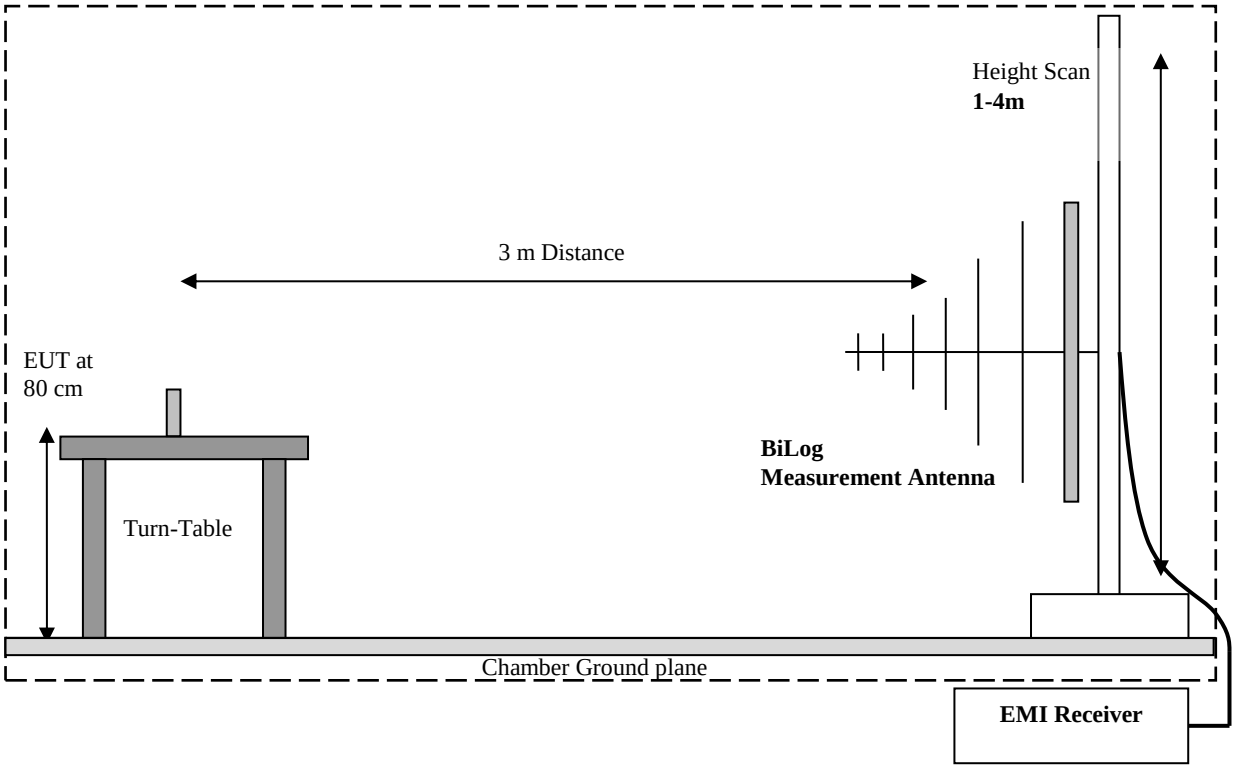
5.1 Radiated Measurement

- 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.

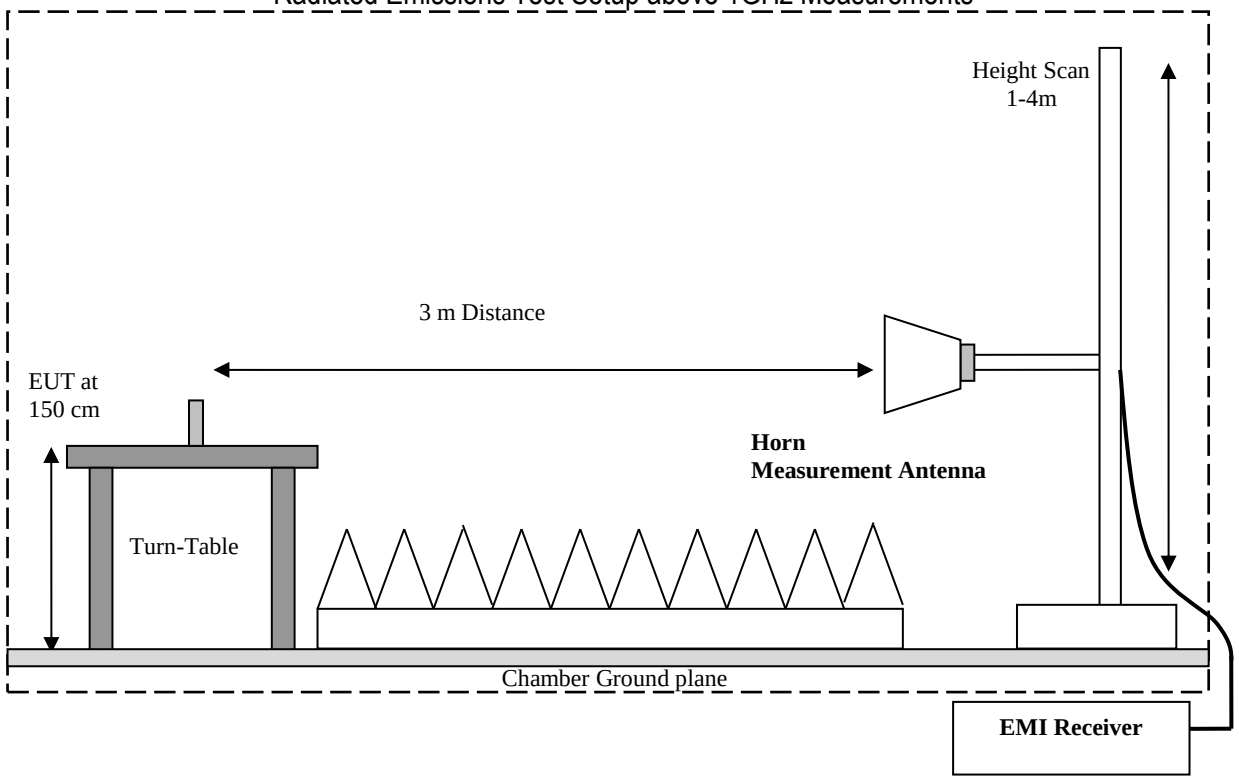
Radiated Emissions Test Setup below 30MHz Measurements



Radiated Emissions Test Setup 30MHz-1GHz Measurements



Radiated Emissions Test Setup above 1GHz Measurements



5.2 Sample Calculations for Field Strength Measurements

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

- Measured reading in dBµV
- Cable Loss between the receiving antenna and SA in dB and
- 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

6 Measurement Results Summary

6.1 Part 22 / RSS-132

Test Specification	Test Case	Temperature and Voltage Conditions	Mode	Pass	Fail	NA	NP	Result
§2.1046; §22.913 (a)	RF Output Power	Nominal	-	☐	☐	☐	■	Complies Note 1 Note 2
§2.1055; §22.355	Frequency Tolerance	Extreme Temperature and Voltage	-	☐	☐	☐	■	Complies Note 1 Note 2
§2.1049; §22.917	Occupied Bandwidth	Nominal	-	☐	☐	☐	■	Complies Note 1 Note 2
§2.1051; §22.917	Band Edge Compliance	Nominal	-	☐	☐	☐	■	Complies Note 1 Note 2
§2.1051; §22.917	Conducted Spurious Emissions	Nominal	-	☐	☐	☐	■	Complies Note 1 Note 2
§2.1053; §22.917	Radiated Spurious Emissions	Nominal	Op. 1	■	☐	☐	☐	Complies

Note 1: NA= Not Applicable; NP= Not Performed.
Note 2: Leveraged from module certification Murata LBAD0XX1SC (FCC ID: HSW-TY1SC; IC ID: 4492A-TY1SC)

6.2 Part 24 / RSS-133

Test Specification	Test Case	Temperature and Voltage Conditions	Mode	Pass	Fail	NA	NP	Result
§2.1046; §24.232 (a)	RF Output Power	Nominal	-	☐	☐	☐	■	Complies Note 1 Note 2
§2.1055; §24.235	Frequency Stability	Extreme Temperature and Voltage	-	☐	☐	☐	■	Complies Note 1 Note 2
§2.1049; §24.238	Occupied Bandwidth	Nominal	-	☐	☐	☐	■	Complies Note 1 Note 2
§2.1051; §24.238	Band Edge Compliance	Nominal	-	☐	☐	☐	■	Complies Note 1 Note 2
§2.1051; §24.238	Conducted Spurious Emissions	Nominal	-	☐	☐	☐	■	Complies Note 1 Note 2
§2.1053; §24.238	Radiated Spurious Emissions	Nominal	Op. 1	■	☐	☐	☐	Complies

Note 1: NA= Not Applicable; NP= Not Performed.
Note 2: Leveraged from module certification Murata LBAD0XX1SC (FCC ID: HSW-TY1SC; IC ID: 4492A-TY1SC)

6.3 FCC 27 / RSS-139

Test Specification	Test Case	Temperature and Voltage Conditions	Mode	Pass	Fail	NA	NP	Result
§2.1046; §27.50	RF Output Power	Nominal	-	☐	☐	☐	■	Complies Note 1 Note 2
§2.1055; §27.54	Frequency Stability	Extreme Temperature and Voltage	-	☐	☐	☐	■	Complies Note 1 Note 2
§2.1049; §27.53	Occupied Bandwidth	Nominal	-	☐	☐	☐	■	Complies Note 1 Note 2
§2.1051; §27.53	Band Edge Compliance	Nominal	-	☐	☐	☐	■	Complies Note 1 Note 2
§2.1051; §27.53	Conducted Spurious Emissions	Nominal	-	☐	☐	☐	■	Complies Note 1 Note 2
§2.1053; §27.53	Radiated Spurious Emissions	Nominal	Op. 1	■	☐	☐	☐	Complies

Note 1: NA= Not Applicable; NP= Not Performed.
Note 2: Leveraged from module certification Murata LBAD0XX1SC (FCC ID: HSW-TY1SC; IC ID: 4492A-TY1SC)

7 Test Result Data

7.1 ERP/EIRP

FCC Rule Parts	Band	Frequency Range (MHz)	Power Conducted (dBm) Note 1	Power Conducted (W)	Gain (dBi)	Gain Linear	EIRP (W) Note 2	ERP (W) Note 2	Limit EIRP (W)	Limit ERP (W)
24E	LTE 2	1850 – 1910	22.80	0.19	5.0	3.162	0.6	-	2	-
27	LTE 4	1710 – 1755	22.97	0.198	4.0	2.512	0.497	-	1	-
27	LTE 12	699 – 716	20.85	0.193	-2.1	0.617	-	0.119	-	3

Note 1: Power Conducted (dBm) leveraged from test report "103652106LEX-007" prepared by Intertek for cellular module LBAD0XX1SC (FCC ID: HSW-TY1SC, IC ID: 4492A-TY1SC).

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

7.2 Radiated Spurious Emissions

7.2.1 Measurement utilizing KDB 971168 D01 Power Meas License Digital Systems v03r01, and according to ANSI/TIA-603-D-2010

Spectrum Analyzer Settings for FCC 22

Frequency Range	30MHz – 1 GHz	1 – 1.58 GHz	1.58 – 9 GHz
Resolution Bandwidth	100 kHz	1 MHz	1 MHz
Video Bandwidth	100 kHz	1 MHz	1 MHz
Detector	Peak	Peak	Peak
Trace Mode	Max Hold	Max Hold	Max Hold
Sweep Time	Auto	Auto	Auto

Spectrum Analyzer Settings for FCC 24 and 27

Frequency Range	30MHz – 1 GHz	1 – 2.7 GHz	2.7 – 18 GHz	18 – 19.1 GHz
Resolution Bandwidth	100 kHz	1 MHz	1 MHz	1 MHz
Video Bandwidth	100 kHz	1 MHz	1 MHz	1 MHz
Detector	Peak	Peak	Peak	Peak
Trace Mode	Max Hold	Max Hold	Max Hold	Max Hold
Sweep Time	Auto	Auto	Auto	Auto

7.2.2 Limits:

7.2.2.1 FCC Part 22.917 (a); FCC Part 24.238 (a); FCC Part 27.53 (h)

Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

7.2.2.2 RSS-132 Part 5.5; RSS-133 Part 6.5; RSS-139 Part 6.6 Transmitter Unwanted Emissions

Mobile and base station equipment shall comply with the limits in (i) and (ii) below.

i.In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands specified in Section 5.1, the power of emissions per any 1% of the occupied bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10p (watts).

ii.After the first 1.0 MHz immediately outside and adjacent to each of the sub-bands, the power of emissions in any 100 kHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10 p (watts). If the measurement is performed using 1% of the occupied bandwidth, power integration over 100 kHz is required.

Note: The limit calculation result is a constant of -13 dBm.

7.2.3 Test conditions and setup:

Ambient Temperature (°C)	EUT Set-Up #	EUT operating mode	Power Input
22.0	1	Op. 1	5 VDC

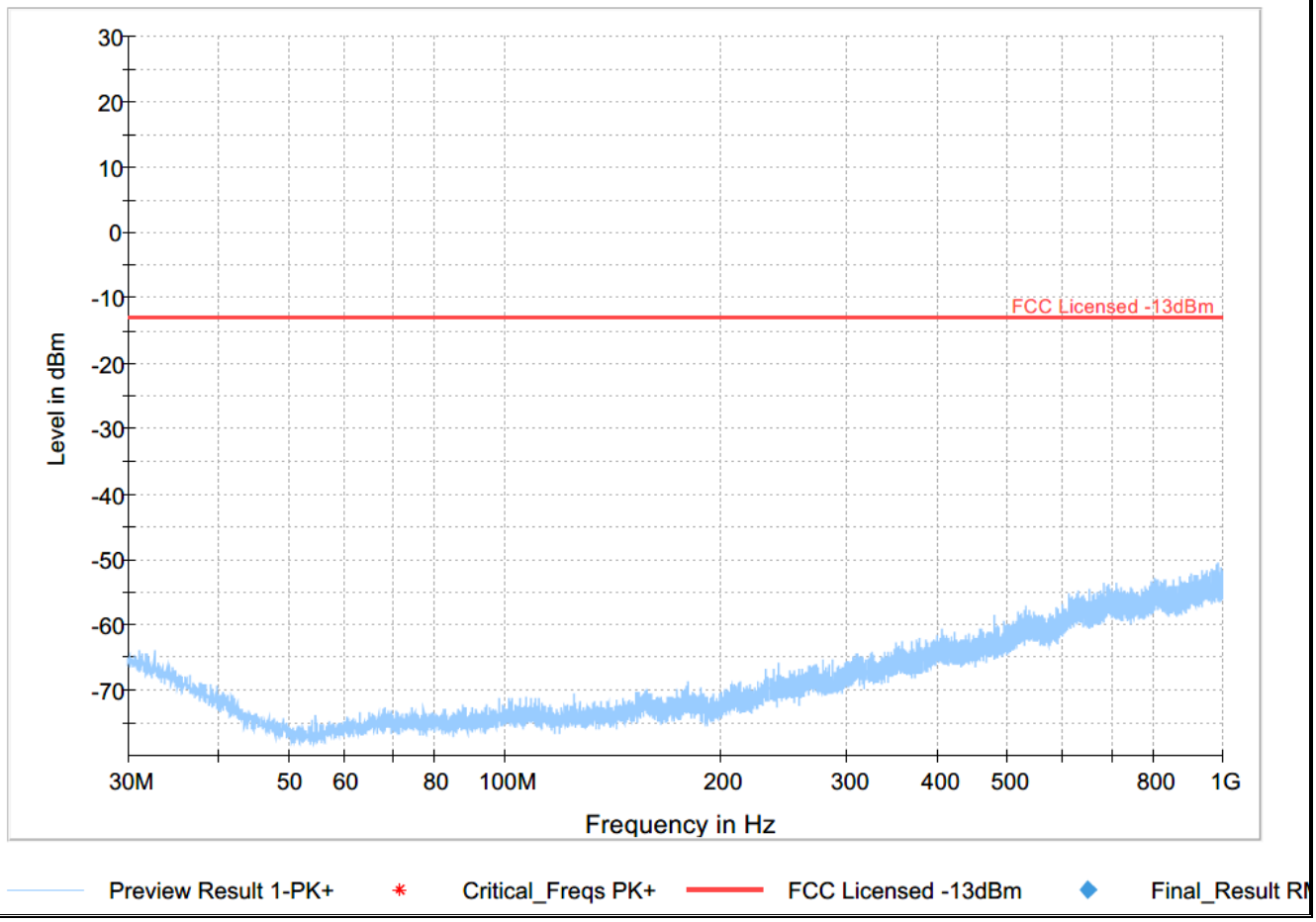
7.2.4 Measurement result:

Plot #	Channel	EUT operating mode	Scan Frequency	Limit (dBm)	Result
1-3	Low	LTE Band 2	30 MHz – 18 GHz	-13	Pass
4-8	Mid		9 kHz – 26 GHz	-13	Pass
9-11	High		30 MHz – 18 GHz	-13	Pass
12-14	Low	LTE Band 4	30 MHz – 18 GHz	-13	Pass
15-18	Mid		9 kHz – 18 GHz	-13	Pass
19-21	High		30 MHz – 18 GHz	-13	Pass
22-24	Low	LTE Band 12	30 MHz – 18 GHz	-13	Pass
25-28	Mid		9 kHz – 18 GHz	-13	Pass
29-31	High		30 MHz – 18 GHz	-13	Pass

7.2.5 Measurement Plots:

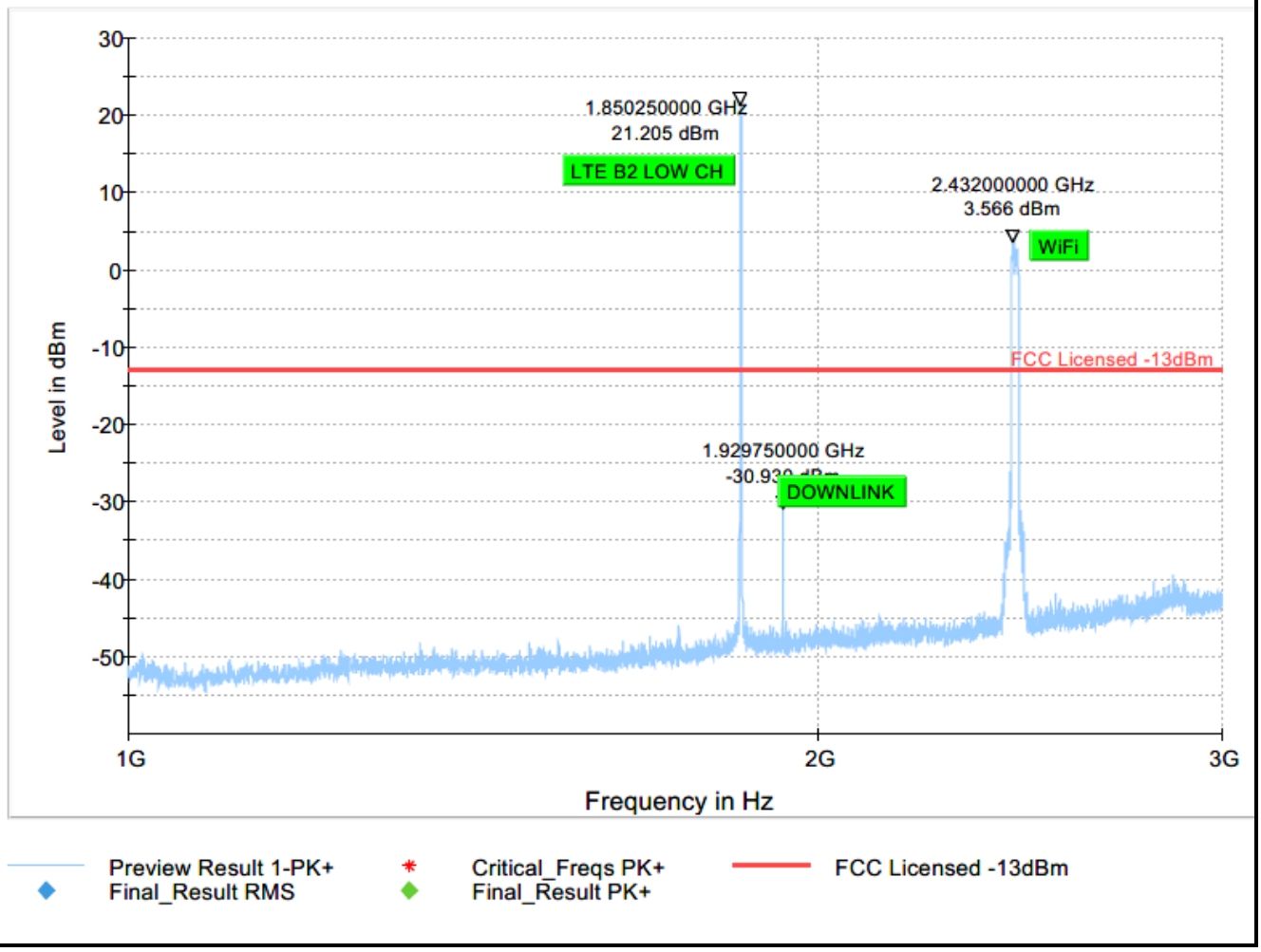
LTE Band 2

Plot #1 Radiated Emissions: 30 MHz – 1GHz
Channel: Low



Plot # 2 Radiated Emissions: 1-3 GHz

Channel: Low

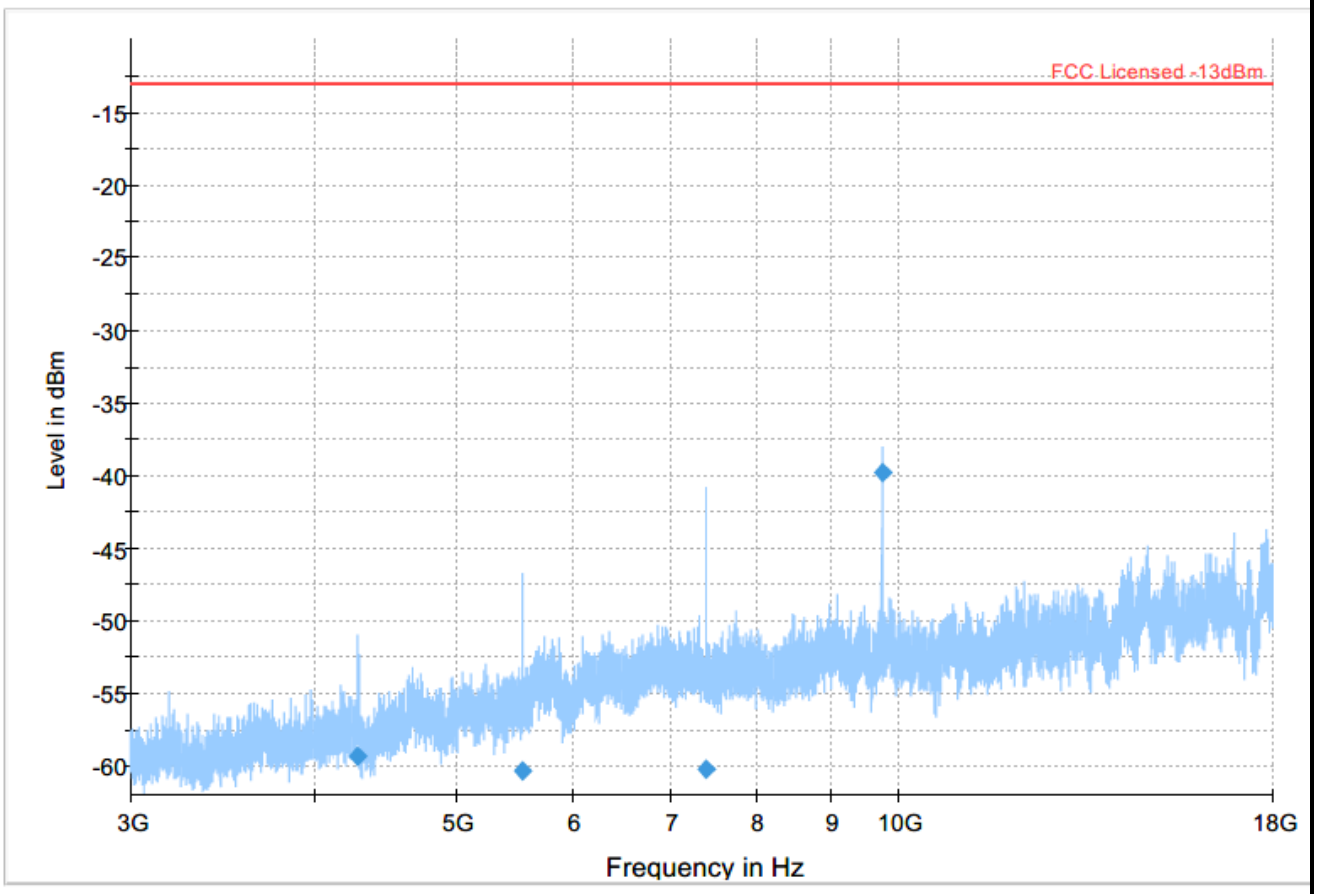


Plot # 3 Radiated Emissions: 3-18 GHz

Channel: Low

Final_Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
4279.250	-59.36	-13.00	46.36	500.0	1000.000	141.0	H	165.0	-99.3	
5551.250	-60.28	-13.00	47.28	500.0	1000.000	183.0	H	149.0	-97.5	
7401.500	-60.22	-13.00	47.22	500.0	1000.000	203.0	H	324.0	-95.2	
9747.750	-39.84	-13.00	26.84	500.0	1000.000	100.0	H	161.0	-93.2	

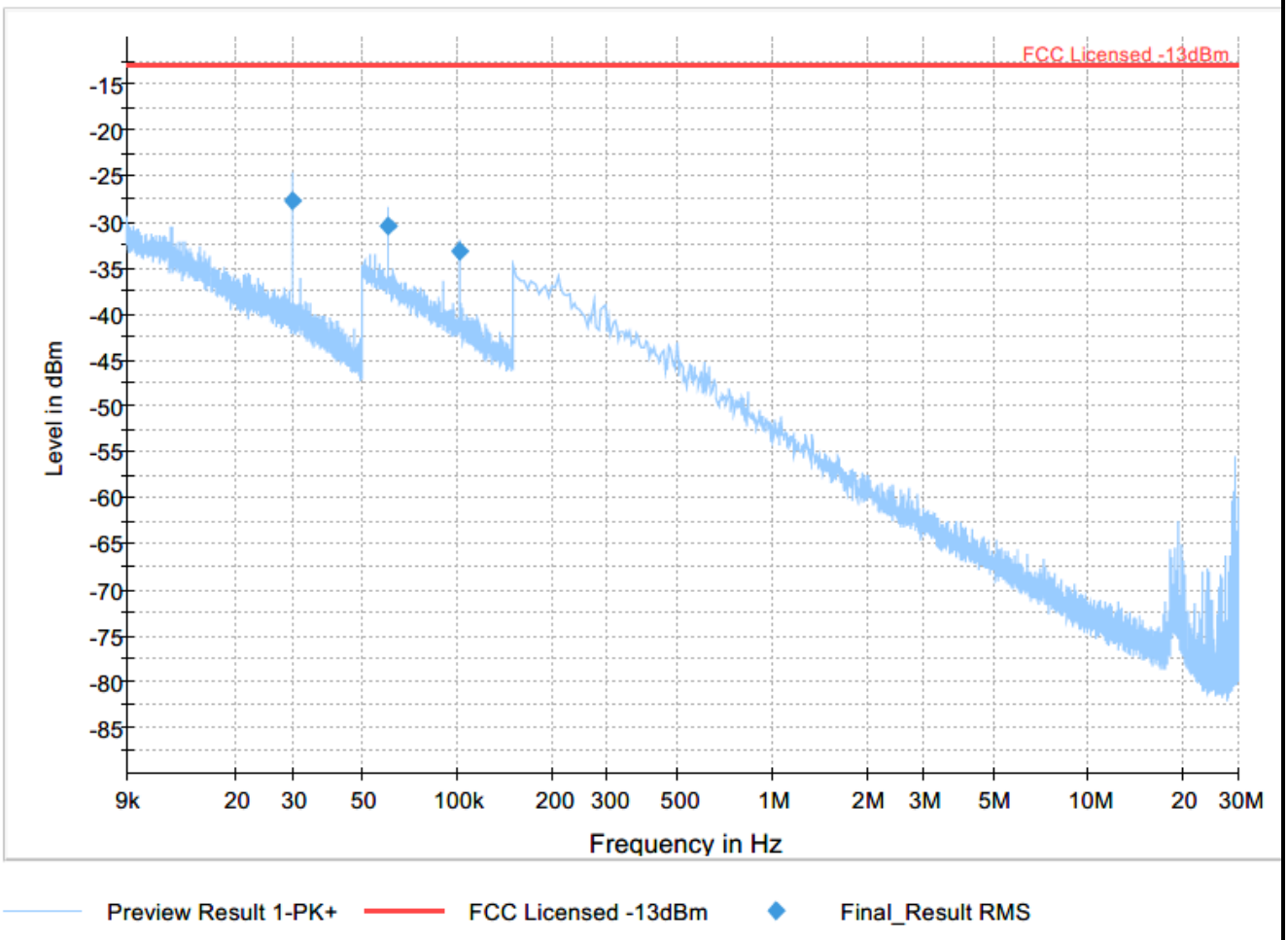


Plot #4 Radiated Emissions: 9 kHz – 30 MHz

Channel: Mid

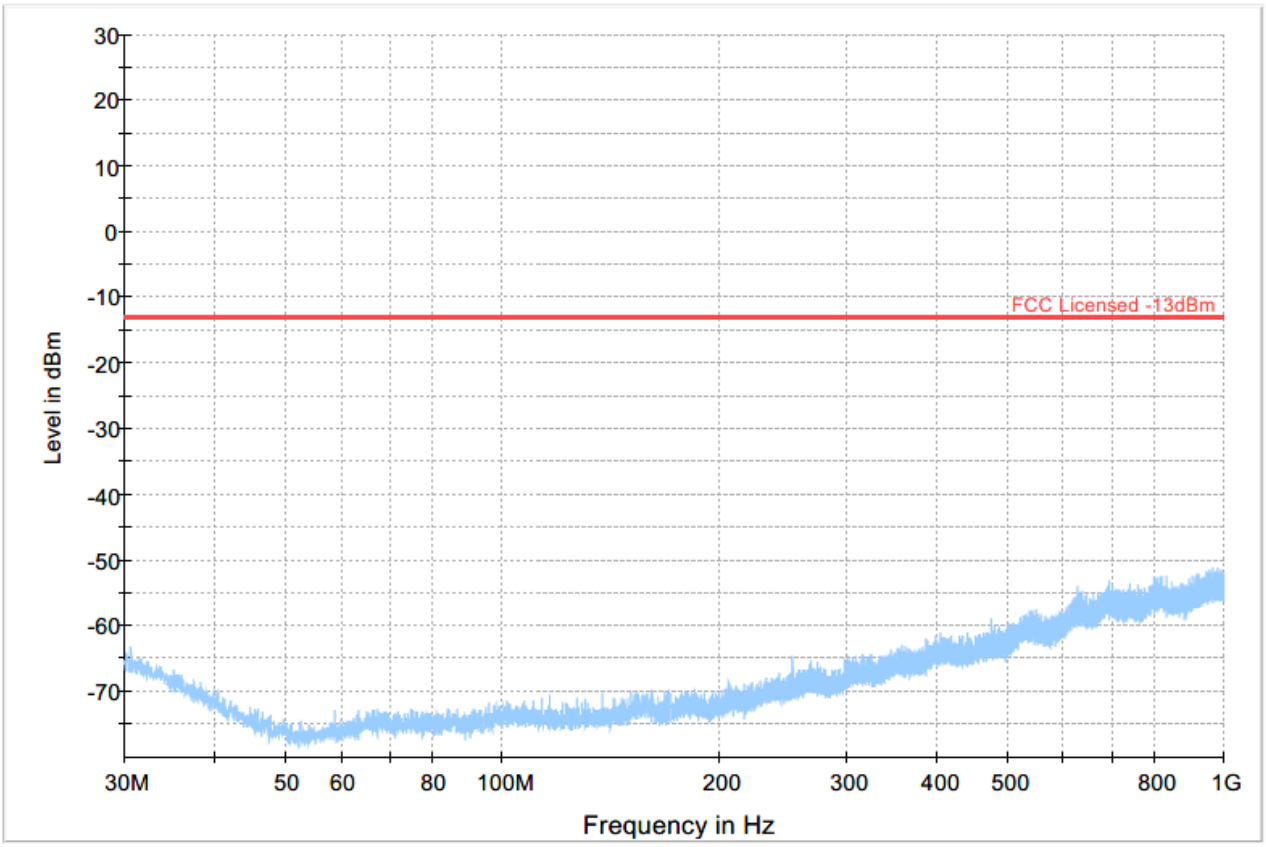
Final_Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
0.030	-27.71	-13.00	14.71	500.0	1.000	192.0	V	235.0	-72.1	
0.061	-30.45	-13.00	17.45	500.0	1.000	100.0	H	345.0	-75.4	
0.102	-33.10	-13.00	20.10	500.0	1.000	100.0	H	84.0	-76.3	

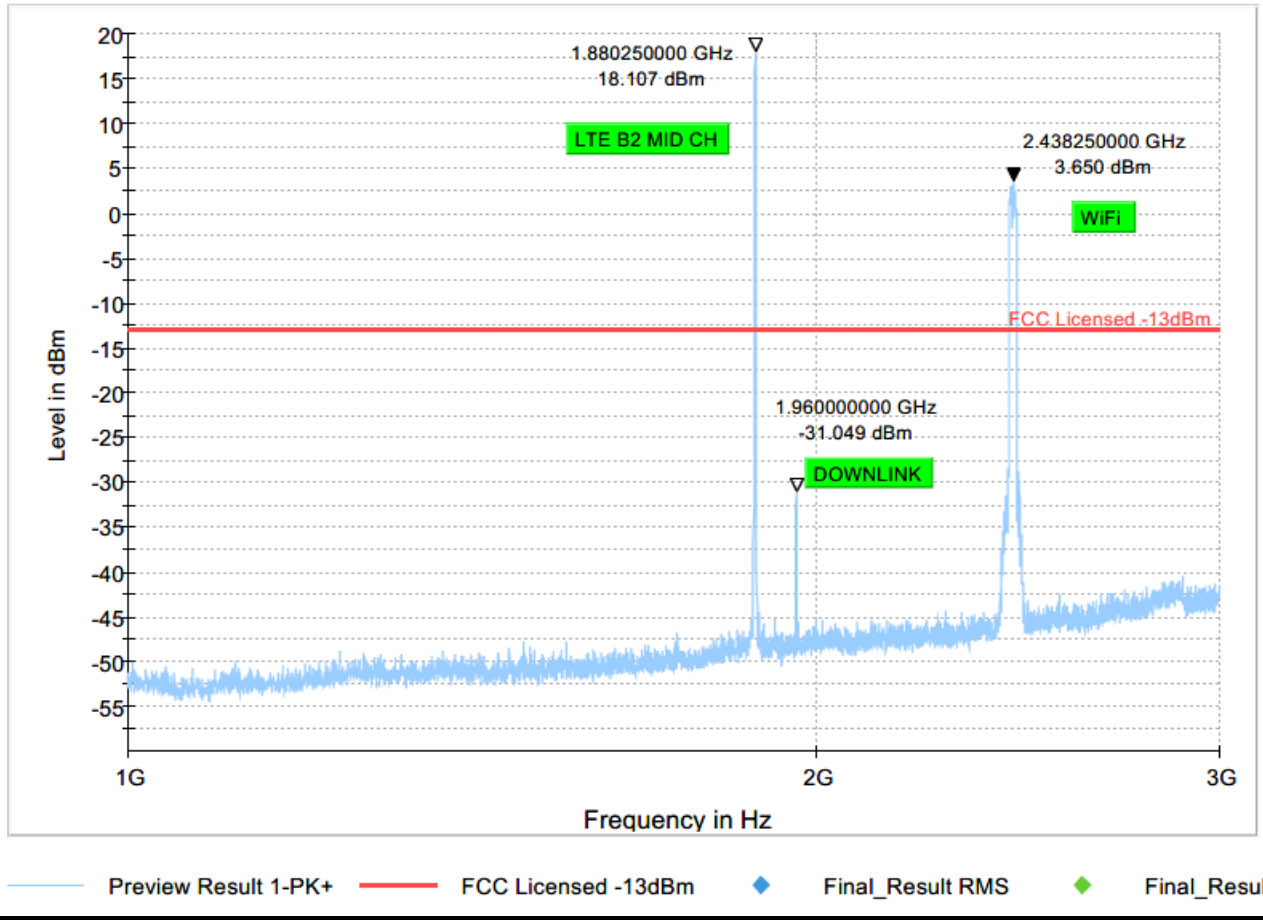


Plot #5 Radiated Emissions: 30 MHz – 1 GHz

Channel: Mid



Plot #6 Radiated Emissions: 1-3 GHz
Channel: Mid

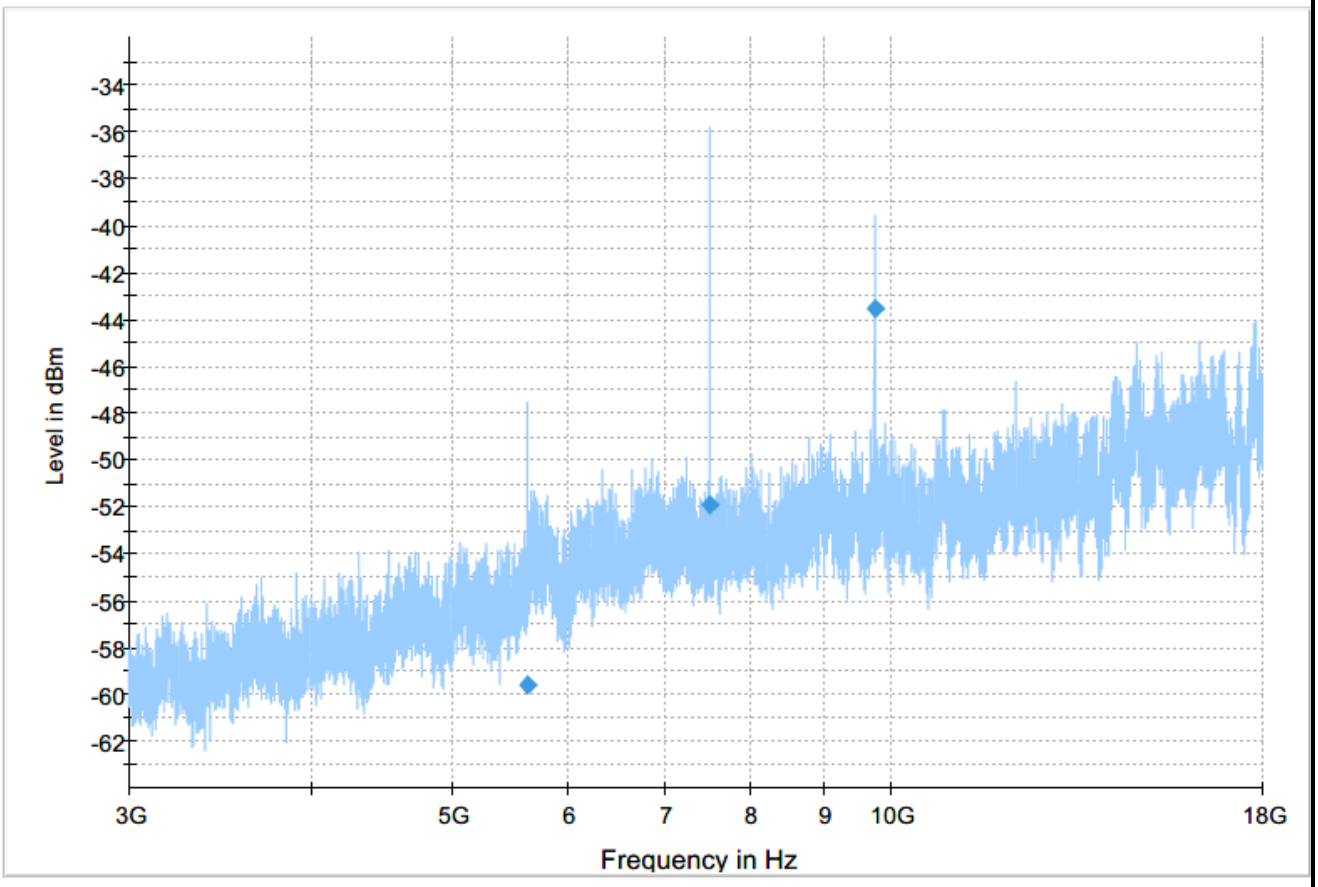


Plot #7 Radiated Emissions: 3-18 GHz

Channel: Mid

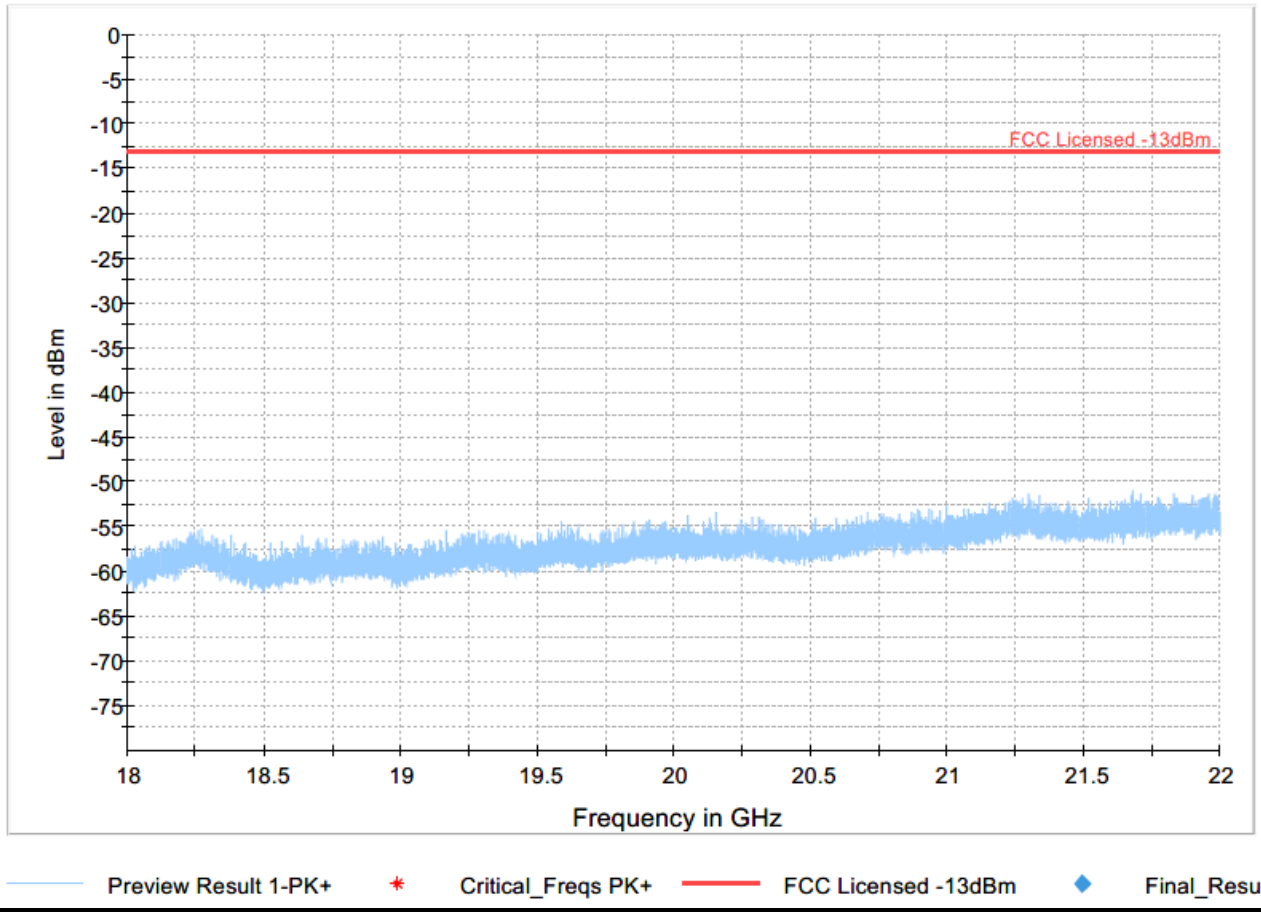
Final_Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
5641.250	-59.64	-13.00	46.64	500.0	1000.000	100.0	H	239.0	-96.3	
7521.500	-51.94	-13.00	38.94	500.0	1000.000	158.0	V	37.0	-95.0	
9747.750	-43.52	-13.00	30.52	500.0	1000.000	210.0	V	179.0	-93.2	



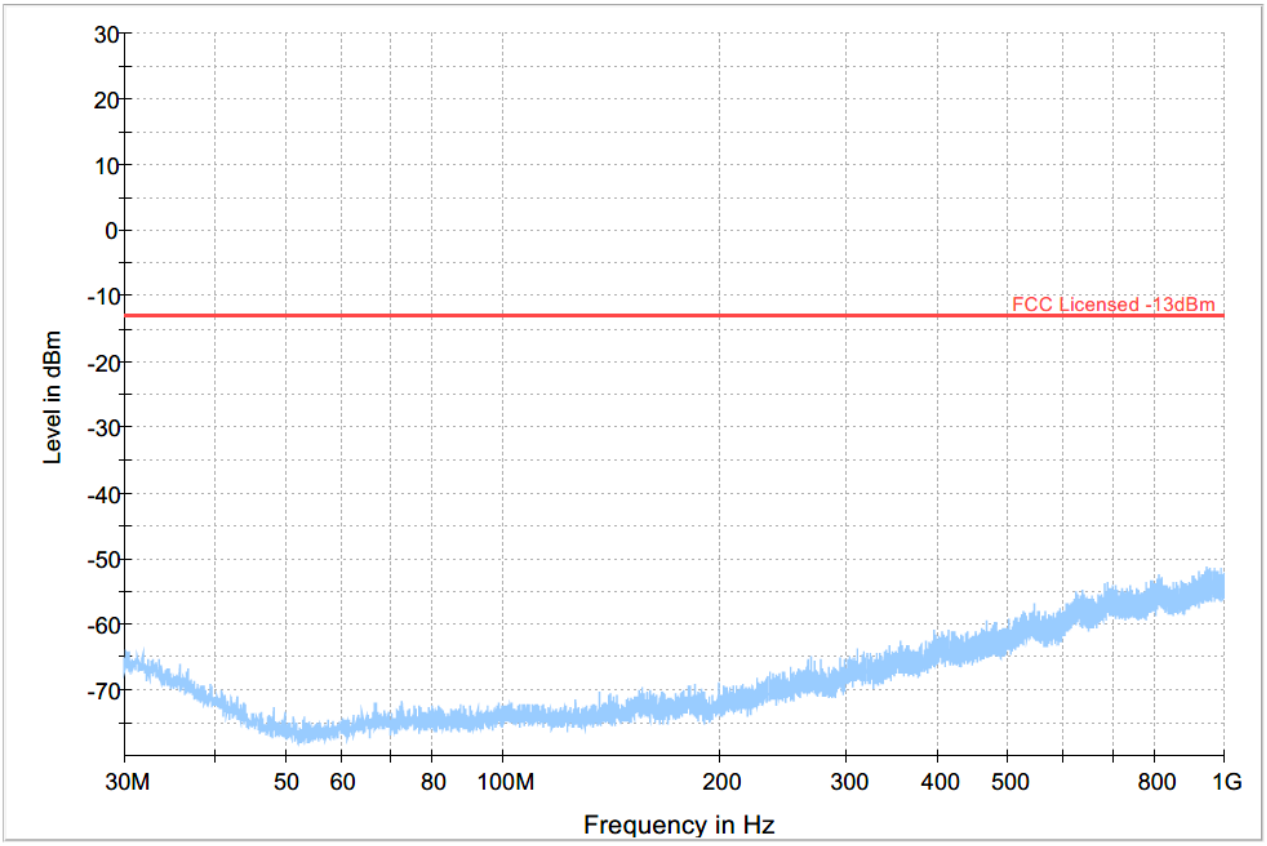
Plot #8 Radiated Emissions: 18-26 GHz

Channel: Mid



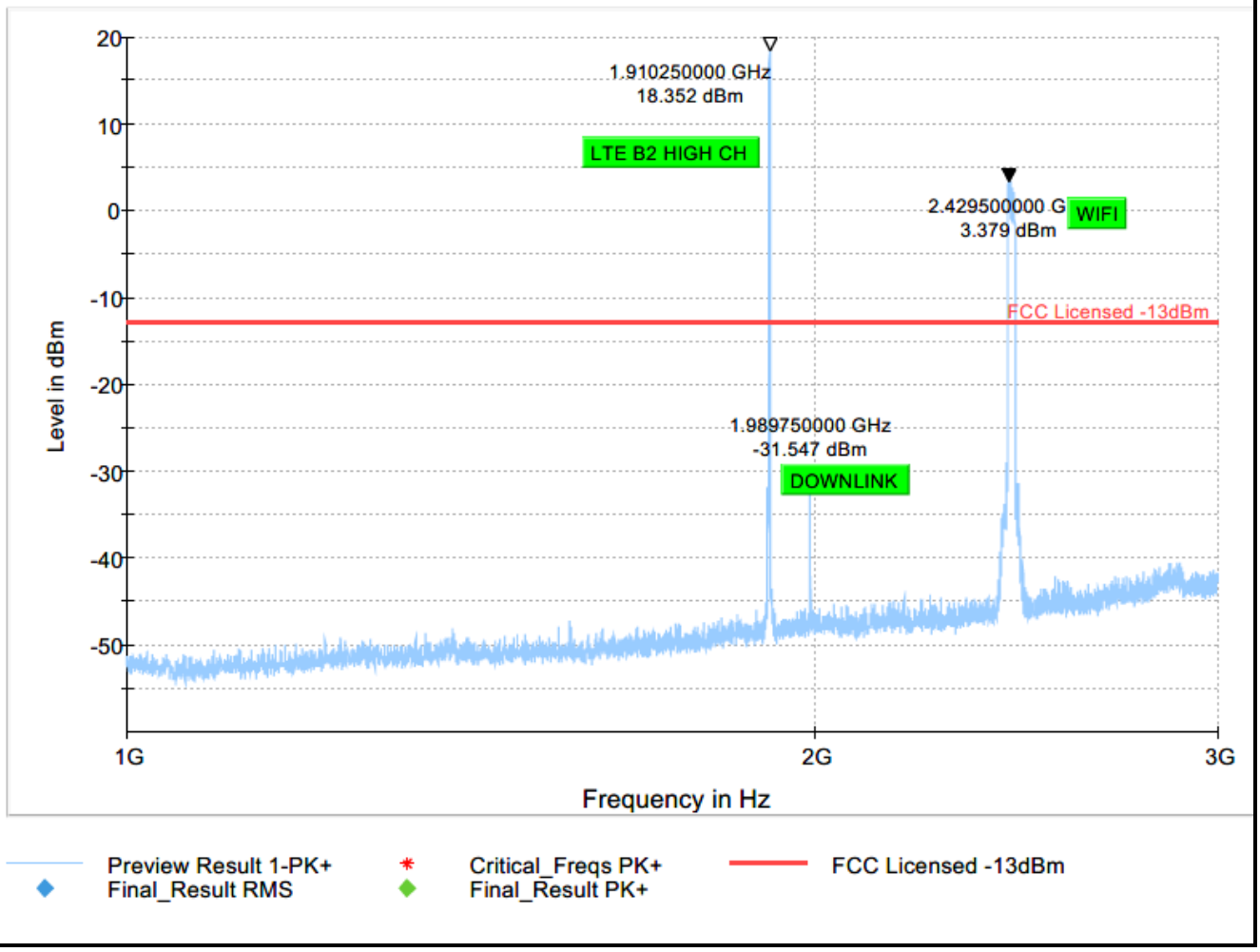
Plot #9 Radiated Emissions: 30 MHz – 1 GHz

Channel: High



Plot #10 Radiated Emissions: 1-3 GHz

Channel: High

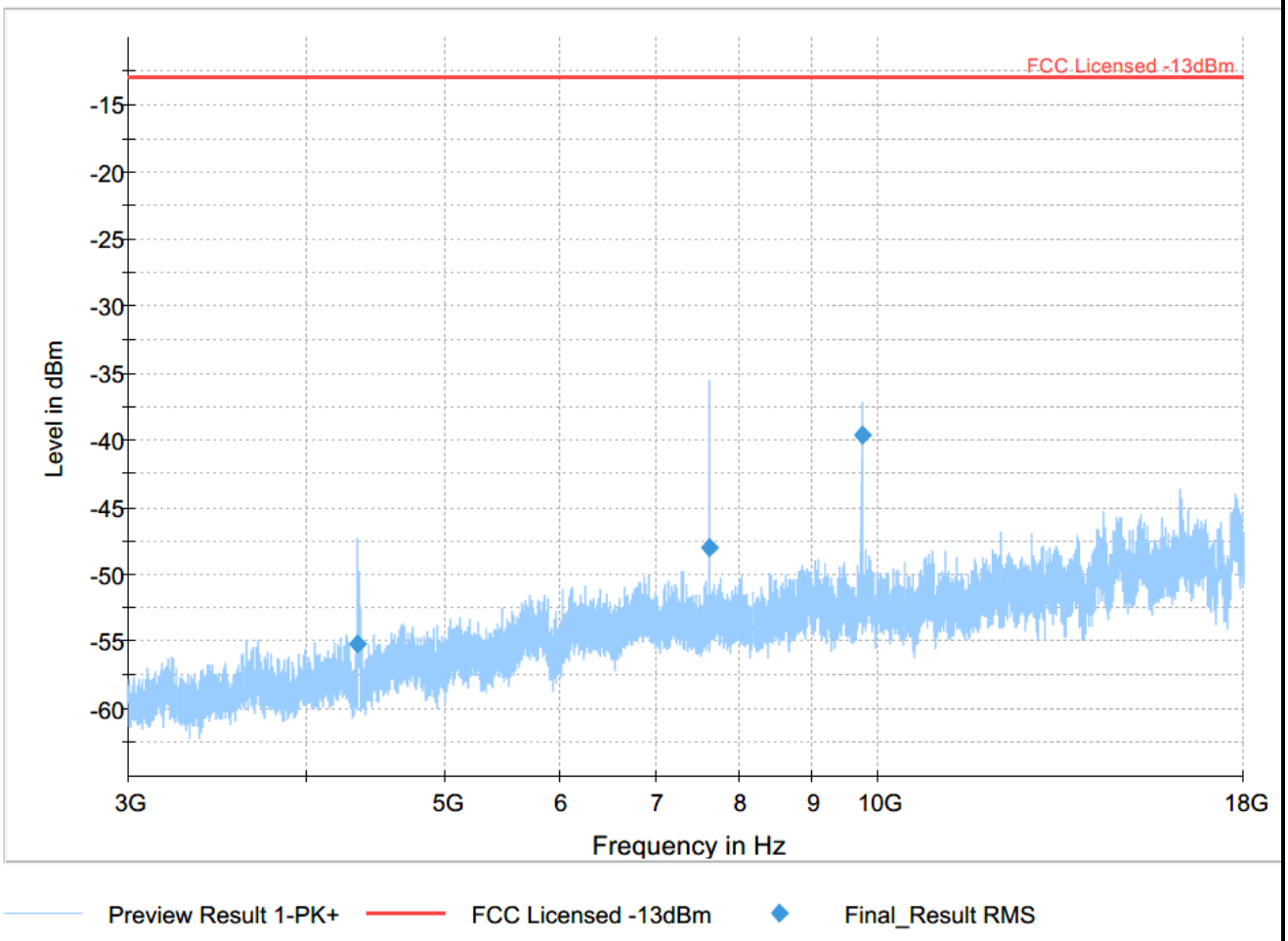


Plot #11 Radiated Emissions: 3-18 GHz

Channel: High

Final_Result

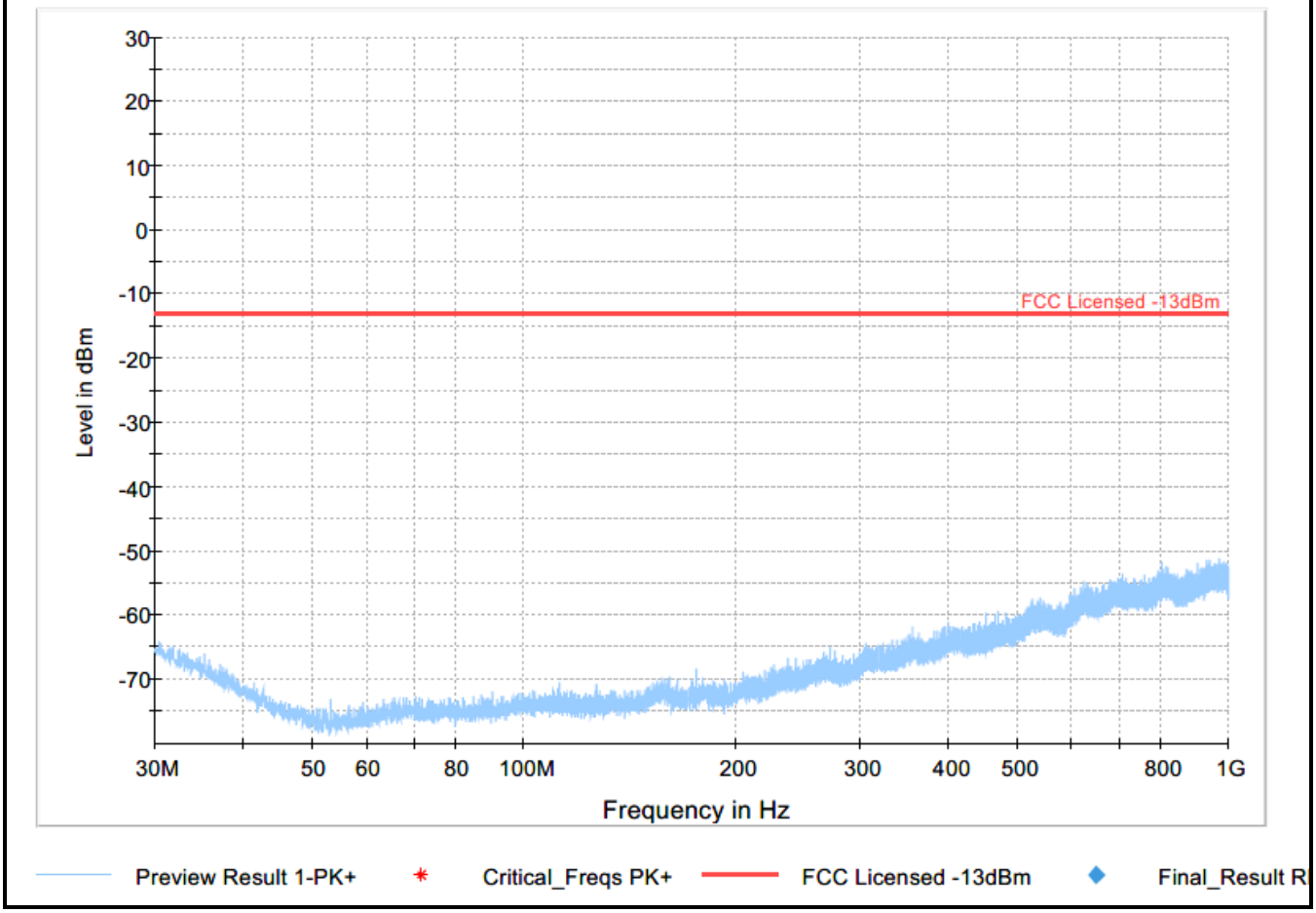
Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
4339.750	-55.24	-13.00	42.24	500.0	1000.000	117.0	H	163.0	-99.9	
7641.250	-48.04	-13.00	35.04	500.0	1000.000	256.0	H	308.0	-95.0	
9748.000	-39.60	-13.00	26.60	500.0	1000.000	191.0	H	156.0	-93.2	



LTE Band 4

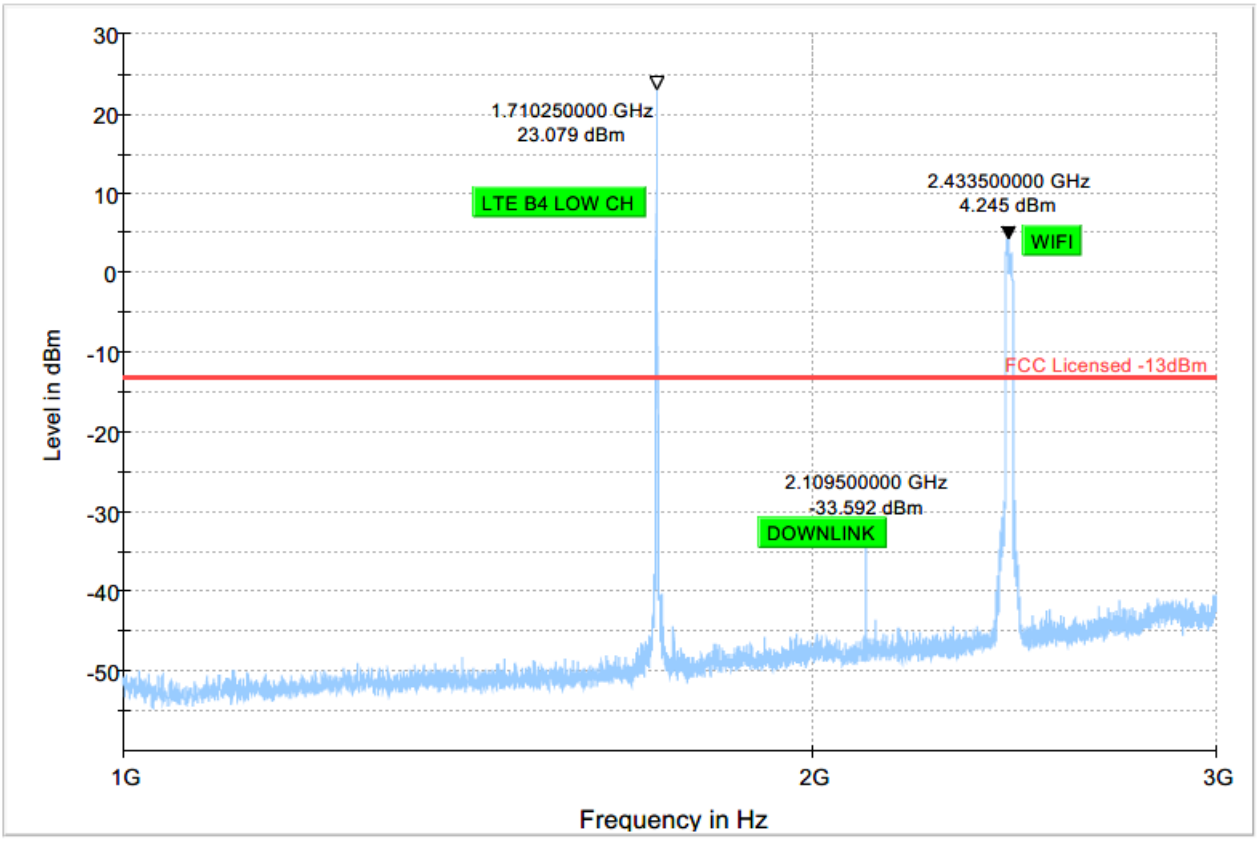
Plot #12 Radiated Emissions: 30 MHz – 1GHz

Channel: Low



Plot # 13 Radiated Emissions: 1-3 GHz

Channel: Low

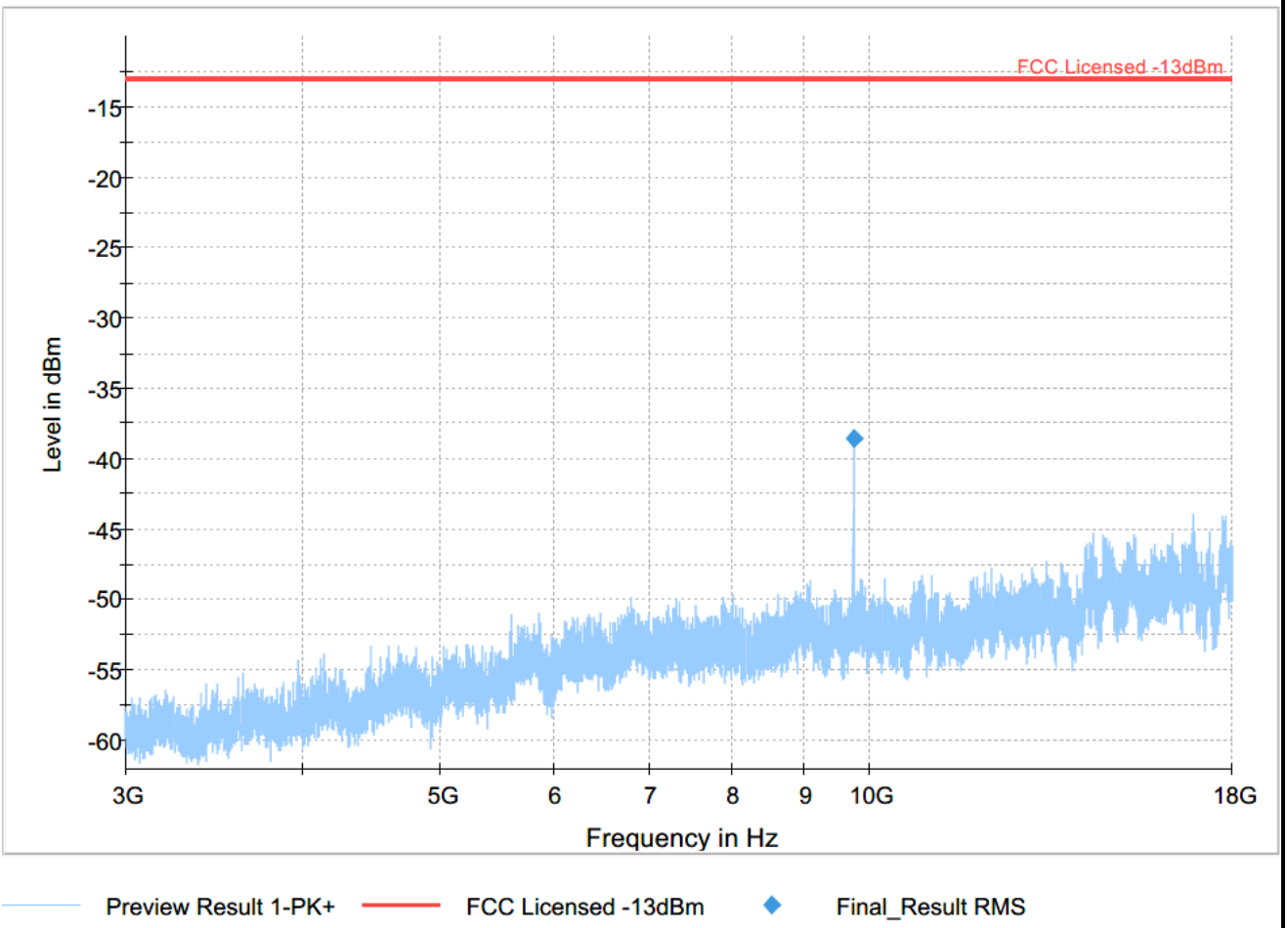


Plot # 14 Radiated Emissions: 3-18 GHz

Channel: Low

Final_Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
9748.000	-38.54	-13.00	25.54	500.0	1000.000	107.0	V	120.0	-93.2	

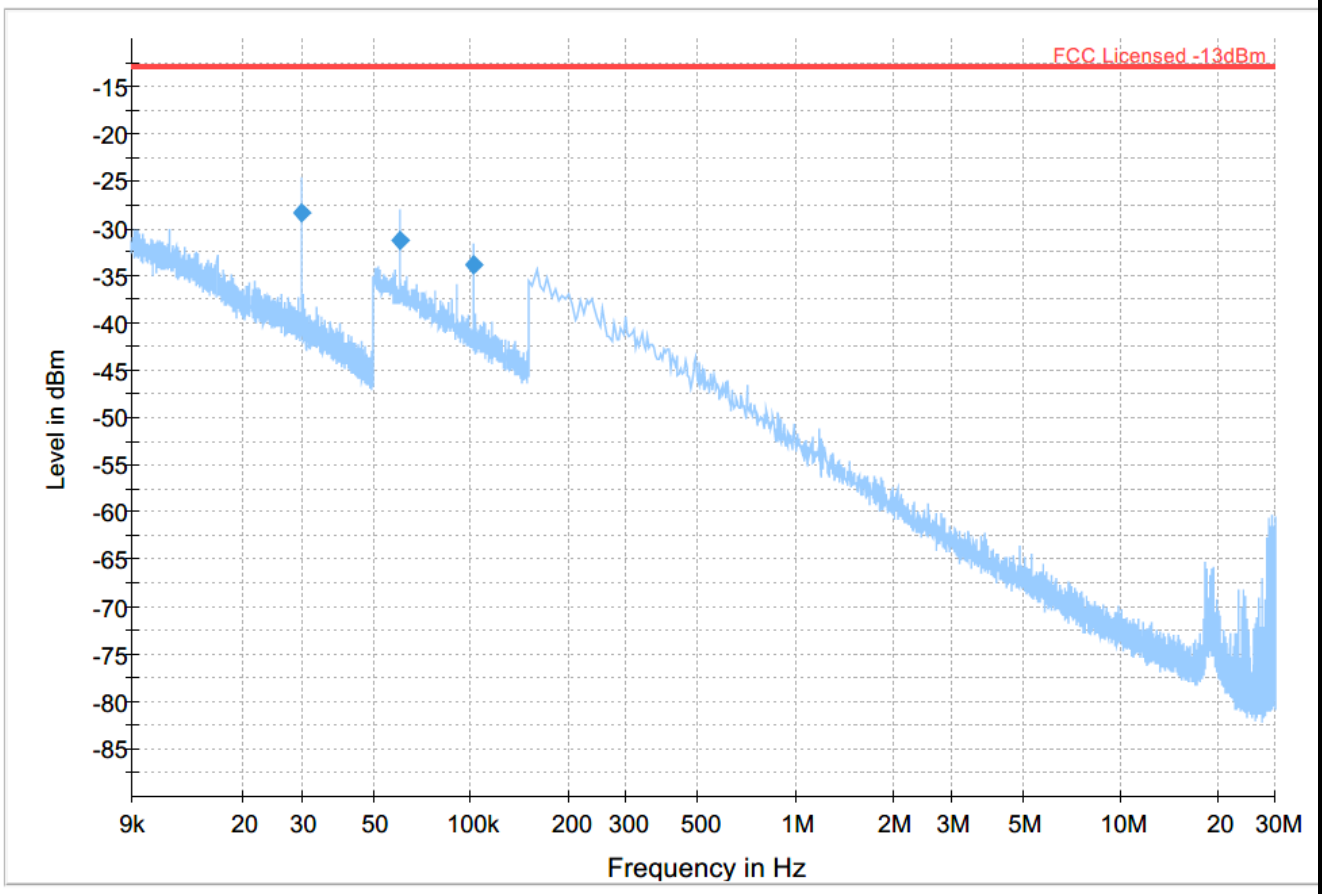


Plot #15 Radiated Emissions: 9 kHz – 30 MHz

Channel: Mid

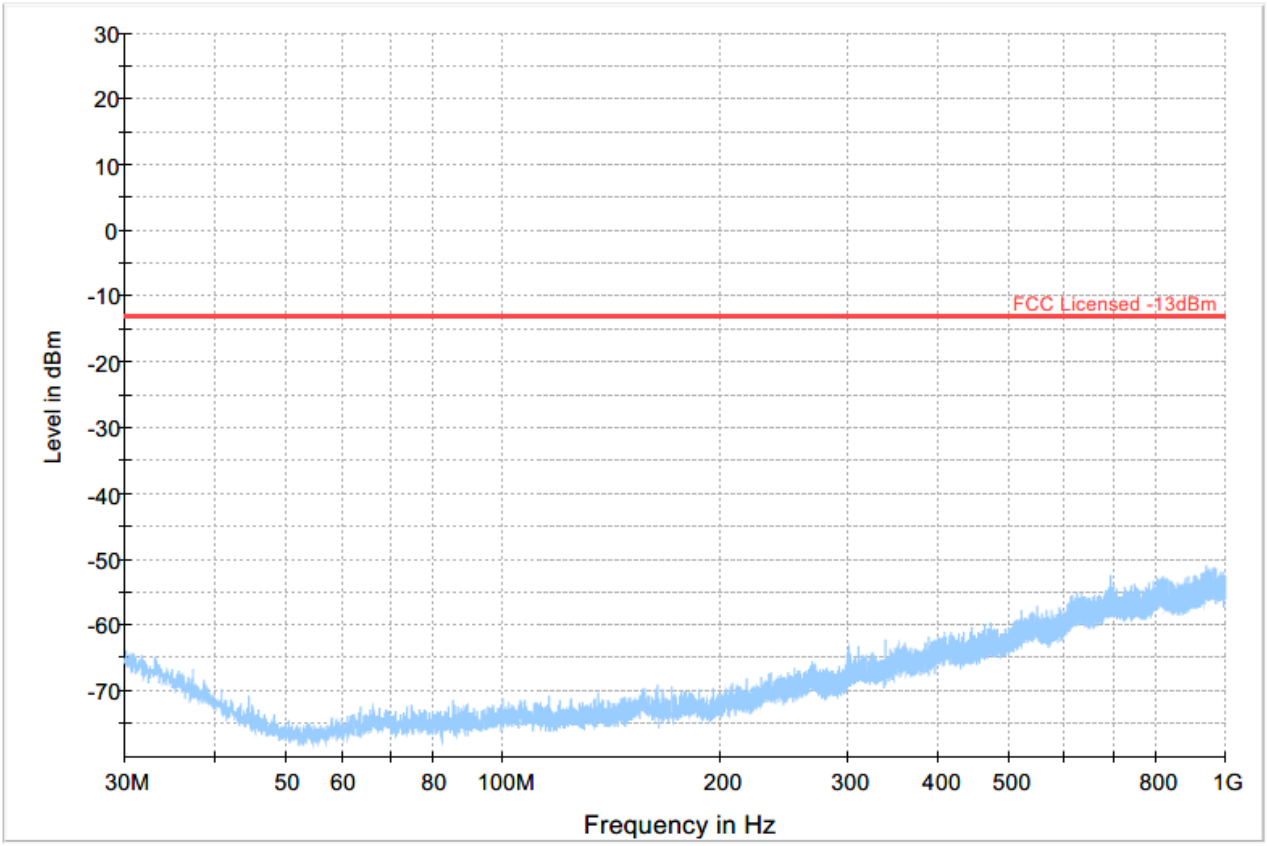
Final_Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
0.030	-28.38	-13.00	15.38	500.0	1.000	123.0	V	250.0	-72.1	
0.060	-31.35	-13.00	18.35	500.0	1.000	112.0	V	195.0	-75.4	
0.102	-33.91	-13.00	20.91	500.0	1.000	112.0	H	37.0	-76.3	



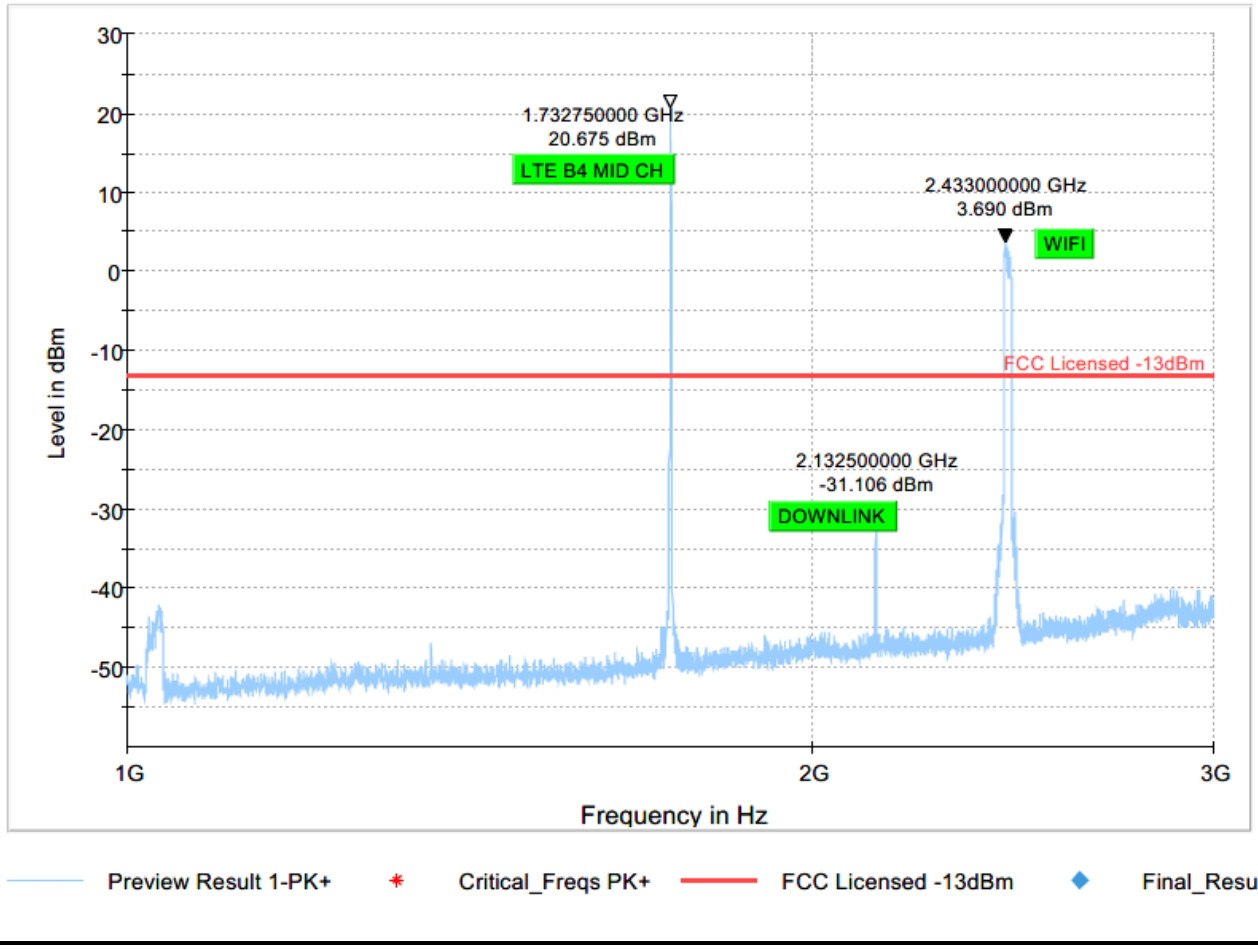
Plot #16 Radiated Emissions: 30 MHz – 1 GHz

Channel: Mid



Plot #17 Radiated Emissions: 1-3 GHz

Channel: Mid

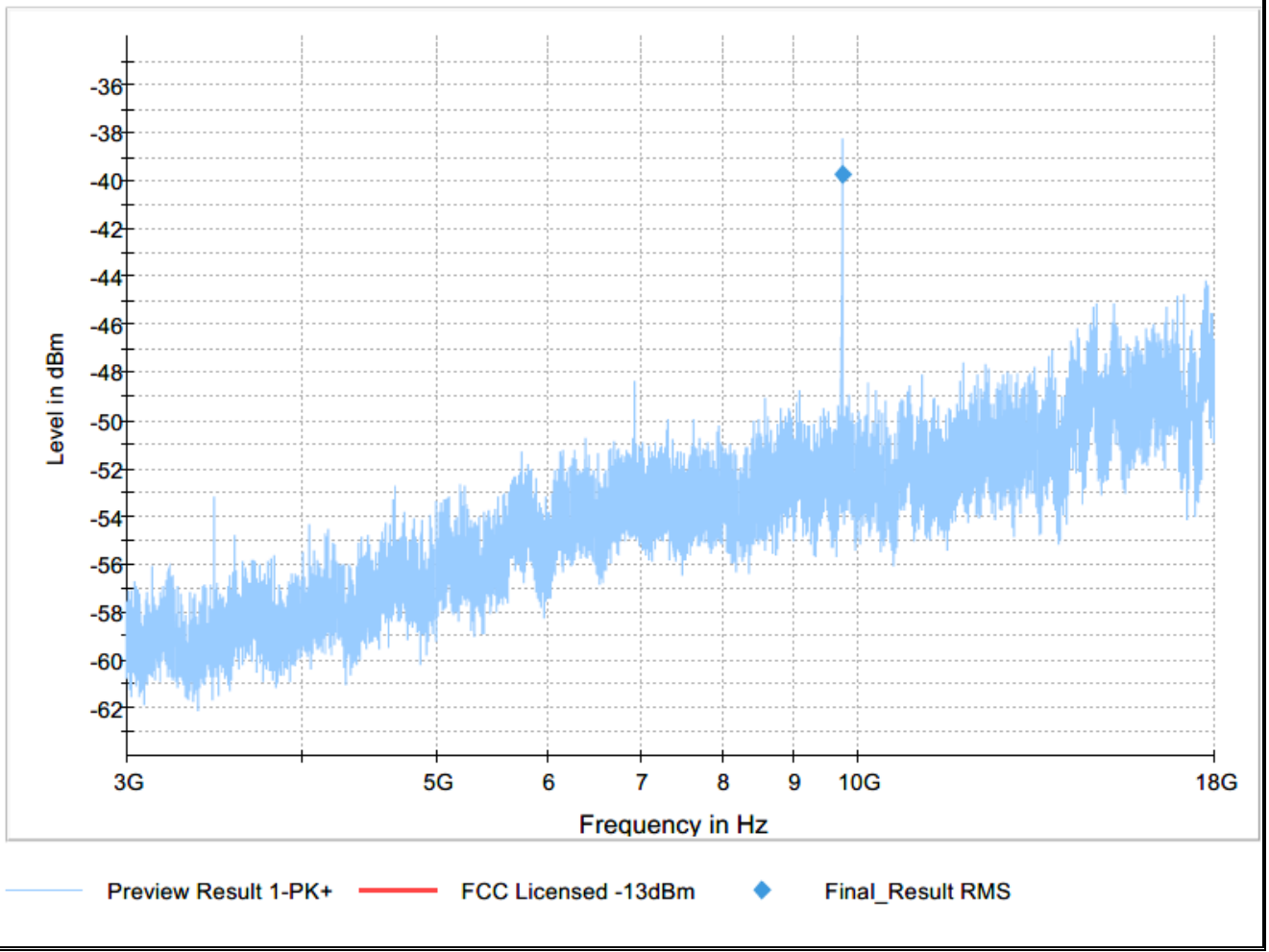


Plot #18 Radiated Emissions: 3-18 GHz

Channel: Mid

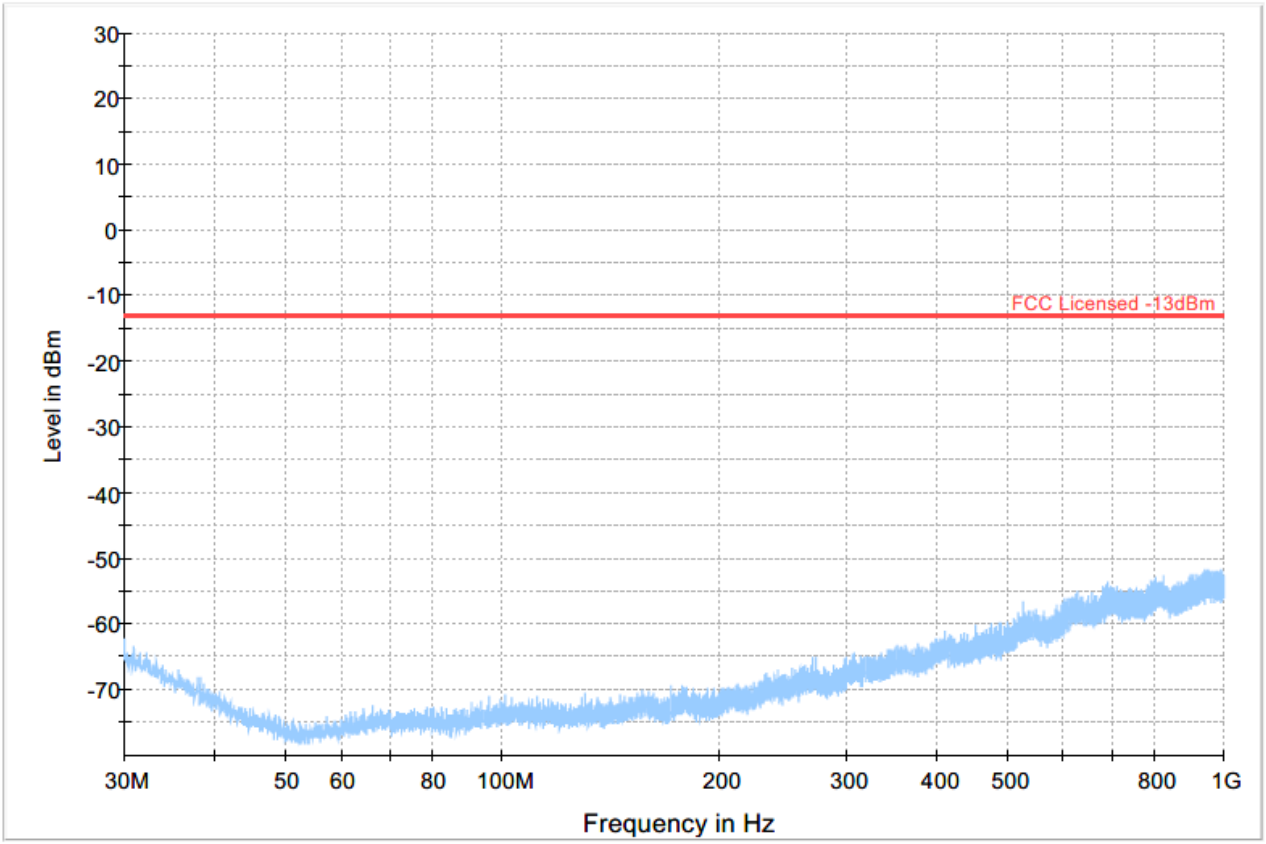
Final_Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
9748.000	-39.73	-13.00	26.73	500.0	1000.000	100.0	V	118.0	-93.2	



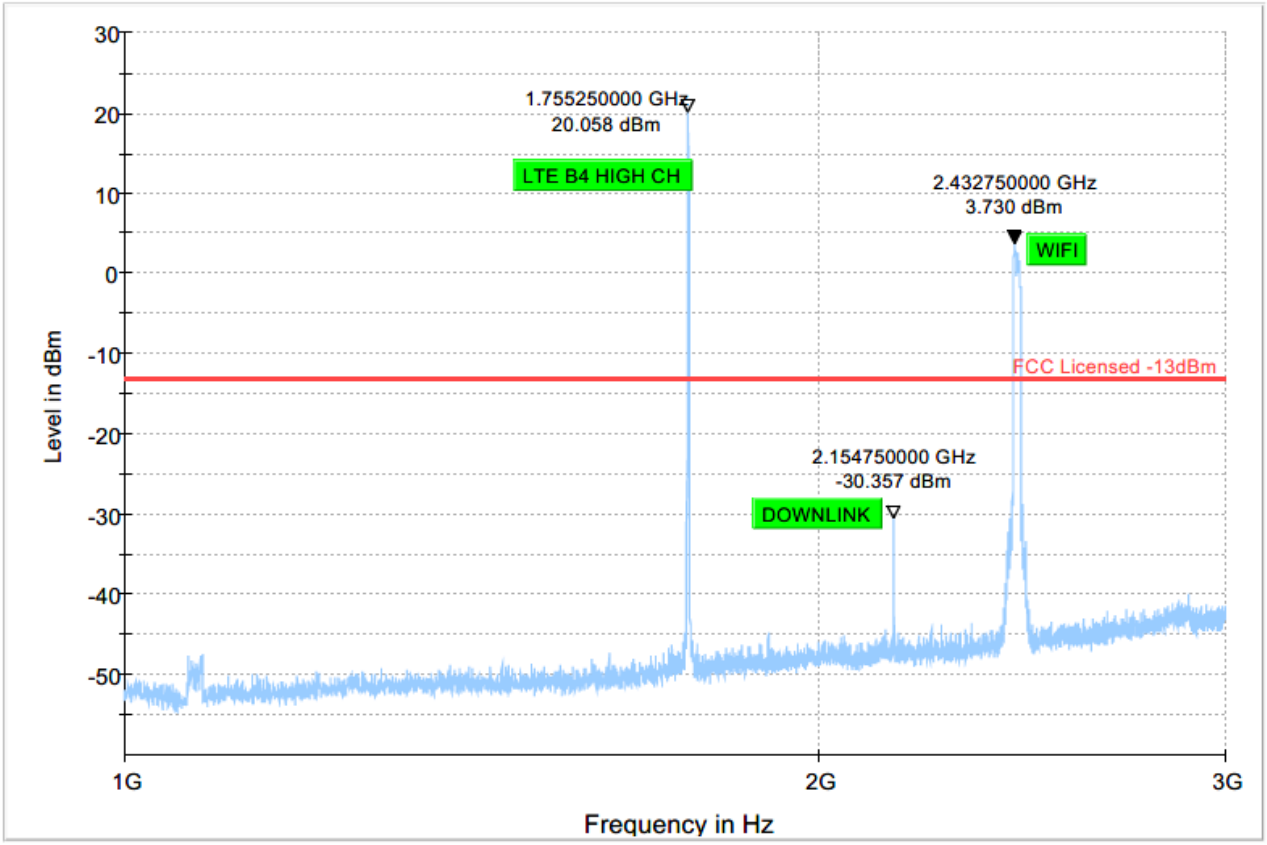
Plot #19 Radiated Emissions: 30 MHz – 1 GHz

Channel: High



Plot #20 Radiated Emissions: 1-3 GHz

Channel: High

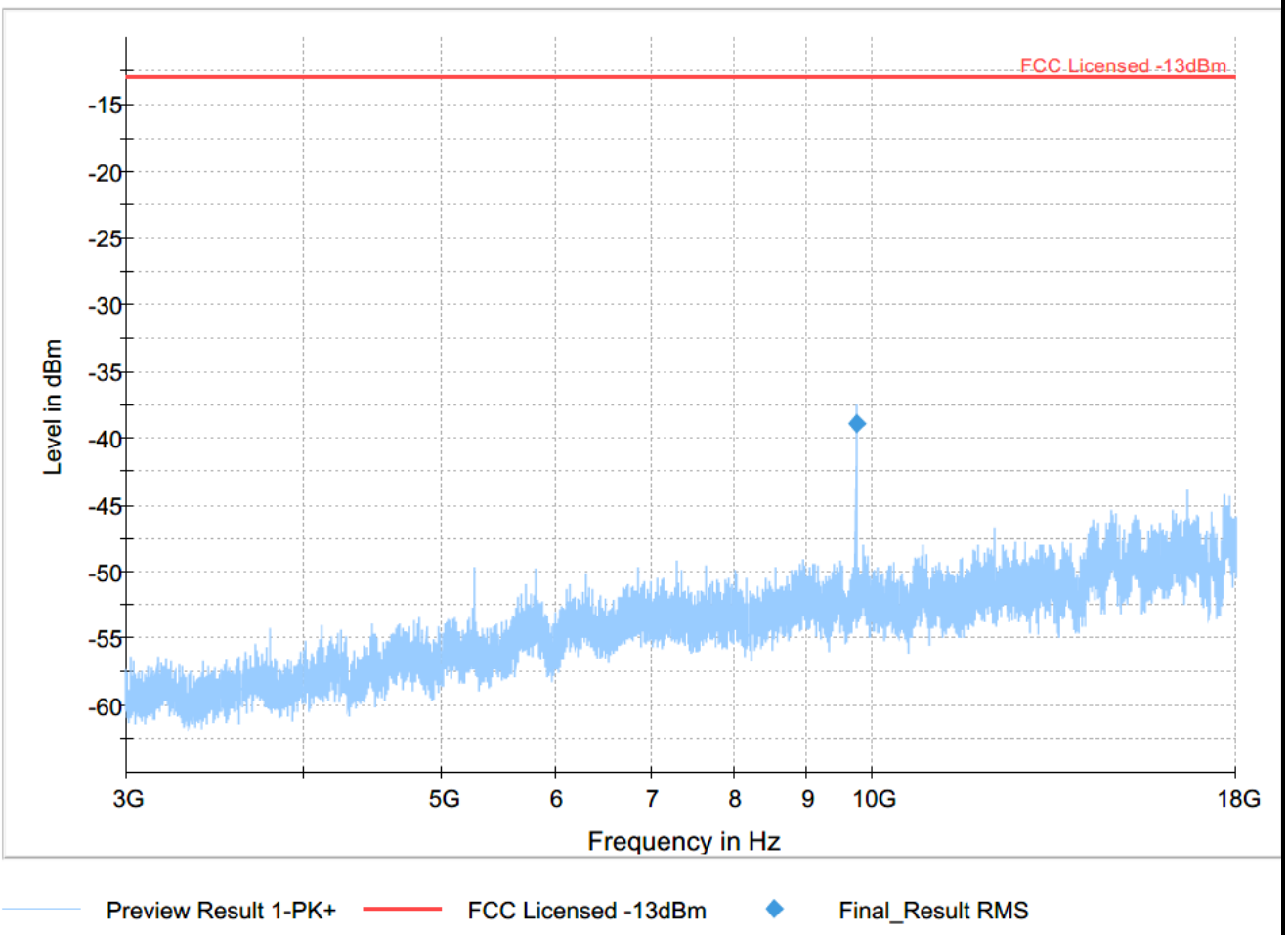


Plot #21 Radiated Emissions: 3-18 GHz

Channel: High

Final_Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
9748.000	-38.87	-13.00	25.87	500.0	1000.000	186.0	H	157.0	-93.2	



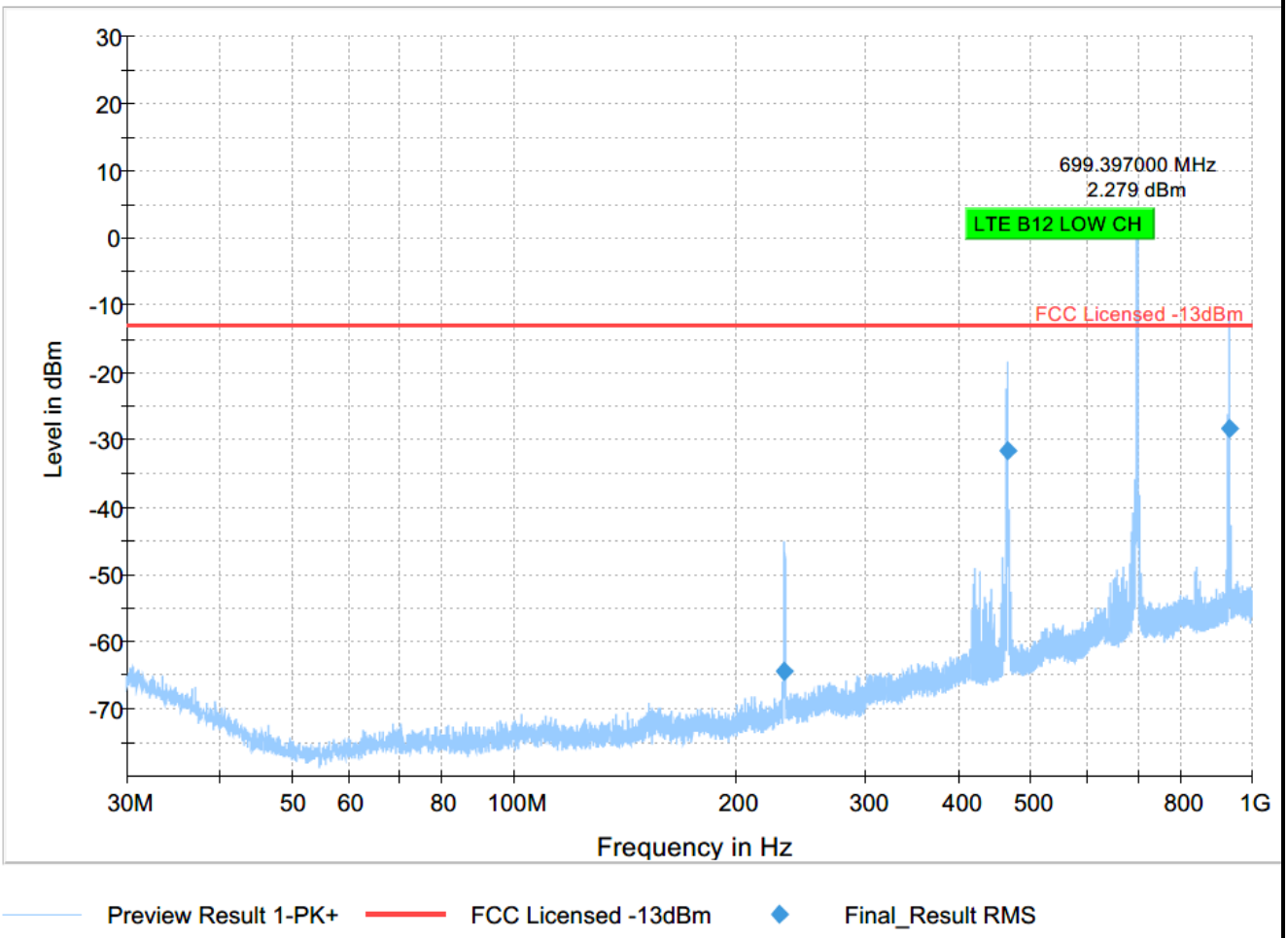
LTE Band 12

Plot #22 Radiated Emissions: 30 MHz – 1GHz

Channel: Low

Final_Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
232.892	-64.39	-13.00	51.39	500.0	100.000	140.0	H	203.0	-86.6	
466.015	-31.64	-13.00	18.64	500.0	100.000	163.0	H	236.0	-79.9	
932.682	-28.29	-13.00	15.29	500.0	100.000	140.0	H	-45.0	-73.0	

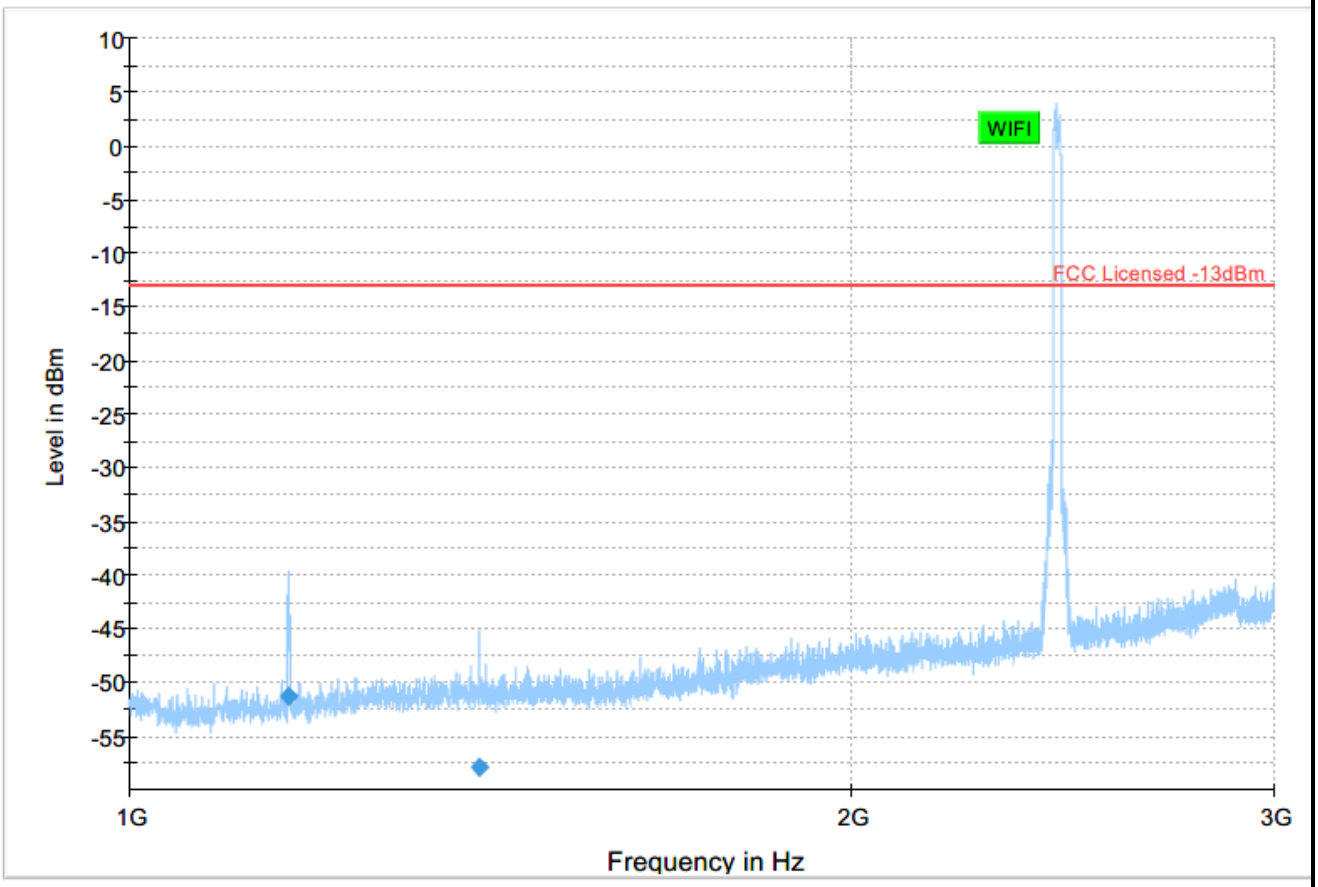


Plot # 23 Radiated Emissions: 1-3 GHz

Channel: Low

Final_Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
1165.500	-51.24	-13.00	38.24	500.0	1000.000	216.0	V	332.0	-67.5	
1398.750	-57.94	-13.00	44.94	500.0	1000.000	167.0	H	179.0	-66.7	

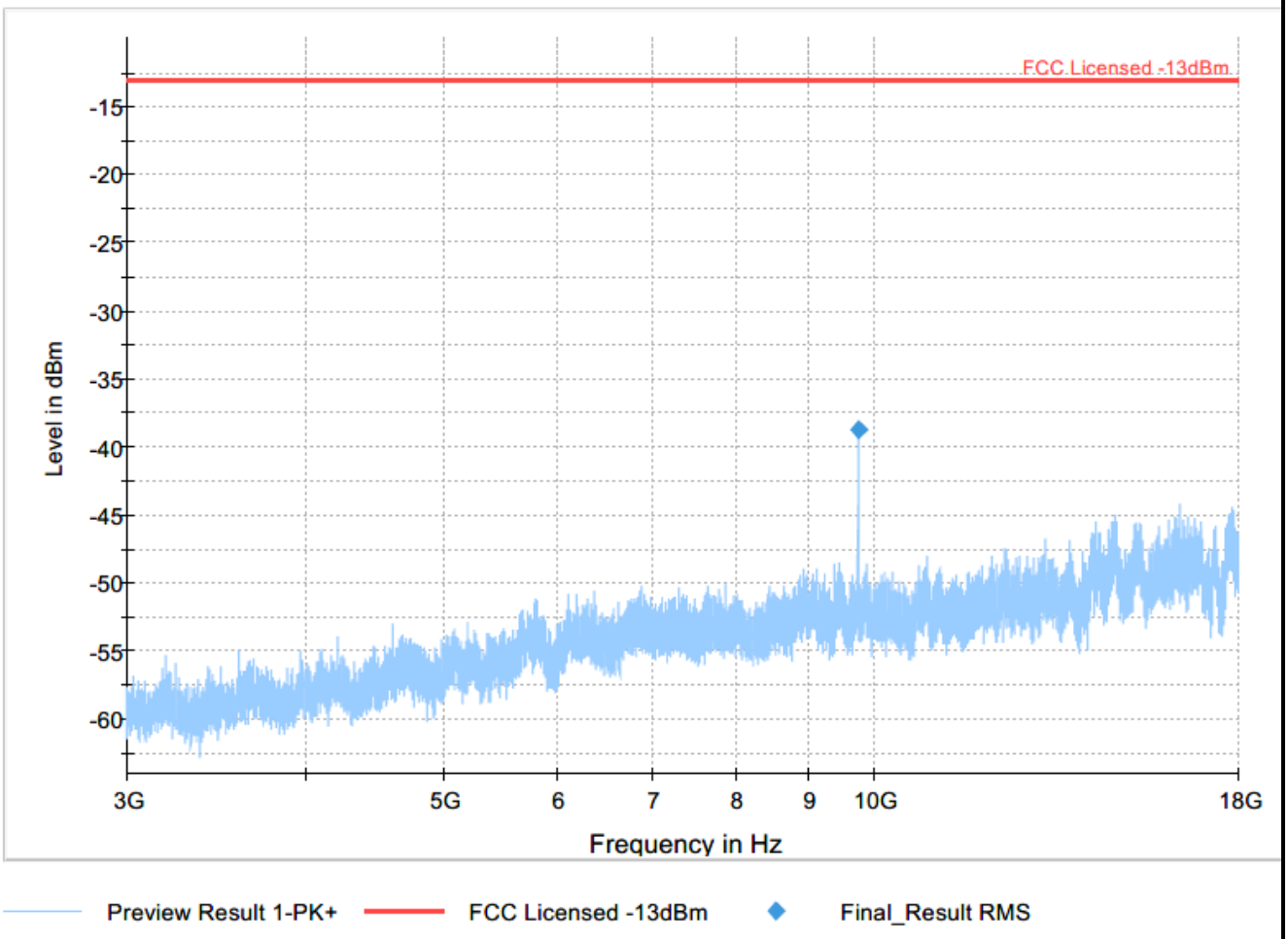


Plot # 24 Radiated Emissions: 3-18 GHz

Channel: Low

Final_Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
9748.000	-38.73	-13.00	25.73	500.0	1000.000	200.0	V	257.0	-93.2	

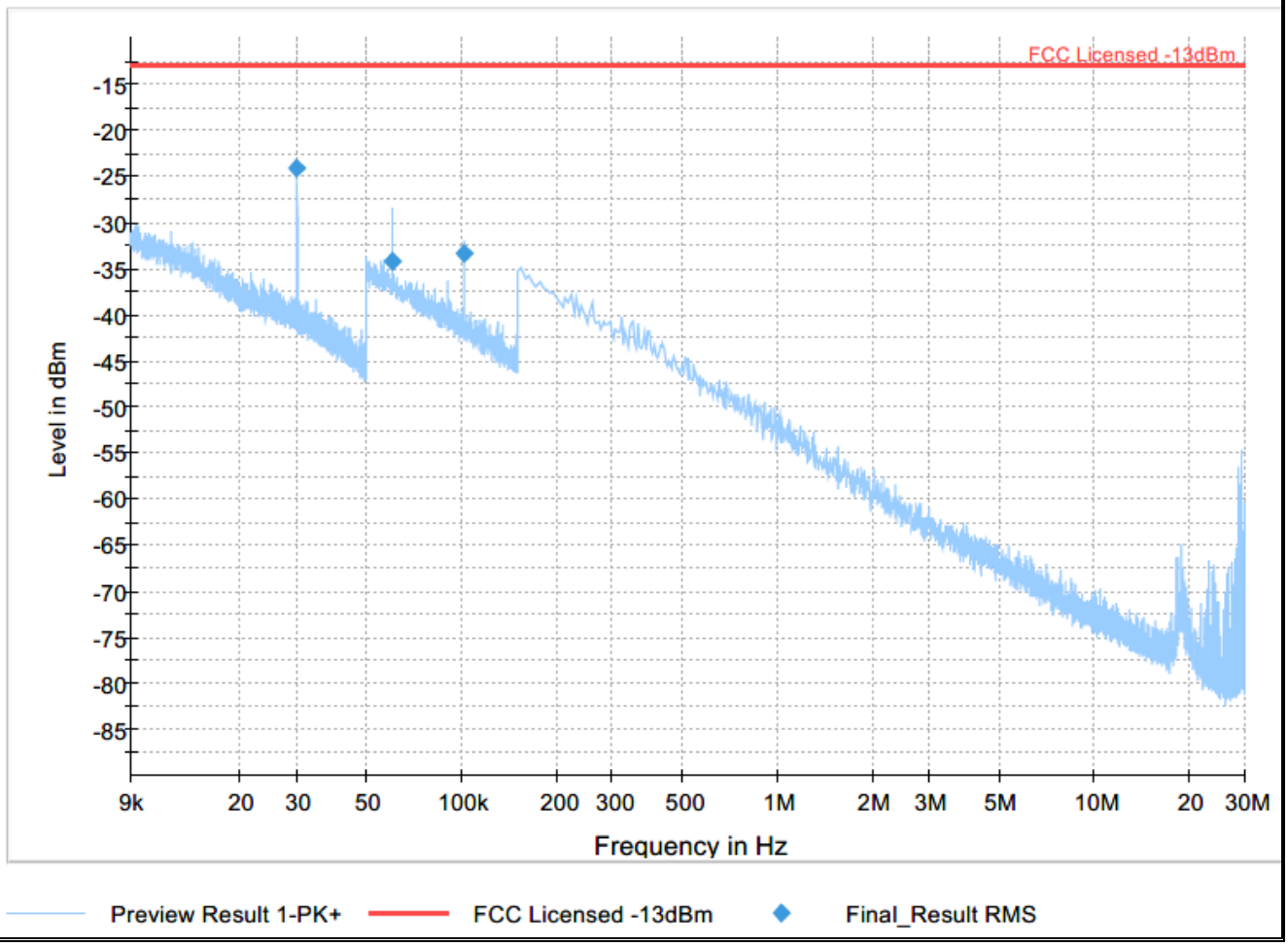


Plot #25 Radiated Emissions: 9 kHz – 30 MHz

Channel: Mid

Final_Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
0.030	-24.04	-13.00	11.04	500.0	1.000	100.0	V	152.0	-72.1	
0.061	-34.17	-13.00	21.17	500.0	1.000	123.0	V	274.0	-75.4	
0.102	-33.31	-13.00	20.31	500.0	1.000	100.0	H	238.0	-76.3	

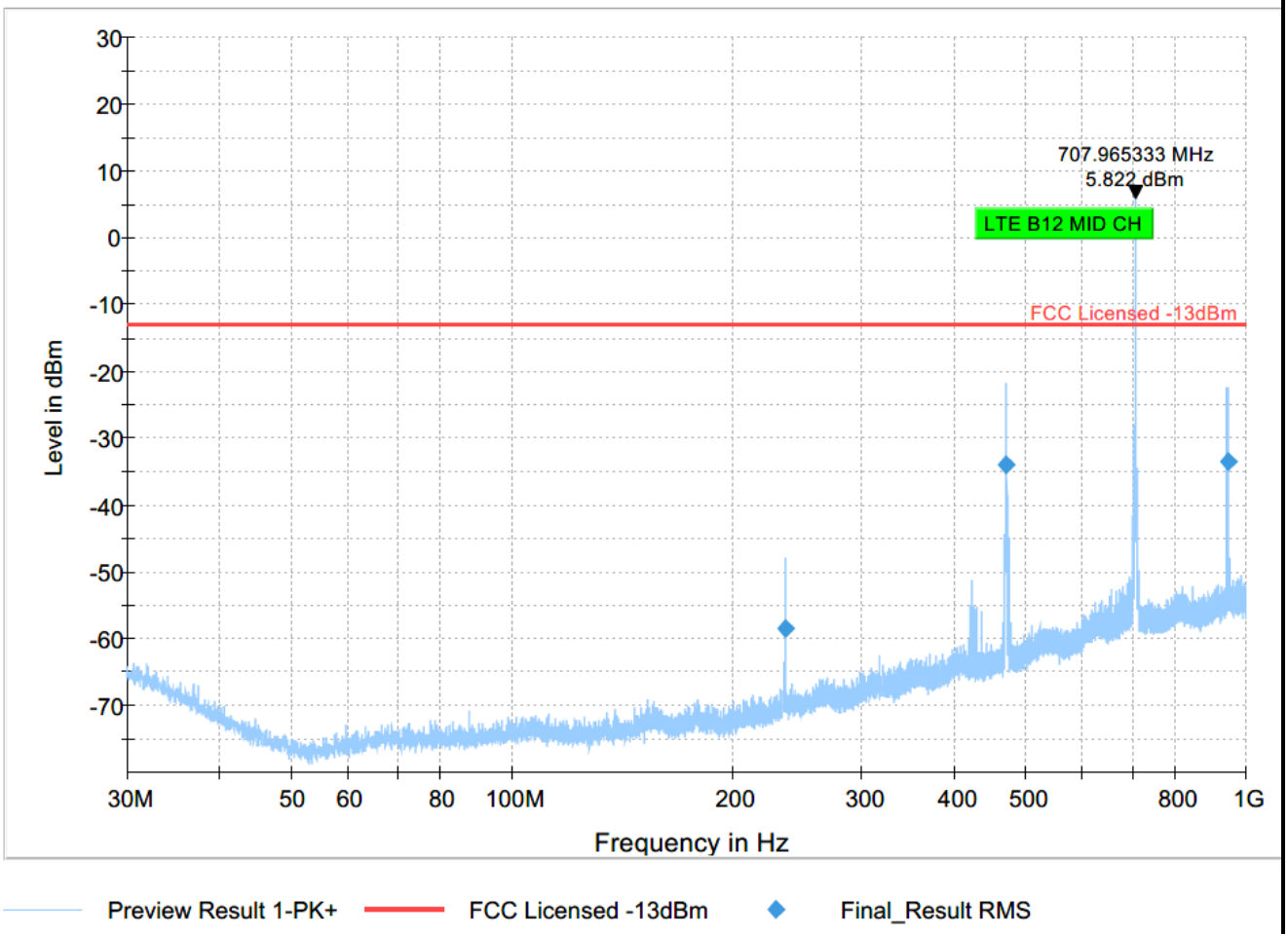


Plot #26 Radiated Emissions: 30 MHz – 1 GHz

Channel: Mid

Final_Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
235.963	-58.57	-13.00	45.57	500.0	100.000	312.0	H	58.0	-86.5	
471.706	-34.04	-13.00	21.04	500.0	100.000	220.0	V	169.0	-79.8	
943.869	-33.49	-13.00	20.49	500.0	100.000	140.0	H	105.0	-72.6	

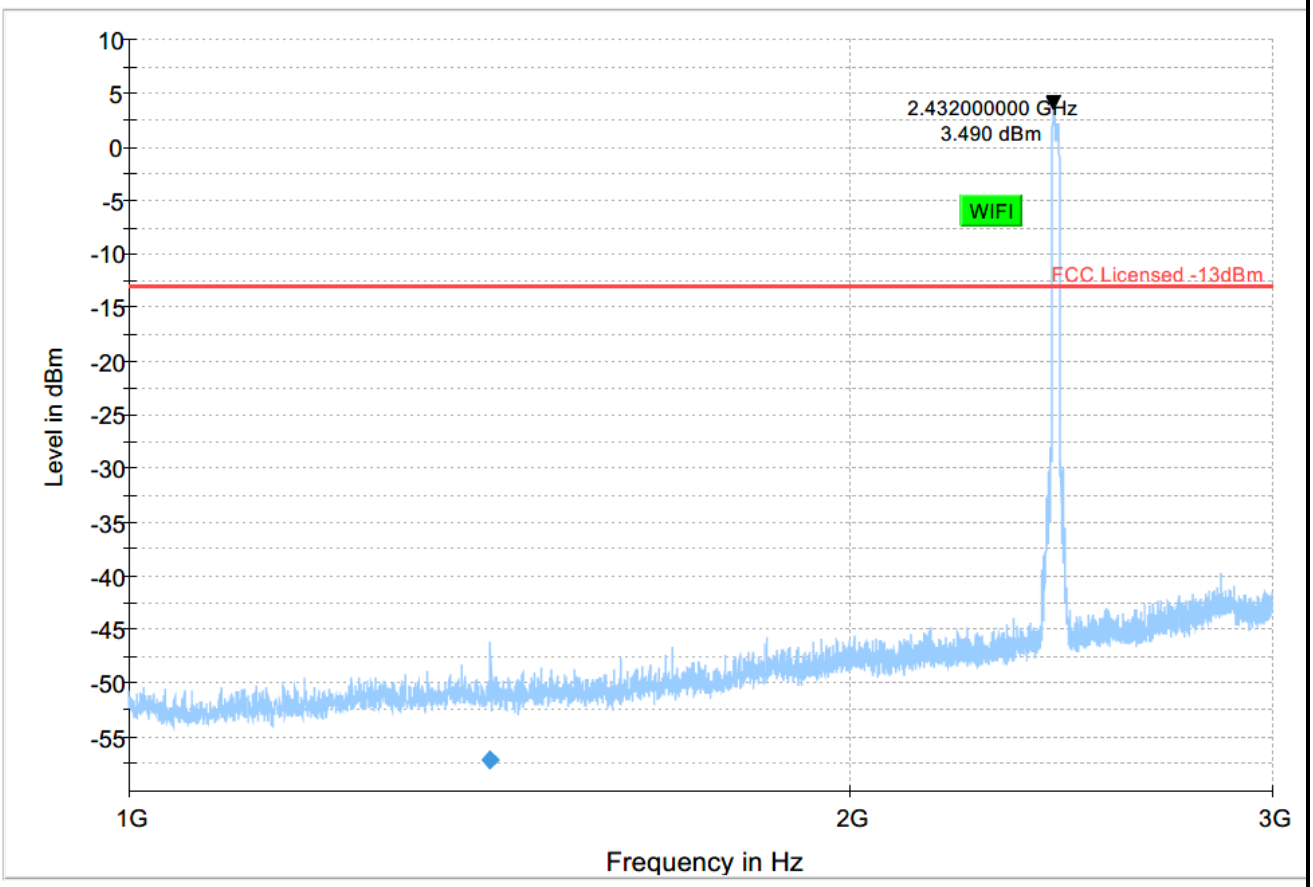


Plot #27 Radiated Emissions: 1-3 GHz

Channel: Mid

Final_Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
1415.750	-57.10	-13.00	44.10	500.0	1000.000	216.0	V	245.0	-66.7	

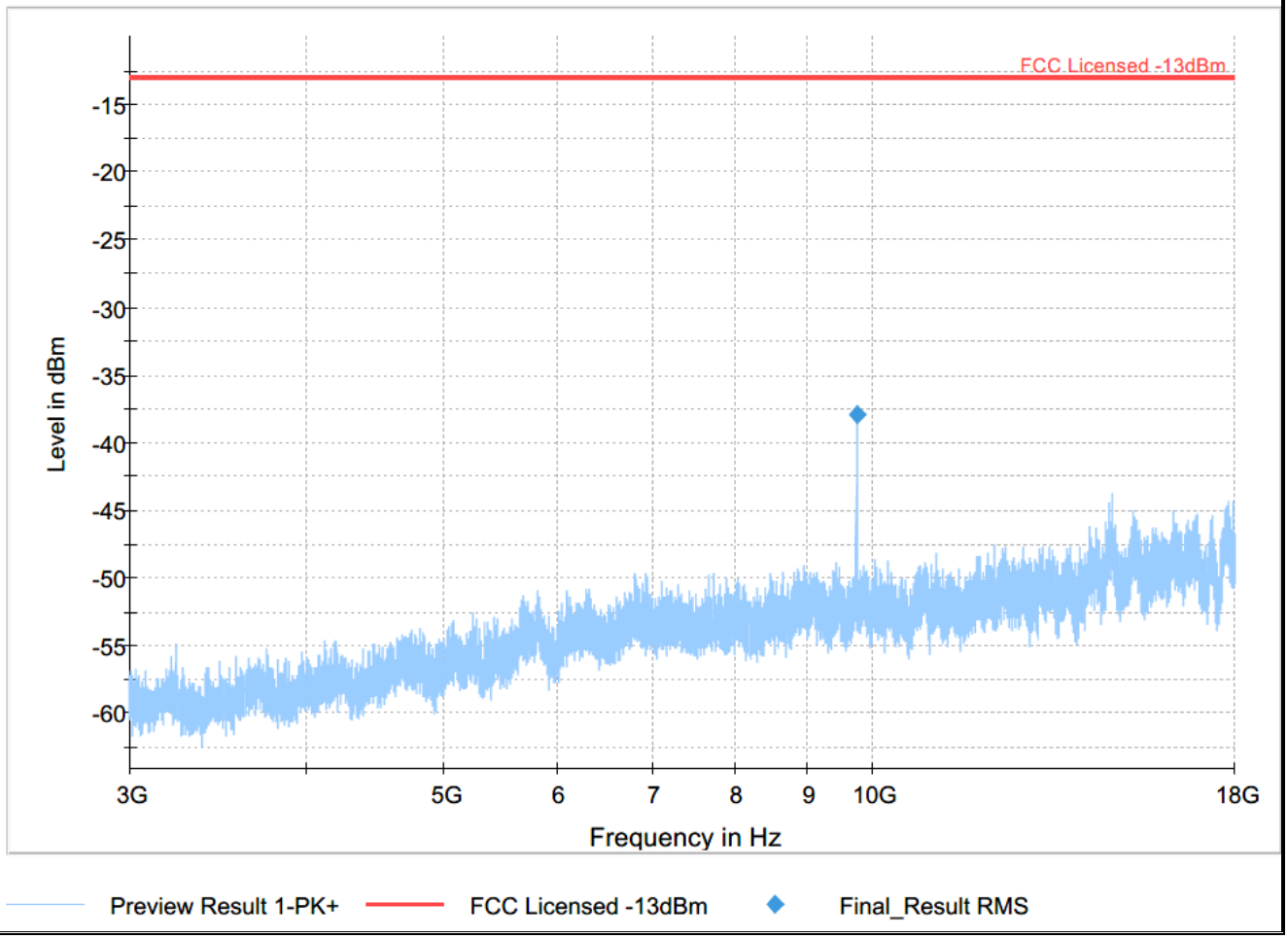


Plot #28 Radiated Emissions: 3-18 GHz

Channel: Mid

Final_Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
9748.000	-37.93	-13.00	24.93	500.0	1000.000	125.0	H	159.0	-93.2	

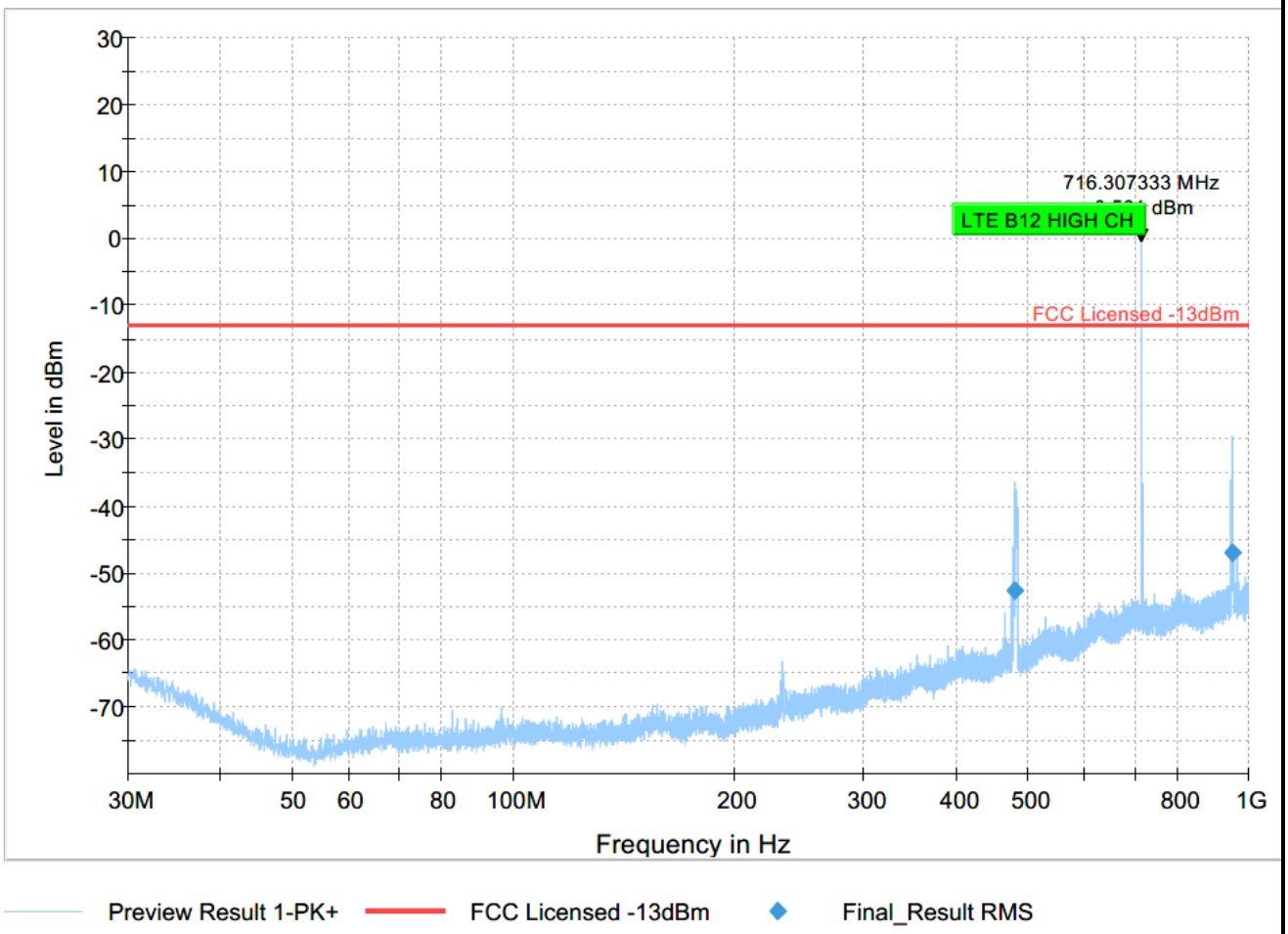


Plot #29 Radiated Emissions: 30 MHz – 1 GHz

Channel: High

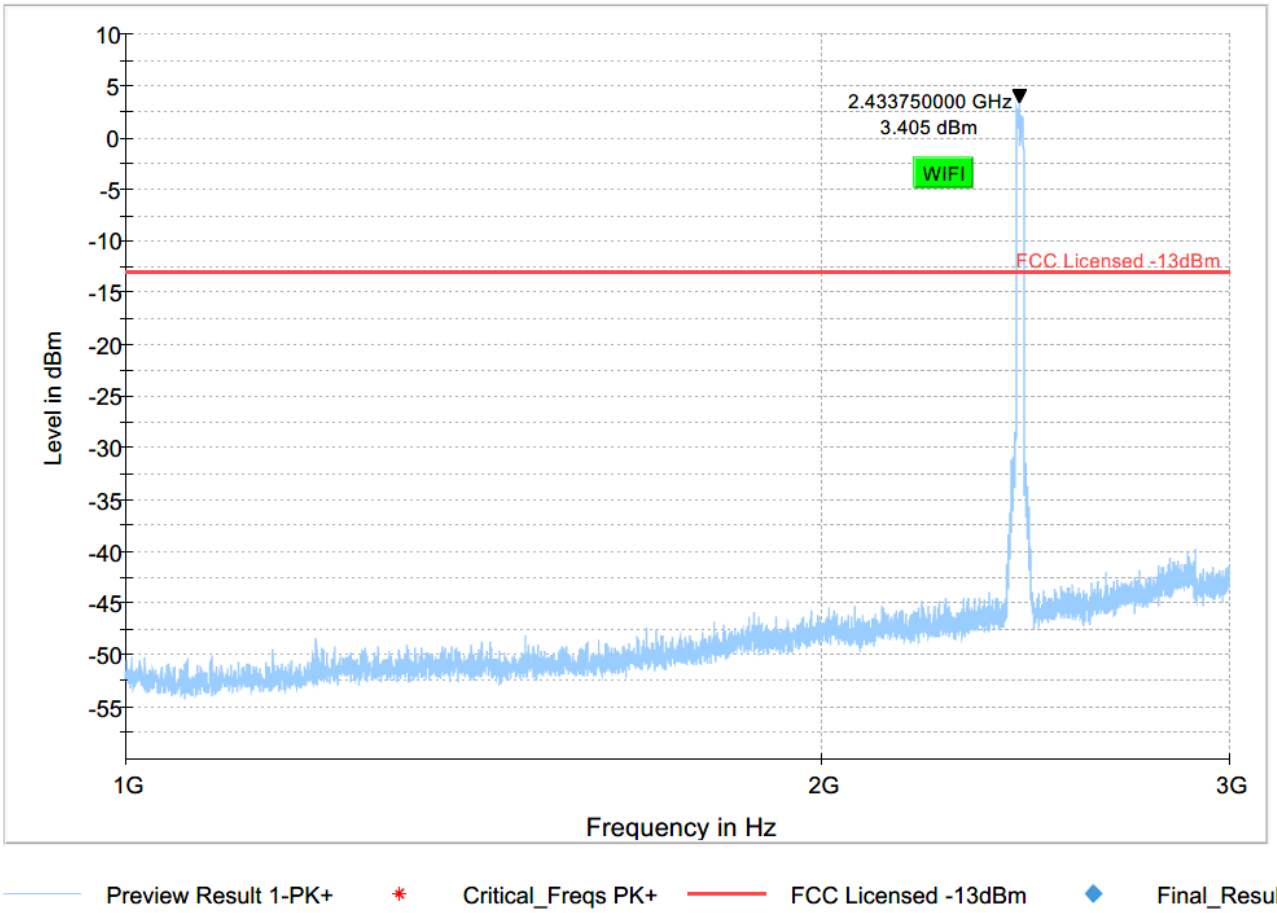
Final_Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
481.212	-52.73	-13.00	39.73	500.0	100.000	164.0	H	241.0	-79.9	
949.786	-47.00	-13.00	34.00	500.0	100.000	152.0	H	222.0	-72.5	



Plot #30 Radiated Emissions: 1-3 GHz

Channel: High

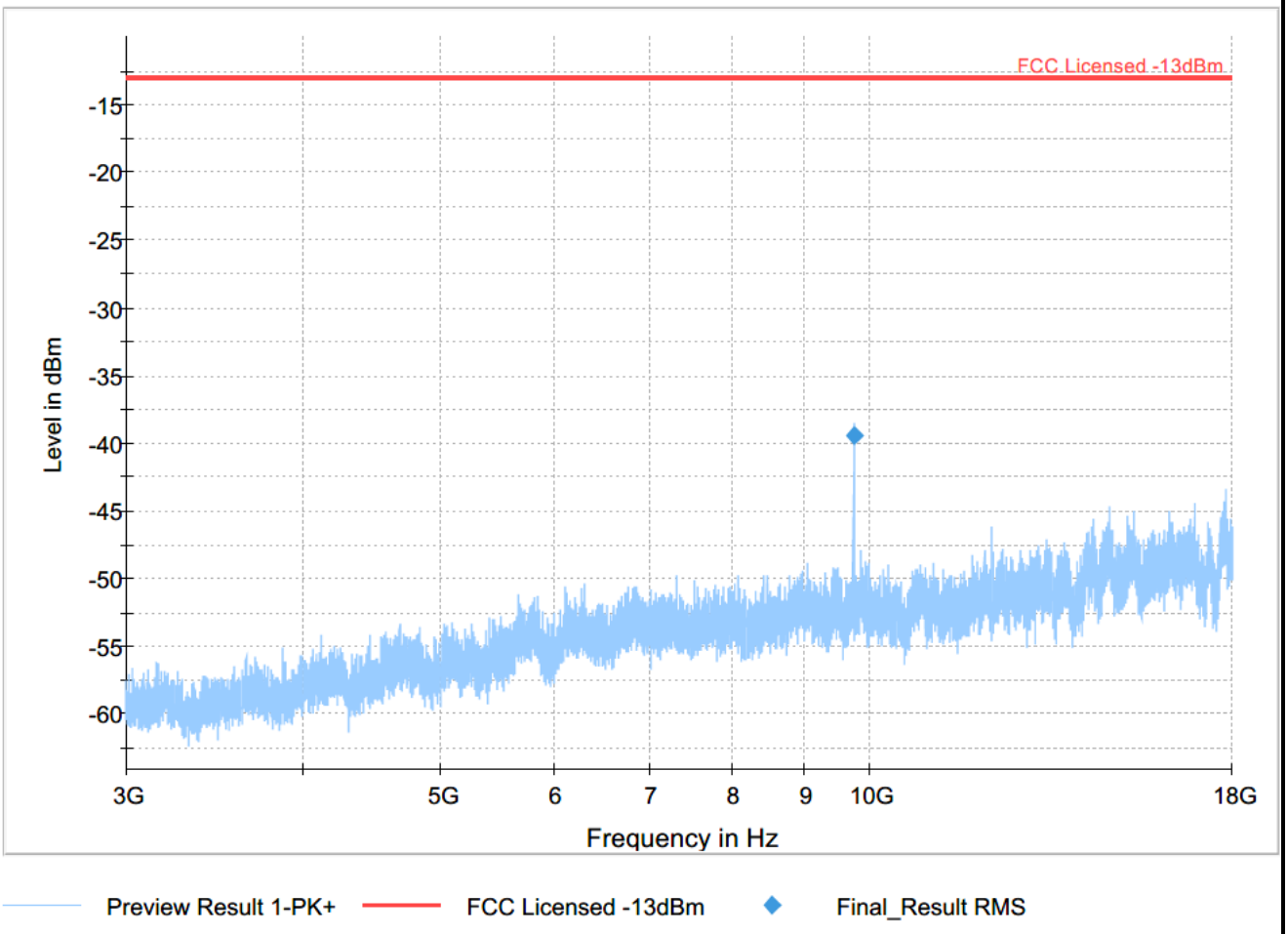


Plot #31 Radiated Emissions: 3-18 GHz

Channel: High

Final_Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
9748.000	-39.40	-13.00	26.40	500.0	1000.000	142.0	V	266.0	-93.2	



8 Test setup photos

Setup photos are included in supporting file name: "EMC_GARMI-080-20001_FCC_Setup_photos.pdf"

9 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	10/30/2020
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	11/23/2020
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
EMI Receiver	EMI Receiver	R&S	ESU40	100251	3 years	07/16/2019
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: 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.

10 Revision History

Date	Report Name	Changes to report	Report prepared by
2021-07-02	EMC_GARMI-080-20001_FCC_24_27	Initial Version	Yuchan Lu

<<< The End >>>