



FCC / ISED & Test Report

For:

Telular Corporation

Model Name:

ST100

Product Description:

Telematic gateway for communicating measurement data

FCC ID: MTFST1001

IC: 2175D-ST1001

Applied Rules and Standards:

47 CFR Parts 24, 27

RSS: 130 Issue 2, 133 Issue 7, 139 Issue 4

REPORT #: EMC_TELUL_118_23001_FCC_24_27_Rev2

DATE: 2025-06-04



A2LA Accredited

IC recognized #
3462B-1

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CETECOM Inc. is a Delaware Corporation with Corporation number: 2905571

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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 24, 27, and Industry Canada Standards RSS-GEN issue 5, RSS-130 Issue 2, RSS-133 Issue7, RSS-139 Issue 4.

No deficiencies were ascertained.

Company Name	Product Description	Model #
Telular Corporation	Telematic gateway for communicating measurement data	ST100

Responsible for Testing Laboratory:

2025-06-04	Compliance	Alvin Ilarina (Senior Manager Regulatory Services)	Alvin ILARINA	Digitally signed by Alvin ILARINA Date: 2025.06.04 15:14:33 -07'00'
Date	Section	Name		

Responsible for the Report:

2025-06-04	Compliance	Cheng Song (Senior EMC Engineer)	Cheng Song CN = Cheng Song email = cheng.song@cetecom.com C = US O = CETECOM INC. 2025.06.04 16:00:07 -07'00'
Date	Section	Name	Signature

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:	Alvin Ilarina
Responsible Project Leader:	Sudarshan Biligiri

2.2 Identification of the Client

Client's Name:	Telular Corporation
Street Address:	3225 Cumberland Blvd., Suite 300
City/Zip Code	Atlanta, GA 30339
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

Product Description:	Telematic gateway for communicating measurement data
Marketing Name:	SkyTank
Model No:	ST100
HW Version:	X4
SW Version:	v2.60
FCC-ID:	MTFST1001
ISED:	2175D-ST1001
Radio Information as declared:	<u>Cellular</u> • Module: Telit ME910G1-W1 • LTE Cat-M • Bands: 2, 4, 12, 13, 66 <u>Bluetooth 5.1 w/ BLE (1Mbps)</u> <u>ISM900</u>
Antenna Information as declared:	<u>LTE (KAVX P822601)</u> : 698-960MHz (2.6 dBi), 1710-2200MHz (4.4 dBi), 2500-2700MHz (3.4 dBi), 2300-2400MHz (1.8 dBi), 3300-3800MHz (2.8 dBi) <u>BLE</u> : (integrated on module) <u>ISM900 (WLAN) (KAVX 1001011)</u> : 868-928MHz (1.0 dBi)
Power Supply/ Rated Operating Voltage Range	Four 1.5V Lithium Cells (Energizer L91) in Series -- 4V min, 6V nom, 7.2V max.
Operating Temperature Range	-30 to 60 deg C
Sample Revision	☐ Production ☒ Pre-Production
EUT Diameter	☒ < 60 cm ☐ Other _____
Note 1: The EUT specifications listed in the table above were provided by the client. Note 2: The radios within the EUT do not operate simultaneously.	

3.2 EUT Sample details

EUT #	Serial Number	HW Version	SW Version	Comments
1	0045	X4	v2.60	Radiated Emissions

3.3 Accessory Equipment (AE) details

AE #	Type	Model	Manufacturer	Serial Number
1	Pre-Production	ST131	Telular Corporation	001

3.4 Test Sample Configuration

Set-up #	EUT / AE used for set-up	Comments
1	EUT#1 + AE#1	The internal antenna of the EUT was connected.

3.5 Mode of Operation

Mode of Operation	Description of Operating modes	Additional Information
Op. 1	LTE CAT-M1	Cellular was tested on LTE CAT-M1 Low, Mid and High Channels at the maximum power. ❖ The client provides a USB cable to communicate with the device and send commands for configuring the Cellular radio into a specific test mode. This test mode configuration, designed for worst-case scenarios, is not intended for end-user applications and is outlined as follows: Cellular: send AT commands to connect to the base station simulator (R&S CMW500)

Note: The radios within the EUT do not operate simultaneously.

3.6 Justification for Mode of Operation

During the testing process, the cellular radio was tested with transmitter sets to low, mid and high channels at the maximum power, as it is described in section 3.5 of this document, representing the worst-case mode of operation.

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 section 1.

4.1 Dates of Testing:

12/5/2024 - 12/9/2024

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=2.

Measurement System		EMC 1	EMC 2
Conducted emissions (mains port)	150 kHz – 30 MHz	2.47 dB	N/A
Radiated emissions	9 kHz – 30 MHz	2.68 dB	2.53 dB
	30 – 100 MHz	4.39 dB	3.85 dB
	100 MHz – 1 GHz	5.65 dB	5.24 dB
	1 – 6 GHz	5.0 dB	4.88 dB
	6 – 18 GHz	4.76 dB	4.58 dB
	18 – 40 GHz	4.65 dB	4.61 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.

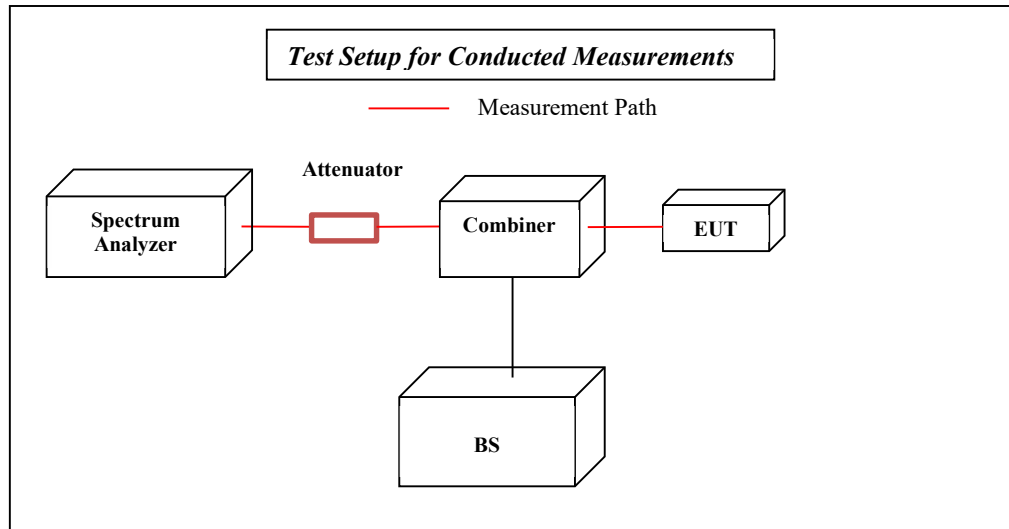
4.4 Decision Rule:

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.

5 Measurement Procedures

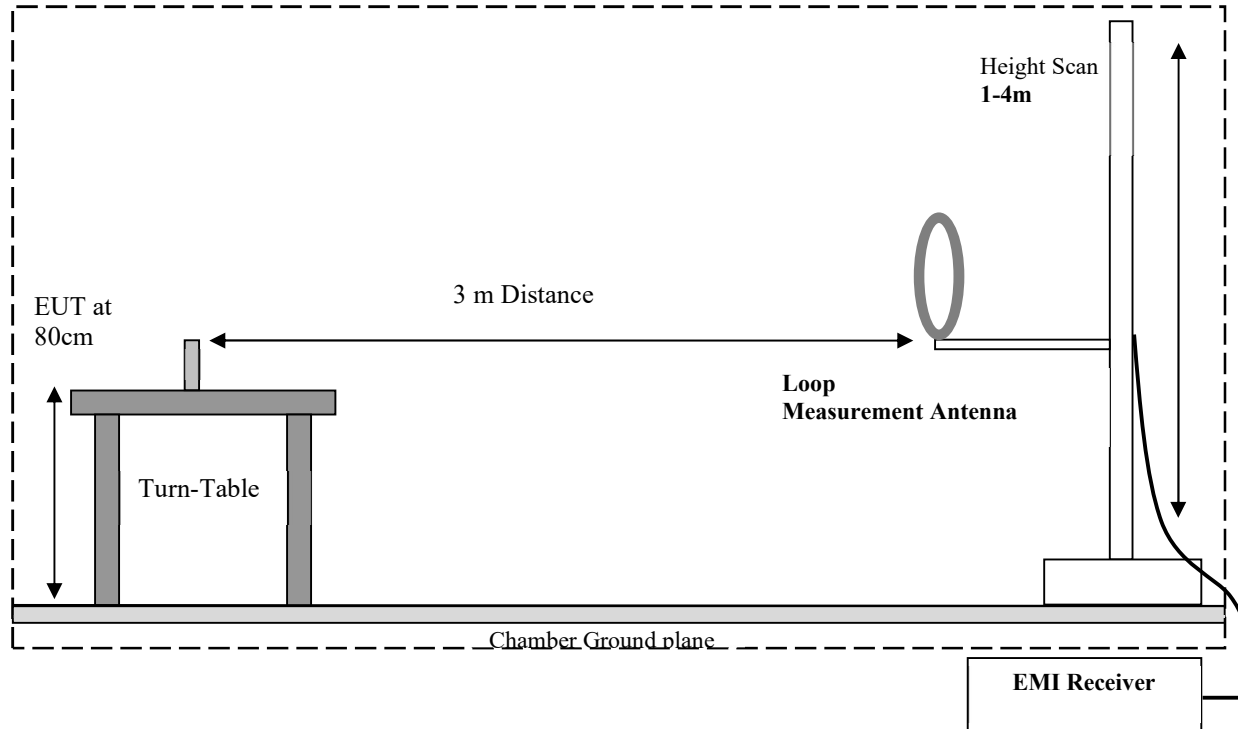
Testing is performed according to the guidelines provided in FCC publication (KDB) 971168 D01 v03r01 – “Measurement Guidance for Certification of Licensed Digital Transmitters” and according to relevant parts of ANSI/TIA-603-D-2010 as detailed below.



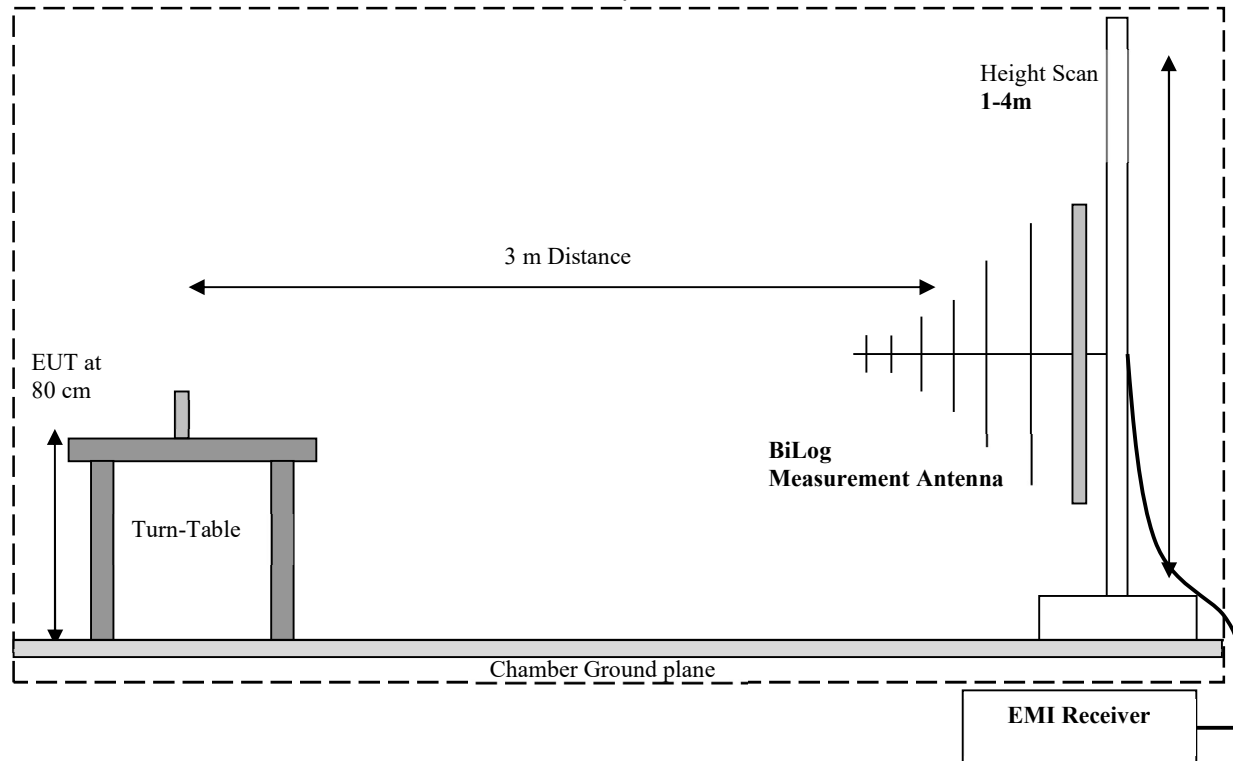
5.1 Radiated Measurement

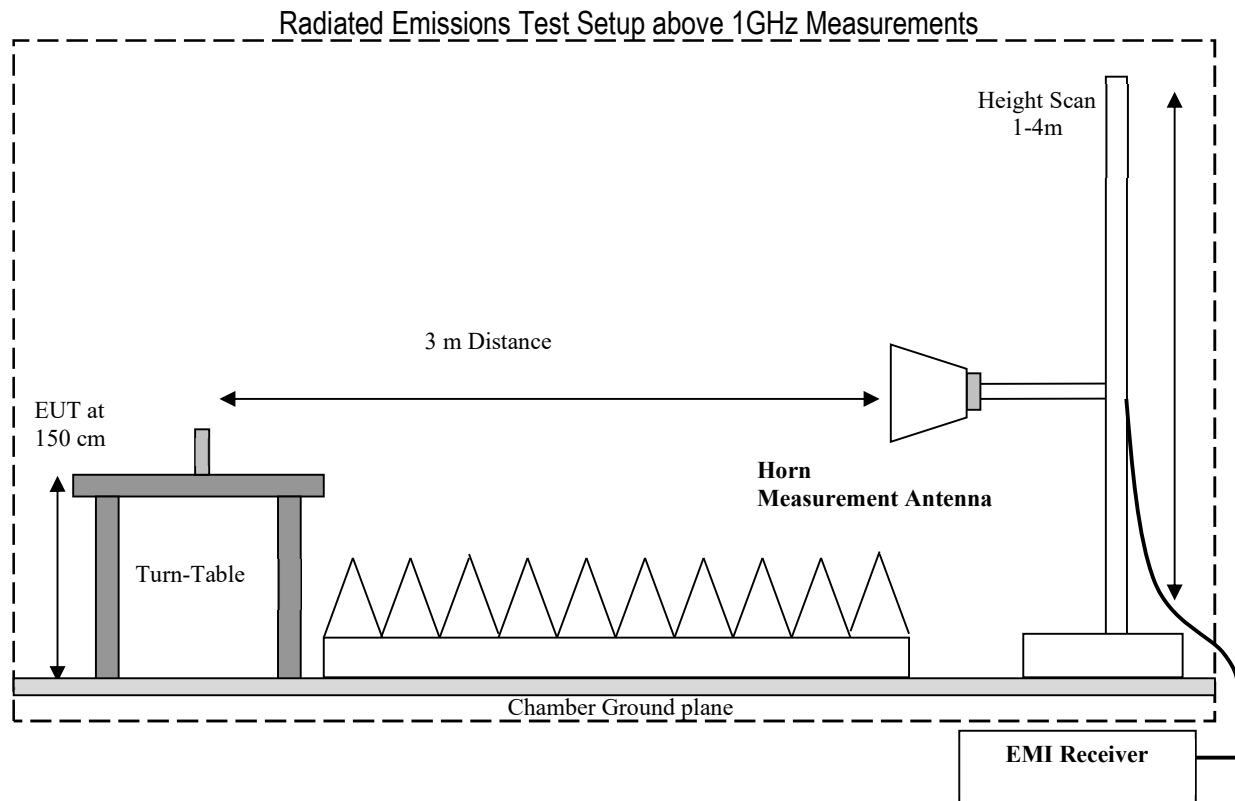
- The exploratory measurement is accomplished by running a matrix of 16 sweeps over the required frequency range with R&S Test-SW EMC32 for 4 positions of the turntable, two orthogonal positions of the EUT and both antenna polarizations. This procedure exceeds the requirement of the above standards to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





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 dB μ V
- 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:

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

Example:

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

6 Measurement Results Summary

6.1 FCC 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	-	☐	☐	☐	■	Note 1 Note 2
§2.1055; §24.235	Frequency Stability	Extreme Temperature and Voltage	-	☐	☐	☐	■	Note 1 Note 2
§2.1049; §24.238	Occupied Bandwidth	Nominal	-	☐	☐	☐	■	Note 1 Note 2
§2.1051; §24.238	Band Edge Compliance	Nominal	-	☐	☐	☐	■	Note 1 Note 2
§2.1051; §24.238	Conducted Spurious Emissions	Nominal	-	☐	☐	☐	■	Note 1 Note 2
§2.1053; §24.238	Radiated Spurious Emissions	Nominal	Op. 1	■	☐	☐	☐	Note 3

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

Note 2: The LTE CAT-M test results are leveraged from Report # 50289118 009, corresponding to FCC ID: RI7ME910G1W1; IC: 5131A-ME910G1W1.

Note 3: The testing for LTE Band 2 was performed in accordance with the test specifications outlined in FCC Part 24, and RSS-133.

6.2 FCC 27 / RSS-130, RSS-139

Test Specification	Test Case	Temperature and Voltage Conditions	Mode	Pass	Fail	NA	NP	Result
§2.1046; §27.50	RF Output Power	Nominal	-	☐	☐	☐	■	Note 1 Note 2
§2.1055; §27.54	Frequency Stability	Extreme Temperature and Voltage	-	☐	☐	☐	■	Note 1 Note 2
§2.1049; §27.53	Occupied Bandwidth	Nominal	-	☐	☐	☐	■	Note 1 Note 2
§2.1051; §27.53	Band Edge Compliance	Nominal	-	☐	☐	☐	■	Note 1 Note 2
§2.1051; §27.53	Conducted Spurious Emissions	Nominal	-	☐	☐	☐	■	Note 1 Note 2
§2.1053; §27.53	Radiated Spurious Emissions	Nominal	Op. 1	■	☐	☐	☐	Note 3

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

Note 2: The LTE CAT-M test results are leveraged from Report # 50289118 009, corresponding to FCC ID: RI7ME910G1W1; IC: 5131A-ME910G1W1.

Note 3: The testing for LTE Band 4, LTE Band 12, LTE Band 13, LTE Band 66 was performed in accordance with the test specifications outlined in FCC Part 27, RSS-130, and RSS-139.

7 Test Result Data

7.1 Radiated Spurious Emissions

7.1.1 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, 27, and 90

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

7.1.2 Limits:

7.1.2.1 FCC Part 22.917 (a); FCC Part 24.238 (a); FCC Part 27.53 (c); FCC Part 27.53 (g); FCC Part 27.53 (h) and FCC Part 90.691 (a) 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.

7.1.2.2 RSS-130 Part 4.7, 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 $43 + 10 \log_{10} p$ (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 $43 + 10 \log_{10} p$ (watts). If the measurement is performed using 1% of the occupied bandwidth, power integration over 100 kHz is required.

7.1.3 Test conditions and setup:

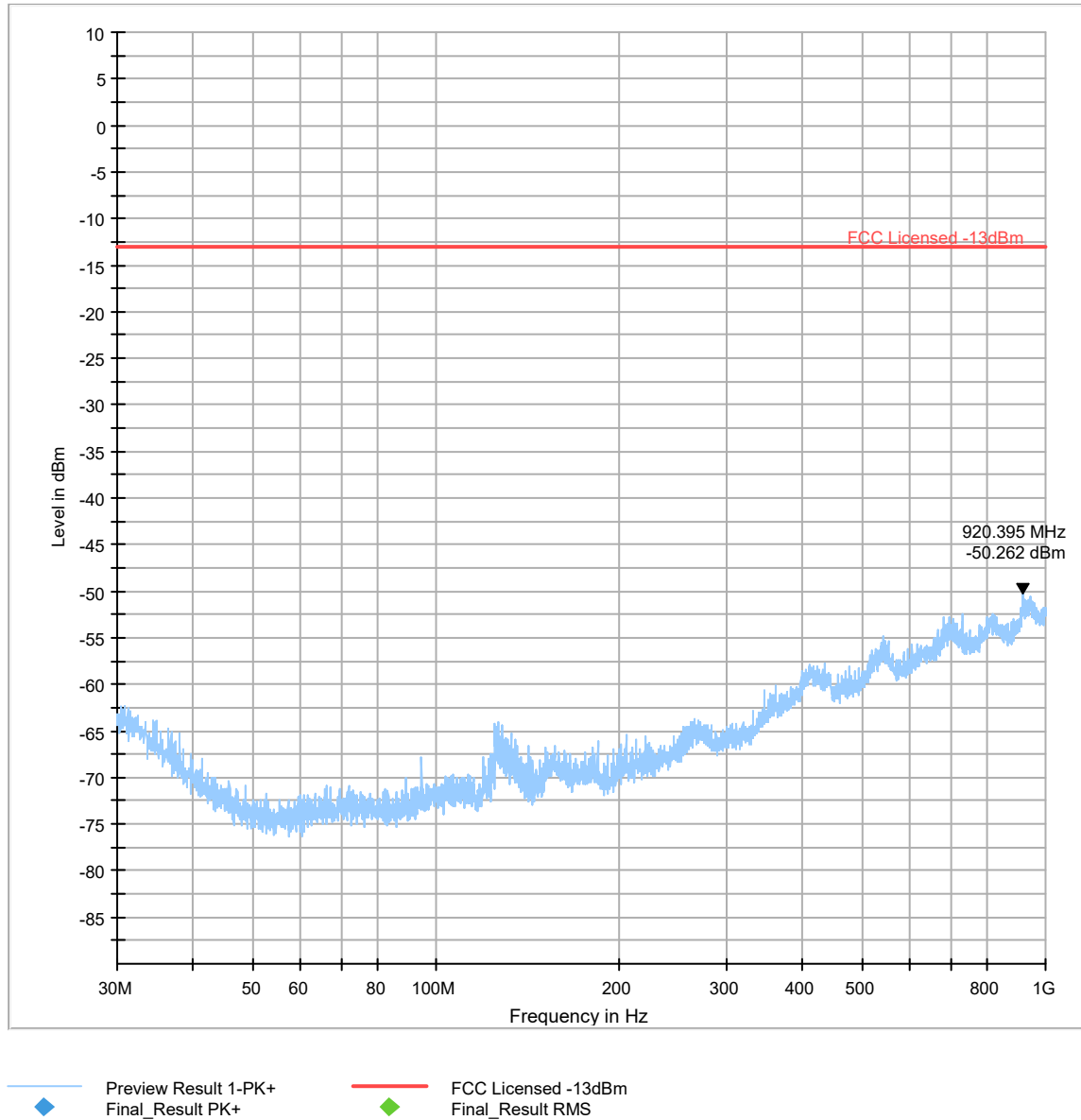
Ambient Temperature (C)	EUT Set-Up #	EUT operating mode	Power Input
23	1	Op. 1	Battery

7.1.4 Measurement result:

Plot #	Channel	EUT operating mode	Scan Frequency	Limit (dBm)	Result
1-4	Low	LTE 2	30 MHz – 22 GHz	-13	Pass
5-8	Mid	LTE 2	30 MHz – 22 GHz	-13	Pass
9-12	High	LTE 2	30 MHz – 22 GHz	-13	Pass
13-15	Low	LTE 4	30 MHz – 18 GHz	-13	Pass
16-18	Mid	LTE 4	30 MHz – 18 GHz	-13	Pass
19-21	High	LTE 4	30 MHz – 18 GHz	-13	Pass
22-24	Low	LTE 12	30 MHz – 8 GHz	-13	Pass
25-27	Mid	LTE 12	30 MHz – 8 GHz	-13	Pass
28-30	High	LTE 12	30 MHz – 8 GHz	-13	Pass
31-33	Low	LTE 13	30 MHz – 8 GHz	-13	Pass
34-36	Mid	LTE 13	30 MHz – 8 GHz	-13	Pass
37-39	High	LTE 13	30 MHz – 8 GHz	-13	Pass
40-43	Low	LTE 66	30 MHz – 26 GHz	-13	Pass
44-47	Mid	LTE 66	30 MHz – 26 GHz	-13	Pass
48-51	High	LTE 66	30 MHz – 26 GHz	-13	Pass
52-54	Low	Idle / BLE	30 MHz – 18 GHz	-13	Pass

7.1.5 Measurement Plots:

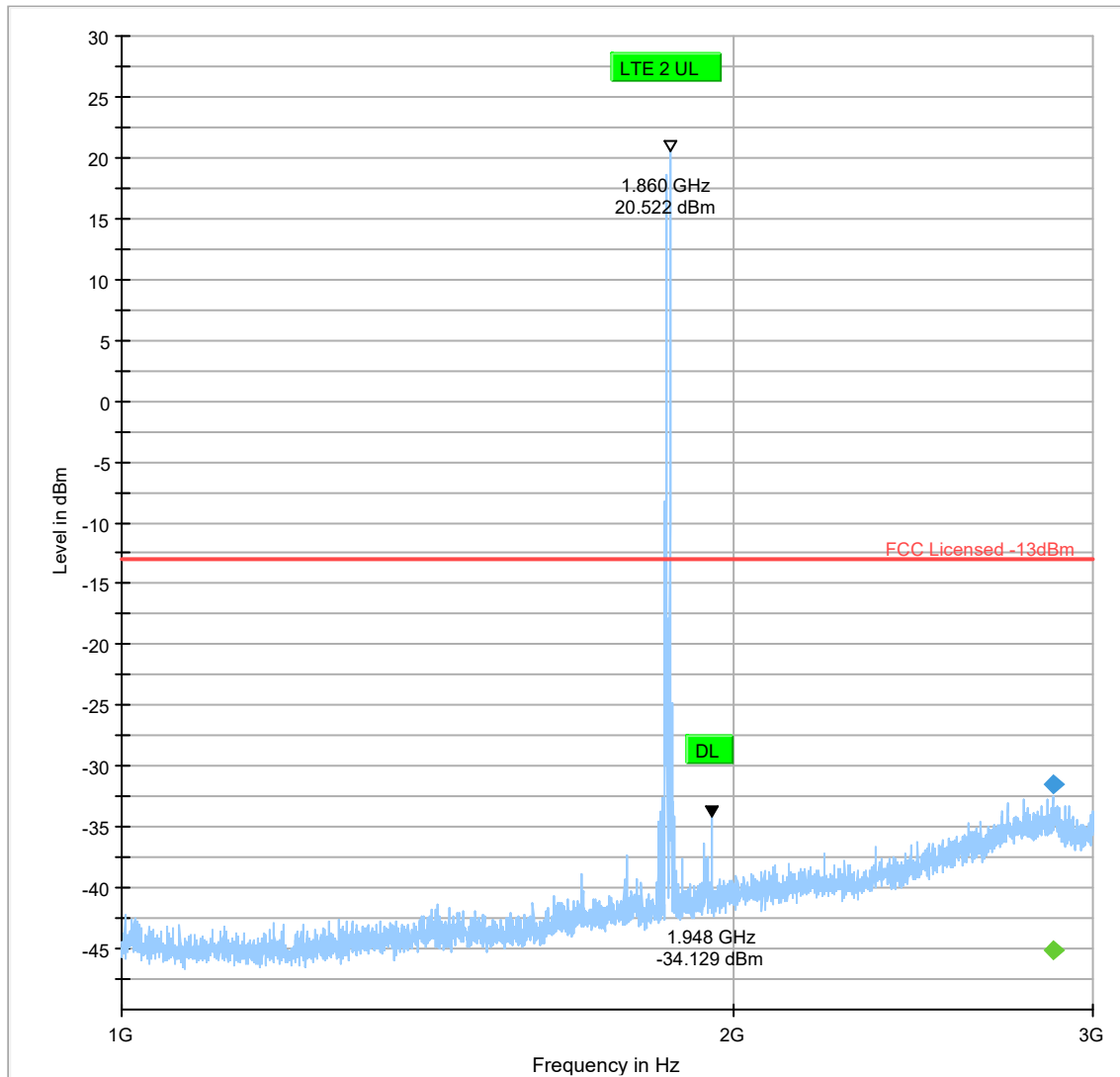
Plot # 1



Plot # 2

Final_Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
2866.250	---	-45.10	---	---	500.0	1000.0	100.0	V	185.0	-59.6	
2866.250	-31.47	---	-13.00	18.47	500.0	1000.0	100.0	V	185.0	-59.6	



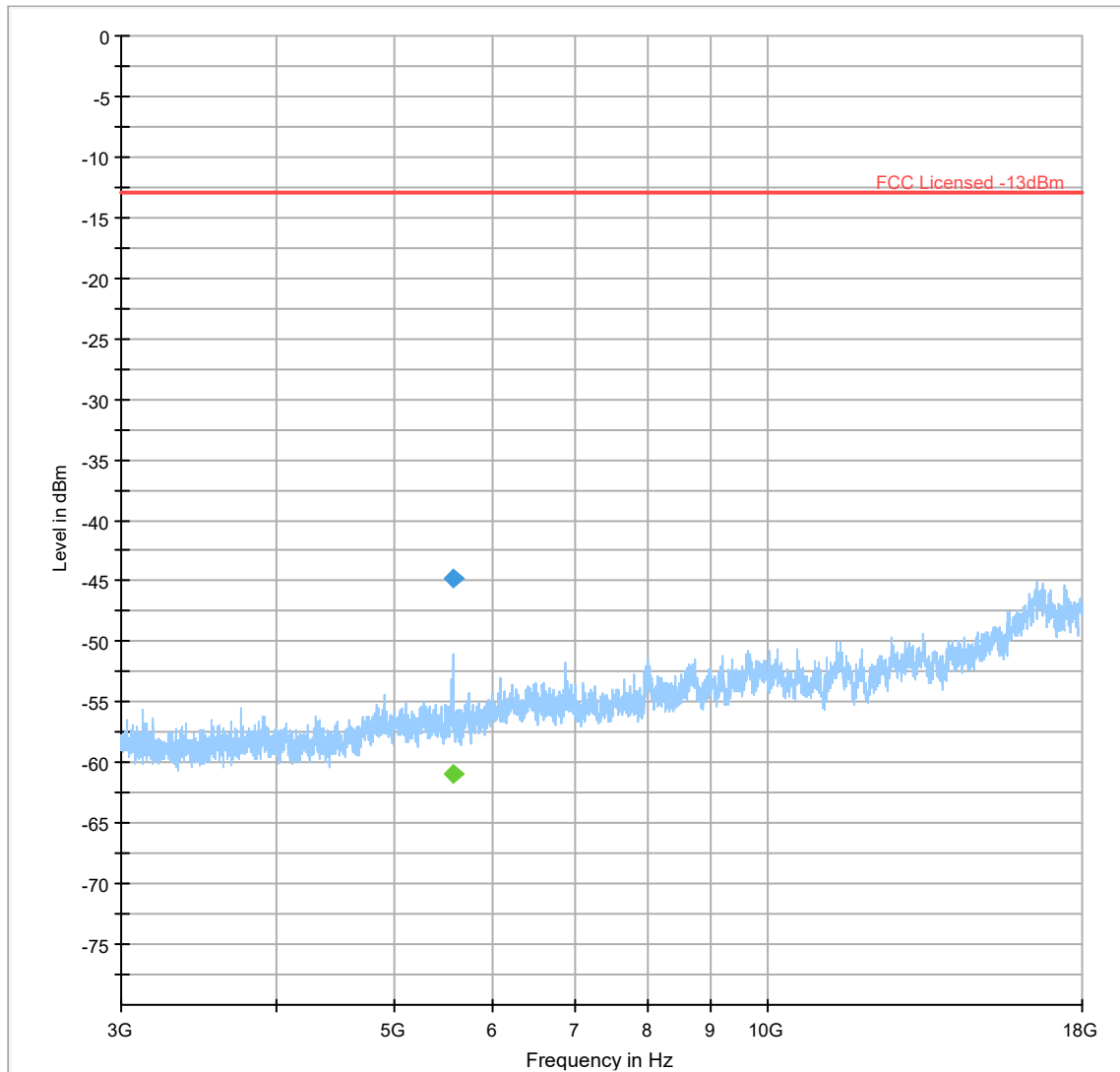
Preview Result 1-PK+
Final_Result PK+

FCC Licensed -13dBm
Final_Result RMS

Plot # 3

Final_Result

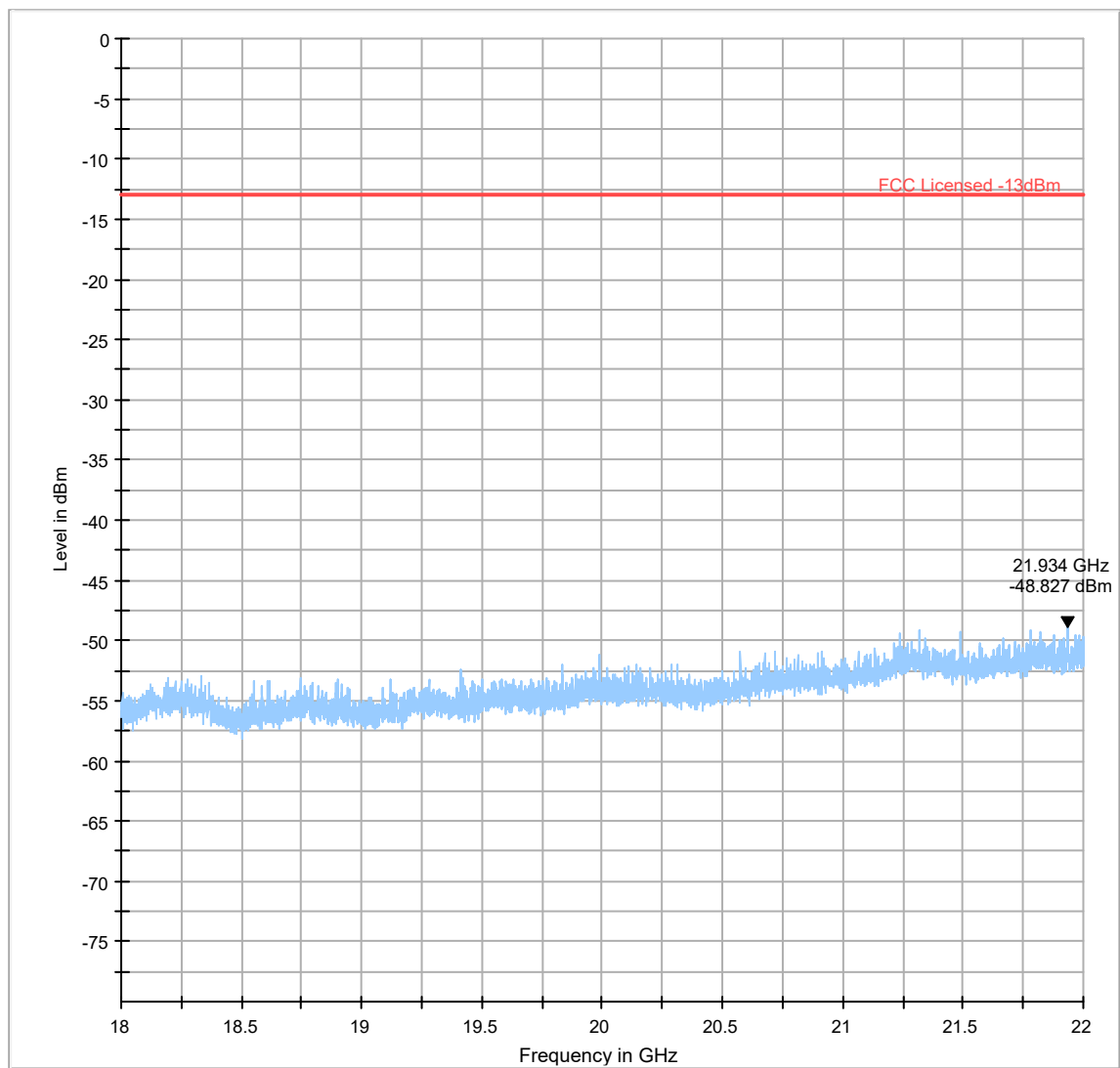
Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
5578.500	---	-60.97	---	---	500.0	1000.0	222.0	H	73.0	-97.2	
5578.500	-44.80	---	-13.00	31.80	500.0	1000.0	222.0	H	73.0	-97.2	



Preview Result 1-PK+
Final_Result PK+

FCC Licensed -13dBm
Final_Result RMS

Plot # 4



Preview Result 1-PK+
Final_Result PK+

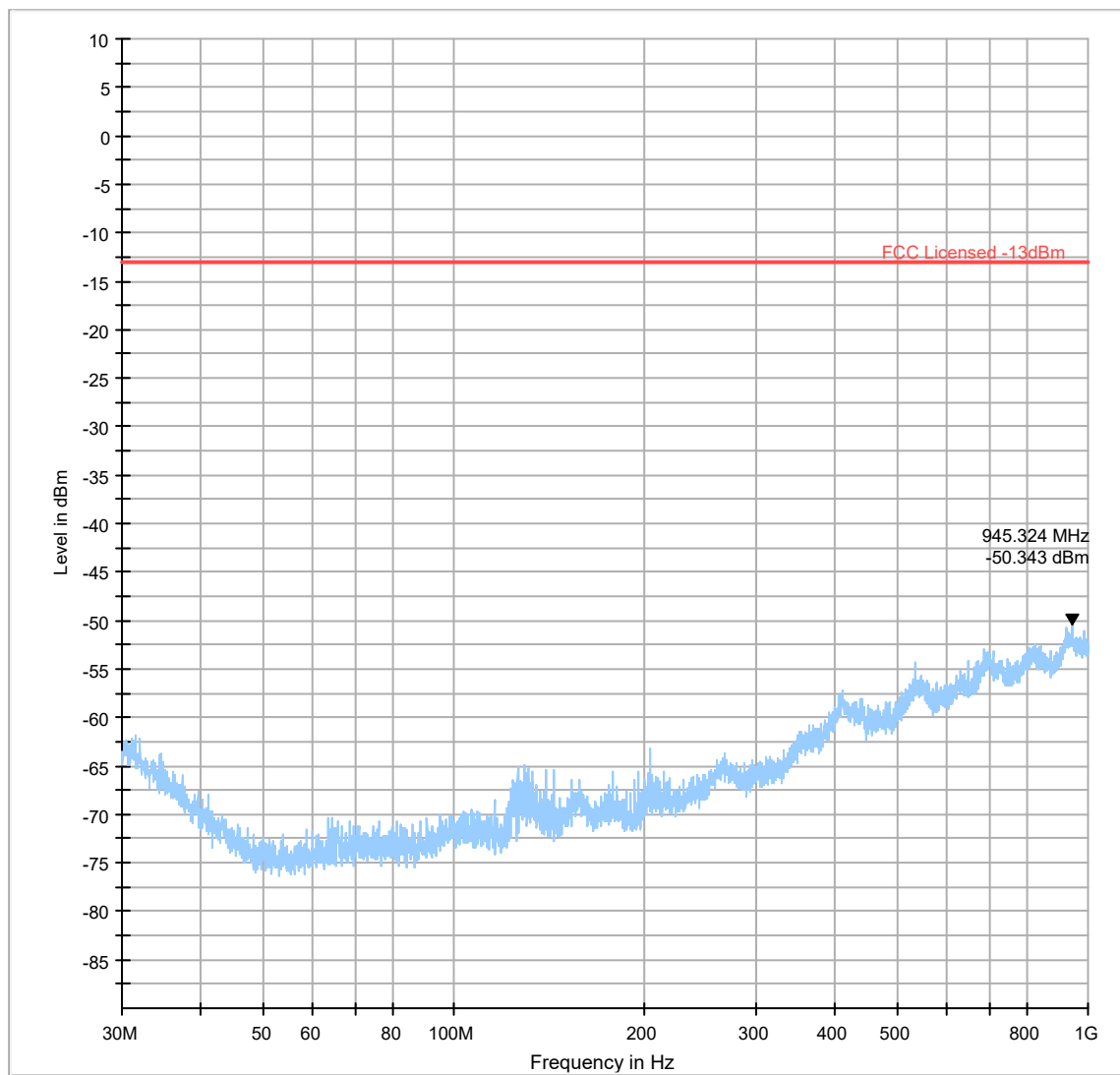


Critical_Freqs PK+
Final_Result RMS



FCC Licensed -13dBm

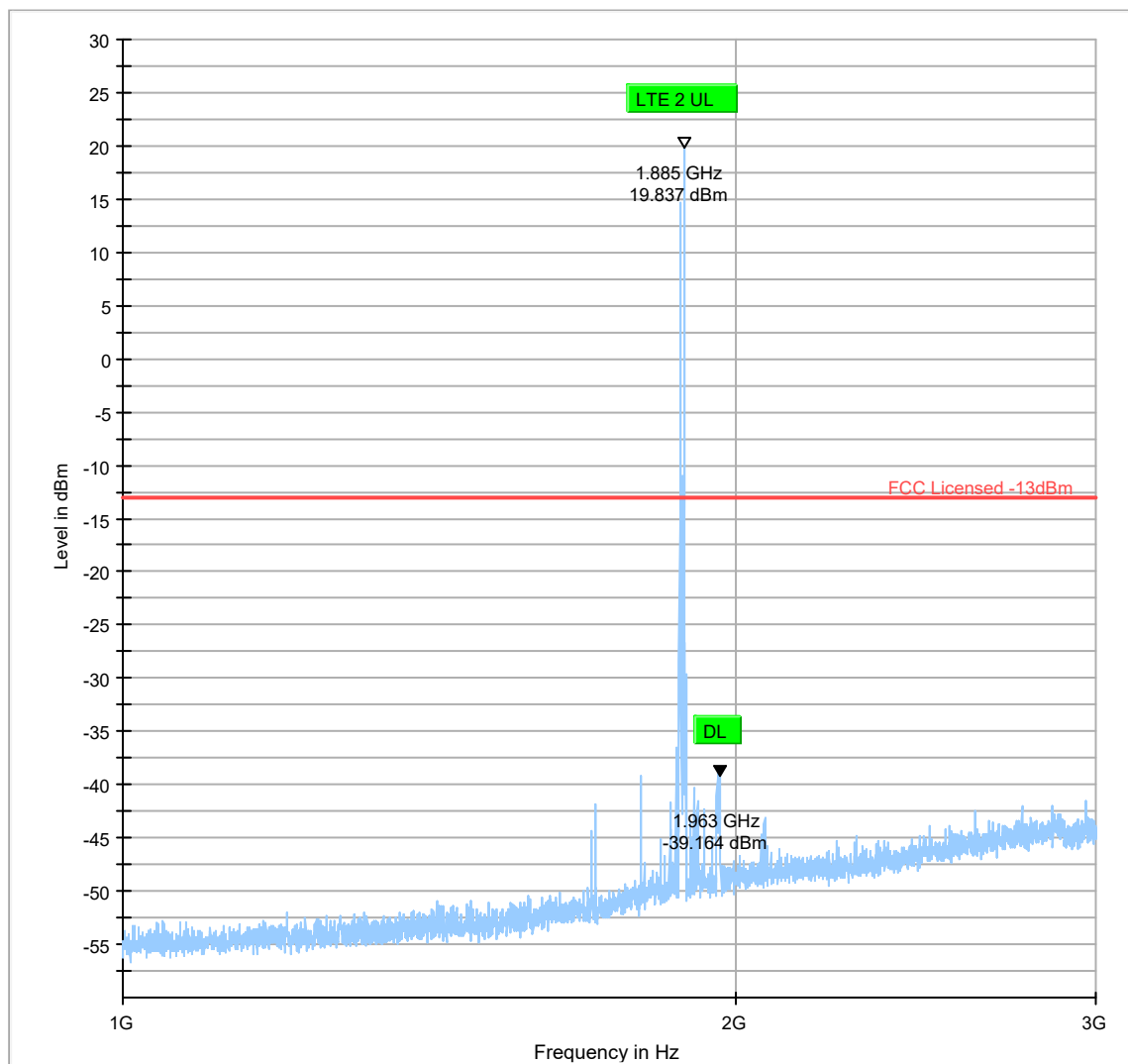
Plot # 5



Preview Result 1-PK+
Final_Result PK+

FCC Licensed -13dBm
Final_Result RMS

Plot # 6



RMS_MAXH
Critical_Freqs PK+
Final_Result RMS

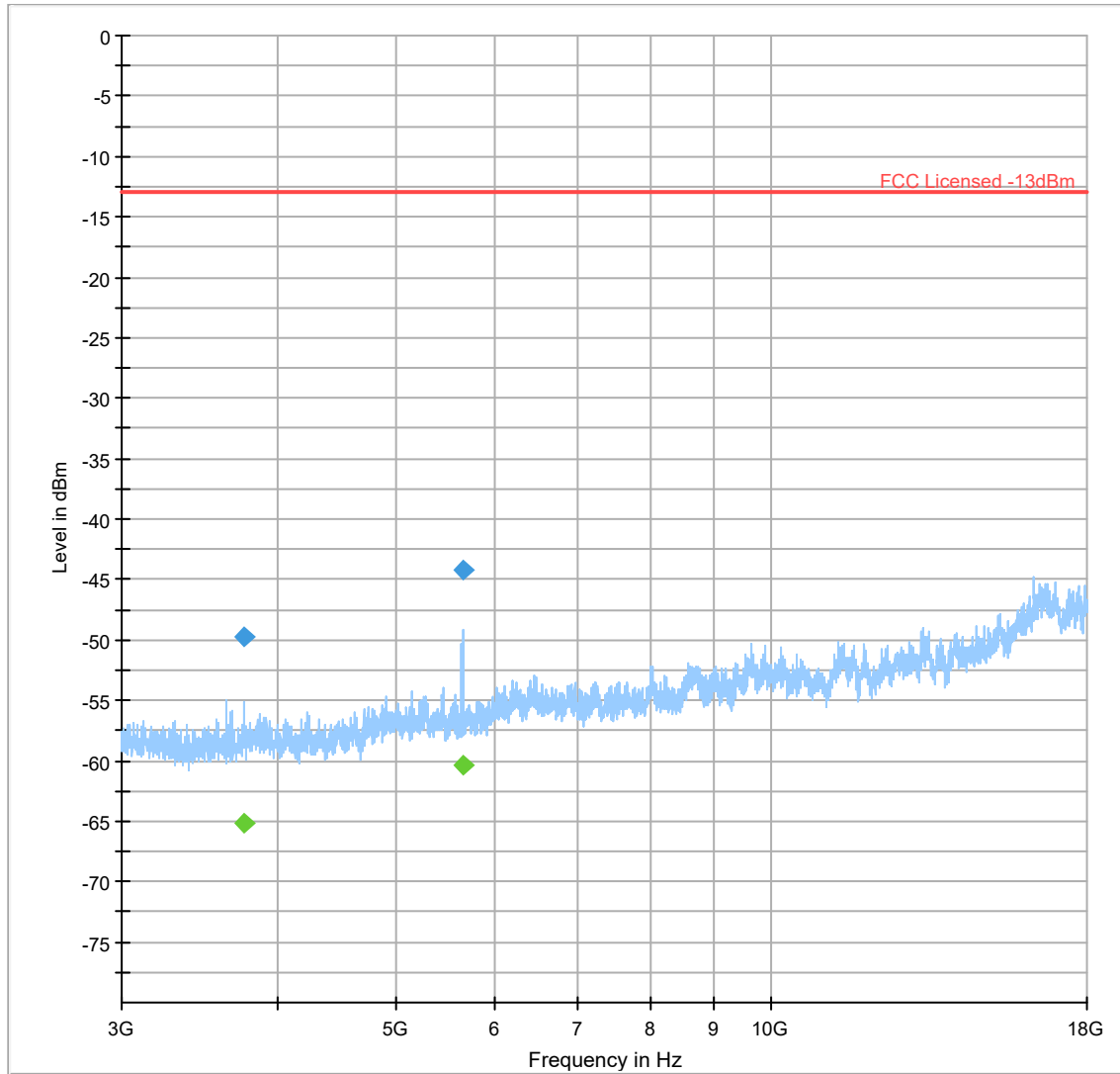
PK+_MAXH
FCC Licensed -13dBm

Critical_Freqs RMS
Final_Result PK+

Plot # 7

Final_Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
3768.500	-49.76	---	-13.00	36.76	500.0	1000.0	238.0	H	134.0	-99.8	
3768.500	---	-65.13	---	---	500.0	1000.0	238.0	H	134.0	-99.8	
5653.000	-44.28	---	-13.00	31.28	500.0	1000.0	166.0	H	52.0	-97.3	
5653.000	---	-60.42	---	---	500.0	1000.0	166.0	H	52.0	-97.3	

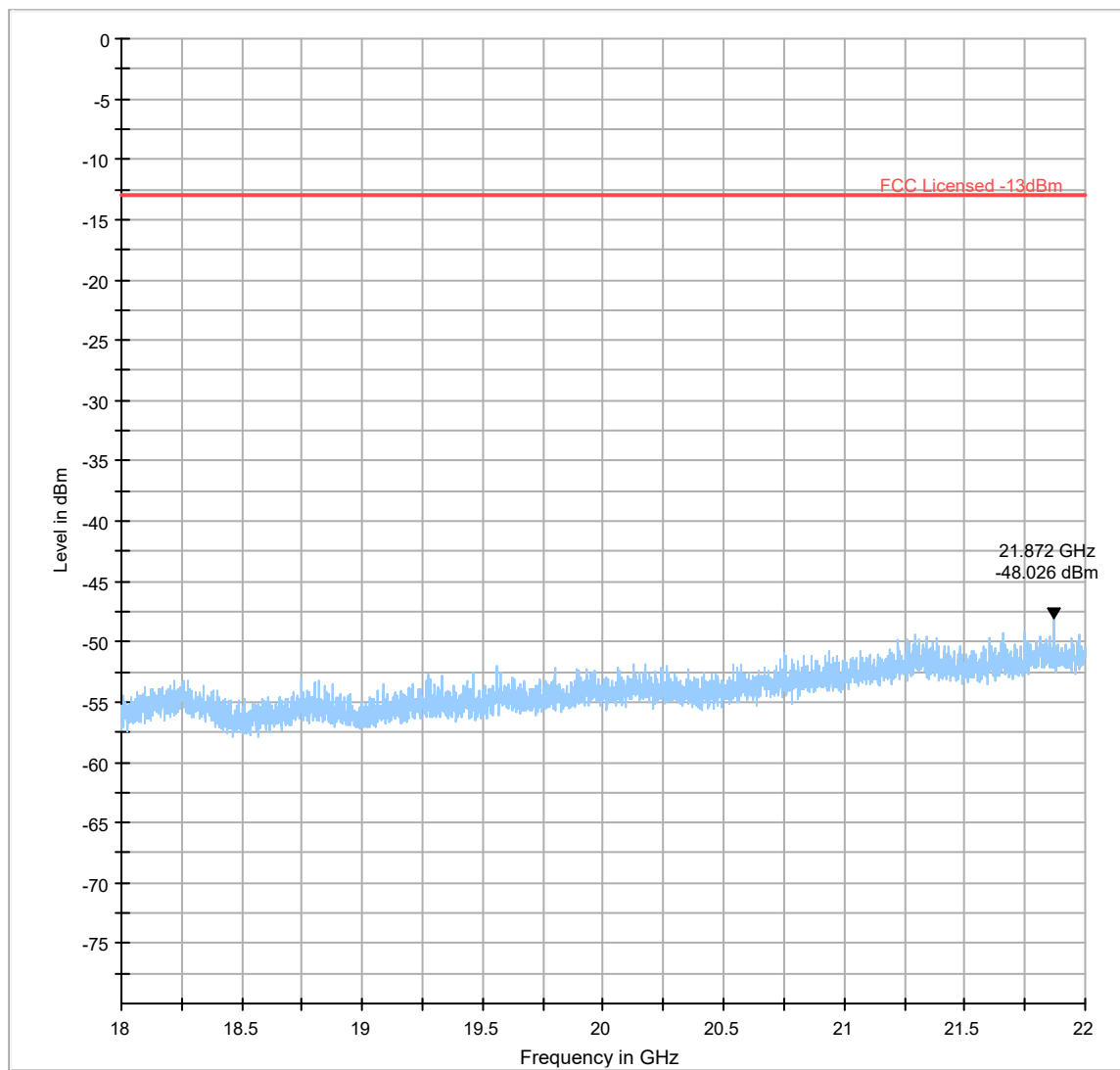


Preview Result 1-PK+ Final_Result PK+ (Blue line)

FCC Licensed -13dBm (Red line)

Final_Result RMS (Green diamonds)

Plot # 8



Preview Result 1-PK+
Final_Result PK+

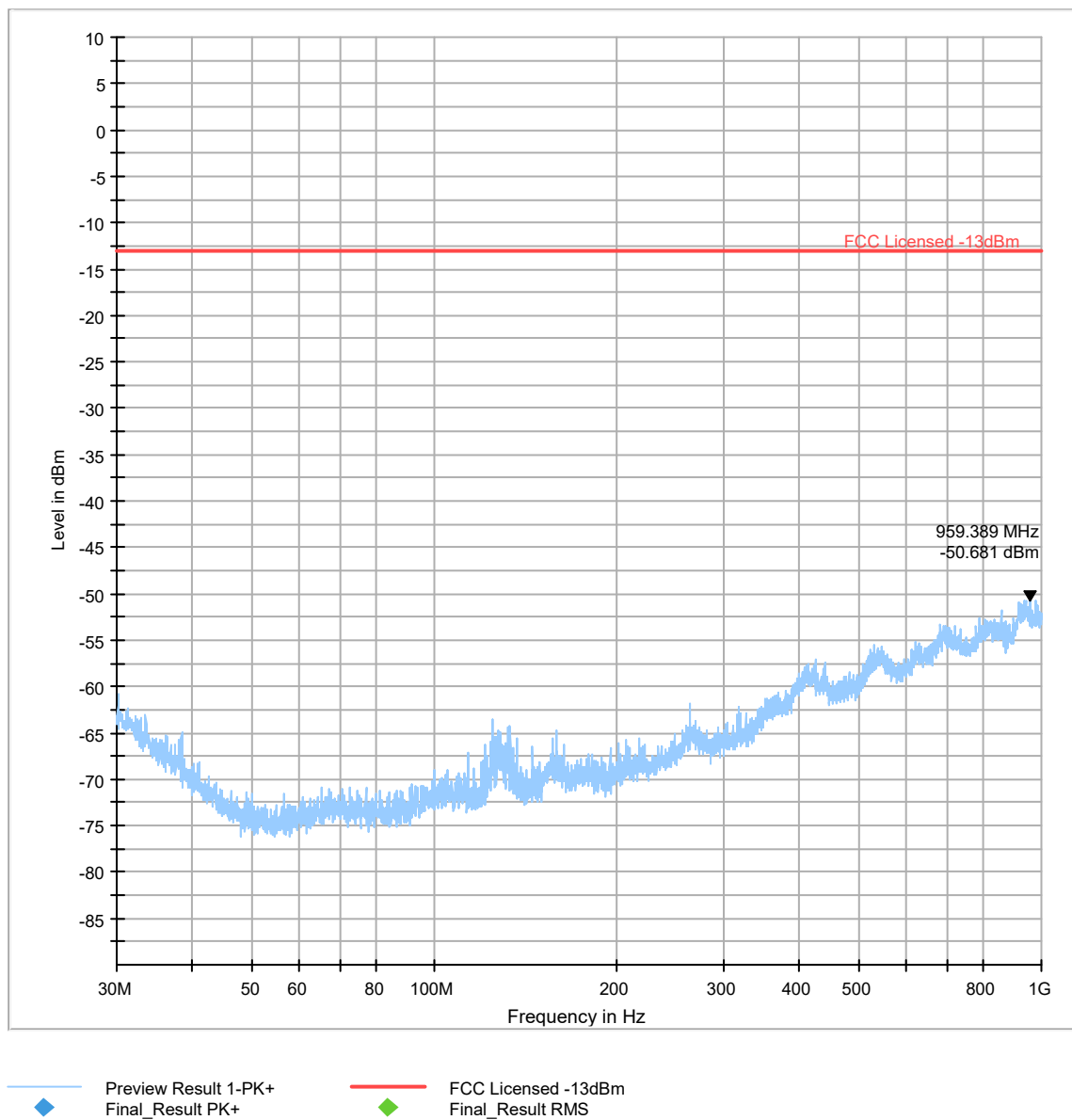


Critical_Freqs PK+
Final_Result RMS



FCC Licensed -13dBm

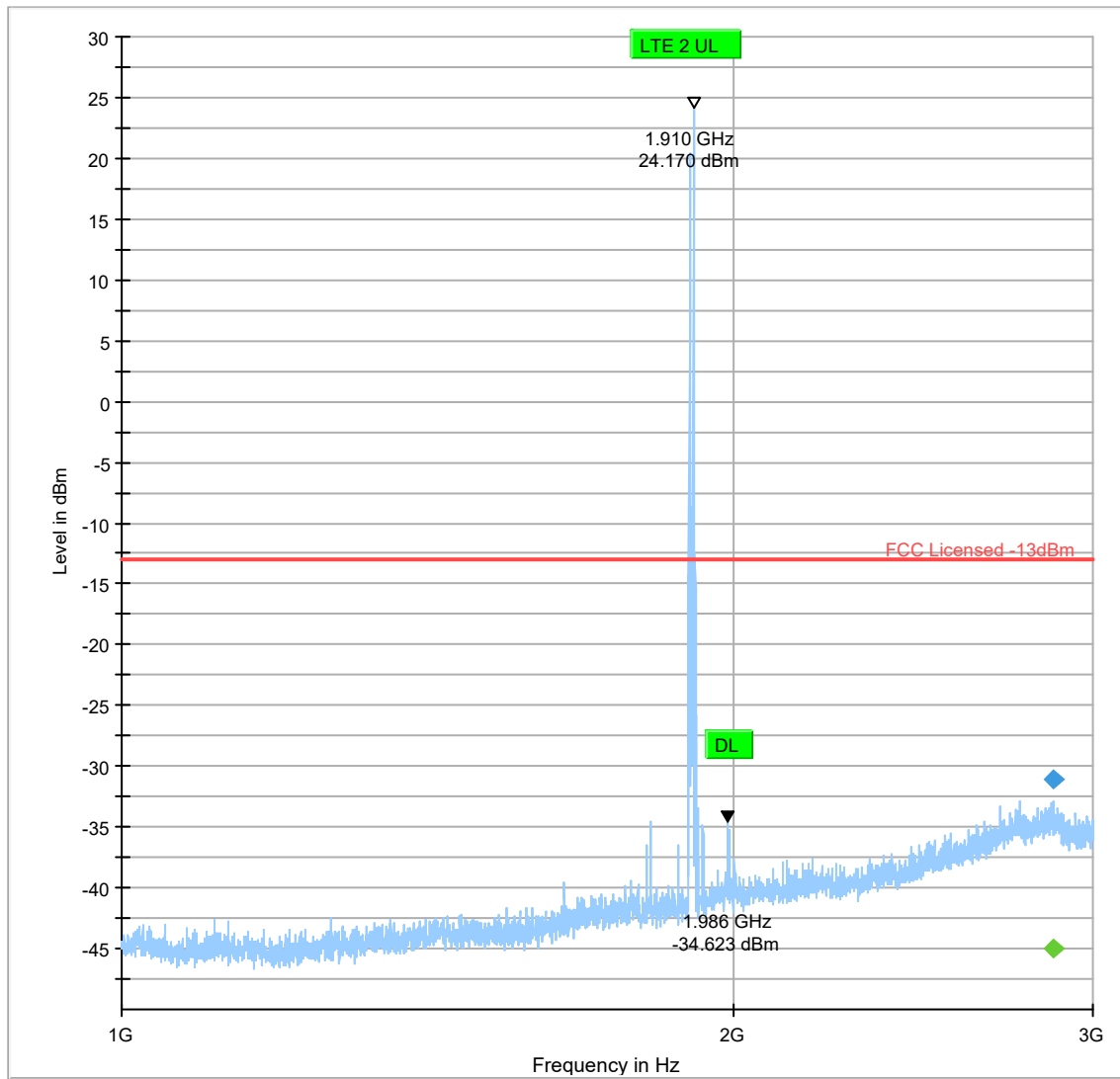
Plot # 9



Plot # 10

Final_Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
2870.750	---	-45.05	---	---	500.0	1000.0	354.0	V	302.0	-59.6	
2870.750	-31.05	---	-13.00	18.05	500.0	1000.0	354.0	V	302.0	-59.6	



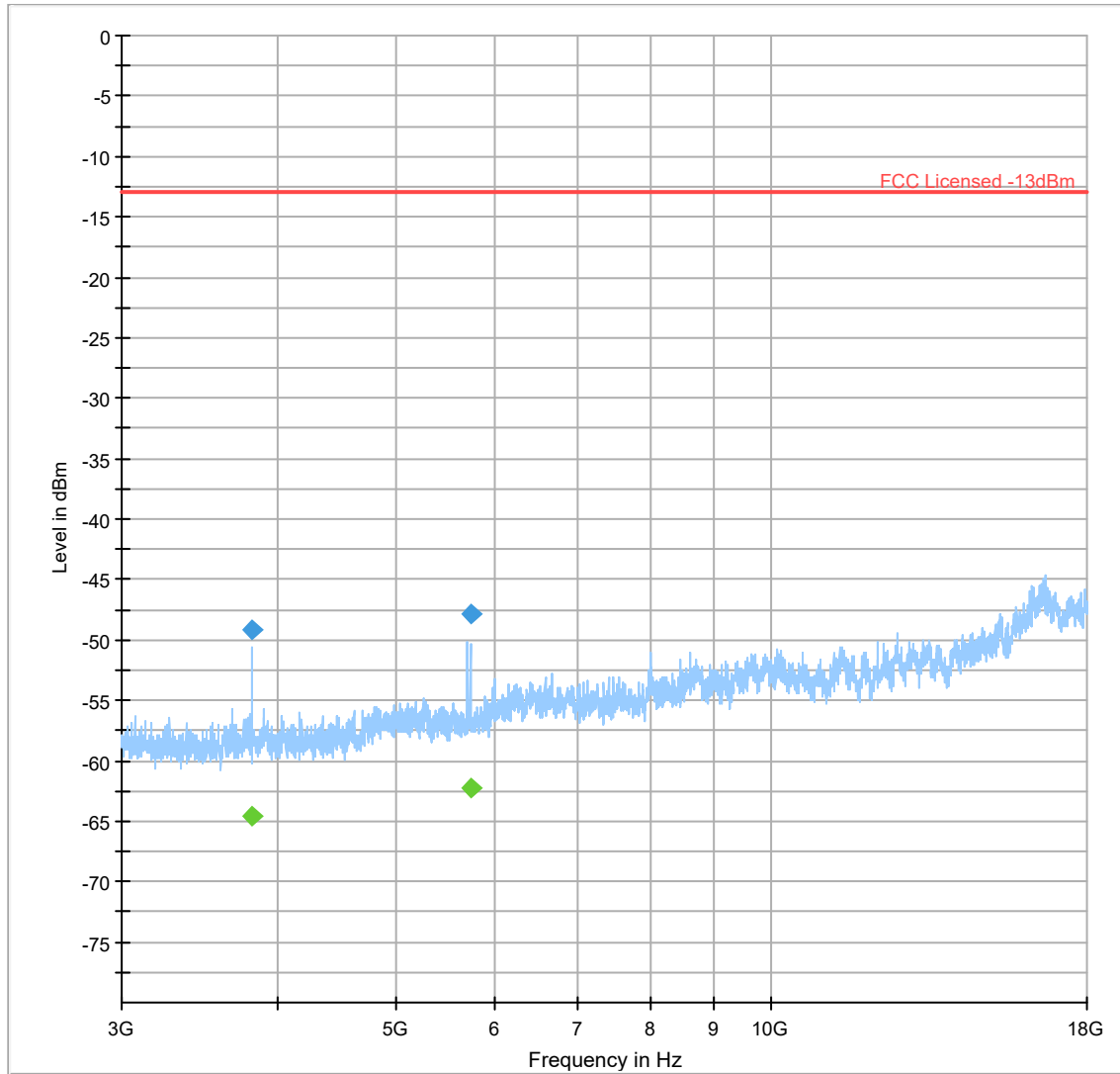
Preview Result 1-PK+
Final_Result PK+

FCC Licensed -13dBm
Final_Result RMS

Plot # 11

Final_Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
3818.500	---	-64.58	---	---	500.0	1000.0	251.0	H	135.0	-99.6	
3818.500	-49.21	---	-13.00	36.21	500.0	1000.0	251.0	H	135.0	-99.6	
5728.000	---	-62.26	---	---	500.0	1000.0	145.0	V	285.0	-96.7	
5728.000	-47.80	---	-13.00	34.80	500.0	1000.0	145.0	V	285.0	-96.7	

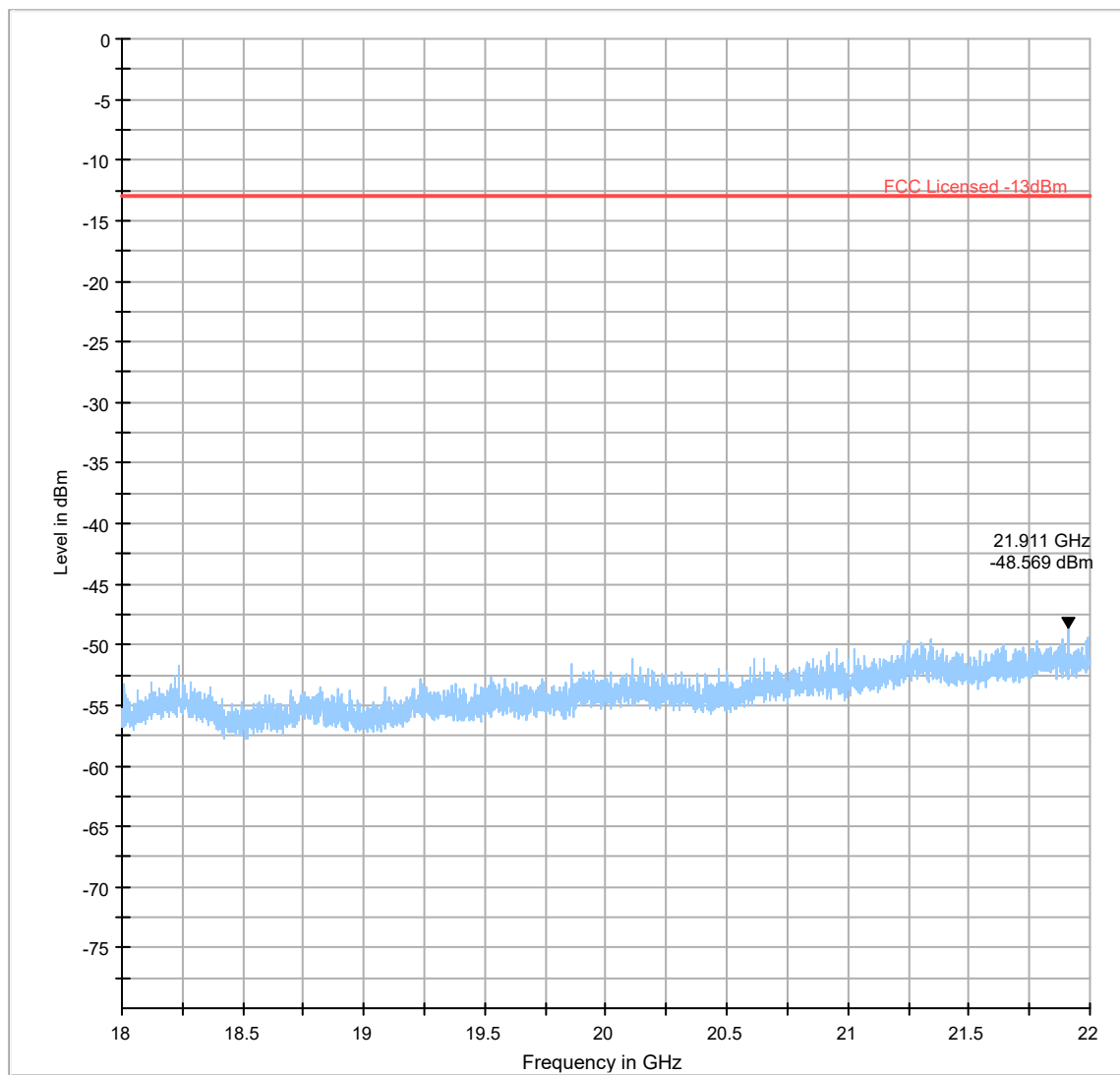


Preview Result 1-PK+ Final_Result PK+ (Blue Diamond)

FCC Licensed -13dBm (Red Line)

Final_Result RMS (Green Diamond)

Plot # 12

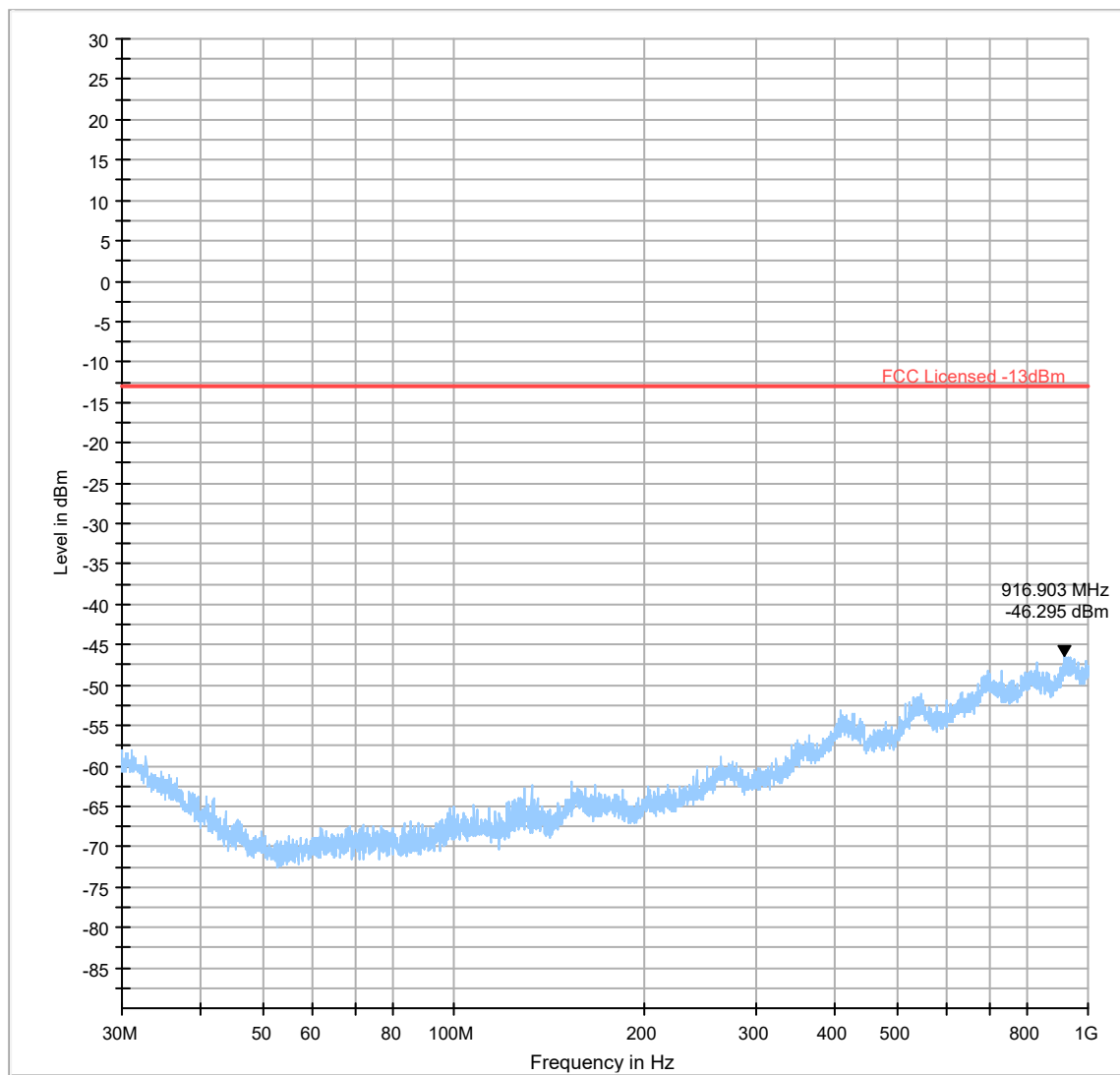


Preview Result 1-PK+
Final_Result PK+

* Critical_Freqs PK+
Final_Result RMS

FCC Licensed -13dBm

Plot # 13



— RMS_MAXH
◆ Final_Result PK+

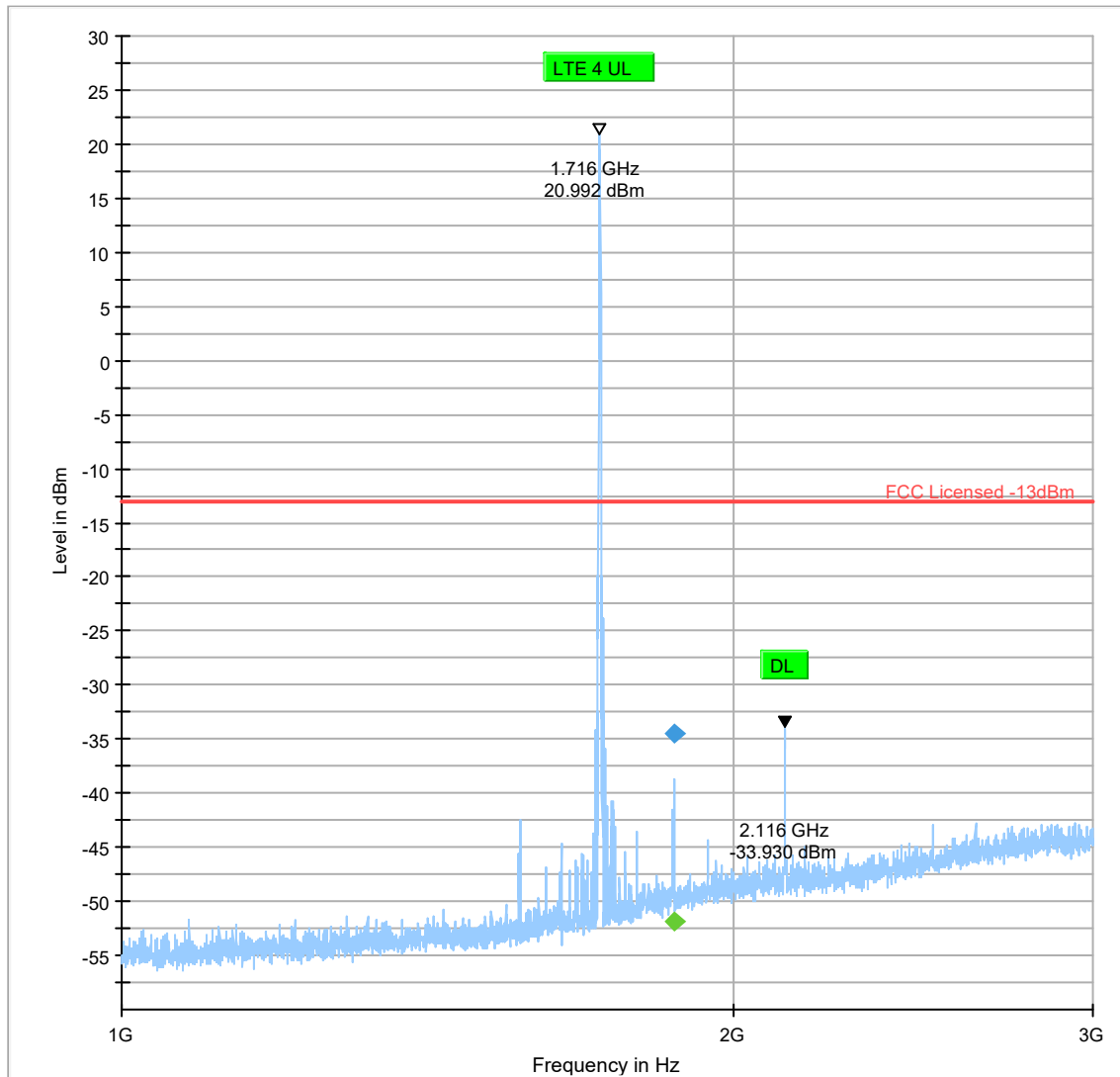
— PK+_MAXH
◆ Final_Result RMS

— FCC Licensed -13dBm

Plot # 14

Final_Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
1867.750	---	-51.81	---	---	500.0	1000.0	145.0	H	108.0	-64.3	
1867.750	-34.44	---	-13.00	21.44	500.0	1000.0	145.0	H	108.0	-64.3	



◆ RMS_MAXH
Final_Result PK+

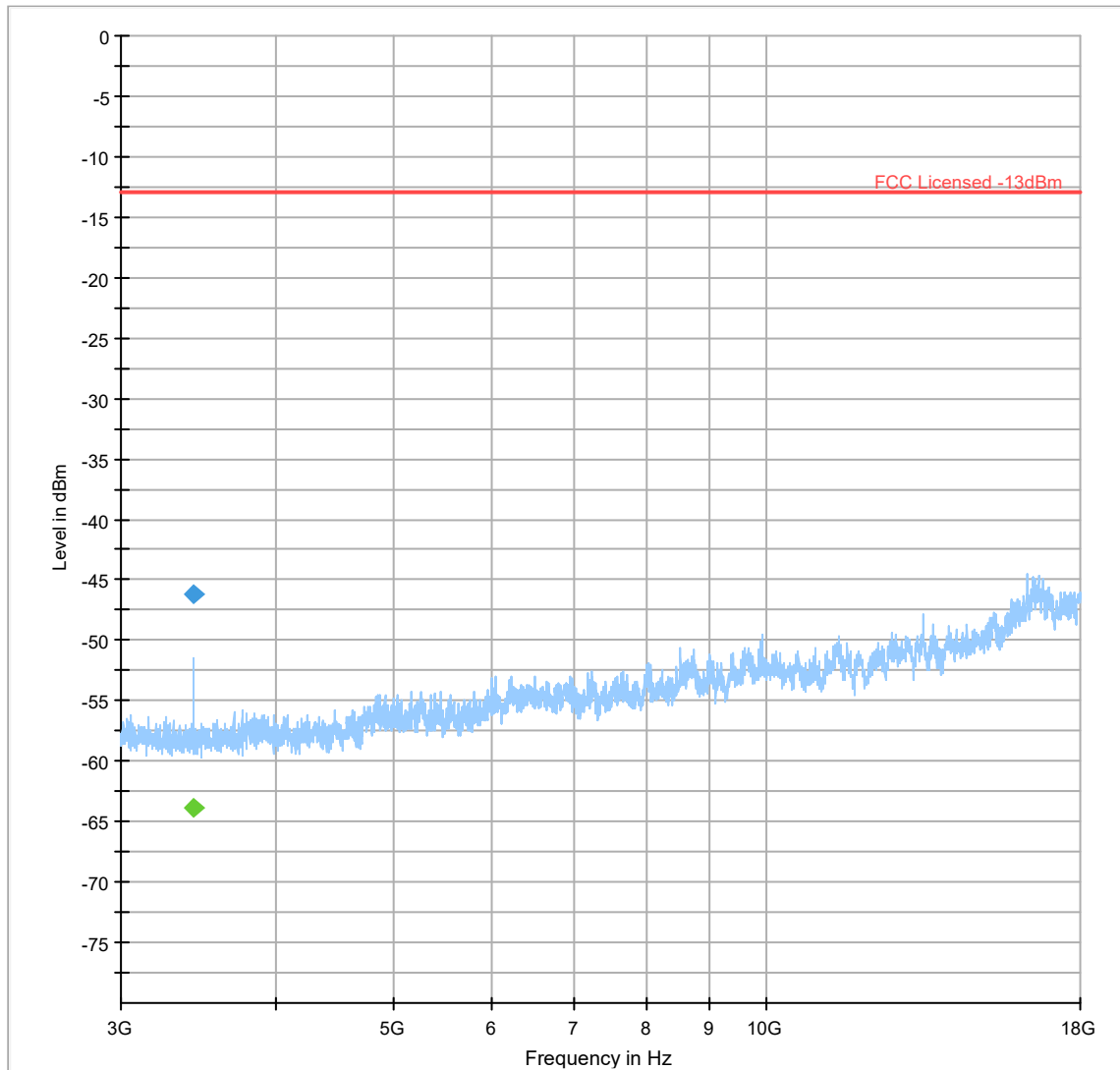
◆ PK+_MAXH
Final_Result RMS

— FCC Licensed -13dBm

Plot # 15

Final_Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
3436.000	---	-63.83	---	---	500.0	1000.0	100.0	V	29.0	-101.1	
3436.000	-46.17	---	-13.00	33.17	500.0	1000.0	100.0	V	29.0	-101.1	

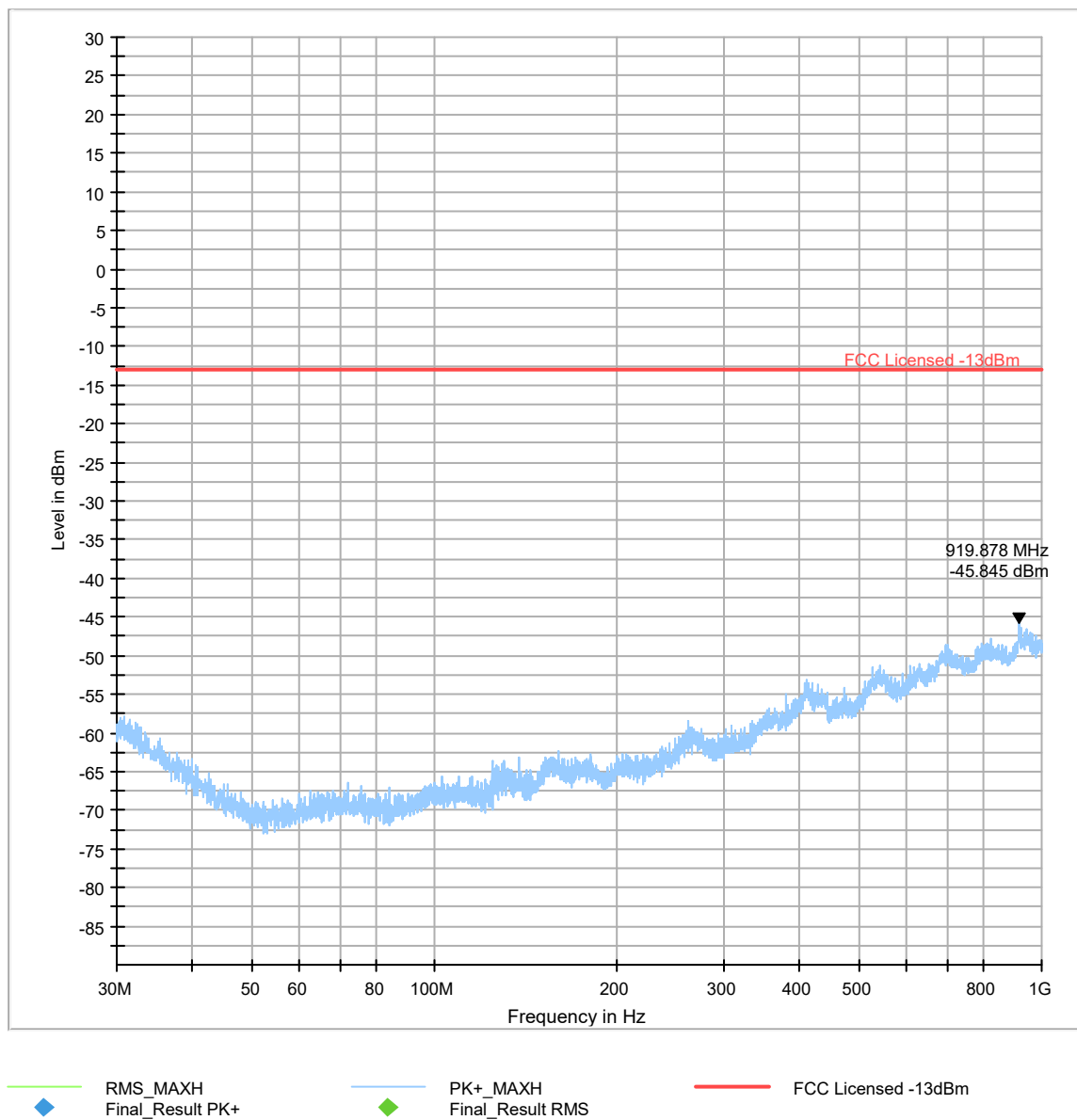


— RMS_MAXH
Final_Result PK+

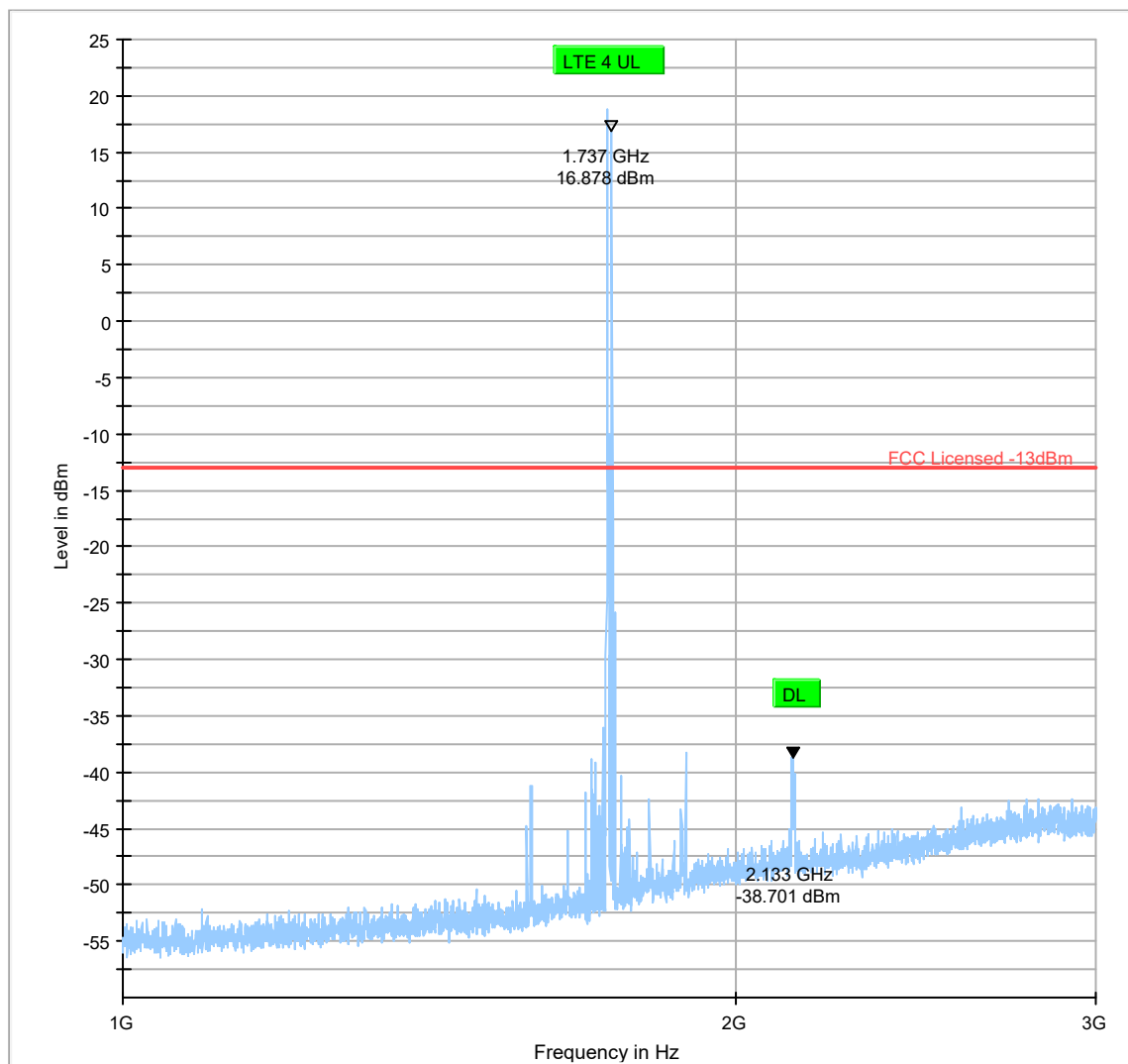
— PK+_MAXH
Final_Result RMS

— FCC Licensed -13dBm

Plot # 16



Plot # 17



RMS_MAXH
Critical_Freqs PK+
Final_Result RMS

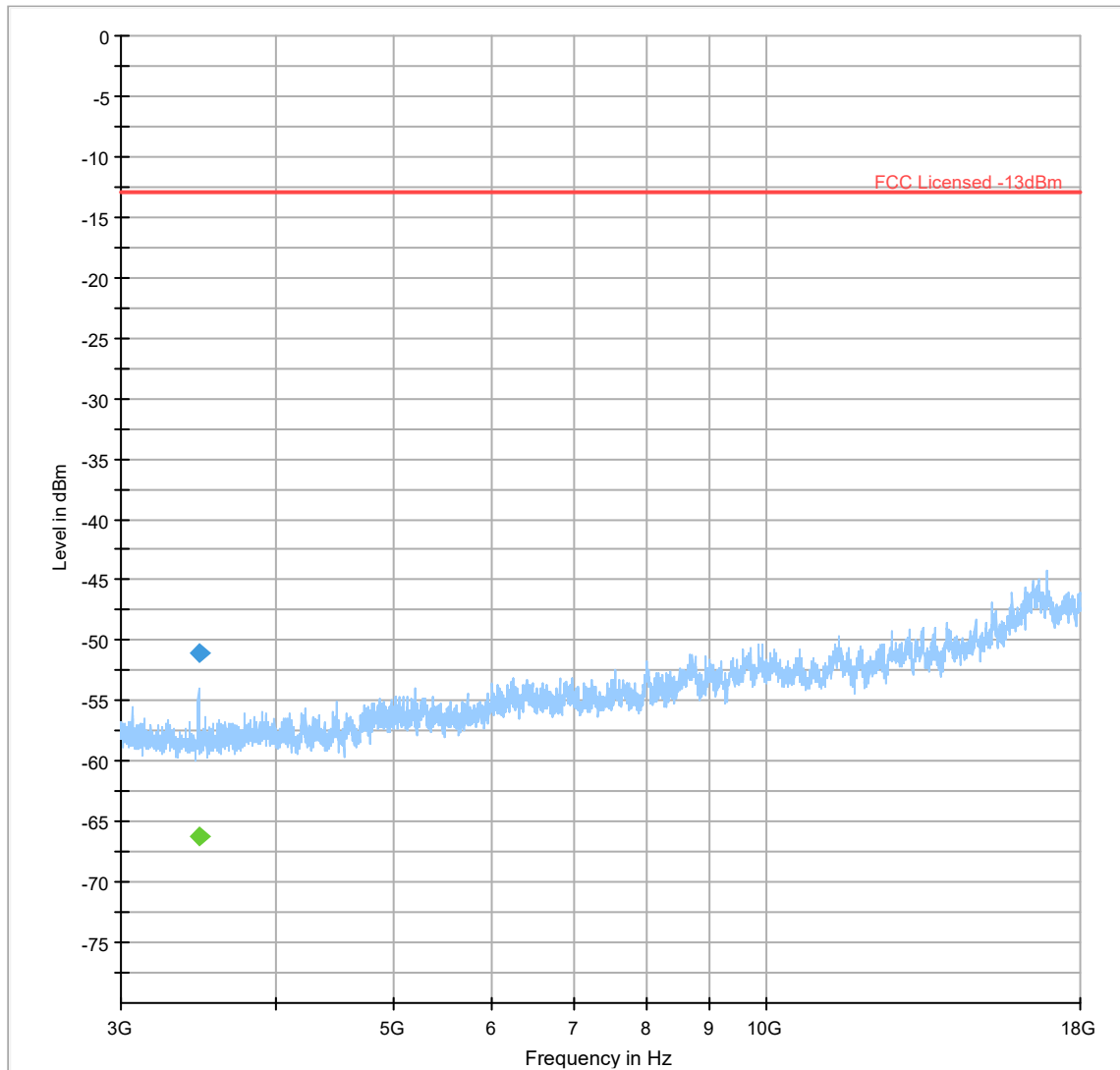
PK+_MAXH
FCC Licensed -13dBm

Critical_Freqs RMS
Final_Result PK+

Plot # 18

Final_Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
3467.500	---	-66.19	---	---	500.0	1000.0	107.0	H	132.0	-101.1	
3467.500	-51.09	---	-13.00	38.09	500.0	1000.0	107.0	H	132.0	-101.1	

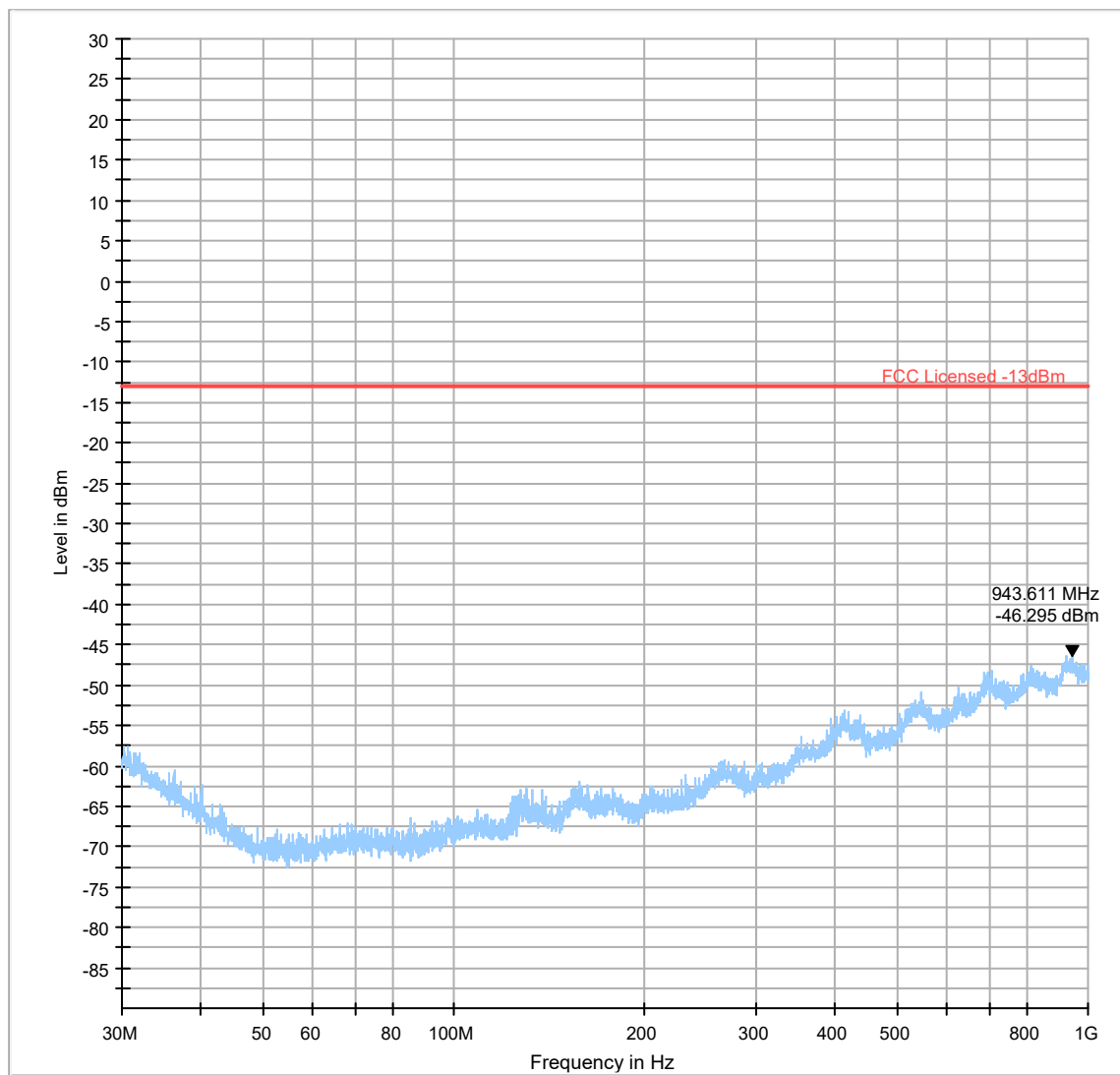


— RMS_MAXH
Final_Result PK+

— PK+_MAXH
Final_Result RMS

— FCC Licensed -13dBm

Plot # 19



— RMS_MAXH
◆ Final_Result PK+

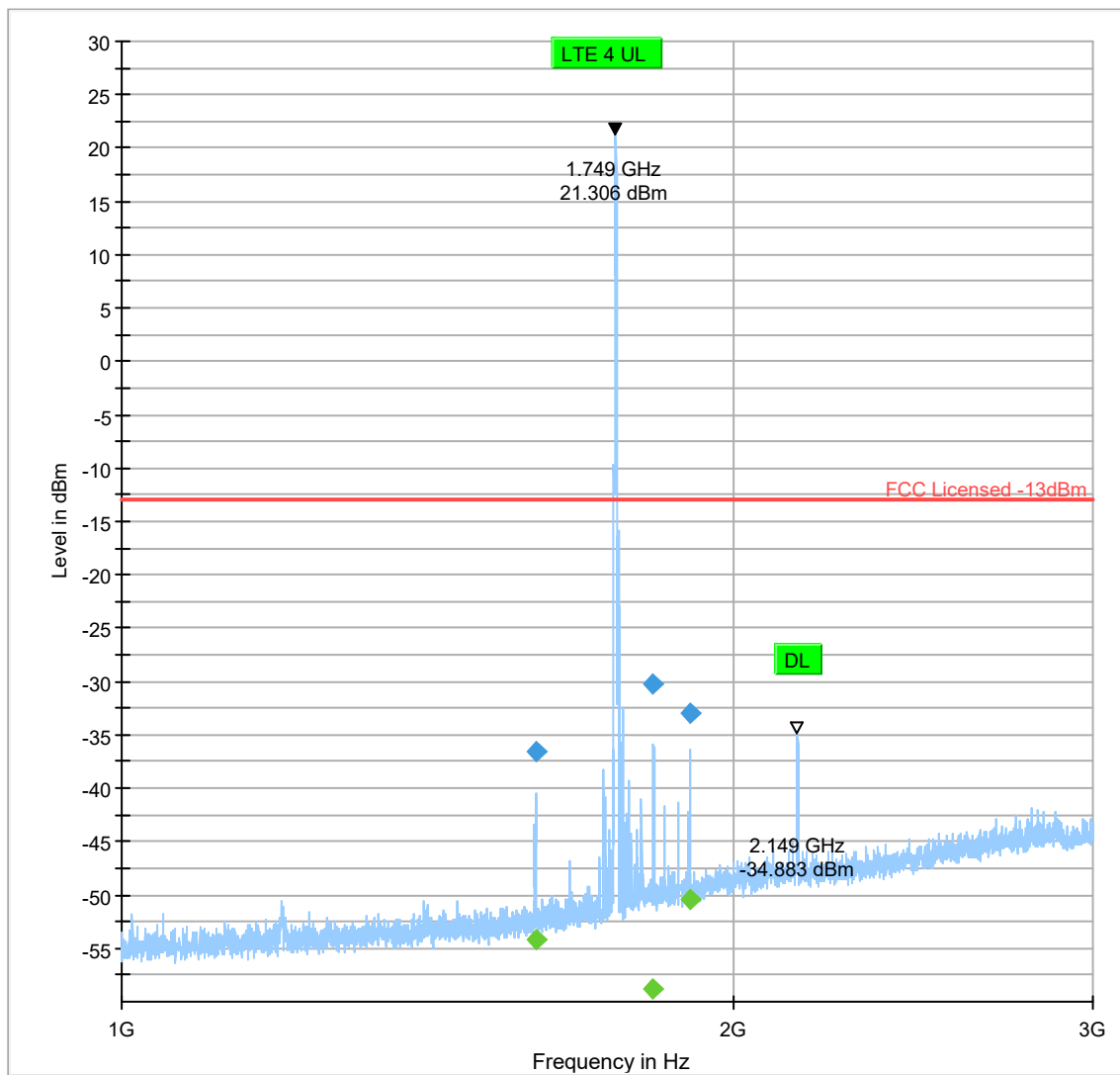
— PK+ MAXH
◆ Final_Result RMS

— FCC Licensed -13dBm

Plot # 20

Final Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
1597.250	---	-54.14	---	---	500.0	1000.0	237.0	H	-30.0	-65.9	
1597.250	-36.54	---	-13.00	23.54	500.0	1000.0	237.0	H	-30.0	-65.9	
1825.250	---	-58.77	---	---	500.0	1000.0	225.0	H	-34.0	-64.5	
1825.250	-30.28	---	-13.00	17.28	500.0	1000.0	225.0	H	-34.0	-64.5	
1901.500	---	-50.47	---	---	500.0	1000.0	167.0	H	117.0	-64.0	
1901.500	-33.03	---	-13.00	20.03	500.0	1000.0	167.0	H	117.0	-64.0	

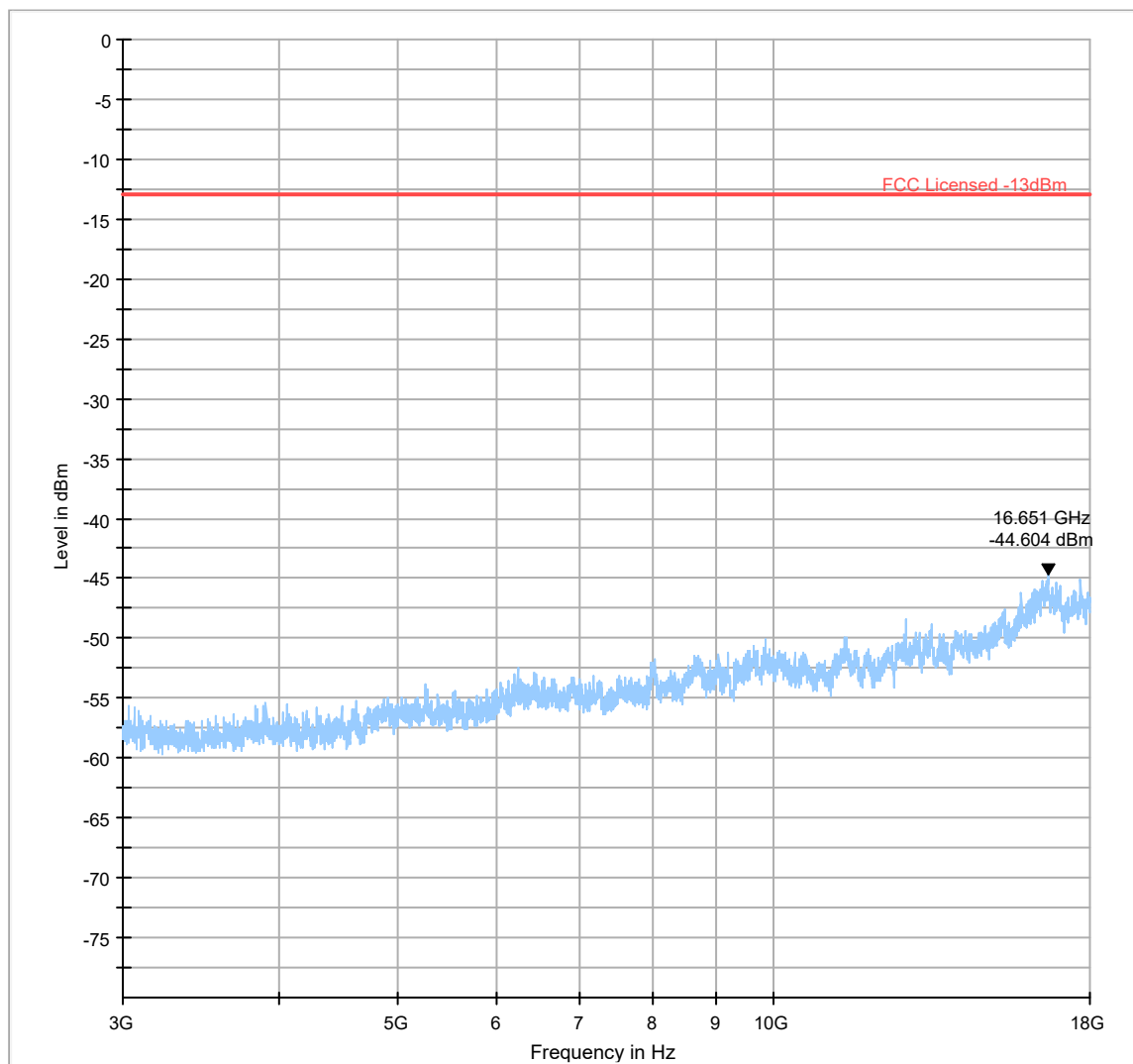


— RMS_MAXH
◆ Final_Result PK+

— PK+ _MAXH
◆ Final_Result RMS

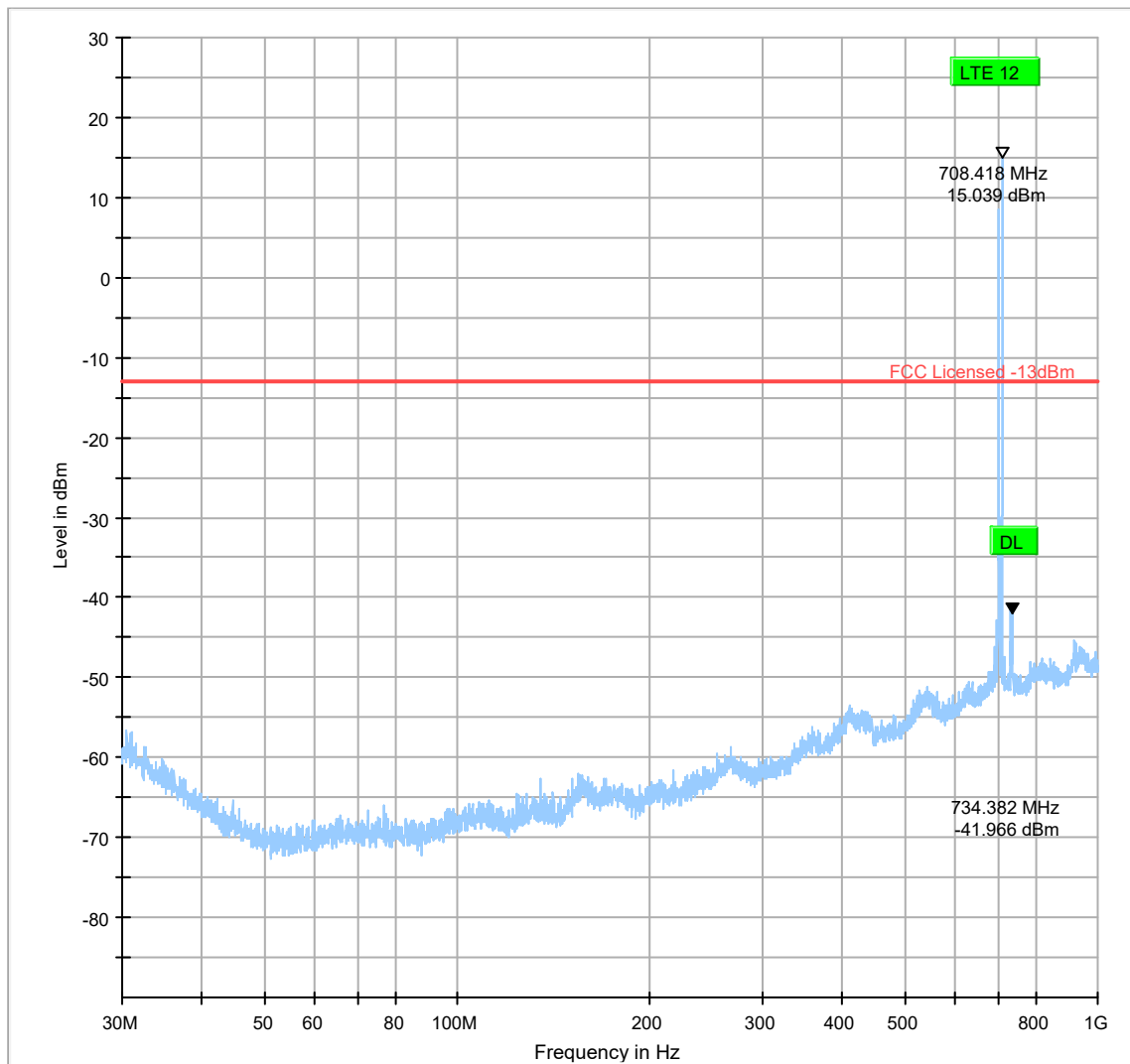
— FCC Licensed -13dBm

Plot # 21



—	RMS_MAXH	—	PK+_MAXH	*	Critical_Freqs RMS
*	Critical_Freqs PK+	—	FCC Licensed -13dBm	◆	Final_Result PK+
◆	Final_Result RMS				

Plot # 22



RMS_MAXH
Critical_Freqs PK+
Final_Result RMS

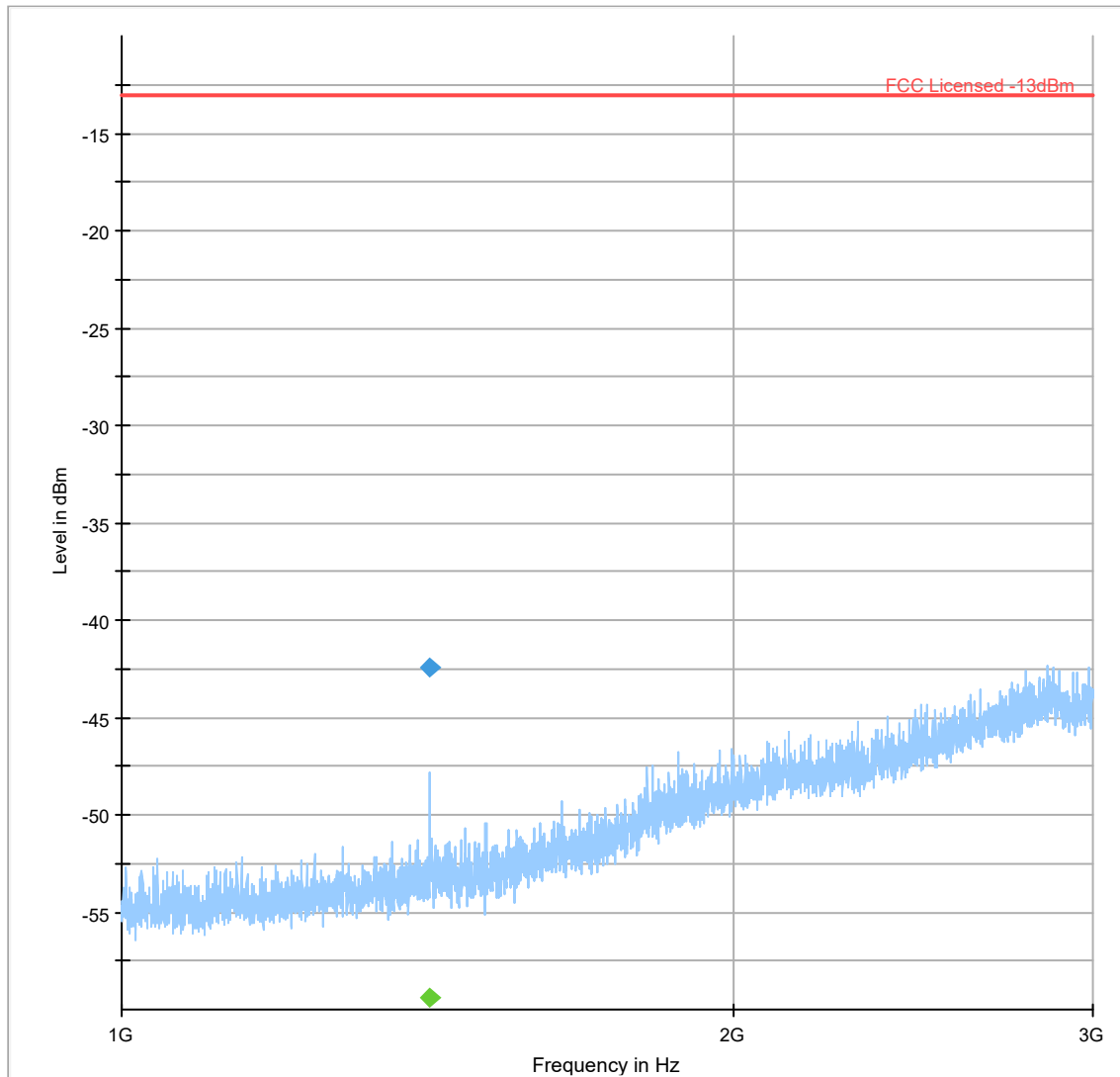
PK+_MAXH
FCC Licensed -13dBm

Critical_Freqs RMS
Final_Result PK+

Plot # 23

Final_Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
1416.500	---	-59.38	---	---	500.0	1000.0	350.0	H	156.0	-66.3	
1416.500	-42.41	---	-13.00	29.41	500.0	1000.0	350.0	H	156.0	-66.3	

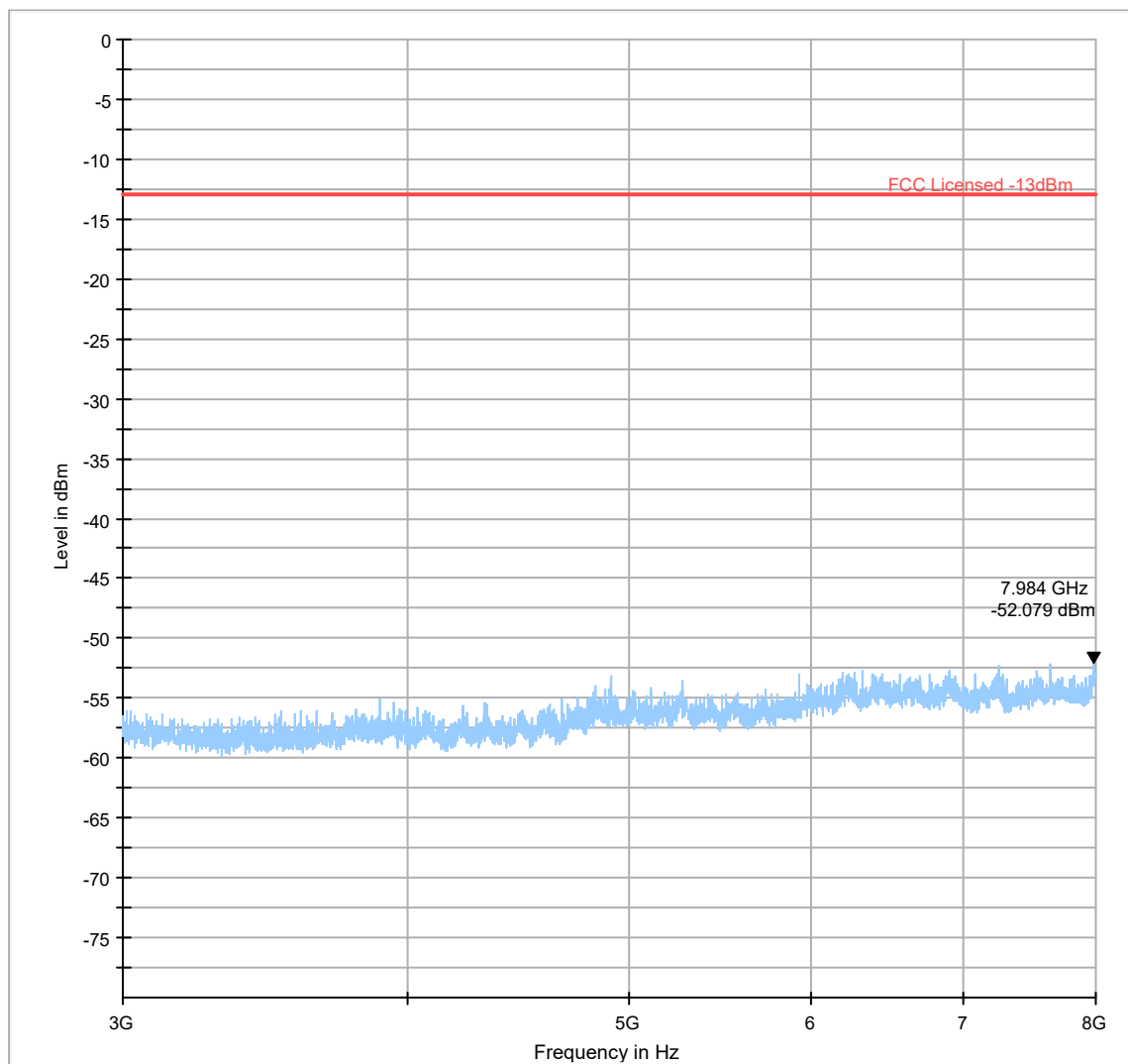


◆ RMS_MAXH
Final_Result PK+

◆ PK+_MAXH
Final_Result RMS

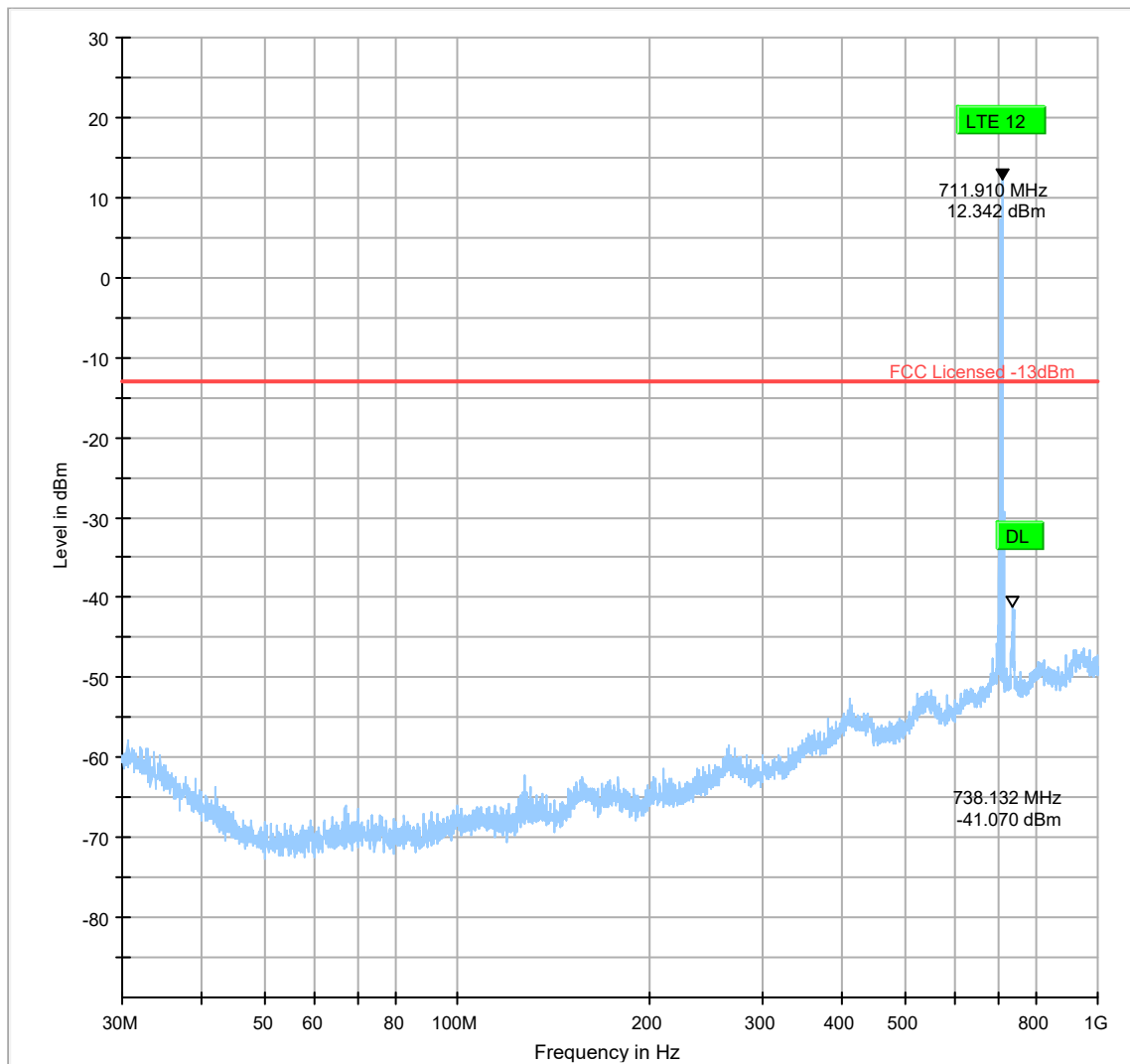
— FCC Licensed -13dBm

Plot # 24



	RMS_MAXH		PK+_MAXH		Critical_Freqs RMS
	Critical_Freqs PK+		FCC Licensed -13dBm		Final_Result PK+
	Final_Result RMS				

Plot # 25



RMS_MAXH
Critical_Freqs PK+
Final_Result RMS

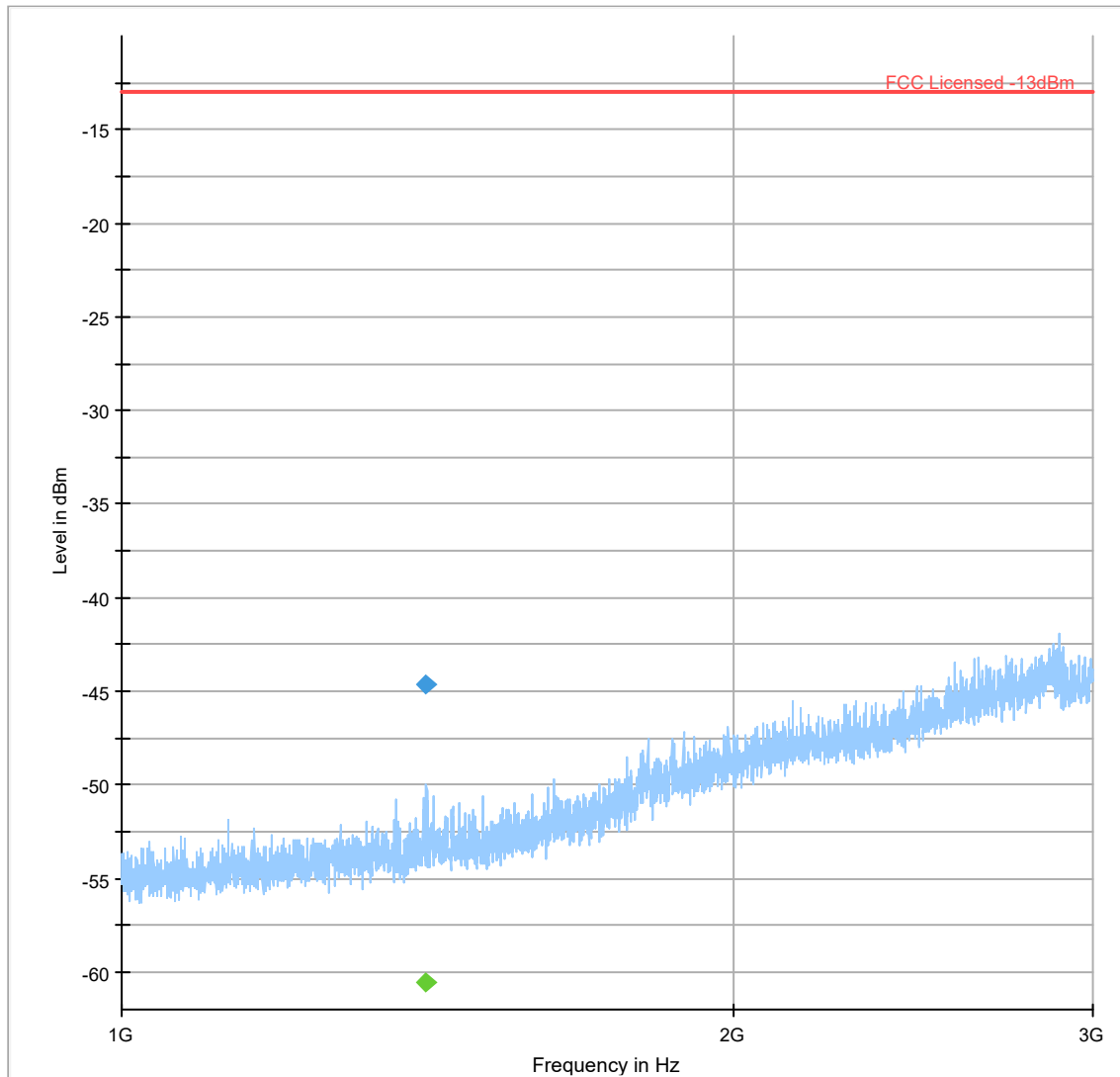
PK+_MAXH
FCC Licensed -13dBm

Critical_Freqs RMS
Final_Result PK+

Plot # 26

Final_Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
1411.750	---	-60.57	---	---	500.0	1000.0	107.0	H	225.0	-66.3	
1411.750	-44.62	---	-13.00	31.62	500.0	1000.0	107.0	H	225.0	-66.3	

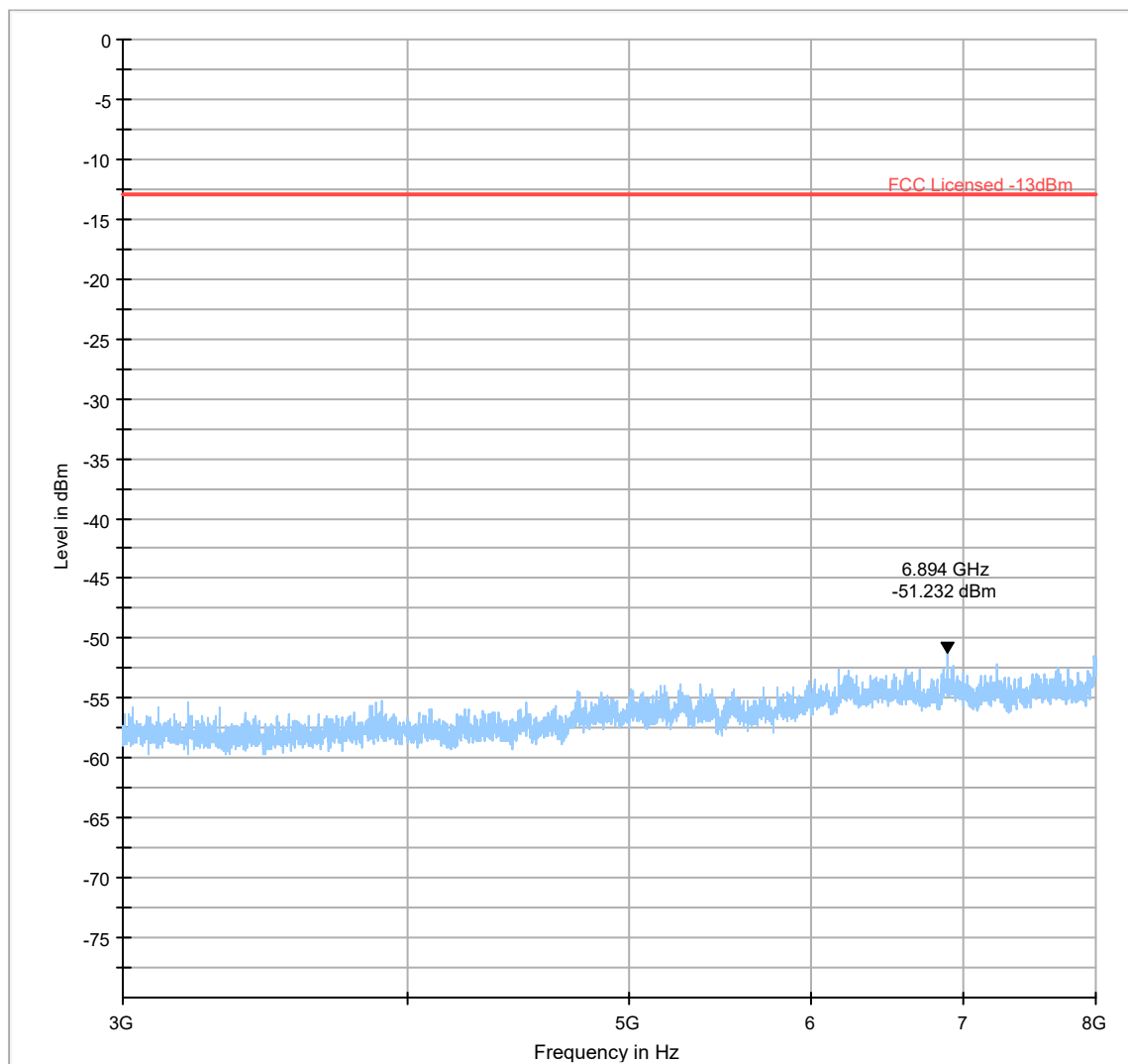


◆ RMS_MAXH
Final_Result PK+

◆ PK+_MAXH
Final_Result RMS

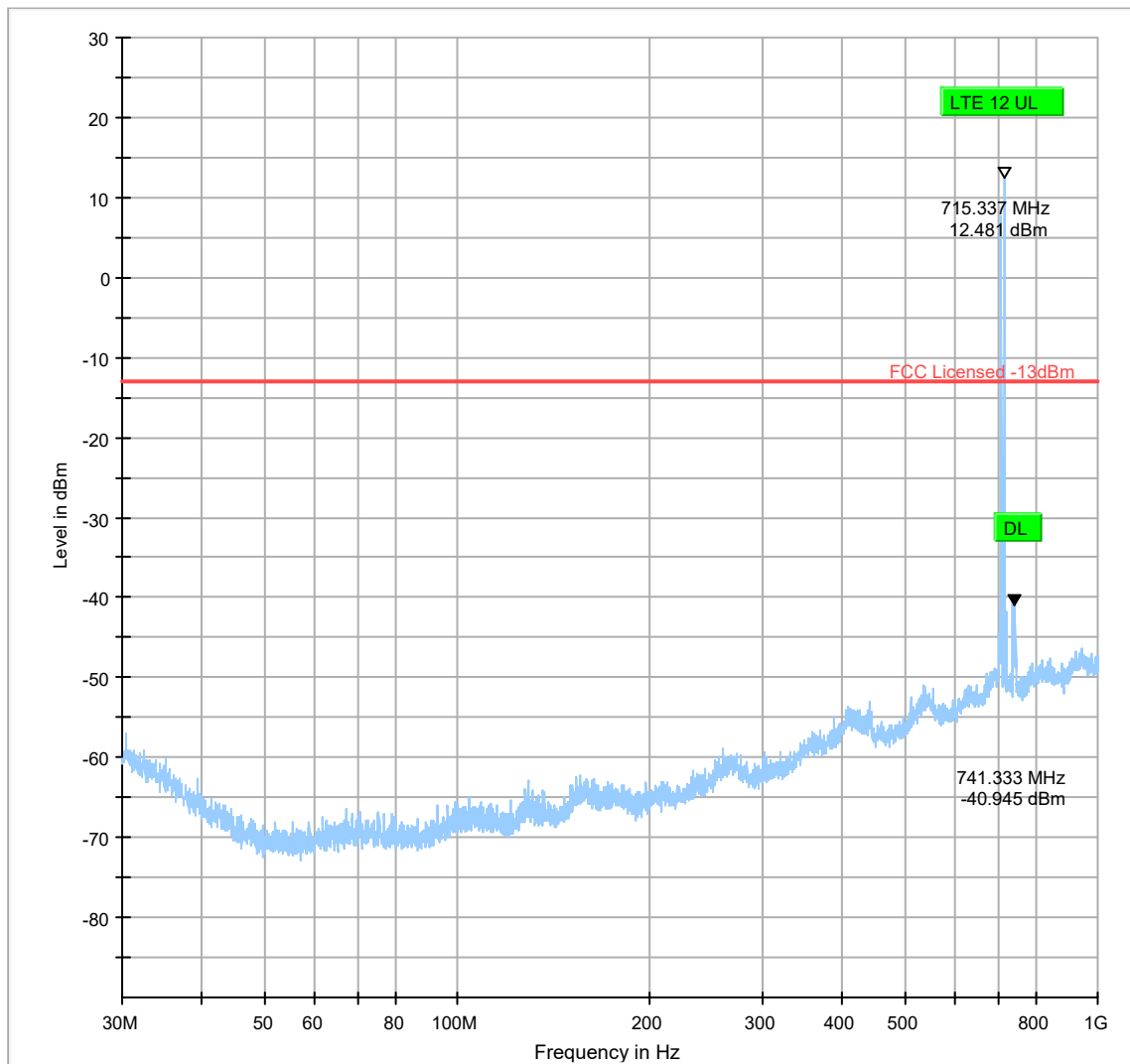
— FCC Licensed -13dBm

Plot # 27



	RMS_MAXH		PK+_MAXH		Critical_Freqs RMS
	Critical_Freqs PK+		FCC Licensed -13dBm		Final_Result PK+
	Final_Result RMS				

Plot # 28



RMS_MAXH
Critical_Freqs PK+
Final_Result RMS

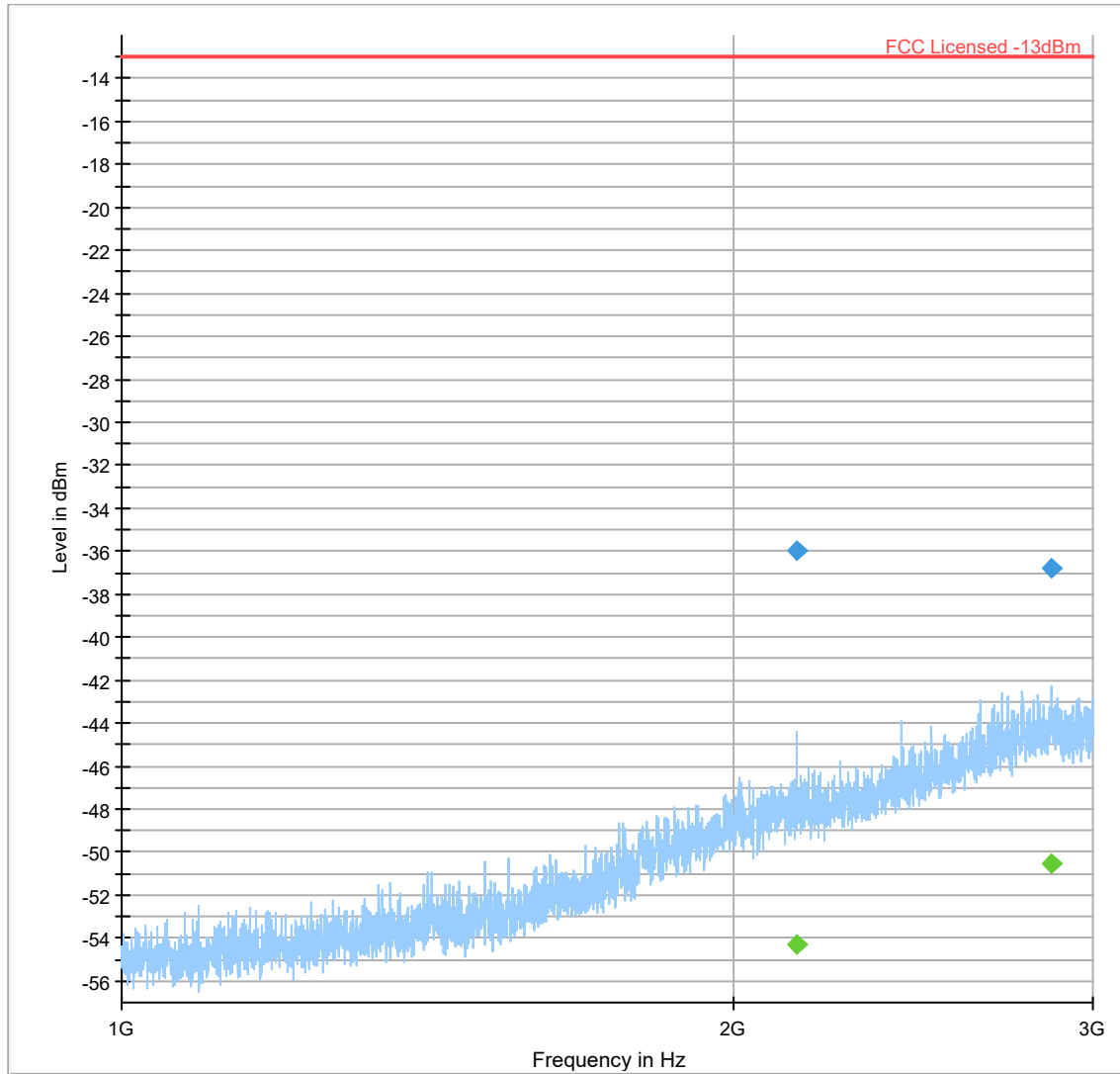
PK+_MAXH
FCC Licensed -13dBm

Critical_Freqs RMS
Final_Result PK+

Plot # 29

Final_Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
2146.250	-35.98	---	-13.00	22.98	500.0	1000.0	346.0	H	320.0	-63.1	
2146.250	---	-54.27	---	---	500.0	1000.0	346.0	H	320.0	-63.1	
2860.250	-36.81	---	-13.00	23.81	500.0	1000.0	327.0	V	189.0	-60.1	
2860.250	---	-50.57	---	---	500.0	1000.0	327.0	V	189.0	-60.1	

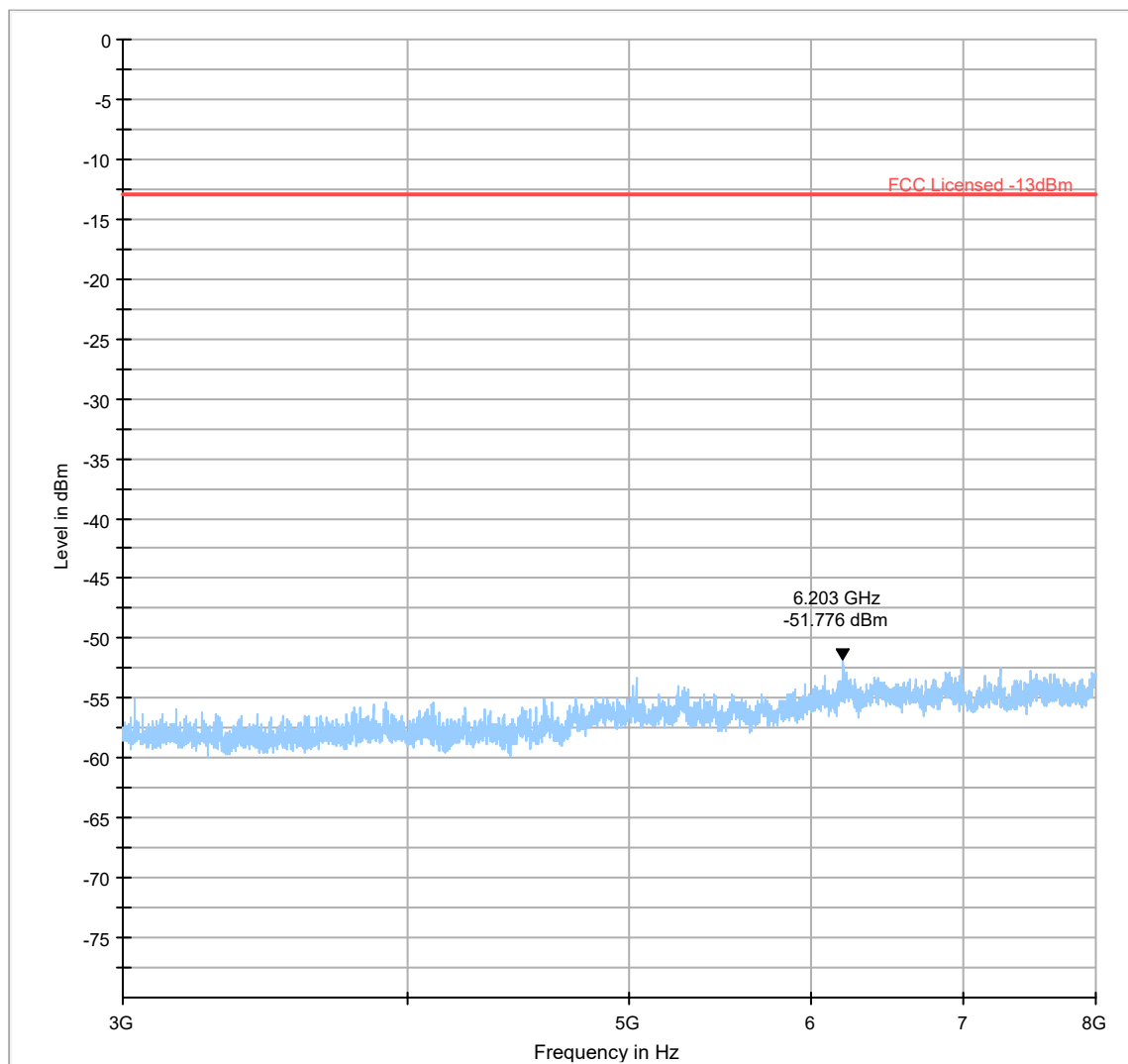


— RMS_MAXH
◆ Final_Result PK+

— PK+_MAXH
◆ Final_Result RMS

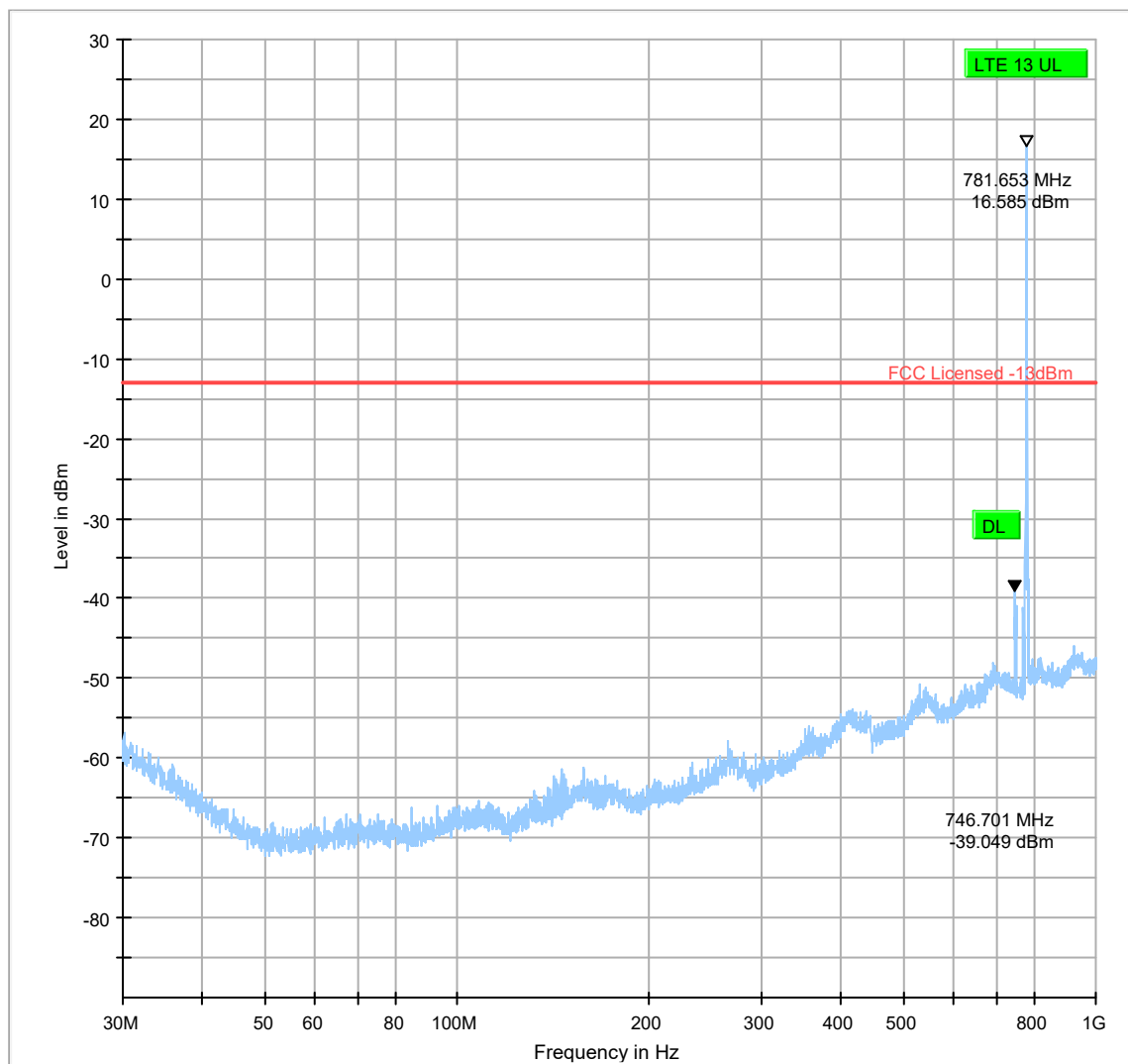
— FCC Licensed -13dBm

Plot # 30



	RMS_MAXH		PK+_MAXH		Critical_Freqs RMS
	Critical_Freqs PK+		FCC Licensed -13dBm		Final_Result PK+
	Final_Result RMS				

Plot # 31

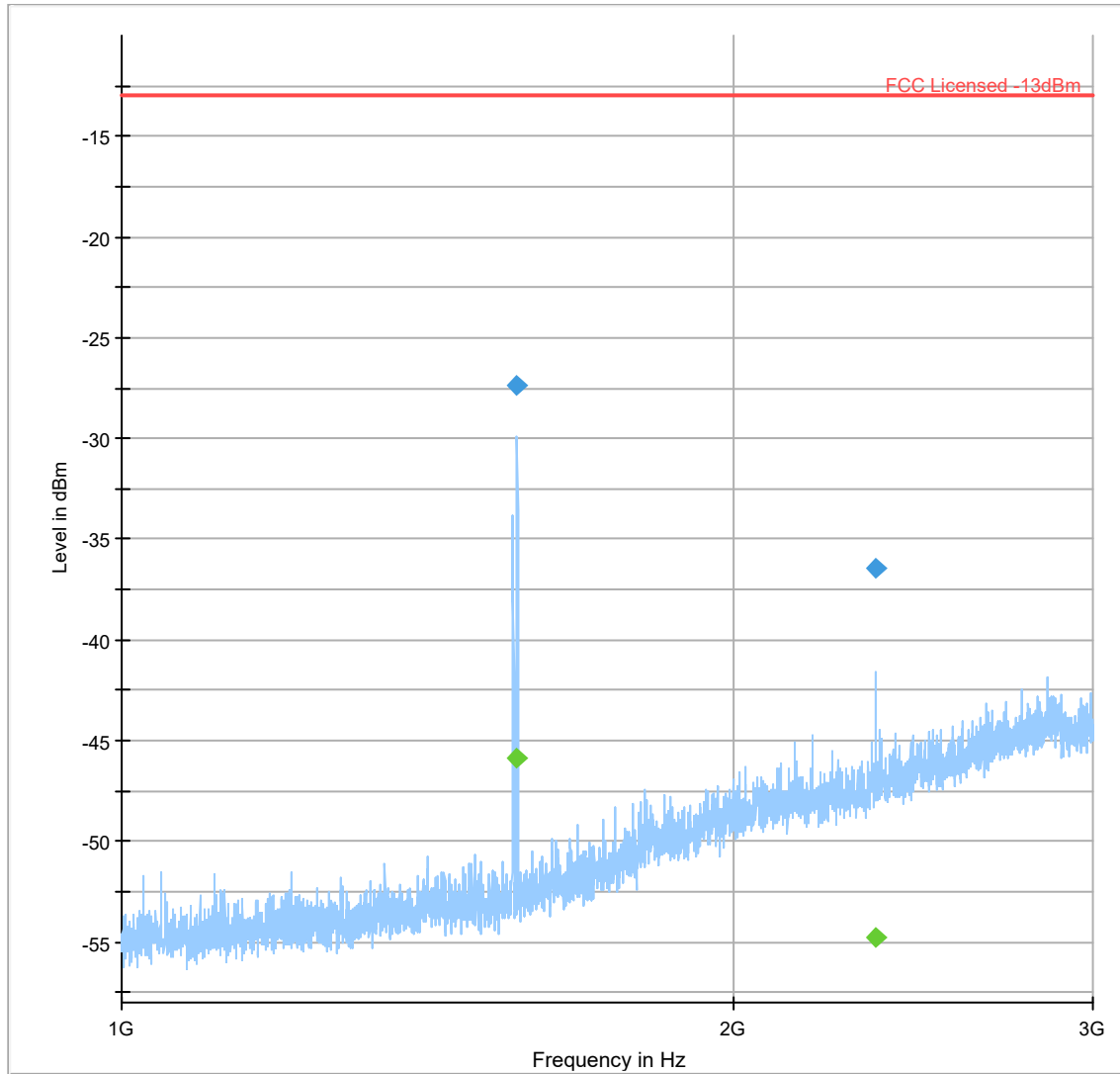


—	RMS_MAXH	—	PK+_MAXH	*	Critical_Freqs RMS
*	Critical_Freqs PK+	—	FCC Licensed -13dBm	◆	Final_Result PK+
◆	Final_Result RMS				

Plot # 32

Final_Result

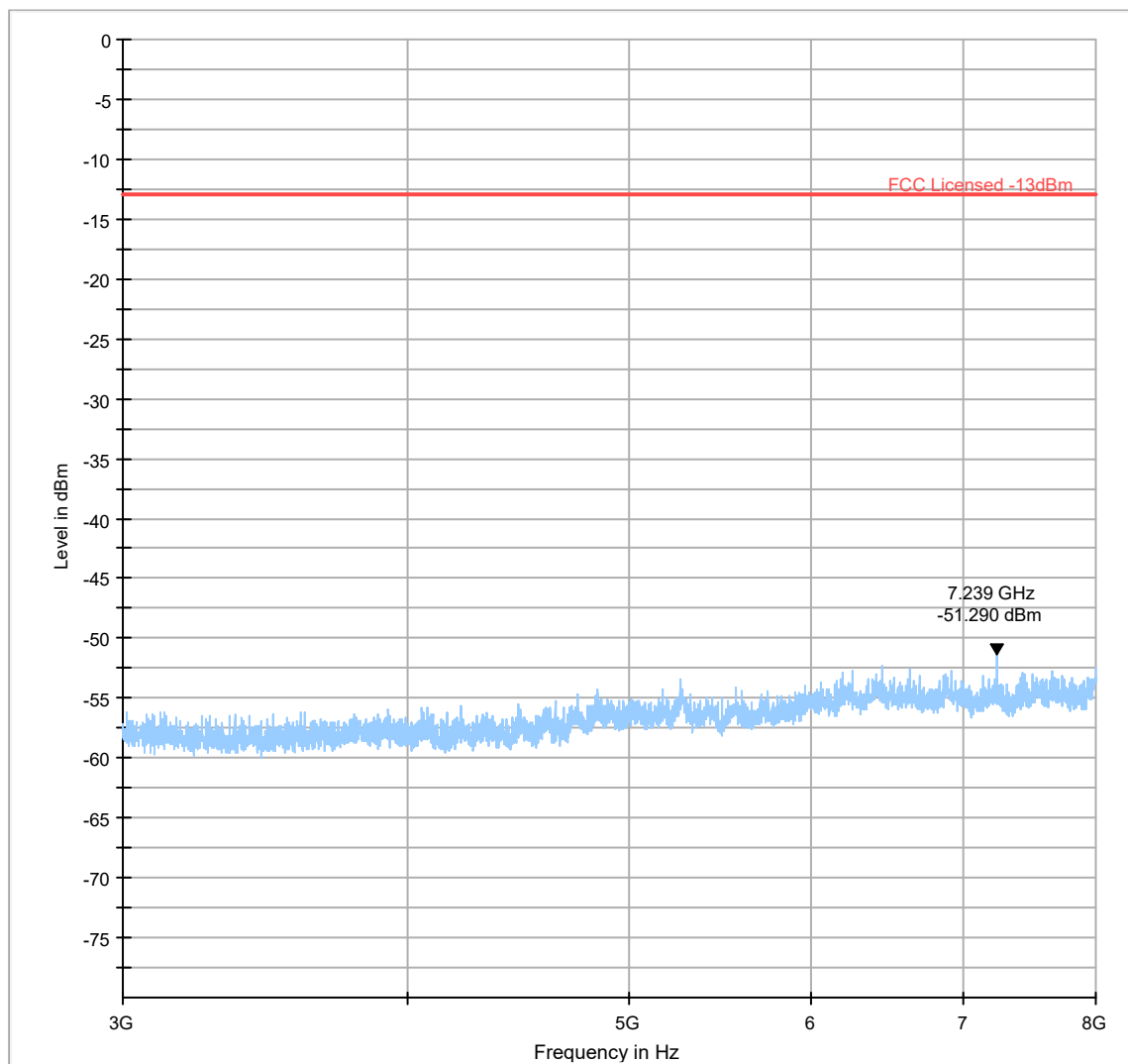
Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
1564.250	---	-45.89	---	---	500.0	1000.0	100.0	V	212.0	-66.0	
1564.250	-27.32	---	-13.00	14.32	500.0	1000.0	100.0	V	212.0	-66.0	
2346.500	---	-54.81	---	---	500.0	1000.0	129.0	V	336.0	-62.1	
2346.500	-36.44	---	-13.00	23.44	500.0	1000.0	129.0	V	336.0	-62.1	



— RMS_MAXH
— PK+_MAXH
— FCC Licensed -13dBm

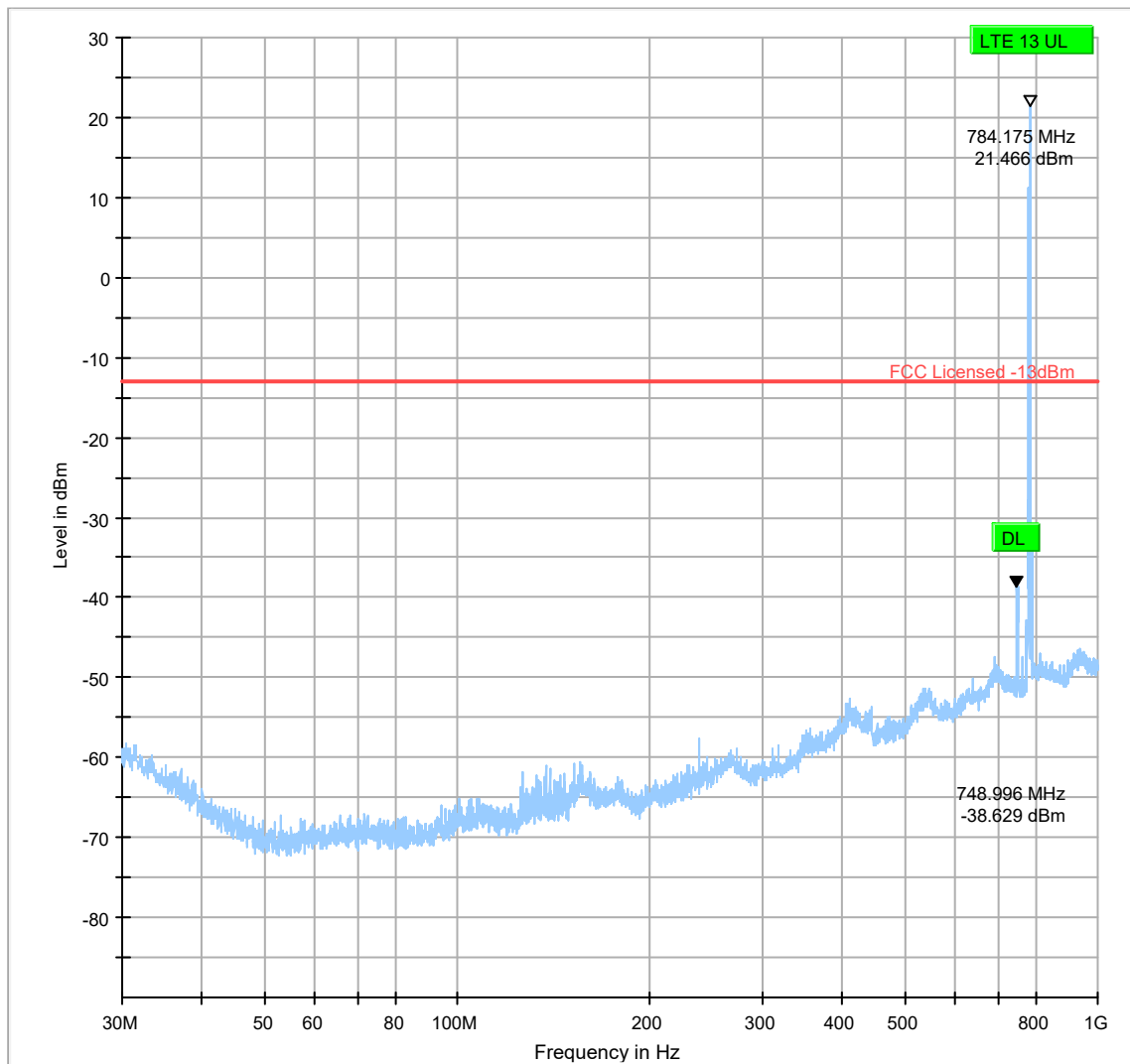
◆ Final_Result PK+
◆ Final_Result RMS

Plot # 33



	RMS_MAXH		PK+_MAXH		Critical_Freqs RMS
	Critical_Freqs PK+		FCC Licensed -13dBm		Final_Result PK+
	Final_Result RMS				

Plot # 34



RMS_MAXH
Critical_Freqs PK+
Final_Result RMS

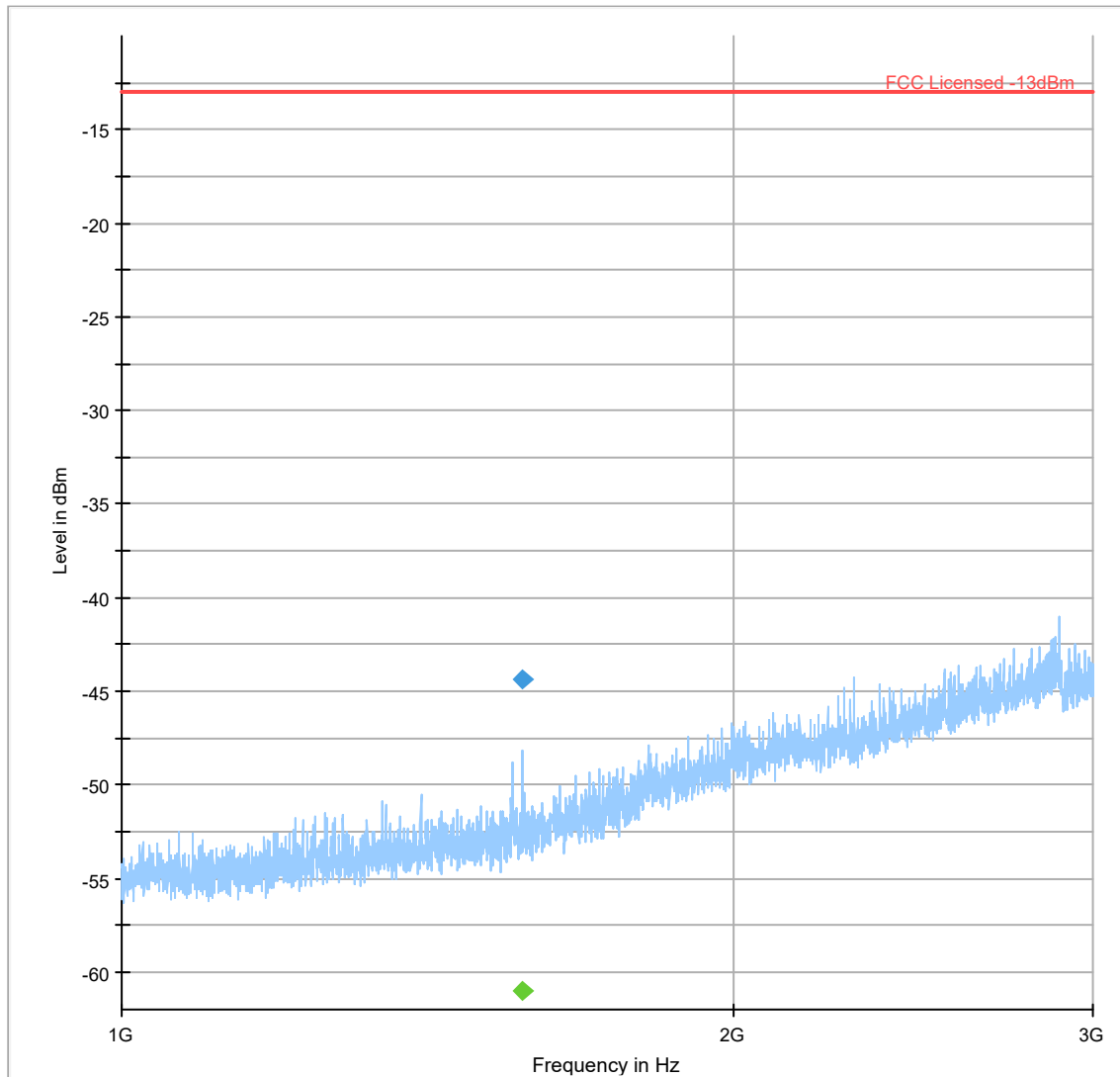
PK+_MAXH
FCC Licensed -13dBm

Critical_Freqs RMS
Final_Result PK+

Plot # 35

Final_Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
1573.000	---	-60.99	---	---	500.0	1000.0	366.0	V	-6.0	-65.9	
1573.000	-44.37	---	-13.00	31.37	500.0	1000.0	366.0	V	-6.0	-65.9	

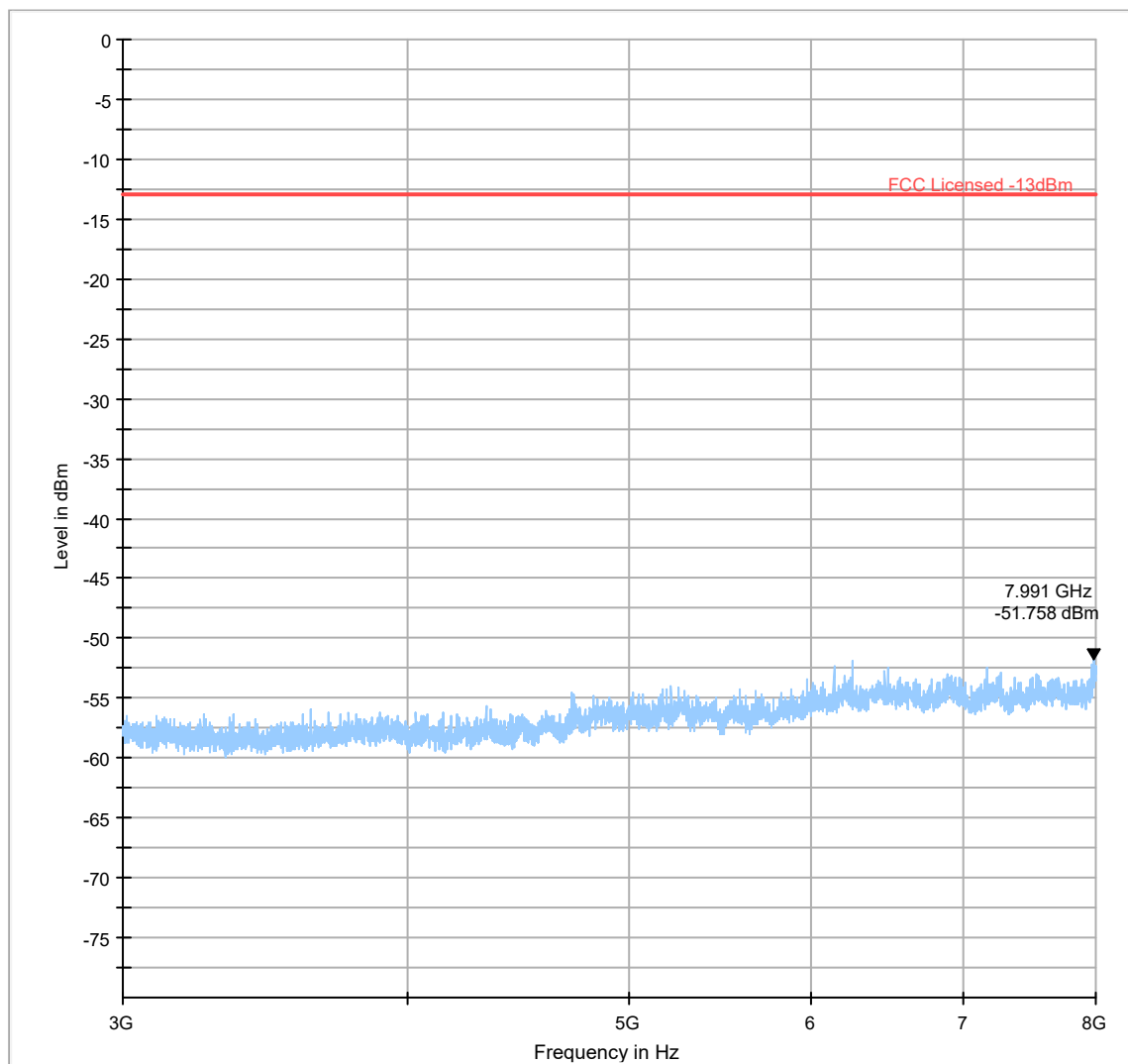


◆ RMS_MAXH
Final_Result PK+

◆ PK+_MAXH
Final_Result RMS

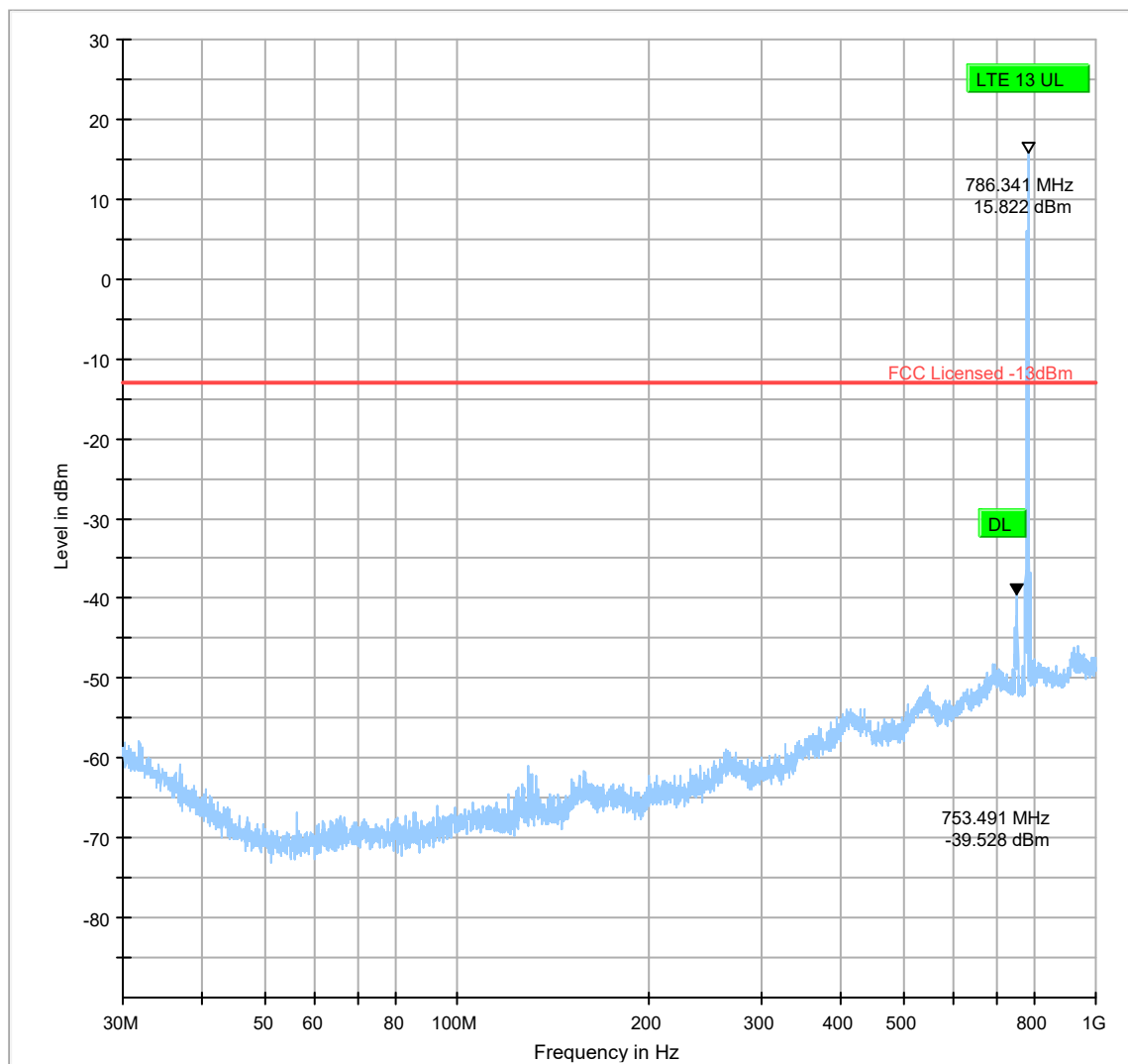
— FCC Licensed -13dBm

Plot # 36



	RMS_MAXH		PK+_MAXH		Critical_Freqs RMS
	Critical_Freqs PK+		FCC Licensed -13dBm		Final_Result PK+
	Final_Result RMS				

Plot # 37

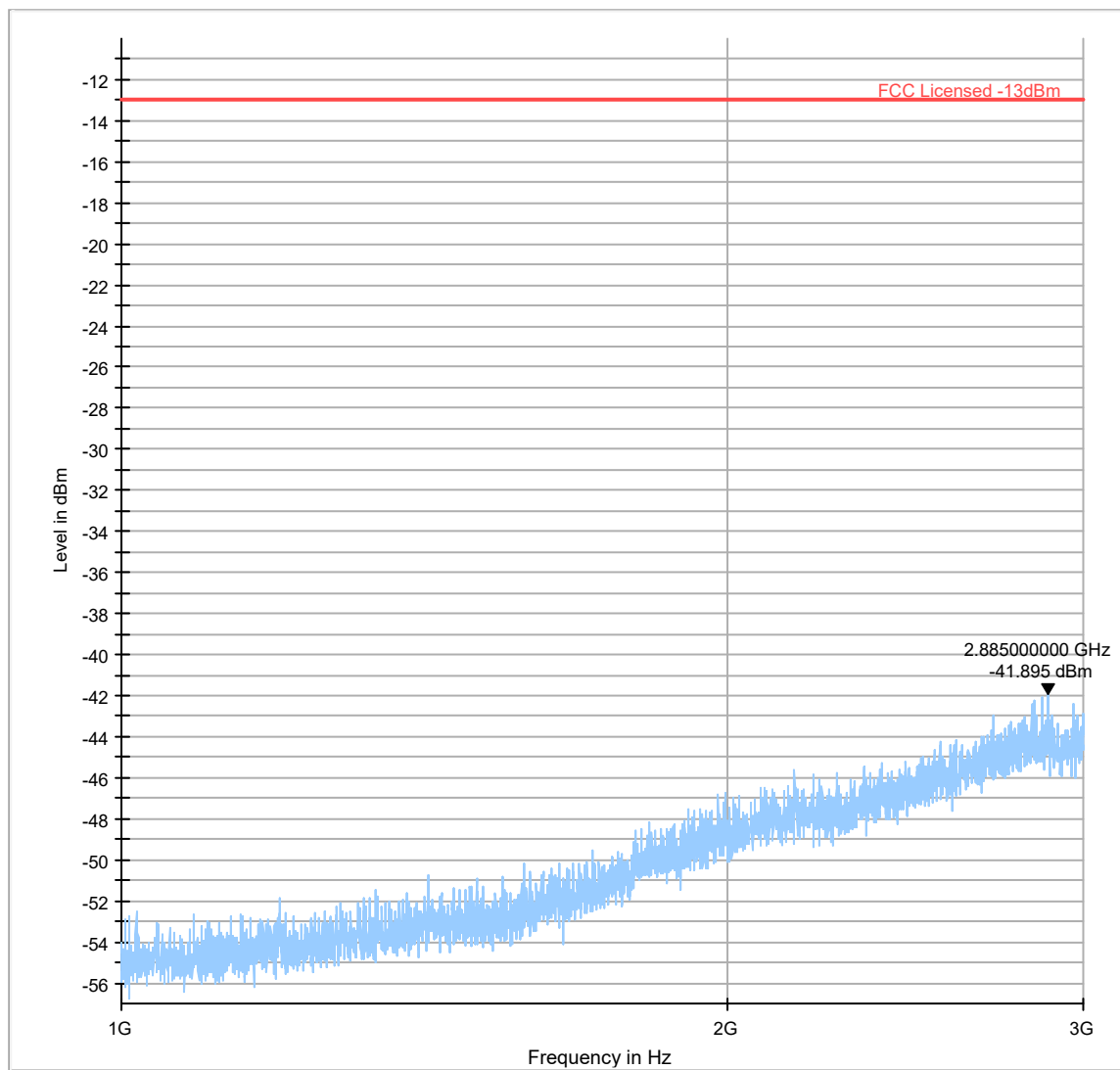


RMS_MAXH
Critical_Freqs PK+
Final_Result RMS

PK+_MAXH
FCC Licensed -13dBm

Critical_Freqs RMS
Final_Result PK+

Plot # 38

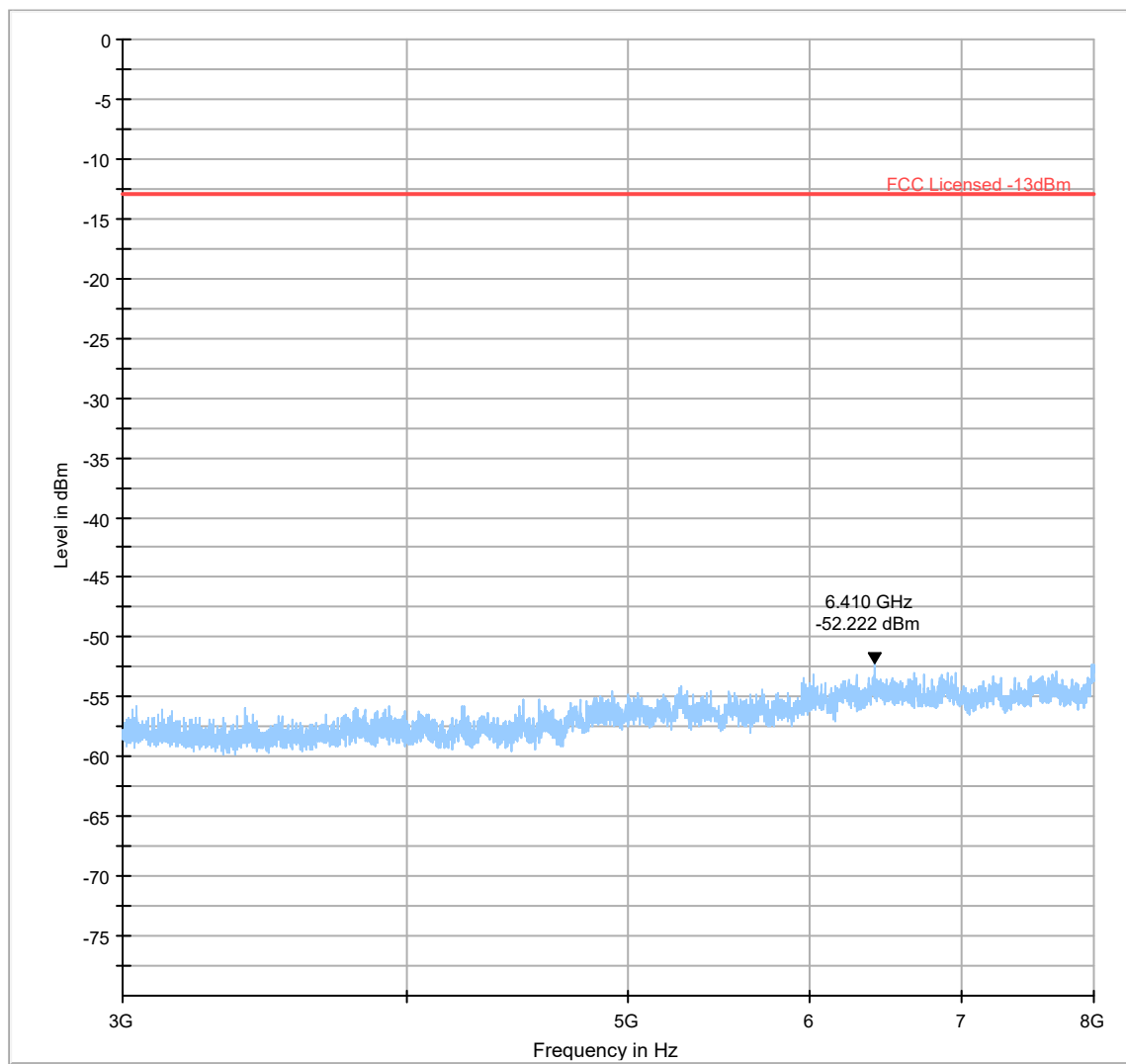


◆ RMS_MAXH
Final_Result PK+

◆ PK+_MAXH
Final_Result RMS

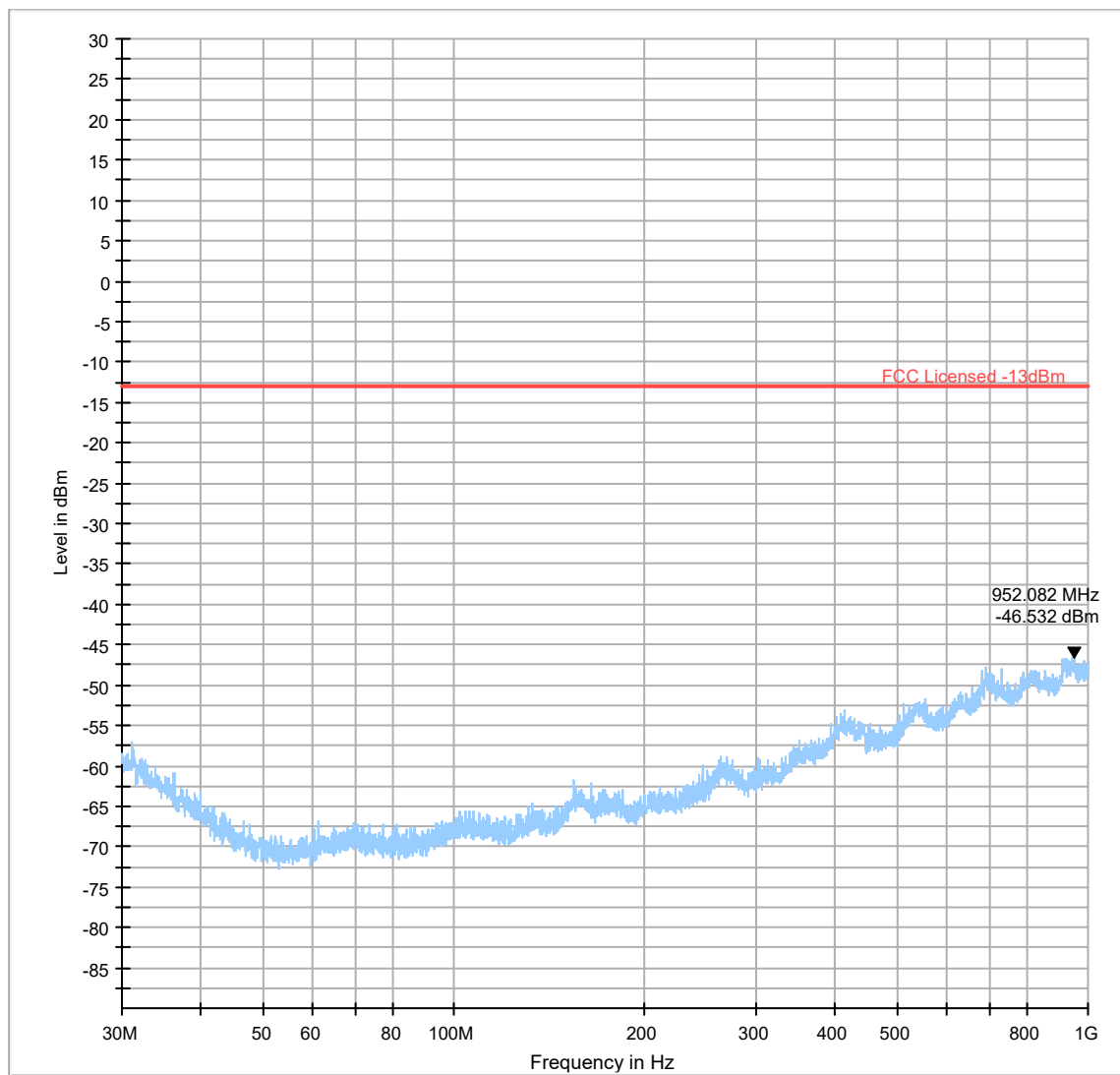
— FCC Licensed -13dBm

Plot # 39



	RMS_MAXH		PK+_MAXH		Critical_Freqs RMS
	Critical_Freqs PK+		FCC Licensed -13dBm		Final_Result PK+
	Final_Result RMS				

Plot # 40



— RMS_MAXH
◆ Final_Result PK+

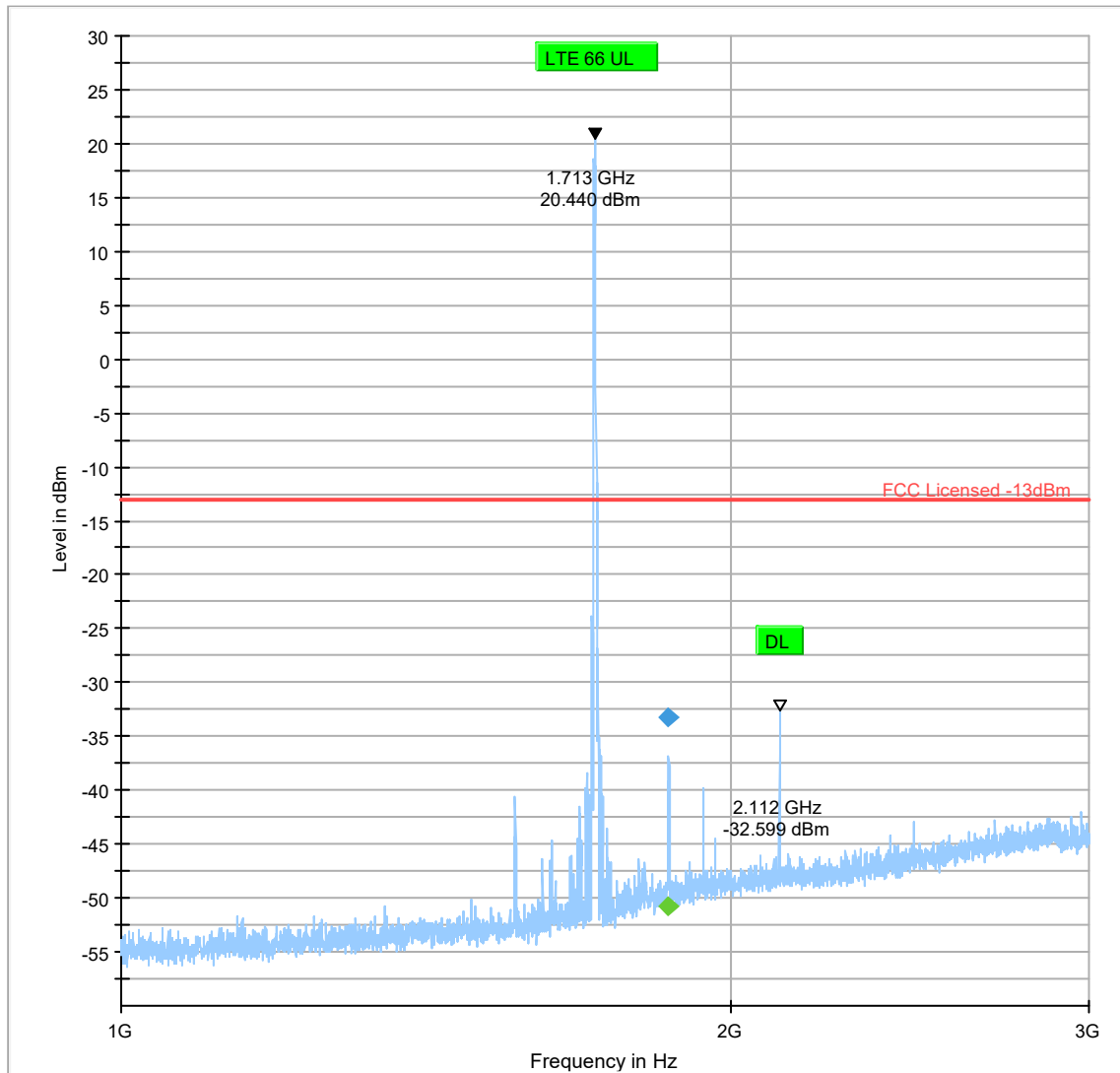
— PK+ MAXH
◆ Final_Result RMS

— FCC Licensed -13dBm

Plot # 41

Final_Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
1862.250	---	-50.76	---	---	500.0	1000.0	217.0	H	94.0	-64.3	
1862.250	-33.25	---	-13.00	20.25	500.0	1000.0	217.0	H	94.0	-64.3	



◆ RMS_MAXH
Final_Result PK+

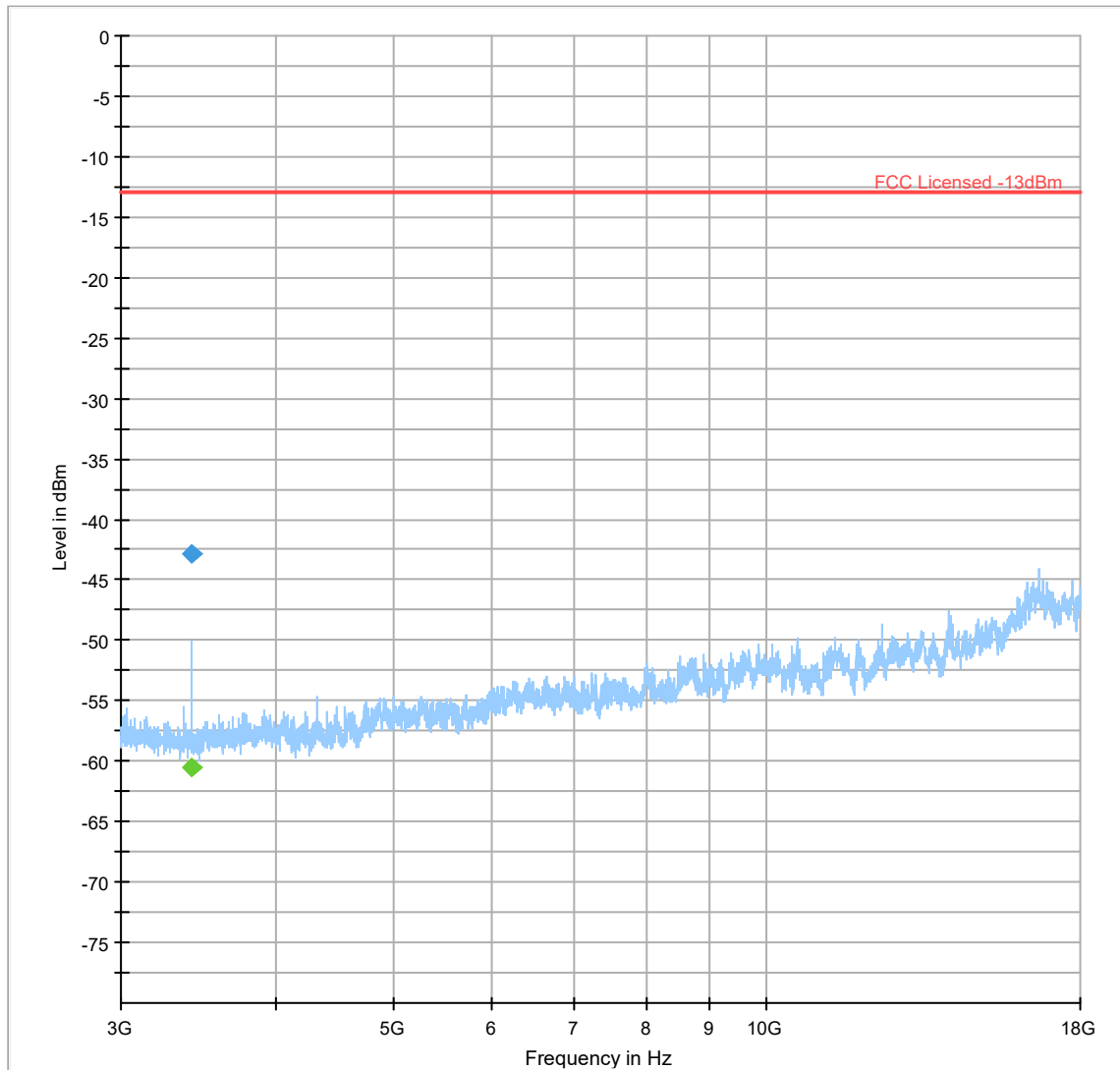
◆ PK+_MAXH
Final_Result RMS

— FCC Licensed -13dBm

Plot # 42

Final_Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
3427.500	---	-60.55	---	---	500.0	1000.0	100.0	V	28.0	-101.1	
3427.500	-42.86	---	-13.00	29.86	500.0	1000.0	100.0	V	28.0	-101.1	

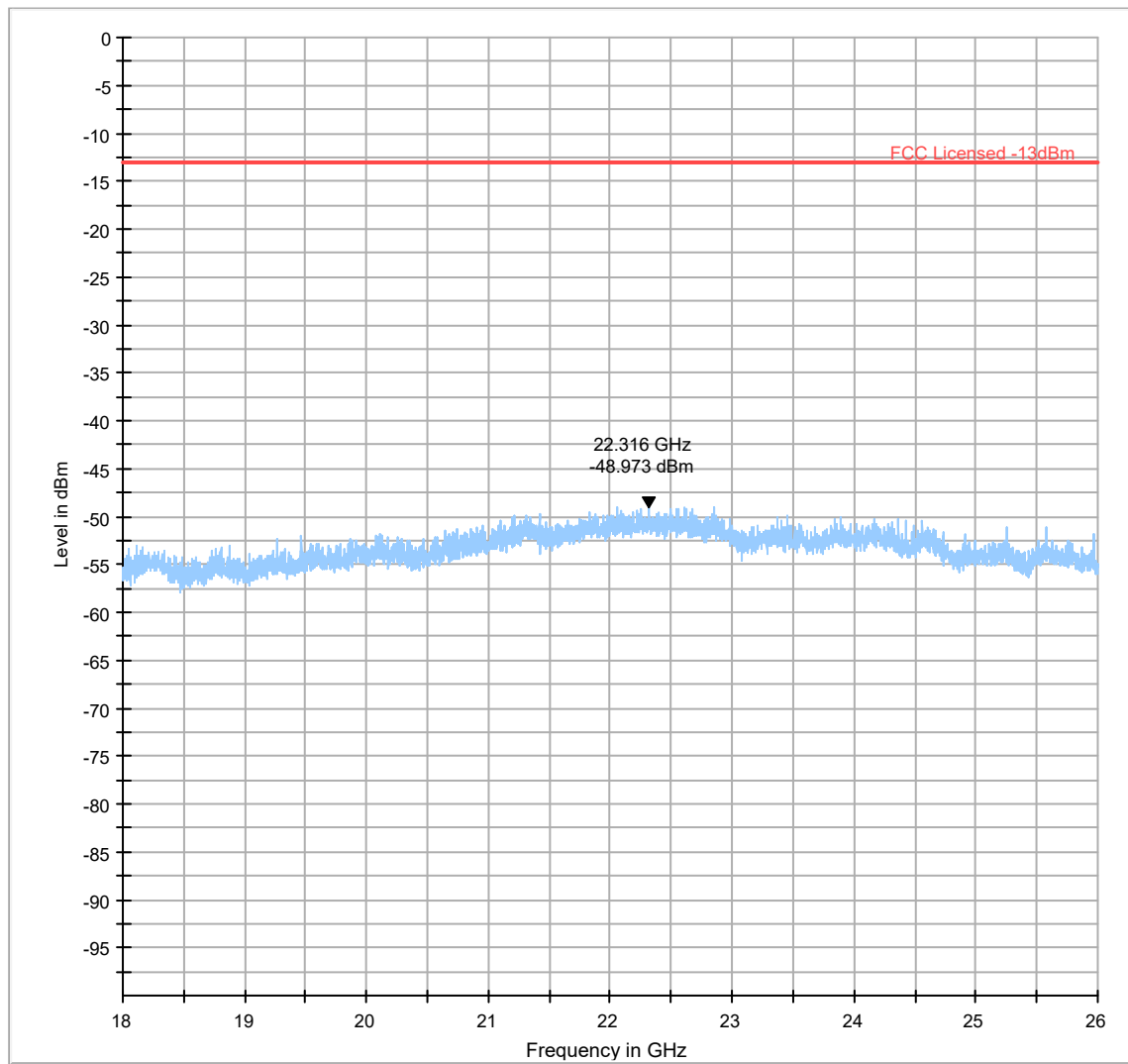


◆ RMS_MAXH
Final_Result PK+

◆ PK+_MAXH
Final_Result RMS

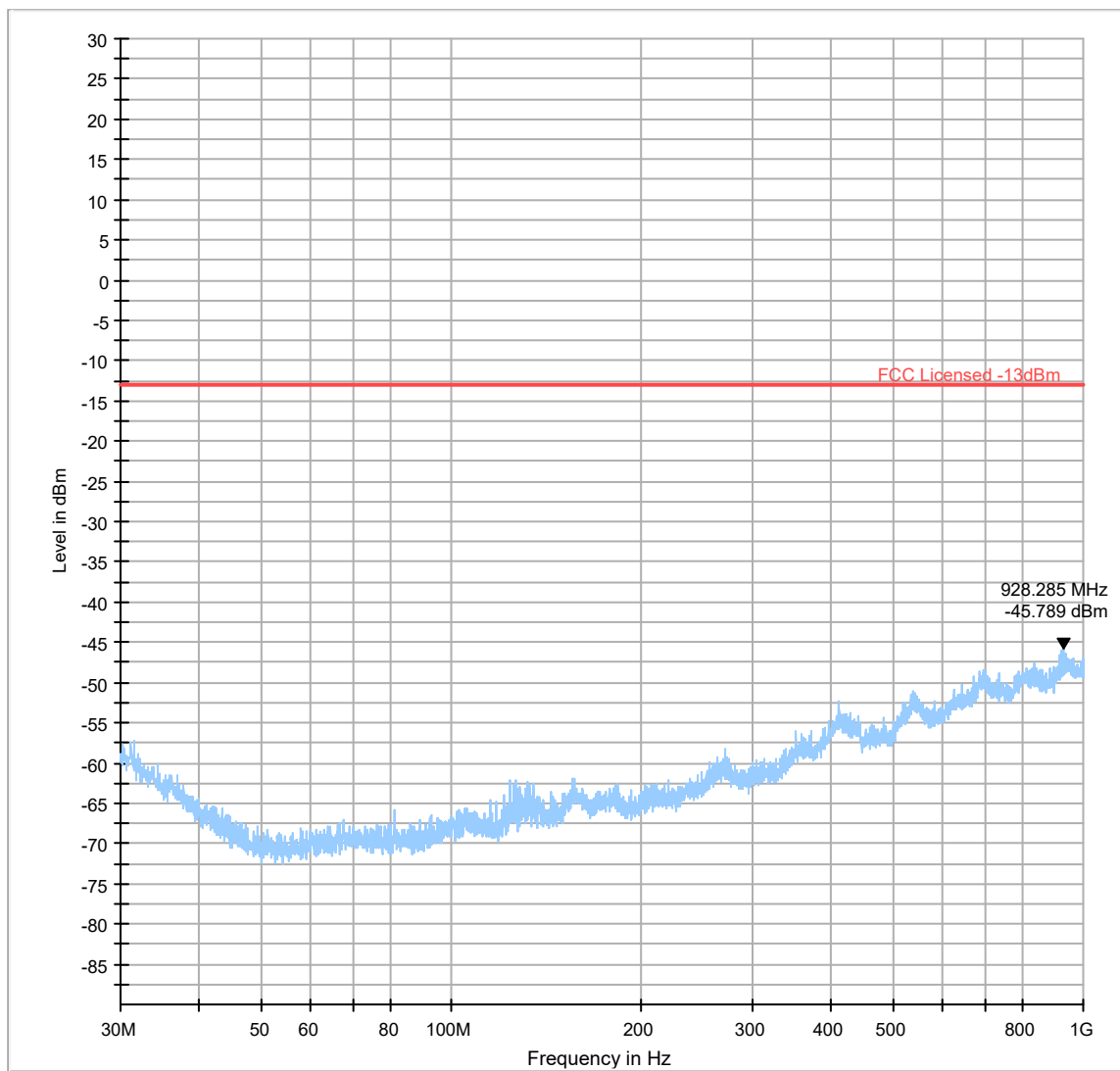
— FCC Licensed -13dBm

Plot # 43



	RMS_MAXH		PK+_MAXH		Critical_Freqs RMS
	Critical_Freqs PK+		FCC Licensed -13dBm		Final_Result PK+
	Final_Result RMS				

Plot # 44

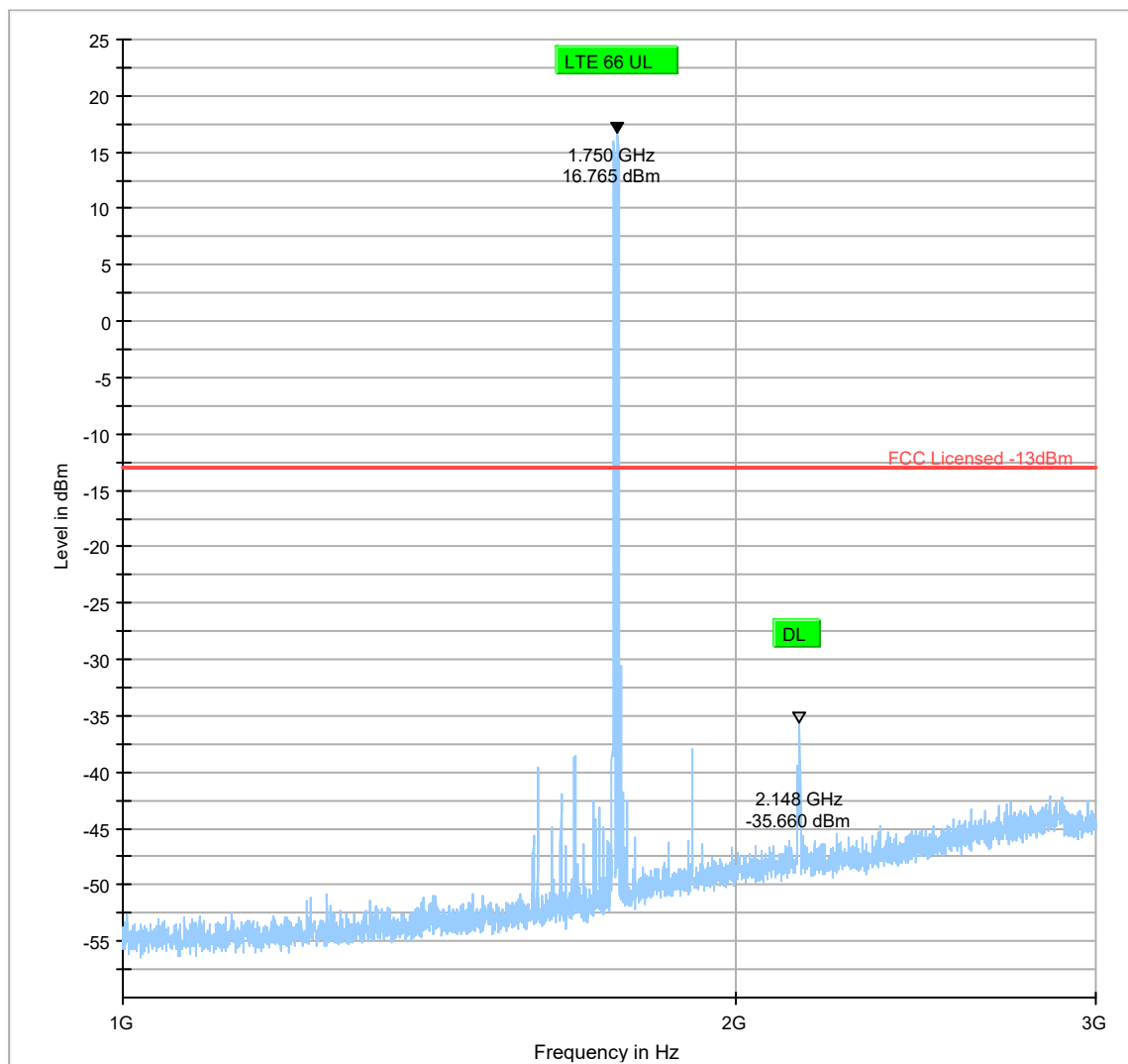


— RMS_MAXH
◆ Final_Result PK+

— PK+_MAXH
◆ Final_Result RMS

— FCC Licensed -13dBm

Plot # 45

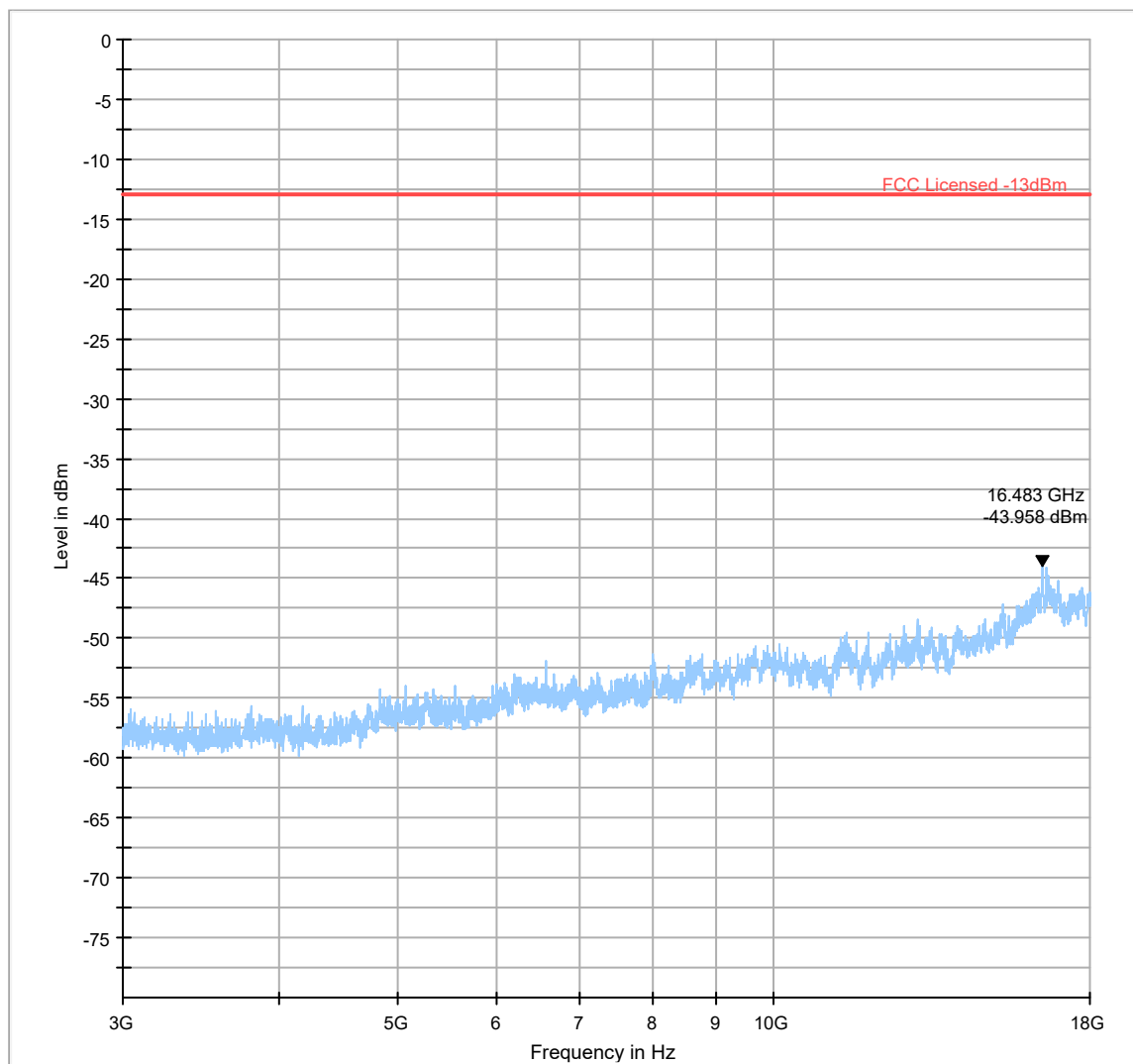


* RMS_MAXH
Critical_Freqs PK+
Final_Result RMS

PK+_MAXH
FCC Licensed -13dBm

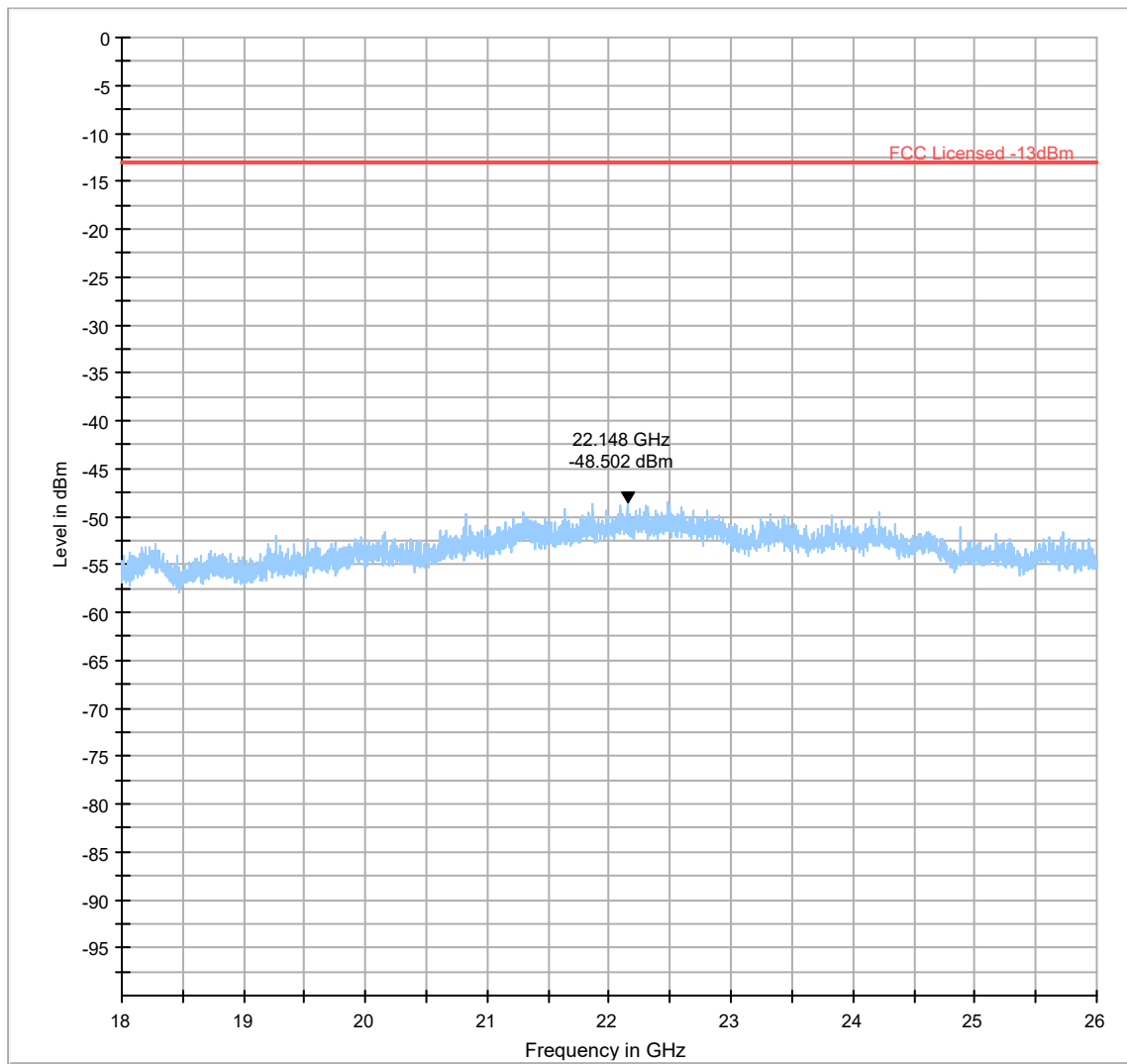
* Critical_Freqs RMS
Final_Result PK+

Plot # 46



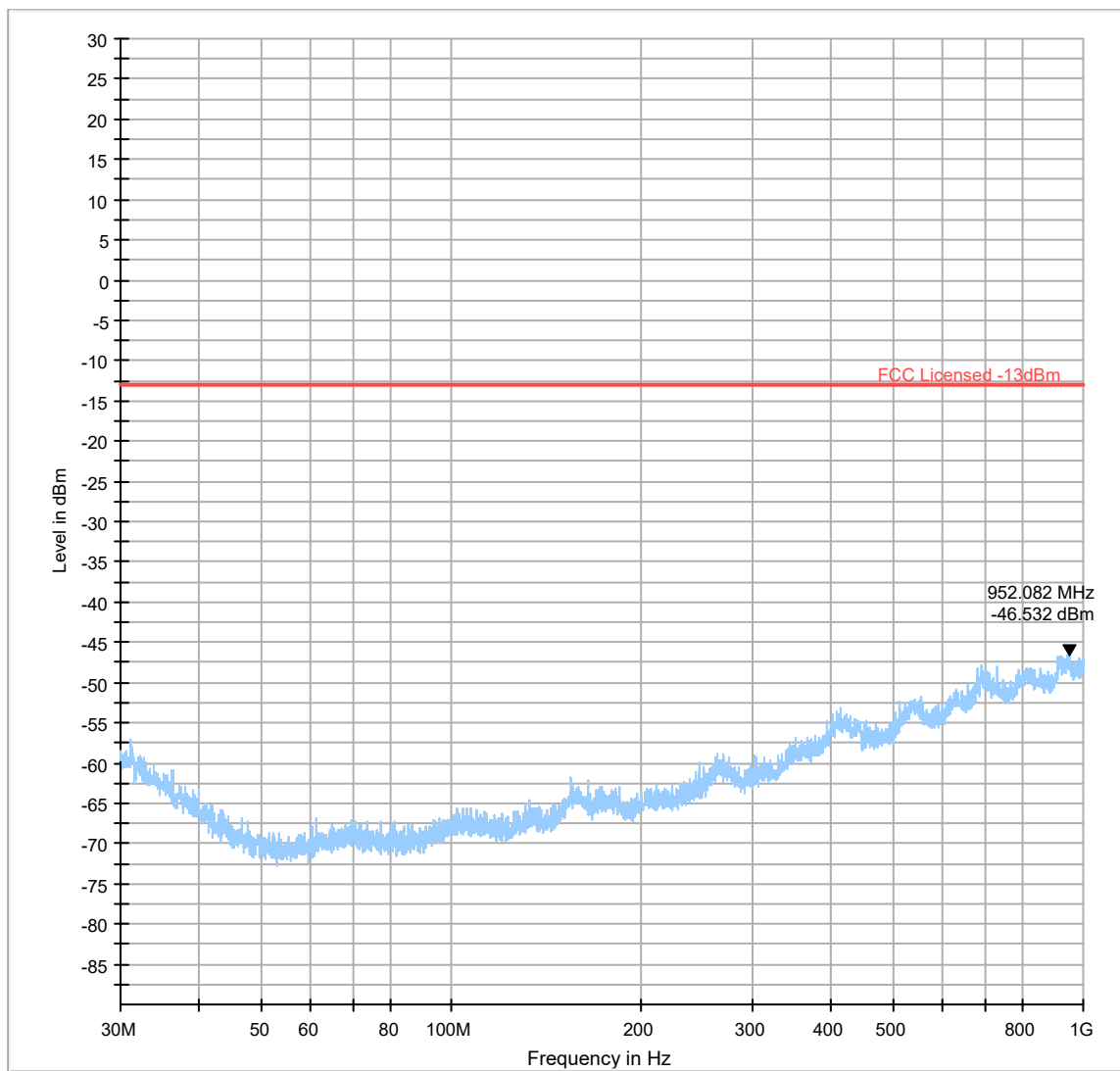
	RMS_MAXH		PK+_MAXH		Critical_Freqs RMS
	Critical_Freqs PK+		FCC Licensed -13dBm		Final_Result PK+
	Final_Result RMS				

Plot # 47



	RMS_MAXH		PK+_MAXH		Critical_Freqs RMS
	Critical_Freqs PK+		FCC Licensed -13dBm		Final_Result PK+
	Final_Result RMS				

Plot # 48



— RMS_MAXH
◆ Final_Result PK+

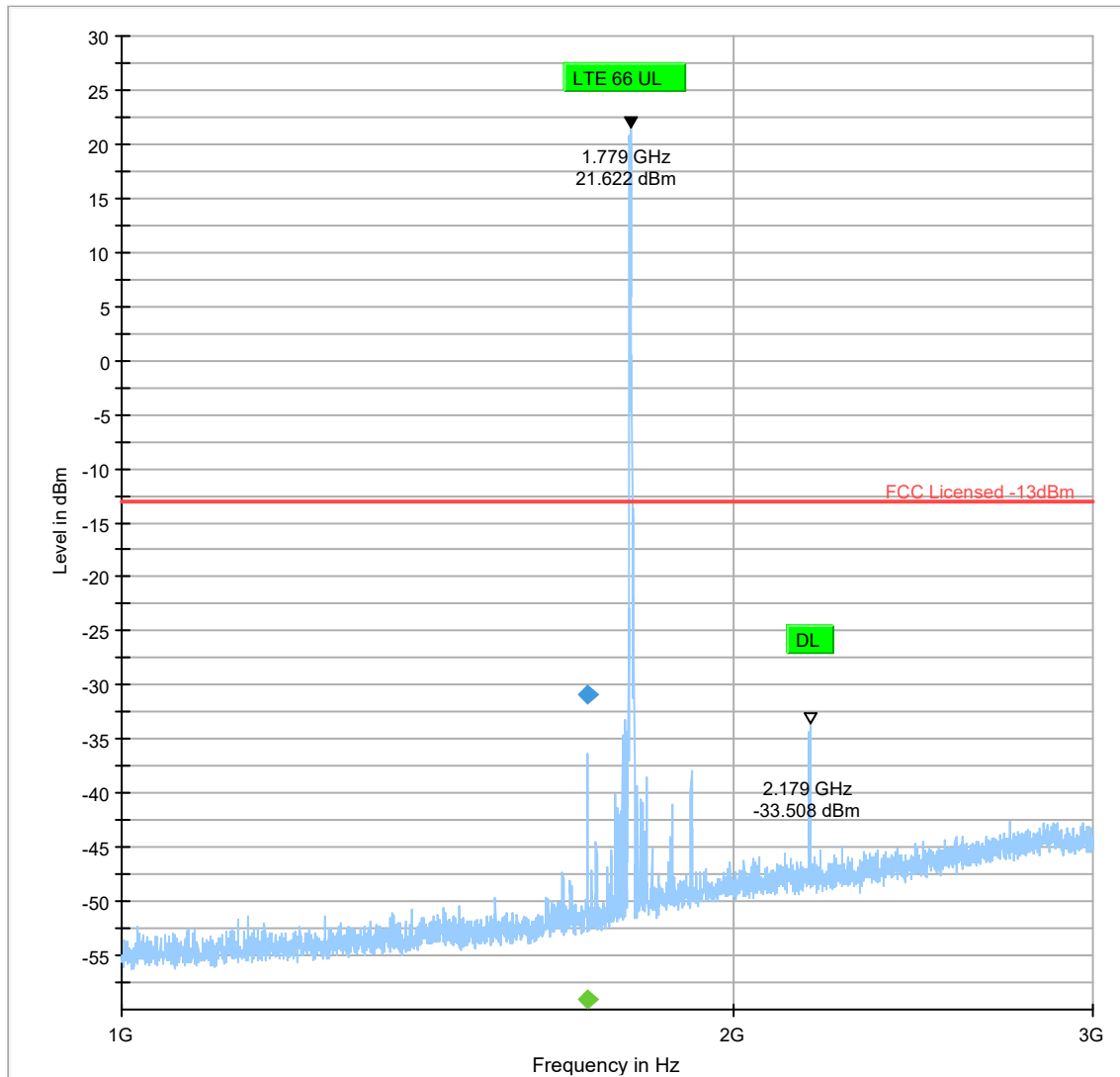
— PK+ MAXH
◆ Final_Result RMS

— FCC Licensed -13dBm

Plot # 49

Final_Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
1694.500	---	-59.03	---	---	500.0	1000.0	381.0	V	39.0	-65.0	
1694.500	-30.94	---	-13.00	17.94	500.0	1000.0	381.0	V	39.0	-65.0	



◆ RMS_MAXH
Final_Result PK+

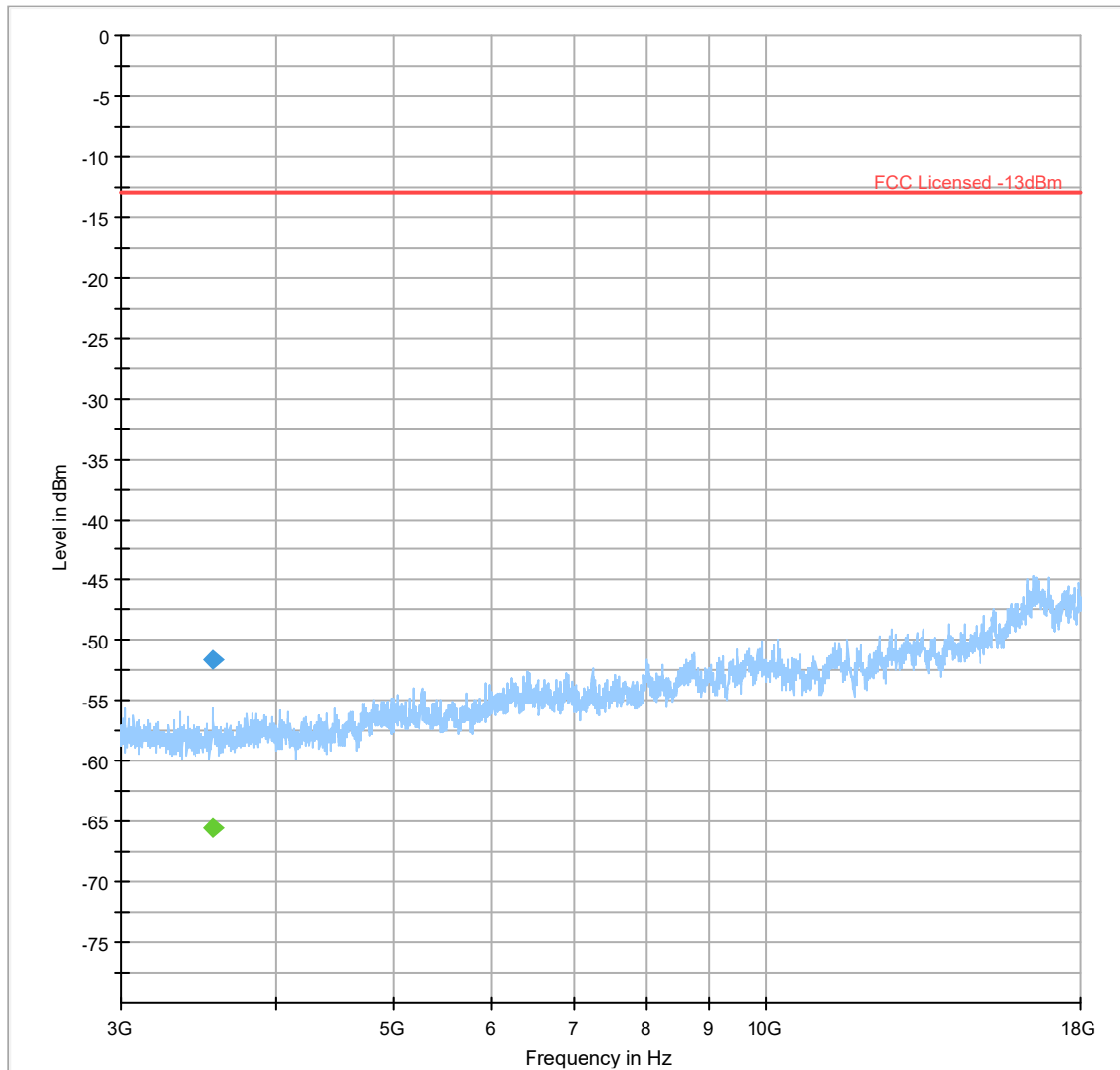
◆ PK+_MAXH
Final_Result RMS

— FCC Licensed -13dBm

Plot # 50

Final_Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
3558.500	---	-65.49	---	---	500.0	1000.0	119.0	H	74.0	-100.6	
3558.500	-51.61	---	-13.00	38.61	500.0	1000.0	119.0	H	74.0	-100.6	

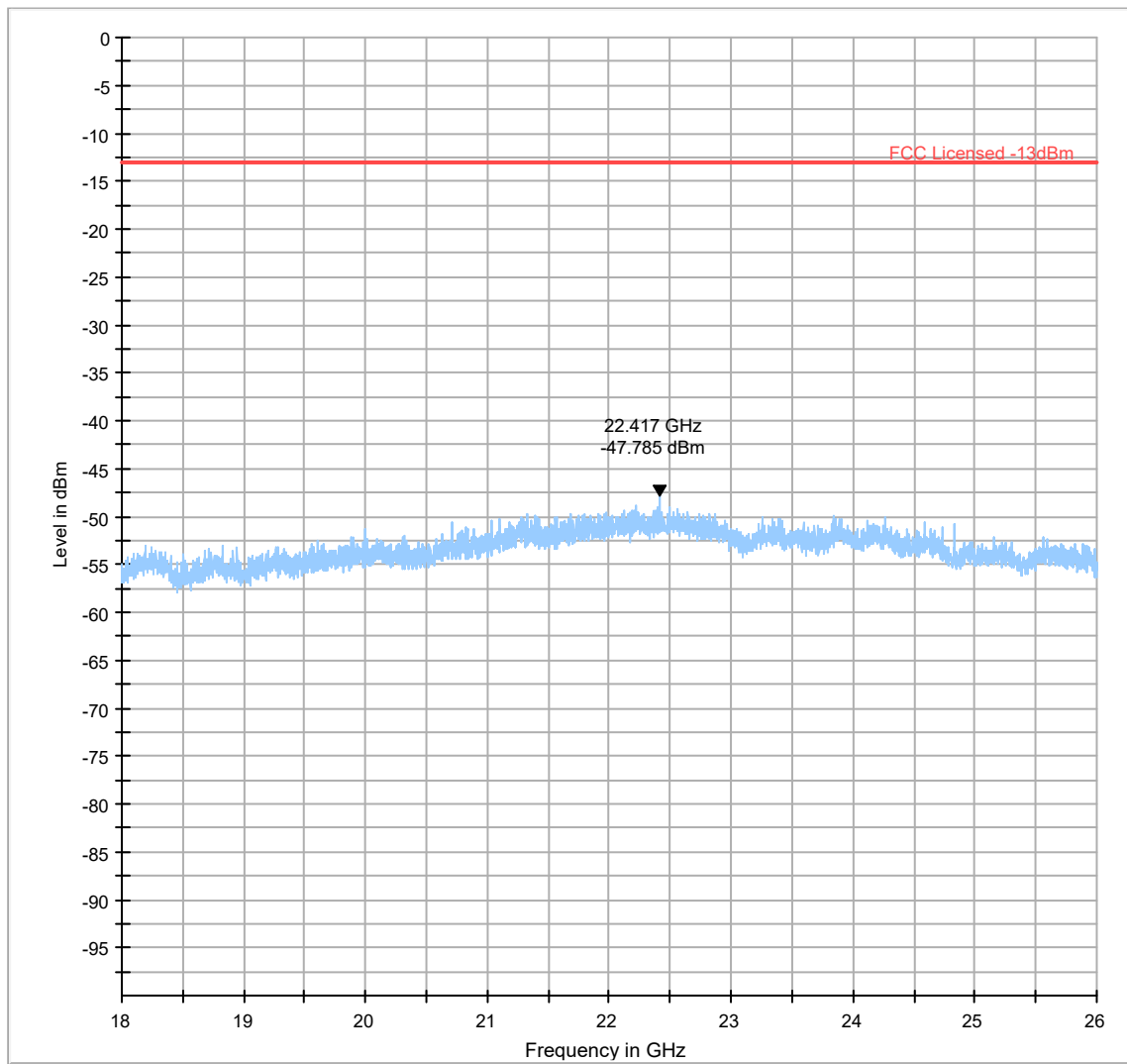


— RMS_MAXH
◆ Final_Result PK+

— PK+_MAXH
◆ Final_Result RMS

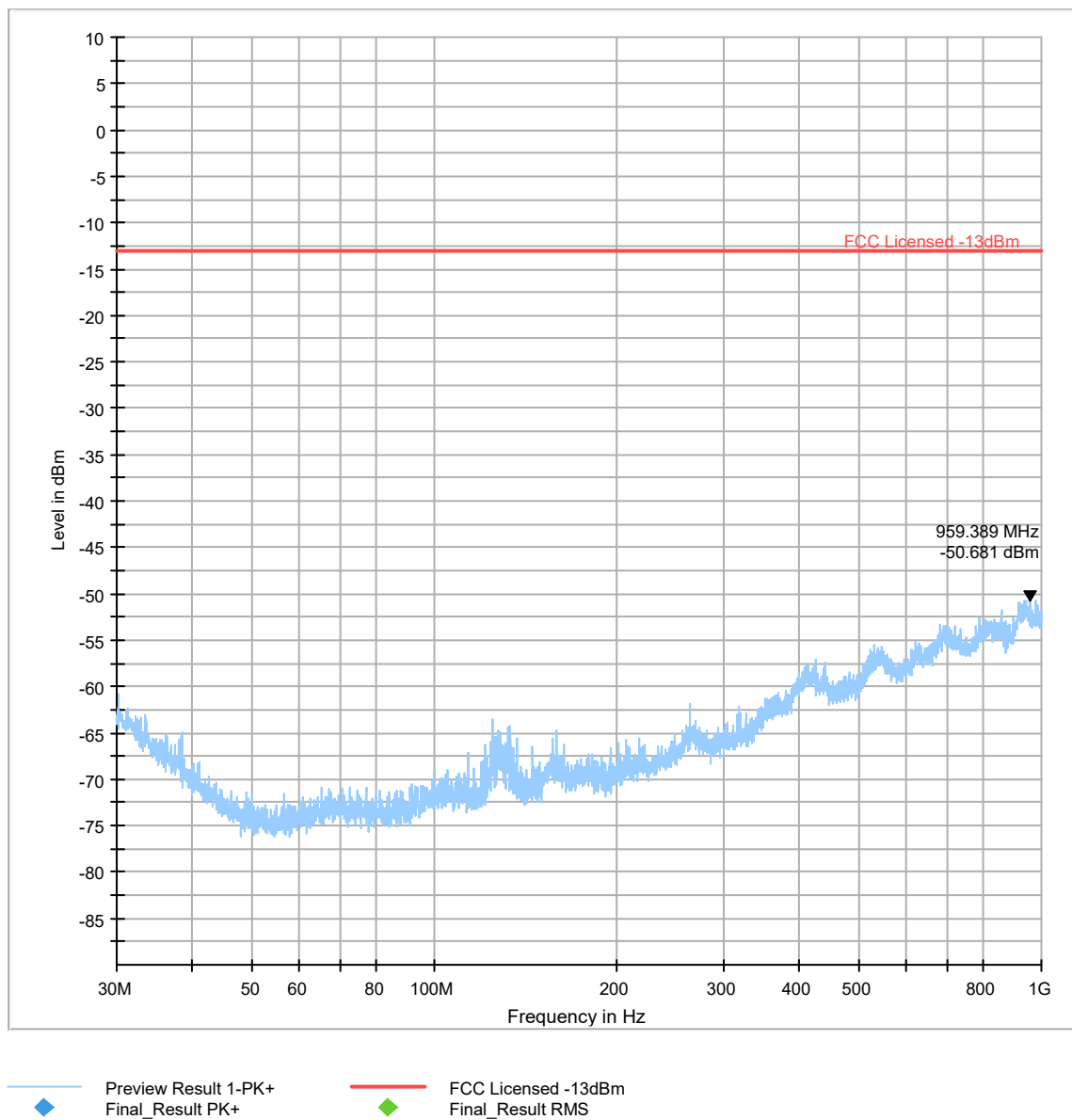
— FCC Licensed -13dBm

Plot # 51



	RMS_MAXH		PK+_MAXH		Critical_Freqs RMS
	Critical_Freqs PK+		FCC Licensed -13dBm		Final_Result PK+
	Final_Result RMS				

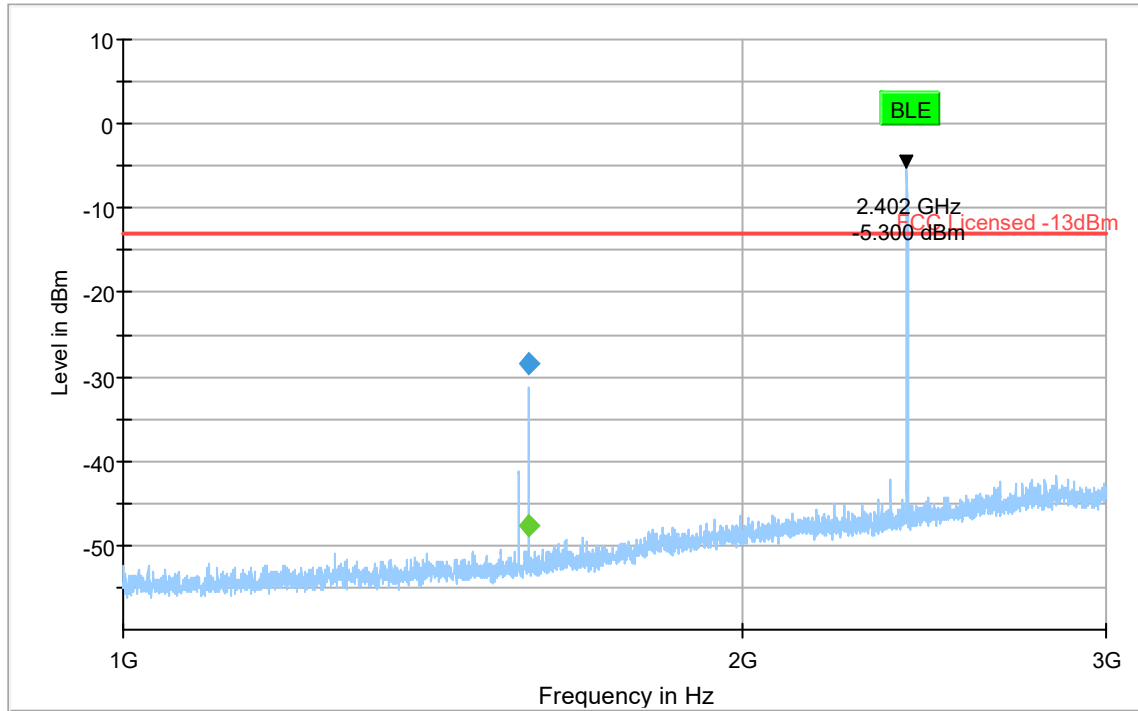
Plot # 52



Plot # 53

Final_Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
1572.750	---	-47.70	---	---	500.0	1000.0	100.0	H	13.0	-65.9	
1572.750	-28.44	---	-13.00	15.44	500.0	1000.0	100.0	H	13.0	-65.9	

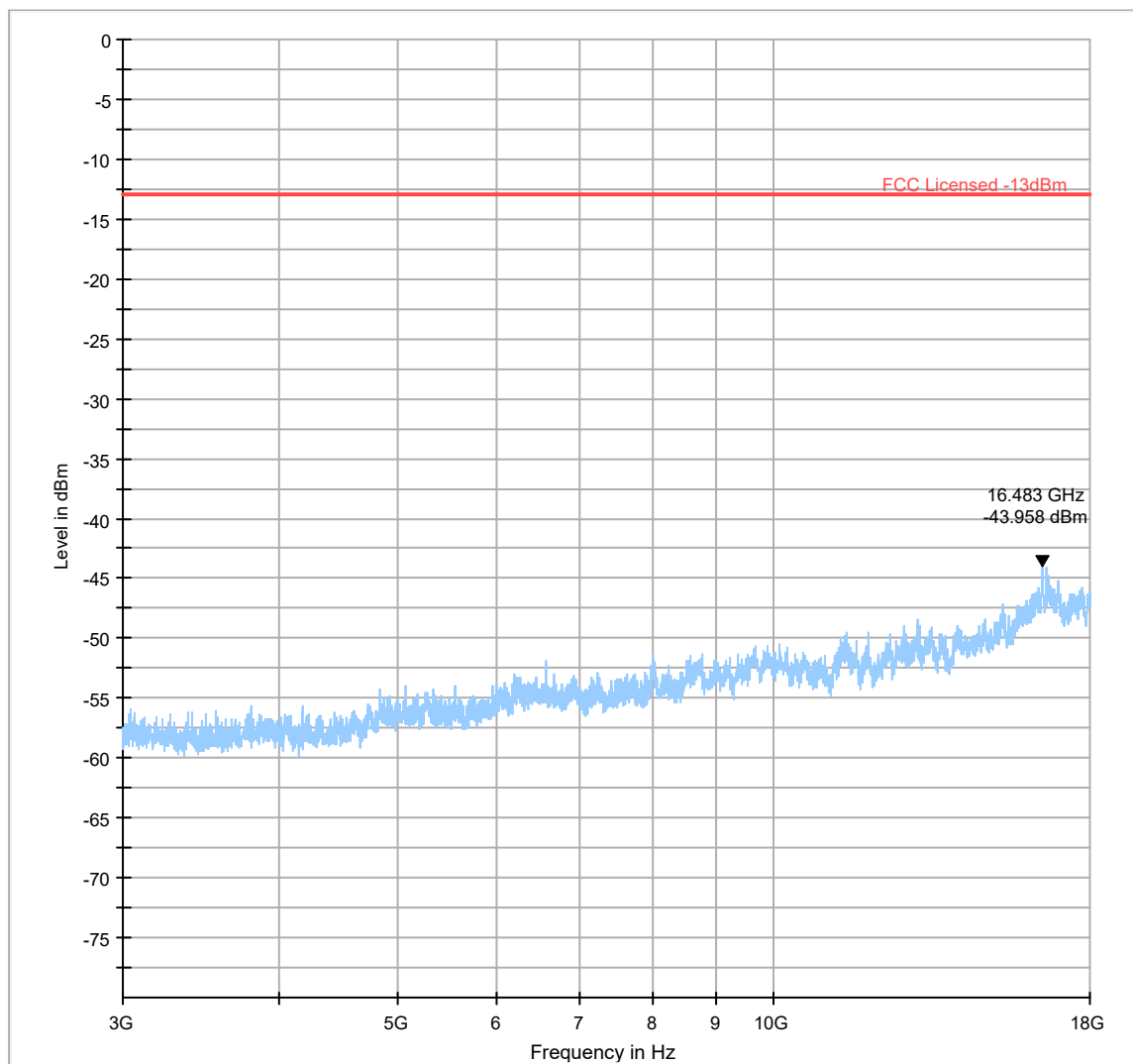


— RMS_MAXH
◆ Final_Result PK+

— PK+_MAXH
◆ Final_Result RMS

— FCC Licensed -13dBm

Plot # 54



	RMS_MAXH		PK+_MAXH		Critical_Freqs RMS
	Critical_Freqs PK+		FCC Licensed -13dBm		Final_Result PK+
	Final_Result RMS				

8 Test setup photos

Setup photos are included in supporting file name: "EMC_TELUL_118_23001_FCC_24_27_Setup_Photos"

9 Test Equipment And Ancillaries Used For Testing

Equipment Type	Manufacturer	Model	Serial #	Calibration Cycle	Last Calibration Date
BILOG ANTENNA	ETS.LINDGREN	3142E	00166067	3 Years	08/01/2024
HORN ANTENNA	EMCO	3115	00035114	3 Years	09/13/2023
HORN ANTENNA	ETS.LINDGREN	3117	00215984	3 Years	10/26/2023
HORN ANTENNA	ETS LINDGREN	3116C-PA	00166821	3 Years	10/26/2023
TEST RECEIVER	R&S	ESW44	103143	2 Years	09/12/2024
DIGITAL THERMOMETER	CONTROL COMPANY	4410,90080-03	230713059	3 Years	10/18/2023
Multimeter	Fluke	115	56090717MV	3 Years	09/26/2023
Software	EMC32	Version 11.40.00	-	-	-

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	Prepared by
2025-02-20	EMC_TELUL_118_23001_FCC_24_27	Initial Version	Art Thammanavarat
2025-04-28	EMC_TELUL_118_23001_FCC_24_27_Rev1	Updated FCC ID & ISED Section 7.1.4 & 7.1.5: Updated table and plots	Art Thammanavarat
2025-06-04	EMC_TELUL_118_23001_FCC_24_27_Rev2	Section 7.1.4 & 7.1.5: Updated table and plots	Alvin ILARINA

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