



FCC/ISED Test Report

FOR: Digi Wireless Design Services, Inc.

Marketing name: Onvation Hub

Model number: 51914

Product description: Accepts wireless transfer of end node sensor data. Uploads data to remote server periodically for tracking purposes.

FCC ID: 2AQVA-ONVAHUB51914

IC ID: 24318-ONVHUB51914

Per:

47 CFR: Part 22, Part 24, Part 27

RSS-130; RSS-132 Issue 3; RSS-133 Issue 6; RSS-139 Issue 3

REPORT #: EMC_DIGII_047_18001_FCC_22_24_27_ISED

DATE: 01/18/2019



A2LA Accredited

**IC recognized #
3462B-2**

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

TABLE OF CONTENTS

1	ASSESSMENT.....	3
2	ADMINISTRATIVE DATA	4
2.1	IDENTIFICATION OF THE TESTING LABORATORY ISSUING THE EMC TEST REPORT	4
2.2	IDENTIFICATION OF THE CLIENT	4
2.3	IDENTIFICATION OF THE MANUFACTURER.....	4
3	EQUIPMENT UNDER TEST (EUT).....	5
3.1	EUT SPECIFICATIONS	5
3.2	EUT SAMPLE DETAILS	6
3.3	ACCESSORY EQUIPMENT	7
3.4	TEST SAMPLE CONFIGURATION	7
3.5	MODE OF OPERATION DETAILS	7
3.6	JUSTIFICATION FOR WORST CASE MODE OF OPERATION.....	8
4	SUBJECT OF INVESTIGATION	9
4.1	DATES OF TESTING:	9
4.2	MEASUREMENT UNCERTAINTY	9
4.3	ENVIRONMENTAL CONDITIONS DURING TESTING:	9
5	MEASUREMENT PROCEDURES.....	10
5.1	RADIATED MEASUREMENT.....	10
5.2	SAMPLE CALCULATIONS FOR FIELD STRENGTH MEASUREMENTS	12
6	MEASUREMENT RESULTS SUMMARY	13
6.1	FCC 22, RSS-132:	13
6.2	FCC 24, RSS-133:	14
6.3	FCC 27, RSS-130, RSS-139:	15
7	TEST RESULT DATA	16
7.1	7.1 E(I)RP.....	16
7.2	RADIATED SPURIOUS EMISSIONS.....	17
8	TEST SETUP PHOTOS.....	101
9	TEST EQUIPMENT AND ANCILLARIES USED FOR TESTING	101
10	REVISION HISTORY	101

1 Assessment

The following device as further described in section 3 of this report was evaluated for radiated spurious emissions in simultaneous transmission of cellular and unlicensed radios according to criteria specified in the Code of Federal Regulations Title 47 parts 22, 24, 27 and Industry Canada Radio Standard Specifications RSS: 130, 132 Issue 3, 133 Issue 6 and 139 Issue3.

Company	Description	Model #
Digi Wireless Design Services, Inc.	Accepts wireless transfer of end node sensor data. Uploads data to remote server periodically for tracking purposes.	51914

No deficiencies were ascertained.

Responsible for Testing Laboratory:

01/18/2019	Compliance	Cindy Li (Lab Manager)	
Date	Section	Name	Signature

Responsible for the Report:

01/18/2019	Compliance	Issa Ghanma (EMC Engineer)	
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
Lab Manager:	Cindy Li
Responsible Project Leader:	Sangeetha Sivaraman

2.2 Identification of the Client

Applicant's Name:	Digi Wireless Design Services, Inc.
Street Address:	11001 Bren Rd E
City/Zip Code	Minnetonka, MN 55343
Country	USA

2.3 Identification of the Manufacturer

Manufacturer's Name:	Kimberly-Clark Professional
Manufacturers Address:	1400 Holcomb Bridge Road
City/Zip Code	Roswell, GA 30076
Country	USA

3 Equipment Under Test (EUT)**3.1 EUT Specifications**

Firmware Version Identification Number (FVIN):	1.0
Hardware Version Identification Number (HVIN):	51914
Product Marketing Name (PMN):	HUB
Antenna (Primary & Diversity) Information as declared:	Primary antenna maximum gain: 3.93 dBi Diversity antenna maximum gain: 3.62 dBi
Other Radios included in the device:	❖ <u>Bluetooth LE:</u> • Module name: Nordic • Model number: nRF52832 ❖ <u>ZigBee:</u> • Product name: XBee-PRO S2C • Model number: PRO S2C • FCC ID: MCQ-PS2CTH • IC ID:1846A-PS2CTH
Power Supply/ Rated Operating Voltage Range:	Low 12VDC, Nominal 12VDC, High 24VDC
Operating Temperature Range:	Low 0° C, Nominal 27° C, High 50° C
Sample Revision	☐ Prototype Unit; ☐ Production Unit; ☒ Pre-Production
EUT Dimensions(mm):	15 x 15 x 5
Weight(grams):	0.9kg (2 lbs)
EUT Diameter	☒ < 60 cm ☐ Other _____

Module Information

Module Name:	Telit
Model Number:	LE910C1-NA
FCC ID:	RI7LE910C1NA
IC ID:	5131A-LE910C1NA

3.2 EUT Sample details

EUT #	Unit number	HW Version	SW Version	Notes/Comments
1	D72	1.0	1.0	Radiated Measurement / -

3.3 Accessory Equipment

AE #	Comments
1	TPE-115GI / A (H/W:V1.1R)TRENDNET - Gigabit POE + Injector, S/N: JW16525G0026 - Input: 100-240VAC, 50/60Hz, 1.2A - Output: 53V/0.566A
2	TRIAD Switching Mode Power Supply - P/N: WSX120-2000-13 - Model: WSX120-2000 - Input: 100-240V_50/60Hz 0.8A MAX - Output: 12.0V/2.0A

3.4 Test Sample Configuration

EUT Set-up #	Combination of AE used for test set up	Comments
1	EUT# 1 + AE# 1	Worst Case

3.5 Mode of Operation details

Mode of Operation	Description of Operating modes	Additional Information
Op. 1	Cellular and ZigBee Co-Transmission	Cellular was tested on Low, Mid, High Channels at the maximum power in a co-transmission mode. Putty terminal tool and special commands provided by the customer used to configure the ZigBee radio to: - Modulated TX carrier. - Low, Mid, High channel. - Maximum Power. - Highest duty cycle. The commands will not be available to the end user. For radiated measurements: The internal antenna was connected.

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 ZigBee radio, channel 25. Which it is the worst case of the radios supported, based on the maximum conducted output power from the modular grant and 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 evaluation conducted by CETECOM Inc. is to support a request for new equipment authorization under **FCC ID: 2AQVAONVAHUB51914 / IC ID: 24318-ONVHUB51914**

The pre-certified module to be integrated (Telit LE310C1-NA) as described in Section 3, Radiated Spurious Emissions test was performed. Results have been checked to meet limits per Code of Federal Regulations Title 47 parts 22, 24, 27 and Industry Canada Radio Standard Specifications RSS: 130, 132 Issue 3, 133 Issue 6 and 139 Issue 3.

The conducted module test data that can be obtained under the **FCC Filing ID: RI7LE910C1NA / IC ID: 5131A-LE910C1NA** is applicable for the host described in section 3.

4.1 Dates of Testing:

10/31/2018 – 12/07/2018

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)

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%

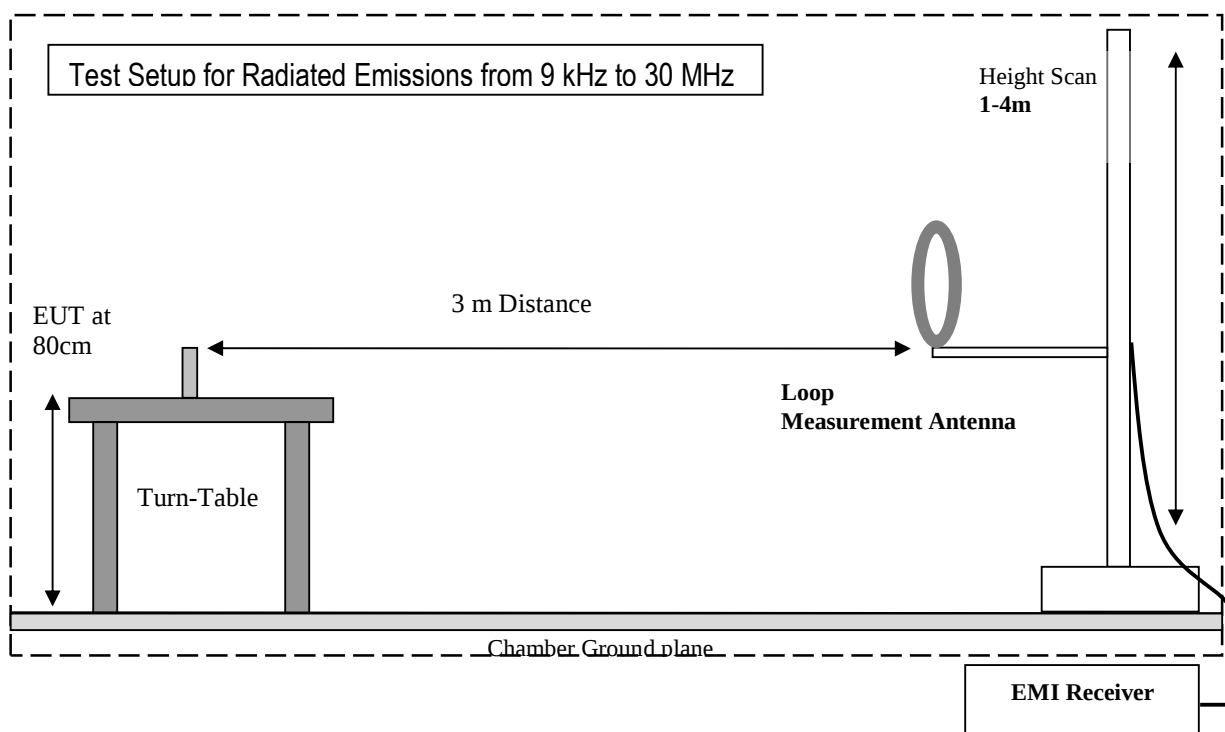
Deviating test conditions are indicated at individual test description where applicable.

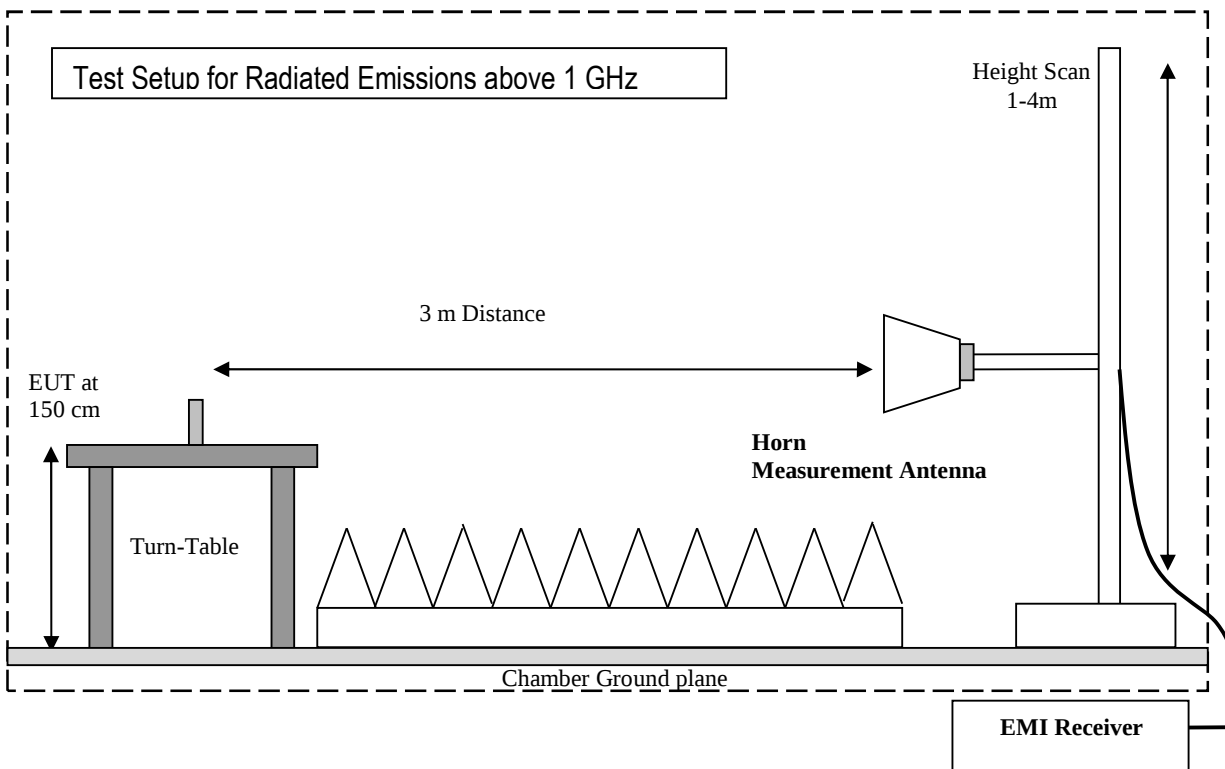
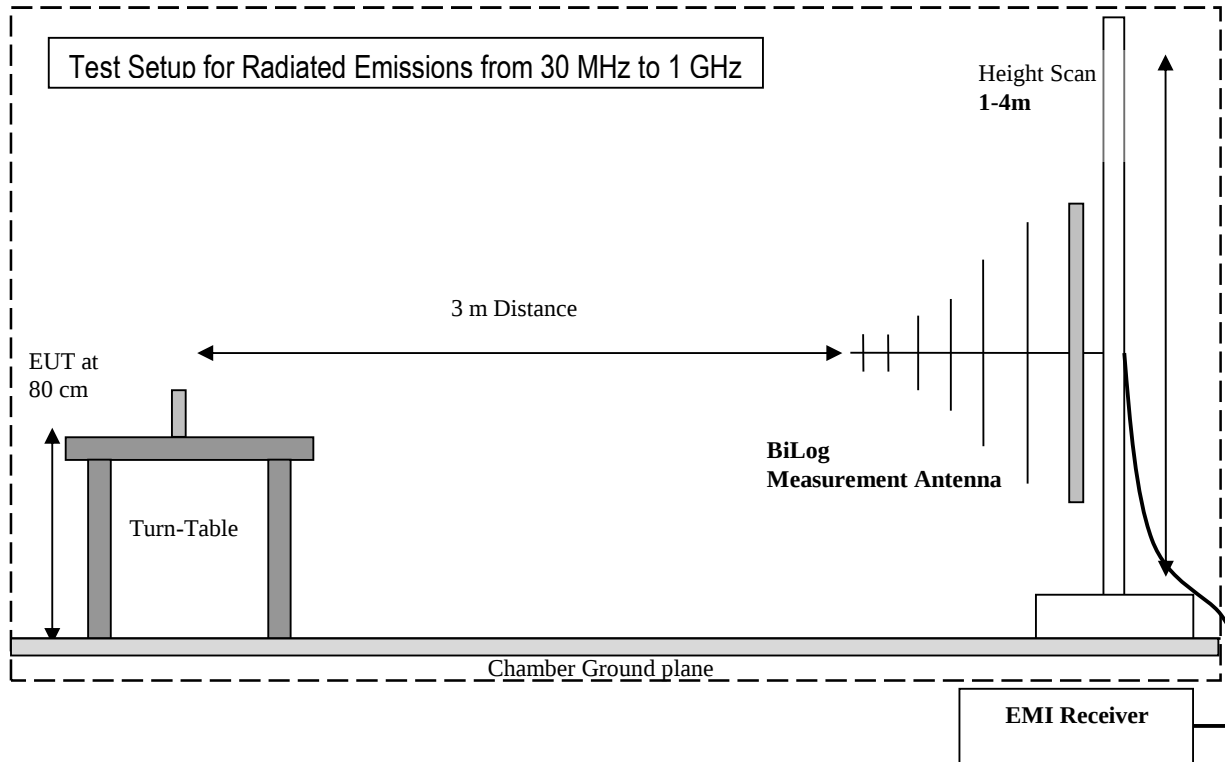
5 Measurement Procedures

Testing is performed according to the guidelines provided in FCC publication (KDB) 971168 D01 v03 – “Measurement Guidance for Certification of Licensed Digital Transmitters” and according to ANSI C63.26 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.





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 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
§2.1055; §22.355	Frequency Stability	Nominal	-	□	□	□	■	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(a); RSS-132 Issue 3-5.5;	Radiated Spurious Emissions	Nominal	Op.1	■	□	□	□	Complies

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

Note 2: Leveraged from module certification FCC ID: R17LE910C1NA / IC ID: 5131A-LE910C1NA

6.2 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	-	■	□	□	□	Complies
§2.1055; §24.235	Frequency Stability	Nominal	-	□	□	□	■	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(a); RSS-133 Issue 6-6.5.1;	Radiated Spurious Emissions	Nominal	Op.1	■	□	□	□	Complies

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

Note 2: Leveraged from module certification FCC ID: R17LE910C1NA / IC ID: 5131A-LE910C1NA

6.3 FCC 27, RSS-130, RSS-139:

Test Specification	Test Case	Temperature and Voltage Conditions	Mode	Pass	Fail	NA	NP	Result
§2.1046; §27.50 (d)	RF Output Power	Nominal	-	■	□	□	□	Complies
§2.1055; §27.54	Frequency Stability	Nominal	-	□	□	□	■	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(g); §27.53(h); RSS-130 Issue 1-4.6; RSS-139 Issue 3-6.6;	Radiated Spurious Emissions	Nominal	Op.1	■	□	□	□	Complies

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

Note 2: Leveraged from module certification FCC ID: R17LE910C1NA / IC ID: 5131A-LE910C1NA

7 Test Result Data**7.1 7.1 E(I)RP**

The following tables evaluates the E(I)RP for the EUT based on the highest power and highest bandwidth modes for each supported radio technology based on the conducted reports for the cellular module FCC ID: RI7LE910C1NA by adding the maximum declared gains of the antennas on the host product.

The limit of 2W EIRP is met for part 24E. The limit of 7W ERP is met for part 22H. The limit of 3W ERP is met for part 27 LTE12. The limit of 1 W EIRP is met for part 27 LTE 4 and UMTS IV.

Radio	part	f range MHz	power W	f dev	ident	gain in dBi	gain lin	EIRP W	ERP W
GPRS 850	22H	824.0 - 849.0	2.228	1.0 PM	244KGXW	2.7	1.86		2.53
GPRS 1900	24E	1850.0 - 1910.0	0.986	1.0 PM	248KGXW	2.9	1.95	1.92	
EGPRS 850	22H	824.0 - 849.0	0.372	1.0 PM	247KGXW	2.7	1.86		0.42
EGPRS 1900	24E	1850.0 - 1910.0	0.287	1.0 PM	246KGXW	2.9	1.95	0.56	
UMTS V	22H	824.0 - 849.0	0.230	1.0 PM	4M15F9W	2.7	1.86		0.26
UMTS II	24E	1850.0 - 1910.0	0.238	1.0 PM	4M14F9W	2.9	1.95	0.46	
UMTS IV	27	1710.0 - 1755.0	0.285	1.0 PM	4M13F9W	3.9	2.45	0.7	
LTE 2	24E	1850.0 - 1910.0	0.231	1.0 PM	1M10G7W	2.9	1.95	0.45	
LTE 2	24E	1850.0 - 1910.0	0.219	1.0 PM	9M04G7W	2.9	1.95	0.43	
LTE 4	27	1710.0 - 1755.0	0.273	1.0 PM	1M10G7W	3.9	2.45	0.67	
LTE 4	27	1710.0 - 1755.0	0.248	1.0 PM	9M04G7W	3.9	2.45	0.61	
LTE 12	27	699.0 - 716.0	0.215	1.0 PM	2M73G7W	2.7	1.86		0.24
LTE 12	27	699.0 - 716.0	0.199	1.0 PM	8M97G7W	2.7	1.86		0.23

7.2 Radiated Spurious Emissions

7.2.1 Measurement according to FCC: CFR 47 Part 2.1053; CFR Part 22.917; CFR Part 24.238, Part 27.53 utilizing KDB 971168 D01 Power Meas License Digital Systems v03, and according to ANSI C63.26 2017

Spectrum Analyzer Settings for FCC 22

Frequency Range	30 MHz – 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:

- FCC Part 22.917(a) and Part 24.238(a), Part 27.53 (g), and Part 27.53 (h)
- RSS-130-4.6, RSS-132 Issue 3 5.5, RSS-133 Issue 6 6.5.1, RSS-139 Issue 3 6.6

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 = (-13dBm)

7.2.3 Test conditions and setup:

Ambient Temperature (C)	EUT operating mode	Power Input
22	Op. 1	12 VDC

7.2.4 Measurement result:

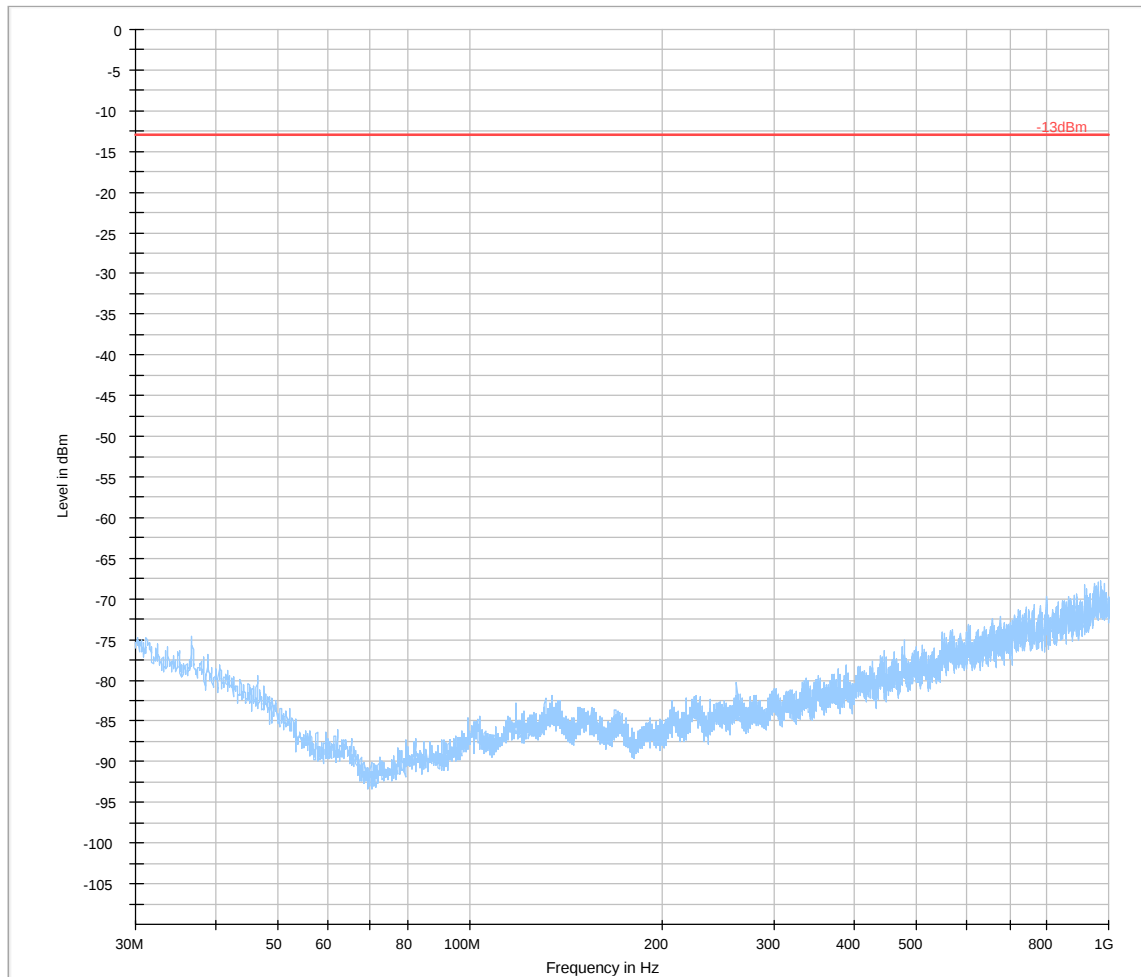
Plot #	Cellular Channel	EUT operating mode	Scan Frequency	Critical Frequency [MHz]	Emission level [dBm]	Limit [dBm]	Result
1 – 3	Low	WCDMA II	30 MHz – 18 GHz	3097.49	-25.22	-13	Pass
4 – 8	Mid	WCDMA II	9 kHz – 26 GHz	3070.16	-26.66	-13	Pass
9 – 11	High	WCDMA II	30 MHz – 18 GHz	7423.44	-27.71	-13	Pass
12 – 14	Low	WCDMA IV	30 MHz – 18 GHz	3235.35	-27.49	-13	Pass
15 – 18	Mid	WCDMA IV	9 kHz – 18 GHz	3217.22	-26.36	-13	Pass
19 – 21	High	WCDMA IV	30 MHz – 18 GHz	3199.63	-26.28	-13	Pass
22 - 24	Low	WCDMA V	30 MHz – 9 GHz	1647.78	-32.63	-13	Pass
25 – 28	Mid	WCDMA V	9 kHz – 9 GHz	3.83	-20.76	-13	Pass
29 – 31	High	WCDMA V	30 MHz – 9 GHz	7426.47	-34.05	-13	Pass
32 – 34	Low	LTE 2	30 MHz – 18 GHz	3094.09	-23.00	-13	Pass
35 – 39	Mid	LTE 2	9 kHz – 26 GHz	3069.05	-23.13	-13	Pass
40 - 42	High	LTE 2	30 MHz – 18 GHz	3046.18	-24.40	-13	Pass
43 - 45	Low	LTE 4	30 MHz – 18 GHz	3235.91	-25.71	-13	Pass
46 – 49	Mid	LTE 4	9 kHz – 18 GHz	3216.54	-27.28	-13	Pass
50 - 52	High	LTE 4	30 MHz – 18 GHz	3198.95	-26.79	-13	Pass
53 - 55	Low	LTE 12	30 MHz – 9 GHz	7423.45	-36.41	-13	Pass
56 - 59	Mid	LTE 12	9 kHz – 9 GHz	0.009	-19.02	-13	Pass
60 - 62	High	LTE 12	30 MHz – 9 GHz	7426.51	-33.58	-13	Pass
63 – 65	Low	GSM850	30 MHz – 9 GHz	1650.32	-27.10	-13	Pass
66 – 79	Mid	GSM850	9 kHz – 9 GHz	1639.20	-29.24	-13	Pass
70 – 72	High	GSM850	30 MHz – 9 GHz	1625.5	-28.85	-13	Pass
73 – 75	Low	GSM1900	30 MHz – 18 GHz	3098.84	-21.64	-13	Pass
76 – 79	Mid	GSM1900	9 kHz – 18 GHz	3071.02	-21.07	-13	Pass
80 – 82	High	GSM1900	30 MHz – 18 GHz	3039.11	-25.33	-13	Pass

7.2.5 Measurement Plots:

WCDMA Band II

Plot # 1 Radiated Emissions: 30 MHz - 1 GHz

Channel: Low



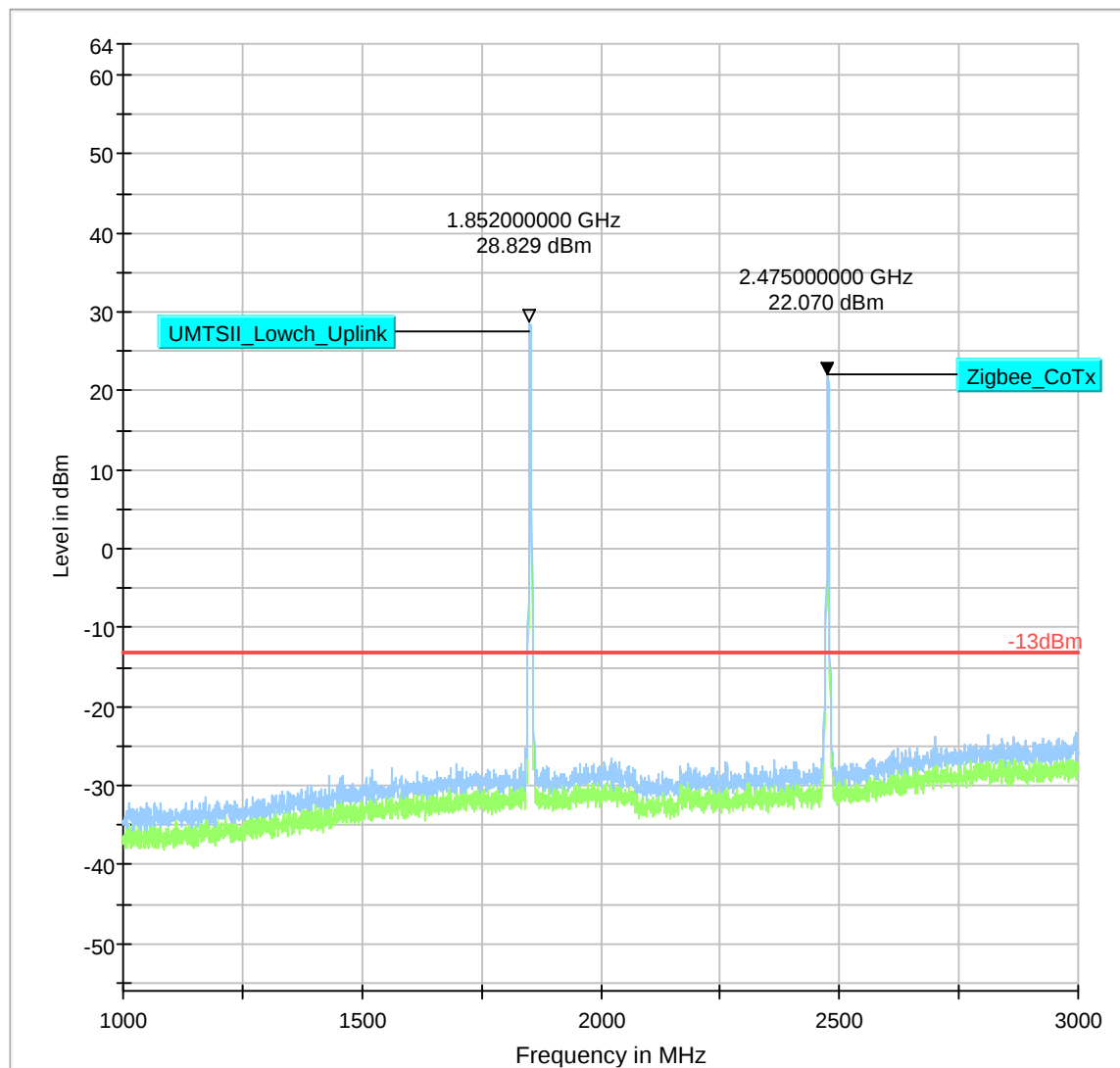
Preview Result 2-RMS
Critical_Freqs PK+
Final_Result RMS

Preview Result 1-PK+
-13dBm

* Critical_Freqs RMS
◆ Final_Result PK+

Plot # 2 Radiated Emissions: 1 GHz - 3 GHz

Channel: Low



Preview Result 2-RMS
Critical_Freqs PK+
Final_Result RMS

Preview Result 1-PK+
-13dBm

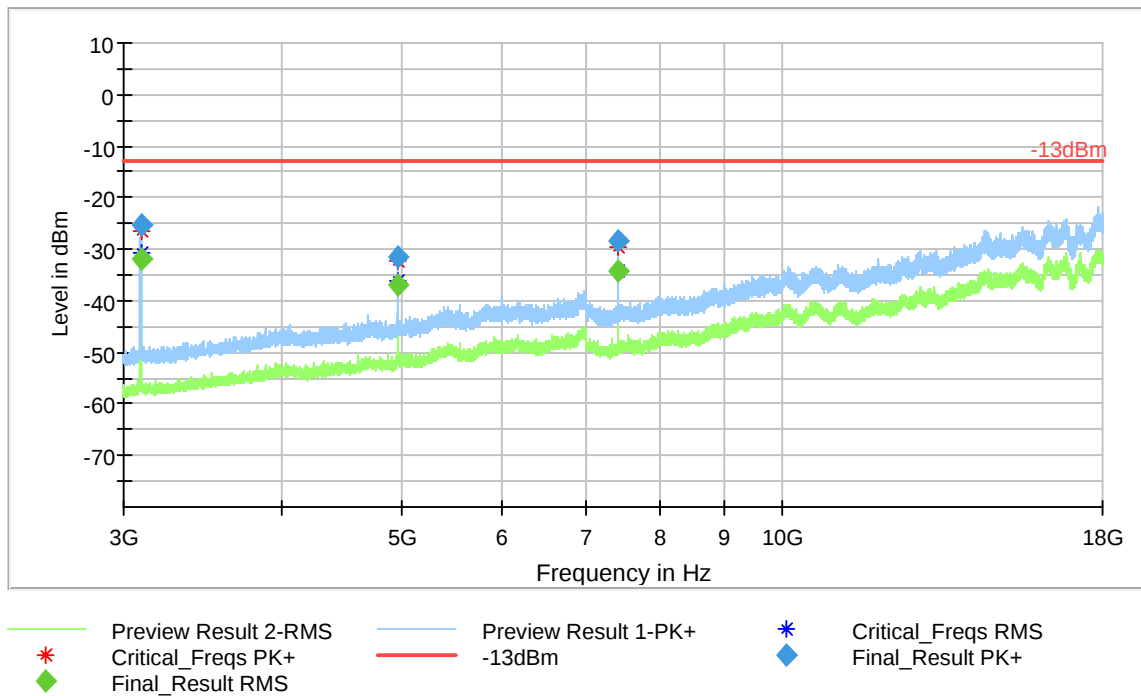
Critical_Freqs RMS
Final_Result PK+

Plot # 3 Radiated Emissions: 3 GHz - 18 GHz

Channel: Low

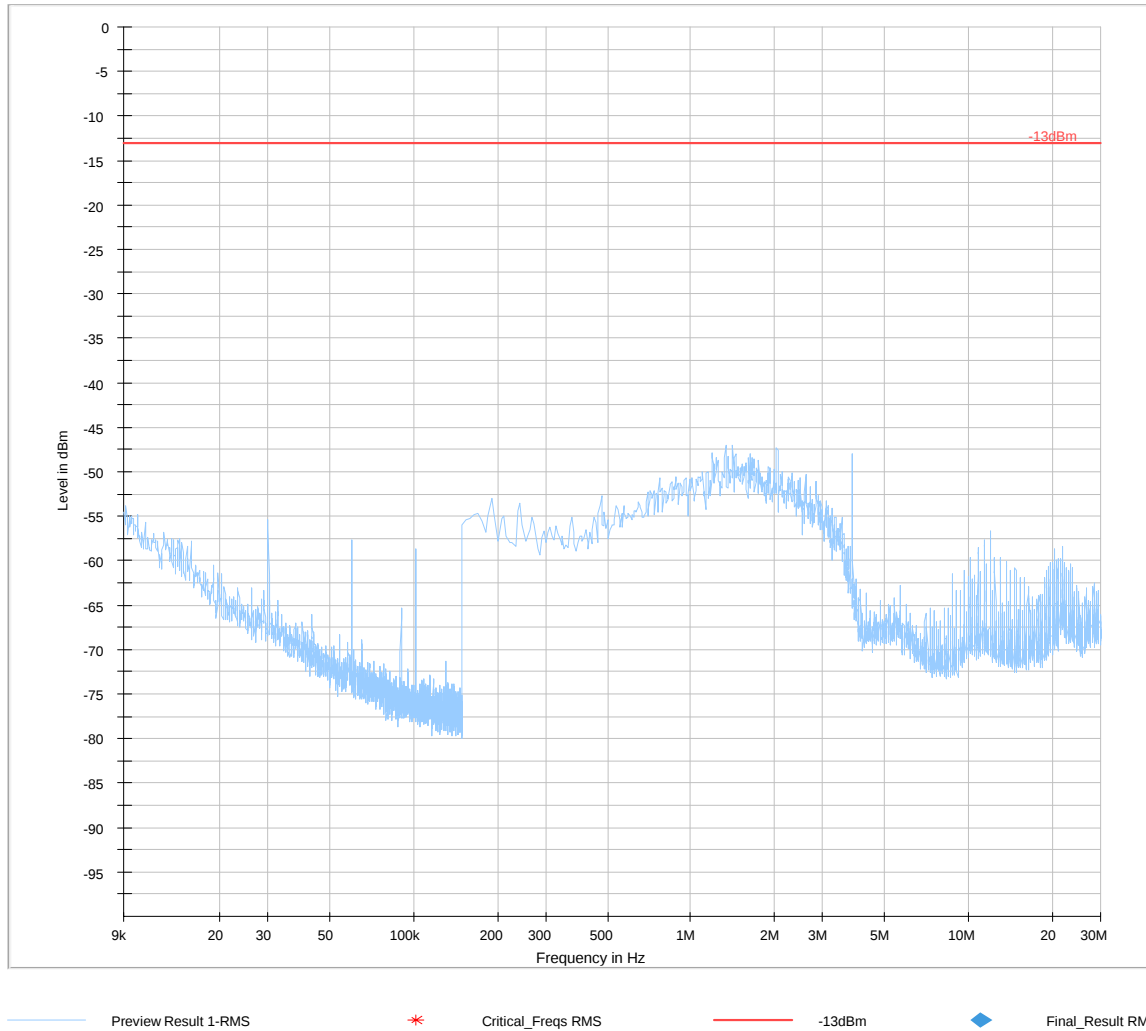
Final Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
3097.49	-25.22	---	-13.00	12.22	200.0	1000.000	147.0	V	93.0	-105.0	1:22:06 PM - 11/13/2018
3097.58	---	-32.00	---	---	200.0	1000.000	274.0	H	78.0	-105.0	1:31:23 PM - 11/13/2018
4951.06	---	-37.00	---	---	200.0	1000.000	158.0	H	105.0	-101.5	1:34:33 PM - 11/13/2018
4951.13	-31.59	---	-13.00	18.59	200.0	1000.000	164.0	H	105.0	-101.5	1:25:17 PM - 11/13/2018
7423.46	-28.57	---	-13.00	15.57	200.0	1000.000	161.0	H	117.0	-97.8	1:28:23 PM - 11/13/2018
7426.66	---	-34.23	---	---	200.0	1000.000	162.0	H	117.0	-97.8	1:37:40 PM - 11/13/2018



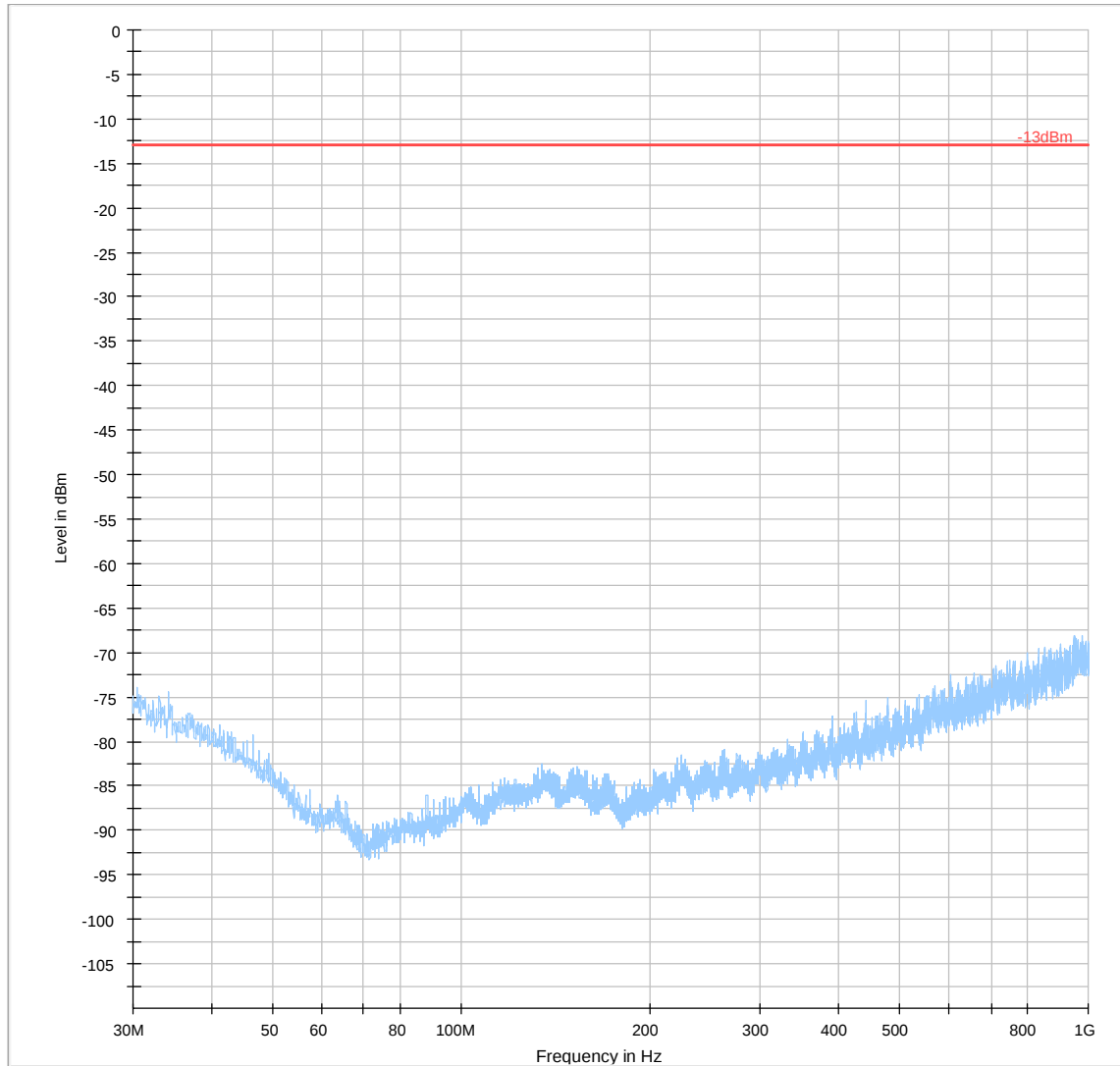
Plot # 4 Radiated Emissions: 9 kHz - 30 MHz

Channel: Mid



Plot # 5 Radiated Emissions: 30 MHz – 1GHz

Channel: Mid



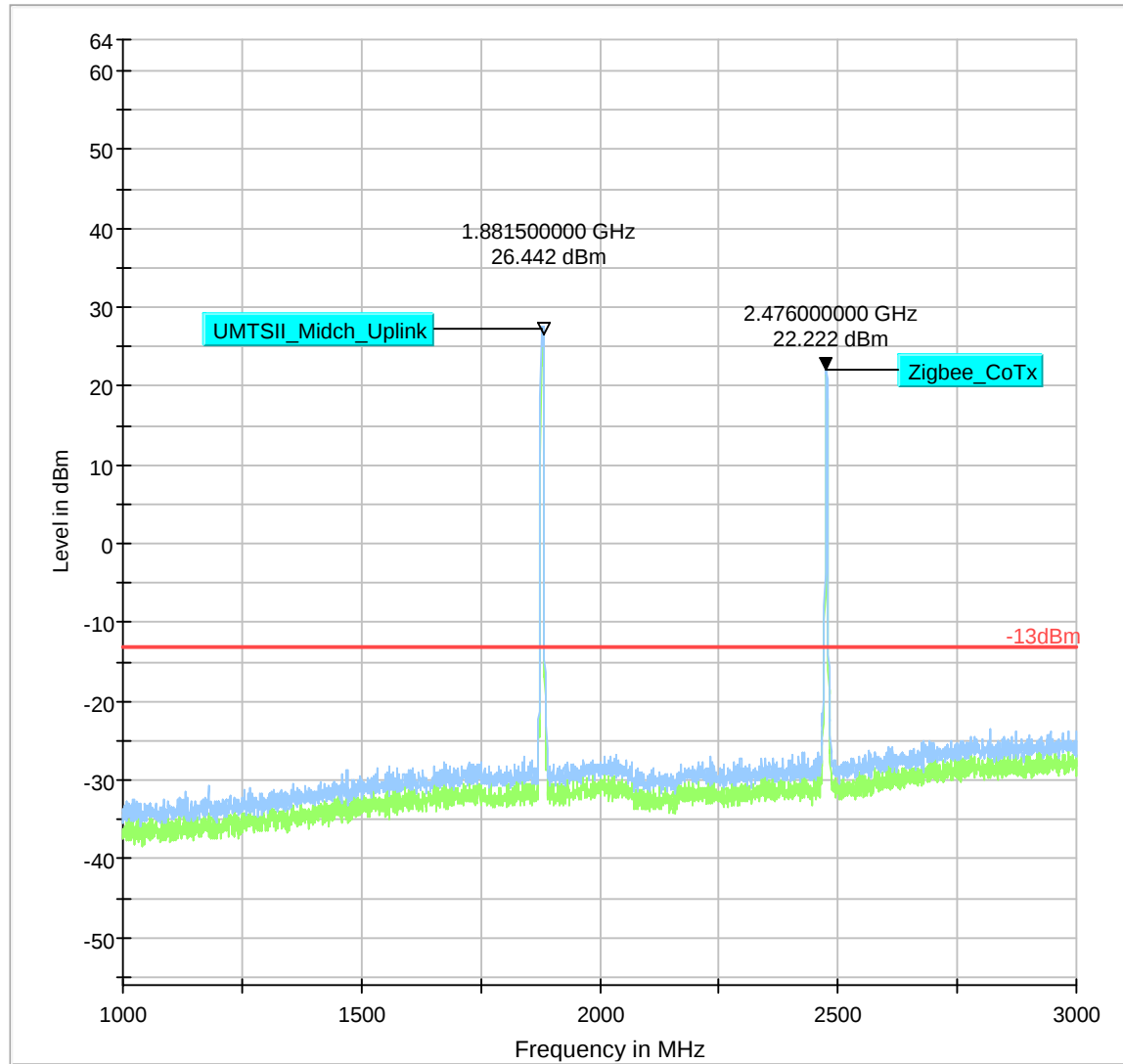
Preview Result 2-RMS
Critical_Freqs PK+
Final_Result RMS

Preview Result 1-PK+
-13dBm

Critical_Freqs RMS
Final_Result PK+

Plot # 6 Radiated Emissions: 1 GHz - 3 GHz

Channel: Mid



Preview Result 2-RMS
Critical_Freqs PK+
Final_Result RMS

Preview Result 1-PK+
-13dBm

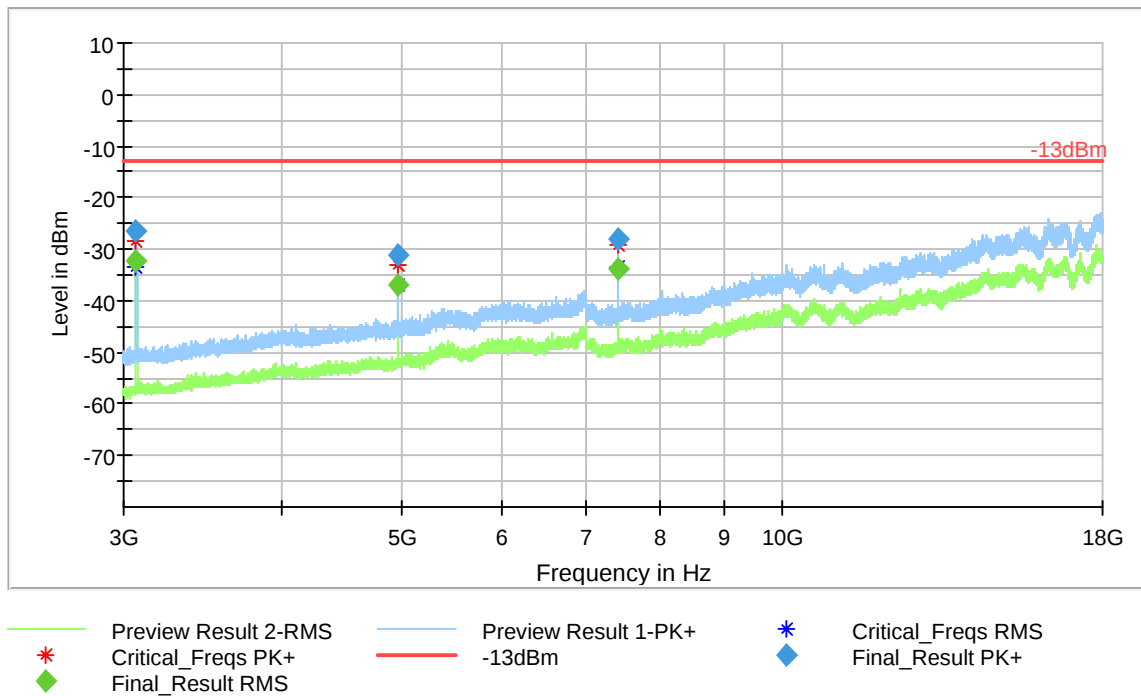
Critical_Freqs RMS
Final_Result PK+

Plot # 7 Radiated Emissions: 3 GHz – 18 GHz

Channel: Mid

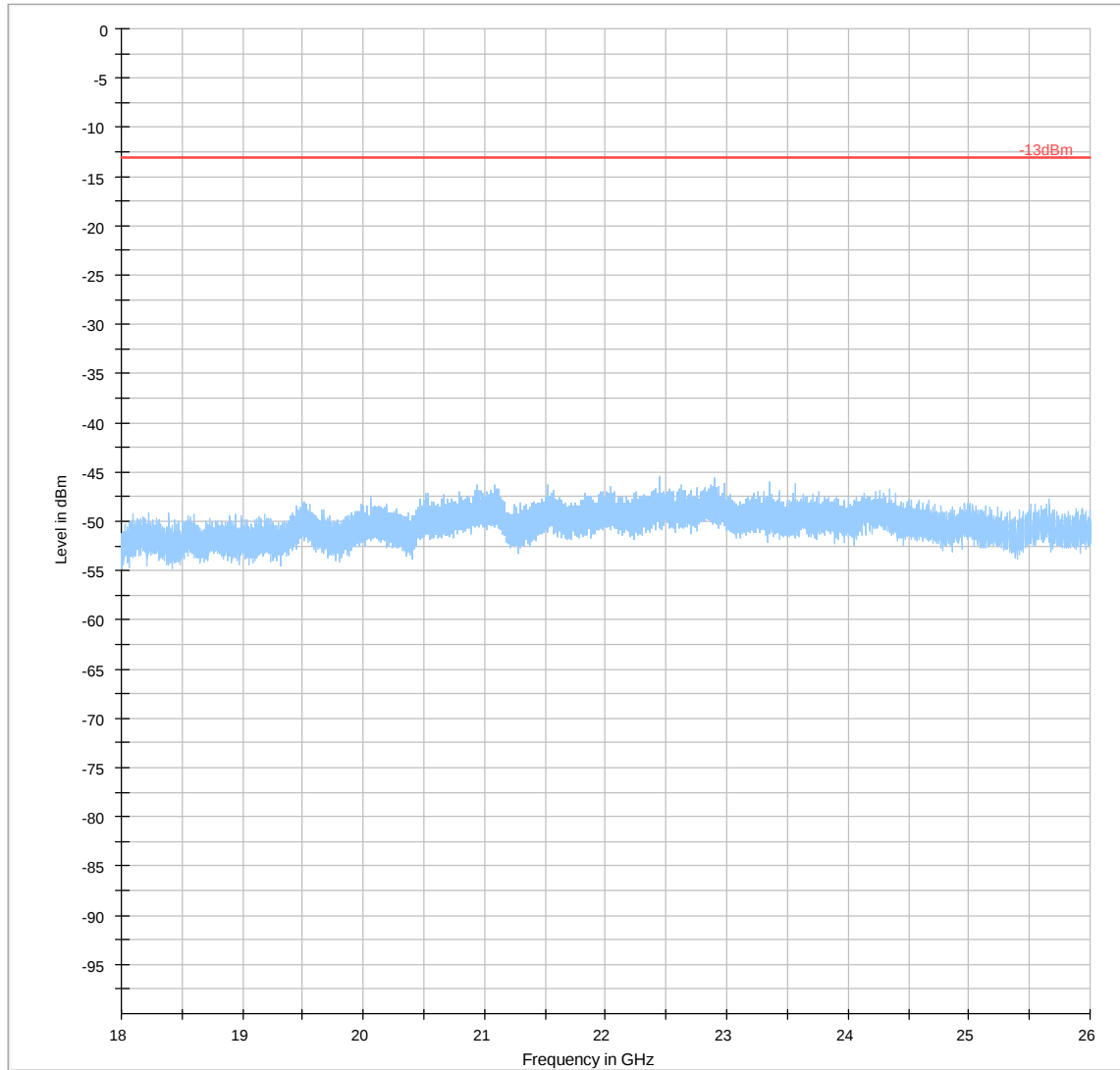
Final Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
3069.93	---	-32.22	---	---	200.0	1000.000	244.0	H	70.0	-105.3	12:29:01 PM - 11/13/2018
3070.16	-26.66	---	-13.00	13.66	200.0	1000.000	303.0	H	70.0	-105.3	12:19:46 PM - 11/13/2018
4948.85	-31.26	---	-13.00	18.26	200.0	1000.000	166.0	H	107.0	-101.5	12:22:56 PM - 11/13/2018
4950.90	---	-37.10	---	---	200.0	1000.000	158.0	H	106.0	-101.5	12:32:09 PM - 11/13/2018
7423.21	-27.83	---	-13.00	14.83	200.0	1000.000	164.0	H	122.0	-97.8	12:26:00 PM - 11/13/2018
7423.42	---	-33.91	---	---	200.0	1000.000	149.0	H	118.0	-97.8	12:35:13 PM - 11/13/2018



Plot # 8 Radiated Emissions: 18 GHz – 26 GHz

Channel: Mid



Preview Result 1-RMS



Critical_Freqs RMS



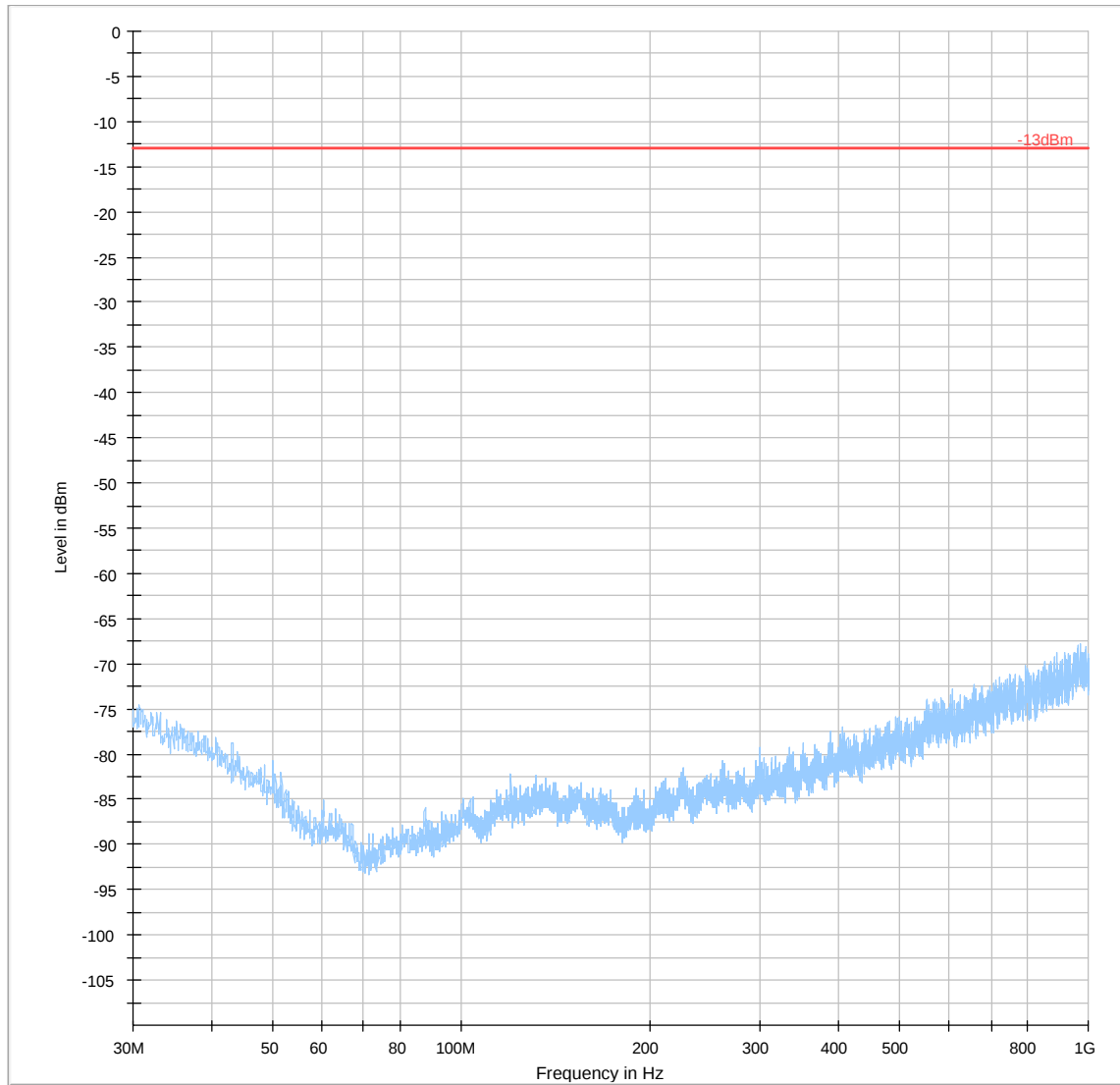
-13dBm



Final_Result RMS

Plot # 9 Radiated Emissions: 30 MHz - 1 GHz

Channel: High



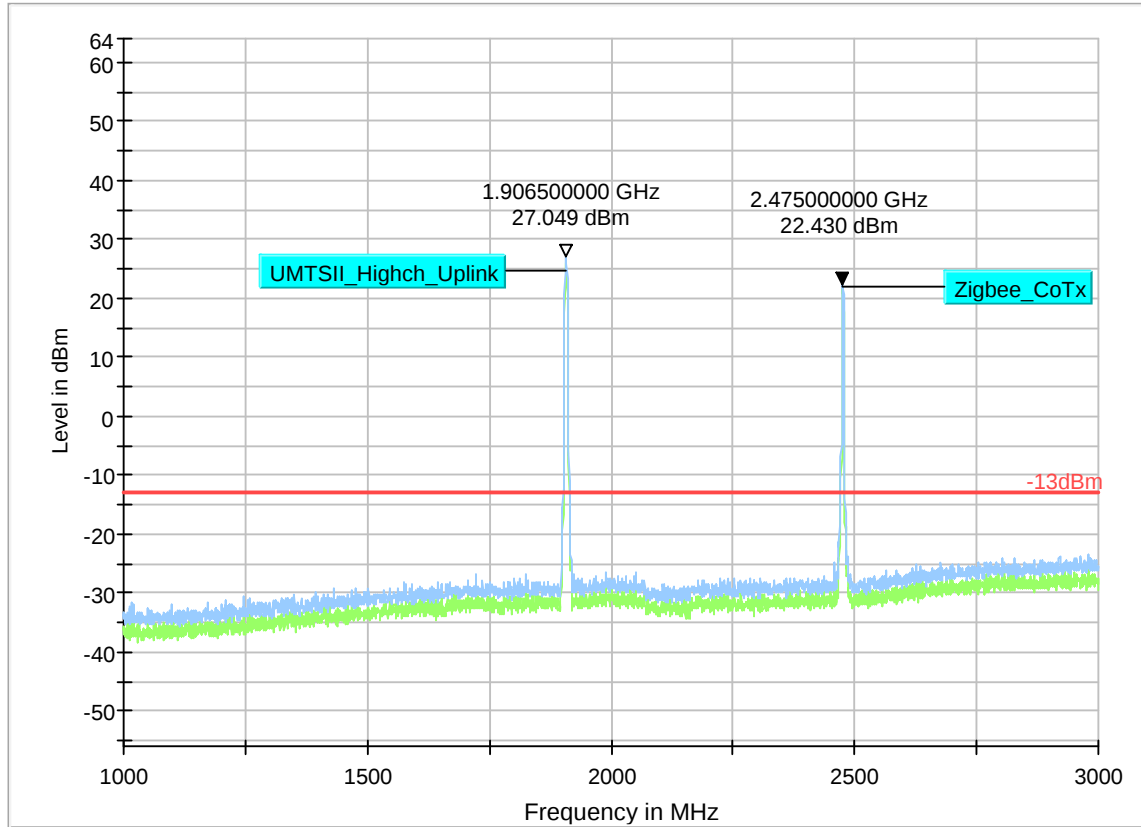
Preview Result 2-RMS
Critical_Freqs PK+
Final_Result RMS

Preview Result 1-PK+
-13dBm

* Critical_Freqs RMS
◆ Final_Result PK+

Plot # 10 Radiated Emissions: 1 GHz - 3 GHz

Channel: High



Preview Result 2-RMS
Critical_Freqs PK+
Final_Result RMS

Preview Result 1-PK+
-13dBm

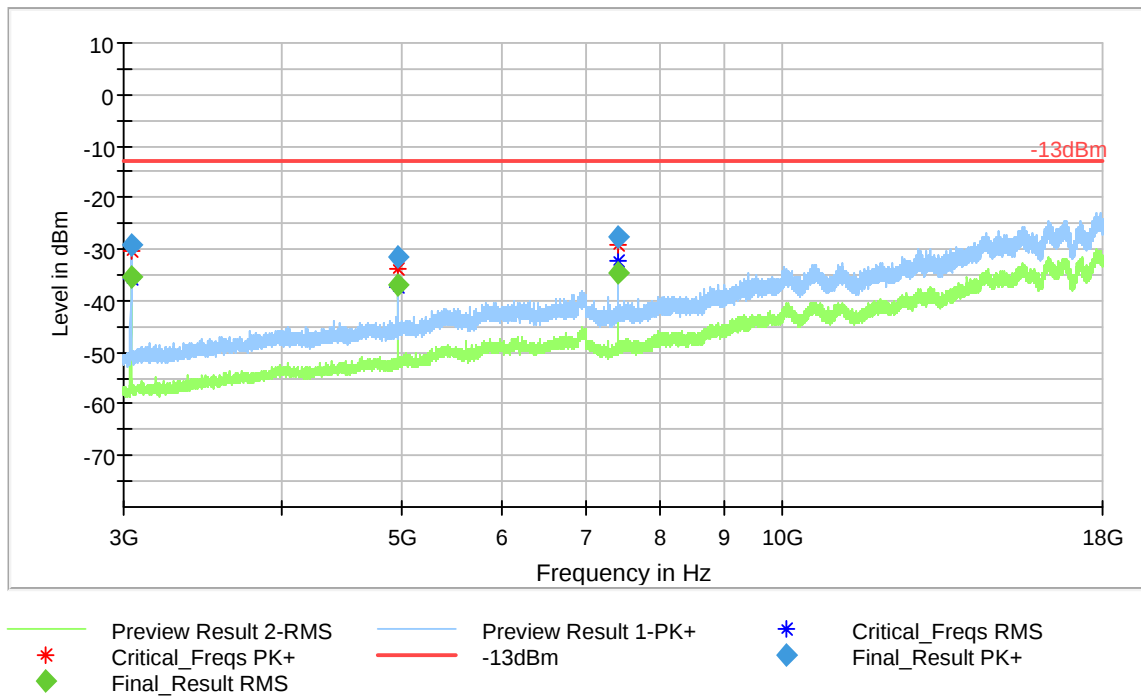
Critical_Freqs RMS
Final_Result PK+

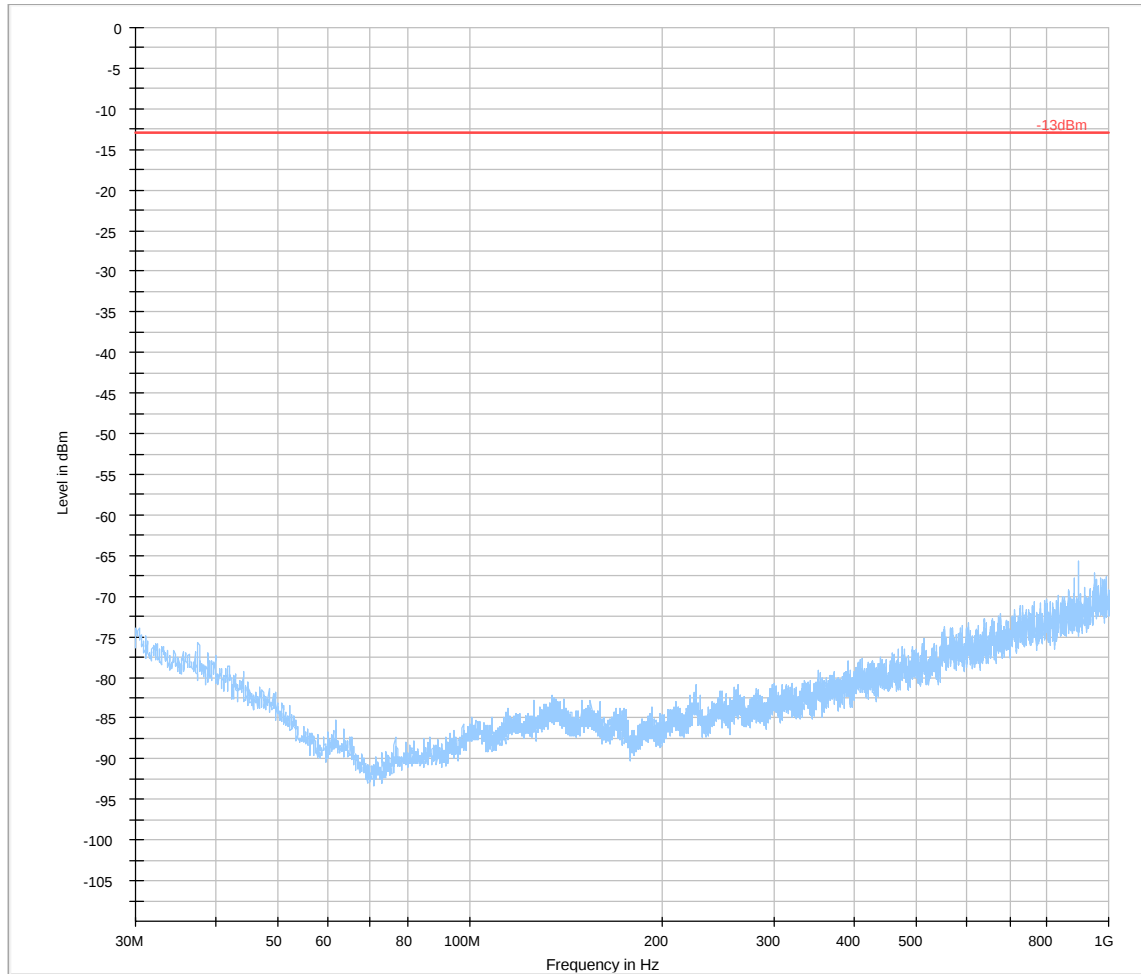
Plot # 11 Radiated Emissions: 3 GHz - 18 GHz

Channel: High

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
3042.62	---	-35.49	---	---	200.0	1000.000	120.0	V	119.0	-105.6	1:07:02 PM - 11/13/2018
3044.99	-29.17	---	-13.00	16.17	200.0	1000.000	121.0	V	122.0	-105.6	12:57:38 PM - 11/13/2018
4950.92	---	-36.94	---	---	200.0	1000.000	162.0	H	107.0	-101.5	1:00:47 PM - 11/13/2018
4951.04	-31.32	---	-13.00	18.32	200.0	1000.000	165.0	H	106.0	-101.5	12:51:25 PM - 11/13/2018
7423.44	-27.71	---	-13.00	14.71	200.0	1000.000	163.0	H	118.0	-97.8	12:54:29 PM - 11/13/2018
7423.53	---	-34.43	---	---	200.0	1000.000	148.0	H	117.0	-97.8	1:03:51 PM - 11/13/2018



WCDMA Band IV**Plot # 12 Radiated Emissions: 30 MHz - 1 GHz****Channel: Low**

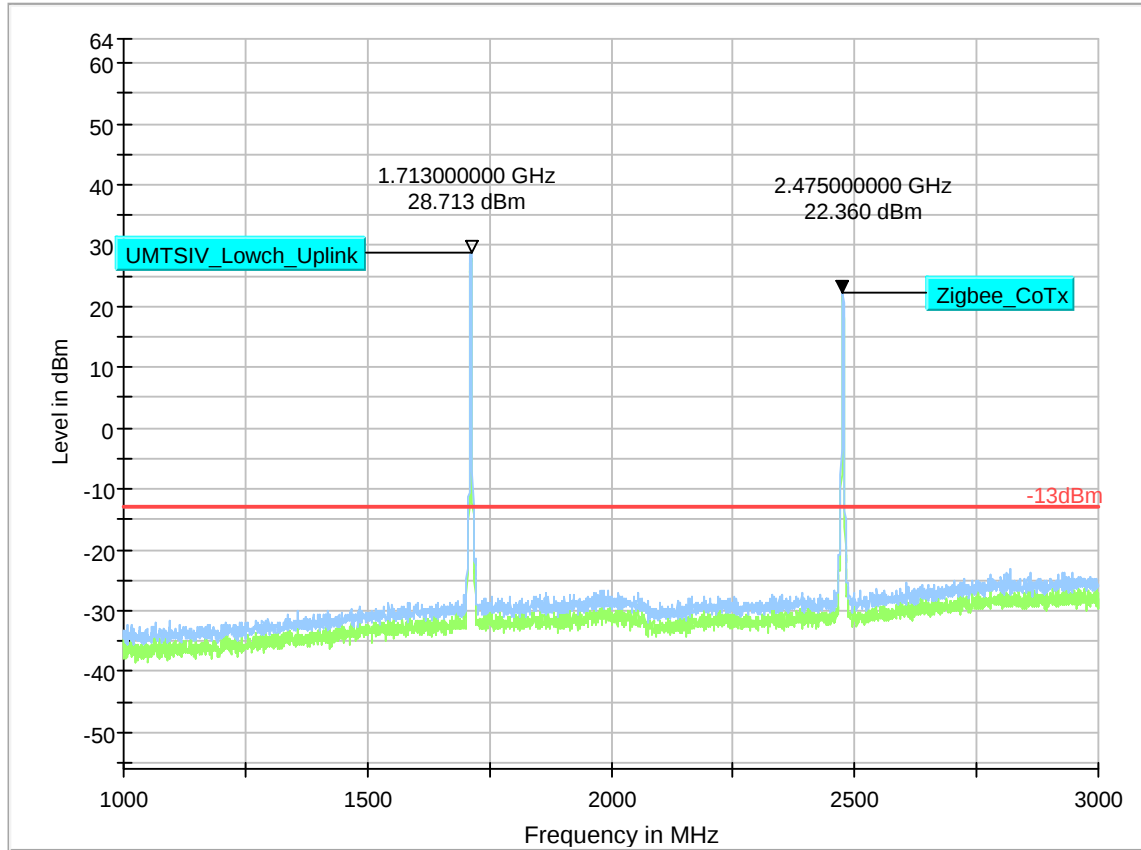
Preview Result 2-RMS
Critical_Freqs PK+
Final_Result RMS

Preview Result 1-PK+
-13dBm

Critical_Freqs RMS
Final_Result PK+

Plot # 13 Radiated Emissions: 1 GHz - 3 GHz

Channel: Low



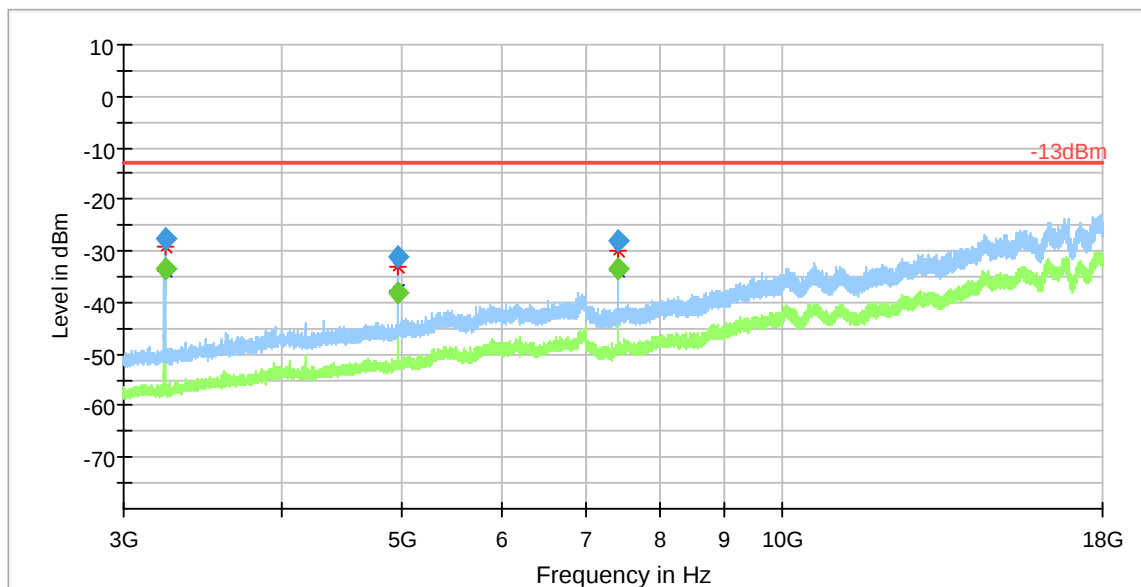
Preview Result 2-RMS	Preview Result 1-PK+	Critical_Freqs RMS
Critical_Freqs PK+	-13dBm	Final_Result PK+
Final_Result RMS		

Plot # 14 Radiated Emissions: 3 GHz - 18 GHz

Channel: Low

Final Result

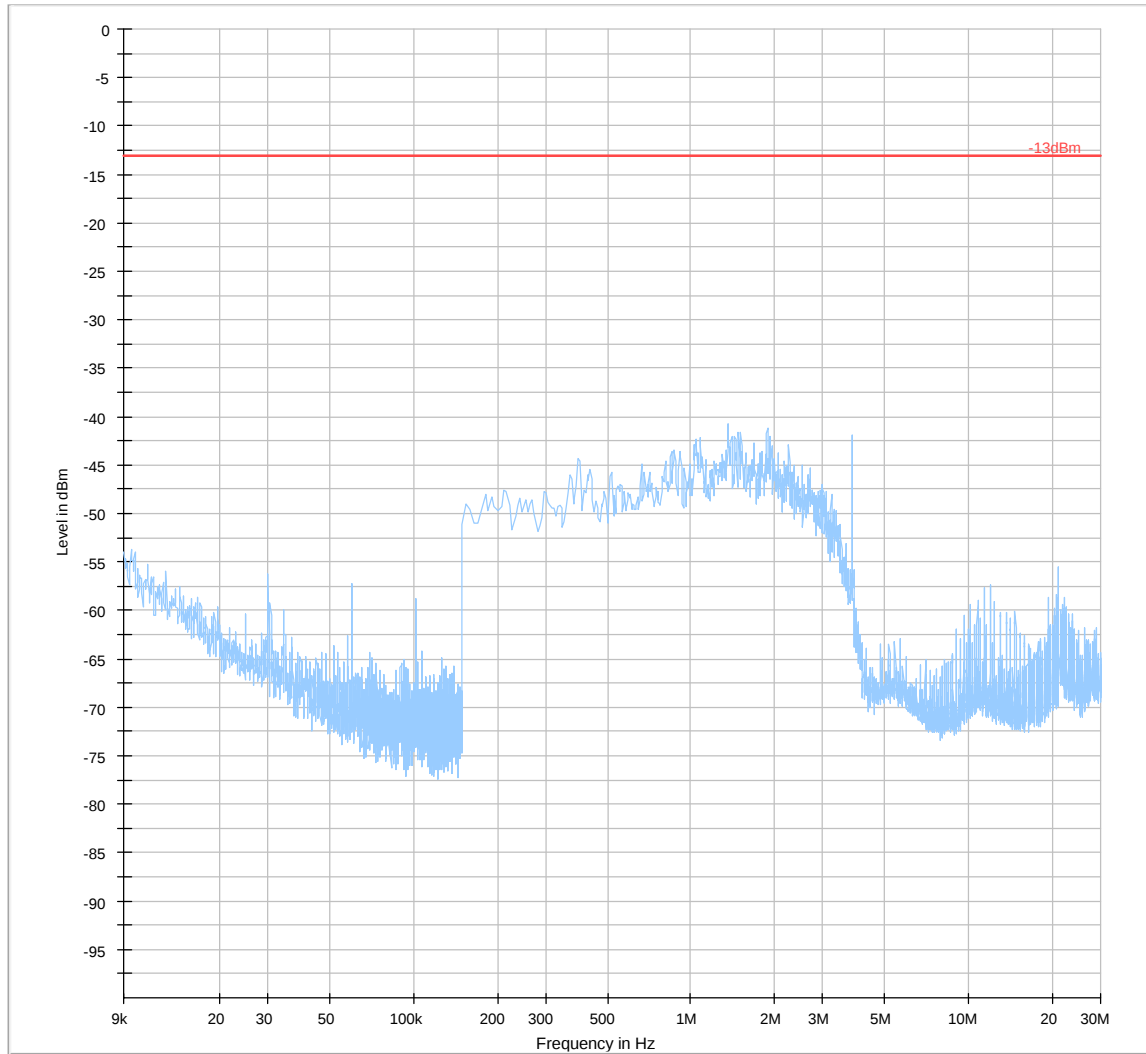
Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
3235.34	-27.49	---	-13.00	14.49	200.0	1000.000	221.0	H	78.0	-105.2	11:47:08 AM - 11/13/2018
3237.27	---	-33.31	---	---	200.0	1000.000	199.0	H	77.0	-105.2	11:56:16 AM - 11/13/2018
4948.98	-30.96	---	-13.00	17.96	200.0	1000.000	162.0	H	105.0	-101.5	11:50:16 AM - 11/13/2018
4951.23	---	-38.29	---	---	200.0	1000.000	144.0	H	99.0	-101.5	11:59:22 AM - 11/13/2018
7423.29	-27.84	---	-13.00	14.84	200.0	1000.000	163.0	H	121.0	-97.8	11:53:12 AM - 11/13/2018
7426.42	---	-33.62	---	---	200.0	1000.000	163.0	H	119.0	-97.8	12:02:26 PM - 11/13/2018



— Preview Result 2-RMS — Preview Result 1-PK+ * Critical_Freqs RMS
* Critical_Freqs PK+ — -13dBm ◆ Final_Result PK+
◆ Final_Result RMS

Plot # 15 Radiated Emissions: 9 kHz - 30 MHz

Channel: Mid



Preview Result 1-RMS



Critical_Freqs RMS



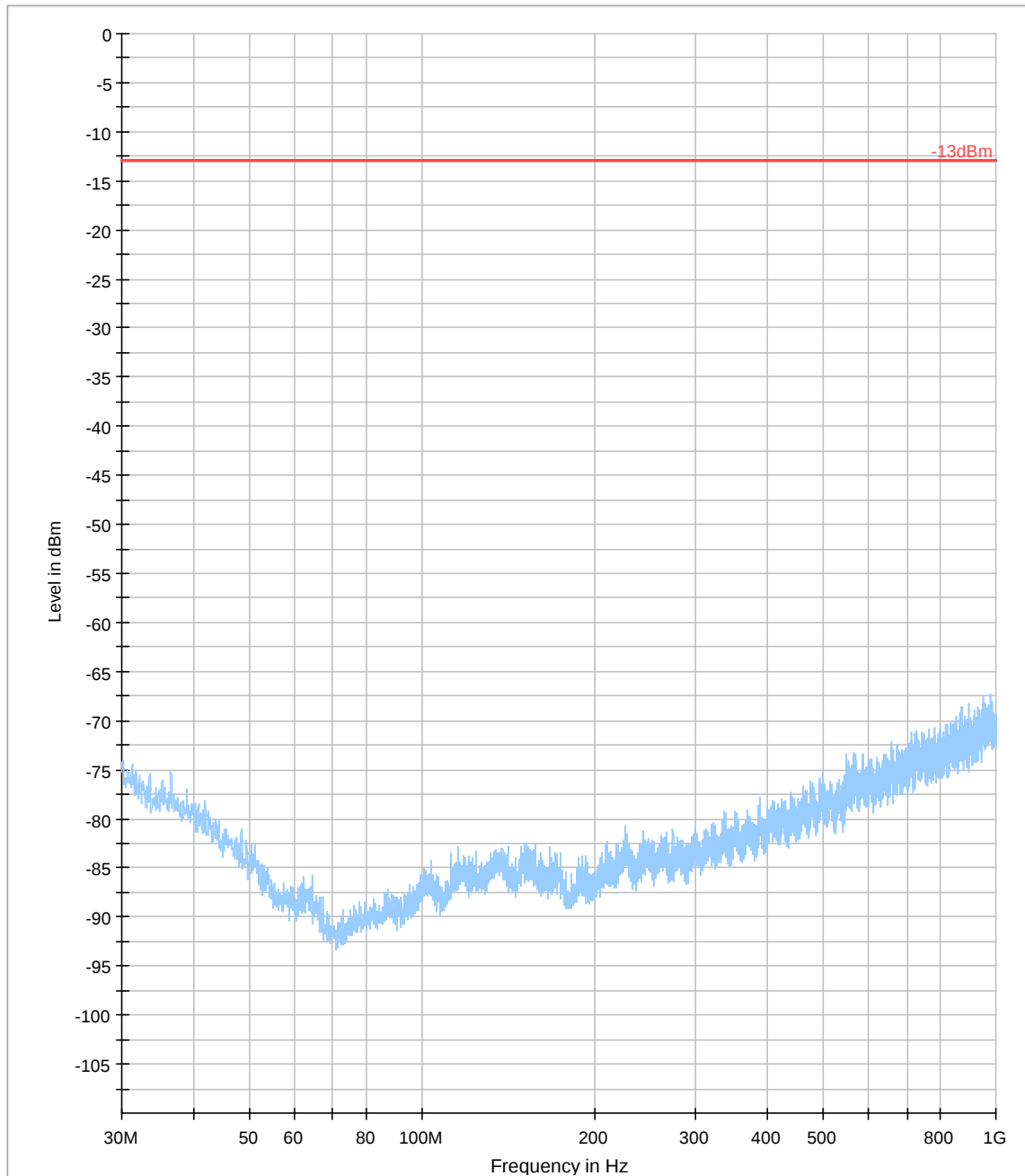
-13dBm



Final_Result RMS

Plot # 16 Radiated Emissions: 30 MHz – 1 GHz

Channel: Mid



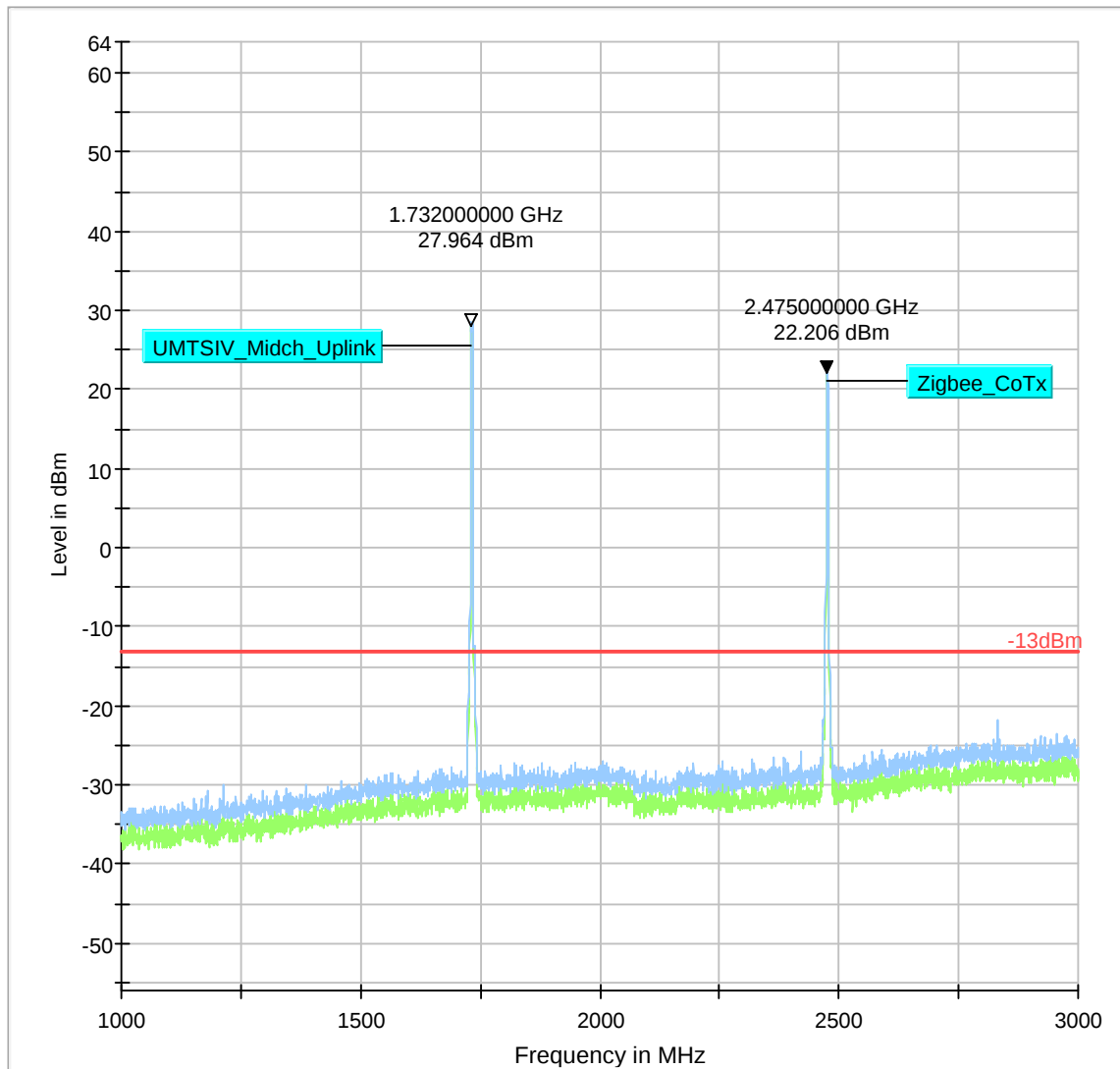
Preview Result 2-RMS
Critical_Freqs PK+
Final_Result RMS

Preview Result 1-PK+
-13dBm

* Critical_Freqs RMS
◆ Final_Result PK+

Plot #17 Radiated Emissions: 1 GHz - 3 GHz

Channel: Mid



Preview Result 2-RMS
Critical_Freqs PK+
Final_Result RMS

Preview Result 1-PK+
-13dBm

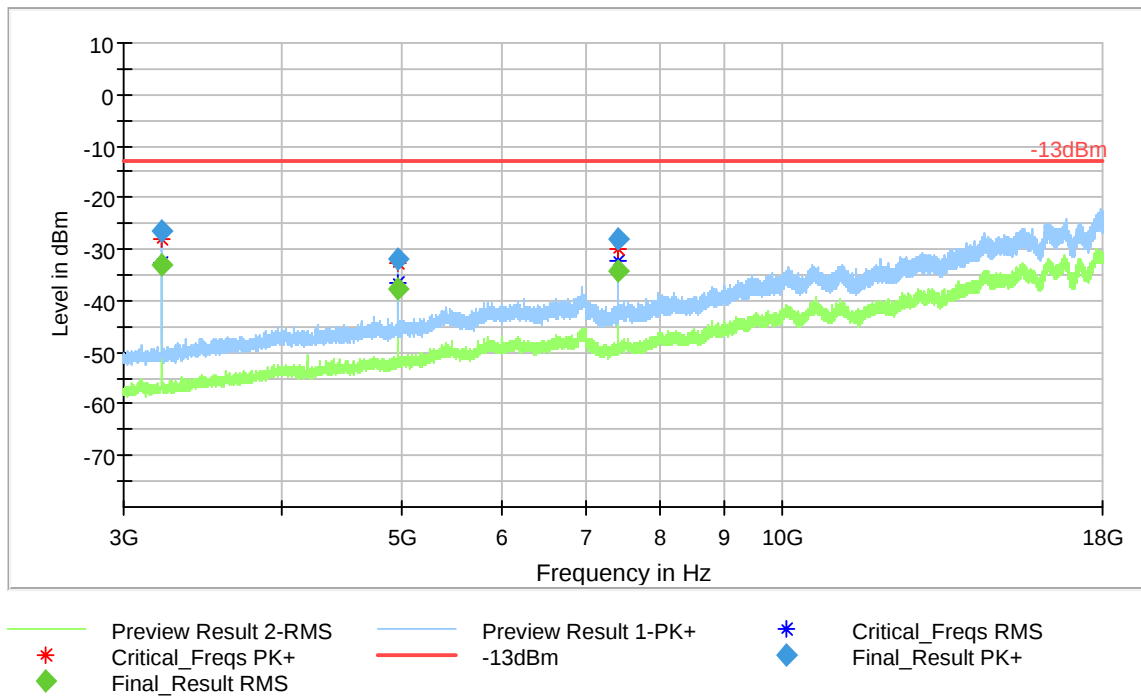
Critical_Freqs RMS
Final_Result PK+

Plot # 18 Radiated Emissions: 3 GHz – 18GHz

Channel: Mid

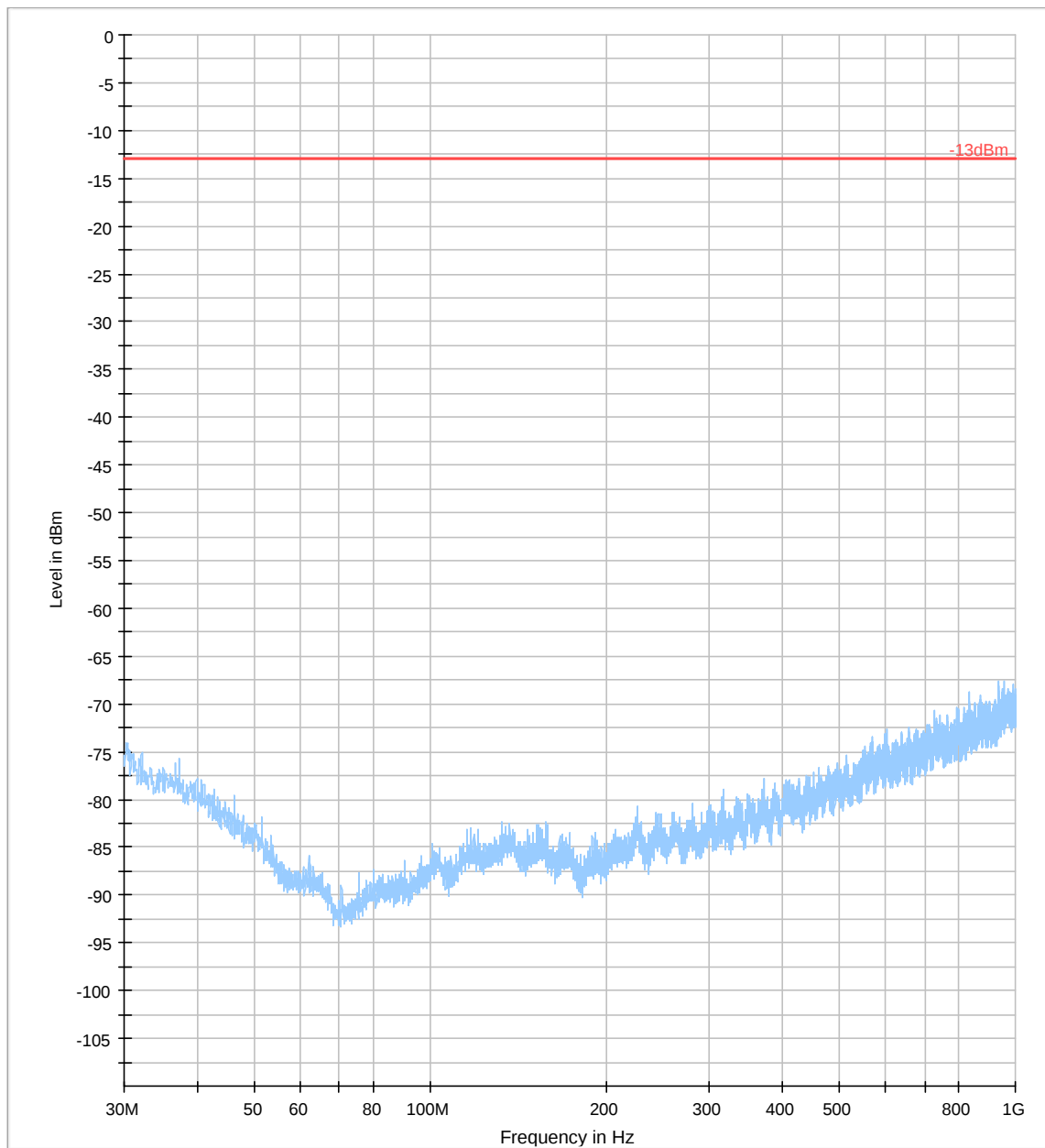
Final_Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
3217.22	-26.36	---	-13.00	13.36	200.0	1000.000	253.0	H	74.0	-105.2	10:52:12 AM - 11/13/2018
3217.43	---	-32.89	---	---	200.0	1000.000	197.0	H	73.0	-105.2	11:01:24 AM - 11/13/2018
4948.89	-31.73	---	-13.00	18.73	200.0	1000.000	145.0	H	99.0	-101.5	10:55:20 AM - 11/13/2018
4950.96	---	-37.61	---	---	200.0	1000.000	143.0	H	100.0	-101.5	11:04:29 AM - 11/13/2018
7423.41	-28.21	---	-13.00	15.21	200.0	1000.000	158.0	H	122.0	-97.8	10:58:22 AM - 11/13/2018
7426.40	---	-34.14	---	---	200.0	1000.000	160.0	H	119.0	-97.8	11:07:33 AM - 11/13/2018



Plot # 19 Radiated Emissions: 30 MHz - 1 GHz

Channel: High



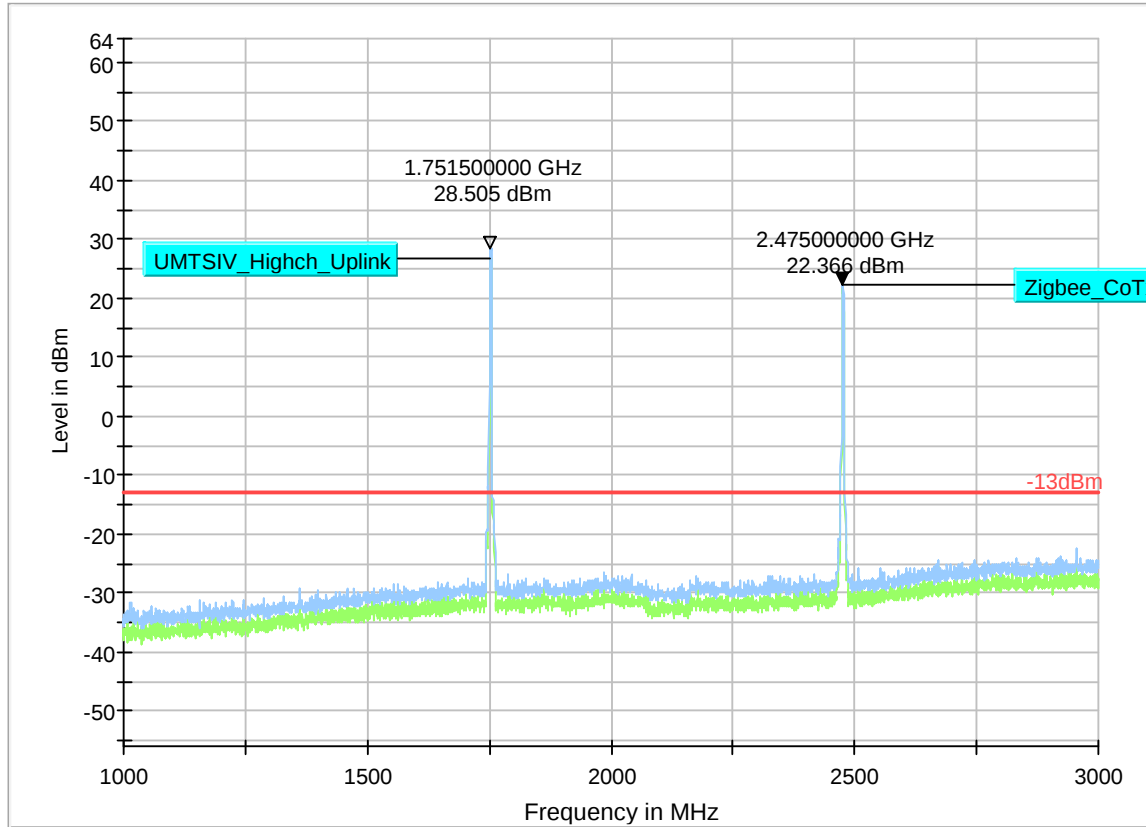
Preview Result 2-RMS
Critical_Freqs PK+
Final_Result RMS

Preview Result 1-PK+
-13dBm

* Critical_Freqs RMS
◆ Final_Result PK+

Plot # 20 Radiated Emissions: 1 GHz - 3 GHz

Channel: High



Preview Result 2-RMS
Critical_Freqs PK+
Final_Result RMS

Preview Result 1-PK+
-13dBm

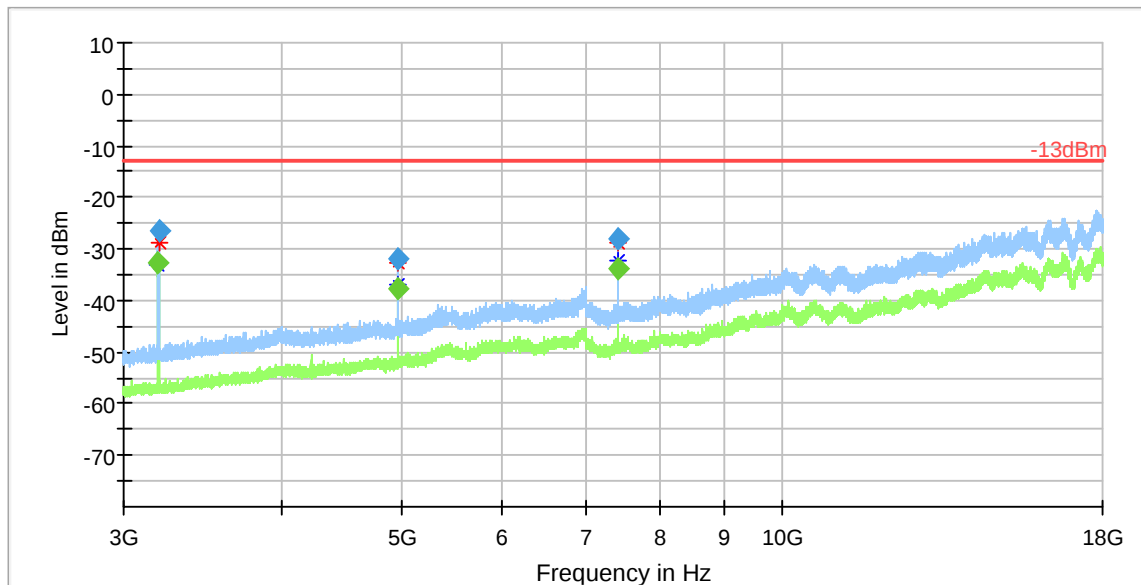
Critical_Freqs RMS
Final_Result PK+

Plot # 21 Radiated Emissions: 3 GHz - 18 GHz

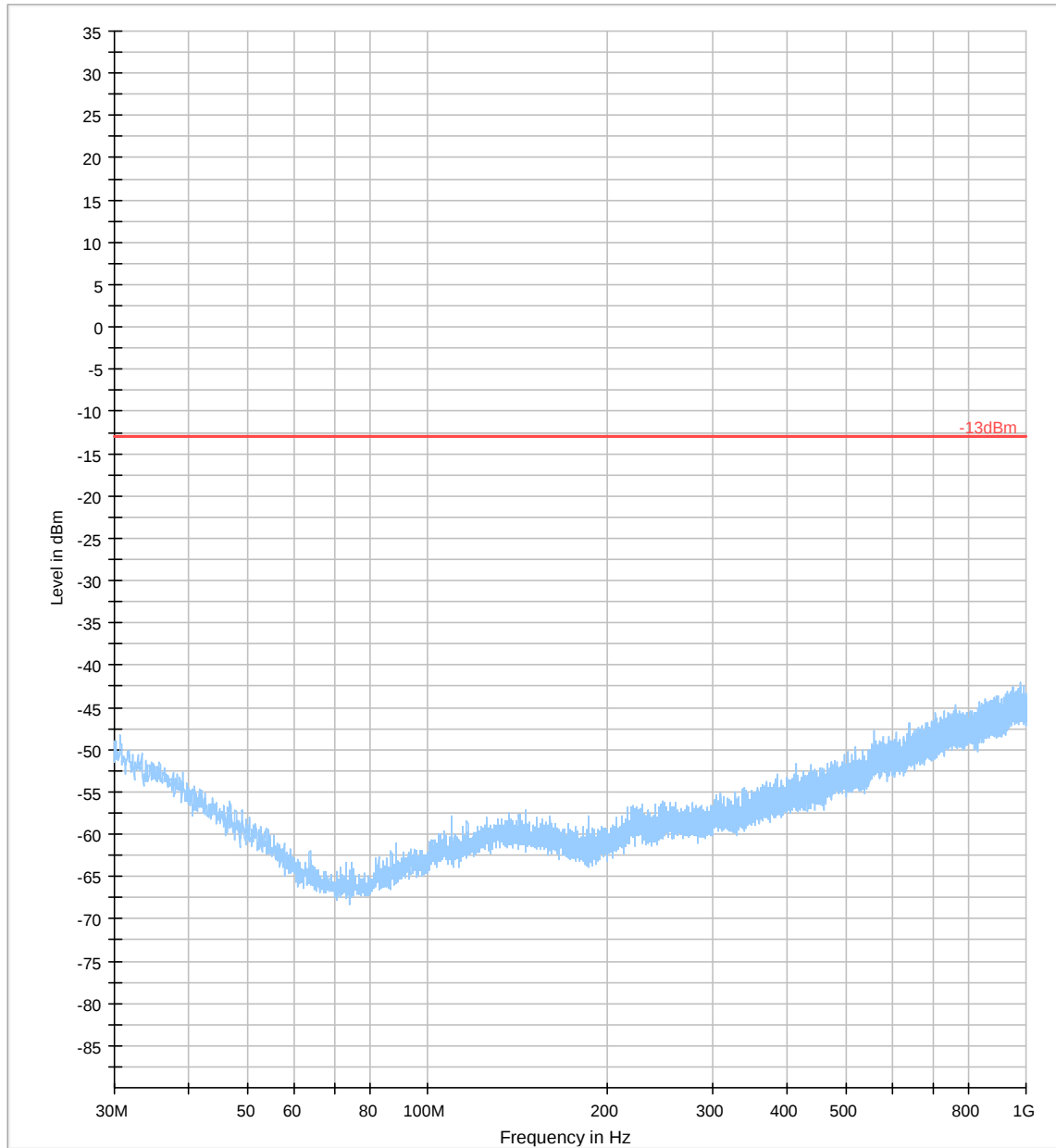
Channel: High

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
3197.34	---	-32.60	---	---	200.0	1000.000	114.0	V	94.0	-105.2	11:35:38 AM - 11/13/2018
3199.63	-26.28	---	-13.00	13.28	200.0	1000.000	176.0	H	84.0	-105.2	11:20:08 AM - 11/13/2018
4948.94	---	-37.67	---	---	200.0	1000.000	143.0	H	100.0	-101.5	11:29:21 AM - 11/13/2018
4951.07	-32.03	---	-13.00	19.03	200.0	1000.000	143.0	H	100.0	-101.5	11:23:13 AM - 11/13/2018
7423.58	---	-33.95	---	---	200.0	1000.000	162.0	H	116.0	-97.8	11:32:28 AM - 11/13/2018
7426.62	-27.95	---	-13.00	14.95	200.0	1000.000	162.0	H	118.0	-97.8	11:26:18 AM - 11/13/2018



— Preview Result 2-RMS — Preview Result 1-PK+ * Critical_Freqs RMS
* Critical_Freqs PK+ — -13dBm ◆ Final_Result PK+
◆ Final_Result RMS

WCDMA Band V**Plot # 22 Radiated Emissions: 30 MHz - 1 GHz****Channel: Low**

Preview Result 1-RMS



Critical_Freqs RMS

-13dBm



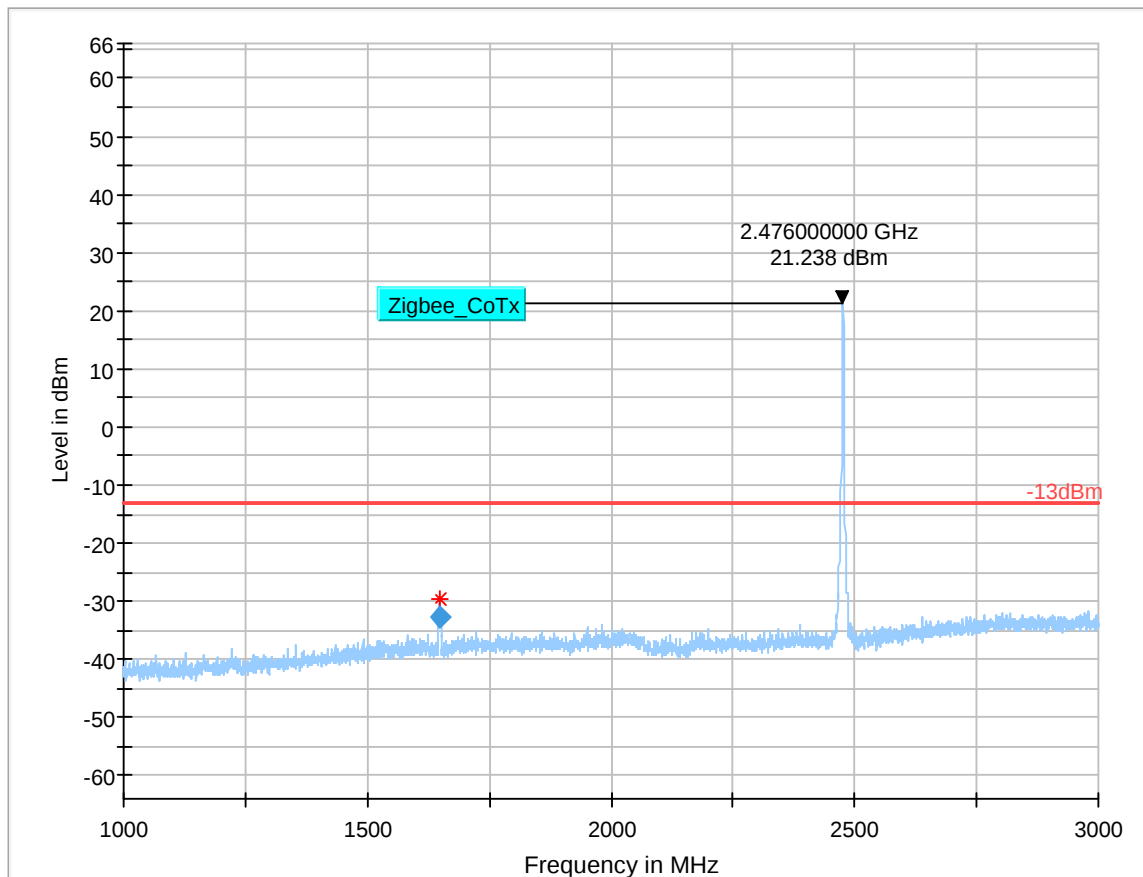
Final_Result RMS

Plot # 23 Radiated Emissions: 1 GHz - 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
1647.78	-32.63	-13.00	19.63	500.0	1000.000	255.0	H	147.0	-87.4	7:16:31 PM - 11/8/2018



Preview Result 1-RMS



Critical_Freqs RMS

-13dBm



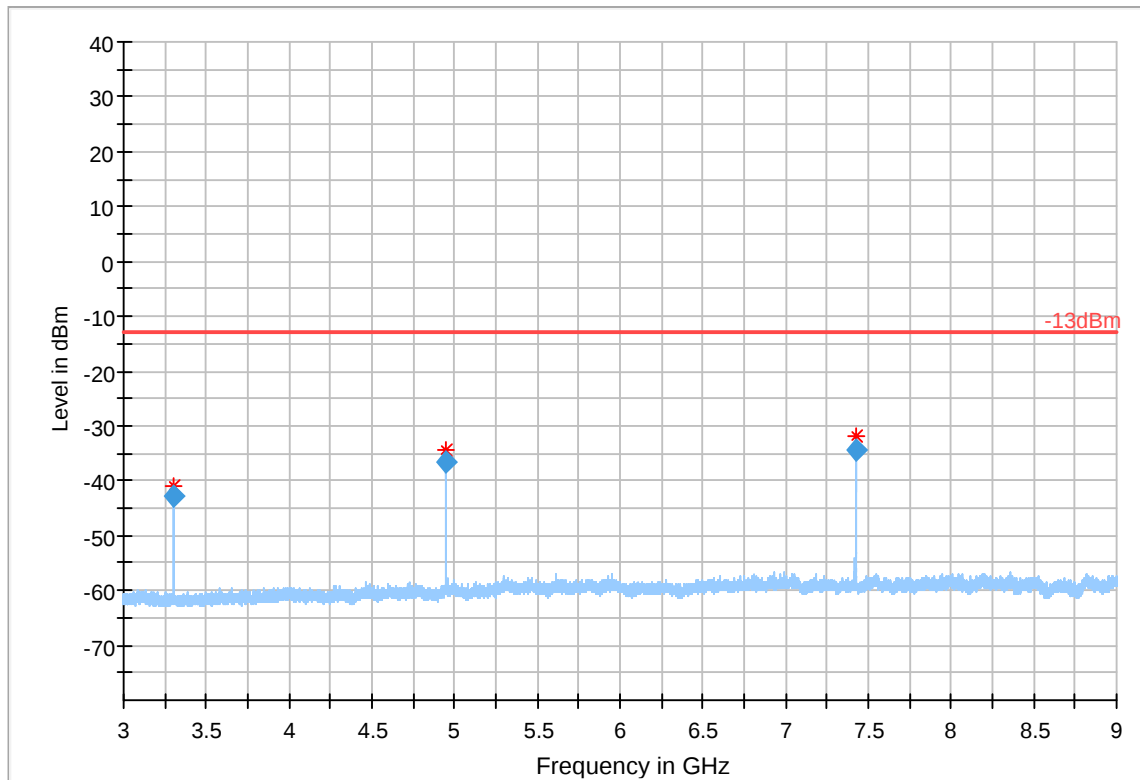
Final_Result RM

Plot # 24 Radiated Emissions: 3 GHz - 9 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
3301.72	-42.85	-13.00	29.85	500.0	1000.000	166.0	H	73.0	-132.0	9:17:37 AM - 11/13/2018
4951.04	-36.58	-13.00	23.58	500.0	1000.000	166.0	H	103.0	-128.4	9:20:38 AM - 11/13/2018
7423.46	-34.25	-13.00	21.25	500.0	1000.000	158.0	H	119.0	-124.7	9:23:40 AM - 11/13/2018



Preview Result 1-RMS



Critical_Freqs RMS



-13dBm



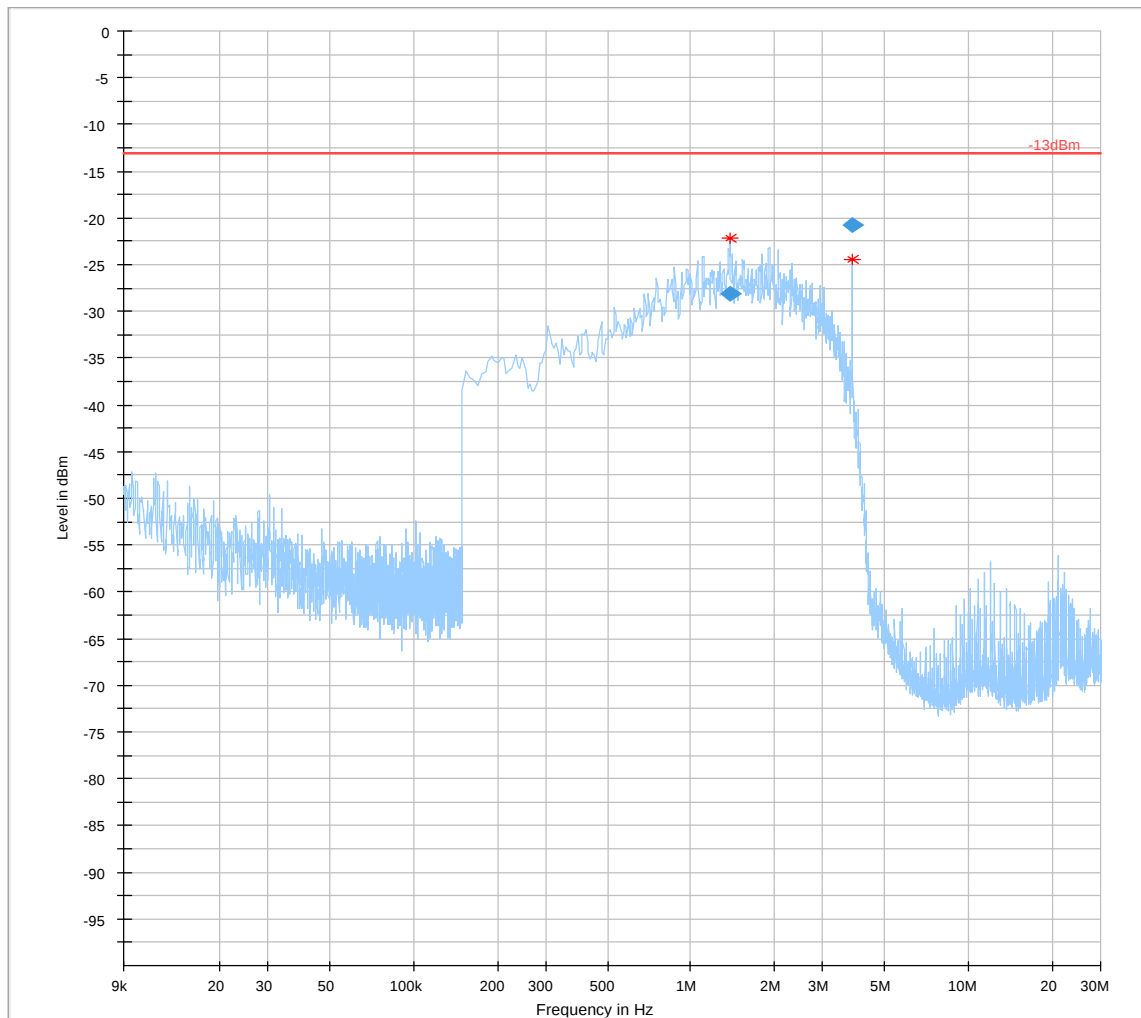
Final_Result RM

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
1.38	-28.12	-13.00	15.12	500.0	9.000	116.0	H	52.0	-79.3	6:25:26 PM - 11/26/2018
3.83	-20.76	-13.00	7.76	500.0	9.000	116.0	H	57.0	-79.5	6:27:50 PM - 11/26/2018



Preview Result 1-RMS

*

Critical_Freqs RMS

—

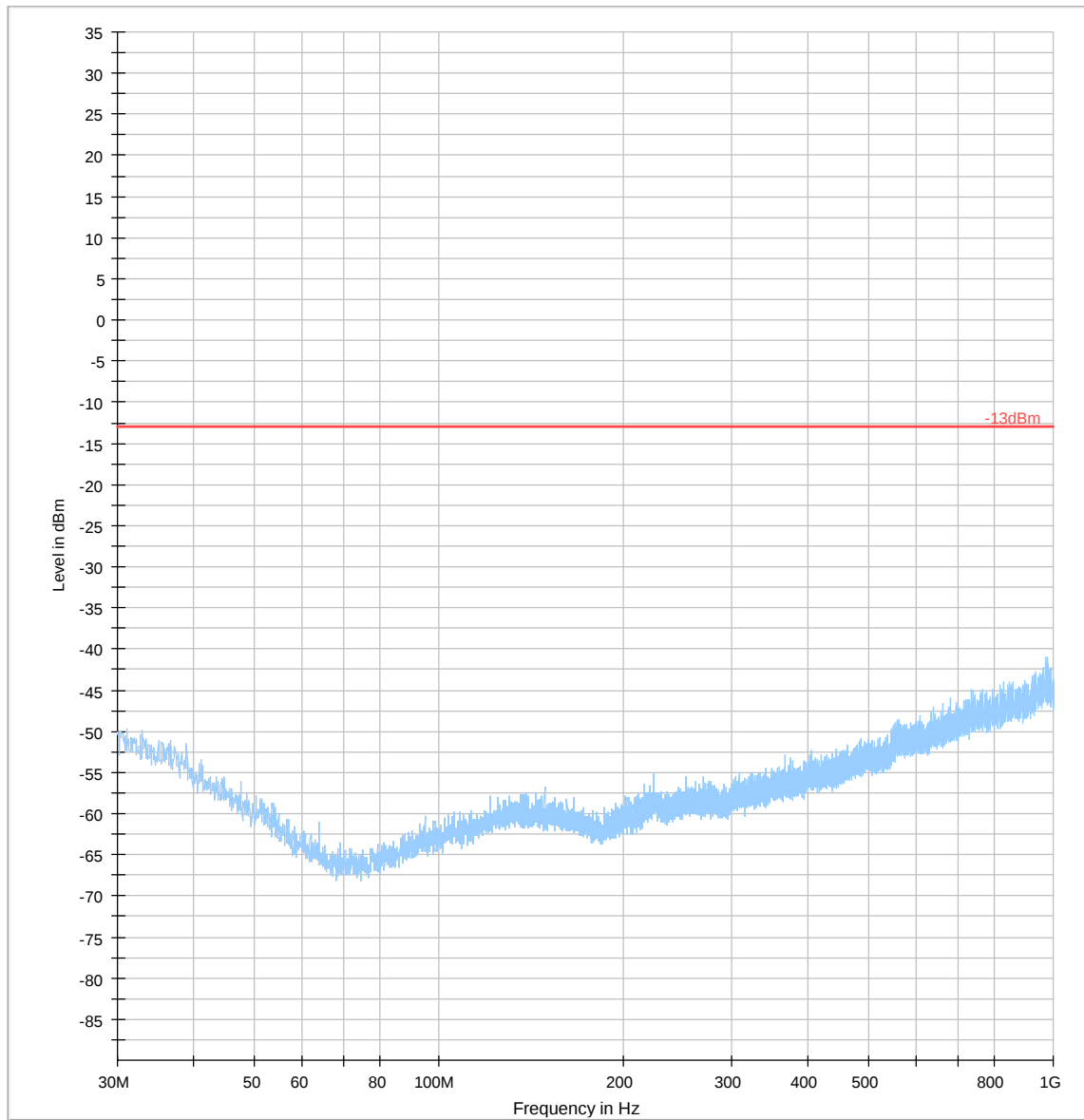
-13dBm

◆

Final_Result RMS

Plot # 26 Radiated Emissions: 30 MHz – 1 GHz

Channel: Mid



Preview Result 1-RMS



Critical_Freqs RMS



-13dBm



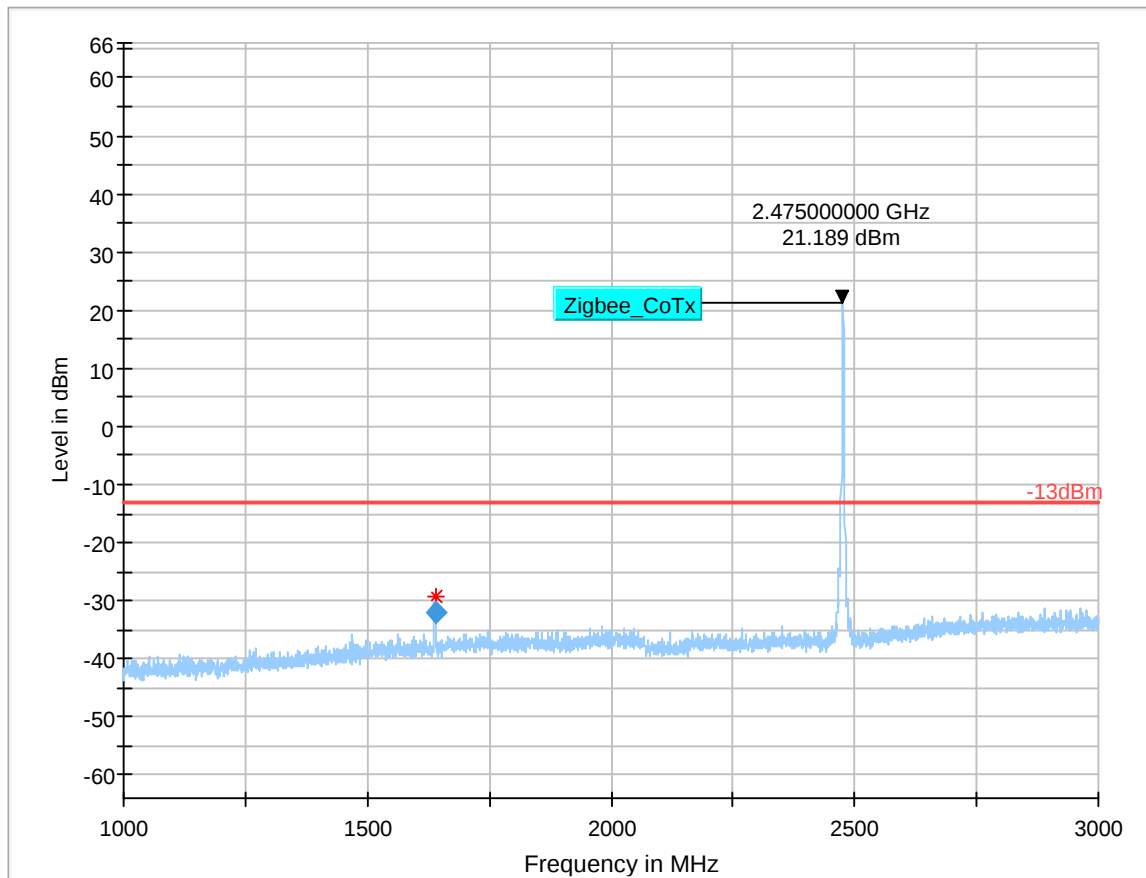
Final_Result RMS

Plot # 27 Radiated Emissions: 1 GHz - 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
1639.43	-32.04	-13.00	19.04	500.0	1000.000	242.0	H	152.0	-87.4	7:26:49 PM - 11/8/2018



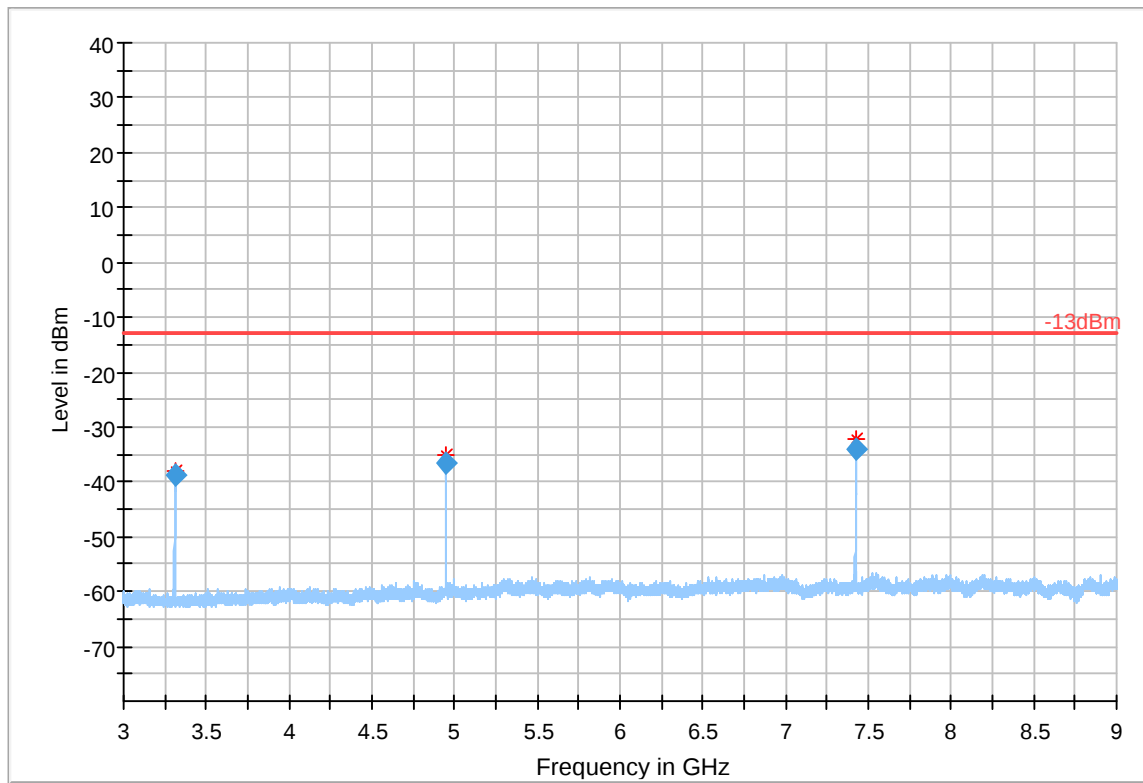
— Preview Result 1-RMS * Critical_Freqs RMS — -13dBm ◆ Final_Result RV

Plot # 28 Radiated Emissions: 3 GHz – 9GHz

Channel: Mid

Final_Result

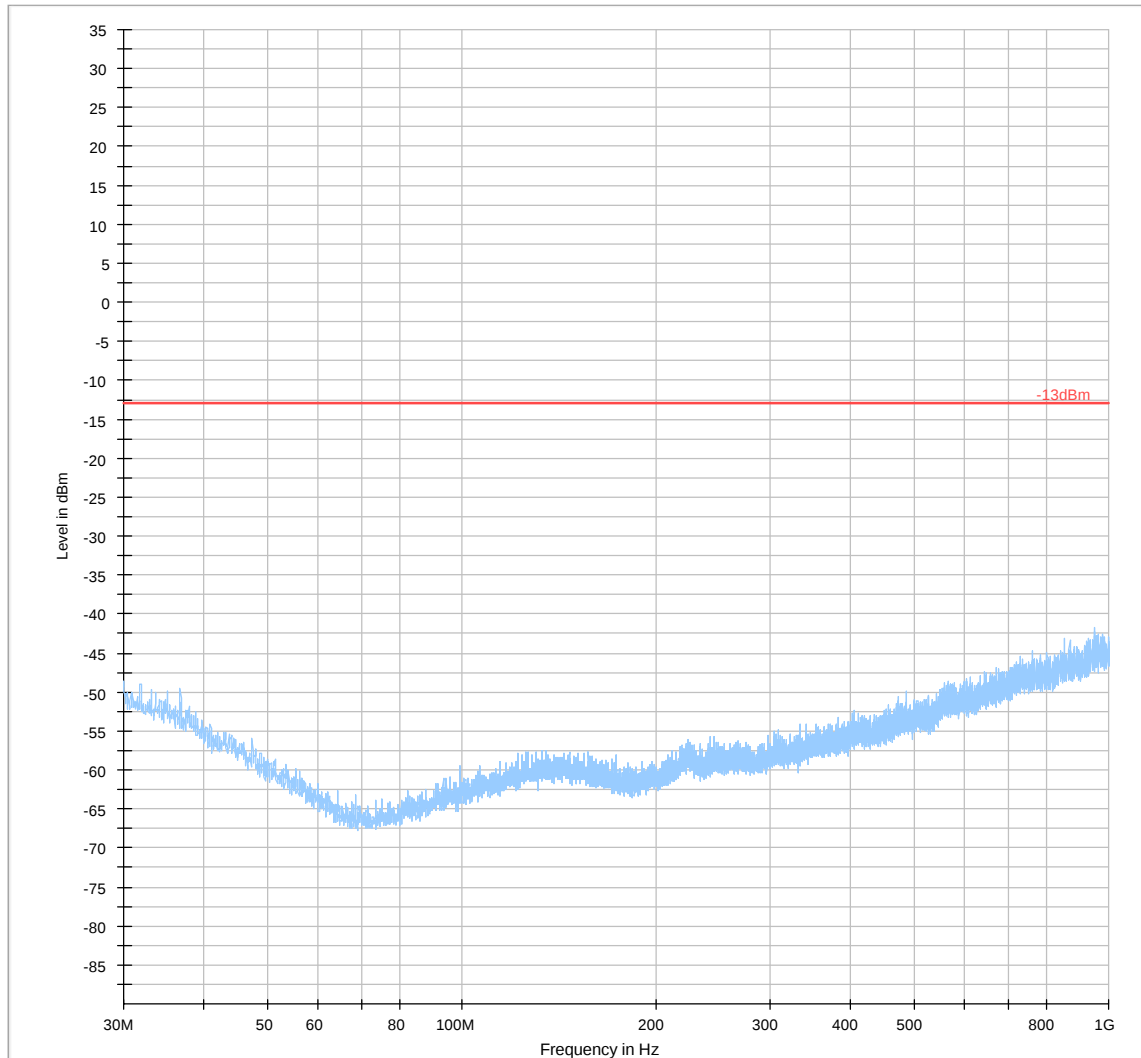
Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
3312.52	-38.69	-13.00	25.69	500.0	1000.000	165.0	H	80.0	-132.0	9:35:20 AM - 11/13/2018
4949.12	-36.44	-13.00	23.44	500.0	1000.000	165.0	H	106.0	-128.4	9:38:22 AM - 11/13/2018
7426.49	-33.96	-13.00	20.96	500.0	1000.000	158.0	H	120.0	-124.7	9:41:23 AM - 11/13/2018



— Preview Result 1-RMS * Critical_Freqs RMS — -13dBm ◆ Final_Result RV

Plot # 29 Radiated Emissions: 30 MHz - 1 GHz

Channel: High



Preview Result 1-RMS



Critical_Freqs RMS



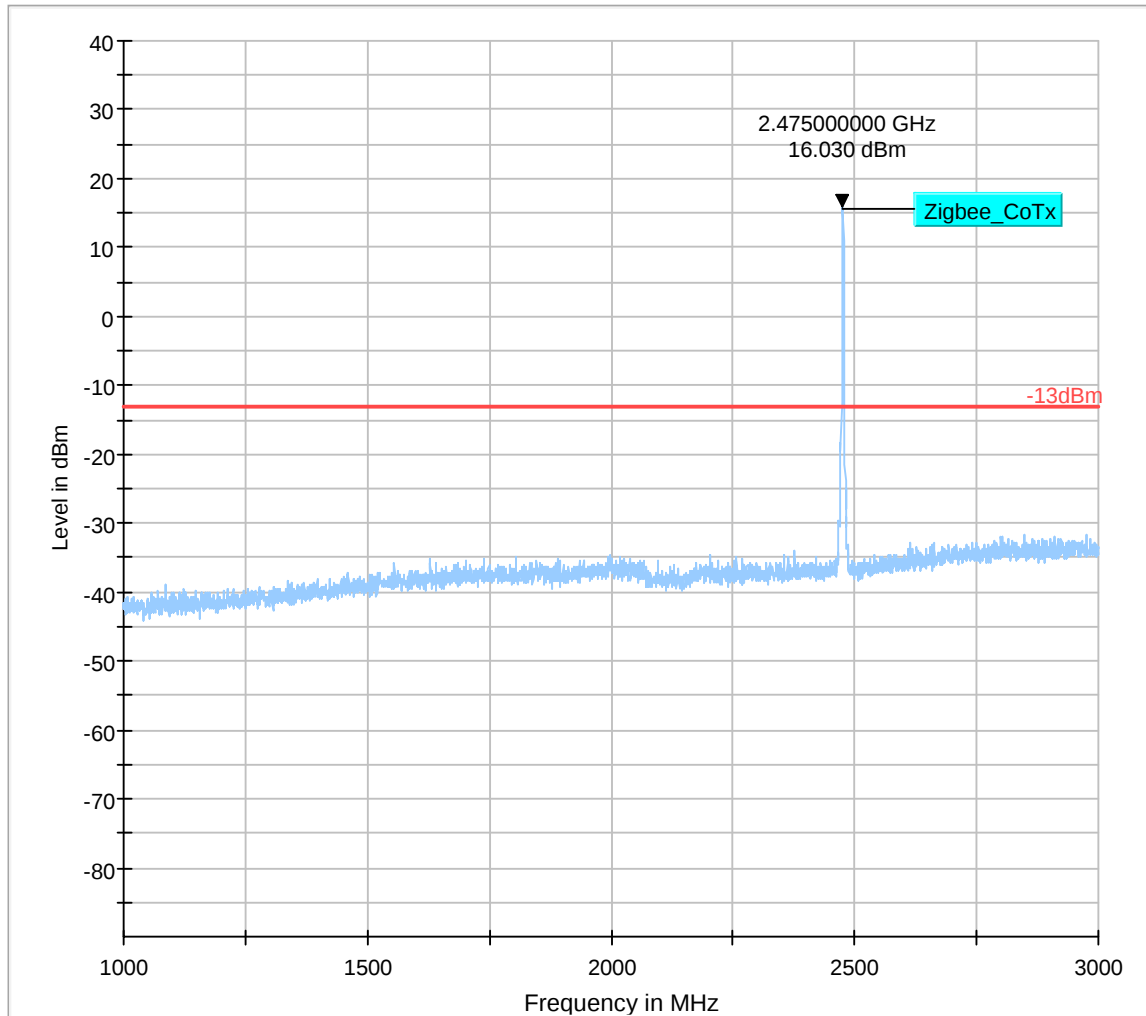
-13dBm



Final_Result RMS

Plot # 30 Radiated Emissions: 1 GHz - 3 GHz

Channel: High



Preview Result 1-RMS



Critical_Freqs RMS



-13dBm



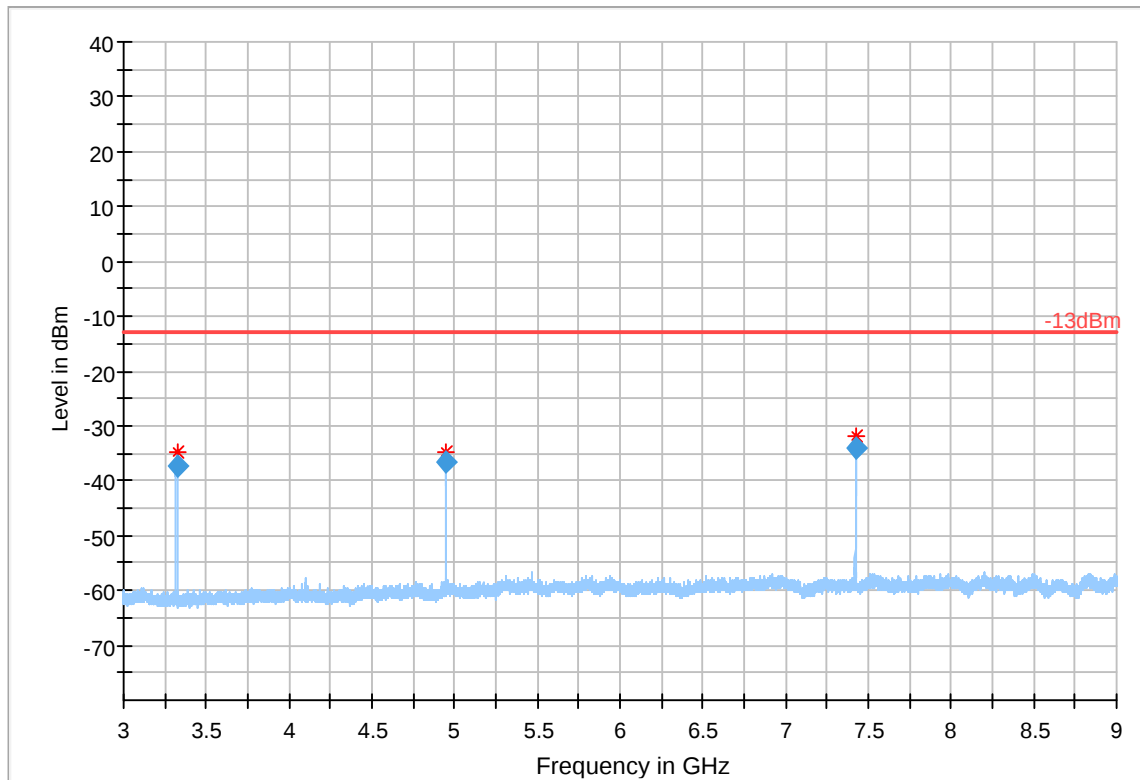
Final_Result RM

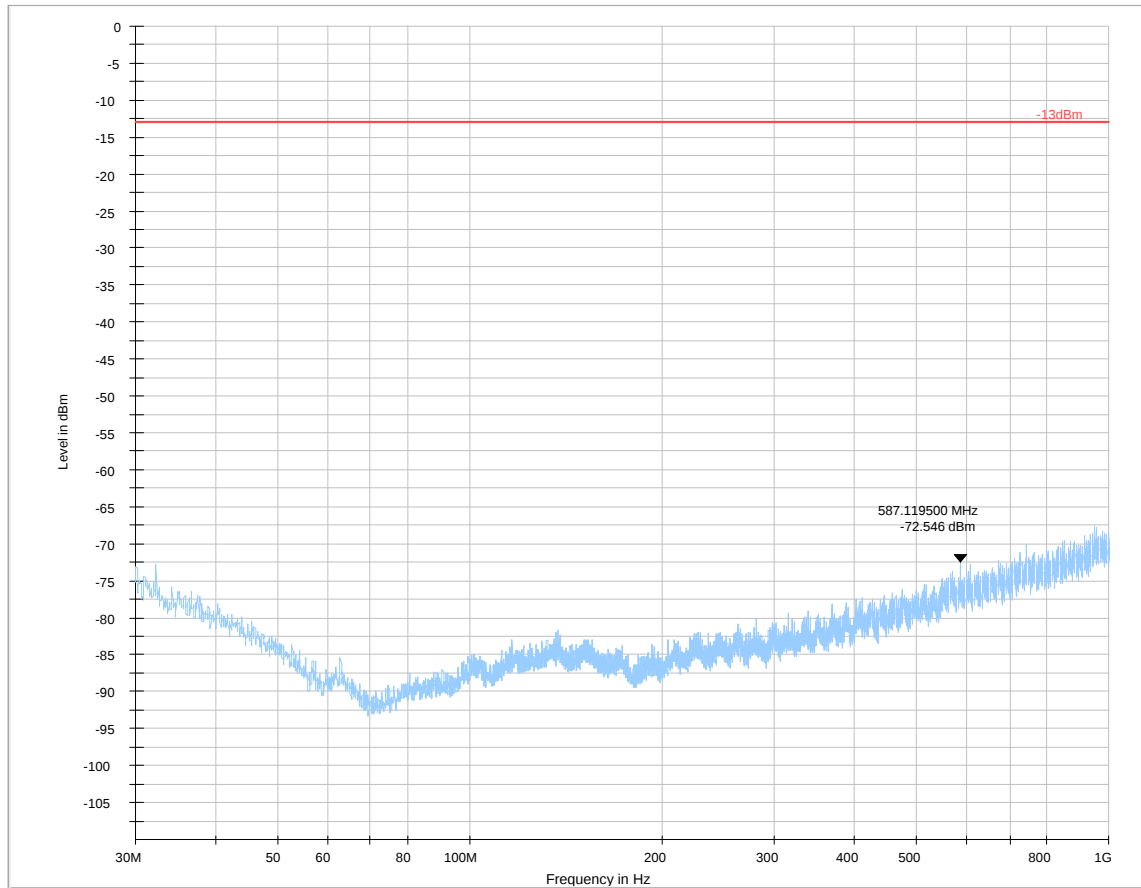
Plot # 31 Radiated Emissions: 3 GHz - 9 GHz

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
3320.76	-37.42	-13.00	24.42	500.0	1000.000	149.0	H	84.0	-132.0	9:52:12 AM - 11/13/2018
4950.98	-36.57	-13.00	23.57	500.0	1000.000	167.0	H	103.0	-128.4	9:55:09 AM - 11/13/2018
7426.47	-34.05	-13.00	21.05	500.0	1000.000	158.0	H	120.0	-124.7	9:58:13 AM - 11/13/2018



LTE Band 2**Plot # 32 Radiated Emissions: 30 MHz - 1 GHz****Channel: Low**

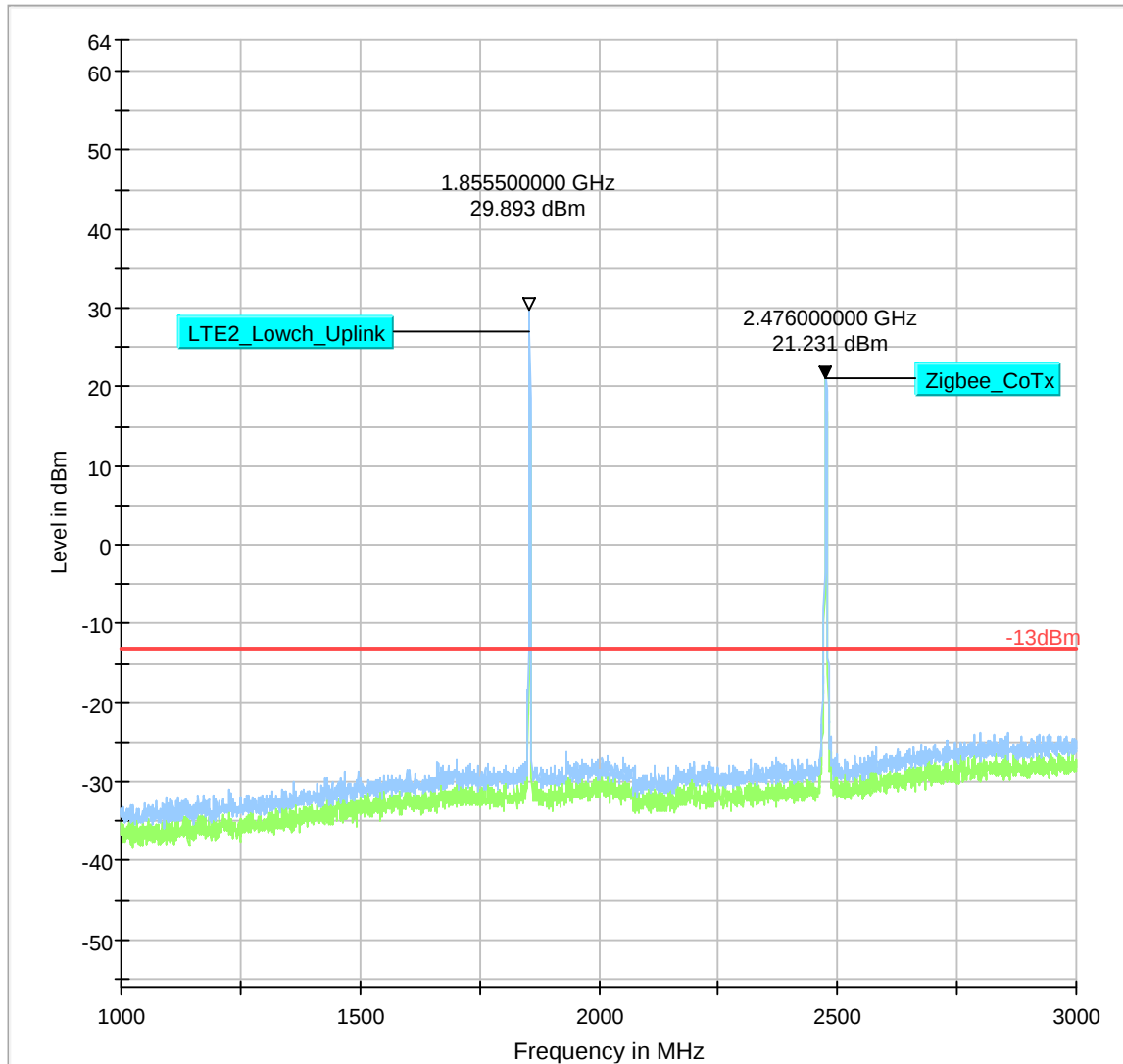
Preview Result 2-RMS
Critical_Freqs PK+
Final_Result RMS

Preview Result 1-PK+
-13dBm

Critical_Freqs RMS
Final_Result PK+

Plot # 33 Radiated Emissions: 1 GHz - 3 GHz

Channel: Low



Preview Result 2-RMS
Critical_Freqs PK+
Final_Result RMS

Preview Result 1-PK+
-13dBm

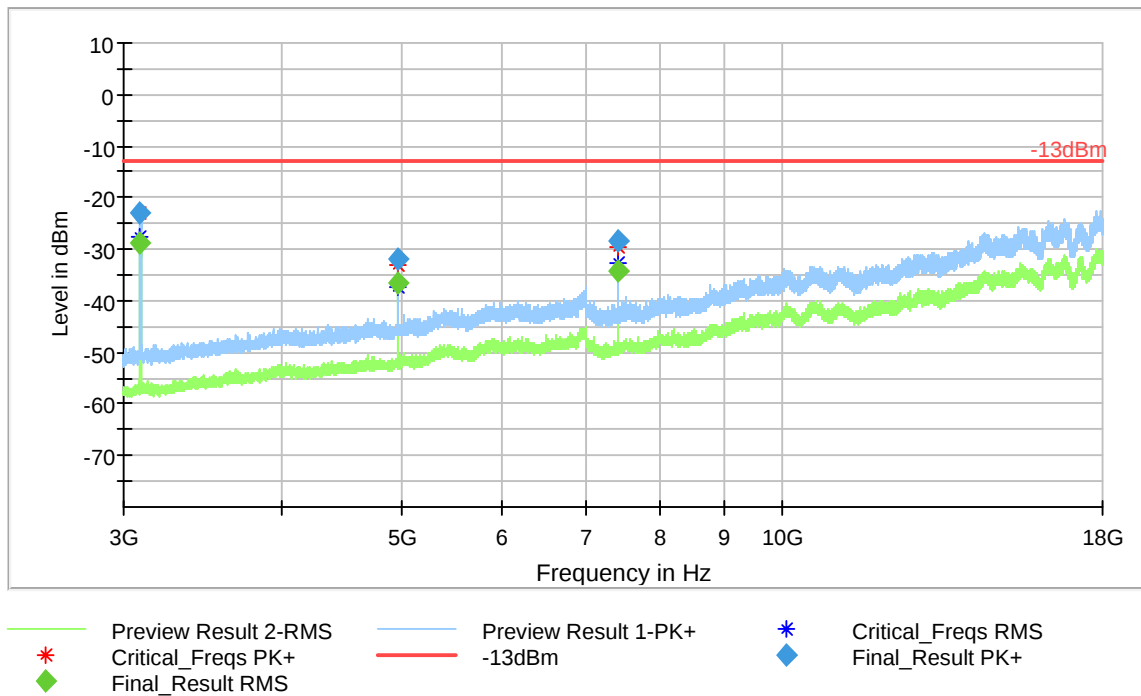
* Critical_Freqs RMS
◆ Final_Result PK+

Plot # 34 Radiated Emissions: 3 GHz - 18 GHz

Channel: Low

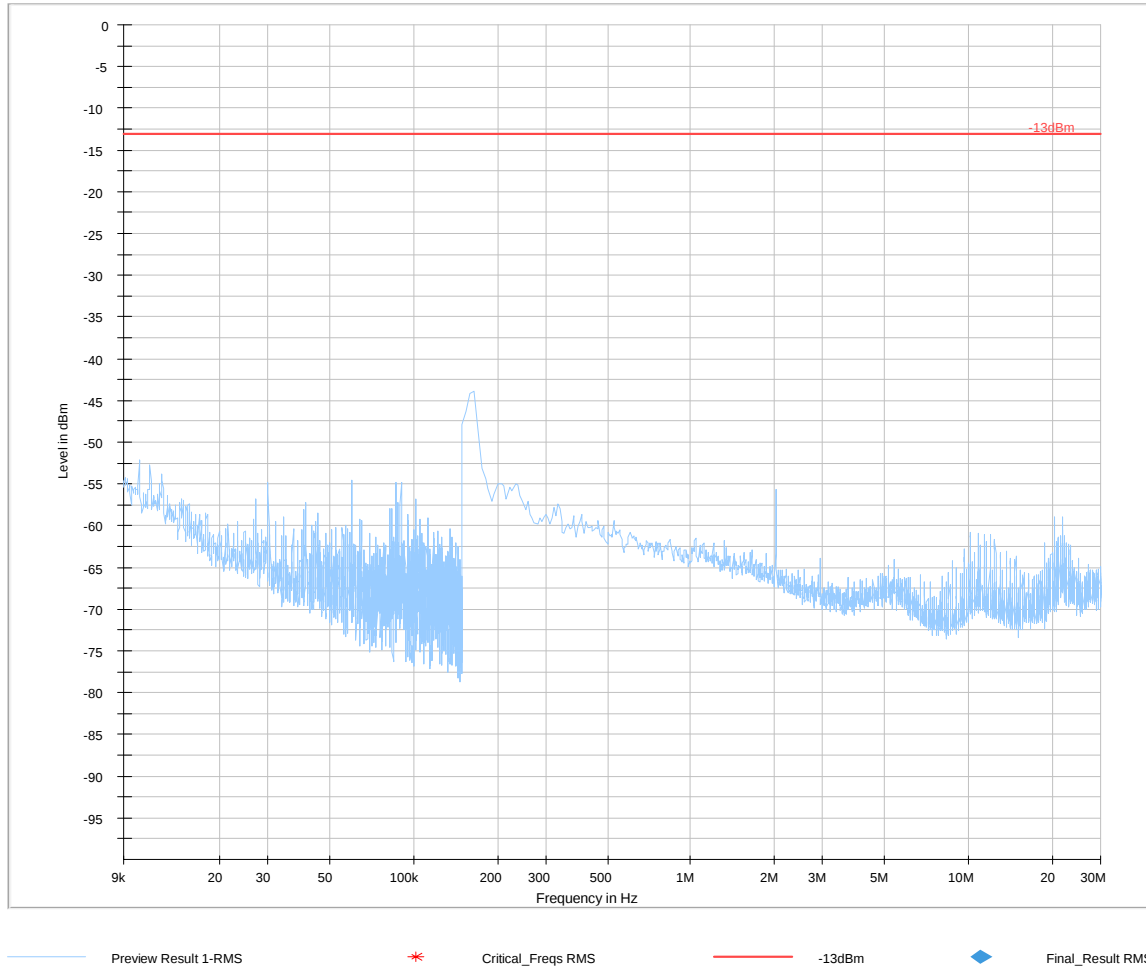
Final Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
3094.09	-23.00	---	-13.00	10.00	200.0	1000.000	143.0	V	91.0	-105.0	2:45:24 PM - 11/13/2018
3094.16	---	-28.75	---	---	200.0	1000.000	305.0	H	78.0	-105.0	2:54:47 PM - 11/13/2018
4950.88	-31.82	---	-13.00	18.82	200.0	1000.000	127.0	H	101.0	-101.5	2:48:38 PM - 11/13/2018
4950.99	---	-36.73	---	---	200.0	1000.000	157.0	H	104.0	-101.5	2:58:00 PM - 11/13/2018
7423.51	-28.30	---	-13.00	15.30	200.0	1000.000	162.0	H	119.0	-97.8	2:51:47 PM - 11/13/2018
7426.47	---	-34.33	---	---	200.0	1000.000	161.0	H	118.0	-97.8	3:01:07 PM - 11/13/2018



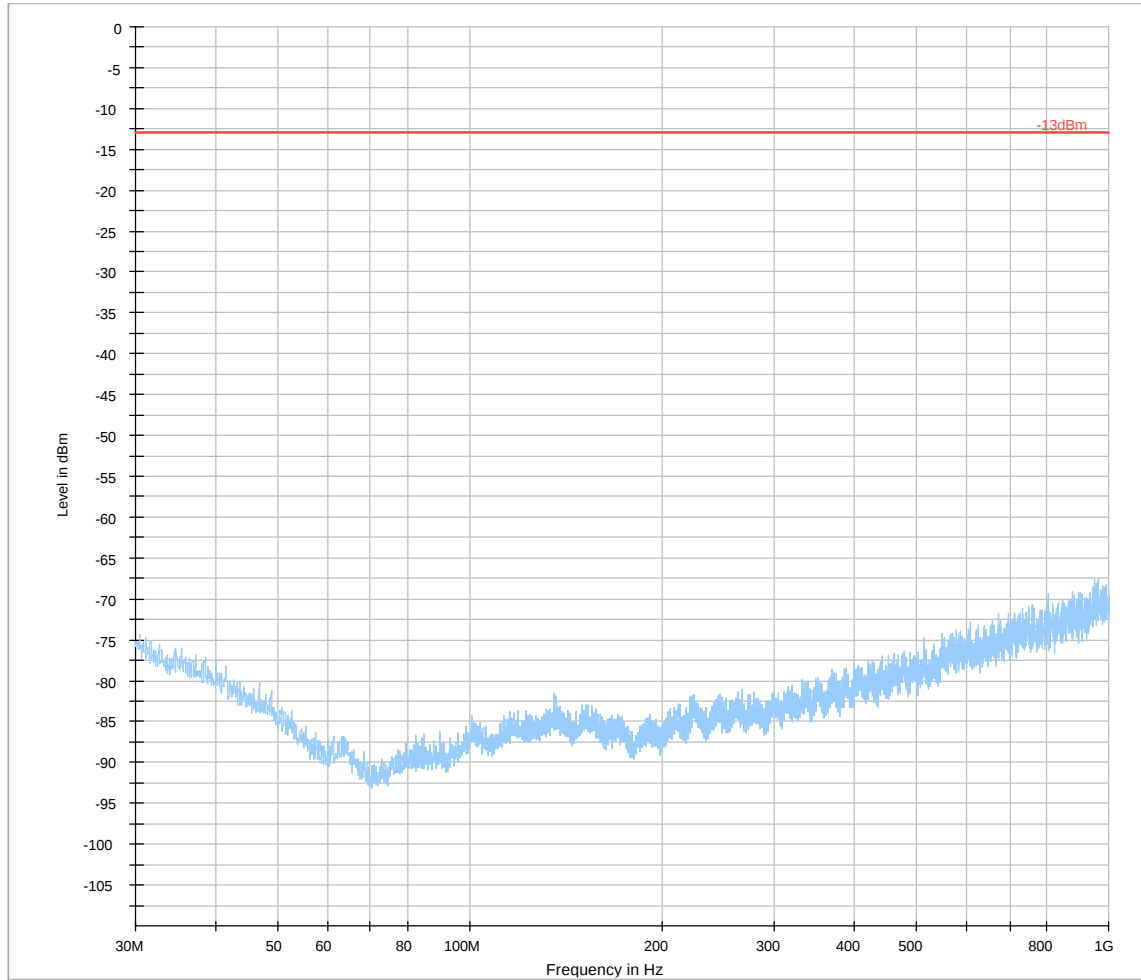
Plot # 35 Radiated Emissions: 9 kHz - 30 MHz

Channel: Mid



Plot # 36 Radiated Emissions: 30 MHz – 1GHz

Channel: Mid



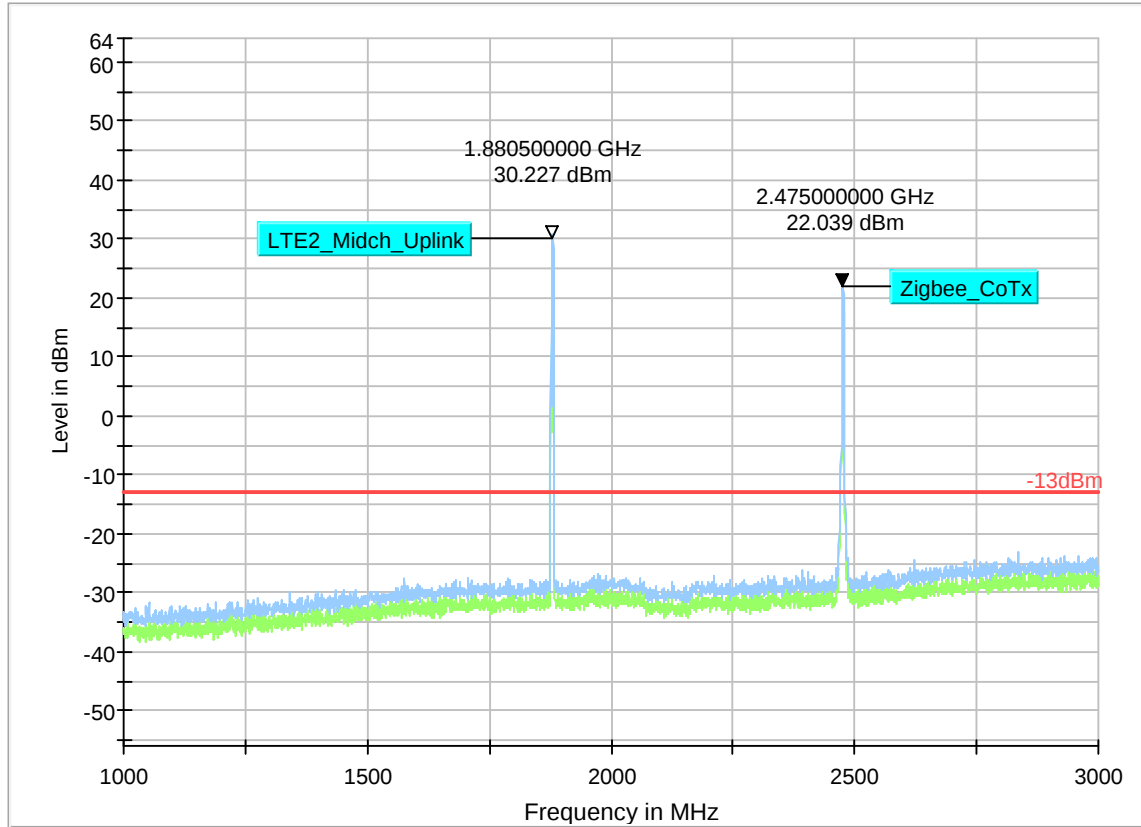
Preview Result 2-RMS
Critical_Freqs PK+
Final_Result RMS

Preview Result 1-PK+
-13dBm

Critical_Freqs RMS
Final_Result PK+

Plot # 37 Radiated Emissions: 1 GHz - 3 GHz

Channel: Mid



Preview Result 2-RMS
Critical_Freqs PK+
Final_Result RMS

Preview Result 1-PK+
-13dBm

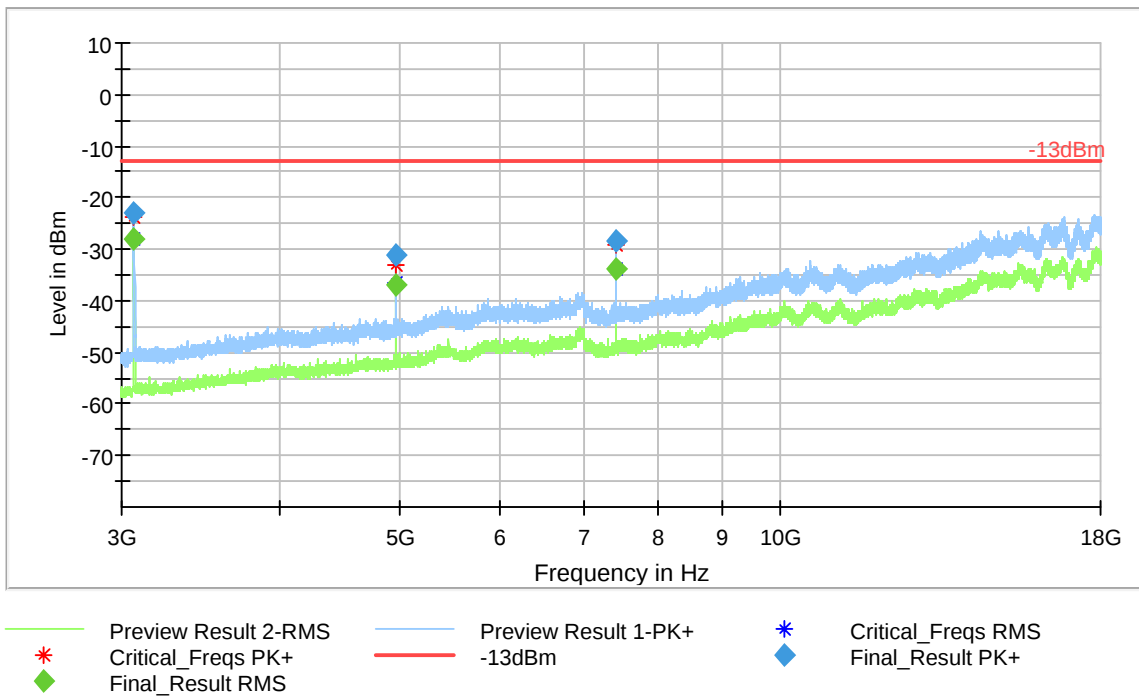
Critical_Freqs RMS
Final_Result PK+

Plot # 38 Radiated Emissions: 3 GHz – 18 GHz

Channel: Mid

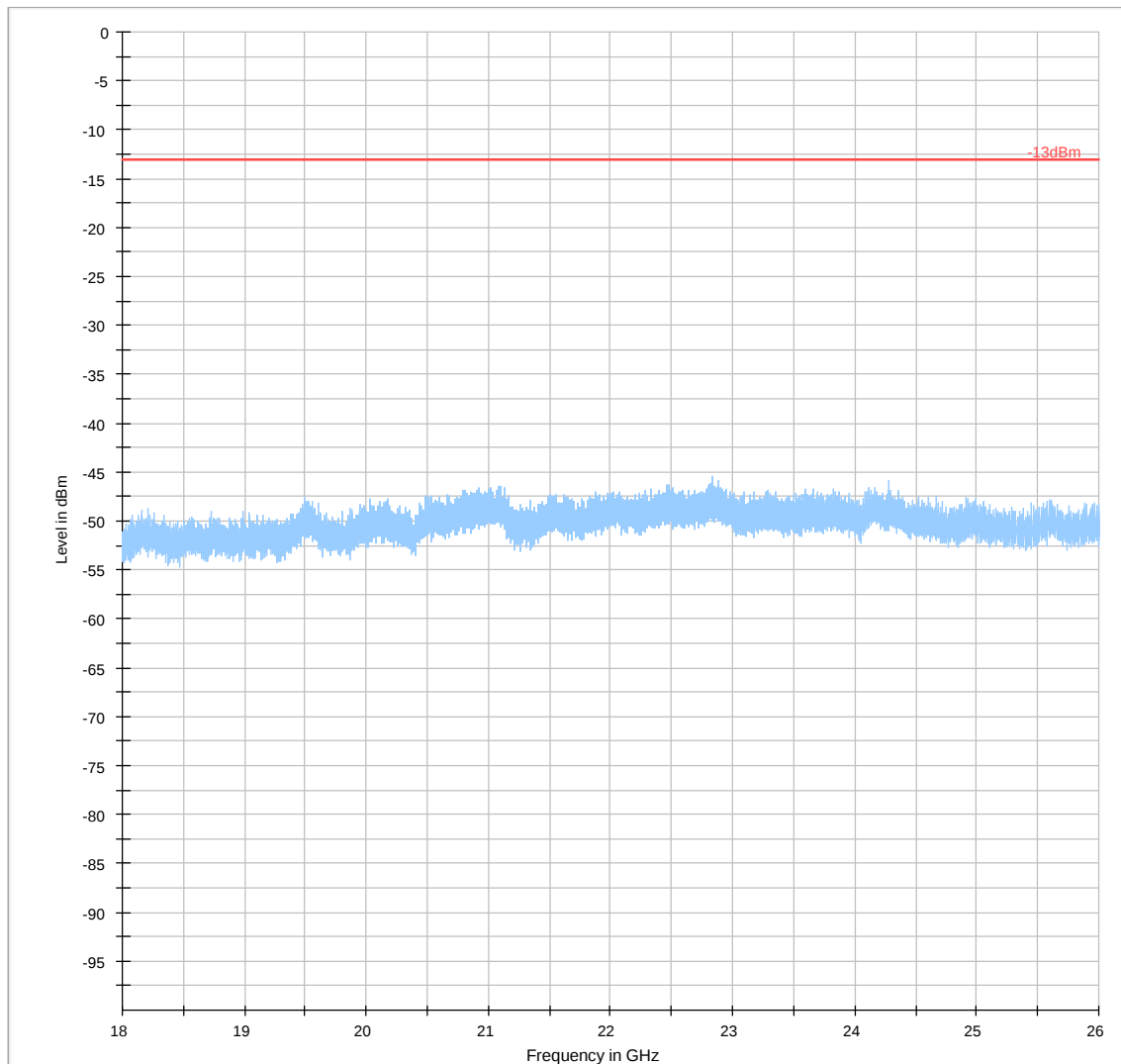
Final Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
3069.05	-23.13	---	-13.00	10.13	200.0	1000.000	149.0	V	86.0	-105.3	1:58:07 PM - 11/13/2018
3069.33	---	-28.18	---	---	200.0	1000.000	247.0	H	69.0	-105.3	2:07:24 PM - 11/13/2018
4951.02	---	-36.83	---	---	200.0	1000.000	162.0	H	106.0	-101.5	2:10:34 PM - 11/13/2018
4951.14	-31.29	---	-13.00	18.29	200.0	1000.000	163.0	H	106.0	-101.5	2:01:16 PM - 11/13/2018
7426.38	---	-34.01	---	---	200.0	1000.000	162.0	H	117.0	-97.8	2:13:38 PM - 11/13/2018
7426.60	-28.35	---	-13.00	15.35	200.0	1000.000	137.0	H	118.0	-97.8	2:04:22 PM - 11/13/2018



Plot # 39 Radiated Emissions: 18 GHz – 26 GHz

Channel: Mid



Preview Result 1-RMS



Critical_Freqs RMS



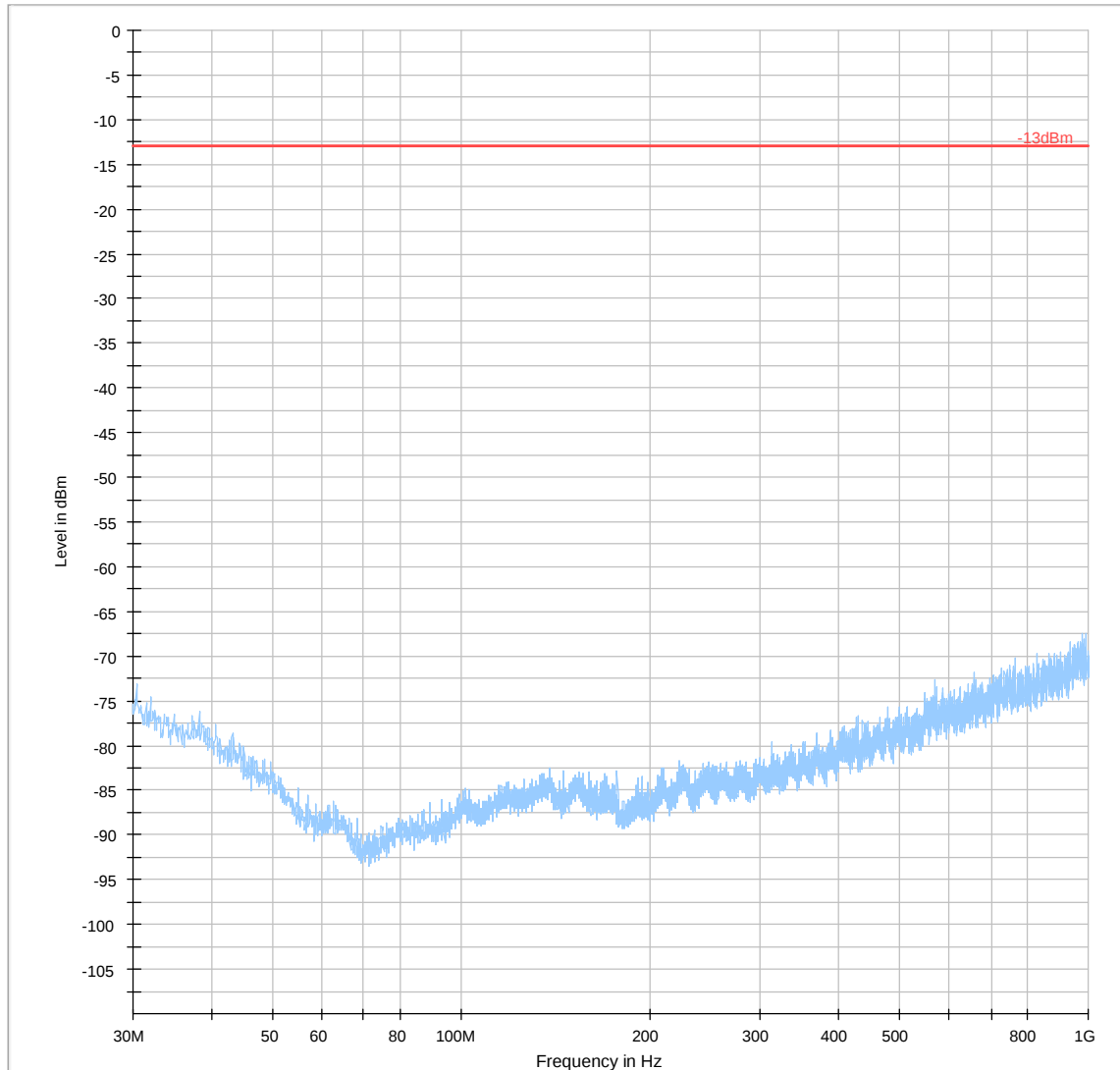
-13dBm



Final_Result RMS

Plot # 40 Radiated Emissions: 30 MHz - 1 GHz

Channel: High



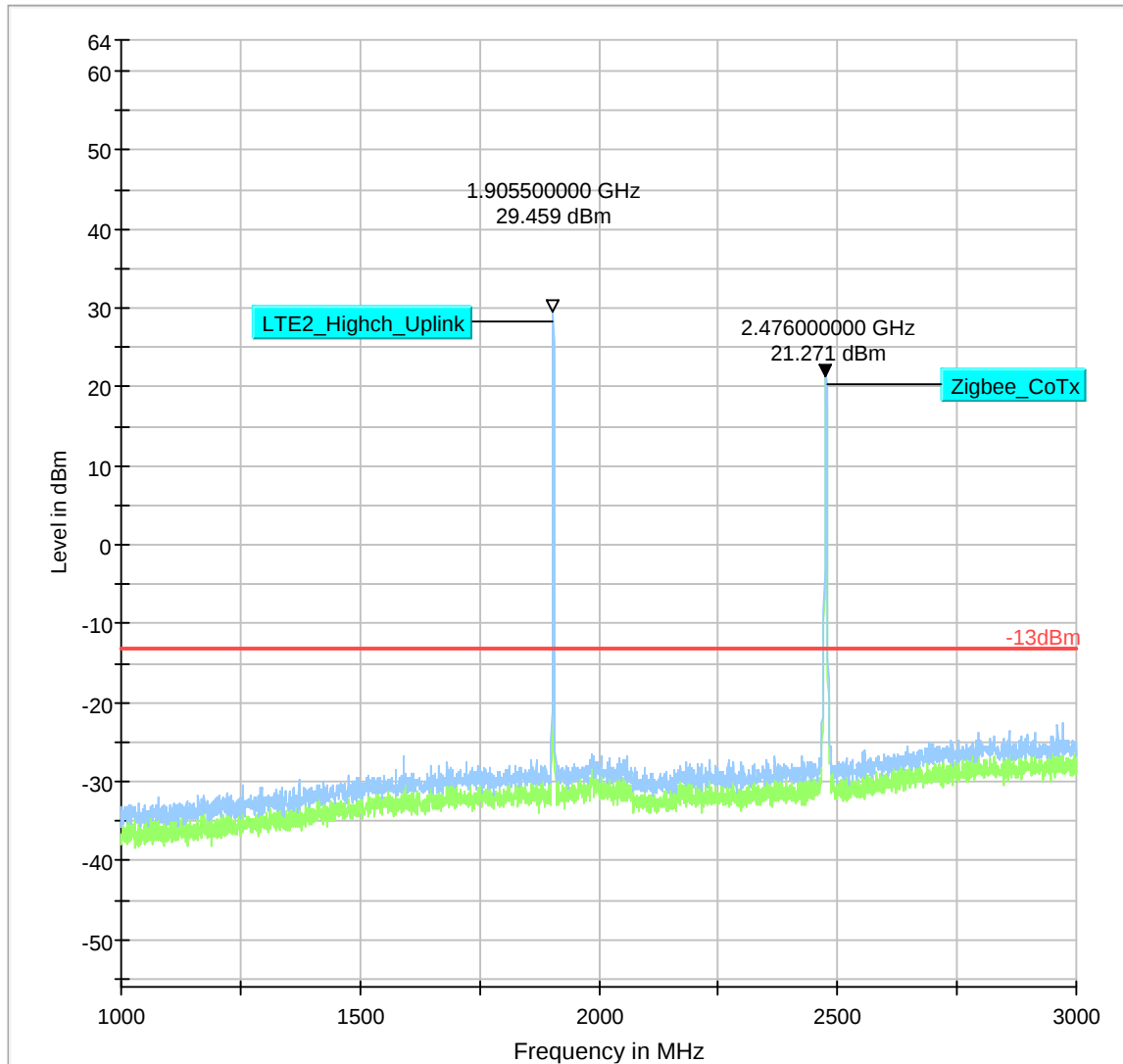
Preview Result 2-RMS
Critical_Freqs PK+
Final_Result RMS

Preview Result 1-PK+
-13dBm

Critical_Freqs RMS
Final_Result PK+

Plot # 41 Radiated Emissions: 1 GHz - 3 GHz

Channel: High



Preview Result 2-RMS
Critical_Freqs PK+
Final_Result RMS

Preview Result 1-PK+
-13dBm

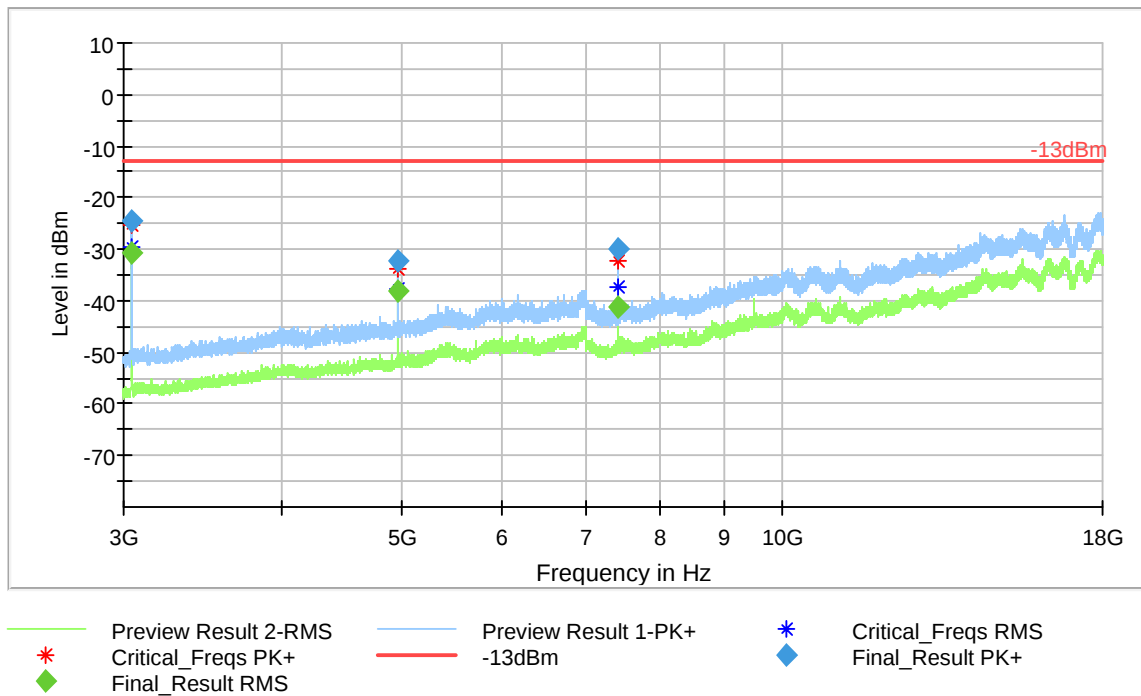
* Critical_Freqs RMS
◆ Final_Result PK+

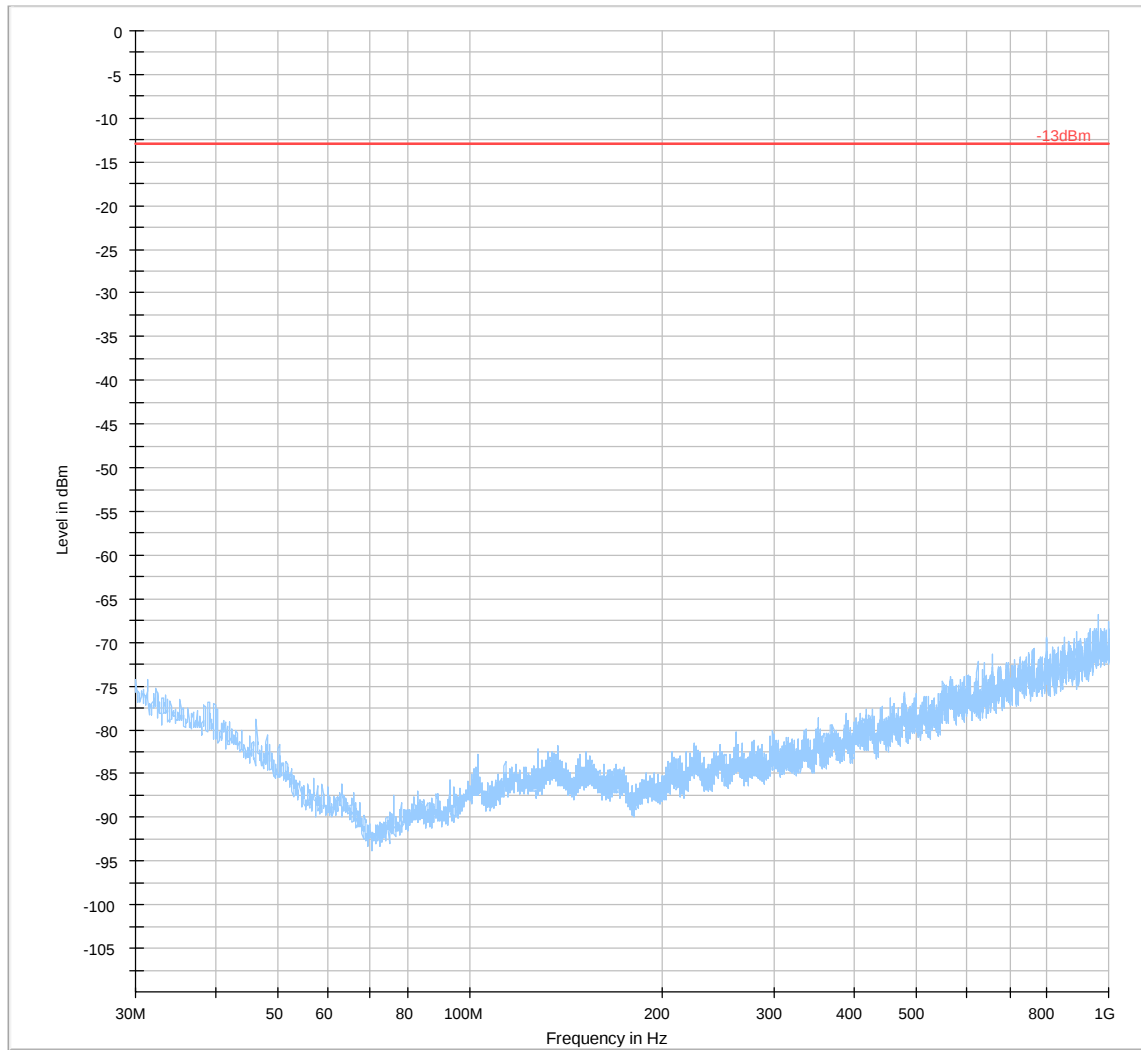
Plot # 42 Radiated Emissions: 3 GHz - 18 GHz

Channel: High

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
3045.82	---	-30.74	---	---	200.0	1000.000	258.0	V	72.0	-105.6	3:33:35 PM - 11/13/2018
3046.18	-24.40	---	-13.00	11.40	200.0	1000.000	144.0	V	95.0	-105.6	3:21:01 PM - 11/13/2018
4948.91	-32.38	---	-13.00	19.38	200.0	1000.000	175.0	H	128.0	-101.5	3:17:47 PM - 11/13/2018
4951.03	---	-38.26	---	---	200.0	1000.000	174.0	H	128.0	-101.5	3:27:19 PM - 11/13/2018
7423.45	---	-41.38	---	---	200.0	1000.000	210.0	H	113.0	-97.8	3:30:25 PM - 11/13/2018
7426.61	-30.15	---	-13.00	17.15	200.0	1000.000	257.0	V	122.0	-97.8	3:24:05 PM - 11/13/2018



LTE Band 4**Plot # 43 Radiated Emissions: 30 MHz - 1 GHz****Channel: Low**

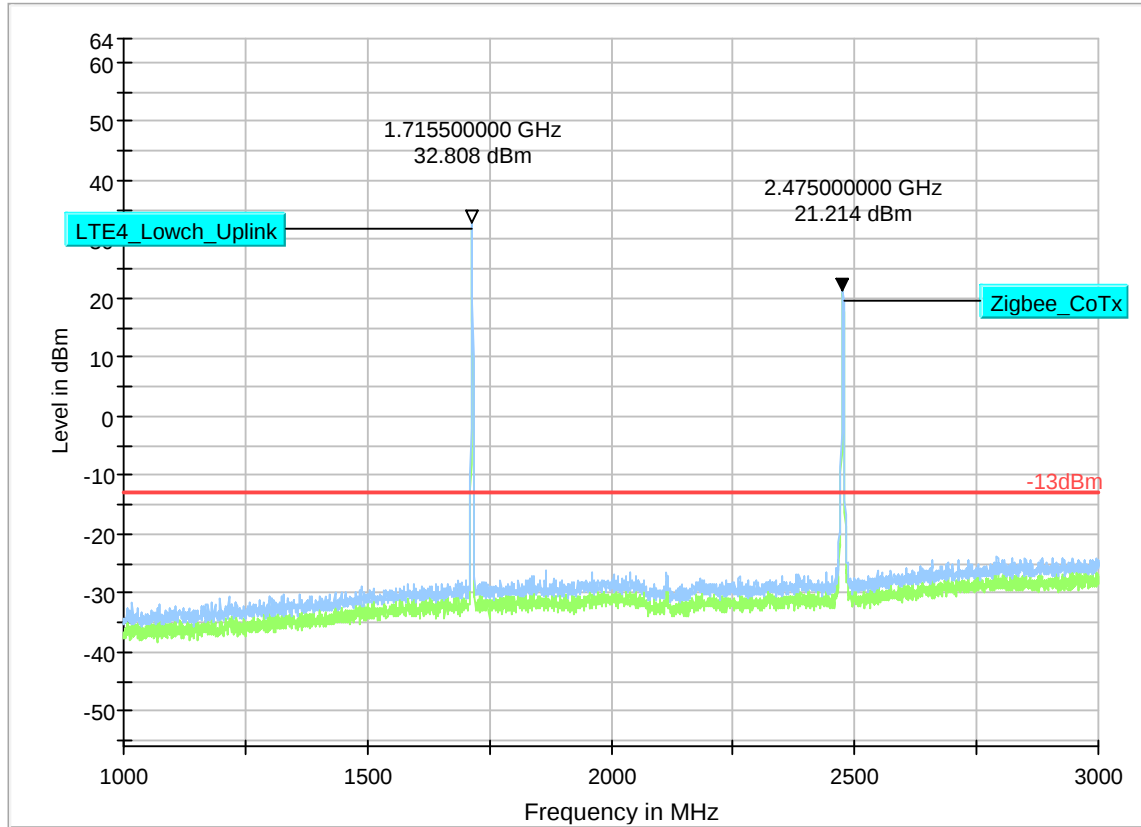
Preview Result 2-RMS
Critical_Freqs PK+
Final_Result RMS

Preview Result 1-PK+
-13dBm

Critical_Freqs RMS
Final_Result PK+

Plot # 44 Radiated Emissions: 1 GHz - 3 GHz

Channel: Low



Preview Result 2-RMS
Critical_Freqs PK+
Final_Result RMS

Preview Result 1-PK+
-13dBm

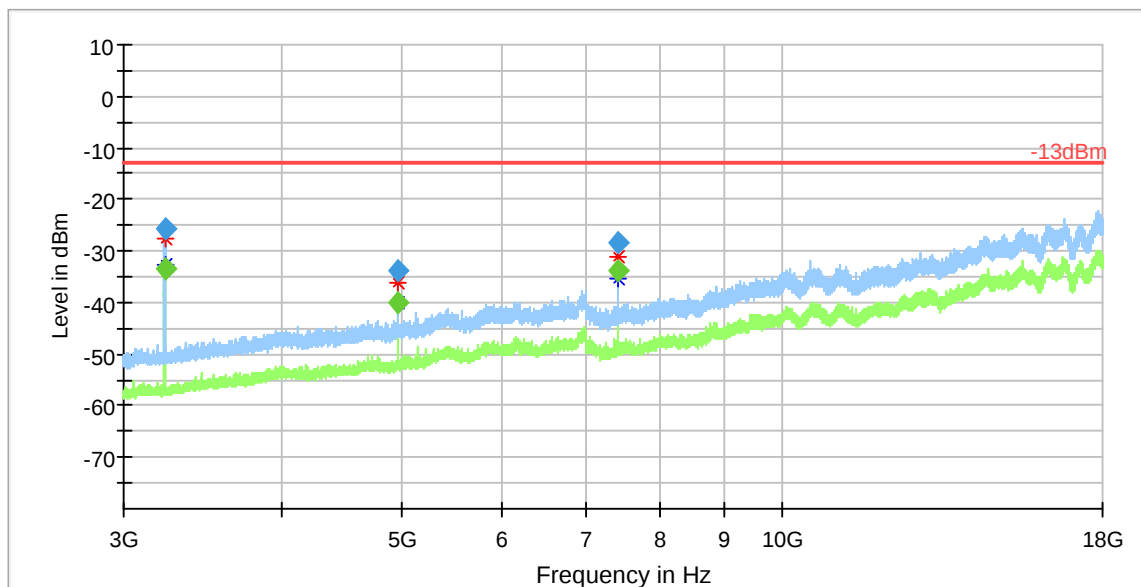
Critical_Freqs RMS
Final_Result PK+

Plot # 45 Radiated Emissions: 3 GHz - 18 GHz

Channel: Low

Final Result

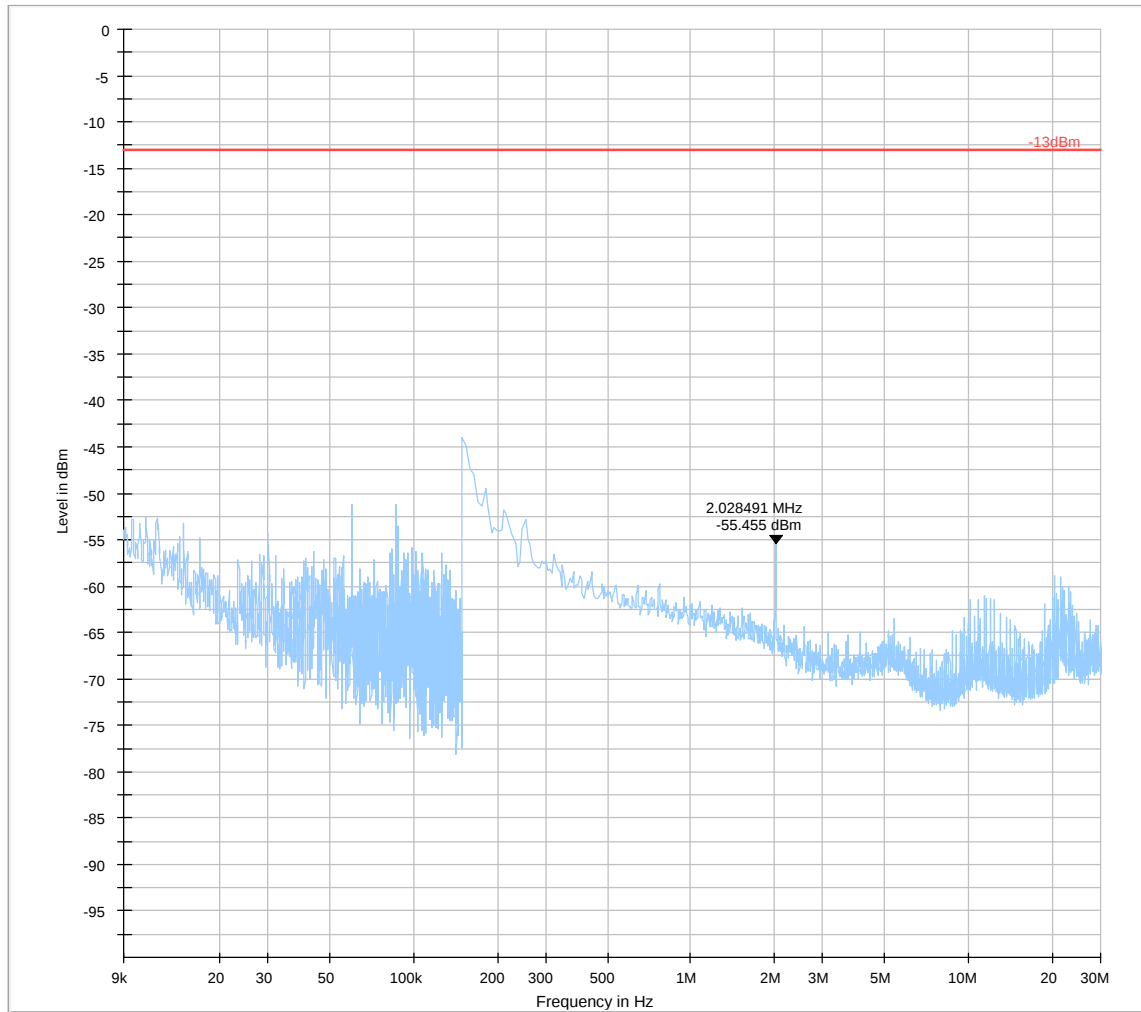
Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
3235.91	-25.71	---	-13.00	12.71	200.0	1000.000	163.0	V	211.0	-105.2	4:20:05 PM - 11/13/2018
3236.04	---	-33.64	---	---	200.0	1000.000	162.0	V	213.0	-105.2	4:29:56 PM - 11/13/2018
4950.89	---	-40.12	---	---	200.0	1000.000	219.0	H	65.0	-101.5	4:26:40 PM - 11/13/2018
4951.02	-33.93	---	-13.00	20.93	200.0	1000.000	283.0	H	66.0	-101.5	4:16:44 PM - 11/13/2018
7423.48	-28.22	---	-13.00	15.22	200.0	1000.000	248.0	V	259.0	-97.8	4:23:12 PM - 11/13/2018
7426.40	---	-33.77	---	---	200.0	1000.000	246.0	V	259.0	-97.8	4:33:03 PM - 11/13/2018



— Preview Result 2-RMS — Preview Result 1-PK+ * Critical_Freqs RMS
* Critical_Freqs PK+ — -13dBm ◆ Final_Result PK+
◆ Final_Result RMS

Plot # 46 Radiated Emissions: 9 kHz - 30 MHz

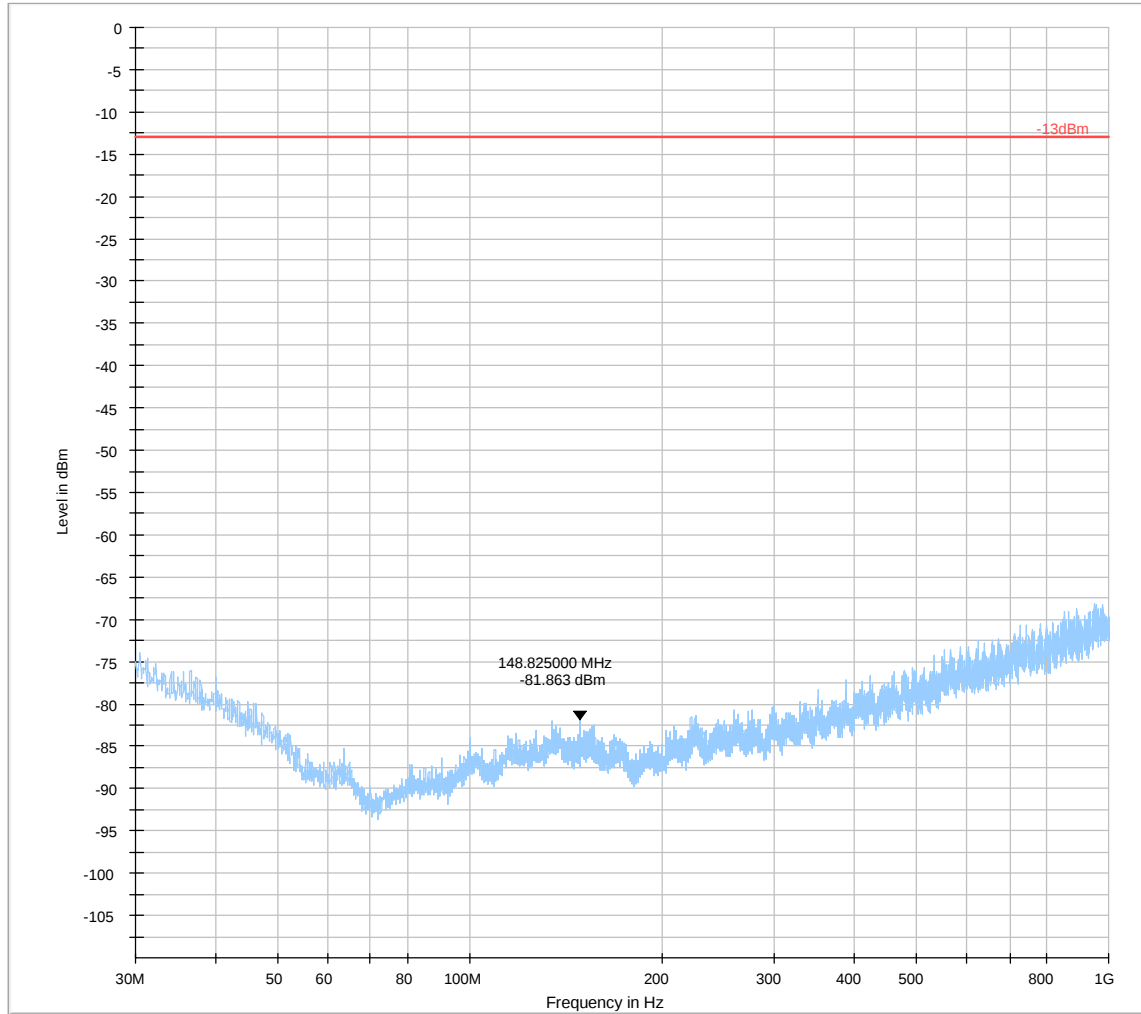
Channel: Mid

Preview Result 1-RMS
Final_Result RMS* Critical_Freqs RMS
X RMS (Single)

-13dBm

Plot # 47 Radiated Emissions: 30 MHz – 1 GHz

Channel: Mid



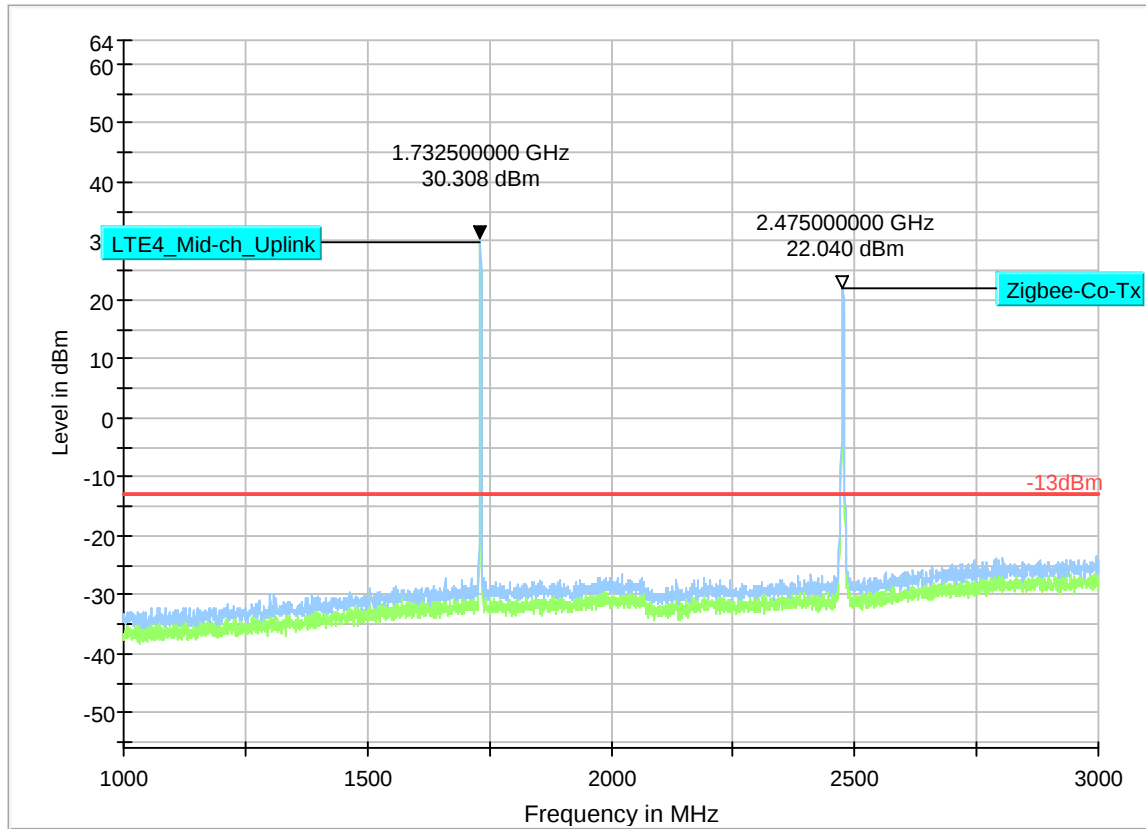
Preview Result 2-RMS
Critical_Freqs PK+
Final_Result RMS

Preview Result 1-PK+
-13dBm

Critical_Freqs RMS
Final_Result PK+

Plot # 48 Radiated Emissions: 1 GHz - 3 GHz

Channel: Mid



Preview Result 2-RMS
Critical_Freqs PK+
Final_Result RMS

Preview Result 1-PK+
-13dBm

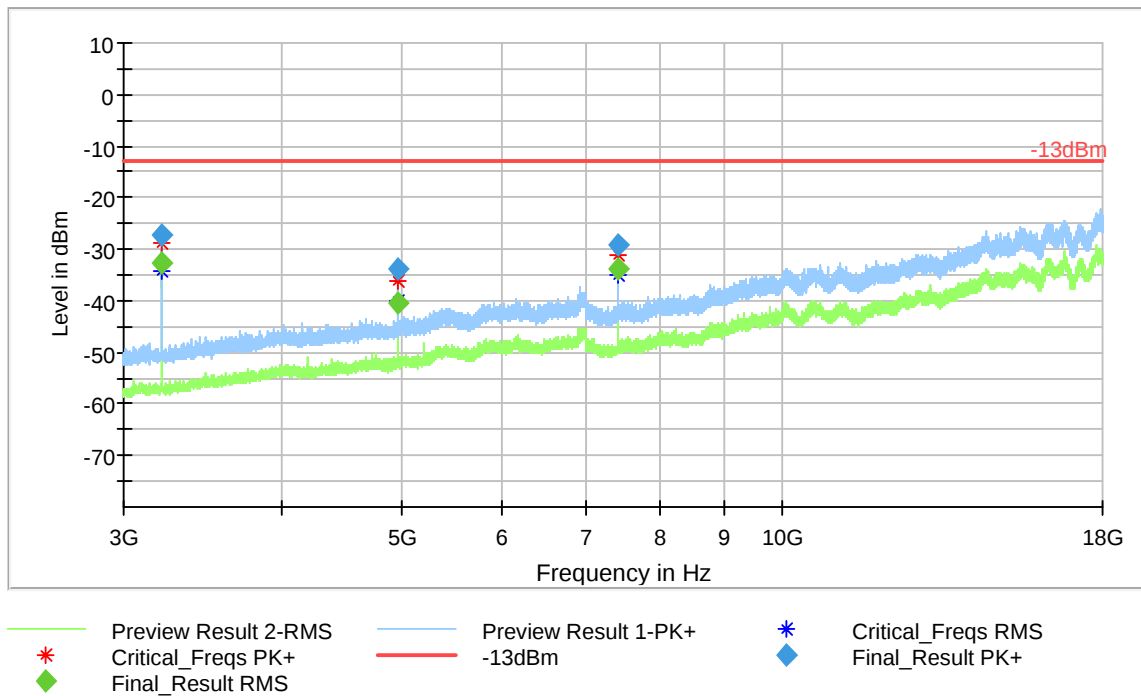
Critical_Freqs RMS
Final_Result PK+

Plot # 49 Radiated Emissions: 3 GHz – 18GHz

Channel: Mid

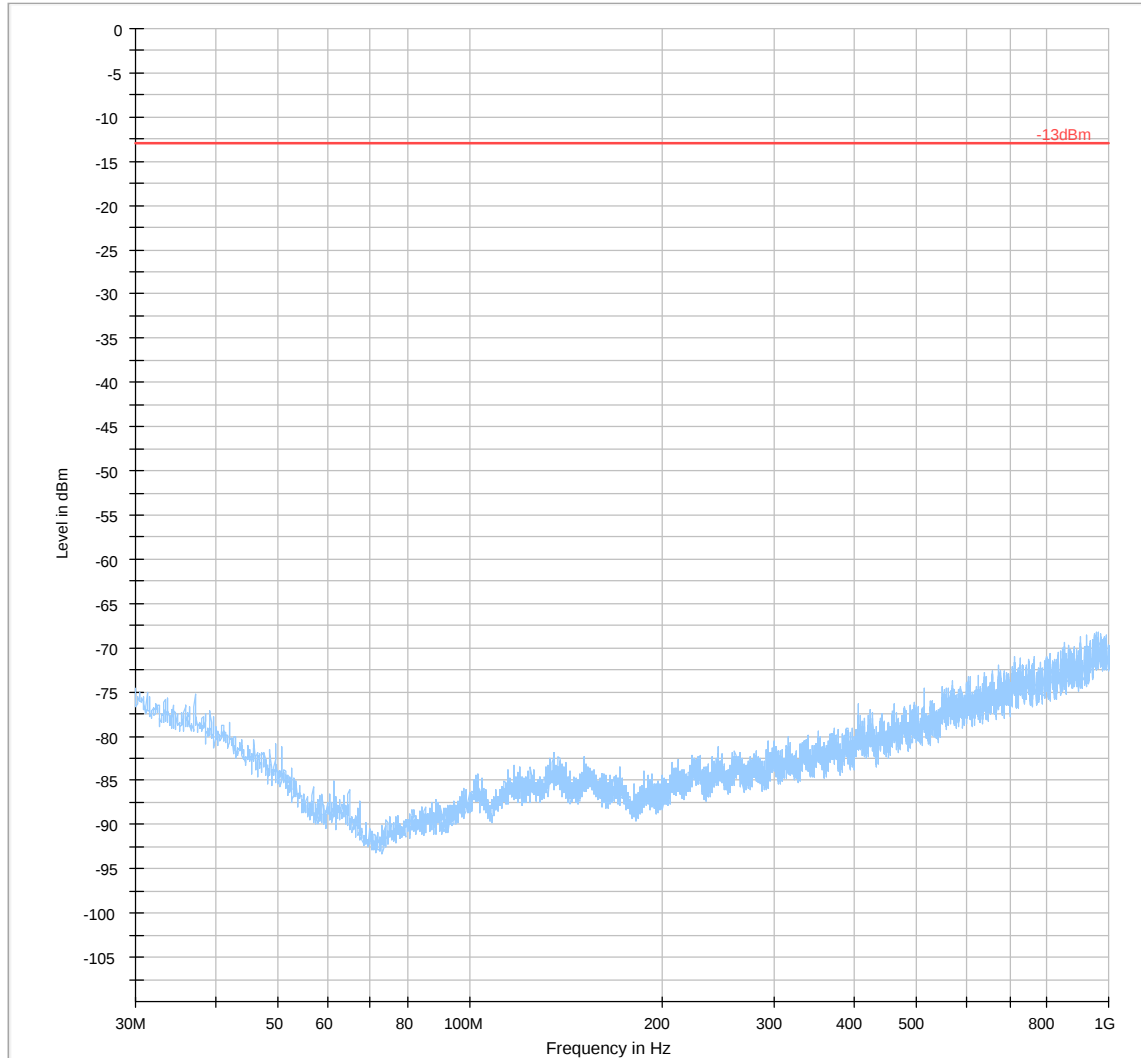
Final_Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
3216.45	---	-32.67	---	---	200.0	1000.000	243.0	V	73.0	-105.2	3:59:47 PM - 11/13/2018
3216.54	-27.28	---	-13.00	14.28	200.0	1000.000	144.0	V	173.0	-105.2	3:50:02 PM - 11/13/2018
4950.85	---	-40.30	---	---	200.0	1000.000	285.0	H	66.0	-101.5	3:56:34 PM - 11/13/2018
4950.89	-33.97	---	-13.00	20.97	200.0	1000.000	283.0	V	69.0	-101.5	3:47:02 PM - 11/13/2018
7423.52	---	-33.71	---	---	200.0	1000.000	284.0	V	260.0	-97.8	4:03:06 PM - 11/13/2018
7426.35	-29.01	---	-13.00	16.01	200.0	1000.000	230.0	V	255.0	-97.8	3:53:10 PM - 11/13/2018



Plot # 50 Radiated Emissions: 30 MHz - 1 GHz

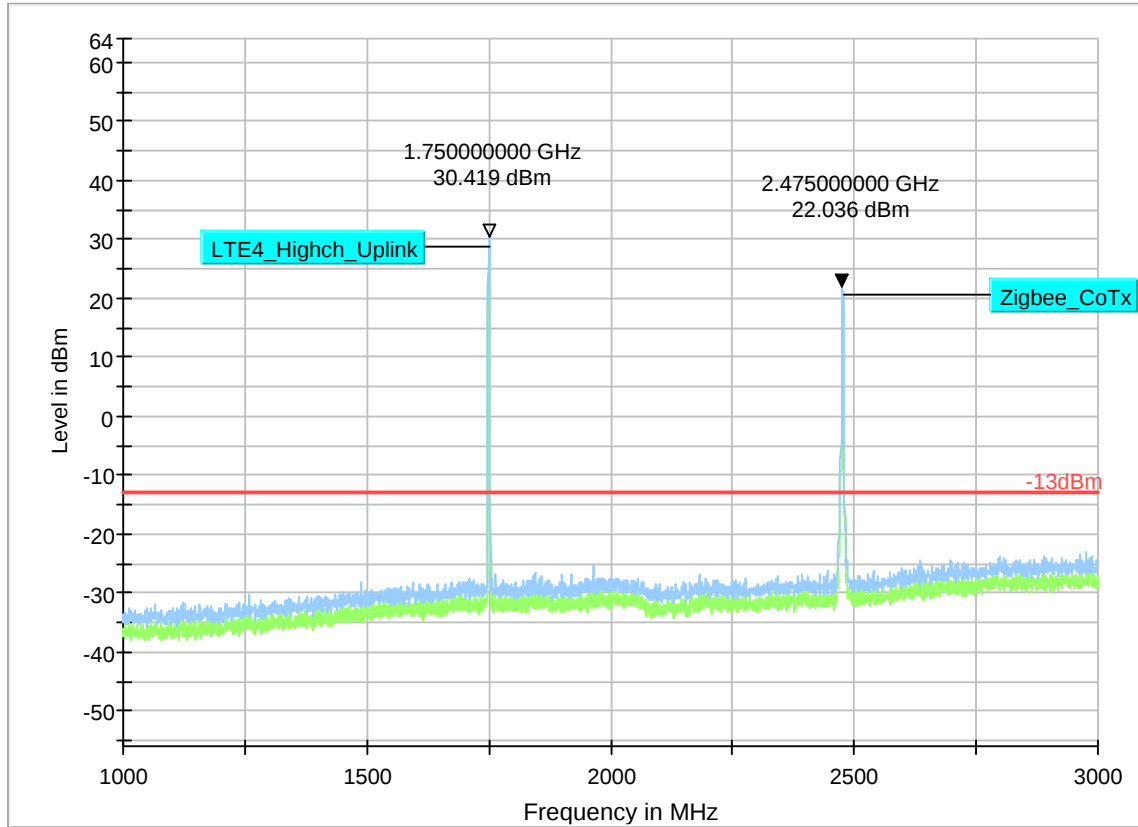
Channel: High



Preview Result 2-RMS	Preview Result 1-PK+	Critical_Freqs RMS
Critical_Freqs PK+	-13dBm	Final_Result PK+
Final_Result RMS		

Plot # 51 Radiated Emissions: 1 GHz - 3 GHz

Channel: High



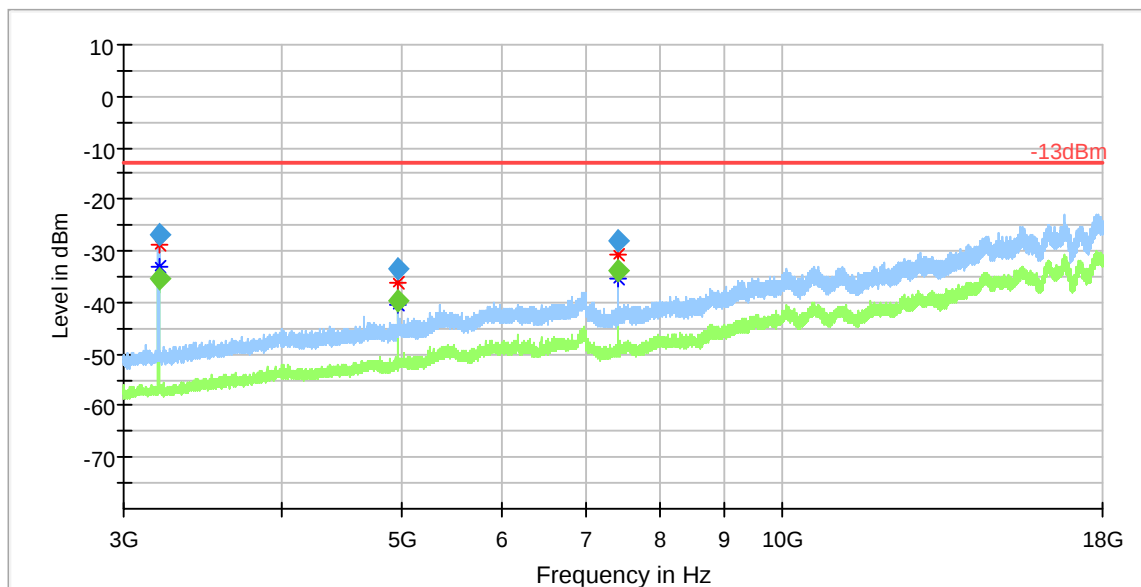
Preview Result 2-RMS	Preview Result 1-PK+	Critical_Freqs RMS
* Critical_Freqs PK+	-13dBm	* Final_Result PK+
◆ Final_Result RMS		

Plot # 52 Radiated Emissions: 3 GHz - 18 GHz

Channel: High

Final Result

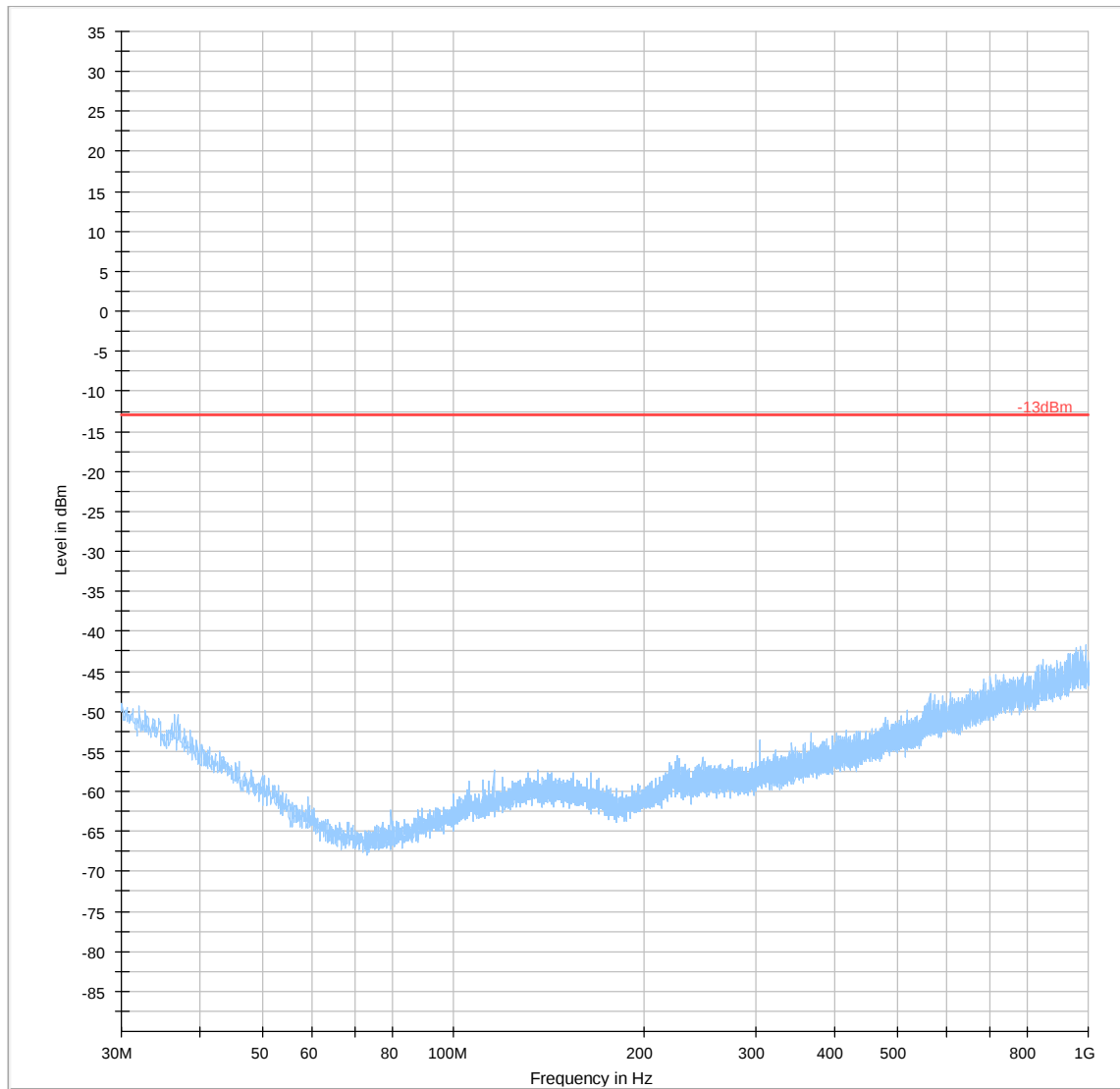
Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
3198.95	-26.79	---	-13.00	13.79	200.0	1000.000	187.0	V	195.0	-105.2	4:51:35 PM - 11/13/2018
3201.02	---	-35.26	---	---	200.0	1000.000	189.0	V	192.0	-105.2	5:01:19 PM - 11/13/2018
4948.95	-33.54	---	-13.00	20.54	200.0	1000.000	241.0	V	70.0	-101.5	4:48:15 PM - 11/13/2018
4950.89	---	-39.78	---	---	200.0	1000.000	263.0	V	67.0	-101.5	4:58:02 PM - 11/13/2018
7426.51	---	-33.74	---	---	200.0	1000.000	249.0	V	259.0	-97.8	5:04:29 PM - 11/13/2018
7426.74	-28.02	---	-13.00	15.02	200.0	1000.000	258.0	V	257.0	-97.8	4:54:44 PM - 11/13/2018



◆ Preview Result 2-RMS
* Critical_Freqs PK+
◆ Final_Result PK+

— Preview Result 1-PK+
— -13dBm

* Critical_Freqs RMS

LTE Band 12**Plot # 53 Radiated Emissions: 30 MHz - 1 GHz****Channel: Low**

Preview Result 1-RMS



Critical_Freqs RMS



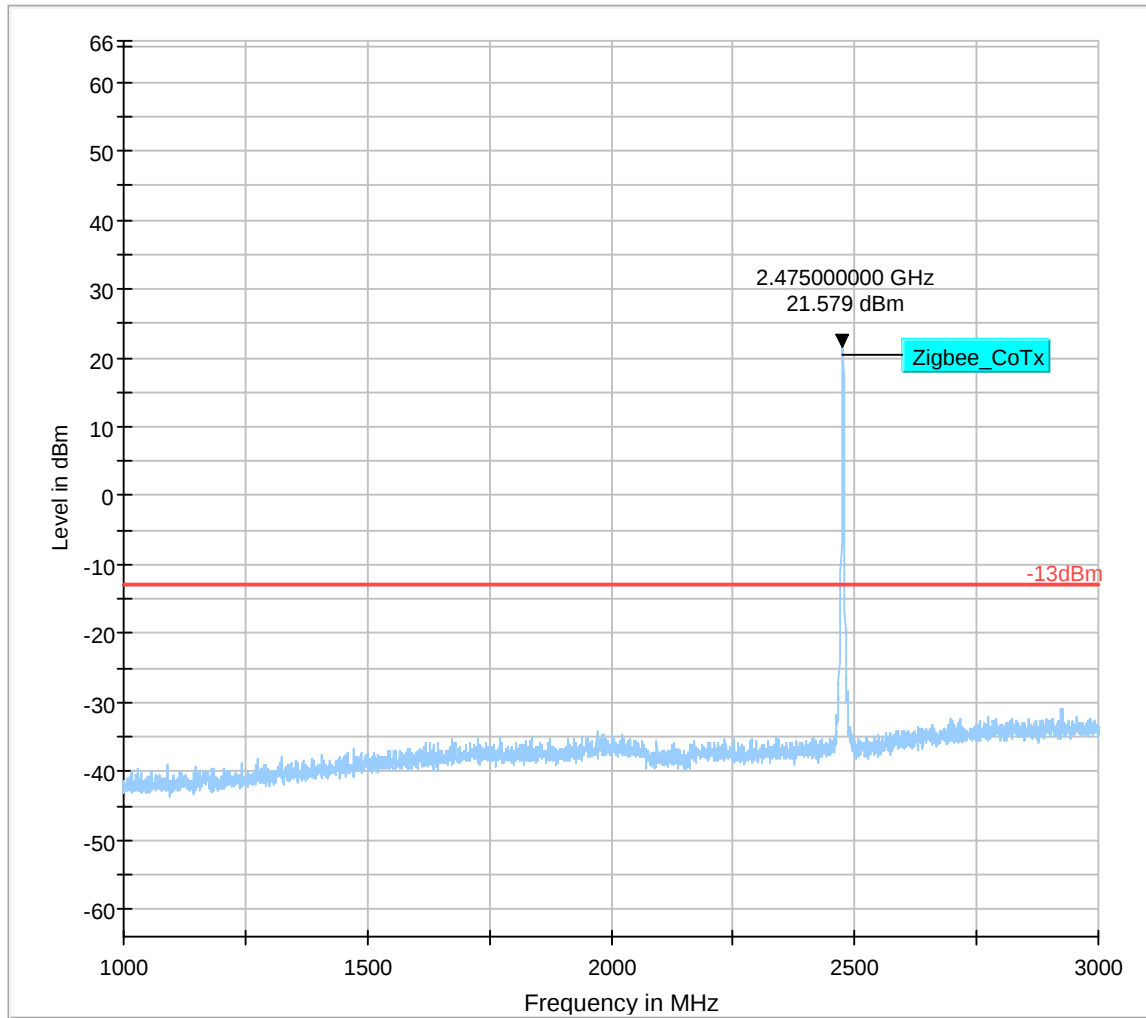
-13dBm



Final_Result RMS

Plot # 54 Radiated Emissions: 1 GHz - 3 GHz

Channel: Low



Preview Result 1-RMS



Critical_Freqs RMS



-13dBm



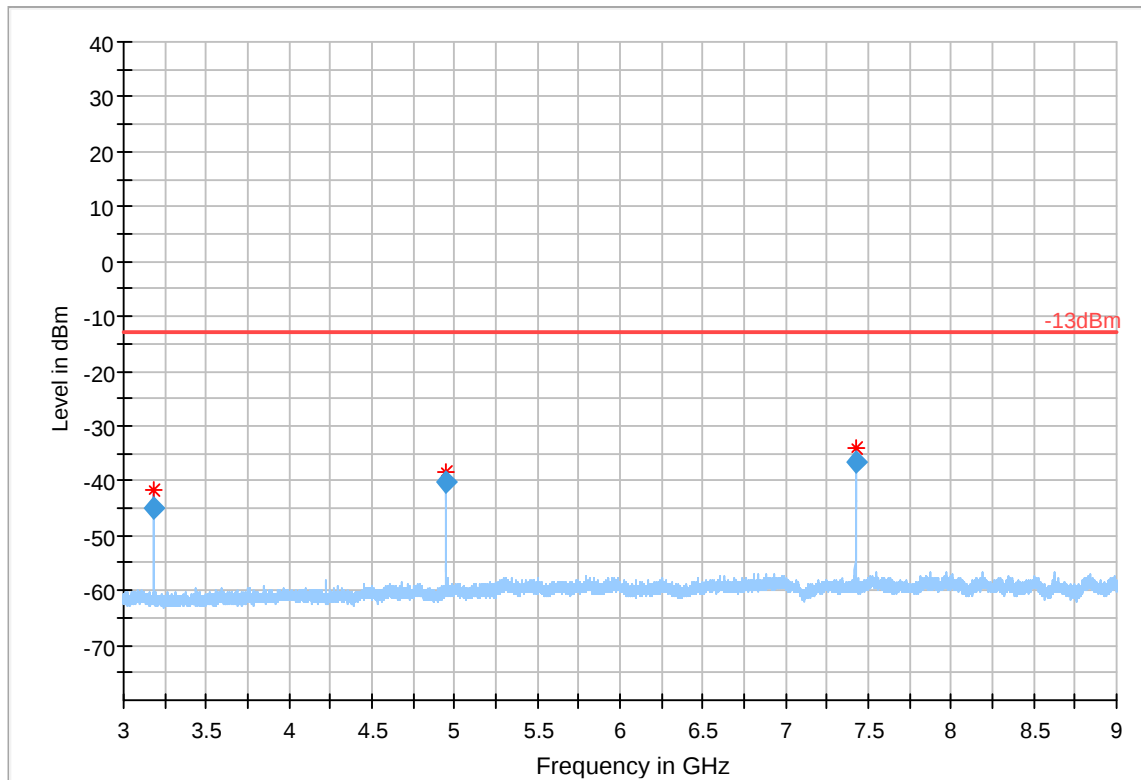
Final_Result RM

Plot # 55 Radiated Emissions: 3 GHz - 9 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
3179.43	-44.98	-13.00	31.98	500.0	1000.000	141.0	V	211.0	-132.1	6:07:07 PM - 11/13/2018
4950.99	-40.06	-13.00	27.06	500.0	1000.000	283.0	V	60.0	-128.4	6:03:43 PM - 11/13/2018
7423.45	-36.41	-13.00	23.41	500.0	1000.000	100.0	V	314.0	-124.7	6:10:25 PM - 11/13/2018



Preview Result 1-RMS



Critical_Freqs RMS



-13dBm



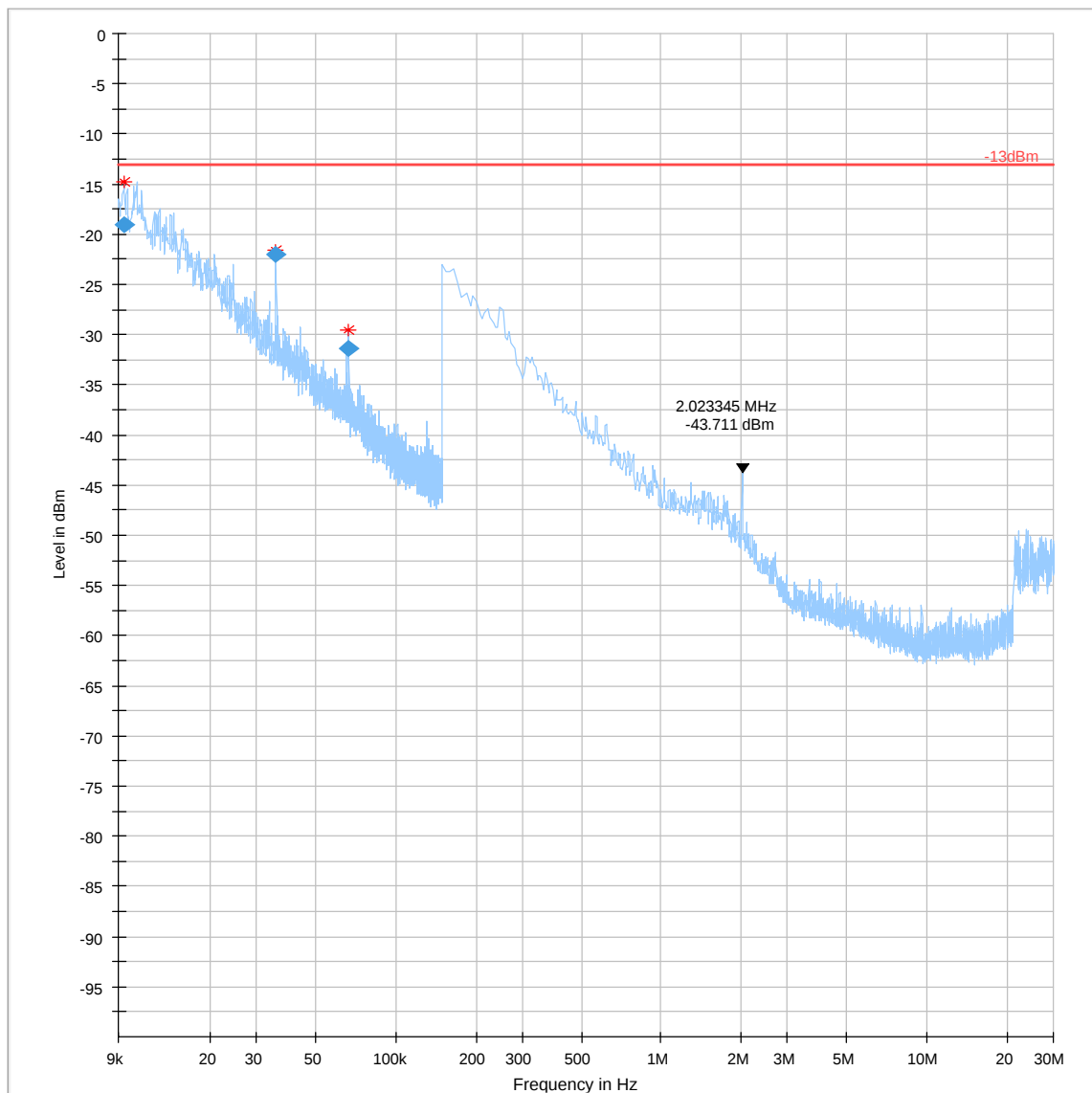
Final_Result RM

Plot # 56 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
0.009	-19.02	-13.00	6.02	100.0	0.100	149.0	V	78.0	-11.4	6:03:51 PM - 12/7/2018
0.035	-22.03	-13.00	9.03	100.0	0.100	159.0	H	260.0	-22.2	6:06:10 PM - 12/7/2018
0.066	-31.34	-13.00	18.34	100.0	0.100	171.0	H	195.0	-27.5	6:08:16 PM - 12/7/2018



Preview Result 1-RMS



Critical_Freqs RMS



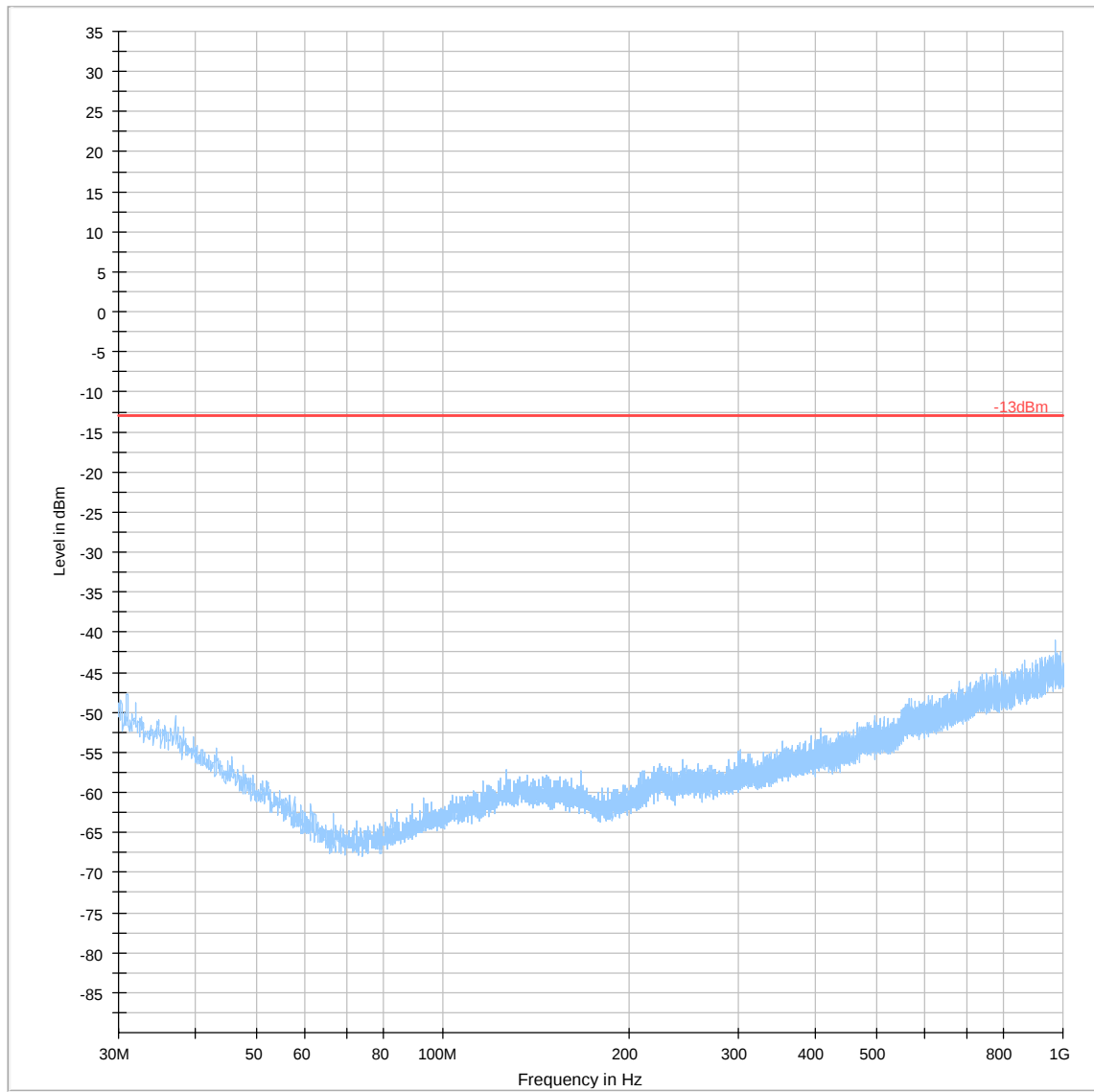
-13dBm



Final_Result RMS

Plot # 57 Radiated Emissions: 30 MHz – 1 GHz

Channel: Mid



Preview Result 1-RMS



Critical_Freqs RMS

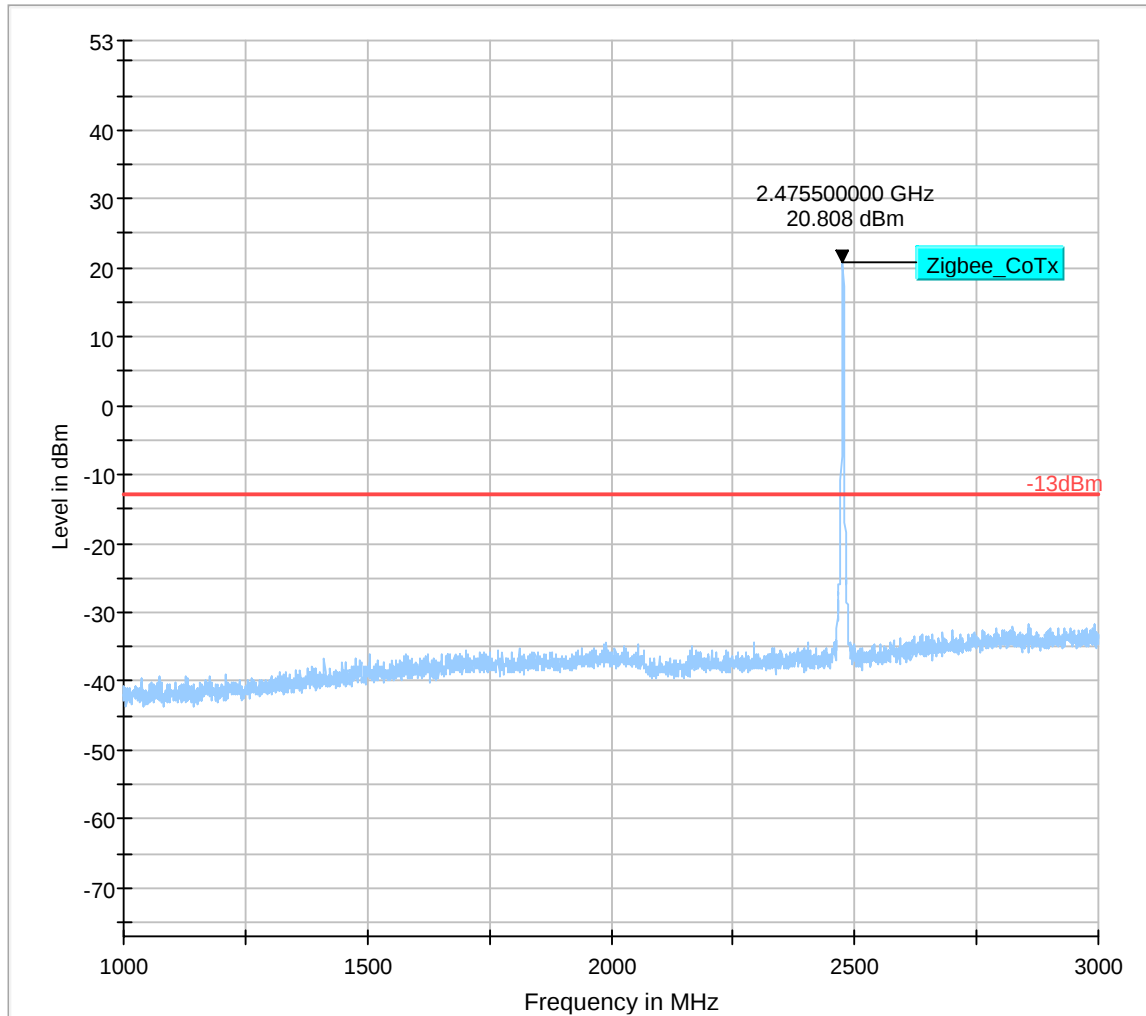
-13dBm



Final_Result RMS

Plot # 58 Radiated Emissions: 1 GHz - 3 GHz

Channel: Mid



Preview Result 1-RMS



Critical_Freqs RMS



-13dBm



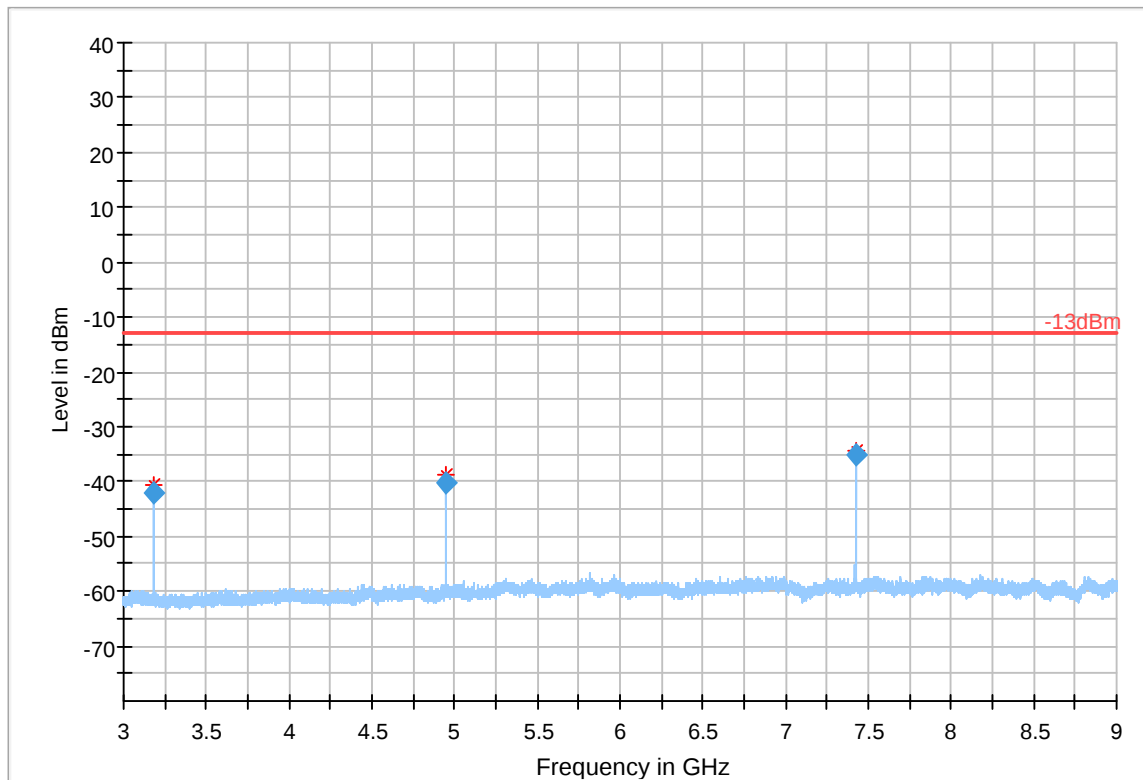
Final_Result RM

Plot # 59 Radiated Emissions: 3 GHz – 9 GHz

Channel: Mid

Final_Result

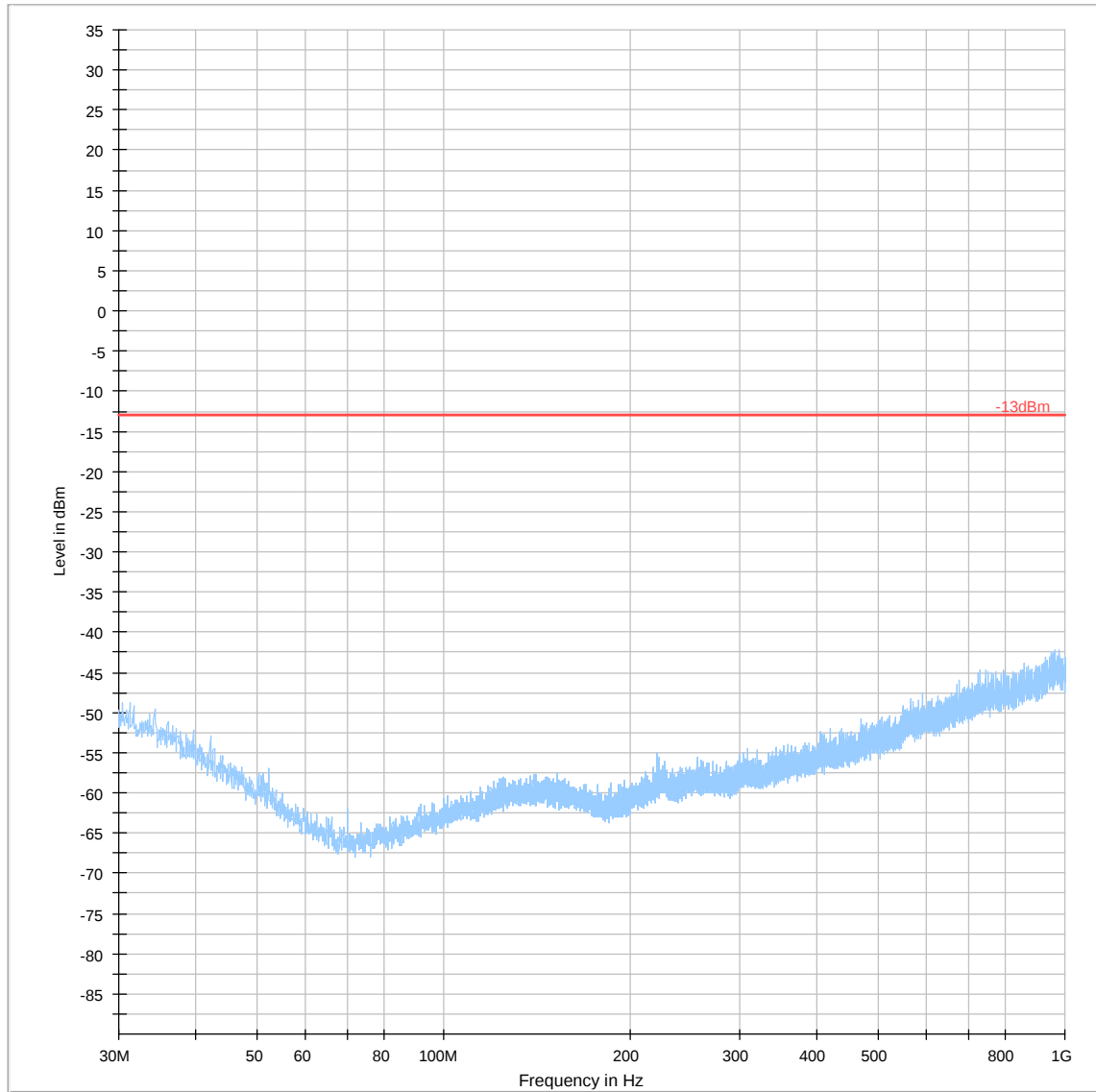
Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
3182.35	-41.95	-13.00	28.95	500.0	1000.000	326.0	V	75.0	-132.1	5:21:21 PM - 11/13/2018
4948.86	-40.33	-13.00	27.33	500.0	1000.000	234.0	V	66.0	-128.4	5:18:21 PM - 11/13/2018
7426.31	-35.19	-13.00	22.19	500.0	1000.000	224.0	V	256.0	-124.7	5:24:50 PM - 11/13/2018



— Preview Result 1-RMS * Critical_Freqs RMS — -13dBm ◆ Final_Result RM

Plot # 60 Radiated Emissions: 30 MHz - 1 GHz

Channel: High



Preview Result 1-RMS



Critical_Freqs RMS

-13dBm



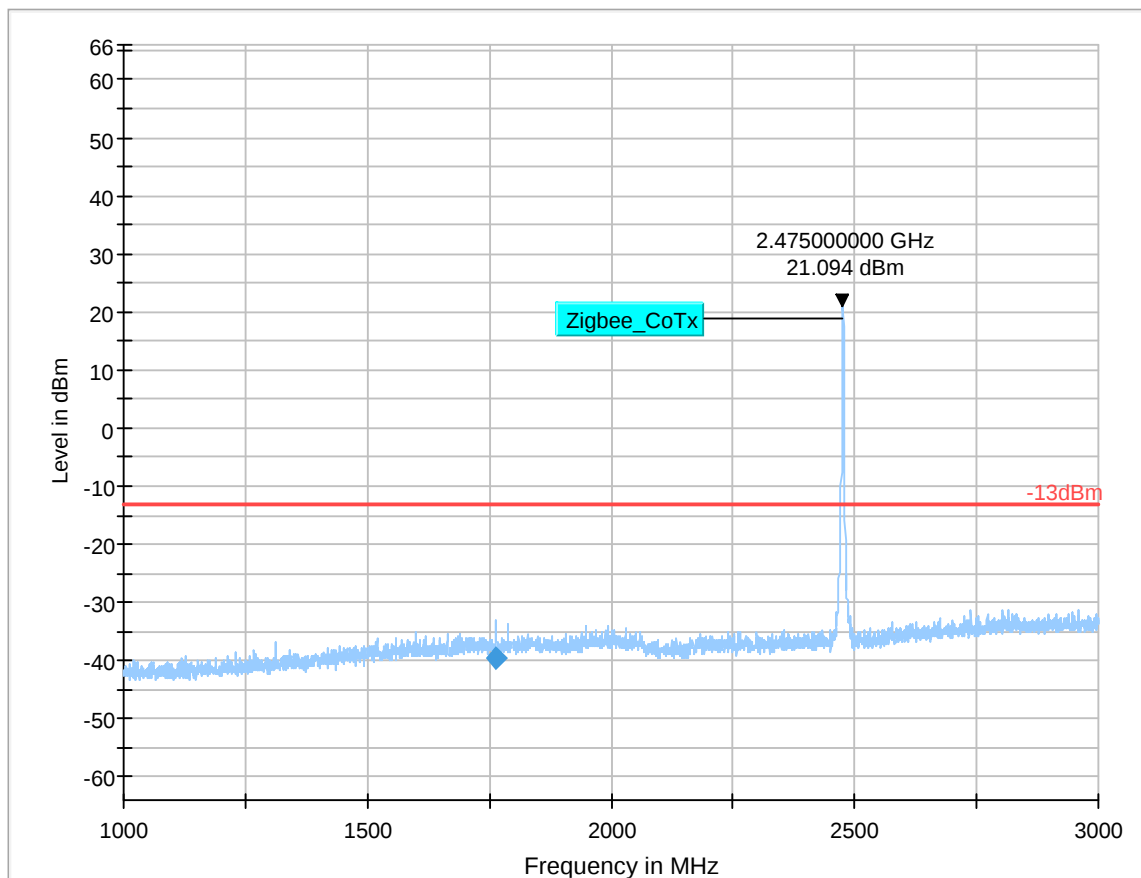
Final_Result RMS

Plot # 61 Radiated Emissions: 1 GHz - 3 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
1763.605	-39.45	-13.00	26.45	500.0	1000.000	157.0	H	224.0	-86.9	6:46:35 PM - 11/8/2018



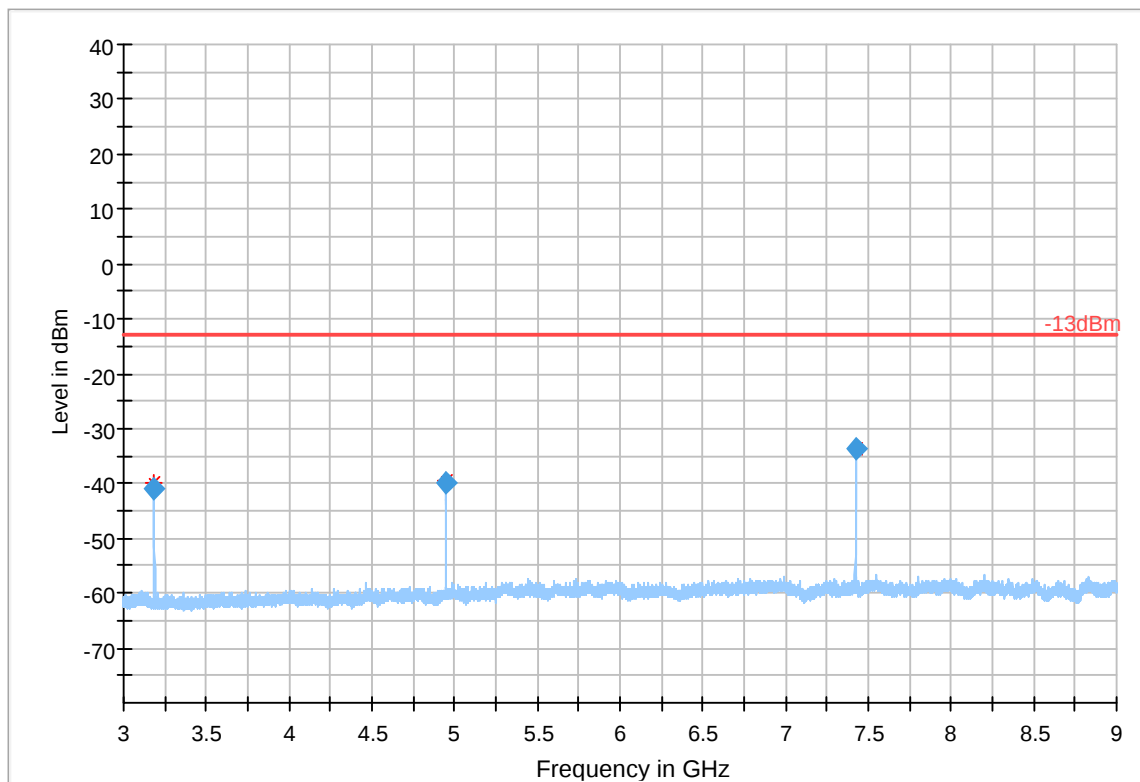
Preview Result 1-RMS * Critical_Freqs RMS -13dBm Final_Result RV

Plot # 62 Radiated Emissions: 3 GHz - 9 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
3185.85	-40.97	-13.00	27.97	500.0	1000.000	332.0	V	82.0	-132.1	6:24:41 PM - 11/13/2018
4950.90	-39.81	-13.00	26.81	500.0	1000.000	250.0	V	63.0	-128.4	6:21:39 PM - 11/13/2018
7426.51	-33.58	-13.00	20.58	500.0	1000.000	242.0	V	260.0	-124.7	6:28:08 PM - 11/13/2018



Preview Result 1-RMS



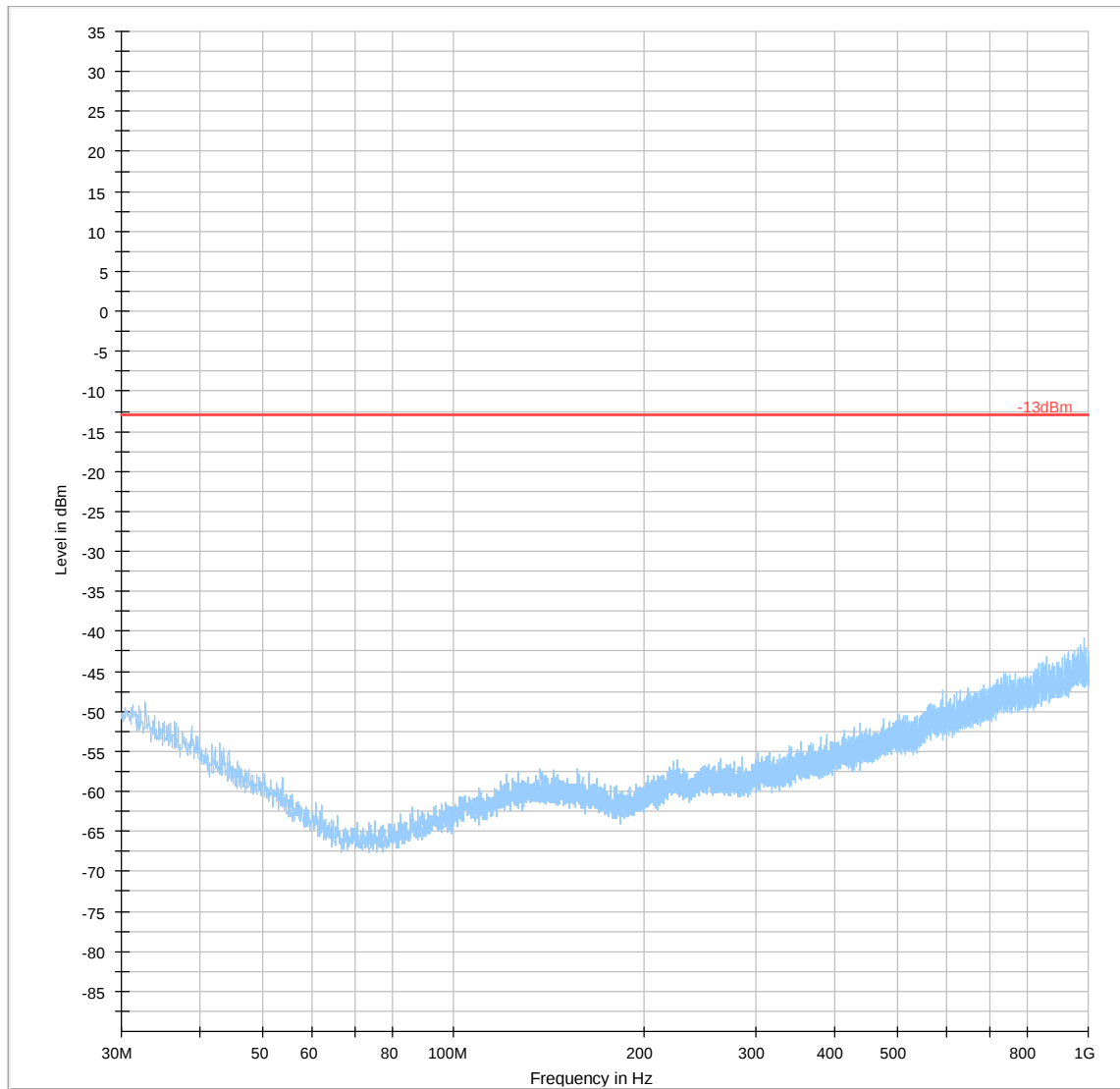
Critical_Freqs RMS



-13dBm



Final_Result RV

GSM 850**Plot # 63 Radiated Emissions: 30 MHz – 1GHz****Channel: Low**

Preview Result 1-RMS



Critical_Freqs RMS



-13dBm



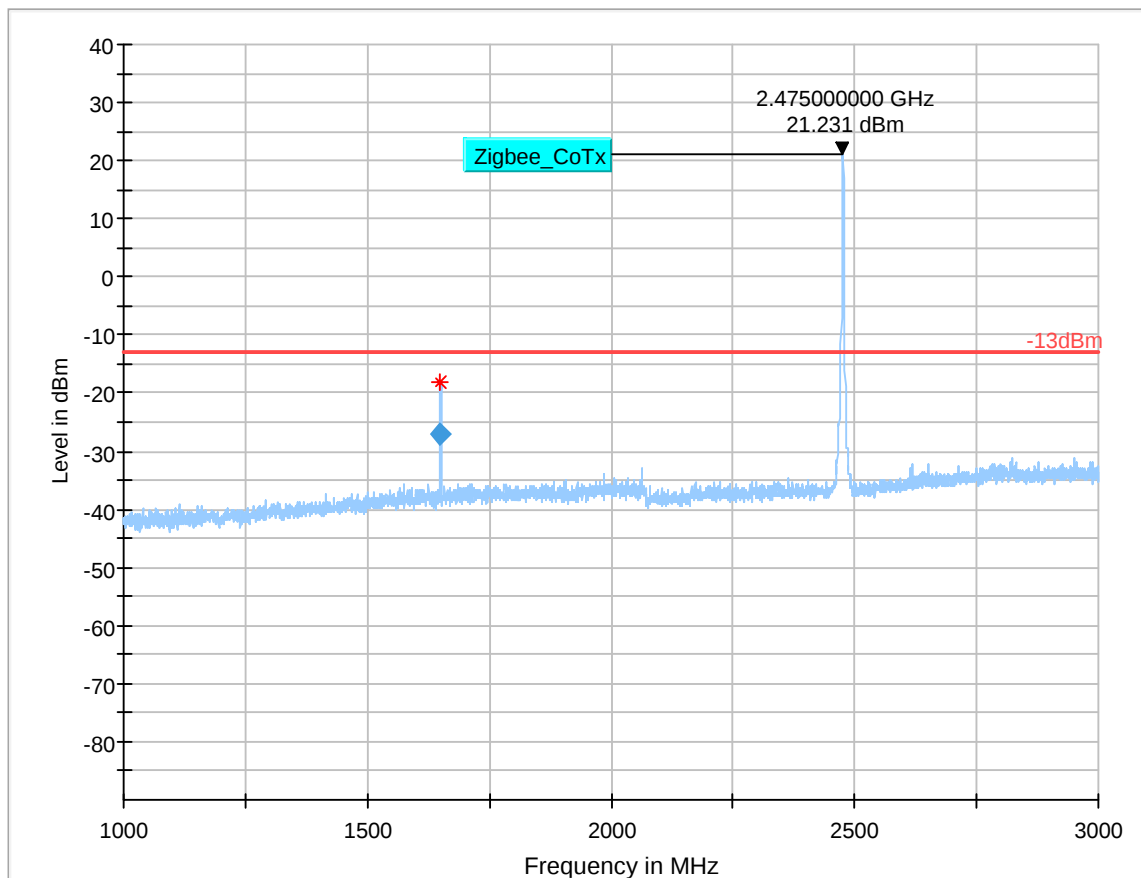
Final_Result RMS

Plot # 64 Radiated Emissions: 1 GHz - 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
1650.325	-27.10	-13.00	14.10	500.0	1000.000	254.0	H	177.0	-87.3	5:32:26 PM - 11/9/2018



Preview Result 1-RMS

*

Critical_Freqs RMS

-13dBm

◆

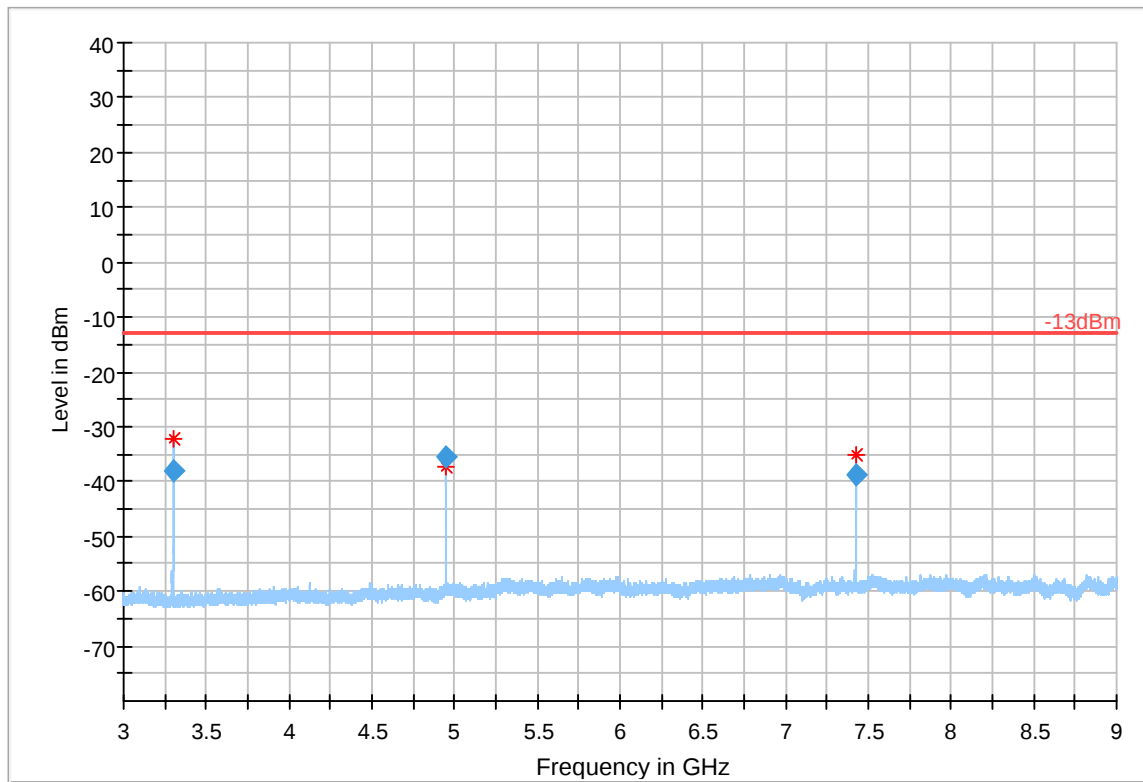
Final_Result RV

Plot # 65 Radiated Emissions: 3 GHz – 9 GHz

Channel: Low

Final_Result

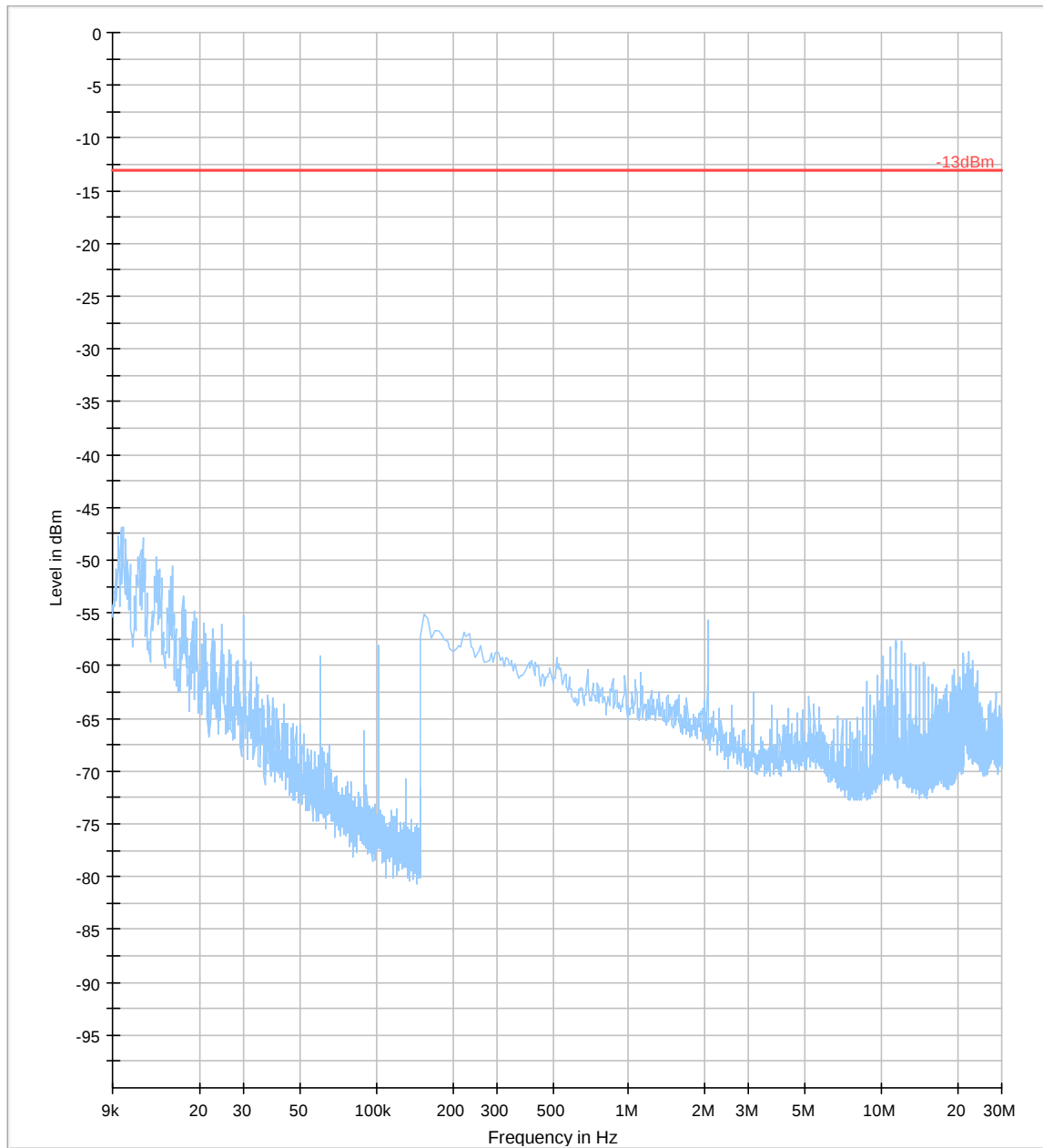
Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
3298.636	-38.23	-13.00	25.23	500.0	1000.000	269.0	H	128.0	-132.0	1:11:47 PM - 11/12/2018
4948.872	-35.49	-13.00	22.49	500.0	1000.000	224.0	V	12.0	-128.4	1:05:25 PM - 11/12/2018
7426.380	-38.62	-13.00	25.62	500.0	1000.000	158.0	V	39.0	-124.7	1:08:36 PM - 11/12/2018



Preview Result 1-RMS * Critical_Freqs RMS -13dBm ◆ Final_Result RM

Plot # 66 Radiated Emissions: 9 kHz - 30 MHz

Channel: Mid



— Preview Result 1-RMS



Critical_Freqs RMS



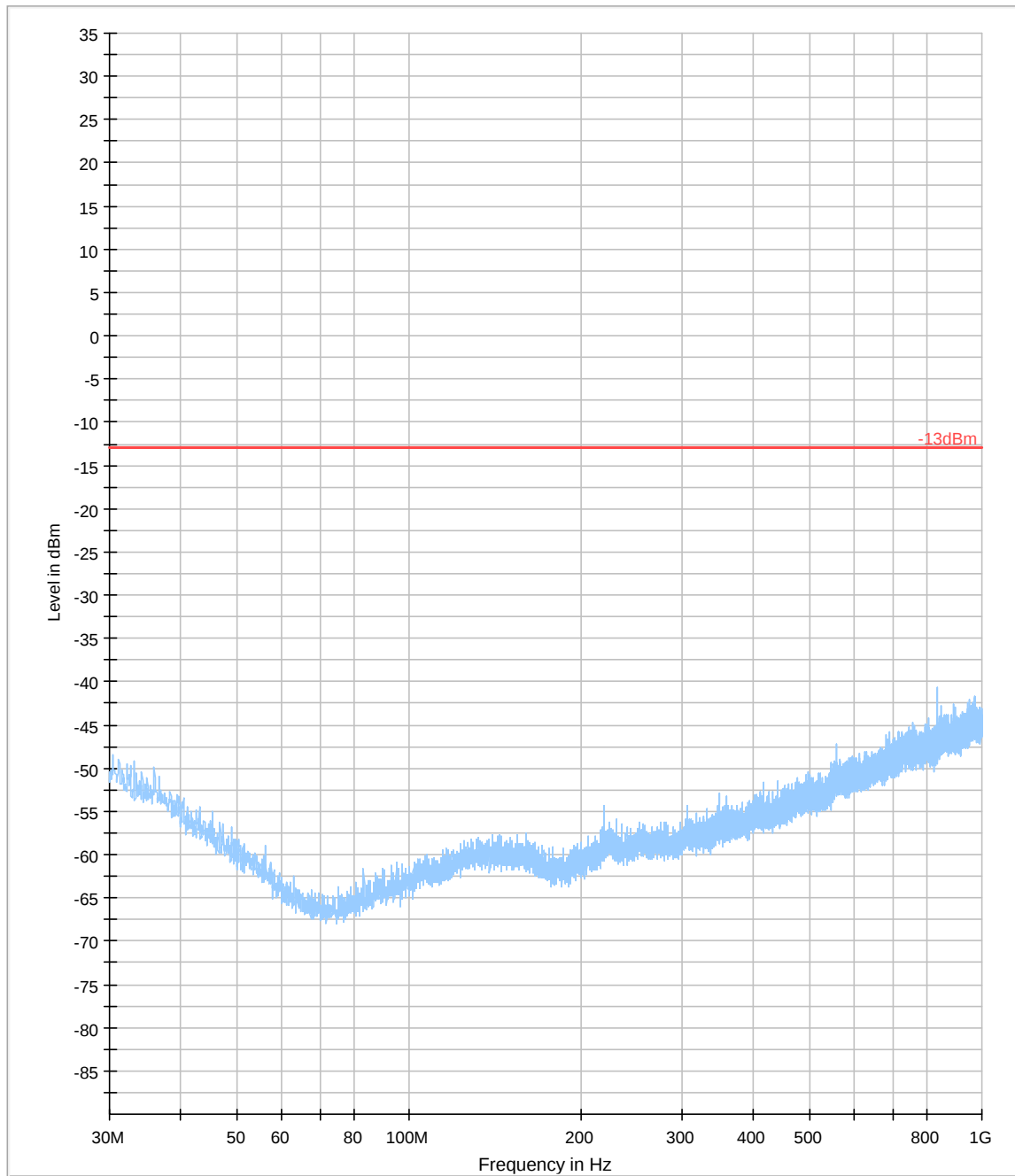
-13dBm



Final_Result RMS

Plot # 67 Radiated Emissions: 30 MHz – 1GHz

Channel: Mid



Preview Result 1-RMS



Critical_Freqs RMS



-13dBm



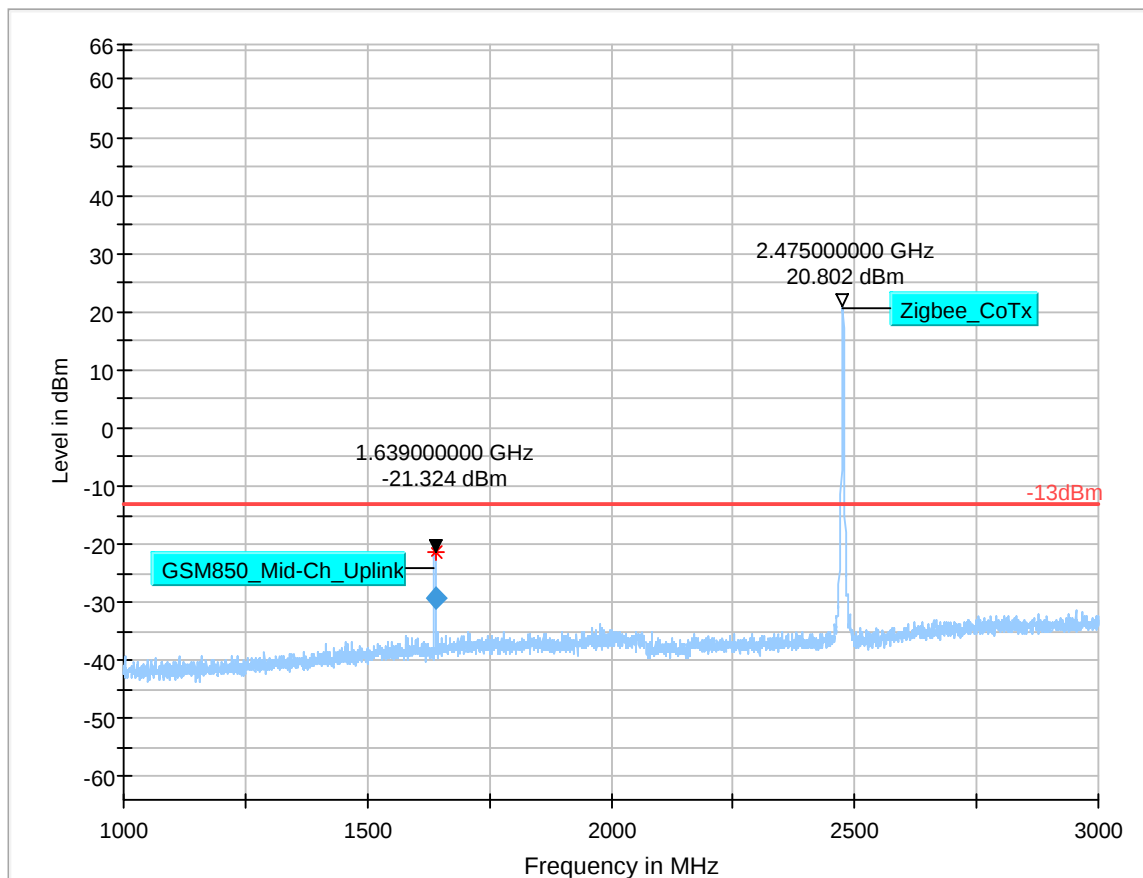
Final_Result RMS

Plot # 68 Radiated Emissions: 1 GHz - 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
1639.205	-29.24	-13.00	16.24	500.0	1000.000	181.0	H	58.0	-87.4	12:03:41 PM - 11/12/2018



Preview Result 1-RMS



Critical_Freqs RMS

-13dBm



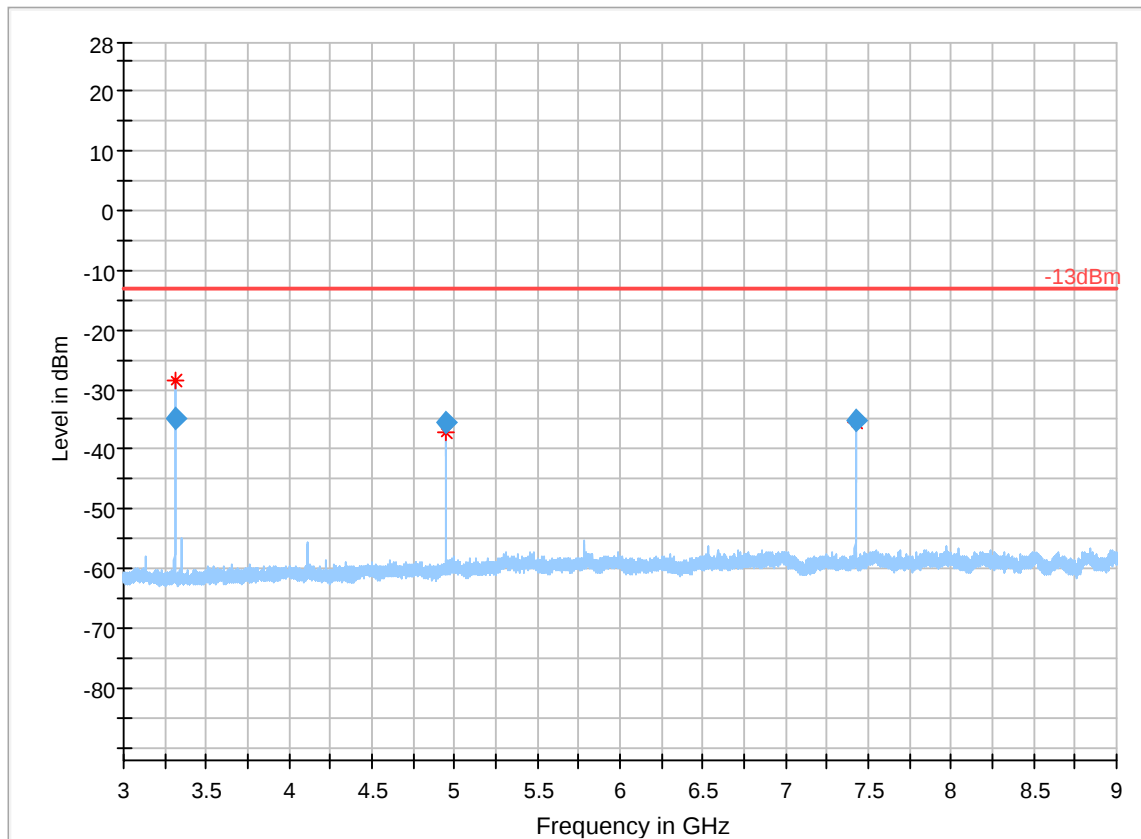
Final_Result RV

Plot # 69 Radiated Emissions: 3 GHz – 9 GHz

Channel: Mid

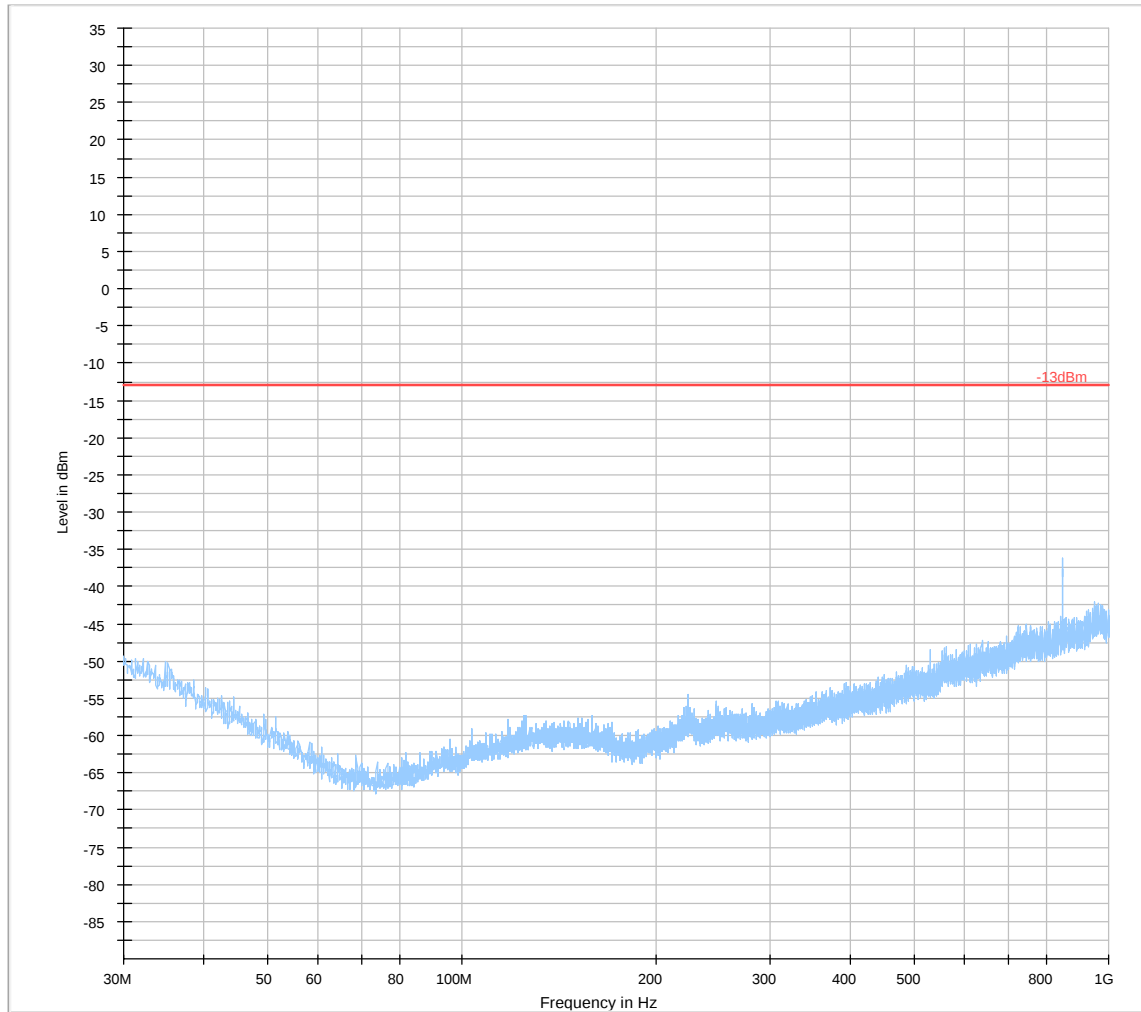
Final Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
3311.29	-34.91	-13.00	21.91	500.0	1000.000	316.0	H	118.0	-132.0	12:46:34 PM - 11/12/2018
4948.94	-35.57	-13.00	22.57	500.0	1000.000	224.0	V	10.0	-128.4	12:43:21 PM - 11/12/2018
7426.37	-35.13	-13.00	22.13	500.0	1000.000	258.0	V	262.0	-124.7	12:50:00 PM - 11/12/2018



Plot # 70 Radiated Emissions: 30 MHz – 1GHz

Channel: High



Preview Result 1-RMS



Critical_Freqs RMS



-13dBm



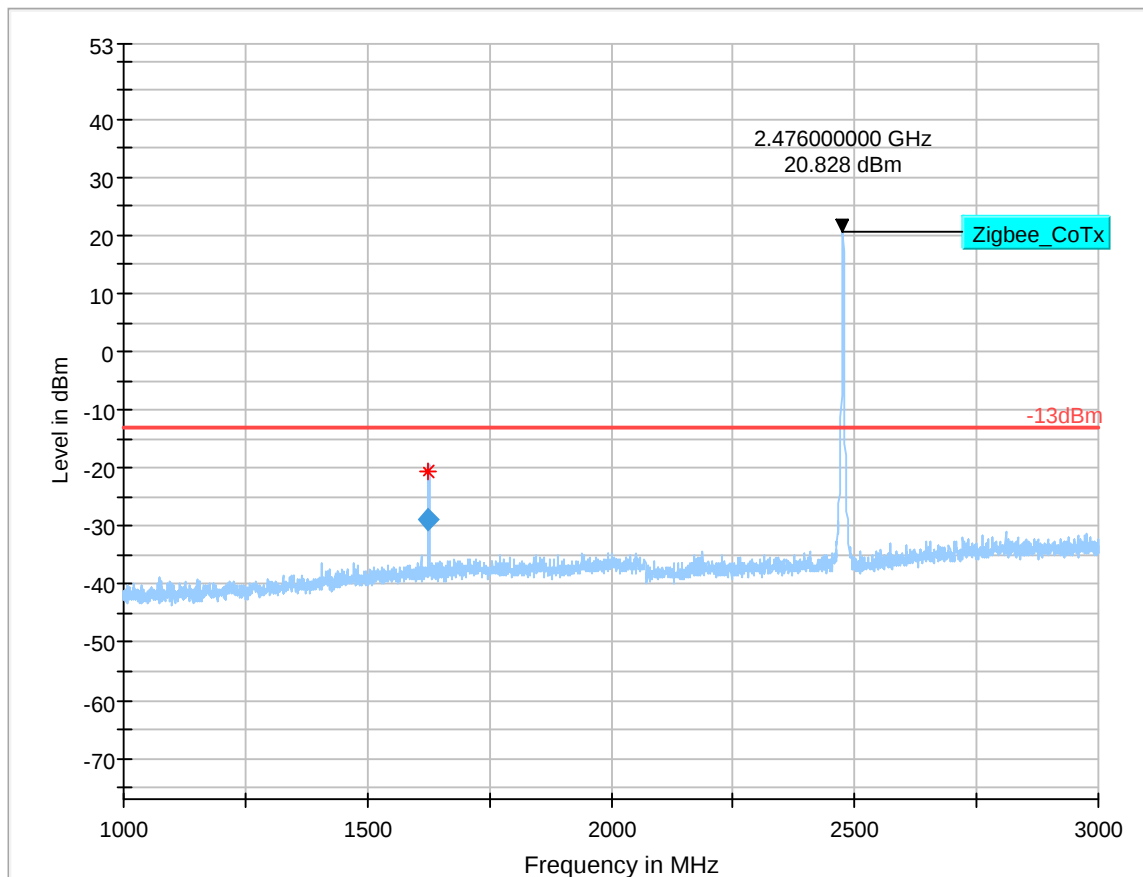
Final_Result RMS

Plot # 71 Radiated Emissions: 1 GHz - 3 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
1625.50	-28.85	-13.00	15.85	500.0	1000.000	248.0	H	40.0	-87.4	11:43:34 AM - 11/12/2018



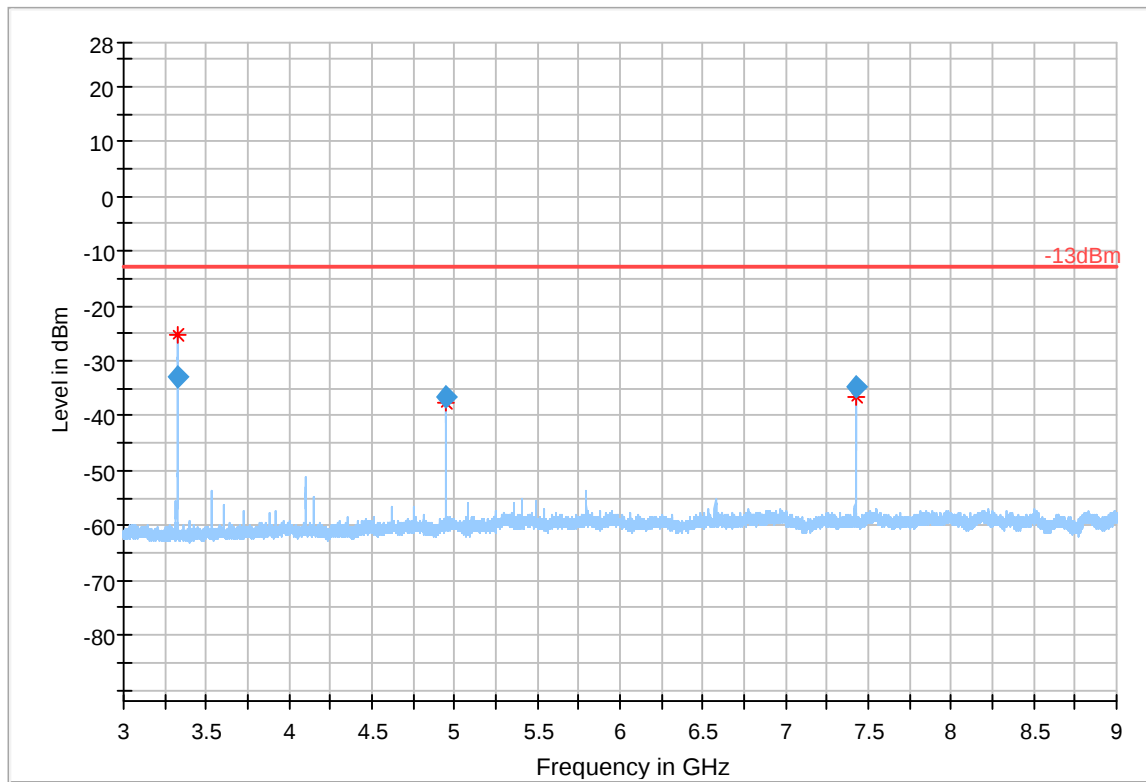
— Preview Result 1-RMS * Critical_Freqs RMS — -13dBm ◆ Final_Result RV

Plot # 72 Radiated Emissions: 3 GHz – 9 GHz

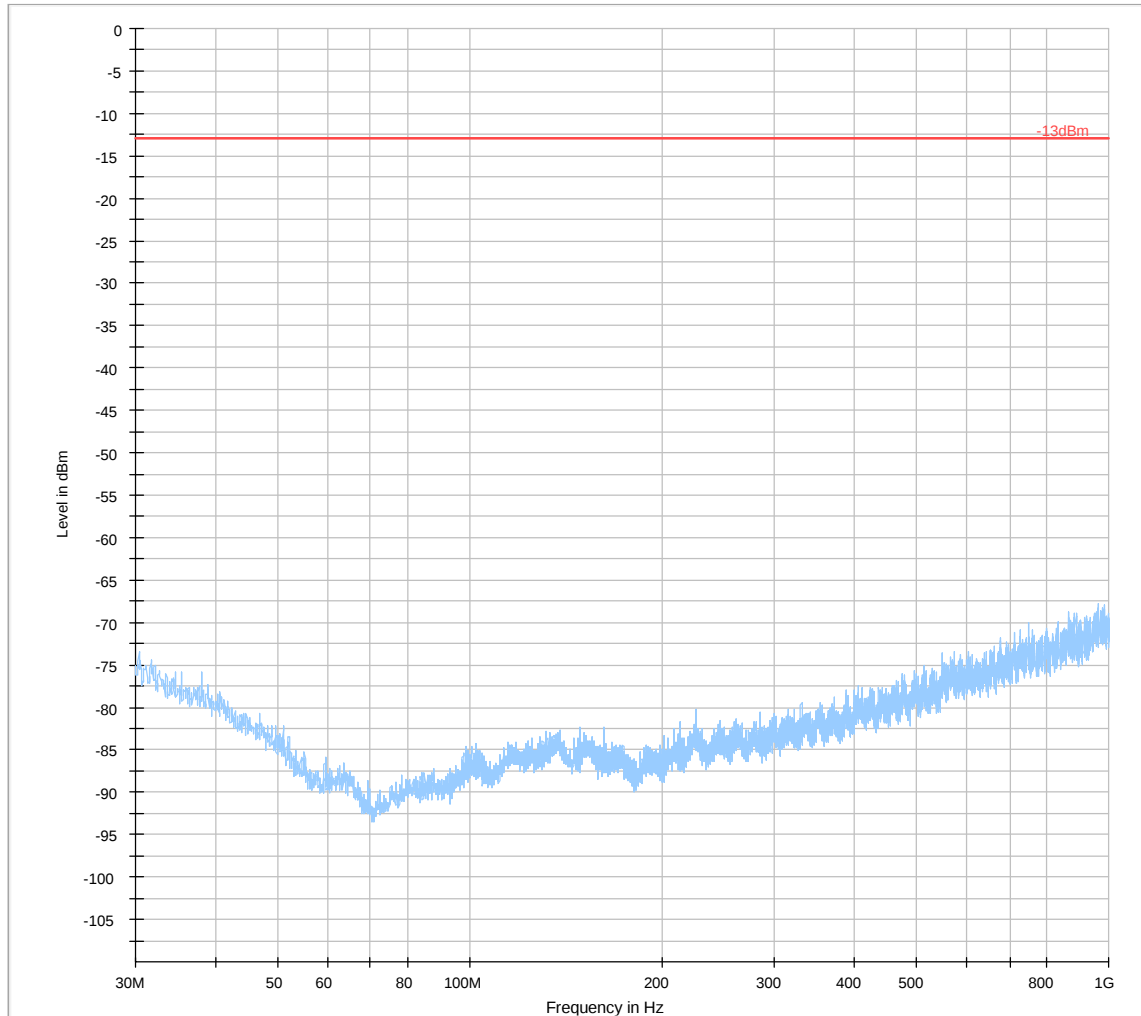
Channel: High

Final_Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
3324.26	-33.07	-13.00	20.07	500.0	1000.000	291.0	H	115.0	-132.0	1:27:49 PM - 11/12/2018
4950.95	-36.64	-13.00	23.65	500.0	1000.000	219.0	V	10.0	-128.4	1:34:24 PM - 11/12/2018
7423.46	-34.81	-13.00	21.81	500.0	1000.000	249.0	V	338.0	-124.7	1:31:09 PM - 11/12/2018



— Preview Result 1-RMS * Critical_Freqs RMS — -13dBm ◆ Final_Result RM

GSM1900**Plot # 73 Radiated Emissions: 30 MHz - 1 GHz****Channel: Low**

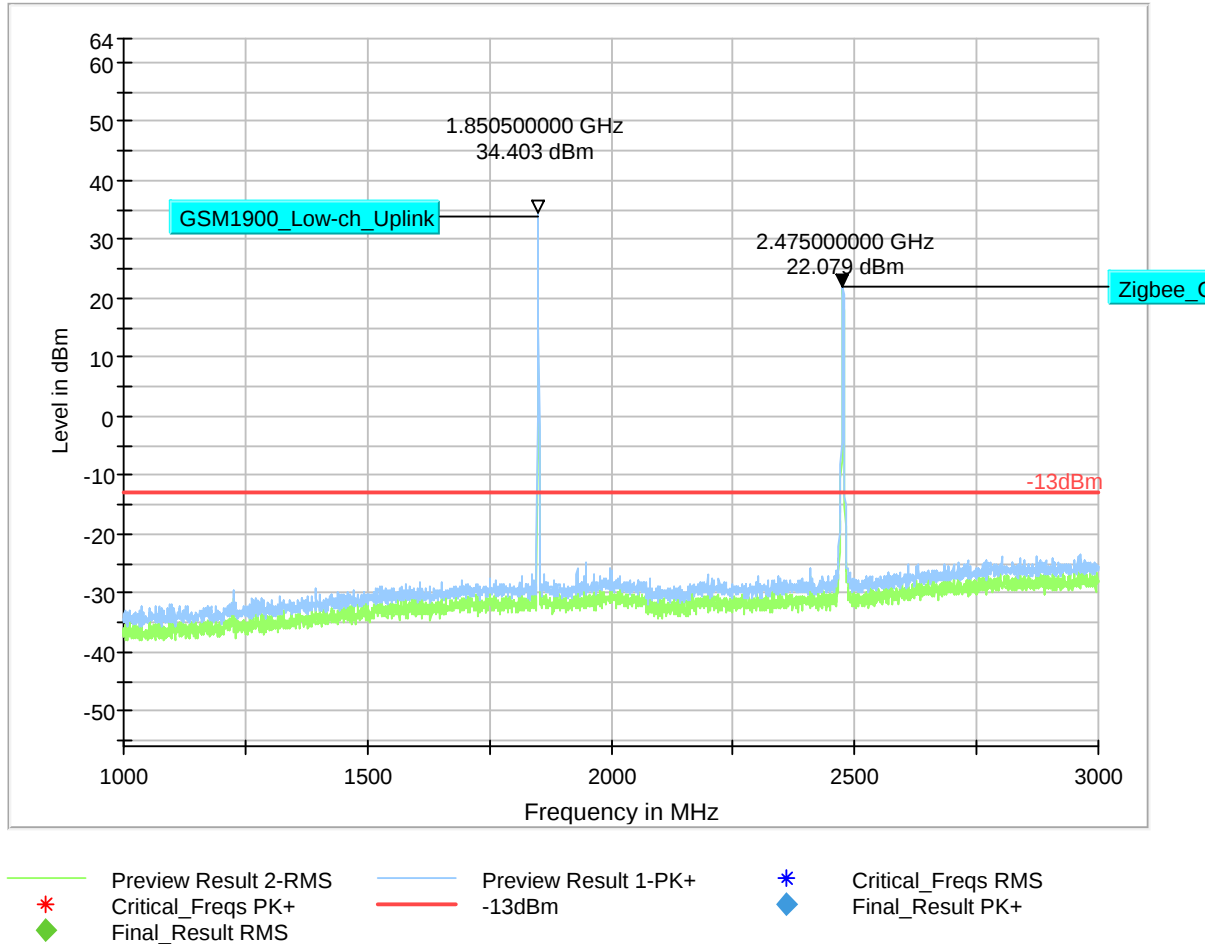
Preview Result 2-RMS
Critical_Freqs PK+
Final_Result RMS

Preview Result 1-PK+
-13dBm

Critical_Freqs RMS
Final_Result PK+

Plot # 74 Radiated Emissions: 1 GHz - 3 GHz

Channel: Low

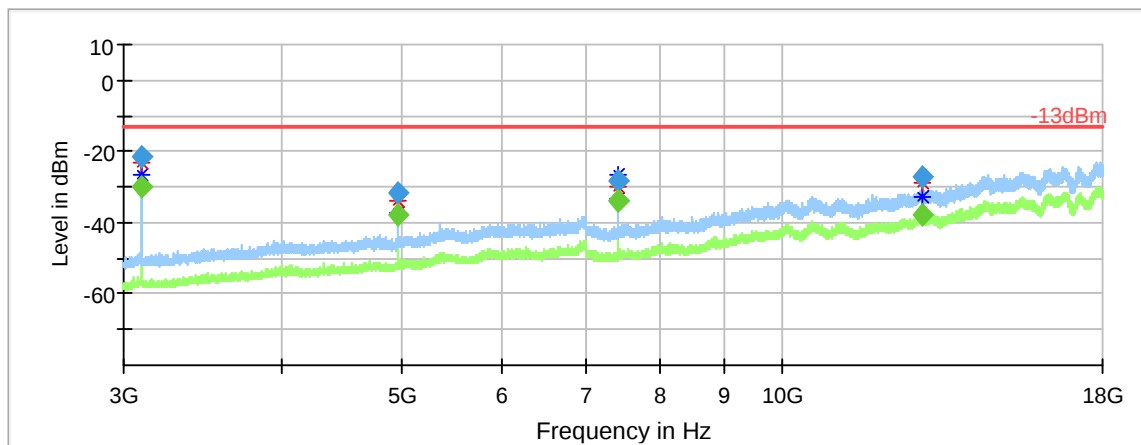


Plot # 75 Radiated Emissions: 3 GHz - 18 GHz

Channel: Low

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
3098.846	-21.64	---	-13.00	8.64	200.0	1000.000	173.0	V	309.0	-105.0	12:10:27 PM - 12/7/2018
3100.746	---	-30.20	---	---	200.0	1000.000	175.0	V	307.0	-105.0	12:38:45 PM - 12/7/2018
4948.862	-31.46	---	-13.00	18.46	200.0	1000.000	137.0	H	326.0	-101.5	12:13:33 PM - 12/7/2018
4950.984	---	-37.59	---	---	200.0	1000.000	156.0	H	327.0	-101.5	12:19:32 PM - 12/7/2018
7426.539	---	-33.82	---	---	200.0	1000.000	143.0	H	310.0	-97.8	12:07:25 PM - 12/7/2018
7426.546	-28.16	---	-13.00	15.16	200.0	1000.000	144.0	H	307.0	-97.8	12:16:36 PM - 12/7/2018
7426.562	---	-33.98	---	---	200.0	1000.000	156.0	H	310.0	-97.8	12:22:33 PM - 12/7/2018
12951.018	-27.35	---	-13.00	14.35	200.0	1000.000	132.0	V	342.0	-89.0	12:35:51 PM - 12/7/2018
12951.389	---	-38.05	---	---	200.0	1000.000	132.0	V	344.0	-89.0	12:41:44 PM - 12/7/2018

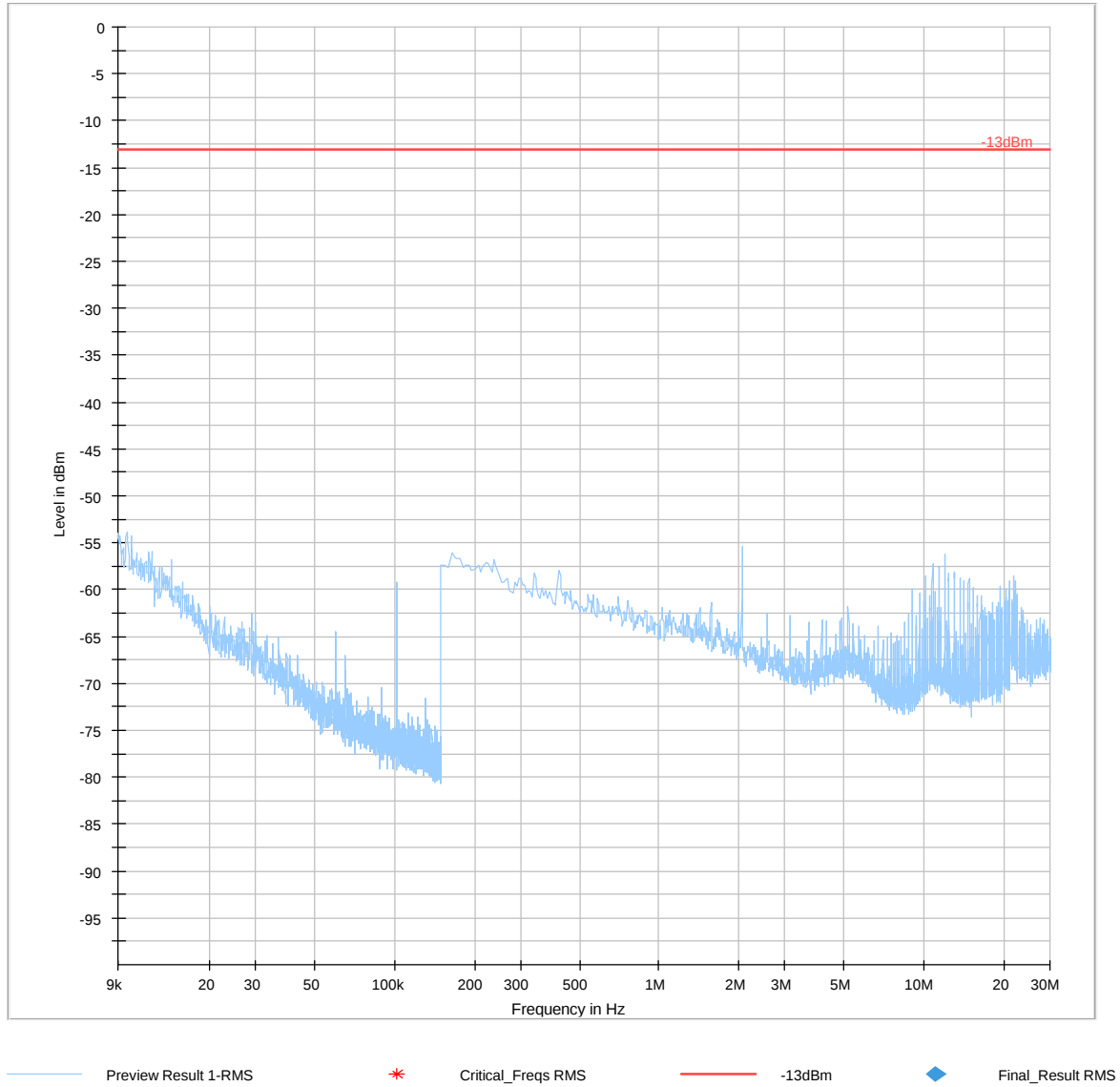


◆ Preview Result 2-RMS
* Critical_Freqs PK+
◆ Final_Result RMS

— Preview Result 1-PK+
— -13dBm
◆ Critical_Freqs RMS
◆ Final_Result PK+

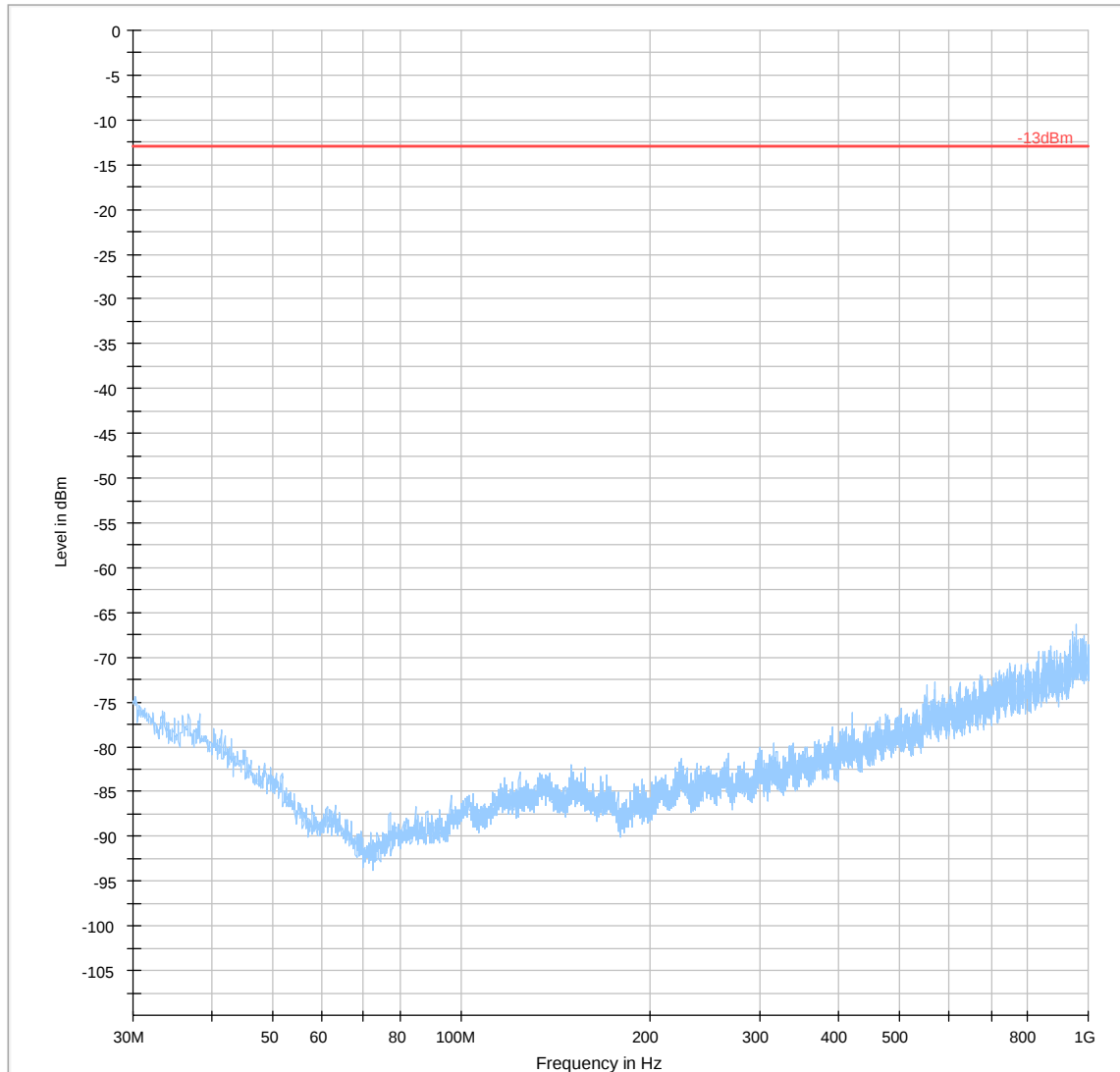
Plot # 76 Radiated Emissions: 9 kHz - 30 MHz

Channel: Mid



Plot # 77 Radiated Emissions: 30 MHz – 1GHz

Channel: Mid



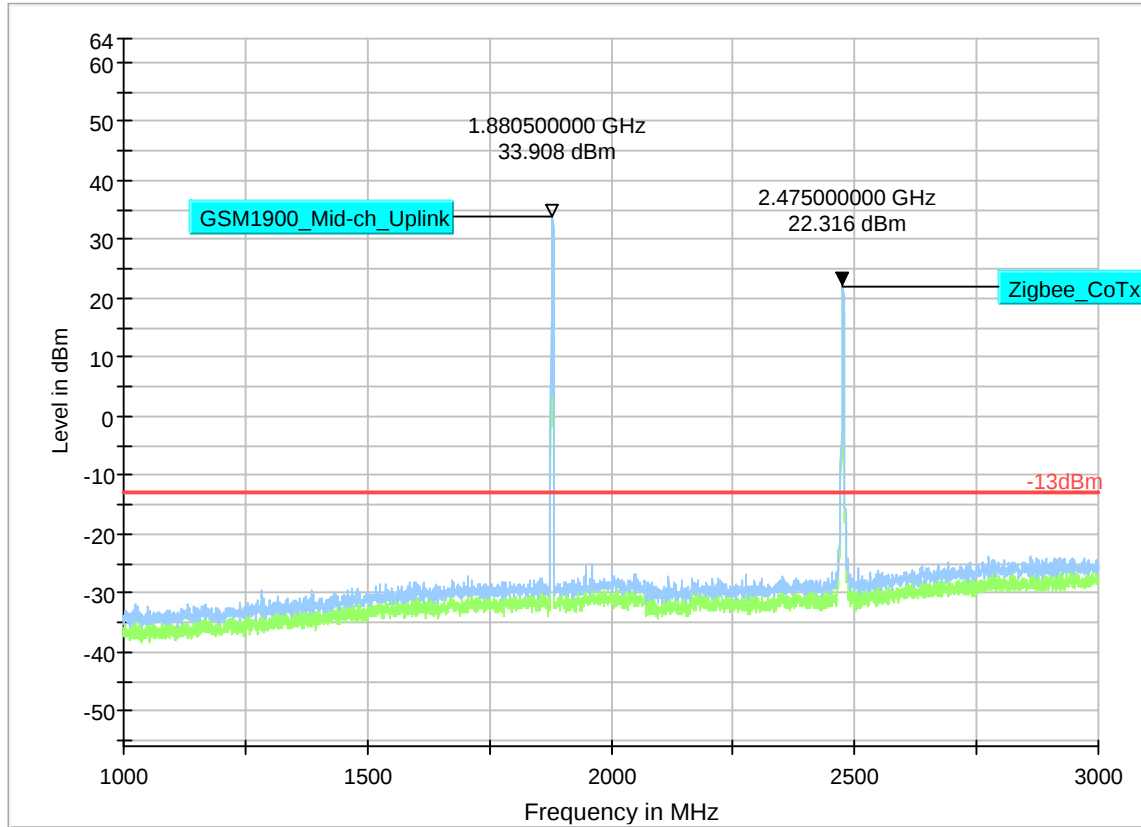
Preview Result 2-RMS
Critical_Freqs PK+
Final_Result RMS

Preview Result 1-PK+
-13dBm

Critical_Freqs RMS
Final_Result PK+

Plot # 78 Radiated Emissions: 1 GHz – 3 GHz

Channel: Mid



Preview Result 2-RMS
Critical_Freqs PK+
Final_Result RMS

Preview Result 1-PK+
-13dBm

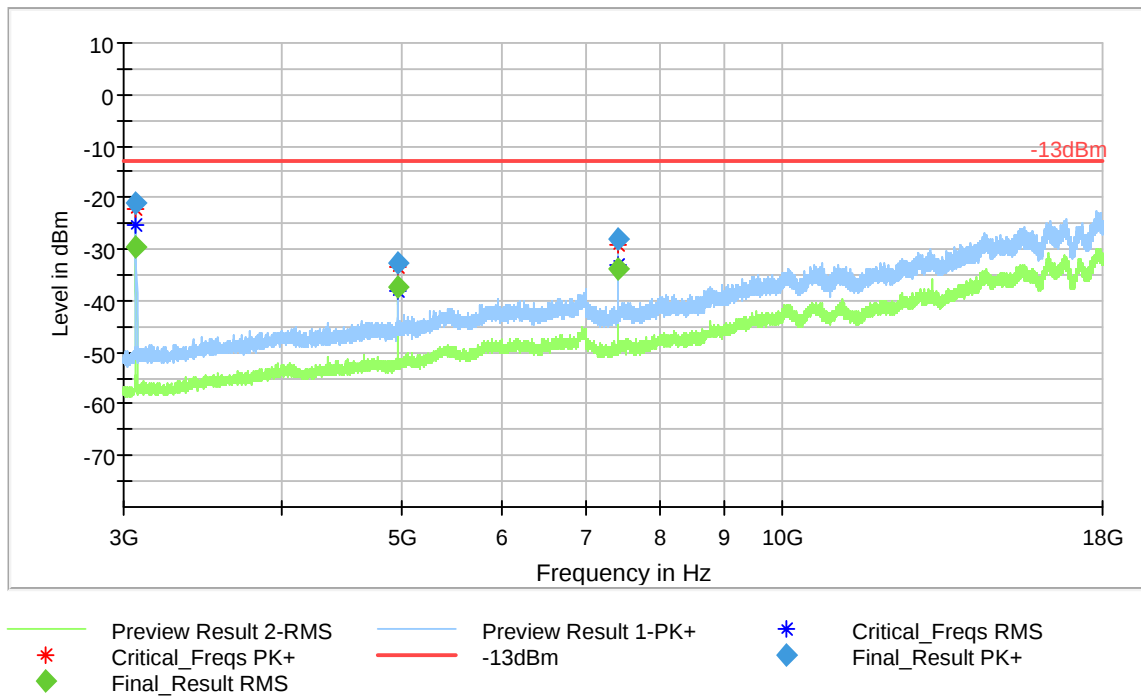
Critical_Freqs RMS
Final_Result PK+

Plot # 79 Radiated Emissions: 3 GHz – 18 GHz

Channel: Mid

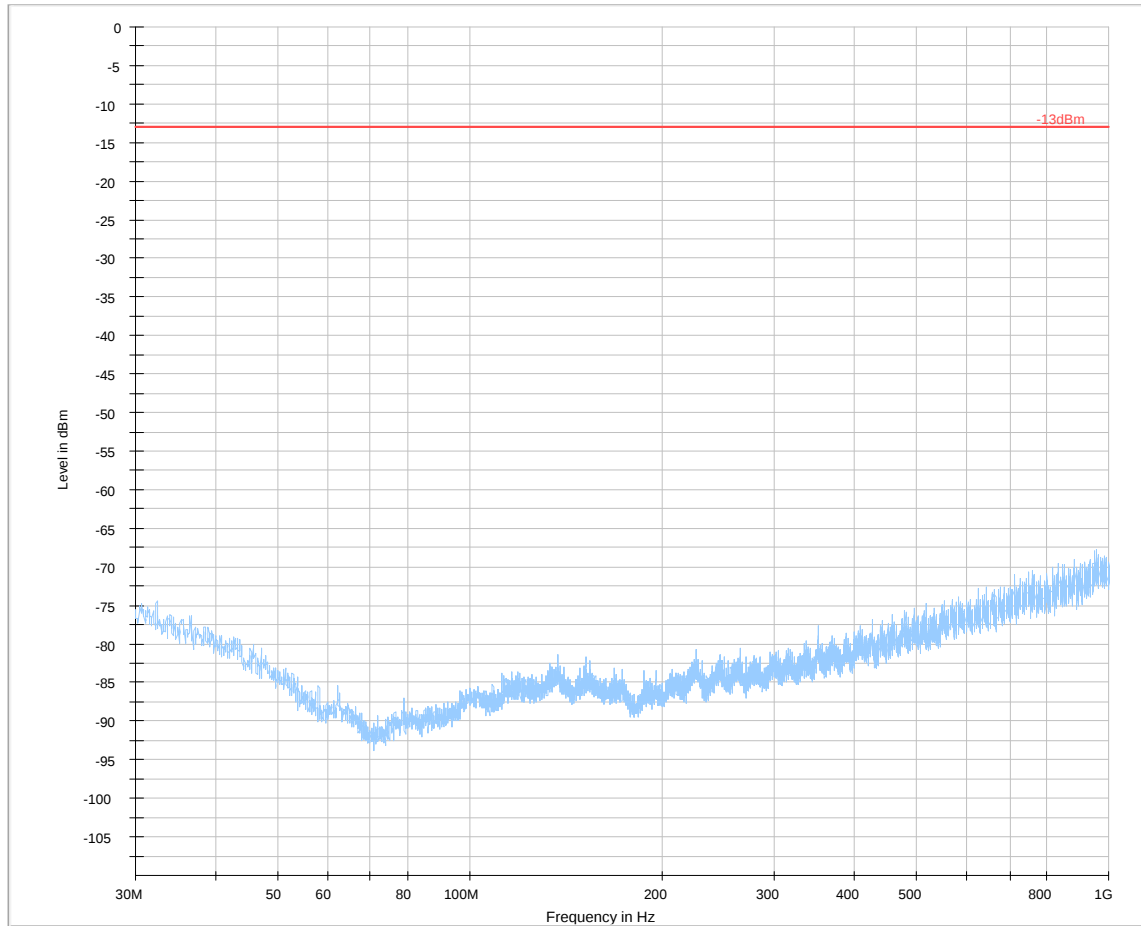
Final Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
3070.88	---	-29.57	---	---	200.0	1000.000	155.0	V	311.0	-105.3	11:53:12 AM - 12/7/2018
3071.02	-21.07	---	-13.00	8.07	200.0	1000.000	151.0	V	311.0	-105.3	11:44:14 AM - 12/7/2018
4949.21	---	-37.48	---	---	200.0	1000.000	138.0	H	324.0	-101.5	11:50:13 AM - 12/7/2018
4950.76	-32.58	---	-13.00	19.58	200.0	1000.000	138.0	H	321.0	-101.5	11:41:11 AM - 12/7/2018
7426.31	-28.08	---	-13.00	15.08	200.0	1000.000	157.0	H	310.0	-97.8	11:38:09 AM - 12/7/2018
7426.48	---	-33.84	---	---	200.0	1000.000	143.0	H	310.0	-97.8	11:47:19 AM - 12/7/2018



Plot # 80 Radiated Emissions: 30 MHz - 1 GHz

Channel: High



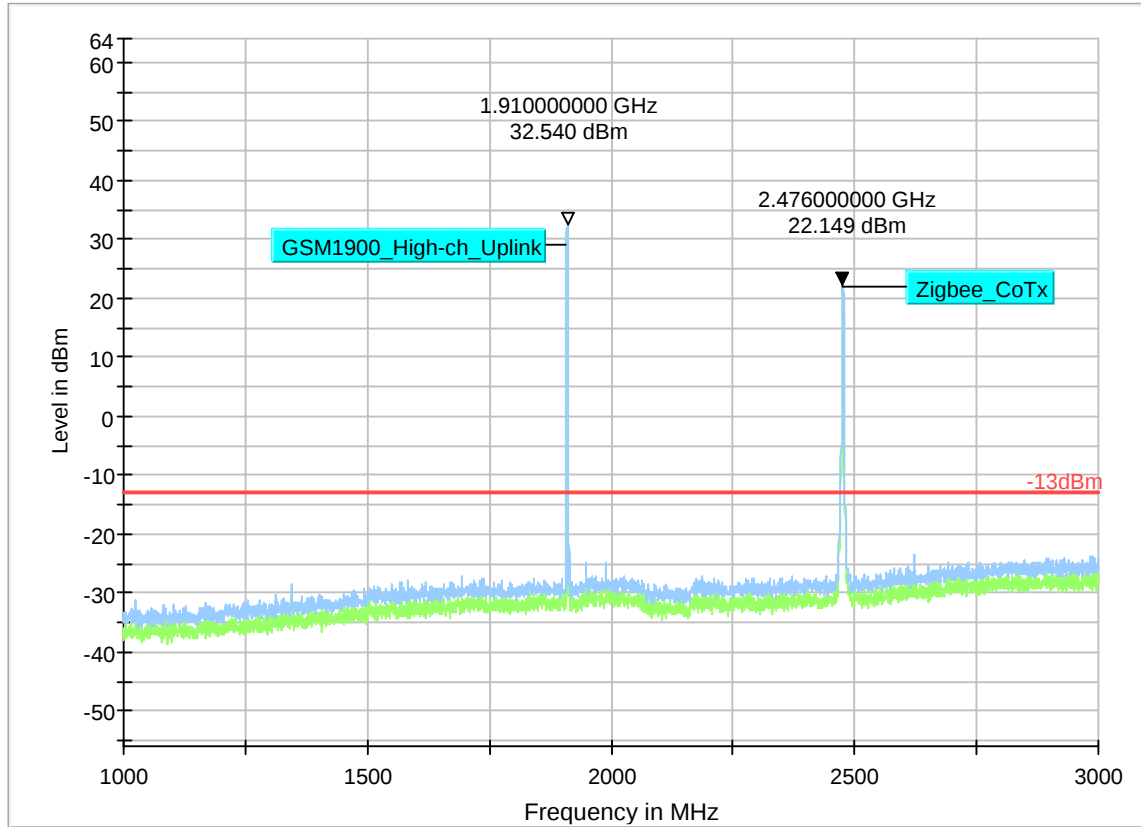
Preview Result 2-RMS
Critical_Freqs PK+
Final_Result RMS

Preview Result 1-PK+
-13dBm

Critical_Freqs RMS
Final_Result PK+

Plot # 81 Radiated Emissions: 1 GHz - 3 GHz

Channel: High



Preview Result 2-RMS
Critical_Freqs PK+
Final_Result RMS

Preview Result 1-PK+
-13dBm

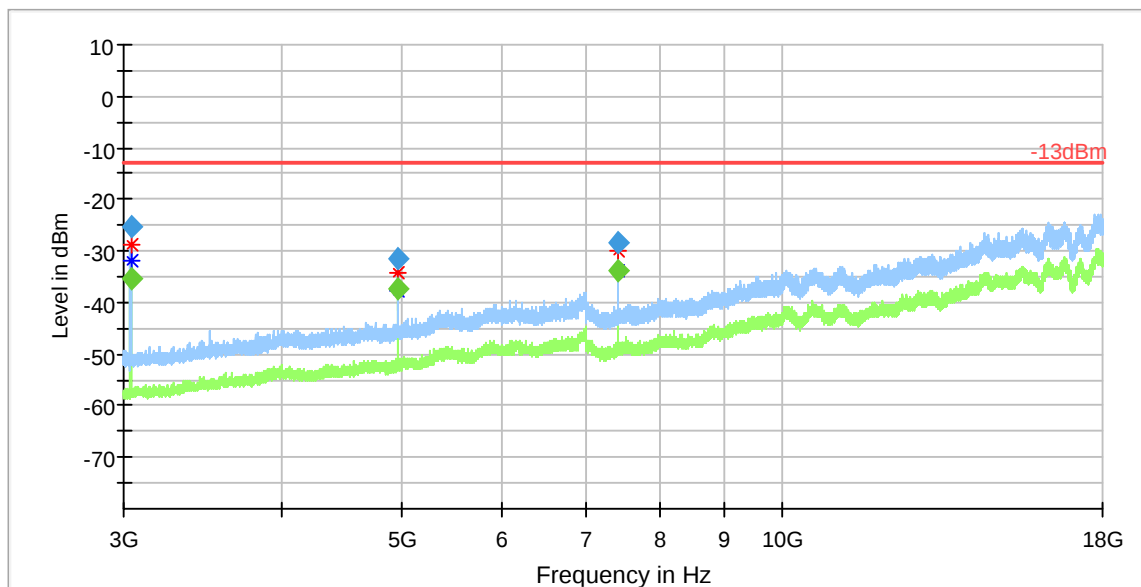
Critical_Freqs RMS
Final_Result PK+

Plot # 82 Radiated Emissions: 3 GHz - 18 GHz

Channel: High

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
3039.118	-25.33	---	-13.00	12.33	200.0	1000.000	126.0	H	269.0	-105.6	2:32:38 PM - 12/7/2018
3039.311	---	-35.29	---	---	200.0	1000.000	125.0	H	270.0	-105.6	2:41:48 PM - 12/7/2018
4950.801	-31.42	---	-13.00	18.42	200.0	1000.000	138.0	H	326.0	-101.5	2:38:42 PM - 12/7/2018
4951.084	---	-37.25	---	---	200.0	1000.000	138.0	H	325.0	-101.5	2:47:49 PM - 12/7/2018
7426.406	-28.43	---	-13.00	15.43	200.0	1000.000	174.0	H	310.0	-97.8	2:35:45 PM - 12/7/2018
7426.506	---	-33.83	---	---	200.0	1000.000	143.0	H	310.0	-97.8	2:44:54 PM - 12/7/2018



Preview Result 2-RMS
Critical_Freqs PK+
Final_Result RMS

Preview Result 1-PK+
-13dBm

Critical_Freqs RMS
Final_Result PK+

8 Test setup photos

Setup photos are included in supporting file name: "EMC_DIGII_047_18001_FCC_ISED_Setup_Photos.pdf"

9 Test Equipment And Ancillaries Used For Testing

Equipment Type	Manufacturer	Model	Serial #	Calibration Cycle	Last Calibration Date
PASSIVE LOOP ANTENNA	ETS LINDGREN	6512	00164698	3 YEARS	08/08/2017
BILOG ANTENNA	TESEO	CBL 6141B	41106	3 YEARS	11/01/2017
HORN ANTENNA	EMCO	3115	00035114	3 YEARS	07/31/2017
HORN ANTENNA	ETS LINDGREN	3117	00167061	3 YEARS	08/08/2017
HORN ANTENNA	ETS LINDGREN	3116C	00166821	3 YEARS	09/24/2017
UNIVERSAL RADIO COMMUNICATION TESTER	R&S	CMU 200	101821	2 YEARS	07/06/2017
WIDEBAND RADIO COMMUNICATION	R&S	CMW500	127068	2 YEARS	07/01/2017
SIGNAL ANALYZER	R&S	FSV 40	101022	2 YEARS	07/05/2017
COMPACT DIGITAL BAROMETER	CONTROL COMPANY	35519-055	91119547	2 YEARS	06/20/2017
THRMOMETER HUMIDIY	DICKSON	TM320	16253639	3 YEARS	11/02/2017

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
01/18/2019	EMC_CHARG_017_18501_FCC_22_24_27_ISED	Initial Version	Issa Ghanma