



FCC/ISED Test Report

FOR:
CalAmp

Model Name:
LMU-3030

Product Description:
GPS tracking device with OBD support

FCC ID: APV-3030LVB
IC ID: 5843C-3030LVB

Per:
47 CFR: Part 27
RSS-130 Issue 2; RSS-139 Issue 3

REPORT #: EMC_CALAM_081_19001_FCC_27_ISED

DATE: 03/06/2019



A2LA Accredited

IC recognized #
3462B-1

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1 Assessment

The following device as further described in section 3 of this report was evaluated 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 27 and Industry Canada Radio Standard Specifications RSS: 130, 132 Issue 3, 133 Issue 6 and 139 Issue3.

Company	Description	Model
CalAmp	GPS tracking device with OBD support	LMU-3030

No deficiencies were ascertained.

Responsible for Testing Laboratory:

03/06/2019	Compliance	Cindy Li (Lab Manager)	
Date	Section	Name	Signature

Responsible for the Report:

03/06/2019	Compliance	Yuchan Lu (Test 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:	Cathy Palacios

2.2 Identification of the Client

Applicant's Name:	CalAmp
Street Address:	2177 Salk Ave, Suite 200
City/Zip Code	Carlsbad, CA 90228
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

Firmware Version Identification Number (FVIN):	7.5
Hardware Version Identification Number (HVIN):	REV A1
Product Marketing Name (PMN):	LMU-3030
Model Number:	LMU3030LVBL, LMU3035LVBL
Antenna Information as declared:	<ul style="list-style-type: none"> ❖ <u>LTE</u> <ul style="list-style-type: none"> • Module name: Telit • Model number: LE910B1-SA • FCC/IC ID: RI7LE910NAV2 • Trace Antenna, max peak gain 2.8dBi ❖ <u>BLE</u> <ul style="list-style-type: none"> • Ceramic Antenna, max peak gain 2.5dBi
Other Radios included in the device:	<u>GPS</u>
Power Supply/ Rated Operating Voltage Range:	Low 9 VDC, Nominal 12 VDC, High 16 VDC
Operating Temperature Range:	Low -30° C, High 75° C
Sample Revision	<input type="checkbox"/> Prototype Unit; <input checked="" type="checkbox"/> Production Unit; <input type="checkbox"/> Pre-Production
EUT Dimensions(mm):	46 x 67 x 28
Weight(grams):	52
EUT Diameter	<input checked="" type="checkbox"/> < 60 cm <input type="checkbox"/> Other _____

Module Information

Module Name:	Telit
Model Number:	LE910B1-SA
FCC/IC ID:	RI7LE910NAV2



3.2 EUT Sample details

EUT #	Unit IMEI number	HW Version	SW Version	Notes/Comments
1	353650075703459	REV A1	7.5	Radiated Measurement

3.3 Support Equipment

SE #	Comments
1	DC power supply cable

3.4 Test Sample Configuration

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

3.5 Mode of Operation details

Mode of Operation	Description of Operating modes	Additional Information
Op. 1	Cellular and BLE Co-Transmission	<p>Cellular was tested on Low, Mid and High Channel at the maximum power in a co-transmission mode.</p> <p>TeraTerm terminal tool and special commands provided by the customer used to configure the BT radio to Mid channel. The commands will not be available to the end user.</p> <p>For radiated measurements: The internal antenna was connected.</p>

3.6 Justification for Worst Case Mode of Operation

During the testing process the EUT was tested with transmitter sets on fixed low, mid, high channel at the maximum power simultaneous transmission with BT radio, mid channel.

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: APV-3030LVB / IC ID: 5843C-3030LVB**.

The pre-certified module to be integrated (Telit LE866SV1) 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 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/IC Filing ID: RI7LE910NAV2** applicable for the host described in section 3.

4.1 **Dates of Testing:**

02/19/2019

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%

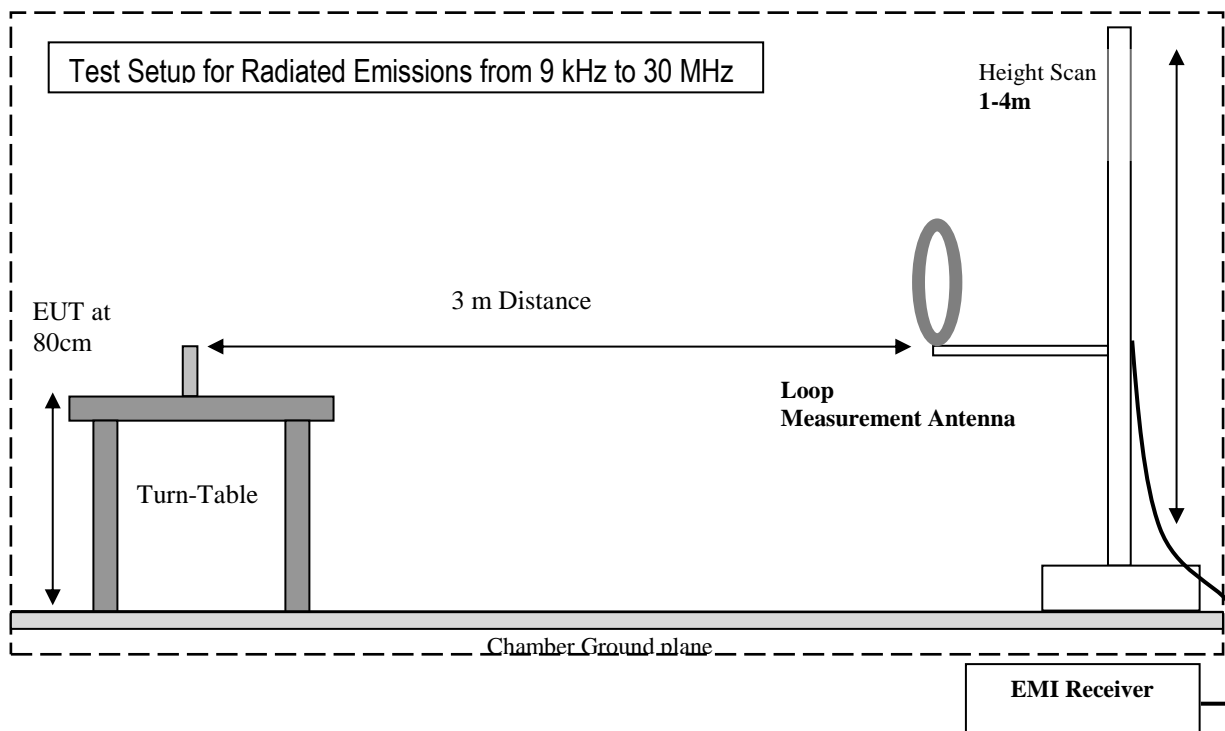
Deviating test conditions are indicated at individual test description where applicable.

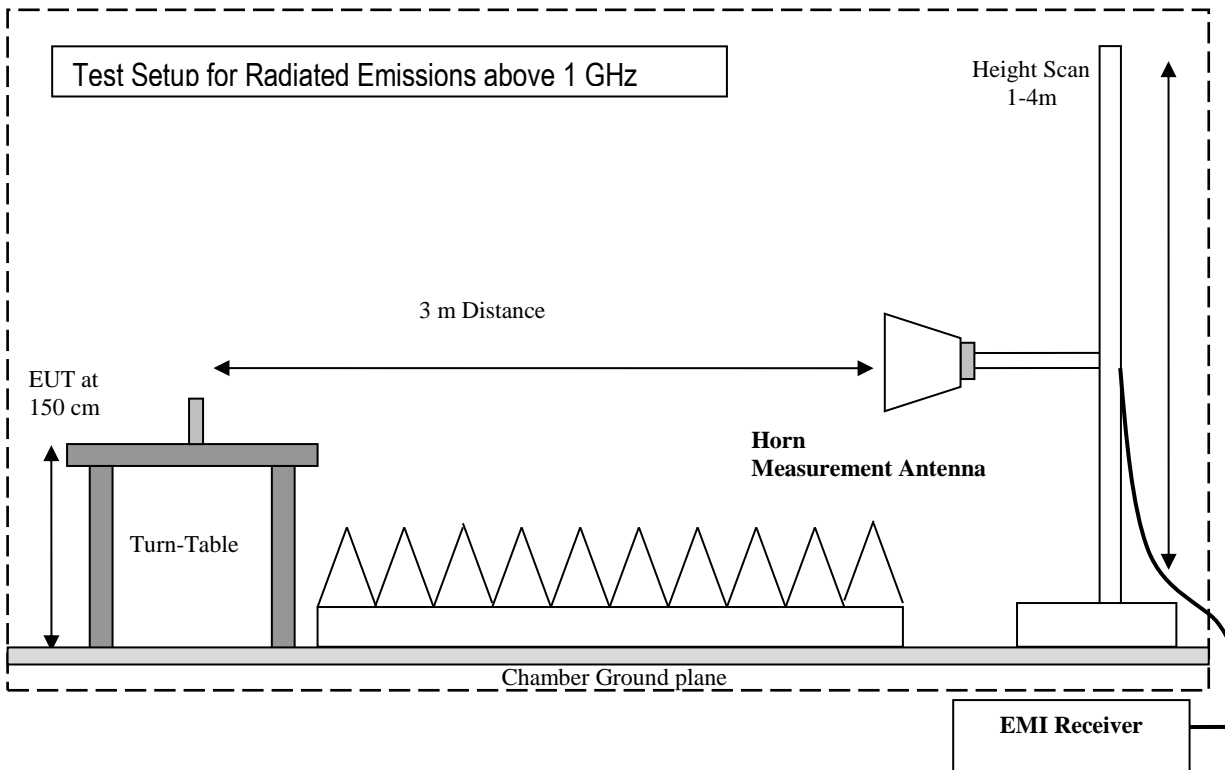
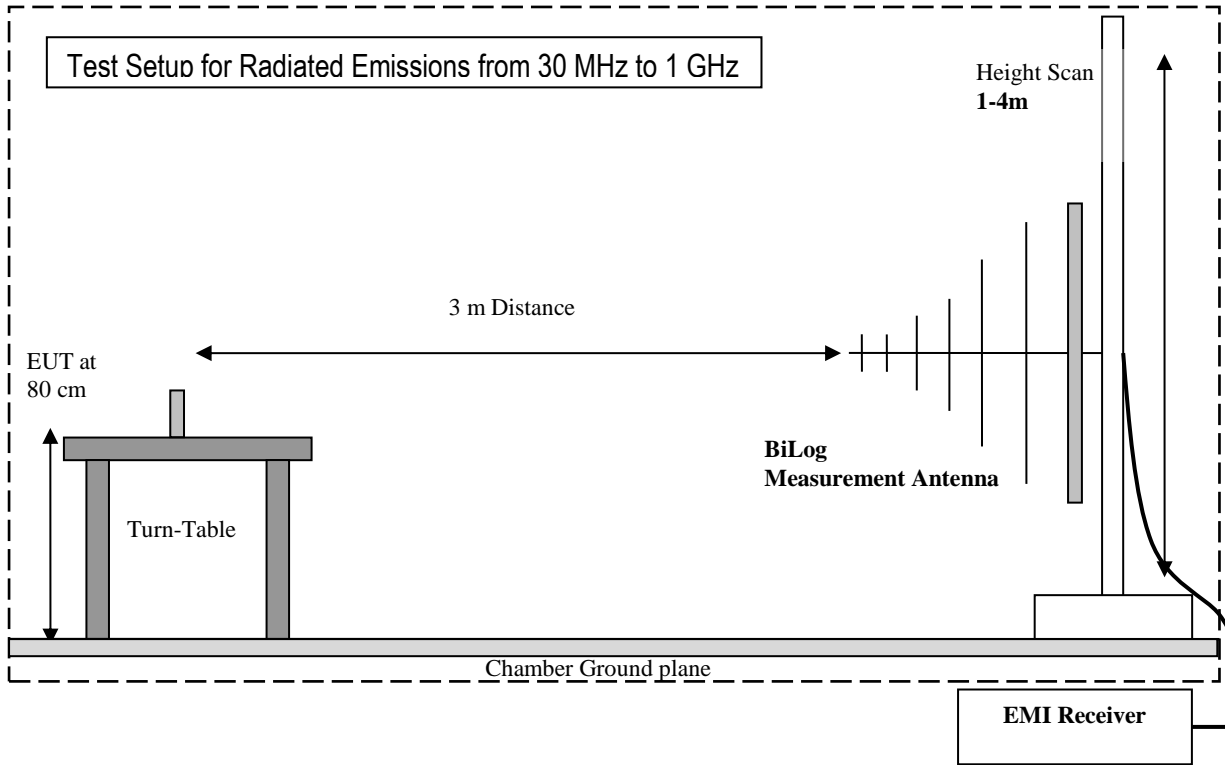
5 Measurement Procedures

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 27, RSS-130, RSS-139:

Test Specification	Test Case	Temperature and Voltage Conditions	Mode	Pass	Fail	NA	NP	Result
§2.1046; §27.50 (d) RSS-130 Issue 2; RSS-139 Issue 3;	RF Output Power	Nominal	-	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Complies Note 1 Note 2
§2.1055; §27.54	Frequency Stability	Nominal	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Complies Note 1 Note 2
§2.1049; §27.53	Occupied Bandwidth	Nominal	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Complies Note 1 Note 2
§2.1051; §27.53	Band Edge Compliance	Nominal	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Complies Note 1 Note 2
§2.1051; §27.53	Conducted Spurious Emissions	Nominal	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Complies Note 1 Note 2
§2.1053; §27.53(g); §27.53(h); RSS-130 Issue 2; RSS-139 Issue 3;	Radiated Spurious Emissions	Nominal	Op.1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Complies

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

Note 2: Leveraged from module certification FCC ID: R17LE910NAV2

7 Test Result Data

7.1 ERP

Band	Freq [MHz]	power [W]	Emission designator	Gain [dBi]	gain [lin]	EIRP [W]	ERP [W]	Limit [W]
LTE 4	1710.7 - 1754.3	0.205	1M08G7D	2.8	1.91	0.39		1 W EIRP
LTE 4	1720.0 - 1745.0	0.203	18M0G7D	2.8	1.91	0.39		1 W EIRP
LTE 13	779.5 - 784.5	0.194	4M47G7D	2.8	1.91	0.37	0.23	3 W ERP
LTE 13	782.0 - 782.0	0.188	8M96G7D	2.8	1.91	0.36	0.22	3 W ERP

Note: E(I)RP are calculated from maximum power in grant of cellular module Telit LE910B1-SA adding the maximum gain of the utilized cellular antenna per operational description.

7.2 Radiated Spurious Emissions

7.2.1 Measurement according to FCC: CFR 47 Part 2.1053; 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 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	300 kHz	3 MHz	3 MHz	3 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 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

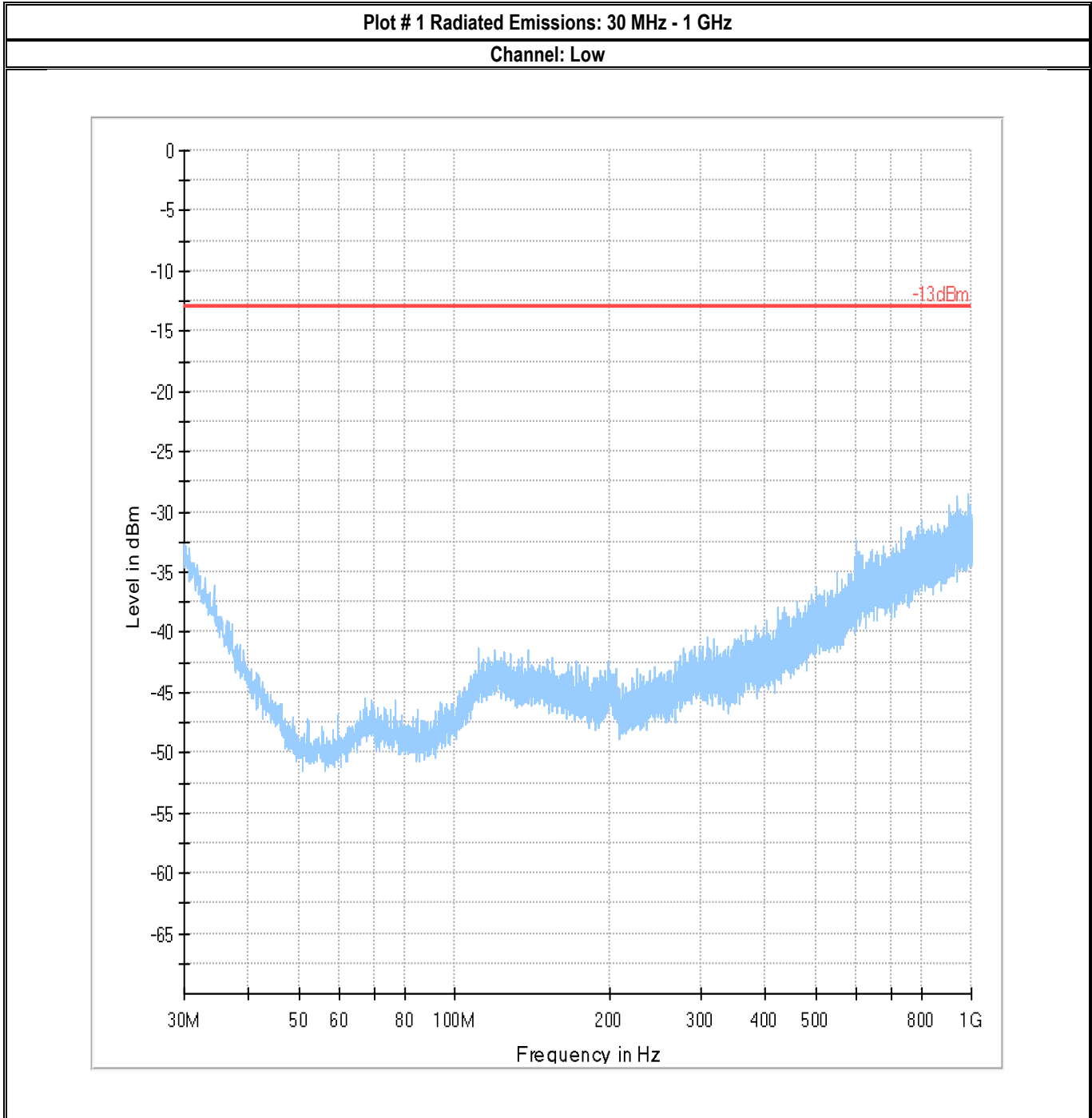


7.2.4 Measurement result:

Plot #	Cellular Channel	EUT operating mode	Scan Frequency	Frequency of highest emission [MHz]	Highest emission [dBm]	Detector	Limit [dBm]	Result
1-3	Low	LTE 4	30 MHz – 18 GHz	2111.11	-32.31	Peak	-13	Pass
4-7	Mid		9 kHz – 18 GHz	6929.66	-33.32	Peak	-13	Pass
8-10	High		30 MHz – 18 GHz	2147.91	-34.05	Peak	-13	Pass
11 – 14	Mid	LTE 13	9 kHz – 18 GHz	2345.46	-30.82	Peak	-13	Pass

7.2.5 Measurement Plots:

LTE Band 4



Plot # 2 Radiated Emissions: 1 GHz - 3 GHz

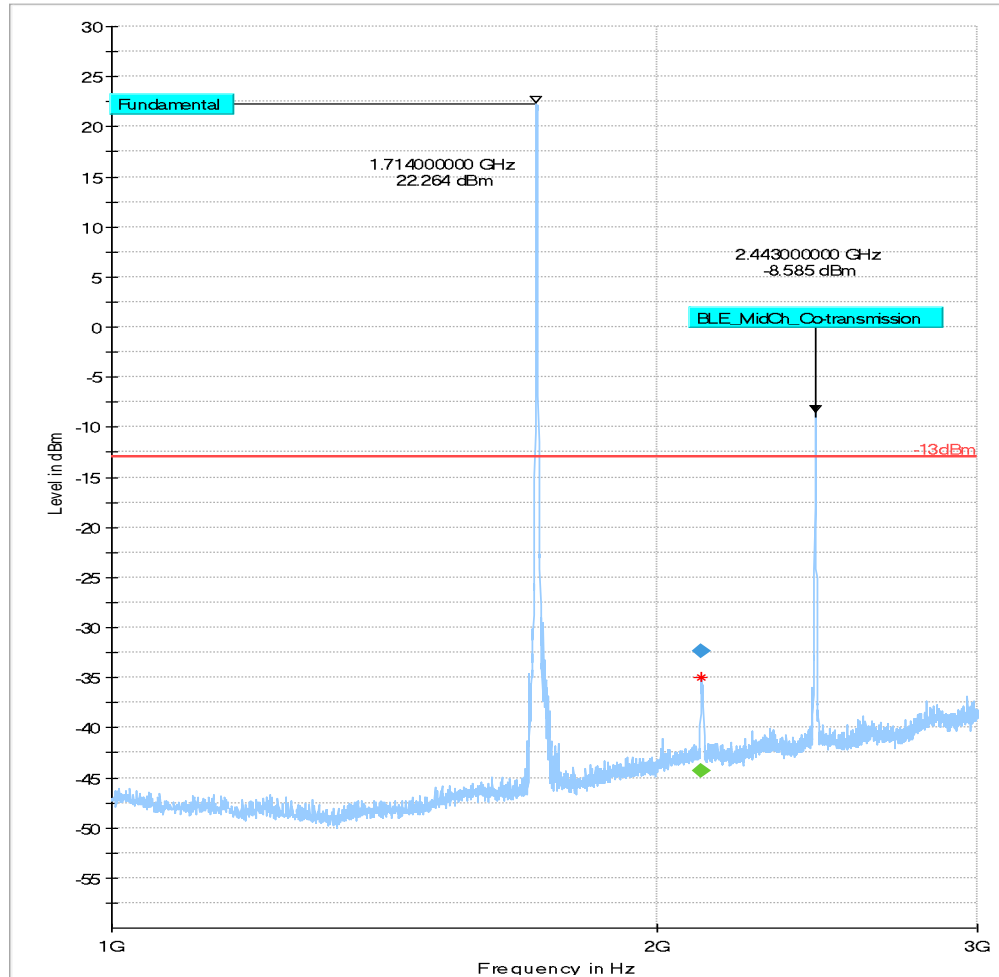
Channel: Low

Final Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
2111.107250	---	-44.30	---	---	100.0	1000.000	162.0	V	247.0	-60.9
2111.107250	-32.31	---	-13.00	19.31	100.0	1000.000	162.0	V	247.0	-60.9

(continuation of the "Final_Result" table from column 16 ...)

Frequency (MHz)	Comment
2111.107250	5:56:59 PM - 2/19/2019
2111.107250	5:56:59 PM - 2/19/2019



Plot # 3 Radiated Emissions: 3 GHz - 18 GHz

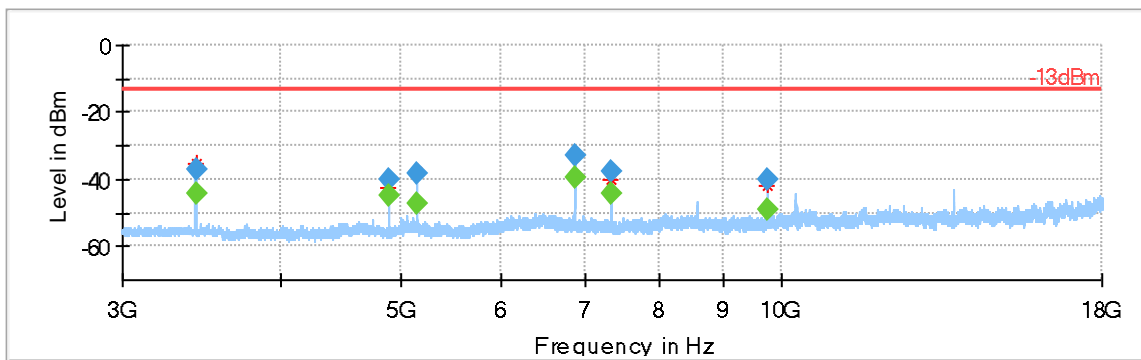
Channel: Low

Final Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
3430.057667	-36.84	---	-13.00	23.84	100.0	1000.000	153.0	H	166.0	-103.1
3430.057667	---	-44.02	---	---	100.0	1000.000	153.0	H	166.0	-103.1
4883.677500	-39.99	---	-13.00	26.99	100.0	1000.000	197.0	H	107.0	-100.6
4883.677500	---	-44.76	---	---	100.0	1000.000	197.0	H	107.0	-100.6
5146.522167	-38.13	---	-13.00	25.13	100.0	1000.000	153.0	V	232.0	-99.3
5146.522167	---	-46.97	---	---	100.0	1000.000	153.0	V	232.0	-99.3
6860.001833	-32.96	---	-13.00	19.96	100.0	1000.000	166.0	V	37.0	-95.6
6860.001833	---	-39.30	---	---	100.0	1000.000	166.0	V	37.0	-95.6
7325.198500	---	-44.14	---	---	100.0	1000.000	302.0	V	71.0	-95.8
7325.198500	-37.59	---	-13.00	24.59	100.0	1000.000	302.0	V	71.0	-95.8
9766.490167	---	-48.90	---	---	100.0	1000.000	294.0	H	291.0	-93.0
9766.490167	-39.91	---	-13.00	26.91	100.0	1000.000	294.0	H	291.0	-93.0

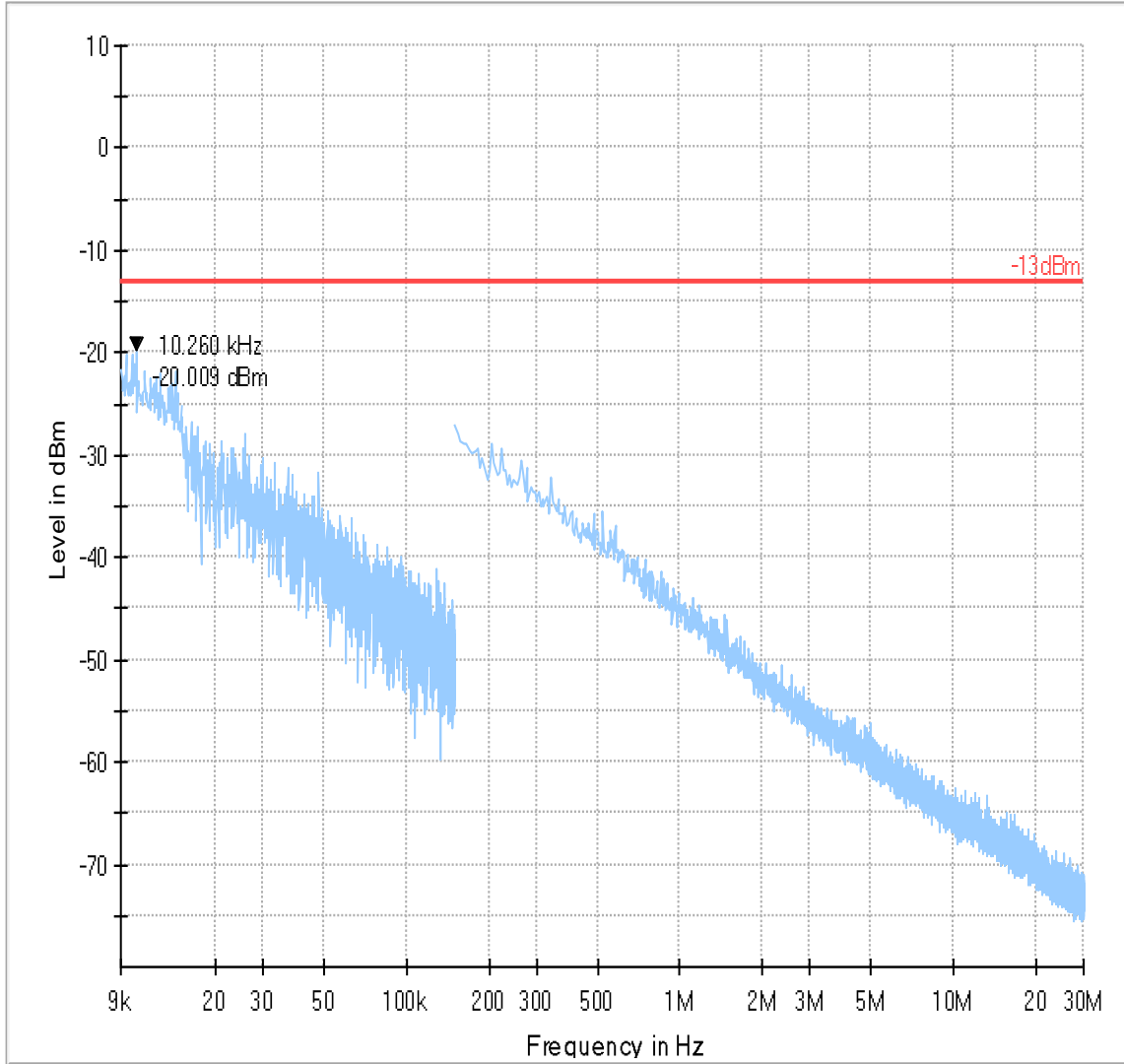
(continuation of the "Final_Result" table from column 16 ...)

Frequency (MHz)	Comment
3430.057667	6:20:31 PM - 2/19/2019
3430.057667	6:20:31 PM - 2/19/2019
4883.677500	6:18:40 PM - 2/19/2019
4883.677500	6:18:40 PM - 2/19/2019
5146.522167	6:22:25 PM - 2/19/2019
5146.522167	6:22:25 PM - 2/19/2019
6860.001833	6:12:30 PM - 2/19/2019
6860.001833	6:12:30 PM - 2/19/2019
7325.198500	6:16:44 PM - 2/19/2019
7325.198500	6:16:44 PM - 2/19/2019
9766.490167	6:24:07 PM - 2/19/2019
9766.490167	6:24:07 PM - 2/19/2019



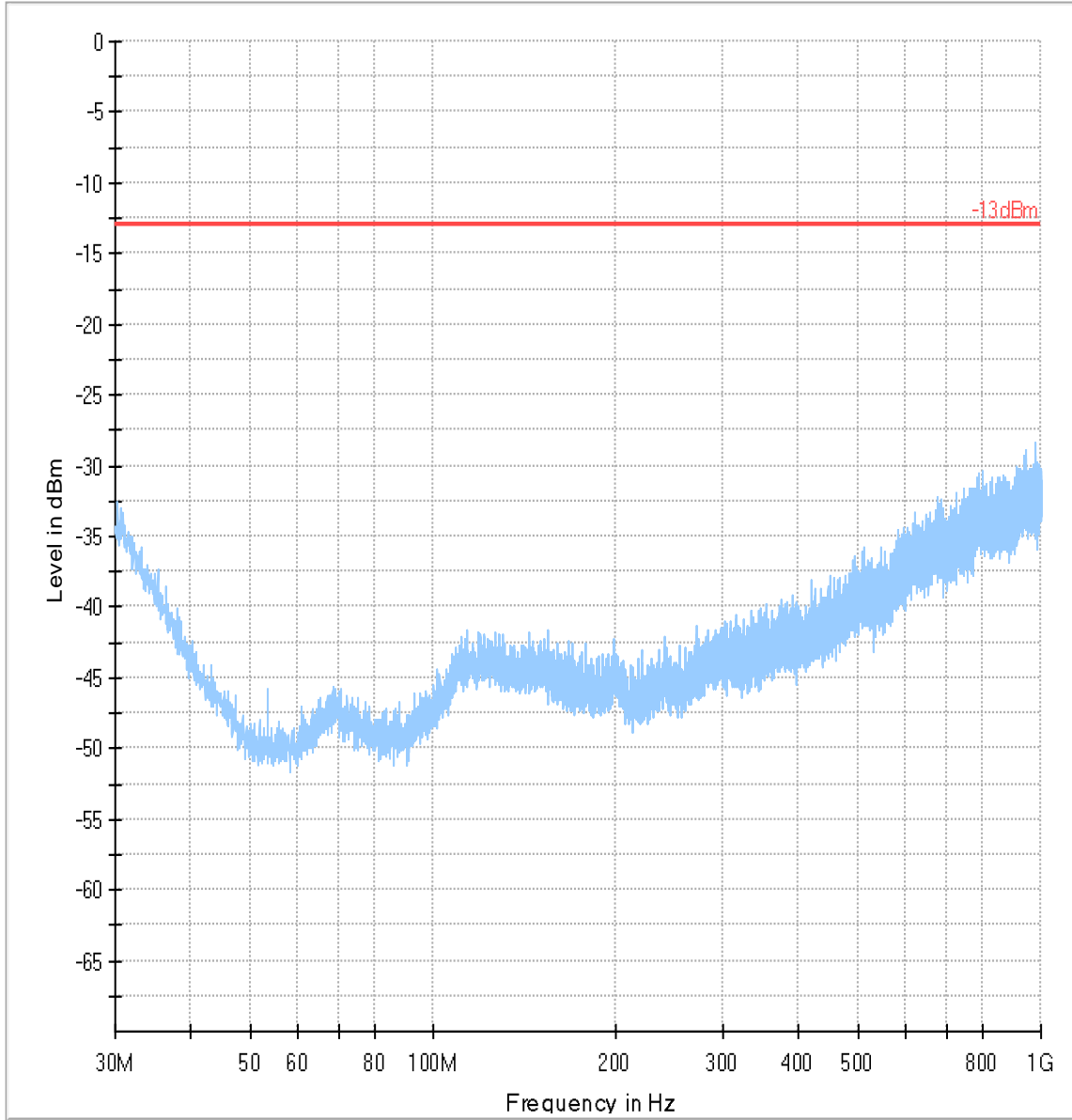
Plot # 4 Radiated Emissions: 9 kHz - 30 MHz

Channel: Mid



Plot # 5 Radiated Emissions: 30 MHz – 1 GHz

Channel: Mid



Plot # 6 Radiated Emissions: 1 GHz - 3 GHz

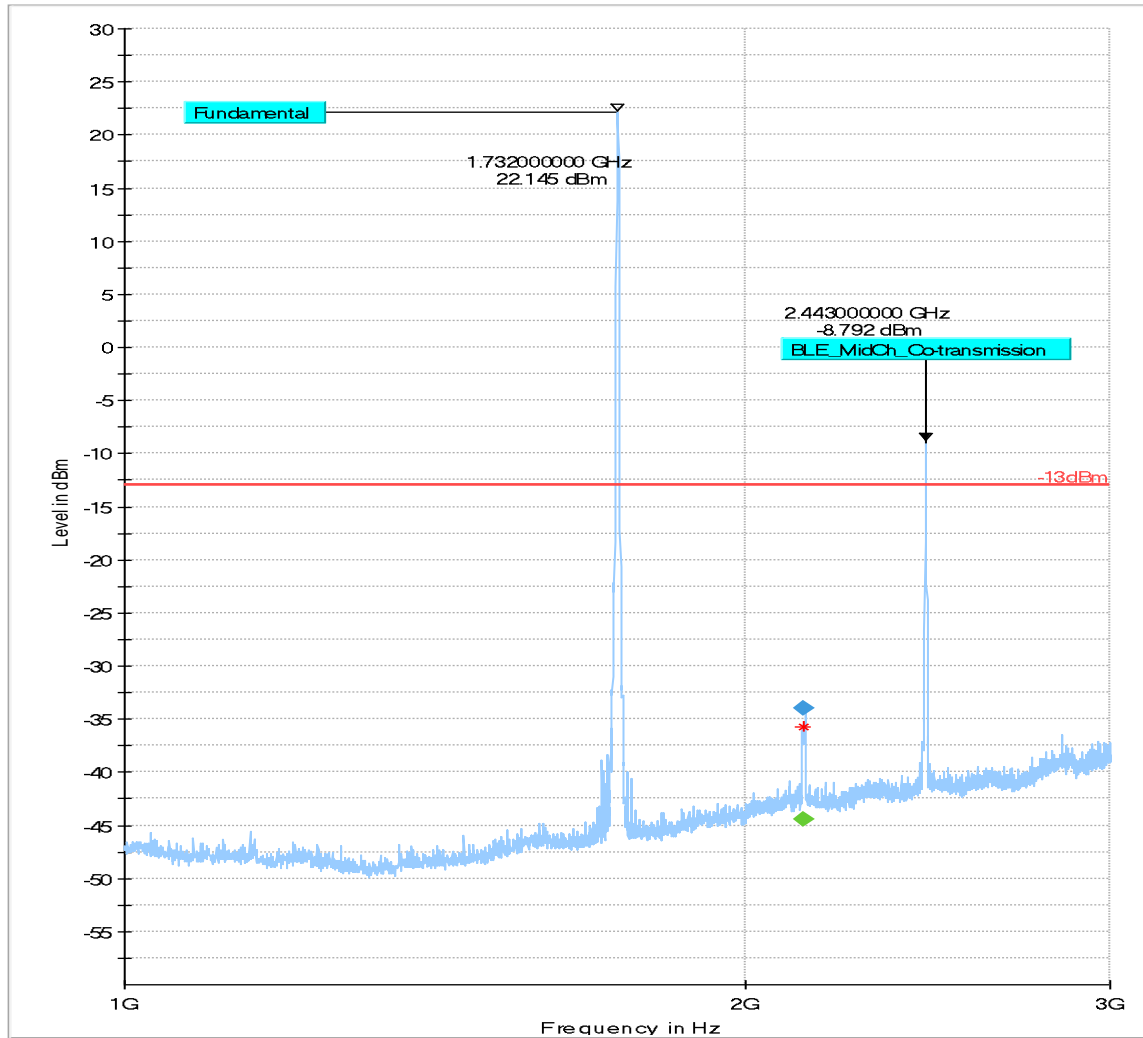
Channel: Mid

Final Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
2133.651875	---	-44.49	---	---	100.0	1000.000	225.0	V	262.0	-60.8
2133.651875	-33.94	---	-13.00	20.94	100.0	1000.000	225.0	V	262.0	-60.8

(continuation of the "Final_Result" table from column 16 ...)

Frequency (MHz)	Comment
2133.651875	5:48:54 PM - 2/19/2019
2133.651875	5:48:54 PM - 2/19/2019



Plot # 7 Radiated Emissions: 3 GHz – 18GHz

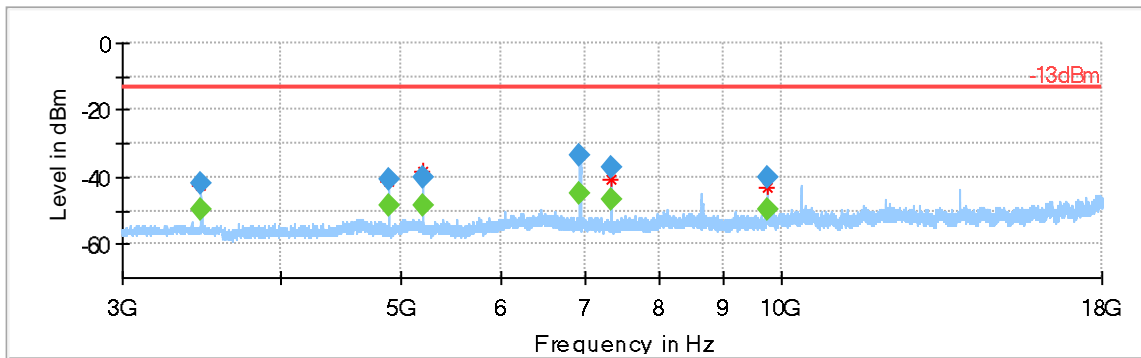
Channel: Mid

Final Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
3463.973500	---	-49.72	---	---	100.0	1000.000	248.0	H	2.0	-103.0
3463.973500	-41.62	---	-13.00	28.62	100.0	1000.000	248.0	H	2.0	-103.0
4883.083833	---	-48.51	---	---	100.0	1000.000	153.0	H	130.0	-100.6
4883.083833	-40.39	---	-13.00	27.39	100.0	1000.000	153.0	H	130.0	-100.6
5197.586500	---	-48.69	---	---	100.0	1000.000	274.0	V	254.0	-99.4
5197.586500	-40.36	---	-13.00	27.36	100.0	1000.000	274.0	V	254.0	-99.4
6929.657500	---	-44.58	---	---	100.0	1000.000	284.0	V	-14.0	-95.6
6929.657500	-33.32	---	-13.00	20.32	100.0	1000.000	284.0	V	-14.0	-95.6
7326.397167	---	-46.46	---	---	100.0	1000.000	300.0	V	71.0	-95.8
7326.397167	-37.26	---	-13.00	24.26	100.0	1000.000	300.0	V	71.0	-95.8
9766.271167	---	-49.88	---	---	100.0	1000.000	325.0	H	299.0	-93.0
9766.271167	-39.94	---	-13.00	26.94	100.0	1000.000	325.0	H	299.0	-93.0

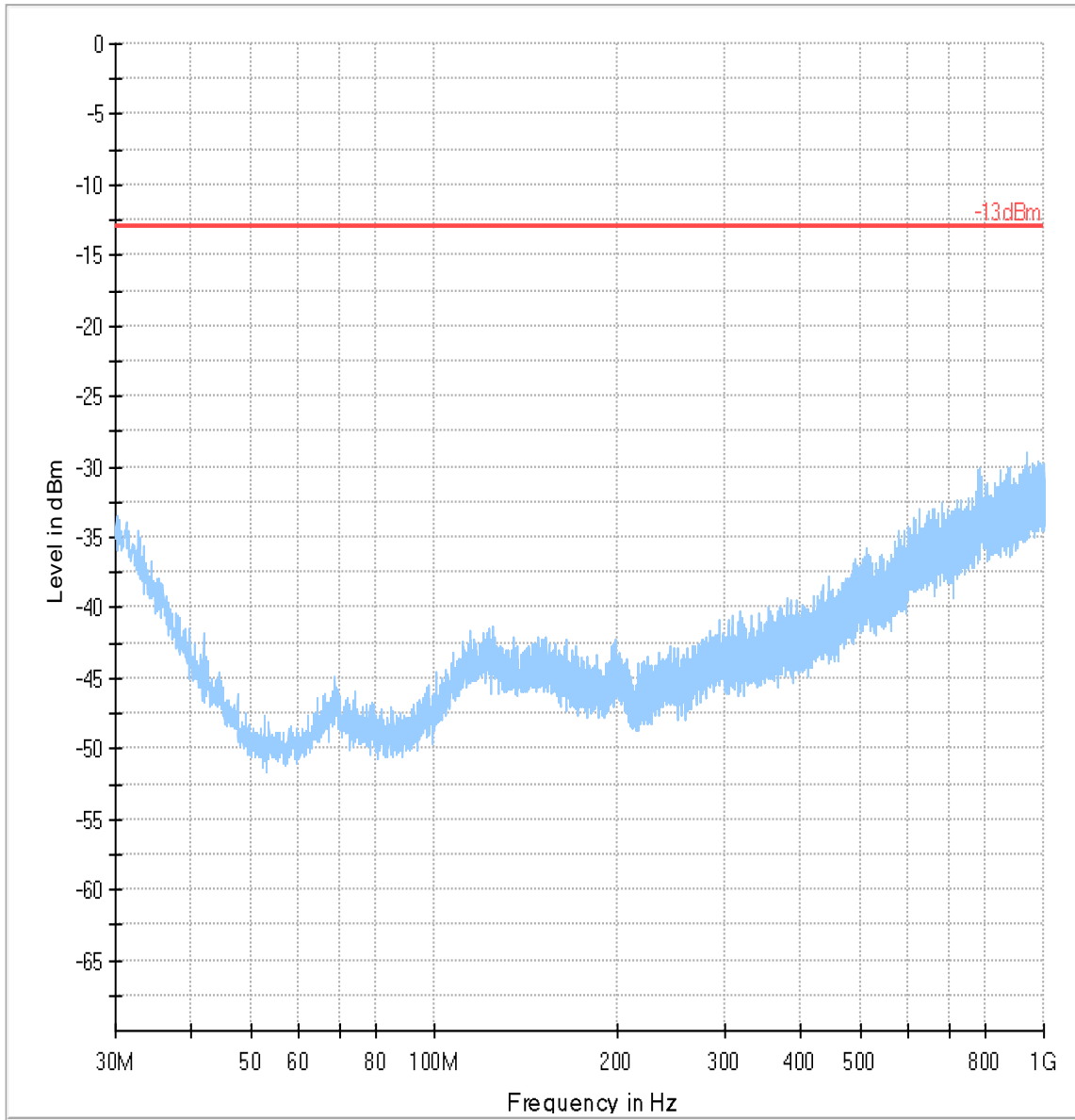
(continuation of the "Final_Result" table from column 16 ...)

Frequency (MHz)	Comment
3463.973500	6:32:31 PM - 2/19/2019
3463.973500	6:32:31 PM - 2/19/2019
4883.083833	6:34:30 PM - 2/19/2019
4883.083833	6:34:30 PM - 2/19/2019
5197.586500	6:36:19 PM - 2/19/2019
5197.586500	6:36:19 PM - 2/19/2019
6929.657500	6:38:25 PM - 2/19/2019
6929.657500	6:38:25 PM - 2/19/2019
7326.397167	6:40:16 PM - 2/19/2019
7326.397167	6:40:16 PM - 2/19/2019
9766.271167	6:42:18 PM - 2/19/2019
9766.271167	6:42:18 PM - 2/19/2019



Plot # 8 Radiated Emissions: 30 MHz - 1 GHz

Channel: High



Plot # 9 Radiated Emissions: 1 GHz - 3 GHz

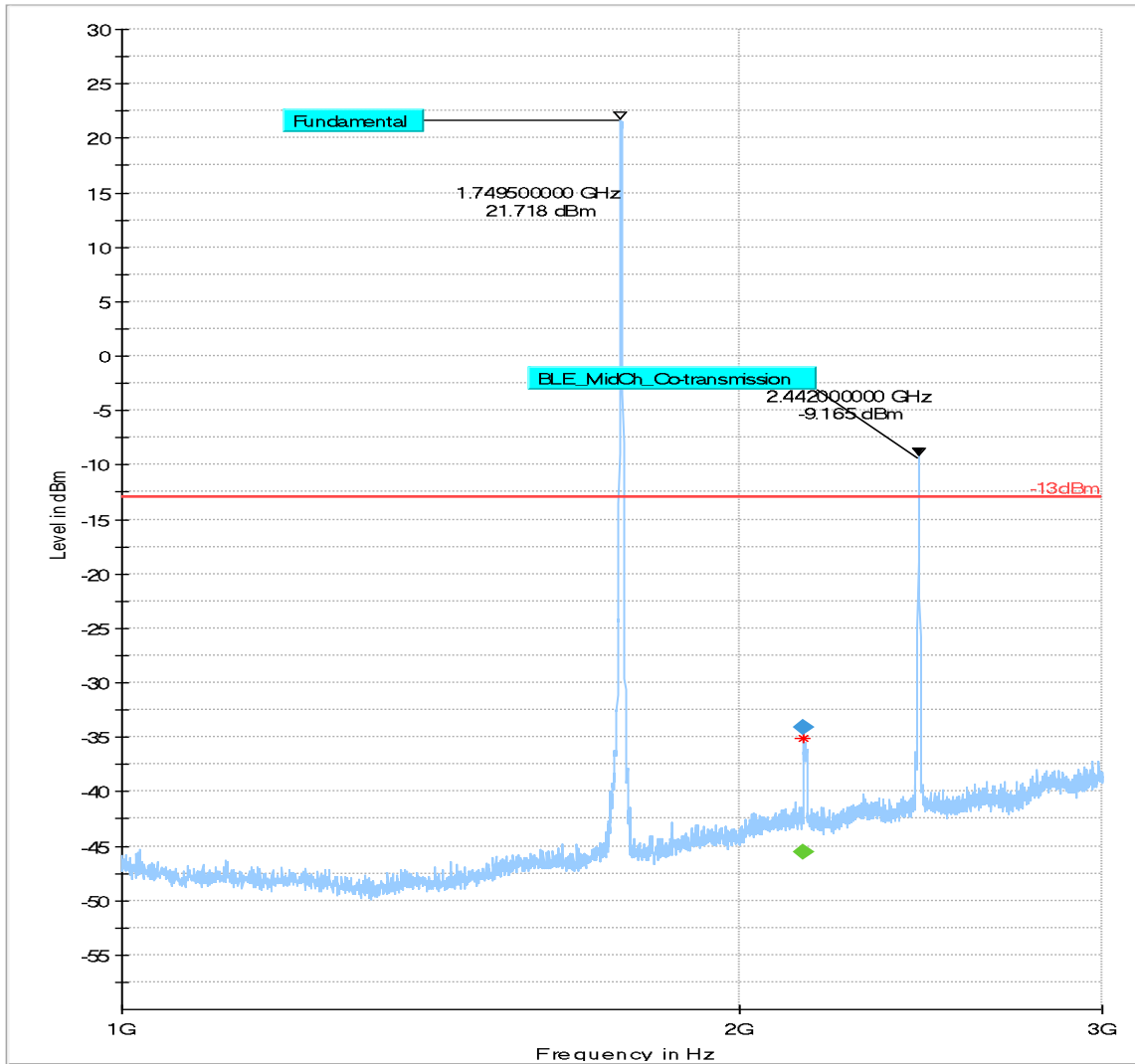
Channel: High

Final Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
2147.908000	---	-45.60	---	---	100.0	1000.000	253.0	V	258.0	-60.6
2147.908000	-34.05	---	-13.00	21.05	100.0	1000.000	253.0	V	258.0	-60.6

(continuation of the "Final_Result" table from column 16 ...)

Frequency (MHz)	Comment
2147.908000	5:41:22 PM - 2/19/2019
2147.908000	5:41:22 PM - 2/19/2019



Plot # 10 Radiated Emissions: 3 GHz - 18 GHz

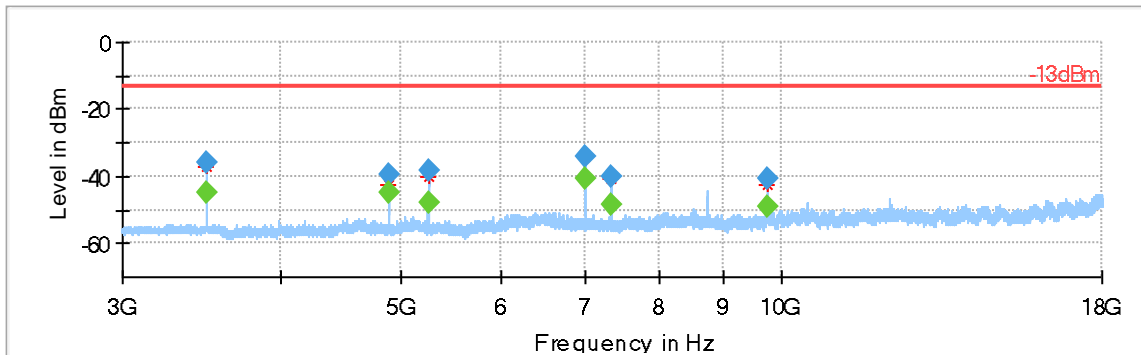
Channel: High

Final Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
3501.273833	---	-44.93	---	---	100.0	1000.000	140.0	H	165.0	-102.9
3501.273833	-36.00	---	-13.00	23.00	100.0	1000.000	140.0	H	165.0	-102.9
4883.427000	---	-45.10	---	---	100.0	1000.000	289.0	H	127.0	-100.6
4883.427000	-39.65	---	-13.00	26.65	100.0	1000.000	289.0	H	127.0	-100.6
5249.979167	---	-47.67	---	---	100.0	1000.000	316.0	V	16.0	-99.4
5249.979167	-38.57	---	-13.00	25.57	100.0	1000.000	316.0	V	16.0	-99.4
7000.069833	---	-40.57	---	---	100.0	1000.000	140.0	V	343.0	-95.3
7000.069833	-34.17	---	-13.00	21.17	100.0	1000.000	140.0	V	343.0	-95.3
7324.764833	---	-48.65	---	---	100.0	1000.000	184.0	H	82.0	-95.8
7324.764833	-39.90	---	-13.00	26.90	100.0	1000.000	184.0	H	82.0	-95.8
9768.333333	---	-49.09	---	---	100.0	1000.000	325.0	H	297.0	-93.0
9768.333333	-40.48	---	-13.00	27.48	100.0	1000.000	325.0	H	297.0	-93.0

(continuation of the "Final_Result" table from column 16 ...)

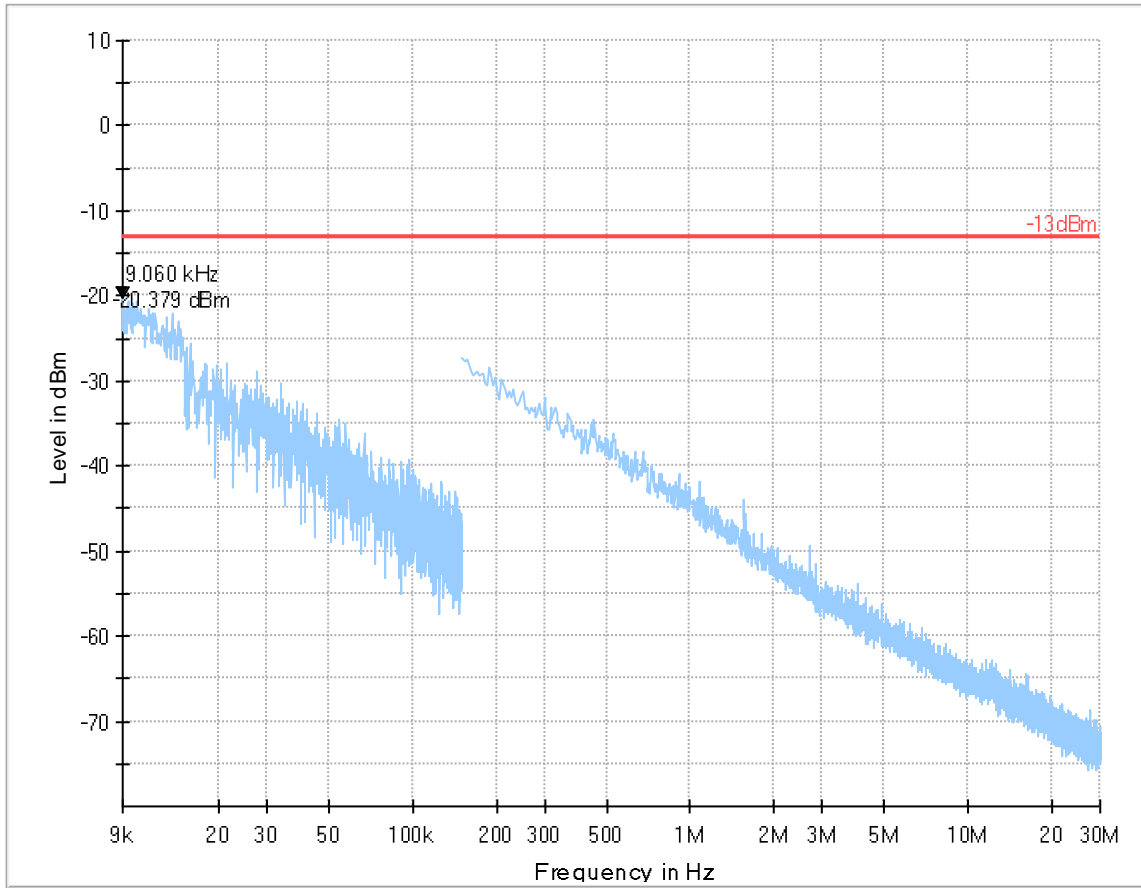
Frequency (MHz)	Comment
3501.273833	6:57:35 PM - 2/19/2019
3501.273833	6:57:35 PM - 2/19/2019
4883.427000	6:59:18 PM - 2/19/2019
4883.427000	6:59:18 PM - 2/19/2019
5249.979167	7:01:15 PM - 2/19/2019
5249.979167	7:01:15 PM - 2/19/2019
7000.069833	7:03:34 PM - 2/19/2019
7000.069833	7:03:34 PM - 2/19/2019
7324.764833	7:05:45 PM - 2/19/2019
7324.764833	7:05:45 PM - 2/19/2019
9768.333333	7:07:39 PM - 2/19/2019
9768.333333	7:07:38 PM - 2/19/2019



LTE Band 13

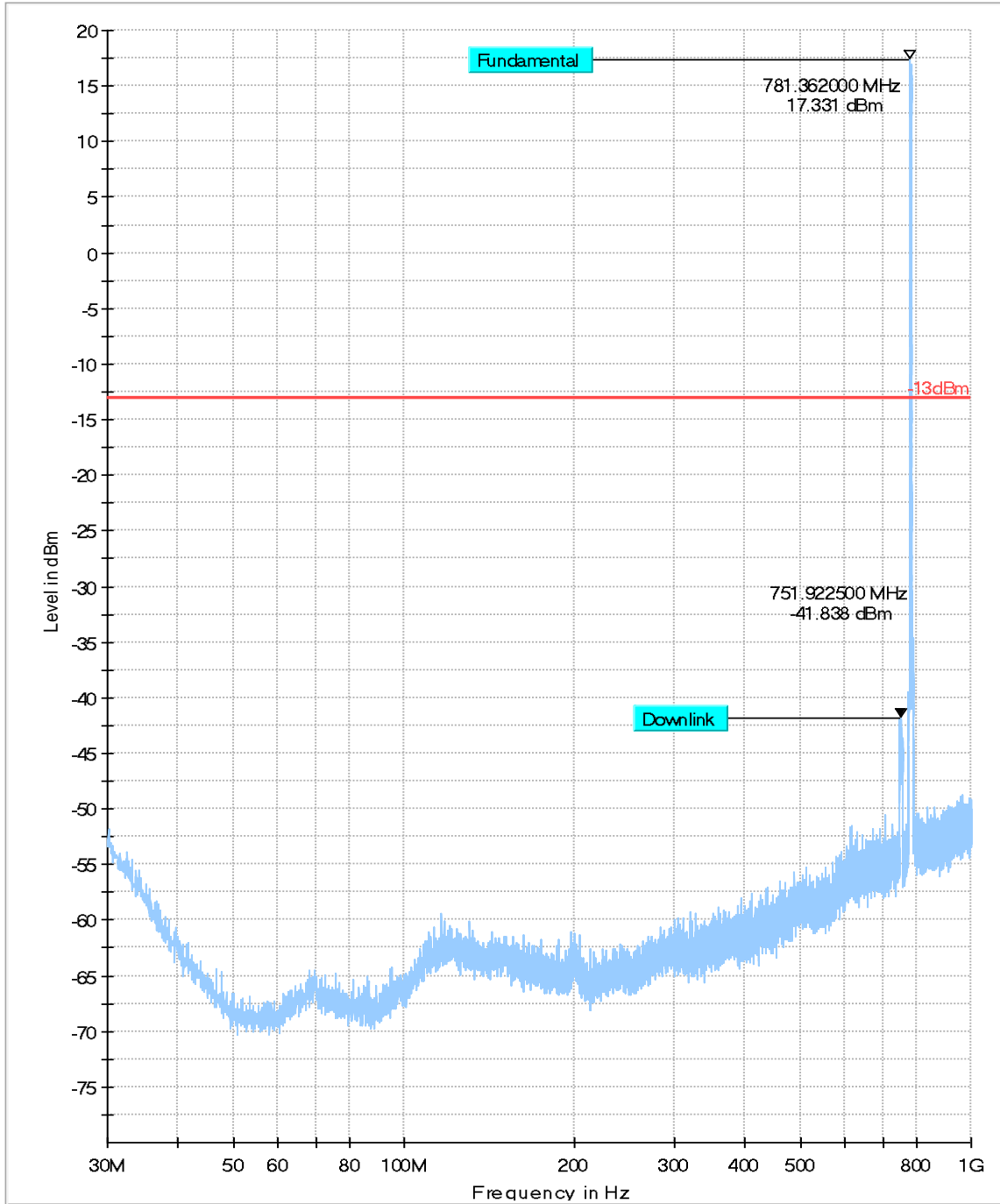
Plot # 11 Radiated Emissions: 9 kHz - 30 MHz

Channel: Mid



Plot # 12 Radiated Emissions: 30 MHz – 1 GHz

Channel: Mid





Plot # 13 Radiated Emissions: 1 GHz - 3 GHz

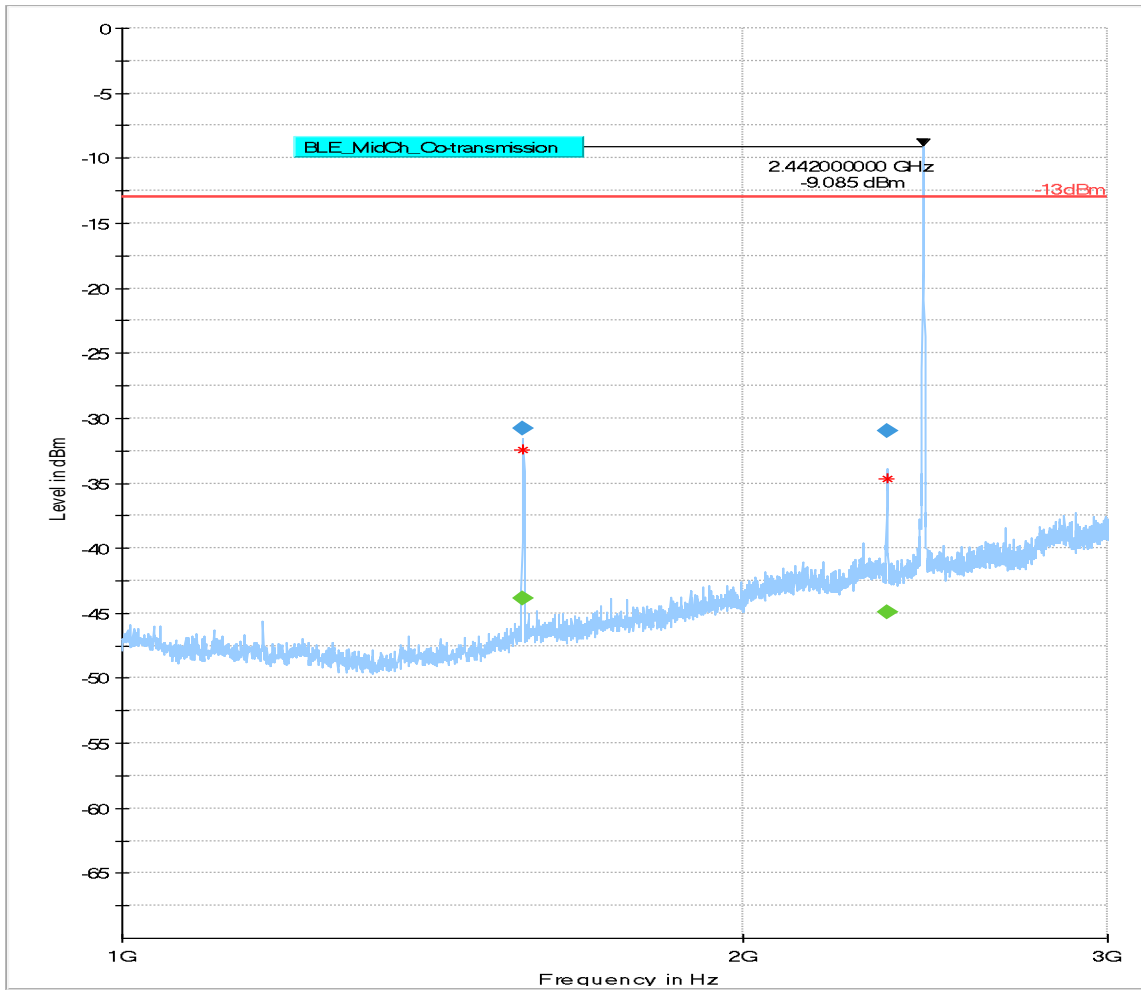
Channel: Mid

Final Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1563.943625	---	-43.85	---	---	100.0	1000.000	325.0	V	273.0	-63.9
1563.943625	-30.82	---	-13.00	17.82	100.0	1000.000	325.0	V	273.0	-63.9
2345.464500	---	-44.92	---	---	100.0	1000.000	166.0	H	317.0	-60.0
2345.464500	-30.98	---	-13.00	17.98	100.0	1000.000	166.0	H	317.0	-60.0

(continuation of the "Final_Result" table from column 16 ...)

Frequency (MHz)	Comment
1563.943625	5:22:12 PM - 2/19/2019
1563.943625	5:22:12 PM - 2/19/2019
2345.464500	5:24:09 PM - 2/19/2019
2345.464500	5:24:09 PM - 2/19/2019



Plot # 14 Radiated Emissions: 3 GHz – 18 GHz

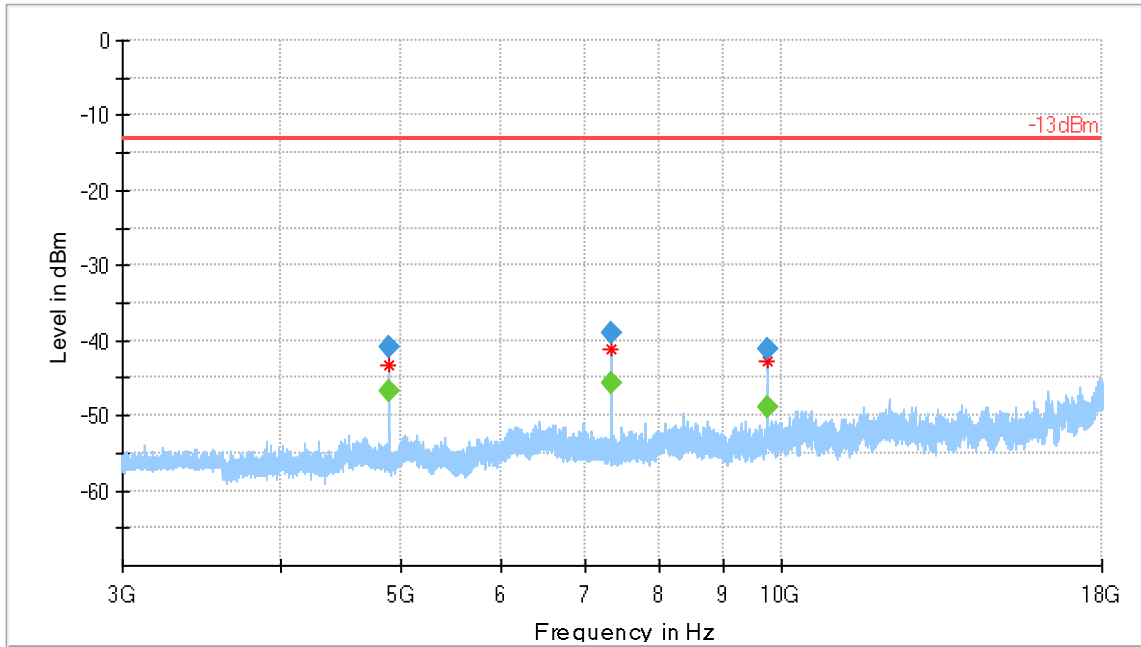
Channel: Mid

Final Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
4884.078500	-40.85	---	-13.00	27.85	100.0	1000.000	256.0	H	106.0	-100.6
4884.078500	---	-46.79	---	---	100.0	1000.000	256.0	H	106.0	-100.6
7325.399667	-39.03	---	-13.00	26.03	100.0	1000.000	295.0	H	68.0	-95.8
7325.399667	---	-45.81	---	---	100.0	1000.000	295.0	H	68.0	-95.8
9766.937333	---	-48.78	---	---	100.0	1000.000	325.0	H	302.0	-93.0
9766.937333	-41.14	---	-13.00	28.14	100.0	1000.000	325.0	H	302.0	-93.0

(continuation of the "Final_Result" table from column 16 ...)

Frequency (MHz)	Comment
4884.078500	7:24:35 PM - 2/19/2019
4884.078500	7:24:35 PM - 2/19/2019
7325.399667	7:22:43 PM - 2/19/2019
7325.399667	7:22:43 PM - 2/19/2019
9766.937333	7:26:31 PM - 2/19/2019
9766.937333	7:26:31 PM - 2/19/2019



8 Test setup photos

Setup photos are included in supporting file name: "EMC_CALAM_081_19001_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
THRMMOMETER 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
03/06/2019	EMC_CALAM_081_19001_FCC_27_ISED	Initial Version	Yuchan Lu