



FCC / ISED & Test Report

For:
Crane Payment Innovations

Model Name:
COR151-US102

Product Description:
Modular Data Port

Applied Rules and Standards:
47 CFR Parts 27

FCC ID: QP8CORABT

REPORT #: EMC_MEIGR_008_FCC_27
DATE: 2018-10-16



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 27.

No deficiencies were ascertained.

Company Name	Product Description	Model #
Crane Payment Innovations	Modular Data Port	COR151-US102

Responsible for Testing Laboratory:

2018-10-16	Compliance	Cindy Li (Lab Manager – EMC)	
Date	Section	Name	Signature

Responsible for the Report:

2018-10-16	Compliance	Kevin Wang (Senior EMC Engineer)	
Date	Section	Name	Signature

The test results of this test report relate exclusively to the test item specified in Section 3. 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:	Kevin Wang

2.2 Identification of the Client

Applicant's Name:	Crane Payment Innovations
Street Address:	3222 Phoenixville Pike, Suite 200
City/Zip Code	Malvern, PA 19355
Country	USA

2.3 Identification of the Manufacturer

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

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

Model No	CORA151-US102
HW Version	G1
SW Version	9.15
FCC-ID	QP8CORABT
Product Description	CORA modular data port is a two pcb solution on-line monitoring device that capture transaction activities of bottling and full-service vending machines.
Transceiver Technology / Type(s) of Modulation	Telit Wireless LE910-SVL, 4G, CAT 1 radio module FCC ID: RI7LE910SVL LTE Band 4/13 QualComm model CSR1010 Bluetooth Low Energy Radio
Frequency Range	LTE Band 4: 1710-1755 LTE Band 13: 777-787 Bluetooth LE: 2400-2483.5
Max. declared antenna gain	Genesis Connected Solutions, model: 650-10010-01; peak gain: 5.1dBi Bluetooth Antenna: PCB trace; peak gain: 3.2dBi
Power Supply/ Rated Operating Voltage Range	20V (Low) / 24V (Nominal) / 42V (Max), DC
Operating Temperature Range	-15°C ~ +60°C
Sample Revision	<input type="checkbox"/> Prototype <input type="checkbox"/> Production <input checked="" type="checkbox"/> Pre-Production

3.2 EUT Sample details

EUT #	Serial Number	HW Version	SW Version	Notes/Comments
1	29890100013	G1	9.15	Radiated Sample
2	29890100010	G1	9.15	Conducted Sample

3.3 Accessory Equipment (AE) details

AE #	Type	Model	Manufacturer	Serial Number
1	Vending Demo Tester	-	MEI	-
2	AC Adaptor	DSI65-24-U	CUI Inc.	-

3.4 Test Sample Configuration

Set-up #	EUT / AE used for set-up	Comments
1	EUT#1+AE#1+AE#2	Radiated Measurements

4 **Subject of Investigation**

The objective of the measurements done by CETECOM Inc. was to evaluate the compliance of the EUT against the relevant requirements specified in the Code of Federal Regulations Title 47 parts.

4.1 **Dates of Testing:**

08/21/2018 – 08/24/2018

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)

Conducted measurement

150 kHz to 30 MHz ±0.7 dB (LISN)

RF conducted measurement ±0.5 dB

4.3 **Environmental Conditions during Testing:**

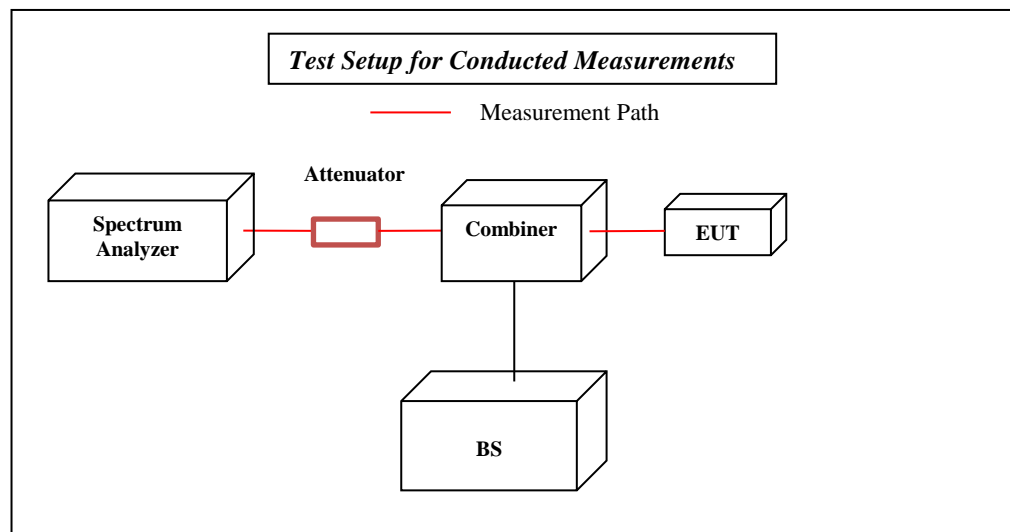
The following environmental conditions were maintained during the course of testing:

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

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

5 Measurement Procedures

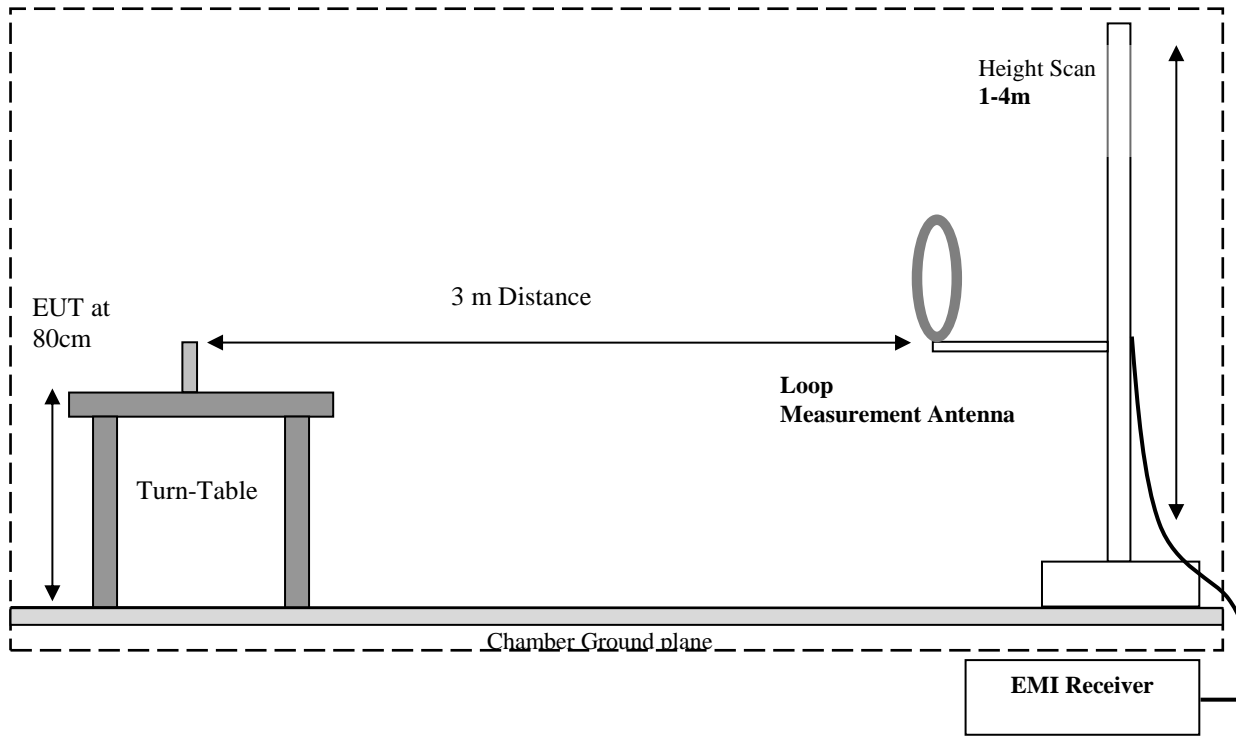
Testing is performed according to the guidelines provided in FCC publication (KDB) 971168 D01 v02r02 – “Measurement Guidance for Certification of Licensed Digital Transmitters” and according to relevant parts of ANSI/TIA-603-D-2010 as detailed below.



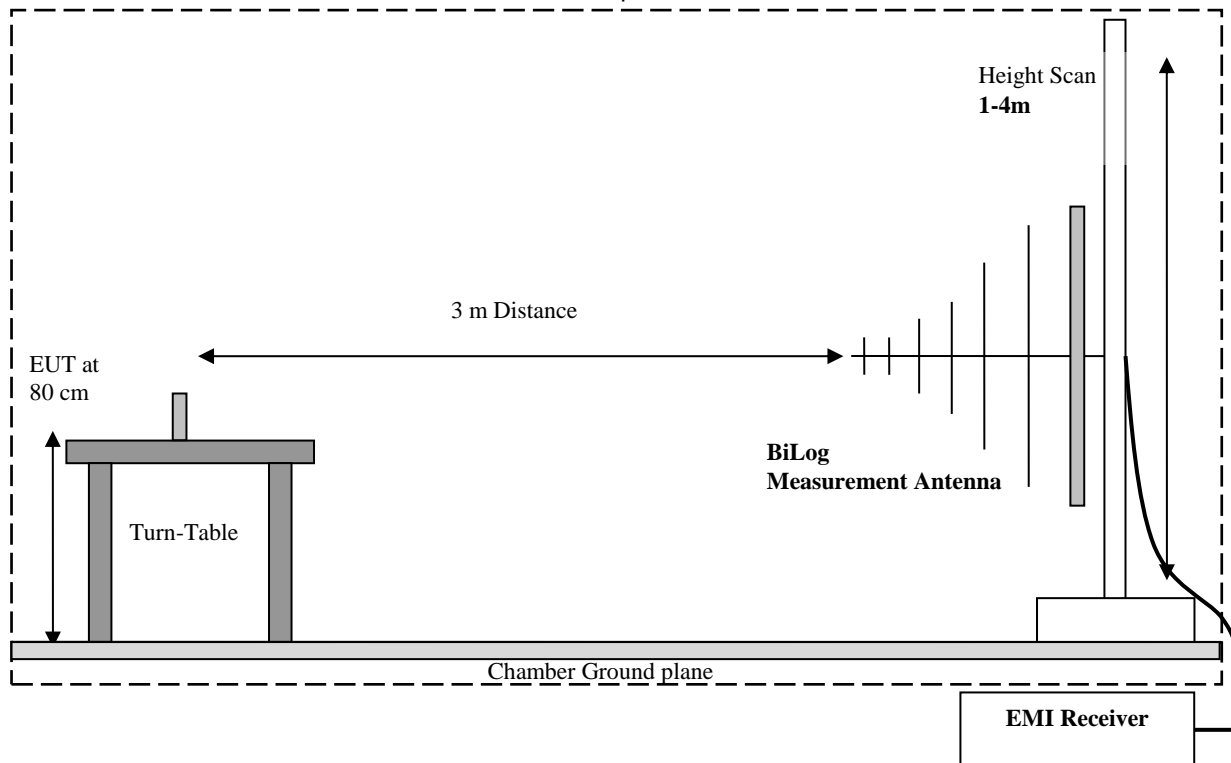
5.1 Radiated Measurement

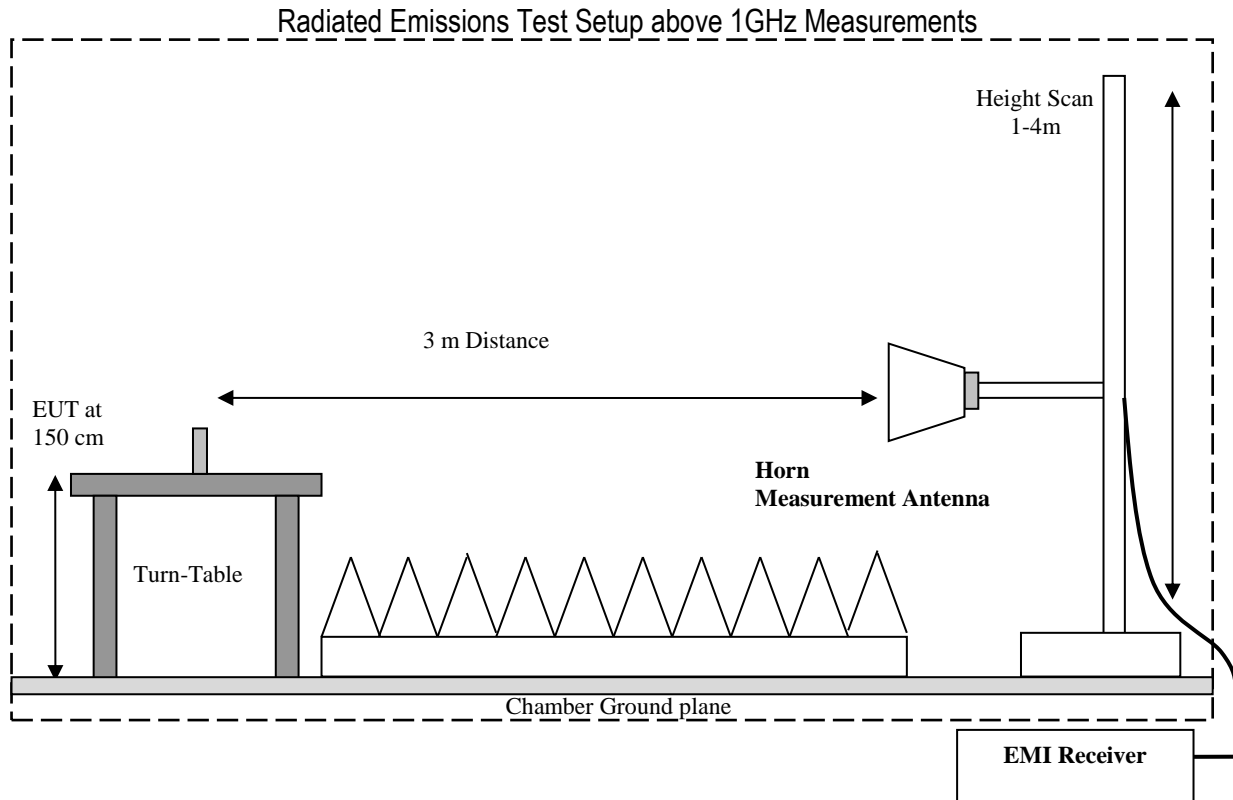
- The exploratory measurement is accomplished by running a matrix of 16 sweeps over the required frequency range with R&S Test-SW EMC32 for 4 positions of the turntable, two orthogonal positions of the EUT and both antenna polarizations. This procedure exceeds the requirement of the above standards to 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 27

Test Specification	Test Case	Temperature and Voltage Conditions	Mode	Pass	Fail	NA	NP	Result
§2.1046; §27.50	RF Output Power	Nominal	LTE Band 4/13	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Note 2
§2.1055; §27.54	Frequency Stability	Extreme Temperature and Voltage	LTE Band 4/13	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Note 2
§2.1049; §27.53	Occupied Bandwidth	Nominal	LTE Band 4/13	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Note 2
§2.1051; §27.53	Band Edge Compliance	Nominal	LTE Band 4/13	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Note 2
§2.1051; §27.53	Conducted Spurious Emissions	Nominal	LTE Band 4/13	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Note 2
§2.1053; §27.53	Radiated Spurious Emissions	Nominal	LTE Band 4/13	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Complies

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

Note 2: Data leveraged from modular approval, FCC ID: R17LE910SVL.

7 Test Result Data

7.1 Radiated Spurious Emissions

7.1.1 Measurement utilizing KDB 971168 D01 Power Meas License Digital Systems v02r02, 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

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 (h)

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

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

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

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

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

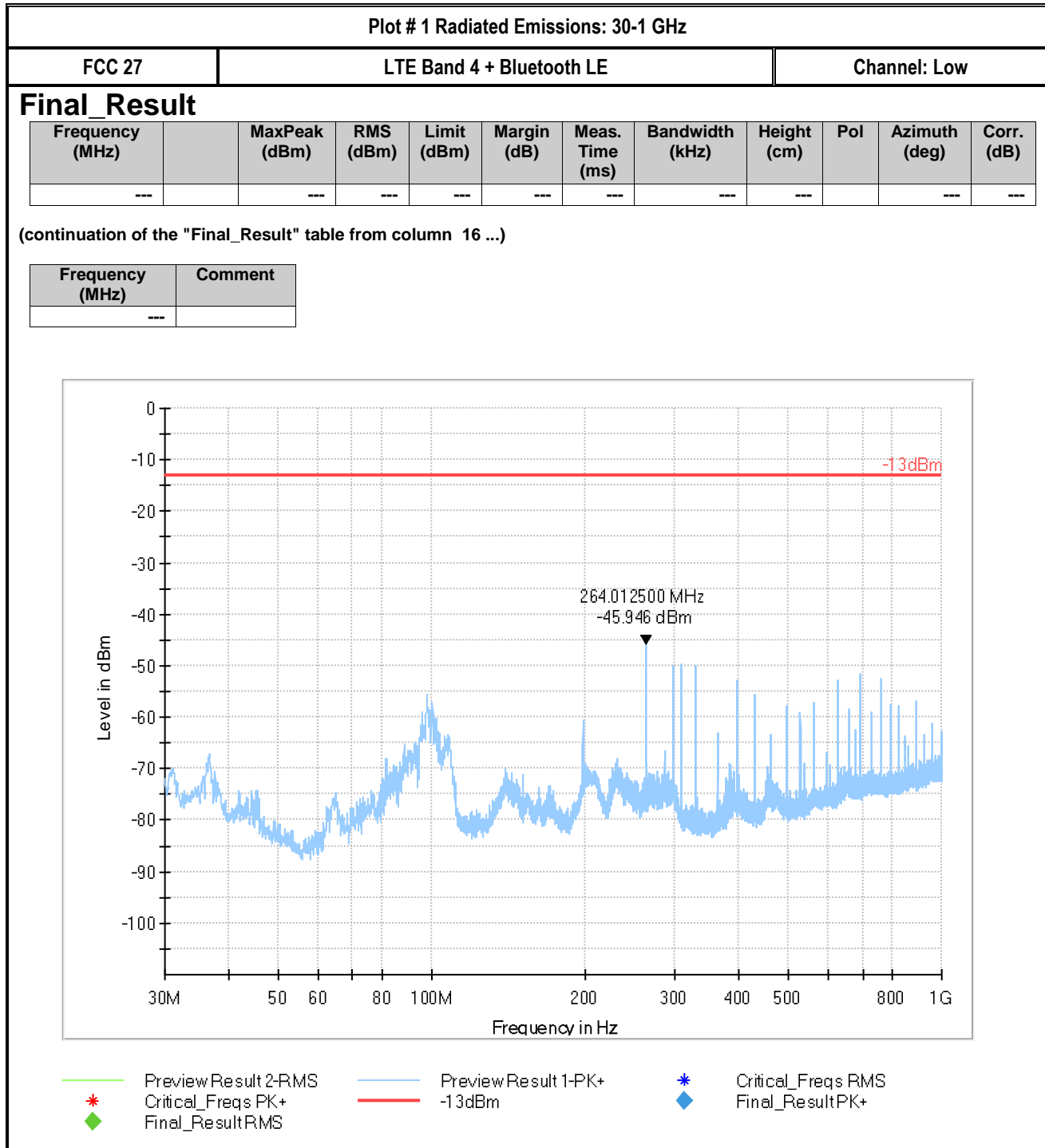
7.1.3 Test conditions and setup:

Ambient Temperature (C)	EUT Set-Up #	EUT operating mode	Power Input
22	1	LTE Band 4/13	110V / 60Hz

7.1.4 Measurement result:

Plot #	Channel	EUT operating mode	Scan Frequency	Limit (dBm)	Result
1-3	Low	LTE Band 4	30 MHz – 18 GHz	-13	Pass
4-8	Mid	LTE Band 4	9 kHz – 26 GHz	-13	Pass
9-11	High	LTE Band 4	30 MHz – 18 GHz	-13	Pass
12-16	Mid	LTE Band 13	9 kHz – 26 GHz	-13	Pass

7.1.5 Measurement Plots:



Plot # 2 Radiated Emissions: 1-3 GHz

FCC 27

LTE Band 4 + Bluetooth LE

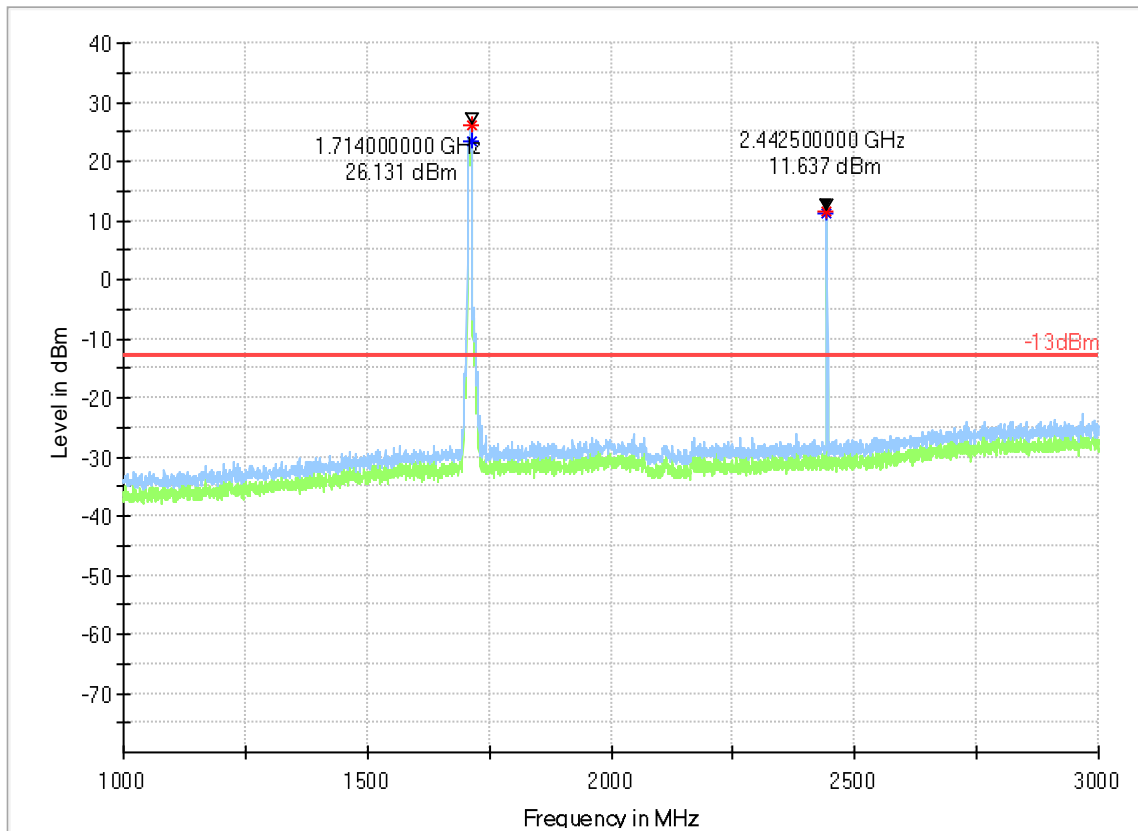
Channel: Low

Final Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
---	---	---	---	---	---	---	---	---	---	---

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

Frequency (MHz)	Comment



- PreviewResult 2-RMS
- PreviewResult 1-PK+
- * Critical_Freqs PK+
- -13dBm
- * Critical_Freqs RMS
- ◆ Final_ResultRMS
- ◆ Final_ResultPK+

Plot # 3 Radiated Emissions: 3-18 GHz

FCC 27

LTE Band 4 + Bluetooth LE

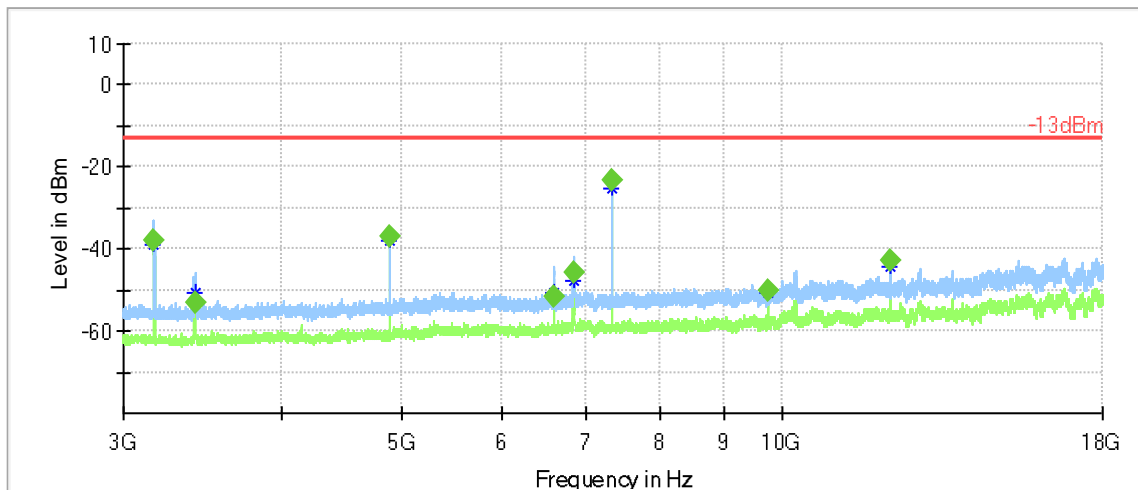
Channel: Low

Final Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
3171.114667	---	-37.73	---	---	200.0	1000.000	100.0	H	255.0	-132.1
3420.036667	---	-52.99	---	---	200.0	1000.000	234.0	V	11.0	-131.7
4883.973333	---	-36.84	---	---	200.0	1000.000	307.0	H	247.0	-128.6
6596.672000	---	-51.59	---	---	200.0	1000.000	217.0	H	254.0	-125.4
6839.926667	---	-45.65	---	---	200.0	1000.000	107.0	V	138.0	-125.0
7325.937333	---	-23.46	---	---	200.0	1000.000	241.0	H	267.0	-125.1
9767.890000	---	-50.22	---	---	200.0	1000.000	114.0	H	263.0	-119.8
12209.892000	---	-42.80	---	---	200.0	1000.000	100.0	H	220.0	-117.5

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

Frequency (MHz)	Comment
3171.114667	6:23:41 PM - 8/22/2018
3420.036667	6:01:44 PM - 8/22/2018
4883.973333	6:17:25 PM - 8/22/2018
6596.672000	6:11:27 PM - 8/22/2018
6839.926667	6:05:02 PM - 8/22/2018
7325.937333	6:20:31 PM - 8/22/2018
9767.890000	6:14:33 PM - 8/22/2018
12209.892000	6:08:23 PM - 8/22/2018



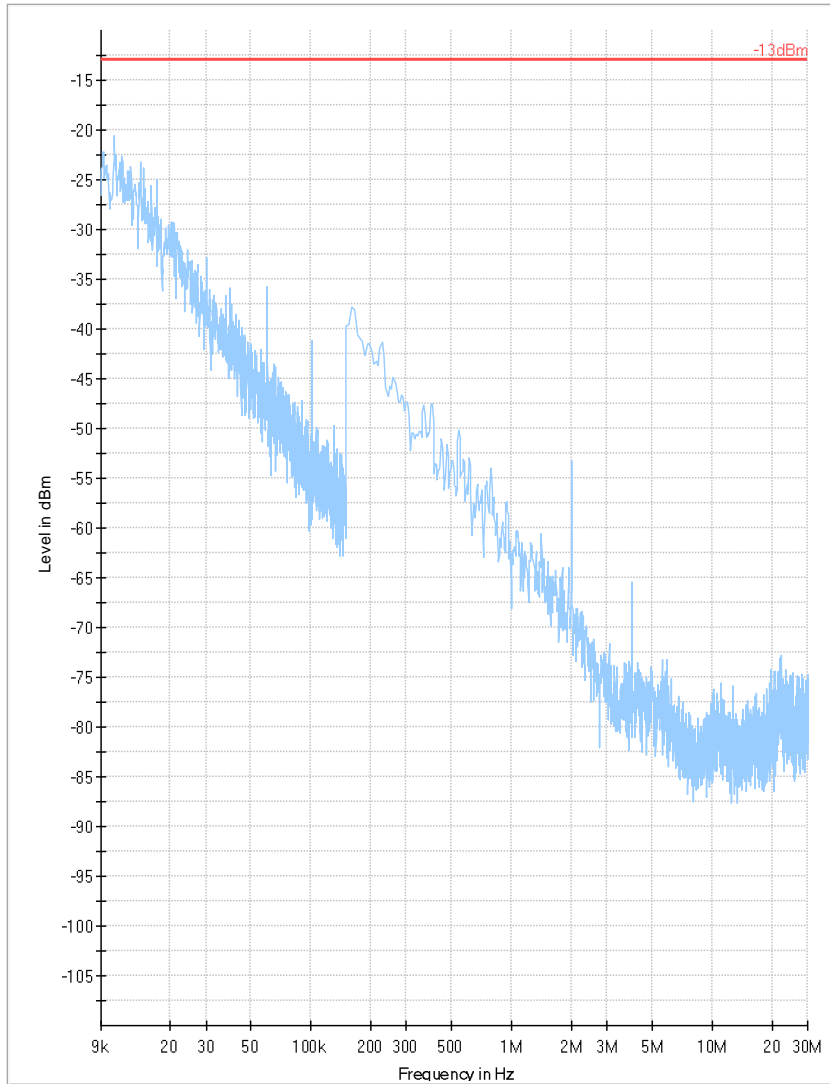
- Preview Result 2-RMS
- Preview Result 1-PK+
- * Critical_Freqs RMS
- * Critical_Freqs PK+
- -13dBm
- ◆ Final_Result PK+
- ◆ Final_Result RMS

Plot # 4 Radiated Emissions: 9kHz – 30MHz

FCC 27

LTE Band 4 + Bluetooth LE

Channel: Mid



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

Plot # 5 Radiated Emissions: 30-1 GHz

FCC 27

LTE Band 4 + Bluetooth LE

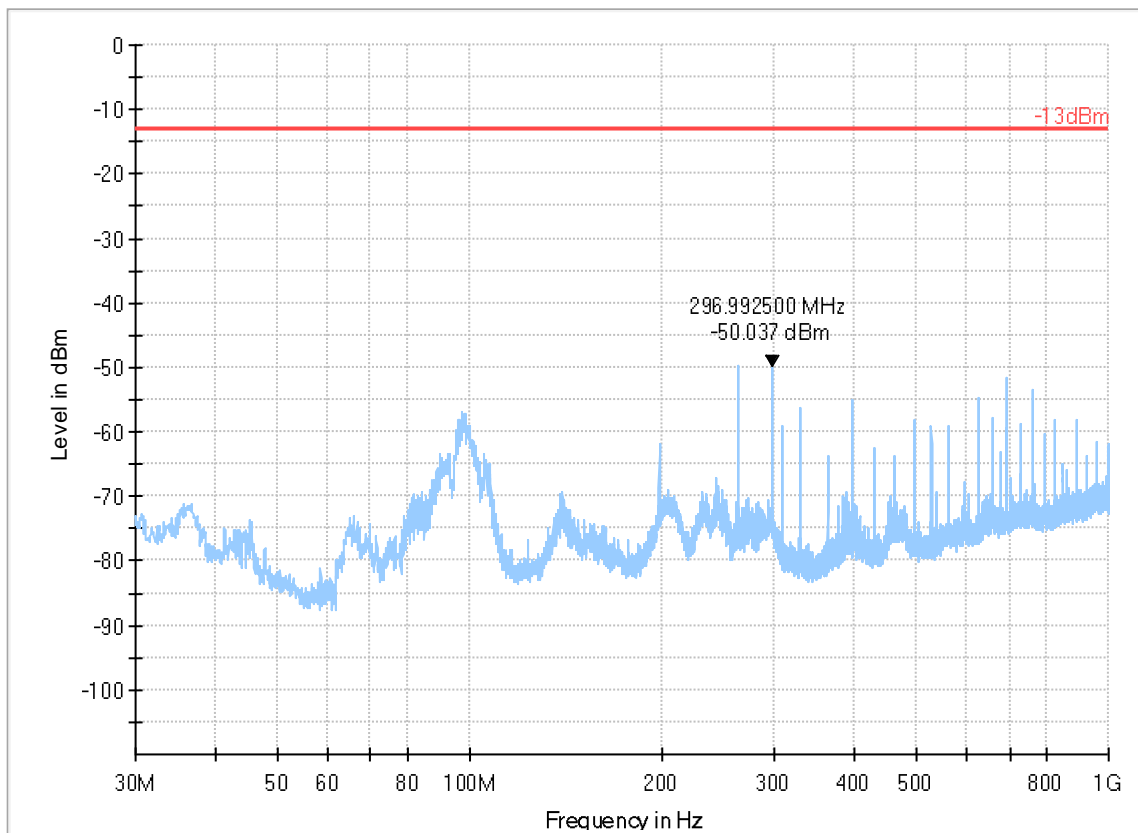
Channel: Mid

Final Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
---	---	---	---	---	---	---	---	---	---	---

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

Frequency (MHz)	Comment



- PreviewResult 2-RMS
- PreviewResult 1-PK+
- -13dBm
- * Critical_Freqs RMS
- * Critical_Freqs PK+
- ◆ Final_ResultPK+
- ◆ Final_ResultRMS

Plot # 6 Radiated Emissions: 1-3 GHz

FCC 27

LTE Band 4 + Bluetooth LE

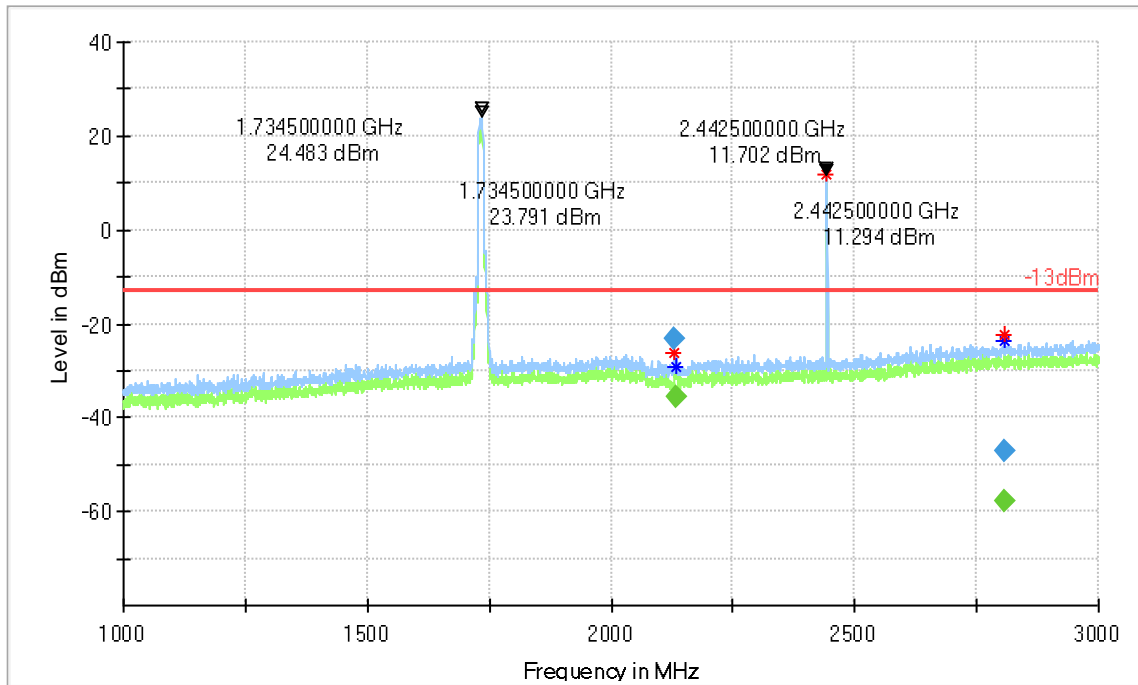
Channel: Mid

Final_Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
2130.244500	-23.06	---	-13.00	10.06	200.0	1000.000	350.0	V	185.0	-87.0
2132.697250	---	-35.45	---	---	200.0	1000.000	350.0	V	193.0	-87.0
2807.935250	---	-57.97	---	---	200.0	1000.000	176.0	H	99.0	-84.8
2808.198250	-47.06	---	-13.00	34.06	200.0	1000.000	137.0	H	125.0	-84.8

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

Frequency (MHz)	Comment
2130.244500	3:43:25 PM - 8/22/2018
2132.697250	3:49:46 PM - 8/22/2018
2807.935250	3:46:41 PM - 8/22/2018
2808.198250	3:40:36 PM - 8/22/2018



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

Plot # 7 Radiated Emissions: 3-18 GHz

FCC 27

LTE Band 4 + Bluetooth LE

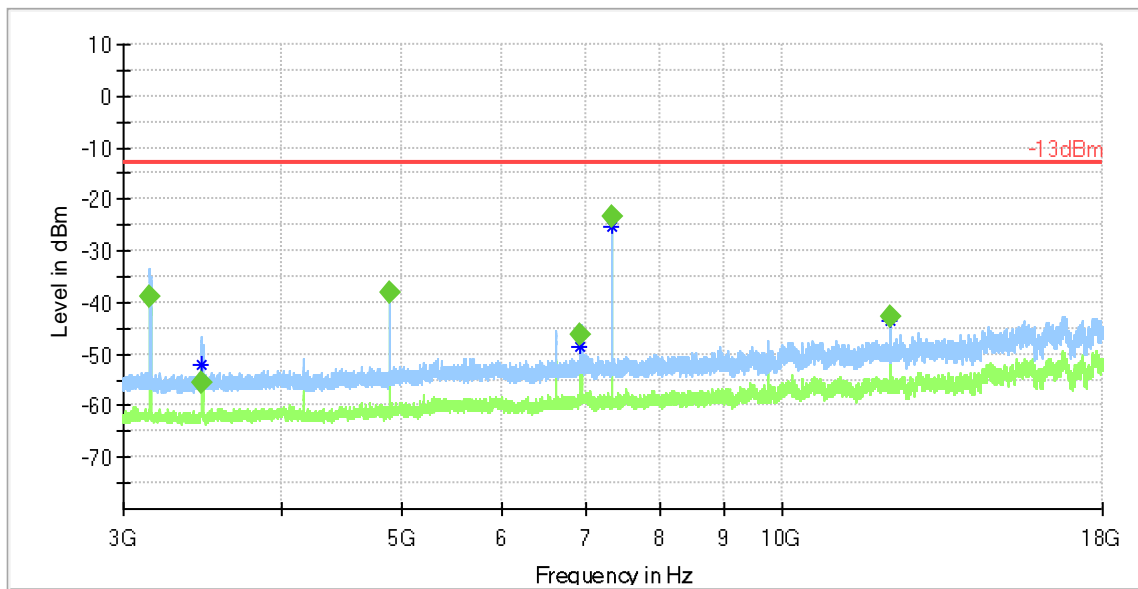
Channel: Mid

Final_Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
3148.687333	---	-38.84	---	---	200.0	1000.000	246.0	H	255.0	-132.1
3464.742667	---	-55.54	---	---	200.0	1000.000	158.0	V	16.0	-131.6
4884.008667	---	-37.93	---	---	200.0	1000.000	227.0	H	232.0	-128.6
6930.010000	---	-46.33	---	---	200.0	1000.000	100.0	V	139.0	-124.8
7325.955333	---	-23.47	---	---	200.0	1000.000	240.0	H	268.0	-125.1
12209.816000	---	-42.69	---	---	200.0	1000.000	100.0	H	220.0	-117.5

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

Frequency (MHz)	Comment
3148.687333	5:11:22 PM - 8/22/2018
3464.742667	5:01:47 PM - 8/22/2018
4884.008667	5:14:24 PM - 8/22/2018
6930.010000	5:05:04 PM - 8/22/2018
7325.955333	5:17:31 PM - 8/22/2018
12209.816000	5:08:26 PM - 8/22/2018



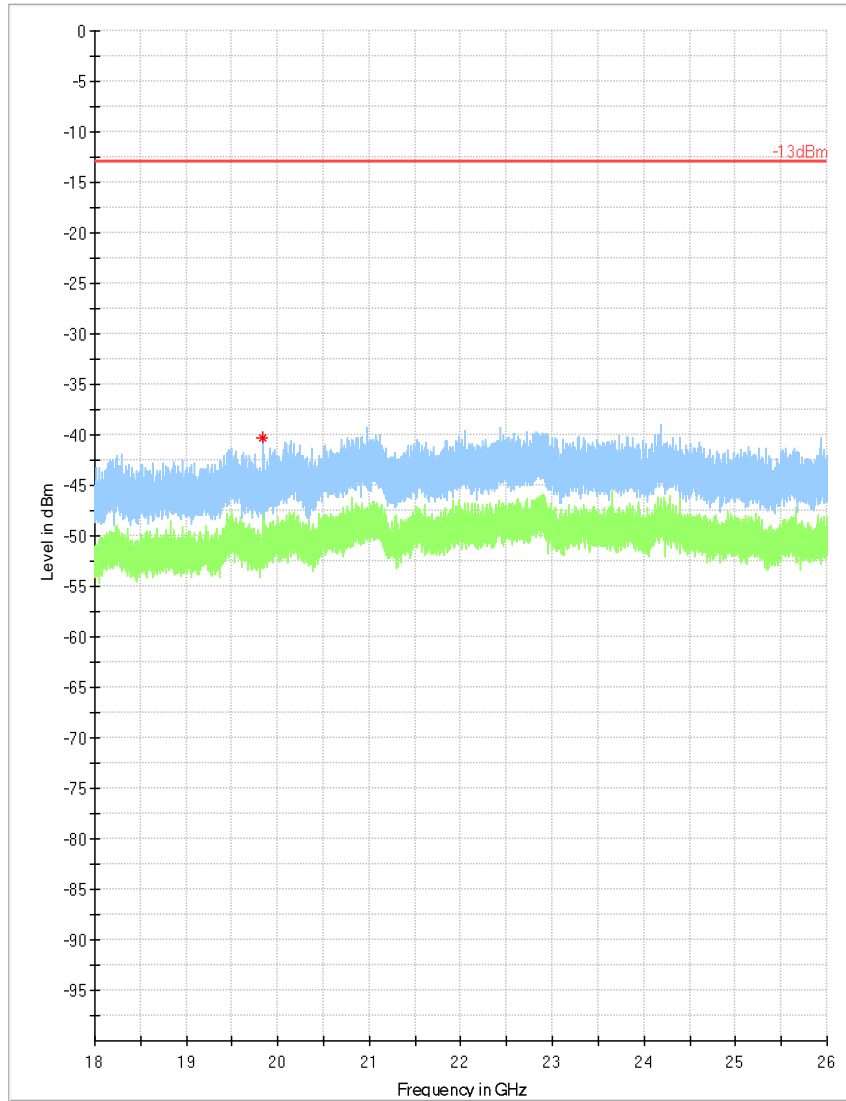
- ◆ Preview Result 2-RMS
- * Critical_Freqs PK+
- ◆ Final_ResultRMS
- Preview Result 1-PK+
- -13dBm
- * Critical_Freqs RMS
- ◆ Final_ResultPK+

Plot # 8 Radiated Emissions: 18-26 GHz

FCC 27

LTE Band 4 + Bluetooth LE

Channel: Mid



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

Plot # 9 Radiated Emissions: 30-1 GHz

FCC 27

LTE Band 4 + Bluetooth LE

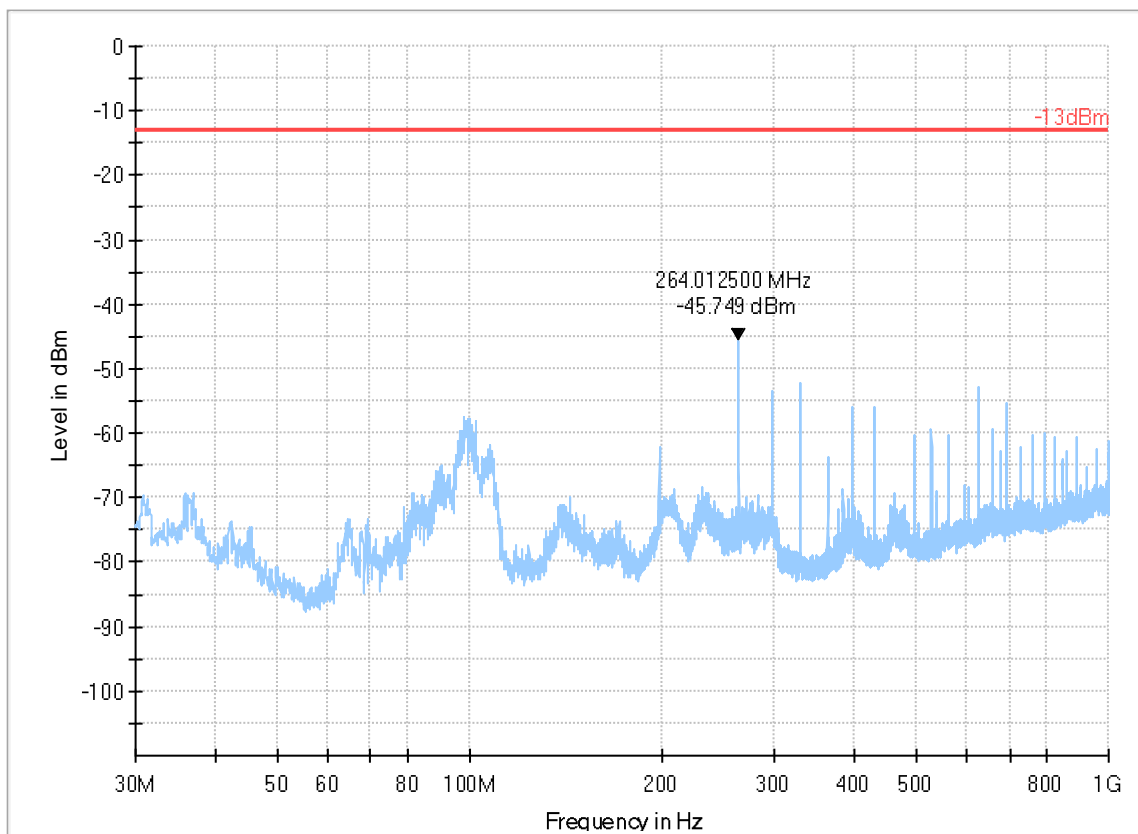
Channel: High

Final_Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
---	---	---	---	---	---	---	---		---	---

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

Frequency (MHz)	Comment



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

Plot # 10 Radiated Emissions: 1-3 GHz

FCC 27

LTE Band 4 + Bluetooth LE

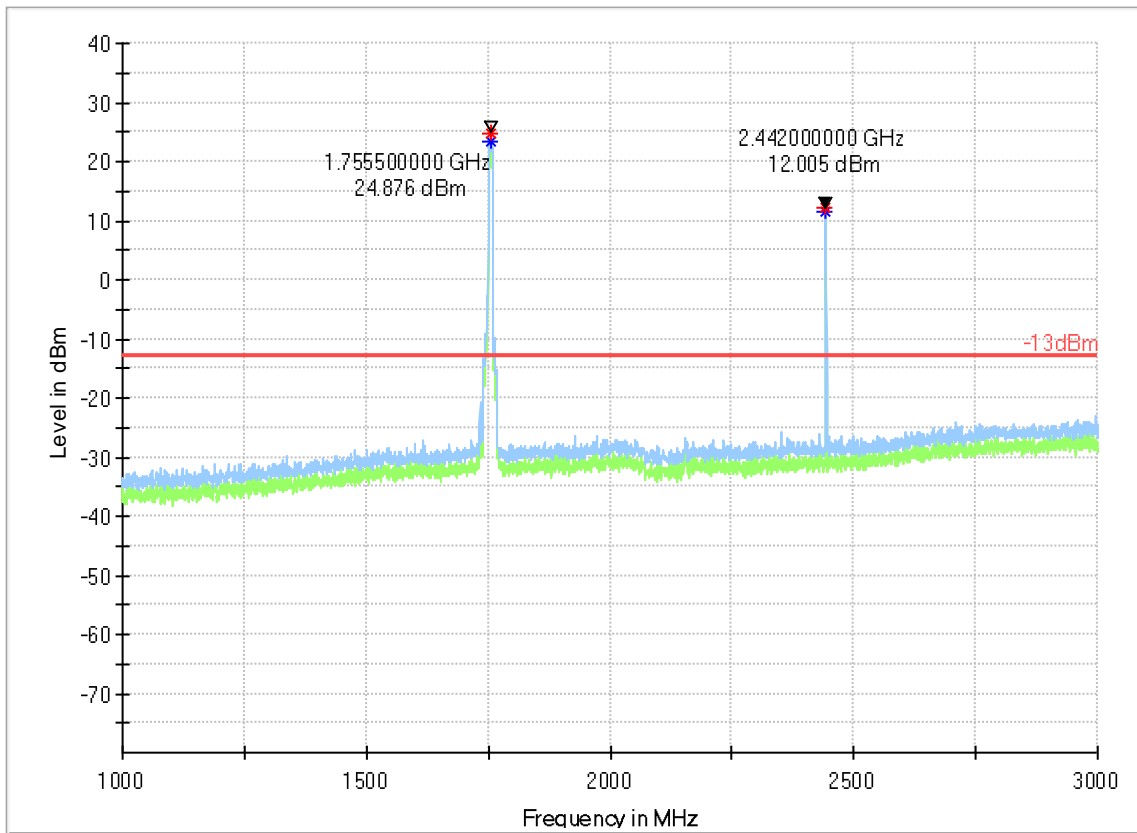
Channel: High

Final_Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
---	---	---	---	---	---	---	---		---	---

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

Frequency (MHz)	Comment



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

Plot # 11 Radiated Emissions: 3-18 GHz

FCC 27

LTE Band 4 + Bluetooth LE

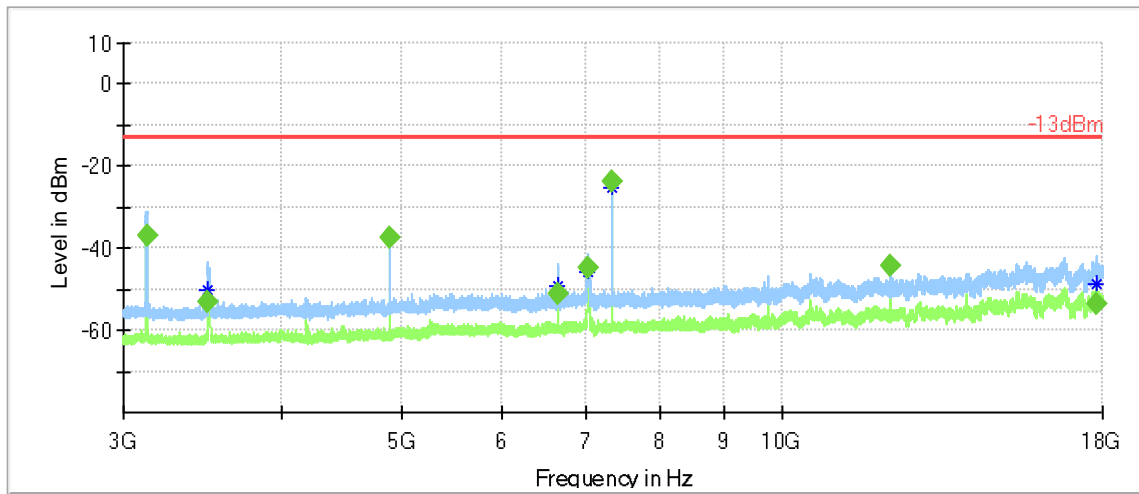
Channel: High

Final_Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
3130.403333	---	-37.02	---	---	200.0	1000.000	252.0	H	278.0	-132.1
3504.421333	---	-53.20	---	---	200.0	1000.000	150.0	V	0.0	-131.3
4883.884667	---	-37.40	---	---	200.0	1000.000	265.0	H	233.0	-128.6
6636.008000	---	-50.98	---	---	200.0	1000.000	165.0	H	257.0	-125.4
7019.780000	---	-44.58	---	---	200.0	1000.000	153.0	V	144.0	-124.2
7325.905333	---	-23.60	---	---	200.0	1000.000	240.0	H	267.0	-125.1
12209.892667	---	-44.50	---	---	200.0	1000.000	205.0	H	160.0	-117.5
17798.538667	---	-53.49	---	---	200.0	1000.000	214.0	V	29.0	-107.9

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

Frequency (MHz)	Comment
3130.403333	5:50:15 PM - 8/22/2018
3504.421333	5:28:20 PM - 8/22/2018
4883.884667	5:41:12 PM - 8/22/2018
6636.008000	5:44:19 PM - 8/22/2018
7019.780000	5:34:50 PM - 8/22/2018
7325.905333	5:47:16 PM - 8/22/2018
12209.892667	5:38:06 PM - 8/22/2018
17798.538667	5:31:28 PM - 8/22/2018



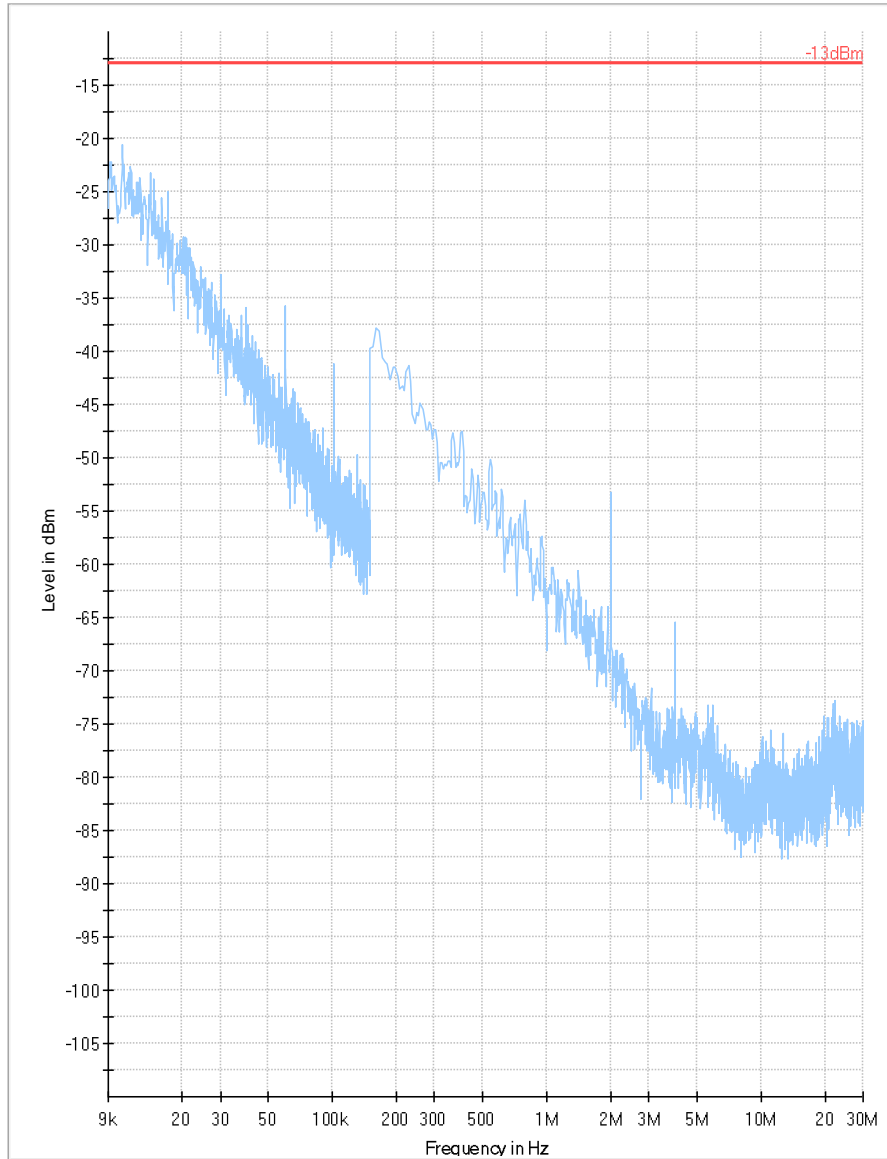
- Preview Result 2-RMS
- Preview Result 1-PK+
- ◆ Final_Result PK+
- * Critical_Freqs PK+
- -13dBm
- ◆ Final_Result RMS
- * Critical_Freqs RMS

Plot # 12 Radiated Emissions: 9kHz – 30MHz

FCC 27

LTE Band 13 + Bluetooth LE

Channel: Mid



- Preview Result 2-RMS
- Preview Result 1-PK+
- Critical_Freqs RMS
- Critical_Freqs PK+
- 13dBm
- Final_ResultRMS
- Final_ResultPK+

Plot # 13 Radiated Emissions: 30-1 GHz

FCC 27

LTE Band 13 + Bluetooth LE

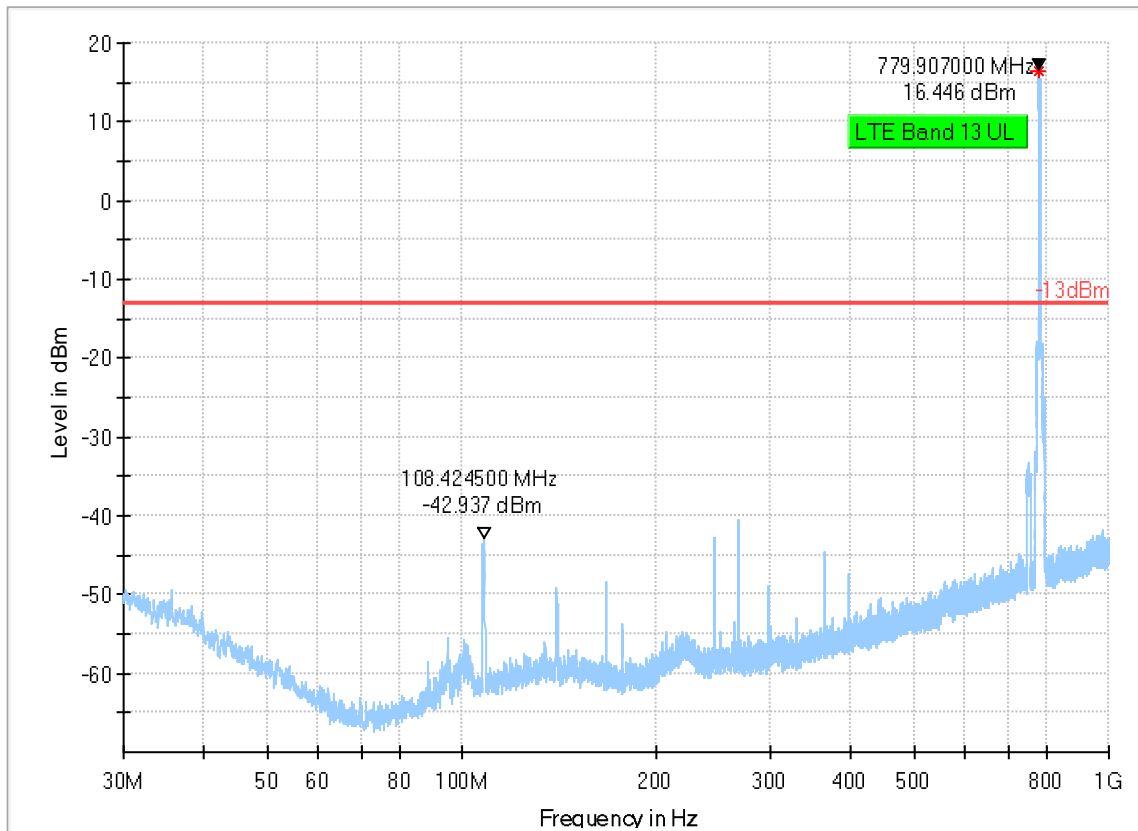
Channel: Mid

Final Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
---	---	---	---	---	---	---	---	---	---	---

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

Frequency (MHz)	Comment



- PreviewResult 2-RMS
- PreviewResult 1-PK+
- -13dBm
- * Critical_Freqs RMS
- * Critical_Freqs PK+
- ◆ Final_ResultPK+
- ◆ Final_ResultRMS

Plot # 14 Radiated Emissions: 1-3 GHz

FCC 27

LTE Band 13 + Bluetooth LE

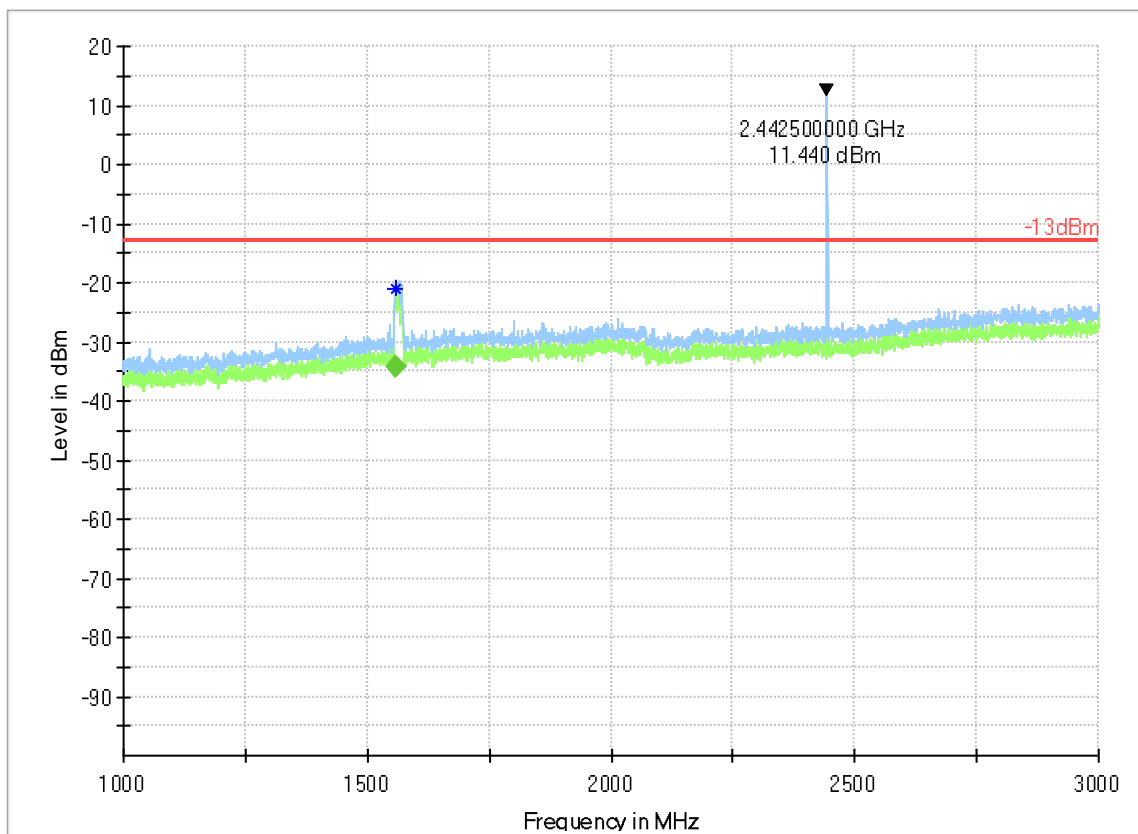
Channel: Mid

Final_Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1559.063250	---	-34.37	---	---	200.0	1000.000	139.0	H	18.0	-87.6

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

Frequency (MHz)	Comment
1559.063250	4:35:17 PM - 8/22/2018



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

Plot # 15 Radiated Emissions: 3-18 GHz

FCC 27

LTE Band 13 + Bluetooth LE

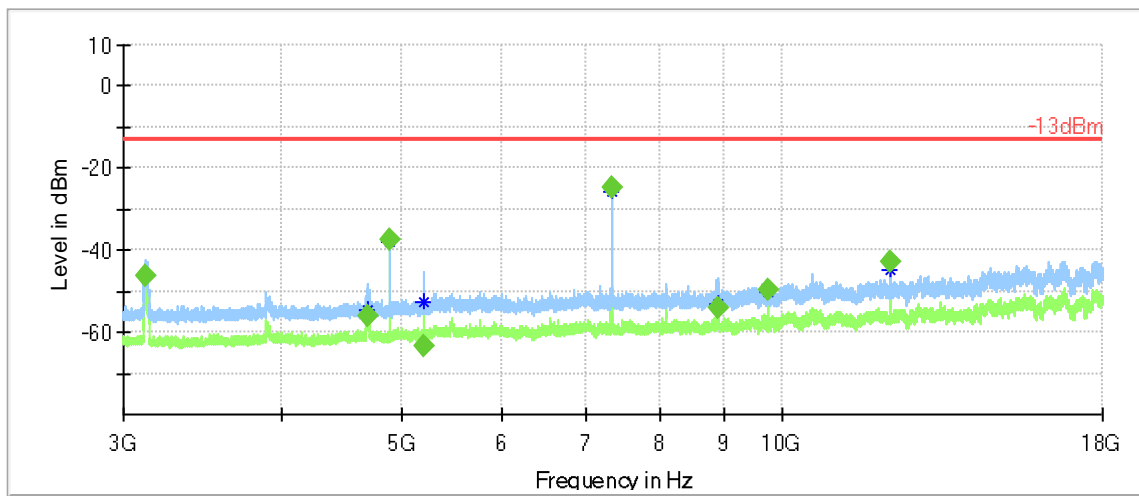
Channel: Mid

Final_Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
3128.069333	---	-46.01	---	---	200.0	1000.000	130.0	H	306.0	-132.1
4691.998000	---	-55.99	---	---	200.0	1000.000	133.0	H	114.0	-128.8
4883.949333	---	-37.32	---	---	200.0	1000.000	268.0	H	231.0	-128.6
5198.736000	---	-63.48	---	---	200.0	1000.000	250.0	H	190.0	-127.7
7325.958000	---	-24.83	---	---	200.0	1000.000	228.0	H	274.0	-125.1
8891.519333	---	-53.92	---	---	200.0	1000.000	234.0	H	292.0	-121.4
9767.980000	---	-49.76	---	---	200.0	1000.000	100.0	H	264.0	-119.8
12209.896000	---	-42.60	---	---	200.0	1000.000	100.0	H	221.0	-117.5

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

Frequency (MHz)	Comment
3128.069333	6:59:48 PM - 8/22/2018
4691.998000	6:38:00 PM - 8/22/2018
4883.949333	6:50:31 PM - 8/22/2018
5198.736000	6:44:14 PM - 8/22/2018
7325.958000	6:53:40 PM - 8/22/2018
8891.519333	6:56:43 PM - 8/22/2018
9767.980000	6:47:33 PM - 8/22/2018
12209.896000	6:41:07 PM - 8/22/2018



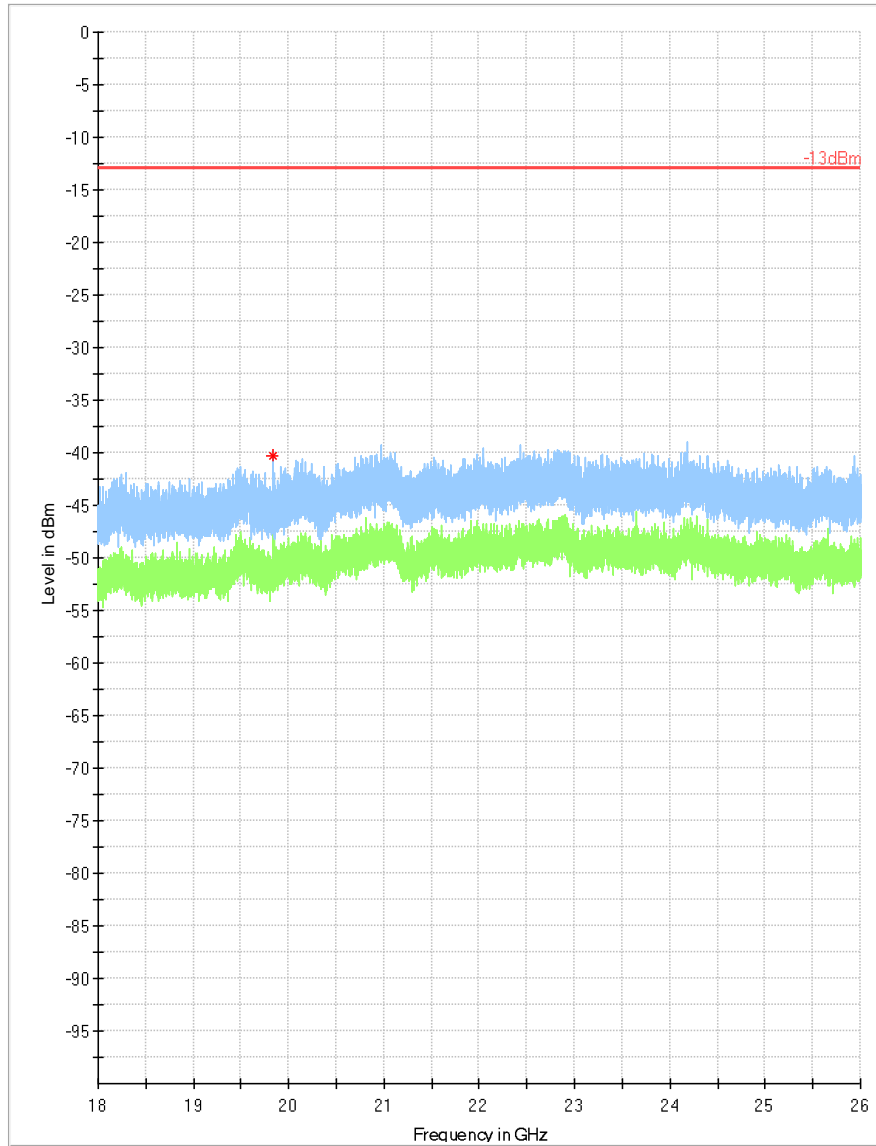
- Preview Result 2-RMS
- Preview Result 1-PK+
- -13dBm
- * Critical_Freqs PK+
- * Critical_Freqs RMS
- ◆ Final_ResultRMS
- ◆ Final_ResultPK+

Plot # 16 Radiated Emissions: 18-26 GHz

FCC 27

LTE Band 4 + Bluetooth LE

Channel: Mid



- Preview Result 2-RMS
- Preview Result 1-PK+
- Critical_Freqs RMS
- Critical_Freqs PK+
- 13dBm
- Final_ResultPK+
- Final_ResultRMS

8 Test setup photos

Setup photos are included in supporting file name: "EMC_MEIGR_008_FCC_Setup_photos.pdf"

9 Test Equipment And Ancillaries Used For Testing

Item Name	Equipment Type	Manufacturer	Model	Serial #	Calibration Cycle	Last Calibration Date
Antenna Loop 6507	Active Loop Antenna	ETS Lindgren	6507	161344	3 years	10/26/2017
Antenna Biconilog 3142E	Biconlog Antenna	EMCO	3142E	166067	3 years	06/27/2017
Antenna Horn 3115 SN 35114	Horn Antenna	EMCO	3115	35114	3 years	07/31/2017
Antenna Horn 3117	Horn Antenna	ETS Lindgren	3117-PA	215984	3 years	01/26/2018
Antenna Horn 3116	Horn Antenna	ETS Lindgren	3116	70497	3 years	10/31/2017
EMI Test Receiver	EMI Test Receiver	Rohde & Schwarz	ESU40	100251	3 years	01/31/2018
Digital Barometer	Compact Digital Barometer	Control Company	35519-055	91119547	3 Years	06/08/2017
CMW 500	Base Station Simulator	R&S	CMW 500	127068	2 Years	07/01/2017
Thermometer Humidity TM325	Thermometer Humidity	Dickson	TM325	16253651	1 Year	11/02/2017
Turn table	Turn table	EMCO	2075	N/A	N/A	N/A
MAPS Position Controller	MAPS Position Controller	ETS Lindgren	2092	0004-1510	N/A	N/A
Antenna Mast	Antenna Mast	EMCO	2075	N/A	N/A	N/A
Relay Switch Unit	Relay Switch Unit	R&S	RSU	338964/001	N/A	N/A

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
2018-10-16	EMC_MEIGR_008_FCC_27	Initial Version	Kevin Wang