

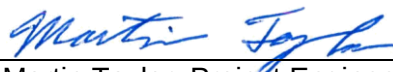
# EMC Test Report

**Project Number:** 4494805**Quotation Number:** 02212019TH-1.3**Report Number:** 4494805EMC03**Revision Level:** 2**Client:** Lifeline Systems Inc**Equipment Under Test:** Medical Alert System**Model Name:** Wireless Communicator**Model Number:** 7200C**FCC ID:** BDZ7200C**IC:** 655C-7200C**FCC Rule Parts:** Part 2, Part 24(E), Part 27**Industry Canada:** RSS-GEN, Issue 5, Amendment 1, March 2019

RSS-130, Issue 2, February 2019

RSS-133, Issue 6, Amendment 1, January 2018

RSS-139, Issue 3, July 2015

**Applicable Standards:** ANSI C63.26: 2015**Report issued on:** 20 January 2020**Test Result:** Compliant**Tested by:**

Martin Taylor, Project Engineer

**Reviewed by:**

David Schramm, Operations Manager

*Remarks: This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.*

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# 1 Summary of Test Results

| Reference Sections                          |                                                                     | Test Description                            | Test Condition | Test Result  |
|---------------------------------------------|---------------------------------------------------------------------|---------------------------------------------|----------------|--------------|
| FCC                                         | IC                                                                  |                                             |                |              |
| 2.1046                                      | RSS-GEN (6.12)                                                      | Conducted Output Power                      | Conducted      | (see Note 1) |
| 24.232(d)<br>27.50(d)(5)                    | RSS-130 (4.4)<br>RSS-133 (6.4)<br>RSS-139 (6.5)                     | Peak-to-Average Ratio                       |                | (see Note 1) |
| 2.1049<br>24.238(b)<br>27.53(h)(3)          | RSS-GEN (6.7)<br>RSS-133 (2.3)                                      | Occupied Bandwidth<br>Emission Bandwidth    |                | (see Note 1) |
| 2.1051<br>24.238(a)<br>27.53(g)<br>27.53(h) | RSS-130 (4.6.1)<br>RSS-133 (6.5.1)<br>RSS-139 (6.6)                 | Band Edge / Conducted<br>Spurious Emissions |                | (see Note 1) |
| 27.50(c)(9)                                 | --                                                                  | Effective Radiated Power                    | Radiated       | (see Note 1) |
| 24.232(c)<br>27.50(d)(4)                    | RSS-130 (4.4)<br>RSS-133 (6.4)<br>RSS-139 (6.5)                     | Effective Isotropic<br>Radiated Power       |                | (see Note 1) |
| 2.1053<br>24.238(a)<br>27.53(g)<br>27.53(h) | RSS-GEN (6.13)<br>RSS-130 (4.6)<br>RSS-133 (6.5.1)<br>RSS-139 (6.6) | Radiated Spurious<br>Emissions              |                | Compliant    |
| 2.1055<br>24.235<br>27.54                   | RSS-GEN (6.11)<br>RSS-130 (4.3)<br>RSS-133 (6.3)<br>RSS-139 (6.4)   | Frequency Stability                         | Conducted      | (see Note 1) |
| 15.107                                      | RSS-GEN (7.2)                                                       | AC Powerline Conducted<br>Emissions         |                | Compliant    |

Note 1: See separate test report on LARA-R203 LTE radio module (MDE\_UBLOX\_1712\_FCCb\_rev1).

## 1.1 Modifications Required to Compliance

None

## 2 General Information

### 2.1 Client Information

Name: Lifeline Systems Inc  
Address: 111 Lawrence Street  
City, State, Zip, Country: Framingham, MA 01702 USA

### 2.2 Test Laboratory

Name: SGS North America, Inc.  
Address: 620 Old Peachtree Road NW, Suite 100  
City, State, Zip, Country: Suwanee, GA 30024, USA

Accrediting Body: A2LA  
Type of lab: Testing Laboratory  
Certificate Number: 3212.01

### 2.3 General Information of EUT

Equipment Under Test: Medical Alert System  
Model Name: Wireless Communicator  
Model Number: 7200C  
Serial Number: 9040234871, 9040234870  
IMEI Number: 356935081116433, 356935081109347

FCC ID: BDZ7200C  
IC: 655C-7200C

Tx Frequency Range: 1850 – 1910 MHz (LTE Band 2)  
1710 – 1755 MHz (LTE Band 4)  
699 – 716 MHz (LTE Band 12)

FCC Classification: PCS Licensed Transmitter PCB  
Type: Pre-Production

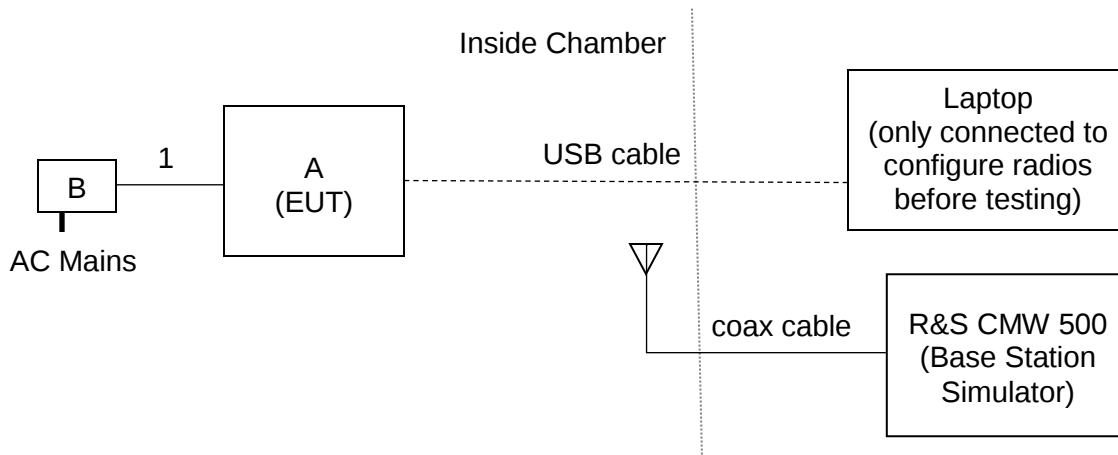
Rated Voltage: 100-240Vac, 50/60Hz  
Test Voltage: 120Vac, 60Hz

Sample Received Date: 08 July 2019  
Dates of testing: 08-09 July 2019

### 2.4 Operating Modes and Conditions

The EUT was tested under normal operating conditions, but with a Rohde & Schwarz test SIM installed. The EUT had an internal battery pack installed and was connected to the AC Mains using the supplied AC/DC wall adapter. When the EUT was turned on it was configured to establish a 4G LTE call with a R&S CMW 500 Wideband Radio Communication Tester which was used to control the EUT to operate with maximum transmit (uplink) power in LTE Bands 2, 4 and 12.

## 2.5 EUT Connection Block Diagram



## 2.6 System Configurations

| Device Reference | Manufacturer         | Description                 | Model Number      | Serial Number            |
|------------------|----------------------|-----------------------------|-------------------|--------------------------|
| A                | Lifeline Systems Inc | Wireless Communicator (EUT) | 7200C             | 9040234871<br>9040234870 |
| B                | Lifeline Systems Inc | AC/DC Adapter (EUT)         | MANGO018-12B-USA2 | Not labeled              |

## 2.7 Cable List

| Cable reference | Port Name | Start         | End                   | Cable Length (m) | Ferrite installed? | Shielded? |
|-----------------|-----------|---------------|-----------------------|------------------|--------------------|-----------|
| 1               | DC Power  | AC/DC Adapter | Wireless Communicator | 3.5              | No                 | No        |

### 3 Radiated Spurious Emissions

#### 3.1 Test Result

| Test Description            | Basic Standards                                             |                                                                     | Test Result |
|-----------------------------|-------------------------------------------------------------|---------------------------------------------------------------------|-------------|
| Radiated Spurious Emissions | FCC 2.1053<br>FCC 24.238(a)<br>FCC 27.53(g)<br>FCC 27.53(h) | RSS-GEN (6.13)<br>RSS-130 (4.6)<br>RSS-133 (6.5.1)<br>RSS-139 (6.6) | Compliant   |

#### 3.2 Test Method

The radiated power emanating from the EUT of the band edge (out-of-band) and spurious band emissions are measured by means of a calibrated spectrum analyzer. The spectrum is investigated from the lowest radio frequency signal generated in the equipment, without going below 9 kHz, up to at least the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower. The power of any emissions outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) measured in watts by at least  $43 + 10 \log (P)$  dB.

The EUT was manipulated through each of its three orthogonal axes with the measurement oriented in both vertical and horizontal polarizations.

A radio link was established between the EUT and a Radio Communications Tester. The output power of the EUT was set to maximum value by using the maximum power setting on the Radio Communications Tester.

The measurements were performed at the middle channel of each band tested.

#### 3.3 Test Site

Absorber Lined Shielded Enclosure (ALSE), Suwanee, GA

|                          |             |            |            |
|--------------------------|-------------|------------|------------|
| Environmental Conditions | 30-1000 MHz | 1-18 GHz   | 18-20 GHz  |
| Enclosure:               | 10m chamber | 3m chamber | 3m chamber |
| Temperature:             | 22.5 °C     | 22.4 °C    | 22.6 °C    |
| Relative Humidity:       | 58.4 %      | 52.9 %     | 55.0 %     |
| Atmospheric Pressure:    | 97.8 kPa    | 97.3 kPa   | 97.3 kPa   |

### 3.4 Test Equipment

30-1000 MHz

Test End Date: 9-Jul-2019

Tester: MT

| Equipment           | Model        | Manufacturer    | Asset Number | Cal Due Date |
|---------------------|--------------|-----------------|--------------|--------------|
| ANTENNA, BILOG      | JB6          | SUNOL           | B079690      | 23-Jul-2019  |
| RF CABLE            | SF106        | HUBER & SUHNER  | B079712      | 30-Sep-2019  |
| RF CABLE            | SF106        | HUBER & SUHNER  | B079713      | 30-Sep-2019  |
| RF CABLE            | SF106        | HUBER & SUHNER  | B079659      | 30-Sep-2019  |
| RF CABLE            | SUCOFLEX 100 | HUBER & SUHNER  | B108523      | 30-Sep-2019  |
| LOW NOISE AMPLIFIER | TS-PR18      | ROHDE & SCHWARZ | 15003        | 24-Jan-2020  |
| EMI TEST RECEIVER   | ESU40        | ROHDE & SCHWARZ | B079629      | 15-Aug-2019  |

1-18 GHz

Test End Date: 8-Jul-2019

Tester: MT

| Equipment                    | Model             | Manufacturer    | Asset Number | Cal Due Date |
|------------------------------|-------------------|-----------------|--------------|--------------|
| ANTENNA, DRG HORN (MEDIUM)   | 3117              | ETS LINDGREN    | B079699      | 2-Jul-2020   |
| RF CABLE                     | NMS-290-236.2-NMS | FLORIDA RF LABS | B095020      | 23-Jul-2019  |
| RF CABLE                     | SUCOFLEX 100      | HUBER & SUHNER  | B108523      | 30-Sep-2019  |
| LOW NOISE AMPLIFIER          | TS-PR18           | ROHDE & SCHWARZ | 15003        | 24-Jan-2020  |
| EMI TEST RECEIVER            | ESU40             | ROHDE & SCHWARZ | B079629      | 15-Aug-2019  |
| FILTER, HIGH PASS (>2800MHZ) | HPM50111          | MICRO-TRONICS   | B085747      | 30-Sep-2019  |
| FILTER, HIGH PASS (>1150MHZ) | HPM50108          | MICRO-TRONICS   | B079802      | 30-Sep-2019  |

18-20GHz

Test End Date: 8-Jul-2019

Tester: MT

| Equipment             | Model             | Manufacturer    | Asset Number | Cal Due Date |
|-----------------------|-------------------|-----------------|--------------|--------------|
| ANTENNA, HORN (SMALL) | LB-180400-20-C-KF | A-INFO          | 15007        | 23-Jul-2019  |
| RF CABLE              | SF102             | HUBER & SUHNER  | B079822      | 17-Jul-2020  |
| RF CABLE              | SF102             | HUBER & SUHNER  | B079823      | 17-Jul-2020  |
| LOW NOISE AMPLIFIER   | NSP1840-HG        | MITEQ           | B087572      | 30-Sep-2019  |
| EMI TEST RECEIVER     | ESU40             | ROHDE & SCHWARZ | B079629      | 15-Aug-2019  |

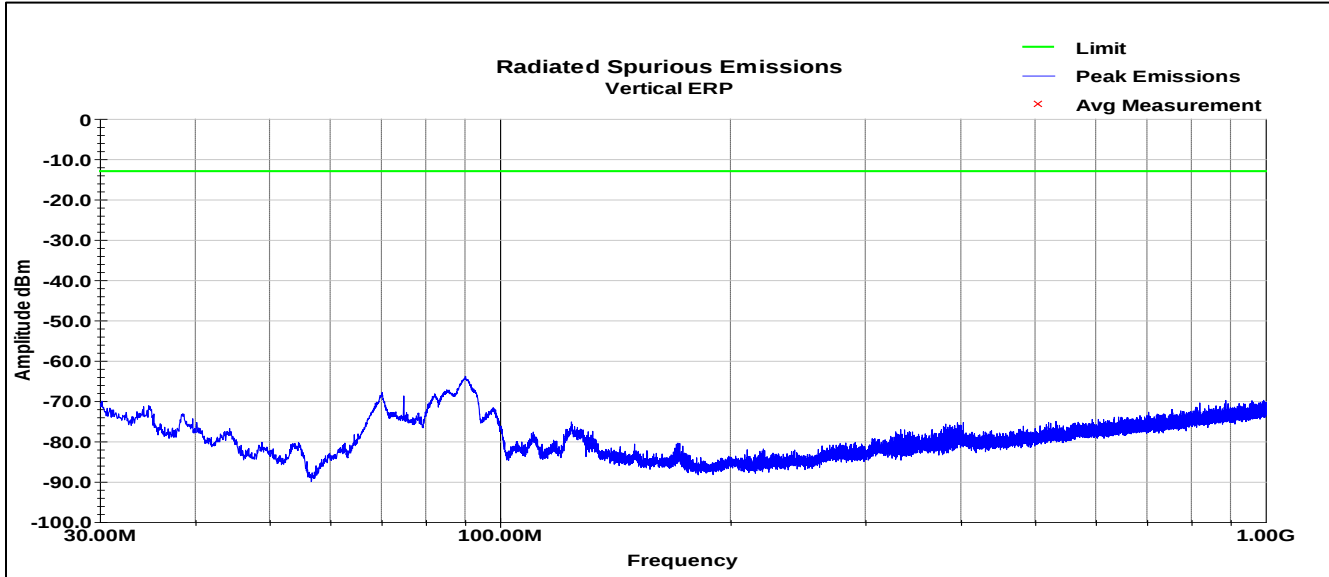
- Unless otherwise noted, equipment is on a 1-year calibration cycle.

### 3.5 Test Data

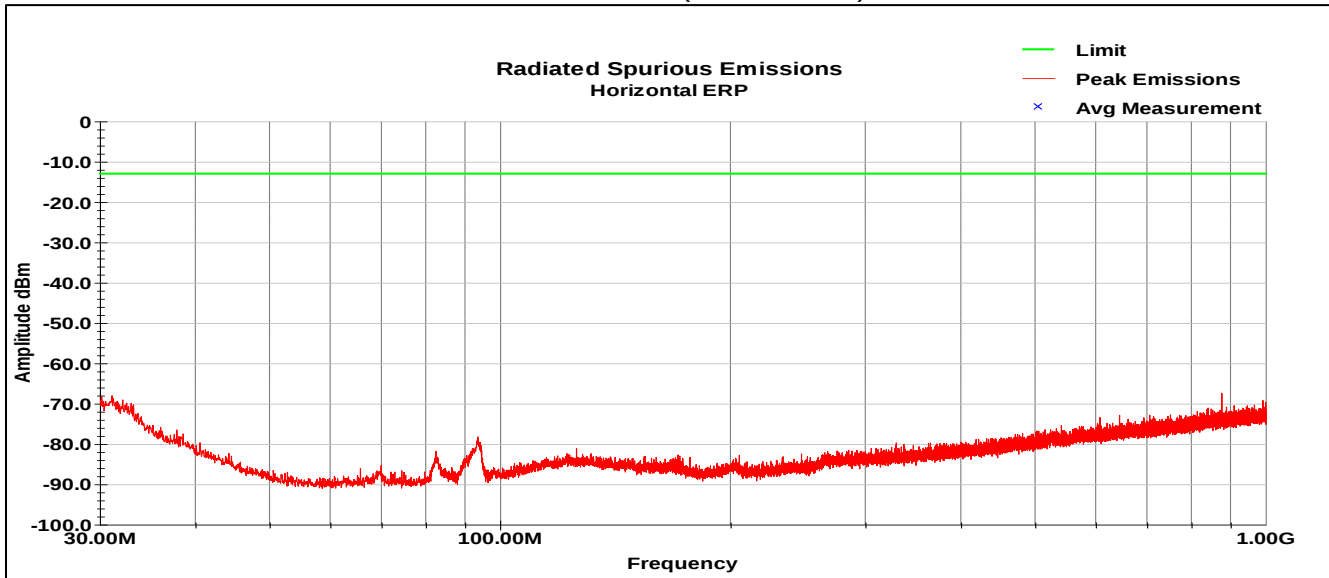
LTE Band 2, QPSK modulation, 10MHz

Mid Channel (18900)

Vertical Data (30-1000MHz)



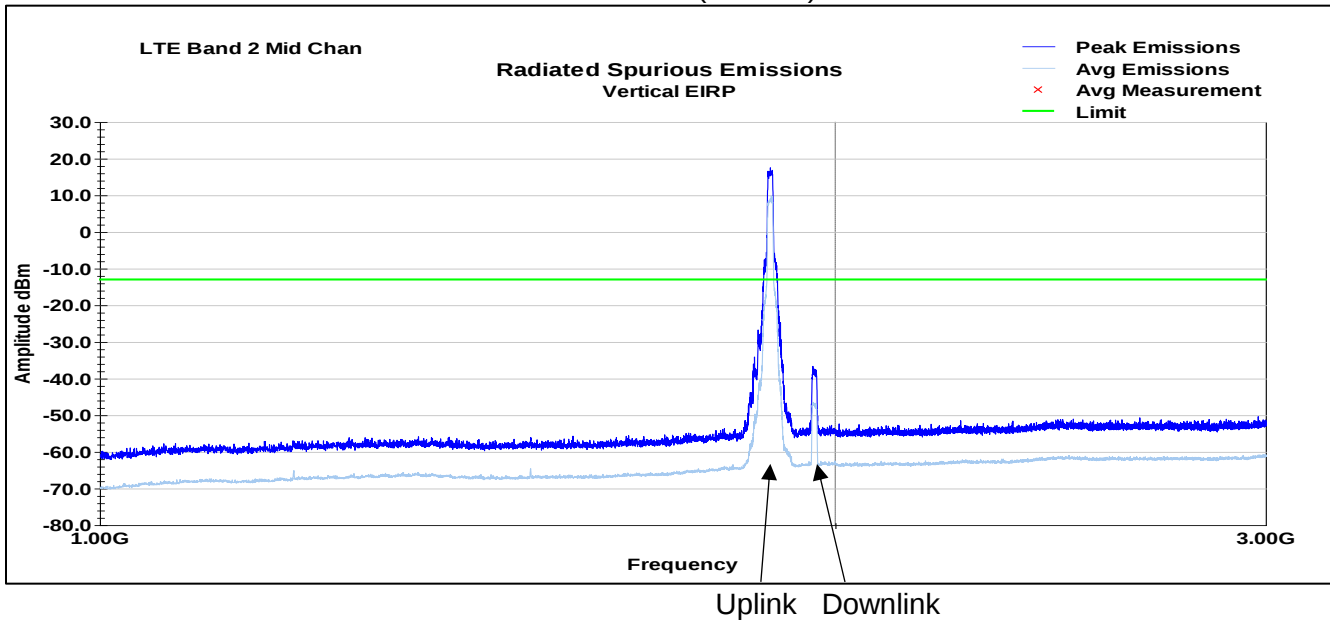
Horizontal Data (30-1000MHz)



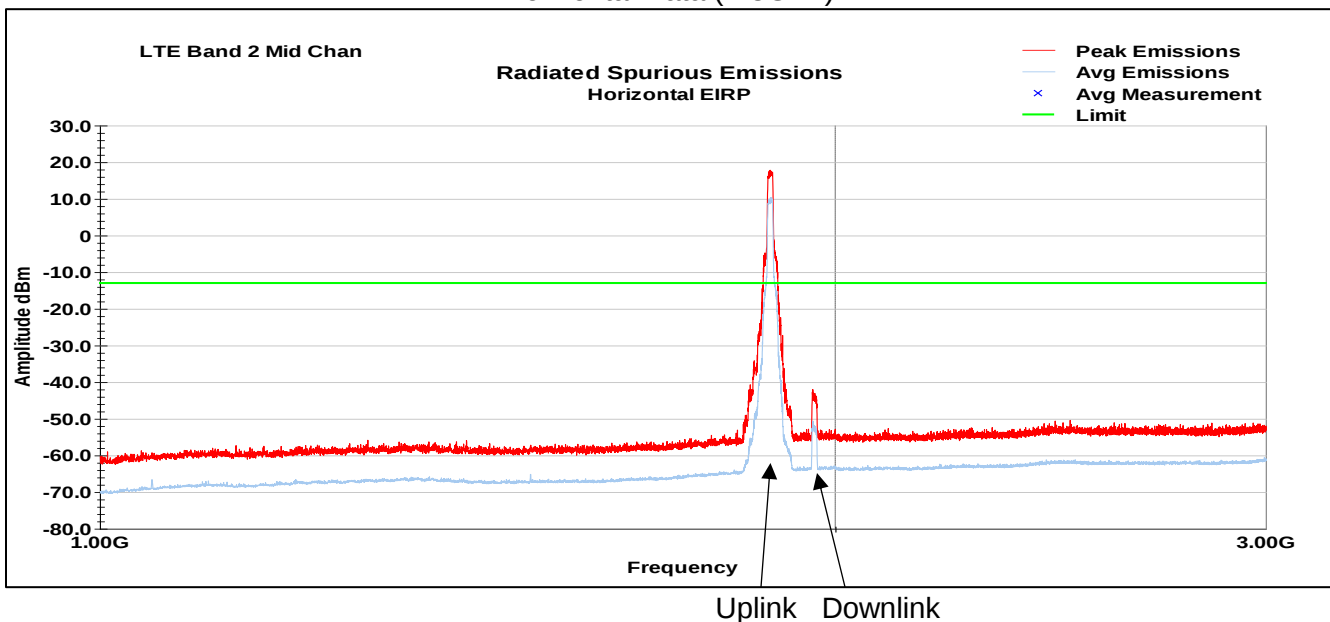
## LTE Band 2, QPSK modulation, 10MHz

### Mid Channel (18900)

### Vertical Data (1-3GHz)



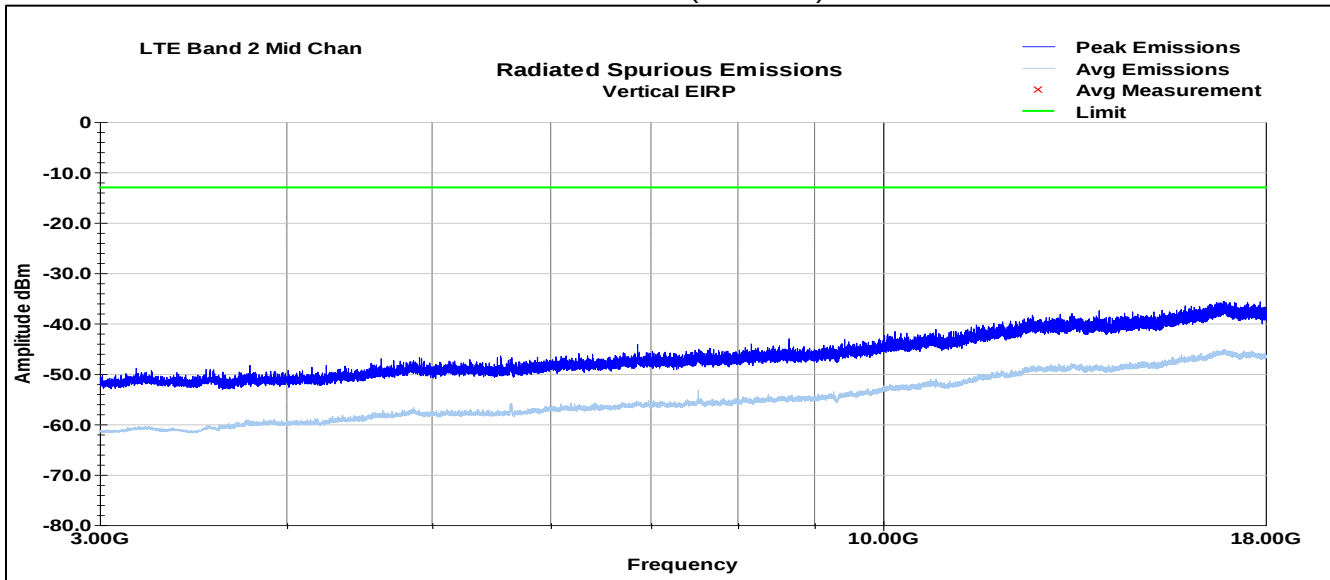
### Horizontal Data (1-3GHz)



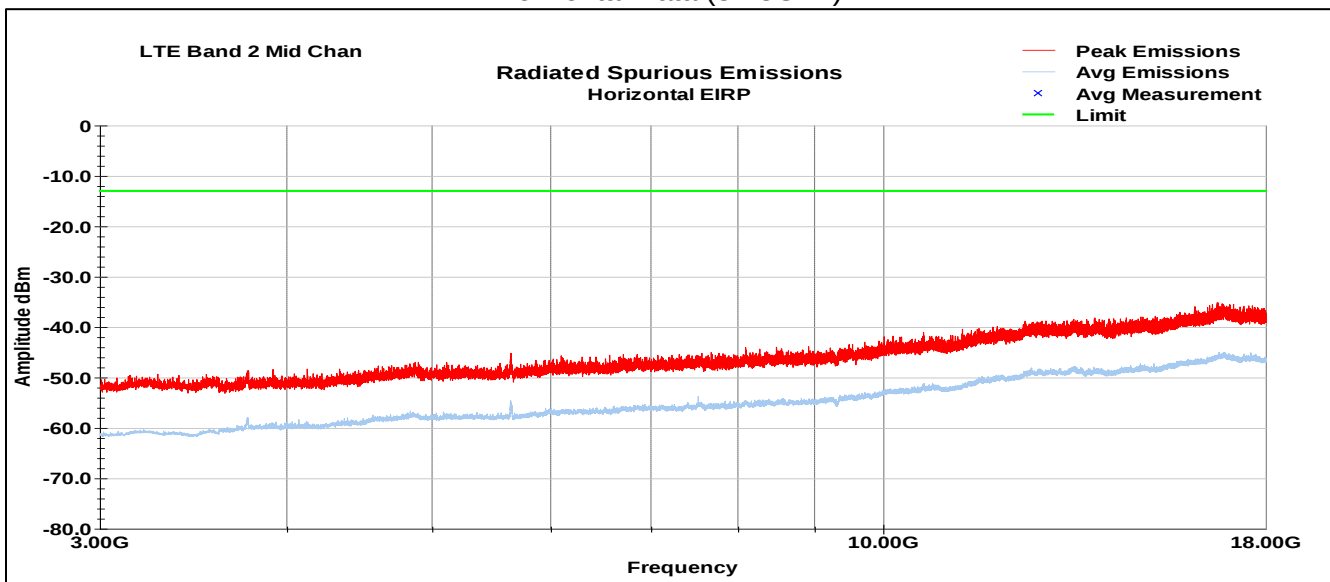
# LTE Band 2, QPSK modulation, 10MHz

## Mid Channel (18900)

### Vertical Data (3-18GHz)



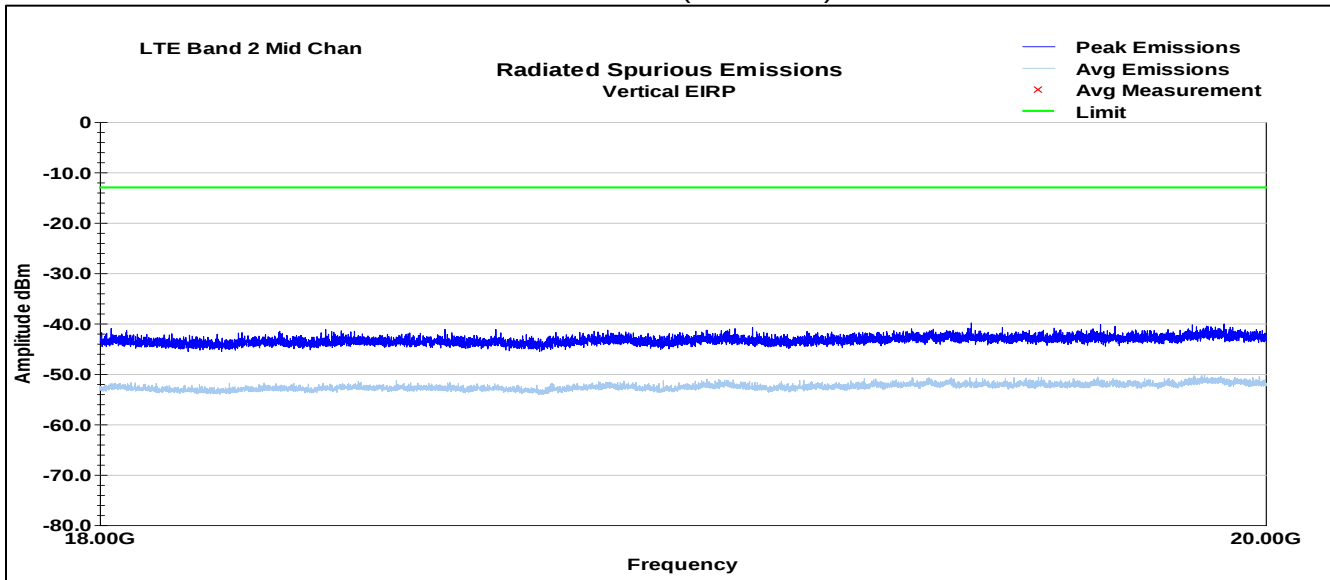
### Horizontal Data (3-18GHz)



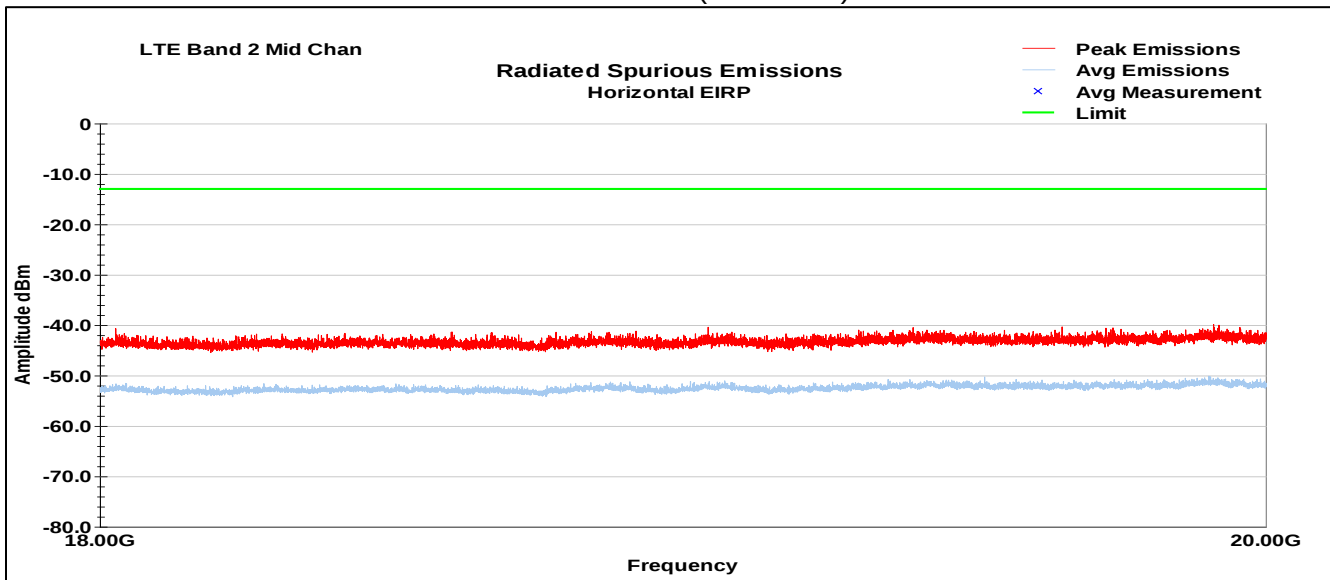
# LTE Band 2, QPSK modulation, 10MHz

## Mid Channel (18900)

### Vertical Data (18-20GHz)



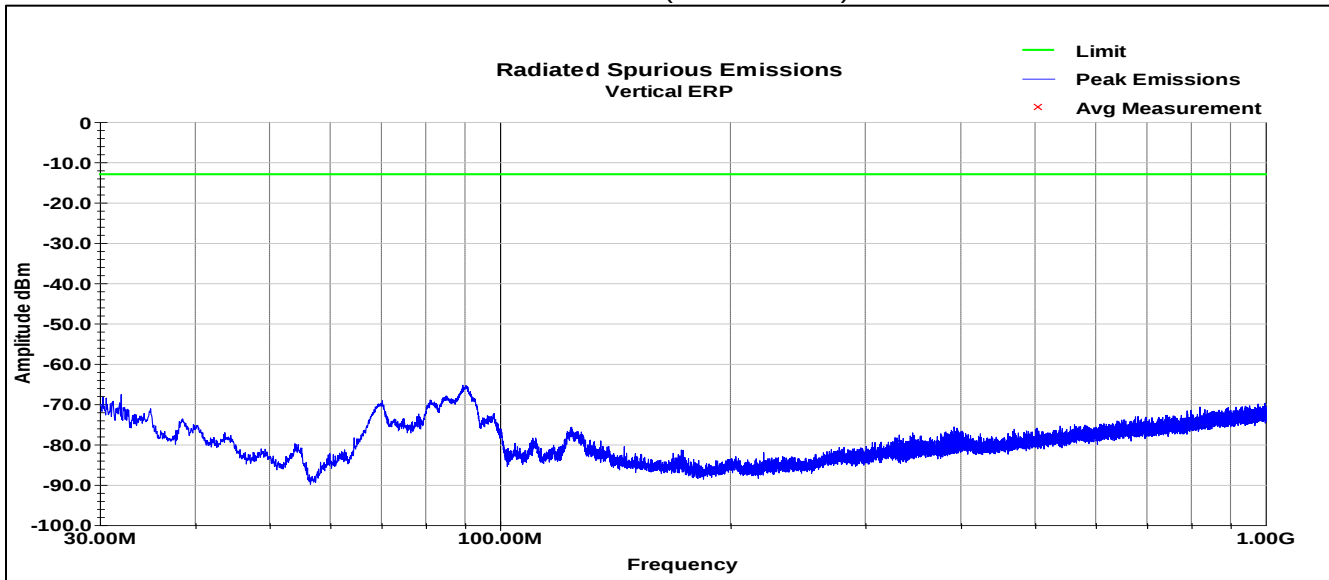
### Horizontal Data (18-20GHz)



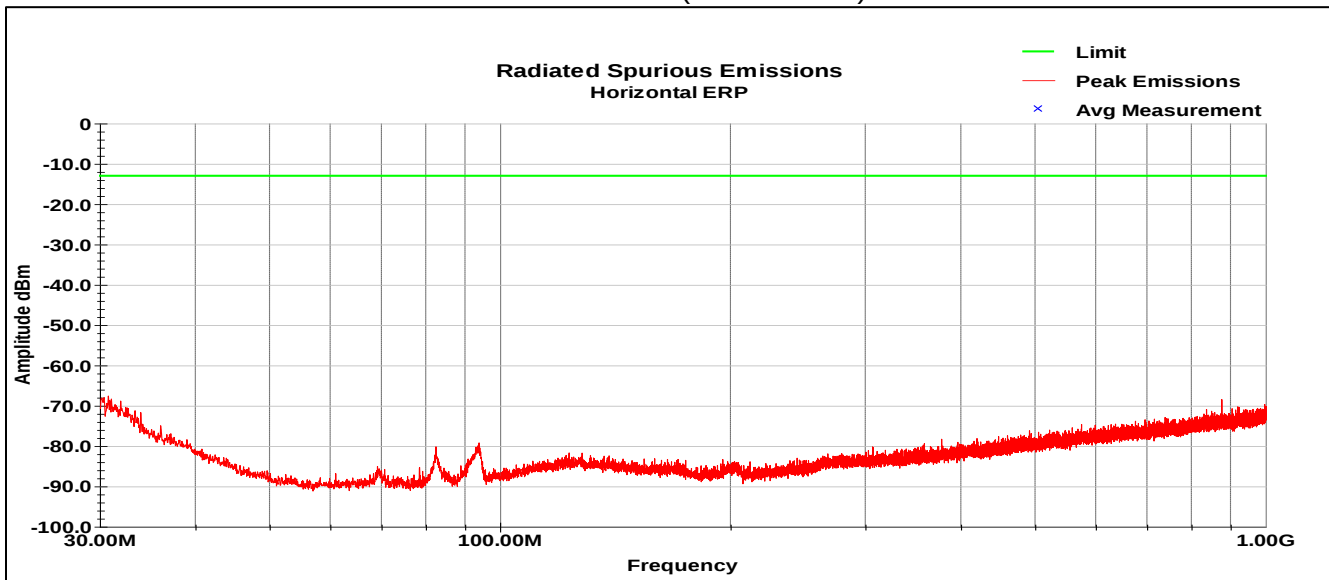
## LTE Band 4, QPSK modulation, 10MHz

## Mid Channel (20175)

## Vertical Data (30-1000MHz)



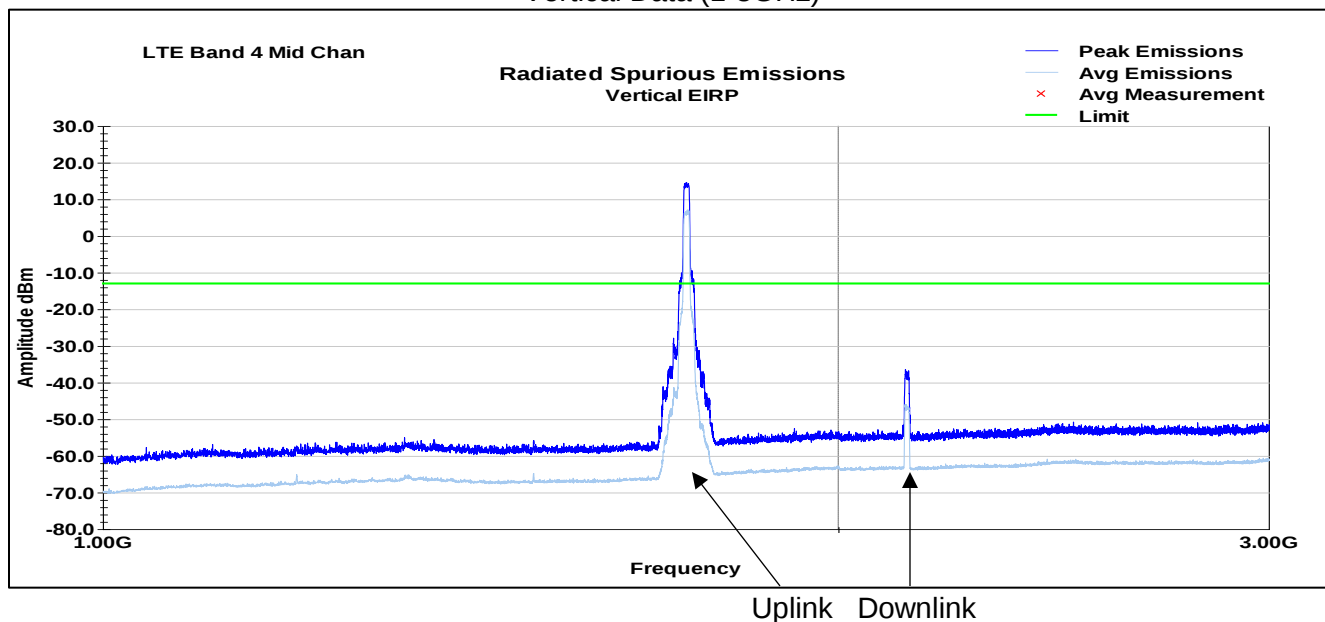
## Horizontal Data (30-1000MHz)



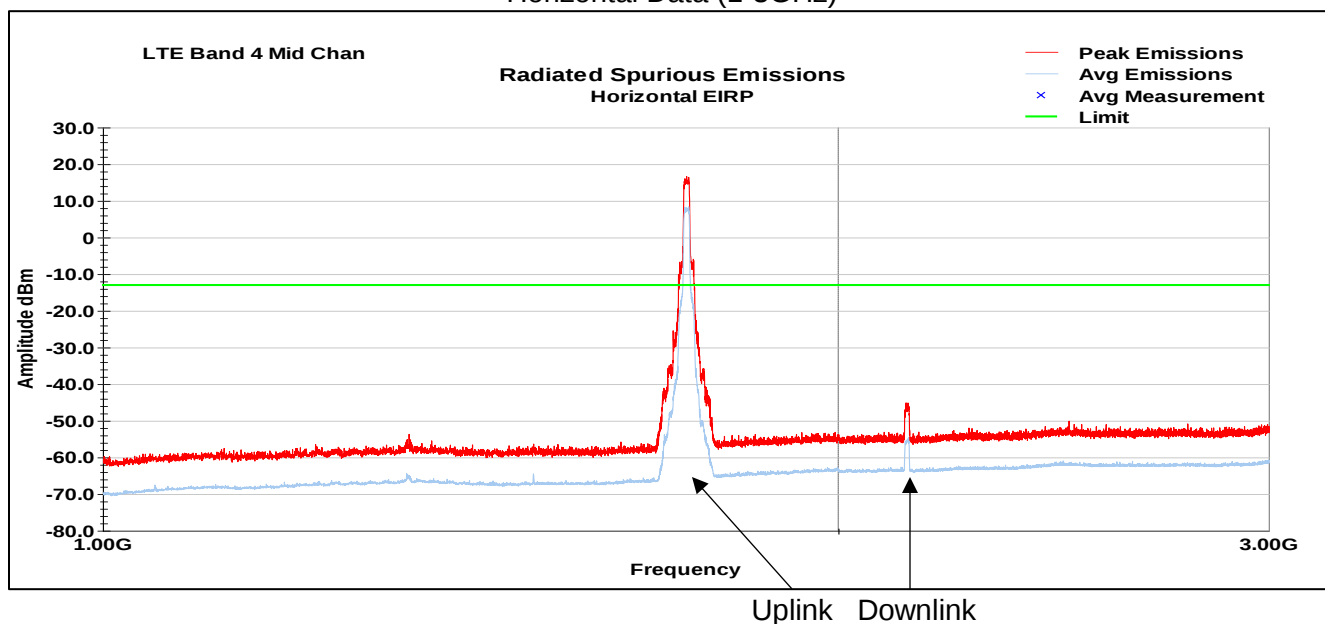
## LTE Band 4, QPSK modulation, 10MHz

### Mid Channel (20175)

### Vertical Data (1-3GHz)



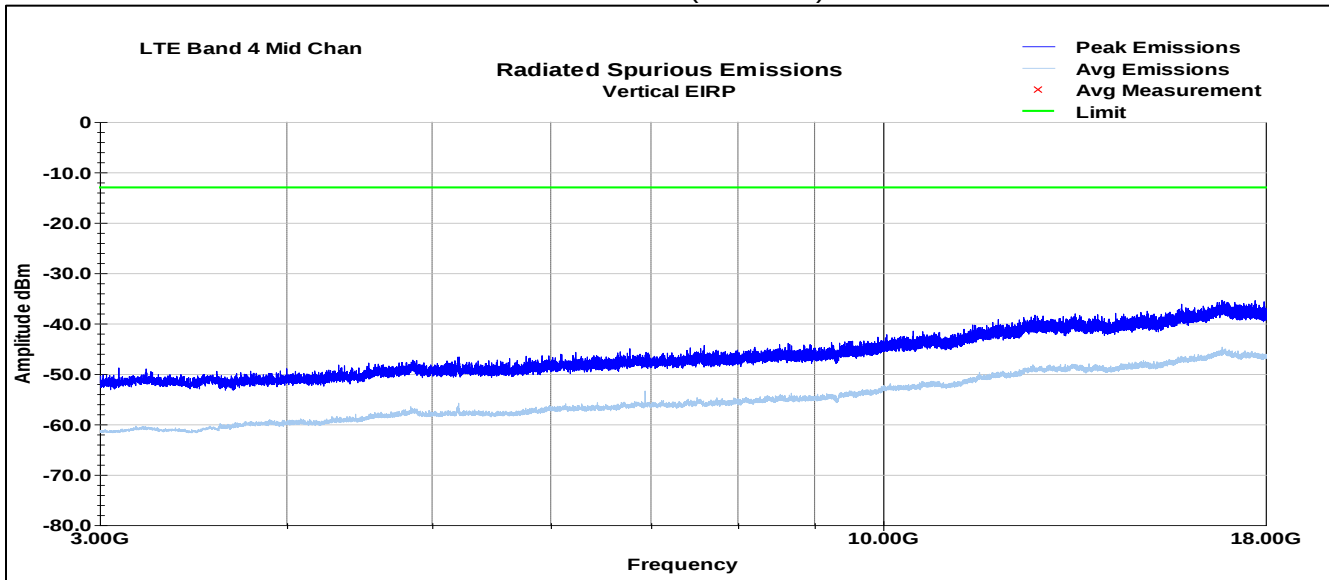
### Horizontal Data (1-3GHz)



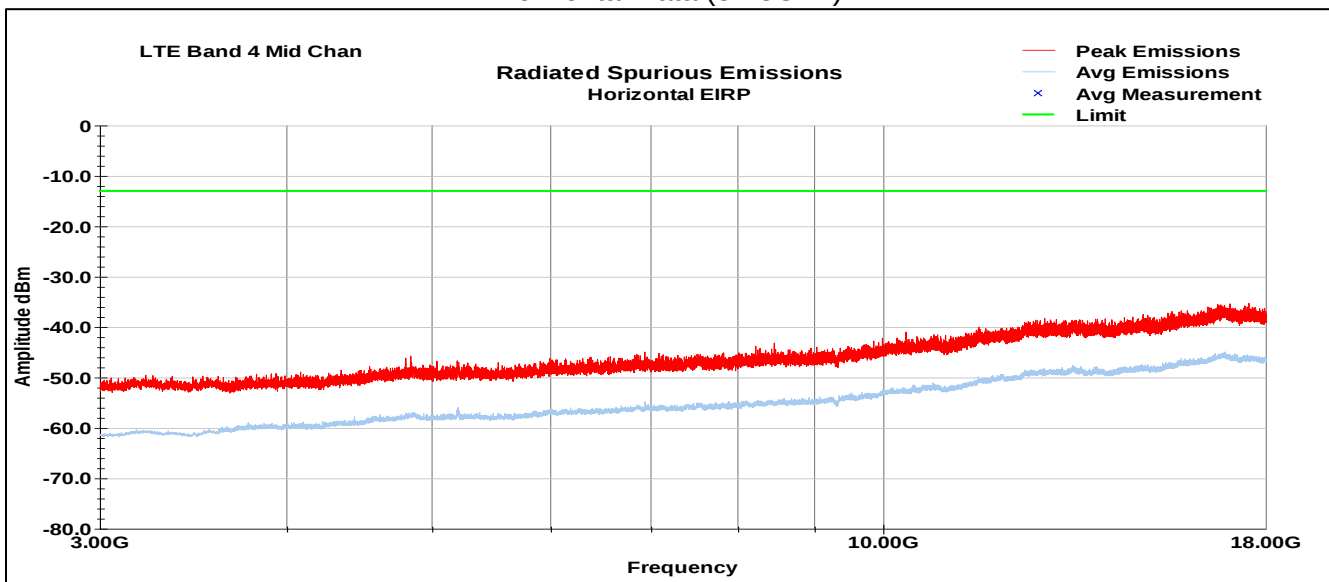
## LTE Band 4, QPSK modulation, 10MHz

## Mid Channel (20175)

## Vertical Data (3-18GHz)



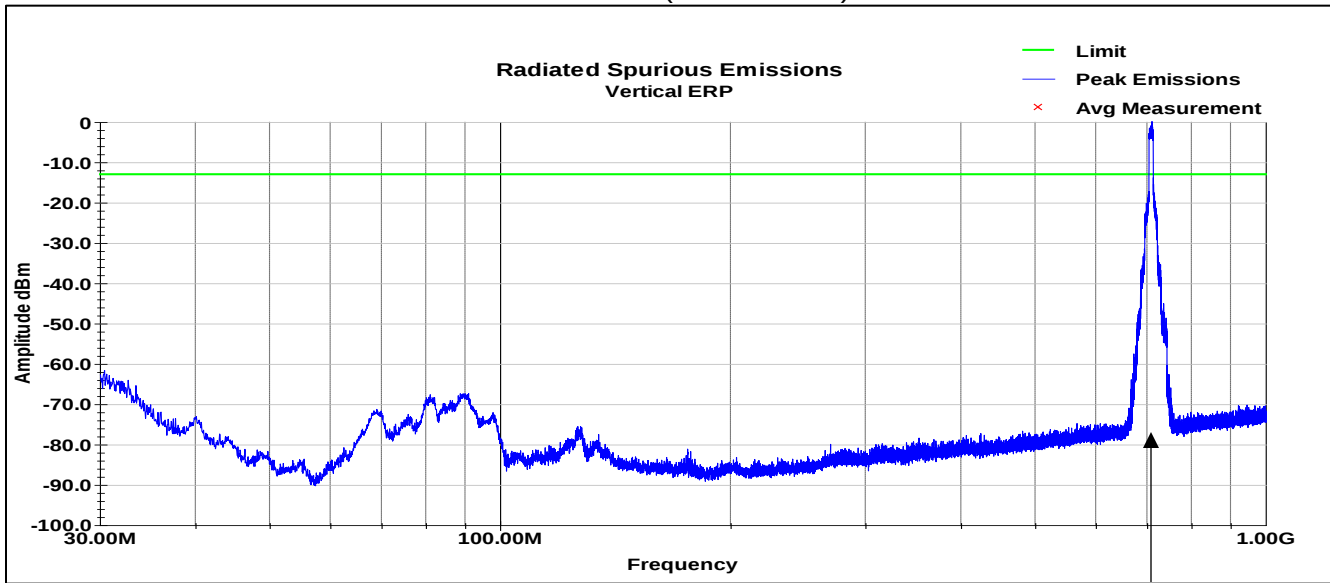
## Horizontal Data (3-18GHz)



LTE Band 12, QPSK modulation, 10MHz

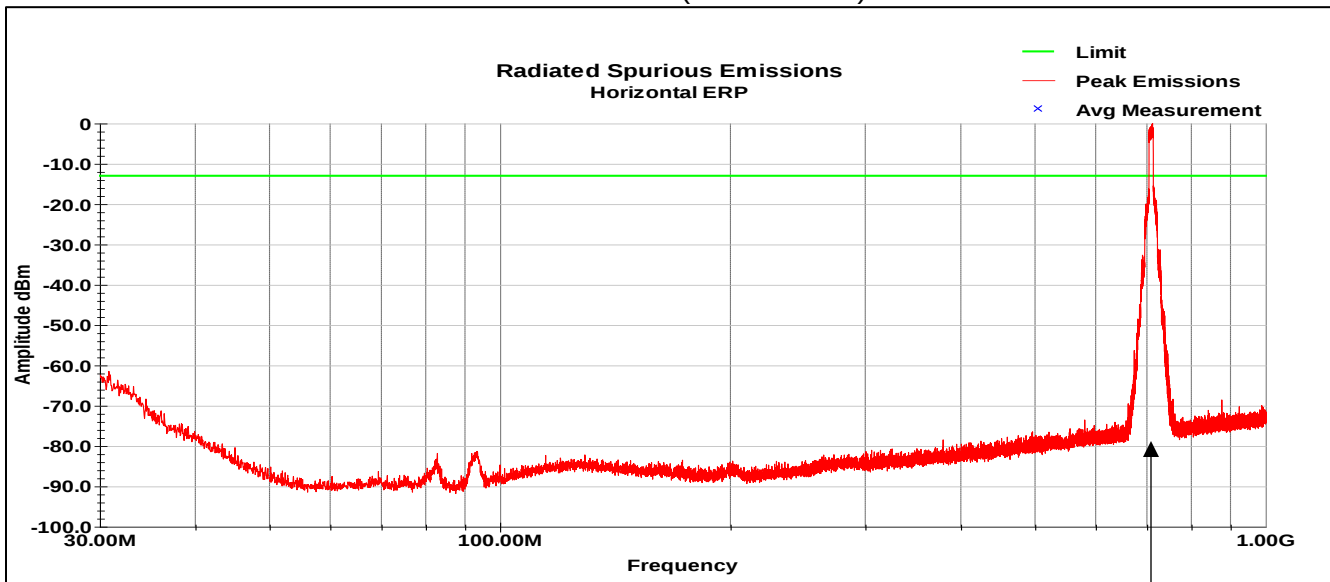
Mid Channel (23095)

Vertical Data (30-1000MHz)



Uplink + Downlink

Horizontal Data (30-1000MHz)

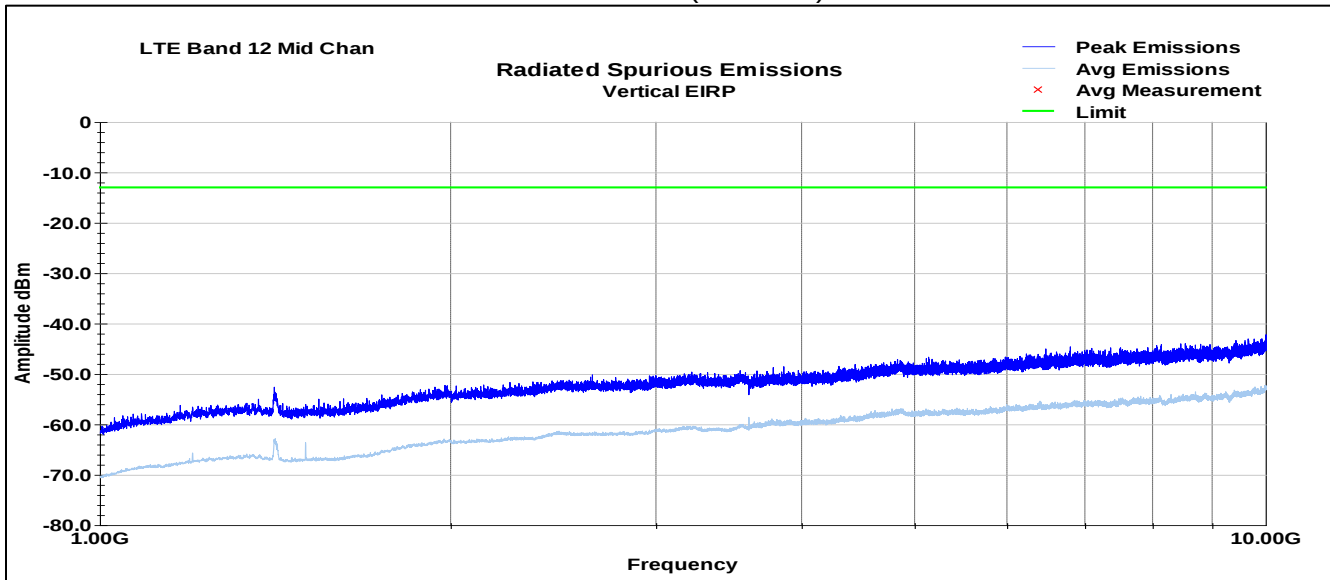


Uplink + Downlink

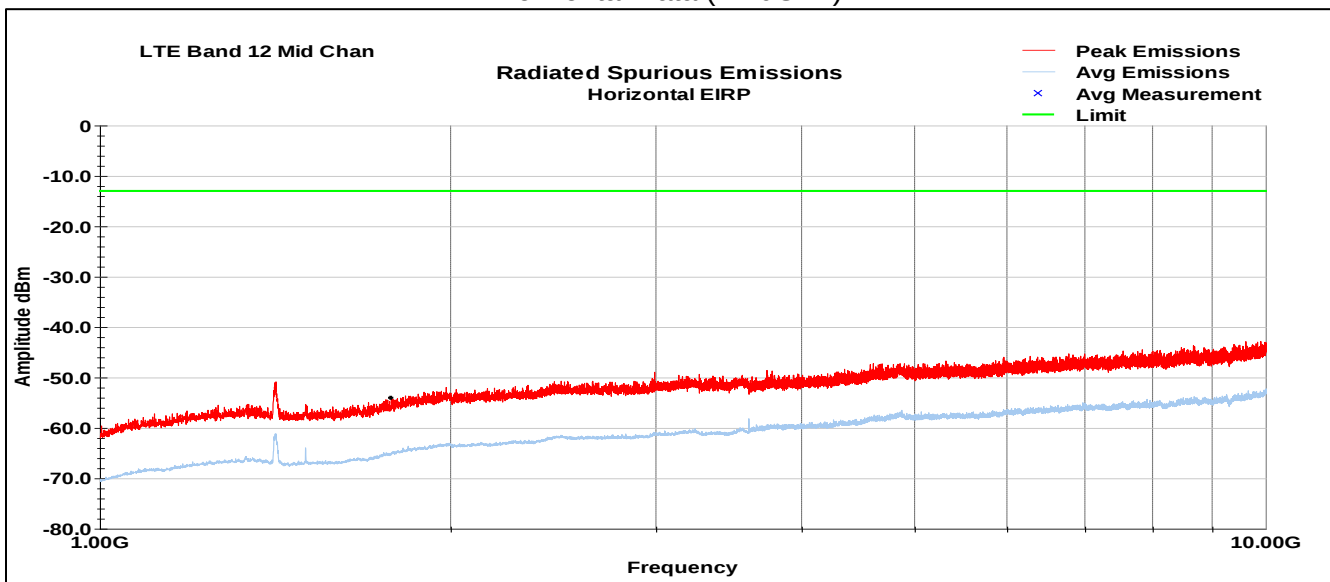
LTE Band 12, QPSK modulation, 10MHz

Mid Channel (23095)

Vertical Data (1-10GHz)



Horizontal Data (1-10GHz)



## 4 AC Powerline Conducted Emissions

### 4.1 Test Result

| Test Description                          | Basic Standards   | Test Result |
|-------------------------------------------|-------------------|-------------|
| AC Powerline Conducted Emissions, Class B | ANSI C63.04: 2014 | Compliant   |

### 4.2 Test Method

With the receiver's resolution bandwidth was set to 9 kHz, exploratory scans were performed over the measuring frequency range (0.15 MHz to 30 MHz) using a max hold mode incorporating a Peak detector and Average detector and using the TILE! software. The final test data was measured using a Quasi-Peak detector and Average detector and compared against the limits indicated in the table below.

| Frequency Range | Limits (dBuV)               |
|-----------------|-----------------------------|
| 0.15 to 0.5 MHz | Avg 56 to 46<br>QP 66 to 56 |
| 0.5 to 5 MHz    | Avg 46<br>Pk 56             |
| 5 to 30 MHz     | Avg 50<br>Pk 60             |

### 4.3 Test Site

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions:

Temperature: 23.5 °C

Relative Humidity: 45.2 %

Atmospheric Pressure 97.7 kPa

### 4.4 Test Equipment

Test End Date: 10-Jul-2019

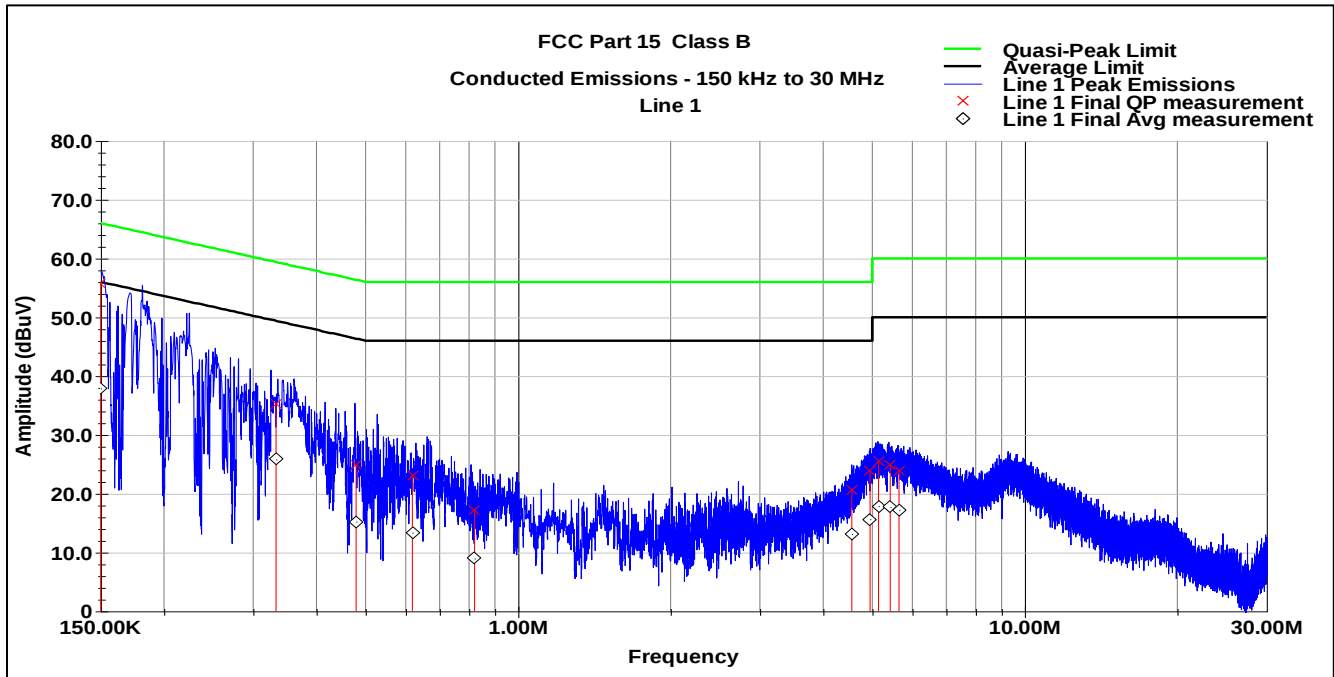
Tester: MT

| Equipment                            | Model      | Manufacturer    | Asset Number | Cal Due Date |
|--------------------------------------|------------|-----------------|--------------|--------------|
| LINE IMPEDANCE STABILIZATION NETWORK | NNB 51     | TESEQ           | B087573      | 3-Dec-2019   |
| RF CABLE                             | UC-N-MM-78 | MAURY MICROWAVE | 17017        | 30-Sep-2019  |
| EMI TEST RECEIVER                    | ESU8       | ROHDE & SCHWARZ | B085759      | 17-Aug-2019  |

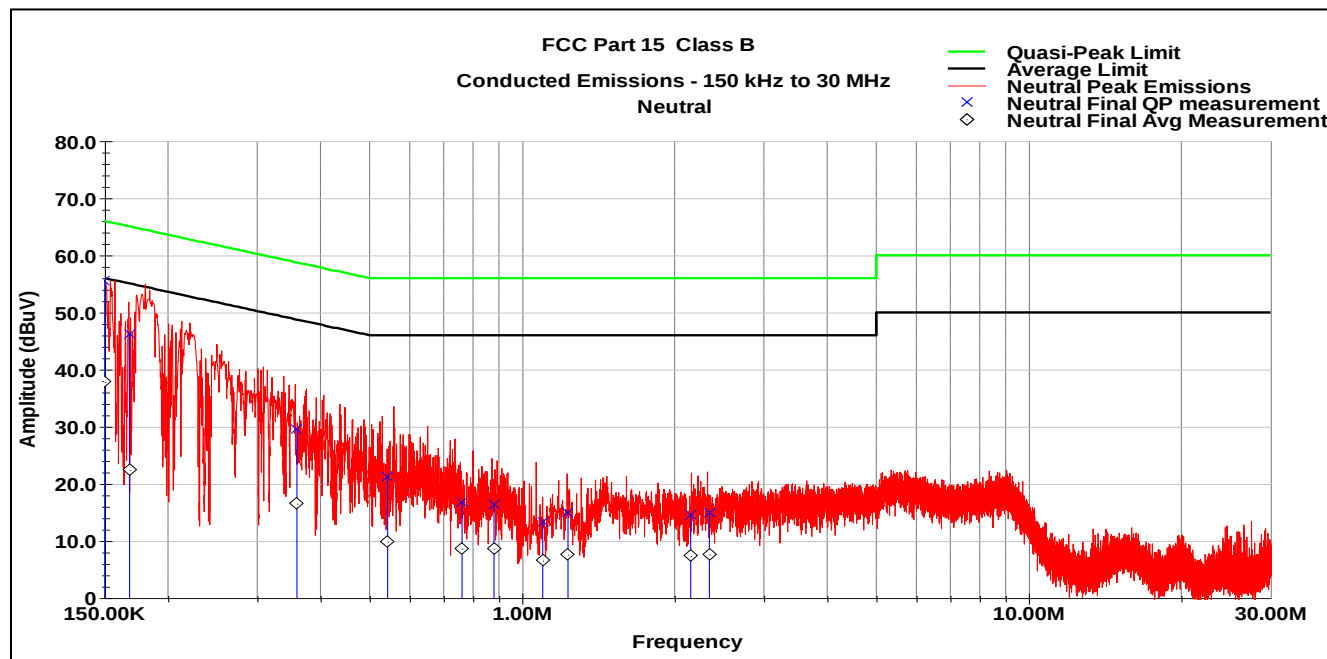
Note: The equipment calibration period is 1 year.

Software: "181112 Conducted Emissions TILE7" TILE! profile dated 12 Nov 2018

## 4.5 Test Data



| Frequency<br>MHz | QP Value<br>dBuV | QP Limit<br>dBuV | QP Margin<br>dB | Avg Value<br>dBuV | Avg Limit<br>dBuV | Avg Margin<br>dB |
|------------------|------------------|------------------|-----------------|-------------------|-------------------|------------------|
| 0.150            | 55.8             | 66.0             | -10.2           | 37.9              | 56.0              | -18.1            |
| 0.333            | 35.2             | 59.4             | -24.2           | 25.8              | 49.4              | -23.6            |
| 0.479            | 25.0             | 56.3             | -31.4           | 15.3              | 46.3              | -31.1            |
| 0.618            | 23.1             | 56.0             | -32.9           | 13.4              | 46.0              | -32.6            |
| 0.820            | 17.2             | 56.0             | -38.8           | 9.0               | 46.0              | -37.0            |
| 4.555            | 20.6             | 56.0             | -35.4           | 13.1              | 46.0              | -32.9            |
| 4.950            | 23.9             | 56.0             | -32.1           | 15.7              | 46.0              | -30.3            |
| 5.144            | 25.4             | 60.0             | -34.6           | 17.9              | 50.0              | -32.1            |
| 5.424            | 25.0             | 60.0             | -35.0           | 17.7              | 50.0              | -32.3            |
| 5.646            | 24.0             | 60.0             | -36.0           | 17.2              | 50.0              | -32.8            |



| Frequency<br>MHz | QP Value<br>dBuV | QP Limit<br>dBuV | QP Margin<br>dB | Avg Value<br>dBuV | Avg Limit<br>dBuV | Avg Margin<br>dB |
|------------------|------------------|------------------|-----------------|-------------------|-------------------|------------------|
| 0.150            | 55.6             | 66.0             | -10.4           | 37.8              | 56.0              | -18.2            |
| 0.168            | 46.2             | 65.1             | -18.9           | 22.5              | 55.1              | -32.6            |
| 0.359            | 29.7             | 58.7             | -29.0           | 16.5              | 48.7              | -32.2            |
| 0.543            | 21.2             | 56.0             | -34.8           | 9.9               | 46.0              | -36.1            |
| 0.761            | 16.7             | 56.0             | -39.3           | 8.6               | 46.0              | -37.4            |
| 0.880            | 16.4             | 56.0             | -39.6           | 8.6               | 46.0              | -37.4            |
| 1.098            | 13.4             | 56.0             | -42.6           | 6.5               | 46.0              | -39.5            |
| 1.232            | 15.0             | 56.0             | -41.0           | 7.6               | 46.0              | -38.4            |
| 2.151            | 14.6             | 56.0             | -41.4           | 7.4               | 46.0              | -38.6            |
| 2.342            | 14.9             | 56.0             | -41.1           | 7.6               | 46.0              | -38.4            |

## 5 Revision History

| Revision Level | Description of changes                                                                                                                                                                                                                                                                     | Revision Date     |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| Draft          | --                                                                                                                                                                                                                                                                                         | 03 September 2019 |
| 0              | Initial release                                                                                                                                                                                                                                                                            | 12 September 2019 |
| 1              | <ul style="list-style-type: none"> <li>- Corrected FCC ID and IC ID (Title page and section 2.3)</li> <li>- Changed note in section 1 to reference results from separate test report on u-blox module</li> <li>- Added AC Powerline Conducted Emissions test (sections 1 and 4)</li> </ul> | 11 December 2019  |
| 2              | Updated standards references on title page                                                                                                                                                                                                                                                 | 20 January 2020   |
|                |                                                                                                                                                                                                                                                                                            |                   |
|                |                                                                                                                                                                                                                                                                                            |                   |
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