

# ENGINEERING TEST REPORT



**Onsight Rugged Smart Camera**  
**Model: 5000HD**  
**FCC ID: T78-5000HD**

*Applicant:*

**Librestream Technologies Inc.**  
Suite 110, 895 Waverley St.  
Winnipeg, MB  
Canada R3T 5P4

*In Accordance With*

**Federal Communications Commission (FCC)**  
**Part 15, Subpart C**  
**Unlicensed Low Power Transmitter Operating in the Band 13.110-14.010 MHz**

**UltraTech's File No.: 17LIBT073\_FCC15C225**

This Test report is Issued under the Authority of  
Tri M. Luu  
Vice President of Engineering  
UltraTech Group of Labs

Date: March 6, 2017

Report Prepared by: Dan Huynh

Tested by: Wei Wu

Issued Date: March 6, 2017

Test Date(s): January 24-27, 2017  
February 2 & March 3, 2017

- The results in this Test Report apply only to the sample(s) tested, and the sample tested is randomly selected.*
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- This test report shall not be reproduced, except in full, without a written approval from UltraTech*

## UltraTech

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91038



1309



46390-2049



AT-1945



SL2-IN-E-1119



CA2049

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## EXHIBIT 1. INTRODUCTION

### 1.1. SCOPE

|                                      |                                                                                                                    |
|--------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| <b>Reference:</b>                    | FCC Part 15, Subpart C, Sec. 15.225 - Operation within the band 13.110 – 14.010 MHz.                               |
| <b>Title:</b>                        | Code of Federal Regulations (CFR), Title 47 Telecommunication, Part 15, Subpart C - Intentional Radiators          |
| <b>Purpose of Test:</b>              | Equipment Certification for FCC Part 15C.                                                                          |
| <b>Test Procedures:</b>              | ANSI C63.4 and ANSI C63.10                                                                                         |
| <b>Environmental Classification:</b> | <ul style="list-style-type: none"><li>Residential</li><li>Commercial, industrial or business environment</li></ul> |

### 1.2. RELATED SUBMITTAL(S)/GRANT(S)

None.

### 1.3. NORMATIVE REFERENCES

| Publication         | Year                         | Title                                                                                                                                                               |
|---------------------|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FCC 47 CFR 15       | 2017                         | Code of Federal Regulations (CFR), Title 47 – Telecommunication, Part 15 – Radio Frequency Devices                                                                  |
| ANSI C63.4          | 2014                         | American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 KHz to 40 GHz |
| ANSI C63.10         | 2013                         | American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices                                                                      |
| CISPR 22 & EN 55022 | 2008-09, Edition 6.0<br>2006 | Information Technology Equipment - Radio Disturbance Characteristics - Limits and Methods of Measurement                                                            |

## EXHIBIT 2. PERFORMANCE ASSESSMENT

### 2.1. CLIENT INFORMATION

| Applicant              |                                                                                                                                                                          |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Name:</b>           | Librestream Technologies Inc.                                                                                                                                            |
| <b>Address:</b>        | Suite 110, 895 Waverley St.<br>Winnipeg MB<br>Canada R3T 5P4                                                                                                             |
| <b>Contact Person:</b> | Gilles Aminot<br>Phone #: 204-487-0612 ext 218<br>Fax #: 204-487-0914<br>Email Address: <a href="mailto:gilles.aminot@librestream.com">gilles.aminot@librestream.com</a> |

| Manufacturer           |                                                                                                                                                                          |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Name:</b>           | Librestream Technologies Inc.                                                                                                                                            |
| <b>Address:</b>        | Suite 110, 895 Waverley St.<br>Winnipeg MB<br>Canada R3T 5P4                                                                                                             |
| <b>Contact Person:</b> | Gilles Aminot<br>Phone #: 204-487-0612 ext 218<br>Fax #: 204-487-0914<br>Email Address: <a href="mailto:gilles.aminot@librestream.com">gilles.aminot@librestream.com</a> |

### 2.2. EQUIPMENT UNDER TEST (EUT) INFORMATION

The following information (with the exception of the Date of Receipt) has been supplied by the applicant.

|                                       |                                                                                                                                                                                                                              |
|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Brand Name:</b>                    | Librestream Technologies Inc.                                                                                                                                                                                                |
| <b>Product Name:</b>                  | Onsight Rugged Smart Camera                                                                                                                                                                                                  |
| <b>Model Name or Number:</b>          | 5000HD                                                                                                                                                                                                                       |
| <b>Serial Number:</b>                 | Test sample                                                                                                                                                                                                                  |
| <b>Type of Equipment:</b>             | Part 15 Low Power Communication Device Transmitter                                                                                                                                                                           |
| <b>Input Power Supply Type:</b>       | External DC 5 VDC<br>Battery, 3.2 - 4.2 VDC, 3.7 VDC nominal                                                                                                                                                                 |
| <b>Primary User Functions of EUT:</b> | The Onsight mobile collaboration devices are used to communicate with an Onsight Expert user (or multiple Onsight Expert users) over an Onsight System network. The Onsight device can fully collaborate from a remote site. |

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### ULTRATECH GROUP OF LABS

3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4

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File #: 17LIBT073\_FCC15C225

March 6, 2017

## 2.3. EUT'S TECHNICAL SPECIFICATIONS

| Transmitter                            |                                                                                                                    |
|----------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| <b>Intended Operating Environment:</b> | <ul style="list-style-type: none"><li>Residential</li><li>Commercial, industrial or business environment</li></ul> |
| <b>Power Supply Requirement:</b>       | Battery 3.2 - 4.2 VDC, 3.7 VDC nominal                                                                             |
| <b>Field Strength:</b>                 | 45.55 dB $\mu$ V/m at 10 m                                                                                         |
| <b>Operating Frequency Range:</b>      | 13.56 MHz                                                                                                          |
| <b>RF Output Impedance:</b>            | 50 $\Omega$                                                                                                        |
| <b>20 dB Bandwidth:</b>                | 918.27 kHz                                                                                                         |
| <b>Modulation Type:</b>                | ASK                                                                                                                |
| <b>Oscillator Frequencies:</b>         | 24.0000MHz, 28.63636MHz, 32.768KHz, 27.12MHz                                                                       |
| <b>Antenna Connector Type:</b>         | Integral                                                                                                           |

## 2.4. LIST OF EUT'S PORTS

| Port Number | EUT's Port Description | Number of Identical Ports | Connector Type | Cable Type (Shielded/Non-shielded) |
|-------------|------------------------|---------------------------|----------------|------------------------------------|
| 1           | USB 2.0 OTG Port       | 1                         | USB            | Shielded                           |
| 2           | USB 2.0 Host Port      | 1                         | USB            | Shielded                           |
| 3           | HDMI                   | 1                         | HDMI           | Shielded                           |
| 4           | DC IN                  | 1                         | Power Jack     | Non-shielded                       |
| 5           | Headphone              | 1                         | Headphone Jack | Non-shielded                       |

## 2.5. ANCILLARY EQUIPMENT

The EUT was tested while connected to the following representative configuration of ancillary equipment necessary to exercise the ports during tests:

| <b>Ancillary Equipment # 1</b> |                             |
|--------------------------------|-----------------------------|
| Description:                   | ITE Power Supply AC Adapter |
| Brand name:                    | CUI INC                     |
| Model Name or Number:          | SMI18-5                     |
| Connected to EUT's Port:       | Power Port                  |

| <b>Ancillary Equipment # 2</b> |           |
|--------------------------------|-----------|
| Description:                   | Headphone |
| Brand name:                    | Eartec    |
| Model Name or Number:          | N/A       |
| Connected to EUT's Port:       | Earphone  |

| <b>Ancillary Equipment # 3</b> |             |
|--------------------------------|-------------|
| Description:                   | Mouse       |
| Brand name:                    | Dell        |
| Model Name or Number:          | P/N: 04P608 |
| Connected to EUT's Port:       | USB         |

| <b>Ancillary Equipment # 4</b> |             |
|--------------------------------|-------------|
| Description:                   | LCD Monitor |
| Brand name:                    | Dell        |
| Model Name or Number:          | 2408WFPB    |
| Connected to EUT's Port:       | HDMI        |

| <b>Ancillary Equipment # 5</b> |                             |
|--------------------------------|-----------------------------|
| Description:                   | USB cable connected to load |
| Brand name:                    | Generic                     |
| Model Name or Number:          | N/A                         |
| Connected to EUT's Port:       | USB                         |

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## ULTRATECH GROUP OF LABS

3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4

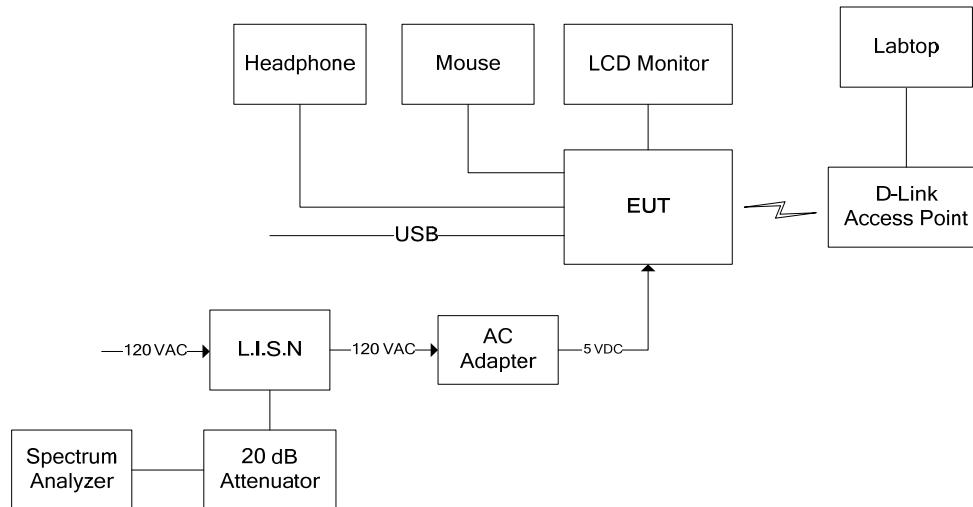
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: [vic@ultratech-labs.com](mailto:vic@ultratech-labs.com), Website: <http://www.ultratech-labs.com>

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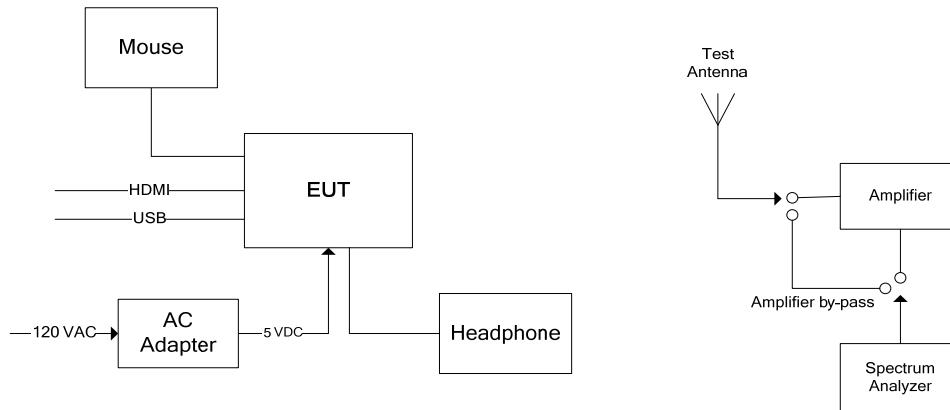
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## 2.6. GENERAL TEST SETUP

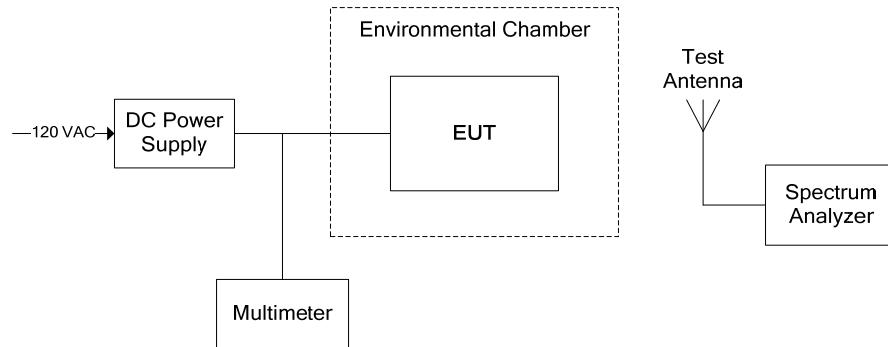
### Power Line Conducted Emission



### Transmitter Radiated Emission



### Frequency Stability



## EXHIBIT 3. EUT OPERATING CONDITIONS AND CONFIGURATIONS DURING TESTS

### 3.1.1. EUT OPERATING CONDITIONS AND CONFIGURATIONS DURING TESTS

#### 3.2. CLIMATE TEST CONDITIONS

The climate conditions of the test environment are as follows:

|                     |               |
|---------------------|---------------|
| Temperature:        | 21 to 23 °C   |
| Humidity:           | 45 to 58%     |
| Pressure:           | 102 kPa       |
| Power input source: | 3.2 - 4.2 VDC |

#### 3.3. OPERATIONAL TEST CONDITIONS & ARRANGEMENT FOR TESTS

|                                  |                                                                                                                      |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------|
| <b>Operating Modes:</b>          | The EUT was configured for continuous transmission for the duration of testing.                                      |
| <b>Special Test Software:</b>    | N/A                                                                                                                  |
| <b>Special Hardware Used:</b>    | N/A                                                                                                                  |
| <b>Transmitter Test Antenna:</b> | The EUT was tested with the antenna fitted in a manner typical of normal intended use as integral antenna equipment. |

| <b>Transmitter Test Signals:</b>                   |                            |
|----------------------------------------------------|----------------------------|
| <b>Frequency Band(s):</b>                          | 13.56 MHz                  |
| <b>Test Frequency(ies):</b>                        | 13.56 MHz                  |
| <b>Transmitter Wanted Output Test Signals:</b>     |                            |
| ▪ RF Power Output (measured maximum output power): | 45.55 dB $\mu$ V/m at 10 m |
| ▪ Normal Test Modulation:                          | ASK                        |
| ▪ Modulating signal source:                        | Internal                   |

## EXHIBIT 4. SUMMARY OF TEST RESULTS

### 4.1. LOCATION OF TESTS

All of the measurements described in this report were performed at Ultratech Group of Labs located in the city of Oakville, Province of Ontario, Canada.

- AC Power Line Conducted Emissions were performed in UltraTech's shielded room, 24'(L) by 16'(W) by 8'(H).
- Radiated Emissions were performed at the Ultratech's 3-10 TDK Semi-Anechoic Chamber situated in the Town of Oakville, province of Ontario. This test site been calibrated in accordance with ANSI C63.4, and found to be in compliance with the requirements of Sec. 2.948 of the FCC Rules. The descriptions and site measurement data of the Oakville 3-10 TDK Semi-Anechoic Chamber has been filed with FCC office (FCC File No.: 91038) and Industry Canada office (Industry Canada File No.: 2049A-3). Expiry Date: 2017-04-02.

### 4.2. APPLICABILITY & SUMMARY OF EMC EMISSION TEST RESULTS

| FCC Regulations | Test Requirements                                                                       | Compliance (Yes/No) |
|-----------------|-----------------------------------------------------------------------------------------|---------------------|
| 15.203 & 15.204 | The transmitter shall use a transmitting antenna that is an integral part of the device | Yes*                |
| 15.207(a)       | Power Line Conducted Emissions                                                          | Yes                 |
| 15.215(c)       | Emission Bandwidth                                                                      | Yes                 |
| 15.225(a) – (d) | Field Strength of Emissions Inside and Outside the Permitted Band 13.110 - 14.010 MHz   | Yes                 |
| 15.225(e)       | Frequency Stability                                                                     | Yes                 |

\* The EUT complies with the requirement; it employs integral antenna.

### 4.3. MODIFICATIONS INCORPORATED IN THE EUT FOR COMPLIANCE PURPOSES

None.

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## EXHIBIT 5. TEST DATA

### 5.1. POWER LINE CONDUCTED EMISSIONS [§15.207(a)]

#### 5.1.1. Limit(s)

The equipment shall meet the limits of the following table:

| Frequency of emission<br>(MHz) | Conducted Limits (dB $\mu$ V) |           |
|--------------------------------|-------------------------------|-----------|
|                                | Quasi-peak                    | Average   |
| 0.15–0.5 .....                 | 66 to 56*                     | 56 to 46* |
| 0.5–5 .....                    | 56 .....                      | 46        |
| 5–30 .....                     | 60 .....                      | 50        |

\*Decreases linearly with the logarithm of the frequency

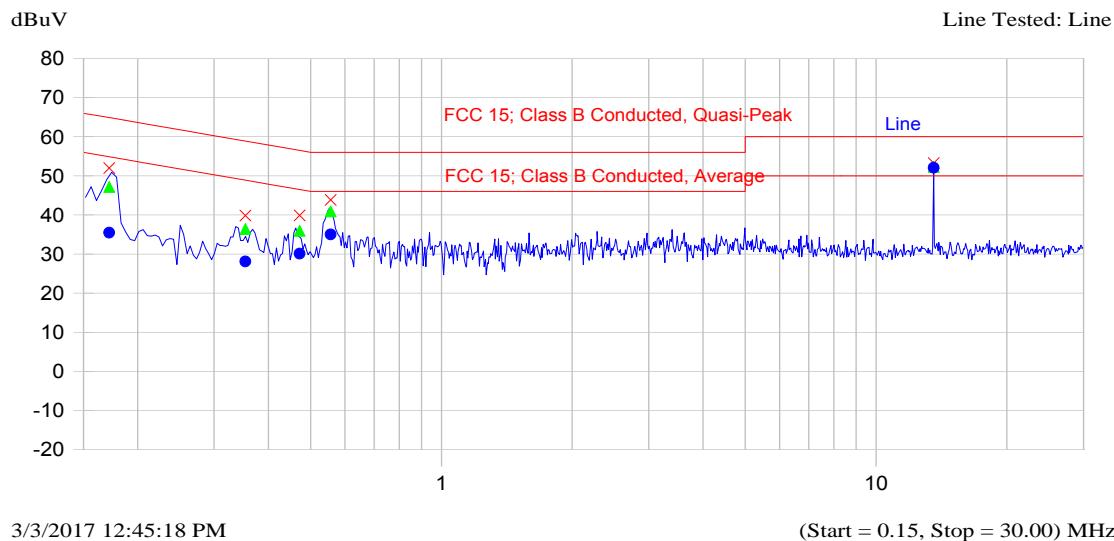
#### 5.1.2. Method of Measurements

ANSI C63.4-2014

### 5.1.3. Test Data

**Plot 5.1.3.1. Power Line Conducted Emissions**  
Test Configuration 1: EUT without shielding  
Line Tested: Line

#### Current Graph

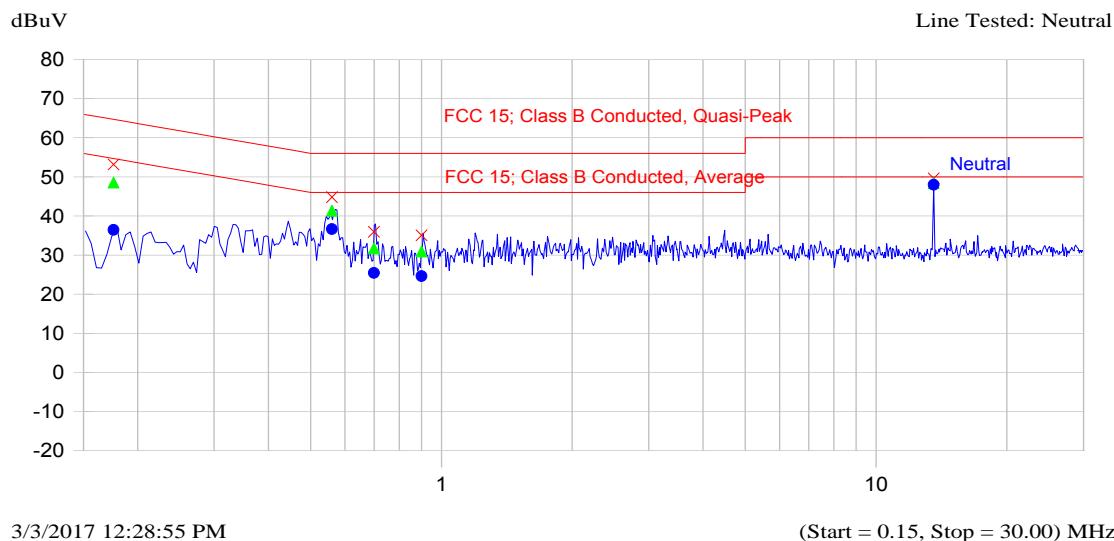


#### Current List

| Frequency<br>MHz | Peak<br>dBuV | QP<br>dBuV | QP-QP Limit<br>dB | Avg<br>dBuV | Avg-Avg Limit<br>dB | Trace Name |
|------------------|--------------|------------|-------------------|-------------|---------------------|------------|
| 0.172            | 52.0         | 47.2       | -17.7             | 35.4        | -19.4               | Line       |
| 0.556            | 43.8         | 40.9       | -15.1             | 35.0        | -11.0               | Line       |
| 0.354            | 39.8         | 36.4       | -22.5             | 28.1        | -20.8               | Line       |
| 0.472            | 39.9         | 35.9       | -20.6             | 30.1        | -16.4               | Line       |
| 13.560           | 53.2         | 52.3       | -7.7              | 52.0        | 2.0                 | Line       |

**Plot 5.1.3.2.** Power Line Conducted Emissions  
Test Configuration 1: EUT without shielding  
Line Tested: Neutral

**Current Graph**



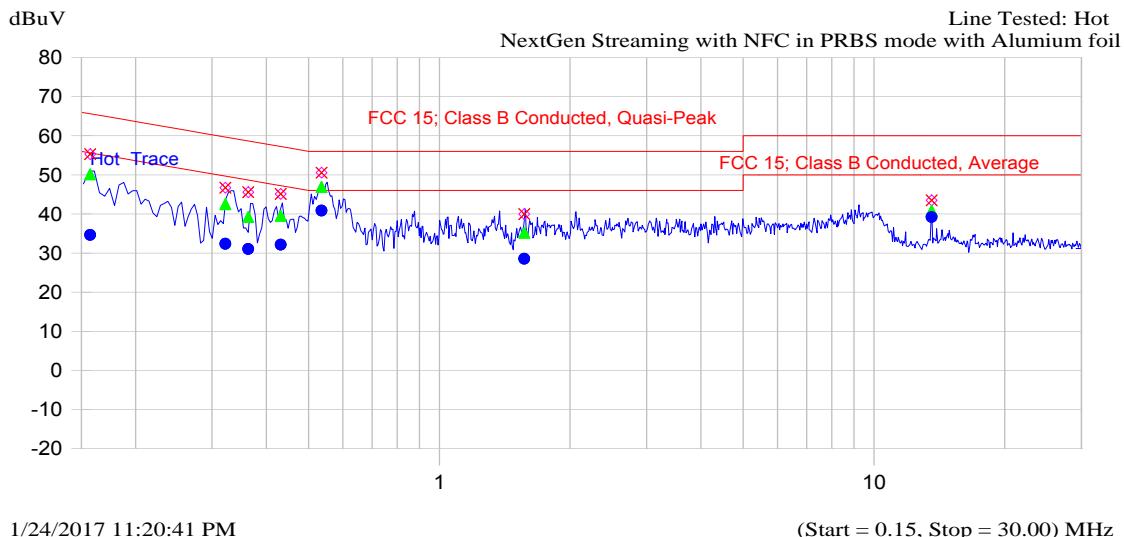
**Current List**

| Frequency<br>MHz | Peak<br>dBuV | QP<br>dBuV | QP-QP Limit<br>dB | Avg<br>dBuV | Avg-Avg Limit<br>dB | Trace Name |
|------------------|--------------|------------|-------------------|-------------|---------------------|------------|
| 0.176            | 53.2         | 48.5       | -16.1             | 36.4        | -18.2               | Neutral    |
| 0.560            | 44.8         | 41.4       | -14.6             | 36.6        | -9.4                | Neutral    |
| 0.700            | 35.9         | 31.7       | -24.3             | 25.4        | -20.6               | Neutral    |
| 0.900            | 35.0         | 30.9       | -25.1             | 24.6        | -21.4               | Neutral    |
| 13.561           | 49.6         | 48.4       | -11.6             | 48.0        | -2.0                | Neutral    |

**Plot 5.1.3.3. Power Line Conducted Emissions**

Test Configuration 2: EUT with shielding from aluminum foil was used since testing with a dummy load was not possible  
Line Voltage: 120 VAC; Line Tested: Hot

**Current Graph**



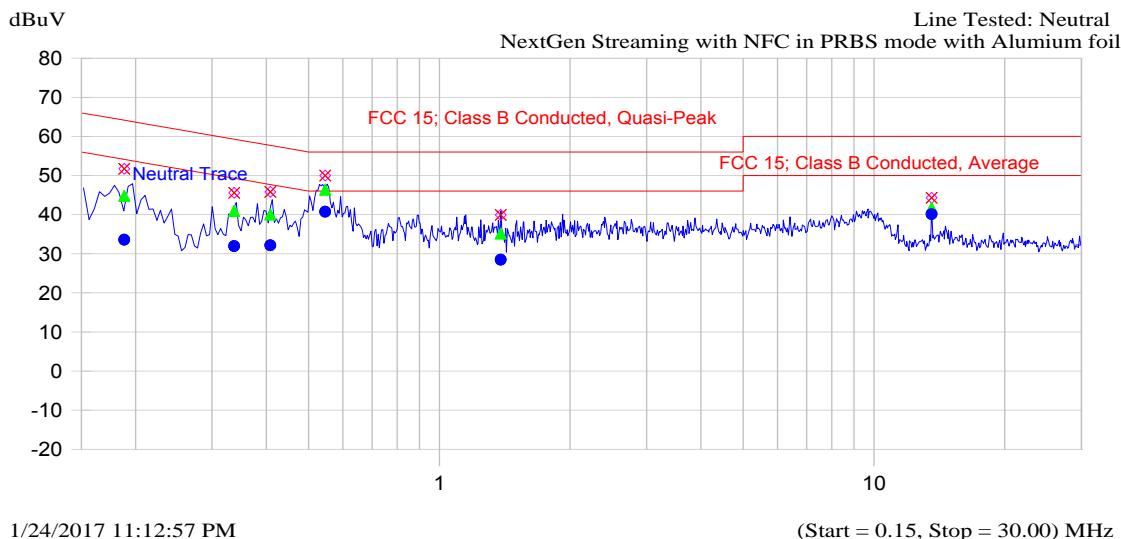
**Current List**

| Frequency<br>MHz | Peak<br>dBuV | QP<br>dBuV | QP-QP Limit<br>dB | Avg<br>dBuV | Avg-Avg Limit<br>dB | Trace Name |
|------------------|--------------|------------|-------------------|-------------|---------------------|------------|
| 0.157            | 55.3         | 50.1       | -15.5             | 34.7        | -21.0               | Hot Trace  |
| 0.322            | 46.7         | 42.5       | -17.1             | 32.4        | -17.3               | Hot Trace  |
| 0.363            | 45.6         | 39.2       | -19.4             | 31.0        | -17.6               | Hot Trace  |
| 0.432            | 45.1         | 39.5       | -17.7             | 32.1        | -15.1               | Hot Trace  |
| 0.536            | 50.5         | 46.9       | -9.1              | 40.8        | -5.2                | Hot Trace  |
| 1.568            | 40.0         | 35.2       | -20.8             | 28.5        | -17.5               | Hot Trace  |
| 13.562           | 43.5         | 40.9       | -19.1             | 39.2        | -10.8               | Hot Trace  |

**Plot 5.1.3.4.** Power Line Conducted Emissions

Test Configuration 2: EUT with shielding from aluminum foil was used since testing with a dummy load was not possible  
Line Tested: Neutral

**Current Graph**



**Current List**

| Frequency<br>MHz | Peak<br>dBuV | QP<br>dBuV | QP-QP Limit<br>dB | Avg<br>dBuV | Avg-Avg Limit<br>dB | Trace Name    |
|------------------|--------------|------------|-------------------|-------------|---------------------|---------------|
| 0.188            | 51.7         | 44.8       | -19.3             | 33.5        | -20.6               | Neutral Trace |
| 0.337            | 45.6         | 40.9       | -18.4             | 31.9        | -17.3               | Neutral Trace |
| 0.408            | 45.8         | 40.0       | -17.6             | 32.1        | -15.6               | Neutral Trace |
| 0.546            | 50.0         | 46.4       | -9.6              | 40.7        | -5.3                | Neutral Trace |

## 5.2. EMISSION BANDWIDTH

### 5.2.1. Limit(s)

The 20 dB bandwidth of the emission shall be contained within the band 13.110–14.010 MHz.

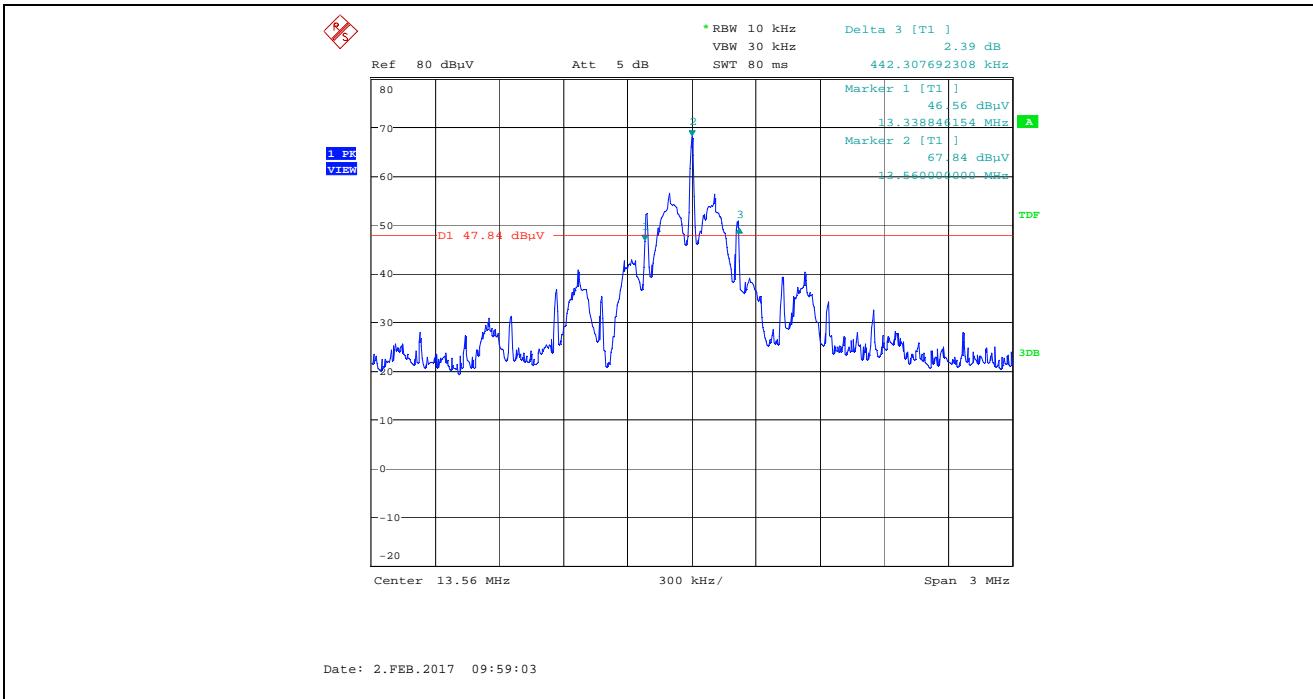
### 5.2.2. Method of Measurements

ANSI C63.4.

### 5.2.3. Test Data

| Test Frequency (MHz) | Technology | Bit Rate | 20 dB Occupied Bandwidth (kHz) |
|----------------------|------------|----------|--------------------------------|
| 13.56                | A          | 106      | 442.31                         |
|                      |            | 212      | 860.58                         |
|                      |            | 424      | 754.81                         |
|                      |            | 848      | 33.65                          |
|                      | B          | 106      | 35.26                          |
|                      |            | 212      | 33.65                          |
|                      |            | 424      | 33.65                          |
|                      |            | 848      | 33.33                          |

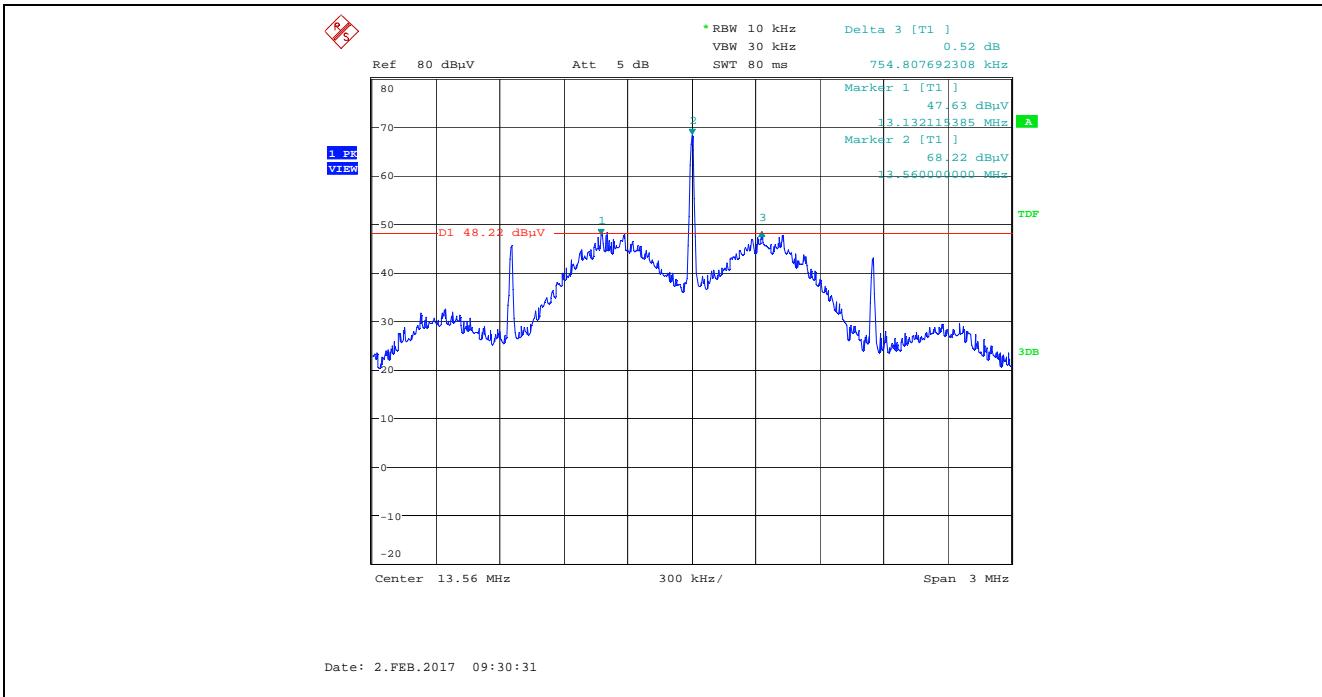
Plot 5.2.3.1. 20 dB Bandwidth, Fc: 13.56 MHz, Technology A, Bit Rate 106



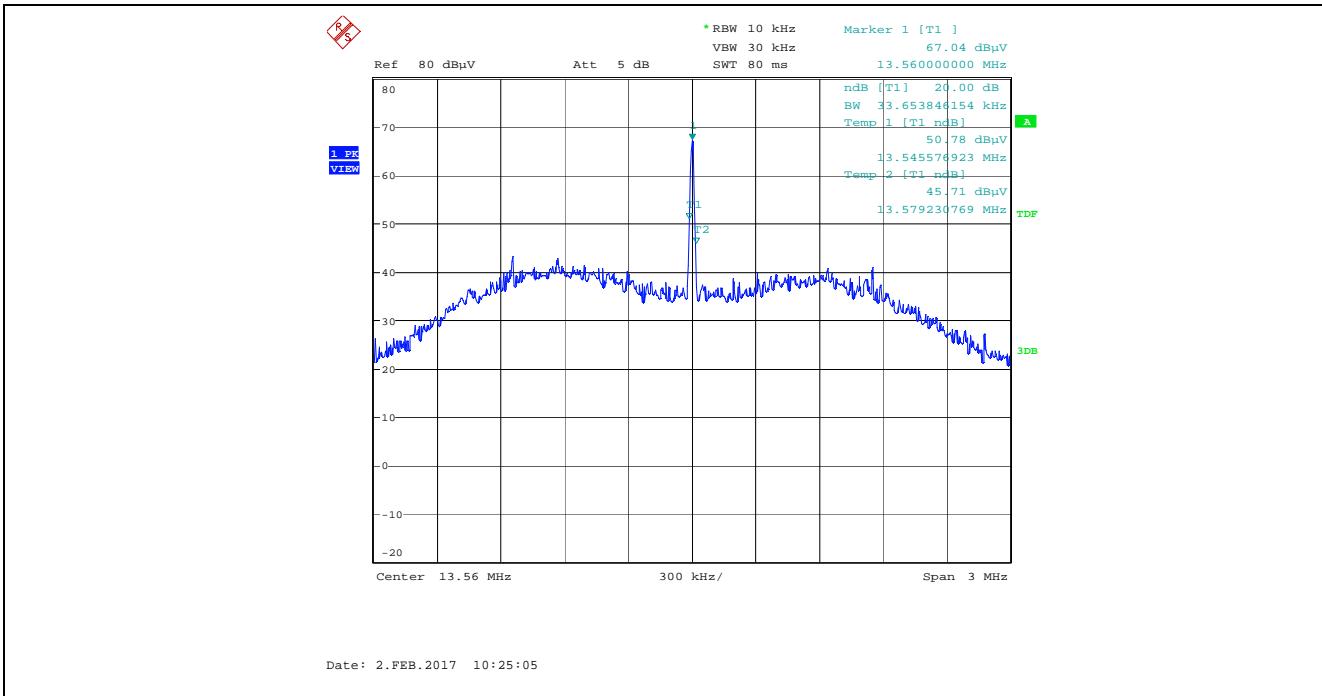
Plot 5.2.3.2. 20 dB Bandwidth, Fc: 13.56 MHz, Technology A, Bit Rate 212



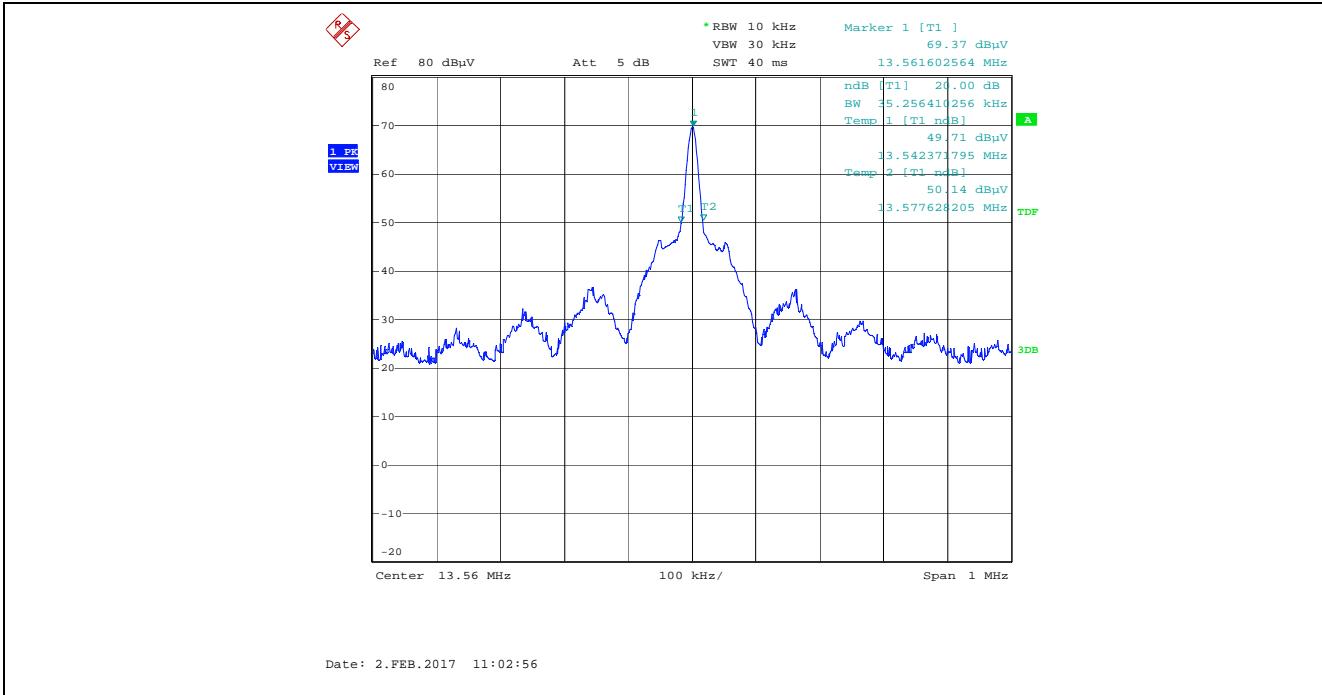
Plot 5.2.3.3. 20 dB Bandwidth, Fc: 13.56 MHz, Technology A, Bit Rate 424



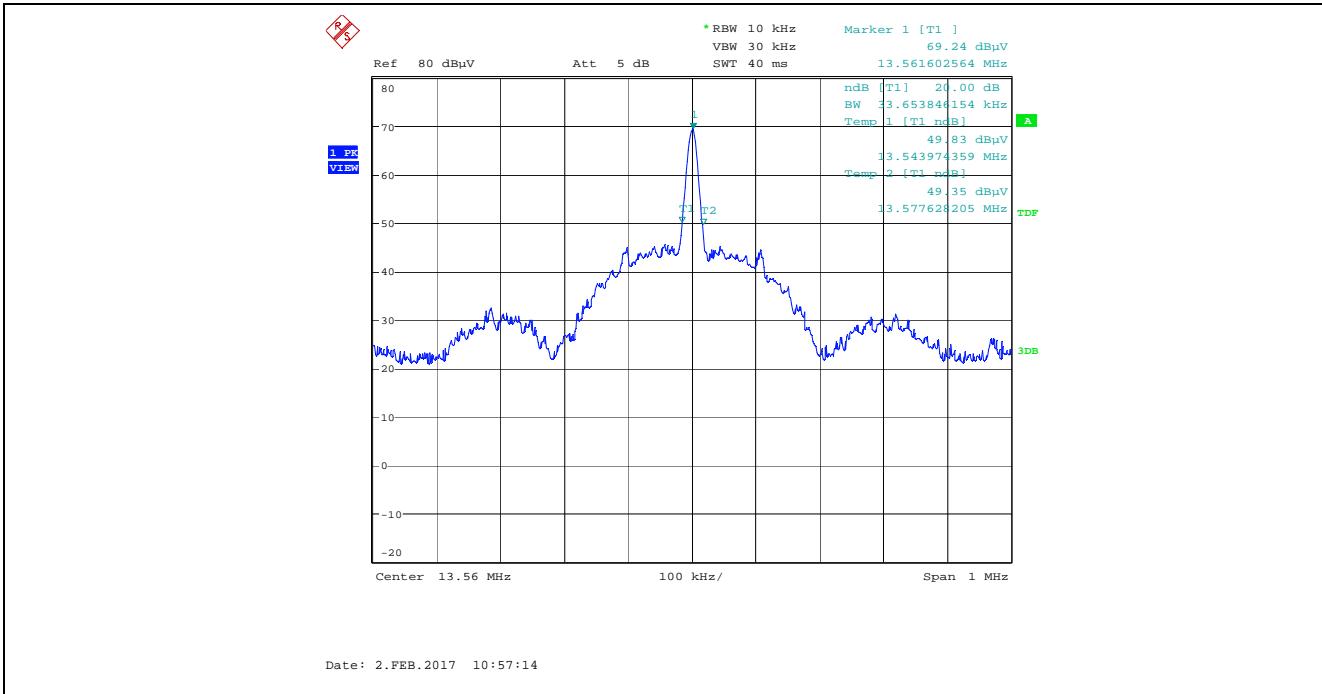
Plot 5.2.3.4. 20 dB Bandwidth, Fc: 13.56 MHz, Technology A, Bit Rate 848



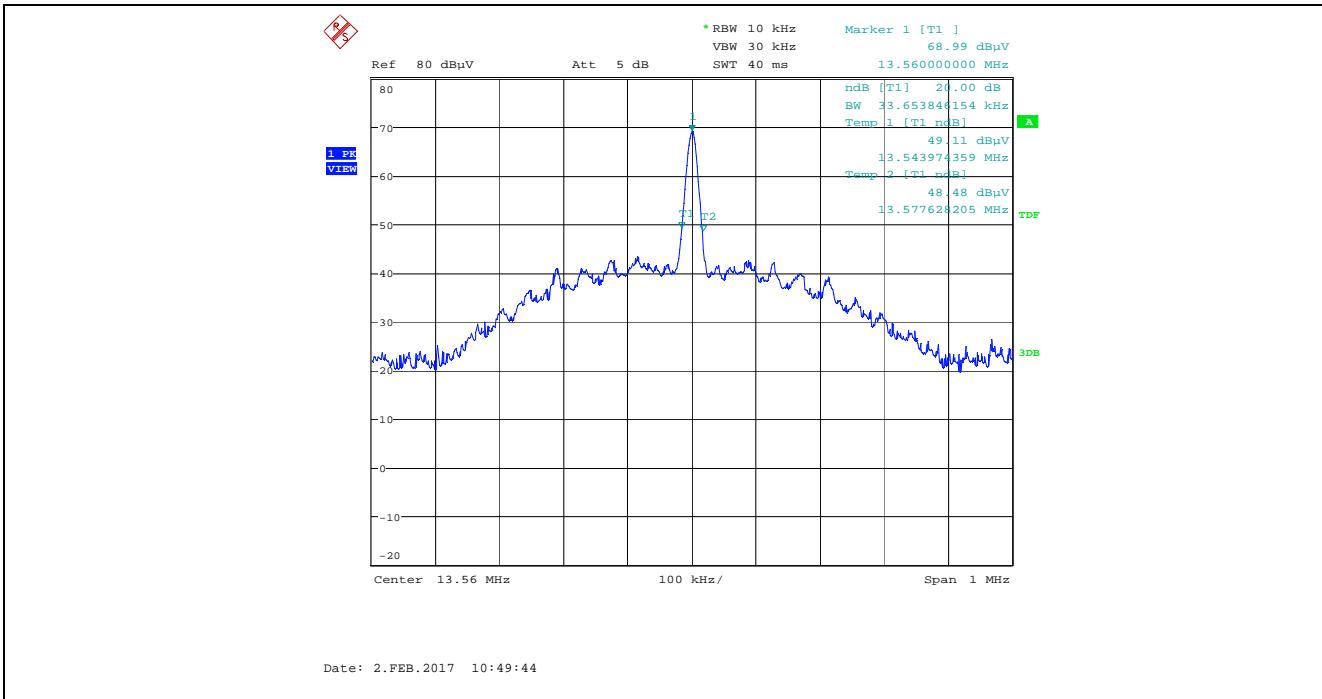
**Plot 5.2.3.5. 20 dB Bandwidth, Fc: 13.56 MHz, Technology B, Bit Rate 106**



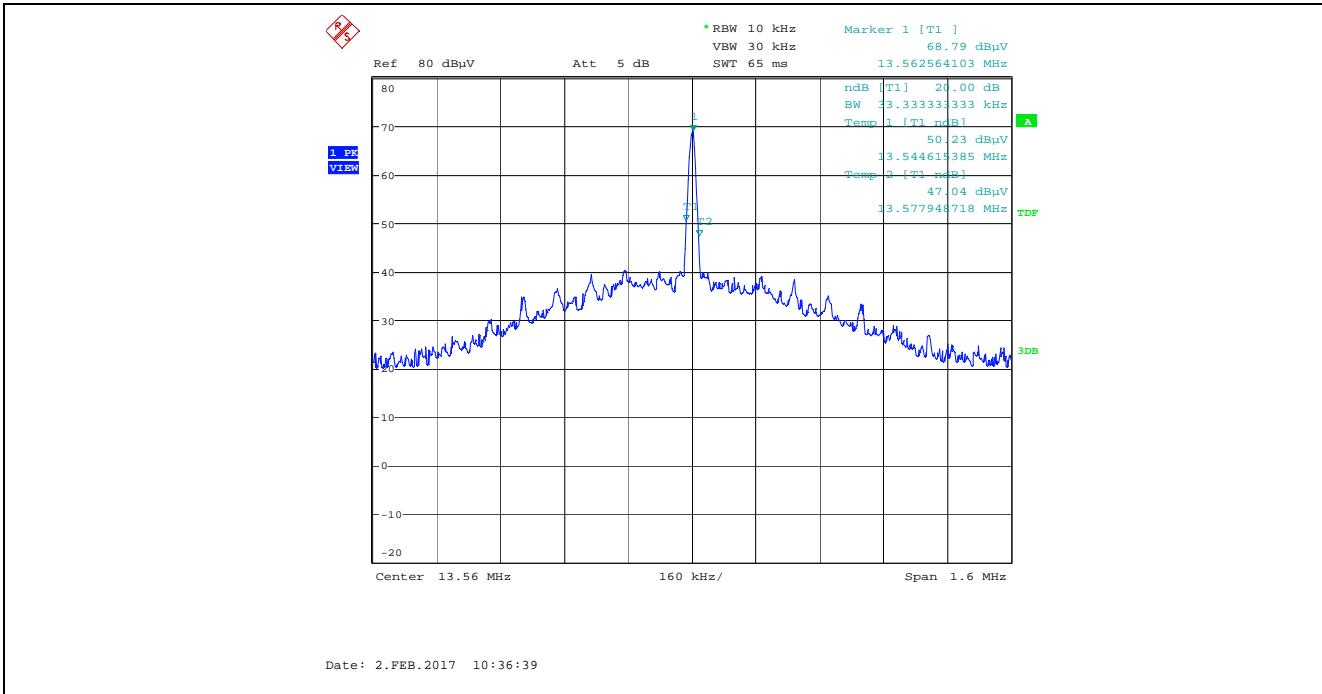
**Plot 5.2.3.6. 20 dB Bandwidth, Fc: 13.56 MHz, Technology B, Bit Rate 212**



Plot 5.2.3.7. 20 dB Bandwidth, Fc: 13.56 MHz, Technology B, Bit Rate 424



Plot 5.2.3.8. 20 dB Bandwidth, Fc: 13.56 MHz, Technology B, Bit Rate 848



**5.3. FIELD STRENGTH OF EMISSIONS WITHIN & OUTSIDE THE PERMITTED BAND 13.110-14.010 MHz  
[47 CFR 15.225 (a) to (d)]**

**5.3.1. Limits**

- (a) The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.
- (b) Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.
- (c) Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.
- (d) The field strength of any emissions appearing outside of the 13.110 – 14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.

**47 CFR 15.209(a) – Radiated Emission Limits; general requirements**

| Frequency (MHz) | Field Strength Limits (microvolts/m) | Distance (Meters) |
|-----------------|--------------------------------------|-------------------|
| 0.009 - 0.490   | 2,400 / F (KHz)                      | 300               |
| 0.490 - 1.705   | 24,000 / F (KHz)                     | 30                |
| 1.705 - 30.0    | 30                                   | 30                |
| 30 – 88         | 100                                  | 3                 |
| 88 – 216        | 150                                  | 3                 |
| 216 – 960       | 200                                  | 3                 |
| Above 960       | 500                                  | 3                 |

**5.3.2. Method of Measurements**

ANSI C63.10 and ANSI C63.4 for measurement methods.

### 5.3.3. Test Data

#### Remarks:

- Radiated spurious emissions measurements were performed at a measuring distance of 10 m (for frequencies below 30 MHz) and 3 m (for frequencies at or above 30 MHz), from 10 kHz – 10<sup>th</sup> harmonic of the fundamental or the range applicable to the digital device, whichever is the higher frequency range and all spurious emissions that are in excess of 20 dB below the specified limit shall be recorded.
- For frequencies below 30 MHz, the results measured at 10 m distance shall be extrapolated to the specified distance using an extrapolation factor of 40 dB/decade for determining compliance.

#### 5.3.3.1. Field Strength of Emissions Within the Permitted Band at 10 m

| Frequency (MHz) | Measured Field Strength @ 10 m (dB $\mu$ V/m) | Detector Used (Peak/QP) | Antenna Plane (H/V) | Field Strength Extrapolated Value (dB $\mu$ V/m) | § 15.225 Field Strength Limits (dB $\mu$ V/m) | Margin (dB) |
|-----------------|-----------------------------------------------|-------------------------|---------------------|--------------------------------------------------|-----------------------------------------------|-------------|
| 13.56           | 45.55                                         | Peak                    | V                   | 26.47                                            | 84.0                                          | -57.5       |
| 13.56           | 38.95                                         | Peak                    | H                   | 19.87                                            | 84.0                                          | -64.1       |

#### 5.3.3.2. Field Strength of Emissions Outside the Permitted Band Below 30 MHz at 10 m

| Frequency (MHz)                                                       | Measured Field Strength @ 10 m (dB $\mu$ V/m) | Detector Used (Peak/QP) | Antenna Plane (H/V) | Field Strength Extrapolated Value (dB $\mu$ V/m) | § 15.209 Field Strength Limits (dB $\mu$ V/m) | Margin (dB) |
|-----------------------------------------------------------------------|-----------------------------------------------|-------------------------|---------------------|--------------------------------------------------|-----------------------------------------------|-------------|
| All spurious emissions are more than 20 dB below the specified limit. |                                               |                         |                     |                                                  |                                               |             |

#### 5.3.3.3. Field Strength of Emissions Outside the Permitted Band at or Above 30 MHz at 3 m

| Frequency (MHz) | Measured Field Strength @ 3 m (dB $\mu$ V/m) | Detector Used (Peak/QP) | Antenna Plane (H/V) | § 15.209 Field Strength Limits (dB $\mu$ V/m) | Margin (dB) |
|-----------------|----------------------------------------------|-------------------------|---------------------|-----------------------------------------------|-------------|
| 81.36           | 34.30                                        | Peak                    | V                   | 40.0                                          | -5.7        |
| 81.36           | 30.60                                        | QP                      | H                   | 40.0                                          | -9.4        |
| 94.92           | 34.10                                        | QP                      | V                   | 43.5                                          | -9.4        |
| 94.92           | 38.85                                        | Peak                    | H                   | 43.5                                          | -4.7        |

#### 5.4. FREQUENCY STABILITY [47 CFR 15.225(e)]

##### 5.4.1. Limit(s)

The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

##### 5.4.2. Method of Measurements

ANSI C63.10.

##### 5.4.3. Test Data

|                                    |                               |
|------------------------------------|-------------------------------|
| Frequency Band:                    | 13.56 MHz                     |
| Center Frequency:                  | 13.56 MHz                     |
| Frequency Tolerance Limit:         | <u>± 0.01% (±1356 Hz)</u>     |
| Max. Frequency Tolerance Measured: | +160 Hz                       |
| Input Voltage Rating:              | 3.2- 4.2 VDC, 3.7 VDC Nominal |

| Ambient Temperature (°C) | Frequency Drift (Hz)               |                                             |                                             |
|--------------------------|------------------------------------|---------------------------------------------|---------------------------------------------|
|                          | Supply Voltage (Nominal)<br>3.7VDC | Supply Voltage (85 % of Nominal)<br>3.2 VDC | Supply Voltage (115% of Nominal)<br>4.2 VDC |
| -20                      | +160                               | --                                          | --                                          |
| -10                      | +160                               | --                                          | --                                          |
| 0                        | +160                               | --                                          | --                                          |
| +10                      | +160                               | --                                          | --                                          |
| +20                      | 0                                  | 0                                           | 0                                           |
| +30                      | +160                               | --                                          | --                                          |
| +40                      | +160                               | --                                          | --                                          |
| +50                      | +160                               | --                                          | --                                          |
| +60                      | +160                               | --                                          | --                                          |

## EXHIBIT 6. TEST EQUIPMENT LIST

| Test Instruments                                | Manufacturer    | Model No. | Serial No.       | Frequency Range | Cal. Due Date |
|-------------------------------------------------|-----------------|-----------|------------------|-----------------|---------------|
| Spectrum Analyzer                               | Rhode & Schwarz | FSU       | 1100398          | 20Hz-26.5GHz    | 14 Sep 2017   |
| Biconical Antenna                               | ETS             | 3110B     | 3379             | 20-200MHz       | 11 Sep 2017   |
| Loop Antenna                                    | EMCO            | 6502      | 9104-2611        | 10kHz-30MHz     | 5 Nov 2017    |
| Preamplifier                                    | Com-power       | PA-103A   | 161243           | 10-1000MHz      | 4 Oct 2017    |
| Environmental Chamber                           | Envirotronics   | SSH32C    | 11994847-S-11059 | -60 to 177 °C   | 2 Jun 2017    |
| Spectrum Analyzer                               | Rhode & Schwarz | FSU       | 1100398          | 20Hz-26.5GHz    | 14 Sep 2017   |
| Spectrum Analyzer                               | HP              | 8593EM    | 3412A00103       | 9kHz-26.5GHz    | 9 Apr 2017    |
| LISN                                            | EMCO            | 3825/2R   | 1165             | 10kHz-30MHz     | 11 Nov 2017   |
| Attenuator                                      | Pasternack      | PE7010-20 | 7                | DC-2GHz         | 26 Mar 2017   |
| EMI Receiver                                    | Rhode & Schwarz | ESU40     | 100037           | 20Hz-40GHz      | 8 May 2017    |
| Biconical Antenna                               | EMCO            | 3142      | 9601-1005        | 26-2000MHz      | 12 May 2017   |
| DC Power Supply                                 | Tenma           | 726153    | 0001526          | 0-20 V, 0-10 A  | Note 1        |
| Multi-meter                                     | Tenma           | 72-6202   | 02080027         | Max: 1kV, 10A   | 20 Nov 2017   |
| Note 1: Internal Verification/Calibration check |                 |           |                  |                 |               |

## EXHIBIT 7. MEASUREMENT UNCERTAINTY

The measurement uncertainties stated were calculated in accordance with the requirements of CISPR 16-4-2 @ IEC:2003 and JCGM 100:2008 (GUM 1995) – Guide to the Expression of Uncertainty in Measurement.

### 7.1. LINE CONDUCTED EMISSION MEASUREMENT UNCERTAINTY

|       | Line Conducted Emission Measurement Uncertainty (9 kHz – 30 MHz):                | Measured   | Limit     |
|-------|----------------------------------------------------------------------------------|------------|-----------|
| $u_c$ | <b>Combined standard uncertainty:</b><br>$u_c(y) = \sqrt{\sum_{i=1}^m u_i^2(y)}$ | $\pm 1.44$ | $\pm 1.8$ |
| $U$   | <b>Expanded uncertainty U:</b><br>$U = 2u_c(y)$                                  | $\pm 2.89$ | $\pm 3.6$ |

### 7.2. RADIATED EMISSION MEASUREMENT UNCERTAINTY

|       | Radiated Emission Measurement Uncertainty @ 3m, Horizontal (30-1000 MHz):        | Measured (dB) | Limit (dB) |
|-------|----------------------------------------------------------------------------------|---------------|------------|
| $u_c$ | <b>Combined standard uncertainty:</b><br>$u_c(y) = \sqrt{\sum_{i=1}^m u_i^2(y)}$ | $\pm 2.39$    | $\pm 2.6$  |
| $U$   | <b>Expanded uncertainty U:</b><br>$U = 2u_c(y)$                                  | $\pm 4.79$    | $\pm 5.2$  |

|       | Radiated Emission Measurement Uncertainty @ 3m, Vertical (30-1000 MHz):          | Measured (dB) | Limit (dB) |
|-------|----------------------------------------------------------------------------------|---------------|------------|
| $u_c$ | <b>Combined standard uncertainty:</b><br>$u_c(y) = \sqrt{\sum_{i=1}^m u_i^2(y)}$ | $\pm 2.39$    | $\pm 2.6$  |
| $U$   | <b>Expanded uncertainty U:</b><br>$U = 2u_c(y)$                                  | $\pm 4.78$    | $\pm 5.2$  |

|       | Radiated Emission Measurement Uncertainty @ 3 m, Horizontal & Vertical (1 – 18 GHz): | Measured (dB) | Limit (dB)          |
|-------|--------------------------------------------------------------------------------------|---------------|---------------------|
| $u_c$ | <b>Combined standard uncertainty:</b><br>$u_c(y) = \sqrt{\sum_{i=1}^m u_i^2(y)}$     | $\pm 1.87$    | Under consideration |
| $U$   | <b>Expanded uncertainty U:</b><br>$U = 2u_c(y)$                                      | $\pm 3.75$    | Under consideration |