
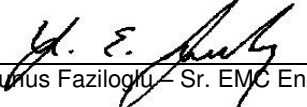




# Test Report

Curtis-Straus LLC, a wholly owned subsidiary of BV CPS

|                                  |   |
|----------------------------------|---|
| Report No                        | ER1905-7  |
| Client                           | Harman International Industries, Inc.<br>Mark Bowman  |
| Address                          | 30001 Cabot Drive<br>Novi, MI 48377   |
| Phone                            | 248-254-7751  |
| Items tested<br>FCC ID<br>IC     | INFO3 CSM MY19 HIGH<br>2AHPN-BE2829<br>6434C-BE2829   |
| Equipment Type<br>Equipment Code | Part 15 Spread Spectrum Transmitter<br>DSS  |
| FCC/IC Rule Parts                | CFR Title 47 FCC Part 15.247, ISED Canada RSS-247 Issue 2   |
| Test Dates                       | August 12 <sup>th</sup> to September 6 <sup>th</sup> , 2017   |
| Results                          | As detailed within this report  |
| Prepared by                      | <br>Zachary Johnson – Test Engineer        |
| Authorized by                    | <br>Yunus Faziloglu – Sr. EMC Engineer     |
| Issue Date                       | 11/9/2017   |
| Conditions of Issue              | This Test Report is issued subject to the conditions stated in the 'Conditions of Testing' section on page 15 of this report. |

Curtis-Straus LLC is accredited by the American Association for Laboratory Accreditation for the specific scope of accreditation under Certificate Number 1627-01. This report may contain data which is not covered by the A2LA accreditation.



Curtis-Straus LLC, a wholly owned subsidiary of BV CPS  
One Distribution Center Circle, #1 • Littleton, MA • TEL (978) 486-8880 • FAX (978) 486-8828



**Contents**

Contents.....2  
Summary.....3  
Test Methodology.....4  
Product Tested - Configuration Documentation .....5  
Statement of Conformity .....6  
Test Results .....7  
    Radiated Spurious Emissions .....7  
    AC Line Conducted Emissions.....13  
Measurement Uncertainty.....14  
Conditions Of Testing.....15  
Appendix A:.....17

Report REV Sep-08-2017 - YF



## Summary

This test report supports an application for certification of a transmitter operating pursuant to:  
CFR Title 47 FCC Part 15.247, ISSED Canada RSS-247 Issue 2

The product is the INFO3 CSM MY19 HIGH. It is a frequency hopping spread spectrum transmitter that operates in the 2402 – 2480 MHz frequency range.

Antenna Type: Single switching PCB trace antenna

| Frequency (MHz) | Efficiency (%) | Average Gain (dB) | Max Gain (dBi) |
|-----------------|----------------|-------------------|----------------|
| 2402            | 77,68          | -1,0969           | 4,5            |
| 2441            | 78,18          | -1,0690           | 4,89           |
| 2480            | 82,09          | -0,8571           | 5,78           |

Maximum Gain: 5.78 dBi

We found that the product met the above requirements without modification.

Test samples were received in good condition.

|           |                   |                  |
|-----------|-------------------|------------------|
| Issue No. | Reason for change | Date Issued      |
| 1         | Original Release  | November 9, 2017 |

page 3 of 46



Curtis-Straus LLC, a wholly owned subsidiary of BV CPS  
One Distribution Center Circle, #1 • Littleton, MA • TEL (978) 486-8880 • FAX (978) 486-8828



## ***Test Methodology***

All testing was performed according to the following rules/procedures/documents;  
CFR 47 Part 15.247, RSS-247 Issue 2, RSS-Gen Issue 4 and ANSI C63.10-2013.

Radiated emissions were maximized by varying the test antenna's height and polarity with the EUT in worst case orientation X (laying flat).

EUT operating voltage is 9-16V DC

The following bandwidths were used during radiated spurious and AC line conducted emissions testing.

| <b>Frequency</b> | <b>RBW</b> | <b>VBW</b> |
|------------------|------------|------------|
| 0.15-30MHz       | 9kHz       | 30kHz      |
| 30-1000MHz       | 120kHz     | 1MHz       |
| 1-25GHz          | 1MHz       | 3MHz       |

## Product Tested - Configuration Documentation

| EUT Configuration  |   |                |                    |                   |                 |                 |                   |               |                                      |
|--|---|----------------|--------------------|-------------------|-----------------|-----------------|-------------------|---------------|--------------------------------------|
| <b>Work Order:</b>   | R1905   |                |                    |                   |                 |                 |                   |               |                                      |
| <b>Company:</b>  | Harman International Industries, Incorporated |                |                    |                   |                 |                 |                   |               |                                      |
| <b>Company Address:</b>                                    | 30001 Cabot Drive                             |                |                    |                   |                 |                 |                   |               |                                      |
|  | Novi, MI, 48377                               |                |                    |                   |                 |                 |                   |               |                                      |
| <b>Contact:</b>  | Mark Bowman                                   |                |                    |                   |                 |                 |                   |               |                                      |
|  | MN  |                |                    | PN                |                 |                 | SN                |               |                                      |
| <b>EUT:</b>  | INFO3 CSM MY19 HIGH                           |                |                    | --                |                 |                 | Sample 1          |               |                                      |
| <b>EUT Description:</b>                                    | GM MY 19 – High Car Stereo                    |                |                    |                   |                 |                 |                   |               |                                      |
|  |   |                |                    |                   |                 |                 |                   |               |                                      |
| <b>Port Label</b>  | <b>Port Type</b>                              | <b># ports</b> | <b># populated</b> | <b>cable type</b> | <b>shielded</b> | <b>ferrites</b> | <b>length (m)</b> | <b>in/out</b> | <b>comment</b>                       |
| Antenna Ports  | other   | 4              | 0                  |                   |                 |                 |                   | in            | not used for permissive change test. |
| LVDS Harness   | other   | 1              | 1                  | other             | No              | No              | 1                 | in            |                                      |
| USB  | USB   | 2              | 2                  | USB               | No              | No              | 2                 | in            |                                      |
| Wiring Harness   | Power DC                                      | 2              | 2                  | other             | No              | No              | 2                 | in            |                                      |
| <b>Software Operating Mode Description:</b>                |   |                |                    |                   |                 |                 |                   |               |                                      |
| EUT runs an internal test mode that generates WIFI signal. |   |                |                    |                   |                 |                 |                   |               |                                      |

### Statement of Conformity

| RSS-GEN | RSP-100 | RSS 247 | Part 15          | Comments   |
|---------|---------|---------|------------------|--|
| 6.3     |         |         | 15.15(b)         | There are no controls accessible to the user that varies the output power to operate in violation of the regulatory requirements.  |
|         | 3.1     |         | 15.19            | The label is shown in the label exhibit.   |
|         | 4       |         | 15.21            | Information to the user is shown in the instruction manual exhibit.  |
|         |         |         | 15.27            | No special accessories are required for compliance.  |
| 3, 6.1  |         |         | 15.31            | The EUT was tested in accordance with the measurement standards in this section.   |
| 6.13    |         |         | 15.33            | Frequency range was investigated according to this section, unless noted in specific rule section under which the equipment operates.  |
| 8.1     |         |         | 15.35            | The EUT emissions were measured using the measurement detector and bandwidth specified in this section, unless noted in specific rule section under which the equipment operates.      |
| 8.3     |         |         | 15.203           | EUT employs single switching PCB trace antenna with 5.78dBi maximum gain   |
| 8.10    |         |         | 15.205<br>15.209 | The fundamental is not in a Restricted band and the spurious and harmonic emissions in the Restricted bands comply with the general emission limits of 15.209 or RSS-Gen as applicable |
| 8.8     |         |         | 15.207           | N/A. EUT is vehicle battery powered only.  |

Refer to Appendix A of this report for antenna port conducted measurements.

## Test Results

### Radiated Spurious Emissions

#### LIMITS

*Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).*

[15.247(d)]

### MEASUREMENTS / RESULTS

|   |                |                   |   |             |                            |                    |                    |
|---|----------------|-------------------|---|-------------|----------------------------|--------------------|--------------------|
| Curtis Straus - a Bureau Veritas Company      |                |                   |   |             |                            | Work Order - R1905 |                    |
| Radiated Emissions Electric Field 3m Distance |                |                   |   |             | EUT Power Input - 13.8V DC |                    |                    |
| 30-1000MHz Vertical Data                      |                |                   |   |             |                            | Test Site - CH1    |                    |
| Operator: CCH                                 |                |                   | Temp; Humid; Pres - 23.8°C; 33%RH; 1018mBar |             |                            |                    |                    |
| FCC High model MY19 BT CH 39                  |                |                   |   |             |                            |                    |                    |
|   |                |                   |   |             |                            |                    |                    |
| Frequency                                     | Raw QP Reading | Correction Factor | Adjusted QP Amplitude                       | Limit FCC B | Margin FCC B               | Test Results FCC B | Worst Margin FCC B |
| MHz   | (dBµV)         | (dB/m)            | (dBµV/m)                                    | (dBµV/m)    | (dB)                       | (Pass/Fail)        | (dB)               |
| 31.349  | 41             | -15.3             | 25.7  | 40          | -14.3                      | PASS               |                    |
| 37.068  | 44.6           | -19.6             | 25  | 40          | -15                        | PASS               |                    |
| 39.682  | 53.5           | -21.5             | 31.9  | 40          | -8.1                       | PASS               | -8.1               |
| 717.754                                       | 42             | -12.3             | 29.7  | 46          | -16.3                      | PASS               |                    |
| 848.138                                       | 43.6           | -10.7             | 33  | 46          | -13.1                      | PASS               |                    |
| 913.67  | 44.5           | -9                | 35.5  | 46          | -10.5                      | PASS               |                    |

|   |                |                   |   |             |                            |                    |                    |
|---|----------------|-------------------|---|-------------|----------------------------|--------------------|--------------------|
| Curtis Straus - a Bureau Veritas Company      |                |                   |   |             |                            | Work Order - R1905 |                    |
| Radiated Emissions Electric Field 3m Distance |                |                   |   |             | EUT Power Input - 13.8V DC |                    |                    |
| 30-1000MHz Horizontal Data                    |                |                   |   |             |                            | Test Site - CH1    |                    |
| Operator: CCH                                 |                |                   | Temp; Humid; Pres - 23.8°C; 33%RH; 1018mBar |             |                            |                    |                    |
| FCC High model MY19 BT CH 39                  |                |                   |   |             |                            |                    |                    |
|   |                |                   |   |             |                            |                    |                    |
| Frequency                                     | Raw QP Reading | Correction Factor | Adjusted QP Amplitude                       | Limit FCC B | Margin FCC B               | Test Results FCC B | Worst Margin FCC B |
| MHz   | (dBµV)         | (dB/m)            | (dBµV/m)                                    | (dBµV/m)    | (dB)                       | (Pass/Fail)        | (dB)               |
| 848.08  | 45.1           | -10.7             | 34.5  | 46          | -11.6                      | PASS               | -11.6              |
| 873.422                                       | 35.2           | -10.1             | 25.1  | 46          | -20.9                      | PASS               |                    |
| 873.987                                       | 37.5           | -10               | 27.4  | 46          | -18.6                      | PASS               |                    |
| 893.492                                       | 38.6           | -9.5              | 29.1  | 46          | -16.9                      | PASS               |                    |
| 913.686                                       | 43.3           | -9                | 34.3  | 46          | -11.8                      | PASS               |                    |
| 918.003                                       | 32.6           | -9.1              | 23.5  | 46          | -22.5                      | PASS               |                    |

### 30-1000MHz

|   |                  |                 |                   |                         |                        |            |             |              |           |            |   |                            |                  |
|---|------------------|-----------------|-------------------|-------------------------|------------------------|------------|-------------|--------------|-----------|------------|---|----------------------------|------------------|
| Curtis Straus - a Bureau Veritas Company      |                  |                 |                   |                         |                        |            |             |              |           |            |   | Work Order - R1905         |                  |
| Radiated Emissions Electric Field 3m Distance |                  |                 |                   |                         |                        |            |             |              |           |            |   | EUT Power Input - 13.8V DC |                  |
| 1-6GHz Vertical Data                          |                  |                 |                   |                         |                        |            |             |              |           |            |   | Test Site - CH1            |                  |
| Operator: CCH                                 |                  |                 |                   |                         |                        |            |             |              |           |            | Temp; Humid; Pres - 23.8°C; 33%RH; 1018mBar |                            |                  |
| FCC High model MY19 BT CH 0                   |                  |                 |                   |                         |                        |            |             |              |           |            |   |                            |                  |
| Frequency                                     | Raw Peak Reading | Raw Avg Reading | Correction Factor | Adjusted Peak Amplitude | Adjusted Avg Amplitude | Peak Limit | Peak Margin | Peak Results | Avg Limit | Avg Margin | Avg Results                                 | Worst Peak Margin          | Worst Avg Margin |
| MHz   | (dBµV)           | (dBµV)          | (dB/m)            | (dBµV/m)                | (dBµV/m)               | (dBµV/m)   | (dB)        | (Pass/Fail)  | (dBµV/m)  | (dB)       | (Pass/Fail)                                 | (dB)                       | (dB)             |
| 1330.6  | 31.5             | 23.5            | 12.1              | 43.6                    | 35.7                   | 74         | -30.4       | PASS         | 54        | -18.3      | PASS  |                            |                  |
| 5235  | 32.9             | 23.4            | 21.9              | 54.8                    | 45.3                   | 74         | -19.2       | PASS         | 54        | -8.7       | PASS  |                            |                  |
| 5723.9  | 33.1             | 24              | 23                | 56.1                    | 47                     | 74         | -17.8       | PASS         | 54        | -7         | PASS  | -17.8                      | -7               |

|   |                  |                 |                   |                         |                        |            |             |              |           |            |   |                            |                  |
|---|------------------|-----------------|-------------------|-------------------------|------------------------|------------|-------------|--------------|-----------|------------|---|----------------------------|------------------|
| Curtis Straus - a Bureau Veritas Company      |                  |                 |                   |                         |                        |            |             |              |           |            |   | Work Order - R1905         |                  |
| Radiated Emissions Electric Field 3m Distance |                  |                 |                   |                         |                        |            |             |              |           |            |   | EUT Power Input - 13.8V DC |                  |
| 1-6GHz Horizontal Data                        |                  |                 |                   |                         |                        |            |             |              |           |            |   | Test Site - CH1            |                  |
| Operator: CCH                                 |                  |                 |                   |                         |                        |            |             |              |           |            | Temp; Humid; Pres - 23.8°C; 33%RH; 1018mBar |                            |                  |
| FCC High model MY19 BT CH 0                   |                  |                 |                   |                         |                        |            |             |              |           |            |   |                            |                  |
| Frequency                                     | Raw Peak Reading | Raw Avg Reading | Correction Factor | Adjusted Peak Amplitude | Adjusted Avg Amplitude | Peak Limit | Peak Margin | Peak Results | Avg Limit | Avg Margin | Avg Results                                 | Worst Peak Margin          | Worst Avg Margin |
| MHz   | (dBµV)           | (dBµV)          | (dB/m)            | (dBµV/m)                | (dBµV/m)               | (dBµV/m)   | (dB)        | (Pass/Fail)  | (dBµV/m)  | (dB)       | (Pass/Fail)                                 | (dB)                       | (dB)             |
| 1423.4  | 32.2             | 23.6            | 12                | 44.3                    | 35.6                   | 74         | -29.7       | PASS         | 54        | -18.4      | PASS  |                            |                  |
| 5833.1  | 33.3             | 23.5            | 23                | 56.3                    | 46.4                   | 74         | -17.7       | PASS         | 54        | -7.5       | PASS  | -17.7                      | -7.5             |

### 1-6GHz Low Channel





**Test Report for Harman International Industries, Inc. • Report No. ER1905-7 • INFO3 CSM MY19 HIGH • November 9, 2017**

| Curtis Straus - a Bureau Veritas Company      |                  |                 |                   |                         |                        |            |             |              |           | Work Order - R1905                          |             |                   |                  |
|---|------------------|-----------------|-------------------|-------------------------|------------------------|------------|-------------|--------------|-----------|---|-------------|-------------------|------------------|
| Radiated Emissions Electric Field 3m Distance |                  |                 |                   |                         |                        |            |             |              |           | EUT Power Input - 13.8V DC                  |             |                   |                  |
| 1-6GHz Vertical Data                          |                  |                 |                   |                         |                        |            |             |              |           | Test Site - CH1                             |             |                   |                  |
| Operator: CCH                                 |                  |                 |                   |                         |                        |            |             |              |           | Temp; Humid; Pres - 23.8°C; 33%RH; 1018mBar |             |                   |                  |
| FCC High model MY19 BT CH 39                  |                  |                 |                   |                         |                        |            |             |              |           |   |             |                   |                  |
| Frequency                                     | Raw Peak Reading | Raw Avg Reading | Correction Factor | Adjusted Peak Amplitude | Adjusted Avg Amplitude | Peak Limit | Peak Margin | Peak Results | Avg Limit | Avg Margin                                  | Avg Results | Worst Peak Margin | Worst Avg Margin |
| MHz   | (dBμV)           | (dBμV)          | (dB/m)            | (dBμV/m)                | (dBμV/m)               | (dBμV/m)   | (dB)        | (Pass/Fail)  | (dBμV/m)  | (dB)  | (Pass/Fail) | (dB)              | (dB)             |
| 1400.4  | 31.5             | 23.2            | 12.3              | 43.8                    | 35.6                   | 74         | -30.2       | PASS         | 54        | -18.4                                       | PASS        |                   |                  |
| 5803.3  | 33.1             | 23.6            | 22.9              | 56                      | 46.5                   | 74         | -18         | PASS         | 54        | -7.5  | PASS        | -18               | -7.5             |

| Curtis Straus - a Bureau Veritas Company      |                  |                 |                   |                         |                        |            |             |              |           | Work Order - R1905                          |             |                   |                  |
|---|------------------|-----------------|-------------------|-------------------------|------------------------|------------|-------------|--------------|-----------|---|-------------|-------------------|------------------|
| Radiated Emissions Electric Field 3m Distance |                  |                 |                   |                         |                        |            |             |              |           | EUT Power Input - 13.8V DC                  |             |                   |                  |
| 1-6GHz Horizontal Data                        |                  |                 |                   |                         |                        |            |             |              |           | Test Site - CH1                             |             |                   |                  |
| Operator: CCH                                 |                  |                 |                   |                         |                        |            |             |              |           | Temp; Humid; Pres - 23.8°C; 33%RH; 1018mBar |             |                   |                  |
| FCC High model MY19 BT CH 39                  |                  |                 |                   |                         |                        |            |             |              |           |   |             |                   |                  |
| Frequency                                     | Raw Peak Reading | Raw Avg Reading | Correction Factor | Adjusted Peak Amplitude | Adjusted Avg Amplitude | Peak Limit | Peak Margin | Peak Results | Avg Limit | Avg Margin                                  | Avg Results | Worst Peak Margin | Worst Avg Margin |
| MHz   | (dBμV)           | (dBμV)          | (dB/m)            | (dBμV/m)                | (dBμV/m)               | (dBμV/m)   | (dB)        | (Pass/Fail)  | (dBμV/m)  | (dB)  | (Pass/Fail) | (dB)              | (dB)             |
| 1043.8  | 36.1             | 28.9            | 8.4               | 44.6                    | 37.3                   | 74         | -29.4       | PASS         | 54        | -16.6                                       | PASS        |                   |                  |
| 1391.4  | 33.4             | 23.1            | 12.4              | 45.8                    | 35.4                   | 74         | -28.2       | PASS         | 54        | -18.5                                       | PASS        |                   |                  |
| 5278.4  | 31.8             | 23              | 22.1              | 53.9                    | 45.2                   | 74         | -20.1       | PASS         | 54        | -8.8  | PASS        |                   |                  |
| 5802.3  | 33.8             | 23.6            | 22.9              | 56.7                    | 46.5                   | 74         | -17.3       | PASS         | 54        | -7.4  | PASS        | -17.3             | -7.4             |

**1-6GHz Center Channel**

| Curtis Straus - a Bureau Veritas Company      |                  |                 |                   |                         |                        |            |             |              |           | Work Order - R1905                          |             |                   |                  |
|---|------------------|-----------------|-------------------|-------------------------|------------------------|------------|-------------|--------------|-----------|---|-------------|-------------------|------------------|
| Radiated Emissions Electric Field 3m Distance |                  |                 |                   |                         |                        |            |             |              |           | EUT Power Input - 13.8V DC                  |             |                   |                  |
| 1-6GHz Vertical Data                          |                  |                 |                   |                         |                        |            |             |              |           | Test Site - CH1                             |             |                   |                  |
| Operator: CCH                                 |                  |                 |                   |                         |                        |            |             |              |           | Temp; Humid; Pres - 23.8°C; 33%RH; 1018mBar |             |                   |                  |
| FCC High model MY19 BT CH 78                  |                  |                 |                   |                         |                        |            |             |              |           |   |             |                   |                  |
| Frequency                                     | Raw Peak Reading | Raw Avg Reading | Correction Factor | Adjusted Peak Amplitude | Adjusted Avg Amplitude | Peak Limit | Peak Margin | Peak Results | Avg Limit | Avg Margin                                  | Avg Results | Worst Peak Margin | Worst Avg Margin |
| MHz   | (dBμV)           | (dBμV)          | (dB/m)            | (dBμV/m)                | (dBμV/m)               | (dBμV/m)   | (dB)        | (Pass/Fail)  | (dBμV/m)  | (dB)  | (Pass/Fail) | (dB)              | (dB)             |
| 1043.9  | 36.7             | 29.4            | 8.4               | 45.1                    | 37.9                   | 74         | -28.8       | PASS         | 54        | -16.1                                       | PASS        |                   |                  |
| 1341.6  | 32               | 23.4            | 12.2              | 44.2                    | 35.6                   | 74         | -29.8       | PASS         | 54        | -18.4                                       | PASS        |                   |                  |
| 3328.4  | 33.2             | 25.1            | 16.9              | 50.1                    | 42                     | 74         | -23.9       | PASS         | 54        | -12   | PASS        |                   |                  |
| 5950.4  | 33               | 24              | 23.2              | 56.2                    | 47.2                   | 74         | -17.8       | PASS         | 54        | -6.7  | PASS        | -17.8             | -6.7             |

| Curtis Straus - a Bureau Veritas Company      |                  |                 |                   |                         |                        |            |             |              |           | Work Order - R1905                          |             |                   |                  |
|---|------------------|-----------------|-------------------|-------------------------|------------------------|------------|-------------|--------------|-----------|---|-------------|-------------------|------------------|
| Radiated Emissions Electric Field 3m Distance |                  |                 |                   |                         |                        |            |             |              |           | EUT Power Input - 13.8V DC                  |             |                   |                  |
| 1-6GHz Horizontal Data                        |                  |                 |                   |                         |                        |            |             |              |           | Test Site - CH1                             |             |                   |                  |
| Operator: CCH                                 |                  |                 |                   |                         |                        |            |             |              |           | Temp; Humid; Pres - 23.8°C; 33%RH; 1018mBar |             |                   |                  |
| FCC High model MY19 BT CH 0                   |                  |                 |                   |                         |                        |            |             |              |           |   |             |                   |                  |
| Frequency                                     | Raw Peak Reading | Raw Avg Reading | Correction Factor | Adjusted Peak Amplitude | Adjusted Avg Amplitude | Peak Limit | Peak Margin | Peak Results | Avg Limit | Avg Margin                                  | Avg Results | Worst Peak Margin | Worst Avg Margin |
| MHz   | (dBμV)           | (dBμV)          | (dB/m)            | (dBμV/m)                | (dBμV/m)               | (dBμV/m)   | (dB)        | (Pass/Fail)  | (dBμV/m)  | (dB)  | (Pass/Fail) | (dB)              | (dB)             |
| 1305.2  | 33.3             | 23.7            | 12.2              | 45.5                    | 35.9                   | 74         | -28.5       | PASS         | 54        | -18.1                                       | PASS        |                   |                  |
| 5216.5  | 32.6             | 23.6            | 21.8              | 54.4                    | 45.4                   | 74         | -19.6       | PASS         | 54        | -8.6  | PASS        | -19.6             | -8.6             |
| 5248.5  | 31               | 23.3            | 22                | 53                      | 45.3                   | 74         | -21         | PASS         | 54        | -8.7  | PASS        |                   |                  |

**1-6GHz High Channel**



**Curtis-Straus LLC, a wholly owned subsidiary of BV CPS**  
**One Distribution Center Circle, #1 • Littleton, MA • TEL (978) 486-8880 • FAX (978) 486-8828**



**Test Report for Harman International Industries, Inc. • Report No. ER1905-7 • INFO3 CSM MY19 HIGH • November 9, 2017**

|   |                  |                 |                   |   |                        |            |             |                   |           |            |                  |                |             |                   |                  |  |  |
|---|------------------|-----------------|-------------------|---|------------------------|------------|-------------|-------------------|-----------|------------|------------------|----------------|-------------|-------------------|------------------|--|--|
| Curtis Straus - a Bureau Veritas Company      |                  |                 |                   | Work Order - R1905                          |                        |            |             |                   |           |            |                  |                |             |                   |                  |  |  |
| Radiated Emissions Electric Field 1m Distance |                  |                 |                   | EUT Power Input - 13.8V DC                  |                        |            |             |                   |           |            |                  |                |             |                   |                  |  |  |
| 6-18GHz Vertical Data                         |                  |                 |                   | Test Site - CH1                             |                        |            |             |                   |           |            |                  |                |             |                   |                  |  |  |
| Operator: CCH                                 |                  |                 |                   | Temp; Humid; Pres - 23.8°C; 33%RH; 1018mBar |                        |            |             |                   |           |            |                  |                |             |                   |                  |  |  |
| FCC High model MY19 BT CH 39                  |                  |                 |                   |   |                        |            |             |                   |           |            |                  |                |             |                   |                  |  |  |
|   |                  |                 |                   |   |                        |            |             |                   |           |            |                  |                |             |                   |                  |  |  |
| Frequency                                     | Raw Peak Reading | Raw Avg Reading | Correction Factor | Adjusted Peak Amplitude                     | Adjusted Avg Amplitude | Peak Limit | Peak Margin | Peak Test Results | Avg Limit | Avg Margin | Avg Test Results | Antenna Height | EUT Azimuth | Worst Peak Margin | Worst Avg Margin |  |  |
| MHz   | (dBμV)           | (dBμV)          | (dB/m)            | (dBμV/m)                                    | (dBμV/m)               | (dBμV/m)   | (dB)        | (Pass/Fail)       | (dBμV/m)  | (dB)       | (Pass/Fail)      | (cm)           | (degrees)   | (dB)              | (dB)             |  |  |
| 16416   | 28.9             | 20.9            | 33.1              | 62  | 53.9                   | 83.5       | -21.5       | PASS              | 63.5      | -9.6       | PASS             | 200            | 310         | -21.5             | -9.6             |  |  |
| Curtis Straus - a Bureau Veritas Company      |                  |                 |                   | Work Order - R1905                          |                        |            |             |                   |           |            |                  |                |             |                   |                  |  |  |
| Radiated Emissions Electric Field 1m Distance |                  |                 |                   | EUT Power Input - 13.8V DC                  |                        |            |             |                   |           |            |                  |                |             |                   |                  |  |  |
| 6-18GHz Horizontal Data                       |                  |                 |                   | Test Site - CH1                             |                        |            |             |                   |           |            |                  |                |             |                   |                  |  |  |
| Operator: CCH                                 |                  |                 |                   | Temp; Humid; Pres - 23.8°C; 33%RH; 1018mBar |                        |            |             |                   |           |            |                  |                |             |                   |                  |  |  |
| FCC High model MY19 BT CH 39                  |                  |                 |                   |   |                        |            |             |                   |           |            |                  |                |             |                   |                  |  |  |
|   |                  |                 |                   |   |                        |            |             |                   |           |            |                  |                |             |                   |                  |  |  |
| Frequency                                     | Raw Peak Reading | Raw Avg Reading | Correction Factor | Adjusted Peak Amplitude                     | Adjusted Avg Amplitude | Peak Limit | Peak Margin | Peak Test Results | Avg Limit | Avg Margin | Avg Test Results | Antenna Height | EUT Azimuth | Worst Peak Margin | Worst Avg Margin |  |  |
| MHz   | (dBμV)           | (dBμV)          | (dB/m)            | (dBμV/m)                                    | (dBμV/m)               | (dBμV/m)   | (dB)        | (Pass/Fail)       | (dBμV/m)  | (dB)       | (Pass/Fail)      | (cm)           | (degrees)   | (dB)              | (dB)             |  |  |
| 17894.2                                       | 28.9             | 19.9            | 34.7              | 63.5  | 54.5                   | 83.5       | -20         | PASS              | 63.5      | -9         | PASS             | 146            | 14          | -20               | -9               |  |  |

**6-18GHz**

**Radiated Emissions Table**

|  |                    |                        |                           |  |                          |                      |                                   |                                  |   |                |                       |                                      |                |                       |
|--|--------------------|------------------------|---------------------------|--|--------------------------|----------------------|-----------------------------------|----------------------------------|---|----------------|-----------------------|--------------------------------------|----------------|-----------------------|
| Date: 29-Aug-17  |                    |                        |                           | Company: Harman International Industries |                          |                      |                                   |                                  | Work Order: R1905                         |                |                       |                                      |                |                       |
| Engineer: Chris Hamel  |                    |                        |                           | EUT Desc: GM MY 19 - HIGH FCC            |                          |                      |                                   |                                  | EUT Operating Voltage/Frequency: 13.8V DC |                |                       |                                      |                |                       |
| Temp: 23.8°C   |                    |                        |                           | Humidity: 33%                            |                          |                      |                                   |                                  | Pressure: 1018mBar                        |                |                       |                                      |                |                       |
| Frequency Range: 18-25GHz  |                    |                        |                           |  |                          |                      |                                   | Measurement Distance: 0.1 m      |   |                |                       |                                      |                |                       |
| Notes: No Emissions Found.   |                    |                        |                           |  |                          |                      |                                   | EUT Max Freq:                    |   |                |                       |                                      |                |                       |
| Antenna Polarization<br>(H / V)  | Frequency<br>(MHz) | Peak Reading<br>(dBμV) | Average Reading<br>(dBμV) | Preamp Factor<br>(dB)                    | Antenna Factor<br>(dB/m) | Cable Factor<br>(dB) | Adjusted Peak Reading<br>(dBμV/m) | Adjusted Avg Reading<br>(dBμV/m) | FCC Class B High Frequency - Peak         |                |                       | FCC Class B High Frequency - Average |                |                       |
|  |                    |                        |                           |  |                          |                      |                                   |                                  | Limit<br>(dBμV/m)                         | Margin<br>(dB) | Result<br>(Pass/Fail) | Limit<br>(dBμV/m)                    | Margin<br>(dB) | Result<br>(Pass/Fail) |
|  |                    |                        |                           |  |                          |                      |                                   |                                  | No Emissions Found                        |                |                       |                                      |                |                       |
| Table Result:  |                    |                        |                           | Pass by --- dB                           |                          |                      |                                   |                                  | Worst Freq: --- MHz                       |                |                       |                                      |                |                       |
| Test Site: ---   |                    |                        |                           | Cable 1: Asset #2328                     |                          |                      |                                   |                                  | Cable 2: ---                              |                |                       | Cable 3: ---                         |                |                       |
| Analyzer: Brown  |                    |                        |                           | Preamp: 18-26.5GHz                       |                          |                      |                                   |                                  | Antenna: 18-26.5GHz Horn                  |                |                       | Preselector: ---                     |                |                       |
| CSsoft Radiated Emissions Calculator v 1.017.188                           |                    |                        |                           |  |                          |                      |                                   |                                  | Copyright Curtis-Siraus LLC 2000          |                |                       |                                      |                |                       |
| Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor |                    |                        |                           |  |                          |                      |                                   |                                  |   |                |                       |                                      |                |                       |

**18-25GHz**



Curtis-Straus LLC, a wholly owned subsidiary of BV CPS  
One Distribution Center Circle, #1 • Littleton, MA • TEL (978) 486-8880 • FAX (978) 486-8828



**Test Report for Harman International Industries, Inc. • Report No. ER1905-7 • INFO3 CSM MY19 HIGH • November 9, 2017**

**Test Equipment Used:**

|  |                 |                |                   |              |              |            |                        |                      |
|--|-----------------|----------------|-------------------|--------------|--------------|------------|------------------------|----------------------|
| Rev. 8/25/2017   |                 |                |                   |              |              |            |                        |                      |
| <b>Cables</b>  | <b>Range</b>    |                | <b>Mfr</b>        |              |              | <b>Cat</b> | <b>Calibration Due</b> | <b>Calibrated on</b> |
| Asset #2051  | 9kHz - 18GHz    |                | Florida RF        |              |              | II         | 3/5/2018               | 3/5/2017             |
| Asset #2054  | 9kHz - 18GHz    |                | Florida RF        |              |              | II         | 10/30/2017             | 10/30/2016           |
| <b>Spectrum Analyzers / Receivers/Preselectors</b>   | <b>Range</b>    | <b>MN</b>      | <b>Mfr</b>        | <b>SN</b>    | <b>Asset</b> | <b>Cat</b> | <b>Calibration Due</b> | <b>Calibrated on</b> |
| Rental MXE EMI Receiver(1170725)   | 20Hz-26.5GHz    | N9038A         | Agilent           | MY51210151   | 1170725      | I          | 12/22/2017             | 12/22/2016           |
| <b>Radiated Emissions Sites</b>  | <b>FCC Code</b> | <b>IC Code</b> | <b>VCCI Code</b>  | <b>Range</b> | <b>Asset</b> | <b>Cat</b> | <b>Calibration Due</b> | <b>Calibrated on</b> |
| EMI Chamber 1  | 719150          | 2762A-6        | A-0015            | 30-1000MHz   | 1685         | I          | 12/21/2018             | 12/21/2016           |
| EMI Chamber 1  | 719150          | 2762A-6        | A-0015            | 1-18GHz      | 1685         | I          | 12/21/2018             | 12/21/2016           |
| <b>Preamps/Couplers Attenuators / Filters</b>  | <b>Range</b>    | <b>MN</b>      | <b>Mfr</b>        | <b>SN</b>    | <b>Asset</b> | <b>Cat</b> | <b>Calibration Due</b> | <b>Calibrated on</b> |
| 2311 PA  | 1-1000MHz       | PAM-103        | COM-POWER         | 441175       | 2311         | II         | 2/4/2018               | 2/4/2017             |
| <b>Antennas</b>  | <b>Range</b>    | <b>MN</b>      | <b>Mfr</b>        | <b>SN</b>    | <b>Asset</b> | <b>Cat</b> | <b>Calibration Due</b> | <b>Calibrated on</b> |
| Red-Black Bilog  | 30-2000MHz      | JB1            | Sunol             | A091604-2    | 1106         | I          | 2/28/2019              | 2/28/2017            |
| <b>Meteorological Meters</b>   |                 | <b>MN</b>      | <b>Mfr</b>        | <b>SN</b>    | <b>Asset</b> | <b>Cat</b> | <b>Calibration Due</b> | <b>Calibrated on</b> |
| Weather Clock (Pressure Only)  |                 | BA928          | Oregon Scientific | C3166-1      | 831          | I          | 4/28/2018              | 4/28/2016            |
| TH A#2084  |                 | HTC-1          | HDE               |              | 2084         | II         | 3/23/2018              | 3/23/2017            |
| All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard. |                 |                |                   |              |              |            |                        |                      |

**30-1000MHz**

|  |                 |                |                   |              |              |            |                        |                      |
|--|-----------------|----------------|-------------------|--------------|--------------|------------|------------------------|----------------------|
| Rev. 8/25/2017   |                 |                |                   |              |              |            |                        |                      |
| <b>Cables</b>  | <b>Range</b>    |                | <b>Mfr</b>        |              |              | <b>Cat</b> | <b>Calibration Due</b> | <b>Calibrated on</b> |
| Asset #2051  | 9kHz - 18GHz    |                | Florida RF        |              |              | II         | 3/5/2018               | 3/5/2017             |
| Asset #2054  | 9kHz - 18GHz    |                | Florida RF        |              |              | II         | 10/30/2017             | 10/30/2016           |
| <b>Spectrum Analyzers / Receivers/Preselectors</b>   | <b>Range</b>    | <b>MN</b>      | <b>Mfr</b>        | <b>SN</b>    | <b>Asset</b> | <b>Cat</b> | <b>Calibration Due</b> | <b>Calibrated on</b> |
| Rental MXE EMI Receiver(1170725)   | 20Hz-26.5GHz    | N9038A         | Agilent           | MY51210151   | 1170725      | I          | 12/22/2017             | 12/22/2016           |
| <b>Radiated Emissions Sites</b>  | <b>FCC Code</b> | <b>IC Code</b> | <b>VCCI Code</b>  | <b>Range</b> | <b>Asset</b> | <b>Cat</b> | <b>Calibration Due</b> | <b>Calibrated on</b> |
| EMI Chamber 1  | 719150          | 2762A-6        | A-0015            | 30-1000MHz   | 1685         | I          | 12/21/2018             | 12/21/2016           |
| EMI Chamber 1  | 719150          | 2762A-6        | A-0015            | 1-18GHz      | 1685         | I          | 12/21/2018             | 12/21/2016           |
| <b>Preamps/Couplers Attenuators / Filters</b>  | <b>Range</b>    | <b>MN</b>      | <b>Mfr</b>        | <b>SN</b>    | <b>Asset</b> | <b>Cat</b> | <b>Calibration Due</b> | <b>Calibrated on</b> |
| 1517 HF Preamp   | 1-20GHz         | CS             | CS                | N/A          | 1517         | II         | 9/14/2017              | 8/14/2016            |
| <b>Antennas</b>  | <b>Range</b>    | <b>MN</b>      | <b>Mfr</b>        | <b>SN</b>    | <b>Asset</b> | <b>Cat</b> | <b>Calibration Due</b> | <b>Calibrated on</b> |
| Blue Horn  | 1-18Ghz         | 3117           | ETS               | 157647       | 1861         | I          | 2/14/2019              | 2/14/2017            |
| <b>Meteorological Meters</b>   |                 | <b>MN</b>      | <b>Mfr</b>        | <b>SN</b>    | <b>Asset</b> | <b>Cat</b> | <b>Calibration Due</b> | <b>Calibrated on</b> |
| Weather Clock (Pressure Only)  |                 | BA928          | Oregon Scientific | C3166-1      | 831          | I          | 4/28/2018              | 4/28/2016            |
| TH A#2084  |                 | HTC-1          | HDE               |              | 2084         | II         | 3/23/2018              | 3/23/2017            |
| All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard. |                 |                |                   |              |              |            |                        |                      |

**1-18GHz**

|  |                 |                       |                   |              |              |            |                        |                      |
|--|-----------------|-----------------------|-------------------|--------------|--------------|------------|------------------------|----------------------|
| Rev. 8/25/2017   |                 |                       |                   |              |              |            |                        |                      |
| <b>Spectrum Analyzers / Receivers/Preselectors</b>   | <b>Range</b>    | <b>MN</b>             | <b>Mfr</b>        | <b>SN</b>    | <b>Asset</b> | <b>Cat</b> | <b>Calibration Due</b> | <b>Calibrated on</b> |
| Brown  | 9kHz-26.5GHz    | E4407B                | Agilent           | SG44210511   | 1510         | I          | 7/26/2018              | 7/26/2017            |
| <b>Radiated Emissions Sites</b>  | <b>FCC Code</b> | <b>IC Code</b>        | <b>VCCI Code</b>  | <b>Range</b> | <b>Asset</b> | <b>Cat</b> | <b>Calibration Due</b> | <b>Calibrated on</b> |
| EMI Chamber 1  | 719150          | 2762A-6               | A-0015            | 30-1000MHz   | 1685         | I          | 12/21/2018             | 12/21/2016           |
| EMI Chamber 1  | 719150          | 2762A-6               | A-0015            | 1-18GHz      | 1685         | I          | 12/21/2018             | 12/21/2016           |
| <b>Preamps/Couplers Attenuators / Filters</b>  | <b>Range</b>    | <b>MN</b>             | <b>Mfr</b>        | <b>SN</b>    | <b>Asset</b> | <b>Cat</b> | <b>Calibration Due</b> | <b>Calibrated on</b> |
| HF (Yellow)  | 18-26.5GHz      | AFS4-18002650-60-8P-4 | CS                | 467559       | 1266         | II         | 9/16/2017              | 9/16/2016            |
| <b>Antennas</b>  | <b>Range</b>    | <b>MN</b>             | <b>Mfr</b>        | <b>SN</b>    | <b>Asset</b> | <b>Cat</b> | <b>Calibration Due</b> | <b>Calibrated on</b> |
| HF (White) Horn  | 18-26.5GHz      | 801-WLM               | Waveline          | 758          | 758          | III        | Verify before Use      | date of test         |
| <b>Meteorological Meters</b>   |                 | <b>MN</b>             | <b>Mfr</b>        | <b>SN</b>    | <b>Asset</b> | <b>Cat</b> | <b>Calibration Due</b> | <b>Calibrated on</b> |
| Weather Clock (Pressure Only)  |                 | BA928                 | Oregon Scientific | C3166-1      | 831          | I          | 4/28/2018              | 4/28/2016            |
| TH A#2084  |                 | HTC-1                 | HDE               |              | 2084         | II         | 3/23/2018              | 3/23/2017            |
| <b>Cables</b>  | <b>Range</b>    |                       | <b>Mfr</b>        |              |              | <b>Cat</b> | <b>Calibration Due</b> | <b>Calibrated on</b> |
| Asset #2328  | 1 - 26.5GHz     | PE350-72              | Pasternack        | 1539         |              | II         | 2/6/2018               | 2/6/2017             |
| All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard. |                 |                       |                   |              |              |            |                        |                      |

**18-25GHz**



**Curtis-Straus LLC, a wholly owned subsidiary of BV CPS**  
**One Distribution Center Circle, #1 • Littleton, MA • TEL (978) 486-8880 • FAX (978) 486-8828**



## Radiated Band Edge

| Radiated Emissions Table   |                    |                        |                           |                               |                          |                      |                                   |                                  |                                   |   |                       |                                      |                  |                       |  |  |
|--|--------------------|------------------------|---------------------------|-------------------------------|--------------------------|----------------------|-----------------------------------|----------------------------------|-----------------------------------|---|-----------------------|--------------------------------------|------------------|-----------------------|--|--|
| Date: 05-Sep-17  |                    |                        |                           | Company: Harman int.          |                          |                      |                                   |                                  |                                   | Work Order: R1905                         |                       |                                      |                  |                       |  |  |
| Engineer: Chris Hamel  |                    |                        |                           | EUT Desc: GM MY 19 - HIGH FCC |                          |                      |                                   |                                  |                                   | EUT Operating Voltage/Frequency: 13.8V DC |                       |                                      |                  |                       |  |  |
| Temp: 24.4°C   |                    |                        |                           | Humidity: 40%                 |                          |                      |                                   |                                  |                                   | Pressure: 1001mbar                        |                       |                                      |                  |                       |  |  |
| Frequency Range:   |                    |                        |                           |                               |                          |                      |                                   |                                  | Measurement Distance: 3 m         |   |                       |                                      |                  |                       |  |  |
| Notes: Band Edge BT mode DH5   |                    |                        |                           |                               |                          |                      |                                   |                                  | EUT Max Freq:                     |   |                       |                                      |                  |                       |  |  |
| Antenna Polarization<br>(H/ V)   | Frequency<br>(MHz) | Peak Reading<br>(dBμV) | Average Reading<br>(dBμV) | Preamp Factor<br>(dB)         | Antenna Factor<br>(dB/m) | Cable Factor<br>(dB) | Adjusted Peak Reading<br>(dBμV/m) | Adjusted Avg Reading<br>(dBμV/m) | FCC Class B High Frequency - Peak |   |                       | FCC Class B High Frequency - Average |                  |                       |  |  |
|  |                    |                        |                           |                               |                          |                      |                                   |                                  | Limit<br>(dBμV/m)                 | Margin<br>(dB)                            | Result<br>(Pass/Fail) | Limit<br>(dBμV/m)                    | Margin<br>(dB)   | Result<br>(Pass/Fail) |  |  |
| Fund V   | 2402.2             | 83.3                   |                           | ---                           | ---                      | ---                  | ---                               | ---                              | ---                               | ---                                       | ---                   | ---                                  | ---              | ---                   |  |  |
| Fund H   | 2402.1             | 81.64                  |                           | ---                           | ---                      | ---                  | ---                               | ---                              | ---                               | ---                                       | ---                   | ---                                  | ---              | ---                   |  |  |
| V  | 2390.0             | 34.05                  | 34.1                      | 20.8                          | 28.0                     | 3.2                  | 44.5                              | 44.5                             | 74.0                              | -29.5                                     | Pass                  | 54.0                                 | -9.5             | Pass                  |  |  |
| V  | 2310.0             | 33.78                  | 33.8                      | 20.8                          | 27.9                     | 3.2                  | 44.1                              | 44.1                             | 74.0                              | -29.9                                     | Pass                  | 54.0                                 | -9.9             | Pass                  |  |  |
|  |                    |                        |                           |                               |                          |                      |                                   |                                  |                                   |   |                       |                                      |                  |                       |  |  |
| Fund V   | 2480.04            | 83.25                  |                           | ---                           | ---                      | ---                  | ---                               | ---                              | ---                               | ---                                       | ---                   | ---                                  | ---              | ---                   |  |  |
| Fund H   | 2480.03            | 82.22                  |                           | ---                           | ---                      | ---                  | ---                               | ---                              | ---                               | ---                                       | ---                   | ---                                  | ---              | ---                   |  |  |
| V  | 2483.5             | 40.3                   | 26.1                      | 21.0                          | 28.2                     | 3.2                  | 50.7                              | 36.5                             | 74.0                              | -23.3                                     | Pass                  | 54.0                                 | -17.5            | Pass                  |  |  |
| V  | 2484.8             | 42.2                   | 26.0                      | 21.0                          | 28.2                     | 3.2                  | 52.6                              | 36.4                             | 74.0                              | -21.4                                     | Pass                  | 54.0                                 | -17.6            | Pass                  |  |  |
| Vpk  | 2500.0             | 34.4                   | 34.4                      | 21.1                          | 28.3                     | 3.2                  | 44.8                              | 44.8                             | 74.0                              | -29.2                                     | Pass                  | 54.0                                 | -9.2             | Pass                  |  |  |
| Table Result:  |                    |                        |                           | Pass                          |                          | by                   |                                   | -9.2 dB                          |                                   | Worst Freq:                               |                       |                                      |                  | 2500.0 MHz            |  |  |
| Test Site: EMI Chamber 1   |                    |                        |                           | Cable 1: Asset #2051          |                          |                      |                                   |                                  |                                   | Cable 2: Asset #2054                      |                       |                                      | Cable 3: ---     |                       |  |  |
| Analyzer: Rental SA#3  |                    |                        |                           | Preamp: Asset #1517           |                          |                      |                                   |                                  |                                   | Antenna: Orange Horn                      |                       |                                      | Preselector: --- |                       |  |  |
| CSsoft Radiated Emissions Calculator v 1.017.188                           |                    |                        |                           |                               |                          |                      |                                   |                                  |                                   |   |                       |                                      |                  |                       |  |  |
| Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor |                    |                        |                           |                               |                          |                      |                                   |                                  |                                   |   |                       |                                      |                  |                       |  |  |
| Copyright Curtis-Straus LLC 2000   |                    |                        |                           |                               |                          |                      |                                   |                                  |                                   |   |                       |                                      |                  |                       |  |  |

## AC Line Conducted Emissions LIMITS

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

\*Decreases with the logarithm of the frequency.

[47 CFR 15.207(a)]

## MEASUREMENTS / RESULTS

N/A. EUT is vehicle battery powered only.

## Measurement Uncertainty

The listed uncertainties are the worst case uncertainty for the entire range of measurement. Please note that the uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results.

| Measurement   | Expanded Uncertainty k=2 | Maximum allowable uncertainty |
|---|--------------------------|-------------------------------|
| Radiated Emissions (30-1000MHz)   | 5.6dB                    | N/A                           |
| NIST  | 4.6dB                    | 5.2dB (Ucisp)                 |
| CISPR   |                          |                               |
| Radiated Emissions (1-26.5GHz)  | 4.6dB                    | N/A                           |
| Radiated Emissions (above 26.5GHz)  | 4.9dB                    | N/A                           |
| Magnetic Radiated Emissions   | 5.6dB                    | N/A                           |
| Conducted Emissions   |                          |                               |
| NIST  | 3.9dB                    | N/A                           |
| CISPR   | 3.6dB                    | 3.6dB (Ucisp)                 |
| Telco Conducted Emissions (Current)   | 2.9dB                    | N/A                           |
| Telco Conducted Emissions (Voltage)   | 4.4dB                    | N/A                           |
| Electrostatic Discharge   | 11.5%                    | N/A                           |
| Radiated RF Immunity (Uniform Field)  | 1.6dB                    | N/A                           |
| Electrical Fast Transients  | 23.1%                    | N/A                           |
| Surge   | 23.1%                    | N/A                           |
| Conducted RF Immunity   | 3dB                      | N/A                           |
| Magnetic Immunity   | 12.8%                    | N/A                           |
| Dips and Interrupts   | 2.3V                     | N/A                           |
| Harmonics   | 3.5%                     | N/A                           |
| Flicker   | 3.5%                     | N/A                           |
| Radio frequency (@ 2.4GHz)  | $3.23 \times 10^{-8}$    | $1 \times 10^{-7}$            |
| RF power, conducted   | 0.40dB                   | 0.75dB                        |
| Maximum frequency deviation:  |                          |                               |
| • Within 300Hz and 6kHz of audio frequency / Within 6kHz and 25kHz of audio frequency | 3.4%                     | 5%                            |
|   | 0.3dB                    | 3dB                           |
| Adjacent channel power  | 1.9dB                    | 3dB                           |
| Conducted spurious emission of transmitter, valid up to 12.75GHz                      | 2.39dB                   | 3dB                           |
| Conducted emission of receivers   | 1.3dB                    | 3dB                           |
| Radiated emission of transmitter, valid up to 26.5GHz                                 | 3.9dB                    | 6dB                           |
| Radiated emission of transmitter, valid up to 80GHz                                   | 3.3dB                    | 6dB                           |
| Radiated emission of receiver, valid up to 26.5GHz                                    | 3.9dB                    | 6dB                           |
| Radiated emission of receiver, valid up to 80GHz                                      | 3.3dB                    | 6dB                           |
| Humidity  | 2.37%                    | 5%                            |
| Temperature   | 0.7°C                    | 1.0°C                         |
| Time  | 4.1%                     | 10%                           |
| RF Power Density, Conducted   | 0.4dB                    | 3dB                           |
| DC and low frequency voltages   | 1.3%                     | 3%                            |
| Voltage (AC, <10kHz)  | 1.3%                     | 2%                            |
| Voltage (DC)  | 0.62%                    | 1%                            |
| The above reflects a 95% confidence level   |                          |                               |



## Conditions Of Testing

[Bureau Veritas Consumer Products Services, Inc., a Massachusetts corporation], and/or its affiliates (collectively, the "Company") will conduct, at the request of the Submitter ("Client"), the tests specified on the submitted Test Request Form or equivalent in accordance with, and subject to, the following terms and conditions (collectively, "Conditions"):

1. All orders for tests are subject to acceptance by the Company, and no order will constitute a binding commitment of the Company unless and until such order is accepted by it, as evidenced by the issuance of a written report ("Test Report") by the Company. The Test Report is issued solely by the Company, is intended for the exclusive use of Client and shall not be published, used for advertising purposes, copied or replicated for distribution to any other person or entity or otherwise publicly disclosed without the prior written consent of the Company. By submitting a request for services to the Company, Client consents to the disclosure to accreditation bodies of those records of Client relevant to the accreditation body's assessment of the Company's competence and compliance with relevant accreditation criteria. The Company shall not be liable for any loss or damage whatsoever resulting from the failure of the Company to provide its services within any time period for completion estimated by the Company. If Client anticipates using the Test Report in any legal proceeding, arbitration, dispute resolution forum or other proceeding, it shall so notify the Company prior to submitting the Test Report in such proceeding. The Company has no obligation to provide a fact or expert witness at such proceeding unless the Company agrees in advance to do so for a separate and additional fee.
2. The Test Report will set forth the findings of the Company solely with respect to the test samples identified therein. Unless specifically and expressly indicated in the Test Report, the results set forth in such Test Report are not intended to be indicative or representative of the quality or characteristics of the lot from which a test sample is taken, and Client shall not rely upon the Test Report as being so indicative or representative of the lot or of the tested product in general. The Test Report will reflect the findings of the Company at the time of testing only, and the Company shall have no obligation to update the Test Report after its issuance. The Test Report will set forth the results of the tests performed by the Company based upon the written information provided to the Company. The Test Report will be based solely on the samples and written information submitted to the Company by Client, and the Company shall not be obligated to conduct any independent investigation or inquiry with respect thereto.
3. The Company may, in its sole discretion, destroy samples which have been furnished to the Company for testing and which have not been destroyed in the course of testing. The Company may delegate the performance of all or a portion of the services contemplated hereunder to an affiliate, agent or subcontractor of the Company, and Client consents to such delegation.
4. These Conditions and the Test Report represent the entire understanding of the parties hereto with respect to the subject matter hereof and of the Test Report, and no modification, variance or extrapolation with respect thereto shall be permitted without the prior written consent of the Company.
5. The names, service marks, trademarks and copyrights of the Company and its affiliates, including the names "BUREAU VERITAS," "BUREAU VERITAS CONSUMER PRODUCTS SERVICES," "BVCPS," "MTL," "ACTS," "MTL-ACTS" and CURTIS-STRAUS (collectively, the "Marks") are and shall remain the sole property of the Company or its affiliates and shall not be used by Client except solely to the extent that Client obtains the prior written approval of the Company and then only in the manner prescribed by the Company. Client shall not contest the validity of the Marks or take any action that might impair the value or goodwill associated with the Marks or the image or reputation of the Company or its affiliates.
6. Payment in full shall be due 30 days after the date of invoice. Interest shall be due on overdue amounts from the due date until paid at an interest rate of 1.5% per month or, if less, the maximum rate permitted by law. The Company reserves the right, at any time and from time to time, to revoke any credit extended to Client. Client shall reimburse the Company for any costs it incurs in collecting past due amounts, including court costs and fees and expenses of attorneys and collection agencies. The Test Report may not be used or relied upon by Client if and for so long as Client fails to pay when due any invoice issued by the Company or any affiliate of it to Client or any affiliate or subsidiary of Client together with interest and penalties, if any, accrued thereon.
7. The Company disclaims any and all responsibility or liability arising out of or in connection with e-mail transmissions of such information.
8. Client understands and agrees that the Company is neither an insurer nor a guarantor, that the Company does not take the place of Client or any designer, manufacturer, agent, buyer, distributor or transportation or shipping company, and that the Company disclaims all liability in such capacities. Client further understands that if it seeks assurance against loss or damage, it should obtain appropriate insurance.
9. Client agrees that the Company, by providing the services, does not take the place of Client nor any third party, nor does the Company release them from any of their obligations, nor does the Company otherwise assume, abridge, abrogate or undertake to discharge any duty of any third party to Client or any duty of Client or any third party to any other third party, and Client will not release any third party from its obligations and duties with respect to the tested goods.
10. Client shall, on a timely basis, (a) provide adequate instructions to the Company in order to enable the Company to perform properly its services, (b) provide, or cause Client's suppliers and contractors to provide, the Company with all documents necessary to enable the Company to perform its services, (c) furnish the Company with all relevant information regarding Client's intended use and purposes of the tested goods, (d) advise the Company of essential dates and deadlines relevant to the tested goods and (e) fully exercise all rights and remedies available to Client against third parties in respect of the tested goods.
11. The Company shall undertake due care and ordinary skill in the performance of its services to Client, and the Company shall accept responsibility only where such skill has not been exercised and, even in such event, only to the extent of the limitation of liability set forth herein.
12. If Client desires to assert a claim arising from or relating to (i) the performance, purported performance or non-performance of any services by the Company or (ii) the sale, resale, manufacture, distribution or use of any tested goods, it must submit that claim to the Company in a writing that sets forth with particularity the basis for such claim within 60 days from discovery of the potential claim and not more than six months after the date of issuance of the Test Report to Client. Client waives any and all such claims including, without limitation, claims that the Test Report is inaccurate, incomplete or misleading or that additional or different testing is required, unless and then only to the extent that Client submits a written claim to the Company within both such time periods.
13. CLIENT SHALL, EXCEPT TO THE EXTENT OF COMPANY'S LIABILITY TO CLIENT HEREUNDER (WHICH IN NO EVENT SHALL EXCEED THE LIMITATION OF LIABILITY HEREIN), HOLD HARMLESS AND INDEMNIFY THE COMPANY, ITS AFFILIATES AND THEIR RESPECTIVE DIRECTORS, OFFICERS, EMPLOYEES, AGENTS AND SUBCONTRACTORS AGAINST ALL ACTUAL OR ALLEGED THIRD PARTY CLAIMS FOR LOSS, DAMAGE OR EXPENSE OF WHATSOEVER NATURE AND HOWSOEVER ARISING FROM OR RELATING TO (i) THE PERFORMANCE, PURPORTED PERFORMANCE OR NON-PERFORMANCE OF ANY SERVICES BY THE COMPANY OR (ii) THE SALE, RESALE, MANUFACTURE, DISTRIBUTION OR USE OF ANY TESTED GOODS.
14. EXCEPT AS MAY OTHERWISE BE EXPRESSLY AGREED TO IN WRITING BY THE COMPANY AND NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN OR IN ANY TEST REPORT, NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, IS MADE.



15. (A) IN NO EVENT WHATSOEVER SHALL THE COMPANY BE LIABLE FOR ANY CONSEQUENTIAL, SPECIAL, INCIDENTAL, EXEMPLARY OR PUNITIVE DAMAGES IN CONNECTION WITH, RELATING TO OR ARISING OUT OF THE TEST REPORT OR THE SERVICES PROVIDED BY THE COMPANY HEREUNDER, INCLUDING WITHOUT LIMITATION LOSS OF OR DAMAGE TO PROPERTY; LOSS OF INCOME, PROFIT OR USE; OR ANY CLAIMS OR DEMANDS MADE AGAINST CLIENT OR ANY OTHER PERSON BY ANY THIRD PARTY IN CONNECTION WITH, RELATING TO OR ARISING OUT OF THE SERVICES PROVIDED BY THE COMPANY HEREUNDER.

(B) NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN, AND IN RECOGNITION OF THE RELATIVE RISKS AND BENEFITS TO CLIENT AND THE COMPANY ASSOCIATED WITH THE TESTING SERVICES CONTEMPLATED HEREBY, THE RISKS HAVE BEEN ALLOCATED SUCH THAT UNDER NO CIRCUMSTANCES WHATSOEVER SHALL THE LIABILITY OF THE COMPANY TO CLIENT OR ANY THIRD PARTY IN RESPECT OF ANY CLAIM FOR LOSS, DAMAGE OR EXPENSE, OF WHATSOEVER NATURE OR MAGNITUDE, AND HOWSOEVER ARISING, EXCEED AN AMOUNT EQUAL TO FIVE (5) TIMES THE AMOUNT OF THE FEES PAID TO THE COMPANY FOR THE SPECIFIC SERVICES WHICH GAVE RISE TO SUCH CLAIM OR U.S.\$10,000, WHICHEVER IS THE LESSER AMOUNT.

16. The Company shall not be liable for any loss or damage resulting from any delay or failure in performance of its obligations hereunder resulting directly or indirectly from any event of force majeure or any event outside the control of the Company. If any such event occurs, the Company may immediately cancel or suspend its performance hereunder without incurring any liability whatsoever to Client.

17. Company's services, including these Conditions, shall be governed by, and construed in accordance with, the local laws of the country where the Company performs the tests or, in the case of tests performed in the United States of America, the laws of Massachusetts without regard to conflicts of laws principles. If any aspect(s) of these Conditions is found to be illegal or unenforceable, the validity, legality and enforceability of all remaining aspects of these Conditions shall not in any way be affected or impaired thereby. Any proceeding related to the subject matter hereof shall be brought, if at all, in the courts of the country where the Company performs the tests or, in the case of tests performed in the United States of America, in the courts of Massachusetts. Client waives the right to interpose any counterclaim or setoffs of any nature in any litigation arising hereunder.

The complete list of the Approved Subcontractors Curtis-Straus may use to delegate the performance of work can be provided upon request.  
Rev.160009121(2)\_#684340 v14CS





## Appendix A:

### ER1905-7 Appendix A CFR Title 47 FCC Part §15.247 and ISSED Canada RSS-247 Issue 2

#### DUT Information

DUT Name: MY19 HIGH  
Manufacturer: Harman International Industries, Inc.  
Serial Number: 016

#### Frequencies

|                     |                     |                     |
|---------------------|---------------------|---------------------|
| BT CH 0 (2402 MHz)  |                     |                     |
| BT CH 1 (2403 MHz)  | BT CH 2 (2404 MHz)  | BT CH 3 (2405 MHz)  |
| BT CH 4 (2406 MHz)  | BT CH 5 (2407 MHz)  | BT CH 6 (2408 MHz)  |
| BT CH 7 (2409 MHz)  | BT CH 8 (2410 MHz)  | BT CH 9 (2411 MHz)  |
| BT CH 10 (2412 MHz) | BT CH 11 (2413 MHz) | BT CH 12 (2414 MHz) |
| BT CH 13 (2415 MHz) | BT CH 14 (2416 MHz) | BT CH 15 (2417 MHz) |
| BT CH 16 (2418 MHz) | BT CH 17 (2419 MHz) | BT CH 18 (2420 MHz) |
| BT CH 19 (2421 MHz) | BT CH 20 (2422 MHz) | BT CH 21 (2423 MHz) |
| BT CH 22 (2424 MHz) | BT CH 23 (2425 MHz) | BT CH 24 (2426 MHz) |
| BT CH 25 (2427 MHz) | BT CH 26 (2428 MHz) | BT CH 27 (2429 MHz) |
| BT CH 28 (2430 MHz) | BT CH 29 (2431 MHz) | BT CH 30 (2432 MHz) |
| BT CH 31 (2433 MHz) | BT CH 32 (2434 MHz) | BT CH 33 (2435 MHz) |
| BT CH 34 (2436 MHz) | BT CH 35 (2437 MHz) | BT CH 36 (2438 MHz) |
| BT CH 37 (2439 MHz) | BT CH 38 (2440 MHz) | BT CH 39 (2441 MHz) |
| BT CH 40 (2442 MHz) | BT CH 41 (2443 MHz) | BT CH 42 (2444 MHz) |
| BT CH 43 (2445 MHz) | BT CH 44 (2446 MHz) | BT CH 45 (2447 MHz) |
| BT CH 46 (2448 MHz) | BT CH 47 (2449 MHz) | BT CH 48 (2450 MHz) |
| BT CH 49 (2451 MHz) | BT CH 50 (2452 MHz) | BT CH 51 (2453 MHz) |
| BT CH 52 (2454 MHz) | BT CH 53 (2455 MHz) | BT CH 54 (2456 MHz) |
| BT CH 55 (2457 MHz) | BT CH 56 (2458 MHz) | BT CH 57 (2459 MHz) |
| BT CH 58 (2460 MHz) | BT CH 59 (2461 MHz) | BT CH 60 (2462 MHz) |
| BT CH 61 (2463 MHz) | BT CH 62 (2464 MHz) | BT CH 63 (2465 MHz) |
| BT CH 64 (2466 MHz) | BT CH 65 (2467 MHz) | BT CH 66 (2468 MHz) |
| BT CH 67 (2469 MHz) | BT CH 68 (2470 MHz) | BT CH 69 (2471 MHz) |
| BT CH 70 (2472 MHz) | BT CH 71 (2473 MHz) | BT CH 72 (2474 MHz) |
| BT CH 73 (2475 MHz) | BT CH 74 (2476 MHz) | BT CH 75 (2477 MHz) |
| BT CH 76 (2478 MHz) | BT CH 77 (2479 MHz) | BT CH 78 (2480 MHz) |

#### DUT Settings

No. of transmission chains: 1  
Equipment Type: Frequency Hopping Spread Spectrum

#### Antenna Gain

| Frequency (MHz) | Efficiency (%) | Average Gain (dB) | Max Gain (dBi) |
|-----------------|----------------|-------------------|----------------|
| 2402            | 77,68          | -1,0969           | 4,5            |
| 2441            | 78,18          | -1,0690           | 4,89           |
| 2480            | 82,09          | -0,8571           | 5,78           |



**Test Equipment Used:**

| Spectrum Analyzers / Receivers / Preselectors | Range        | MN        | Mfr             | SN        | Asset        | Cat        | Calibration Due        | Calibrated on        |
|---|--------------|-----------|-----------------|-----------|--------------|------------|------------------------|----------------------|
| FSV40 Signal Generator                        | 10Hz-40GHz   | FSV40     | ROHDE & SCHWARZ | 101551    | 2200         | I          | 6/30/2018              | 6/30/2017            |
| <b>Signal Generators</b>                      | <b>Range</b> | <b>MN</b> | <b>Mfr</b>      | <b>SN</b> | <b>Asset</b> | <b>Cat</b> | <b>Calibration Due</b> | <b>Calibrated on</b> |
| SMBV100A Vector Signal Generator              | 9KHz-6GHz    | SMBV100A  | ROHDE & SCHWARZ | 261919    | 2201         | I          | 6/26/2018              | 6/26/2017            |
| SMB100A Signal Generator                      | 100kHz-40GHz | SMB100A   | ROHDE & SCHWARZ | 179846    | 2434         | I          | 5/30/2018              | 5/30/2017            |
| R&S@OSP120 with R&S@OSP-B157                  | 30MHz-18GHz  | OSP120    | ROHDE & SCHWARZ | 101674    |              | I          | 6/1/2018               | 6/1/2017             |
| <b>Cables</b>                                 | <b>Range</b> |           | <b>Mfr</b>      |           |              | <b>Cat</b> | <b>Calibration Due</b> | <b>Calibrated on</b> |
| Asset #2052                                   | 9kHz - 18GHz |           | Florida RF      |           |              | II         | 3/5/2018               | 3/5/2017             |
| DUT1  | 30MHz-26GHz  |           | Micro-Coax      |           |              | II         | 6/21/2018              | 6/21/2017            |
| <b>Attenuators</b>                            | <b>Range</b> | <b>MN</b> | <b>Mfr</b>      | <b>SN</b> | <b>Asset</b> | <b>Cat</b> | <b>Calibration Due</b> | <b>Calibrated on</b> |
| 10dB Attenuator-01 Brown                      | 30MHz-26GHz  |           | Mini Curcuits   |           |              | II         | 7/13/2018              | 7/14/2017            |
| 10dB Attenuator-02 Yellow                     | 30MHz-26GHz  |           | Mini Curcuits   |           |              | II         | 7/13/2018              | 7/14/2017            |
| <b>Wideband Radio Communication Tester</b>    | <b>Range</b> | <b>MN</b> | <b>Mfr</b>      | <b>SN</b> | <b>Asset</b> | <b>Cat</b> | <b>Calibration Due</b> | <b>Calibrated on</b> |
| (Rental)CMW500                                | DC to 6GHz   | CMW500    | ROHDE & SCHWARZ | 155905    |              | I          | 6/2/2018               | 6/2/2017             |

## Summary

| Test                         | Frequency (MHz)    | DH1 Result | DH3 Result | DH5 Result | 2-DH1 Result | 2-DH3 Result | 2-DH5 Result | 3-DH1 Result | 3-DH3 Result | 3-DH5 Result |
|------------------------------|--------------------|------------|------------|------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Hopping Frequencies          | --- (hopping)      | PASS       | PASS       | PASS       | PASS         | PASS         | PASS         | PASS         | PASS         | PASS         |
| Band Edge (during hopping)   | --- (hopping)      | PASS       | PASS       | PASS       | PASS         | PASS         | PASS         | PASS         | PASS         | PASS         |
| Carrier Frequency Separation | 2402.000 (hopping) | PASS       | PASS       | PASS       | PASS         | PASS         | PASS         | PASS         | PASS         | PASS         |
| Carrier Frequency Separation | 2480.000 (hopping) | PASS       | PASS       | PASS       | PASS         | PASS         | PASS         | PASS         | PASS         | PASS         |
| Time of Channel Occupancy    | 2402.000 (hopping) | PASS       | PASS       | PASS       | PASS         | PASS         | PASS         | PASS         | PASS         | PASS         |
| Time of Channel Occupancy    | 2441.000 (hopping) | PASS       | PASS       | PASS       | PASS         | PASS         | PASS         | PASS         | PASS         | PASS         |
| Time of Channel Occupancy    | 2480.000 (hopping) | PASS       | PASS       | PASS       | PASS         | PASS         | PASS         | PASS         | PASS         | PASS         |
| Emission Bandwidth 20 dB     | 2402.000 (single)  | PASS       | PASS       | PASS       | PASS         | PASS         | PASS         | PASS         | PASS         | PASS         |
| Band Edge low                | 2402.000 (single)  | PASS       | PASS       | PASS       | PASS         | PASS         | PASS         | PASS         | PASS         | PASS         |
| Peak output power            | 2402.000 (single)  | PASS       | PASS       | PASS       | PASS         | PASS         | PASS         | PASS         | PASS         | PASS         |
| Conducted Spurious Emissions | 2402.000 (single)  | PASS       | PASS       | PASS       | PASS         | PASS         | PASS         | PASS         | PASS         | PASS         |
| Emission Bandwidth 20 dB     | 2441.000 (single)  | PASS       | PASS       | PASS       | PASS         | PASS         | PASS         | PASS         | PASS         | PASS         |
| Peak output power            | 2441.000 (single)  | PASS       | PASS       | PASS       | PASS         | PASS         | PASS         | PASS         | PASS         | PASS         |
| Conducted Spurious Emissions | 2441.000 (single)  | PASS       | PASS       | PASS       | PASS         | PASS         | PASS         | PASS         | PASS         | PASS         |
| Emission Bandwidth 20 dB     | 2480.000 (single)  | PASS       | PASS       | PASS       | PASS         | PASS         | PASS         | PASS         | PASS         | PASS         |
| Band Edge high               | 2480.000 (single)  | PASS       | PASS       | PASS       | PASS         | PASS         | PASS         | PASS         | PASS         | PASS         |
| Peak output power            | 2480.000 (single)  | PASS       | PASS       | PASS       | PASS         | PASS         | PASS         | PASS         | PASS         | PASS         |
| Conducted Spurious Emissions | 2480.000 (single)  | PASS       | PASS       | PASS       | PASS         | PASS         | PASS         | PASS         | PASS         | PASS         |



BUREAU  
VERITAS

Curtis-Straus LLC, a wholly owned subsidiary of BV CPS  
One Distribution Center Circle, #1 • Littleton, MA • TEL (978) 486-8880 • FAX (978) 486-8828



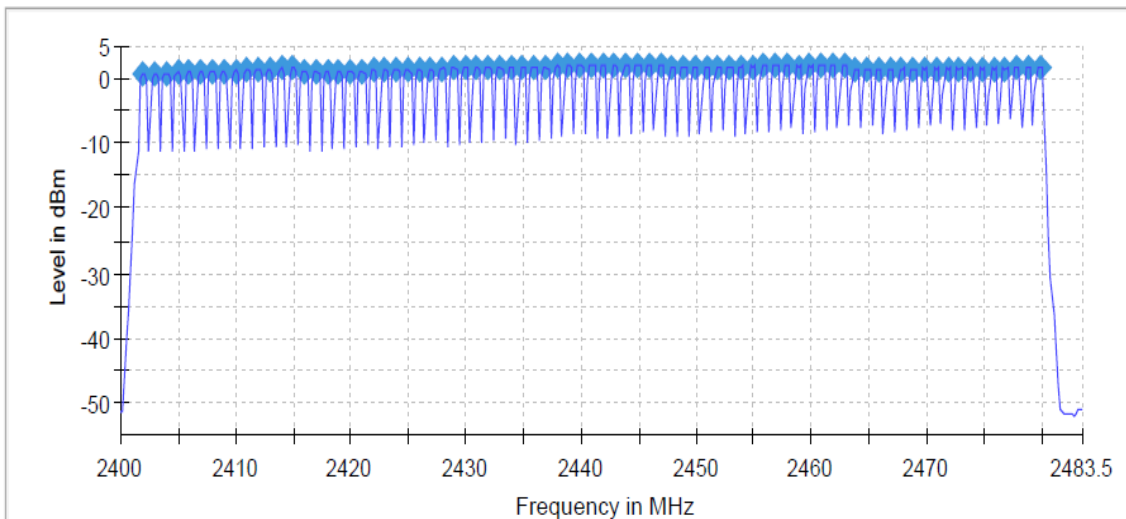
## Number of Hopping Frequencies

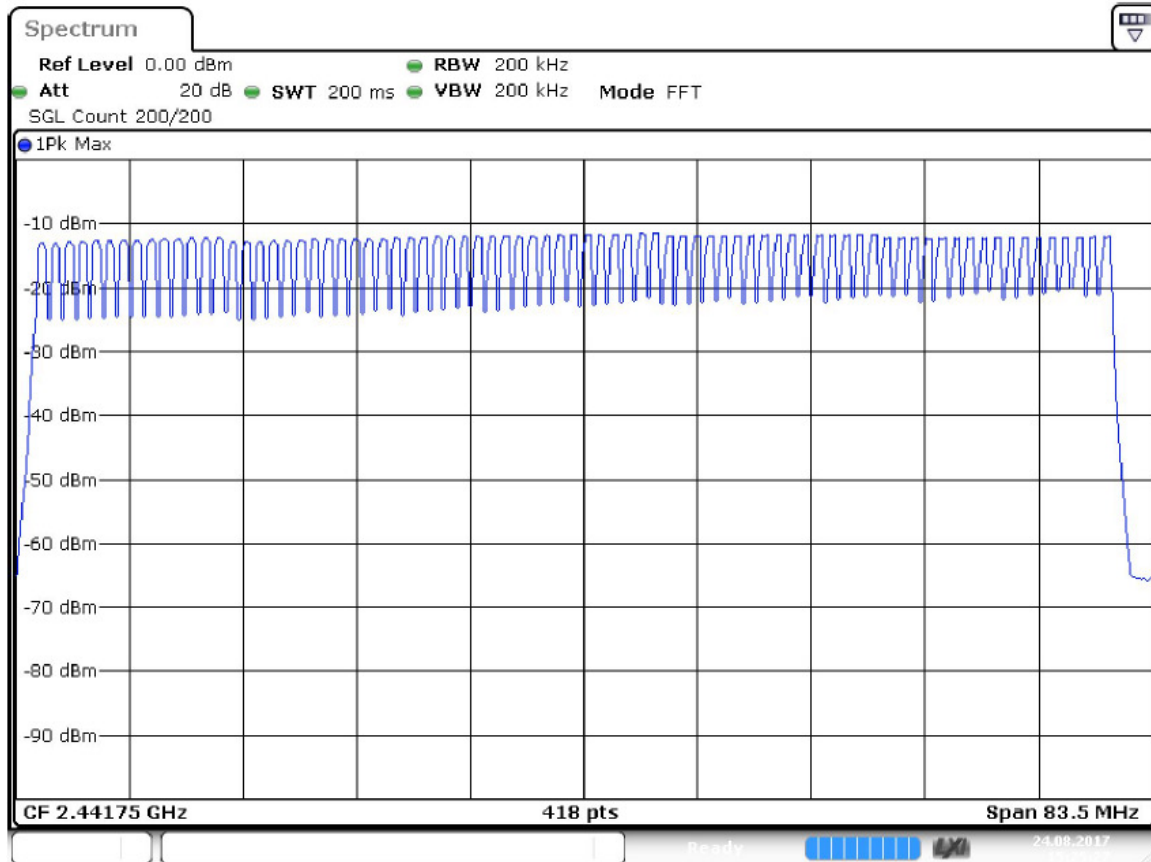
Test procedure in accordance with ANSI C63.10-2013

### Channels

| Channels | Limit Min | Result |
|----------|-----------|--------|
| 79       | 15        | PASS   |

Sequence





## Band Edge (during hopping)

Test procedure in accordance with ANSI C63.10-2013

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 0.8 dB

### Inband Peak

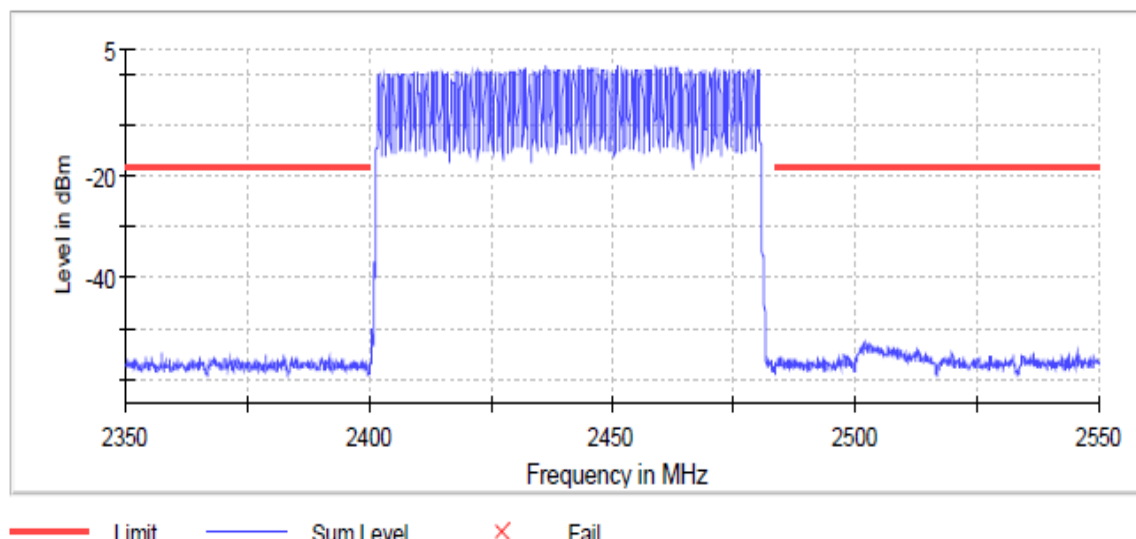
| Data Rate | Frequency (MHz) | Level (dBm) |
|-----------|-----------------|-------------|
| DH1       | 2447.100725     | 1.8         |
| DH3       | 2462.946763     | 1.6         |
| DH5       | 2443.101725     | 2.0         |
| 2-DH1     | 2445.951012     | -1.7        |
| 2-DH3     | 2441.952012     | -2.0        |
| 2-DH5     | 2431.104724     | -1.7        |
| 3-DH1     | 2444.801300     | -1.6        |
| 3-DH3     | 2430.104974     | -1.5        |
| 3-DH5     | 2442.101975     | -1.7        |

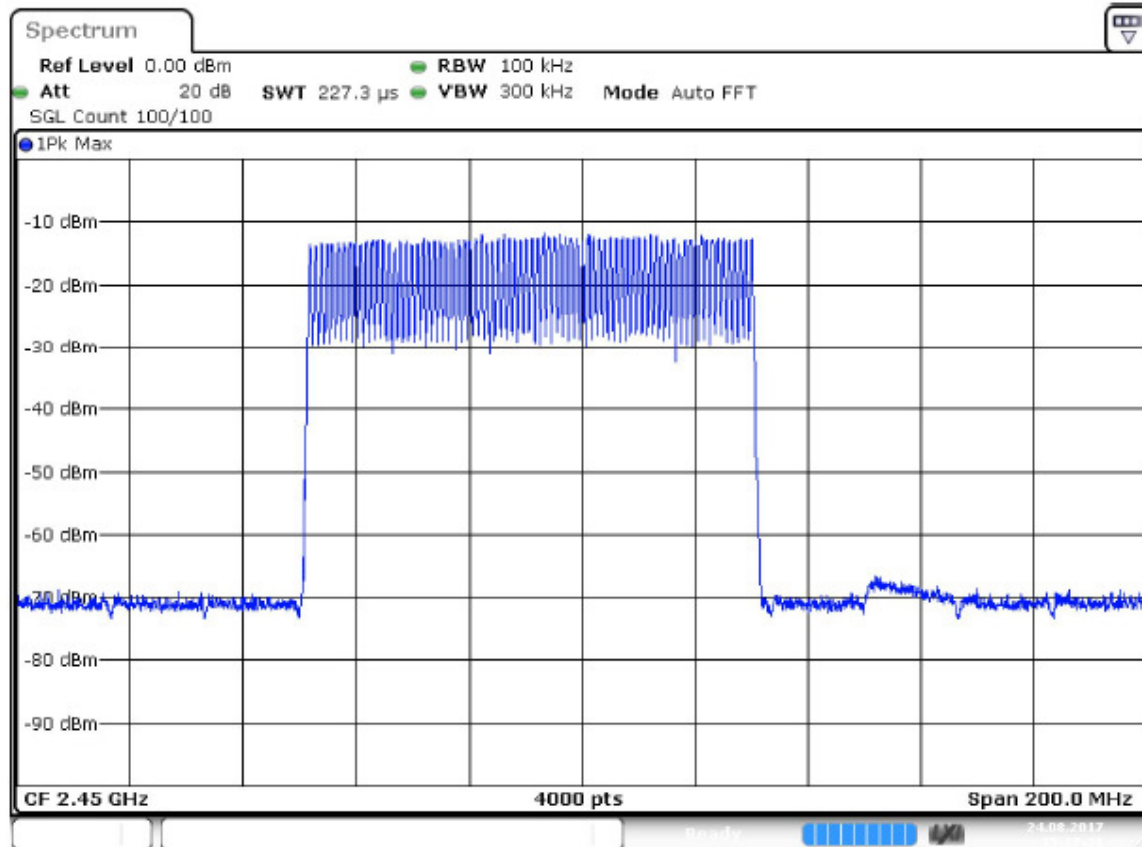
Plots for packet type DH5 shown below.

### Measurements

| Frequency (MHz) | Level (dBm) | Margin (dB) | Limit (dBm) | Result |
|-----------------|-------------|-------------|-------------|--------|
| 2501.787053     | -52.7       | 34.7        | -18.0       | PASS   |
| 2501.837041     | -52.9       | 34.9        | -18.0       | PASS   |
| 2502.036991     | -53.0       | 34.9        | -18.0       | PASS   |
| 2501.737066     | -53.0       | 35.0        | -18.0       | PASS   |
| 2502.936766     | -53.0       | 35.0        | -18.0       | PASS   |
| 2501.987003     | -53.0       | 35.0        | -18.0       | PASS   |
| 2502.886778     | -53.1       | 35.1        | -18.0       | PASS   |
| 2501.937016     | -53.3       | 35.3        | -18.0       | PASS   |
| 2502.236941     | -53.4       | 35.3        | -18.0       | PASS   |
| 2502.586853     | -53.6       | 35.6        | -18.0       | PASS   |
| 2506.435891     | -53.7       | 35.7        | -18.0       | PASS   |
| 2506.485879     | -53.7       | 35.7        | -18.0       | PASS   |
| 2501.337166     | -53.7       | 35.7        | -18.0       | PASS   |
| 2502.286928     | -53.8       | 35.8        | -18.0       | PASS   |
| 2504.386403     | -53.8       | 35.8        | -18.0       | PASS   |

Band Edge





## Carrier Frequency Separation

Test procedure in accordance with ANSI C63.10-2013

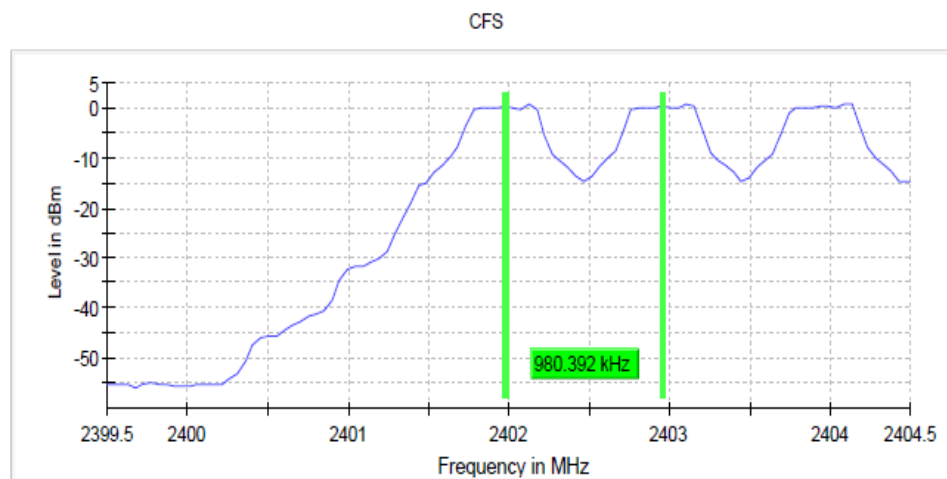
Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty(k = 2) < 1%

### 2402 MHz

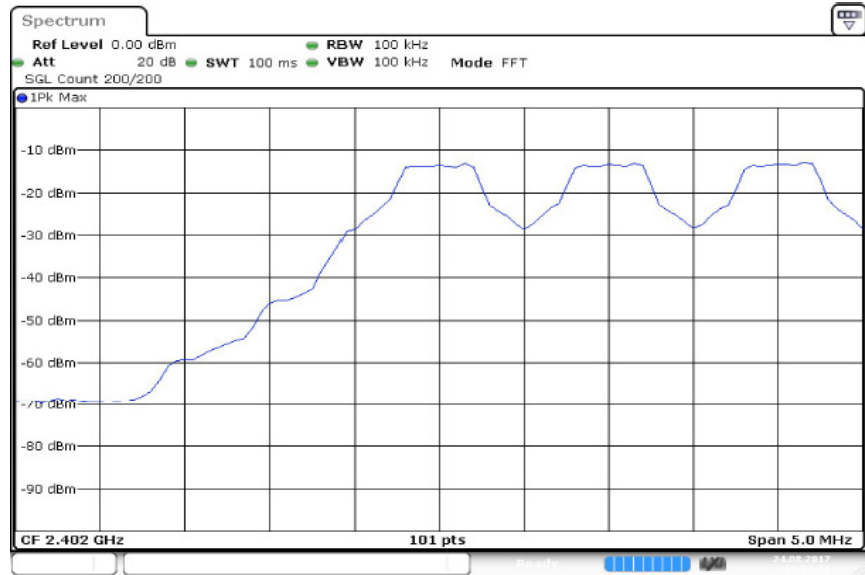
Limit is 2/3 of the widest 20dB bandwidth measured for worst case.

| Packet Type | DUT Frequency (MHz) | Frequency Separation (MHz) | Minimum Limit (MHz) | Result |
|-------------|---------------------|----------------------------|---------------------|--------|
| DH1         | 2402.000000         | 0.980392                   | 0.921569            | PASS   |
| DH3         | 2402.000000         | 0.980392                   | 0.921569            | PASS   |
| DH5         | 2402.000000         | 0.980392                   | 0.921569            | PASS   |
| 2-DH1       | 2402.000000         | 0.980392                   | 0.921569            | PASS   |
| 2-DH3       | 2402.000000         | 0.980393                   | 0.921569            | PASS   |
| 2-DH5       | 2402.000000         | 0.980392                   | 0.921569            | PASS   |
| 3-DH1       | 2402.000000         | 0.980392                   | 0.921569            | PASS   |
| 3-DH3       | 2402.000000         | 0.980392                   | 0.921569            | PASS   |
| 3-DH5       | 2402.000000         | 0.931373                   | 0.921569            | PASS   |

Plots for packet type DH5 shown below.





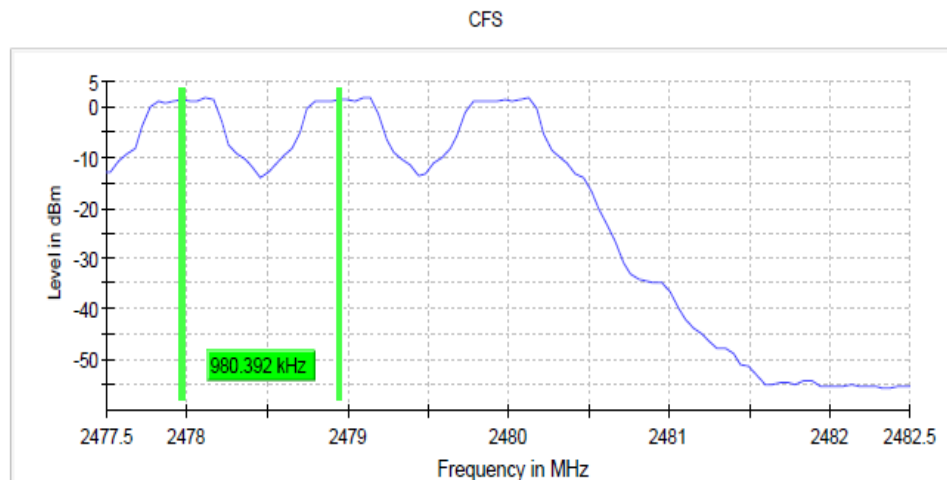


## 2480 MHz

Limit is 2/3 of the widest 20dB bandwidth measured for worst case.

| Packet Type | DUT Frequency (MHz) | Frequency Separation (MHz) | Minimum Limit (MHz) | Result |
|-------------|---------------------|----------------------------|---------------------|--------|
| DH1         | 2480.000000         | 0.980392                   | 0.921569            | PASS   |
| DH3         | 2480.000000         | 0.980392                   | 0.921569            | PASS   |
| DH5         | 2480.000000         | 0.980392                   | 0.921569            | PASS   |
| 2-DH1       | 2480.000000         | 0.980392                   | 0.921569            | PASS   |
| 2-DH3       | 2480.000000         | 0.980392                   | 0.921569            | PASS   |
| 2-DH5       | 2480.000000         | 0.980392                   | 0.921569            | PASS   |
| 3-DH1       | 2480.000000         | 0.980392                   | 0.921569            | PASS   |
| 3-DH3       | 2480.000000         | 0.980392                   | 0.921569            | PASS   |
| 3-DH5       | 2480.000000         | 0.980392                   | 0.921569            | PASS   |

Plots for packet type DH5 shown below.



## Time of Channel Occupancy (Dwell Time)

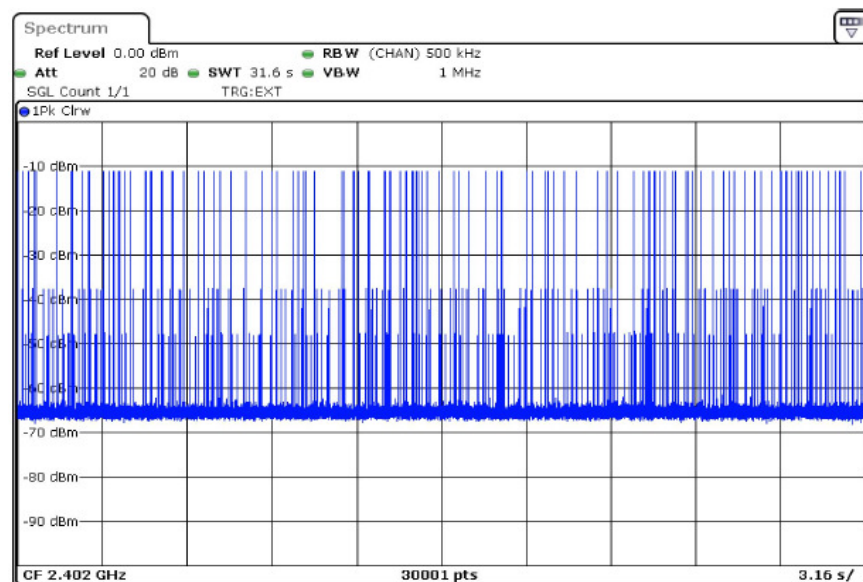
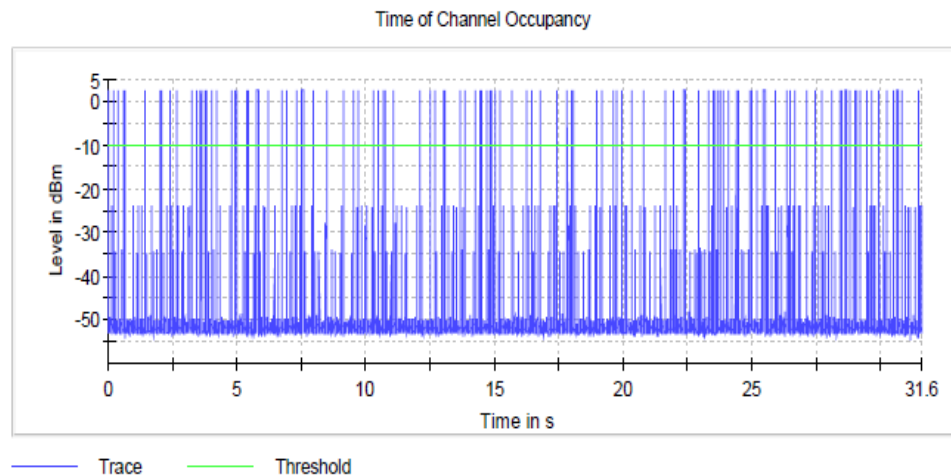
Test procedure in accordance with ANSI C63.10-2013

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 1%

### 2402 MHz

| Data Rate | Time (ms) | Limit Max (ms) | Result |
|-----------|-----------|----------------|--------|
| DH1       | 123.150   | 400.000        | PASS   |
| DH3       | 239.410   | 400.000        | PASS   |
| DH5       | 326.370   | 400.000        | PASS   |
| 2-DH1     | 104.860   | 400.000        | PASS   |
| 2-DH3     | 197.500   | 400.000        | PASS   |
| 2-DH5     | 244.210   | 400.000        | PASS   |
| 3-DH1     | 103.780   | 400.000        | PASS   |
| 3-DH3     | 191.030   | 400.000        | PASS   |
| 3-DH5     | 208.260   | 400.000        | PASS   |

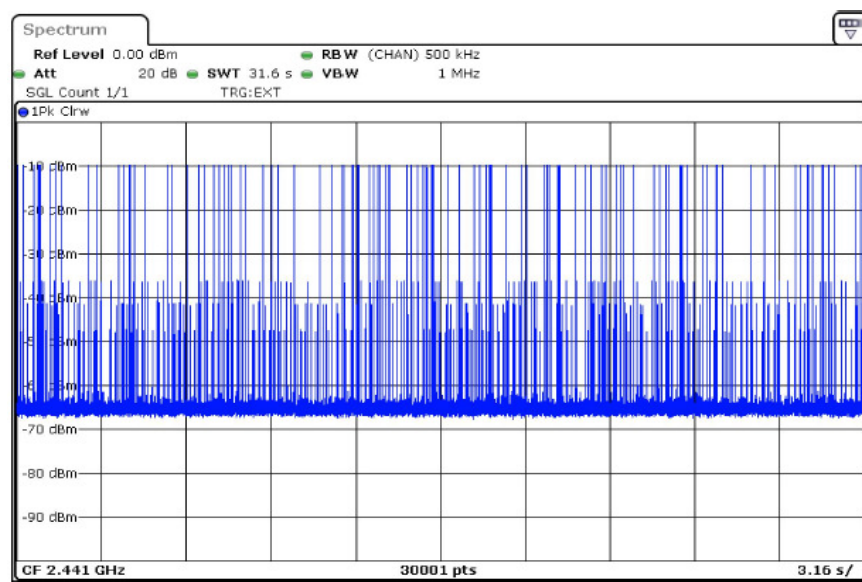
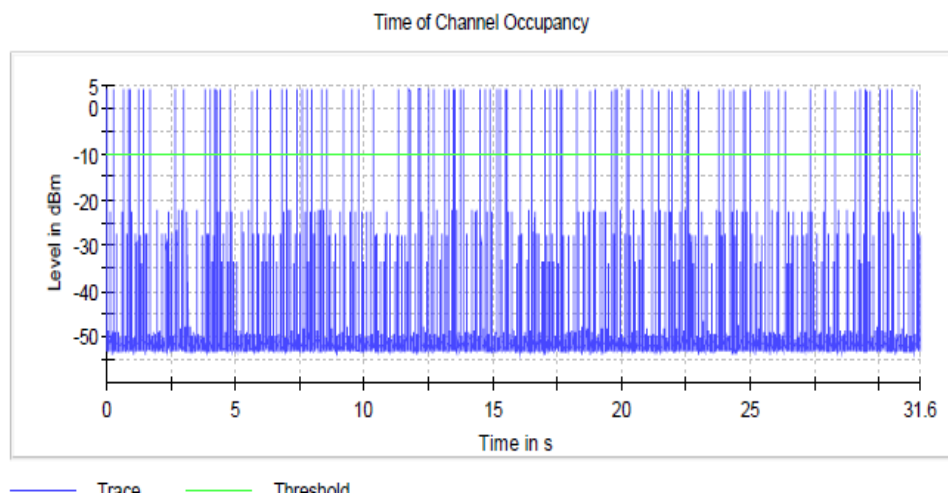
Plots for packet type DH5 shown below.



## 2441 MHz

| Data Rate | Time (ms) | Limit Max (ms) | Result |
|-----------|-----------|----------------|--------|
| DH1       | 122.530   | 400.000        | PASS   |
| DH3       | 268.960   | 400.000        | PASS   |
| DH5       | 291.700   | 400.000        | PASS   |
| 2-DH1     | 109.750   | 400.000        | PASS   |
| 2-DH3     | 219.300   | 400.000        | PASS   |
| 2-DH5     | 257.090   | 400.000        | PASS   |
| 3-DH1     | 109.730   | 400.000        | PASS   |
| 3-DH3     | 232.810   | 400.000        | PASS   |
| 3-DH5     | 238.300   | 400.000        | PASS   |

Plots for packet type DH5 shown below.





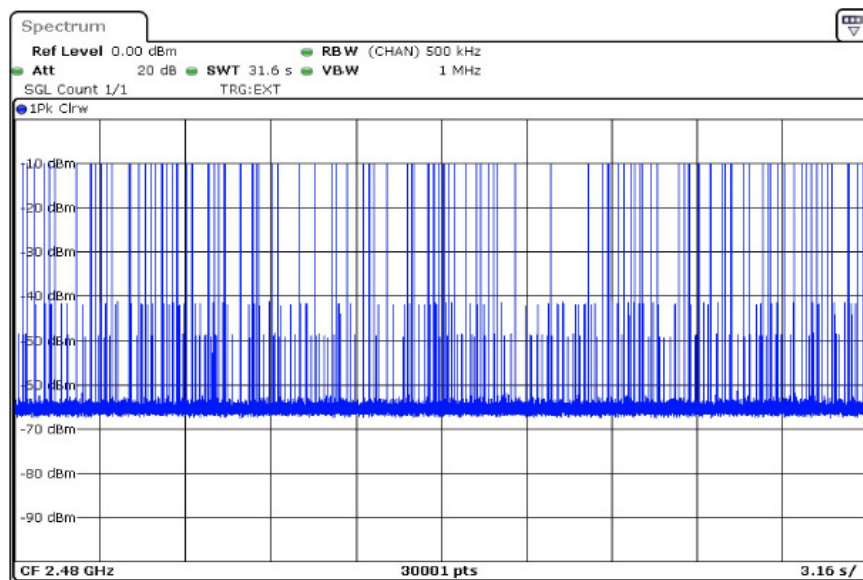
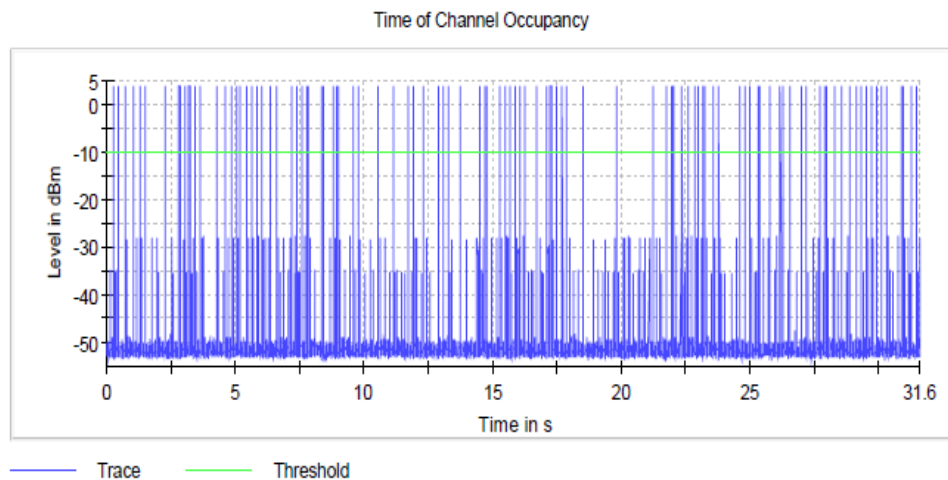
Curtis-Straus LLC, a wholly owned subsidiary of BV CPS  
One Distribution Center Circle, #1 • Littleton, MA • TEL (978) 486-8880 • FAX (978) 486-8828



## 2480 MHz

| Data Rate | Time (ms) | Limit Max (ms) | Result |
|-----------|-----------|----------------|--------|
| DH1       | 122.430   | 400.000        | PASS   |
| DH3       | 270.600   | 400.000        | PASS   |
| DH5       | 308.970   | 400.000        | PASS   |
| 2-DH1     | 108.890   | 400.000        | PASS   |
| 2-DH3     | 222.320   | 400.000        | PASS   |
| 2-DH5     | 258.690   | 400.000        | PASS   |
| 3-DH1     | 109.170   | 400.000        | PASS   |
| 3-DH3     | 211.820   | 400.000        | PASS   |
| 3-DH5     | 226.990   | 400.000        | PASS   |

Plots for packet type DH5 shown below.



## Peak Output Power

Test procedure in accordance with ANSI C63.10-2013

| Data Rate | 2402MHz | 2441MHz | 2480MHz | Limit dBm |
|-----------|---------|---------|---------|-----------|
| DH1       | 0.933   | 1.927   | 1.597   | 30        |
| DH3       | 0.599   | 1.641   | 2.15    | 30        |
| DH5       | 1.158   | 2.202   | 2.128   | 30        |
| 2-DH1     | -0.523  | 0.498   | 0.297   | 30        |
| 2-DH3     | -0.496  | 0.676   | 0.46    | 30        |
| 2-DH5     | -0.528  | 0.794   | 0.46    | 30        |
| 3-DH1     | -0.256  | 0.786   | 0.469   | 30        |
| 3-DH3     | 0.067   | 1.321   | 0.848   | 30        |
| 3-DH5     | -0.08   | 1.113   | 0.927   | 30        |

Plot for packet type DH5 shown below.



## Emission Bandwidth 20 dB

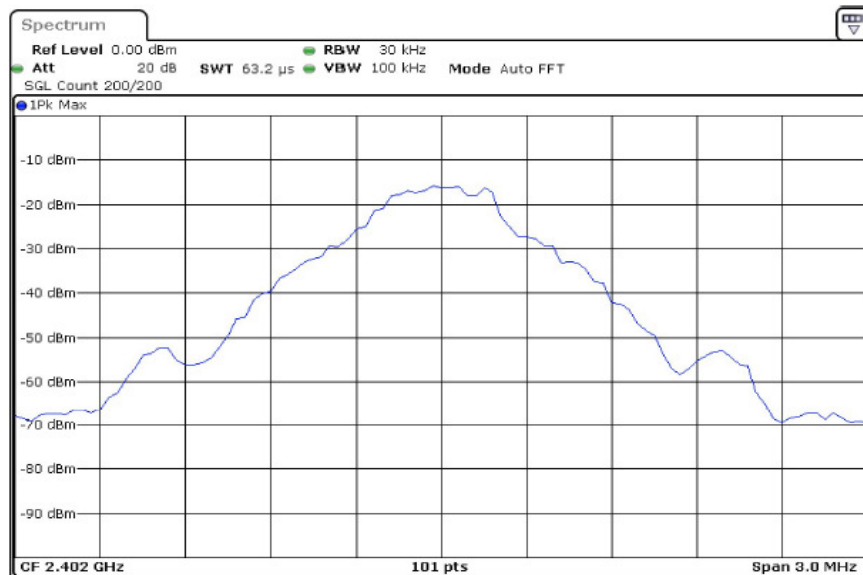
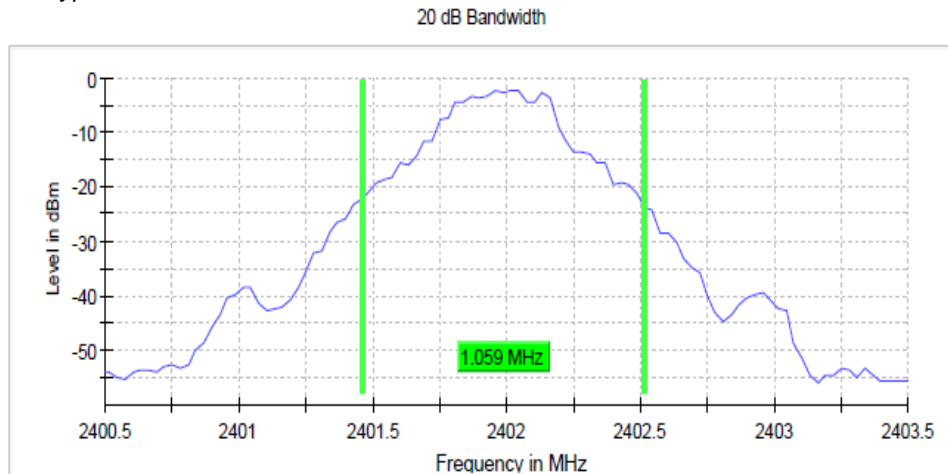
Test procedure in accordance with ANSI C63.10-2013

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 2%

### 2402 MHz

| Data Rate | Bandwidth (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) | Result |
|-----------|-----------------|----------------------|-----------------------|--------|
| DH1       | 1.058824        | 2401.455882          | 2402.514706           | PASS   |
| DH3       | 1.058824        | 2401.455882          | 2402.514706           | PASS   |
| DH5       | 1.058824        | 2401.455882          | 2402.514706           | PASS   |
| 2-DH1     | 1.382353        | 2401.279412          | 2402.661765           | PASS   |
| 2-DH3     | 1.382353        | 2401.279412          | 2402.661765           | PASS   |
| 2-DH5     | 1.382353        | 2401.279412          | 2402.661765           | PASS   |
| 3-DH1     | 1.352941        | 2401.308824          | 2402.661765           | PASS   |
| 3-DH3     | 1.382353        | 2401.279412          | 2402.661765           | PASS   |
| 3-DH5     | 1.382353        | 2401.279412          | 2402.661765           | PASS   |

Plots for packet type DH5 shown below.







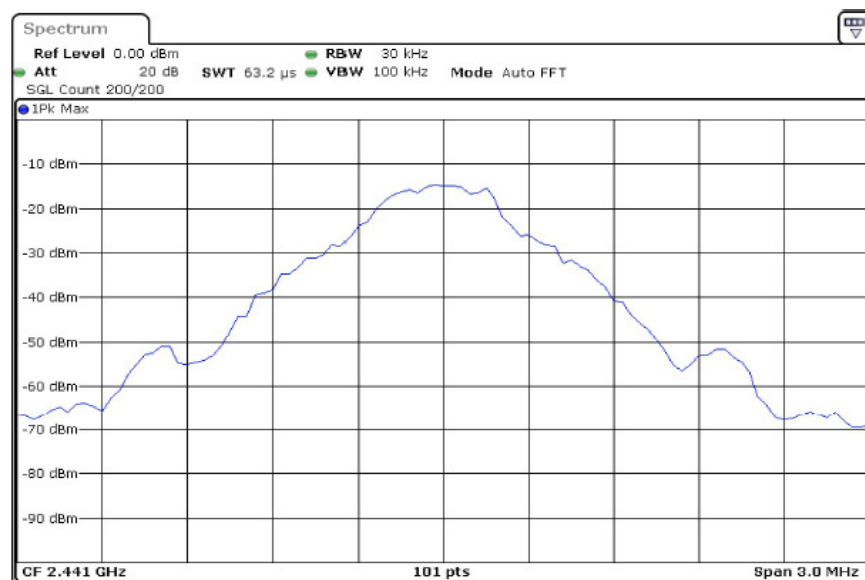
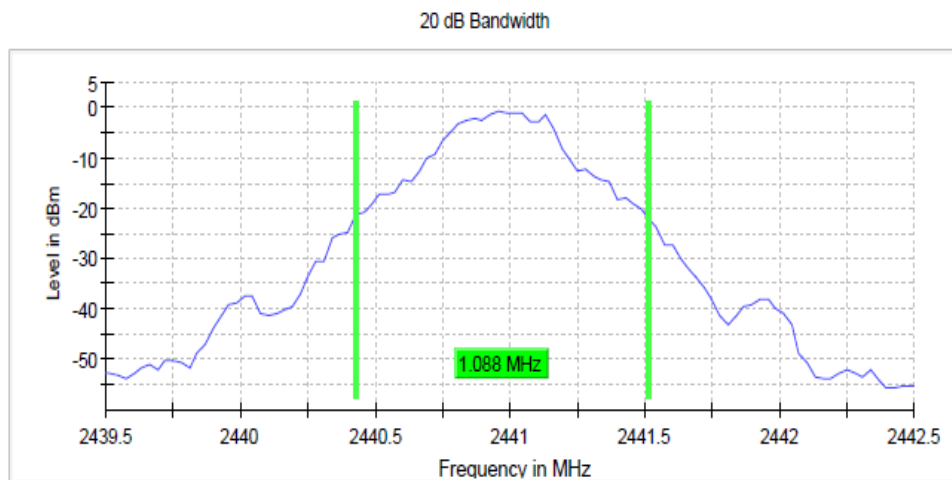
Curtis-Straus LLC, a wholly owned subsidiary of BV CPS  
One Distribution Center Circle, #1 • Littleton, MA • TEL (978) 486-8880 • FAX (978) 486-8828



## 2441 MHz

| Data Rate | Bandwidth (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) | Result |
|-----------|-----------------|----------------------|-----------------------|--------|
| DH1       | 1.058824        | 2440.455882          | 2441.514706           | PASS   |
| DH3       | 1.058824        | 2440.455882          | 2441.514706           | PASS   |
| DH5       | 1.088235        | 2440.426471          | 2441.514706           | PASS   |
| 2-DH1     | 1.382353        | 2440.279412          | 2441.661765           | PASS   |
| 2-DH3     | 1.382353        | 2440.279412          | 2441.661765           | PASS   |
| 2-DH5     | 1.382353        | 2440.279412          | 2441.661765           | PASS   |
| 3-DH1     | 1.352941        | 2440.308824          | 2441.661765           | PASS   |
| 3-DH3     | 1.382353        | 2440.279412          | 2441.661765           | PASS   |
| 3-DH5     | 1.382353        | 2440.279412          | 2441.661765           | PASS   |

Plots for packet type DH5 shown below.





Curtis-Straus LLC, a wholly owned subsidiary of BV CPS  
One Distribution Center Circle, #1 • Littleton, MA • TEL (978) 486-8880 • FAX (978) 486-8828

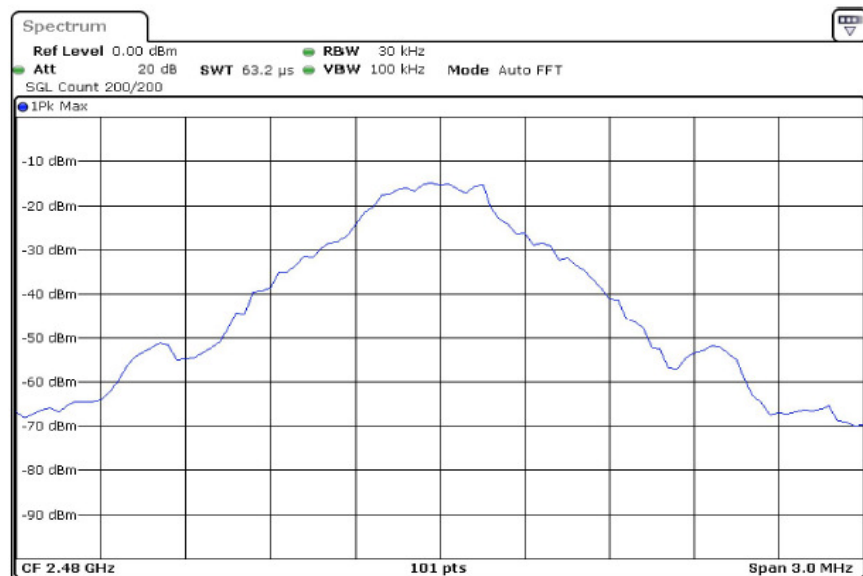
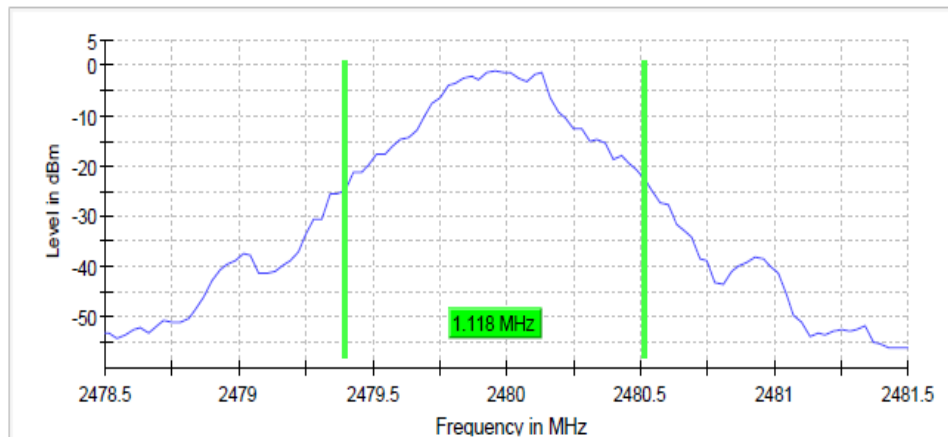


## 2480 MHz

| Data Rate | Bandwidth (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) | Result |
|-----------|-----------------|----------------------|-----------------------|--------|
| DH1       | 1.058824        | 2479.455882          | 2480.514706           | PASS   |
| DH3       | 1.029412        | 2479.455882          | 2480.485294           | PASS   |
| DH5       | 1.117647        | 2479.397059          | 2480.514706           | PASS   |
| 2-DH1     | 1.382353        | 2479.279412          | 2480.661765           | PASS   |
| 2-DH3     | 1.382353        | 2479.279412          | 2480.661765           | PASS   |
| 2-DH5     | 1.382353        | 2479.279412          | 2480.661765           | PASS   |
| 3-DH1     | 1.323529        | 2479.308824          | 2480.632353           | PASS   |
| 3-DH3     | 1.352941        | 2479.279412          | 2480.632353           | PASS   |
| 3-DH5     | 1.382353        | 2479.279412          | 2480.661765           | PASS   |

Plots for packet type DH5 shown below.

20 dB Bandwidth



## Band Edge Low (2402 MHz)

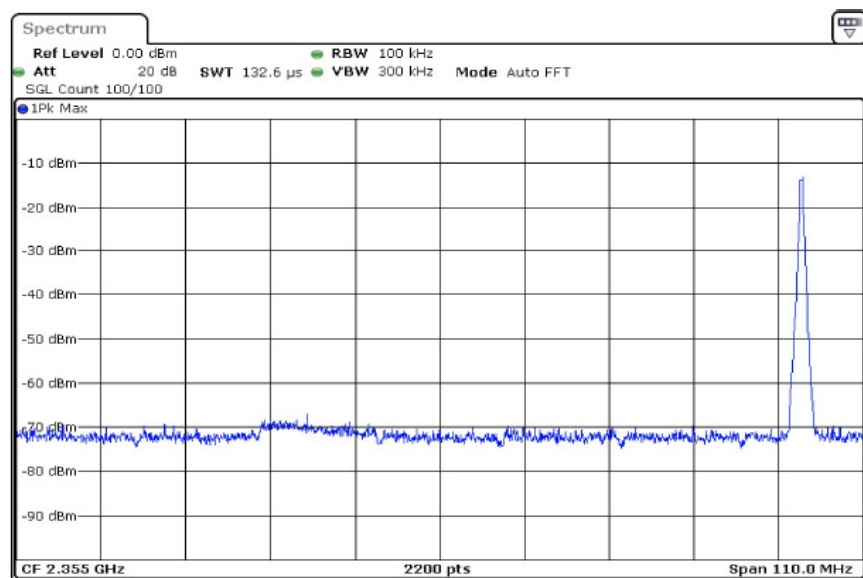
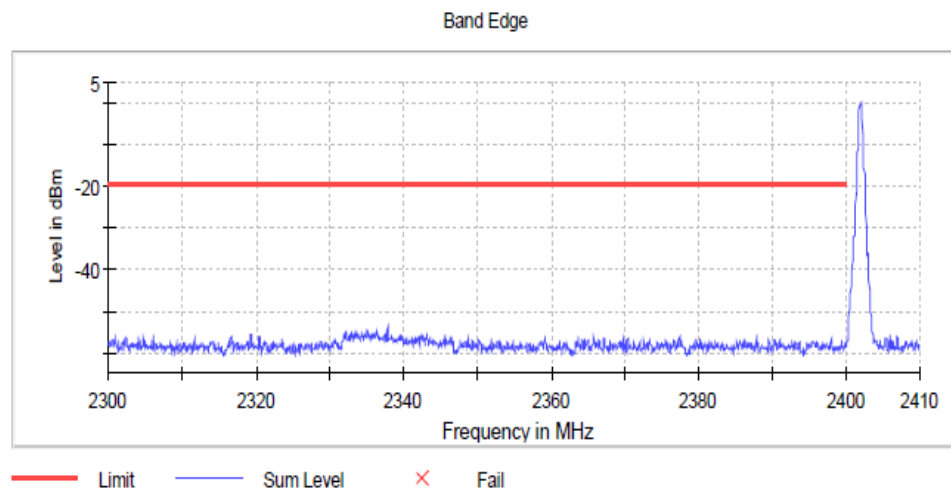
Test procedure in accordance with ANSI C63.10-2013

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 0.8 dB

### Inband Peak

| Data Rate | Frequency (MHz) | Level (dBm) |
|-----------|-----------------|-------------|
| DH1       | 2401.778737     | 0.6         |
| DH3       | 2402.078601     | 0.3         |
| DH5       | 2402.078601     | 0.6         |
| 2-DH1     | 2401.778737     | -3.0        |
| 2-DH3     | 2401.928669     | -3.3        |
| 2-DH5     | 2401.778737     | -3.3        |
| 3-DH1     | 2401.778737     | -2.9        |
| 3-DH3     | 2402.128578     | -3.0        |
| 3-DH5     | 2402.078601     | -3.0        |

Plots for packet type DH5 shown below.





Curtis-Straus LLC, a wholly owned subsidiary of BV CPS  
One Distribution Center Circle, #1 • Littleton, MA • TEL (978) 486-8880 • FAX (978) 486-8828



## Band Edge High (2480 MHz)

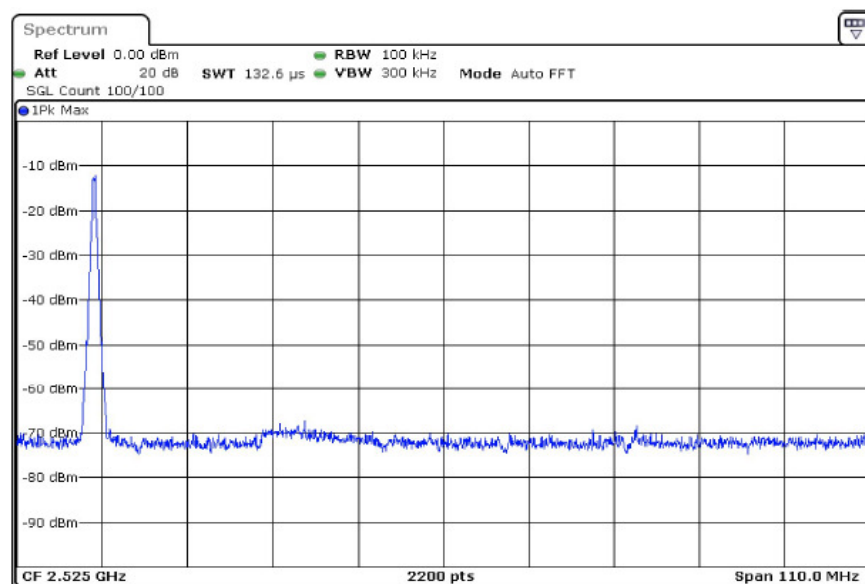
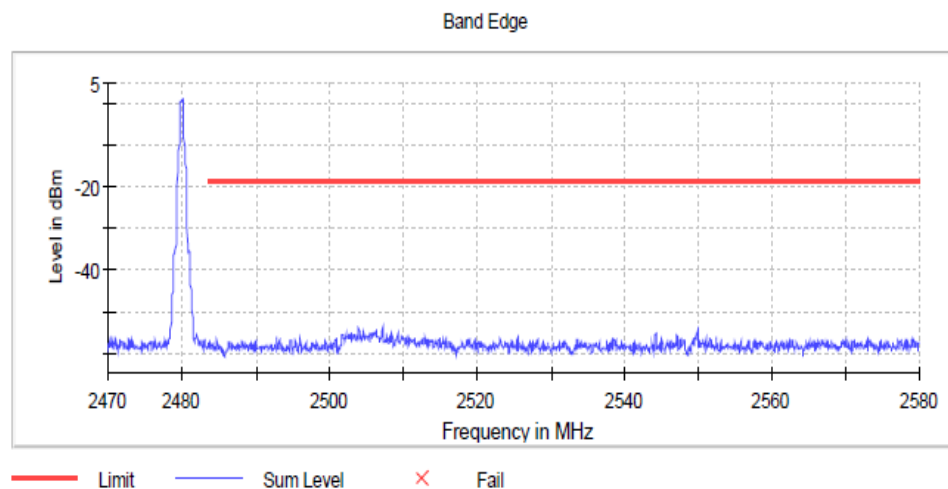
Test procedure in accordance with ANSI C63.10-2013

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 0.8 dB

### Inband Peak

| Data Rate | Frequency (MHz) | Level (dBm) |
|-----------|-----------------|-------------|
| DH1       | 2479.820536     | 1.6         |
| DH3       | 2480.120400     | 1.7         |
| DH5       | 2480.120400     | 1.5         |
| 2-DH1     | 2479.820536     | -2.2        |
| 2-DH3     | 2479.970468     | -2.4        |
| 2-DH5     | 2480.120400     | -2.2        |
| 3-DH1     | 2479.820536     | -1.9        |
| 3-DH3     | 2479.970468     | -2.4        |
| 3-DH5     | 2479.970468     | -2.4        |

Plots for packet type DH5 shown below.





Curtis-Straus LLC, a wholly owned subsidiary of BV CPS  
One Distribution Center Circle, #1 • Littleton, MA • TEL (978) 486-8880 • FAX (978) 486-8828





## Conducted Spurious Emissions

Test procedure in accordance with ANSI C63.10-2013

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 0.8 dB

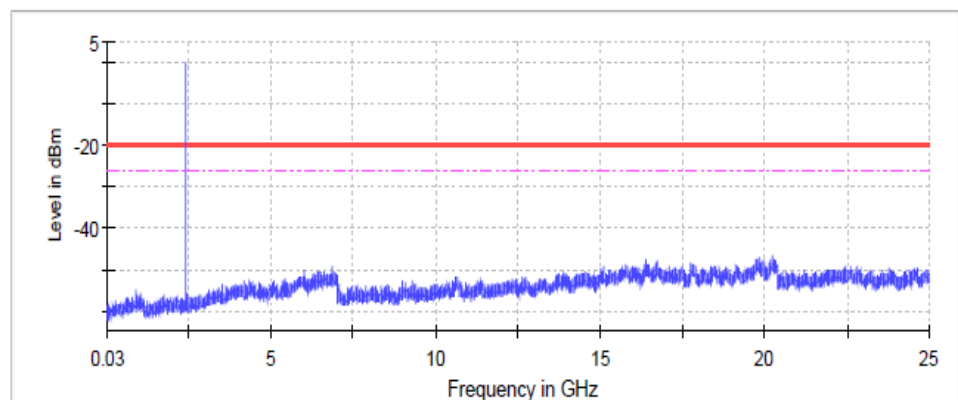
### 2402 MHz

Plots for packet type DH5 shown below.

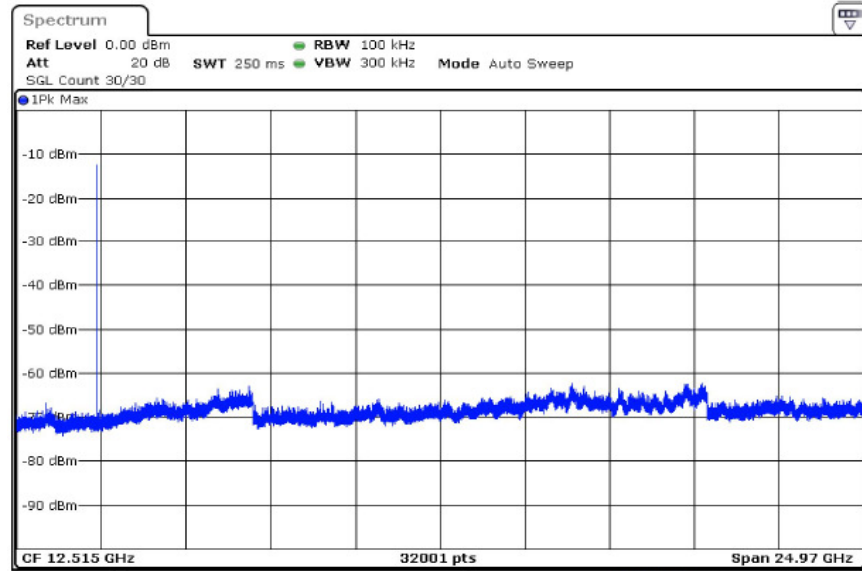
### Pre Measurements

| Frequency (MHz) | Level (dBm) | Margin (dB) | Limit (dBm) |
|-----------------|-------------|-------------|-------------|
| 20232.978720    | -46.8       | 26.9        | -19.9       |
| 19815.537623    | -47.1       | 27.2        | -19.9       |
| 19774.183645    | -47.4       | 27.5        | -19.9       |
| 20311.785357    | -47.5       | 27.6        | -19.9       |
| 16405.785107    | -47.5       | 27.6        | -19.9       |
| 19728.928348    | -47.5       | 27.7        | -19.9       |
| 19771.842854    | -47.6       | 27.7        | -19.9       |
| 20195.526061    | -47.6       | 27.7        | -19.9       |
| 20268.870852    | -47.8       | 27.9        | -19.9       |
| 16743.639304    | -47.8       | 27.9        | -19.9       |
| 20333.632742    | -47.9       | 28.0        | -19.9       |
| 19750.775733    | -47.9       | 28.0        | -19.9       |
| 20275.893225    | -47.9       | 28.0        | -19.9       |
| 19837.385007    | -47.9       | 28.1        | -19.9       |
| 20003.581182    | -47.9       | 28.1        | -19.9       |

Spurious



— Limit — Sum Level - - - Threshold × Critical × Final Critical



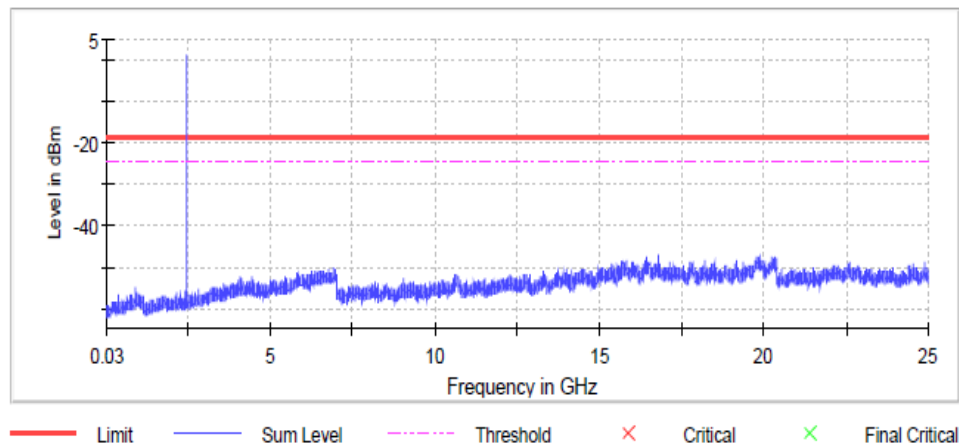
## 2441 MHz

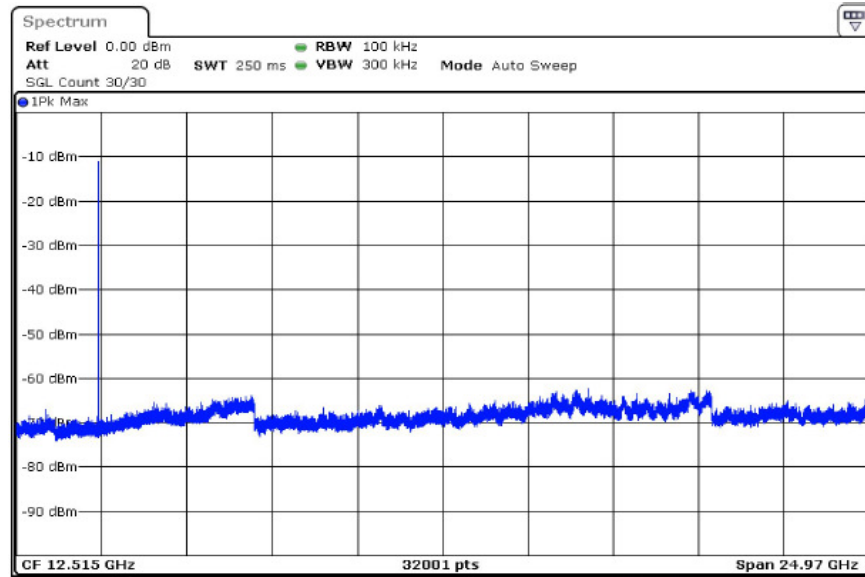
Plots for packet type DH5 shown below.

### Pre Measurements

| Frequency (MHz) | Level (dBm) | Margin (dB) | Limit (dBm) |
|-----------------|-------------|-------------|-------------|
| 16777.970908    | -47.2       | 28.7        | -18.5       |
| 19892.003469    | -47.5       | 29.0        | -18.5       |
| 20218.933973    | -47.5       | 29.0        | -18.5       |
| 20329.731423    | -47.6       | 29.1        | -18.5       |
| 20236.880039    | -47.6       | 29.1        | -18.5       |
| 19821.779733    | -47.6       | 29.1        | -18.5       |
| 19780.425755    | -47.6       | 29.1        | -18.5       |
| 19834.263952    | -47.6       | 29.1        | -18.5       |
| 16434.654865    | -47.7       | 29.2        | -18.5       |
| 19813.977095    | -47.8       | 29.3        | -18.5       |
| 20267.310324    | -47.8       | 29.3        | -18.5       |
| 20323.489313    | -47.9       | 29.4        | -18.5       |
| 19832.703425    | -47.9       | 29.4        | -18.5       |
| 19824.120524    | -47.9       | 29.4        | -18.5       |
| 20300.861665    | -47.9       | 29.4        | -18.5       |

Spurious





## 2480 MHz

Plots for packet type DH5 shown below.

### Pre Measurements

| Frequency (MHz) | Level (dBm) | Margin (dB) | Limit (dBm) |
|-----------------|-------------|-------------|-------------|
| 19784.327073    | -46.9       | 27.7        | -19.2       |
| 19775.744172    | -47.3       | 28.1        | -19.2       |
| 19796.811293    | -47.4       | 28.2        | -19.2       |
| 19570.534810    | -47.5       | 28.3        | -19.2       |
| 19763.259953    | -47.5       | 28.3        | -19.2       |
| 19846.748172    | -47.6       | 28.4        | -19.2       |
| 19812.416568    | -47.6       | 28.4        | -19.2       |
| 19774.963909    | -47.7       | 28.5        | -19.2       |
| 19852.990282    | -47.9       | 28.8        | -19.2       |
| 19771.842854    | -48.0       | 28.8        | -19.2       |
| 20275.112962    | -48.0       | 28.8        | -19.2       |
| 20254.045841    | -48.0       | 28.8        | -19.2       |
| 20328.951159    | -48.0       | 28.8        | -19.2       |
| 20238.440566    | -48.0       | 28.8        | -19.2       |
| 16443.237766    | -48.0       | 28.8        | -19.2       |

Spurious

