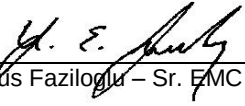




Bureau Veritas Consumer Product Services Inc.

# Test Report

|                                  |                                                                                                                               |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| Report No                        | ET0487-4                                                                                                                      |
| Client                           | Aptiv Services US, LLC                                                                                                        |
| Address                          | 2151 East Lincoln Road<br>Kokomo, Indiana 46902 USA                                                                           |
| Phone                            | (915) 612 8967                                                                                                                |
| Items tested<br>FCC ID<br>IC     | RADIO GP – AM/FM (Model: DEA731)<br>L2C0080TR<br>3432A-0080TR                                                                 |
| 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                       | April 19 to 24, 2019                                                                                                          |
| Results                          | As detailed within this report                                                                                                |
| Prepared by                      | <br>Christopher Hamel – EMC Engineer       |
| Authorized by                    | <br>Yunus Faziloglu – Sr. EMC Engineer     |
| Issue Date                       | 5/29/2019                                                                                                                     |
| Conditions of Issue              | This Test Report is issued subject to the conditions stated in the 'Conditions of Testing' section on page 18 of this report. |



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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 tested is the Radio GP-AM/FM. It is a frequency hopping spread spectrum transmitter that operates in the 2402 – 2480 MHz frequency range.

Antenna Type: Non-detachable internal PCB trace

Gain: 2.3dBi

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

The product tested in this report is provided as representative of the family it belongs to. See the table below for clarification of the specific variations between family models and the relationship between the model tested and the additional model.

| Identification |        |        | Tuner |               |               | USB    |           |          | Bluetooth |    | Supply |     |
|----------------|--------|--------|-------|---------------|---------------|--------|-----------|----------|-----------|----|--------|-----|
| Family         | Model  | Tested | AM/FM | AM/FM/<br>SXM | AM/FM/<br>DAB | No USB | Front USB | Rear USB | No BT     | BT | 12V    | 24V |
| DEA731         | DEA731 | Yes    |       | x             |               |        | x         |          |           | x  |        | x   |
| DEA731         | DEA711 | No     | x     |               |               |        | x         |          |           | x  |        | x   |

Test samples were received in good condition.

## Test Methodology

All testing was performed according to the following rules/procedures/documents;  
CFR Title 47 FCC Part 15.247, ISED Canada RSS-247 Issue 2, ISED Canada RSS-Gen Issue 5, FCC KDB 558074 D01 15.247 Measurement Guidance v05r01 and ANSI C63.10-2013

Radiated emissions were maximized by rotating the device around 3 orthogonal planes (X, Y and Z) as well as varying the test antenna's height and polarity.

EUT operating voltage is 24V DC from a vehicle battery, therefore AC line conducted emissions testing is not applicable.

Following bandwidths were used during radiated spurious emissions testing.

| Frequency  | RBW    | VBW  |
|------------|--------|------|
| 30-1000MHz | 120kHz | 1MHz |
| 1-25GHz    | 1MHz   | 3MHz |

**Product Tested - Configuration Documentation**

| EUT Configuration                                                                                                         |                                            |                |                    |                   |                 |                 |                   |               |                   |                |  |
|---------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|----------------|--------------------|-------------------|-----------------|-----------------|-------------------|---------------|-------------------|----------------|--|
| <b>Work Order:</b>                                                                                                        | T0487                                      |                |                    |                   |                 |                 |                   |               |                   |                |  |
| <b>Company:</b>                                                                                                           | Aptiv Services US, LLC                     |                |                    |                   |                 |                 |                   |               |                   |                |  |
| <b>Company Address:</b>                                                                                                   | 2151 East Lincoln Road                     |                |                    |                   |                 |                 |                   |               |                   |                |  |
|                                                                                                                           | Kokomo, Indiana 46902 USA                  |                |                    |                   |                 |                 |                   |               |                   |                |  |
| <b>Contact:</b>                                                                                                           | Manuel R. Ramirez                          |                |                    |                   |                 |                 |                   |               |                   |                |  |
|                                                                                                                           | MN                                         |                |                    | PN                |                 |                 | SN                |               |                   |                |  |
| <b>EUT:</b>                                                                                                               | Radio GP-AM/FM                             |                |                    |                   |                 |                 |                   |               |                   |                |  |
| <b>EUT Description:</b>                                                                                                   | Vehicle infotainment system with Bluetooth |                |                    |                   |                 |                 |                   |               |                   |                |  |
| <b>EUT Max Frequency:</b>                                                                                                 | 2480 MHz                                   |                |                    |                   |                 |                 |                   |               |                   |                |  |
| <b>EUT Min Frequency:</b>                                                                                                 | 2480 MHz                                   |                |                    |                   |                 |                 |                   |               |                   |                |  |
| <b>EUT Components</b>                                                                                                     | MN                                         |                |                    | SN                |                 |                 |                   |               |                   |                |  |
| Head Unit                                                                                                                 | DEA731                                     |                |                    | 001, 002          |                 |                 |                   |               |                   |                |  |
| <b>Support Equipment</b>                                                                                                  | MN                                         |                |                    | SN                |                 |                 |                   |               |                   |                |  |
| Saint 2 Box                                                                                                               |                                            |                |                    |                   |                 |                 |                   |               |                   |                |  |
| <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>under test</b> | <b>comment</b> |  |
| AM/FM                                                                                                                     | other                                      | 1              | 1                  | Coaxial           | Yes             | No              | 2                 | in            | yes               |                |  |
| Harness                                                                                                                   | other                                      | 1              | 1                  | other             | No              | No              | 1                 | in            | yes               |                |  |
| SXM                                                                                                                       | other                                      | 1              | 1                  | Coaxial           | Yes             | No              | 2                 | in            | yes               |                |  |
| <b>Operating Mode Description:</b>                                                                                        |                                            |                |                    |                   |                 |                 |                   |               |                   |                |  |
| Client provided test mode. EUT can transmit different BT packet types on 3 channels. Hopping can be enabled and disabled. |                                            |                |                    |                   |                 |                 |                   |               |                   |                |  |

**Statement of Conformity**

| RSS-GEN | RSP-100 | RSS 247 | Part 15          | Comments                                                                                                                                                                               |
|---------|---------|---------|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6.4     |         |         | 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.                                                                                                                                               |
|         | 3.2     |         | 15.21            | Information to the user is shown in the instruction manual exhibit.                                                                                                                    |
|         |         |         | 15.27            | No special accessories are required for compliance.                                                                                                                                    |
| 3.2     |         |         | 15.31            | The EUT was tested in accordance with the measurement standards in this section.                                                                                                       |
| 6.13.2  |         |         | 15.33            | Frequency range was investigated according to this section, unless noted in specific rule section under which the equipment operates.                                                  |
| 6.13.1  |         |         | 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.      |
| 6.8     |         |         | 15.203           | EUT employs a non-detachable internal PCB trace antenna with 2.3dBi 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           | The unit complies with AC line conducted emissions requirements.                                                                                                                       |
|         |         |         | 15.247           | The unit complies with the requirements of 15.247                                                                                                                                      |
|         |         | RSS 247 |                  | The unit complies with the requirements of RSS-247                                                                                                                                     |

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)]

Radiated emissions were maximized by rotating the device around 3 orthogonal planes (X, Y and Z) and worst case emissions observed in installed orientation. All the results below are for the worst case orientation only.

#### MEASUREMENTS / RESULTS

Bluetooth DH1 was identified as the worst case packet type.

|                                               |                                      |
|-----------------------------------------------|--------------------------------------|
| Curtis Straus - a Bureau Veritas Company      | Work Order - T0487                   |
| Radiated Emissions Electric Field 3m Distance | EUT Power Input - 26.2V DC           |
| 30-1000MHz Vertical Data                      | Test Site - CH1                      |
| Operator: CCH2                                | Conditions - 23.5°C; 31%RH; 1002mBar |
| Notes:                                        | EUT Maximum Frequency - 2480MHz      |
| BT TX DH1 Low channel                         | 0                                    |

Data Taken at April 24, 2019

| Frequency<br>(MHz) | Raw QP<br>Reading<br>(dBμV) | Correction<br>Factor<br>(dB/m) | Adjusted QP<br>Amplitude<br>(dBμV/m) | Lim1:<br>FCC_pt15_2<br>09<br>(dBμV/m) | Margin to<br>Lim1<br>(dB) | Test Results<br>Lim1<br>(Pass/Fail) | Worst<br>Margin<br>Lim1<br>(dB) |
|--------------------|-----------------------------|--------------------------------|--------------------------------------|---------------------------------------|---------------------------|-------------------------------------|---------------------------------|
| 40.249             | 42.5                        | -11.2                          | 31.2                                 | 40                                    | -8.8                      | PASS                                |                                 |
| 47.894             | 48.2                        | -16.2                          | 32.1                                 | 40                                    | -7.9                      | PASS                                |                                 |
| 51.904             | 50.3                        | -17.2                          | 33.1                                 | 40                                    | -6.9                      | PASS                                |                                 |
| 547.538            | 46.1                        | -5.8                           | 40.3                                 | 46                                    | -5.7                      | PASS                                |                                 |
| 550.019            | 49.1                        | -5.8                           | 43.4                                 | 46                                    | -2.6                      | PASS                                | -2.6                            |
| 552.463            | 45.3                        | -5.7                           | 39.6                                 | 46                                    | -6.4                      | PASS                                |                                 |

Curtis Straus - a Bureau Veritas Company Work Order - T0487  
 Radiated Emissions Electric Field 3m Distance EUT Power Input - 26.2V DC  
 30-1000MHz Horizontal Data Test Site - CH1  
 Operator: CCH<sup>2</sup> Conditions - 23.5°C; 31%RH; 1002mBar  
 Notes: EUT Maximum Frequency - 2480MHz  
 BT TX DH1 Low channel 0

Data Taken at April 24, 2019

| Frequency<br>(MHz) | Raw QP<br>Reading<br>(dBμV) | Correction<br>Factor<br>(dB/m) | Adjusted QP<br>Amplitude<br>(dBμV/m) | Lim1:<br>FCC_pt15_2<br>09<br>(dBμV/m) | Margin to<br>Lim1<br>(dB) | Test Results<br>Lim1<br>(Pass/Fail) | Worst<br>Margin<br>Lim1<br>(dB) |
|--------------------|-----------------------------|--------------------------------|--------------------------------------|---------------------------------------|---------------------------|-------------------------------------|---------------------------------|
| 182.43             | 35.9                        | -13.5                          | 22.4                                 | 43.5                                  | -21.1                     | PASS                                |                                 |
| 482.454            | 34.1                        | -6.6                           | 27.5                                 | 46                                    | -18.5                     | PASS                                |                                 |
| 500.006            | 40.8                        | -6.2                           | 34.5                                 | 46                                    | -11.5                     | PASS                                |                                 |
| 547.56             | 38.1                        | -5.8                           | 32.3                                 | 46                                    | -13.7                     | PASS                                |                                 |
| 550.018            | 43.5                        | -5.8                           | 37.7                                 | 46                                    | -8.3                      | PASS                                | -8.3                            |
| 552.512            | 37.9                        | -5.7                           | 32.2                                 | 46                                    | -13.8                     | PASS                                |                                 |

**30-1000MHz Low channel**

Curtis Straus - a Bureau Veritas Company Work Order - T0487  
 Radiated Emissions Electric Field 3m Distance EUT Power Input - 26.2V DC  
 30-1000MHz Vertical Data Test Site - CH1  
 Operator: CCH<sup>2</sup> Conditions - 23.5°C; 31%RH; 1002mBar  
 Notes: EUT Maximum Frequency - 2480MHz  
 BT TX DH1 Mid channel 0

Data Taken at April 24, 2019

| Frequency<br>(MHz) | Raw QP<br>Reading<br>(dBμV) | Correction<br>Factor<br>(dB/m) | Adjusted QP<br>Amplitude<br>(dBμV/m) | Lim1:<br>FCC_pt15_2<br>09<br>(dBμV/m) | Margin to<br>Lim1<br>(dB) | Test Results<br>Lim1<br>(Pass/Fail) | Worst<br>Margin<br>Lim1<br>(dB) |
|--------------------|-----------------------------|--------------------------------|--------------------------------------|---------------------------------------|---------------------------|-------------------------------------|---------------------------------|
| 39.917             | 45.3                        | -11                            | 34.4                                 | 40                                    | -5.6                      | PASS                                | -5.6                            |
| 47.219             | 46.6                        | -15.9                          | 30.6                                 | 40                                    | -9.4                      | PASS                                |                                 |
| 49.266             | 48                          | -16.7                          | 31.4                                 | 40                                    | -8.6                      | PASS                                |                                 |
| 182.49             | 47.8                        | -13.5                          | 34.3                                 | 43.5                                  | -9.2                      | PASS                                |                                 |
| 549.963            | 45.1                        | -5.8                           | 39.3                                 | 46                                    | -6.7                      | PASS                                |                                 |
| 552.415            | 40.8                        | -5.7                           | 35.1                                 | 46                                    | -10.9                     | PASS                                |                                 |



Curtis Straus - a Bureau Veritas Company Work Order - T0487  
 Radiated Emissions Electric Field 3m Distance EUT Power Input - 26.2V DC  
 30-1000MHz Horizontal Data Test Site - CH1  
 Operator: CCH<sup>2</sup> Conditions - 23.5°C; 31%RH; 1002mBar  
 Notes: EUT Maximum Frequency - 2480MHz  
 BT TX DH1 Mid channel 0

Data Taken at April 24, 2019

| Frequency<br>(MHz) | Raw QP<br>Reading<br>(dBμV) | Correction<br>Factor<br>(dB/m) | Adjusted QP<br>Amplitude<br>(dBμV/m) | Lim1:<br>FCC_pt15_2<br>09<br>(dBμV/m) | Margin to<br>Lim1<br>(dB) | Test Results<br>Lim1<br>(Pass/Fail) | Worst<br>Margin<br>Lim1<br>(dB) |
|--------------------|-----------------------------|--------------------------------|--------------------------------------|---------------------------------------|---------------------------|-------------------------------------|---------------------------------|
| 30.839             | 23.8                        | -3.9                           | 19.9                                 | 40                                    | -20.1                     | PASS                                |                                 |
| 62.034             | 27.6                        | -17.4                          | 10.1                                 | 40                                    | -29.9                     | PASS                                |                                 |
| 63.656             | 24.2                        | -17.4                          | 6.8                                  | 40                                    | -33.2                     | PASS                                |                                 |
| 94.168             | 24.1                        | -15.9                          | 8.2                                  | 43.5                                  | -35.3                     | PASS                                |                                 |
| 130.192            | 23.7                        | -10.9                          | 12.8                                 | 43.5                                  | -30.7                     | PASS                                |                                 |
| 549.911            | 35.6                        | -5.8                           | 29.8                                 | 46                                    | -16.2                     | PASS                                | -16.2                           |

**30-1000MHz Middle channel**

Curtis Straus - a Bureau Veritas Company Work Order - T0487  
 Radiated Emissions Electric Field 3m Distance EUT Power Input - 26.2V DC  
 30-1000MHz Vertical Data Test Site - CH1  
 Operator: CCH<sup>2</sup> Conditions - 23.5°C; 31%RH; 1002mBar  
 Notes: EUT Maximum Frequency - 2480MHz  
 BT TX DH1 High channel 0

Data Taken at April 24, 2019

| Frequency<br>(MHz) | Raw QP<br>Reading<br>(dBμV) | Correction<br>Factor<br>(dB/m) | Adjusted QP<br>Amplitude<br>(dBμV/m) | Lim1:<br>FCC_pt15_2<br>09<br>(dBμV/m) | Margin to<br>Lim1<br>(dB) | Test Results<br>Lim1<br>(Pass/Fail) | Worst<br>Margin<br>Lim1<br>(dB) |
|--------------------|-----------------------------|--------------------------------|--------------------------------------|---------------------------------------|---------------------------|-------------------------------------|---------------------------------|
| 39.262             | 44.5                        | -10.5                          | 34                                   | 40                                    | -6                        | PASS                                |                                 |
| 40.169             | 43.7                        | -11.2                          | 32.5                                 | 40                                    | -7.5                      | PASS                                |                                 |
| 48.054             | 53.1                        | -16.2                          | 36.9                                 | 40                                    | -3.1                      | PASS                                | -3.1                            |
| 51.145             | 49.5                        | -17.1                          | 32.4                                 | 40                                    | -7.6                      | PASS                                |                                 |
| 76.812             | 32                          | -17.1                          | 14.9                                 | 40                                    | -25.1                     | PASS                                |                                 |
| 549.982            | 42.5                        | -5.8                           | 36.7                                 | 46                                    | -9.3                      | PASS                                |                                 |

Curtis Straus - a Bureau Veritas Company  
 Radiated Emissions Electric Field 3m Distance  
 30-1000MHz Horizontal Data  
 Operator: CCH  
 Notes:  
 BT TX DH1 High channel

Work Order - T0487  
 EUT Power Input - 26.2V DC  
 Test Site - CH1  
 Conditions - 23.5°C; 31%RH; 1002mBar  
 EUT Maximum Frequency - 2480MHz  
 0

Data Taken at April 24, 2019

| Frequency<br>(MHz) | Raw QP<br>Reading<br>(dBμV) | Correction<br>Factor<br>(dB/m) | Adjusted QP<br>Amplitude<br>(dBμV/m) | Lim1:<br>FCC_pt15_2<br>09<br>(dBμV/m) | Margin to<br>Lim1<br>(dB) | Test Results<br>Lim1<br>(Pass/Fail) | Worst<br>Margin<br>Lim1<br>(dB) |
|--------------------|-----------------------------|--------------------------------|--------------------------------------|---------------------------------------|---------------------------|-------------------------------------|---------------------------------|
| 30.433             | 23.7                        | -3.6                           | 20                                   | 40                                    | -20                       | PASS                                |                                 |
| 40.045             | 29.7                        | -11.1                          | 18.6                                 | 40                                    | -21.4                     | PASS                                |                                 |
| 40.25              | 28.7                        | -11.2                          | 17.4                                 | 40                                    | -22.6                     | PASS                                |                                 |
| 259.977            | 24.8                        | -12.1                          | 12.7                                 | 46                                    | -33.3                     | PASS                                |                                 |
| 550.011            | 43.2                        | -5.8                           | 37.4                                 | 46                                    | -8.6                      | PASS                                | -8.6                            |
| 552.421            | 38                          | -5.7                           | 32.3                                 | 46                                    | -13.7                     | PASS                                |                                 |

**30-1000MHz High channel**

Curtis Straus - a Bureau Veritas Company  
 Radiated Emissions Electric Field 3m Distance  
 1-6GHz Vertical Data  
 Operator: CCH  
 Notes:  
 BT TX DH1 Low channel

Work Order - T0487  
 EUT Power Input - 26.2V DC  
 Test Site - CH1  
 Conditions - 23.5°C; 31%RH; 1002mBar  
 EUT Maximum Frequency - 2480MHz  
 0

Data Taken at April 24, 2019

| Frequency<br>(MHz) | Raw Peak<br>Reading<br>(dBμV) | Raw Avg<br>Reading<br>(dBμV) | Correction<br>Factor<br>(dB/m) | Adjusted<br>Peak<br>Amplitude<br>(dBμV/m) | Pk Lim:<br>FCC_pt15_2<br>09_Peak<br>(dBμV/m) | Peak<br>Margin<br>(dB) | Peak<br>Results<br>(Pass/Fail) | Worst Peak<br>Margin<br>(dB) | Adjusted<br>Avg<br>Amplitude<br>(dBμV/m) | Av Lim:<br>FCC_pt15_2<br>09_Average<br>(dBμV/m) | Avg Margin<br>(dB) | Avg Results<br>(Pass/Fail) | Worst Avg<br>Margin<br>(dB) |
|--------------------|-------------------------------|------------------------------|--------------------------------|-------------------------------------------|----------------------------------------------|------------------------|--------------------------------|------------------------------|------------------------------------------|-------------------------------------------------|--------------------|----------------------------|-----------------------------|
| 2171.3             | 44.2                          | 34.8                         | -1.2                           | 43                                        | 74                                           | -31                    | PASS                           |                              | 33.6                                     | 54                                              | -20.4              | PASS                       |                             |
| 2879.8             | 51.9                          | 49                           | 0                              | 51.9                                      | 74                                           | -22.1                  | PASS                           | -22.1                        | 49                                       | 54                                              | -5                 | PASS                       | -5                          |
| 3195.1             | 44.2                          | 35                           | -0.5                           | 43.7                                      | 74                                           | -30.3                  | PASS                           |                              | 34.5                                     | 54                                              | -19.5              | PASS                       |                             |
| 4609.2             | 41.6                          | 33.2                         | 0                              | 41.6                                      | 74                                           | -32.4                  | PASS                           |                              | 33.2                                     | 54                                              | -20.8              | PASS                       |                             |
| 5828.5             | 41                            | 32.3                         | 1.7                            | 42.6                                      | 74                                           | -31.4                  | PASS                           |                              | 33.9                                     | 54                                              | -20.1              | PASS                       |                             |



Curtis Straus - a Bureau Veritas Company  
 Radiated Emissions Electric Field 3m Distance  
 1-6GHz Horizontal Data  
 Operator: CCH  
 Notes:  
 BT TX DH1 Low channel

Work Order - T0487  
 EUT Power Input - 26.2V DC  
 Test Site - CH1  
 Conditions - 23.5°C; 31%RH; 1002mBar  
 EUT Maximum Frequency - 2480MHz  
 0

Data Taken at April 24, 2019

| Frequency (MHz) | Raw Peak Reading (dBμV) | Raw Avg Reading (dBμV) | Correction Factor (dB/m) | Adjusted Peak Amplitude (dBμV/m) | Pk Lim: FCC_pt15_2 09_Peak (dBμV/m) | Peak Margin (dB) | Peak Results (Pass/Fail) | Worst Peak Margin (dB) | Adjusted Avg Amplitude (dBμV/m) | Av Lim: FCC_pt15_2 09_Average (dBμV/m) | Avg Margin (dB) | Avg Results (Pass/Fail) | Worst Average Margin (dB) |
|-----------------|-------------------------|------------------------|--------------------------|----------------------------------|-------------------------------------|------------------|--------------------------|------------------------|---------------------------------|----------------------------------------|-----------------|-------------------------|---------------------------|
| 1255.1          | 44                      | 35                     | -7.2                     | 36.8                             | 74                                  | -37.2            | PASS                     |                        | 27.8                            | 54                                     | -26.2           | PASS                    |                           |
| 2160.3          | 44.3                    | 34.9                   | -1.3                     | 43                               | 74                                  | -31              | PASS                     |                        | 33.7                            | 54                                     | -20.3           | PASS                    |                           |
| 2880.1          | 47.6                    | 38.1                   | 0                        | 47.6                             | 74                                  | -26.4            | PASS                     | -26.4                  | 38.1                            | 54                                     | -15.9           | PASS                    | -15.9                     |
| 4631.7          | 43.3                    | 33.2                   | -0.2                     | 43.1                             | 74                                  | -30.9            | PASS                     |                        | 33                              | 54                                     | -21             | PASS                    |                           |
| 5721.1          | 42.1                    | 32.5                   | 1.6                      | 43.8                             | 74                                  | -30.2            | PASS                     |                        | 34.2                            | 54                                     | -19.8           | PASS                    |                           |

### 1-6GHz Low channel

Curtis Straus - a Bureau Veritas Company  
 Radiated Emissions Electric Field 3m Distance  
 1-6GHz Vertical Data  
 Operator: CCH  
 Notes:  
 BT TX DH1 Mid channel

Work Order - T0487  
 EUT Power Input - 26.2V DC  
 Test Site - CH1  
 Conditions - 23.5°C; 31%RH; 1002mBar  
 EUT Maximum Frequency - 2480MHz  
 0

Data Taken at April 24, 2019

| Frequency (MHz) | Raw Peak Reading (dBμV) | Raw Avg Reading (dBμV) | Correction Factor (dB/m) | Adjusted Peak Amplitude (dBμV/m) | Pk Lim: FCC_pt15_2 09_Peak (dBμV/m) | Peak Margin (dB) | Peak Results (Pass/Fail) | Worst Peak Margin (dB) | Adjusted Avg Amplitude (dBμV/m) | Av Lim: FCC_pt15_2 09_Average (dBμV/m) | Avg Margin (dB) | Avg Results (Pass/Fail) | Worst Avg Margin (dB) |
|-----------------|-------------------------|------------------------|--------------------------|----------------------------------|-------------------------------------|------------------|--------------------------|------------------------|---------------------------------|----------------------------------------|-----------------|-------------------------|-----------------------|
| 1728.3          | 48.6                    | 34.5                   | -5.5                     | 43                               | 74                                  | -31              | PASS                     |                        | 29                              | 54                                     | -25             | PASS                    |                       |
| 2184            | 43                      | 34.3                   | -1.1                     | 41.9                             | 74                                  | -32.1            | PASS                     |                        | 33.2                            | 54                                     | -20.8           | PASS                    |                       |
| 2879.9          | 52.9                    | 50.1                   | 0                        | 52.9                             | 74                                  | -21.1            | PASS                     | -21.1                  | 50.1                            | 54                                     | -3.9            | PASS                    | -3.9                  |
| 4640.5          | 42.3                    | 33.2                   | -0.3                     | 42                               | 74                                  | -32              | PASS                     |                        | 32.9                            | 54                                     | -21.1           | PASS                    |                       |
| 5759.2          | 43                      | 32.4                   | 1.8                      | 44.8                             | 74                                  | -29.2            | PASS                     |                        | 34.2                            | 54                                     | -19.8           | PASS                    |                       |

Curtis Straus - a Bureau Veritas Company  
 Radiated Emissions Electric Field 3m Distance  
 1-6GHz Horizontal Data  
 Operator: CCH  
 Notes:  
 BT TX DH1 Mid channel

Work Order - T0487  
 EUT Power Input - 26.2V DC  
 Test Site - CH1  
 Conditions - 23.5°C; 31%RH; 1002mBar  
 EUT Maximum Frequency - 2480MHz  
 0

Data Taken at April 24, 2019

| Frequency (MHz) | Raw Peak Reading (dBμV) | Raw Avg Reading (dBμV) | Correction Factor (dB/m) | Adjusted Peak Amplitude (dBμV/m) | Pk Lim: FCC_pt15_2 09_Peak (dBμV/m) | Peak Margin (dB) | Peak Results (Pass/Fail) | Worst Peak Margin (dB) | Adjusted Avg Amplitude (dBμV/m) | Av Lim: FCC_pt15_2 09_Average (dBμV/m) | Avg Margin (dB) | Avg Results (Pass/Fail) | Worst Average Margin (dB) |
|-----------------|-------------------------|------------------------|--------------------------|----------------------------------|-------------------------------------|------------------|--------------------------|------------------------|---------------------------------|----------------------------------------|-----------------|-------------------------|---------------------------|
| 1725.9          | 43.2                    | 34.8                   | -5.6                     | 37.7                             | 74                                  | -36.3            | PASS                     |                        | 29.2                            | 54                                     | -24.8           | PASS                    |                           |
| 2145.6          | 42.7                    | 34.7                   | -1.4                     | 41.2                             | 74                                  | -32.8            | PASS                     |                        | 33.2                            | 54                                     | -20.8           | PASS                    |                           |
| 2880.3          | 44.5                    | 37.9                   | 0                        | 44.5                             | 74                                  | -29.5            | PASS                     | -29.5                  | 37.9                            | 54                                     | -16.1           | PASS                    | -16.1                     |
| 4656.3          | 41.7                    | 33                     | -0.4                     | 41.2                             | 74                                  | -32.8            | PASS                     |                        | 32.6                            | 54                                     | -21.4           | PASS                    |                           |
| 5872.1          | 42.1                    | 32.4                   | 1.6                      | 43.8                             | 74                                  | -30.2            | PASS                     |                        | 34                              | 54                                     | -20             | PASS                    |                           |

### 1-6GHz Middle Channel



Bureau Veritas Consumer Product Services Inc.  
 One Distribution Center Circle, #1 • Littleton, MA • TEL (978) 486-8880 • FAX (978) 486-8828



Curtis Straus - a Bureau Veritas Company  
 Radiated Emissions Electric Field 3m Distance  
 1-6GHz Vertical Data  
 Operator: CCH  
 Notes:  
 BT TX DH1 High channel

Work Order - T0487  
 EUT Power Input - 26.2V DC  
 Test Site - CH1  
 Conditions - 23.5°C; 31%RH; 1002mBar  
 EUT Maximum Frequency - 2480MHz  
 0

Data Taken at April 24, 2019

| Frequency (MHz) | Raw Peak Reading (dBμV) | Raw Avg Reading (dBμV) | Correction Factor (dB/m) | Adjusted Peak Amplitude (dBμV/m) | Pk Lim: FCC_pt15_2 09_Peak (dBμV/m) | Peak Margin (dB) | Peak Results (Pass/Fail) | Worst Peak Margin (dB) | Adjusted Avg Amplitude (dBμV/m) | Av Lim: FCC_pt15_2 09_Average (dBμV/m) | Avg Margin (dB) | Avg Results (Pass/Fail) | Worst Avg Margin (dB) |
|-----------------|-------------------------|------------------------|--------------------------|----------------------------------|-------------------------------------|------------------|--------------------------|------------------------|---------------------------------|----------------------------------------|-----------------|-------------------------|-----------------------|
| 2176.6          | 42.3                    | 34.6                   | -1.1                     | 41.2                             | 74                                  | -32.8            | PASS                     |                        | 33.4                            | 54                                     | -20.6           | PASS                    |                       |
| 2880.1          | 51.6                    | 48.8                   | 0                        | 51.6                             | 74                                  | -22.4            | PASS                     | -22.4                  | 48.8                            | 54                                     | -5.2            | PASS                    | -5.2                  |
| 3969            | 41.5                    | 32.7                   | -0.7                     | 40.9                             | 74                                  | -33.1            | PASS                     |                        | 32                              | 54                                     | -22             | PASS                    |                       |
| 5065.9          | 40.8                    | 32.7                   | 0.7                      | 41.5                             | 74                                  | -32.5            | PASS                     |                        | 33.4                            | 54                                     | -20.6           | PASS                    |                       |
| 5680.7          | 44.1                    | 32.5                   | 1.5                      | 45.5                             | 74                                  | -28.5            | PASS                     |                        | 34                              | 54                                     | -20             | PASS                    |                       |

Curtis Straus - a Bureau Veritas Company  
 Radiated Emissions Electric Field 3m Distance  
 1-6GHz Horizontal Data  
 Operator: CCH  
 Notes:  
 BT TX DH1 High channel

Work Order - T0487  
 EUT Power Input - 26.2V DC  
 Test Site - CH1  
 Conditions - 23.5°C; 31%RH; 1002mBar  
 EUT Maximum Frequency - 2480MHz  
 0

Data Taken at April 24, 2019

| Frequency (MHz) | Raw Peak Reading (dBμV) | Raw Avg Reading (dBμV) | Correction Factor (dB/m) | Adjusted Peak Amplitude (dBμV/m) | Pk Lim: FCC_pt15_2 09_Peak (dBμV/m) | Peak Margin (dB) | Peak Results (Pass/Fail) | Worst Peak Margin (dB) | Adjusted Avg Amplitude (dBμV/m) | Av Lim: FCC_pt15_2 09_Average (dBμV/m) | Avg Margin (dB) | Avg Results (Pass/Fail) | Worst Average Margin (dB) |
|-----------------|-------------------------|------------------------|--------------------------|----------------------------------|-------------------------------------|------------------|--------------------------|------------------------|---------------------------------|----------------------------------------|-----------------|-------------------------|---------------------------|
| 1143.6          | 46.3                    | 36.2                   | -8.4                     | 37.9                             | 74                                  | -36.1            | PASS                     |                        | 27.8                            | 54                                     | -26.2           | PASS                    |                           |
| 1263.5          | 45.5                    | 35.3                   | -7.1                     | 38.3                             | 74                                  | -35.7            | PASS                     |                        | 28.2                            | 54                                     | -25.8           | PASS                    |                           |
| 2155.4          | 43.2                    | 34.7                   | -1.3                     | 41.8                             | 74                                  | -32.2            | PASS                     |                        | 33.4                            | 54                                     | -20.6           | PASS                    |                           |
| 2879.8          | 49.2                    | 44.9                   | 0                        | 49.2                             | 74                                  | -24.8            | PASS                     | -24.8                  | 44.9                            | 54                                     | -9.1            | PASS                    | -9.1                      |
| 4609.2          | 41.6                    | 33.1                   | 0                        | 41.6                             | 74                                  | -32.4            | PASS                     |                        | 33.1                            | 54                                     | -20.9           | PASS                    |                           |
| 5727.4          | 42.2                    | 32.5                   | 1.7                      | 43.9                             | 74                                  | -30.1            | PASS                     |                        | 34.2                            | 54                                     | -19.8           | PASS                    |                           |

## 1-6GHz High channel

Curtis Straus - a Bureau Veritas Company  
 Radiated Emissions Electric Field 1m Distance  
 6-18GHz Vertical Data  
 Operator: CCH  
 Notes:  
 BT TX DH1 Low channel

Work Order - T0487  
 EUT Power Input - 26.2V DC  
 Test Site - CH1  
 Conditions - 23.5°C; 31%RH; 1002mBar  
 EUT Maximum Frequency - 2480MHz  
 0

Data Taken at April 24, 2019

| Frequency (MHz) | Raw Peak Reading (dBμV) | Raw Avg Reading (dBμV) | Correction Factor (dB/m) | Adjusted Peak Amplitude (dBμV/m) | Pk Lim: FCC_pt15_2 09_Peak (dBμV/m) | Peak Margin (dB) | Peak Results (Pass/Fail) | Worst Peak Margin (dB) | Adjusted Avg Amplitude (dBμV/m) | Av Lim: FCC_pt15_2 09_Average (dBμV/m) | Avg Margin (dB) | Avg Results (Pass/Fail) | Worst Avg Margin (dB) |
|-----------------|-------------------------|------------------------|--------------------------|----------------------------------|-------------------------------------|------------------|--------------------------|------------------------|---------------------------------|----------------------------------------|-----------------|-------------------------|-----------------------|
| 7912.4          | 41                      | 33                     | 3.9                      | 45                               | 83.5                                | -38.5            | PASS                     |                        | 37                              | 63.5                                   | -26.5           | PASS                    |                       |
| 10531.6         | 42.4                    | 33.1                   | 7.1                      | 49.5                             | 83.5                                | -34              | PASS                     |                        | 40.2                            | 63.5                                   | -23.3           | PASS                    |                       |
| 10590.7         | 48.7                    | 33.3                   | 6.8                      | 55.5                             | 83.5                                | -28              | PASS                     |                        | 40.2                            | 63.5                                   | -23.3           | PASS                    |                       |
| 17953.3         | 43                      | 34.4                   | 14.6                     | 57.6                             | 83.5                                | -25.9            | PASS                     | -25.9                  | 49                              | 63.5                                   | -14.5           | PASS                    | -14.5                 |



| Curtis Straus - a Bureau Veritas Company      |                               |                              |                                |                                           |                                              | Work Order - T0487                   |                                     |                              |                                          |                                                 |                    |                                    |                             |
|-----------------------------------------------|-------------------------------|------------------------------|--------------------------------|-------------------------------------------|----------------------------------------------|--------------------------------------|-------------------------------------|------------------------------|------------------------------------------|-------------------------------------------------|--------------------|------------------------------------|-----------------------------|
| Radiated Emissions Electric Field 1m Distance |                               |                              |                                |                                           |                                              | EUT Power Input - 26.2V DC           |                                     |                              |                                          |                                                 |                    |                                    |                             |
| 6-18GHz Horizontal Data                       |                               |                              |                                |                                           |                                              | Test Site - CH1                      |                                     |                              |                                          |                                                 |                    |                                    |                             |
| Operator: CCH                                 |                               |                              |                                |                                           |                                              | Conditions - 23.5°C; 31%RH; 1002mBar |                                     |                              |                                          |                                                 |                    |                                    |                             |
| Notes:                                        |                               |                              |                                |                                           |                                              | EUT Maximum Frequency - 2480MHz      |                                     |                              |                                          |                                                 |                    |                                    |                             |
| BT TX DH1 Low channel                         |                               |                              |                                |                                           |                                              | 0                                    |                                     |                              |                                          |                                                 |                    |                                    |                             |
| Data Taken at April 24, 2019                  |                               |                              |                                |                                           |                                              |                                      |                                     |                              |                                          |                                                 |                    |                                    |                             |
| Frequency<br>(MHz)                            | Raw Peak<br>Reading<br>(dBμV) | Raw Avg<br>Reading<br>(dBμV) | Correction<br>Factor<br>(dB/m) | Adjusted<br>Peak<br>Amplitude<br>(dBμV/m) | Pk Lim:<br>FCC_pt15_2<br>09_Peak<br>(dBμV/m) | Peak<br>Margin<br>(dB)               | Peak Test<br>Results<br>(Pass/Fail) | Worst Peak<br>Margin<br>(dB) | Adjusted<br>Avg<br>Amplitude<br>(dBμV/m) | Av Lim:<br>FCC_pt15_2<br>09_Average<br>(dBμV/m) | Avg Margin<br>(dB) | Avg Test<br>Results<br>(Pass/Fail) | Worst Avg<br>Margin<br>(dB) |
| 10532.2                                       | 42.2                          | 33.2                         | 7.1                            | 49.3                                      | 83.5                                         | -34.2                                | PASS                                |                              | 40.3                                     | 63.5                                            | -23.2              | PASS                               |                             |
| 10590.3                                       | 41.9                          | 33.3                         | 6.8                            | 48.7                                      | 83.5                                         | -34.8                                | PASS                                |                              | 40.1                                     | 63.5                                            | -23.4              | PASS                               |                             |
| 12636.5                                       | 42.3                          | 33                           | 10.1                           | 52.4                                      | 83.5                                         | -31.1                                | PASS                                |                              | 43.1                                     | 63.5                                            | -20.4              | PASS                               |                             |
| 17968.8                                       | 42.4                          | 34.4                         | 14.6                           | 57                                        | 83.5                                         | -26.5                                | PASS                                | -26.5                        | 49                                       | 63.5                                            | -14.5              | PASS                               | -14.5                       |

## 6-18GHz Low channel

Curtis Straus - a Bureau Veritas Company

Radiated Emissions Electric Field 1m Distance

6-18GHz Vertical Data

Operator: CCH

Notes:

BT TX DH1 Mid channel

Work Order - T0487

EUT Power Input - 26.2V DC

Test Site - CH1

Conditions - 23.5°C; 31%RH; 1002mBar

EUT Maximum Frequency - 2480MHz

0

Data Taken at April 24, 2019

| Frequency<br>(MHz) | Raw Peak Reading<br>(dBμV) | Raw Avg Reading<br>(dBμV) | Correction Factor<br>(dB/m) | Adjusted Peak Amplitude<br>(dBμV/m) | Pk Lim: FCC_pt15_2 09_Peak<br>(dBμV/m) | Peak Margin<br>(dB) | Peak Results<br>(Pass/Fail) | Worst Peak Margin<br>(dB) | Adjusted Avg Amplitude<br>(dBμV/m) | Av Lim: FCC_pt15_2 09_Average<br>(dBμV/m) | Avg Margin<br>(dB) | Avg Results<br>(Pass/Fail) | Worst Avg Margin<br>(dB) |
|--------------------|----------------------------|---------------------------|-----------------------------|-------------------------------------|----------------------------------------|---------------------|-----------------------------|---------------------------|------------------------------------|-------------------------------------------|--------------------|----------------------------|--------------------------|
| 7908.9             | 40.5                       | 33                        | 4                           | 44.5                                | 83.5                                   | -39                 | PASS                        |                           | 37                                 | 63.5                                      | -26.5              | PASS                       |                          |
| 10532.9            | 43.4                       | 33.2                      | 7.1                         | 50.5                                | 83.5                                   | -33                 | PASS                        |                           | 40.3                               | 63.5                                      | -23.2              | PASS                       |                          |
| 12740.8            | 42.5                       | 32.9                      | 10.2                        | 52.7                                | 83.5                                   | -30.8               | PASS                        |                           | 43.2                               | 63.5                                      | -20.3              | PASS                       |                          |
| 16782.6            | 42.1                       | 33.7                      | 12.8                        | 54.8                                | 83.5                                   | -28.7               | PASS                        |                           | 46.5                               | 63.5                                      | -17                | PASS                       |                          |
| 17847.2            | 43.6                       | 34.4                      | 14.5                        | 58.1                                | 83.5                                   | -25.4               | PASS                        | -25.4                     | 49                                 | 63.5                                      | -14.5              | PASS                       | -14.5                    |

Curtis Straus - a Bureau Veritas Company

Radiated Emissions Electric Field 1m Distance

6-18GHz Horizontal Data

Operator: CCH

Notes:

BT TX DH1 Mid channel

Work Order - T0487

EUT Power Input - 26.2V DC

Test Site - CH1

Conditions - 23.5°C; 31%RH; 1002mBar

EUT Maximum Frequency - 2480MHz

0

Data Taken at April 24, 2019

| Frequency<br>(MHz) | Raw Peak<br>Reading<br>(dBμV) | Raw Avg<br>Reading<br>(dBμV) | Correction<br>Factor<br>(dB/m) | Adjusted<br>Peak<br>Amplitude<br>(dBμV/m) | Pk Lim:<br>FCC_pt15_2<br>09_Peak<br>(dBμV/m) | Peak<br>Margin<br>(dB) | Peak Test<br>Results<br>(Pass/Fail) | Worst Peak<br>Margin<br>(dB) | Adjusted<br>Avg<br>Amplitude<br>(dBμV/m) | Av Lim:<br>FCC_pt15_2<br>09_Average<br>(dBμV/m) | Avg Margin<br>(dB) | Avg Test<br>Results<br>(Pass/Fail) | Worst Avg<br>Margin<br>(dB) |
|--------------------|-------------------------------|------------------------------|--------------------------------|-------------------------------------------|----------------------------------------------|------------------------|-------------------------------------|------------------------------|------------------------------------------|-------------------------------------------------|--------------------|------------------------------------|-----------------------------|
| 10533.4            | 42.4                          | 33.2                         | 7.1                            | 49.5                                      | 83.5                                         | -34                    | PASS                                |                              | 40.3                                     | 63.5                                            | -23.2              | PASS                               |                             |
| 12724.5            | 42                            | 32.9                         | 10.2                           | 52.2                                      | 83.5                                         | -31.3                  | PASS                                |                              | 43.1                                     | 63.5                                            | -20.4              | PASS                               |                             |
| 17945.9            | 44.8                          | 34.3                         | 14.6                           | 59.5                                      | 83.5                                         | -24                    | PASS                                | -24                          | 48.9                                     | 63.5                                            | -14.6              | PASS                               | -14.6                       |

## 6-18GHz Middle channel



| Curtis Straus - a Bureau Veritas Company      |                               |                              |                                |                                           |                                              | Work Order - T0487                   |                                |                              |                                          |                                                 |                    |                            |                             |
|-----------------------------------------------|-------------------------------|------------------------------|--------------------------------|-------------------------------------------|----------------------------------------------|--------------------------------------|--------------------------------|------------------------------|------------------------------------------|-------------------------------------------------|--------------------|----------------------------|-----------------------------|
| Radiated Emissions Electric Field 1m Distance |                               |                              |                                |                                           |                                              | EUT Power Input - 26.2V DC           |                                |                              |                                          |                                                 |                    |                            |                             |
| 6-18GHz Vertical Data                         |                               |                              |                                |                                           |                                              | Test Site - CH1                      |                                |                              |                                          |                                                 |                    |                            |                             |
| Operator: CCH                                 |                               |                              |                                |                                           |                                              | Conditions - 23.5°C; 31%RH; 1002mBar |                                |                              |                                          |                                                 |                    |                            |                             |
| Notes:                                        |                               |                              |                                |                                           |                                              | EUT Maximum Frequency - 2480MHz      |                                |                              |                                          |                                                 |                    |                            |                             |
| BT TX DH1 High channel                        |                               |                              |                                |                                           |                                              | 0                                    |                                |                              |                                          |                                                 |                    |                            |                             |
| Data Taken at April 24, 2019                  |                               |                              |                                |                                           |                                              |                                      |                                |                              |                                          |                                                 |                    |                            |                             |
| Frequency<br>(MHz)                            | Raw Peak<br>Reading<br>(dBμV) | Raw Avg<br>Reading<br>(dBμV) | Correction<br>Factor<br>(dB/m) | Adjusted<br>Peak<br>Amplitude<br>(dBμV/m) | Pk Lim:<br>FCC_pt15_2<br>09_Peak<br>(dBμV/m) | Peak<br>Margin<br>(dB)               | Peak<br>Results<br>(Pass/Fail) | Worst Peak<br>Margin<br>(dB) | Adjusted<br>Avg<br>Amplitude<br>(dBμV/m) | Av Lim:<br>FCC_pt15_2<br>09_Average<br>(dBμV/m) | Avg Margin<br>(dB) | Avg Results<br>(Pass/Fail) | Worst Avg<br>Margin<br>(dB) |
| 10532.2                                       | 40.6                          | 33.2                         | 7.1                            | 47.7                                      | 83.5                                         | -35.8                                | PASS                           |                              | 40.3                                     | 63.5                                            | -23.2              | PASS                       |                             |
| 10590.6                                       | 44.7                          | 33.3                         | 6.8                            | 51.5                                      | 83.5                                         | -32                                  | PASS                           |                              | 40.1                                     | 63.5                                            | -23.4              | PASS                       |                             |
| 12294.5                                       | 42                            | 33.7                         | 9.2                            | 51.2                                      | 83.5                                         | -32.3                                | PASS                           |                              | 42.9                                     | 63.5                                            | -20.6              | PASS                       |                             |
| 17953.1                                       | 44.1                          | 34.4                         | 14.6                           | 58.7                                      | 83.5                                         | -24.8                                | PASS                           | -24.8                        | 49                                       | 63.5                                            | -14.5              | PASS                       | -14.5                       |

Curtis Straus - a Bureau Veritas Company

Radiated Emissions Electric Field 1m Distance

6-18GHz Horizontal Data

Operator: CCH

Notes:

BT TX DH1 High channel

Work Order - T0487

EUT Power Input - 26.2V DC

Test Site - CH1

Conditions - 23.5°C; 31%RH; 1002mBar

EUT Maximum Frequency - 2480MHz

0

Data Taken at April 24, 2019

| Frequency<br>(MHz) | Raw Peak<br>Reading<br>(dBμV) | Raw Avg<br>Reading<br>(dBμV) | Correction<br>Factor<br>(dB/m) | Adjusted<br>Peak<br>Amplitude<br>(dBμV/m) | Pk Lim:<br>FCC_pt15_2<br>09_Peak<br>(dBμV/m) | Peak<br>Margin<br>(dB) | Peak Test<br>Results<br>(Pass/Fail) | Worst Peak<br>Margin<br>(dB) | Adjusted<br>Avg<br>Amplitude<br>(dBμV/m) | Av Lim:<br>FCC_pt15_2<br>09_Average<br>(dBμV/m) | Avg Margin<br>(dB) | Avg Test<br>Results<br>(Pass/Fail) | Worst Avg<br>Margin<br>(dB) |
|--------------------|-------------------------------|------------------------------|--------------------------------|-------------------------------------------|----------------------------------------------|------------------------|-------------------------------------|------------------------------|------------------------------------------|-------------------------------------------------|--------------------|------------------------------------|-----------------------------|
| 10534.1            | 42.2                          | 33.2                         | 7.1                            | 49.3                                      | 83.5                                         | -34.2                  | PASS                                |                              | 40.3                                     | 63.5                                            | -23.2              | PASS                               |                             |
| 10593              | 46.2                          | 33.3                         | 6.8                            | 53                                        | 83.5                                         | -30.5                  | PASS                                |                              | 40.1                                     | 63.5                                            | -23.4              | PASS                               |                             |
| 12391.1            | 42.8                          | 33.5                         | 9.5                            | 52.3                                      | 83.5                                         | -31.2                  | PASS                                |                              | 43                                       | 63.5                                            | -20.5              | PASS                               |                             |
| 17920.2            | 42                            | 33.8                         | 14.7                           | 56.7                                      | 83.5                                         | -26.8                  | PASS                                | -26.8                        | 48.5                                     | 63.5                                            | -15                | PASS                               | -15                         |

## 6-18GHz High channel

## Radiated Emissions Table

| Date: 24-Apr-19                                                            |                    |                        |                           |                       |                          |                      |                                   |                                  |                                   | Work Order: T0487                       |                       |                                      |                |                       |                  |  |  |  |  |
|----------------------------------------------------------------------------|--------------------|------------------------|---------------------------|-----------------------|--------------------------|----------------------|-----------------------------------|----------------------------------|-----------------------------------|-----------------------------------------|-----------------------|--------------------------------------|----------------|-----------------------|------------------|--|--|--|--|
| Engineer: Chris Hamel                                                      |                    |                        |                           |                       |                          |                      |                                   |                                  |                                   | EUT Operating Voltage/Frequency: 24V DC |                       |                                      |                |                       |                  |  |  |  |  |
| Temp: 23.5°C                                                               |                    |                        |                           |                       | Humidity: 34%            |                      |                                   |                                  |                                   | Pressure: 1010mBar                      |                       |                                      |                |                       |                  |  |  |  |  |
| Frequency Range: 18-26.5GHz                                                |                    |                        |                           |                       |                          |                      |                                   |                                  |                                   | Measurement Distance: 0.1 m             |                       |                                      |                |                       |                  |  |  |  |  |
| Notes: No emissions found. BT high mid and low channels DH1                |                    |                        |                           |                       |                          |                      |                                   |                                  |                                   | EUT Max Freq: 2480MHz                   |                       |                                      |                |                       |                  |  |  |  |  |
| 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 N/A dB Worst Freq: N/A MHz                           |                    |                        |                           |                       |                          |                      |                                   |                                  |                                   |                                         |                       |                                      |                |                       |                  |  |  |  |  |
| Test Site: EMI Chamber 1                                                   |                    |                        |                           |                       | Cable 1: Asset #2323     |                      |                                   |                                  |                                   | Cable 2: ---                            |                       |                                      |                |                       | Cable 3: ---     |  |  |  |  |
| Analyzer: Rental SA#3                                                      |                    |                        |                           |                       | Preamp: 18-26.5GHz       |                      |                                   |                                  |                                   | Antenna: 18-26.5GHz Horn                |                       |                                      |                |                       | Preselector: --- |  |  |  |  |
| CSsoft Radiated Emissions Calculator v 1.017.214                           |                    |                        |                           |                       |                          |                      |                                   |                                  |                                   |                                         |                       |                                      |                |                       |                  |  |  |  |  |
| Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor |                    |                        |                           |                       |                          |                      |                                   |                                  |                                   |                                         |                       |                                      |                |                       |                  |  |  |  |  |
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## 18-26.5GHz



Rev. 4/29/2019

| <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> |
|-----------------------------------------------------|-----------------|-----------------------|-------------------|--------------|--------------|------------|------------------------|
| 2093 MXE EMI Receiver                               | 20Hz-26.5GHz    | N9038A                | Agilent           | MY51210181   | 2093         | I          | 11/21/2019             |
| <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> |
| EMI Chamber 1                                       | 719150          | 2762A-6               | A-0015            | 30-1000MHz   | 1685         | I          | 12/7/2020              |
| EMI Chamber 1                                       | 719150          | 2762A-6               | A-0015            | 1-18GHz      | 1685         | I          | 12/7/2020              |
| <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> |
| 8449B HF Preamp                                     | 1-18GHz         | 8449B                 | Agilent           | 1149055      |              | II         | 11/26/2019             |
| 185710 Rental PA                                    | 9KHz-1GHz       | 310                   | SONOMA INSTRUMENT | 185710       |              | II         | 4/16/2020              |
| HF (Yellow)                                         | 18-26.5GHz      | AFS4-18002650-60-8P-4 | CS                | 467559       | 1266         | II         | 10/24/2019             |
| <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> |
| Red-White Bilog                                     | 30-2000MHz      | JB1                   | Sunol             | A091604-1    | 1105         | I          | 8/21/2019              |
| HF (White) Horn                                     | 18-26.5GHz      | 801-WLM               | Waveline          | 758          | 758          | III        | Verify before Use      |
| Blue Horn                                           | 1-18Ghz         | 3117                  | ETS               | 157647       | 1861         | I          | 3/9/2021               |
| <b>Meteorological Meters/Chambers</b>               |                 | <b>MN</b>             | <b>Mfr</b>        | <b>SN</b>    | <b>Asset</b> | <b>Cat</b> | <b>Calibration Due</b> |
| Weather Clock (Pressure Only)                       |                 | BA928                 | Oregon Scientific | C3166-1      | 831          | I          | 5/15/2020              |
| Asset #2657                                         |                 | 1235C97               | Control Company   | 181683806    | 2657         | I          | 4/3/2020               |
| <b>Cables</b>                                       | <b>Range</b>    |                       | <b>Mfr</b>        |              |              | <b>Cat</b> | <b>Calibration Due</b> |
| Asset #2456                                         | 9KHz-18GHz      |                       | MegaPhase         |              |              | II         | 10/31/2019             |
| Asset #2467                                         | 9KHz-18GHz      |                       | MegaPhase         |              |              | II         | 10/31/2019             |
| Asset #2606                                         | 9KHz-18GHz      |                       | MegaPhase         |              |              | II         | 4/2/2020               |
| Asset #2323                                         | 1-26.5GHz       | TM26-S1S1-120         | MEGAPHASE         | 17139101 002 | 2323         | II         | 8/9/2019               |

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

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## Radiated Band Edge

| Radiated Emissions Table                                                   |                 |                     |                        |                    |                       |                   |                                |                               |                                   |                                         |                    |                                      |             |                    |
|----------------------------------------------------------------------------|-----------------|---------------------|------------------------|--------------------|-----------------------|-------------------|--------------------------------|-------------------------------|-----------------------------------|-----------------------------------------|--------------------|--------------------------------------|-------------|--------------------|
| Date: 24-Apr-19                                                            |                 |                     |                        |                    |                       |                   |                                |                               |                                   | Work Order: T0487                       |                    |                                      |             |                    |
| Engineer: Chris Hamel                                                      |                 |                     |                        |                    |                       |                   |                                |                               |                                   | EUT Operating Voltage/Frequency: 24V DC |                    |                                      |             |                    |
| Temp: 23.5°C                                                               |                 |                     |                        |                    | Humidity: 34%         |                   |                                |                               |                                   | Pressure: 1010mBar                      |                    |                                      |             |                    |
| Frequency Range: 2.3-2.5GHz                                                |                 |                     |                        |                    |                       |                   |                                |                               |                                   | Measurement Distance: 3 m               |                    |                                      |             |                    |
| Notes: Bluetooth DH1                                                       |                 |                     |                        |                    |                       |                   |                                |                               |                                   | EUT Max Freq: 2480MHz                   |                    |                                      |             |                    |
| Antenna Polarization (H/V)                                                 | Frequency (MHz) | Peak Reading (dBμV) | Average Reading (dBμV) | Preamp Factor (dB) | Antenna Factor (dB/m) | Cable Factor (dB) | Adjusted Peak Reading (dBμV/m) | Adjusted Avg Reading (dBμV/m) | FCC Class B High Frequency - Peak |                                         |                    | FCC Class B High Frequency - Average |             |                    |
|                                                                            |                 |                     |                        |                    |                       |                   |                                |                               | Limit (dBμV/m)                    | Margin (dB)                             | Result (Pass/Fail) | Limit (dBμV/m)                       | Margin (dB) | Result (Pass/Fail) |
| Low Channel                                                                |                 |                     |                        |                    |                       |                   |                                |                               |                                   |                                         |                    |                                      |             |                    |
| V                                                                          | 2390.0          | 14.7                | 4.1                    | 0.0                | 32.2                  | 0.8               | 47.7                           | 37.1                          | 74.0                              | -26.3                                   | Pass               | 54.0                                 | -16.9       | Pass               |
| V                                                                          | 2326.2          | 16.5                | 4.4                    | 0.0                | 31.9                  | 0.7               | 49.1                           | 37.0                          | 74.0                              | -24.9                                   | Pass               | 54.0                                 | -17.0       | Pass               |
| V                                                                          | 2356.7          | 18.6                | 4.8                    | 0.0                | 32.0                  | 0.8               | 51.4                           | 37.6                          | 74.0                              | -22.6                                   | Pass               | 54.0                                 | -16.4       | Pass               |
| Low edge hopping                                                           |                 |                     |                        |                    |                       |                   |                                |                               |                                   |                                         |                    |                                      |             |                    |
| V                                                                          | 2390.0          | 14.7                | 4.1                    | 0.0                | 32.2                  | 0.8               | 47.7                           | 37.1                          | 74.0                              | -26.3                                   | Pass               | 54.0                                 | -16.9       | Pass               |
| V                                                                          | 2383.8          | 16.0                | 4.2                    | 0.0                | 32.2                  | 0.8               | 49.0                           | 37.2                          | 74.0                              | -25.0                                   | Pass               | 54.0                                 | -16.8       | Pass               |
| High Channel                                                               |                 |                     |                        |                    |                       |                   |                                |                               |                                   |                                         |                    |                                      |             |                    |
| V                                                                          | 2483.5          | 16.1                | 5.3                    | 0.0                | 32.4                  | 0.8               | 49.3                           | 38.5                          | 74.0                              | -24.7                                   | Pass               | 54.0                                 | -15.5       | Pass               |
| V                                                                          | 2490.2          | 16.8                | 5.4                    | 0.0                | 32.4                  | 0.8               | 50.0                           | 38.6                          | 74.0                              | -24.0                                   | Pass               | 54.0                                 | -15.4       | Pass               |
| High edge hopping                                                          |                 |                     |                        |                    |                       |                   |                                |                               |                                   |                                         |                    |                                      |             |                    |
| V                                                                          | 2483.5          | 16.2                | 5.2                    | 0.0                | 32.4                  | 0.8               | 49.4                           | 38.4                          | 74.0                              | -24.6                                   | Pass               | 54.0                                 | -15.6       | Pass               |
| V                                                                          | 2491.4          | 16.6                | 5.4                    | 0.0                | 32.4                  | 0.8               | 49.8                           | 38.6                          | 74.0                              | -24.2                                   | Pass               | 54.0                                 | -15.4       | Pass               |
| Table Result: Pass by -15.4 dB Worst Freq: 2490.2 MHz                      |                 |                     |                        |                    |                       |                   |                                |                               |                                   |                                         |                    |                                      |             |                    |
| Test Site: EMI Chamber 1                                                   |                 |                     |                        |                    | Cable 1: Asset #2456  |                   |                                |                               |                                   | Cable 2: Asset #2606                    |                    |                                      |             |                    |
| Analyzer: Rental SA#3                                                      |                 |                     |                        |                    | Preamp: None          |                   |                                |                               |                                   | Antenna: Blue Horn                      |                    |                                      |             |                    |
| Cable 3: ---                                                               |                 |                     |                        |                    |                       |                   |                                |                               |                                   |                                         |                    |                                      |             |                    |
| Preselector: ---                                                           |                 |                     |                        |                    |                       |                   |                                |                               |                                   |                                         |                    |                                      |             |                    |
| CSsoft Radiated Emissions Calculator v1.017.214                            |                 |                     |                        |                    |                       |                   |                                |                               |                                   |                                         |                    |                                      |             |                    |
| Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor |                 |                     |                        |                    |                       |                   |                                |                               |                                   |                                         |                    |                                      |             |                    |
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Rev. 4/29/2019

| Spectrum Analyzers / Receivers / Preselectors |  | Range        | MN      | Mfr               | SN         | Asset | Cat | Calibration Due |
|-----------------------------------------------|--|--------------|---------|-------------------|------------|-------|-----|-----------------|
| 2093 MXE EMI Receiver                         |  | 20Hz-26.5GHz | N9038A  | Agilent           | MY51210181 | 2093  | I   | 11/21/2019      |
| Radiated Emissions Sites                      |  | FCC Code     | IC Code | VCCI Code         | Range      | Asset | Cat | Calibration Due |
| EMI Chamber 1                                 |  | 719150       | 2762A-6 | A-0015            | 1-18GHz    | 1685  | I   | 12/7/2020       |
| Antennas                                      |  | Range        | MN      | Mfr               | SN         | Asset | Cat | Calibration Due |
| Blue Horn                                     |  | 1-18GHz      | 3117    | ETS               | 157647     | 1861  | I   | 3/9/2021        |
| Meteorological Meters/Chambers                |  |              | MN      | Mfr               | SN         | Asset | Cat | Calibration Due |
| Weather Clock (Pressure Only)                 |  |              | BA928   | Oregon Scientific | C3166-1    | 831   | I   | 5/15/2020       |
| Asset #2657                                   |  |              | 1235C97 | Control Company   | 181683806  | 2657  | I   | 4/3/2020        |
| Cables                                        |  | Range        |         | Mfr               |            |       | Cat | Calibration Due |
| Asset #2456                                   |  | 9KHz-18GHz   |         | MegaPhase         |            |       | II  | 10/31/2019      |
| Asset #2606                                   |  | 9KHz-18GHz   |         | MegaPhase         |            |       | II  | 4/2/2020        |

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

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## 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 BUREAU VERITAS CONSUMER PRODUCT SERVICES INC. (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 Bureau Veritas Consumer Product Services Inc. may use to delegate the performance of work can be provided upon request.

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**Appendix A****CFR Title 47 FCC Part §15.247 and ISCED Canada RSS-247 Issue 2****DUT Information**

Model Number: DEA731  
 Manufacturer: Aptiv Services US, LLC.  
 Serial Number: 0012

79 channels are provided for Bluetooth BR/EDR:

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

**Notes:** Channels 0, 39 and 78 were selected as representative test channels.

| Modulation     | Data Rate | Packet Types             |
|----------------|-----------|--------------------------|
| GFSK           | 1Mbps     | BR: DH1, DH3, DH5        |
| $\pi/4$ -DQPSK | 2Mbps     | EDR: 2-DH1, 2-DH3, 2-DH5 |
| 8DPSK          | 3Mbps     | EDR: 3-DH1, 3-DH3, 3-DH5 |



|                           |                                   |
|---------------------------|-----------------------------------|
| Antenna type              | Non-detachable internal PCB trace |
| Antenna gain              | 2.3dBi Peak                       |
| Number of transmit chains | 1                                 |
| Equipment type            | Frequency Hopping Spread Spectrum |

## Test Equipment Used

|                                                     |              |            |                   |                        |              |            |                        |                      |
|-----------------------------------------------------|--------------|------------|-------------------|------------------------|--------------|------------|------------------------|----------------------|
| Rev. 04/10/2019                                     |              |            |                   |                        |              |            |                        |                      |
| <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> |
| FSV40 Signal/Spectrum Analyzer                      | 10Hz-40GHz   | FSV40      | ROHDE & SCHWARZ   | 101551                 | 2200         | I          | 10/1/2019              | 10/1/2018            |
| <b>Signal Generators/Comparison Noise Emitter</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          | 10/1/2019              | 10/1/2018            |
| SMB100A Signal Generator                            | 100kHz-40GHz | SMB100A    | ROHDE & SCHWARZ   | 179884                 | 2557         | I          | 10/1/2019              | 10/1/2018            |
| <b>Power/Noise Meters</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> |
| OSP - open switch and control platform              | 30MHz-18GHz  | OSP-B157W8 | ROHDE & SCHWARZ   | 1527.1144.02-100955-Ck | 2558         | I          | 3/14/2020              | 3/14/2019            |
| <b>Cables</b>                                       | <b>Range</b> |            | <b>Mfr</b>        | <b>SN</b>              | <b>Asset</b> | <b>Cat</b> | <b>Calibration Due</b> | <b>Calibrated on</b> |
| DUT1                                                | 30MHz-40GHz  |            | Micro-Coax        | UFB142A-1-0787-200200  | 2593         | I          | 3/13/2020              | 3/13/2019            |
| DUT2                                                | 30MHz-40GHz  |            | Micro-Coax        | UFB142A-1-0787-200200  | 2594         | I          | 3/13/2020              | 3/13/2019            |
| DUT3                                                | 30MHz-40GHz  |            | Micro-Coax        | UFB142A-1-0787-200200  | 2595         | I          | 3/13/2020              | 3/13/2019            |
| DUT4                                                | 30MHz-40GHz  |            | Micro-Coax        | UFB142A-1-0787-200200  | 2596         | I          | 3/13/2020              | 3/13/2019            |
| <b>Attenuators / Couplers</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-18GHz  |            | Mini Circuits     | BW-S10W2+              |              | I          | 3/13/2020              | 3/13/2019            |
| 10dB Attenuator-02 Yellow                           | 30MHz-18GHz  |            | Mini Circuits     | BW-S10W2+              |              | I          | 3/13/2020              | 3/13/2019            |
| 10dB Attenuator-03 Red                              | 30MHz-18GHz  |            | Mini Circuits     | BW-S10W2+              |              | I          | 3/13/2020              | 3/13/2019            |
| 10dB Attenuator-04 orange                           | 30MHz-18GHz  |            | Mini Circuits     | BW-S10W2+              |              | I          | 3/13/2020              | 3/13/2019            |
| API - 30dB 20W Attenuator                           | 9KHz-40GHz   | 89-30-11   | API Weinschel     | 703                    | 2121         | II         | 3/23/2020              | 3/23/2019            |
| Directional Coupler                                 | 0.5GHz-18GHz | UDC        | AA MCS            | 001040                 | 2434         | I          | 8/8/2019               | 8/9/2018             |
| <b>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> |
| CMW270 Wideband Radio Communication Tester          | DC to 6GHz   | CMW270     | ROHDE & SCHWARZ   | 1201.0002K75-101066-MV | 2559         | I          | 2/14/2020              | 2/14/2019            |
| <b>Meteorological Meters/Chambers</b>               |              | <b>MN</b>  | <b>Mfr</b>        | <b>SN</b>              | <b>Asset</b> | <b>Cat</b> | <b>Calibration Due</b> | <b>Calibrated on</b> |
| Temp/Humidity Chamber #18                           |              | EPX-2H     | Espec             | 137664                 | 1645         | I          | 1/2/2020               | 1/2/2019             |
| Weather Clock (Pressure only)                       |              | BA928      | Oregon Scientific | C3166-1                | 831          | I          | 5/15/2020              | 5/15/2018            |
| TH A#2086                                           |              | HTC-1      | HDE               |                        | 2086         | II         | 3/23/2020              | 3/23/2019            |

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

| Rohde&Schwarz Test System TS8997 |               |              |               |                                                 |                  |
|----------------------------------|---------------|--------------|---------------|-------------------------------------------------|------------------|
| Test Equipment                   | Manufacturer  | Model Number | Serial Number | Firmware Version                                | Software Version |
| Spectrum Analyzer                | Rohde&Schwarz | FSV40        | 101551        | 3.40                                            | N/A              |
| Signal Generator                 | Rohde&Schwarz | SMB100A      | 179884        | 3.20.390.24 / Drv:Rev 2.21.0, 07/2016, CVI 2015 | N/A              |
| Vector Signal Generator          | Rohde&Schwarz | SMBV100A     | 261919        | 3.1.19.15 - 3.50.082.47                         | N/A              |
| Switching Platform               | Rohde&Schwarz | OSP-B157W    | 100955        | 1.23.0.2                                        | N/A              |
| Wireless Connectivity Tester     | Rohde&Schwarz | CMW270       | 101066        | 3.7                                             | N/A              |
| Test Software                    | Rohde&Schwarz | WMS32        | N/A           | N/A                                             | V10.50.00        |



**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         |
| Occupied Channel Bandwidth 99% | 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       | -----      | -----        | -----        | -----        | -----        | -----        | -----        |
| Emission Bandwidth 20 dB       | 2441.000 (single)  | PASS       | PASS       | PASS       | PASS         | PASS         | PASS         | PASS         | PASS         | PASS         |
| Occupied Channel Bandwidth 99% | 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       | -----      | -----        | -----        | -----        | -----        | -----        | -----        |
| Emission Bandwidth 20 dB       | 2480.000 (single)  | PASS       | PASS       | PASS       | PASS         | PASS         | PASS         | PASS         | PASS         | PASS         |
| Occupied Channel Bandwidth 99% | 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       | -----      | -----        | -----        | -----        | -----        | -----        | -----        |

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Testing Cert. No. 1627-01

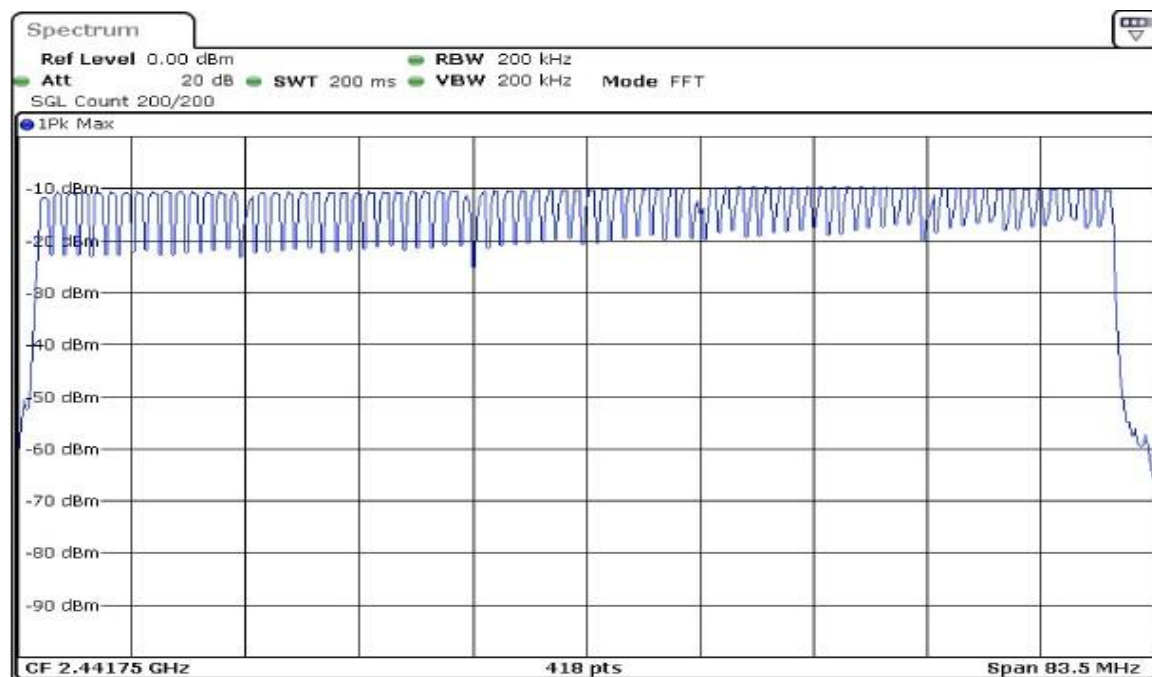
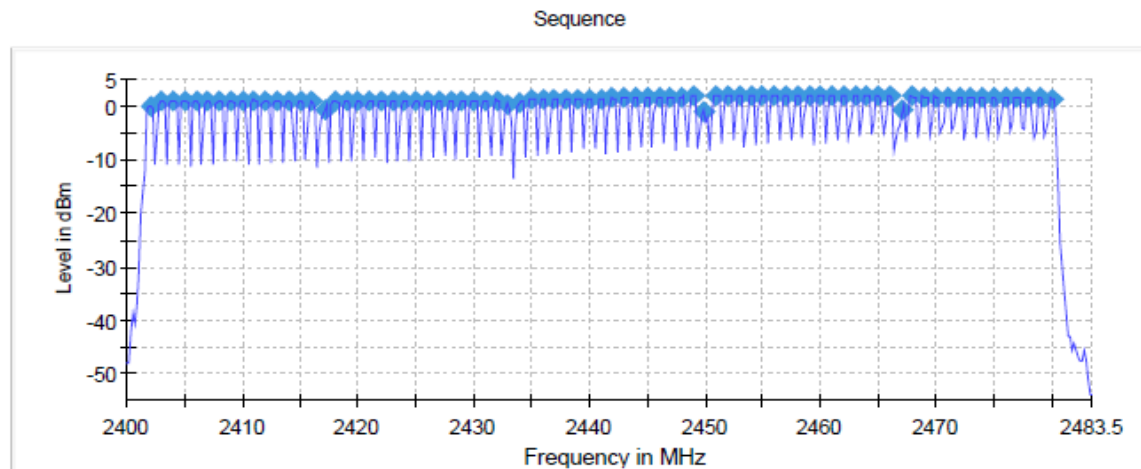
## Number of Hopping Frequencies

Test procedure in accordance with ANSI C63.10-2013

### Channels

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

Plot for packet type DH3 shown below.



**Band Edge (during hopping)**

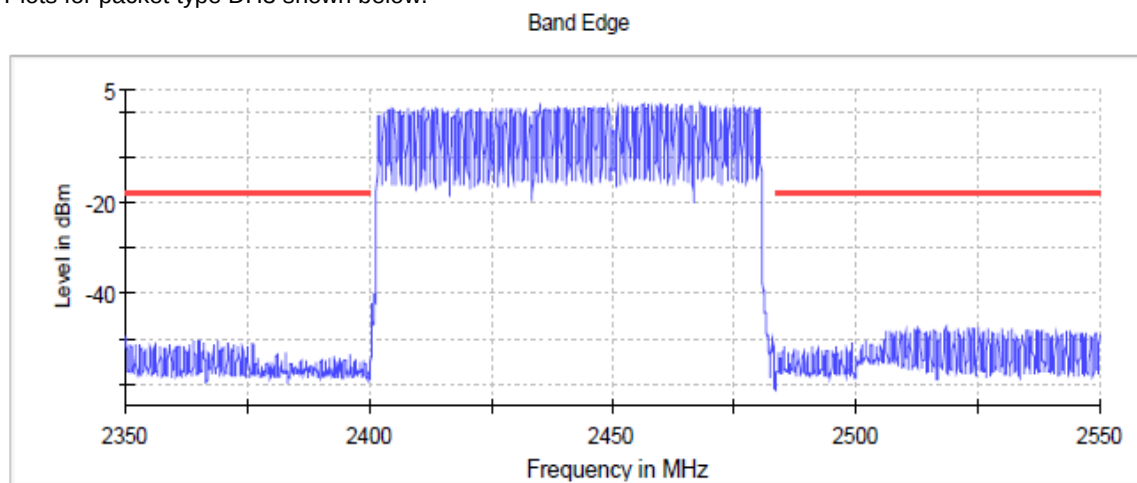
Test procedure in accordance with ANSI C63.10-2013

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

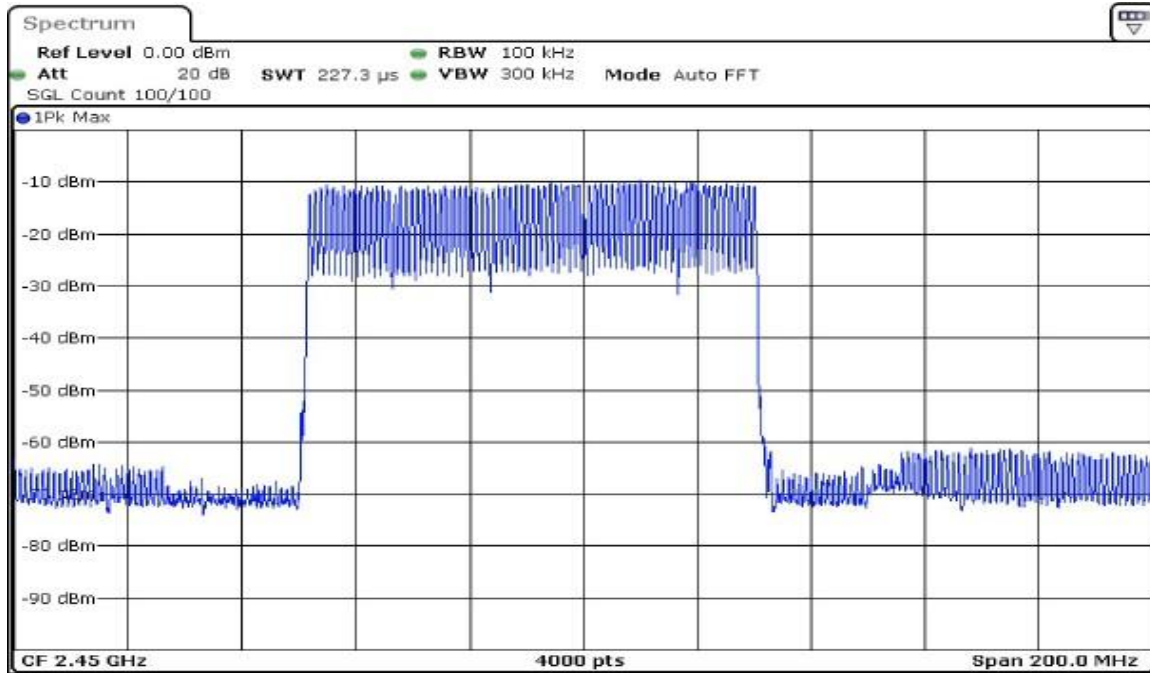
**In-band Peak**

| Data Rate | Frequency (MHz) | Level (dBm) |
|-----------|-----------------|-------------|
| DH1       | 2454.825000     | 2.1         |
| DH3       | 2459.825000     | 2.1         |
| DH5       | 2455.175000     | 1.9         |
| 2-DH1     | 2453.975000     | -0.7        |
| 2-DH3     | 2455.025000     | -0.7        |
| 2-DH5     | 2460.825000     | -0.5        |
| 3-DH1     | 2456.825000     | -0.6        |
| 3-DH3     | 2453.175000     | -0.8        |
| 3-DH5     | 2453.975000     | -0.7        |

Plots for packet type DH3 shown below.







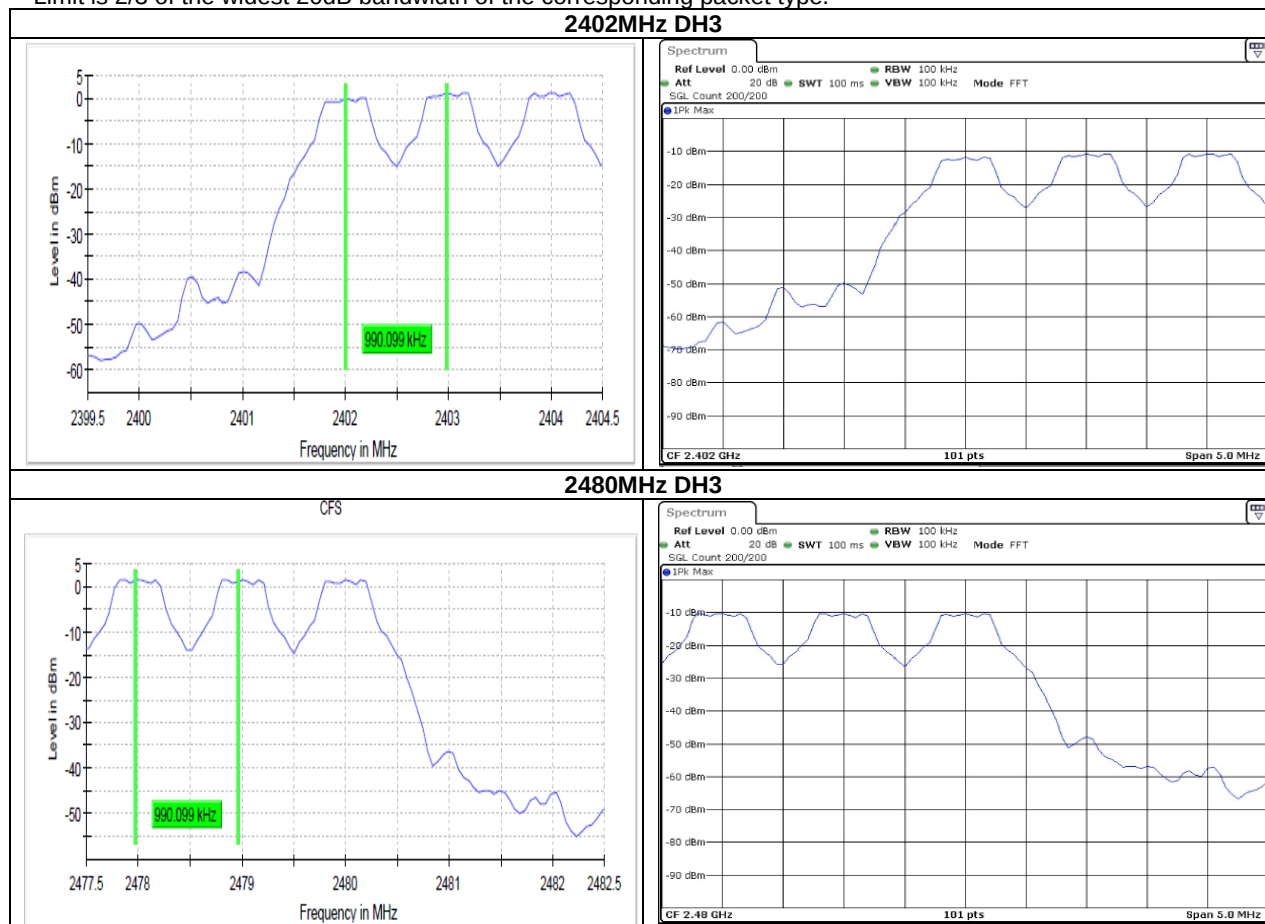
## Carrier Frequency Separation

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%

| Hopping Mode |                            |                     |                            |                     |
|--------------|----------------------------|---------------------|----------------------------|---------------------|
| Packet Type  | 2402MHz                    |                     | 2480MHz                    |                     |
|              | Frequency Separation (MHz) | Minimum Limit (MHz) | Frequency Separation (MHz) | Minimum Limit (MHz) |
| DH1          | 0.990099                   | 0.653465            | 0.990099                   | 0.613862            |
| DH3          | 0.990099                   | 0.653465            | 0.990099                   | 0.673267            |
| DH5          | 0.990099                   | 0.673267            | 0.990099                   | 0.673267            |
| 2-DH1        | 0.990099                   | 0.871287            | 0.990099                   | 0.871287            |
| 2-DH3        | 0.990099                   | 0.910891            | 0.990099                   | 0.910891            |
| 2-DH5        | 0.990099                   | 0.910891            | 0.990099                   | 0.910891            |
| 3-DH1        | 0.990099                   | 0.871287            | 0.990099                   | 0.871287            |
| 3-DH3        | 0.990099                   | 0.891089            | 0.990099                   | 0.891089            |
| 3-DH5        | 0.990099                   | 0.891089            | 0.990099                   | 0.910891            |

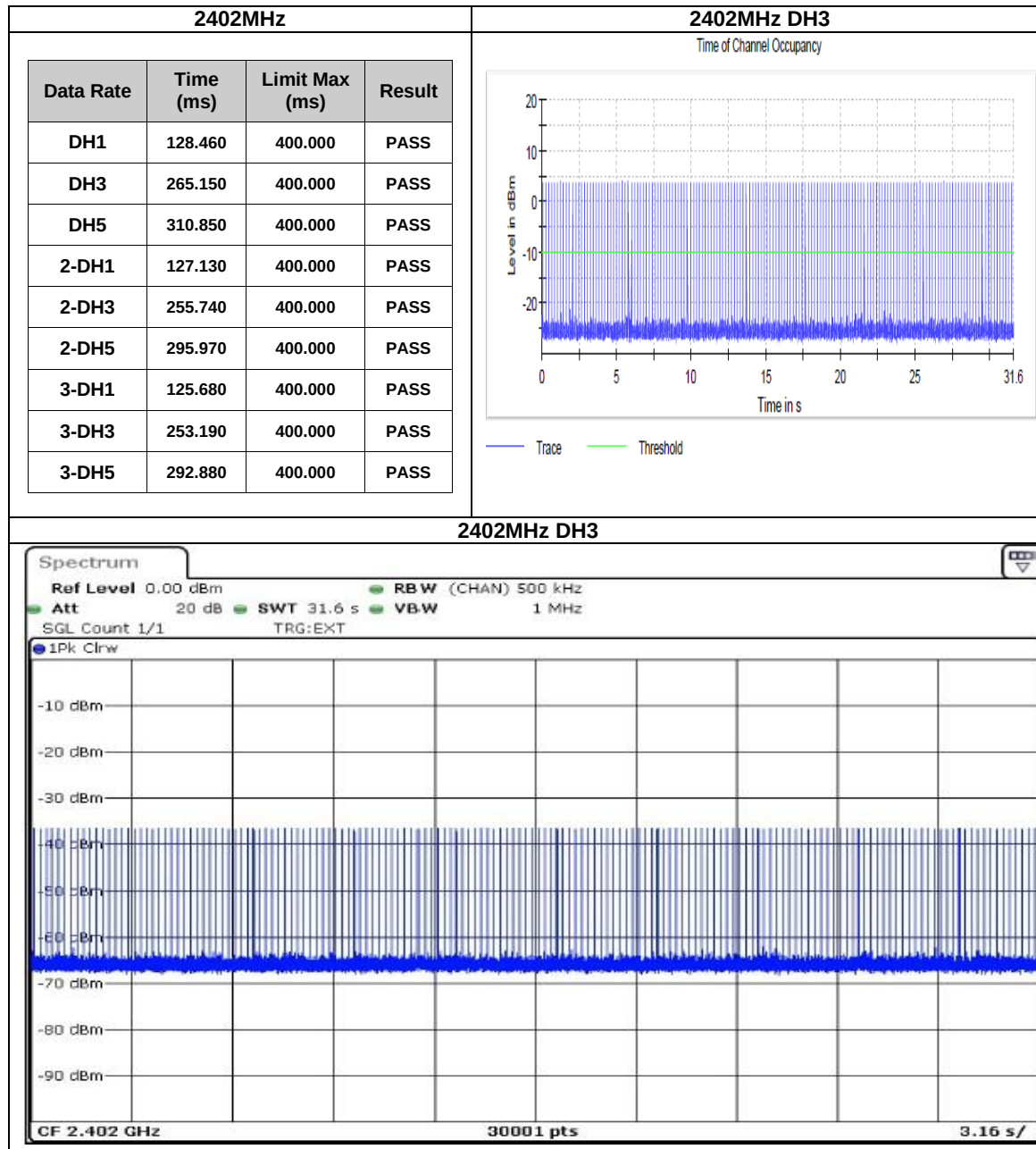
\*Limit is 2/3 of the widest 20dB bandwidth of the corresponding packet type.

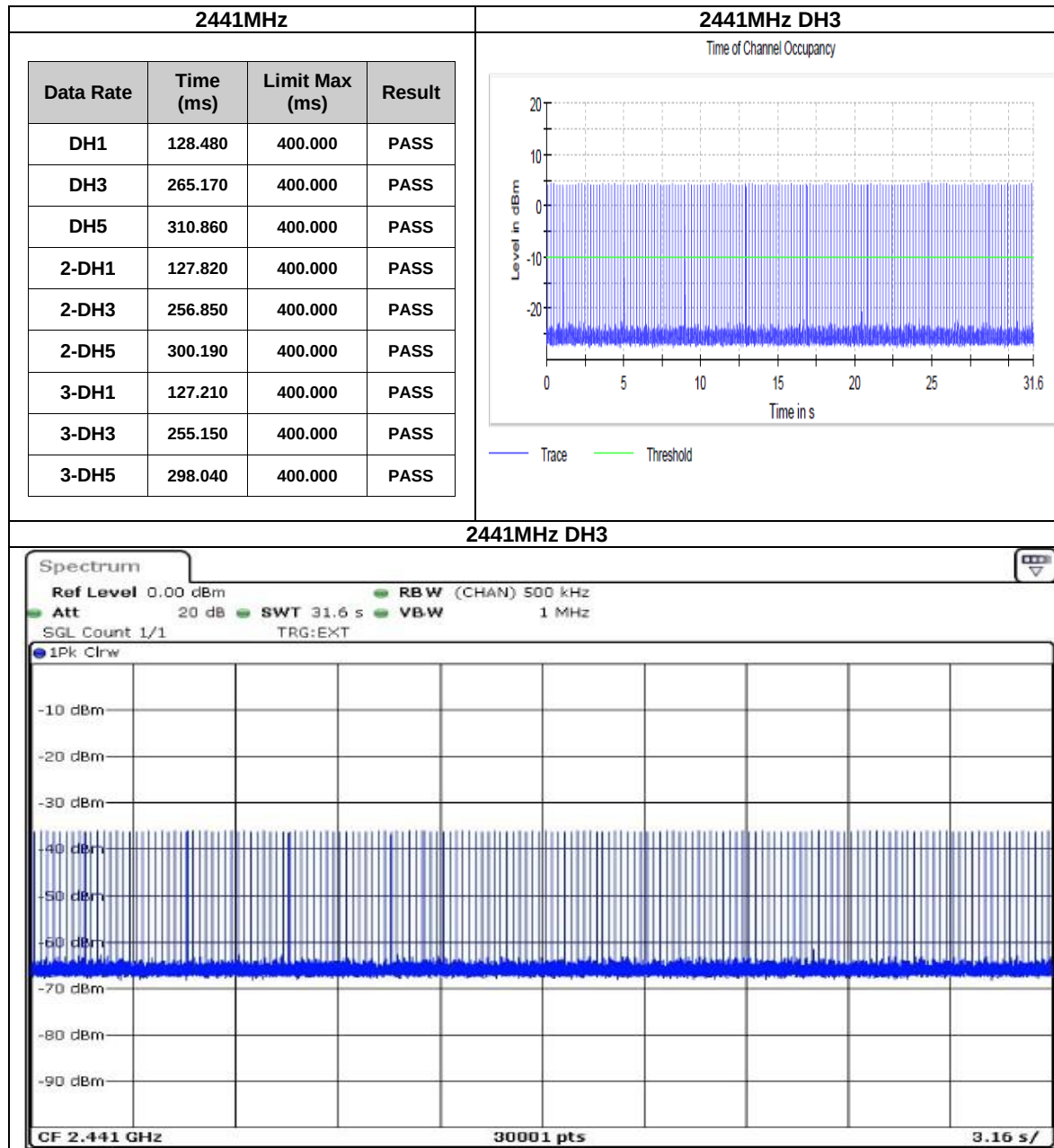


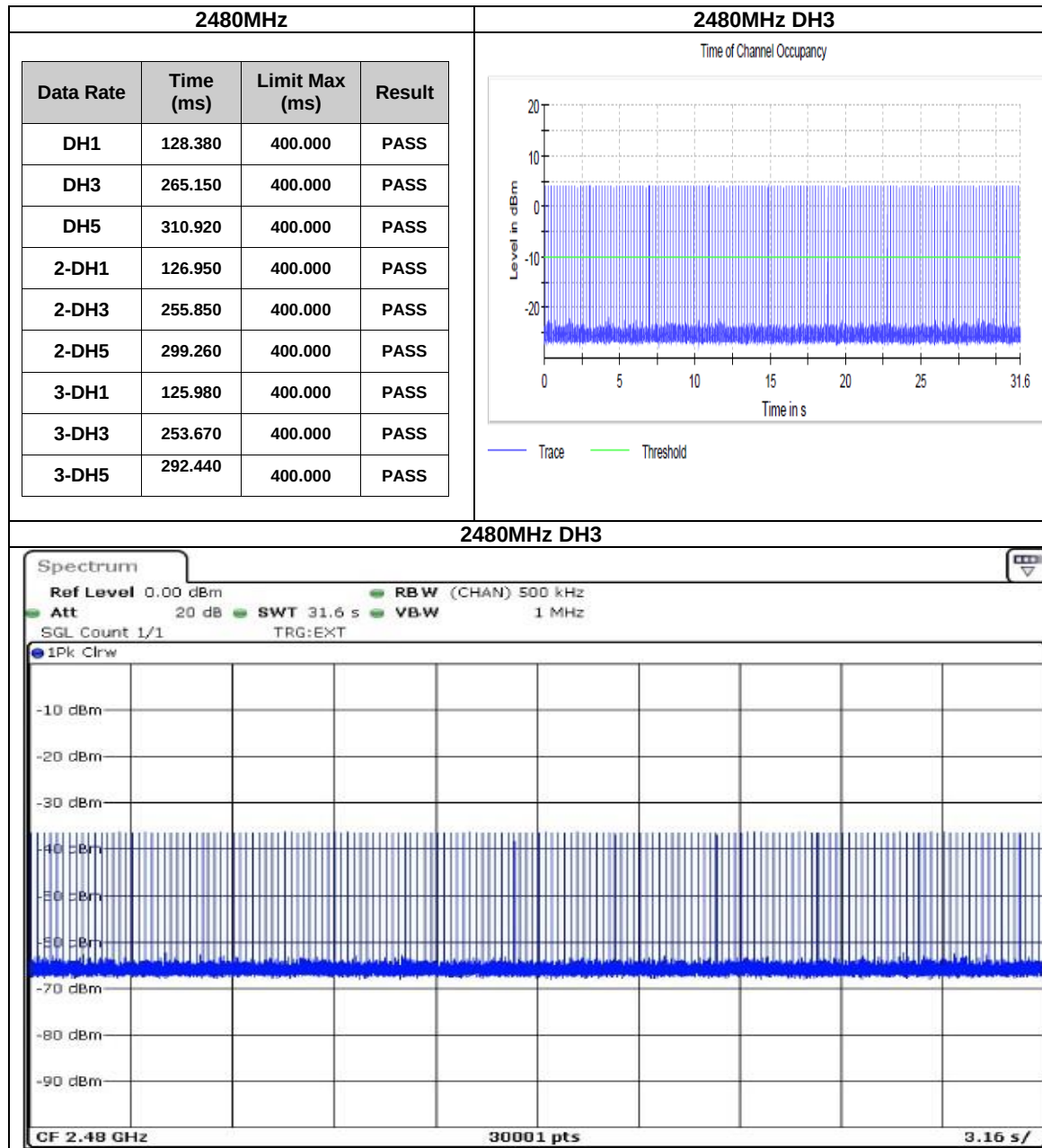
**Time of Channel Occupancy (Dwell Time)**

Test procedure in accordance with ANSI C63.10-2013

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

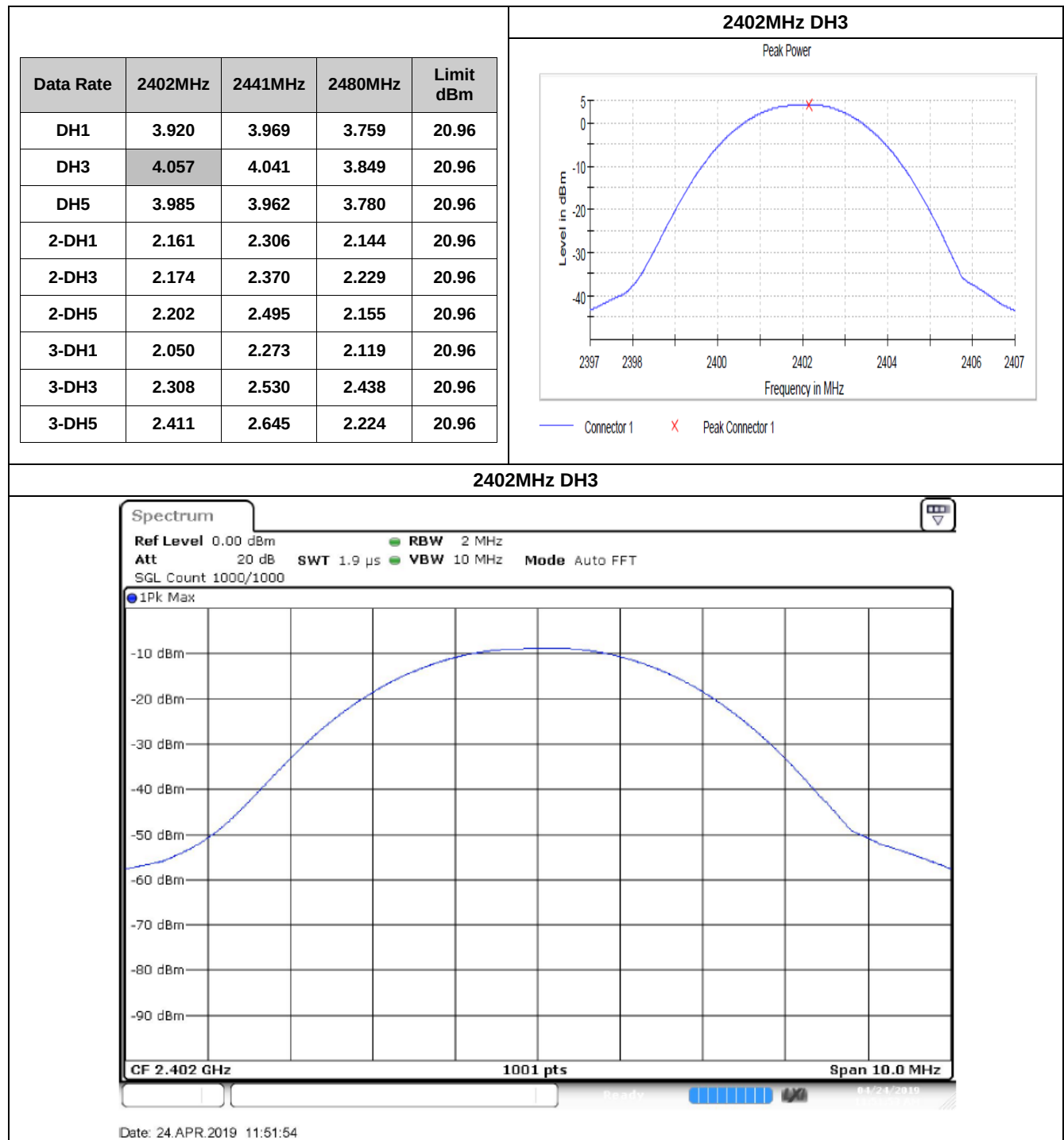






**Peak Output Power**

Test procedure in accordance with ANSI C63.10-2013



**Emission Bandwidth 20 dB**

Test procedure in accordance with ANSI C63.10-2013

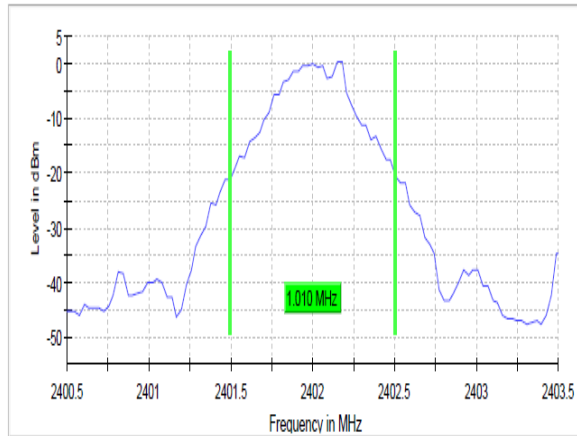
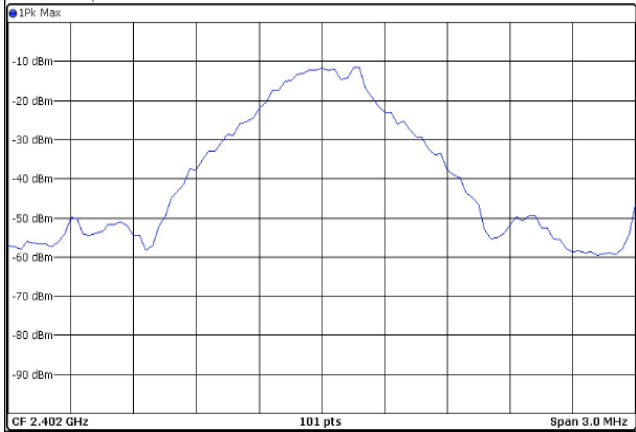
Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) &lt; 2%

**Modulation: GFSK**

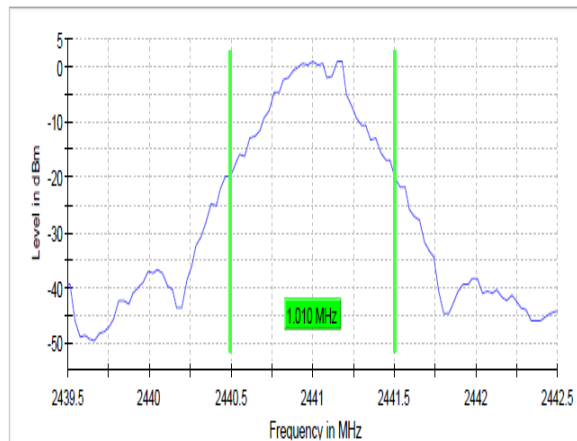
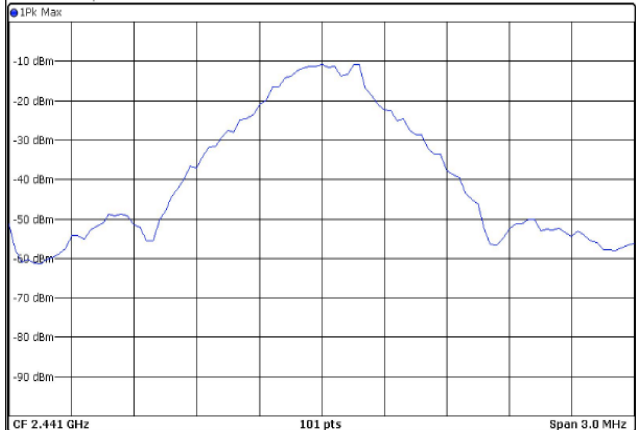
| Channel | Data Rate | 20dB Bandwidth (MHz) |
|---------|-----------|----------------------|
| 0       | DH1       | 0.980198             |
|         | DH3       | 0.980198             |
|         | DH5       | 1.009900             |
| 39      | DH1       | 0.920793             |
|         | DH3       | 1.009900             |
|         | DH5       | 1.009900             |
| 78      | DH1       | 0.920793             |
|         | DH3       | 1.009900             |
|         | DH5       | 1.009900             |

**2402 MHz DH5**

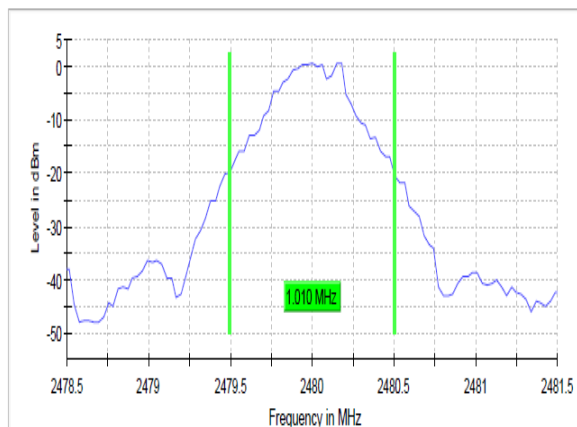
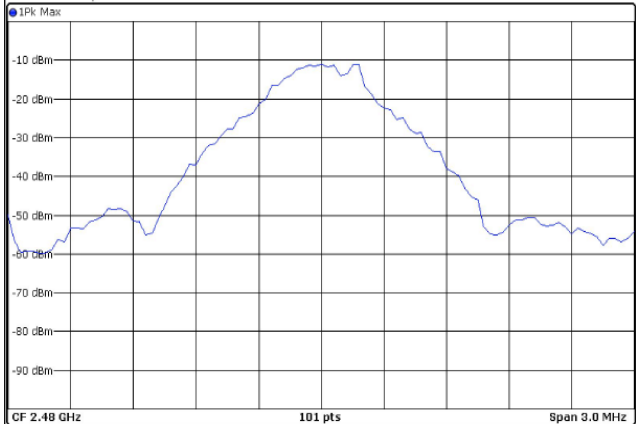
20 dB Bandwidth

**Spectrum**Ref Level 0.00 dBm RBW 30 kHz  
Att 20 dB SWT 63.2  $\mu$ s VBW 100 kHz Mode Auto FFT  
SGL Count 200/200**2441 MHz DH5**

20 dB Bandwidth

**Spectrum**Ref Level 0.00 dBm RBW 30 kHz  
Att 20 dB SWT 63.2  $\mu$ s VBW 100 kHz Mode Auto FFT  
SGL Count 200/200**2480 MHz DH5**

20 dB Bandwidth

**Spectrum**Ref Level 0.00 dBm RBW 30 kHz  
Att 20 dB SWT 63.2  $\mu$ s VBW 100 kHz Mode Auto FFT  
SGL Count 200/200

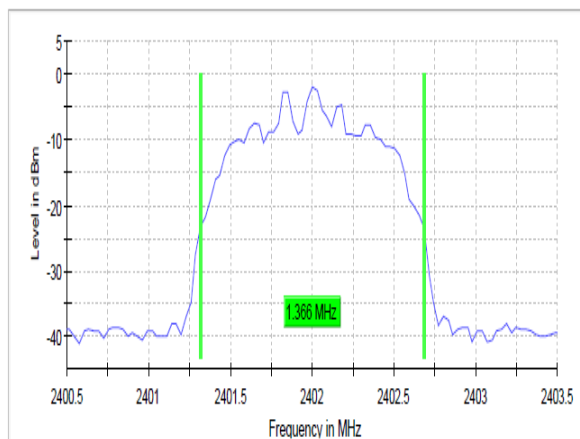


**Modulation:  $\pi/4$ -DQPSK**

| Channel | Data Rate | 20dB Bandwidth (MHz) |
|---------|-----------|----------------------|
| 0       | 2-DH1     | 1.306930             |
|         | 2-DH3     | 1.366336             |
|         | 2-DH5     | 1.366336             |
| 39      | 2-DH1     | 1.306930             |
|         | 2-DH3     | 1.366336             |
|         | 2-DH5     | 1.366336             |
| 78      | 2-DH1     | 1.306930             |
|         | 2-DH3     | 1.366336             |
|         | 2-DH5     | 1.366336             |

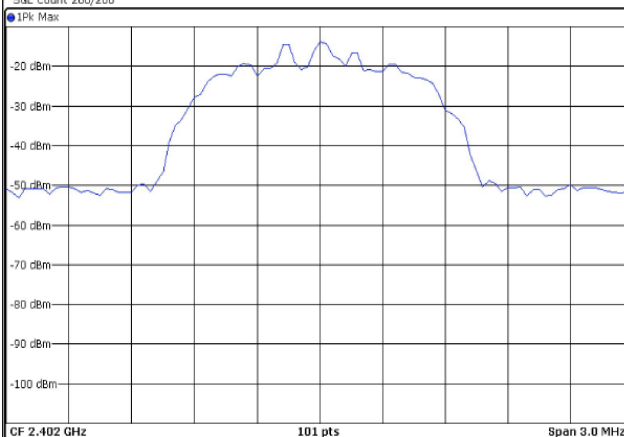
## 2402 MHz 2-DH3

20 dB Bandwidth



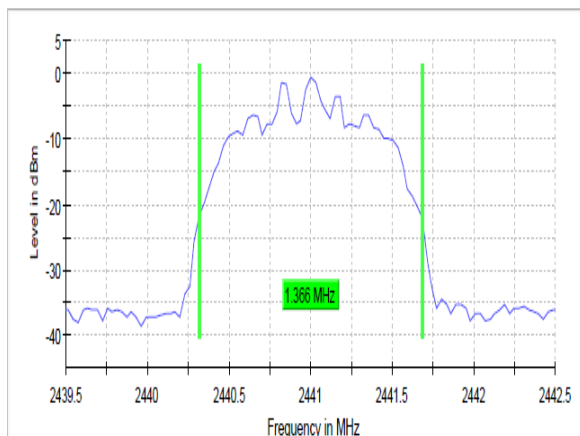
## Spectrum

Ref Level -10.00 dBm  
Att 10 dB SWT 63.2  $\mu$ s RBW 30 kHz  
SGL Count 200/200 VBW 100 kHz Mode Auto FFT



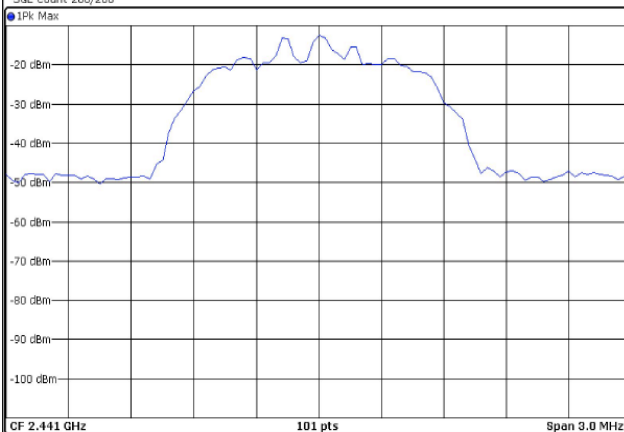
## 2441 MHz 2-DH3

20 dB Bandwidth



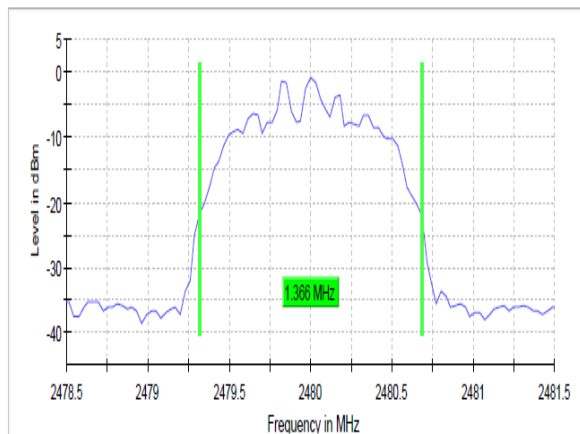
## Spectrum

Ref Level -10.00 dBm  
Att 10 dB SWT 63.2  $\mu$ s RBW 30 kHz  
SGL Count 200/200 VBW 100 kHz Mode Auto FFT



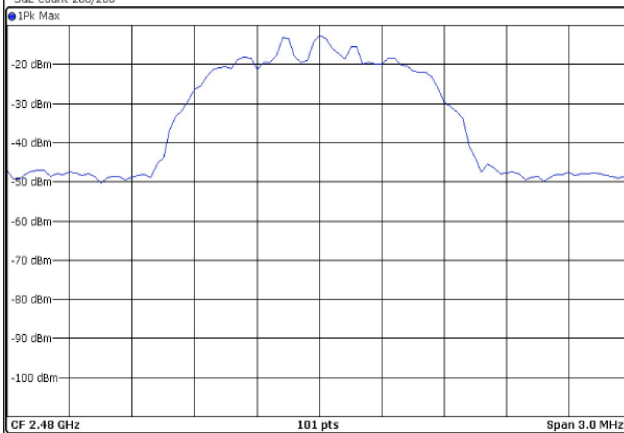
## 2480 MHz 2-DH3

20 dB Bandwidth



## Spectrum

Ref Level -10.00 dBm  
Att 10 dB SWT 63.2  $\mu$ s RBW 30 kHz  
SGL Count 200/200 VBW 100 kHz Mode Auto FFT



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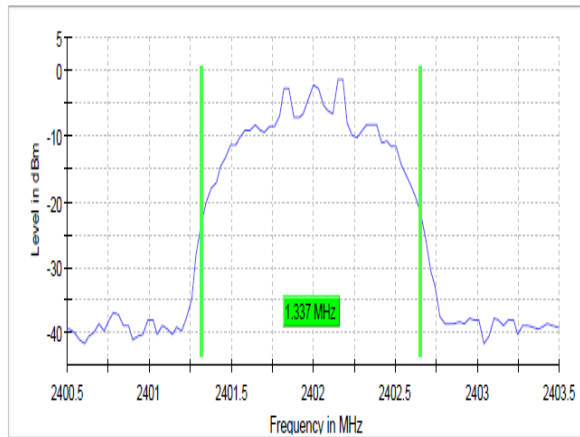


**Modulation: 8DPSK**

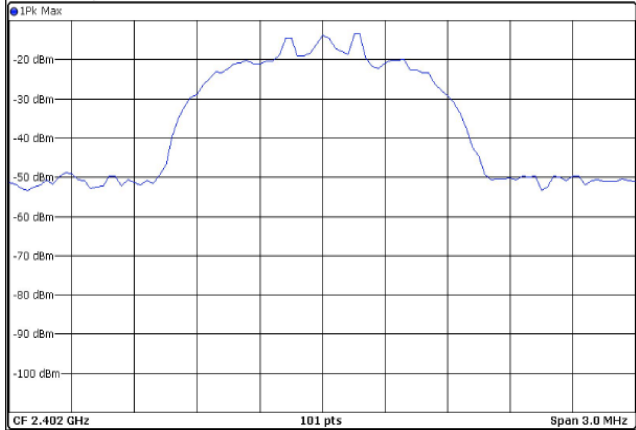
| Channel | Data Rate | 20dB Bandwidth (MHz) |
|---------|-----------|----------------------|
| 0       | 3-DH1     | 1.306930             |
|         | 3-DH3     | 1.336633             |
|         | 3-DH5     | 1.336633             |
| 39      | 3-DH1     | 1.306930             |
|         | 3-DH3     | 1.366336             |
|         | 3-DH5     | 1.336633             |
| 78      | 3-DH1     | 1.306930             |
|         | 3-DH3     | 1.336633             |
|         | 3-DH5     | 1.366336             |

**2402 MHz 3-DH5**

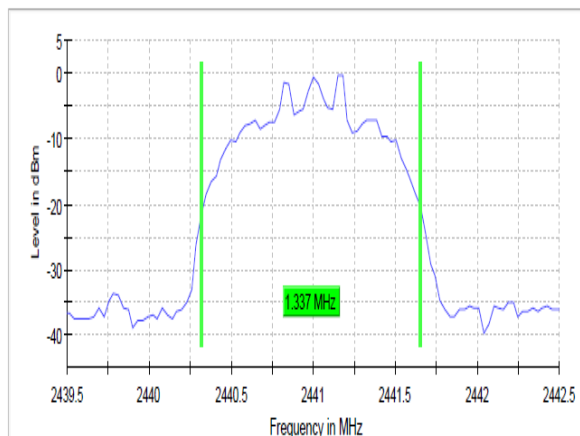
20 dB Bandwidth

**Spectrum**

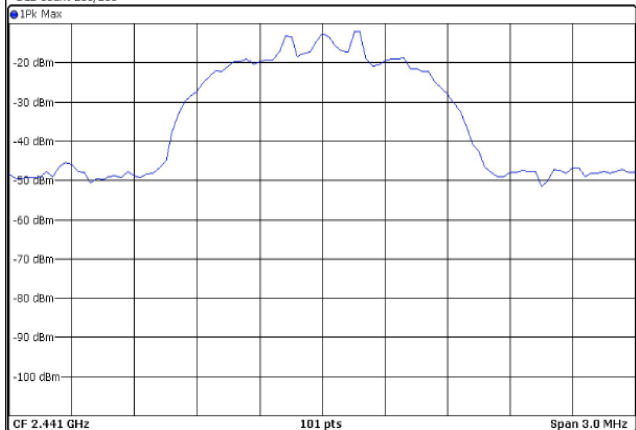
Ref Level -10.00 dBm RBW 30 kHz  
Att 10 dB SWT 63.2  $\mu$ s VBW 100 kHz Mode Auto FFT  
SGL Count 200/200

**2441 MHz 3-DH5**

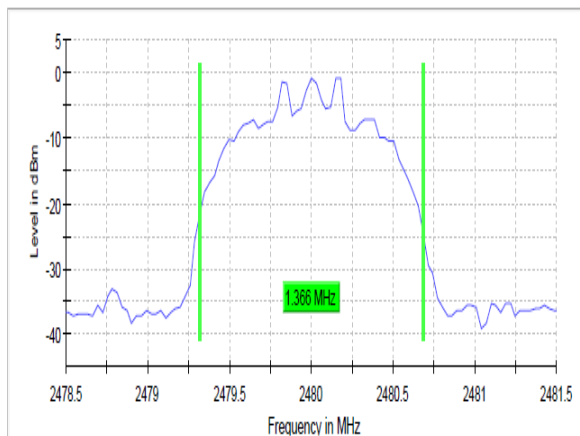
20 dB Bandwidth

**Spectrum**

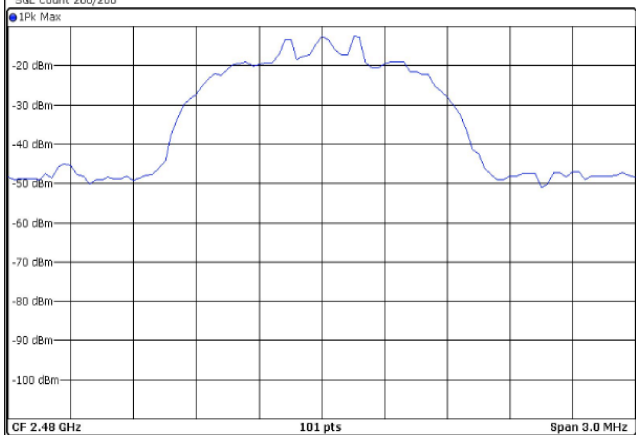
Ref Level -10.00 dBm RBW 30 kHz  
Att 10 dB SWT 63.2  $\mu$ s VBW 100 kHz Mode Auto FFT  
SGL Count 200/200

**2480 MHz 3-DH5**

20 dB Bandwidth

**Spectrum**

Ref Level -10.00 dBm RBW 30 kHz  
Att 10 dB SWT 63.2  $\mu$ s VBW 100 kHz Mode Auto FFT  
SGL Count 200/200



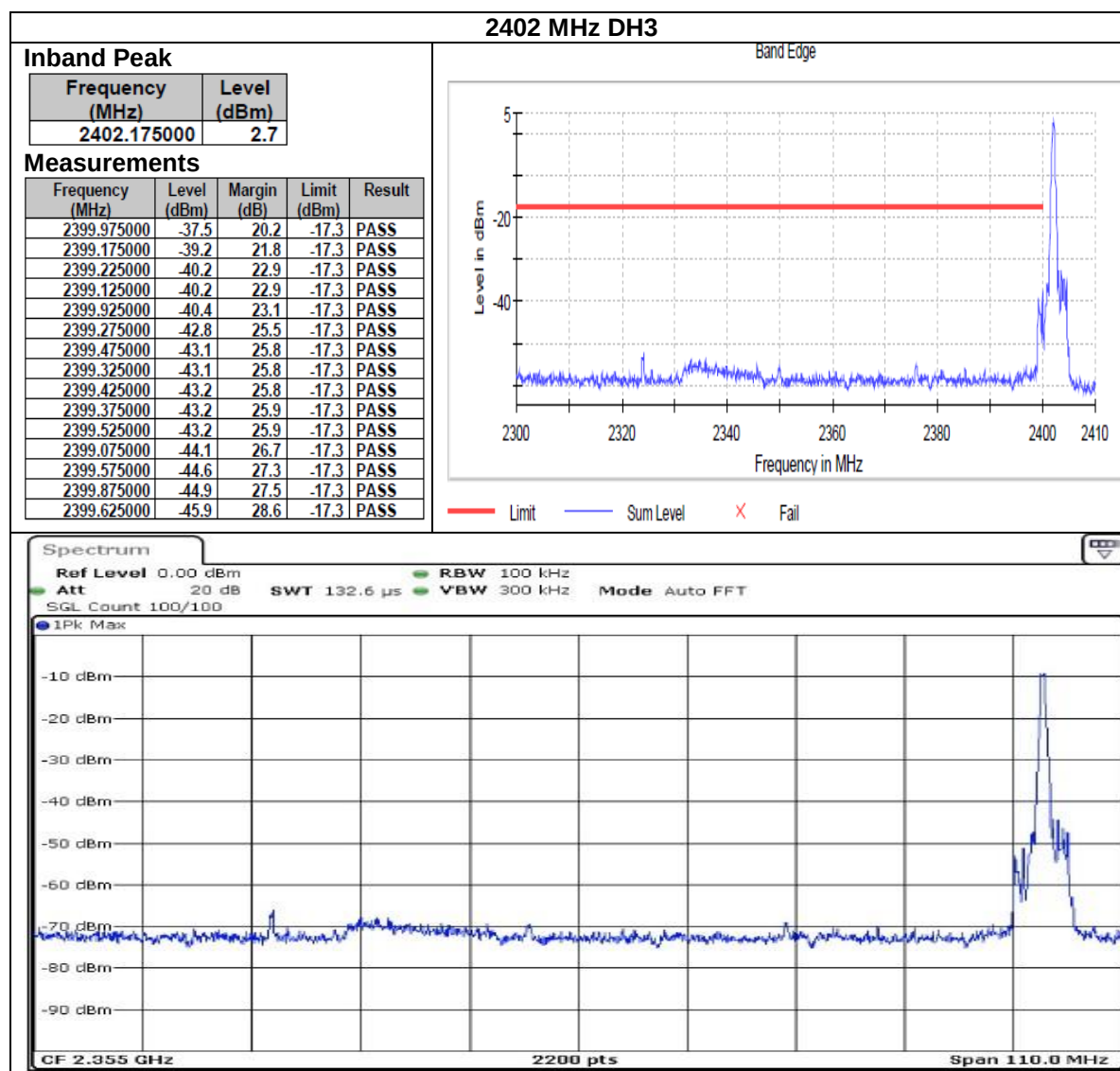
**Band Edge Low**

Test procedure in accordance with ANSI C63.10-2013

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

**In-band Peak**

| Channel | Inband Peak     | DH1      | DH3      | DH5      | 2-DH1    | 2-DH3    | 2-DH5    | 3-DH1    | 3-DH3    | 3-DH5    |
|---------|-----------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 0       | Frequency (MHz) | 2401.825 | 2402.175 | 2402.175 | 2402.025 | 2402.025 | 2402.025 | 2402.025 | 2402.025 | 2402.025 |
|         | Level (dBm)     | 2.6      | 2.7      | 2.7      | 0.3      | 0.3      | 0.3      | 0.3      | 0.3      | 0.4      |



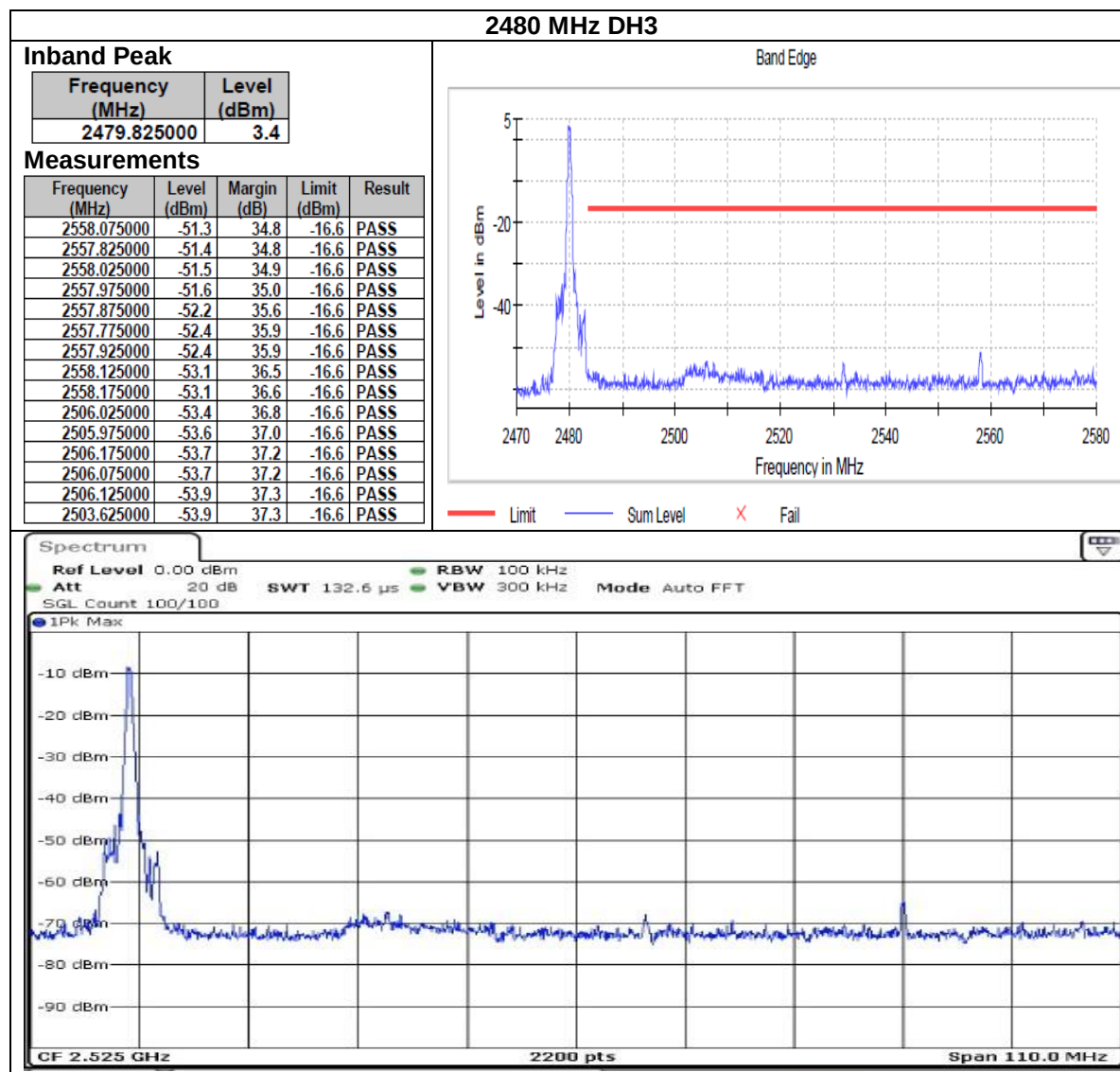
**Band Edge High**

Test procedure in accordance with ANSI C63.10-2013

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

**In-band Peak**

| Channel | Inband Peak     | DH1      | DH3      | DH5      | 2-DH1    | 2-DH3    | 2-DH5    | 3-DH1    | 3-DH3    | 3-DH5    |
|---------|-----------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 78      | Frequency (MHz) | 2479.825 | 2479.825 | 2479.975 | 2479.975 | 2479.825 | 2480.025 | 2479.975 | 2480.025 | 2479.825 |
|         | Level (dBm)     | 3.4      | 3.4      | 3.3      | 1.6      | 1.6      | 1.5      | 1.6      | 1.6      | 1.7      |



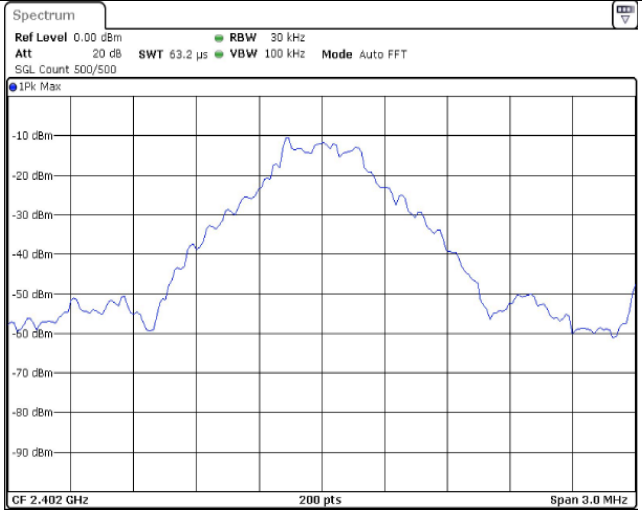
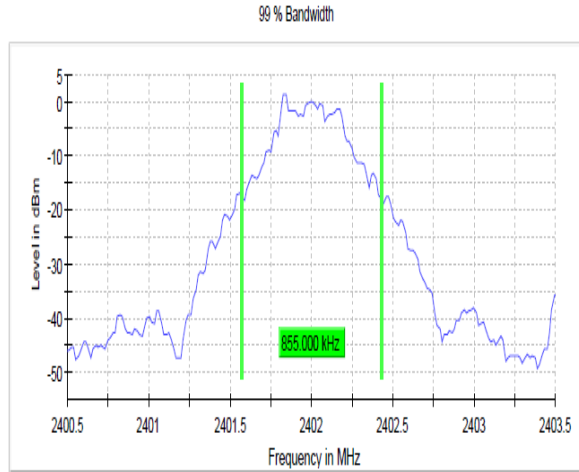
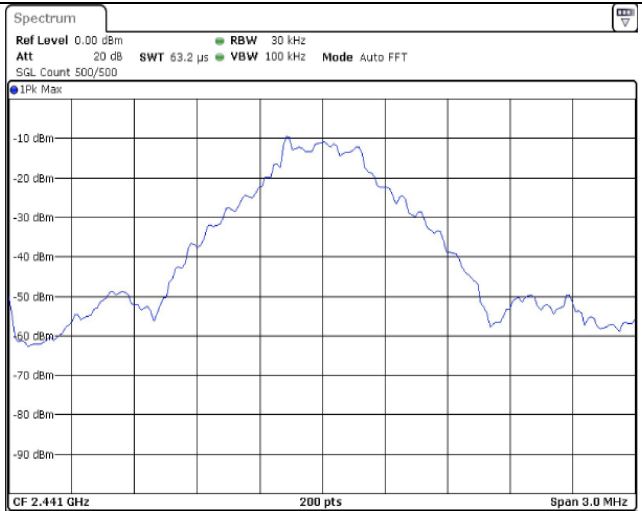
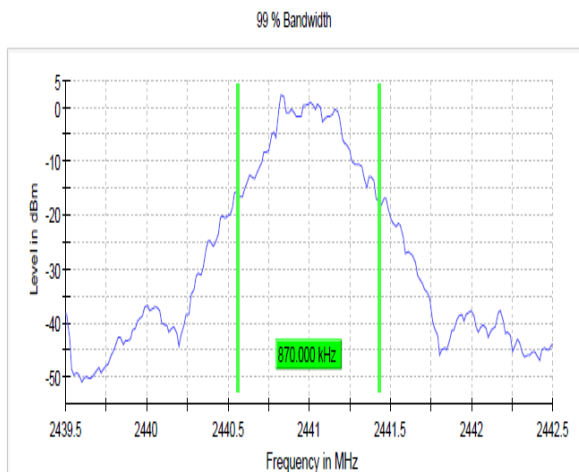
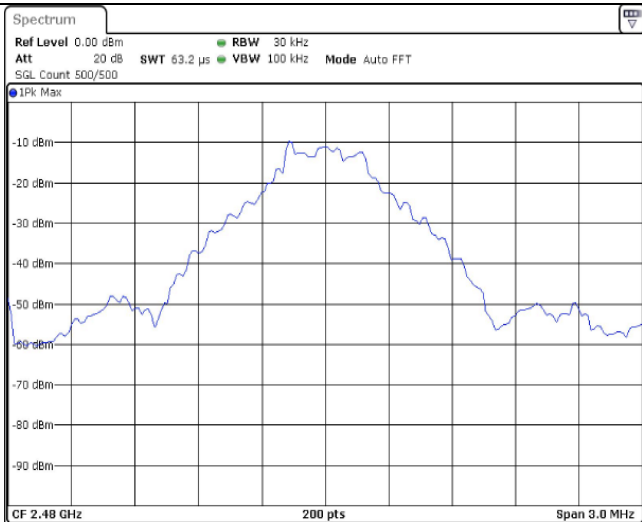
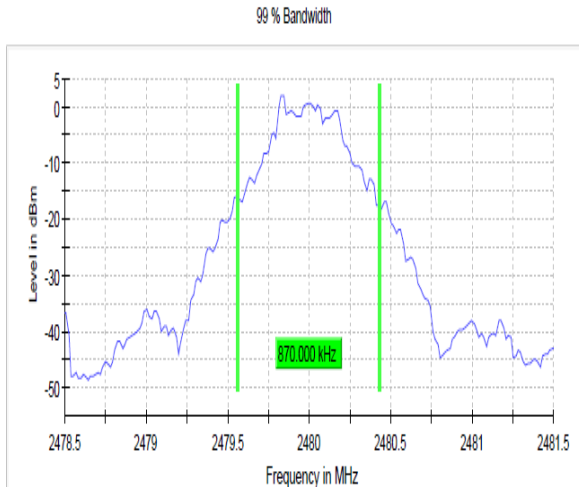
**Occupied Channel Bandwidth 99%**

Test procedure in accordance with RSS-Gen Issue 5 Section 6.7.

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

**Modulation: GFSK**

| Channel | Data Rate | Occupied Channel Bandwidth 99% (MHz) |
|---------|-----------|--------------------------------------|
| 0       | DH1       | 0.855000                             |
|         | DH3       | 0.855000                             |
|         | DH5       | 0.855000                             |
| 39      | DH1       | 0.840000                             |
|         | DH3       | 0.870000                             |
|         | DH5       | 0.870000                             |
| 78      | DH1       | 0.840000                             |
|         | DH3       | 0.870000                             |
|         | DH5       | 0.870000                             |

**2402 MHz DH3****2441 MHz DH3****2480 MHz DH3**

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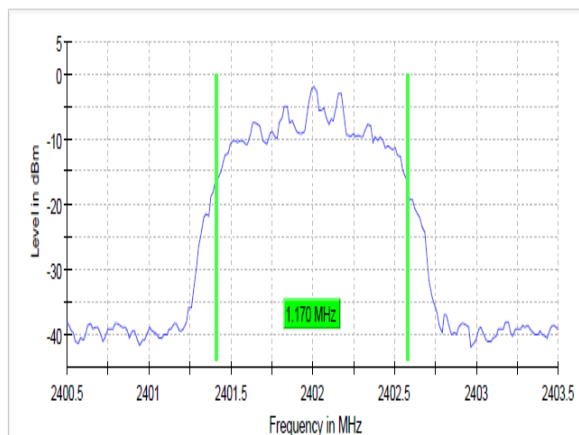


**Modulation:  $\pi/4$ -DQPSK**

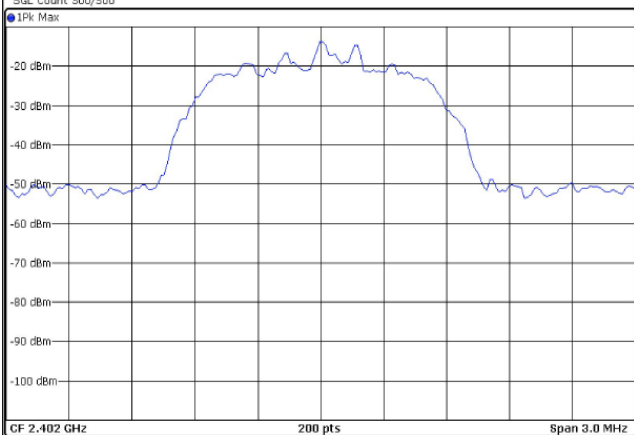
| Channel | Data Rate | Occupied Channel Bandwidth 99% (MHz) |
|---------|-----------|--------------------------------------|
| 0       | 2-DH1     | 1.170000                             |
|         | 2-DH3     | 1.170000                             |
|         | 2-DH5     | 1.170000                             |
| 39      | 2-DH1     | 1.185000                             |
|         | 2-DH3     | 1.200000                             |
|         | 2-DH5     | 1.200000                             |
| 78      | 2-DH1     | 1.185000                             |
|         | 2-DH3     | 1.200000                             |
|         | 2-DH5     | 1.200000                             |

**2402 MHz 2-DH5**

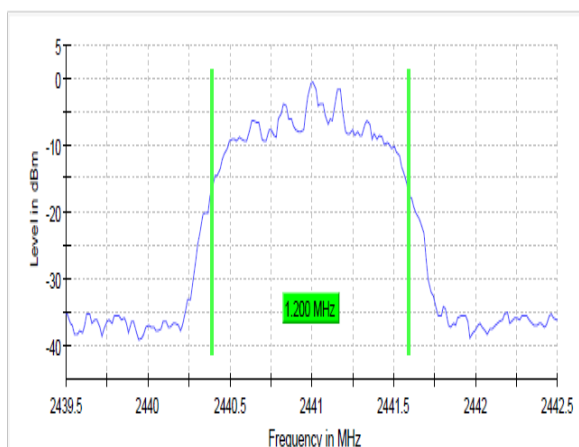
99 % Bandwidth

**Spectrum**

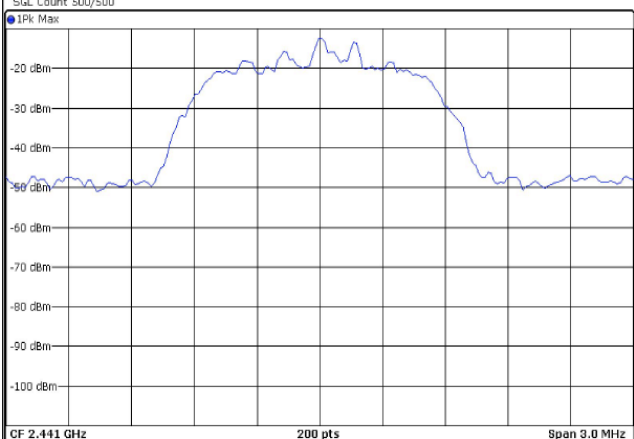
Ref Level -10.00 dBm  
Att 10 dB SWT 63.2  $\mu$ s RBW 30 kHz  
SGL Count 500/500 VBW 100 kHz Mode Auto FFT

**2441 MHz 2-DH5**

99 % Bandwidth

**Spectrum**

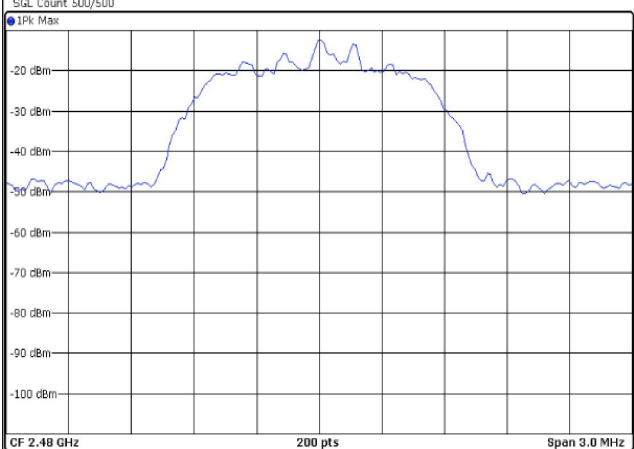
Ref Level -10.00 dBm  
Att 10 dB SWT 63.2  $\mu$ s RBW 30 kHz  
SGL Count 500/500 VBW 100 kHz Mode Auto FFT

**2480 MHz 2-DH5**

99 % Bandwidth

**Spectrum**

Ref Level -10.00 dBm  
Att 10 dB SWT 63.2  $\mu$ s RBW 30 kHz  
SGL Count 500/500 VBW 100 kHz Mode Auto FFT



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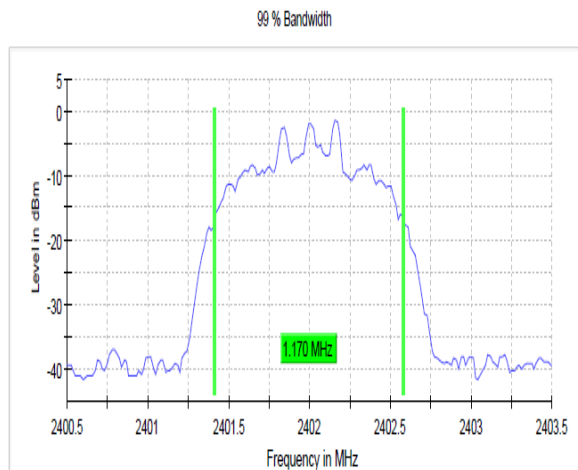
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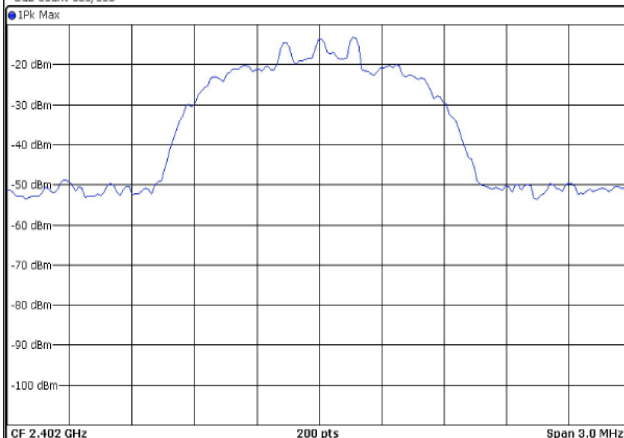
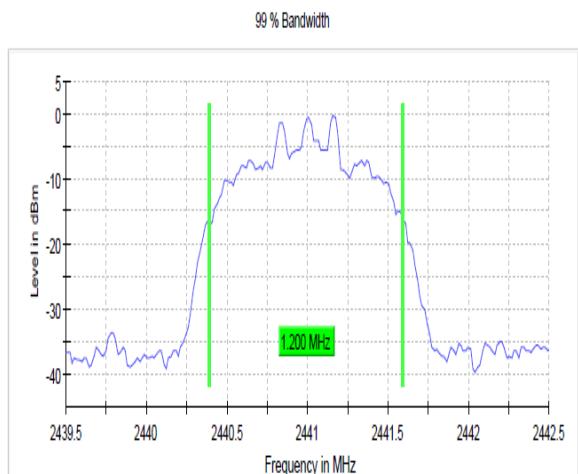


**Modulation: 8DPSK**

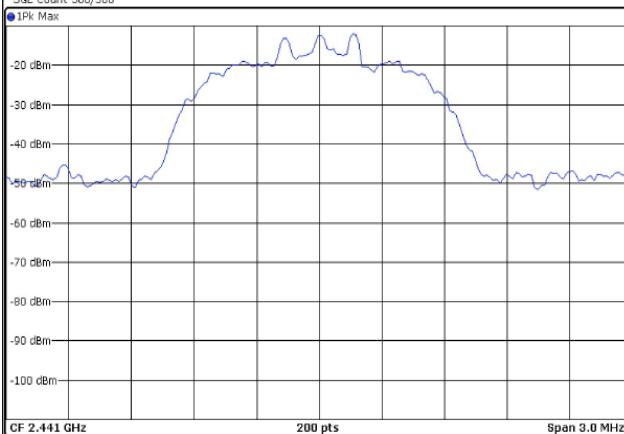
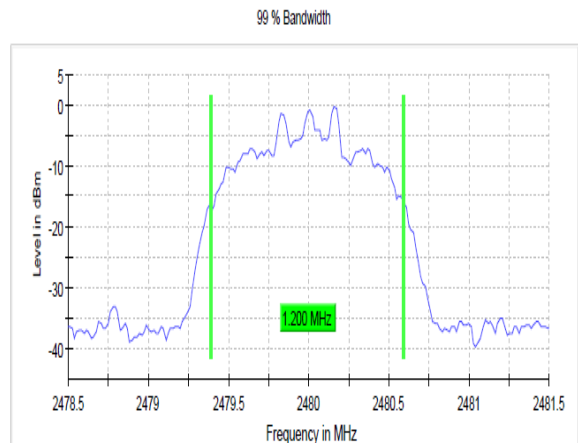
| Channel | Data Rate | Occupied Channel Bandwidth 99% (MHz) |
|---------|-----------|--------------------------------------|
| 0       | 3-DH1     | 1.170000                             |
|         | 3-DH3     | 1.200000                             |
|         | 3-DH5     | 1.170000                             |
| 39      | 3-DH1     | 1.170000                             |
|         | 3-DH3     | 1.200000                             |
|         | 3-DH5     | 1.200000                             |
| 78      | 3-DH1     | 1.170000                             |
|         | 3-DH3     | 1.200000                             |
|         | 3-DH5     | 1.200000                             |

**2402 MHz 3-DH5****Spectrum**

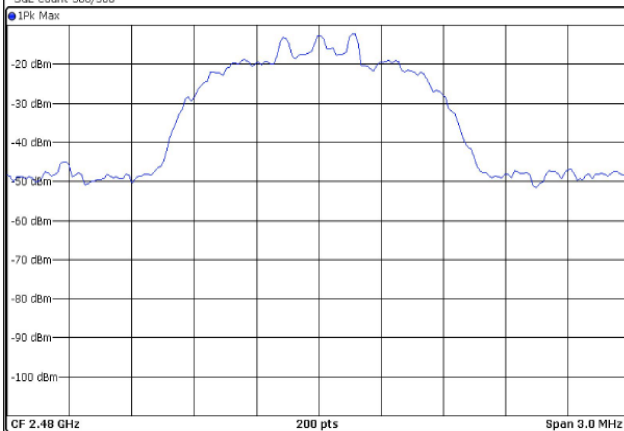
Ref Level -10.00 dBm RBW 30 kHz  
Att 10 dB SWT 63.2  $\mu$ s VBW 100 kHz Mode Auto FFT  
SGL Count 500/500

**2441 MHz 3-DH5****Spectrum**

Ref Level -10.00 dBm RBW 30 kHz  
Att 10 dB SWT 63.2  $\mu$ s VBW 100 kHz Mode Auto FFT  
SGL Count 500/500

**2480 MHz 3-DH5****Spectrum**

Ref Level -10.00 dBm RBW 30 kHz  
Att 10 dB SWT 63.2  $\mu$ s VBW 100 kHz Mode Auto FFT  
SGL Count 500/500

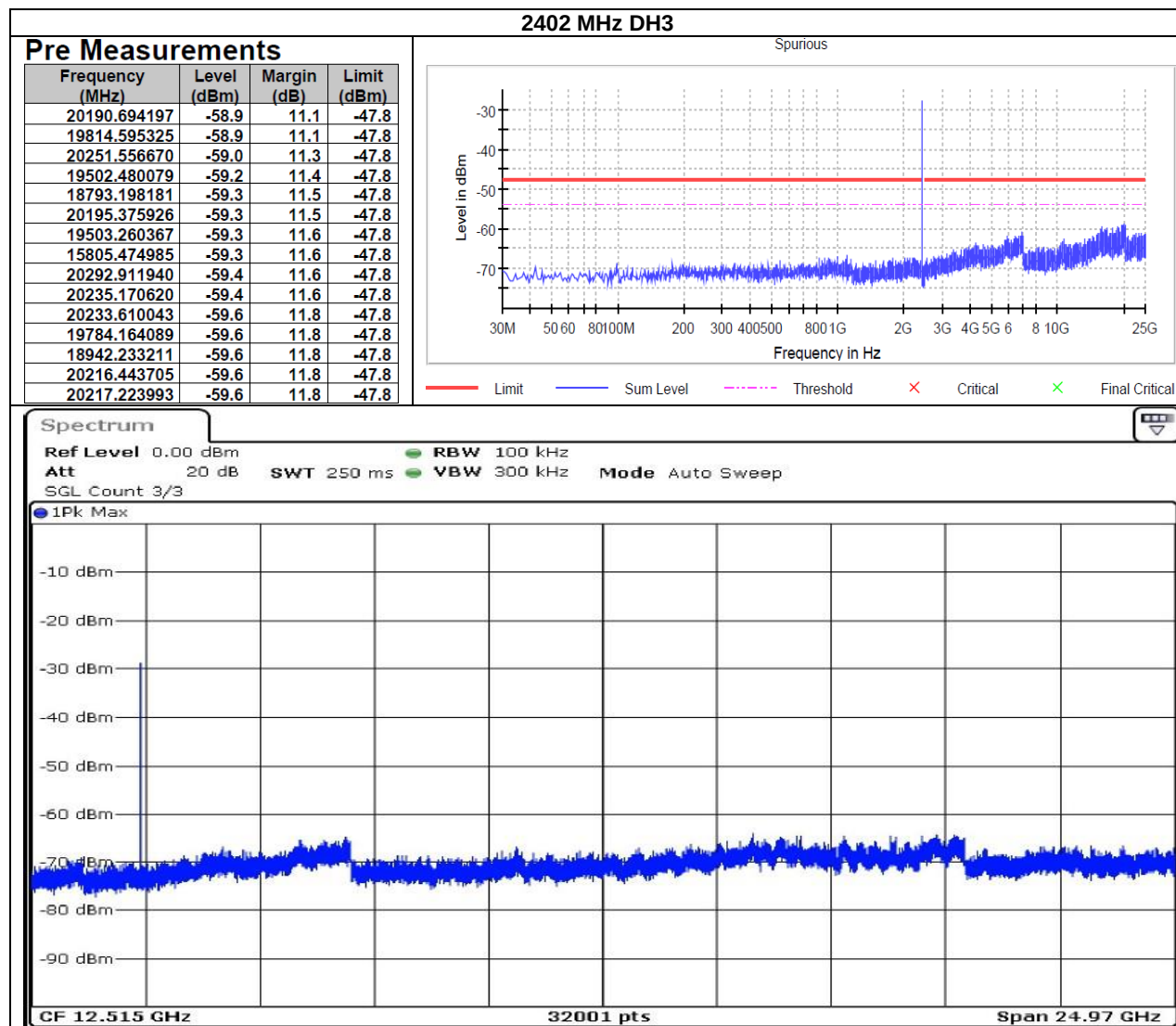


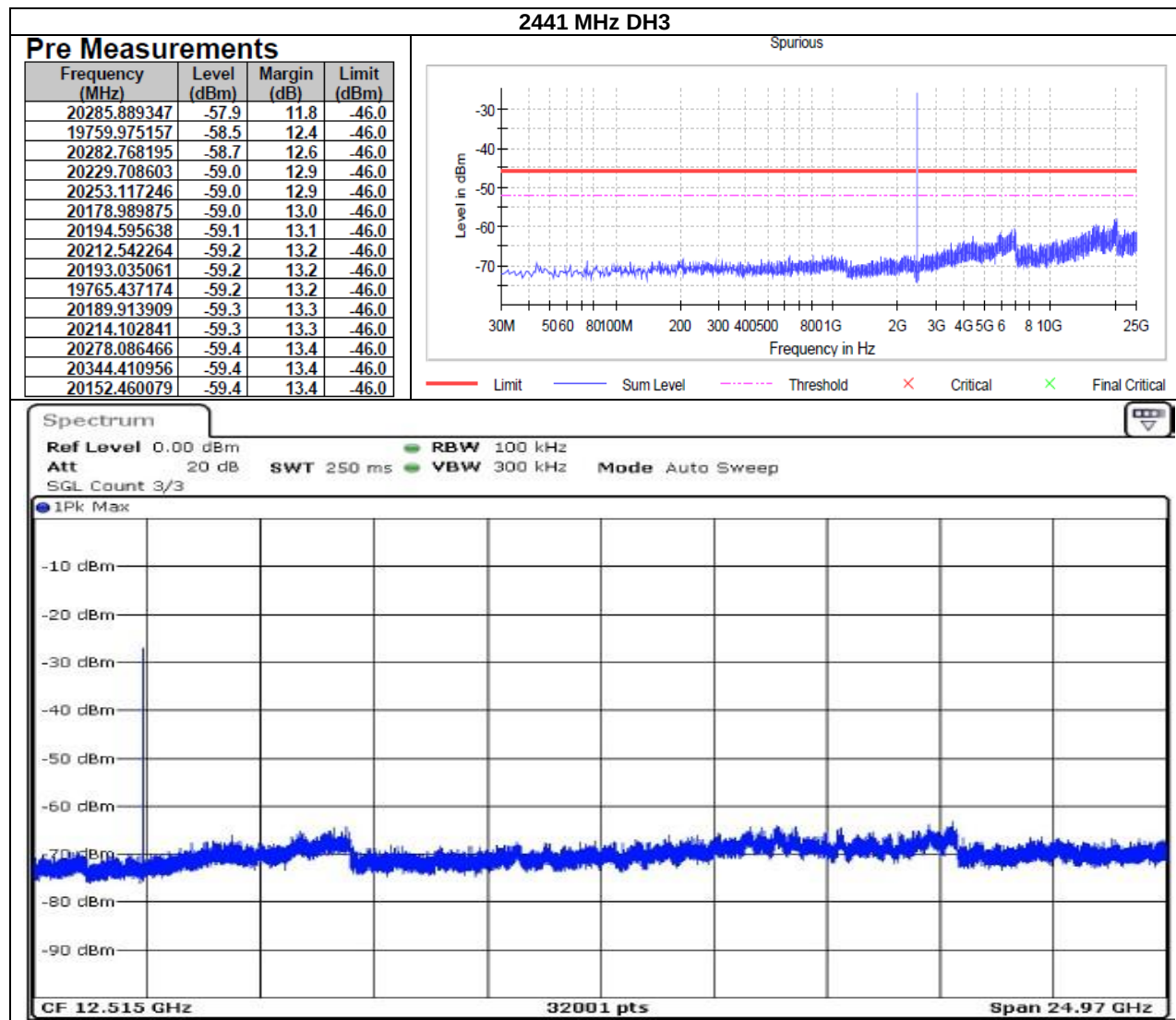
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## Conducted Spurious Emissions

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

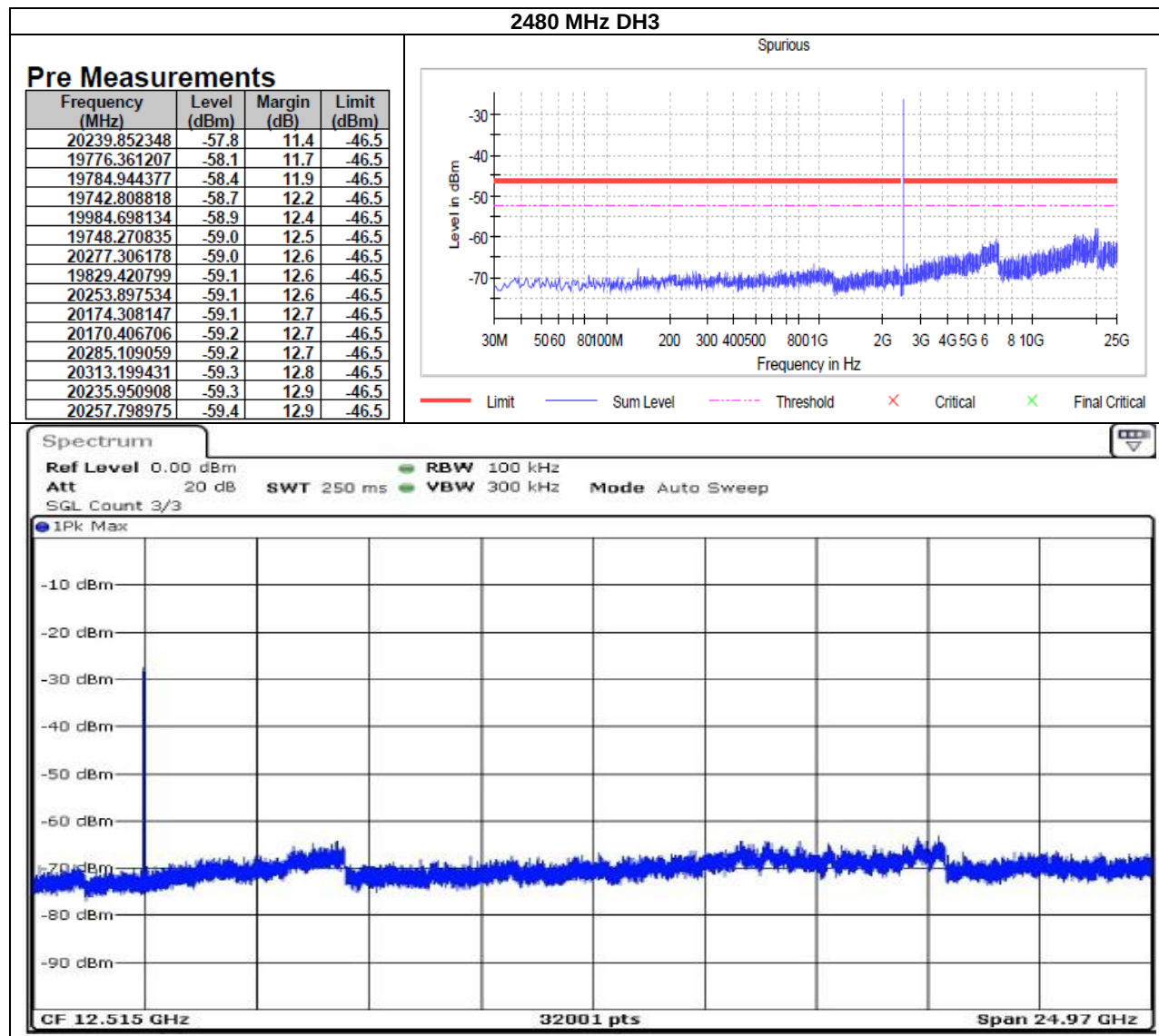




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