

***FCC 15.247 & RSS-247  
2.4 GHz Report***

***for***

**LG Electronics Inc.**

222 LG-ro Jinwi-myeon 451-713  
Pyeongtaek-si, Gyeonggi-do 451-713, Korea

|                     |                                            |
|---------------------|--------------------------------------------|
| <b>Brand</b>        | <b>: GM</b>                                |
| <b>Product Name</b> | <b>: Silver box RADIO<br/>ASM-RECEIVER</b> |
| <b>Model Name</b>   | <b>: LC10S-B</b>                           |
| <b>FCC ID</b>       | <b>: BEJLC10SB</b>                         |
| <b>IC</b>           | <b>: 2703H-LC10SB</b>                      |

## TABLE OF CONTENTS

| Description                                              | Page      |
|----------------------------------------------------------|-----------|
| TEST REPORT CERTIFICATION .....                          | 4         |
| <b>1. REPORT HISTORY.....</b>                            | <b>5</b>  |
| <b>2. SUMMARY OF TEST RESULTS .....</b>                  | <b>6</b>  |
| <b>3. GENERAL INFORMATION .....</b>                      | <b>7</b>  |
| 3.1. Description of EUT .....                            | 7         |
| 3.2. EUT Specifications Assessed in Current Report ..... | 8         |
| 3.3. Antenna Information .....                           | 9         |
| 3.4. Test Configuration .....                            | 9         |
| 3.5. Tested Supporting System List .....                 | 10        |
| 3.6. Setup Configuration .....                           | 10        |
| 3.7. Operating Condition of EUT .....                    | 10        |
| 3.8. Description of Test Facility .....                  | 11        |
| 3.9. Measurement Uncertainty .....                       | 11        |
| <b>4. MEASUREMENT EQUIPMENT LIST .....</b>               | <b>12</b> |
| 4.1. Radiated Emission Measurement .....                 | 12        |
| 4.2. RF Conducted Measurement .....                      | 12        |
| <b>5. RADIATED EMISSION MEASUREMENT .....</b>            | <b>13</b> |
| 5.1. Block Diagram of Test Setup .....                   | 13        |
| 5.2. Radiated Emission Limits .....                      | 14        |
| 5.3. Test Procedure .....                                | 14        |
| 5.4. Measurement Result Explanation .....                | 15        |
| 5.5. Test Results .....                                  | 15        |
| <b>6. 20dB BANDWIDTH MEASUREMENT .....</b>               | <b>24</b> |
| 6.1. Block Diagram of Test Setup .....                   | 24        |
| 6.2. Specification Limits .....                          | 24        |
| 6.3. Test Procedure .....                                | 24        |
| 6.4. Test Results .....                                  | 24        |
| <b>7. CARRIER FREQUENCY SEPARATION MEASUREMENT .....</b> | <b>25</b> |
| 7.1. Block Diagram of Test Setup .....                   | 25        |
| 7.2. Specification Limits .....                          | 25        |
| 7.3. Test Procedure .....                                | 25        |
| 7.4. Test Results .....                                  | 25        |
| <b>8. TIME OF OCCUPANCY MEASUREMENT .....</b>            | <b>26</b> |
| 8.1. Block Diagram of Test Setup .....                   | 26        |
| 8.2. Specification Limits .....                          | 26        |
| 8.3. Test Procedure .....                                | 26        |
| 8.4. Test Results .....                                  | 26        |
| <b>9. NUMBER OF HOPPING CHANNELS MEASUREMENT .....</b>   | <b>27</b> |
| 9.1. Block Diagram of Test Setup .....                   | 27        |
| 9.2. Specification Limits .....                          | 27        |
| 9.3. Test Procedure .....                                | 27        |
| 9.4. Test Results .....                                  | 27        |
| <b>10. MAXIMUM PEAK OUTPUT POWER MEASUREMENT .....</b>   | <b>28</b> |

**AUDIX Technology Corp.**  
No. 53-11, Dingfu, Linkou, Dist.,  
New Taipei City 244, Taiwan

**Tel: +886 2 26099301**  
**Fax: +886 2 26099303**

---

|                                                   |           |
|---------------------------------------------------|-----------|
| <b>10.1. Block Diagram of Test Setup .....</b>    | <b>28</b> |
| <b>10.2. Specification Limits .....</b>           | <b>28</b> |
| <b>10.3. Test Procedure .....</b>                 | <b>28</b> |
| <b>10.4. Test Results .....</b>                   | <b>28</b> |
| <b>11. EMISSION LIMITATIONS MEASUREMENT .....</b> | <b>29</b> |
| <b>11.1. Block Diagram of Test Setup .....</b>    | <b>29</b> |
| <b>11.2. Specification Limits .....</b>           | <b>29</b> |
| <b>11.3. Test Procedure .....</b>                 | <b>29</b> |
| <b>11.4. Test Results .....</b>                   | <b>29</b> |
| <b>12. DEVIATION TO TEST SPECIFICATIONS .....</b> | <b>30</b> |

APPENDIX A TEST PLOTS

APPENDIX B TEST PHOTOGRAPHS

## TEST REPORT CERTIFICATION

Applicant : LG Electronics Inc.  
Manufacture : LG Electronics Inc.  
Factory : LG ELECTRONICS VIETNAM HAI PHONG CO., LTD.  
Product Name : Silver box RADIO ASM-RECEIVER  
Model No. : LC10S-B  
Serial No. : N/A  
Brand : GM

### Applicable Standards:

FCC Rules and Regulations Part 15 Subpart C, Oct. 2014  
RSS-Gen (Issue 4), November 2014  
RSS-247 (Issue 1), May 2015  
ANSI C63.10:2013  
FCC Public Notice DA 00-705

**AUDIX Technology Corp.** tested the equipment mentioned in accordance with the requirements set forth in the above standards. Test results indicate that the equipment tested is capable of demonstrating compliance with the requirements as documented within this report. **AUDIX Technology Corp.** does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens and samples.

Date of Test: 2016. 01. 12 ~ 14

Date of Report: 2016. 01. 19

Producer: Sabrina Wang  
(Sabrina Wang/Administrator)

Signatory: Ben Cheng  
(Ben Cheng/Manager)

## 1. REPORT HISTORY

| Revision | Date         | Revision Summary | Report Number |
|----------|--------------|------------------|---------------|
| 0        | 2016. 01. 19 | Original Report. | EM-F160035    |

## 2. SUMMARY OF TEST RESULTS

| Rule                                                                                  |                              | Description                                             | Results          |
|---------------------------------------------------------------------------------------|------------------------------|---------------------------------------------------------|------------------|
| FCC                                                                                   | IC                           |                                                         |                  |
| 15.207                                                                                | RSS-Gen §8.8                 | Conducted Emission                                      | <b>N/A, Note</b> |
| 15.247(d)/<br>15.205                                                                  | RSS-Gen §8.9<br>RSS-247 §5.5 | Radiated Band Edge and<br>Radiated Spurious Emission    | <b>PASS</b>      |
| 15.247(a)(1)                                                                          | RSS-247 §5.1(2)              | 20dB Bandwidth                                          | <b>PASS</b>      |
| 15.247(a)(1)                                                                          | RSS-247 §5.1(2)              | Carrier Frequency Separation                            | <b>PASS</b>      |
| 15.247(a)(1)(iii)                                                                     | RSS-247 §5.1(4)              | Time of Occupancy                                       | <b>PASS</b>      |
| 15.247(a)(1)(iii)                                                                     | RSS-247 §5.1(4)              | Number of Hopping Channels                              | <b>PASS</b>      |
| 15.247(b)(1)                                                                          | RSS-247 §5.1(2)              | Maximum Peak Output Power                               | <b>PASS</b>      |
| 15.247(d)                                                                             | RSS-247 §5.5                 | Conducted Band Edges and<br>Conducted Spurious Emission | <b>PASS</b>      |
| 15.203                                                                                | ---                          | Antenna Requirement                                     | <b>PASS</b>      |
| Note: The EUT only employs battery power for operation, so it is unnecessary to test. |                              |                                                         |                  |

### 3. GENERAL INFORMATION

#### 3.1. Description of EUT

|                           |                                                                                                                                                                                      |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product                   | Silver box RADIO ASM-RECEIVER                                                                                                                                                        |
| Model Number              | LC10S-B                                                                                                                                                                              |
| Serial Number             | N/A                                                                                                                                                                                  |
| Brand Name                | GM                                                                                                                                                                                   |
| Applicant                 | LG Electronics Inc.<br>222 LG-ro Jinwi-myeon 451-713 Pyeongtaek-si, Gyeonggi-do<br>451-713, Korea                                                                                    |
| Manufacture               | LG Electronics Inc.<br>222 LG-ro Jinwi-myeon 451-713 Pyeongtaek-si, Gyeonggi-do<br>451-713, Korea                                                                                    |
| Factory                   | LG ELECTRONICS VIETNAM HAI PHONG CO., LTD.<br>Lots CN2 and CN3, Trang Due Industrial Zone, An Duong<br>District, within Dinh Vu - Cat Hai Economic Zone, Hai Phong<br>City, Vietnam. |
| RF Features               | WLAN:802.11a/b/g/n<br>Bluetooth: BT 3.0+EDR                                                                                                                                          |
| Transmit Type             | 1T1R                                                                                                                                                                                 |
| Date of Receipt of Sample | 2016. 01. 06                                                                                                                                                                         |

### 3.2. EUT Specifications Assessed in Current Report

| Mode      | Fundamental Range (MHz) | Channel Number | Modulation                            | Data Rate (Mbps) |
|-----------|-------------------------|----------------|---------------------------------------|------------------|
| Bluetooth | 2402-2480               | 79             | FHSS<br>(GFSK, $\pi/4$ DQPSK, 8-DPSK) | 1/2/3            |

| Channel List   |                 |                |                 |                |                 |
|----------------|-----------------|----------------|-----------------|----------------|-----------------|
| Channel Number | Frequency (MHz) | Channel Number | Frequency (MHz) | Channel Number | Frequency (MHz) |
| 00             | 2402            | 27             | 2429            | 54             | 2456            |
| 01             | 2403            | 28             | 2430            | 55             | 2457            |
| 02             | 2404            | 29             | 2431            | 56             | 2458            |
| 03             | 2405            | 30             | 2432            | 57             | 2459            |
| 04             | 2406            | 31             | 2433            | 58             | 2460            |
| 05             | 2407            | 32             | 2434            | 59             | 2461            |
| 06             | 2408            | 33             | 2435            | 60             | 2462            |
| 07             | 2409            | 34             | 2436            | 61             | 2463            |
| 08             | 2410            | 35             | 2437            | 62             | 2464            |
| 09             | 2411            | 36             | 2438            | 63             | 2465            |
| 10             | 2412            | 37             | 2439            | 64             | 2466            |
| 11             | 2413            | 38             | 2440            | 65             | 2467            |
| 12             | 2414            | 39             | 2441            | 66             | 2468            |
| 13             | 2415            | 40             | 2442            | 67             | 2469            |
| 14             | 2416            | 41             | 2443            | 68             | 2470            |
| 15             | 2417            | 42             | 2444            | 69             | 2471            |
| 16             | 2418            | 43             | 2445            | 70             | 2472            |
| 17             | 2419            | 44             | 2446            | 71             | 2473            |
| 18             | 2420            | 45             | 2447            | 72             | 2474            |
| 19             | 2421            | 46             | 2448            | 73             | 2475            |
| 20             | 2422            | 47             | 2449            | 74             | 2476            |
| 21             | 2423            | 48             | 2450            | 75             | 2477            |
| 22             | 2424            | 49             | 2451            | 76             | 2478            |
| 23             | 2425            | 50             | 2452            | 77             | 2479            |
| 24             | 2426            | 51             | 2453            | 78             | 2480            |
| 25             | 2427            | 52             | 2454            |                |                 |
| 26             | 2428            | 53             | 2455            |                |                 |



### 3.3. Antenna Information

| Antenna Part Number | Manufacture       | Antenna Type               | Frequency             | Max Gain (dBi)                         |
|---------------------|-------------------|----------------------------|-----------------------|----------------------------------------|
| AMAN1003030LG02     | Amotech<br>CO.LTD | Dielectric<br>Chip Antenna | 2.4GHz<br>(WLAN & BT) | 2.9                                    |
|                     |                   |                            | 5GHz<br>(WLAN)        | UNII Band I: 3.6<br>UNII Band III: 2.9 |

### 3.4. Test Configuration

| Item                                       |                                             | Modulation | Data Rate | Test Channel |
|--------------------------------------------|---------------------------------------------|------------|-----------|--------------|
| Radiated<br>Test Case                      | Radiated Band Edge <sup>Note1</sup>         | 8DPSK      | 3Mbps     | 00/78        |
|                                            | Radiated Spurious Emission <sup>Note1</sup> | 8DPSK      | 3Mbps     | 00/39/78     |
| Conducted<br>Test Case<br><sup>Note2</sup> | 20dB Bandwidth                              | GFSK       | 1Mbps     | 00/39/78     |
|                                            |                                             | 8-DPSK     | 3Mbps     | 00/39/78     |
|                                            | Carrier Frequency Separation                | GFSK       | 1Mbps     | 00/39/78     |
|                                            |                                             | 8-DPSK     | 3Mbps     | 00/39/78     |
|                                            | Time of Occupancy                           | GFSK       | 1Mbps     | 00/39/78     |
|                                            |                                             | 8-DPSK     | 3Mbps     | 00/39/78     |
|                                            | Number of Hopping Channels                  | GFSK       | 1Mbps     | 39           |
|                                            |                                             | 8-DPSK     | 3Mbps     | 39           |
|                                            | Maximum Peak Output Power                   | GFSK       | 1Mbps     | 00/39/78     |
|                                            |                                             | 8-DPSK     | 3Mbps     | 00/39/78     |
|                                            | Band Edges                                  | GFSK       | 1Mbps     | 00/78        |
|                                            |                                             | 8-DPSK     | 3Mbps     | 00/78        |
|                                            | Spurious Emission                           | GFSK       | 1Mbps     | 00/39/78     |
|                                            |                                             | 8-DPSK     | 3Mbps     | 00/39/78     |

Note 1:

☒ Mobile Device

☐ Portable Device, and 3 axis were assessed. The worst scenario for Radiated Spurious Emission as follow:

- ☐ Lie
- ☐ Side
- ☐ Stand

Note 2: We performed testing of the highest and lowest data rate.

### 3.5. Tested Supporting System List

#### 3.5.1. Support Peripheral Unit

| No. | Product         | Brand    | Model No. | Serial No. | FCC ID |
|-----|-----------------|----------|-----------|------------|--------|
| 1.  | Display         | LG       | LC10S     | 511194947  | N/A    |
| 2.  | DC Power Supply | TOP WARD | 3303A     | 721773     | N/A    |
| 3.  | DC Power Supply | KIKUSUI  | PWR400L   | N/A        | N/A    |

#### 3.5.2. Cable Lists

| No. | Cable Description Of The Above Support Units                                   |
|-----|--------------------------------------------------------------------------------|
| 1.  | Cable: Unshielded, Detachable, 0.6m<br>USB Cable: Unshielded, Detachable, 1.2m |
| 2.  | DC Power Cord*2: Unshielded, Detachable, 0.6+0.6m*2                            |
| 3.  | DC Power Cord*2: Unshielded, Detachable, 0.6+0.6m*2                            |

### 3.6. Setup Configuration

#### 3.6.1. EUT Configuration for Power Line and Radiated Emission



#### 3.6.2. EUT Configuration for Conducted Test Items



### 3.7. Operating Condition of EUT

EUT was set into test mode and able to be controlled through BT simulator to set channels / hopping / modulations.

### 3.8. Description of Test Facility

|                          |   |                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Firm Name           | : | <b>AUDIX Technology Corporation</b><br><b>EMC Department</b><br>No. 53-11, Dingfu, Linkou Dist.,<br>New Taipei City 244, Taiwan                                                                                                                                                                                                                            |
| Test Location & Facility | : | <b>Semi-Anechoic Chamber</b><br>No. 53-11, Dingfu, Linkou Dist.,<br>New Taipei City 244, Taiwan<br>IC Test Site Registration No.: 5183B-1<br>Renewal on September 17, 2014<br><br><b>Fully Anechoic Chamber</b><br>No. 53-11, Dingfu, Linkou Dist.,<br>New Taipei City 244, Taiwan<br>IC Test Site Registration No.: 5183B-4<br>Renewal on August 31, 2015 |
| NVLAP Lab. Code          | : | 200077-0                                                                                                                                                                                                                                                                                                                                                   |
| TAF Accreditation No     | : | 1724                                                                                                                                                                                                                                                                                                                                                       |

### 3.9. Measurement Uncertainty

| Test Item                        | Frequency Range | Uncertainty |
|----------------------------------|-----------------|-------------|
| Radiation Test<br>(Distance: 3m) | 30MHz~300MHz    | ±3.5dB      |
|                                  | 300MHz~1000MHz  | ± 4.70dB    |
|                                  | Above 1GHz      | ± 1.60dB    |

Remark : Uncertainty =  $ku_c(y)$

| Test Item                      | Uncertainty |
|--------------------------------|-------------|
| 20dB Bandwidth                 | ±0.2kHz     |
| Carrier Frequency Separation   | ±0.2kHz     |
| Time of Occupancy              | ±0.03sec    |
| Maximum peak Output power      | ± 0.52dB    |
| Conducted Emission Limitations | ± 0.13dB    |

## 4. MEASUREMENT EQUIPMENT LIST

### 4.1. Radiated Emission Measurement

#### 4.1.1. Frequency Range 30MHz~1000MHz (Semi-Anechoic Chamber)

| Item | Type               | Manufacturer | Model No.  | Serial No. | Cal. Date    | Cal. Interval |
|------|--------------------|--------------|------------|------------|--------------|---------------|
| 1    | Spectrum Analyzer  | Agilent      | N9010A-526 | MY53400071 | 2015. 09. 14 | 1 Year        |
| 2    | Test Receiver      | R & S        | ESCS30     | 100338     | 2015. 06. 24 | 1 Year        |
| 3    | Amplifier          | HP           | 8447D      | 2944A06305 | 2015. 02. 12 | 1 Year        |
| 4    | Bilog Antenna      | CHASE        | CBL6112D   | 33821      | 2015. 02. 27 | 1 Year        |
| 5    | Bluetooth Test Set | Anritsu      | MT8852B    | 6K00005697 | 2015. 03. 18 | 1 Year        |

#### 4.1.2. Frequency Range Above 1000MHz (Fully Anechoic Chamber)

| Item | Type                | Manufacturer | Model No.                  | Serial No. | Cal. Date    | Cal. Interval |
|------|---------------------|--------------|----------------------------|------------|--------------|---------------|
| 1.   | Spectrum Analyzer   | Agilent      | E4446A                     | US44300366 | 2015. 08. 20 | 1 Year        |
| 2.   | Amplifier           | Sonoma       | 310N                       | 187161     | 2015. 06. 17 | 1 Year        |
| 3.   | Horn Antenna        | ETS-Lindgren | 3117                       | 00135902   | 2015. 03. 06 | 1 Year        |
| 4.   | 2.4GHz Notch Filter | K&L          | 7NSL10-2441.5<br>E130.5-00 | 1          | 2015. 07. 22 | 1 Year        |
| 5    | Bluetooth Test Set  | Anritsu      | MT8852B                    | 6K00005697 | 2015. 03. 18 | 1 Year        |

### 4.2. RF Conducted Measurement

| Item | Type               | Manufacturer | Model No.  | Serial No. | Cal. Date    | Cal. Interval |
|------|--------------------|--------------|------------|------------|--------------|---------------|
| 1    | Spectrum Analyzer  | Agilent      | N9030A-544 | US51350140 | 2015. 06. 10 | 1 Year        |
| 2    | Bluetooth Test Set | Anritsu      | MT8852B    | 6K00005697 | 2015. 03. 18 | 1 Year        |
| 3    | Power Divider      | Anritsu      | K240C      | 19728      | 2015. 02. 09 | 1 Year        |

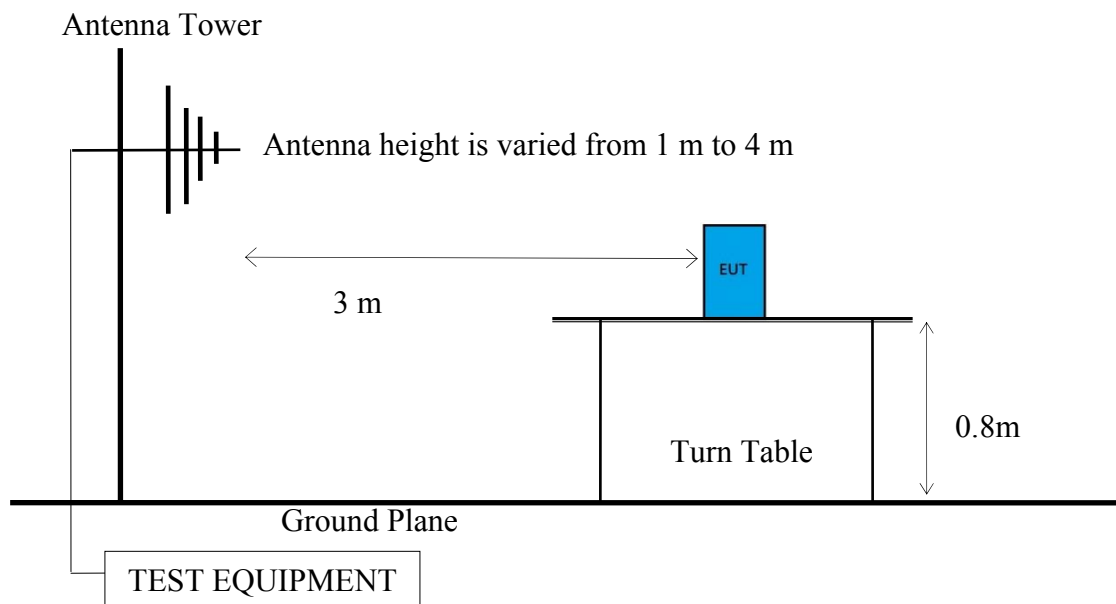
## 5. RADIATED EMISSION MEASUREMENT

### 5.1. Block Diagram of Test Setup

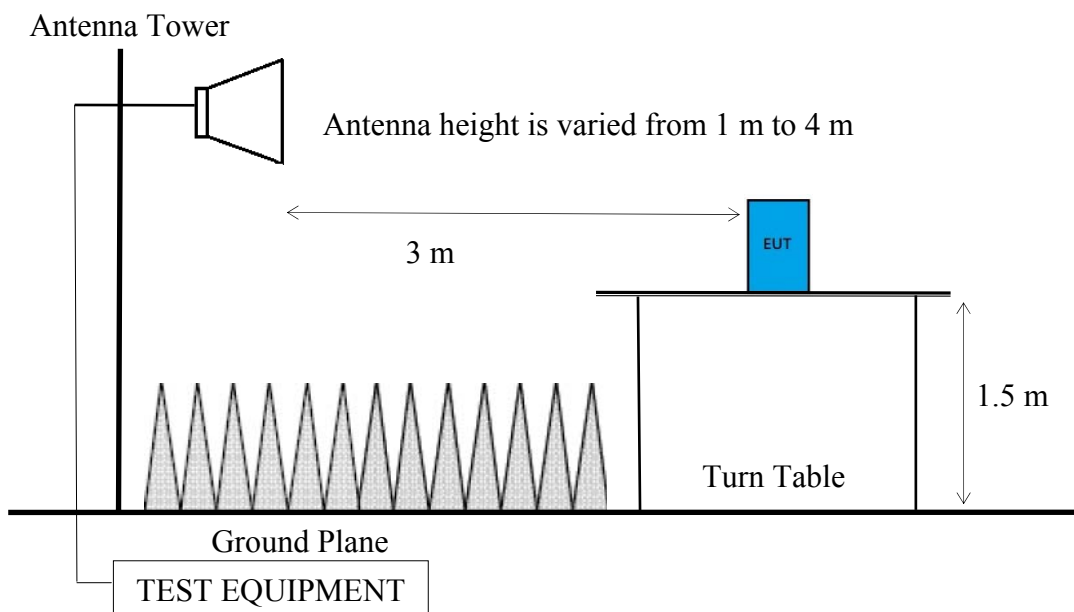
#### 5.1.1. Block Diagram of EUT

Indicated as section 3.6

#### 5.1.2. Setup Diagram for 30-1000 MHz



#### 5.1.3. Semi-Anechoic Chamber (3m) Setup Diagram for above 1GHz



## 5.2. Radiated Emission Limits

In any 100kHz bandwidth outside the frequency band, the radio frequency power produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level. In addition, radiated emissions which fall in restricted bands, as defined in Section 15.205, must also comply with the radiated emission limits specified as below.

| Frequency (MHz) | Distance (m) | Field Strengths Limits                                                          |                          |
|-----------------|--------------|---------------------------------------------------------------------------------|--------------------------|
|                 |              | $\mu\text{V/m}$                                                                 | $\text{dB}\mu\text{V/m}$ |
| 30 ~ 88         | 3            | 100                                                                             | 40.0                     |
| 88 ~ 216        | 3            | 150                                                                             | 43.5                     |
| 216 ~ 960       | 3            | 200                                                                             | 46.0                     |
| Above 960       | 3            | 500                                                                             | 54.0                     |
| Above 1000      | 3            | 74.0 $\text{dB}\mu\text{V/m}$ (Peak)<br>54.0 $\text{dB}\mu\text{V/m}$ (Average) |                          |

Remark : (1)  $\text{dB}\mu\text{V/m} = 20 \log (\mu\text{V/m})$

- (2) The tighter limit applies to the edge between two frequency bands.
- (3) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
- (4) Fundamental and emission fall within operation band are exempted from this section.
- (5) Pursuant to ANSI C63.10: 6.6.4.3, if the maximized peak measured value complies with the average limit, then it is unnecessary to perform an average measurement.

## 5.3. Test Procedure

The EUT setup on the turn table which has 1.5m height to the ground. The turn table rotated 360 degrees and antenna varied from 1 m to 4 m to find the maximum emission level. Both horizontal and vertical polarization are required. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10-2013, RSS-Gen and RSS-247 regulation.

Frequency below 1 GHz:

Spectrum Analyzer is used for pre-testing with following setting:

- (1) RBW = 120KHz
- (2) VBW  $\geq 3 \times$  RBW.
- (3) Detector = Peak.
- (4) Sweep time = auto.
- (5) Trace mode = max hold.
- (6) Allow sweeps to continue until the trace stabilizes.
- (7) When peak-detected value is lower than limit that the measurement using the Q.P. detector is not required. Otherwise using Q.P. for finally measurement.

Frequency above 1GHz to 10th harmonic:

**Peak Detector:**

- (1) RBW = 1MHz
- (2) VBW  $\geq 3 \times$  RBW.
- (3) Detector = Peak.
- (4) Sweep time = auto.
- (5) Trace mode = max hold.
- (6) Allow sweeps to continue until the trace stabilizes.
- (7) When peak-detected value is lower than limit that the measurement using the average detector is not required. Otherwise using average for finally measurement.

**Average Measurement:**

☒ **Option 1:**

- (1) RBW = 1 MHz
- (2) VBW = 1/T
- (3) Detector = Peak.
- (4) Sweep time = auto.
- (5) Trace mode = max hold.
- (6) Allow sweeps to continue until the trace stabilizes.

☐ **Option 2:**

Average Emission Level = Peak Emission Level + D.C.C.F.

## 5.4. Measurement Result Explanation

☒ Peak Emission Level = Antenna Factor + Cable Loss + Meter Reading

☒ Average Emission Level = Antenna Factor + Cable Loss + Meter Reading

☐ Average Emission Level = Peak Emission Level + DCCF

Duty Cycle Correction Factor (DCCF) =  $20\log(TX_{on}/100ms)$  presented in section 3.4

☐ EPR = Peak Emission Level - 95.2dB - 2.14dBi

## 5.5. Test Results

**PASSED.**

|              |            |            |          |
|--------------|------------|------------|----------|
| Test Date    | 2016/01/14 | Temp./Hum. | 24°C/41% |
| Test Voltage | DC 12V     |            |          |

### 5.5.1. Emissions within Restricted Frequency Bands

#### 5.5.1.1. Frequency Below 1 GHz

**[Note: We performed testing of the highest data rate.]**

| Modulation | 8-DPSK | Frequency | TX 2402MHz |
|------------|--------|-----------|------------|
|------------|--------|-----------|------------|

#### Antenna at Horizontal Polarization

| Emission Frequency (MHz) | Antenna Factor (dB/m) | Cable Loss (dB) | Meter Reading (dBμV) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector |
|--------------------------|-----------------------|-----------------|----------------------|-------------------------|-----------------|-------------|----------|
| 84.32                    | 8.17                  | 3.06            | 28.08                | 39.31                   | 40.00           | 0.69        | Peak     |
| 191.02                   | 9.20                  | 3.91            | 24.45                | 37.56                   | 43.50           | 5.94        | Peak     |
| 947.62                   | 20.83                 | 7.82            | 16.95                | 45.60                   | 46.00           | 0.40        | Peak     |

#### Antenna at Vertical Polarization

| Emission Frequency (MHz) | Antenna Factor (dB/m) | Cable Loss (dB) | Meter Reading (dBμV) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector |
|--------------------------|-----------------------|-----------------|----------------------|-------------------------|-----------------|-------------|----------|
| 45.52                    | 10.51                 | 2.59            | 24.98                | 38.08                   | 40.00           | 1.92        | Peak     |
| 82.38                    | 7.83                  | 3.02            | 27.92                | 38.77                   | 40.00           | 1.23        | Peak     |
| 611.03                   | 18.38                 | 6.53            | 13.29                | 38.20                   | 46.00           | 7.80        | Peak     |

| Modulation | 8-DPSK | Frequency | TX 2441MHz |
|------------|--------|-----------|------------|
|------------|--------|-----------|------------|

#### Antenna at Horizontal Polarization

| Emission Frequency (MHz) | Antenna Factor (dB/m) | Cable Loss (dB) | Meter Reading (dBμV) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector |
|--------------------------|-----------------------|-----------------|----------------------|-------------------------|-----------------|-------------|----------|
| 84.32                    | 8.17                  | 3.06            | 27.51                | 38.74                   | 40.00           | 1.26        | Peak     |
| 179.38                   | 9.14                  | 3.83            | 25.86                | 38.83                   | 43.50           | 4.67        | Peak     |
| 958.29                   | 20.89                 | 7.88            | 16.32                | 45.09                   | 46.00           | 0.91        | Peak     |

#### Antenna at Vertical Polarization

| Emission Frequency (MHz) | Antenna Factor (dB/m) | Cable Loss (dB) | Meter Reading (dBμV) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector |
|--------------------------|-----------------------|-----------------|----------------------|-------------------------|-----------------|-------------|----------|
| 45.52                    | 10.51                 | 2.59            | 24.90                | 38.00                   | 40.00           | 2.00        | Peak     |
| 74.62                    | 7.01                  | 2.94            | 29.05                | 39.00                   | 40.00           | 1.00        | Peak     |
| 675.05                   | 18.64                 | 6.67            | 11.96                | 37.27                   | 46.00           | 8.73        | Peak     |



|            |        |           |            |
|------------|--------|-----------|------------|
| Modulation | 8-DPSK | Frequency | TX 2480MHz |
|------------|--------|-----------|------------|

**Antenna at Horizontal Polarization**

| Emission<br>Frequency<br>(MHz) | Antenna<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Meter<br>Reading<br>(dBμV) | Emission<br>Level<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) | Detector |
|--------------------------------|-----------------------------|-----------------------|----------------------------|-------------------------------|--------------------|----------------|----------|
| 83.35                          | 7.97                        | 3.04                  | 27.55                      | 38.56                         | 40.00              | 1.44           | Peak     |
| 190.05                         | 9.19                        | 3.90                  | 25.87                      | 38.96                         | 43.50              | 4.54           | Peak     |
| 957.32                         | 20.89                       | 7.88                  | 15.81                      | 44.58                         | 46.00              | 1.42           | Peak     |

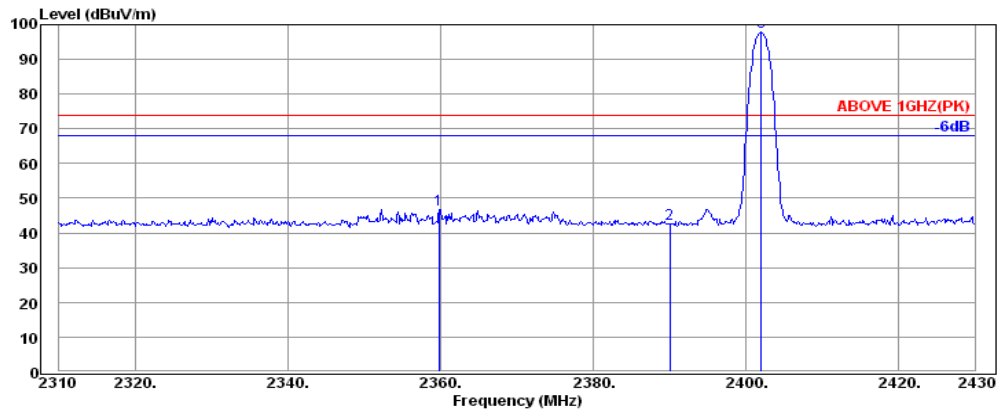
**Antenna at Vertical Polarization**

| Emission<br>Frequency<br>(MHz) | Antenna<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Meter<br>Reading<br>(dBμV) | Emission<br>Level<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) | Detector |
|--------------------------------|-----------------------------|-----------------------|----------------------------|-------------------------------|--------------------|----------------|----------|
| 46.49                          | 10.03                       | 2.60                  | 25.46                      | 38.09                         | 40.00              | 1.91           | Peak     |
| 83.35                          | 7.97                        | 3.04                  | 28.03                      | 39.04                         | 40.00              | 0.96           | Peak     |
| 604.24                         | 18.34                       | 6.51                  | 13.71                      | 38.56                         | 46.00              | 7.44           | Peak     |

### 5.5.1.2. Frequency Above 1 GHz to 10<sup>th</sup> harmonics

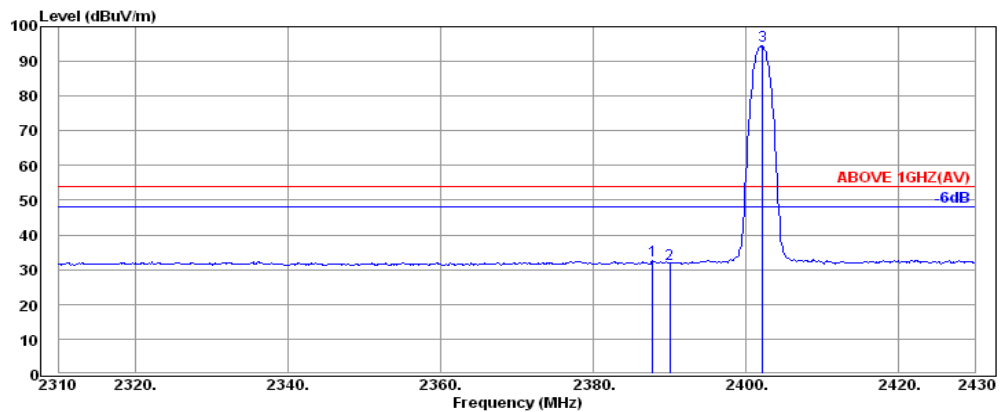
#### Band Edge:

|            |        |           |            |
|------------|--------|-----------|------------|
| Modulation | 8-DPSK | Frequency | TX 2402MHz |
|------------|--------|-----------|------------|



#### Antenna at Horizontal Polarization

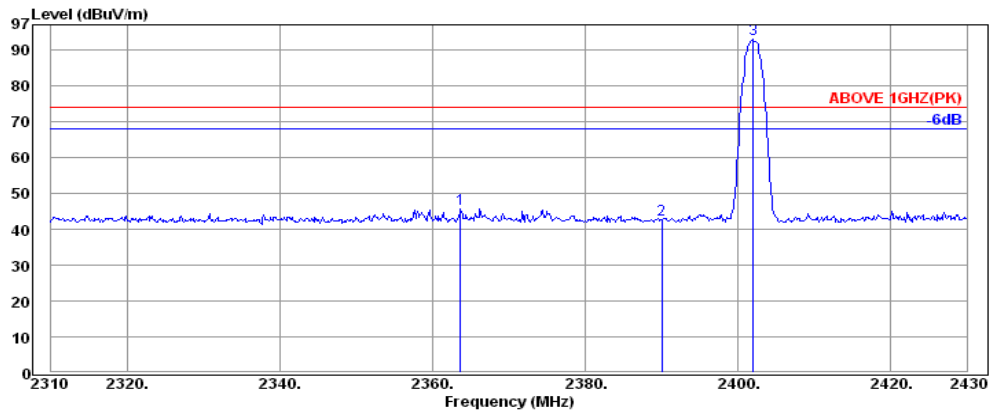
| Emission Frequency (MHz) | Antenna Factor (dB/m) | Cable Loss (dB) | Meter Reading (dBμV) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector |
|--------------------------|-----------------------|-----------------|----------------------|-------------------------|-----------------|-------------|----------|
| 2359.80                  | 31.64                 | 6.04            | 9.16                 | 46.84                   | 74.00           | 27.16       | Peak     |
| 2390.04                  | 31.68                 | 6.08            | 4.77                 | 42.53                   | 74.00           | 31.47       | Peak     |
| 2402.04                  | 31.69                 | 6.09            | 60.25                | 98.03                   | ---             | ---         | Peak     |



#### Antenna at Horizontal Polarization

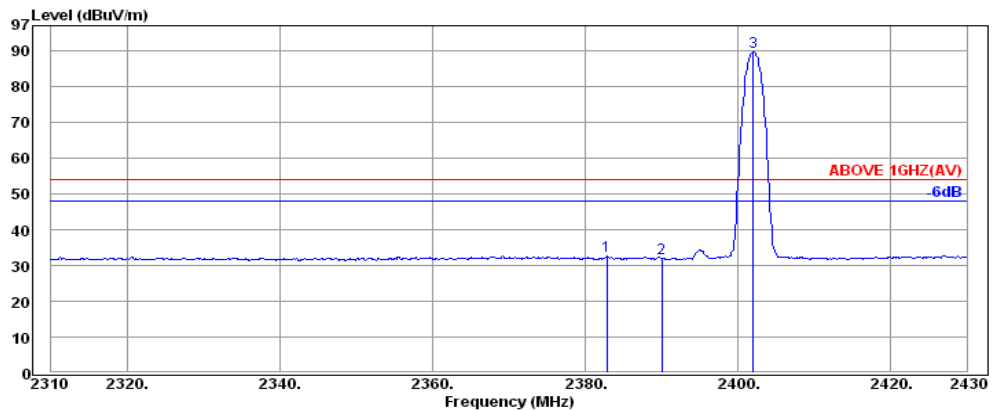
| Emission Frequency (MHz) | Antenna Factor (dB/m) | Cable Loss (dB) | Meter Reading (dBμV) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector |
|--------------------------|-----------------------|-----------------|----------------------|-------------------------|-----------------|-------------|----------|
| 2387.76                  | 31.68                 | 6.08            | -5.28                | 32.48                   | 54.00           | 21.52       | Average  |
| 2390.04                  | 31.68                 | 6.08            | -6.03                | 31.73                   | 54.00           | 22.27       | Average  |
| 2402.16                  | 31.69                 | 6.09            | 56.62                | 94.40                   | ---             | ---         | Average  |

|            |        |           |            |
|------------|--------|-----------|------------|
| Modulation | 8-DPSK | Frequency | TX 2402MHz |
|------------|--------|-----------|------------|



### Antenna at Vertical Polarization

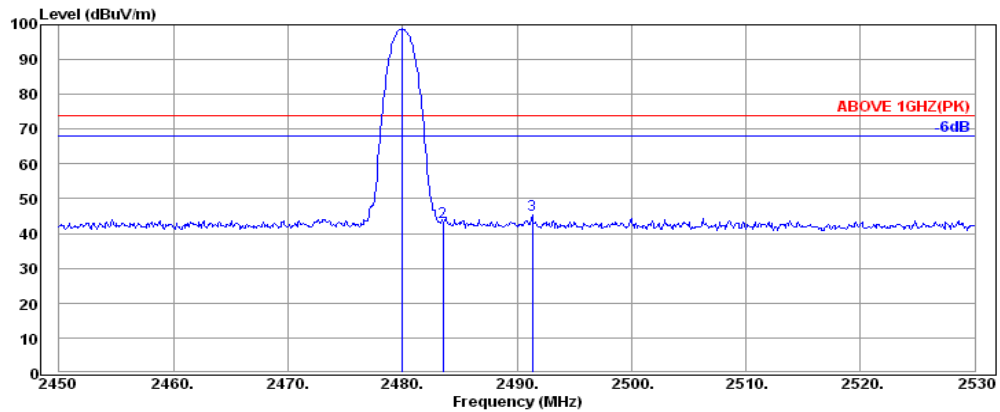
| Emission Frequency (MHz) | Antenna Factor (dB/m) | Cable Loss (dB) | Meter Reading (dBμV) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector |
|--------------------------|-----------------------|-----------------|----------------------|-------------------------|-----------------|-------------|----------|
| 2363.64                  | 31.65                 | 6.04            | 8.13                 | 45.82                   | 74.00           | 28.18       | Peak     |
| 2390.04                  | 31.68                 | 6.08            | 5.02                 | 42.78                   | 74.00           | 31.22       | Peak     |
| 2402.04                  | 31.69                 | 6.09            | 55.07                | 92.85                   | ---             | ---         | Peak     |



### Antenna at Vertical Polarization

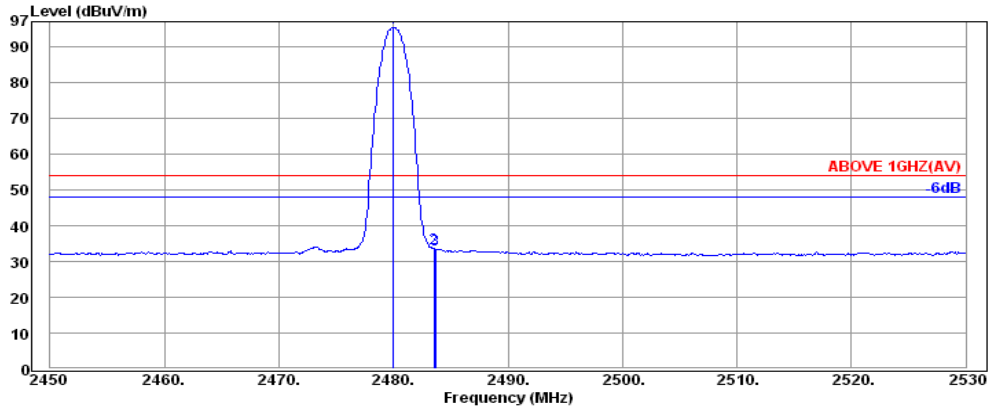
| Emission Frequency (MHz) | Antenna Factor (dB/m) | Cable Loss (dB) | Meter Reading (dBμV) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector |
|--------------------------|-----------------------|-----------------|----------------------|-------------------------|-----------------|-------------|----------|
| 2382.84                  | 31.67                 | 6.07            | -5.15                | 32.59                   | 54.00           | 21.41       | Average  |
| 2390.04                  | 31.68                 | 6.08            | -5.86                | 31.90                   | 54.00           | 22.10       | Average  |
| 2402.04                  | 31.69                 | 6.09            | 51.79                | 89.57                   | ---             | ---         | Average  |

|            |        |           |            |
|------------|--------|-----------|------------|
| Modulation | 8-DPSK | Frequency | TX 2480MHz |
|------------|--------|-----------|------------|



#### Antenna at Horizontal Polarization

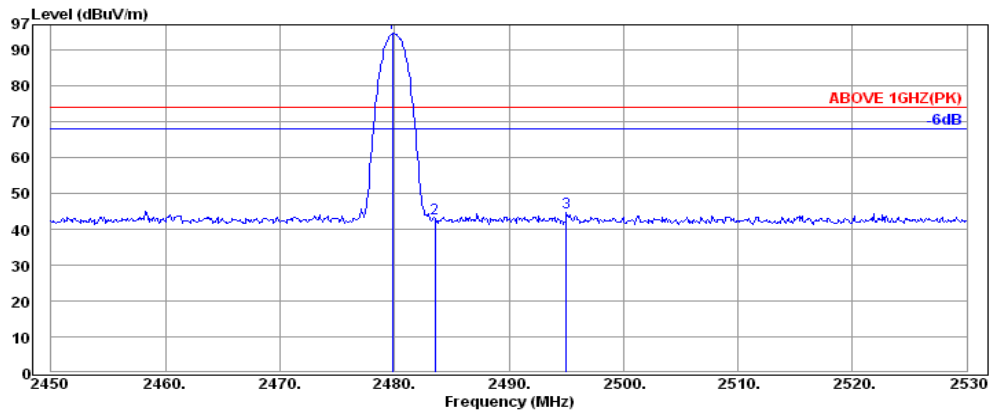
| Emission Frequency (MHz) | Antenna Factor (dB/m) | Cable Loss (dB) | Meter Reading (dBμV) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector |
|--------------------------|-----------------------|-----------------|----------------------|-------------------------|-----------------|-------------|----------|
| 2480.00                  | 31.78                 | 6.18            | 60.93                | 98.89                   | ---             | ---         | Peak     |
| 2483.52                  | 31.78                 | 6.19            | 5.39                 | 43.36                   | 74.00           | 30.64       | Peak     |
| 2491.36                  | 31.79                 | 6.20            | 7.51                 | 45.50                   | 74.00           | 28.50       | Peak     |



#### Antenna at Horizontal Polarization

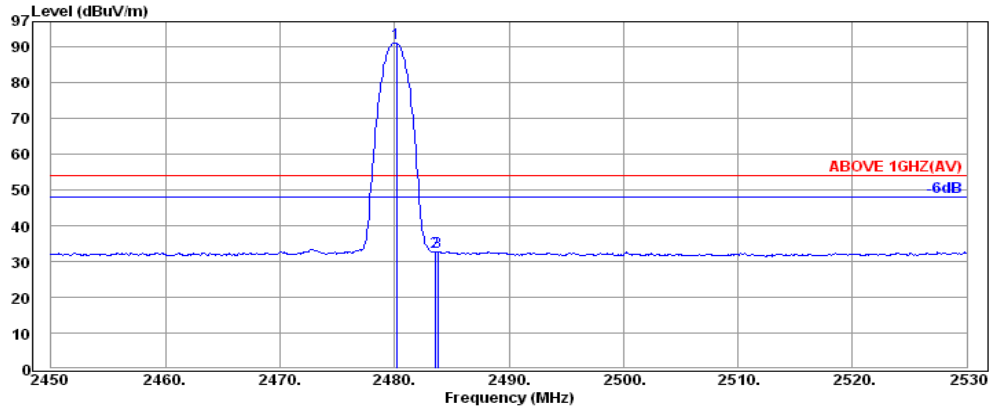
| Emission Frequency (MHz) | Antenna Factor (dB/m) | Cable Loss (dB) | Meter Reading (dBμV) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector |
|--------------------------|-----------------------|-----------------|----------------------|-------------------------|-----------------|-------------|----------|
| 2480.00                  | 31.78                 | 6.18            | 57.38                | 95.34                   | ---             | ---         | Average  |
| 2483.52                  | 31.78                 | 6.19            | -4.42                | 33.55                   | 54.00           | 20.45       | Average  |
| 2483.68                  | 31.78                 | 6.19            | -4.55                | 33.42                   | 54.00           | 20.58       | Average  |

|            |        |           |            |
|------------|--------|-----------|------------|
| Modulation | 8-DPSK | Frequency | TX 2480MHz |
|------------|--------|-----------|------------|



### Antenna at Vertical Polarization

| Emission Frequency (MHz) | Antenna Factor (dB/m) | Cable Loss (dB) | Meter Reading (dBμV) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector |
|--------------------------|-----------------------|-----------------|----------------------|-------------------------|-----------------|-------------|----------|
| 2479.84                  | 31.78                 | 6.18            | 56.79                | 94.75                   | ---             | ---         | Peak     |
| 2483.52                  | 31.78                 | 6.19            | 5.13                 | 43.10                   | 74.00           | 30.90       | Peak     |
| 2495.04                  | 31.79                 | 6.20            | 6.81                 | 44.80                   | 74.00           | 29.20       | Peak     |



### Antenna at Vertical Polarization

| Emission Frequency (MHz) | Antenna Factor (dB/m) | Cable Loss (dB) | Meter Reading (dBμV) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector |
|--------------------------|-----------------------|-----------------|----------------------|-------------------------|-----------------|-------------|----------|
| 2480.16                  | 31.78                 | 6.18            | 53.15                | 91.11                   | ---             | ---         | Average  |
| 2483.52                  | 31.78                 | 6.19            | -5.44                | 32.53                   | 54.00           | 21.47       | Average  |
| 2483.76                  | 31.78                 | 6.19            | -5.36                | 32.61                   | 54.00           | 21.39       | Average  |

### 5.5.2. Emissions outside the frequency band:

The emissions (up to 25GHz) not reported for there is no emission be found.

|            |        |           |            |
|------------|--------|-----------|------------|
| Modulation | 8-DPSK | Frequency | TX 2402MHz |
|------------|--------|-----------|------------|

#### Antenna at Horizontal Polarization

| Emission<br>Frequency<br>(MHz) | Antenna<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Meter<br>Reading<br>(dBμV) | Emission<br>Level<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) | Detector |
|--------------------------------|-----------------------------|-----------------------|----------------------------|-------------------------------|--------------------|----------------|----------|
| 4792.00                        | 33.82                       | 8.82                  | 2.56                       | 45.20                         | 54.00              | 8.80           | Peak     |

|            |        |           |            |
|------------|--------|-----------|------------|
| Modulation | 8-DPSK | Frequency | TX 2441MHz |
|------------|--------|-----------|------------|

#### Antenna at Horizontal Polarization

| Emission<br>Frequency<br>(MHz) | Antenna<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Meter<br>Reading<br>(dBμV) | Emission<br>Level<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) | Detector |
|--------------------------------|-----------------------------|-----------------------|----------------------------|-------------------------------|--------------------|----------------|----------|
| 4868.00                        | 33.85                       | 9.09                  | 3.88                       | 46.82                         | 54.00              | 7.18           | Peak     |

#### Antenna at Vertical Polarization

| Emission<br>Frequency<br>(MHz) | Antenna<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Meter<br>Reading<br>(dBμV) | Emission<br>Level<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) | Detector |
|--------------------------------|-----------------------------|-----------------------|----------------------------|-------------------------------|--------------------|----------------|----------|
| 4868.00                        | 33.85                       | 9.09                  | 2.88                       | 45.82                         | 54.00              | 8.18           | Peak     |
| 5528.00                        | 34.47                       | 9.61                  | 0.34                       | 44.42                         | 54.00              | 9.58           | Peak     |

|            |        |           |            |
|------------|--------|-----------|------------|
| Modulation | 8-DPSK | Frequency | TX 2480MHz |
|------------|--------|-----------|------------|

**Antenna at Horizontal Polarization**

| Emission<br>Frequency<br>(MHz) | Antenna<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Meter<br>Reading<br>(dBμV) | Emission<br>Level<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) | Detector |
|--------------------------------|-----------------------------|-----------------------|----------------------------|-------------------------------|--------------------|----------------|----------|
| 4948.00                        | 33.88                       | 9.35                  | 4.51                       | 47.74                         | 54.00              | 6.26           | Peak     |
| 5648.00                        | 34.70                       | 10.02                 | 1.87                       | 46.59                         | 54.00              | 7.41           | Peak     |

**Antenna at Vertical Polarization**

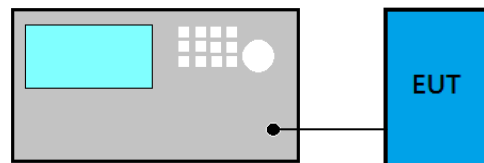
| Emission<br>Frequency<br>(MHz) | Antenna<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Meter<br>Reading<br>(dBμV) | Emission<br>Level<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) | Detector |
|--------------------------------|-----------------------------|-----------------------|----------------------------|-------------------------------|--------------------|----------------|----------|
| 4948.00                        | 33.88                       | 9.35                  | 5.15                       | 48.38                         | 54.00              | 5.62           | Peak     |
| 5648.00                        | 34.70                       | 10.02                 | 2.35                       | 47.07                         | 54.00              | 6.93           | Peak     |

**5.5.3. Emissions in Non-restricted Frequency Bands**

All emission levels below the 15.209 general radiated emissions limits is not required.

## 6. 20dB BANDWIDTH MEASUREMENT

### 6.1. Block Diagram of Test Setup



### 6.2. Specification Limits

Alternatively, frequency hopping systems operating in the 2400-2483.5MHz band may have hopping channel carrier frequencies that are separated by 25kHz or two-thirds of the 20dB bandwidth of the hopping channel, whichever is greater.

### 6.3. Test Procedure

Following measurement procedure is reference to DA00-705:

- (1) Set RBW close to 1% of OBW.
- (2) Set  $VBW \geq RBW$ .
- (3) Detector = Peak.
- (4) Trace mode = max hold.
- (5) Sweep = auto couple.
- (6) Allow the trace to stabilize.
- (7) Setting channel bandwidth function x dB to -20 dB to record the final bandwidth.

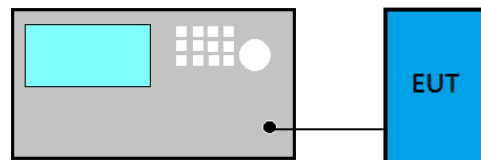
### 6.4. Test Results

Please refer to Appendix A



## 7. CARRIER FREQUENCY SEPARATION MEASUREMENT

### 7.1. Block Diagram of Test Setup



### 7.2. Specification Limits

Alternatively, frequency hopping systems operating in the 2400-2483.5MHz band may have hopping channel carrier frequencies that are separated by 25kHz or two-thirds of the 20dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output no greater than 125mW.

### 7.3. Test Procedure

Following measurement procedure is reference to DA00-705:

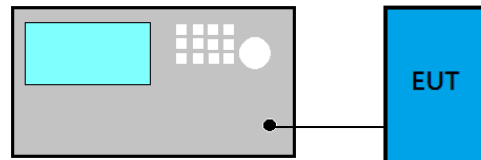
- (1) Span = wide enough to capture the peaks of two adjacent channels
- (2) RBW  $\geq$  1% of the span
- (3) VBW  $\geq$  RBW
- (4) Sweep = auto
- (5) Detector function = peak
- (6) Trace = max hold

### 7.4. Test Results

Please refer to Appendix A

## 8. TIME OF OCCUPANCY MEASUREMENT

### 8.1. Block Diagram of Test Setup



### 8.2. Specification Limits

Frequency hopping systems in the 2400-2483.5MHz shall use at least 15 non-overlapping channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by number of hopping channels employed.

### 8.3. Test Procedure

Following measurement procedure is reference to DA00-705:

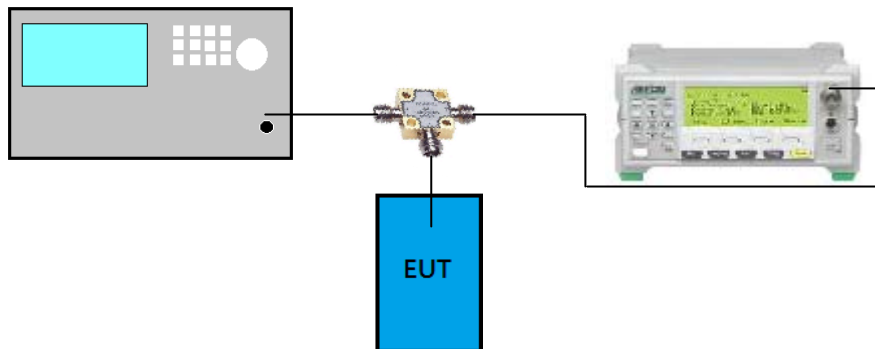
- (1) Span = zero span, centered on a hopping channel
- (2) RBW = 1 MHz
- (3) VBW  $\geq$  RBW
- (4) Sweep = as necessary to capture the entire dwell time per hopping channel
- (5) Detector function = peak
- (6) Trace = max hold

### 8.4. Test Results

Please refer to Appendix A

## 9. NUMBER OF HOPPING CHANNELS MEASUREMENT

### 9.1. Block Diagram of Test Setup



### 9.2. Specification Limits

Frequency hopping systems which use fewer than 20 hopping frequencies may employ intelligent hopping techniques to avoid interference to other transmissions. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 non-overlapping channels.

### 9.3. Test Procedure

Following measurement procedure is reference to DA00-705:

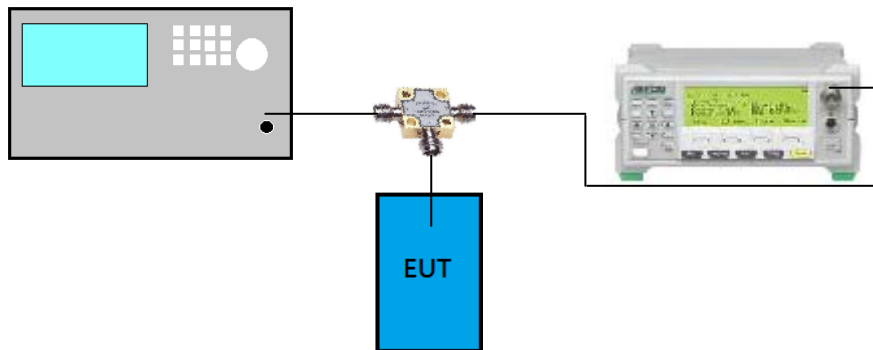
- (1) Span = the frequency band of operation
- (2) RBW  $\geq$  1% of the span
- (3) VBW  $\geq$  RBW
- (4) Sweep = auto
- (5) Detector function = peak
- (6) Trace = max hold

### 9.4. Test Results

Please refer to Appendix A

## 10. MAXIMUM PEAK OUTPUT POWER MEASUREMENT

### 10.1. Block Diagram of Test Setup



### 10.2. Specification Limits

The Limits of maximum Peak Output Power for frequency hopping systems in 2400-2483.5MHz is: 0.125Watt. (21dBm)

### 10.3. Test Procedure

Following measurement procedure is reference to DA00-705:

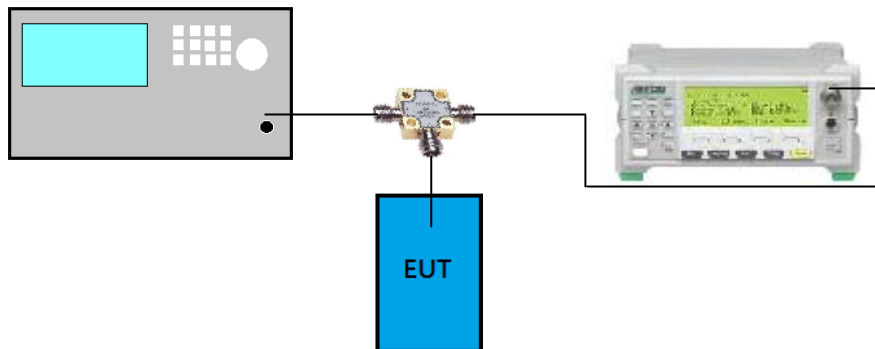
- (1) Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel
- (2) RBW  $\geq$  1% of the span
- (3) VBW  $\geq$  RBW
- (4) Sweep = auto
- (5) Detector function = peak
- (6) Trace = max hold

### 10.4. Test Results

Please refer to Appendix A

## 11. EMISSION LIMITATIONS MEASUREMENT

### 11.1. Block Diagram of Test Setup



### 11.2. Specification Limits

In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (See Section 15.205(c)).

### 11.3. Test Procedure

Following measurement procedure is reference to DA00-705:

- (1) Set span wide enough to capture the peak level of the in-band emission and all spurious emissions; up to 10<sup>th</sup> harmonic.
- (2) RBW = 100 kHz
- (3) VBW ≥ RBW
- (4) Sweep = auto
- (5) Detector function = peak
- (6) Trace = max hold

### 11.4. Test Results

Please refer to Appendix A

## **12.DEVIATION TO TEST SPECIFICATIONS**

**【NONE】**



**AUDIX Technology Corp.**  
No. 53-11, Dingfu, Linkou, Dist.,  
New Taipei City 244, Taiwan

APPENDIX A-Page 1 of 26

**Tel:** +886 2 26099301  
**Fax:** +886 2 26099303

# APPDNDIX A

## TEST PLOTS

(Model: LC10S-B)

## TABLE OF CONTENTS

|            |                                                      |           |
|------------|------------------------------------------------------|-----------|
| <b>A.1</b> | <b>20dB BANDWIDTH MEASUREMENT.....</b>               | <b>2</b>  |
| A.1.1      | 20dB Bandwidth Result.....                           | 2         |
| A.1.2      | Measurement Plots .....                              | 3         |
| <b>A.2</b> | <b>CARRIER FREQUENCY SEPARATION MEASUREMENT.....</b> | <b>4</b>  |
| A.2.1      | Measurement Plots .....                              | 4         |
| <b>A.3</b> | <b>TIME OF OCCUPANCY MEASUREMENT .....</b>           | <b>6</b>  |
| A.3.1      | Time of Occupancy.....                               | 6         |
| A.3.2      | Measurement Plots .....                              | 10        |
| <b>A.4</b> | <b>NUMBER OF HOPPING CHANNELS MEASUREMENT .....</b>  | <b>16</b> |
| A.4.1      | Measurement Plots .....                              | 16        |
| <b>A.5</b> | <b>MAXIMUM PEAK OUTPUT POWER MEASUREMENT .....</b>   | <b>17</b> |
| A.5.1      | Output Power .....                                   | 17        |
| A.5.2      | Measurement Plots .....                              | 18        |
| <b>A.6</b> | <b>EMISSION LIMITATIONS MEASUREMENT .....</b>        | <b>19</b> |
| A.6.1      | Band Edge .....                                      | 19        |
| A.6.2      | Spurious Emission .....                              | 21        |



## A.1 20dB BANDWIDTH MEASUREMENT

|              |            |            |          |
|--------------|------------|------------|----------|
| Test Date    | 2016/01/12 | Temp./Hum. | 22°C/60% |
| Test Voltage | DC 12V     |            |          |

### A.1.1 20dB Bandwidth Result

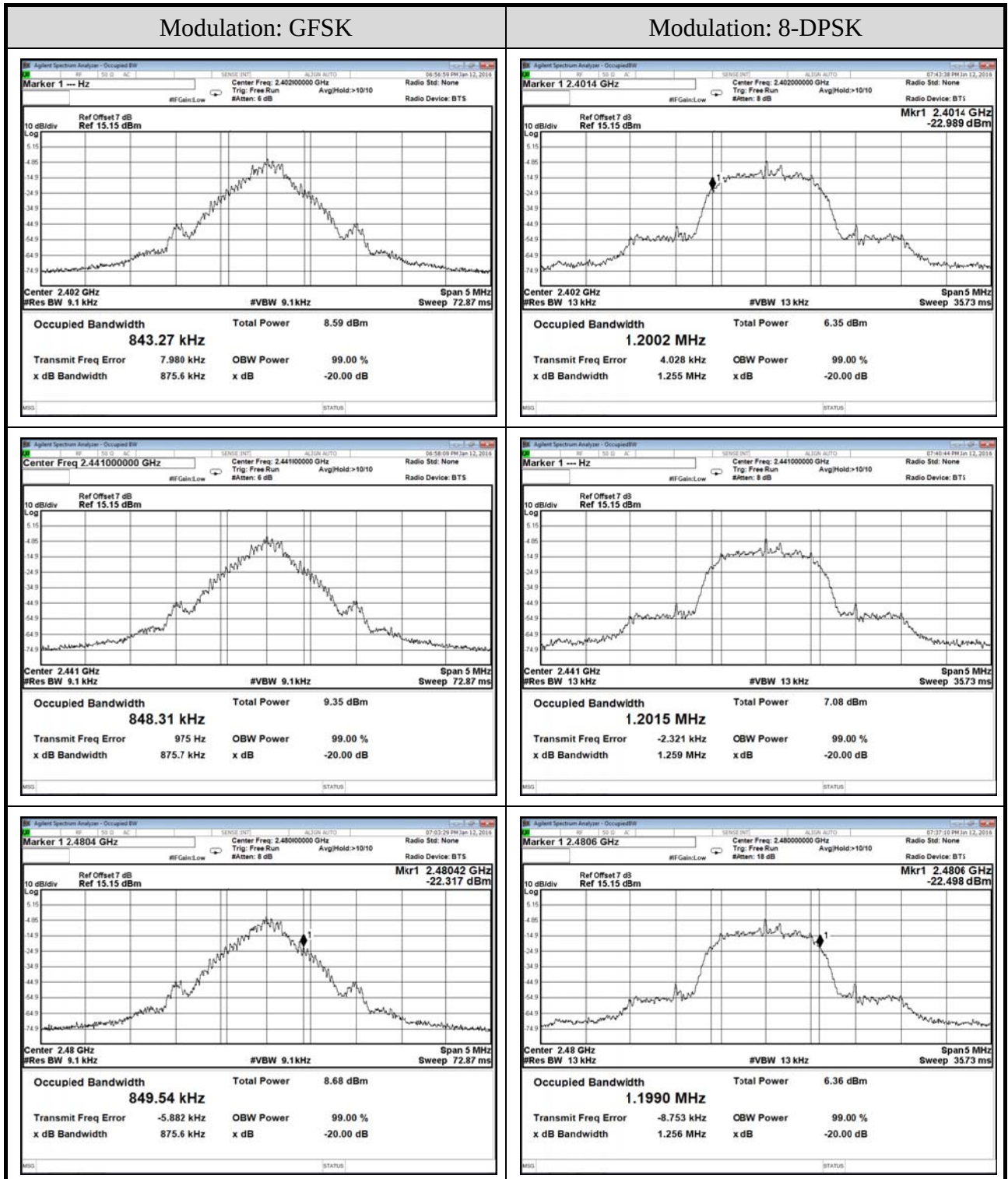
| Modulation | Centre Frequency<br>(MHz) | 20 dB Bandwidth<br>(MHz) | 2/3 (20dB Bandwidth) |
|------------|---------------------------|--------------------------|----------------------|
| GFSK       | 2402                      | 0.8756                   | 0.584                |
|            | 2441                      | 0.8757                   | 0.584                |
|            | 2480                      | 0.8756                   | 0.584                |

| Modulation | Centre Frequency<br>(MHz) | 20 dB Bandwidth<br>(MHz) | 2/3 (20dB Bandwidth) |
|------------|---------------------------|--------------------------|----------------------|
| 8-DPSK     | 2402                      | 1.255                    | 0.837                |
|            | 2441                      | 1.259                    | 0.839                |
|            | 2480                      | 1.256                    | 0.837                |

Note: 1. All results have been included cable loss.

2. The maximum two-thirds of the 20dB bandwidth is the limit for carrier frequency separation presented.

## A.1.2 Measurement Plots

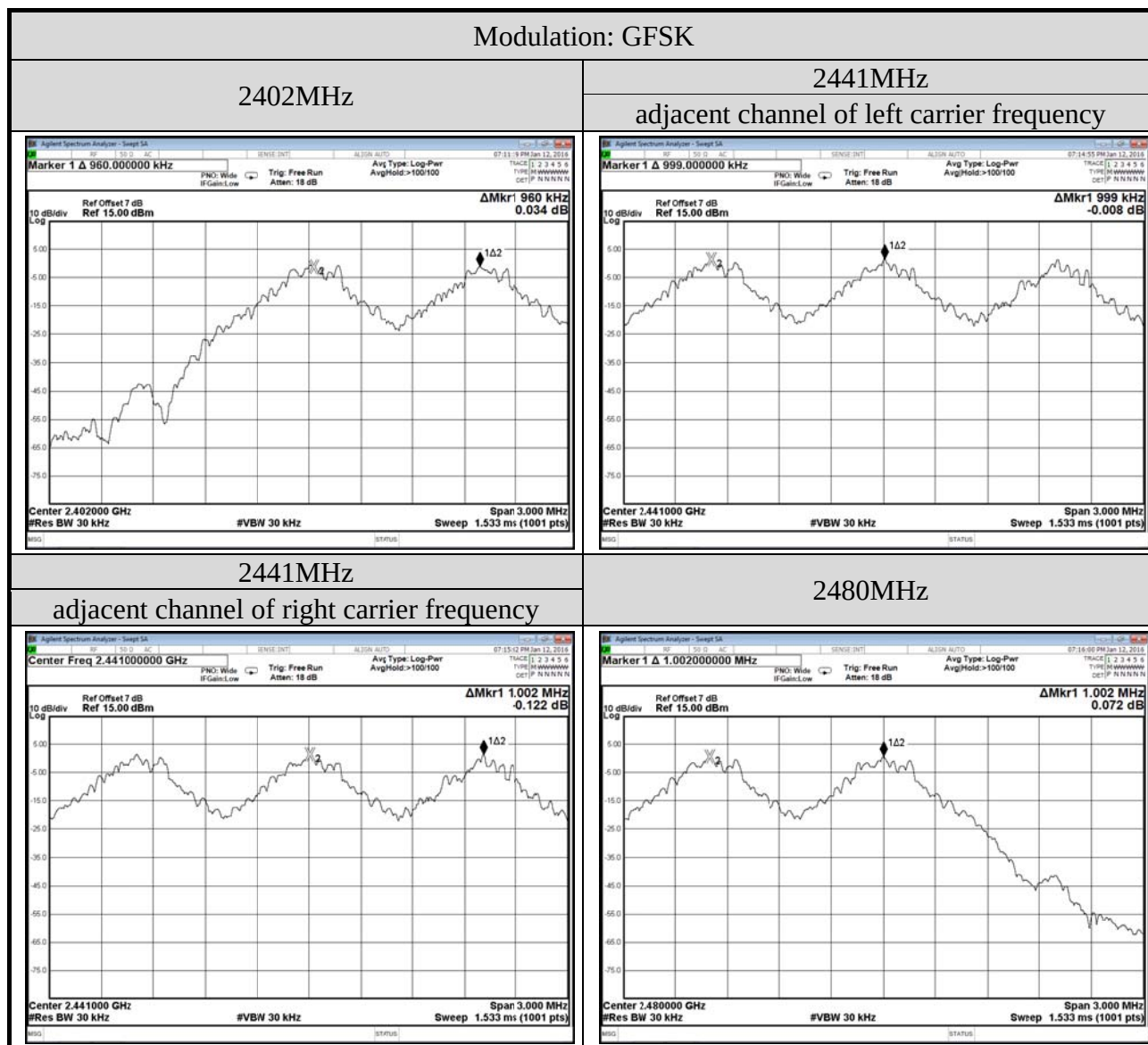


Note: All results have been included cable loss.

## A.2 CARRIER FREQUENCY SEPARATION MEASUREMENT

|              |            |            |          |
|--------------|------------|------------|----------|
| Test Date    | 2016/01/12 | Temp./Hum. | 22°C/60% |
| Test Voltage | DC 12V     |            |          |

### A.2.1 Measurement Plots



Note: All results have been included cable loss.

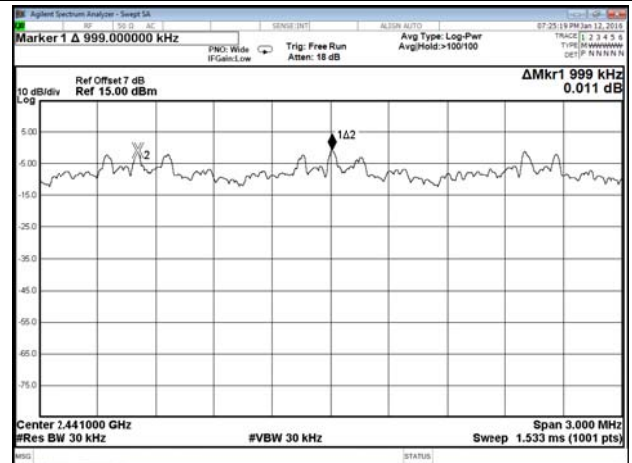
## Modulation: 8-DPSK

2402MHz



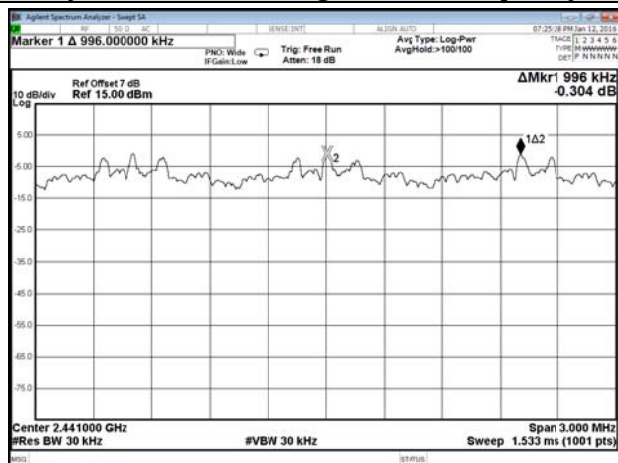
2441MHz

adjacent channel of left carrier frequency

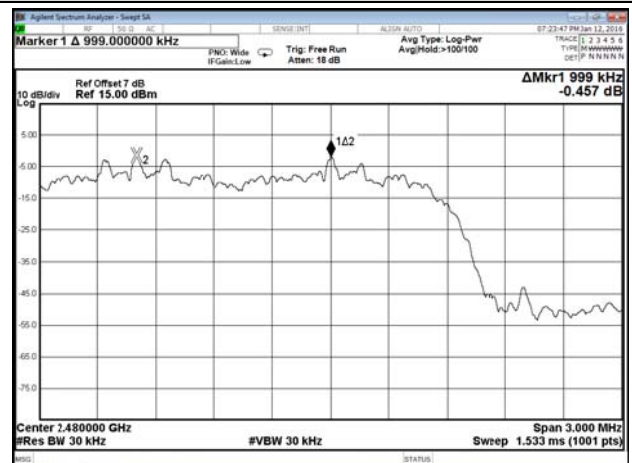


2441MHz

adjacent channel of right carrier frequency



2480MHz



Note: All results have been included cable loss.

### A.3 TIME OF OCCUPANCY MEASUREMENT

|              |            |            |          |
|--------------|------------|------------|----------|
| Test Date    | 2016/01/12 | Temp./Hum. | 22°C/60% |
| Test Voltage | DC 12V     |            |          |

#### A.3.1 Time of Occupancy

| Modulation | Centre Frequency (MHz) | Mode | Time of Occupancy (ms) | Maximum accumulated Time of Occupancy (ms) | Limit (ms) |
|------------|------------------------|------|------------------------|--------------------------------------------|------------|
| GFSK       | 2402                   | DH1  | 0.385                  | 121.660                                    | <400       |
|            |                        | DH3  | 1.640                  | 259.120                                    | <400       |
|            |                        | DH5  | 2.880                  | 364.032                                    | <400       |
|            | 2441                   | DH1  | 0.385                  | 121.660                                    | <400       |
|            |                        | DH3  | 1.630                  | 257.540                                    | <400       |
|            |                        | DH5  | 2.890                  | 365.296                                    | <400       |
|            | 2480                   | DH1  | 0.385                  | 121.660                                    | <400       |
|            |                        | DH3  | 1.640                  | 259.120                                    | <400       |
|            |                        | DH5  | 2.890                  | 365.296                                    | <400       |

Note: All results have been included cable loss.

Observation Period: 79 channels\*0.4 seconds = 31.6 seconds

**Centre Frequency: 2402MHz**

DH1: For each 1 second of 10 channel appearance, the longest time of occupancy for each of 31.6 seconds is:

10 channels\*31.6 seconds\*      **0.385**      ms=      **121.660**      ms

DH3: For each 5 second of 5 channel appearance, the longest time of occupancy for each of 31.6 seconds is:

5 channels\*31.6 seconds\*      **1.640**      ms=      **259.120**      ms

DH5: For each 5 second of 4 channel appearance, the longest time of occupancy for each of 31.6 seconds is:

4 channels\*31.6 seconds\*      **2.880**      ms=      **364.032**      ms

**Centre Frequency: 2441MHz**

DH1: For each 1 second of 10 channel appearance, the longest time of occupancy for each of 31.6 seconds is:

10 channels\*31.6 seconds\*      **0.385**      ms=      **121.660**      ms

DH3: For each 5 second of 5 channel appearance, the longest time of occupancy for each of 31.6 seconds is:

5 channels\*31.6 seconds\*      **1.630**      ms=      **257.540**      ms

DH5: For each 5 second of 4 channel appearance, the longest time of occupancy for each of 31.6 seconds is:

4 channels\*31.6 seconds\*      **2.890**      ms=      **365.296**      ms

**Centre Frequency: 2480MHz**

DH1: For each 1 second of 10 channel appearance, the longest time of occupancy for each of 31.6 seconds is:

10 channels\*31.6 seconds\*      **0.385**      ms=      **121.660**      ms

DH3: For each 5 second of 5 channel appearance, the longest time of occupancy for each of 31.6 seconds is:

5 channels\*31.6 seconds\*      **1.640**      ms=      **259.120**      ms

DH5: For each 5 second of 4 channel appearance, the longest time of occupancy for each of 31.6 seconds is:

4 channels\*31.6 seconds\*      **2.890**      ms=      **365.296**      ms

| Modulation | Centre Frequency (MHz) | Mode | Time of Occupancy (ms) | Maximum accumulated Time of Occupancy (ms) | Limit (ms) |
|------------|------------------------|------|------------------------|--------------------------------------------|------------|
| 8-DPSK     | 2402                   | 3DH1 | 0.390                  | 123.240                                    | <400       |
|            |                        | 3DH3 | 1.640                  | 259.120                                    | <400       |
|            |                        | 3DH5 | 2.890                  | 365.296                                    | <400       |
|            | 2441                   | 3DH1 | 0.390                  | 123.240                                    | <400       |
|            |                        | 3DH3 | 1.640                  | 259.120                                    | <400       |
|            |                        | 3DH5 | 2.880                  | 364.032                                    | <400       |
|            | 2480                   | 3DH1 | 0.390                  | 123.240                                    | <400       |
|            |                        | 3DH3 | 1.630                  | 257.540                                    | <400       |
|            |                        | 3DH5 | 2.890                  | 365.296                                    | <400       |

Note: All results have been included cable loss.



Observation Period: 79 channels\*0.4 seconds = 31.6 seconds

**Centre Frequency: 2402MHz**

3DH1: For each 1 second of 10 channel appearance, the longest time of occupancy for each of 31.6 seconds is:

10 channels\*31.6 seconds\*      **0.390**      ms=      **123.240**      ms

3DH3: For each 5 second of 5 channel appearance, the longest time of occupancy for each of 31.6 seconds is:

5 channels\*31.6 seconds\*      **1.640**      ms=      **259.120**      ms

3DH5: For each 5 second of 4 channel appearance, the longest time of occupancy for each of 31.6 seconds is:

4 channels\*31.6 seconds\*      **2.890**      ms=      **365.296**      ms

**Centre Frequency: 2441MHz**

3DH1: For each 1 second of 10 channel appearance, the longest time of occupancy for each of 31.6 seconds is:

10 channels\*31.6 seconds\*      **0.390**      ms=      **123.240**      ms

3DH3: For each 5 second of 5 channel appearance, the longest time of occupancy for each of 31.6 seconds is:

5 channels\*31.6 seconds\*      **1.640**      ms=      **259.120**      ms

3DH5: For each 5 second of 4 channel appearance, the longest time of occupancy for each of 31.6 seconds is:

4 channels\*31.6 seconds\*      **2.880**      ms=      **364.032**      ms

**Centre Frequency: 2480MHz**

3DH1: For each 1 second of 10 channel appearance, the longest time of occupancy for each of 31.6 seconds is:

10 channels\*31.6 seconds\*      **0.390**      ms=      **123.240**      ms

3DH3: For each 5 second of 5 channel appearance, the longest time of occupancy for each of 31.6 seconds is:

5 channels\*31.6 seconds\*      **1.630**      ms=      **257.540**      ms

3DH5: For each 5 second of 4 channel appearance, the longest time of occupancy for each of 31.6 seconds is:

4 channels\*31.6 seconds\*      **2.890**      ms=      **365.296**      ms

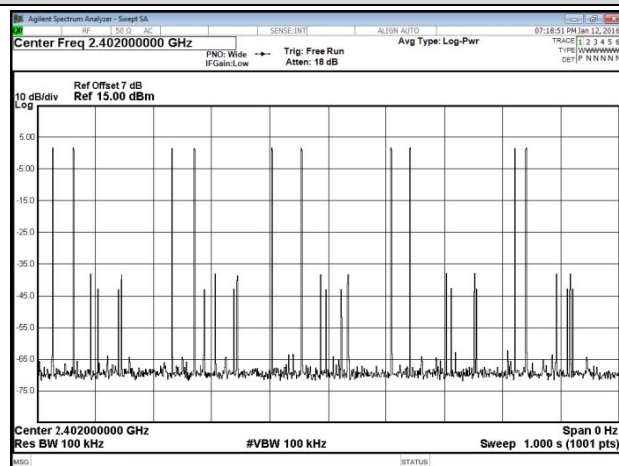
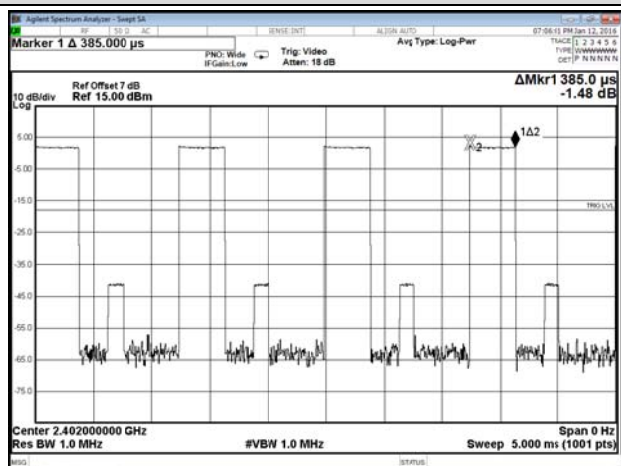


## A.3.2 Measurement Plots

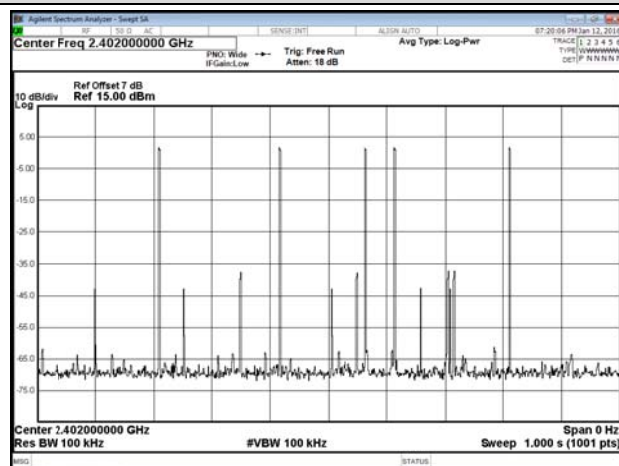
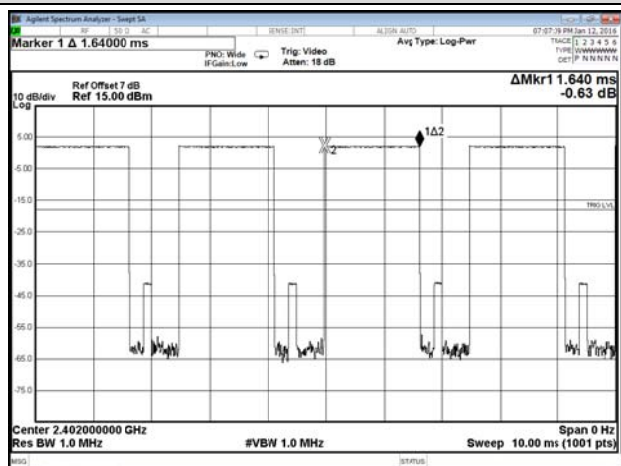
Modulation: GFSK

Centre Frequency: 2402MHz

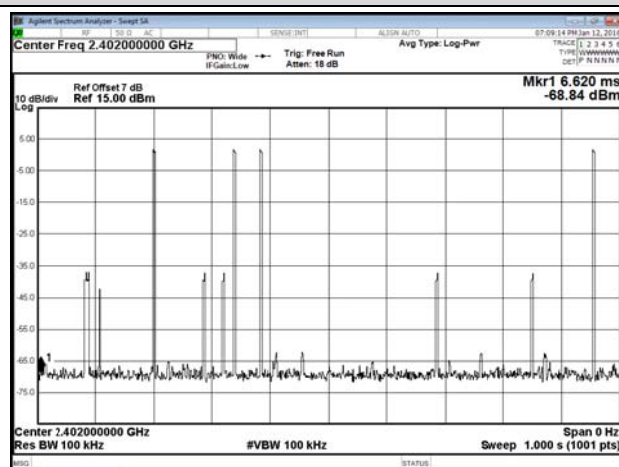
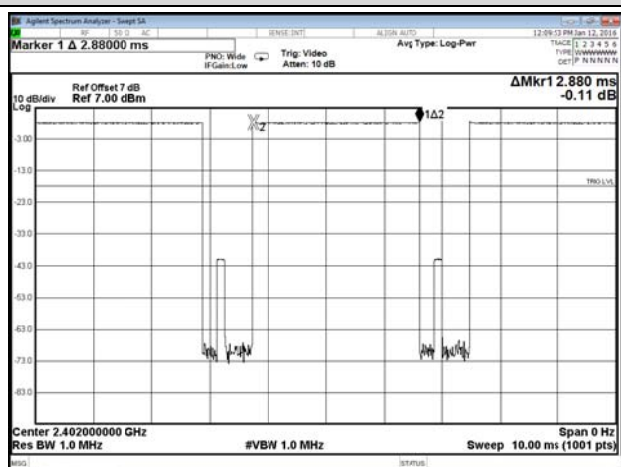
Mode: DH1



Mode: DH3



Mode: DH5

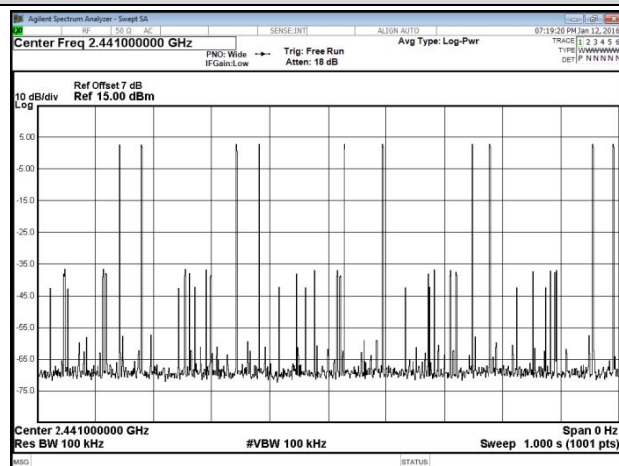
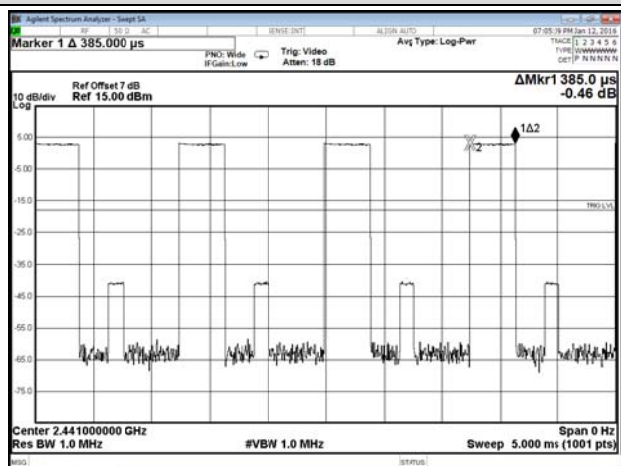


Note: All results have been included cable loss.

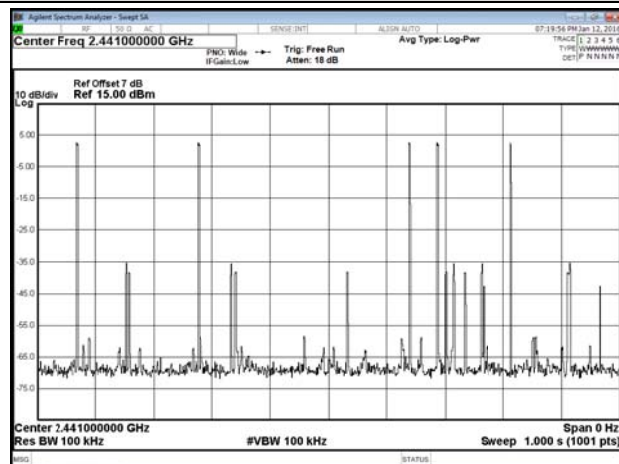
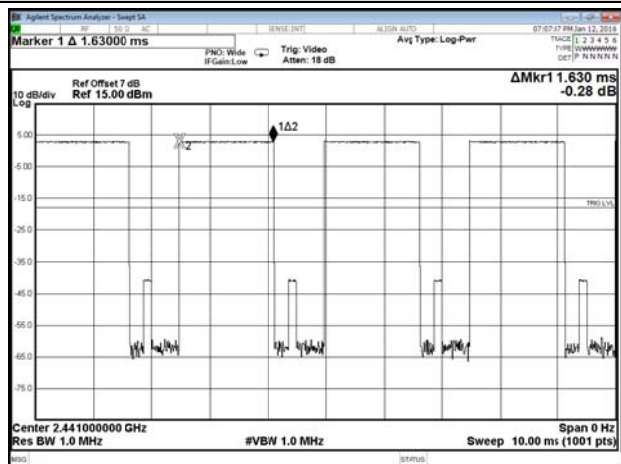
Modulation: GFSK

Centre Frequency: 2441MHz

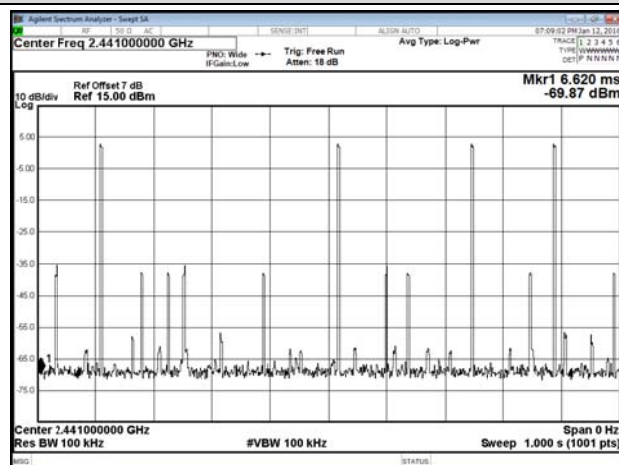
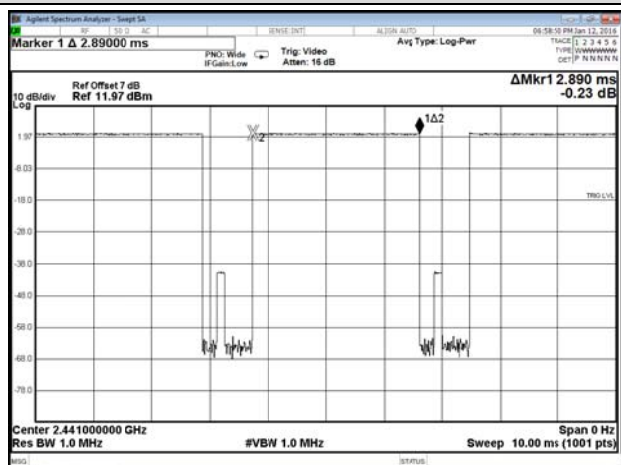
Mode: DH1



Mode: DH3



Mode: DH5

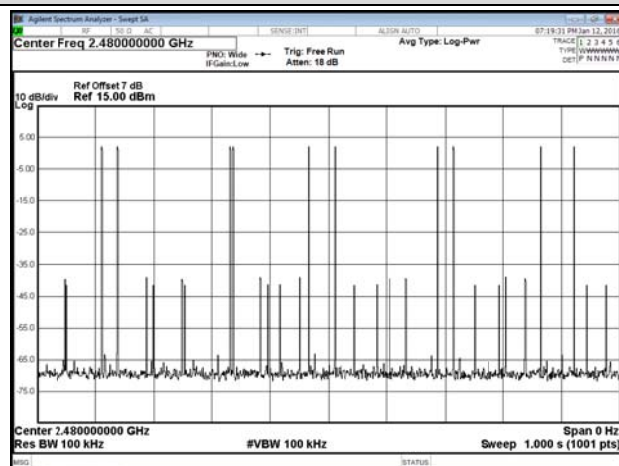
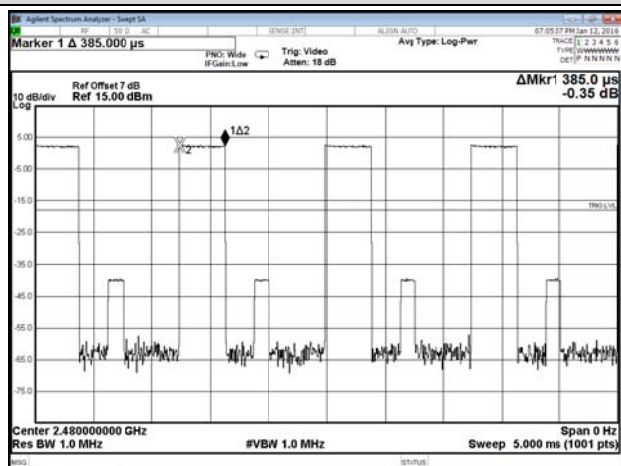


Note: All results have been included cable loss.

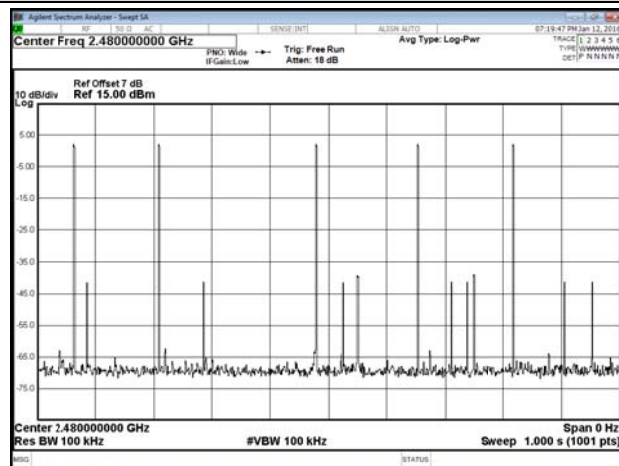
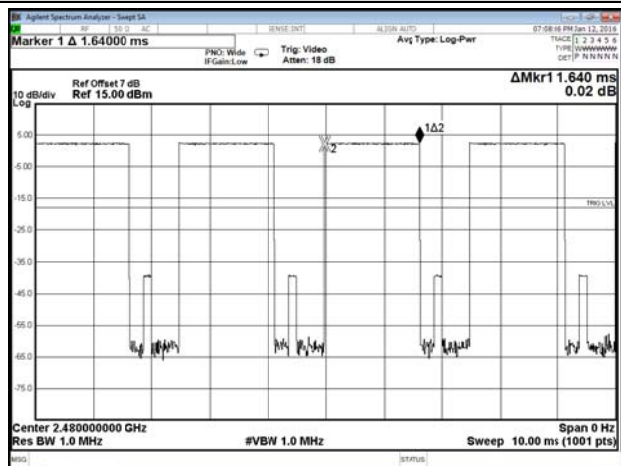
Modulation: GFSK

Centre Frequency: 2480MHz

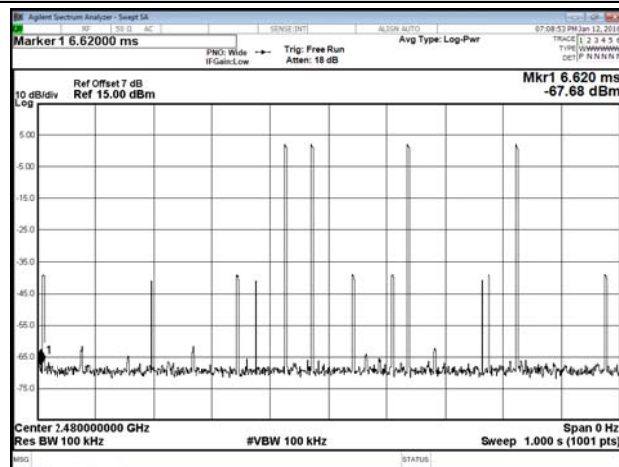
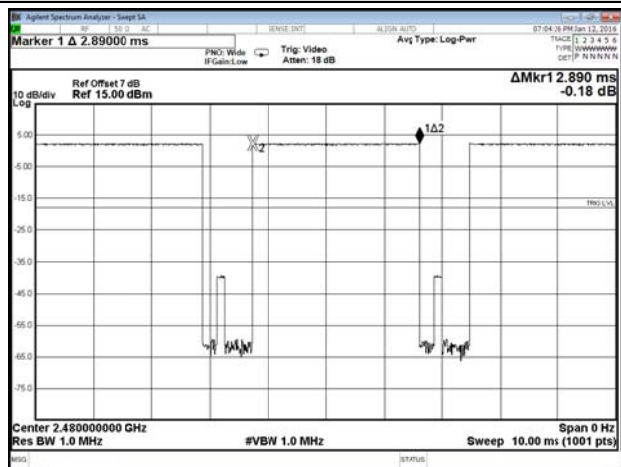
Mode: DH1



Mode: DH3



Mode: DH5

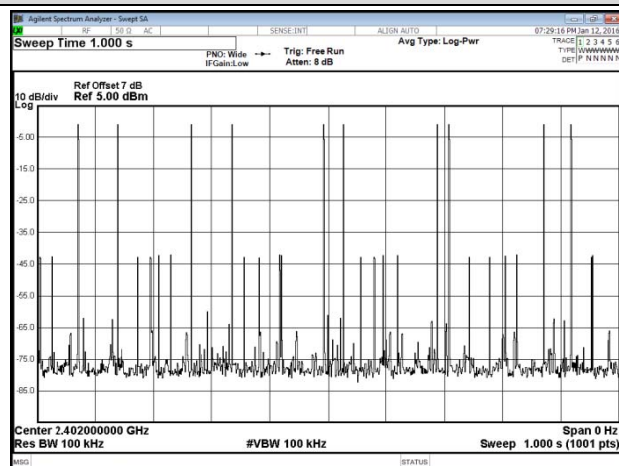
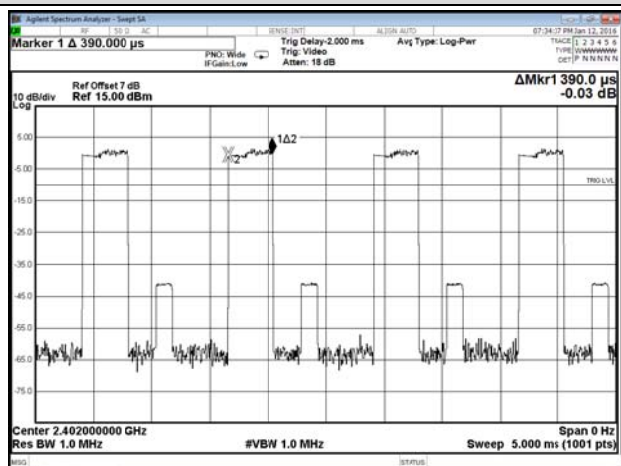


Note: All results have been included cable loss.

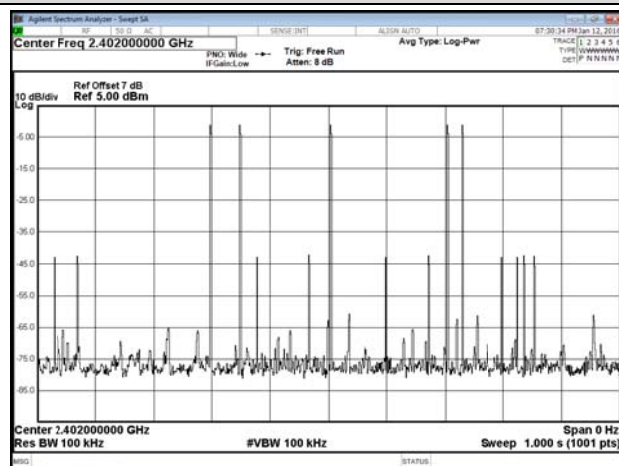
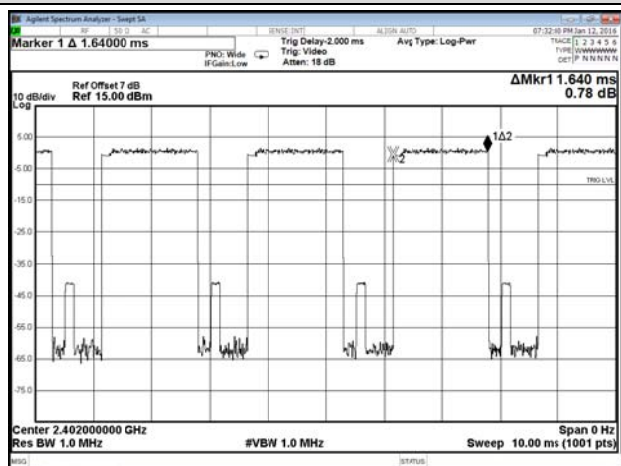
Modulation: 8-DPSK

Centre Frequency: 2402MHz

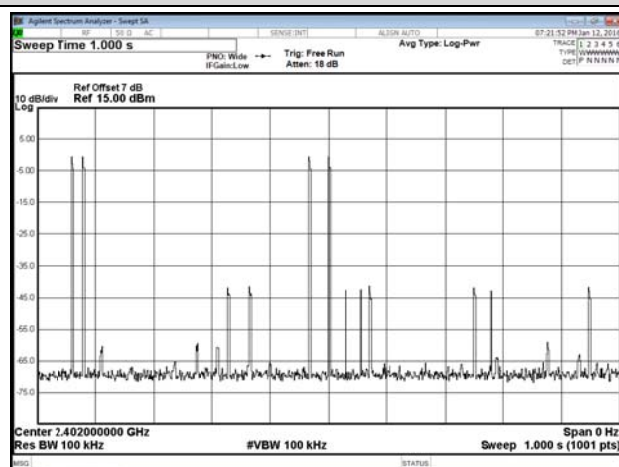
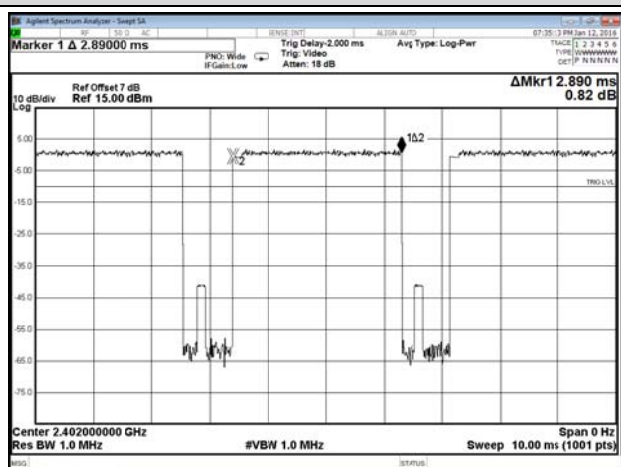
Mode: 3DH1



Mode: 3DH3



Mode: 3DH5



Note: All results have been included cable loss.

File Number: C1M1512133

Report Number: EM-F160035

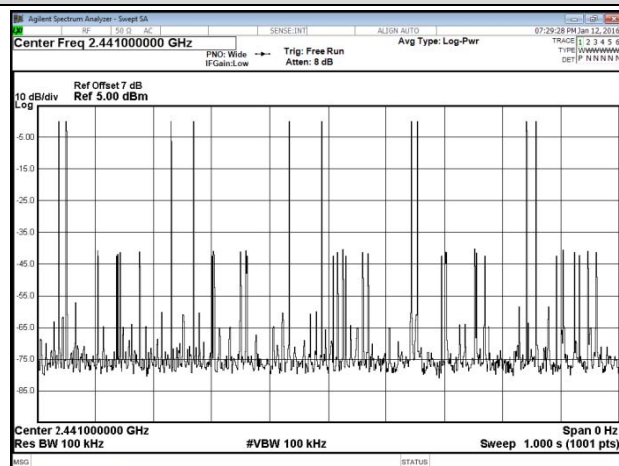
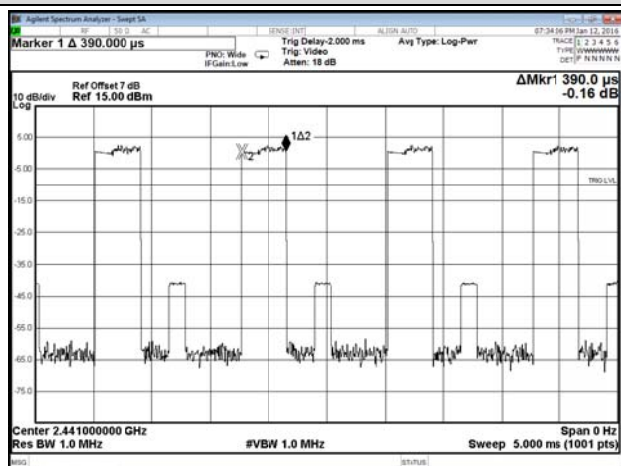
This test report may be reproduced in full only. The document may only be updated by AUDIX Technology Corp. personnel. Any changes will be noted in the Document History section of the report.



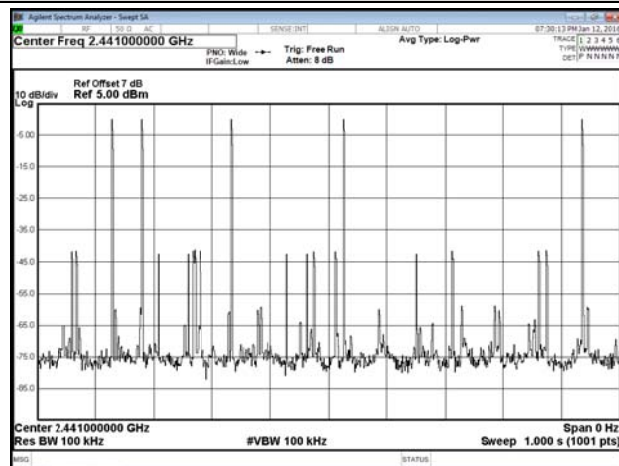
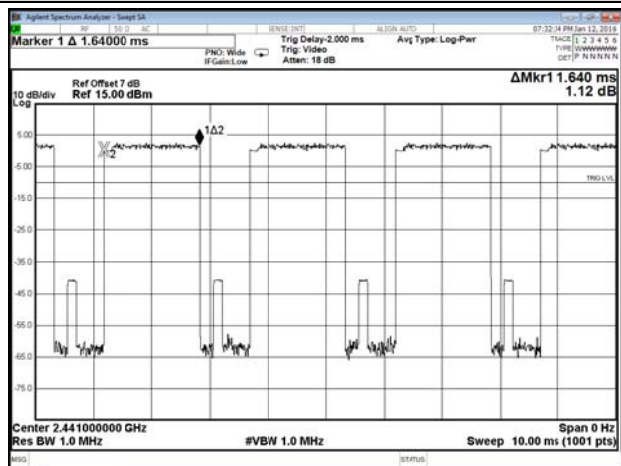
Modulation: 8-DPSK

Centre Frequency: 2441MHz

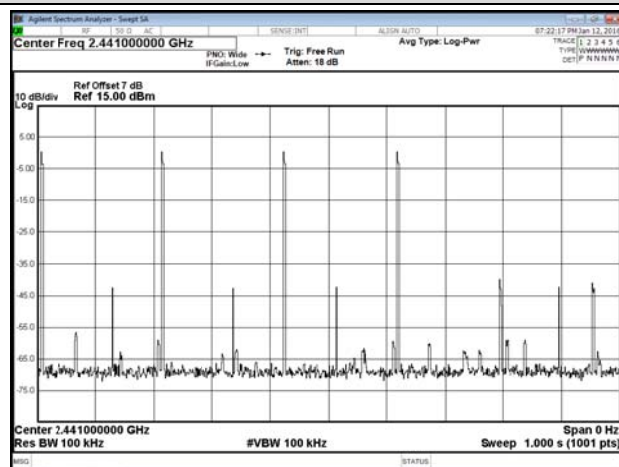
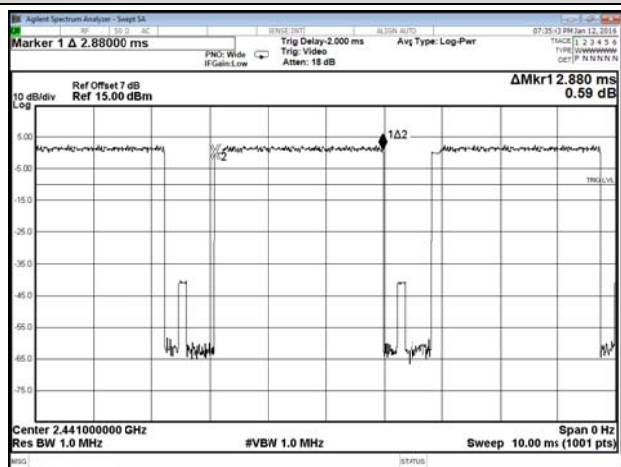
Mode: 3DH1



Mode: 3DH3



Mode: 3DH5

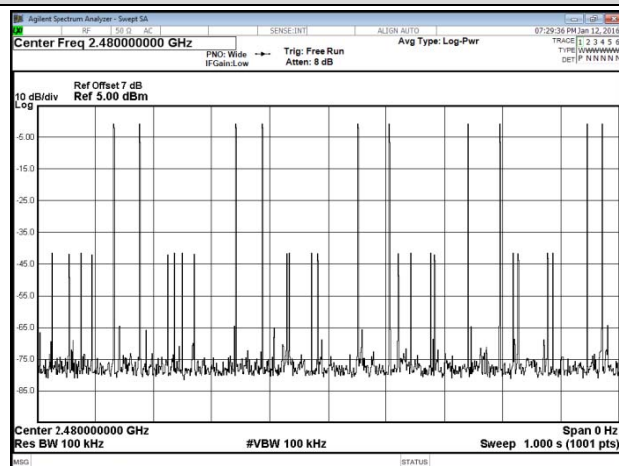
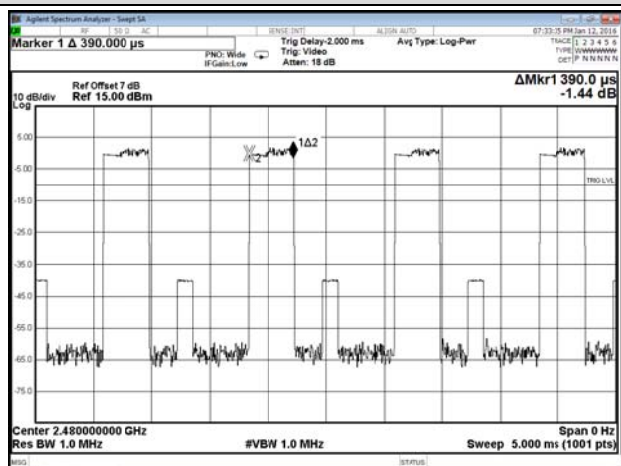


Note: All results have been included cable loss.

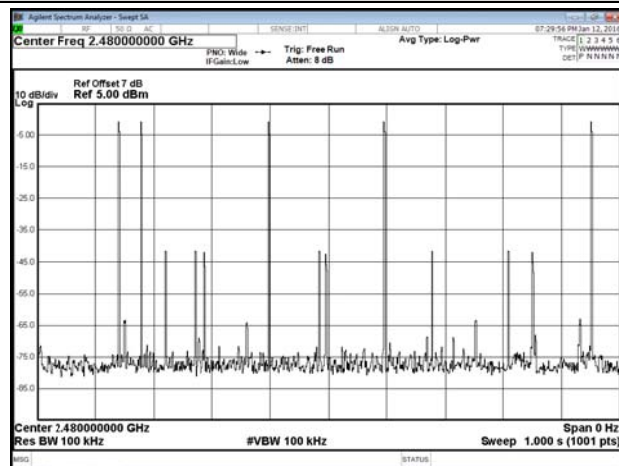
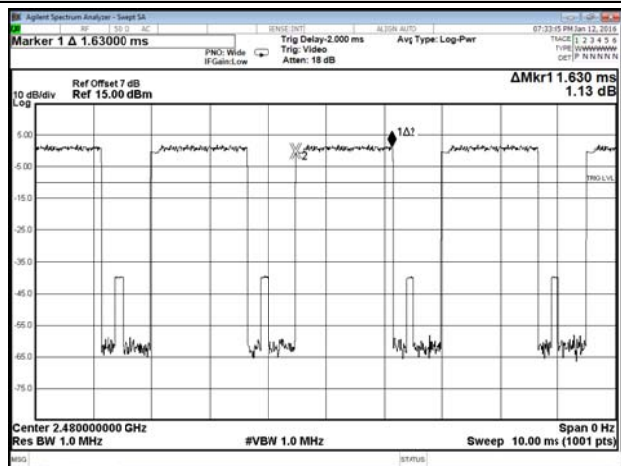
Modulation: 8-DPSK

Centre Frequency: 2480MHz

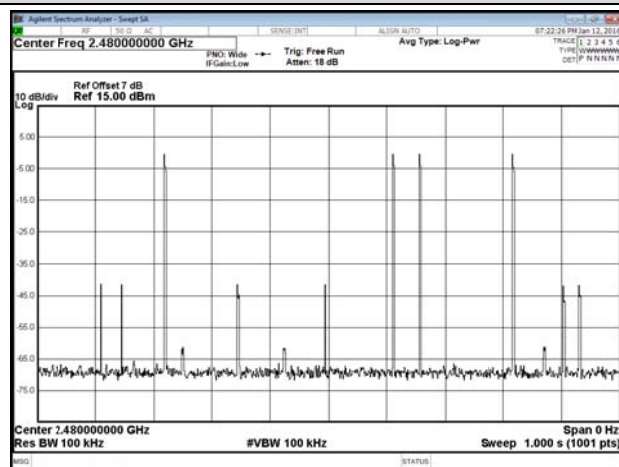
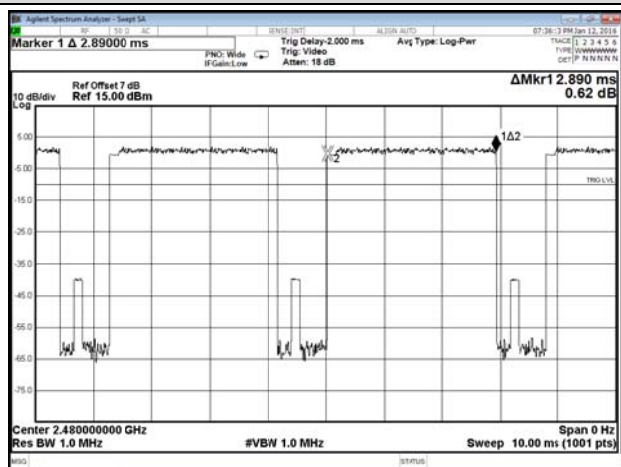
Mode: 3DH1



Mode: 3DH3



Mode: 3DH5

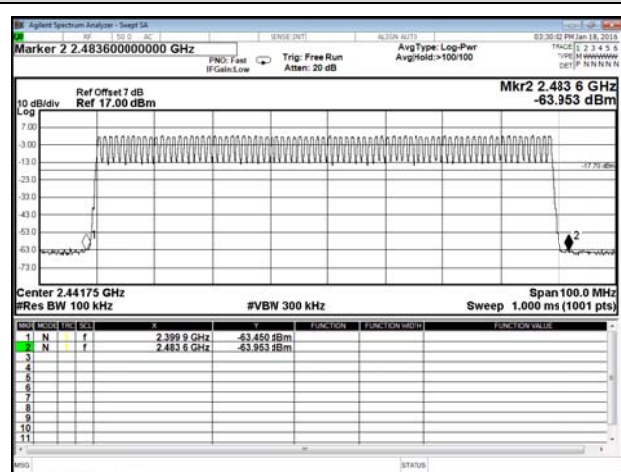
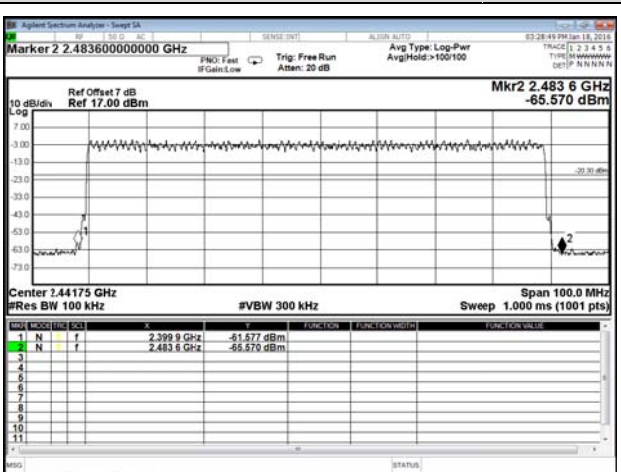


Note: All results have been included cable loss.

## A.4 NUMBER OF HOPPING CHANNELS MEASUREMENT

|              |            |            |          |
|--------------|------------|------------|----------|
| Test Date    | 2016/01/12 | Temp./Hum. | 22°C/60% |
| Test Voltage | DC 12V     |            |          |

### A.4.1 Measurement Plots

| Modulation: GFSK                                                                                                            | Modulation: 8-DPSK                                                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
|  <p>The number hopping channel is 79.</p> |  <p>The number hopping channel is 79.</p> |

Note: All results have been included cable loss.

## A.5 MAXIMUM PEAK OUTPUT POWER MEASUREMENT

|              |            |            |          |
|--------------|------------|------------|----------|
| Test Date    | 2016/01/12 | Temp./Hum. | 22°C/60% |
| Test Voltage | DC 12V     |            |          |

### A.5.1 Output Power

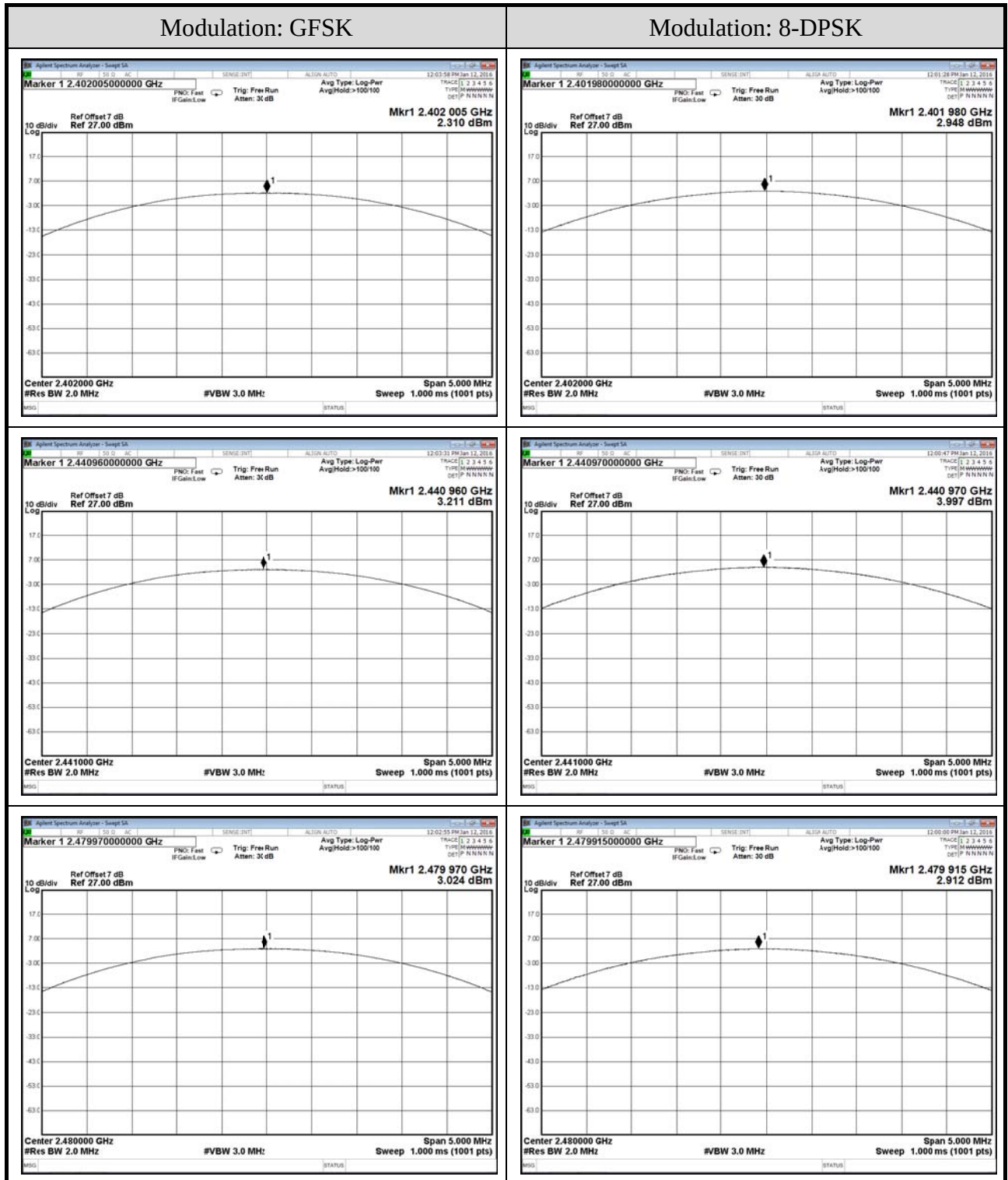
| Modulation | Centre Frequency<br>(MHz) | Peak Output Power |          | Limit             |
|------------|---------------------------|-------------------|----------|-------------------|
|            |                           | dBm               | W        |                   |
| GFSK       | 2402                      | 2.310             | 0.001702 | 21dBm<br>(0.125W) |
|            | 2441                      | 3.211             | 0.002095 |                   |
|            | 2480                      | 3.024             | 0.002006 |                   |

| Modulation | Centre Frequency<br>(MHz) | Peak Output Power |          | Limit             |
|------------|---------------------------|-------------------|----------|-------------------|
|            |                           | dBm               | W        |                   |
| 8-DPSK     | 2402                      | 2.948             | 0.001972 | 21dBm<br>(0.125W) |
|            | 2441                      | 3.997             | 0.002510 |                   |
|            | 2480                      | 2.912             | 0.001955 |                   |

Note: All results have been included cable loss.



## A.5.2 Measurement Plots

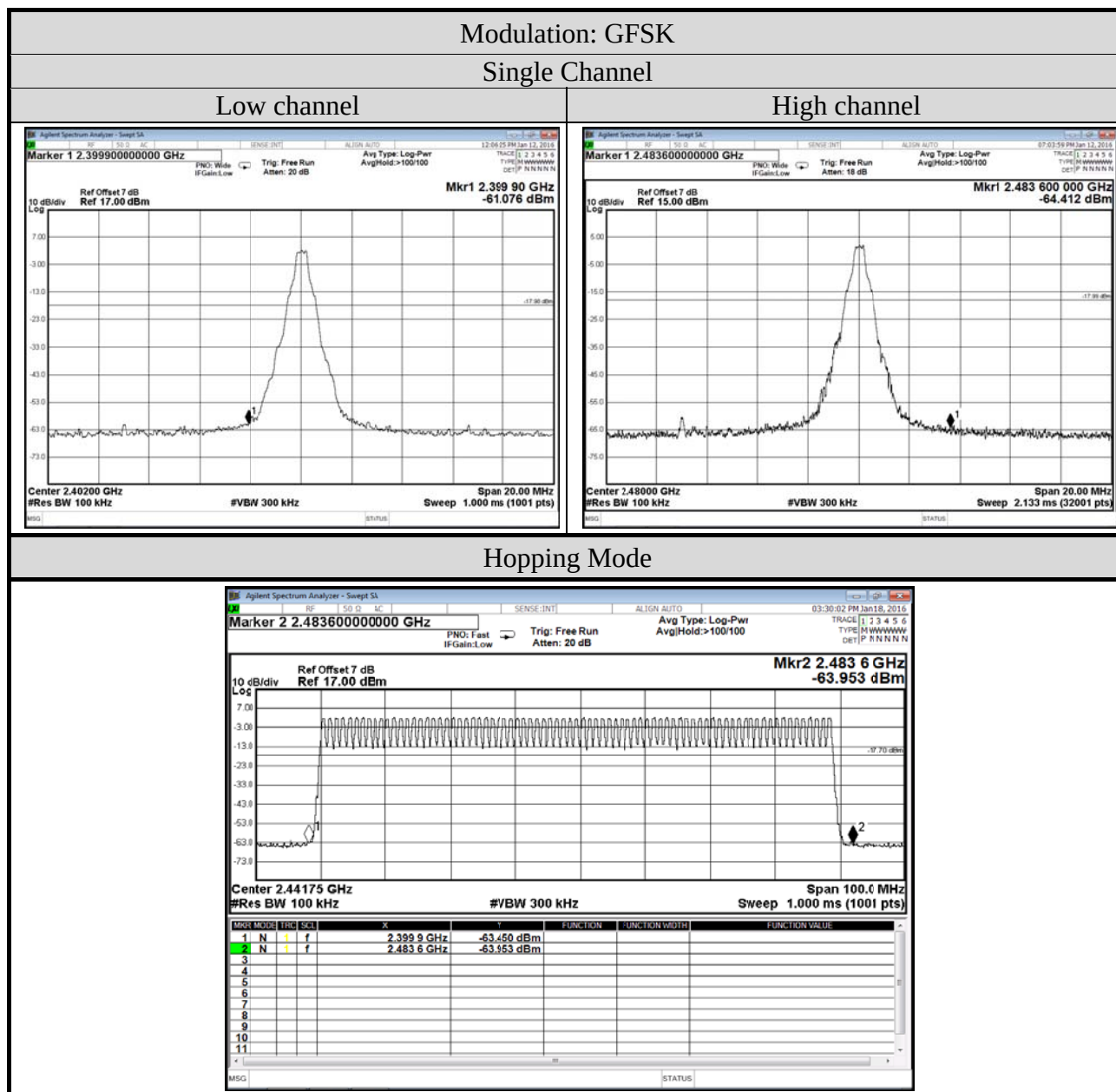


Note: All results have been included cable loss.

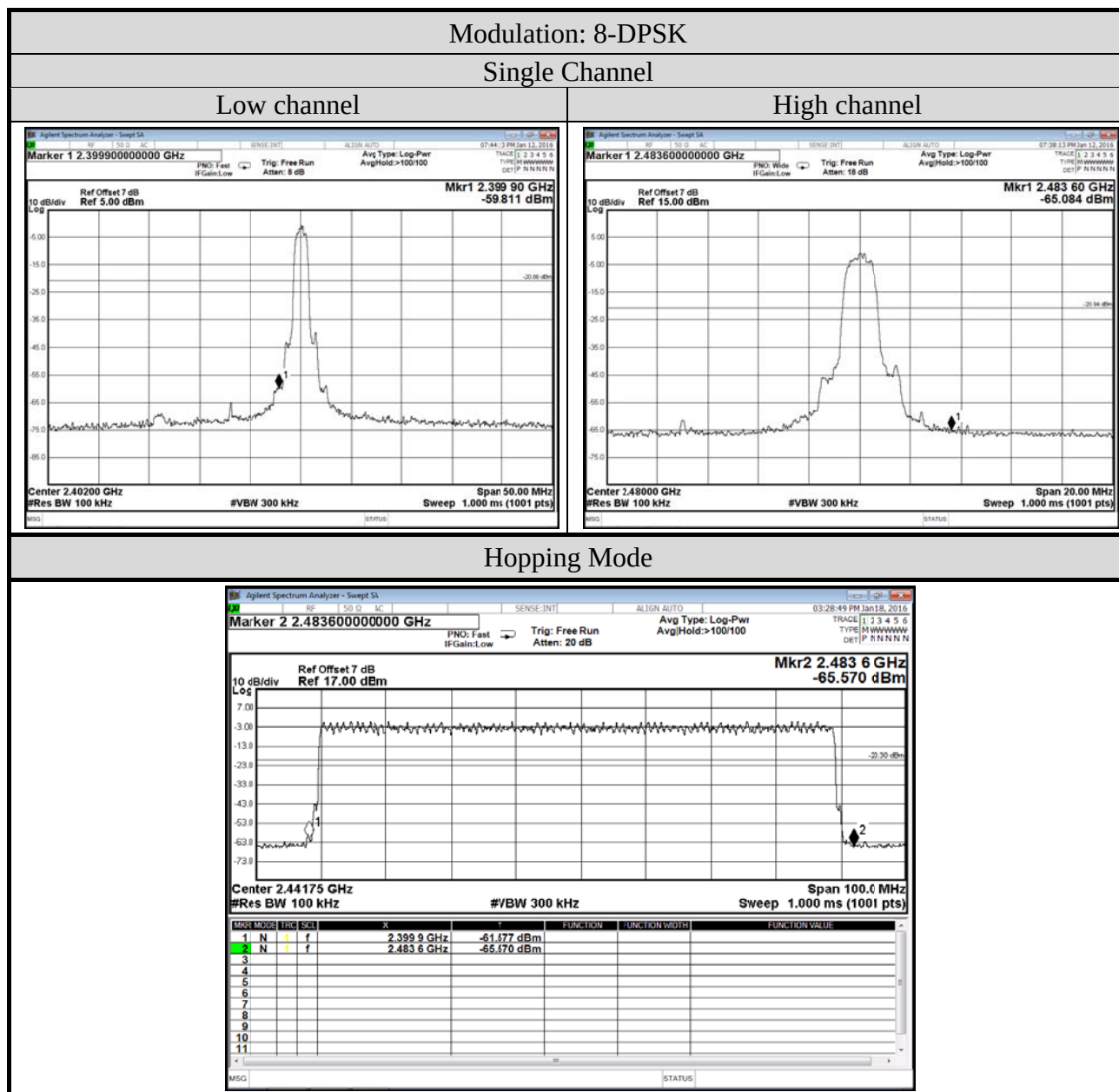
## A.6 EMISSION LIMITATIONS MEASUREMENT

### A.6.1 Band Edge

|              |            |            |          |
|--------------|------------|------------|----------|
| Test Date    | 2016/01/12 | Temp./Hum. | 22°C/60% |
| Test Voltage | DC 12V     |            |          |



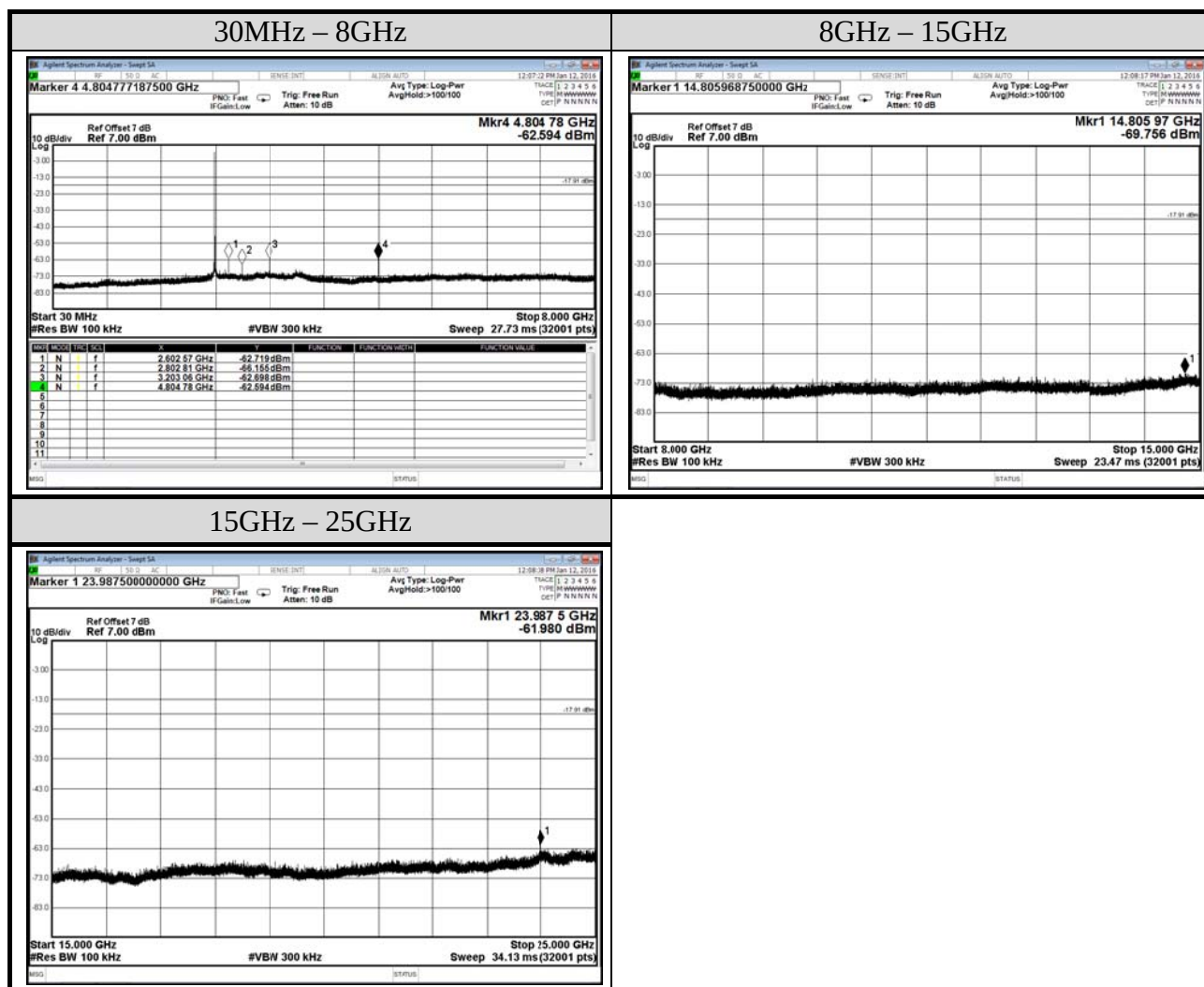
Note: All results have been included cable loss.



Note: All results have been included cable loss.

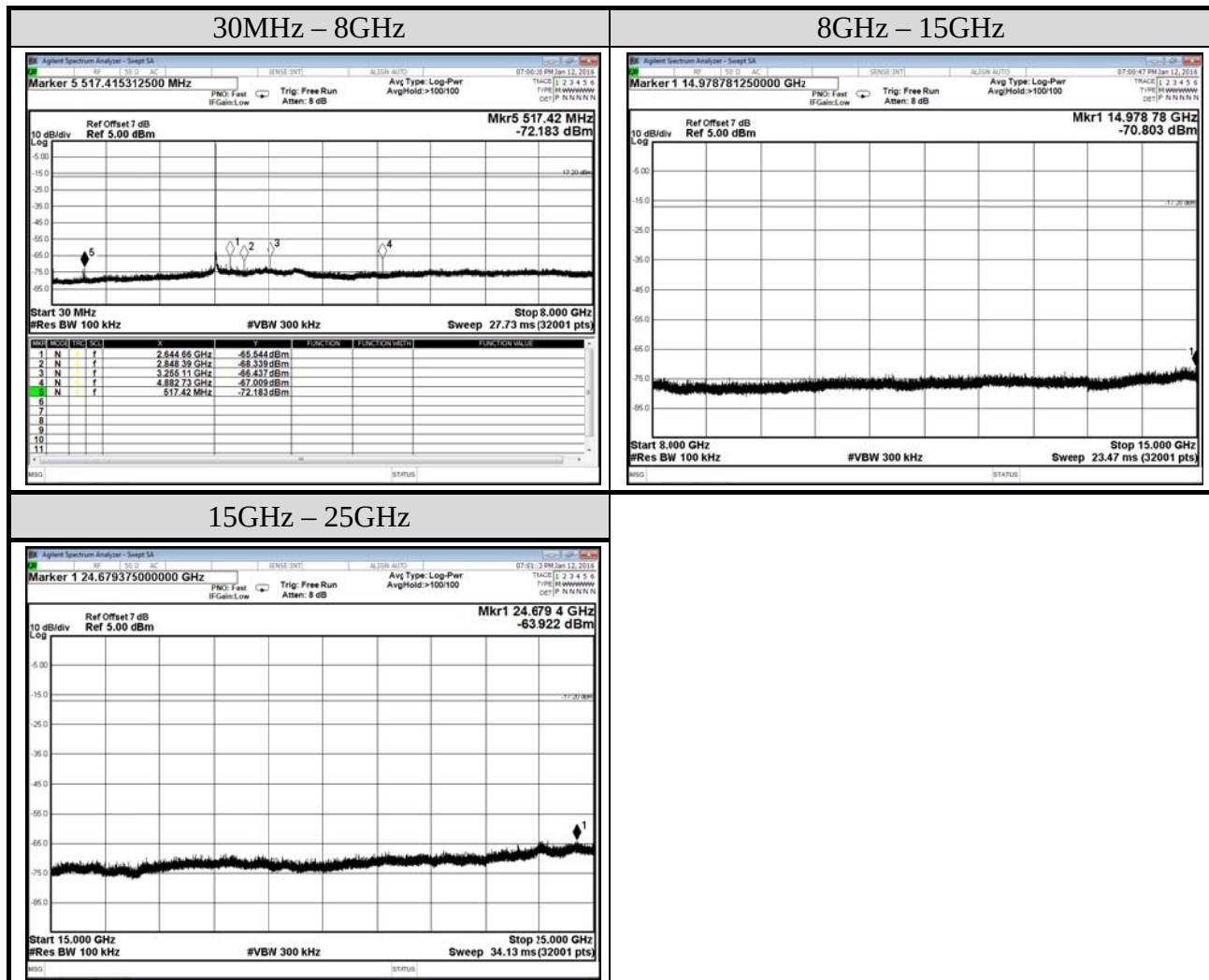
## A.6.2 Spurious Emission

|              |            |            |          |
|--------------|------------|------------|----------|
| Test Date    | 2016/01/12 | Temp./Hum. | 22°C/60% |
| Modulation   | GFSK       | Frequency  | 2402MHz  |
| Test Voltage | DC 12V     |            |          |



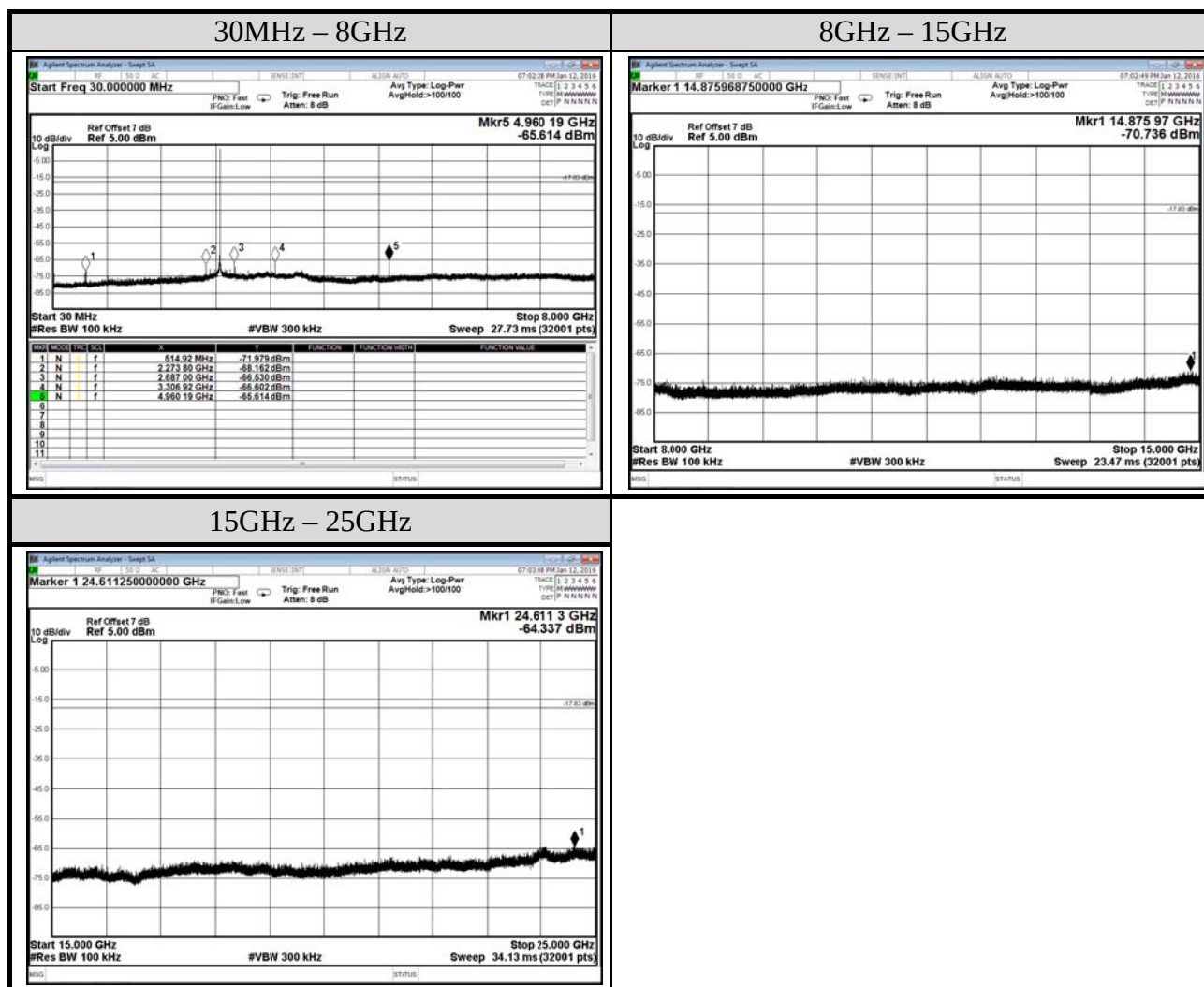
Note: All results have been included cable loss.

|              |            |            |          |
|--------------|------------|------------|----------|
| Test Date    | 2016/01/12 | Temp./Hum. | 22°C/60% |
| Modulation   | GFSK       | Frequency  | 2441MHz  |
| Test Voltage | DC 12V     |            |          |



Note: All results have been included cable loss.

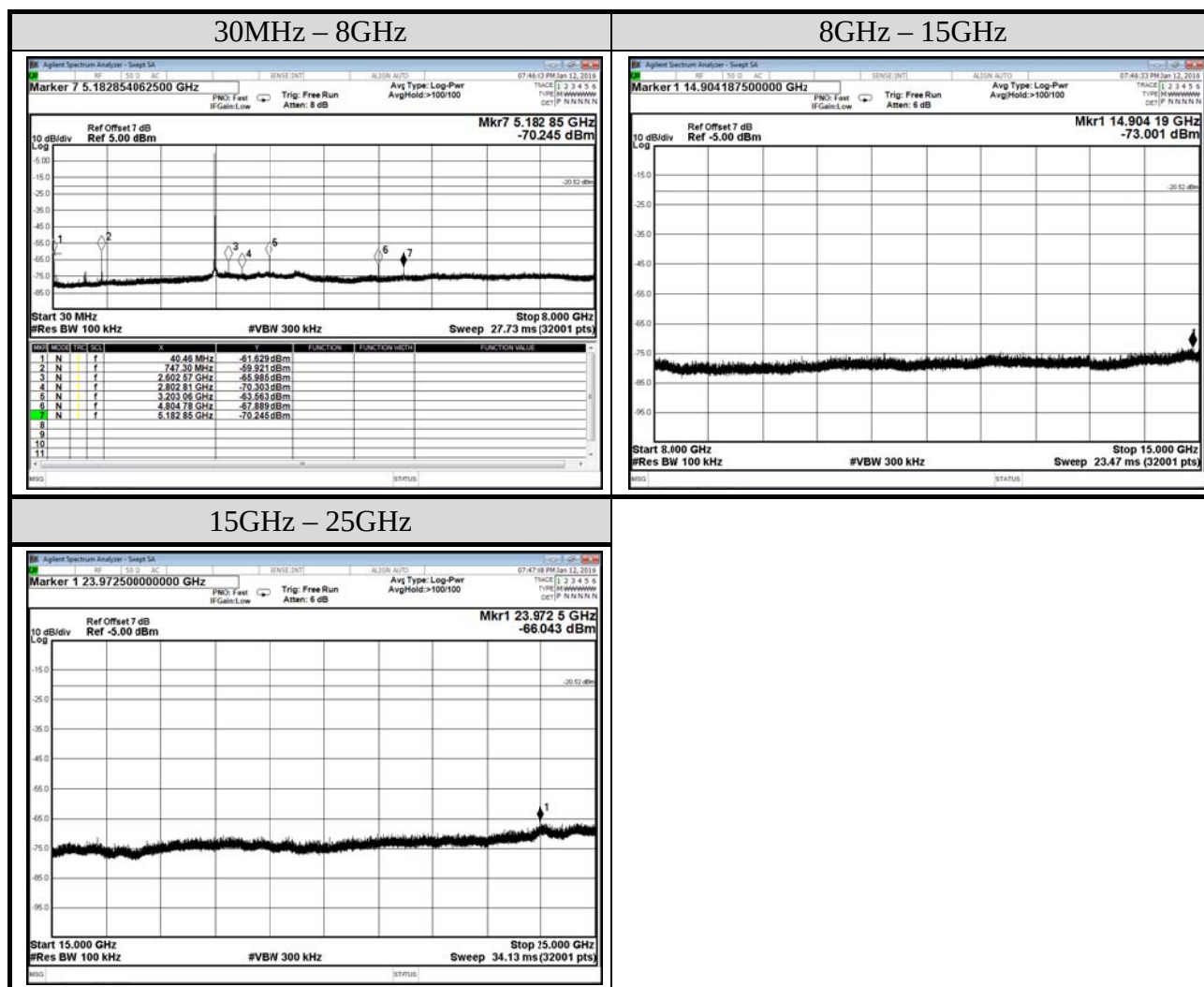
|              |            |            |          |
|--------------|------------|------------|----------|
| Test Date    | 2016/01/12 | Temp./Hum. | 22°C/60% |
| Modulation   | GFSK       | Frequency  | 2480MHz  |
| Test Voltage | DC 12V     |            |          |



Note: All results have been included cable loss.

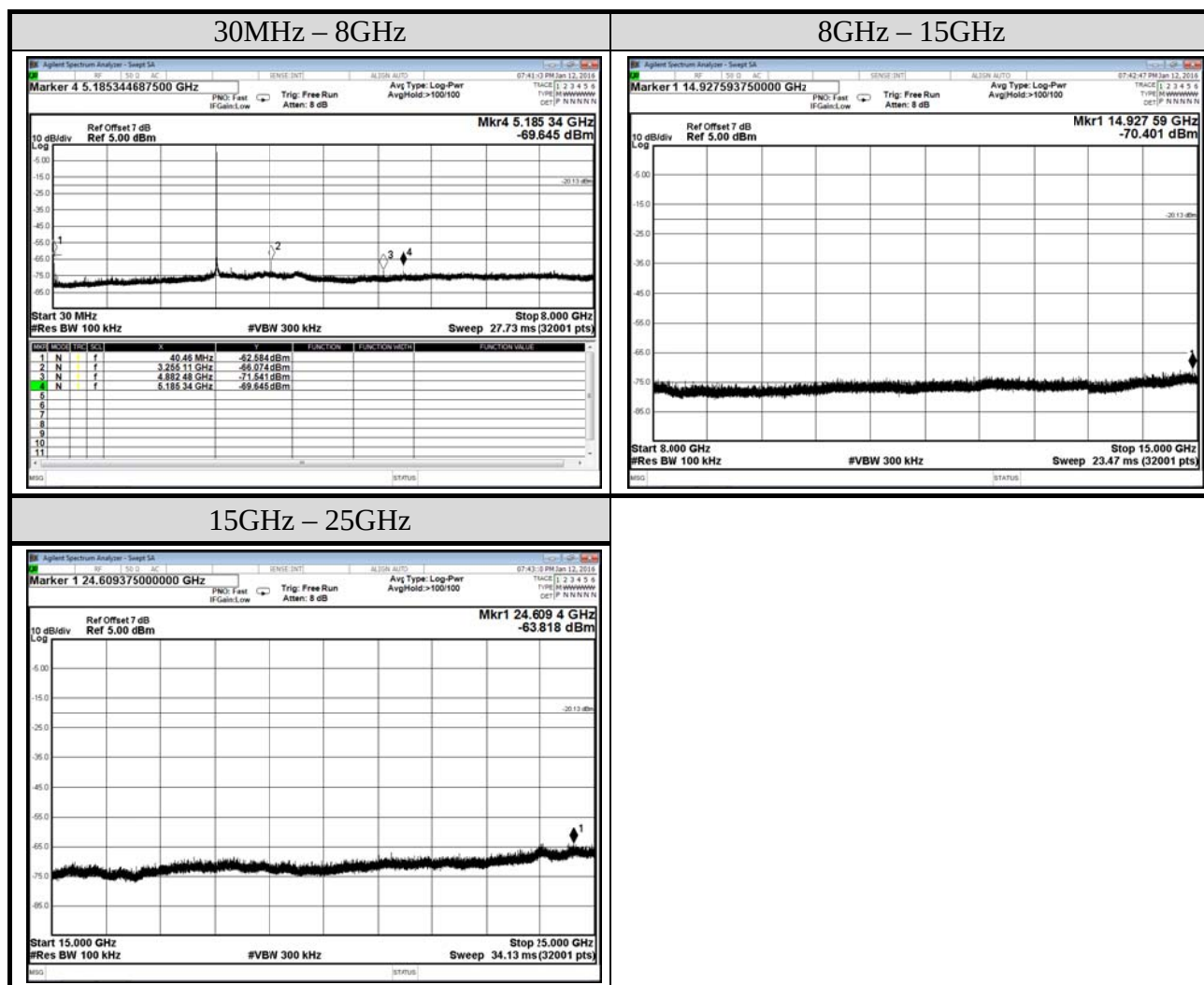


|              |            |            |          |
|--------------|------------|------------|----------|
| Test Date    | 2016/01/12 | Temp./Hum. | 22°C/60% |
| Modulation   | 8-DPSK     | Frequency  | 2402MHz  |
| Test Voltage | DC 12V     |            |          |



Note: All results have been included cable loss.

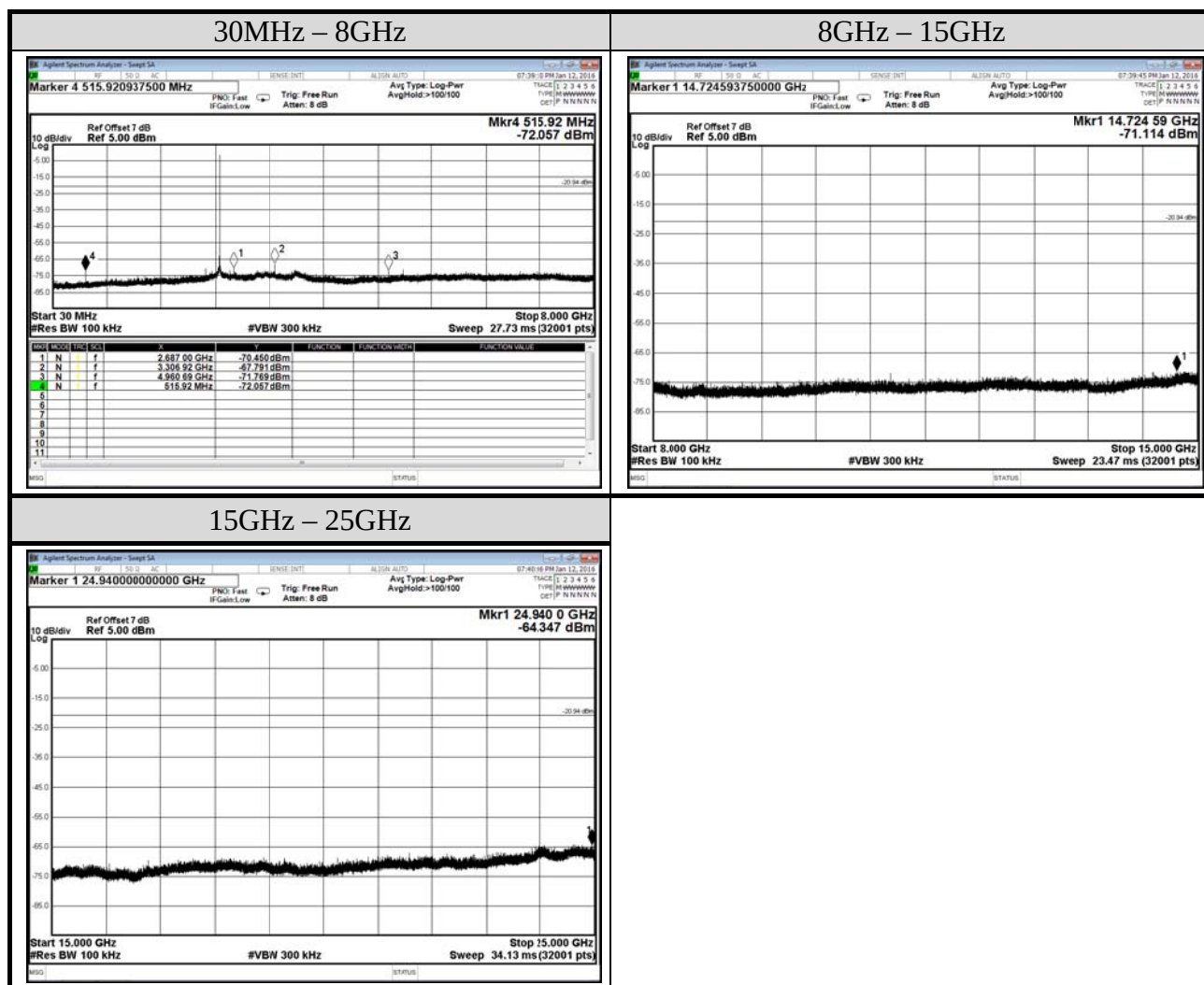
|              |            |            |          |
|--------------|------------|------------|----------|
| Test Date    | 2016/01/12 | Temp./Hum. | 22°C/60% |
| Modulation   | 8-DPSK     | Frequency  | 2441MHz  |
| Test Voltage | DC 12V     |            |          |



Note: All results have been included cable loss.



|              |            |            |          |
|--------------|------------|------------|----------|
| Test Date    | 2016/01/12 | Temp./Hum. | 22°C/60% |
| Modulation   | 8-DPSK     | Frequency  | 2480MHz  |
| Test Voltage | DC 12V     |            |          |



Note: All results have been included cable loss.