



## FCC Test Report (Bluetooth)

**FCC ID** : 2ABPGDKBIGBOX

**Applicant** : DKNIGHT INC.  
10990 Matinal Cir, San Diego, CA, USA 92127.

### Sample Description

**Product Name** : DKnight Big Magicbox Wireless Speaker

**Model No.** : DK-BigMAGICBOX-040

**Trademark** : DKnight

**Receipt Date** : 2015-12-01

**Test Date** : 2015-12-04 to 2015-12-05

**Issue Date** : 2015-12-07

**Test Standard(s)** : FCC CFR Title 47 Part 15 Subpart C Section 15.247

**Conclusions** : PASSED\*

\*In the configuration tested, the EUT complied with the standards specified above.

**Test/Witness Engineer** :

*Jason Deng*

**Approved & Authorized** :

*Frank Zhang*

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



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## 1. General Information

### 1.1. Client Information

|              |   |                                                                                                         |
|--------------|---|---------------------------------------------------------------------------------------------------------|
| Applicant    | : | DKNIGHT INC.                                                                                            |
| Address      | : | 10990 Matinal Cir, San Diego, CA, USA 92127.                                                            |
| Manufacturer | : | Shenzhen Tranbel Technology CO., LTD.                                                                   |
| Address      | : | Floor 4, Building C, Yinfeng Industrial park, Aviation Road, Xixiang Street, Bao'an District, Shenzhen. |

### 1.2. General Description of EUT (Equipment Under Test)

|                     |   |                                                   |                              |
|---------------------|---|---------------------------------------------------|------------------------------|
| Product Name        | : | DKnight Big Magicbox Wireless Speaker             |                              |
| Models No.          | : | DK-BigMAGICBOX-040                                |                              |
| Trademark           | : | DKnight                                           |                              |
| Product Description | : | Operation Frequency:                              | 2402MHz~2480MHz              |
|                     |   | Transfer Rate:                                    | 1/2/3 Mbits/s                |
|                     |   | Number of Channel:                                | 79 Channels                  |
|                     |   | Modulation Type:                                  | GFSK, $\pi/4$ -DQPSK, 8-DPSK |
|                     |   | Modulation Technology:                            | FHSS                         |
|                     |   | Antenna Type:                                     | Integral PCB Antenna         |
|                     |   | Antenna Gain:                                     | 0 dBi                        |
| Power Supply        | : | DC 3.7V From battery or DC 5V From USB For Charge |                              |

**Note:**

- (1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
- (2) Channel List:

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | 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            |



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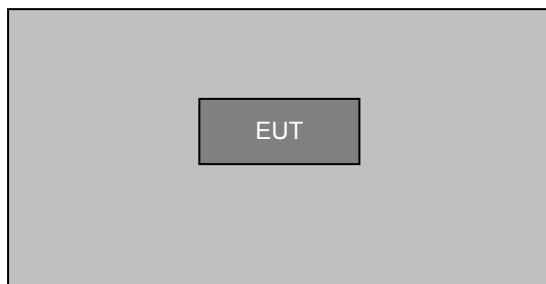
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|    |      |    |      |    |      |
|----|------|----|------|----|------|
| 07 | 2409 | 34 | 2436 | 61 | 2463 |
| 08 | 2410 | 35 | 2437 | 62 | 2464 |
| 09 | 2411 | 36 | 2438 | 63 | 2465 |
| 10 | 2412 | 37 | 2439 | 64 | 2466 |
| 11 | 2413 | 38 | 2440 | 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 |    |      |

**Remark:** Channel 0, 39 & 78 selected for GFSK,  $\pi/4$ -DQPSK and 8DPSK.

## 1.3. Block Diagram Showing The Configuration of System Tested





## 1.4. Description of Support Units

| Name        | Model        | Serial Number          | Manufacturer |
|-------------|--------------|------------------------|--------------|
| Printer     | HP1020       | CNCJ410726             | HP           |
| LCD Monitor | G205HV       | 10306738385            | ACER         |
| PC          | ASPIREM1830  | PTSF90C00305005CAC3000 | ACER         |
| Keyboard    | SK-9625      | KBUSB1580500037E0100   | ACER         |
| Mouse       | MS.11200.014 | M-UAY-ACR2             | ACER         |

## 1.5. External I/O Cable

N/A

## 1.6. Description of Test Mode

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned follow was evaluated respectively.

| Test Mode         | Description                                                 |
|-------------------|-------------------------------------------------------------|
| Transmitting mode | Keep the EUT in Transmitting mode with worst case data rate |
| Remark            | GFSK(1Mbps) is the worst case mode                          |

**Remark:** The sample was placed 0.8m above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

## 1.7. Test Instruments List

|   | Test Equipment                   | Manufacturer                   | Model No. | Cal. Date     | Cal. Due date |
|---|----------------------------------|--------------------------------|-----------|---------------|---------------|
| 1 | Bilog Antenna                    | SCHWARZBECK<br>MESS-ELEKTRONIK | VULB9163  | May 23, 2015  | May 22, 2016  |
| 2 | Double -ridged<br>waveguide horn | SCHWARZBECK<br>MESS-ELEKTRONIK | BBHA9120D | May 28, 2015  | May 27, 2016  |
| 3 | Coaxial Cable                    | N/A                            | N/A       | Mar. 30, 2015 | Mar. 29, 2016 |



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|    |                                            |                                      |                             |               |               |
|----|--------------------------------------------|--------------------------------------|-----------------------------|---------------|---------------|
| 4  | Coaxial Cable                              | N/A                                  | N/A                         | Mar. 30, 2015 | Mar. 29, 2016 |
| 5  | Coaxial cable                              | N/A                                  | N/A                         | Mar. 30, 2015 | Mar. 29, 2016 |
| 6  | Coaxial Cable                              | N/A                                  | N/A                         | Mar. 30, 2015 | Mar. 29, 2016 |
| 7  | Coaxial Cable                              | N/A                                  | N/A                         | Mar. 30, 2015 | Mar. 29, 2016 |
| 8  | Amplifier<br>(10kHz-1.3GHz)                | HP                                   | 8447D                       | Mar. 30, 2015 | Mar. 29, 2016 |
| 9  | Amplifier<br>(1GHz-18GHz)                  | Compliance Direction<br>Systems Inc. | PAP-1G18                    | Jun. 07, 2015 | Jun. 06, 2016 |
| 10 | Pre-amplifier<br>(18-26GHz)                | Rohde & Schwarz                      | AFS33-18002<br>650-30-8P-44 | Mar. 30, 2015 | Mar. 29, 2016 |
| 11 | Horn Antenna                               | ETS-LINDGREN                         | 3160                        | Mar. 30, 2015 | Mar. 29, 2016 |
| 12 | Positioning<br>Controller                  | UC                                   | UC3000                      | N/A           | N/A           |
| 13 | Spectrum<br>analyzer<br>9kHz-30GHz         | Rohde & Schwarz                      | FSP                         | May 27, 2015  | May 26, 2016  |
| 14 | EMI Test<br>Receiver                       | Rohde & Schwarz                      | ESPI                        | Mar. 30, 2015 | Mar. 29, 2016 |
| 15 | Loop antenna                               | Laplace instrument                   | RF300                       | May 27, 2015  | May 26, 2016  |
| 16 | Universal radio<br>communication<br>tester | Rhode & Schwarz                      | CMU200                      | May 27, 2015  | May 26, 2016  |
| 17 | Signal Analyzer                            | Rohde & Schwarz                      | FSIQ3                       | May 27, 2015  | May 26, 2016  |
| 18 | L.I.S.N.#1                                 | Rohde & Schwarz                      | NSLK8126                    | May 27, 2015  | May 26, 2016  |
| 19 | L.I.S.N.#2                                 | Rohde & Schwarz                      | ENV216                      | May 27, 2015  | May 26, 2016  |
| 20 | Power Meter                                | Anritsu                              | ML2487A                     | May 27, 2015  | May 26, 2016  |
| 21 | Power sensor                               | Anritsu                              | MA2491A                     | May 27, 2015  | May 26, 2016  |

## 1.8. Laboratory Location

Shenzhen TOBY technology Co.,Ltd

Address: 1 A/F., Bldg.6, Yusheng Industrial Zone The National Road No.107 Xixiang Section 467,  
Xixiang, Bao'an, Shenzhen, Guangdong, 518057, China

At the time of testing, the Laboratory is accredited. It is listed in the United States of American Federal Communications Commission (FCC), and the registration number is 811562 7.

Tel:0086-755-26509301 Fax: 0086-755-26509195



## 2. Test Summary

| Standard Section                                            | Test Item                                  | Judgment |
|-------------------------------------------------------------|--------------------------------------------|----------|
| 15.203/15.247(c)                                            | Antenna Requirement                        | PASSED   |
| 15.207                                                      | Conducted Emission                         | PASSED   |
| 15.247(b)(1)                                                | Conducted Peak Output Power                | PASSED   |
| 15.247(a)(1)                                                | 20dB Occupied Bandwidth                    | PASSED   |
| 15.247(a)(1)                                                | Carrier Frequencies Separation             | PASSED   |
| 15.247(a)(1)                                                | Hopping Channel Number                     | PASSED   |
| 15.247(a)(1)                                                | Dwell Time                                 | PASSED   |
| 15.247(b)(4)&TCB<br>Exclusion List (7 July 2002)            | Pseudorandom Frequency<br>Hopping Sequence | PASSED   |
| 15.205/15.209                                               | Spurious Emission                          | PASSED   |
| 15.247(d)                                                   | Band Edge                                  | PASSED   |
| <b>Remark:</b> "N/A" is an abbreviation for Not Applicable. |                                            |          |



## 3. Antenna Requirement

### 3.1. Standard Requirement

#### 3.1.1 Test standard

FCC Part15 Section 15.203 /247(c)

#### 3.1.2 Requirement

##### 1) 15.203 requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

##### 2) 15.247(c) (1)(i) requirement:

Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

### 3.2. Antenna Connected Construction

The bluetooth antenna is an integral antenna which permanently attached, and the best case gain of the antenna is 0 dBi. It complies with the standard requirement.

## 4. Conducted Emission Test

### 4.1. Test Standard and Limit

#### 4.1.1 Test Standard

FCC Part15 Section 15.207

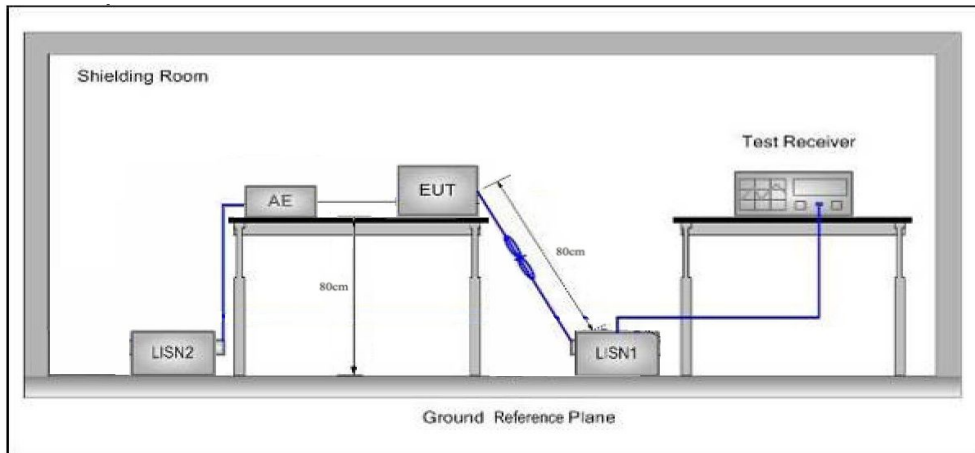
#### 4.1.2 Test Limit

Conducted Emission Test Limit

| Frequency     | Maximum RF Line Voltage (dB $\mu$ V) |               |
|---------------|--------------------------------------|---------------|
|               | Quasi-peak Level                     | Average Level |
| 150kHz~500kHz | 66 ~ 56 *                            | 56 ~ 46 *     |
| 500kHz~5MHz   | 56                                   | 46            |
| 5MHz~30MHz    | 60                                   | 50            |

Remark: (1) \*Decreasing linearly with logarithm of the frequency.  
(2) The lower limit shall apply at the transition frequencies.

### 4.2. Test Setup



### 4.3. Test Procedure

- 1) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a  $50 \Omega / 50 \mu H + 5 \Omega$  linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
- 2) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane.

The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal



ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.

The Test Receiver setup: RBW=9kHz, VBW=30kHz, Sweep time= auto

#### 4.4. Test Data

PASS.

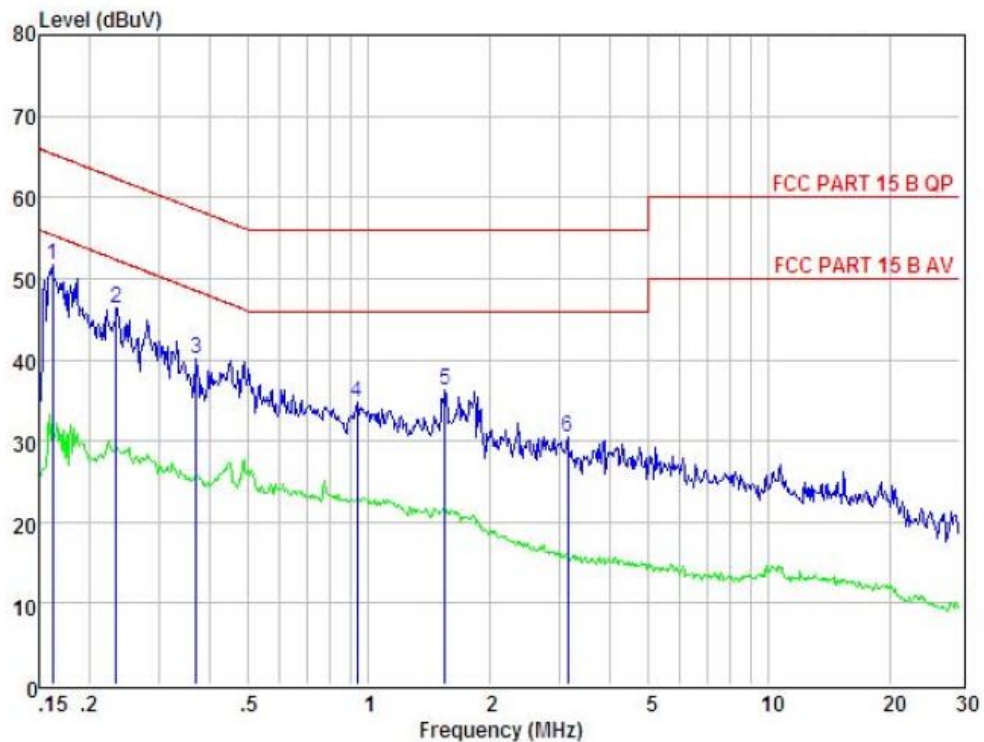


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EUT: DKnight Big Magicbox Wireless Speaker  
M/N: DK-BigMAGICBOX-040  
Operating Condition: Bluetooth TX mode  
Test Site: Conduction Room  
Operator: Jason  
Test Specification: DC 5V from USB port with AC120V/60HZ  
Polarization: Line  
Note: Tem:23℃ Hum:50%



Condition : FCC PART 15 B QP POL: LINE Temp:24.3℃ Hum:51 %

| Item | Freq<br>MHz | Read<br>dBuV | LISN<br>Factor<br>dB | Preamp<br>Factor<br>dB | Cable<br>Loss<br>dB | Level<br>dBuV | Limit<br>dBuV | Margin<br>dBuV | Remark |
|------|-------------|--------------|----------------------|------------------------|---------------------|---------------|---------------|----------------|--------|
| 1    | 0.162       | 41.80        | 0.03                 | -9.72                  | 0.10                | 51.65         | 65.34         | -13.69         | Peak   |
| 2    | 0.234       | 36.37        | 0.03                 | -9.72                  | 0.10                | 46.22         | 62.30         | -16.08         | Peak   |
| 3    | 0.371       | 30.30        | 0.03                 | -9.72                  | 0.10                | 40.15         | 58.47         | -18.32         | Peak   |
| 4    | 0.933       | 24.81        | 0.04                 | -9.71                  | 0.10                | 34.66         | 56.00         | -21.34         | Peak   |
| 5    | 1.552       | 26.43        | 0.05                 | -9.71                  | 0.10                | 36.29         | 56.00         | -19.71         | Peak   |
| 6    | 3.140       | 20.63        | 0.07                 | -9.69                  | 0.12                | 30.51         | 56.00         | -25.49         | Peak   |

Remarks: Level = Read + LISN Factor - Preamp Factor + Cable loss

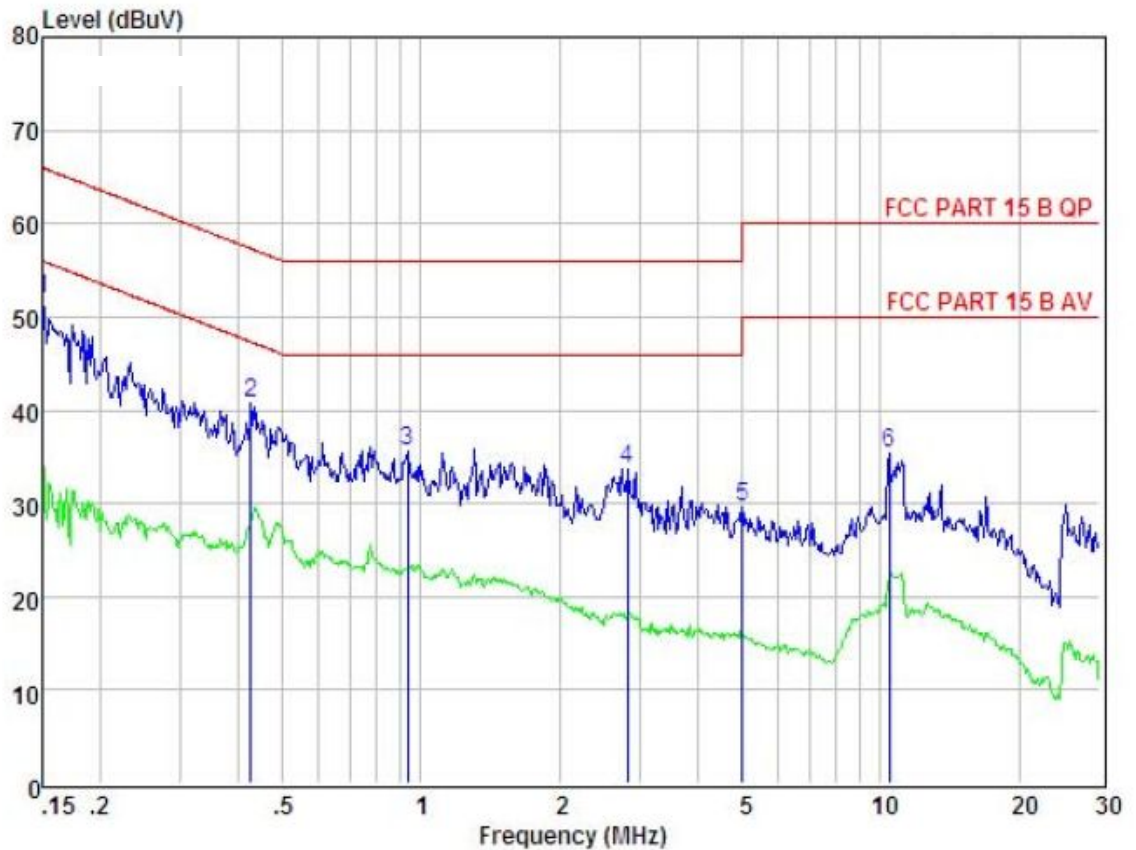


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EUT: DKnight Big Magicbox Wireless Speaker  
M/N: DK-BigMAGICBOX-040  
Operating Condition: Bluetooth TX mode  
Test Site: Conduction Room  
Operator: Jason  
Test Specification: DC 5V from USB port with AC120V/60HZ  
Polarization: Neutral  
Note Tem:23℃ Hum:50%



| Condition : FCC PART 15 B QP     |        |       |        |        |       |       |       |        |        |
|----------------------------------|--------|-------|--------|--------|-------|-------|-------|--------|--------|
| POL: NEUTRAL Temp:24.3℃ Hum:51 % |        |       |        |        |       |       |       |        |        |
| Item                             | Freq   | Read  | LISN   | Preamp | Cable | Level | Limit | Margin | Remark |
|                                  | MHz    | dBuV  | Factor | Factor | Loss  | dBuV  | dBuV  | dBuV   |        |
| 1                                | 0.150  | 41.98 | 0.03   | -9.72  | 0.10  | 51.83 | 66.00 | -14.17 | Peak   |
| 2                                | 0.426  | 30.87 | 0.03   | -9.72  | 0.10  | 40.72 | 57.33 | -16.61 | Peak   |
| 3                                | 0.933  | 25.66 | 0.04   | -9.71  | 0.10  | 35.51 | 56.00 | -20.49 | Peak   |
| 4                                | 2.809  | 23.78 | 0.07   | -9.70  | 0.12  | 33.67 | 56.00 | -22.33 | Peak   |
| 5                                | 5.005  | 19.69 | 0.10   | -9.68  | 0.12  | 29.59 | 60.00 | -30.41 | Peak   |
| 6                                | 10.452 | 25.47 | 0.20   | -9.51  | 0.21  | 35.39 | 60.00 | -24.61 | Peak   |

Remarks: Level = Read + LISN Factor - Preamp Factor + Cable loss



## 5. Conducted Peak Output Power Test

### 5.1. Test Standard and Limit

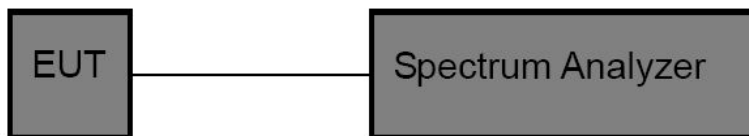
#### 5.1.1 Test Standard

FCC Part15 C Section 15.247 (b)(3)

#### 5.1.2 Test Limit

| FCC Part 15 Subpart C(15.247) |                                                             |                       |
|-------------------------------|-------------------------------------------------------------|-----------------------|
| Test Item                     | Limit                                                       | Frequency Range (MHz) |
| Peak Output Power             | Hopping Channels>75 Power<1W(30dBm)<br>Other <125 mW(21dBm) | 2400~2483.5           |

### 5.2. Test Setup



### 5.3. Test Procedure

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Spectrum Setting:  
RBW=1MHz, VBW=3MHz, Detector=Peak (If 20dB BW  $\leq$  1 MHz)  
RBW=3MHz, VBW=10MHz, Detector=Peak (If 20dB BW > 1 MHz)
- (3) The EUT was set to continuously transmitting in the max power during the test.

### 5.4. Test Data



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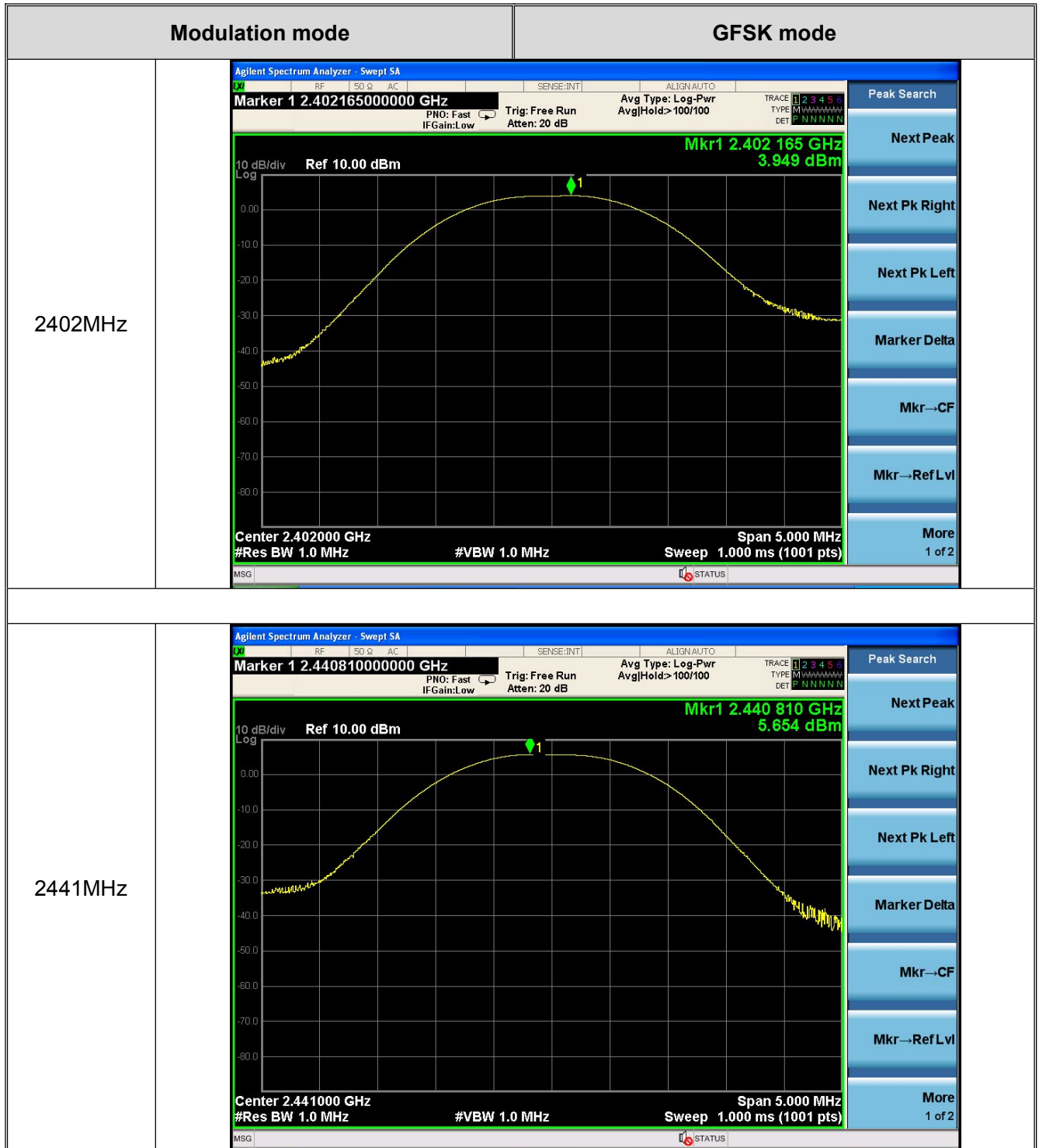
| GFSK mode           |                         |                   |               |          |
|---------------------|-------------------------|-------------------|---------------|----------|
| Channel Number      | Channel Frequency (MHz) | Test Result (dBm) | Limit (30dBm) | Judgment |
| CH 00               | 2402                    | 3.949             | 21            | PASSED   |
| CH 39               | 2441                    | 5.654             | 21            | PASSED   |
| CH 78               | 2480                    | 6.234             | 21            | PASSED   |
| $\pi/4$ -DQPSK mode |                         |                   |               |          |
| Channel Number      | Channel Frequency (MHz) | Test Result (dBm) | Limit (30dBm) | Judgment |
| CH 00               | 2402                    | 1.795             | 21            | PASSED   |
| CH 39               | 2441                    | 4.185             | 21            | PASSED   |
| CH 78               | 2480                    | 4.979             | 21            | PASSED   |
| 8DPSK mode          |                         |                   |               |          |
| Channel Number      | Channel Frequency (MHz) | Test Result (dBm) | Limit (30dBm) | Judgment |
| CH 00               | 2402                    | 2.243             | 21            | PASSED   |
| CH 39               | 2441                    | 4.599             | 21            | PASSED   |
| CH 78               | 2480                    | 5.350             | 21            | PASSED   |
|                     |                         |                   |               |          |



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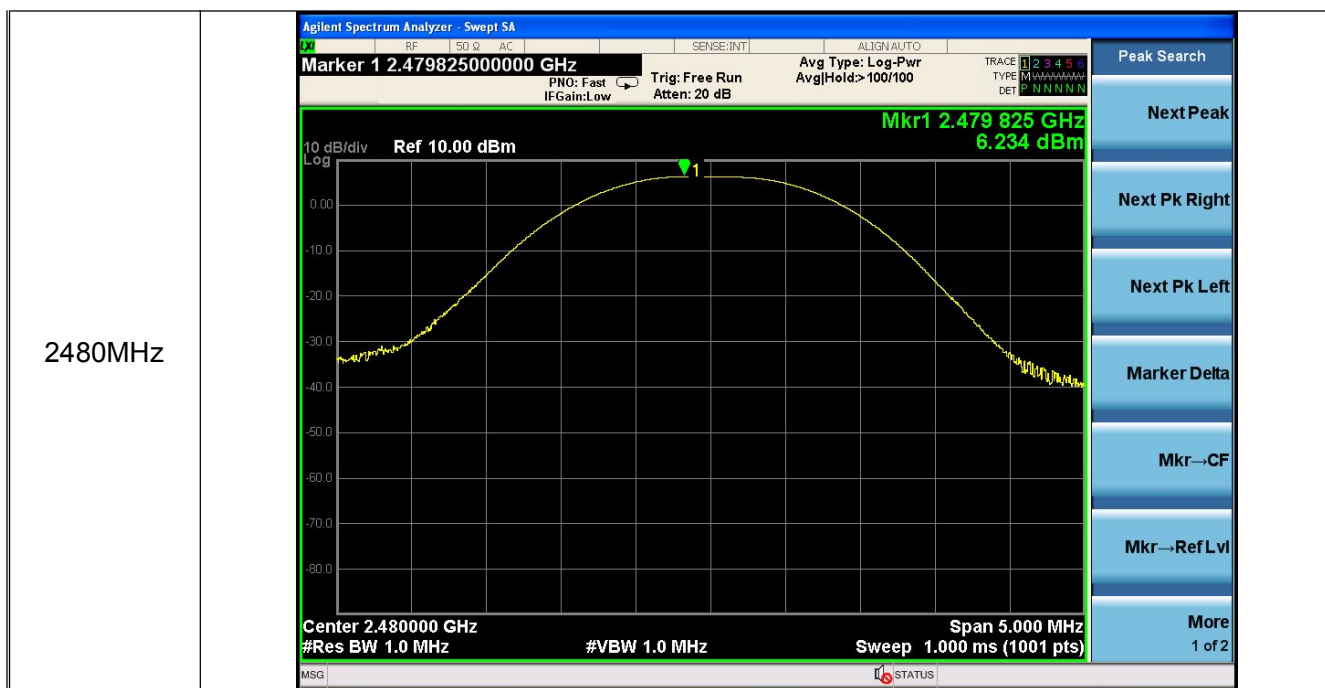
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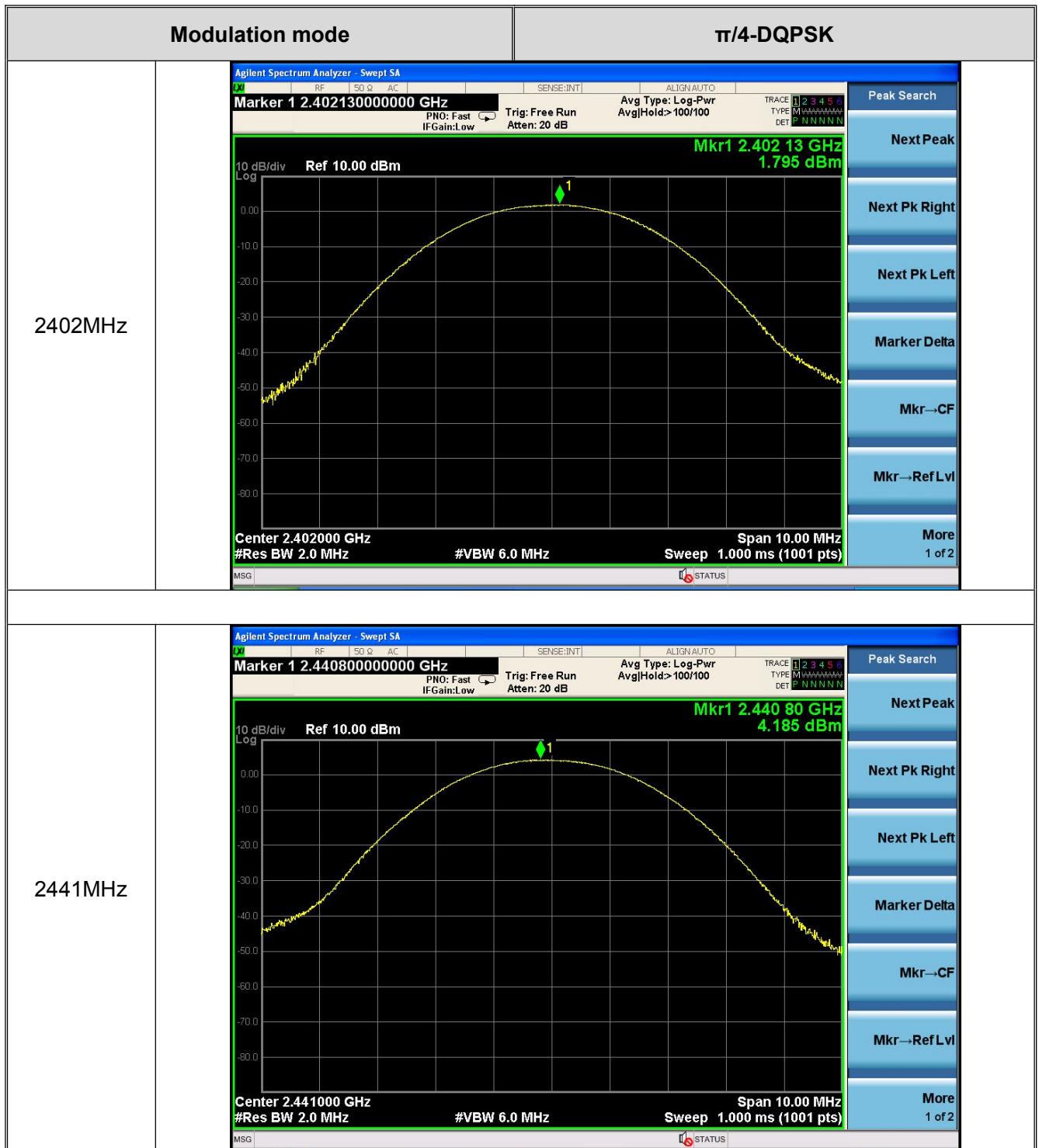




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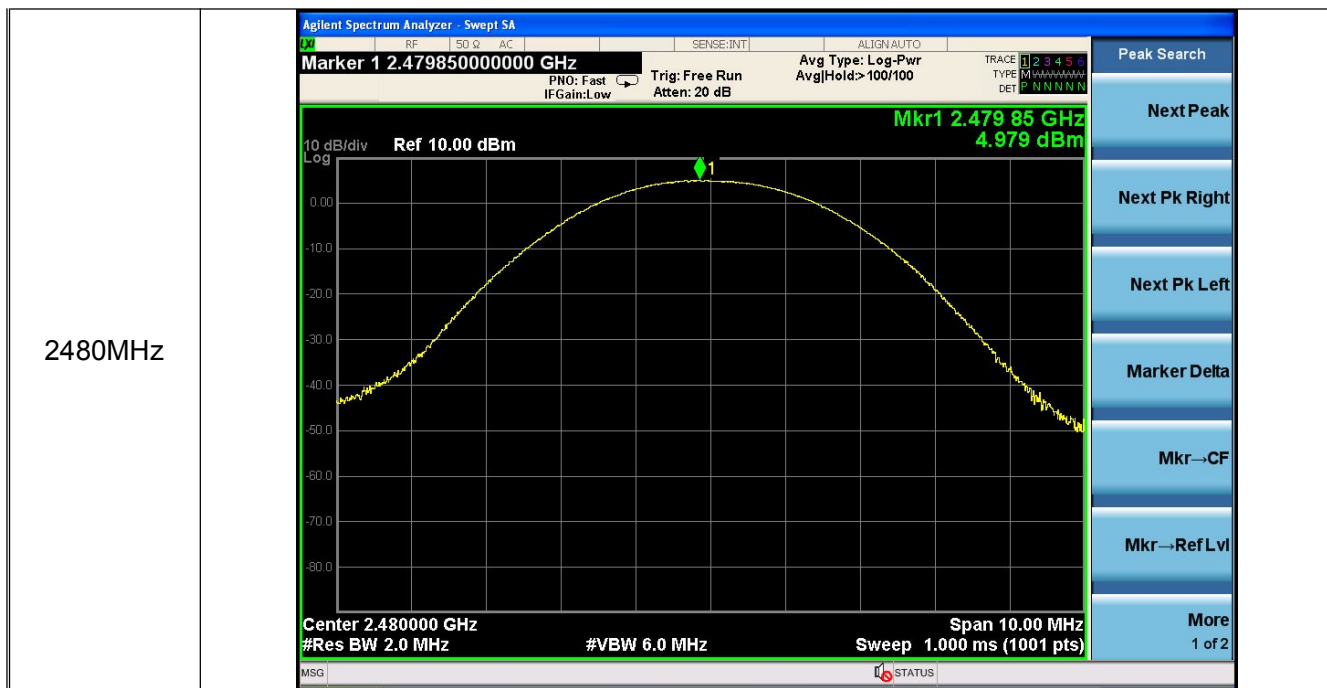
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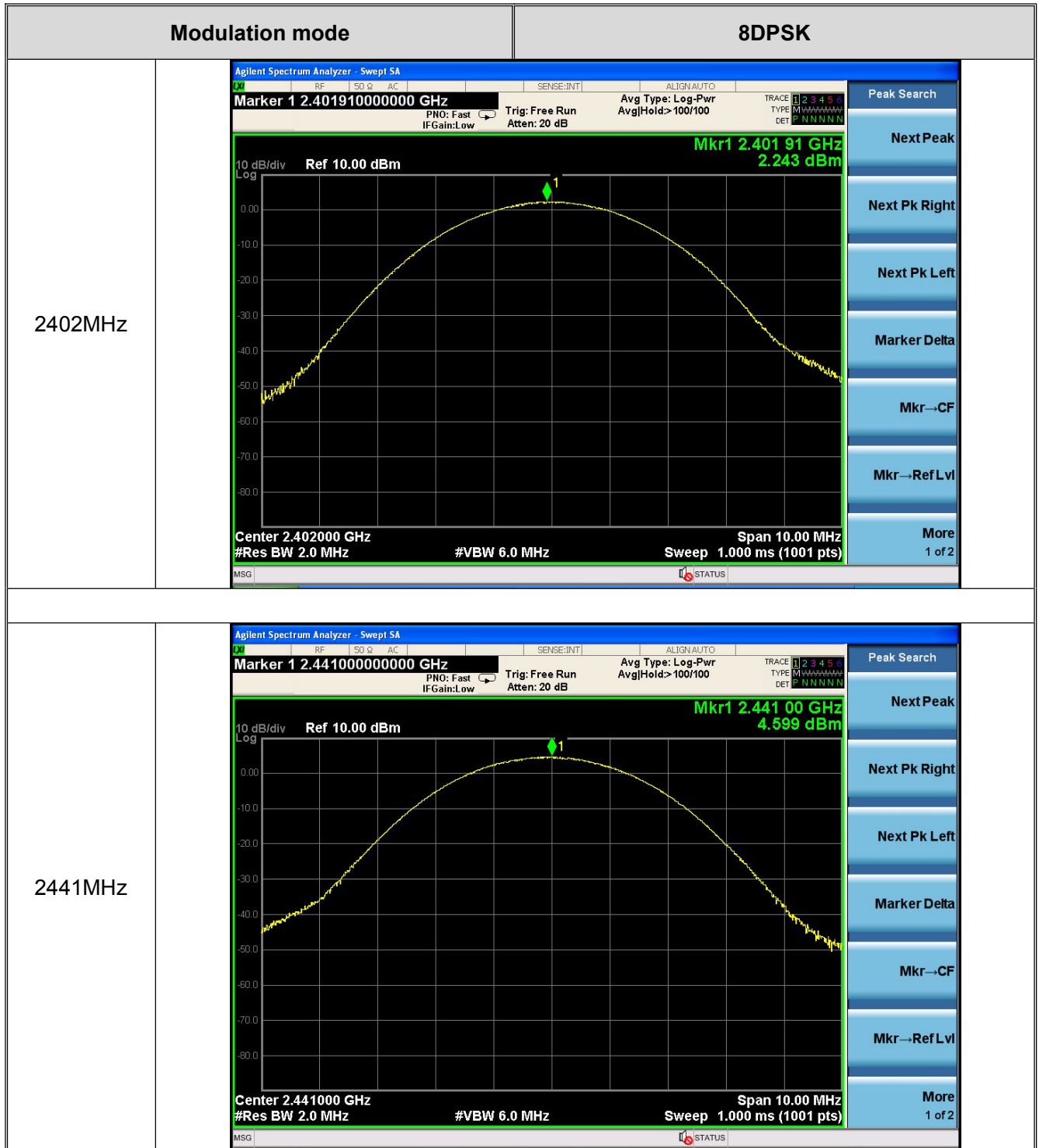




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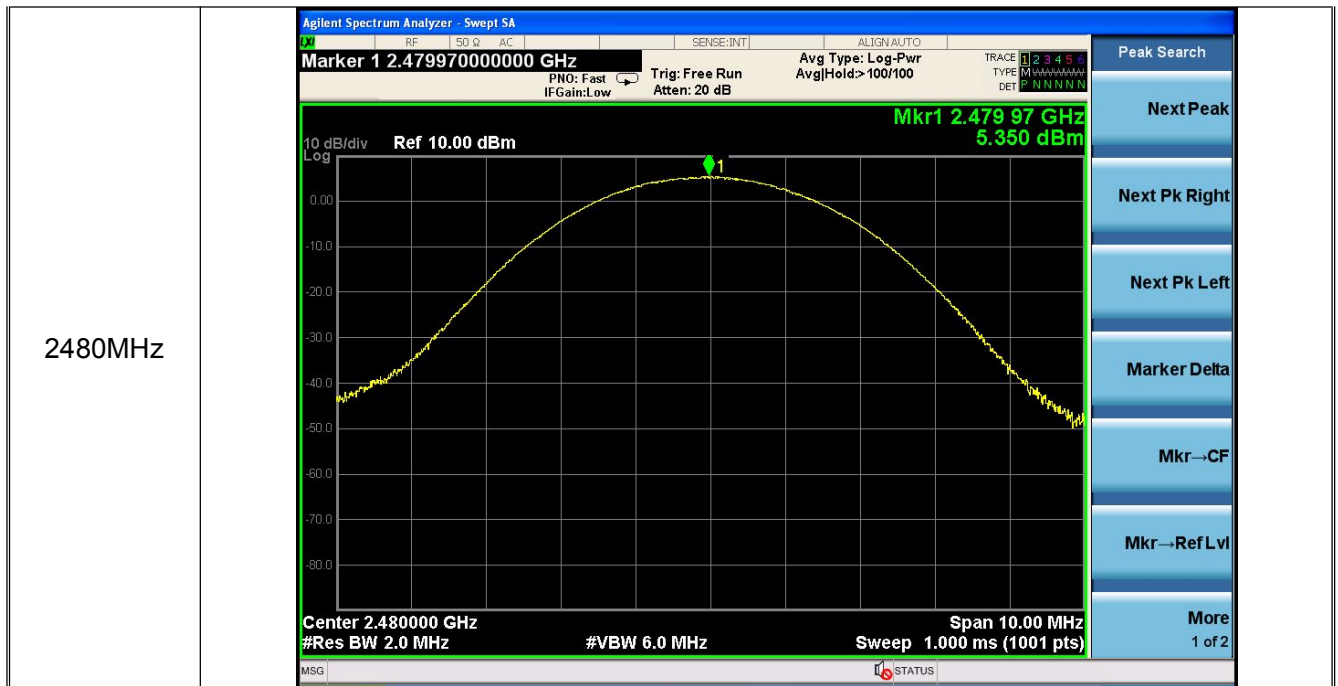




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## 6. 20dB Occupy Bandwidth Test

### 6.1. Test Standard and Limit

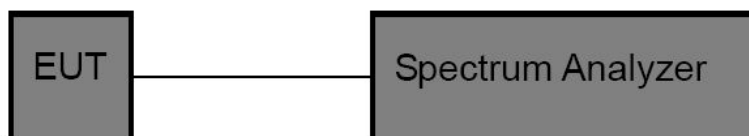
#### 6.1.1 Test Standard

FCC Part15 C Section 15.247 (a)(1)

#### 6.1.2 Test Limit

| FCC Part 15 Subpart C(15.247) |                |                       |
|-------------------------------|----------------|-----------------------|
| Test Item                     | Limit          | Frequency Range (MHz) |
| Bandwidth                     | 20dB bandwidth | 2400~2483.5           |

### 6.2. Test Setup



### 6.3. Test Procedure

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Spectrum Setting:  
Bandwidth: RBW=10 kHz, VBW=30 kHz, detector= Peak

### 6.4. Test Data

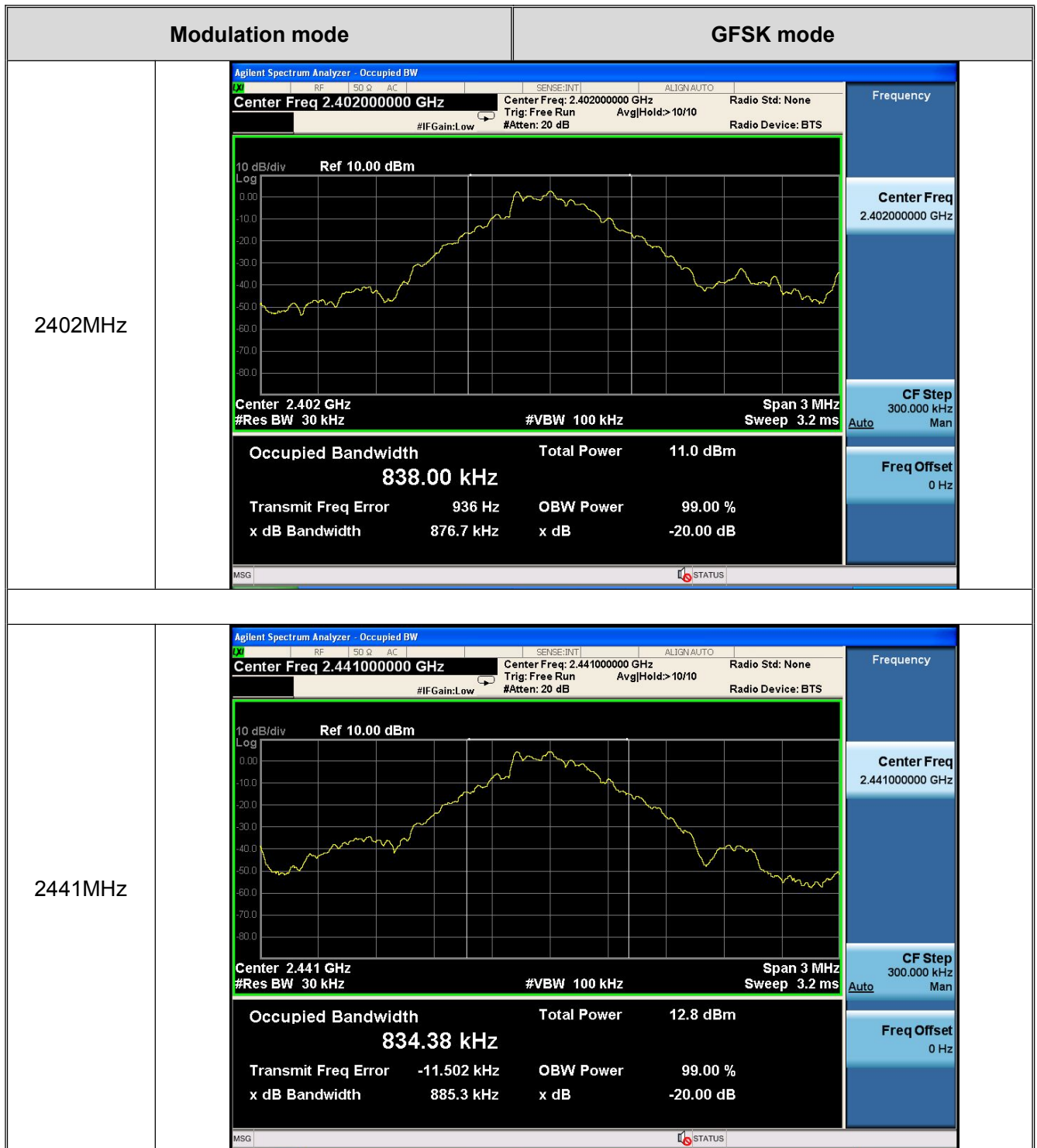
| Channel Number               | Channel Frequency | 20dB Bandwidth (kHz) |                |       |
|------------------------------|-------------------|----------------------|----------------|-------|
|                              |                   | GFSK                 | $\pi/4$ -DQPSK | 8DPSK |
| CH 00                        | 2402(MHz)         | 876.6                | 1220           | 1218  |
| CH 39                        | 2441(MHz)         | 885.3                | 1214           | 1210  |
| CH 78                        | 2480(MHz)         | 874.3                | 1223           | 1210  |
| Remark: Test plot as follows |                   |                      |                |       |



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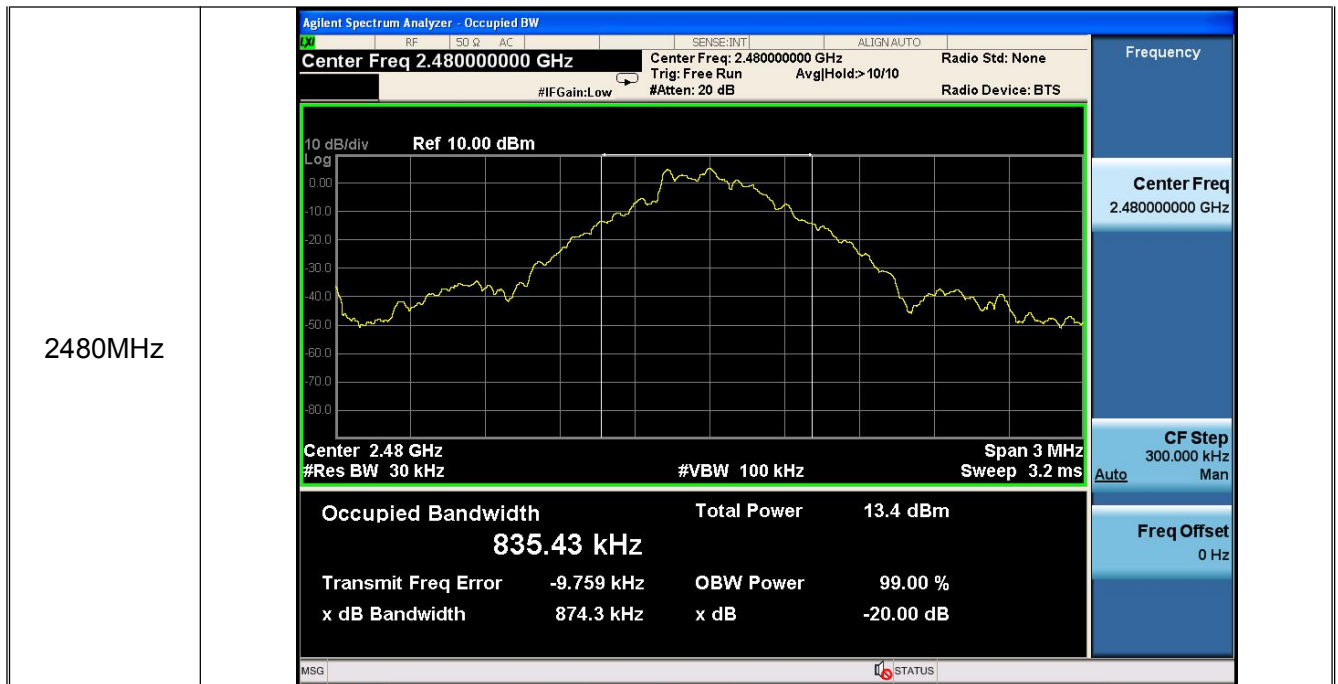




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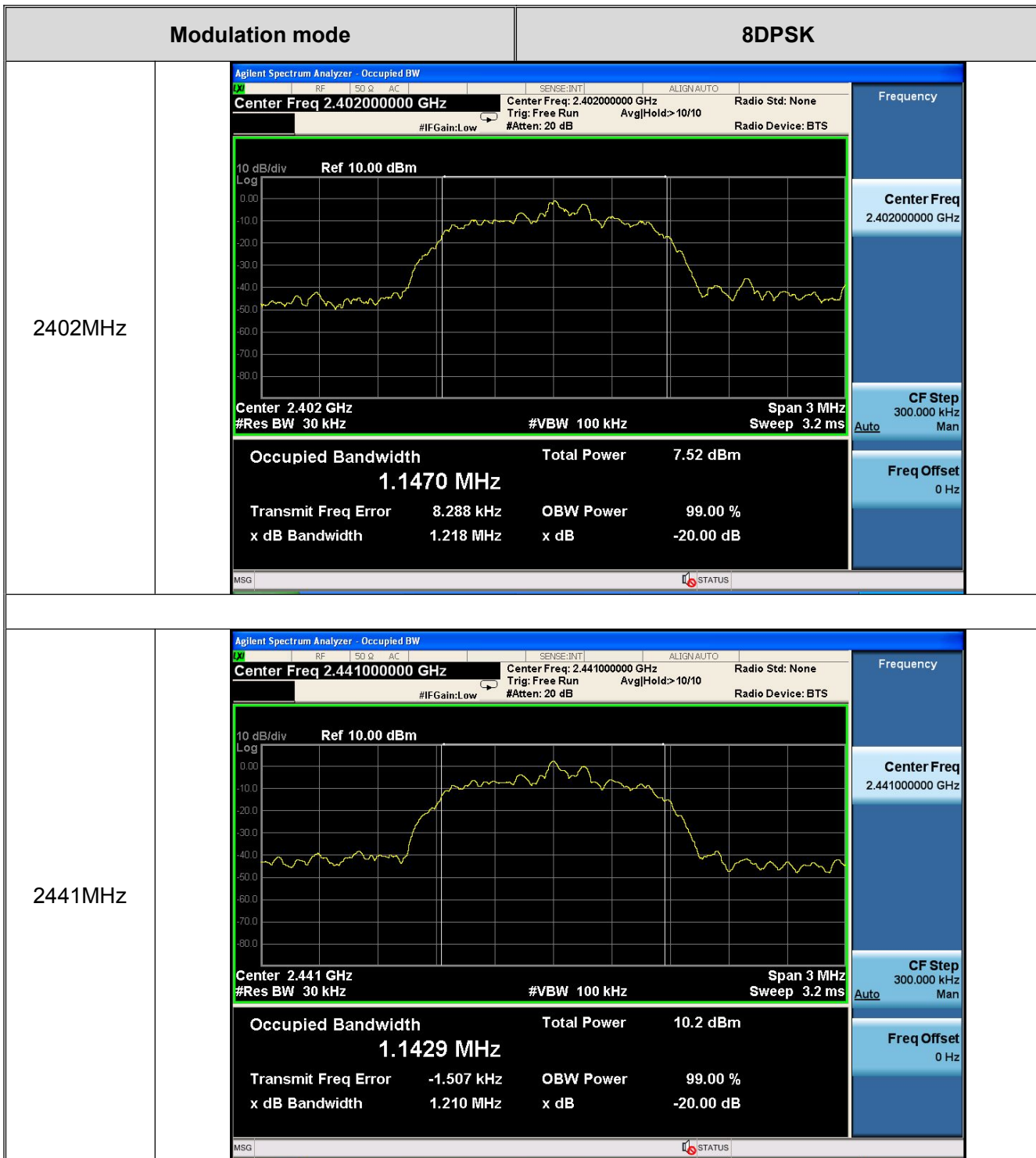




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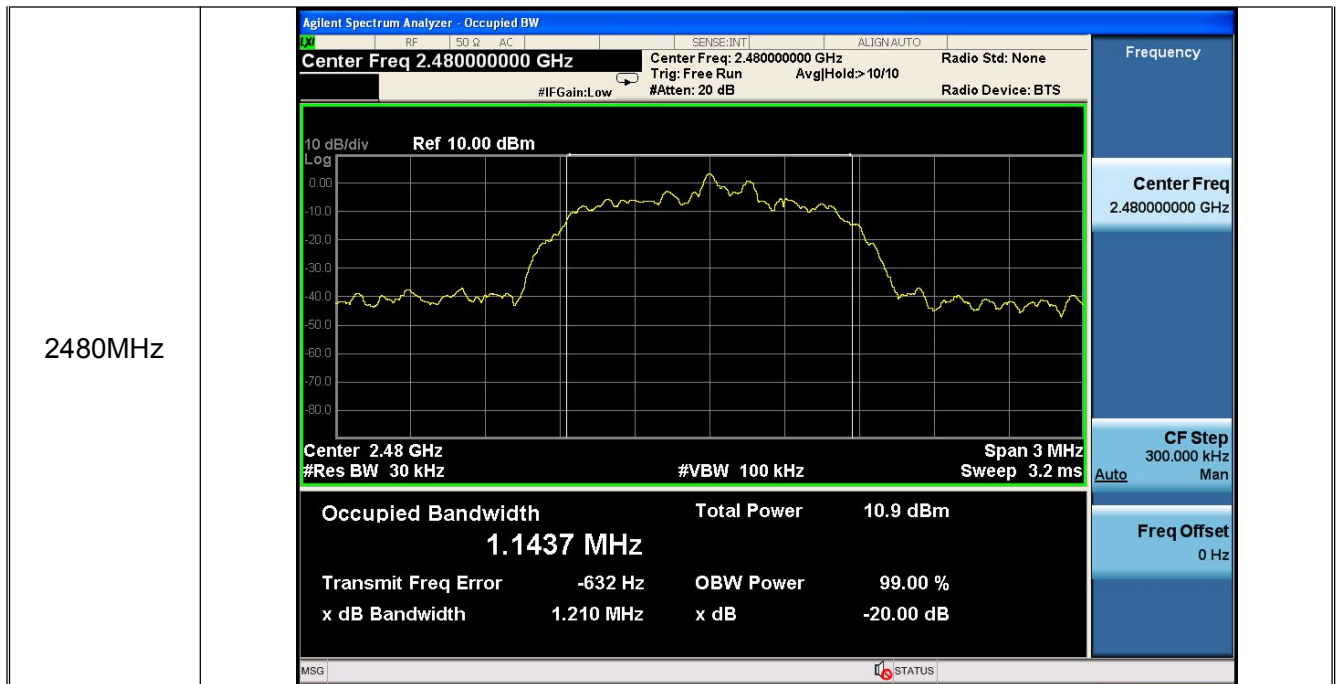




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## 7. Carrier Frequency Separation Test

### 7.1. Test Standard and Limit

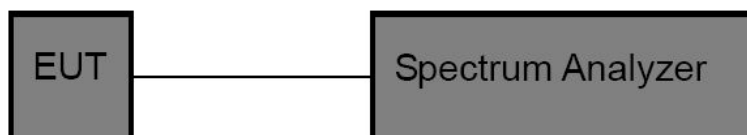
#### 7.1.1 Test Standard

FCC Part15 C Section 15.247 (a)(1)

#### 7.1.2 Test Limit

| FCC Part 15 Subpart C(15.247) |                                                                 |                       |
|-------------------------------|-----------------------------------------------------------------|-----------------------|
| Test Item                     | Limit                                                           | Frequency Range (MHz) |
| Channel Separation            | >25KHz or >two-thirds of the 20 dB bandwidth (Which is greater) | 2400~2483.5           |

### 7.2. Test Setup



### 7.3. Test Procedure

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Spectrum Setting:  
RBW=100 kHz, VBW=300 kHz, detector= Peak, Sweep Time =auto.
- (3) The EUT was set to the Hopping Mode for Channel Separation Test and continuously transmitting for the Test.

### 7.4. Test Data



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| GFSK mode                    |                         |                   |             |          |
|------------------------------|-------------------------|-------------------|-------------|----------|
| Channel Number               | Channel Frequency (MHz) | Test Result (KHz) | Limit (KHz) | Judgment |
| CH 39                        | 2441                    | 1002              | 590.200     | PASSED   |
| $\pi/4$ -DQPSK mode          |                         |                   |             |          |
| Channel Number               | Channel Frequency (MHz) | Test Result (KHz) | Limit (KHz) | Judgment |
| CH 39                        | 2441                    | 1005              | 809.333     | PASSED   |
| 8DPSK mode                   |                         |                   |             |          |
| Channel Number               | Channel Frequency (MHz) | Test Result (KHz) | Limit (KHz) | Judgment |
| CH 39                        | 2441                    | 1002              | 806.667     | PASSED   |
| Remark: Test plot as follows |                         |                   |             |          |

According to section 6.4

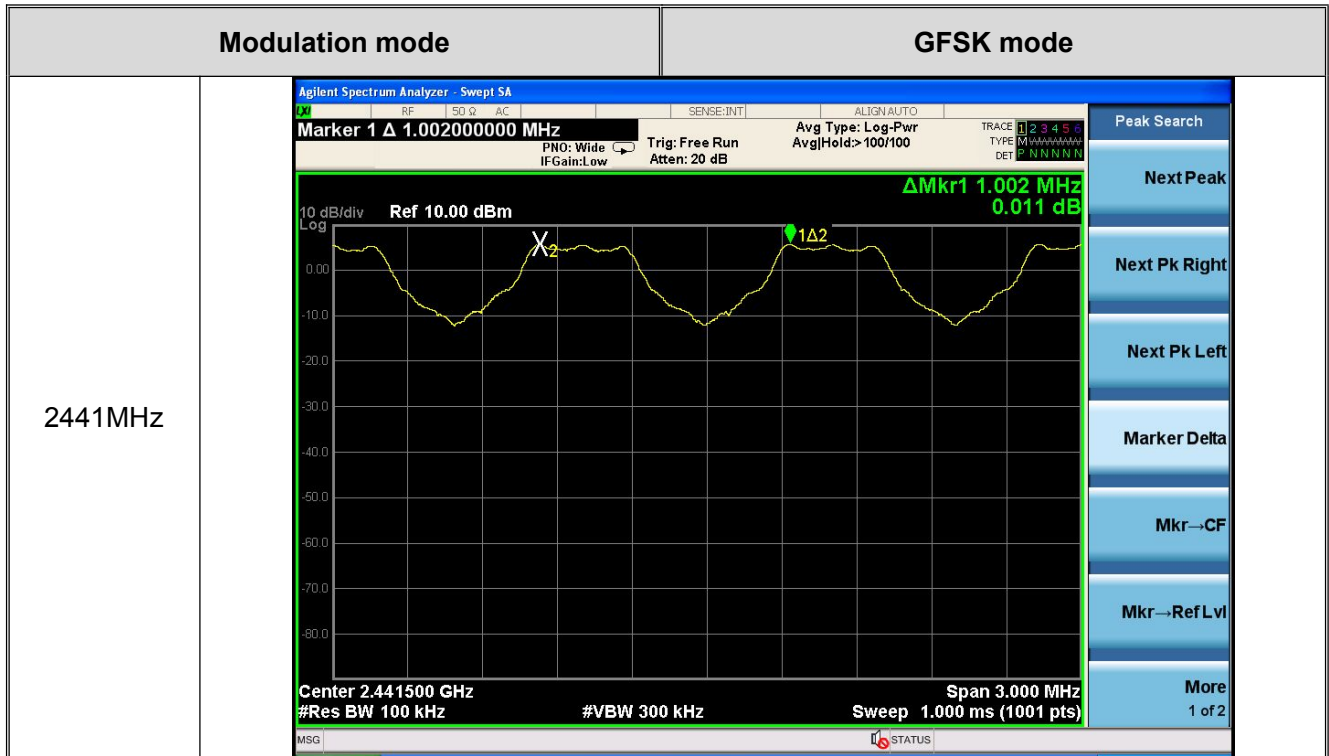
| Test Mode      | 20dB bandwidth (KHz) | Limit (KHz)<br>(Carrier Frequency Separation) |
|----------------|----------------------|-----------------------------------------------|
| GFSK           | 885.3                | 590.200                                       |
| $\pi/4$ -DQPSK | 1214                 | 809.333                                       |
| 8DPSK          | 1210                 | 806.667                                       |



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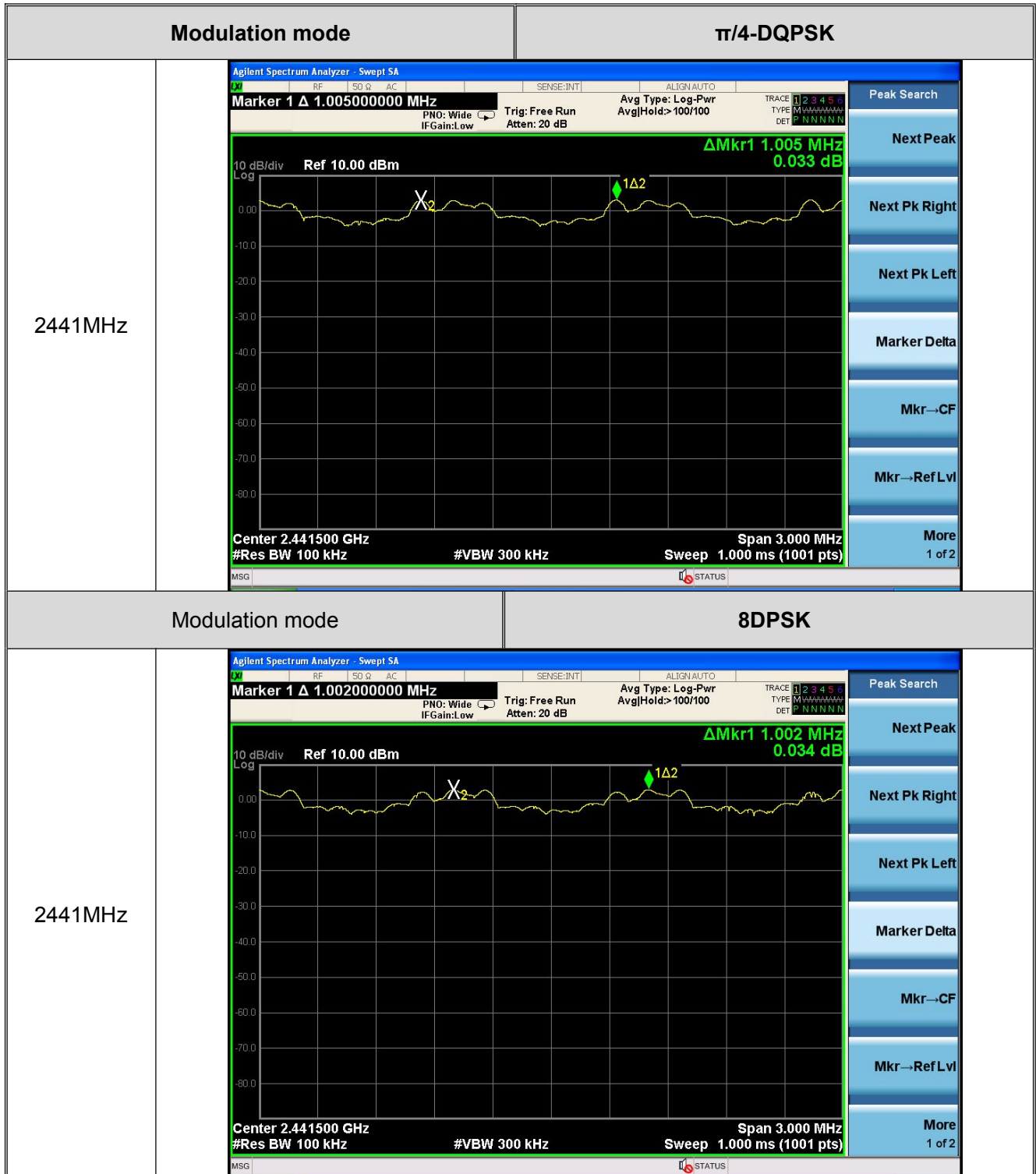




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## 8. Number of Hopping Channel

### 8.1. Test Standard and Limit

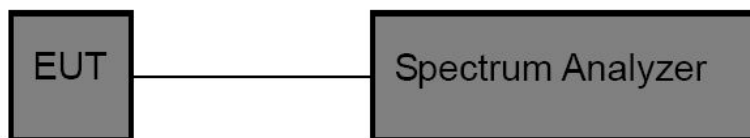
#### 8.1.1 Test Standard

FCC Part15 C Section 15.247 (a)(1)

#### 8.1.2 Test Limit

| FCC Part 15 Subpart C (15.247) |              |                       |
|--------------------------------|--------------|-----------------------|
| Test Item                      | Limit        | Frequency Range (MHz) |
| Number of Hopping Channel      | >15 channels | 2400~2483.5           |

### 8.2. Test Setup



### 8.3. Test Procedure

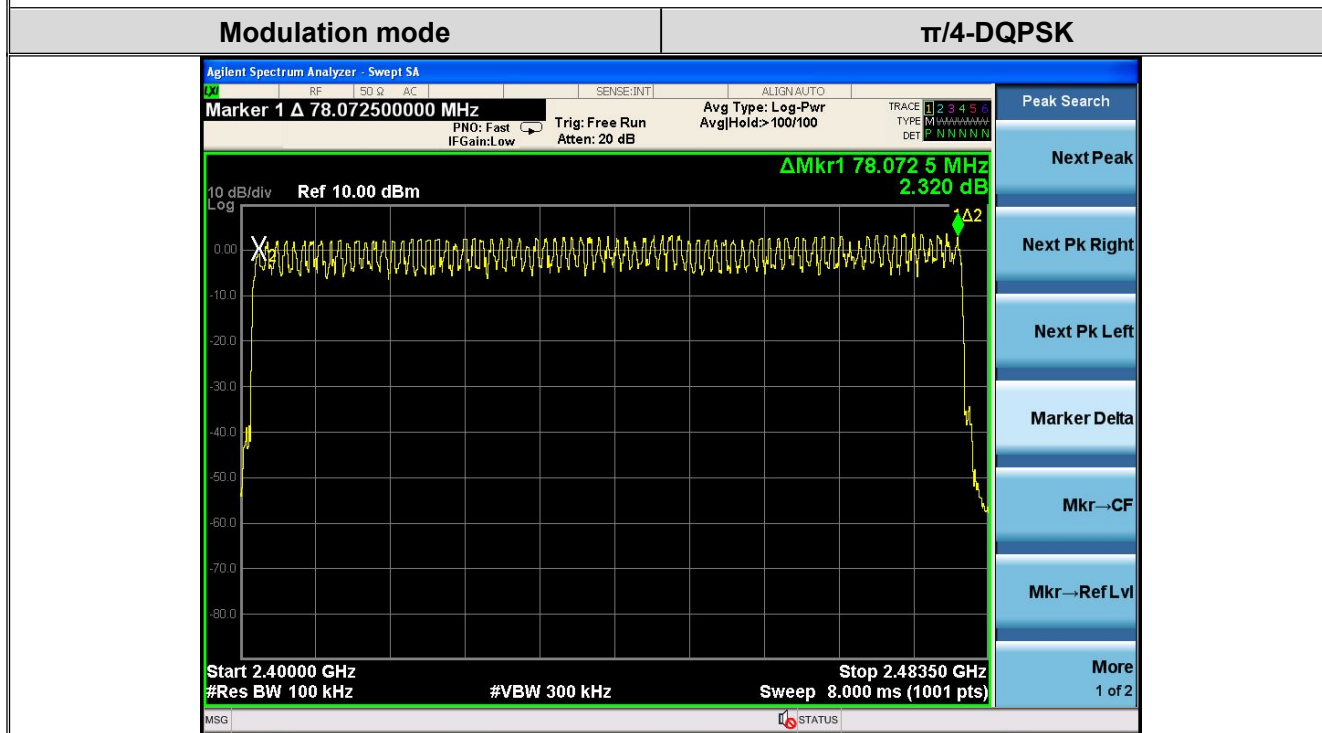
- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Spectrum Setting: RBW=100 kHz, VBW=300 kHz, Detector=Peak, Sweep time= Auto.
- (3) The EUT was set to the Hopping Mode for Channel Separation Test and continuously transmitting for the Test.

### 8.4. Test Data

| Mode                        | Quantity of Hopping Channel | Limit | Judgment |
|-----------------------------|-----------------------------|-------|----------|
| GFSK, $\pi/4$ -DQPSK, 8DPSK | 79                          | >15   | PASSED   |



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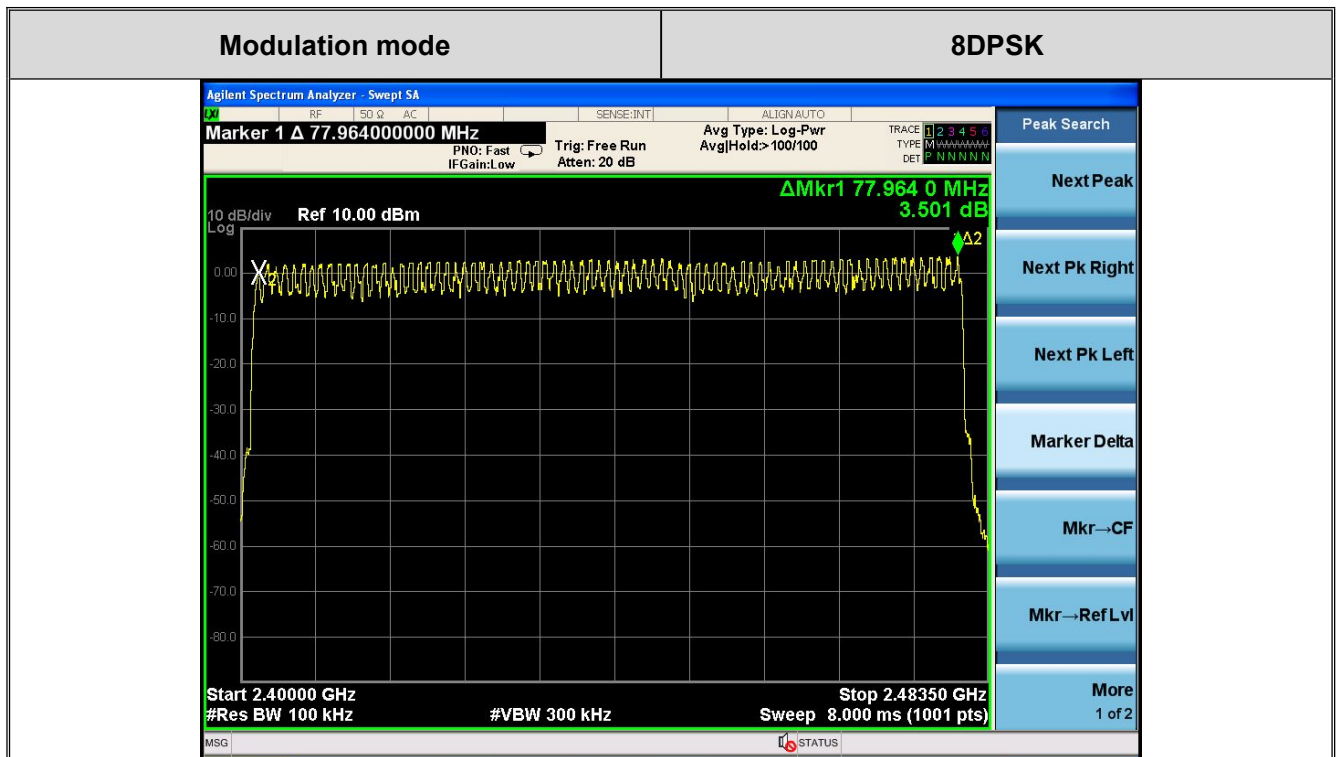




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## 9. Dwell Time Test

### 9.1. Test Standard and Limit

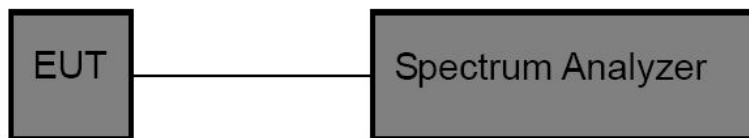
#### 9.1.1 Test Standard

FCC Part15 C Section 15.247 (a)(1)

#### 9.1.2 Test Limit

| FCC Part 15 Subpart C(15.247) |            |         |
|-------------------------------|------------|---------|
| Section                       | Test Item  | Limit   |
| 15.247(a)(1)                  | Dwell time | 0.4 sec |

### 9.2. Test Setup



### 9.3. Test Procedure

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Spectrum Setting: RBW=1MHz, VBW=1MHz, Span=0Hz, Detector=Peak
- (3) Use video trigger with the trigger level set to enable triggering only on full pulses.
- (4) Sweep Time is more than once pulse time.
- (5) Set the center frequency on any frequency would be measure and set the frequency span to zero span.
- (6) Measure the maximum time duration of one single pulse.
- (7) Set the EUT for packet transmitting.
- (8) Measure the maximum time duration of one single pulse.
- (9) The EUT was set to the Hopping Mode for Dwell Time Test

### 9.4. Test Data



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For GFSK,  $\pi/4$ -DQPSK and 8DPSK:

The test period:  $T = 0.4 \text{ Second/Channel} \times 79 \text{ Channel} = 31.6 \text{ s}$

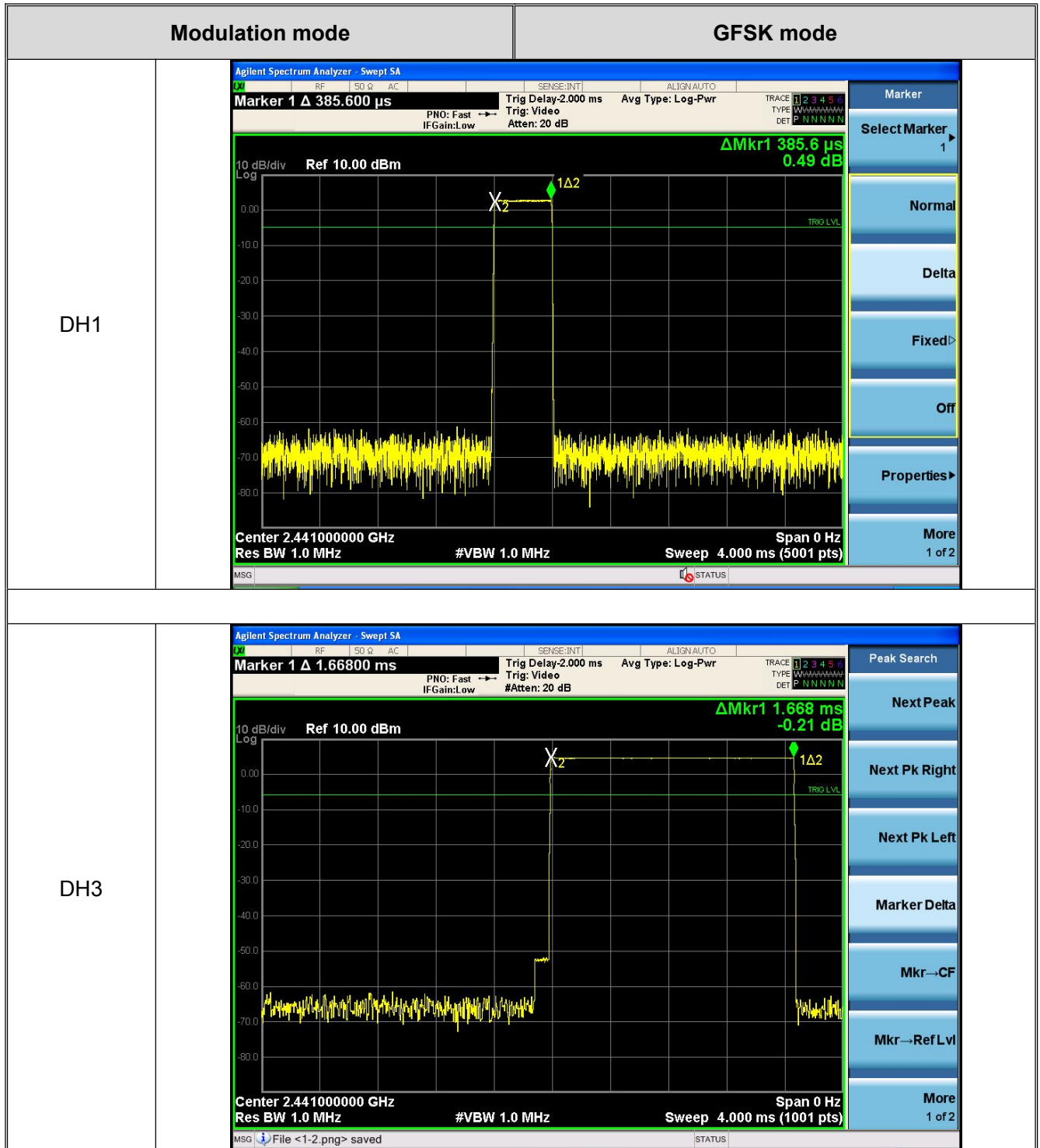
| EUT: DKnight Big Magicbox Wireless Speaker M/N: DK-BigMAGICBOX-040                                                                                                                                                                                                                                                                                                                                  |             |                 |                     |                |           |            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------------|---------------------|----------------|-----------|------------|
| Mode                                                                                                                                                                                                                                                                                                                                                                                                | Data Packet | Frequency (MHz) | Pulse Duration (ms) | Dwell Time (s) | Limit (s) | Conclusion |
| GFSK                                                                                                                                                                                                                                                                                                                                                                                                | DH1         | 2441            | 0.3856              | 0.247          | <0.4      | PASS       |
|                                                                                                                                                                                                                                                                                                                                                                                                     | DH3         | 2441            | 1.668               | 0.356          | <0.4      | PASS       |
|                                                                                                                                                                                                                                                                                                                                                                                                     | DH5         | 2441            | 2.887               | 0.370          | <0.4      | PASS       |
| $\pi/4$ DQPSK                                                                                                                                                                                                                                                                                                                                                                                       | DH1         | 2441            | 0.396               | 0.253          | <0.4      | PASS       |
|                                                                                                                                                                                                                                                                                                                                                                                                     | DH3         | 2441            | 1.668               | 0.356          | <0.4      | PASS       |
|                                                                                                                                                                                                                                                                                                                                                                                                     | DH5         | 2441            | 2.898               | 0.371          | <0.4      | PASS       |
| 8- DQPSK                                                                                                                                                                                                                                                                                                                                                                                            | DH1         | 2441            | 0.3952              | 0.253          | <0.4      | PASS       |
|                                                                                                                                                                                                                                                                                                                                                                                                     | DH3         | 2441            | 1.668               | 0.356          | <0.4      | PASS       |
|                                                                                                                                                                                                                                                                                                                                                                                                     | DH5         | 2441            | 2.891               | 0.370          | <0.4      | PASS       |
| <p>Note: 1 A period time = <math>0.4 \text{ (s)} \times 79 = 31.6 \text{ (s)}</math><br/>2 DH1 time slot = Pulse Duration * <math>(1600/(1 \times 79)) \times \text{A period time}</math><br/>DH3 time slot = Pulse Duration * <math>(1600/(3 \times 79)) \times \text{A period time}</math><br/>DH5 time slot = Pulse Duration * <math>(1600/(5 \times 79)) \times \text{A period time}</math></p> |             |                 |                     |                |           |            |



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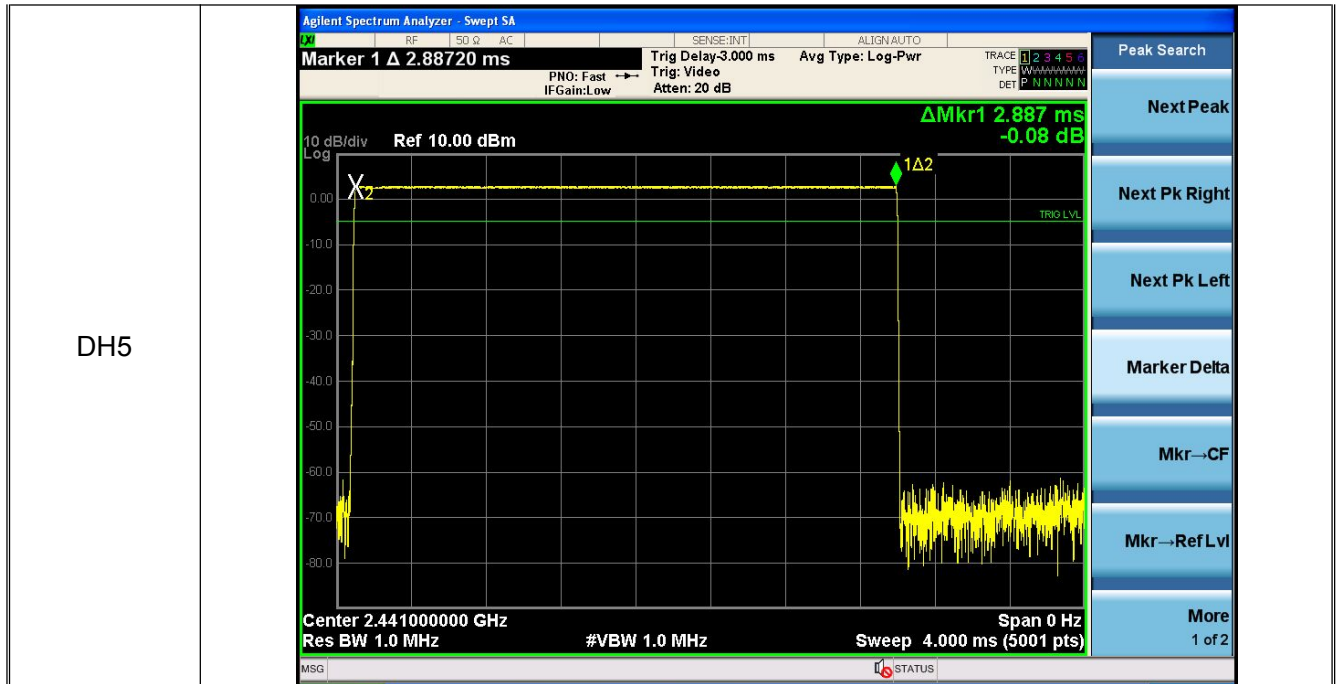




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