



## FCC Test Report (4G)

**FCC ID** : 2AIV5CWELL001

**Applicant** : CWELL INTERNATIONAL CO.,LTD.

Room 2810-2814, Building A, Qunxing Plaza, Huaqiang North Rd,  
Futian District, Shenzhen, 518031, China .

### Sample Description

**Product Name** : Rugged Smartphone

**Model No.** : HG06

**Serial No.** : N/A

**Trademark** : AngelLira

**Receipt Date** : 2016-06-26

**Test Date** : 2016-06-27 to 2016-07-05

**Issue Date** : 2016-07-06

**Test Standard(s)** : FCC PART 2; FCC PART 27

**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    | : | CWELL INTERNATIONAL CO.,LTD.                                                                |
| Address      | : | Room 24, 7/F. Nan Fung Commercial Centre, 19 Lam Lok Street, Kowloon Bay, Hong Kong, China. |
| Manufacturer | : | CWELL INTERNATIONAL CO.,LTD.                                                                |
| Address      | : | Room 24, 7/F. Nan Fung Commercial Centre, 19 Lam Lok Street, Kowloon Bay, Hong Kong, China. |

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

|                     |   |                                                |                     |
|---------------------|---|------------------------------------------------|---------------------|
| Product Name        | : | Rugged Smartphone                              |                     |
| Models No.          | : | HG06                                           |                     |
| Difference          | : | N/A                                            |                     |
| Trademark           | : | AngellLira                                     |                     |
| Product Description | : | Operation Band:                                | LTE B2              |
|                     |   | Operation frequency                            | LTE B2 1850-1910MHz |
|                     |   | Modulation Technology:                         | 16QAM, QPSK         |
|                     |   | Antenna Type:                                  | Integral Antenna    |
|                     |   | Antenna Gain:                                  | 1dBi                |
| Power Supply        | : | USB DC 5V from PC, DC 3.7V from Li-ion battery |                     |

**Note:**

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



## 1.3 Description of Test Mode

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

| Test Mode                | Description                                             |
|--------------------------|---------------------------------------------------------|
| Transmitting mode(QPSK)  | Keep the EUT in continuous transmitting with modulation |
| Transmitting mode(16QAM) | Keep the EUT in continuous transmitting with modulation |

**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.

We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows: During all testing, EUT is in link mode with base station emulator at maximum power level in each test mode and channel as below:

| Mode           | Channel | Frequency(MHz) |
|----------------|---------|----------------|
| LTE B2(1.4MHz) | 18607   | 1850.7         |
|                | 18900   | 1880.0         |
|                | 19193   | 1909.3         |
| LTE B2(1.4MHz) | 18615   | 1851.5         |
|                | 18900   | 1880           |
|                | 19185   | 1908.5         |
| LTE B2((5MHz)  | 18625   | 1852.5         |
|                | 18900   | 1880.0         |
|                | 19175   | 1907.5         |
| LTE B2 (10MHz) | 18650   | 1855           |
|                | 18900   | 1880.0         |
|                | 19150   | 1905           |
| LTE B2 (15MHz) | 18675   | 1857.5         |
|                | 18900   | 1880.0         |
|                | 19125   | 1902.5         |
| LTE B2 (20MHz) | 18700   | 1860           |
|                | 18900   | 1880.0         |
|                | 19100   | 1900           |



## 1.4 Test Instruments List

|    | Test Equipment                             | Manufacturer                         | Model No.                   | Cal. Date     | Cal. Due date |
|----|--------------------------------------------|--------------------------------------|-----------------------------|---------------|---------------|
| 1  | Bilog Antenna                              | SCHWARZBECK<br>MESS-ELEKTRONIK       | VULB9163                    | May 22, 2016  | May 21, 2017  |
| 2  | Double -ridged<br>waveguide horn           | SCHWARZBECK<br>MESS-ELEKTRONIK       | BBHA9120D                   | May 27, 2016  | May 26, 2017  |
| 3  | Coaxial Cable                              | N/A                                  | N/A                         | Mar. 28, 2016 | Mar. 27, 2017 |
| 4  | Coaxial Cable                              | N/A                                  | N/A                         | Mar. 29, 2016 | Mar. 29, 2017 |
| 5  | Coaxial cable                              | N/A                                  | N/A                         | Mar. 29, 2016 | Mar. 29, 2017 |
| 6  | Coaxial Cable                              | N/A                                  | N/A                         | Mar. 29, 2016 | Mar. 29, 2017 |
| 7  | Coaxial Cable                              | N/A                                  | N/A                         | Mar. 29, 2016 | Mar. 29, 2017 |
| 8  | Amplifier<br>(10kHz-1.3GHz)                | HP                                   | 8447D                       | Mar. 29, 2016 | Mar. 29, 2017 |
| 9  | Amplifier<br>(1GHz-18GHz)                  | Compliance Direction<br>Systems Inc. | PAP-1G18                    | Jun. 06, 2016 | Mar. 29, 2017 |
| 10 | Pre-amplifier<br>(18-26GHz)                | Rohde & Schwarz                      | AFS33-18002<br>650-30-8P-44 | Mar. 29, 2016 | Mar. 29, 2017 |
| 11 | Horn Antenna                               | ETS-LINDGREN                         | 3160                        | Mar. 27, 2016 | Mar. 27, 2017 |
| 12 | Positioning<br>Controller                  | UC                                   | UC3000                      | N/A           | N/A           |
| 13 | Spectrum<br>analyzer<br>9kHz-30GHz         | Rohde & Schwarz                      | FSP                         | May 26, 2016  | May 27, 2017  |
| 14 | EMI Test<br>Receiver                       | Rohde & Schwarz                      | ESPI                        | Mar. 29, 2016 | Mar. 30, 2017 |
| 15 | Loop antenna                               | Laplace instrument                   | RF300                       | May 22,, 2016 | May 23, 2017  |
| 16 | Universal radio<br>communication<br>tester | Rhode & Schwarz                      | CMU200                      | May 26, 2016  | May 27, 2017  |
| 17 | Signal Analyzer                            | Rohde & Schwarz                      | FSIQ3                       | May 26, 2016  | May 27, 2017  |
| 18 | L.I.S.N.#1                                 | Rohde & Schwarz                      | NSLK8126                    | May 26, 2016  | May 27, 2017  |
| 19 | L.I.S.N.#2                                 | Rohde & Schwarz                      | ENV216                      | May 26, 2016  | May 27, 2017  |
| 20 | Power Meter                                | Anritsu                              | ML2495A                     | May 26, 2016  | May 27, 2017  |
| 21 | Power sensor                               | Anritsu                              | ML2491A                     | May 26, 2016  | May 27, 2017  |
| 22 | Base station                               | Agilent                              | E5515C                      | May 26, 2016  | May 27, 2017  |



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## **1.5 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

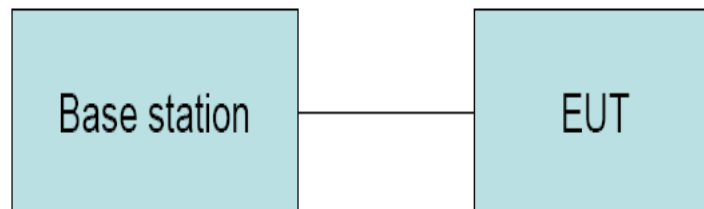
| Description of Test Item                          | Standard                                       | Results |
|---------------------------------------------------|------------------------------------------------|---------|
| Conducted Output power                            | FCC PART 2: 2.1046<br>FCC PART 24E: 24.232 (c) | PASS    |
| Radiated Output power(erp/eirp)                   | FCC PART 24E:24.232(c)                         | PASS    |
| Occupied bandwidth                                | FCC PART 2: 2.1049<br>FCC PART 24E: 24.238 (b) | PASS    |
| Frequency stability                               | FCC PART 2: 2.1055<br>FCC PART 24E: 24.235     | PASS    |
| Conducted spurious emission<br>(Antenna terminal) | FCC PART 2: 2.1051<br>FCC PART 24E: 24.238     | PASS    |
| Radiated spurious emissions                       | FCC PART 2: 2.1053<br>FCC PART 24E: 24.238     | PASS    |
| Band edge compliance                              | FCC PART 24E: 24.238 (b)                       | PASS    |
| Power Line Conducted Emission Test                | FCC Part 15: 15.207<br>ANSI C63.4: 2014        | PASS    |





## 3. Conducted Output Power

### 3.1. Test Setup



### 3.2. Limit

|           |
|-----------|
| LTE Band2 |
| 30m(ERP)  |

### 3.3. Test Procedure

- (1) The EUT's RF output port was connected to base station.
- (2) A call is set up by the SS according to the generic call set up procedure
- (3) Set EUT at maximum power level through base station by power level command
- (4) Measure the maximum output power of EUT at each frequency band and mode by base station.



## 3.4. Test Result

| Band   | Test Mode | Test bandwidth | Channel | RB    | Output Power | Limit | Result |
|--------|-----------|----------------|---------|-------|--------------|-------|--------|
| Band 2 | QPSK      | 1.4MHz         | LCH     | RB1#0 | 22.35        | 30    | Pass   |
|        |           |                |         | RB1#3 | 22.27        | 30    | Pass   |
|        |           |                |         | RB1#5 | 22.47        | 30    | Pass   |
|        |           |                |         | RB3#0 | 22.17        | 30    | Pass   |
|        |           |                |         | RB3#2 | 22.27        | 30    | Pass   |
|        |           |                |         | RB3#3 | 22.45        | 30    | Pass   |
|        |           |                |         | RB6#0 | 20.77        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB    | Output Power | Limit | Result |
|--------|-----------|----------------|---------|-------|--------------|-------|--------|
| Band 2 | QPSK      | 1.4MHz         | MCH     | RB1#0 | 22.12        | 30    | Pass   |
|        |           |                |         | RB1#3 | 22.46        | 30    | Pass   |
|        |           |                |         | RB1#5 | 22.54        | 30    | Pass   |
|        |           |                |         | RB3#0 | 22.36        | 30    | Pass   |
|        |           |                |         | RB3#2 | 22.42        | 30    | Pass   |
|        |           |                |         | RB3#3 | 22.19        | 30    | Pass   |
|        |           |                |         | RB6#0 | 20.87        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB    | Output Power | Limit | Result |
|--------|-----------|----------------|---------|-------|--------------|-------|--------|
| Band 2 | QPSK      | 1.4MHz         | HCH     | RB1#0 | 22.43        | 30    | Pass   |
|        |           |                |         | RB1#3 | 22.61        | 30    | Pass   |
|        |           |                |         | RB1#5 | 22.54        | 30    | Pass   |
|        |           |                |         | RB3#0 | 22.28        | 30    | Pass   |
|        |           |                |         | RB3#2 | 22.15        | 30    | Pass   |
|        |           |                |         | RB3#3 | 22.42        | 30    | Pass   |
|        |           |                |         | RB6#0 | 20.35        | 30    | Pass   |



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| Band   | Test Mode | Test bandwidth | Channel | RB     | Output Power | Limit | Result |
|--------|-----------|----------------|---------|--------|--------------|-------|--------|
| Band 2 | QPSK      | 3MHz           | LCH     | RB1#0  | 22.12        | 30    | Pass   |
|        |           |                |         | RB1#7  | 22.23        | 30    | Pass   |
|        |           |                |         | RB1#14 | 22.41        | 30    | Pass   |
|        |           |                |         | RB8#0  | 22.56        | 30    | Pass   |
|        |           |                |         | RB8#4  | 21.43        | 30    | Pass   |
|        |           |                |         | RB8#7  | 21.35        | 30    | Pass   |
|        |           |                |         | RB15#0 | 21.56        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB     | Output Power | Limit | Result |
|--------|-----------|----------------|---------|--------|--------------|-------|--------|
| Band 2 | QPSK      | 3MHz           | MCH     | RB1#0  | 22.24        | 30    | Pass   |
|        |           |                |         | RB1#7  | 22.37        | 30    | Pass   |
|        |           |                |         | RB1#14 | 22.51        | 30    | Pass   |
|        |           |                |         | RB8#0  | 22.27        | 30    | Pass   |
|        |           |                |         | RB8#4  | 21.16        | 30    | Pass   |
|        |           |                |         | RB8#7  | 21.46        | 30    | Pass   |
|        |           |                |         | RB15#0 | 21.86        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB     | Output Power | Limit | Result |
|--------|-----------|----------------|---------|--------|--------------|-------|--------|
| Band 2 | QPSK      | 3MHz           | HCH     | RB1#0  | 22.36        | 30    | Pass   |
|        |           |                |         | RB1#7  | 22.57        | 30    | Pass   |
|        |           |                |         | RB1#14 | 22.39        | 30    | Pass   |
|        |           |                |         | RB8#0  | 22.12        | 30    | Pass   |
|        |           |                |         | RB8#4  | 21.09        | 30    | Pass   |
|        |           |                |         | RB8#7  | 21.87        | 30    | Pass   |
|        |           |                |         | RB15#0 | 21.79        | 30    | Pass   |



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| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | QPSK      | 5MHz           | LCH     | RB1#0   | 21.64        | 30    | Pass   |
|        |           |                |         | RB1#13  | 21.89        | 30    | Pass   |
|        |           |                |         | RB1#24  | 21.22        | 30    | Pass   |
|        |           |                |         | RB12#0  | 20.85        | 30    | Pass   |
|        |           |                |         | RB12#6  | 20.95        | 30    | Pass   |
|        |           |                |         | RB12#13 | 20.68        | 30    | Pass   |
|        |           |                |         | RB25#0  | 20.81        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | QPSK      | 5MHz           | MCH     | RB1#0   | 21.69        | 30    | Pass   |
|        |           |                |         | RB1#13  | 21.82        | 30    | Pass   |
|        |           |                |         | RB1#24  | 21.32        | 30    | Pass   |
|        |           |                |         | RB12#0  | 20.78        | 30    | Pass   |
|        |           |                |         | RB12#6  | 20.81        | 30    | Pass   |
|        |           |                |         | RB12#13 | 20.57        | 30    | Pass   |
|        |           |                |         | RB25#0  | 20.78        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | QPSK      | 5MHz           | HCH     | RB1#0   | 21.35        | 30    | Pass   |
|        |           |                |         | RB1#13  | 21.54        | 30    | Pass   |
|        |           |                |         | RB1#24  | 21.26        | 30    | Pass   |
|        |           |                |         | RB12#0  | 20.61        | 30    | Pass   |
|        |           |                |         | RB12#6  | 20.22        | 30    | Pass   |
|        |           |                |         | RB12#13 | 20.21        | 30    | Pass   |
|        |           |                |         | RB25#0  | 20.46        | 30    | Pass   |



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| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | QPSK      | 10MHz          | LCH     | RB1#0   | 21.22        | 30    | Pass   |
|        |           |                |         | RB1#25  | 21.46        | 30    | Pass   |
|        |           |                |         | RB1#49  | 21.26        | 30    | Pass   |
|        |           |                |         | RB25#0  | 20.61        | 30    | Pass   |
|        |           |                |         | RB25#13 | 20.22        | 30    | Pass   |
|        |           |                |         | RB25#25 | 20.21        | 30    | Pass   |
|        |           |                |         | RB50#0  | 20.46        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | QPSK      | 10MHz          | MCH     | RB1#0   | 21.34        | 30    | Pass   |
|        |           |                |         | RB1#25  | 21.53        | 30    | Pass   |
|        |           |                |         | RB1#49  | 20.56        | 30    | Pass   |
|        |           |                |         | RB25#0  | 20.49        | 30    | Pass   |
|        |           |                |         | RB25#13 | 20.58        | 30    | Pass   |
|        |           |                |         | RB25#25 | 20.38        | 30    | Pass   |
|        |           |                |         | RB50#0  | 20.42        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | QPSK      | 10MHz          | HCH     | RB1#0   | 21.49        | 30    | Pass   |
|        |           |                |         | RB1#25  | 21.72        | 30    | Pass   |
|        |           |                |         | RB1#49  | 20.91        | 30    | Pass   |
|        |           |                |         | RB25#0  | 20.37        | 30    | Pass   |
|        |           |                |         | RB25#13 | 20.56        | 30    | Pass   |
|        |           |                |         | RB25#25 | 20.71        | 30    | Pass   |
|        |           |                |         | RB50#0  | 20.87        | 30    | Pass   |



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| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | QPSK      | 15MHz          | LCH     | RB1#0   | 21.02        | 30    | Pass   |
|        |           |                |         | RB1#38  | 21.34        | 30    | Pass   |
|        |           |                |         | RB1#74  | 21.11        | 30    | Pass   |
|        |           |                |         | RB38#0  | 20.63        | 30    | Pass   |
|        |           |                |         | RB38#19 | 20.71        | 30    | Pass   |
|        |           |                |         | RB25#39 | 20.52        | 30    | Pass   |
|        |           |                |         | RB75#0  | 20.66        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | QPSK      | 15MHz          | MCH     | RB1#0   | 21.25        | 30    | Pass   |
|        |           |                |         | RB1#38  | 21.47        | 30    | Pass   |
|        |           |                |         | RB1#74  | 21.32        | 30    | Pass   |
|        |           |                |         | RB38#0  | 20.59        | 30    | Pass   |
|        |           |                |         | RB38#19 | 20.82        | 30    | Pass   |
|        |           |                |         | RB25#39 | 20.59        | 30    | Pass   |
|        |           |                |         | RB75#0  | 20.74        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | QPSK      | 15MHz          | HCH     | RB1#0   | 21.46        | 30    | Pass   |
|        |           |                |         | RB1#38  | 21.73        | 30    | Pass   |
|        |           |                |         | RB1#74  | 21.51        | 30    | Pass   |
|        |           |                |         | RB38#0  | 20.78        | 30    | Pass   |
|        |           |                |         | RB38#19 | 20.86        | 30    | Pass   |
|        |           |                |         | RB25#39 | 20.65        | 30    | Pass   |
|        |           |                |         | RB75#0  | 20.89        | 30    | Pass   |



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| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | QPSK      | 20MHz          | LCH     | RB1#0   | 21.15        | 30    | Pass   |
|        |           |                |         | RB1#50  | 21.45        | 30    | Pass   |
|        |           |                |         | RB1#99  | 21.17        | 30    | Pass   |
|        |           |                |         | RB50#0  | 20.74        | 30    | Pass   |
|        |           |                |         | RB50#25 | 20.79        | 30    | Pass   |
|        |           |                |         | RB50#50 | 20.54        | 30    | Pass   |
|        |           |                |         | RB100#0 | 20.73        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | QPSK      | 20MHz          | MCH     | RB1#0   | 21.26        | 30    | Pass   |
|        |           |                |         | RB1#50  | 21.57        | 30    | Pass   |
|        |           |                |         | RB1#99  | 21.31        | 30    | Pass   |
|        |           |                |         | RB50#0  | 20.79        | 30    | Pass   |
|        |           |                |         | RB50#25 | 20.84        | 30    | Pass   |
|        |           |                |         | RB50#50 | 20.46        | 30    | Pass   |
|        |           |                |         | RB100#0 | 20.83        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | QPSK      | 20MHz          | HCH     | RB1#0   | 21.32        | 30    | Pass   |
|        |           |                |         | RB1#50  | 21.63        | 30    | Pass   |
|        |           |                |         | RB1#99  | 21.42        | 30    | Pass   |
|        |           |                |         | RB50#0  | 20.85        | 30    | Pass   |
|        |           |                |         | RB50#25 | 20.91        | 30    | Pass   |
|        |           |                |         | RB50#50 | 20.55        | 30    | Pass   |
|        |           |                |         | RB100#0 | 20.87        | 30    | Pass   |



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| Band   | Test Mode | Test bandwidth | Channel | RB    | Output Power | Limit | Result |
|--------|-----------|----------------|---------|-------|--------------|-------|--------|
| Band 2 | QPSK      | 1.4MHz         | LCH     | RB1#0 | 22.22        | 30    | Pass   |
|        |           |                |         | RB1#3 | 22.31        | 30    | Pass   |
|        |           |                |         | RB1#5 | 22.41        | 30    | Pass   |
|        |           |                |         | RB3#0 | 22.24        | 30    | Pass   |
|        |           |                |         | RB3#2 | 22.35        | 30    | Pass   |
|        |           |                |         | RB3#3 | 22.51        | 30    | Pass   |
|        |           |                |         | RB6#0 | 20.79        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB    | Output Power | Limit | Result |
|--------|-----------|----------------|---------|-------|--------------|-------|--------|
| Band 2 | QPSK      | 1.4MHz         | MCH     | RB1#0 | 22.16        | 30    | Pass   |
|        |           |                |         | RB1#3 | 22.43        | 30    | Pass   |
|        |           |                |         | RB1#5 | 22.14        | 30    | Pass   |
|        |           |                |         | RB3#0 | 22.35        | 30    | Pass   |
|        |           |                |         | RB3#2 | 22.28        | 30    | Pass   |
|        |           |                |         | RB3#3 | 22.31        | 30    | Pass   |
|        |           |                |         | RB6#0 | 20.95        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB    | Output Power | Limit | Result |
|--------|-----------|----------------|---------|-------|--------------|-------|--------|
| Band 2 | QPSK      | 1.4MHz         | HCH     | RB1#0 | 22.24        | 30    | Pass   |
|        |           |                |         | RB1#3 | 22.45        | 30    | Pass   |
|        |           |                |         | RB1#5 | 22.28        | 30    | Pass   |
|        |           |                |         | RB3#0 | 22.23        | 30    | Pass   |
|        |           |                |         | RB3#2 | 22.32        | 30    | Pass   |
|        |           |                |         | RB3#3 | 22.16        | 30    | Pass   |
|        |           |                |         | RB6#0 | 20.78        | 30    | Pass   |





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| Band   | Test Mode | Test bandwidth | Channel | RB     | Output Power | Limit | Result |
|--------|-----------|----------------|---------|--------|--------------|-------|--------|
| Band 2 | QPSK      | 3MHz           | LCH     | RB1#0  | 22.34        | 30    | Pass   |
|        |           |                |         | RB1#7  | 22.52        | 30    | Pass   |
|        |           |                |         | RB1#14 | 22.67        | 30    | Pass   |
|        |           |                |         | RB8#0  | 22.51        | 30    | Pass   |
|        |           |                |         | RB8#4  | 21.25        | 30    | Pass   |
|        |           |                |         | RB8#7  | 21.61        | 30    | Pass   |
|        |           |                |         | RB15#0 | 21.36        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB     | Output Power | Limit | Result |
|--------|-----------|----------------|---------|--------|--------------|-------|--------|
| Band 2 | QPSK      | 3MHz           | MCH     | RB1#0  | 22.28        | 30    | Pass   |
|        |           |                |         | RB1#7  | 22.13        | 30    | Pass   |
|        |           |                |         | RB1#14 | 22.43        | 30    | Pass   |
|        |           |                |         | RB8#0  | 22.53        | 30    | Pass   |
|        |           |                |         | RB8#4  | 21.22        | 30    | Pass   |
|        |           |                |         | RB8#7  | 21.25        | 30    | Pass   |
|        |           |                |         | RB15#0 | 21.97        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB     | Output Power | Limit | Result |
|--------|-----------|----------------|---------|--------|--------------|-------|--------|
| Band 2 | QPSK      | 3MHz           | HCH     | RB1#0  | 22.31        | 30    | Pass   |
|        |           |                |         | RB1#7  | 22.17        | 30    | Pass   |
|        |           |                |         | RB1#14 | 22.09        | 30    | Pass   |
|        |           |                |         | RB8#0  | 22.16        | 30    | Pass   |
|        |           |                |         | RB8#4  | 21.21        | 30    | Pass   |
|        |           |                |         | RB8#7  | 21.33        | 30    | Pass   |
|        |           |                |         | RB15#0 | 21.45        | 30    | Pass   |



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| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | 16QAM     | 5MHz           | LCH     | RB1#0   | 21.45        | 30    | Pass   |
|        |           |                |         | RB1#13  | 21.63        | 30    | Pass   |
|        |           |                |         | RB1#24  | 21.11        | 30    | Pass   |
|        |           |                |         | RB12#0  | 20.57        | 30    | Pass   |
|        |           |                |         | RB12#6  | 20.79        | 30    | Pass   |
|        |           |                |         | RB12#13 | 20.53        | 30    | Pass   |
|        |           |                |         | RB25#0  | 20.68        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | 16QAM     | 5MHz           | MCH     | RB1#0   | 21.54        | 30    | Pass   |
|        |           |                |         | RB1#13  | 21.67        | 30    | Pass   |
|        |           |                |         | RB1#24  | 21.21        | 30    | Pass   |
|        |           |                |         | RB12#0  | 20.51        | 30    | Pass   |
|        |           |                |         | RB12#6  | 20.63        | 30    | Pass   |
|        |           |                |         | RB12#13 | 20.36        | 30    | Pass   |
|        |           |                |         | RB25#0  | 20.44        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | 16QAM     | 5MHz           | HCH     | RB1#0   | 21.28        | 30    | Pass   |
|        |           |                |         | RB1#13  | 21.38        | 30    | Pass   |
|        |           |                |         | RB1#24  | 21.12        | 30    | Pass   |
|        |           |                |         | RB12#0  | 20.46        | 30    | Pass   |
|        |           |                |         | RB12#6  | 20.05        | 30    | Pass   |
|        |           |                |         | RB12#13 | 20.15        | 30    | Pass   |
|        |           |                |         | RB25#0  | 20.34        | 30    | Pass   |



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| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | 16QAM     | 10MHz          | LCH     | RB1#0   | 21.46        | 30    | Pass   |
|        |           |                |         | RB1#25  | 21.53        | 30    | Pass   |
|        |           |                |         | RB1#49  | 21.35        | 30    | Pass   |
|        |           |                |         | RB25#0  | 20.51        | 30    | Pass   |
|        |           |                |         | RB25#13 | 20.02        | 30    | Pass   |
|        |           |                |         | RB25#25 | 20.11        | 30    | Pass   |
|        |           |                |         | RB50#0  | 20.23        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | 16QAM     | 10MHz          | MCH     | RB1#0   | 21.16        | 30    | Pass   |
|        |           |                |         | RB1#25  | 21.26        | 30    | Pass   |
|        |           |                |         | RB1#49  | 20.34        | 30    | Pass   |
|        |           |                |         | RB25#0  | 20.27        | 30    | Pass   |
|        |           |                |         | RB25#13 | 20.34        | 30    | Pass   |
|        |           |                |         | RB25#25 | 20.13        | 30    | Pass   |
|        |           |                |         | RB50#0  | 20.26        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | 16QAM     | 10MHz          | HCH     | RB1#0   | 21.34        | 30    | Pass   |
|        |           |                |         | RB1#25  | 21.59        | 30    | Pass   |
|        |           |                |         | RB1#49  | 20.81        | 30    | Pass   |
|        |           |                |         | RB25#0  | 20.09        | 30    | Pass   |
|        |           |                |         | RB25#13 | 20.34        | 30    | Pass   |
|        |           |                |         | RB25#25 | 20.46        | 30    | Pass   |
|        |           |                |         | RB50#0  | 20.67        | 30    | Pass   |



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| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | 16QAM     | 15MHz          | LCH     | RB1#0   | 21.12        | 30    | Pass   |
|        |           |                |         | RB1#38  | 21.25        | 30    | Pass   |
|        |           |                |         | RB1#74  | 21.31        | 30    | Pass   |
|        |           |                |         | RB38#0  | 20.43        | 30    | Pass   |
|        |           |                |         | RB38#19 | 20.56        | 30    | Pass   |
|        |           |                |         | RB25#39 | 20.42        | 30    | Pass   |
|        |           |                |         | RB75#0  | 20.53        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | 16QAM     | 15MHz          | MCH     | RB1#0   | 21.34        | 30    | Pass   |
|        |           |                |         | RB1#38  | 21.56        | 30    | Pass   |
|        |           |                |         | RB1#74  | 21.18        | 30    | Pass   |
|        |           |                |         | RB38#0  | 20.43        | 30    | Pass   |
|        |           |                |         | RB38#19 | 20.37        | 30    | Pass   |
|        |           |                |         | RB25#39 | 20.51        | 30    | Pass   |
|        |           |                |         | RB75#0  | 20.78        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | 16QAM     | 15MHz          | HCH     | RB1#0   | 21.54        | 30    | Pass   |
|        |           |                |         | RB1#38  | 21.46        | 30    | Pass   |
|        |           |                |         | RB1#74  | 21.56        | 30    | Pass   |
|        |           |                |         | RB38#0  | 20.91        | 30    | Pass   |
|        |           |                |         | RB38#19 | 20.76        | 30    | Pass   |
|        |           |                |         | RB25#39 | 20.57        | 30    | Pass   |
|        |           |                |         | RB75#0  | 20.83        | 30    | Pass   |



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| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | 16QAM     | 20MHz          | LCH     | RB1#0   | 21.24        | 30    | Pass   |
|        |           |                |         | RB1#50  | 21.55        | 30    | Pass   |
|        |           |                |         | RB1#99  | 21.23        | 30    | Pass   |
|        |           |                |         | RB50#0  | 20.77        | 30    | Pass   |
|        |           |                |         | RB50#25 | 20.87        | 30    | Pass   |
|        |           |                |         | RB50#50 | 20.62        | 30    | Pass   |
|        |           |                |         | RB100#0 | 20.84        | 30    | Pass   |

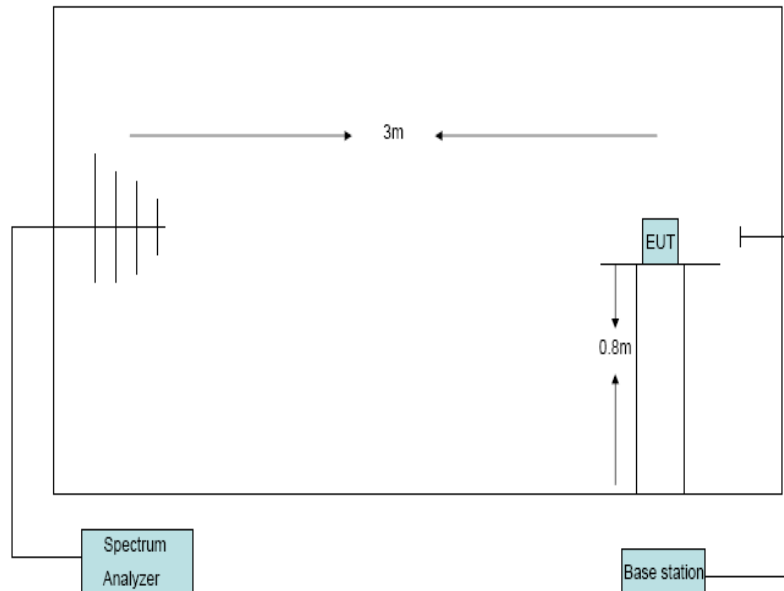
| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | 16QAM     | 20MHz          | MCH     | RB1#0   | 21.53        | 30    | Pass   |
|        |           |                |         | RB1#50  | 21.42        | 30    | Pass   |
|        |           |                |         | RB1#99  | 21.29        | 30    | Pass   |
|        |           |                |         | RB50#0  | 20.56        | 30    | Pass   |
|        |           |                |         | RB50#25 | 20.49        | 30    | Pass   |
|        |           |                |         | RB50#50 | 20.35        | 30    | Pass   |
|        |           |                |         | RB100#0 | 20.54        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | 16QAM     | 20MHz          | HCH     | RB1#0   | 21.24        | 30    | Pass   |
|        |           |                |         | RB1#50  | 21.54        | 30    | Pass   |
|        |           |                |         | RB1#99  | 21.23        | 30    | Pass   |
|        |           |                |         | RB50#0  | 20.57        | 30    | Pass   |
|        |           |                |         | RB50#25 | 20.62        | 30    | Pass   |
|        |           |                |         | RB50#50 | 20.43        | 30    | Pass   |
|        |           |                |         | RB100#0 | 20.76        | 30    | Pass   |



## 4. Effective (Isotropic) Radiated Power

### 4.1 Test Setup



### 4.2 Limit

|             |
|-------------|
| LTE Band 2  |
| 33dBm(EIRP) |

### 4.3 Test Procedure

1. The EUT was placed on an non-conductive rotating platform with 0.8 meter height in an anechoic chamber. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and a spectrum analyzer with RBW= 3MHz,VBW= 3MHz and peak detector settings.
2. During the measurement, the EUT was enforced in maximum power and linked with a base station. The highest emission was recorded from analyzer power level (LVL) from the 360 degrees rotation of the turntable and the test antenna raised and lowered over a range from 1 to 4 meters in both horizontally and vertically polarized orientations
3. Effective Isotropic Radiated Power (EIRP) was measured by substitution method according to TIA/EIA-603-C. The EUT was replaced by dipole antenna (for frequency below 1GHz) or Horn antenna(for frequency above 1GHz) at same location with same polarize of receiver antenna and then a known power of each measure frequency from S.G. was applied into the dipole antenna or Horn antenna through a Tx cable, and then recorded the maximum Analyzer reading through raised and lowered the test antenna.



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The correction factor (in dB) = S.G. - Tx Cable loss + Substitution antenna gain –Substitution antenna Loss(only for Dipole antenna) - Analyzer reading. Then the EUT's EIRP was calculated with the correction factor,  $EIRP = LVL + \text{Correction factor}$  and  $ERP = EIRP - 2.15$



## 4.4 Test Data

| Band   | Test Mode | Test bandwidth | Channel | RB    | Output Power | Limit | Result |
|--------|-----------|----------------|---------|-------|--------------|-------|--------|
| Band 2 | QPSK      | 1.4MHz         | LCH     | RB1#0 | 23.35        | 30    | Pass   |
|        |           |                |         | RB1#3 | 23.27        | 30    | Pass   |
|        |           |                |         | RB1#5 | 23.47        | 30    | Pass   |
|        |           |                |         | RB3#0 | 23.17        | 30    | Pass   |
|        |           |                |         | RB3#2 | 23.27        | 30    | Pass   |
|        |           |                |         | RB3#3 | 23.45        | 30    | Pass   |
|        |           |                |         | RB6#0 | 21.77        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB    | Output Power | Limit | Result |
|--------|-----------|----------------|---------|-------|--------------|-------|--------|
| Band 2 | QPSK      | 1.4MHz         | MCH     | RB1#0 | 23.12        | 30    | Pass   |
|        |           |                |         | RB1#3 | 23.46        | 30    | Pass   |
|        |           |                |         | RB1#5 | 23.54        | 30    | Pass   |
|        |           |                |         | RB3#0 | 23.36        | 30    | Pass   |
|        |           |                |         | RB3#2 | 23.42        | 30    | Pass   |
|        |           |                |         | RB3#3 | 23.19        | 30    | Pass   |
|        |           |                |         | RB6#0 | 21.87        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB    | Output Power | Limit | Result |
|--------|-----------|----------------|---------|-------|--------------|-------|--------|
| Band 2 | QPSK      | 1.4MHz         | HCH     | RB1#0 | 23.43        | 30    | Pass   |
|        |           |                |         | RB1#3 | 23.61        | 30    | Pass   |
|        |           |                |         | RB1#5 | 23.54        | 30    | Pass   |
|        |           |                |         | RB3#0 | 23.28        | 30    | Pass   |
|        |           |                |         | RB3#2 | 23.15        | 30    | Pass   |
|        |           |                |         | RB3#3 | 23.42        | 30    | Pass   |
|        |           |                |         | RB6#0 | 21.35        | 30    | Pass   |





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| Band   | Test Mode | Test bandwidth | Channel | RB     | Output Power | Limit | Result |
|--------|-----------|----------------|---------|--------|--------------|-------|--------|
| Band 2 | QPSK      | 3MHz           | LCH     | RB1#0  | 23.12        | 30    | Pass   |
|        |           |                |         | RB1#7  | 23.23        | 30    | Pass   |
|        |           |                |         | RB1#14 | 23.41        | 30    | Pass   |
|        |           |                |         | RB8#0  | 23.56        | 30    | Pass   |
|        |           |                |         | RB8#4  | 22.43        | 30    | Pass   |
|        |           |                |         | RB8#7  | 22.35        | 30    | Pass   |
|        |           |                |         | RB15#0 | 22.56        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB     | Output Power | Limit | Result |
|--------|-----------|----------------|---------|--------|--------------|-------|--------|
| Band 2 | QPSK      | 3MHz           | MCH     | RB1#0  | 23.24        | 30    | Pass   |
|        |           |                |         | RB1#7  | 23.37        | 30    | Pass   |
|        |           |                |         | RB1#14 | 23.51        | 30    | Pass   |
|        |           |                |         | RB8#0  | 23.27        | 30    | Pass   |
|        |           |                |         | RB8#4  | 22.16        | 30    | Pass   |
|        |           |                |         | RB8#7  | 22.46        | 30    | Pass   |
|        |           |                |         | RB15#0 | 22.86        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB     | Output Power | Limit | Result |
|--------|-----------|----------------|---------|--------|--------------|-------|--------|
| Band 2 | QPSK      | 3MHz           | HCH     | RB1#0  | 23.36        | 30    | Pass   |
|        |           |                |         | RB1#7  | 23.57        | 30    | Pass   |
|        |           |                |         | RB1#14 | 23.39        | 30    | Pass   |
|        |           |                |         | RB8#0  | 23.12        | 30    | Pass   |
|        |           |                |         | RB8#4  | 22.09        | 30    | Pass   |
|        |           |                |         | RB8#7  | 22.87        | 30    | Pass   |
|        |           |                |         | RB15#0 | 22.79        | 30    | Pass   |



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| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | QPSK      | 5MHz           | LCH     | RB1#0   | 22.64        | 30    | Pass   |
|        |           |                |         | RB1#13  | 22.89        | 30    | Pass   |
|        |           |                |         | RB1#24  | 22.22        | 30    | Pass   |
|        |           |                |         | RB12#0  | 21.85        | 30    | Pass   |
|        |           |                |         | RB12#6  | 21.95        | 30    | Pass   |
|        |           |                |         | RB12#13 | 21.68        | 30    | Pass   |
|        |           |                |         | RB25#0  | 21.81        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | QPSK      | 5MHz           | MCH     | RB1#0   | 22.69        | 30    | Pass   |
|        |           |                |         | RB1#13  | 22.82        | 30    | Pass   |
|        |           |                |         | RB1#24  | 22.32        | 30    | Pass   |
|        |           |                |         | RB12#0  | 21.78        | 30    | Pass   |
|        |           |                |         | RB12#6  | 21.81        | 30    | Pass   |
|        |           |                |         | RB12#13 | 21.57        | 30    | Pass   |
|        |           |                |         | RB25#0  | 21.78        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | QPSK      | 5MHz           | HCH     | RB1#0   | 22.35        | 30    | Pass   |
|        |           |                |         | RB1#13  | 22.54        | 30    | Pass   |
|        |           |                |         | RB1#24  | 22.26        | 30    | Pass   |
|        |           |                |         | RB12#0  | 21.61        | 30    | Pass   |
|        |           |                |         | RB12#6  | 21.22        | 30    | Pass   |
|        |           |                |         | RB12#13 | 21.21        | 30    | Pass   |
|        |           |                |         | RB25#0  | 21.46        | 30    | Pass   |



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| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | QPSK      | 10MHz          | LCH     | RB1#0   | 22.22        | 30    | Pass   |
|        |           |                |         | RB1#25  | 22.46        | 30    | Pass   |
|        |           |                |         | RB1#49  | 22.26        | 30    | Pass   |
|        |           |                |         | RB25#0  | 21.61        | 30    | Pass   |
|        |           |                |         | RB25#13 | 21.22        | 30    | Pass   |
|        |           |                |         | RB25#25 | 21.21        | 30    | Pass   |
|        |           |                |         | RB50#0  | 21.46        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | QPSK      | 10MHz          | MCH     | RB1#0   | 22.34        | 30    | Pass   |
|        |           |                |         | RB1#25  | 22.53        | 30    | Pass   |
|        |           |                |         | RB1#49  | 21.56        | 30    | Pass   |
|        |           |                |         | RB25#0  | 21.49        | 30    | Pass   |
|        |           |                |         | RB25#13 | 21.58        | 30    | Pass   |
|        |           |                |         | RB25#25 | 21.38        | 30    | Pass   |
|        |           |                |         | RB50#0  | 21.42        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | QPSK      | 10MHz          | HCH     | RB1#0   | 22.49        | 30    | Pass   |
|        |           |                |         | RB1#25  | 22.72        | 30    | Pass   |
|        |           |                |         | RB1#49  | 21.91        | 30    | Pass   |
|        |           |                |         | RB25#0  | 21.37        | 30    | Pass   |
|        |           |                |         | RB25#13 | 21.56        | 30    | Pass   |
|        |           |                |         | RB25#25 | 21.71        | 30    | Pass   |
|        |           |                |         | RB50#0  | 21.87        | 30    | Pass   |



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| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | QPSK      | 15MHz          | LCH     | RB1#0   | 22.02        | 30    | Pass   |
|        |           |                |         | RB1#38  | 22.34        | 30    | Pass   |
|        |           |                |         | RB1#74  | 22.11        | 30    | Pass   |
|        |           |                |         | RB38#0  | 21.63        | 30    | Pass   |
|        |           |                |         | RB38#19 | 21.71        | 30    | Pass   |
|        |           |                |         | RB25#39 | 21.52        | 30    | Pass   |
|        |           |                |         | RB75#0  | 21.66        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | QPSK      | 15MHz          | MCH     | RB1#0   | 22.25        | 30    | Pass   |
|        |           |                |         | RB1#38  | 22.47        | 30    | Pass   |
|        |           |                |         | RB1#74  | 22.32        | 30    | Pass   |
|        |           |                |         | RB38#0  | 21.59        | 30    | Pass   |
|        |           |                |         | RB38#19 | 21.82        | 30    | Pass   |
|        |           |                |         | RB25#39 | 21.59        | 30    | Pass   |
|        |           |                |         | RB75#0  | 21.74        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | QPSK      | 15MHz          | HCH     | RB1#0   | 22.46        | 30    | Pass   |
|        |           |                |         | RB1#38  | 22.73        | 30    | Pass   |
|        |           |                |         | RB1#74  | 22.51        | 30    | Pass   |
|        |           |                |         | RB38#0  | 21.78        | 30    | Pass   |
|        |           |                |         | RB38#19 | 21.86        | 30    | Pass   |
|        |           |                |         | RB25#39 | 21.65        | 30    | Pass   |
|        |           |                |         | RB75#0  | 21.89        | 30    | Pass   |



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| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | QPSK      | 20MHz          | LCH     | RB1#0   | 22.15        | 30    | Pass   |
|        |           |                |         | RB1#50  | 22.45        | 30    | Pass   |
|        |           |                |         | RB1#99  | 22.17        | 30    | Pass   |
|        |           |                |         | RB50#0  | 21.74        | 30    | Pass   |
|        |           |                |         | RB50#25 | 21.79        | 30    | Pass   |
|        |           |                |         | RB50#50 | 21.54        | 30    | Pass   |
|        |           |                |         | RB100#0 | 21.73        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | QPSK      | 20MHz          | MCH     | RB1#0   | 22.26        | 30    | Pass   |
|        |           |                |         | RB1#50  | 22.57        | 30    | Pass   |
|        |           |                |         | RB1#99  | 22.31        | 30    | Pass   |
|        |           |                |         | RB50#0  | 21.79        | 30    | Pass   |
|        |           |                |         | RB50#25 | 21.84        | 30    | Pass   |
|        |           |                |         | RB50#50 | 21.46        | 30    | Pass   |
|        |           |                |         | RB100#0 | 21.83        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | QPSK      | 20MHz          | HCH     | RB1#0   | 22.32        | 30    | Pass   |
|        |           |                |         | RB1#50  | 22.63        | 30    | Pass   |
|        |           |                |         | RB1#99  | 22.42        | 30    | Pass   |
|        |           |                |         | RB50#0  | 21.85        | 30    | Pass   |
|        |           |                |         | RB50#25 | 21.91        | 30    | Pass   |
|        |           |                |         | RB50#50 | 21.55        | 30    | Pass   |
|        |           |                |         | RB100#0 | 21.87        | 30    | Pass   |



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| Band   | Test Mode | Test bandwidth | Channel | RB    | Output Power | Limit | Result |
|--------|-----------|----------------|---------|-------|--------------|-------|--------|
| Band 2 | QPSK      | 1.4MHz         | LCH     | RB1#0 | 23.22        | 30    | Pass   |
|        |           |                |         | RB1#3 | 23.31        | 30    | Pass   |
|        |           |                |         | RB1#5 | 23.41        | 30    | Pass   |
|        |           |                |         | RB3#0 | 23.24        | 30    | Pass   |
|        |           |                |         | RB3#2 | 23.35        | 30    | Pass   |
|        |           |                |         | RB3#3 | 23.51        | 30    | Pass   |
|        |           |                |         | RB6#0 | 21.79        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB    | Output Power | Limit | Result |
|--------|-----------|----------------|---------|-------|--------------|-------|--------|
| Band 2 | QPSK      | 1.4MHz         | MCH     | RB1#0 | 23.16        | 30    | Pass   |
|        |           |                |         | RB1#3 | 23.43        | 30    | Pass   |
|        |           |                |         | RB1#5 | 23.14        | 30    | Pass   |
|        |           |                |         | RB3#0 | 23.35        | 30    | Pass   |
|        |           |                |         | RB3#2 | 23.28        | 30    | Pass   |
|        |           |                |         | RB3#3 | 23.31        | 30    | Pass   |
|        |           |                |         | RB6#0 | 21.95        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB    | Output Power | Limit | Result |
|--------|-----------|----------------|---------|-------|--------------|-------|--------|
| Band 2 | QPSK      | 1.4MHz         | HCH     | RB1#0 | 23.24        | 30    | Pass   |
|        |           |                |         | RB1#3 | 23.45        | 30    | Pass   |
|        |           |                |         | RB1#5 | 23.28        | 30    | Pass   |
|        |           |                |         | RB3#0 | 23.23        | 30    | Pass   |
|        |           |                |         | RB3#2 | 23.32        | 30    | Pass   |
|        |           |                |         | RB3#3 | 23.16        | 30    | Pass   |
|        |           |                |         | RB6#0 | 21.78        | 30    | Pass   |



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| Band   | Test Mode | Test bandwidth | Channel | RB     | Output Power | Limit | Result |
|--------|-----------|----------------|---------|--------|--------------|-------|--------|
| Band 2 | QPSK      | 3MHz           | LCH     | RB1#0  | 23.34        | 30    | Pass   |
|        |           |                |         | RB1#7  | 23.52        | 30    | Pass   |
|        |           |                |         | RB1#14 | 23.67        | 30    | Pass   |
|        |           |                |         | RB8#0  | 23.51        | 30    | Pass   |
|        |           |                |         | RB8#4  | 22.25        | 30    | Pass   |
|        |           |                |         | RB8#7  | 22.61        | 30    | Pass   |
|        |           |                |         | RB15#0 | 22.36        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB     | Output Power | Limit | Result |
|--------|-----------|----------------|---------|--------|--------------|-------|--------|
| Band 2 | QPSK      | 3MHz           | MCH     | RB1#0  | 23.28        | 30    | Pass   |
|        |           |                |         | RB1#7  | 23.13        | 30    | Pass   |
|        |           |                |         | RB1#14 | 23.43        | 30    | Pass   |
|        |           |                |         | RB8#0  | 23.53        | 30    | Pass   |
|        |           |                |         | RB8#4  | 22.22        | 30    | Pass   |
|        |           |                |         | RB8#7  | 22.25        | 30    | Pass   |
|        |           |                |         | RB15#0 | 22.97        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB     | Output Power | Limit | Result |
|--------|-----------|----------------|---------|--------|--------------|-------|--------|
| Band 2 | QPSK      | 3MHz           | HCH     | RB1#0  | 23.31        | 30    | Pass   |
|        |           |                |         | RB1#7  | 23.17        | 30    | Pass   |
|        |           |                |         | RB1#14 | 23.09        | 30    | Pass   |
|        |           |                |         | RB8#0  | 23.16        | 30    | Pass   |
|        |           |                |         | RB8#4  | 22.21        | 30    | Pass   |
|        |           |                |         | RB8#7  | 22.33        | 30    | Pass   |
|        |           |                |         | RB15#0 | 22.45        | 30    | Pass   |



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| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | 16QAM     | 5MHz           | LCH     | RB1#0   | 22.45        | 30    | Pass   |
|        |           |                |         | RB1#13  | 22.63        | 30    | Pass   |
|        |           |                |         | RB1#24  | 22.11        | 30    | Pass   |
|        |           |                |         | RB12#0  | 21.57        | 30    | Pass   |
|        |           |                |         | RB12#6  | 21.79        | 30    | Pass   |
|        |           |                |         | RB12#13 | 21.53        | 30    | Pass   |
|        |           |                |         | RB25#0  | 21.68        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | 16QAM     | 5MHz           | MCH     | RB1#0   | 22.54        | 30    | Pass   |
|        |           |                |         | RB1#13  | 22.67        | 30    | Pass   |
|        |           |                |         | RB1#24  | 22.21        | 30    | Pass   |
|        |           |                |         | RB12#0  | 21.51        | 30    | Pass   |
|        |           |                |         | RB12#6  | 21.63        | 30    | Pass   |
|        |           |                |         | RB12#13 | 21.36        | 30    | Pass   |
|        |           |                |         | RB25#0  | 21.44        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | 16QAM     | 5MHz           | HCH     | RB1#0   | 22.28        | 30    | Pass   |
|        |           |                |         | RB1#13  | 22.38        | 30    | Pass   |
|        |           |                |         | RB1#24  | 22.12        | 30    | Pass   |
|        |           |                |         | RB12#0  | 21.46        | 30    | Pass   |
|        |           |                |         | RB12#6  | 21.05        | 30    | Pass   |
|        |           |                |         | RB12#13 | 21.15        | 30    | Pass   |
|        |           |                |         | RB25#0  | 21.34        | 30    | Pass   |





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| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | 16QAM     | 10MHz          | LCH     | RB1#0   | 22.46        | 30    | Pass   |
|        |           |                |         | RB1#25  | 22.53        | 30    | Pass   |
|        |           |                |         | RB1#49  | 22.35        | 30    | Pass   |
|        |           |                |         | RB25#0  | 21.51        | 30    | Pass   |
|        |           |                |         | RB25#13 | 21.02        | 30    | Pass   |
|        |           |                |         | RB25#25 | 21.11        | 30    | Pass   |
|        |           |                |         | RB50#0  | 21.23        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | 16QAM     | 10MHz          | MCH     | RB1#0   | 22.16        | 30    | Pass   |
|        |           |                |         | RB1#25  | 22.26        | 30    | Pass   |
|        |           |                |         | RB1#49  | 21.34        | 30    | Pass   |
|        |           |                |         | RB25#0  | 21.27        | 30    | Pass   |
|        |           |                |         | RB25#13 | 21.34        | 30    | Pass   |
|        |           |                |         | RB25#25 | 21.13        | 30    | Pass   |
|        |           |                |         | RB50#0  | 21.26        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | 16QAM     | 10MHz          | HCH     | RB1#0   | 22.34        | 30    | Pass   |
|        |           |                |         | RB1#25  | 22.59        | 30    | Pass   |
|        |           |                |         | RB1#49  | 21.81        | 30    | Pass   |
|        |           |                |         | RB25#0  | 21.09        | 30    | Pass   |
|        |           |                |         | RB25#13 | 21.34        | 30    | Pass   |
|        |           |                |         | RB25#25 | 21.46        | 30    | Pass   |
|        |           |                |         | RB50#0  | 21.67        | 30    | Pass   |



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| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | 16QAM     | 15MHz          | LCH     | RB1#0   | 22.12        | 30    | Pass   |
|        |           |                |         | RB1#38  | 22.25        | 30    | Pass   |
|        |           |                |         | RB1#74  | 22.31        | 30    | Pass   |
|        |           |                |         | RB38#0  | 21.43        | 30    | Pass   |
|        |           |                |         | RB38#19 | 21.56        | 30    | Pass   |
|        |           |                |         | RB25#39 | 21.42        | 30    | Pass   |
|        |           |                |         | RB75#0  | 21.53        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | 16QAM     | 15MHz          | MCH     | RB1#0   | 22.34        | 30    | Pass   |
|        |           |                |         | RB1#38  | 22.56        | 30    | Pass   |
|        |           |                |         | RB1#74  | 22.18        | 30    | Pass   |
|        |           |                |         | RB38#0  | 21.43        | 30    | Pass   |
|        |           |                |         | RB38#19 | 21.37        | 30    | Pass   |
|        |           |                |         | RB25#39 | 21.51        | 30    | Pass   |
|        |           |                |         | RB75#0  | 21.78        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | 16QAM     | 15MHz          | HCH     | RB1#0   | 22.54        | 30    | Pass   |
|        |           |                |         | RB1#38  | 22.46        | 30    | Pass   |
|        |           |                |         | RB1#74  | 22.56        | 30    | Pass   |
|        |           |                |         | RB38#0  | 21.91        | 30    | Pass   |
|        |           |                |         | RB38#19 | 21.76        | 30    | Pass   |
|        |           |                |         | RB25#39 | 21.57        | 30    | Pass   |
|        |           |                |         | RB75#0  | 21.83        | 30    | Pass   |



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| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | 16QAM     | 20MHz          | LCH     | RB1#0   | 22.24        | 30    | Pass   |
|        |           |                |         | RB1#50  | 22.55        | 30    | Pass   |
|        |           |                |         | RB1#99  | 22.23        | 30    | Pass   |
|        |           |                |         | RB50#0  | 21.77        | 30    | Pass   |
|        |           |                |         | RB50#25 | 21.87        | 30    | Pass   |
|        |           |                |         | RB50#50 | 21.62        | 30    | Pass   |
|        |           |                |         | RB100#0 | 21.84        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | 16QAM     | 20MHz          | MCH     | RB1#0   | 22.53        | 30    | Pass   |
|        |           |                |         | RB1#50  | 22.42        | 30    | Pass   |
|        |           |                |         | RB1#99  | 22.29        | 30    | Pass   |
|        |           |                |         | RB50#0  | 21.56        | 30    | Pass   |
|        |           |                |         | RB50#25 | 21.49        | 30    | Pass   |
|        |           |                |         | RB50#50 | 21.35        | 30    | Pass   |
|        |           |                |         | RB100#0 | 21.54        | 30    | Pass   |

| Band   | Test Mode | Test bandwidth | Channel | RB      | Output Power | Limit | Result |
|--------|-----------|----------------|---------|---------|--------------|-------|--------|
| Band 2 | 16QAM     | 20MHz          | HCH     | RB1#0   | 22.24        | 30    | Pass   |
|        |           |                |         | RB1#50  | 22.54        | 30    | Pass   |
|        |           |                |         | RB1#99  | 22.23        | 30    | Pass   |
|        |           |                |         | RB50#0  | 21.57        | 30    | Pass   |
|        |           |                |         | RB50#25 | 21.62        | 30    | Pass   |
|        |           |                |         | RB50#50 | 21.43        | 30    | Pass   |
|        |           |                |         | RB100#0 | 21.76        | 30    | Pass   |

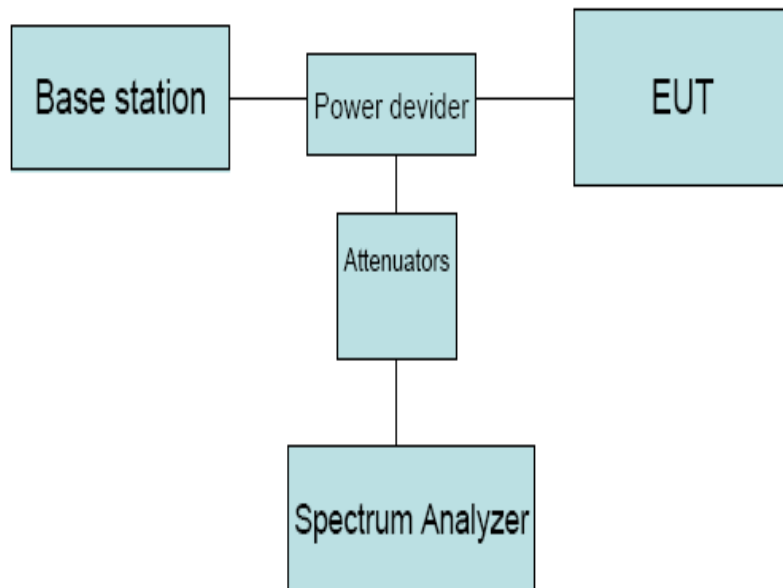


## 5. Occupied Bandwidth

### 5.1. Limit

N/A

### 5.2. Test Setup



### 5.3. Test Procedure

1. The EUT' RF output port was connected to Spectrum Analyzer and Base Station via power divider.
2. Spectrum analyzer's occupied bandwidth measure function was used to measure 99% bandwidth and -26dBc bandwidth



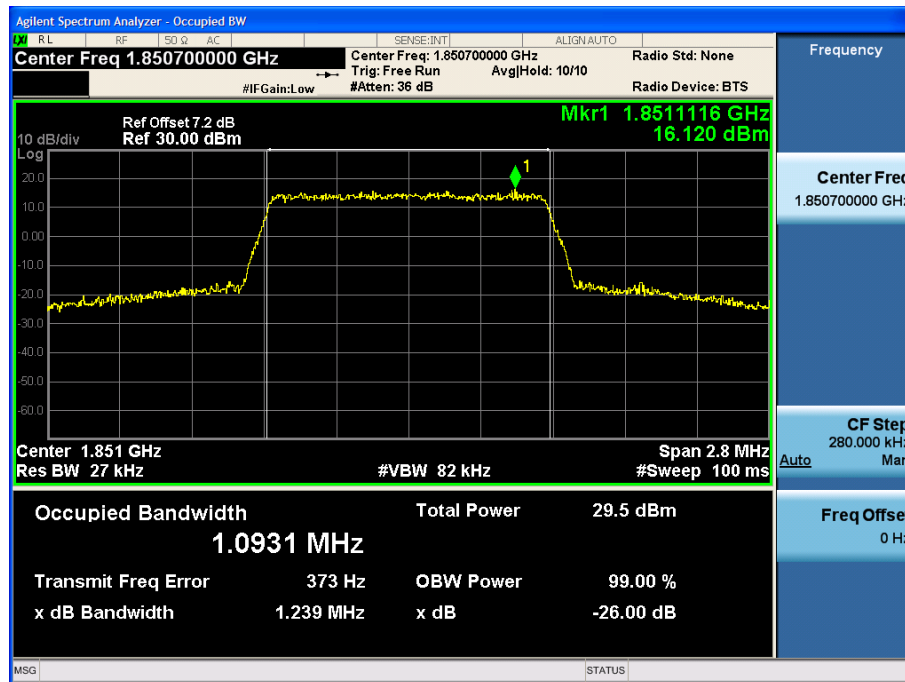
## 5.4. Test Data

| BW [MHz] | Mod   | Bandwidth [MHz] |        |         |        |         |        |
|----------|-------|-----------------|--------|---------|--------|---------|--------|
|          |       | Lowest          |        | Middle  |        | Highest |        |
|          |       | 26dB BW         | 99% BW | 26dB BW | 99% BW | 26dB BW | 99% BW |
| 1.4      | QPSK  | 1.239           | 1.0931 | 1.239   | 1.0940 | 1.243   | 1.0971 |
| 1.4      | 16QAM | 1.240           | 1.0951 | 1.233   | 1.0918 | 1.239   | 1.0931 |
| 3.0      | QPSK  | 2.972           | 2.7052 | 2.979   | 2.8045 | 2.983   | 2.7072 |
| 3.0      | 16QAM | 2.973           | 2.7152 | 2.991   | 2.7110 | 2.995   | 2.7107 |
| 5        | QPSK  | 4.970           | 4.5167 | 4.973   | 4.5164 | 4.970   | 4.5230 |
| 5        | 16QAM | 4.989           | 4.5175 | 4.961   | 4.5165 | 4.959   | 4.5122 |
| 10       | QPSK  | 9.928           | 8.9887 | 9.902   | 8.9988 | 9.949   | 8.9985 |
| 10       | 16QAM | 9.990           | 9.0078 | 9.973   | 9.0052 | 9.949   | 9.0210 |
| 15       | QPSK  | 15.00           | 13.480 | 15.02   | 13.520 | 15.14   | 13.497 |
| 15       | 16QAM | 15.09           | 13.500 | 15.01   | 13.480 | 14.97   | 13.529 |
| 20       | QPSK  | 19.71           | 17.967 | 19.85   | 17.985 | 19.67   | 17.956 |
| 20       | 16QAM | 19.86           | 17.985 | 19.83   | 18.025 | 19.86   | 18.012 |

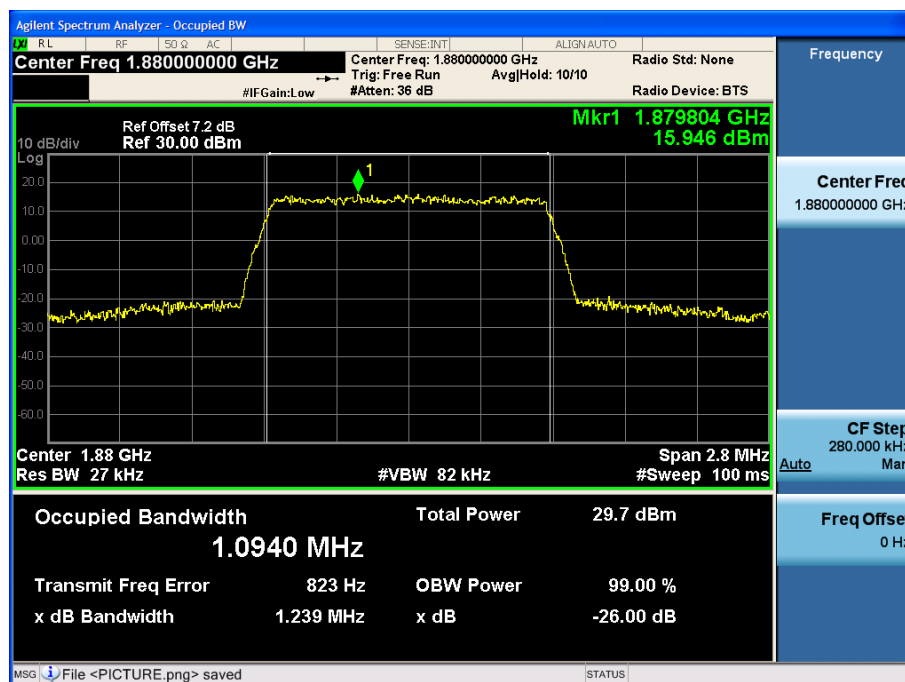


## 5.5. Test Plot

### 1.4MHz Lowest QPSK



### 1.4MHz Middle QPSK



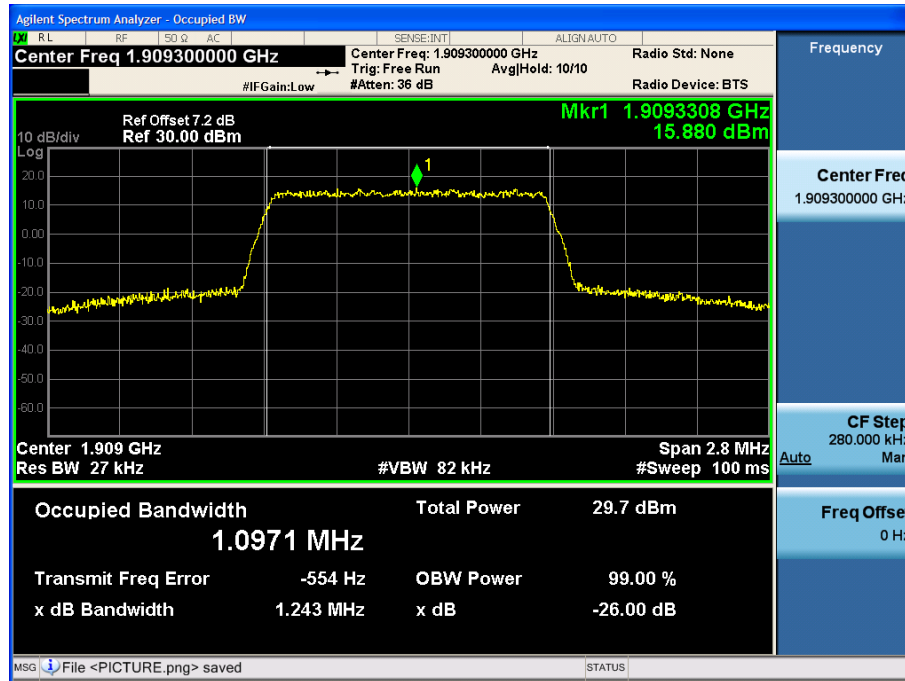


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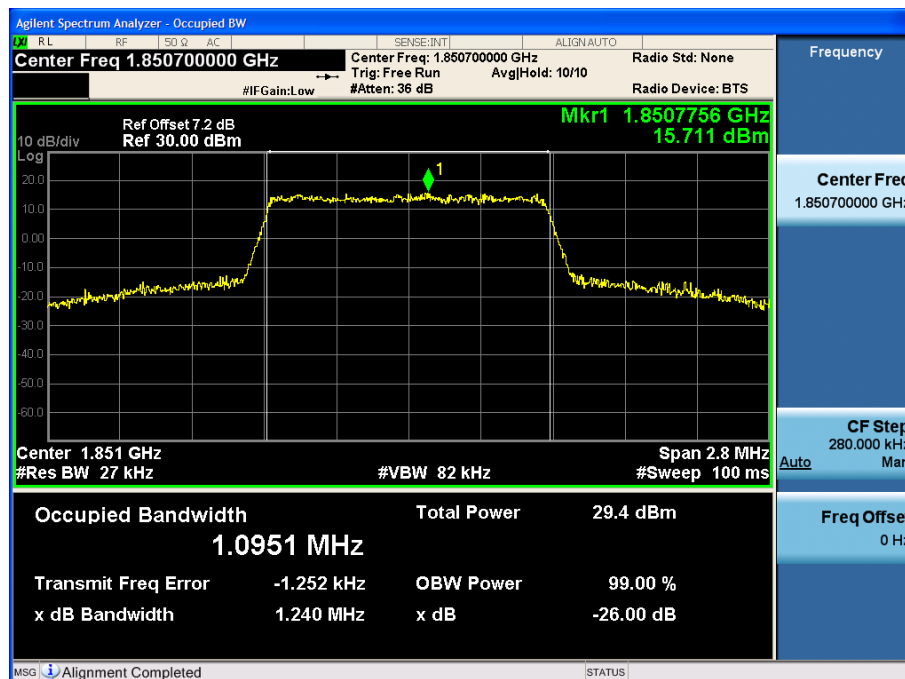
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## 1.4MHz Highest QPSK



## 1.4MHz Lowest 16QAM



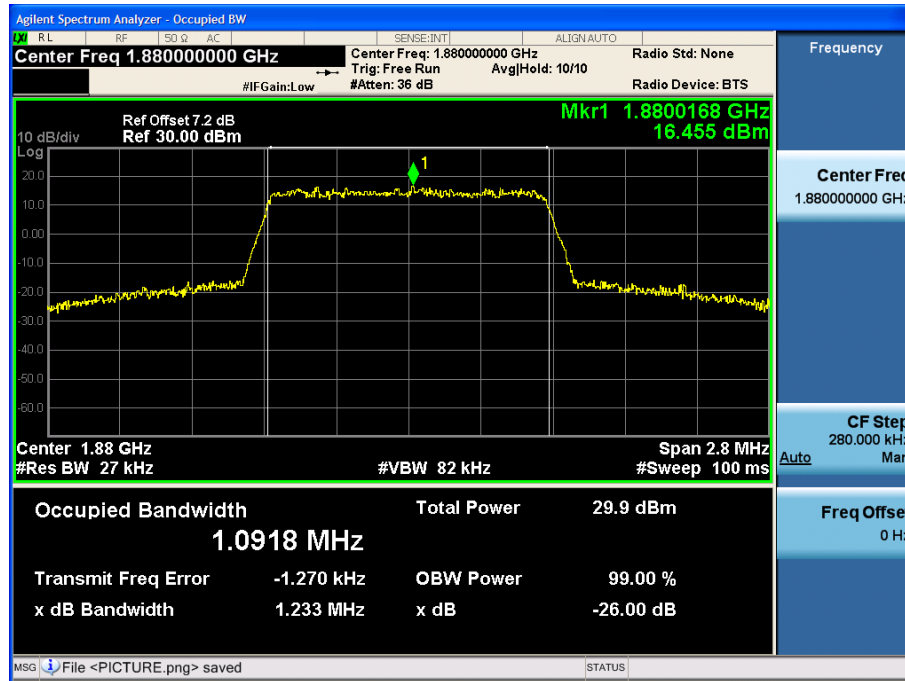


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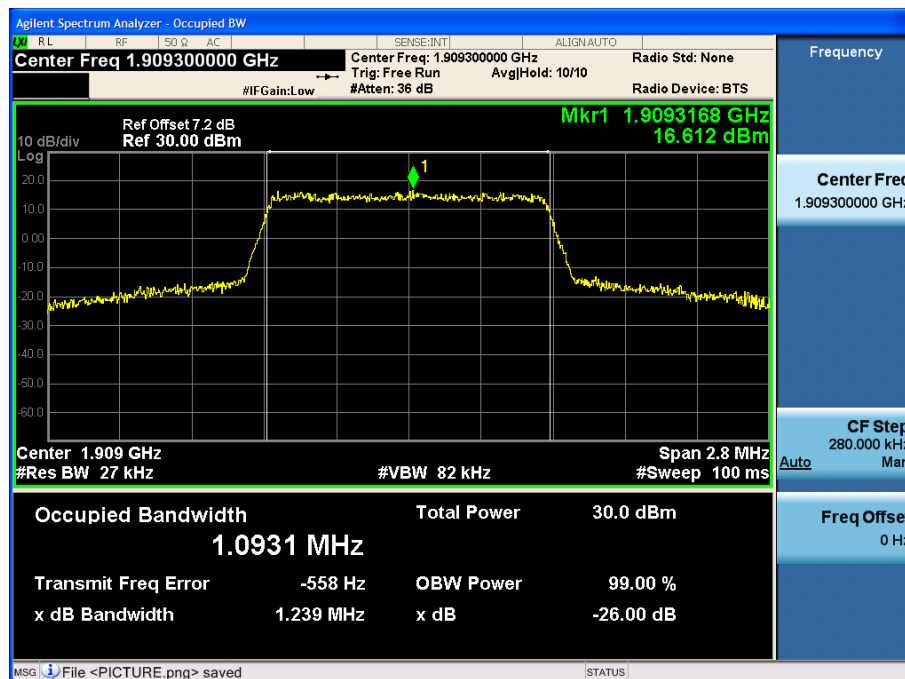
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## 1.4MHz Middle 16QAM



## 1.4MHz Highest 16QAM





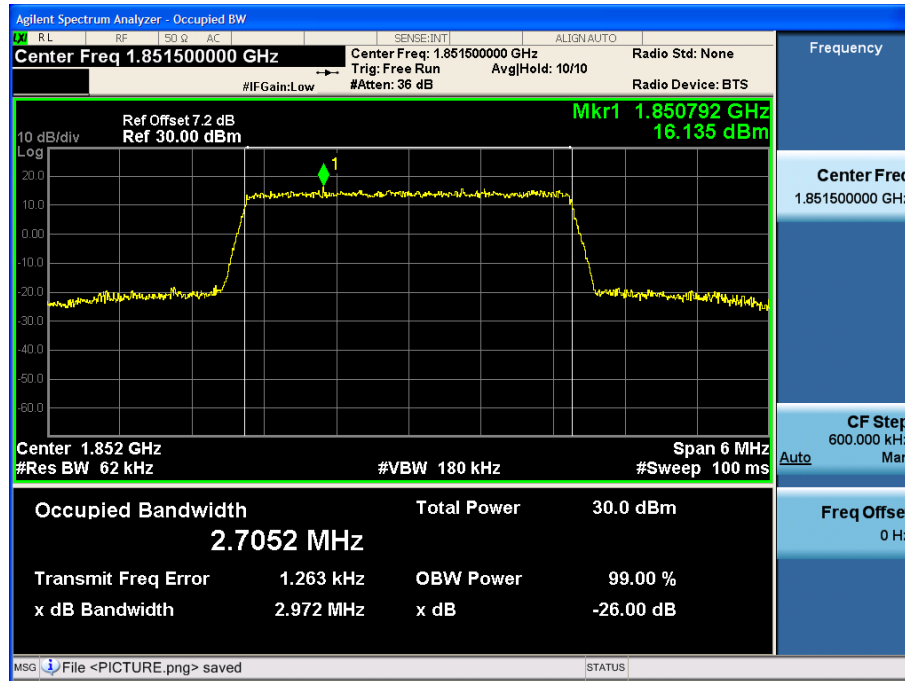


# ATA Testing Technology Service Co., Ltd.

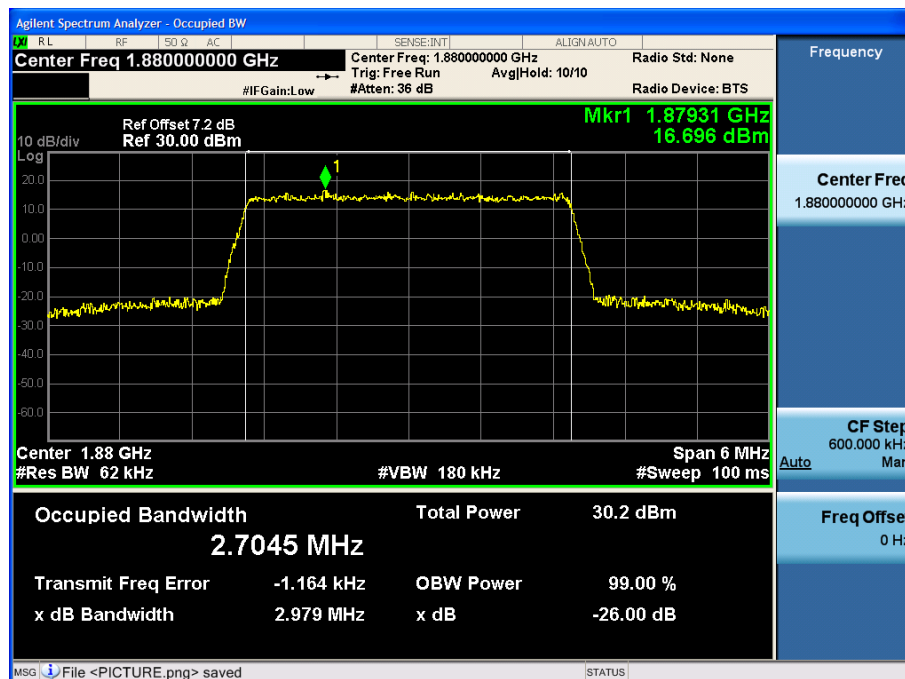
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## 3MHz Lowest QPSK



## 3MHz Middle QPSK



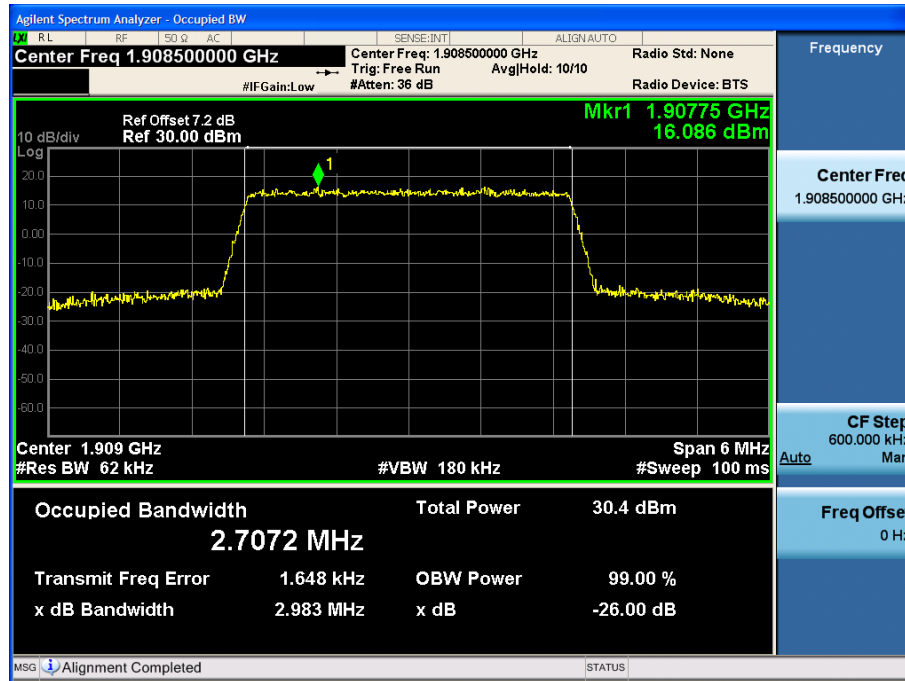


# ATA Testing Technology Service Co., Ltd.

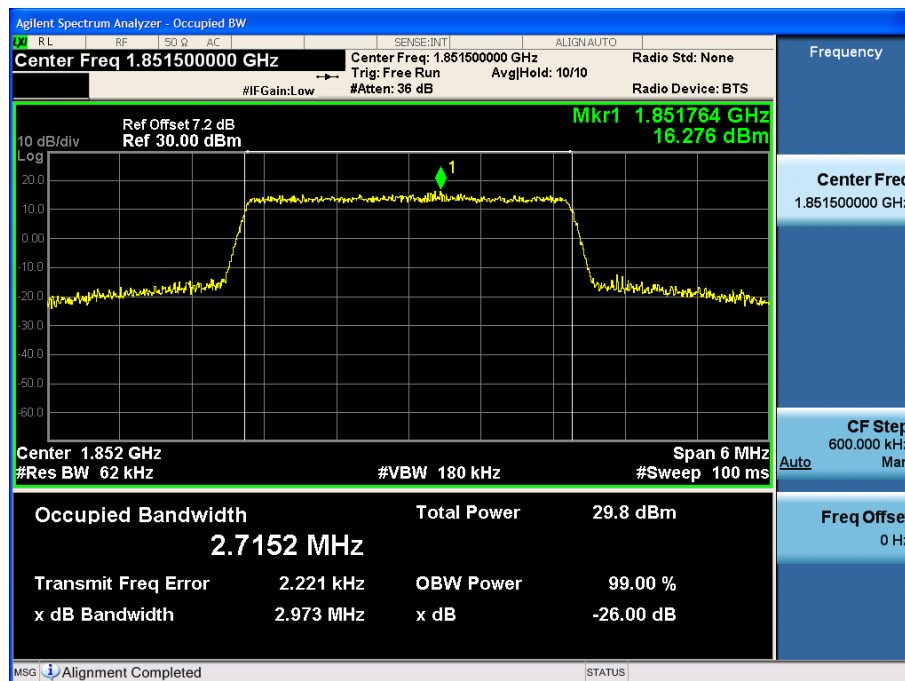
Report No.: ATA160705017F

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## 3MHz Highest QPSK



## 3MHz Lowest 16QAM



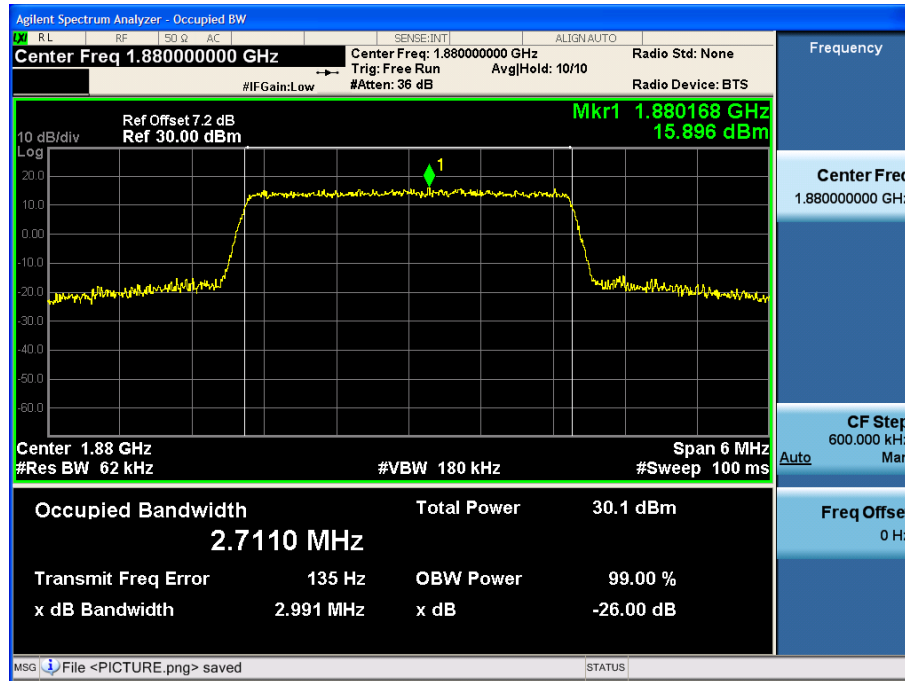


# ATA Testing Technology Service Co., Ltd.

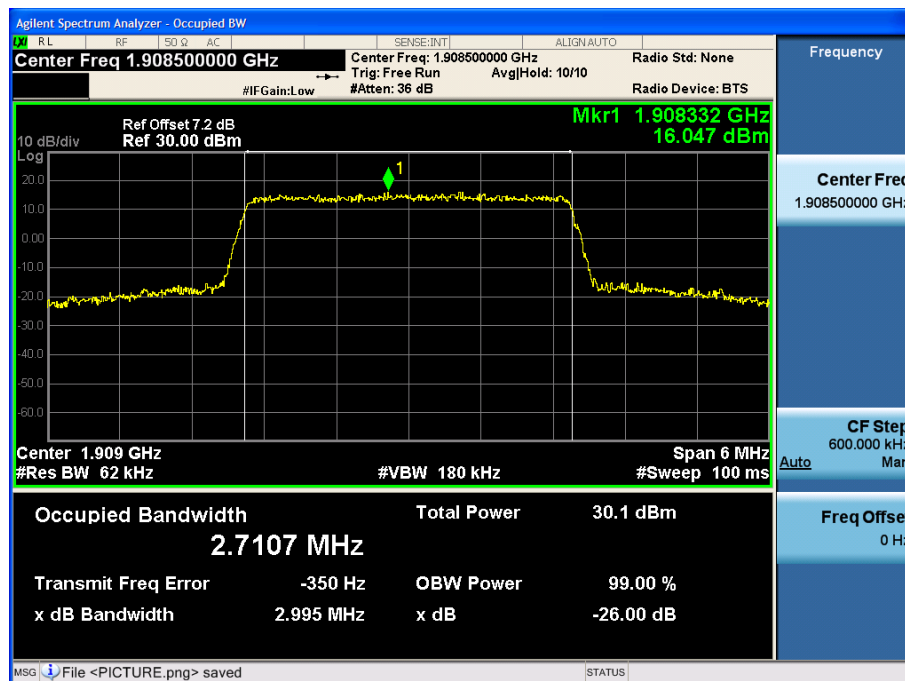
Report No.: ATA160705017F

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## 3MHz Middle 16QAM



## 3MHz Highest 16QAM



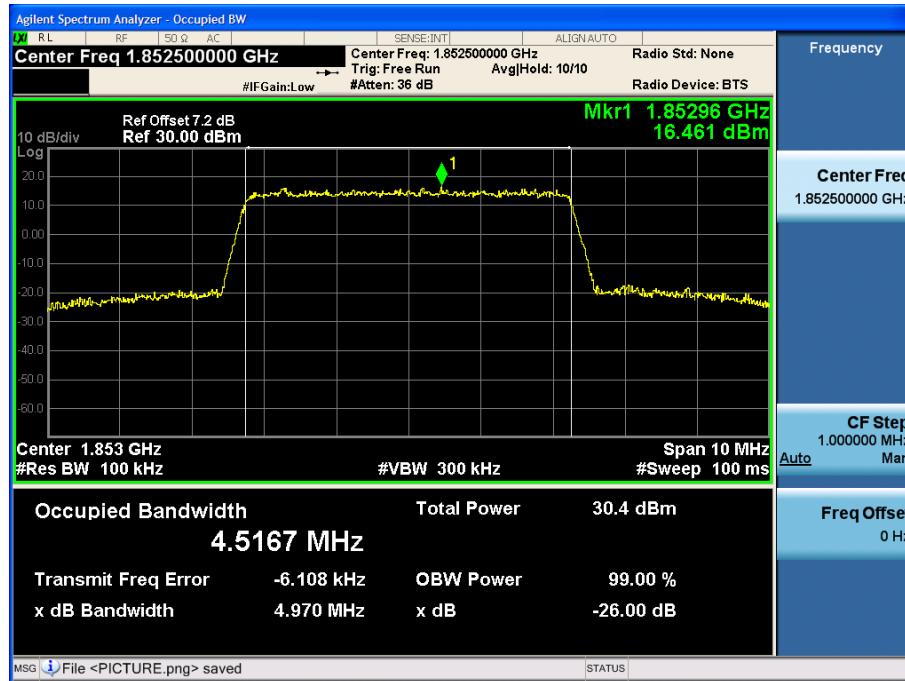


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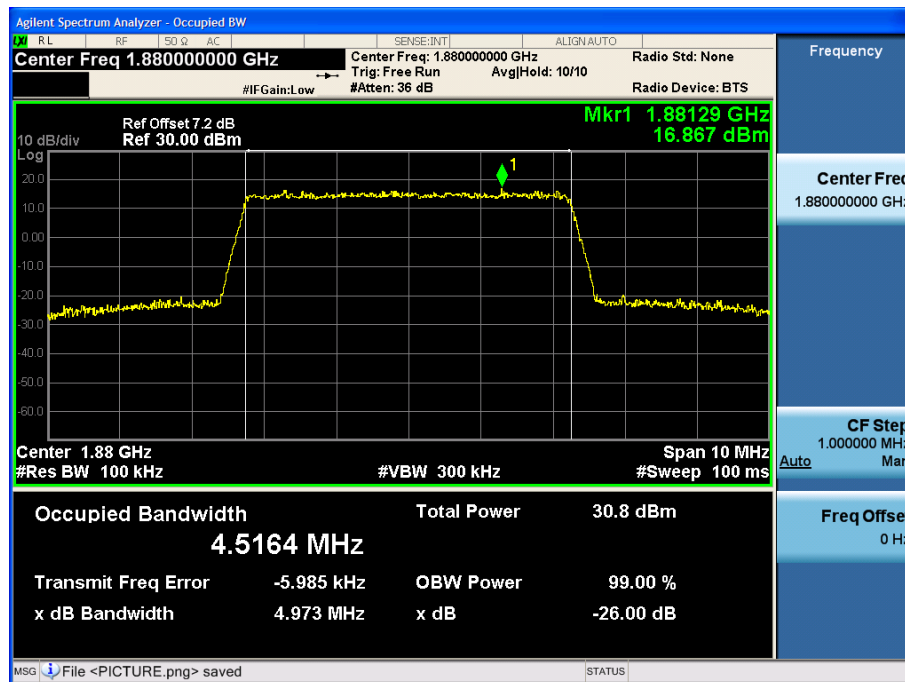
Report No.: ATA160705017F

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## 5MHz Lowest QPSK



## 5MHz Middle QPSK



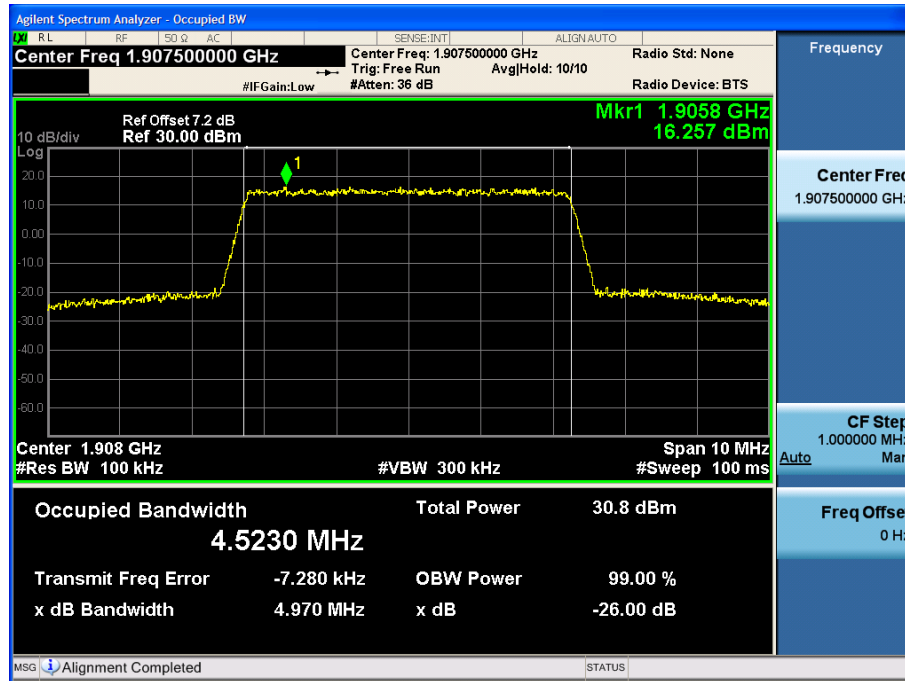


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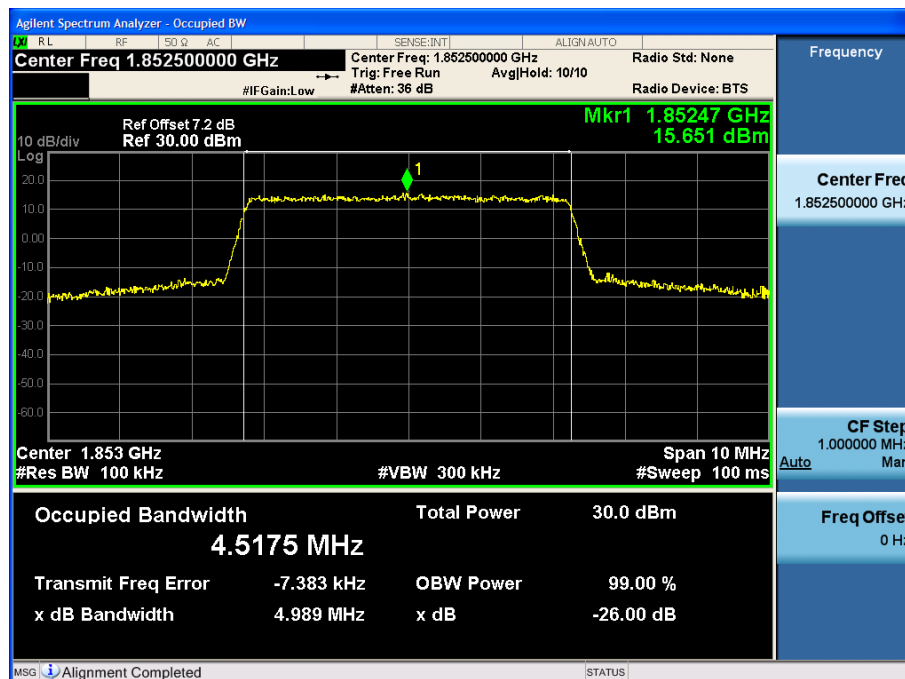
Report No.: ATA160705017F

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## 5MHz Highest QPSK



## 5MHz Lowest 16QAM



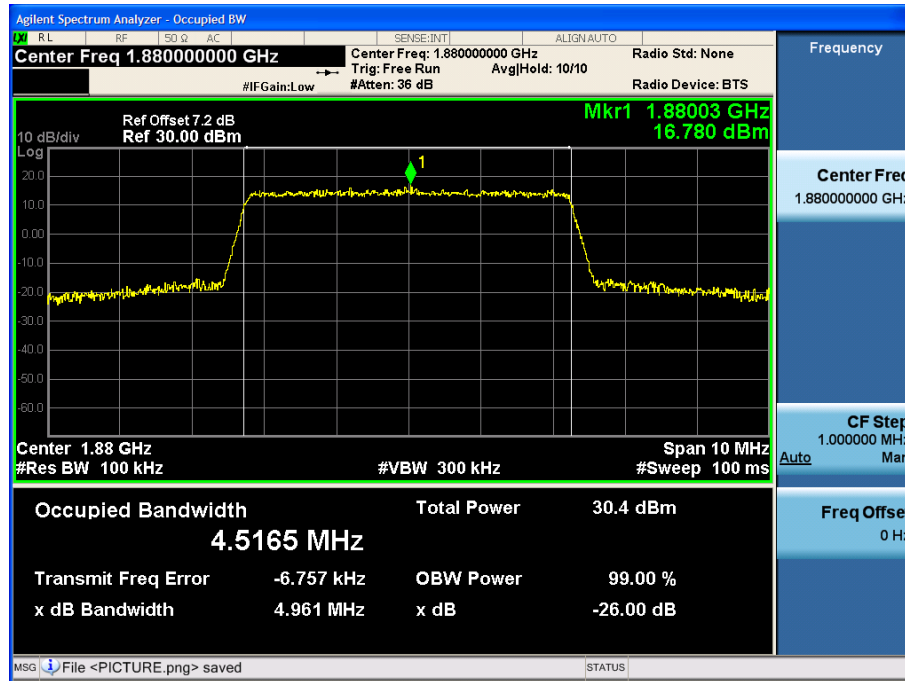


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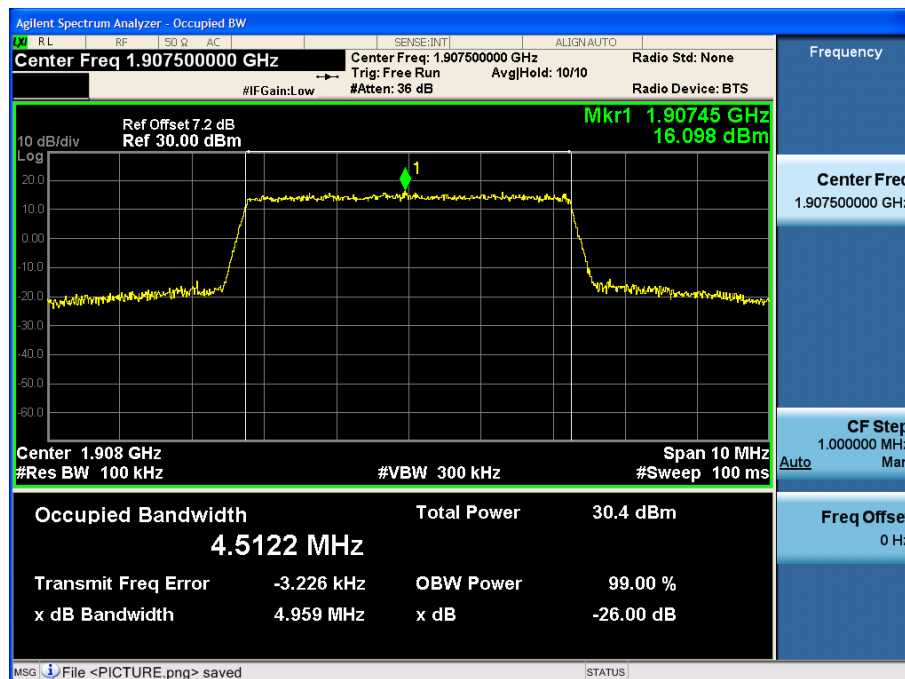
Report No.: ATA160705017F

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## 5MHz Middle 16QAM



## 5MHz Highest 16QAM



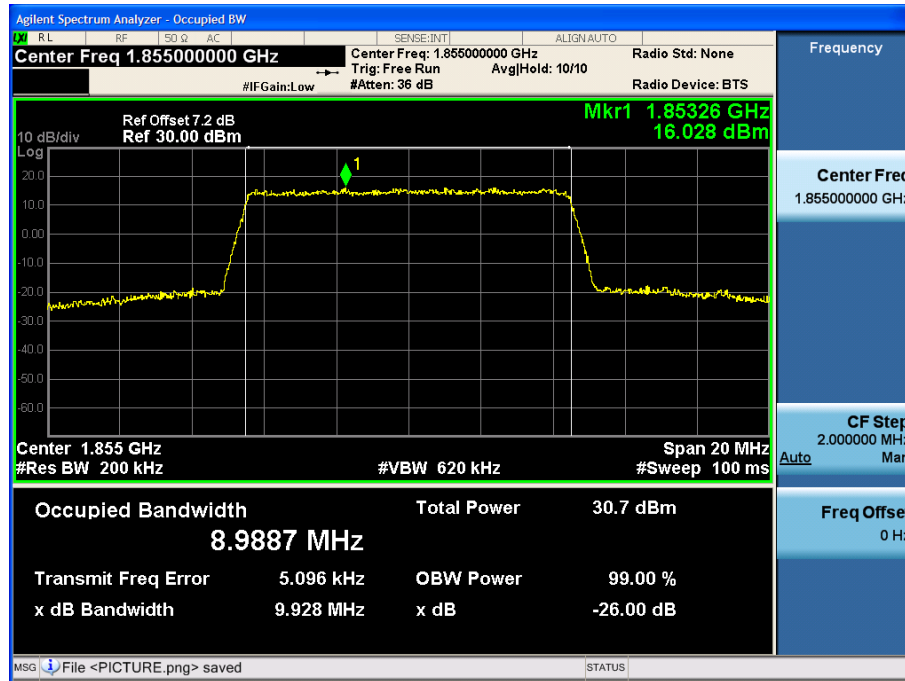


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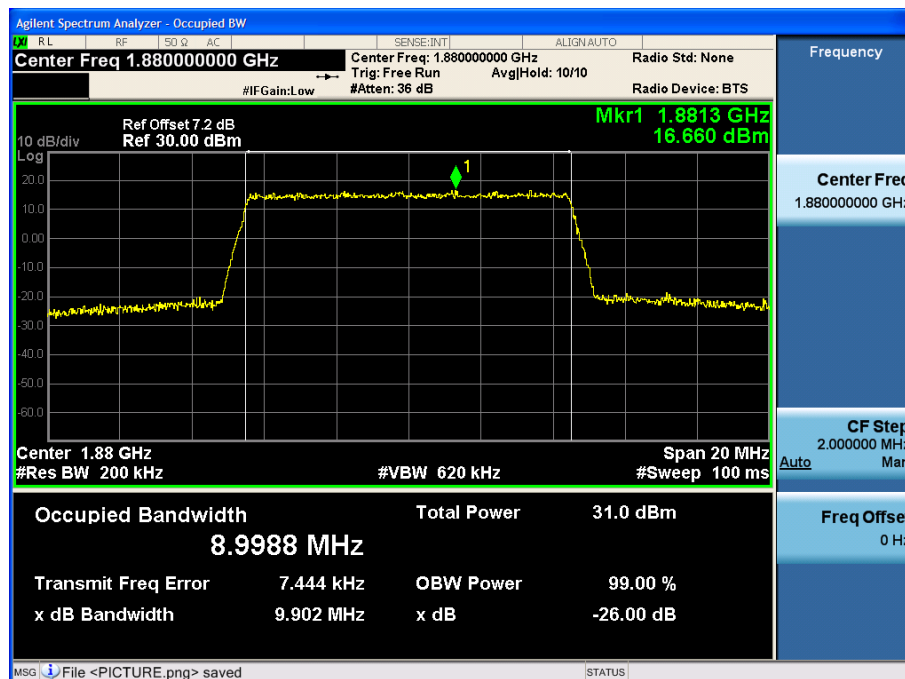
Report No.: ATA160705017F

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## 10MHz Lowest QPSK



## 10MHz Middle QPSK





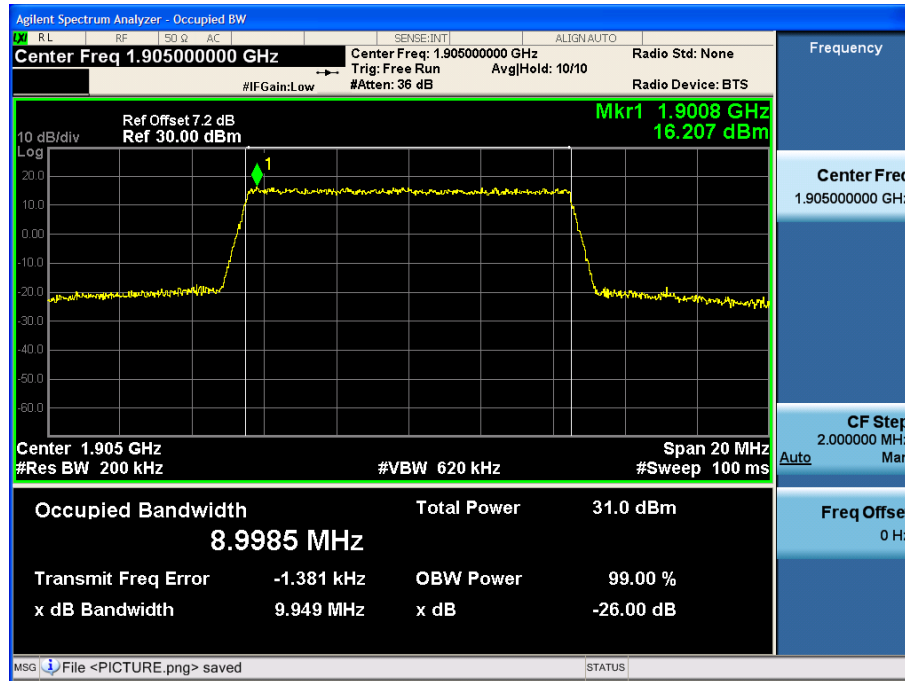


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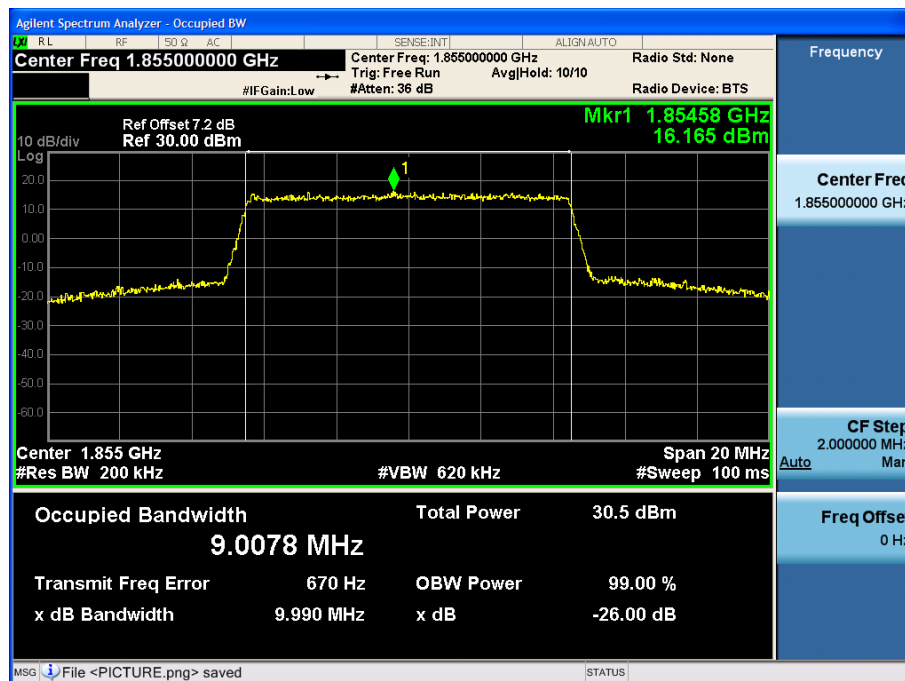
Report No.: ATA160705017F

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## 10MHz Highest QPSK



## 10MHz Lowest 16QAM





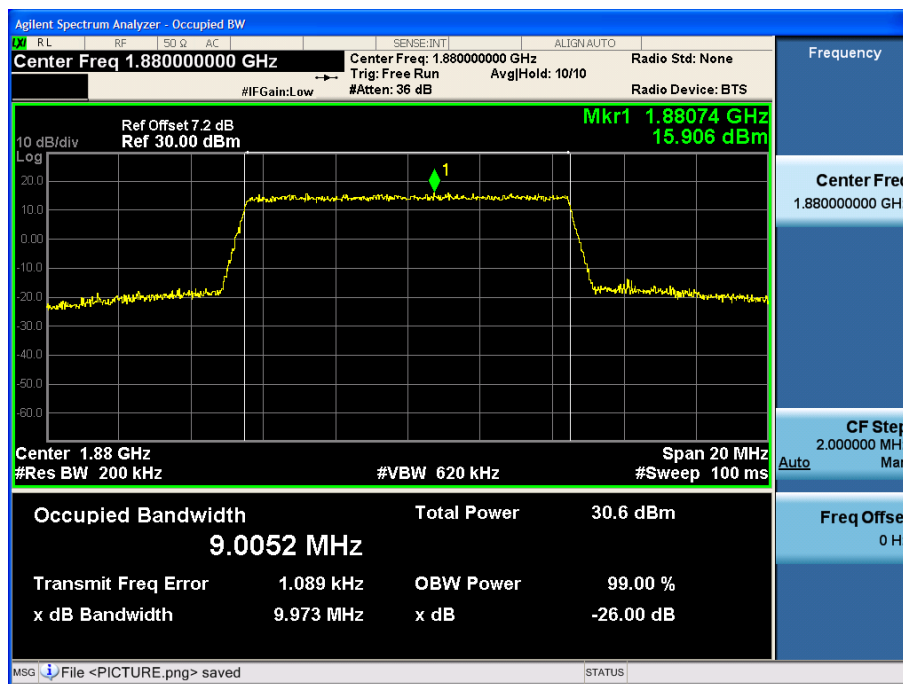


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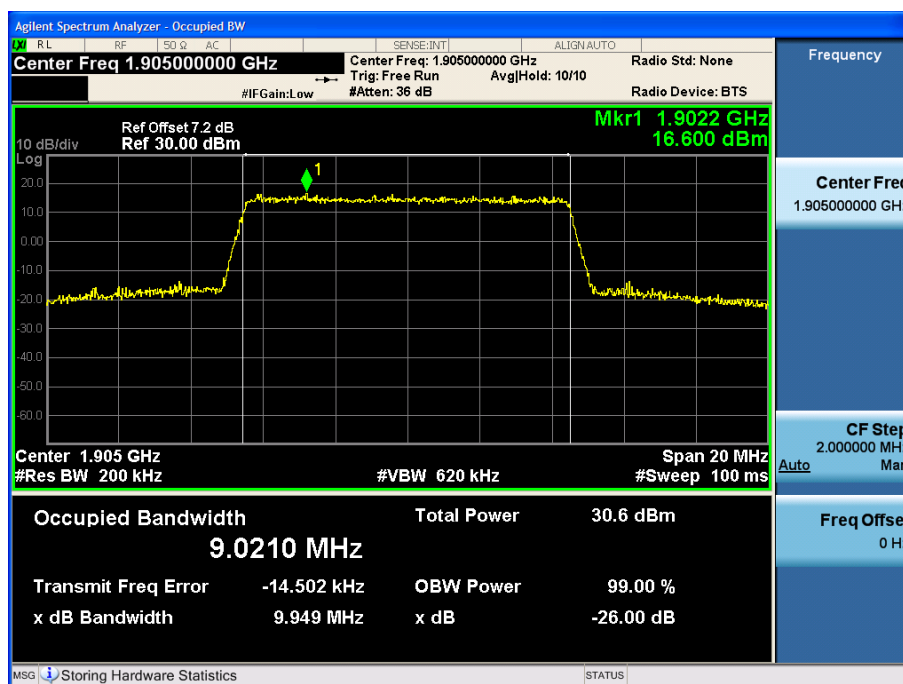
Report No.: ATA160705017F

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## 10MHz Middle 16QAM



## 10MHz Highest 16QAM



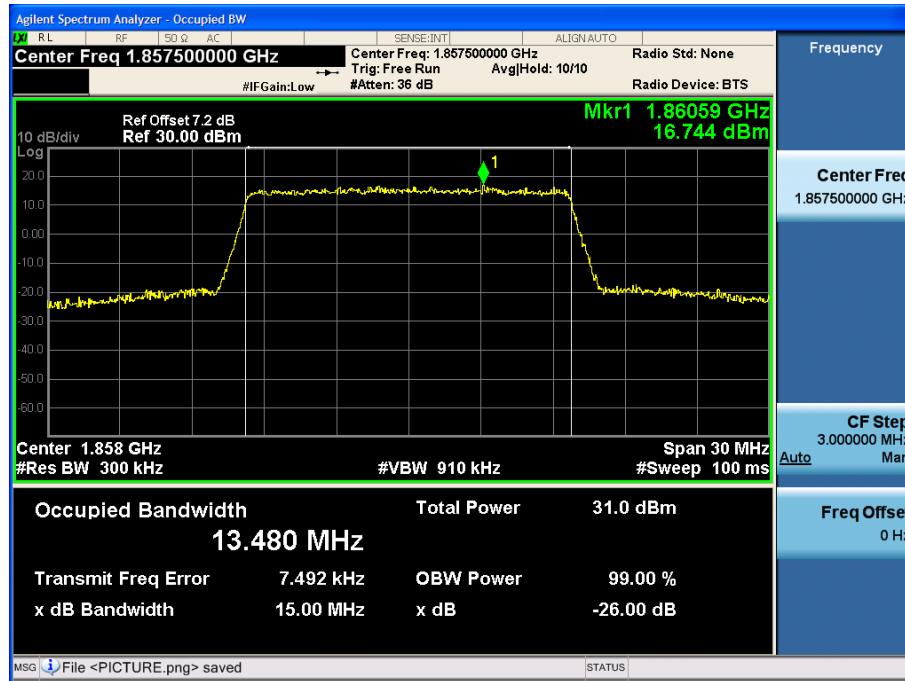


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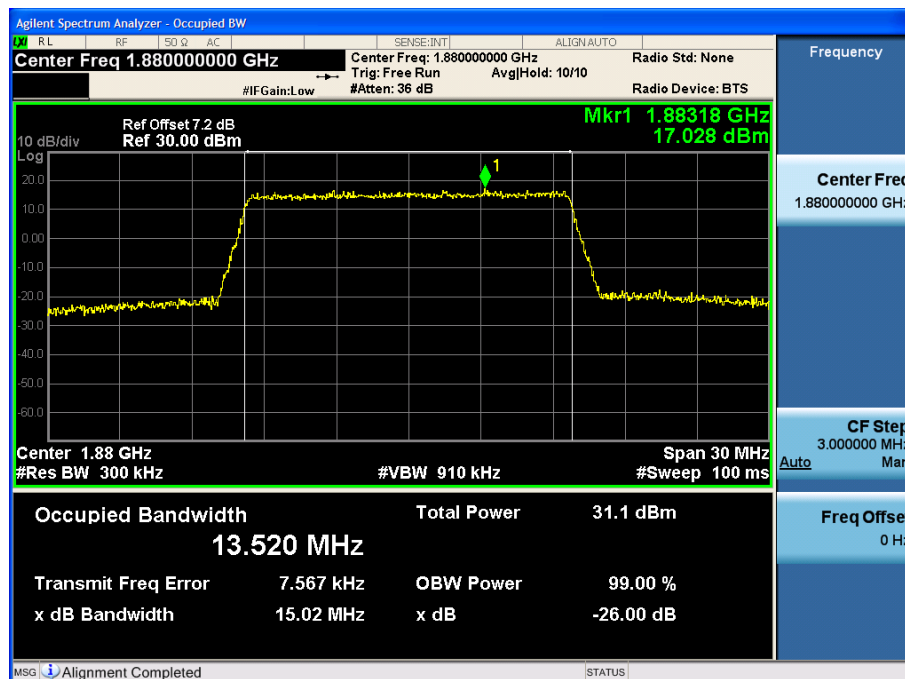
Report No.: ATA160705017F

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## 15MHz Lowest QPSK



## 15MHz Middle QPSK



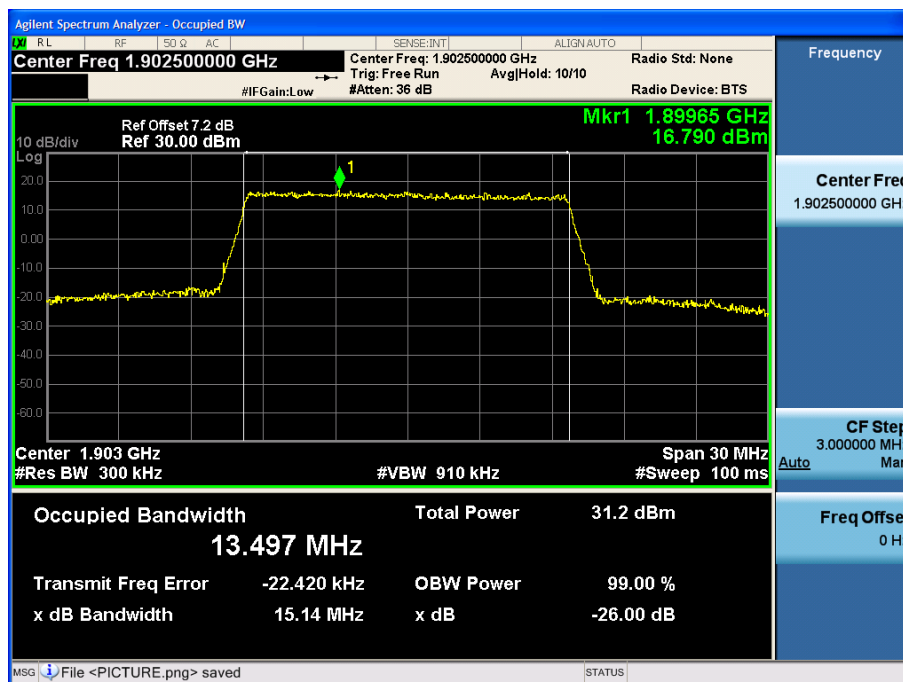


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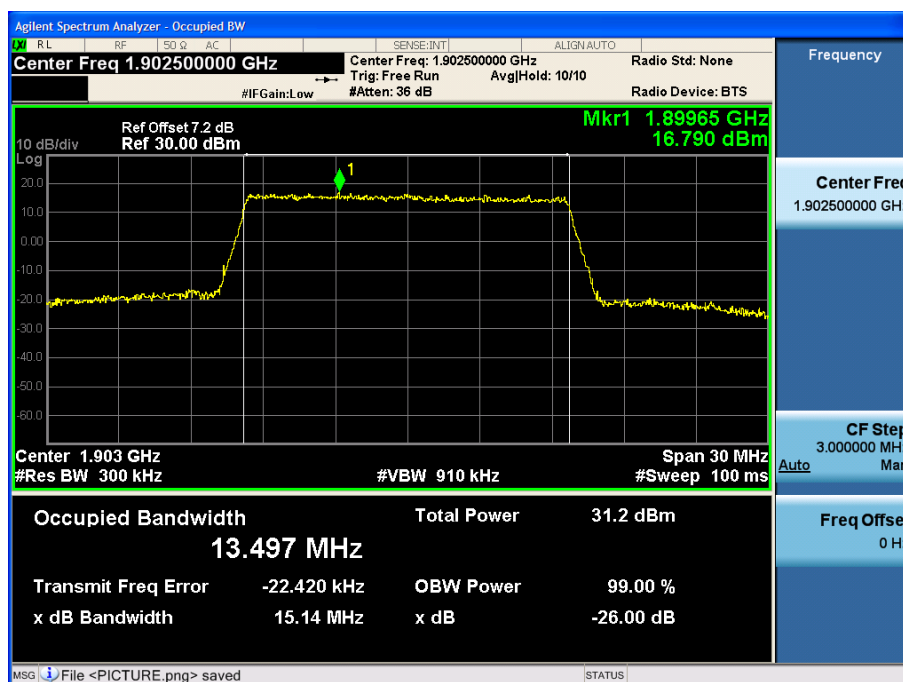
Report No.: ATA160705017F

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## 15MHz Highest QPSK



## 15MHz Lowest 16QAM



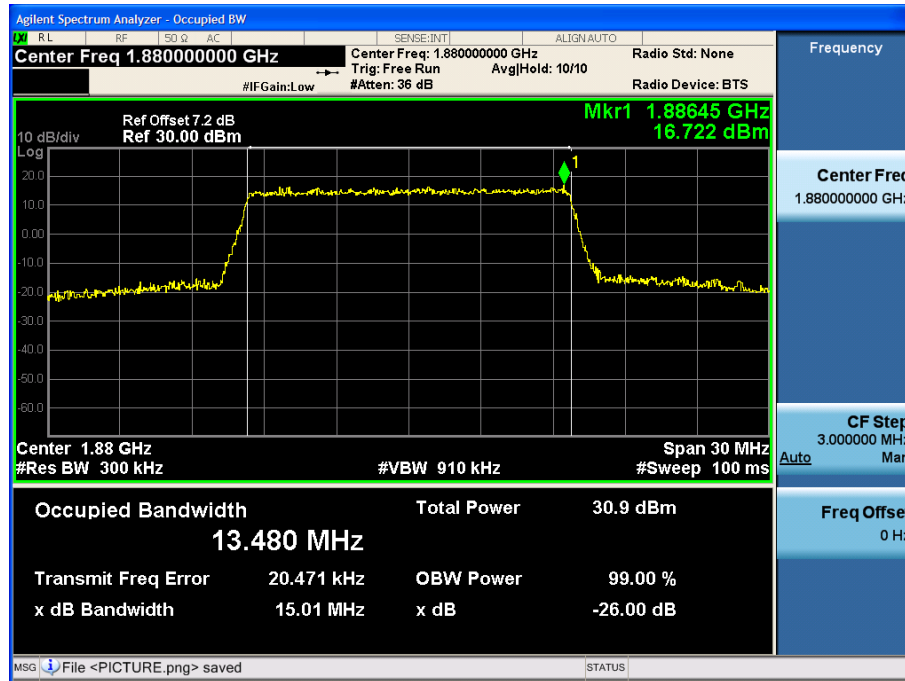


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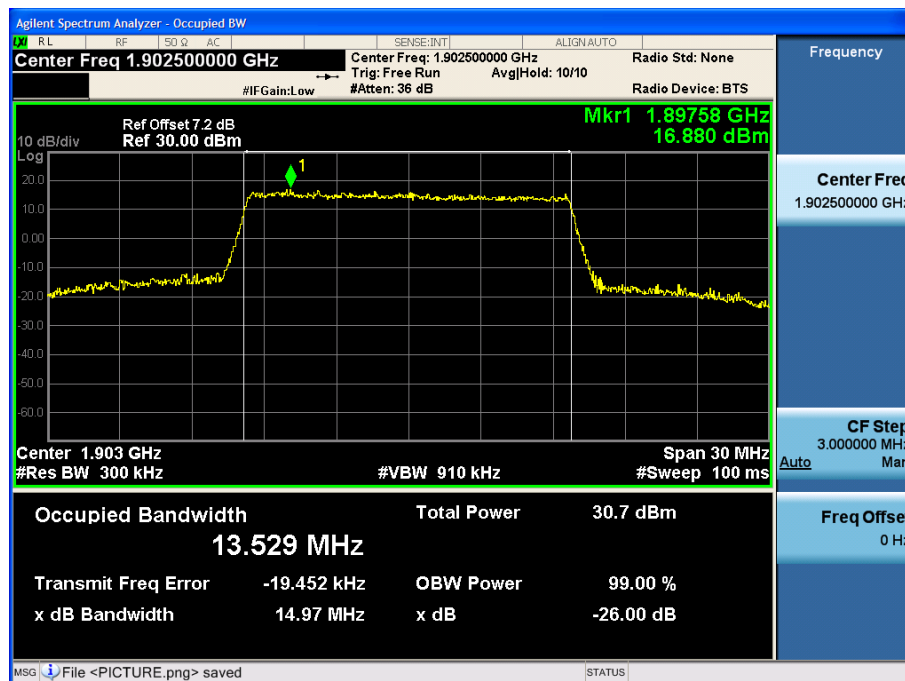
Report No.: ATA160705017F

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## 15MHz Middle 16QAM



## 15MHz Highest 16QAM



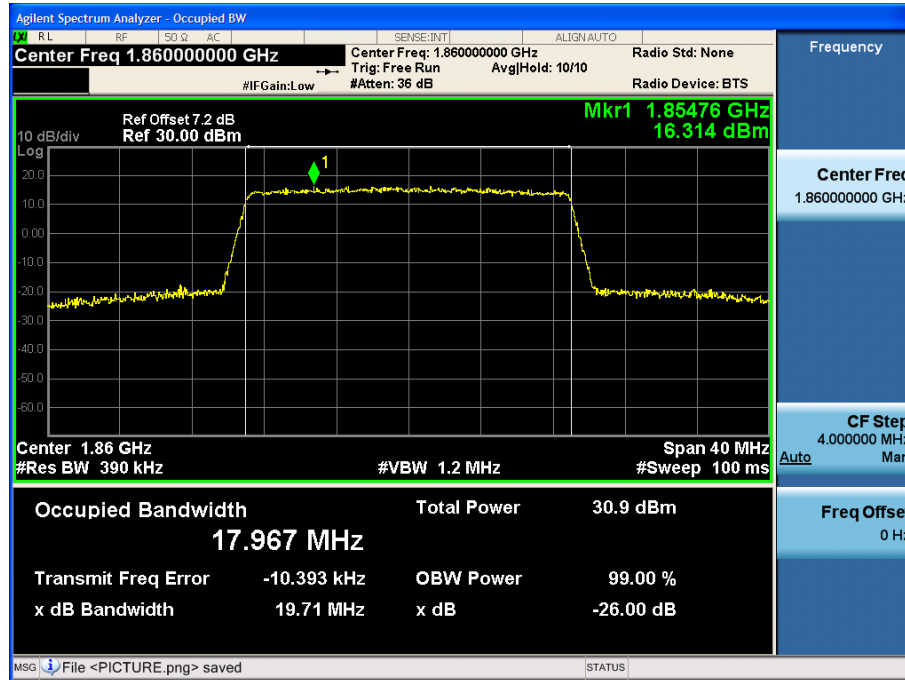


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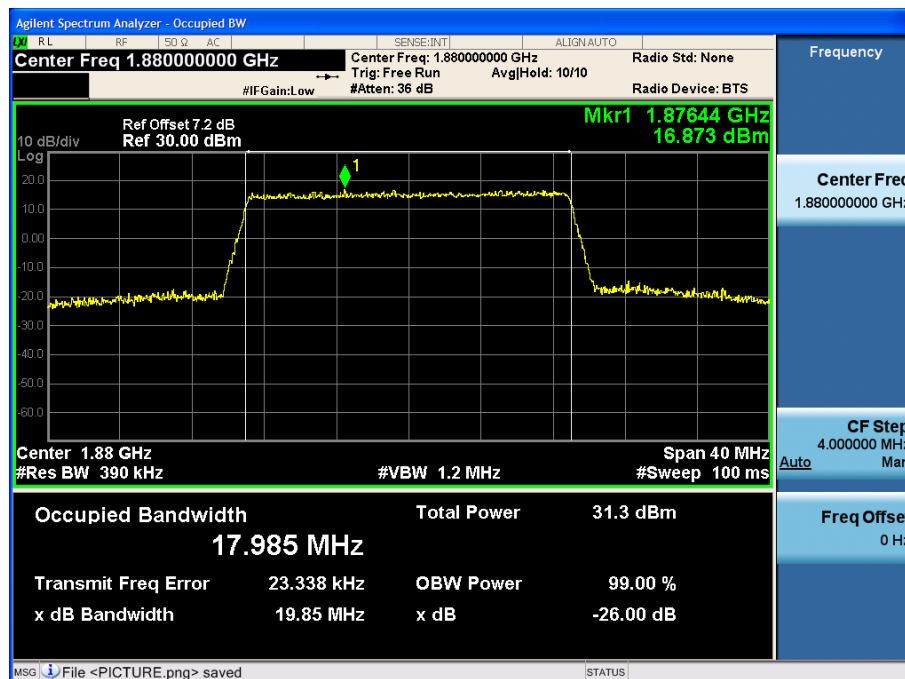
Report No.: ATA160705017F

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## 20MHz Lowest QPSK



## 20MHz Middle QPSK



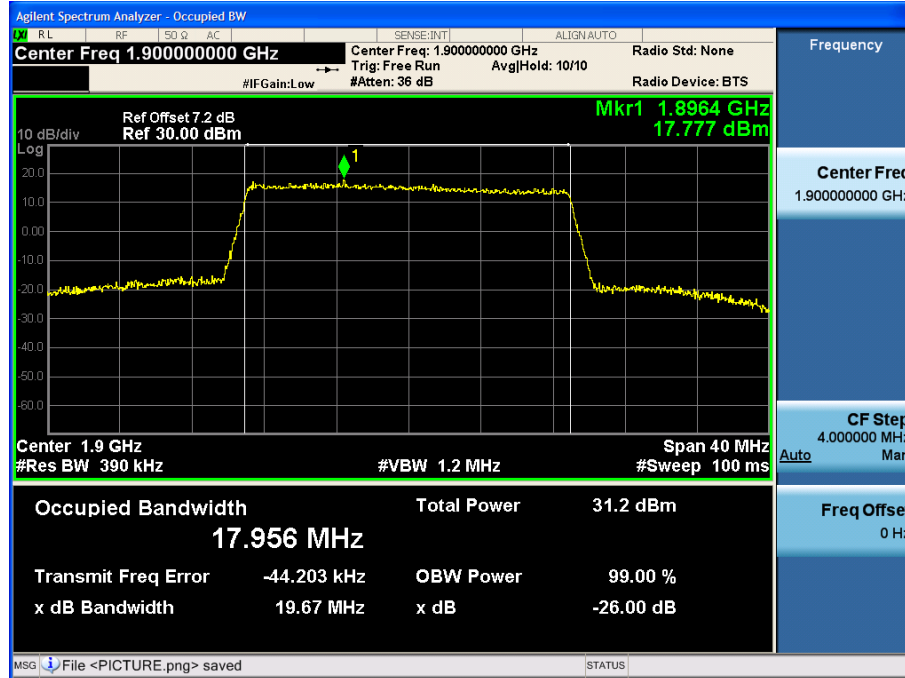


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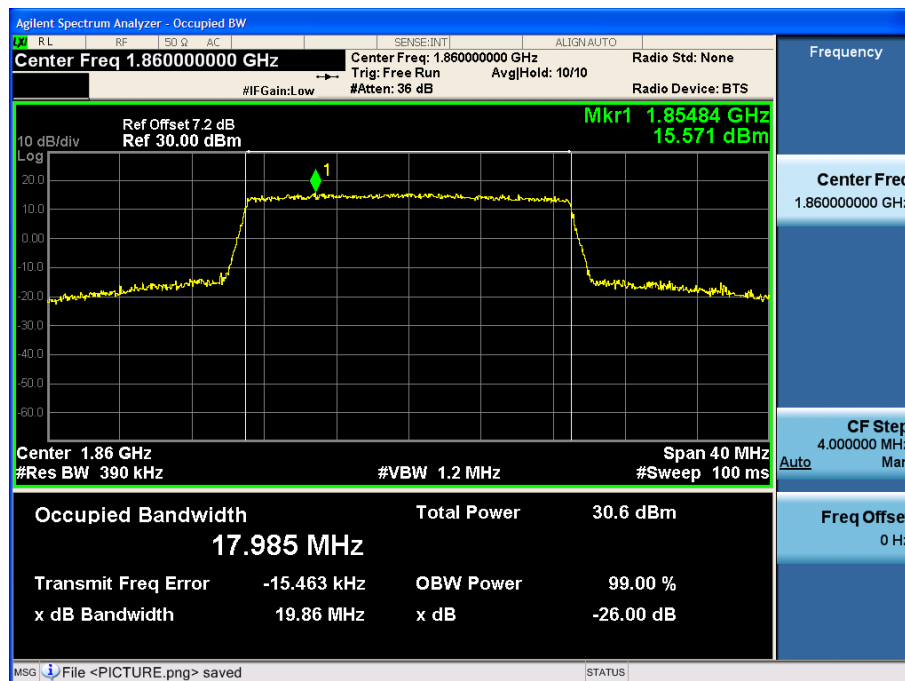
Report No.: ATA160705017F

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## 20MHz Highest QPSK



## 20MHz Lowest 16QAM



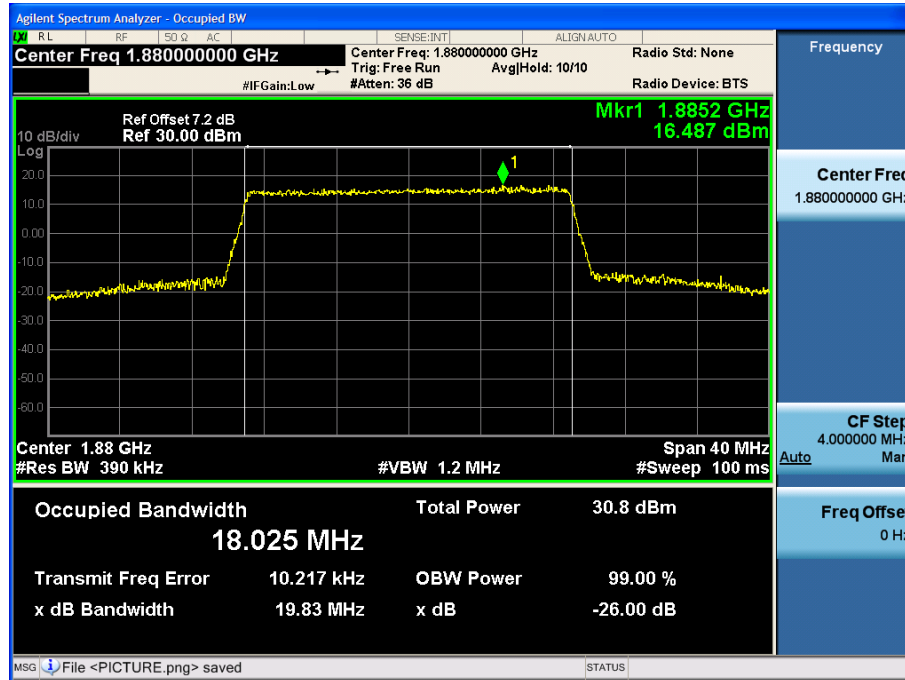


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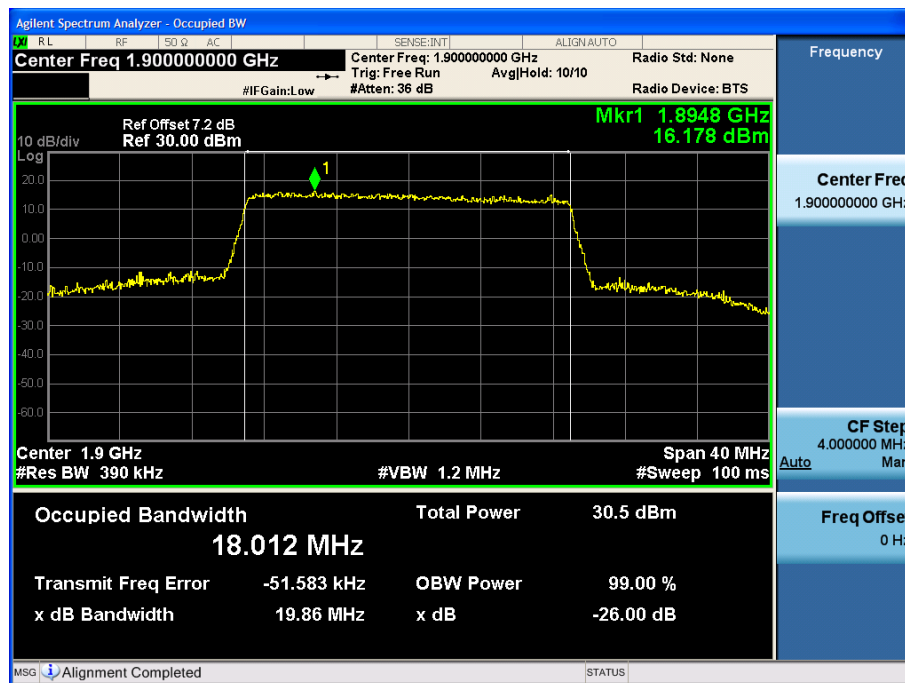
Report No.: ATA160705017F

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## 20MHz Middle 16QAM



## 20MHz Highest 16QAM





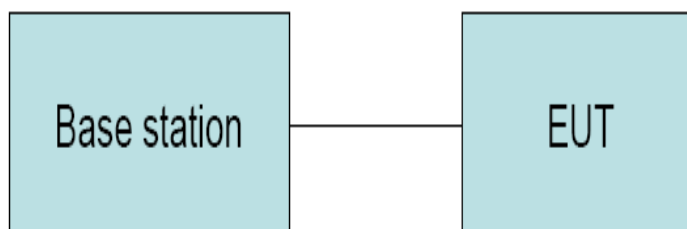


## 6. Frequency Stability

### 6.1. Limit

|                                                 |
|-------------------------------------------------|
| LTE Band2                                       |
| Must stay within the authorized frequency block |

### 6.2. Test Setup



### 6.3. Test Procedure

Test Procedures for Temperature Variation:

1. The EUT was set up in the thermal chamber and connected with the base station.
2. With power OFF, the temperature was decreased to -10°C and the EUT was stabilized for three hours. Power was applied and the maximum change in frequency was recorded within one minute.
3. With power OFF, the temperature was raised in 10°C step up to 45°C. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.
4. If the EUT can not be turned on at -10°C, the testing lowest temperature will be raised in 10°C step until the EUT can be turned on.

Test Procedures for Voltage Variation

1. The EUT was placed in a temperature chamber at 25±5° C and connected with the base station.
2. The power supply voltage to the EUT was varied from DC 5V to 3.5V
3. The variation in frequency was measured for the worst case.





## 6.4. Test Data

| Test Conditions     |                   | (QPSK) / Middle Channel |                 | Limit  |
|---------------------|-------------------|-------------------------|-----------------|--------|
| Temperature<br>(°C) | Voltage<br>(Volt) | BW 10MHz                |                 | Note   |
|                     |                   | Deviation (Hz)          | Deviation (ppm) | Result |
| 50°C                | Normal Voltage    | 25                      | 0.013           | PASS   |
| 30°C                | Normal Voltage    | 22                      | 0.012           |        |
| 20°C                | Normal Voltage    | 31                      | 0.016           |        |
| 10°C                | Normal Voltage    | -22                     | -0.012          |        |
| 0°C                 | Normal Voltage    | -23                     | -0.012          |        |
| -10°C               | Normal Voltage    | 23                      | 0.012           |        |
| -20°C               | Normal Voltage    | 32                      | 0.017           |        |
| -30°C               | Normal Voltage    | 31                      | 0.016           |        |
| 25°C                | Maximum Voltage   | -32                     | -0.017          |        |
| 25°C                | Normal Voltage    | -26                     | -0.014          |        |
| 25°C                | Minimum Voltage   | -21                     | -0.011          |        |

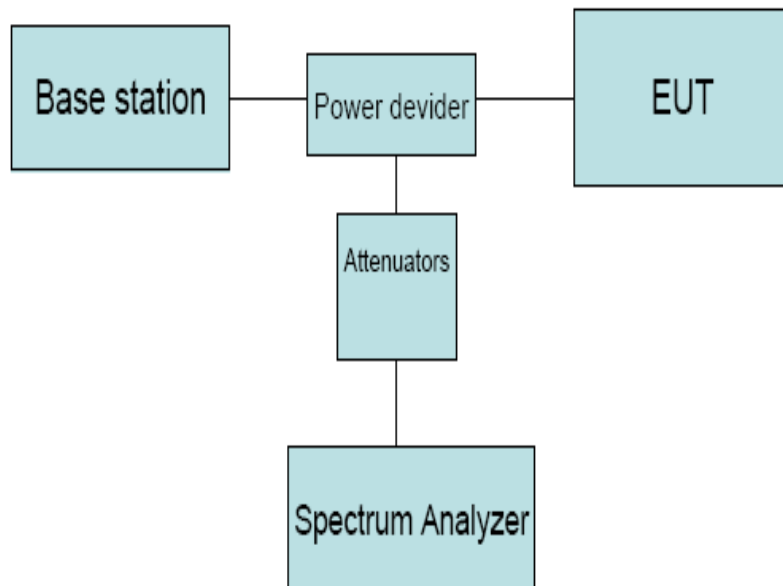


## 7. Conducted Spurious Emission

### 7.1. Limit

The mean power of emissions must be attenuated below the mean power of the unmodulated carrier (P) on any frequency outside the frequency band by at least  $(43 + 10 \log P)$  dB, in this case, -13dBm.

### 7.2. Test Setup



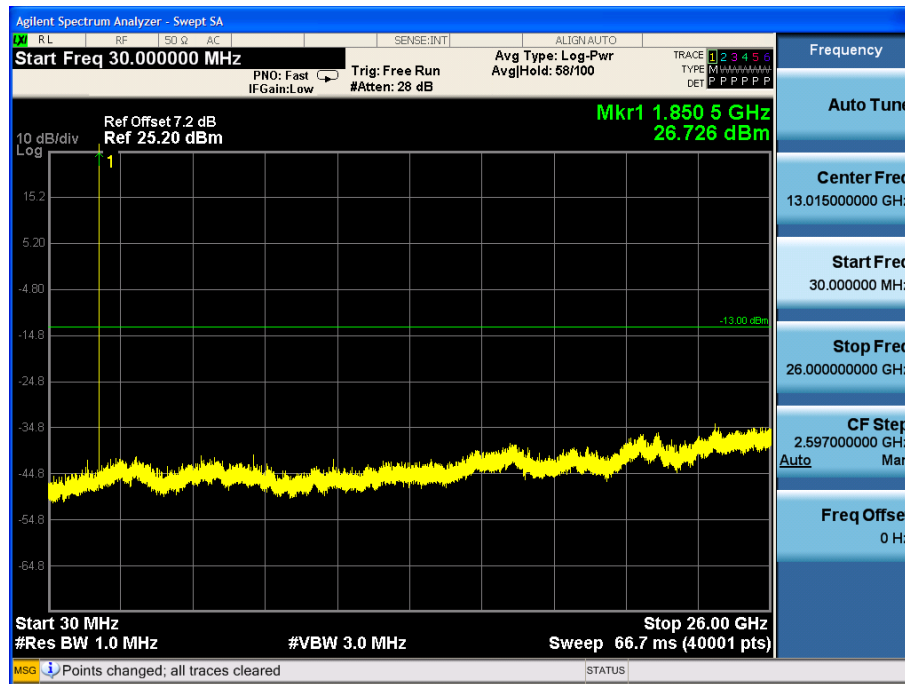
### 7.3. Test Procedure

1. The EUT was connected to spectrum analyzer and base station via power divider.
2. The low, middle and high channels of each band and mode's spurious emissions for 30MHz to 10th Harmonic were measured by Spectrum analyzer.

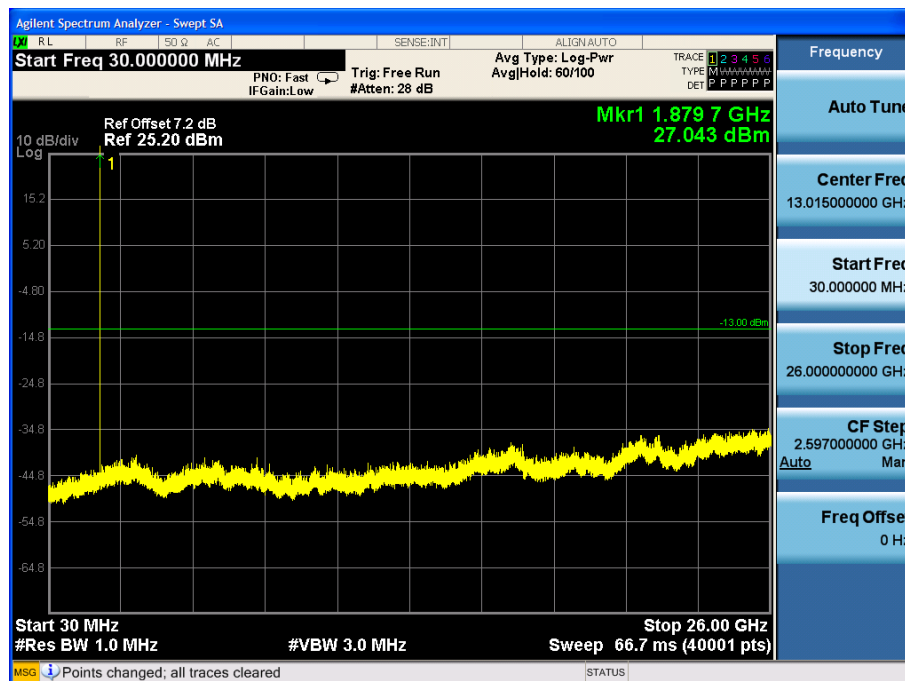


## 7.4. Test Plot

### QPSK 1.4MHz Low



### QPSK 1.4MHz Middle



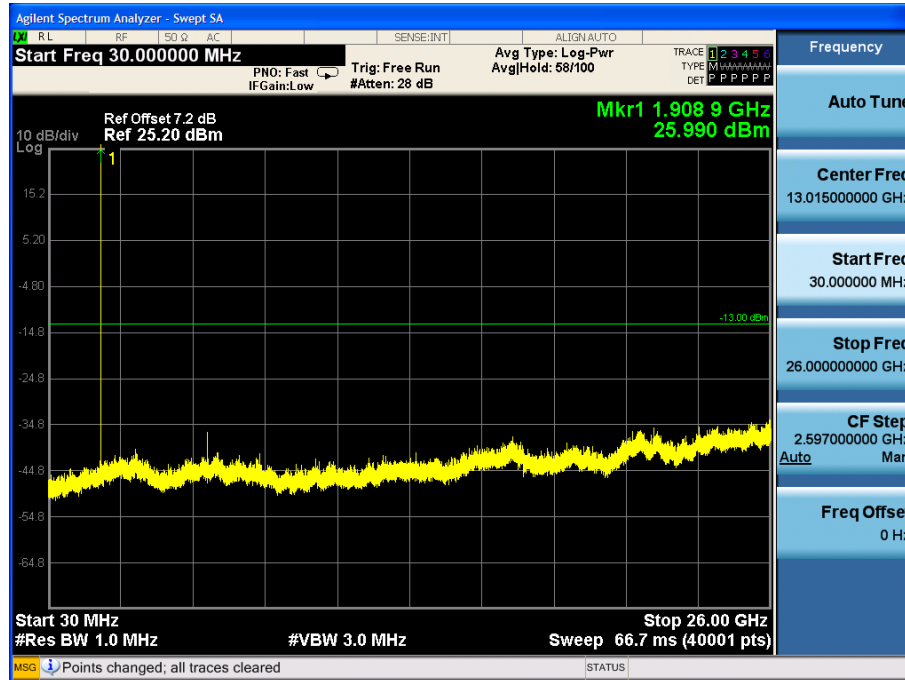


# ATA Testing Technology Service Co., Ltd.

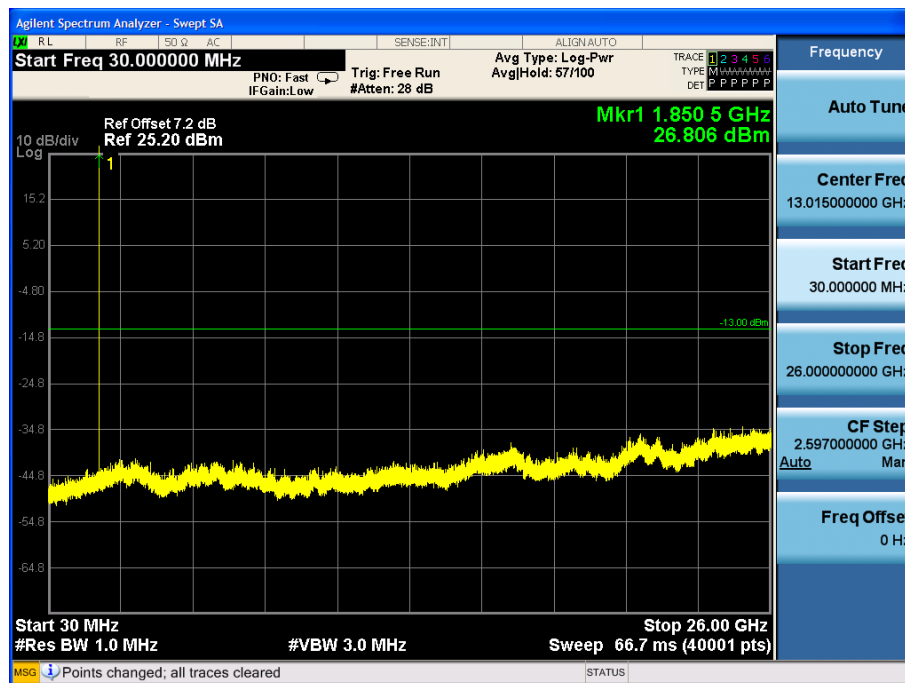
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QPSK 1.4MHz High



16QAM 1.4MHz Low



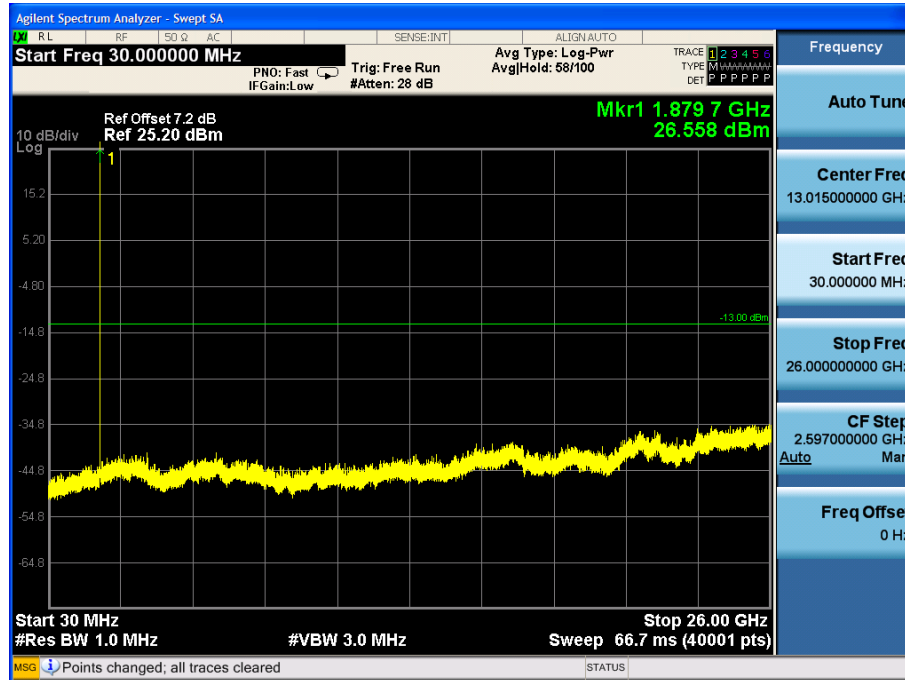


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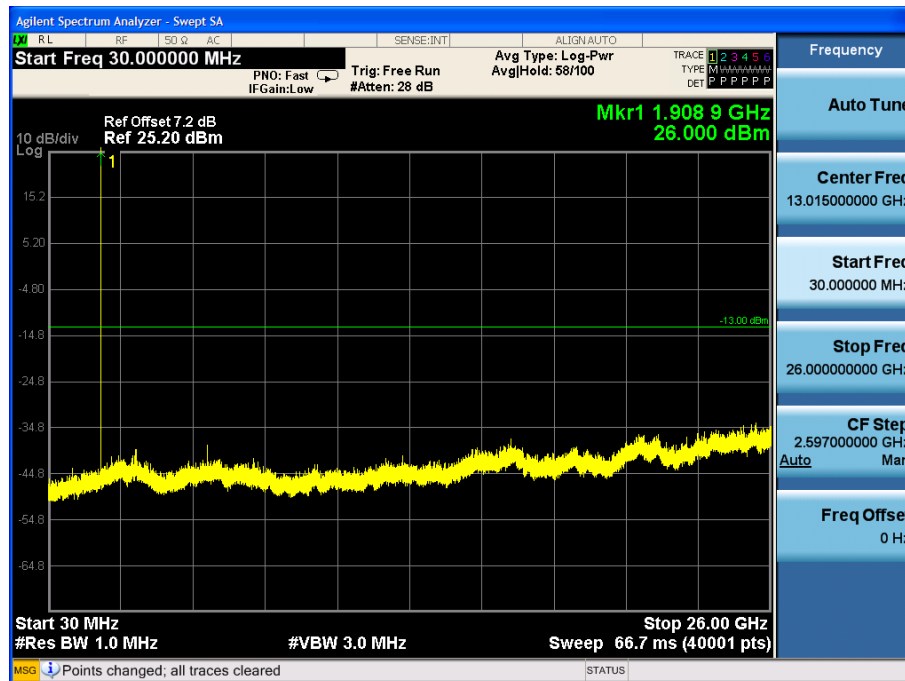
Report No.: ATA160705017F

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16QAM 1.4MHz Middle



16QAM 1.4MHz High



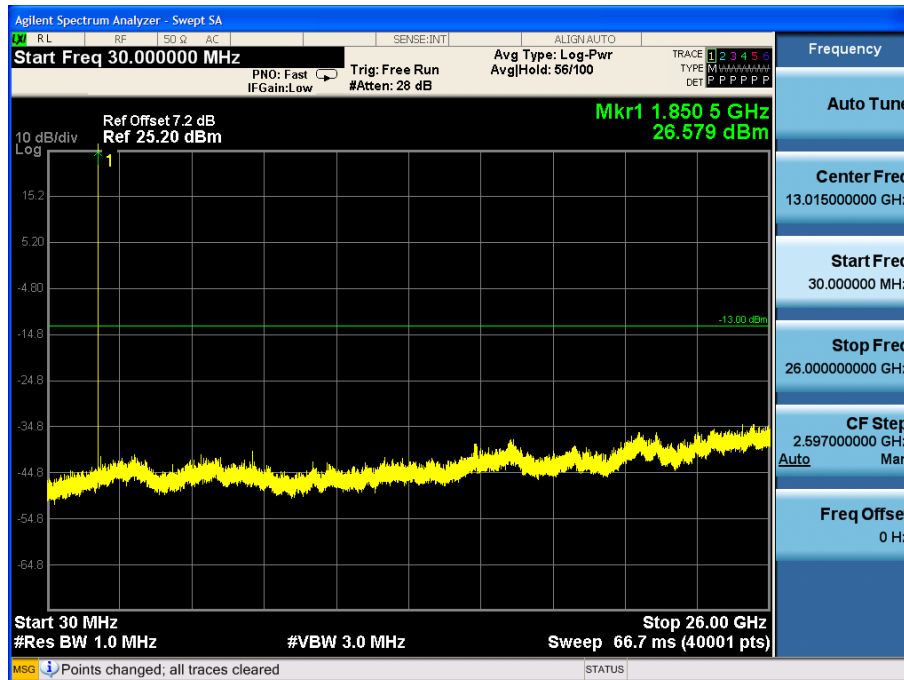


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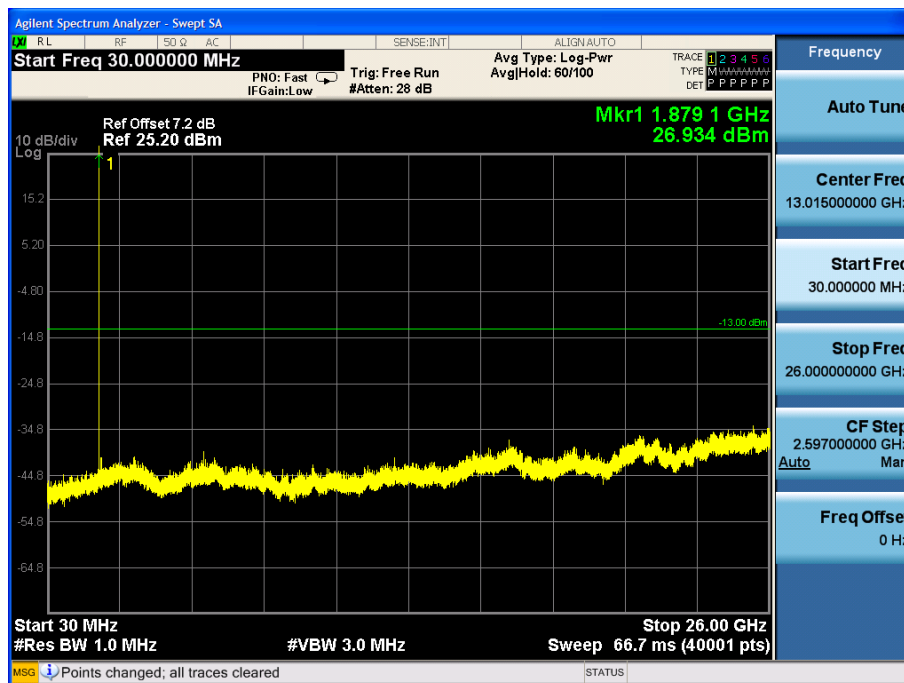
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## QPSK 3MHz Low



## QPSK 3MHz Middle



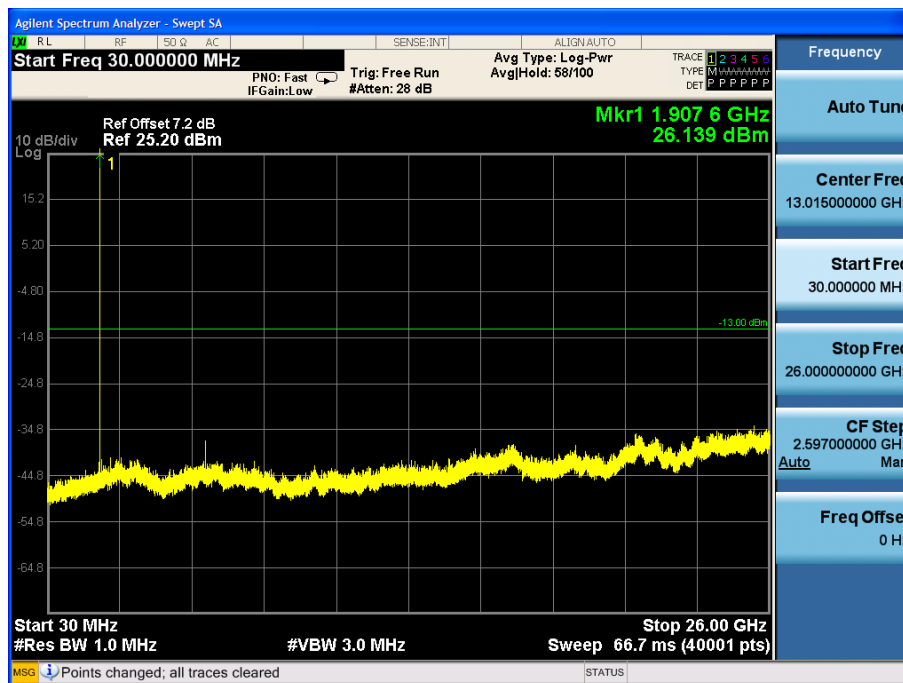


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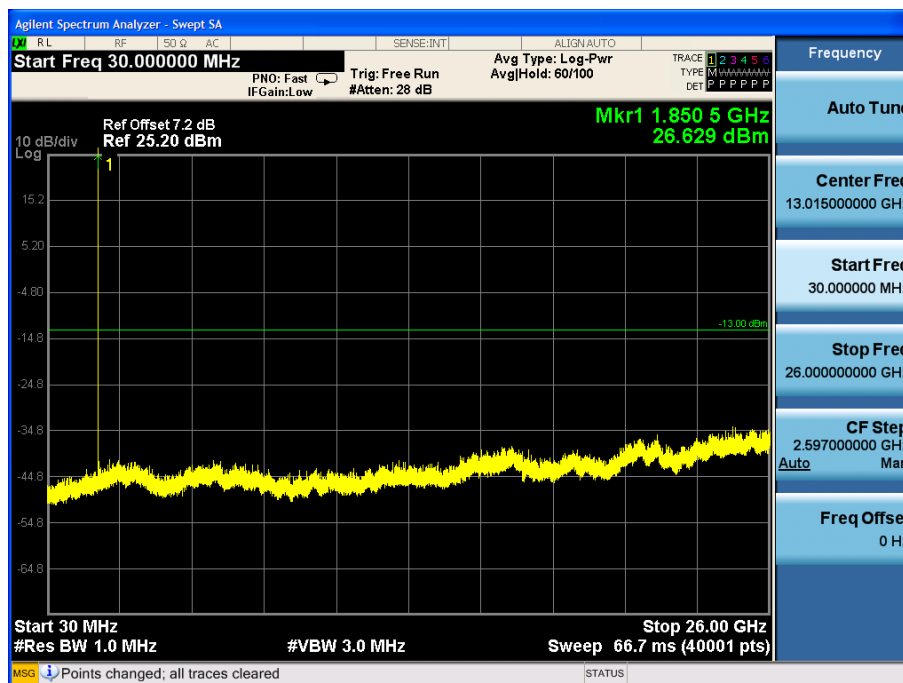
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## QPSK 3MHz High



## 16QAM 3MHz Low



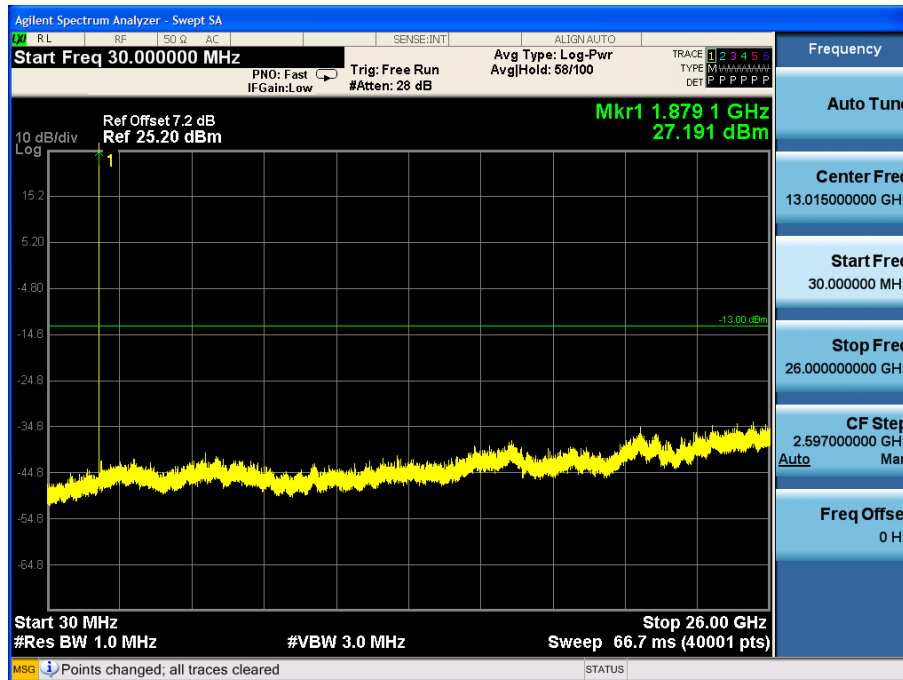


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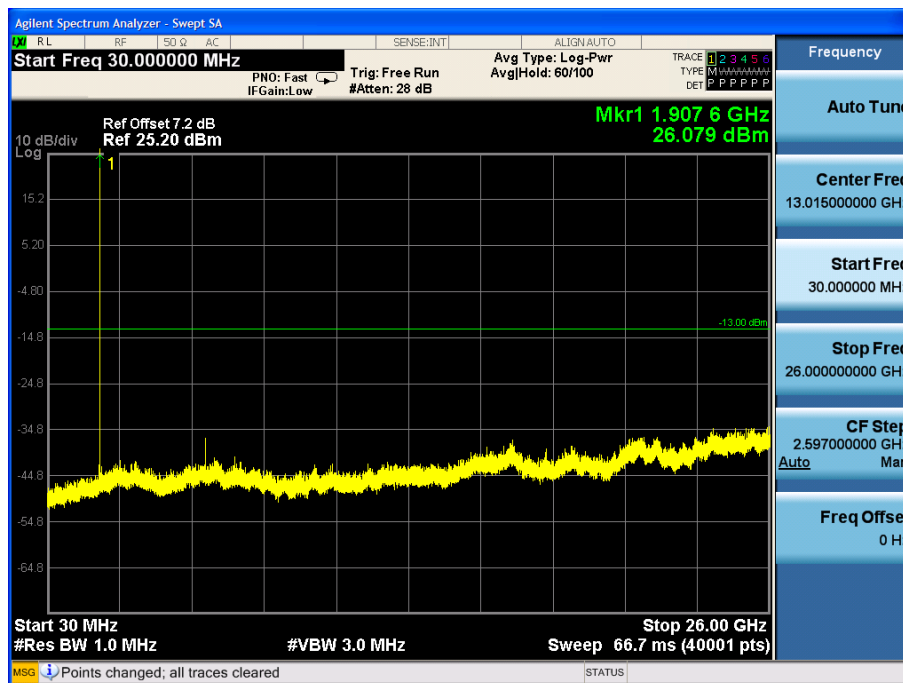
Report No.: ATA160705017F

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## 16QAM 3MHz Middle



## 16QAM 3MHz High





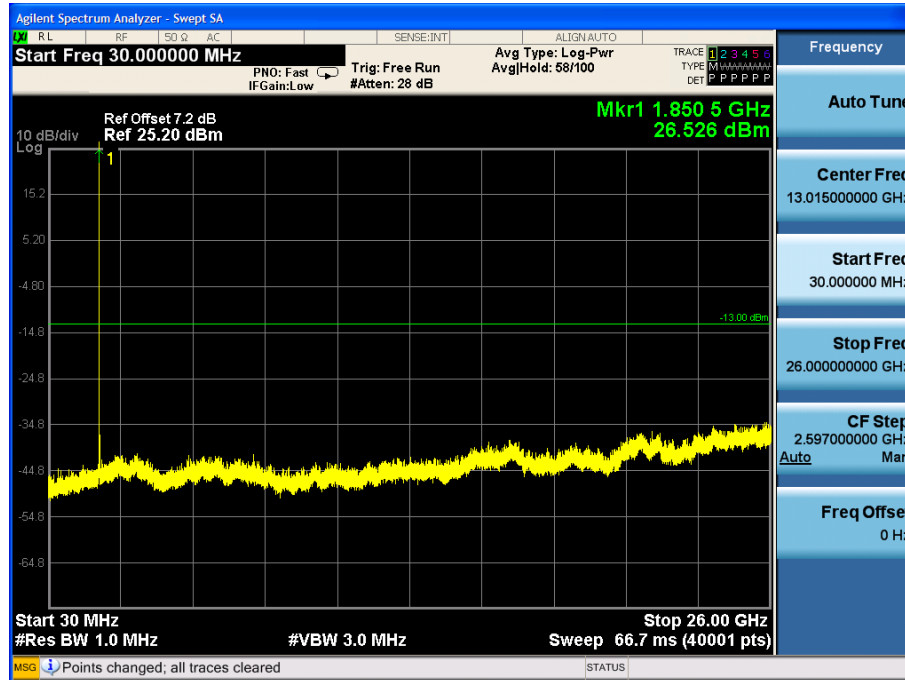


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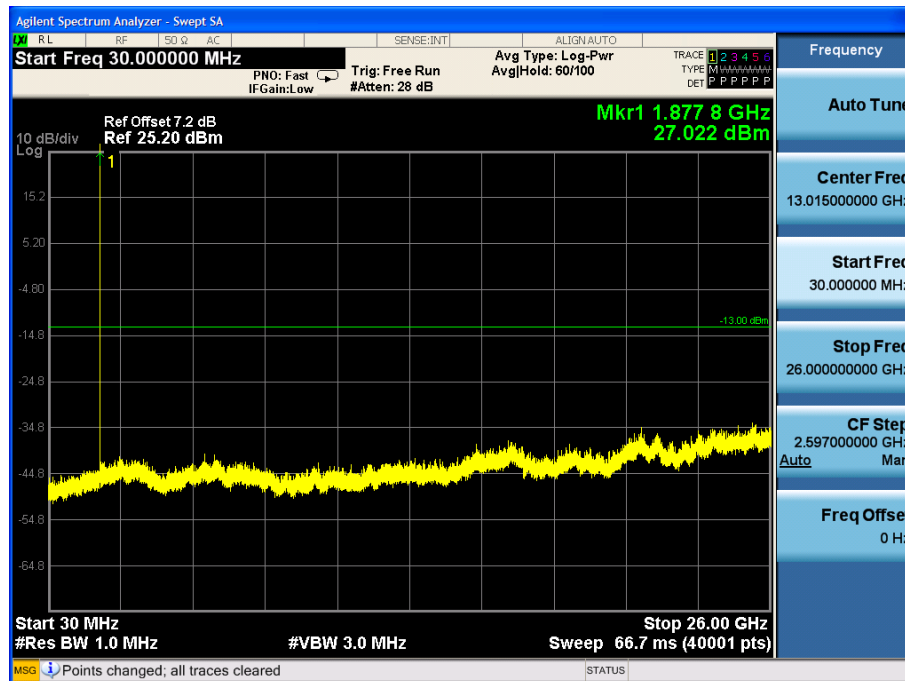
Report No.: ATA160705017F

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## QPSK 5MHz Low



## QPSK 5MHz Middle



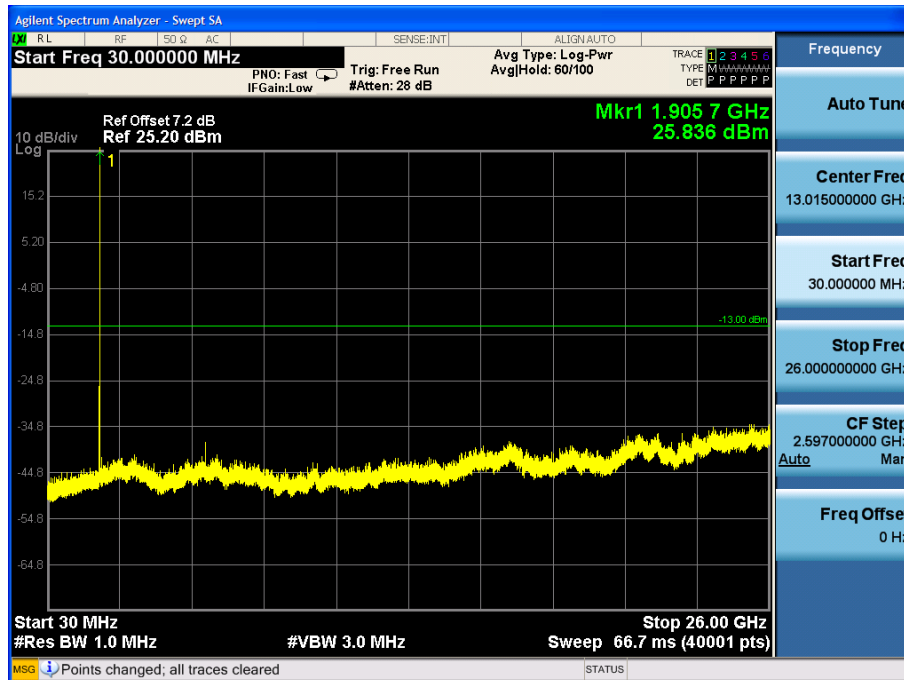


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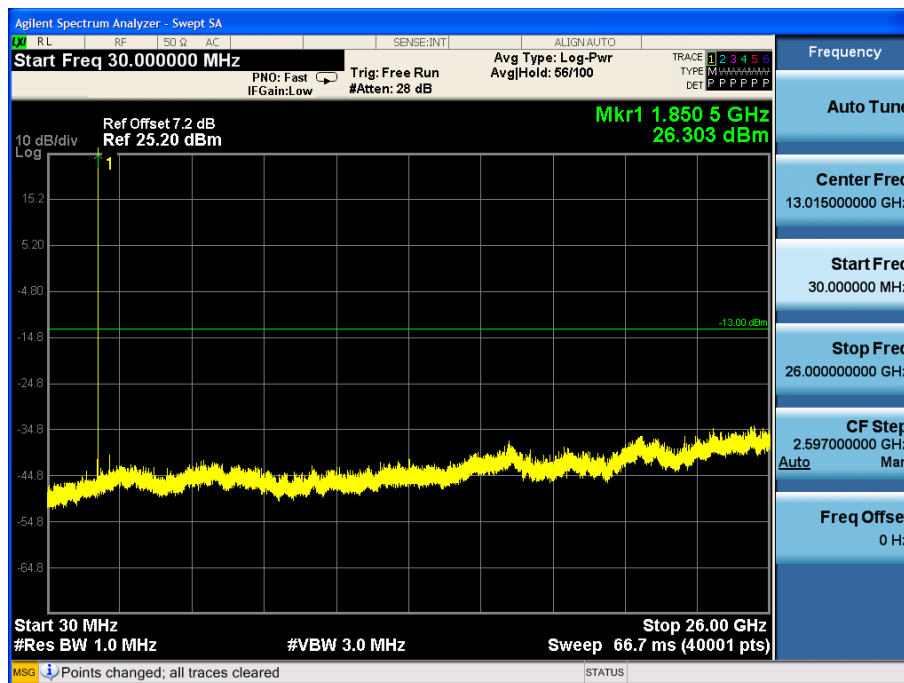
Report No.: ATA160705017F

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## QPSK 5MHz High



## 16QAM 5MHz Low



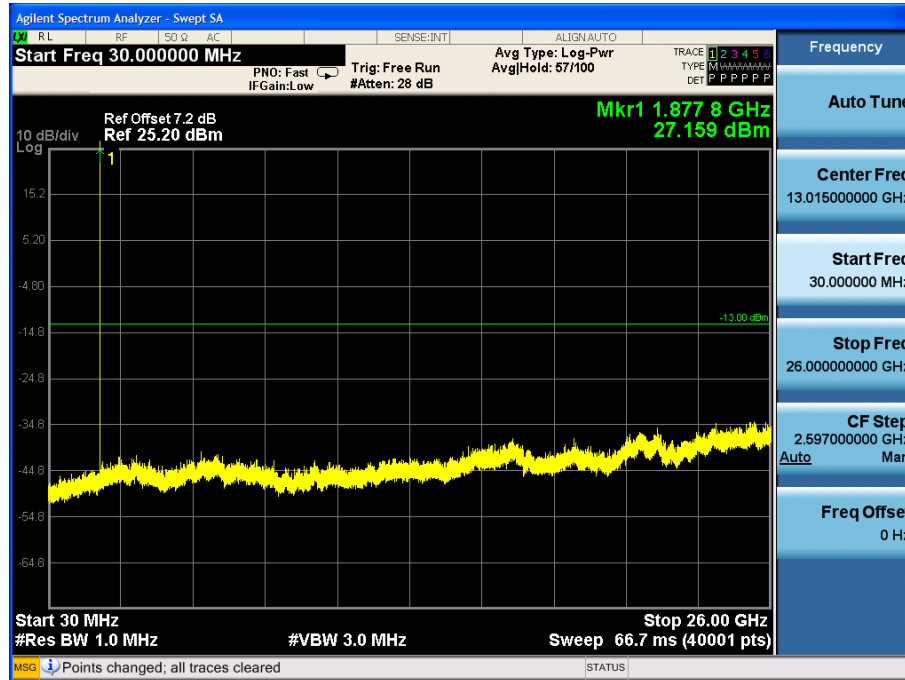


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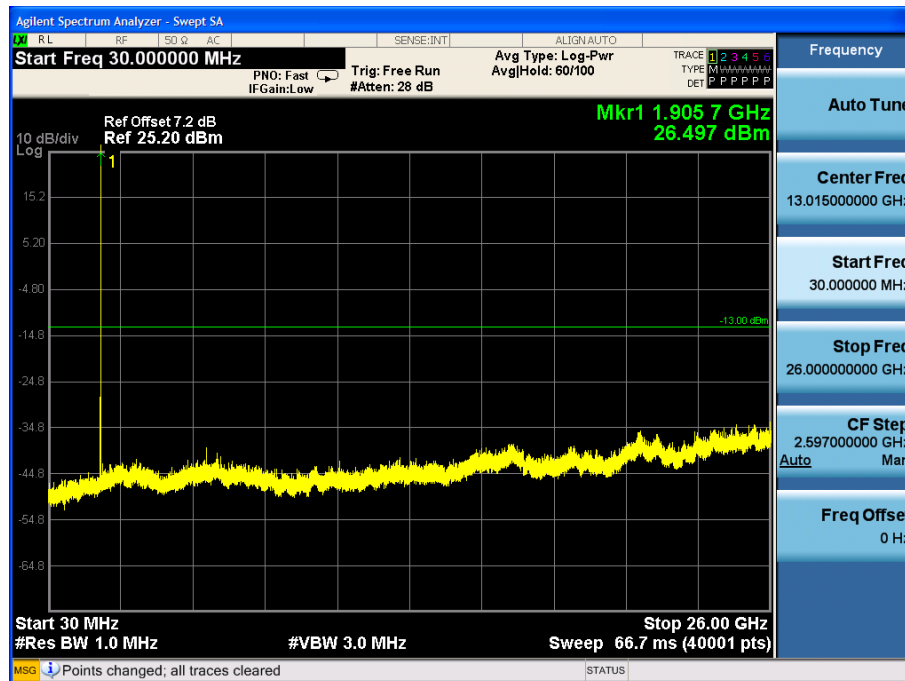
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## 16QAM 5MHz Middle



## 16QAM 5MHz High



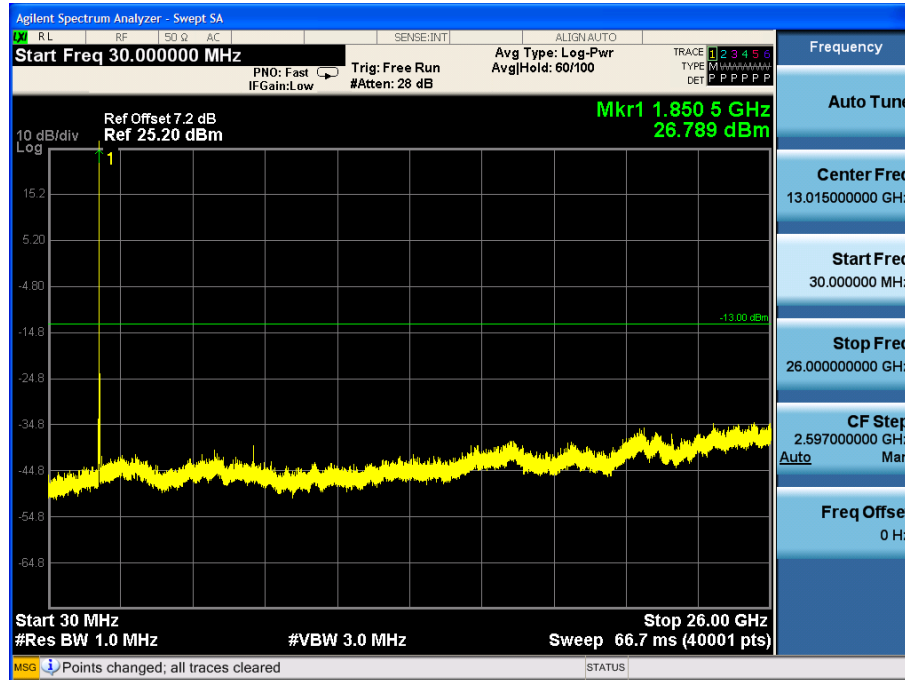


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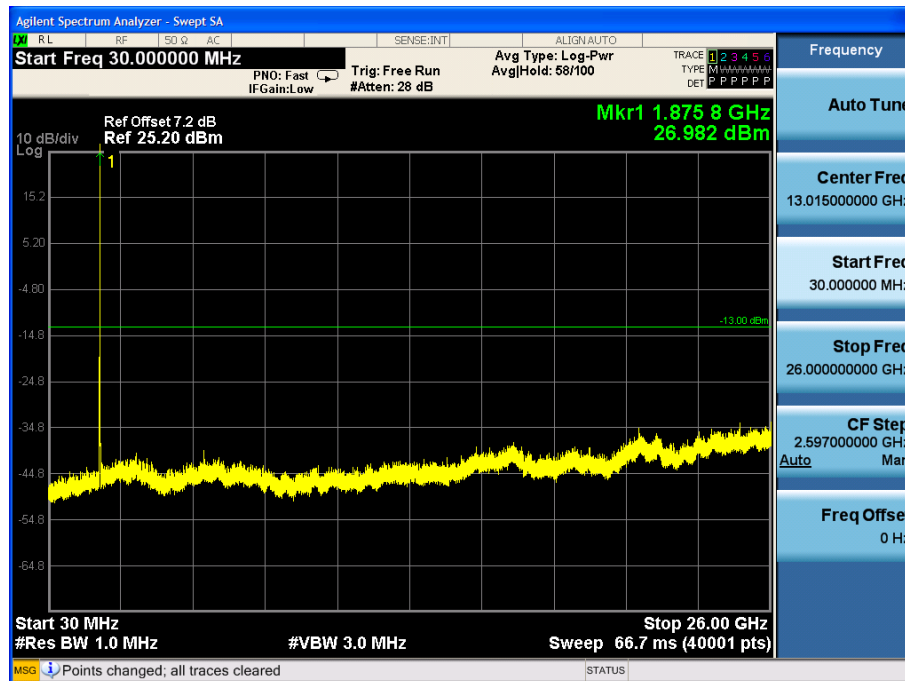
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## QPSK 10MHz Low



## QPSK 10MHz Middle



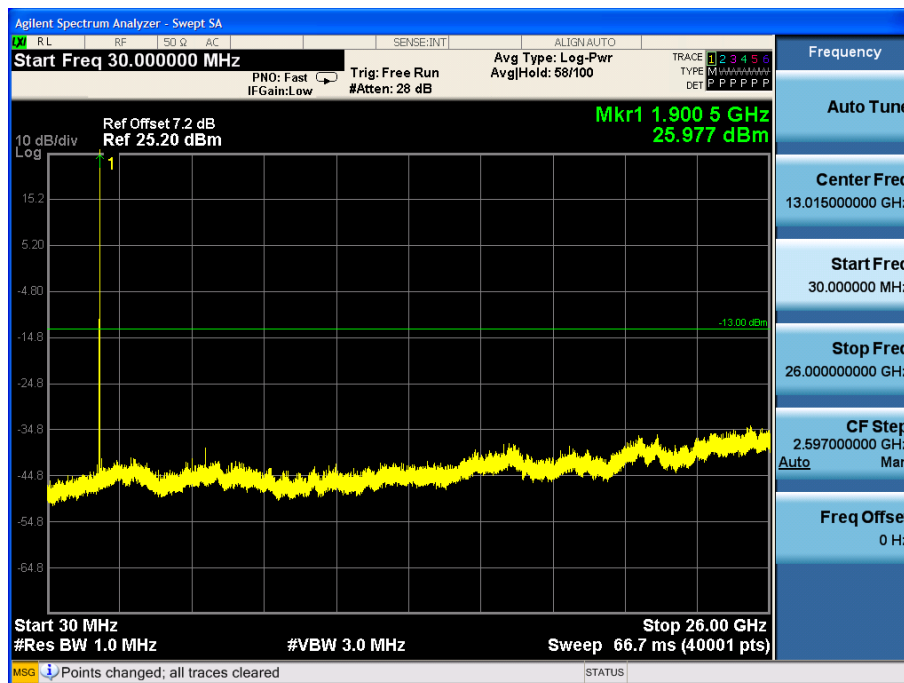


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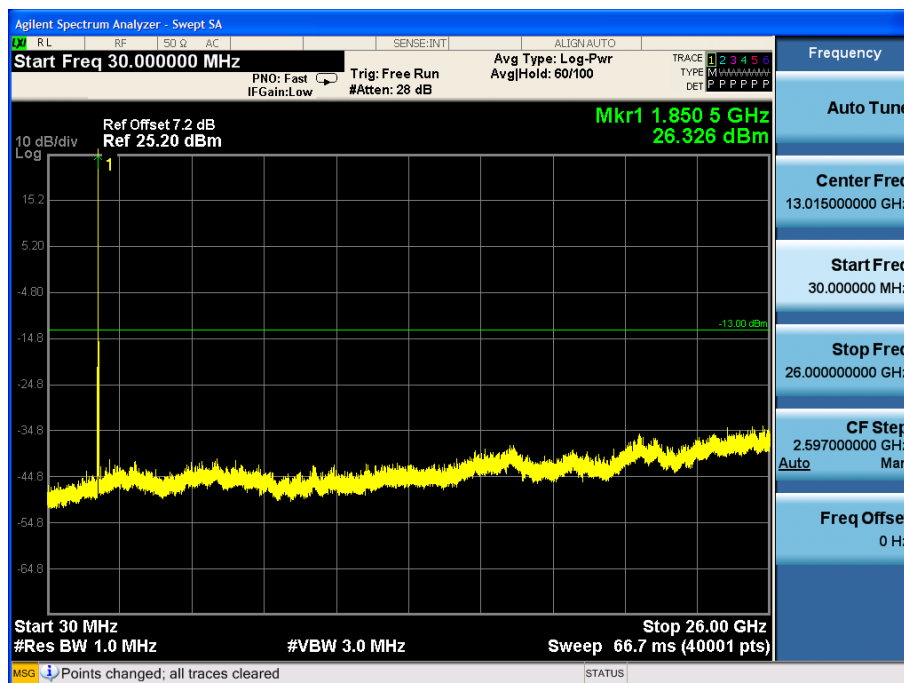
Report No.: ATA160705017F

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## QPSK 10MHz High



## 16QAM 10MHz Low



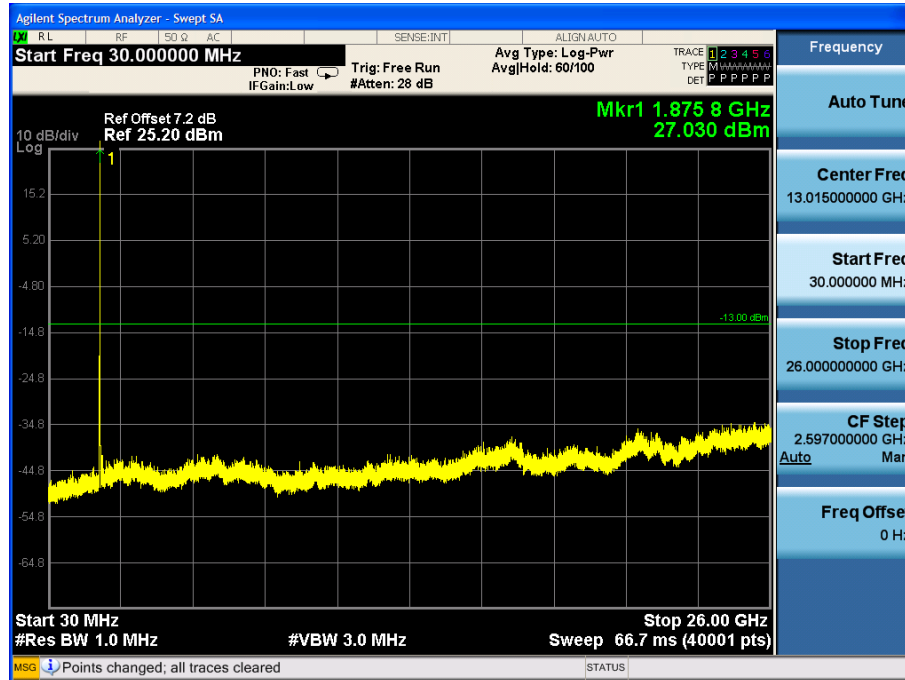


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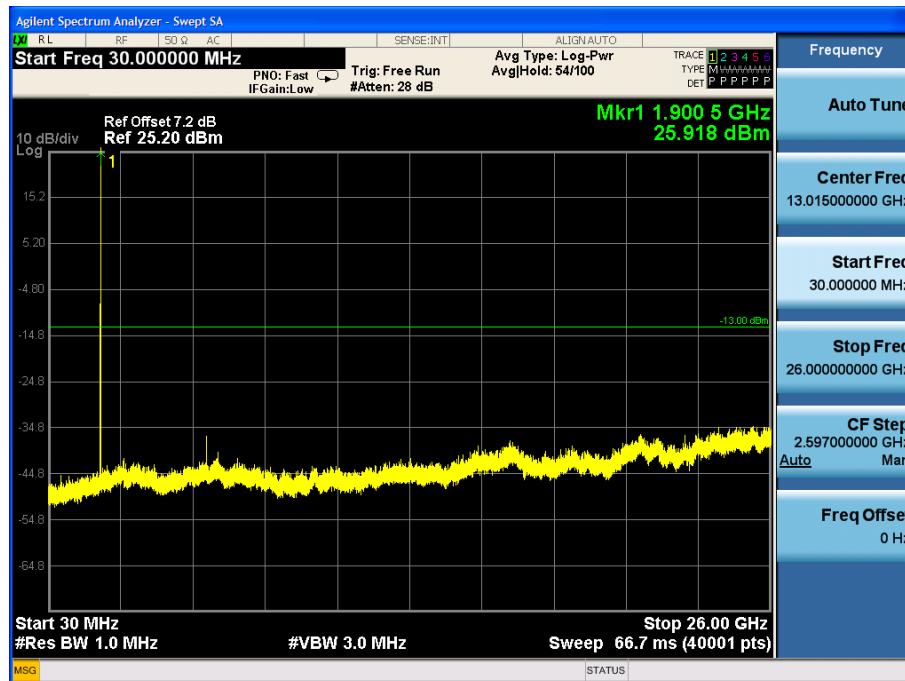
Report No.: ATA160705017F

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## 16QAM 10MHz Middle



## 16QAM 10MHz High



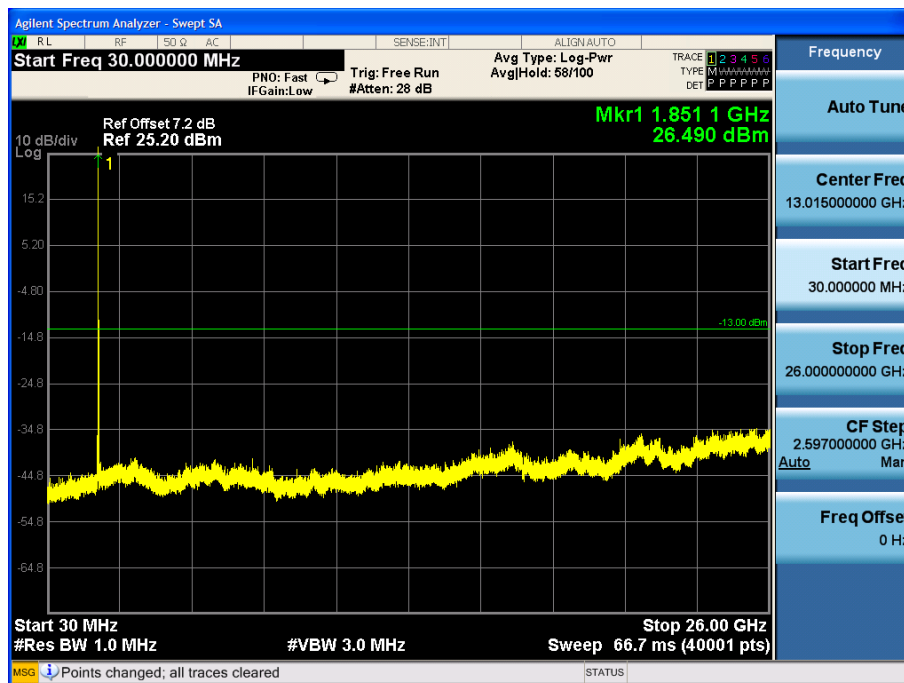


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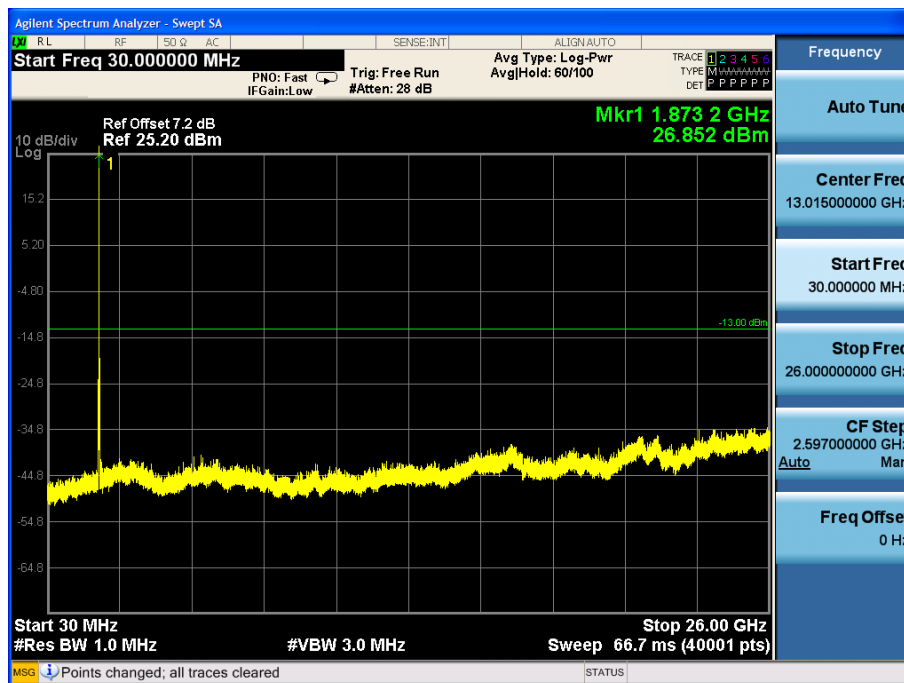
Report No.: ATA160705017F

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## QPSK 15MHz Low



## QPSK 15MHz Middle





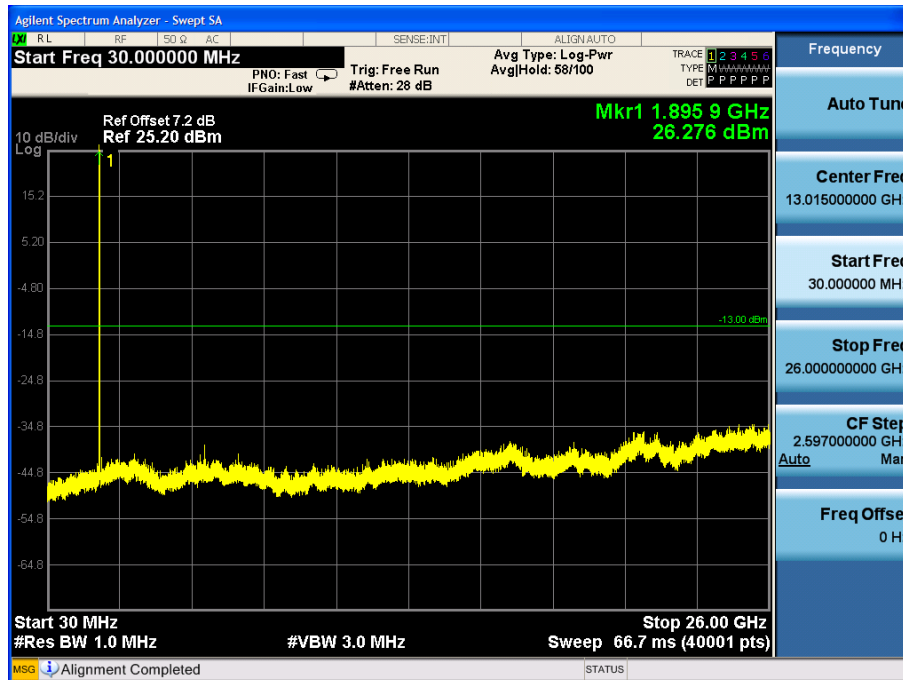


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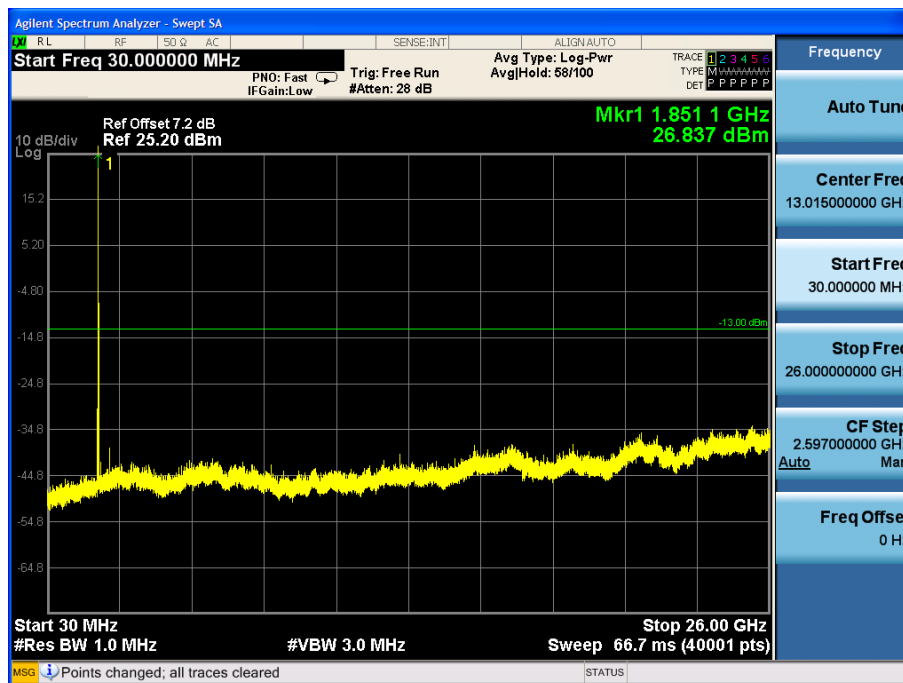
Report No.: ATA160705017F

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## QPSK 15MHz High



## 16QAM 15MHz Low





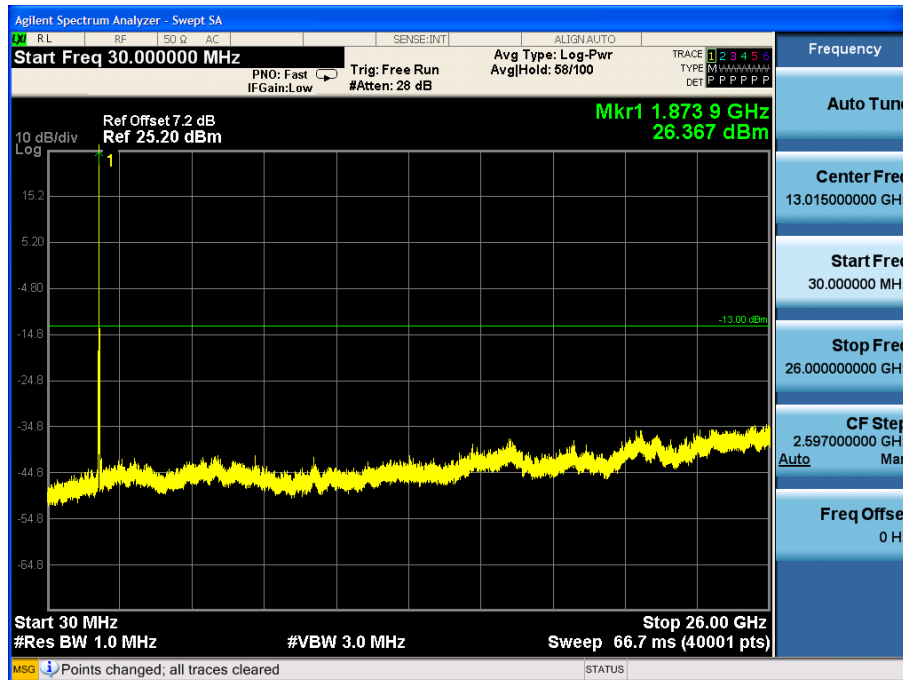


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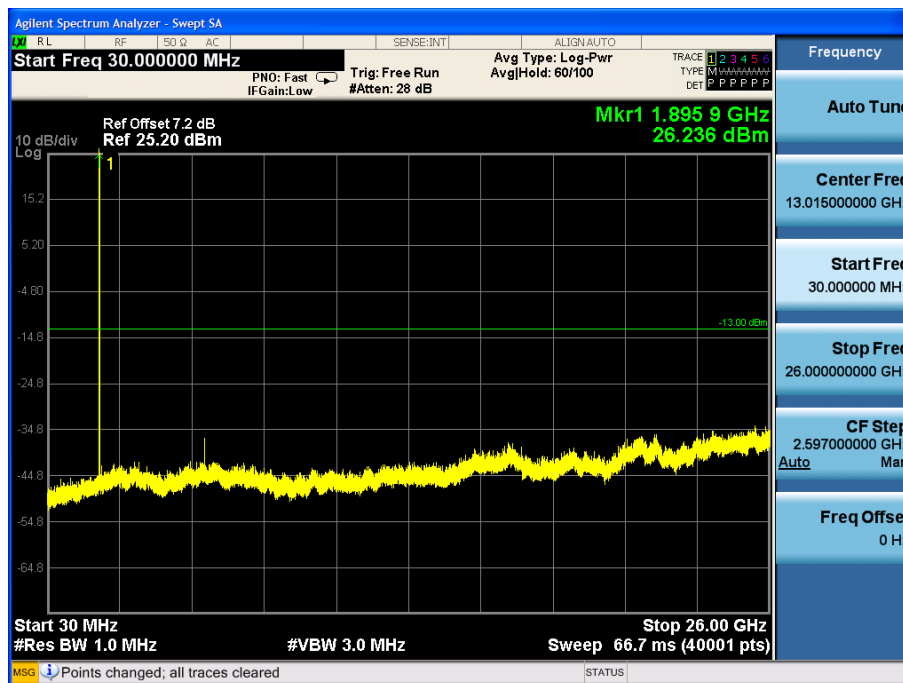
Report No.: ATA160705017F

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## 16QAM 15MHz Middle



## 16QAM 15MHz High



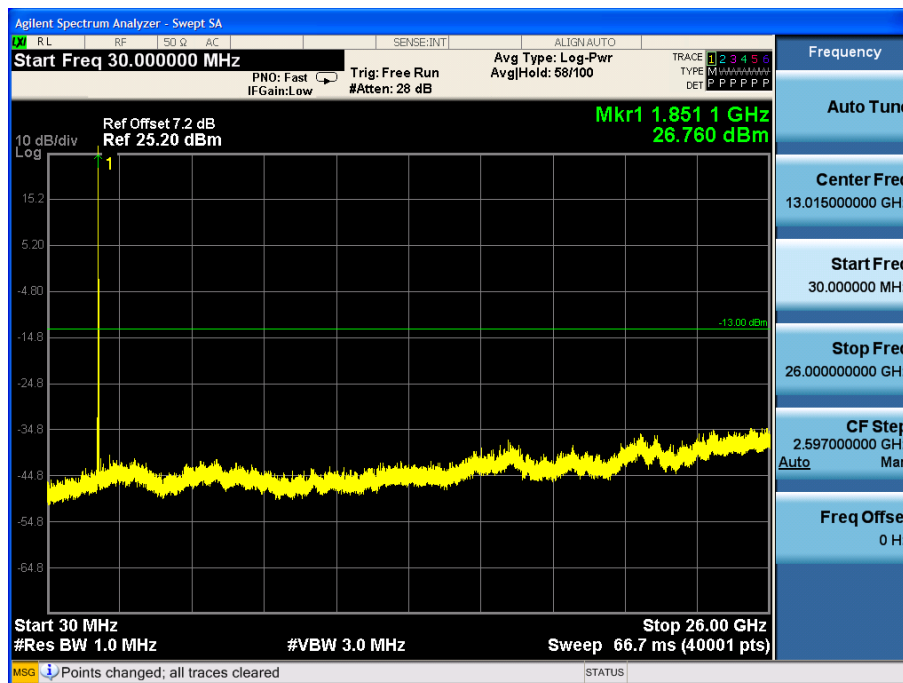


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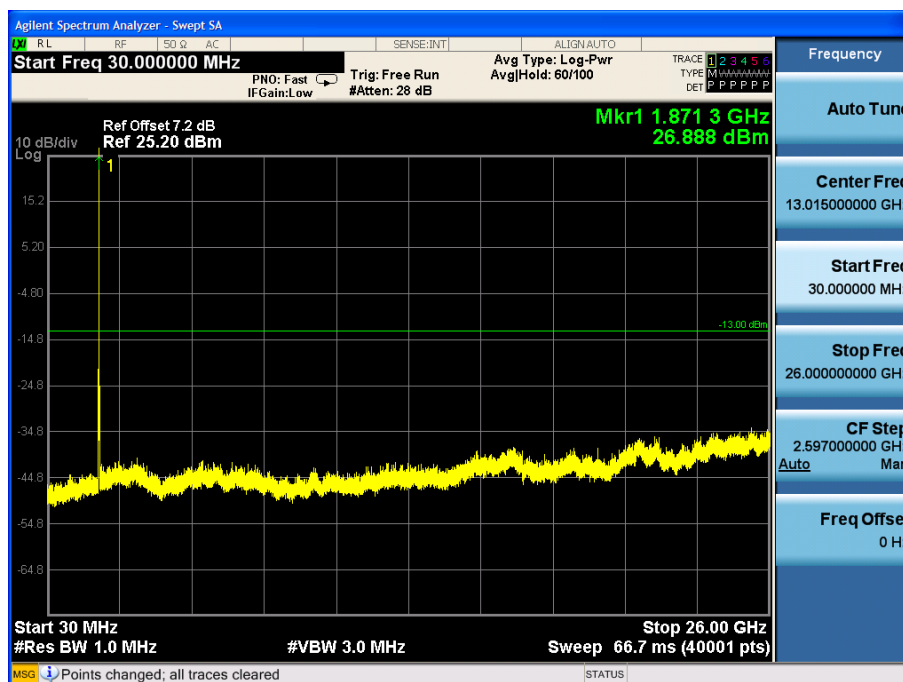
Report No.: ATA160705017F

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## QPSK 20MHz Low



## QPSK 20MHz Middle



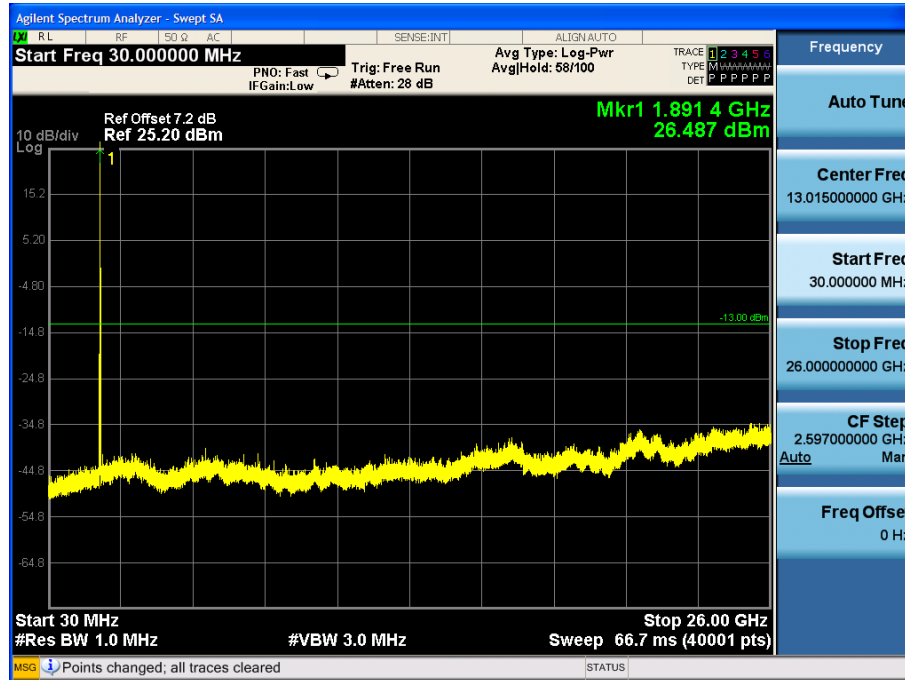


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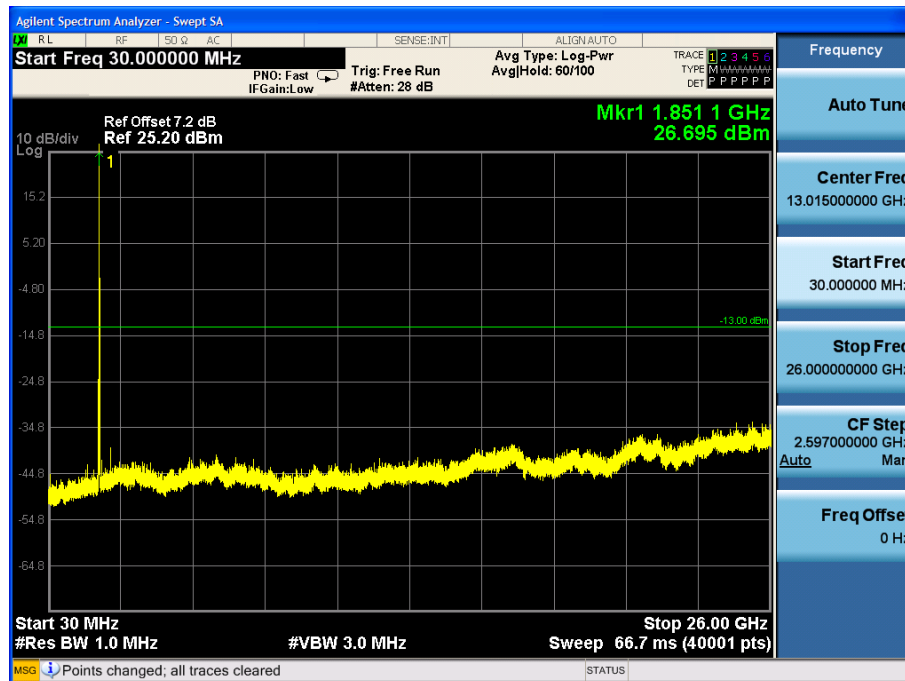
Report No.: ATA160705017F

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## QPSK 20MHz High



## 16QAM 20MHz Low



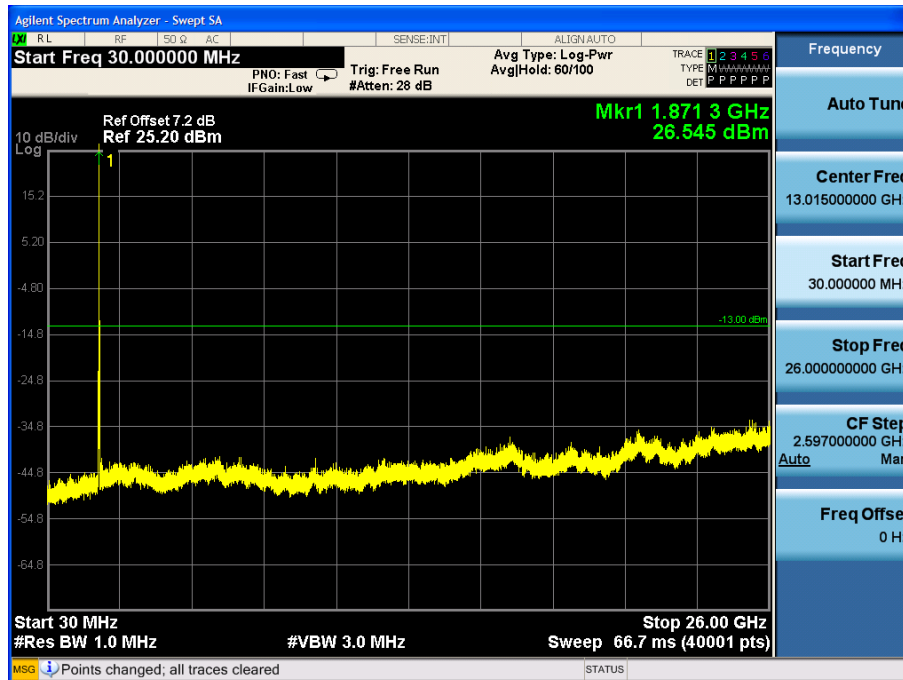


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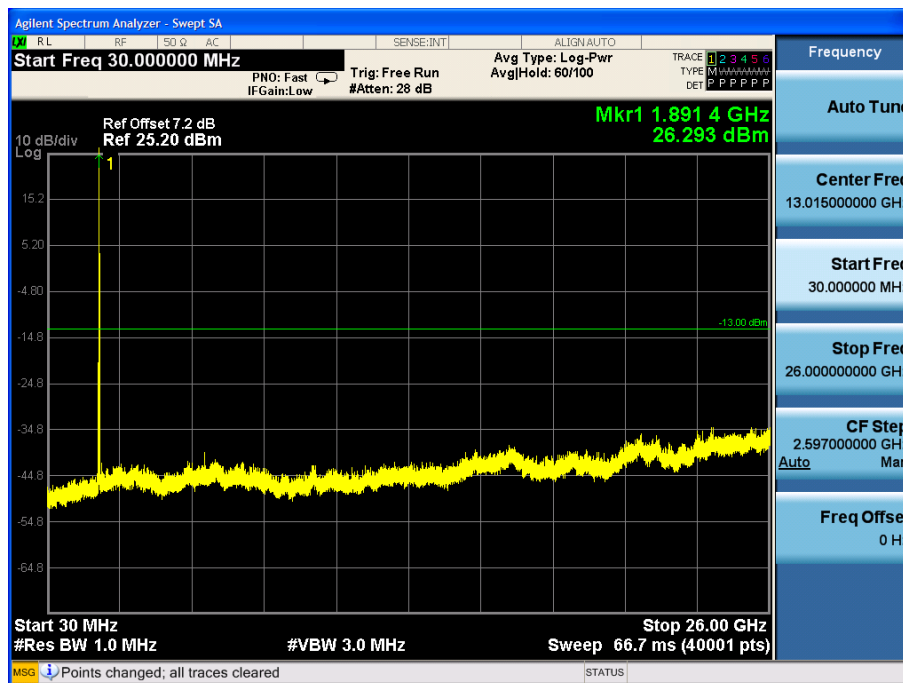
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## 16QAM 20MHz Middle



## 16QAM 20MHz High

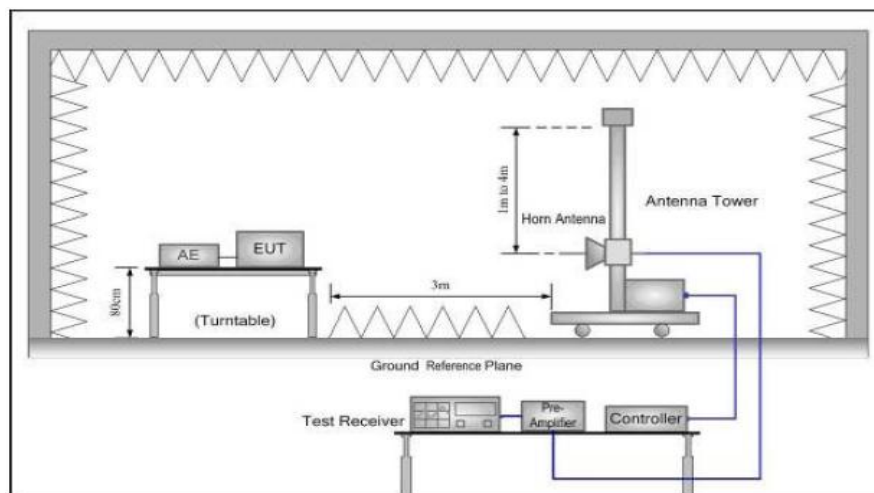


## 8. Radiated Spurious Emission

### 8.1. Limit

The mean power of emissions must be attenuated below the mean power of the unmodulated carrier (P) on any frequency outside the frequency band by at least  $(43 + 10 \log P)$  dB, in this case, -13dBm.

### 8.2. Test Setup



### 8.3. Test Procedure

1. The EUT was placed on a non-conductive rotating platform with 0.8 meter height in an anechoic chamber. The radiated spurious emissions from 30MHz to 10th harmonic of fundamental frequency were measured at 3m with a test antenna and a spectrum analyzer with RBW= 1MHz, VBW= 1MHz, peak detector settings.
2. During the measurement, the EUT was enforced in maximum power and linked with a base station. All the spurious emissions (record as LVL) at 3m were measured by rotation of the turntable and the test antenna raised and lowered over a range from 1 to 4 meters in both horizontally and vertically polarized orientations.
3. Final spurious emissions levels were measured by substitution method according to TIA/EIA-603-C. The EUT was replaced by dipole antenna (for frequency below 1GHz) or Horn antenna (for frequency above 1GHz) at same location with same polarize of receiver antenna and then a known power of each measure frequency from S.G. was applied into the dipole antenna or Horn antenna through a Tx cable, and then recorded the maximum Analyzer reading through raised and lowered the test antenna. The correction factor (in dB) = S.G. - Tx Cable loss + Substitution antenna gain - Substitution antenna Loss (only for Dipole antenna) - Analyzer reading. Then final

spurious emissions were calculated with the correction factor,  $EIRP = LVL + \text{Correction factor}$  and



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ERP = EIRP – 2.15

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## 8.4. Test Result

| Test result for Lowest Channel QPSK(1.4MHz) |                      |           |                       |                   |             |             |
|---------------------------------------------|----------------------|-----------|-----------------------|-------------------|-------------|-------------|
| Frequency (MHz)                             | Antenna polarization | LVL (dBm) | Correction factor(dB) | Result (ERP)(dBm) | Limit (dBm) | Margin (dB) |
| 1232.9                                      | H                    | -55.58    | 4.25                  | -51.33            | -13.00      | 38.33       |
| 3701.4                                      | H                    | -57.93    | 6.50                  | -51.43            | -13.00      | 38.43       |
| 1232.9                                      | V                    | -53.27    | 4.25                  | -49.02            | -13.00      | 36.02       |
| 3701.4                                      | V                    | -58.61    | 6.50                  | -52.11            | -13.00      | 39.11       |
| /                                           | /                    | /         | /                     | /                 | /           | /           |
|                                             |                      |           |                       |                   |             |             |

| Test result for Lowest Channel 16QAM(1.4MHz) |                      |           |                       |                   |             |             |
|----------------------------------------------|----------------------|-----------|-----------------------|-------------------|-------------|-------------|
| Frequency (MHz)                              | Antenna polarization | LVL (dBm) | Correction factor(dB) | Result (ERP)(dBm) | Limit (dBm) | Margin (dB) |
| 1232.9                                       | H                    | -55.85    | 4.25                  | -51.6             | -13.00      | 38.60       |
| 3701.4                                       | H                    | -57.67    | 6.50                  | -51.17            | -13.00      | 38.17       |
| 1232.9                                       | V                    | -53.27    | 4.25                  | -49.02            | -13.00      | 36.02       |
| 3701.4                                       | V                    | -58.39    | 6.50                  | -51.89            | -13.00      | 38.89       |
| /                                            | /                    | /         | /                     | /                 | /           | /           |
|                                              |                      |           |                       |                   |             |             |



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| Test result for Middle Channel QPSK(1.4MHz) |                      |           |                       |                   |             |             |
|---------------------------------------------|----------------------|-----------|-----------------------|-------------------|-------------|-------------|
| Frequency (MHz)                             | Antenna polarization | LVL (dBm) | Correction factor(dB) | Result (ERP)(dBm) | Limit (dBm) | Margin (dB) |
| 1232.9                                      | H                    | -55.68    | 4.25                  | -51.43            | -13.00      | 38.43       |
| 3760                                        | H                    | -57.43    | 6.65                  | -50.78            | -13.00      | 37.78       |
| 1232.9                                      | V                    | -53.41    | 4.25                  | -49.16            | -13.00      | 36.16       |
| 3760                                        | V                    | -58.54    | 6.65                  | -51.89            | -13.00      | 38.89       |
| /                                           | /                    | /         | /                     | /                 | /           | /           |
|                                             |                      |           |                       |                   |             |             |

| Test result for Middle Channel 16QAM(1.4MHz) |                      |           |                       |                   |             |             |
|----------------------------------------------|----------------------|-----------|-----------------------|-------------------|-------------|-------------|
| Frequency (MHz)                              | Antenna polarization | LVL (dBm) | Correction factor(dB) | Result (ERP)(dBm) | Limit (dBm) | Margin (dB) |
| 1232.9                                       | H                    | -55.82    | 4.25                  | -51.57            | -13.00      | 38.57       |
| 3760                                         | H                    | -57.59    | 6.65                  | -50.94            | -13.00      | 37.94       |
| 1232.9                                       | V                    | -53.38    | 4.25                  | -49.13            | -13.00      | 36.13       |
| 3760                                         | V                    | -58.19    | 6.65                  | -51.54            | -13.00      | 38.54       |
| /                                            | /                    | /         | /                     | /                 | /           | /           |
|                                              |                      |           |                       |                   |             |             |



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| Test result for Highest Channel QPSK(1.4MHz) |                             |              |                          |                          |                |                |
|----------------------------------------------|-----------------------------|--------------|--------------------------|--------------------------|----------------|----------------|
| Frequenc<br>y<br>(MHz)                       | Antenna<br>polarizatio<br>n | LVL<br>(dBm) | Correction<br>factor(dB) | Result<br>(ERP)(dB<br>m) | Limit<br>(dBm) | Margin<br>(dB) |
| 1232.9                                       | H                           | -55.68       | 4.25                     | -51.43                   | -13.00         | 38.43          |
| 3818.6                                       | H                           | -57.43       | 6.93                     | -50.5                    | -13.00         | 37.50          |
| 1232.9                                       | V                           | -53.41       | 4.25                     | -49.16                   | -13.00         | 36.16          |
| 3818.6                                       | V                           | -58.54       | 6.93                     | -51.61                   | -13.00         | 38.61          |
| /                                            | /                           | /            | /                        | /                        | /              | /              |
|                                              |                             |              |                          |                          |                |                |

| Test result for Highest Channel 16QAM(1.4MHz) |                             |              |                          |                          |                |                |
|-----------------------------------------------|-----------------------------|--------------|--------------------------|--------------------------|----------------|----------------|
| Frequenc<br>y<br>(MHz)                        | Antenna<br>polarizatio<br>n | LVL<br>(dBm) | Correction<br>factor(dB) | Result<br>(ERP)(dB<br>m) | Limit<br>(dBm) | Margin<br>(dB) |
| 1232.9                                        | H                           | -55.46       | 4.25                     | -51.21                   | -13.00         | 38.21          |
| 3818.6                                        | H                           | -57.76       | 6.93                     | -50.83                   | -13.00         | 37.83          |
| 1232.9                                        | V                           | -53.87       | 4.25                     | -49.62                   | -13.00         | 36.62          |
| 3818.6                                        | V                           | -58.26       | 6.93                     | -51.33                   | -13.00         | 38.33          |
| /                                             | /                           | /            | /                        | /                        | /              | /              |
|                                               |                             |              |                          |                          |                |                |

Note1: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

Note2: Only worst data of 5MHz mode was listed in report..



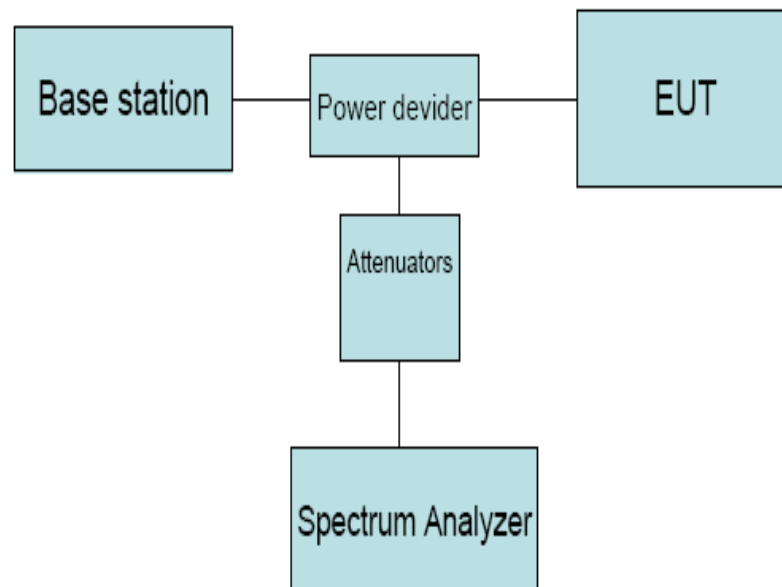


## 9. Band Edge Requirement

### 9.1. Limit

The mean power of emissions must be attenuated below the mean power of the unmodulated carrier (P) on any frequency outside the frequency band by at least  $(43 + 10 \log P)$  dB, in this case, -13dBm.

### 9.2. Test Setup



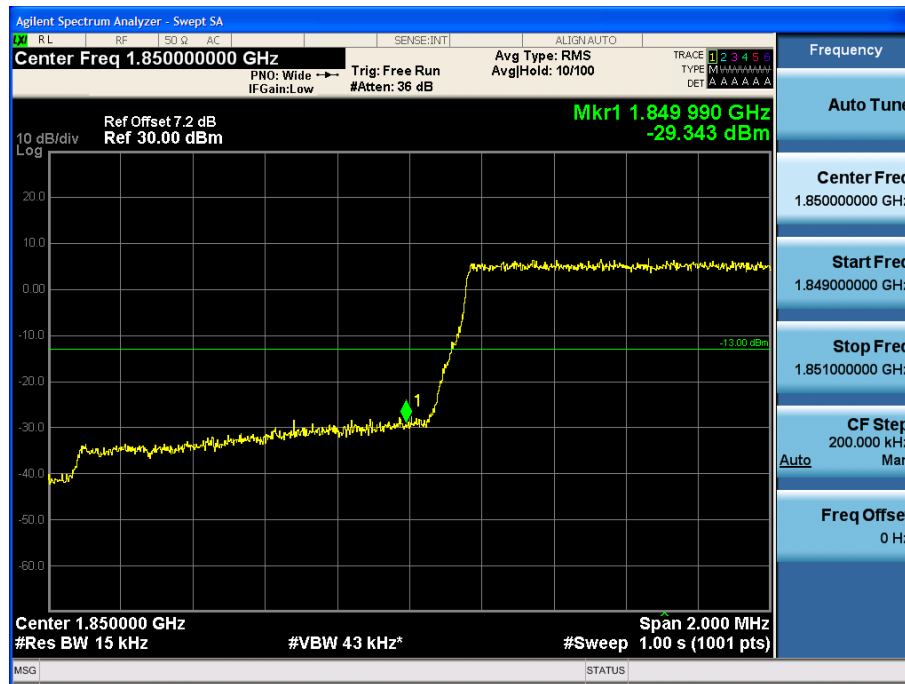
### 9.3. Test Procedure

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The band edges of low and high channels for the highest RF powers were measured.



## 9.4. Test Plot

### 1.4MHz Lowest QPSK



### 1.4MHz Highest QPSK



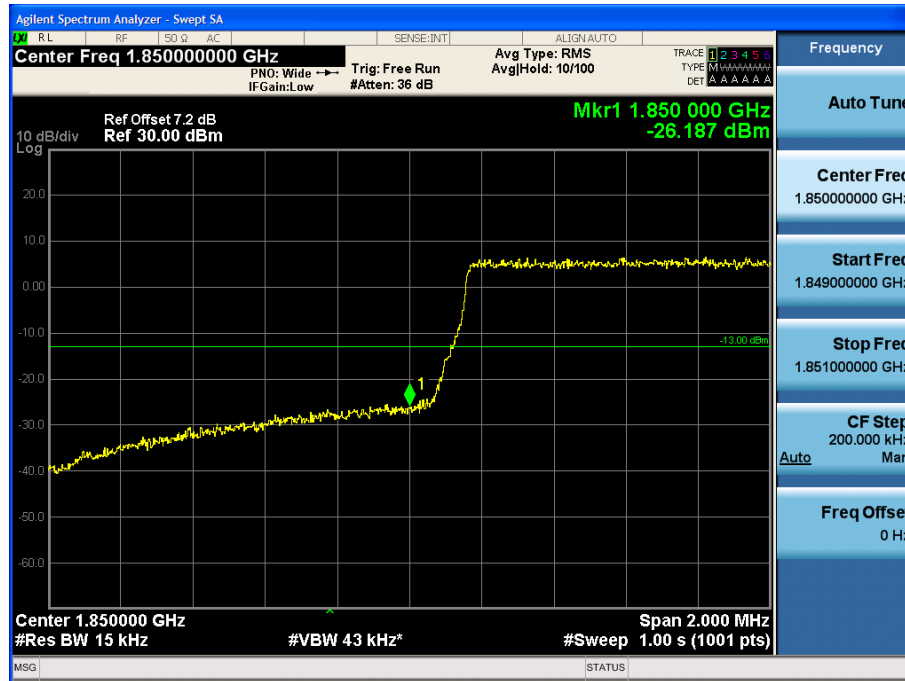


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## 1.4MHz Lowest 16QAM



## 1.4MHz Highest 16QAM



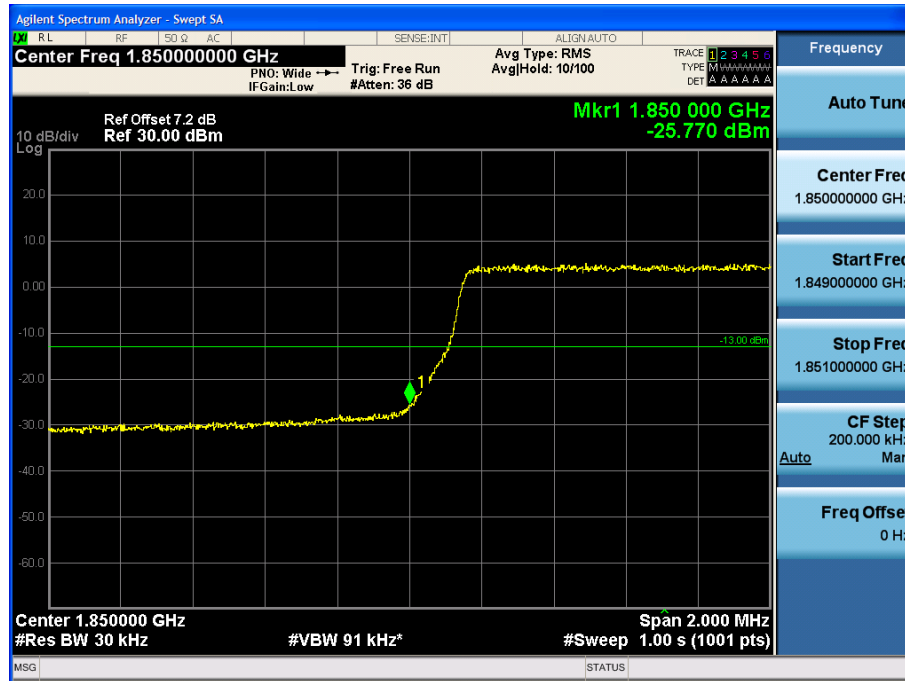


# ATA Testing Technology Service Co., Ltd.

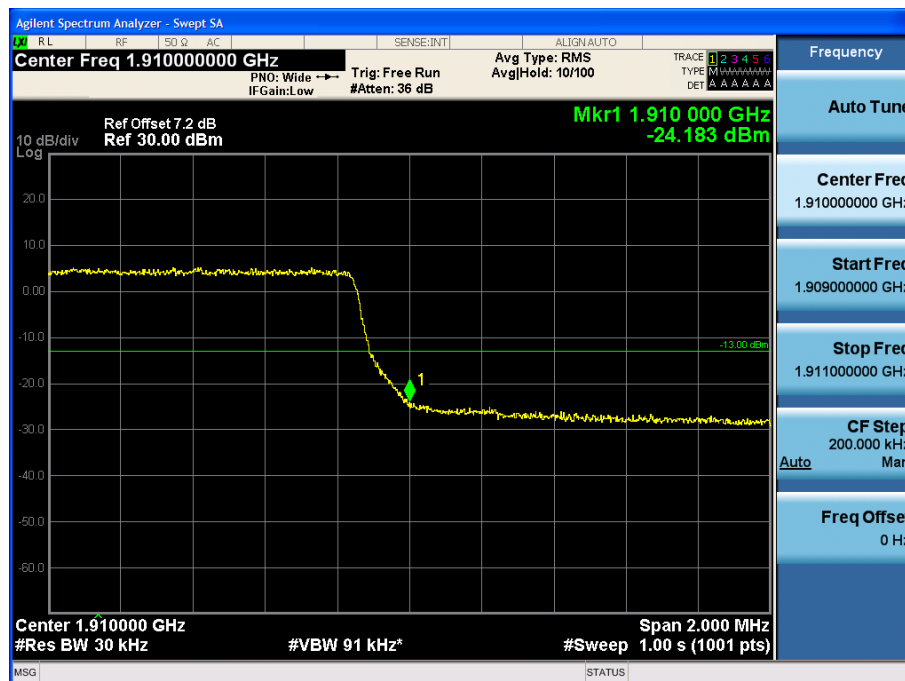
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## 3MHz Lowest QPSK



## 3MHz Highest QPSK



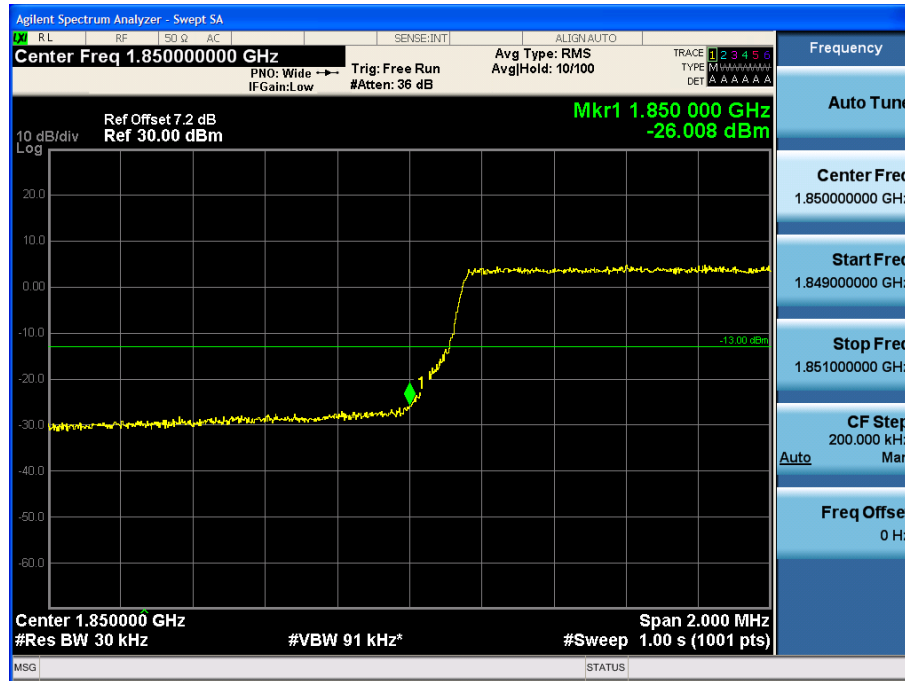


# ATA Testing Technology Service Co., Ltd.

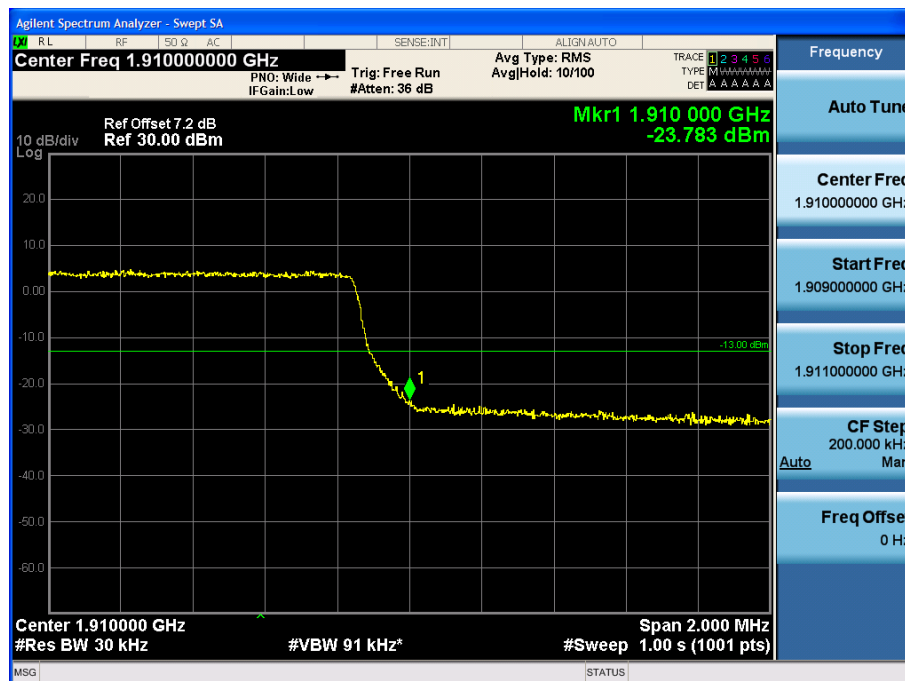
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## 3MHz Lowest 16QAM



## 3MHz Highest 16QAM



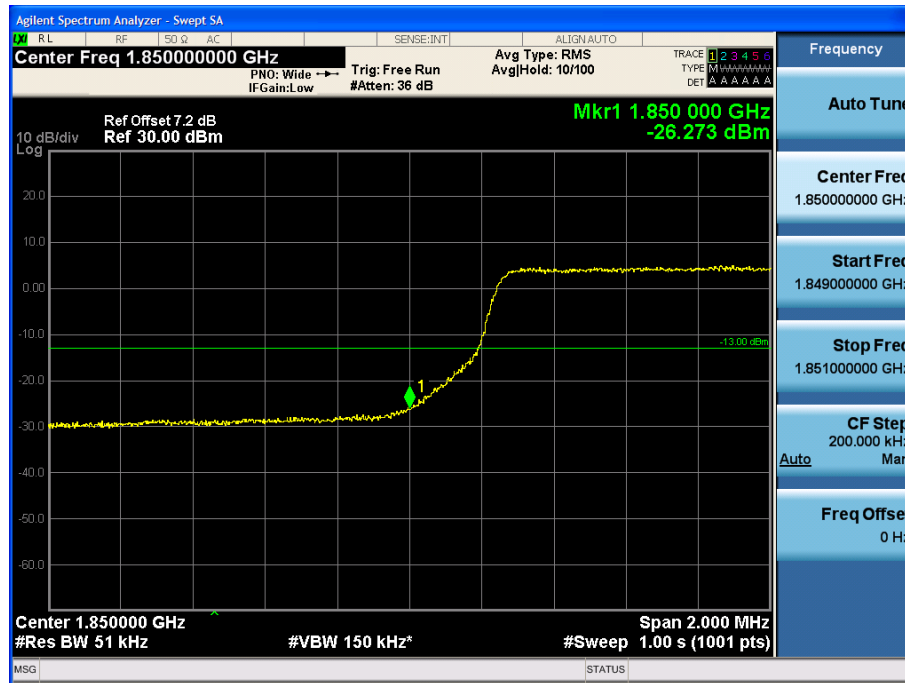


# ATA Testing Technology Service Co., Ltd.

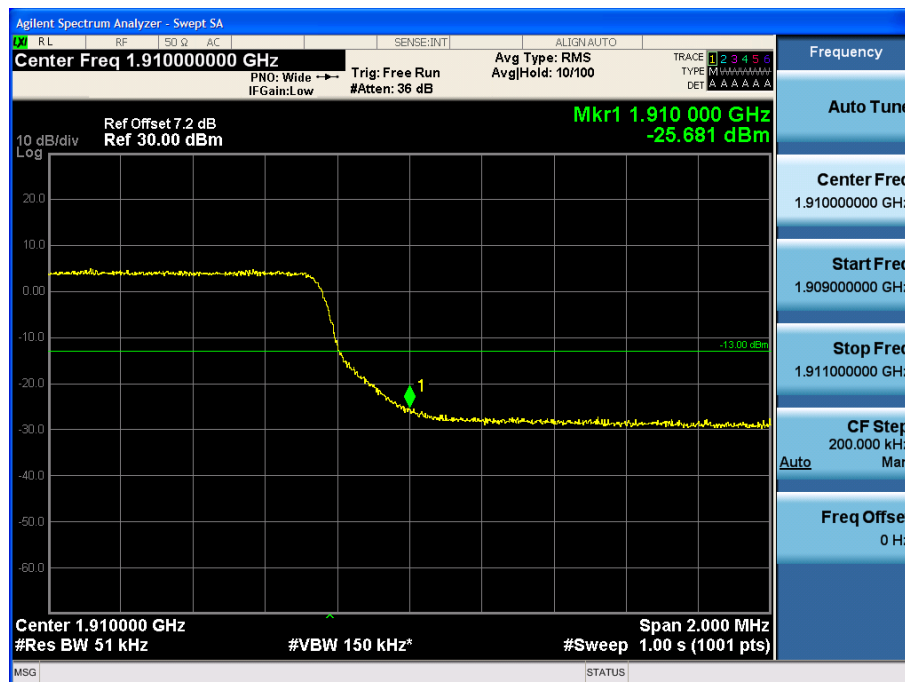
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## 5MHz Lowest QPSK



## 5MHz Highest QPSK





# ATA Testing Technology Service Co., Ltd.

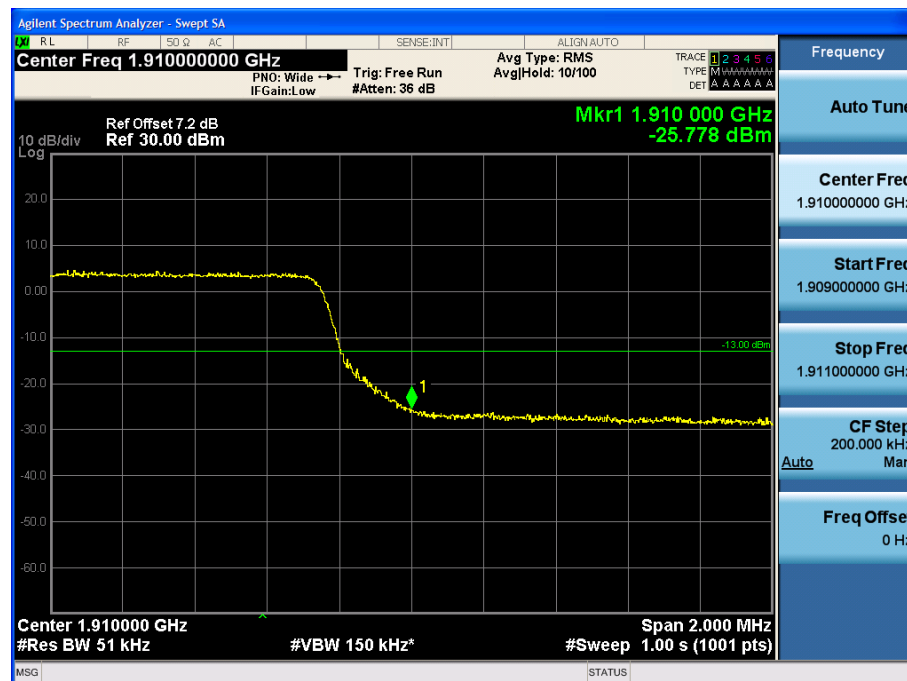
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## 5MHz Lowest 16QAM



## 5MHz Highest 16QAM



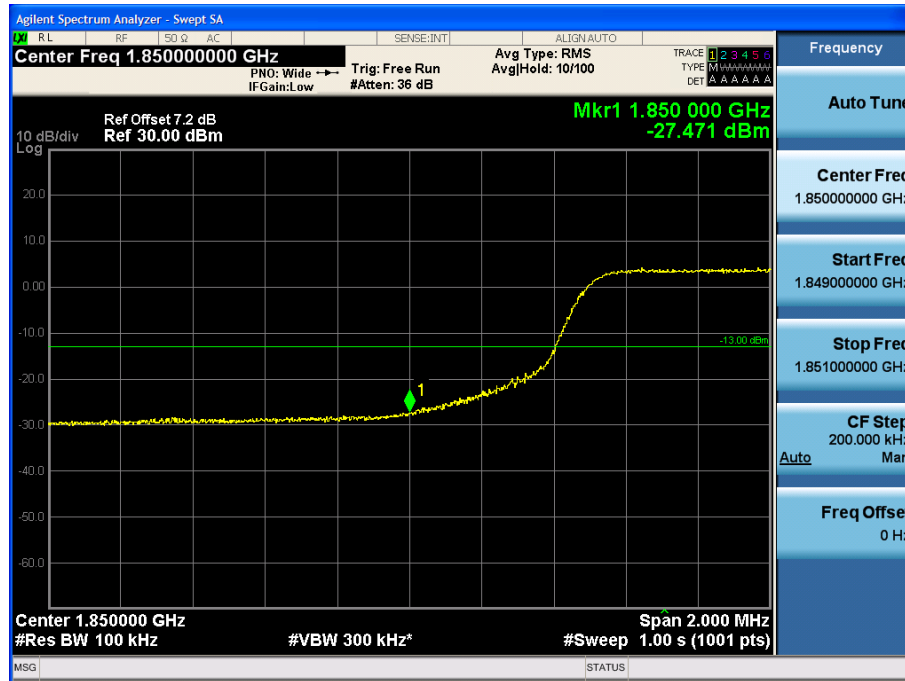


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## 10MHz Lowest QPSK



## 10MHz Highest QPSK







## 10MHz Lowest 16QAM



## 10MHz Highest 16QAM



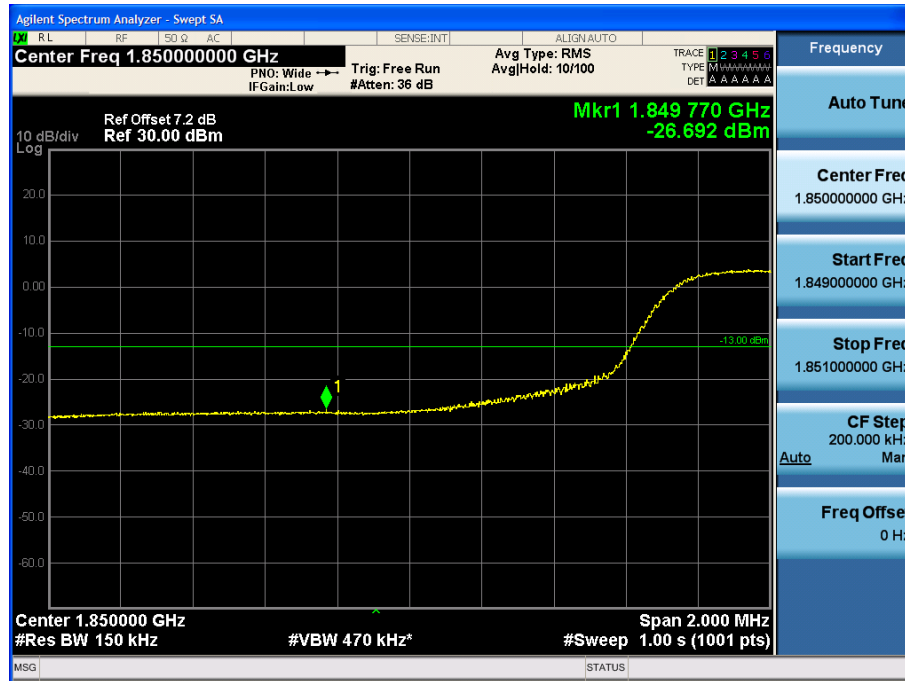


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## 15MHz Lowest QPSK

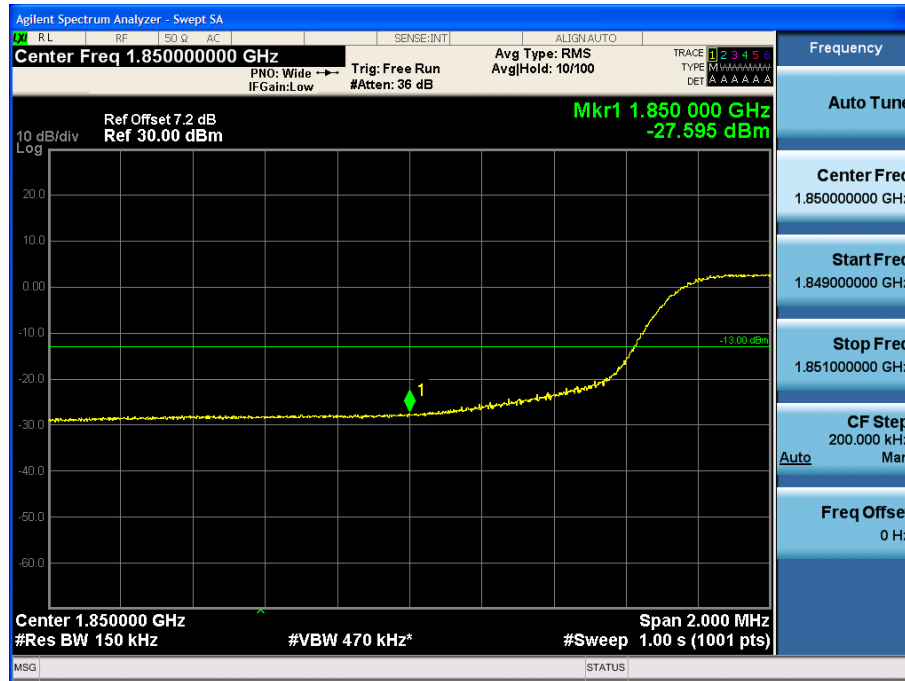


## 15MHz Highest QPSK





## 15MHz Lowest 16QAM



## 15MHz Highest 16QAM





## 20MHz Lowest QPSK

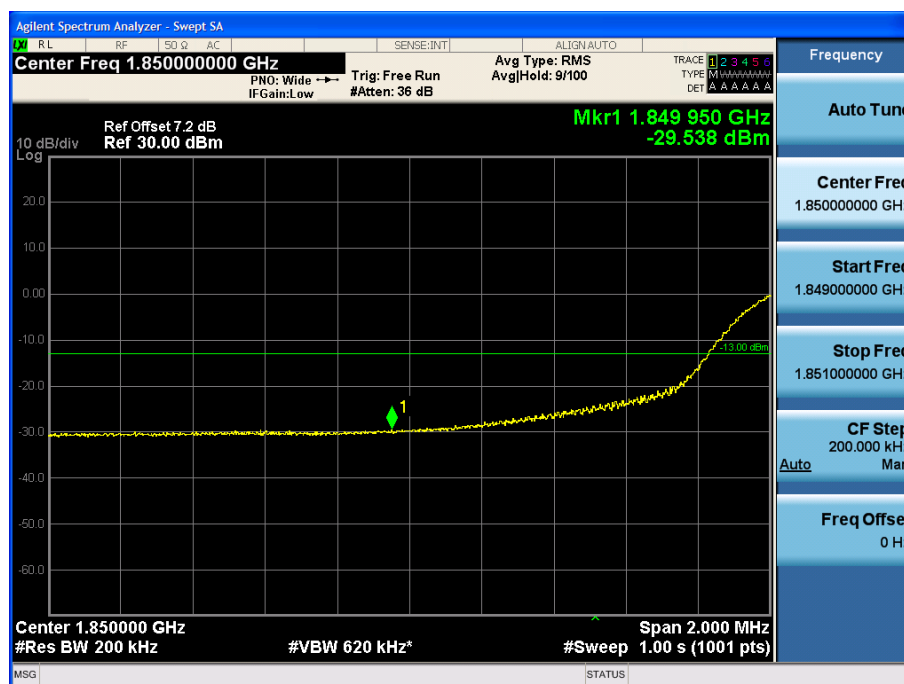


## 20MHz Highest QPSK

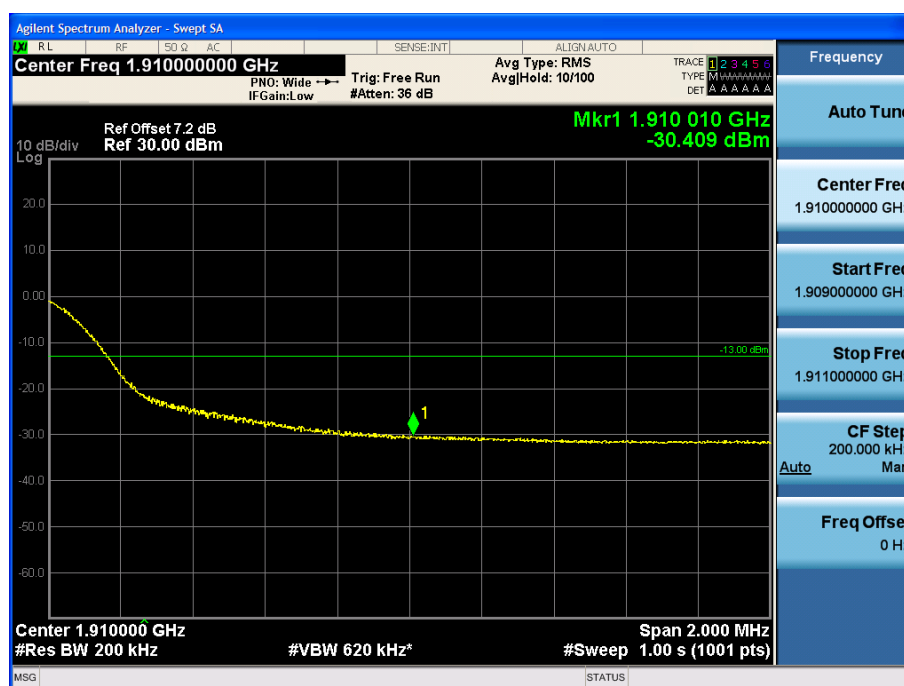




## 20MHz Lowest 16QAM



## 20MHz Highest 16QAM





## 10. Power Line Conducted Emission

### 11.1. Test Standard and Limit

#### 11.1.1 Test Standard

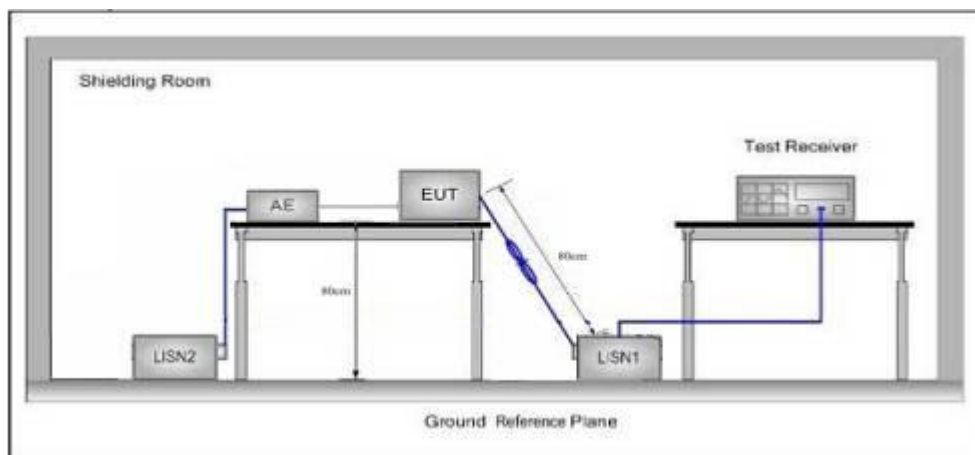
FCC Part15 C Section 15.207

#### 11.1.2 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.

### 11.2. Test Setup



### 11.3. Test Procedure

1) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a  $50\Omega / 50\mu\text{H} + 5\Omega$  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



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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

## 11.4. Test Data

Please to see the following pages



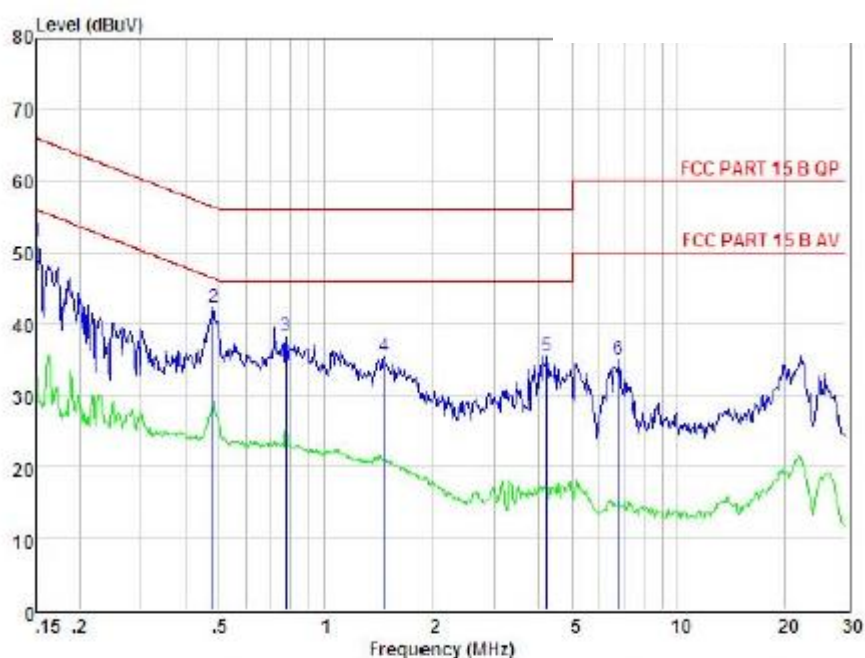


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Conducted Emission Test Data

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EUT: Rugged Smartphone M/N: HG06  
Operating Condition: Charging & Working mode  
Test Site: Shielded room  
Operator: Jason  
Test Specification: AC120V/60Hz  
Polarization: Line  
Note: Tem:25°C Hum:50%



| Condition : FCC PART 15 B QP |       |       |             | POL: LINE           |            |       | Temp:25.7 °C Hum:51 % |        |        |
|------------------------------|-------|-------|-------------|---------------------|------------|-------|-----------------------|--------|--------|
| Item                         | Freq  | Read  | LISN Factor | Preamplifier Factor | Cable Loss | Level | Limit                 | Margin | Remark |
|                              | MHz   | dBuV  | dB          | dB                  | dB         | dBuV  | dBuV                  | dBuV   |        |
| 1                            | 0.150 | 41.88 | 0.03        | -9.49               | 0.10       | 51.45 | 56.00                 | -14.55 | Peak   |
| 2                            | 0.481 | 32.53 | 0.03        | -9.58               | 0.10       | 42.24 | 56.32                 | -14.08 | Peak   |
| 3                            | 0.775 | 28.48 | 0.00        | -9.60               | 0.10       | 38.18 | 56.00                 | -17.82 | Peak   |
| 4                            | 1.480 | 25.50 | 0.05        | -9.68               | 0.10       | 35.33 | 56.00                 | -20.67 | Peak   |
| 5                            | 4.224 | 25.32 | 0.08        | -9.89               | 0.12       | 35.41 | 56.00                 | -20.59 | Peak   |
| 6                            | 6.805 | 24.66 | 0.12        | -9.97               | 0.15       | 34.90 | 60.00                 | -25.10 | Peak   |

Remarks: Level = Read + LISN Factor - Preamplifier Factor + Cable Loss



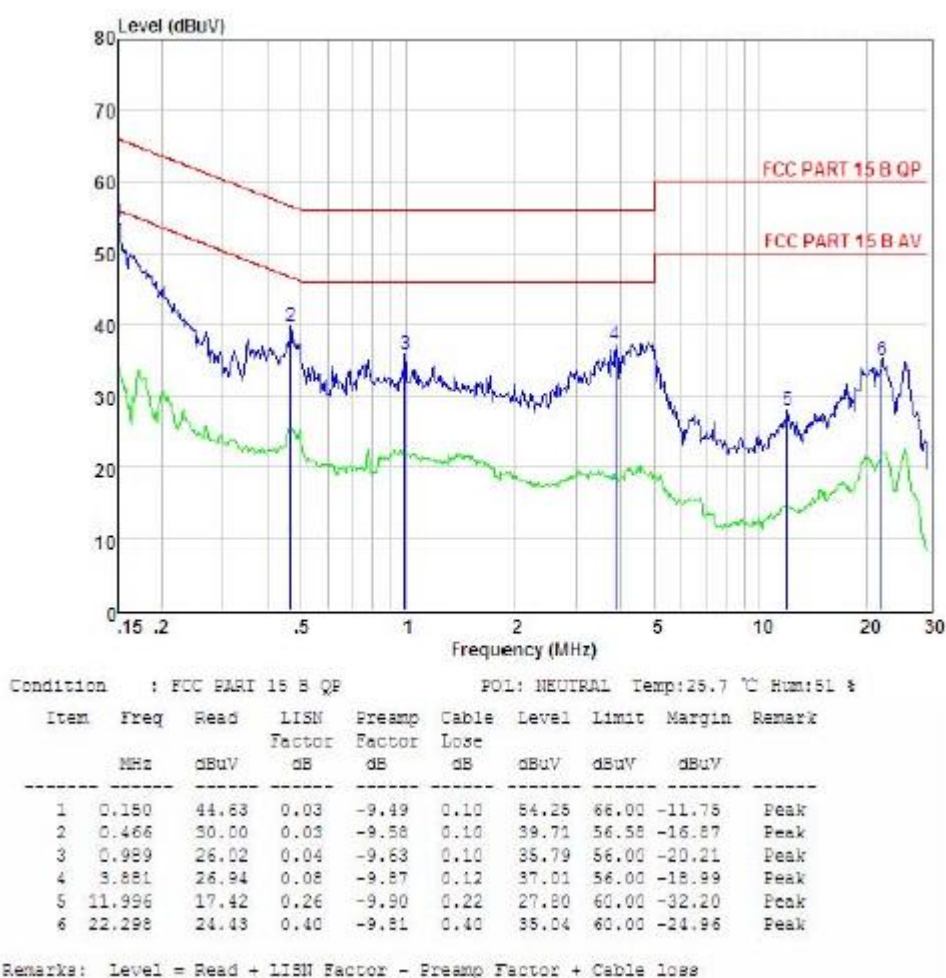


# ATA Testing Technology Service Co., Ltd.

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Conducted Emission Test Data

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EUT: Rugged Smartphone M/N: HG06  
Operating Condition: Charging & Working mode  
Test Site: Shielded room  
Operator: Jason  
Test Specification: AC 120V/60Hz  
Polarization: Neutral  
Note: Tem:25°C Hum:50%



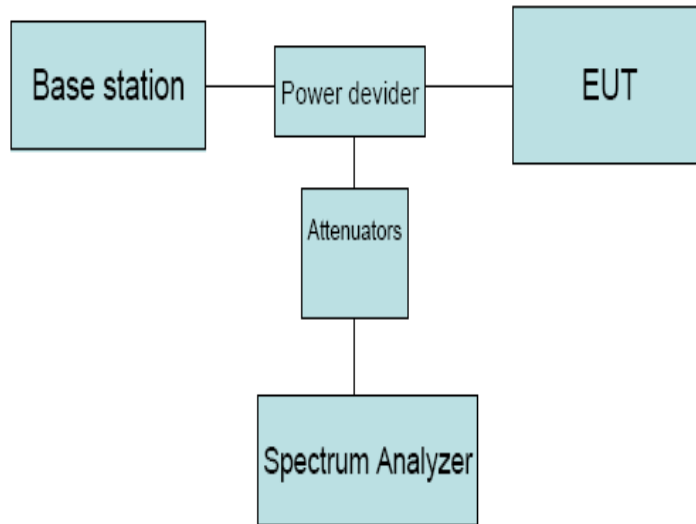


## 11 Peak-to-Average Ratio

### 11.1 Limit

In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

### 11.2 Test Setup



### 11.3 Test Procedure

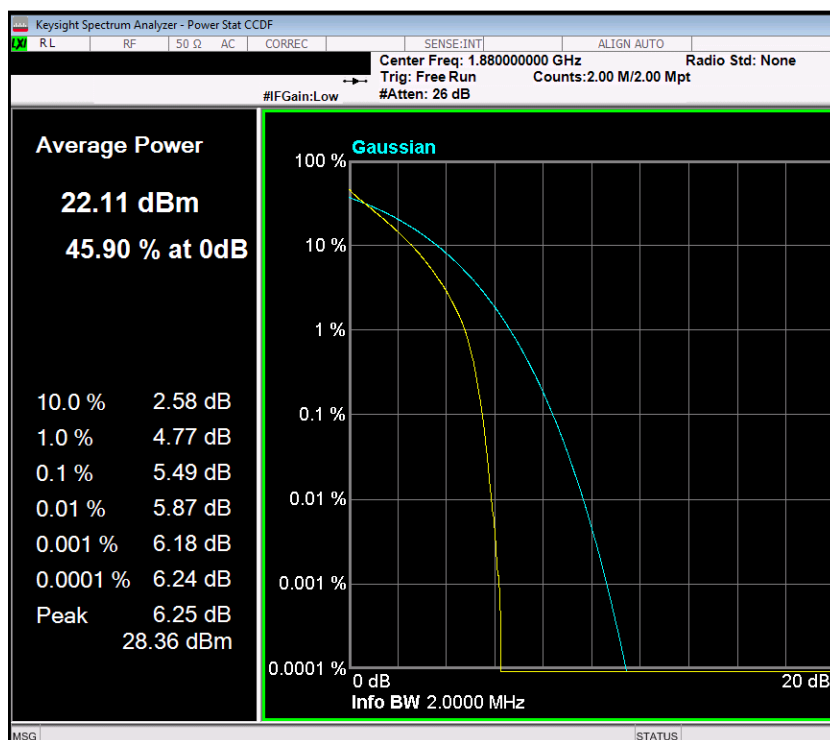
The EUT' RF output port was connected to Measurement Instrument(s) and Base Station via power divider, and then measure the test data.

### 11.4 Test Result

| Test Band | Test Mode | Test Channel | Measured[dB] | Limit [dB] | Verdict |
|-----------|-----------|--------------|--------------|------------|---------|
| LTE BAND2 | QPSK      | LCH          | 6.24         | 13         | PASS    |
|           |           | MCH          | 6.25         | 13         | PASS    |
|           |           | HCH          | 6.19         | 13         | PASS    |
|           | 16QAM     | LCH          | 6.57         | 13         | PASS    |
|           |           | MCH          | 7.11         | 13         | PASS    |
|           |           | HCH          | 6.82         | 13         | PASS    |



Test plots of worst case  
QPSK



16QAM

