

# FCC Test Report

## (Part 27)

Product Name : Notebook PC  
Model No : C300MA  
FCC ID : MSQC300MA

Applicant : ASUSTeK COMPUTER INC.

Address : 4F, No. 150, Li-Te Rd., Peitou, Taipei, Taiwan

Date of Receipt : 2014/09/12  
Issued Date : 2014/10/03  
Report No. : 1490338R-HPUSP44V00  
Report Version : V1.0



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

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# Test Report

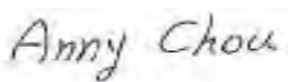
Issued Date : 2014/10/03

Report No.: 1490338R-HPUSP44V00

**Accredited by NIST (NVLAP)**

NVLAP Lab Code: 200533-0

Product Name : Notebook PC  
Applicant : ASUSTeK COMPUTER INC.  
Address : 4F, No. 150, Li-Te Rd., Peitou, Taipei, Taiwan  
Manufacturer : Tech-Front (Chongqing) Computer Co., Ltd  
Trade Name : ASUS  
Model No. : C300MA  
EUT Rated Voltage : AC 120V~240V  
EUT Test Voltage : AC 120V  
Measurement Standard : FCC CFR Title 47 Part 27(L)  
Measurement : TIA/EIA 603-C  
Reference :  
Test Result : Complied

Documented By :   
(Adm. Specialist / Anny Chou)

Tested By :   
(Senior Engineer / Vorana Chen)

Approved By :   
(Director / Vincent Lin)

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## 1. GENERAL INFORMATION

### 1.1. EUT Description

|                 |                                                 |
|-----------------|-------------------------------------------------|
| Product Name    | Notebook PC                                     |
| Model No.       | C300MA                                          |
| Trade Name      | ASUS                                            |
| FCC ID          | MSQC300MA                                       |
| Modulation      | LTE Band IV : QPSK/16-QAM                       |
|                 | LTE Band XIII : QPSK/16-QAM                     |
| Frequency Range | LTE Band IV : 1710MHz ~1755MHz (5M,10M,15M,20M) |
|                 | LTE Band XIII : 777MHz ~ 787MHz (5M,10M)        |
| Software        | CHROMEOS: R37-5978.59.0                         |
| Hardware        | MB_R2.1                                         |
| Antenna Type    | PIFA                                            |
| Antenna Kit     | Refer Antenna list                              |

### 1.2. Antenna List

| No. | Manufacturer | Part No.                   | Peak Gain                               |
|-----|--------------|----------------------------|-----------------------------------------|
| 1   | INPAQ        | WA-P-LTE8LTE8-04-001(Main) | -4.49 for Band XIII<br>1.70 for Band IV |

### 1.3. Operational Description

The information contained within this report is intended to show verification of compliance of the 700/1700MHz Notebook to the requirements of FCC 47 CFR Part 2, 27.

The EUT provide all functions described as above. The EUT is tested with maximum rated TX power via the Base Station simulator.

Quietek has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

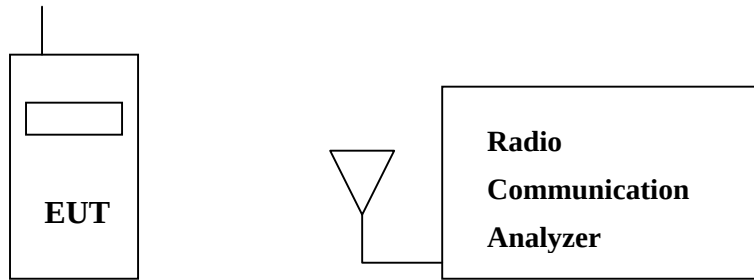
|            |                                |
|------------|--------------------------------|
| Test Mode: | LTE Band IV (5M)-QPSK/16QAM    |
|            | LTE Band IV (10M)-QPSK/16QAM   |
|            | LTE Band IV (15M)-QPSK/16QAM   |
|            | LTE Band IV (20M)-QPSK/16QAM   |
|            | LTE Band XIII (5M)-QPSK/16QAM  |
|            | LTE Band XIII (10M)-QPSK/16QAM |

Note :

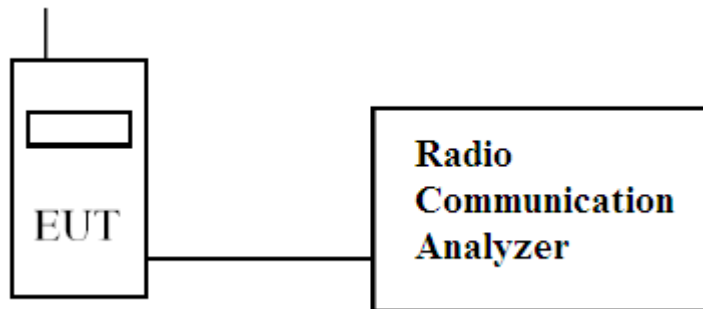
The maximum power levels are chosen in the LTE Band IV/XIII, only these modes were used for all tests.

## 1.4. Configuration of tested System

### (a) Configuration of Radiated measurement



### (b) Configuration of Conducted measurement



## 1.5. EUT Setup Procedures

- (1) Setup the EUT and simulators as shown on 1.3
- (2) Turn on the power of all equipments.
- (3) The EUT was set to communicate with MT8820C.
- (4) Repeat the above procedure (3).

## 1.6. Test Facility

Ambient conditions in the laboratory:

| Items                      | Required (IEC 68-1) | Actual |
|----------------------------|---------------------|--------|
| Temperature (°C)           | 15-35               | 21     |
| Humidity (%RH)             | 25-75               | 53     |
| Barometric pressure (mbar) | 860-1060            | 982    |

Site Description: File on  
Federal Communications Commission  
FCC Engineering Laboratory  
7435 Oakland Mills Road  
Columbia, MD 21046  
FCC Registration Number :92195

Site Name: Quietek Corporation

Linkou Testing Laboratory:  
No.5-22, Ruishukeng, Linkou Dist.,  
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Taiwan, R.O.C.  
TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789  
E-Mail : [service@quietek.com](mailto:service@quietek.com)

FCC Accreditation Number: TW1014

## 1.7. Type of Emission

| Band | Bandwidth(MHz) | Modulation | Emission Designator |
|------|----------------|------------|---------------------|
| IV   | 5              | QPSK       | 4M49G7D             |
| IV   | 10             | QPSK       | 8M93G7D             |
| IV   | 15             | QPSK       | 13M4G7D             |
| IV   | 20             | QPSK       | 17M9G7D             |
| IV   | 5              | 16-QAM     | 4M49W7D             |
| IV   | 10             | 16-QAM     | 8M93W7D             |
| IV   | 15             | 16-QAM     | 13M4W7D             |
| IV   | 20             | 16-QAM     | 17M9W7D             |
| XIII | 5              | QPSK       | 4M50G7D             |
| XIII | 10             | QPSK       | 8M94G7D             |
| XIII | 5              | 16-QAM     | 4M50W7D             |
| XIII | 10             | 16-QAM     | 8M94W7D             |

## 1.8. Voltages and DC currents

|                                      |                                           |
|--------------------------------------|-------------------------------------------|
| LTE Band IV/XIII                     |                                           |
| EUT Transmitting (in maximum power): | AC voltage: 120V/60Hz, DC current: 0.17A  |
| EUT Standby                          | : AC voltage:120V/60Hz, DC current: 0.12A |

## 2. Peak Power Output

### 2.1. Test Equipment

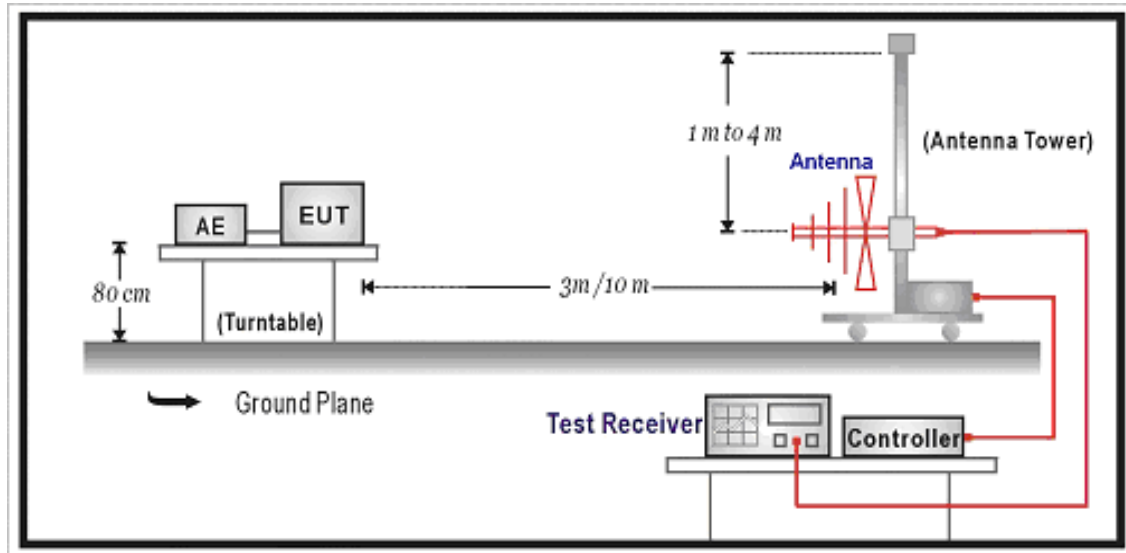
The following test equipments are used during the radiated emission test:

| Test Site | Equipment                    | Manufacturer    | Model No./Serial No.            | Last Cal.  |
|-----------|------------------------------|-----------------|---------------------------------|------------|
| ☒ CTR     | Spectrum Analyzer            | Agilent         | N9020A / MY48010570             | 2014/06/24 |
|           | Dual Directional couple      | Agilent         | 778D / 50550                    | 2013/10/07 |
|           | Directional coupler          | Agilent         | 87300C / MY44300352             | 2014/01/06 |
|           | Radio Communication Analyzer | Anritsu         | MT8820C / 6201091166            | 2014/01/17 |
| ☒ Site#3  | Test Receiver                | R & S           | ESCS 30/ 100367                 | 2013/12/04 |
|           | Radio Communication Analyzer | Anritsu         | MT8820C / 6201091166            | 2014/01/17 |
|           | Spectrum Analyzer            | Agilent         | N9010A/ MY48030495              | 2014/07/08 |
|           | Bilog Antenna                | Schaffner Chase | CBL6112B/ 2707                  | 2014/06/13 |
|           | Horn Antenna                 | Schwarzbeck     | 9120D / 556                     | 2013/12/20 |
|           | Pre-Amplifier                | QTK             | QTK-LK-E-I-AMP4/<br>CHM-0201003 | 2014/06/18 |

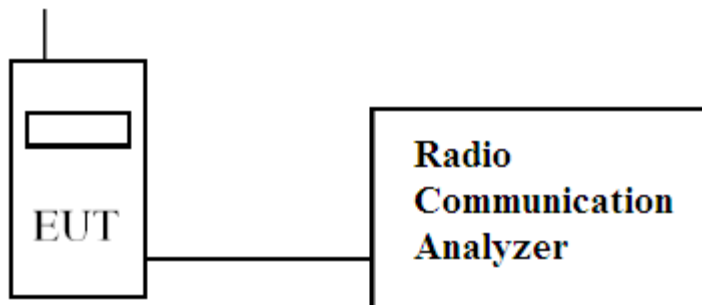
Note: All equipments that need to be calibrated are with calibration period of 1 year.

## 2.2. Test Setup

### Radiated Power Measurement



### Conducted Power Measurement



## 2.3. Limits

|               |            |
|---------------|------------|
| LTE Band IV   | <1W (EIRP) |
| LTE Band XIII | <3W (ERP)  |

## 2.4. Test Procedure

### ➤RF Out Power (Radiated)

The Spectrum Analyzer was tuned to the test frequency. The EUT was tested in three The device was put into Transmit mode then rotated through 360 degrees until the highest power level was observed in both horizontal and vertical polarization. The device was then replaced with a substitution antenna, which input signal was adjusted until the received level matched that of the previously detected emission.

- (1) The EUT is tested with maximum rated TX power via the Base Station simulator.
- (2) The EUT is tested in three orthogonal planes , The worst case test configuration was found in the horizontal position.

### ➤RF Out Power (Conducted)

The EUT is tested with maximum rated TX power via the Base Station simulator, and the output power was measured at the antenna terminals of the EUT.

## 2.5. Test Specification

According to Part 2.1046, 27.50(d)(4).

## 2.6. Test Result of Peak Power Output

|                |                            |           |       |
|----------------|----------------------------|-----------|-------|
| Product        | Notebook PC                |           |       |
| Test Mode      | RF Output Power (Radiated) |           |       |
| Date of Test   | 2014/09/26                 | Test Site | Site3 |
| Test Condition | LTE Band IV (5M)           |           |       |

### Maximum Power- LTE Band IV (5M)-QPSK

| Frequency (MHz) | Reading Level (dBm) | Substitution Level (dBm) | Substitution Antenna Gain (dBi) | Cable Loss (dB) | Result EIRP (dBm) | Result ERP (W) |
|-----------------|---------------------|--------------------------|---------------------------------|-----------------|-------------------|----------------|
| 1712.5          | -20.02              | 16.33                    | 9                               | 0.8             | 24.53             | 0.28           |
| 1732.5          | -20.15              | 16.21                    | 9                               | 0.8             | 24.41             | 0.28           |
| 1752.5          | -18.84              | 17.44                    | 9                               | 0.8             | 25.64             | 0.37           |

### Maximum Power- LTE Band IV 5M-16QAM

| Frequency (MHz) | Raw Result (dBm) | Substitution Level (dBm) | Substitution Antenna Gain (dB) | Cable Loss (dB) | Result EIRP (dBm) | Result EIRP (W) |
|-----------------|------------------|--------------------------|--------------------------------|-----------------|-------------------|-----------------|
| 1712.5          | -20.95           | 15.45                    | 9                              | 0.8             | 23.65             | 0.23            |
| 1732.5          | -21.23           | 15.19                    | 9                              | 0.8             | 23.39             | 0.22            |
| 1752.5          | -19.76           | 16.58                    | 9                              | 0.8             | 24.78             | 0.30            |

Note:

1. The EUT meets the requirements of FCC CFR 47: Part 24, Section 24.232(b) for Effective Isotropically Radiated Power.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz
3. Result EIRP = Substitution Level + Substitution Antenna Gain - Cable Loss

|                |                            |           |       |
|----------------|----------------------------|-----------|-------|
| Product        | Notebook PC                |           |       |
| Test Mode      | RF Output Power (Radiated) |           |       |
| Date of Test   | 2014/09/26                 | Test Site | Site3 |
| Test Condition | LTE Band IV (10M)          |           |       |

#### Maximum Power- LTE Band IV (10M) -QPSK

| Frequency (MHz) | Reading Level (dBm) | Substitution Level (dBm) | Substitution Antenna Gain (dBi) | Cable Loss (dB) | Result EIRP (dBm) | Result EIRP (W) |
|-----------------|---------------------|--------------------------|---------------------------------|-----------------|-------------------|-----------------|
| 1715            | -19.60              | 16.73                    | 9                               | 0.8             | 24.93             | 0.31            |
| 1732.5          | -20.03              | 16.32                    | 9                               | 0.8             | 24.52             | 0.28            |
| 1750            | -19.77              | 16.57                    | 9                               | 0.8             | 24.77             | 0.30            |

#### Maximum Power- LTE Band IV 10M-16QAM

| Frequency (MHz) | Raw Result (dBm) | Substitution Level (dBm) | Substitution Antenna Gain (dB) | Cable Loss (dB) | Result EIRP (dBm) | Result EIRP (W) |
|-----------------|------------------|--------------------------|--------------------------------|-----------------|-------------------|-----------------|
| 1715            | -20.76           | 15.63                    | 9                              | 0.8             | 23.83             | 0.24            |
| 1732.5          | -21.28           | 15.14                    | 9                              | 0.8             | 23.34             | 0.22            |
| 1750            | -20.81           | 15.58                    | 9                              | 0.8             | 23.78             | 0.24            |

Note:

1. The EUT meets the requirements of FCC CFR 47: Part 24, Section 24.232(b) for Effective Isotropically Radiated Power.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz
3. Result EIRP = Substitution Level + Substitution Antenna Gain - Cable Loss

|                |                            |           |       |
|----------------|----------------------------|-----------|-------|
| Product        | Notebook PC                |           |       |
| Test Mode      | RF Output Power (Radiated) |           |       |
| Date of Test   | 2014/09/26                 | Test Site | Site3 |
| Test Condition | LTE Band IV (15M)          |           |       |

#### Maximum Power- LTE Band IV (15M) -QPSK

| Frequency (MHz) | Reading Level (dBm) | Substitution Level (dBm) | Substitution Antenna Gain (dBi) | Cable Loss (dB) | Result EIRP (dBm) | Result EIRP (W) |
|-----------------|---------------------|--------------------------|---------------------------------|-----------------|-------------------|-----------------|
| 1717.5          | -18.05              | 18.19                    | 9                               | 0.8             | 26.39             | 0.44            |
| 1732.5          | -19.10              | 17.20                    | 9                               | 0.8             | 25.40             | 0.35            |
| 1747.5          | -17.83              | 18.40                    | 9                               | 0.8             | 26.60             | 0.46            |

#### Maximum Power- LTE Band IV 15M-16QAM

| Frequency (MHz) | Raw Result (dBm) | Substitution Level (dBm) | Substitution Antenna Gain (dB) | Cable Loss (dB) | Result EIRP (dBm) | Result EIRP (W) |
|-----------------|------------------|--------------------------|--------------------------------|-----------------|-------------------|-----------------|
| 1717.5          | -19.16           | 17.14                    | 9                              | 0.8             | 25.34             | 0.34            |
| 1732.5          | -20.03           | 16.32                    | 9                              | 0.8             | 24.52             | 0.28            |
| 1747.5          | -19.02           | 17.27                    | 9                              | 0.8             | 25.47             | 0.35            |

Note:

1. The EUT meets the requirements of FCC CFR 47: Part 24, Section 24.232(b) for Effective Isotropically Radiated Power.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz
3. Result EIRP = Substitution Level + Substitution Antenna Gain - Cable Loss

|                |                            |           |       |
|----------------|----------------------------|-----------|-------|
| Product        | Notebook PC                |           |       |
| Test Mode      | RF Output Power (Radiated) |           |       |
| Date of Test   | 2014/09/26                 | Test Site | Site3 |
| Test Condition | LTE Band IV (20M)          |           |       |

#### Maximum Power- LTE Band IV (20M) -QPSK

| Frequency (MHz) | Reading Level (dBm) | Substitution Level (dBm) | Substitution Antenna Gain (dBi) | Cable Loss (dB) | Result EIRP (dBm) | Result EIRP (W) |
|-----------------|---------------------|--------------------------|---------------------------------|-----------------|-------------------|-----------------|
| 1720            | -17.95              | 18.28                    | 9                               | 0.8             | 26.48             | 0.44            |
| 1732.5          | -17.44              | 18.76                    | 9                               | 0.8             | 26.96             | 0.50            |
| 1745            | -17.51              | 18.70                    | 9                               | 0.8             | 26.90             | 0.49            |

#### Maximum Power- LTE Band IV 20M-16QAM

| Frequency (MHz) | Raw Result (dBm) | Substitution Level (dBm) | Substitution Antenna Gain (dB) | Cable Loss (dB) | Result EIRP (dBm) | Result EIRP (W) |
|-----------------|------------------|--------------------------|--------------------------------|-----------------|-------------------|-----------------|
| 1720            | -19.24           | 17.07                    | 9                              | 0.8             | 25.27             | 0.34            |
| 1732.5          | -18.35           | 17.91                    | 9                              | 0.8             | 26.11             | 0.41            |
| 1745            | -18.72           | 17.56                    | 9                              | 0.8             | 25.76             | 0.38            |

Note:

1. The EUT meets the requirements of FCC CFR 47: Part 24, Section 24.232(b) for Effective Isotropically Radiated Power.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz
3. Result EIRP = Substitution Level + Substitution Antenna Gain - Cable Loss

|                |                            |           |       |
|----------------|----------------------------|-----------|-------|
| Product        | Notebook PC                |           |       |
| Test Mode      | RF Output Power (Radiated) |           |       |
| Date of Test   | 2014/09/26                 | Test Site | Site3 |
| Test Condition | LTE Band XIII (5M)         |           |       |

#### Maximum Power- LTE Band XIII (5M) -QPSK

| Frequency (MHz) | Reading Level (dBm) | Substitution Level (dBm) | Substitution Antenna Gain (dBd) | Cable Loss (dB) | Result ERP (dBm) | Result ERP (W) |
|-----------------|---------------------|--------------------------|---------------------------------|-----------------|------------------|----------------|
| 779.5           | -13.96              | 21.48                    | -0.05                           | 0.6             | 20.83            | 0.12           |
| 782             | -14.05              | 21.40                    | -0.05                           | 0.6             | 20.75            | 0.12           |
| 784.5           | -13.45              | 21.98                    | -0.05                           | 0.6             | 21.33            | 0.14           |

#### Maximum Power- LTE Band XIII 5M-16QAM

| Frequency (MHz) | Raw Result (dBm) | Substitution Level (dBm) | Substitution Antenna Gain (dBd) | Cable Loss (dB) | Result EIRP (dBm) | Result EIRP (W) |
|-----------------|------------------|--------------------------|---------------------------------|-----------------|-------------------|-----------------|
| 779.5           | -15.01           | 20.46                    | -0.05                           | 0.6             | 19.81             | 0.10            |
| 782             | -15.20           | 20.27                    | -0.05                           | 0.6             | 19.62             | 0.09            |
| 784.5           | -14.57           | 20.89                    | -0.05                           | 0.6             | 20.24             | 0.11            |

Note:

1. The EUT meets the requirements of FCC CFR 47: Part 2.1046, 27.50(d)(4).for Effective Radiated Power.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz
3. Result ERP = Substitution Level + Substitution Antenna Gain - Cable Loss

|                |                            |           |       |
|----------------|----------------------------|-----------|-------|
| Product        | Notebook PC                |           |       |
| Test Mode      | RF Output Power (Radiated) |           |       |
| Date of Test   | 2014/09/26                 | Test Site | Site3 |
| Test Condition | LTE Band XIII (10M)        |           |       |

#### Maximum Power- LTE Band XIII (10M) -QPSK

| Frequency (MHz) | Reading Level (dBm) | Substitution Level (dBm) | Substitution Antenna Gain (dBd) | Cable Loss (dB) | Result ERP (dBm) | Result ERP (W) |
|-----------------|---------------------|--------------------------|---------------------------------|-----------------|------------------|----------------|
| --              | --                  | --                       | --                              | --              | --               | --             |
| 782             | -13.80              | 21.64                    | -0.05                           | 0.6             | 20.99            | 0.13           |
| --              | --                  | --                       | --                              | --              | --               | --             |

#### Maximum Power- LTE Band XIII 10M-16QAM

| Frequency (MHz) | Raw Result (dBm) | Substitution Level (dBm) | Substitution Antenna Gain (dBd) | Cable Loss (dB) | Result EIRP (dBm) | Result EIRP (W) |
|-----------------|------------------|--------------------------|---------------------------------|-----------------|-------------------|-----------------|
| --              | --               | --                       | --                              | --              | --                | --              |
| 782             | -14.92           | 20.55                    | -0.05                           | 0.6             | 19.90             | 0.10            |
| --              | --               | --                       | --                              | --              | --                | --              |

Note:

1. The EUT meets the requirements of FCC CFR 47: Part 2.1046, 27.50(d)(4).for Effective Radiated Power.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz
3. Result ERP = Substitution Level + Substitution Antenna Gain - Cable Loss

| Band                   | Channel | Modulation | RB No. | RB Offset | MPR | Max Power (Conducted) | Limit (dBm) |
|------------------------|---------|------------|--------|-----------|-----|-----------------------|-------------|
| Band IV (1700MHz)/5MHz | 19975   | QPSK       | 1      | #0        | 0   | 21.99                 | 23.5        |
|                        |         |            | 1      | #Mid      | 0   | 22.49                 | 23.5        |
|                        |         |            | 1      | #Max      | 0   | 22.55                 | 23.5        |
|                        |         |            | 50%    | #0        | 1   | 22.5                  | 23.5        |
|                        |         |            | 50%    | #Mid      | 1   | 22.49                 | 23.5        |
|                        |         |            | 50%    | #Max      | 1   | <b>22.64</b>          | 23.5        |
|                        |         |            | 100%   | --        | 1   | 22.5                  | 23.5        |
|                        |         | 16QAM      | 1      | #0        | 1   | 21.63                 | 23.5        |
|                        |         |            | 1      | #Mid      | 1   | 22.27                 | 23.5        |
|                        |         |            | 1      | #Max      | 1   | 22.63                 | 23.5        |
|                        |         |            | 50%    | #0        | 2   | 22.5                  | 23.5        |
|                        |         |            | 50%    | #Mid      | 2   | 22.65                 | 23.5        |
|                        |         |            | 50%    | #Max      | 2   | <b>22.91</b>          | 23.5        |
|                        |         |            | 100%   | --        | 2   | 22.76                 | 23.5        |
|                        | 20175   | QPSK       | 1      | #0        | 0   | 23.15                 | 23.5        |
|                        |         |            | 1      | #Mid      | 0   | 22.92                 | 23.5        |
|                        |         |            | 1      | #Max      | 0   | 22.76                 | 23.5        |
|                        |         |            | 50%    | #0        | 1   | 23.37                 | 23.5        |
|                        |         |            | 50%    | #Mid      | 1   | <b>23.38</b>          | 23.5        |
|                        |         |            | 50%    | #Max      | 1   | 23.14                 | 23.5        |
|                        |         |            | 100%   | --        | 1   | 23.16                 | 23.5        |
|                        |         | 16QAM      | 1      | #0        | 1   | 23.4                  | 23.5        |
|                        |         |            | 1      | #Mid      | 1   | 23.02                 | 23.5        |
|                        |         |            | 1      | #Max      | 1   | 23.04                 | 23.5        |
|                        |         |            | 50%    | #0        | 2   | 23.28                 | 23.5        |
|                        |         |            | 50%    | #Mid      | 2   | 23.35                 | 23.5        |
|                        |         |            | 50%    | #Max      | 2   | 23.35                 | 23.5        |
|                        |         |            | 100%   | --        | 2   | <b>23.4</b>           | 23.5        |
|                        | 20375   | QPSK       | 1      | #0        | 0   | 22.43                 | 23.5        |
|                        |         |            | 1      | #Mid      | 0   | 22.79                 | 23.5        |
|                        |         |            | 1      | #Max      | 0   | 21.5                  | 23.5        |
|                        |         |            | 50%    | #0        | 1   | 22.76                 | 23.5        |
|                        |         |            | 50%    | #Mid      | 1   | 22.71                 | 23.5        |
|                        |         |            | 50%    | #Max      | 1   | <b>23.01</b>          | 23.5        |
|                        |         |            | 100%   | --        | 1   | 22.47                 | 23.5        |
|                        |         | 16QAM      | 1      | #0        | 1   | 23.06                 | 23.5        |
|                        |         |            | 1      | #Mid      | 1   | 22.92                 | 23.5        |
|                        |         |            | 1      | #Max      | 1   | 22.04                 | 23.5        |
|                        |         |            | 50%    | #0        | 2   | 22.78                 | 23.5        |
|                        |         |            | 50%    | #Mid      | 2   | 22.73                 | 23.5        |
|                        |         |            | 50%    | #Max      | 2   | <b>23.28</b>          | 23.5        |
|                        |         |            | 100%   | --        | 2   | 22.76                 | 23.5        |

| Band                    | Channel | Modulation | RB No. | RB Offset | MPR | Max Power (Conducted) | Limit (dBm) |
|-------------------------|---------|------------|--------|-----------|-----|-----------------------|-------------|
| Band IV (1700MHz)/10MHz | 20000   | QPSK       | 1      | #0        | 0   | 21.75                 | 23.5        |
|                         |         |            | 1      | #Mid      | 0   | 22.36                 | 23.5        |
|                         |         |            | 1      | #Max      | 0   | 22.76                 | 23.5        |
|                         |         |            | 50%    | #0        | 1   | 22.34                 | 23.5        |
|                         |         |            | 50%    | #Mid      | 1   | 22.69                 | 23.5        |
|                         |         |            | 50%    | #Max      | 1   | <b>22.89</b>          | 23.5        |
|                         |         |            | 100%   | --        | 1   | 22.72                 | 23.5        |
|                         |         | 16QAM      | 1      | #0        | 1   | 22.39                 | 23.5        |
|                         |         |            | 1      | #Mid      | 1   | 23.11                 | 23.5        |
|                         |         |            | 1      | #Max      | 1   | <b>23.50</b>          | 23.5        |
|                         |         |            | 50%    | #0        | 2   | 22.69                 | 23.5        |
|                         |         |            | 50%    | #Mid      | 2   | 23.08                 | 23.5        |
|                         |         |            | 50%    | #Max      | 2   | 23.19                 | 23.5        |
|                         |         |            | 100%   | --        | 2   | 23.13                 | 23.5        |
|                         | 20175   | QPSK       | 1      | #0        | 0   | 23.09                 | 23.5        |
|                         |         |            | 1      | #Mid      | 0   | 22.91                 | 23.5        |
|                         |         |            | 1      | #Max      | 0   | 22.78                 | 23.5        |
|                         |         |            | 50%    | #0        | 1   | 23.08                 | 23.5        |
|                         |         |            | 50%    | #Mid      | 1   | 23.36                 | 23.5        |
|                         |         |            | 50%    | #Max      | 1   | 23.06                 | 23.5        |
|                         |         |            | 100%   | --        | 1   | <b>23.47</b>          | 23.5        |
|                         |         | 16QAM      | 1      | #0        | 1   | 22.79                 | 23.5        |
|                         |         |            | 1      | #Mid      | 1   | 23.07                 | 23.5        |
|                         |         |            | 1      | #Max      | 1   | 22.79                 | 23.5        |
|                         |         |            | 50%    | #0        | 2   | 23.44                 | 23.5        |
|                         |         |            | 50%    | #Mid      | 2   | 23.36                 | 23.5        |
|                         |         |            | 50%    | #Max      | 2   | 23.08                 | 23.5        |
|                         |         |            | 100%   | --        | 2   | <b>23.50</b>          | 23.5        |
|                         | 20350   | QPSK       | 1      | #0        | 0   | 22.36                 | 23.5        |
|                         |         |            | 1      | #Mid      | 0   | 21.82                 | 23.5        |
|                         |         |            | 1      | #Max      | 0   | 22.32                 | 23.5        |
|                         |         |            | 50%    | #0        | 1   | 22.21                 | 23.5        |
|                         |         |            | 50%    | #Mid      | 1   | 21.95                 | 23.5        |
|                         |         |            | 50%    | #Max      | 1   | 22.16                 | 23.5        |
|                         |         |            | 100%   | --        | 1   | <b>22.8</b>           | 23.5        |
|                         |         | 16QAM      | 1      | #0        | 1   | 22.46                 | 23.5        |
|                         |         |            | 1      | #Mid      | 1   | 22.08                 | 23.5        |
|                         |         |            | 1      | #Max      | 1   | 22.25                 | 23.5        |
|                         |         |            | 50%    | #0        | 2   | 22.54                 | 23.5        |
|                         |         |            | 50%    | #Mid      | 2   | 22.47                 | 23.5        |
|                         |         |            | 50%    | #Max      | 2   | 22.48                 | 23.5        |
|                         |         |            | 100%   | --        | 2   | <b>22.99</b>          | 23.5        |

| Band                    | Channel | Modulation | RB No. | RB Offset | MPR | Max Power (Conducted) | Limit (dBm) |
|-------------------------|---------|------------|--------|-----------|-----|-----------------------|-------------|
| Band IV (1700MHz)/15MHz | 20025   | QPSK       | 1      | #0        | 0   | 21.99                 | 23.5        |
|                         |         |            | 1      | #Mid      | 0   | 22.66                 | 23.5        |
|                         |         |            | 1      | #Max      | 0   | 23.1                  | 23.5        |
|                         |         |            | 50%    | #0        | 1   | 22.62                 | 23.5        |
|                         |         |            | 50%    | #Mid      | 1   | 22.97                 | 23.5        |
|                         |         |            | 50%    | #Max      | 1   | <b>23.35</b>          | 23.5        |
|                         |         |            | 100%   | --        | 1   | 23.34                 | 23.5        |
|                         |         | 16QAM      | 1      | #0        | 1   | 22.56                 | 23.5        |
|                         |         |            | 1      | #Mid      | 1   | 22.74                 | 23.5        |
|                         |         |            | 1      | #Max      | 1   | 23.45                 | 23.5        |
|                         |         |            | 50%    | #0        | 2   | 23.03                 | 23.5        |
|                         |         |            | 50%    | #Mid      | 2   | 23.34                 | 23.5        |
|                         |         |            | 50%    | #Max      | 2   | <b>23.50</b>          | 23.5        |
|                         |         |            | 100%   | --        | 2   | 22.97                 | 23.5        |
|                         | 20175   | QPSK       | 1      | #0        | 0   | 23.17                 | 23.5        |
|                         |         |            | 1      | #Mid      | 0   | 22.82                 | 23.5        |
|                         |         |            | 1      | #Max      | 0   | 22.22                 | 23.5        |
|                         |         |            | 50%    | #0        | 1   | <b>23.4</b>           | 23.5        |
|                         |         |            | 50%    | #Mid      | 1   | 23.12                 | 23.5        |
|                         |         |            | 50%    | #Max      | 1   | 22.93                 | 23.5        |
|                         |         |            | 100%   | --        | 1   | 23.36                 | 23.5        |
|                         |         | 16QAM      | 1      | #0        | 1   | 23.59                 | 23.5        |
|                         |         |            | 1      | #Mid      | 1   | 23.07                 | 23.5        |
|                         |         |            | 1      | #Max      | 1   | 22.24                 | 23.5        |
|                         |         |            | 50%    | #0        | 2   | 23.66                 | 23.5        |
|                         |         |            | 50%    | #Mid      | 2   | 23.39                 | 23.5        |
|                         |         |            | 50%    | #Max      | 2   | 23.27                 | 23.5        |
|                         |         |            | 100%   | --        | 2   | <b>23.50</b>          | 23.5        |
|                         | 20325   | QPSK       | 1      | #0        | 0   | 22.16                 | 23.5        |
|                         |         |            | 1      | #Mid      | 0   | 21.96                 | 23.5        |
|                         |         |            | 1      | #Max      | 0   | <b>22.94</b>          | 23.5        |
|                         |         |            | 50%    | #0        | 1   | 22.26                 | 23.5        |
|                         |         |            | 50%    | #Mid      | 1   | 22.31                 | 23.5        |
|                         |         |            | 50%    | #Max      | 1   | 22.77                 | 23.5        |
|                         |         |            | 100%   | --        | 1   | 22.72                 | 23.5        |
|                         |         | 16QAM      | 1      | #0        | 1   | 22.21                 | 23.5        |
|                         |         |            | 1      | #Mid      | 1   | 22.1                  | 23.5        |
|                         |         |            | 1      | #Max      | 1   | 22.76                 | 23.5        |
|                         |         |            | 50%    | #0        | 2   | 22.51                 | 23.5        |
|                         |         |            | 50%    | #Mid      | 2   | 22.64                 | 23.5        |
|                         |         |            | 50%    | #Max      | 2   | <b>22.96</b>          | 23.5        |
|                         |         |            | 100%   | --        | 2   | 22.59                 | 23.5        |

| Band                    | Channel | Modulation | RB No. | RB Offset | MPR | Max Power (Conducted) | Limit (dBm) |
|-------------------------|---------|------------|--------|-----------|-----|-----------------------|-------------|
| Band IV (1700MHz)/20MHz | 20050   | QPSK       | 1      | #0        | 0   | 22.06                 | 23.5        |
|                         |         |            | 1      | #Mid      | 0   | 23.29                 | 23.5        |
|                         |         |            | 1      | #Max      | 0   | 23.37                 | 23.5        |
|                         |         |            | 50%    | #0        | 1   | 22.9                  | 23.5        |
|                         |         |            | 50%    | #Mid      | 1   | 23.18                 | 23.5        |
|                         |         |            | 50%    | #Max      | 1   | <b>23.44</b>          | 23.5        |
|                         |         |            | 100%   | --        | 1   | 23.13                 | 23.5        |
|                         |         | 16QAM      | 1      | #0        | 1   | 22.3                  | 23.5        |
|                         |         |            | 1      | #Mid      | 1   | <b>23.50</b>          | 23.5        |
|                         |         |            | 1      | #Max      | 1   | 23.49                 | 23.5        |
|                         |         |            | 50%    | #0        | 2   | 23.23                 | 23.5        |
|                         |         |            | 50%    | #Mid      | 2   | 23.43                 | 23.5        |
|                         |         |            | 50%    | #Max      | 2   | 23.48                 | 23.5        |
|                         |         |            | 100%   | --        | 2   | 23.48                 | 23.5        |
|                         | 20175   | QPSK       | 1      | #0        | 0   | 23.6                  | 23.5        |
|                         |         |            | 1      | #Mid      | 0   | 23.35                 | 23.5        |
|                         |         |            | 1      | #Max      | 0   | 22.35                 | 23.5        |
|                         |         |            | 50%    | #0        | 1   | <b>23.50</b>          | 23.5        |
|                         |         |            | 50%    | #Mid      | 1   | 23.47                 | 23.5        |
|                         |         |            | 50%    | #Max      | 1   | 23.25                 | 23.5        |
|                         |         |            | 100%   | --        | 1   | 23.44                 | 23.5        |
|                         |         | 16QAM      | 1      | #0        | 1   | 23.41                 | 23.5        |
|                         |         |            | 1      | #Mid      | 1   | 22.93                 | 23.5        |
|                         |         |            | 1      | #Max      | 1   | 22.32                 | 23.5        |
|                         |         |            | 50%    | #0        | 2   | <b>23.50</b>          | 23.5        |
|                         |         |            | 50%    | #Mid      | 2   | 23.47                 | 23.5        |
|                         |         |            | 50%    | #Max      | 2   | 23.42                 | 23.5        |
|                         |         |            | 100%   | --        | 2   | 23.44                 | 23.5        |
|                         | 20300   | QPSK       | 1      | #0        | 0   | 23.03                 | 23.5        |
|                         |         |            | 1      | #Mid      | 0   | 22.15                 | 23.5        |
|                         |         |            | 1      | #Max      | 0   | <b>23.19</b>          | 23.5        |
|                         |         |            | 50%    | #0        | 1   | 22.86                 | 23.5        |
|                         |         |            | 50%    | #Mid      | 1   | 22.78                 | 23.5        |
|                         |         |            | 50%    | #Max      | 1   | 22.83                 | 23.5        |
|                         |         |            | 100%   | --        | 1   | 22.84                 | 23.5        |
|                         |         | 16QAM      | 1      | #0        | 1   | 22.46                 | 23.5        |
|                         |         |            | 1      | #Mid      | 1   | 21.58                 | 23.5        |
|                         |         |            | 1      | #Max      | 1   | 22.7                  | 23.5        |
|                         |         |            | 50%    | #0        | 2   | 23.29                 | 23.5        |
|                         |         |            | 50%    | #Mid      | 2   | <b>23.36</b>          | 23.5        |
|                         |         |            | 50%    | #Max      | 2   | 23.31                 | 23.5        |
|                         |         |            | 100%   | --        | 2   | 23.17                 | 23.5        |

| Band                    | Channel | Modulation | RB No. | RB Offset | MPR | Max Power (Conducted) | Limit (dBm) |
|-------------------------|---------|------------|--------|-----------|-----|-----------------------|-------------|
| Band XIII (700MHz)/5MHz | 23205   | QPSK       | 1      | #0        | 0   | 22.59                 | 23.5        |
|                         |         |            | 1      | #Mid      | 0   | 23.33                 | 23.5        |
|                         |         |            | 1      | #Max      | 0   | <b>23.48</b>          | 23.5        |
|                         |         |            | 50%    | #0        | 1   | 23.06                 | 23.5        |
|                         |         |            | 50%    | #Mid      | 1   | 23.22                 | 23.5        |
|                         |         |            | 50%    | #Max      | 1   | 23.46                 | 23.5        |
|                         |         |            | 100%   | --        | 1   | 23.25                 | 23.5        |
|                         |         | 16QAM      | 1      | #0        | 1   | 22.62                 | 23.5        |
|                         |         |            | 1      | #Mid      | 1   | 22.72                 | 23.5        |
|                         |         |            | 1      | #Max      | 1   | 23                    | 23.5        |
|                         |         |            | 50%    | #0        | 2   | 23.22                 | 23.5        |
|                         |         |            | 50%    | #Mid      | 2   | 23.4                  | 23.5        |
|                         |         |            | 50%    | #Max      | 2   | <b>23.50</b>          | 23.5        |
|                         |         |            | 100%   | --        | 2   | 23.28                 | 23.5        |
|                         | 23230   | QPSK       | 1      | #0        | 0   | 23.36                 | 23.5        |
|                         |         |            | 1      | #Mid      | 0   | 23.45                 | 23.5        |
|                         |         |            | 1      | #Max      | 0   | 23.27                 | 23.5        |
|                         |         |            | 50%    | #0        | 1   | 23.48                 | 23.5        |
|                         |         |            | 50%    | #Mid      | 1   | <b>23.50</b>          | 23.5        |
|                         |         |            | 50%    | #Max      | 1   | 23.46                 | 23.5        |
|                         |         |            | 100%   | --        | 1   | 23.48                 | 23.5        |
|                         |         | 16QAM      | 1      | #0        | 1   | 23.19                 | 23.5        |
|                         |         |            | 1      | #Mid      | 1   | 23.2                  | 23.5        |
|                         |         |            | 1      | #Max      | 1   | 23.06                 | 23.5        |
|                         |         |            | 50%    | #0        | 2   | <b>23.50</b>          | 23.5        |
|                         |         |            | 50%    | #Mid      | 2   | 23.46                 | 23.5        |
|                         |         |            | 50%    | #Max      | 2   | 23.39                 | 23.5        |
|                         |         |            | 100%   | --        | 2   | 23.42                 | 23.5        |
|                         | 23255   | QPSK       | 1      | #0        | 0   | 23.47                 | 23.5        |
|                         |         |            | 1      | #Mid      | 0   | 23.02                 | 23.5        |
|                         |         |            | 1      | #Max      | 0   | 23.03                 | 23.5        |
|                         |         |            | 50%    | #0        | 1   | 23.4                  | 23.5        |
|                         |         |            | 50%    | #Mid      | 1   | <b>23.50</b>          | 23.5        |
|                         |         |            | 50%    | #Max      | 1   | 23.16                 | 23.5        |
|                         |         |            | 100%   | --        | 1   | 23.11                 | 23.5        |
|                         |         | 16QAM      | 1      | #0        | 1   | 23.08                 | 23.5        |
|                         |         |            | 1      | #Mid      | 1   | 22.47                 | 23.5        |
|                         |         |            | 1      | #Max      | 1   | 22.66                 | 23.5        |
|                         |         |            | 50%    | #0        | 2   | 23.47                 | 23.5        |
|                         |         |            | 50%    | #Mid      | 2   | <b>23.50</b>          | 23.5        |
|                         |         |            | 50%    | #Max      | 2   | 23.24                 | 23.5        |
|                         |         |            | 100%   | --        | 2   | 23.38                 | 23.5        |

| Band                     | Channel | Modulation | RB No. | RB Offset | MPR | Max Power (Conducted) | Limit (dBm) |
|--------------------------|---------|------------|--------|-----------|-----|-----------------------|-------------|
| Band XIII (700MHz)/10MHz | 23230   | QPSK       | 1      | #0        |     |                       |             |
|                          |         |            | 1      | #Mid      |     |                       |             |
|                          |         |            | 1      | #Max      |     |                       |             |
|                          |         |            | 50%    | #0        |     |                       |             |
|                          |         |            | 50%    | #Mid      |     |                       |             |
|                          |         |            | 50%    | #Max      |     |                       |             |
|                          |         |            | 100%   | --        |     |                       |             |
|                          |         | 16QAM      | 1      | #0        |     |                       |             |
|                          |         |            | 1      | #Mid      |     |                       |             |
|                          |         |            | 1      | #Max      |     |                       |             |
|                          |         |            | 50%    | #0        |     |                       |             |
|                          |         |            | 50%    | #Mid      |     |                       |             |
|                          |         |            | 50%    | #Max      |     |                       |             |
|                          |         |            | 100%   | --        |     |                       |             |
|                          | 23230   | QPSK       | 1      | #0        | 0   | 22.7                  | 23.5        |
|                          |         |            | 1      | #Mid      | 0   | 23.38                 | 23.5        |
|                          |         |            | 1      | #Max      | 0   | 22.85                 | 23.5        |
|                          |         |            | 50%    | #0        | 1   | <b>23.50</b>          | 23.5        |
|                          |         |            | 50%    | #Mid      | 1   | 23.5                  | 23.5        |
|                          |         |            | 50%    | #Max      | 1   | 23.26                 | 23.5        |
|                          |         |            | 100%   | --        | 1   | 23.64                 | 23.5        |
|                          |         | 16QAM      | 1      | #0        | 1   | 22.79                 | 23.5        |
|                          |         |            | 1      | #Mid      | 1   | 22.85                 | 23.5        |
|                          |         |            | 1      | #Max      | 1   | 23.01                 | 23.5        |
|                          |         |            | 50%    | #0        | 2   | 23.44                 | 23.5        |
|                          |         |            | 50%    | #Mid      | 2   | 23.42                 | 23.5        |
|                          |         |            | 50%    | #Max      | 2   | 23.48                 | 23.5        |
|                          |         |            | 100%   | --        | 2   | <b>23.50</b>          | 23.5        |
|                          | 23230   | QPSK       | 1      | #0        |     |                       |             |
|                          |         |            | 1      | #Mid      |     |                       |             |
|                          |         |            | 1      | #Max      |     |                       |             |
|                          |         |            | 50%    | #0        |     |                       |             |
|                          |         |            | 50%    | #Mid      |     |                       |             |
|                          |         |            | 50%    | #Max      |     |                       |             |
|                          |         |            | 100%   | --        |     |                       |             |
|                          |         | 16QAM      | 1      | #0        |     |                       |             |
|                          |         |            | 1      | #Mid      |     |                       |             |
|                          |         |            | 1      | #Max      |     |                       |             |
|                          |         |            | 50%    | #0        |     |                       |             |
|                          |         |            | 50%    | #Mid      |     |                       |             |
|                          |         |            | 50%    | #Max      |     |                       |             |
|                          |         |            | 100%   | --        |     |                       |             |

### 3. Occupied Bandwidth

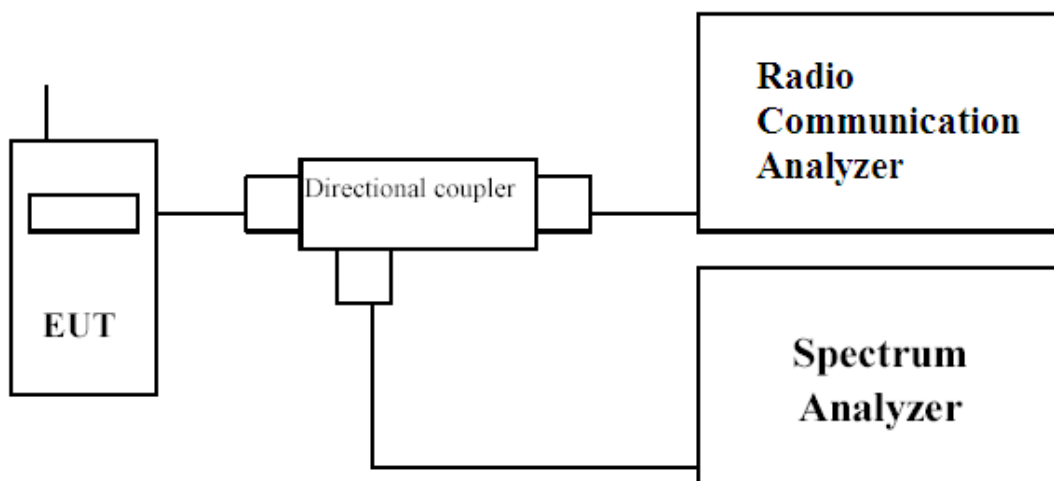
#### 3.1. Test Equipment

The following test equipments are used during the occupied bandwidth tests:

| Equipment                    | Manufacturer | Model No./Serial No. | Last Cal.  |
|------------------------------|--------------|----------------------|------------|
| Spectrum Analyzer            | Agilent      | N9010A/ MY48030495   | 2014/07/08 |
| Radio Communication Analyzer | Anritsu      | MT8820C / 6201091166 | 2014/01/17 |
| Directional coupler          | Agilent      | 87300C / MY44300352  | 2014/01/06 |
| Dual Directional couple      | Agilent      | 778D / 50550         | 2013/10/07 |

Note: All equipments upon which need to be calibrated are with calibration period of 1 year.

#### 3.2. Test Setup



#### 3.3. Test Procedure

The EUT is tested with maximum rated TX power via the Base Station simulator, and the occupied bandwidth was measured at the antenna terminals of the EUT.

The Resolution BW of the analyzer is set to 1 %~5% of the emission bandwidth. The EUT's occupied bandwidth is measured as the width of the signal between two points, one below the carrier center frequency and one above the carrier frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

The plots below show the resultant display from the Spectrum Analyzer.

#### 3.4. Test Specification

According to Part 2.1049, 27.53(h).

### 3.5. Test Result of Occupied Bandwidth

|           |                    |
|-----------|--------------------|
| Product   | Notebook PC        |
| Test Mode | Occupied Bandwidth |
| Test Site | CTR                |

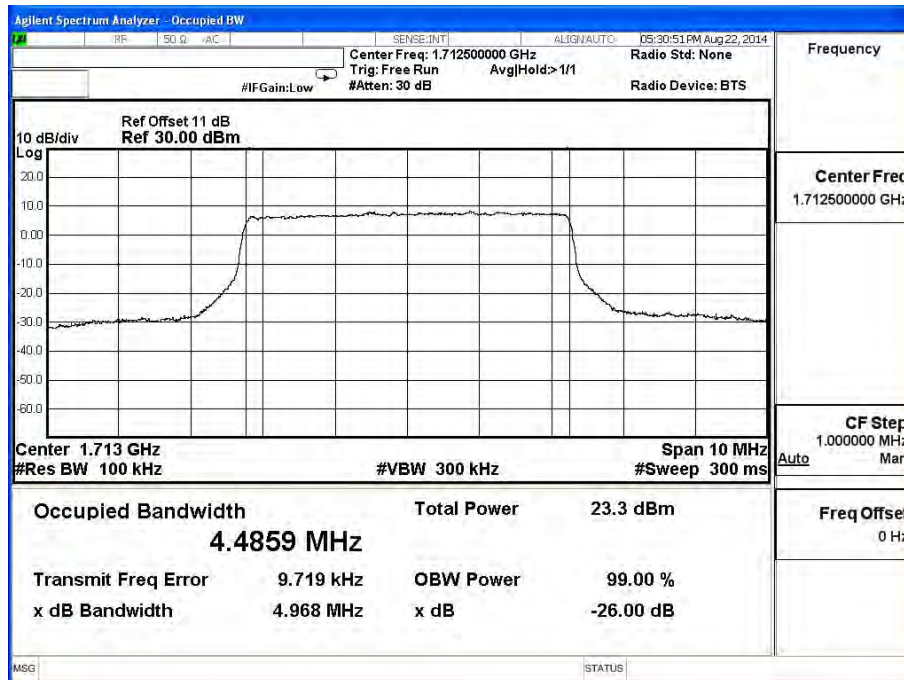
| Test Mode           | Channel | TX Frequency (MHz) | 99% Occupied Bandwidth (MHz) | 26 dB bandwidth (MHz) | Result |
|---------------------|---------|--------------------|------------------------------|-----------------------|--------|
| Band IV (5M) QPSK   | 19975   | 1712.5             | 4.4859                       | 4.968                 | Pass   |
|                     | 20175   | 1732.5             | 4.4818                       | 4.927                 | Pass   |
|                     | 20375   | 1752.5             | 4.4844                       | 4.978                 | Pass   |
| Band IV (5M) 16QAM  | 19975   | 1712.5             | 4.4875                       | 5.058                 | Pass   |
|                     | 20175   | 1732.5             | 4.4840                       | 5.050                 | Pass   |
|                     | 20375   | 1752.5             | 4.4895                       | 5.163                 | Pass   |
| Band IV (10M) QPSK  | 20000   | 1715               | 8.9119                       | 9.572                 | Pass   |
|                     | 20175   | 1732.5             | 8.9047                       | 9.560                 | Pass   |
|                     | 20350   | 1750               | 8.9251                       | 9.742                 | Pass   |
| Band IV (10M) 16QAM | 20000   | 1715               | 8.9096                       | 9.665                 | Pass   |
|                     | 20175   | 1732.5             | 8.9151                       | 9.641                 | Pass   |
|                     | 20350   | 1750               | 8.9316                       | 9.848                 | Pass   |
| Band IV (15M) QPSK  | 20025   | 1717.5             | 13.331                       | 14.16                 | Pass   |
|                     | 20175   | 1732.5             | 13.349                       | 14.14                 | Pass   |
|                     | 20325   | 1747.5             | 13.395                       | 14.38                 | Pass   |
| Band IV (15M) 16QAM | 20025   | 1717.5             | 13.332                       | 14.18                 | Pass   |
|                     | 20175   | 1732.5             | 13.365                       | 14.47                 | Pass   |
|                     | 20325   | 1747.5             | 13.393                       | 14.27                 | Pass   |
| Band IV (20M) QPSK  | 20050   | 1720               | 17.750                       | 18.65                 | Pass   |
|                     | 20175   | 1732.5             | 17.783                       | 18.63                 | Pass   |
|                     | 20300   | 1745               | 17.889                       | 19.02                 | Pass   |
| Band IV (20M) 16QAM | 20050   | 1720               | 17.756                       | 18.89                 | Pass   |
|                     | 20175   | 1732.5             | 17.788                       | 18.64                 | Pass   |
|                     | 20300   | 1745               | 17.872                       | 18.88                 | Pass   |

|           |                    |
|-----------|--------------------|
| Product   | Notebook PC        |
| Test Mode | Occupied Bandwidth |
| Test Site | CTR                |

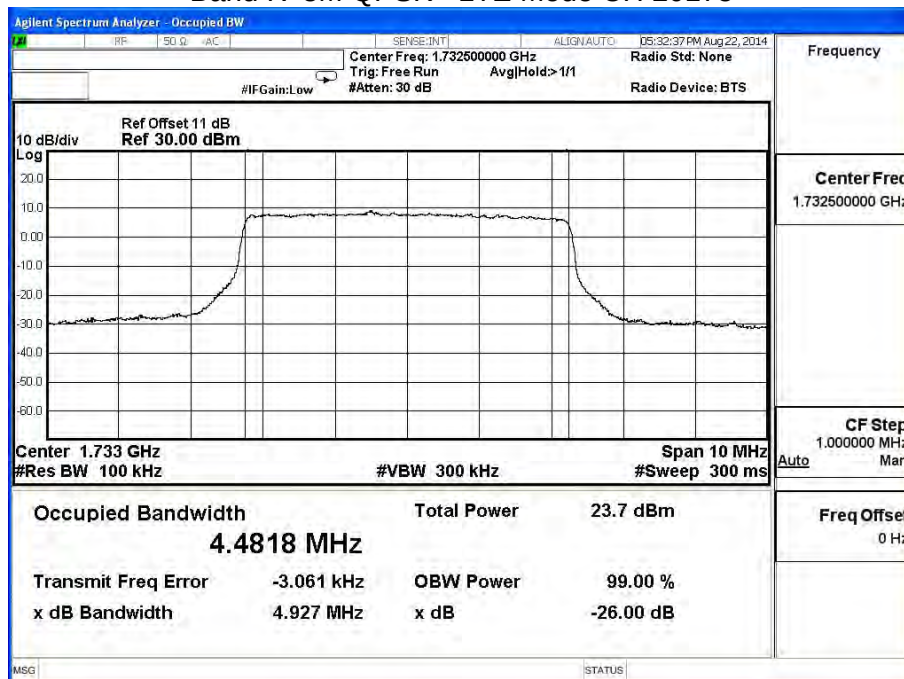
| Test Mode             | Channel | TX Frequency (MHz) | 99% Occupied Bandwidth (MHz) | 26 dB bandwidth (MHz) | Result |
|-----------------------|---------|--------------------|------------------------------|-----------------------|--------|
| Band XIII (5M) QPSK   | 23205   | 779.5              | 4.4858                       | 4.957                 | Pass   |
|                       | 23230   | 782                | 4.4954                       | 5.085                 | Pass   |
|                       | 23255   | 784.5              | 4.4790                       | 4.950                 | Pass   |
| Band XIII (5M) 16QAM  | 23205   | 779.5              | 4.4915                       | 5.246                 | Pass   |
|                       | 23230   | 782                | 4.5000                       | 5.254                 | Pass   |
|                       | 23255   | 784.5              | 4.4813                       | 4.994                 | Pass   |
| Band XIII (10M) QPSK  | --      | --                 | --                           | --                    | Pass   |
|                       | 23230   | 782                | 8.9437                       | 9.769                 | Pass   |
|                       | --      | --                 | --                           | --                    | Pass   |
| Band XIII (10M) 16QAM | --      | --                 | --                           | --                    | Pass   |
|                       | 23230   | 782                | 8.9458                       | 9.882                 | Pass   |
|                       | --      | --                 | --                           | --                    | Pass   |

|                |                    |           |     |
|----------------|--------------------|-----------|-----|
| Product        | Notebook PC        |           |     |
| Test Mode      | Occupied Bandwidth |           |     |
| Date of Test   | 2014/09/26         | Test Site | CTR |
| Test Condition | Band IV 5M         |           |     |

### Band IV 5M QPSK - LTE Mode CH 19975

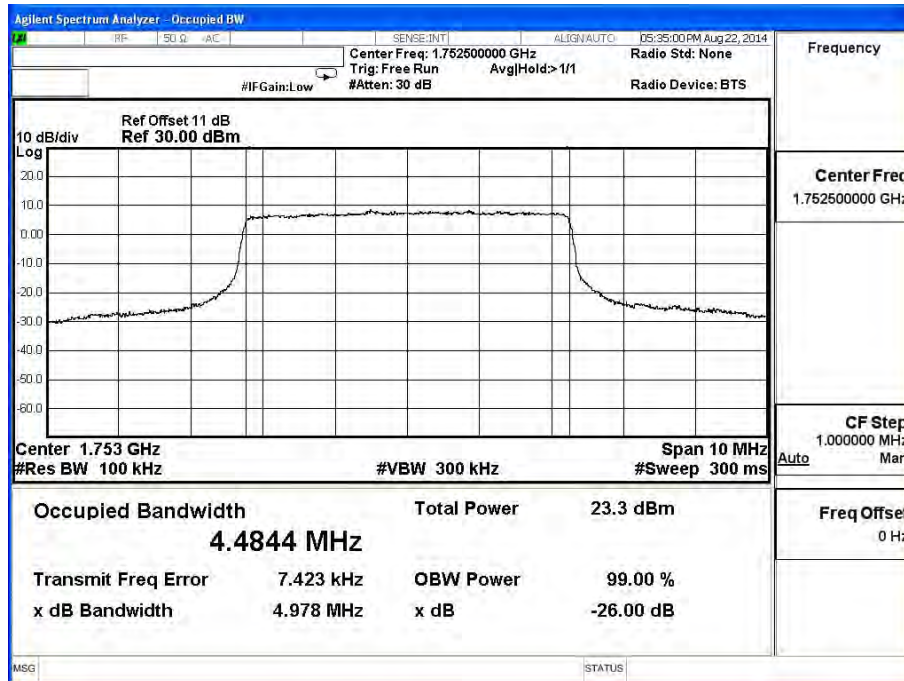


### Band IV 5M QPSK - LTE Mode CH 20175

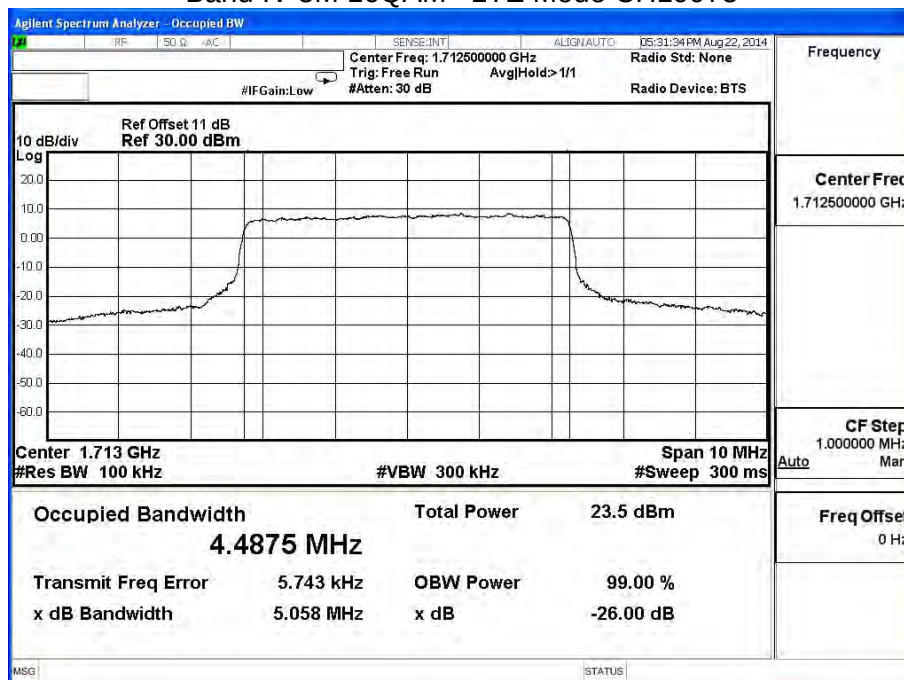


|                |                    |           |     |
|----------------|--------------------|-----------|-----|
| Product        | Notebook PC        |           |     |
| Test Mode      | Occupied Bandwidth |           |     |
| Date of Test   | 2014/09/26         | Test Site | CTR |
| Test Condition | Band IV 5M         |           |     |

Band IV 5M QPSK - LTE Mode CH 20375

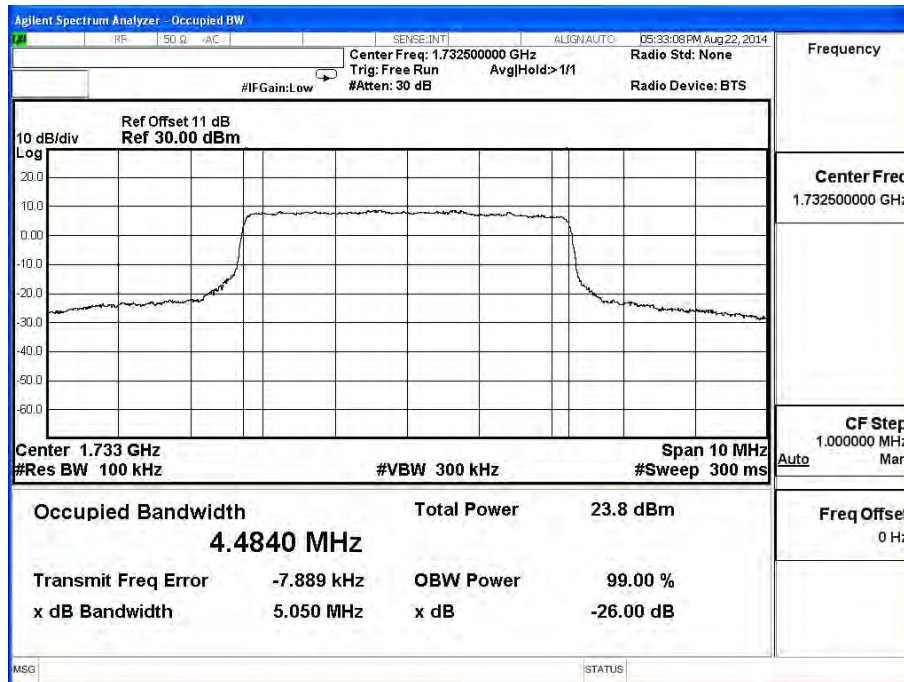


Band IV 5M 16QAM - LTE Mode CH19975

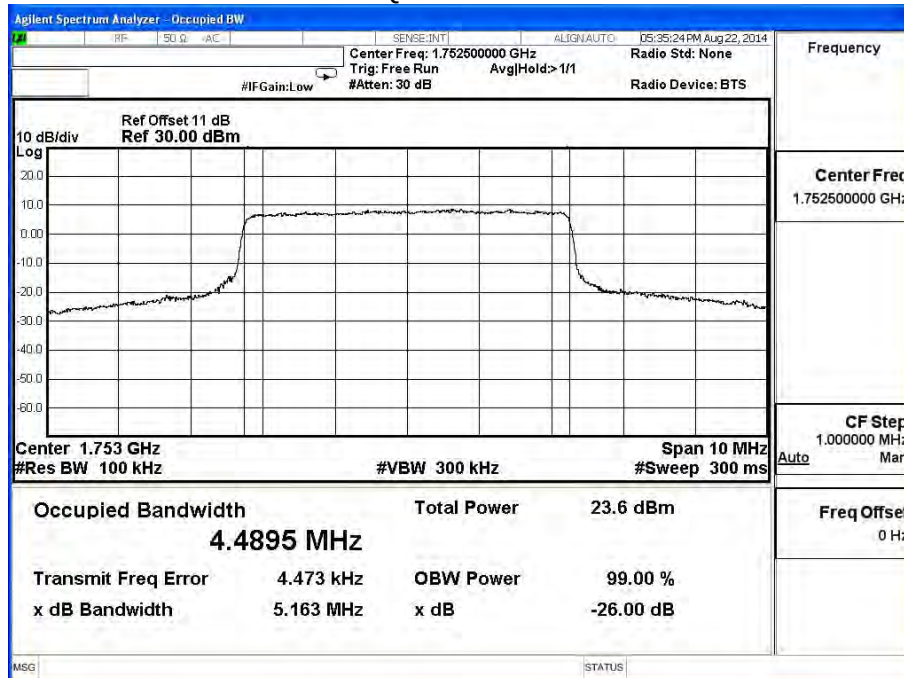


|                |                    |           |     |
|----------------|--------------------|-----------|-----|
| Product        | Notebook PC        |           |     |
| Test Mode      | Occupied Bandwidth |           |     |
| Date of Test   | 2014/09/26         | Test Site | CTR |
| Test Condition | Band IV 5M         |           |     |

### Band IV 5M 16QAM - LTE Mode CH20175

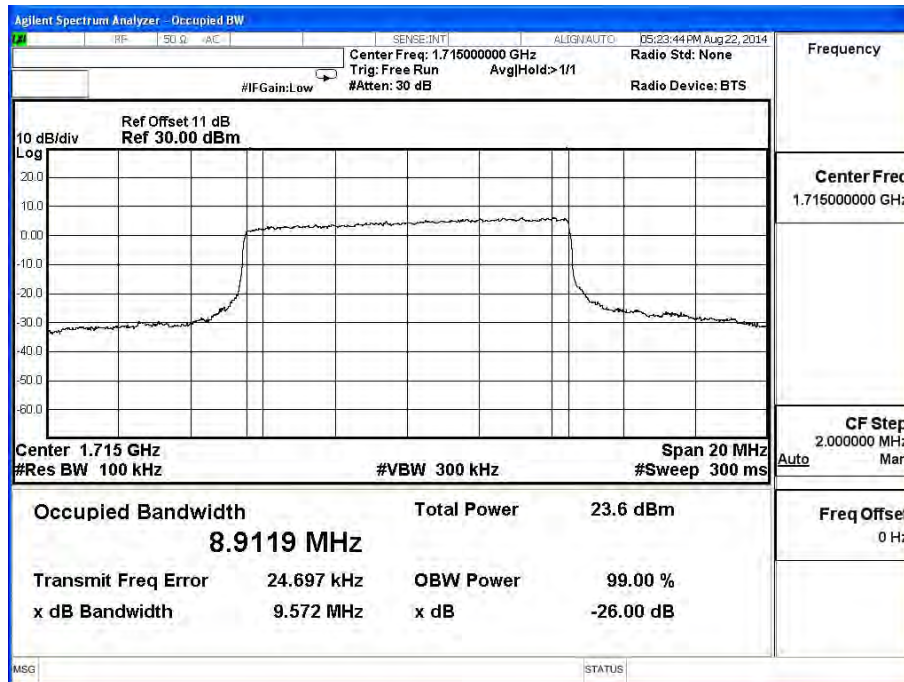


### Band IV 5M 16QAM - LTE Mode CH20375

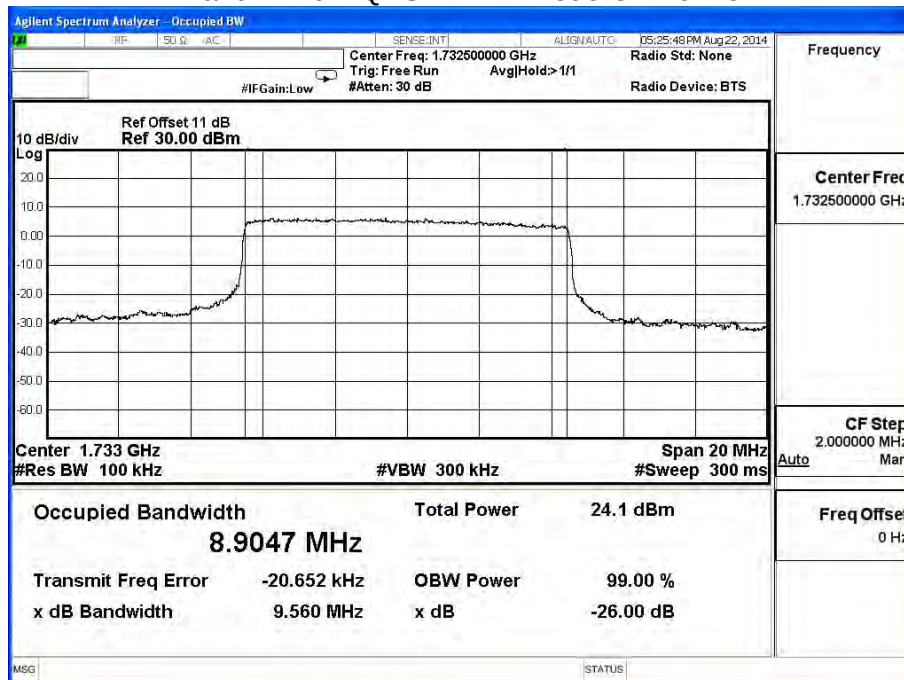


|                |                    |           |     |
|----------------|--------------------|-----------|-----|
| Product        | Notebook PC        |           |     |
| Test Mode      | Occupied Bandwidth |           |     |
| Date of Test   | 2014/09/26         | Test Site | CTR |
| Test Condition | Band IV 10M        |           |     |

Band IV 10M QPSK - LTE Mode CH 20000

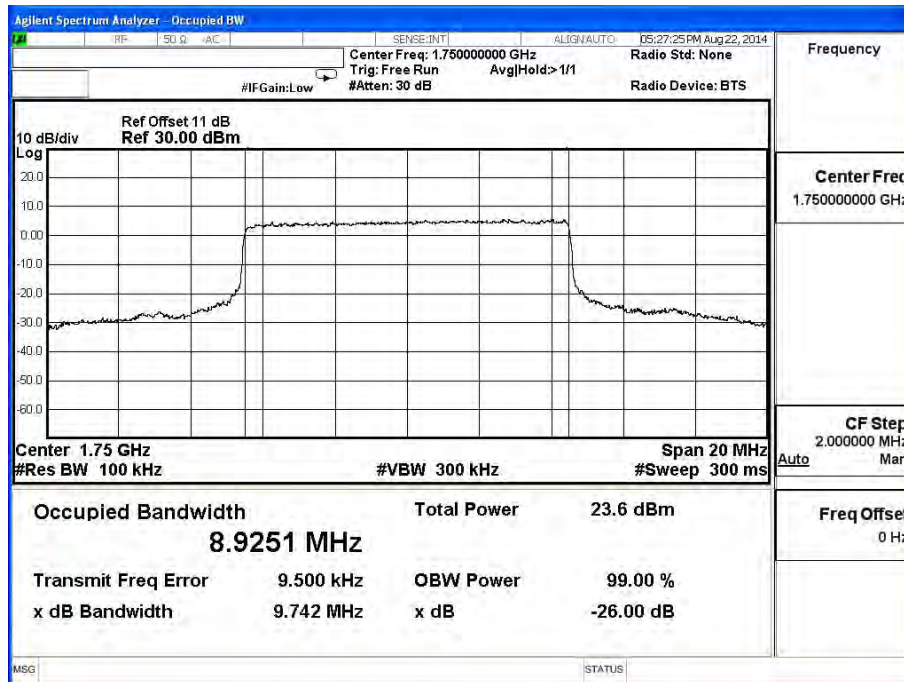


Band IV 10M QPSK - LTE Mode CH 20175

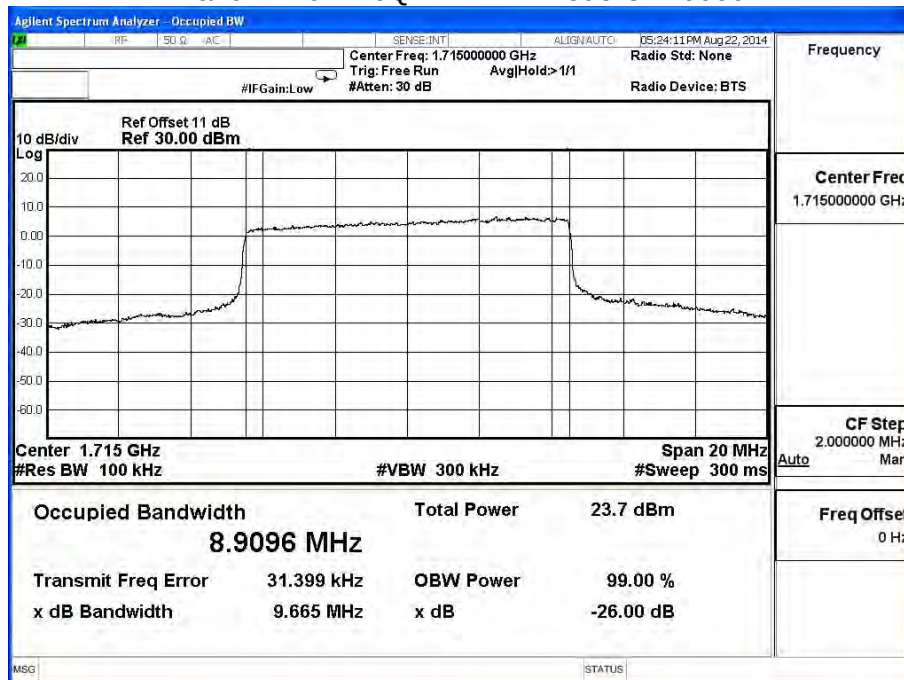


|                |                    |           |     |
|----------------|--------------------|-----------|-----|
| Product        | Notebook PC        |           |     |
| Test Mode      | Occupied Bandwidth |           |     |
| Date of Test   | 2014/09/26         | Test Site | CTR |
| Test Condition | Band IV 10M        |           |     |

### Band IV 10M QPSK - LTE Mode CH 20350

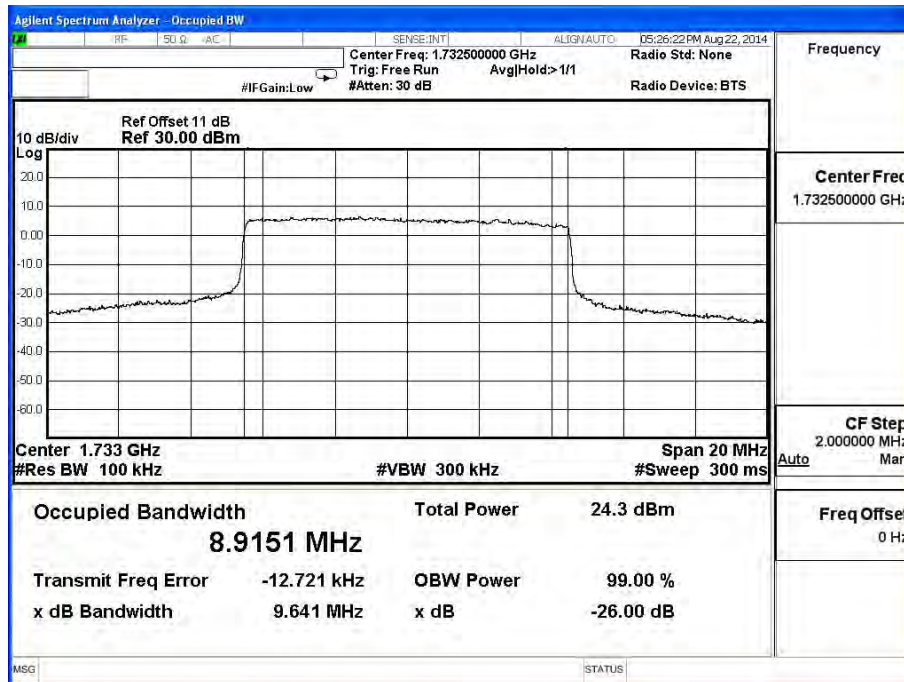


### Band IV 10M 16QAM - LTE Mode CH20000

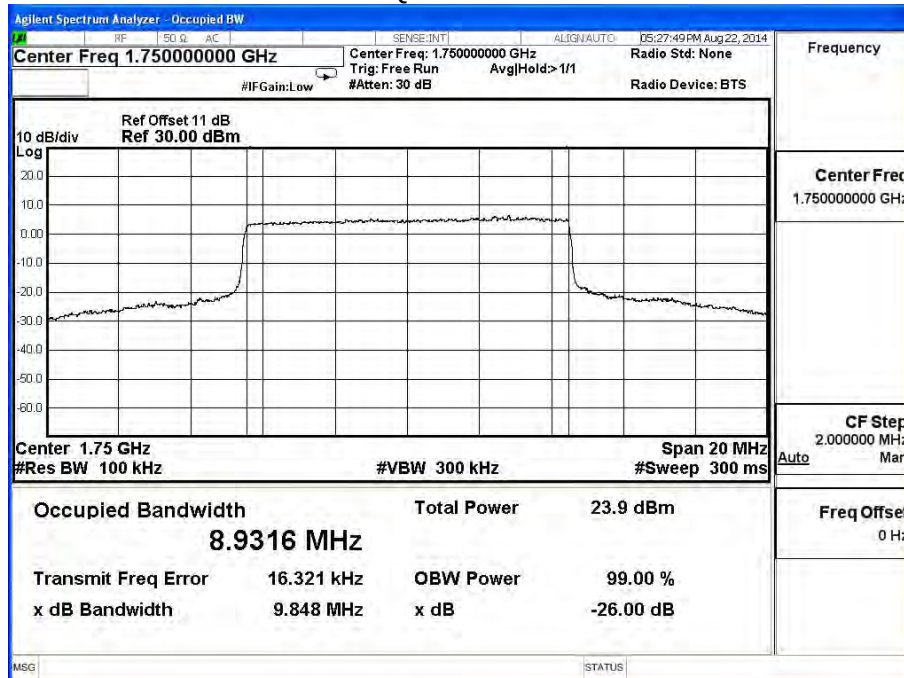


|                |                    |           |     |
|----------------|--------------------|-----------|-----|
| Product        | Notebook PC        |           |     |
| Test Mode      | Occupied Bandwidth |           |     |
| Date of Test   | 2014/09/26         | Test Site | CTR |
| Test Condition | Band IV 10M        |           |     |

Band IV 10M 16QAM - LTE Mode CH20175

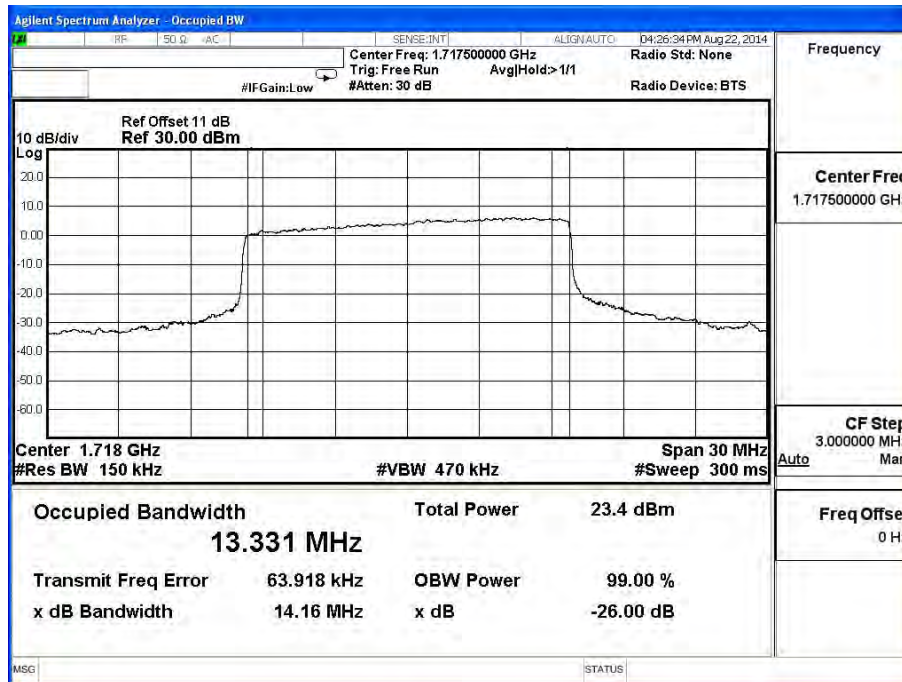


Band IV 10M 16QAM - LTE Mode CH20350

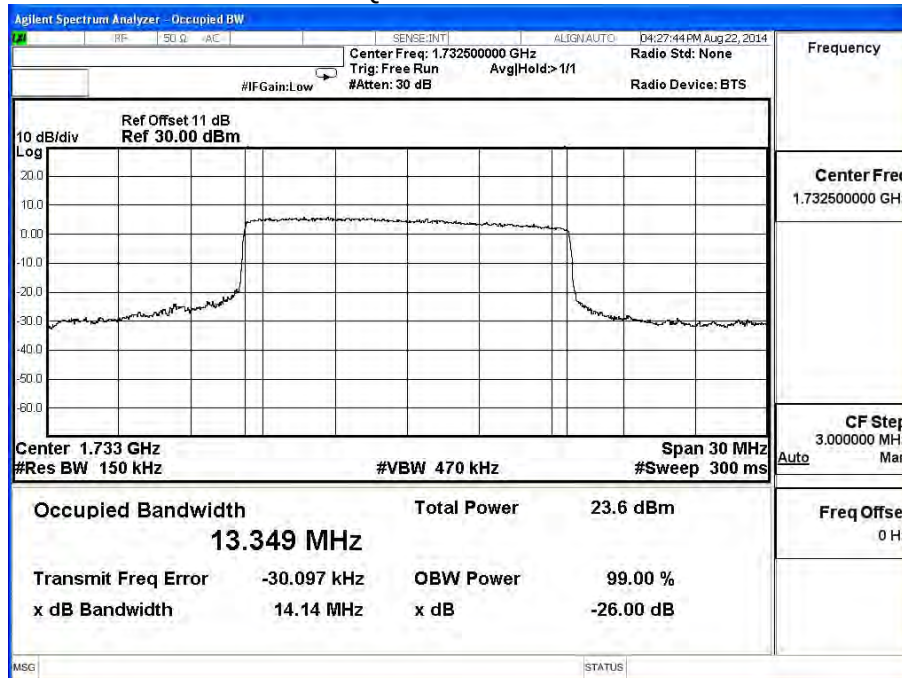


|                |                    |           |     |
|----------------|--------------------|-----------|-----|
| Product        | Notebook PC        |           |     |
| Test Mode      | Occupied Bandwidth |           |     |
| Date of Test   | 2014/09/26         | Test Site | CTR |
| Test Condition | Band IV 15M        |           |     |

### Band IV 15M QPSK - LTE Mode CH 20025

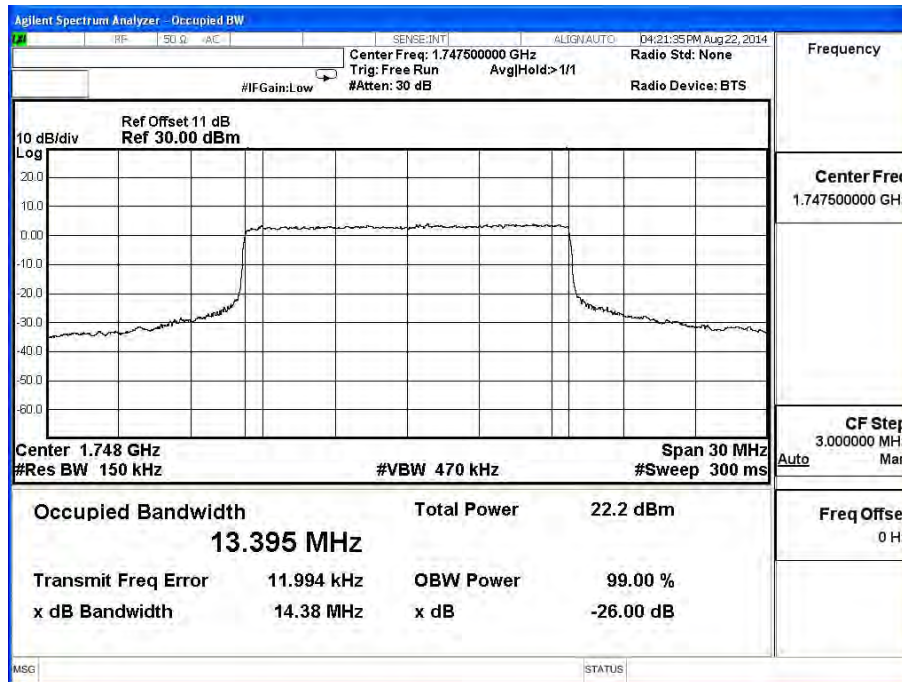


### Band IV 15M QPSK - LTE Mode CH 20175

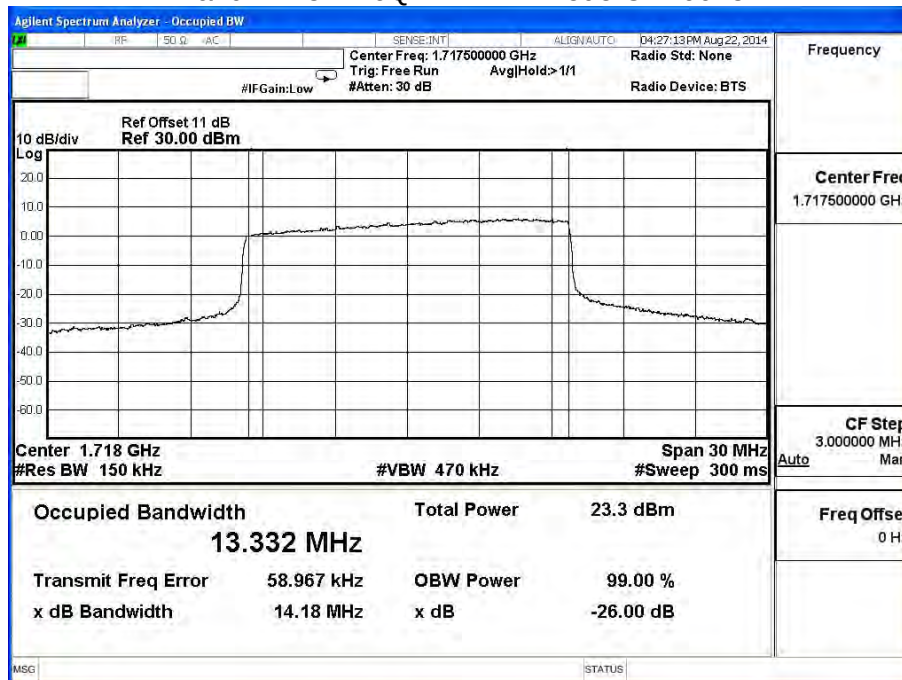


|                |                    |           |     |
|----------------|--------------------|-----------|-----|
| Product        | Notebook PC        |           |     |
| Test Mode      | Occupied Bandwidth |           |     |
| Date of Test   | 2014/09/26         | Test Site | CTR |
| Test Condition | Band IV 15M        |           |     |

### Band IV 15M QPSK - LTE Mode CH 20325

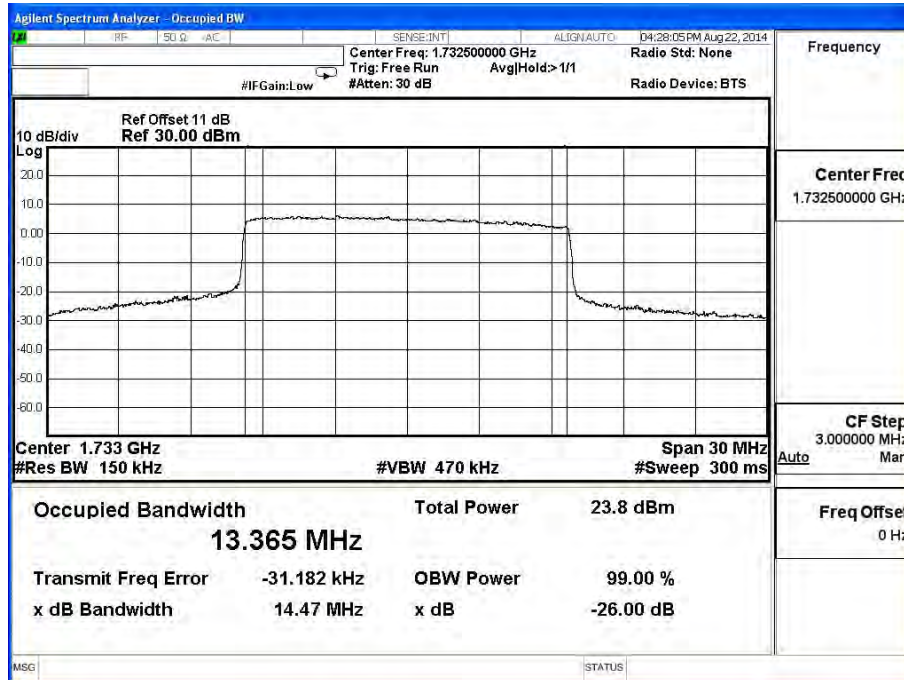


### Band IV 15M 16QAM - LTE Mode CH20025

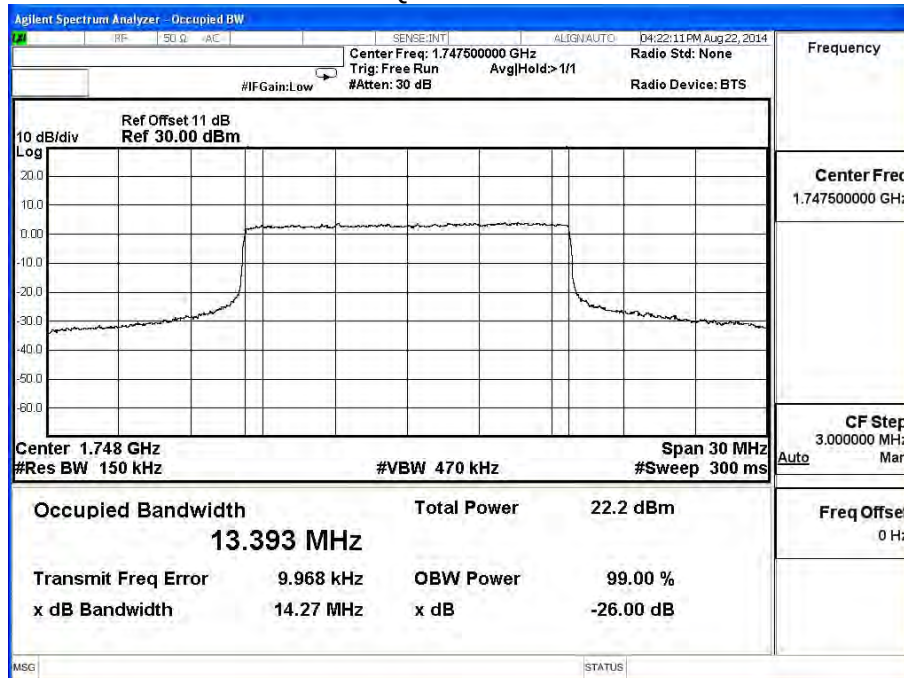


|                |                    |           |     |
|----------------|--------------------|-----------|-----|
| Product        | Notebook PC        |           |     |
| Test Mode      | Occupied Bandwidth |           |     |
| Date of Test   | 2014/09/26         | Test Site | CTR |
| Test Condition | Band IV 15M        |           |     |

Band IV 15M 16QAM - LTE Mode CH20175

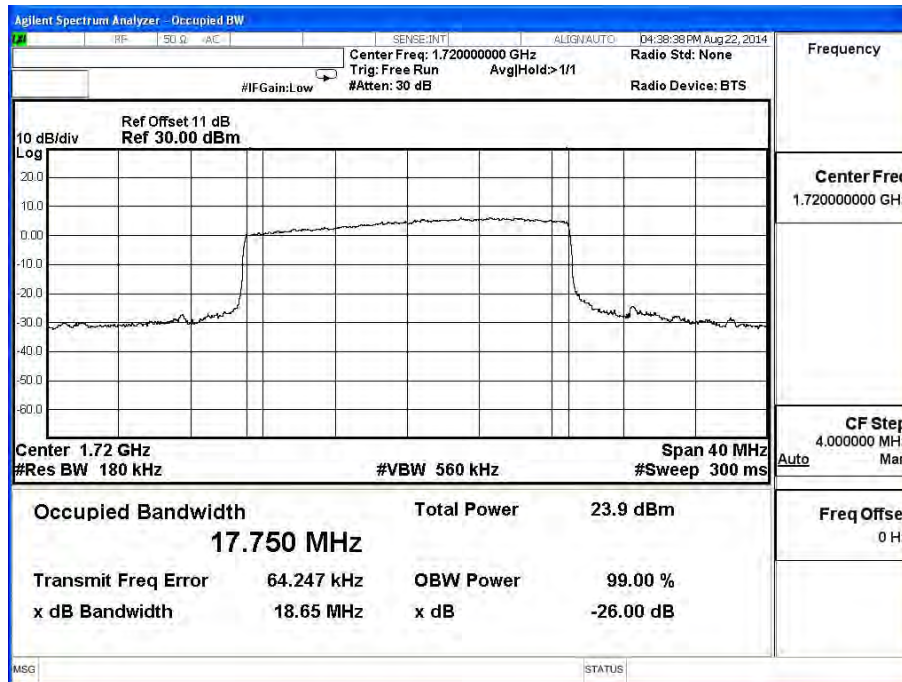


Band IV 15M 16QAM - LTE Mode CH20325

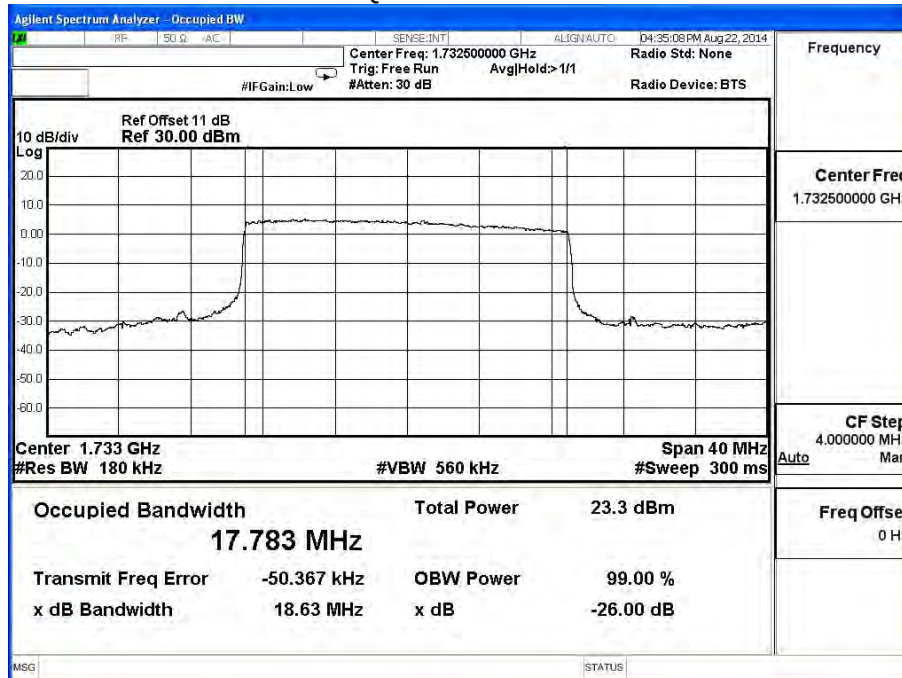


|                |                    |           |     |
|----------------|--------------------|-----------|-----|
| Product        | Notebook PC        |           |     |
| Test Mode      | Occupied Bandwidth |           |     |
| Date of Test   | 2014/09/26         | Test Site | CTR |
| Test Condition | Band IV 20M        |           |     |

### Band IV 20M QPSK - LTE Mode CH 20050

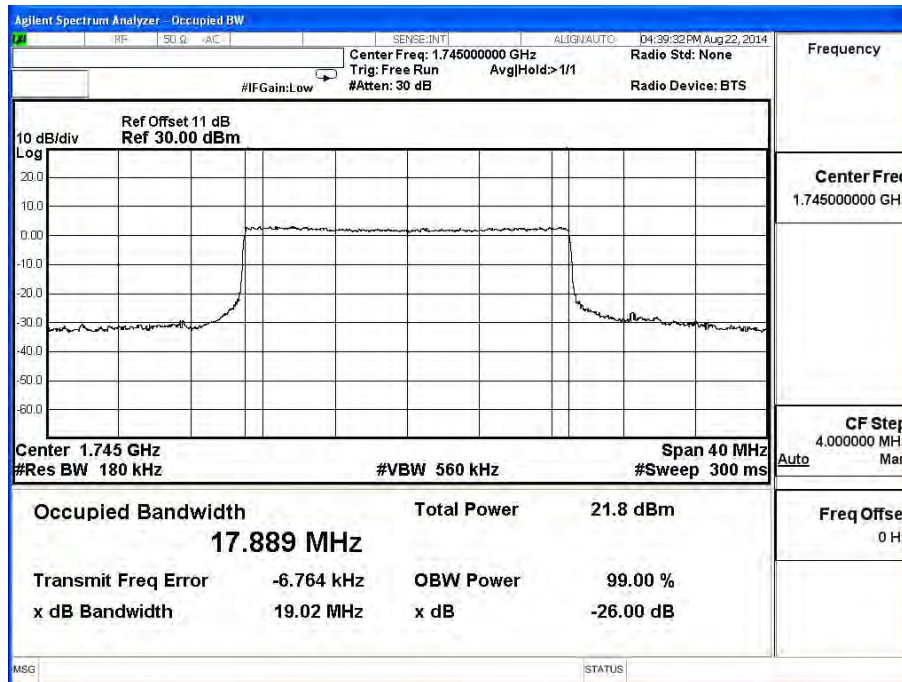


### Band IV 20M QPSK - LTE Mode CH 20175

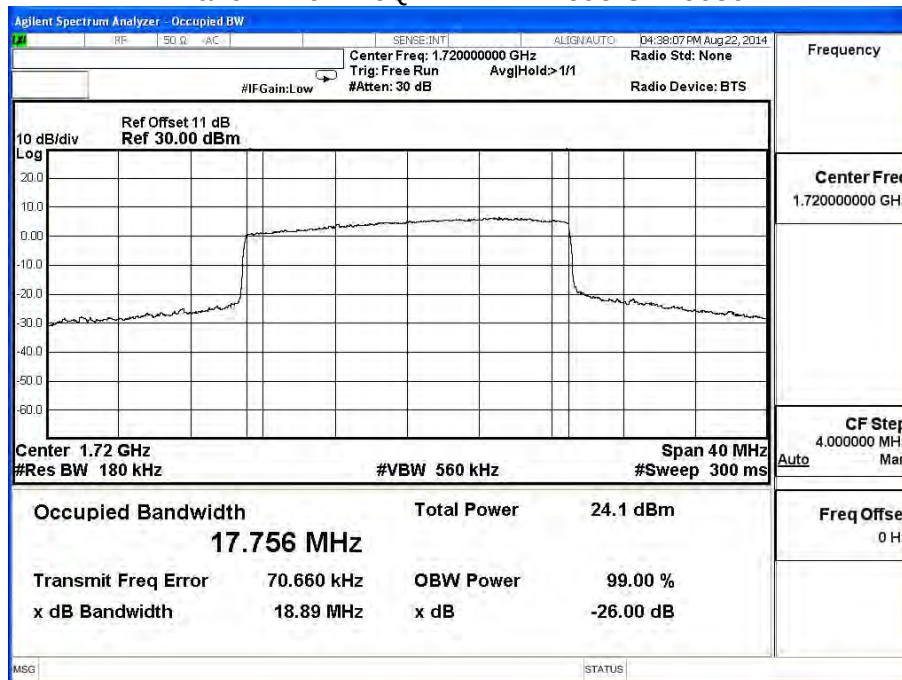


|                |                    |           |     |
|----------------|--------------------|-----------|-----|
| Product        | Notebook PC        |           |     |
| Test Mode      | Occupied Bandwidth |           |     |
| Date of Test   | 2014/09/26         | Test Site | CTR |
| Test Condition | Band IV 20M        |           |     |

### Band IV 20M QPSK - LTE Mode CH 20300

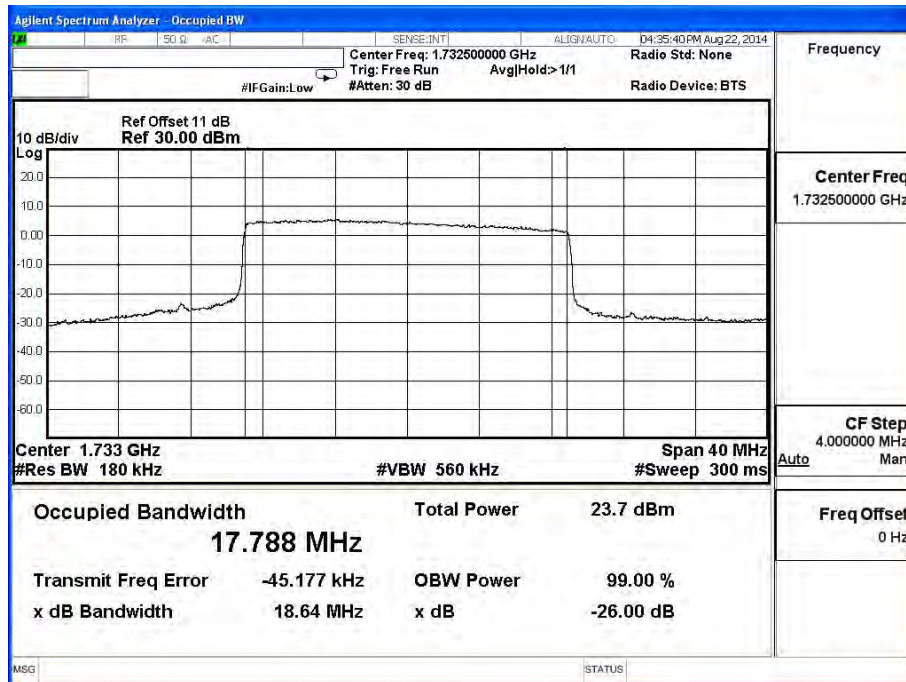


### Band IV 20M 16QAM - LTE Mode CH20050

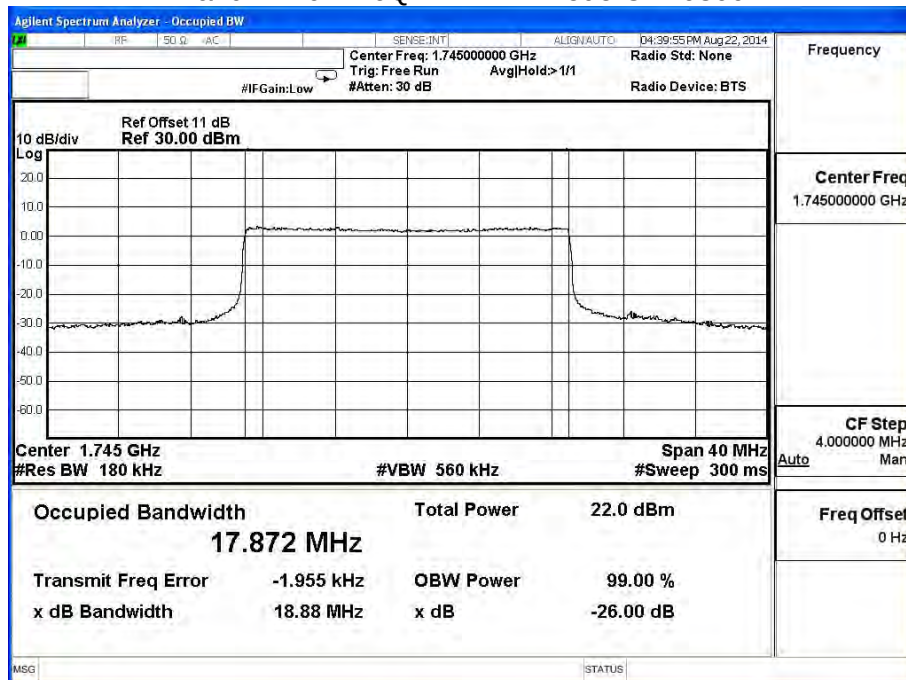


|                |                    |           |     |
|----------------|--------------------|-----------|-----|
| Product        | Notebook PC        |           |     |
| Test Mode      | Occupied Bandwidth |           |     |
| Date of Test   | 2014/09/26         | Test Site | CTR |
| Test Condition | Band IV 20M        |           |     |

Band IV 20M 16QAM - LTE Mode CH20175

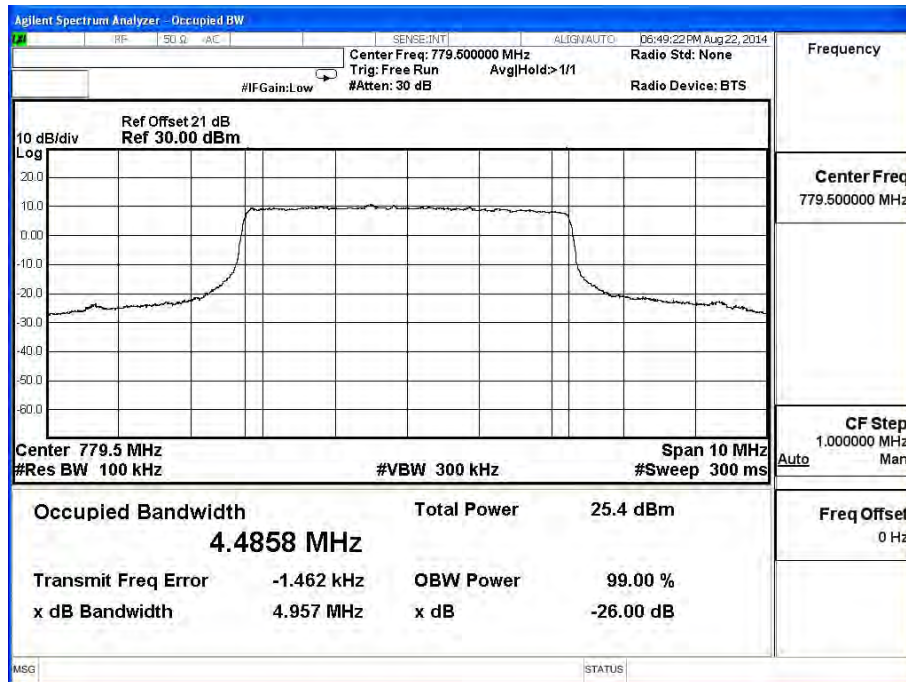


Band IV 20M 16QAM - LTE Mode CH20300

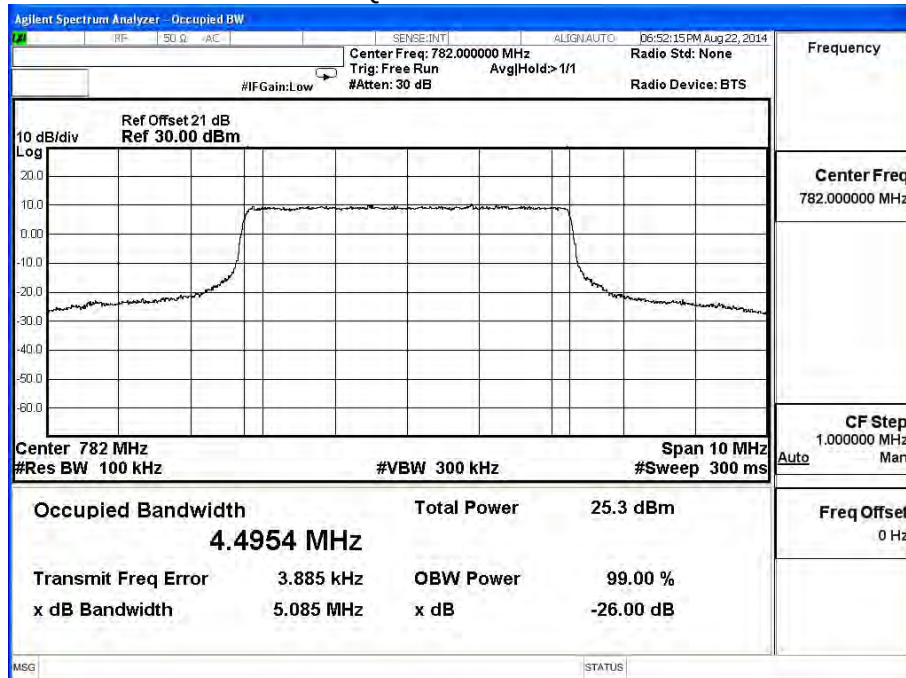


|                |                    |           |     |
|----------------|--------------------|-----------|-----|
| Product        | Notebook PC        |           |     |
| Test Mode      | Occupied Bandwidth |           |     |
| Date of Test   | 2014/09/26         | Test Site | CTR |
| Test Condition | Band XIII 5M       |           |     |

Band XIII 5M QPSK - LTE Mode CH 23205

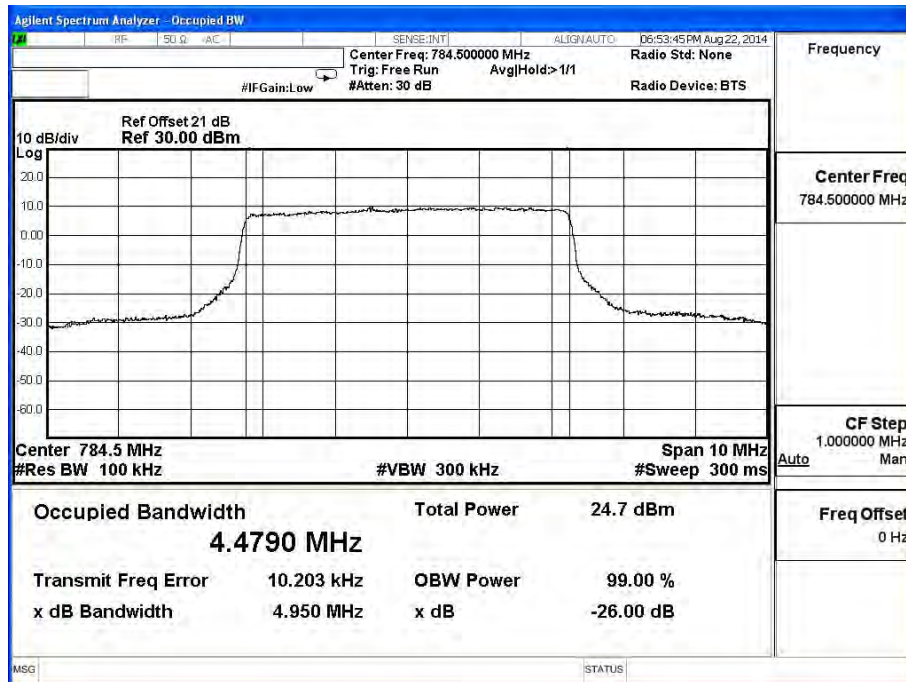


Band XIII 5M QPSK - LTE Mode CH 23230

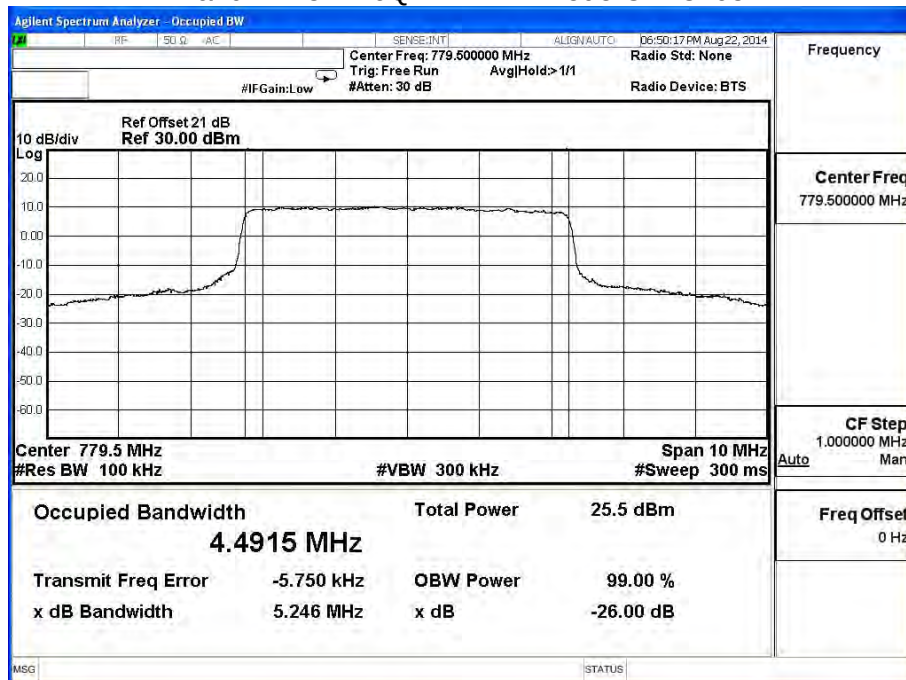


|                |                    |           |     |
|----------------|--------------------|-----------|-----|
| Product        | Notebook PC        |           |     |
| Test Mode      | Occupied Bandwidth |           |     |
| Date of Test   | 2014/09/26         | Test Site | CTR |
| Test Condition | Band XIII 5M       |           |     |

### Band XIII 5M QPSK - LTE Mode CH 23255

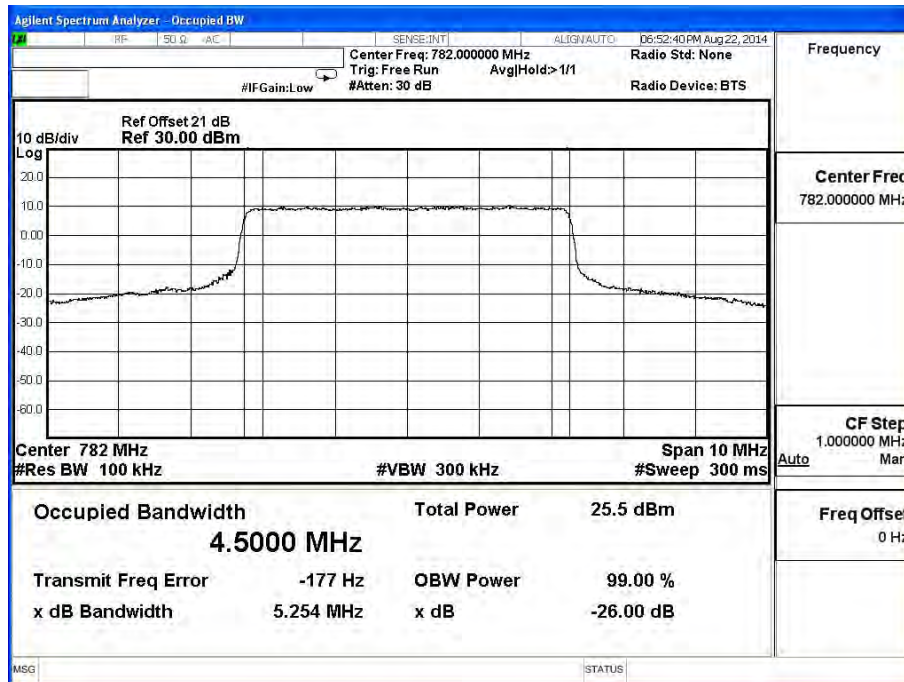


### Band XIII 5M 16QAM - LTE Mode CH23205

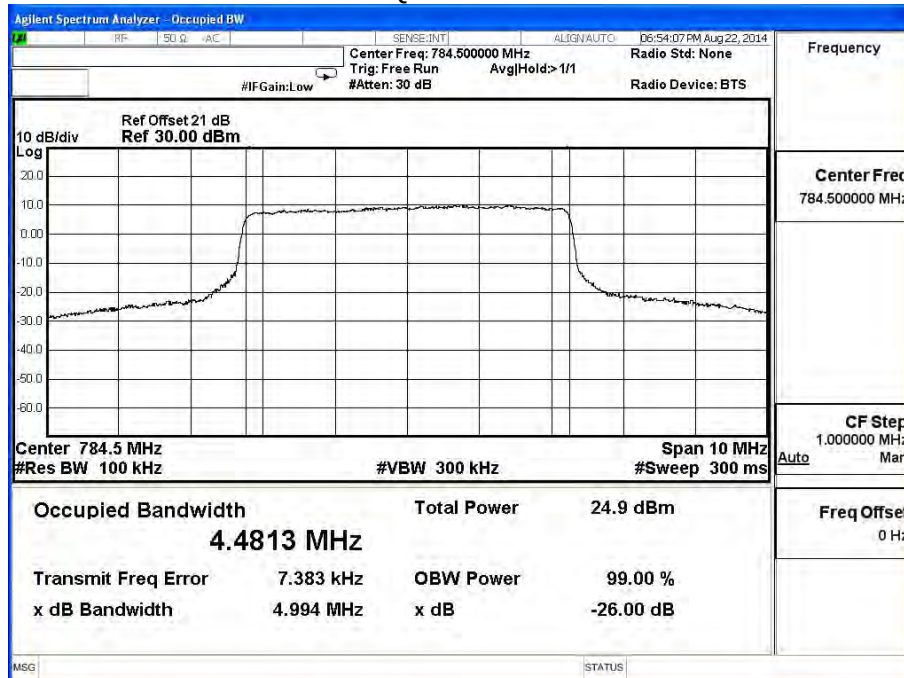


|                |                    |           |     |
|----------------|--------------------|-----------|-----|
| Product        | Notebook PC        |           |     |
| Test Mode      | Occupied Bandwidth |           |     |
| Date of Test   | 2014/09/26         | Test Site | CTR |
| Test Condition | Band XIII 5M       |           |     |

Band XIII 5M 16QAM - LTE Mode CH23230

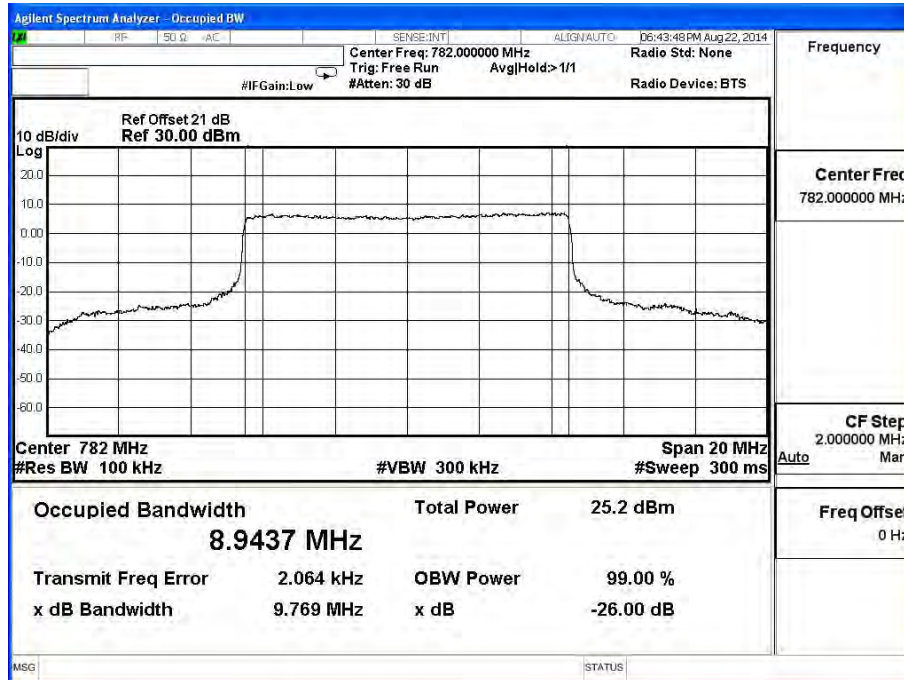


Band XIII 5M 16QAM - LTE Mode CH23255

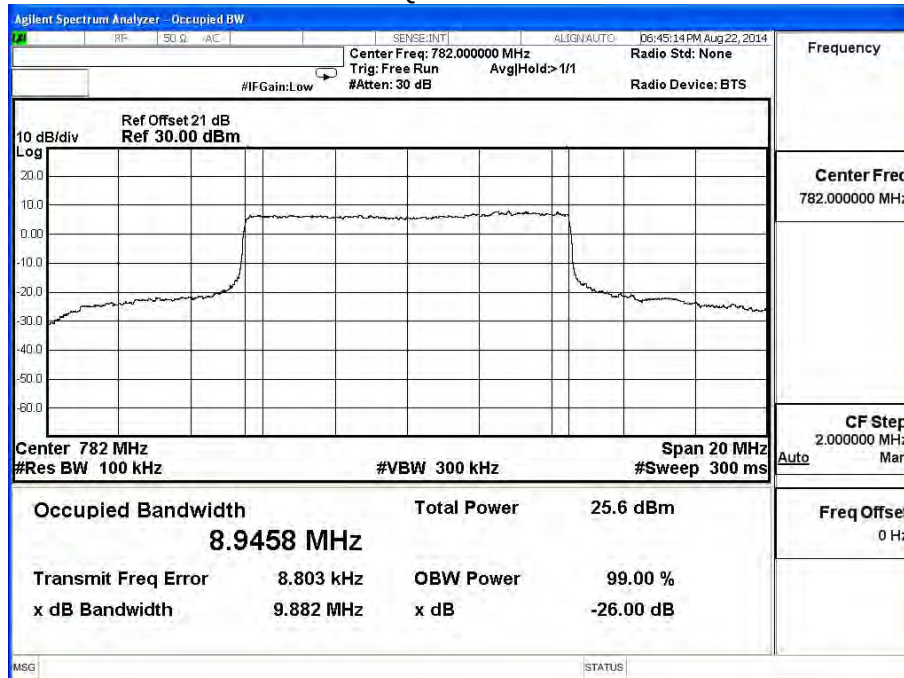


|                |                    |           |     |
|----------------|--------------------|-----------|-----|
| Product        | Notebook PC        |           |     |
| Test Mode      | Occupied Bandwidth |           |     |
| Date of Test   | 2014/09/26         | Test Site | CTR |
| Test Condition | Band XIII 10M      |           |     |

Band XIII 10M QPSK - LTE Mode CH 23230



Band XIII 10M 16QAM - LTE Mode CH23230



#### 4. Spurious Emission At Antenna Terminals (+/-1MHz)

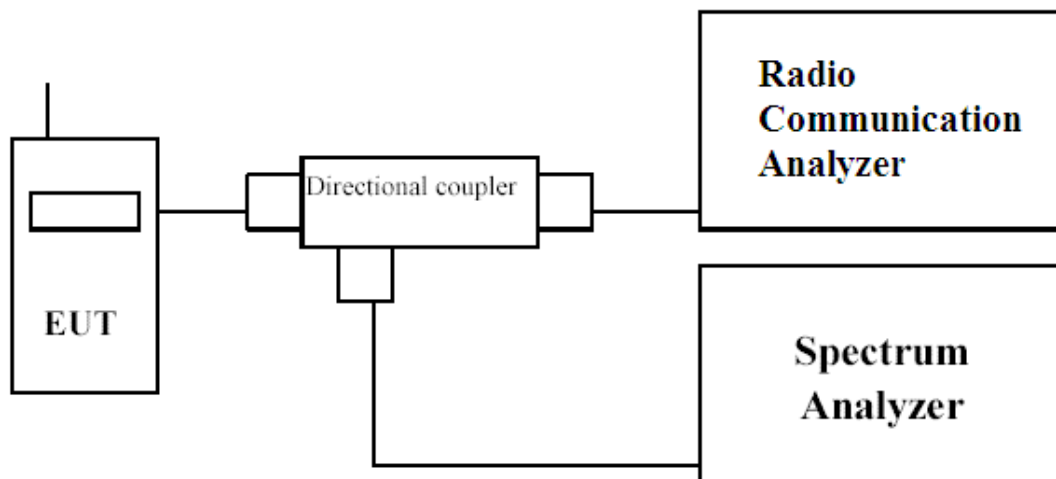
##### 4.1. Test Equipment

The following test equipments are used during the spurious emission test

| Equipment                    | Manufacturer | Model No./Serial No. | Last Cal.  |
|------------------------------|--------------|----------------------|------------|
| Spectrum Analyzer            | Agilent      | N9010A / MY48030495  | 2014/07/08 |
| Radio Communication Analyzer | Anritsu      | MT8820C / 6201091166 | 2014/01/17 |
| Directional coupler          | Agilent      | 87300C / MY44300352  | 2014/01/06 |
| Dual Directional couple      | Agilent      | 778D / 50550         | 2013/10/07 |

Note: All equipments upon which need to be calibrated are with calibration period of 1 year.

##### 4.2. Setup



#### **4.3. Limits**

The spurious (unwanted) emission limits specified in the individual FCC rule parts applicable to licensed digital transmitters (typically referred to under the heading 'emission limits') normally apply to any and all emissions that are present outside of the authorized frequency band/block and apply to emissions in both the out-of-band and spurious domains. unwanted emissions are required by the licensed rule parts to be attenuated below the transmitter power by a factor of at least  $43 + 10\log(P)$  dB, where P represents the transmitter power expressed in watts

#### **4.4. Test Procedure**

In accordance with Part 27.53, at least 1% of the emission bandwidth was used for the resolution and video bandwidths up to 1MHz away from the Block Edge. At greater than 1MHz, the resolution and video bandwidth were increased to 1MHz.

The reference power and path losses of all channels used for testing in each frequency block were measured.

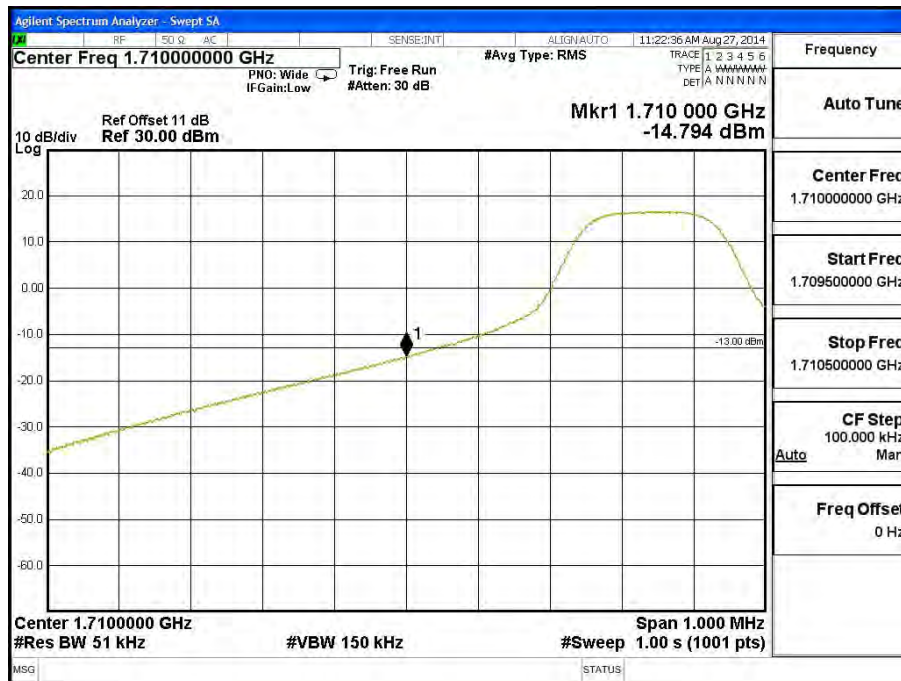
#### **4.5. Test Specification**

According to Part 27.53(h)

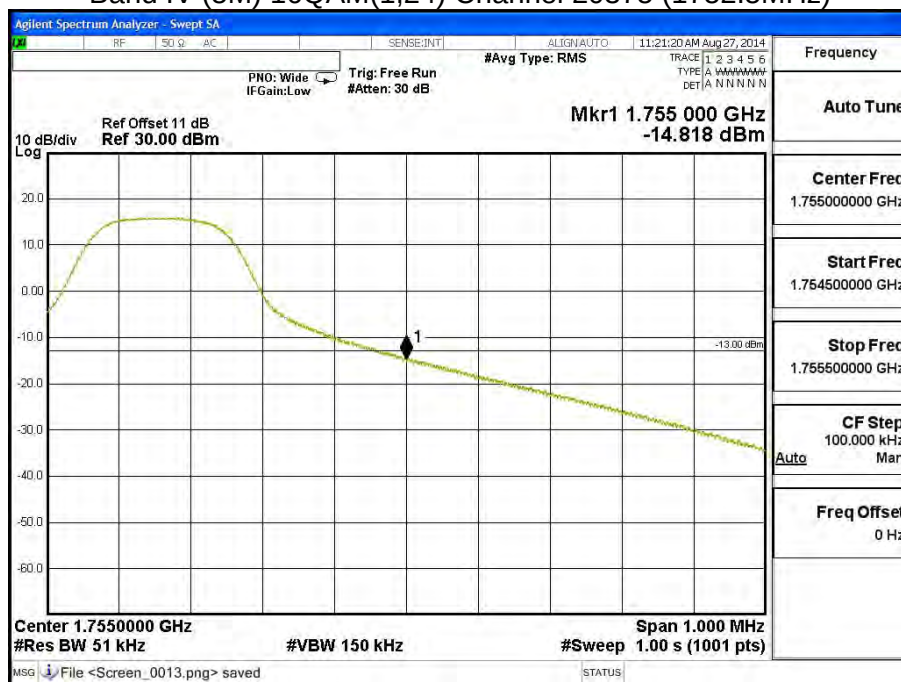
#### 4.6. Test Result of Spurious Emission At Antenna Terminals (+/-1MHz)

|                |                                                  |           |     |
|----------------|--------------------------------------------------|-----------|-----|
| Product        | Notebook PC                                      |           |     |
| Test Mode      | Spurious Emission At Antenna Terminals (+/-1MHz) |           |     |
| Date of Test   | 2014/09/12                                       | Test Site | CTR |
| Test Condition | Block Edge Test (Band IV (5M))                   |           |     |

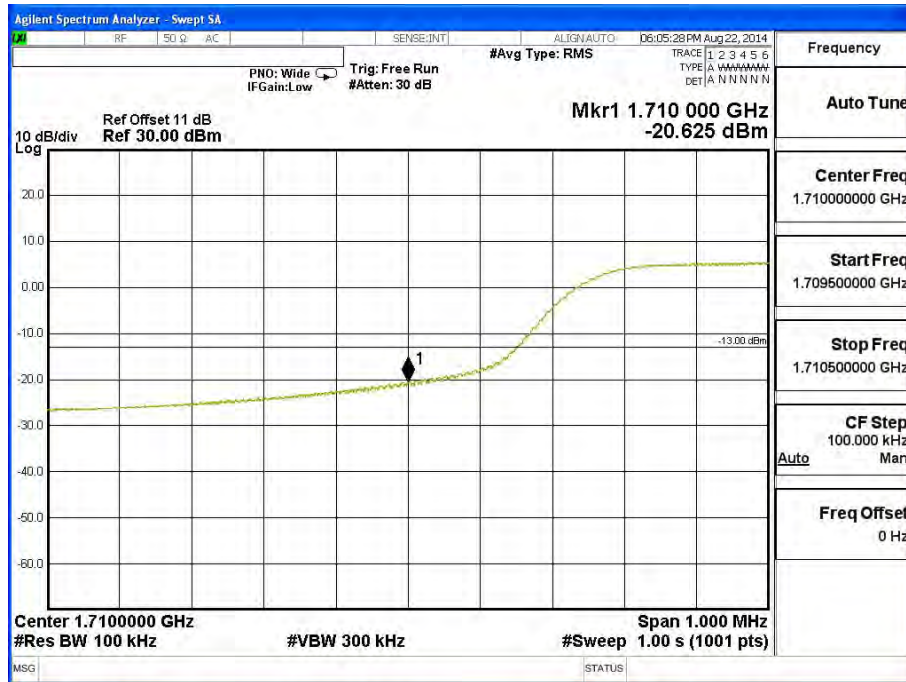
Band IV (5M) 16QAM(1,0) Channel 19975 (1712.5MHz)



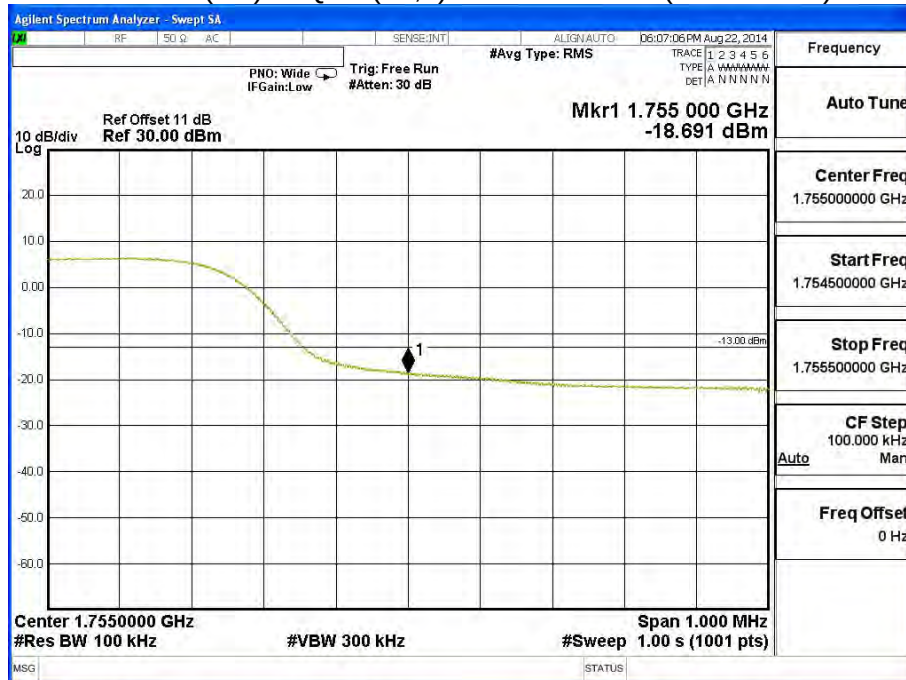
Band IV (5M) 16QAM(1,24) Channel 20375 (1752.5MHz)



### Band IV (5M) 16QAM(25,0) Channel 19975 (1712.5MHz)



### Band IV (5M) 16QAM(25,0) Channel 20375 (1752.5MHz)



Agilent Spectrum Analyzer - Swept SA

RF 50 Q A/C SENSE:INT ALIGN: AUTO 10:37:55 AM Aug 27, 2014

#Avg Type: RMS

Trig: Free Run #Atten: 30 dB

PNO: Wide IF Gain: Low

TRACE 1 2 3 4 5 6  
TYPE A W W W W W W W  
DET A N N N N N

Frequency

Auto Tune

Center Freq 1.71000000 GHz

Start Freq 1.709500000 GHz

Stop Freq 1.710500000 GHz

CF Step 100.000 kHz

Auto Man

Freq Offset 0 Hz

10 dB/div Log

Ref Offset 11 dB  
Ref 30.00 dBm

Mkr1 1.710 000 GHz  
-14.874 dBm

Center 1.7100000 GHz  
#Res BW 51 kHz

#VBW 150 kHz

Span 1.000 MHz  
#Sweep 1.00 s (1001 pts)

MSG STATUS

Agilent Spectrum Analyzer - Swept SA

RF 50 Ω A/C SENSE:INT ALIGN: AUTO 10:50:25 AM Aug 27, 2014

PNO: Wide IF Gain: Low Trig: Free Run #Atten: 30 dB #Avg Type: RMS

TRACE 1 2 3 4 5 6 TYPE: A W W W W W W W W DET: A N N N N N N

Ref Offset 11 dB  
Ref 30.00 dBm

Mkr1 1.755 000 GHz  
-14.676 dBm

10 dB/div  
Log

Center Freq 1.75500000 GHz

Start Freq 1.754500000 GHz

Stop Freq 1.755500000 GHz

CF Step 100.000 kHz

Auto Man

Freq Offset 0 Hz

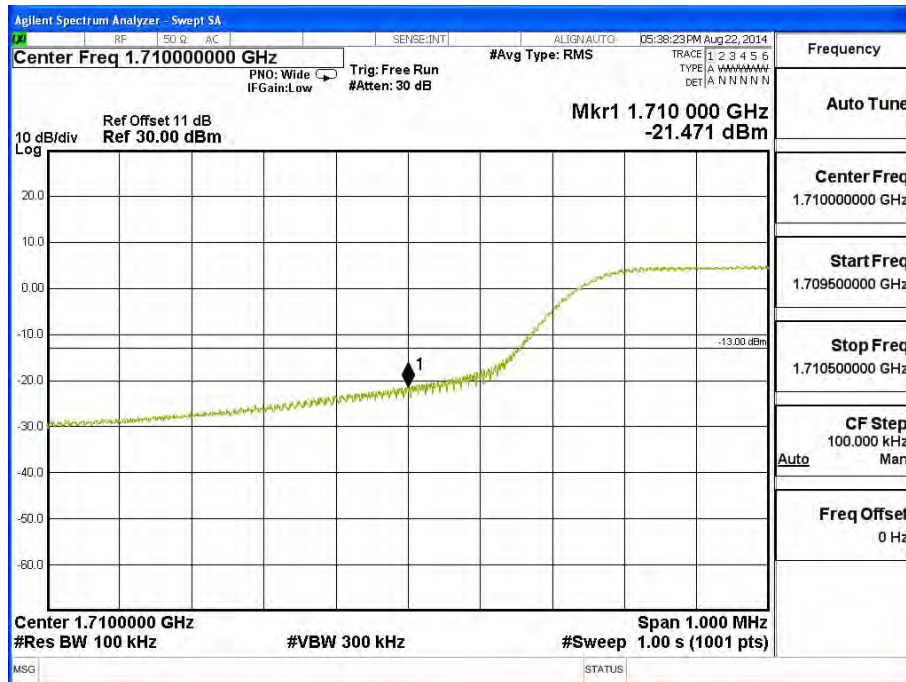
Center 1.7550000 GHz  
#Res BW 51 kHz

#VBW 150 kHz

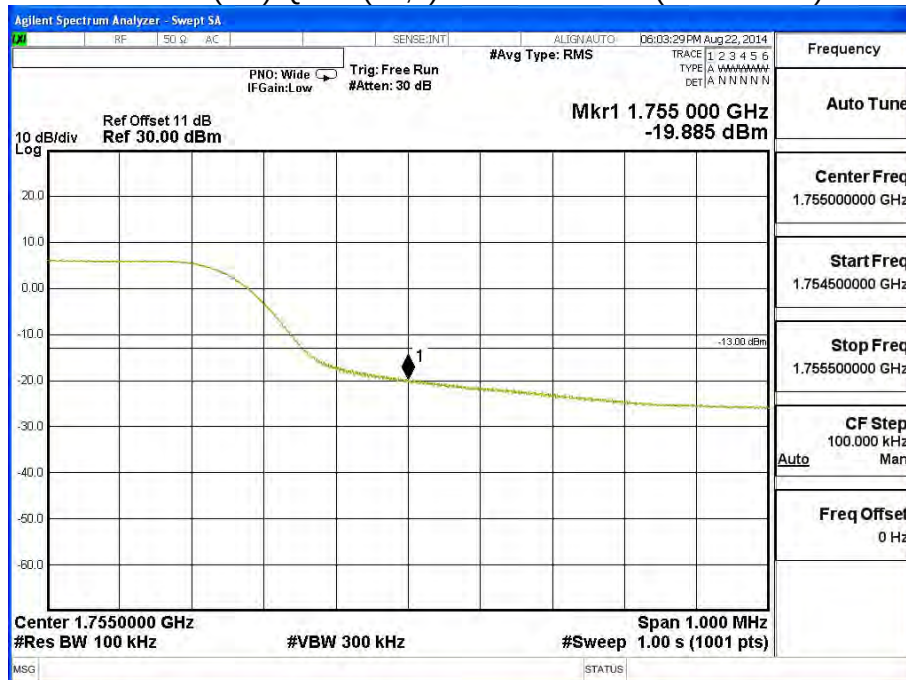
Span 1.000 MHz  
#Sweep 1.00 s (1001 pts)

MSG STATUS

Band IV (5M) QPSK(25,0) Channel 19975 (1712.5MHz)

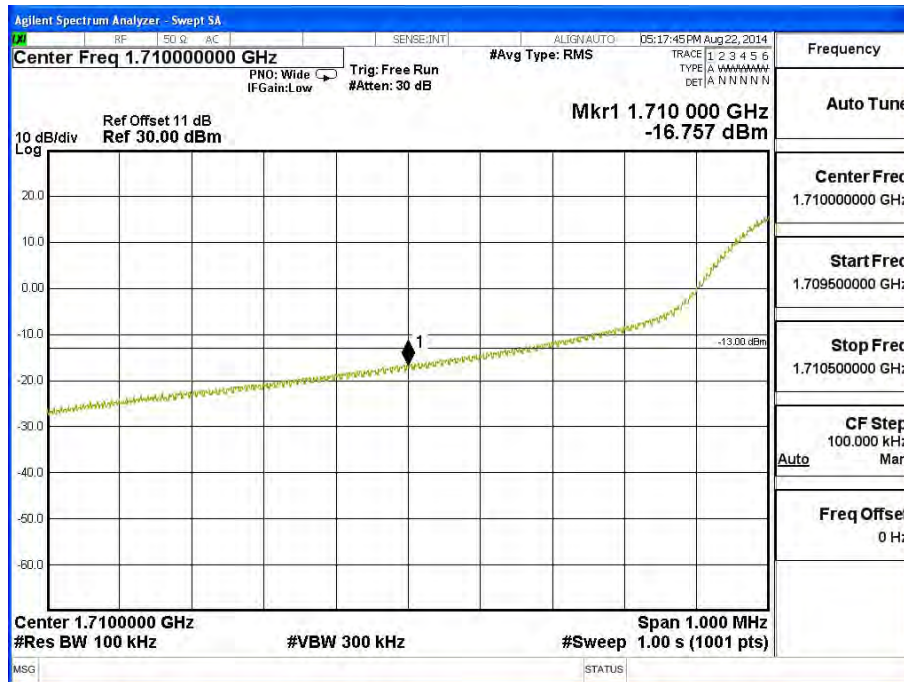


Band IV (5M) QPSK(25,0) Channel 20375 (1752.5MHz)

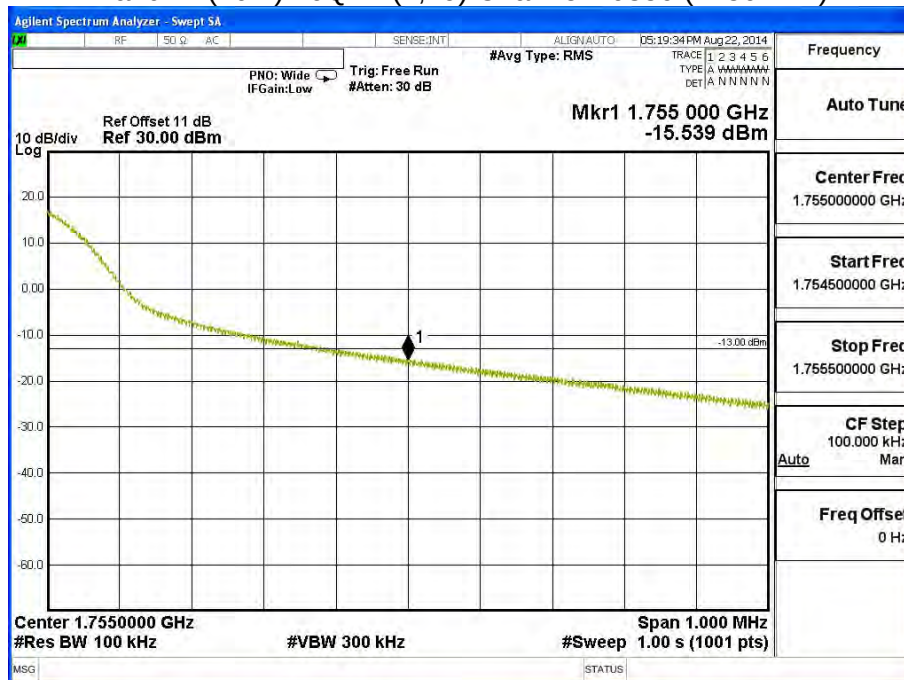


|                |                                                  |           |     |
|----------------|--------------------------------------------------|-----------|-----|
| Product        | Notebook PC                                      |           |     |
| Test Mode      | Spurious Emission At Antenna Terminals (+/-1MHz) |           |     |
| Date of Test   | 2014/09/12                                       | Test Site | CTR |
| Test Condition | Block Edge Test (Band IV (10M))                  |           |     |

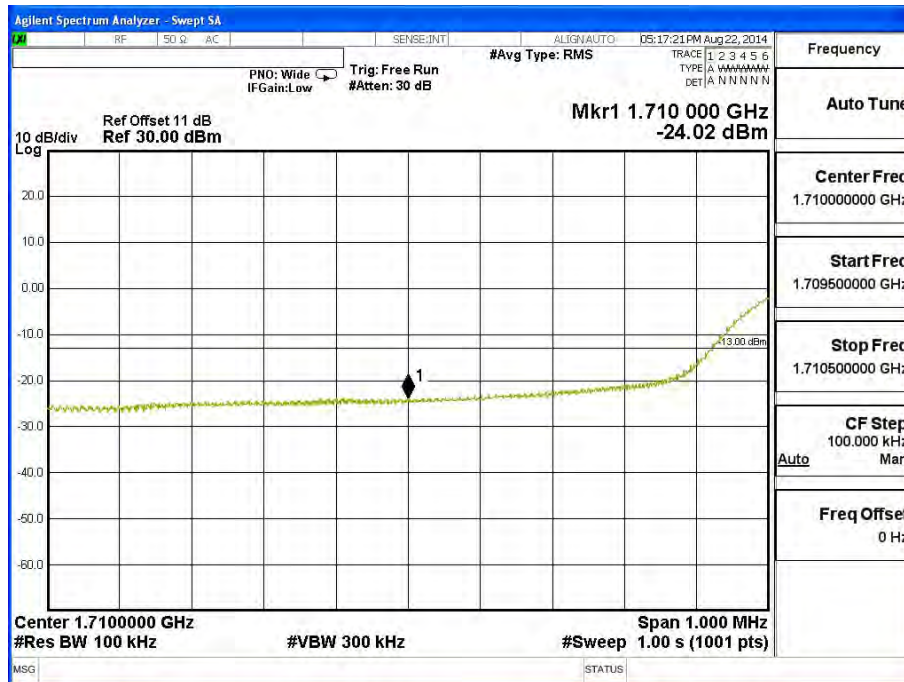
Band IV (10M) 16QAM(1,0) Channel 20000 (1715MHz)



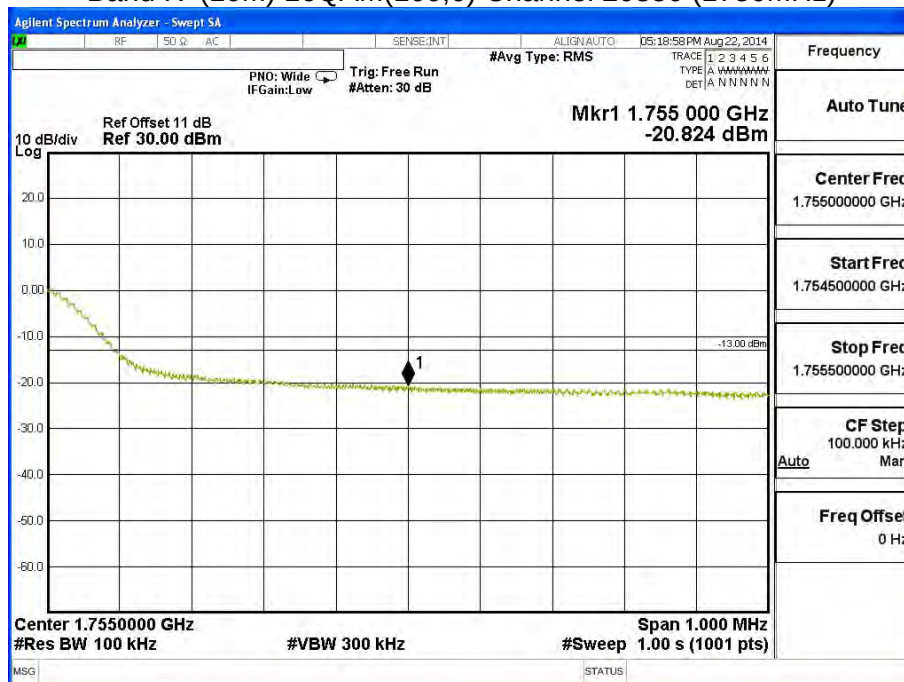
Band IV (10M) 16QAM(1,49) Channel 20350 (1750MHz)



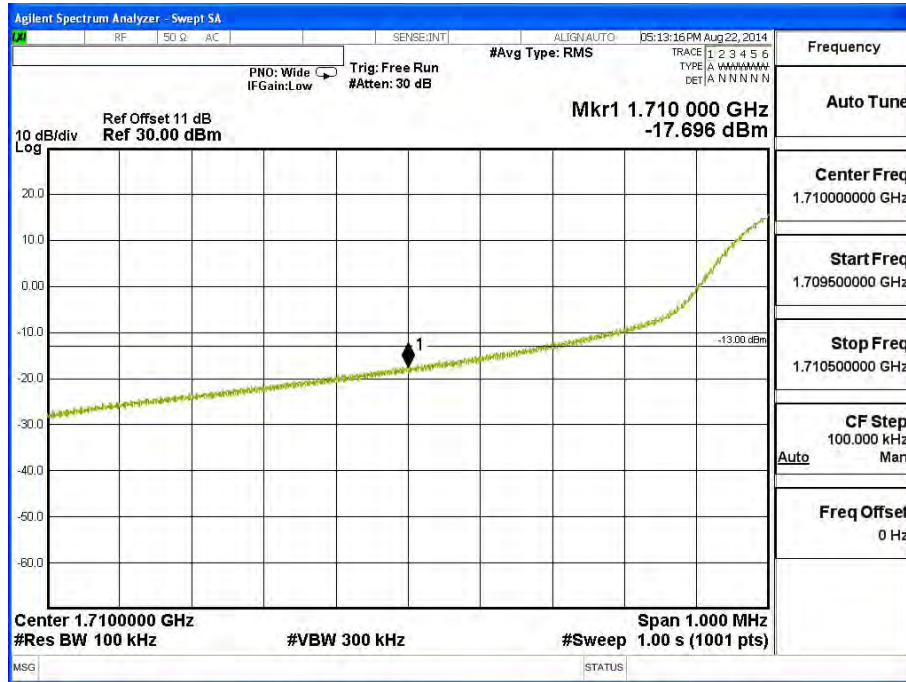
### Band IV (10M) 16QAM(100,0) Channel 20000 (1715MHz)



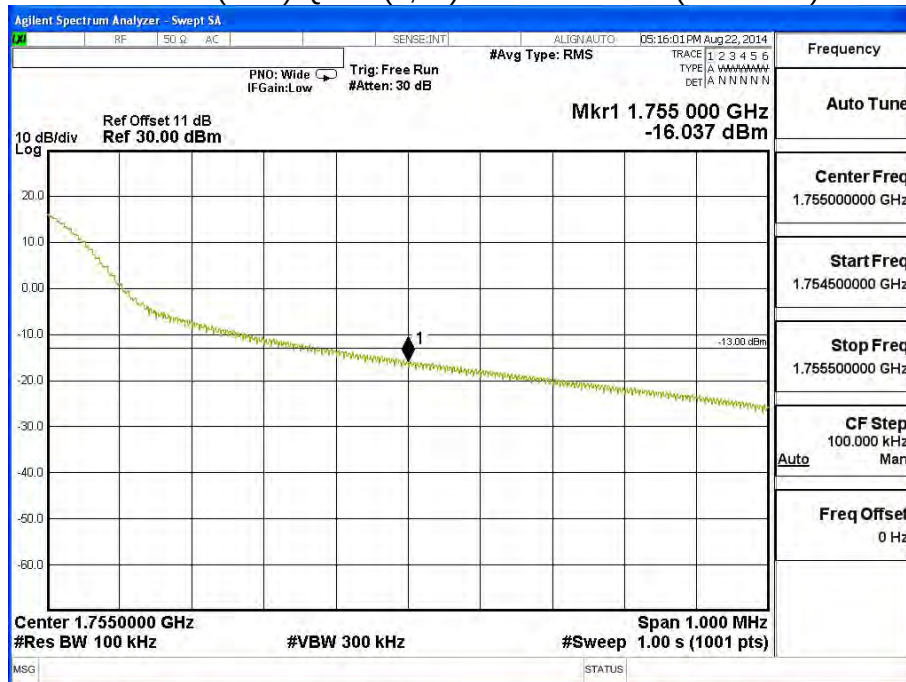
### Band IV (10M) 16QAM(100,0) Channel 20350 (1750MHz)



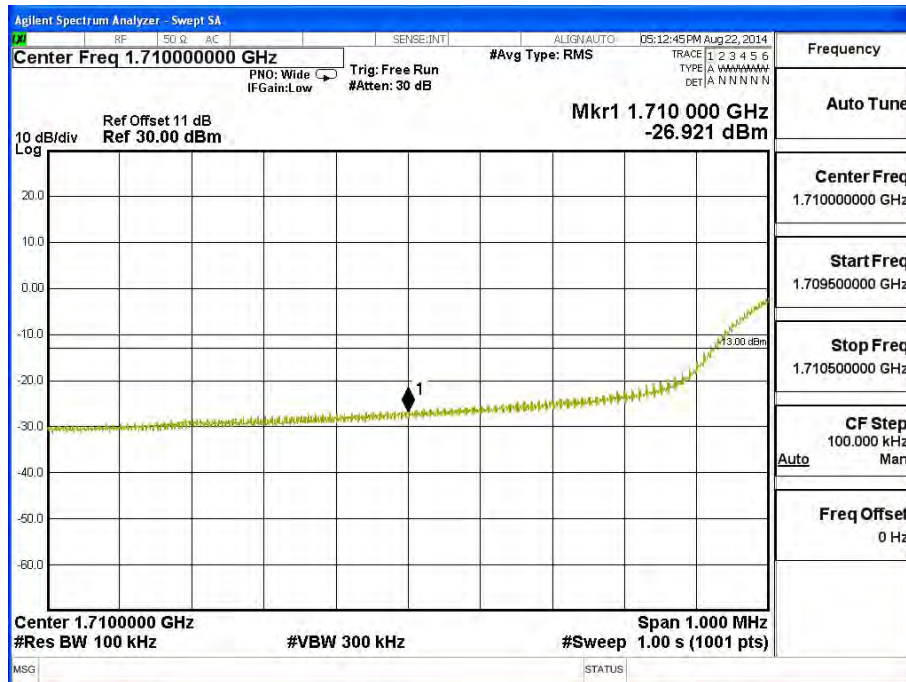
### Band IV (10M) QPSK(1,0) Channel 20000 (1715MHz)



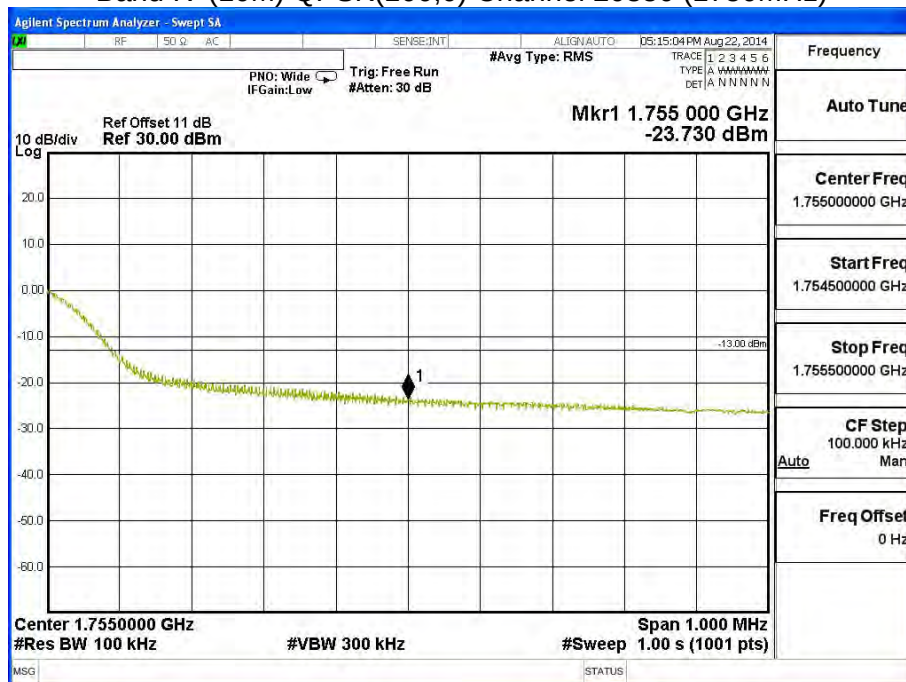
### Band IV (10M) QPSK(1,49) Channel 20350 (1750MHz)



### Band IV (10M) QPSK(100,0) Channel 20000 (1715MHz)

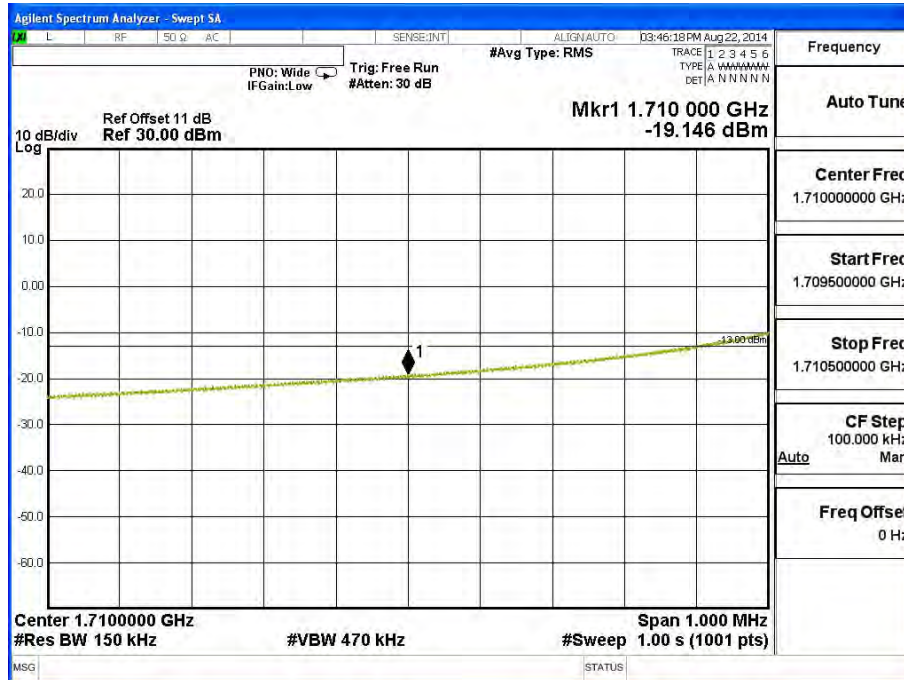


### Band IV (10M) QPSK(100,0) Channel 20350 (1750MHz)

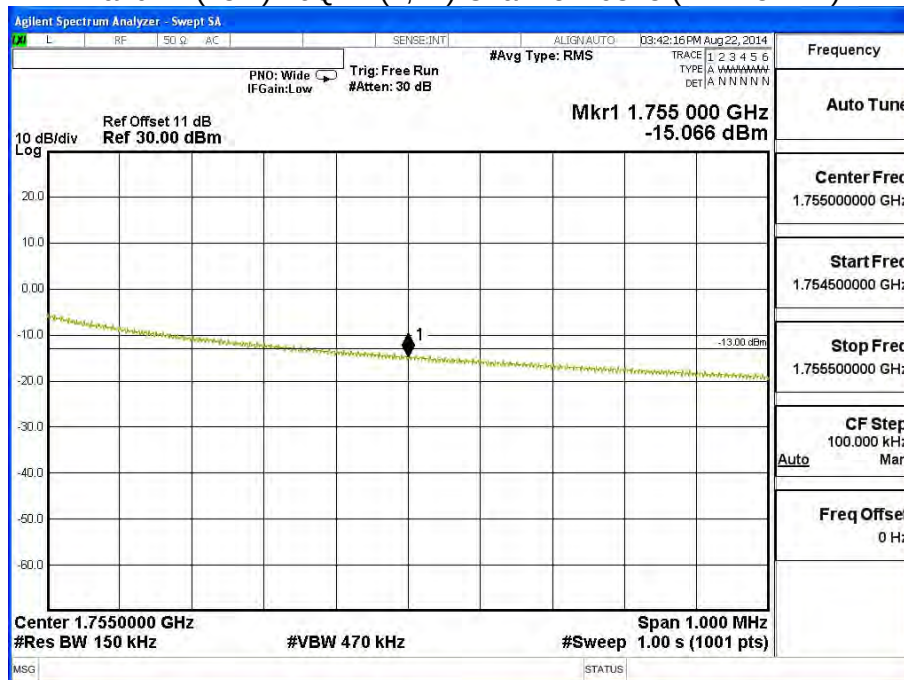


|                |                                                  |           |     |
|----------------|--------------------------------------------------|-----------|-----|
| Product        | Notebook PC                                      |           |     |
| Test Mode      | Spurious Emission At Antenna Terminals (+/-1MHz) |           |     |
| Date of Test   | 2014/09/12                                       | Test Site | CTR |
| Test Condition | Block Edge Test (Band IV (15M))                  |           |     |

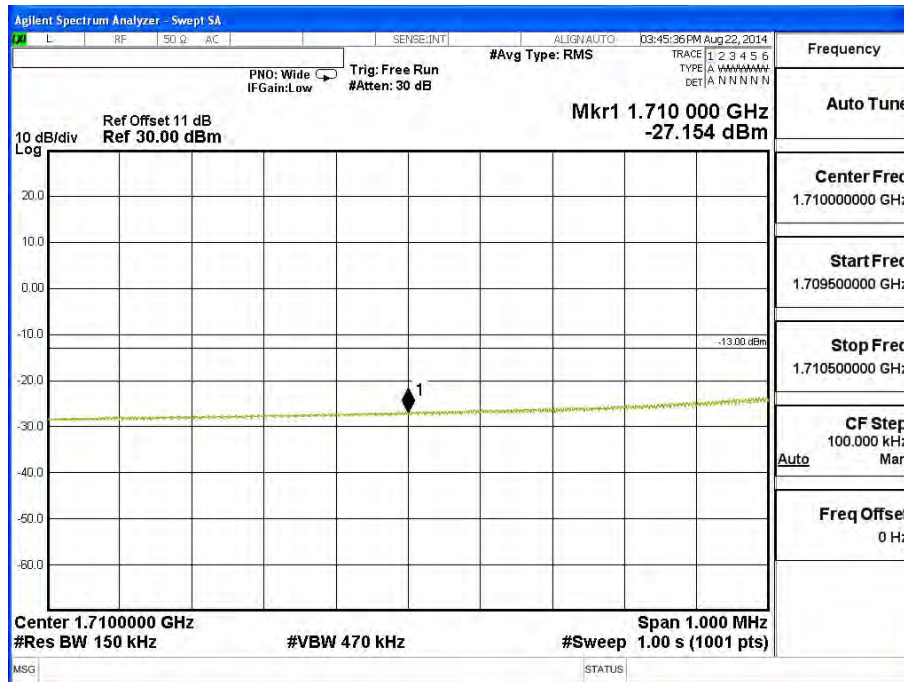
Band IV (15M) 16QAM(1,0) Channel 20025 (1717.5MHz)



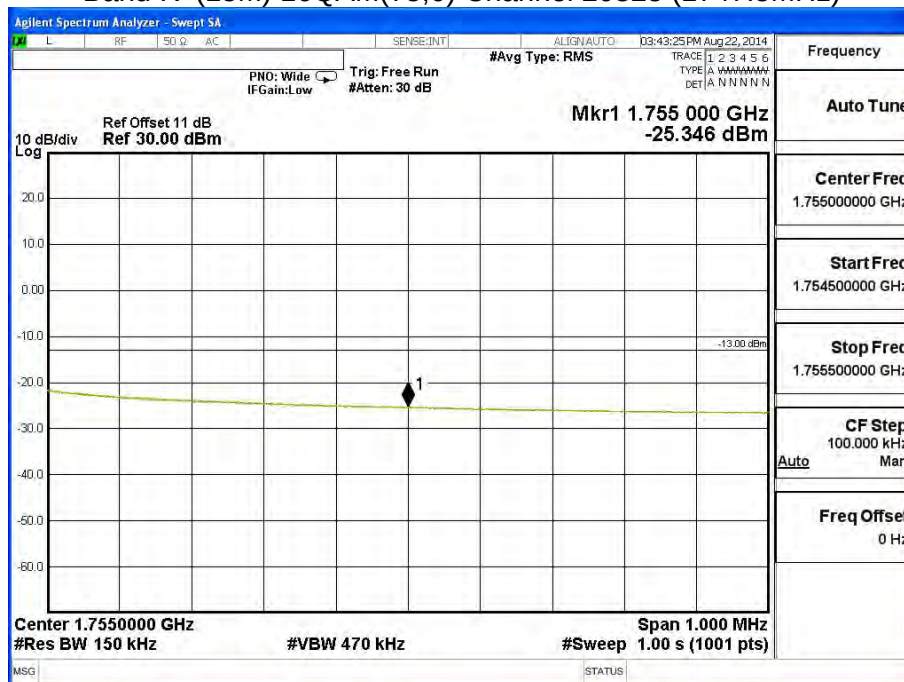
Band IV (15M) 16QAM(1,74) Channel 20325 (1747.5MHz)



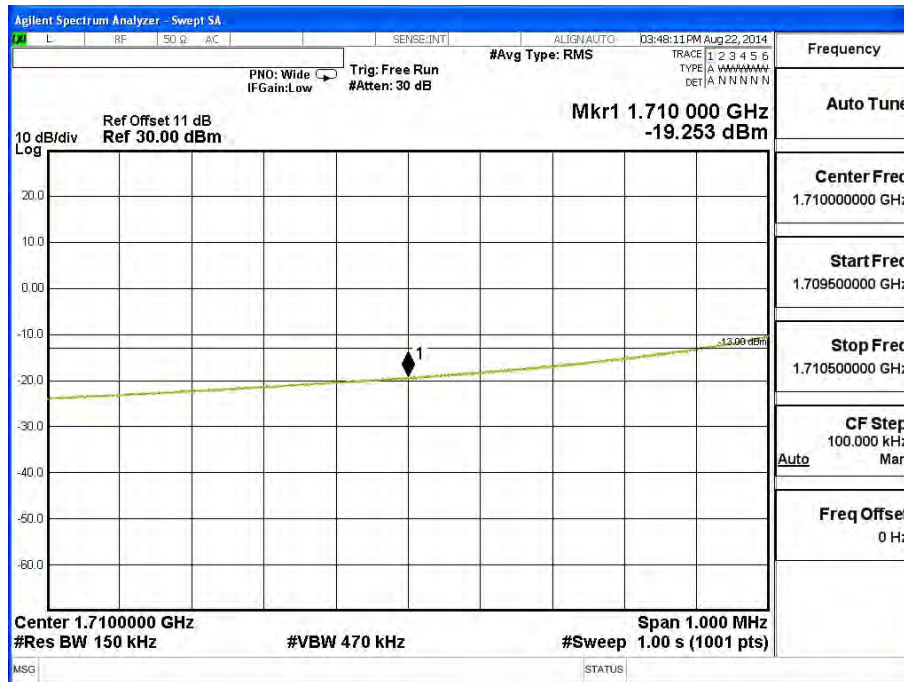
Band IV (15M) 16QAM(75,0) Channel 20025 (1717.5MHz)



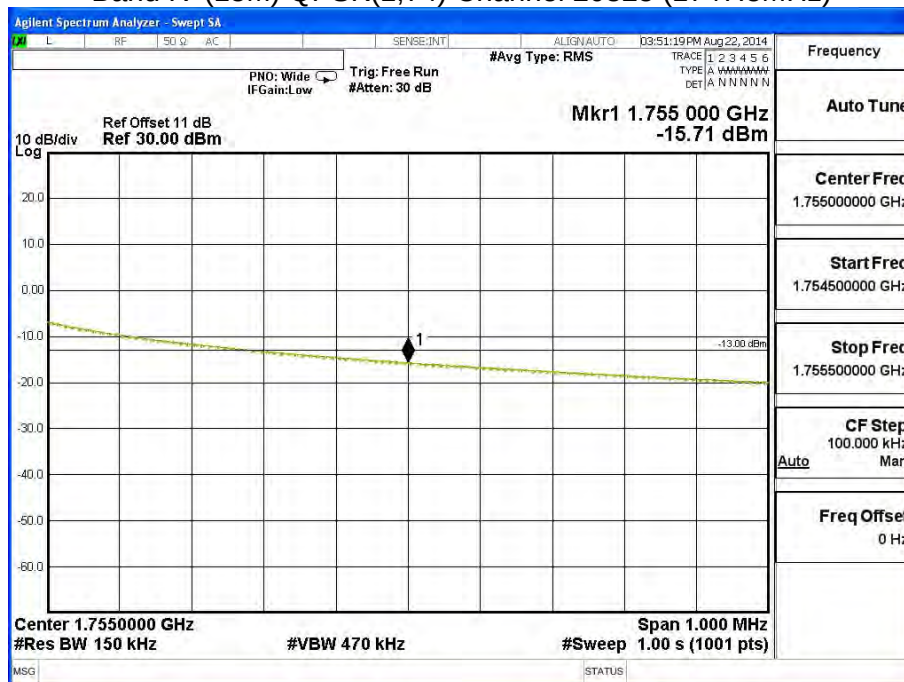
Band IV (15M) 16QAM(75,0) Channel 20325 (1747.5MHz)



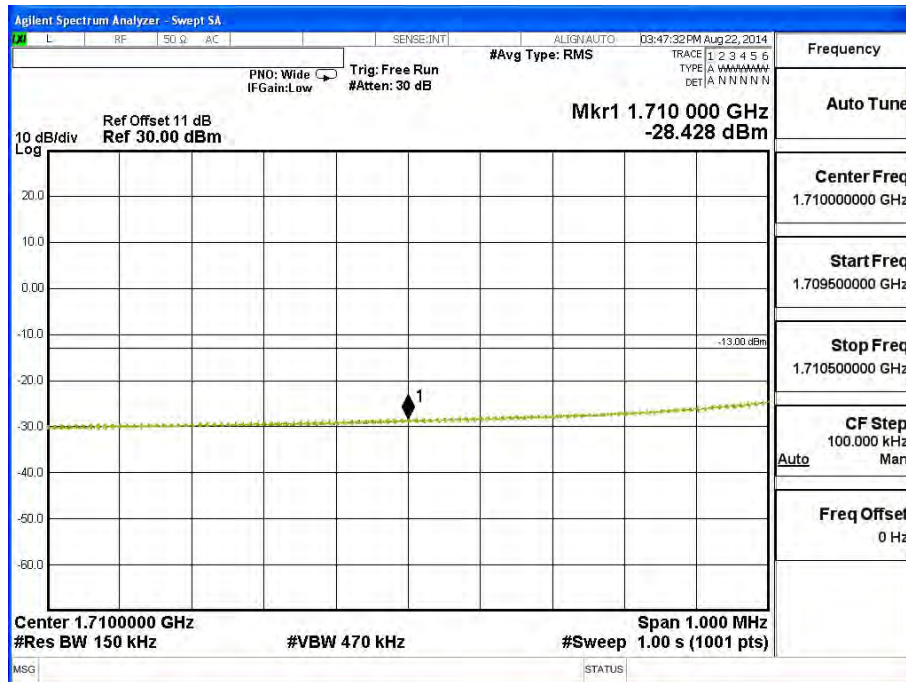
### Band IV (15M)QPSK(1,0) Channel 20025 (1717.5MHz)



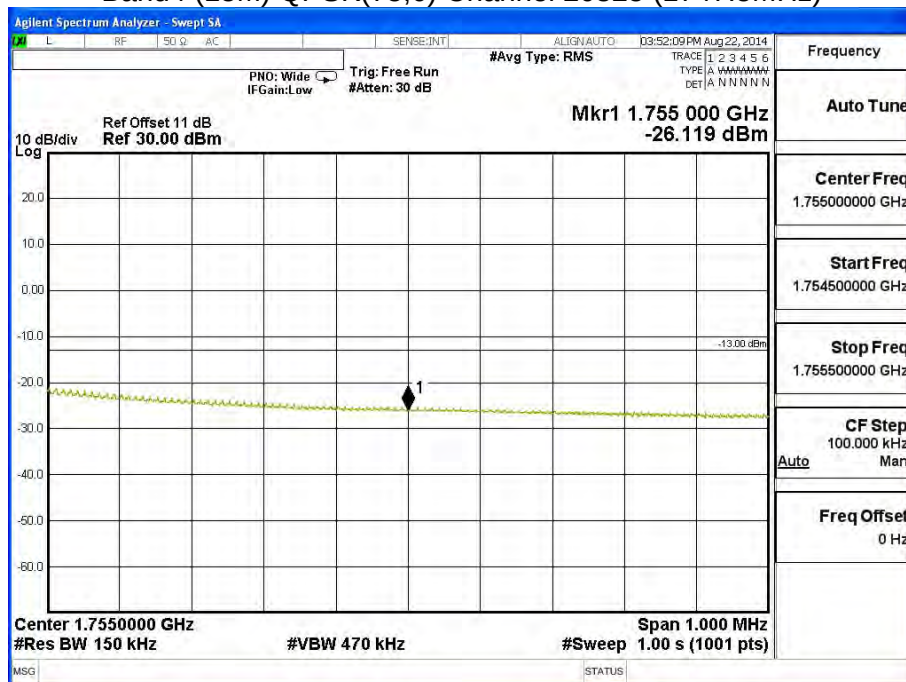
### Band IV (15M) QPSK(1,74) Channel 20325 (1747.5MHz)



### Band IV (15M) QPSK(75,0) Channel 20025 (1717.5MHz)

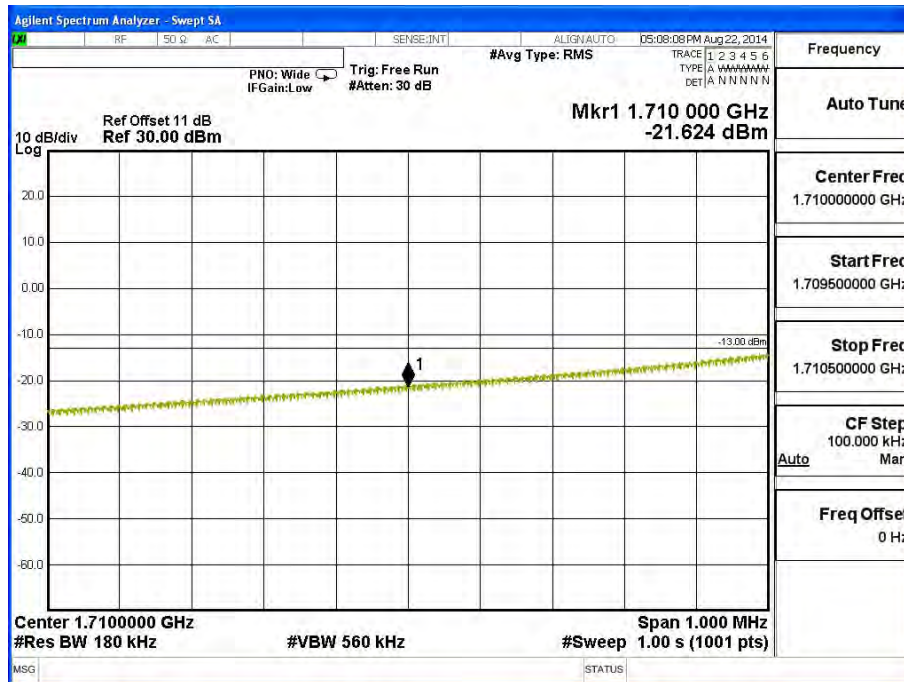


### Band4 (15M) QPSK(75,0) Channel 20325 (1747.5MHz)

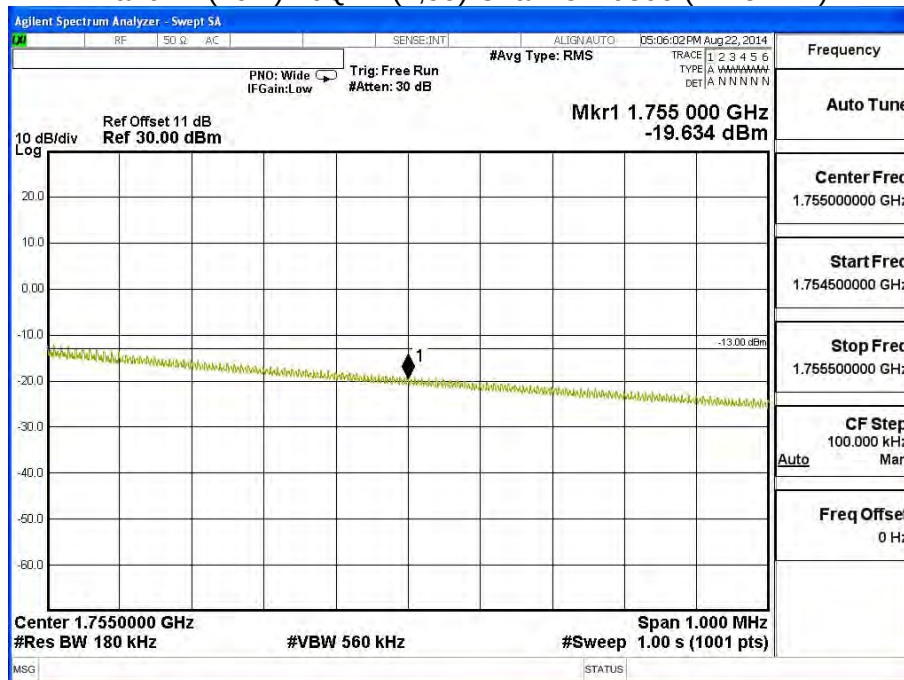


|                |                                                  |           |     |
|----------------|--------------------------------------------------|-----------|-----|
| Product        | Notebook PC                                      |           |     |
| Test Mode      | Spurious Emission At Antenna Terminals (+/-1MHz) |           |     |
| Date of Test   | 2014/09/12                                       | Test Site | CTR |
| Test Condition | Block Edge Test (Band IV (20M))                  |           |     |

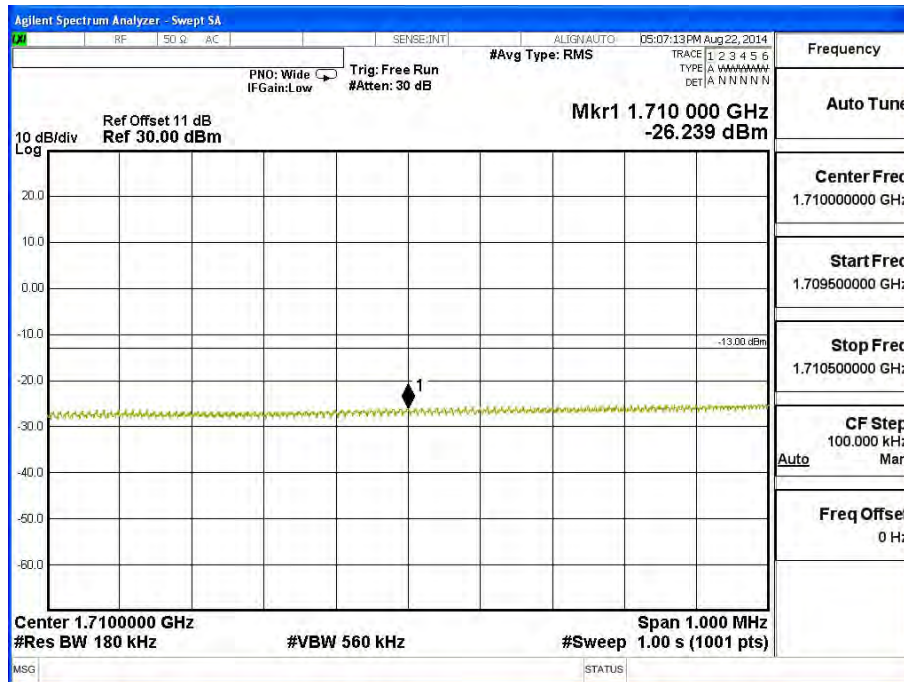
Band IV (20M) 16QAM(1,0) Channel 20050 (1720MHz)



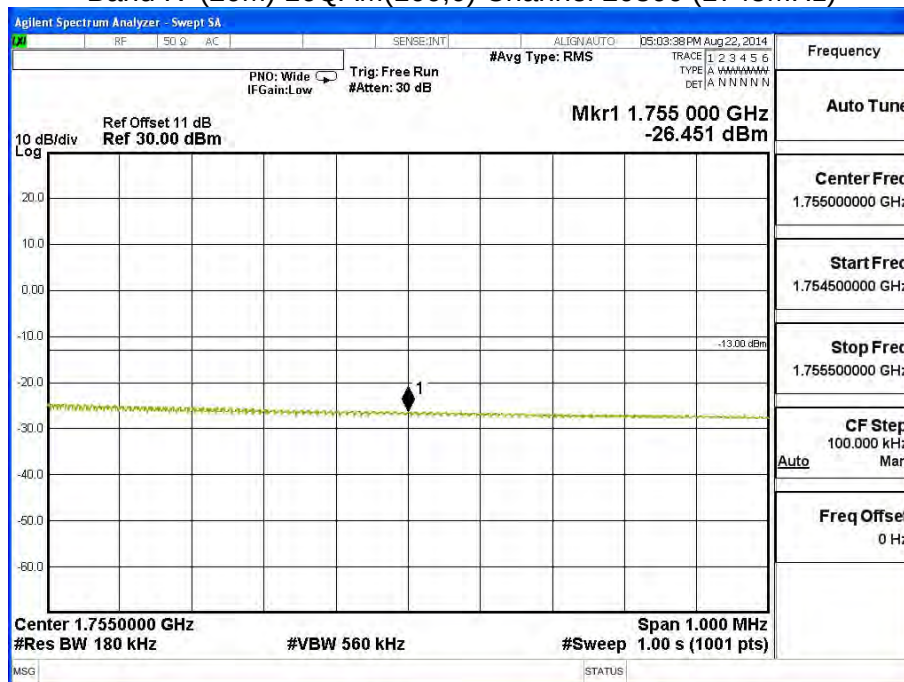
Band IV (20M) 16QAM(1,99) Channel 20300 (1745MHz)



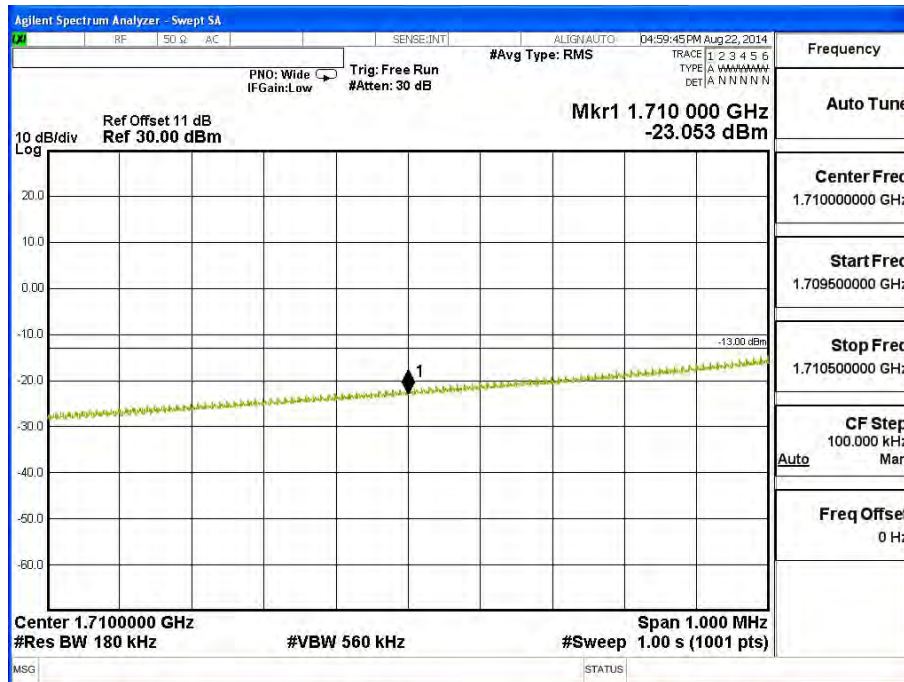
### Band IV (20M) 16QAM(100,0) Channel 20050 (1720MHz)



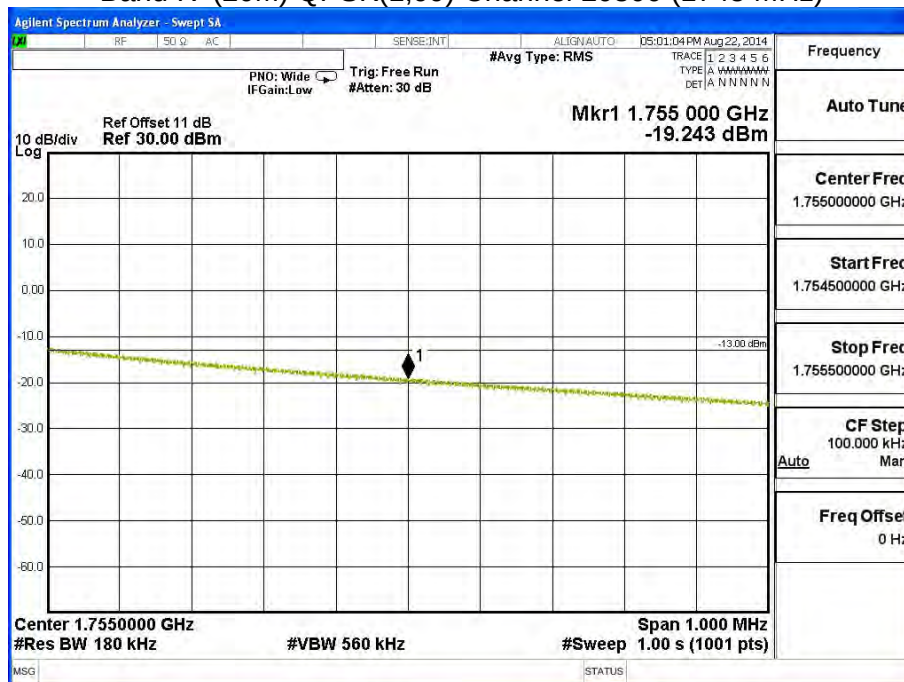
### Band IV (20M) 16QAM(100,0) Channel 20300 (1745MHz)



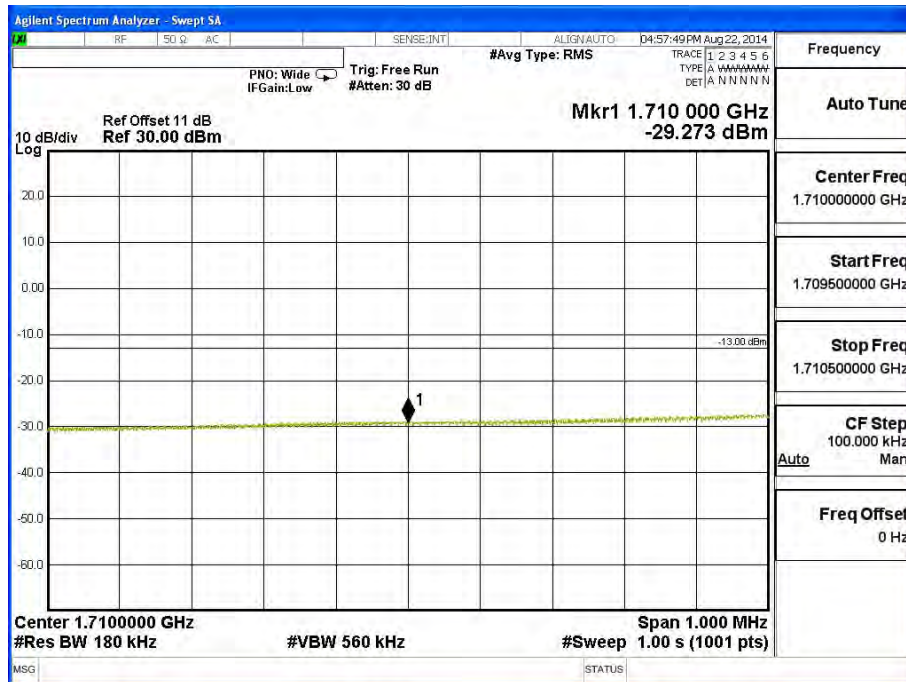
### Band IV (20M) QPSK(1,0) Channel 20050 (1720MHz)



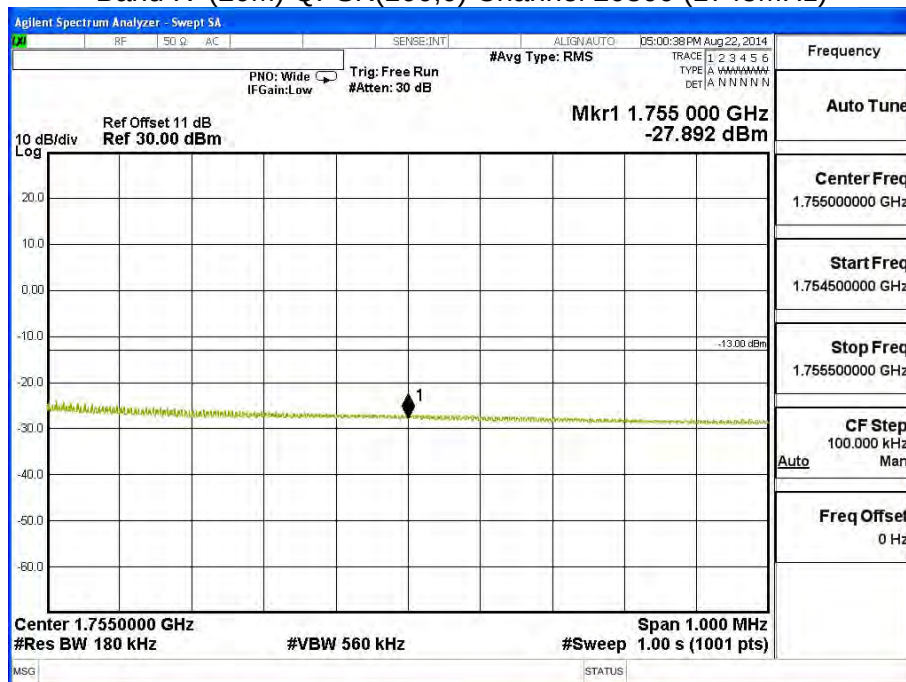
### Band IV (20M) QPSK(1,99) Channel 20300 (1745 MHz)



### Band IV (20M) QPSK(100,0) Channel 20050 (1720MHz)

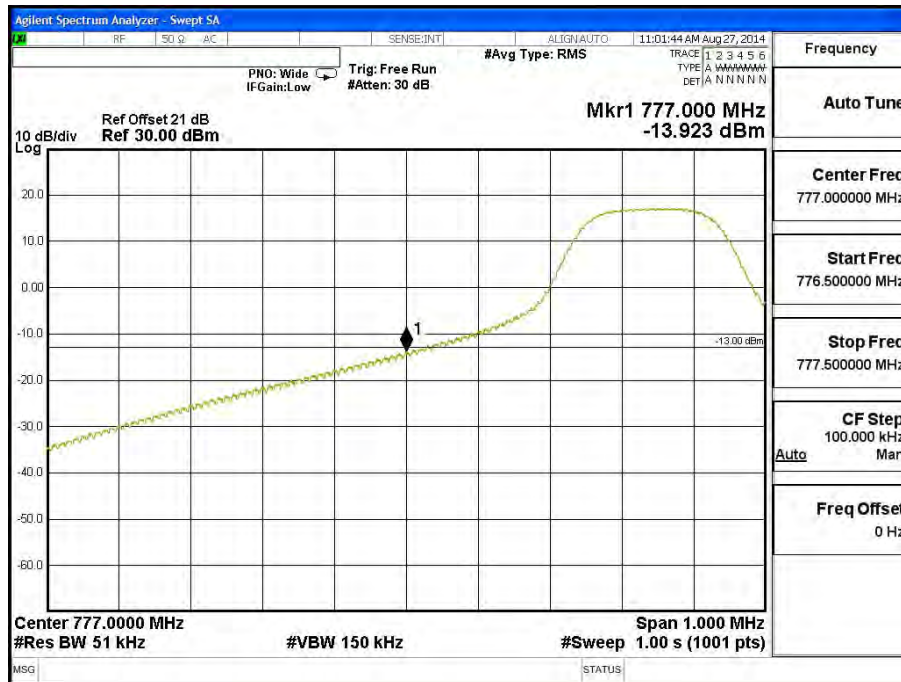


### Band IV (20M) QPSK(100,0) Channel 20300 (1745MHz)

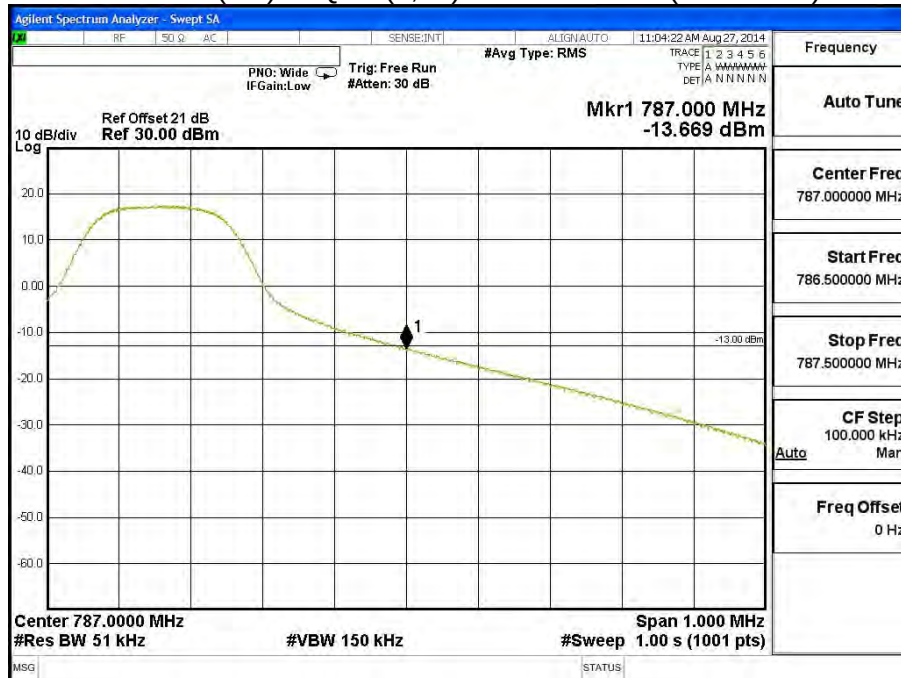


|                |                                                  |           |     |
|----------------|--------------------------------------------------|-----------|-----|
| Product        | Notebook PC                                      |           |     |
| Test Mode      | Spurious Emission At Antenna Terminals (+/-1MHz) |           |     |
| Date of Test   | 2014/09/12                                       | Test Site | CTR |
| Test Condition | Block Edge Test (Band 13 (5M))                   |           |     |

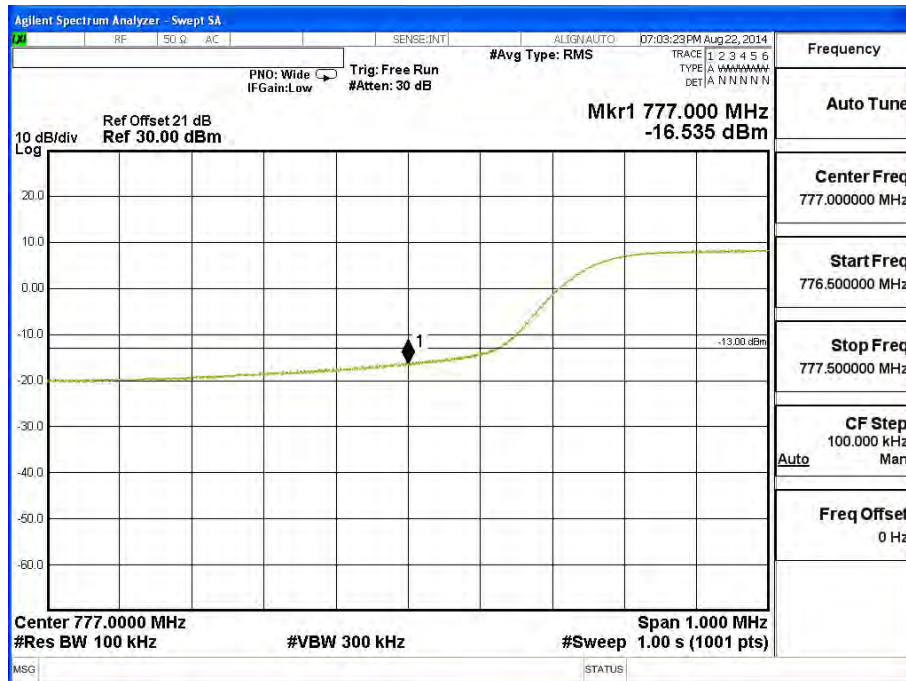
Band 13 (5M) 16QAM(1,0) Channel 23205 (779.5MHz)



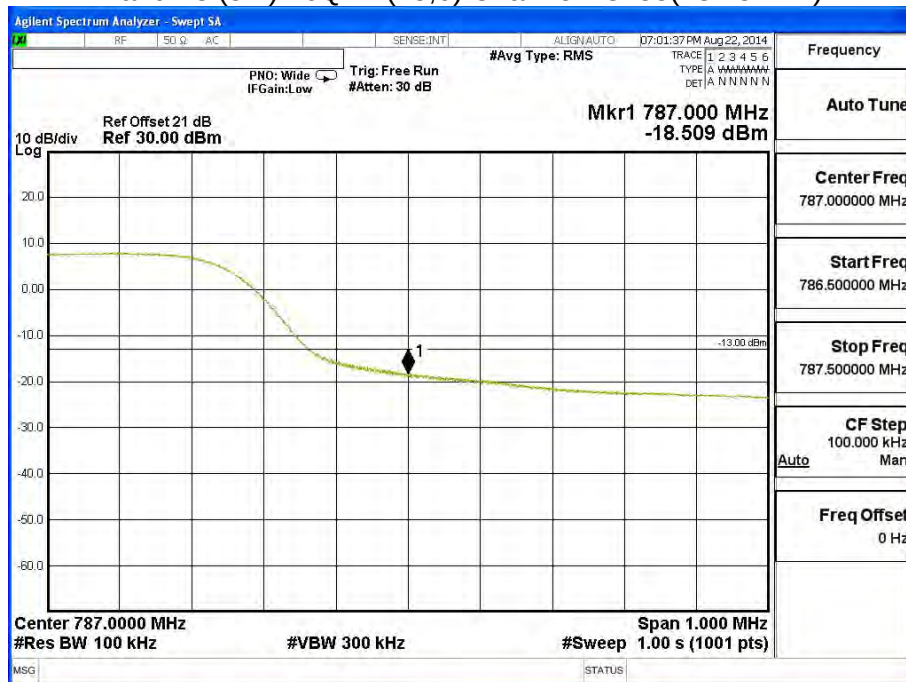
Band 13 (5M) 16QAM(1,24) Channel 23255(784.5MHz)



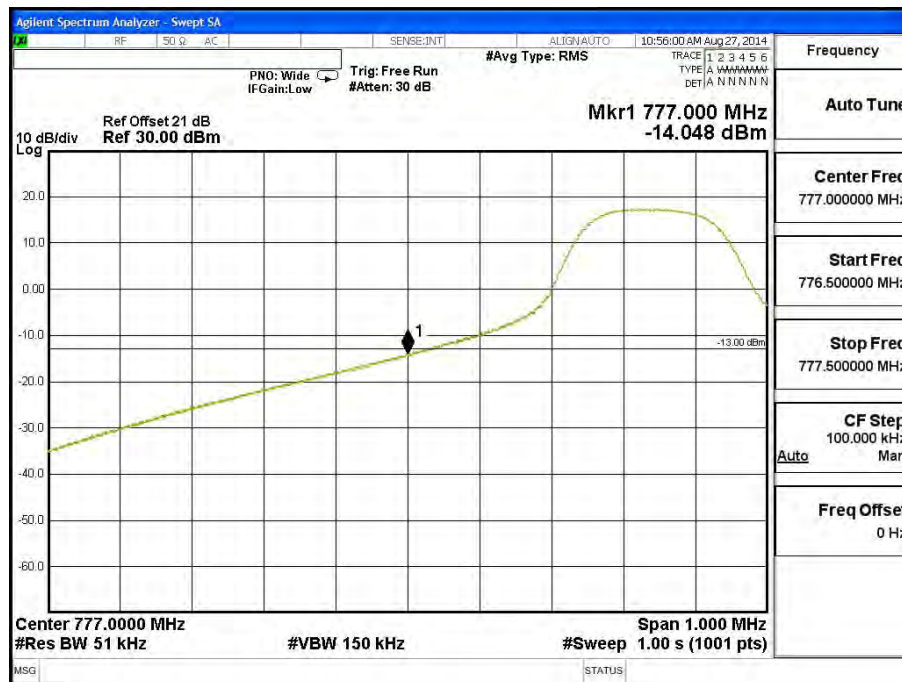
Band 13 (5M) 16QAM(25,0) Channel 23205 (779.5MHz)



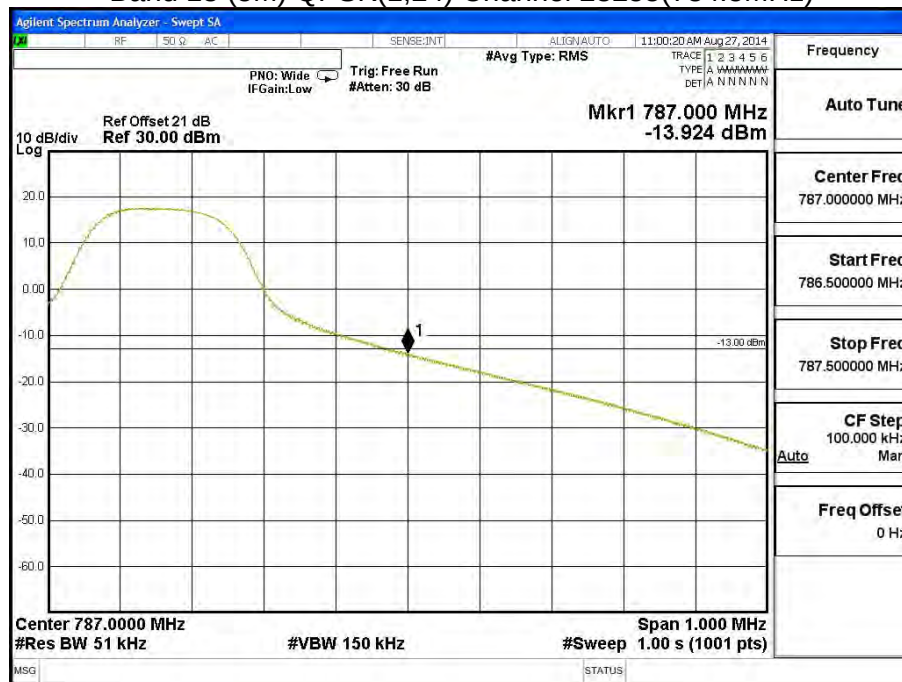
Band 13 (5M) 16QAM(25,0) Channel 23255(784.5MHz)



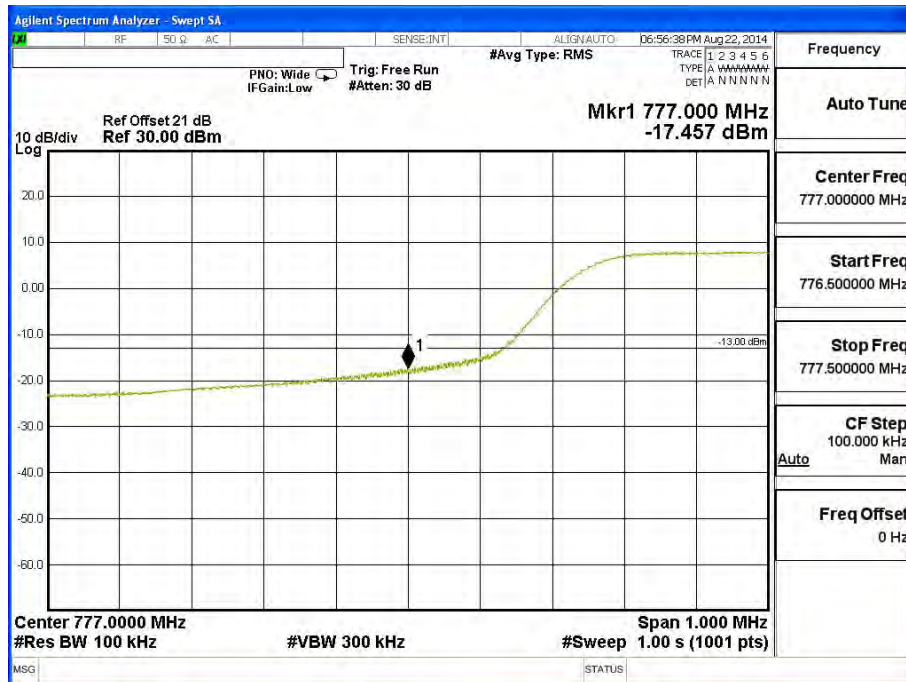
### Band 13 (5M) QPSK(1,0) Channel 23205 (779.5MHz)



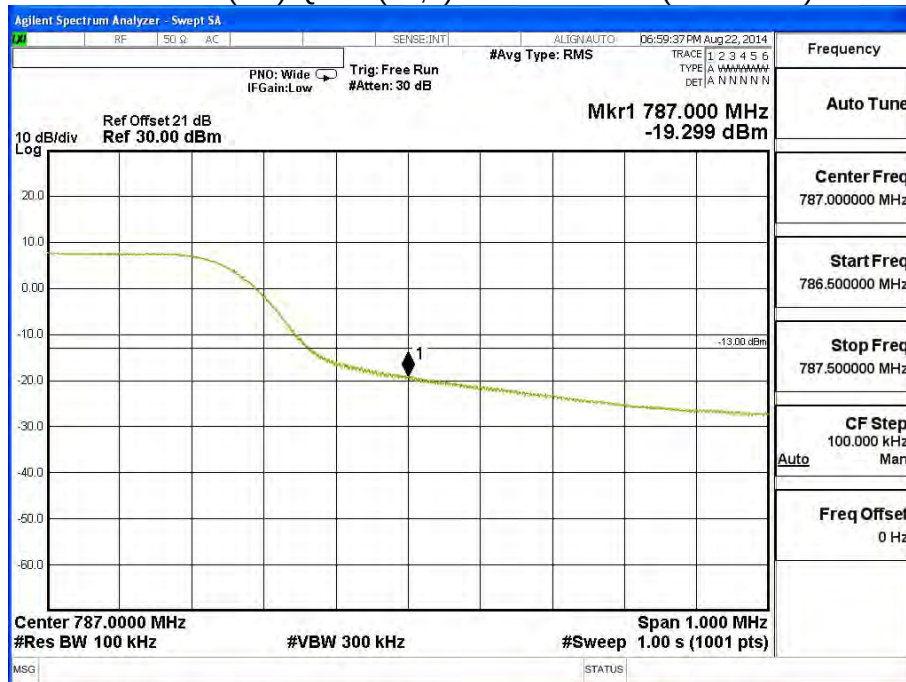
### Band 13 (5M) QPSK(1,24) Channel 23255(784.5MHz)



Band 13 (5M) QPSK(25,0) Channel 23205 (779.5MHz)

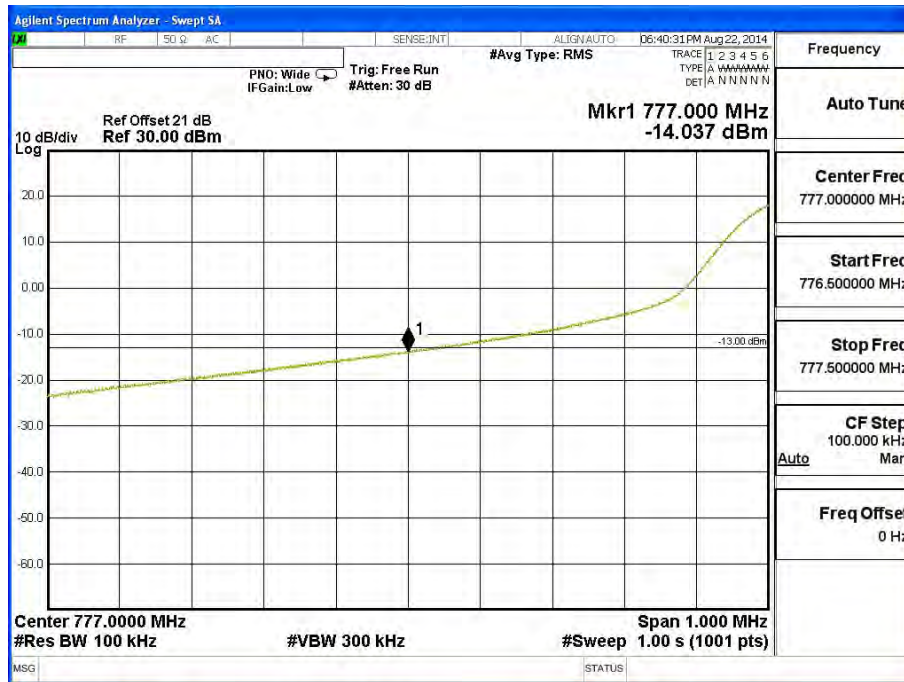


Band 13 (5M) QPSK(25,0) Channel 23255(784.5MHz)

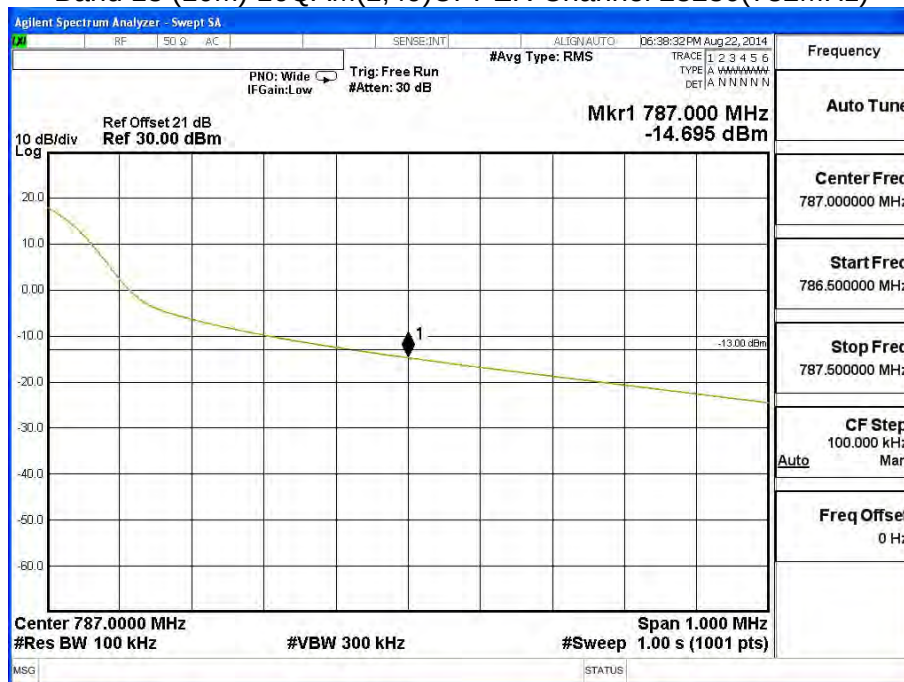


|                |                                                  |           |     |
|----------------|--------------------------------------------------|-----------|-----|
| Product        | Notebook PC                                      |           |     |
| Test Mode      | Spurious Emission At Antenna Terminals (+/-1MHz) |           |     |
| Date of Test   | 2014/09/12                                       | Test Site | CTR |
| Test Condition | Block Edge Test (Band13 (10M))                   |           |     |

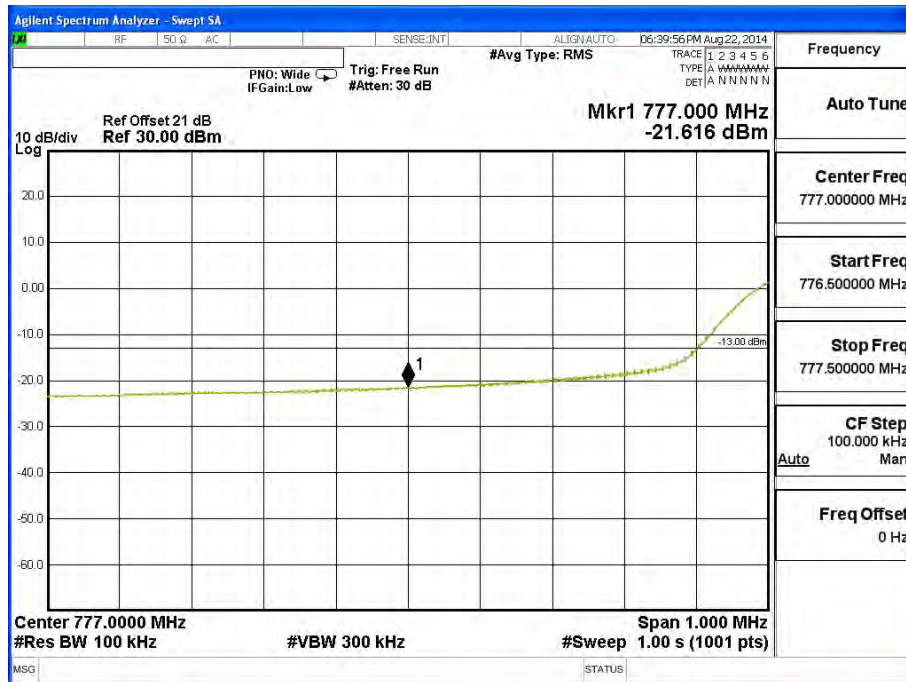
Band 13 (10M) 16QAM(1,0) LOWER Channel 23230 (782MHz)



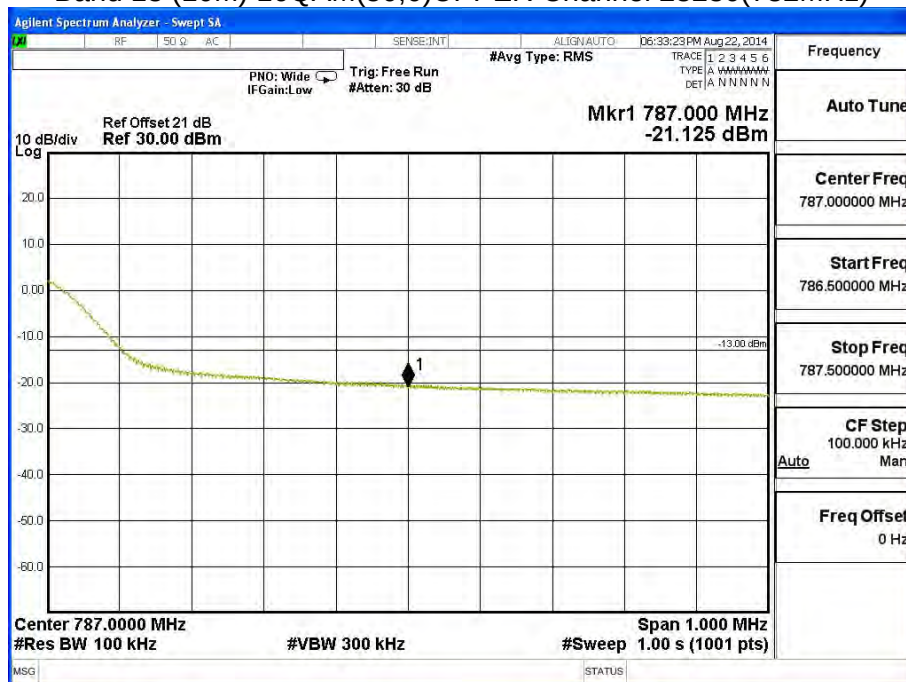
Band 13 (10M) 16QAM(1,49)UPPER Channel 23230(782MHz)



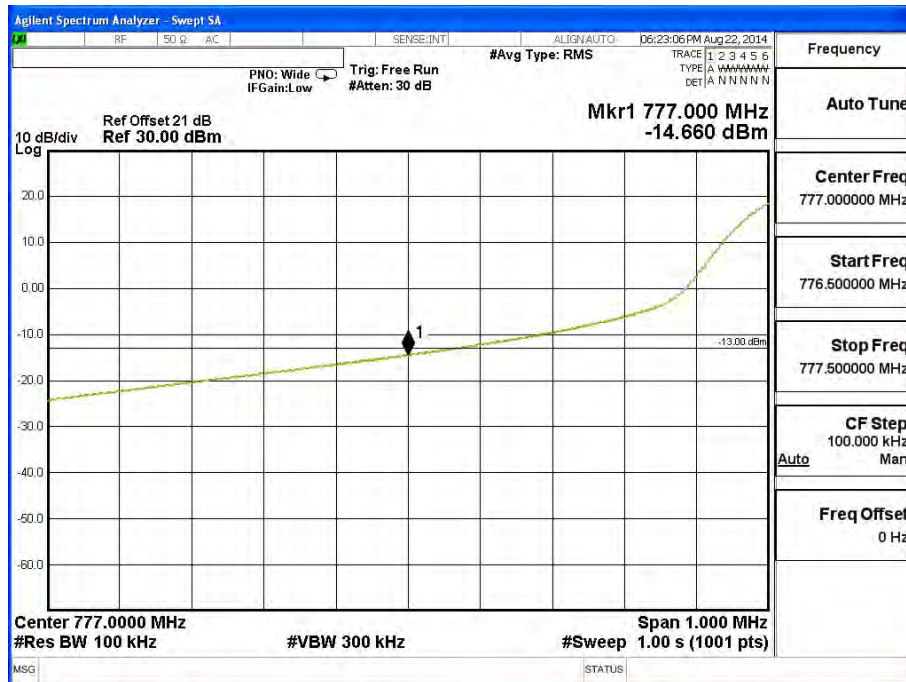
Band 13 (10M) 16QAM(50,0) LOWER Channel 23230 (782MHz)



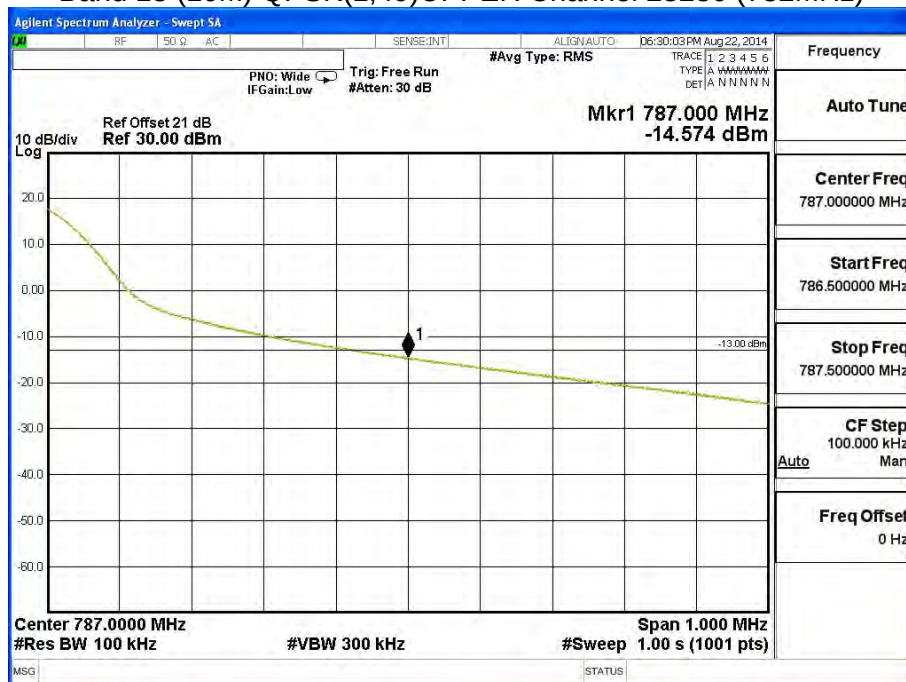
Band 13 (10M) 16QAM(50,0)UPPER Channel 23230(782MHz)



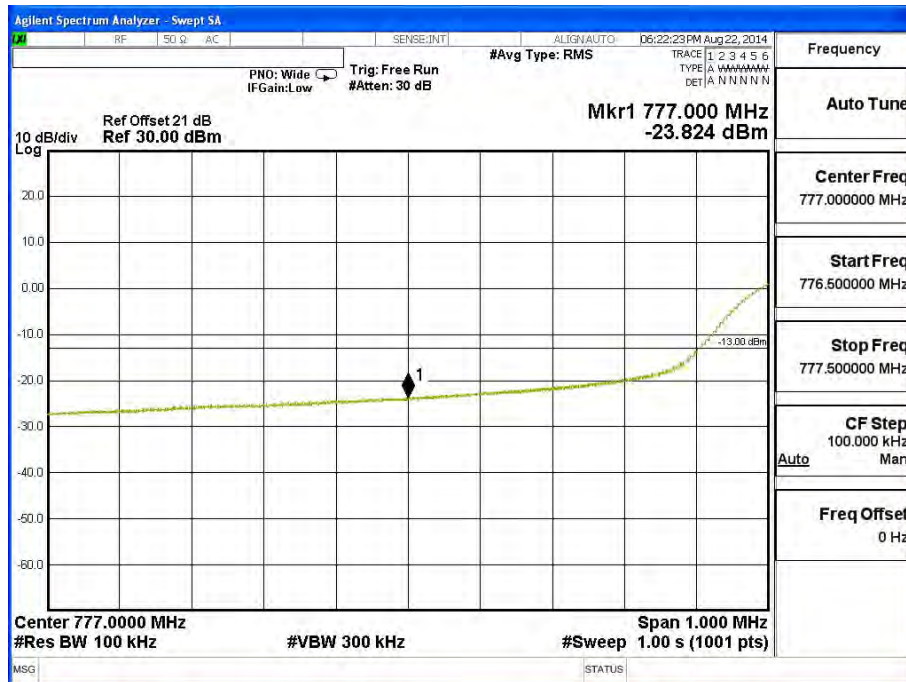
### Band 13 (10M) QPSK(1,0)LOWER Channel 23230 (782MHz)



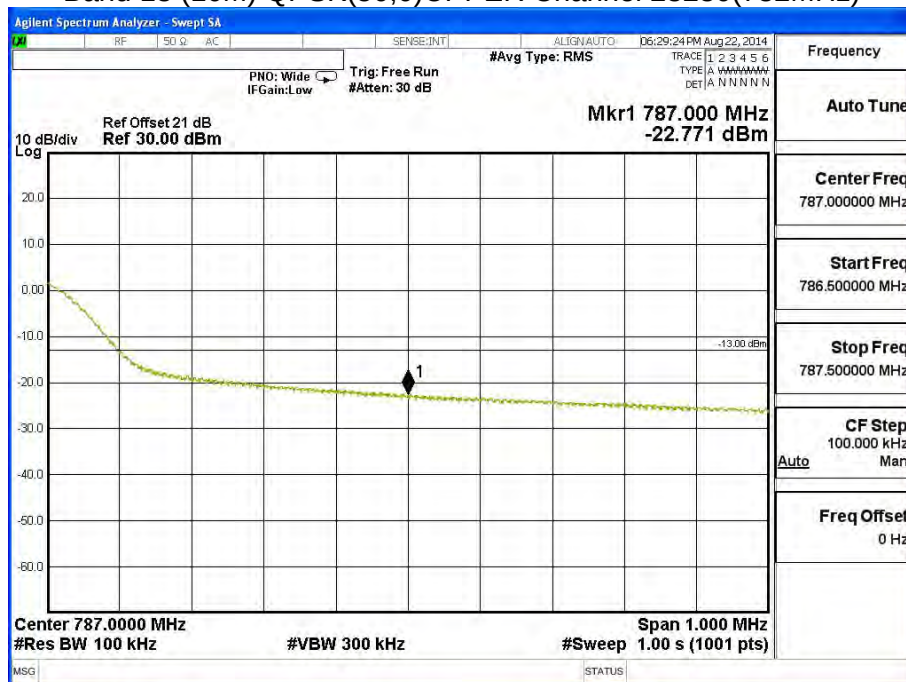
### Band 13 (10M) QPSK(1,49)UPPER Channel 23230 (782MHz)



### Band 13 (10M) QPSK(50,0) LOWER Channel 23230 (782MHz)



### Band 13 (10M) QPSK(50,0) UPPER Channel 23230 (782MHz)



## 5. Spurious Emission

### 5.1. Test Equipment

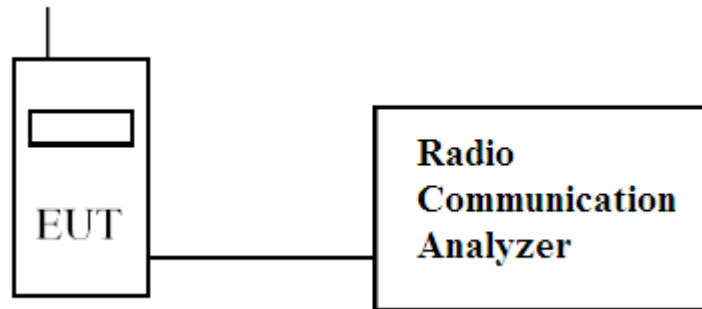
The following test equipments are used during the radiated emission test:

| Test Site                                  | Equipment                    | Manufacturer    | Model No./Serial No.            | Last Cal.  |
|--------------------------------------------|------------------------------|-----------------|---------------------------------|------------|
| <input checked="" type="checkbox"/> CTR    | Spectrum Analyzer            | Agilent         | N9010A / MY48030495             | 2014/07/08 |
|                                            | Dual Directional couple      | Agilent         | 778D / 50550                    | 2013/10/07 |
|                                            | Directional coupler          | Agilent         | 87300C / MY44300352             | 2014/01/06 |
| <input checked="" type="checkbox"/> Site#3 | Test Receiver                | R & S           | ESCS 30/ 100367                 | 2013/12/04 |
|                                            | Radio Communication Analyzer | Anritsu         | MT8820C / 6201091166            | 2014/01/17 |
|                                            | Spectrum Analyzer            | Agilent         | N9010A/ MY48030495              | 2014/07/08 |
|                                            | Bilog Antenna                | Schaffner Chase | CBL6112B/ 2707                  | 2014/06/13 |
|                                            | Horn Antenna                 | Schwarzbeck     | 9120D / 556                     | 2013/12/20 |
|                                            | Pre-Amplifier                | QTK             | QTK-LK-E-I-AMP4/<br>CHM-0201003 | 2014/06/18 |

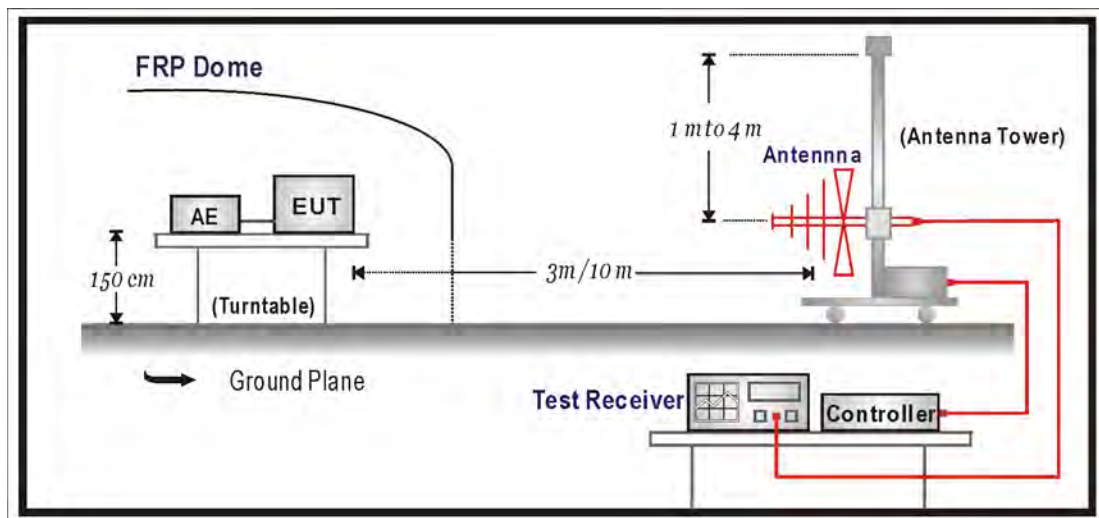
Note: All equipments that need to be calibrated are with calibration period of 1 year.

## 5.2. Test Setup

### 5.2.1.1 Spurious emissions at antenna terminals.



### 5.2.1.2 Field strength of spurious radiation.



## 5.3. Limits

|       |         |
|-------|---------|
| Limit | <-13dBm |
|-------|---------|

$43 + 10\log(P)$  down on the carrier where P is the power in Watts.

#### 5.4. Test Procedure

In accordance with Part 2.1051, the spurious emissions from the antenna terminal were measured. The transmitter output power was attenuated using a combination of filters and attenuators and the frequency spectrum investigated from 30MHz to 20GHz. The EUT was set to transmit on full power. The EUT was tested on Low, middle and High channels for both power levels. The resolution and video bandwidth was set to 1MHz/3MHz in accordance with Part 27.53(h). The spectrum analyzer detector was set to Max Hold. In addition, measurements were made up to the 10<sup>th</sup> harmonic of the fundamental. The device was then replaced with a substitution antenna, which input signal was adjusted until the received level matched that of the previously detected emission.

- (1) The EUT is tested with maximum rated TX power via the Base Station simulator.
- (2) The EUT is tested in three orthogonal planes, The worst case was showing in this report.

The EUT is placed on a turn table which is 1.5 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to TIA/EIA 603-C on radiated measurement.

#### 5.5. Test Specification

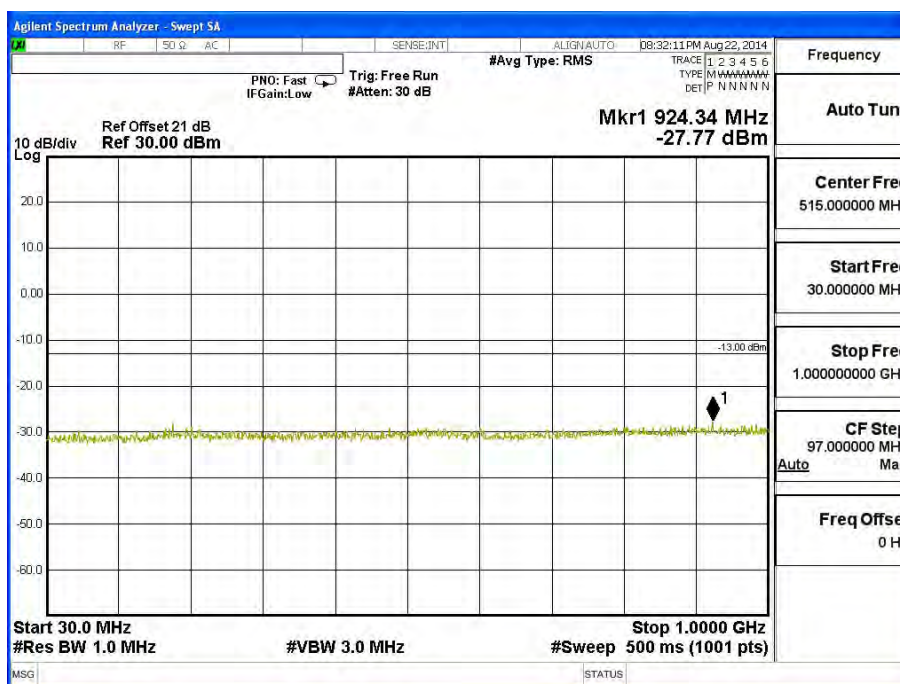
According to Part 2.1051, 2.1053, 27.53(h).

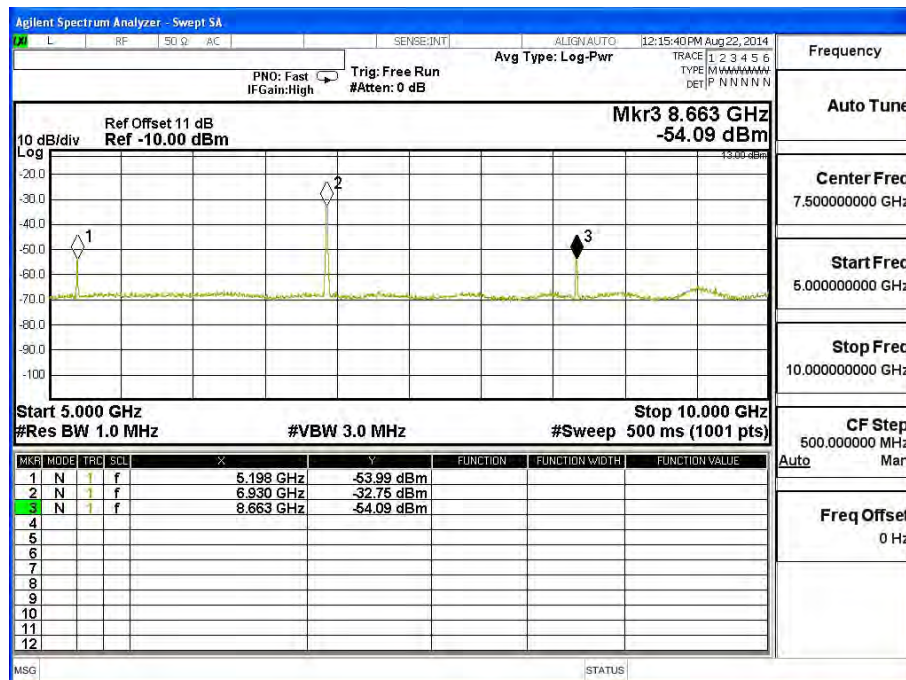
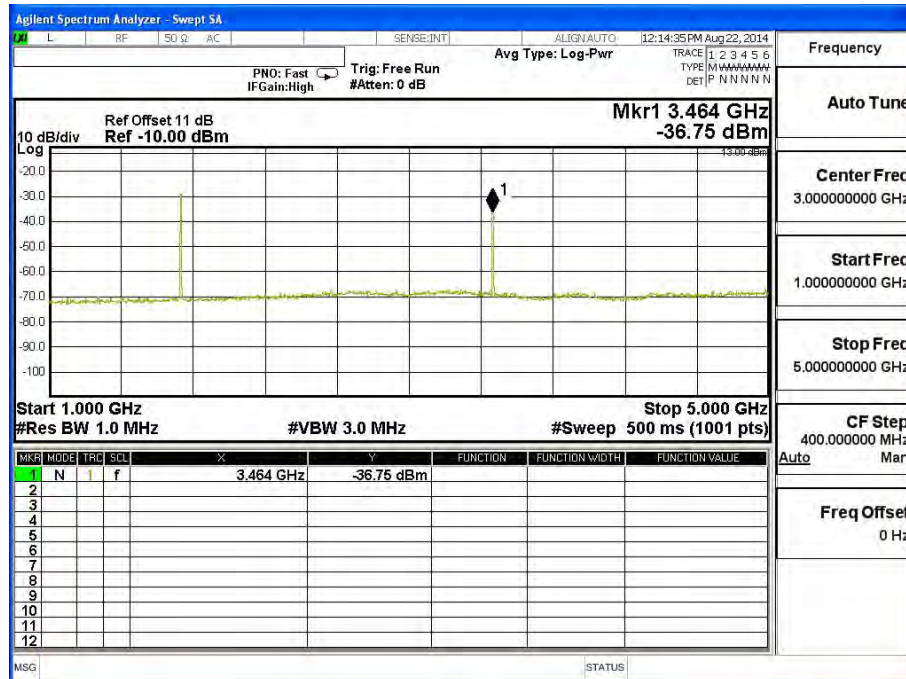
## 5.6. Test Result of Spurious Emission

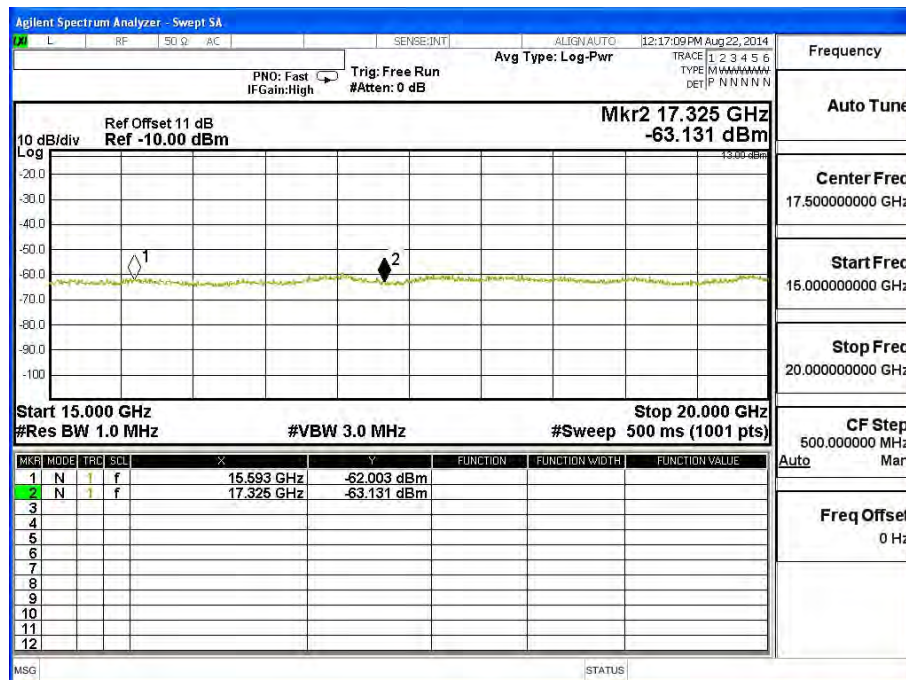
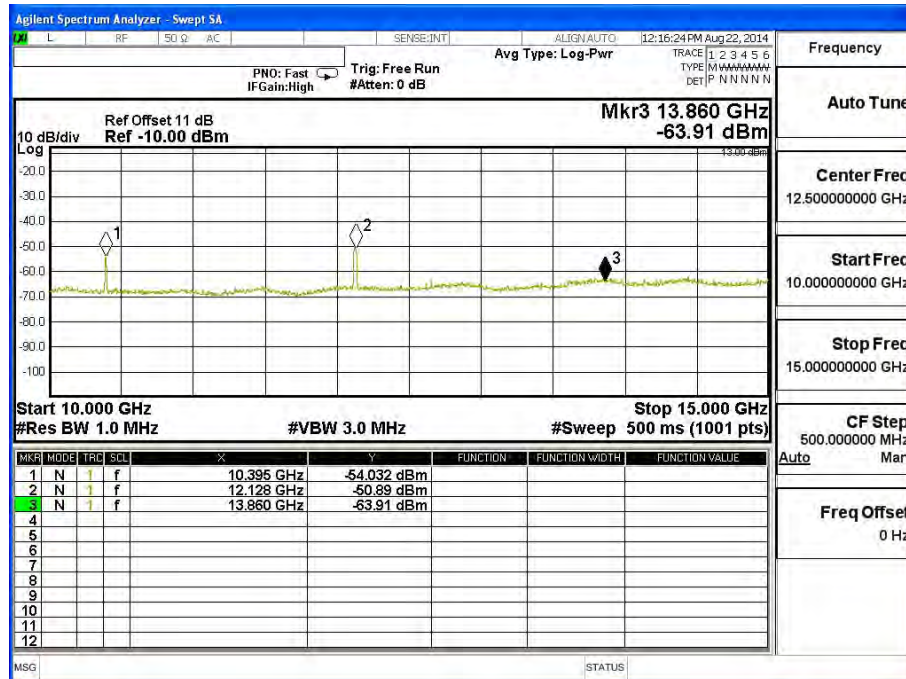
|                |                               |            |             |
|----------------|-------------------------------|------------|-------------|
| Product        | Notebook PC                   |            |             |
| Test Mode      | Spurious Emission (Conducted) |            |             |
| Date of Test   | 2014/09/19                    | Test Site  | CTR         |
| Test Condition | LTE-Band IV (5M)              | Test Range | 30MHz~20GHz |

### LTE-Band IV (5M) QPSK(12,6) CH20175

| Frequency (MHz) | Reading Level (dBm) | Path Loss (dB) | Emission Level (dBm) | Limit (dBm) |
|-----------------|---------------------|----------------|----------------------|-------------|
| 3464            | -36.750             | 1.1            | -35.650              | -13         |
| 5198            | -53.990             | 1.23           | -52.760              | -13         |
| 6930            | -32.750             | 1.59           | -31.160              | -13         |
| 8663            | -54.090             | 1.89           | -52.200              | -13         |
| 10395           | -54.032             | 2.07           | -51.962              | -13         |
| 12128           | -50.890             | 2.26           | -48.630              | -13         |
| 13860           | -63.910             | 2.64           | -61.270              | -13         |
| 15593           | -62.003             | 3.5            | -58.503              | -13         |
| 17325           | -63.131             | 3.7            | -59.431              | -13         |







|                |                               |            |             |
|----------------|-------------------------------|------------|-------------|
| Product        | Notebook PC                   |            |             |
| Test Mode      | Spurious Emission (Conducted) |            |             |
| Date of Test   | 2014/09/19                    | Test Site  | CTR         |
| Test Condition | LTE-Band IV (5M)              | Test Range | 30MHz~20GHz |

### LTE- Band IV (5M) 16QAM(25,0) CH20175

| Frequency (MHz) | Reading Level (dBm) | Path Loss (dB) | Emission Level (dBm) | Limit (dBm) |
|-----------------|---------------------|----------------|----------------------|-------------|
| 3460            | -35.870             | 1.1            | -34.770              | -13         |
| 5198            | -54.810             | 1.23           | -53.580              | -13         |
| 6930            | -31.620             | 1.59           | -30.030              | -13         |
| 8655            | -52.670             | 1.89           | -50.780              | -13         |
| 10395           | -56.040             | 2.07           | -53.970              | -13         |
| 12125           | -50.110             | 2.26           | -47.850              | -13         |
| 13860           | -63.420             | 2.64           | -60.780              | -13         |
| 15593           | -61.769             | 3.5            | -58.269              | -13         |
| 17325           | -62.925             | 3.7            | -59.225              | -13         |

