# EMC
# TEST REPORT

**Report No.** : **150400345TWN-001**
**Model No.** : **UMC-I210C**
**Issued Date** : **May 21, 2015**

| | |
|---|---|
| **Applicant:** | **Wistron Neweb Corporation** |
| **Address:** | **20 Park Avenue II, Hsinchu Science Park, Hsinchu 308, Taiwan** |
| **Test Method/ Standard:** | **47 CFR FCC Part 27,**<br>**47 CFR FCC Part 2,**<br>**ANSI/TIA-603-C-2004**<br>**KDB 971168 D01 Power Meas License Digital Systems v02r02** |
| **Test By:** | **Intertek Testing Services Taiwan Ltd.** |
| **Address:** | **No. 11, Lane 275, Ko-Nan 1 Street, Chia-Tung Li, Shiang-Shan District, Hsinchu City, Taiwan** |



**The test report was prepared by:** Sign on File
Evelyn Lee/ Officer

**These measurements were taken by:** Sign on File
Terry Hsu/ Engineer

**The test report was reviewed by:** Jimmy Yang

Name Jimmy Yang
Title Senior Engineer

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# 1. Summary of Test Data

| Test Requirement | Applicable Rule | Limit | Result |
|---|---|---|---|
| Conducted Output Power | 2.1046 | Reporting Only | Pass |
| Effective Radiated Power (Band 17) | 27.50(c)(10) | ERP < 3 Watts | N/A |
| Effective Radiated Power (Band 13) | 27.50(b)(10) | ERP < 3 Watts | Pass |
| Effective Isotropic Radiated Power (Band 4) | 27.50(d)(4) | EIRP < 1 Watts | Pass |
| Frequency Stability | 2.1055<br>27.54 | < 2.5 ppm / Within frequency range | Pass |
| Occupied Bandwidth | 2.1049<br>27.53(h) | Reporting Only | Pass |
| Peak to average ratio | 27.50(d)(5) | < 13 dB | Pass |
| Band Edge Measurements | 2.1049<br>27.53 | < 43+10log10(P[Watts]) | Pass |
| Conducted Spurious Emissions | 2.1051<br>27.53 | < 43+10log10(P[Watts]) | Pass |
| Radiated Spurious Emissions | 2.1053<br>27.53 | < 43+10log10(P[Watts]) | Pass |

# 2. General Information

## 2.1 Identification of the EUT

| | |
|---|---|
| Product: | Integrate with certified module-End product |
| Model No: | UMC-I210C |
| FCC ID: | NKR-CB1GI210C |
| Manufacturer: | Wistron Neweb Corporation |
| Address: | 20 Park Avenue II, Hsinchu Science Park, Hsinchu 308, Taiwan |
| TX Frequency: | LTE Band 4: 1710.7 MHz ~ 1754.3 MHz<br>LTE Band 13: 779.5 MHz ~ 784.5 MHz |
| RX Frequency: | LTE Band 4: 2110.7 MHz ~ 2154.3 MHz<br>LTE Band 13: 748.5MHz ~ 753.5 MHz |
| Bandwidth: | 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz (Band 4)<br>5MHz / 10MHz (Band 13) |
| Maximum Output Power to Antenna: | LTE Band 4 : 24.5 dBm / 0.28 W |
| Modulation: | LTE Band 4: QPSK, 16QAM<br>LTE Band 13: QPSK, 16QAM |
| Rated Power: | DC 5 V from adapter |
| Power Cord: | N/A |
| Sample Received: | Apr. 20, 2015 |
| Sample condition: | Workable |
| Test Date(s): | Apr. 27, 2015 ~ May 20, 2015 |
| Note 1: | This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program. |
| Note 2: | When determining the test conclusion, the Measurement Uncertainty of test has been considered. |

## 2.2 Emission designator

| FCC Rule | System | Type of Modulation | BW | Emission Designator | Frequency Tolerance (ppm) | Maximum ERP (Watts) | Maximum EIRP (Watts) |
|---|---|---|---|---|---|---|---|
| Part 27 | LTE Band 4 | QPSK | 1.4 MHz | 1M11G7D | 0.012 | - | 0.491 W |
| Part 27 | LTE Band 4 | 16QAM | 1.4 MHz | 1M11D7W | 0.012 | - | 0.412 W |
| Part 27 | LTE Band 4 | QPSK | 3 MHz | 2M69G7D | 0.013 | - | 0.476 W |
| Part 27 | LTE Band 4 | 16QAM | 3 MHz | 2M69D7W | 0.012 | - | 0.374 W |
| Part 27 | LTE Band 4 | QPSK | 5 MHz | 4M47G7D | 0.010 | - | 0.485 W |
| Part 27 | LTE Band 4 | 16QAM | 5 MHz | 4M48D7W | 0.012 | - | 0.469 W |
| Part 27 | LTE Band 4 | QPSK | 10 MHz | 8M95G7D | 0.010 | - | 0.461 W |
| Part 27 | LTE Band 4 | 16QAM | 10 MHz | 8M96D7W | 0.010 | - | 0.384 W |
| Part 27 | LTE Band 4 | QPSK | 15 MHz | 13M4G7D | 0.009 | - | 0.493 W |
| Part 27 | LTE Band 4 | 16QAM | 15 MHz | 13M5D7W | 0.009 | - | 0.402 W |
| Part 27 | LTE Band 4 | QPSK | 20 MHz | 17M9G7D | 0.015 | - | 0.464 W |
| Part 27 | LTE Band 4 | 16QAM | 20 MHz | 18M0D7W | 0.014 | - | 0.421 W |
| Part 27 | LTE Band 13 | QPSK | 5 MHz | 4M47G7D | 0.011 | 0.225 W | 0.370 W |
| Part 27 | LTE Band 13 | 16QAM | 5 MHz | 4M48D7W | 0.010 | 0.188 W | 0.308 W |
| Part 27 | LTE Band 13 | QPSK | 10 MHz | 8M95G7D | 0.024 | 0.237 W | 0.388 W |
| Part 27 | LTE Band 13 | 16QAM | 10 MHz | 8M93D7W | 0.028 | 0.174 W | 0.285 W |

## 2.3 Description of EUT

| | |
|---|---|
| Product SW/HW version : | 2.11.0-Beta2/ DGB |
| Radio SW/HW version : | N/A |
| Test SW Version : | N/A |

## 2.4 Antenna description

The EUT uses a permanently connected antenna.

Antenna Gain : 5.0 dBi max (Band 4), 2.5 dBi max (Band 13)
Antenna Type : PCB antenna
Connector Type : I-PEX

## 2.5 Adapter information

The EUT will be supplied with a power supply from below list:

| No. | Brand | Model no. | Specification |
|---|---|---|---|
| Adapter | Ktec | KSAS0120500200HU | I/P: 100-240V~, 50-60Hz, 0.4A,<br>O/P: 5.0Vdc, 2.0A |

The above EUT information is declared by Wistron Neweb Corporation and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

## 2.6 Peripherals equipment

| Peripherals | Brand | Model No. | Serial No. | Data cable |
|---|---|---|---|---|
| Notebook PC | DELL | Latitude D610 | 6YWZK1S | USB Cable 1 meter |

## 2.7 Applied test modes

| Conducted | Test items | Band | Bandwidth | Modulation | RB # | Test Channel |
|---|---|---|---|---|---|---|
| | Max. Output Power | 4 | 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz | QPSK / 16QAM | 1/Half/Full | L/M/H |
| | | 13 | 5MHz / 10MHz | QPSK / 16QAM | 1/Half/Full | L/M/H |
| | Peak-to-Average Ratio | 4 | 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz | QPSK / 16QAM | 1/Full | L/M/H |
| | | 13 | 5MHz / 10MHz | QPSK / 16QAM | 1/Full | L/M/H |
| | 26dB and 99% Bandwidth | 4 | 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz | QPSK / 16QAM | Full / 0 RB Offset | L/M/H |
| | | 13 | 5MHz / 10MHz | QPSK / 16QAM | Full / 0 RB Offset | L/M/H |
| | Conducted Band Edge | 4 | 1.4MHz | QPSK / 16QAM | 1RB/0RB Offset | L |
| | | | | | 6RB/0RB Offset | |
| | | | | | 1RB/5RB Offset | H |
| | | | | | 6RB/0RB Offset | |
| | | | 3MHz | | 1RB/0RB Offset | L |
| | | | | | 15RB/0RB Offset | |
| | | | | | 1RB/14RB Offset | H |
| | | | | | 15RB/0RB Offset | |
| | | | 5MHz | | 1RB/0RB Offset | L |
| | | | | | 25RB/0RB Offset | |
| | | | | | 1RB/24RB Offset | H |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | 25RB/0RB Offset | |
| | | | 10MHz | | 1RB/0RB Offset | L |
| | | | | | 50RB/0RB Offset | |
| | | | | | 1RB/49RB Offset | H |
| | | | | | 50RB/0RB Offset | |
| | | | 15MHz | | 1RB/0RB Offset | L |
| | | | | | 75RB/0RB Offset | |
| | | | | | 1RB/74RB Offset | H |
| | | | | | 75RB/0RB Offset | |
| | | | 20MHz | | 1RB/0RB Offset | L |
| | | | | | 100RB/0RB Offset | |
| | | | | | 1RB/99RB Offset | H |
| | | | | | 100RB/0RB Offset | |
| | | 13 | 5MHz | QPSK / 16QAM | 1RB/0RB Offset | L |
| | | | | | 25RB/0RB Offset | |
| | | | | | 1RB/24RB Offset | H |
| | | | | | 25RB/0RB Offset | |
| | | | 10MHz | | 1RB/0RB Offset | L |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | 50RB/0RB Offset | |
| | | | | | 1RB/49RB Offset | H |
| | | | | | 50RB/0RB Offset | |
| | Conducted Spurious Emission | 4 | 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz | QPSK / 16QAM | 1RB/0RB Offset | L/M/H |
| | | 13 | 5MHz / 10MHz | QPSK / 16QAM | 1RB/0RB Offset | L/M/H |
| | Frequency Stability | 4 | 20MHz | QPSK / 16QAM | Full / 0 RB Offset | L/H |
| | | 13 | 10MHz | QPSK / 16QAM | Full / 0 RB Offset | L/H |
| Radiated | E.I.R.P / E.R.P | 4 | 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz | QPSK / 16QAM | 1RB/0RB Offset | L/M/H |
| | | 13 | 5MHz / 10MHz | QPSK / 16QAM | 1RB/0RB Offset | L/M/H |
| | Radiated Spurious Emission | 4 | 1.4MHz | QPSK / 16QAM | 1RB/2RB Offset | L/M/H |
| | | | 3MHz | | 1RB/7RB Offset | |
| | | | 5MHz | | 1RB/12RB Offset | |
| | | | 10MHz | | 1RB/49RB Offset | |
| | | | 15MHz | | 1RB/37RB Offset | |
| | | | 20MHz | | 1RB/0RB Offset | |
| | | 13 | 5MHz | QPSK / 16QAM | 1RB/0RB Offset | L/M/H |
| | | | 10MHz | | 1RB/49RB Offset | |

## 2.8 Applied test axis

Pre-Scan has been executed only at X axis.

| Radiated test item | Band | Axis |
|---|---|---|
| ERP/EIRP | LTE Band 4 | X |
| | LTE Band 13 | X |
| Radiated Spurious Emission | LTE Band 4 | X |
| | LTE Band 13 | X |

## 2.9 Applied standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

FCC 47 CFR Part 2
FCC 47 CFR Part 27
ANSI/TIA-603-C-2004
FCC KDB 412172 D01 Determining ERP and EIRP v01
FCC KDB 971168 D01 Power Meas. License Digital Systems v02r02

# 3. Output Power Measurement

## 3.1 Test conditions

| | | |
|---|---|---|
| Temperature: | 20 | ℃ |
| Relative Humidity: | 55 | % |
| Atmospheric Pressure | 1008 | hPa |

## 3.2 Limit for output power measurement

Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP.
Portable stations (hand-held devices) operating in the 704-716 MHz band are limited to 3 watts ERP.
Portable stations (hand-held devices) operating in the 777-787MHz, 776-793 MHz band are limited to 3 watts ERP.

## 3.3 Test procedure

### 3.3.1 Conducted power measurement

1. The EUT was established communication with base station simulator and set up to transmit the maximum power.

2. Set the EUT to transmit at low, middle and high channel and record the power level on the base station simulator.

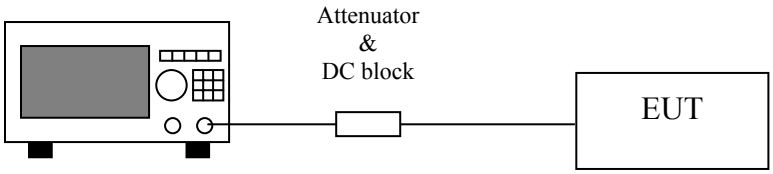
3,According to KDB 412172 D01 Power Approach

ERP/EIRP = $P_T + G_T – L_C$, ERP= EIRP-2.15 ,
where;

$P_T$=transmitter output power, in dBW, dBm
$G_T$= gain of the transmitting antenna, in dBi
$L_C$= signal attenuation in the connecting cable between the transmitter and antenna,in dB.

### 3.4 Test diagram

#### 3.4.1 Conducted test setup




Base station simulator

### 3.5 Test results

#### 3.5.1 Conducted output power

| LTE Band4 | | | | | | | |
|---|---|---|---|---|---|---|---|
| BW | Modulation | CH | Frequency (MHz) | RB Size | RB Offset | Peak Power (dBm) | Average Power (dBm) |
| 1.4MHz | QPSK | 19957 | 1710.7 | 1 | 0 | 27.00 | 22.09 |
| | | 19957 | 1710.7 | 1 | 2 | 26.88 | 22.15 |
| | | 19957 | 1710.7 | 1 | 5 | 27.18 | 22.38 |
| | | 19957 | 1710.7 | 3 | 0 | 27.76 | 22.24 |
| | | 19957 | 1710.7 | 3 | 1 | 27.71 | 22.33 |
| | | 19957 | 1710.7 | 3 | 2 | 27.93 | 22.48 |
| | | 19957 | 1710.7 | 6 | 0 | 28.61 | 21.34 |
| | | 20175 | 1732.5 | 1 | 0 | 26.90 | 21.70 |
| | | 20175 | 1732.5 | 1 | 2 | 26.51 | 21.63 |
| | | 20175 | 1732.5 | 1 | 5 | 26.58 | 21.49 |
| | | 20175 | 1732.5 | 3 | 0 | 26.47 | 21.52 |
| | | 20175 | 1732.5 | 3 | 1 | 26.42 | 21.54 |
| | | 20175 | 1732.5 | 3 | 2 | 26.34 | 21.48 |
| | | 20175 | 1732.5 | 6 | 0 | 26.33 | 20.40 |
| | | 20393 | 1754.3 | 1 | 0 | 26.72 | 22.77 |
| | | 20393 | 1754.3 | 1 | 2 | 26.67 | 22.76 |
| | | 20393 | 1754.3 | 1 | 5 | 26.69 | 22.67 |
| | | 20393 | 1754.3 | 3 | 0 | 27.46 | 22.83 |
| | | 20393 | 1754.3 | 3 | 1 | 27.80 | 22.81 |
| | | 20393 | 1754.3 | 3 | 2 | 27.18 | 22.82 |
| | | 20393 | 1754.3 | 6 | 0 | 27.48 | 21.75 |

| LTE Band4 | | | | | | | |
|---|---|---|---|---|---|---|---|
| BW | Modulation | CH | Frequency (MHz) | RB Size | RB Offset | Peak Power (dBm) | Average Power (dBm) |
| 1.4MHz | 16QAM | 19957 | 1710.7 | 1 | 0 | 26.78 | 21.31 |
| | | 19957 | 1710.7 | 1 | 2 | 27.16 | 21.64 |
| | | 19957 | 1710.7 | 1 | 5 | 27.02 | 21.66 |
| | | 19957 | 1710.7 | 3 | 0 | 27.45 | 21.46 |
| | | 19957 | 1710.7 | 3 | 1 | 27.30 | 21.47 |
| | | 19957 | 1710.7 | 3 | 2 | 27.47 | 21.50 |
| | | 19957 | 1710.7 | 6 | 0 | 27.70 | 21.58 |
| | | 20175 | 1732.5 | 1 | 0 | 26.32 | 20.65 |
| | | 20175 | 1732.5 | 1 | 2 | 26.22 | 20.77 |
| | | 20175 | 1732.5 | 1 | 5 | 26.15 | 20.56 |
| | | 20175 | 1732.5 | 3 | 0 | 26.74 | 20.43 |
| | | 20175 | 1732.5 | 3 | 1 | 26.82 | 20.40 |
| | | 20175 | 1732.5 | 3 | 2 | 26.50 | 20.44 |
| | | 20175 | 1732.5 | 6 | 0 | 27.03 | 20.29 |
| | | 20393 | 1754.3 | 1 | 0 | 26.81 | 21.75 |
| | | 20393 | 1754.3 | 1 | 2 | 26.71 | 21.85 |
| | | 20393 | 1754.3 | 1 | 5 | 26.70 | 21.87 |
| | | 20393 | 1754.3 | 3 | 0 | 27.23 | 21.71 |
| | | 20393 | 1754.3 | 3 | 1 | 27.11 | 22.07 |
| | | 20393 | 1754.3 | 3 | 2 | 27.07 | 22.04 |
| | | 20393 | 1754.3 | 6 | 0 | 27.53 | 21.85 |

| LTE Band4 | | | | | | | |
|---|---|---|---|---|---|---|---|
| BW | Modulation | CH | Frequency (MHz) | RB Size | RB Offset | Peak Power (dBm) | Average Power (dBm) |
| 3MHz | QPSK | 19965 | 1711.5 | 1 | 0 | 26.78 | 22.08 |
| | | 19965 | 1711.5 | 1 | 7 | 26.88 | 22.41 |
| | | 19965 | 1711.5 | 1 | 14 | 26.96 | 22.63 |
| | | 19965 | 1711.5 | 8 | 0 | 27.17 | 21.18 |
| | | 19965 | 1711.5 | 8 | 4 | 27.15 | 21.36 |
| | | 19965 | 1711.5 | 8 | 7 | 27.59 | 21.61 |
| | | 19965 | 1711.5 | 15 | 0 | 27.37 | 21.36 |
| | | 20175 | 1732.5 | 1 | 0 | 26.57 | 21.44 |
| | | 20175 | 1732.5 | 1 | 7 | 26.40 | 21.41 |
| | | 20175 | 1732.5 | 1 | 14 | 26.53 | 21.74 |
| | | 20175 | 1732.5 | 8 | 0 | 26.10 | 20.13 |
| | | 20175 | 1732.5 | 8 | 4 | 26.04 | 20.34 |
| | | 20175 | 1732.5 | 8 | 7 | 26.15 | 20.28 |
| | | 20175 | 1732.5 | 15 | 0 | 26.63 | 20.27 |
| | | 20385 | 1753.5 | 1 | 0 | 26.39 | 22.70 |
| | | 20385 | 1753.5 | 1 | 7 | 26.18 | 22.52 |
| | | 20385 | 1753.5 | 1 | 14 | 26.29 | 22.18 |
| | | 20385 | 1753.5 | 8 | 0 | 26.88 | 21.56 |
| | | 20385 | 1753.5 | 8 | 4 | 26.67 | 21.54 |
| | | 20385 | 1753.5 | 8 | 7 | 26.80 | 21.44 |
| | | 20385 | 1753.5 | 15 | 0 | 27.04 | 21.59 |

| LTE Band4 | | | | | | | |
|---|---|---|---|---|---|---|---|
| BW | Modulation | CH | Frequency (MHz) | RB Size | RB Offset | Peak Power (dBm) | Average Power (dBm) |
| 3MHz | 16QAM | 19965 | 1711.5 | 1 | 0 | 27.47 | 21.07 |
| | | 19965 | 1711.5 | 1 | 7 | 27.54 | 21.52 |
| | | 19965 | 1711.5 | 1 | 14 | 27.51 | 21.76 |
| | | 19965 | 1711.5 | 8 | 0 | 27.71 | 21.28 |
| | | 19965 | 1711.5 | 8 | 4 | 27.47 | 21.47 |
| | | 19965 | 1711.5 | 8 | 7 | 27.88 | 21.57 |
| | | 19965 | 1711.5 | 15 | 0 | 27.98 | 21.31 |
| | | 20175 | 1732.5 | 1 | 0 | 26.89 | 20.52 |
| | | 20175 | 1732.5 | 1 | 7 | 26.69 | 20.51 |
| | | 20175 | 1732.5 | 1 | 14 | 26.55 | 20.55 |
| | | 20175 | 1732.5 | 8 | 0 | 27.10 | 20.40 |
| | | 20175 | 1732.5 | 8 | 4 | 26.70 | 20.52 |
| | | 20175 | 1732.5 | 8 | 7 | 26.77 | 20.40 |
| | | 20175 | 1732.5 | 15 | 0 | 27.20 | 20.45 |
| | | 20385 | 1753.5 | 1 | 0 | 26.57 | 21.64 |
| | | 20385 | 1753.5 | 1 | 7 | 26.61 | 21.65 |
| | | 20385 | 1753.5 | 1 | 14 | 26.75 | 21.25 |
| | | 20385 | 1753.5 | 8 | 0 | 26.91 | 21.64 |
| | | 20385 | 1753.5 | 8 | 4 | 26.81 | 21.63 |
| | | 20385 | 1753.5 | 8 | 7 | 27.09 | 21.50 |
| | | 20385 | 1753.5 | 15 | 0 | 27.97 | 21.52 |

| LTE Band4 | | | | | | | |
|---|---|---|---|---|---|---|---|
| BW | Modulation | CH | Frequency (MHz) | RB Size | RB Offset | Peak Power (dBm) | Average Power (dBm) |
| 5MHz | QPSK | 19975 | 1712.5 | 1 | 0 | 26.69 | 21.77 |
| | | 19975 | 1712.5 | 1 | 12 | 26.94 | 22.46 |
| | | 19975 | 1712.5 | 1 | 24 | 26.89 | 22.44 |
| | | 19975 | 1712.5 | 12 | 0 | 27.27 | 21.08 |
| | | 19975 | 1712.5 | 12 | 6 | 27.20 | 21.49 |
| | | 19975 | 1712.5 | 12 | 11 | 27.39 | 21.62 |
| | | 19975 | 1712.5 | 25 | 0 | 27.80 | 21.33 |
| | | 20175 | 1732.5 | 1 | 0 | 26.26 | 21.30 |
| | | 20175 | 1732.5 | 1 | 12 | 26.04 | 21.30 |
| | | 20175 | 1732.5 | 1 | 24 | 26.38 | 21.85 |
| | | 20175 | 1732.5 | 12 | 0 | 26.12 | 20.24 |
| | | 20175 | 1732.5 | 12 | 6 | 25.77 | 20.18 |
| | | 20175 | 1732.5 | 12 | 11 | 25.88 | 20.17 |
| | | 20175 | 1732.5 | 25 | 0 | 26.69 | 20.25 |
| | | 20375 | 1752.5 | 1 | 0 | 26.52 | 22.77 |
| | | 20375 | 1752.5 | 1 | 12 | 26.44 | 22.79 |
| | | 20375 | 1752.5 | 1 | 24 | 26.56 | 22.34 |
| | | 20375 | 1752.5 | 12 | 0 | 26.87 | 21.73 |
| | | 20375 | 1752.5 | 12 | 6 | 26.59 | 21.85 |
| | | 20375 | 1752.5 | 12 | 11 | 26.85 | 21.54 |
| | | 20375 | 1752.5 | 25 | 0 | 27.35 | 21.63 |

| LTE Band4 | | | | | | | |
|---|---|---|---|---|---|---|---|
| BW | Modulation | CH | Frequency (MHz) | RB Size | RB Offset | Peak Power (dBm) | Average Power (dBm) |
| 5MHz | 16QAM | 19975 | 1712.5 | 1 | 0 | 26.59 | 20.97 |
| | | 19975 | 1712.5 | 1 | 12 | 26.87 | 21.73 |
| | | 19975 | 1712.5 | 1 | 24 | 26.85 | 21.59 |
| | | 19975 | 1712.5 | 12 | 0 | 27.50 | 21.17 |
| | | 19975 | 1712.5 | 12 | 6 | 27.25 | 21.60 |
| | | 19975 | 1712.5 | 12 | 11 | 27.30 | 21.62 |
| | | 19975 | 1712.5 | 25 | 0 | 28.00 | 21.55 |
| | | 20175 | 1732.5 | 1 | 0 | 26.68 | 20.85 |
| | | 20175 | 1732.5 | 1 | 12 | 26.20 | 20.91 |
| | | 20175 | 1732.5 | 1 | 24 | 26.58 | 20.97 |
| | | 20175 | 1732.5 | 12 | 0 | 26.79 | 20.26 |
| | | 20175 | 1732.5 | 12 | 6 | 26.57 | 20.39 |
| | | 20175 | 1732.5 | 12 | 11 | 26.44 | 20.37 |
| | | 20175 | 1732.5 | 25 | 0 | 27.21 | 20.38 |
| | | 20375 | 1752.5 | 1 | 0 | 26.41 | 22.52 |
| | | 20375 | 1752.5 | 1 | 12 | 26.53 | 22.64 |
| | | 20375 | 1752.5 | 1 | 24 | 26.30 | 22.05 |
| | | 20375 | 1752.5 | 12 | 0 | 26.88 | 21.76 |
| | | 20375 | 1752.5 | 12 | 6 | 26.51 | 21.77 |
| | | 20375 | 1752.5 | 12 | 11 | 26.73 | 21.47 |
| | | 20375 | 1752.5 | 25 | 0 | 27.72 | 21.60 |

| LTE Band4 | | | | | | | |
|---|---|---|---|---|---|---|---|
| BW | Modulation | CH | Frequency (MHz) | RB Size | RB Offset | Peak Power (dBm) | Average Power (dBm) |
| 10MHz | QPSK | 20000 | 1715.0 | 1 | 0 | 27.09 | 22.29 |
| | | 20000 | 1715.0 | 1 | 24 | 26.73 | 22.34 |
| | | 20000 | 1715.0 | 1 | 49 | 27.14 | 22.56 |
| | | 20000 | 1715.0 | 25 | 0 | 27.20 | 21.52 |
| | | 20000 | 1715.0 | 25 | 12 | 26.92 | 21.38 |
| | | 20000 | 1715.0 | 25 | 24 | 27.21 | 21.45 |
| | | 20000 | 1715.0 | 50 | 0 | 27.56 | 21.47 |
| | | 20175 | 1732.5 | 1 | 0 | 26.73 | 21.56 |
| | | 20175 | 1732.5 | 1 | 24 | 26.15 | 21.14 |
| | | 20175 | 1732.5 | 1 | 49 | 26.60 | 21.92 |
| | | 20175 | 1732.5 | 25 | 0 | 26.71 | 20.35 |
| | | 20175 | 1732.5 | 25 | 12 | 26.33 | 20.02 |
| | | 20175 | 1732.5 | 25 | 24 | 26.49 | 20.42 |
| | | 20175 | 1732.5 | 50 | 0 | 26.76 | 20.20 |
| | | 20350 | 1750 | 1 | 0 | 26.60 | 22.58 |
| | | 20350 | 1750 | 1 | 24 | 26.33 | 22.59 |
| | | 20350 | 1750 | 1 | 49 | 26.32 | 22.41 |
| | | 20350 | 1750 | 25 | 0 | 27.06 | 21.58 |
| | | 20350 | 1750 | 25 | 12 | 26.79 | 21.64 |
| | | 20350 | 1750 | 25 | 24 | 26.90 | 21.85 |
| | | 20350 | 1750 | 50 | 0 | 27.66 | 21.63 |

| LTE Band4 | | | | | | | |
|---|---|---|---|---|---|---|---|
| BW | Modulation | CH | Frequency (MHz) | RB Size | RB Offset | Peak Power (dBm) | Average Power (dBm) |
| 10MHz | 16QAM | 20000 | 1715.0 | 1 | 0 | 27.55 | 21.21 |
| | | 20000 | 1715.0 | 1 | 24 | 27.33 | 21.47 |
| | | 20000 | 1715.0 | 1 | 49 | 27.44 | 21.45 |
| | | 20000 | 1715.0 | 25 | 0 | 27.83 | 21.41 |
| | | 20000 | 1715.0 | 25 | 12 | 27.38 | 21.42 |
| | | 20000 | 1715.0 | 25 | 24 | 27.69 | 21.48 |
| | | 20000 | 1715.0 | 50 | 0 | 28.18 | 21.68 |
| | | 20175 | 1732.5 | 1 | 0 | 26.55 | 21.03 |
| | | 20175 | 1732.5 | 1 | 24 | 26.04 | 20.65 |
| | | 20175 | 1732.5 | 1 | 49 | 26.28 | 20.99 |
| | | 20175 | 1732.5 | 25 | 0 | 26.95 | 20.40 |
| | | 20175 | 1732.5 | 25 | 12 | 26.38 | 20.08 |
| | | 20175 | 1732.5 | 25 | 24 | 26.82 | 20.47 |
| | | 20175 | 1732.5 | 50 | 0 | 27.42 | 20.37 |
| | | 20350 | 1750 | 1 | 0 | 26.79 | 21.73 |
| | | 20350 | 1750 | 1 | 24 | 26.36 | 21.59 |
| | | 20350 | 1750 | 1 | 49 | 26.34 | 21.41 |
| | | 20350 | 1750 | 25 | 0 | 27.37 | 21.80 |
| | | 20350 | 1750 | 25 | 12 | 26.72 | 21.53 |
| | | 20350 | 1750 | 25 | 24 | 26.92 | 21.76 |
| | | 20350 | 1750 | 50 | 0 | 27.67 | 21.47 |

| LTE Band4 | | | | | | | |
|---|---|---|---|---|---|---|---|
| BW | Modulation | CH | Frequency (MHz) | RB Size | RB Offset | Peak Power (dBm) | Average Power (dBm) |
| 15MHz | QPSK | 20025 | 1717.5 | 1 | 0 | 27.60 | 22.35 |
| | | 20025 | 1717.5 | 1 | 37 | 27.04 | 22.77 |
| | | 20025 | 1717.5 | 1 | 74 | 27.99 | 22.15 |
| | | 20025 | 1717.5 | 36 | 0 | 27.45 | 21.81 |
| | | 20025 | 1717.5 | 36 | 16 | 27.28 | 21.77 |
| | | 20025 | 1717.5 | 36 | 35 | 27.34 | 21.51 |
| | | 20025 | 1717.5 | 75 | 0 | 28.06 | 21.68 |
| | | 20175 | 1732.5 | 1 | 0 | 27.82 | 22.00 |
| | | 20175 | 1732.5 | 1 | 37 | 26.22 | 21.65 |
| | | 20175 | 1732.5 | 1 | 74 | 27.19 | 22.24 |
| | | 20175 | 1732.5 | 36 | 0 | 26.81 | 20.64 |
| | | 20175 | 1732.5 | 36 | 16 | 26.50 | 20.47 |
| | | 20175 | 1732.5 | 36 | 35 | 26.60 | 20.75 |
| | | 20175 | 1732.5 | 75 | 0 | 27.42 | 20.64 |
| | | 20325 | 1747.5 | 1 | 0 | 27.15 | 21.92 |
| | | 20325 | 1747.5 | 1 | 37 | 26.70 | 22.92 |
| | | 20325 | 1747.5 | 1 | 74 | 27.18 | 22.69 |
| | | 20325 | 1747.5 | 36 | 0 | 27.16 | 21.60 |
| | | 20325 | 1747.5 | 36 | 16 | 27.02 | 22.00 |
| | | 20325 | 1747.5 | 36 | 35 | 27.04 | 21.97 |
| | | 20325 | 1747.5 | 75 | 0 | 28.10 | 21.69 |

| LTE Band4 | | | | | | | |
|---|---|---|---|---|---|---|---|
| BW | Modulation | CH | Frequency (MHz) | RB Size | RB Offset | Peak Power (dBm) | Average Power (dBm) |
| | 16QAM | 20025 | 1717.5 | 1 | 0 | 28.30 | 21.51 |
| | | 20025 | 1717.5 | 1 | 37 | 27.37 | 21.82 |
| | | 20025 | 1717.5 | 1 | 74 | 28.23 | 22.04 |
| | | 20025 | 1717.5 | 36 | 0 | 27.60 | 21.76 |
| | | 20025 | 1717.5 | 36 | 16 | 27.60 | 21.80 |
| | | 20025 | 1717.5 | 36 | 35 | 27.50 | 21.44 |
| | | 20025 | 1717.5 | 75 | 0 | 28.04 | 21.64 |
| | | 20175 | 1732.5 | 1 | 0 | 27.67 | 21.89 |
| | | 20175 | 1732.5 | 1 | 37 | 26.55 | 21.09 |
| | | 20175 | 1732.5 | 1 | 74 | 27.12 | 21.67 |
| | | 20175 | 1732.5 | 36 | 0 | 27.37 | 20.60 |
| | | 20175 | 1732.5 | 36 | 16 | 27.00 | 20.42 |
| | | 20175 | 1732.5 | 36 | 35 | 26.97 | 20.69 |
| | | 20175 | 1732.5 | 75 | 0 | 27.73 | 20.62 |
| | | 20325 | 1747.5 | 1 | 0 | 28.29 | 21.21 |
| | | 20325 | 1747.5 | 1 | 37 | 26.95 | 21.99 |
| | | 20325 | 1747.5 | 1 | 74 | 26381 | 21.81 |
| | | 20325 | 1747.5 | 36 | 0 | 27.46 | 21.64 |
| | | 20325 | 1747.5 | 36 | 16 | 27.43 | 22.04 |
| | | 20325 | 1747.5 | 36 | 35 | 27.16 | 21.87 |
| | | 20325 | 1747.5 | 75 | 0 | 27.95 | 21.69 |

| LTE Band4 | | | | | | | |
|---|---|---|---|---|---|---|---|
| BW | Modulation | CH | Frequency (MHz) | RB Size | RB Offset | Peak Power (dBm) | Average Power (dBm) |
| 20MHz | QPSK | 20050 | 1720 | 1 | 0 | 27.35 | 22.23 |
| | | 20050 | 1720 | 1 | 49 | 27.32 | 22.56 |
| | | 20050 | 1720 | 1 | 99 | 26.91 | 21.52 |
| | | 20050 | 1720 | 50 | 0 | 27.72 | 21.82 |
| | | 20050 | 1720 | 50 | 24 | 27.37 | 21.61 |
| | | 20050 | 1720 | 50 | 49 | 27.64 | 21.33 |
| | | 20050 | 1720 | 100 | 0 | 27.62 | 21.57 |
| | | 20175 | 1732.5 | 1 | 0 | 27.42 | 22.09 |
| | | 20175 | 1732.5 | 1 | 49 | 26.80 | 21.59 |
| | | 20175 | 1732.5 | 1 | 99 | 27.03 | 22.04 |
| | | 20175 | 1732.5 | 50 | 0 | 27.57 | 20.99 |
| | | 20175 | 1732.5 | 50 | 24 | 27.08 | 20.75 |
| | | 20175 | 1732.5 | 50 | 49 | 27.34 | 21.03 |
| | | 20175 | 1732.5 | 100 | 0 | 27.62 | 20.93 |
| | | 20300 | 1745 | 1 | 0 | 26.99 | 21.69 |
| | | 20300 | 1745 | 1 | 49 | 26.96 | 22.70 |
| | | 20300 | 1745 | 1 | 99 | 26.84 | 22.65 |
| | | 20300 | 1745 | 50 | 0 | 26.95 | 21.23 |
| | | 20300 | 1745 | 50 | 24 | 27.05 | 21.58 |
| | | 20300 | 1745 | 50 | 49 | 27.14 | 21.89 |
| | | 20300 | 1745 | 100 | 0 | 27.63 | 21.48 |

| LTE Band4 | | | | | | | |
|---|---|---|---|---|---|---|---|
| BW | Modulation | CH | Frequency (MHz) | RB Size | RB Offset | Peak Power (dBm) | Average Power (dBm) |
| 20MHz | 16QAM | 20050 | 1720 | 1 | 0 | 27.38 | 21.84 |
| | | 20050 | 1720 | 1 | 49 | 26.50 | 21.98 |
| | | 20050 | 1720 | 1 | 99 | 27.74 | 21.21 |
| | | 20050 | 1720 | 50 | 0 | 27.69 | 21.82 |
| | | 20050 | 1720 | 50 | 24 | 27.55 | 21.61 |
| | | 20050 | 1720 | 50 | 49 | 27.86 | 21.23 |
| | | 20050 | 1720 | 100 | 0 | 28.33 | 21.69 |
| | | 20175 | 1732.5 | 1 | 0 | 27.37 | 21.71 |
| | | 20175 | 1732.5 | 1 | 49 | 26.43 | 21.47 |
| | | 20175 | 1732.5 | 1 | 99 | 27.19 | 21.66 |
| | | 20175 | 1732.5 | 50 | 0 | 27.83 | 20.91 |
| | | 20175 | 1732.5 | 50 | 24 | 27.24 | 20.81 |
| | | 20175 | 1732.5 | 50 | 49 | 27.58 | 21.04 |
| | | 20175 | 1732.5 | 100 | 0 | 28.27 | 20.94 |
| | | 20300 | 1745 | 1 | 0 | 26.95 | 21.25 |
| | | 20300 | 1745 | 1 | 49 | 27.09 | 22.28 |
| | | 20300 | 1745 | 1 | 99 | 26.81 | 22.05 |
| | | 20300 | 1745 | 50 | 0 | 27.49 | 21.27 |
| | | 20300 | 1745 | 50 | 24 | 27.28 | 21.54 |
| | | 20300 | 1745 | 50 | 49 | 27.43 | 21.83 |
| | | 20300 | 1745 | 100 | 0 | 28.04 | 21.48 |

| LTE Band13 | | | | | | | |
|---|---|---|---|---|---|---|---|
| BW | Modulation | CH | Frequency (MHz) | RB Size | RB Offset | Peak Power (dBm) | Average Power (dBm) |
| 5MHz | QPSK | 23207 | 779.5 | 1 | 0 | 28.4 | 24.03 |
| | | 23207 | 779.5 | 1 | 12 | 28.27 | 24.22 |
| | | 23207 | 779.5 | 1 | 24 | 28.15 | 23.67 |
| | | 23207 | 779.5 | 12 | 0 | 28.60 | 23.04 |
| | | 23207 | 779.5 | 12 | 6 | 28.75 | 23.19 |
| | | 23207 | 779.5 | 12 | 11 | 28.65 | 23.17 |
| | | 23207 | 779.5 | 25 | 0 | 29.35 | 23.11 |
| | | 23230 | 782.5 | 1 | 0 | 28.35 | 24.00 |
| | | 23230 | 782.5 | 1 | 12 | 28.42 | 23.91 |
| | | 23230 | 782.5 | 1 | 24 | 27.97 | 23.63 |
| | | 23230 | 782.5 | 12 | 0 | 28.43 | 22.90 |
| | | 23230 | 782.5 | 12 | 6 | 27.75 | 22.38 |
| | | 23230 | 782.5 | 12 | 11 | 27.87 | 22.39 |
| | | 23230 | 782.5 | 25 | 0 | 28.39 | 22.27 |
| | | 23255 | 784.5 | 1 | 0 | 28.50 | 23.98 |
| | | 23255 | 784.5 | 1 | 12 | 27.92 | 23.58 |
| | | 23255 | 784.5 | 1 | 24 | 27.67 | 23.44 |
| | | 23255 | 784.5 | 12 | 0 | 28.38 | 22.18 |
| | | 23255 | 784.5 | 12 | 6 | 27.94 | 22.09 |
| | | 23255 | 784.5 | 12 | 11 | 27.95 | 21.82 |
| | | 23255 | 784.5 | 25 | 0 | 28.88 | 22.85 |

| LTE Band13 | | | | | | | |
|---|---|---|---|---|---|---|---|
| BW | Modulation | CH | Frequency (MHz) | RB Size | RB Offset | Peak Power (dBm) | Average Power (dBm) |
| 5MHz | 16QAM | 23207 | 779.5 | 1 | 0 | 28.34 | 23.29 |
| | | 23207 | 779.5 | 1 | 12 | 27.99 | 22.84 |
| | | 23207 | 779.5 | 1 | 24 | 27.87 | 22.37 |
| | | 23207 | 779.5 | 12 | 0 | 28.24 | 21.77 |
| | | 23207 | 779.5 | 12 | 6 | 28.26 | 21.74 |
| | | 23207 | 779.5 | 12 | 11 | 28.40 | 21.58 |
| | | 23207 | 779.5 | 25 | 0 | 29.05 | 21.81 |
| | | 23230 | 782.5 | 1 | 0 | 28.65 | 23.48 |
| | | 23230 | 782.5 | 1 | 12 | 28.09 | 22.90 |
| | | 23230 | 782.5 | 1 | 24 | 27.88 | 22.54 |
| | | 23230 | 782.5 | 12 | 0 | 28.26 | 21.70 |
| | | 23230 | 782.5 | 12 | 6 | 28.08 | 21.60 |
| | | 23230 | 782.5 | 12 | 11 | 27.81 | 21.49 |
| | | 23230 | 782.5 | 25 | 0 | 28.43 | 21.44 |
| | | 23255 | 784.5 | 1 | 0 | 27.93 | 23.36 |
| | | 23255 | 784.5 | 1 | 12 | 27.32 | 22.93 |
| | | 23255 | 784.5 | 1 | 24 | 27.33 | 22.95 |
| | | 23255 | 784.5 | 12 | 0 | 28.00 | 21.50 |
| | | 23255 | 784.5 | 12 | 6 | 27.67 | 21.28 |
| | | 23255 | 784.5 | 12 | 11 | 27.58 | 21.00 |
| | | 23255 | 784.5 | 25 | 0 | 28.40 | 21.22 |

| LTE Band13 | | | | | | | |
|---|---|---|---|---|---|---|---|
| BW | Modulation | CH | Frequency (MHz) | RB Size | RB Offset | Peak Power (dBm) | Average Power (dBm) |
| 10MHz | QPSK | 23230 | 782 | 1 | 0 | 28.92 | 24.46 |
| | | 23230 | 782 | 1 | 24 | 28.20 | 23.53 |
| | | 23230 | 782 | 1 | 49 | 27.64 | 23.20 |
| | | 23230 | 782 | 25 | 0 | 28.65 | 22.80 |
| | | 23230 | 782 | 25 | 12 | 28.62 | 22.57 |
| | | 23230 | 782 | 25 | 24 | 28.51 | 22.54 |
| | | 23230 | 782 | 50 | 0 | 28.60 | 22.53 |
| | 16QAM | 23230 | 782 | 1 | 0 | 28.33 | 23.12 |
| | | 23230 | 782 | 1 | 24 | 28.34 | 22.16 |
| | | 23230 | 782 | 1 | 49 | 28.04 | 22.27 |
| | | 23230 | 782 | 25 | 0 | 28.95 | 22.22 |
| | | 23230 | 782 | 25 | 12 | 28.38 | 21.28 |
| | | 23230 | 782 | 25 | 24 | 28.44 | 21.25 |
| | | 23230 | 782 | 50 | 0 | 28.50 | 21.35 |

### 3.5.2 Radiated output power

**Average E.I.R.P. for LTE Band 4**
**Channel Bandwidth: 1.4MHz**
**Modulation: QPSK**

| Channel | Frequency (MHz) | Conducted Power | $G_T$ (dB) | E.I.R.P. (dBm) |
|---|---|---|---|---|
| 19957 | 1710.7 | 22.48 | 5 | 27.48 |
| 20175 | 1732.5 | 21.7 | 5 | 26.7 |
| 20393 | 1754.3 | 22.83 | 5 | 27.83 |

Note: Conducted Power = $P_T$ + $L_C$

**Average E.I.R.P. for LTE Band 4**
**Channel Bandwidth: 1.4MHz**
**Modulation: 16QAM**

| Channel | Frequency (MHz) | Conducted Power | $G_T$ (dB) | E.I.R.P. (dBm) |
|---|---|---|---|---|
| 19957 | 1710.7 | 21.66 | 5 | 26.66 |
| 20175 | 1732.5 | 20.77 | 5 | 25.77 |
| 20393 | 1754.3 | 22.07 | 5 | 27.07 |

Note: Conducted Power = $P_T$ + $L_C$

**Average E.I.R.P. for LTE Band 4**
**Channel Bandwidth: 3MHz**
**Modulation: QPSK**

| Channel | Frequency (MHz) | Conducted Power | $G_T$ (dB) | E.I.R.P. (dBm) |
|---|---|---|---|---|
| 19965 | 1711.5 | 22.63 | 5 | 27.63 |
| 20175 | 1732.5 | 21.74 | 5 | 26.74 |
| 20385 | 1753.5 | 22.7 | 5 | 27.7 |

Note: Conducted Power = $P_T$ + $L_C$

**Average E.I.R.P. for LTE Band 4**

**Channel Bandwidth: 3MHz**

**Modulation: 16QAM**

| Channel | Frequency (MHz) | Conducted Power | $G_T$ (dB) | E.I.R.P. (dBm) |
|---|---|---|---|---|
| 19965 | 1711.5 | 21.76 | 5 | 26.76 |
| 20175 | 1732.5 | 20.55 | 5 | 25.55 |
| 20385 | 1753.5 | 21.65 | 5 | 26.65 |

Note: Conducted Power = $P_T$ + $L_C$

**Average E.I.R.P. for LTE Band 4**

**Channel Bandwidth: 5MHz**

**Modulation: QPSK**

| Channel | Frequency (MHz) | Conducted Power | $G_T$ (dB) | E.I.R.P. (dBm) |
|---|---|---|---|---|
| 19975 | 1712.5 | 22.46 | 5 | 27.46 |
| 20175 | 1732.5 | 21.85 | 5 | 26.85 |
| 20375 | 1752.5 | 22.79 | 5 | 27.79 |

Note: Conducted Power = $P_T$ + $L_C$

**Average E.I.R.P. for LTE Band 4**

**Channel Bandwidth: 5MHz**

**Modulation: 16QAM**

| Channel | Frequency (MHz) | Conducted Power | $G_T$ (dB) | E.I.R.P. (dBm) |
|---|---|---|---|---|
| 19975 | 1712.5 | 21.73 | 5 | 26.73 |
| 20175 | 1732.5 | 20.97 | 5 | 25.97 |
| 20375 | 1752.5 | 22.64 | 5 | 27.64 |

Note: Conducted Power = $P_T$ + $L_C$

**Average E.I.R.P. for LTE Band 4**

**Channel Bandwidth: 10MHz**

**Modulation: QPSK**

| Channel | Frequency (MHz) | Conducted Power | $G_T$ (dB) | E.I.R.P. (dBm) |
|---|---|---|---|---|
| 20000 | 1715 | 22.56 | 5 | 27.56 |
| 20175 | 1732.5 | 21.92 | 5 | 26.92 |
| 20350 | 1750 | 22.59 | 5 | 27.59 |

Note: Conducted Power = $P_T$ + $L_C$

**Average E.I.R.P. for LTE Band 4**

**Channel Bandwidth: 10MHz**

**Modulation: 16QAM**

| Channel | Frequency (MHz) | Conducted Power | $G_T$ (dB) | E.I.R.P. (dBm) |
|---|---|---|---|---|
| 20000 | 1715 | 21.68 | 5 | 26.68 |
| 20175 | 1732.5 | 21.03 | 5 | 26.03 |
| 20350 | 1750 | 21.8 | 5 | 26.8 |

Note: Conducted Power = $P_T$ + $L_C$

**Average E.I.R.P. for LTE Band 4**

**Channel Bandwidth: 15MHz**

**Modulation: QPSK**

| Channel | Frequency (MHz) | Conducted Power | $G_T$ (dB) | E.I.R.P. (dBm) |
|---|---|---|---|---|
| 20025 | 1717.5 | 22.77 | 5 | 27.77 |
| 20175 | 1732.5 | 22.24 | 5 | 27.24 |
| 20325 | 1747.5 | 22.92 | 5 | 27.92 |

Note: Conducted Power = $P_T$ + $L_C$

**Average E.I.R.P. for LTE Band 4**

**Channel Bandwidth: 15MHz**

**Modulation: 16QAM**

| Channel | Frequency (MHz) | Conducted Power | $G_T$ (dB) | E.I.R.P. (dBm) |
|---|---|---|---|---|
| 20025 | 1717.5 | 22.04 | 5 | 27.04 |
| 20175 | 1732.5 | 21.89 | 5 | 26.89 |
| 20325 | 1747.5 | 22.04 | 5 | 27.04 |

Note: Conducted Power = $P_T$ + $L_C$

**Average E.I.R.P. for LTE Band 4**

**Channel Bandwidth: 20MHz**

**Modulation: QPSK**

| Channel | Frequency (MHz) | Conducted Power | $G_T$ (dB) | E.I.R.P. (dBm) |
|---|---|---|---|---|
| 20050 | 1720 | 22.56 | 5 | 27.56 |
| 20175 | 1732.5 | 22.09 | 5 | 27.09 |
| 20300 | 1745 | 22.7 | 5 | 27.7 |

Note: Conducted Power = $P_T$ + $L_C$

**Average E.I.R.P. for LTE Band 4**

**Channel Bandwidth: 20MHz**

**Modulation: 16QAM**

| Channel | Frequency (MHz) | Conducted Power | $G_T$ (dB) | E.I.R.P. (dBm) |
|---|---|---|---|---|
| 20050 | 1720 | 21.98 | 5 | 26.98 |
| 20175 | 1732.5 | 21.71 | 5 | 26.71 |
| 20300 | 1745 | 22.28 | 5 | 27.28 |

Note: Conducted Power = $P_T$ + $L_C$

**Average E.R.P. for LTE Band 13**

**Channel Bandwidth: 5MHz**

**Modulation: QPSK**

| Channel | Frequency (MHz) | Conducted Power | $G_T$ (dB) | E.R.P. (dBm) |
|---|---|---|---|---|
| 23207 | 779.5 | 24.22 | 2.5 | 24.57 |
| 23230 | 782.5 | 24 | 2.5 | 24.35 |
| 23255 | 784.5 | 23.98 | 2.5 | 24.33 |

Note: Conducted Power = $P_T + L_C$

**Average E.R.P. for LTE Band 13**

**Channel Bandwidth: 5MHz**

**Modulation: 16QAM**

| Channel | Frequency (MHz) | Conducted Power | $G_T$ (dB) | E.R.P. (dBm) |
|---|---|---|---|---|
| 23207 | 779.5 | 23.29 | 2.5 | 23.64 |
| 23230 | 782.5 | 23.48 | 2.5 | 23.83 |
| 23255 | 784.5 | 23.36 | 2.5 | 23.71 |

Note: Conducted Power = $P_T + L_C$

**Average E.R.P. for LTE Band 13**

**Channel Bandwidth: 10MHz**

**Modulation: QPSK**

| Channel | Frequency (MHz) | Conducted Power | $G_T$ (dB) | E.R.P. (dBm) |
|---|---|---|---|---|
| 23230 | 782 | 24.46 | 2.5 | 24.81 |

Note: Conducted Power = $P_T + L_C$

**Average E.R.P. for LTE Band 13**

**Channel Bandwidth: 10MHz**

**Modulation: 16QAM**

| Channel | Frequency (MHz) | Conducted Power | $G_T$ (dB) | E.R.P. (dBm) |
|---|---|---|---|---|
| 23230 | 782 | 23.12 | 2.5 | 23.47 |

Note: Conducted Power = $P_T + L_C$

# 4. Frequency Stability

## 4.1 Test conditions

| | | |
|---|---|---|
| Temperature: | -30~60 | ℃ |
| Relative Humidity: | 55 | % |
| Atmospheric Pressure | 1008 | hPa |

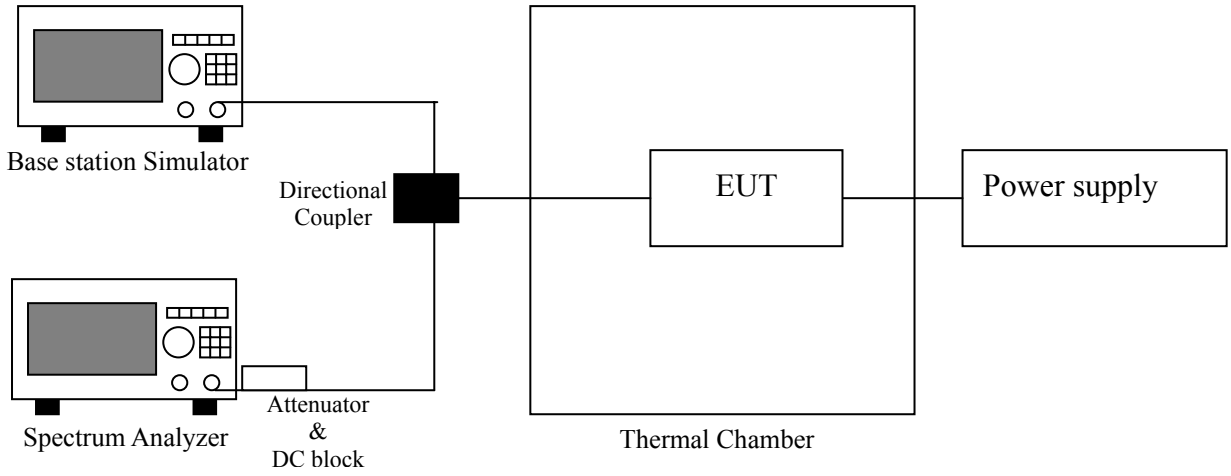
## 4.2 Limit for frequency stability

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

## 4.3 Test procedure

1. The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.
2. Turn the EUT on and couple its output to a spectrum analyzer and Base station Simulator.
3. Turn the EUT off and set the chamber to the highest temperature specified.
4. Allow sufficient time for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency.
5. Repeat step 2 and 3 with the temperature chamber set to the specific temperature. The temperature is decreased by 10 degrees, allowed to stabilize, and then the measurement is repeated. This is repeated until -30℃ is reached.
6. The test chamber was allowed to stabilize at +20degree C for minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record

## 4.4 Test diagram




## 4.5 Test results

### Voltage V.S. Frequency Stability

| LTE Band 4, 20MHz QPSK | | | | | |
|---|---|---|---|---|---|
| Limit | | 1710 | 1755 | Delta (Hz) | Frequency Stability (ppm) |
| Condition | | FLow @-13dBm MHz | FHigh @-13dBm MHz | | |
| Temperature | Voltage | | | | |
| Normal(25℃) | Normal | 1710.84 | 1754.19 | | |
| Extreme(60℃) | | 1710.82 | 1754.21 | 25.78 | 0.015 |
| Extreme(50℃) | | 1710.82 | 1754.21 | -24.4 | -0.014 |
| Extreme(40℃) | | 1710.81 | 1754.19 | 25.29 | 0.015 |
| Extreme(30℃) | | 1710.83 | 1754.20 | -21.14 | -0.012 |
| Extreme(10℃) | | 1710.84 | 1754.21 | 20.31 | 0.012 |
| Extreme(0℃) | | 1710.84 | 1754.20 | 20.43 | 0.012 |
| Extreme(-10℃) | | 1710.84 | 1754.19 | -22.93 | -0.013 |
| Extreme(-20℃) | | 1710.86 | 1754.21 | 23.62 | 0.014 |
| Extreme(-30℃) | | 1710.86 | 1754.20 | -22.20 | -0.013 |
| | | | | | |
| 25℃ | +15% | 1710.83 | 1754.19 | 22.44 | 0.013 |
| | -15% | 1710.83 | 2854.21 | 21.01 | 0.012 |

| LTE Band 4, 20MHz 16QAM | | | | | |
|---|---|---|---|---|---|
| Limit | | 1710 | 1755 | Delta (Hz) | Frequency Stability (ppm) |
| Condition | | FLow @-13dBm MHz | FHigh @-13dBm MHz | | |
| Temperature | Voltage | | | | |
| Normal(25℃) | Normal | 1710.82 | 1754.19 | | |
| Extreme(60℃) | | 1710.82 | 1754.19 | 20.77 | 0.012 |
| Extreme(50℃) | | 1710.82 | 1754.20 | -21.86 | -0.013 |
| Extreme(40℃) | | 1710.82 | 1754.19 | -22.50 | -0.013 |
| Extreme(30℃) | | 1710.82 | 1754.19 | -21.57 | -0.013 |
| Extreme(10℃) | | 1710.84 | 1754.19 | -24.93 | -0.014 |
| Extreme(0℃) | | 1710.83 | 1754.20 | -20.61 | -0.012 |
| Extreme(-10℃) | | 1710.84 | 1754.20 | 24.33 | 0.014 |
| Extreme(-20℃) | | 1710.85 | 1754.20 | 21.01 | 0.012 |
| Extreme(-30℃) | | 1710.85 | 1754.21 | 19.38 | 0.011 |
| | | | | | |
| 25℃ | +15% | 1710.83 | 1754.20 | -17.77 | -0.010 |
| | -15% | 1710.83 | 1754.20 | -18.44 | -0.011 |

| LTE Band 13, 10MHz QPSK | | | | | |
|---|---|---|---|---|---|
| Limit | | 777 | 787 | Delta (Hz) | Frequency Stability (ppm) |
| Condition | | FLow @-13dBm MHz | FHigh @-13dBm MHz | | |
| Temperature | Voltage | | | | |
| Normal(25℃) | Normal | 777.40 | 786.60 | | |
| Extreme(60℃) | | 777.40 | 786.59 | 15.39 | 0.020 |
| Extreme(50℃) | | 777.39 | 786.60 | 17.67 | 0.023 |
| Extreme(40℃) | | 777.40 | 786.61 | 16.06 | 0.021 |
| Extreme(30℃) | | 777.40 | 786.61 | -17.25 | 0.022 |
| Extreme(10℃) | | 777.41 | 786.61 | -14.86 | 0.019 |
| Extreme(0℃) | | 777.41 | 786.60 | 17.15 | 0.022 |
| Extreme(-10℃) | | 777.40 | 786.60 | 16.49 | 0.021 |
| Extreme(-20℃) | | 777.39 | 786.60 | -15.05 | 0.019 |
| Extreme(-30℃) | | 777.40 | 786.60 | 18.71 | 0.024 |
| | | | | | |
| 25℃ | +15% | 777.41 | 786.60 | 16.37 | 0.021 |
| | -15% | 777.39 | 786.61 | 17.14 | 0.022 |

| LTE Band 13, 10MHz 16QAM | | | | | |
|---|---|---|---|---|---|
| Limit | | 1710 | 1755 | Delta (Hz) | Frequency Stability (ppm) |
| Condition | | FLow @-13dBm MHz | FHigh @-13dBm MHz | | |
| Temperature | Voltage | | | | |
| Normal(25℃) | Normal | 777.41 | 786.60 | | |
| Extreme(60℃) | | 777.40 | 786.61 | 17.85 | 0.023 |
| Extreme(50℃) | | 777.41 | 786.60 | 21.97 | 0.028 |
| Extreme(40℃) | | 777.41 | 786.60 | -20.74 | 0.027 |
| Extreme(30℃) | | 777.41 | 786.59 | 17.12 | 0.022 |
| Extreme(10℃) | | 777.41 | 786.59 | -14.91 | 0.019 |
| Extreme(0℃) | | 777.41 | 786.61 | 18.37 | 0.023 |
| Extreme(-10℃) | | 777.41 | 786.60 | 18.11 | 0.023 |
| Extreme(-20℃) | | 777.41 | 786.59 | 16.79 | 0.021 |
| Extreme(-30℃) | | 777.40 | 786.60 | -15.61 | 0.020 |
| | | | | | |
| 25℃ | +15% | 777.41 | 786.60 | 17.55 | 0.022 |
| | -15% | 777.41 | 786.59 | 17.84 | 0.023 |

# 5. Occupied Bandwidth Measurement

## 5.1 Test conditions

| | | |
|---|---|---|
| Temperature: | 20 | ℃ |
| Relative Humidity: | 55 | % |
| Atmospheric Pressure | 1008 | hPa |

## 5.2 Limit for minimum occupied bandwidth

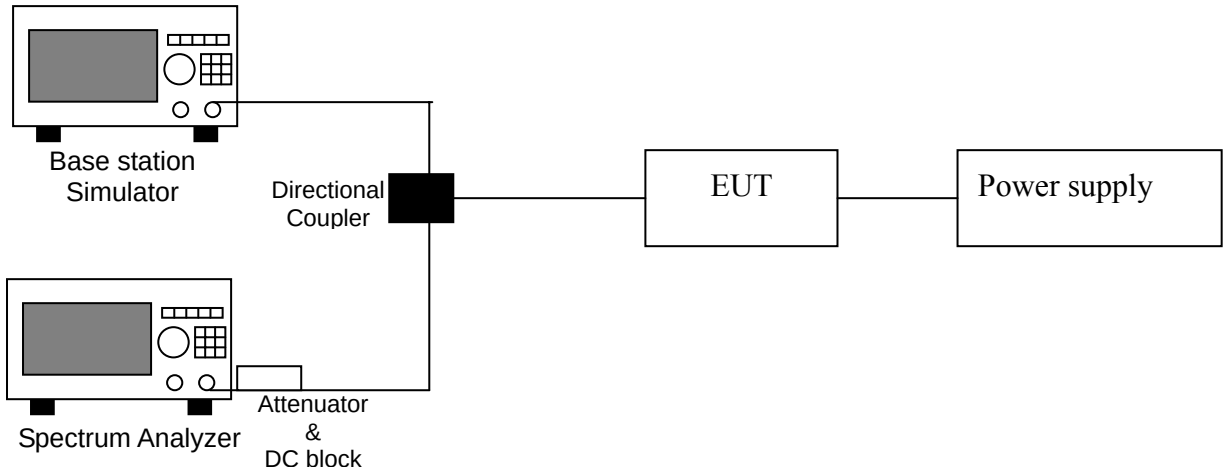
The occupied bandwidth (OBW), that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission,

## 5.4 Test procedure

1. The conducted occupied bandwidth test used the directional coupler via EUT RF power connector between Base station Simulator and spectrum analyzer.

2. Use OBW measurement function of Spectrum analyzer to measure 99 % Occupied bandwidth.

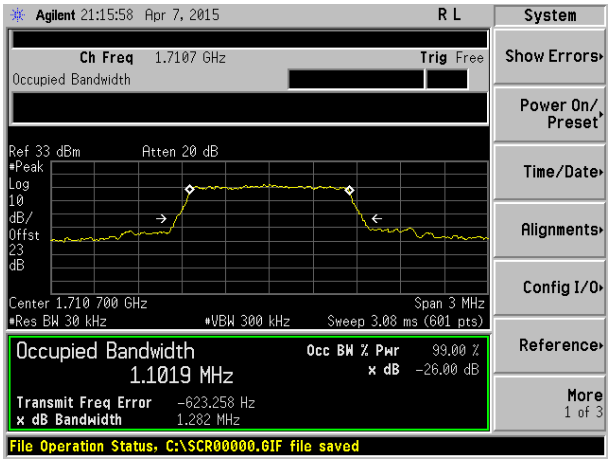
## 5.5 Test diagram



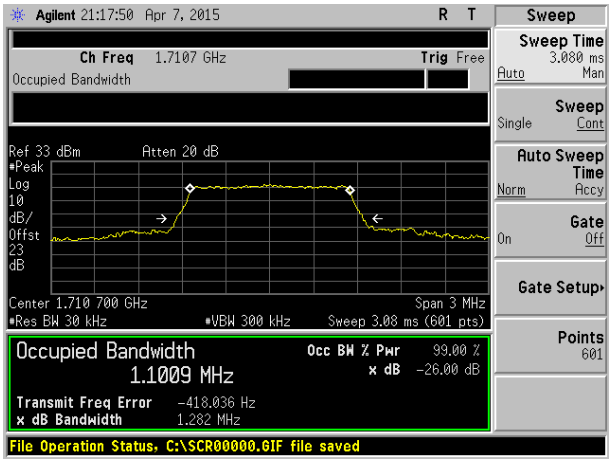

## 5.6 Test results

| LTE Band 4 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Band Width | Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | | Band Width | Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | |
| | | | QPSK | 16QAM | | | | QPSK | 16QAM |
| 1.4MHz | 19957 | 1710.7 | 1.1019 | 1.1009 | 10MHz | 20000 | 1715 | 8.9340 | 8.9563 |
| | 20175 | 1732.5 | 1.0998 | 1.1038 | | 20175 | 1732.5 | 8.9487 | 8.9632 |
| | 20393 | 1754.3 | 1.1055 | 1.1058 | | 20350 | 1750 | 8.9539 | 8.9339 |
| 3MHz | 19965 | 1711.5 | 2.6800 | 2.6868 | 15MHz | 20025 | 1717.5 | 13.3840 | 13.3625 |
| | 20175 | 1732.5 | 2.6864 | 2.6798 | | 20175 | 1732.5 | 13.4460 | 13.4780 |
| | 20385 | 1753.5 | 2.6817 | 2.6832 | | 20325 | 1747.5 | 13.4097 | 13.4093 |
| 5MHz | 19975 | 1712.5 | 4.4717 | 4.4630 | 20MHz | 20050 | 1720 | 17.8509 | 17.8384 |
| | 20175 | 1732.5 | 4.4725 | 4.4758 | | 20175 | 1732.5 | 17.9253 | 17.9746 |
| | 20375 | 1752.5 | 4.4537 | 4.4648 | | 20300 | 1745 | 17.8456 | 17.8417 |

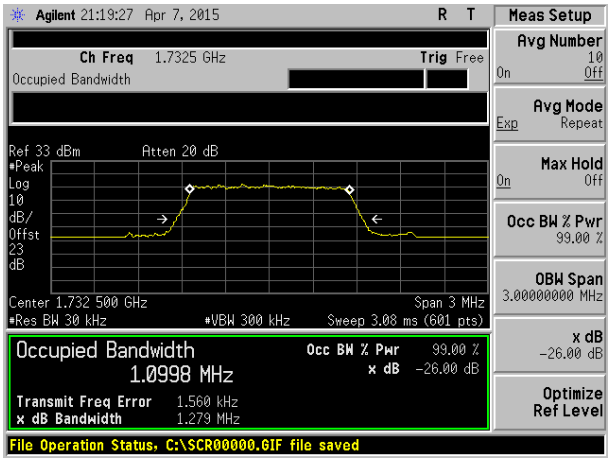
## 1.4 MHz / Low channel / QPSK



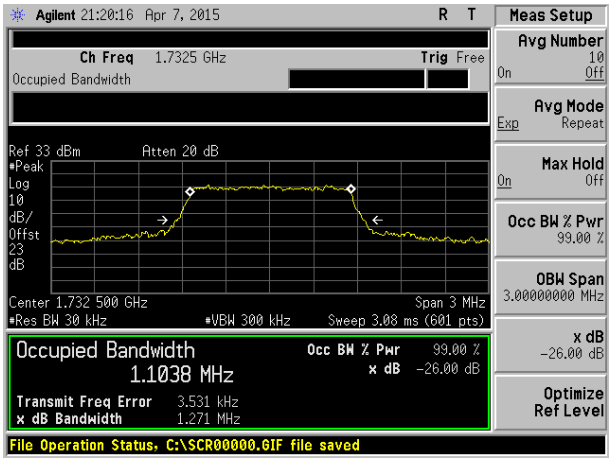

## 1.4 MHz / Low channel / 16QAM



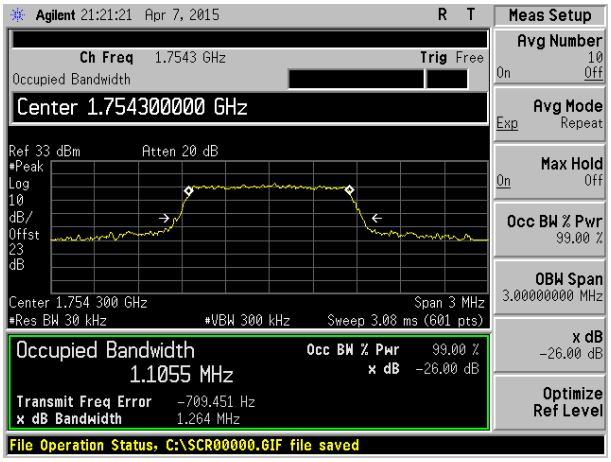

## 1.4 MHz / Middle channel / QPSK



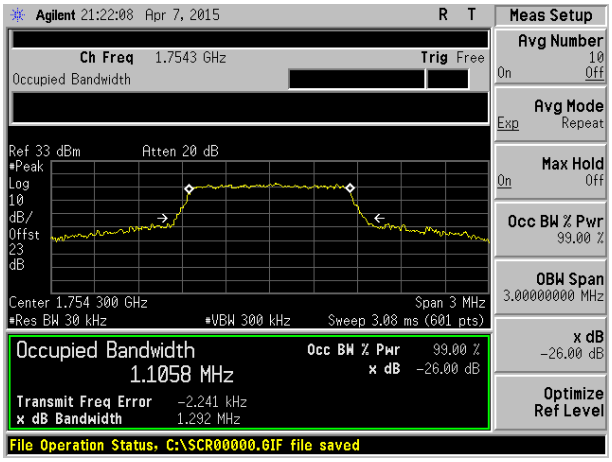

## 1.4 MHz / Middle channel / 16QAM



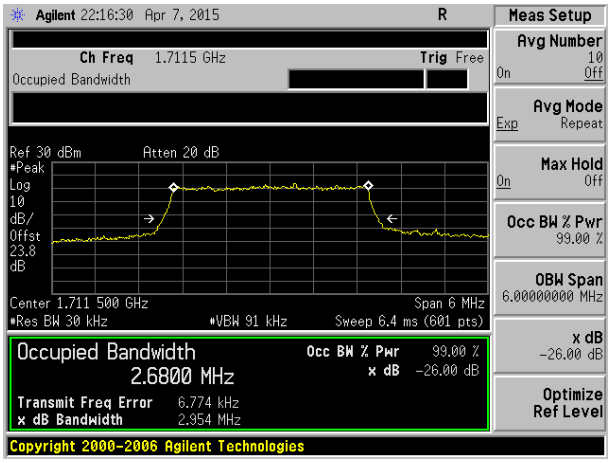

## 1.4 MHz / High channel / QPSK



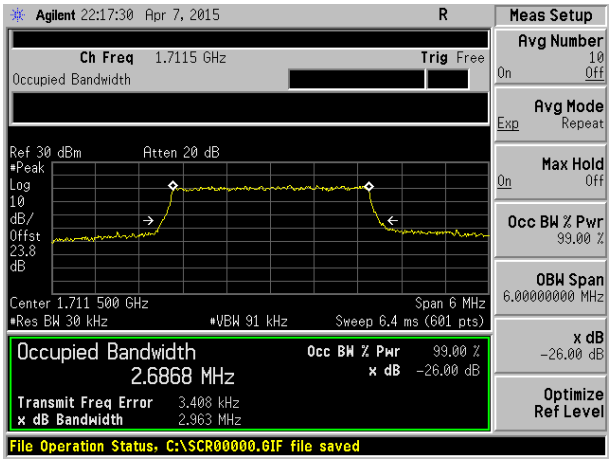

## 1.4 MHz / High channel / 16QAM



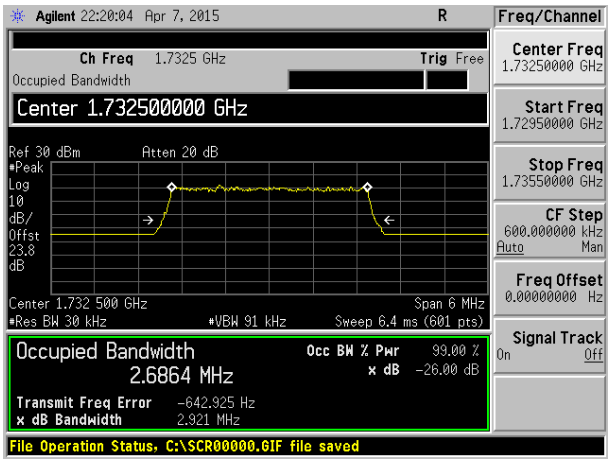
## 3 MHz / Low channel / QPSK



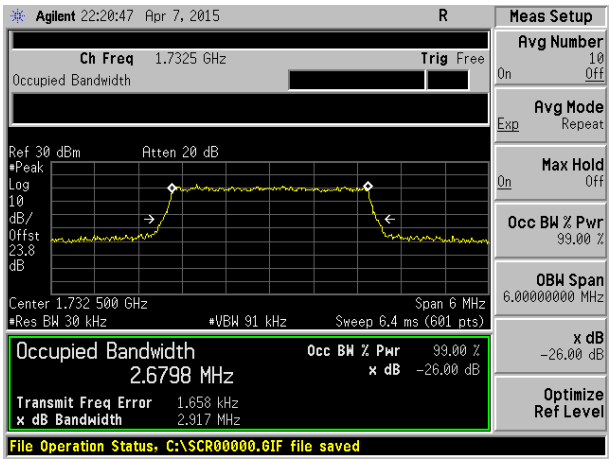

## 3 MHz / Low channel / 16QAM



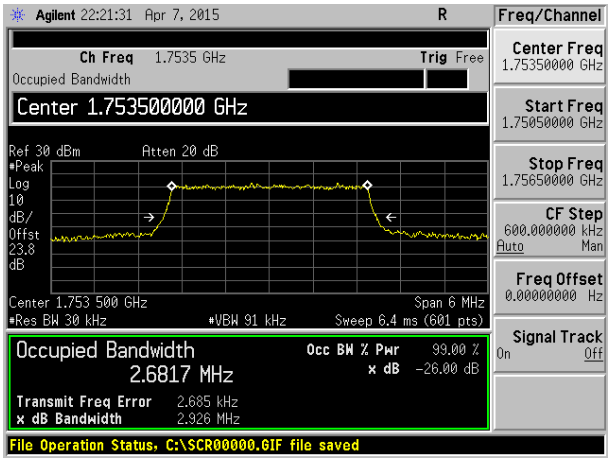

## 3 MHz / Middle channel / QPSK



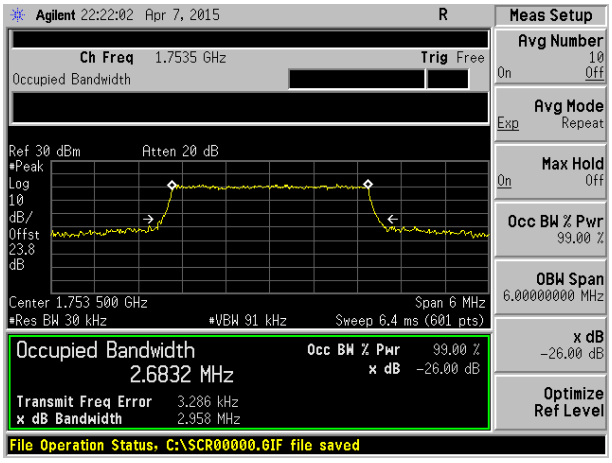

## 3 MHz / Middle channel / 16QAM



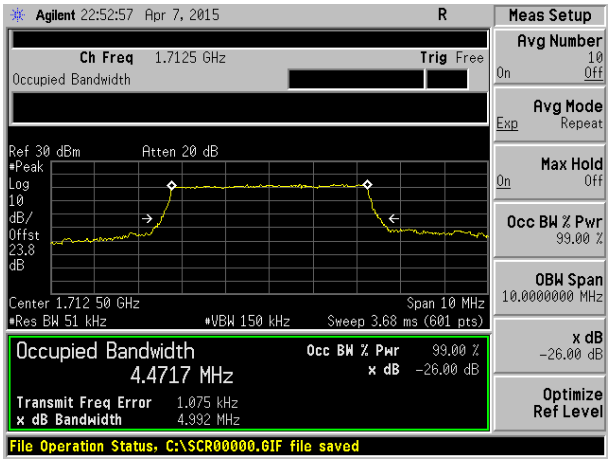

## 3 MHz / High channel / QPSK



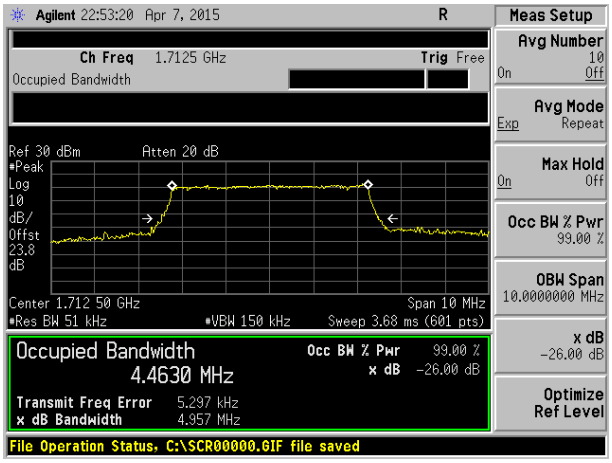

## 3 MHz / High channel / 16QAM



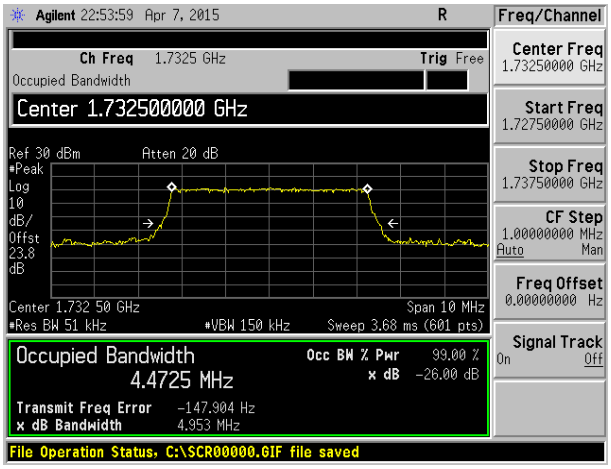
## 5 MHz / Low channel / QPSK



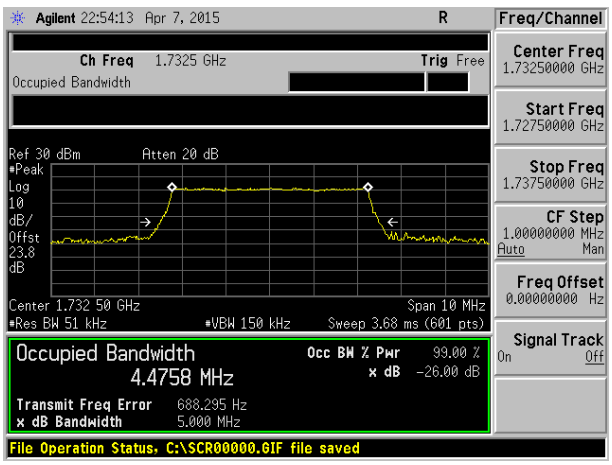

## 5 MHz / Low channel / 16QAM



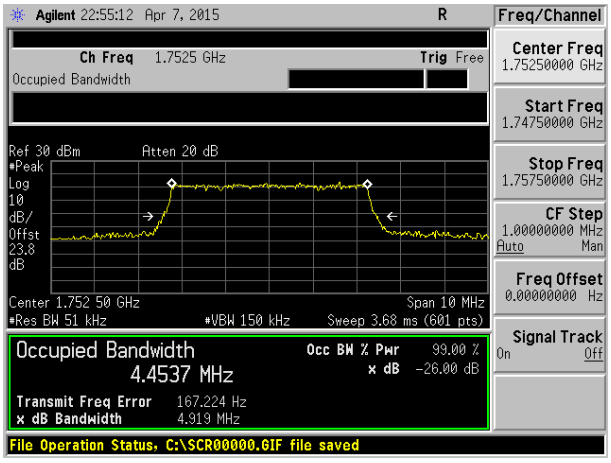

## 5 MHz / Middle channel / QPSK



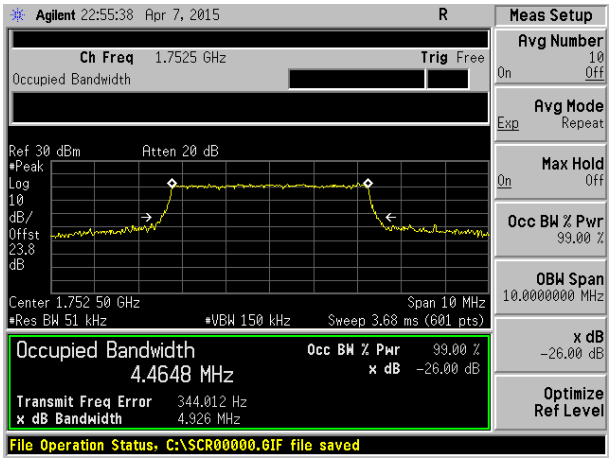

## 5 MHz / Middle channel / 16QAM



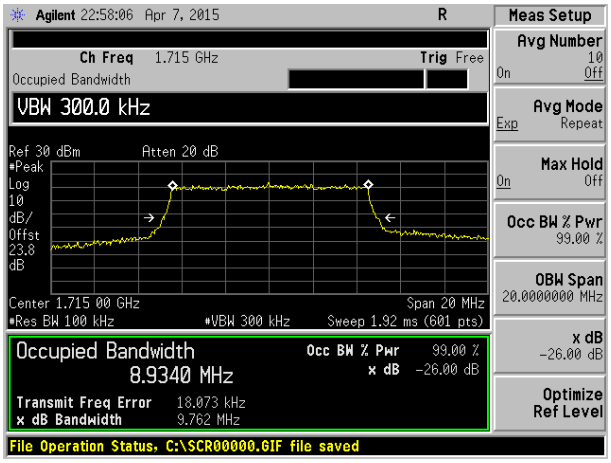

## 5 MHz / High channel / QPSK



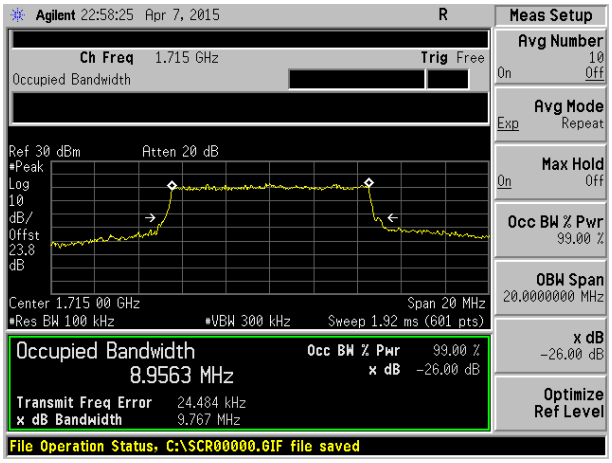

## 5 MHz / High channel / 16QAM



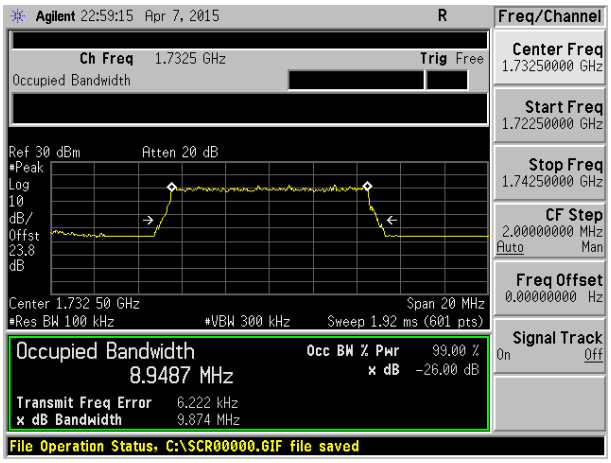
## 10 MHz / Low channel / QPSK



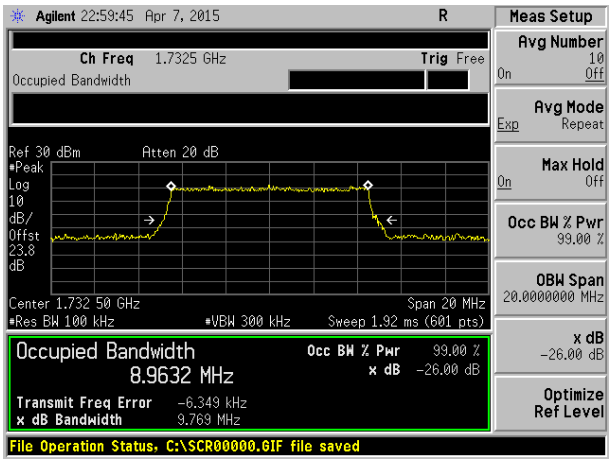

## 10 MHz / Low channel / 16QAM



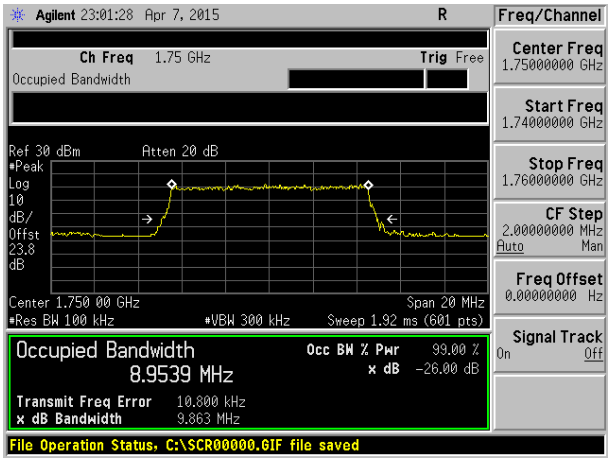

## 10 MHz / Middle channel / QPSK



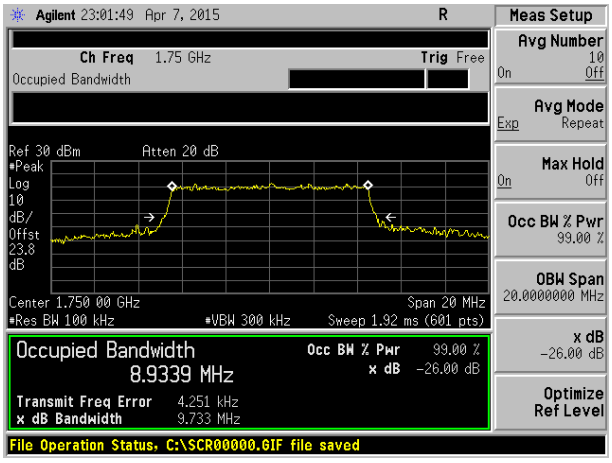

## 10 MHz / Middle channel / 16QAM



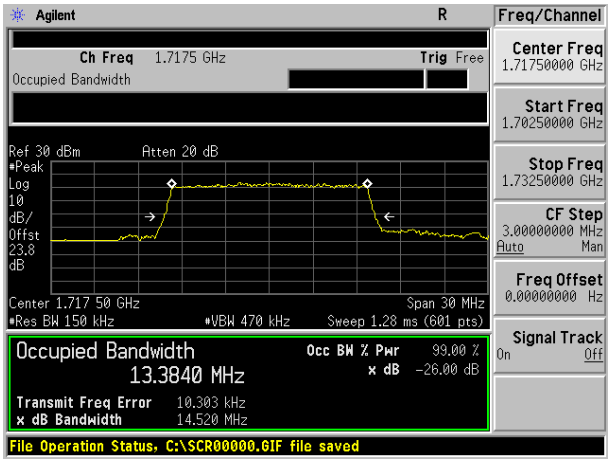

## 10 MHz / High channel / QPSK



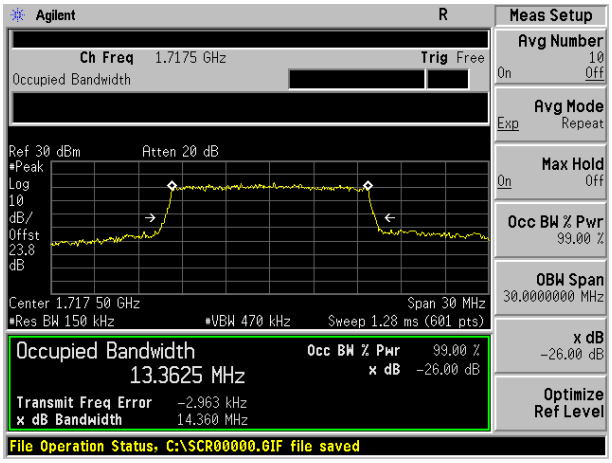

## 10 MHz / High channel / 16QAM



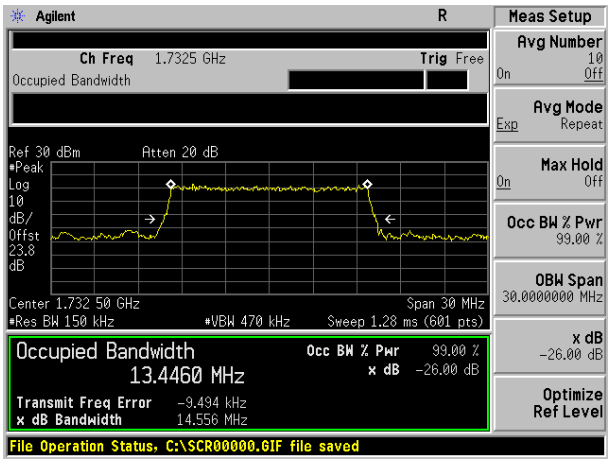
## 15 MHz / Low channel / QPSK



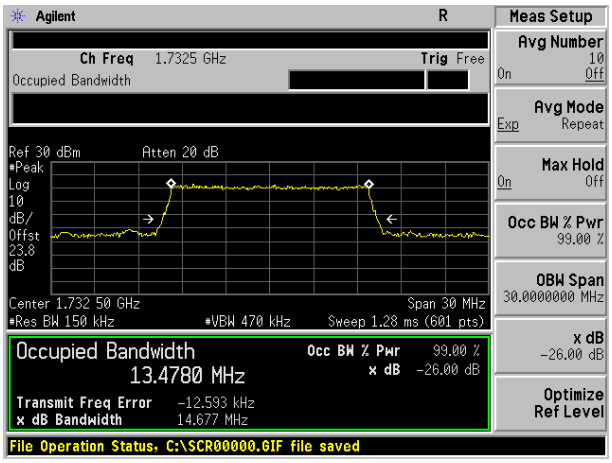

## 15 MHz / Low channel / 16QAM



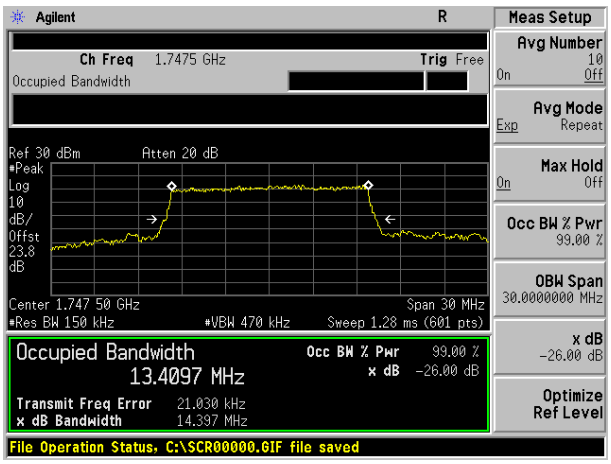

## 15 MHz / Middle channel / QPSK



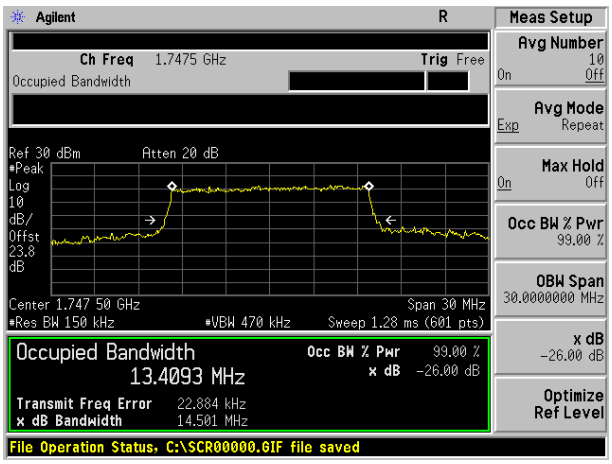

## 15 MHz / Middle channel / 16QAM



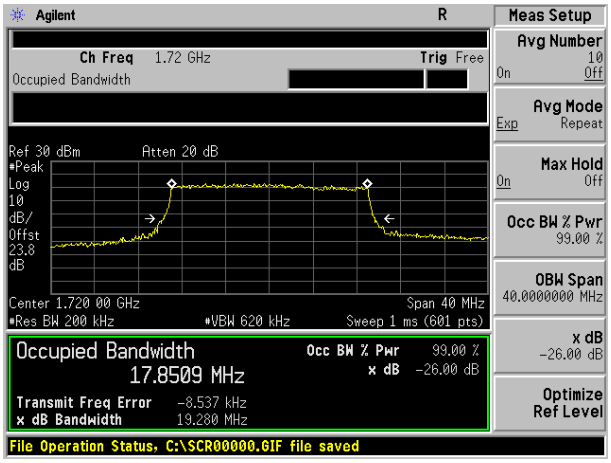

## 15 MHz / High channel / QPSK



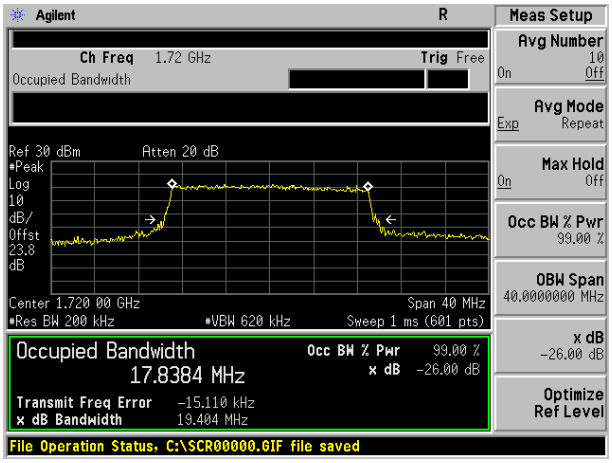

## 15 MHz / High channel / 16QAM



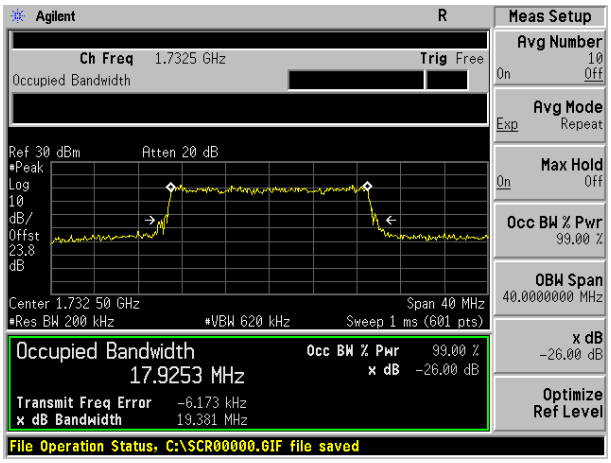
## 20 MHz / Low channel / QPSK



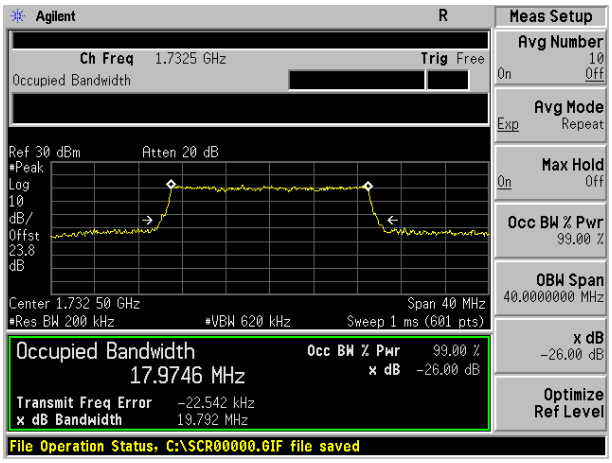

## 20 MHz / Low channel / 16QAM



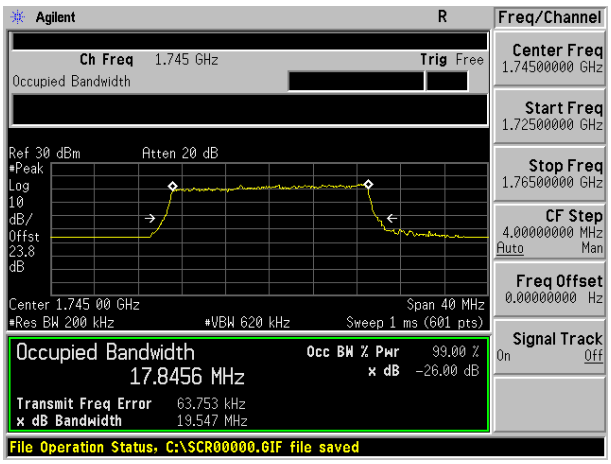

## 20 MHz / Middle channel / QPSK



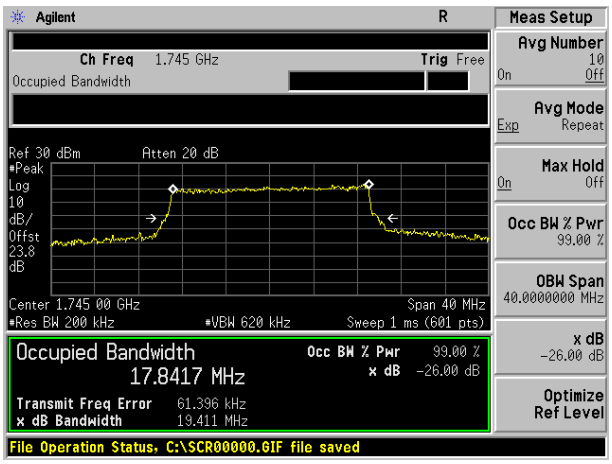

## 20 MHz / Middle channel / 16QAM




## 20 MHz / High channel / QPSK

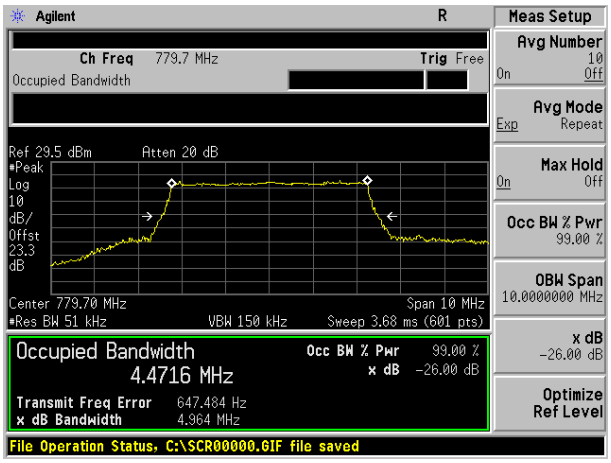



## 20 MHz / High channel / 16QAM

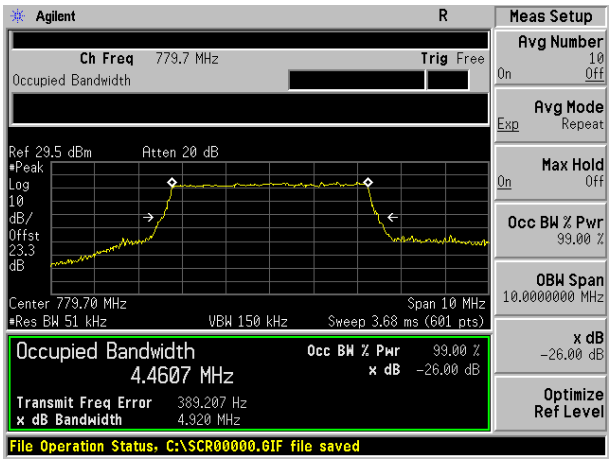


| LTE Band 13 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Band Width | Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | | Band Width | Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | |
| | | | QPSK | 16QAM | | | | QPSK | 16QAM |
| 5MHz | 23207 | 779.7 | 4.4716 | 4.4607 | 10MHz | 23230 | 782 | 8.9545 | 8.9268 |
| | 23230 | 782 | 4.4589 | 4.4780 | | | | | |
| | 23255 | 784.5 | 4.4665 | 4.4721 | | | | | |

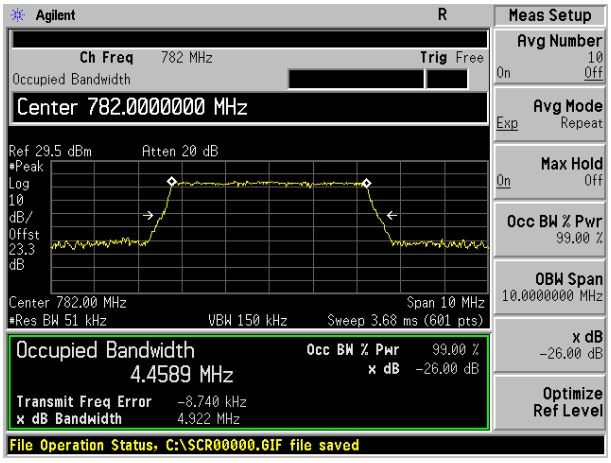
**5 MHz / Low channel / QPSK**



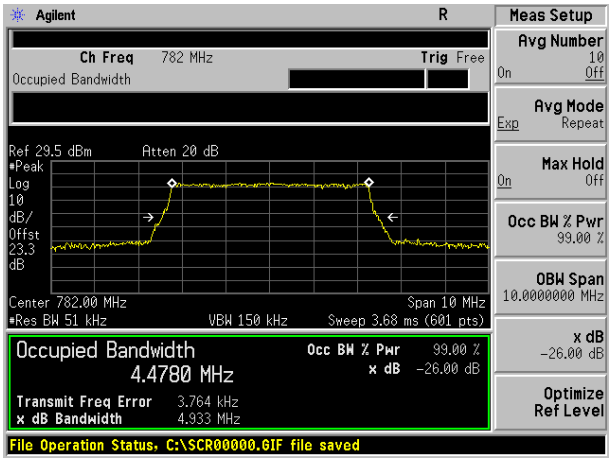

**5 MHz / Low channel / 16QAM**

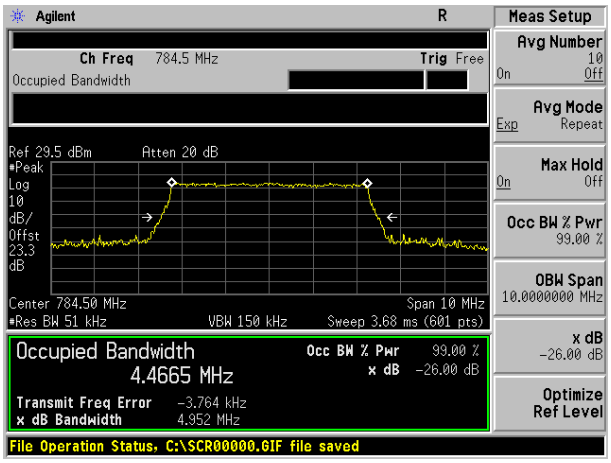
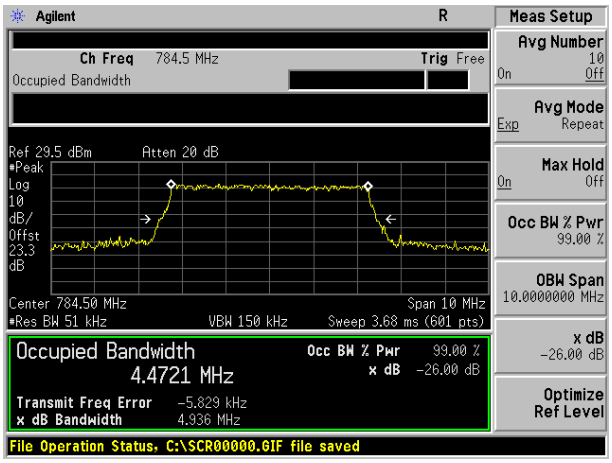


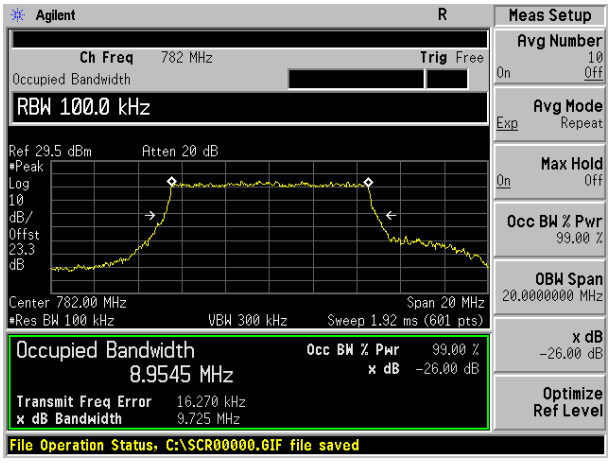
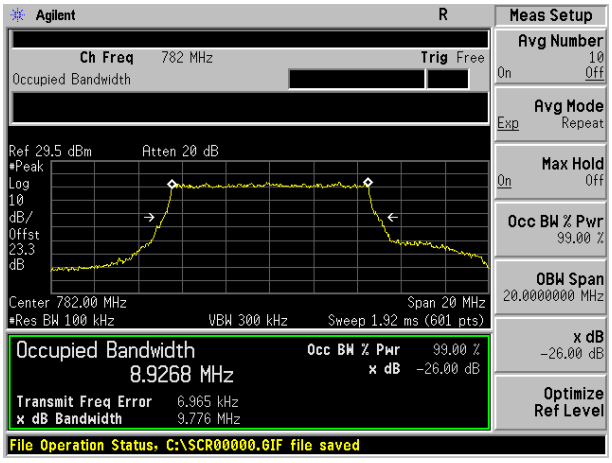

**5 MHz / Middle channel / QPSK**




**5 MHz / Middle channel / 16QAM**



| 5 MHz / High channel / QPSK | 5 MHz / High channel / 16QAM |
|---|---|
|  |  |

| 10 MHz / QPSK | 10 MHz / 16QAM |
|---|---|
|  |  |

# 6. Peak Excursion to Average Ratio

## 6.1 Test conditions

| | | |
|---|---|---|
| Temperature: | 20 | ℃ |
| Relative Humidity: | 55 | % |
| Atmospheric Pressure | 1008 | hPa |

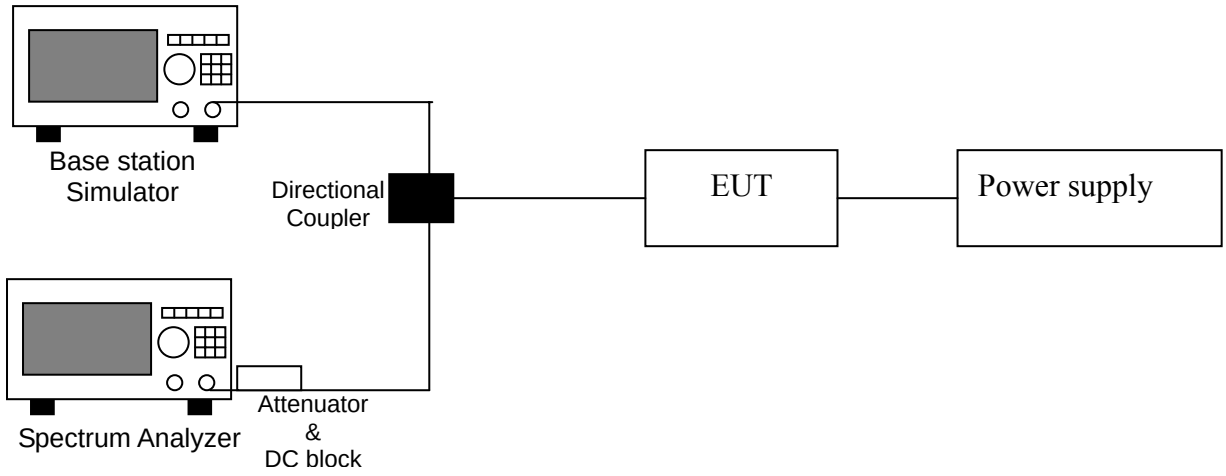
## 6.2 Limit for peak excursion to average ratio

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

## 6.3 Test procedure

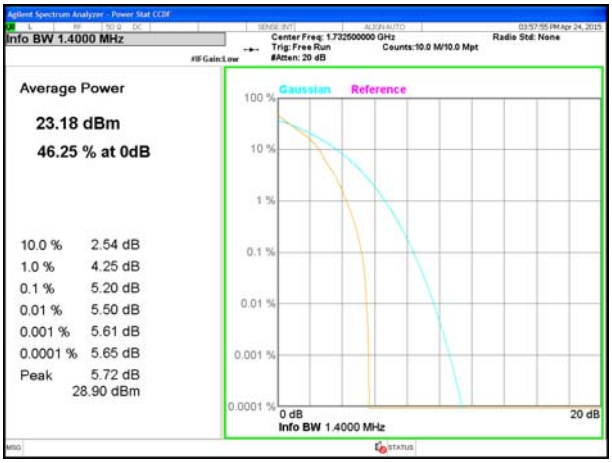
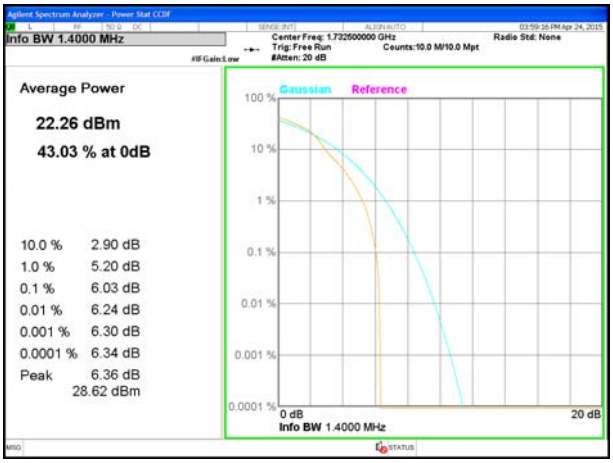
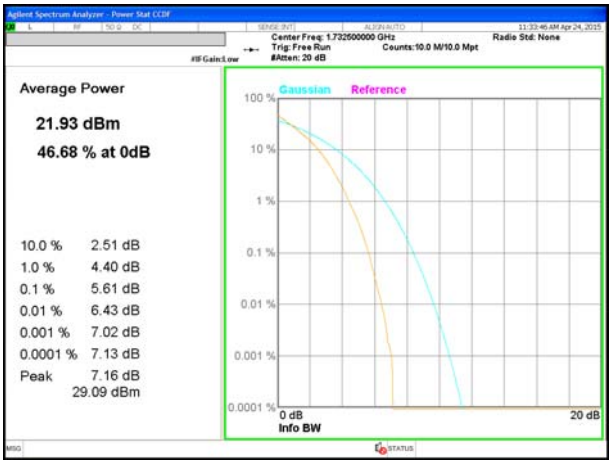
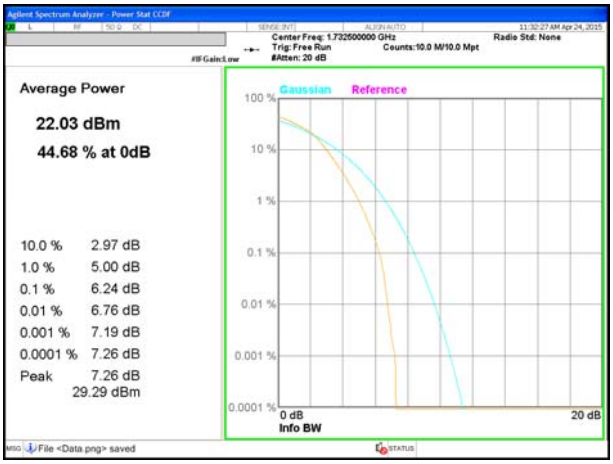
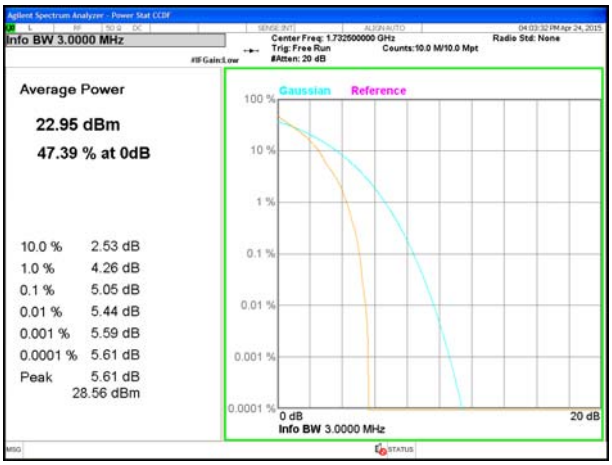
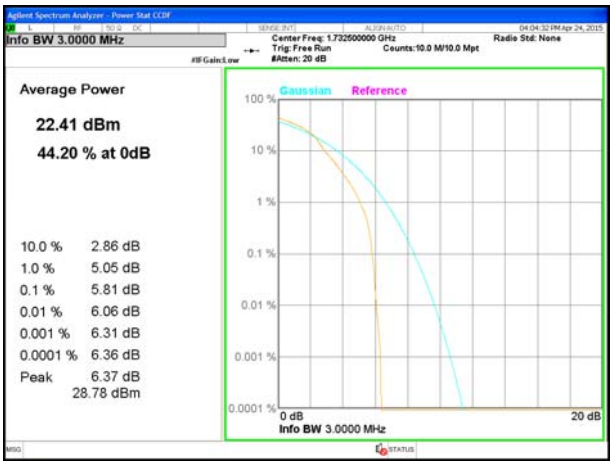
1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1%.

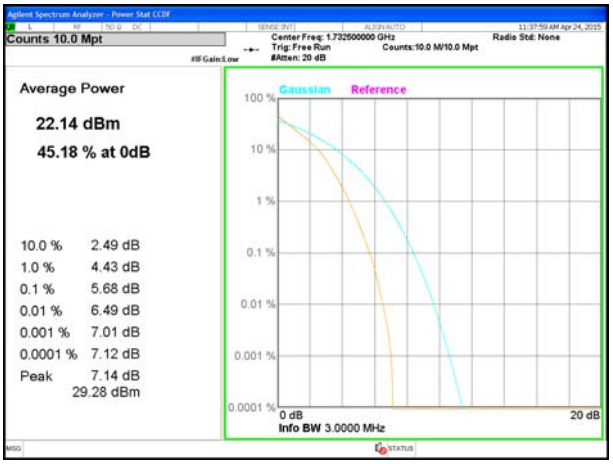
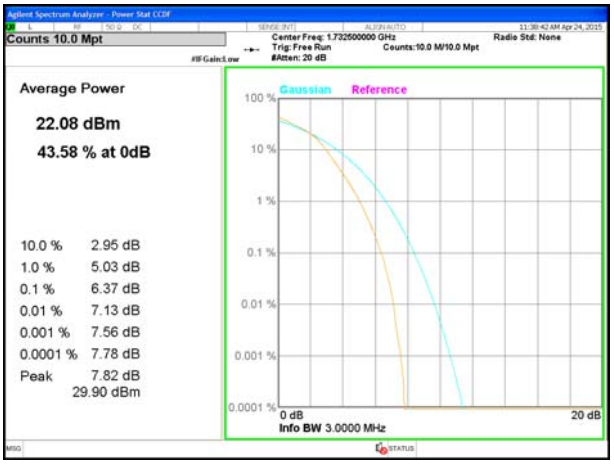
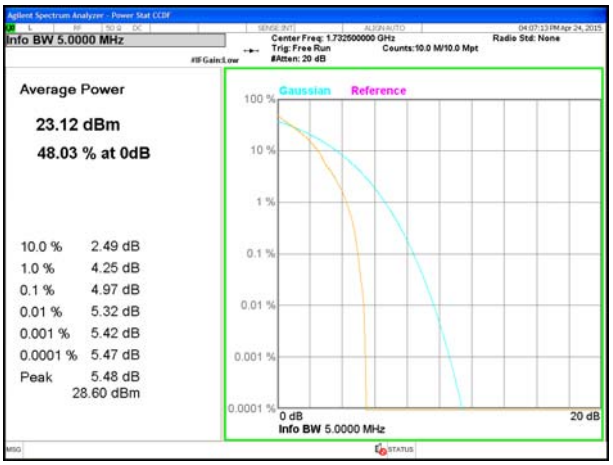
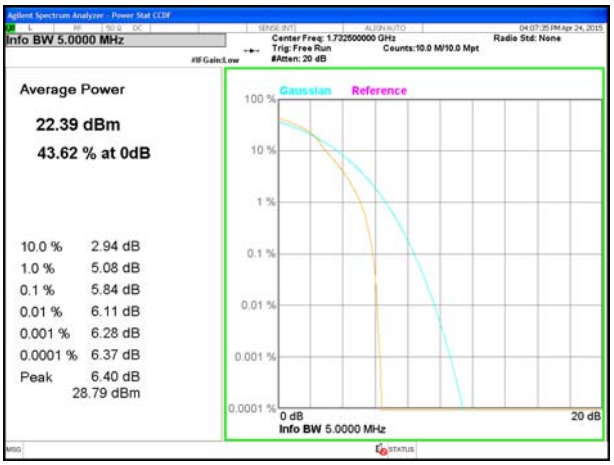
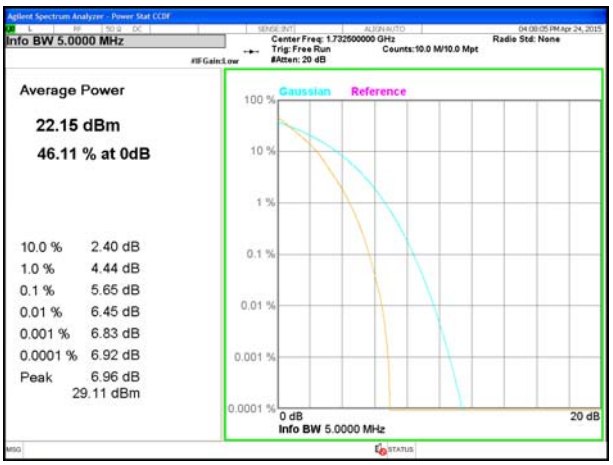
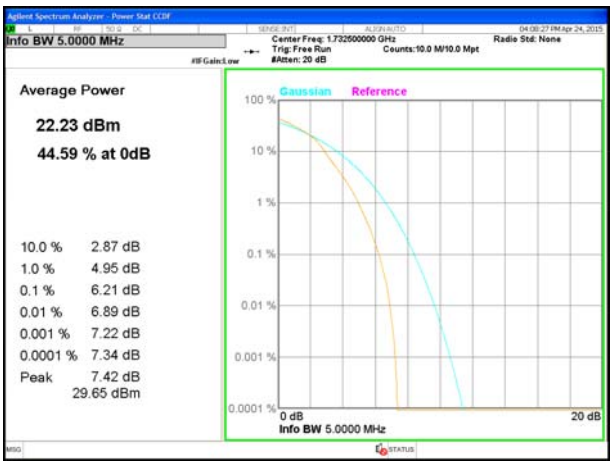
## 6.4 Test diagram

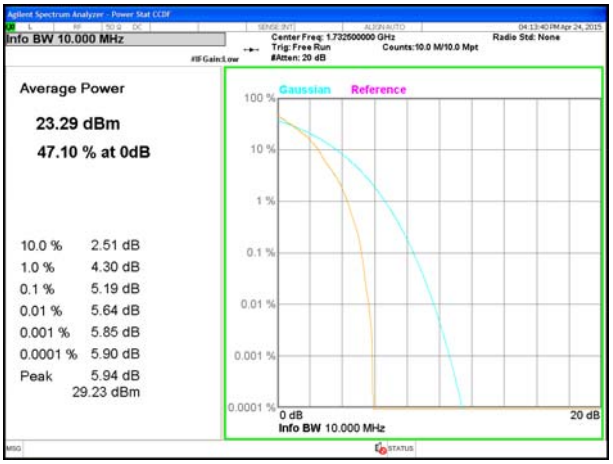
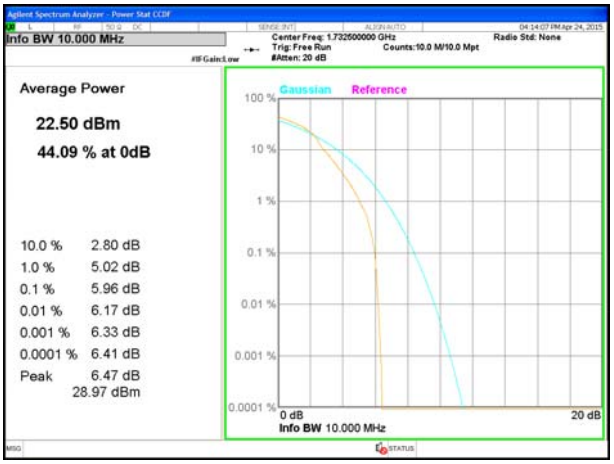
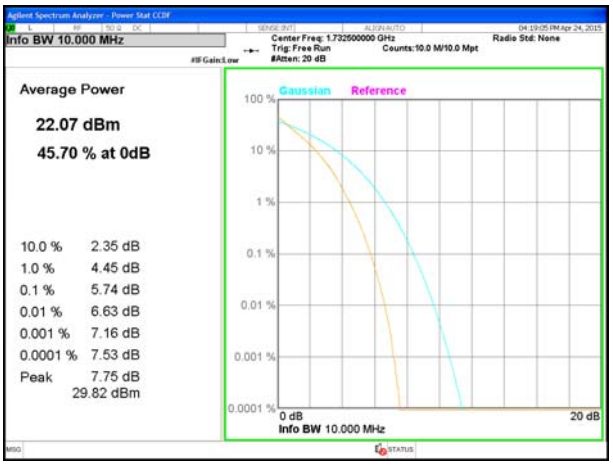
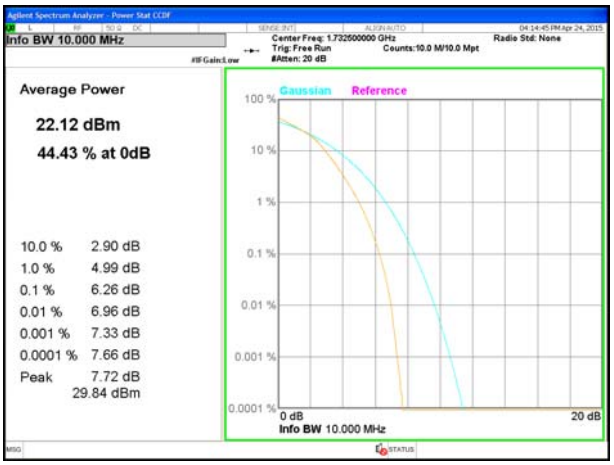
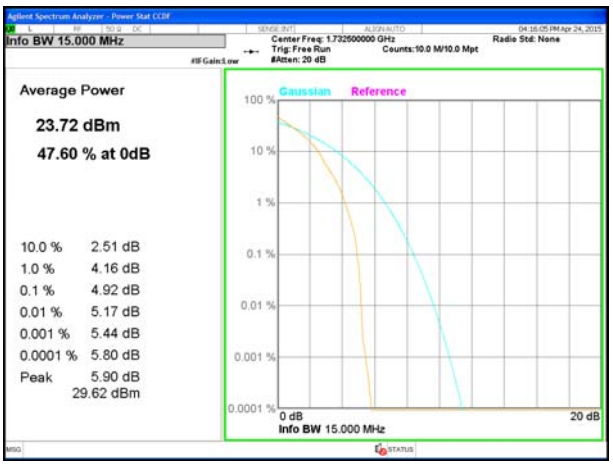
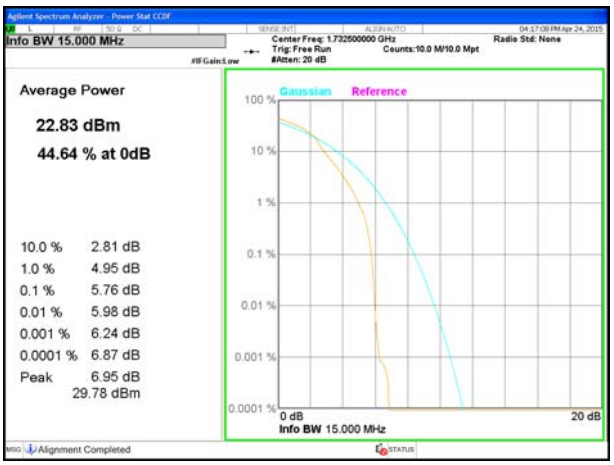


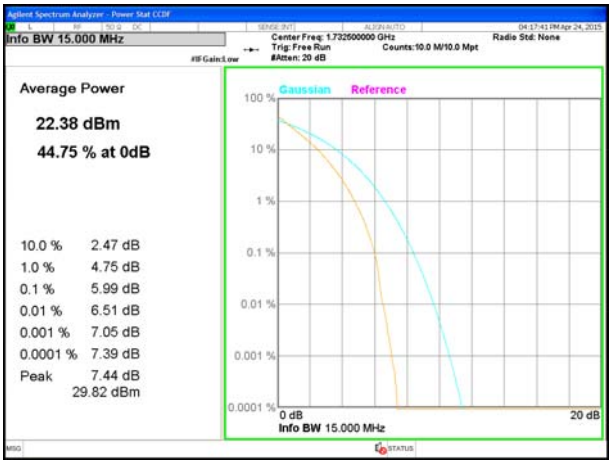
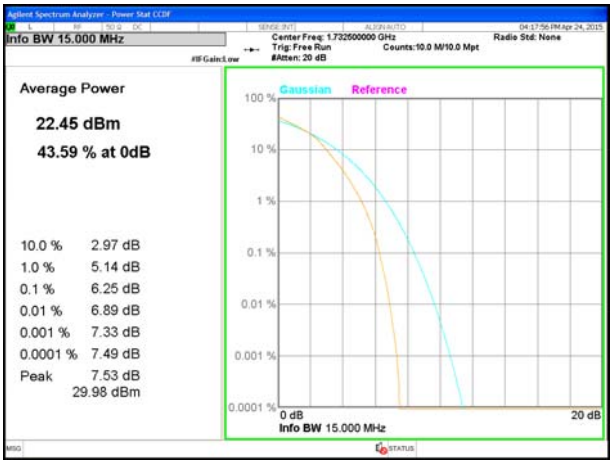
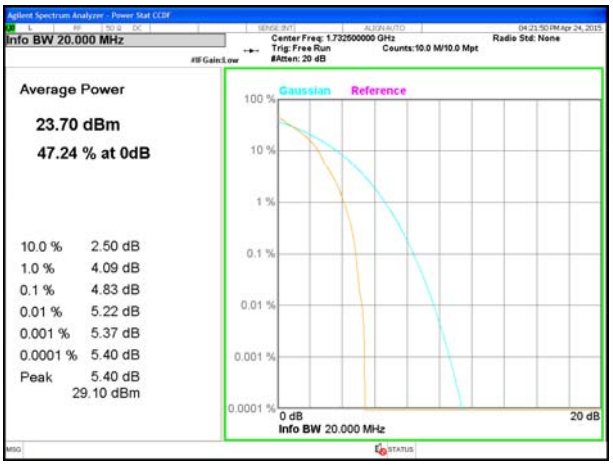
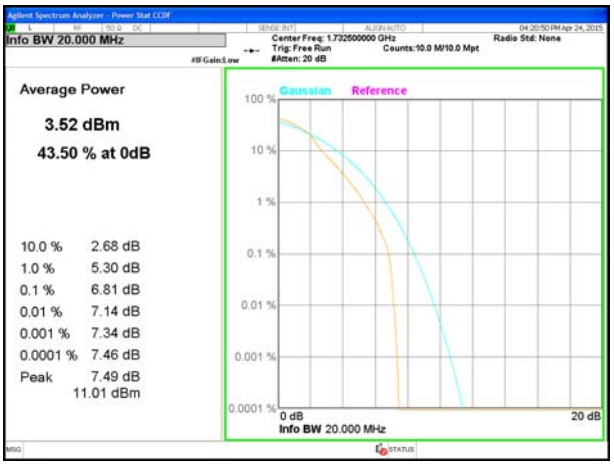
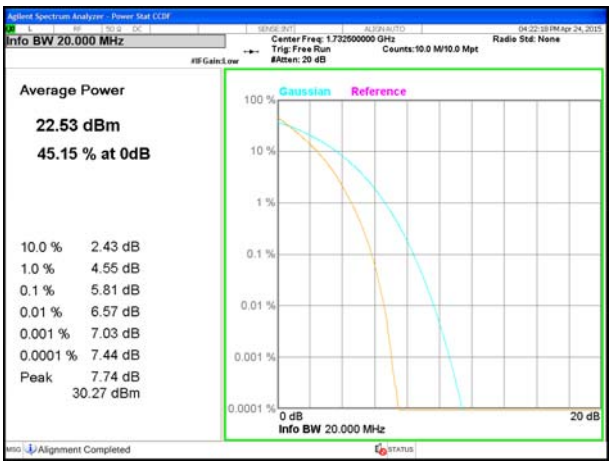
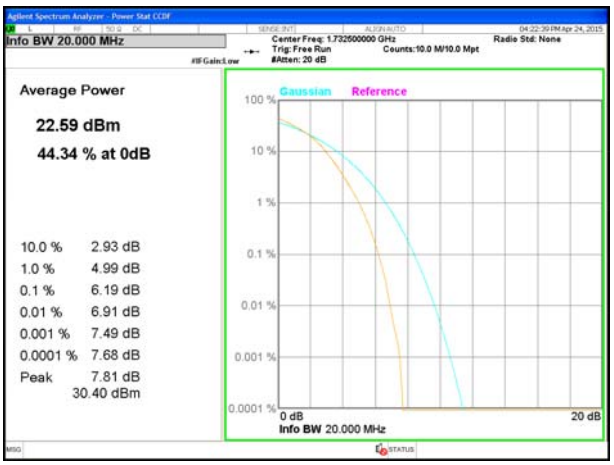

## 6.5 Test results

| Band 4 | | | | | | | |
|---|---|---|---|---|---|---|---|
| BW | Channel | Frequency (MHz) | Peak to Average Ratio (dB) | | | | Pass/Fail |
| | | | QPSK | | 16QAM | | |
| | | | 1 RB | Full RB | 1 RB | Full RB | |
| 1.4MHz | 20175 | 1732.5 | 5.72 | 7.16 | 6.36 | 7.26 | Pass |
| 3 MHz | 20175 | 1732.5 | 5.61 | 7.14 | 6.37 | 7.82 | Pass |
| 5 MHz | 20175 | 1732.5 | 5.48 | 6.96 | 6.40 | 7.42 | Pass |
| 10 MHz | 20175 | 1732.5 | 5.94 | 7.75 | 6.47 | 7.72 | Pass |
| 15 MHz | 20175 | 1732.5 | 5.90 | 7.44 | 6.95 | 7.53 | Pass |
| 20MHz | 20175 | 1732.5 | 5.40 | 7.74 | 7.49 | 7.81 | Pass |

| 1.4 MHz / 1 RB / QPSK | 1.4 MHz / 1 RB / 16QAM |
|---|---|
|  |  |
| **1.4 MHz / Full RB / QPSK** | **1.4 MHz / Full RB / 16QAM** |
|  |  |
| **3 MHz / 1 RB / QPSK** | **3 MHz / 1 RB / 16QAM** |
|  |  |

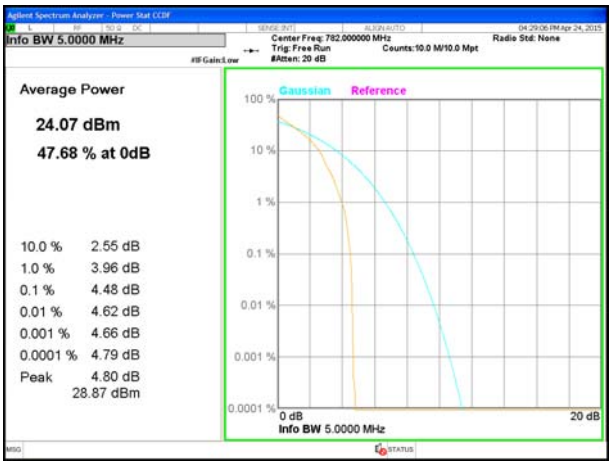
| 3 MHz / Full RB / QPSK | 3 MHz / Full RB / 16QAM |
|---|---|
|  |  |
| **5 MHz / 1 RB / QPSK** | **5 MHz / 1 RB / 16QAM** |
|  |  |
| **5 MHz / Full RB / QPSK** | **5 MHz / Full RB / 16QAM** |
|  |  |

| 10 MHz / 1 RB / QPSK | 10 MHz / 1 RB / 16QAM |
|---|---|
|  |  |
| **10 MHz / Full RB / QPSK** | **10 MHz / Full RB / 16QAM** |
|  |  |
| **15 MHz / 1 RB / QPSK** | **15 MHz / 1 RB / 16QAM** |
|  |  |

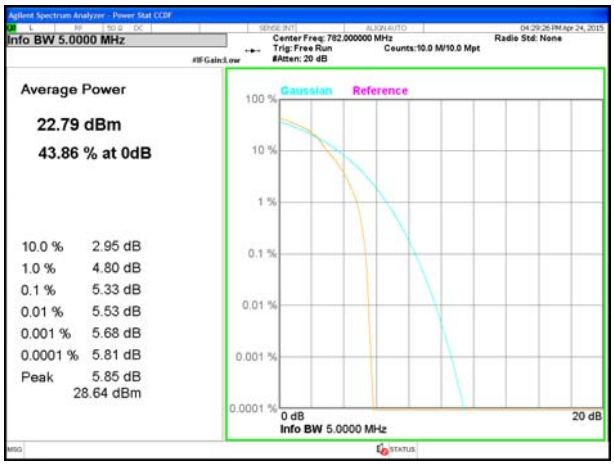
| 15 MHz / Full RB / QPSK | 15 MHz / Full RB / 16QAM |
|---|---|
|  |  |
| **20 MHz / 1 RB / QPSK** | **20 MHz / 1 RB / 16QAM** |
|  |  |
| **20 MHz / Full RB / QPSK** | **20 MHz / Full RB / 16QAM** |
|  |  |

| Band 13 | | | | | | | |
|---|---|---|---|---|---|---|---|
| BW | Channel | Frequency (MHz) | Peak to Average Ratio (dB) | | | | Pass/Fail |
| | | | QPSK | | 16QAM | | |
| | | | 1 RB | Full RB | 1 RB | Full RB | |
| 5 MHz | 23230 | 782 | 4.80 | 6.81 | 5.85 | 7.65 | Pass |
| 10 MHz | 23230 | 782 | 5.04 | 6.43 | 5.77 | 7.32 | Pass |

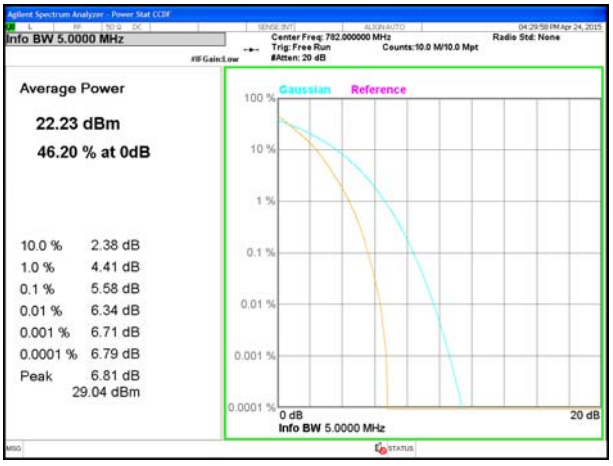
**5 MHz / 1 RB / QPSK**



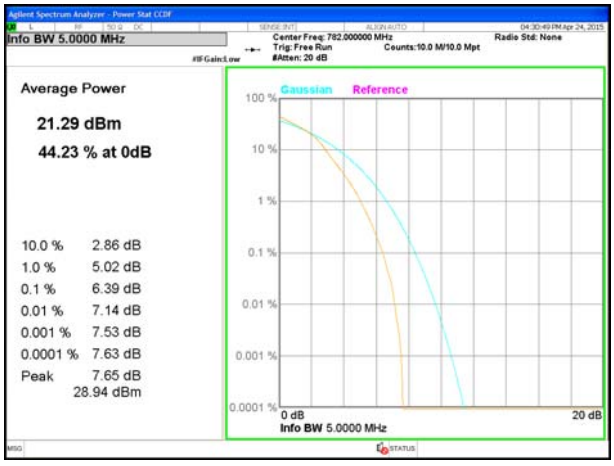

**5 MHz / 1 RB / 16QAM**

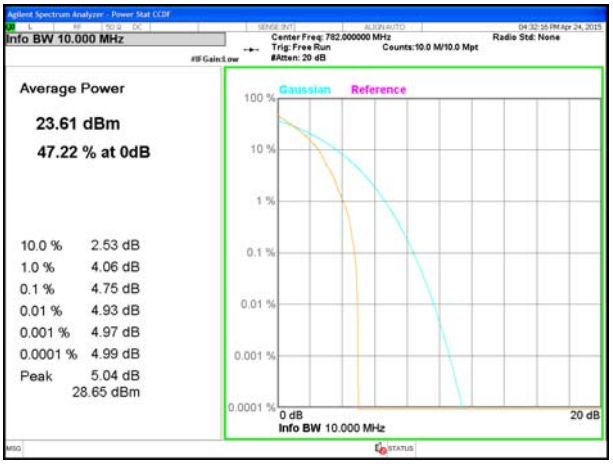
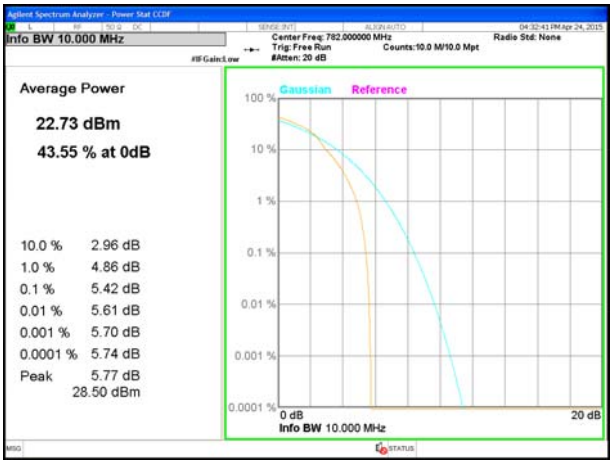
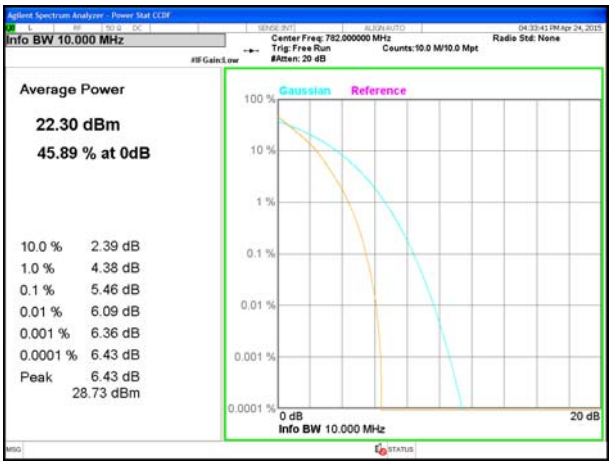
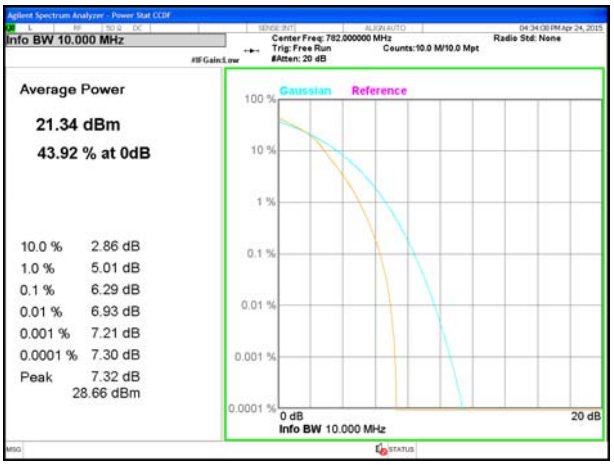



**5 MHz / Full RB / QPSK**




**5 MHz / Full RB / 16QAM**



| 10 MHz / 1 RB / QPSK | 10 MHz / 1 RB / 16QAM |
|---|---|
|  |  |
| **10 MHz / Full RB / QPSK** | **10 MHz / Full RB / 16QAM** |
|  |  |

# 7. Emission on the Band Edge

## 7.1 Test conditions

| | | |
|---|---|---|
| Temperature: | 20 | ℃ |
| Relative Humidity: | 55 | % |
| Atmospheric Pressure | 1008 | hPa |

## 7.2 Limit for emission on the band edge

For operations in the 776 - 788 MHz band, the FCC limit is 43 + 10log10(P[Watts]) dB below the transmitter power P(Watts) in a 100 kHz bandwidth. However, in the 100 kHz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

For operations in the 763 - 775 and 793 - 805 MHz band, the FCC limit is 65 + 10log10(P[Watts]) dB below the transmitter power P(Watts) in a 6.25 kHz bandwidth. However, in the 100 kHz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

For operations in the 1710 – 1755 MHz band, the limit is 43 + 10log10(P[Watts]) dB below the transmitter power P(Watts) in a 1 MHz bandwidth. However, in the 1MHz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

### 7.3 Test procedure

1. The EUT was set up for the maximum peak power with LTE link data modulation.
   The power was measured with Spectrum Analyzer. All measurements were done at 2 channels (lowest and highest operating channel for each band.).

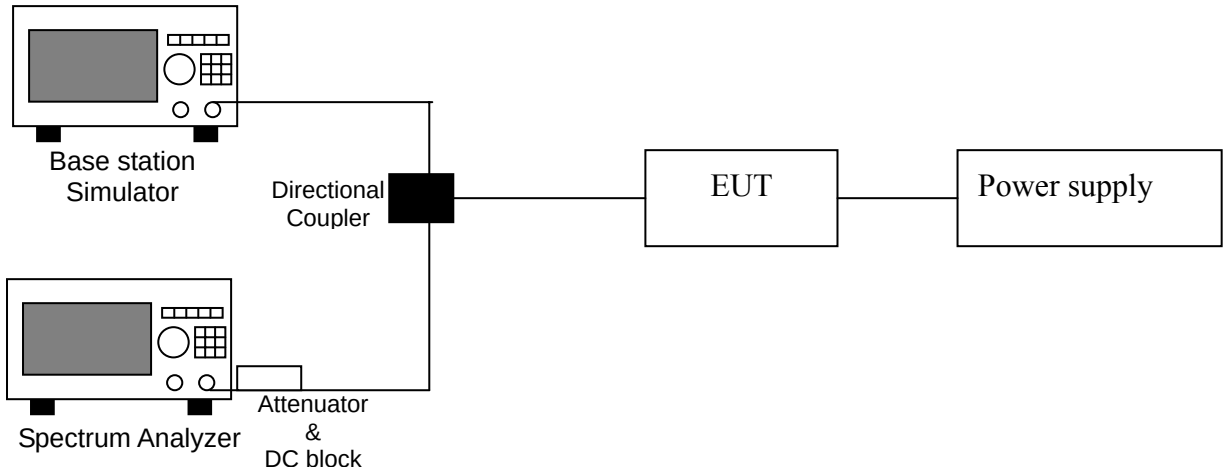
2. The band edge measurement used the directional coupler via EUT RF power connector between Base station Simulator and spectrum analyzer.

3. Set the spectrum analyzer span to include the block edge frequency.

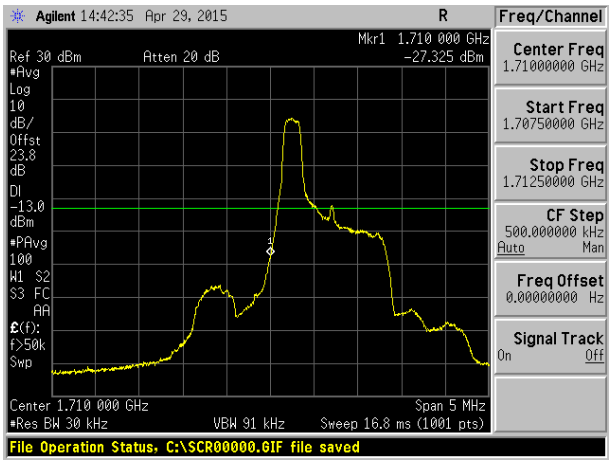
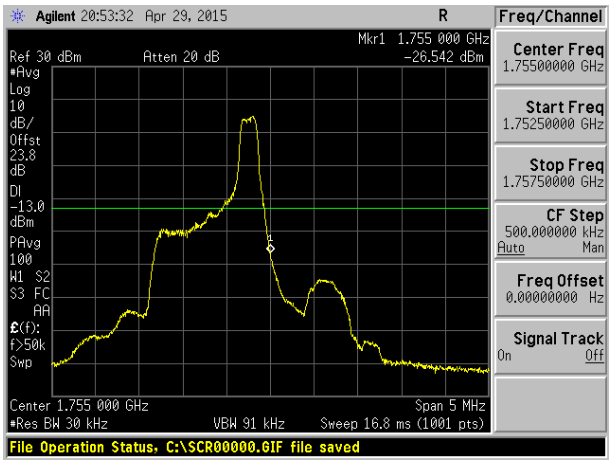
4. Set a marker to point the corresponding band edge frequency in each band.

5. Record the max trace plot into the test report.

## 7.4 Test diagram

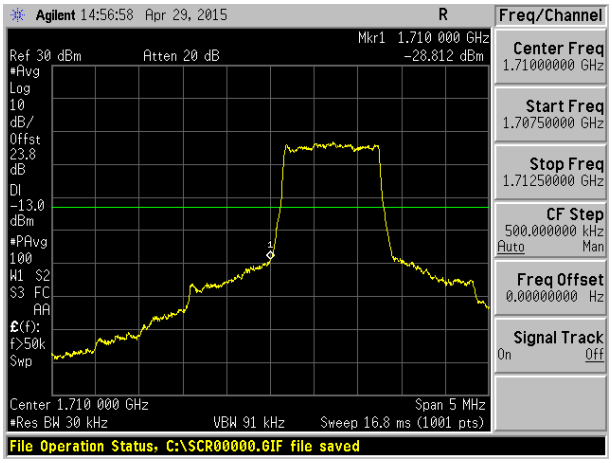



## 7.4 Test results

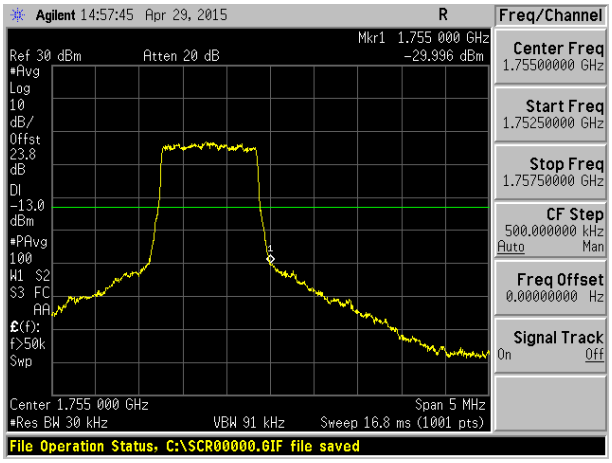
| Band 4 | |
|---|---|
| **1.4 MHz / 1 RB / QPSK/ LOW CH** | **1.4 MHz / 1 RB / QPSK/ HIGH CH** |
|  |  |

## Band 4

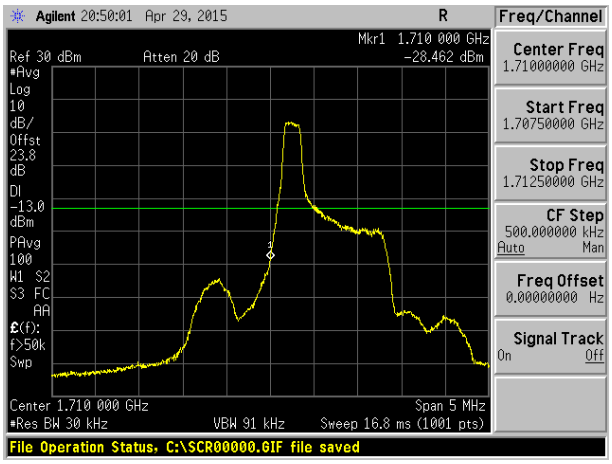
### 1.4 MHz / Full RB / QPSK/ LOW CH



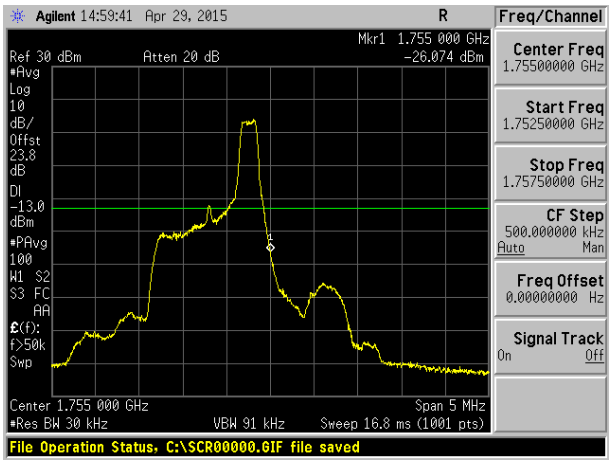

### 1.4 MHz / Full RB / QPSK/ HIGH CH



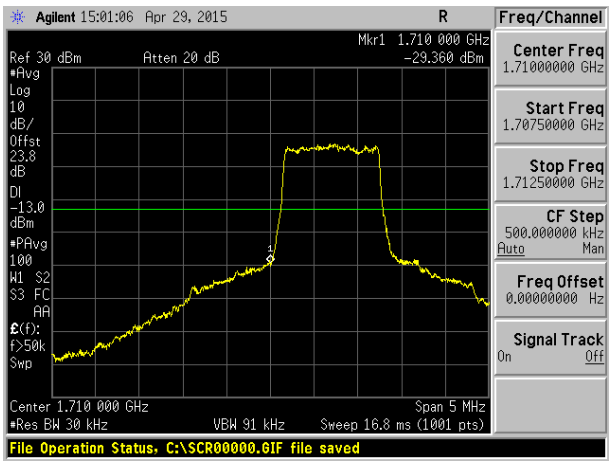

### 1.4 MHz / 1 RB / 16QAM / LOW CH



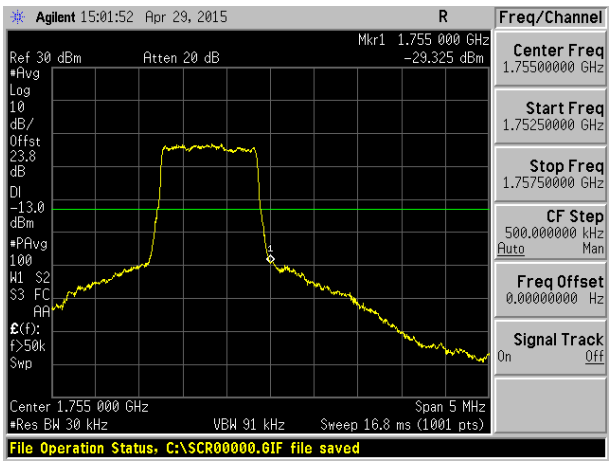

### 1.4 MHz / 1 RB / 16QAM / HIGH CH




### 1.4 MHz / Full RB / 16QAM / LOW CH

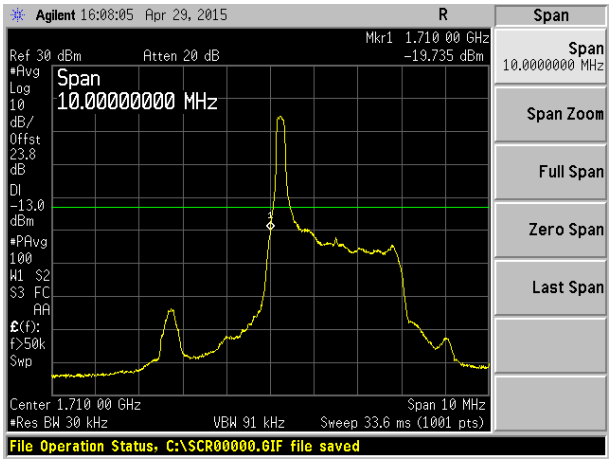



### 1.4 MHz / Full RB / 16QAM / HIGH CH

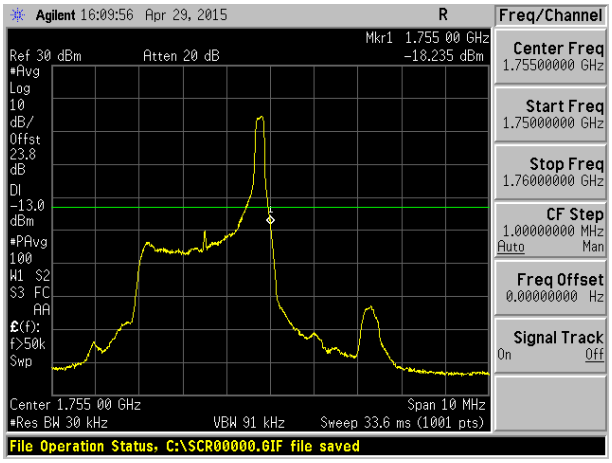


## Band 4

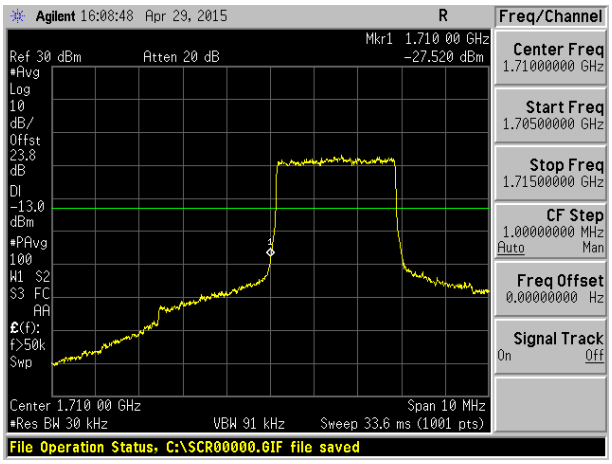
### 3 MHz / 1 RB / QPSK/ LOW CH



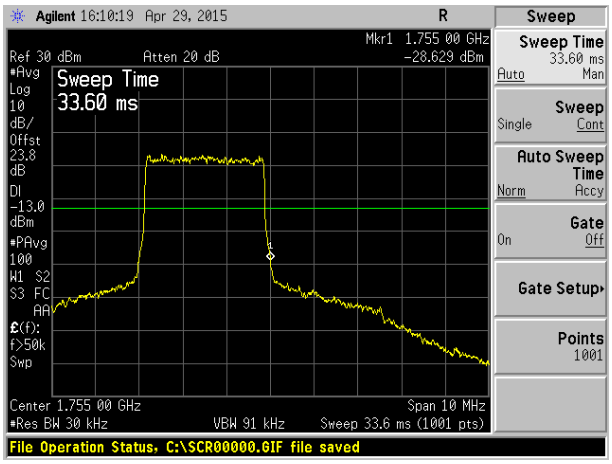

### 3 MHz / 1 RB / QPSK/ HIGH CH



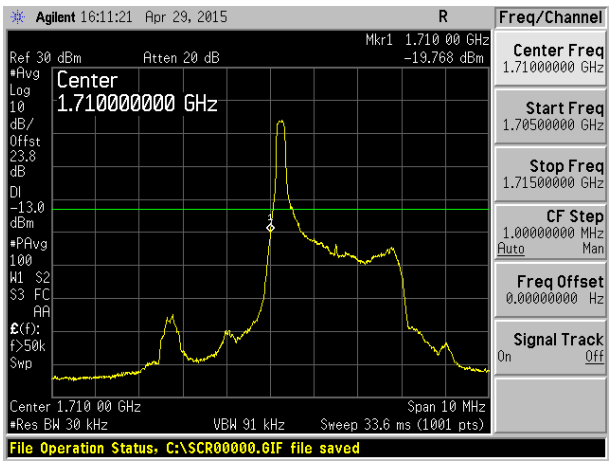

### 3 MHz / Full RB / QPSK/ LOW CH



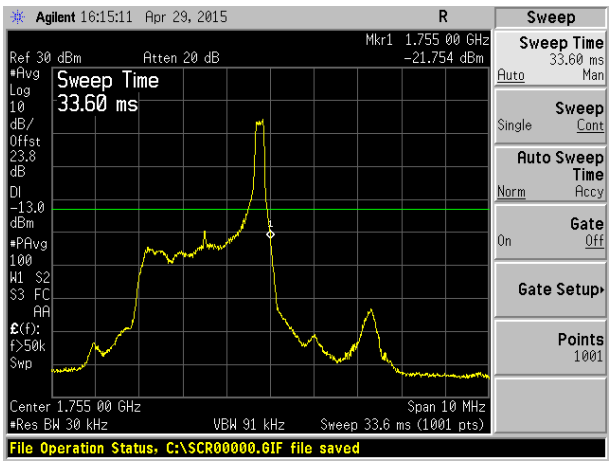

### 3 MHz / Full RB / QPSK/ HIGH CH




### 3 MHz / 1 RB / 16QAM / LOW CH

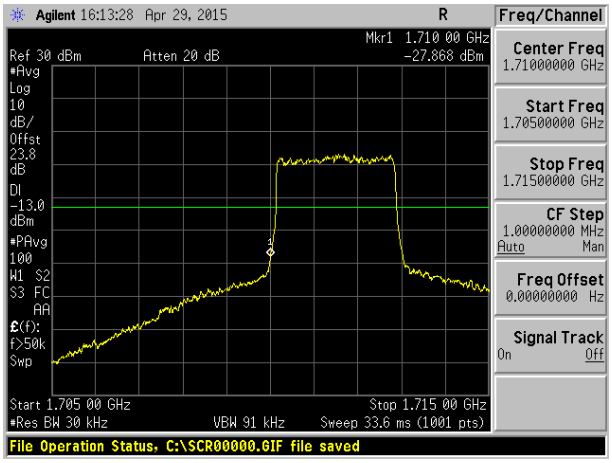



### 3 MHz / 1 RB / 16QAM / HIGH CH

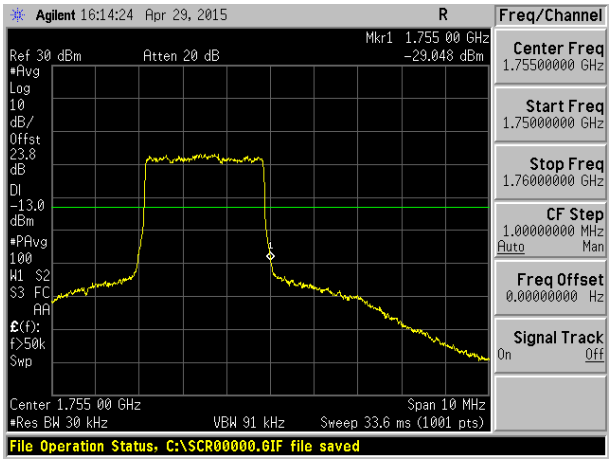


## Band 4

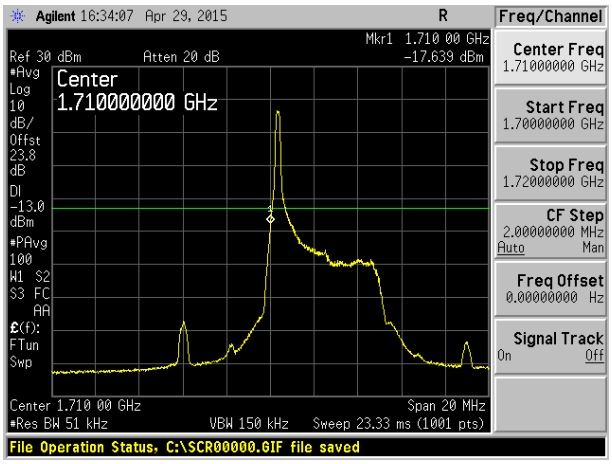
### 3 MHz / Full RB / 16QAM / LOW CH



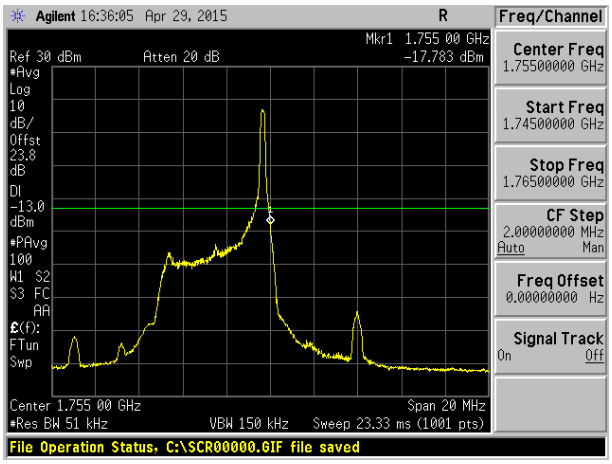

### 3 MHz / Full RB / 16QAM / HIGH CH



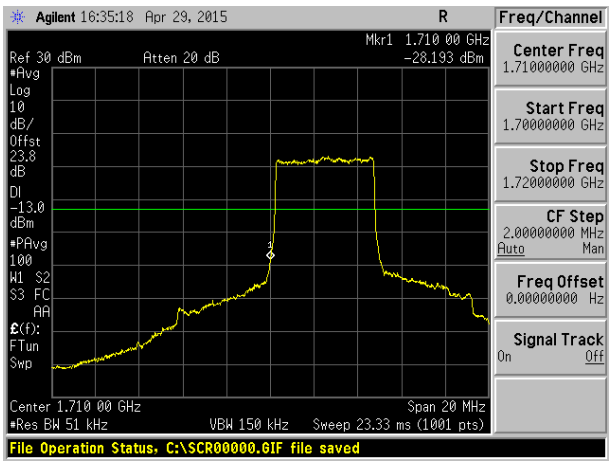

### 5 MHz / 1 RB / QPSK/ LOW CH



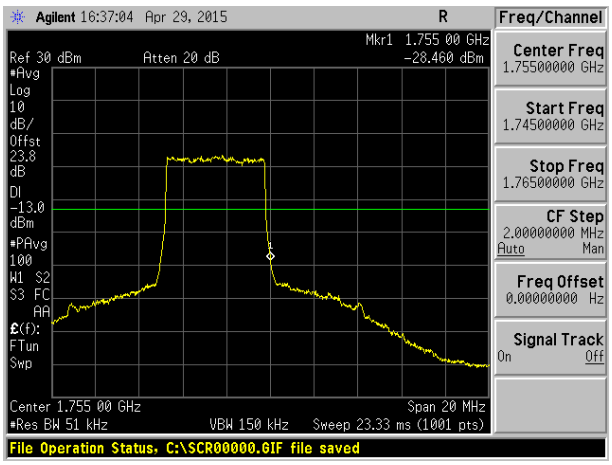

### 5 MHz / 1 RB / QPSK/ HIGH CH




### 5 MHz / Full RB / QPSK/ LOW CH

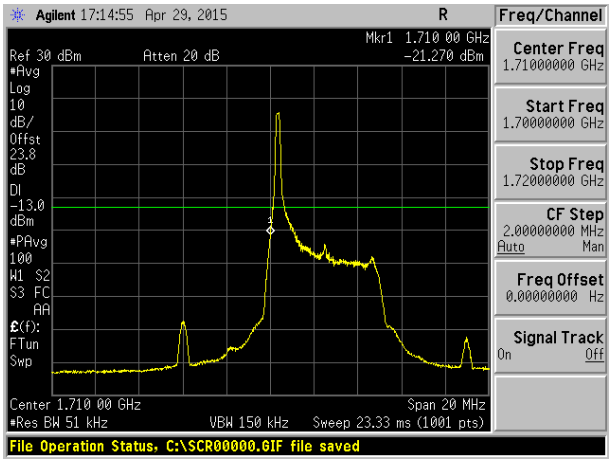



### 5 MHz / Full RB / QPSK/ HIGH CH

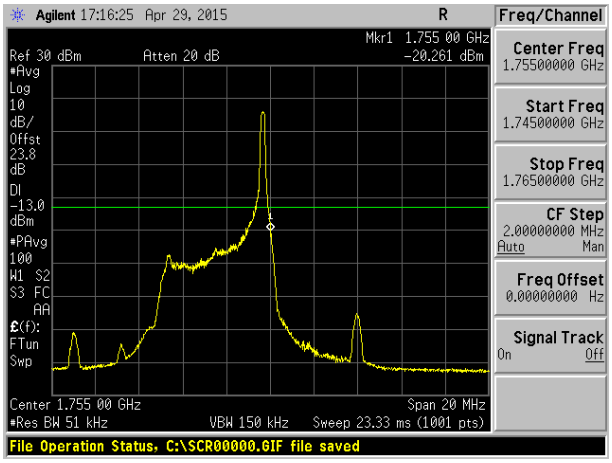


## Band 4

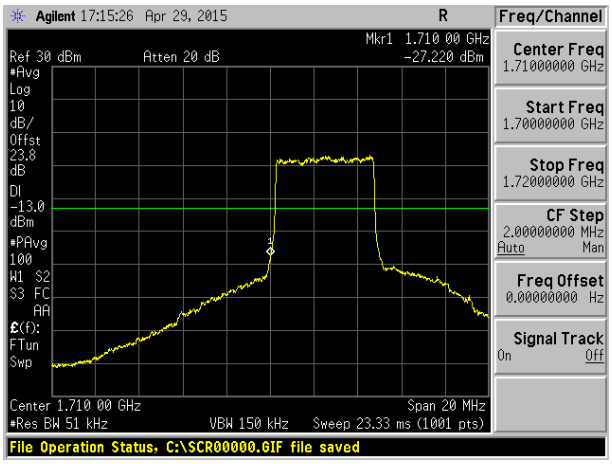
### 5 MHz / 1 RB / 16QAM / LOW CH



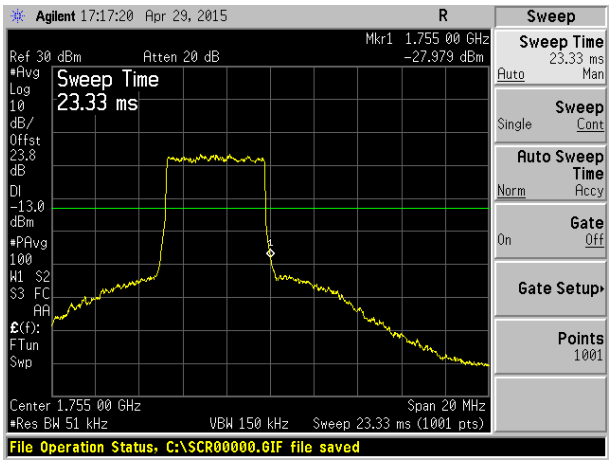

### 5 MHz / 1 RB / 16QAM / HIGH CH



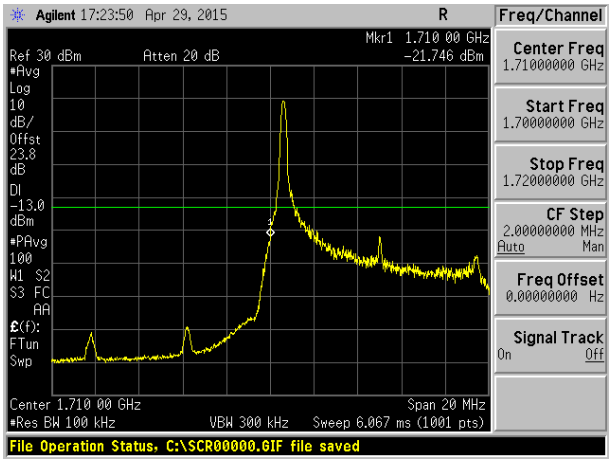

### 5 MHz / Full RB / 16QAM / LOW CH



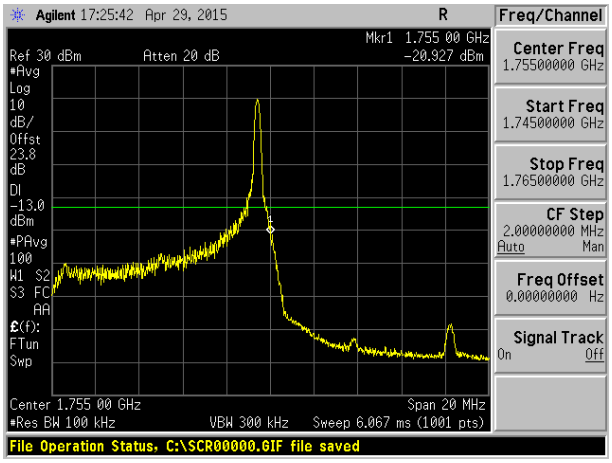

### 5 MHz / Full RB / 16QAM / HIGH CH




### 10 MHz / 1 RB / QPSK/ LOW CH

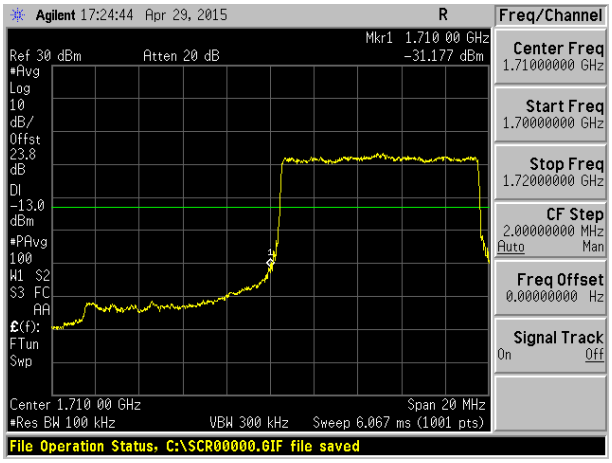



### 10 MHz / 1 RB / QPSK/ HIGH CH

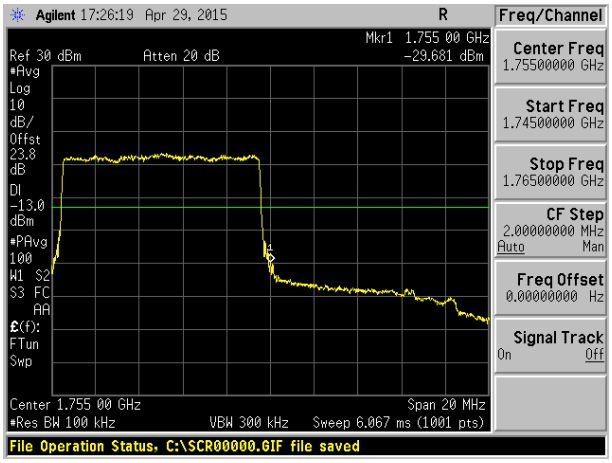


## Band 4

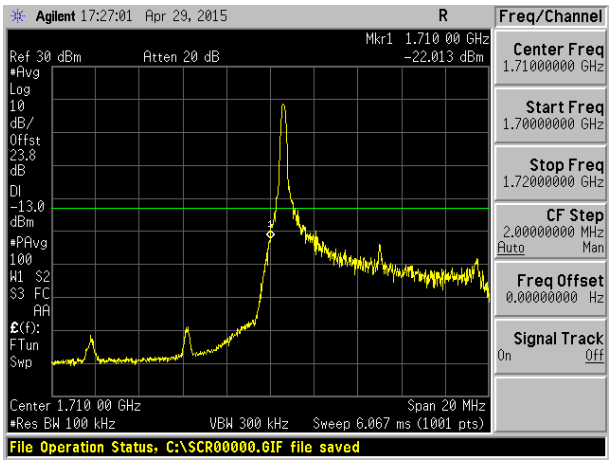
### 10 MHz / Full RB / QPSK/ LOW CH



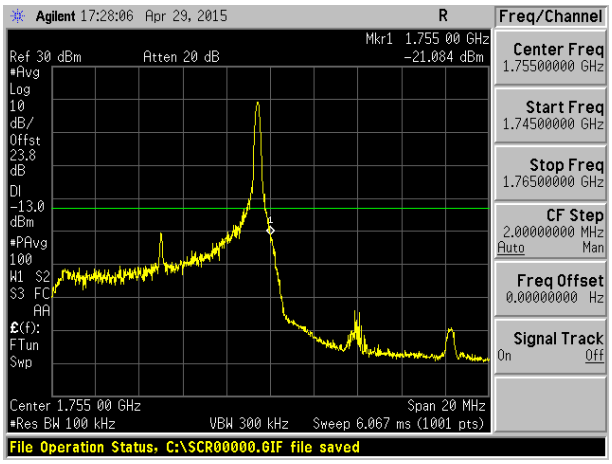

### 10 MHz / Full RB / QPSK/ HIGH CH



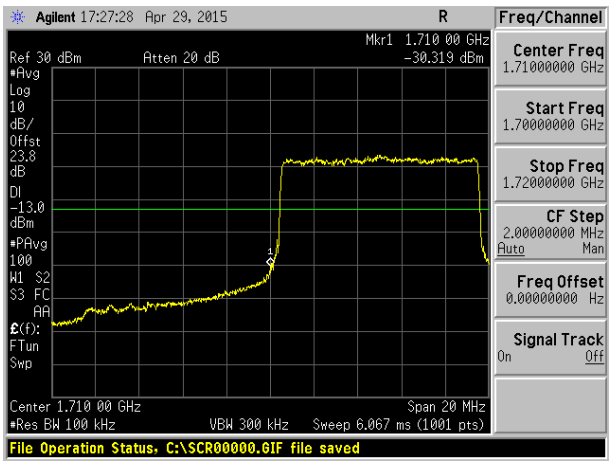

### 10 MHz / 1 RB / 16QAM / LOW CH



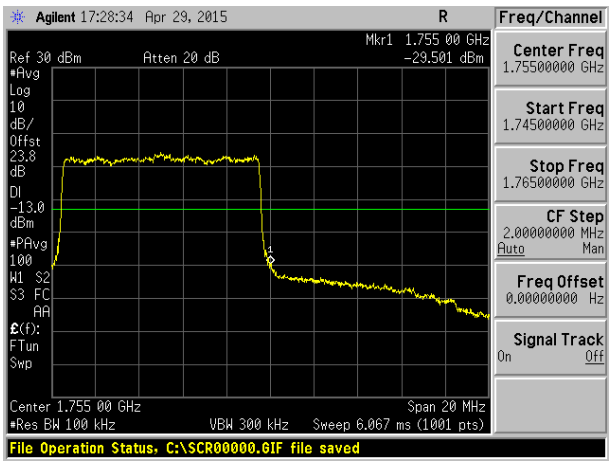

### 10 MHz / 1 RB / 16QAM / HIGH CH




### 10 MHz / Full RB / 16QAM / LOW CH

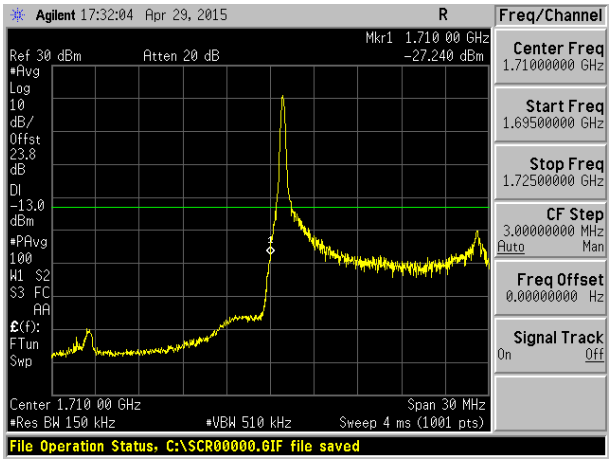



### 10 MHz / Full RB / 16QAM / HIGH CH

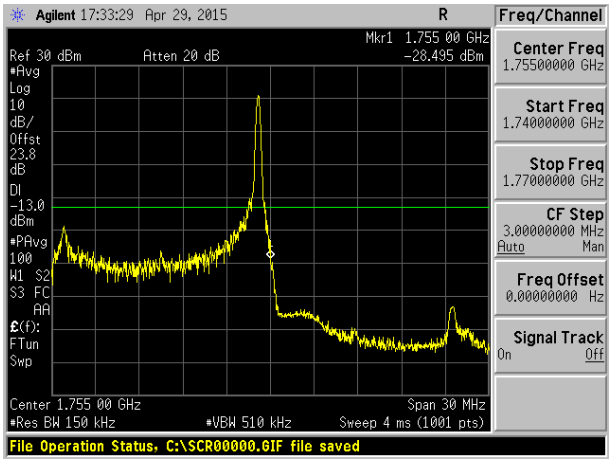


## Band 4

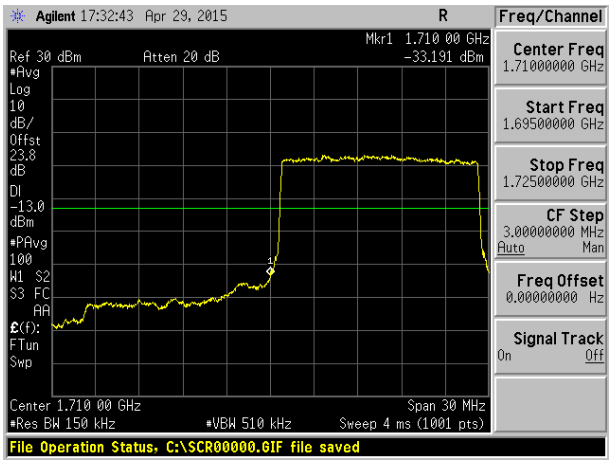
### 15 MHz / 1 RB / QPSK/ LOW CH



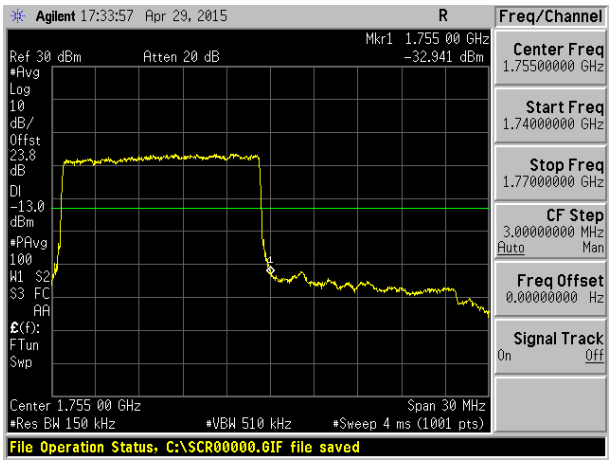

### 15 MHz / 1 RB / QPSK/ HIGH CH



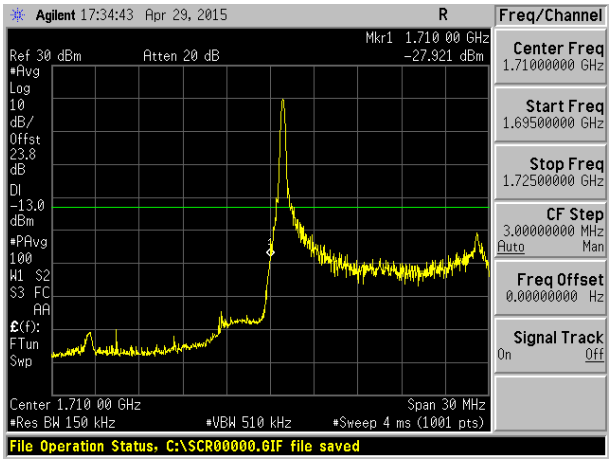

### 15 MHz / Full RB / QPSK/ LOW CH



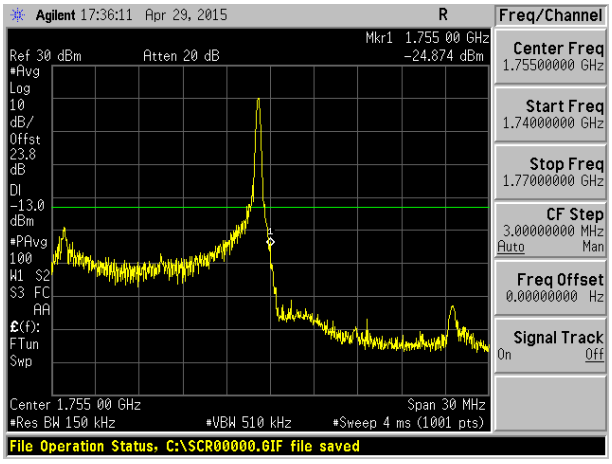

### 15 MHz / Full RB / QPSK/ HIGH CH




### 15 MHz / 1 RB / 16QAM / LOW CH

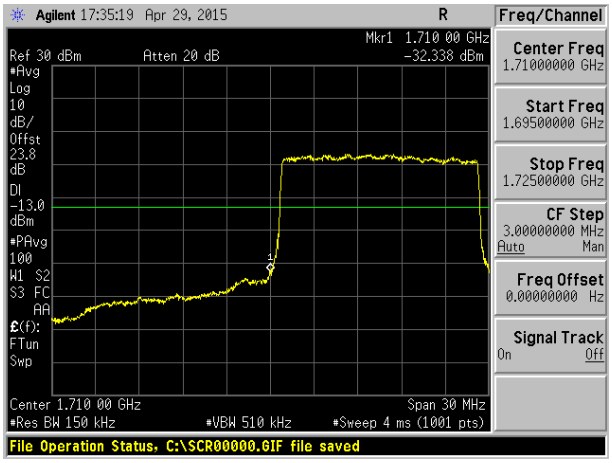



### 15 MHz / 1 RB / 16QAM / HIGH CH

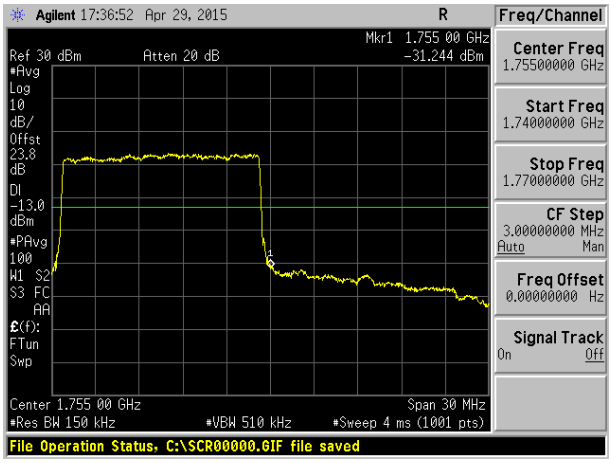


## Band 4

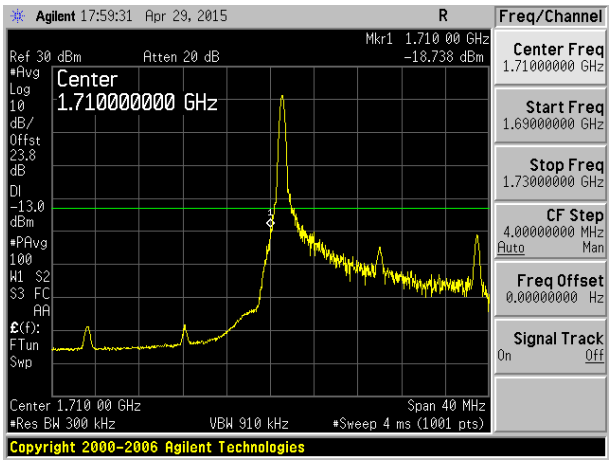
### 15 MHz / Full RB / 16QAM / LOW CH



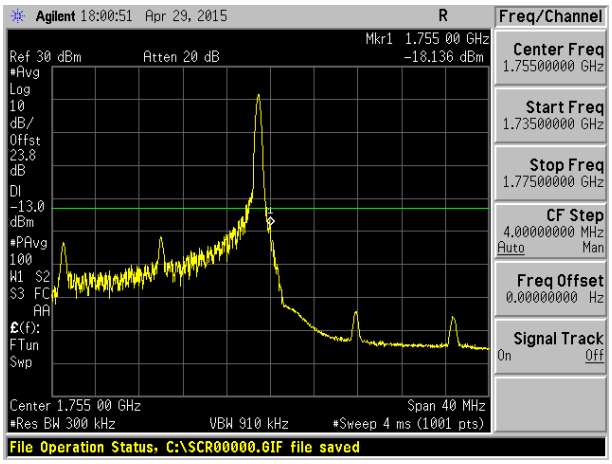

### 15 MHz / Full RB / 16QAM / HIGH CH



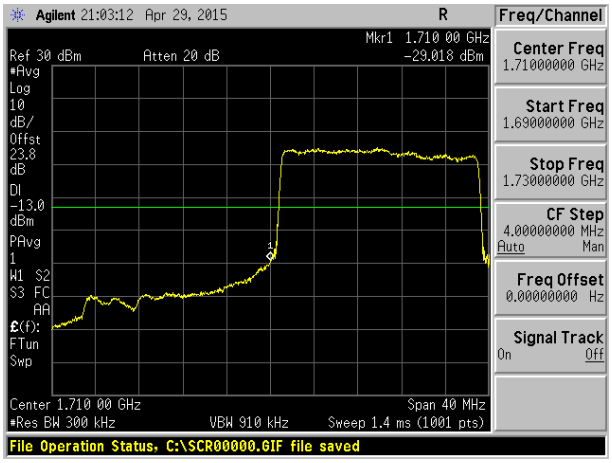

### 20 MHz / 1 RB / QPSK/ LOW CH



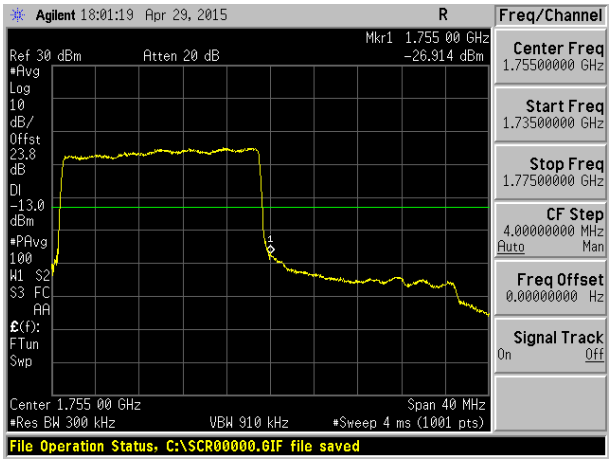

### 20 MHz / 1 RB / QPSK/ HIGH CH

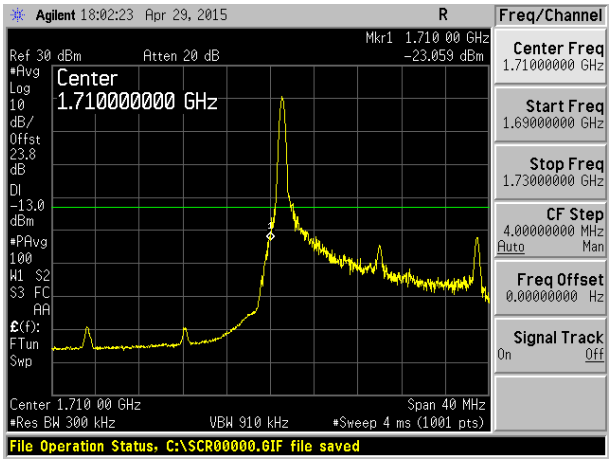
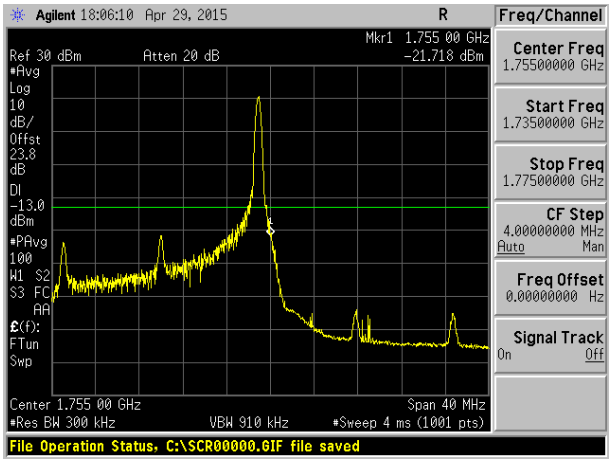
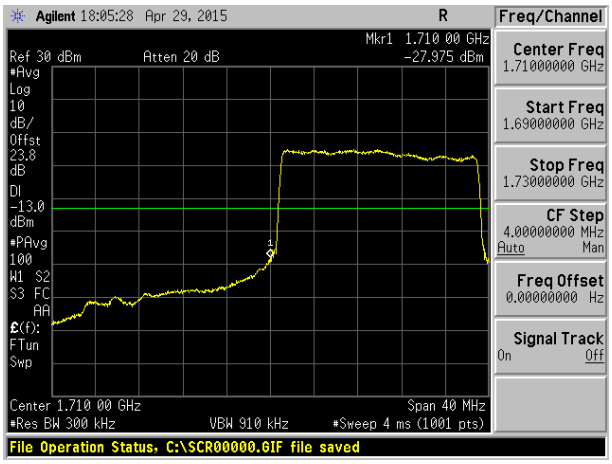
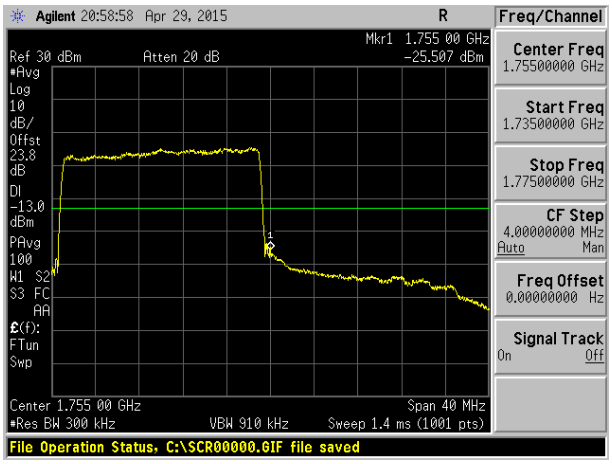


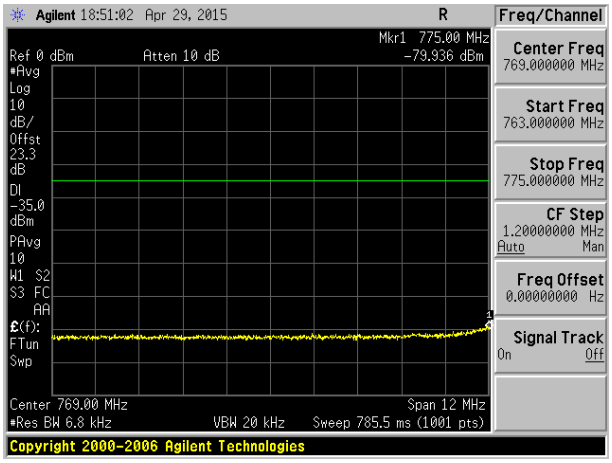
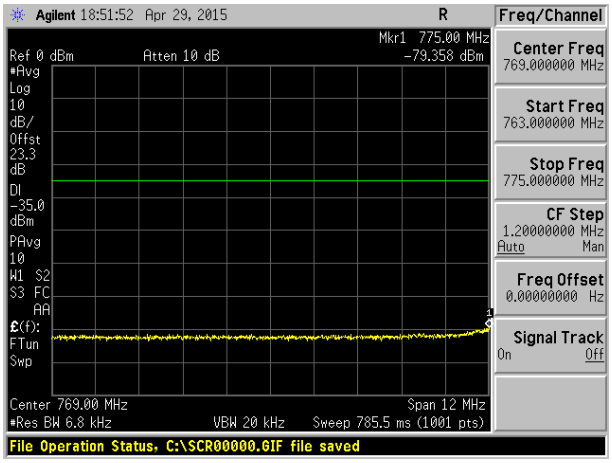
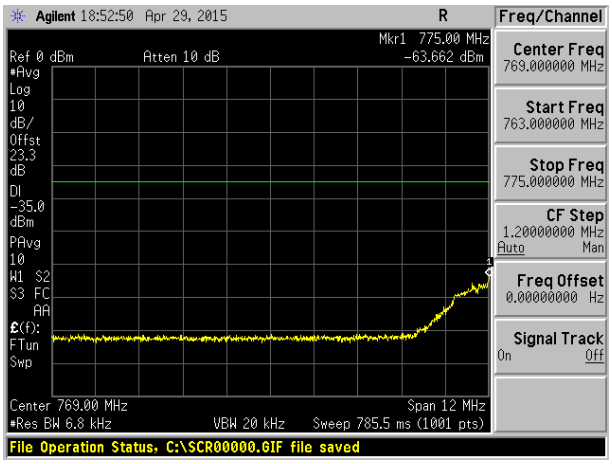
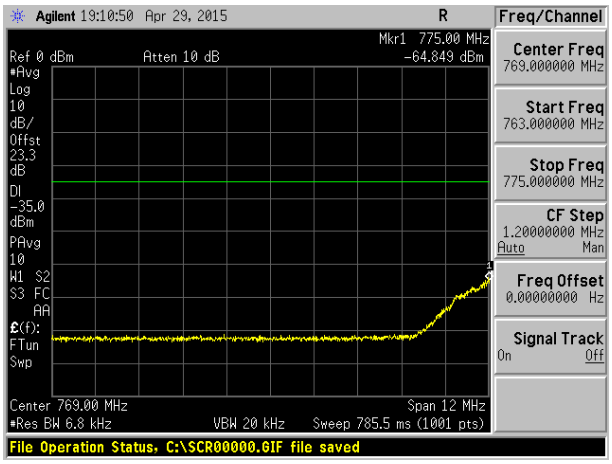

### 20 MHz / Full RB / QPSK/ LOW CH

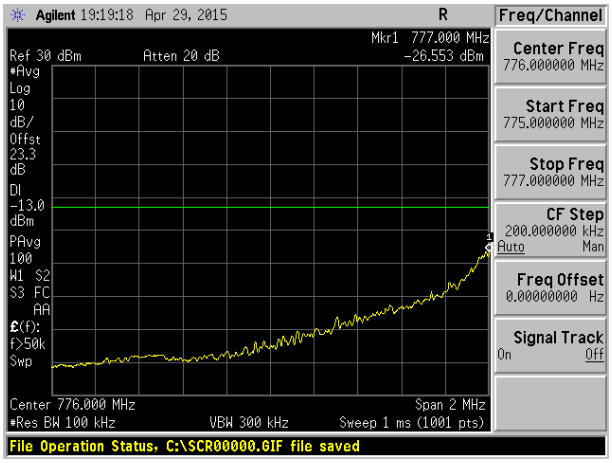
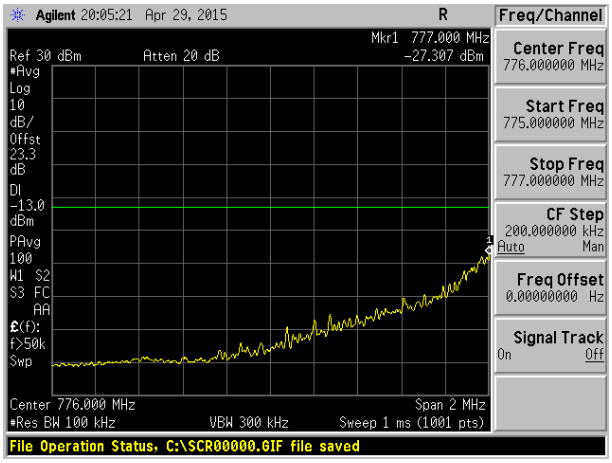
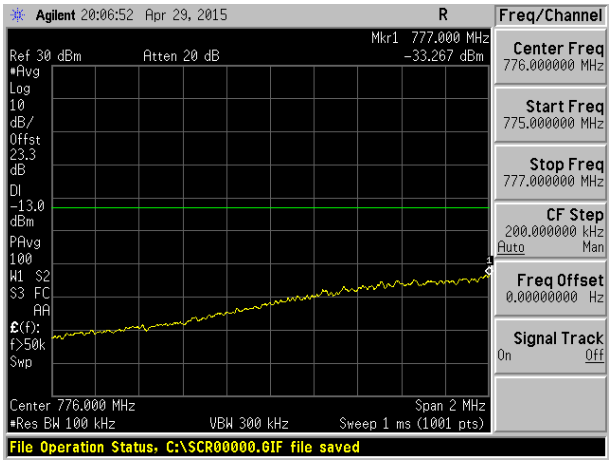
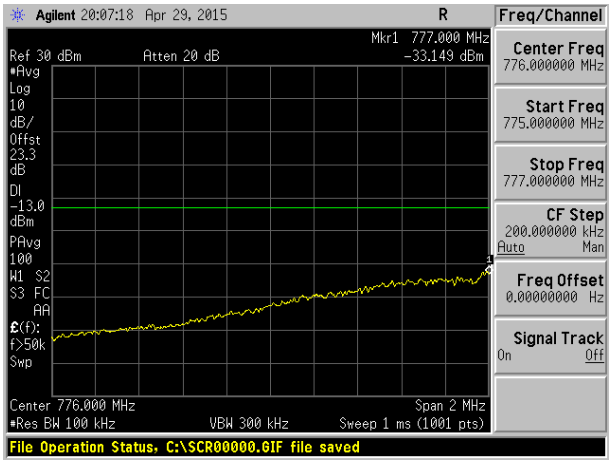


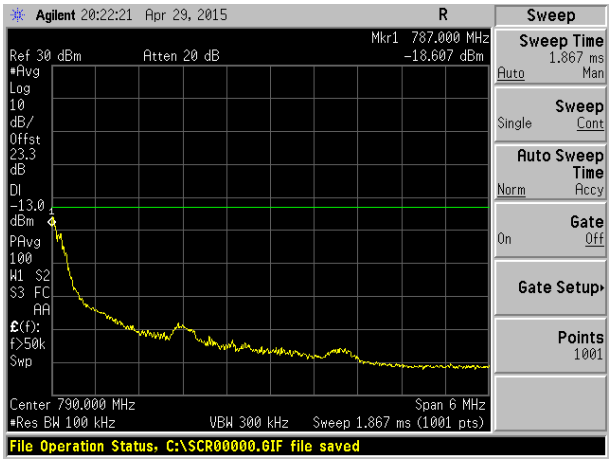
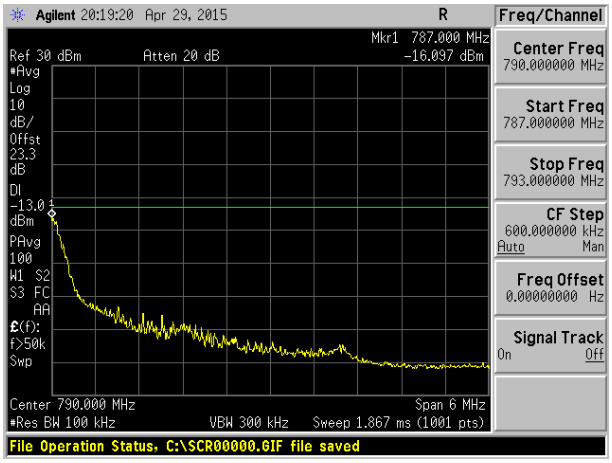
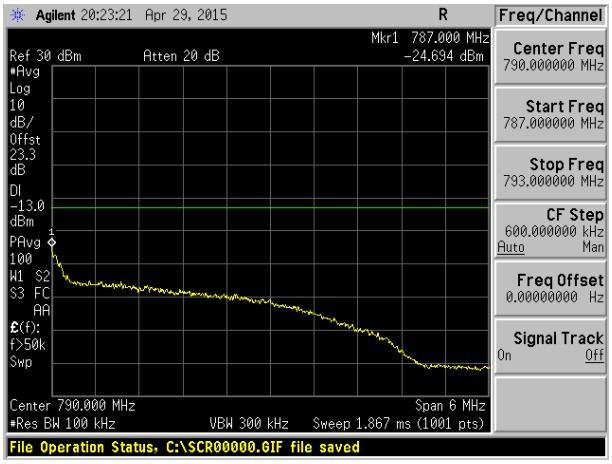
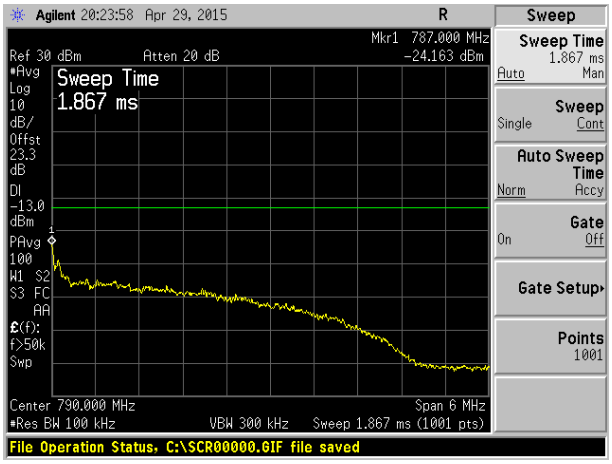

### 20 MHz / Full RB / QPSK/ HIGH CH

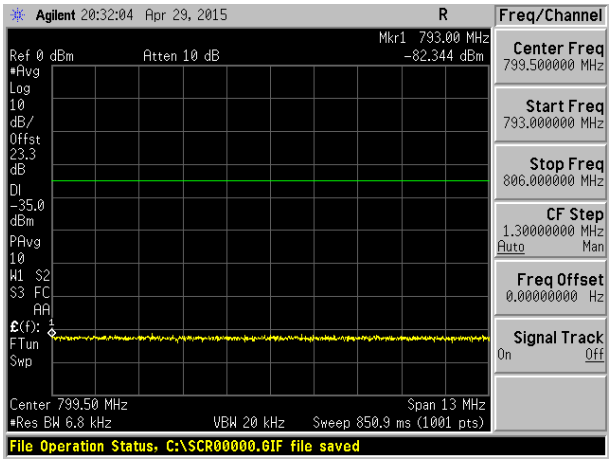
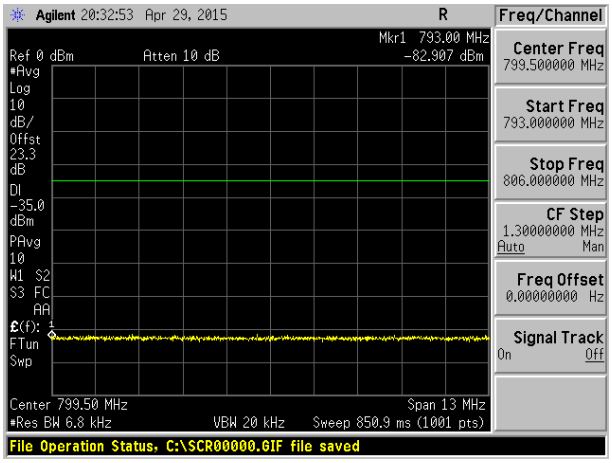
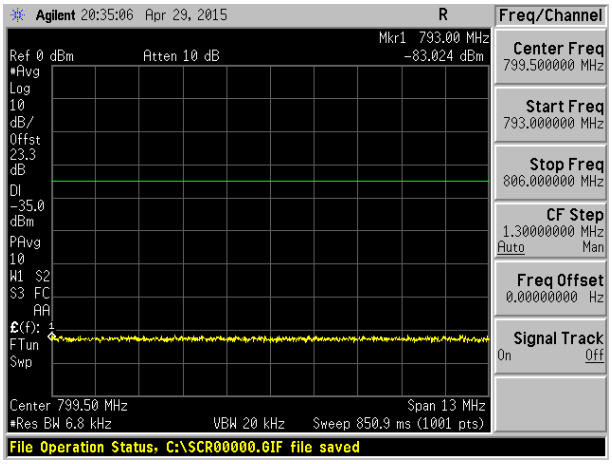
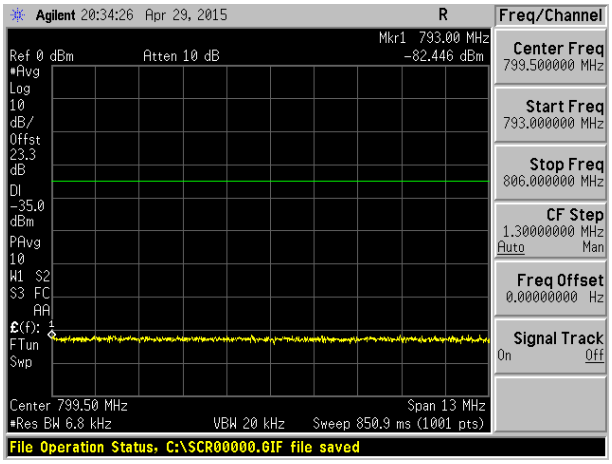


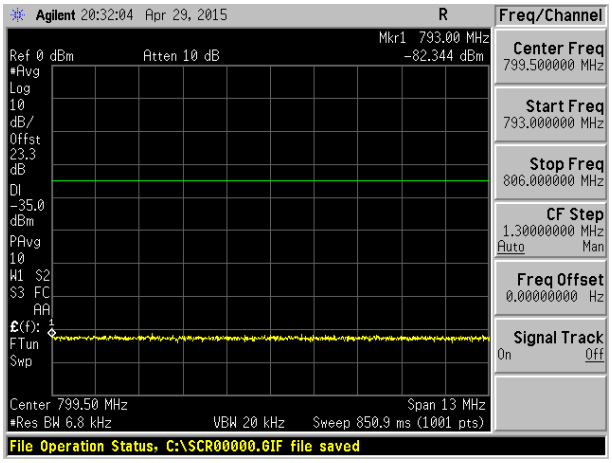
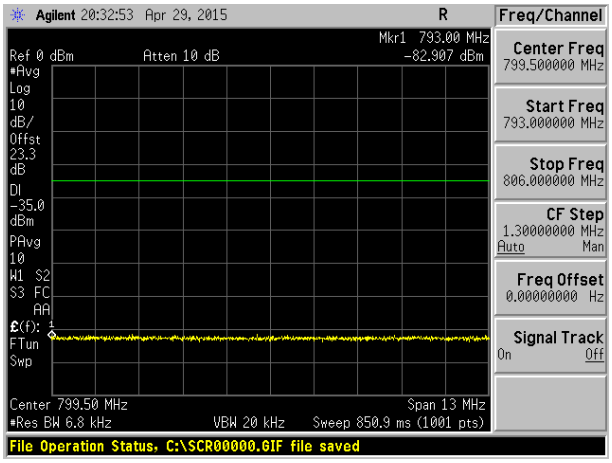
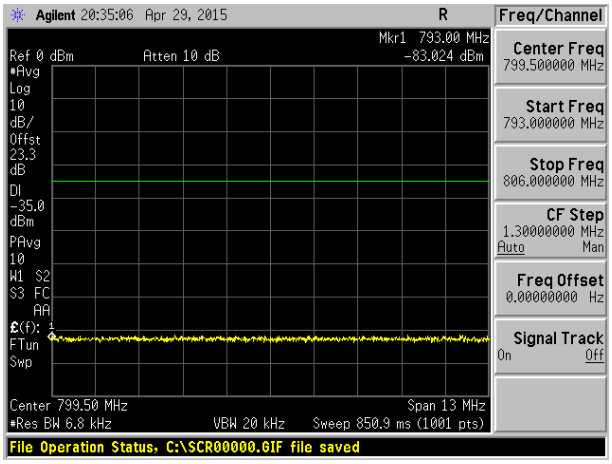
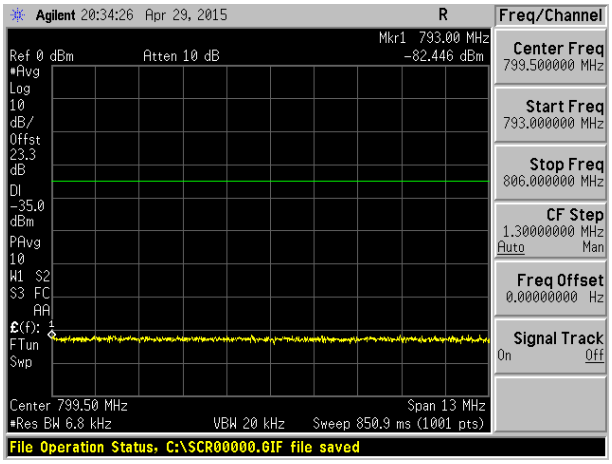
| Band 4 | |
|---|---|
| **20 MHz / 1 RB / 16QAM / LOW CH** | **20 MHz / 1 RB / 16QAM / HIGH CH** |
|  |  |
| **20 MHz / Full RB / 16QAM / LOW CH** | **20 MHz / Full RB / 16QAM / HIGH CH** |
|  |  |

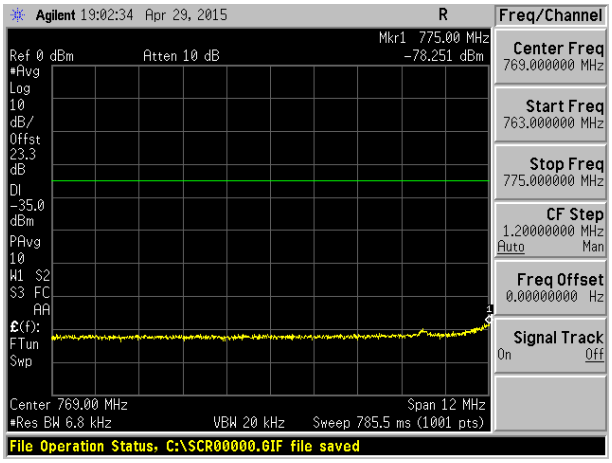
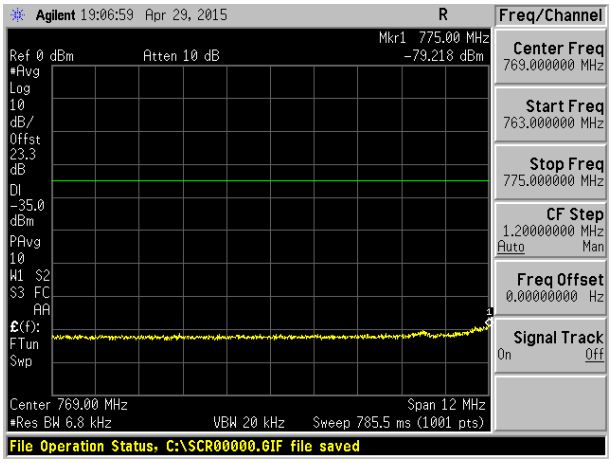
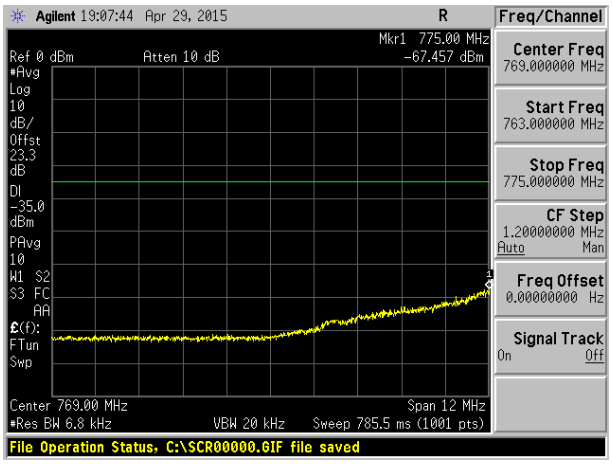
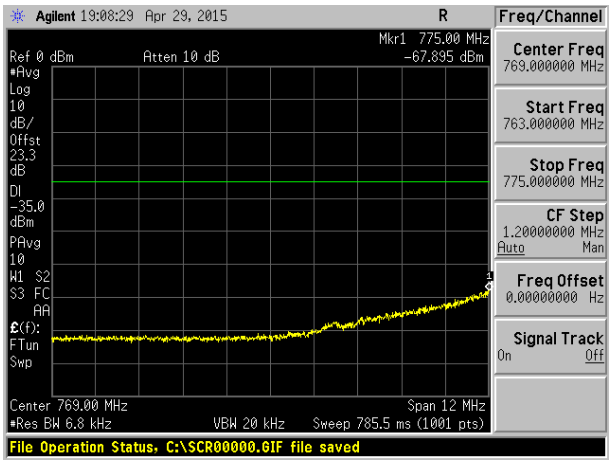
| Band 13 /763MHz – 775MHz | |
|---|---|
| **5 MHz / 1 RB / QPSK/ LOW CH** | **5 MHz / 1 RB / 16 QAM/ LOW CH** |
|  |  |
| **5 MHz / Full RB / QPSK/ LOW CH** | **5 MHz / Full RB / 16 QAM/ LOW CH** |
|  |  |

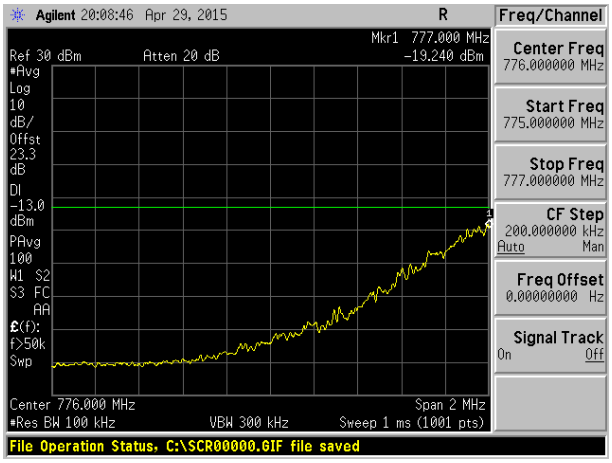
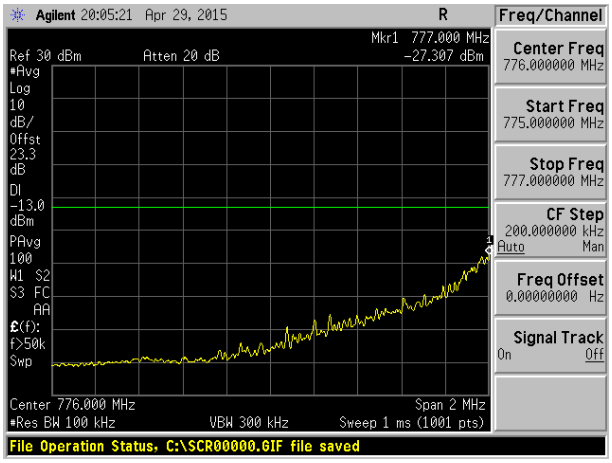
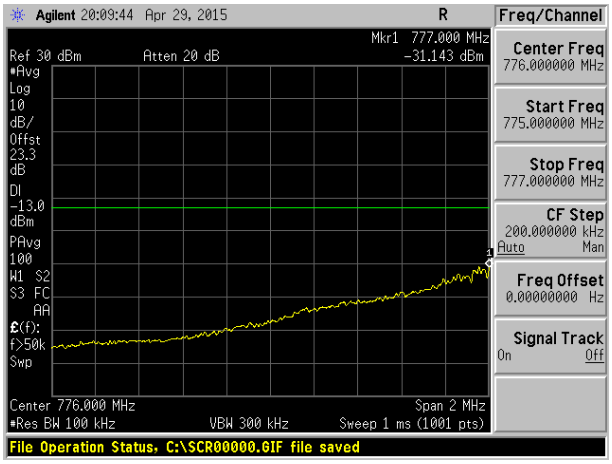
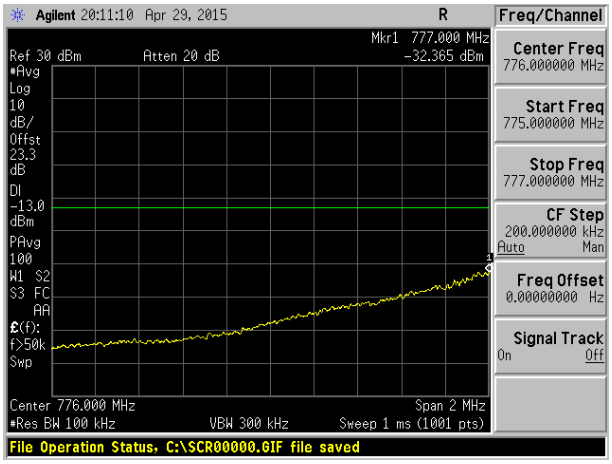
| Band 13 /775MHz – 777MHz | |
|---|---|
| **5 MHz / 1 RB / QPSK/ LOW CH** | **5 MHz / 1 RB / 16 QAM/ LOW CH** |
|  |  |
| **5 MHz / Full RB / QPSK/ LOW CH** | **5 MHz / Full RB / 16 QAM/ LOW CH** |
|  |  |

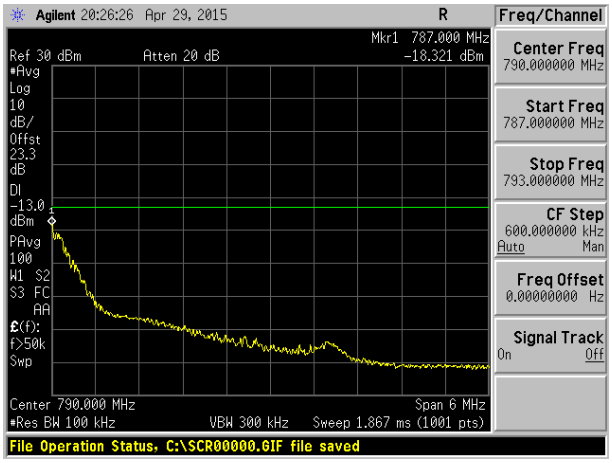
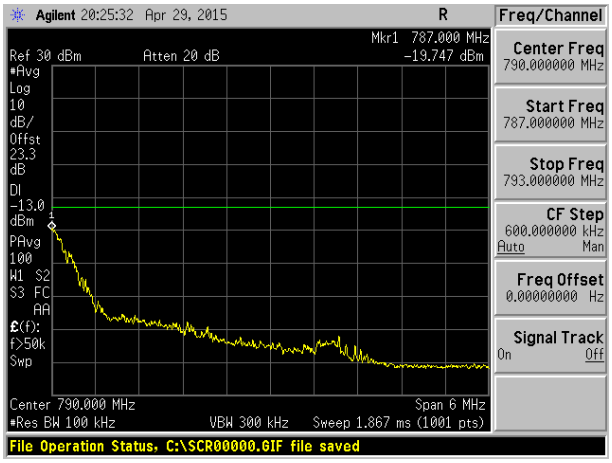
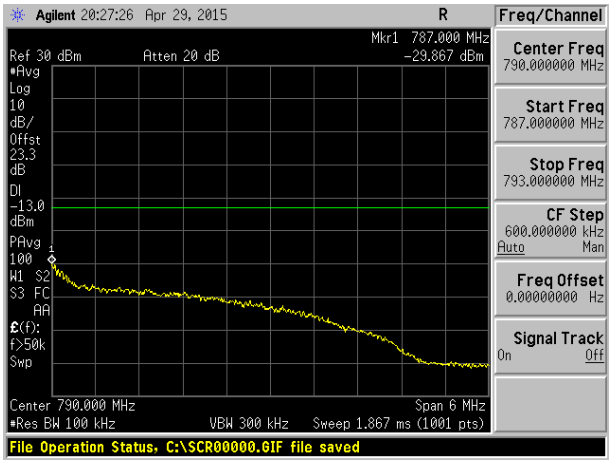
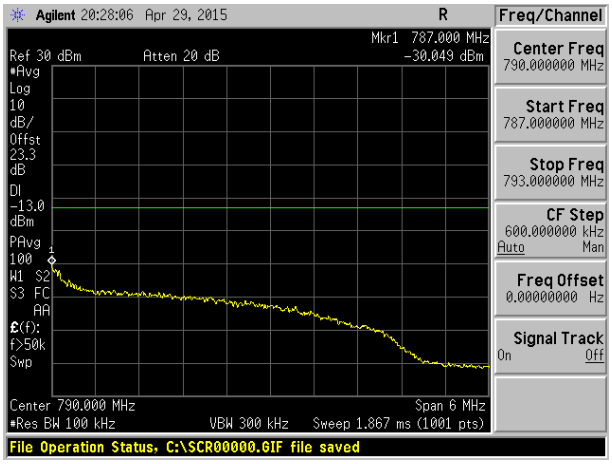
| Band 13 /787MHz – 793MHz | |
|---|---|
| **5 MHz / 1 RB / QPSK/ HIGH CH** | **5 MHz / 1 RB / 16 QAM/ HIGH CH** |
|  |  |
| **5 MHz / Full RB / QPSK/ HIGH CH** | **5 MHz / Full RB / 16 QAM/ HIGH CH** |
|  |  |

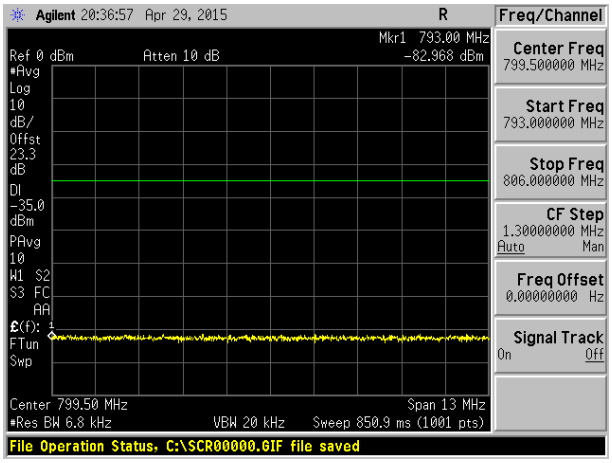
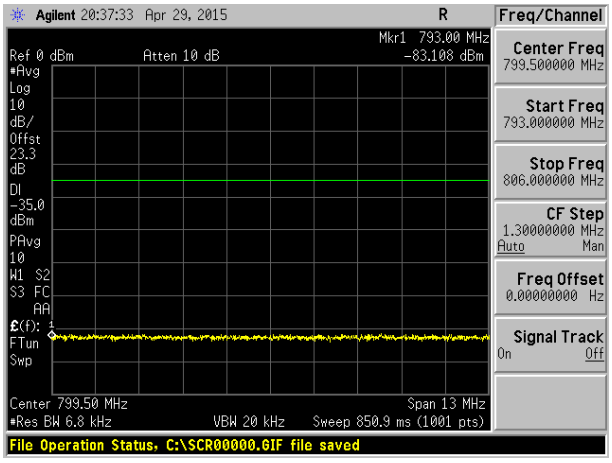
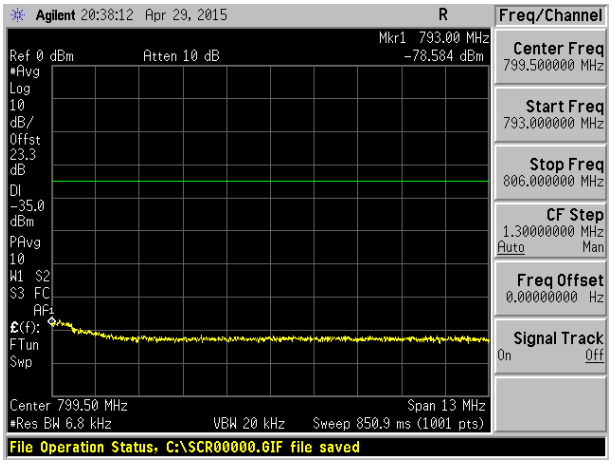
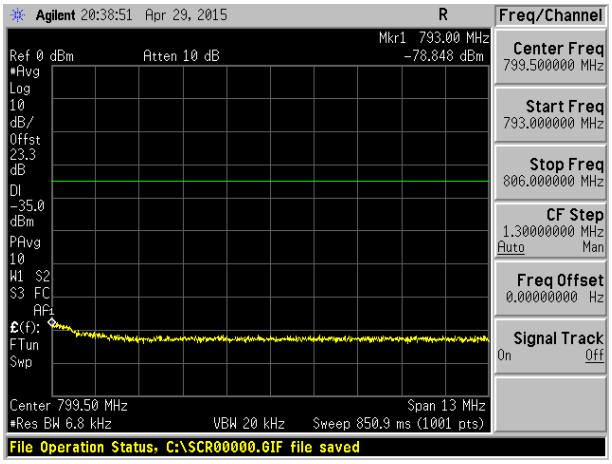
| Band 13 /787MHz – 793MHz | |
|---|---|
| **5 MHz / 1 RB / QPSK/ HIGH CH** | **5 MHz / 1 RB / 16 QAM/ HIGH CH** |
|  |  |
| **5 MHz / Full RB / QPSK/ HIGH CH** | **5 MHz / Full RB / 16 QAM/ HIGH CH** |
|  |  |

| Band 13 /793MHz – 806MHz | |
|---|---|
| **5 MHz / 1 RB / QPSK/ HIGH CH** | **5 MHz / 1 RB / 16 QAM/ HIGH CH** |
|  |  |
| **5 MHz / Full RB / QPSK/ HIGH CH** | **5 MHz / Full RB / 16 QAM/ HIGH CH** |
|  |  |

| Band 13 /763MHz – 775MHz | |
|---|---|
| **10 MHz / 1 RB / QPSK/ LOW Edge** | **10 MHz / 1 RB / 16 QAM/ LOW Edge** |
|  |  |
| **5 MHz / Full RB / QPSK/ LOW Edge** | **5 MHz / Full RB / 16 QAM/ LOW Edge** |
|  |  |

| Band 13 /775MHz – 777MHz | |
|---|---|
| **5 MHz / 1 RB / QPSK/ LOW Edge** | **5 MHz / 1 RB / 16 QAM/ LOW Edge** |
|  |  |
| **5 MHz / Full RB / QPSK/ LOW Edge** | **5 MHz / Full RB / 16 QAM/ LOW Edge** |
|  |  |

| Band 13 /787MHz – 793MHz | |
|---|---|
| **5 MHz / 1 RB / QPSK/ HIGH Edge** | **5 MHz / 1 RB / 16 QAM/ HIGH Edge** |
|  |  |
| **5 MHz / Full RB / QPSK/ HIGH Edge** | **5 MHz / Full RB / 16 QAM/ HIGH Edge** |
|  |  |

| Band 13 /793MHz – 806MHz | |
|---|---|
| **5 MHz / 1 RB / QPSK/ HIGH Edge** | **5 MHz / 1 RB / 16 QAM/ HIGH Edge** |
|  |  |
| **5 MHz / Full RB / QPSK/ HIGH Edge** | **5 MHz / Full RB / 16 QAM/ HIGH Edge** |
|  |  |

# 8. Conducted Spurious Emissions

## 8.1 Test conditions

| | | |
|---|---|---|
| Temperature: | 20 | ℃ |
| Relative Humidity: | 55 | % |
| Atmospheric Pressure | 1008 | hPa |

## 8.2 Limit for conducted spurious emissions

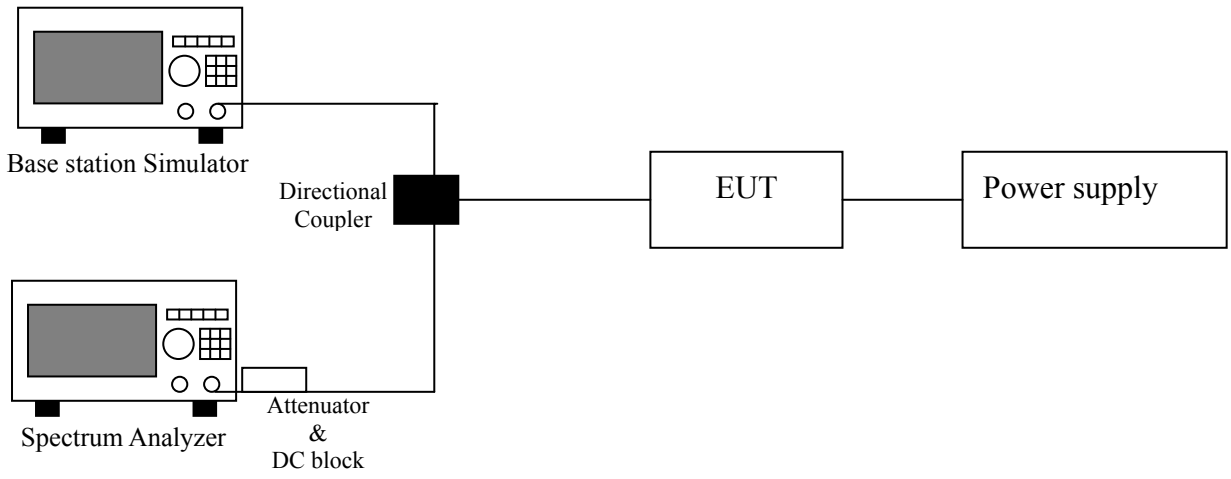
The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 +10 log10 (P) dB. The limit of emission equal to –13dBm

## 8.3 Test procedure

1. The EUT connected to the Base station simulator. All measurements were done at low, middle and high operational frequency range.

2. Measuring frequency range is from 30 MHz to 8GHz for LTE Band 13 and from 30MHz to 18GHz for LTE Band 4. 10dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz are used for conducted emission measurement.

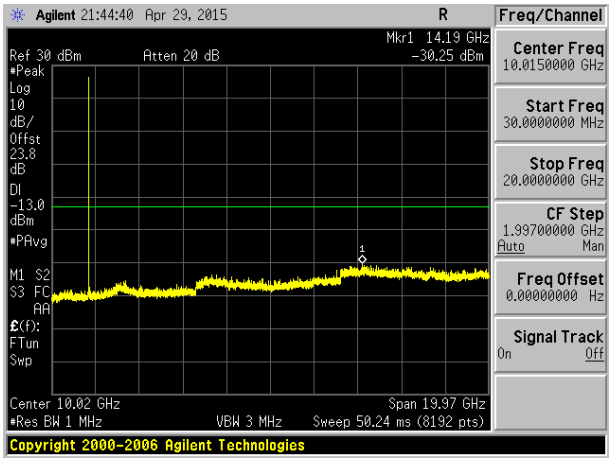
## 8.4 Test diagram



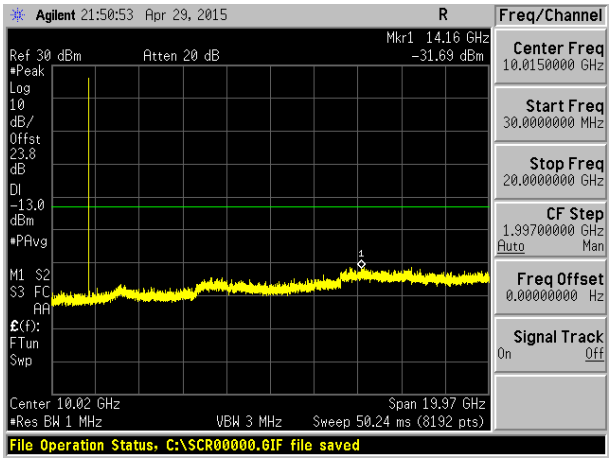
## 8.5 Test results

### Band 4

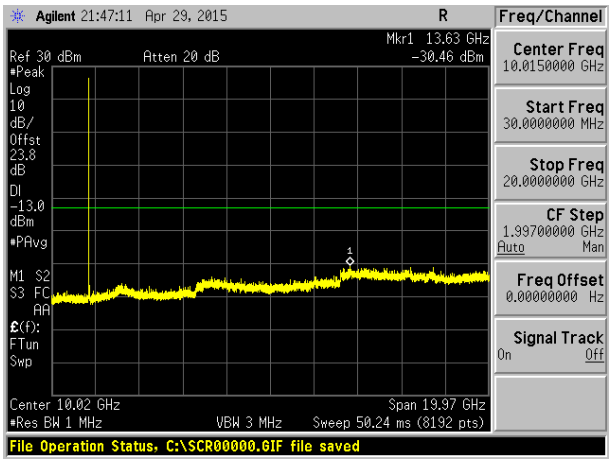
#### 1.4 MHz / 1 RB / QPSK/ LOW CH



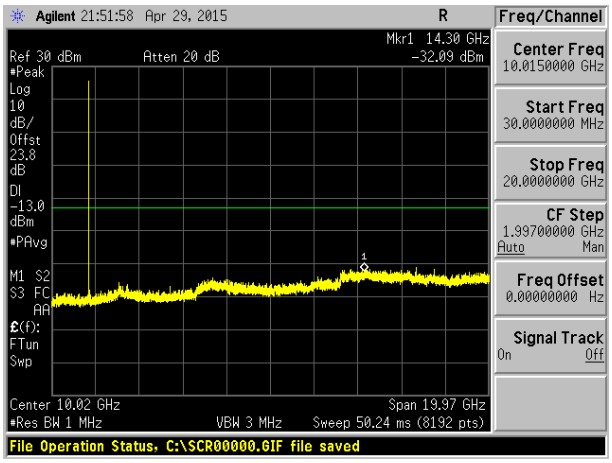

#### 1.4 MHz / 1 RB / 16QAM / LOW CH



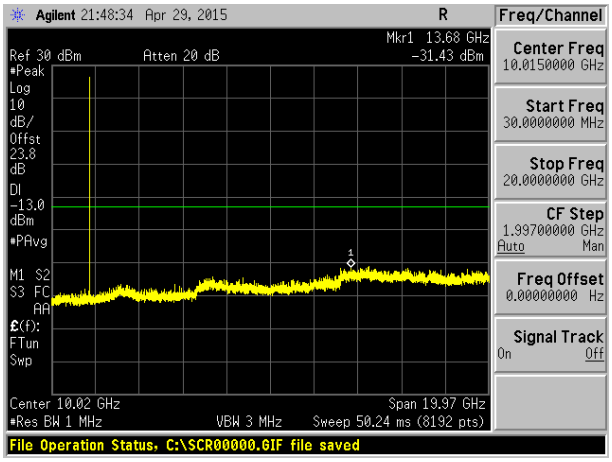

#### 1.4 MHz / 1 RB / QPSK/ MIDDLE CH



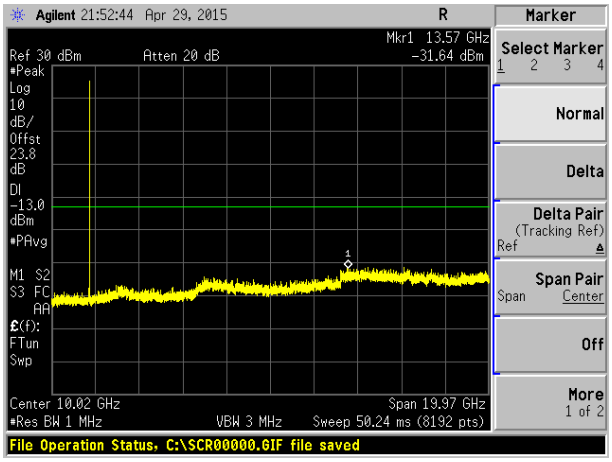

#### 1.4 MHz / 1 RB / 16QAM / MIDDLE CH




#### 1.4 MHz / 1 RB / QPSK / HIGH CH

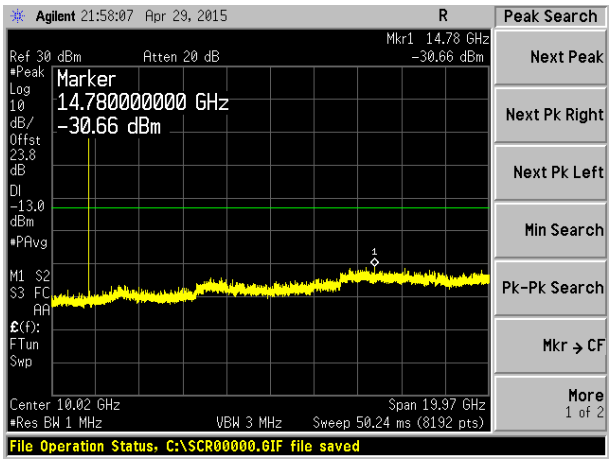



#### 1.4 MHz / 1 RB / 16QAM / HIGH CH

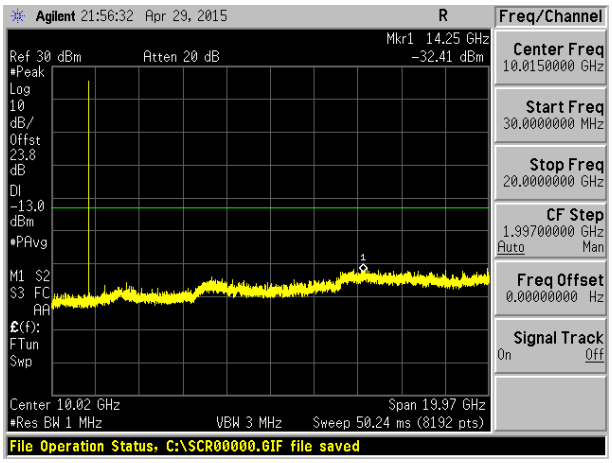


## Band 4

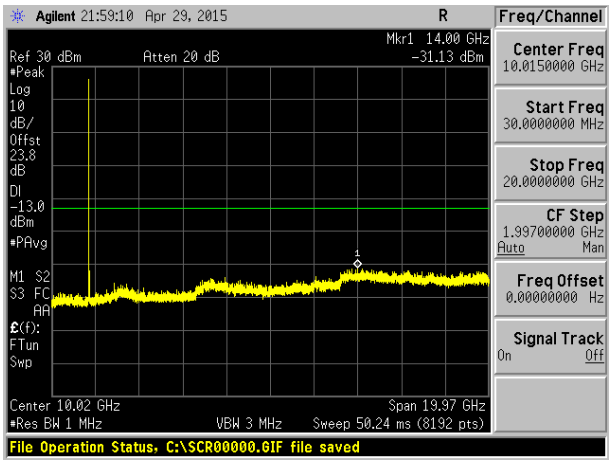
### 3 MHz / 1 RB / QPSK/ LOW CH



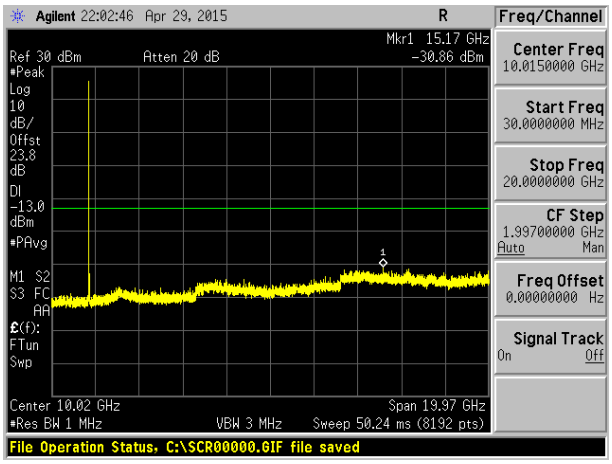

### 3 MHz / 1 RB / 16QAM / LOW CH



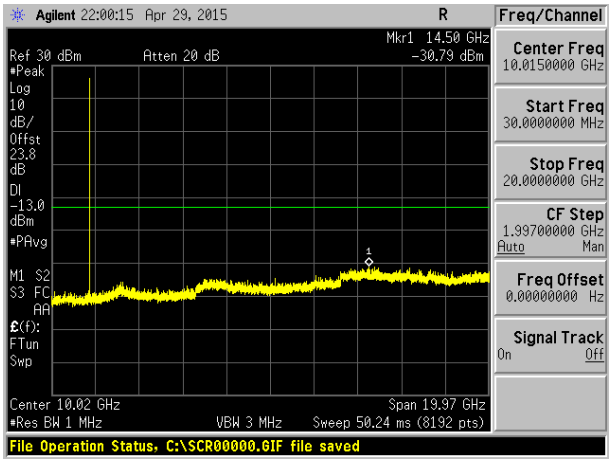

### 3 MHz / 1 RB / QPSK/ MIDDLE CH



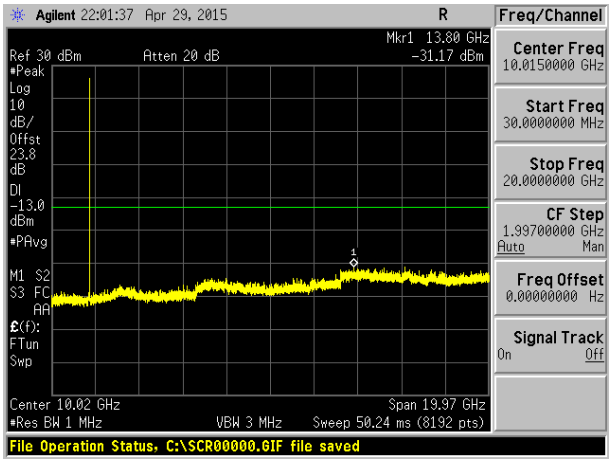

### 3 MHz / 1 RB / 16QAM / MIDDLE CH




### 3 MHz / 1 RB / QPSK / HIGH CH

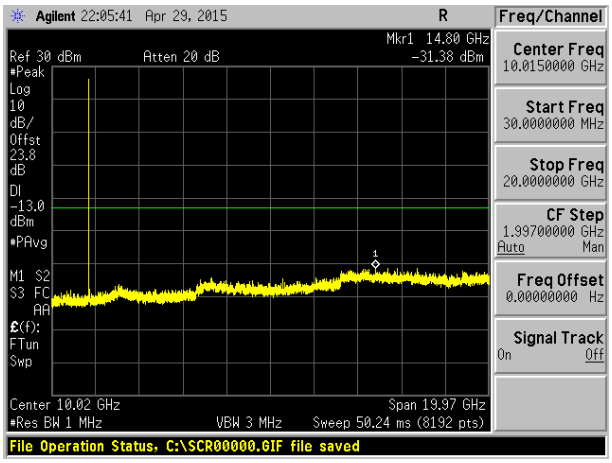



### 3 MHz / 1 RB / 16QAM / HIGH CH

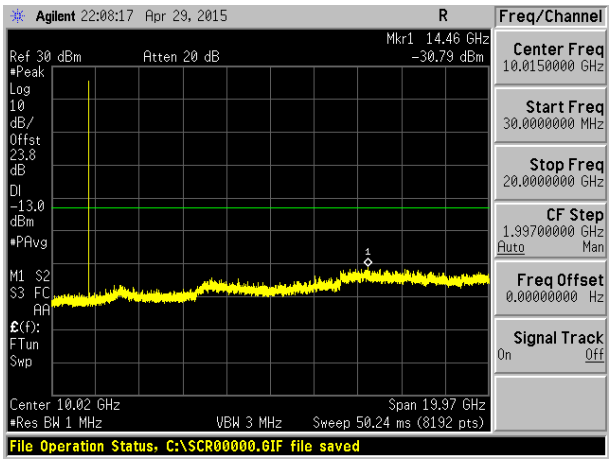


## Band 4

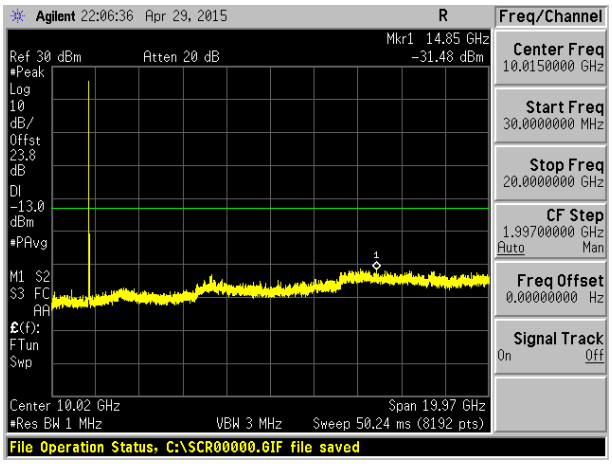
### 5 MHz / 1 RB / QPSK/ LOW CH



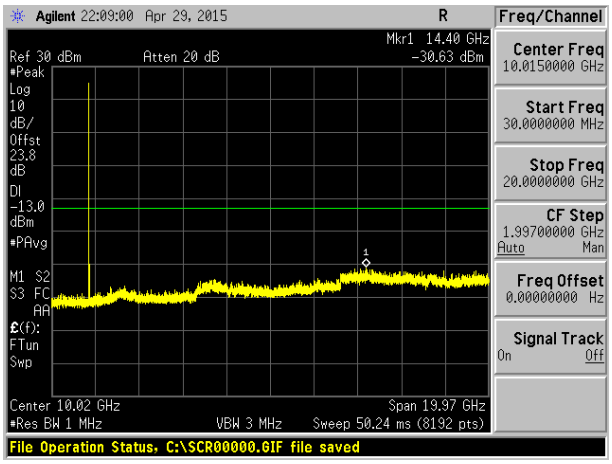

### 5 MHz / 1 RB / 16QAM / LOW CH



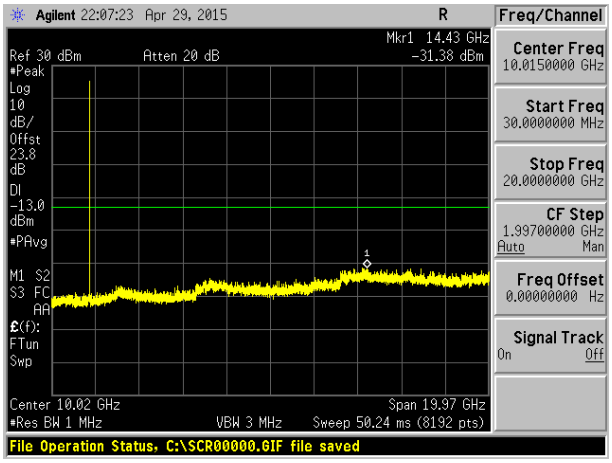

### 5 MHz / 1 RB / QPSK/ MIDDLE CH



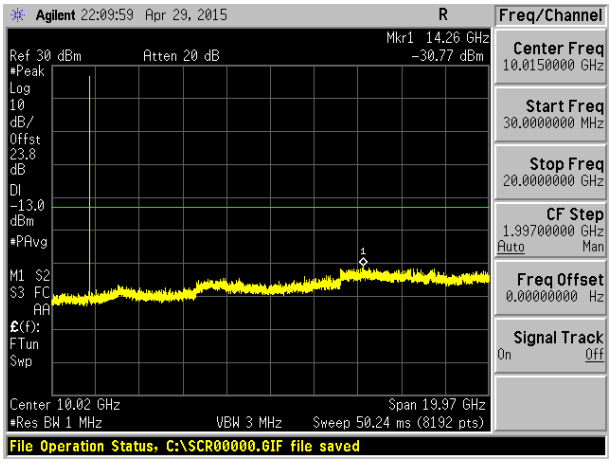

### 5 MHz / 1 RB / 16QAM / MIDDLE CH




### 5 MHz / 1 RB / QPSK / HIGH CH

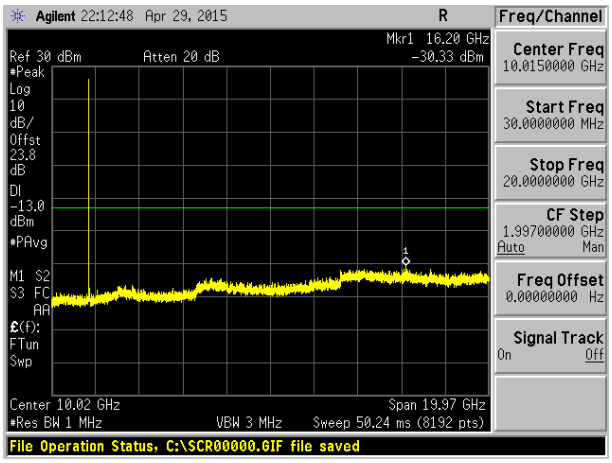



### 5 MHz / 1 RB / 16QAM / HIGH CH

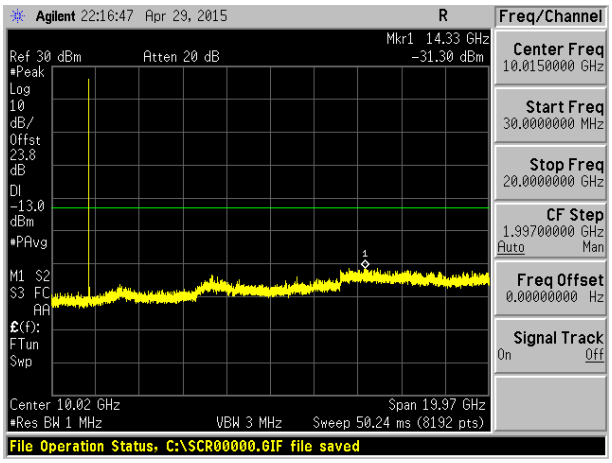


## Band 4

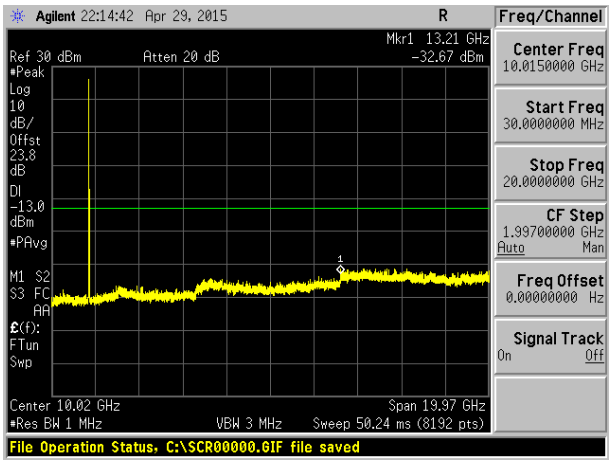
### 10 MHz / 1 RB / QPSK/ LOW CH



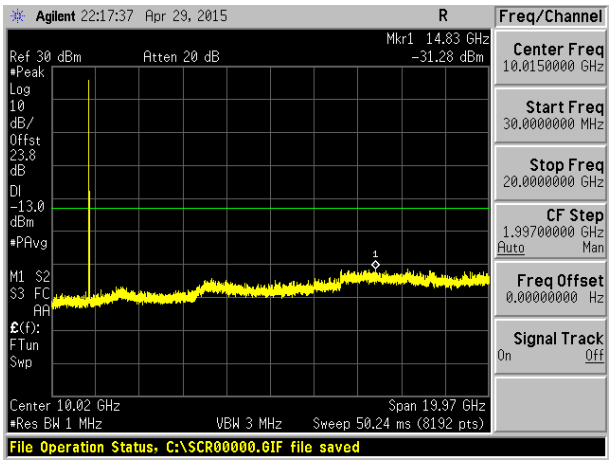

### 10 MHz / 1 RB / 16QAM / LOW CH



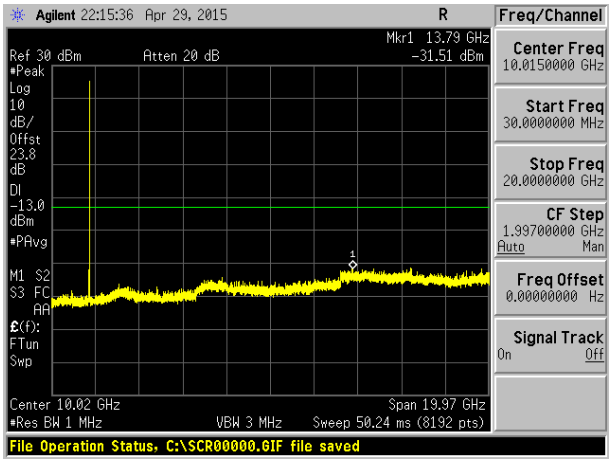

### 10 MHz / 1 RB / QPSK/ MIDDLE CH



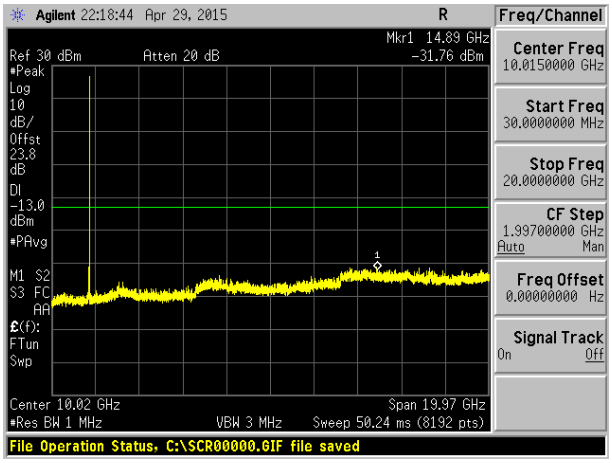

### 10 MHz / 1 RB / 16QAM / MIDDLE CH




### 10 MHz / 1 RB / QPSK / HIGH CH

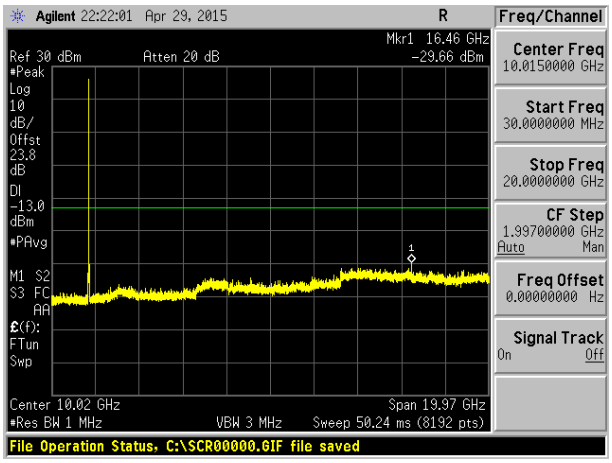



### 10 MHz / 1 RB / 16QAM / HIGH CH

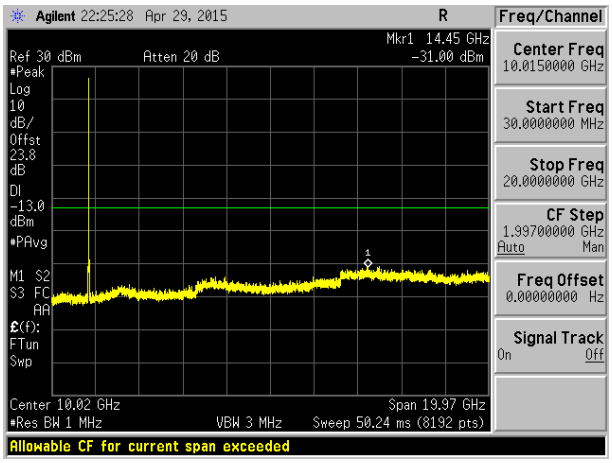


## Band 4

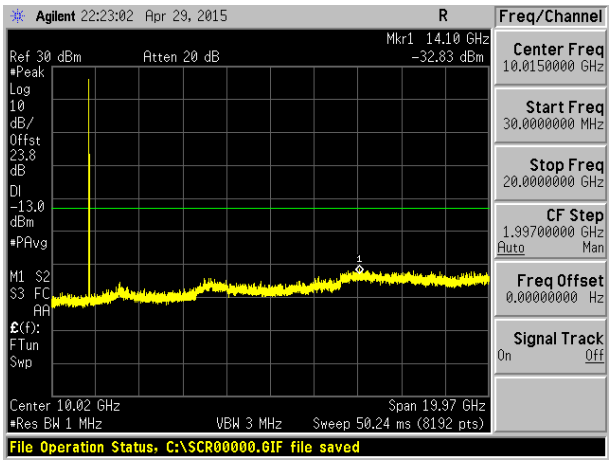
### 15 MHz / 1 RB / QPSK/ LOW CH



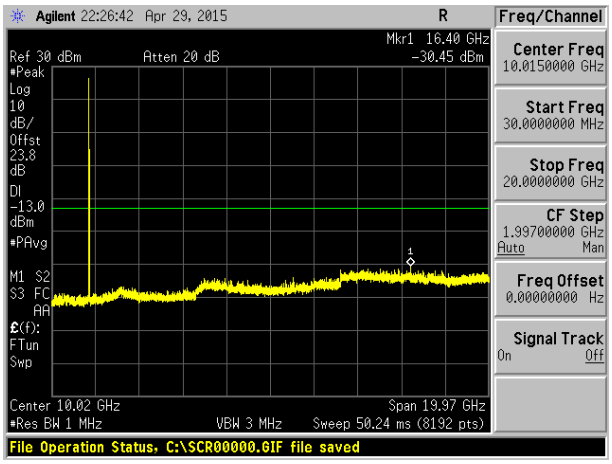

### 15 MHz / 1 RB / 16QAM / LOW CH



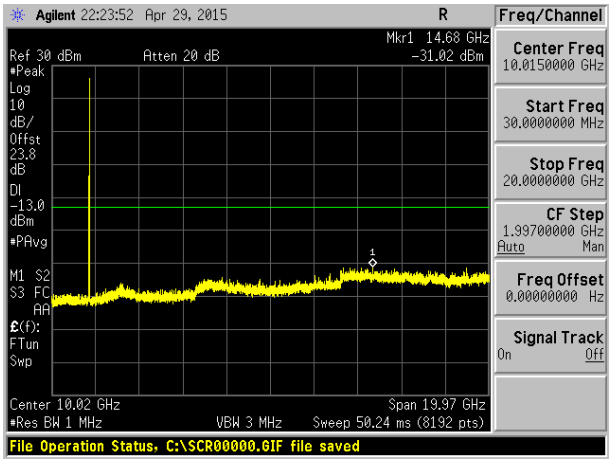

### 15 MHz / 1 RB / QPSK/ MIDDLE CH



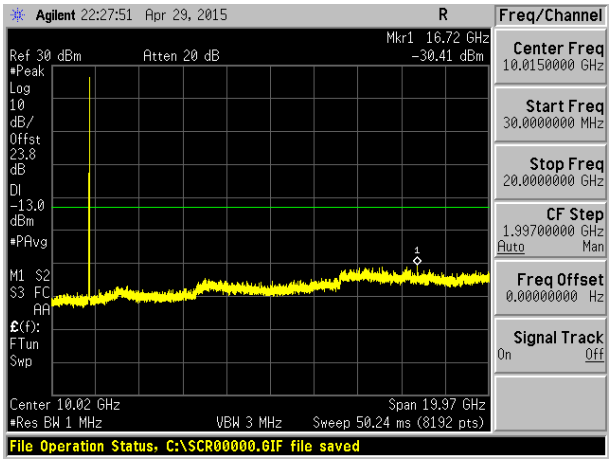

### 15 MHz / 1 RB / 16QAM / MIDDLE CH




### 15 MHz / 1 RB / QPSK / HIGH CH

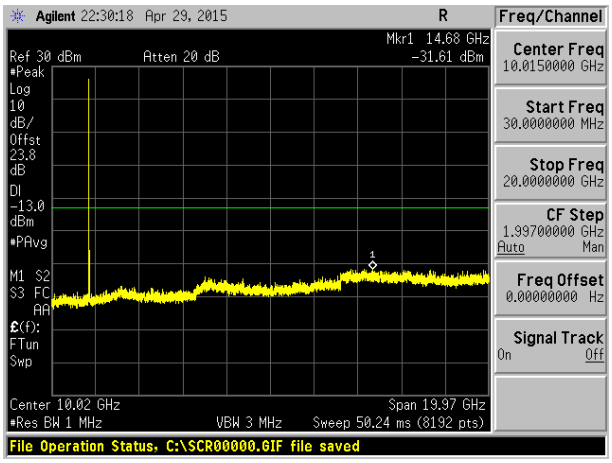



### 15 MHz / 1 RB / 16QAM / HIGH CH

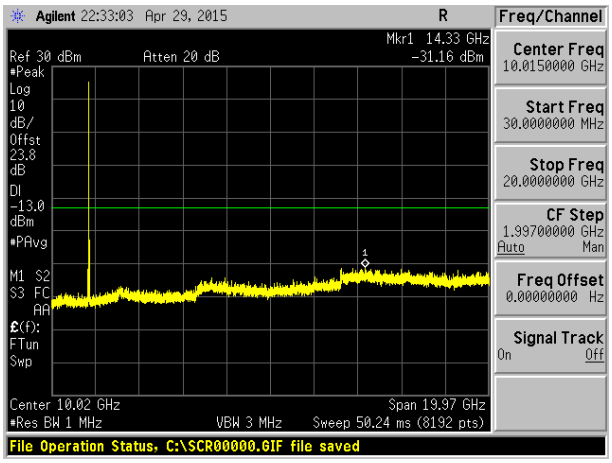


## Band 4

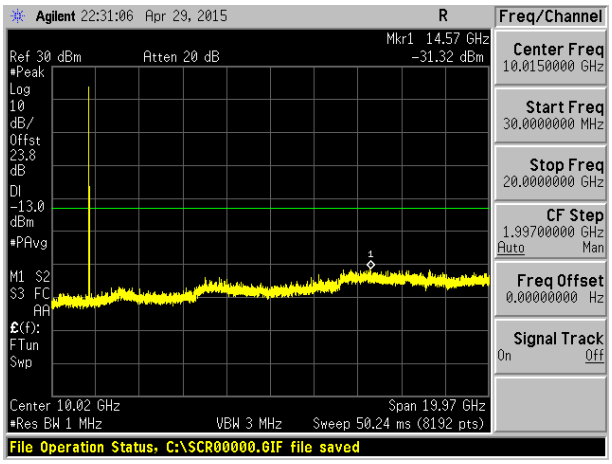
### 20 MHz / 1 RB / QPSK/ LOW CH



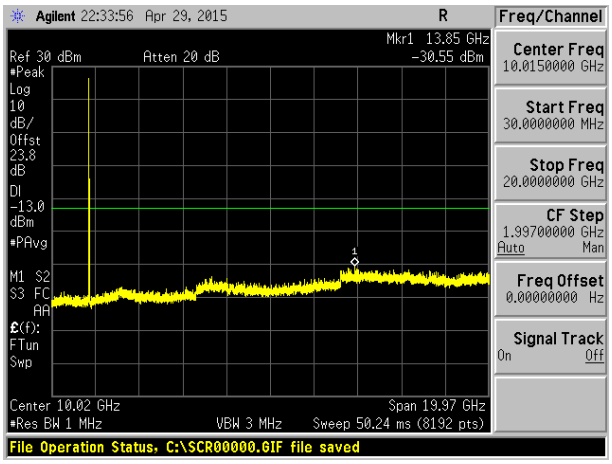

### 20 MHz / 1 RB / 16QAM / LOW CH



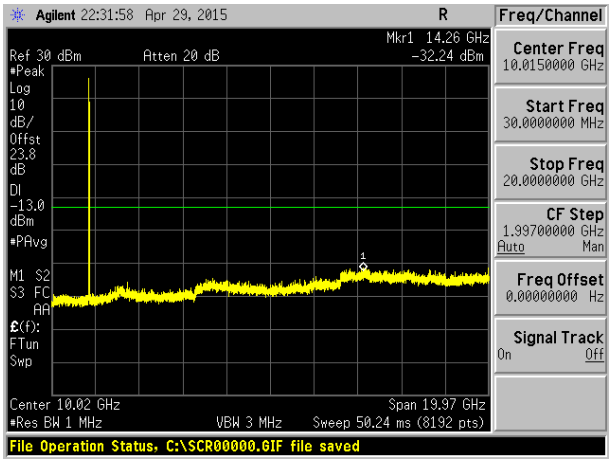

### 20 MHz / 1 RB / QPSK/ MIDDLE CH



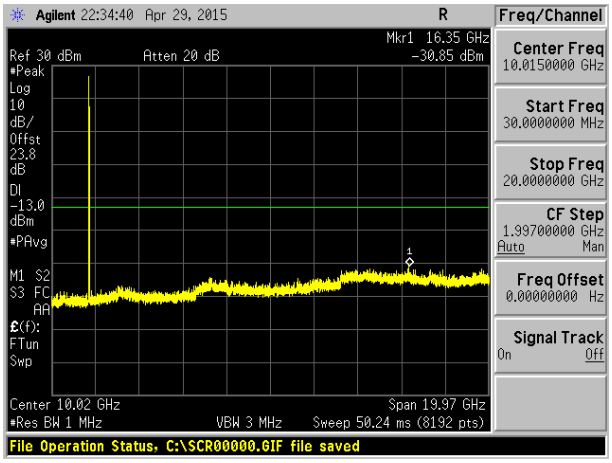

### 20 MHz / 1 RB / 16QAM / MIDDLE CH




### 20 MHz / 1 RB / QPSK / HIGH CH

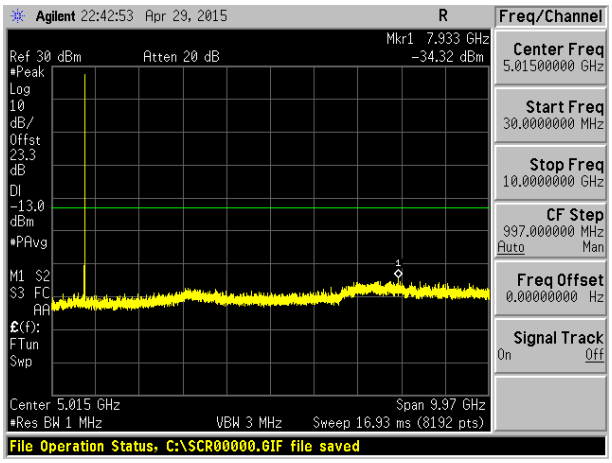



### 20 MHz / 1 RB / 16QAM / HIGH CH

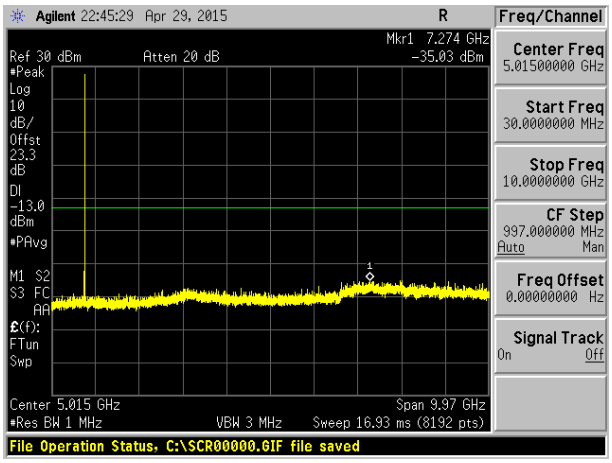


## Band 4

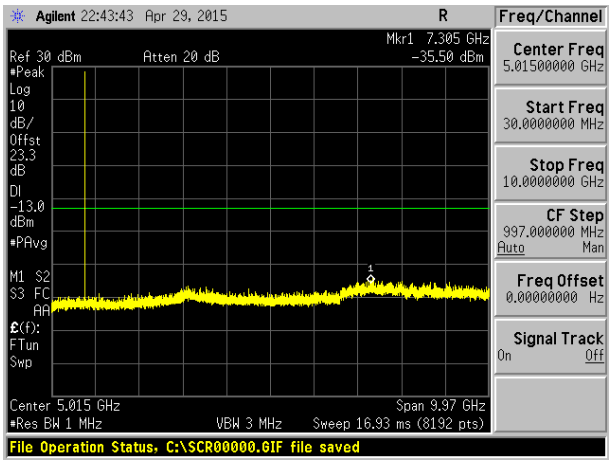
### 5 MHz / 1 RB / QPSK/ LOW CH



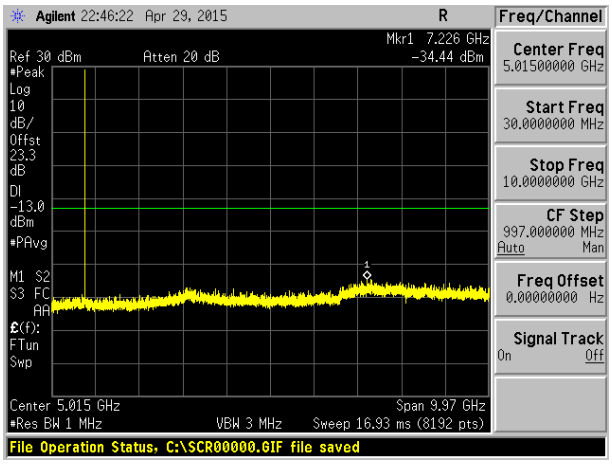

### 5 MHz / 1 RB / 16QAM / LOW CH



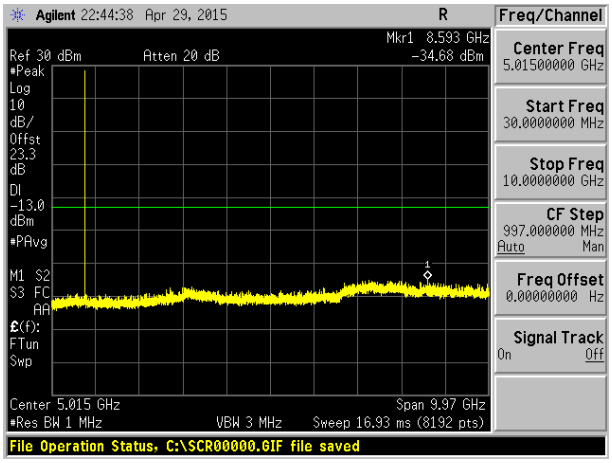

### 5 MHz / 1 RB / QPSK/ MIDDLE CH



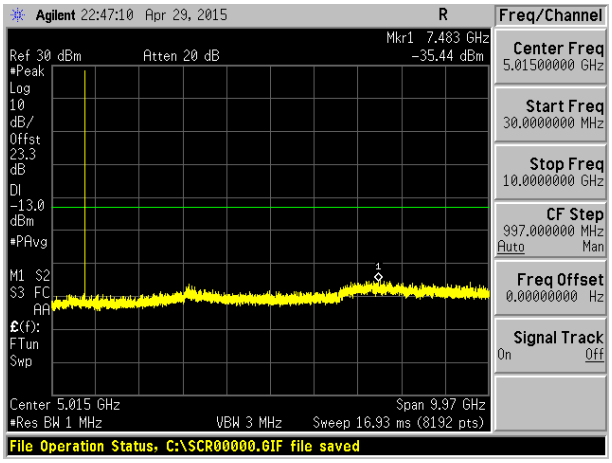

### 5 MHz / 1 RB / 16QAM / MIDDLE CH

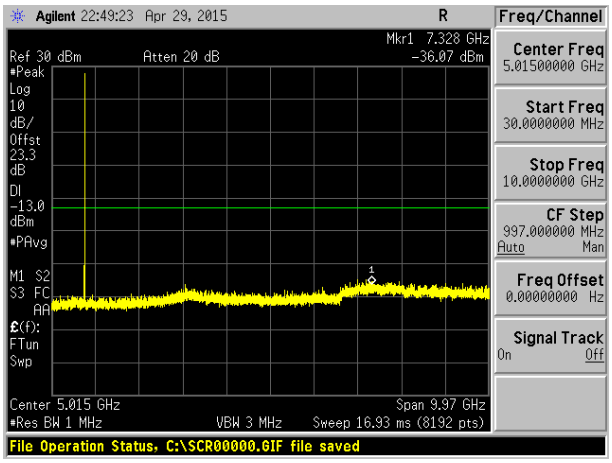
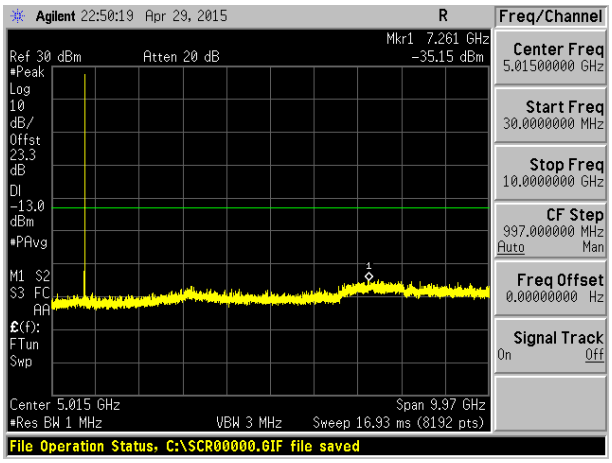



### 5 MHz / 1 RB / QPSK / HIGH CH




### 5 MHz / 1 RB / 16QAM / HIGH CH



| Band 4 | |
|---|---|
| **10 MHz / 1 RB / QPSK** | **10 MHz / 1 RB / 16QAM** |
|  |  |

# 9. Radiated Emission Measurement

## 9.1 Test conditions

| | | |
|---|---|---|
| Temperature: | 20 | ℃ |
| Relative Humidity: | 55 | % |
| Atmospheric Pressure | 1008 | hPa |

## 9.2 Limit for radiated emission measurement

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 +10 log10(P) dB. The limit of emission equal to –13dBm

For operations in the 746–763 MHz, 775–793 MHz, and 805–806 MHz bands, emissions in the band 1559–1610 MHz shall be limited to − 70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and −80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth.

## 9.3 Test procedure

1. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.

2. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the turn table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value" of step a. Record the power level of S.G

3. EIRP = Output power level of S.G –TX cable loss + Antenna gain of substitution horn.

4.E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power - 2.15dBi.

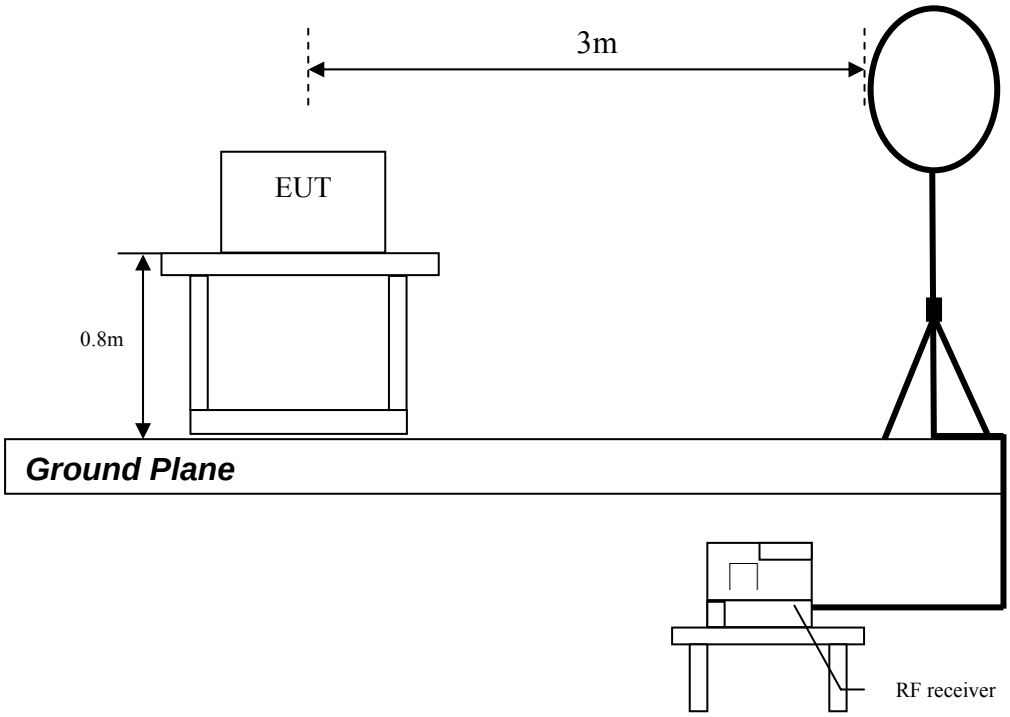
NOTE: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

**9.4 Test diagram**

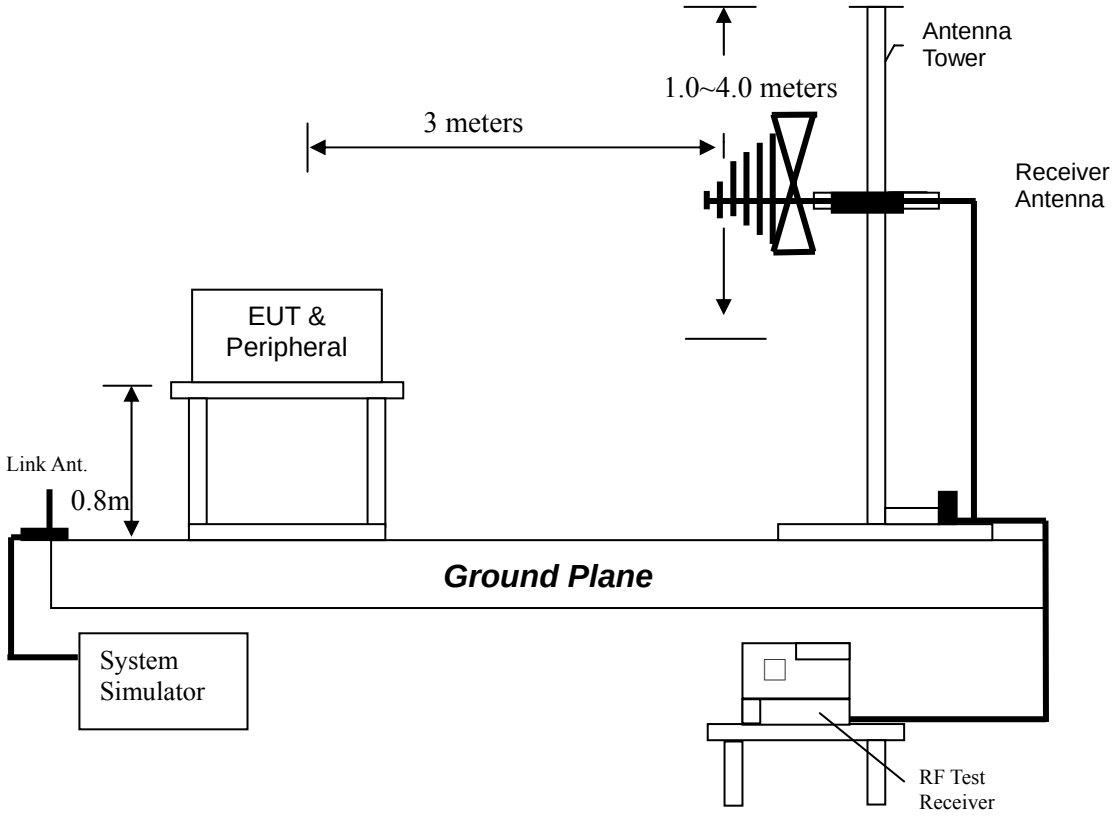
The EUT can only placement in one orthogonal axes.
The final test data was executed under this configuration.

## 9.5 Test configuration

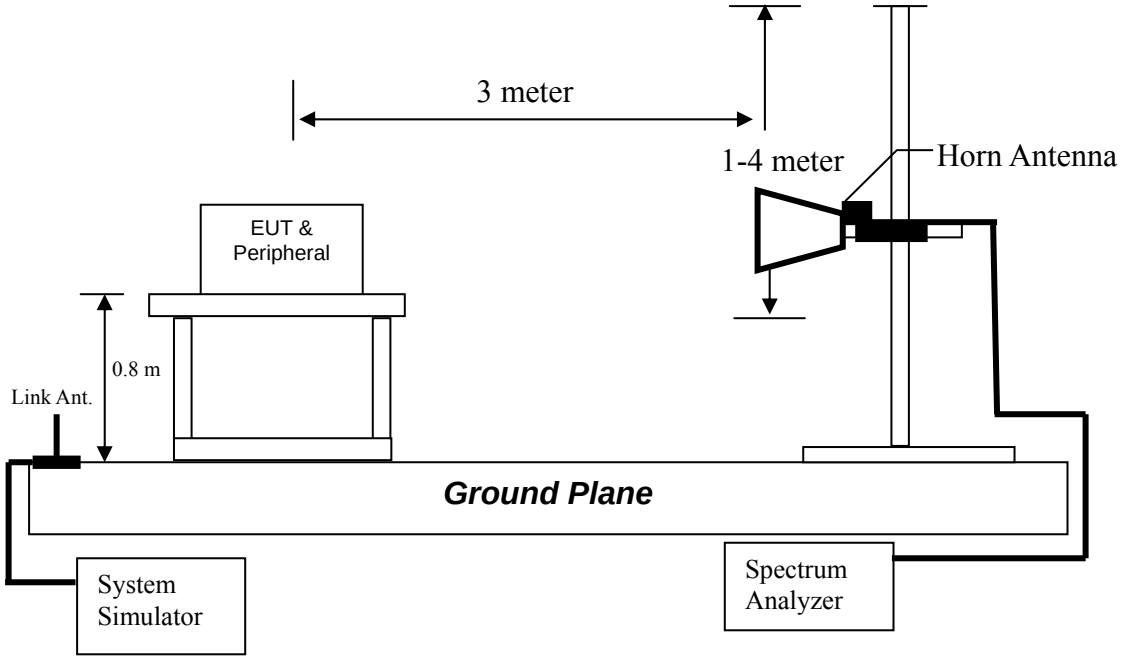
### 9.5.1 Radiated emission from 9 kHz to 30MHz using Loop Antenna



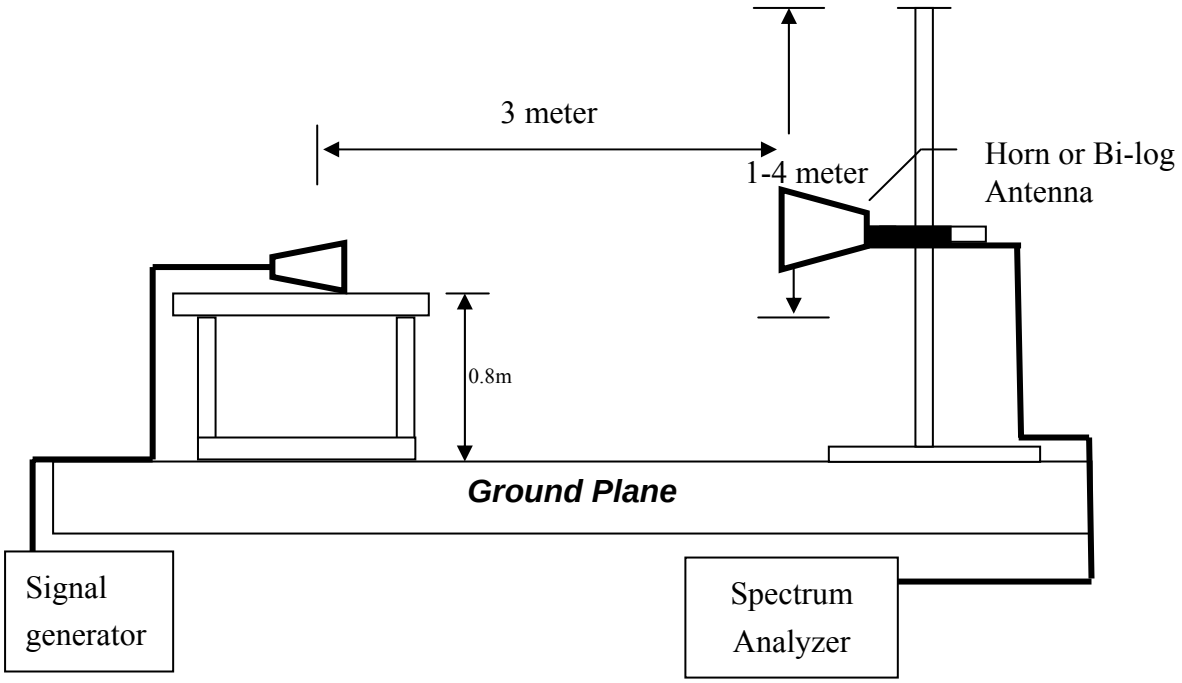
### 9.5.2 Radiated emission below 1GHz using Bilog Antenna



### 9.5.3 Radiated emission above 1GHz using Horn Antenna




### 9.5.4 Radiated emission with Substitution Antenna



### 9.5 Test results

**Average E.I.R.P. for LTE Band 4**

**Channel Bandwidth: 1.4MHz**

| RB | Mode | Channel | Vertical | | Horizontal | | Ant Gain | Cable Loss | Result | | Margin | | Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Frequency (MHz) | S.G. Value (dBm) | Frequency (MHz) | S.G. Value (dBm) | (dBi) | (dB) | Ver | Hor | Ver | Hor | |
| 1-2 | QPSK | Low | 3420 | -43.26 | 3420 | -55.26 | 9.77 | 3.76 | -37.25 | -49.25 | -24.25 | -36.25 | -13 |
| | | | 5131 | -53.59 | 5131 | -54.62 | 10.93 | 6.62 | -49.29 | -50.32 | -36.29 | -37.32 | -13 |
| | | | 6843 | -50.20 | 6843 | -59.33 | 11.93 | 5.85 | -44.13 | -53.26 | -31.13 | -40.26 | -13 |
| | | Middle | 3462 | -43.87 | 3462 | -52.64 | 9.78 | 3.70 | -37.79 | -46.56 | -24.79 | -33.56 | -13 |
| | | | 5198 | -43.20 | 5198 | -48.23 | 10.94 | 7.02 | -39.28 | -44.31 | -26.28 | -31.31 | -13 |
| | | | 6934 | -52.88 | 6934 | -54.76 | 11.85 | 5.30 | -46.33 | -48.21 | -33.33 | -35.21 | -13 |
| | | High | 3504 | -47.79 | 3504 | -54.38 | 9.80 | 3.72 | -41.71 | -48.30 | -28.71 | -35.30 | -13 |
| | | | 5261 | -50.66 | 5261 | -53.41 | 10.95 | 6.63 | -46.34 | -49.09 | -33.34 | -36.09 | -13 |
| | | | 6920 | -58.22 | 6920 | -61.52 | 11.86 | 5.43 | -51.79 | -55.09 | -38.79 | -42.09 | -13 |
| | 16QAM | Low | 3420 | -42.77 | 3420 | -55.26 | 9.77 | 3.76 | -36.76 | -49.25 | -23.76 | -36.25 | -13 |
| | | | 5128 | -52.52 | 5128 | -55.91 | 10.93 | 6.63 | -48.23 | -51.62 | -35.23 | -38.62 | -13 |
| | | | 6843 | -48.70 | 6843 | -59.41 | 11.93 | 5.85 | -42.63 | -53.34 | -29.63 | -40.34 | -13 |
| | | Middle | 3462 | -43.55 | 3462 | -54.71 | 9.78 | 3.70 | -37.47 | -48.63 | -24.47 | -35.63 | -13 |
| | | | 5198 | -44.32 | 5198 | -48.78 | 10.94 | 7.02 | -40.40 | -44.86 | -27.40 | -31.86 | -13 |
| | | | 6934 | -47.24 | 6934 | -54.96 | 11.85 | 5.30 | -40.69 | -48.41 | -27.69 | -35.41 | -13 |
| | | High | 3504 | -47.40 | 3504 | -57.20 | 9.80 | 3.72 | -41.32 | -51.12 | -28.32 | -38.12 | -13 |
| | | | 5261 | -46.94 | 5261 | -54.50 | 10.95 | 6.63 | -42.62 | -50.18 | -29.62 | -37.18 | -13 |
| | | | 7158 | -57.21 | 7158 | -55.40 | 11.64 | 6.17 | -51.74 | -49.93 | -38.74 | -36.93 | -13 |

**Average E.I.R.P. for LTE Band 4**

**Channel Bandwidth: 3MHz**

| RB | Mode | Channel | Vertical | | Horizontal | | Ant Gain | Cable Loss | Result | | Margin | | Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Frequency (MHz) | S.G. Value (dBm) | Frequency (MHz) | S.G. Value (dBm) | (dBi) | (dB) | Ver | Hor | Ver | Hor | |
| 1-7 | QPSK | Low | 3420 | -43.85 | 3420 | -55.13 | 9.77 | 3.76 | -37.84 | -49.12 | -24.84 | -36.12 | -13 |
| | | | 5135 | -53.36 | 5135 | -54.81 | 10.93 | 6.61 | -49.04 | -50.49 | -36.04 | -37.49 | -13 |
| | | | 6850 | -47.88 | 6850 | -60.64 | 11.92 | 5.95 | -41.91 | -54.67 | -28.91 | -41.67 | -13 |
| | | Middle | 3462 | -43.14 | 3462 | -52.05 | 9.78 | 3.70 | -37.06 | -45.97 | -24.06 | -32.97 | -13 |
| | | | 5198 | -44.51 | 5198 | -49.13 | 10.94 | 7.02 | -40.59 | -45.21 | -27.59 | -32.21 | -13 |
| | | | 6934 | -48.10 | 6934 | -55.54 | 11.85 | 5.30 | -41.55 | -48.99 | -28.55 | -35.99 | -13 |
| | | High | 3504 | -45.96 | 3504 | -53.36 | 9.80 | 3.72 | -39.88 | -47.28 | -26.88 | -34.28 | -13 |
| | | | 5261 | -49.55 | 5261 | -55.63 | 10.95 | 6.63 | -45.23 | -51.31 | -32.23 | -38.31 | -13 |
| | | | 6969 | -59.18 | 6969 | -56.24 | 11.82 | 5.54 | -52.90 | -49.96 | -39.90 | -36.96 | -13 |
| | 16QAM | Low | 3420 | -44.06 | 3420 | -52.91 | 9.77 | 3.76 | -38.05 | -46.90 | -25.05 | -33.90 | -13 |
| | | | 5135 | -53.05 | 5135 | -54.23 | 10.93 | 6.61 | -48.73 | -49.91 | -35.73 | -36.91 | -13 |
| | | | 6850 | -53.45 | 6850 | -55.76 | 11.92 | 5.95 | -47.48 | -49.79 | -34.48 | -36.79 | -13 |
| | | Middle | 3462 | -44.97 | 3462 | -53.46 | 9.78 | 3.70 | -38.89 | -47.38 | -25.89 | -34.38 | -13 |
| | | | 5198 | -47.49 | 5198 | -46.20 | 10.94 | 7.02 | -43.57 | -42.28 | -30.57 | -29.28 | -13 |
| | | | 6934 | -50.20 | 6934 | -56.47 | 11.85 | 5.30 | -43.65 | -49.92 | -30.65 | -36.92 | -13 |
| | | High | 3504 | -47.44 | 3504 | -53.32 | 9.80 | 3.72 | -41.36 | -47.24 | -28.36 | -34.24 | -13 |
| | | | 5261 | -48.27 | 5261 | -52.59 | 10.95 | 6.63 | -43.95 | -48.27 | -30.95 | -35.27 | -13 |
| | | | 7018 | -59.67 | 7018 | -61.76 | 11.78 | 6.32 | -54.21 | -56.30 | -41.21 | -43.30 | -13 |

**Average E.I.R.P. for LTE Band 4**

**Channel Bandwidth: 5MHz**

| RB | Mode | Channel | Vertical | | Horizontal | | Ant Gain (dBi) | Cable Loss (dB) | Result | | Margin | | Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Frequency (MHz) | S.G. Value (dBm) | Frequency (MHz) | S.G. Value (dBm) | | | Ver | Hor | Ver | Hor | |
| 1-12 | QPSK | Low | 3420 | -44.43 | 3420 | -54.65 | 9.77 | 3.76 | -38.42 | -48.64 | -25.42 | -35.64 | -13 |
| | | | 5135 | -52.88 | 5135 | -54.74 | 10.93 | 6.61 | -48.56 | -50.42 | -35.56 | -37.42 | -13 |
| | | | 6850 | -52.47 | 6850 | -55.43 | 11.92 | 5.95 | -46.50 | -49.46 | -33.50 | -36.46 | -13 |
| | | Middle | 3462 | -42.64 | 3462 | -52.38 | 9.78 | 3.70 | -36.56 | -46.30 | -23.56 | -33.30 | -13 |
| | | | 5198 | -46.42 | 5198 | -47.50 | 10.94 | 7.02 | -42.50 | -43.58 | -29.50 | -30.58 | -13 |
| | | | 6934 | -51.56 | 6934 | -52.44 | 11.85 | 5.30 | -45.01 | -45.89 | -32.01 | -32.89 | -13 |
| | | High | 3504 | -46.37 | 3504 | -51.14 | 9.80 | 3.72 | -40.29 | -45.06 | -27.29 | -32.06 | -13 |
| | | | 5254 | -49.17 | 5254 | -57.67 | 10.95 | 6.73 | -44.95 | -53.45 | -31.95 | -40.45 | -13 |
| | | | 7018 | -59.42 | 7018 | -61.80 | 11.78 | 6.32 | -53.96 | -56.34 | -40.96 | -43.34 | -13 |
| | 16QAM | Low | 3420 | -43.07 | 3420 | -52.59 | 9.77 | 3.76 | -37.06 | -46.58 | -24.06 | -33.58 | -13 |
| | | | 5135 | -52.80 | 5135 | -53.92 | 10.93 | 6.61 | -48.48 | -49.60 | -35.48 | -36.60 | -13 |
| | | | 6850 | -53.74 | 6850 | -55.59 | 11.92 | 5.95 | -47.77 | -49.62 | -34.77 | -36.62 | -13 |
| | | Middle | 3462 | -44.18 | 3462 | -49.78 | 9.78 | 3.70 | -38.10 | -43.70 | -25.10 | -30.70 | -13 |
| | | | 5198 | -48.59 | 5198 | -48.38 | 10.94 | 7.02 | -44.67 | -44.46 | -31.67 | -31.46 | -13 |
| | | | 6934 | -49.13 | 6934 | -55.85 | 11.85 | 5.30 | -42.58 | -49.30 | -29.58 | -36.30 | -13 |
| | | High | 3504 | -48.74 | 3504 | -52.81 | 9.80 | 3.72 | -42.66 | -46.73 | -29.66 | -33.73 | -13 |
| | | | 5254 | -49.61 | 5254 | -56.06 | 10.95 | 6.73 | -45.39 | -51.84 | -32.39 | -38.84 | -13 |
| | | | 7011 | -59.21 | 7011 | -61.04 | 11.79 | 6.26 | -53.68 | -55.51 | -40.68 | -42.51 | -13 |

**Average E.I.R.P. for LTE Band 4**

**Channel Bandwidth: 10MHz**

| RB | Mode | Channel | Vertical | | Horizontal | | Ant | Cable | Result | | Margin | | Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Frequency (MHz) | S.G. Value (dBm) | Frequency (MHz) | S.G. Value (dBm) | Gain (dBi) | Loss (dB) | Ver | Hor | Ver | Hor | |
| 1-49 | QPSK | Low | 3434 | -43.37 | 3434 | -51.50 | 9.77 | 3.73 | -37.33 | -45.46 | -24.33 | -32.46 | -13 |
| | | | 5156 | -47.94 | 5156 | -50.92 | 10.93 | 6.62 | -43.63 | -46.61 | -30.63 | -33.61 | -13 |
| | | | 6878 | -53.86 | 6878 | -55.92 | 11.90 | 5.76 | -47.72 | -49.78 | -34.72 | -36.78 | -13 |
| | | Middle | 3469 | -46.19 | 3469 | -53.37 | 9.79 | 3.70 | -40.11 | -47.29 | -27.11 | -34.29 | -13 |
| | | | 5212 | -42.58 | 5212 | -48.70 | 10.94 | 6.98 | -38.62 | -44.74 | -25.62 | -31.74 | -13 |
| | | | 6948 | -59.10 | 6948 | -56.17 | 11.84 | 5.17 | -52.43 | -49.50 | -39.43 | -36.50 | -13 |
| | | High | 3511 | -48.85 | 3511 | -54.81 | 9.80 | 3.75 | -42.81 | -48.77 | -29.81 | -35.77 | -13 |
| | | | 5261 | -47.68 | 5261 | -52.69 | 10.95 | 6.63 | -43.36 | -48.37 | -30.36 | -35.37 | -13 |
| | | | 7018 | -59.53 | 7018 | -61.42 | 11.78 | 6.32 | -54.07 | -55.96 | -41.07 | -42.96 | -13 |
| | 16QAM | Low | 3441 | -44.41 | 3441 | -51.67 | 9.78 | 3.72 | -38.35 | -45.61 | -25.35 | -32.61 | -13 |
| | | | 5156 | -47.67 | 5156 | -48.99 | 10.93 | 6.62 | -43.36 | -44.68 | -30.36 | -31.68 | -13 |
| | | | 6878 | -50.66 | 6878 | -55.08 | 11.90 | 5.76 | -44.52 | -48.94 | -31.52 | -35.94 | -13 |
| | | Middle | 3469 | -47.98 | 3469 | -53.27 | 9.79 | 3.70 | -41.90 | -47.19 | -28.90 | -34.19 | -13 |
| | | | 5212 | -45.93 | 5212 | -50.51 | 10.94 | 6.98 | -41.97 | -46.55 | -28.97 | -33.55 | -13 |
| | | | 6948 | -59.64 | 6948 | -53.54 | 11.84 | 5.17 | -52.97 | -46.87 | -39.97 | -33.87 | -13 |
| | | High | 3504 | -46.83 | 3504 | -51.16 | 9.80 | 3.72 | -40.75 | -45.08 | -27.75 | -32.08 | -13 |
| | | | 5261 | -49.07 | 5261 | -53.99 | 10.95 | 6.63 | -44.75 | -49.67 | -31.75 | -36.67 | -13 |
| | | | 7018 | -59.32 | 7018 | -61.79 | 11.78 | 6.32 | -53.86 | -56.33 | -40.86 | -43.33 | -13 |

**Average E.I.R.P. for LTE Band 4**

**Channel Bandwidth: 15MHz**

| RB | Mode | Channel | Vertical | | Horizontal | | Ant Gain (dBi) | Cable Loss (dB) | Result | | Margin | | Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Frequency (MHz) | S.G. Value (dBm) | Frequency (MHz) | S.G. Value (dBm) | | | Ver | Hor | Ver | Hor | |
| 1-37 | QPSK | Low | 3434 | -43.97 | 3434 | -52.53 | 9.77 | 3.73 | -37.93 | -46.49 | -24.93 | -33.49 | -13 |
| | | | 5149 | -46.44 | 5149 | -56.63 | 10.93 | 6.57 | -42.08 | -52.27 | -29.08 | -39.27 | -13 |
| | | | 6871 | -48.70 | 6871 | -52.75 | 11.90 | 5.81 | -42.61 | -46.66 | -29.61 | -33.66 | -13 |
| | | Middle | 3462 | -43.52 | 3462 | -52.83 | 9.78 | 3.70 | -37.44 | -46.75 | -24.44 | -33.75 | -13 |
| | | | 5198 | -46.68 | 5198 | -48.68 | 10.94 | 7.02 | -42.76 | -44.76 | -29.76 | -31.76 | -13 |
| | | | 6934 | -50.45 | 6934 | -54.76 | 11.85 | 5.30 | -43.90 | -48.21 | -30.90 | -35.21 | -13 |
| | | High | 3490 | -47.63 | 3490 | -54.25 | 9.80 | 3.70 | -41.53 | -48.15 | -28.53 | -35.15 | -13 |
| | | | 5240 | -54.67 | 5240 | -60.53 | 10.95 | 6.84 | -50.56 | -56.42 | -37.56 | -43.42 | -13 |
| | | | 6990 | -59.51 | 6990 | -62.00 | 11.81 | 5.97 | -53.67 | -56.16 | -40.67 | -43.16 | -13 |
| | 16QAM | Low | 3434 | -44.47 | 3434 | -54.99 | 9.77 | 3.73 | -38.43 | -48.95 | -25.43 | -35.95 | -13 |
| | | | 5156 | -48.30 | 5156 | -47.92 | 10.93 | 6.62 | -43.99 | -43.61 | -30.99 | -30.61 | -13 |
| | | | 6871 | -47.84 | 6871 | -55.35 | 11.90 | 5.81 | -41.75 | -49.26 | -28.75 | -36.26 | -13 |
| | | Middle | 3462 | -44.75 | 3462 | -54.72 | 9.78 | 3.70 | -38.67 | -48.64 | -25.67 | -35.64 | -13 |
| | | | 5198 | -44.95 | 5198 | -48.41 | 10.94 | 7.02 | -41.03 | -44.49 | -28.03 | -31.49 | -13 |
| | | | 6934 | -50.83 | 6934 | -56.59 | 11.85 | 5.30 | -44.28 | -50.04 | -31.28 | -37.04 | -13 |
| | | High | 3490 | -48.77 | 3490 | -48.16 | 9.80 | 3.70 | -42.67 | -42.06 | -29.67 | -29.06 | -13 |
| | | | 5240 | -54.92 | 5240 | -41.24 | 10.95 | 6.84 | -50.81 | -37.13 | -37.81 | -24.13 | -13 |
| | | | 6990 | -59.79 | 6990 | -43.96 | 11.81 | 5.97 | -53.95 | -38.12 | -40.95 | -25.12 | -13 |

**Average E.I.R.P. for LTE Band 4**

**Channel Bandwidth: 20MHz**

| RB | Mode | Channel | Vertical | | Horizontal | | Ant Gain (dBi) | Cable Loss (dB) | Result | | Margin | | Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Frequency (MHz) | S.G. Value (dBm) | Frequency (MHz) | S.G. Value (dBm) | | | Ver | Hor | Ver | Hor | |
| 1-0 | QPSK | Low | 3420 | -45.57 | 3420 | -56.09 | 9.77 | 3.76 | -39.56 | -50.08 | -26.56 | -37.08 | -13 |
| | | | 5135 | -51.76 | 5135 | -57.15 | 10.93 | 6.61 | -47.44 | -52.83 | -34.44 | -39.83 | -13 |
| | | | 6843 | -51.95 | 6843 | -60.01 | 11.93 | 5.85 | -45.88 | -53.94 | -32.88 | -40.94 | -13 |
| | | Middle | 3448 | -44.63 | 3448 | -53.49 | 9.78 | 3.71 | -38.56 | -47.42 | -25.56 | -34.42 | -13 |
| | | | 5170 | -45.91 | 5170 | -48.31 | 10.93 | 6.75 | -41.73 | -44.13 | -28.73 | -31.13 | -13 |
| | | | 6892 | -51.07 | 6892 | -55.91 | 11.89 | 5.67 | -44.85 | -49.69 | -31.85 | -36.69 | -13 |
| | | High | 3469 | -44.04 | 3469 | -53.33 | 9.79 | 3.70 | -37.96 | -47.25 | -24.96 | -34.25 | -13 |
| | | | 5205 | -45.51 | 5205 | -47.33 | 10.94 | 7.01 | -41.58 | -43.40 | -28.58 | -30.40 | -13 |
| | | | 6948 | -52.43 | 6948 | -55.81 | 11.84 | 5.17 | -45.76 | -49.14 | -32.76 | -36.14 | -13 |
| | 16QAM | Low | 3420 | -46.73 | 3420 | -57.03 | 9.77 | 3.76 | -40.72 | -51.02 | -27.72 | -38.02 | -13 |
| | | | 5135 | -51.39 | 5135 | -57.13 | 10.93 | 6.61 | -47.07 | -52.81 | -34.07 | -39.81 | -13 |
| | | | 6843 | -51.52 | 6843 | -60.03 | 11.93 | 5.85 | -45.45 | -53.96 | -32.45 | -40.96 | -13 |
| | | Middle | 3448 | -45.61 | 3448 | -54.54 | 9.78 | 3.71 | -39.54 | -48.47 | -26.54 | -35.47 | -13 |
| | | | 5170 | -45.02 | 5170 | -50.03 | 10.93 | 6.75 | -40.84 | -45.85 | -27.84 | -32.85 | -13 |
| | | | 6892 | -49.91 | 6892 | -55.53 | 11.89 | 5.67 | -43.69 | -49.31 | -30.69 | -36.31 | -13 |
| | | High | 3469 | -44.52 | 3469 | -52.18 | 9.79 | 3.70 | -38.44 | -46.10 | -25.44 | -33.10 | -13 |
| | | | 5205 | -45.89 | 5205 | -47.59 | 10.94 | 7.01 | -41.96 | -43.66 | -28.96 | -30.66 | -13 |
| | | | 6948 | -52.63 | 6948 | -55.65 | 11.84 | 5.17 | -45.96 | -48.98 | -32.96 | -35.98 | -13 |

**Average E.R.P. for LTE Band 13**

**Channel Bandwidth: 5MHz**

| RB | Mode | Channel | Vertical | | Horizontal | | Ant Gain (dBi) | Cable Loss (dB) | Result | | Margin | | Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Frequency (MHz) | S.G. Value (dBm) | Frequency (MHz) | S.G. Value (dBm) | | | Ver | Hor | Ver | Hor | |
| 1-0 | QPSK | Low | 1553 | -68.72 | 1553 | -63.82 | 8.64 | 2.56 | -62.64 | -57.74 | -22.64 | -17.74 | -40 |
| | | | 2330 | -59.97 | 2330 | -62.49 | 9.53 | 3.66 | -54.10 | -56.62 | -41.10 | -43.62 | -13 |
| | | | 3016 | -62.60 | 3016 | -64.70 | 9.61 | 3.85 | -56.84 | -58.94 | -43.84 | -45.94 | -13 |
| | | Middle | 1518 | -70.87 | 1518 | -67.09 | 8.61 | 2.51 | -64.77 | -60.99 | -24.77 | -20.99 | -40 |
| | | | 2337 | -62.00 | 2337 | -62.79 | 9.54 | 3.67 | -56.13 | -56.92 | -43.13 | -43.92 | -13 |
| | | | 3121 | -64.93 | 3121 | -67.46 | 9.65 | 3.89 | -59.17 | -61.70 | -46.17 | -48.70 | -13 |
| | | High | 1560 | -69.20 | 1560 | -66.09 | 8.65 | 2.56 | -63.11 | -60.00 | -23.11 | -20.00 | -40 |
| | | | 2344 | -62.64 | 2344 | -64.81 | 9.55 | 3.68 | -56.77 | -58.94 | -43.77 | -45.94 | -13 |
| | | | 3162 | -63.63 | 3162 | -67.39 | 9.66 | 3.90 | -57.87 | -61.63 | -44.87 | -48.63 | -13 |
| | 16QAM | Low | 1553 | -68.20 | 1553 | -64.43 | 8.64 | 2.56 | -62.12 | -58.35 | -22.12 | -18.35 | -40 |
| | | | 2330 | -59.24 | 2330 | -62.78 | 9.53 | 3.66 | -53.37 | -56.91 | -40.37 | -43.91 | -13 |
| | | | 3016 | -62.66 | 3016 | -64.97 | 9.61 | 3.85 | -56.90 | -59.21 | -43.90 | -46.21 | -13 |
| | | Middle | 1518 | -69.94 | 1518 | -66.77 | 8.61 | 2.51 | -63.84 | -60.67 | -23.84 | -20.67 | -40 |
| | | | 2337 | -60.49 | 2337 | -64.73 | 9.54 | 3.67 | -54.62 | -58.86 | -41.62 | -45.86 | -13 |
| | | | 3121 | -64.96 | 3121 | -67.50 | 9.65 | 3.89 | -59.20 | -61.74 | -46.20 | -48.74 | -13 |
| | | High | 1560 | -69.15 | 1560 | -68.49 | 8.65 | 2.56 | -63.06 | -62.40 | -23.06 | -22.40 | -40 |
| | | | 2344 | -62.80 | 2344 | -63.75 | 9.55 | 3.68 | -56.93 | -57.88 | -43.93 | -44.88 | -13 |
| | | | 3128 | -64.17 | 3128 | -67.93 | 9.65 | 3.89 | -58.41 | -62.17 | -45.41 | -49.17 | -13 |

**Average E.R.P. for LTE Band 13**

**Channel Bandwidth: 10MHz**

| RB | Mode | Channel | Vertical | | Horizontal | | Ant Gain (dBi) | Cable Loss (dB) | Result | | Margin | | Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Frequency (MHz) | S.G. Value (dBm) | Frequency (MHz) | S.G. Value (dBm) | | | Ver | Hor | Ver | Hor | |
| 1-49 | QPSK | Middle | 1567 | -69.10 | 1567 | -66.71 | 8.65 | 2.56 | -63.00 | -60.61 | -23.00 | -20.61 | -40 |
| | | | 2358 | -61.83 | 2358 | -64.00 | 9.57 | 2.91 | -55.17 | -57.34 | -42.17 | -44.34 | -13 |
| | | | 3128 | -64.65 | 3128 | -67.53 | 9.65 | 3.89 | -58.89 | -61.77 | -45.89 | -48.77 | -13 |
| | 16QAM | Middle | 1567 | -69.45 | 1567 | -66.74 | 8.65 | 2.56 | -63.35 | -60.64 | -23.35 | -20.64 | -40 |
| | | | 2358 | -60.79 | 2358 | -63.04 | 9.57 | 2.91 | -54.13 | -56.38 | -41.13 | -43.38 | -13 |
| | | | 3128 | -64.76 | 3128 | -67.51 | 9.65 | 3.89 | -59.00 | -61.75 | -46.00 | -48.75 | -13 |

# Appendix A: Test equipments list

| Equipment | Brand | Model No. | Serial No. | Calibration Date | Next Calibration Date |
|---|---|---|---|---|---|
| ESCI EMI Test Receiver | Rohde & Schwarz | ESCI | 100018 | 2014/12/02 | 2015/12/01 |
| Spectrum Analyzer | Rohde & Schwarz | FSP30 | 100137 | 2014/06/16 | 2015/06/15 |
| Spectrum Analyzer | Rohde & Schwarz | FSEK30 | 100186 | 2015/01/14 | 2016/01/13 |
| Horn Antenna (1-18G) | Schwarzbeck | BBHA 9120 D | 9120D-456 | 2014/08/29 | 2017/08/27 |
| Horn Antenna (14-42G) | SHWARZBECK | BBHA 9170 | BBHA9170159 | 2014/09/16 | 2017/09/14 |
| Broadband Antenna | SCHWARZBECK | VULB 9168 | 9168-172 | 2013/08/08 | 2015/08/07 |
| Loop Antenna | RolfHeine | LA-285 | 02/10033 | 2014/03/18 | 2017/03/16 |
| Pre-Amplifier | MITEQ | AFS44-00102650--42-10P-44 | 1495287 | 2013/10/27 | 2015/10/26 |
| Pre-Amplifier | MITEQ | JS4-26004000--27-8A | 828825 | 2014/09/15 | 2015/09/14 |
| Power Meter | Anritsu | ML2495A | 0844001 | 2014/11/12 | 2015/11/11 |
| Power Senor | Anritsu | MA2411B | 0738452 | 2014/11/12 | 2015/11/11 |
| Two-Line -V-Network | Rohde & Schwarz | ESH3-Z5 | 825562/003 | 2014/10/15 | 2015/10/14 |
| Two-Line V-Network | Rohde & Schwarz | ESH3-Z5 | 838979/014 | 2014/10/05 | 2015/10/4 |
| Simulator | Rohde & Schwarz | CMW 500 | 124781 | 2014/10/03 | 2015/10/02 |
| Spectrum Analyzer | Agilent | N9030A | MY51380492 | 2014/09/19 | 2015/09/18 |
| Brand | | Software | | Version | |
| ADT | | Radiated test system | | 7.5.14 | |

## Appendix B: Measurement Uncertainty

Measurement uncertainty was calculated in accordance with TR 100 028-1.

| Parameter | Uncertainty | | |
|---|---|---|---|
| Radiated Emission | Below 1 GHz | Vertical | 3.90 dB |
| | | Horizontal | 3.86 dB |
| | 1G~18GHz | Vertical | 4.19 dB |
| | | Horizontal | 4.30 dB |
| | 18GHz~40GHz | Vertical | 2.92 dB |
| | | Horizontal | 2.90 dB |
| Conducted Output power | 0.86 dB | | |
| Conducted Spurious Emission | 0.84 dB | | |

This uncertainty represents an expanded uncertainty expressed at approximately the 95 %