

## FCC Test Report

### (Part 27)

**Report No.:** RF170328D10-1

**FCC ID:** P27LC4RT1

**Test Model:** LC4R-T

**Received Date:** Jun. 17, 2016

**Test Date:** Jun. 29 ~ 30, 2016, Nov. 10, 2016 & Mar. 29 ~ 30, 2017

**Issued Date:** Mar. 31, 2017

**Applicant:** Sercomm Corp.

**Address:** 8F, No. 3-1, YuanQu St., NanKang, Taipei 115, Taiwan, R.O.C.

**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

**Lab Address:** No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan, R.O.C.



This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specifically mentioned, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification. The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.

## Table of Contents

|   |           |
|---|-----------|
| <b>Release Control Record</b> .....                             | <b>3</b>  |
| <b>1 Certificate of Conformity</b> .....                        | <b>4</b>  |
| <b>2 Summary of Test Results</b> .....                          | <b>5</b>  |
| 2.1 Measurement Uncertainty .....                               | 5         |
| 2.2 Test Site and Instruments.....                              | 6         |
| <b>3 General Information</b> .....                              | <b>9</b>  |
| 3.1 General Description of EUT.....                             | 9         |
| 3.2 Configuration of System Under Test .....                    | 10        |
| 3.2.1 Description of Support Units .....                        | 10        |
| 3.3 Test Mode Applicability and Tested Channel Detail .....     | 11        |
| 3.4 EUT Operating Conditions.....                               | 12        |
| 3.5 General Description of Applied Standards.....               | 12        |
| <b>4 Test Types and Results</b> .....                           | <b>13</b> |
| 4.1 Output Power Measurement.....                               | 13        |
| 4.1.1 Limits of Output Power Measurement.....                   | 13        |
| 4.1.2 Test Procedures .....                                     | 13        |
| 4.1.3 Test Setup .....  | 14        |
| 4.1.4 Test Results.....   | 15        |
| 4.2 Frequency Stability Measurement .....                       | 18        |
| 4.2.1 Limits of Frequency Stability Measurement .....           | 18        |
| 4.2.2 Test Procedure .....                                      | 18        |
| 4.2.3 Test Setup .....  | 18        |
| 4.2.4 Test Results.....   | 19        |
| 4.3 Emission Bandwidth Measurement.....                         | 23        |
| 4.3.1 Limits of Emission Bandwidth Measurement .....            | 23        |
| 4.3.2 Test Procedure .....                                      | 23        |
| 4.3.3 Test Setup .....  | 23        |
| 4.3.4 Test Result .....   | 24        |
| 4.4 Channel Edge Measurement .....                              | 26        |
| 4.4.1 Limits of Band Edge Measurement .....                     | 26        |
| 4.4.2 Test Setup .....  | 26        |
| 4.4.3 Test Procedures .....                                     | 26        |
| 4.4.4 Test Results.....   | 27        |
| 4.5 Peak To Average Ratio.....                                  | 39        |
| 4.5.1 Limits of Peak To Average Ratio Measurement .....         | 39        |
| 4.5.2 Test Setup .....  | 39        |
| 4.5.3 Test Procedures .....                                     | 39        |
| 4.5.4 Test Results.....   | 40        |
| 4.6 Conducted Spurious Emissions .....                          | 41        |
| 4.6.1 Limits of Conducted Spurious Emissions Measurement .....  | 41        |
| 4.6.2 Test Setup .....  | 41        |
| 4.6.3 Test Procedure .....                                      | 41        |
| 4.6.4 Test Results.....   | 42        |
| 4.7 Radiated Emission Measurement .....                         | 58        |
| 4.7.1 Limits of Radiated Emission Measurement .....             | 58        |
| 4.7.2 Test Procedure .....                                      | 58        |
| 4.7.3 Deviation from Test Standard.....                         | 58        |
| 4.7.4 Test Setup .....  | 59        |
| 4.7.5 Test Results.....   | 60        |
| <b>5 Pictures of Test Arrangements</b> .....                    | <b>65</b> |
| <b>Appendix – Information on the Testing Laboratories</b> ..... | <b>66</b> |

### Release Control Record

| Issue No.     | Description       | Date Issued   |
|---------------|-------------------|---------------|
| RF170328D10-1 | Original release. | Mar. 31, 2017 |

## 1 Certificate of Conformity

**Product:** Ninja LTE module  
**Brand:** Sercomm  
**Test Model:** LC4R-T  
**Sample Status:** Engineering sample  
**Applicant:** Sercomm Corp.  
**Test Date:** Jun. 29 ~ 30, 2016, Nov. 10, 2016 & Mar. 29 ~ 30, 2017  
**Standards:** FCC Part 27, Subpart H, M

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by :



, Date:

Mar. 31, 2017

Celia Chen / Supervisor

Approved by :



, Date:

Mar. 31, 2017

Rex Lai / Assistant Manager

## 2 Summary of Test Results

| Applied Standard: FCC Part 27 & Part 2 |  |        |  |
|--|--|--------|--|
| FCC Clause                             | Test Item  | Result | Remarks  |
| LTE Band 41                            |  |        |  |
| 2.1046<br>27.50(h)                     | Transmitter Output Power   | Pass   | Meet the requirement of limit.   |
| ----                                   | Peak To Average Ratio  | Pass   | Meet the requirement of limit.   |
| 2.1055<br>27.54                        | Frequency Stability<br>Stay with the authorized bands of operation | Pass   | Meet the requirement of limit.   |
| 2.1049<br>27.53(m)(6)                  | Emission Bandwidth   | Pass   | Meet the requirement of limit.   |
| 2.1051<br>27.53(m)                     | Band Edge Measurements   | Pass   | Meet the requirement of limit.   |
| 2.1051<br>27.53(h)                     | Conducted Spurious Emissions                                       | Pass   | Meet the requirement of limit.   |
| 2.1053<br>27.53(m)(4)(6)               | Radiated Spurious Emissions  | Pass   | Meet the requirement of limit.<br>Minimum passing margin is<br>-8.24 dB at 5028.97MHz. |

### 2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

| Measurement                    | Frequency       | Expanded Uncertainty<br>(k=2) ( $\pm$ ) |
|--------------------------------|-----------------|---|
| Radiated Emissions up to 1 GHz | 30MHz ~ 1000MHz | 5.54 dB                                 |
| Radiated Emissions above 1 GHz | 1GHz ~ 40GHz    | 5.48 dB                                 |

## 2.2 Test Site and Instruments

For all test items (Tested channel: 39790, 40040, 40290, 40990, 41240, 41490) except for Radiated Spurious Emissions test

| DESCRIPTION & MANUFACTURER                 | MODEL NO.            | SERIAL NO.     | CALIBRATED DATE | CALIBRATED UNTIL |
|--|----------------------|----------------|-----------------|------------------|
| HP Preamplifier                            | 8447D                | 2432A03504     | Feb. 26, 2016   | Feb. 25, 2017    |
| HP Preamplifier                            | 8449B                | 3008A01201     | Feb. 26, 2016   | Feb. 25, 2017    |
| MITEQ Preamplifier                         | AMF-6F-260400-33-8P  | 892164         | Mar. 01, 2016   | Feb. 28, 2017    |
| Agilent<br>TEST RECEIVER                   | N9038A               | MY51210129     | Feb. 02, 2016   | Feb. 01, 2017    |
| Schwarzbeck Antenna                        | VULB 9168            | 139            | Jan. 04, 2016   | Jan. 03, 2017    |
| Schwarzbeck Antenna                        | VHBA 9123            | 480            | May 29, 2015    | May 28, 2017     |
| Schwarzbeck Horn Antenna                   | BBHA-9170            | 212            | Jan. 08, 2016   | Jan. 07, 2017    |
| Schwarzbeck Horn Antenna                   | BBHA 9120-D1         | D130           | Jan. 21, 2016   | Jan. 20, 2017    |
| ADT. Turn Table                            | TT100                | 0306           | NA              | NA               |
| ADT. Tower                                 | AT100                | 0306           | NA              | NA               |
| Software                                   | Radiated_V7.6.15.9.4 | NA             | NA              | NA               |
| SUHNER RF cable<br>With 4dB PAD            | SF104                | CABLE-CH6      | Aug. 15, 2015   | Aug. 14, 2016    |
| SUHNER RF cable<br>With 3dB PAD            | SF102                | Cable-CH8-3.6m | Aug. 15, 2015   | Aug. 14, 2016    |
| KEYSIGHT MIMO<br>Powermeasurement Test set | U2021XA              | U2021XA-001    | May 25, 2016    | May 24, 2017     |
| KEYSIGHT<br>Spectrum Analyzer              | N9030A               | MY54490260     | Jul. 14, 2015   | Jul. 13, 2016    |
| EMCO Horn Antenna                          | 3115                 | 00028257       | Jan. 19, 2016   | Jan. 18, 2017    |
| Highpass filter<br>Wainwright Instruments  | WHK 3.1/18G-10SS     | SN 8           | NA              | NA               |
| ROHDE & SCHWARZ<br>Spectrum Analyzer       | FSV40                | 101042         | Sep. 23, 2015   | Sep. 22, 2016    |
| Anritsu<br>Power Sensor                    | MA2411B              | 0738404        | Apr. 28, 2016   | Apr. 27, 2017    |
| Anritsu<br>Power Meter                     | ML2495A              | 0842014        | Apr. 28, 2016   | Apr. 27, 2017    |

- NOTE:**
1. The calibration interval of the above test instruments is 12/24 months. And the calibrations are traceable to NML/ROC and NIST/USA.
  2. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
  3. The test was performed in Chamber No. 6.
  4. The Industry Canada Reference No. IC 7450E-6.
  5. The FCC Site Registration No. is 447212.
  6. Tested date: Jun. 29 ~ 30, 2016

For all test items (Tested channel: 39758, 40978) except for Radiated Spurious Emissions test

| DESCRIPTION & MANUFACTURER                 | MODEL NO.            | SERIAL NO.     | CALIBRATED DATE | CALIBRATED UNTIL |
|--|----------------------|----------------|-----------------|------------------|
| HP Preamplifier                            | 8447D                | 2432A03504     | Feb. 26, 2016   | Feb. 25, 2017    |
| HP Preamplifier                            | 8449B                | 3008A01201     | Feb. 26, 2016   | Feb. 25, 2017    |
| MITEQ Preamplifier                         | AMF-6F-260400-33-8P  | 892164         | Mar. 01, 2016   | Feb. 28, 2017    |
| Agilent<br>TEST RECEIVER                   | N9038A               | MY51210129     | Feb. 02, 2016   | Feb. 01, 2017    |
| Schwarzbeck Antenna                        | VULB 9168            | 139            | Jan. 04, 2016   | Jan. 03, 2017    |
| Schwarzbeck Antenna                        | VHBA 9123            | 480            | May 29, 2015    | May 28, 2017     |
| Schwarzbeck Horn Antenna                   | BBHA-9170            | 212            | Jan. 08, 2016   | Jan. 07, 2017    |
| Schwarzbeck Horn Antenna                   | BBHA 9120-D1         | D130           | Jan. 21, 2016   | Jan. 20, 2017    |
| ADT. Turn Table                            | TT100                | 0306           | NA              | NA               |
| ADT. Tower                                 | AT100                | 0306           | NA              | NA               |
| Software                                   | Radiated_V7.6.15.9.5 | NA             | NA              | NA               |
| SUHNER RF cable<br>With 4dB PAD            | SF104                | CABLE-CH6      | Aug. 15, 2016   | Aug. 14, 2017    |
| SUHNER RF cable<br>With 3dB PAD            | SF102                | Cable-CH8-3.6m | Aug. 15, 2016   | Aug. 14, 2017    |
| KEYSIGHT MIMO<br>Powermeasurement Test set | U2021XA              | U2021XA-001    | May 25, 2016    | May 24, 2017     |
| KEYSIGHT<br>Spectrum Analyzer              | N9030A               | MY54490260     | Jul. 26, 2016   | Jul. 25, 2017    |
| EMCO Horn Antenna                          | 3115                 | 00028257       | Jan. 19, 2016   | Jan. 18, 2017    |
| Highpass filter<br>Wainwright Instruments  | WHK 3.1/18G-10SS     | SN 8           | NA              | NA               |
| ROHDE & SCHWARZ<br>Spectrum Analyzer       | FSV40                | 101042         | Sep. 30, 2016   | Sep. 29, 2017    |
| Anritsu<br>Power Sensor                    | MA2411B              | 0738404        | Apr. 28, 2016   | Apr. 27, 2017    |
| Anritsu<br>Power Meter                     | ML2495A              | 0842014        | Apr. 28, 2016   | Apr. 27, 2017    |

- NOTE:**
1. The calibration interval of the above test instruments is 12/24 months. And the calibrations are traceable to NML/ROC and NIST/USA.
  2. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
  3. The test was performed in Chamber No. 6.
  4. The Industry Canada Reference No. IC 7450E-6.
  5. The FCC Site Registration No. is 447212.
  6. Tested date: Nov. 10, 2016

For Radiated Spurious Emissions test only

| DESCRIPTION & MANUFACTURER                 | MODEL NO.            | SERIAL NO.     | CALIBRATED DATE | CALIBRATED UNTIL |
|--|----------------------|----------------|-----------------|------------------|
| HP Preamplifier                            | 8447D                | 2432A03504     | Feb. 21, 2017   | Feb. 20, 2018    |
| HP Preamplifier                            | 8449B                | 3008A01201     | Feb. 22, 2017   | Feb. 21, 2018    |
| MITEQ Preamplifier                         | AMF-6F-260400-33-8P  | 892164         | Feb. 21, 2017   | Feb. 20, 2018    |
| Agilent<br>TEST RECEIVER                   | N9038A               | MY51210129     | Feb. 08, 2017   | Feb. 07, 2018    |
| Schwarzbeck Antenna                        | VULB 9168            | 139            | Dec. 13, 2016   | Dec. 12, 2017    |
| Schwarzbeck Antenna                        | VHBA 9123            | 480            | May 29, 2015    | May 28, 2017     |
| Schwarzbeck Horn Antenna                   | BBHA-9170            | 212            | Dec. 30, 2016   | Dec. 29, 2017    |
| Schwarzbeck Horn Antenna                   | BBHA 9120-D1         | D130           | Dec. 27, 2016   | Dec. 26, 2017    |
| ADT. Turn Table                            | TT100                | 0306           | NA              | NA               |
| ADT. Tower                                 | AT100                | 0306           | NA              | NA               |
| Software                                   | Radiated_V7.6.15.9.5 | NA             | NA              | NA               |
| SUHNER RF cable<br>With 4dB PAD            | SF104                | CABLE-CH6      | Aug. 15, 2016   | Aug. 14, 2017    |
| SUHNER RF cable<br>With 3dB PAD            | SF102                | Cable-CH8-3.6m | Aug. 15, 2016   | Aug. 14, 2017    |
| KEYSIGHT MIMO<br>Powermeasurement Test set | U2021XA              | U2021XA-001    | May 25, 2016    | May 24, 2017     |
| KEYSIGHT<br>Spectrum Analyzer              | N9030A               | MY54490260     | Jul. 26, 2016   | Jul. 25, 2017    |
| EMCO Horn Antenna                          | 3115                 | 00028257       | Dec. 15, 2016   | Dec. 14, 2017    |
| Highpass filter<br>Wainwright Instruments  | WHK 3.1/18G-10SS     | SN 8           | NA              | NA               |
| ROHDE & SCHWARZ<br>Spectrum Analyzer       | FSV40                | 101042         | Sep. 30, 2016   | Sep. 29, 2017    |
| Anritsu<br>Power Sensor                    | MA2411B              | 0738404        | Apr. 28, 2016   | Apr. 27, 2017    |
| Anritsu<br>Power Meter                     | ML2495A              | 0842014        | Apr. 28, 2016   | Apr. 27, 2017    |

- NOTE:**
1. The calibration interval of the above test instruments is 12/24 months. And the calibrations are traceable to NML/ROC and NIST/USA.
  2. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
  3. The test was performed in Chamber No. 6.
  4. The Industry Canada Reference No. IC 7450E-6.
  5. The FCC Site Registration No. is 447212.
  6. Tested Date: Mar. 29 ~ 30, 2017



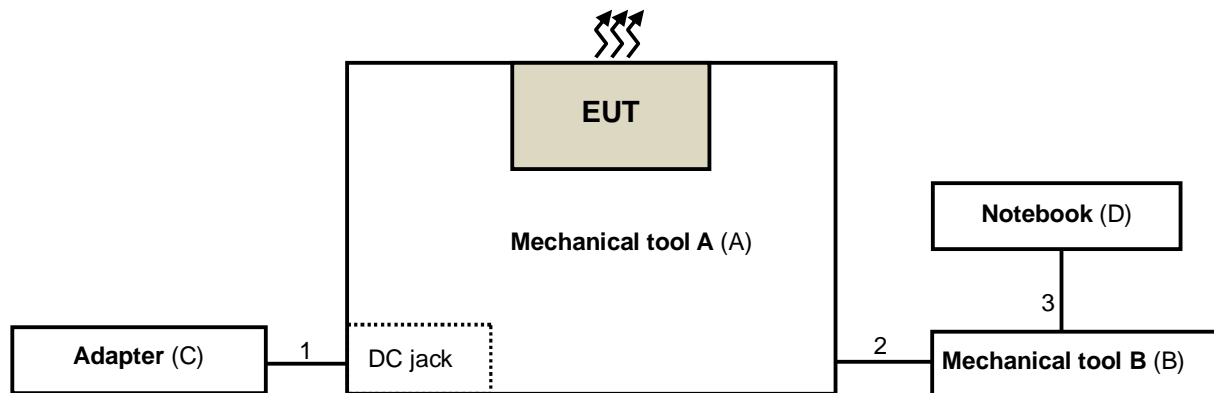
### 3 General Information

#### 3.1 General Description of EUT

|                                |  |  |
|--------------------------------|--|--|
| Product                        | Ninja LTE module                         |  |
| Brand                          | Sercomm                                  |  |
| Test Model                     | LC4R-T                                   |  |
| Status of EUT                  | Engineering sample                       |  |
| Power Supply Rating            | 3.3Vdc                                   |  |
| Modulation Type                | QPSK, 16QAM, 64QAM                       |  |
| Operating Frequency            | LTE Band 41<br>(Channel Bandwidth 20MHz) | 2506.8MHz ~ 2560MHz,<br>2628.8MHz ~ 2680MHz  |
| Max. Conducted<br>Output Power | LTE Band 41<br>(Channel Bandwidth 20MHz) | 2506.8MHz ~ 2560MHz: 368.978mW (25.67dBm)<br>2628.8MHz ~ 2680MHz: 477.529mW (26.79dBm) |
| Antenna Type                   | LTE Band 41                              | Dipole antenna with 7.5dBi gain  |
| Antenna Connector              | I-PEX                                    |  |
| Accessory Device               | N/A                                      |  |
| Data Cable Supplied            | N/A                                      |  |

Note: The EUT is a Ninja LTE module.

### 3.2 Configuration of System Under Test



#### 3.2.1 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| ID | Product           | Brand   | Model No.  | Serial No. | FCC ID           | Remarks            |
|----|-------------------|---------|------------|------------|------------------|--------------------|
| A. | Mechanical tool A | N/A     | N/A        | N/A        | N/A              | Supplied by client |
| B. | Mechanical tool B | N/A     | N/A        | N/A        | N/A              | Supplied by client |
| C. | Adapter           | FAIRWAY | WT10A-050U | N/A        | N/A              | Supplied by client |
| D. | Notebook          | DELL    | PP27L      | 8SNZ12S    | FCC DoC Approved | Provided by Lab    |

Note: All power cords of the above support units are non-shielded (1.8m).

| ID | Descriptions | Qty. | Length (m) | Shielding (Yes/No) | Cores (Qty.) | Remarks            |
|----|--------------|------|------------|--------------------|--------------|--------------------|
| 1. | DC cable     | 1    | 3.0        | N                  | 0            | Supplied by client |
| 2. | Data cable   | 1    | 0.2        | N                  | 0            | Supplied by client |
| 3. | USB cable    | 1    | 1.0        | Y                  | 0            | Supplied by client |

### 3.3 Test Mode Applicability and Tested Channel Detail

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports.

The worst case was found when positioned on X-plane. Following channel(s) was (were) selected for the final test as listed below:

#### LTE Band 41

| Test item                    | Available channel              | Tested channel   | Channel Bandwidth | Modulation           | Mode                 |
|------------------------------|--------------------------------|--|-------------------|----------------------|----------------------|
| Transmitter Output Power     | 39758 to 40290, 40978 to 41490 | 39758, 39790, 40040, 40290, 40978, 40990, 41240, 41490 | 20MHz             | QPSK                 | 100 RB / 0 RB Offset |
| Frequency Stability          | 39758 to 40290, 40978 to 41490 | 39758, 40040, 40978, 41240                             | 20MHz             | QPSK                 | 100 RB / 0 RB Offset |
| Emission Bandwidth           | 39758 to 40290, 40978 to 41490 | 39758, 39790, 40040, 40290, 40978, 40990, 41240, 41490 | 20MHz             | QPSK / 16QAM / 64QAM | 100 RB / 0 RB Offset |
| Band Edge                    | 39758 to 40290, 40978 to 41490 | 39758, 39790, 40040, 40290, 40978, 40990, 41240, 41490 | 20MHz             | QPSK / 16QAM / 64QAM | 100 RB / 0 RB Offset |
| Peak to Average Ratio        | 39758 to 40290, 40978 to 41490 | 39758, 39790, 40040, 40290, 40978, 40990, 41240, 41490 | 20MHz             | QPSK / 16QAM / 64QAM | 100 RB / 0 RB Offset |
| Conducuted Emission          | 39758 to 40290, 40978 to 41490 | 39758, 39790, 40040, 40290, 40978, 40990, 41240, 41490 | 20MHz             | QPSK                 | 100 RB / 0 RB Offset |
| Radiated Emission Below 1GHz | 39758 to 40290, 40978 to 41490 | 39790, 40990   | 20MHz             | QPSK                 | 100 RB / 0 RB Offset |
| Radiated Emission Above 1GHz | 39758 to 40290, 40978 to 41490 | 39758, 39790, 40040, 40290, 40978, 40990, 41240, 41490 | 20MHz             | QPSK                 | 100 RB / 0 RB Offset |

#### Test Condition:

| Test Item                | Test Channel   | Environmental Conditions | Input Power | Tested By |
|--------------------------|--|--------------------------|-------------|-----------|
| Transmitter Output Power | 39790, 40040, 40290, 40990, 41240, 41490               | 26deg. C, 65%RH          | 3.3Vdc      | Aaron You |
|                          | 39758, 40978   | 27deg. C, 61%RH          | 3.3Vdc      | Dalen Dai |
| Frequency Stability      | 39790, 40040, 40290, 40990, 41240, 41490               | 26deg. C, 65%RH          | 3.3Vdc      | Aaron You |
|                          | 39758, 40978   | 27deg. C, 61%RH          | 3.3Vdc      | Dalen Dai |
| Occupied Bandwidth       | 39790, 40040, 40290, 40990, 41240, 41490               | 26deg. C, 65%RH          | 3.3Vdc      | Aaron You |
|                          | 39758, 40978   | 27deg. C, 61%RH          | 3.3Vdc      | Dalen Dai |
| Band Edge                | 39790, 40040, 40290, 40990, 41240, 41490               | 26deg. C, 65%RH          | 3.3Vdc      | Aaron You |
|                          | 39758, 40978   | 27deg. C, 61%RH          | 3.3Vdc      | Dalen Dai |
| Peak To Average Ratio    | 39790, 40040, 40290, 40990, 41240, 41490               | 26deg. C, 65%RH          | 3.3Vdc      | Aaron You |
|                          | 39758, 40978   | 27deg. C, 61%RH          | 3.3Vdc      | Dalen Dai |
| Conducted Emission       | 39790, 40040, 40290, 40990, 41240, 41490               | 26deg. C, 65%RH          | 3.3Vdc      | Aaron You |
|                          | 39758, 40978   | 27deg. C, 61%RH          | 3.3Vdc      | Dalen Dai |
| Radiated Emission        | 39758, 39790, 40040, 40290, 40978, 40990, 41240, 41490 | 22deg. C, 77%RH          | 3.3Vdc      | Dalen Dai |

### **3.4 EUT Operating Conditions**

The software provided by client to enable the EUT to export maximum output power under transmission mode and specific channel frequency.

### **3.5 General Description of Applied Standards**

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**FCC 47 CFR Part 2**

**FCC 47 CFR Part 27**

**KDB 971168 D01 Power Meas License Digital Systems v02r02**

**KDB 662911 D01 Multiple Transmitter Output v02r01**

**ANSI/TIA/EIA-603-D 2010**

**Note:** All test items have been performed and recorded as per the above standards.

## **4 Test Types and Results**

### **4.1 Output Power Measurement**

#### **4.1.1 Limits of Output Power Measurement**

According FCC Part 27 Clause 27.50(h)(2), the all user stations except for mobile stations are limited to 2.0 watts transmitter output power.

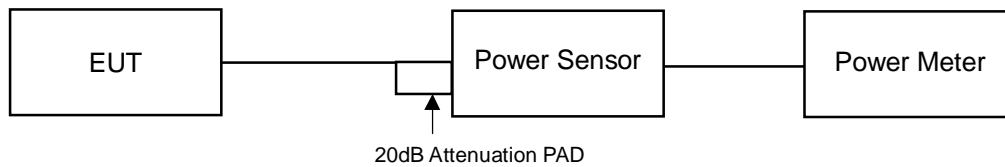
#### **4.1.2 Test Procedures**

##### **Conducted Power Measurement:**

A power sensor was used on the output port of the EUT. A power meter was used to read the response of the power sensor. Record the power level.

### 4.1.3 Test Setup

CONDUCTED POWER MEASUREMENT:



For the actual test configuration, please refer to the attached file (Test Setup Photo).

#### 4.1.4 Test Results

##### CONDUCTED OUTPUT POWER (dBm)

| Band / BW | RB Size | RB Offset | QPSK       |        |       |          |        |              |          |        |       |          |        |       |
|-----------|---------|-----------|------------|--------|-------|----------|--------|--------------|----------|--------|-------|----------|--------|-------|
|           |         |           | Low CH     |        |       |          |        |              | Mid CH   |        |       | High CH  |        |       |
|           |         |           | 39758      |        |       | 39790    |        |              | 40040    |        |       | 40290    |        |       |
|           |         |           | 2506.8 MHz |        |       | 2510 MHz |        |              | 2535 MHz |        |       | 2560 MHz |        |       |
|           |         |           | Chain0     | Chain1 | Total | Chain0   | Chain1 | Total        | Chain0   | Chain1 | Total | Chain0   | Chain1 | Total |
| 41 / 20M  | 1       | 0         | 21.89      | 22.72  | 25.34 | 21.92    | 22.74  | 25.36        | 22.09    | 21.53  | 24.83 | 21.81    | 22.48  | 25.17 |
|           | 1       | 50        | 21.70      | 22.81  | 25.30 | 21.74    | 22.83  | 25.33        | 22.05    | 21.48  | 24.78 | 22.11    | 22.39  | 25.26 |
|           | 1       | 99        | 21.91      | 22.94  | 25.47 | 21.88    | 22.96  | 25.46        | 21.99    | 21.56  | 24.79 | 22.08    | 22.42  | 25.26 |
|           | 50      | 0         | 21.92      | 22.83  | 25.41 | 21.90    | 22.89  | 25.43        | 21.98    | 21.51  | 24.76 | 22.19    | 22.50  | 25.36 |
|           | 50      | 25        | 21.95      | 22.90  | 25.46 | 21.94    | 22.94  | 25.48        | 22.02    | 21.63  | 24.84 | 22.17    | 22.37  | 25.28 |
|           | 50      | 50        | 21.83      | 22.91  | 25.41 | 21.81    | 22.98  | 25.44        | 22.06    | 21.59  | 24.84 | 22.15    | 22.46  | 25.32 |
|           | 100     | 0         | 21.99      | 23.08  | 25.58 | 22.08    | 23.17  | <b>25.67</b> | 22.14    | 21.76  | 24.96 | 22.27    | 22.90  | 25.61 |
| Band / BW | RB Size | RB Offset | QPSK       |        |       |          |        |              |          |        |       |          |        |       |
|           |         |           | Low CH     |        |       |          |        |              | Mid CH   |        |       | High CH  |        |       |
|           |         |           | 40978      |        |       | 40990    |        |              | 41240    |        |       | 41490    |        |       |
|           |         |           | 2628.8 MHz |        |       | 2630 MHz |        |              | 2655 MHz |        |       | 2680 MHz |        |       |
|           |         |           | Chain0     | Chain1 | Total | Chain0   | Chain1 | Total        | Chain0   | Chain1 | Total | Chain0   | Chain1 | Total |
| 41 / 20M  | 1       | 0         | 22.14      | 22.98  | 25.59 | 22.16    | 23.02  | 25.62        | 21.62    | 21.53  | 24.59 | 22.14    | 21.89  | 25.03 |
|           | 1       | 50        | 24.91      | 22.02  | 26.71 | 24.93    | 22.04  | 26.73        | 21.87    | 21.14  | 24.53 | 22.12    | 21.53  | 24.85 |
|           | 1       | 99        | 24.22      | 22.04  | 26.28 | 24.31    | 22.08  | 26.35        | 21.96    | 21.09  | 24.56 | 22.05    | 21.32  | 24.71 |
|           | 50      | 0         | 24.35      | 22.15  | 26.40 | 24.36    | 22.31  | 26.47        | 21.63    | 21.48  | 24.57 | 22.16    | 21.75  | 24.97 |
|           | 50      | 25        | 24.20      | 21.84  | 26.19 | 24.21    | 21.76  | 26.17        | 21.54    | 21.39  | 24.48 | 22.07    | 21.78  | 24.94 |
|           | 50      | 50        | 24.19      | 21.85  | 26.19 | 24.19    | 21.71  | 26.13        | 21.53    | 21.42  | 24.49 | 22.08    | 21.83  | 24.97 |
|           | 100     | 0         | 24.89      | 22.07  | 26.72 | 24.96    | 22.15  | <b>26.79</b> | 21.72    | 21.58  | 24.66 | 22.21    | 21.96  | 25.10 |

| Band / BW | RB Size | RB Offset | 16QAM      |        |       |          |        |       |          |        |       |          |        |       |
|-----------|---------|-----------|------------|--------|-------|----------|--------|-------|----------|--------|-------|----------|--------|-------|
|           |         |           | Low CH     |        |       |          |        |       | Mid CH   |        |       | High CH  |        |       |
|           |         |           | 39758      |        |       | 39790    |        |       | 40040    |        |       | 40290    |        |       |
|           |         |           | 2506.8 MHz |        |       | 2510 MHz |        |       | 2535 MHz |        |       | 2560 MHz |        |       |
|           |         |           | Chain0     | Chain1 | Total | Chain0   | Chain1 | Total | Chain0   | Chain1 | Total | Chain0   | Chain1 | Total |
| 41 / 20M  | 1       | 0         | 21.82      | 22.51  | 25.19 | 21.84    | 22.62  | 25.26 | 21.96    | 21.44  | 24.72 | 21.76    | 22.38  | 25.09 |
|           | 1       | 50        | 21.65      | 22.65  | 25.19 | 21.69    | 22.71  | 25.24 | 21.92    | 21.39  | 24.67 | 22.02    | 22.20  | 25.12 |
|           | 1       | 99        | 21.57      | 22.84  | 25.26 | 21.80    | 22.85  | 25.37 | 21.88    | 21.50  | 24.70 | 21.95    | 22.29  | 25.13 |
|           | 50      | 0         | 21.72      | 22.75  | 25.28 | 21.79    | 22.80  | 25.33 | 21.90    | 21.41  | 24.67 | 22.04    | 22.30  | 25.18 |
|           | 50      | 25        | 21.83      | 22.72  | 25.31 | 21.82    | 22.89  | 25.40 | 21.95    | 21.55  | 24.76 | 22.02    | 22.27  | 25.16 |
|           | 50      | 50        | 21.77      | 22.82  | 25.34 | 21.73    | 22.91  | 25.37 | 21.99    | 21.48  | 24.75 | 22.00    | 22.31  | 25.17 |
|           | 100     | 0         | 21.79      | 22.89  | 25.39 | 21.96    | 23.02  | 25.53 | 22.05    | 21.68  | 24.88 | 22.13    | 22.76  | 25.47 |
| Band / BW | RB Size | RB Offset | 16QAM      |        |       |          |        |       |          |        |       |          |        |       |
|           |         |           | Low CH     |        |       |          |        |       | Mid CH   |        |       | High CH  |        |       |
|           |         |           | 40978      |        |       | 40990    |        |       | 41240    |        |       | 41490    |        |       |
|           |         |           | 2628.8 MHz |        |       | 2630 MHz |        |       | 2655 MHz |        |       | 2680 MHz |        |       |
|           |         |           | Chain0     | Chain1 | Total | Chain0   | Chain1 | Total | Chain0   | Chain1 | Total | Chain0   | Chain1 | Total |
| 41 / 20M  | 1       | 0         | 22.11      | 22.91  | 25.54 | 22.09    | 22.93  | 25.54 | 21.56    | 21.52  | 24.55 | 22.08    | 21.84  | 24.97 |
|           | 1       | 50        | 24.72      | 21.92  | 26.55 | 24.88    | 21.94  | 26.66 | 21.81    | 21.07  | 24.47 | 22.05    | 21.46  | 24.78 |
|           | 1       | 99        | 24.15      | 22.04  | 26.23 | 24.29    | 22.01  | 26.31 | 21.87    | 21.02  | 24.48 | 21.97    | 21.27  | 24.64 |
|           | 50      | 0         | 24.18      | 22.18  | 26.30 | 24.32    | 22.27  | 26.43 | 21.58    | 21.41  | 24.51 | 22.09    | 21.61  | 24.87 |
|           | 50      | 25        | 23.99      | 21.85  | 26.06 | 24.08    | 21.94  | 26.15 | 21.49    | 21.37  | 24.44 | 21.94    | 21.70  | 24.83 |
|           | 50      | 50        | 24.06      | 21.86  | 26.11 | 24.11    | 21.89  | 26.15 | 21.51    | 21.38  | 24.46 | 22.01    | 21.79  | 24.91 |
|           | 100     | 0         | 24.79      | 22.04  | 26.64 | 24.92    | 22.08  | 26.74 | 21.65    | 21.52  | 24.60 | 22.17    | 21.88  | 25.04 |



| Band / BW | RB Size | RB Offset | 64QAM      |        |       |          |        |       |          |        |       |          |        |       |
|-----------|---------|-----------|------------|--------|-------|----------|--------|-------|----------|--------|-------|----------|--------|-------|
|           |         |           | Low CH     |        |       |          |        |       | Mid CH   |        |       | High CH  |        |       |
|           |         |           | 39758      |        |       | 39790    |        |       | 40040    |        |       | 40290    |        |       |
|           |         |           | 2506.8 MHz |        |       | 2510 MHz |        |       | 2535 MHz |        |       | 2560 MHz |        |       |
|           |         |           | Chain0     | Chain1 | Total | Chain0   | Chain1 | Total | Chain0   | Chain1 | Total | Chain0   | Chain1 | Total |
| 41 / 20M  | 1       | 0         | 21.82      | 22.58  | 25.23 | 21.88    | 22.64  | 25.29 | 21.93    | 21.28  | 24.63 | 21.74    | 22.34  | 25.06 |
|           | 1       | 50        | 21.60      | 22.69  | 25.19 | 21.62    | 22.73  | 25.22 | 21.90    | 21.45  | 24.69 | 22.03    | 22.32  | 25.19 |
|           | 1       | 99        | 21.69      | 22.71  | 25.24 | 21.79    | 22.81  | 25.34 | 21.82    | 21.37  | 24.61 | 22.00    | 22.29  | 25.16 |
|           | 50      | 0         | 21.77      | 22.74  | 25.29 | 21.81    | 22.75  | 25.32 | 21.81    | 21.42  | 24.63 | 22.06    | 22.41  | 25.25 |
|           | 50      | 25        | 21.72      | 22.79  | 25.30 | 21.74    | 22.82  | 25.32 | 21.79    | 21.54  | 24.68 | 22.05    | 22.25  | 25.16 |
|           | 50      | 50        | 21.70      | 22.85  | 25.32 | 21.75    | 22.90  | 25.37 | 21.94    | 21.51  | 24.74 | 22.08    | 22.31  | 25.21 |
|           | 100     | 0         | 21.92      | 22.92  | 25.46 | 21.99    | 22.97  | 25.52 | 22.01    | 21.65  | 24.84 | 22.16    | 22.80  | 25.50 |
| Band / BW | RB Size | RB Offset | 64QAM      |        |       |          |        |       |          |        |       |          |        |       |
|           |         |           | Low CH     |        |       |          |        |       | Mid CH   |        |       | High CH  |        |       |
|           |         |           | 40978      |        |       | 40990    |        |       | 41240    |        |       | 41490    |        |       |
|           |         |           | 2628.8 MHz |        |       | 2630 MHz |        |       | 2655 MHz |        |       | 2680 MHz |        |       |
|           |         |           | Chain0     | Chain1 | Total | Chain0   | Chain1 | Total | Chain0   | Chain1 | Total | Chain0   | Chain1 | Total |
| 41 / 20M  | 1       | 0         | 22.07      | 22.84  | 25.48 | 22.08    | 22.91  | 25.53 | 21.55    | 21.40  | 24.49 | 22.08    | 21.83  | 24.97 |
|           | 1       | 50        | 24.82      | 21.78  | 26.57 | 24.85    | 21.79  | 26.59 | 21.74    | 21.09  | 24.44 | 22.06    | 21.42  | 24.76 |
|           | 1       | 99        | 24.25      | 21.75  | 26.19 | 24.25    | 21.97  | 26.27 | 21.91    | 21.02  | 24.50 | 21.98    | 21.20  | 24.62 |
|           | 50      | 0         | 24.19      | 21.19  | 25.95 | 24.30    | 21.29  | 26.06 | 21.51    | 21.33  | 24.43 | 22.09    | 21.64  | 24.88 |
|           | 50      | 25        | 24.05      | 21.58  | 26.00 | 24.09    | 21.62  | 26.04 | 21.39    | 21.27  | 24.34 | 21.95    | 21.68  | 24.83 |
|           | 50      | 50        | 24.00      | 21.60  | 25.97 | 24.02    | 21.64  | 26.00 | 21.46    | 21.30  | 24.39 | 21.98    | 21.77  | 24.89 |
|           | 100     | 0         | 24.73      | 21.84  | 26.53 | 24.82    | 21.93  | 26.62 | 21.63    | 21.51  | 24.58 | 22.19    | 21.92  | 25.07 |

## 4.2 Frequency Stability Measurement

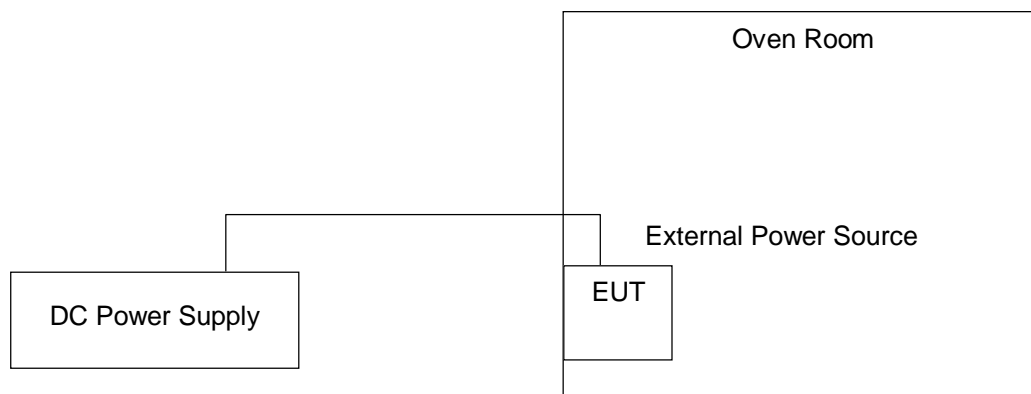
### 4.2.1 Limits of Frequency Stability Measurement

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

### 4.2.2 Test Procedure

- Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
- EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
- The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the  $\pm 0.5$  °C during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

### 4.2.3 Test Setup



#### 4.2.4 Test Results

TX channel 39758

Frequency Error vs. Voltage

| Voltage<br>(Volts) | Frequency Error (ppm) |              | Limit<br>(ppm) |
|--------------------|-----------------------|--------------|----------------|
|                    | LTE Band 41           |              |                |
|                    | 20MHz                 |              |                |
|                    | Chain 0               | Chain 1      |                |
| 3.465              | 0.0067815542          | 0.0067815542 | 2.5            |
| 3.3                | 0.0059837243          | 0.0063826392 | 2.5            |
| 3.135              | 0.0055848093          | 0.0059837243 | 2.5            |

Note: The applicant defined the normal working voltage is from 3.135Vdc to 3.465Vdc.

Frequency Error vs. Temperature

| Voltage<br>(Volts) | Frequency Error (ppm) |              | Limit<br>(ppm) |
|--------------------|-----------------------|--------------|----------------|
|                    | LTE Band 41           |              |                |
|                    | 20MHz                 |              |                |
|                    | Chain 0               | Chain 1      |                |
| 50                 | 0.0067815542          | 0.0063826392 | 2.5            |
| 40                 | 0.0063826392          | 0.0055848093 | 2.5            |
| 30                 | 0.0059837243          | 0.0055848093 | 2.5            |
| 20                 | 0.0055848093          | 0.0047869794 | 2.5            |
| 10                 | 0.0047869794          | 0.0039891495 | 2.5            |
| 0                  | 0.0039891495          | 0.0039891495 | 2.5            |

TX channel 40040

Frequency Error vs. Voltage

| Voltage<br>(Volts) | Frequency Error (ppm) |              | Limit<br>(ppm) |
|--------------------|-----------------------|--------------|----------------|
|                    | LTE Band 41           |              |                |
|                    | 20MHz                 |              |                |
|                    | Chain 0               | Chain 1      |                |
| 3.465              | 0.0067061144          | 0.0063116371 | 2.5            |
| 3.3                | 0.0063116371          | 0.0055226824 | 2.5            |
| 3.135              | 0.0055226824          | 0.0051282051 | 2.5            |

Note: The applicant defined the normal working voltage is from 3.135Vdc to 3.465Vdc.

Frequency Error vs. Temperature

| Voltage<br>(Volts) | Frequency Error (ppm) |              | Limit<br>(ppm) |
|--------------------|-----------------------|--------------|----------------|
|                    | LTE Band 41           |              |                |
|                    | 20MHz                 |              |                |
|                    | Chain 0               | Chain 1      |                |
| 50                 | 0.0071005917          | 0.0067061144 | 2.5            |
| 40                 | 0.0067061144          | 0.0059171598 | 2.5            |
| 30                 | 0.0059171598          | 0.0055226824 | 2.5            |
| 20                 | 0.0055226824          | 0.0047337278 | 2.5            |
| 10                 | 0.0047337278          | 0.0039447732 | 2.5            |
| 0                  | 0.0043392505          | 0.0035502959 | 2.5            |

TX channel 40978

Frequency Error vs. Voltage

| Voltage<br>(Volts) | Frequency Error (ppm) |              | Limit<br>(ppm) |
|--------------------|-----------------------|--------------|----------------|
|                    | LTE Band 41           |              |                |
|                    | 20MHz                 |              |                |
|                    | Chain 0               | Chain 1      |                |
| 3.465              | 0.0068472307          | 0.0064668290 | 2.5            |
| 3.3                | 0.0060864273          | 0.0057060256 | 2.5            |
| 3.135              | 0.0060864273          | 0.0057060256 | 2.5            |

Note: The applicant defined the normal working voltage is from 3.135Vdc to 3.465Vdc.

Frequency Error vs. Temperature

| Voltage<br>(Volts) | Frequency Error (ppm) |              | Limit<br>(ppm) |
|--------------------|-----------------------|--------------|----------------|
|                    | LTE Band 41           |              |                |
|                    | 20MHz                 |              |                |
|                    | Chain 0               | Chain 1      |                |
| 50                 | 0.0060864273          | 0.0064668290 | 2.5            |
| 40                 | 0.0057060256          | 0.0060864273 | 2.5            |
| 30                 | 0.0049452222          | 0.0057060256 | 2.5            |
| 20                 | 0.0049452222          | 0.0053256239 | 2.5            |
| 10                 | 0.0041844187          | 0.0041844187 | 2.5            |
| 0                  | 0.0038040170          | 0.0038040170 | 2.5            |

TX channel 41240

Frequency Error vs. Voltage

| Voltage<br>(Volts) | Frequency Error (ppm) |              | Limit<br>(ppm) |
|--------------------|-----------------------|--------------|----------------|
|                    | LTE Band 41           |              |                |
|                    | 20MHz                 |              |                |
|                    | Chain 0               | Chain 1      |                |
| 3.465              | 0.0071563089          | 0.0067796610 | 2.5            |
| 3.3                | 0.0064030132          | 0.0060263653 | 2.5            |
| 3.135              | 0.0060263653          | 0.0056497175 | 2.5            |

Note: The applicant defined the normal working voltage is from 3.135Vdc to 3.465Vdc.

Frequency Error vs. Temperature

| Voltage<br>(Volts) | Frequency Error (ppm) |              | Limit<br>(ppm) |
|--------------------|-----------------------|--------------|----------------|
|                    | LTE Band 41           |              |                |
|                    | 20MHz                 |              |                |
|                    | Chain 0               | Chain 1      |                |
| 50                 | 0.0060263653          | 0.0064030132 | 2.5            |
| 40                 | 0.0056497175          | 0.0060263653 | 2.5            |
| 30                 | 0.0048964218          | 0.0056497175 | 2.5            |
| 20                 | 0.0045197740          | 0.0041431262 | 2.5            |
| 10                 | 0.0037664783          | 0.0037664783 | 2.5            |
| 0                  | 0.0030131827          | 0.0033898305 | 2.5            |

### 4.3 Emission Bandwidth Measurement

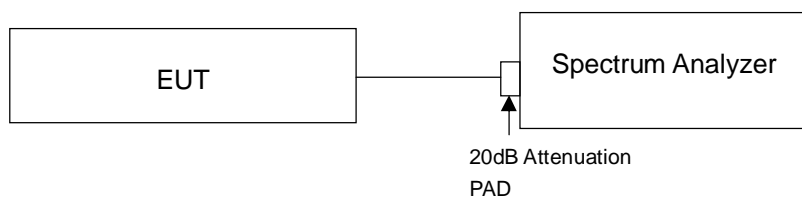
#### 4.3.1 Limits of Emission Bandwidth Measurement

According to FCC 27.53(m)(6) specified that emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power.

#### 4.3.2 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with RBW = 430kHz and VBW = 1.2MHz (Channel Bandwidth: 20MHz). The 26dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 26dB.

#### 4.3.3 Test Setup



#### 4.3.4 Test Result

| LTE Band 41              |                 |                        |         |         |         |         |         |
|--------------------------|-----------------|------------------------|---------|---------|---------|---------|---------|
| Channel Bandwidth: 20MHz |                 |                        |         |         |         |         |         |
| Channel                  | Frequency (MHz) | -26dBc Bandwidth (MHz) |         |         |         |         |         |
|                          |                 | QPSK                   |         | 16QAM   |         | 64QAM   |         |
|                          |                 | Chain 0                | Chain 1 | Chain 0 | Chain 1 | Chain 0 | Chain 1 |
| 39758                    | 2506.8          | 19.34                  | 19.55   | 19.51   | 19.30   | 19.31   | 19.38   |
| 39790                    | 2510            | 19.73                  | 19.78   | 19.55   | 19.67   | 19.70   | 19.62   |
| 40040                    | 2535            | 19.94                  | 19.92   | 19.96   | 20.00   | 20.13   | 19.98   |
| 40290                    | 2560            | 19.57                  | 19.58   | 19.57   | 19.63   | 19.56   | 19.62   |
| 40978                    | 2628.8          | 19.52                  | 19.29   | 19.37   | 20.82   | 19.33   | 20.82   |
| 40990                    | 2630            | 19.50                  | 19.56   | 19.48   | 19.53   | 19.49   | 19.54   |
| 41240                    | 2655            | 19.73                  | 19.64   | 19.57   | 19.45   | 19.60   | 19.60   |
| 41490                    | 2680            | 19.44                  | 19.56   | 19.47   | 19.48   | 19.59   | 19.55   |

| LTE Band 41              |                 |                          |         |         |         |         |         |
|--------------------------|-----------------|--------------------------|---------|---------|---------|---------|---------|
| Channel Bandwidth: 20MHz |                 |                          |         |         |         |         |         |
| Channel                  | Frequency (MHz) | Occupied Bandwidth (MHz) |         |         |         |         |         |
|                          |                 | QPSK                     |         | 16QAM   |         | 64QAM   |         |
|                          |                 | Chain 0                  | Chain 1 | Chain 0 | Chain 1 | Chain 0 | Chain 1 |
| 39758                    | 2506.8          | 17.86                    | 17.86   | 17.86   | 17.93   | 17.86   | 17.93   |
| 39790                    | 2510            | 17.93                    | 17.86   | 17.93   | 17.93   | 17.80   | 17.93   |
| 40040                    | 2535            | 17.93                    | 18.00   | 17.93   | 17.86   | 17.93   | 18.00   |
| 40290                    | 2560            | 17.86                    | 18.00   | 17.86   | 17.86   | 17.86   | 17.80   |
| 40978                    | 2628.8          | 17.93                    | 17.93   | 17.86   | 17.93   | 17.86   | 17.93   |
| 40990                    | 2630            | 17.93                    | 18.00   | 17.80   | 18.00   | 17.93   | 18.06   |
| 41240                    | 2655            | 17.86                    | 18.00   | 17.93   | 17.80   | 17.93   | 17.80   |
| 41490                    | 2680            | 18.06                    | 18.00   | 18.00   | 17.93   | 18.00   | 17.93   |



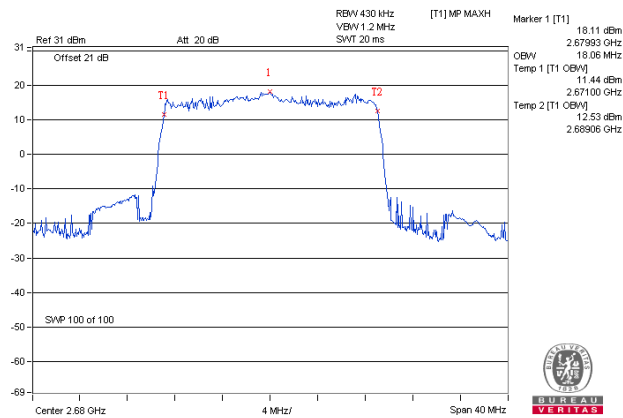
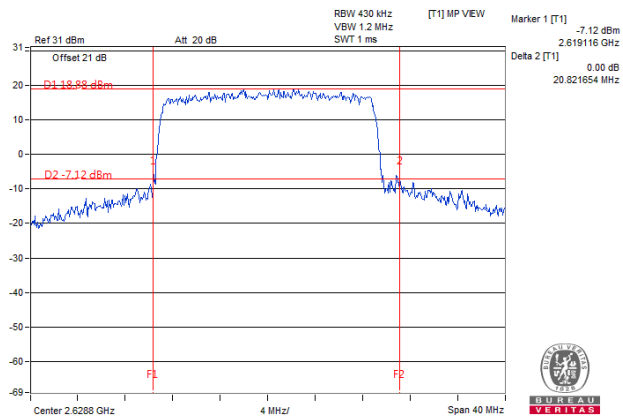
-26dBc Bandwidth

Occupied Bandwidth

Spectrum Plot Of Worst Value

20MHz / 64QAM

20MHz / QPSK



## 4.4 Channel Edge Measurement

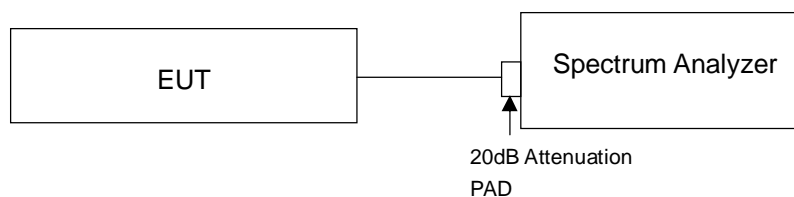
### 4.4.1 Limits of Band Edge Measurement

For LTE Band 41

According to FCC 27.53(m)(4) specified that power of any emission outside of the channel edge must be attenuated below the transmitting power (P) by a factor shall be not less than  $43 + 10 \log (P)$  dB at the channel edge, the limit of emission equal to  $-13\text{dBm}$ . And  $55 + 10 \log (P)$  dB at 5.5 MHz from the channel edges, the limit of emission equal to  $-25\text{dBm}$ . In the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

Note: The results for each of the transmit chains shall be individually compared with the limits after these limits have been added by  $10 \times \log (N)$  (number of active transmit chains).

### 4.4.2 Test Setup



### 4.4.3 Test Procedures

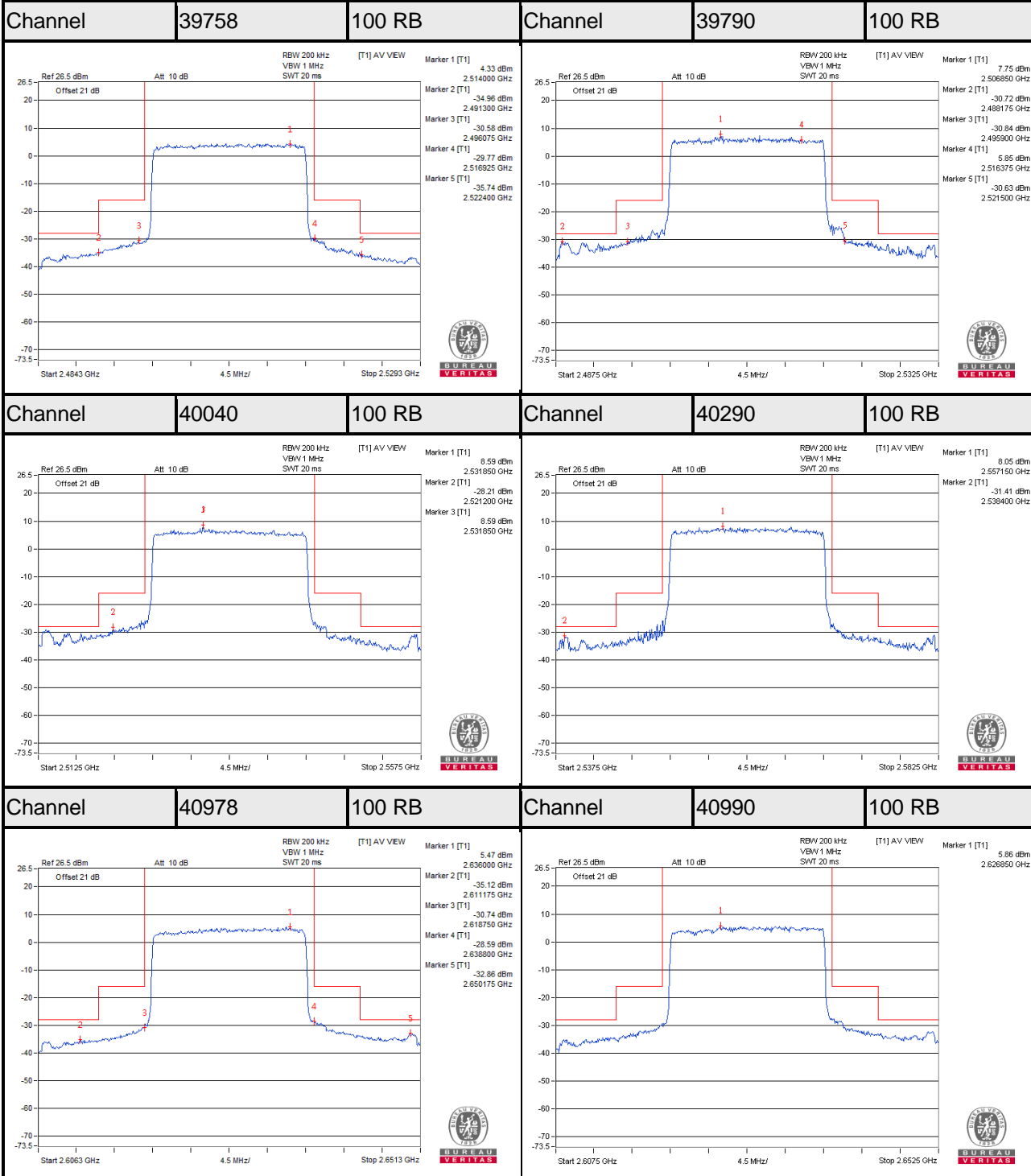
- The EUT was set up for the rated peak power. The power was measured with Spectrum Analyzer. For LTE Band 41 measurements were done at 6 channels: low, middle and high operational frequency range.
- The center frequency of spectrum is the band edge frequency and span is 1.5MHz. RBW = 200kHz and VBW = 1MHz (Channel Bandwidth: 20MHz).
- Record the max trace plot into the test report.

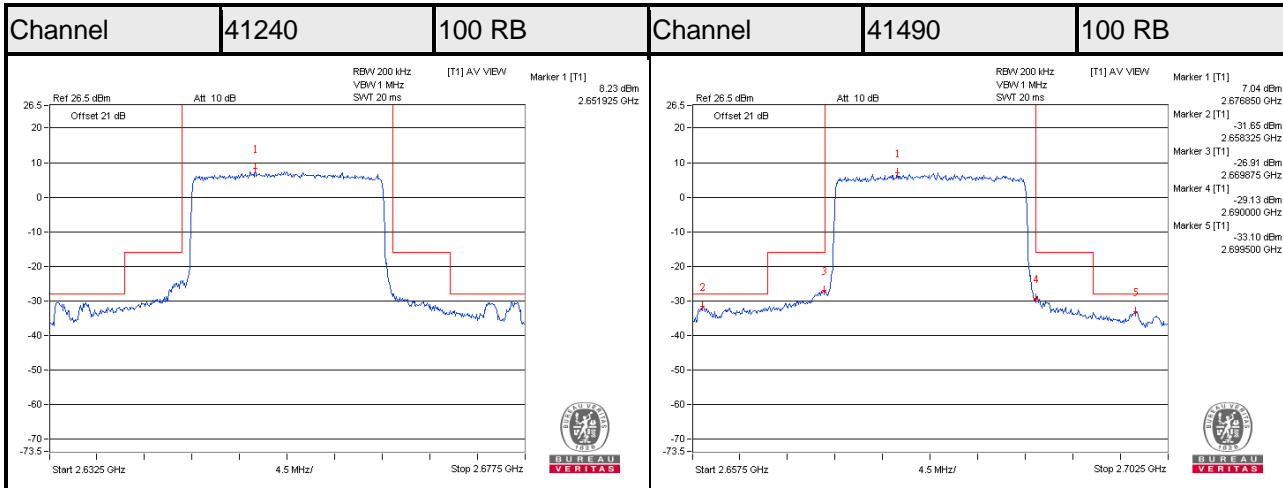
### 4.4.4 Test Results

LTE Band 41 / QPSK

Channel Bandwidth 20MHz

Chain 0



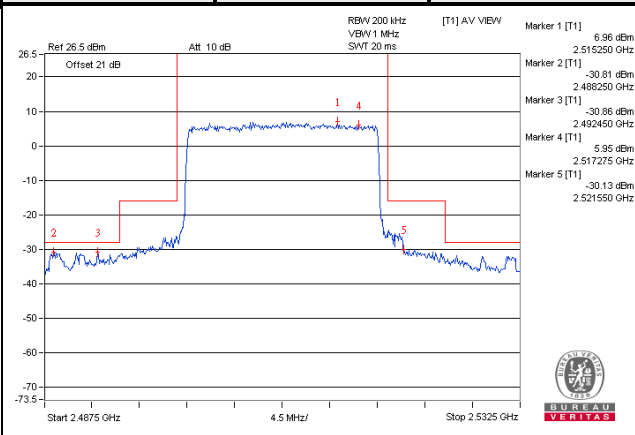
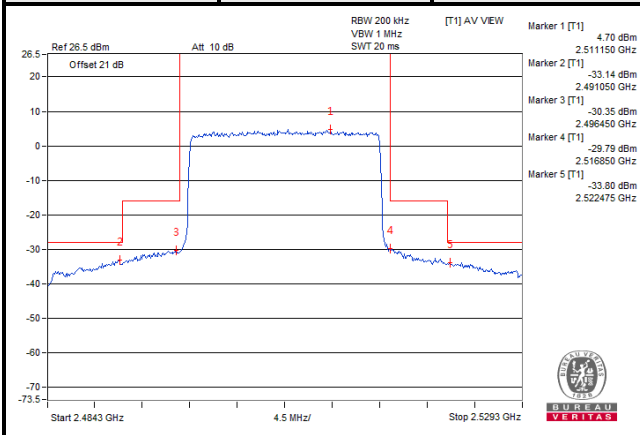


LTE Band 41 / 16QAM

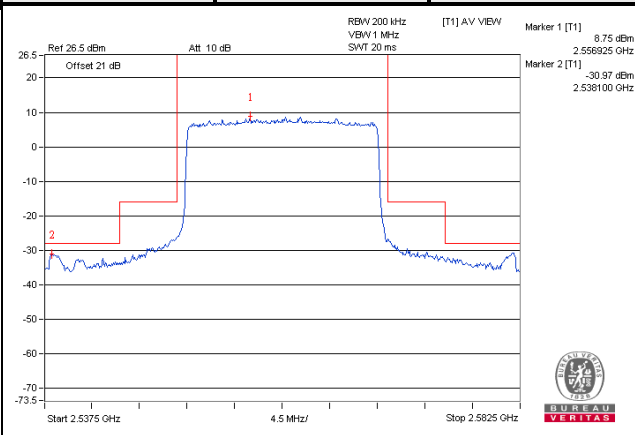
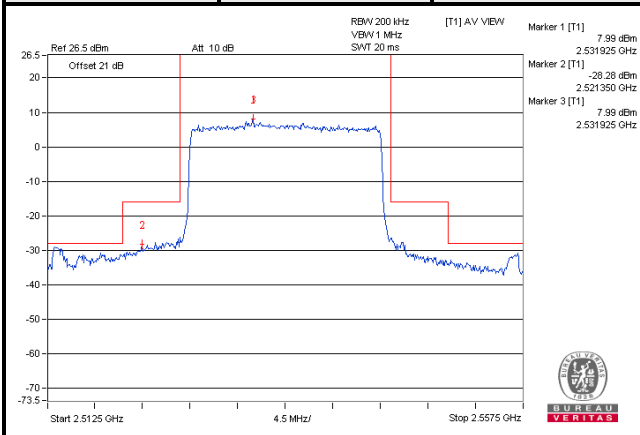
Channel Bandwidth 20MHz

Chain 0

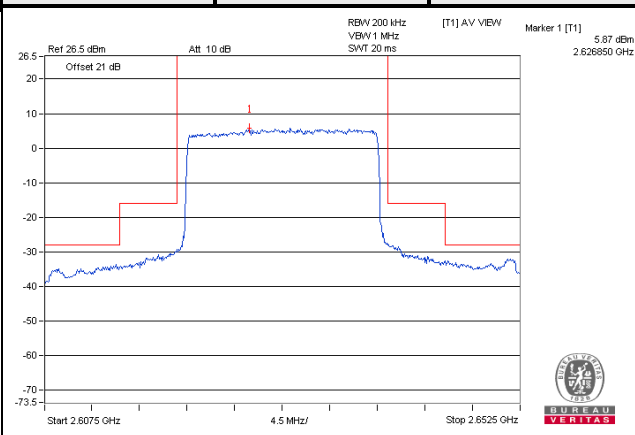
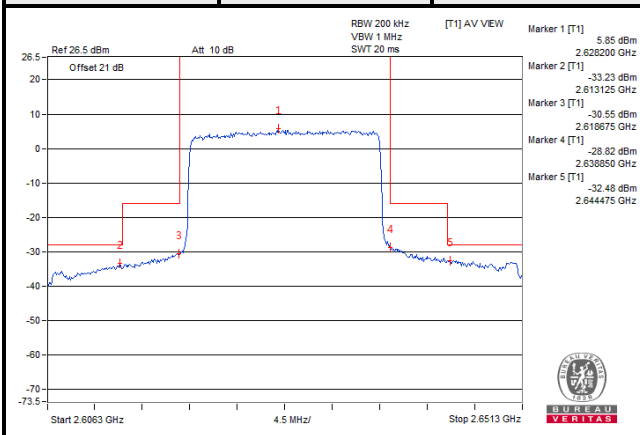
|         |       |        |         |       |        |
|---------|-------|--------|---------|-------|--------|
| Channel | 39758 | 100 RB | Channel | 39790 | 100 RB |
|---------|-------|--------|---------|-------|--------|

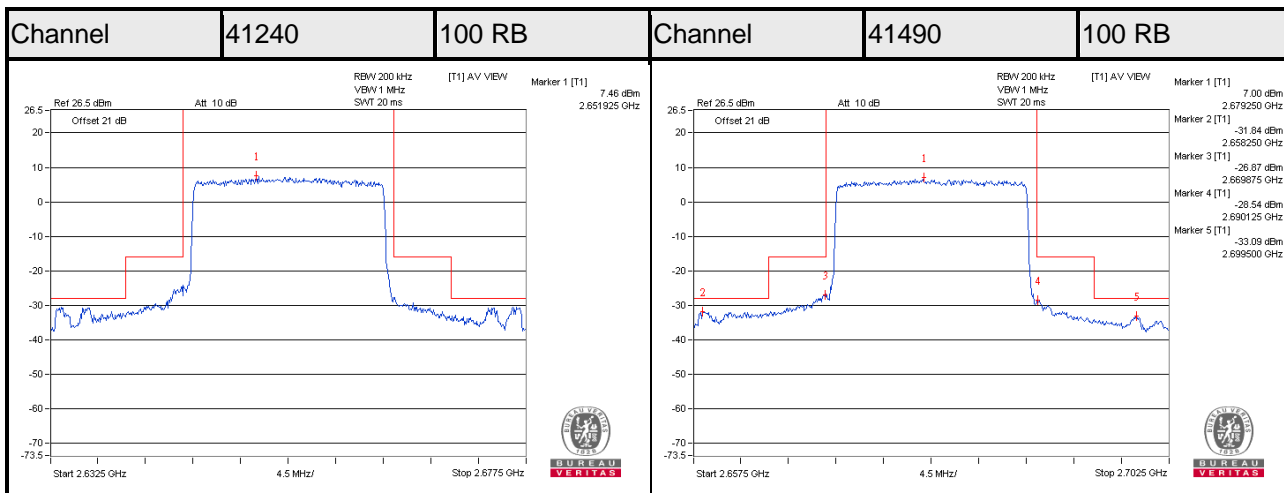


|         |       |        |         |       |        |
|---------|-------|--------|---------|-------|--------|
| Channel | 40040 | 100 RB | Channel | 40290 | 100 RB |
|---------|-------|--------|---------|-------|--------|



|         |       |        |         |       |        |
|---------|-------|--------|---------|-------|--------|
| Channel | 40978 | 100 RB | Channel | 40990 | 100 RB |
|---------|-------|--------|---------|-------|--------|



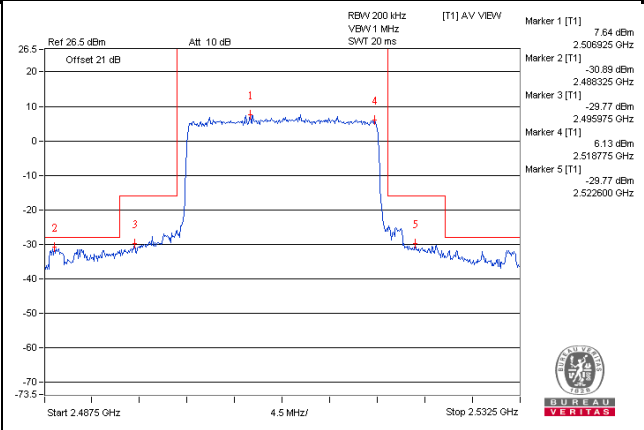
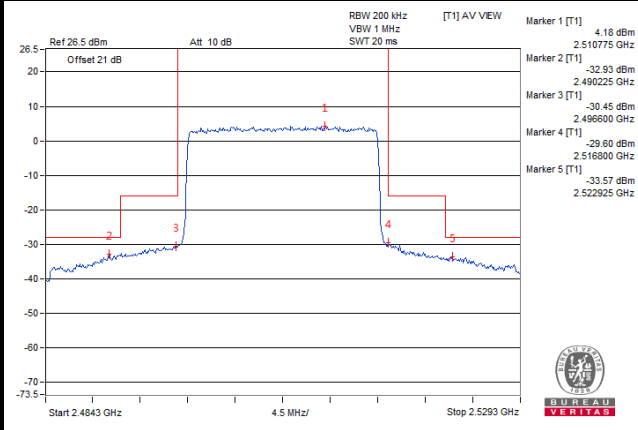


# LTE Band 41 / 64QAM

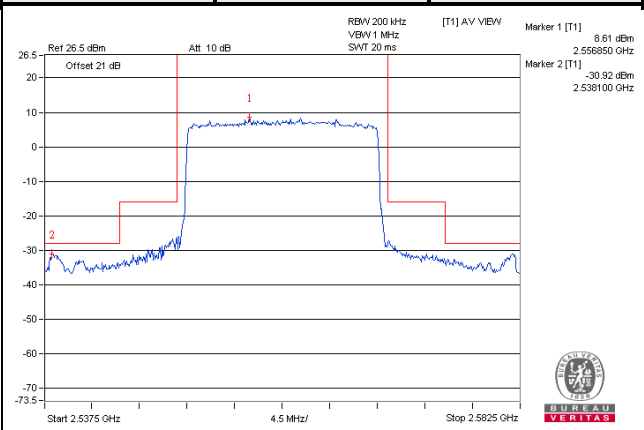
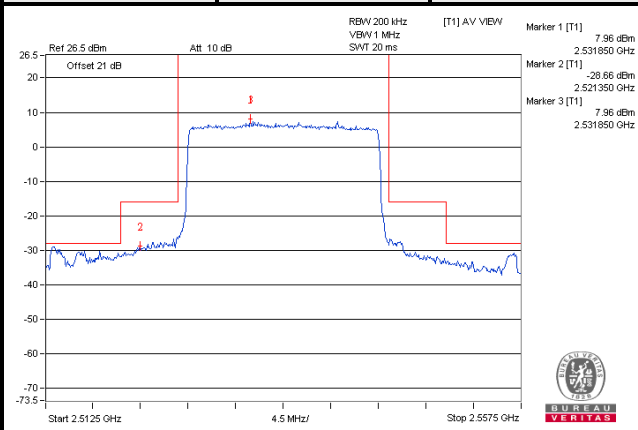
Channel Bandwidth 20MHz

Chain 0

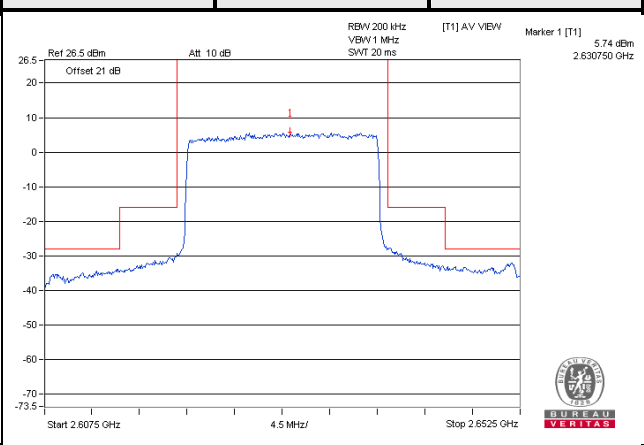
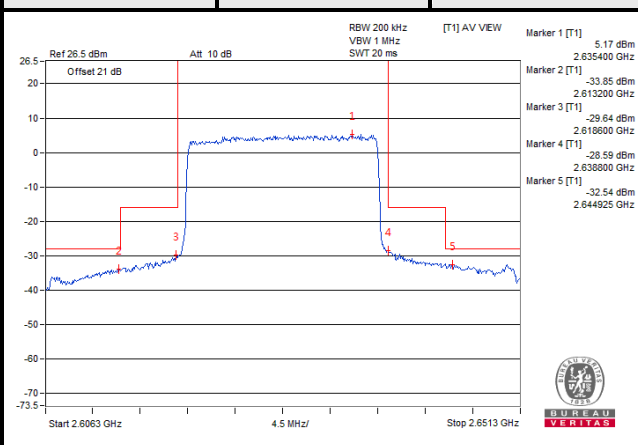
|         |       |        |         |       |        |
|---------|-------|--------|---------|-------|--------|
| Channel | 39758 | 100 RB | Channel | 39790 | 100 RB |
|---------|-------|--------|---------|-------|--------|

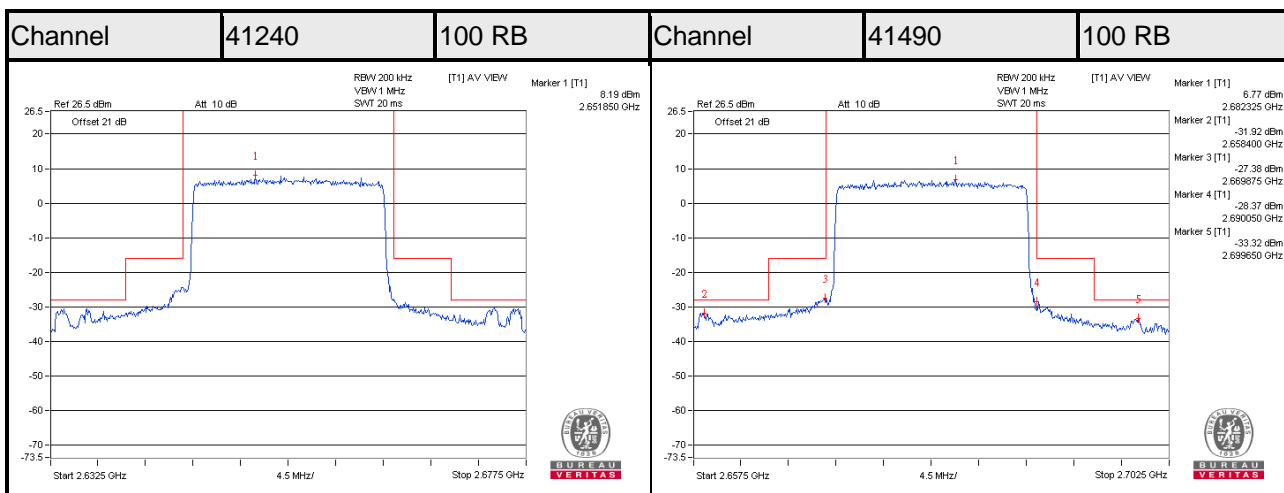


|         |       |        |         |       |        |
|---------|-------|--------|---------|-------|--------|
| Channel | 40040 | 100 RB | Channel | 40290 | 100 RB |
|---------|-------|--------|---------|-------|--------|



|         |       |        |         |       |        |
|---------|-------|--------|---------|-------|--------|
| Channel | 40978 | 100 RB | Channel | 40990 | 100 RB |
|---------|-------|--------|---------|-------|--------|





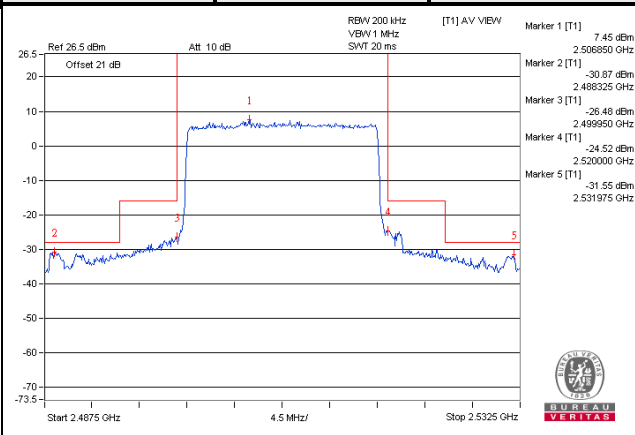
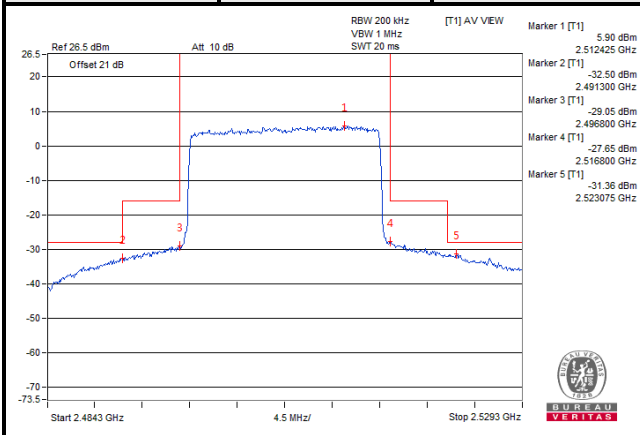


LTE Band 41 / QPSK

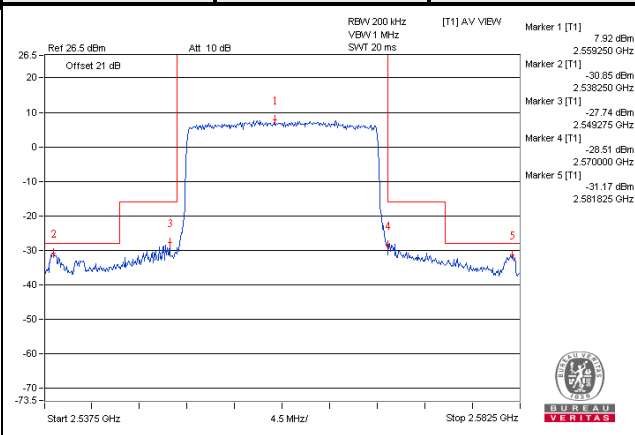
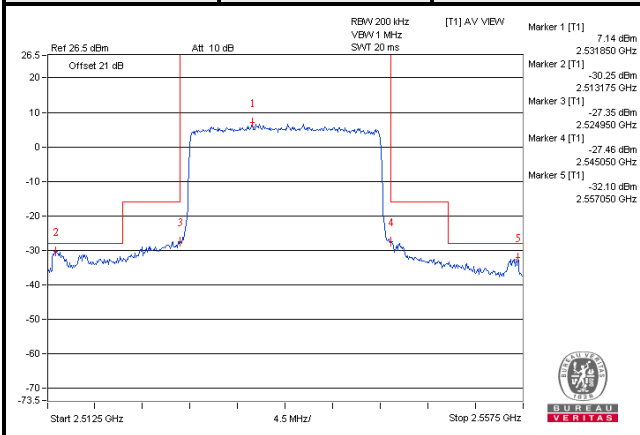
Channel Bandwidth 20MHz

Chain 1

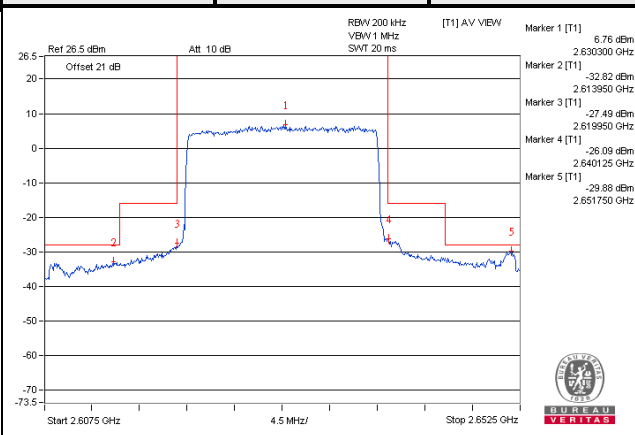
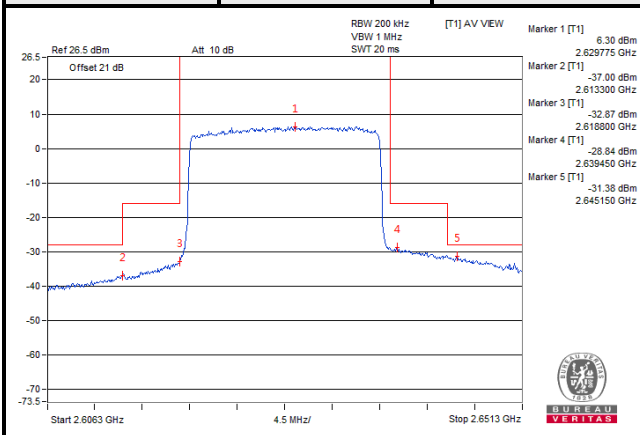
|         |       |        |         |       |        |
|---------|-------|--------|---------|-------|--------|
| Channel | 39758 | 100 RB | Channel | 39790 | 100 RB |
|---------|-------|--------|---------|-------|--------|

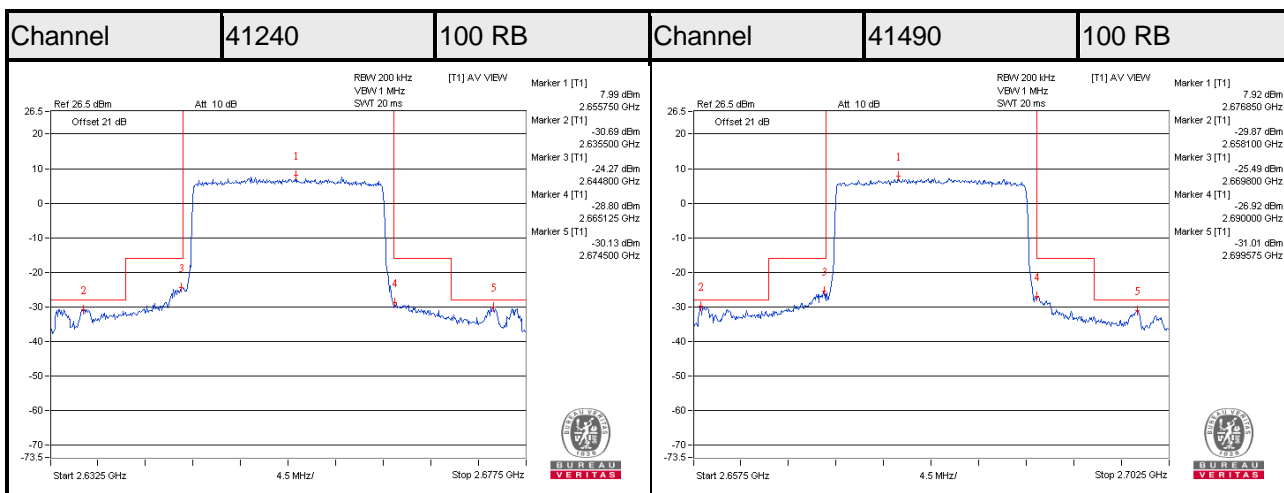


|         |       |        |         |       |        |
|---------|-------|--------|---------|-------|--------|
| Channel | 40040 | 100 RB | Channel | 40290 | 100 RB |
|---------|-------|--------|---------|-------|--------|



|         |       |        |         |       |        |
|---------|-------|--------|---------|-------|--------|
| Channel | 40978 | 100 RB | Channel | 40990 | 100 RB |
|---------|-------|--------|---------|-------|--------|



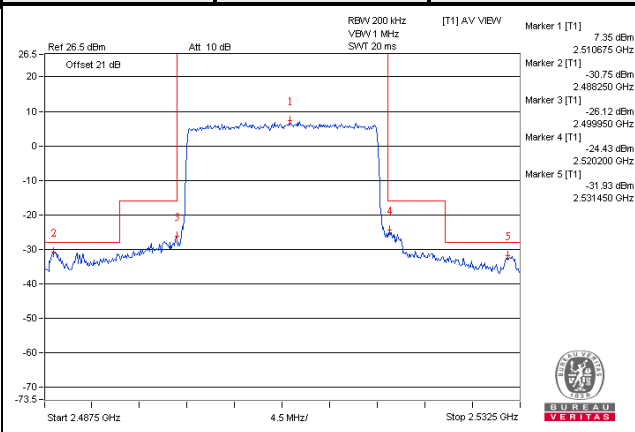
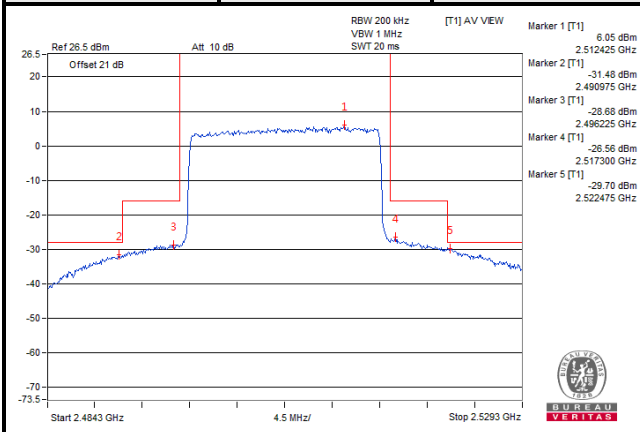


LTE Band 41 / 16QAM

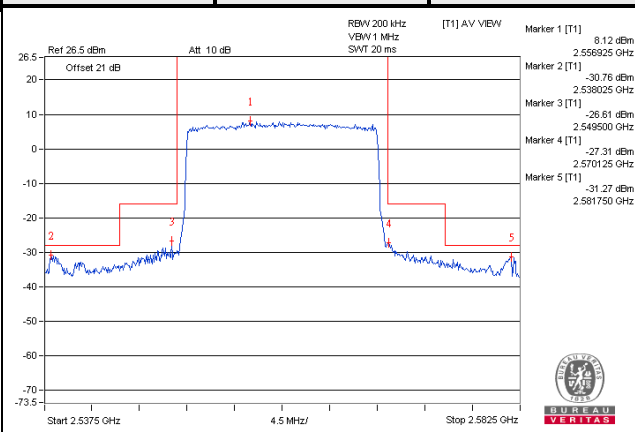
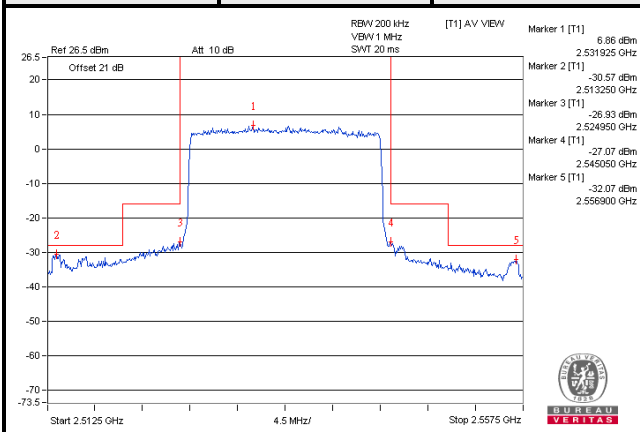
Channel Bandwidth 20MHz

Chain 1

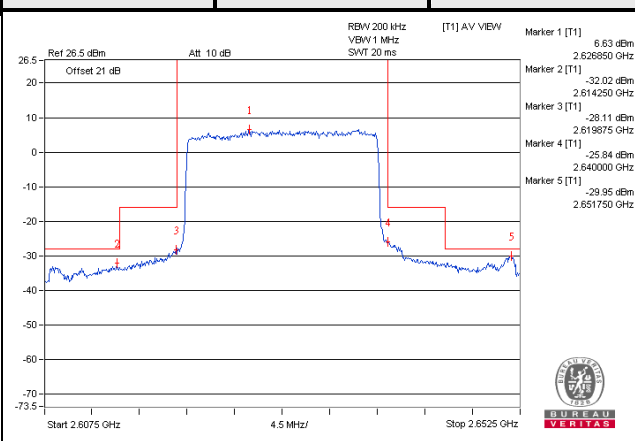
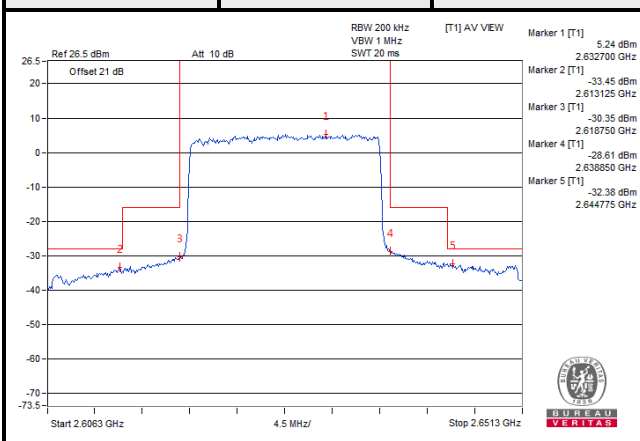
|         |       |        |         |       |        |
|---------|-------|--------|---------|-------|--------|
| Channel | 39758 | 100 RB | Channel | 39790 | 100 RB |
|---------|-------|--------|---------|-------|--------|

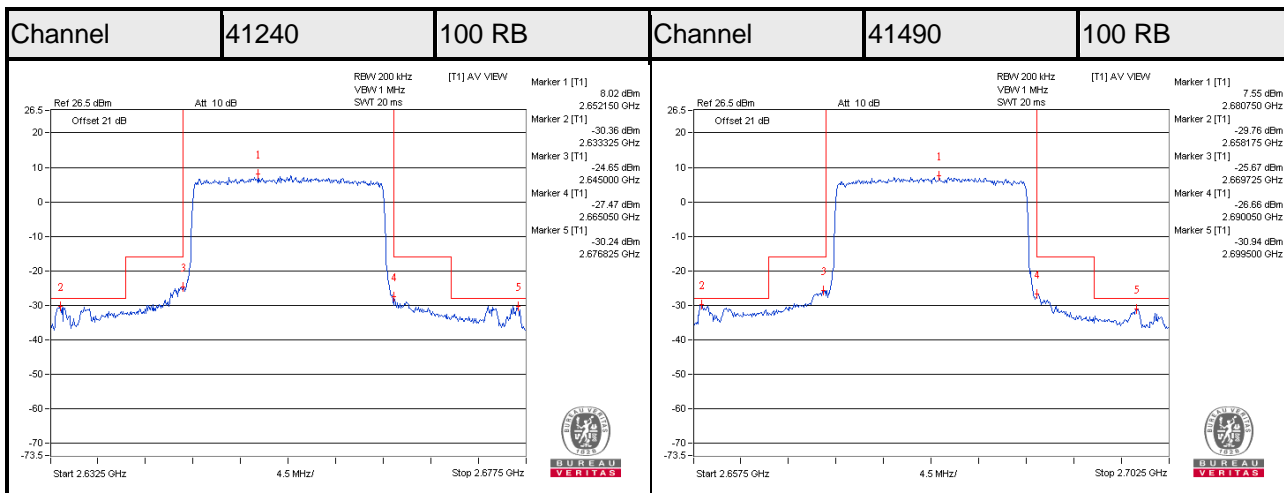


|         |       |        |         |       |        |
|---------|-------|--------|---------|-------|--------|
| Channel | 40040 | 100 RB | Channel | 40290 | 100 RB |
|---------|-------|--------|---------|-------|--------|



|         |       |        |         |       |        |
|---------|-------|--------|---------|-------|--------|
| Channel | 40978 | 100 RB | Channel | 40990 | 100 RB |
|---------|-------|--------|---------|-------|--------|



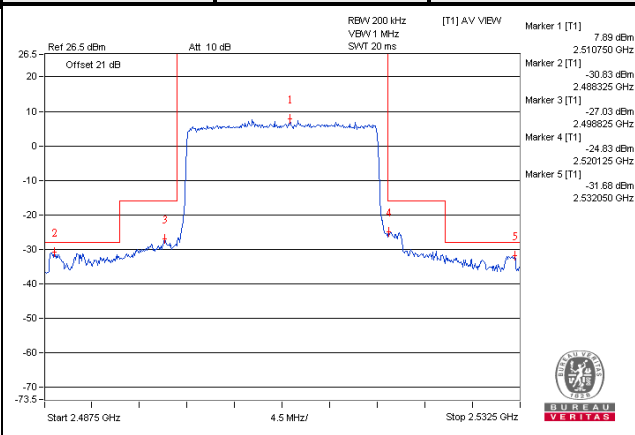
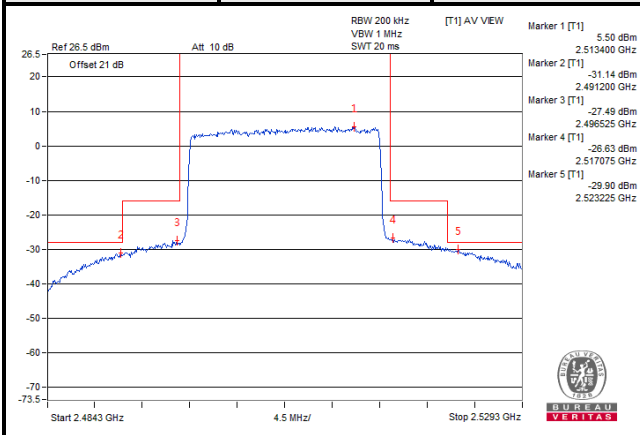


# LTE Band 41 / 64QAM

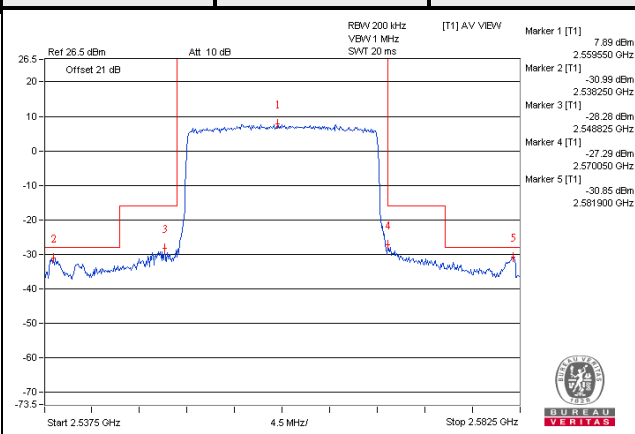
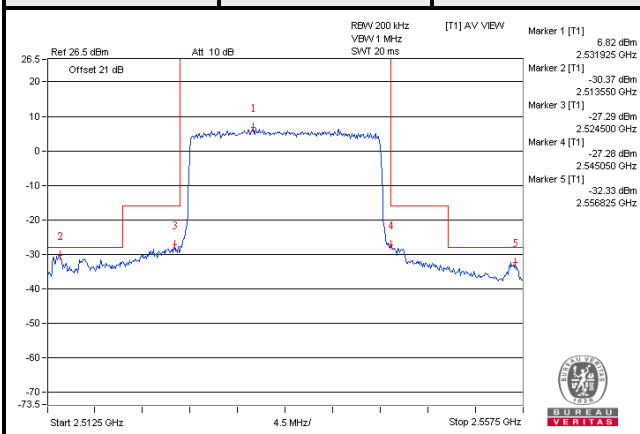
## Channel Bandwidth 20MHz

### Chain 1

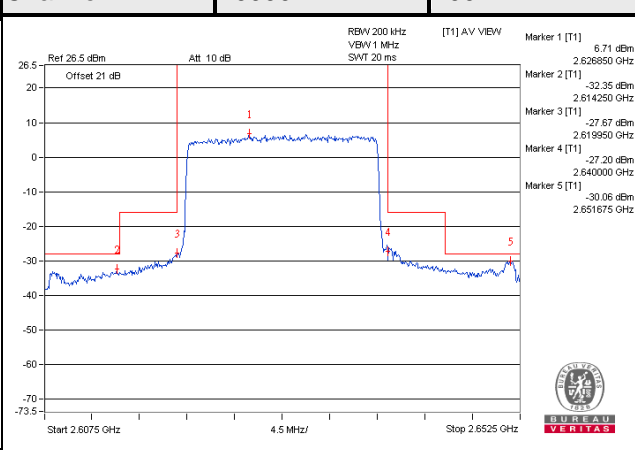
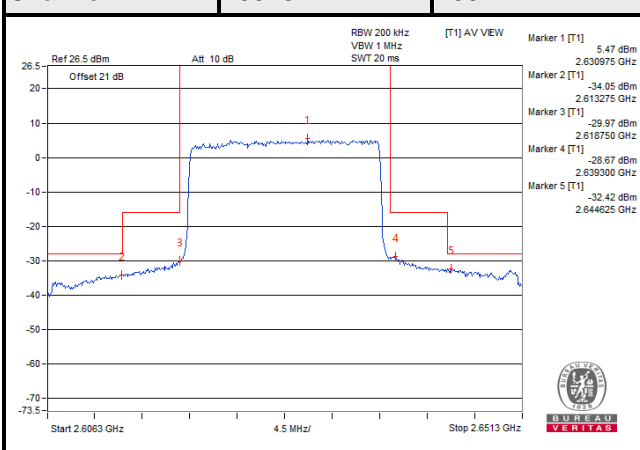
|         |       |        |         |       |        |
|---------|-------|--------|---------|-------|--------|
| Channel | 39758 | 100 RB | Channel | 39790 | 100 RB |
|---------|-------|--------|---------|-------|--------|

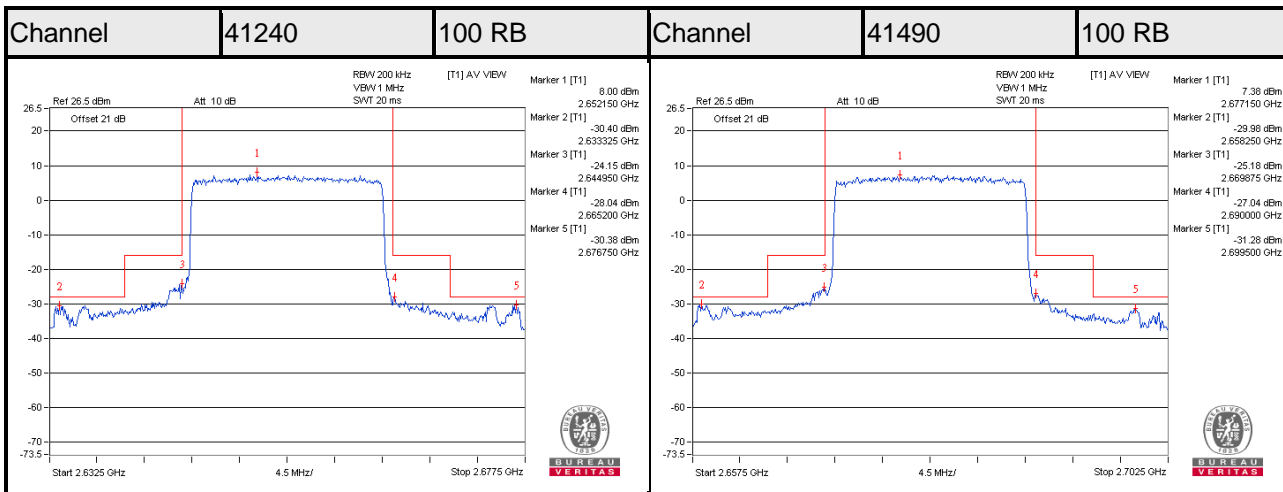


|         |       |        |         |       |        |
|---------|-------|--------|---------|-------|--------|
| Channel | 40040 | 100 RB | Channel | 40290 | 100 RB |
|---------|-------|--------|---------|-------|--------|



|         |       |        |         |       |        |
|---------|-------|--------|---------|-------|--------|
| Channel | 40978 | 100 RB | Channel | 40990 | 100 RB |
|---------|-------|--------|---------|-------|--------|



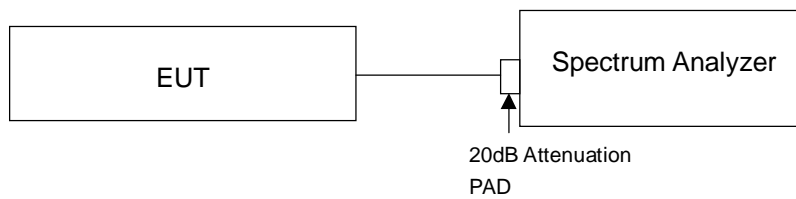


## 4.5 Peak To Average Ratio

### 4.5.1 Limits of Peak To Average Ratio Measurement

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

### 4.5.2 Test Setup

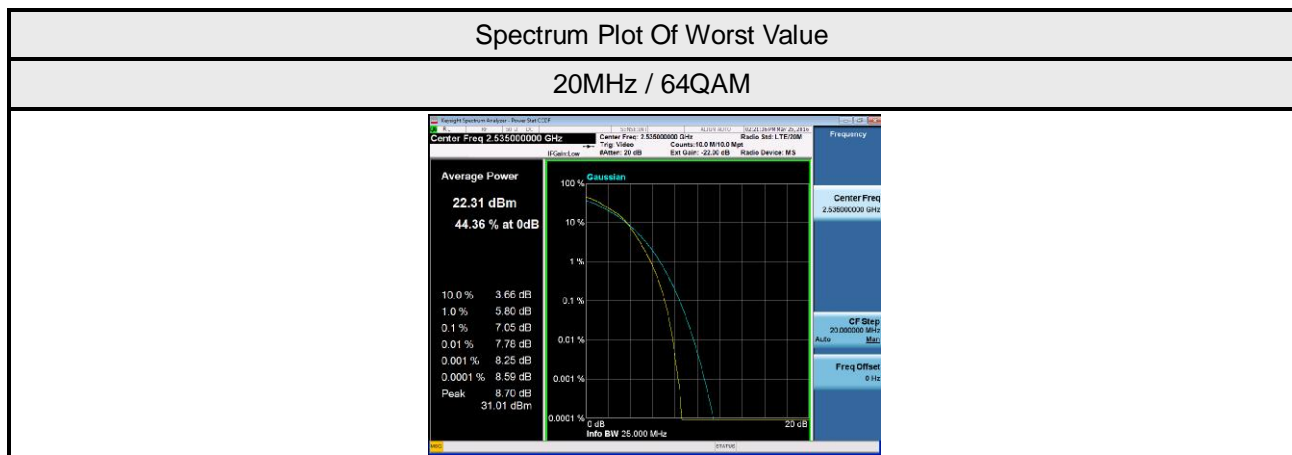


### 4.5.3 Test Procedures

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

#### 4.5.4 Test Results

| LTE Band 41             |                 |                            |         |         |         |         |         |
|-------------------------|-----------------|----------------------------|---------|---------|---------|---------|---------|
| Channel Bandwidth 20MHz |                 |                            |         |         |         |         |         |
| Channel                 | Frequency (MHz) | Peak To Average Ratio (dB) |         |         |         |         |         |
|                         |                 | QPSK                       |         | 16QAM   |         | 64QAM   |         |
|                         |                 | Chain 0                    | Chain 1 | Chain 0 | Chain 1 | Chain 0 | Chain 1 |
| 39758                   | 2506.8          | 5.92                       | 5.82    | 6.79    | 6.80    | 6.89    | 6.43    |
| 39790                   | 2510            | 5.89                       | 5.51    | 6.65    | 6.60    | 6.90    | 6.28    |
| 40040                   | 2535            | 5.83                       | 6.14    | 6.50    | 6.88    | 6.42    | 7.05    |
| 40290                   | 2560            | 5.78                       | 5.77    | 5.63    | 5.94    | 5.61    | 5.72    |
| 40978                   | 2628.8          | 6.08                       | 6.07    | 6.35    | 6.32    | 6.75    | 6.84    |
| 40990                   | 2630            | 6.02                       | 6.06    | 6.32    | 6.22    | 6.75    | 6.94    |
| 41240                   | 2655            | 5.38                       | 5.34    | 5.96    | 5.91    | 6.27    | 6.11    |
| 41490                   | 2680            | 5.87                       | 6.30    | 6.24    | 6.36    | 6.46    | 6.37    |





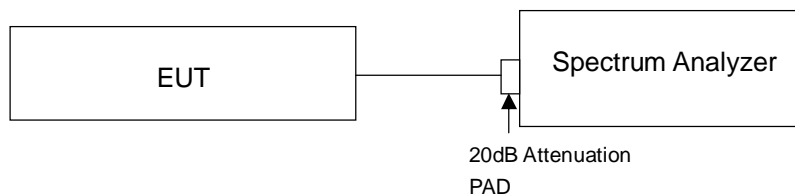
## 4.6 Conducted Spurious Emissions

### 4.6.1 Limits of Conducted Spurious Emissions Measurement

For LTE Band 41

On any frequency outside a licensee's frequency block, The power of any emission shall be attenuated below the transmitter power (P) by at least  $55 + 10 \log (P)$  dB. The emission limit equal to  $-25\text{dBm}$ .

### 4.6.2 Test Setup



### 4.6.3 Test Procedure

- For LTE band LTE Band 41 measurements were done at 6 channels: low, middle and high operational frequency range.
- When the spectrum scanned from 9kHz to 20GHz, it shall be connected to the 20dB pad attenuated the carried frequency. The spectrum set  $\text{RB} = 1\text{MHz}$ ,  $\text{VB} = 3\text{MHz}$  for LTE Band 41.

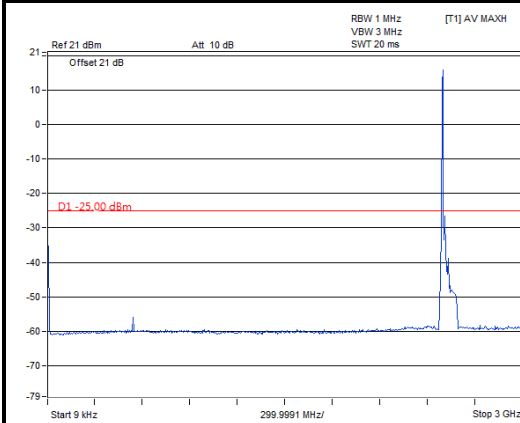
#### 4.6.4 Test Results

LTE Band 41 Channel Band width: 20MHz

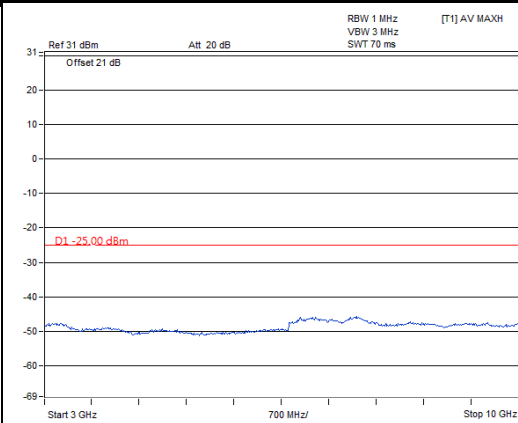
Channel 39758

Chain 0

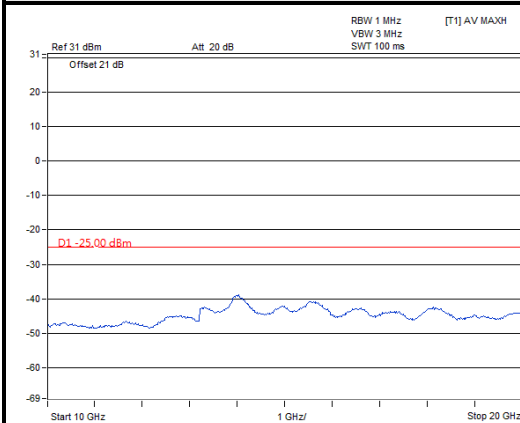
Frequency Range : 9kHz~3GHz



Frequency Range : 3GHz~10GHz



Frequency Range : 10GHz~20GHz

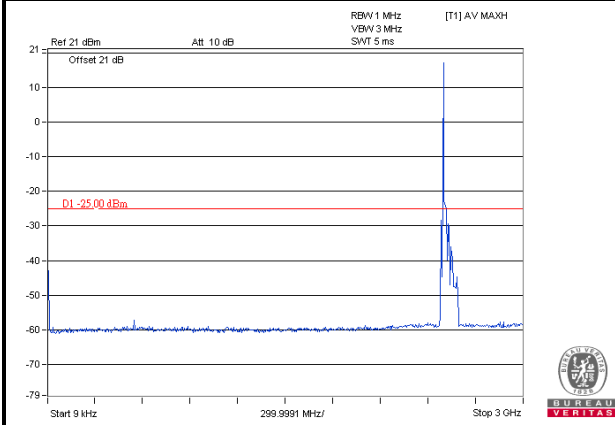


LTE Band 41 Channel Band width: 20MHz

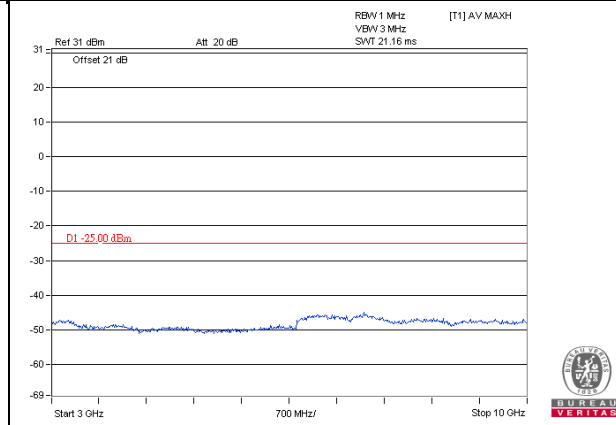
Channel 39790

Chain 0

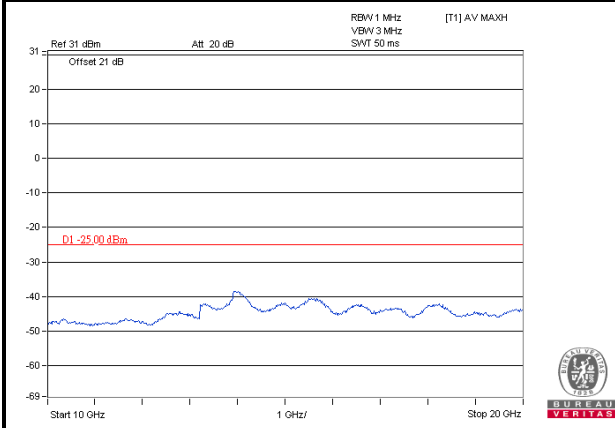
Frequency Range : 9kHz~3GHz



Frequency Range : 3GHz~10GHz



Frequency Range : 10GHz~20GHz

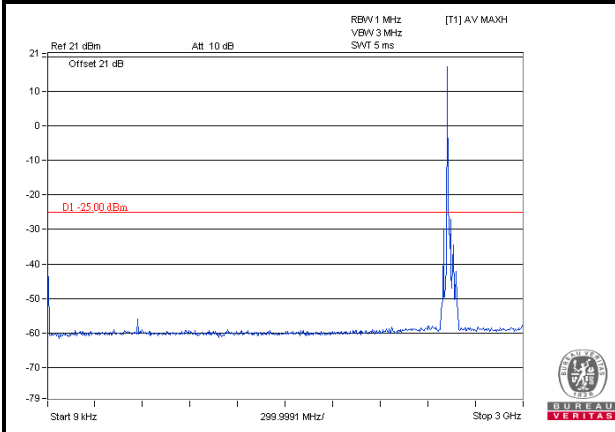


LTE Band 41 Channel Band width: 20MHz

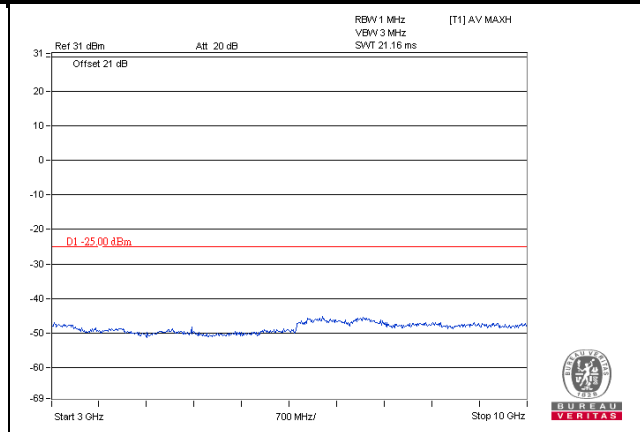
Channel 40040

Chain 0

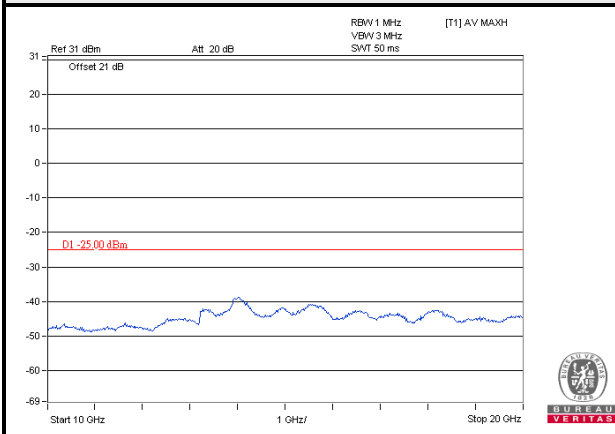
Frequency Range : 9kHz~3GHz



Frequency Range : 3GHz~10GHz



Frequency Range : 10GHz~20GHz

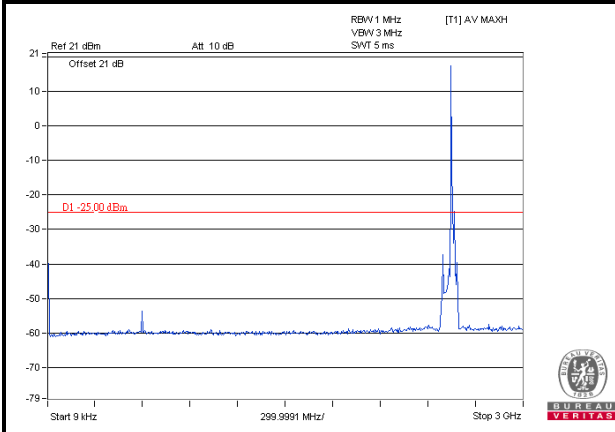


LTE Band 41 Channel Band width: 20MHz

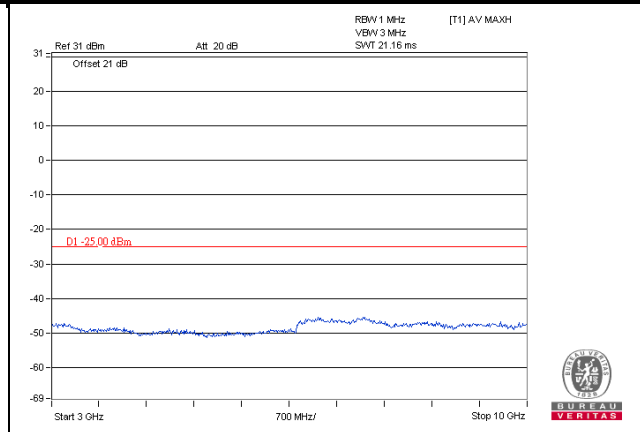
Channel 40290

Chain 0

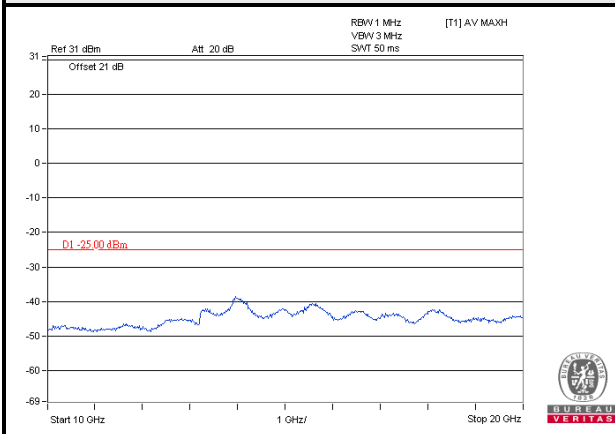
Frequency Range : 9kHz~3GHz



Frequency Range : 3GHz~10GHz



Frequency Range : 10GHz~20GHz

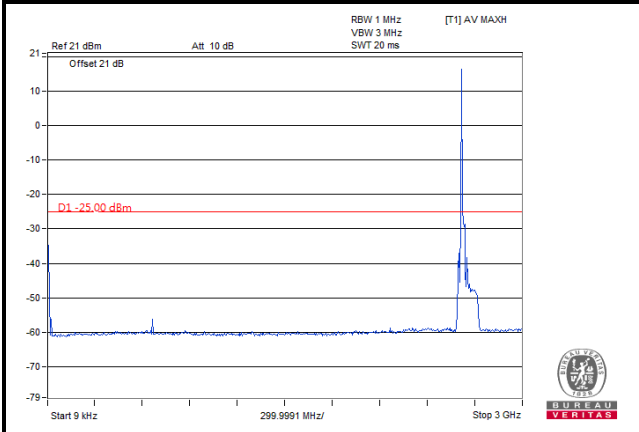


LTE Band 41 Channel Band width: 20MHz

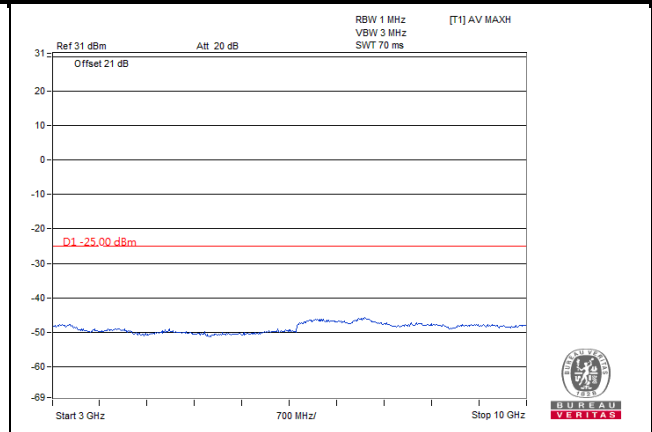
Channel 40978

Chain 0

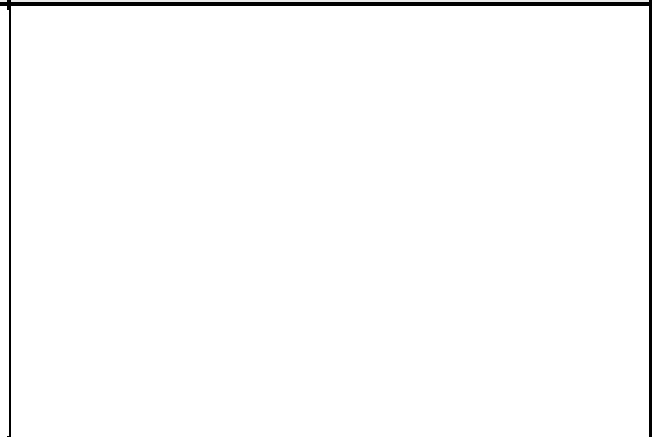
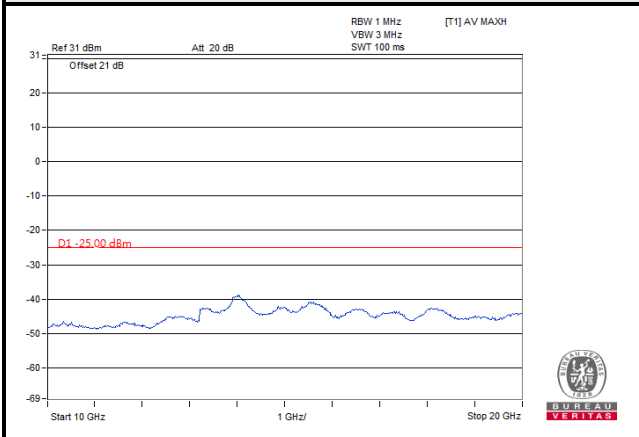
Frequency Range : 9kHz~3GHz



Frequency Range : 3GHz~10GHz



Frequency Range : 10GHz~20GHz



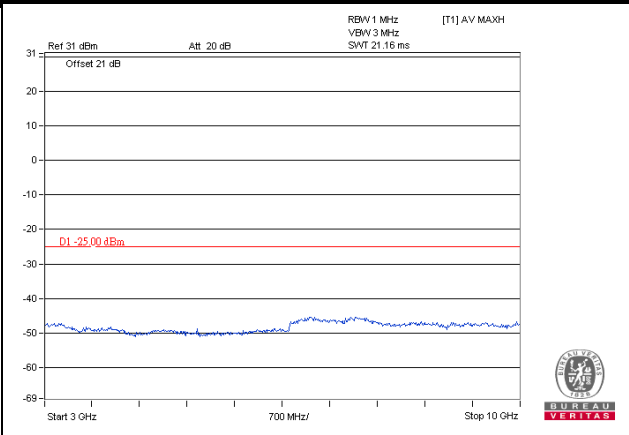
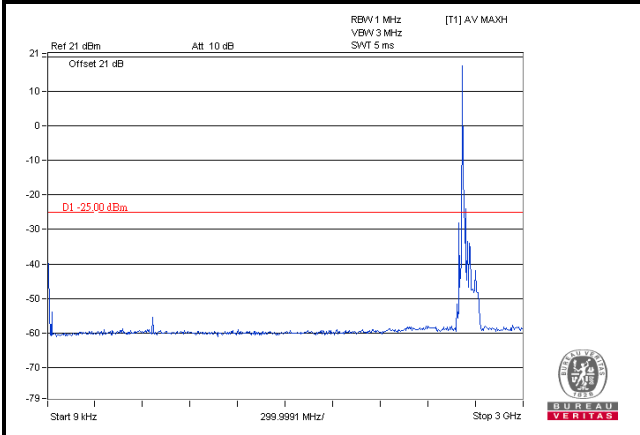
LTE Band 41 Channel Band width: 20MHz

Channel 40990

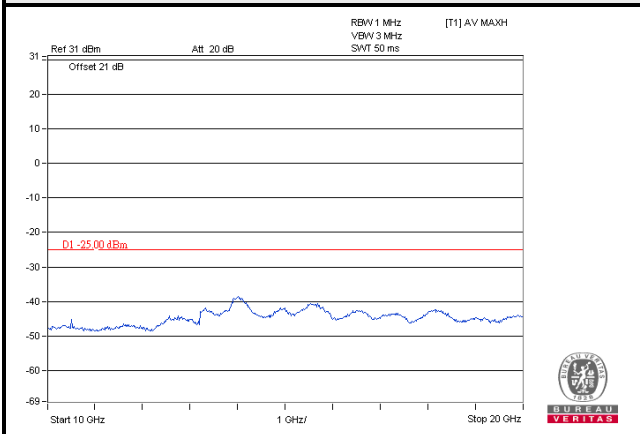
Chain 0

Frequency Range : 9kHz~3GHz

Frequency Range : 3GHz~10GHz



Frequency Range : 10GHz~20GHz



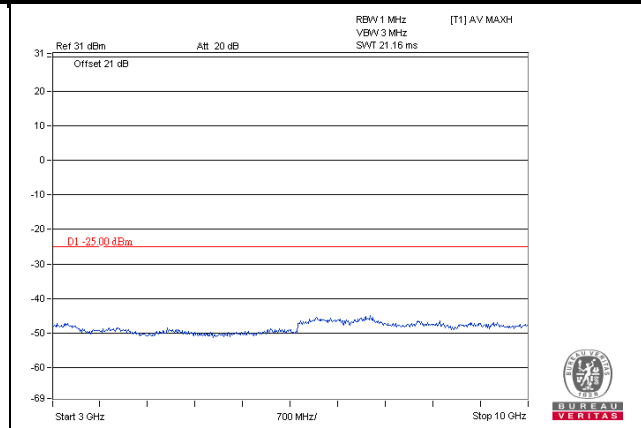
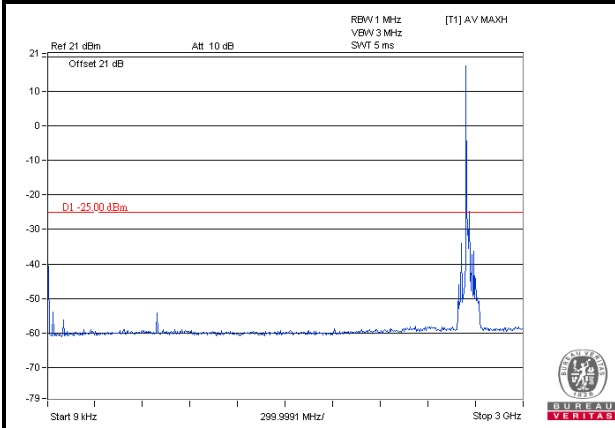
LTE Band 41 Channel Band width: 20MHz

Channel 41240

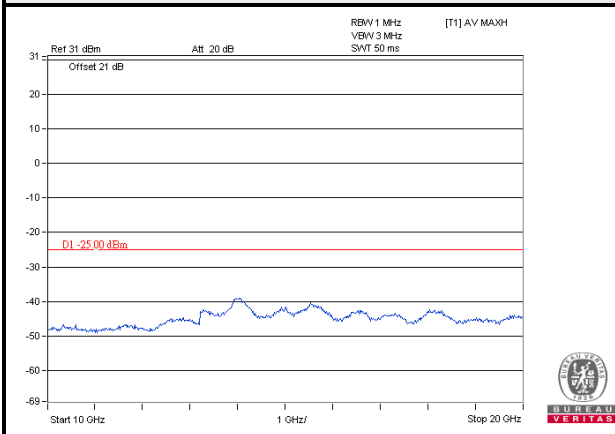
Chain 0

Frequency Range : 9kHz~3GHz

Frequency Range : 3GHz~10GHz



Frequency Range : 10GHz~20GHz





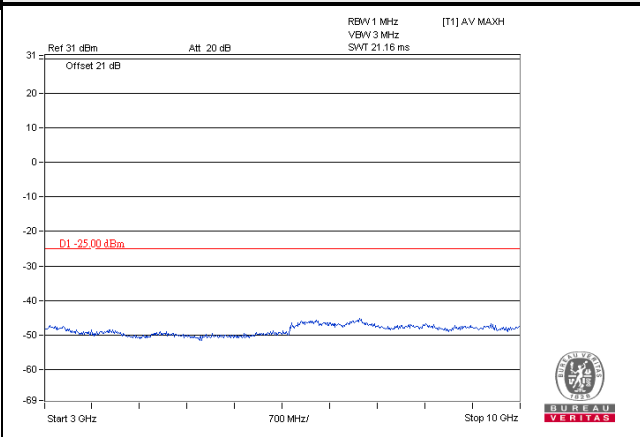
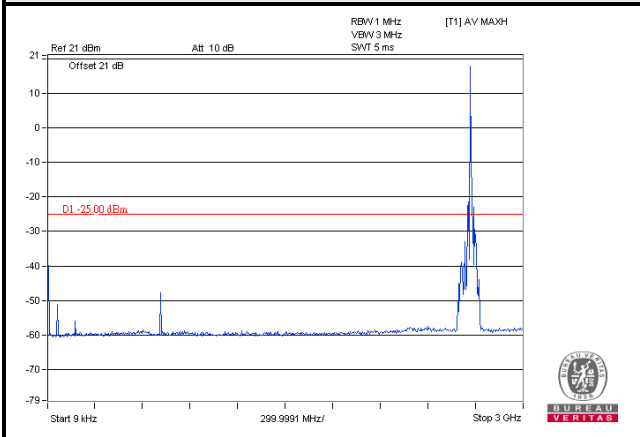
LTE Band 41 Channel Band width: 20MHz

Channel 41490

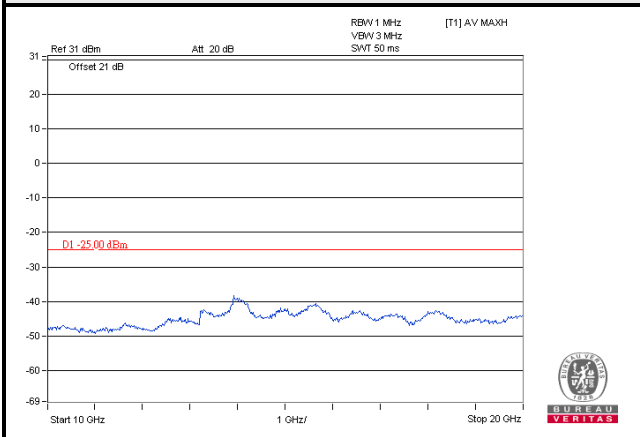
Chain 0

Frequency Range : 9kHz~3GHz

Frequency Range : 3GHz~10GHz



Frequency Range : 10GHz~20GHz

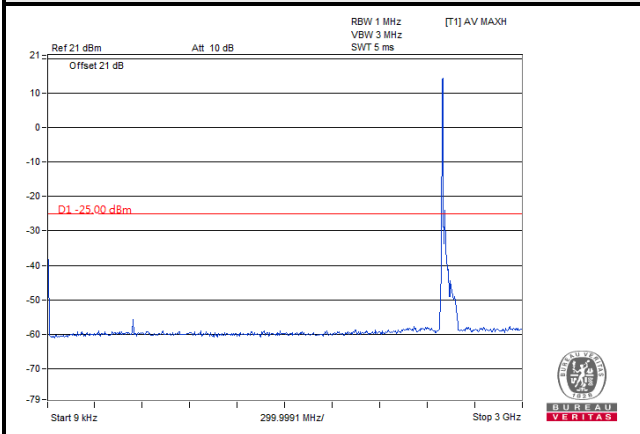


LTE Band 41 Channel Band width: 20MHz

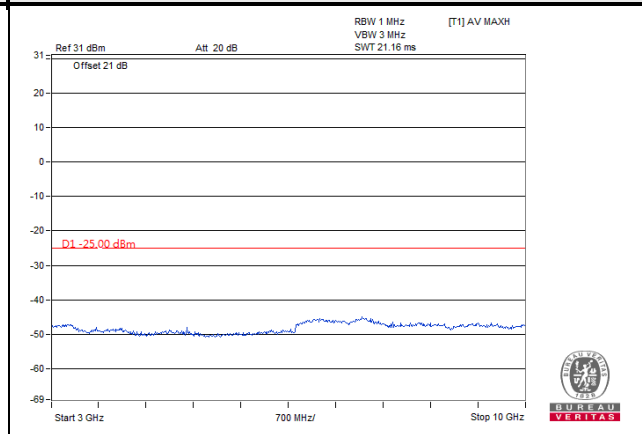
Channel 39758

Chain 1

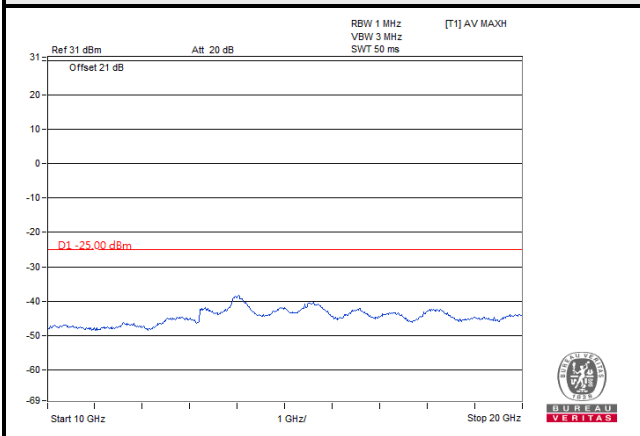
Frequency Range : 9kHz~3GHz



Frequency Range : 3GHz~10GHz



Frequency Range : 10GHz~20GHz

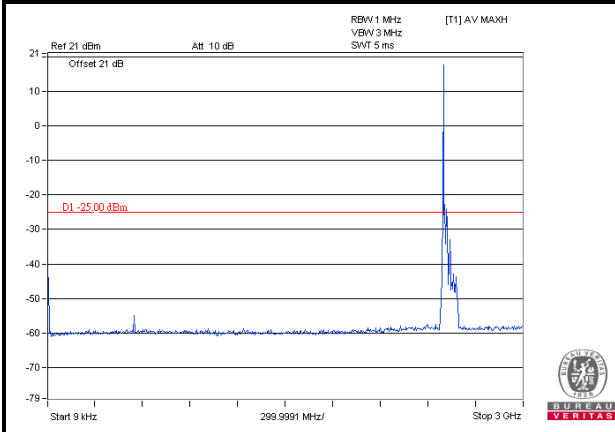


LTE Band 41 Channel Band width: 20MHz

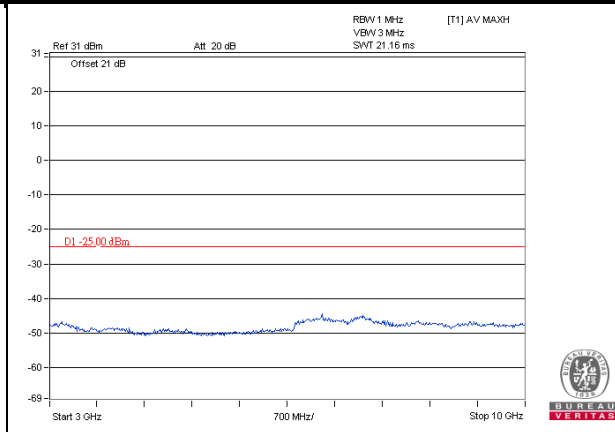
Channel 39790

Chain 1

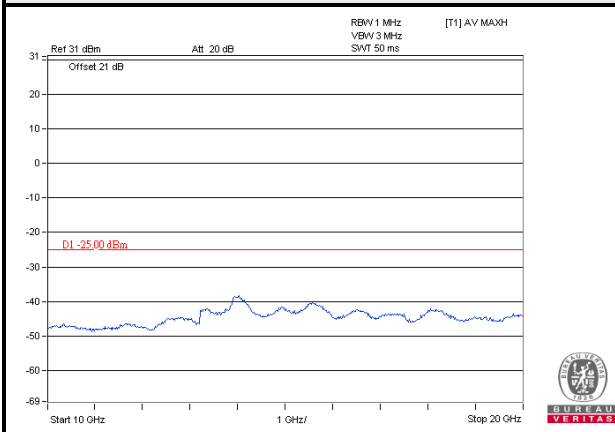
Frequency Range : 9kHz~3GHz



Frequency Range : 3GHz~10GHz



Frequency Range : 10GHz~20GHz



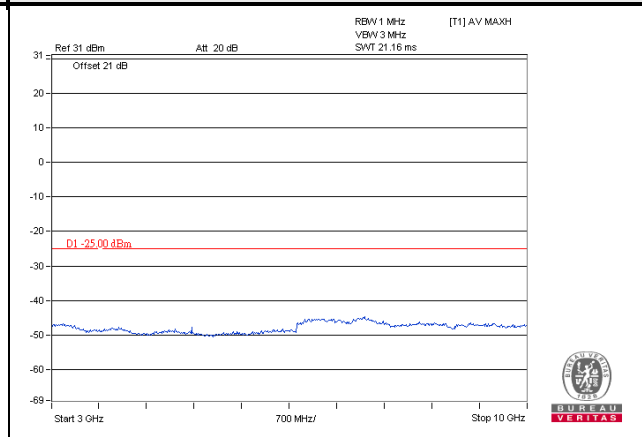
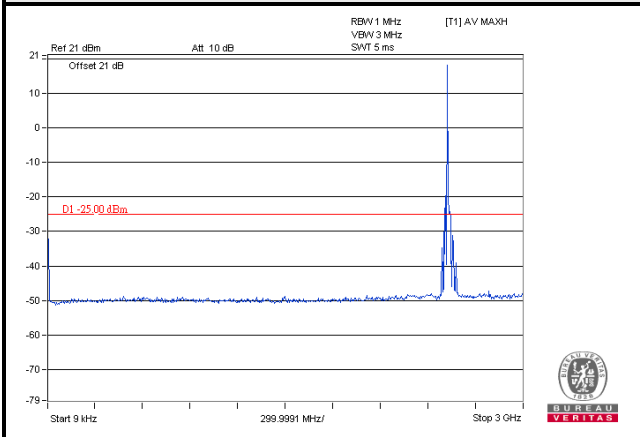
LTE Band 41 Channel Band width: 20MHz

Channel 40040

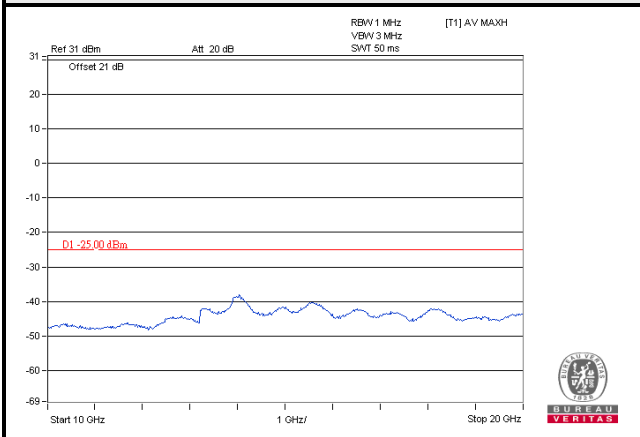
Chain 1

Frequency Range : 9kHz~3GHz

Frequency Range : 3GHz~10GHz



Frequency Range : 10GHz~20GHz



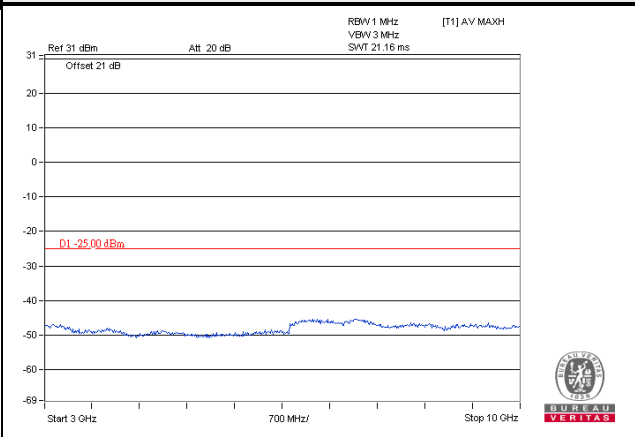
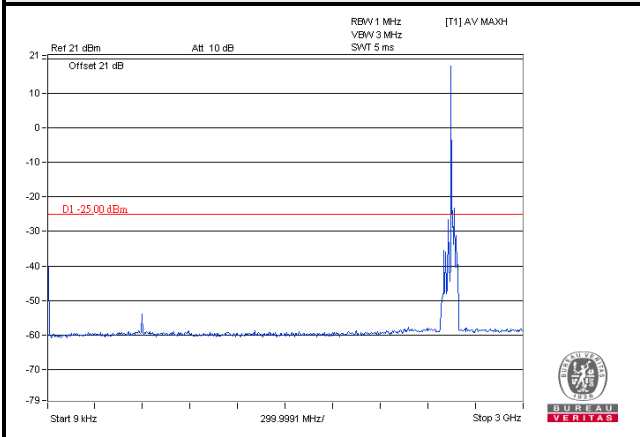
LTE Band 41 Channel Band width: 20MHz

Channel 40290

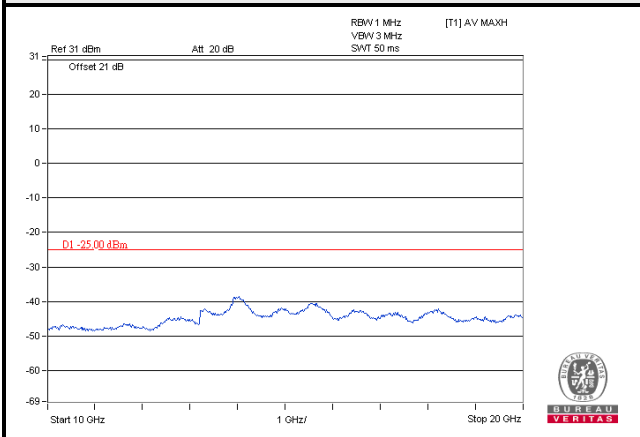
Chain 1

Frequency Range : 9kHz~3GHz

Frequency Range : 3GHz~10GHz



Frequency Range : 10GHz~20GHz

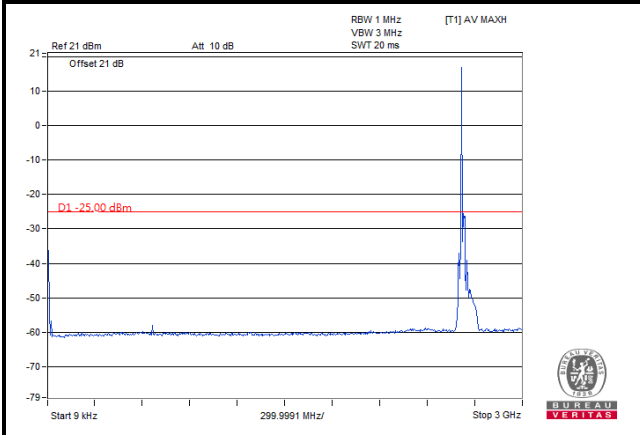


LTE Band 41 Channel Band width: 20MHz

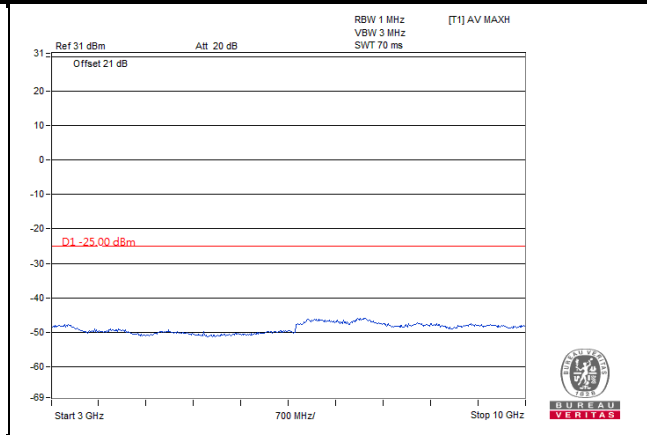
Channel 40978

Chain 1

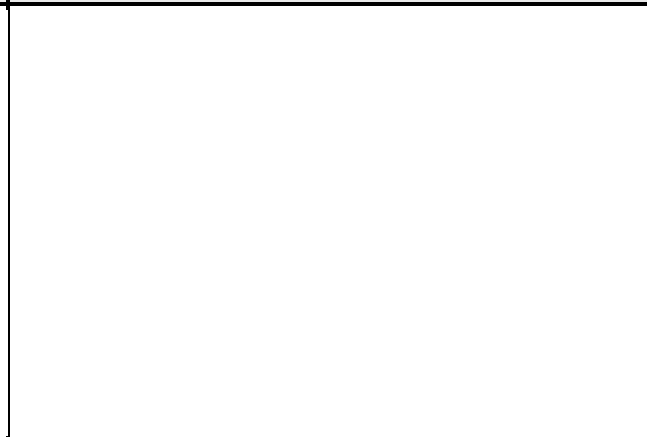
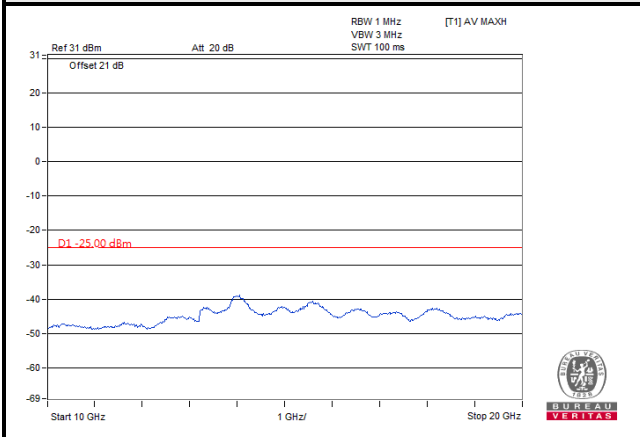
Frequency Range : 9kHz~3GHz



Frequency Range : 3GHz~10GHz



Frequency Range : 10GHz~20GHz



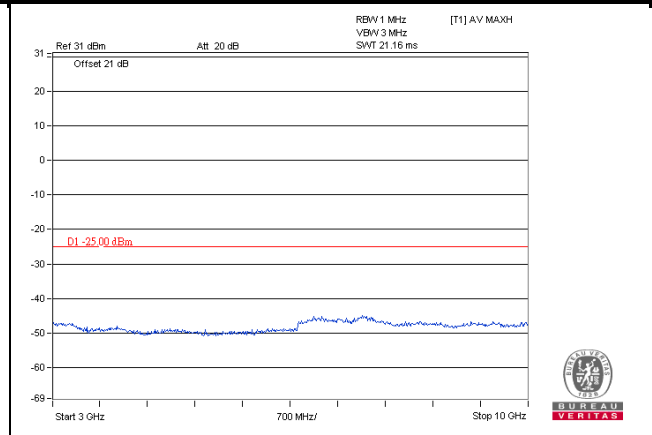
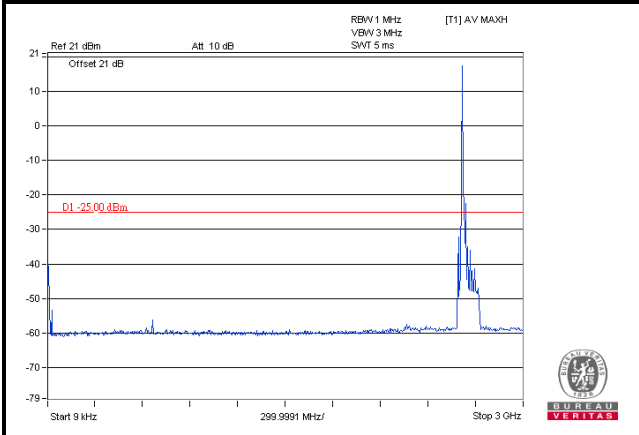
LTE Band 41 Channel Band width: 20MHz

Channel 40990

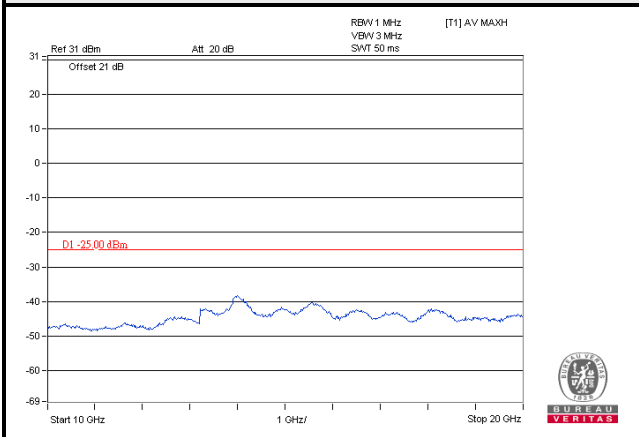
Chain 1

Frequency Range : 9kHz~3GHz

Frequency Range : 3GHz~10GHz



Frequency Range : 10GHz~20GHz



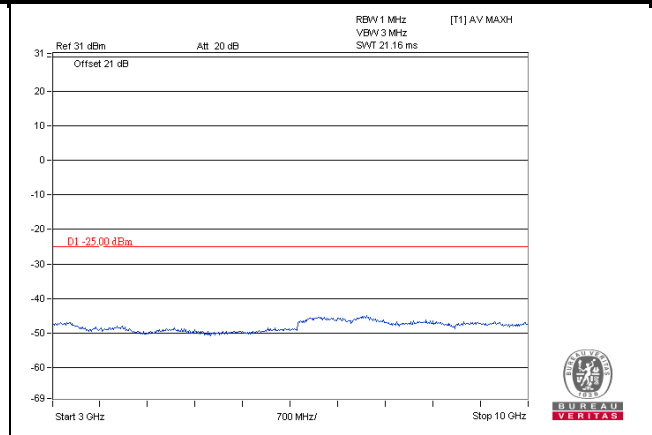
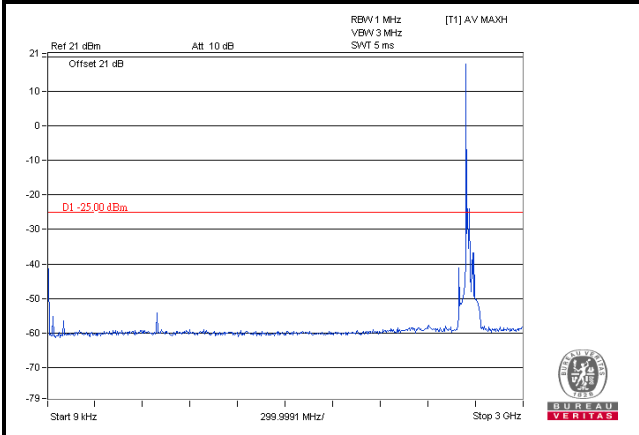
LTE Band 41 Channel Band width: 20MHz

Channel 41240

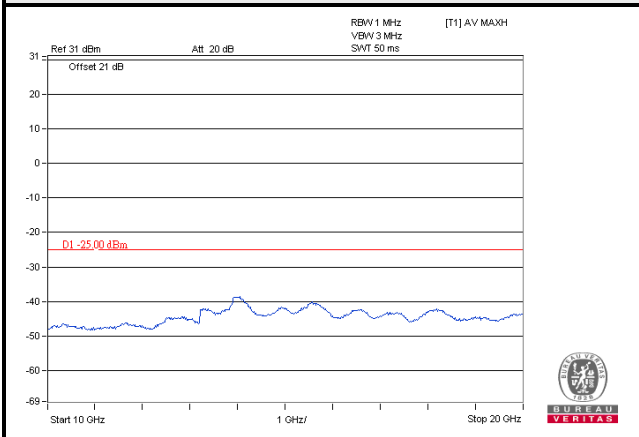
Chain 1

Frequency Range : 9kHz~3GHz

Frequency Range : 3GHz~10GHz



Frequency Range : 10GHz~20GHz



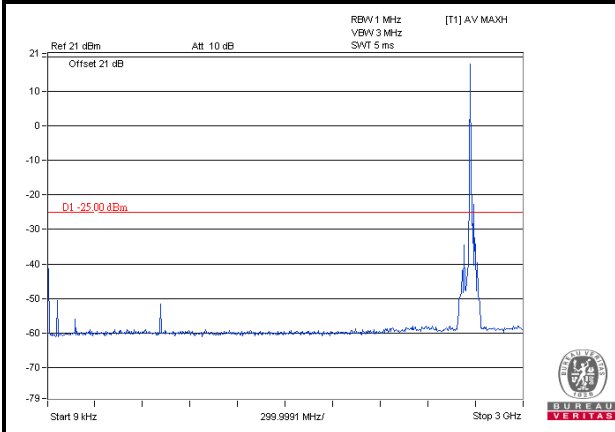


LTE Band 41 Channel Band width: 20MHz

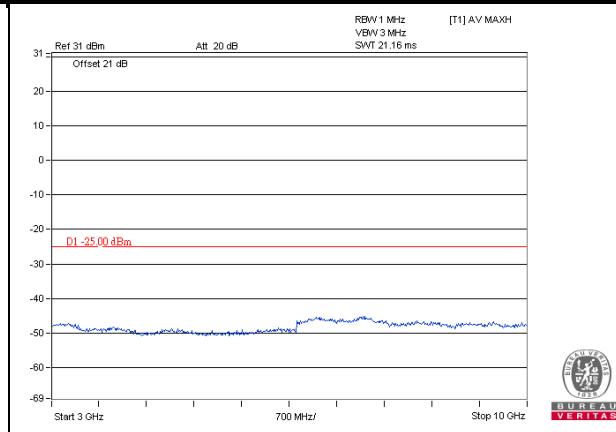
Channel 41490

Chain 1

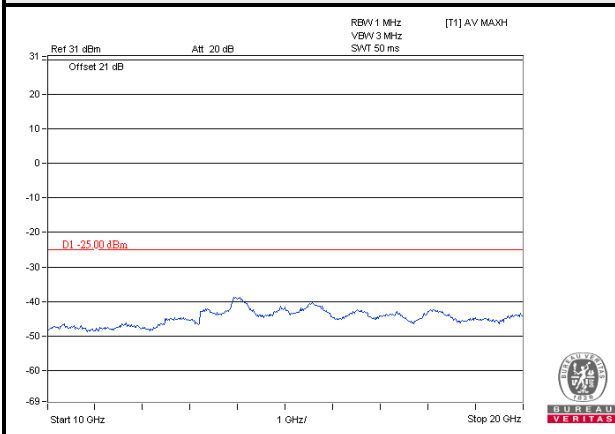
Frequency Range : 9kHz~3GHz



Frequency Range : 3GHz~10GHz



Frequency Range : 10GHz~20GHz



## 4.7 Radiated Emission Measurement

### 4.7.1 Limits of Radiated Emission Measurement

For LTE Band 41

On any frequency outside a licensee's frequency block, The power of any emission shall be attenuated below the transmitter power (P) by at least  $55 + 10 \log (P)$  dB. The emission limit equal to  $-25\text{dBm}$ .

### 4.7.2 Test Procedure

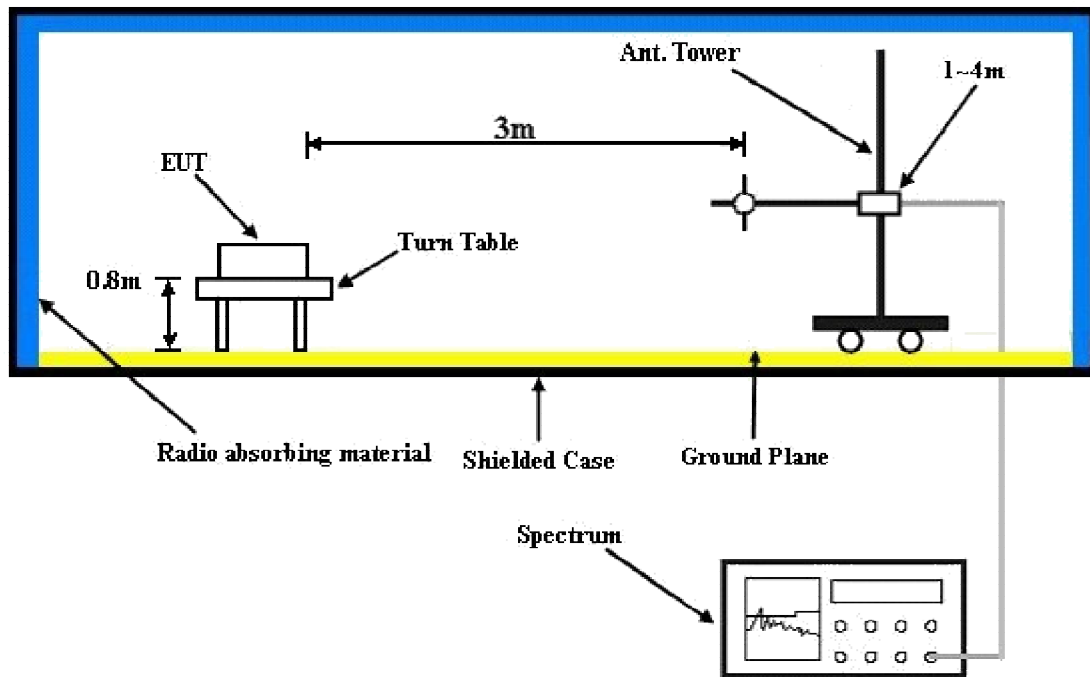
- a. The power was measured with R&S Spectrum Analyzer. For LTE Band 41 measurements were done at 6 channels (low, middle and high channel of operational frequency range.)
- b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, 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.
- c. The substitution 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 b. Record the power level of S.G
- d.  $\text{EIRP} = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution antenna}$ .

**Note:** The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

### 4.7.3 Deviation from Test Standard

No deviation.

#### 4.7.4 Test Setup



For the actual test configuration, please refer to the attached file (Test Setup Photo).

#### 4.7.5 Test Results

Below 1GHz

LTE Band 41

Channel Bandwidth: 20MHz

|      |                  |                 |                |
|------|------------------|-----------------|----------------|
| Mode | TX channel 39790 | Frequency Range | Below 1000 MHz |
|------|------------------|-----------------|----------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |               |                       |                        |            |             |             |
|---|-------------|---------------|-----------------------|------------------------|------------|-------------|-------------|
| No.   | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1   | 98.88       | -64.06        | -79.24                | 10.03                  | -69.21     | -25.00      | -44.21      |
| 2   | 122.78      | -63.00        | -78.45                | 13.03                  | -65.42     | -25.00      | -40.42      |
| 3   | 191.67      | -70.85        | -86.99                | 12.45                  | -74.54     | -25.00      | -49.54      |
| 4   | 245.09      | -64.75        | -82.18                | 14.03                  | -68.15     | -25.00      | -43.15      |
| 5   | 342.09      | -70.10        | -87.97                | 17.17                  | -70.80     | -25.00      | -45.80      |
| 6   | 687.91      | -75.59        | -94.92                | 24.88                  | -70.04     | -25.00      | -45.04      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |               |                       |                        |            |             |             |
| No.   | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1   | 98.88       | -64.73        | -80.25                | 10.03                  | -70.22     | -25.00      | -45.22      |
| 2   | 166.36      | -66.46        | -81.45                | 14.47                  | -66.98     | -25.00      | -41.98      |
| 3   | 232.43      | -66.37        | -82.80                | 12.84                  | -69.96     | -25.00      | -44.96      |
| 4   | 364.58      | -71.24        | -89.11                | 17.85                  | -71.26     | -25.00      | -46.26      |
| 5   | 498.13      | -73.48        | -93.30                | 21.24                  | -72.06     | -25.00      | -47.06      |
| 6   | 687.91      | -73.25        | -93.20                | 24.88                  | -68.32     | -25.00      | -43.32      |

Remarks:

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

|      |                  |                 |                |
|------|------------------|-----------------|----------------|
| Mode | TX channel 40990 | Frequency Range | Below 1000 MHz |
|------|------------------|-----------------|----------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |  |  |  |  |  |  |  |
|---|--|--|--|--|--|--|--|
|---|--|--|--|--|--|--|--|

| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
|-----|-------------|---------------|-----------------------|------------------------|------------|-------------|-------------|
| 1   | 98.88       | -64.43        | -79.61                | 10.03                  | -69.58     | -25.00      | -44.58      |
| 2   | 122.78      | -62.92        | -78.37                | 13.03                  | -65.34     | -25.00      | -40.34      |
| 3   | 233.84      | -52.88        | -69.58                | 13.07                  | -56.51     | -25.00      | -31.51      |
| 4   | 268.99      | -63.84        | -80.67                | 15.09                  | -65.58     | -25.00      | -40.58      |
| 5   | 450.33      | -60.34        | -79.95                | 20.40                  | -59.55     | -25.00      | -34.55      |
| 6   | 687.91      | -76.23        | -95.56                | 24.88                  | -70.68     | -25.00      | -45.68      |

| Antenna Polarity & Test Distance: Vertical at 3 M |  |  |  |  |  |  |  |
|---|--|--|--|--|--|--|--|
|---|--|--|--|--|--|--|--|

| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
|-----|-------------|---------------|-----------------------|------------------------|------------|-------------|-------------|
| 1   | 98.88       | -64.36        | -79.88                | 10.03                  | -69.85     | -25.00      | -44.85      |
| 2   | 166.36      | -65.42        | -80.41                | 14.47                  | -65.94     | -25.00      | -40.94      |
| 3   | 232.43      | -66.80        | -83.23                | 12.84                  | -70.39     | -25.00      | -45.39      |
| 4   | 433.46      | -64.40        | -83.75                | 19.93                  | -63.82     | -25.00      | -38.82      |
| 5   | 687.91      | -74.05        | -94.00                | 24.88                  | -69.12     | -25.00      | -44.12      |
| 6   | 797.57      | -76.18        | -95.93                | 26.56                  | -69.37     | -25.00      | -44.37      |

Remarks:

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Above 1GHz

LTE Band 41

Channel Bandwidth: 20MHz

|      |                  |                 |               |
|------|------------------|-----------------|---------------|
| Mode | TX channel 39758 | Frequency Range | Above 1000MHz |
|------|------------------|-----------------|---------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |               |                       |                        |            |             |             |
|---|-------------|---------------|-----------------------|------------------------|------------|-------------|-------------|
| No.   | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1   | 5013.45     | -42.19        | -55.98                | 21.02                  | -34.96     | -25.00      | -9.96       |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |               |                       |                        |            |             |             |
| No.   | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1   | 5013.88     | -41.34        | -54.81                | 21.02                  | -33.79     | -25.00      | -8.79       |

Remarks:

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

|      |                  |                 |               |
|------|------------------|-----------------|---------------|
| Mode | TX channel 39790 | Frequency Range | Above 1000MHz |
|------|------------------|-----------------|---------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |                |               |                       |                        |               |               |              |
|---|----------------|---------------|-----------------------|------------------------|---------------|---------------|--------------|
| No.   | Freq. (MHz)    | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm)    | Limit (dBm)   | Margin (dB)  |
| 1   | 5028.68        | -41.57        | -55.34                | 21.06                  | -34.28        | -25.00        | -9.28        |
| Antenna Polarity & Test Distance: Vertical at 3 M   |                |               |                       |                        |               |               |              |
| No.   | Freq. (MHz)    | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm)    | Limit (dBm)   | Margin (dB)  |
| <b>1</b>  | <b>5028.97</b> | <b>-40.83</b> | <b>-54.30</b>         | <b>21.06</b>           | <b>-33.24</b> | <b>-25.00</b> | <b>-8.24</b> |

Remarks:

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

|      |                  |                 |               |
|------|------------------|-----------------|---------------|
| Mode | TX channel 40040 | Frequency Range | Above 1000MHz |
|------|------------------|-----------------|---------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |               |                       |                        |            |             |             |
|---|-------------|---------------|-----------------------|------------------------|------------|-------------|-------------|
| No.   | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1   | 5070.14     | -44.22        | -57.93                | 21.15                  | -36.78     | -25.00      | -11.78      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |               |                       |                        |            |             |             |
| No.   | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1   | 5069.71     | -43.01        | -56.47                | 21.15                  | -35.32     | -25.00      | -10.32      |

Remarks:

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

|      |                  |                 |               |
|------|------------------|-----------------|---------------|
| Mode | TX channel 40290 | Frequency Range | Above 1000MHz |
|------|------------------|-----------------|---------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |               |                       |                        |            |             |             |
|---|-------------|---------------|-----------------------|------------------------|------------|-------------|-------------|
| No.   | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1   | 5111.32     | -45.92        | -59.60                | 21.27                  | -38.33     | -25.00      | -13.33      |

| Antenna Polarity & Test Distance: Vertical at 3 M |             |               |                       |                        |            |             |             |
|---|-------------|---------------|-----------------------|------------------------|------------|-------------|-------------|
| No.   | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1   | 5119.71     | -44.43        | -57.91                | 21.30                  | -36.61     | -25.00      | -11.61      |

Remarks:

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

|      |                  |                 |               |
|------|------------------|-----------------|---------------|
| Mode | TX channel 40978 | Frequency Range | Above 1000MHz |
|------|------------------|-----------------|---------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |               |                       |                        |            |             |             |
|---|-------------|---------------|-----------------------|------------------------|------------|-------------|-------------|
| No.   | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1   | 5257.73     | -41.69        | -55.31                | 21.76                  | -33.55     | -25.00      | -8.55       |

| Antenna Polarity & Test Distance: Vertical at 3 M |             |               |                       |                        |            |             |             |
|---|-------------|---------------|-----------------------|------------------------|------------|-------------|-------------|
| No.   | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1   | 5257.64     | -41.51        | -55.08                | 21.76                  | -33.32     | -25.00      | -8.32       |

Remarks:

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

|      |                  |                 |               |
|------|------------------|-----------------|---------------|
| Mode | TX channel 40990 | Frequency Range | Above 1000MHz |
|------|------------------|-----------------|---------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |               |                       |                        |            |             |             |
|---|-------------|---------------|-----------------------|------------------------|------------|-------------|-------------|
| No.   | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1   | 5251.17     | -46.58        | -60.21                | 21.74                  | -38.47     | -25.00      | -13.47      |

| Antenna Polarity & Test Distance: Vertical at 3 M |             |               |                       |                        |            |             |             |
|---|-------------|---------------|-----------------------|------------------------|------------|-------------|-------------|
| No.   | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1   | 5260.14     | -45.40        | -58.97                | 21.76                  | -37.21     | -25.00      | -12.21      |

Remarks:

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

|      |                  |                 |               |
|------|------------------|-----------------|---------------|
| Mode | TX channel 41240 | Frequency Range | Above 1000MHz |
|------|------------------|-----------------|---------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |               |                       |                        |            |             |             |
|---|-------------|---------------|-----------------------|------------------------|------------|-------------|-------------|
| No.   | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1   | 5310.14     | -48.47        | -62.04                | 21.90                  | -40.14     | -25.00      | -15.14      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |               |                       |                        |            |             |             |
| No.   | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1   | 5309.86     | -44.66        | -58.24                | 21.90                  | -36.34     | -25.00      | -11.34      |

Remarks:

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

|      |                  |                 |               |
|------|------------------|-----------------|---------------|
| Mode | TX channel 41490 | Frequency Range | Above 1000MHz |
|------|------------------|-----------------|---------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |               |                       |                        |            |             |             |
|---|-------------|---------------|-----------------------|------------------------|------------|-------------|-------------|
| No.   | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1   | 5360.43     | -49.13        | -62.67                | 22.06                  | -40.61     | -25.00      | -15.61      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |               |                       |                        |            |             |             |
| No.   | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1   | 5360.00     | -46.37        | -59.98                | 22.06                  | -37.92     | -25.00      | -12.92      |

Remarks:

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).



## 5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

## Appendix – Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

**Linko EMC/RF Lab**

Tel: 886-2-26052180

Fax: 886-2-26051924

**Hsin Chu EMC/RF/Telecom Lab**

Tel: 886-3-6668565

Fax: 886-3-6668323

**Hwa Ya EMC/RF/Safety Lab**

Tel: 886-3-3183232

Fax: 886-3-3270892

**Email:** [service.adt@tw.bureauveritas.com](mailto:service.adt@tw.bureauveritas.com)

**Web Site:** [www.bureauveritas-adt.com](http://www.bureauveritas-adt.com)

The address and road map of all our labs can be found in our web site also.

--- END ---