Shenzhen Huatongwei International Inspection Co., Ltd.
1/F,Bldg 3,Hongfa Hi-tech Industrial Park,Genyu Road,Tianliao,Gongming,Shenzhen,China
Phone:86-755-26748019 Fax:86-755-26748089 http://www.szhtw.com.cn

# FCC REPORT

| | | |
|---|---|---|
| **Report Reference No. ..... :** | **TRE1706002502** | R/C…….: 47277 |
| **FCC ID ..... :** | **PJ7-1705** | |
| **Applicant's name ..... :** | **Shenzhen Neoway Technology Co., Ltd.** | |
| Address.....: | 4F-2#,Lian Jian Science & Industry Park,Huarong Road, Dalang Street,Longhua New District,Shenzhen City, Guandong Province,P.R.China | |
| Manufacturer.....: | Shenzhen Neoway Technology Co., Ltd. | |
| Address.....: | 4F-2#,Lian Jian Science & Industry Park,Huarong Road, Dalang Street,Longhua New District,Shenzhen City, Guandong Province,P.R.China | |
| **Test item description ..... :** | **LTE Module** | |
| Trade Mark .....: | Neoway | |
| Model/Type reference.....: | N720 | |
| Listed Model(s) .....: | - | |
| **Standard ..... :** | **FCC Part 22: PUBLIC MOBILE SERVICES**<br>**FCC Part 24: PERSONAL COMMUNICATIONS SERVICES**<br>**FCC Part 27: MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES** | |
| Date of receipt of test sample…….: | Jun. 05, 2017 | |
| Date of testing……...: | Jun. 06, 2017 - Jun. 26, 2017 | |
| Date of issue……: | Jun. 27, 2017 | |
| **Result..... ……...:** | **Pass** | |

| | | |
|---|---|---|
| Compiled by<br>( position+printedname+signature)...: | File administrators Becky Liang | Becky Liang |
| Supervised by<br>(position+printedname+signature)....: | Project Engineer Lion Cai | Lion Cai |
| Approved by<br>(position+printedname+signature)....: | Manager Hans Hu | Hans Hu |

| | |
|---|---|
| **Testing Laboratory Name ..... :** | **Shenzhen Huatongwei International Inspection Co., Ltd.** |
| Address.....: | 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China |



*The test report merely corresponds to the test sample.*
*It is not permitted to copy extracts of these test result without the written permission of the test laboratory.*

# Contents

# 1. Test standards and Report version

## 1.1. Applicable Standards

The tests were performed according to following standards:

FCC Part 22:PRIVATE LAND MOBILE RADIO SERVICES.
FCC Part 24:PUBLIC MOBILE SERVICES
FCC Part 27:MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES
TIA/EIA 603 D June 2010:Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.
FCC Part 2:FREQUENCY ALLOCA-TIONS AND RADIO TREATY MAT-TERS; GENERAL RULES AND REG-ULATIONS
971168 D01 Power Meas License Digital Systems v02r02:provides a methodology for fully characterizing the fundamental power of wideband (> 1 MHz) digitally modulated RF signals acceptable to the FCC for demonstrating compliance for licensed transmitters.

## 1.2. Report version

| Version No. | Date of issue | Description |
|---|---|---|
| 00 | Jun. 27, 2017 | Original |
| | | |
| | | |
| | | |
| | | |

# 2. Test Description

| Test Item | Section in CFR 47 | Result |
|---|---|---|
| RF Output Power | Part 2.1046<br>Part 22.913(a)<br>Part 24.232(c)<br>Part 27.50 | Pass |
| 99% & -26 dB Occupied Bandwidth | Part 2.1049<br>Part 22.917(b)<br>Part 24.238(b) | Pass |
| Conducted Spurious Emissions | Part 2.1051<br>Part 22.917<br>Part 24.238<br>Part 27.53 | Pass |
| Band Edge | Part 2.1051<br>Part 22.917<br>Part 24.238<br>Part 27.53 | Pass |
| ERP and EIRP | Part 22.913(a)<br>Part 24.232(b) | Pass |
| Radiated Spurious Emissions | Part 2.1053<br>Part 22.917<br>Part 24.238<br>Part 27.53 | Pass |
| Frequency stability vs. temperature | Part 2.1055(a)(1)(b)<br>Part 22.255<br>Part 24.235<br>Part 27.54 | Pass |
| Frequency stability vs. voltage | Part 2.1055(d)(1)(2)<br>Part 22.255<br>Part 24.235<br>Part 27.54 | Pass |
| Peak-Average Ratio | Part 24.232<br>Part 27.50 | Pass |

Note: The measurement uncertainty is not included in the test result.

# 3. SUMMARY

## 3.1. Client Information

| | |
|---|---|
| Applicant: | Shenzhen Neoway Technology Co., Ltd. |
| Address: | 4F-2#,Lian Jian Science & Industry Park,Huarong Road,Dalang Street, Longhua New District,Shenzhen City,Guandong Province,P.R.China |
| Manufacturer: | Shenzhen Neoway Technology Co., Ltd. |
| Address: | 4F-2#,Lian Jian Science & Industry Park,Huarong Road,Dalang Street, Longhua New District,Shenzhen City,Guandong Province,P.R.China |

## 3.2. Product Description

| | |
|---|---|
| Name of EUT: | LTE Module |
| Trade Mark: | Neoway |
| Model No.: | N720 |
| Listed Model(s): | - |
| IMEI: | 869235021680512 |
| Power supply: | DC 5V |
| Adapter information: | - |
| Hardware version: | 1750-v1.1 |
| Software version: | N720_EAB0CM_BZ_CTA_V001A_20170120 |
| **RF Technical Description** | |
| ☒FDD Band 2 | |
| Operation Frequency: | Uplink:1850.7 MHz – 1909.3 MHz<br>Downlink: 1930.7 MHz – 1989.3 MHz |
| Channel bandwidth: | ☒1.4MHz ☒ 3MHz ☒ 5MHz ☒ 10MHz ☒15MHz |
| ☒FDD Band 4 | |
| Operation Frequency: | Uplink:1710.7 MHz – 1754.3 MHz<br>Downlink: 2110.7 MHz – 2154.3 MHz |
| Channel bandwidth: | ☒1.4MHz ☒ 3MHz ☒ 5MHz ☒ 10MHz ☒15MHz ☒20MHz |
| ☒FDD Band 5 | |
| Operation Frequency: | Uplink:824.7 MHz – 848.3 MHz<br>Downlink: 869.7 MHz – 893.3 MHz |
| Channel bandwidth: | ☒1.4MHz ☒ 3MHz ☒ 5MHz ☒ 10MHz ☐15MHz ☐20MHz |
| ☒FDD Band 7 | |
| Operation Frequency: | Uplink:2502.5 MHz – 2567.5 MHz<br>Downlink: 2622.5 MHz – 2687.5 MHz |
| Channel bandwidth: | ☐1.4MHz ☐ 3MHz ☒ 5MHz ☒ 10MHz ☐15MHz ☐20MHz |
| ☒FDD Band 12 | |
| Operation Frequency: | Uplink:699.7 MHz – 715.3 MHz<br>Downlink: 729.7 MHz – 745.3 MHz |
| Channel bandwidth: | ☒1.4MHz ☒ 3MHz ☒ 5MHz ☒ 10MHz ☐15MHz ☐20MHz |
| ☒FDD Band 17 | |
| Operation Frequency: | Uplink:706.5 MHz – 713.5 MHz<br>Downlink: 736.5 MHz – 743.5 MHz |

| | |
|---|---|
| Channel bandwidth: | ☐1.4MHz ☐ 3MHz ☒ 5MHz ☒ 10MHz ☐15MHz ☐20MHz |
| Power Class: | ☐ Class 1 ☐ Class 2 ☒ Class 3 ☐ Class 4 |
| Modulation type: | ☒QPSK ☒16QAM ☐64QAM |

## 3.3. Operation state

➢ **Test frequency list**

**FDD Band 2**

| Test Frequency ID | Bandwidth [MHz] | $N_{UL}$ | Frequency of Uplink [MHz] | $N_{DL}$ | Frequency of Downlink [MHz] |
|---|---|---|---|---|---|
| Low Range | 1.4 | 18607 | 1850.7 | 607 | 1930.7 |
| | 3 | 18615 | 1851.5 | 615 | 1931.5 |
| | 5 | 18625 | 1852.5 | 625 | 1932.5 |
| | 10 | 18650 | 1855 | 650 | 1935 |
| | 15 [1] | 18675 | 1857.5 | 675 | 1937.5 |
| | 20 [1] | 18700 | 1860 | 700 | 1940 |
| Mid Range | 1.4/3/5/10 15 [1]/20 [1] | 18900 | 1880 | 900 | 1960 |
| High Range | 1.4 | 19193 | 1909.3 | 1193 | 1989.3 |
| | 3 | 19185 | 1908.5 | 1185 | 1988.5 |
| | 5 | 19175 | 1907.5 | 1175 | 1987.5 |
| | 10 | 19150 | 1905 | 1150 | 1985 |
| | 15 [1] | 19125 | 1902.5 | 1125 | 1982.5 |
| | 20 [1] | 19100 | 1900 | 1100 | 1980 |
| NOTE 1: Bandwidth for which a relaxation of the specified UE receiver sensitivity requirement (TS 36.101 [27] Clause 7.3) is allowed. | | | | | |

**FDD Band 4**

| Test Frequency ID | Bandwidth [MHz] | $N_{UL}$ | Frequency of Uplink [MHz] | $N_{DL}$ | Frequency of Downlink [MHz] |
|---|---|---|---|---|---|
| Low Range | 1.4 | 19957 | 1710.7 | 1957 | 2110.7 |
| | 3 | 19965 | 1711.5 | 1965 | 2111.5 |
| | 5 | 19975 | 1712.5 | 1975 | 2112.5 |
| | 10 | 20000 | 1715 | 2000 | 2115 |
| | 15 | 20025 | 1717.5 | 2025 | 2117.5 |
| | 20 | 20050 | 1720 | 2050 | 2120 |
| Mid Range | 1.4/3/5/10/15/20 | 20175 | 1732.5 | 2175 | 2132.5 |
| High Range | 1.4 | 20393 | 1754.3 | 2393 | 2154.3 |
| | 3 | 20385 | 1753.5 | 2385 | 2153.5 |
| | 5 | 20375 | 1752.5 | 2375 | 2152.5 |
| | 10 | 20350 | 1750 | 2350 | 2150 |
| | 15 | 20325 | 1747.5 | 2325 | 2147.5 |
| | 20 | 20300 | 1745 | 2300 | 2145 |

**FDD Band 5**

| Test Frequency ID | Bandwidth [MHz] | $N_{UL}$ | Frequency of Uplink [MHz] | $N_{DL}$ | Frequency of Downlink [MHz] |
|---|---|---|---|---|---|
| Low Range | 1.4 | 20407 | 824.7 | 2407 | 869.7 |
| | 3 | 20415 | 825.5 | 2415 | 870.5 |
| | 5 | 20425 | 826.5 | 2425 | 871.5 |
| | 10 [1] | 20450 | 829 | 2450 | 874 |
| Mid Range | 1.4/3/5 10 [1] | 20525 | 836.5 | 2525 | 881.5 |
| High Range | 1.4 | 20643 | 848.3 | 2643 | 893.3 |
| | 3 | 20635 | 847.5 | 2635 | 892.5 |
| | 5 | 20625 | 846.5 | 2625 | 891.5 |
| | 10 [1] | 20600 | 844 | 2600 | 889 |
| NOTE 1: Bandwidth for which a relaxation of the specified UE receiver sensitivity requirement (TS 36.101 [27] Clause 7.3) is allowed. | | | | | |

## FDD Band 7

| Test Frequency ID | Bandwidth [MHz] | $N_{UL}$ | Frequency of Uplink [MHz] | $N_{DL}$ | Frequency of Downlink [MHz] |
|---|---|---|---|---|---|
| Low Range | 5 | 20775 | 2502.5 | 2775 | 2622.5 |
| | 10 | 20800 | 2505 | 2800 | 2625 |
| | 15 | 20825 | 2507.5 | 2825 | 2627.5 |
| | 20 [1] | 20850 | 2510 | 2850 | 2630 |
| Mid Range | 5/10/15 20 [1] | 21100 | 2535 | 3100 | 2655 |
| High Range | 5 | 21425 | 2567.5 | 3425 | 2687.5 |
| | 10 | 21400 | 2565 | 3400 | 2685 |
| | 15 | 21375 | 2562.5 | 3375 | 2682.5 |
| | 20 [1] | 21350 | 2560 | 3350 | 2680 |
| NOTE 1: Bandwidth for which a relaxation of the specified UE receiver sensitivity requirement (TS 36.101 [27] Clause 7.3) is allowed. | | | | | |

## FDD Band 12

| Test Frequency ID | Bandwidth [MHz] | $N_{UL}$ | Frequency of Uplink [MHz] | $N_{DL}$ | Frequency of Downlink [MHz] |
|---|---|---|---|---|---|
| Low Range | 1.4 | 23017 | 699.7 | 5017 | 729.7 |
| | 3 | 23025 | 700.5 | 5025 | 730.5 |
| | 5 [1] | 23035 | 701.5 | 5035 | 731.5 |
| | 10 [1] | 23060 | 704 | 5060 | 734 |
| Mid Range | 1.4/3 5 [1]/10 [1] | 23095 | 707.5 | 5095 | 737.5 |
| High Range | 1.4 | 23173 | 715.3 | 5173 | 745.3 |
| | 3 | 23165 | 714.5 | 5165 | 744.5 |
| | 5 [1] | 23155 | 713.5 | 5155 | 743.5 |
| | 10 [1] | 23130 | 711 | 5130 | 741 |
| NOTE 1: Bandwidth for which a relaxation of the specified UE receiver sensitivity requirement (TS 36.101 [27] Clause 7.3) is allowed. | | | | | |

## FDD Band 17

| Test Frequency ID | Bandwidth [MHz] | $N_{UL}$ | Frequency of Uplink [MHz] | $N_{DL}$ | Frequency of Downlink [MHz] |
|---|---|---|---|---|---|
| Low Range | 5 [1] | 23755 | 706.5 | 5755 | 736.5 |
| | 10 [1] | 23780 | 709 | 5780 | 739 |
| Mid Range | 5 [1]/10 [1] | 23790 | 710 | 5790 | 740 |
| High Range | 5 [1] | 23825 | 713.5 | 5825 | 743.5 |
| | 10 [1] | 23800 | 711 | 5800 | 741 |
| NOTE 1: Bandwidth for which a relaxation of the specified UE receiver sensitivity requirement (TS 36.101 [27] Clause 7.3) is allowed. | | | | | |

## 3.4. EUT operation mode

| For RF test items |
|---|
| The EUT has been tested under typical operating condition. The Applicant providessoftware to control the EUT for staying in continoustransmitting and receiving mode for testing. |

| Test Items | Band | Bandwidth (MHz) | | | | | | Modulation | | RB # | | | Test Channel | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1.4 | 3 | 5 | 10 | 15 | 20 | QPSK | 16QAM | 1 | Half | Full | L | M | H |
| Max OutputPower | 2 | v | v | v | v | v | v | v | v | v | v | v | v | v | v |
| | 4 | v | v | v | v | v | v | v | v | v | v | v | v | v | v |
| | 5 | v | v | v | v | - | - | v | v | v | v | v | v | v | v |
| | 7 | - | - | v | v | v | v | v | v | v | v | v | v | v | v |
| | 12 | v | v | v | v | | | v | v | v | v | v | v | v | v |
| | 17 | - | - | v | v | - | - | v | v | v | v | v | v | v | v |
| 26dB and 99% Bandwidth | 2 | v | v | v | v | v | v | v | v | | | v | v | v | v |
| | 4 | v | v | v | v | v | v | v | v | | | v | v | v | v |
| | 5 | v | v | v | v | - | - | v | v | | | v | v | v | v |
| | 7 | - | - | v | v | v | v | v | v | | | v | v | v | v |
| | 12 | v | v | v | v | | | v | v | | | v | v | v | v |
| | 17 | - | - | v | v | - | - | v | v | | | v | v | v | v |
| Conducted Band Edge | 2 | v | v | v | v | v | v | v | v | v | | v | v | | v |
| | 4 | v | v | v | v | v | v | v | v | v | | v | v | | v |
| | 5 | v | v | v | v | - | - | v | v | v | | v | v | | v |
| | 7 | - | - | v | v | v | v | v | v | v | | v | v | | v |
| | 12 | v | v | v | v | | | v | v | v | | v | v | | v |
| | 17 | - | - | v | v | - | - | v | v | v | | v | v | | v |
| Conducted Spurious Emission | 2 | v | v | v | v | v | v | v | v | v | | | v | v | v |
| | 4 | v | v | v | v | v | v | v | v | v | | | v | v | v |
| | 5 | v | v | v | v | - | - | v | v | v | | | v | v | v |
| | 7 | - | - | v | v | v | v | v | v | v | | | v | v | v |
| | 12 | | | | | | | v | v | v | | | v | v | v |
| | 17 | - | - | v | v | - | - | v | v | v | | | v | v | v |
| E.R.P./ E.I.R.P. | 2 | v | v | v | v | v | v | v | v | v | | | v | v | v |
| | 4 | v | v | v | v | v | v | v | v | v | | | v | v | v |
| | 5 | v | v | v | v | - | - | v | v | v | | | v | v | v |
| | 7 | - | - | v | v | v | v | v | v | v | | | v | v | v |
| | 12 | v | v | v | v | v | v | v | v | v | | | v | v | v |
| | 17 | | | v | v | - | - | v | v | v | | | v | v | v |
| Radiated Spurious Emission | 2 | v | v | v | v | v | v | v | | v | | | v | v | v |
| | 4 | v | v | v | v | v | v | v | | v | | | v | v | v |
| | 5 | v | v | v | v | - | - | v | | v | | | v | v | v |
| | 7 | - | - | v | v | v | v | v | | v | | | v | v | v |
| | 12 | | | v | | | | v | | v | | | v | v | v |
| | 17 | | | v | v | - | - | v | | v | | | v | v | v |
| Frequency Stability | 2 | | | | | | v | v | v | | | v | | v | |
| | 4 | | | | | | v | v | v | | | v | | v | |
| | 5 | | | | v | | | v | v | | | v | | v | |
| | 7 | | | | | | v | v | v | | | v | | v | |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **12** | | | | v | | | v | v | | | v | | v | |
| | **17** | | | | v | | | v | v | | | v | | v | |
| **Peak-to-AverageRatio** | **2** | | | | | | v | v | v | v | | v | v | v | v |
| | **4** | | | | | | v | v | v | v | | v | v | v | v |
| | **5** | | | | v | | | v | v | v | | v | v | v | v |
| | **7** | | | | | | v | v | v | v | | v | v | v | v |
| | **12** | | | | v | | | v | v | v | | v | v | v | v |
| | **17** | | | | v | | | v | v | v | | v | v | v | v |
| **Remark** | 1. The mark “v“means that this configuration is chosenfor testing<br>2. The mark “-“means that this bandwidth is not supported.<br>3. The device is investigatedfrom 30MHz to10 times offundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported. | | | | | | | | | | | | | | |

## 3.5. EUT configuration

**The following peripheral devices and interface cables were connected during the measurement:**

● - supplied by the manufacturer

○ - supplied by the lab

| | | | |
|---|---|---|---|
| ● | Test Fixture | Manufacturer : | Shenzhen Neoway Technology Co.,Ltd. |
| | | Model No. : | N720-DMEO-V1.2 |
| ● | Antenna | Manufacturer : | Shenzhen Neoway Technology Co.,Ltd. |
| | | Model No. : | CS-G10-5F3-LE,Antenna Gani 0dBi |
| ● | Adapter | Manufacturer : | Shenzhen Neoway Technology Co.,Ltd. |
| | | Model No. : | HH-0500300A<br>Input: 100-240Va.c., 50/60Hz,<br>Output: 5.0Vd.c., 3A |
| Note:All the LTE Module test is test with the Fixture(N720-DMEO-V1.2) and the antenna(CS-G10-5F3-LE) | | | |

## 3.6. Modifications

No modifications were implemented to meet testing criteria.

# 4. TEST ENVIRONMENT

## 4.1. Address of the test laboratory

Laboratory:Shenzhen Huatongwei International Inspection Co., Ltd.
Address: 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China
Phone: 86-755-26748019 Fax: 86-755-26748089

## 4.2. Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

**CNAS-Lab Code: L1225**

Shenzhen Huatongwei International Inspection Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories.

**A2LA-Lab Cert. No.: 3902.01**

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

**FCC-Registration No.: 317478**

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration 317478.

**IC-Registration No.: 5377B**

Two 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 5377B.

**ACA**

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our A2LA accreditation.

## 4.3. Equipments Used during the Test

| Output Power(Conducted) &Occupied Bandwidth&EmissionBandwidth&Band Edge Compliance&Conducted Spurious Emission | | | | | |
|---|---|---|---|---|---|
| No. | Equipment | Manufacturer | Model No. | SerialNo. | Last Cal. |
| 1 | UNIVERSAL RADIO COMMUNICATION | Rohde&Schwarz | CMU200 | 112012 | 2016/11/13 |
| 2 | WIDEB.RADIO COMM.TESRER | Rohde&Schwarz | CMW500 | 1201.0002K50 | 2016/11/13 |
| 3 | Spectrum Analyzer | Rohde&Schwarz | FSU26 | 201141 | 2016/11/13 |
| 4 | Splitter | Mini-Circuit | ZAPD-4 | 400059 | 2016/11/13 |

| Frequency Stability | | | | | |
|---|---|---|---|---|---|
| No. | Equipment | Manufacturer | Model No. | SerialNo. | Last Cal. |
| 1 | UNIVERSAL RADIO COMMUNICATION | Rohde&Schwarz | CMU200 | 112012 | 2016/11/13 |
| 2 | WIDEB.RADIO COMM.TESRER | Rohde&Schwarz | CMW500 | 1201.0002K50 | 2016/11/13 |
| 3 | Spectrum Analyzer | Rohde&Schwarz | FSU26 | 201141 | 2016/11/13 |
| 4 | Climate Chamber | ESPEC | EL-10KA | 05107008 | 2016/11/13 |
| 5 | Splitter | Mini-Circuit | ZAPD-4 | 400059 | 2016/11/13 |

| Output Power (Radiated) &Radiated Spurious Emission | | | | | |
|---|---|---|---|---|---|
| No. | Equipment | Manufacturer | Model No. | SerialNo. | Last Cal. |
| 1 | UNIVERSAL RADIO COMMUNICATION | Rohde&Schwarz | CMU200 | 112012 | 2016/11/13 |
| 2 | Spectrum Analyzer | Rohde&Schwarz | FSU26 | 201141 | 2016/11/13 |
| 3 | HORNANTENNA | ShwarzBeck | 9120D | 1012 | 2016/11/13 |
| 4 | HORNANTENNA | ShwarzBeck | 9120D | 1011 | 2016/11/13 |
| 5 | Ultra-Broadband Antenna | ShwarzBeck | VULB9163 | 538 | 2016/11/13 |
| 6 | Ultra-Broadband Antenna | ShwarzBeck | VULB9163 | 539 | 2016/11/13 |
| 7 | TURNTABLE | MATURO | TT2.0 | ---- | 2016/11/13 |
| 8 | ANTENNA MAST | MATURO | TAM-4.0-P | ---- | N/A |
| 9 | EMI Test Software | Audix | E3 | N/A | N/A |
| 10 | EMI Test Receiver | Rohde&Schwarz | ESIB 26 | 100009 | 2016/11/13 |
| 11 | RF Test Panel | Rohde&Schwarz | TS / RSP | 335015/ 0017 | 2016/11/13 |
| 12 | High pass filter | Compliance Direction systems | BSU-6 | 34202 | 2016/11/13 |
| 13 | Splitter | Mini-Circuit | ZAPD-4 | 400059 | 2016/11/13 |
| 14 | Horn Antenna | SCHWARZBECK | BBHA9170 | 25841 | 2016/11/13 |
| 15 | Horn Antenna | SCHWARZBECK | BBHA9170 | 25842 | 2016/11/13 |
| 16 | Preamplifier | ShwarzBeck | BBV 9718 | BBV 9718 | 2016/11/13 |
| 17 | Broadband Preamplifier | ShwarzBeck | BBV743 | 9743-0079 | 2016/11/13 |
| 18 | Signal Generator | Rohde&Schwarz | SMF100A | 101932 | 2016/11/13 |
| 19 | Amplifer | Compliance Direction systems | PAP1-4060 | 120 | 2016/11/13 |
| 20 | TURNTABLE | ETS | 2088 | 2149 | 2016/11/13 |
| 21 | ANTENNA MAST | ETS | 2075 | 2346 | 2016/11/13 |
| 22 | HORNANTENNA | Rohde&Schwarz | HF906 | 100068 | 2016/11/13 |
| 23 | HORNANTENNA | Rohde&Schwarz | HF906 | 100039 | 2016/11/13 |
| 24 | WIDEB.RADIO COMM.TESRER | R&S | CMW500 | 1201.0002K50 | 2016/11/13 |

The calibration interval was one year.

## 4.4. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

| | |
|---|---|
| Normal Temperature/Tnor: | 15~35°C |
| lative Humidity | 30~60 % |
| Air Pressure | 950-1050 hPa |

## 4.5. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01"Electromagnetic compatibilityand Radio spectrum Matters (ERM);Uncertainties in the measurementof mobile radio equipment characteristics;Part 1"and TR-100028-02 "Electromagnetic compatibilityand Radio spectrum Matters (ERM);Uncertainties in the measurementof mobile radio equipment characteristics;Part 2 " and is documented in the Shenzhen Huatongwei International Inspection Co., Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen Huatongweilaboratory is reported:

| Test Items | MeasurementUncertainty | Notes |
|---|---|---|
| Frequency stability | 25 Hz | (1) |
| Transmitter power conducted | 0.57 dB | (1) |
| Transmitter power Radiated | 2.20 dB | (1) |
| Conducted spurious emission 9KHz-12.75 GHz | 1.60 dB | (1) |
| Conducted Emission 9KHz-30MHz | 3.39 dB | (1) |
| Radiated Emission 30~1000MHz | 4.24 dB | (1) |
| Radiated Emissio 1~18GHz | 5.16 dB | (1) |
| Radiated Emissio 18-40GHz | 5.54 dB | (1) |
| Occupied Bandwidth | --------- | (1) |
| Emission Mask | --------- | (1) |
| Modulation Characteristic | --------- | (1) |
| Transmitter Frequency Behavior | --------- | (1) |

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

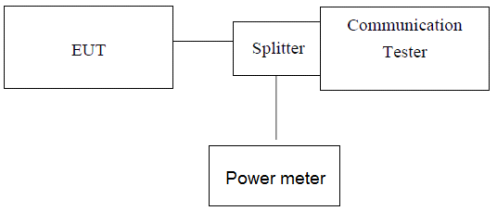
# 5. TEST CONDITIONS AND RESULTS

## 5.1. Conducted Output Power

**LIMIT**

N/A

**TEST CONFIGURATION**




*Note: Measurement setup for testing on Antenna connector*

**TEST PROCEDURE**

1. The transmitter output port was connected to base station.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator, the path loss was compensated to the results for each measurement.
3. Set EUT at maximum power through base station.
4. Select lowest, middle, and highest channels for each band and different modulation.
5. Measure the maximum burst average power.

**TEST MODE:**

Please refer to the clause 3.3

**TEST RESULTS**

☒ **Passed** ☐ **Not Applicable**

| LTE-FDD Band 2 | | | | Actual output Power (dBm) | | |
|---|---|---|---|---|---|---|
| Band-width | RBallocation | RBoffset | Modulation | Low | Middle | High |
| 1.4 MHz | | | | 1850.7MHz | 1880MHz | 1909.3MHz |
| | 1RB | High | QPSK | 22.23 | 22.31 | 22.23 |
| | | | 16QAM | 21.45 | 21.27 | 21.32 |
| | | Middle | QPSK | 22.21 | 22.38 | 22.32 |
| | | | 16QAM | 21.52 | 21.52 | 21.31 |
| | | Low | QPSK | 22.31 | 22.47 | 22.25 |
| | | | 16QAM | 21.41 | 21.54 | 21.43 |
| | 3RB | High | QPSK | 22.12 | 22.52 | 22.12 |
| | | | 16QAM | 21.13 | 21.38 | 21.13 |
| | | Middle | QPSK | 22.25 | 22.21 | 22.14 |
| | | | 16QAM | 21.11 | 21.27 | 21.12 |
| | | Low | QPSK | 22.17 | 22.25 | 22.12 |
| | | | 16QAM | 21.38 | 21.23 | 21.13 |
| | 6RB | - | QPSK | 21.32 | 21.42 | 21.25 |
| | | | 16QAM | 20.52 | 20.31 | 20.22 |
| 3 MHz | | | | 1851.5MHz | 1880MHz | 1908.5MHz |
| | 1RB | High | QPSK | 22.24 | 22.22 | 22.31 |
| | | | 16QAM | 21.43 | 21.40 | 21.49 |
| | | Middle | QPSK | 22.22 | 22.22 | 22.29 |
| | | | 16QAM | 21.48 | 21.43 | 21.50 |
| | | Low | QPSK | 22.35 | 22.23 | 22.31 |
| | | | 16QAM | 21.41 | 21.40 | 21.48 |
| | 8RB | High | QPSK | 21.35 | 21.29 | 21.35 |
| | | | 16QAM | 20.22 | 20.24 | 20.32 |
| | | Middle | QPSK | 21.26 | 21.22 | 21.32 |
| | | | 16QAM | 20.25 | 20.24 | 20.30 |
| | | Low | QPSK | 21.27 | 21.25 | 21.33 |
| | | | 16QAM | 20.27 | 20.24 | 20.34 |
| | 15RB | - | QPSK | 21.23 | 21.23 | 21.30 |
| | | | 16QAM | 20.24 | 20.25 | 20.28 |
| 5 MHz | | | | 1852.5MHz | 1880MHz | 1907.5MHz |
| | 1RB | High | QPSK | 22.25 | 22.21 | 22.23 |
| | | | 16QAM | 21.45 | 21.41 | 21.43 |
| | | Middle | QPSK | 22.27 | 22.24 | 22.25 |
| | | | 16QAM | 21.47 | 21.44 | 21.43 |
| | | Low | QPSK | 22.26 | 22.21 | 22.22 |
| | | | 16QAM | 21.45 | 21.41 | 21.43 |
| | 12RB | High | QPSK | 21.35 | 21.33 | 21.29 |
| | | | 16QAM | 20.34 | 20.34 | 20.31 |
| | | Middle | QPSK | 21.35 | 21.32 | 21.32 |
| | | | 16QAM | 20.35 | 20.32 | 20.30 |
| | | Low | QPSK | 21.34 | 21.30 | 21.31 |
| | | | 16QAM | 20.37 | 20.33 | 20.34 |
| | 25RB | - | QPSK | 21.32 | 21.29 | 21.29 |
| | | | 16QAM | 20.31 | 20.27 | 20.27 |
| 10 MHz | | | | 1855MHz | 1880MHz | 1905MHz |
| | 1RB | High | QPSK | 22.24 | 22.33 | 22.21 |
| | | | 16QAM | 21.42 | 21.51 | 21.40 |
| | | Middle | QPSK | 22.25 | 22.35 | 22.22 |
| | | | 16QAM | 21.44 | 21.54 | 21.40 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | Low | QPSK | 22.25 | 22.35 | 22.22 |
| | | | 16QAM | 21.44 | 21.52 | 21.41 |
| | 25RB | High | QPSK | 21.29 | 21.40 | 21.27 |
| | | | 16QAM | 20.32 | 20.42 | 20.29 |
| | | Middle | QPSK | 21.29 | 21.40 | 21.27 |
| | | | 16QAM | 20.36 | 20.44 | 20.31 |
| | | Low | QPSK | 21.28 | 21.38 | 21.25 |
| | | | 16QAM | 20.34 | 20.43 | 20.31 |
| | 50RB | - | QPSK | 21.31 | 21.40 | 21.26 |
| | | | 16QAM | 20.30 | 20.39 | 20.25 |
| 15 MHz | | | | 1857.5MHz | 1880MHz | 1902.5MHz |
| | 1RB | High | QPSK | 22.26 | 22.44 | 22.25 |
| | | | 16QAM | 21.44 | 21.62 | 21.44 |
| | | Middle | QPSK | 22.27 | 22.46 | 22.26 |
| | | | 16QAM | 21.46 | 21.65 | 21.44 |
| | | Low | QPSK | 22.27 | 22.46 | 22.26 |
| | | | 16QAM | 21.46 | 21.63 | 21.45 |
| | 36RB | High | QPSK | 21.31 | 21.51 | 21.31 |
| | | | 16QAM | 20.34 | 20.53 | 20.33 |
| | | Middle | QPSK | 21.31 | 21.51 | 21.31 |
| | | | 16QAM | 20.38 | 20.55 | 20.35 |
| | | Low | QPSK | 21.30 | 21.49 | 21.29 |
| | | | 16QAM | 20.36 | 20.54 | 20.35 |
| | 75RB | - | QPSK | 21.33 | 21.51 | 21.30 |
| | | | 16QAM | 20.32 | 20.50 | 20.29 |
| 20 MHz | | | | 1860MHz | 1880MHz | 1900MHz |
| | 1RB | High | QPSK | 22.14 | 22.52 | 22.29 |
| | | | 16QAM | 21.30 | 21.68 | 21.45 |
| | | Middle | QPSK | 22.11 | 22.52 | 22.25 |
| | | | 16QAM | 21.31 | 21.71 | 21.45 |
| | | Low | QPSK | 22.13 | 22.51 | 22.28 |
| | | | 16QAM | 21.32 | 21.70 | 21.47 |
| | 50RB | High | QPSK | 21.18 | 21.57 | 21.32 |
| | | | 16QAM | 20.19 | 20.56 | 20.32 |
| | | Middle | QPSK | 21.16 | 21.56 | 21.28 |
| | | | 16QAM | 20.21 | 20.59 | 20.33 |
| | | Low | QPSK | 21.19 | 21.59 | 21.34 |
| | | | 16QAM | 20.17 | 20.56 | 20.31 |
| | 100RB | - | QPSK | 21.09 | 21.48 | 21.23 |
| | | | 16QAM | 20.12 | 20.52 | 20.26 |

| LTE-FDD Band 4 | | | | Actual output Power (dBm) | | |
|---|---|---|---|---|---|---|
| Band-width | RBallocation | RBoffset | Modulation | Low | Middle | High |
| 1.4 MHz | | | | 1710.7MHz | 1732.5MHz | 1754.3MHz |
| | 1RB | High | QPSK | 22.51 | 22.65 | 22.48 |
| | | | 16QAM | 21.71 | 21.85 | 21.68 |
| | | Middle | QPSK | 22.53 | 22.68 | 22.50 |
| | | | 16QAM | 21.73 | 21.88 | 21.68 |
| | | Low | QPSK | 22.52 | 22.65 | 22.47 |
| | | | 16QAM | 21.71 | 21.85 | 21.68 |
| | 3RB | High | QPSK | 21.89 | 22.05 | 21.83 |
| | | | 16QAM | 20.88 | 21.06 | 20.85 |
| | | Middle | QPSK | 21.89 | 22.04 | 21.86 |
| | | | 16QAM | 20.89 | 21.04 | 20.84 |
| | | Low | QPSK | 21.88 | 22.02 | 21.85 |
| | | | 16QAM | 20.91 | 21.05 | 20.88 |
| | 6RB | - | QPSK | 21.86 | 22.01 | 21.83 |
| | | | 16QAM | 20.85 | 20.99 | 20.81 |
| 3 MHz | | | | 1711.5MHz | 1732.5MHz | 1753.5MHz |
| | 1RB | High | QPSK | 22.37 | 22.74 | 22.53 |
| | | | 16QAM | 21.50 | 21.86 | 21.66 |
| | | Middle | QPSK | 22.36 | 22.73 | 22.50 |
| | | | 16QAM | 21.51 | 21.88 | 21.67 |
| | | Low | QPSK | 22.38 | 22.70 | 22.50 |
| | | | 16QAM | 21.53 | 21.88 | 21.68 |
| | 8RB | High | QPSK | 22.25 | 22.63 | 22.40 |
| | | | 16QAM | 21.27 | 21.62 | 21.41 |
| | | Middle | QPSK | 22.26 | 22.61 | 22.41 |
| | | | 16QAM | 21.29 | 21.65 | 21.42 |
| | | Low | QPSK | 22.25 | 22.64 | 22.43 |
| | | | 16QAM | 21.27 | 21.64 | 21.43 |
| | 15RB | - | QPSK | 21.42 | 21.80 | 21.56 |
| | | | 16QAM | 20.36 | 20.73 | 20.52 |
| 5 MHz | | | | 1712.5MHz | 1732.5MHz | 1752.5MHz |
| | 1RB | High | QPSK | 22.46 | 22.53 | 22.45 |
| | | | 16QAM | 21.66 | 21.73 | 21.65 |
| | | Middle | QPSK | 22.48 | 22.56 | 22.47 |
| | | | 16QAM | 21.68 | 21.76 | 21.65 |
| | | Low | QPSK | 22.47 | 22.53 | 22.44 |
| | | | 16QAM | 21.66 | 21.73 | 21.65 |
| | 12RB | High | QPSK | 21.84 | 21.93 | 21.80 |
| | | | 16QAM | 20.83 | 20.94 | 20.82 |
| | | Middle | QPSK | 21.84 | 21.92 | 21.83 |
| | | | 16QAM | 20.84 | 20.92 | 20.81 |
| | | Low | QPSK | 21.83 | 21.90 | 21.82 |
| | | | 16QAM | 20.86 | 20.93 | 20.85 |
| | 25RB | - | QPSK | 21.81 | 21.89 | 21.80 |
| | | | 16QAM | 20.80 | 20.87 | 20.78 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 MHz | | | | 1715MHz | 1732.5MHz | 1750MHz |
| | 1RB | High | QPSK | 22.50 | 22.58 | 22.49 |
| | | | 16QAM | 21.63 | 21.70 | 21.62 |
| | | Middle | QPSK | 22.49 | 22.57 | 22.46 |
| | | | 16QAM | 21.64 | 21.72 | 21.63 |
| | | Low | QPSK | 22.51 | 22.54 | 22.46 |
| | | | 16QAM | 21.66 | 21.72 | 21.64 |
| | 25RB | High | QPSK | 22.38 | 22.47 | 22.36 |
| | | | 16QAM | 21.40 | 21.46 | 21.37 |
| | | Middle | QPSK | 22.39 | 22.45 | 22.37 |
| | | | 16QAM | 21.42 | 21.49 | 21.38 |
| | | Low | QPSK | 22.38 | 22.48 | 22.39 |
| | | | 16QAM | 21.40 | 21.48 | 21.39 |
| | 50RB | - | QPSK | 21.55 | 21.64 | 21.52 |
| | | | 16QAM | 20.49 | 20.57 | 20.48 |
| 15 MHz | | | | 1717.5MHz | 1732.5MHz | 1747.5MHz |
| | 1RB | High | QPSK | 22.55 | 22.69 | 22.52 |
| | | | 16QAM | 21.71 | 21.85 | 21.68 |
| | | Middle | QPSK | 22.52 | 22.69 | 22.48 |
| | | | 16QAM | 21.72 | 21.88 | 21.68 |
| | | Low | QPSK | 22.54 | 22.68 | 22.51 |
| | | | 16QAM | 21.73 | 21.87 | 21.70 |
| | 36RB | High | QPSK | 21.87 | 22.02 | 21.84 |
| | | | 16QAM | 20.88 | 21.01 | 20.84 |
| | | Middle | QPSK | 21.85 | 22.01 | 21.80 |
| | | | 16QAM | 20.90 | 21.04 | 20.85 |
| | | Low | QPSK | 21.88 | 22.04 | 21.86 |
| | | | 16QAM | 20.86 | 21.01 | 20.83 |
| | 75RB | - | QPSK | 21.78 | 21.93 | 21.75 |
| | | | 16QAM | 20.81 | 20.97 | 20.78 |
| 20 MHz | | | | 1720MHz | 1732.5MHz | 1745MHz |
| | 1RB | High | QPSK | 22.33 | 22.72 | 22.49 |
| | | | 16QAM | 21.53 | 21.91 | 21.70 |
| | | Middle | QPSK | 22.36 | 22.73 | 22.52 |
| | | | 16QAM | 21.56 | 21.91 | 21.69 |
| | | Low | QPSK | 22.38 | 22.74 | 22.54 |
| | | | 16QAM | 21.56 | 21.92 | 21.72 |
| | 50RB | High | QPSK | 21.70 | 22.09 | 21.77 |
| | | | 16QAM | 20.68 | 21.07 | 20.84 |
| | | Middle | QPSK | 21.69 | 22.06 | 21.85 |
| | | | 16QAM | 20.74 | 21.11 | 20.90 |
| | | Low | QPSK | 21.70 | 22.06 | 21.86 |
| | | | 16QAM | 20.75 | 21.11 | 20.91 |
| | 100RB | - | QPSK | 21.63 | 22.02 | 21.77 |
| | | | 16QAM | 20.62 | 21.01 | 20.76 |

| LTE-FDD Band 5 | | | | Actual output Power (dBm) | | |
|---|---|---|---|---|---|---|
| Band-width | RBallocation | RBoffset | Modulation | Low | Middle | High |
| 1.4 MHz | | | | 824.7MHz | 836.5MHz | 848.3MHz |
| | 1RB | High | QPSK | 22.73 | 22.84 | 22.70 |
| | | | 16QAM | 21.95 | 22.02 | 21.92 |
| | | Middle | QPSK | 22.76 | 22.87 | 22.73 |
| | | | 16QAM | 21.94 | 22.03 | 21.93 |
| | | Low | QPSK | 22.72 | 22.86 | 22.73 |
| | | | 16QAM | 21.94 | 22.05 | 21.90 |
| | 3RB | High | QPSK | 21.59 | 21.65 | 21.55 |
| | | | 16QAM | 20.67 | 20.75 | 20.69 |
| | | Middle | QPSK | 21.57 | 21.66 | 21.55 |
| | | | 16QAM | 20.71 | 20.77 | 20.68 |
| | | Low | QPSK | 21.56 | 21.68 | 21.53 |
| | | | 16QAM | 20.65 | 20.79 | 20.62 |
| | 6RB | - | QPSK | 21.58 | 21.64 | 21.53 |
| | | | 16QAM | 20.67 | 20.76 | 20.63 |
| 3 MHz | | | | 825.5MHz | 836.5MHz | 847.5MHz |
| | 1RB | High | QPSK | 22.56 | 22.88 | 22.71 |
| | | | 16QAM | 21.77 | 22.08 | 21.89 |
| | | Middle | QPSK | 22.58 | 22.89 | 22.74 |
| | | | 16QAM | 21.77 | 22.10 | 21.93 |
| | | Low | QPSK | 22.55 | 22.89 | 22.75 |
| | | | 16QAM | 21.76 | 22.06 | 21.92 |
| | 8RB | High | QPSK | 22.39 | 22.67 | 22.53 |
| | | | 16QAM | 21.46 | 21.77 | 21.66 |
| | | Middle | QPSK | 22.39 | 22.67 | 22.53 |
| | | | 16QAM | 21.46 | 21.77 | 21.66 |
| | | Low | QPSK | 22.36 | 22.67 | 22.54 |
| | | | 16QAM | 21.52 | 21.82 | 21.65 |
| | 15RB | - | QPSK | 21.38 | 21.71 | 21.55 |
| | | | 16QAM | 20.51 | 20.85 | 20.66 |
| 5 MHz | | | | 826.5MHz | 836.5MHz | 846.5MHz |
| | 1RB | High | QPSK | 22.66 | 22.82 | 22.71 |
| | | | 16QAM | 21.90 | 22.04 | 21.92 |
| | | Middle | QPSK | 22.72 | 22.88 | 22.72 |
| | | | 16QAM | 21.90 | 22.06 | 21.96 |
| | | Low | QPSK | 22.72 | 22.89 | 22.76 |
| | | | 16QAM | 21.93 | 22.06 | 21.96 |
| | 12RB | High | QPSK | 21.60 | 21.72 | 21.62 |
| | | | 16QAM | 20.70 | 20.81 | 20.74 |
| | | Middle | QPSK | 21.61 | 21.77 | 21.61 |
| | | | 16QAM | 20.65 | 20.83 | 20.73 |
| | | Low | QPSK | 21.64 | 21.80 | 21.64 |
| | | | 16QAM | 20.69 | 20.84 | 20.67 |
| | 25RB | - | QPSK | 21.60 | 21.73 | 21.57 |
| | | | 16QAM | 20.70 | 20.85 | 20.70 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 MHz | | | | 829MHz | 836.5MHz | 844MHz |
| | 1RB | High | QPSK | 22.60 | 22.88 | 22.70 |
| | | | 16QAM | 21.81 | 22.07 | 21.93 |
| | | Middle | QPSK | 22.60 | 22.89 | 22.74 |
| | | | 16QAM | 21.78 | 22.06 | 21.90 |
| | | Low | QPSK | 22.59 | 22.86 | 22.72 |
| | | | 16QAM | 21.78 | 22.07 | 21.91 |
| | 25RB | High | QPSK | 21.49 | 21.75 | 21.59 |
| | | | 16QAM | 20.50 | 20.77 | 20.62 |
| | | Middle | QPSK | 21.47 | 21.74 | 21.59 |
| | | | 16QAM | 20.54 | 20.84 | 20.68 |
| | | Low | QPSK | 21.46 | 21.75 | 21.60 |
| | | | 16QAM | 20.57 | 20.79 | 20.66 |
| | 50RB | - | QPSK | 21.51 | 21.72 | 21.54 |
| | | | 16QAM | 20.57 | 20.84 | 20.68 |

| LTE-FDD Band 7 | | | | Actual output Power (dBm) | | |
|---|---|---|---|---|---|---|
| Band-width | RBallocation | RBoffset | Modulation | Low | Middle | High |
| 5 MHz | | | | 2502.5MHz | 2535MHz | 2567.5MHz |
| | 1RB | High | QPSK | 22.19 | 22.38 | 22.16 |
| | | | 16QAM | 21.26 | 21.47 | 21.28 |
| | | Middle | QPSK | 22.19 | 22.34 | 22.13 |
| | | | 16QAM | 21.30 | 21.48 | 21.28 |
| | | Low | QPSK | 22.14 | 22.31 | 22.14 |
| | | | 16QAM | 21.27 | 21.46 | 21.29 |
| | 12RB | High | QPSK | 21.27 | 21.48 | 21.32 |
| | | | 16QAM | 20.19 | 20.37 | 20.20 |
| | | Middle | QPSK | 21.34 | 21.51 | 21.32 |
| | | | 16QAM | 20.25 | 20.43 | 20.27 |
| | | Low | QPSK | 21.33 | 21.54 | 21.28 |
| | | | 16QAM | 20.19 | 20.39 | 20.24 |
| | 25RB | - | QPSK | 21.33 | 21.50 | 21.31 |
| | | | 16QAM | 20.21 | 20.41 | 20.23 |
| 10 MHz | | | | 2505MHz | 2535MHz | 2565MHz |
| | 1RB | High | QPSK | 21.97 | 22.34 | 22.15 |
| | | | 16QAM | 21.06 | 21.40 | 21.21 |
| | | Middle | QPSK | 21.99 | 22.34 | 22.14 |
| | | | 16QAM | 21.11 | 21.46 | 21.28 |
| | | Low | QPSK | 21.99 | 22.29 | 22.16 |
| | | | 16QAM | 21.10 | 21.42 | 21.28 |
| | 25RB | High | QPSK | 21.13 | 21.45 | 21.26 |
| | | | 16QAM | 20.04 | 20.39 | 20.20 |
| | | Middle | QPSK | 21.16 | 21.50 | 21.33 |
| | | | 16QAM | 20.05 | 20.41 | 20.20 |
| | | Low | QPSK | 21.16 | 21.47 | 21.26 |
| | | | 16QAM | 20.13 | 20.44 | 20.18 |
| | 50RB | - | QPSK | 21.15 | 21.53 | 21.28 |
| | | | 16QAM | 20.10 | 20.44 | 20.23 |
| 15 MHz | | | | 2507.5MHz | 2535MHz | 2562.5MHz |
| | 1RB | High | QPSK | 22.09 | 22.21 | 22.13 |
| | | | 16QAM | 21.18 | 21.27 | 21.19 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | Middle | QPSK | 22.11 | 22.21 | 22.12 |
| | | | 16QAM | 21.23 | 21.33 | 21.26 |
| | | Low | QPSK | 22.11 | 22.16 | 22.14 |
| | | | 16QAM | 21.22 | 21.29 | 21.26 |
| | 36RB | High | QPSK | 21.25 | 21.32 | 21.24 |
| | | | 16QAM | 20.16 | 20.26 | 20.18 |
| | | Middle | QPSK | 21.28 | 21.37 | 21.31 |
| | | | 16QAM | 20.17 | 20.28 | 20.18 |
| | | Low | QPSK | 21.28 | 21.34 | 21.24 |
| | | | 16QAM | 20.25 | 20.31 | 20.16 |
| | 75RB | - | QPSK | 21.27 | 21.40 | 21.26 |
| | | | 16QAM | 20.22 | 20.31 | 20.21 |
| 20 MHz | | | | 2510MHz | 2535MHz | 2560MHz |
| | 1RB | High | QPSK | 22.17 | 22.22 | 22.11 |
| | | | 16QAM | 21.24 | 21.31 | 21.23 |
| | | Middle | QPSK | 22.17 | 22.18 | 22.08 |
| | | | 16QAM | 21.28 | 21.32 | 21.23 |
| | | Low | QPSK | 22.12 | 22.15 | 22.09 |
| | | | 16QAM | 21.25 | 21.3 | 21.24 |
| | 50RB | High | QPSK | 21.25 | 21.32 | 21.27 |
| | | | 16QAM | 20.17 | 20.21 | 20.15 |
| | | Middle | QPSK | 21.32 | 21.35 | 21.27 |
| | | | 16QAM | 20.23 | 20.27 | 20.22 |
| | | Low | QPSK | 21.31 | 21.38 | 21.23 |
| | | | 16QAM | 20.17 | 20.23 | 20.19 |
| | 100RB | - | QPSK | 21.31 | 21.34 | 21.26 |
| | | | 16QAM | 20.19 | 20.25 | 20.18 |

| LTE-FDD Band 12 | | | | Actual output Power (dBm) | | |
|---|---|---|---|---|---|---|
| Band-width | RBallocation | RBoffset | Modulation | Low | Middle | High |
| 1.4 MHz | | | | 699.7MHz | 707.5MHz | 715.3MHz |
| | 1RB | High | QPSK | 22.79 | 22.82 | 22.87 |
| | | | 16QAM | 21.95 | 21.84 | 21.82 |
| | | Middle | QPSK | 22.92 | 22.78 | 23.04 |
| | | | 16QAM | 22.01 | 21.83 | 21.95 |
| | | Low | QPSK | 22.86 | 22.76 | 22.91 |
| | | | 16QAM | 21.97 | 21.74 | 21.81 |
| | 3RB | High | QPSK | 22.75 | 22.86 | 22.89 |
| | | | 16QAM | 21.60 | 21.96 | 21.65 |
| | | Middle | QPSK | 22.91 | 22.90 | 23.02 |
| | | | 16QAM | 21.69 | 21.97 | 21.77 |
| | | Low | QPSK | 22.90 | 22.91 | 22.88 |
| | | | 16QAM | 21.62 | 21.98 | 21.74 |
| | 6RB | - | QPSK | 21.71 | 21.94 | 21.85 |
| | | | 16QAM | 20.83 | 21.10 | 20.92 |
| 3 MHz | | | | 700.5MHz | 707.5MHz | 714.5MHz |
| | 1RB | High | QPSK | 22.62 | 22.37 | 22.79 |
| | | | 16QAM | 21.57 | 21.62 | 21.70 |
| | | Middle | QPSK | 22.66 | 22.50 | 22.81 |
| | | | 16QAM | 21.51 | 21.53 | 21.78 |
| | | Low | QPSK | 22.69 | 22.55 | 22.88 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | 16QAM | 21.71 | 21.60 | 21.89 |
| | 8RB | High | QPSK | 21.69 | 21.69 | 21.74 |
| | | | 16QAM | 20.60 | 20.64 | 20.98 |
| | | Middle | QPSK | 21.58 | 21.56 | 21.78 |
| | | | 16QAM | 20.59 | 20.57 | 21.02 |
| | | Low | QPSK | 21.51 | 21.55 | 21.80 |
| | | | 16QAM | 20.55 | 20.67 | 21.03 |
| | 15RB | - | QPSK | 21.59 | 21.56 | 21.80 |
| | | | 16QAM | 20.58 | 20.54 | 20.89 |
| 5 MHz | | | | 701.5MHz | 707.5MHz | 713.5MHz |
| | 1RB | High | QPSK | 22.77 | 22.65 | 22.78 |
| | | | 16QAM | 21.93 | 21.67 | 21.73 |
| | | Middle | QPSK | 22.90 | 22.61 | 22.95 |
| | | | 16QAM | 21.99 | 21.66 | 21.86 |
| | | Low | QPSK | 22.84 | 22.59 | 22.82 |
| | | | 16QAM | 21.95 | 21.57 | 21.72 |
| | 12RB | High | QPSK | 22.73 | 22.69 | 22.80 |
| | | | 16QAM | 21.58 | 21.79 | 21.56 |
| | | Middle | QPSK | 22.89 | 22.73 | 22.93 |
| | | | 16QAM | 21.67 | 21.80 | 21.68 |
| | | Low | QPSK | 22.88 | 22.74 | 22.79 |
| | | | 16QAM | 21.60 | 21.81 | 21.65 |
| | 25RB | - | QPSK | 21.69 | 21.77 | 21.76 |
| | | | 16QAM | 20.81 | 20.93 | 20.83 |
| 10 MHz | | | | 704MHz | 707.5MHz | 711MHz |
| | 1RB | High | QPSK | 22.67 | 22.49 | 22.73 |
| | | | 16QAM | 21.62 | 21.74 | 21.64 |
| | | Middle | QPSK | 22.71 | 22.62 | 22.75 |
| | | | 16QAM | 21.56 | 21.65 | 21.72 |
| | | Low | QPSK | 22.74 | 22.67 | 22.82 |
| | | | 16QAM | 21.76 | 21.72 | 21.83 |
| | 25RB | High | QPSK | 21.74 | 21.81 | 21.68 |
| | | | 16QAM | 20.65 | 20.76 | 20.92 |
| | | Middle | QPSK | 21.63 | 21.68 | 21.72 |
| | | | 16QAM | 20.64 | 20.69 | 20.96 |
| | | Low | QPSK | 21.56 | 21.67 | 21.74 |
| | | | 16QAM | 20.60 | 20.79 | 20.97 |
| | 50RB | - | QPSK | 21.64 | 21.68 | 21.74 |
| | | | 16QAM | 20.63 | 20.66 | 20.83 |

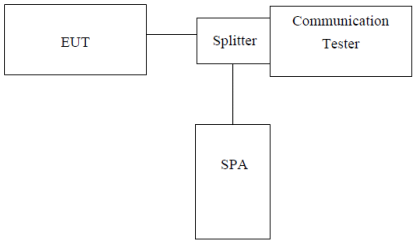
| LTE-FDD Band 17 | | | | Actual output Power (dBm) | | |
|---|---|---|---|---|---|---|
| Band-width | RBallocation | RBoffset | Modulation | High | Middle | Low |
| 5 MHz | | | | 706.5MHz | 710MHz | 713.5MHz |
| | 1RB | High | QPSK | 22.58 | 22.70 | 22.63 |
| | | | 16QAM | 21.64 | 21.79 | 21.70 |
| | | Middle | QPSK | 22.54 | 22.68 | 22.64 |
| | | | 16QAM | 21.61 | 21.77 | 21.70 |
| | | Low | QPSK | 22.54 | 22.69 | 22.64 |
| | | | 16QAM | 21.62 | 21.77 | 21.68 |
| | 12RB | High | QPSK | 21.58 | 21.68 | 21.64 |
| | | | 16QAM | 20.79 | 20.92 | 20.86 |
| | | Middle | QPSK | 21.56 | 21.70 | 21.63 |
| | | | 16QAM | 20.77 | 20.90 | 20.83 |
| | | Low | QPSK | 21.56 | 21.71 | 21.63 |
| | | | 16QAM | 20.75 | 20.91 | 20.85 |
| | 25RB | - | QPSK | 21.53 | 21.66 | 21.60 |
| | | | 16QAM | 20.74 | 20.87 | 20.81 |
| 10 MHz | | | | 709MHz | 710MHz | 711MHz |
| | 1RB | High | QPSK | 22.52 | 22.48 | 22.60 |
| | | | 16QAM | 21.60 | 21.54 | 21.70 |
| | | Middle | QPSK | 22.48 | 22.42 | 22.60 |
| | | | 16QAM | 21.58 | 21.52 | 21.68 |
| | | Low | QPSK | 22.50 | 22.44 | 22.62 |
| | | | 16QAM | 21.57 | 21.52 | 21.67 |
| | 25RB | High | QPSK | 21.55 | 21.53 | 21.67 |
| | | | 16QAM | 20.73 | 20.66 | 20.84 |
| | | Middle | QPSK | 21.50 | 21.44 | 21.62 |
| | | | 16QAM | 20.69 | 20.65 | 20.85 |
| | | Low | QPSK | 21.50 | 21.43 | 21.62 |
| | | | 16QAM | 20.69 | 20.60 | 20.83 |
| | 50RB | - | QPSK | 21.47 | 21.42 | 21.61 |
| | | | 16QAM | 20.67 | 20.63 | 20.83 |

## 5.2. 99% & -26 dB Occupied Bandwidth

**LIMIT**

N/A

**TEST CONFIGURATION**




*Note: Measurement setup for testing on Antenna connector*

**TEST PROCEDURE**

1. The EUT's output RF connector was connected with a short cable to the spectrum analyzer
2. RBWwas set to about 1% of emission BW, VBW= 3 times RBW.
3. -26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth isthe delta frequency between the two points where the display line intersects the signal trace.

**TEST MODE:**

Please refer to the clause 3.3

**TEST RESULTS**

☒ **Passed** ☐ **Not Applicable**

| LTE Band 2 | | | | | |
|---|---|---|---|---|---|
| Bandwidth | Channel | 99% Occupy bandwidth (MHz) | | -26dB bandwidth (MHz) | |
| | | QPSK | 16QAM | QPSK | 16QAM |
| 1.4MHz | Low | 1.10 | 1.10 | 1.30 | 1.31 |
| | Mid | 1.10 | 1.10 | 1.32 | 1.32 |
| | High | 1.10 | 1.10 | 1.33 | 1.30 |
| 3MHz | Low | 2.69 | 2.68 | 2.93 | 2.95 |
| | Mid | 2.69 | 2.68 | 2.96 | 2.95 |
| | High | 2.69 | 2.68 | 2.96 | 2.96 |
| 5MHz | Low | 4.51 | 4.53 | 5.05 | 5.03 |
| | Mid | 4.50 | 4.52 | 5.03 | 5.04 |
| | High | 4.52 | 4.49 | 5.04 | 5.03 |
| 10MHz | Low | 8.92 | 8.92 | 9.74 | 9.75 |
| | Mid | 8.92 | 8.92 | 9.71 | 9.71 |
| | High | 8.94 | 8.92 | 9.80 | 9.65 |
| 15MHz | Low | 13.41 | 13.43 | 14.82 | 14.79 |
| | Mid | 13.46 | 13.46 | 14.85 | 14.86 |
| | High | 13.46 | 13.49 | 14.88 | 14.79 |
| 20MHz | Low | 17.87 | 17.87 | 19.29 | 19.50 |
| | Mid | 17.87 | 17.84 | 19.57 | 19.35 |
| | High | 17.87 | 17.91 | 19.30 | 19.43 |

| LTE Band 4 | | | | | |
|---|---|---|---|---|---|
| Bandwidth | Channel | 99% Occupy bandwidth (MHz) | | -26dB bandwidth (MHz) | |
| | | QPSK | 16QAM | QPSK | 16QAM |
| 1.4MHz | Low | 1.10 | 1.10 | 1.32 | 1.31 |
| | Mid | 1.09 | 1.10 | 1.30 | 1.31 |
| | High | 1.10 | 1.10 | 1.32 | 1.30 |
| 3MHz | Low | 2.69 | 2.68 | 2.93 | 2.95 |
| | Mid | 2.68 | 2.68 | 2.94 | 2.94 |
| | High | 2.69 | 2.68 | 2.94 | 2.96 |
| 5MHz | Low | 4.51 | 4.53 | 5.04 | 5.03 |
| | Mid | 4.53 | 4.50 | 5.03 | 5.02 |
| | High | 4.50 | 4.52 | 5.03 | 5.06 |
| 10MHz | Low | 8.93 | 8.93 | 9.70 | 9.71 |
| | Mid | 8.95 | 8.93 | 9.80 | 9.65 |
| | High | 8.93 | 8.93 | 9.73 | 9.73 |
| 15MHz | Low | 13.40 | 13.45 | 14.73 | 14.76 |
| | Mid | 13.45 | 13.45 | 14.90 | 14.77 |
| | High | 13.45 | 13.45 | 14.87 | 14.77 |
| 20MHz | Low | 17.87 | 17.91 | 19.28 | 19.46 |
| | Mid | 17.91 | 17.91 | 19.25 | 19.45 |
| | High | 17.87 | 17.80 | 19.53 | 19.31 |

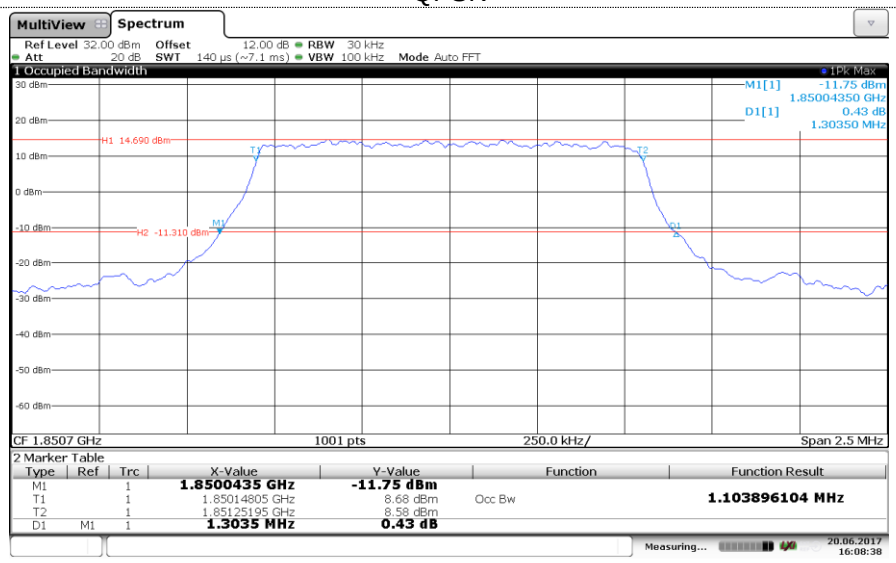
| LTE Band 5 | | | | | |
|---|---|---|---|---|---|
| Bandwidth | Channel | 99% Occupy bandwidth (MHz) | | -26dB bandwidth (MHz) | |
| | | QPSK | 16QAM | QPSK | 16QAM |
| 1.4MHz | Low | 1.10 | 1.10 | 1.31 | 1.31 |
| | Mid | 1.10 | 1.10 | 1.31 | 1.31 |
| | High | 1.10 | 1.10 | 1.31 | 1.29 |
| 3MHz | Low | 2.69 | 2.68 | 2.93 | 2.93 |
| | Mid | 2.96 | 2.68 | 2.93 | 2.94 |
| | High | 2.69 | 2.68 | 2.95 | 2.95 |
| 5MHz | Low | 4.51 | 4.52 | 5.07 | 5.05 |
| | Mid | 4.51 | 4.50 | 5.01 | 5.04 |
| | High | 4.49 | 4.52 | 4.99 | 5.04 |
| 10MHz | Low | 8.92 | 8.92 | 9.75 | 9.74 |
| | Mid | 8.94 | 8.92 | 9.85 | 9.70 |
| | High | 8.92 | 8.92 | 9.68 | 9.70 |

| LTE Band 7 | | | | | |
|---|---|---|---|---|---|
| Bandwidth | Channel | 99% Occupy bandwidth (MHz) | | -26dB bandwidth (MHz) | |
| | | QPSK | 16QAM | QPSK | 16QAM |
| 5MHz | Low | 4.50 | 4.52 | 5.03 | 5.03 |
| | Mid | 4.53 | 4.50 | 5.02 | 5.00 |
| | High | 4.50 | 4.51 | 5.01 | 5.08 |
| 10MHz | Low | 8.92 | 8.92 | 9.76 | 9.76 |
| | Mid | 8.94 | 8.92 | 9.83 | 9.64 |
| | High | 8.94 | 8.92 | 9.77 | 9.72 |
| 15MHz | Low | 13.40 | 13.45 | 14.76 | 14.78 |
| | Mid | 13.48 | 13.45 | 14.84 | 14.82 |
| | High | 13.45 | 13.45 | 14.91 | 14.85 |
| 20MHz | Low | 17.85 | 17.85 | 19.23 | 19.39 |
| | Mid | 17.89 | 17.89 | 19.27 | 19.42 |
| | High | 17.93 | 17.89 | 19.58 | 19.34 |

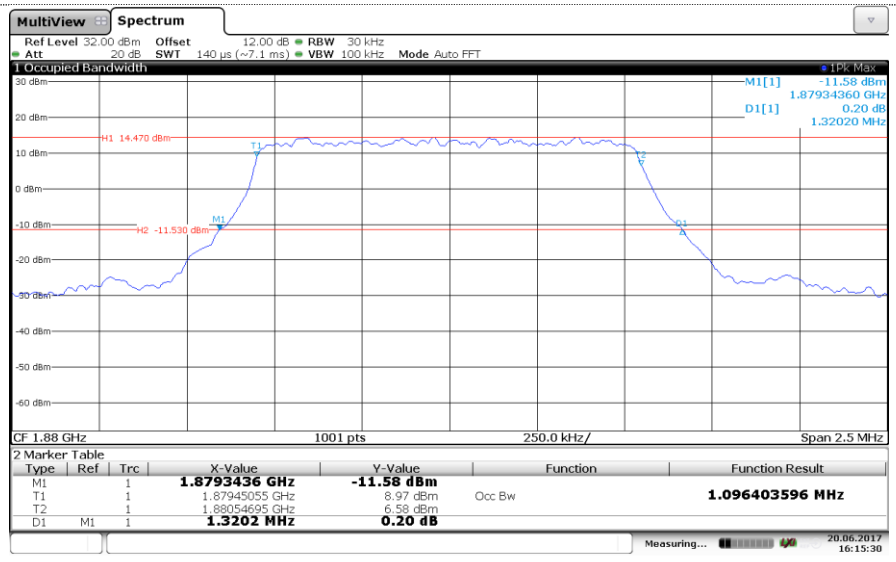
| LTE Band 12 | | | | | |
|---|---|---|---|---|---|
| Bandwidth | Channel | 99% Occupy bandwidth (MHz) | | -26dB bandwidth (MHz) | |
| | | QPSK | 16QAM | QPSK | 16QAM |
| 1.4MHz | Low | 1.10 | 1.10 | 1.32 | 1.30 |
| | Mid | 1.09 | 1.10 | 1.32 | 1.32 |
| | High | 1.10 | 1.10 | 1.32 | 1.31 |
| 3MHz | Low | 2.69 | 2.68 | 2.94 | 2.94 |
| | Mid | 2.69 | 2.68 | 2.95 | 2.97 |
| | High | 2.68 | 2.68 | 2.97 | 2.95 |
| 5MHz | Low | 4.50 | 4.51 | 5.01 | 5.02 |
| | Mid | 4.52 | 4.50 | 5.04 | 5.00 |
| | High | 4.49 | 4.50 | 5.00 | 5.05 |
| 10MHz | Low | 8.91 | 8.91 | 9.69 | 9.68 |
| | Mid | 8.95 | 8.95 | 9.87 | 9.66 |
| | High | 8.93 | 8.93 | 9.76 | 9.70 |

| LTE Band 17 | | | | | |
|---|---|---|---|---|---|
| Bandwidth | Channel | 99% Occupy bandwidth (MHz) | | -26dB bandwidth (MHz) | |
| | | QPSK | 16QAM | QPSK | 16QAM |
| 5MHz | Low | 4.51 | 4.52 | 5.04 | 5.03 |
| | Mid | 4.50 | 4.53 | 5.02 | 5.06 |
| | High | 4.50 | 4.49 | 5.04 | 5.01 |
| 10MHz | Low | 8.93 | 8.95 | 9.75 | 9.73 |
| | Mid | 8.93 | 8.95 | 9.86 | 9.66 |
| | High | 8.93 | 8.93 | 9.74 | 9.70 |

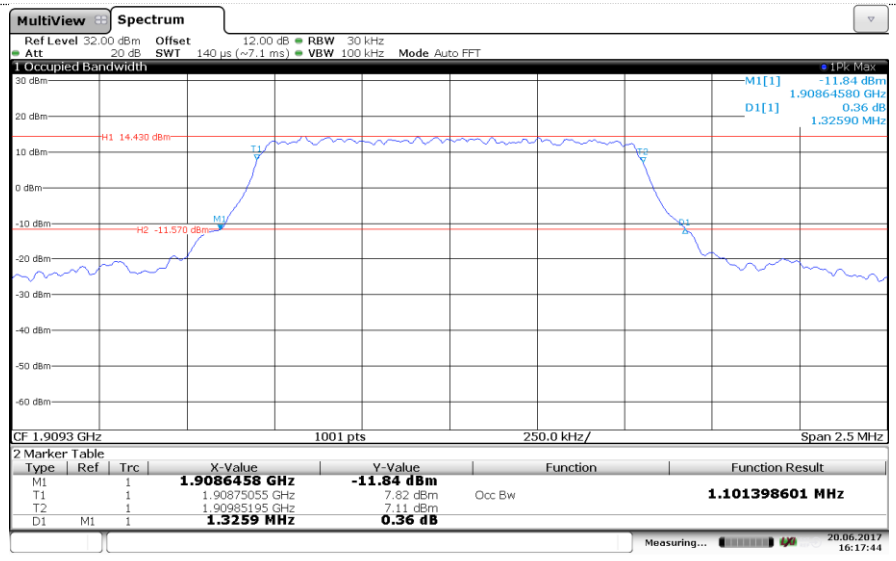
| LTE Band 2-1.4MHz |
|---|
| QPSK |




| Channel Low |
|---|

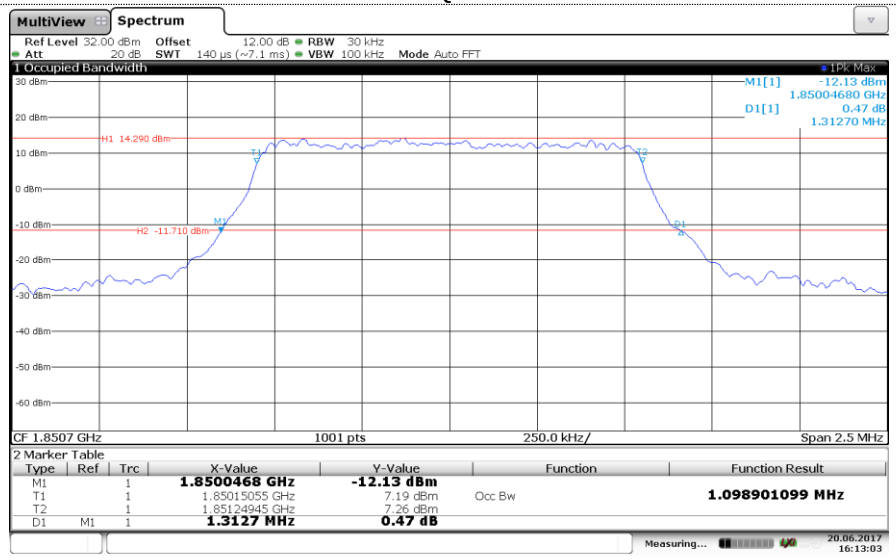



| Channel Mid |
|---|

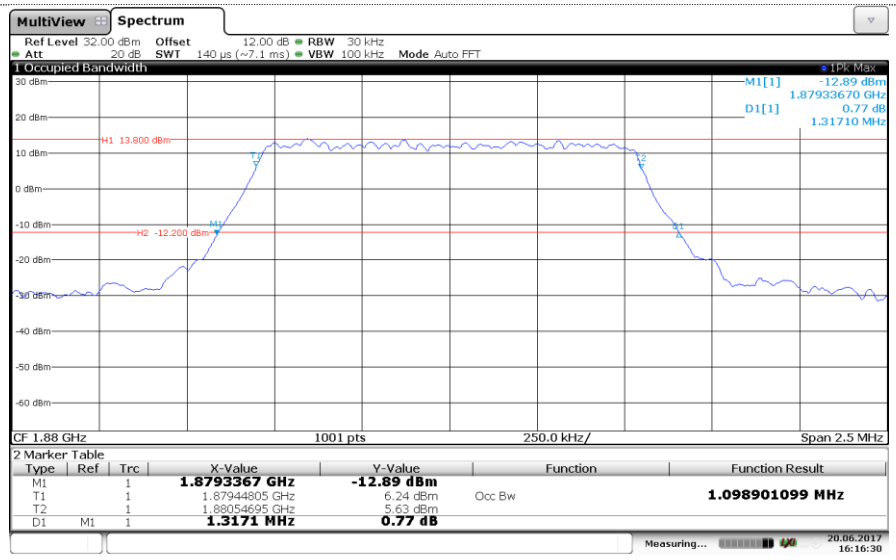



| Channel High |
|---|

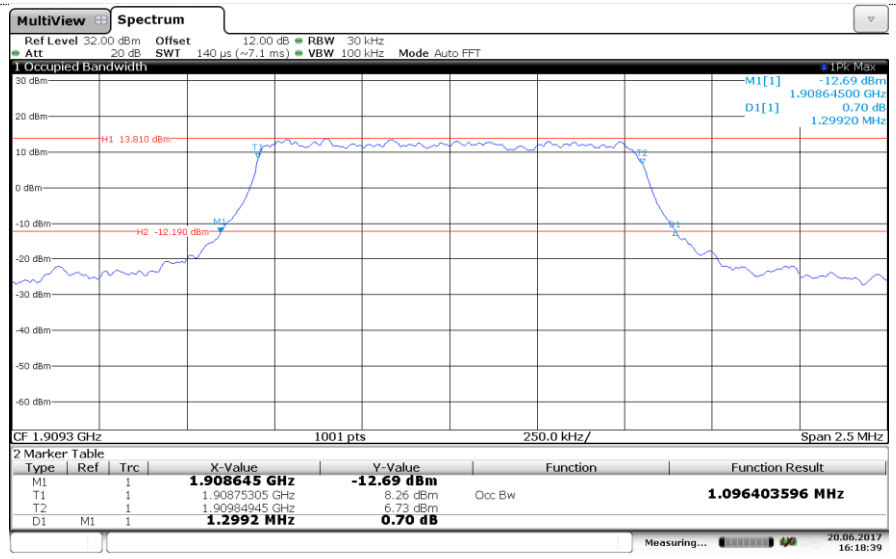
| LTE Band 2-1.4MHz |
|---|
| 16QAM |




Channel Low

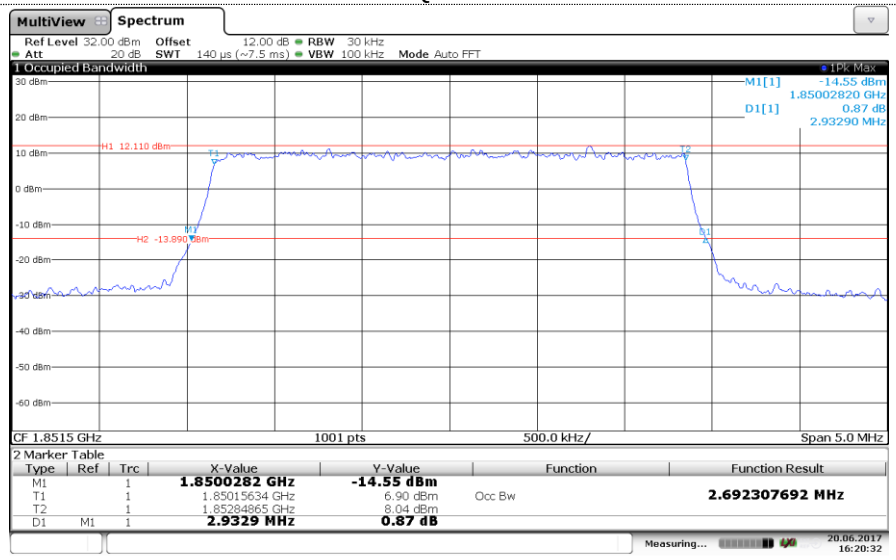



Channel Mid

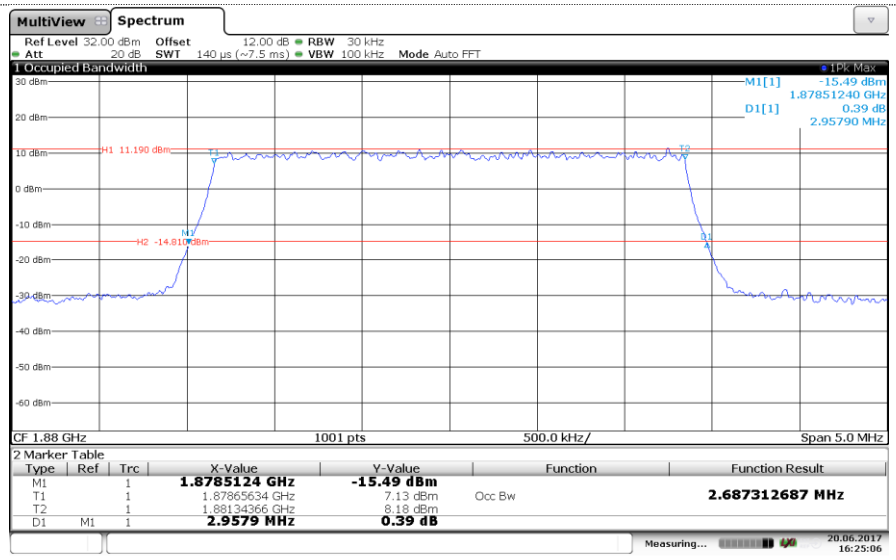



Channel High

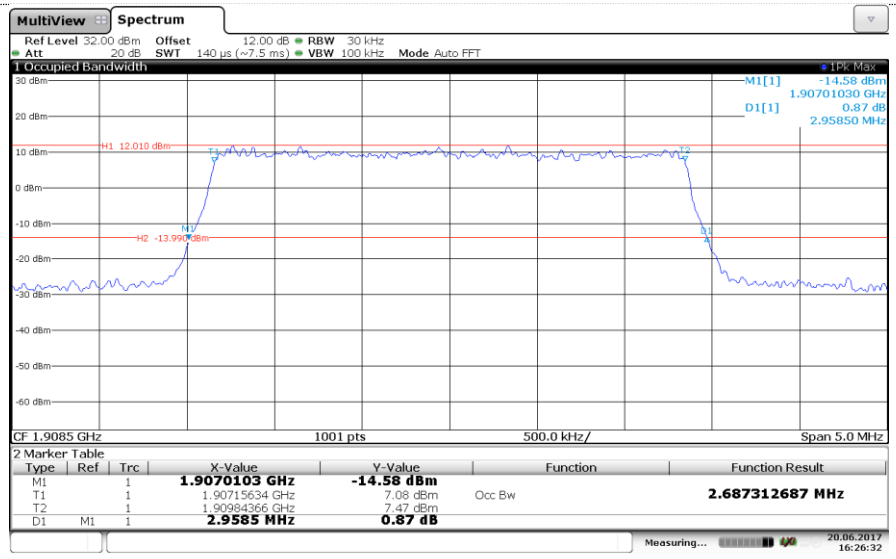
| LTE Band 2-3MHz |
|---|
| QPSK |




Channel Low

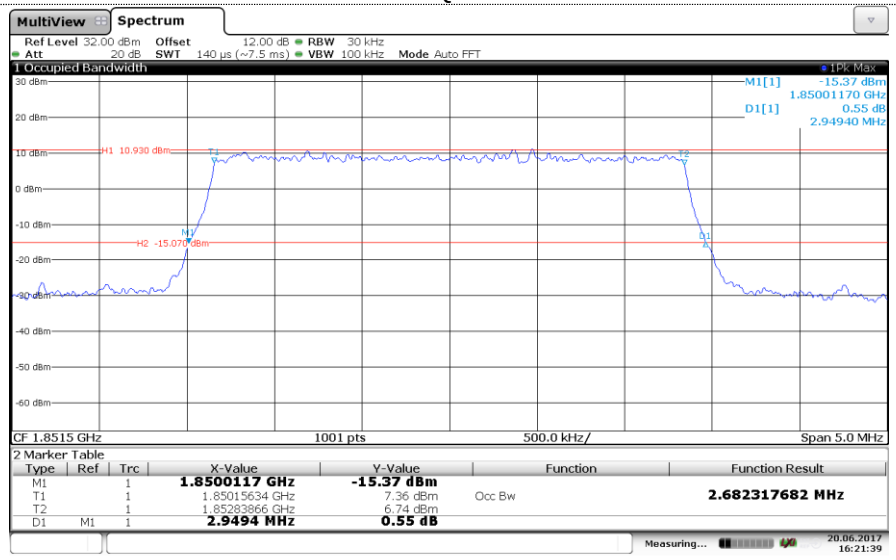



Channel Mid

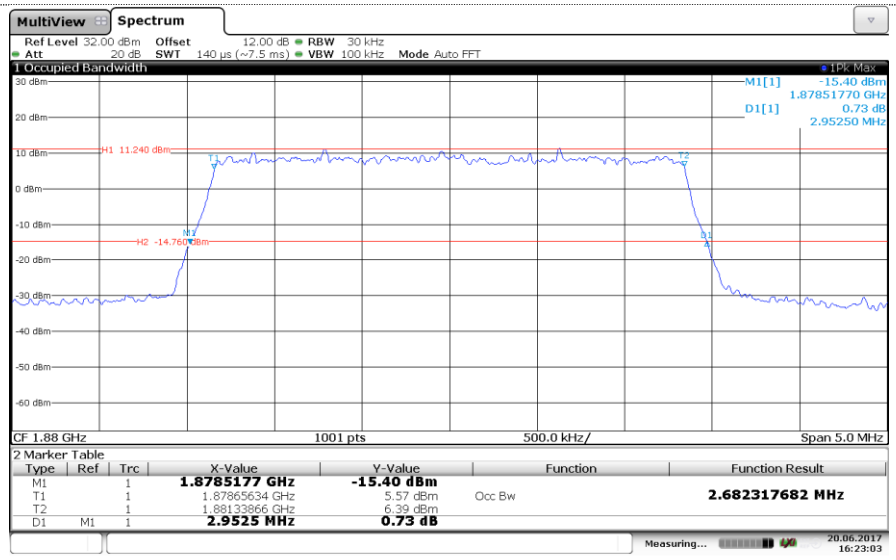



Channel High

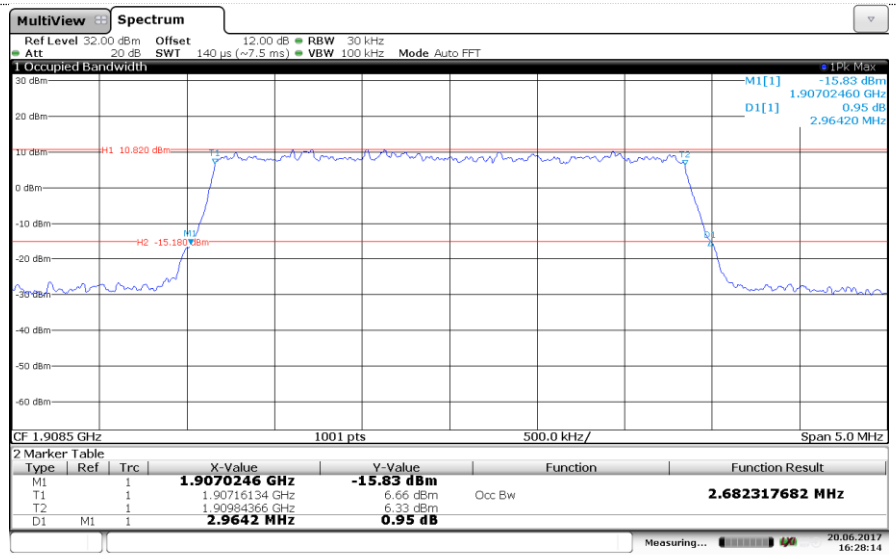
| LTE Band 2-3MHz |
|---|
| 16QAM |




Channel Low

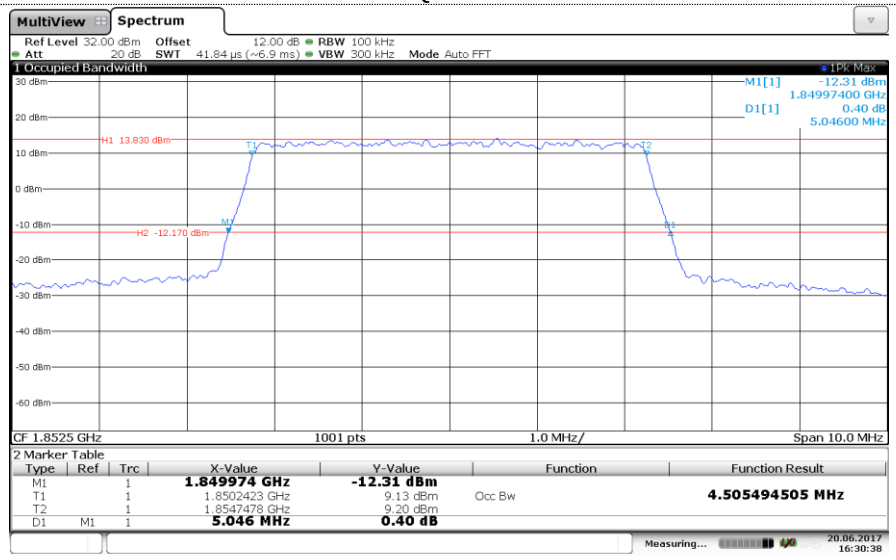



Channel Mid

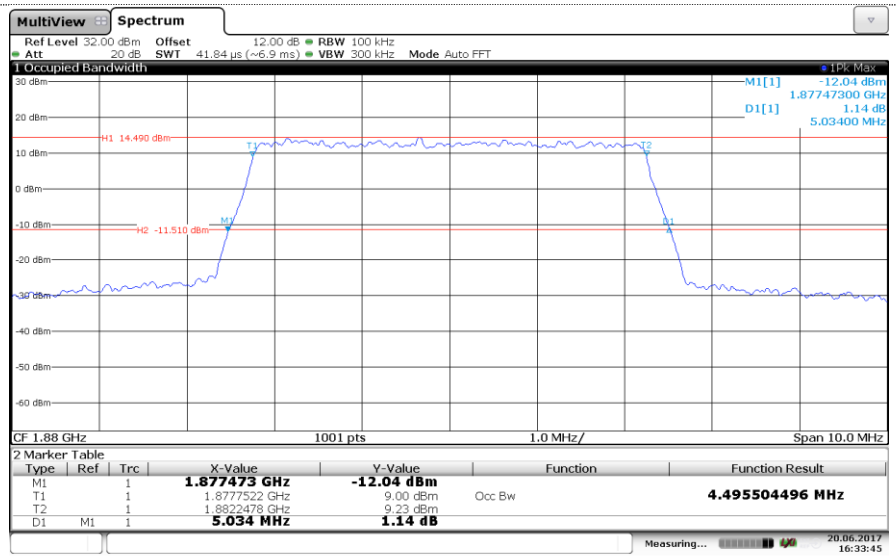



Channel High

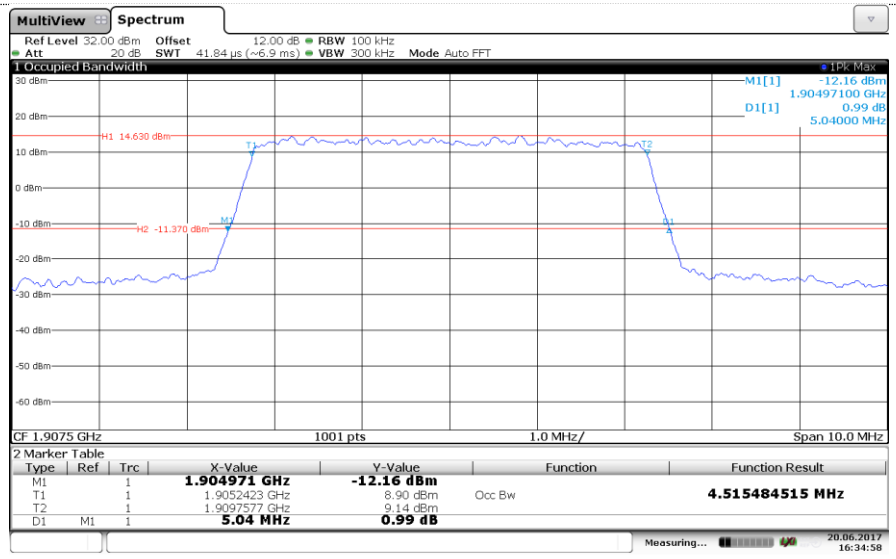
| LTE Band 2-5MHz |
|---|
| QPSK |




Channel Low

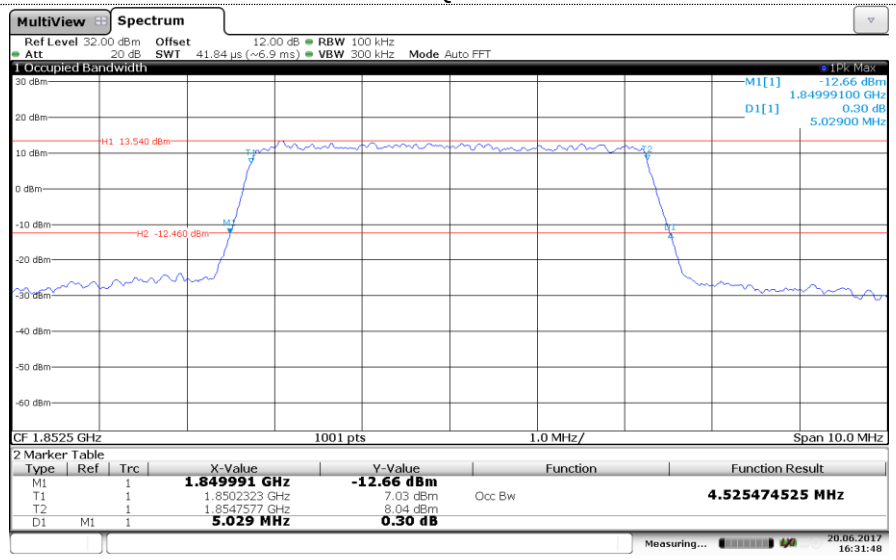



Channel Mid

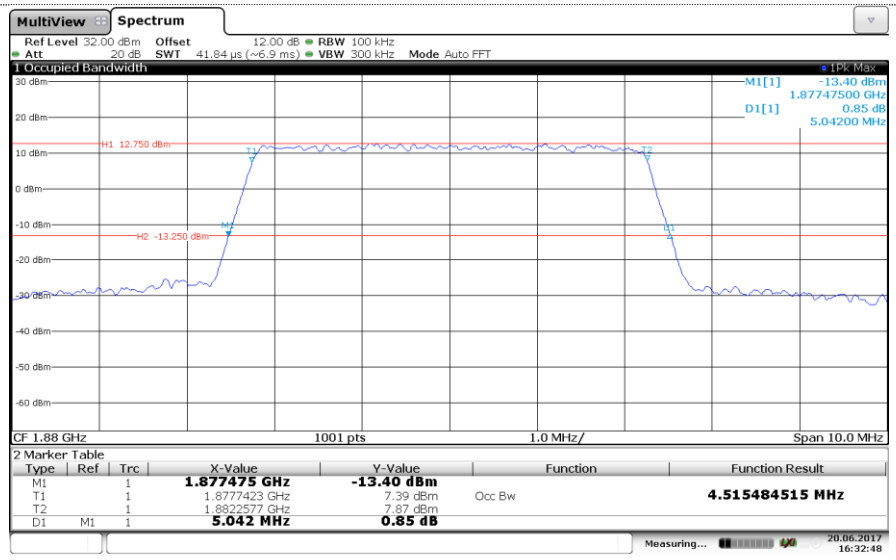



Channel High

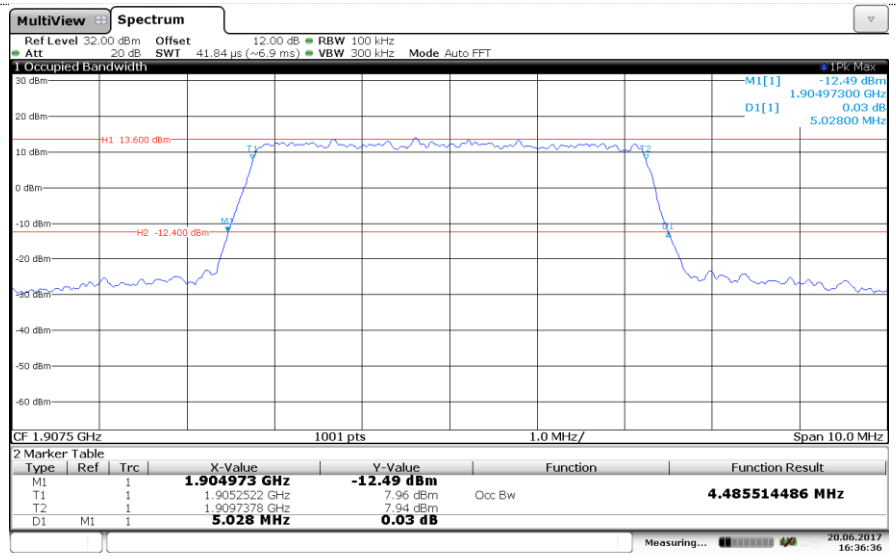
| LTE Band 2-5MHz |
|---|
| 16QAM |




Channel Low

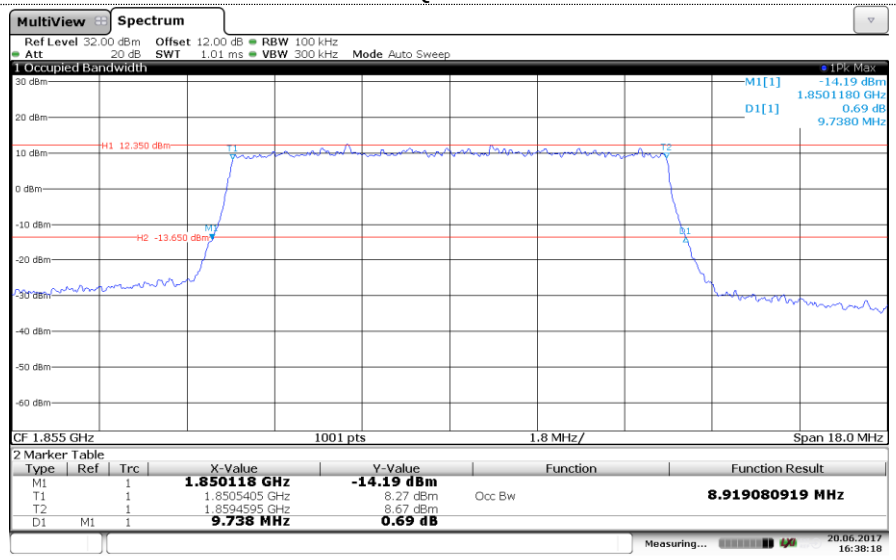



Channel Mid

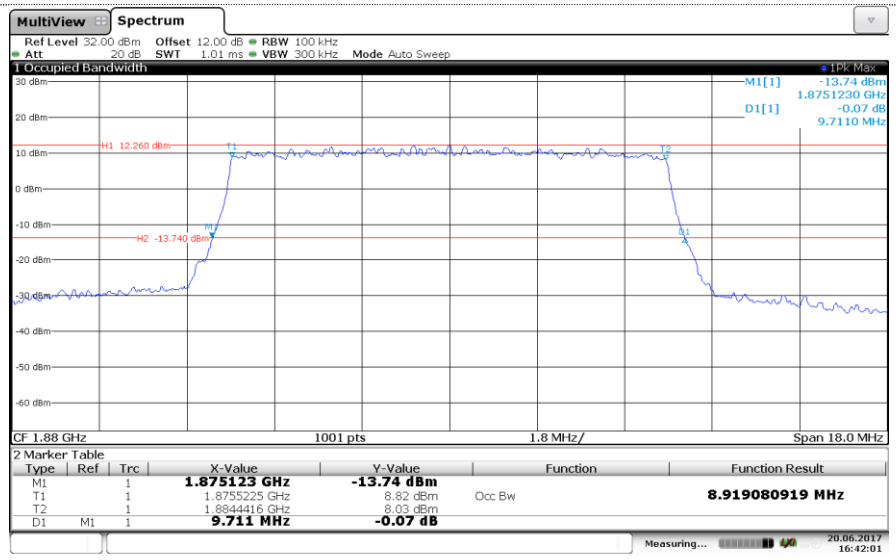



Channel High

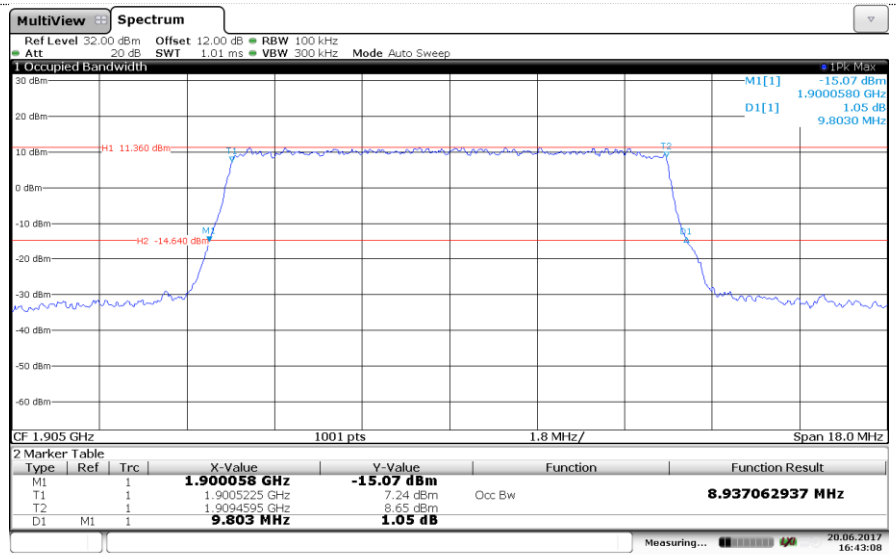
| LTE Band 2-10MHz |
|---|
| QPSK |




Channel Low

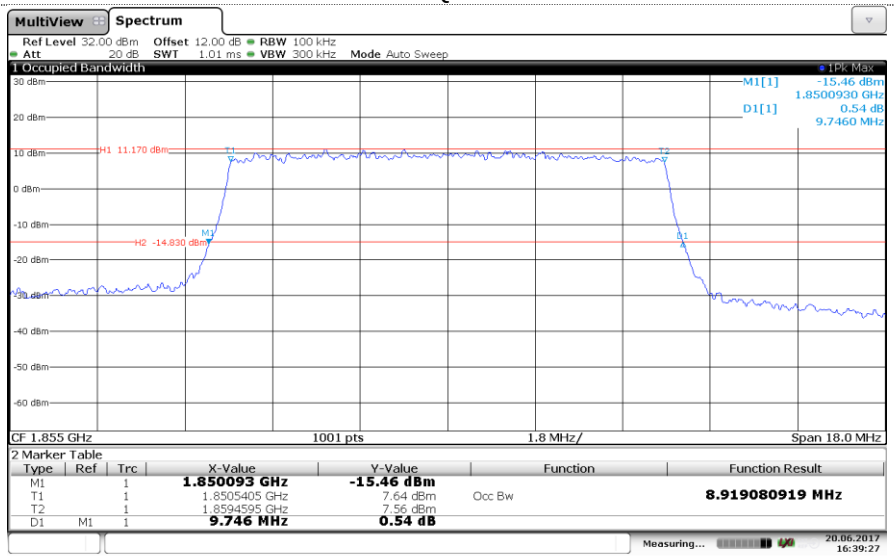



Channel Mid

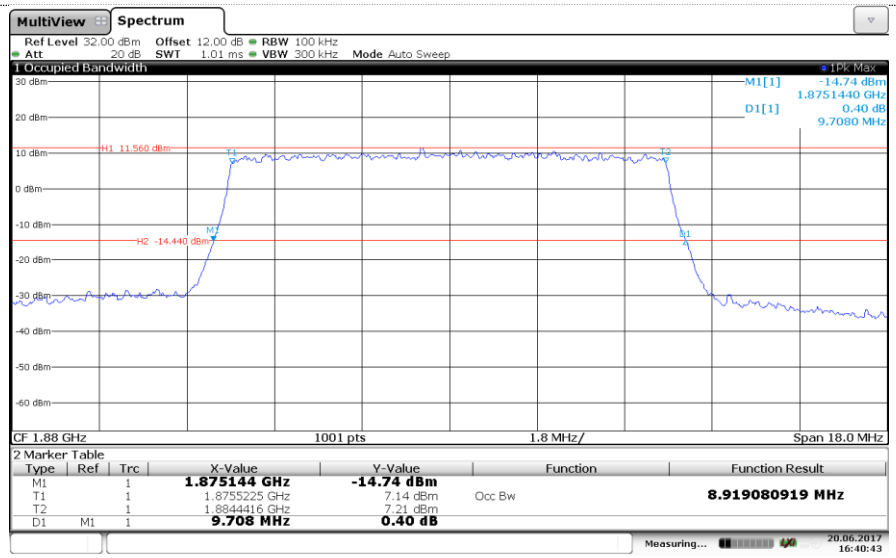



Channel High

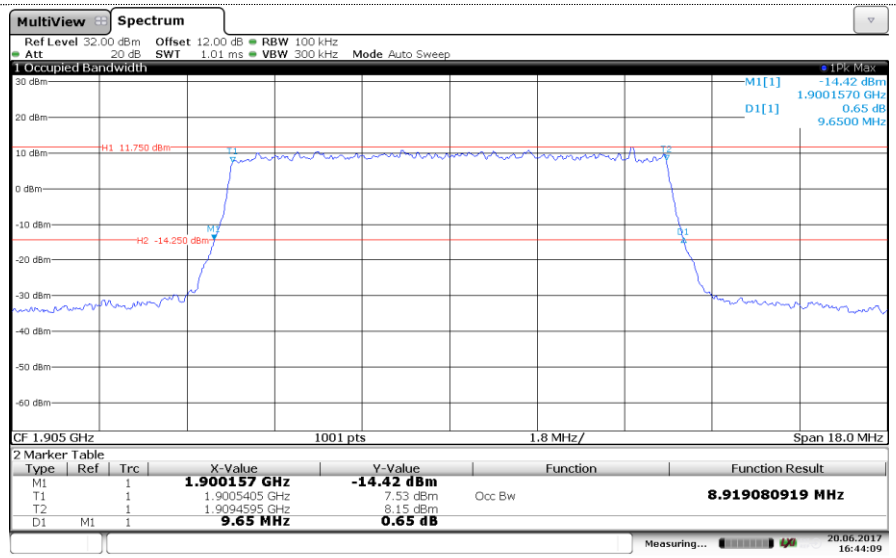
| LTE Band 2-10MHz |
|---|
| 16QAM |



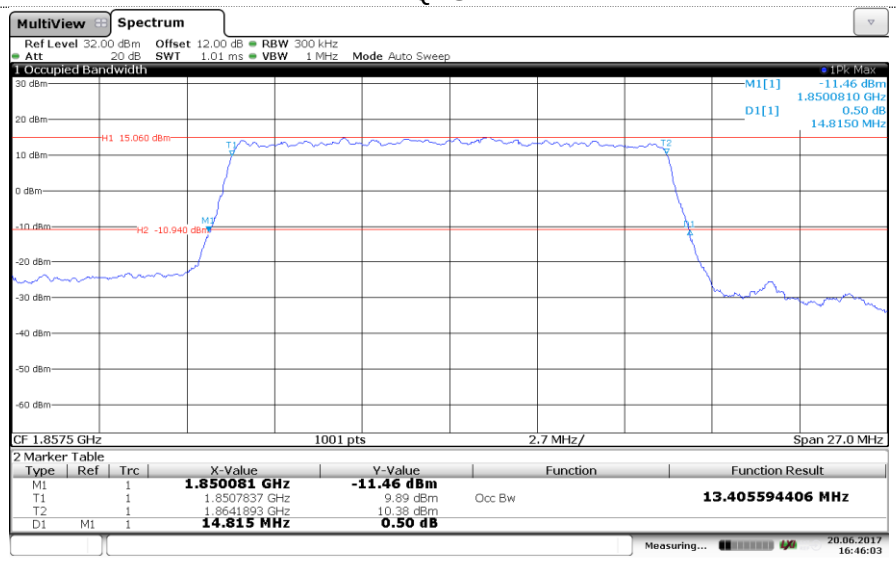
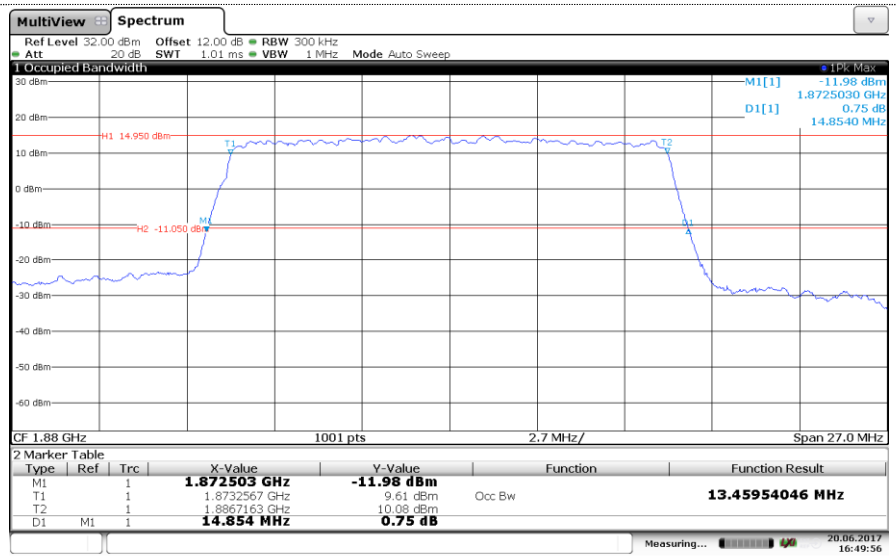
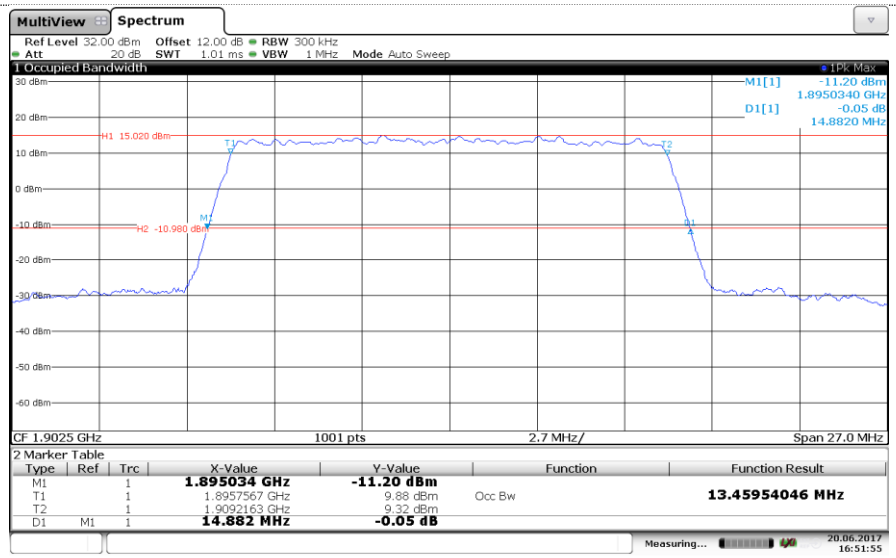

Channel Low

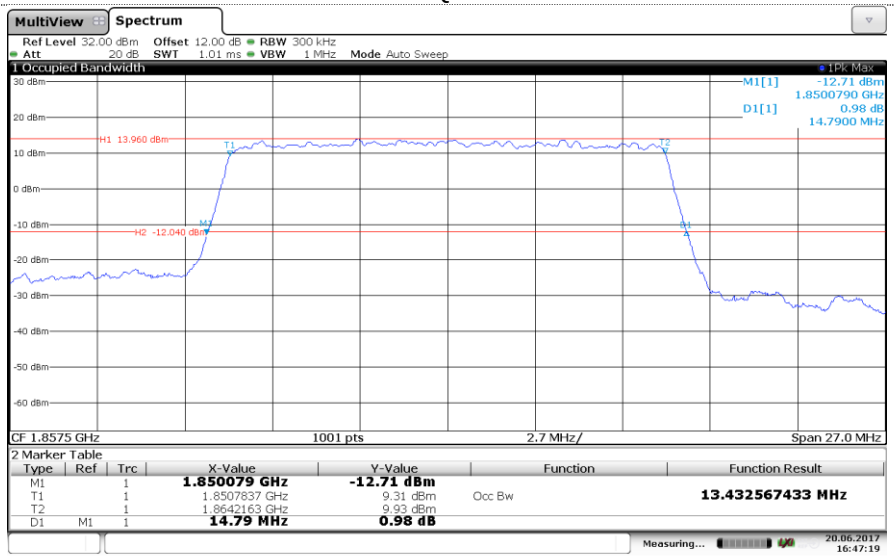
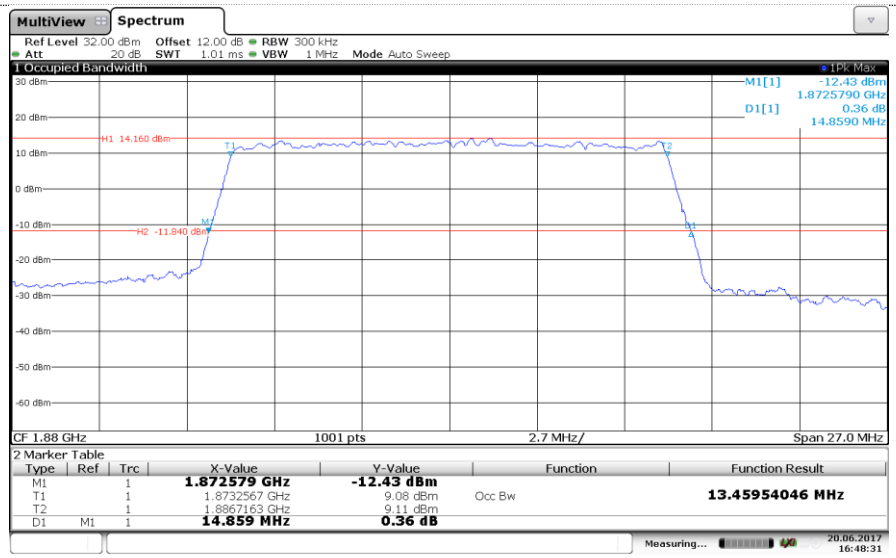
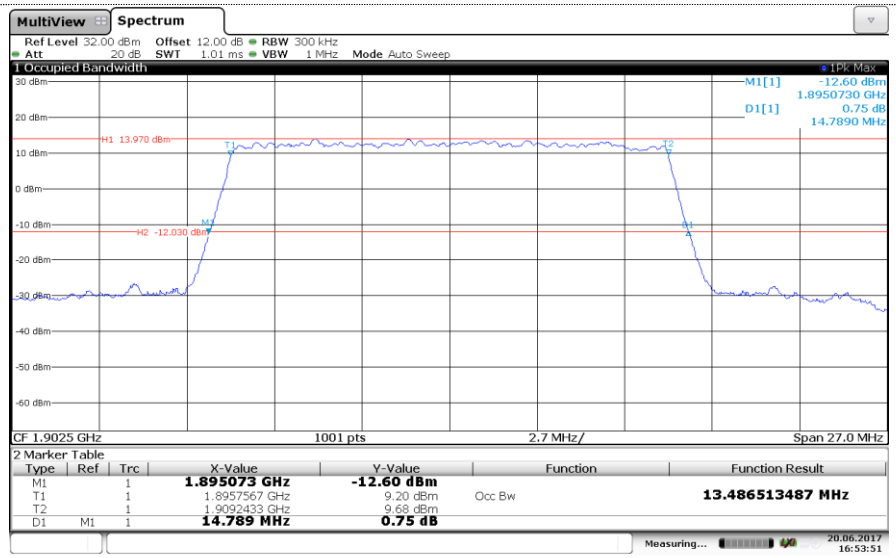



Channel Mid

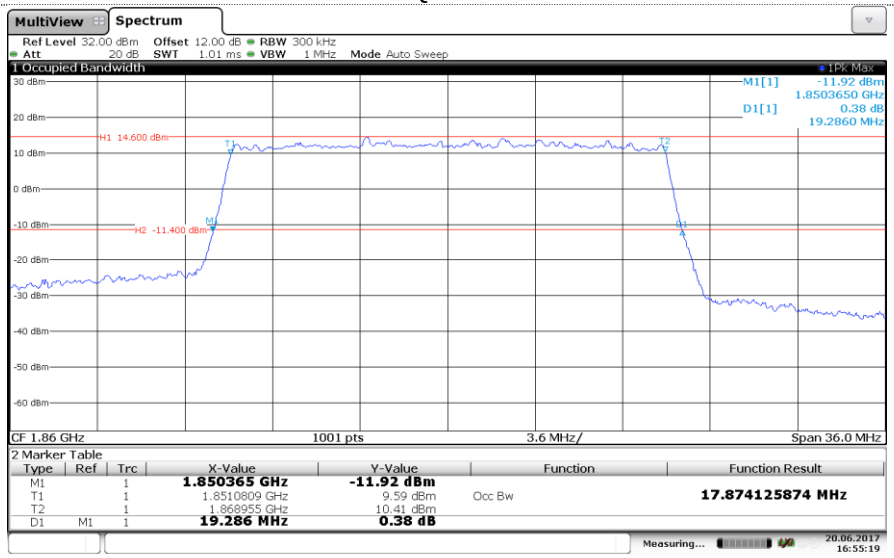



Channel High

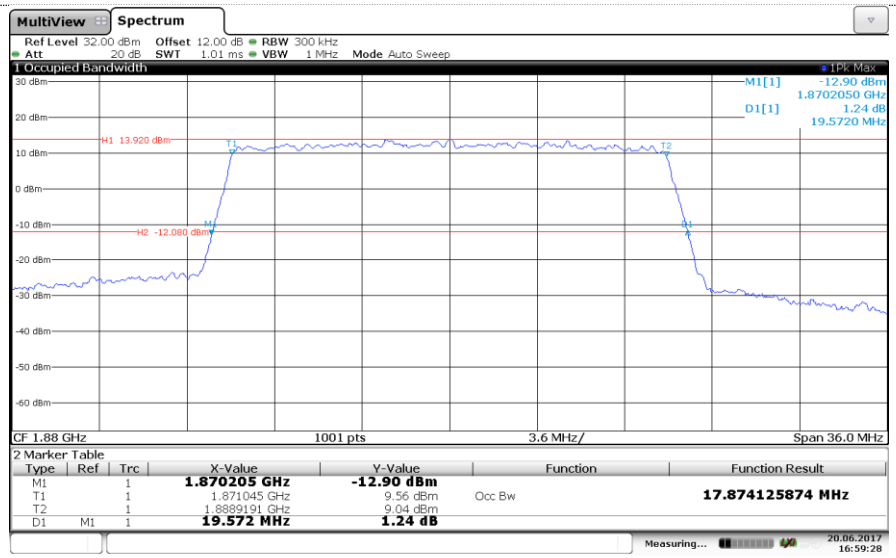
| LTE Band 2-15MHz |
|---|
| QPSK |
|  |
| Channel Low |
|  |
| Channel Mid |
|  |
| Channel High |

| LTE Band 2-15MHz |
|---|
| 16QAM |
|  |
| Channel Low |
|  |
| Channel Mid |
|  |
| Channel High |

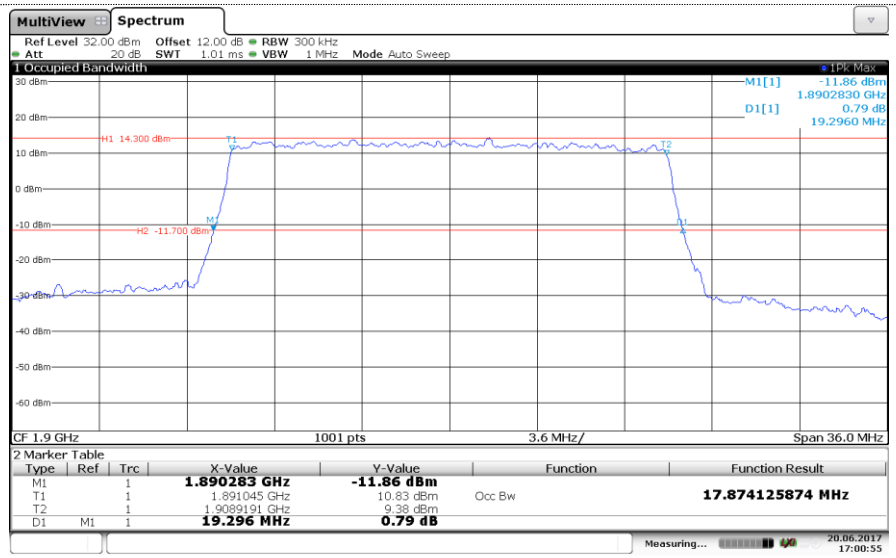
| LTE Band 2-20MHz |
|---|
| QPSK |




| Channel Low |
|---|

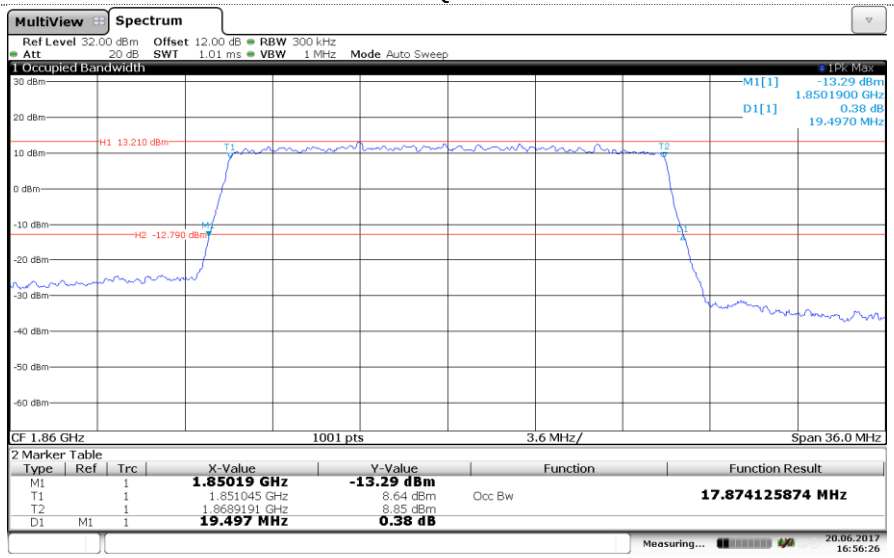



| Channel Mid |
|---|

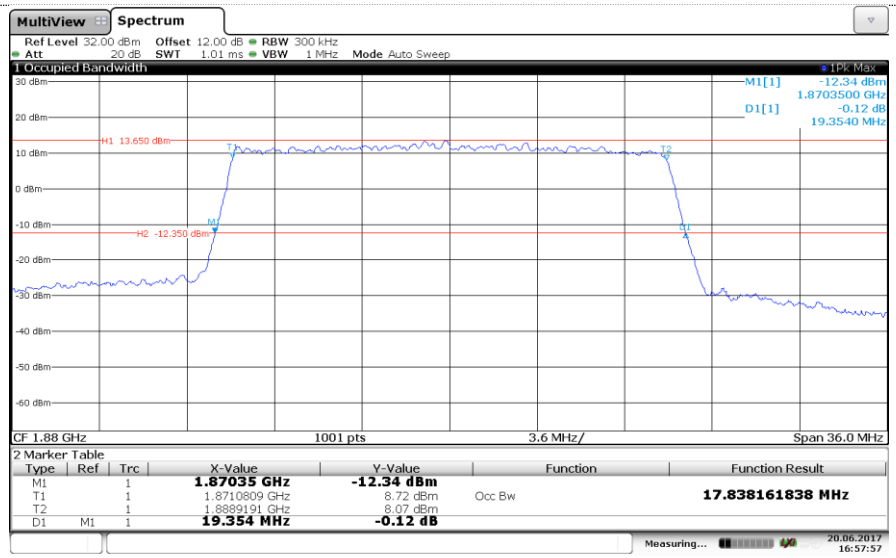



| Channel High |
|---|

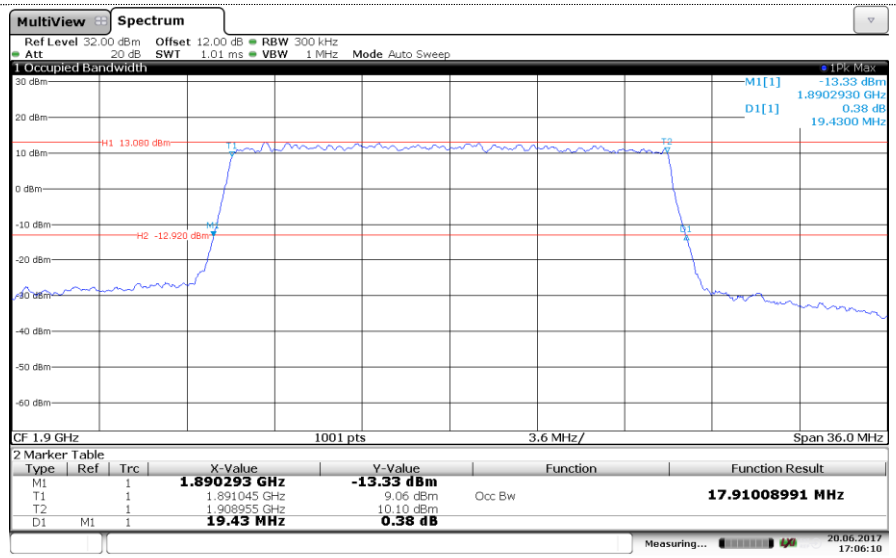
| LTE Band 2-20MHz |
|---|
| 16QAM |




Channel Low

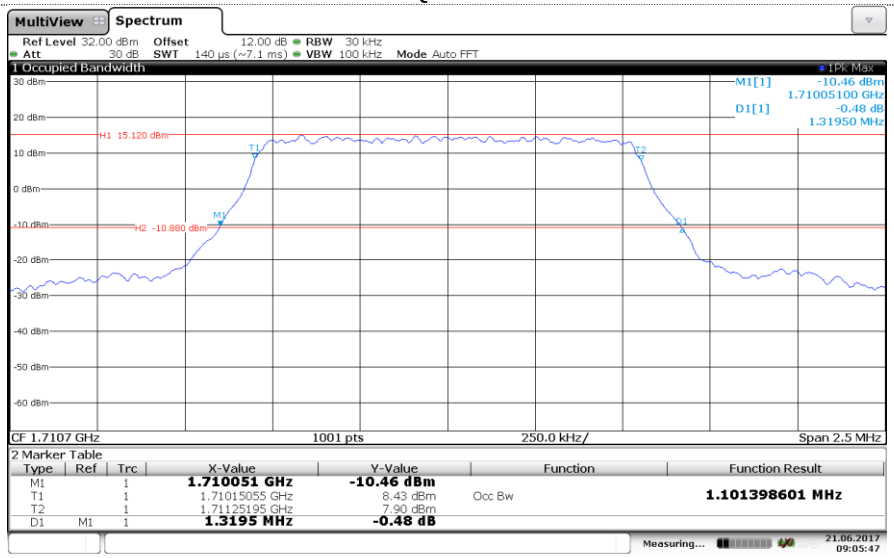



Channel Mid

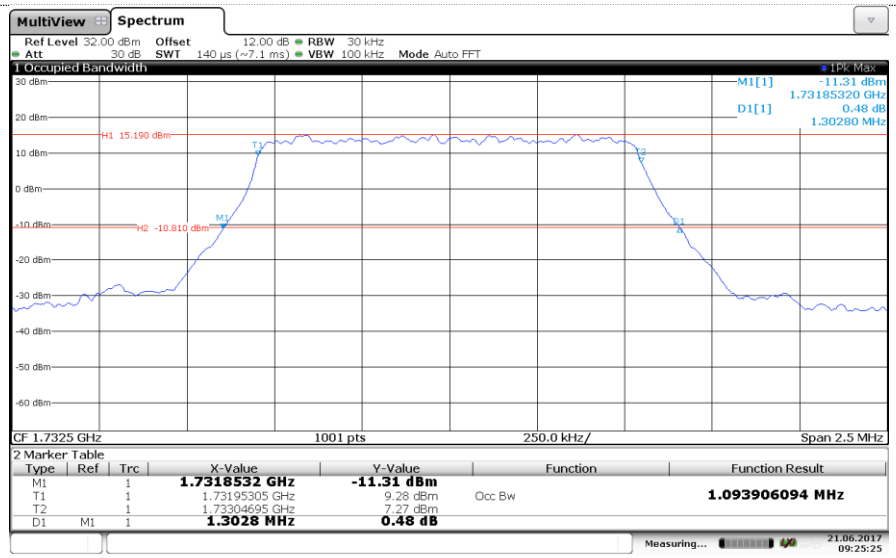



Channel High

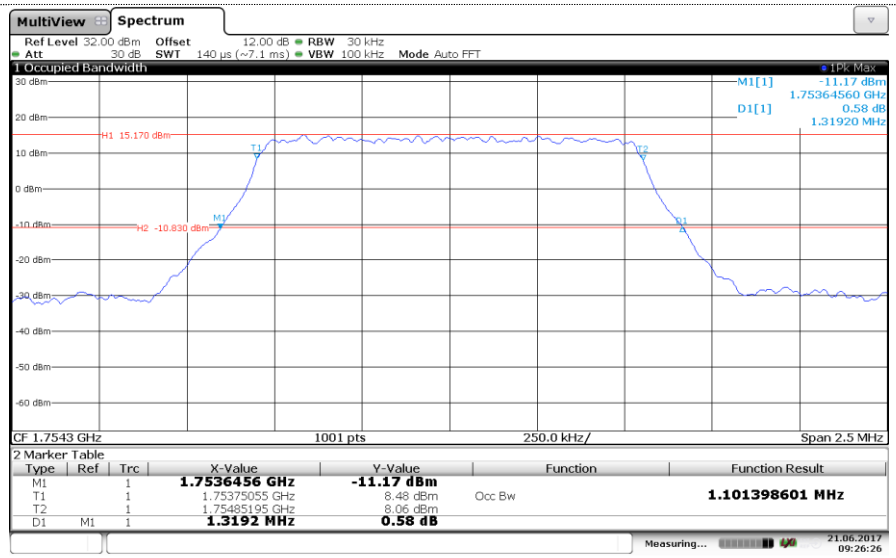
| LTE Band 4-1.4MHz |
|---|
| QPSK |



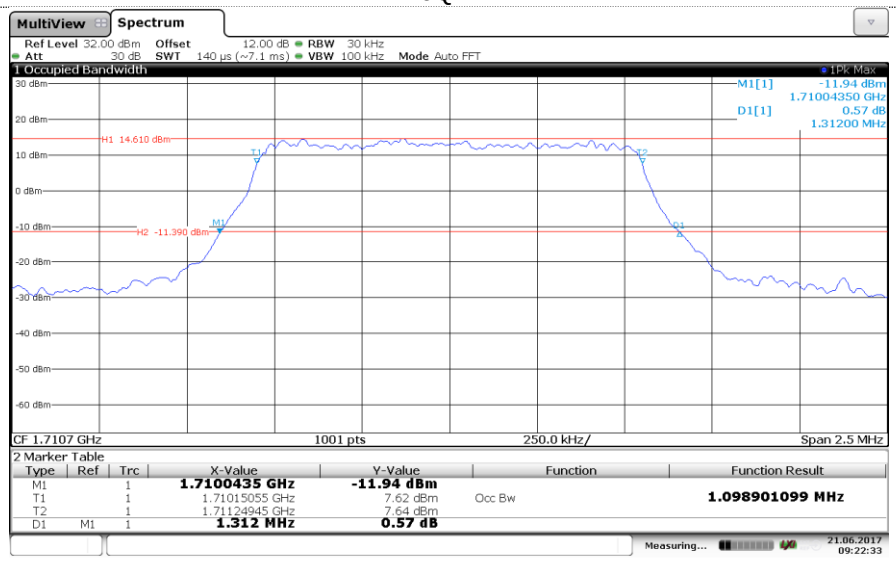
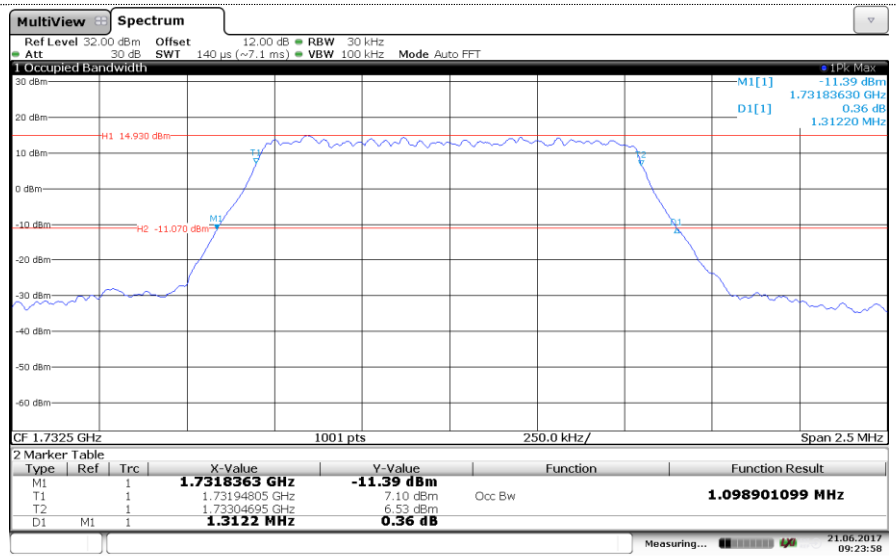
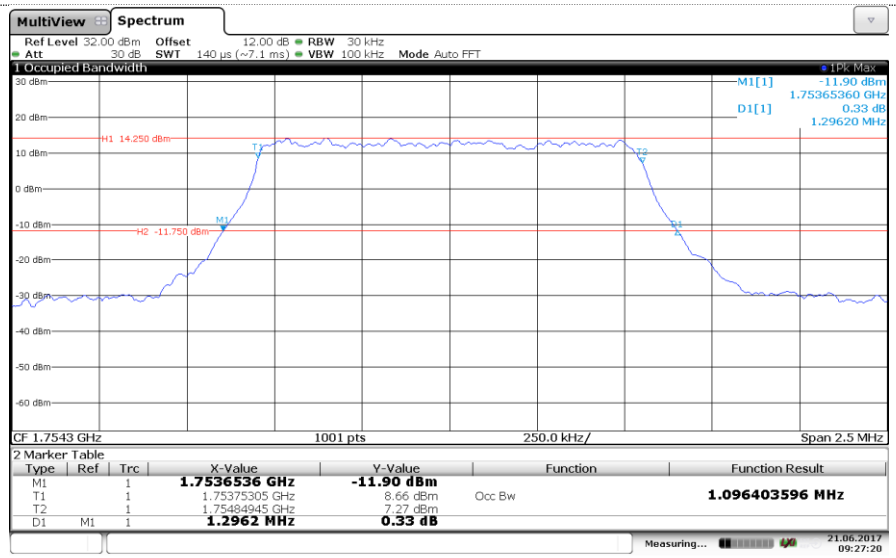

Channel Low

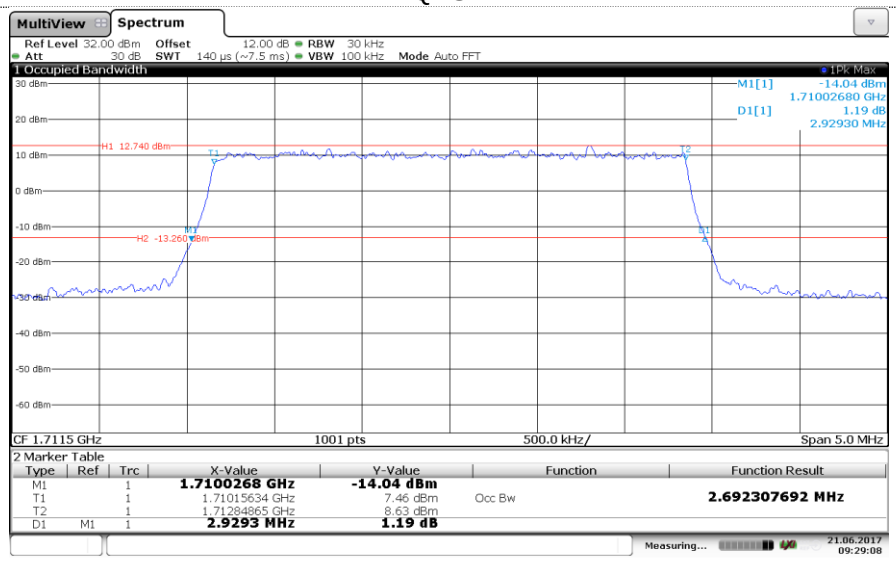
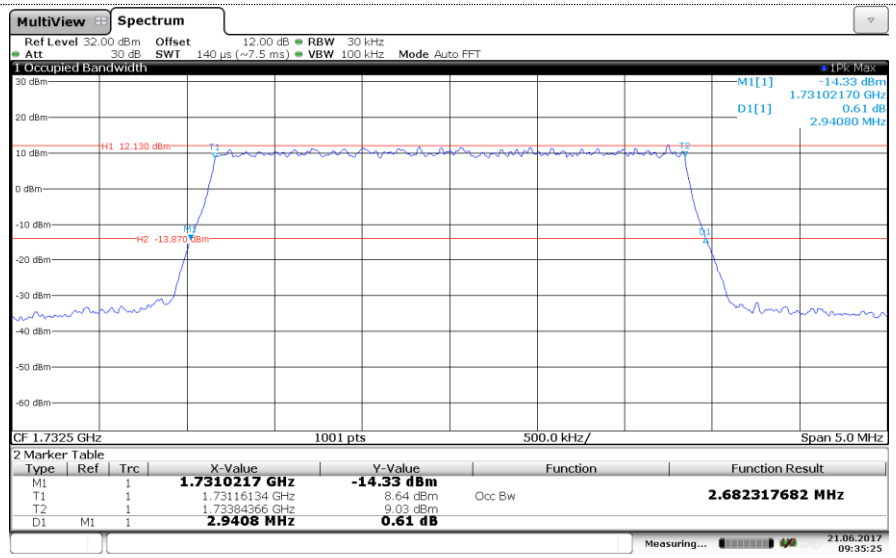
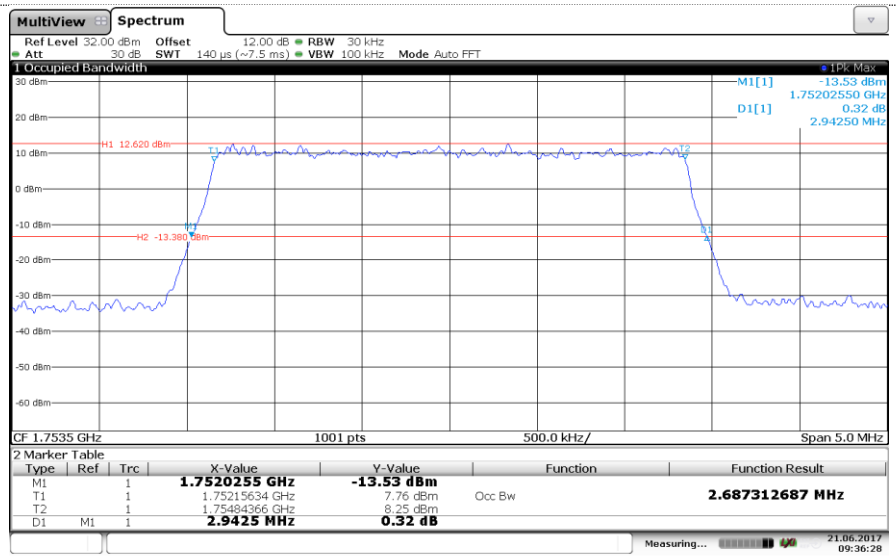


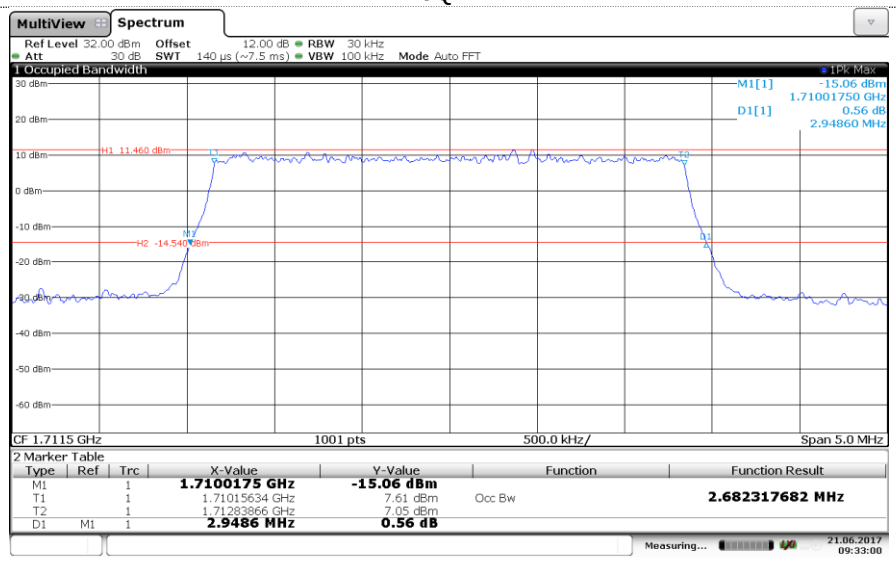
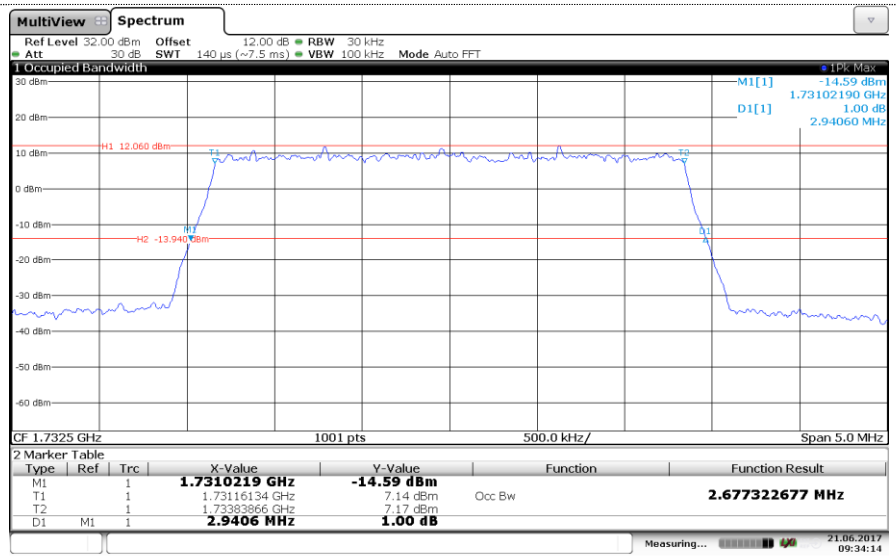
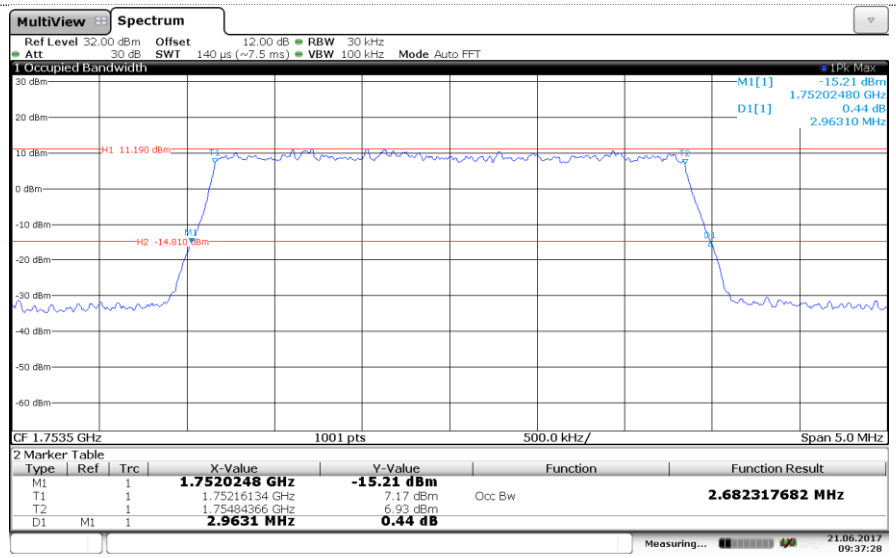

Channel Mid

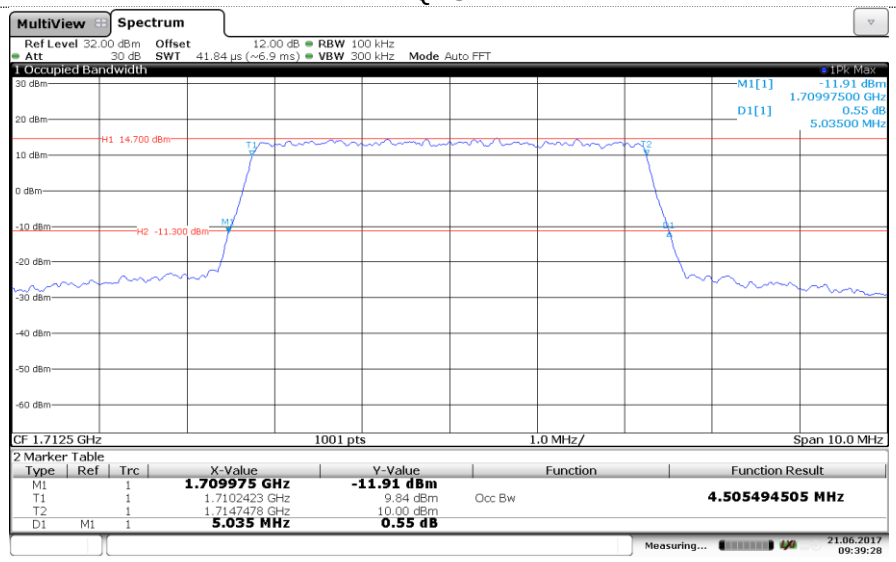
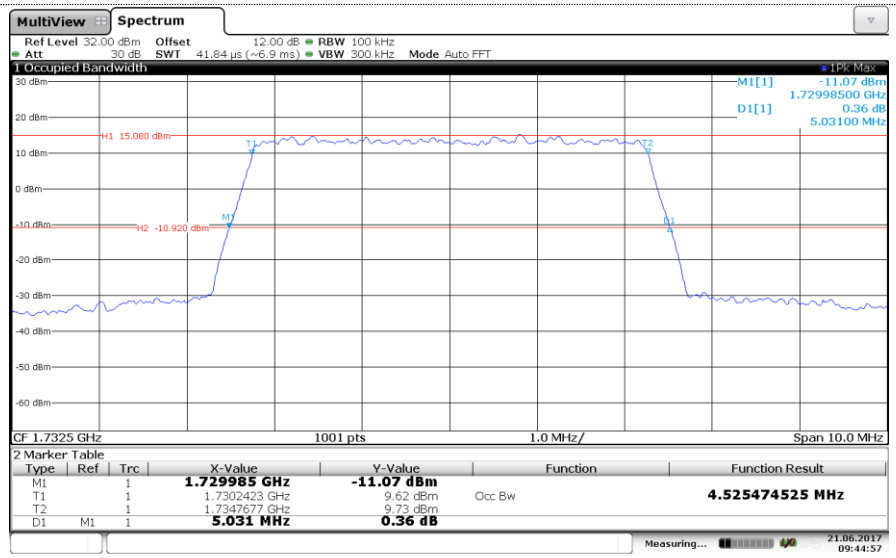
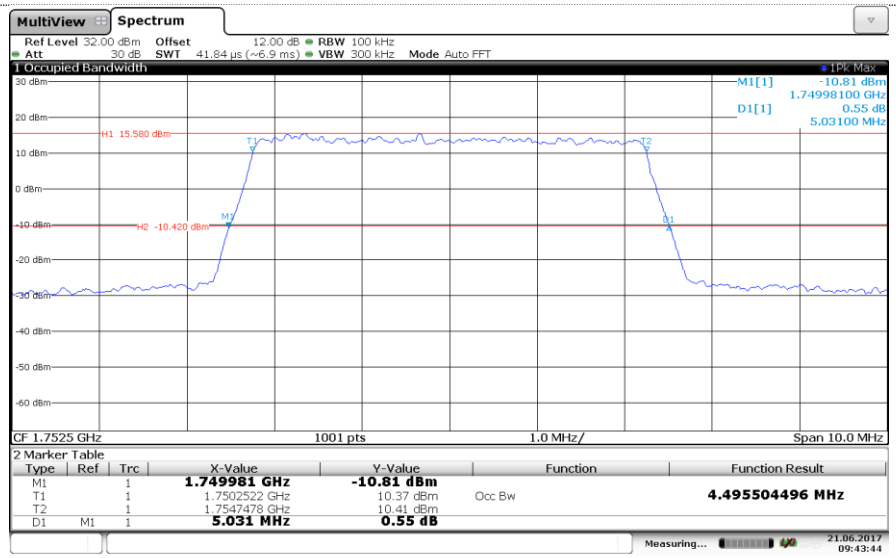


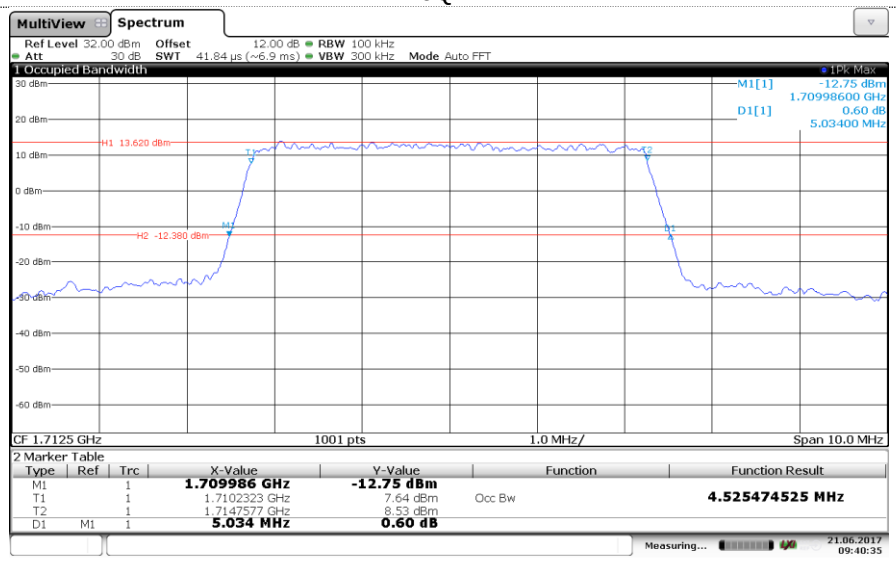
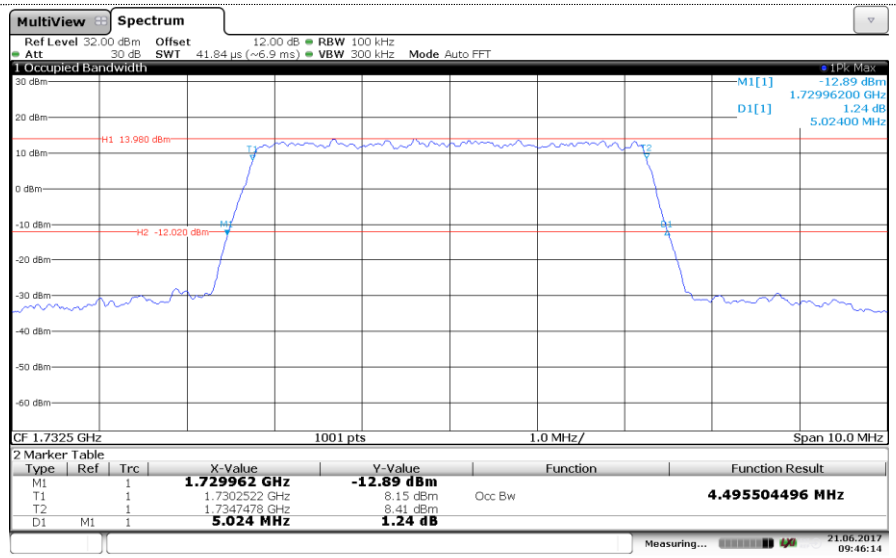
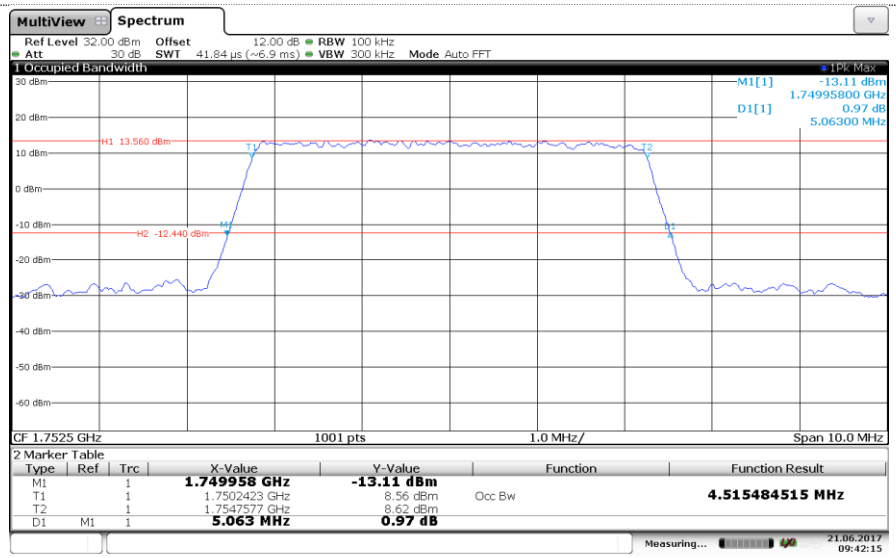

Channel High

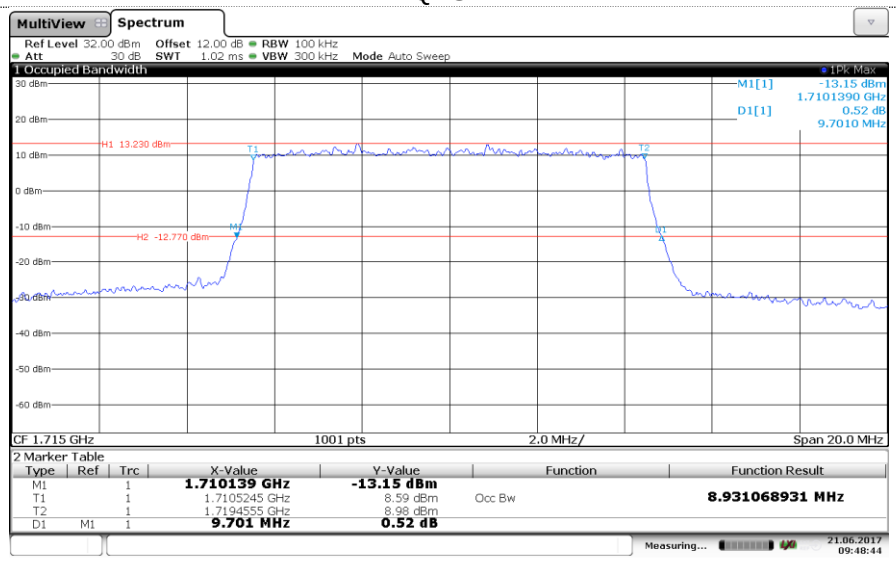
| LTE Band 4-1.4MHz |
|---|
| 16QAM |
|  |
| Channel Low |
|  |
| Channel Mid |
|  |
| Channel High |

| LTE Band 4-3MHz |
|---|
| QPSK |
|  |
| Channel Low |
|  |
| Channel Mid |
|  |
| Channel High |

| LTE Band 4-3MHz |
|---|
| 16QAM |
|  |
| Channel Low |
|  |
| Channel Mid |
|  |
| Channel High |

| LTE Band 4-5MHz |
|---|
| QPSK |
|  |
| Channel Low |
|  |
| Channel Mid |
|  |
| Channel High |

| LTE Band 4-5MHz |
|---|
| 16QAM |
|  |
| Channel Low |
|  |
| Channel Mid |
|  |
| Channel High |

| LTE Band 4-10MHz |
|---|
| QPSK |
|  |
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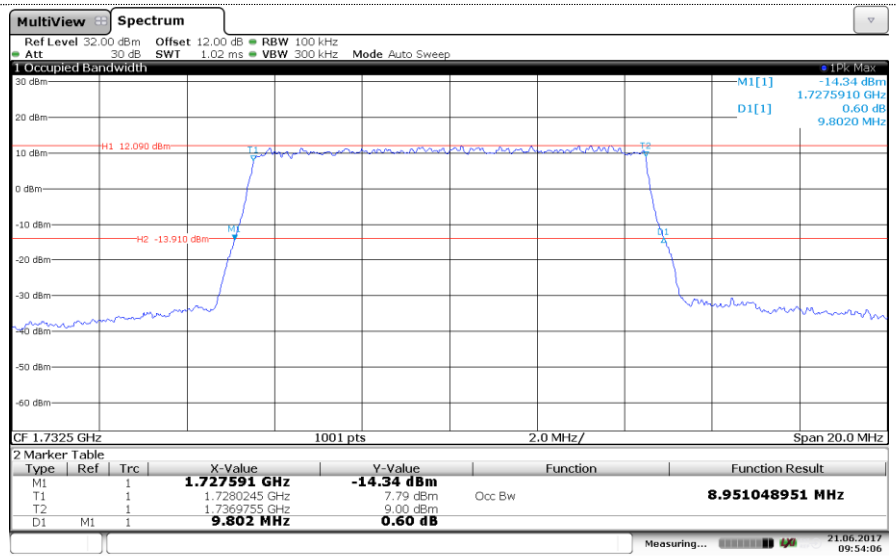
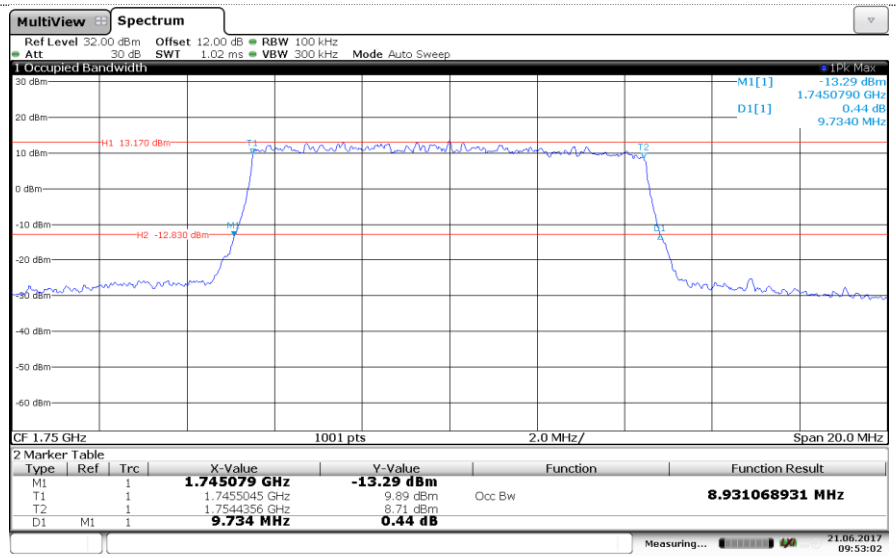
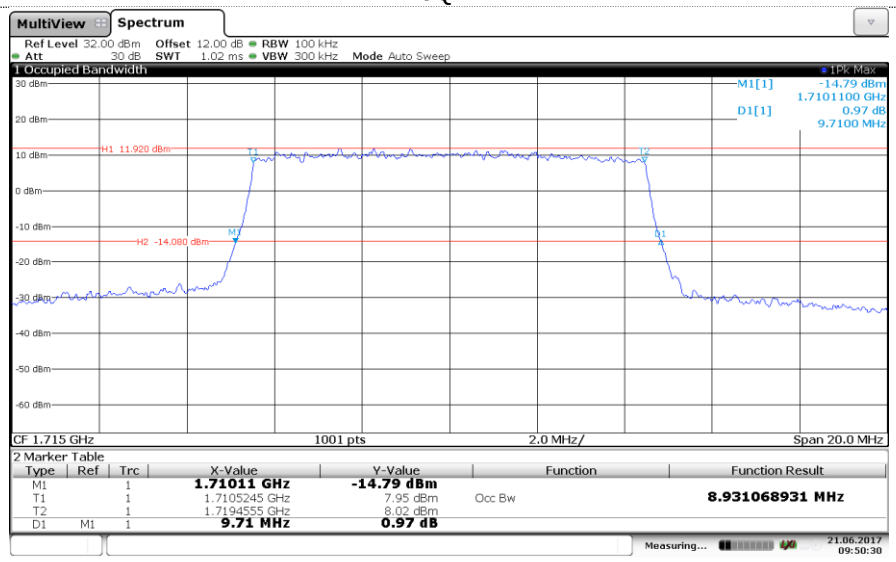
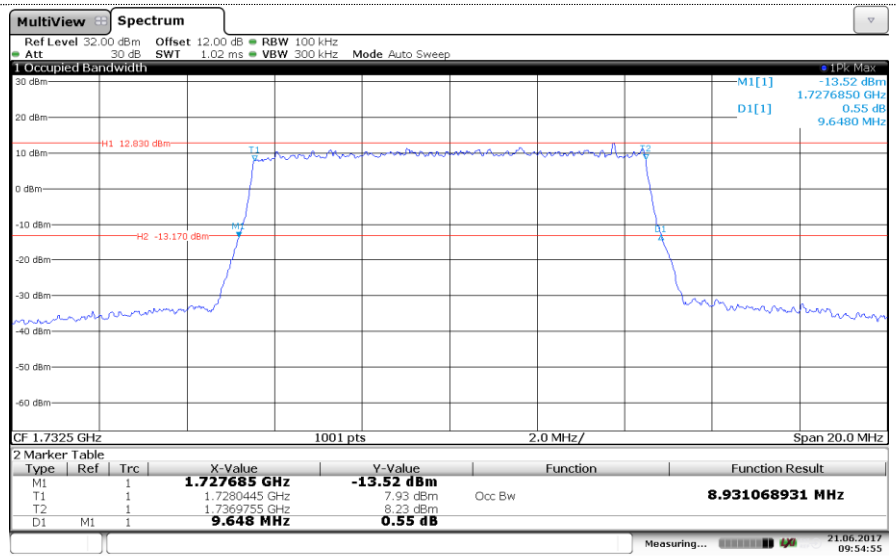
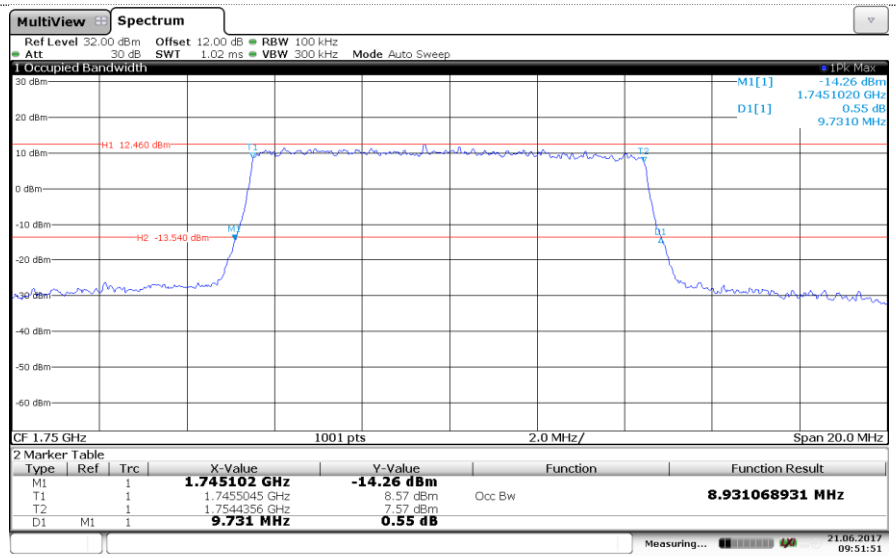
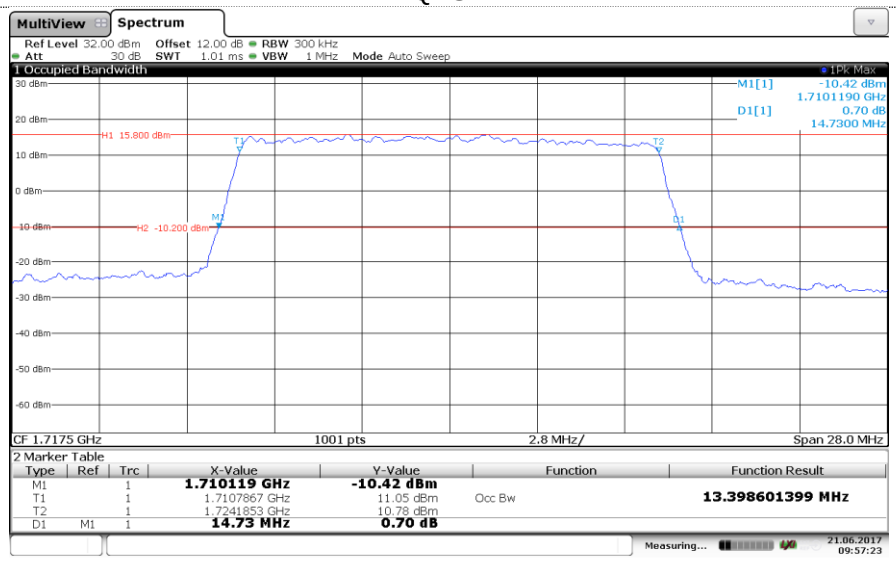
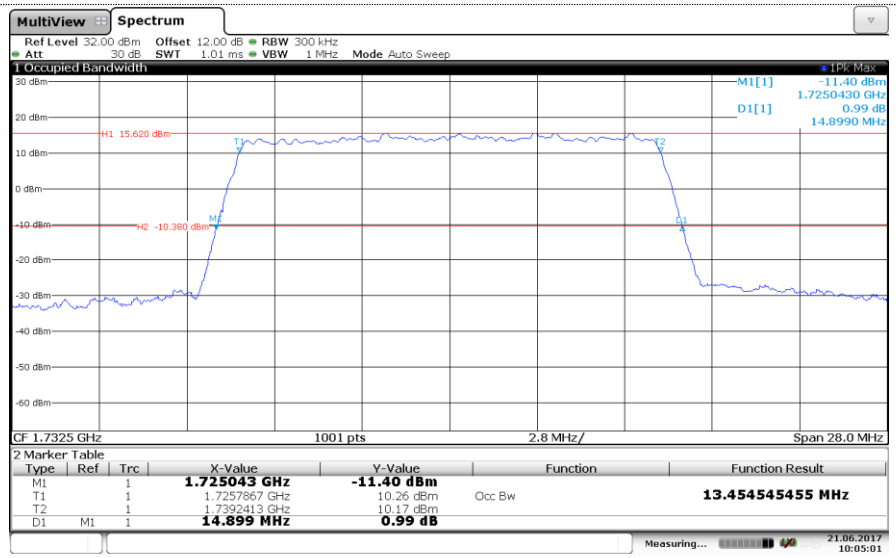
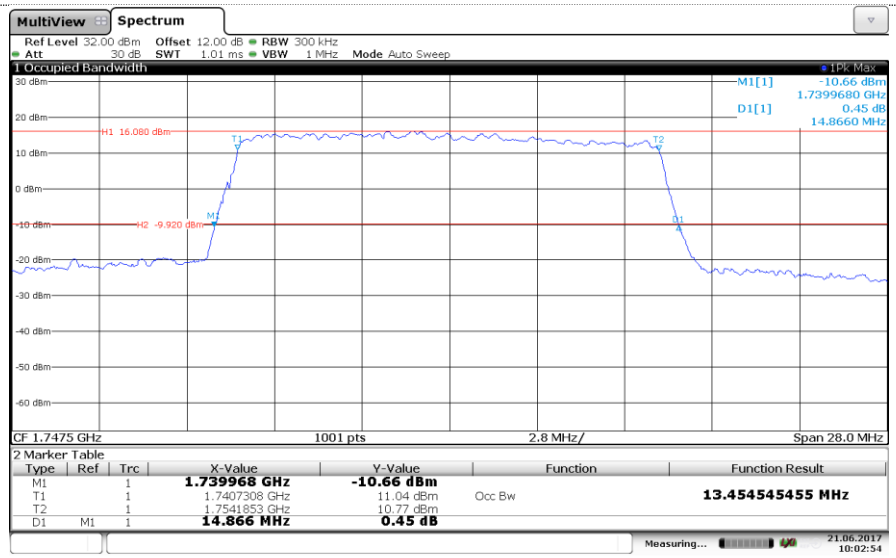
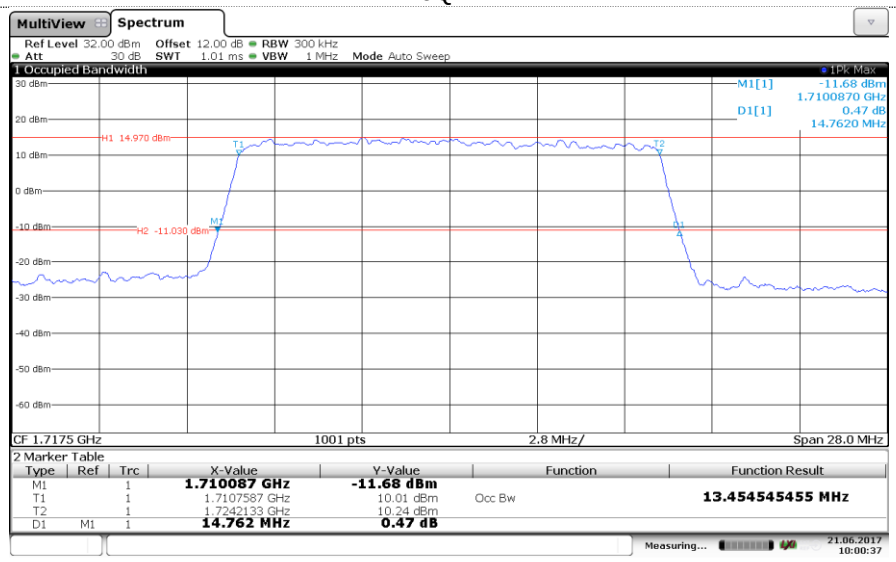
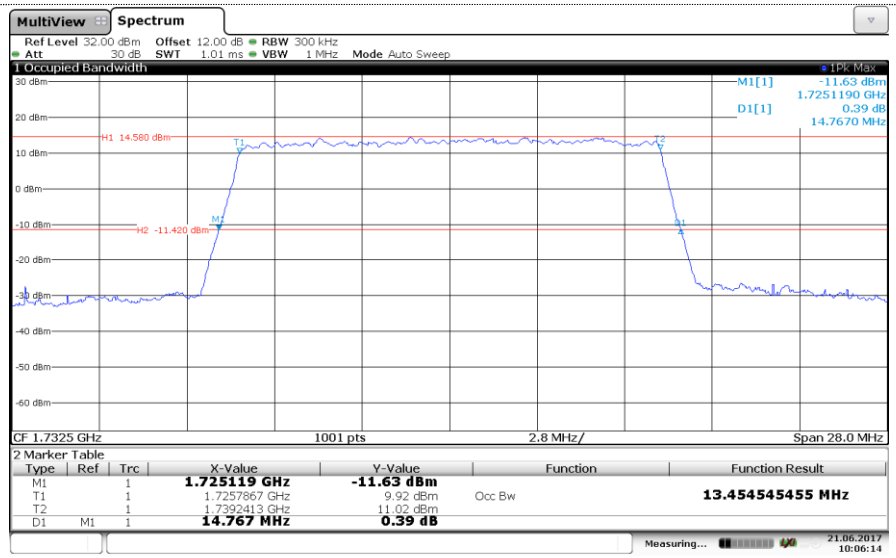
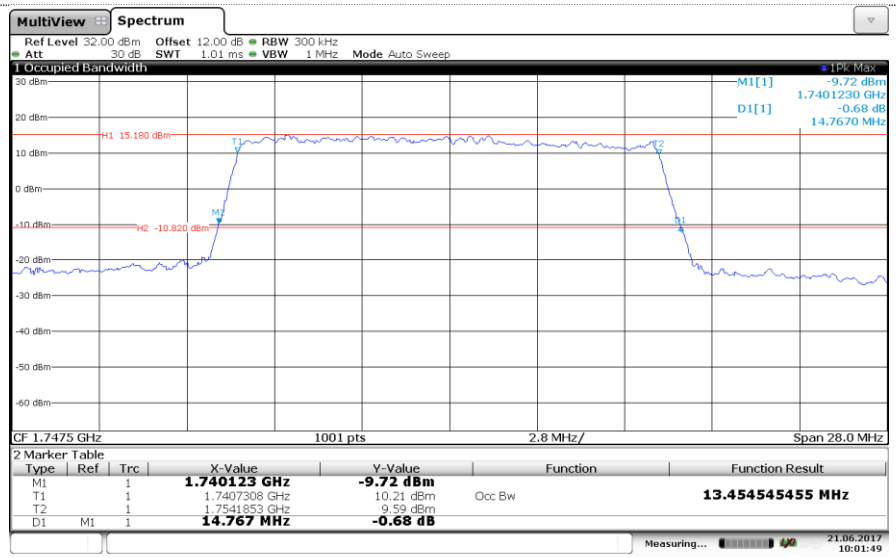
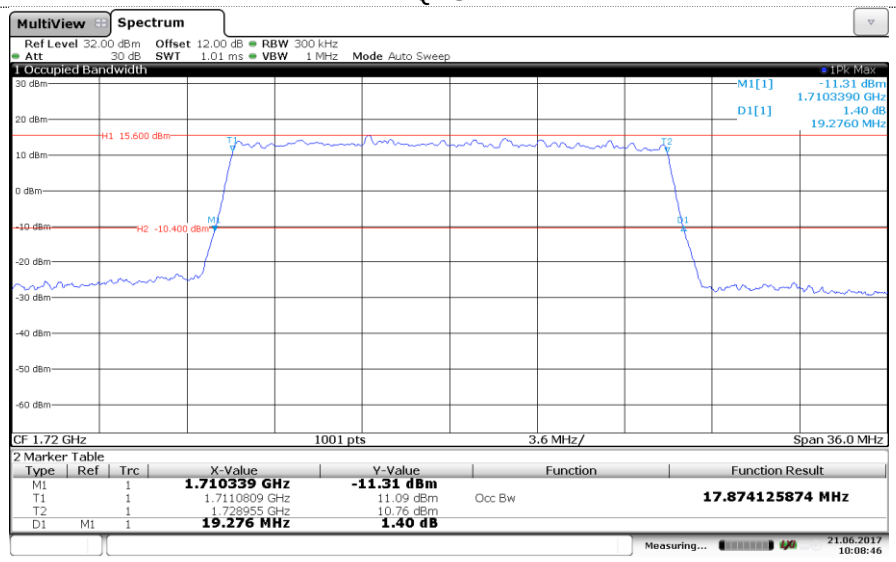
|  |
| Channel Mid |
|  |
| Channel High |

| LTE Band 4-10MHz |
|---|
| 16QAM |
|  |
| Channel Low |
|  |
| Channel Mid |
|  |
| Channel High |

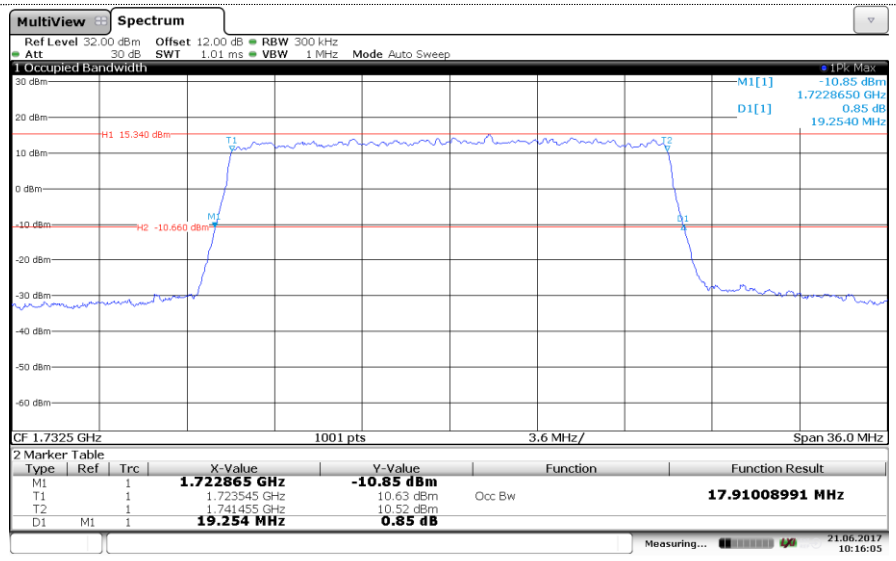
| LTE Band 4-15MHz |
|---|
| QPSK |
|  |
| Channel Low |
|  |
| Channel Mid |
|  |
| Channel High |

| LTE Band 4-15MHz |
|---|
| 16QAM |
|  |
| Channel Low |
|  |
| Channel Mid |
|  |
| Channel High |

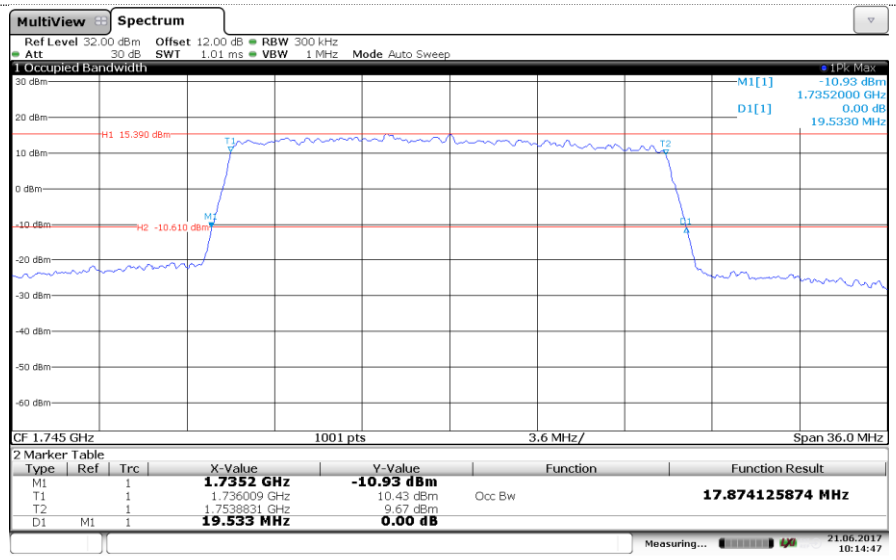
| LTE Band 4-20MHz |
|---|
| QPSK |




Channel Low

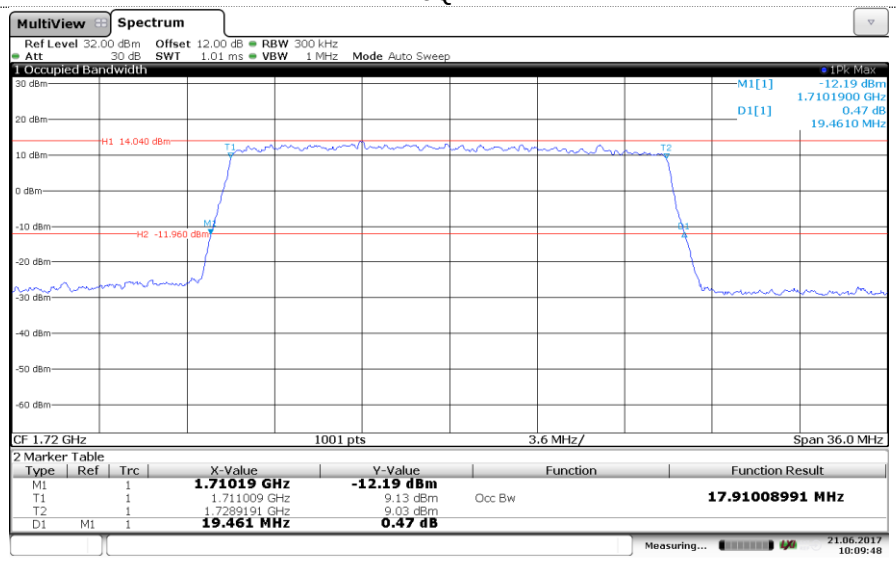



Channel Mid

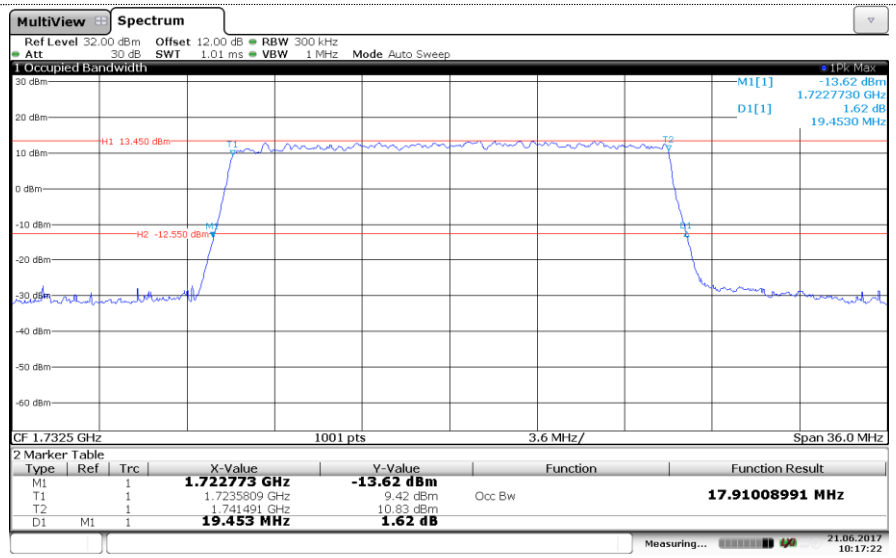



Channel High

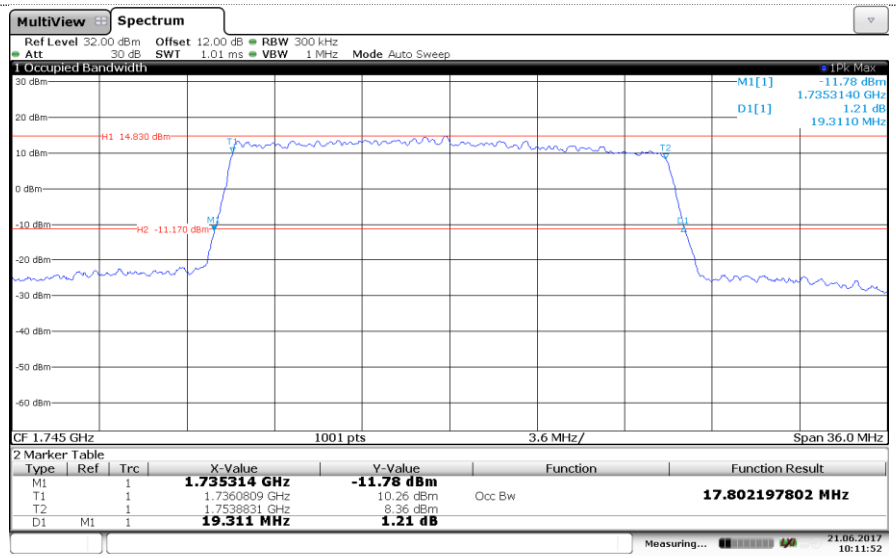
| LTE Band 4-20MHz |
|---|
| 16QAM |




Channel Low

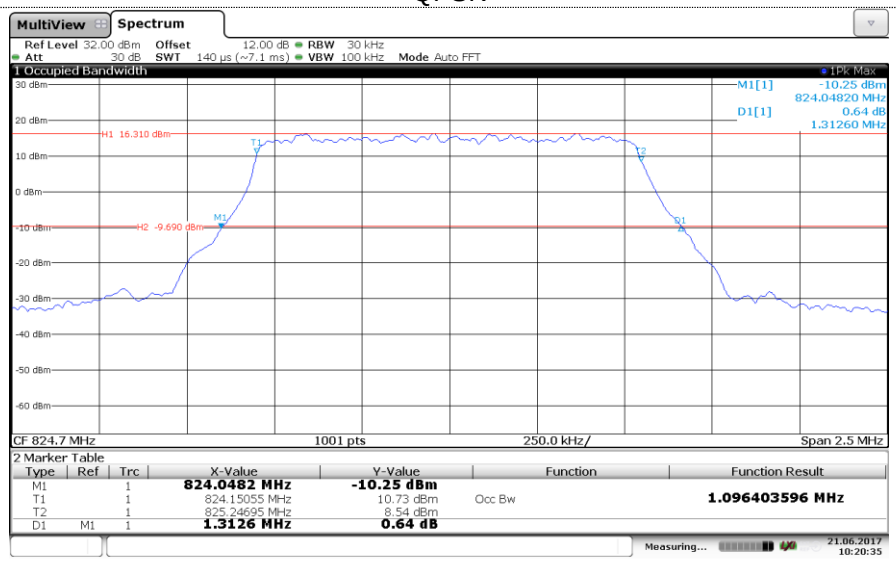



Channel Mid

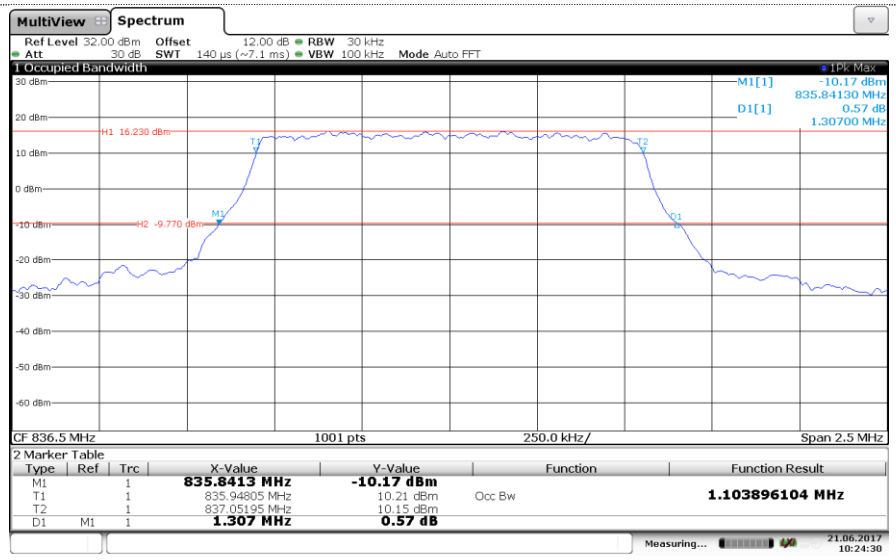



Channel High

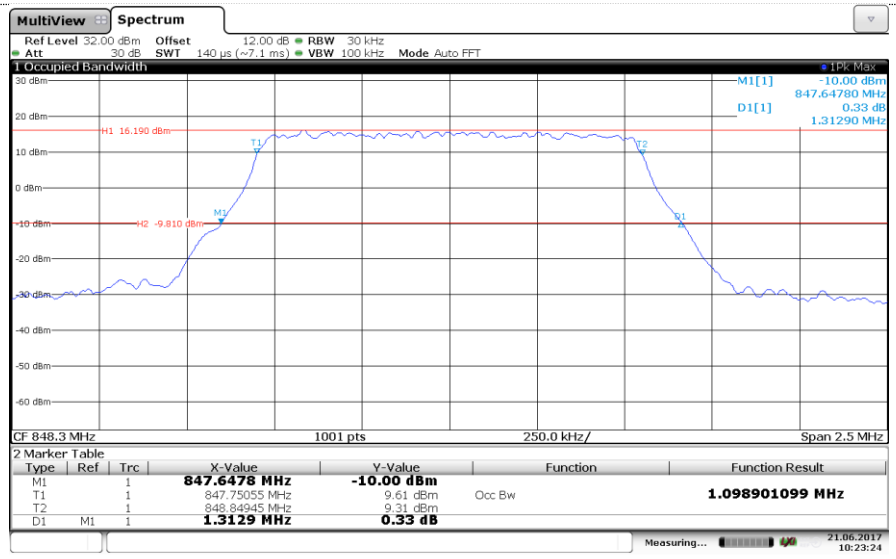
| LTE Band 5-1.4MHz |
|---|
| QPSK |




Channel Low




Channel Mid




Channel High