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# FCC ID TEST REPORT

Under  
47 CFR FCC Part 2 & 47 CFR FCC Part 27(C)  
☒PCB\_PCS Licensed Transmitter

Prepared for:

**Moochies Technologies LTD**

159 Wardour Street, London, W1F 8WH, UK

|                                      |
|--------------------------------------|
| <b>FCC ID: 2AW9Z-MW12</b>            |
| <b>EUT: Kids 4G Smartwatch Phone</b> |
| <b>Model: MW12</b>                   |

|                                                                                                                                |
|--------------------------------------------------------------------------------------------------------------------------------|
| July 17, 2020<br><b>Issue Date:</b>                                                                                            |
| Original Report<br><b>Report Type:</b>                                                                                         |
| <br><b>Test Engineer: Jacky Huang</b>       |
| <br><b>Review By: Apollo Liu / Manager</b> |

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**Report Revision History**

| <b>Report #</b>  | <b>Version</b> | <b>Description</b>      | <b>Issued Date</b> |
|------------------|----------------|-------------------------|--------------------|
| KSZ2020032301J03 | Rev.01         | Initial issue of report | July 17, 2020      |

## 1. General Information

### 1.1 Notes

The test results of this report relate exclusively to the test item specified in 1.6. The KMO Lab does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the KMO Lab.

### 1.2 Testing Laboratory

|                                                                                                                                                                                                                                                                    |                                                                                                                               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| <b>Test Firm Name:</b>                                                                                                                                                                                                                                             | <b>Ke Mei Ou Lab Co., Ltd.</b>                                                                                                |
| <b>Test Firm Address:</b>                                                                                                                                                                                                                                          | 2013-2016, 20th Floor, Business Center, Jiahui Xin Cheng, No 3027, Shen Nan Road, Fu Tian, Shen Zhen, Guang Dong, P. R. China |
| <b>FCC Designation Number:</b>                                                                                                                                                                                                                                     | CN1532                                                                                                                        |
| <b>Test Firm Registration Number:</b>                                                                                                                                                                                                                              | 344480                                                                                                                        |
| <b>Internet:</b>                                                                                                                                                                                                                                                   | <a href="http://www.kmolab.com">www.kmolab.com</a>                                                                            |
| <b>Email:</b>                                                                                                                                                                                                                                                      | <a href="mailto:kmo@kmolab.com">kmo@kmolab.com</a>                                                                            |
| ANSI-ASQ National Accreditation Board/ACLASS ISO/IEC 17025 Accredited Lab for telecommunication standards. The Registration Number is AT-1532. The testing quality system meets with ISO/IEC-17025 requirements, This approval results is accepted by MRA of ILAC. |                                                                                                                               |

### 1.3 Details of Applicant

|                |                                         |
|----------------|-----------------------------------------|
| <b>Name</b>    | Moochies Technologies LTD               |
| <b>Address</b> | 159 Wardour Street, London, W1F 8WH, UK |

### 1.4 Application Details

|                                       |                          |
|---------------------------------------|--------------------------|
| <b>Date of Receipt of Application</b> | : March 23, 2020         |
| <b>Date of Receipt of Test Item</b>   | : May 11, 2020           |
| <b>Date of Test</b>                   | : May 11 ~ July 17, 2020 |

### 1.5 Details of Manufacturer

|                |                                         |
|----------------|-----------------------------------------|
| <b>Name</b>    | Moochies Technologies LTD               |
| <b>Address</b> | 159 Wardour Street, London, W1F 8WH, UK |

### 1.6 Test Item

| EUT Feature                         |                                                                                             |                                                 |                                                           |             |
|-------------------------------------|---------------------------------------------------------------------------------------------|-------------------------------------------------|-----------------------------------------------------------|-------------|
| EUT Description:                    | Kids 4G Smartwatch Phone                                                                    |                                                 |                                                           |             |
| Brand Name:                         | Moochies                                                                                    |                                                 |                                                           |             |
| Model Name:                         | MW12                                                                                        |                                                 |                                                           |             |
| EUT RF Technology:                  | <input type="checkbox"/> WCDMA                                                              | Band                                            | UL(MHz)                                                   | DL(MHz)     |
|                                     |                                                                                             | <input type="checkbox"/> WCDMA Band IV          | 1710 ~ 1755                                               | 2110 ~ 2155 |
|                                     | <input checked="" type="checkbox"/> LTE                                                     | Band                                            | UL(MHz)                                                   | DL(MHz)     |
|                                     |                                                                                             | <input checked="" type="checkbox"/> LTE Band 4  | 1710 ~ 1755                                               | 2110 ~ 2155 |
|                                     |                                                                                             | <input type="checkbox"/> LTE Band 7             | 2500 ~ 2570                                               | 2620 ~ 2690 |
|                                     |                                                                                             | <input checked="" type="checkbox"/> LTE Band 12 | 699 ~ 716                                                 | 729 ~ 746   |
|                                     |                                                                                             | <input type="checkbox"/> LTE Band 17            | 704 ~ 716                                                 | 734 ~ 746   |
|                                     |                                                                                             | <input type="checkbox"/> LTE Band 38            | 2570 ~ 2620                                               | 2570 ~ 2620 |
|                                     |                                                                                             | <input type="checkbox"/> LTE Band 41            | 2496 ~ 2690                                               | 2496 ~ 2690 |
|                                     |                                                                                             | <input type="checkbox"/> LTE Band 66            | 1710 ~ 1780                                               | 2110 ~ 2200 |
|                                     |                                                                                             | <input type="checkbox"/> LTE CA 38C             | 2570 ~ 2620                                               | 2570 ~ 2620 |
| <input type="checkbox"/> LTE CA 41C | 2496 ~ 2690                                                                                 | 2496 ~ 2690                                     |                                                           |             |
| Antenna Type / Gain:                | <input checked="" type="checkbox"/> Internal      0.8dBi->LTE Band 4<br>0.5dBi->LTE Band 12 |                                                 | <input type="checkbox"/> External      dBi                |             |
| Test Mode(s):                       | <input type="checkbox"/> WCDMA Band IV                                                      |                                                 | <input checked="" type="checkbox"/> LTE Band 4/12         |             |
| Test Modulation:                    | <input checked="" type="checkbox"/> WCDMA-> BPSK, QPSK,16QAM                                |                                                 | <input checked="" type="checkbox"/> LTE->QPSK,16QAM,64QAM |             |
| HSDPA UE Category                   | 14                                                                                          | HSUPA UE Category                               | 6                                                         |             |
| LTE Category                        | 19                                                                                          |                                                 |                                                           |             |
| HW Version:                         | G4H-MB                                                                                      |                                                 |                                                           |             |
| SW Version:                         | G4P EMMC 240 5M COMMON OVERSEA 20190919 17.19.00                                            |                                                 |                                                           |             |
| EUT Stage:                          | <input checked="" type="checkbox"/> Identical Prototype <input type="checkbox"/> Production |                                                 |                                                           |             |

|                                                                                                                                                    |              |               |              |
|----------------------------------------------------------------------------------------------------------------------------------------------------|--------------|---------------|--------------|
| <b>Power Supply</b>                                                                                                                                | Vmin: 3.6Vdc | Vnom : 3.8Vdc | Vmax: 4.2Vdc |
| <b>Operating Temperature</b>                                                                                                                       | Tmin: -10 °C | Tnom: 25 °C   | Tmax: 45 °C  |
| Note: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description. |              |               |              |

|                                  |                                                                                                                                                                       |
|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>EUT Operational Condition</b> | <input type="checkbox"/> AC                                                                                                                                           |
|                                  | <input checked="" type="checkbox"/> DC → <input checked="" type="checkbox"/> From Battery → <input type="checkbox"/> External AC adapter <input type="checkbox"/> POE |

| Specification of Accessory                  |                     |                      |                           |
|---------------------------------------------|---------------------|----------------------|---------------------------|
| <input checked="" type="checkbox"/> Battery | <b>Brand Name</b>   | N/A                  | <b>Model Name</b> 663032V |
|                                             | <b>Power Rating</b> | 3.7V, 700mAh, 2.59Wh |                           |

| Maximum ERP/EIRP Power & Frequency Tolerance & Emission Designator |                               |                    |                           |                     |                          |                           |                     |
|--------------------------------------------------------------------|-------------------------------|--------------------|---------------------------|---------------------|--------------------------|---------------------------|---------------------|
| FCC Rule                                                           | RF Technology                 | Type of Modulation | Band (MHz)                | Output Watts(W)     | Frequency Tolerance(ppm) | Emission Designator       |                     |
| <input type="checkbox"/> 27                                        | WCDMA Band IV RMC<br>12.2Kbps | BPSK               | 1712.4 ~ 1752.6           | -                   | -                        | F9W                       |                     |
| <input checked="" type="checkbox"/> FCC Rule 27                    |                               |                    |                           |                     |                          |                           |                     |
| LTE Band 4                                                         |                               | QPSK               |                           |                     | 16QAM                    |                           |                     |
| BW (MHz)                                                           | Band (MHz)                    | Output Watts(W)    | Frequency Tolerance (ppm) | Emission Designator | Output Watts(W)          | Frequency Tolerance (ppm) | Emission Designator |
| 1.4                                                                | 1710.7 - 1754.3               | 0.2565             | -                         | 1M10G7D             | 0.2218                   | -                         | 1M10W7D             |
| 3                                                                  | 1711.5 - 1753.5               | 0.2483             | -                         | 2M70G7D             | 0.2178                   | -                         | 2M70W7D             |
| 5                                                                  | 1712.5 - 1752.5               | 0.2541             | -                         | 4M54G7D             | 0.2128                   | -                         | 4M54W7D             |
| 10                                                                 | 1715.0 - 1750.0               | 0.2559             | -                         | 9M00G7D             | 0.2085                   | -                         | 9M00W7D             |
| 15                                                                 | 1717.5 - 1747.5               | 0.2559             | -                         | 13M6G7D             | 0.2280                   | -                         | 13M6W7D             |
| 20                                                                 | 1720.0 - 1745.0               | 0.2594             | -                         | 18M0G7D             | 0.2123                   | -                         | 18M1W7D             |
| LTE Band 4                                                         |                               | 64QAM              |                           |                     | -                        |                           |                     |
| BW (MHz)                                                           | Band (MHz)                    | Output Watts(W)    | Frequency Tolerance (ppm) | Emission Designator | -                        | -                         | -                   |
| 1.4                                                                | 1710.7 - 1754.3               | 0.1656             | -                         | 1M10W7D             | -                        | -                         |                     |
| 3                                                                  | 1711.5 - 1753.5               | 0.1667             | -                         | 2M69W7D             | -                        | -                         |                     |
| 5                                                                  | 1712.5 - 1752.5               | 0.1578             | -                         | 4M56W7D             | -                        | -                         |                     |
| 10                                                                 | 1715.0 - 1750.0               | 0.1694             | -                         | 9M00W7D             | -                        | -                         |                     |
| 15                                                                 | 1717.5 - 1747.5               | 0.1641             | 0.0115                    | 13M6W7D             |                          |                           |                     |
| 20                                                                 | 1720.0 - 1745.0               | 0.1500             | -                         | 18M1W7D             |                          |                           |                     |
| <input checked="" type="checkbox"/> FCC Rule 27                    |                               |                    |                           |                     |                          |                           |                     |
| LTE Band 12                                                        |                               | QPSK               |                           |                     | 16QAM                    |                           |                     |
| BW (MHz)                                                           | Band (MHz)                    | Output Watts(W)    | Frequency Tolerance (ppm) | Emission Designator | Output Watts(W)          | Frequency Tolerance (ppm) | Emission Designator |
| 1.4                                                                | 699.7 - 715.3                 | 0.1563             | -                         | 1M10G7D             | 0.1294                   |                           | 1M10W7D             |
| 3                                                                  | 700.5 - 714.5                 | 0.1552             | -                         | 2M70G7D             | 0.1327                   |                           | 2M70W7D             |
| 5                                                                  | 701.5 - 713.5                 | 0.1563             | -                         | 4M52G7D             | 0.1239                   | 0.0282                    | 4M54W7D             |
| 10                                                                 | 704.0 - 711.0                 | 0.1585             | -                         | 8M96G7D             | 0.1268                   |                           | 8M96W7D             |
| LTE Band 12                                                        |                               | 64QAM              |                           |                     | -                        |                           |                     |
| BW (MHz)                                                           | Band (MHz)                    | Output Watts(W)    | Frequency Tolerance (ppm) | Emission Designator | -                        | -                         | -                   |
| 1.4                                                                | 699.7 - 715.3                 | 0.1072             | -                         | 1M11W7D             | -                        | -                         |                     |
| 3                                                                  | 700.5 - 714.5                 | 0.1072             | -                         | 2M70W7D             | -                        | -                         |                     |
| 5                                                                  | 701.5 - 713.5                 | 0.0920             | -                         | 4M54W7D             | -                        | -                         |                     |
| 10                                                                 | 704.0 - 711.0                 | 0.0931             | -                         | 9M00W7D             | -                        | -                         |                     |

## 1. 7 Applicable Standards

| Applicable Standards                                                                                                                                                                                                                                                 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:<br>FCC CFR47 Part 2 (2018)<br>FCC CFR47 Part 27C (2018)<br>ANSI C63.26 (2015)<br>KDB 971168 D01 Power Meas License Digital Systems v03r01 |
| Note: All test items were verified and recorded according to the standards and without any deviation during the test.                                                                                                                                                |

## 2. Technical Test

### 2.1 Summary of Test Results

The EUT has been tested according to the following specifications:

| FCC Rule                                                                                                                                                                                                                                                          | Test Type                                     | Limit                                  | Result | Notes    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|----------------------------------------|--------|----------|
| §2.1046                                                                                                                                                                                                                                                           | Conducted Output Power                        | N/A                                    | PASS   | Complies |
| §27.50(d)(5)                                                                                                                                                                                                                                                      | Peak-to-Average Ratio                         | < 13 dB                                | PASS   | Complies |
| §27.50(b)(10)<br>§27.50(c)(10)<br>§27.50(d)(4)                                                                                                                                                                                                                    | Equivalent Isotropic Radiated Power           | < 1 Watts                              | PASS   | Complies |
| §2.1049                                                                                                                                                                                                                                                           | Occupied Bandwidth                            | N/A                                    | PASS   | Complies |
| §2.1051<br>§27.53(c)(2)<br>§27.53(g) §27.53(h)(1)                                                                                                                                                                                                                 | Band Edge Measurement                         | $< 43 + 10 \log_{10}(P[\text{Watts}])$ | PASS   | Complies |
| §2.1051<br>§27.53(c)(2)<br>§27.53(g) §27.53(h)(1)                                                                                                                                                                                                                 | Conducted Spurious Emission                   | $< 43 + 10 \log_{10}(P[\text{Watts}])$ | PASS   | Complies |
| §2.1051<br>§27.53(c)(2)<br>§27.53(g) §27.53(h)(1)                                                                                                                                                                                                                 | Field Strength of Spurious Radiation          | $< 43 + 10 \log_{10}(P[\text{Watts}])$ | PASS   | Complies |
| §2.1055<br>§27.54                                                                                                                                                                                                                                                 | Frequency Stability for Temperature & Voltage | < 2.5 ppm                              | PASS   | Complies |
| Note:<br>a. All test items were verified and recorded according to the standards and without any deviation during the test.<br>b. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report. |                                               |                                        |        |          |

### 2.2 EUT Modification

No modification by test lab.

## 2. 4 Test Configuration

| EUT Operation Test Setup                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> One SIM card slot only                                                                                                                                                                                                                                                                             | <input type="checkbox"/> More than one SIM card slot, each one should be applied throughout the compliance test respectively, and however, only the worst case (SIM 1) will be recorded in this report. |
| Radiated measurements are performed by rotating the EUT in three different orthogonal test planes. EUT stand-up position (Z axis), lie-down position (X, Y axis). Receiver antenna polarization (horizontal and vertical), the worst emission was found in position (Z axis, horizontal polarization) and the worst case was recorded. |                                                                                                                                                                                                         |
| All mode and data rates and positions were investigated. Subsequently, only the worst mode emissions are reported. The following testing in GSM/WCDMA/LTE is set based on the maximum RF Output Power. Test modes are chosen to be reported as the worst mode configuration below:                                                     |                                                                                                                                                                                                         |
| Test Item                                                                                                                                                                                                                                                                                                                              | Modes/Modulation<br><input type="checkbox"/> WCDMA Band IV<br>Bandwidth: 5 MHz                                                                                                                          |
| RF power output                                                                                                                                                                                                                                                                                                                        | RMC<br>HSDPA/HSUPA<br>DC-HSDPA/HSPA+                                                                                                                                                                    |
| Effective Radiated Power                                                                                                                                                                                                                                                                                                               | RMC                                                                                                                                                                                                     |
| Occupied Bandwidth                                                                                                                                                                                                                                                                                                                     | RMC                                                                                                                                                                                                     |
| Band Edge Compliance                                                                                                                                                                                                                                                                                                                   | RMC                                                                                                                                                                                                     |
| Peak-to-Average Ratio                                                                                                                                                                                                                                                                                                                  | RMC                                                                                                                                                                                                     |
| Frequency Stability                                                                                                                                                                                                                                                                                                                    | RMC                                                                                                                                                                                                     |
| Conducted Spurious Emission                                                                                                                                                                                                                                                                                                            | RMC                                                                                                                                                                                                     |
| Radiates Spurious Emission                                                                                                                                                                                                                                                                                                             | RMC                                                                                                                                                                                                     |

| Test modes are chosen to be reported as the worst case configuration below for LTE Band |                                        |                 |   |   |    |    |    |            |       |     |      |      |              |   |   |
|-----------------------------------------------------------------------------------------|----------------------------------------|-----------------|---|---|----|----|----|------------|-------|-----|------|------|--------------|---|---|
| Test Items                                                                              | LTE Band                               | Bandwidth (MHz) |   |   |    |    |    | Modulation |       | RB# |      |      | Test Channel |   |   |
|                                                                                         |                                        | 1.4             | 3 | 5 | 10 | 15 | 20 | QPSK       | 16QAM | 1   | Half | Full | L            | M | H |
| Max. Output Power                                                                       | <input checked="" type="checkbox"/> 4  | √               | √ | √ | √  | √  | √  | √          | √     | √   | √    | √    | √            | √ | √ |
|                                                                                         | <input type="checkbox"/> 7             | -               | - | √ | √  | √  | √  | √          | √     | √   | √    | √    | √            | √ | √ |
|                                                                                         | <input checked="" type="checkbox"/> 12 | √               | √ | √ | √  | -  | -  | √          | √     | √   | √    | √    | √            | √ | √ |
|                                                                                         | <input type="checkbox"/> 17            | -               | - | √ | √  | -  | -  | √          | √     | √   | √    | √    | √            | √ | √ |
|                                                                                         | <input type="checkbox"/> 38            | -               | - | √ | √  | √  | √  | √          | √     | √   | √    | √    | √            | √ | √ |
|                                                                                         | <input type="checkbox"/> 41            | -               | - | √ | √  | √  | √  | √          | √     | √   | √    | √    | √            | √ | √ |
| ERP/EIRP                                                                                | <input checked="" type="checkbox"/> 4  | √               | √ | √ | √  | √  | √  | √          | √     | √   | √    | √    | √            | √ | √ |
|                                                                                         | <input type="checkbox"/> 7             | -               | - | √ | √  | √  | √  | √          | √     | √   | √    | √    | √            | √ | √ |
|                                                                                         | <input checked="" type="checkbox"/> 12 | √               | √ | √ | √  | -  | -  | √          | √     | √   | √    | √    | √            | √ | √ |
|                                                                                         | <input type="checkbox"/> 17            | -               | - | √ | √  | -  | -  | √          | √     | √   | √    | √    | √            | √ | √ |
|                                                                                         | <input type="checkbox"/> 38            | -               | - | √ | √  | √  | √  | √          | √     | √   | √    | √    | √            | √ | √ |
|                                                                                         | <input type="checkbox"/> 41            | -               | - | √ | √  | √  | √  | √          | √     | √   | √    | √    | √            | √ | √ |
| 26dB and 99% Bandwidth                                                                  | <input checked="" type="checkbox"/> 4  | √               | √ | √ | √  | √  | √  | √          | √     | -   | -    | √    | √            | √ | - |
|                                                                                         | <input type="checkbox"/> 7             | -               | - | √ | √  | √  | √  | √          | √     | -   | -    | √    | √            | √ | √ |
|                                                                                         | <input checked="" type="checkbox"/> 12 | √               | √ | √ | √  | -  | -  | √          | √     | -   | -    | √    | √            | √ | √ |
|                                                                                         | <input type="checkbox"/> 17            | -               | - | √ | √  | -  | -  | √          | √     | -   | -    | √    | √            | √ | √ |
|                                                                                         | <input type="checkbox"/> 38            | -               | - | √ | √  | √  | √  | √          | √     | -   | -    | √    | √            | √ | √ |
|                                                                                         | <input type="checkbox"/> 41            | -               | - | √ | √  | √  | √  | √          | √     | -   | -    | √    | √            | √ | √ |
| Conducted Band Edge                                                                     | <input checked="" type="checkbox"/> 4  | √               | √ | √ | √  | √  | √  | √          | √     | √   | -    | √    | √            | - | √ |
|                                                                                         | <input type="checkbox"/> 7             | -               | - | √ | √  | √  | √  | √          | √     | √   | -    | √    | √            | - | √ |
|                                                                                         | <input checked="" type="checkbox"/> 12 | √               | √ | √ | √  | -  | -  | √          | √     | √   | -    | √    | √            | - | √ |
|                                                                                         | <input type="checkbox"/> 17            | -               | - | √ | √  | -  | -  | √          | √     | √   | -    | √    | √            | - | √ |
|                                                                                         | <input type="checkbox"/> 38            | -               | - | √ | √  | √  | √  | √          | √     | √   | -    | √    | √            | - | √ |
|                                                                                         | <input type="checkbox"/> 41            | -               | - | √ | √  | √  | √  | √          | √     | √   | -    | √    | √            | - | √ |
| Peak-to-Average Ratio                                                                   | <input checked="" type="checkbox"/> 4  | √               | √ | √ | √  | √  | √  | √          | √     | -   | -    | √    | √            | √ | √ |
|                                                                                         | <input type="checkbox"/> 7             | -               | - | √ | √  | √  | √  | √          | √     |     |      | √    | √            | √ | √ |
|                                                                                         | <input checked="" type="checkbox"/> 12 | √               | √ | √ | √  | -  | -  | √          | √     |     |      | √    | √            | √ | √ |
|                                                                                         | <input type="checkbox"/> 17            | -               | - | √ | √  | -  | -  | √          | √     |     |      | √    | √            | √ | √ |
|                                                                                         | <input type="checkbox"/> 38            | -               | - | √ | √  | √  | √  | √          | √     |     |      | √    | √            | √ | √ |
|                                                                                         | <input type="checkbox"/> 41            | -               | - | √ | √  | √  | √  | √          | √     |     |      | √    | √            | √ | √ |
| Frequency Stability                                                                     | <input checked="" type="checkbox"/> 4  | √               | √ | √ | √  | √  | √  | √          | √     | √   | √    | √    | √            | √ | √ |
|                                                                                         | <input type="checkbox"/> 7             | -               | - | √ | √  | √  | √  | √          | √     | √   | √    | √    | √            | √ | √ |

|                                                                                                                                                |                                        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|                                                                                                                                                | <input checked="" type="checkbox"/> 12 | √ | √ | √ | √ | - | - | √ | √ | √ | √ | √ | √ | √ | √ |
|                                                                                                                                                | <input type="checkbox"/> 17            | - | - | √ | √ | - | - | √ | √ | √ | √ | √ | √ | √ | √ |
|                                                                                                                                                | <input type="checkbox"/> 38            | - | - | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
|                                                                                                                                                | <input type="checkbox"/> 41            | - | - | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| <b>Conducted<br/>Spurious<br/>Emission</b>                                                                                                     | <input checked="" type="checkbox"/> 4  | √ | √ | √ | √ | √ | √ | √ | - | √ | - | - | √ | √ | √ |
|                                                                                                                                                | <input type="checkbox"/> 7             | - | - | √ | √ | √ | √ | √ | - | √ | - | - | √ | √ | √ |
|                                                                                                                                                | <input checked="" type="checkbox"/> 12 | √ | √ | √ | √ | - | - | √ | - | √ | - | - | √ | √ | √ |
|                                                                                                                                                | <input type="checkbox"/> 17            | - | - | √ | √ | - | - | √ | - | √ | - | - | √ | √ | √ |
|                                                                                                                                                | <input type="checkbox"/> 38            | - | - | √ | √ | √ | √ | √ | - | √ | - | - | √ | √ | √ |
|                                                                                                                                                | <input type="checkbox"/> 41            | - | - | √ | √ | √ | √ | √ | - | √ | - | - | √ | √ | √ |
| <b>Radiated<br/>Spurious<br/>Emission</b>                                                                                                      | <input checked="" type="checkbox"/> 4  | √ | √ | √ | - | - | √ | √ | - | √ | - | - | √ | √ | √ |
|                                                                                                                                                | <input type="checkbox"/> 7             | - | - | √ | - | √ | √ | √ | - |   | - | - | √ | √ | √ |
|                                                                                                                                                | <input checked="" type="checkbox"/> 12 | √ | √ | √ | √ | - | - | √ | - |   | - | - | √ | √ | √ |
|                                                                                                                                                | <input type="checkbox"/> 17            | - | - | √ | √ | - | - | √ | - |   | - | - | √ | √ | √ |
|                                                                                                                                                | <input type="checkbox"/> 38            | - | - | √ | √ | √ | √ | √ | - |   | - | - | √ | √ | √ |
|                                                                                                                                                | <input type="checkbox"/> 41            | - | - | √ | √ | - | √ | √ | - |   | - | - | √ | √ | √ |
| Note:<br>1. The mark “√” means that this configuration is chosen for testing.<br>2. The mark “-” means that this configuration is not testing. |                                        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

### 3. Technical Characteristics Test

#### 3.1 Conducted Output Power

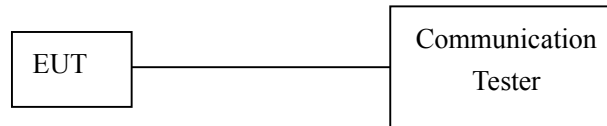
##### 3.1.1 Test Equipment

Please refer to section 6 this report.

##### 3.1.2 Test Procedure

The EUT, which is powered by the Battery, During the process of the testing, The EUT is controlled by the Base Station Simulator to ensure max power transmission and proper modulation. The loss between RF output port of the EUT and the input port of the tester has been taken into consideration.

##### 3.1.3 Test Setup



##### 3.1.4 Limit

According to FCC 2.1046, FCC 22.913(a) Mobile station are limited to 7W; FCC 24.232(b) Mobile stations are limited to 2W eirp peak power, 3GPP Power limitation for HSDPA and HSUPA

### **3.1.5 RF Output Power Test Result**

Refer to Appendix\_PCB\_FCC 27

### 3.2 ERP / EIRP Measurement

#### 3.2.1 Test Equipment

Please refer to section 6 this report.

#### 3.2.2 Test Procedure

The testing follows FCC KDB 971168 v03r01 Section 5.8 and ANSI C63.26 (2015).

- Connect the equipment as illustrated. Mount the equipment with the manufacturer specified antenna in a vertical orientation on a manufacturer specified mounting surface located on a non-conducting rotating platform of a RF anechoic chamber (preferred) or a standard radiation site.
- Key the transmitter, then rotate the EUT 360° azimuthally and record spectrum analyzer power level (LVL) measurements at angular increments that are sufficiently small to permit resolution of all peaks. If a standard radiation test site is used, raise and lower the test antenna to obtain a maximum reading at each angular increment. (Note: several batteries may be needed to offset the effect of battery voltage droop, which should not exceed 5% of the manufactured specified battery voltage during transmission).
- Replace the transmitter under test with a vertically polarized half-wave dipole (or an antenna whose gain is known relative to an ideal half-wave dipole). The center of the antenna should be at the same location as the center of the antenna under test.
- Connect the antenna to a signal generator with a known output power and record the path loss (in dB) as LOSS. If a standard radiation test site is used, raise and lower the test antenna to obtain a maximum reading.  $LOSS = \text{Generator Output Power (dBm)} - \text{Analyzer reading (dBm)}$
- Determine the effective radiated output power at each angular position from the readings in steps b) and d) using the following equation:  $ERP \text{ (dBm)} = LVL \text{ (dBm)} + LOSS \text{ (dB)}$
- The maximum ERP is the maximum value determined in the preceding step.
- When calculating ERP, in addition to knowing the antenna radiation and matching characteristics, it is necessary to know the loss values of all elements (e.g. transmission line attenuation, mismatches, filters, combiners) interposed between the point where transmitter output power is measured, and the point where power is applied to the antenna. ERP can then be calculated as follows:

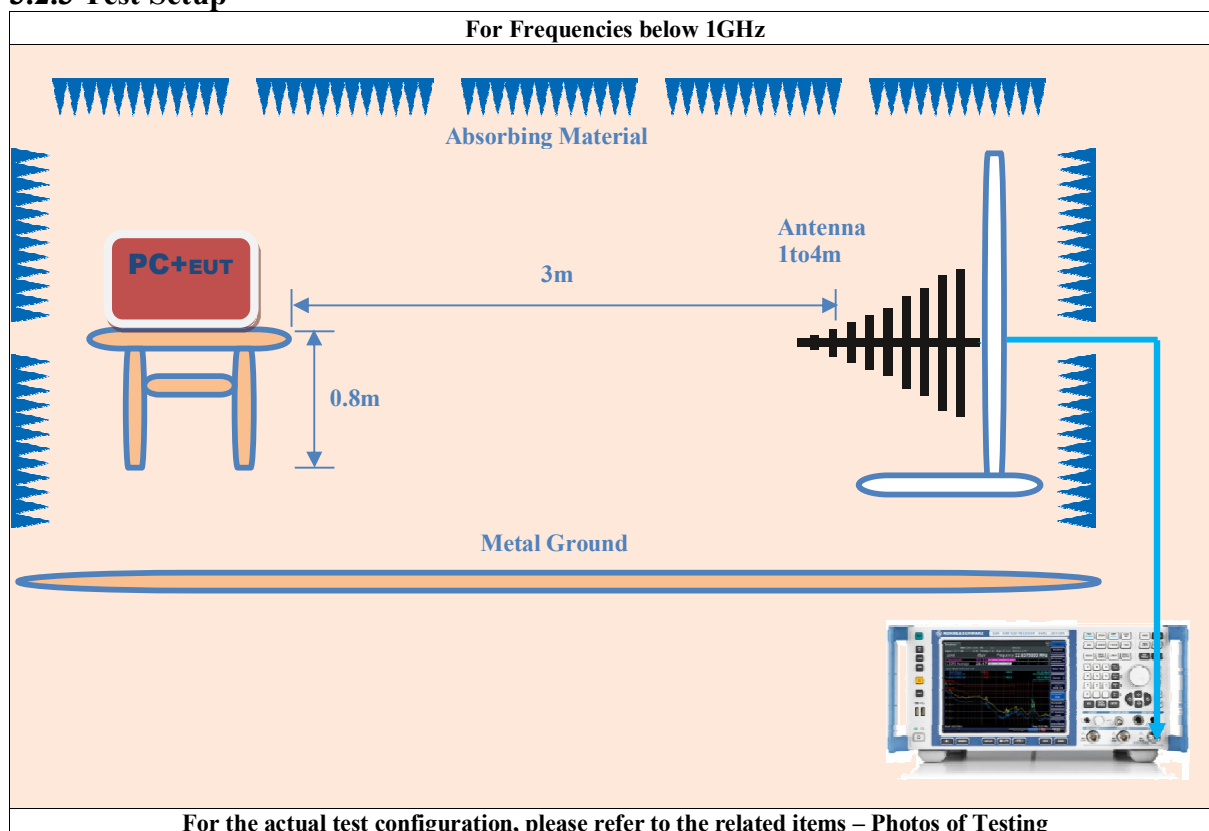
$$EIRP \text{ (dBm)} = \text{Output Power (dBm)} - \text{Losses (dB)} + \text{Antenna Gain (dBi)}$$

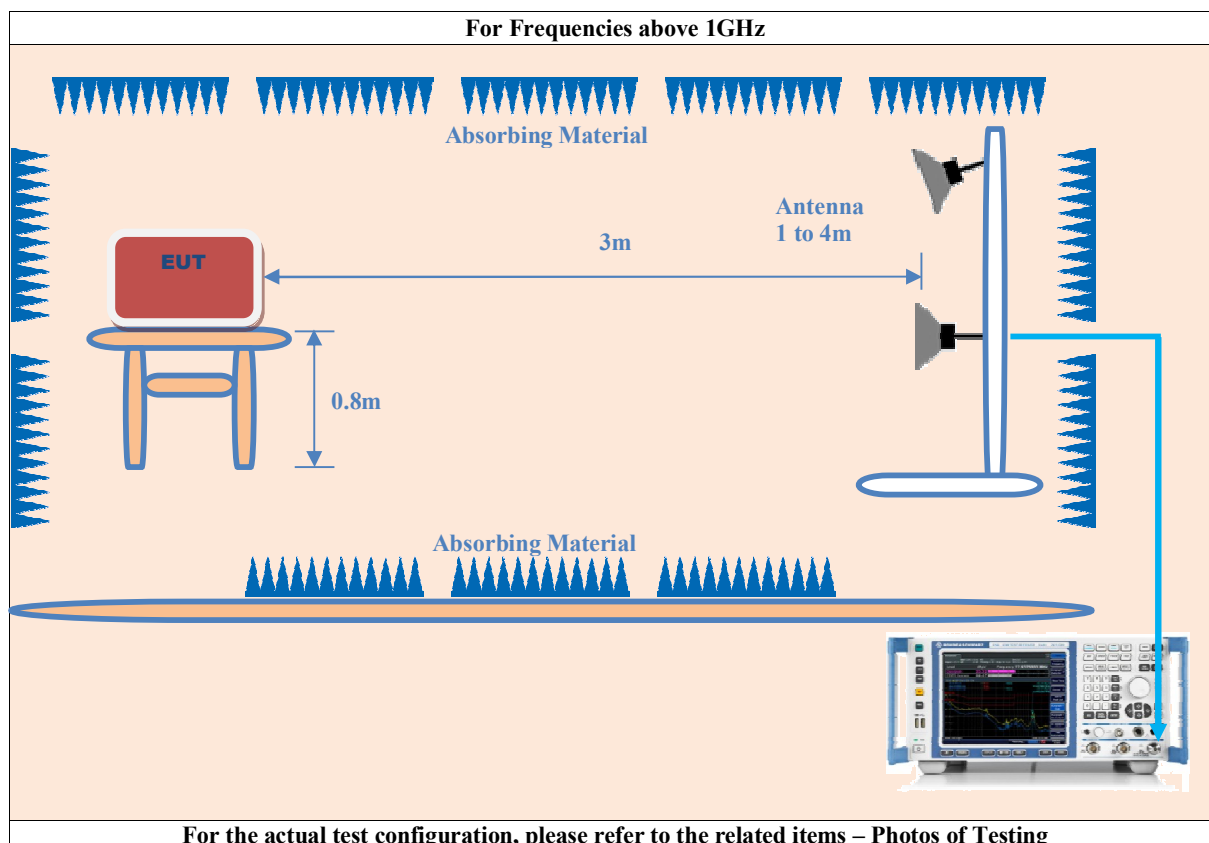
where: dBd refers to gain relative to an ideal dipole.

$$EIRP \text{ (dBm)} = ERP \text{ (dBm)} + 2.15 \text{ (dB)}$$

The RB allocation refers to section 5.1, using the maximum output power configuration.

#### 3.2.3 Test Setup





### 3.3.4 Limit

Rule Part 27.50(b) (10) specifies that “Portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP”

Rule Part 27.50(c) (10) specifies that “Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP”

Rule Part 27.50(d) (4) specifies that “Fixed, mobile and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP”

Rule Part 27.50(h) (2) specifies that “Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.”

|                               |                                |
|-------------------------------|--------------------------------|
| <b>Part 27.50(c)(10)Limit</b> | $\leq 3 \text{ W (34.77 dBm)}$ |
| <b>Part 27.50(d)(4)Limit</b>  | $\leq 1 \text{ W (30 dBm)}$    |
| <b>Part 27.50(h)(2) Limit</b> | $\leq 2 \text{ W (33 dBm)}$    |

### **3.3.5 Test Result**

Refer to Appendix\_PCB\_FCC 27

### 3.3 99% Occupied Bandwidth and 26dB Bandwidth Measurement

#### 3.3.1 Test Equipment

Please refer to section 6 this report.

#### 3.3.2 Test Procedure

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The occupied bandwidth is measured using spectrum analyzer.

RBW is set to 51 kHz, VBW is set to 160 kHz for WCDMA Band IV.

RBW is set to 51 kHz, VBW is set to 160 kHz for LTE Band 4/12 (1.4MHz).

RBW is set to 100 kHz, VBW is set to 300 kHz for LTE Band 4/12 (3MHz).

RBW is set to 100 kHz, VBW is set to 300 kHz for LTE Band 4/7/12/17/38/41 (5MHz).

RBW is set to 300 kHz, VBW is set to 1MHz for LTE Band 4/7/12/17/38/41 (10MHz).

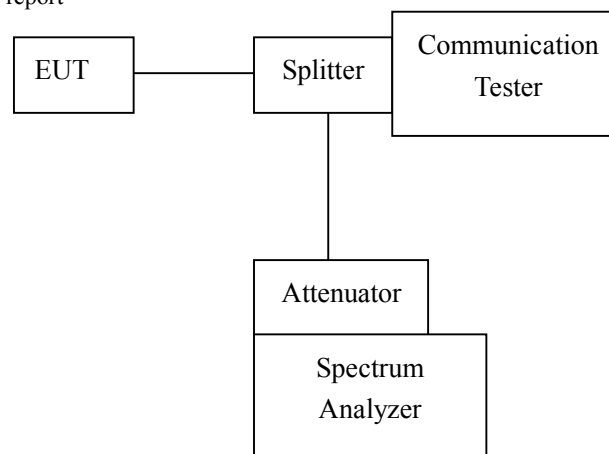
RBW is set to 300 kHz, VBW is set to 1MHz for LTE Band 4/7/38/41 (15MHz/20MHz).

RBW is set to 1MHz, VBW is set to 3MHz for CA Band.

99% power and -26dBc occupied bandwidths are recorded.

#### 3.3.3 Test Setup

Same as section 2.4.1 of this report



#### 3.3.4 Limit

According to FCC section 2.1049, the occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean transmitted power. The 26 dB emission bandwidth is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated 26 dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth equal to approximately 1.0% of the emission bandwidth.

### **3.3.5 Occupied Bandwidth Test Result**

Refer to Appendix\_PCB\_FCC 27

### 3.4 Band Edge Measurement

#### 3.4.1 Test Equipment

Please refer to section 6 this report.

#### 3.4.2 Test Procedure

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The band edge of the lowest and highest channels were measured. The average detector is used. The testing follows KDB 971168 D01 v03r01 Section 6.0 For LTE Band 41 Set RBW  $\geq$  1% EBW in the 1MHz band immediately outside and adjacent to the band edge. Beyond the 1 MHz band from the band edge, RBW=1MHz was used.

RBW is set to 51 kHz, VBW is set to 160 kHz for WCDMA Band IV.

RBW is set to 15 kHz, VBW is set to 51 kHz for LTE Band 4/12 (1.4MHz).

RBW is set to 30 kHz, VBW is set to 100 kHz for LTE Band 4/12 (3MHz).

RBW is set to 51 kHz, VBW is set to 160 kHz for LTE Band 4/7/12/41 (5MHz).

RBW is set to 100 kHz, VBW is set to 300kHz for LTE Band 4/7/12/41 (10MHz).

RBW is set to 150 kHz, VBW is set to 510 kHz for LTE Band 4/7/41 (15MHz).

RBW is set to 200 kHz, VBW is set to 620 kHz for LTE Band 4/7/41 (20MHz)

RBW is set to 30 kHz, VBW is set to 200 kHz for LTE Band 38 (5MHz).

RBW is set to 100 kHz, VBW is set to 300kHz for LTE Band 38 (10MHz).

RBW is set to 200 kHz, VBW is set to 1MHz for LTE Band 38 (15/20MHz)

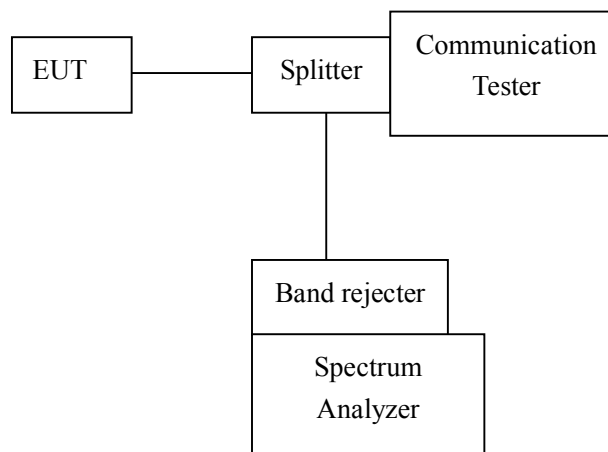
RBW is set to 430 kHz, VBW is set to 1.3MHz for CA Band.

on spectrum analyzer.

Set spectrum analyzer with RMS detector.

#### 3.4.3 Test Setup

##### Band Edge



### 3.4.4 Limit

Rule Part 27.53(h) specifies that “ for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10}(P)$  dB”

Rule Part 27.53(g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43 + 10 \log(P)$  dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

Rule Part 27.53(m) (4) specifies that “for BRS and EBS stations. For mobile digital stations, the attenuation factor shall be not less than  $40 + 10 \log(P)$  dB on all frequencies between the channel edge and 5 megahertz from the channel edge,  $43 + 10 \log(P)$  dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and  $55 + 10 \log(P)$  dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(4) of this section. In addition, the attenuation factor shall not be less than  $43 + 10 \log(P)$  dB on all frequencies between 2490.5 MHz and 2496 MHz and  $55 + 10 \log(P)$  dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

Example:

The limit line is derived from  $43 + 10 \log(P)$  dB below the transmitter power P(Watts)

$= P(W) - [43 + 10 \log(P)]$  (dB)

$= [30 + 10 \log(P)]$  (dBm) -  $[43 + 10 \log(P)]$  (dB) = -13dBm.

Rule Part 27.53(f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

Rule Part 27.53 (c) For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

- (1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB;
- (2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB;
- (3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than  $76 + 10 \log(P)$  dB in a 6.25 kHz band segment, for base and fixed stations;
- (4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than  $65 + 10 \log(P)$  dB in a 6.25 kHz band segment, for mobile and portable stations;
- (5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

### **3.4.5 Conducted Band Edge Test Result**

Refer to Appendix\_PCB\_FCC 27

### 3.5 Peak-to-Average Ratio

#### 3.5.1 Test Equipment

Please refer to section 6 this report.

#### 3.5.2 Test Procedure

Here the lowest, middle and highest channels are selected to perform testing to verify the peak-to-average ratio. Test procedures:

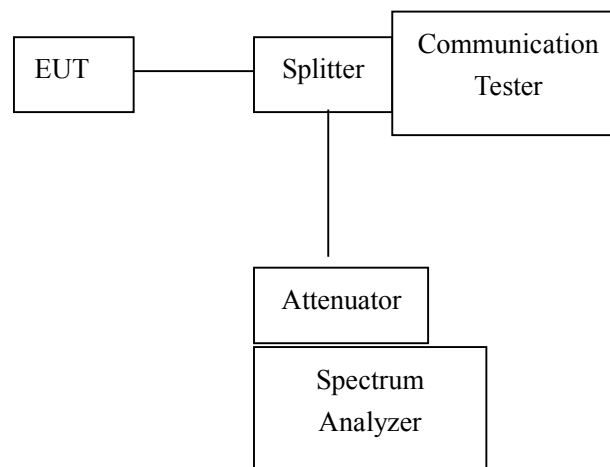
A. For GSM operating mode:

- Set RBW=1MHz, VBW=3MHz, Peak detector on spectrum analyzer for first trace.
- Set the RBW = 1MHz, VBW = 3MHz, RMS detector on spectrum analyzer for second trace.
- The wanted burst signal is triggered by spectrum analyzer, and measured respectively the peak level and Mean level without burst-off time, after system simulator has synchronized with the spectrum analyzer.

B. For UMTS operating mode:

- Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
- The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1%.
- Record the deviation as Peak to Average Ratio.

#### 3.5.3 Test Setup



#### 3.5.4 Limit

Rule Part 27.50(d)(5) Equipment employed must be authorized in accordance with the provisions of 24.51. Power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (d)(6) of this section. 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.

### **3.5.5 Peak-to-Average Ratio Test Result**

Refer to Appendix\_PCB\_FCC 27

### 3.6 Frequency Stability

#### 3.6.1 Test Equipment

Please refer to section 6 this report.

#### 3.6.2 Test Procedure

Frequency Stability (Temperature Variation)

The temperature inside the climate chamber is varied from -30°C to +55°C in 10°C step size,

(1) With all power removed, the temperature was decreased to 0°C and permitted to stabilize for three hours.

(2) Measure the carrier frequency with the test equipment in a “call mode”. These measurements should be made within 1 minute of powering up the mobile station, to prevent significant self warming.

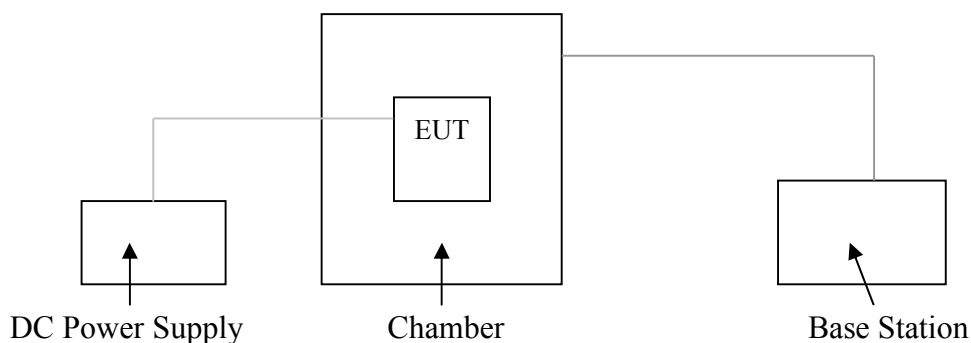
(3) Repeat the above measurements at 10°C increments from -30°C to +55°. Allow at least 1.5 hours at each temperature, un-powered, before making measurements. Frequency Stability (Voltage Variation)

The frequency stability shall be measured with variation of primary supply voltage as follows:

(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

(2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery-operating end point which shall be specified by the manufacturer.

#### 3.6.3 Test Setup



#### 3.6.4 Limit

According to FCC §2.1055(a) (1)

Frequency Tolerance: +/-2.5ppm for 850MHz band; +/-2.5ppm for 1900MHz band

According to RSS-133 §6.3, RSS-132 §4.3

The carrier frequency shall not depart from the reference frequency in excess of ±2.5 ppm for mobile stations

### **3.6.5 Frequency Stability Test Result**

Refer to Appendix\_PCB\_FCC 27

### 3.7 Conducted Spurious Emission Measurement

#### 3.7.1 Test Equipment

Please refer to section 6 this report.

#### 3.7.2 Test Procedure

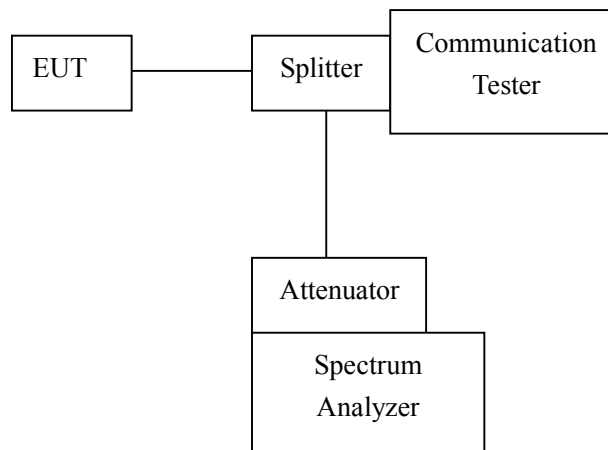
The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The measurement is carried out using a spectrum analyzer. The spectrum analyzer scans from 9kHz to the 10th harmonic of the carrier.

The peak detector is used. RBW are set to 100 kHz and VBW are set to 300 kHz for below 1G, RBW are set to 1MHz and VBW are set to 3MHz for above 1G, Sweep is set to ATUO.

The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

#### 3.7.3 Test Setup

##### Out of band emission



#### 3.7.4 Limit

LTE -4 Rule Part 27.53(h) specifies that “for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10}(P)$  dB.”

LTE -12 Rule Part 27.53 (g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43 + 10 \log_{10}(P)$  dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

LTE -7/38/41 Rule Part 27.53(m)  $55 + 10 \log_{10}(P)$  dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(4) of this section.

|                                 |         |
|---------------------------------|---------|
| <b>Part 27.53 (h)/(g) Limit</b> | -13 dBm |
| <b>Part 27.53(m) Limit</b>      | -25 dBm |

### **3.7.5 Conducted Spurious Emission Test Result**

Refer to Appendix\_PCB\_FCC 27

### 3.8 Radiated Spurious Emission

#### 3.8.1 Test Equipment

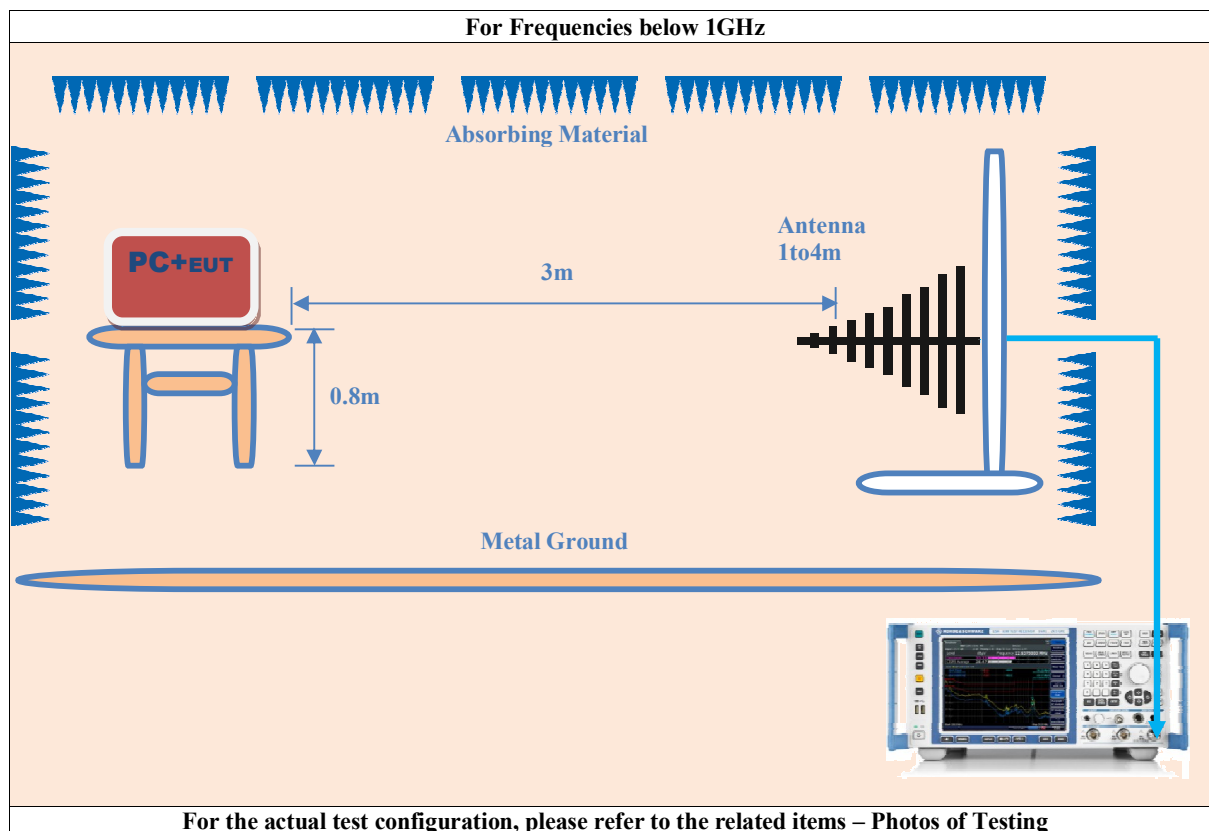
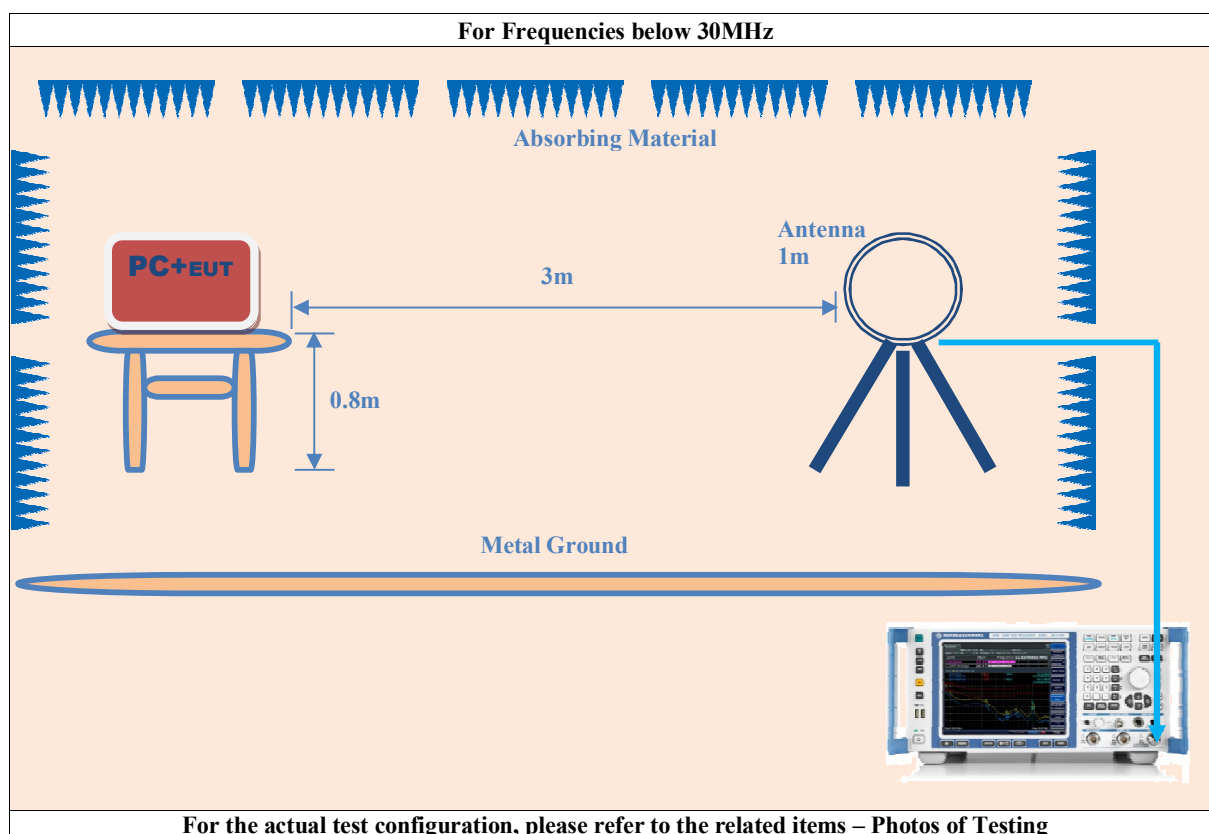
Please refer to section 6 this report.

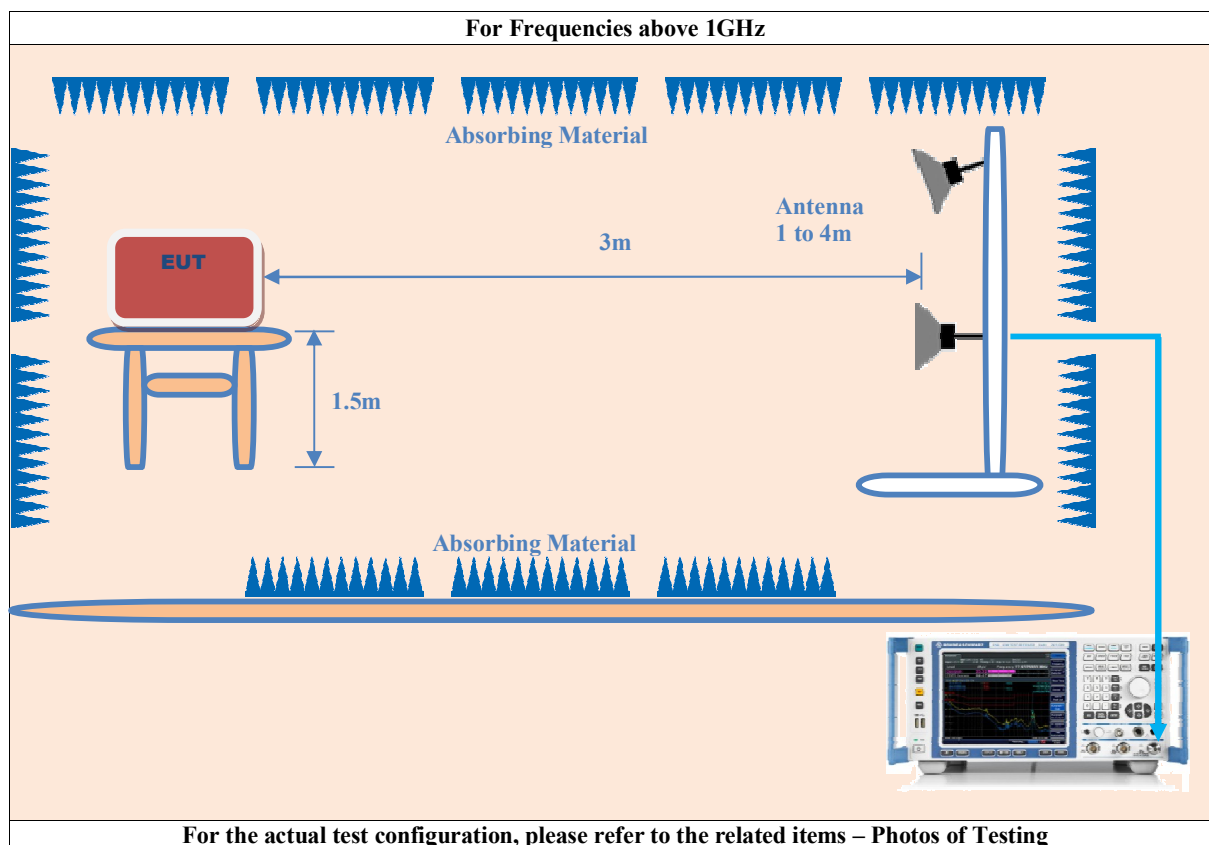
#### 3.8.2 Test Procedure

1. The testing follows FCC KDB 971168 v03r01 Section 5.8 and ANSI C63.26 (2015).
2. Below 1GHz: The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H). Above 1GHz: (Note: the FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 2, 2014.) The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).
3. A loop antenna, A log-periodic antenna or horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
4. The EUT is then put into continuously transmitting mode at its maximum power level during the test.  
Set Test Receiver or Spectrum RBW=200Hz,VBW=600Hz for 9kHz150kHz , RBW=10kHz, VBW=30kHz 150kHz-30MHz , RBW=100kHz,VBW=300kHz for 30MHz to 1GHz and RBW=1MHz, VBW=3MHz for above 1GHz, And the maximum value of the receiver should be recorded as (Pr).
5. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
6. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (Pcl) ,the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test.
7. The measurement results are obtained as described below:  
$$\text{Power(EIRP)} = \text{PMea} - \text{PAg} - \text{Pcl} + \text{Ga}$$
  
The measurement results are amend as described below:  
$$\text{Power(EIRP)} = \text{PMea} - \text{Pcl} + \text{Ga}$$
8. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole,  $\text{ERP} = \text{EIRP} - 2.15\text{dBi}$ .

The modulation mode and RB allocation refer to section 2.2, using the maximum output power Configuration.

### 3.8.3 Test Setup





### 3.8.4 Limit

Rule Part 22.917(a) specifies that “The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10\log(P)$  dB.

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

### **3.8.5 Radiated Spurious Emission Test Result**

Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the emissions below the noise floor will not be recorded in the report.

Refer to Appendix\_PCB\_FCC 27

## **4. Photos of Testing**

### **4.1 EUT Test Photographs**

Please refer to Exhibits \_External Photos & Internal Photos

## **4. 2 EUT Detailed Photographs**

Please refer to Exhibits \_External Photos & Internal Photos

## 5. FCC ID Label

Please refer to Exhibits \_ ID Label & Location Info

## 6. Test Equipment

The following test equipment were used during the radiated & conducted emission test:

| Equipment/<br>Facilities                   | Manufacturer       | Model #       | Serial No.    | Cal/Char Date | Due Date      |
|--------------------------------------------|--------------------|---------------|---------------|---------------|---------------|
| Turntable                                  | Innco systems GmbH | CT-0801       | N/A           | NCR           | NCR           |
| Antenna Tower                              | Innco systems GmbH | MA-4640-XP-ET | N/A           | NCR           | NCR           |
| Controller                                 | Innco systems GmbH | CO3000        | 955/38850716L | NCR           | NCR           |
| Pre-Amplifier                              | Agilent            | 87405C        | MY47010722    | Dec.6, 2019   | Dec.6, 2021   |
| EMI Test Receiver                          | Rohde & Schwarz    | ESR7          | 101091        | Nov.21, 2018  | Nov.21, 2020  |
| Spectrum Analyzer                          | Rohde & Schwarz    | FSP40         | 100273        | Dec.14, 2019  | Dec.14, 2021  |
| Vector Signal Generator                    | Rohde & Schwarz    | SMU200A       | 101824        | Dec.13, 2017  | Dec.13, 2020  |
| Signal Generator                           | Rohde & Schwarz    | SMB100A       | 177847        | Dec.13, 2017  | Dec.13, 2020  |
| Power Meter                                | Rohde & Schwarz    | OSP-B157      | KMO-HK015     | Dec.13, 2017  | Dec.13, 2020  |
| Wideband Radio<br>Communication Tester     | Rohde & Schwarz    | CMW500        | 124004        | Jan. 14, 2020 | Jan. 14, 2023 |
| Regulatory Test System<br>30 MHz to 40 GHz | Rohde & Schwarz    | TS8997        | KMO-HK015     | Dec.13, 2017  | Dec.13, 2020  |
| Trilog-Super Broadband<br>Antenna          | SCHWARZBECK        | VULB9161      | 9161-4079     | Nov.27, 2018  | Nov.27, 2021  |
| Broad-Band Horn<br>Antenna                 | SCHWARZBECK        | BBHA 9120D    | 9120D-565     | Nov.29, 2018  | Nov.29, 2021  |
| AMN                                        | Rohde & Schwarz    | ESH3-Z5       | 100197        | Dec.25, 2017  | Dec.25, 2020  |
| AMN                                        | CYBERTEK           | EM5040A       | E115040054    | Nov.21, 2018  | Nov.21, 2021  |
| KMO Shielded Room                          | KMO                | KMO-001       | N/A           | NCR           | NCR           |
| Coaxial Cable with<br>N-Connectors         | SCHWARZBECK        | AK9515H       | 95549         | Sep.18, 2019  | Sep.18, 2021  |
| 3m Anechoic Chamber                        | KMO                | KMO-3AC       | N/A           | Dec.23, 2019  | Dec.23, 2021  |
| Temperature<br>Chamber                     | TABAI              | PSL-4GTW      | N/A           | Feb.10, 2019  | Feb.10, 2021  |

-----End of Report -----

AppendixA: RF Output Power Test Result

Test Result

| LTE FDD Band 4 |            |         |           | Conducted Power(dBm) |               |               |
|----------------|------------|---------|-----------|----------------------|---------------|---------------|
| BW             | Modulation | RB size | RB offset | Channel 19957        | Channel 20175 | Channel 20393 |
|                |            |         |           | 1710.7(MHz)          | 1732.5(MHz)   | 1754.3(MHz)   |
| 1.4MHz         | QPSK       | 1       | 0         | 23.13                | 23.22         | 23.04         |
|                |            | 1       | 2         | 23.10                | 23.29         | 23.01         |
|                |            | 1       | 5         | 23.19                | 23.27         | 23.08         |
|                |            | 3       | 0         | 23.10                | 23.24         | 23.03         |
|                |            | 3       | 2         | 23.16                | 23.28         | 23.08         |
|                |            | 3       | 3         | 23.14                | 23.27         | 23.06         |
|                |            | 6       | 0         | 21.80                | 22.07         | 21.83         |
|                | 16QAM      | 1       | 0         | 22.66                | 22.36         | 22.47         |
|                |            | 1       | 2         | 22.61                | 22.36         | 22.41         |
|                |            | 1       | 5         | 22.60                | 22.39         | 22.41         |
|                |            | 3       | 0         | 22.65                | 22.35         | 22.48         |
|                |            | 3       | 2         | 22.68                | 22.31         | 22.49         |
|                |            | 3       | 3         | 22.66                | 22.36         | 22.45         |
|                |            | 6       | 0         | 21.28                | 21.38         | 21.17         |
|                | 64QAM      | 1       | 0         | 21.13                | 21.36         | 21.29         |
|                |            | 1       | 2         | 21.10                | 21.39         | 21.20         |
|                |            | 1       | 5         | 21.10                | 21.33         | 21.29         |
|                |            | 3       | 0         | 21.17                | 21.46         | 21.28         |
|                |            | 3       | 2         | 21.12                | 21.39         | 21.24         |
|                |            | 3       | 3         | 21.16                | 21.47         | 21.21         |
|                |            | 6       | 0         | 20.32                | 20.42         | 20.20         |
| BW             | Modulation | RB size | RB offset | Channel 19965        | Channel 20175 | Channel 20385 |
|                |            |         |           | 1711.5(MHz)          | 1732.5(MHz)   | 1753.5(MHz)   |
| 3MHz           | QPSK       | 1       | 0         | 23.07                | 23.13         | 23.04         |
|                |            | 1       | 7         | 23.02                | 23.15         | 23.09         |
|                |            | 1       | 14        | 23.01                | 23.15         | 23.09         |
|                |            | 8       | 0         | 21.80                | 22.03         | 22.16         |
|                |            | 8       | 4         | 21.87                | 22.06         | 22.17         |
|                |            | 8       | 7         | 21.85                | 22.07         | 22.13         |
|                |            | 15      | 0         | 21.83                | 22.02         | 22.15         |
|                | 16QAM      | 1       | 0         | 22.41                | 22.43         | 22.54         |
|                |            | 1       | 7         | 22.42                | 22.43         | 22.58         |
|                |            | 1       | 14        | 22.40                | 22.46         | 22.56         |
|                |            | 8       | 0         | 21.05                | 21.23         | 21.11         |
|                |            | 8       | 4         | 21.01                | 21.24         | 21.18         |
|                |            | 8       | 7         | 21.05                | 21.21         | 21.17         |
|                |            | 15      | 0         | 21.02                | 21.27         | 21.11         |
|                | 64QAM      | 1       | 0         | 21.21                | 21.42         | 21.33         |
|                |            | 1       | 7         | 21.19                | 21.38         | 21.31         |
|                |            | 1       | 14        | 21.17                | 21.46         | 21.30         |
|                |            | 8       | 0         | 20.20                | 20.39         | 20.28         |
|                |            | 8       | 4         | 20.18                | 20.43         | 20.29         |
|                |            | 8       | 7         | 20.19                | 20.42         | 20.29         |
|                |            | 15      | 0         | 20.21                | 20.46         | 20.24         |

| BW    | Modulation | RB size | RB offset | Channel 19975 | Channel 20175 | Channel 20375 |
|-------|------------|---------|-----------|---------------|---------------|---------------|
|       |            |         |           | 1712.5(MHz)   | 1732.5(MHz)   | 1752.5(MHz)   |
| 5MHz  | QPSK       | 1       | 0         | 22.97         | 23.22         | 23.13         |
|       |            | 1       | 13        | 22.93         | 23.25         | 23.11         |
|       |            | 1       | 24        | 22.99         | 23.24         | 23.18         |
|       |            | 12      | 0         | 22.10         | 22.13         | 22.07         |
|       |            | 12      | 6         | 22.11         | 22.17         | 22.06         |
|       |            | 12      | 13        | 22.19         | 22.16         | 22.04         |
|       |            | 25      | 0         | 22.14         | 22.13         | 22.00         |
|       | 16QAM      | 1       | 0         | 22.18         | 22.40         | 22.02         |
|       |            | 1       | 13        | 22.13         | 22.48         | 22.09         |
|       |            | 1       | 24        | 22.17         | 22.46         | 22.06         |
|       |            | 12      | 0         | 21.12         | 21.29         | 20.90         |
|       |            | 12      | 6         | 21.19         | 21.28         | 20.95         |
|       |            | 12      | 13        | 21.15         | 21.27         | 20.94         |
|       |            | 25      | 0         | 21.19         | 21.24         | 20.90         |
|       | 64QAM      | 1       | 0         | 20.63         | 21.04         | 21.18         |
|       |            | 1       | 13        | 20.64         | 21.03         | 21.11         |
|       |            | 1       | 24        | 20.63         | 21.10         | 21.10         |
|       |            | 12      | 0         | 19.82         | 20.04         | 20.12         |
|       |            | 12      | 6         | 19.87         | 20.09         | 20.15         |
|       |            | 12      | 13        | 19.85         | 20.03         | 20.18         |
|       |            | 25      | 0         | 19.81         | 20.03         | 20.18         |
| BW    | Modulation | RB size | RB offset | Channel 20000 | Channel 20175 | Channel 20350 |
|       |            |         |           | 1715(MHz)     | 1732.5(MHz)   | 1750(MHz)     |
| 10MHz | QPSK       | 1       | 0         | 23.14         | 23.28         | 22.94         |
|       |            | 1       | 25        | 23.19         | 23.27         | 22.90         |
|       |            | 1       | 49        | 23.10         | 23.21         | 22.94         |
|       |            | 25      | 0         | 22.11         | 22.23         | 22.14         |
|       |            | 25      | 13        | 22.12         | 22.25         | 22.12         |
|       |            | 25      | 25        | 22.18         | 22.24         | 22.14         |
|       |            | 50      | 0         | 22.16         | 22.29         | 22.10         |
|       | 16QAM      | 1       | 0         | 21.95         | 22.00         | 22.33         |
|       |            | 1       | 25        | 21.93         | 22.04         | 22.39         |
|       |            | 1       | 49        | 21.93         | 22.03         | 22.32         |
|       |            | 25      | 0         | 21.25         | 21.28         | 21.20         |
|       |            | 25      | 13        | 21.25         | 21.21         | 21.29         |
|       |            | 25      | 25        | 21.20         | 21.23         | 21.20         |
|       |            | 50      | 0         | 21.22         | 21.23         | 21.27         |
|       | 64QAM      | 1       | 0         | 21.12         | 21.47         | 21.20         |
|       |            | 1       | 25        | 21.11         | 21.47         | 21.34         |
|       |            | 1       | 49        | 21.11         | 21.49         | 21.38         |
|       |            | 25      | 0         | 20.00         | 20.26         | 20.10         |
|       |            | 25      | 13        | 20.07         | 20.24         | 20.15         |
|       |            | 25      | 25        | 20.00         | 20.29         | 20.19         |
|       |            | 50      | 0         | 20.08         | 20.28         | 20.10         |

| BW    | Modulation | RB size | RB offset | Channel 20025 | Channel 20175 | Channel 20325 |
|-------|------------|---------|-----------|---------------|---------------|---------------|
|       |            |         |           | 1717.5(MHz)   | 1732.5(MHz)   | 1747.5(MHz)   |
| 15MHz | QPSK       | 1       | 0         | 23.05         | 23.26         | 22.98         |
|       |            | 1       | 38        | 23.07         | 23.24         | 22.96         |
|       |            | 1       | 74        | 23.09         | 23.28         | 22.92         |
|       |            | 36      | 0         | 22.20         | 22.20         | 22.08         |
|       |            | 36      | 18        | 22.25         | 22.22         | 22.03         |
|       |            | 36      | 39        | 22.27         | 22.27         | 22.02         |
|       |            | 75      | 0         | 22.29         | 22.25         | 22.01         |
|       | 16QAM      | 1       | 0         | 22.13         | 22.28         | 22.70         |
|       |            | 1       | 38        | 22.11         | 22.24         | 22.78         |
|       |            | 1       | 74        | 22.14         | 22.28         | 22.76         |
|       |            | 36      | 0         | 20.97         | 21.33         | 20.99         |
|       |            | 36      | 18        | 20.93         | 21.30         | 21.01         |
|       |            | 36      | 39        | 20.99         | 21.34         | 21.01         |
|       |            | 75      | 0         | 20.98         | 21.36         | 20.97         |
|       | 64QAM      | 1       | 0         | 21.06         | 21.18         | 21.30         |
|       |            | 1       | 38        | 21.02         | 21.16         | 21.35         |
|       |            | 1       | 74        | 21.08         | 21.22         | 21.34         |
|       |            | 36      | 0         | 20.02         | 20.15         | 20.29         |
|       |            | 36      | 18        | 20.04         | 20.20         | 20.38         |
|       |            | 36      | 39        | 20.11         | 20.22         | 20.31         |
|       |            | 75      | 0         | 20.06         | 20.21         | 20.30         |
| BW    | Modulation | RB size | RB offset | Channel 20050 | Channel 20175 | Channel 20300 |
|       |            |         |           | 1720(MHz)     | 1732.5(MHz)   | 1745(MHz)     |
| 20MHz | QPSK       | 1       | 0         | 23.34         | 23.06         | 23.24         |
|       |            | 1       | 50        | 23.32         | 23.04         | 23.22         |
|       |            | 1       | 99        | 23.33         | 23.08         | 23.20         |
|       |            | 50      | 0         | 22.10         | 22.08         | 22.12         |
|       |            | 50      | 25        | 22.13         | 22.04         | 22.10         |
|       |            | 50      | 50        | 22.17         | 22.07         | 22.19         |
|       |            | 100     | 0         | 22.16         | 22.02         | 22.14         |
|       | 16QAM      | 1       | 0         | 21.72         | 21.96         | 22.47         |
|       |            | 1       | 50        | 21.74         | 21.95         | 22.44         |
|       |            | 1       | 99        | 21.79         | 21.92         | 22.46         |
|       |            | 50      | 0         | 20.89         | 21.06         | 21.18         |
|       |            | 50      | 25        | 20.83         | 21.07         | 21.13         |
|       |            | 50      | 50        | 20.85         | 21.06         | 21.10         |
|       |            | 100     | 0         | 20.83         | 21.05         | 21.19         |
|       | 64QAM      | 1       | 0         | 20.93         | 20.73         | 20.94         |
|       |            | 1       | 50        | 20.90         | 20.70         | 20.90         |
|       |            | 1       | 99        | 20.96         | 20.66         | 20.95         |
|       |            | 50      | 0         | 19.86         | 19.66         | 19.87         |
|       |            | 50      | 25        | 19.88         | 19.68         | 19.90         |
|       |            | 50      | 50        | 19.86         | 19.71         | 19.90         |
|       |            | 100     | 0         | 19.81         | 19.66         | 19.87         |

| LTE FDD Band 12 |            |         |           | Conducted Power(dBm) |               |               |
|-----------------|------------|---------|-----------|----------------------|---------------|---------------|
| BW              | Modulation | RB size | RB offset | Channel 23017        | Channel 23095 | Channel 23173 |
|                 |            |         |           | 699.7(MHz)           | 707.5(MHz)    | 715.3(MHz)    |
| 1.4MHz          | QPSK       | 1       | 0         | 23.50                | 23.45         | 23.44         |
|                 |            | 1       | 2         | 23.53                | 23.46         | 23.48         |
|                 |            | 1       | 5         | 23.52                | 23.45         | 23.45         |
|                 |            | 3       | 0         | 23.56                | 23.47         | 23.49         |
|                 |            | 3       | 2         | 23.55                | 23.41         | 23.47         |
|                 |            | 3       | 3         | 23.59                | 23.45         | 23.45         |
|                 |            | 6       | 0         | 22.47                | 22.37         | 22.38         |
|                 | 16QAM      | 1       | 0         | 22.39                | 22.60         | 22.85         |
|                 |            | 1       | 2         | 22.63                | 22.69         | 22.71         |
|                 |            | 1       | 5         | 22.60                | 22.62         | 22.75         |
|                 |            | 3       | 0         | 22.67                | 22.63         | 22.77         |
|                 |            | 3       | 2         | 22.62                | 22.63         | 22.77         |
|                 |            | 3       | 3         | 22.60                | 22.64         | 22.74         |
|                 |            | 6       | 0         | 21.44                | 21.48         | 21.43         |
|                 | 64QAM      | 1       | 0         | 21.79                | 21.75         | 21.88         |
|                 |            | 1       | 2         | 21.77                | 21.79         | 21.90         |
|                 |            | 1       | 5         | 21.78                | 21.73         | 21.85         |
|                 |            | 3       | 0         | 21.79                | 21.76         | 21.87         |
|                 |            | 3       | 2         | 21.79                | 21.79         | 21.91         |
|                 |            | 3       | 3         | 21.72                | 21.77         | 21.95         |
|                 |            | 6       | 0         | 20.68                | 20.70         | 20.86         |
| BW              | Modulation | RB size | RB offset | Channel 23025        | Channel 23095 | Channel 23165 |
|                 |            |         |           | 700.5(MHz)           | 707.5(MHz)    | 714.5(MHz)    |
| 3MHz            | QPSK       | 1       | 0         | 23.50                | 23.56         | 23.33         |
|                 |            | 1       | 7         | 23.43                | 23.55         | 23.36         |
|                 |            | 1       | 14        | 23.43                | 23.53         | 23.37         |
|                 |            | 8       | 0         | 22.42                | 22.40         | 22.54         |
|                 |            | 8       | 4         | 22.49                | 22.47         | 22.57         |
|                 |            | 8       | 7         | 22.45                | 22.46         | 22.52         |
|                 |            | 15      | 0         | 22.42                | 22.47         | 22.58         |
|                 | 16QAM      | 1       | 0         | 22.65                | 22.32         | 22.88         |
|                 |            | 1       | 7         | 22.65                | 22.33         | 22.81         |
|                 |            | 1       | 14        | 22.66                | 22.35         | 22.80         |
|                 |            | 8       | 0         | 21.41                | 21.31         | 21.53         |
|                 |            | 8       | 4         | 21.48                | 21.37         | 21.54         |
|                 |            | 8       | 7         | 21.47                | 21.39         | 21.50         |
|                 |            | 15      | 0         | 21.49                | 21.35         | 21.57         |
|                 | 64QAM      | 1       | 0         | 21.55                | 21.95         | 21.78         |
|                 |            | 1       | 7         | 21.59                | 21.90         | 21.70         |
|                 |            | 1       | 14        | 21.53                | 22.00         | 21.75         |
|                 |            | 8       | 0         | 20.56                | 20.91         | 20.77         |
|                 |            | 8       | 4         | 20.49                | 20.97         | 20.81         |
|                 |            | 8       | 7         | 20.47                | 21.00         | 20.85         |
|                 |            | 15      | 0         | 20.50                | 20.97         | 20.76         |

| BW    | Modulation | RB size | RB offset | Channel 23035 | Channel 23095 | Channel 23155 |
|-------|------------|---------|-----------|---------------|---------------|---------------|
|       |            |         |           | 701.5(MHz)    | 707.5(MHz)    | 713.5(MHz)    |
| 5MHz  | QPSK       | 1       | 0         | 23.43         | 23.53         | 23.47         |
|       |            | 1       | 13        | 23.47         | 23.56         | 23.52         |
|       |            | 1       | 24        | 23.45         | 23.56         | 23.59         |
|       |            | 12      | 0         | 22.45         | 22.42         | 22.52         |
|       |            | 12      | 6         | 22.42         | 22.21         | 22.58         |
|       |            | 12      | 13        | 22.44         | 22.18         | 22.52         |
|       |            | 25      | 0         | 22.42         | 22.15         | 22.51         |
|       | 16QAM      | 1       | 0         | 22.53         | 21.88         | 21.94         |
|       |            | 1       | 13        | 22.53         | 21.89         | 21.95         |
|       |            | 1       | 24        | 22.58         | 21.86         | 21.97         |
|       |            | 12      | 0         | 21.65         | 21.32         | 21.61         |
|       |            | 12      | 6         | 21.62         | 21.35         | 21.61         |
|       |            | 12      | 13        | 21.69         | 21.38         | 21.69         |
|       |            | 25      | 0         | 21.65         | 21.34         | 21.66         |
|       | 64QAM      | 1       | 0         | 21.12         | 21.29         | 21.27         |
|       |            | 1       | 13        | 21.16         | 21.20         | 21.27         |
|       |            | 1       | 24        | 21.07         | 21.28         | 21.22         |
|       |            | 12      | 0         | 20.09         | 20.27         | 20.20         |
|       |            | 12      | 6         | 20.11         | 20.23         | 20.24         |
|       |            | 12      | 13        | 20.14         | 20.26         | 20.25         |
|       |            | 25      | 0         | 20.04         | 20.25         | 20.22         |
| BW    | Modulation | RB size | RB offset | Channel 23060 | Channel 23095 | Channel 23130 |
|       |            |         |           | 704(MHz)      | 707.5(MHz)    | 711(MHz)      |
| 10MHz | QPSK       | 1       | 0         | 23.38         | 23.56         | 23.64         |
|       |            | 1       | 25        | 23.35         | 23.51         | 23.63         |
|       |            | 1       | 49        | 23.34         | 23.53         | 23.65         |
|       |            | 25      | 0         | 22.44         | 22.45         | 22.35         |
|       |            | 25      | 13        | 22.48         | 22.40         | 22.38         |
|       |            | 25      | 25        | 22.45         | 22.43         | 22.35         |
|       |            | 50      | 0         | 22.45         | 22.44         | 22.37         |
|       | 16QAM      | 1       | 0         | 22.61         | 22.50         | 22.26         |
|       |            | 1       | 25        | 22.68         | 22.58         | 22.27         |
|       |            | 1       | 49        | 22.66         | 22.55         | 22.33         |
|       |            | 25      | 0         | 21.58         | 21.37         | 21.34         |
|       |            | 25      | 13        | 21.57         | 21.32         | 21.37         |
|       |            | 25      | 25        | 21.57         | 21.34         | 21.33         |
|       |            | 50      | 0         | 21.50         | 21.37         | 21.38         |
|       | 64QAM      | 1       | 0         | 21.21         | 21.04         | 21.30         |
|       |            | 1       | 25        | 21.21         | 21.08         | 21.34         |
|       |            | 1       | 49        | 21.29         | 21.10         | 21.31         |
|       |            | 25      | 0         | 20.30         | 20.07         | 20.33         |
|       |            | 25      | 13        | 20.39         | 20.12         | 20.39         |
|       |            | 25      | 25        | 20.31         | 20.06         | 20.32         |
|       |            | 50      | 0         | 20.38         | 20.00         | 20.38         |

**AppendixB: ERP / EIRP Measurement  
Test Result**

| LTE Band 4      |         |           |              |            |             |        |
|-----------------|---------|-----------|--------------|------------|-------------|--------|
| Bandwidth       | Channel | Frequency | Polarization | EIRP (dBm) | Limit (dBm) | Result |
| 1.4 MHz (QPSK)  | Low     | 1710.7    | Horizontal   | 23.90      | 30          | Pass   |
|                 | Mid     | 1732.5    | Horizontal   | 24.09      | 30          | Pass   |
|                 | High    | 1754.3    | Horizontal   | 23.81      | 30          | Pass   |
| 3 MHz (QPSK)    | Low     | 1711.5    | Horizontal   | 23.82      | 30          | Pass   |
|                 | Mid     | 1732.5    | Horizontal   | 23.95      | 30          | Pass   |
|                 | High    | 1753.5    | Horizontal   | 23.89      | 30          | Pass   |
| 5 MHz (QPSK)    | Low     | 1712.5    | Horizontal   | 23.73      | 30          | Pass   |
|                 | Mid     | 1732.5    | Horizontal   | 24.05      | 30          | Pass   |
|                 | High    | 1752.5    | Horizontal   | 23.91      | 30          | Pass   |
| 10 MHz (QPSK)   | Low     | 1715      | Horizontal   | 23.94      | 30          | Pass   |
|                 | Mid     | 1732.5    | Horizontal   | 24.08      | 30          | Pass   |
|                 | High    | 1750      | Horizontal   | 23.74      | 30          | Pass   |
| 15 MHz (QPSK)   | Low     | 1717.5    | Horizontal   | 23.89      | 30          | Pass   |
|                 | Mid     | 1732.5    | Horizontal   | 24.08      | 30          | Pass   |
|                 | High    | 1747.5    | Horizontal   | 23.72      | 30          | Pass   |
| 20 MHz (QPSK)   | Low     | 1720      | Horizontal   | 24.14      | 30          | Pass   |
|                 | Mid     | 1732.5    | Horizontal   | 23.86      | 30          | Pass   |
|                 | High    | 1745      | Horizontal   | 24.04      | 30          | Pass   |
| 1.4 MHz (16QAM) | Low     | 1710.7    | Horizontal   | 23.46      | 30          | Pass   |
|                 | Mid     | 1732.5    | Horizontal   | 23.16      | 30          | Pass   |
|                 | High    | 1754.3    | Horizontal   | 23.27      | 30          | Pass   |
| 3 MHz (16QAM)   | Low     | 1711.5    | Horizontal   | 23.22      | 30          | Pass   |
|                 | Mid     | 1732.5    | Horizontal   | 23.23      | 30          | Pass   |
|                 | High    | 1753.5    | Horizontal   | 23.38      | 30          | Pass   |
| 5 MHz (16QAM)   | Low     | 1712.5    | Horizontal   | 22.93      | 30          | Pass   |
|                 | Mid     | 1732.5    | Horizontal   | 23.28      | 30          | Pass   |
|                 | High    | 1752.5    | Horizontal   | 22.89      | 30          | Pass   |
| 10 MHz (16QAM)  | Low     | 1715      | Horizontal   | 22.73      | 30          | Pass   |
|                 | Mid     | 1732.5    | Horizontal   | 22.84      | 30          | Pass   |
|                 | High    | 1750      | Horizontal   | 23.19      | 30          | Pass   |
| 15 MHz (16QAM)  | Low     | 1717.5    | Horizontal   | 22.91      | 30          | Pass   |
|                 | Mid     | 1732.5    | Horizontal   | 23.04      | 30          | Pass   |
|                 | High    | 1747.5    | Horizontal   | 23.58      | 30          | Pass   |
| 20 MHz (16QAM)  | Low     | 1720      | Horizontal   | 22.52      | 30          | Pass   |
|                 | Mid     | 1732.5    | Horizontal   | 22.76      | 30          | Pass   |
|                 | High    | 1745      | Horizontal   | 23.27      | 30          | Pass   |

|                 |      |        |            |       |    |      |
|-----------------|------|--------|------------|-------|----|------|
| 1.4 MHz (64QAM) | Low  | 1710.7 | Horizontal | 21.93 | 30 | Pass |
|                 | Mid  | 1732.5 | Horizontal | 22.19 | 30 | Pass |
|                 | High | 1754.3 | Horizontal | 22.00 | 30 | Pass |
| 3 MHz (64QAM)   | Low  | 1711.5 | Horizontal | 22.01 | 30 | Pass |
|                 | Mid  | 1732.5 | Horizontal | 22.22 | 30 | Pass |
|                 | High | 1753.5 | Horizontal | 22.13 | 30 | Pass |
| 5 MHz (64QAM)   | Low  | 1712.5 | Horizontal | 21.43 | 30 | Pass |
|                 | Mid  | 1732.5 | Horizontal | 21.84 | 30 | Pass |
|                 | High | 1752.5 | Horizontal | 21.98 | 30 | Pass |
| 10 MHz (64QAM)  | Low  | 1715   | Horizontal | 21.91 | 30 | Pass |
|                 | Mid  | 1732.5 | Horizontal | 22.29 | 30 | Pass |
|                 | High | 1750   | Horizontal | 22.18 | 30 | Pass |
| 15 MHz (64QAM)  | Low  | 1717.5 | Horizontal | 21.82 | 30 | Pass |
|                 | Mid  | 1732.5 | Horizontal | 21.96 | 30 | Pass |
|                 | High | 1747.5 | Horizontal | 22.15 | 30 | Pass |
| 20 MHz (64QAM)  | Low  | 1720   | Horizontal | 21.76 | 30 | Pass |
|                 | Mid  | 1732.5 | Horizontal | 21.46 | 30 | Pass |
|                 | High | 1745   | Horizontal | 21.75 | 30 | Pass |

| LTE Band 12     |         |           |              |           |             |        |
|-----------------|---------|-----------|--------------|-----------|-------------|--------|
| Bandwidth       | Channel | Frequency | Polarization | ERP (dBm) | Limit (dBm) | Result |
| 1.4 MHz (QPSK)  | Low     | 699.7     | Horizontal   | 21.94     | 34.77       | Pass   |
|                 | Mid     | 707.5     | Horizontal   | 21.80     | 34.77       | Pass   |
|                 | High    | 715.3     | Horizontal   | 21.80     | 34.77       | Pass   |
| 3 MHz (QPSK)    | Low     | 700.5     | Horizontal   | 21.85     | 34.77       | Pass   |
|                 | Mid     | 707.5     | Horizontal   | 21.91     | 34.77       | Pass   |
|                 | High    | 714.5     | Horizontal   | 21.68     | 34.77       | Pass   |
| 5 MHz (QPSK)    | Low     | 701.5     | Horizontal   | 21.80     | 34.77       | Pass   |
|                 | Mid     | 707.5     | Horizontal   | 21.91     | 34.77       | Pass   |
|                 | High    | 713.5     | Horizontal   | 21.94     | 34.77       | Pass   |
| 10 MHz (QPSK)   | Low     | 704       | Horizontal   | 21.69     | 34.77       | Pass   |
|                 | Mid     | 707.5     | Horizontal   | 21.88     | 34.77       | Pass   |
|                 | High    | 711       | Horizontal   | 22.00     | 34.77       | Pass   |
| 1.4 MHz (16QAM) | Low     | 699.7     | Horizontal   | 21.02     | 34.77       | Pass   |
|                 | Mid     | 707.5     | Horizontal   | 20.98     | 34.77       | Pass   |
|                 | High    | 715.3     | Horizontal   | 21.12     | 34.77       | Pass   |
| 3 MHz (16QAM)   | Low     | 700.5     | Horizontal   | 21.00     | 34.77       | Pass   |
|                 | Mid     | 707.5     | Horizontal   | 20.67     | 34.77       | Pass   |
|                 | High    | 714.5     | Horizontal   | 21.23     | 34.77       | Pass   |
| 5 MHz (16QAM)   | Low     | 701.5     | Horizontal   | 20.93     | 34.77       | Pass   |
|                 | Mid     | 707.5     | Horizontal   | 20.21     | 34.77       | Pass   |
|                 | High    | 713.5     | Horizontal   | 20.32     | 34.77       | Pass   |
| 10 MHz (16QAM)  | Low     | 704       | Horizontal   | 21.03     | 34.77       | Pass   |
|                 | Mid     | 707.5     | Horizontal   | 20.93     | 34.77       | Pass   |
|                 | High    | 711       | Horizontal   | 20.62     | 34.77       | Pass   |
| 1.4 MHz (64QAM) | Low     | 699.7     | Horizontal   | 20.07     | 34.77       | Pass   |
|                 | Mid     | 707.5     | Horizontal   | 20.12     | 34.77       | Pass   |
|                 | High    | 715.3     | Horizontal   | 20.30     | 34.77       | Pass   |
| 3 MHz (64QAM)   | Low     | 700.5     | Horizontal   | 19.90     | 34.77       | Pass   |
|                 | Mid     | 707.5     | Horizontal   | 20.30     | 34.77       | Pass   |
|                 | High    | 714.5     | Horizontal   | 20.13     | 34.77       | Pass   |
| 5 MHz (64QAM)   | Low     | 701.5     | Horizontal   | 19.47     | 34.77       | Pass   |
|                 | Mid     | 707.5     | Horizontal   | 19.64     | 34.77       | Pass   |
|                 | High    | 713.5     | Horizontal   | 19.62     | 34.77       | Pass   |
| 10 MHz (64QAM)  | Low     | 704       | Horizontal   | 19.56     | 34.77       | Pass   |
|                 | Mid     | 707.5     | Horizontal   | 19.43     | 34.77       | Pass   |
|                 | High    | 711       | Horizontal   | 19.69     | 34.77       | Pass   |

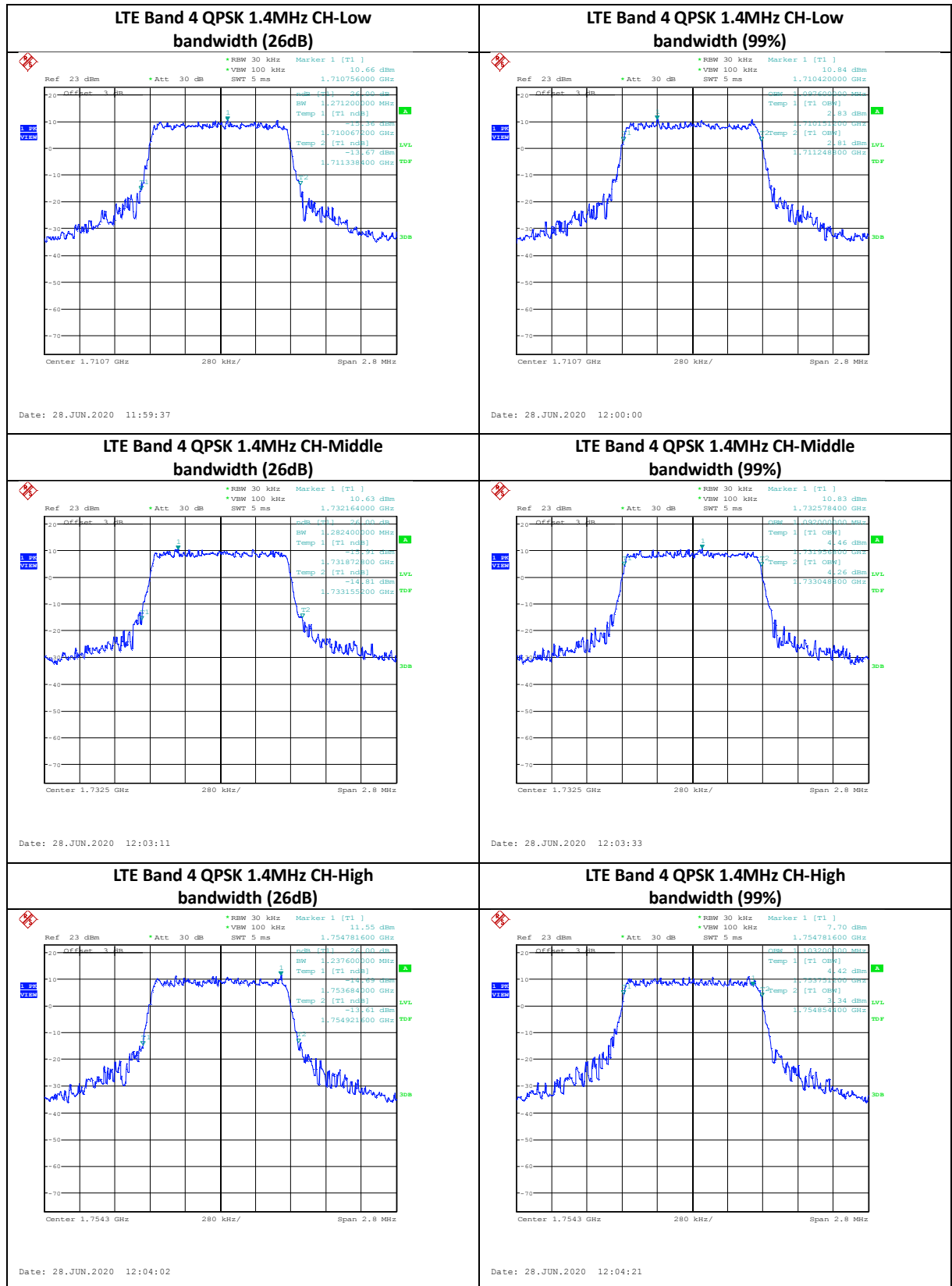
AppendixC: 99% Occupied Bandwidth and 26dB Bandwidth Measurement

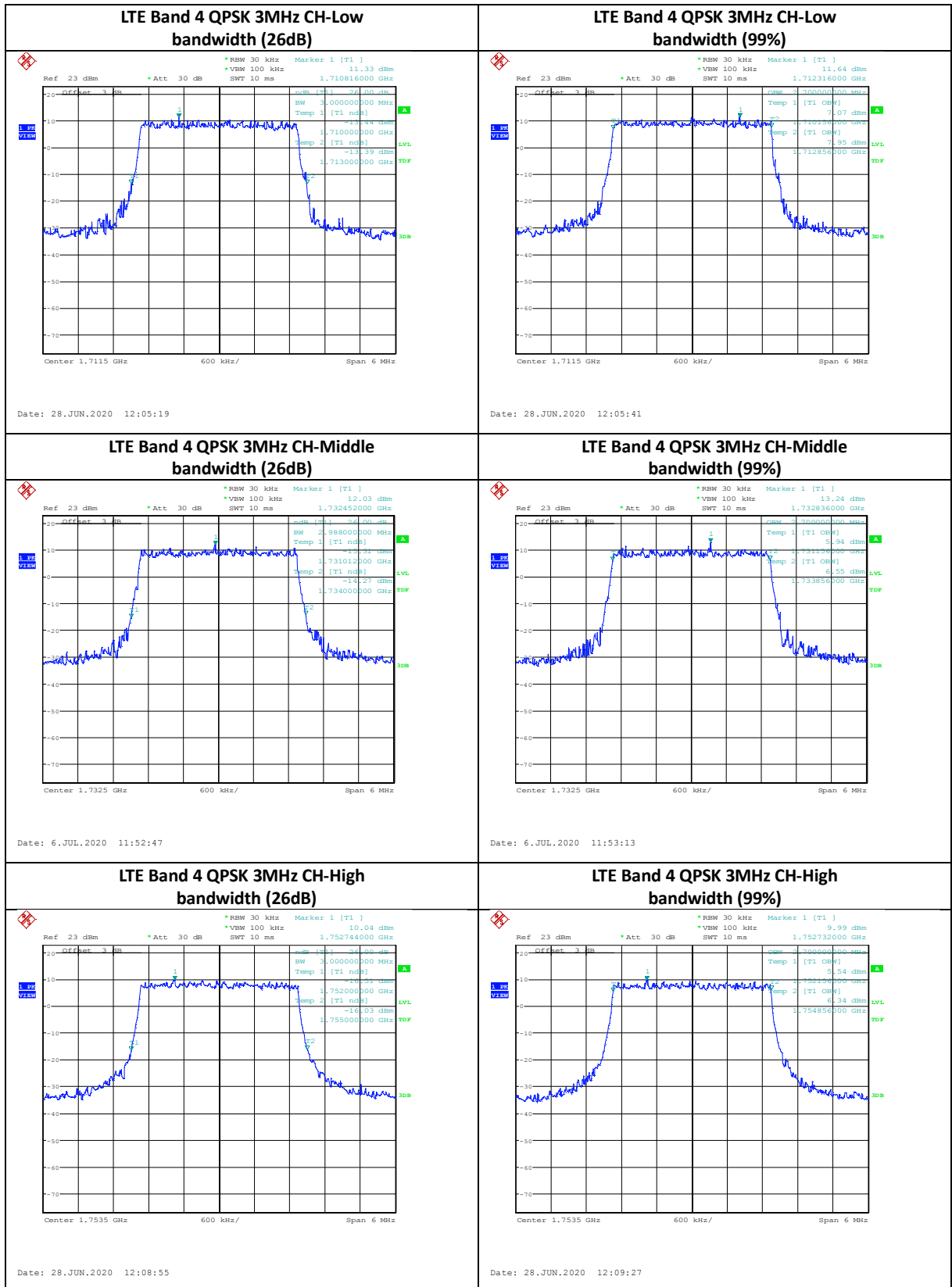
Test Result

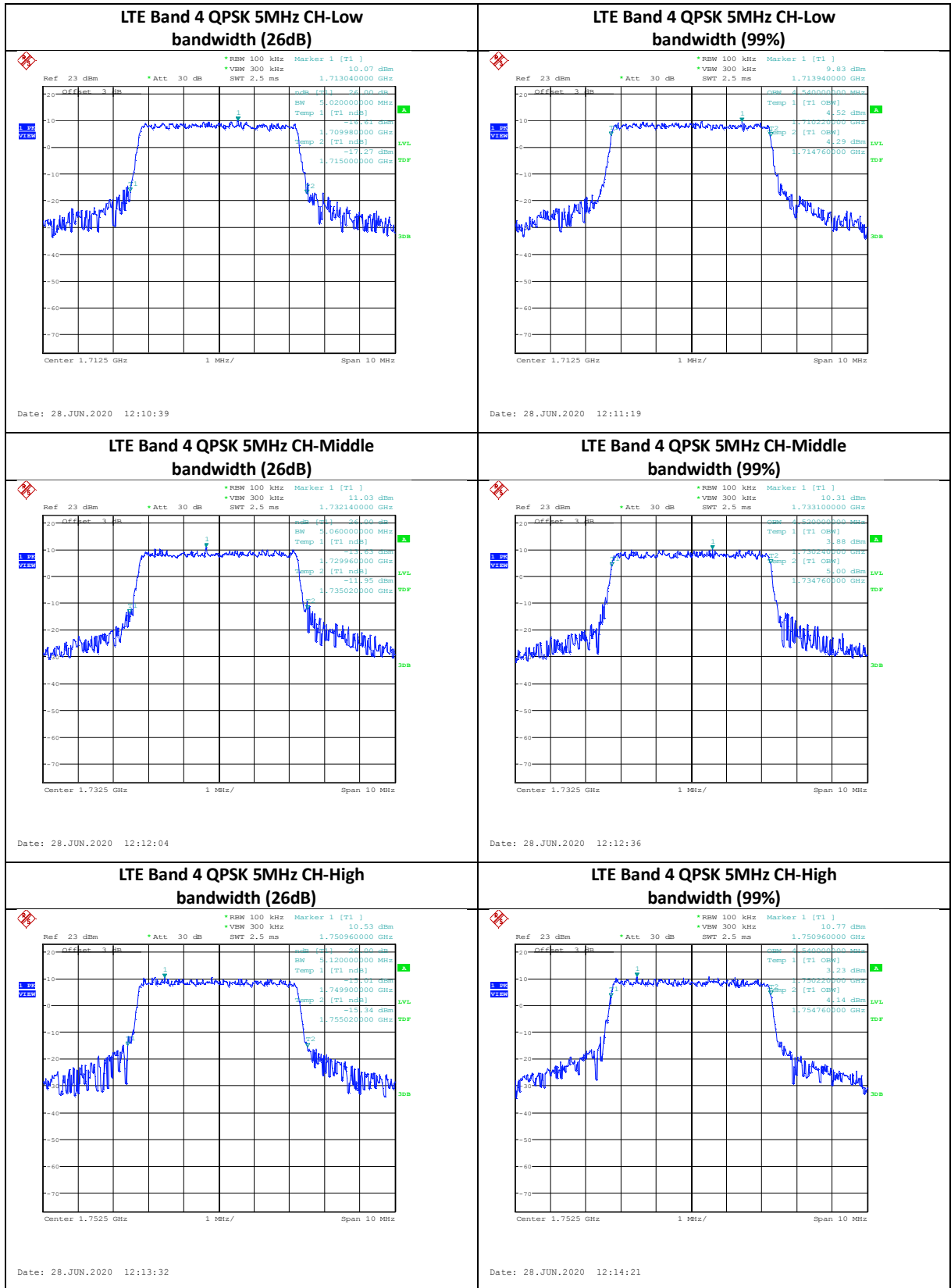
| LTE Band 4 |            |                 |         |                 |                      |                              |
|------------|------------|-----------------|---------|-----------------|----------------------|------------------------------|
| RB         | Modulation | Bandwidth (MHz) | Channel | Frequency (MHz) | 26dB Bandwidth (MHz) | 99% Occupied Bandwidth (MHz) |
| 100%       | QPSK       | 1.4             | 19957   | 1710.7          | 1.2712               | 1.0976                       |
|            |            |                 | 20175   | 1732.5          | 1.2824               | 1.0920                       |
|            |            |                 | 20393   | 1754.3          | 1.2376               | 1.1032                       |
|            |            | 3               | 19965   | 1711.5          | 3.000                | 2.700                        |
|            |            |                 | 20175   | 1732.5          | 2.988                | 2.700                        |
|            |            |                 | 20385   | 1753.5          | 3.000                | 2.700                        |
|            |            | 5               | 19975   | 1712.5          | 5.020                | 4.540                        |
|            |            |                 | 20175   | 1732.5          | 5.060                | 4.520                        |
|            |            |                 | 20375   | 1752.5          | 5.120                | 4.540                        |
|            |            | 10              | 20000   | 1715            | 9.760                | 9.000                        |
|            |            |                 | 20175   | 1732.5          | 9.720                | 8.960                        |
|            |            |                 | 20350   | 1750            | 9.720                | 8.960                        |
|            |            | 15              | 20025   | 1717.5          | 15.060               | 13.500                       |
|            |            |                 | 20175   | 1732.5          | 15.000               | 13.500                       |
|            |            |                 | 20325   | 1747.5          | 14.820               | 13.560                       |
|            |            | 20              | 20050   | 1720            | 19.680               | 17.960                       |
|            |            |                 | 20175   | 1732.5          | 19.680               | 18.000                       |
|            |            |                 | 20300   | 1745            | 19.520               | 18.000                       |
|            | 16QAM      | 1.4             | 19957   | 1710.7          | 1.2544               | 1.1032                       |
|            |            |                 | 20175   | 1732.5          | 1.2656               | 1.0920                       |
|            |            |                 | 20393   | 1754.3          | 1.2544               | 1.1032                       |
|            |            | 3               | 19965   | 1711.5          | 2.988                | 2.700                        |
|            |            |                 | 20175   | 1732.5          | 2.988                | 2.700                        |
|            |            |                 | 20385   | 1753.5          | 2.976                | 2.700                        |
|            |            | 5               | 19975   | 1712.5          | 5.020                | 4.520                        |
|            |            |                 | 20175   | 1732.5          | 5.180                | 4.520                        |
|            |            |                 | 20375   | 1752.5          | 5.080                | 4.540                        |
|            |            | 10              | 20000   | 1715            | 9.640                | 9.000                        |
|            |            |                 | 20175   | 1732.5          | 9.880                | 9.000                        |
|            |            |                 | 20350   | 1750            | 9.800                | 8.960                        |
|            |            | 15              | 20025   | 1717.5          | 15.060               | 13.560                       |
|            |            |                 | 20175   | 1732.5          | 15.000               | 13.500                       |
|            |            |                 | 20325   | 1747.5          | 15.120               | 13.560                       |
|            |            | 20              | 20050   | 1720            | 19.760               | 18.000                       |
|            |            |                 | 20175   | 1732.5          | 19.600               | 18.080                       |
|            |            |                 | 20300   | 1745            | 19.440               | 18.080                       |
| 100%       | 64QAM      | 1.4             | 19957   | 1710.7          | 1.2656               | 1.0976                       |
|            |            |                 | 20175   | 1732.5          | 1.2544               | 1.0976                       |
|            |            |                 | 20393   | 1754.3          | 1.2376               | 1.0976                       |
|            |            | 3               | 19965   | 1711.5          | 2.976                | 2.688                        |
|            |            |                 | 20175   | 1732.5          | 3.000                | 2.688                        |
|            |            |                 | 20385   | 1753.5          | 3.024                | 2.688                        |
|            |            | 5               | 19975   | 1712.5          | 5.040                | 4.560                        |
|            |            |                 | 20175   | 1732.5          | 5.000                | 4.520                        |
|            |            |                 | 20375   | 1752.5          | 4.980                | 4.540                        |
|            |            | 10              | 20000   | 1715            | 9.840                | 9.000                        |
|            |            |                 | 20175   | 1732.5          | 9.720                | 8.960                        |
|            |            |                 | 20350   | 1750            | 9.800                | 8.960                        |
|            |            | 15              | 20025   | 1717.5          | 15.180               | 13.560                       |
|            |            |                 | 20175   | 1732.5          | 15.120               | 13.560                       |
|            |            |                 | 20325   | 1747.5          | 15.000               | 13.560                       |
|            |            | 20              | 20050   | 1720            | 19.440               | 18.000                       |
|            |            |                 | 20175   | 1732.5          | 19.840               | 18.000                       |
|            |            |                 | 20300   | 1745            | 19.600               | 18.080                       |

| LTE Band 12 |            |                 |         |                 |                      |                              |
|-------------|------------|-----------------|---------|-----------------|----------------------|------------------------------|
| RB          | Modulation | Bandwidth (MHz) | Channel | Frequency (MHz) | 26dB Bandwidth (MHz) | 99% Occupied Bandwidth (MHz) |
| 100%        | QPSK       | 1.4             | 23017   | 699.7           | 1.2656               | 1.0920                       |
|             |            |                 | 23095   | 707.5           | 1.2332               | 1.1032                       |
|             |            |                 | 23173   | 715.3           | 1.2768               | 1.1032                       |
|             |            | 3               | 23025   | 700.5           | 2.376                | 2.700                        |
|             |            |                 | 23095   | 707.5           | 3.000                | 2.700                        |
|             |            |                 | 23165   | 714.5           | 2.988                | 2.688                        |
|             |            | 5               | 23035   | 701.5           | 5.020                | 4.520                        |
|             |            |                 | 23095   | 707.5           | 4.940                | 4.520                        |
|             |            |                 | 23155   | 713.5           | 4.960                | 4.520                        |
|             |            | 10              | 23060   | 704             | 9.720                | 8.960                        |
|             |            |                 | 23095   | 707.5           | 9.880                | 8.960                        |
|             |            |                 | 23130   | 711             | 9.560                | 8.960                        |
|             | 16QAM      | 1.4             | 23017   | 699.7           | 1.2712               | 1.0920                       |
|             |            |                 | 23095   | 707.5           | 1.2712               | 1.0976                       |
|             |            |                 | 23173   | 715.3           | 1.2432               | 1.1032                       |
|             |            | 3               | 23025   | 700.5           | 2.988                | 2.688                        |
|             |            |                 | 23095   | 707.5           | 2.988                | 2.688                        |
|             |            |                 | 23165   | 714.5           | 2.988                | 2.700                        |
|             |            | 5               | 23035   | 701.5           | 4.940                | 4.540                        |
|             |            |                 | 23095   | 707.5           | 5.120                | 4.540                        |
|             |            |                 | 23155   | 713.5           | 5.080                | 4.500                        |
|             |            | 10              | 23060   | 704             | 9.760                | 8.920                        |
|             |            |                 | 23095   | 707.5           | 9.680                | 8.960                        |
|             |            |                 | 23130   | 711             | 9.680                | 8.960                        |
|             | 64QAM      | 1.4             | 23017   | 699.7           | 1.2488               | 1.0976                       |
|             |            |                 | 23095   | 707.5           | 1.2600               | 1.1088                       |
|             |            |                 | 23173   | 715.3           | 1.2712               | 1.1088                       |
|             |            | 3               | 23025   | 700.5           | 2.952                | 2.688                        |
|             |            |                 | 23095   | 707.5           | 3.012                | 2.688                        |
|             |            |                 | 23165   | 714.5           | 3.012                | 2.700                        |
|             |            | 5               | 23035   | 701.5           | 4.880                | 4.520                        |
|             |            |                 | 23095   | 707.5           | 5.040                | 4.520                        |
|             |            |                 | 23155   | 713.5           | 4.900                | 4.540                        |
|             |            | 10              | 23060   | 704             | 9.800                | 9.000                        |
|             |            |                 | 23095   | 707.5           | 9.680                | 8.960                        |
|             |            |                 | 23130   | 711             | 9.720                | 8.960                        |

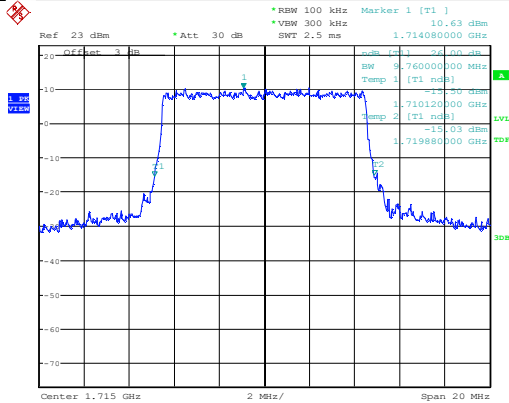
## Test Graphs





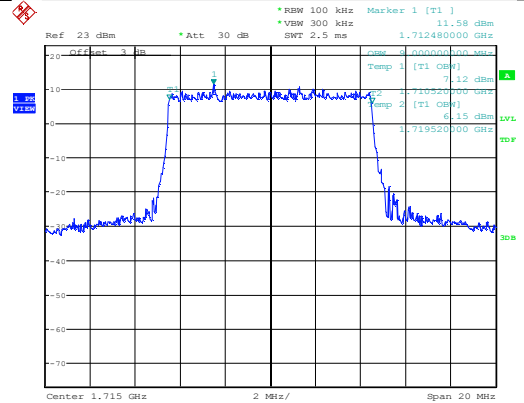


## LTE Band 4 QPSK 10MHz CH-Low bandwidth (26dB)



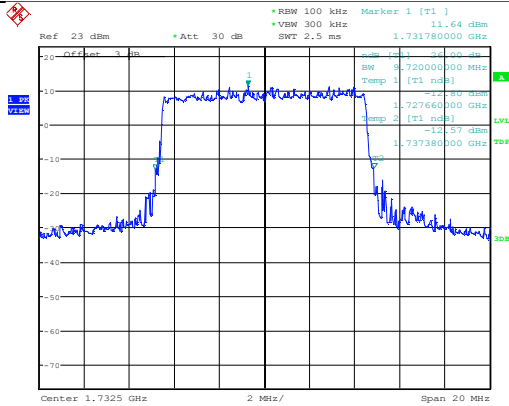
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## LTE Band 4 QPSK 10MHz CH-Low bandwidth (99%)



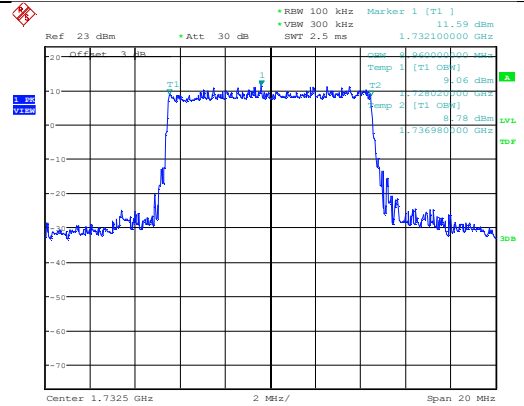
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## LTE Band 4 QPSK 10MHz CH-Middle bandwidth (26dB)



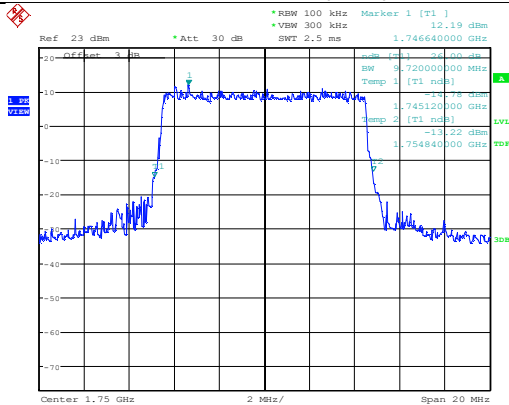
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## LTE Band 4 QPSK 10MHz CH-Middle bandwidth (99%)



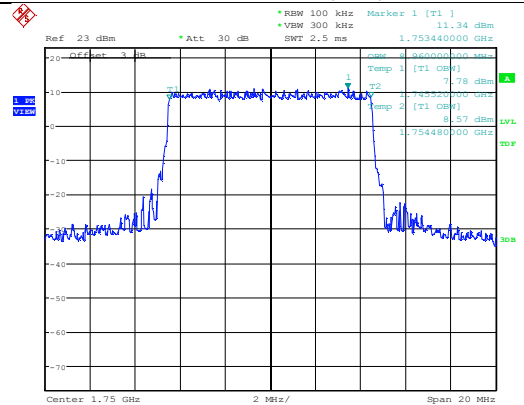
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## LTE Band 4 QPSK 10MHz CH-High bandwidth (26dB)

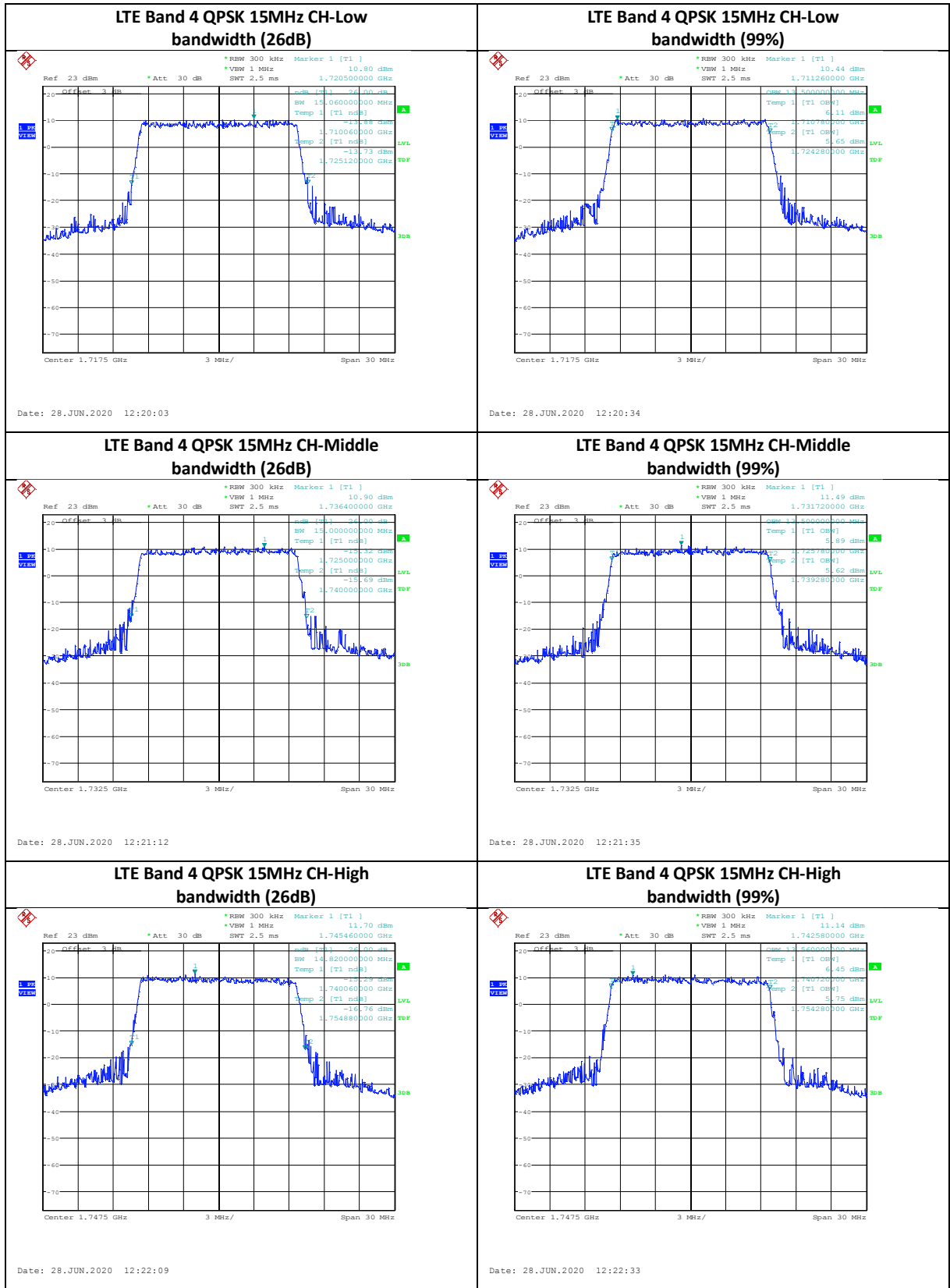


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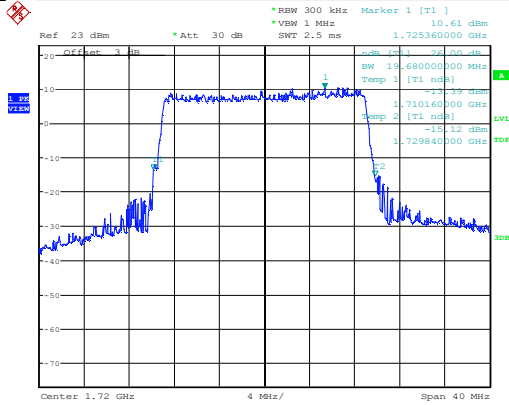
## LTE Band 4 QPSK 10MHz CH-High bandwidth (99%)



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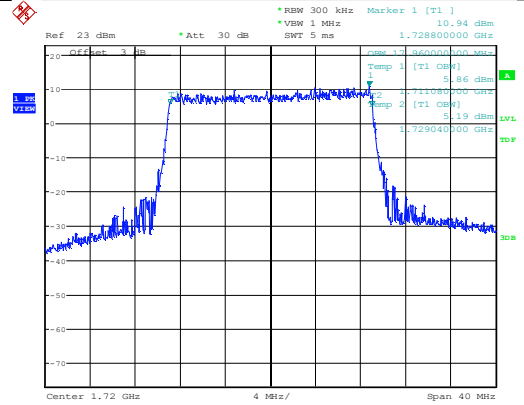


## LTE Band 4 QPSK 20MHz CH-Low bandwidth (26dB)



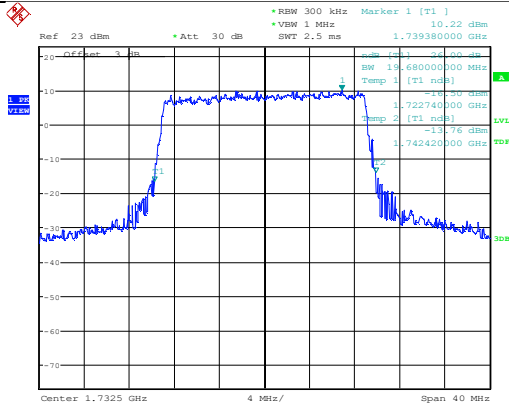
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## LTE Band 4 QPSK 20MHz CH-Low bandwidth (99%)



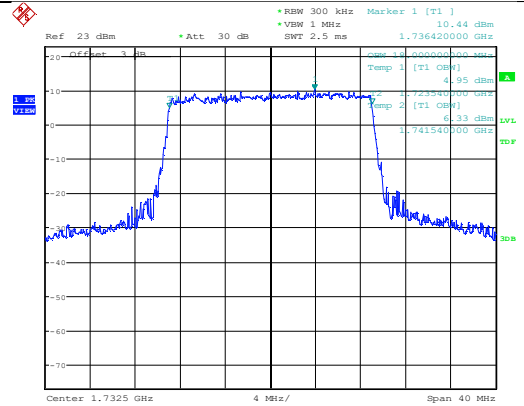
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## LTE Band 4 QPSK 20MHz CH-Middle bandwidth (26dB)



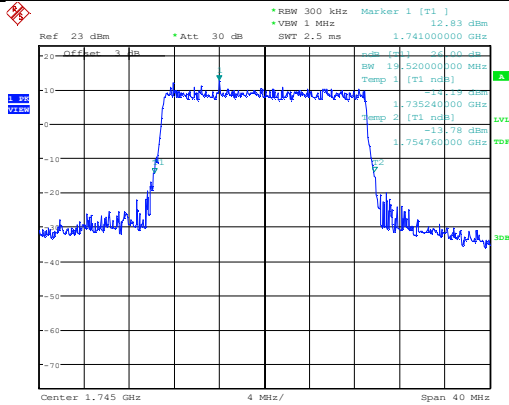
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## LTE Band 4 QPSK 20MHz CH-Middle bandwidth (99%)



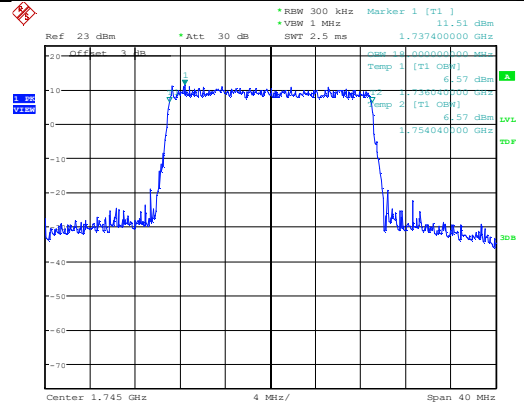
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## LTE Band 4 QPSK 20MHz CH-High bandwidth (26dB)



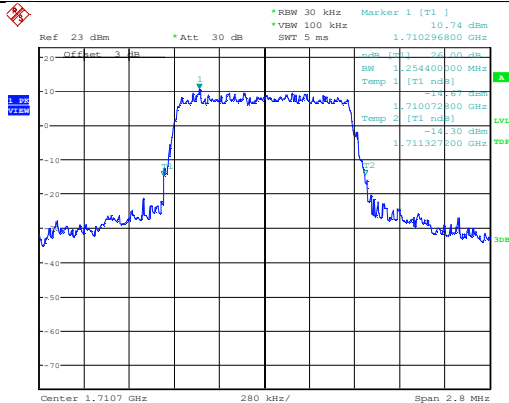
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## LTE Band 4 QPSK 20MHz CH-High bandwidth (99%)



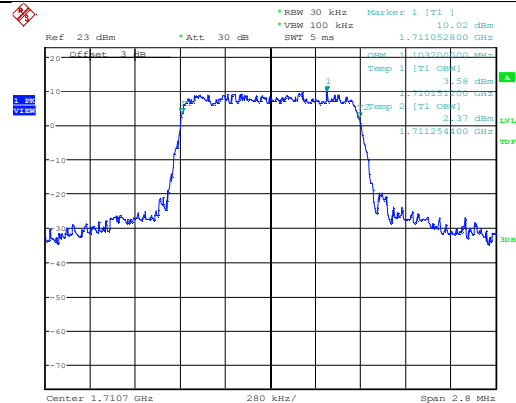
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## LTE Band 4 16QAM 1.4MHz CH-Low bandwidth (26dB)



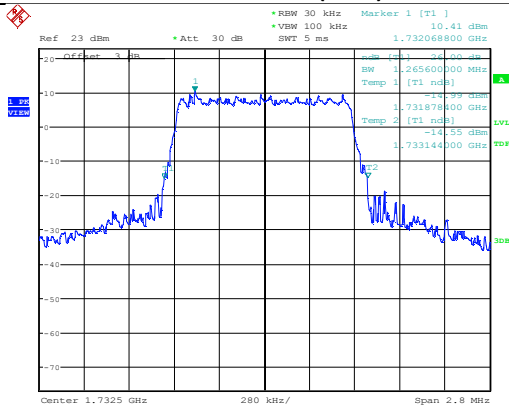
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## LTE Band 4 16QAM 1.4MHz CH-Low bandwidth (99%)



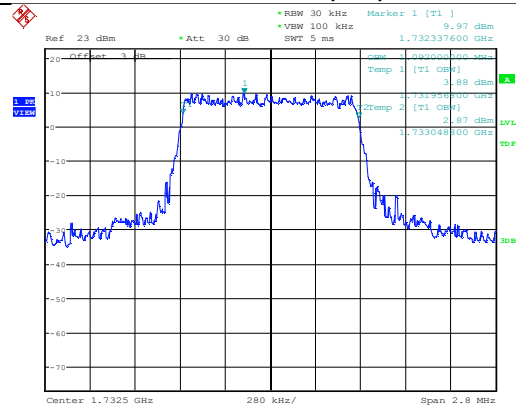
Date: 29.JUN.2020 16:05:21

## LTE Band 4 16QAM 1.4MHz CH-Middle bandwidth (26dB)



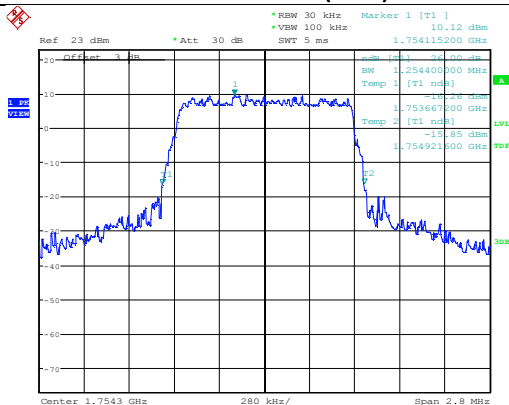
Date: 29.JUN.2020 16:06:39

## LTE Band 4 16QAM 1.4MHz CH-Middle bandwidth (99%)



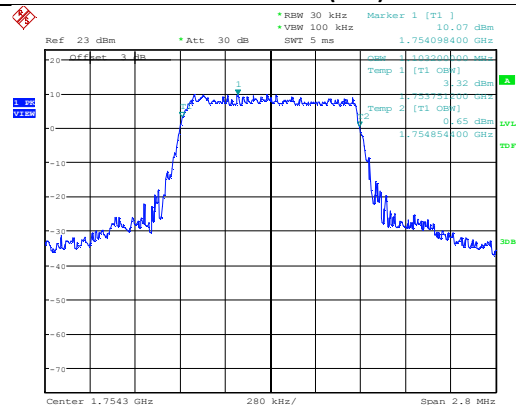
Date: 29.JUN.2020 16:06:56

## LTE Band 4 16QAM 1.4MHz CH-High bandwidth (26dB)



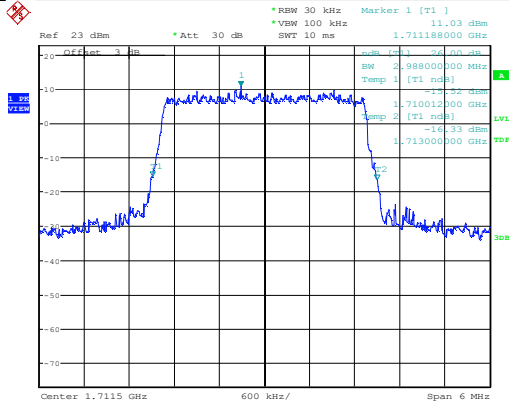
Date: 29.JUN.2020 16:07:52

## LTE Band 4 16QAM 1.4MHz CH-High bandwidth (99%)



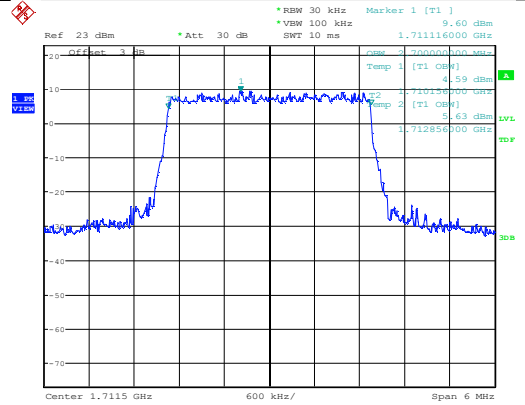
Date: 29.JUN.2020 16:08:47

## LTE Band 4 16QAM 3MHz CH-Low bandwidth (26dB)



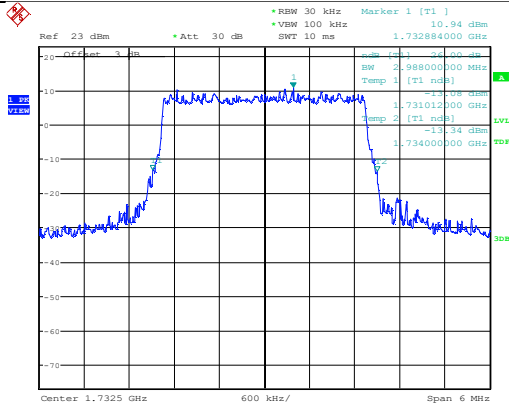
Date: 29.JUN.2020 16:22:59

## LTE Band 4 16QAM 3MHz CH-Low bandwidth (99%)



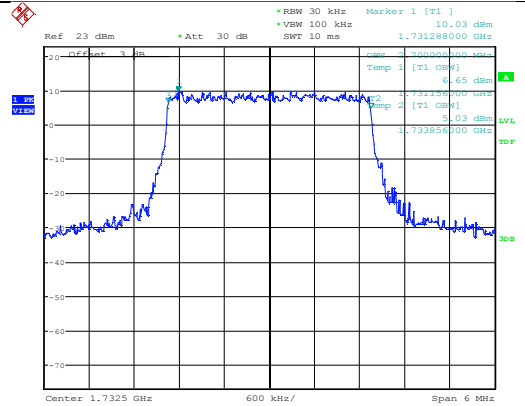
Date: 29.JUN.2020 16:22:44

## LTE Band 4 16QAM 3MHz CH-Middle bandwidth (26dB)



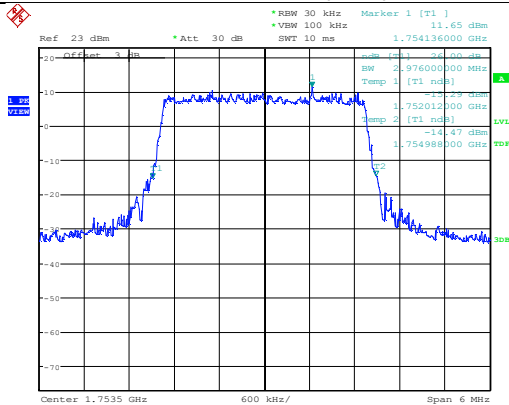
Date: 29.JUN.2020 16:23:44

## LTE Band 4 16QAM 3MHz CH-Middle bandwidth (99%)



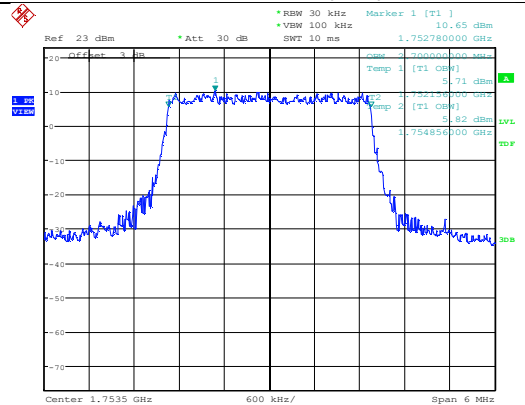
Date: 29.JUN.2020 16:24:04

## LTE Band 4 16QAM 3MHz CH-High bandwidth (26dB)

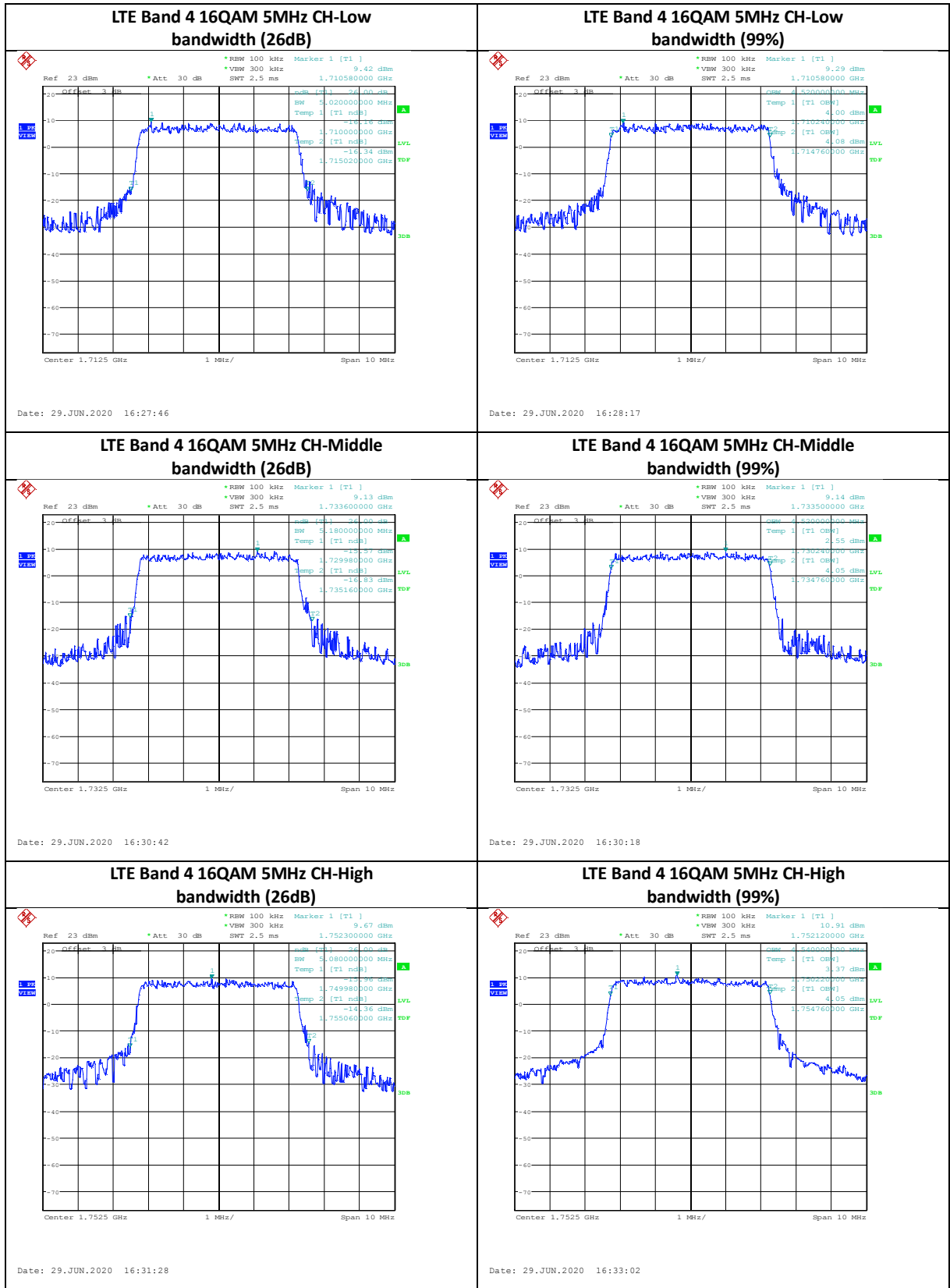


Date: 29.JUN.2020 16:26:58

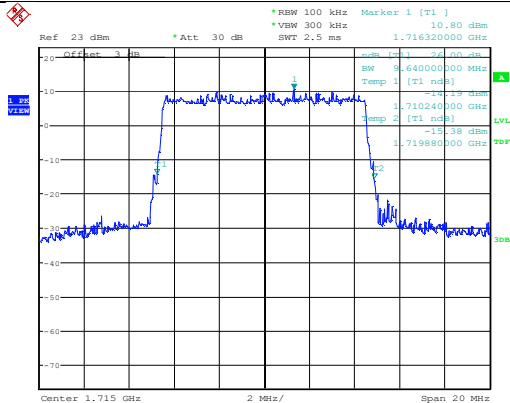
## LTE Band 2 16QAM 3MHz CH-High bandwidth (99%)



Date: 29.JUN.2020 16:26:40

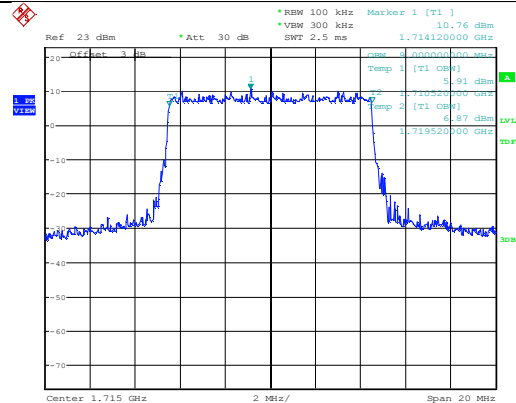


## LTE Band 4 16QAM 10MHz CH-Low bandwidth (26dB)



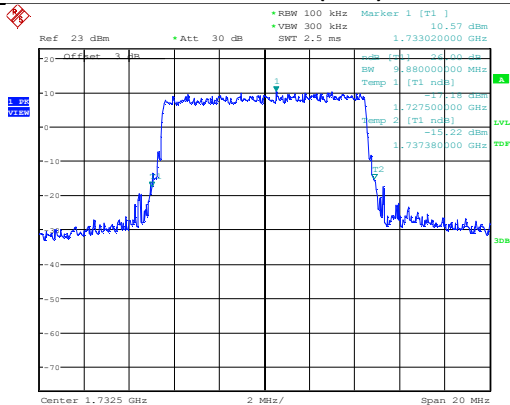
Date: 29.JUN.2020 16:35:55

## LTE Band 4 16QAM 10MHz CH-Low bandwidth (99%)



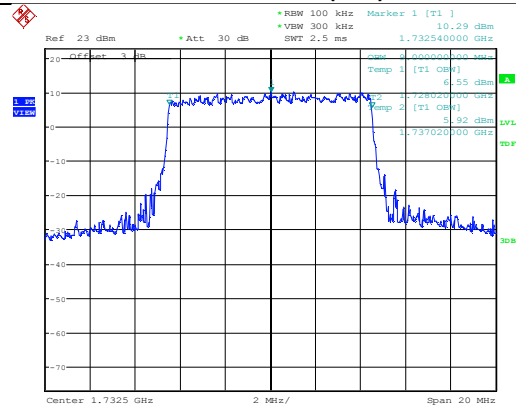
Date: 29.JUN.2020 16:35:37

## LTE Band 4 16QAM 10MHz CH-Middle bandwidth (26dB)



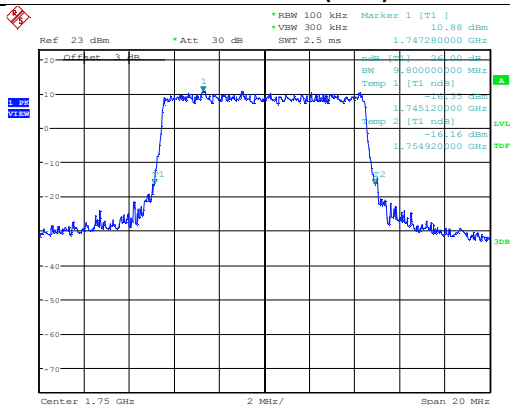
Date: 29.JUN.2020 16:36:37

## LTE Band 4 16QAM 10MHz CH-Middle bandwidth (99%)



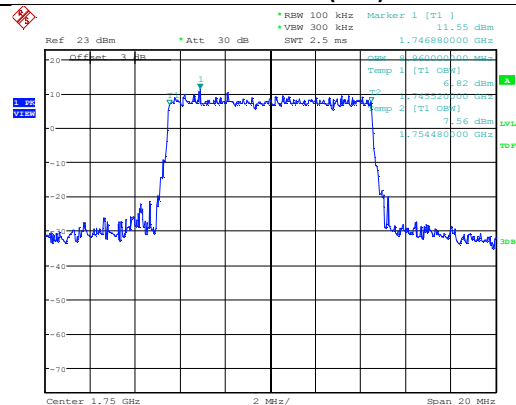
Date: 29.JUN.2020 16:36:59

## LTE Band 4 16QAM 10MHz CH-High bandwidth (26dB)



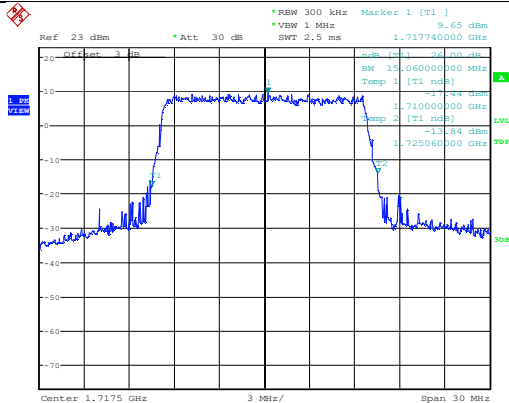
Date: 29.JUN.2020 16:39:16

## LTE Band 4 16QAM 10MHz CH-High bandwidth (99%)



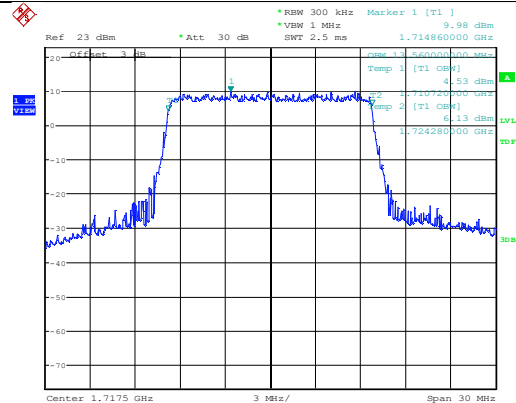
Date: 29.JUN.2020 16:39:30

## LTE Band 4 16QAM 15MHz CH-Low bandwidth (26dB)



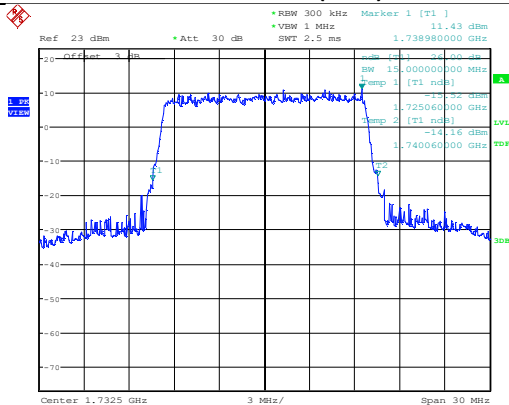
Date: 29.JUN.2020 16:41:20

## LTE Band 4 16QAM 15MHz CH-Low bandwidth (99%)



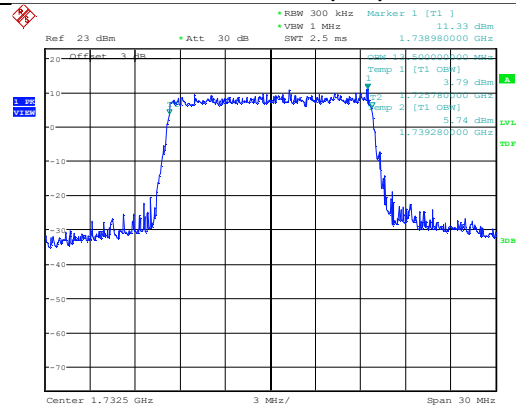
Date: 29.JUN.2020 16:41:53

## LTE Band 4 16QAM 15MHz CH-Middle bandwidth (26dB)



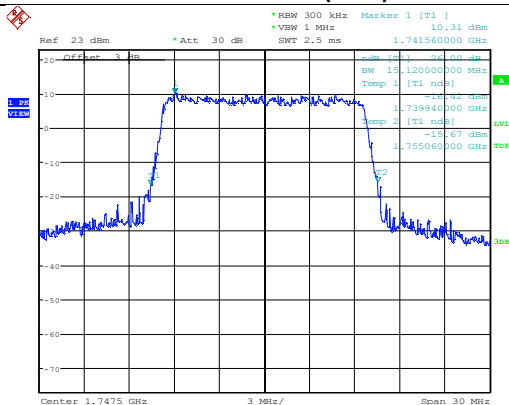
Date: 29.JUN.2020 16:43:25

## LTE Band 4 16QAM 15MHz CH-Middle bandwidth (99%)



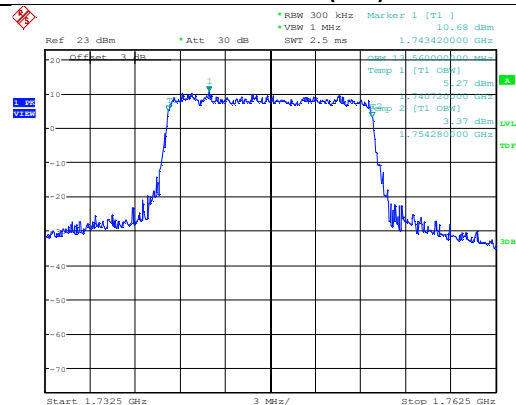
Date: 29.JUN.2020 16:43:48

## LTE Band 4 16QAM 15MHz CH-High bandwidth (26dB)



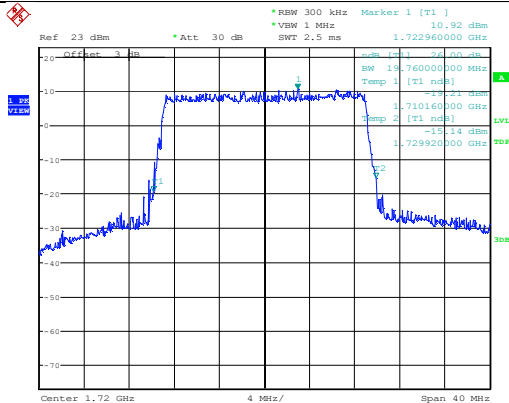
Date: 29.JUN.2020 16:45:11

## LTE Band 4 16QAM 15MHz CH-High bandwidth (99%)



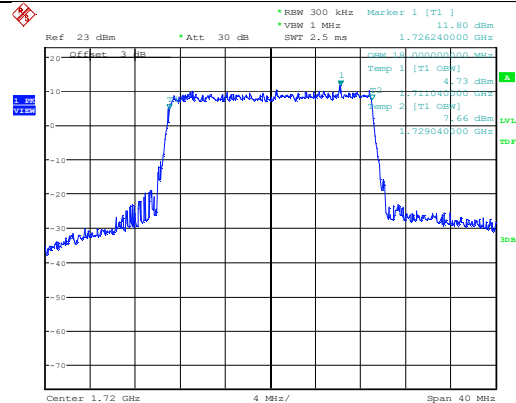
Date: 29.JUN.2020 16:45:38

## LTE Band 4 16QAM 20MHz CH-Low bandwidth (26dB)



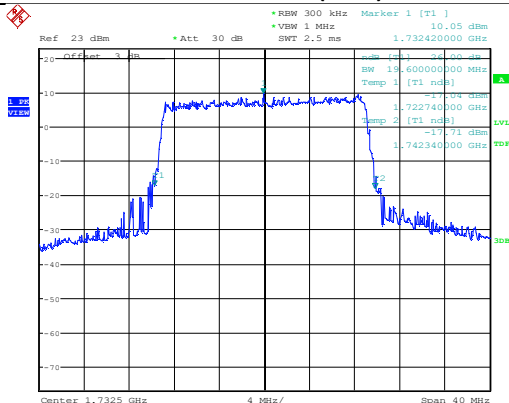
Date: 29.JUN.2020 16:47:56

## LTE Band 4 16QAM 20MHz CH-Low bandwidth (99%)



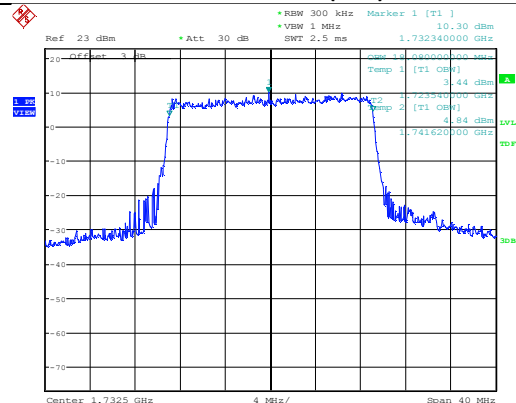
Date: 29.JUN.2020 16:49:26

## LTE Band 4 16QAM 20MHz CH-Middle bandwidth (26dB)



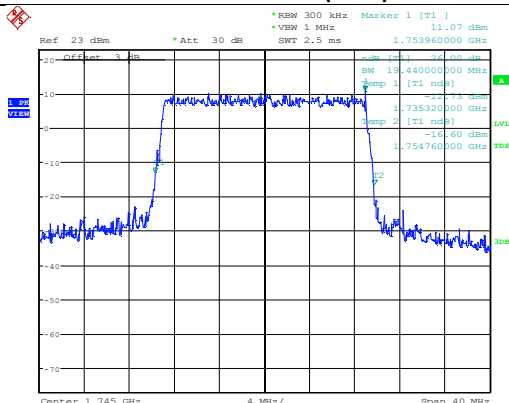
Date: 29.JUN.2020 16:51:01

## LTE Band 4 16QAM 20MHz CH-Middle bandwidth (99%)



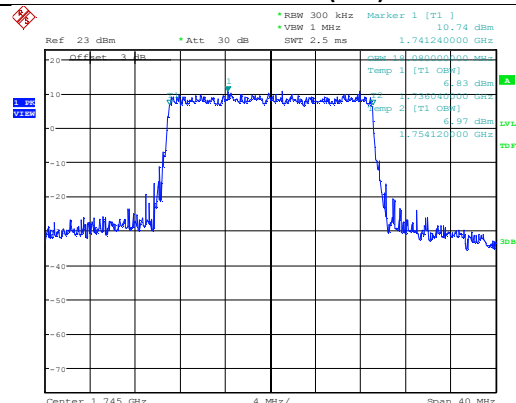
Date: 29.JUN.2020 16:51:38

## LTE Band 4 16QAM 20MHz CH-High bandwidth (26dB)



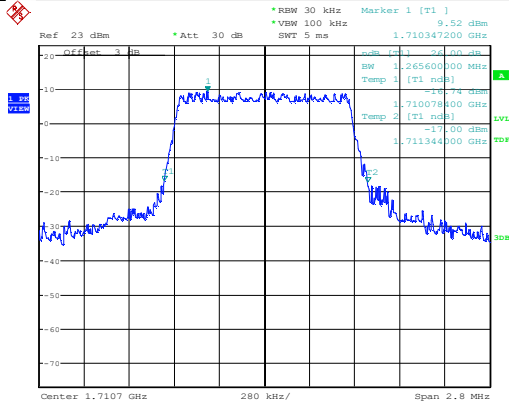
Date: 29.JUN.2020 16:53:09

## LTE Band 4 16QAM 20MHz CH-High bandwidth (99%)



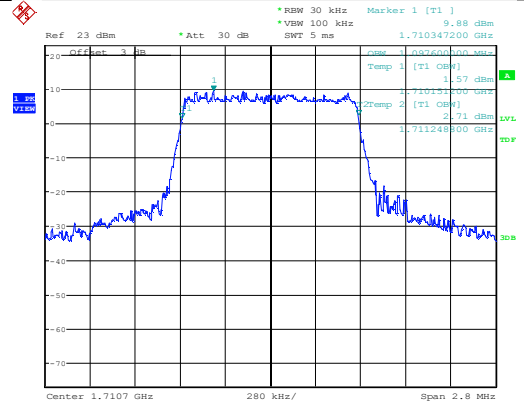
Date: 29.JUN.2020 16:53:24

## LTE Band 4 64QAM 1.4MHz CH-Low bandwidth (26dB)



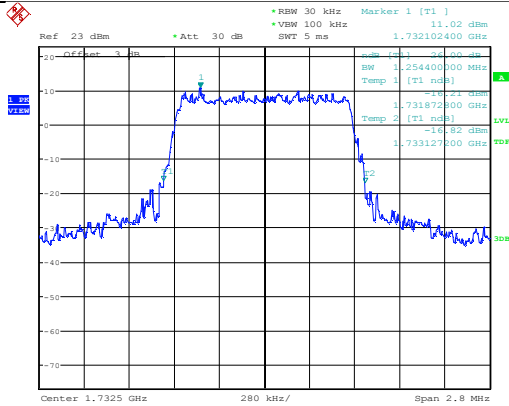
Date: 29.JUN.2020 16:10:04

## LTE Band 4 64QAM 1.4MHz CH-Low bandwidth (99%)



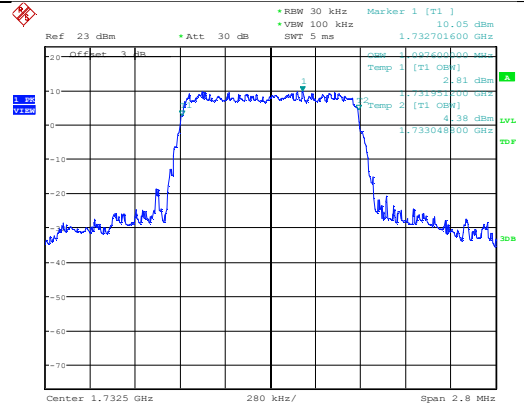
Date: 29.JUN.2020 16:10:24

## LTE Band 4 64QAM 1.4MHz CH-Middle bandwidth (26dB)



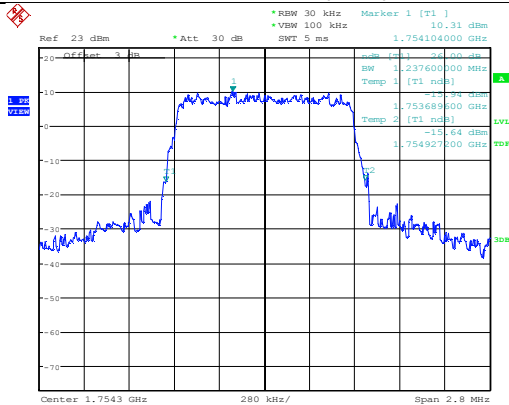
Date: 29.JUN.2020 16:09:21

## LTE Band 4 64QAM 1.4MHz CH-Middle bandwidth (99%)



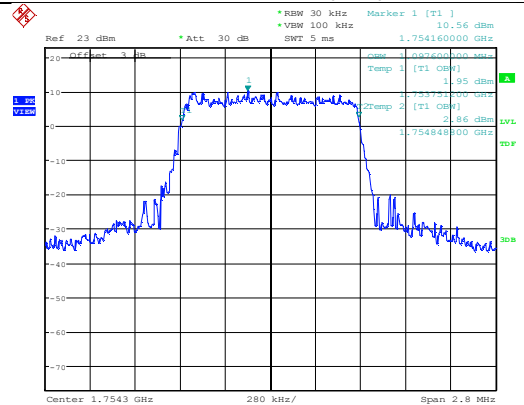
Date: 29.JUN.2020 16:09:36

## LTE Band 4 64QAM 1.4MHz CH-High bandwidth (26dB)

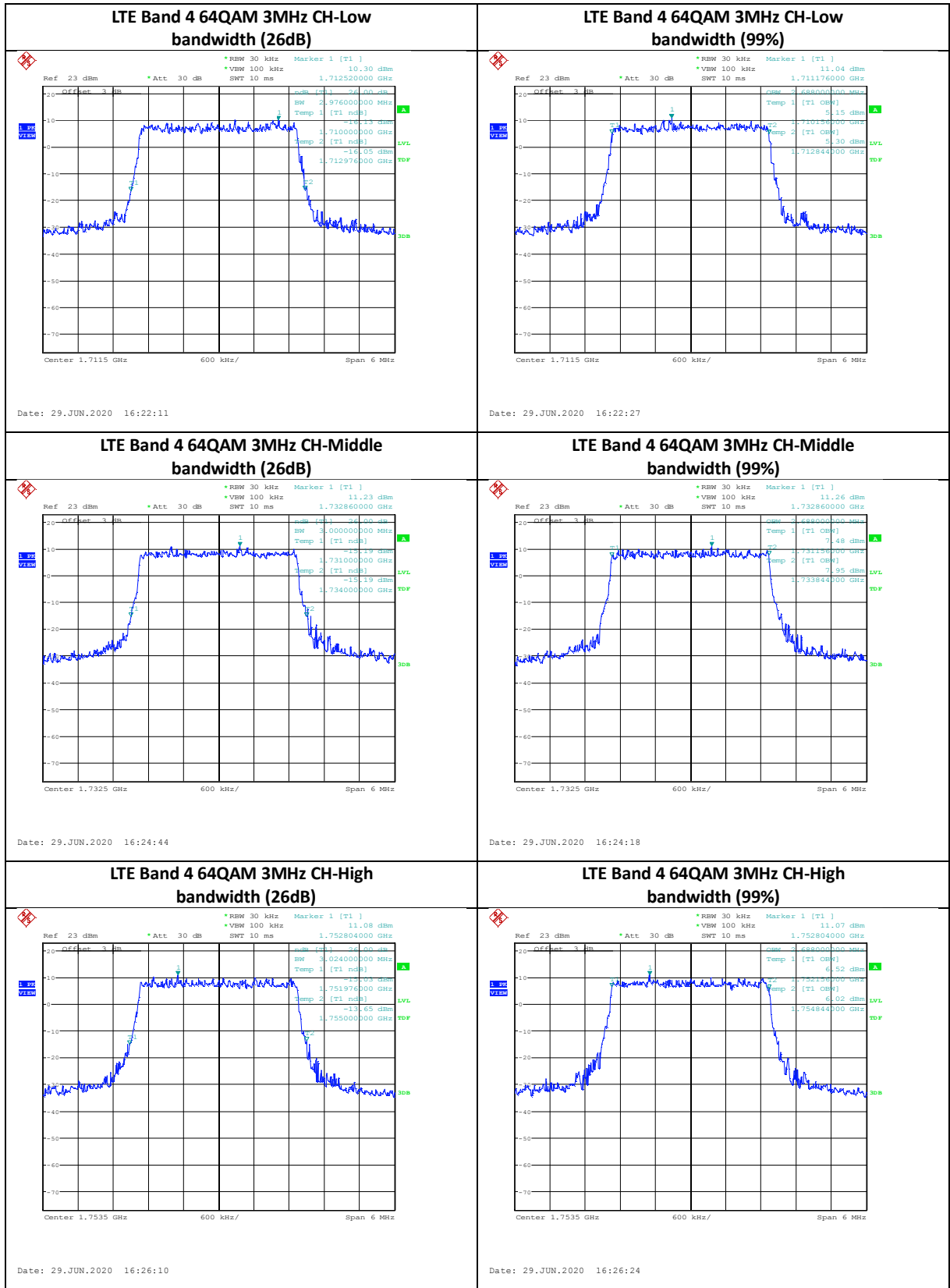


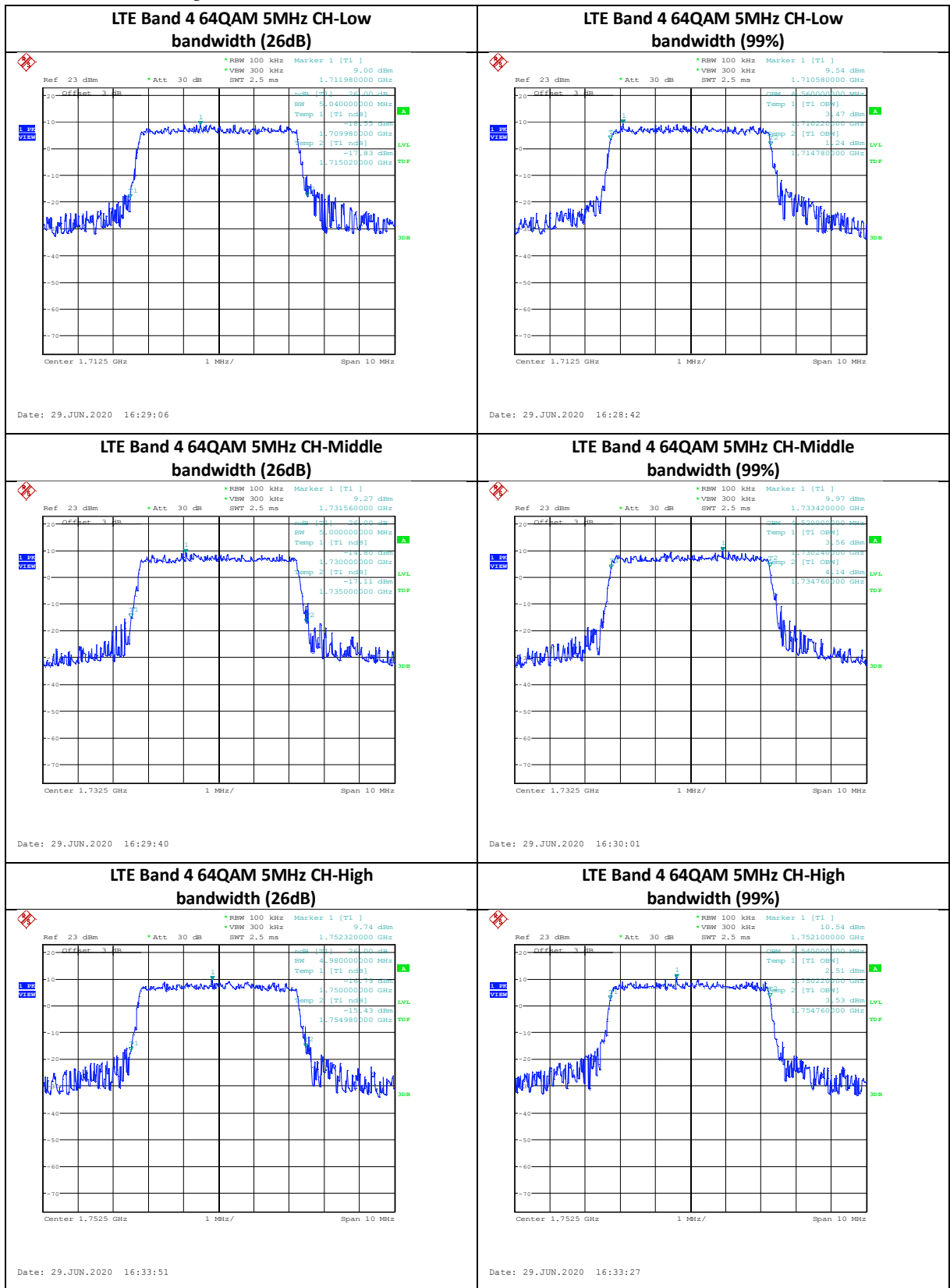
Date: 29.JUN.2020 16:08:17

## LTE Band 4 64QAM 1.4MHz CH-High bandwidth (99%)

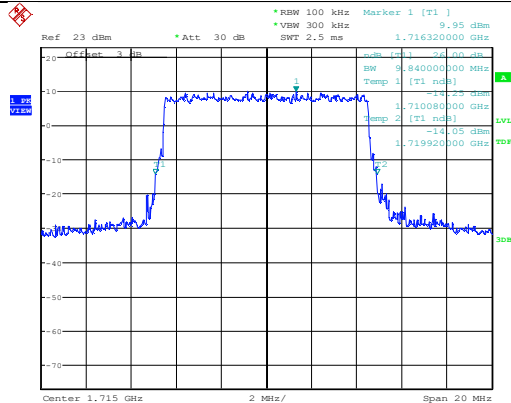


Date: 29.JUN.2020 16:08:31



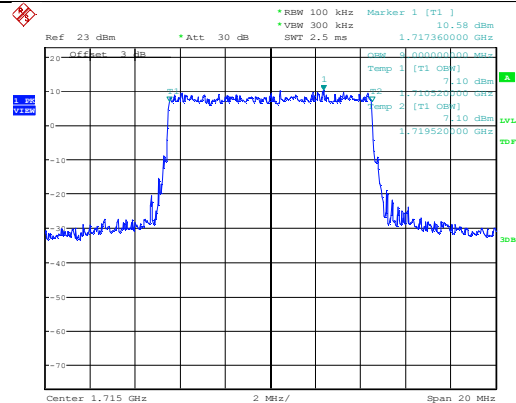


## LTE Band 4 64QAM 10MHz CH-Low bandwidth (26dB)



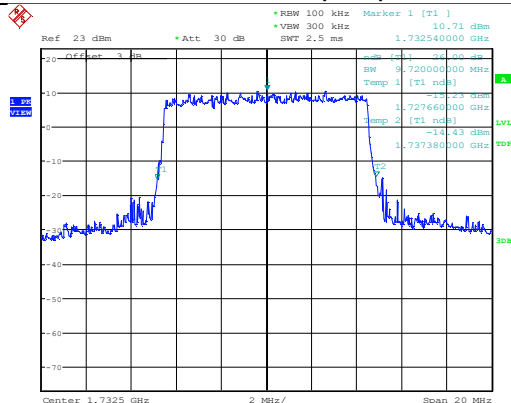
Date: 29.JUN.2020 16:35:00

## LTE Band 4 64QAM 10MHz CH-Low bandwidth (99%)



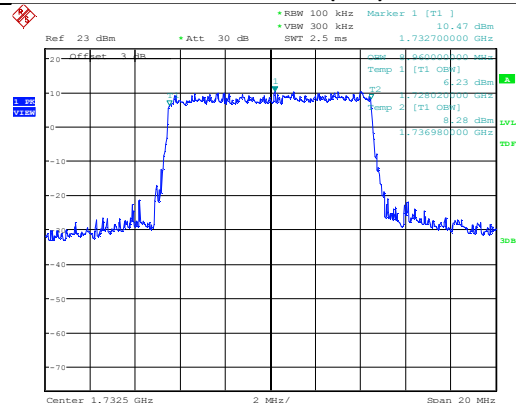
Date: 29.JUN.2020 16:35:18

## LTE Band 4 64QAM 10MHz CH-Middle bandwidth (26dB)



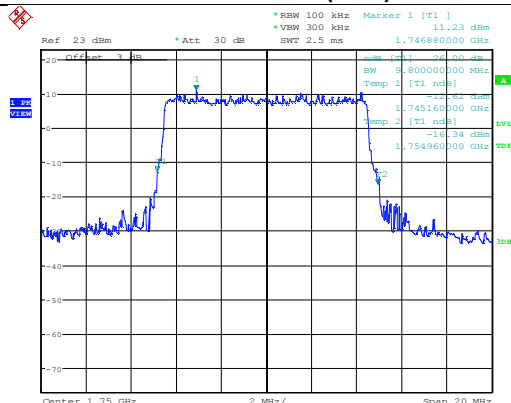
Date: 29.JUN.2020 16:37:50

## LTE Band 4 64QAM 10MHz CH-Middle bandwidth (99%)



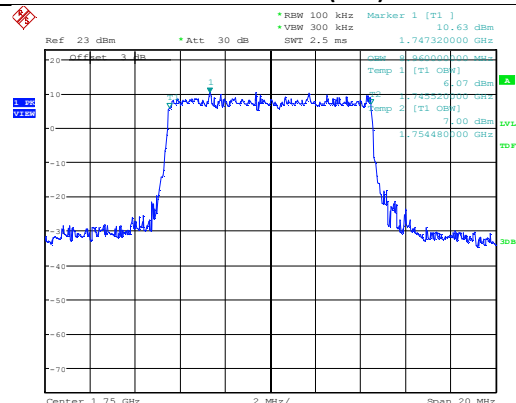
Date: 29.JUN.2020 16:37:26

## LTE Band 4 64QAM 10MHz CH-High bandwidth (26dB)



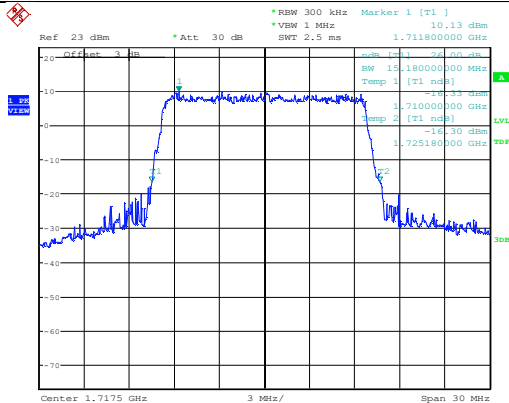
Date: 29.JUN.2020 16:38:41

## LTE Band 4 64QAM 10MHz CH-High bandwidth (99%)



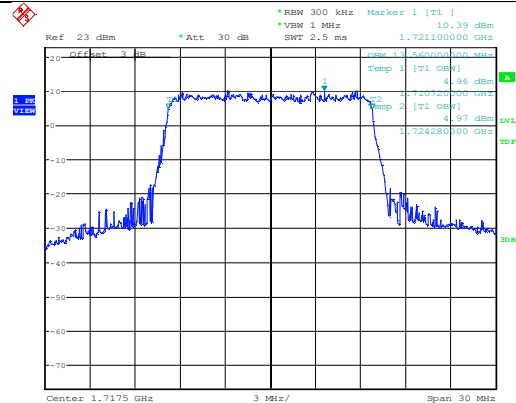
Date: 29.JUN.2020 16:40:02

## LTE Band 4 64QAM 15MHz CH-Low bandwidth (26dB)



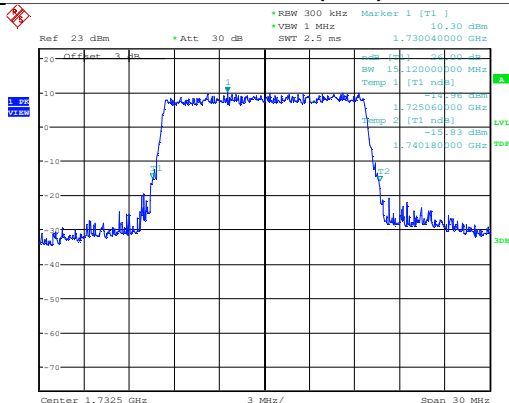
Date: 29.JUN.2020 16:40:58

## LTE Band 4 64QAM 15MHz CH-Low bandwidth (99%)



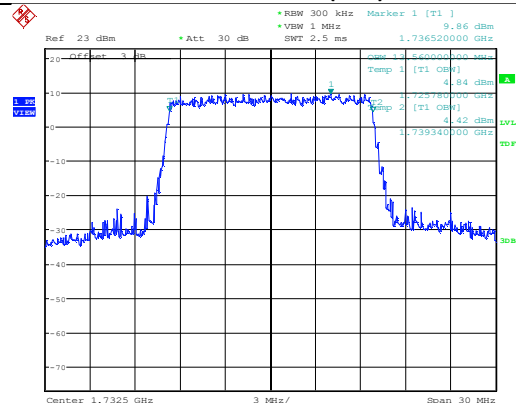
Date: 29.JUN.2020 16:42:27

## LTE Band 4 64QAM 15MHz CH-Middle bandwidth (26dB)



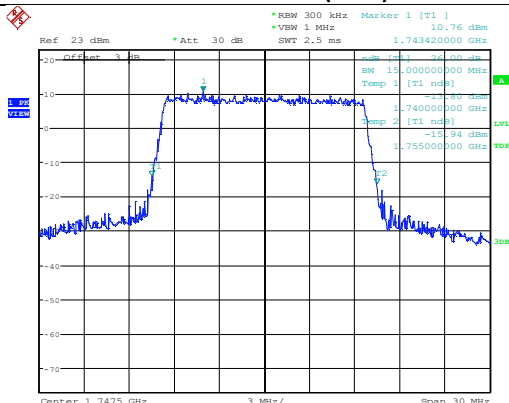
Date: 29.JUN.2020 16:43:05

## LTE Band 4 64QAM 15MHz CH-Middle bandwidth (99%)



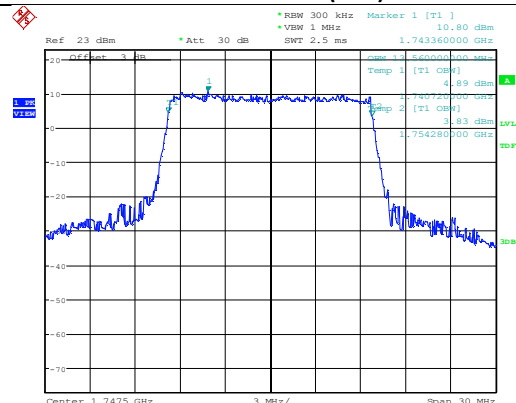
Date: 29.JUN.2020 16:44:03

## LTE Band 4 64QAM 15MHz CH-High bandwidth (26dB)



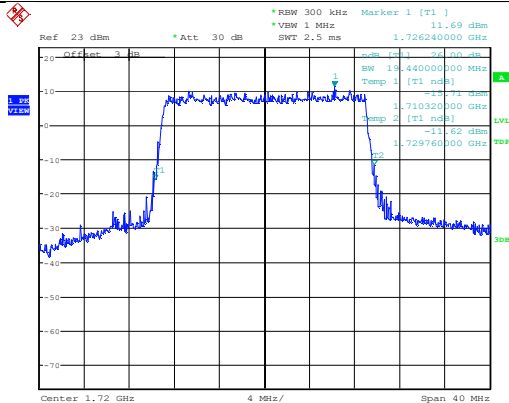
Date: 29.JUN.2020 16:44:48

## LTE Band 4 64QAM 15MHz CH-High bandwidth (99%)



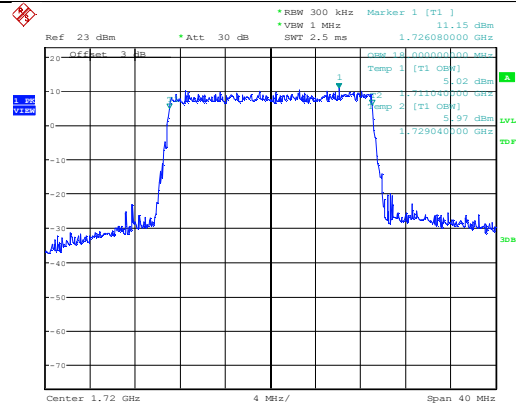
Date: 29.JUN.2020 16:46:33

## LTE Band 4 64QAM 20MHz CH-Low bandwidth (26dB)



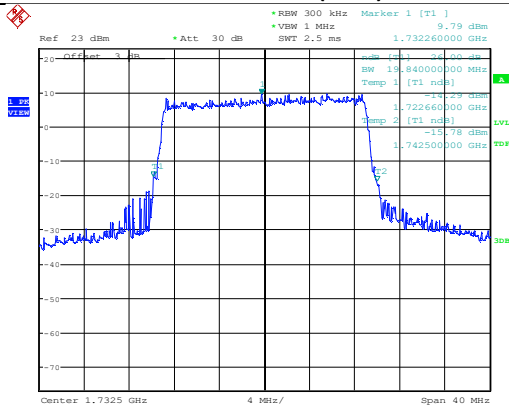
Date: 29.JUN.2020 16:47:38

## LTE Band 4 64QAM 20MHz CH-Low bandwidth (99%)



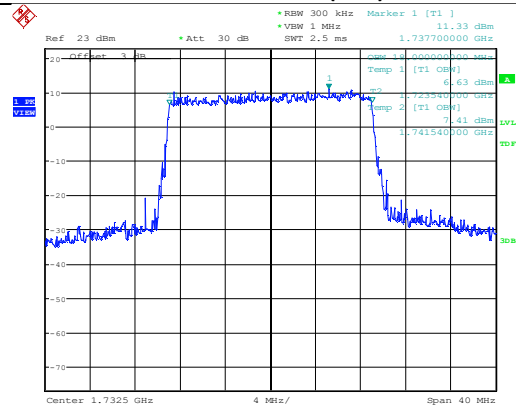
Date: 29.JUN.2020 16:49:46

## LTE Band 4 64QAM 20MHz CH-Middle bandwidth (26dB)



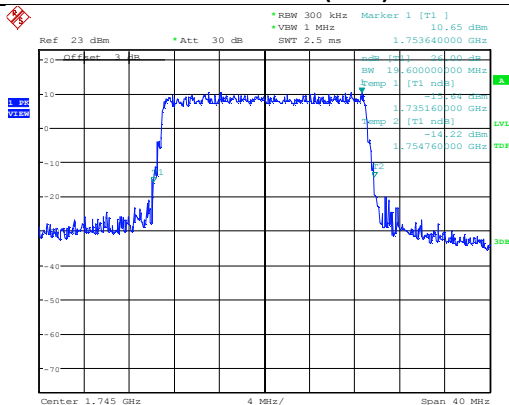
Date: 29.JUN.2020 16:50:33

## LTE Band 4 64QAM 20MHz CH-Middle bandwidth (99%)



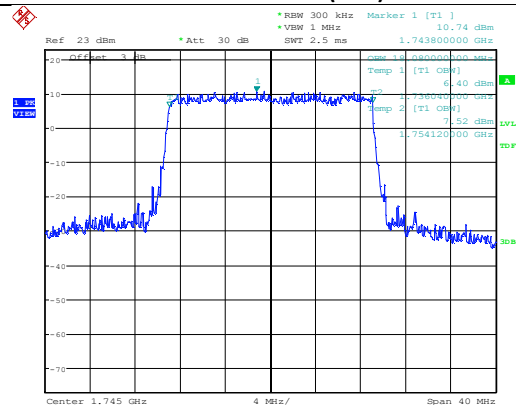
Date: 29.JUN.2020 16:52:16

## LTE Band 4 64QAM 20MHz CH-High bandwidth (26dB)



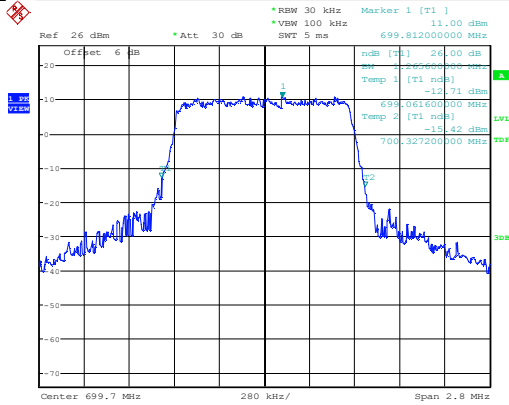
Date: 29.JUN.2020 16:52:49

## LTE Band 4 64QAM 20MHz CH-High bandwidth (99%)



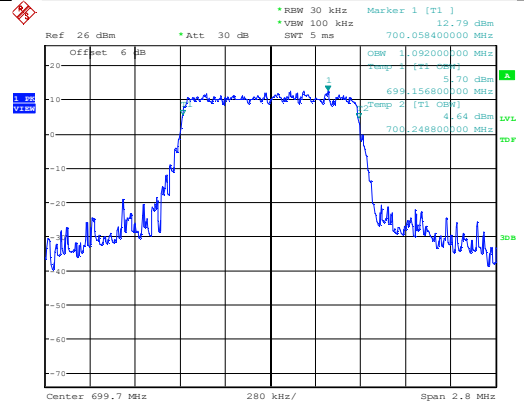
Date: 29.JUN.2020 16:53:43

## LTE Band 12 QPSK 1.4MHz CH-Low bandwidth (26dB)



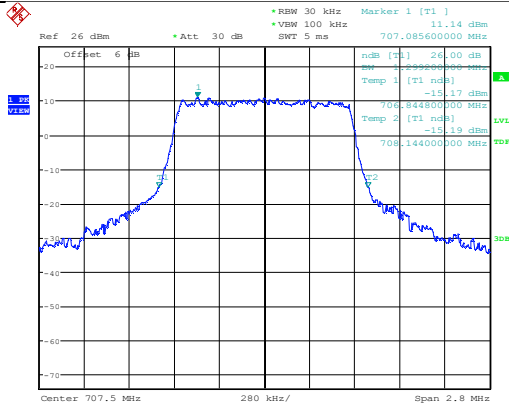
Date: 29.JUN.2020 17:59:58

## LTE Band 12 QPSK 1.4MHz CH-Low bandwidth (99%)



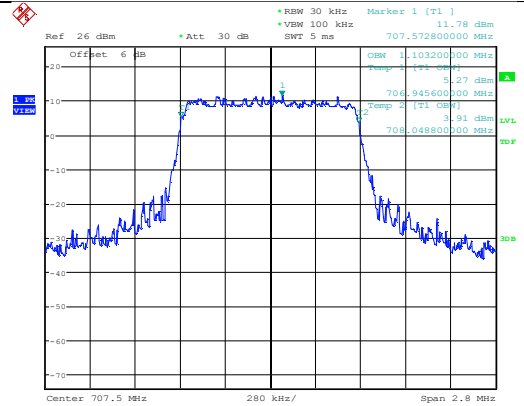
Date: 29.JUN.2020 18:02:10

## LTE Band 12 QPSK 1.4MHz CH-Middle bandwidth (26dB)



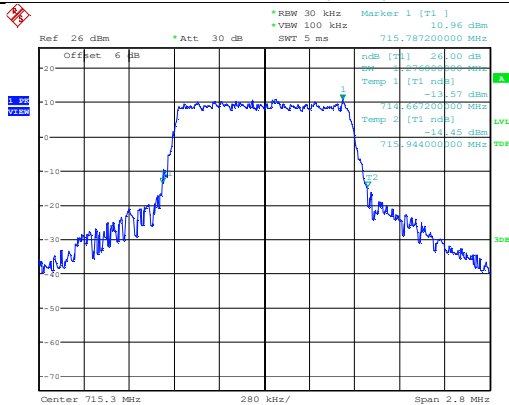
Date: 29.JUN.2020 18:03:41

## LTE Band 12 QPSK 1.4MHz CH-Middle bandwidth (99%)



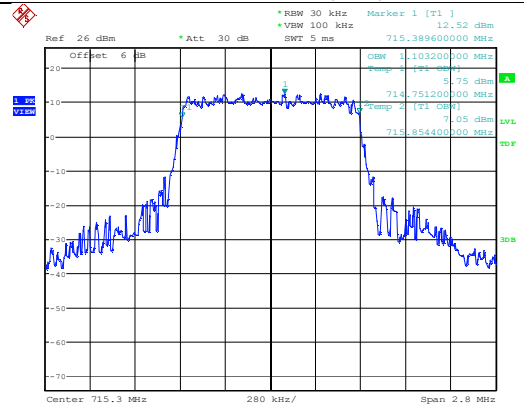
Date: 29.JUN.2020 18:04:02

## LTE Band 12 QPSK 1.4MHz CH-High bandwidth (26dB)

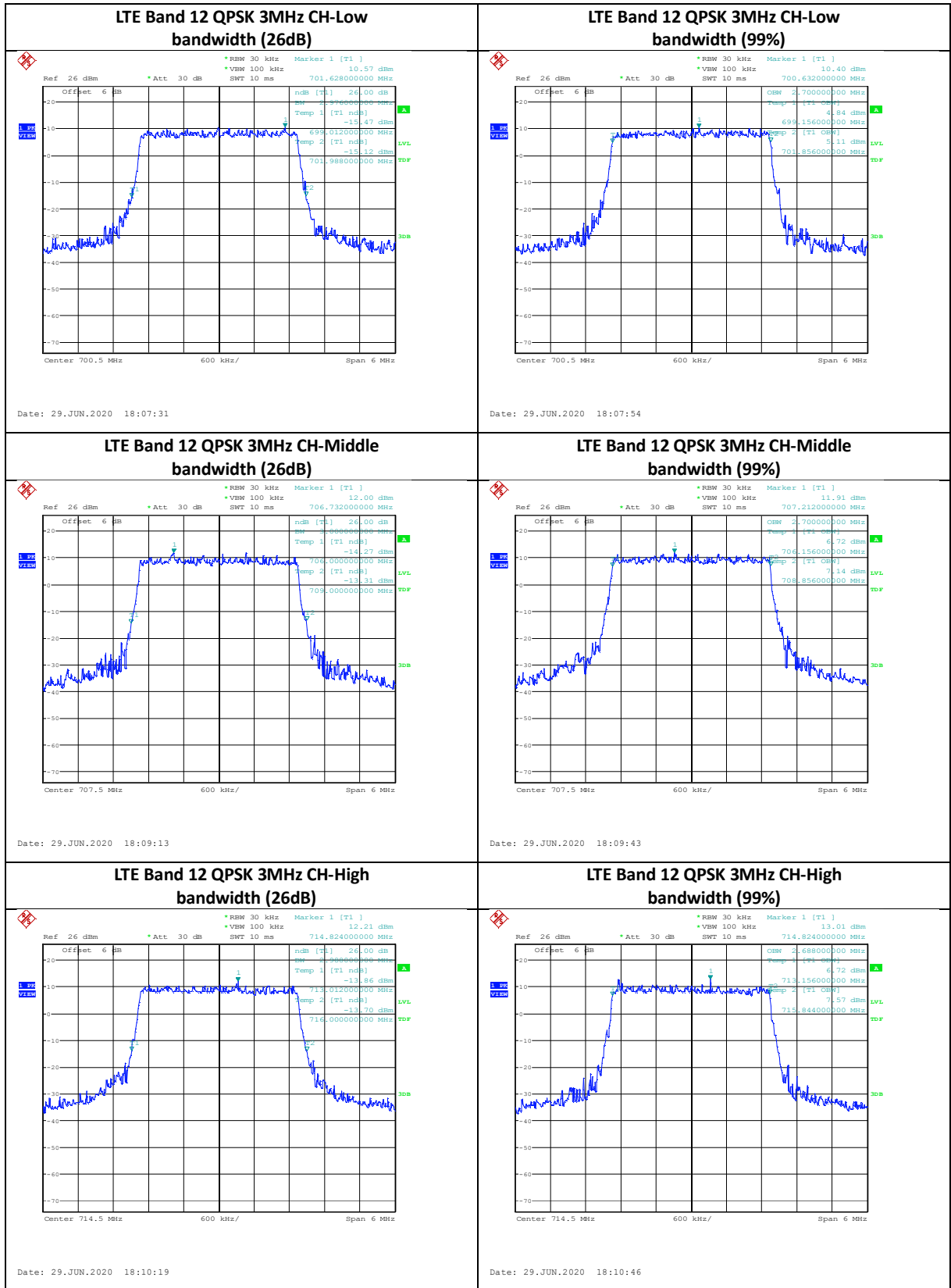


Date: 29.JUN.2020 18:06:22

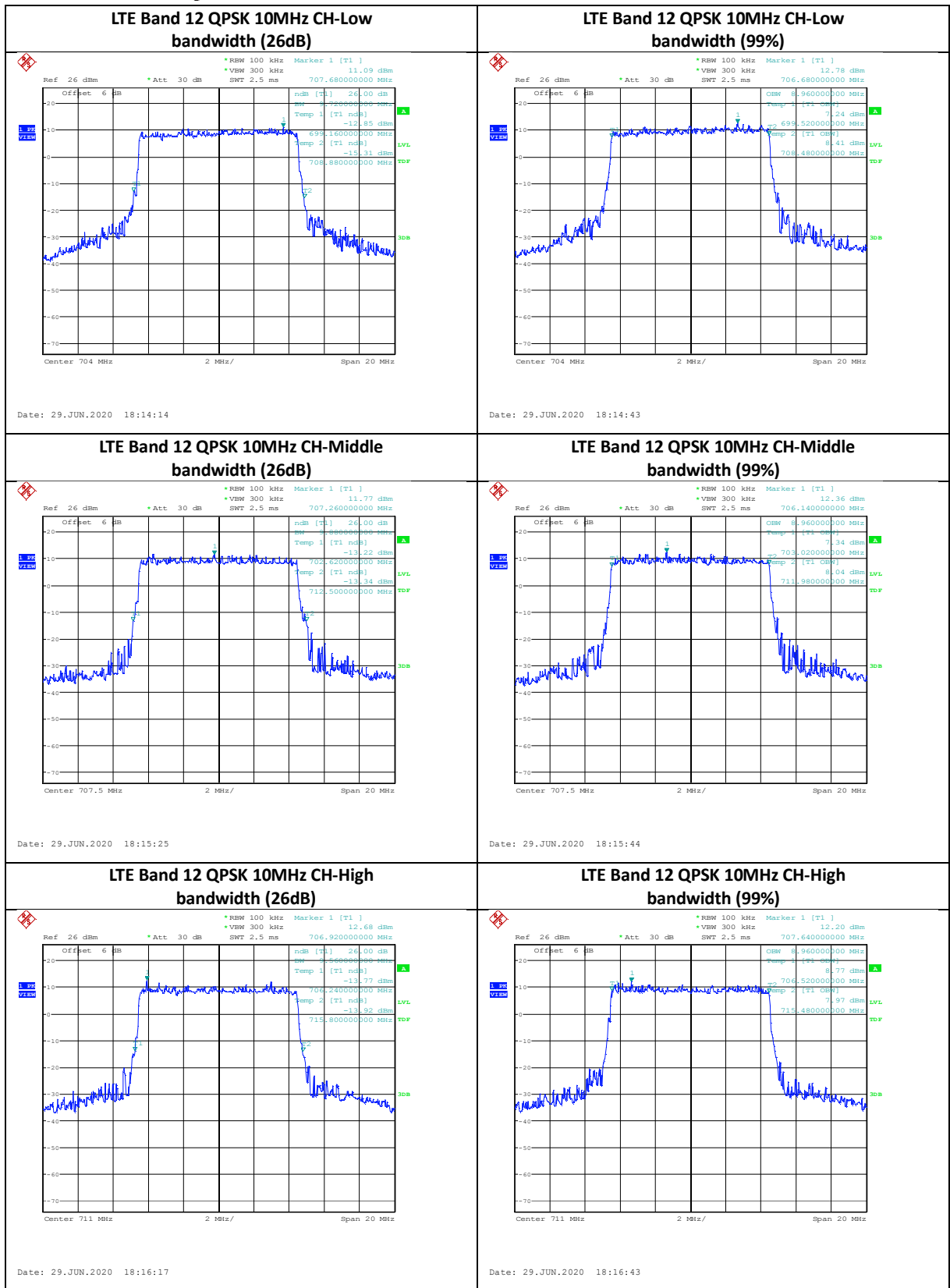
## LTE Band 12 QPSK 1.4MHz CH-High bandwidth (99%)

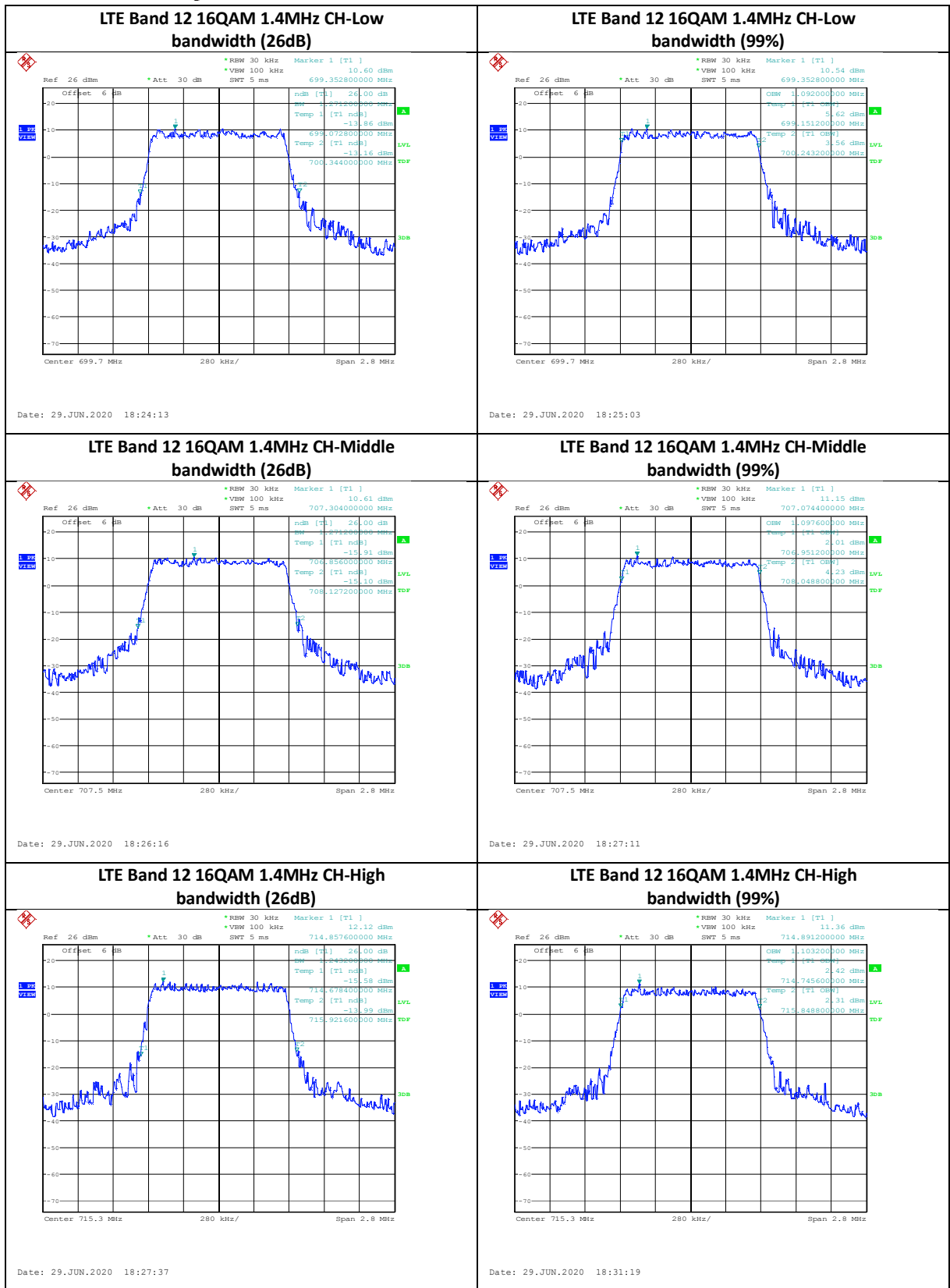


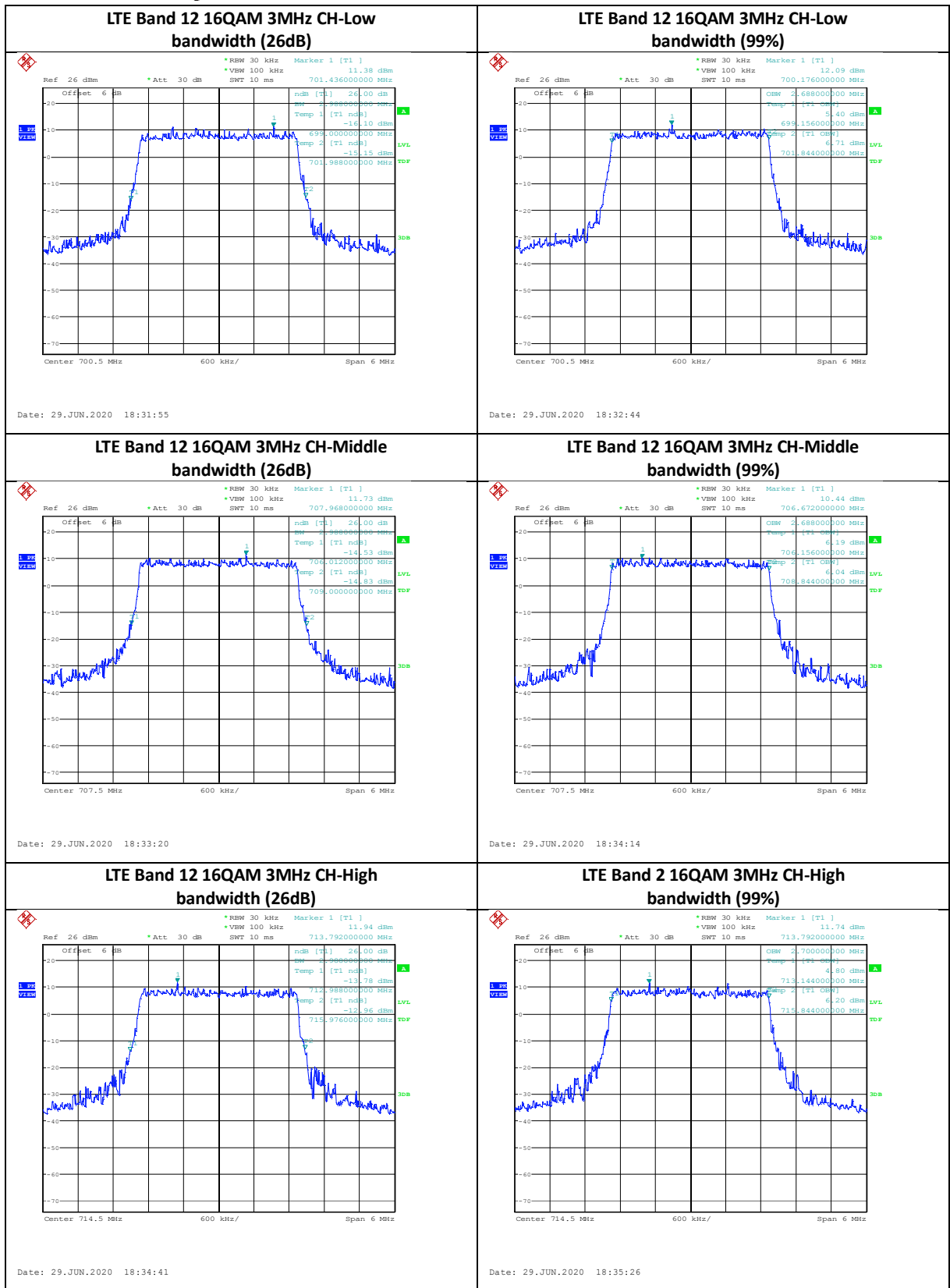
Date: 29.JUN.2020 18:05:57



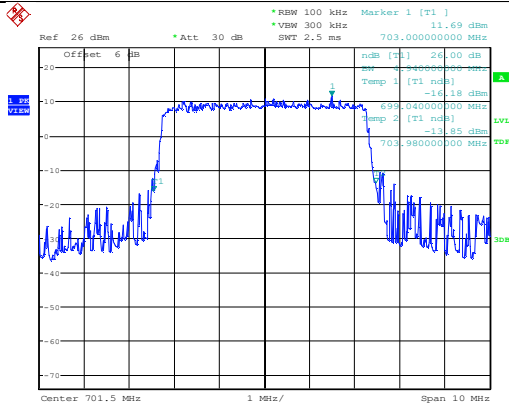






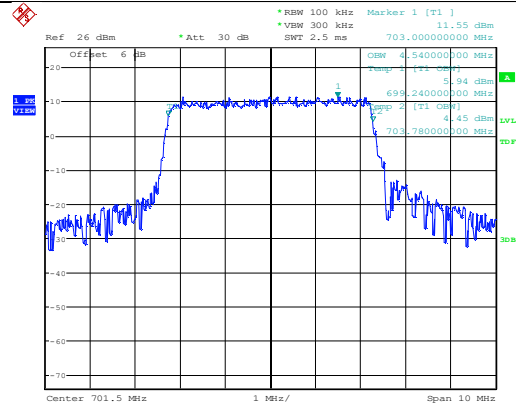


**LTE Band 12 16QAM 5MHz CH-Low  
bandwidth (26dB)**



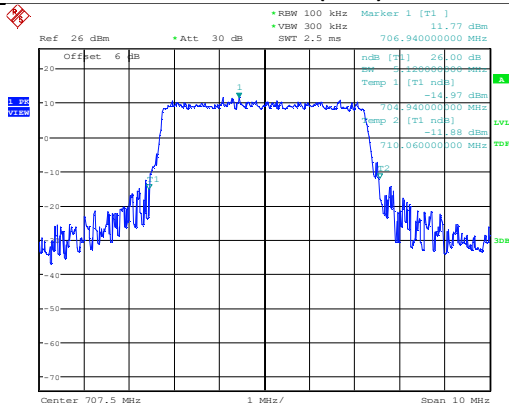
Date: 29.JUN.2020 18:36:20

**LTE Band 12 16QAM 5MHz CH-Low  
bandwidth (99%)**



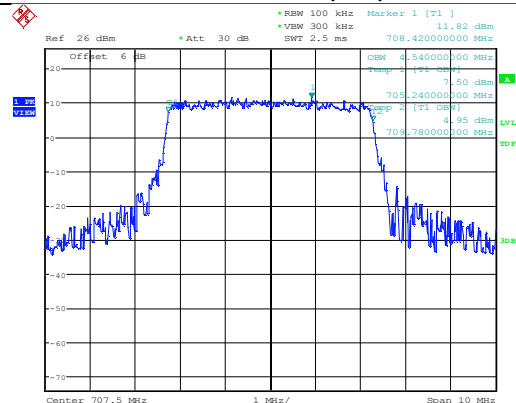
Date: 29.JUN.2020 18:36:59

**LTE Band 12 16QAM 5MHz CH-Middle  
bandwidth (26dB)**



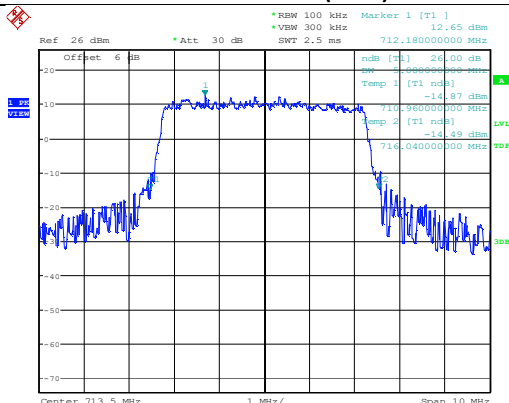
Date: 29.JUN.2020 18:38:21

**LTE Band 12 16QAM 5MHz CH-Middle  
bandwidth (99%)**



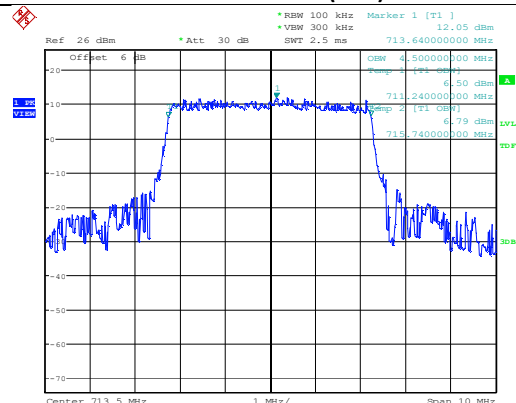
Date: 29.JUN.2020 18:39:36

**LTE Band 12 16QAM 5MHz CH-High  
bandwidth (26dB)**

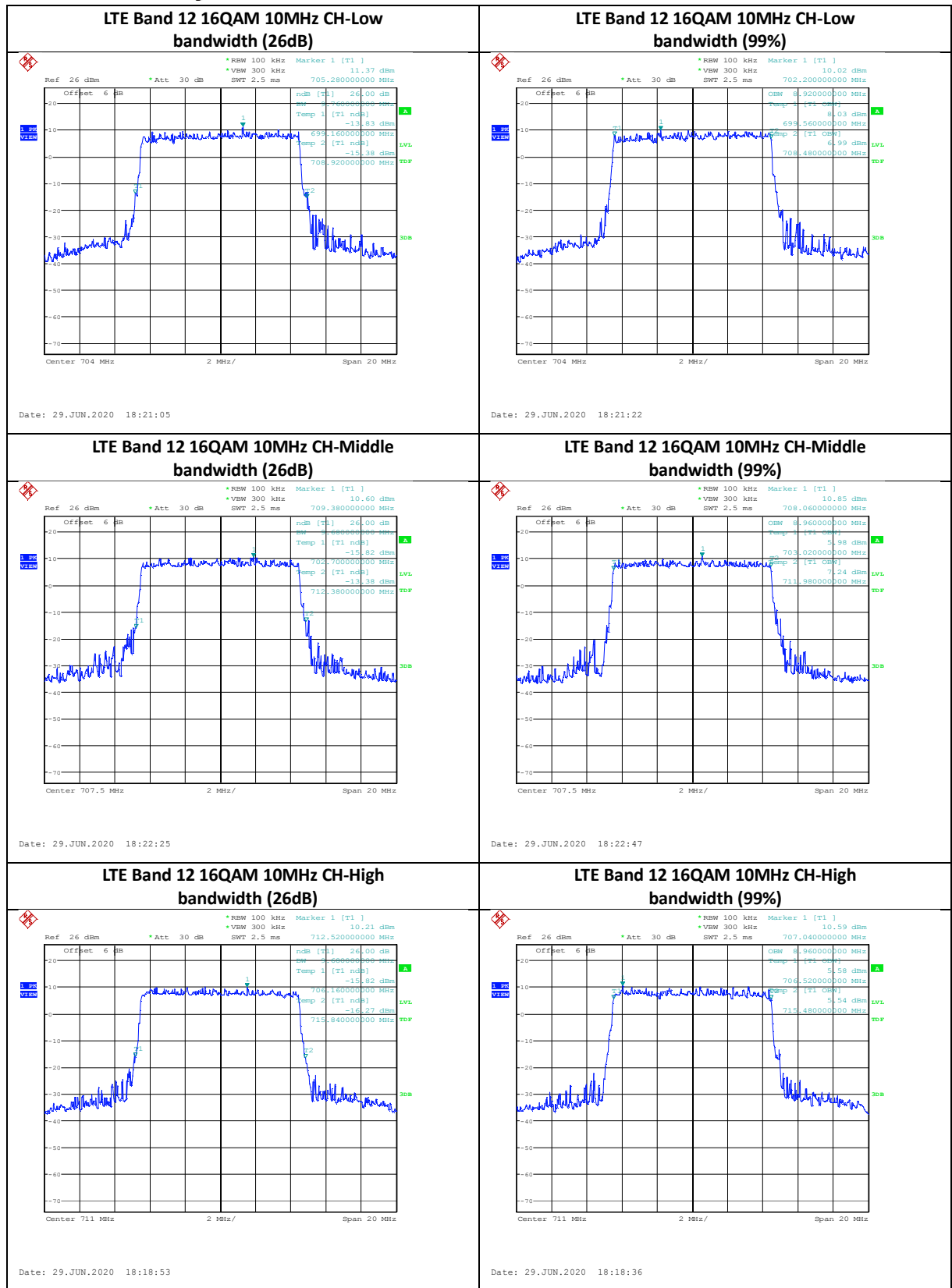


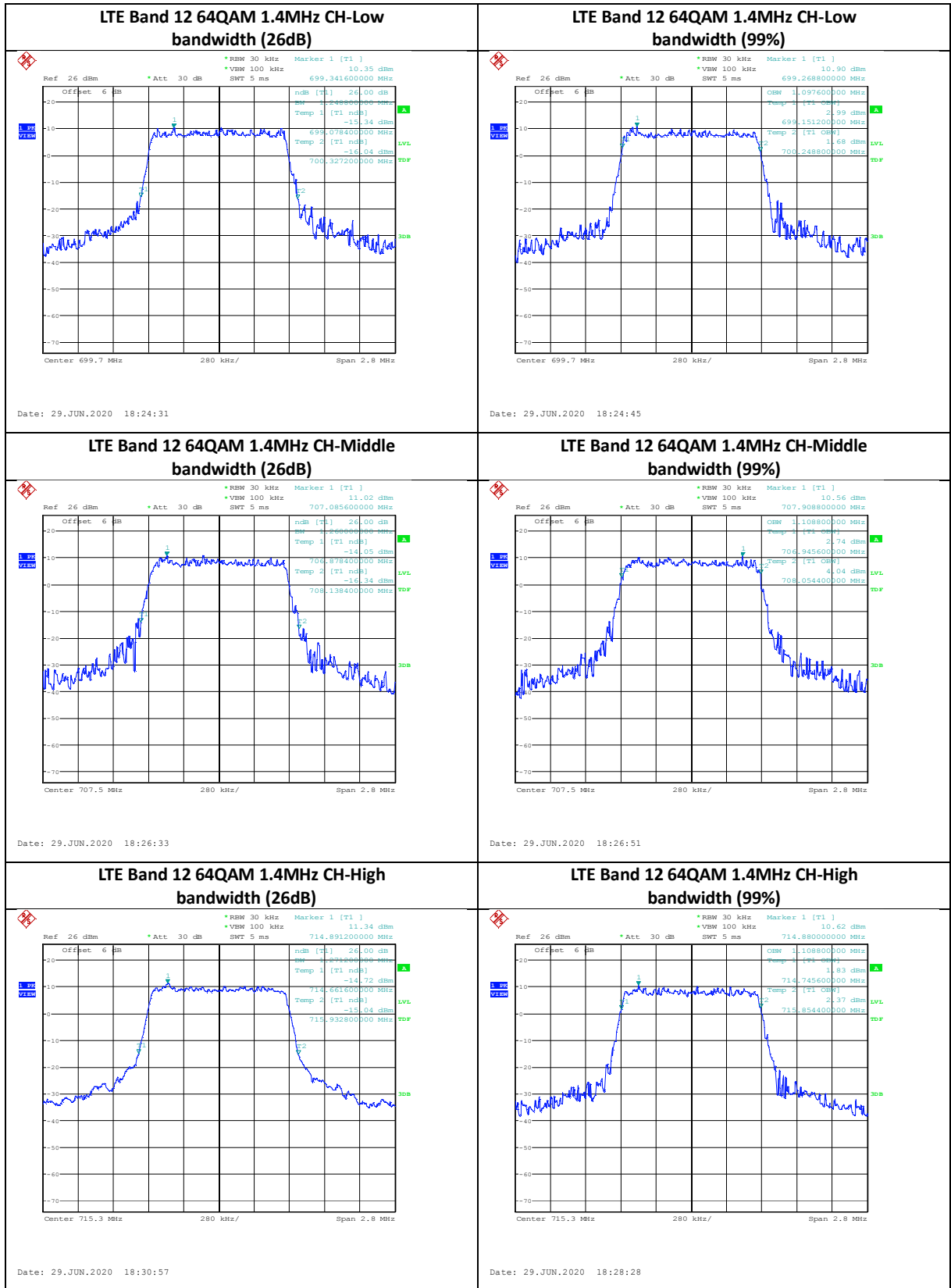
Date: 29.JUN.2020 18:40:54

**LTE Band 12 16QAM 5MHz CH-High  
bandwidth (99%)**

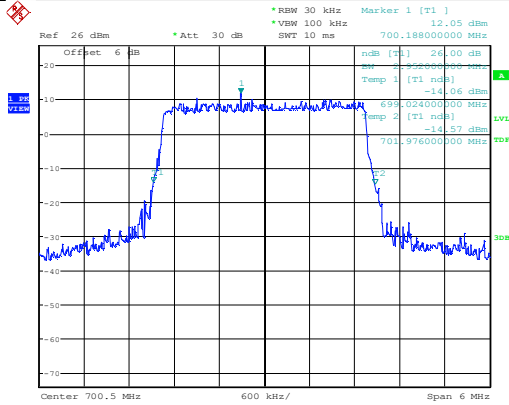


Date: 29.JUN.2020 18:41:40



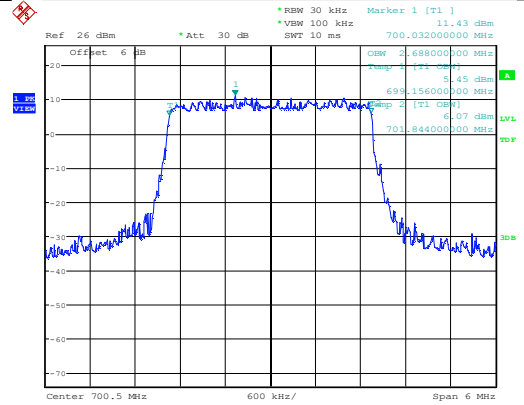


## LTE Band 12 64QAM 3MHz CH-Low bandwidth (26dB)



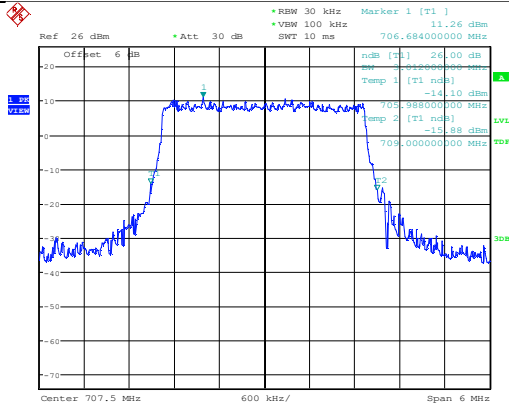
Date: 29.JUN.2020 18:32:11

## LTE Band 12 64QAM 3MHz CH-Low bandwidth (99%)



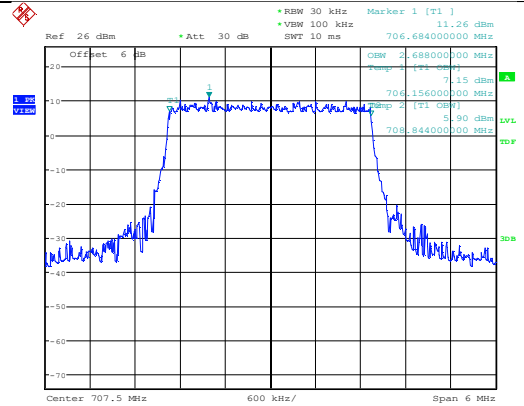
Date: 29.JUN.2020 18:32:30

## LTE Band 12 64QAM 3MHz CH-Middle bandwidth (26dB)



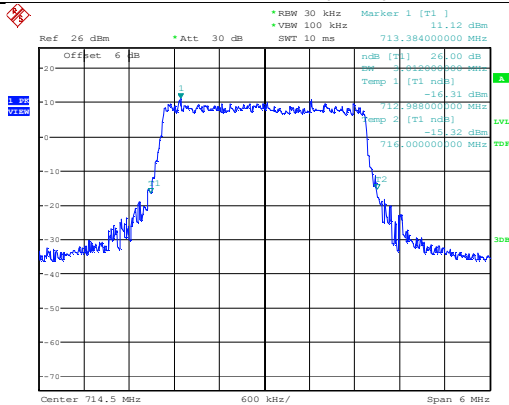
Date: 29.JUN.2020 18:33:39

## LTE Band 12 64QAM 3MHz CH-Middle bandwidth (99%)



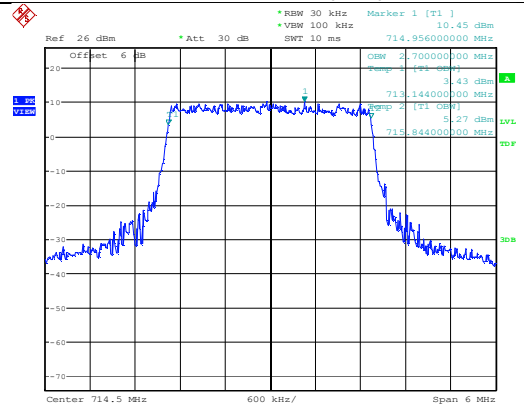
Date: 29.JUN.2020 18:33:56

## LTE Band 12 64QAM 3MHz CH-High bandwidth (26dB)

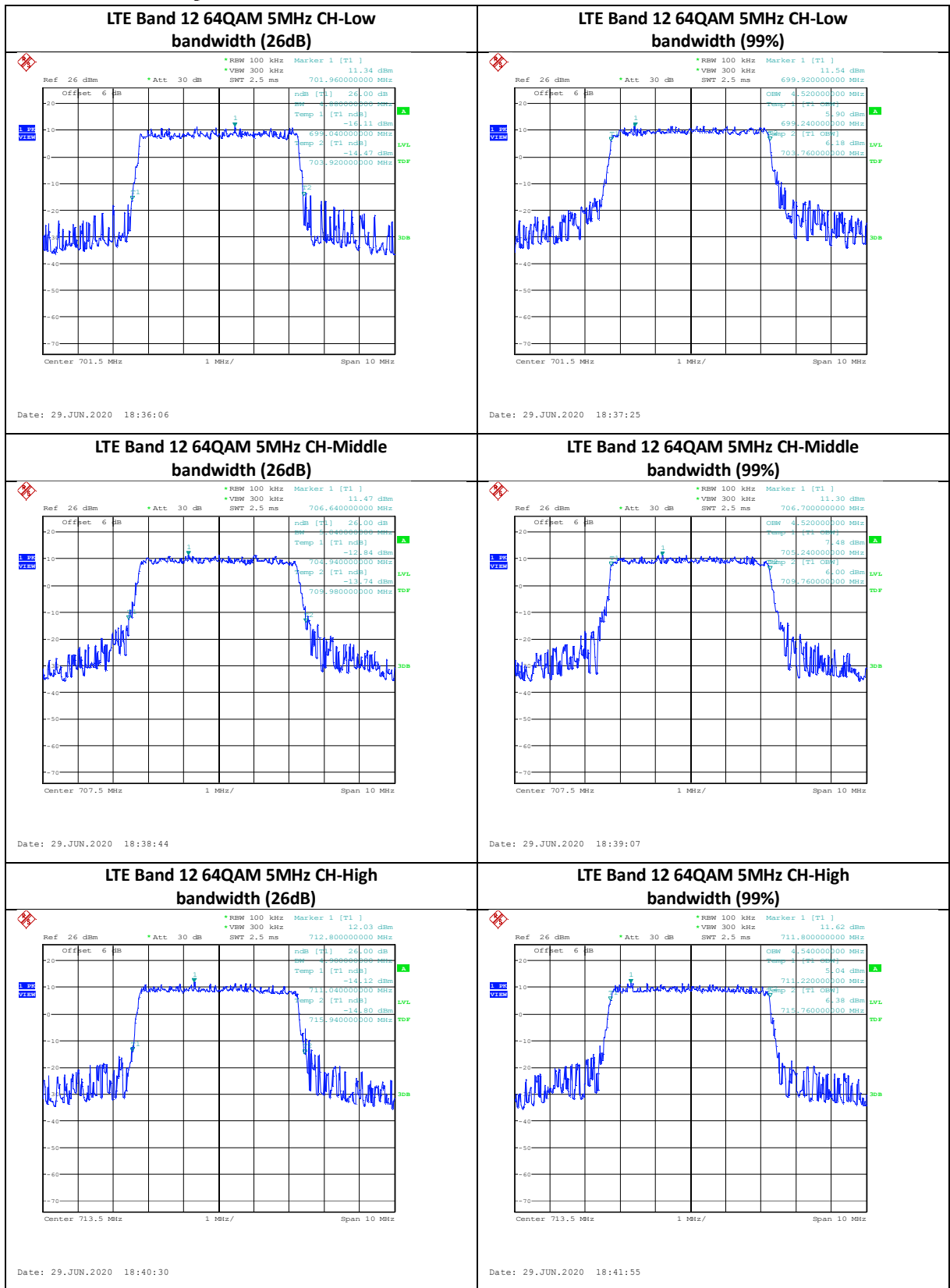


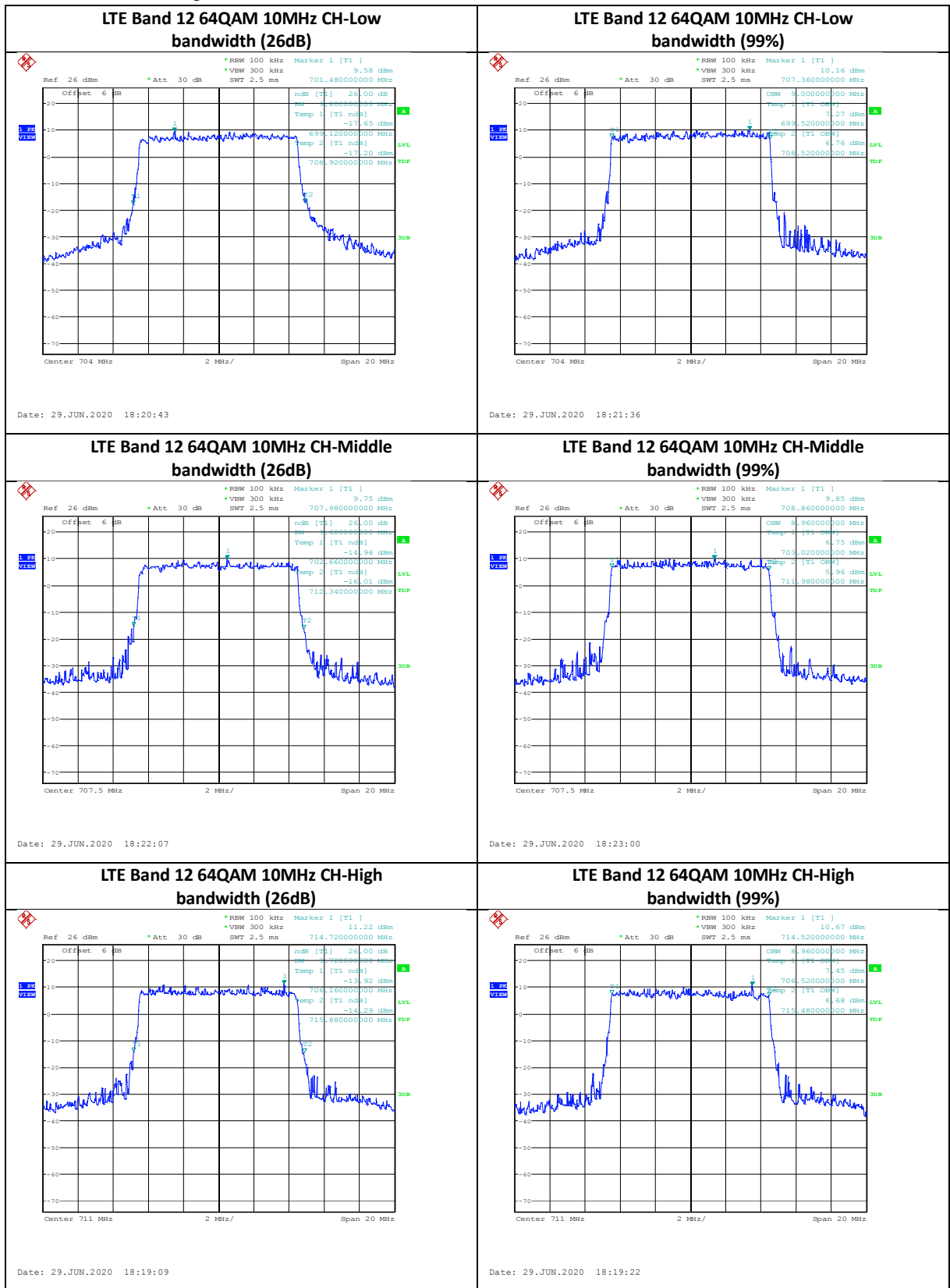
Date: 29.JUN.2020 18:34:55

## LTE Band 12 64QAM 3MHz CH-High bandwidth (99%)



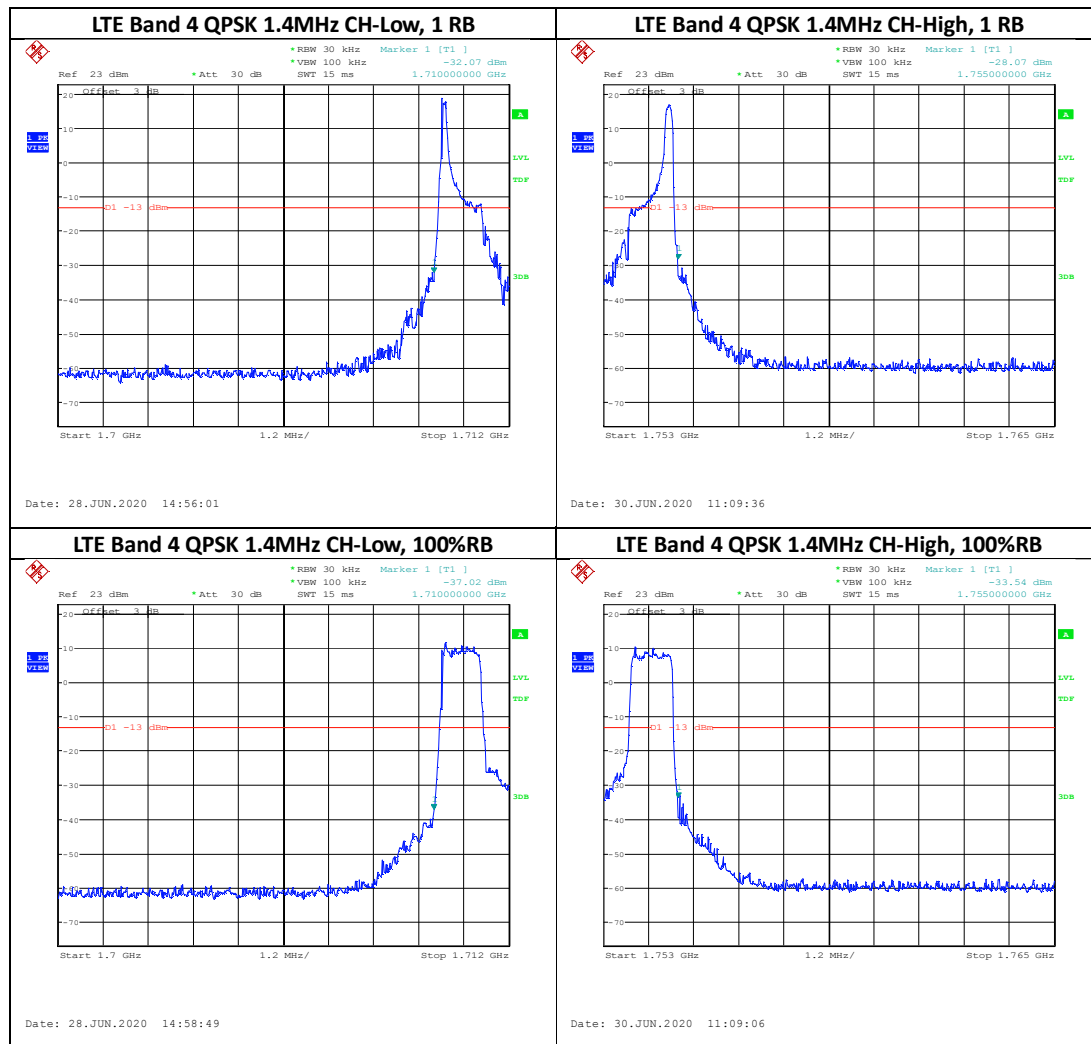
Date: 29.JUN.2020 18:35:12

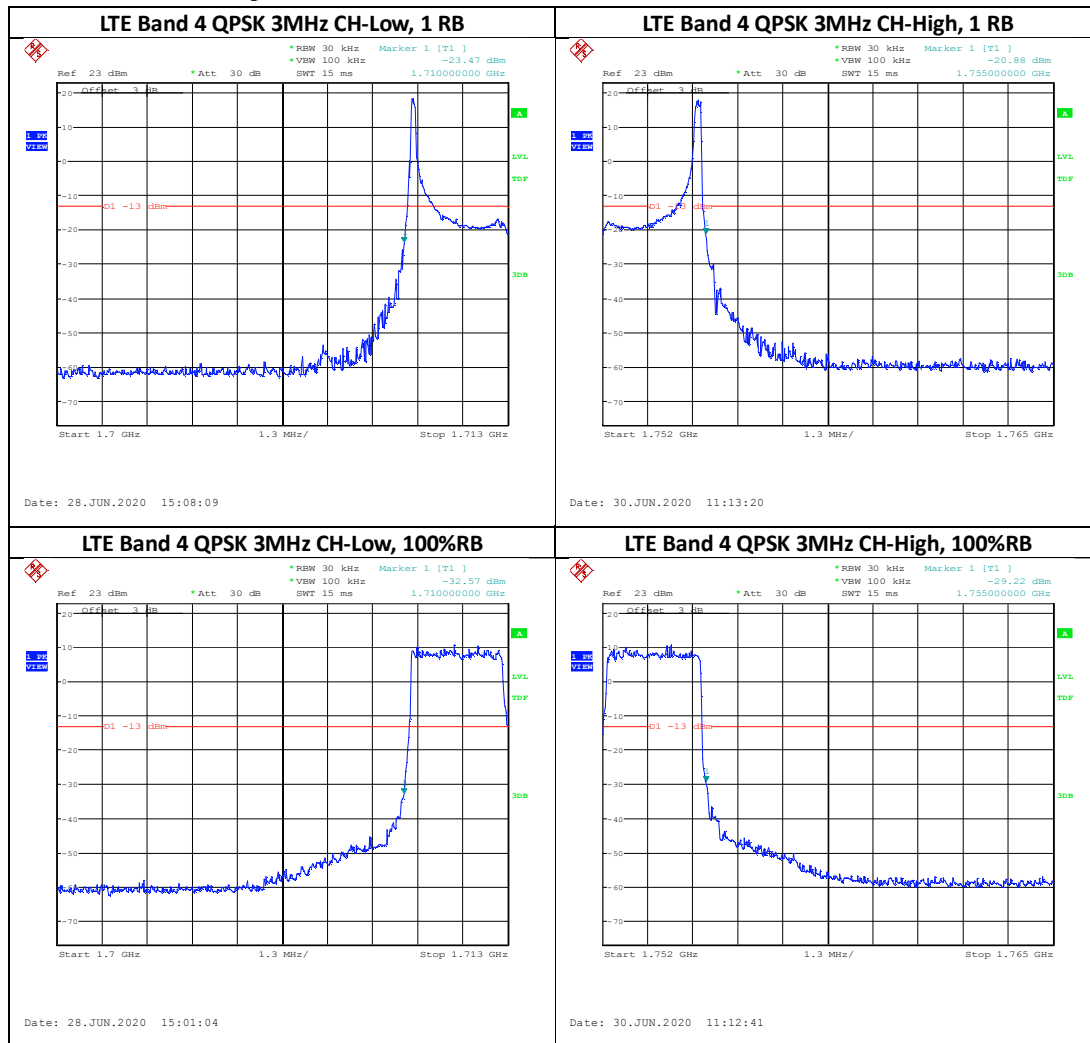


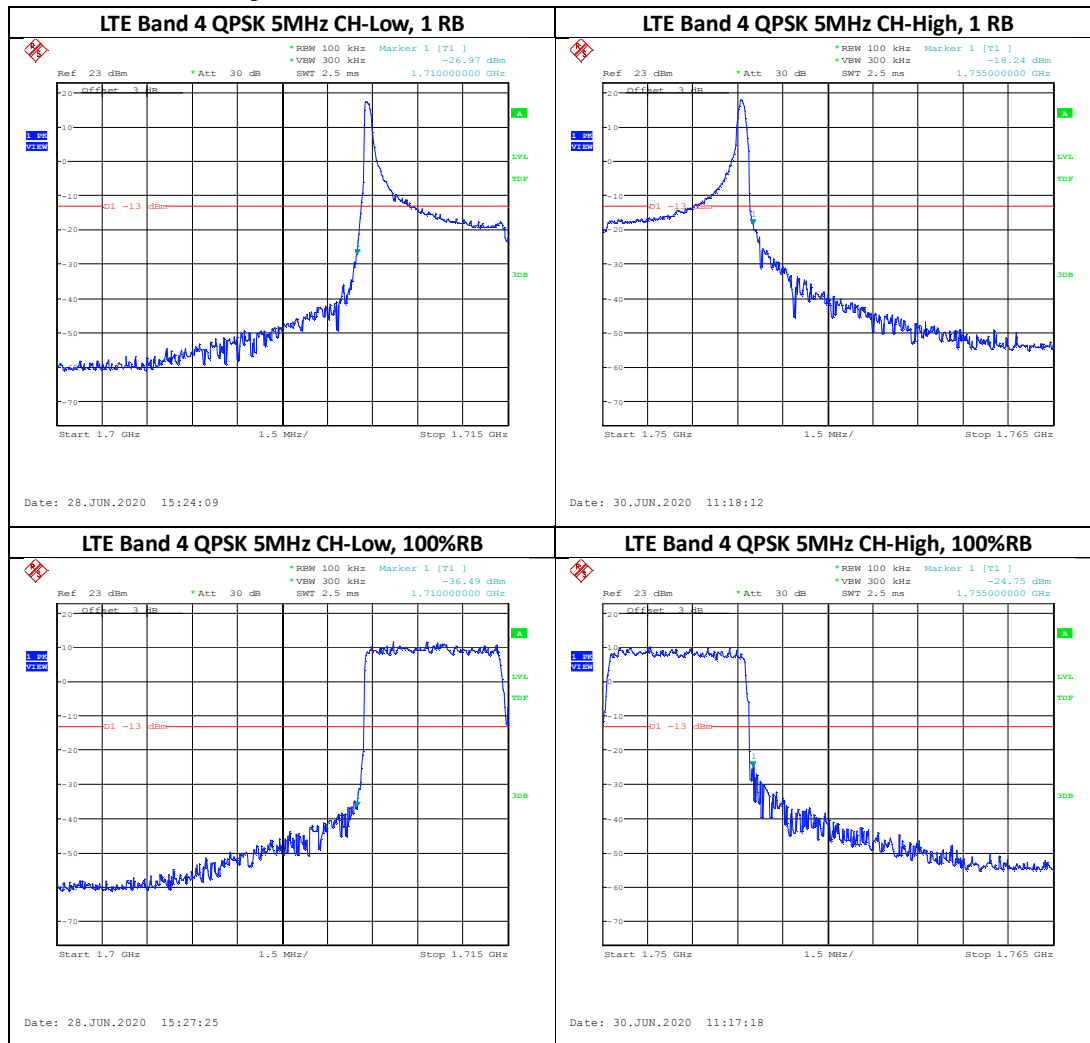


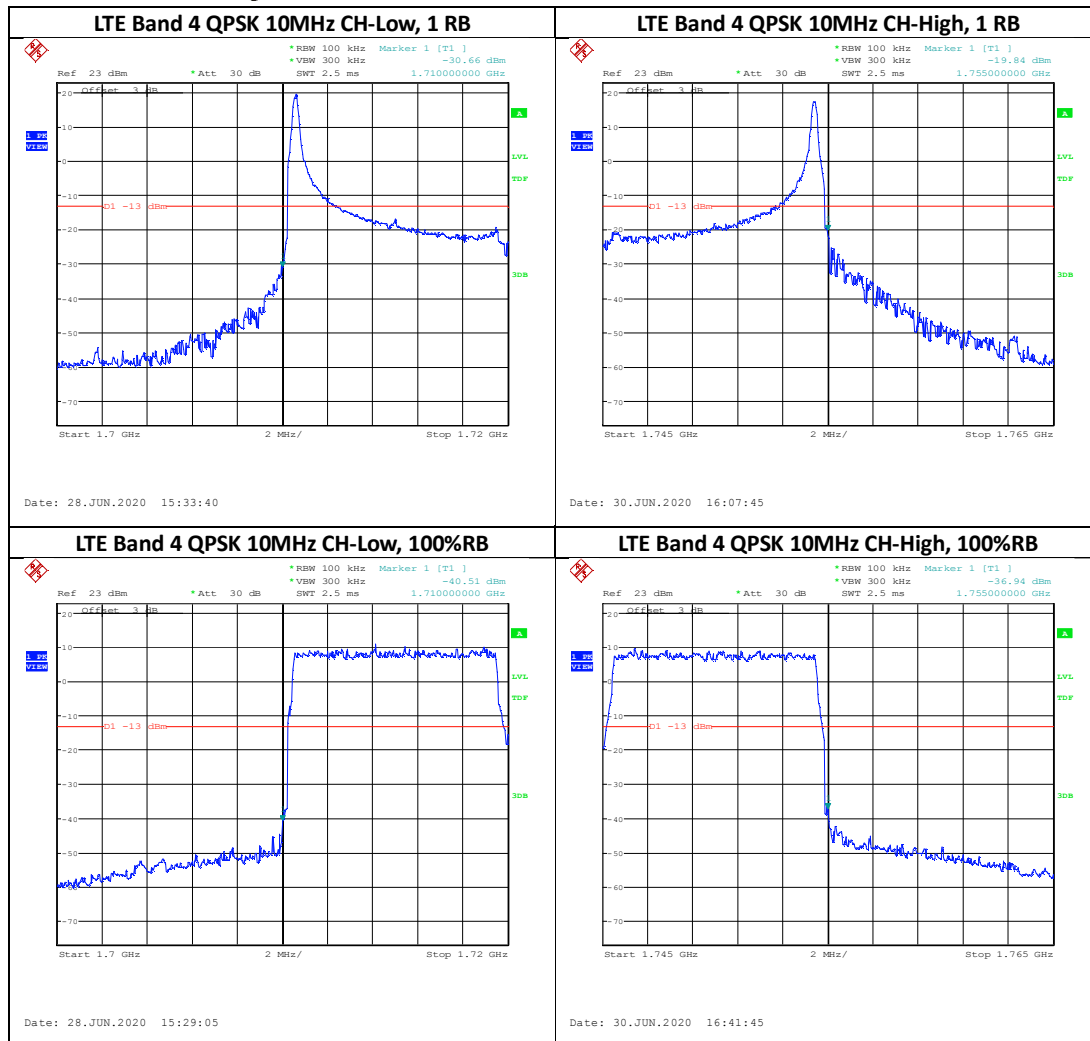
## AppendixD: Band Edge Measurement

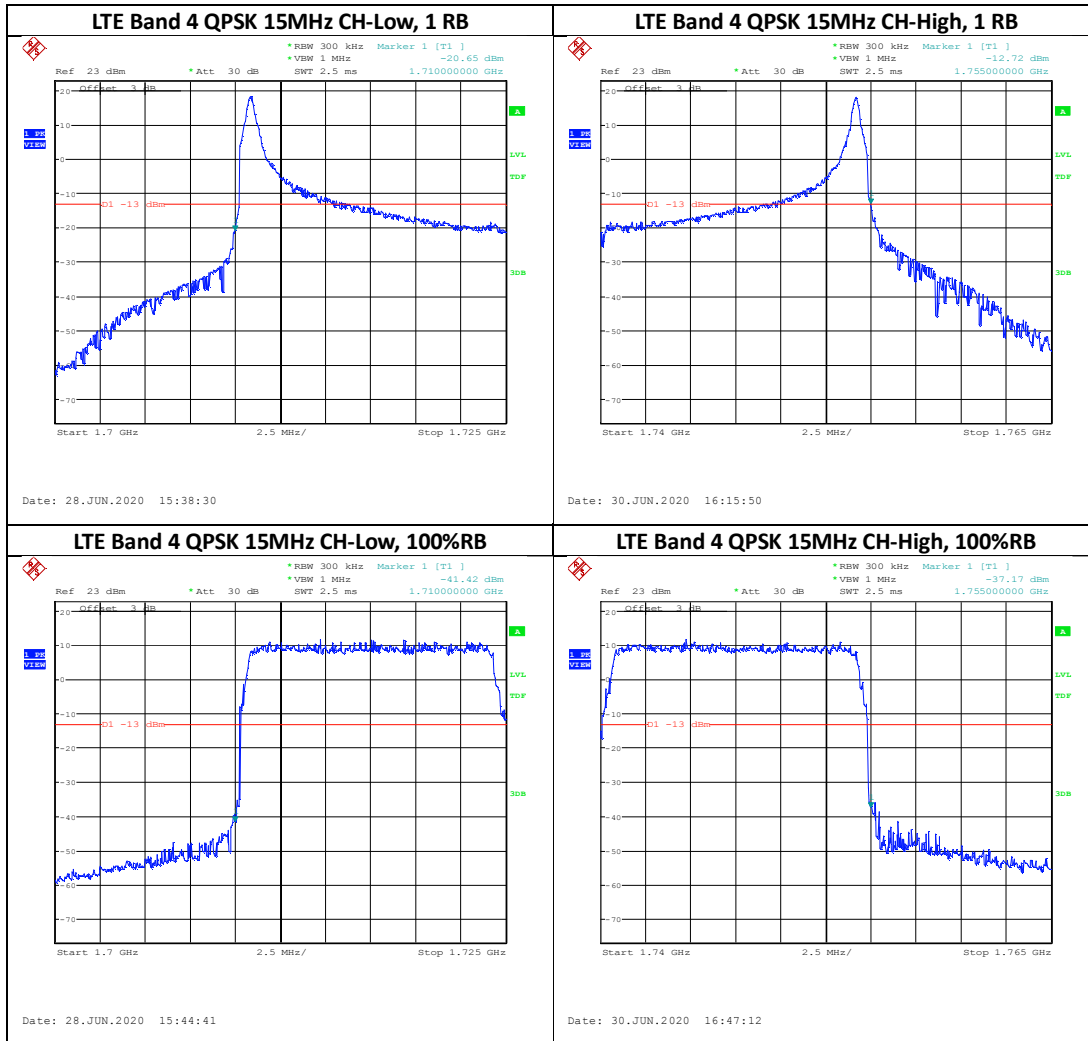
### Test Result

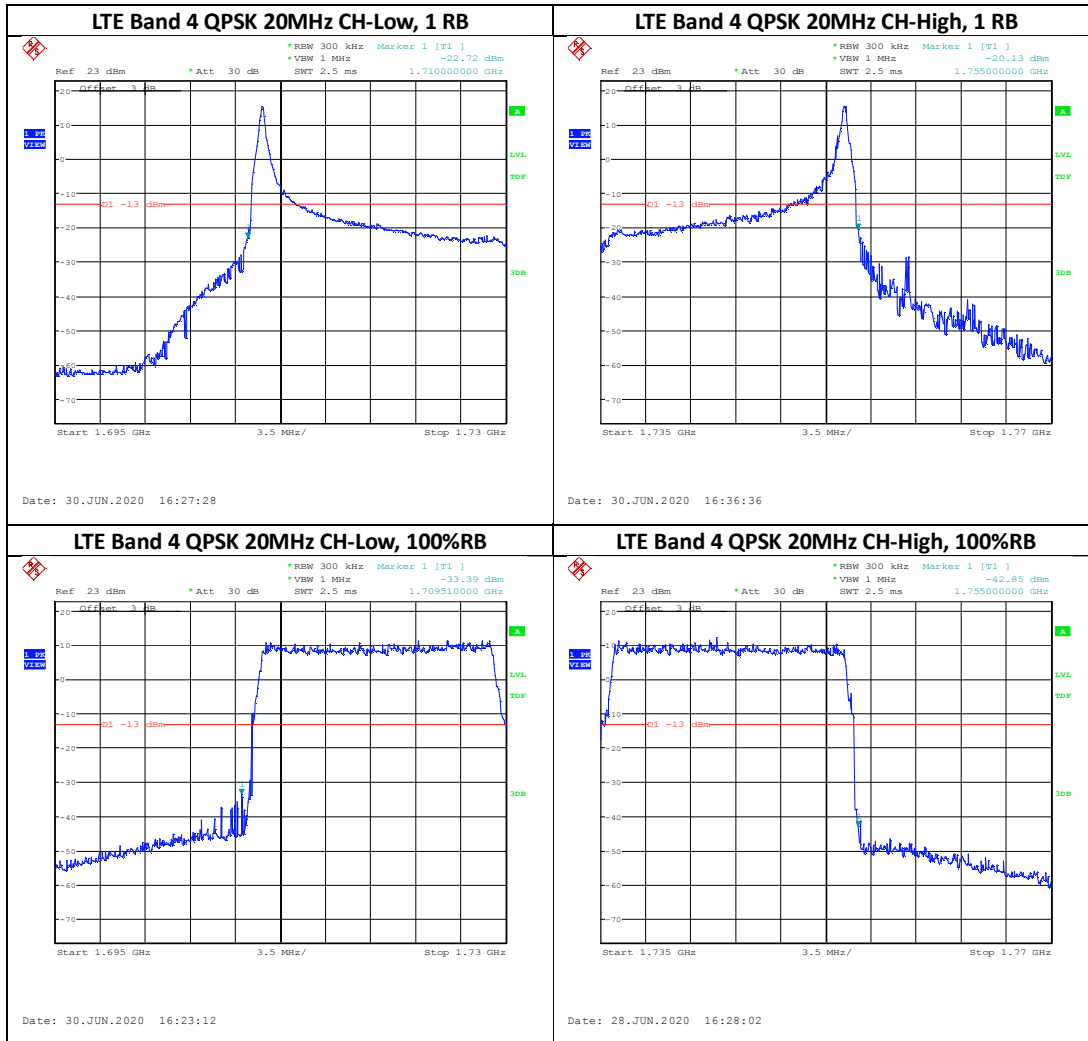


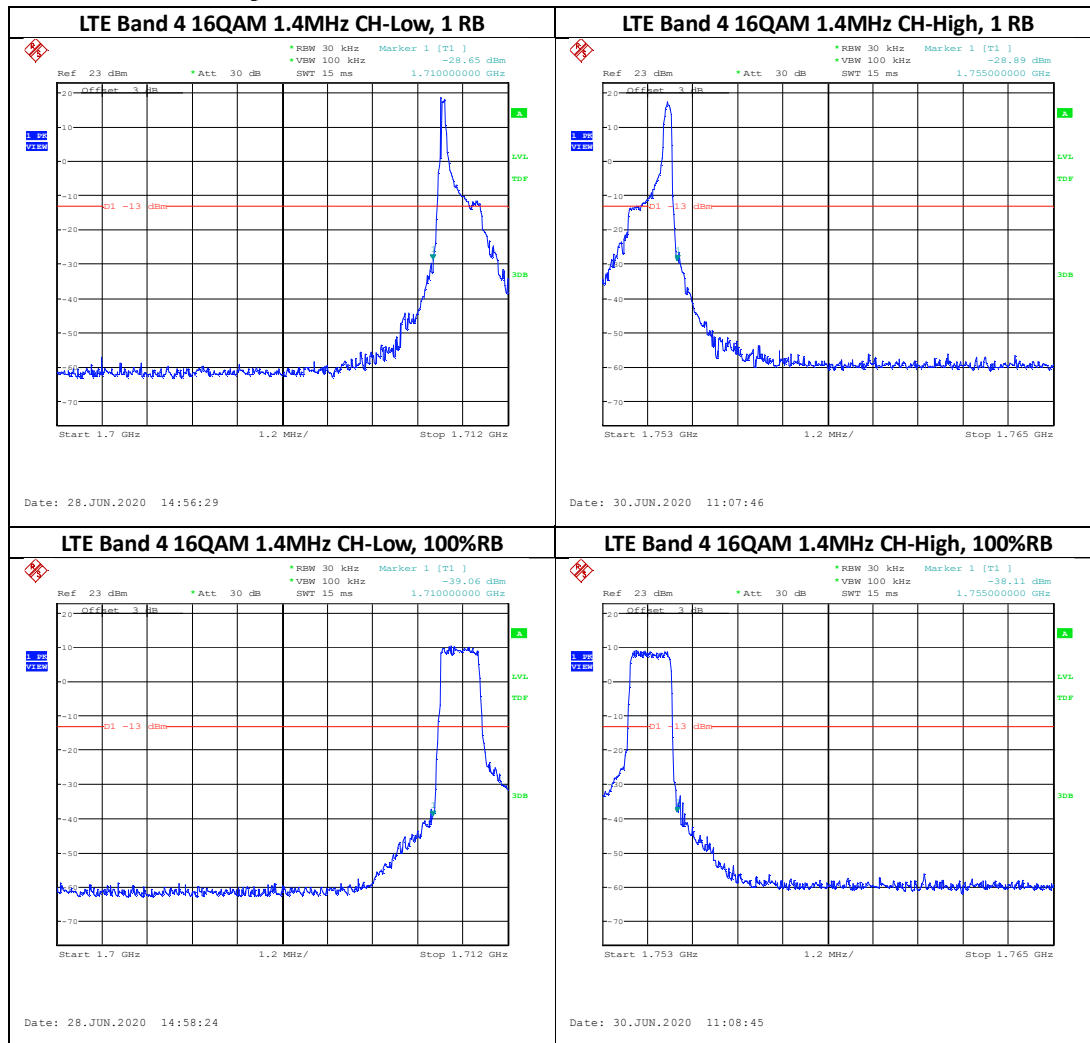


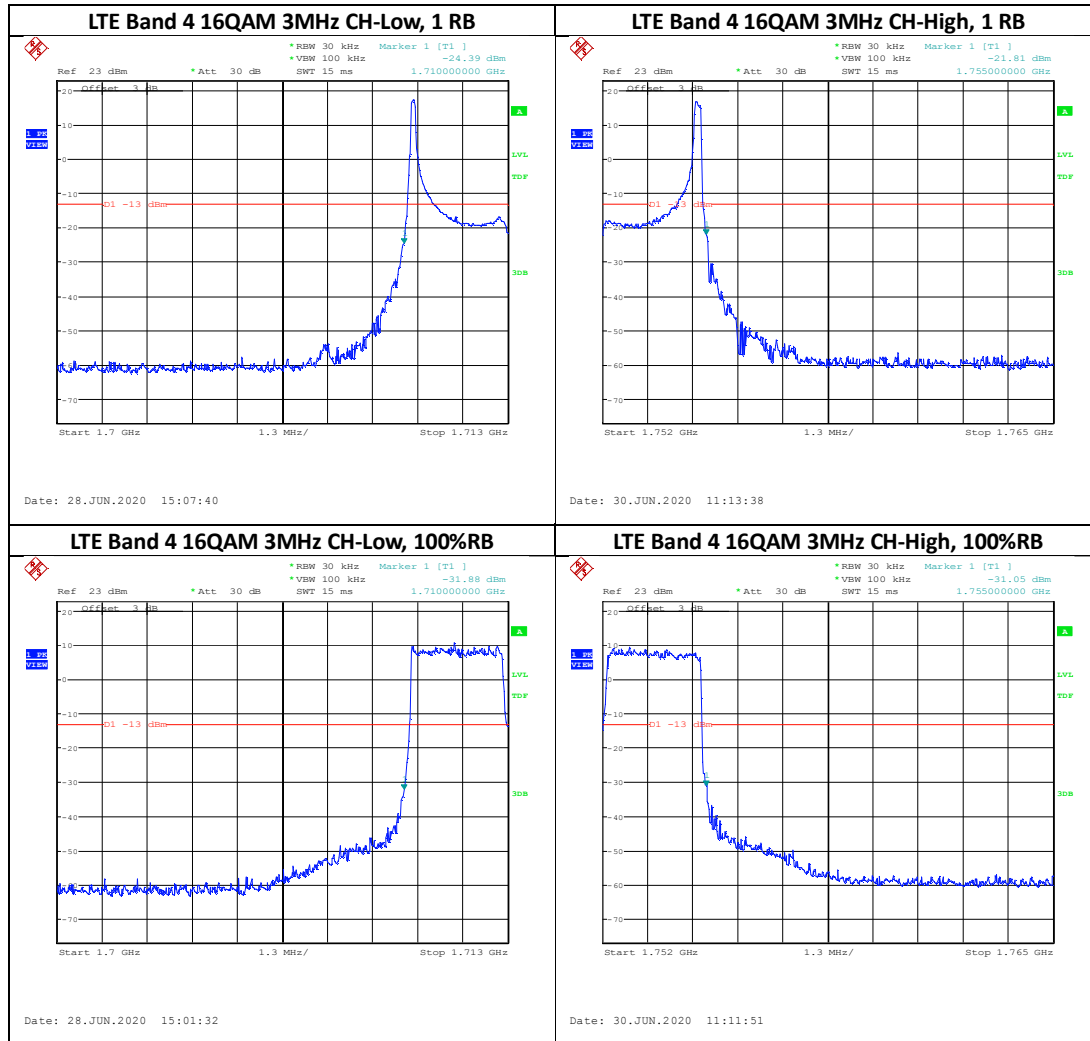


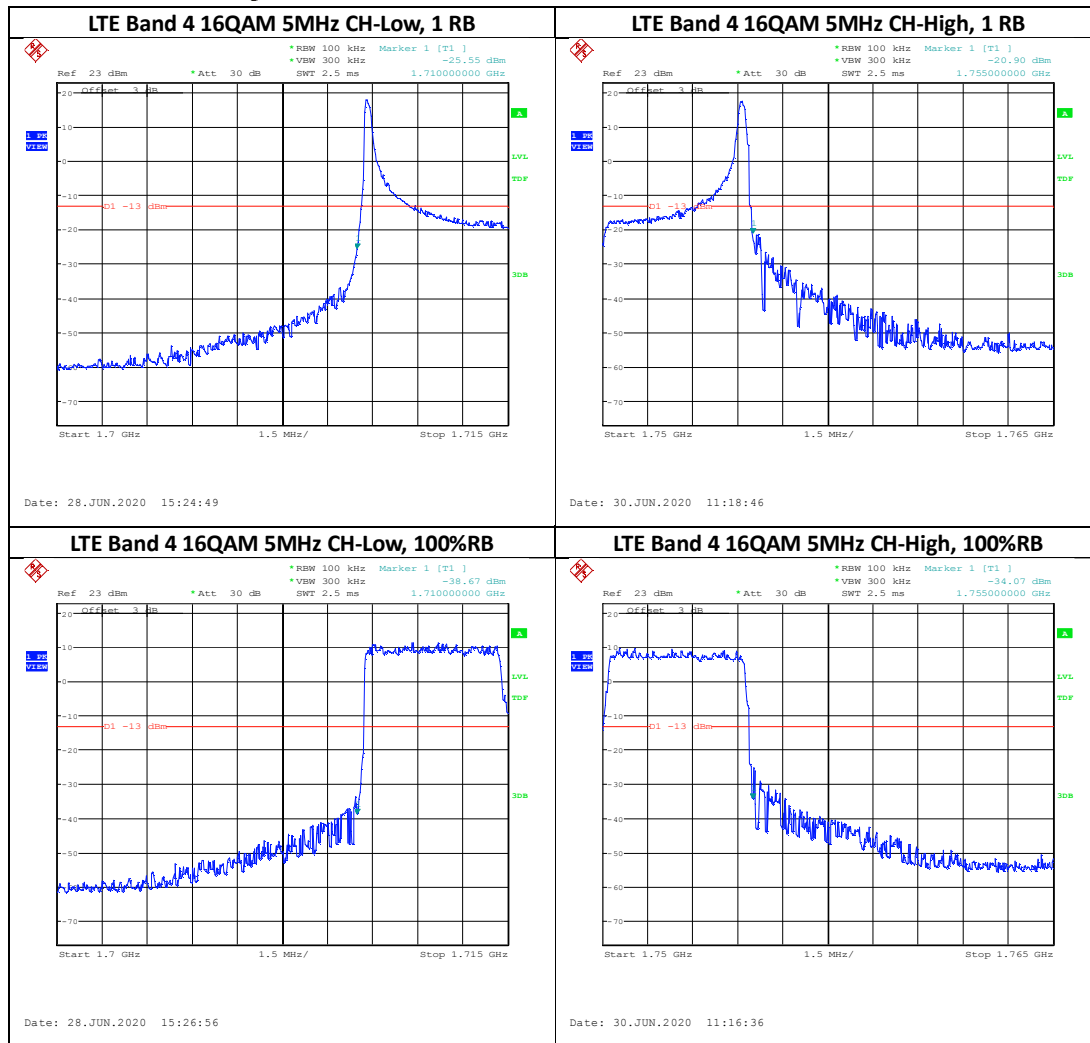


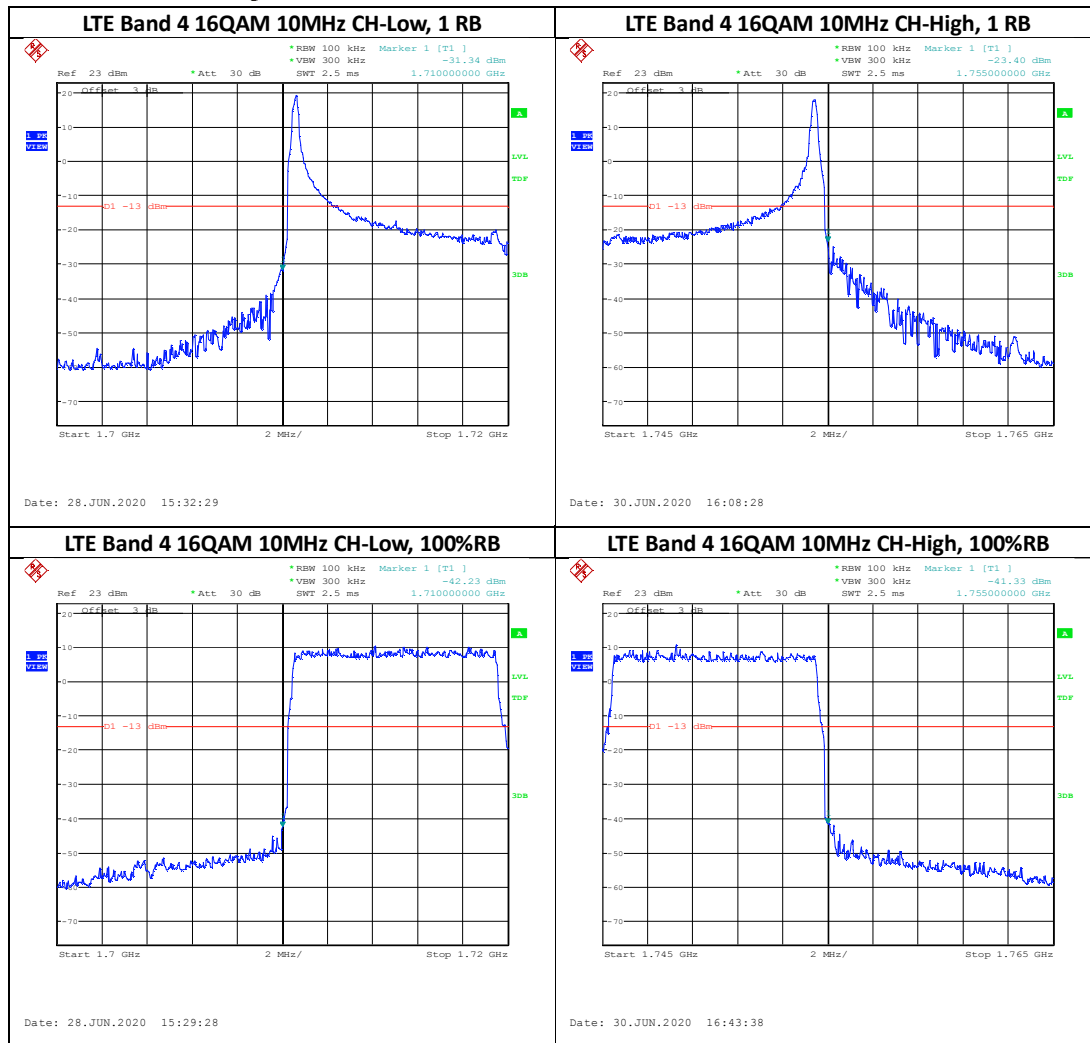


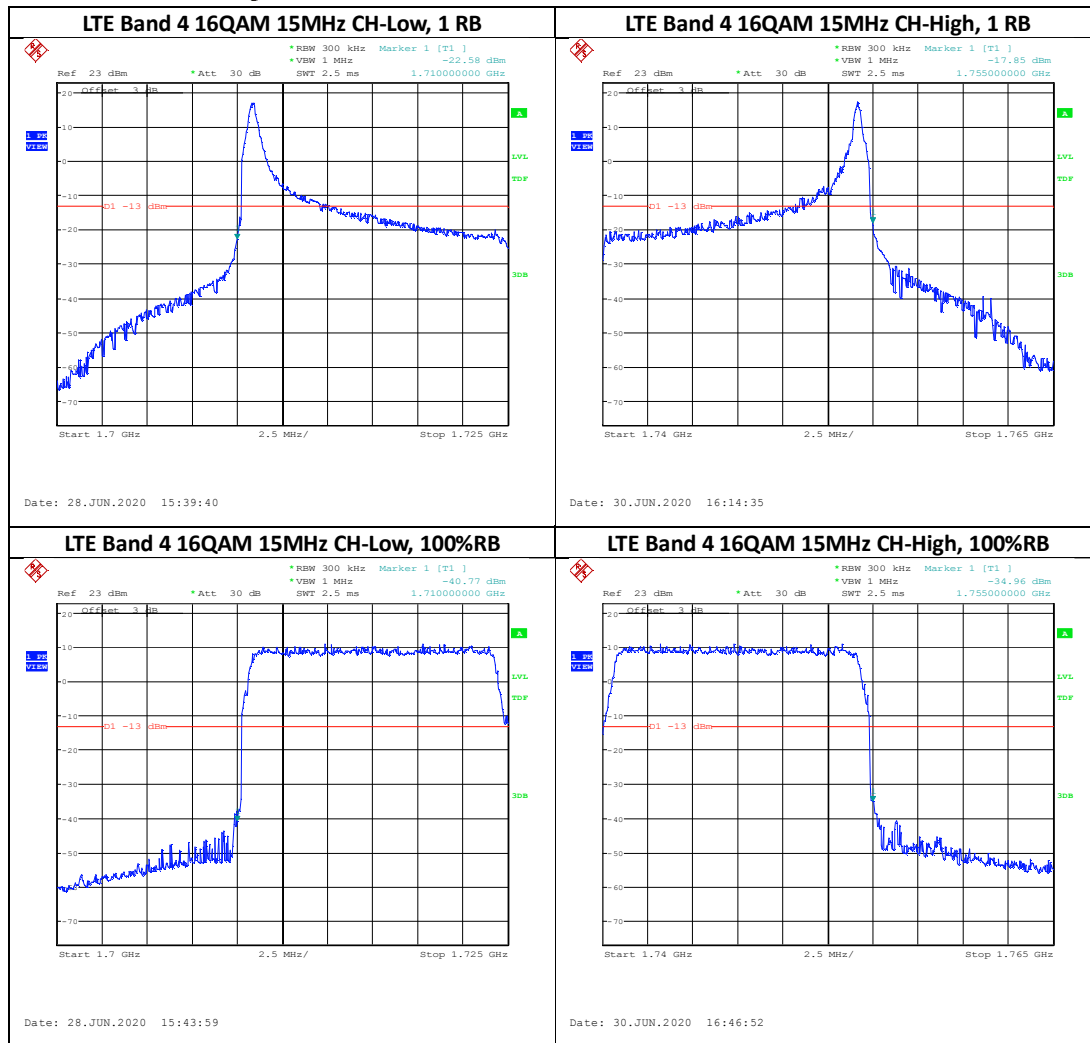


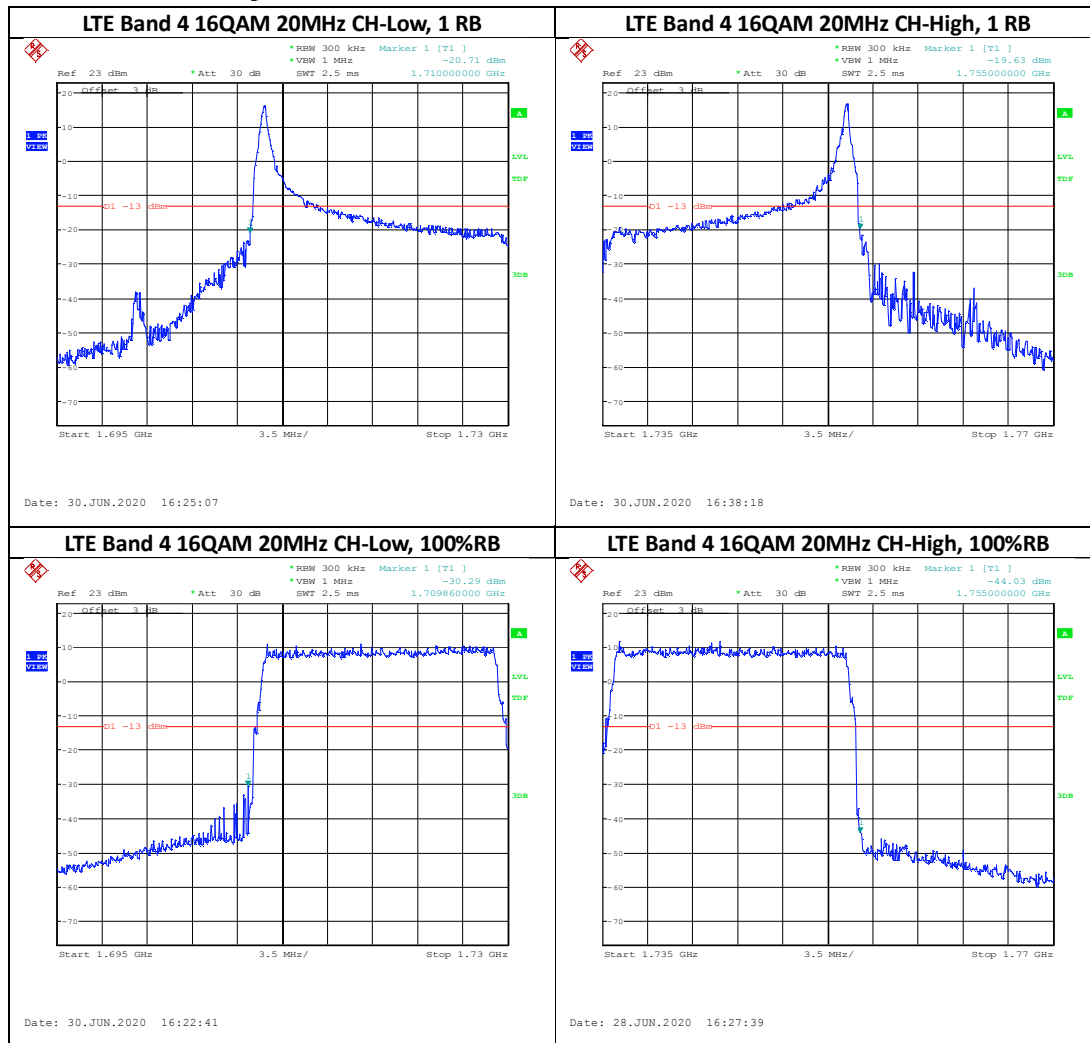


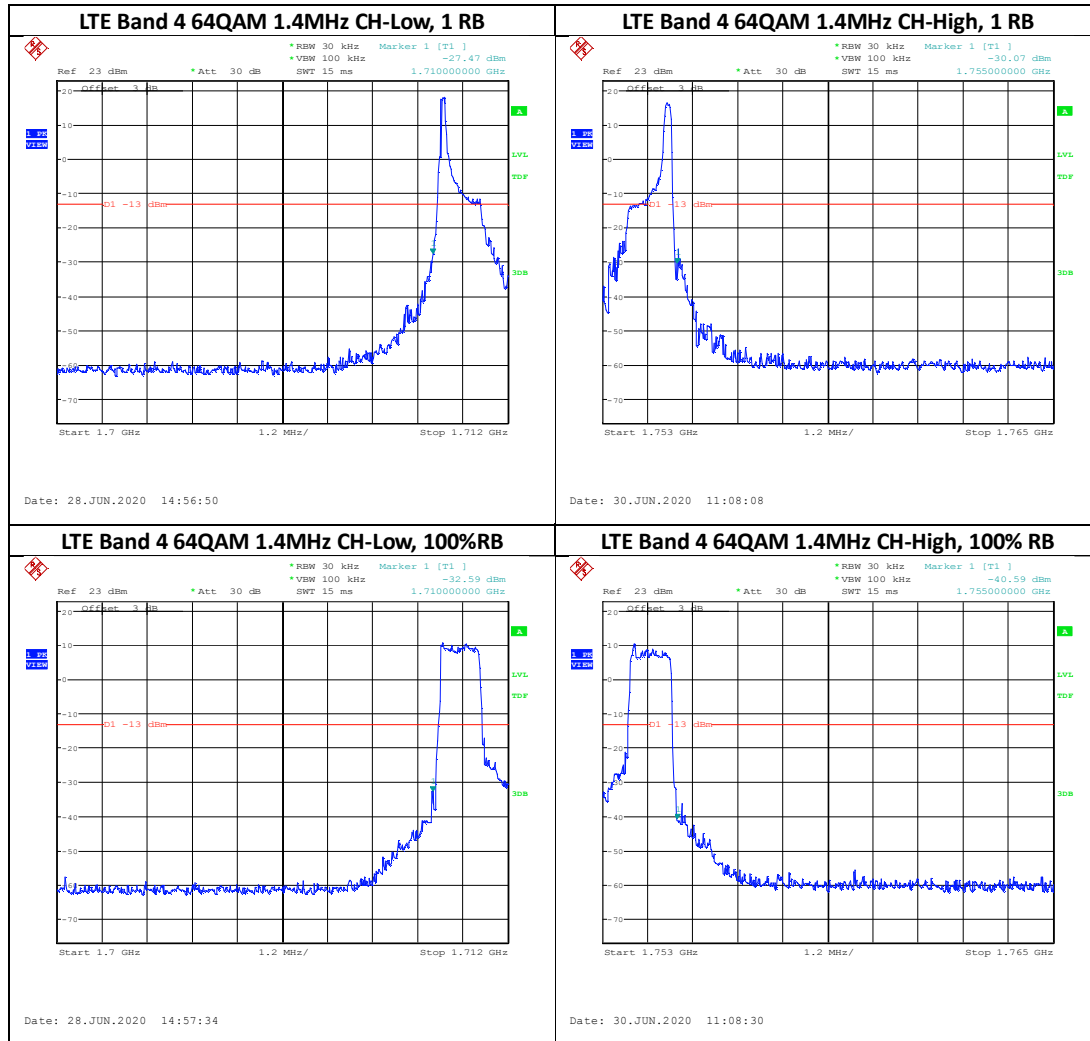


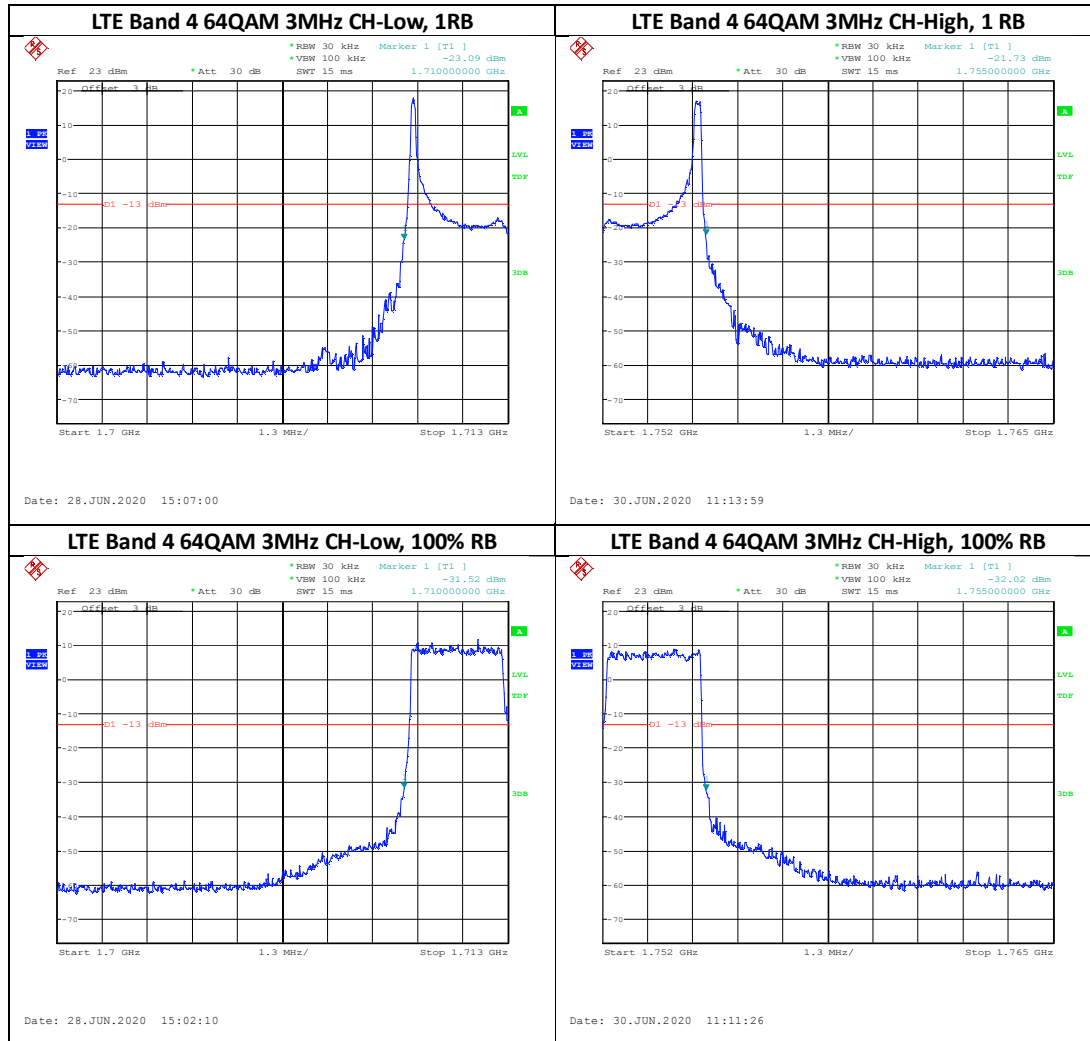


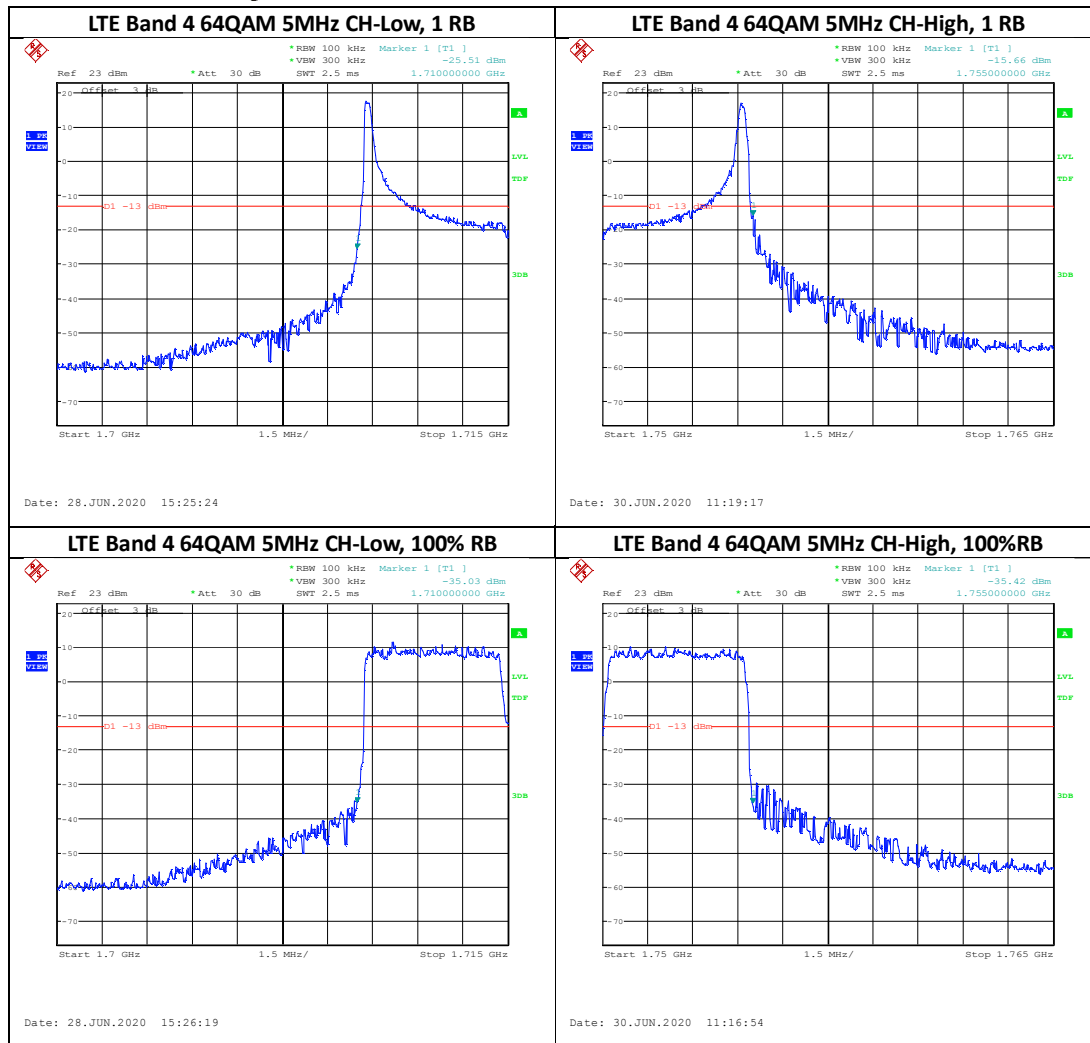


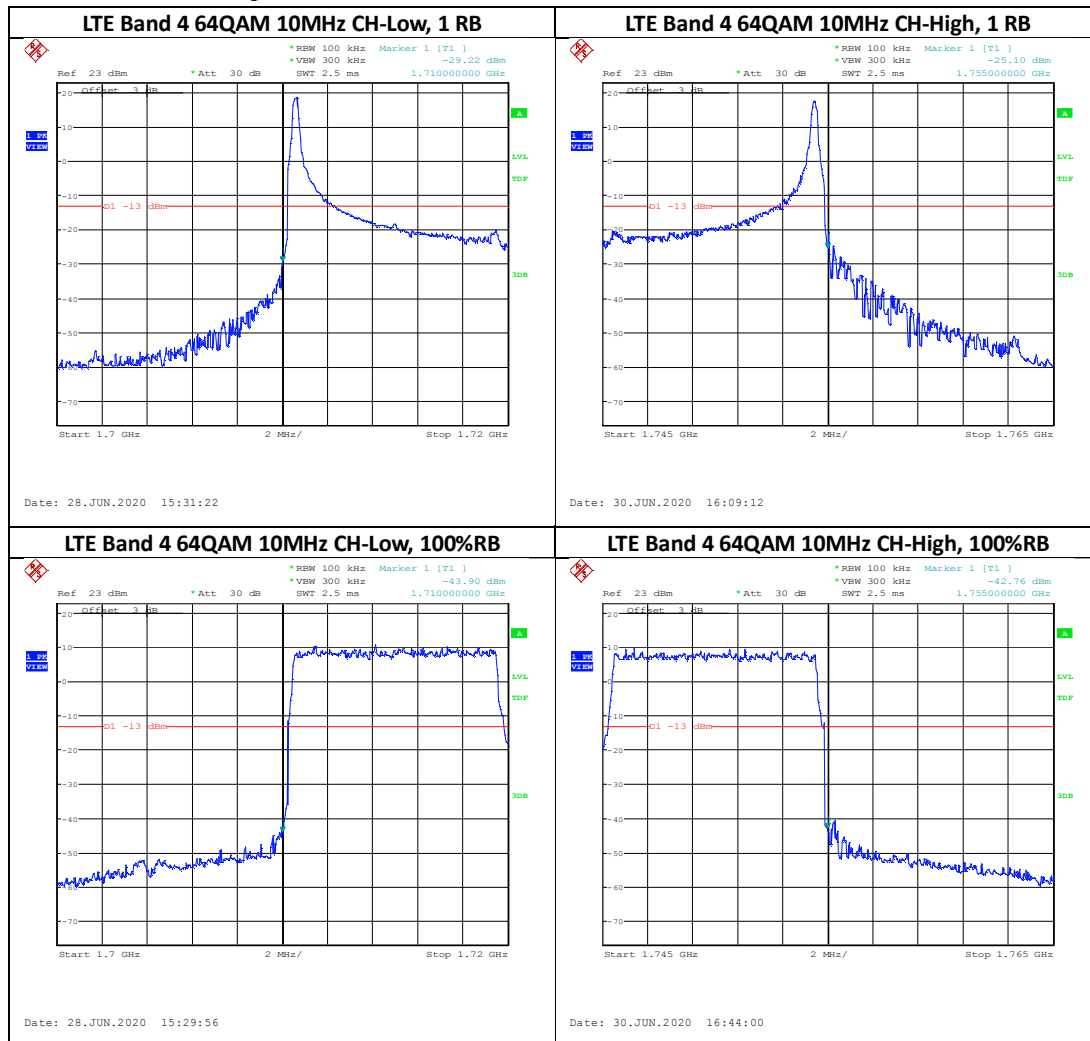


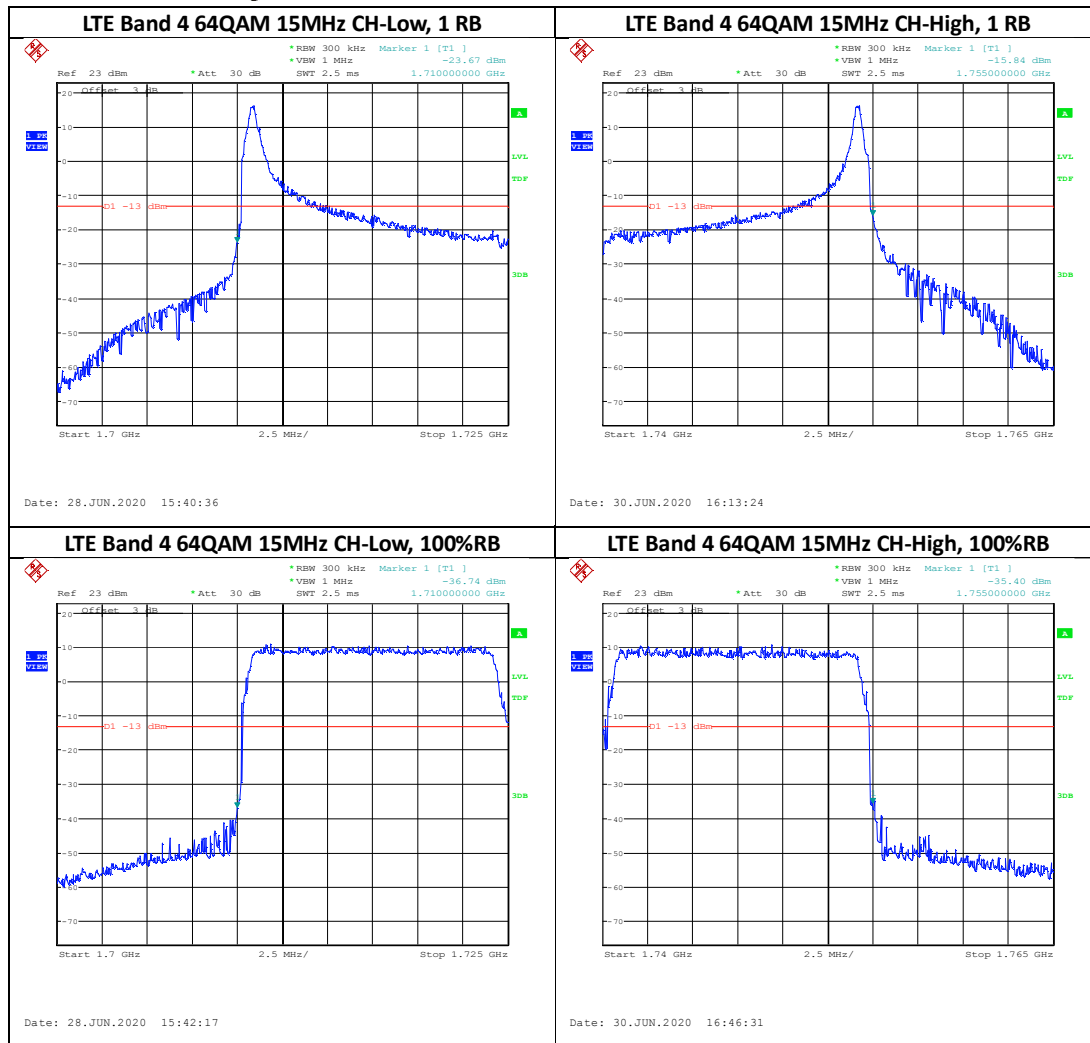


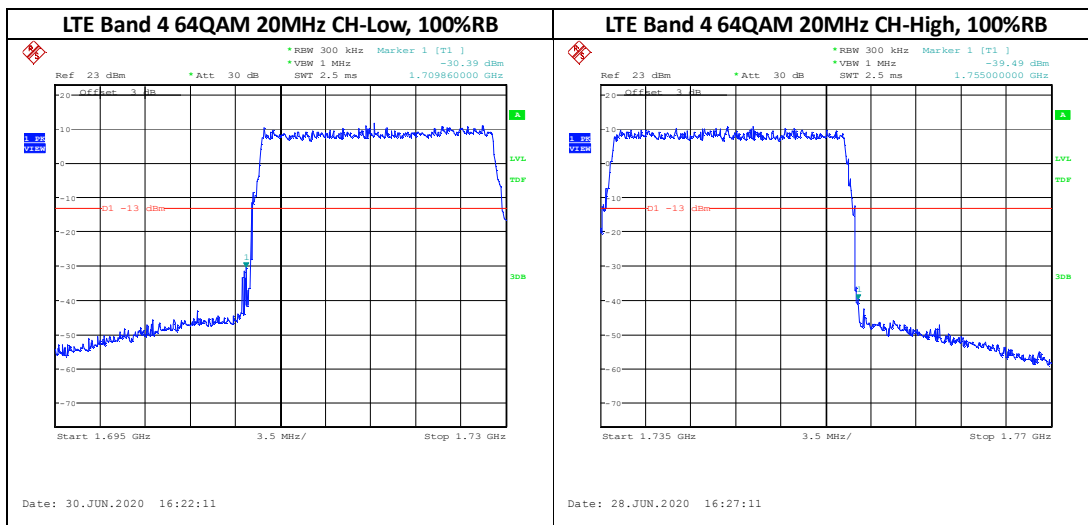
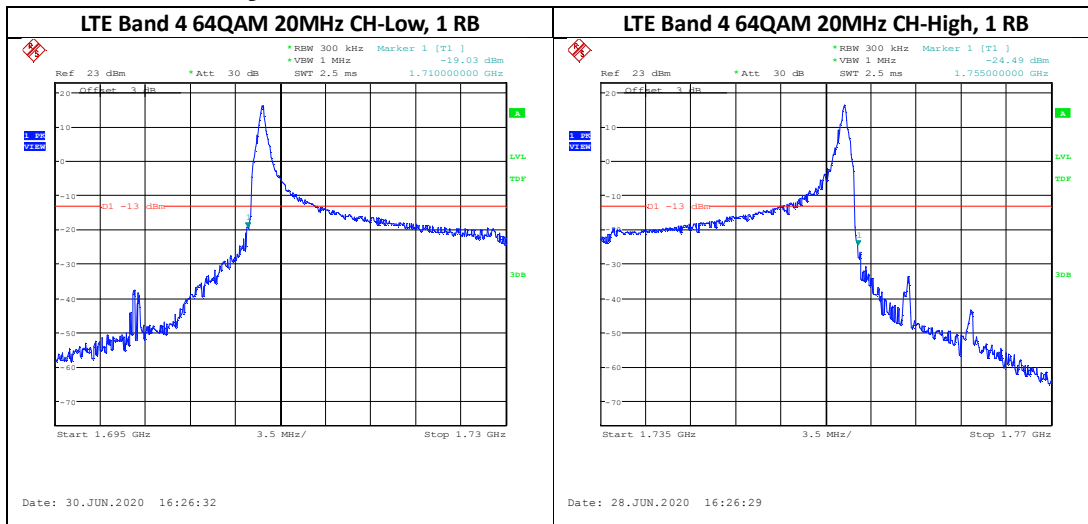


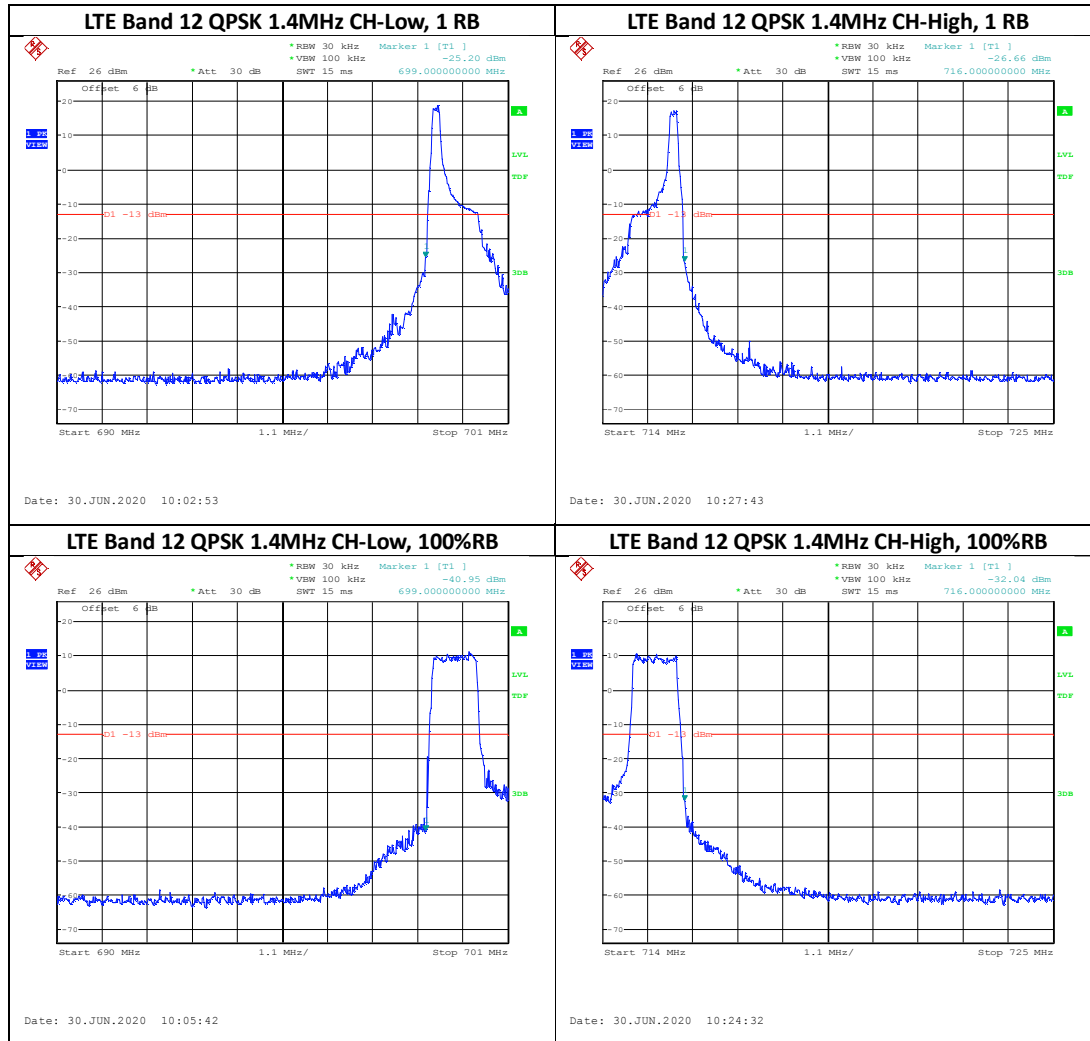


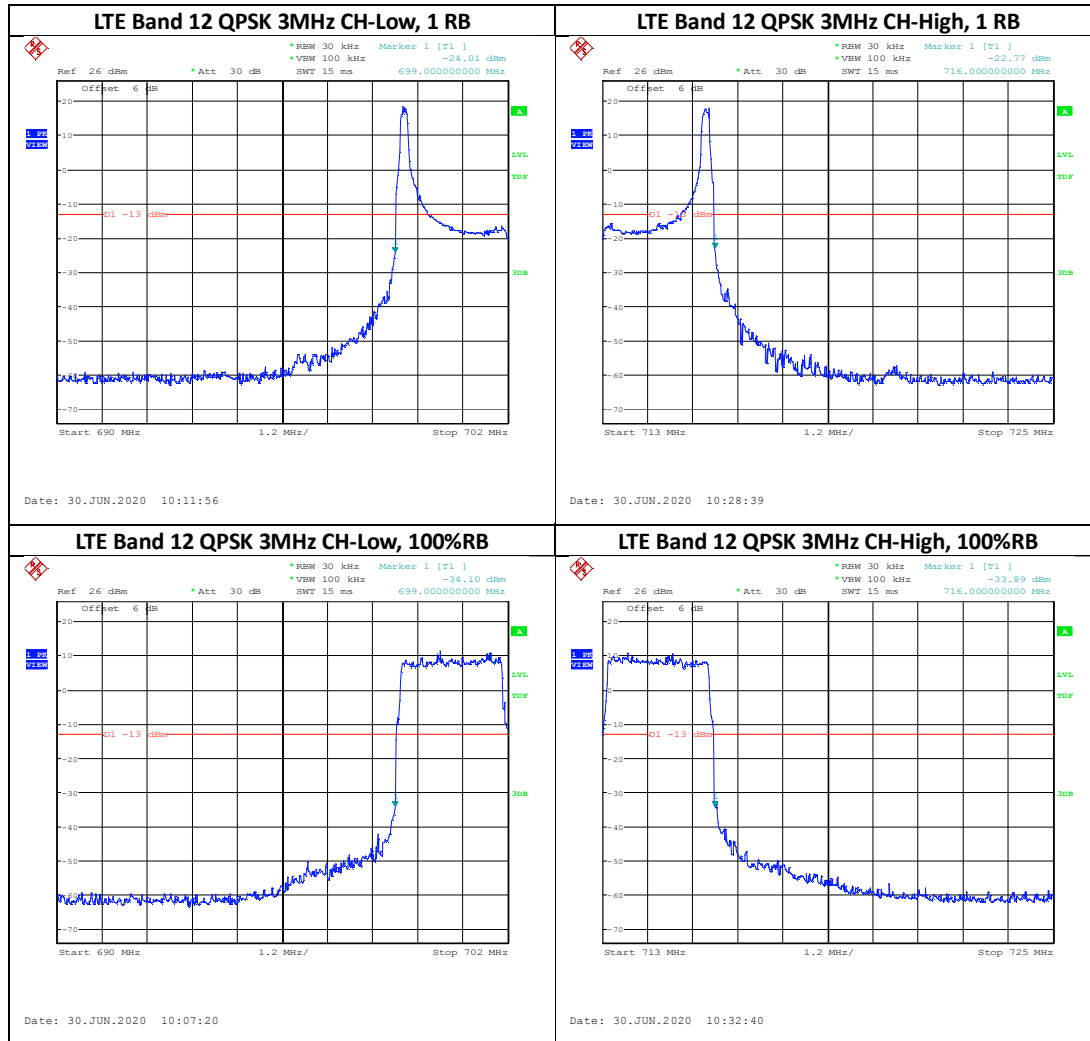


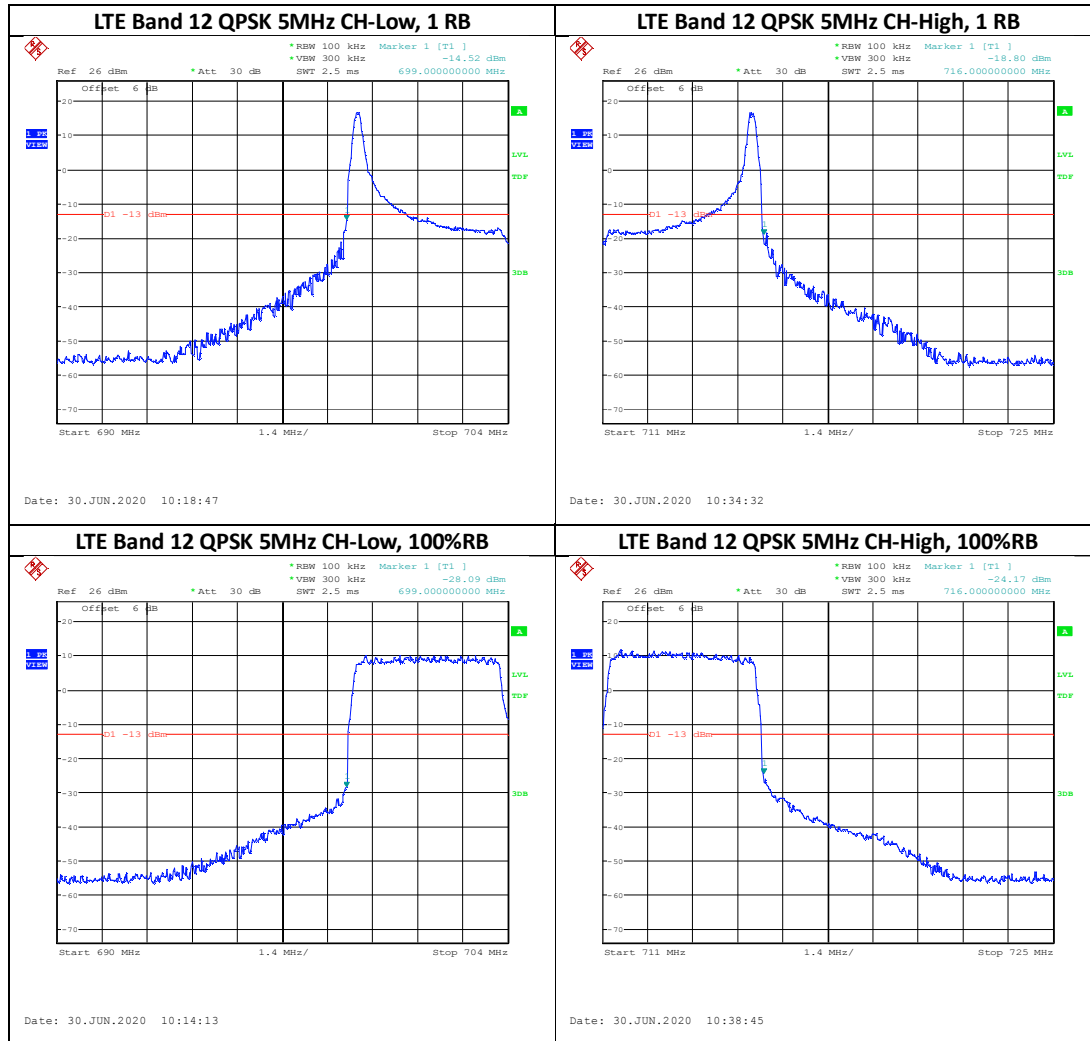


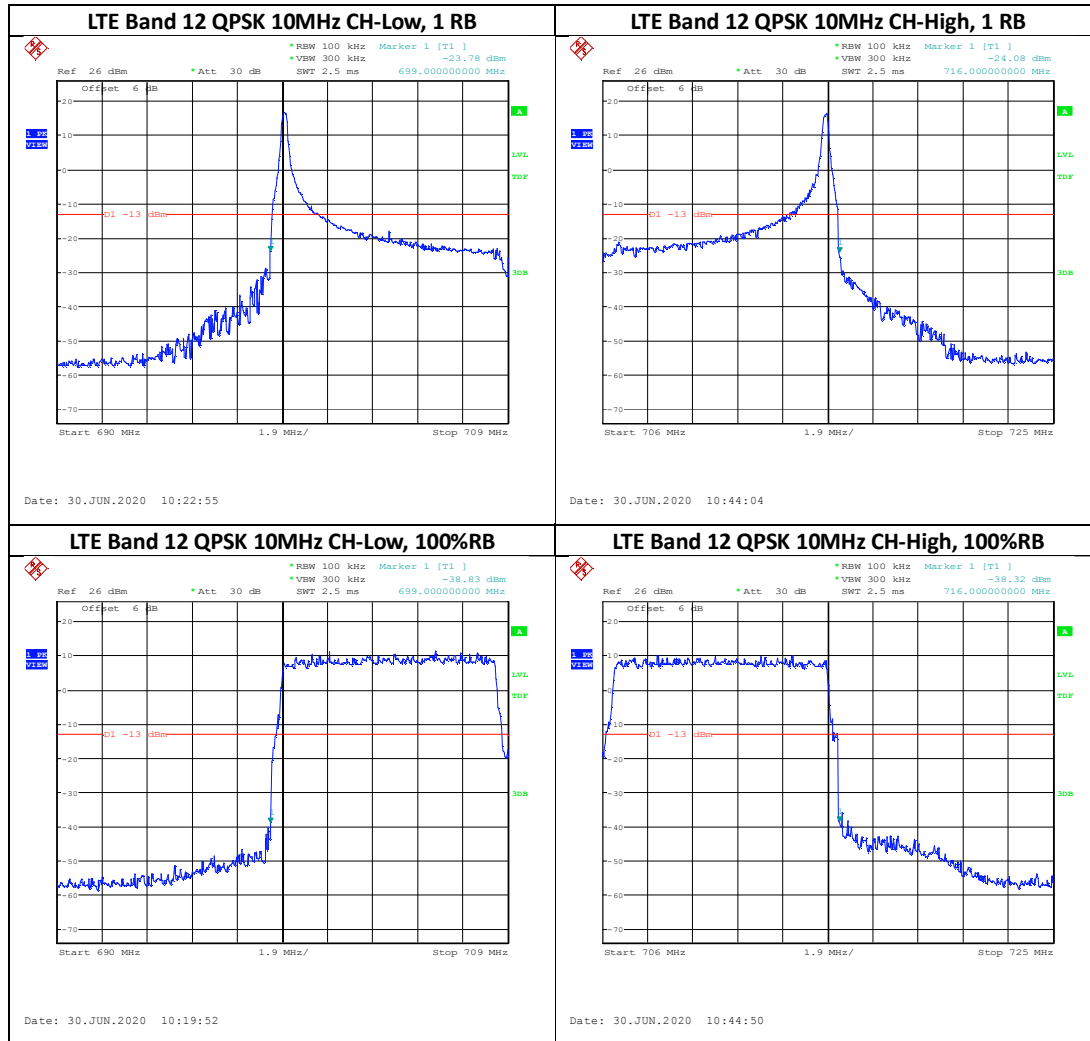


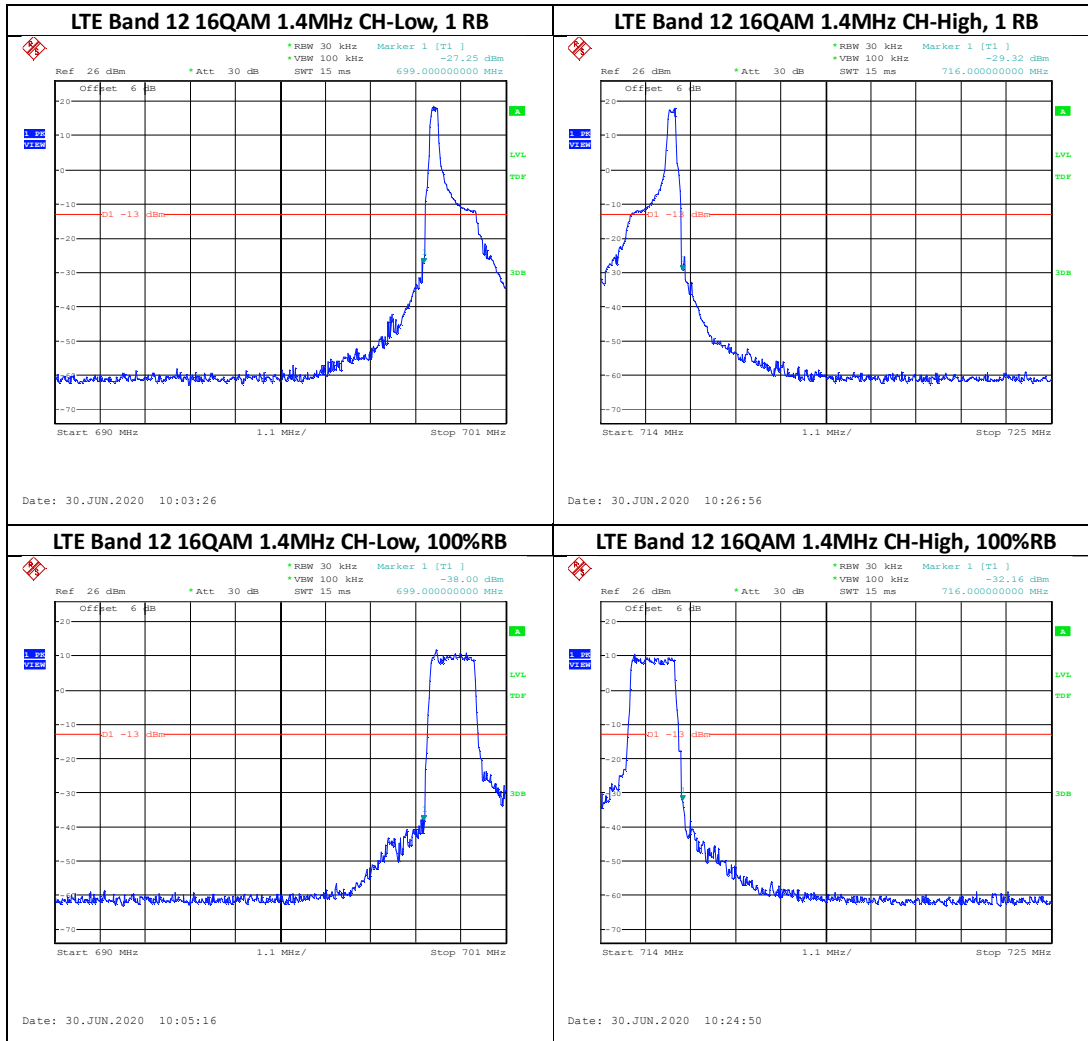


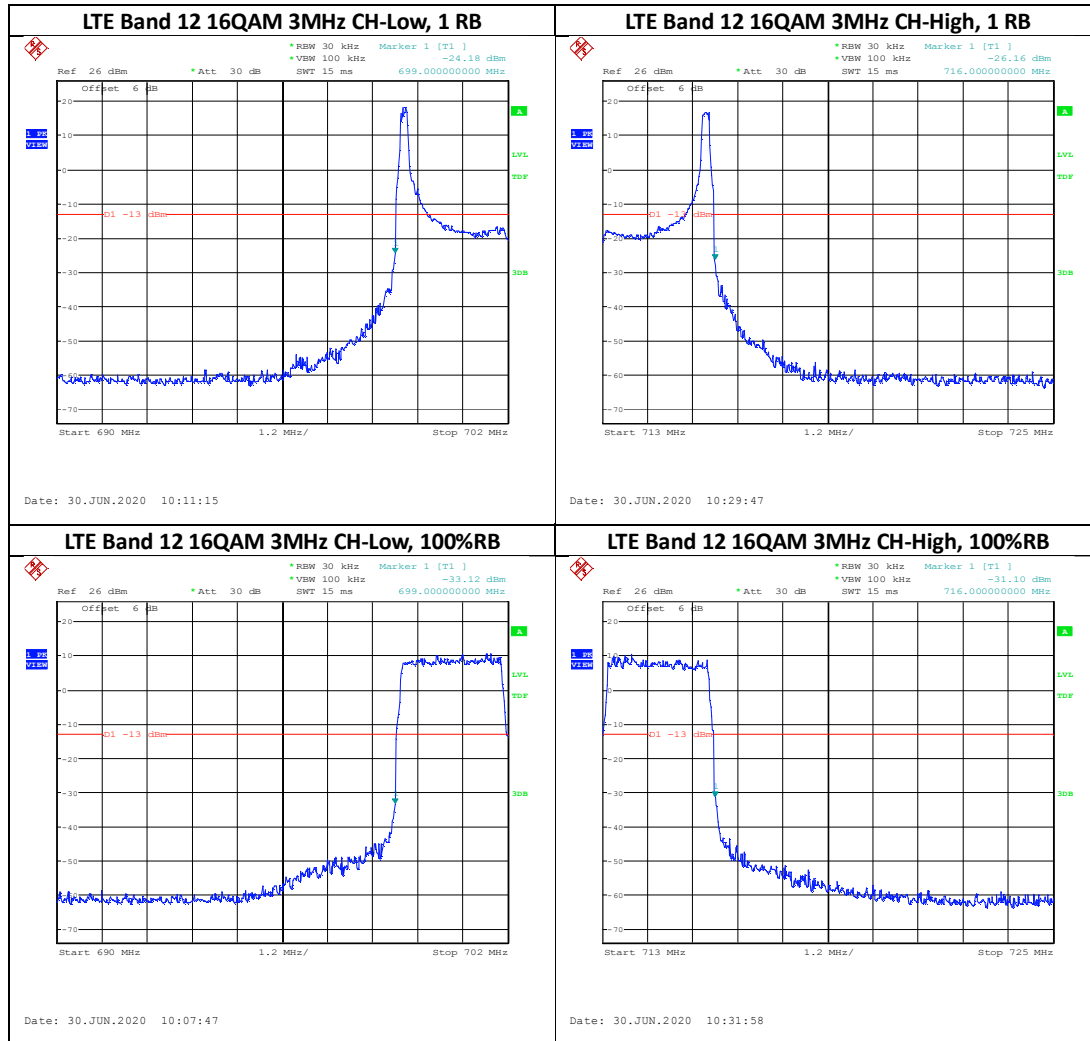


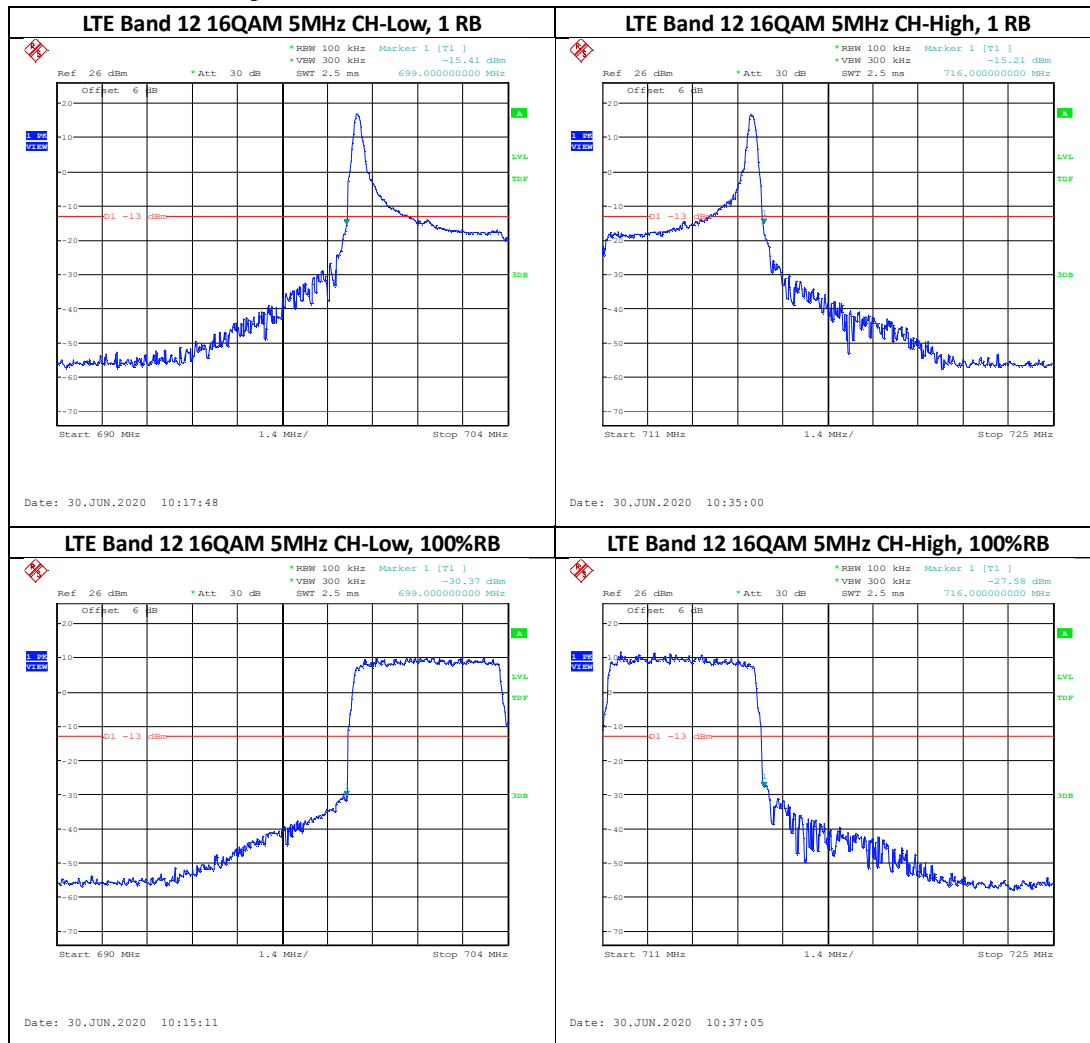


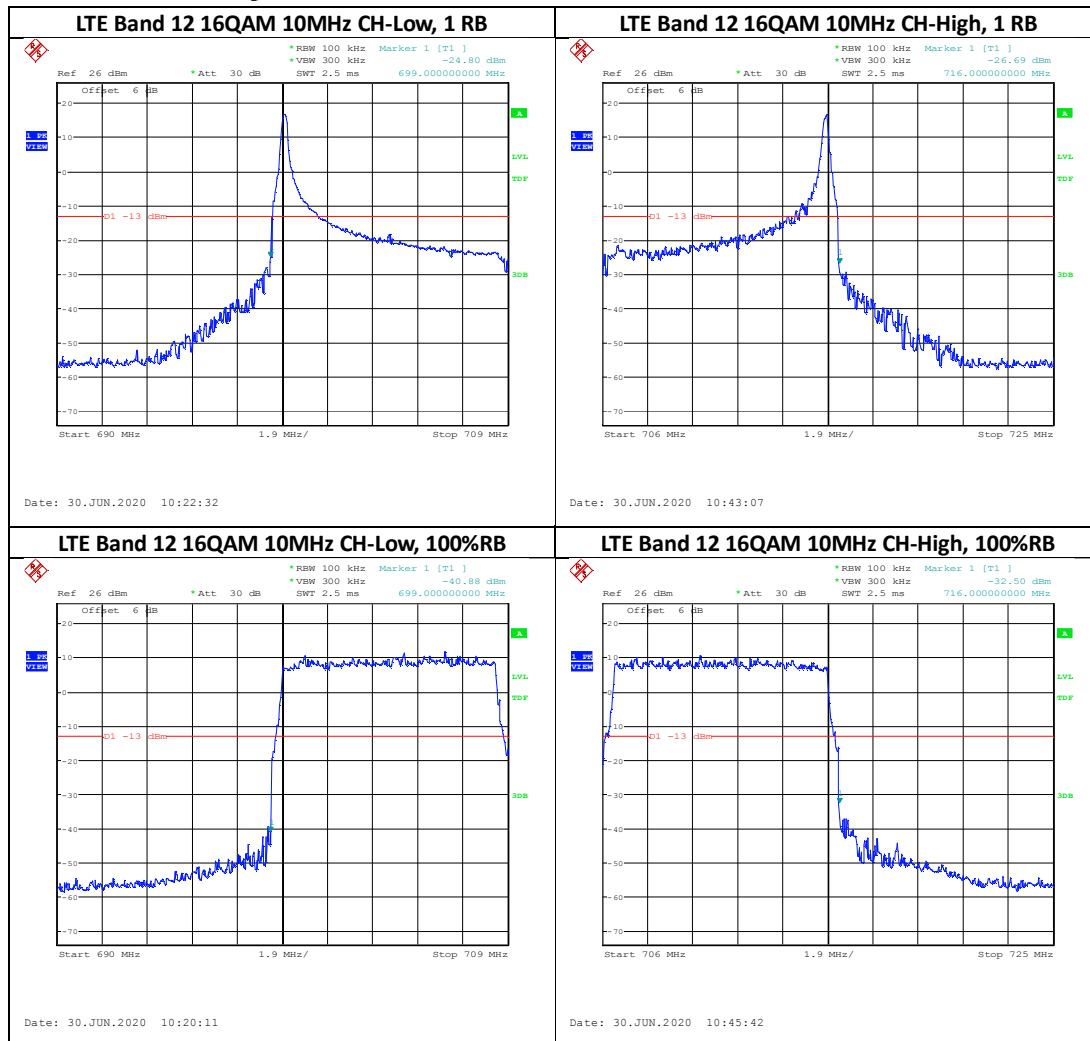


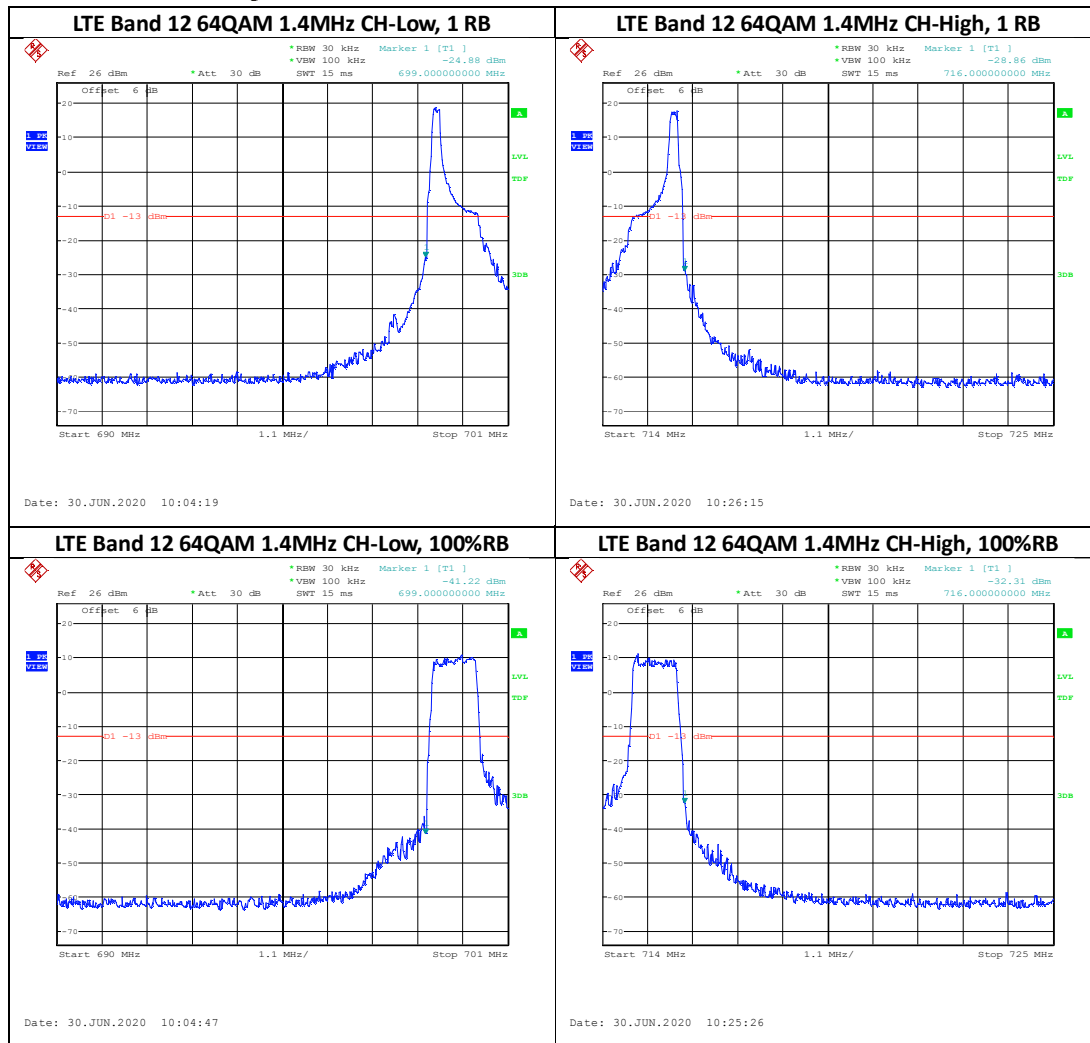


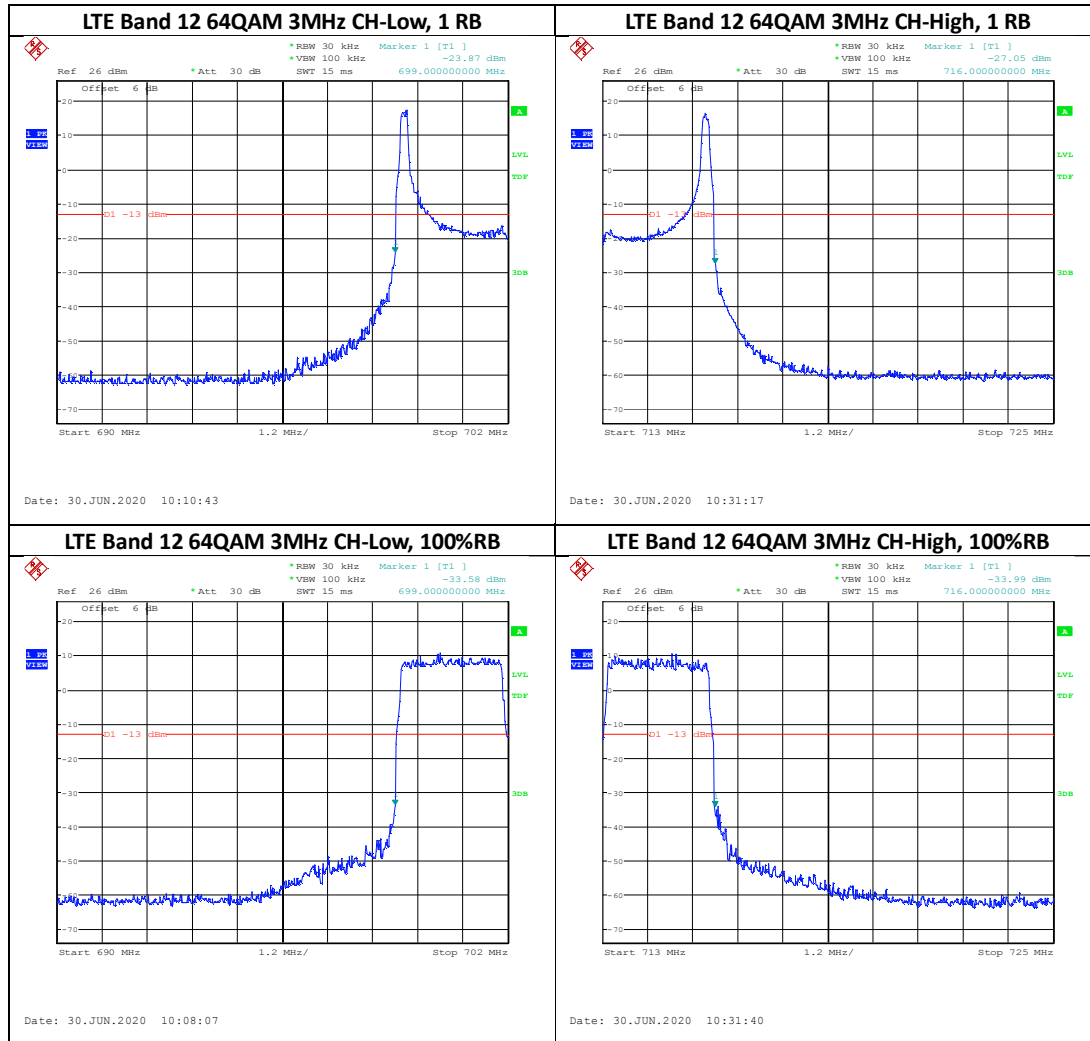


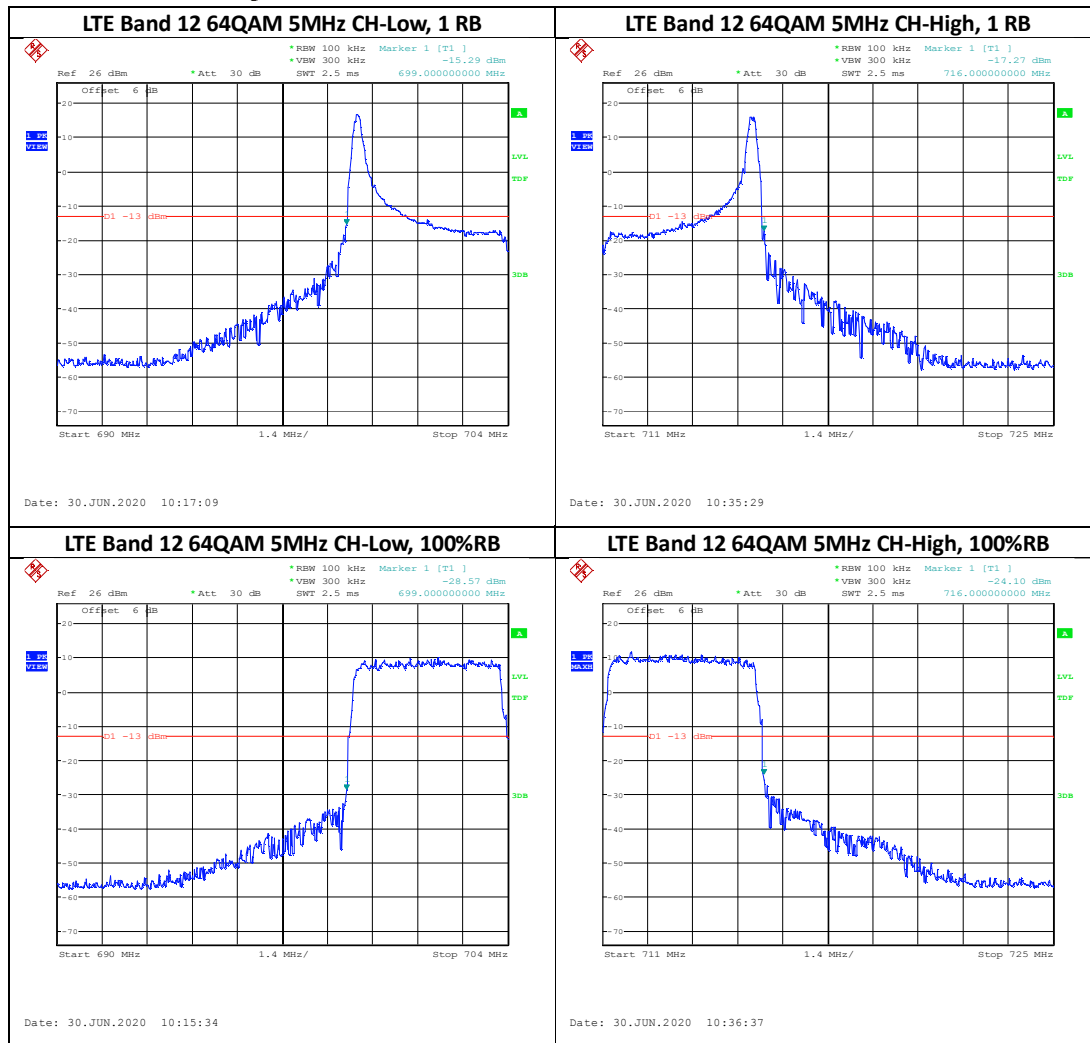


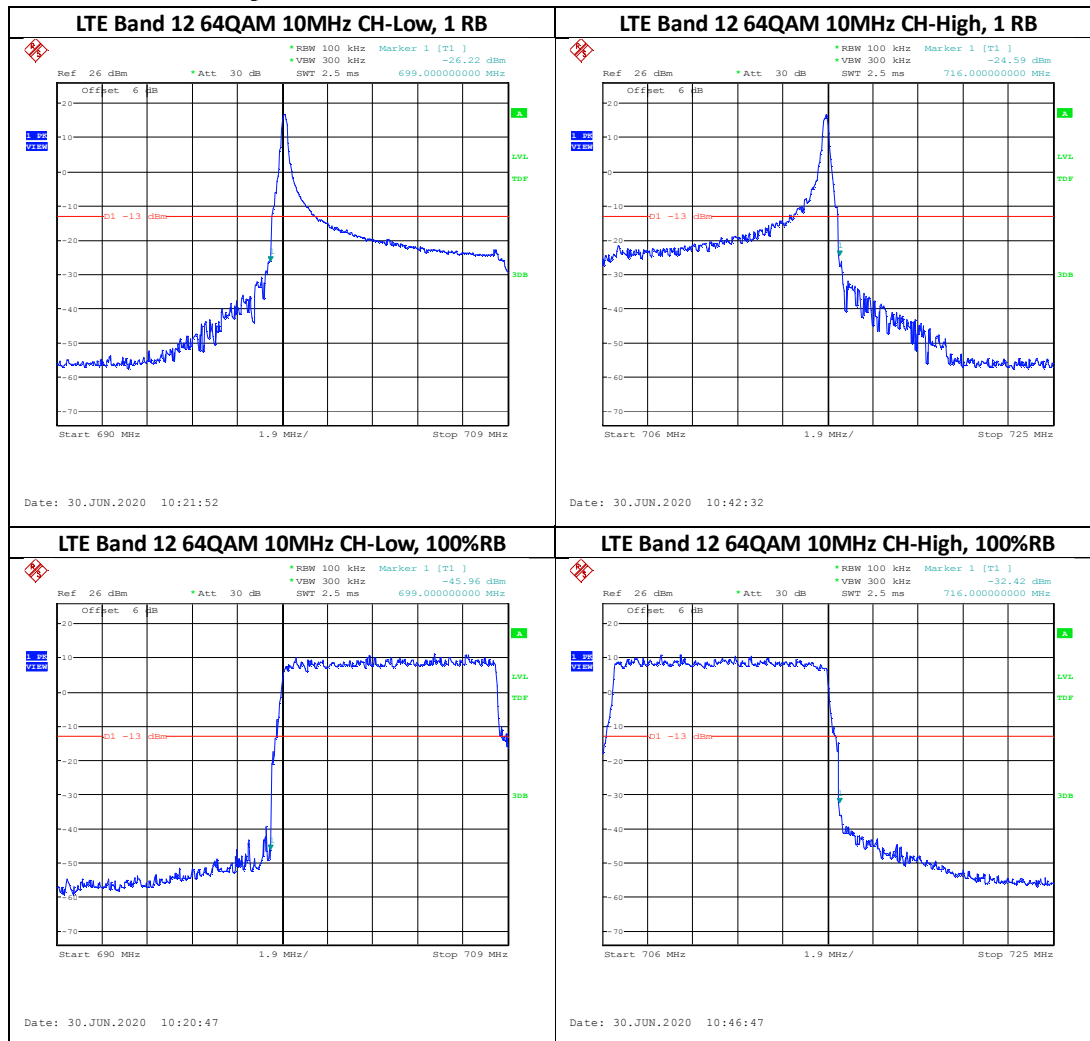












Test Result

| LTE Band 4 |                 |        |         |                 |                           |           |         |
|------------|-----------------|--------|---------|-----------------|---------------------------|-----------|---------|
| Modulation | Bandwidth (MHz) | RB     | Channel | Frequency (MHz) | Peak-to-Average Ratio(dB) | Limit(dB) | Verdict |
| QPSK       | 20              | 1RB    | 20050   | 1720            | -                         | 13        | PASS    |
|            |                 |        | 20175   | 1732.5          | 4.96                      | 13        | PASS    |
|            |                 |        | 20300   | 1745            | -                         | 13        | PASS    |
|            |                 | 100%RB | 20050   | 1720            | -                         | 13        | PASS    |
|            |                 |        | 20175   | 1732.5          | 5.48                      | 13        | PASS    |
|            |                 |        | 20300   | 1745            | -                         | 13        | PASS    |
| 16QAM      | 20              | 1RB    | 20050   | 1720            | -                         | 13        | PASS    |
|            |                 |        | 20175   | 1732.5          | 6.60                      | 13        | PASS    |
|            |                 |        | 20300   | 1745            | -                         | 13        | PASS    |
|            |                 | 100%RB | 20050   | 1720            | -                         | 13        | PASS    |
|            |                 |        | 20175   | 1732.5          | 6.20                      | 13        | PASS    |
|            |                 |        | 20300   | 1745            | -                         | 13        | PASS    |
| 64QAM      | 20              | 1RB    | 20050   | 1720            | -                         | 13        | PASS    |
|            |                 |        | 20175   | 1732.5          | 7.16                      | 13        | PASS    |
|            |                 |        | 20300   | 1745            | -                         | 13        | PASS    |
|            |                 | 100%RB | 20050   | 1720            | -                         | 13        | PASS    |
|            |                 |        | 20175   | 1732.5          | 6.52                      | 13        | PASS    |
|            |                 |        | 20300   | 1745            | -                         | 13        | PASS    |

| LTE Band 12 |                 |        |         |                 |                           |           |         |
|-------------|-----------------|--------|---------|-----------------|---------------------------|-----------|---------|
| Modulation  | Bandwidth (MHz) | RB     | Channel | Frequency (MHz) | Peak-to-Average Ratio(dB) | Limit(dB) | Verdict |
| QPSK        | 10              | 1RB    | 23060   | 704             | -                         | 13        | PASS    |
|             |                 |        | 23095   | 707.5           | 5.24                      | 13        | PASS    |
|             |                 |        | 23130   | 711             | -                         | 13        | PASS    |
|             |                 | 100%RB | 23060   | 704             | -                         | 13        | PASS    |
|             |                 |        | 23095   | 707.5           | 5.68                      | 13        | PASS    |
|             |                 |        | 23130   | 711             | -                         | 13        | PASS    |
| 16QAM       | 10              | 1RB    | 23060   | 704             | -                         | 13        | PASS    |
|             |                 |        | 23095   | 707.5           | 6.76                      | 13        | PASS    |
|             |                 |        | 23130   | 711             | -                         | 13        | PASS    |
|             |                 | 100%RB | 23060   | 704             | -                         | 13        | PASS    |
|             |                 |        | 23095   | 707.5           | 6.52                      | 13        | PASS    |
|             |                 |        | 23130   | 711             | -                         | 13        | PASS    |
| 64QAM       | 10              | 1RB    | 23060   | 704             | -                         | 13        | PASS    |
|             |                 |        | 23095   | 707.5           | 7.08                      | 13        | PASS    |
|             |                 |        | 23130   | 711             | -                         | 13        | PASS    |
|             |                 | 100%RB | 23060   | 704             | -                         | 13        | PASS    |
|             |                 |        | 23095   | 707.5           | 7.28                      | 13        | PASS    |
|             |                 |        | 23130   | 711             | -                         | 13        | PASS    |

AppendixF: Frequency Stability

Test Result

| LTE Band 4(BANDWIDTH, 1.4MHz) |         |                      |       |       |                           |         |         |         |
|-------------------------------|---------|----------------------|-------|-------|---------------------------|---------|---------|---------|
| Condition                     |         | Frequency Error (Hz) |       |       | Frequency Stability (ppm) |         |         | Verdict |
| Temperature                   | Voltage | 64QAM                | 16QAM | QPSK  | 64QAM                     | 16QAM   | QPSK    |         |
| 25℃                           | Normal  | 5.01                 | 12.44 | 13.95 | 0.00289                   | 0.00718 | 0.00805 | PASS    |
| 55℃                           |         | 8.74                 | 16.08 | 17.81 | 0.00504                   | 0.00928 | 0.01028 | PASS    |
| 50℃                           |         | 19.22                | 14.97 | 5.58  | 0.01109                   | 0.00864 | 0.00322 | PASS    |
| 40℃                           |         | 15.34                | 3.17  | 16.79 | 0.00885                   | 0.00183 | 0.00969 | PASS    |
| 30℃                           |         | 7.09                 | 16.26 | 18.46 | 0.00409                   | 0.00939 | 0.01066 | PASS    |
| 20℃                           |         | 16.02                | 5.40  | 16.90 | 0.00925                   | 0.00312 | 0.00975 | PASS    |
| 10℃                           |         | 15.17                | 9.39  | 11.46 | 0.00876                   | 0.00542 | 0.00661 | PASS    |
| 0℃                            |         | 3.80                 | 5.79  | 19.36 | 0.00219                   | 0.00334 | 0.01117 | PASS    |
| -10℃                          |         | 13.00                | 13.77 | 9.28  | 0.00750                   | 0.00795 | 0.00536 | PASS    |
| -20℃                          |         | 18.21                | 14.42 | 6.78  | 0.01051                   | 0.00832 | 0.00391 | PASS    |
| -30℃                          |         | 18.04                | 8.76  | 18.00 | 0.01041                   | 0.00506 | 0.01039 | PASS    |
| 25℃                           | LV      | 13.09                | 2.27  | 15.25 | 0.00756                   | 0.00131 | 0.00880 | PASS    |
|                               | HV      | 3.83                 | 2.82  | 7.64  | 0.00221                   | 0.00163 | 0.00441 | PASS    |
| LTE Band 4(BANDWIDTH, 3MHz)   |         |                      |       |       |                           |         |         |         |
| Condition                     |         | Frequency Error (Hz) |       |       | Frequency Stability (ppm) |         |         | Verdict |
| Temperature                   | Voltage | 64QAM                | 16QAM | QPSK  | 64QAM                     | 16QAM   | QPSK    |         |
| 25℃                           | Normal  | 10.91                | 8.54  | 14.09 | 0.00630                   | 0.00493 | 0.00813 | PASS    |
| 55℃                           |         | 17.09                | 10.48 | 13.07 | 0.00986                   | 0.00605 | 0.00754 | PASS    |
| 50℃                           |         | 9.65                 | 13.40 | 6.17  | 0.00557                   | 0.00773 | 0.00356 | PASS    |
| 40℃                           |         | 8.79                 | 8.47  | 2.87  | 0.00507                   | 0.00489 | 0.00166 | PASS    |
| 30℃                           |         | 19.91                | 4.41  | 6.05  | 0.01149                   | 0.00255 | 0.00349 | PASS    |
| 20℃                           |         | 19.88                | 17.74 | 15.03 | 0.01147                   | 0.01024 | 0.00868 | PASS    |
| 10℃                           |         | 19.68                | 6.78  | 2.50  | 0.01136                   | 0.00391 | 0.00144 | PASS    |
| 0℃                            |         | 6.51                 | 5.34  | 12.33 | 0.00376                   | 0.00308 | 0.00712 | PASS    |
| -10℃                          |         | 3.26                 | 16.36 | 17.98 | 0.00188                   | 0.00944 | 0.01038 | PASS    |
| -20℃                          |         | 13.78                | 4.40  | 3.35  | 0.00795                   | 0.00254 | 0.00193 | PASS    |
| -30℃                          |         | 2.56                 | 16.05 | 14.05 | 0.00148                   | 0.00926 | 0.00811 | PASS    |
| 25℃                           | LV      | 7.25                 | 3.44  | 15.99 | 0.00418                   | 0.00199 | 0.00923 | PASS    |
|                               | HV      | 16.47                | 12.32 | 7.29  | 0.00951                   | 0.00711 | 0.00421 | PASS    |
| LTE Band 4(BANDWIDTH, 5MHz)   |         |                      |       |       |                           |         |         |         |
| Condition                     |         | Frequency Error (Hz) |       |       | Frequency Stability (ppm) |         |         | Verdict |
| Temperature                   | Voltage | 64QAM                | 16QAM | QPSK  | 64QAM                     | 16QAM   | QPSK    |         |
| 25℃                           | Normal  | 4.46                 | 10.93 | 6.79  | 0.00257                   | 0.00631 | 0.00392 | PASS    |
| 55℃                           |         | 11.07                | 13.29 | 8.96  | 0.00639                   | 0.00767 | 0.00517 | PASS    |
| 50℃                           |         | 9.79                 | 4.88  | 17.71 | 0.00565                   | 0.00282 | 0.01022 | PASS    |
| 40℃                           |         | 10.17                | 11.55 | 15.82 | 0.00587                   | 0.00667 | 0.00913 | PASS    |
| 30℃                           |         | 13.07                | 18.99 | 9.87  | 0.00754                   | 0.01096 | 0.00570 | PASS    |
| 20℃                           |         | 18.73                | 4.78  | 2.09  | 0.01081                   | 0.00276 | 0.00121 | PASS    |
| 10℃                           |         | 12.46                | 10.43 | 18.19 | 0.00719                   | 0.00602 | 0.01050 | PASS    |
| 0℃                            |         | 9.59                 | 8.11  | 3.64  | 0.00554                   | 0.00468 | 0.00210 | PASS    |
| -10℃                          |         | 5.15                 | 14.97 | 18.84 | 0.00297                   | 0.00864 | 0.01087 | PASS    |
| -20℃                          |         | 11.78                | 15.10 | 2.06  | 0.00680                   | 0.00872 | 0.00119 | PASS    |
| -30℃                          |         | 7.67                 | 16.94 | 16.64 | 0.00443                   | 0.00978 | 0.00960 | PASS    |
| 25℃                           | LV      | 2.64                 | 10.32 | 12.51 | 0.00152                   | 0.00596 | 0.00722 | PASS    |
|                               | HV      | 15.54                | 9.31  | 13.59 | 0.00897                   | 0.00537 | 0.00784 | PASS    |

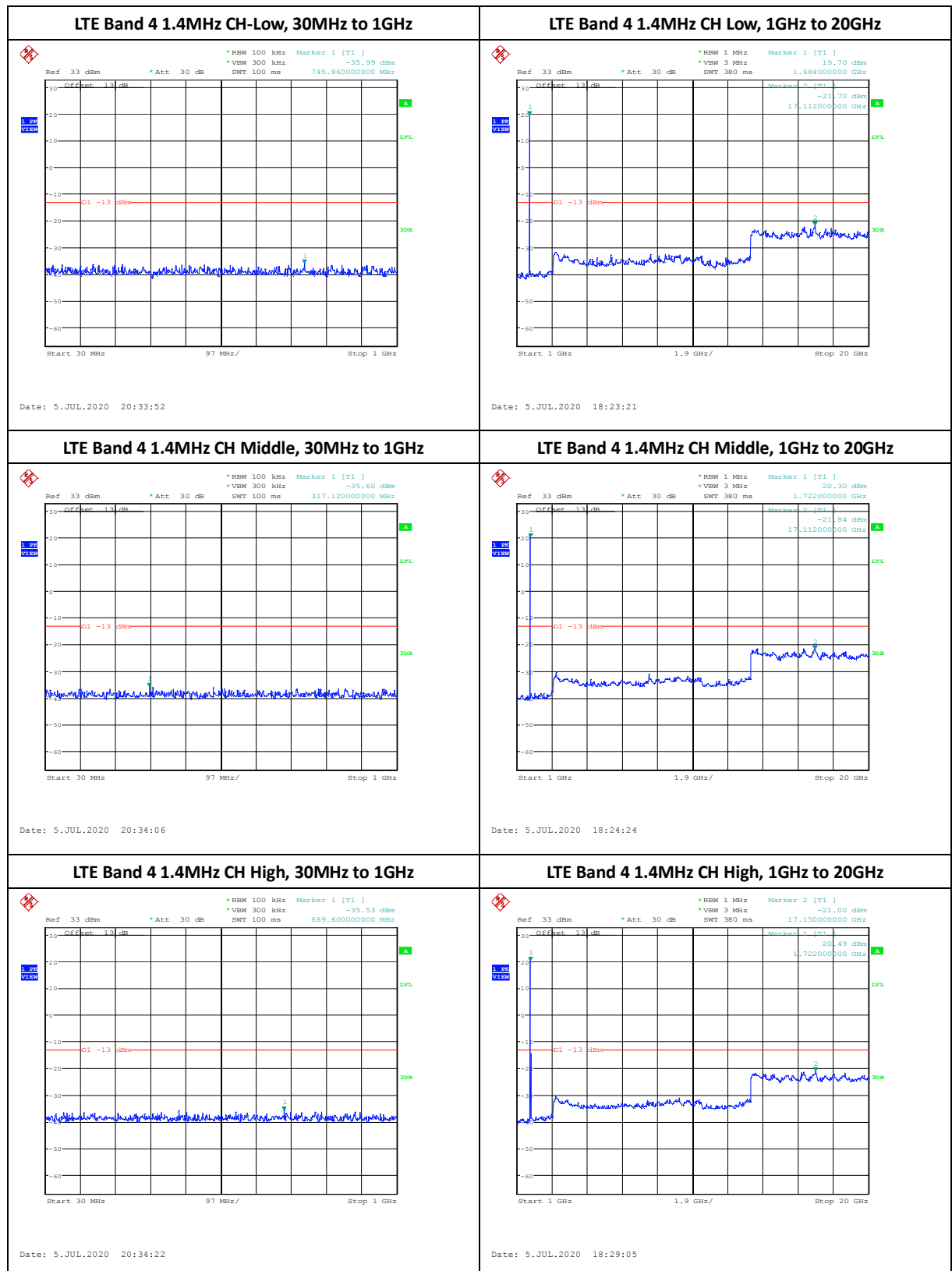
| LTE Band 4(BANDWIDTH, 10MHz) |         |                      |       |       |                           |         |         |         |
|------------------------------|---------|----------------------|-------|-------|---------------------------|---------|---------|---------|
| Condition                    |         | Frequency Error (Hz) |       |       | Frequency Stability (ppm) |         |         | Verdict |
| Temperature                  | Voltage | 64QAM                | 16QAM | QPSK  | 64QAM                     | 16QAM   | QPSK    |         |
| 25℃                          | Normal  | 2.94                 | 13.97 | 12.61 | 0.00170                   | 0.00806 | 0.00728 | PASS    |
| 55℃                          |         | 11.54                | 6.75  | 12.10 | 0.00666                   | 0.00390 | 0.00698 | PASS    |
| 50℃                          |         | 2.93                 | 11.10 | 18.73 | 0.00169                   | 0.00641 | 0.01081 | PASS    |
| 40℃                          |         | 9.87                 | 14.98 | 11.29 | 0.00570                   | 0.00865 | 0.00652 | PASS    |
| 30℃                          |         | 8.90                 | 3.31  | 13.87 | 0.00514                   | 0.00191 | 0.00801 | PASS    |
| 20℃                          |         | 7.08                 | 14.63 | 16.69 | 0.00409                   | 0.00844 | 0.00963 | PASS    |
| 10℃                          |         | 8.33                 | 11.53 | 8.28  | 0.00481                   | 0.00666 | 0.00478 | PASS    |
| 0℃                           |         | 11.79                | 16.07 | 11.67 | 0.00681                   | 0.00928 | 0.00674 | PASS    |
| -10℃                         |         | 12.90                | 15.40 | 7.10  | 0.00745                   | 0.00889 | 0.00410 | PASS    |
| -20℃                         |         | 10.36                | 7.43  | 12.70 | 0.00598                   | 0.00429 | 0.00733 | PASS    |
| -30℃                         |         | 8.44                 | 2.28  | 10.88 | 0.00487                   | 0.00132 | 0.00628 | PASS    |
| 25℃                          | LV      | 11.69                | 19.68 | 12.04 | 0.00675                   | 0.01136 | 0.00695 | PASS    |
|                              | HV      | 19.78                | 4.72  | 4.71  | 0.01142                   | 0.00272 | 0.00272 | PASS    |
| LTE Band 4(BANDWIDTH, 15MHz) |         |                      |       |       |                           |         |         |         |
| Condition                    |         | Frequency Error (Hz) |       |       | Frequency Stability (ppm) |         |         | Verdict |
| Temperature                  | Voltage | 64QAM                | 16QAM | QPSK  | 64QAM                     | 16QAM   | QPSK    |         |
| 25℃                          | Normal  | 19.45                | 4.46  | 2.97  | 0.01123                   | 0.00257 | 0.00171 | PASS    |
| 55℃                          |         | 15.17                | 17.88 | 16.92 | 0.00876                   | 0.01032 | 0.00977 | PASS    |
| 50℃                          |         | 10.26                | 4.57  | 15.45 | 0.00592                   | 0.00264 | 0.00892 | PASS    |
| 40℃                          |         | 19.98                | 12.89 | 3.26  | 0.01153                   | 0.00744 | 0.00188 | PASS    |
| 30℃                          |         | 9.16                 | 7.22  | 7.20  | 0.00529                   | 0.00417 | 0.00416 | PASS    |
| 20℃                          |         | 9.46                 | 4.53  | 15.75 | 0.00546                   | 0.00261 | 0.00909 | PASS    |
| 10℃                          |         | 3.59                 | 6.64  | 12.11 | 0.00207                   | 0.00383 | 0.00699 | PASS    |
| 0℃                           |         | 4.86                 | 18.45 | 6.90  | 0.00281                   | 0.01065 | 0.00398 | PASS    |
| -10℃                         |         | 17.52                | 7.51  | 14.25 | 0.01011                   | 0.00433 | 0.00823 | PASS    |
| -20℃                         |         | 4.82                 | 16.29 | 10.70 | 0.00278                   | 0.00940 | 0.00618 | PASS    |
| -30℃                         |         | 7.09                 | 19.75 | 7.43  | 0.00409                   | 0.01140 | 0.00429 | PASS    |
| 25℃                          | LV      | 13.80                | 12.13 | 19.95 | 0.00797                   | 0.00700 | 0.01152 | PASS    |
|                              | HV      | 16.67                | 4.10  | 7.32  | 0.00962                   | 0.00237 | 0.00423 | PASS    |
| LTE Band 4(BANDWIDTH, 20MHz) |         |                      |       |       |                           |         |         |         |
| Condition                    |         | Frequency Error (Hz) |       |       | Frequency Stability (ppm) |         |         | Verdict |
| Temperature                  | Voltage | 64QAM                | 16QAM | QPSK  | 64QAM                     | 16QAM   | QPSK    |         |
| 25℃                          | Normal  | 12.37                | 9.82  | 9.36  | 0.00714                   | 0.00567 | 0.00540 | PASS    |
| 55℃                          |         | 16.47                | 10.23 | 9.57  | 0.00951                   | 0.00590 | 0.00552 | PASS    |
| 50℃                          |         | 7.34                 | 8.11  | 19.17 | 0.00424                   | 0.00468 | 0.01106 | PASS    |
| 40℃                          |         | 6.13                 | 3.70  | 3.32  | 0.00354                   | 0.00214 | 0.00192 | PASS    |
| 30℃                          |         | 17.51                | 12.54 | 16.09 | 0.01011                   | 0.00724 | 0.00929 | PASS    |
| 20℃                          |         | 16.15                | 16.17 | 10.53 | 0.00932                   | 0.00933 | 0.00608 | PASS    |
| 10℃                          |         | 3.75                 | 5.29  | 17.93 | 0.00216                   | 0.00305 | 0.01035 | PASS    |
| 0℃                           |         | 12.42                | 8.94  | 9.92  | 0.00717                   | 0.00516 | 0.00573 | PASS    |
| -10℃                         |         | 11.65                | 10.32 | 14.52 | 0.00672                   | 0.00596 | 0.00838 | PASS    |
| -20℃                         |         | 13.73                | 10.03 | 18.30 | 0.00792                   | 0.00579 | 0.01056 | PASS    |
| -30℃                         |         | 19.89                | 15.43 | 15.26 | 0.01148                   | 0.00891 | 0.00881 | PASS    |
| 25℃                          | LV      | 16.38                | 14.43 | 6.71  | 0.00945                   | 0.00833 | 0.00387 | PASS    |
|                              | HV      | 18.89                | 9.42  | 19.61 | 0.01090                   | 0.00544 | 0.01132 | PASS    |

| LTE Band 12(BANDWIDTH, 1.4MHz) |         |                      |       |       |                           |         |         |         |
|--------------------------------|---------|----------------------|-------|-------|---------------------------|---------|---------|---------|
| Condition                      |         | Frequency Error (Hz) |       |       | Frequency Stability (ppm) |         |         | Verdict |
| Temperature                    | Voltage | 64QAM                | 16QAM | QPSK  | 64QAM                     | 16QAM   | QPSK    |         |
| 25℃                            | Normal  | 3.48                 | 9.32  | 12.23 | 0.00492                   | 0.01317 | 0.01729 | PASS    |
| 55℃                            |         | 3.65                 | 14.07 | 2.41  | 0.00516                   | 0.01989 | 0.00341 | PASS    |
| 50℃                            |         | 5.65                 | 14.43 | 16.83 | 0.00799                   | 0.02040 | 0.02379 | PASS    |
| 40℃                            |         | 15.87                | 14.42 | 2.22  | 0.02243                   | 0.02038 | 0.00314 | PASS    |
| 30℃                            |         | 19.45                | 12.41 | 12.44 | 0.02749                   | 0.01754 | 0.01758 | PASS    |
| 20℃                            |         | 12.58                | 12.33 | 18.01 | 0.01778                   | 0.01743 | 0.02546 | PASS    |
| 10℃                            |         | 17.67                | 13.55 | 6.62  | 0.02498                   | 0.01915 | 0.00936 | PASS    |
| 0℃                             |         | 16.47                | 11.71 | 4.25  | 0.02328                   | 0.01655 | 0.00601 | PASS    |
| -10℃                           |         | 15.38                | 19.10 | 15.35 | 0.02174                   | 0.02700 | 0.02170 | PASS    |
| -20℃                           |         | 14.00                | 5.34  | 6.47  | 0.01979                   | 0.00755 | 0.00914 | PASS    |
| -30℃                           |         | 5.50                 | 9.76  | 7.69  | 0.00777                   | 0.01380 | 0.01087 | PASS    |
| 25℃                            | LV      | 16.00                | 7.29  | 11.71 | 0.02261                   | 0.01030 | 0.01655 | PASS    |
|                                | HV      | 10.64                | 14.16 | 12.90 | 0.01504                   | 0.02001 | 0.01823 | PASS    |
| LTE Band 12(BANDWIDTH, 3MHz)   |         |                      |       |       |                           |         |         |         |
| Condition                      |         | Frequency Error (Hz) |       |       | Frequency Stability (ppm) |         |         | Verdict |
| Temperature                    | Voltage | 64QAM                | 16QAM | QPSK  | 64QAM                     | 16QAM   | QPSK    |         |
| 25℃                            | Normal  | 12.20                | 5.30  | 4.83  | 0.01724                   | 0.00749 | 0.00683 | PASS    |
| 55℃                            |         | 12.62                | 5.03  | 17.07 | 0.01784                   | 0.00711 | 0.02413 | PASS    |
| 50℃                            |         | 3.79                 | 19.14 | 16.88 | 0.00536                   | 0.02705 | 0.02386 | PASS    |
| 40℃                            |         | 9.77                 | 3.33  | 9.53  | 0.01381                   | 0.00471 | 0.01347 | PASS    |
| 30℃                            |         | 19.21                | 8.71  | 18.57 | 0.02715                   | 0.01231 | 0.02625 | PASS    |
| 20℃                            |         | 12.40                | 3.62  | 16.29 | 0.01753                   | 0.00512 | 0.02302 | PASS    |
| 10℃                            |         | 12.85                | 17.16 | 18.00 | 0.01816                   | 0.02425 | 0.02544 | PASS    |
| 0℃                             |         | 6.34                 | 9.22  | 13.76 | 0.00896                   | 0.01303 | 0.01945 | PASS    |
| -10℃                           |         | 2.73                 | 8.27  | 17.20 | 0.00386                   | 0.01169 | 0.02431 | PASS    |
| -20℃                           |         | 14.84                | 14.04 | 17.03 | 0.02098                   | 0.01984 | 0.02407 | PASS    |
| -30℃                           |         | 15.07                | 14.73 | 4.82  | 0.02130                   | 0.02082 | 0.00681 | PASS    |
| 25℃                            | LV      | 17.15                | 17.06 | 5.66  | 0.02424                   | 0.02411 | 0.00800 | PASS    |
|                                | HV      | 10.78                | 16.76 | 10.24 | 0.01524                   | 0.02369 | 0.01447 | PASS    |
| LTE Band 12(BANDWIDTH, 5MHz)   |         |                      |       |       |                           |         |         |         |
| Condition                      |         | Frequency Error (Hz) |       |       | Frequency Stability (ppm) |         |         | Verdict |
| Temperature                    | Voltage | 64QAM                | 16QAM | QPSK  | 64QAM                     | 16QAM   | QPSK    |         |
| 25℃                            | Normal  | 10.35                | 10.66 | 10.58 | 0.01463                   | 0.01507 | 0.01495 | PASS    |
| 55℃                            |         | 4.66                 | 14.56 | 17.11 | 0.00659                   | 0.02058 | 0.02418 | PASS    |
| 50℃                            |         | 17.20                | 3.05  | 7.44  | 0.02431                   | 0.00431 | 0.01052 | PASS    |
| 40℃                            |         | 15.61                | 8.74  | 11.85 | 0.02206                   | 0.01235 | 0.01675 | PASS    |
| 30℃                            |         | 14.90                | 6.62  | 18.27 | 0.02106                   | 0.00936 | 0.02582 | PASS    |
| 20℃                            |         | 2.31                 | 19.49 | 11.70 | 0.00327                   | 0.02755 | 0.01654 | PASS    |
| 10℃                            |         | 17.50                | 15.51 | 7.74  | 0.02473                   | 0.02192 | 0.01094 | PASS    |
| 0℃                             |         | 3.29                 | 2.15  | 16.81 | 0.00465                   | 0.00304 | 0.02376 | PASS    |
| -10℃                           |         | 8.79                 | 12.68 | 17.79 | 0.01242                   | 0.01792 | 0.02514 | PASS    |
| -20℃                           |         | 16.90                | 3.59  | 11.37 | 0.02389                   | 0.00507 | 0.01607 | PASS    |
| -30℃                           |         | 2.38                 | 16.40 | 2.42  | 0.00336                   | 0.02318 | 0.00342 | PASS    |
| 25℃                            | LV      | 9.49                 | 12.18 | 16.34 | 0.01341                   | 0.01722 | 0.02310 | PASS    |
|                                | HV      | 6.40                 | 19.95 | 2.61  | 0.00905                   | 0.02820 | 0.00369 | PASS    |

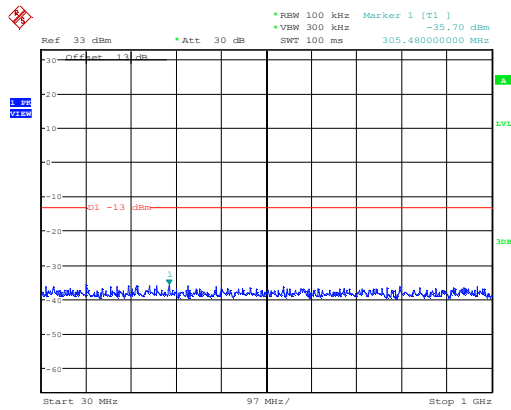
| LTE Band 12(BANDWIDTH, 10MHz) |         |                      |       |       |                           |         |         |         |
|-------------------------------|---------|----------------------|-------|-------|---------------------------|---------|---------|---------|
| Condition                     |         | Frequency Error (Hz) |       |       | Frequency Stability (ppm) |         |         | Verdict |
| Temperature                   | Voltage | 64QAM                | 16QAM | QPSK  | 64QAM                     | 16QAM   | QPSK    |         |
| 25℃                           | Normal  | 3.99                 | 8.99  | 3.90  | 0.00564                   | 0.01271 | 0.00551 | PASS    |
| 55℃                           |         | 15.51                | 19.00 | 9.25  | 0.02192                   | 0.02686 | 0.01307 | PASS    |
| 50℃                           |         | 10.05                | 13.50 | 6.34  | 0.01420                   | 0.01908 | 0.00896 | PASS    |
| 40℃                           |         | 17.67                | 10.11 | 5.92  | 0.02498                   | 0.01429 | 0.00837 | PASS    |
| 30℃                           |         | 2.82                 | 11.10 | 15.49 | 0.00399                   | 0.01569 | 0.02189 | PASS    |
| 20℃                           |         | 17.78                | 16.68 | 11.71 | 0.02513                   | 0.02358 | 0.01655 | PASS    |
| 10℃                           |         | 13.34                | 10.33 | 8.14  | 0.01886                   | 0.01460 | 0.01151 | PASS    |
| 0℃                            |         | 14.99                | 18.73 | 8.54  | 0.02119                   | 0.02647 | 0.01207 | PASS    |
| -10℃                          |         | 16.71                | 10.63 | 7.47  | 0.02362                   | 0.01502 | 0.01056 | PASS    |
| -20℃                          |         | 9.43                 | 12.13 | 5.28  | 0.01333                   | 0.01714 | 0.00746 | PASS    |
| -30℃                          |         | 5.70                 | 19.80 | 9.08  | 0.00806                   | 0.02799 | 0.01283 | PASS    |
| 25℃                           | LV      | 15.88                | 17.50 | 3.92  | 0.02245                   | 0.02473 | 0.00554 | PASS    |
|                               | HV      | 4.16                 | 13.22 | 12.81 | 0.00588                   | 0.01869 | 0.01811 | PASS    |

## AppendixG: Conducted Spurious Emission Measurement

### Test Result

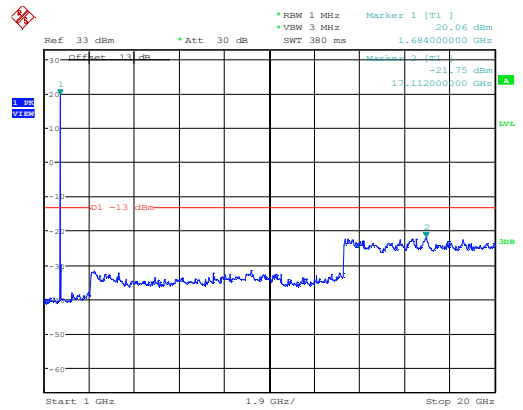


## LTE Band 4 3MHz CH Low, 30MHz to 1GHz



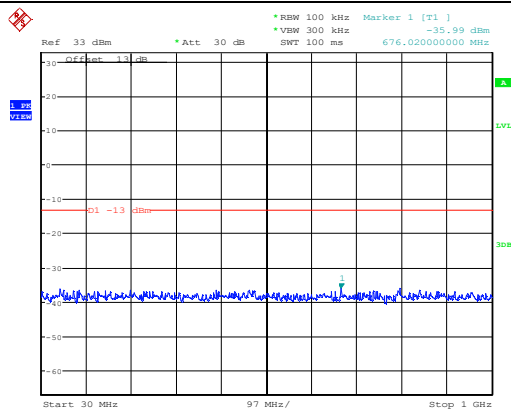
Date: 5.JUL.2020 20:34:44

## LTE Band 4 3MHz CH Low, 1GHz to 20GHz



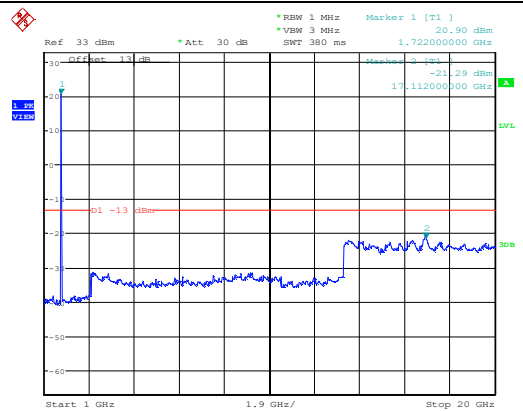
Date: 5.JUL.2020 18:29:51

## LTE Band 4 3MHz CH Middle, 30MHz to 1GHz



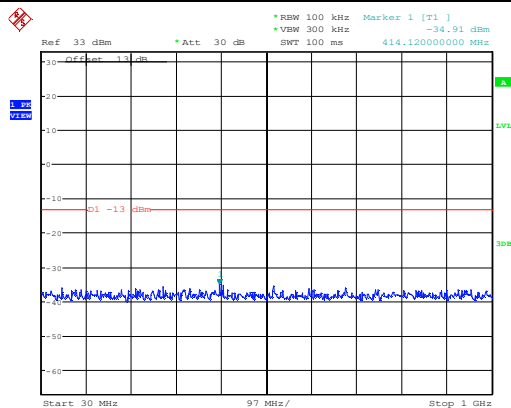
Date: 5.JUL.2020 20:35:00

## LTE Band 4 3MHz CH Middle, 1GHz to 20GHz



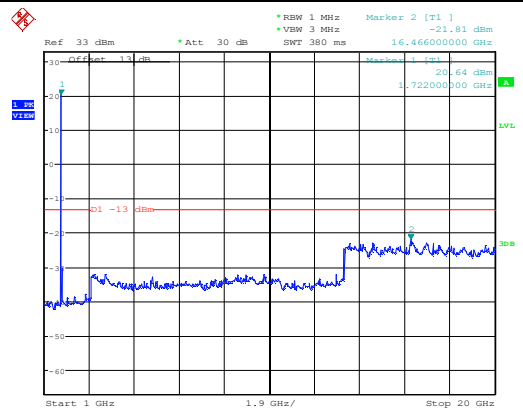
Date: 5.JUL.2020 18:31:02

## LTE Band 4 3MHz CH High, 30MHz to 1GHz



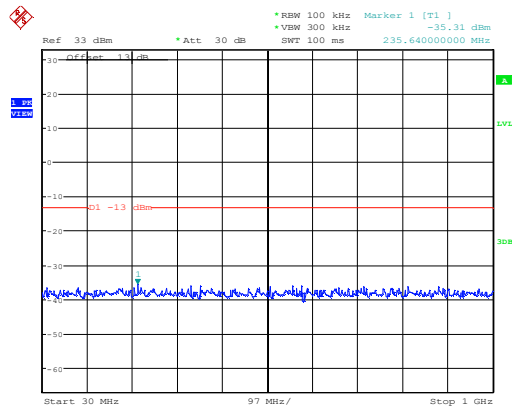
Date: 5.JUL.2020 20:35:17

## LTE Band 4 3MHz CH High, 1GHz to 20GHz



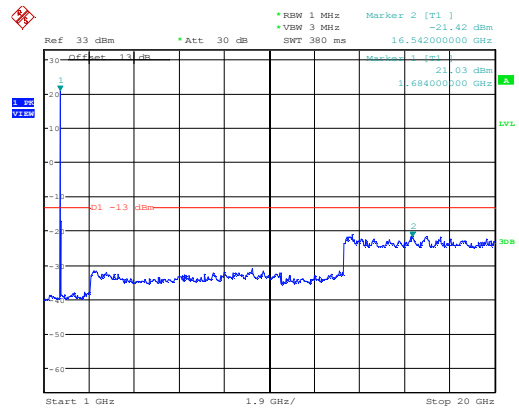
Date: 5.JUL.2020 18:31:33

## LTE Band 4 5MHz CH Low, 30MHz to 1GHz



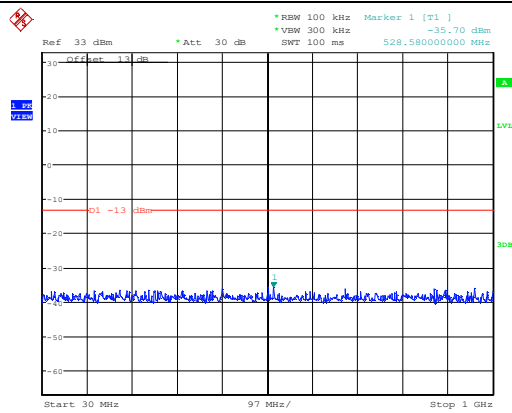
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## LTE Band 4 5MHz CH Low, 1GHz to 20GHz



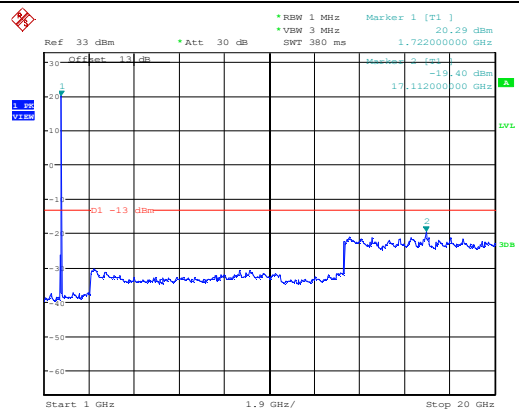
Date: 5.JUL.2020 18:36:09

## LTE Band 4 5MHz CH Middle, 30MHz to 1GHz



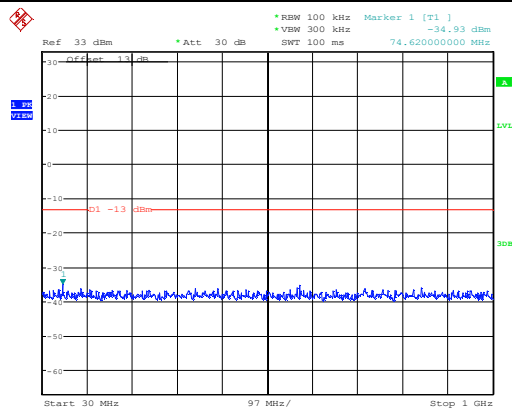
Date: 5.JUL.2020 20:35:54

## LTE Band 4 5MHz CH Middle, 1GHz to 20GHz



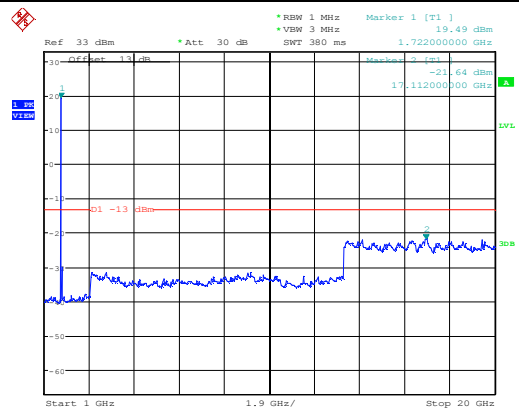
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## LTE Band 4 5MHz CH High, 30MHz to 1GHz

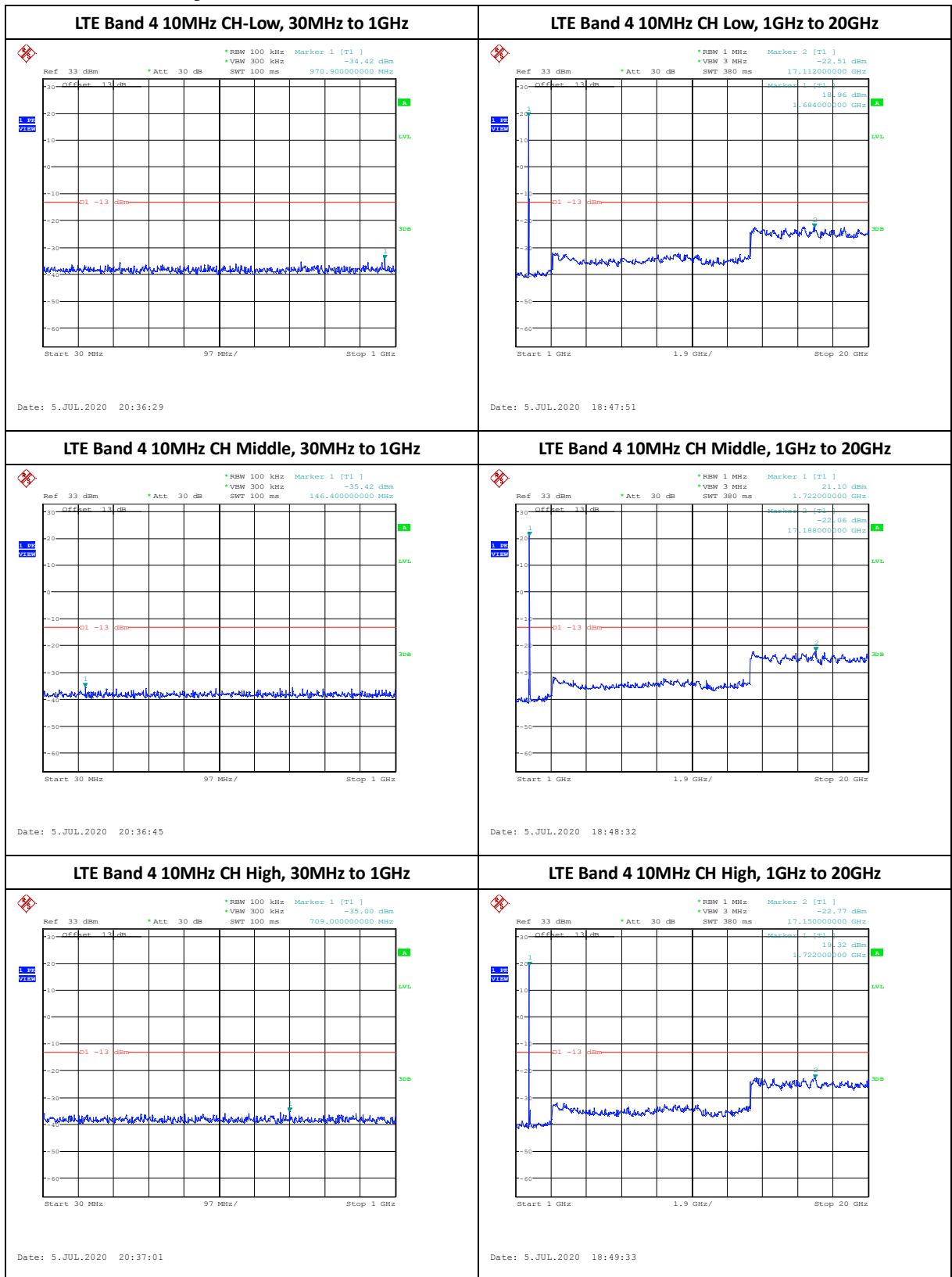


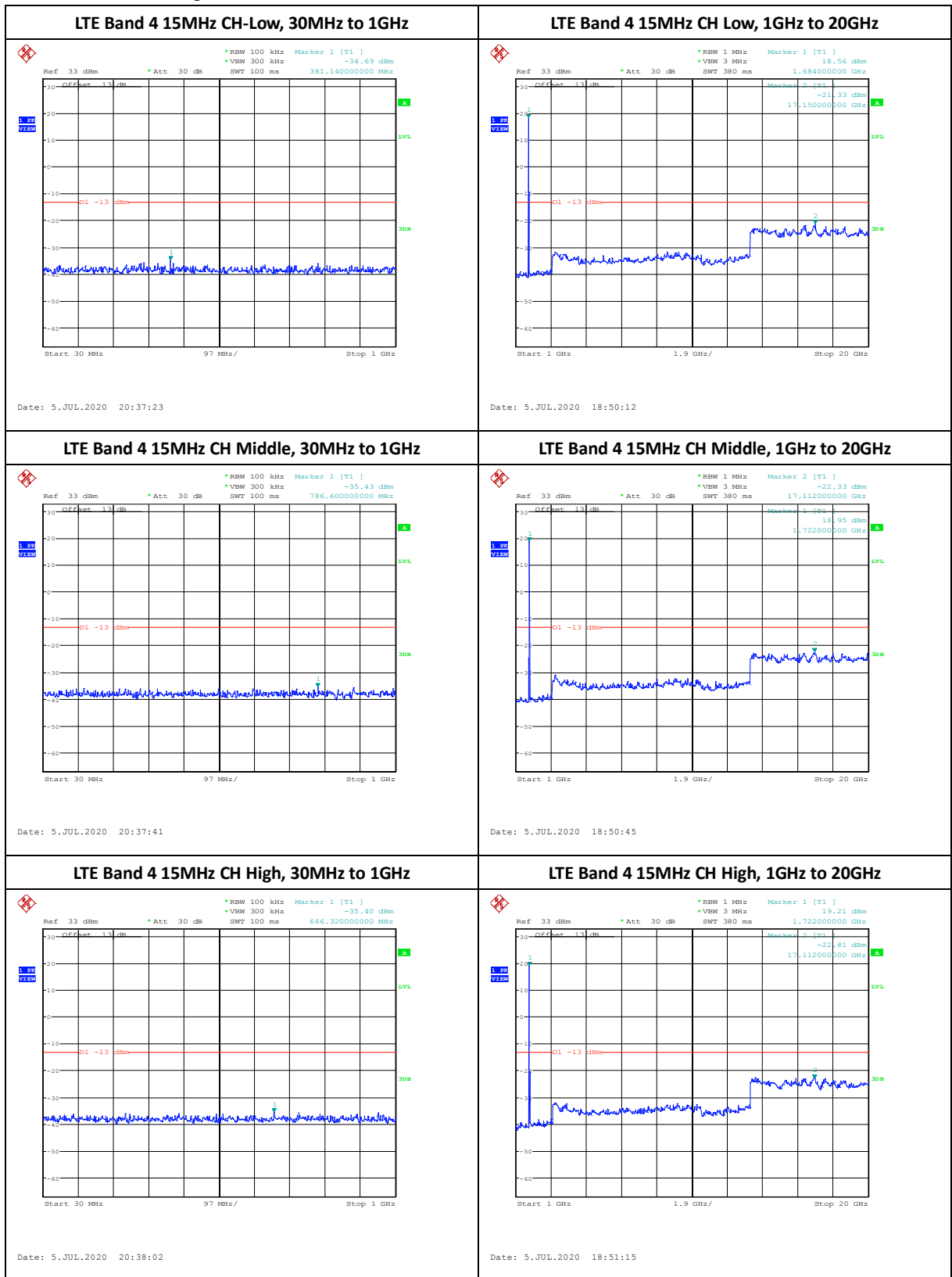
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## LTE Band 4 5MHz CH High, 1GHz to 20GHz

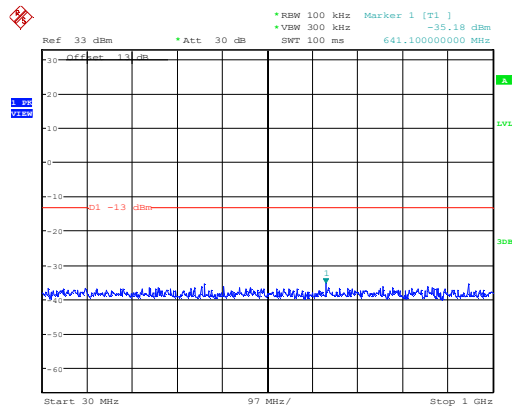


Date: 5.JUL.2020 18:47:18



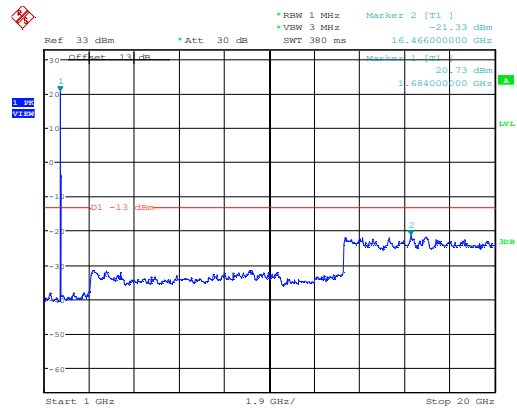


## LTE Band 4 20MHz CH-Low, 30MHz to 1GHz



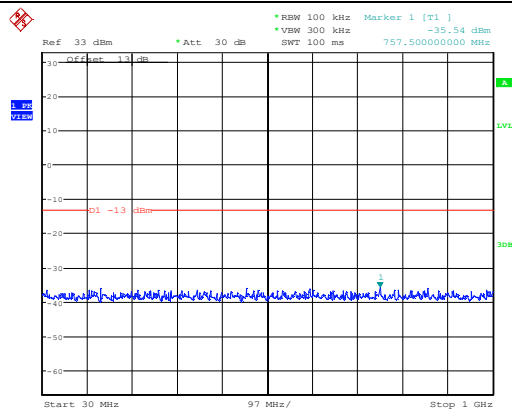
Date: 5.JUL.2020 20:38:23

## LTE Band 4 20MHz CH Low, 1GHz to 20GHz



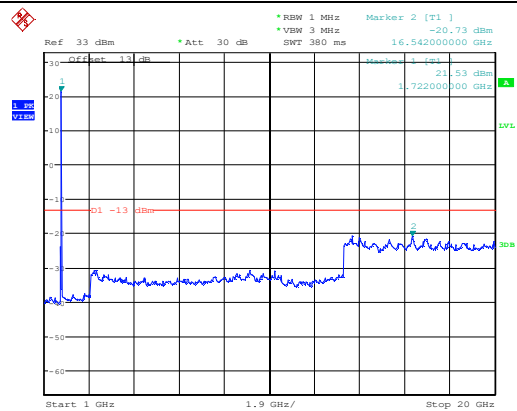
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## LTE Band 4 20MHz CH Middle, 30MHz to 1GHz



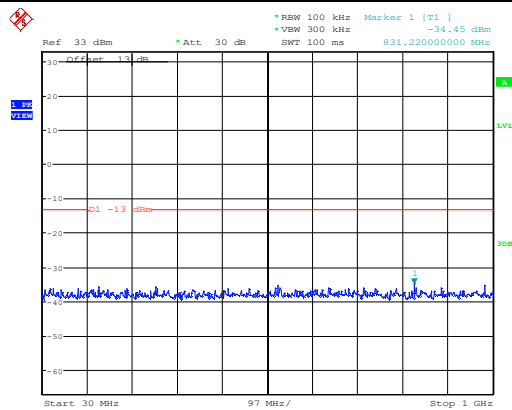
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## LTE Band 4 20MHz CH Middle, 1GHz to 20GHz



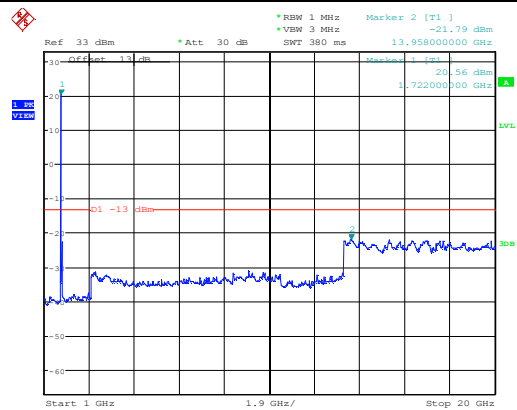
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## LTE Band 4 20MHz CH High, 30MHz to 1GHz

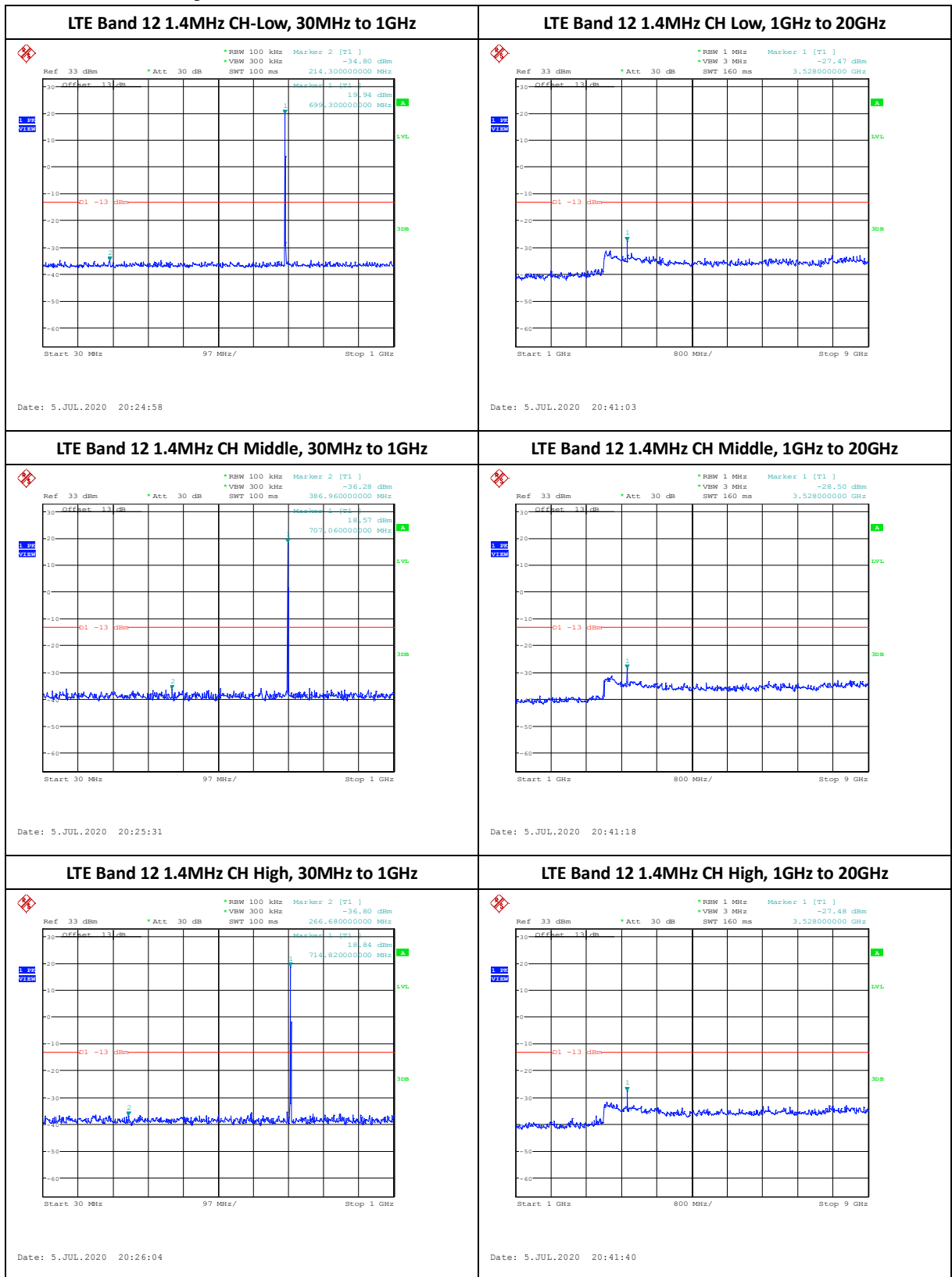


Date: 5.JUL.2020 20:38:57

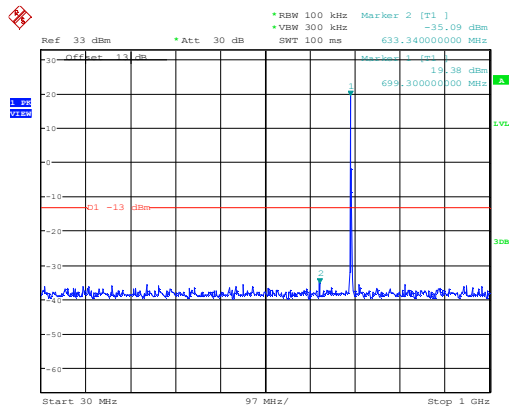
## LTE Band 4 20MHz CH High, 1GHz to 20GHz



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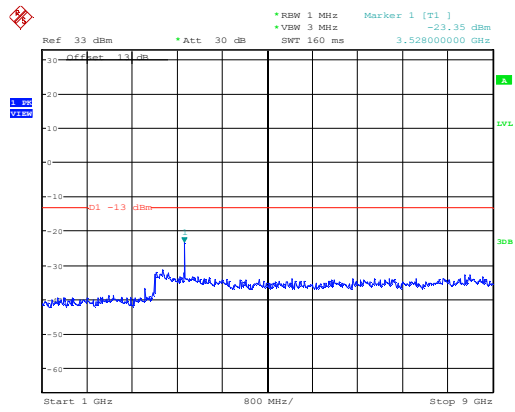


## LTE Band 12 3MHz CH-Low, 30MHz to 1GHz



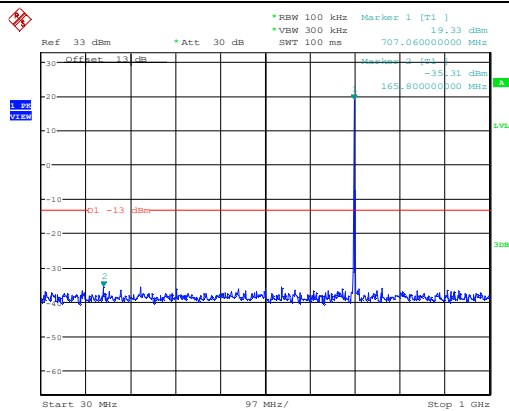
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## LTE Band 12 3MHz CH Low, 1GHz to 20GHz



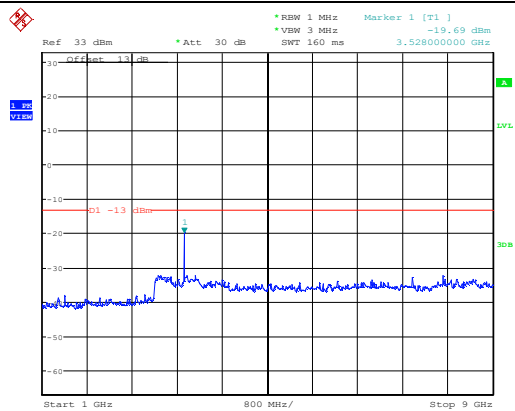
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## LTE Band 12 3MHz CH Middle, 30MHz to 1GHz



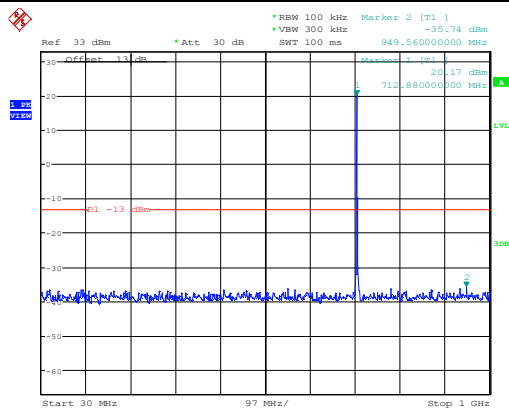
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## LTE Band 12 3MHz CH Middle, 1GHz to 20GHz



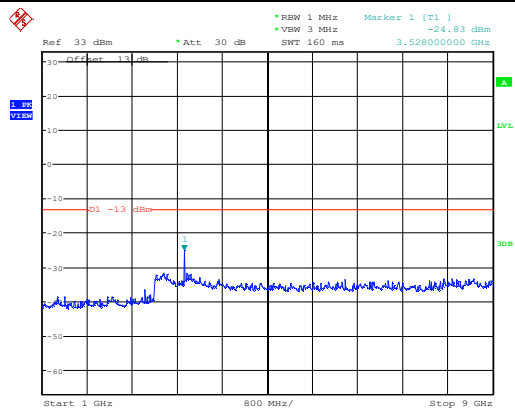
Date: 5.JUL.2020 20:42:10

## LTE Band 12 3MHz CH High, 30MHz to 1GHz



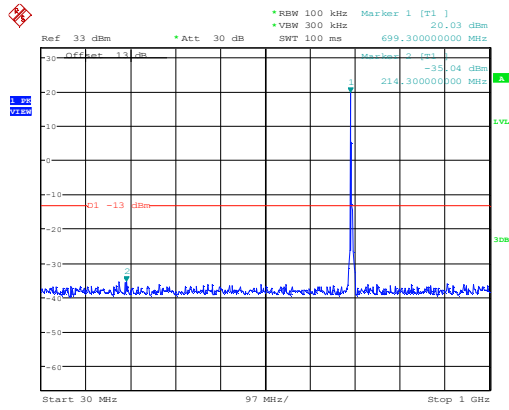
Date: 5.JUL.2020 20:27:44

## LTE Band 12 3MHz CH High, 1GHz to 20GHz



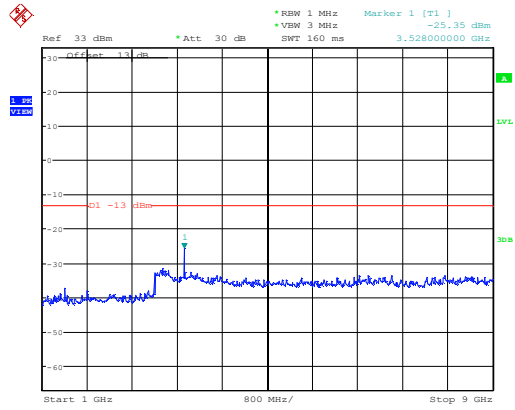
Date: 5.JUL.2020 20:42:24

## LTE Band 12 5MHz CH-Low, 30MHz to 1GHz



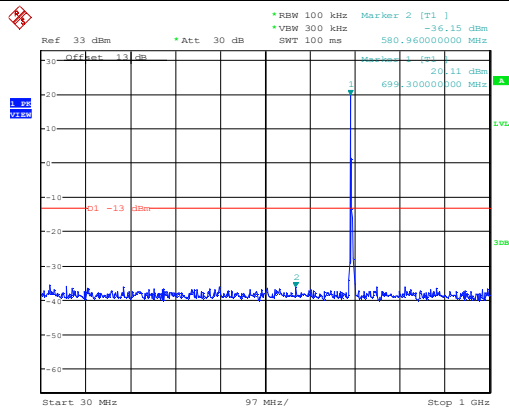
Date: 5.JUL.2020 20:28:22

## LTE Band 12 5MHz CH Low, 1GHz to 20GHz



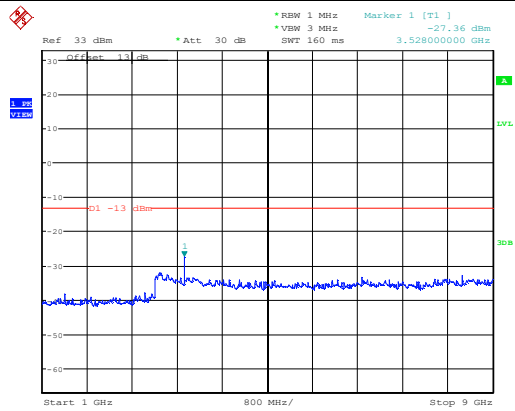
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## LTE Band 12 5MHz CH Middle, 30MHz to 1GHz



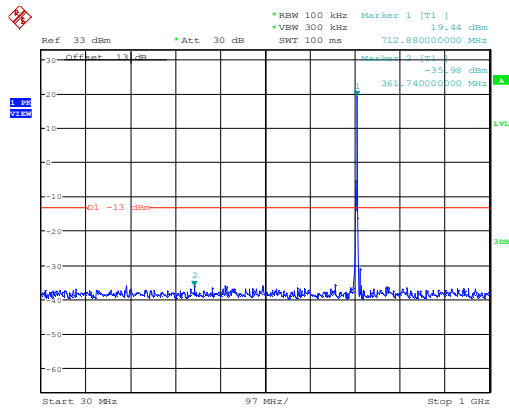
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## LTE Band 12 5MHz CH Middle, 1GHz to 20GHz



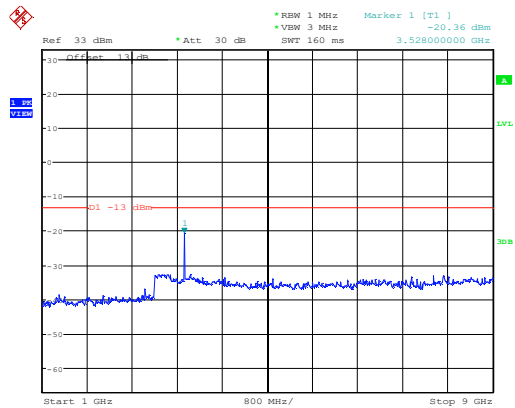
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## LTE Band 12 5MHz CH High, 30MHz to 1GHz

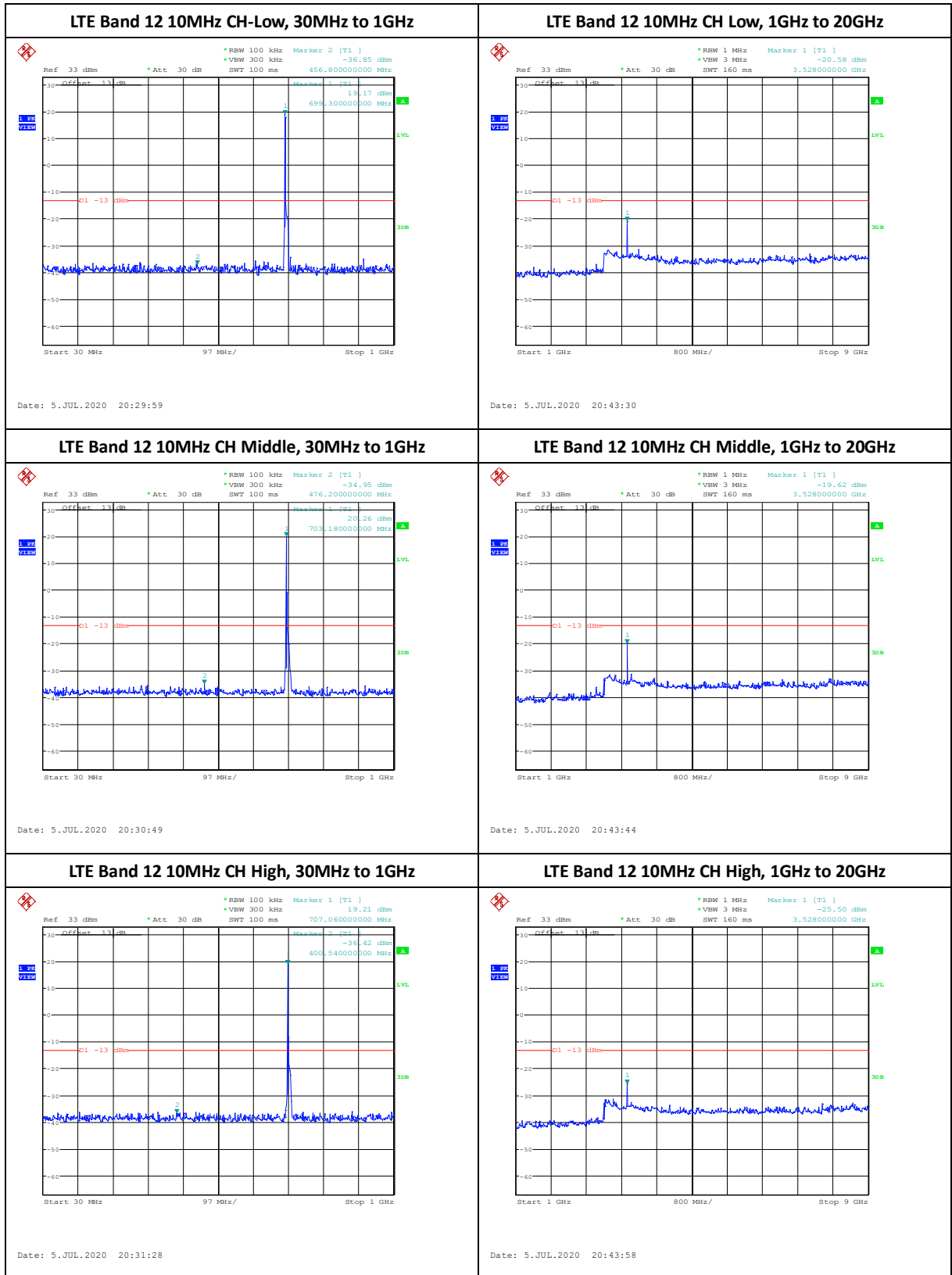


Date: 5.JUL.2020 20:29:28

## LTE Band 12 5MHz CH High, 1GHz to 20GHz



Date: 5.JUL.2020 20:43:13



## AppendixH: Radiated Spurious Emission

### Test Result

| LTE Band 4 QPSK 1.4MHz CH-Middle, RB 1                                         |                  |             |                |               |             |             |
|--------------------------------------------------------------------------------|------------------|-------------|----------------|---------------|-------------|-------------|
| Frequency (MHz)                                                                | Read Level (dBm) | Factor (dB) | Emission (dBm) | Horiz./ Vert. | Limit (dBm) | Margin (dB) |
| 3464.300                                                                       | -56.96           | 7.70        | -51.41         | Horiz./       | -13.00      | -38.41      |
| 5197.500                                                                       | -57.83           | 2.32        | -57.66         | Horiz./       | -13.00      | -44.66      |
| 6930.000                                                                       | -59.46           | 2.32        | -59.29         | Horiz./       | -13.00      | -46.29      |
| 8662.500                                                                       | -57.85           | -0.73       | -60.73         | Horiz./       | -13.00      | -47.73      |
| 10395.000                                                                      | -59.34           | -1.87       | -63.36         | Horiz./       | -13.00      | -50.36      |
| 12127.500                                                                      | -55.36           | -2.27       | -59.78         | Horiz./       | -13.00      | -46.78      |
| 13860.000                                                                      | -53.96           | -2.27       | -58.38         | Horiz./       | -13.00      | -45.38      |
| 15592.500                                                                      | -54.64           | -2.88       | -59.67         | Horiz./       | -13.00      | -46.67      |
| 17325.000                                                                      | -53.12           | -2.77       | -58.04         | Horiz./       | -13.00      | -45.04      |
| Note:                                                                          |                  |             |                |               |             |             |
| a. The other Spurious RF Radiated emissions level is no more than noise floor. |                  |             |                |               |             |             |
| b. The worst emission was found in the antenna is Horizontal position.         |                  |             |                |               |             |             |

| LTE Band 4 QPSK 5MHz CH-Middle, RB 1                                           |                  |             |                |               |             |             |
|--------------------------------------------------------------------------------|------------------|-------------|----------------|---------------|-------------|-------------|
| Frequency (MHz)                                                                | Read Level (dBm) | Factor (dB) | Emission (dBm) | Horiz./ Vert. | Limit (dBm) | Margin (dB) |
| 3460.500                                                                       | -58.42           | 7.70        | -52.87         | Horiz./       | -13.00      | -39.87      |
| 5191.500                                                                       | -62.31           | 2.32        | -62.14         | Horiz./       | -13.00      | -49.14      |
| 6930.000                                                                       | -59.27           | 2.32        | -59.10         | Horiz./       | -13.00      | -46.10      |
| 8662.500                                                                       | -57.51           | -0.73       | -60.39         | Horiz./       | -13.00      | -47.39      |
| 10395.000                                                                      | -55.62           | -1.87       | -59.64         | Horiz./       | -13.00      | -46.64      |
| 12127.500                                                                      | -54.72           | -2.27       | -59.14         | Horiz./       | -13.00      | -46.14      |
| 13860.000                                                                      | -55.28           | -2.27       | -59.70         | Horiz./       | -13.00      | -46.70      |
| 15592.500                                                                      | -55.13           | -2.88       | -60.16         | Horiz./       | -13.00      | -47.16      |
| 17325.000                                                                      | -53.72           | -2.77       | -58.64         | Horiz./       | -13.00      | -45.64      |
| Note:                                                                          |                  |             |                |               |             |             |
| a. The other Spurious RF Radiated emissions level is no more than noise floor. |                  |             |                |               |             |             |
| b. The worst emission was found in the antenna is Horizontal position.         |                  |             |                |               |             |             |

| LTE Band 4 QPSK 20MHz CH-Middle, RB 1                                          |                  |             |                |               |             |             |
|--------------------------------------------------------------------------------|------------------|-------------|----------------|---------------|-------------|-------------|
| Frequency (MHz)                                                                | Read Level (dBm) | Factor (dB) | Emission (dBm) | Horiz./ Vert. | Limit (dBm) | Margin (dB) |
| 3465.000                                                                       | -59.62           | 7.70        | -54.07         | Horiz./       | -13.00      | -41.07      |
| 5170.900                                                                       | -61.27           | 2.32        | -61.10         | Horiz./       | -13.00      | -48.10      |
| 6930.000                                                                       | -60.14           | 2.32        | -59.97         | Horiz./       | -13.00      | -46.97      |
| 8662.500                                                                       | -57.89           | -0.73       | -60.77         | Horiz./       | -13.00      | -47.77      |
| 10395.000                                                                      | -55.46           | -1.87       | -59.48         | Horiz./       | -13.00      | -46.48      |
| 12127.500                                                                      | -54.68           | -2.27       | -59.10         | Horiz./       | -13.00      | -46.10      |
| 13860.000                                                                      | -53.69           | -2.27       | -58.11         | Horiz./       | -13.00      | -45.11      |
| 15592.500                                                                      | -53.12           | -2.88       | -58.15         | Horiz./       | -13.00      | -45.15      |
| 17325.000                                                                      | -53.01           | -2.77       | -57.93         | Horiz./       | -13.00      | -44.93      |
| Note:                                                                          |                  |             |                |               |             |             |
| a. The other Spurious RF Radiated emissions level is no more than noise floor. |                  |             |                |               |             |             |
| b. The worst emission was found in the antenna is Horizontal position.         |                  |             |                |               |             |             |

| LTE Band 12 QPSK 1.4MHz CH-Middle, RB 1                                                                                                                           |                  |             |                |               |             |             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-------------|----------------|---------------|-------------|-------------|
| Frequency (MHz)                                                                                                                                                   | Read Level (dBm) | Factor (dB) | Emission (dBm) | Horiz./ Vert. | Limit (dBm) | Margin (dB) |
| 1415.000                                                                                                                                                          | -59.82           | 5.92        | -56.05         | Horiz./       | -13.00      | -43.05      |
| 2122.500                                                                                                                                                          | -62.34           | 7.52        | -56.97         | Horiz./       | -13.00      | -43.97      |
| 2830.000                                                                                                                                                          | -65.17           | 8.16        | -59.16         | Horiz./       | -13.00      | -46.16      |
| 3537.500                                                                                                                                                          | -62.15           | 7.70        | -56.60         | Horiz./       | -13.00      | -43.60      |
| 4245.000                                                                                                                                                          | -62.33           | 3.56        | -60.92         | Horiz./       | -13.00      | -47.92      |
| 4952.500                                                                                                                                                          | -61.29           | 3.56        | -59.88         | Horiz./       | -13.00      | -46.88      |
| 5660.000                                                                                                                                                          | -61.03           | 2.32        | -60.86         | Horiz./       | -13.00      | -47.86      |
| 6367.500                                                                                                                                                          | -57.98           | 2.32        | -57.81         | Horiz./       | -13.00      | -44.81      |
| 7075.000                                                                                                                                                          | -57.15           | 2.32        | -56.98         | Horiz./       | -13.00      | -43.98      |
| Note:<br>a. The other Spurious RF Radiated emissions level is no more than noise floor.<br>b. The worst emission was found in the antenna is Horizontal position. |                  |             |                |               |             |             |

| LTE Band 12 QPSK 5MHz CH-Middle, RB 1                                                                                                                             |                  |             |                |               |             |             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-------------|----------------|---------------|-------------|-------------|
| Frequency (MHz)                                                                                                                                                   | Read Level (dBm) | Factor (dB) | Emission (dBm) | Horiz./ Vert. | Limit (dBm) | Margin (dB) |
| 1415.000                                                                                                                                                          | -55.69           | 5.92        | -51.92         | Horiz./       | -13.00      | -38.92      |
| 2122.500                                                                                                                                                          | -60.23           | 7.52        | -54.86         | Horiz./       | -13.00      | -41.86      |
| 2830.000                                                                                                                                                          | -64.12           | 8.16        | -58.11         | Horiz./       | -13.00      | -45.11      |
| 3537.500                                                                                                                                                          | -62.39           | 7.70        | -56.84         | Horiz./       | -13.00      | -43.84      |
| 4245.000                                                                                                                                                          | -61.25           | 3.56        | -59.84         | Horiz./       | -13.00      | -46.84      |
| 4952.500                                                                                                                                                          | -61.74           | 3.56        | -60.33         | Horiz./       | -13.00      | -47.33      |
| 5660.000                                                                                                                                                          | -60.28           | 2.32        | -60.11         | Horiz./       | -13.00      | -47.11      |
| 6367.500                                                                                                                                                          | -59.39           | 2.32        | -59.22         | Horiz./       | -13.00      | -46.22      |
| 7075.000                                                                                                                                                          | -55.12           | 2.32        | -54.95         | Horiz./       | -13.00      | -41.95      |
| Note:<br>a. The other Spurious RF Radiated emissions level is no more than noise floor.<br>b. The worst emission was found in the antenna is Horizontal position. |                  |             |                |               |             |             |

| LTE Band 12 QPSK 10MHz CH-Middle, RB 1                                                                                                                            |                  |             |                |               |             |             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-------------|----------------|---------------|-------------|-------------|
| Frequency (MHz)                                                                                                                                                   | Read Level (dBm) | Factor (dB) | Emission (dBm) | Horiz./ Vert. | Limit (dBm) | Margin (dB) |
| 1415.000                                                                                                                                                          | -54.65           | 5.92        | -50.88         | Horiz./       | -13.00      | -37.88      |
| 2122.500                                                                                                                                                          | -61.28           | 7.52        | -55.91         | Horiz./       | -13.00      | -42.91      |
| 2830.000                                                                                                                                                          | -65.14           | 8.16        | -59.13         | Horiz./       | -13.00      | -46.13      |
| 3537.500                                                                                                                                                          | -59.32           | 7.70        | -53.77         | Horiz./       | -13.00      | -40.77      |
| 4245.000                                                                                                                                                          | -61.29           | 3.56        | -59.88         | Horiz./       | -13.00      | -46.88      |
| 4952.500                                                                                                                                                          | -62.03           | 3.56        | -60.62         | Horiz./       | -13.00      | -47.62      |
| 5660.000                                                                                                                                                          | -61.38           | 2.32        | -61.21         | Horiz./       | -13.00      | -48.21      |
| 6367.500                                                                                                                                                          | -59.51           | 2.32        | -59.34         | Horiz./       | -13.00      | -46.34      |
| 7075.000                                                                                                                                                          | -55.13           | 2.32        | -54.96         | Horiz./       | -13.00      | -41.96      |
| Note:<br>a. The other Spurious RF Radiated emissions level is no more than noise floor.<br>b. The worst emission was found in the antenna is Horizontal position. |                  |             |                |               |             |             |