# CERTIFICATION TEST REPORT

## Report Number. : 11626381H-E1V4

| | | |
|---|---|---|
| **Applicant** | : | SONY MOBILE COMMUNICATIONS INC.<br>4-12-3 HIGASHI-SHINAGAWA,<br>SHINAGAWA -KU,TOKYO, 140-0002, JAPAN |
| **FCC ID** | : | PY7-54254H |
| **EUT Description** | : | GSM/WCDMA/LTE Phone with BT,DTS/UNII a/b/g/n/ac, GPS & NFC |
| **Test Standard(s)** | : | FCC CFR47 PART 22 SUBPART H<br>FCC CFR47 PART 24 SUBPART E<br>FCC CFR47 PART 27 SUBPART F, H, L, and M |

**Date Of Issue:**

April 17, 2017

**Prepared by:**
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**Revision History**

NVLAP LAB CODE 200065-0

| Rev. | Issue Date | Revisions | Revised By |
|---|---|---|---|
| V1 | 03/22/17 | Initial Issue | C. Vergonio |
| V2 | 04/10/17 | Deleted Model Number.<br>Updated Test procedure in Section 11.3 (Page 22).<br>Updated Section 11.5 (Page 24).<br>Added LTE 13 Frequency stability results.<br>Updated the reference freq. column and fixed LTE 12 table.<br>Updated LTE7 BW QPSK EIRP table in page 169.<br>Updated Section 17.1.1 (Page 175, 177, 179) test frequencies. | C. Vergonio |
| V3 | 04/11/17 | Corrected Reference Frequency, Pages 156-157 | C. Vergonio |
| V4 | 04/17/17 | Added note in Section 11.9. | C. Vergonio |

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# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** SONY MOBILE COMMUNICATIONS, INC.
4-12-3 HIGASHI-SHINAGAWA,
SHINAGAWA –KU, TOKYO, 140-0002, JAPAN

**EUT DESCRIPTION:** GSM/WCDMA/LTE PHONE with BT, DTS/UNII a/b/g/n/ac & NFC

**SERIAL NUMBER:** CB512DHRLY, CB512DHRQK, CB512DHRWX, CB512DHRTZ(conducted), CB512DQZUX, CB512DQZYK(Radiated)

**DATE TESTED:** March 6-17, 2017

| APPLICABLE STANDARDS | |
|---|---|
| **STANDARD** | **TEST RESULTS** |
| FCC PART 22H, 24E, 27H, 27F, 27L, 27M | PASS |

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

**Note:** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

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# 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with TIA-603-D, FCC CFR 47 Part 22,24, FCC CFR 47 Part 27.

# 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, Fremont, California, USA. Line conducted emissions are measured only at the 47173 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

| 47173 Benicia Street | 47266 Benicia Street |
|---|---|
| ☒ Chamber A | ☐ Chamber D |
| ☒ Chamber B | ☐ Chamber E |
| ☒ Chamber C | ☐ Chamber F |
| | ☐ Chamber G |
| | ☐ Chamber H |

The above test sites and facilities are covered under FCC Test Firm Registration # 208313.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0.

Chambers A through H are covered under Industry Canada company address code 2324B with site numbers 2324B -1 through 2324B-8, respectively.

# 4. CALIBRATION AND UNCERTAINTY

## 4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards

## 4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

EIRP = PSA reading with EUT worst orientation (dBm) + Path loss (dB) – cable loss( between the SG and substitution antenna) + Substitution Antenna Factor (dBi)

ERP = PSA reading with EUT worst orientation (dBm) + Path loss (dB) – cable loss( between the SG and substitution antenna)

(Path loss = Signal generator output – PSA reading with substitution antenna)

## 4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

| PARAMETER | UNCERTAINTY |
|---|---|
| Occupied Channel Bandwidth | ±1.1 % |
| RF output power, conducted | ±0.35 dB |
| Power Spectral Density, conducted | ±0.39 dB |
| Unwanted Emissions, conducted | ±2.9 dB |
| All emissions, radiated | ±5.36 dB |
| Temperature | ±0.9 °C |
| Humidity | ±2.26% RH |
| Supply Voltages | ±0.45 % |
| Time | ±0.2 % |

Uncertainty figures are valid to a confidence level of 95%.

# 5. EQUIPMENT UNDER TEST

## 5.1. DESCRIPTION OF EUT

This EUT is a GSM/WCDMA/LTE PHONE + BLUETOOTH, DTS/UNII a/b/g/n/ac, GPS & NFC.

# 6. MAXIMUM OUTPUT POWER

## 6.1. MAXIMUM OUTPUT POWER (GSM/EGPRS)

The transmitter has a maximum peak conducted and radiated ERP / EIRP output powers as follows:

| FCC Part 22/24 | | | | | | |
|---|---|---|---|---|---|---|
| Band | Frequency Range(MHz) | Modulation | Conducted | | Radiated | |
| | | | AVG(dBm) | AVG(mW) | AVG(dBm) | AVG(mW) |
| GSM850 | 824~849 | GSM | 32.7 | 1862.09 | | |
| | 824~849 | GPRS | 32.7 | 1862.09 | 28.48 | 704.69 |
| | 824~849 | EGPRS | 27.1 | 512.86 | 24.32 | 270.40 |
| GSM1900 | 1850~1910 | GSM | 29.8 | 954.99 | | |
| | 1850~1910 | GPRS | 29.8 | 954.99 | 29.20 | 831.76 |
| | 1850~1910 | EGPRS | 25.4 | 346.74 | 26.70 | 467.74 |

## 6.2. MAXIMUM OUTPUT POWER (WCDMA)

The transmitter has a maximum peak conducted and radiated ERP / EIRP output powers as follows:

| FCC Part 22 | | | | | | |
|---|---|---|---|---|---|---|
| Band | Frequency Range(MHz) | Modulation | Conducted | | Radiated | |
| | | | AVG(dBm) | AVG(mW) | AVG(dBm) | AVG(mW) |
| Band 5 | 824~849 | REL99 | 24.2 | 263.03 | 18.93 | 78.16 |
| | 824~849 | HSDPA | 23.1 | 204.17 | 17.79 | 60.12 |
| | 824~849 | HSUPA | 23.1 | 204.17 | | |

## 6.3. MAXIMUM OUTPUT POWER (LTE)

The transmitter has a maximum peak conducted and radiated ERP/EIRP output powers as follows:

**LTE Band 4**

| FCC Part 27 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Band | Frequency Range(MHz) | BandWidth (MHz) | Modulation | Conducted | | Radiated | |
| | | | | AVG(dBm) | AVG(mW) | AVG(dBm) | AVG(mW) |
| LTE4 | 1710~1755 | 1.4MHz | QPSK | 21.65 | 146.22 | 21.20 | 131.83 |
| | | | 16QAM | 20.76 | 119.12 | 21.05 | 127.35 |
| | | 3MHz | QPSK | 21.60 | 144.54 | 21.72 | 148.59 |
| | | | 16QAM | 20.78 | 119.67 | 20.87 | 122.18 |
| | | 5MHz | QPSK | 21.95 | 156.68 | 21.55 | 142.89 |
| | | | 16QAM | 21.00 | 125.89 | 20.87 | 122.18 |
| | | 10MHz | QPSK | 21.87 | 153.82 | 20.56 | 113.76 |
| | | | 16QAM | 21.00 | 125.89 | 19.74 | 94.19 |
| | | 15MHz | QPSK | 21.88 | 154.17 | 21.30 | 134.90 |
| | | | 16QAM | 21.00 | 125.89 | 20.32 | 107.65 |
| | | 20MHz | QPSK | 21.80 | 151.36 | 21.09 | 128.53 |
| | | | 16QAM | 21.00 | 125.89 | 20.51 | 112.46 |

**LTE Band 5**

| FCC Part 22 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Band | Frequency Range(MHz) | BandWidth (MHz) | Modulation | Conducted | | Radiated | |
| | | | | AVG(dBm) | AVG(mW) | AVG(dBm) | AVG(mW) |
| LTE5 | 824~849 | 1.4MHz | QPSK | 23.77 | 238.23 | 19.71 | 93.54 |
| | | | 16QAM | 23.00 | 199.53 | 18.61 | 72.61 |
| | | 3MHz | QPSK | 23.86 | 243.22 | 19.46 | 88.31 |
| | | | 16QAM | 23.00 | 199.53 | 18.64 | 73.11 |
| | | 5MHz | QPSK | 23.87 | 243.78 | 19.54 | 89.95 |
| | | | 16QAM | 23.00 | 199.53 | 18.73 | 74.64 |
| | | 10MHz | QPSK | 23.82 | 240.99 | 19.43 | 87.70 |
| | | | 16QAM | 22.79 | 190.11 | 18.57 | 71.94 |

**LTE Band 7**

| FCC Part 27 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Band | Frequency Range(MHz) | BandWidth (MHz) | Modulation | Conducted | | Radiated | |
| | | | | AVG(dBm) | AVG(mW) | PEAK(dBm) | PEAK(mW) |
| LTE7 | 2500~2570 | 5MHz | QPSK | 19.77 | 94.84 | 27.48 | 559.76 |
| | | | 16QAM | 19.00 | 79.43 | 27.36 | 544.50 |
| | | 10MHz | QPSK | 20.00 | 100.00 | 25.51 | 355.63 |
| | | | 16QAM | 19.00 | 79.43 | 26.79 | 477.53 |
| | | 15MHz | QPSK | 20.00 | 100.00 | 25.38 | 345.14 |
| | | | 16QAM | 19.00 | 79.43 | 25.60 | 363.08 |
| | | 20MHz | QPSK | 19.95 | 98.86 | 25.86 | 385.48 |
| | | | 16QAM | 19.00 | 79.43 | 25.95 | 393.55 |

**LTE Band 12**

| FCC Part 27 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Band | Frequency Range(MHz) | BandWidth (MHz) | Modulation | Conducted | | Radiated | |
| | | | | AVG(dBm) | AVG(mW) | AVG(dBm) | AVG(mW) |
| LTE12 | 699~716 | 1.4MHz | QPSK | 24.78 | 300.61 | 17.32 | 53.95 |
| | | | 16QAM | 24.00 | 251.19 | 16.49 | 44.57 |
| | | 3MHz | QPSK | 24.89 | 308.32 | 17.49 | 56.10 |
| | | | 16QAM | 24.00 | 251.19 | 16.73 | 47.10 |
| | | 5MHz | QPSK | 24.79 | 301.30 | 16.68 | 46.56 |
| | | | 16QAM | 24.00 | 251.19 | 15.80 | 38.02 |
| | | 10MHz | QPSK | 24.81 | 302.69 | 17.28 | 53.46 |
| | | | 16QAM | 24.00 | 251.19 | 16.70 | 46.77 |

**LTE Band 13**

| FCC Part 27 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Band | Frequency Range(MHz) | BandWidth (MHz) | Modulation | Conducted | | Radiated | |
| | | | | AVG(dBm) | AVG(mW) | AVG(dBm) | AVG(mW) |
| LTE13 | 777~787 | 5MHz | QPSK | 23.75 | 237.14 | 20.73 | 118.30 |
| | | | 16QAM | 23.00 | 199.53 | 20.02 | 100.46 |
| | | 10MHz | QPSK | 23.75 | 237.14 | 20.41 | 109.90 |
| | | | 16QAM | 23.00 | 199.53 | 19.54 | 89.95 |

**LTE Band 17**

| FCC Part 27 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Band | Frequency Range(MHz) | BandWidth (MHz) | Modulation | Conducted | | Radiated | |
| | | | | AVG(dBm) | AVG(mW) | AVG(dBm) | AVG(mW) |
| LTE17 | 704~716 | 5MHz | QPSK | 24.45 | 278.61 | 18.37 | 68.71 |
| | | | 16QAM | 23.58 | 228.03 | 17.71 | 59.02 |
| | | 10MHz | QPSK | 24.46 | 279.25 | 17.48 | 55.98 |
| | | | 16QAM | 23.39 | 218.27 | 16.60 | 45.71 |

**LTE Band 41**

| FCC Part 27 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Band | Frequency Range(MHz) | BandWidth (MHz) | Modulation | Conducted | | Radiated | |
| | | | | AVG(dBm) | AVG(mW) | PEAK(dBm) | PEAK(mW) |
| LTE41 | 2496~2690 | 5MHz | QPSK | 19.69 | 93.11 | 24.95 | 312.61 |
| | | | 16QAM | 18.59 | 72.28 | 24.98 | 314.77 |
| | | 10MHz | QPSK | 19.68 | 92.90 | 24.60 | 288.40 |
| | | | 16QAM | 18.81 | 76.03 | 24.68 | 293.76 |
| | | 15MHz | QPSK | 19.78 | 95.06 | 23.29 | 213.30 |
| | | | 16QAM | 18.72 | 74.47 | 23.86 | 243.22 |
| | | 20MHz | QPSK | 19.76 | 94.62 | 25.54 | 358.10 |
| | | | 16QAM | 18.65 | 73.28 | 25.45 | 350.75 |

# 7. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a PIFA antenna for the [List the bands supported] with a maximum peak gain as follow:

| Frequency (MHz) | Peak Gain (dBi) |
|---|---|
| GSM850, 824~849MHz | -4.7 |
| GSM1900, 1850~1910MHz | -1.3 |
| WCDMA Band 5, 824~849 | -4.7 |
| LTE Band 4, 1710~1755MHz | -2.3 |
| LTE Band 5, 824~849MHz | -4.7 |
| LTE Band 7, 2500~2570MHz | -1.2 |
| LTE Band 12, 699~716MHz | -7.5 |
| LTE Band 13, 777~787MHz | -6.6 |
| LTE Band 17, 704~716MHz | -7.5 |
| LTE Band 41, 2496~2690MHz | -1.9 |

# 8. DESCRIPTION OF TEST SETUP

**SUPPORT EQUIPMENT**

| Support Equipment List | | | | |
|---|---|---|---|---|
| **Description** | **Manufacturer** | **Model** | **Serial Number** | **FCC ID** |
| AC Adapter | SONY | 1300-7137.1 | 4016W40310044 | NA |
| Earphone | SONY | N/A | N/A | N/A |

**I/O CABLES (CONDUCTED SETUP)**

| I/O Cable List | | | | | | |
|---|---|---|---|---|---|---|
| **Cable No** | **Port** | **# of Identical ports** | **Connector Type** | **Serial Type** | **Cable Length (m)** | **Remarks** |
| 1 | RF Out | 1 | Spectrum Analyzer | Shielded | None | NA |
| 2 | Antenna Port | 1 | EUT | Shielded | 0.1m | NA |
| 3 | RF In/Out | 1 | Communication Test Set | Shielded | 1m | NA |

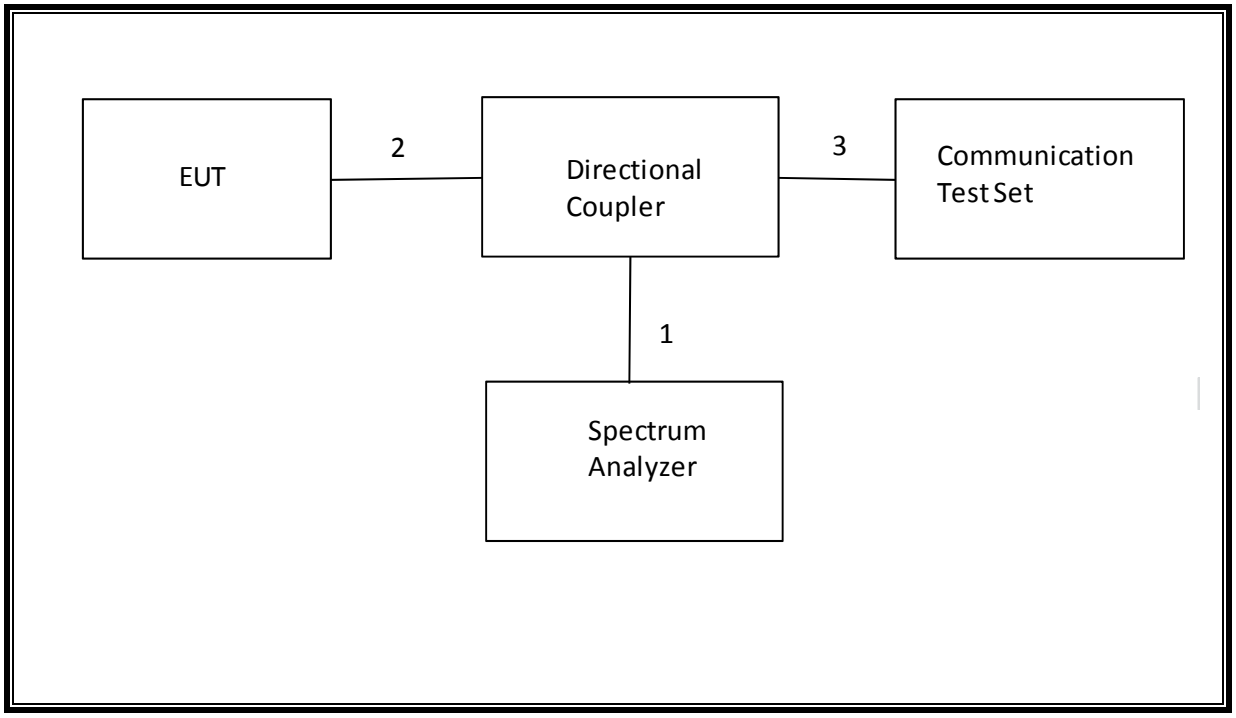
**I/O CABLES (RADIATED SETUP)**

| I/O Cable List | | | | | | |
|---|---|---|---|---|---|---|
| **Cable No** | **Port** | **# of Identical ports** | **Connector Type** | **Serial Type** | **Cable Length (m)** | **Remarks** |
| 1 | USB | 1 | AC Adapter | Un-shielded | 1.2m | No |
| 2 | Jack | 1 | Headset | Shielded | 1m | No |
| 3 | RF In/out | 1 | Communication Test Set | Un-shielded | 2m | Yes |

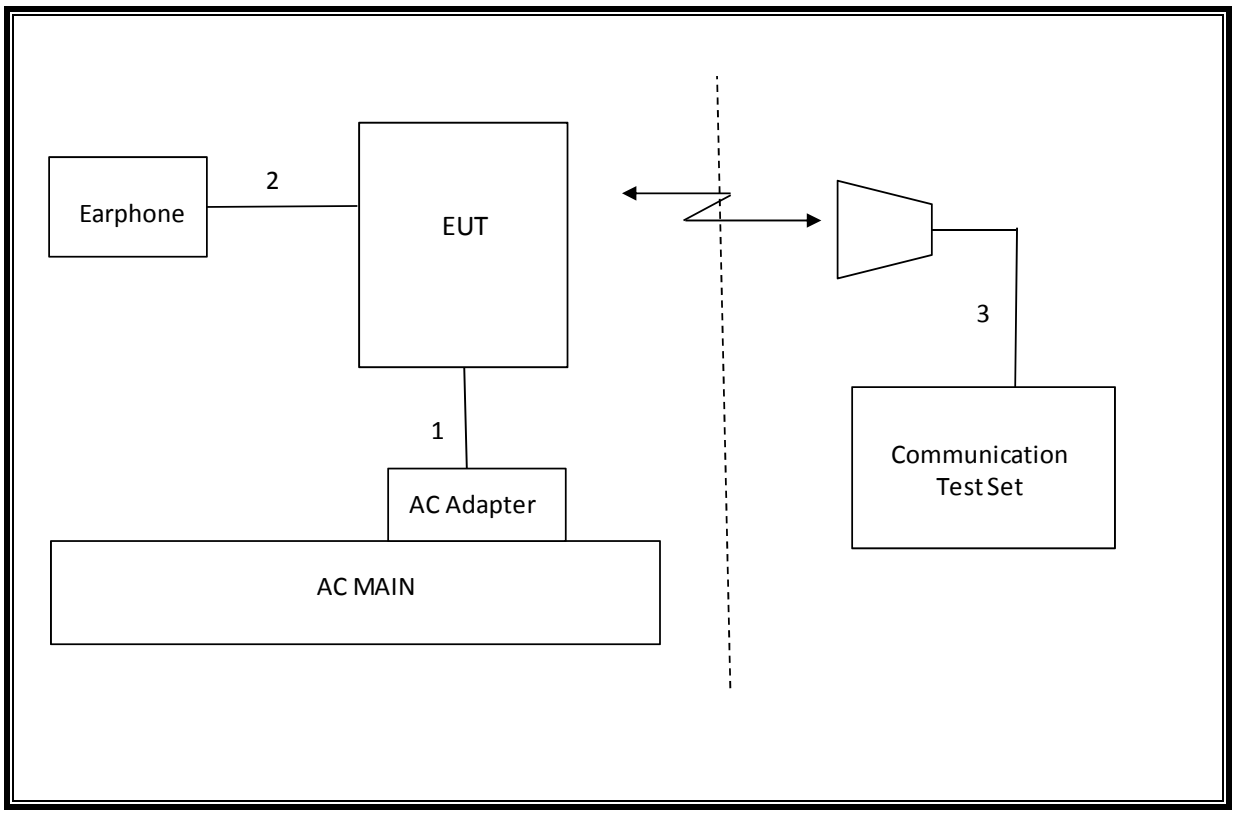
**TEST SETUP**

The EUT is continuously communicated to the call box during the tests.

**SETUP DIAGRAM FOR TESTS (CONDUCTED TEST SETUP)**



**SETUP DIAGRAM FOR TESTS (RADIATED TEST SETUP)**



# 9. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

| Test Equipment List | | | | | |
|---|---|---|---|---|---|
| **Description** | **Manufacturer** | **Model** | **T Number** | **Cal Date** | **Cal Due** |
| Amplifier, 1 to 18 GHz | Miteq | AFS43-00101800-25-S-42 | 493 | 02/15/17 | 02/15/18 |
| Amplifier, 1 to 8 GHz | Miteq | AMF-4D-01000800-30-29P | 1156 | 02/15/17 | 02/15/18 |
| Amplifier, 10KHz to 1GHz, 32dB | Keysight | 8447D | 10 | 02/15/17 | 02/15/18 |
| Antenna, Broadband Hybrid, 30MHz to 2000MHz | Sunol Sciences | JB3 | 477 | 06/22/16 | 06/22/17 |
| Spectrum Analyzer, PXA 3Hz to 44GHz | Keysight | N9030A | 907 | 01/23/17 | 01/23/18 |
| Amplifier, 10KHz to 1GHz, 32dB | Keysight | 8447D | 10 | 02/15/17 | 02/15/18 |
| Antenna, Broadband Hybrid, 30MHz to 2000MHz | Sunol Sciences | JB3 | 477 | 06/22/16 | 06/22/17 |
| Highpass Filter, 2.7 GHz | Micro-Circuits | H2G518G6 | T772 | 7/5/16 | 7/5/18 |
| Highpass Filter, 1 GHz | Micro-Tronics | HPM18129 | T889 | 2/21/16 | 2/21/17 |
| Highpass Filter, 4GHz | Micro-Tronics | HPM13351 | T1241 | 7/19/16 | 7/19/17 |
| Spectrum Analyzer, PXA 3Hz to 44GHz | Keysight | N9030A | 907 | 01/23/17 | 01/23/18 |
| Amplifier, 1-18GHz | Miteq | AFS42-00101800-25-S-42 | 931 | 08/26/16 | 08/26/17 |
| Amplifier, 1 to 8GHz | Miteq | AMF-4D-01000800-30-29P | 1170 | 04/28/16 | 04/28/17 |
| Amplifier, 10KHz to 1GHz, 32dB | Keysight | 8447D | 15 | 08/26/16 | 08/26/17 |
| Antenna, Broadband Hybrid 30MHz to 2000MHz | Sunol Sciences | JB3 | 408 | 11/10/16 | 11/10/17 |
| Antenna, Horn 1-18GHz | ETS Lindgren | 3117 | 712 | 01/30/17 | 01/30/18 |
| Spectrum Analyzer, PXA, 3Hz to 44GHz | Keysight | N9030A | 905 | 01/11/17 | 01/11/18 |
| Communications Test Set | R&S | CMW500 | | | |
| DC power supply, 8 V @ 3 A or 15 V @ 2 A | Agilent / HP | E3610A | None | CNR | None |
| Antenna, Tuned Dipole 400~1000 MHz | ETS | 3121C DB4 | T273 | 5/16/16 | 5/16/17 |
| Directional Coupler | Mini-Circuits | ZUDC10-183+ | T1136 | 5/25/16 | 5/25/17 |

| Test Equipment List | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model** | **T Number** |
| Radiated Software | UL | UL EMC | Ver 9.5, June 24, 2015 |
| Conducted Software | UL | UL EMC | Ver 9.5, May 26, 2015 |
| CLT Software | UL | UL RF | Ver 1.0, Feb 2, 2015 |
| Antenna Port Software | UL | UL RF | Ver 3.7, Nov 12, 2015 |

# 10. SUMMARY TABLE

| FCC Part Section | Test Description | Test Limit | Test Condition | Test Result |
|---|---|---|---|---|
| 2.1049 | Occupied Bandwidth (99%) | N/A | Conducted | Pass |
| 22.917(a)<br>24.238(a)<br>27.53(g) | Band Edge / Conducted Spurious Emission | -13dBm | | Pass |
| 27.53(m) | | -25dBm | | |
| 2.1046 | Conducted output power | N/A | | Pass |
| 27.53(m) | Emission Mask | | | Pass |
| 22.355 24.235<br>27.54 | Frequency Stability | 2.5PPM | | Pass |
| 22.913(a)(2) | Effective Radiated Power | 38dBm | Radiated | Pass |
| 27.50©(10) | | 34.77dBm | | Pass |
| 24.232(c )<br>27.50(h)(2) | Equivalent Isotropic Radiated Power | 33dBm | | Pass |
| 27.50(d)(4) | | 30dBm | | Pass |
| 22.917(a)<br>24.238(a)<br>27.53(g) | Radiated Spurious Emission | -13dBm | | Pass |
| 27.53(m) | | -25dBm | | Pass |

# 11. RF POWER OUTPUT VERIFICATION

## 11.1. GSM/GPRS/EDGE

Using CMW500 Communication Test Set
Function: Menu select > GSM Mobile Station > GSM 850/900/1800/1900

Press Connection control to choose the different menus
Press RESET > choose all to reset all settings

| | | |
|---|---|---|
| Connection | Press Signal Off to turn off the signal and change settings<br>Network Support > GSM+GPRS or GSM+EGPRS<br>Main Service > Packet Data<br>Service selection > Test Mode A – Auto Slot Config. off | |
| MS Signal | Press Slot Config bottom on the right twice to select and change the number of time slots and power setting | |
| | > Slot configuration | > Uplink/Gamma<br>> 33 dBm for GPRS 850/900<br>> 27 dBm for EGPRS 850/900<br>> 30 dBm for GPRS1800/1900<br>> 26 dBm for EGPRS1800/1900 |
| BS Signal | Enter the same channel number for TCH channel (test channel) and BCCH channel | |
| | Frequency Offset > | + 0 Hz |
| | Mode > | BCCH and TCH |
| | BCCH Level > | -85 dBm (May need to adjust if link is not stable) |
| | BCCH Channel > | choose desire test channel [Enter the same channel number for TCH channel (test channel) and BCCH channel] |
| | Channel Type > | Off |
| | P0> | 4 dB |
| | Slot Config > | Unchanged (if already set under MS Signal) |
| | TCH > | choose desired test channel |
| | Hopping > | Off |
| | Main Timeslot > | 3 (Default) |
| Network | Coding Scheme > CS 4 (GPRS) and MCS5-9 (EGPRS) | |
| | Bit Stream > | 2E9-1PSR Bit Pattern |
| AF/RF | Enter appropriate offsets for Ext. Att. Output and Ext. Att. Input | |
| Connection | Press Signal On to turn on the signal and change settings | |

## 11.2. GSM OUTPUT POWER RESULT

| | |
|---|---|
| Tested By | Coltyce Sanders |
| Date | 3/10/2017 |

| Mode | Coding Scheme | Time Slots | Ch No. | Freq. (MHz) | Burst Pwr (dBm) | Frame Pwr (dBm) |
|---|---|---|---|---|---|---|
| GSM (Voice) | CS4 | 1 | 128 | 824.4 | 32.5 | 23.5 |
| | | | 190 | 836.6 | 32.7 | 23.6 |
| | | | 251 | 848.8 | 32.6 | 23.5 |
| GPRS (GMSK) | CS4 | 1 | 128 | 824.4 | 32.5 | 23.5 |
| | | | 190 | 836.6 | 32.7 | 23.6 |
| | | | 251 | 848.8 | 32.5 | 23.5 |
| | | 2 | 128 | 824.4 | 29.6 | 23.6 |
| | | | 190 | 836.6 | 29.6 | 23.6 |
| | | | 251 | 848.8 | 29.5 | 23.5 |
| | | 3 | 128 | 824.4 | 27.6 | 23.3 |
| | | | 190 | 836.6 | 27.7 | 23.5 |
| | | | 251 | 848.8 | 27.6 | 23.4 |
| | | 4 | 128 | 824.4 | 26.6 | 23.6 |
| | | | 190 | 836.6 | 26.7 | 23.7 |
| | | | 251 | 848.8 | 26.6 | 23.6 |
| EGPRS (8PSK) | MCS9 | 1 | 128 | 824.4 | 27.0 | 18.0 |
| | | | 190 | 836.6 | 27.1 | 18.0 |
| | | | 251 | 848.8 | 27.1 | 18.0 |
| | | 2 | 128 | 824.4 | 25.5 | 19.5 |
| | | | 190 | 836.6 | 25.5 | 19.5 |
| | | | 251 | 848.8 | 25.5 | 19.4 |
| | | 3 | 128 | 824.4 | 23.7 | 19.5 |
| | | | 190 | 836.6 | 23.8 | 19.5 |
| | | | 251 | 848.8 | 23.6 | 19.3 |
| | | 4 | 128 | 824.4 | 22.9 | 19.9 |
| | | | 190 | 836.6 | 23.0 | 20.0 |
| | | | 251 | 848.8 | 22.9 | 19.9 |

| Mode | Coding Scheme | Time Slots | Ch No. | Freq. (MHz) | Burst Pwr (dBm) | Frame Pwr (dBm) |
|---|---|---|---|---|---|---|
| GSM (Voice) | CS4 | 1 | 512 | 1850.2 | 29.6 | 20.6 |
| | | | 661 | 1880.0 | 29.6 | 20.6 |
| | | | 810 | 1909.8 | 29.8 | 20.7 |
| GPRS (GMSK) | CS4 | 1 | 512 | 1850.2 | 29.7 | 20.6 |
| | | | 661 | 1880.0 | 29.6 | 20.6 |
| | | | 810 | 1909.8 | 29.8 | 20.7 |
| | | 2 | 512 | 1850.2 | 27.1 | 21.1 |
| | | | 661 | 1880.0 | 27.1 | 21.1 |
| | | | 810 | 1909.8 | 27.2 | 21.2 |
| | | 3 | 512 | 1850.2 | 25.0 | 20.7 |
| | | | 661 | 1880.0 | 25.1 | 20.8 |
| | | | 810 | 1909.8 | 25.3 | 21.0 |
| | | 4 | 512 | 1850.2 | 24.1 | 21.1 |
| | | | 661 | 1880.0 | 24.1 | 21.1 |
| | | | 810 | 1909.8 | 24.3 | 21.3 |
| EGPRS (8PSK) | MCS9 | 1 | 512 | 1850.2 | 25.2 | 16.2 |
| | | | 661 | 1880.0 | 25.2 | 16.2 |
| | | | 810 | 1909.8 | 25.4 | 16.4 |
| | | 2 | 512 | 1850.2 | 24.5 | 18.5 |
| | | | 661 | 1880.0 | 24.4 | 18.4 |
| | | | 810 | 1909.8 | 24.6 | 18.6 |
| | | 3 | 512 | 1850.2 | 22.1 | 17.8 |
| | | | 661 | 1880.0 | 22.0 | 17.7 |
| | | | 810 | 1909.8 | 22.3 | 18.0 |
| | | 4 | 512 | 1850.2 | 21.0 | 18.0 |
| | | | 661 | 1880.0 | 20.9 | 17.9 |
| | | | 810 | 1909.8 | 21.2 | 18.2 |

## 11.3. UMTS REL 99

**TEST PROCEDURE**

The following summary of these settings are illustrated below:

| | Mode | Rel99 |
|---|---|---|
| | Subtest | - |
| WCDMA General Settings | Loopback Mode | Test Mode 2 |
| | Rel99 RMC | 12.2kbps RMC |
| | HSDPA FRC | Not Applicable |
| | HSUPA Test | Not Applicable |
| | Power Control Algorithm | Algorithm2 |
| | βc | Not Applicable |
| | βd | Not Applicable |
| | βec | Not Applicable |
| | βc/βd | 8/15 |
| | βhs | Not Applicable |
| | βed | Not Applicable |

**RESULTS**

## 11.4. UMTS REL 99 OUTPUT POWER RESULT

| | |
|---|---|
| Tested By | Coltyce Sanders |
| Date | 3/10/2017 |

| Mode | | UL Ch No. | Freq. (MHz) | MPR | Avg Pwr (dBm) |
|---|---|---|---|---|---|
| Release 99 | Rel 99 (RMC, 12.2 kbps) | 4132 | 826.4 | 0 | 24.2 |
| | | 4183 | 836.6 | 0 | 24.1 |
| | | 4233 | 846.6 | 0 | 24.2 |

## 11.5. UMTS HSDPA

The following 4 Sub-tests were completed according to Release 5 procedures in section 5.2 of 3GPP TS34.121.

Summary of settings are illustrated below:

| | Mode | Rel5 HSDPA | | | |
|---|---|---|---|---|---|
| | Subtest | 1 | 2 | 3 | 4 |
| WCDMA General Settings | Loopback Mode | Test Mode 1 | | | |
| | Rel99 RMC | 12.2kbps RMC | | | |
| | HSDPA FRC | H-Set1 | | | |
| | Power Control Algorithm | Algorithm 2 | | | |
| | βc | 2/15 | 11/15 | 15/15 | 15/15 |
| | βd | 15/15 | 15/15 | 8/15 | 4/15 |
| | Bd (SF) | 64 | | | |
| | βc/βd | 2/15 | 11/15 | 15/8 | 15/4 |
| | βhs | 4/15 | 24/15 | 30/15 | 30/15 |
| | MPR (dB) | 0 | 0 | 0.5 | 0.5 |
| HSDPA Specific Settings | $D_{ACK}$ | 8 | | | |
| | $D_{NAK}$ | 8 | | | |
| | DCQI | 8 | | | |
| | Ack-Nack repetition factor | 3 | | | |
| | CQI Feedback (Table 5.2B.4) | 4ms | | | |
| | CQI Repetition Factor (Table 5.2B.4) | 2 | | | |
| | Ahs =βhs/βc | 30/15 | | | |

**RESULTS**

## 11.6. UMTS HSDPA OUTPUT POWER RESULT

| | |
|---|---|
| Tested By | Coltyce Sanders |
| Date | 3/10/2017 |

| Mode | | UL Ch No. | Freq. (MHz) | MPR | Avg Pwr (dBm) |
|---|---|---|---|---|---|
| HSDPA | Subtest 1 | 4132 | 826.4 | 0 | 23.0 |
| | | 4183 | 836.6 | 0 | 23.1 |
| | | 4233 | 846.6 | 0 | 23.1 |
| | Subtest 2 | 4132 | 826.4 | 0 | 23.0 |
| | | 4183 | 836.6 | 0 | 23.1 |
| | | 4233 | 846.6 | 0 | 23.1 |
| | Subtest 3 | 4132 | 826.4 | 0.5 | 22.5 |
| | | 4183 | 836.6 | 0.5 | 22.6 |
| | | 4233 | 846.6 | 0.5 | 22.5 |
| | Subtest 4 | 4132 | 826.4 | 0.5 | 22.5 |
| | | 4183 | 836.6 | 0.5 | 22.6 |
| | | 4233 | 846.6 | 0.5 | 22.5 |

## 11.7. UMTS HSUPA

The following 4 Sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121.

Summary of settings are illustrated below:

| | Mode | Rel6 HSUPA | Rel6 HSUPA | Rel6 HSUPA | Rel6 HSUPA | Rel6 HSUPA |
|---|---|---|---|---|---|---|
| | Subtest | 1 | 2 | 3 | 4 | 5 |
| WCDMA General Settings | Loopback Mode | Test Mode 1 | | | | |
| | P-CPICH (dB) | -10 | | | | |
| | P-CCPCH (dB) | -12 | | | | |
| | SCH (dB) | -12 | | | | |
| | PICH(dB) | -15 | | | | |
| | DPCH (dB) | -9 | | | | |
| | HS-SCCH_1 (dB) | -8 | | | | |
| | HS-PDSCH (dB) | -3 | | | | |
| | Rel99 RMC | 12.2kbps RMC | | | | |
| | HSDPA FRC | H-Set1 | | | | |
| | HSUPA Test | HSUPA Loopback | | | | |
| | Power Control Algorithm | Algorithm2 | | | | |
| | Bc | 11/15 | 6/15 | 15/15 | 2/15 | 15/15 |
| | Bd | 15/15 | 15/15 | 9/15 | 15/15 | 15/15 |
| | Bec | 209/225 | 12/15 | 30/15 | 2/15 | 5/15 |
| | βc/βd | 11/15 | 6/15 | 15/9 | 2/15 | 15/15 |
| | Bhs | 22/15 | 12/15 | 30/15 | 4/15 | 30/15 |
| | βed (note1) | 1309/225 | 94/75 | 47/15<br>47/15 | 56/75 | 134/15 |
| | MPR | 0 | 2 | 1 | 2 | 0 |
| HSDPA Specific Settings | DACK | 8 | | | | |
| | DNAK | 8 | | | | |
| | DCQI | 8 | | | | |
| | Ack-Nack repetition factor | 3 | | | | |
| | CQI Feedback (Table 5.2B.4) | 4ms | | | | |
| | CQI Repetition Factor (Table 5.2B.4) | 2 | | | | |
| | Ahs = βhs/βc | 30/15 | | | | |
| HSUPA Specific Settings | D E-DPCCH | 6 | 8 | 8 | 5 | 7 |
| | DHARQ | 0 | 0 | 0 | 0 | 0 |
| | AG Index | 20 | 12 | 15 | 17 | 21 |
| | Reference E-TFCIs | 5 | 5 | 2 | 5 | 5 |
| | ETFCI (from 34.121 Table C.11.1.3) | 75 | 67 | 92 | 71 | 81 |
| | Associated Max UL Data Rate kbps | 242.1 | 174.9 | 482.8 | 205.8 | 308.9 |
| | Reference E_TFCIs | E-TFCI 11<br>E-TFCI PO 4<br>E-TFCI 67<br>E-TFCI PO 18<br>E-TFCI 71<br>E-TFCI PO 23<br>E-TFCI 75<br>E-TFCI PO 26<br>E-TFCI 81<br>E-TFCI PO 27 | | E-TFCI 11<br>E-TFCI PO 4<br>E-TFCI 92<br>E-TFCI PO 18 | E-TFCI 11<br>E-TFCI PO 4<br>E-TFCI 67<br>E-TFCI PO 18<br>E-TFCI 71<br>E-TFCI PO 23<br>E-TFCI 75<br>E-TFCI PO 26<br>E-TFCI 81<br>E-TFCI PO 27 | |

Note1: βed cannot be set directly, it is set by Absolute Grant Value.

**RESULT**

## 11.8. UMTS HSUPA OUTPUT POWER RESULT

| Mode | | UL Ch No. | Freq. (MHz) | MPR | Avg Pwr (dBm) |
|---|---|---|---|---|---|
| HSUPA | Subtest 1 | 4132 | 826.4 | 0 | 23.0 |
| | | 4183 | 836.6 | 0 | 23.0 |
| | | 4233 | 846.6 | 0 | 23.1 |
| | Subtest 2 | 4132 | 826.4 | 2 | 21.0 |
| | | 4183 | 836.6 | 2 | 21.1 |
| | | 4233 | 846.6 | 2 | 21.1 |
| | Subtest 3 | 4132 | 826.4 | 1 | 22.0 |
| | | 4183 | 836.6 | 1 | 22.1 |
| | | 4233 | 846.6 | 1 | 22.1 |
| | Subtest 4 | 4132 | 826.4 | 2 | 21.0 |
| | | 4183 | 836.6 | 2 | 21.1 |
| | | 4233 | 846.6 | 2 | 21.1 |
| | Subtest 5 | 4132 | 826.4 | 0 | 23.0 |
| | | 4183 | 836.6 | 0 | 23.0 |
| | | 4233 | 846.6 | 0 | 23.1 |

## 11.9. LTE OUTPUT POWER RESULT

**Note(s):**

**LTE Band 38 Measured Results**

LTE Band 38 (Frequency range: 2570-2620 MHz) is covered by LTE Band 41 (Frequency range: 2496-2690 MHz) and no testing is necessary due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth and same modulations.

| | |
|---|---|
| Tested By | Jason/Remi |
| Date | 3/6/2017 |

**LTE Band 4**

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 19957 | 20175 | 20393 |
| | | | | | | 1710.7 MHz | 1732.5 MHz | 1754.3 MHz |
| LTE Band 4 | 1.4 | QPSK | 1 | 0 | 0 | 21.55 | 21.24 | 21.32 |
| | | | 1 | 3 | 0 | 21.60 | 21.28 | 21.40 |
| | | | 1 | 5 | 0 | 21.56 | 21.25 | 21.29 |
| | | | 3 | 0 | 0 | 21.60 | 21.26 | 21.42 |
| | | | 3 | 1 | 0 | 21.65 | 21.28 | 21.42 |
| | | | 3 | 3 | 0 | 21.64 | 21.28 | 21.54 |
| | | | 6 | 0 | 1 | 20.54 | 20.24 | 20.44 |
| | | 16QAM | 1 | 0 | 1 | 20.71 | 20.60 | 20.48 |
| | | | 1 | 3 | 1 | 20.76 | 20.66 | 20.56 |
| | | | 1 | 5 | 1 | 20.71 | 20.60 | 20.50 |
| | | | 3 | 0 | 1 | 20.67 | 20.46 | 20.66 |
| | | | 3 | 1 | 1 | 20.68 | 20.48 | 20.71 |
| | | | 3 | 3 | 1 | 20.70 | 20.46 | 20.70 |
| | | | 6 | 0 | 2 | 19.72 | 19.17 | 19.61 |
| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) | | |
| | | | | | | 19965 | 20175 | 20385 |
| | | | | | | 1711.5 MHz | 1732.5 MHz | 1753.5 MHz |
| LTE Band 4 | 3 | QPSK | 1 | 0 | 0 | 21.54 | 21.35 | 21.47 |
| | | | 1 | 8 | 0 | 21.60 | 21.39 | 21.54 |
| | | | 1 | 14 | 0 | 21.50 | 21.28 | 21.40 |
| | | | 8 | 0 | 1 | 20.66 | 20.34 | 20.44 |
| | | | 8 | 4 | 1 | 20.68 | 20.35 | 20.41 |
| | | | 8 | 7 | 1 | 20.68 | 20.37 | 20.47 |
| | | | 15 | 0 | 1 | 20.64 | 20.33 | 20.46 |
| | | 16QAM | 1 | 0 | 1 | 20.60 | 20.73 | 20.52 |
| | | | 1 | 8 | 1 | 20.67 | 20.78 | 20.55 |
| | | | 1 | 14 | 1 | 20.54 | 20.68 | 20.43 |
| | | | 8 | 0 | 2 | 19.79 | 19.23 | 19.63 |
| | | | 8 | 4 | 2 | 19.77 | 19.25 | 19.66 |
| | | | 8 | 7 | 2 | 19.75 | 19.25 | 19.65 |
| | | | 15 | 0 | 2 | 19.70 | 19.37 | 19.40 |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 19975 | 20175 | 20375 |
| | | | | | | 1712.5 MHz | 1732.5 MHz | 1752.5 MHz |
| LTE Band 4 | 5 | QPSK | 1 | 0 | 0 | 21.95 | 21.71 | 21.79 |
| | | | 1 | 12 | 0 | 21.87 | 21.58 | 21.68 |
| | | | 1 | 24 | 0 | 21.86 | 21.50 | 21.79 |
| | | | 12 | 0 | 1 | 20.87 | 20.63 | 20.82 |
| | | | 12 | 7 | 1 | 20.90 | 20.59 | 20.81 |
| | | | 12 | 13 | 1 | 20.88 | 20.56 | 20.81 |
| | | | 25 | 0 | 1 | 20.91 | 20.56 | 20.82 |
| | | 16QAM | 1 | 0 | 1 | 21.00 | 20.83 | 21.00 |
| | | | 1 | 12 | 1 | 21.00 | 20.72 | 21.00 |
| | | | 1 | 24 | 1 | 20.99 | 20.75 | 21.00 |
| | | | 12 | 0 | 2 | 20.00 | 19.72 | 19.99 |
| | | | 12 | 7 | 2 | 19.95 | 19.69 | 19.97 |
| | | | 12 | 13 | 2 | 19.94 | 19.65 | 19.96 |
| | | | 25 | 0 | 2 | 19.87 | 19.59 | 19.85 |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 20000 | 20175 | 20350 |
| | | | | | | 1715 MHz | 1732.5 MHz | 1750 MHz |
| LTE Band 4 | 10 | QPSK | 1 | 0 | 0 | 21.87 | 21.76 | 21.78 |
| | | | 1 | 25 | 0 | 21.74 | 21.57 | 21.64 |
| | | | 1 | 49 | 0 | 21.68 | 21.48 | 21.63 |
| | | | 25 | 0 | 1 | 20.84 | 20.64 | 20.74 |
| | | | 25 | 12 | 1 | 20.81 | 20.64 | 20.72 |
| | | | 25 | 25 | 1 | 20.79 | 20.58 | 20.70 |
| | | | 50 | 0 | 1 | 20.83 | 20.62 | 20.72 |
| | | 16QAM | 1 | 0 | 1 | 21.00 | 20.74 | 20.74 |
| | | | 1 | 25 | 1 | 21.00 | 20.59 | 20.61 |
| | | | 1 | 49 | 1 | 21.00 | 20.52 | 20.55 |
| | | | 25 | 0 | 2 | 19.91 | 19.75 | 19.80 |
| | | | 25 | 12 | 2 | 19.85 | 19.74 | 19.77 |
| | | | 25 | 25 | 2 | 19.82 | 19.68 | 19.72 |
| | | | 50 | 0 | 2 | 19.81 | 19.65 | 19.75 |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 20025 | 20175 | 20325 |
| | | | | | | 1717.5 MHz | 1732.5 MHz | 1747.5 MHz |
| LTE Band 4 | 15 | QPSK | 1 | 0 | 0 | 21.68 | 21.88 | 21.80 |
| | | | 1 | 37 | 0 | 21.53 | 21.54 | 21.56 |
| | | | 1 | 74 | 0 | 21.48 | 21.52 | 21.55 |
| | | | 36 | 0 | 1 | 20.66 | 20.69 | 20.75 |
| | | | 36 | 20 | 1 | 20.58 | 20.65 | 20.67 |
| | | | 36 | 39 | 1 | 20.51 | 20.62 | 20.63 |
| | | | 75 | 0 | 1 | 20.59 | 20.60 | 20.66 |
| | | 16QAM | 1 | 0 | 1 | 21.00 | 20.69 | 21.00 |
| | | | 1 | 37 | 1 | 20.94 | 20.52 | 21.00 |
| | | | 1 | 74 | 1 | 20.80 | 20.44 | 20.93 |
| | | | 36 | 0 | 2 | 19.64 | 19.70 | 19.81 |
| | | | 36 | 20 | 2 | 19.60 | 19.64 | 19.75 |
| | | | 36 | 39 | 2 | 19.55 | 19.61 | 19.66 |
| | | | 75 | 0 | 2 | 19.59 | 19.63 | 19.69 |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 20050 | 20175 | 20300 |
| | | | | | | 1720 MHz | 1732.5 MHz | 1745 MHz |
| LTE Band 4 | 20 | QPSK | 1 | 0 | 0 | | 21.80 | |
| | | | 1 | 49 | 0 | | 21.56 | |
| | | | 1 | 99 | 0 | | 21.46 | |
| | | | 50 | 0 | 1 | | 20.73 | |
| | | | 50 | 24 | 1 | | 20.65 | |
| | | | 50 | 50 | 1 | | 20.59 | |
| | | | 100 | 0 | 1 | | 20.65 | |
| | | 16QAM | 1 | 0 | 1 | | 21.00 | |
| | | | 1 | 49 | 1 | | 21.00 | |
| | | | 1 | 99 | 1 | | 21.00 | |
| | | | 50 | 0 | 2 | | 19.77 | |
| | | | 50 | 24 | 2 | | 19.67 | |
| | | | 50 | 50 | 2 | | 19.57 | |
| | | | 100 | 0 | 2 | | 19.67 | |

| Tested By | Florencio Pesigan |
|---|---|
| Date | 3/6/2017 |

**LTE Band 5**

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 20407 | 20525 | 20643 |
| | | | | | | 824.7 MHz | 836.5 MHz | 848.3 MHz |
| LTE Band 5 | 1.4 | QPSK | 1 | 0 | 0 | 23.63 | 23.72 | 23.57 |
| | | | 1 | 3 | 0 | 23.67 | 23.77 | 23.64 |
| | | | 1 | 5 | 0 | 23.60 | 23.70 | 23.57 |
| | | | 3 | 0 | 0 | 23.66 | 23.74 | 23.64 |
| | | | 3 | 1 | 0 | 23.70 | 23.75 | 23.68 |
| | | | 3 | 3 | 0 | 23.68 | 23.77 | 23.68 |
| | | | 6 | 0 | 1 | 22.63 | 22.68 | 22.59 |
| | | 16QAM | 1 | 0 | 1 | 22.79 | 23.00 | 22.64 |
| | | | 1 | 3 | 1 | 22.81 | 23.00 | 22.68 |
| | | | 1 | 5 | 1 | 22.76 | 23.00 | 22.63 |
| | | | 3 | 0 | 1 | 22.70 | 22.95 | 22.78 |
| | | | 3 | 1 | 1 | 22.74 | 22.99 | 22.82 |
| | | | 3 | 3 | 1 | 22.73 | 22.96 | 22.83 |
| | | | 6 | 0 | 2 | 21.80 | 21.62 | 21.78 |
| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) | | |
| | | | | | | 20415 | 20525 | 20635 |
| | | | | | | 825.5 MHz | 836.5 MHz | 847.5 MHz |
| LTE Band 5 | 3 | QPSK | 1 | 0 | 0 | 23.69 | 23.81 | 23.69 |
| | | | 1 | 8 | 0 | 23.73 | 23.86 | 23.74 |
| | | | 1 | 14 | 0 | 23.59 | 23.76 | 23.60 |
| | | | 8 | 0 | 1 | 22.69 | 22.76 | 22.73 |
| | | | 8 | 4 | 1 | 22.69 | 22.77 | 22.68 |
| | | | 8 | 7 | 1 | 22.71 | 22.74 | 22.69 |
| | | | 15 | 0 | 1 | 22.68 | 22.75 | 22.69 |
| | | 16QAM | 1 | 0 | 1 | 22.60 | 23.00 | 22.77 |
| | | | 1 | 8 | 1 | 22.66 | 23.00 | 22.80 |
| | | | 1 | 14 | 1 | 22.51 | 23.00 | 22.67 |
| | | | 8 | 0 | 2 | 21.82 | 21.69 | 21.90 |
| | | | 8 | 4 | 2 | 21.82 | 21.68 | 21.91 |
| | | | 8 | 7 | 2 | 21.81 | 21.65 | 21.90 |
| | | | 15 | 0 | 2 | 21.73 | 21.80 | 21.62 |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 20425 | 20525 | 20625 |
| | | | | | | 826.5 MHz | 836.5 MHz | 846.5 MHz |
| LTE Band 5 | 5 | QPSK | 1 | 0 | 0 | 23.86 | 23.87 | 23.76 |
| | | | 1 | 12 | 0 | 23.80 | 23.77 | 23.67 |
| | | | 1 | 24 | 0 | 23.75 | 23.78 | 23.62 |
| | | | 12 | 0 | 1 | 22.80 | 22.79 | 22.73 |
| | | | 12 | 7 | 1 | 22.79 | 22.74 | 22.73 |
| | | | 12 | 13 | 1 | 22.75 | 22.72 | 22.70 |
| | | | 25 | 0 | 1 | 22.77 | 22.72 | 22.70 |
| | | 16QAM | 1 | 0 | 1 | 23.00 | 23.00 | 22.90 |
| | | | 1 | 12 | 1 | 22.96 | 23.00 | 22.80 |
| | | | 1 | 24 | 1 | 22.95 | 23.00 | 22.78 |
| | | | 12 | 0 | 2 | 21.89 | 21.93 | 21.84 |
| | | | 12 | 7 | 2 | 21.90 | 21.93 | 21.80 |
| | | | 12 | 13 | 2 | 21.85 | 21.90 | 21.76 |
| | | | 25 | 0 | 2 | 21.79 | 21.82 | 21.70 |
| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) | | |
| | | | | | | 20450 | 20525 | 20600 |
| | | | | | | 829 MHz | 836.5 MHz | 844 MHz |
| LTE Band 5 | 10 | QPSK | 1 | 0 | 0 | 23.86 | 23.82 | 23.80 |
| | | | 1 | 25 | 0 | 23.75 | 23.73 | 23.70 |
| | | | 1 | 49 | 0 | 23.65 | 23.60 | 23.57 |
| | | | 25 | 0 | 1 | 22.80 | 22.79 | 22.82 |
| | | | 25 | 12 | 1 | 22.79 | 22.78 | 22.78 |
| | | | 25 | 25 | 1 | 22.70 | 22.73 | 22.68 |
| | | | 50 | 0 | 1 | 22.75 | 22.75 | 22.74 |
| | | 16QAM | 1 | 0 | 1 | 22.90 | 22.79 | 23.00 |
| | | | 1 | 25 | 1 | 22.79 | 22.68 | 23.00 |
| | | | 1 | 49 | 1 | 22.69 | 22.58 | 22.97 |
| | | | 25 | 0 | 2 | 21.92 | 21.84 | 21.87 |
| | | | 25 | 12 | 2 | 21.87 | 21.81 | 21.82 |
| | | | 25 | 25 | 2 | 21.82 | 21.75 | 21.74 |
| | | | 50 | 0 | 2 | 21.82 | 21.75 | 21.77 |

| Tested By | Florencio Pesigan |
|---|---|
| Date | 3/7/2017 |

**LTE Band 7**

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 20775 | 21100 | 21425 |
| | | | | | | 2502.5 MHz | 2535 MHz | 2567.5 MHz |
| , | 5 | QPSK | 1 | 0 | 0 | 19.41 | 19.61 | 19.72 |
| | | | 1 | 12 | 0 | 19.43 | 19.52 | 19.75 |
| | | | 1 | 24 | 0 | 19.40 | 19.47 | 19.77 |
| | | | 12 | 0 | 1 | 18.46 | 18.60 | 18.83 |
| | | | 12 | 7 | 1 | 18.47 | 18.57 | 18.85 |
| | | | 12 | 13 | 1 | 18.46 | 18.55 | 18.86 |
| | | | 25 | 0 | 1 | 18.44 | 18.58 | 18.82 |
| | | 16QAM | 1 | 0 | 1 | 18.61 | 19.00 | 18.90 |
| | | | 1 | 12 | 1 | 18.63 | 19.00 | 18.89 |
| | | | 1 | 24 | 1 | 18.62 | 18.96 | 18.93 |
| | | | 12 | 0 | 2 | 17.52 | 17.78 | 17.88 |
| | | | 12 | 7 | 2 | 17.57 | 17.76 | 17.92 |
| | | | 12 | 13 | 2 | 17.54 | 17.69 | 17.89 |
| | | | 25 | 0 | 2 | 17.49 | 17.62 | 17.78 |
| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) | | |
| | | | | | | 20800 | 21100 | 21400 |
| | | | | | | 2505 MHz | 2535 MHz | 2565 MHz |
| LTE Band 7 | 10 | QPSK | 1 | 0 | 0 | 19.94 | 19.69 | 19.66 |
| | | | 1 | 25 | 0 | 20.00 | 19.49 | 19.67 |
| | | | 1 | 49 | 0 | 19.99 | 19.37 | 19.74 |
| | | | 25 | 0 | 1 | 19.00 | 18.65 | 18.70 |
| | | | 25 | 12 | 1 | 19.00 | 18.62 | 18.76 |
| | | | 25 | 25 | 1 | 19.00 | 18.53 | 18.79 |
| | | | 50 | 0 | 1 | 19.00 | 18.58 | 18.77 |
| | | 16QAM | 1 | 0 | 1 | 19.00 | 19.00 | 18.69 |
| | | | 1 | 25 | 1 | 18.96 | 18.85 | 18.72 |
| | | | 1 | 49 | 1 | 18.92 | 18.74 | 18.79 |
| | | | 25 | 0 | 2 | 18.00 | 17.68 | 17.83 |
| | | | 25 | 12 | 2 | 18.00 | 17.64 | 17.86 |
| | | | 25 | 25 | 2 | 18.00 | 17.56 | 17.87 |
| | | | 50 | 0 | 2 | 18.00 | 17.63 | 17.80 |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 20825 | 21100 | 21375 |
| | | | | | | 2507.5 MHz | 2535 MHz | 2562.5 MHz |
| LTE Band 7 | 15 | QPSK | 1 | 0 | 0 | 19.99 | 19.76 | 19.86 |
| | | | 1 | 37 | 0 | 19.90 | 19.45 | 19.88 |
| | | | 1 | 74 | 0 | 19.76 | 19.29 | 20.00 |
| | | | 36 | 0 | 1 | 19.00 | 18.69 | 18.96 |
| | | | 36 | 20 | 1 | 19.00 | 18.63 | 18.97 |
| | | | 36 | 39 | 1 | 18.97 | 18.52 | 18.99 |
| | | | 75 | 0 | 1 | 18.98 | 18.58 | 18.96 |
| | | 16QAM | 1 | 0 | 1 | 18.96 | 19.00 | 19.00 |
| | | | 1 | 37 | 1 | 18.84 | 18.87 | 18.92 |
| | | | 1 | 74 | 1 | 18.71 | 18.69 | 19.00 |
| | | | 36 | 0 | 2 | 18.00 | 17.80 | 17.91 |
| | | | 36 | 20 | 2 | 18.00 | 17.68 | 17.97 |
| | | | 36 | 39 | 2 | 17.96 | 17.52 | 17.99 |
| | | | 75 | 0 | 2 | 18.00 | 17.61 | 17.99 |
| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) | | |
| | | | | | | 20850 | 21100 | 21350 |
| | | | | | | 2510 MHz | 2535 MHz | 2560 MHz |
| LTE Band 7 | 20 | QPSK | 1 | 0 | 0 | 19.95 | 19.93 | 19.44 |
| | | | 1 | 49 | 0 | 19.77 | 19.56 | 19.33 |
| | | | 1 | 99 | 0 | 19.54 | 19.33 | 19.53 |
| | | | 50 | 0 | 1 | 18.93 | 18.79 | 18.49 |
| | | | 50 | 24 | 1 | 18.87 | 18.61 | 18.53 |
| | | | 50 | 50 | 1 | 18.73 | 18.50 | 18.58 |
| | | | 100 | 0 | 1 | 18.77 | 18.63 | 18.56 |
| | | 16QAM | 1 | 0 | 1 | 19.00 | 19.00 | 18.87 |
| | | | 1 | 49 | 1 | 18.89 | 18.98 | 18.77 |
| | | | 1 | 99 | 1 | 19.00 | 18.75 | 18.96 |
| | | | 50 | 0 | 2 | 17.92 | 17.79 | 17.49 |
| | | | 50 | 24 | 2 | 17.86 | 17.64 | 17.53 |
| | | | 50 | 50 | 2 | 17.72 | 17.49 | 17.56 |
| | | | 100 | 0 | 2 | 17.85 | 17.62 | 17.53 |

| Tested By | Florencio Pesigan |
|---|---|
| Date | 3/6/2017 |

**LTE Band 12**

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 23017 | 23095 | 23173 |
| | | | | | | 699.7 MHz | 707.5 MHz | 715.3 MHz |
| LTE Band 12 | 1.4 | QPSK | 1 | 0 | 0 | 24.76 | 24.63 | 24.68 |
| | | | 1 | 3 | 0 | 24.73 | 24.68 | 24.61 |
| | | | 1 | 5 | 0 | 24.64 | 24.61 | 24.27 |
| | | | 3 | 0 | 0 | 24.73 | 24.71 | 24.60 |
| | | | 3 | 1 | 0 | 24.78 | 24.73 | 24.58 |
| | | | 3 | 3 | 0 | 24.78 | 24.74 | 24.45 |
| | | | 6 | 0 | 1 | 23.68 | 23.69 | 23.73 |
| | | 16QAM | 1 | 0 | 1 | 23.69 | 23.76 | 24.00 |
| | | | 1 | 3 | 1 | 23.76 | 23.80 | 24.00 |
| | | | 1 | 5 | 1 | 23.72 | 23.74 | 23.72 |
| | | | 3 | 0 | 1 | 23.87 | 23.78 | 23.81 |
| | | | 3 | 1 | 1 | 23.90 | 23.82 | 23.80 |
| | | | 3 | 3 | 1 | 23.90 | 23.80 | 23.77 |
| | | | 6 | 0 | 2 | 22.88 | 22.82 | 22.65 |
| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) | | |
| | | | | | | 23025 | 23095 | 23165 |
| | | | | | | 700.5 MHz | 707.5 MHz | 714.5 MHz |
| LTE Band 12 | 3 | QPSK | 1 | 0 | 0 | 24.75 | 24.75 | 24.85 |
| | | | 1 | 8 | 0 | 24.83 | 24.80 | 24.89 |
| | | | 1 | 14 | 0 | 24.69 | 24.66 | 24.29 |
| | | | 8 | 0 | 1 | 23.77 | 23.76 | 23.90 |
| | | | 8 | 4 | 1 | 23.78 | 23.78 | 23.89 |
| | | | 8 | 7 | 1 | 23.79 | 23.76 | 23.89 |
| | | | 15 | 0 | 1 | 23.75 | 23.75 | 23.86 |
| | | 16QAM | 1 | 0 | 1 | 23.81 | 23.64 | 24.00 |
| | | | 1 | 8 | 1 | 23.87 | 23.71 | 24.00 |
| | | | 1 | 14 | 1 | 23.72 | 23.56 | 23.84 |
| | | | 8 | 0 | 2 | 22.97 | 22.88 | 22.79 |
| | | | 8 | 4 | 2 | 22.97 | 22.86 | 22.79 |
| | | | 8 | 7 | 2 | 22.97 | 22.86 | 22.78 |
| | | | 15 | 0 | 2 | 22.72 | 22.80 | 22.89 |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 23035 | 23095 | 23155 |
| | | | | | | 701.5 MHz | 707.5 MHz | 713.5 MHz |
| LTE Band 12 | 5 | QPSK | 1 | 0 | 0 | 24.77 | 24.79 | 24.78 |
| | | | 1 | 12 | 0 | 24.69 | 24.70 | 24.72 |
| | | | 1 | 24 | 0 | 24.63 | 24.70 | 24.34 |
| | | | 12 | 0 | 1 | 23.76 | 23.78 | 23.79 |
| | | | 12 | 7 | 1 | 23.76 | 23.79 | 23.79 |
| | | | 12 | 13 | 1 | 23.73 | 23.76 | 23.77 |
| | | | 25 | 0 | 1 | 23.73 | 23.75 | 23.76 |
| | | 16QAM | 1 | 0 | 1 | 23.96 | 24.00 | 23.94 |
| | | | 1 | 12 | 1 | 23.87 | 24.00 | 23.85 |
| | | | 1 | 24 | 1 | 23.87 | 24.00 | 23.59 |
| | | | 12 | 0 | 2 | 22.84 | 22.93 | 22.87 |
| | | | 12 | 7 | 2 | 22.85 | 22.92 | 22.84 |
| | | | 12 | 13 | 2 | 22.81 | 22.89 | 22.81 |
| | | | 25 | 0 | 2 | 22.77 | 22.83 | 22.74 |
| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) | | |
| | | | | | | 23060 | 23095 | 23130 |
| | | | | | | 704 MHz | 707.5 MHz | 711 MHz |
| LTE Band 12 | 10 | QPSK | 1 | 0 | 0 | 24.85 | 24.81 | 24.84 |
| | | | 1 | 25 | 0 | 24.74 | 24.71 | 24.76 |
| | | | 1 | 49 | 0 | 24.65 | 24.60 | 24.47 |
| | | | 25 | 0 | 1 | 23.87 | 23.81 | 23.85 |
| | | | 25 | 12 | 1 | 23.83 | 23.79 | 23.83 |
| | | | 25 | 25 | 1 | 23.75 | 23.71 | 23.77 |
| | | | 50 | 0 | 1 | 23.80 | 23.76 | 23.81 |
| | | 16QAM | 1 | 0 | 1 | 23.75 | 24.00 | 23.88 |
| | | | 1 | 25 | 1 | 23.66 | 24.00 | 23.81 |
| | | | 1 | 49 | 1 | 23.54 | 23.98 | 23.56 |
| | | | 25 | 0 | 2 | 22.87 | 22.84 | 22.94 |
| | | | 25 | 12 | 2 | 22.84 | 22.81 | 22.91 |
| | | | 25 | 25 | 2 | 22.78 | 22.77 | 22.84 |
| | | | 50 | 0 | 2 | 22.81 | 22.79 | 22.84 |

| | |
|---|---|
| Tested By | Florencio Pesigan |
| Date | 3/6/2017 |

**LTE Band 13**

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) 23230 782 MHz |
|---|---|---|---|---|---|---|
| LTE Band 13 | 5 | QPSK | 1 | 0 | 0 | 23.75 |
| | | | 1 | 12 | 0 | 23.64 |
| | | | 1 | 24 | 0 | 23.62 |
| | | | 12 | 0 | 1 | 22.70 |
| | | | 12 | 7 | 1 | 22.68 |
| | | | 12 | 13 | 1 | 22.65 |
| | | | 25 | 0 | 1 | 22.66 |
| | | 16QAM | 1 | 0 | 1 | 23.00 |
| | | | 1 | 12 | 1 | 23.00 |
| | | | 1 | 24 | 1 | 23.00 |
| | | | 12 | 0 | 2 | 21.87 |
| | | | 12 | 7 | 2 | 21.84 |
| | | | 12 | 13 | 2 | 21.82 |
| | | | 25 | 0 | 2 | 21.74 |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) 23230 782 MHz |
|---|---|---|---|---|---|---|
| LTE Band 13 | 10 | QPSK | 1 | 0 | 0 | 23.75 |
| | | | 1 | 25 | 0 | 23.64 |
| | | | 1 | 49 | 0 | 23.52 |
| | | | 25 | 0 | 1 | 22.75 |
| | | | 25 | 12 | 1 | 22.71 |
| | | | 25 | 25 | 1 | 22.65 |
| | | | 50 | 0 | 1 | 21.43 |
| | | 16QAM | 1 | 0 | 1 | 23.00 |
| | | | 1 | 25 | 1 | 23.00 |
| | | | 1 | 49 | 1 | 22.91 |
| | | | 25 | 0 | 2 | 21.79 |
| | | | 25 | 12 | 2 | 21.74 |
| | | | 25 | 25 | 2 | 21.66 |
| | | | 50 | 0 | 2 | 21.71 |

| | |
|---|---|
| Tested By | Vanessa Moestopo |
| Date | 3/14/2017 |

**LTE Band 17**

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) 23790 710 MHz |
|---|---|---|---|---|---|---|
| LTE Band 17 | 5 | QPSK | 1 | 0 | 0 | 24.45 |
| | | | 1 | 12 | 0 | 24.39 |
| | | | 1 | 24 | 0 | 24.36 |
| | | | 12 | 0 | 1 | 23.46 |
| | | | 12 | 7 | 1 | 23.46 |
| | | | 12 | 13 | 1 | 23.41 |
| | | | 25 | 0 | 1 | 23.45 |
| | | 16QAM | 1 | 0 | 1 | 23.58 |
| | | | 1 | 12 | 1 | 23.51 |
| | | | 1 | 24 | 1 | 23.51 |
| | | | 12 | 0 | 2 | 22.54 |
| | | | 12 | 7 | 2 | 22.52 |
| | | | 12 | 13 | 2 | 22.49 |
| | | | 25 | 0 | 2 | 22.41 |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) 23790 710 MHz |
|---|---|---|---|---|---|---|
| LTE Band 17 | 10 | QPSK | 1 | 0 | 0 | 24.46 |
| | | | 1 | 25 | 0 | 24.35 |
| | | | 1 | 49 | 0 | 24.27 |
| | | | 25 | 0 | 1 | 23.47 |
| | | | 25 | 12 | 1 | 23.45 |
| | | | 25 | 25 | 1 | 23.36 |
| | | | 50 | 0 | 1 | 23.43 |
| | | 16QAM | 1 | 0 | 1 | 23.39 |
| | | | 1 | 25 | 1 | 23.29 |
| | | | 1 | 49 | 1 | 23.19 |
| | | | 25 | 0 | 2 | 22.48 |
| | | | 25 | 12 | 2 | 22.48 |
| | | | 25 | 25 | 2 | 22.42 |
| | | | 50 | 0 | 2 | 22.42 |

| Tested By | Krischelle Aurelio |
|---|---|
| Date | 3/10/2017 |

**LTE Band 41**

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 39750 | 40185 | 40620 | 41055 | 41490 |
| | | | | | | 2506 MHz | 2549.5 MHz | 2593 MHz | 2636.5 MHz | 2680 MHz |
| LTE Band 41 | 5 | QPSK | 1 | 0 | 0 | 19.65 | 19.45 | 19.40 | 19.69 | 19.43 |
| | | | 1 | 12 | 0 | 19.62 | 19.42 | 19.33 | 19.66 | 19.40 |
| | | | 1 | 24 | 0 | 19.54 | 19.35 | 19.31 | 19.62 | 19.36 |
| | | | 12 | 0 | 1 | 18.61 | 18.39 | 18.39 | 18.64 | 18.47 |
| | | | 12 | 7 | 1 | 18.62 | 18.42 | 18.42 | 18.68 | 18.46 |
| | | | 12 | 13 | 1 | 18.58 | 18.41 | 18.39 | 18.67 | 18.45 |
| | | | 25 | 0 | 1 | 18.53 | 18.39 | 18.37 | 18.64 | 18.45 |
| | | 16QAM | 1 | 0 | 1 | 18.46 | 18.29 | 18.35 | 18.59 | 18.50 |
| | | | 1 | 12 | 1 | 18.43 | 18.24 | 18.30 | 18.59 | 18.51 |
| | | | 1 | 24 | 1 | 18.41 | 18.22 | 18.28 | 18.57 | 18.47 |
| | | | 12 | 0 | 2 | 17.58 | 17.40 | 17.37 | 17.61 | 17.51 |
| | | | 12 | 7 | 2 | 17.63 | 17.42 | 17.38 | 17.67 | 17.54 |
| | | | 12 | 13 | 2 | 17.54 | 17.39 | 17.33 | 17.63 | 17.47 |
| | | | 25 | 0 | 2 | 17.59 | 17.41 | 17.40 | 17.68 | 17.46 |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 39750 | 40185 | 40620 | 41055 | 41490 |
| | | | | | | 2506 MHz | 2549.5 MHz | 2593 MHz | 2636.5 MHz | 2680 MHz |
| LTE Band 41 | 10 | QPSK | 1 | 0 | 0 | 19.63 | 19.48 | 19.42 | 19.68 | 19.53 |
| | | | 1 | 25 | 0 | 19.55 | 19.36 | 19.28 | 19.62 | 19.45 |
| | | | 1 | 49 | 0 | 19.52 | 19.31 | 19.24 | 19.63 | 19.40 |
| | | | 25 | 0 | 1 | 18.65 | 18.47 | 18.42 | 18.69 | 18.52 |
| | | | 25 | 12 | 1 | 18.62 | 18.46 | 18.38 | 18.67 | 18.46 |
| | | | 25 | 25 | 1 | 18.57 | 18.40 | 18.36 | 18.63 | 18.47 |
| | | | 50 | 0 | 1 | 18.60 | 18.41 | 18.39 | 18.63 | 18.49 |
| | | 16QAM | 1 | 0 | 1 | 18.76 | 18.44 | 18.33 | 18.81 | 18.52 |
| | | | 1 | 25 | 1 | 18.69 | 18.34 | 18.20 | 18.73 | 18.39 |
| | | | 1 | 49 | 1 | 18.62 | 18.28 | 18.16 | 18.75 | 18.34 |
| | | | 25 | 0 | 2 | 17.64 | 17.45 | 17.43 | 17.68 | 17.51 |
| | | | 25 | 12 | 2 | 17.63 | 17.43 | 17.37 | 17.69 | 17.48 |
| | | | 25 | 25 | 2 | 17.56 | 17.38 | 17.34 | 17.63 | 17.45 |
| | | | 50 | 0 | 2 | 17.62 | 17.43 | 17.38 | 17.70 | 17.51 |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 39750 | 40185 | 40620 | 41055 | 41490 |
| | | | | | | 2506 MHz | 2549.5 MHz | 2593 MHz | 2636.5 MHz | 2680 MHz |
| LTE Band 41 | 15 | QPSK | 1 | 0 | 0 | 19.67 | 19.62 | 19.61 | 19.78 | 19.38 |
| | | | 1 | 37 | 0 | 19.47 | 19.43 | 19.30 | 19.61 | 19.15 |
| | | | 1 | 74 | 0 | 19.41 | 19.35 | 19.27 | 19.62 | 19.08 |
| | | | 36 | 0 | 1 | 18.62 | 18.56 | 18.39 | 18.72 | 18.40 |
| | | | 36 | 20 | 1 | 18.57 | 18.53 | 18.37 | 18.66 | 18.37 |
| | | | 36 | 39 | 1 | 18.50 | 18.48 | 18.29 | 18.64 | 18.30 |
| | | | 75 | 0 | 1 | 18.54 | 18.52 | 18.33 | 18.64 | 18.37 |
| | | 16QAM | 1 | 0 | 1 | 18.59 | 18.55 | 18.44 | 18.72 | 18.51 |
| | | | 1 | 37 | 1 | 18.43 | 18.39 | 18.23 | 18.59 | 18.31 |
| | | | 1 | 74 | 1 | 18.35 | 18.31 | 18.15 | 18.57 | 18.23 |
| | | | 36 | 0 | 2 | 17.59 | 17.56 | 17.42 | 17.66 | 17.42 |
| | | | 36 | 20 | 2 | 17.55 | 17.52 | 17.36 | 17.65 | 17.38 |
| | | | 36 | 39 | 2 | 17.49 | 17.45 | 17.28 | 17.62 | 17.30 |
| | | | 75 | 0 | 2 | 17.56 | 17.50 | 17.34 | 17.69 | 17.37 |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 39750 | 40185 | 40620 | 41055 | 41490 |
| | | | | | | 2506 MHz | 2549.5 MHz | 2593 MHz | 2636.5 MHz | 2680 MHz |
| LTE Band 41 | 20 | QPSK | 1 | 0 | 0 | 19.73 | 19.62 | 19.57 | 19.76 | 19.55 |
| | | | 1 | 49 | 0 | 19.50 | 19.41 | 19.28 | 19.55 | 19.32 |
| | | | 1 | 99 | 0 | 19.40 | 19.31 | 19.19 | 19.55 | 19.20 |
| | | | 50 | 0 | 1 | 18.62 | 18.56 | 18.46 | 18.71 | 18.45 |
| | | | 50 | 24 | 1 | 18.54 | 18.46 | 18.37 | 18.65 | 18.37 |
| | | | 50 | 50 | 1 | 18.43 | 18.39 | 18.26 | 18.57 | 18.31 |
| | | | 100 | 0 | 1 | 18.56 | 18.49 | 18.37 | 18.62 | 18.34 |
| | | 16QAM | 1 | 0 | 1 | 18.64 | 18.58 | 18.37 | 18.65 | 18.64 |
| | | | 1 | 49 | 1 | 18.42 | 18.33 | 18.10 | 18.45 | 18.40 |
| | | | 1 | 99 | 1 | 18.33 | 18.23 | 17.98 | 18.40 | 18.31 |
| | | | 50 | 0 | 2 | 17.59 | 17.52 | 17.46 | 17.70 | 17.50 |
| | | | 50 | 24 | 2 | 17.51 | 17.42 | 17.39 | 17.63 | 17.43 |
| | | | 50 | 50 | 2 | 17.44 | 17.36 | 17.27 | 17.61 | 17.30 |
| | | | 100 | 0 | 2 | 17.53 | 17.41 | 17.38 | 17.66 | 17.38 |

# 12. PEAK TO AVERAGE RATIO

**TEST PROCEDURE**

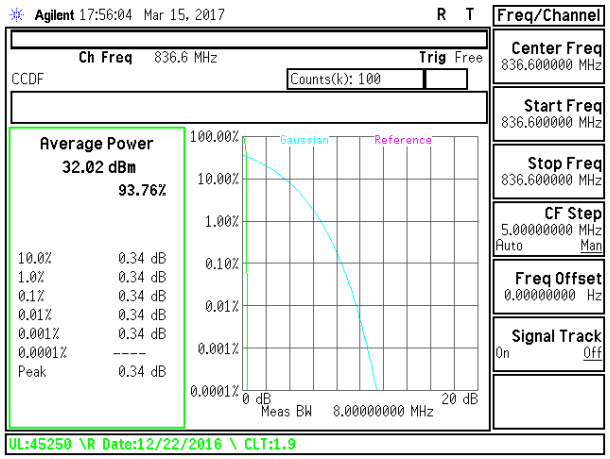
Per KDB 971168 D01 Power Meas License Digital Systems v02r02

**TEST SPEC**

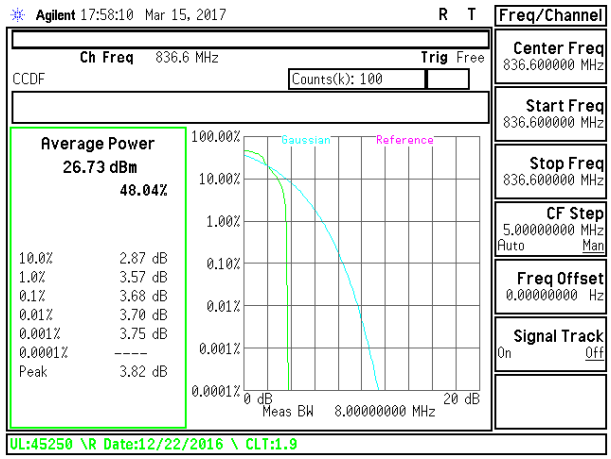
In addition, when the transmitter power is measured in terms of average value, the peak-to-average ratio of the power shall not exceed 13 dB.

# 12.1. CONDUCTED PEAK TO AVERAGE RESULT

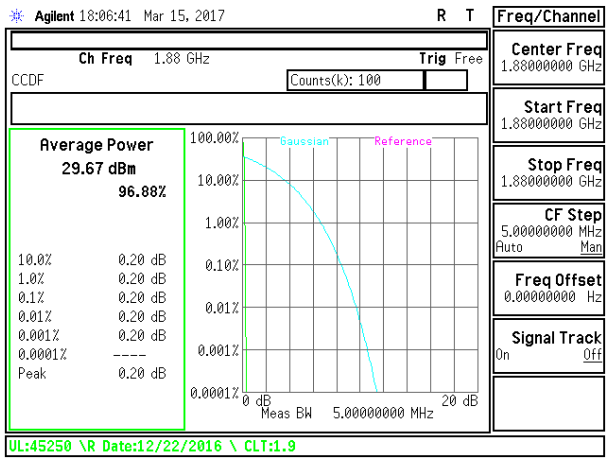
## GSM



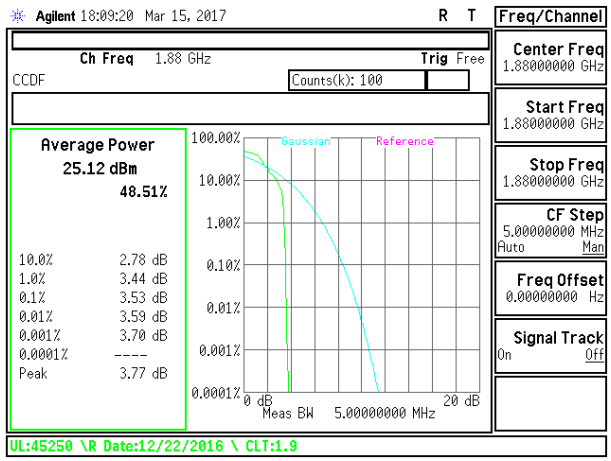

GSM850 GPRS Middle Channel




GSM850 EGPRS Middle Channel

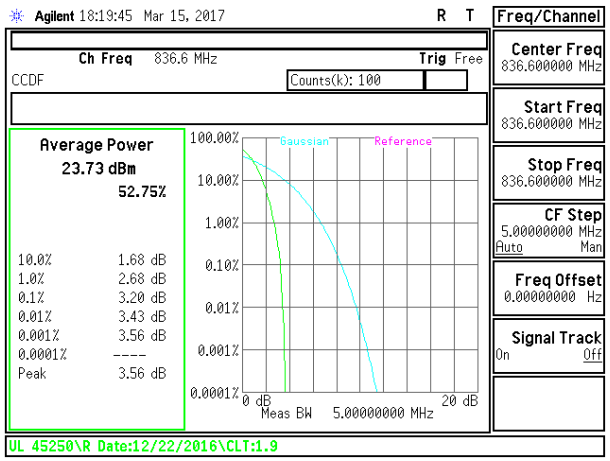



GSM1900 GPRS Middle Channel

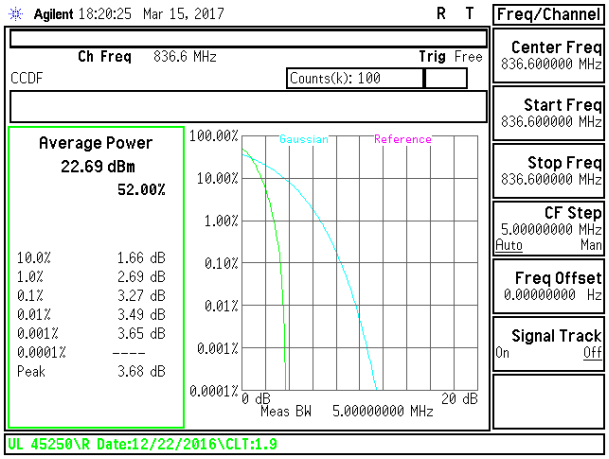



GSM1900 EGPRS Middle Channel

## WCDMA

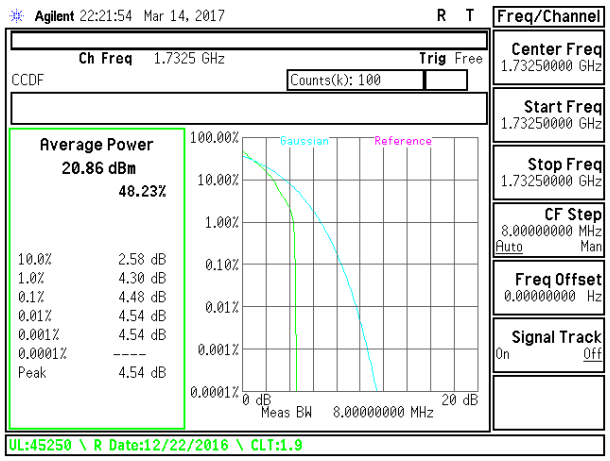



B5 REL99

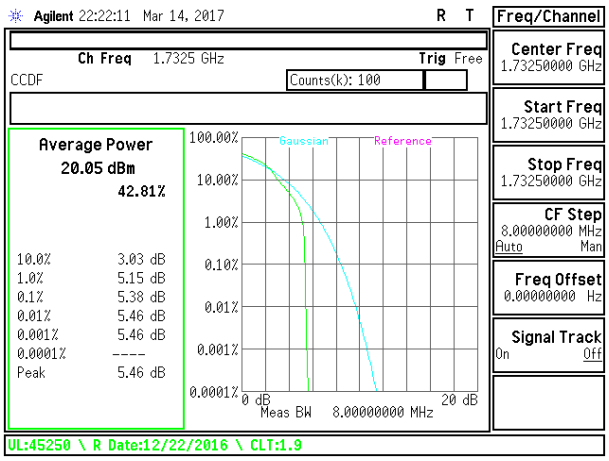



B5 HSDPA

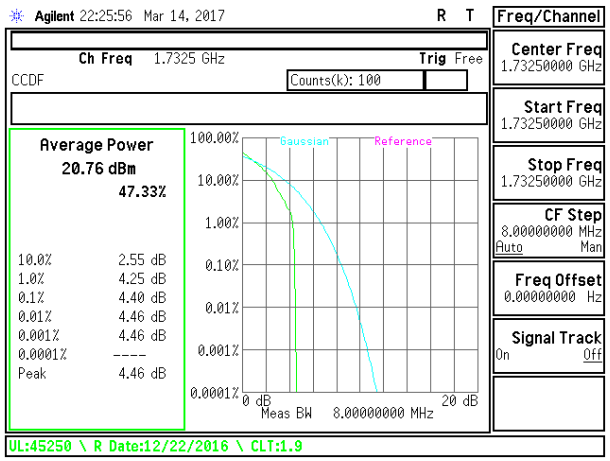
## LTE Band 4



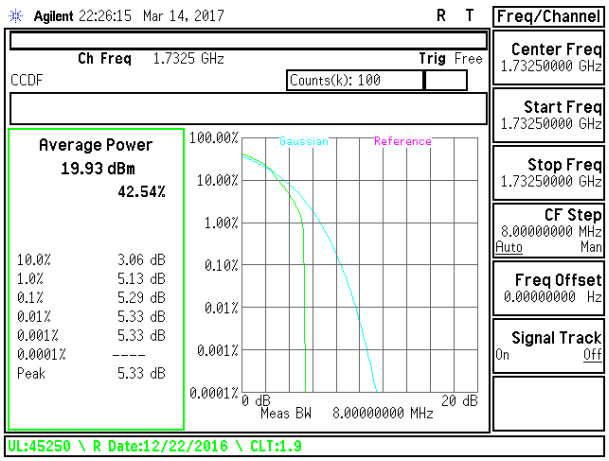

LTE B4 1.4MHz QPSK Middle Channel



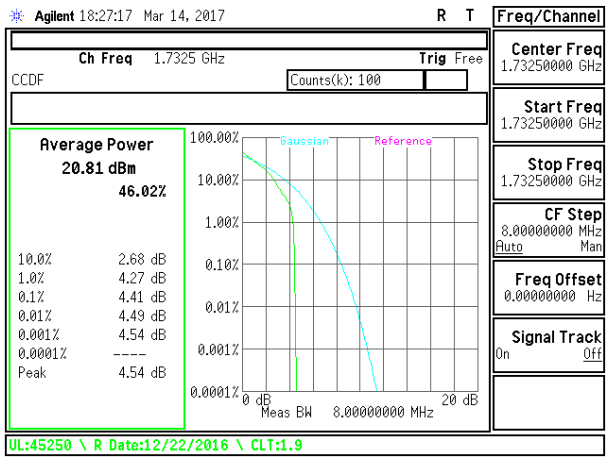

LTE B4 1.4MHz 16QAM Middle Channel



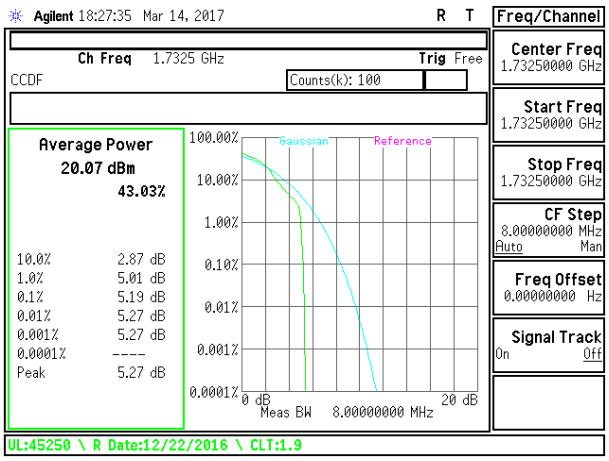

LTE B4 3MHz QPSK Middle Channel



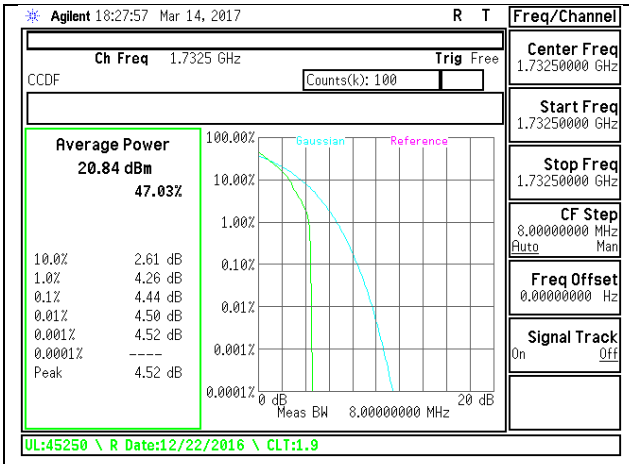

LTE B4 3MHz 16QAM Middle Channel



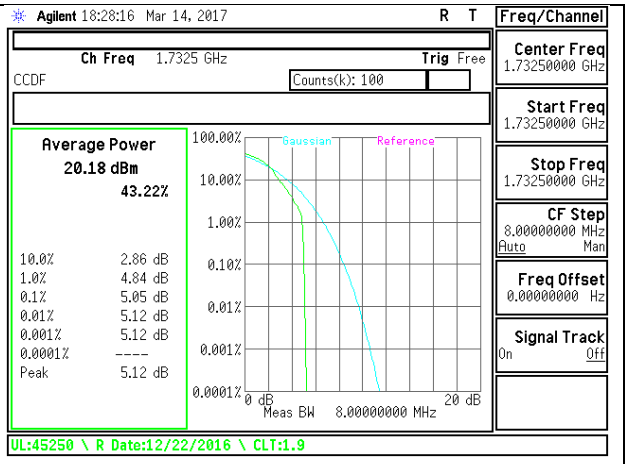

LTE B4 5MHz QPSK Middle Channel



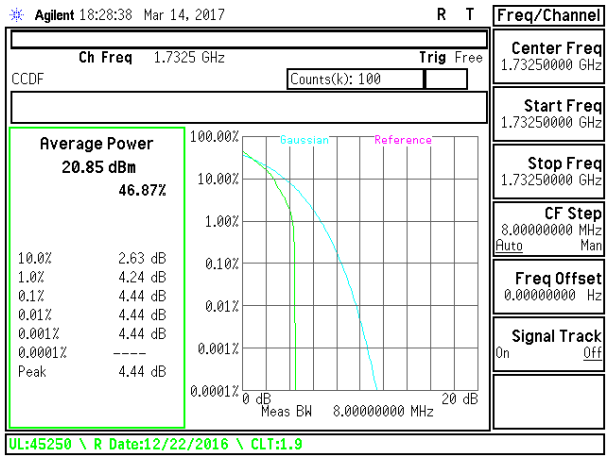

LTE B4 5MHz 16QAM Middle Channel



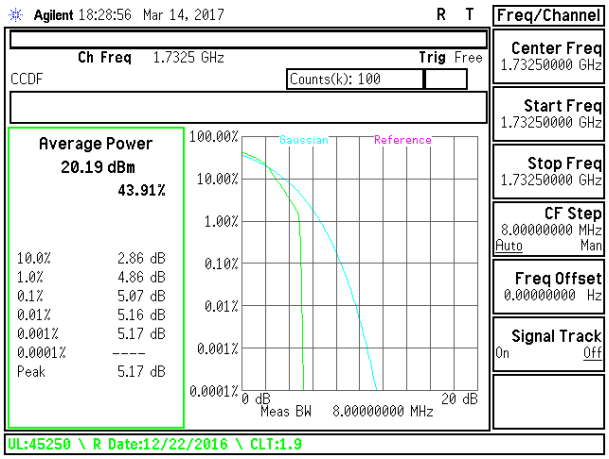

LTE B4 10MHz QPSK Middle Channel



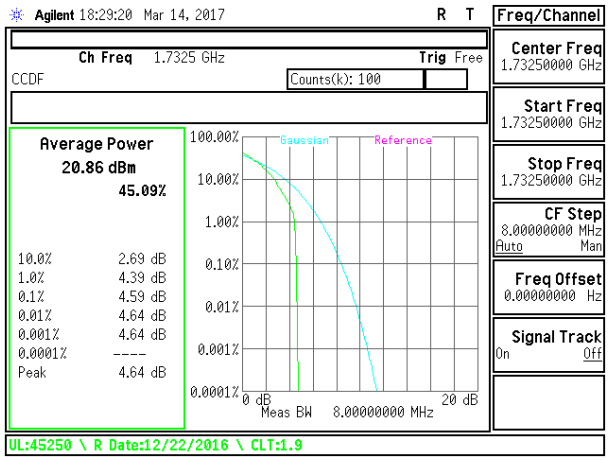

LTE B4 10MHz 16QAM Middle Channel



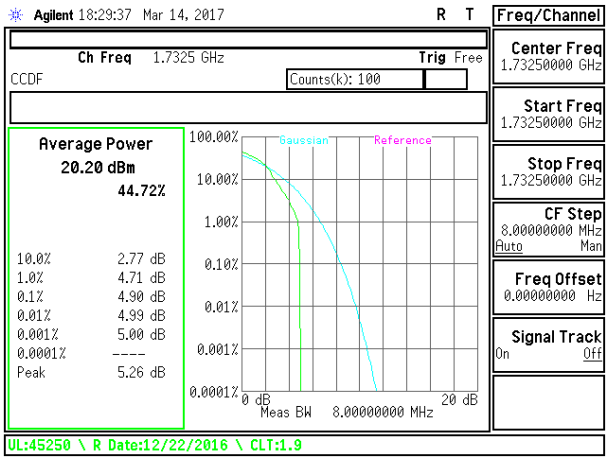

LTE B4 15MHz QPSK Middle Channel




LTE B4 15MHz 16QAM Middle Channel

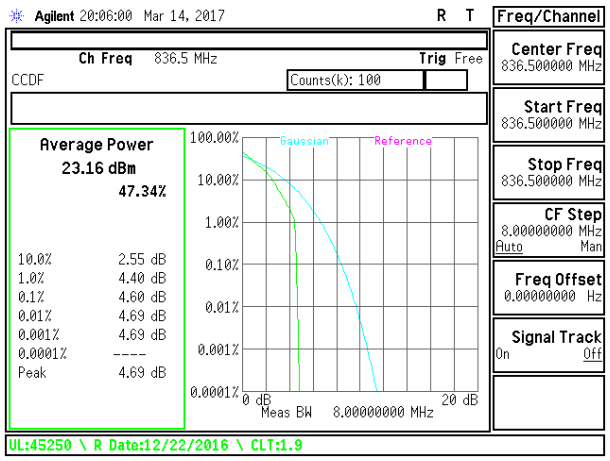



LTE B4 20MHz QPSK Middle Channel

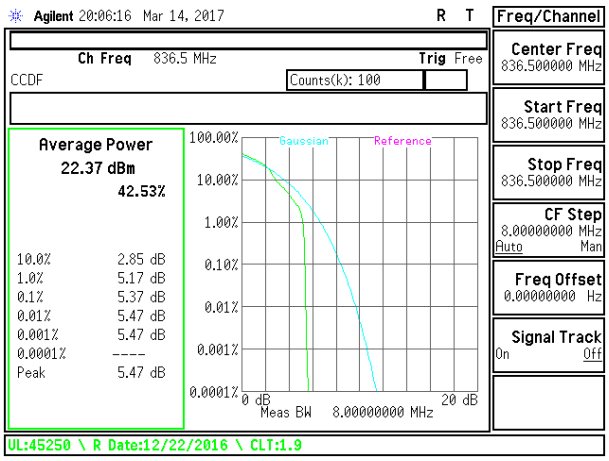



LTE B4 20MHz 16QAM Middle Channel

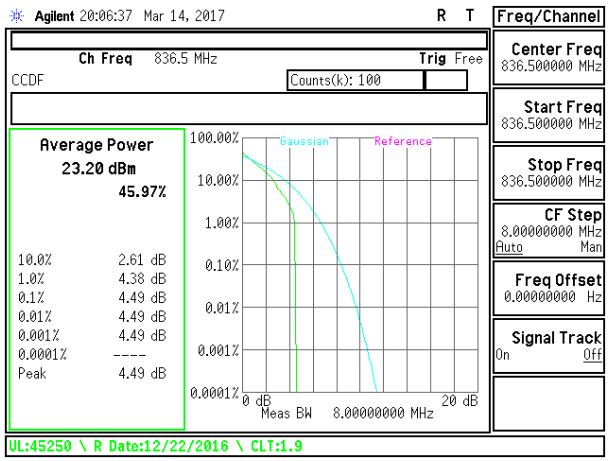
## LTE Band 5



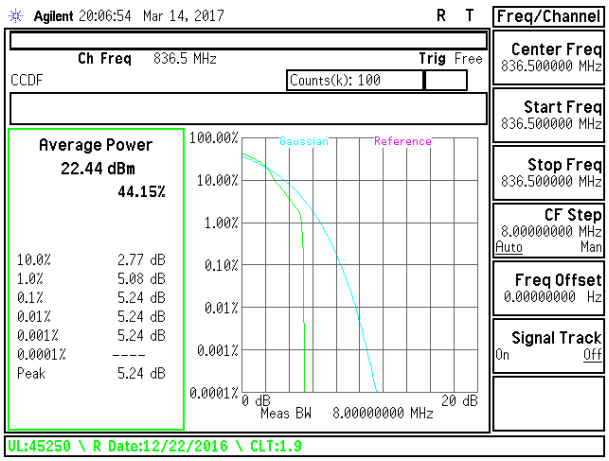

LTE B5 1.4MHz QPSK Middle Channel



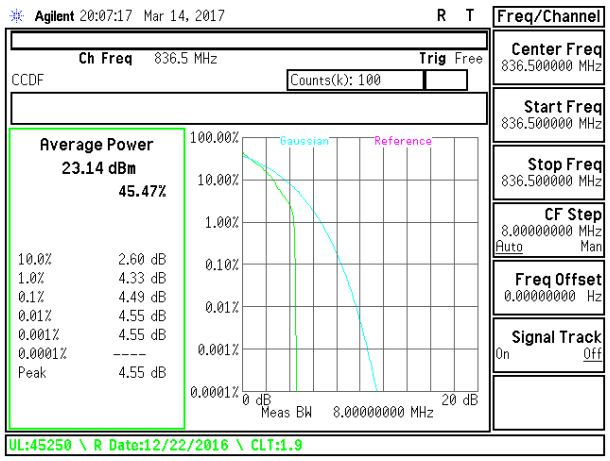

LTE B5 1.4MHz 16QAM Middle Channel



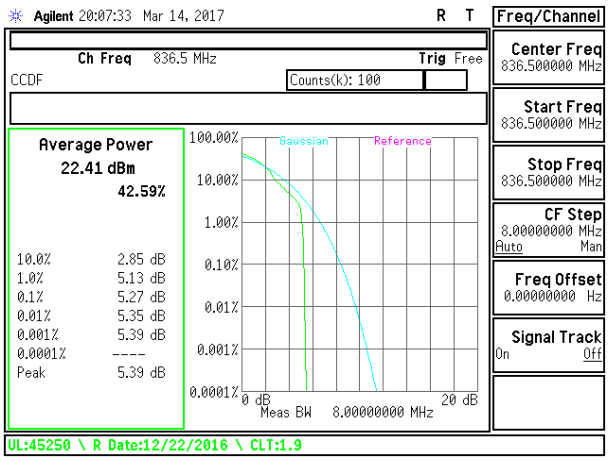

LTE B5 3MHz QPSK Middle Channel



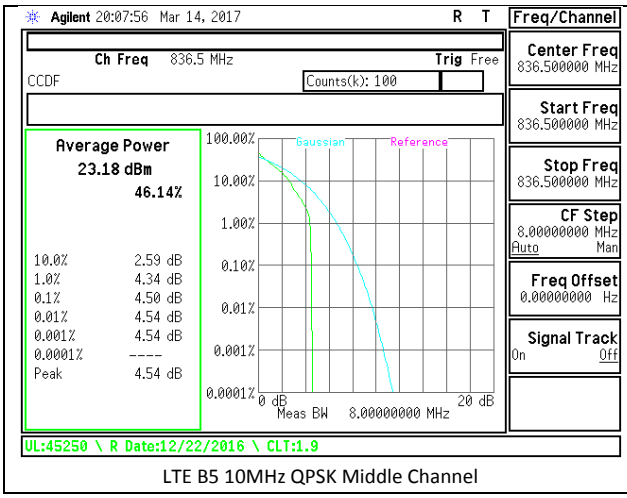

LTE B5 3MHz 16QAM Middle Channel



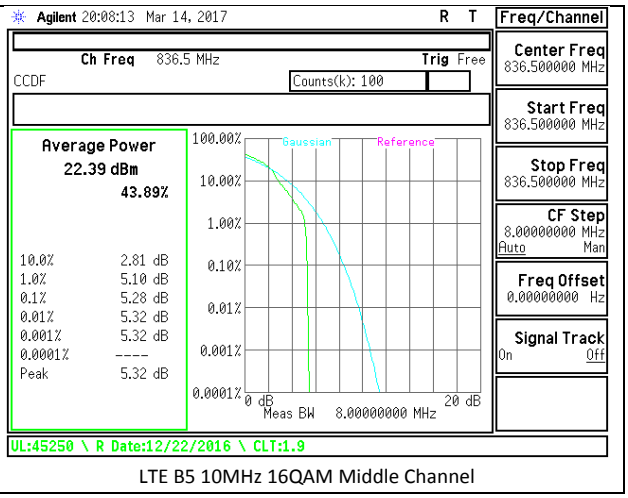

LTE B5 5MHz QPSK Middle Channel




LTE B5 5MHz 16QAM Middle Channel

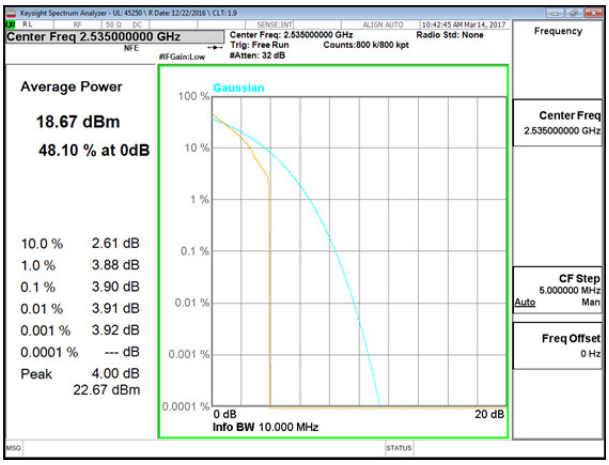



LTE B5 10MHz QPSK Middle Channel

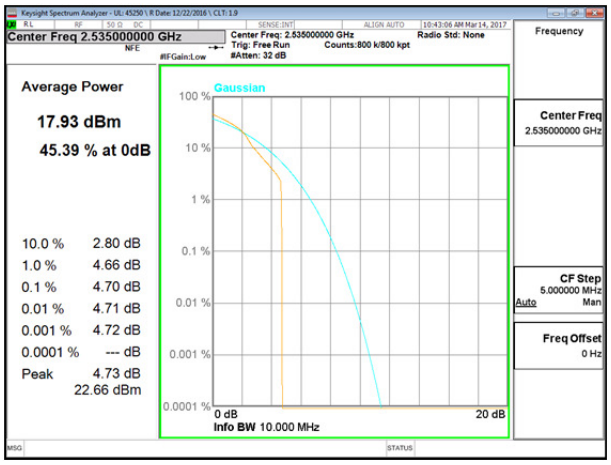



LTE B5 10MHz 16QAM Middle Channel

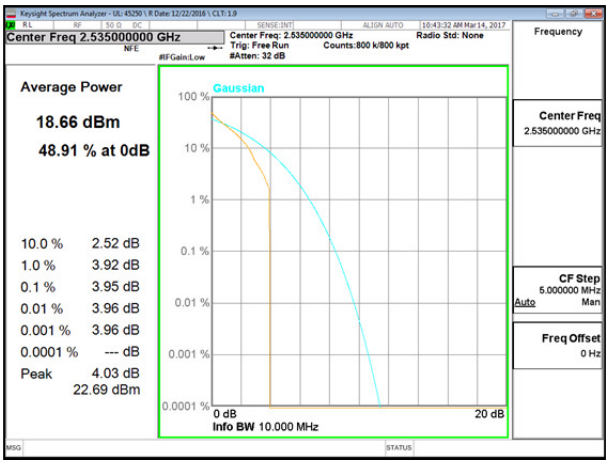
## LTE Band 7



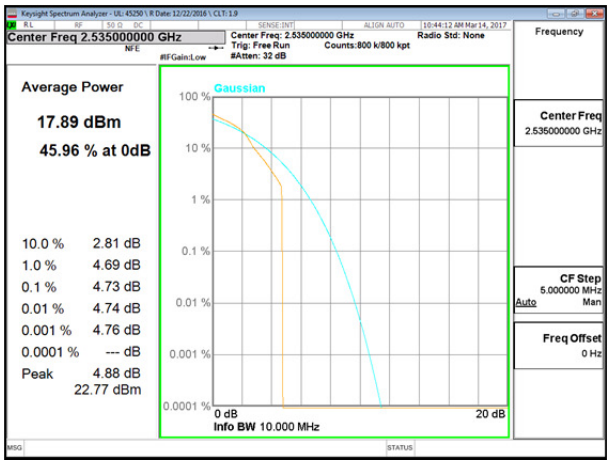

LTE B7 5MHz QPSK Middle Channel



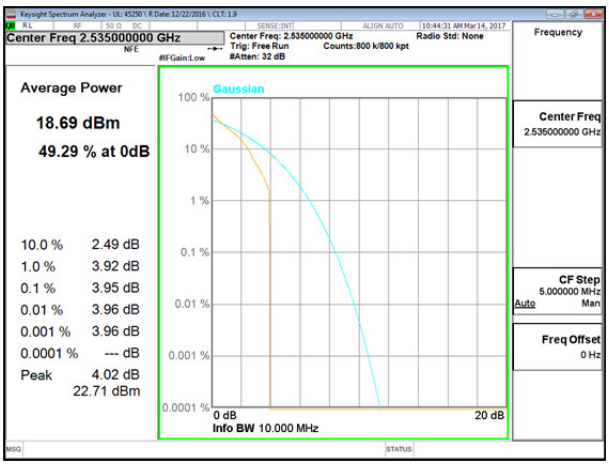

LTE B7 5MHz 16QAM Middle Channel



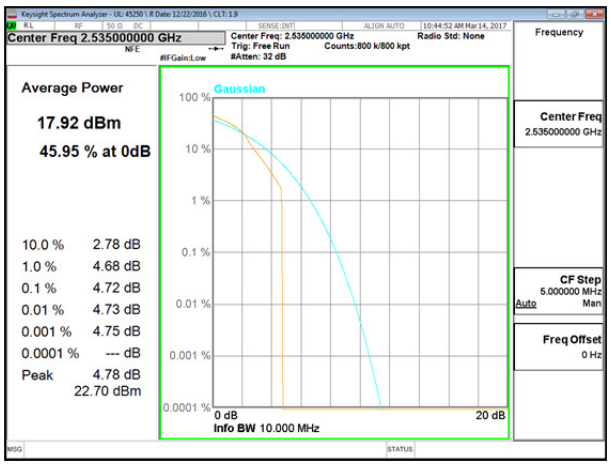

LTE B7 10MHz QPSK Middle Channel



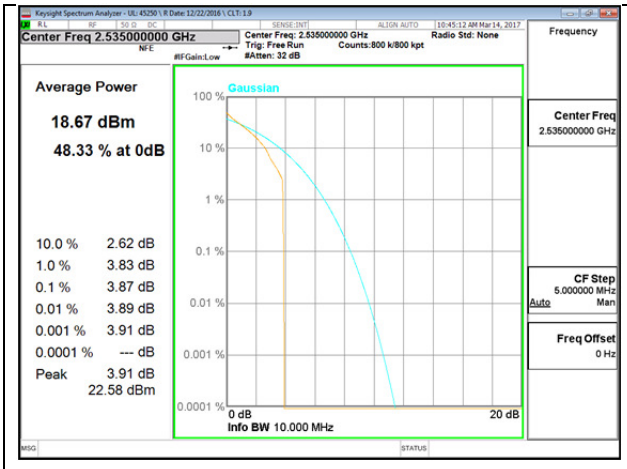

LTE B7 10MHz 16QAM Middle Channel



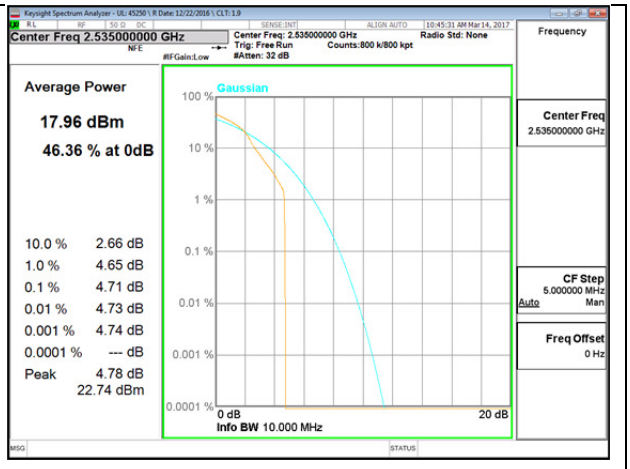

LTE B7 15MHz QPSK Middle Channel




LTE B7 15MHz 16QAM Middle Channel

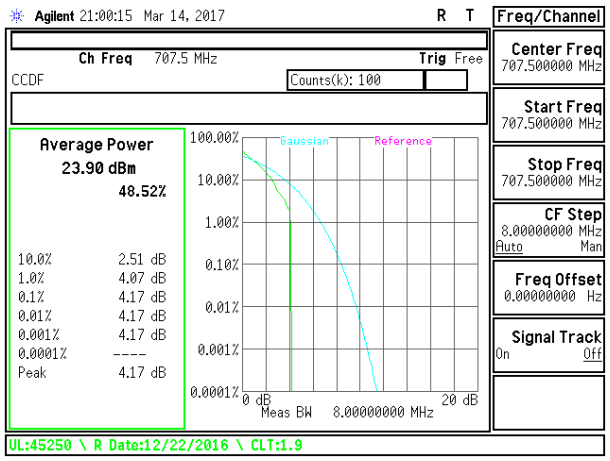



LTE B7 20MHz QPSK Middle Channel

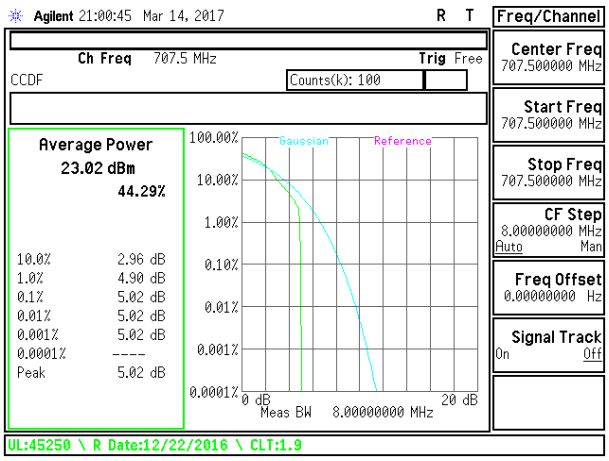



LTE B7 20MHz 16QAM Middle Channel

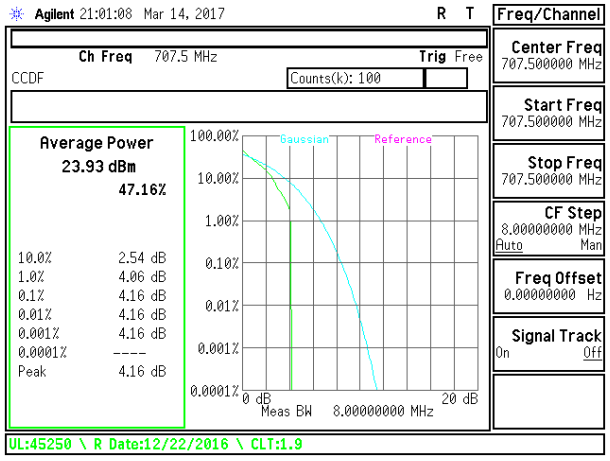
## LTE Band 12



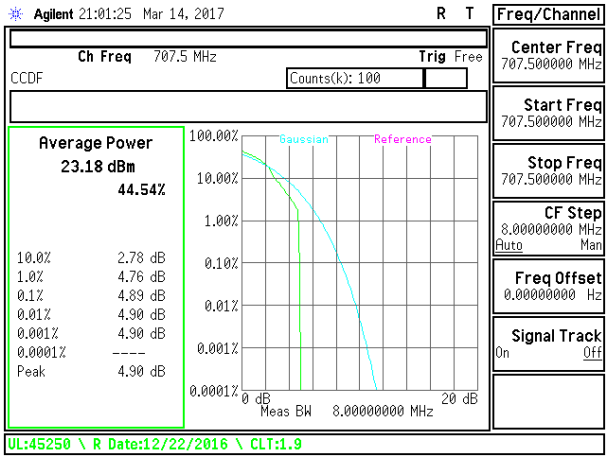

LTE B12 1.4MHz QPSK Middle Channel



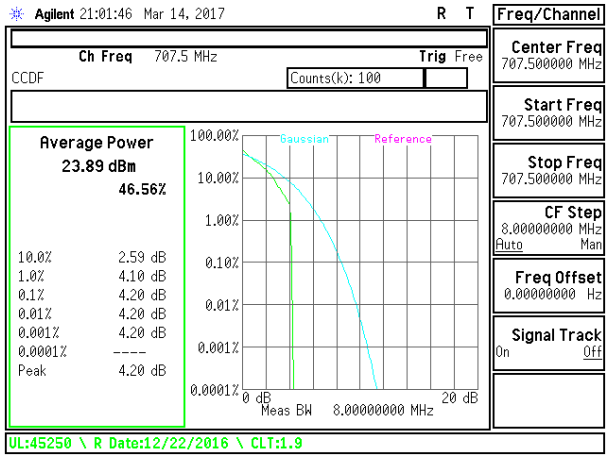

LTE B12 1.4MHz 16QAM Middle Channel



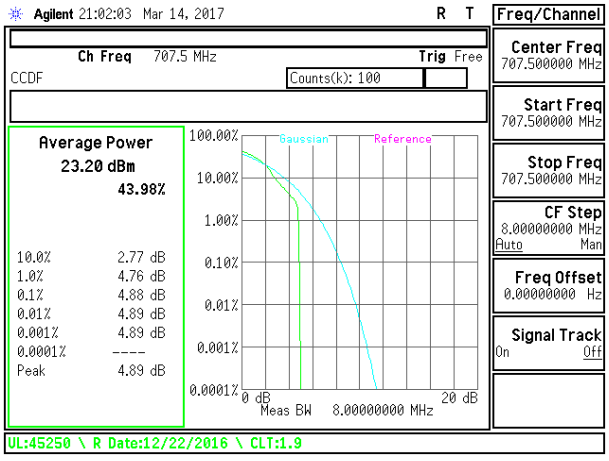

LTE B12 3MHz QPSK Middle Channel



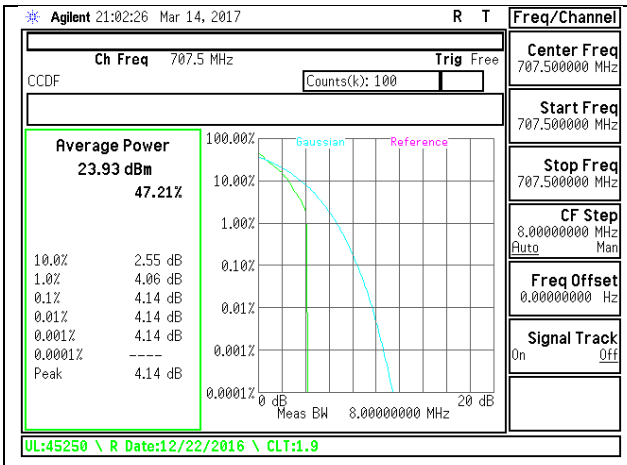

LTE B12 3MHz 16QAM Middle Channel



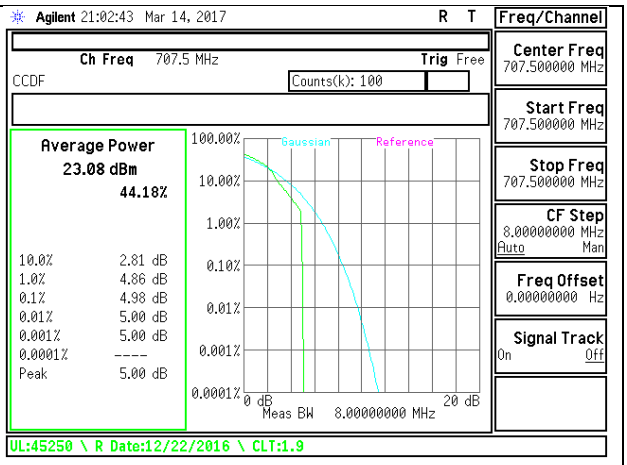

LTE B12 5MHz QPSK Middle Channel




LTE B12 5MHz 16QAM Middle Channel

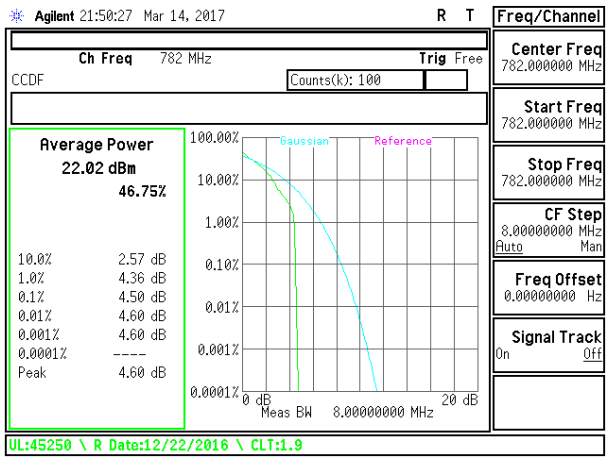



LTE B12 10MHz QPSK Middle Channel

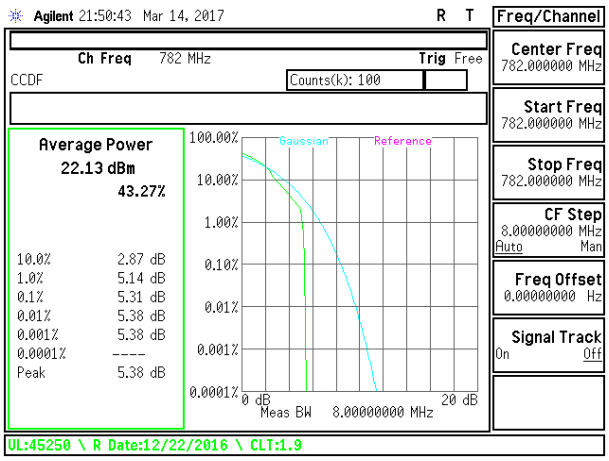



LTE B12 10MHz 16QAM Middle Channel

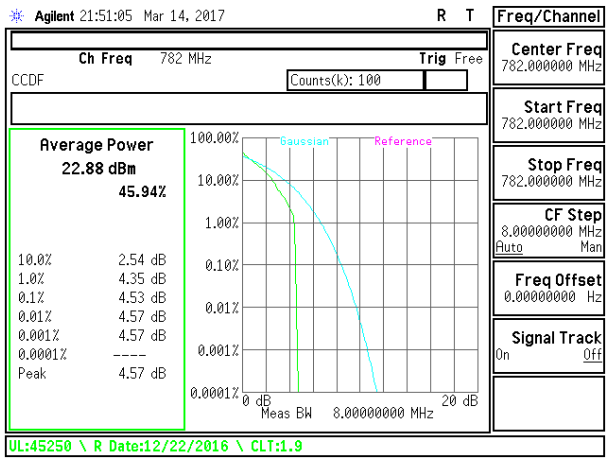
## LTE Band 13



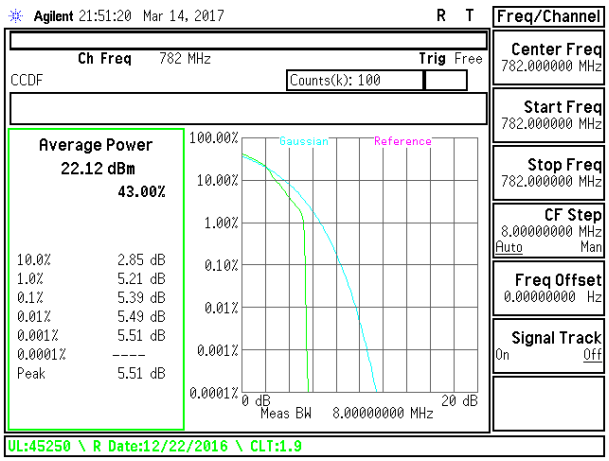

LTE B13 5MHz QPSK Middle Channel




LTE B13 5MHz 16QAM Middle Channel

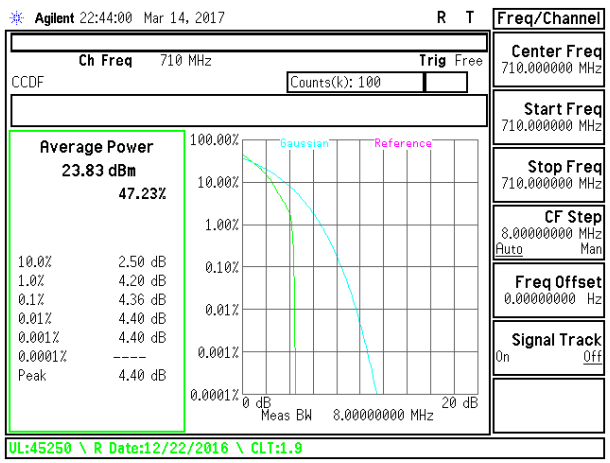



LTE B13 10MHz QPSK Middle Channel

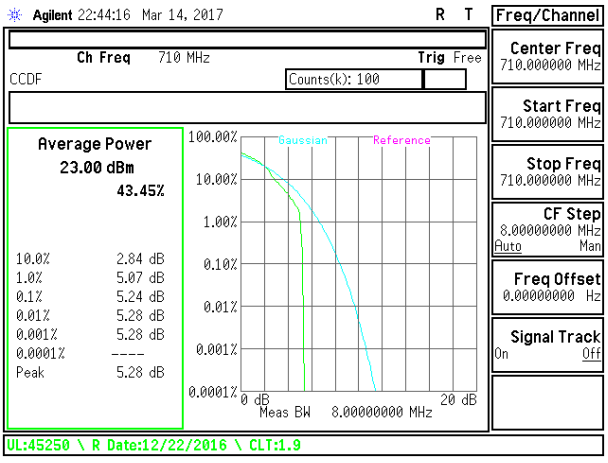



LTE B13 10MHz 16QAM Middle Channel

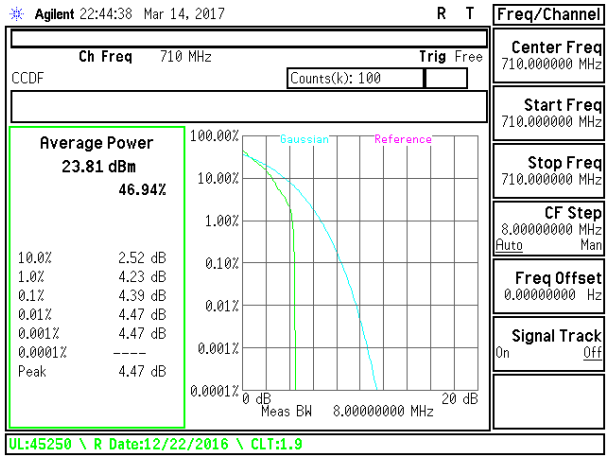
## LTE Band 17



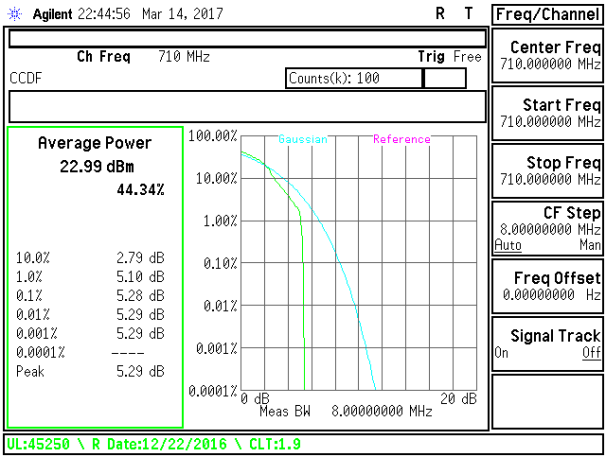

LTE B17 5MHz QPSK Middle Channel




LTE B17 5MHz 16QAM Middle Channel

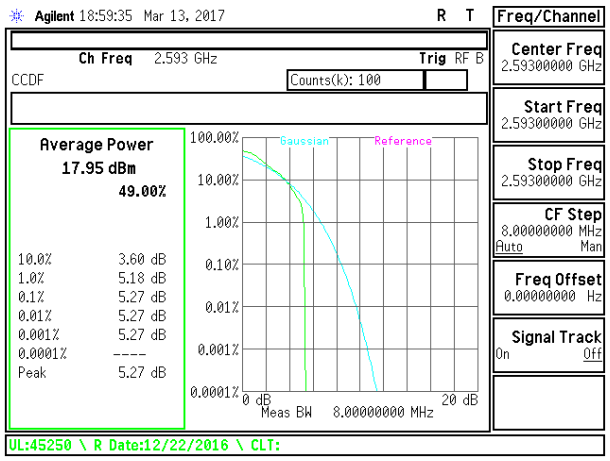



LTE B17 10MHz QPSK Middle Channel

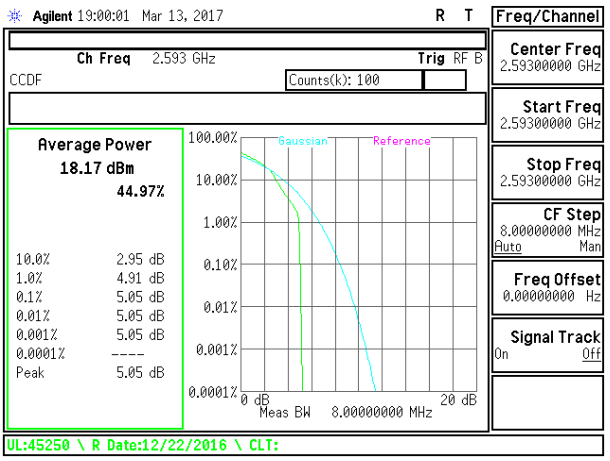



LTE B17 10MHz 16QAM Middle Channel

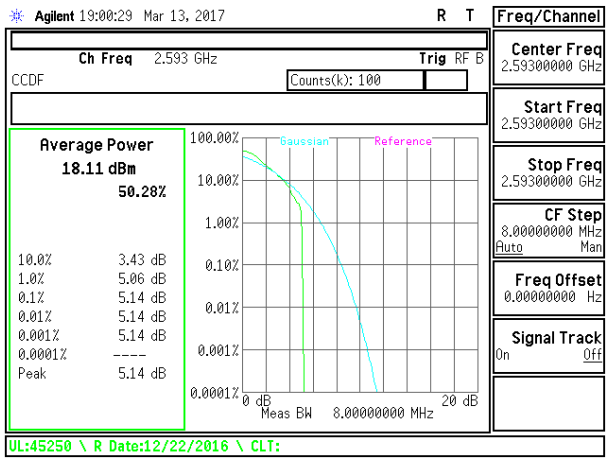
## LTE Band 41



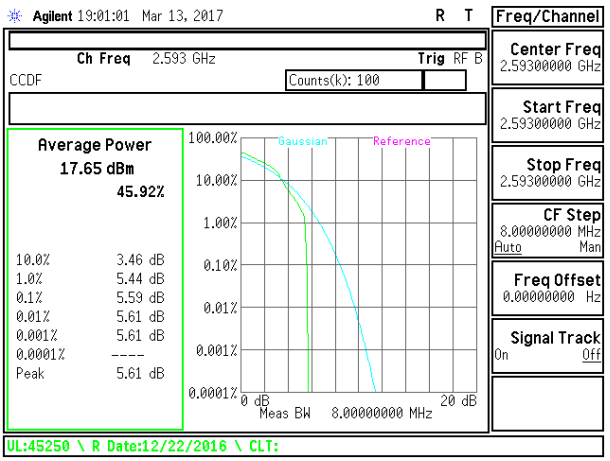

LTE B41 5MHz QPSK Middle Channel



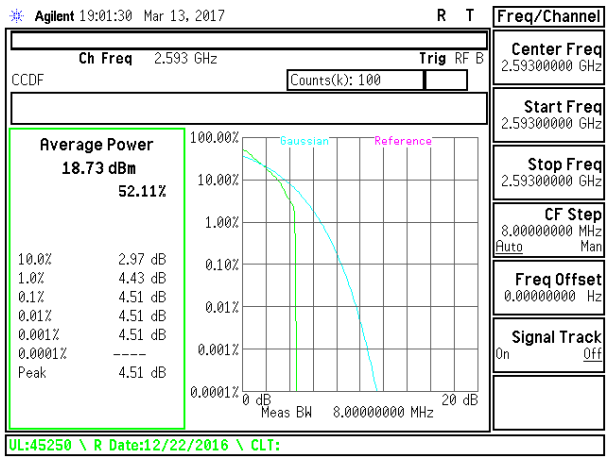

LTE B41 5MHz 16QAM Middle Channel



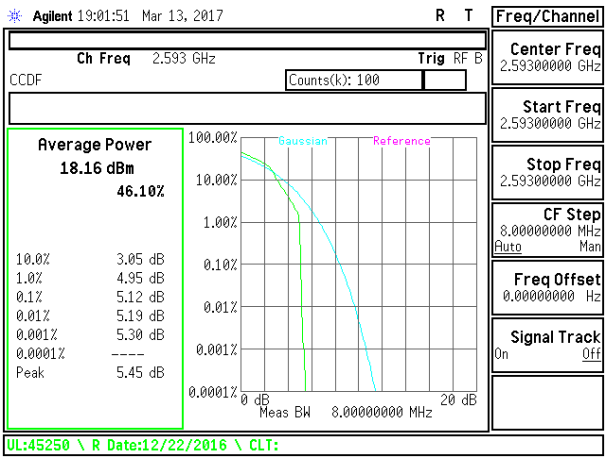

LTE B41 10MHz QPSK Middle Channel



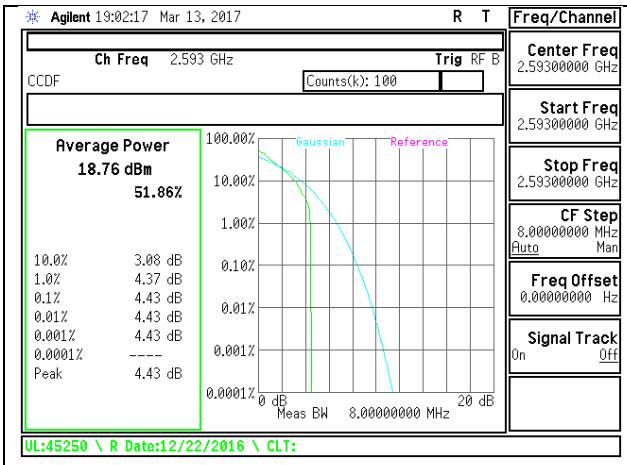

LTE B41 10MHz 16QAM Middle Channel



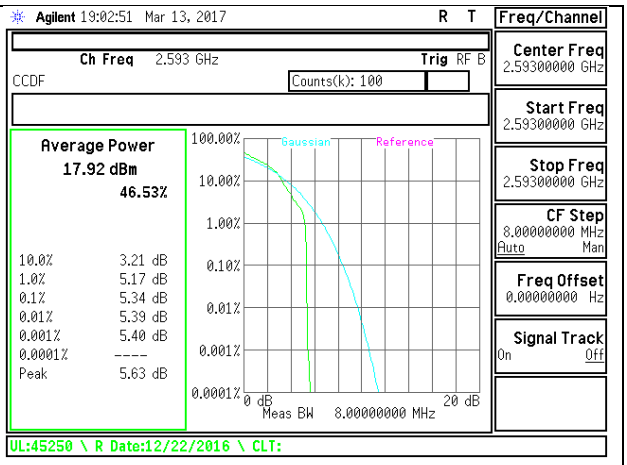

LTE B41 15MHz QPSK Middle Channel




LTE B41 15MHz 16QAM Middle Channel




LTE B41 20MHz QPSK Middle Channel




LTE B41 20MHz 16QAM Middle Channel

# 13. OCCUPIED BANDWIDTH

**RULE PART(S)**

FCC: §2.1049

**LIMITS**

For reporting purposes only

**TEST PROCEDURE**

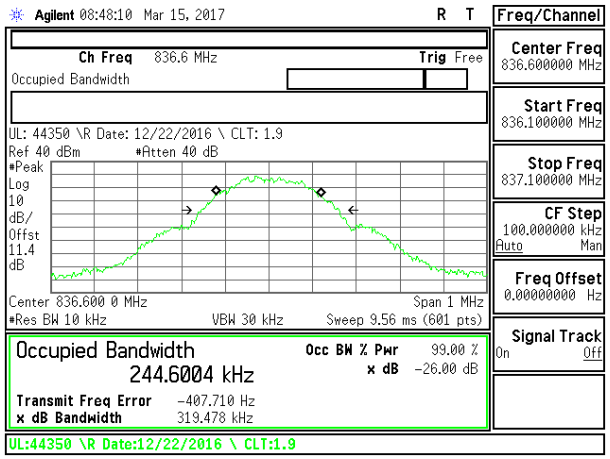
The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at the low, middle and high channel in each band. The -26dB bandwidth was also measured and recorded.

(KDB 971168 D01 Power Meas License Digital Systems v02r02)

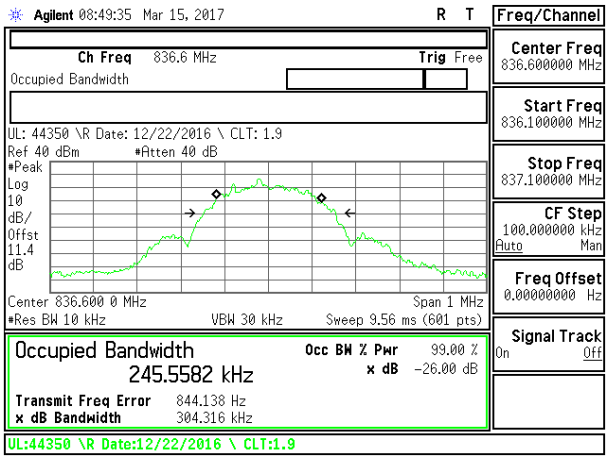
## 13.1. OCCUPIED BANDWIDTH RESULTS AND PLOTS

**GSM**

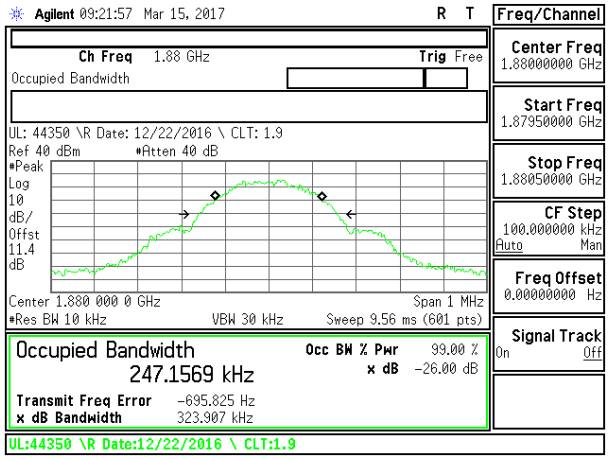
| Band | Mode | Channel | f (MHz) | 99% BW (kHz) | -26dB (kHz) |
|---|---|---|---|---|---|
| GSM 850 | GPRS | 128 | 824.2 | 248.2 | 314.8 |
| | | 190 | 836.6 | 244.6 | 319.5 |
| | | 251 | 848.8 | 243 | 315.2 |
| | EGPRS | 128 | 824.2 | 236.2 | 310.9 |
| | | 190 | 836.6 | 245.6 | 304.3 |
| | | 251 | 848.8 | 241.6 | 310.5 |
| GSM 1900 | GPRS | 512 | 1850.2 | 246.7 | 307 |
| | | 661 | 1880 | 247.2 | 323.9 |
| | | 810 | 1909.8 | 248.5 | 310.1 |
| | EGPRS | 512 | 1850.2 | 244 | 304.1 |
| | | 661 | 1880 | 248.1 | 317.4 |
| | | 810 | 1909.8 | 243.8 | 313.5 |



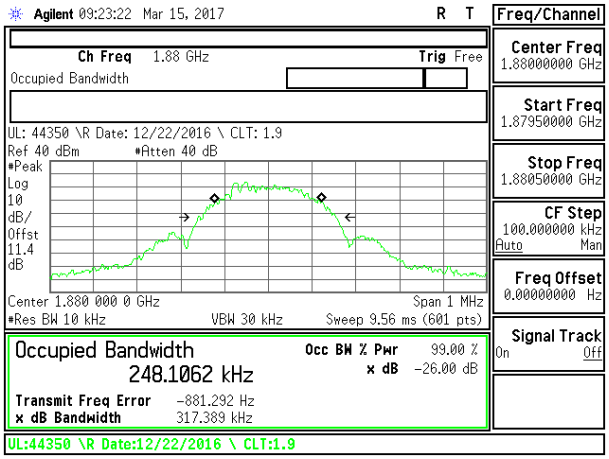

GSM850 GPRS Middle Channel




GSM850 EGPRS Middle Channel



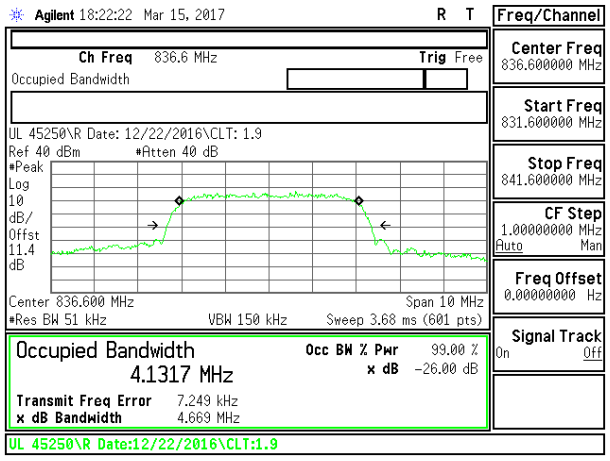

GSM1900 GPRS Middle Channel



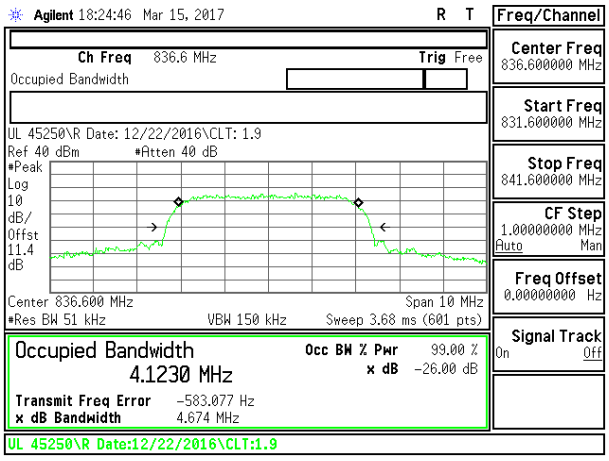

GSM1900 EGPRS Middle Channel

**WCDMA**

| Band | Mode | Channel | f (MHz) | 99% BW (MHz) | -26dB (MHz) |
|---|---|---|---|---|---|
| Band 5 | REL99 | 4132 | 826.4 | 4.13 | 4.67 |
| | | 4183 | 836.6 | 4.13 | 4.67 |
| | | 4233 | 846.6 | 4.13 | 4.68 |
| | HSDPA | 4132 | 826.4 | 4.1 | 4.69 |
| | | 4183 | 836.6 | 4.12 | 4.67 |
| | | 4233 | 846.6 | 4.11 | 4.66 |




B5 REL99 Middle Channel

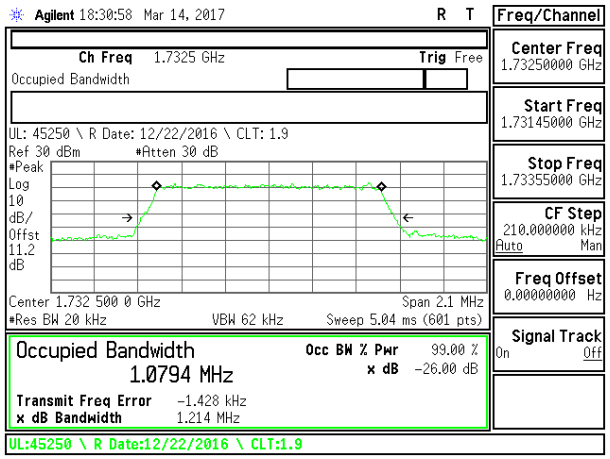



B5 HSDPA Middle Channel

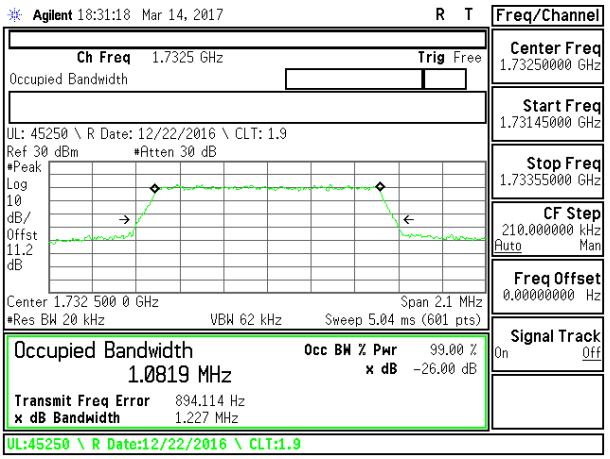
**LTE Band 4**

| Band | BW(MHz) | Mode | RB/RB Size | f (MHz) | 99% BW (MHz) | -26dB BW (MHz) |
|---|---|---|---|---|---|---|
| LTE4 | 20 | 16QAM | 100/0 | 1720 | 17.87 | 19.26 |
| | | | 100/0 | 1732.5 | 17.85 | 19.16 |
| | | | 100/0 | 1745 | 17.79 | 19.19 |
| | | QPSK | 100/0 | 1720 | 17.84 | 19.22 |
| | | | 100/0 | 1732.5 | 17.86 | 19.35 |
| | | | 100/0 | 1745 | 17.87 | 19.07 |
| | 15 | 16QAM | 75/0 | 1717.5 | 13.41 | 14.39 |
| | | | 75/0 | 1732.5 | 13.4 | 14.5 |
| | | | 75/0 | 1747.5 | 13.39 | 14.33 |
| | | QPSK | 75/0 | 1717.5 | 13.41 | 14.48 |
| | | | 75/0 | 1732.5 | 13.4 | 14.49 |
| | | | 75/0 | 1747.5 | 13.43 | 14.46 |
| | 10 | 16QAM | 50/0 | 1715 | 8.95 | 9.68 |
| | | | 50/0 | 1732.5 | 8.95 | 9.72 |
| | | | 50/0 | 1750 | 8.92 | 9.66 |
| | | QPSK | 50/0 | 1715 | 8.94 | 9.65 |
| | | | 50/0 | 1732.5 | 8.96 | 9.66 |
| | | | 50/0 | 1750 | 8.96 | 9.76 |
| | 5 | 16QAM | 25/0 | 1712.5 | 4.49 | 4.82 |
| | | | 25/0 | 1732.5 | 4.5 | 4.91 |
| | | | 25/0 | 1752.5 | 4.49 | 4.87 |
| | | QPSK | 25/0 | 1712.5 | 4.49 | 4.93 |
| | | | 25/0 | 1732.5 | 4.5 | 4.95 |
| | | | 25/0 | 1752.5 | 4.51 | 4.92 |

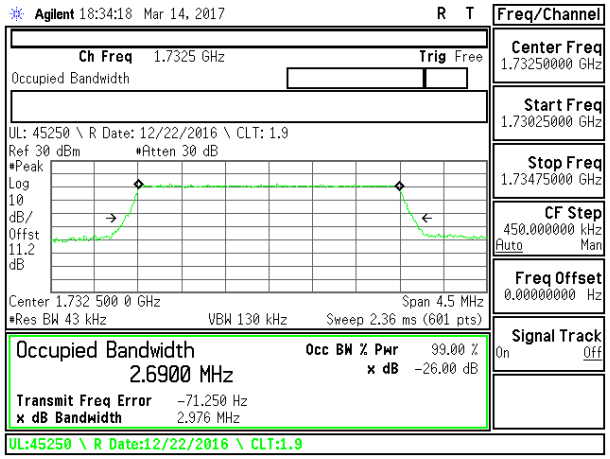
| Band | BW(MHz) | Mode | RB/RB Size | f (MHz) | 99% BW (MHz) | -26dB BW (MHz) |
|---|---|---|---|---|---|---|
| LTE4 | 3 | 16QAM | 15/0 | 1711.5 | 2.68 | 3 |
| | | | 15/0 | 1732.5 | 2.68 | 2.95 |
| | | | 15/0 | 1753.5 | 2.69 | 2.99 |
| | | QPSK | 15/0 | 1711.5 | 2.69 | 2.95 |
| | | | 15/0 | 1732.5 | 2.69 | 2.98 |
| | | | 15/0 | 1753.5 | 2.69 | 2.96 |
| | 1.4 | 16QAM | 6/0 | 1710.7 | 1.08 | 1.22 |
| | | | 6/0 | 1732.5 | 1.08 | 1.23 |
| | | | 6/0 | 1754.3 | 1.08 | 1.23 |
| | | QPSK | 6/0 | 1710.7 | 1.08 | 1.22 |
| | | | 6/0 | 1732.5 | 1.08 | 1.21 |
| | | | 6/0 | 1754.3 | 1.08 | 1.23 |



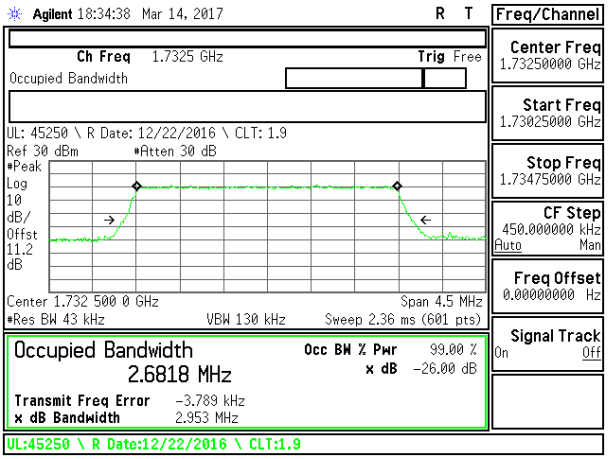

LTE B4 1.4MHz QPSK Middle Channel



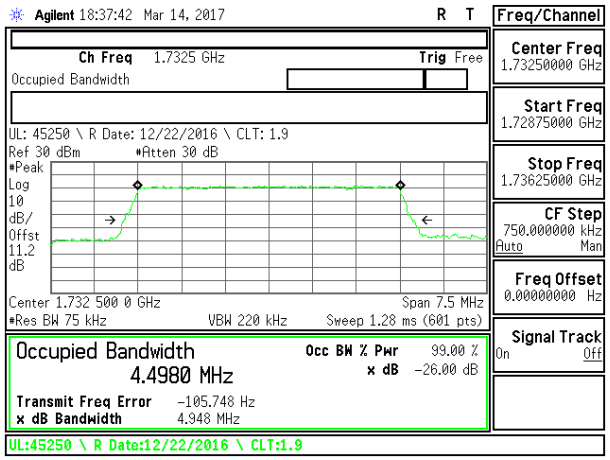

LTE B4 1.4MHz 16QAM Middle Channel



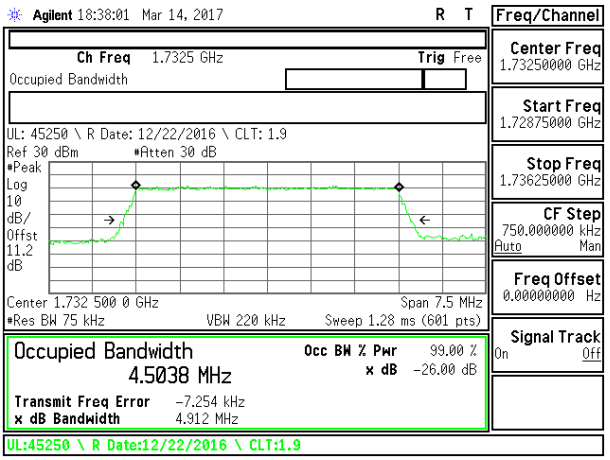

LTE B4 3MHz QPSK Middle Channel



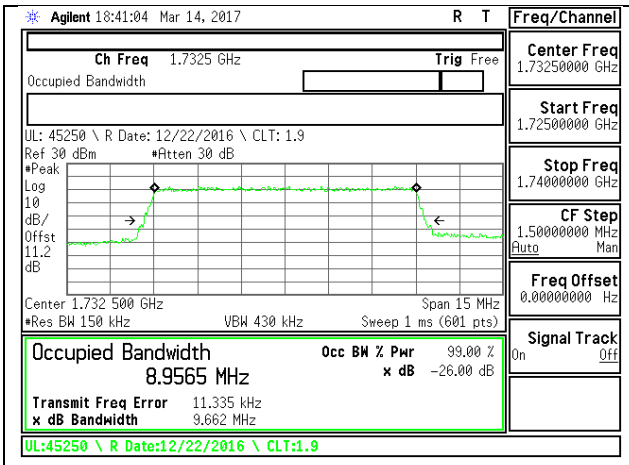

LTE B4 3MHz 16QAM Middle Channel



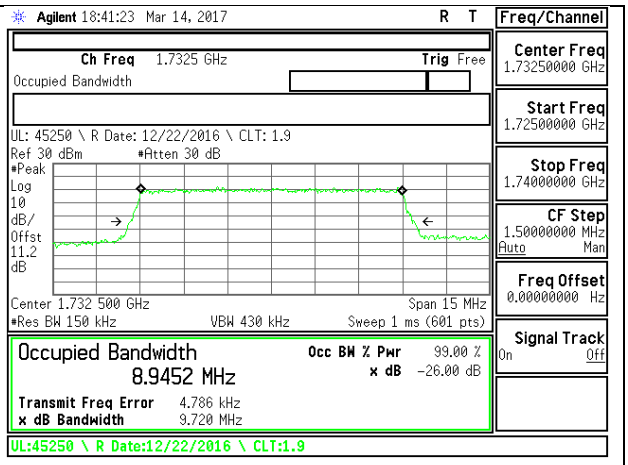

LTE B4 5MHz QPSK Middle Channel



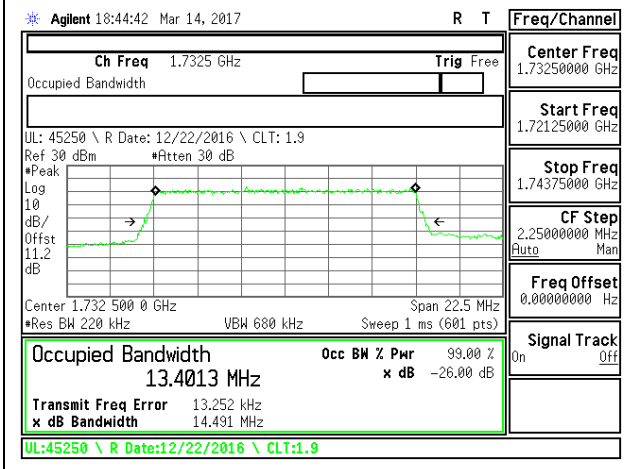

LTE B4 5MHz 16QAM Middle Channel



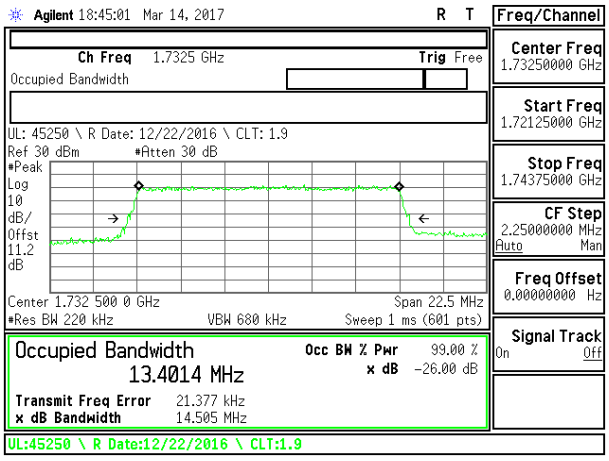

LTE B4 10MHz QPSK Middle Channel



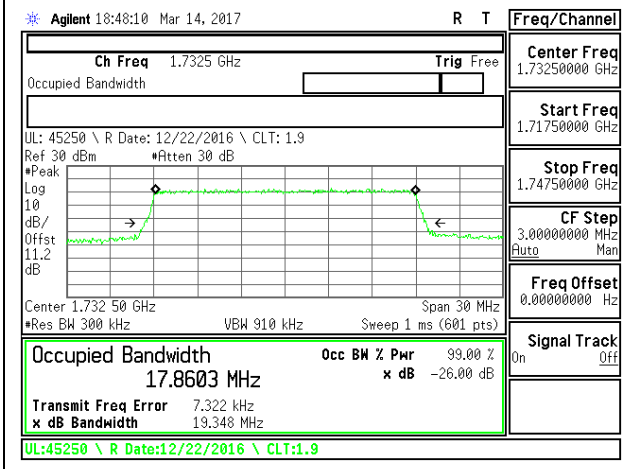

LTE B4 10MHz 16QAM Middle Channel



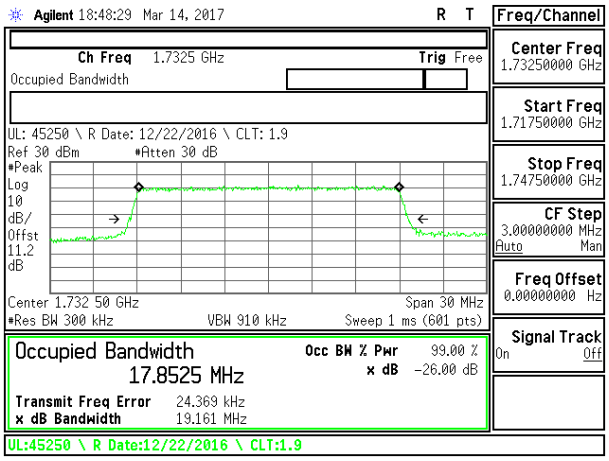

LTE B4 15MHz QPSK Middle Channel




LTE B4 15MHz 16QAM Middle Channel



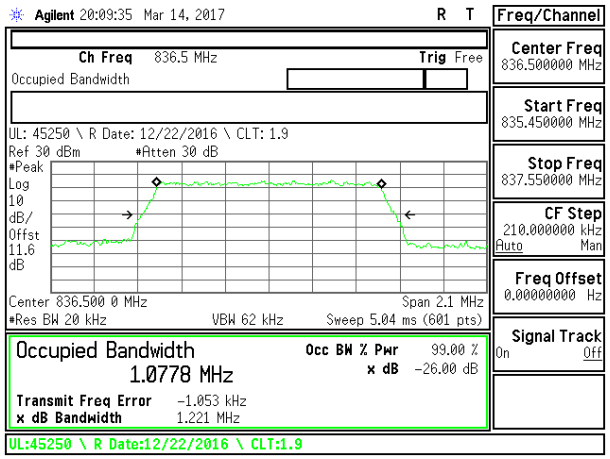

LTE B4 20MHz QPSK Middle Channel



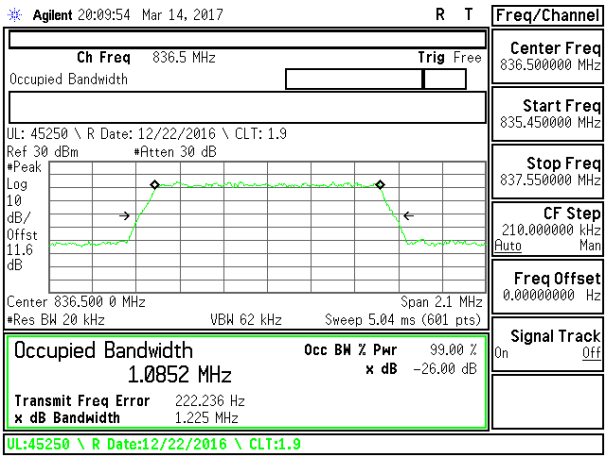

LTE B4 20MHz 16QAM Middle Channel

**LTE Band 5**

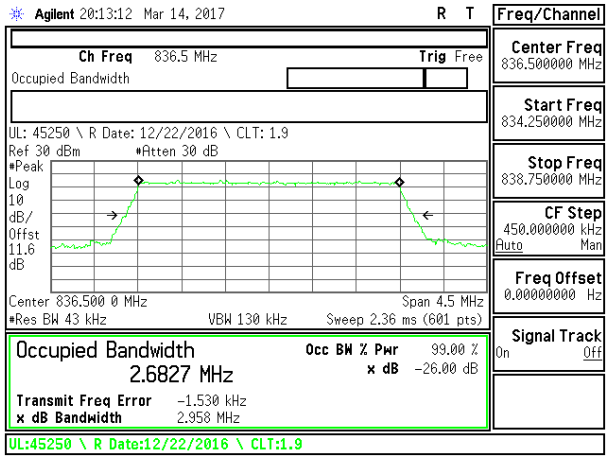
| Band | BW(MHz) | Mode | RB/RB Size | f (MHz) | 99% BW (MHz) | -26dB BW (MHz) |
|---|---|---|---|---|---|---|
| LTE5 | 10 | 16QAM | 50/0 | 829 | 8.98 | 9.58 |
| | | | 50/0 | 836.5 | 8.98 | 9.67 |
| | | | 50/0 | 844 | 8.96 | 9.69 |
| | | QPSK | 50/0 | 829 | 8.95 | 9.7 |
| | | | 50/0 | 836.5 | 8.97 | 9.73 |
| | | | 50/0 | 844 | 8.95 | 9.63 |
| | 5 | 16QAM | 25/0 | 826.5 | 4.49 | 4.9 |
| | | | 25/0 | 836.5 | 4.51 | 4.99 |
| | | | 25/0 | 846.5 | 4.49 | 4.94 |
| | | QPSK | 25/0 | 826.5 | 4.49 | 4.96 |
| | | | 25/0 | 836.5 | 4.51 | 4.91 |
| | | | 25/0 | 846.5 | 4.51 | 4.92 |
| | 3 | 16QAM | 15/0 | 825.5 | 2.69 | 2.98 |
| | | | 15/0 | 836.5 | 2.69 | 2.94 |
| | | | 15/0 | 847.5 | 2.69 | 2.97 |
| | | QPSK | 15/0 | 825.5 | 2.69 | 2.99 |
| | | | 15/0 | 836.5 | 2.68 | 2.96 |
| | | | 15/0 | 847.5 | 2.69 | 2.98 |
| | 1.4 | 16QAM | 6/0 | 824.7 | 1.08 | 1.23 |
| | | | 6/0 | 836.5 | 1.09 | 1.22 |
| | | | 6/0 | 848.3 | 1.08 | 1.22 |
| | | QPSK | 6/0 | 824.7 | 1.08 | 1.22 |
| | | | 6/0 | 836.5 | 1.08 | 1.22 |
| | | | 6/0 | 848.3 | 1.08 | 1.22 |



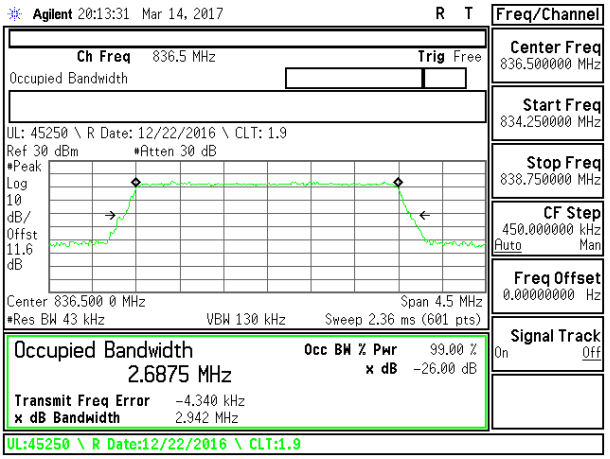

LTE B5 1.4MHz QPSK Middle Channel



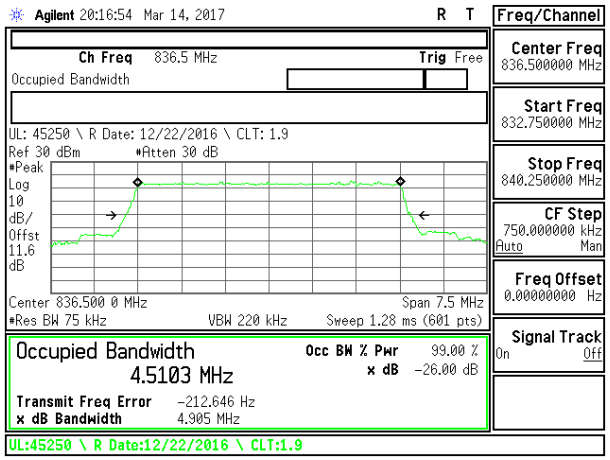

LTE B5 1.4MHz 16QAM Middle Channel



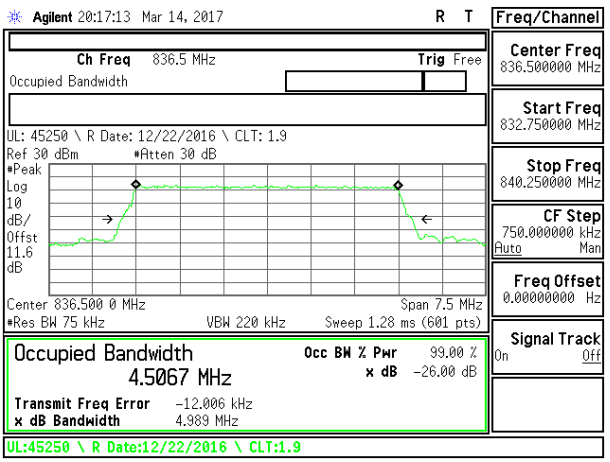

LTE B5 3MHz QPSK Middle Channel



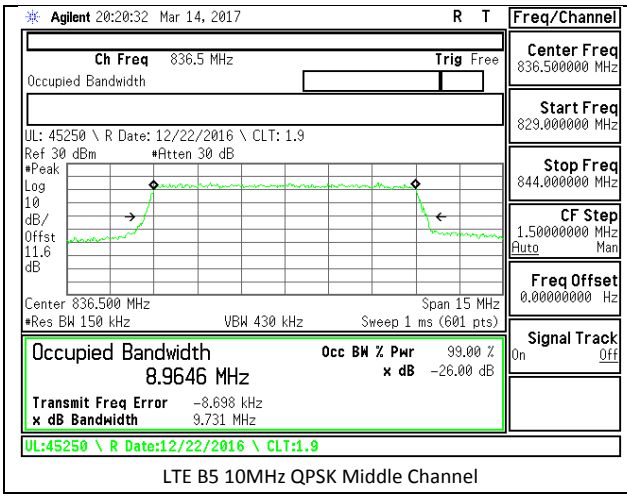

LTE B5 3MHz 16QAM Middle Channel



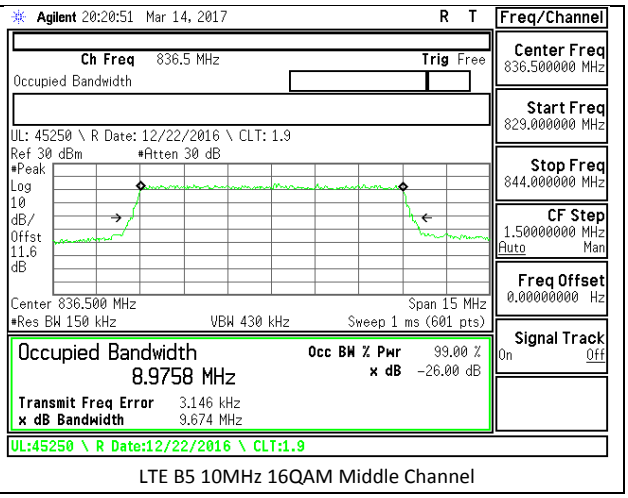

LTE B5 5MHz QPSK Middle Channel




LTE B5 5MHz 16QAM Middle Channel



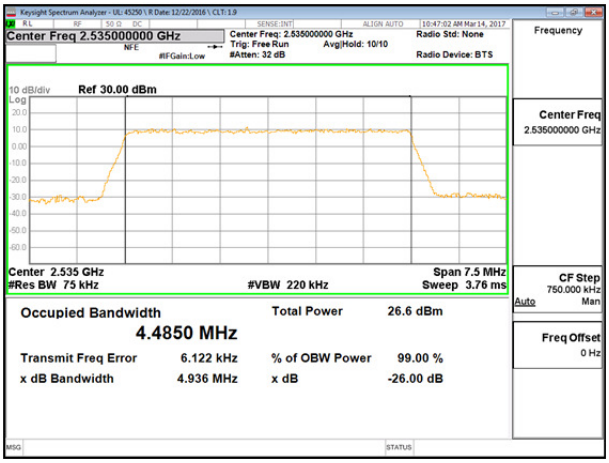

LTE B5 10MHz QPSK Middle Channel



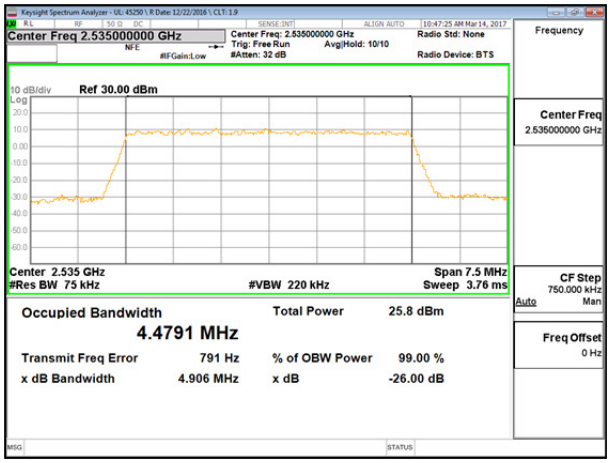

LTE B5 10MHz 16QAM Middle Channel

**LTE Band 7**

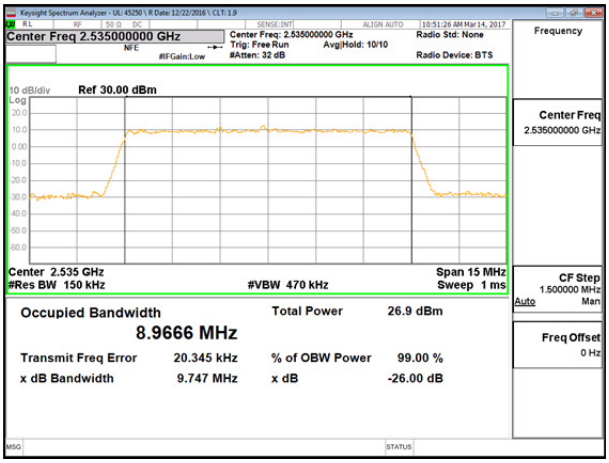
| Band | BW(MHz) | Mode | RB/RB Size | f (MHz) | 99% BW (MHz) | -26dB BW (MHz) |
|---|---|---|---|---|---|---|
| LTE7 | 20 | 16QAM | 100/0 | 2510 | 17.9 | 19.31 |
| | | | 100/0 | 2535 | 17.86 | 19.35 |
| | | | 100/0 | 2560 | 17.84 | 19.22 |
| | | QPSK | 100/0 | 2510 | 17.93 | 19.33 |
| | | | 100/0 | 2535 | 17.91 | 19.26 |
| | | | 100/0 | 2560 | 17.84 | 18.83 |
| | 15 | 16QAM | 75/0 | 2507.5 | 13.42 | 14.47 |
| | | | 75/0 | 2535 | 13.43 | 14.54 |
| | | | 75/0 | 2562.5 | 13.4 | 14.5 |
| | | QPSK | 75/0 | 2507.5 | 13.4 | 14.45 |
| | | | 75/0 | 2535 | 13.46 | 14.6 |
| | | | 75/0 | 2562.5 | 13.41 | 14.58 |
| | 10 | 16QAM | 50/0 | 2505 | 8.97 | 9.75 |
| | | | 50/0 | 2535 | 8.98 | 9.76 |
| | | | 50/0 | 2565 | 8.94 | 9.75 |
| | | QPSK | 50/0 | 2505 | 8.94 | 9.72 |
| | | | 50/0 | 2535 | 8.97 | 9.75 |
| | | | 50/0 | 2565 | 8.98 | 9.77 |
| | 5 | 16QAM | 25/0 | 2502.5 | 4.49 | 4.94 |
| | | | 25/0 | 2535 | 4.48 | 4.91 |
| | | | 25/0 | 2567.5 | 4.5 | 4.96 |
| | | QPSK | 25/0 | 2502.5 | 4.49 | 4.95 |
| | | | 25/0 | 2535 | 4.49 | 4.94 |
| | | | 25/0 | 2567.5 | 4.51 | 4.95 |



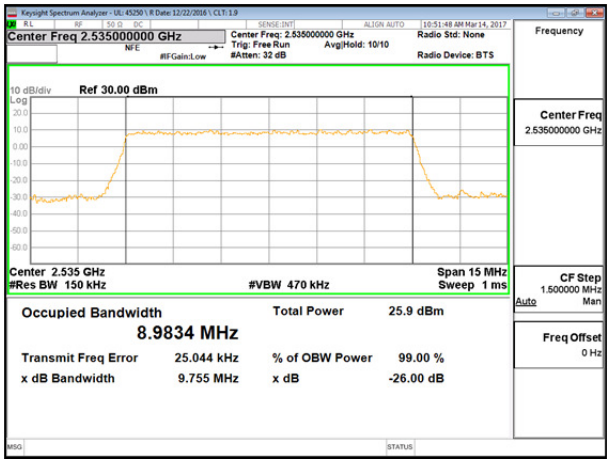

LTE B7 5MHz QPSK Middle Channel



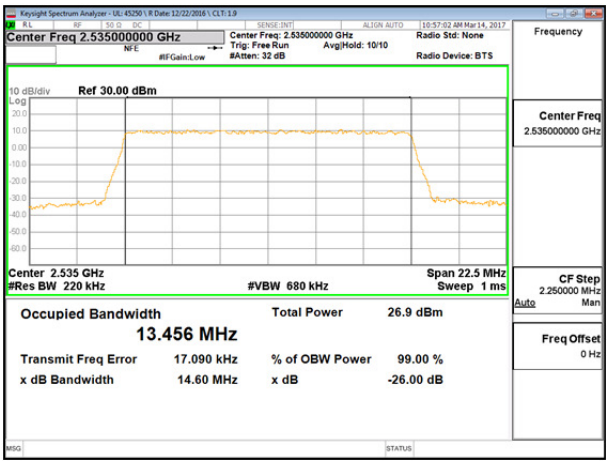

LTE B7 5MHz 16QAM Middle Channel



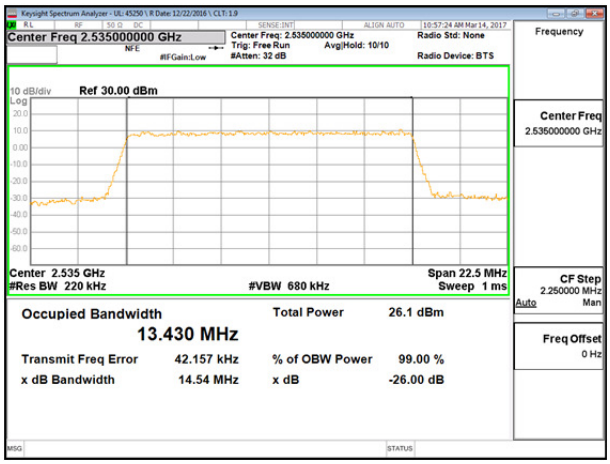

LTE B7 10MHz QPSK Middle Channel



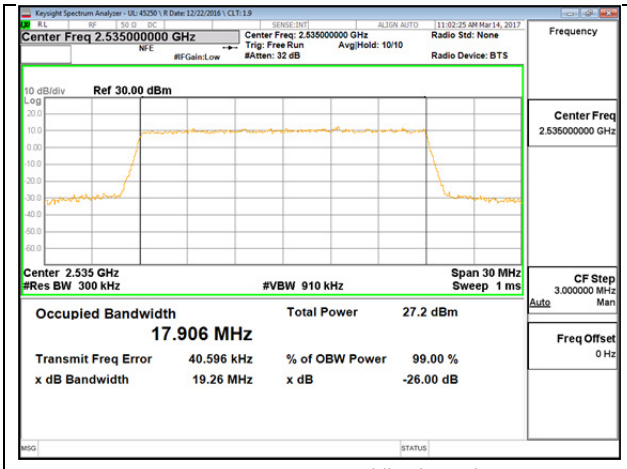

LTE B7 10MHz 16QAM Middle Channel



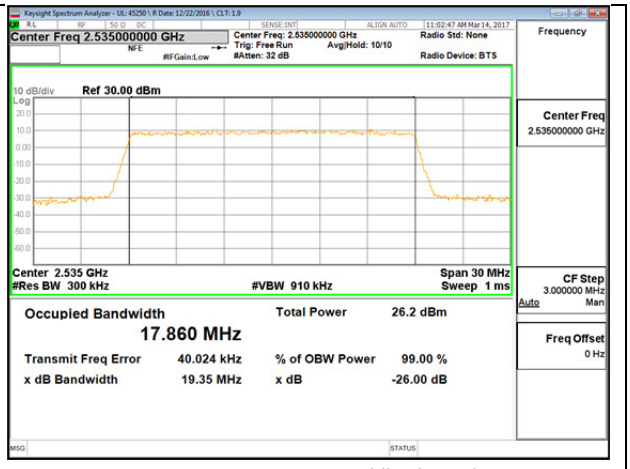

LTE B7 15MHz QPSK Middle Channel




LTE B7 15MHz 16QAM Middle Channel



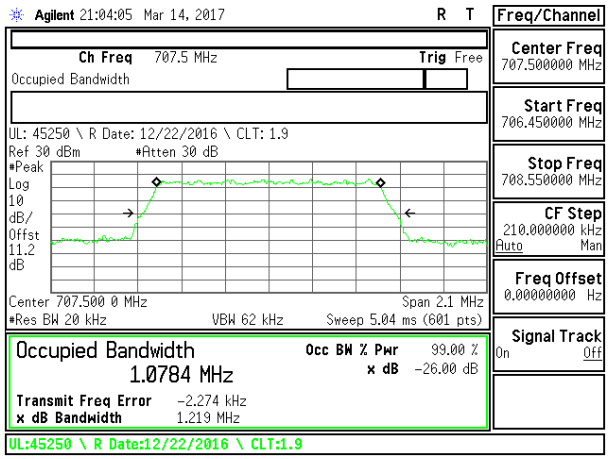

LTE B7 20MHz QPSK Middle Channel



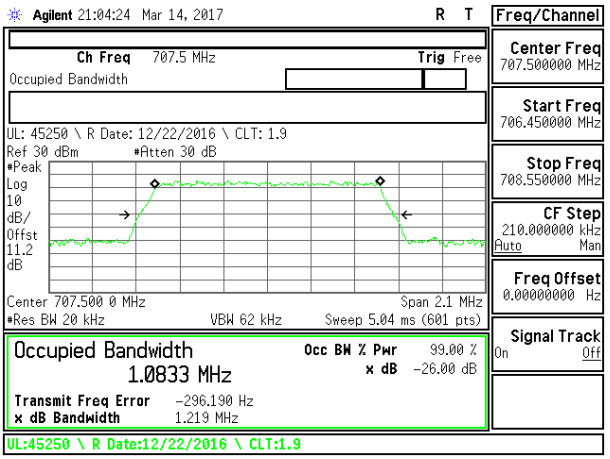

LTE B7 20MHz 16QAM Middle Channel

**LTE Band 12**

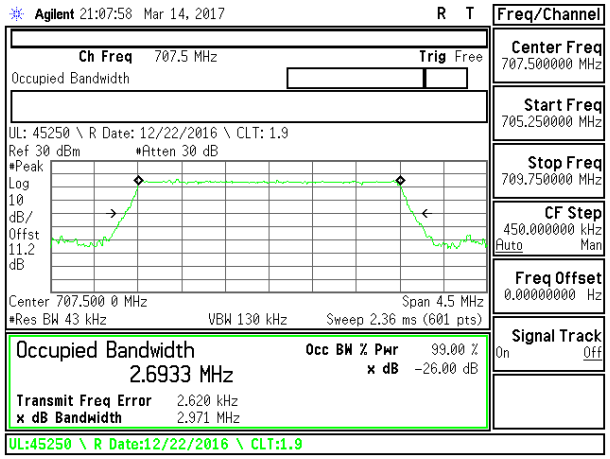
| Band | BW(MHz) | Mode | RB/RB Size | f (MHz) | 99% BW (MHz) | -26dB BW (MHz) |
|---|---|---|---|---|---|---|
| LTE12 | 10 | 16QAM | 50/0 | 704 | 8.98 | 9.69 |
| | | | 50/0 | 707.5 | 8.96 | 9.74 |
| | | | 50/0 | 711 | 8.94 | 9.61 |
| | | QPSK | 50/0 | 704 | 8.96 | 9.59 |
| | | | 50/0 | 707.5 | 8.93 | 9.71 |
| | | | 50/0 | 711 | 8.97 | 9.68 |
| | 5 | 16QAM | 25/0 | 701.5 | 4.48 | 4.89 |
| | | | 25/0 | 707.5 | 4.5 | 4.93 |
| | | | 25/0 | 713.5 | 4.49 | 4.93 |
| | | QPSK | 25/0 | 701.5 | 4.49 | 4.94 |
| | | | 25/0 | 707.5 | 4.51 | 4.94 |
| | | | 25/0 | 713.5 | 4.5 | 4.92 |
| | 3 | 16QAM | 15/0 | 700.5 | 2.69 | 2.98 |
| | | | 15/0 | 707.5 | 2.69 | 2.99 |
| | | | 15/0 | 714.5 | 2.68 | 2.97 |
| | | QPSK | 15/0 | 700.5 | 2.69 | 2.98 |
| | | | 15/0 | 707.5 | 2.69 | 2.97 |
| | | | 15/0 | 714.5 | 2.68 | 2.97 |
| | 1.4 | 16QAM | 6/0 | 699.7 | 1.08 | 1.23 |
| | | | 6/0 | 707.5 | 1.08 | 1.22 |
| | | | 6/0 | 715.3 | 1.09 | 1.22 |
| | | QPSK | 6/0 | 699.7 | 1.08 | 1.23 |
| | | | 6/0 | 707.5 | 1.08 | 1.22 |
| | | | 6/0 | 715.3 | 1.08 | 1.21 |



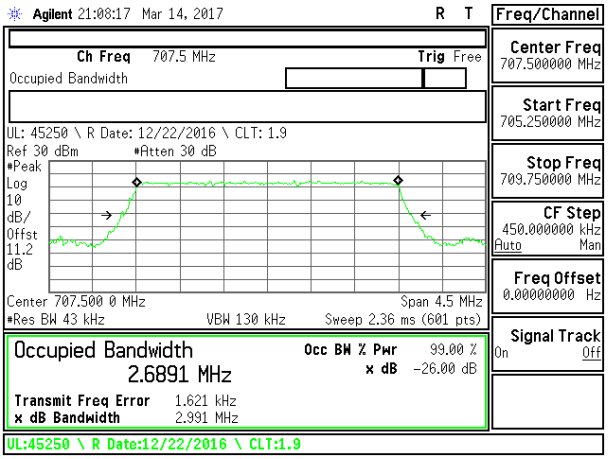

LTE B12 1.4MHz QPSK Middle Channel



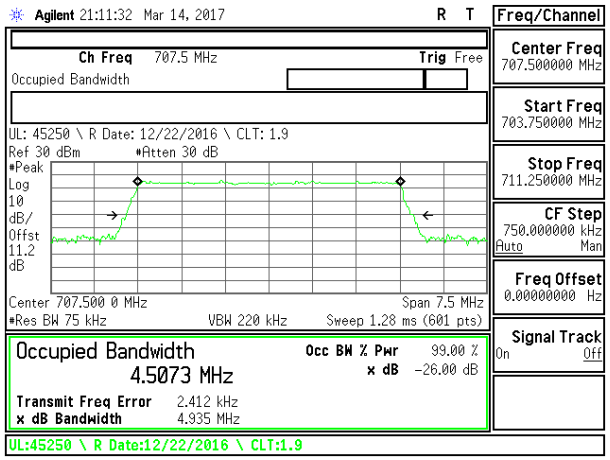

LTE B12 1.4MHz 16QAM Middle Channel



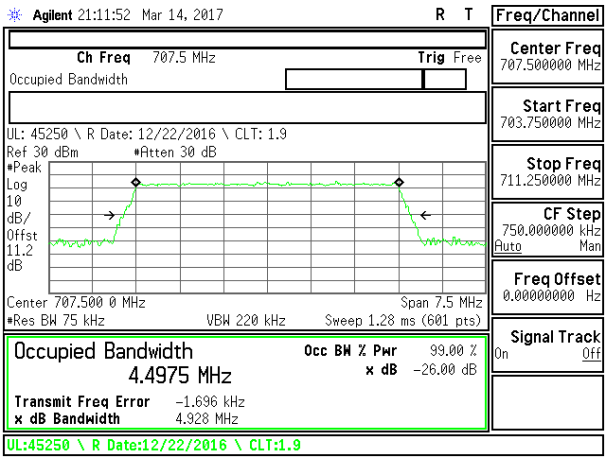

LTE B12 3MHz QPSK Middle Channel



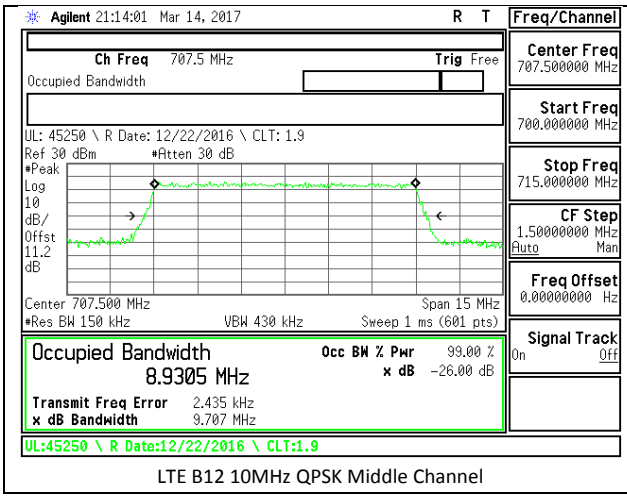

LTE B12 3MHz 16QAM Middle Channel



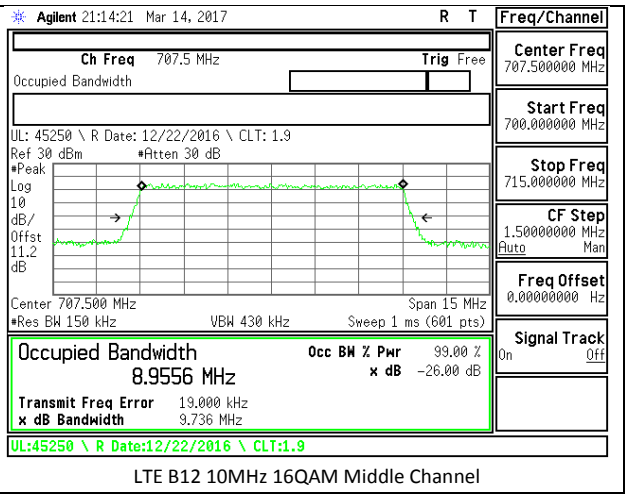

LTE B12 5MHz QPSK Middle Channel




LTE B12 5MHz 16QAM Middle Channel



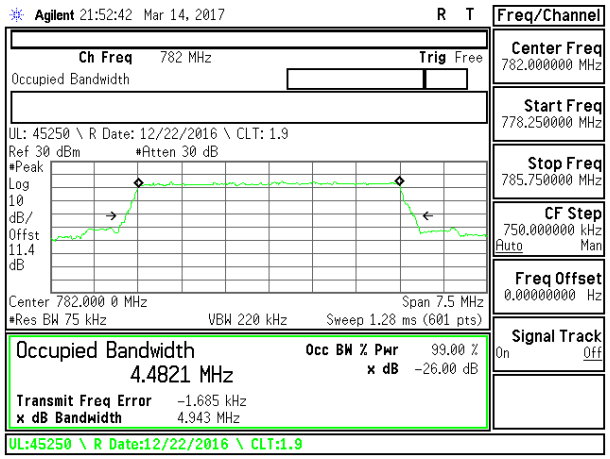

LTE B12 10MHz QPSK Middle Channel



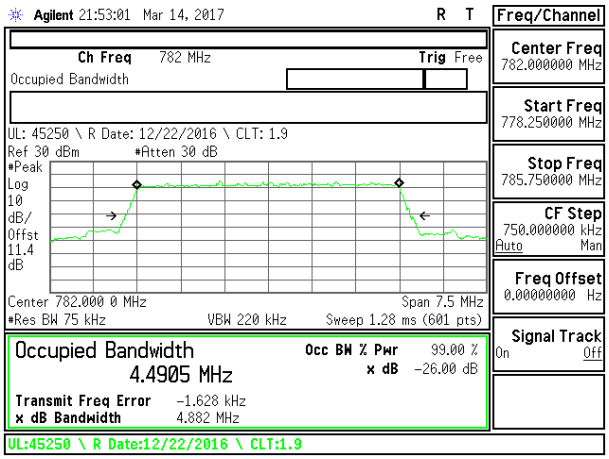

LTE B12 10MHz 16QAM Middle Channel

**LTE Band 13**

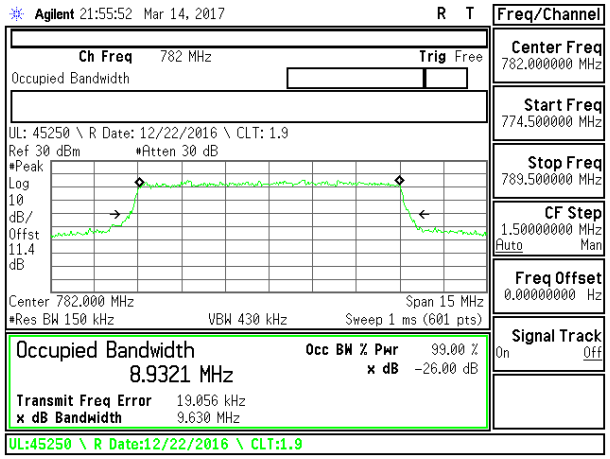
| Band | BW(MHz) | Mode | RB/RB Size | f (MHz) | 99% BW (MHz) | -26dB BW (MHz) |
|---|---|---|---|---|---|---|
| LTE13 | 10 | 16QAM | 50/0 | | | |
| | | | 50/0 | 782 | 8.95 | 9.68 |
| | | | 50/0 | | | |
| | | QPSK | 50/0 | | | |
| | | | 50/0 | 782 | 8.93 | 9.63 |
| | | | 50/0 | | | |
| | 5 | 16QAM | 25/0 | 779.5 | 4.5 | 4.92 |
| | | | 25/0 | 782 | 4.49 | 4.88 |
| | | | 25/0 | 784.5 | 4.5 | 4.9 |
| | | QPSK | 25/0 | 779.5 | 4.49 | 4.88 |
| | | | 25/0 | 782 | 4.48 | 4.94 |
| | | | 25/0 | 784.5 | 4.48 | 4.93 |



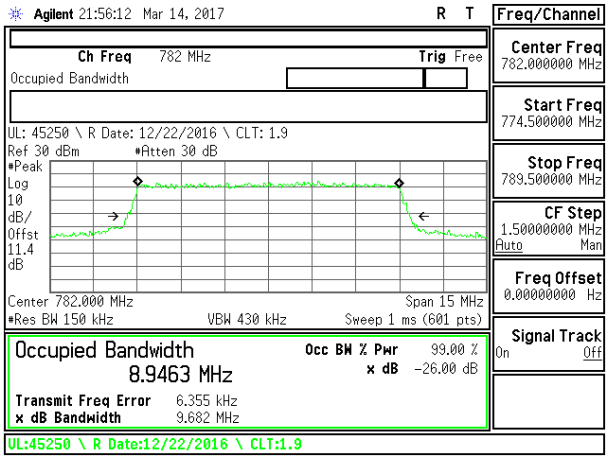

LTE B13 5MHz QPSK Middle Channel




LTE B13 5MHz 16QAM Middle Channel



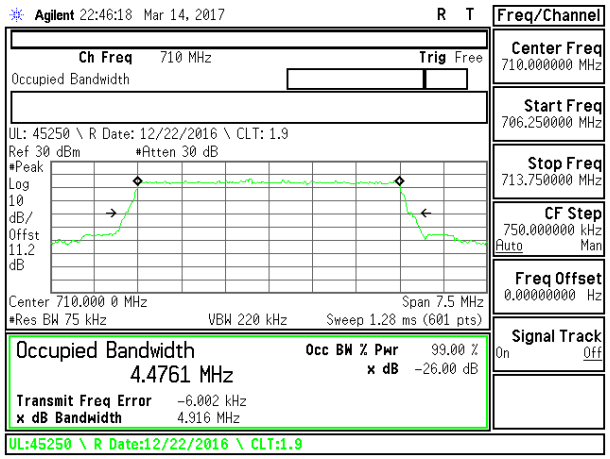

LTE B13 10MHz QPSK Middle Channel



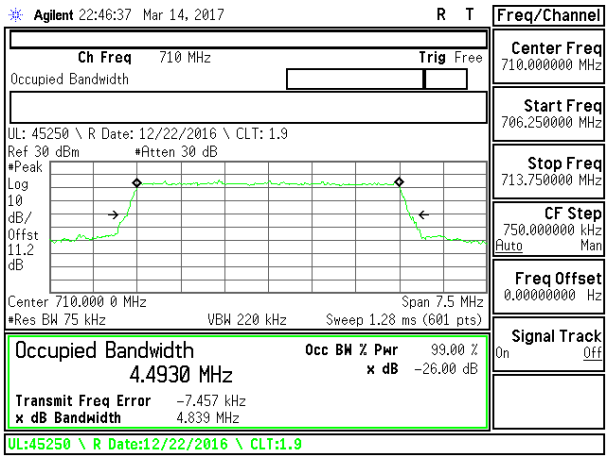

LTE B13 10MHz 16QAM Middle Channel

**LTE Band 17**

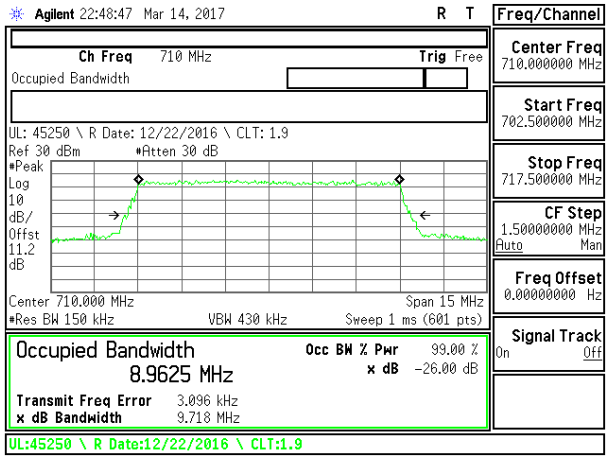
| Band | BW(MHz) | Mode | RB/RB Size | f (MHz) | 99% BW (MHz) | -26dB BW (MHz) |
|---|---|---|---|---|---|---|
| LTE17 | 10 | 16QAM | 50/0 | 709 | 8.95 | 9.63 |
| | | | 50/0 | 710 | 8.94 | 9.78 |
| | | | 50/0 | 711 | 8.93 | 9.7 |
| | | QPSK | 50/0 | 709 | 8.93 | 9.55 |
| | | | 50/0 | 710 | 8.96 | 9.72 |
| | | | 50/0 | 711 | 8.94 | 9.64 |
| | 5 | 16QAM | 25/0 | 706.5 | 4.49 | 4.9 |
| | | | 25/0 | 710 | 4.49 | 4.84 |
| | | | 25/0 | 713.5 | 4.5 | 4.94 |
| | | QPSK | 25/0 | 706.5 | 4.5 | 4.93 |
| | | | 25/0 | 710 | 4.48 | 4.92 |
| | | | 25/0 | 713.5 | 4.49 | 4.94 |



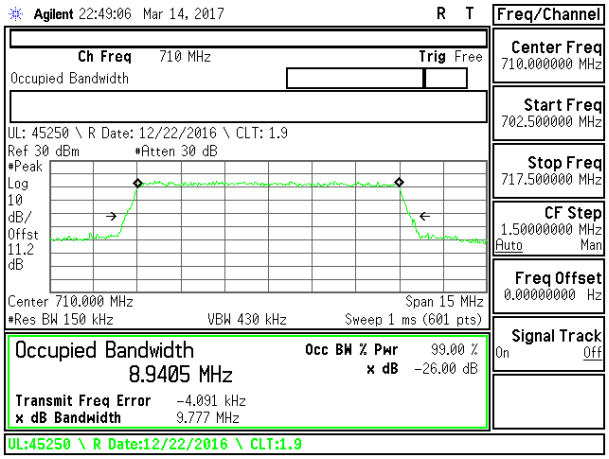

LTE B17 5MHz QPSK Middle Channel




LTE B17 5MHz 16QAM Middle Channel



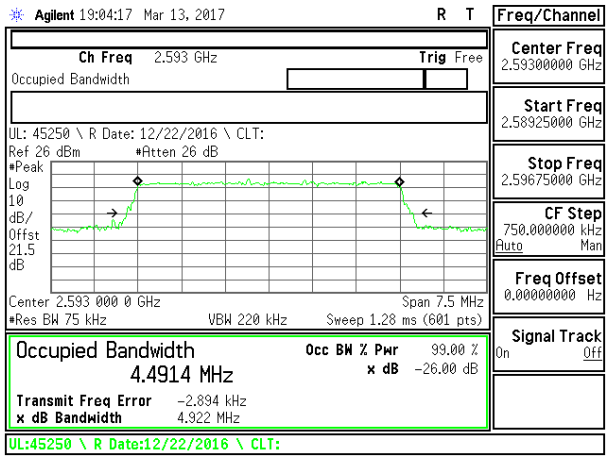

LTE B17 10MHz QPSK Middle Channel



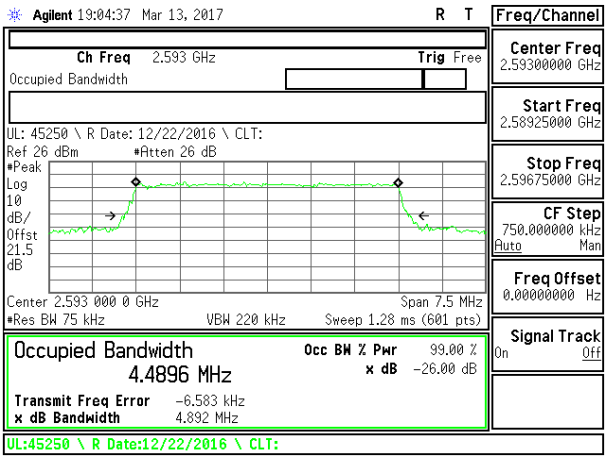

LTE B17 10MHz 16QAM Middle Channel

**LTE Band 41**

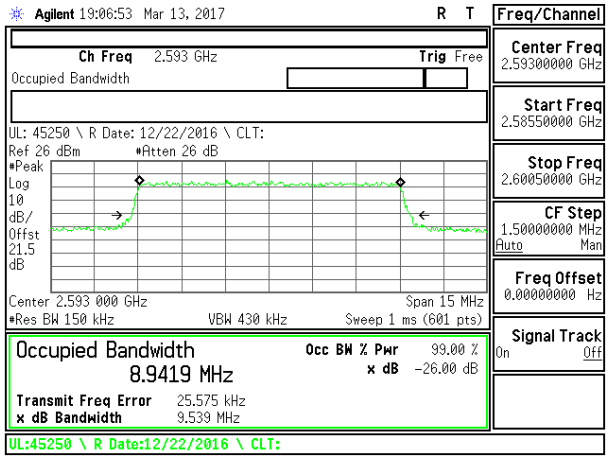
| Band | BW(MHz) | Mode | RB/RB Size | f (MHz) | 99% BW (MHz) | -26dB BW (MHz) |
|---|---|---|---|---|---|---|
| LTE41 | 20 | 16QAM | 100/0 | 2506 | 17.84 | 18.92 |
| | | | 100/0 | 2593 | 17.87 | 19.11 |
| | | | 100/0 | 2680 | 17.81 | 19.08 |
| | | QPSK | 100/0 | 2506 | 17.88 | 19.22 |
| | | | 100/0 | 2593 | 17.88 | 19.15 |
| | | | 100/0 | 2680 | 17.9 | 19.06 |
| | 15 | 16QAM | 75/0 | 2503.5 | 13.39 | 14.44 |
| | | | 75/0 | 2593 | 13.38 | 14.41 |
| | | | 75/0 | 2682.5 | 13.4 | 14.52 |
| | | QPSK | 75/0 | 2503.5 | 13.38 | 14.38 |
| | | | 75/0 | 2593 | 13.44 | 14.6 |
| | | | 75/0 | 2682.5 | 13.38 | 14.39 |
| | 10 | 16QAM | 50/0 | 2501 | 8.96 | 9.58 |
| | | | 50/0 | 2593 | 8.97 | 9.61 |
| | | | 50/0 | 2685 | 8.96 | 9.74 |
| | | QPSK | 50/0 | 2501 | 8.95 | 9.82 |
| | | | 50/0 | 2593 | 8.94 | 9.54 |
| | | | 50/0 | 2685 | 8.96 | 9.64 |
| | 5 | 16QAM | 25/0 | 2498.5 | 4.49 | 4.83 |
| | | | 25/0 | 2593 | 4.49 | 4.89 |
| | | | 25/0 | 2687.5 | 4.48 | 4.9 |
| | | QPSK | 25/0 | 2498.5 | 4.51 | 4.88 |
| | | | 25/0 | 2593 | 4.49 | 4.92 |
| | | | 25/0 | 2687.5 | 4.5 | 4.93 |



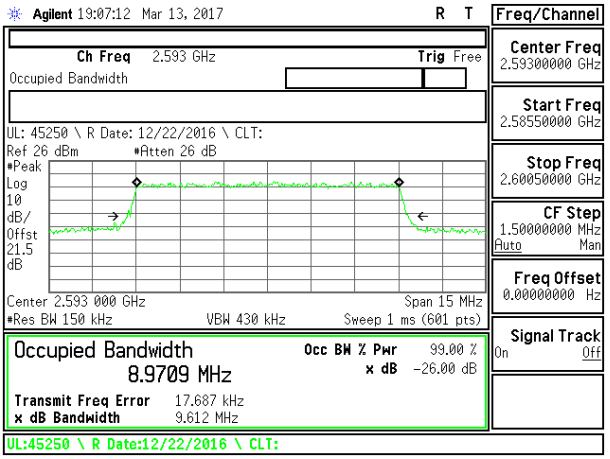

LTE B41 5MHz QPSK Middle Channel



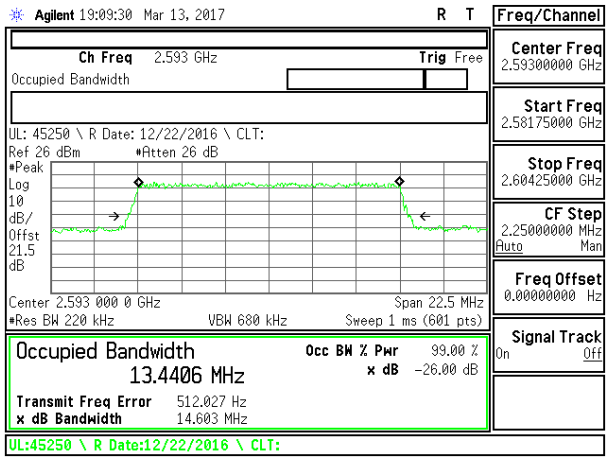

LTE B41 5MHz 16QAM Middle Channel



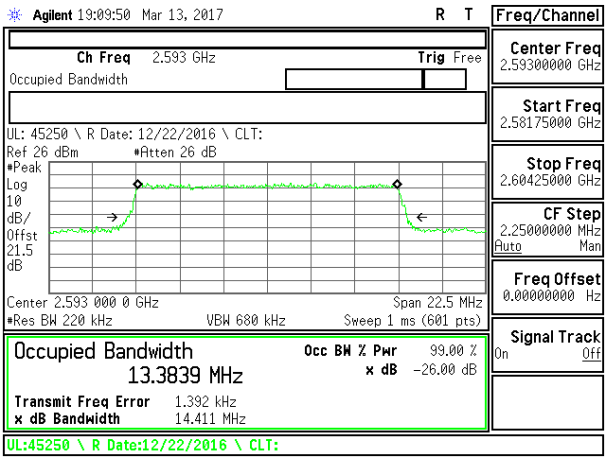

LTE B41 10MHz QPSK Middle Channel



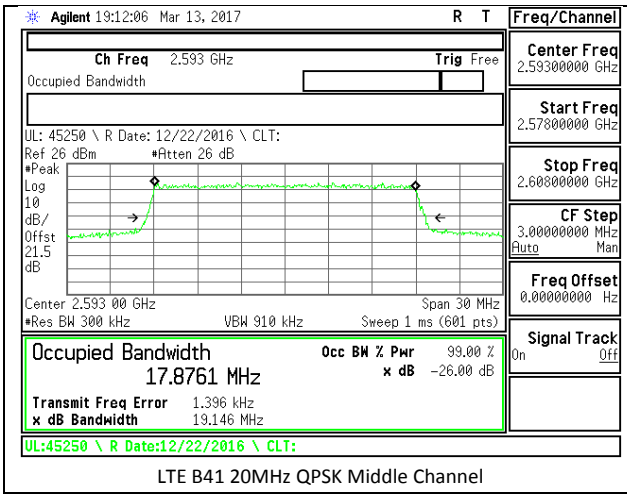

LTE B41 10MHz 16QAM Middle Channel



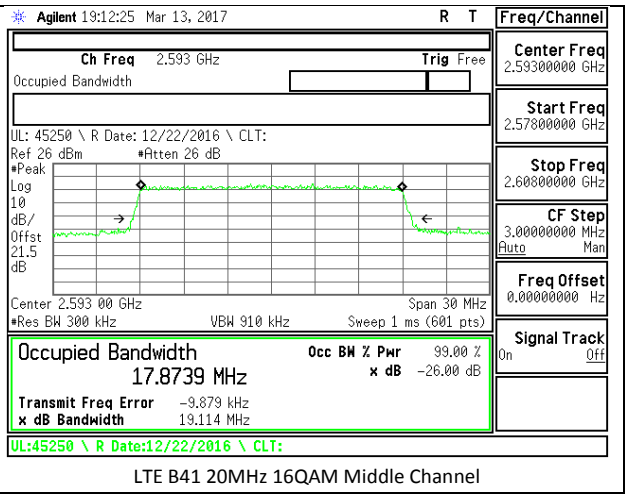

LTE B41 15MHz QPSK Middle Channel




LTE B41 15MHz 16QAM Middle Channel




LTE B41 20MHz QPSK Middle Channel




LTE B41 20MHz 16QAM Middle Channel

# 14. BAND EDGE EMISSIONS

**RULE PART(S)**

FCC: §22.359, §24.238, §27. 53

**LIMITS**

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.

Part 27: (m)(4) (4) 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)(6) of this section. In addition, the attenuation factor shall not be less that 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.

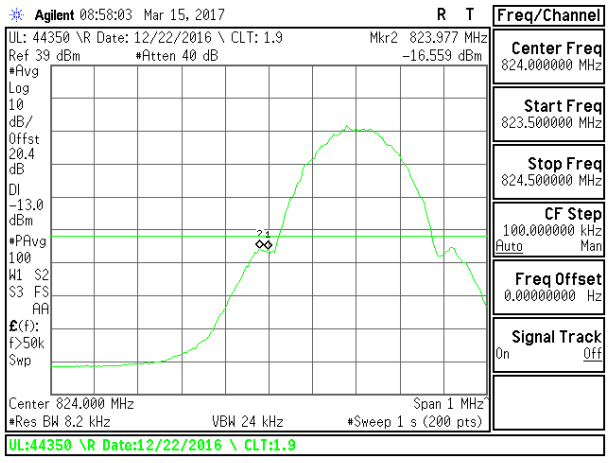
**TEST PROCEDURE**

Per KDB 971168 D01 Power Meas License Digital Systems v02r02
The transmitter output was connected to an Agilent 8960 or a CMW500 Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.
For each band edge measurement:

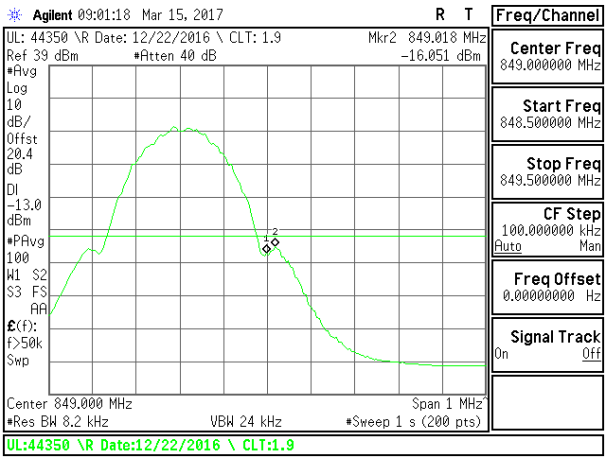
- Set the spectrum analyzer span to include the block edge frequency.
- Set a marker to point the corresponding band edge frequency in each test case.
- Set display line at -13 dBm
- Set resolution bandwidth to at least 1% of emission bandwidth.

## 14.1. BAND EDGE PLOTS

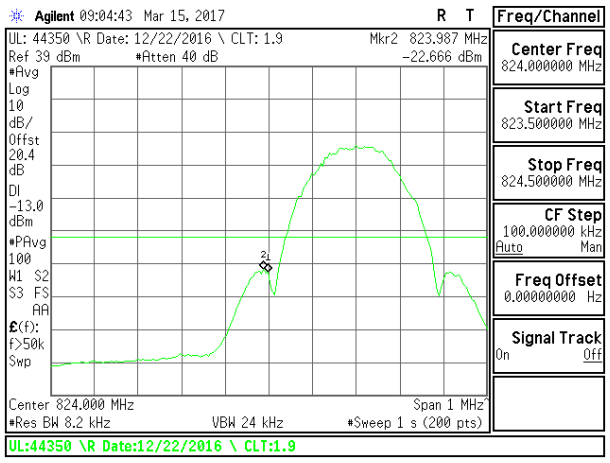
**GSM**



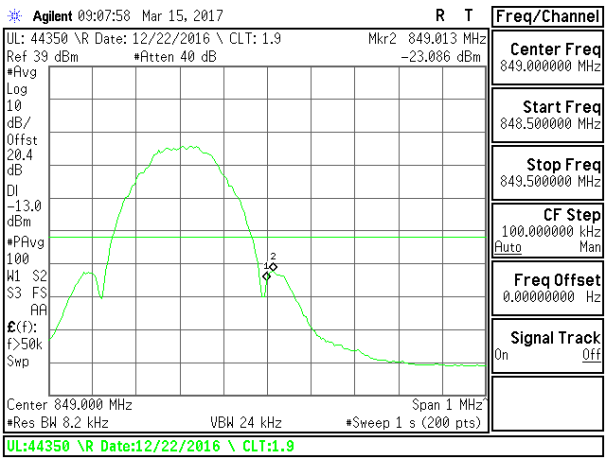

GSM850 GPRS Low Channel



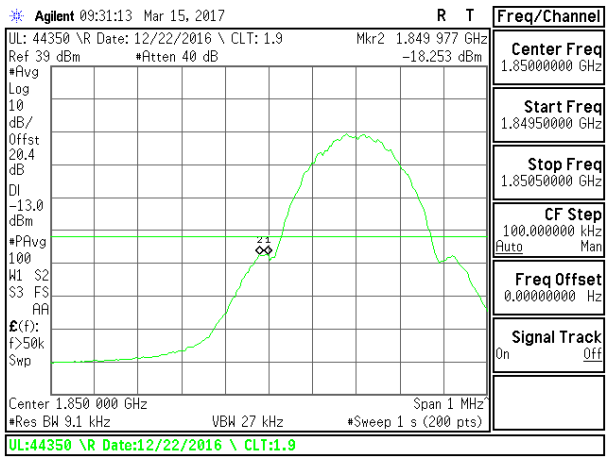

GSM850 GPRS High Channel



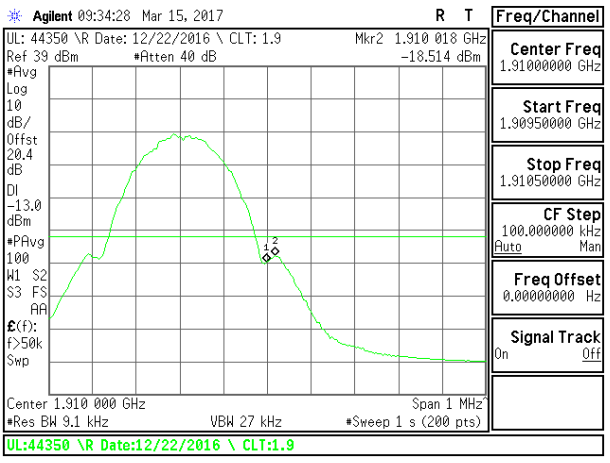

GSM850 EGPRS Low Channel



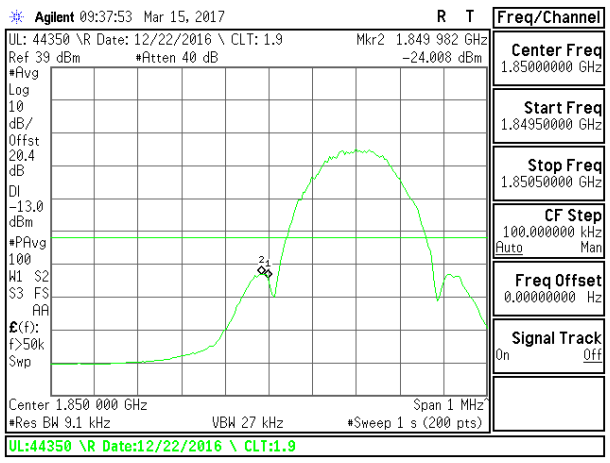

GSM850 EGPRS High Channel



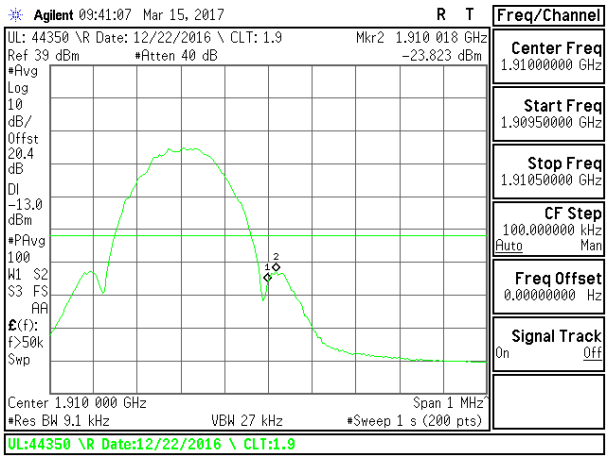

GSM1900 GPRS Low Channel




GSM1900 GPRS High Channel

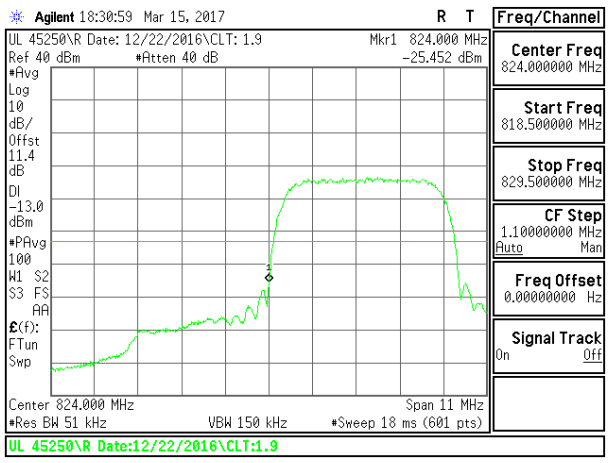



GSM1900 EGPRS Low Channel

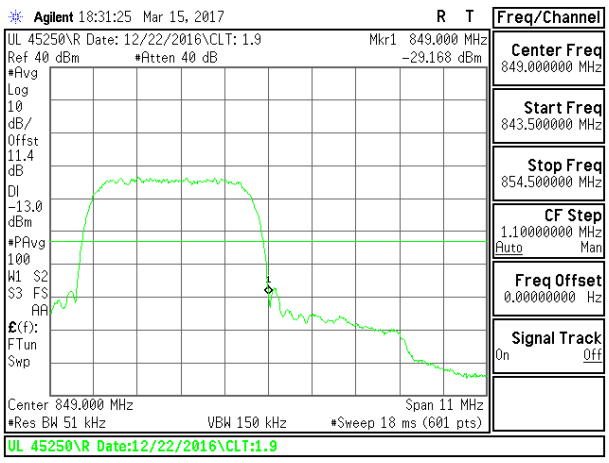



GSM1900 EGPRS High Channel

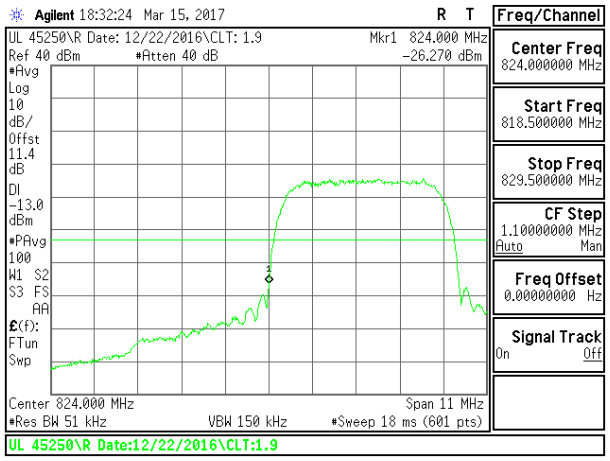
## WCDMA



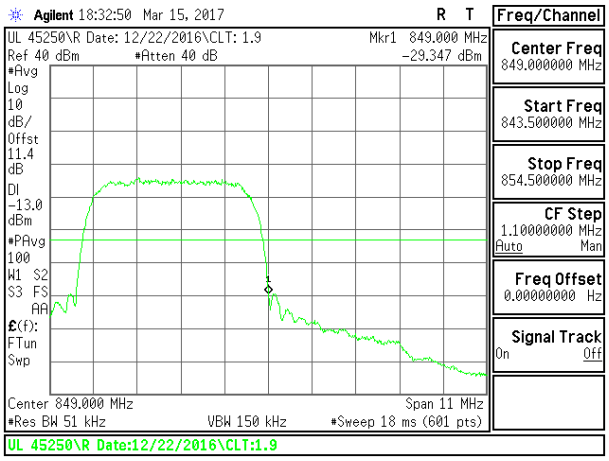

B5 REL99 Low Channel




B5 REL99 High Channel

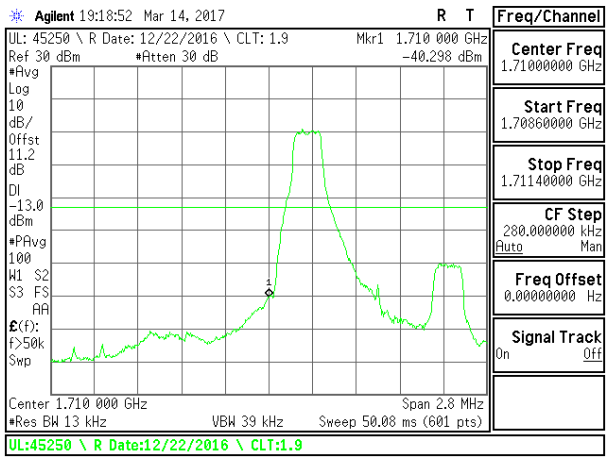



B5 HSDPA Low Channel

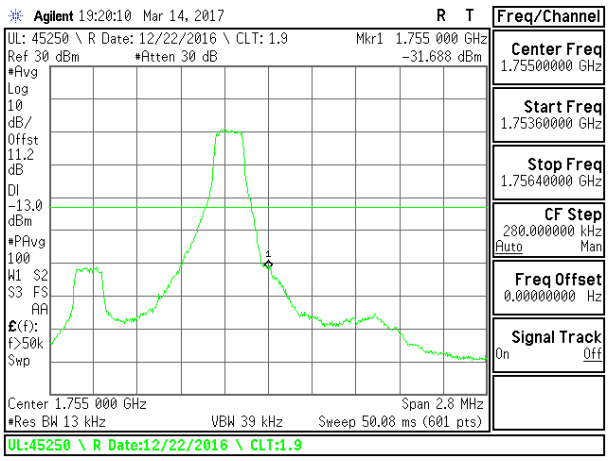



B5 HSDPA High Channel

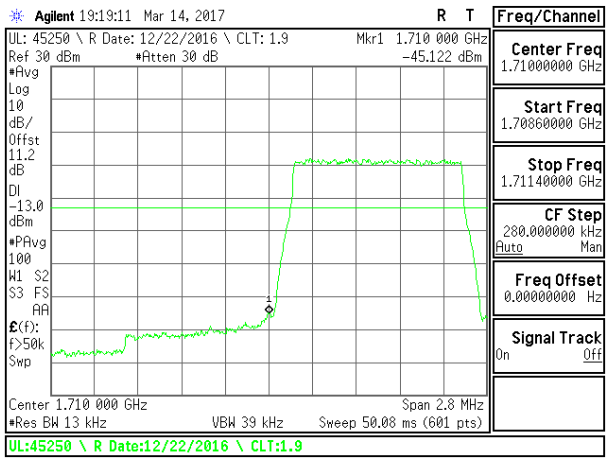
## LTE Band 4



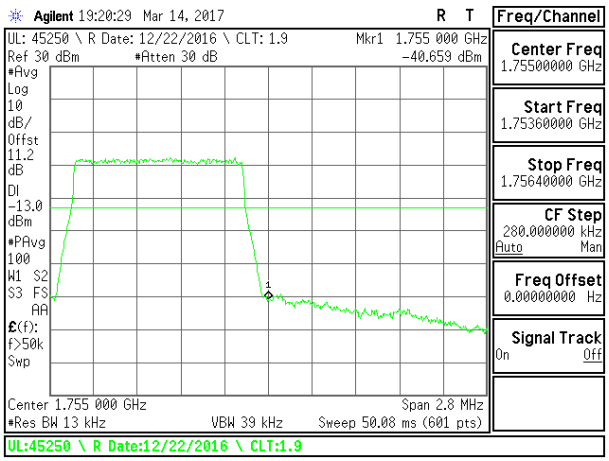

LTE B4 1.4MHz QPSK Low Channel 1RB



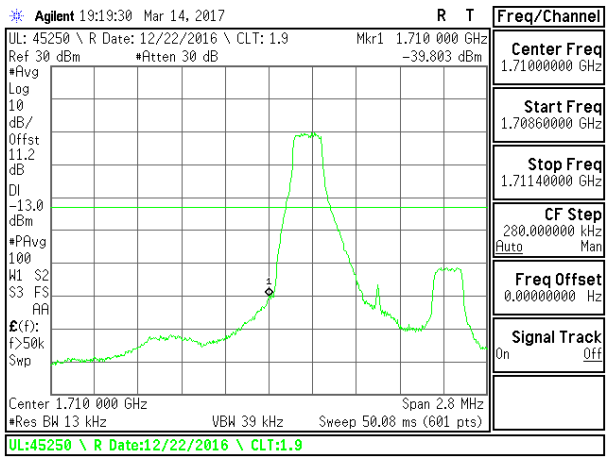

LTE B4 1.4MHz QPSK High Channel 1RB



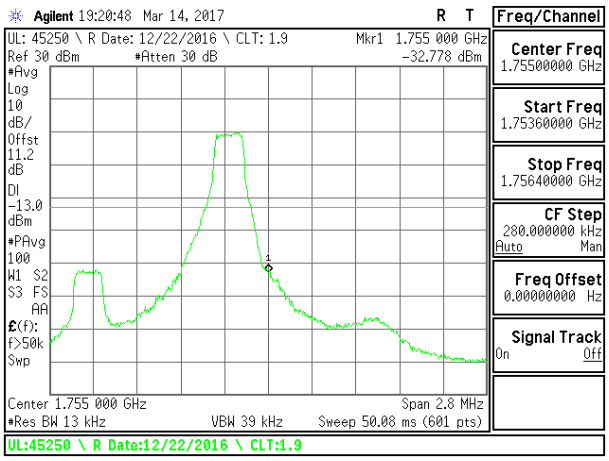

LTE B4 1.4MHz QPSK Low Channel FRB



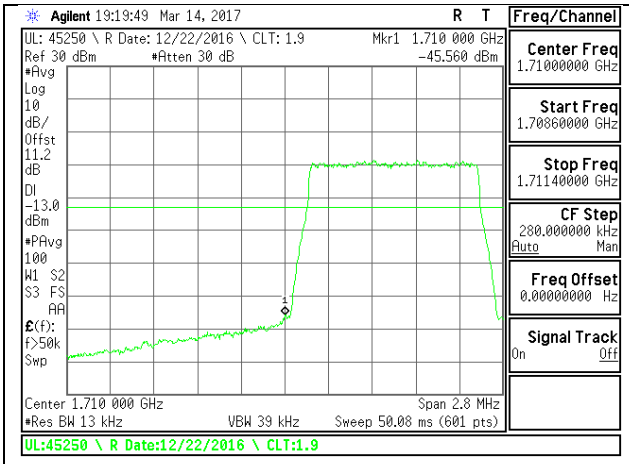

LTE B4 1.4MHz QPSK High Channel FRB



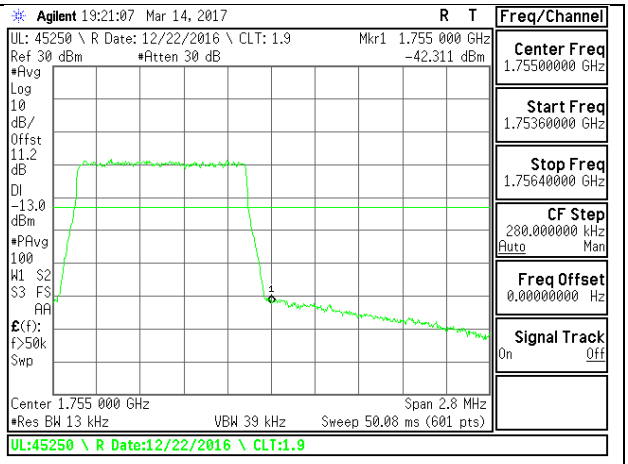

LTE B4 1.4MHz 16QAM Low Channel 1RB



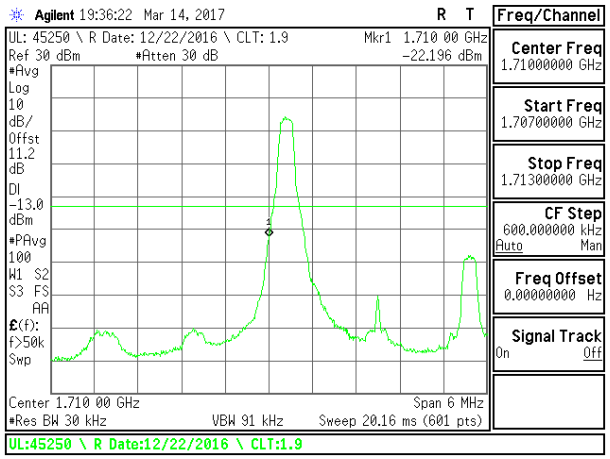

LTE B4 1.4MHz 16QAM High Channel 1RB



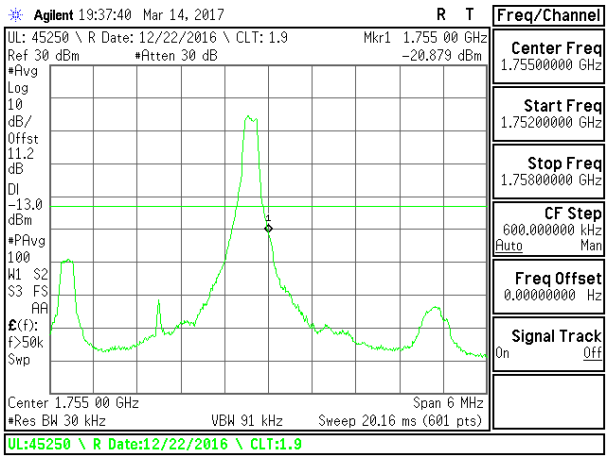

LTE B4 1.4MHz 16QAM Low Channel FRB



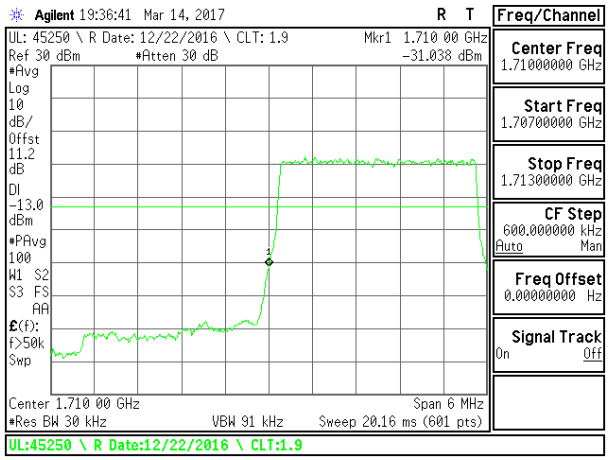

LTE B4 1.4MHz 16QAM High Channel FRB



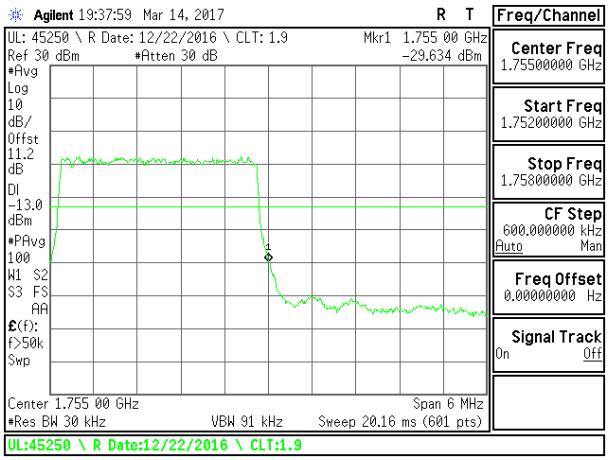

LTE B4 3MHz QPSK Low Channel 1RB



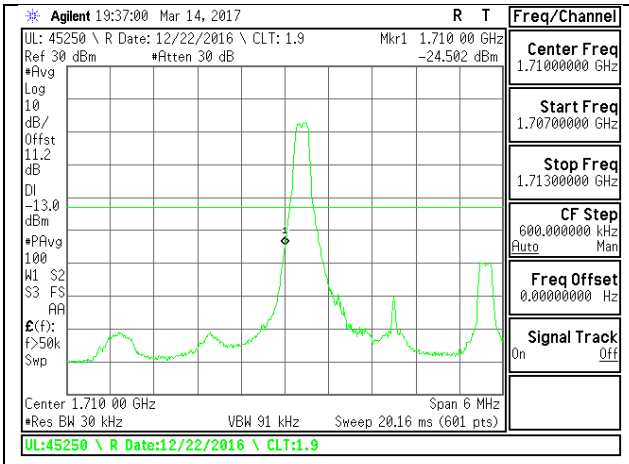

LTE B4 3MHz QPSK High Channel 1RB



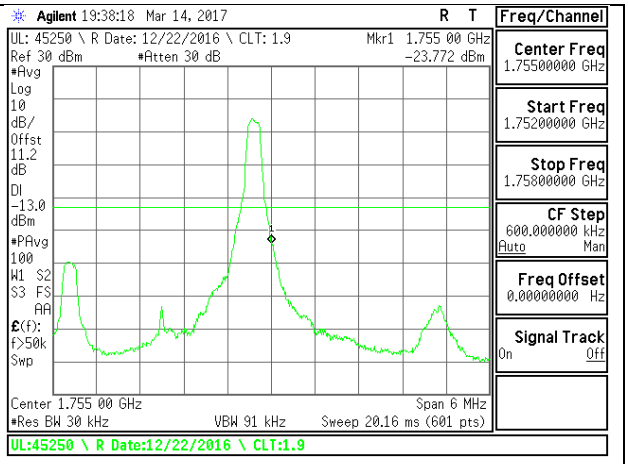

LTE B4 3MHz QPSK Low Channel FRB



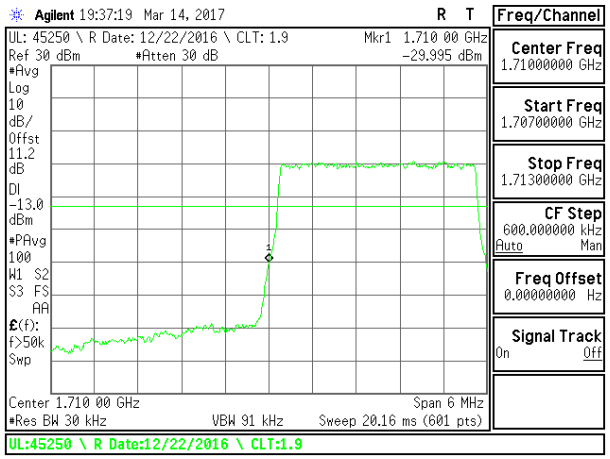

LTE B4 3MHz QPSK High Channel FRB



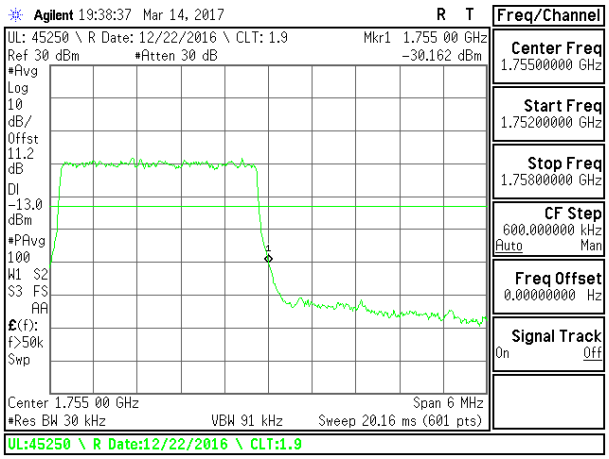

LTE B4 3MHz 16QAM Low Channel 1RB



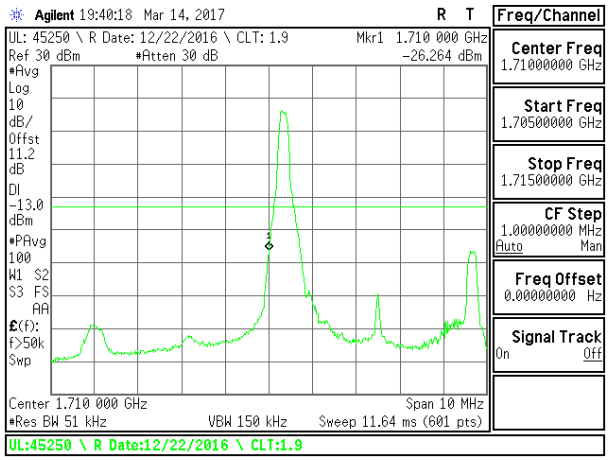

LTE B4 3MHz 16QAM High Channel 1RB



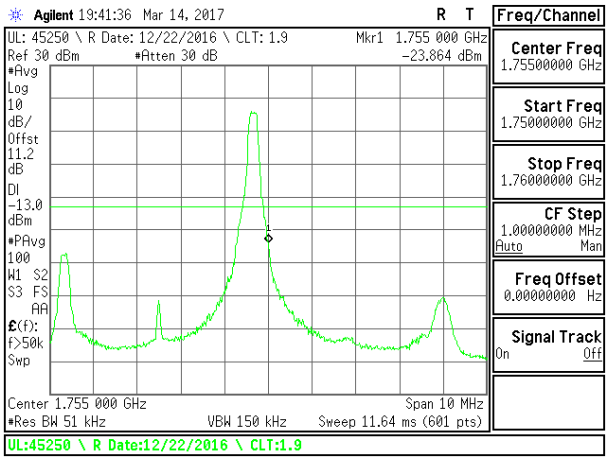

LTE B4 3MHz 16QAM Low Channel FRB




LTE B4 3MHz 16QAM High Channel FRB




LTE B4 5MHz QPSK Low Channel 1RB

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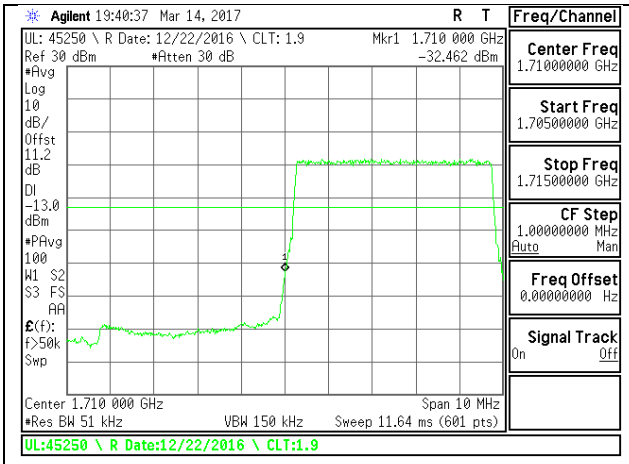
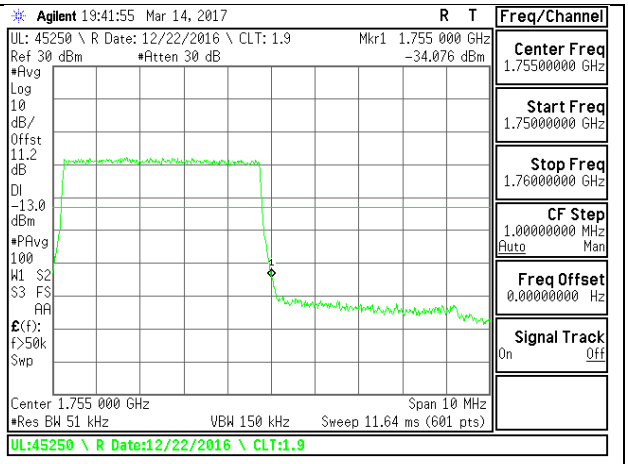



LTE B4 5MHz QPSK Low Channel FRB

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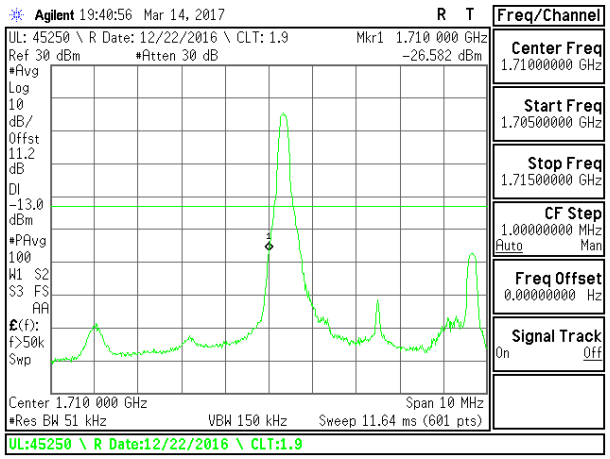
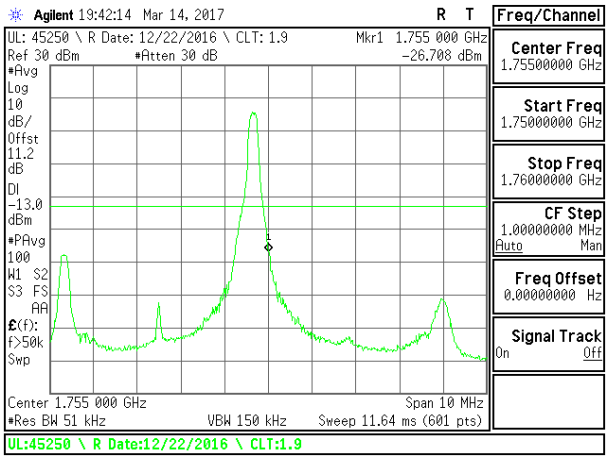



LTE B4 5MHz 16QAM Low Channel 1RB

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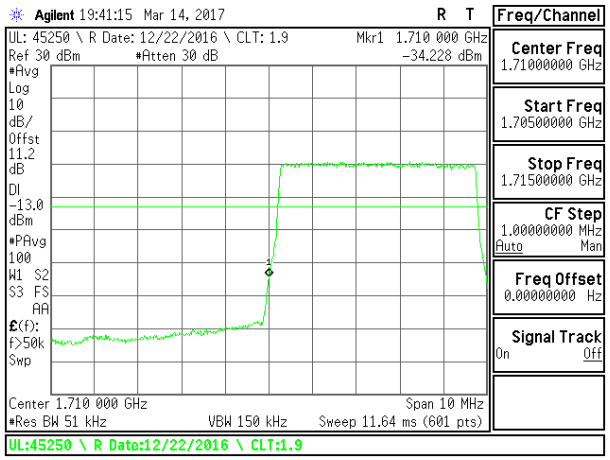
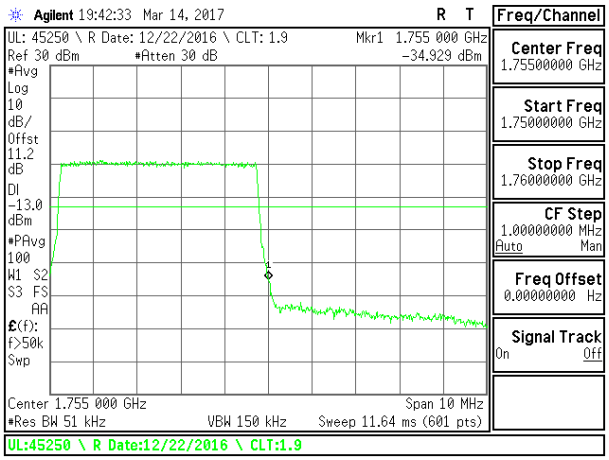
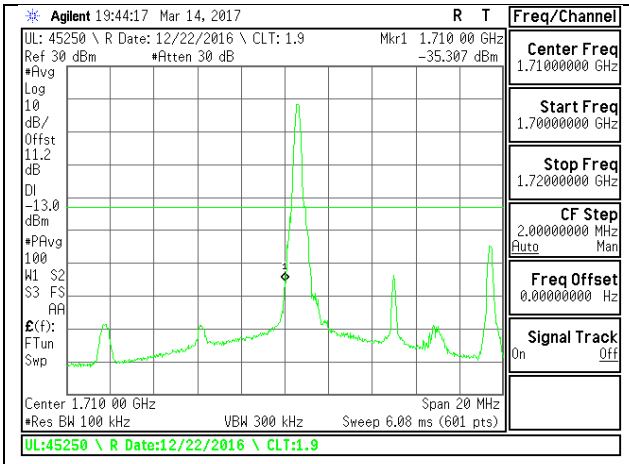


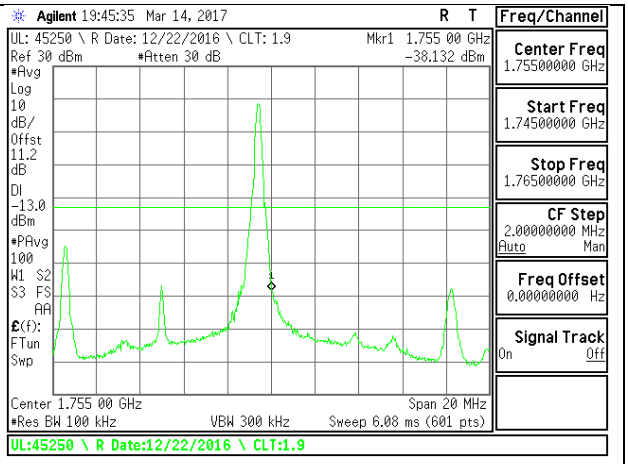

LTE B4 5MHz 16QAM Low Channel FRB




LTE B4 5MHz 16QAM High Channel FRB




LTE B4 10MHz QPSK Low Channel 1RB

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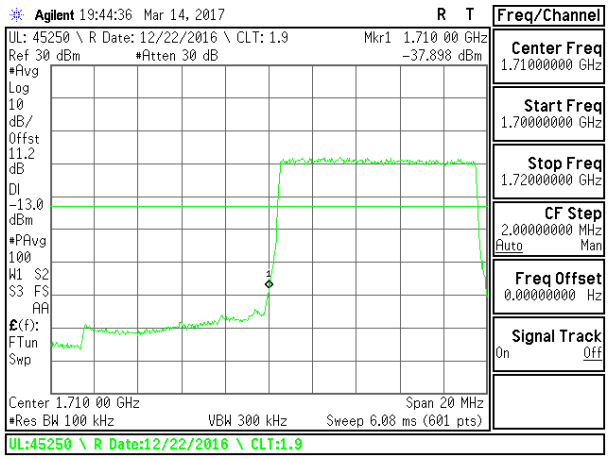
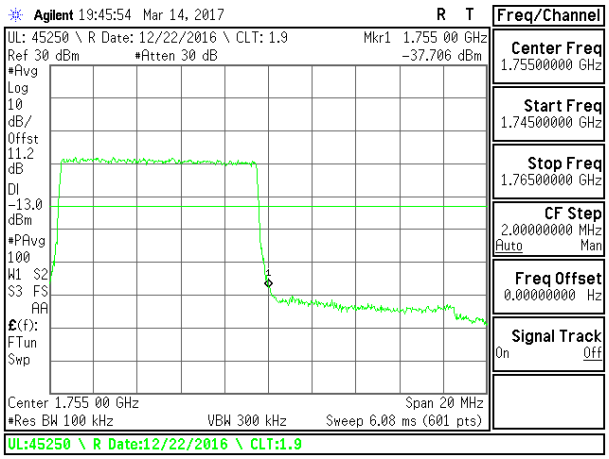
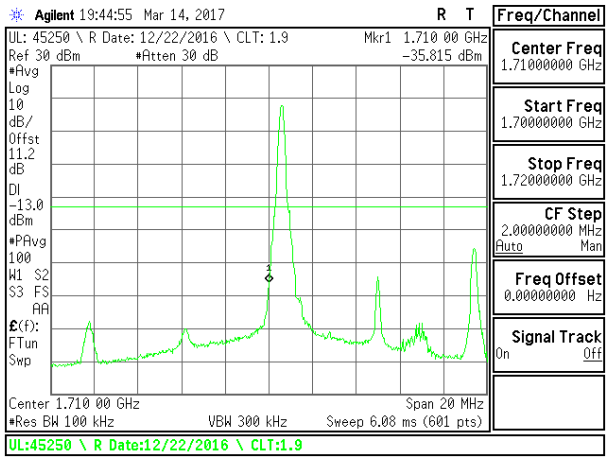


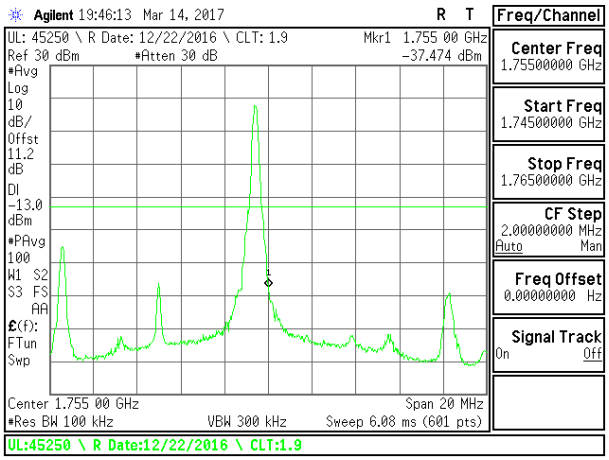

LTE B4 10MHz QPSK Low Channel FRB




LTE B4 10MHz QPSK High Channel FRB




LTE B4 10MHz 16QAM Low Channel 1RB

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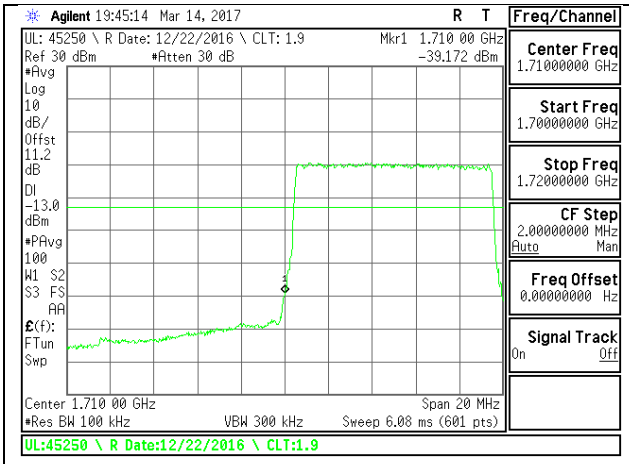
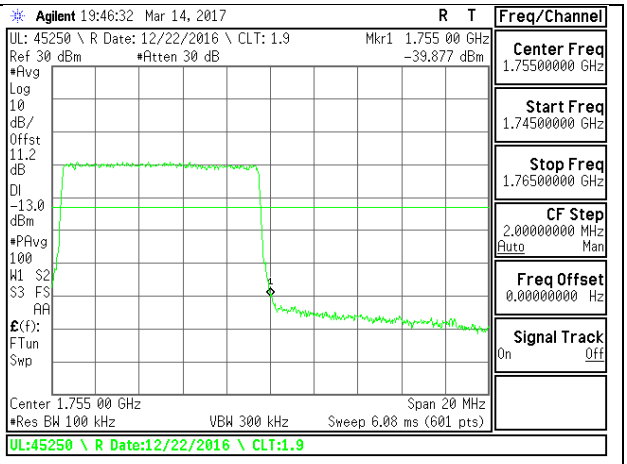
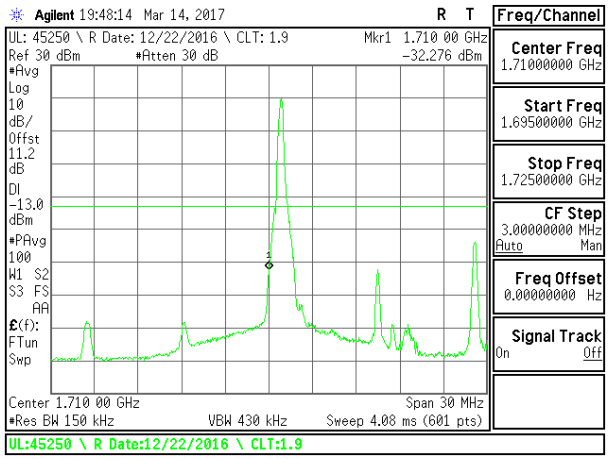


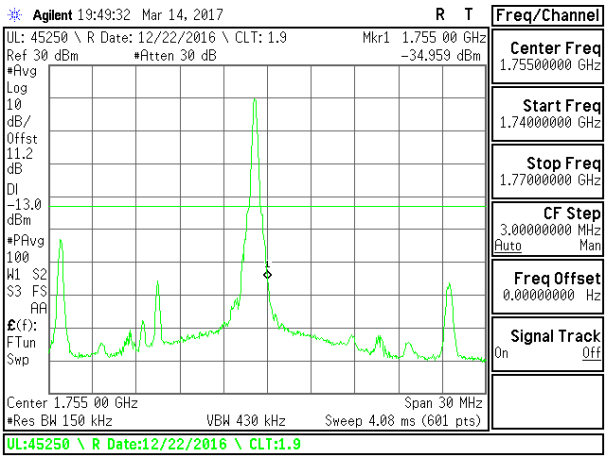

LTE B4 10MHz 16QAM Low Channel FRB




LTE B4 10MHz 16QAM High Channel FRB




LTE B4 15MHz QPSK Low Channel 1RB

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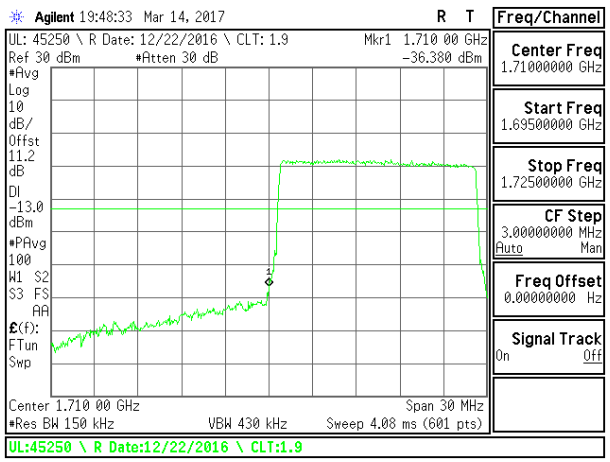
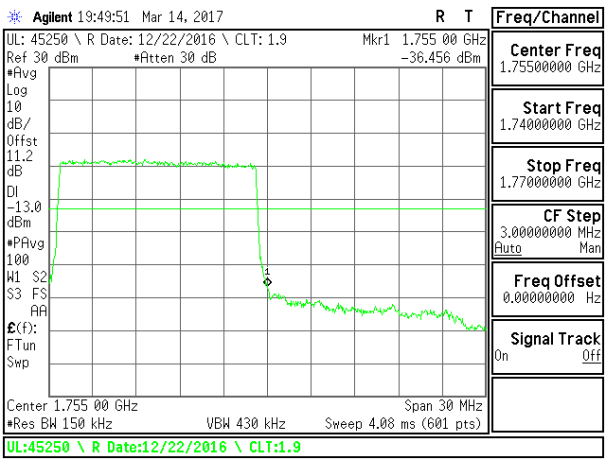
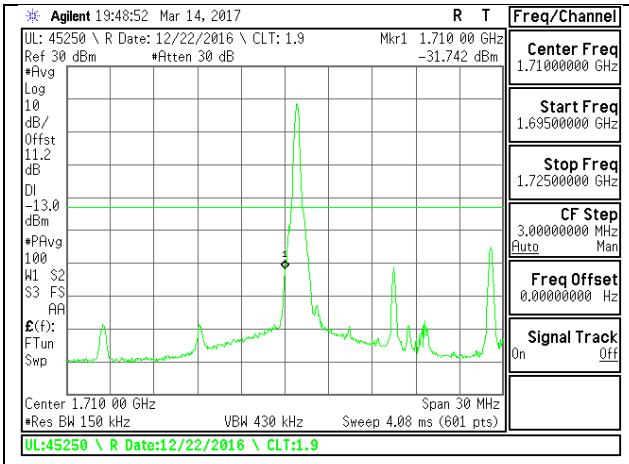


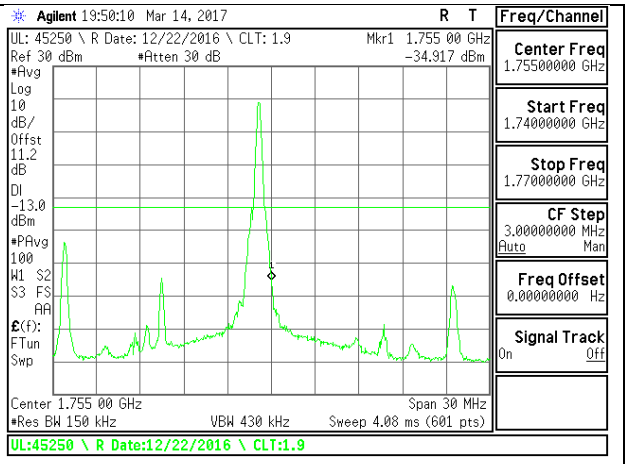

LTE B4 15MHz QPSK Low Channel FRB



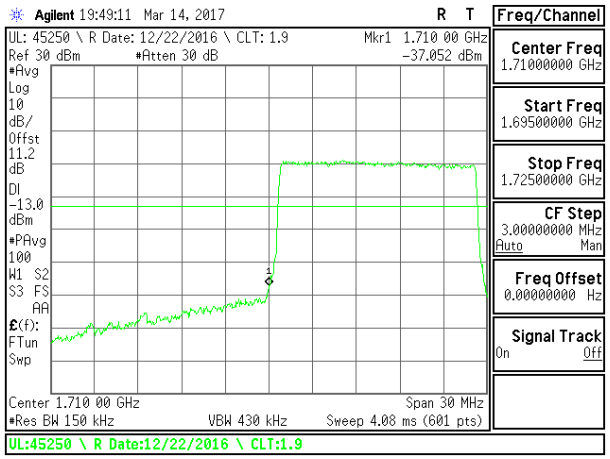

LTE B4 15MHz QPSK High Channel FRB



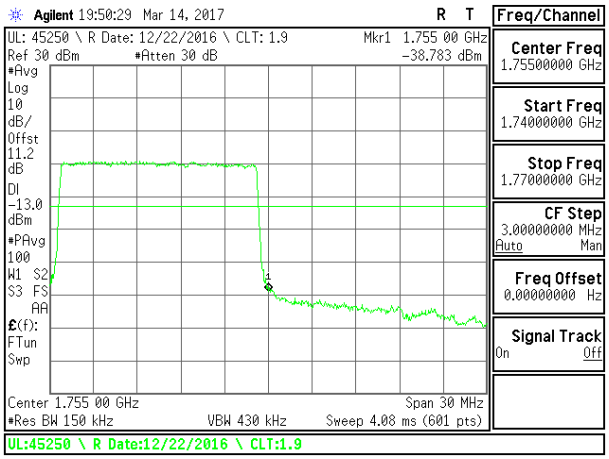

LTE B4 15MHz 16QAM Low Channel 1RB



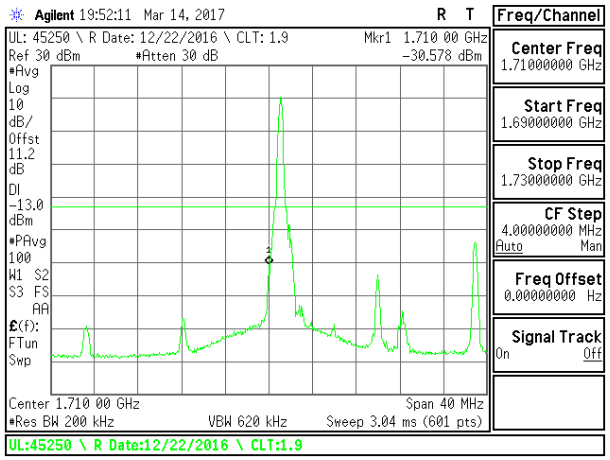

LTE B4 15MHz 16QAM High Channel 1RB



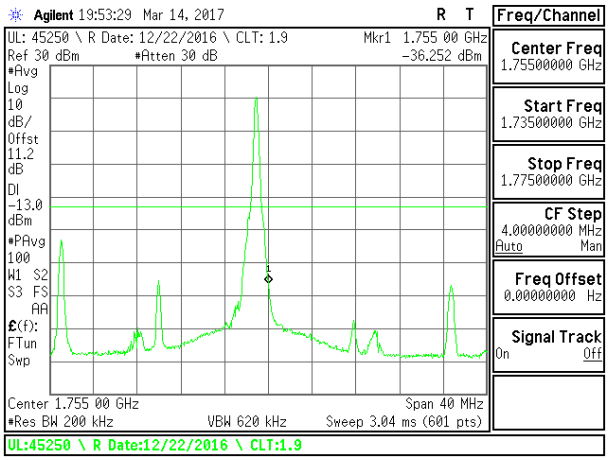

LTE B4 15MHz 16QAM Low Channel FRB




LTE B4 15MHz 16QAM High Channel FRB




LTE B4 20MHz QPSK Low Channel 1RB

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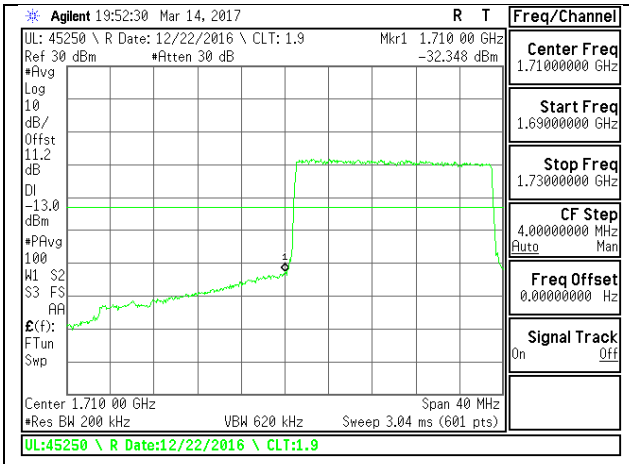
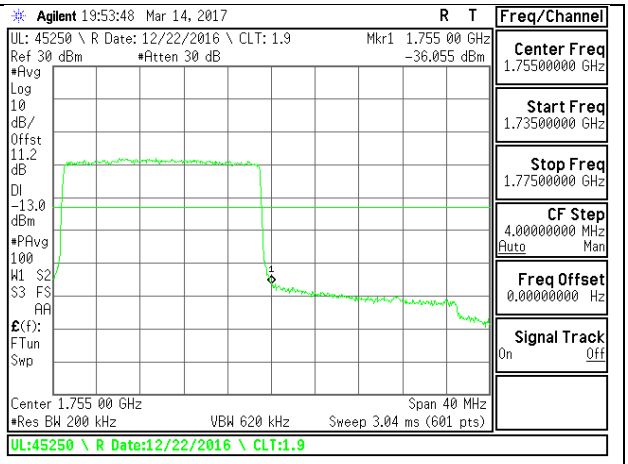



LTE B4 20MHz QPSK Low Channel FRB

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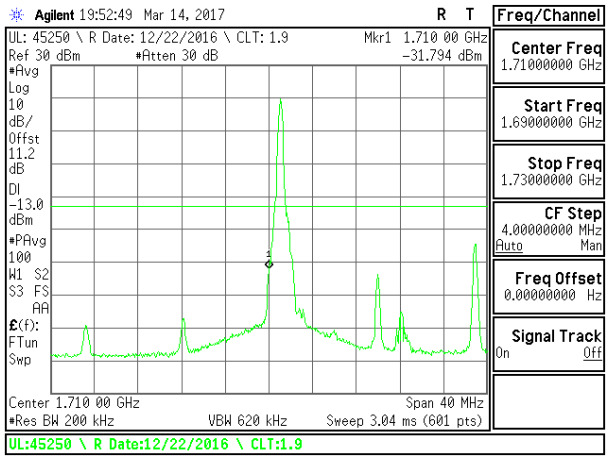


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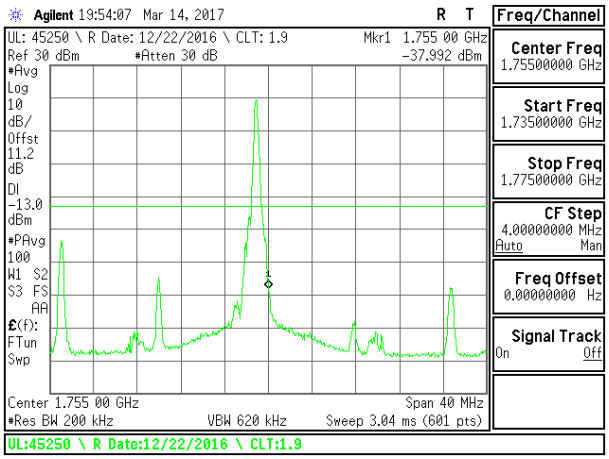


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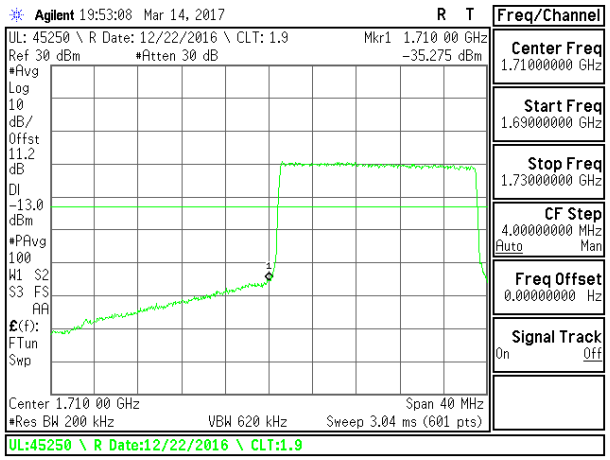
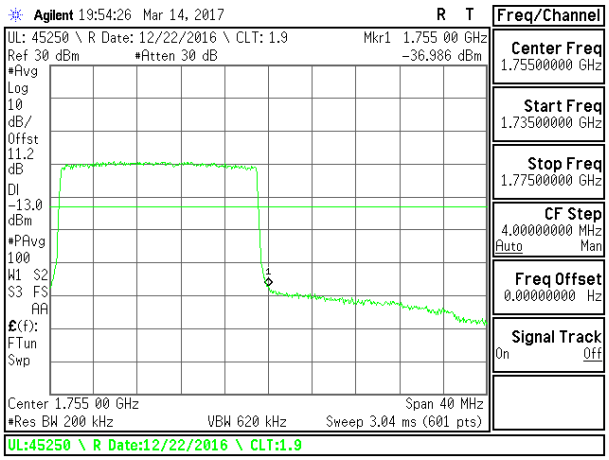
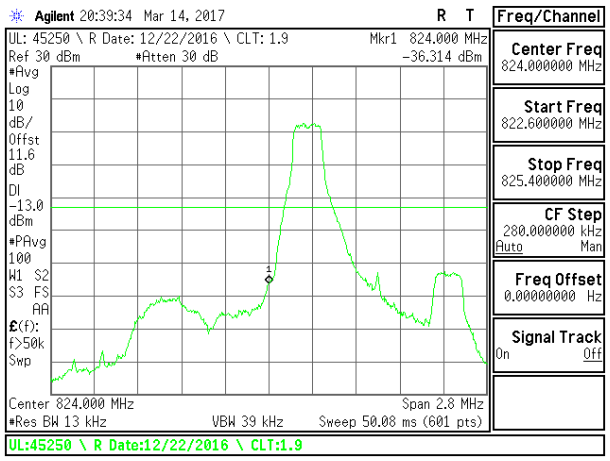



LTE B4 20MHz 16QAM Low Channel FRB

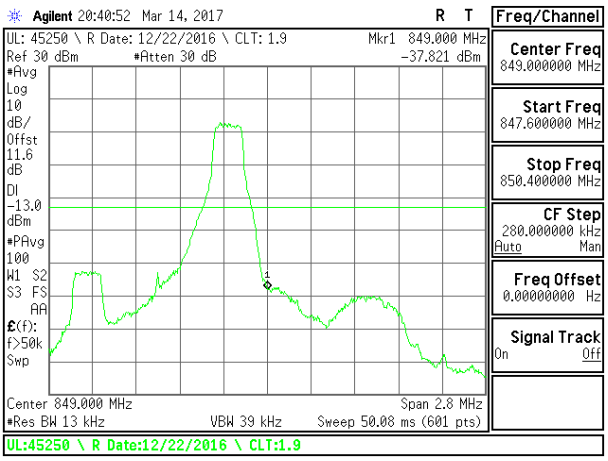



LTE B4 20MHz 16QAM High Channel FRB

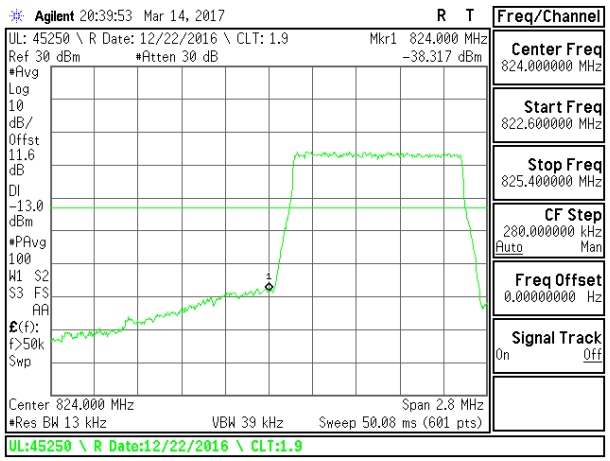
## LTE Band 5



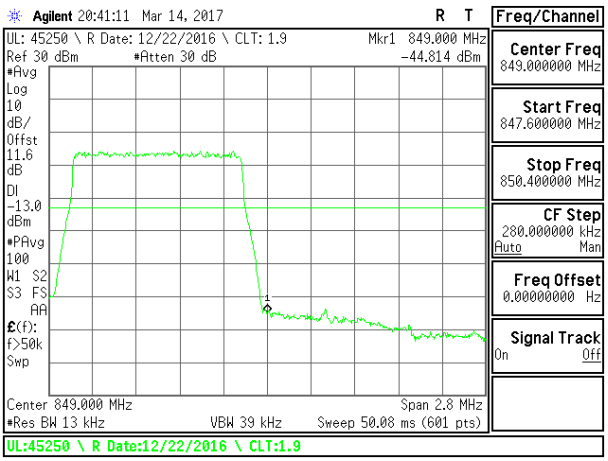

LTE B5 1.4MHz QPSK Low Channel 1RB



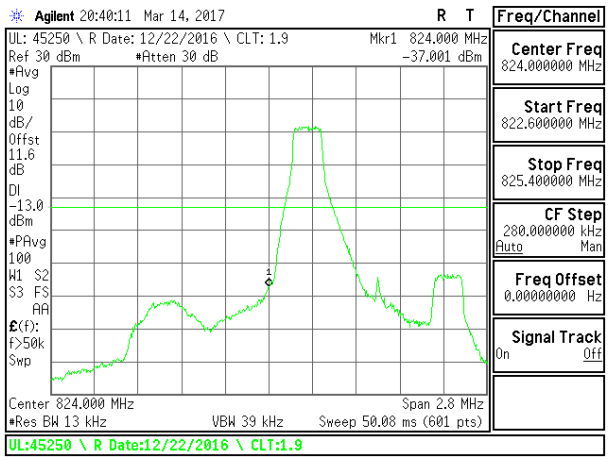

LTE B5 1.4MHz QPSK High Channel 1RB



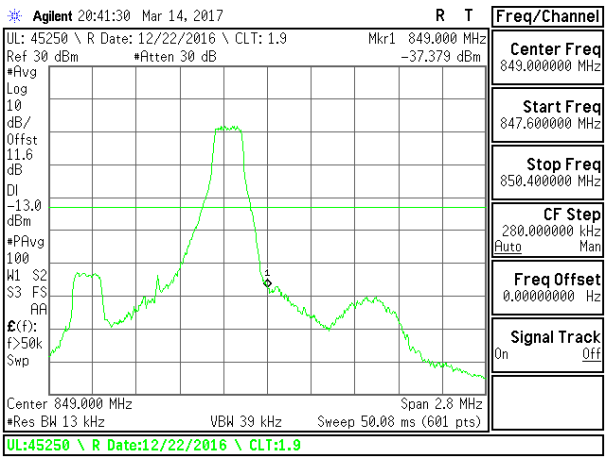

LTE B5 1.4MHz QPSK Low Channel FRB



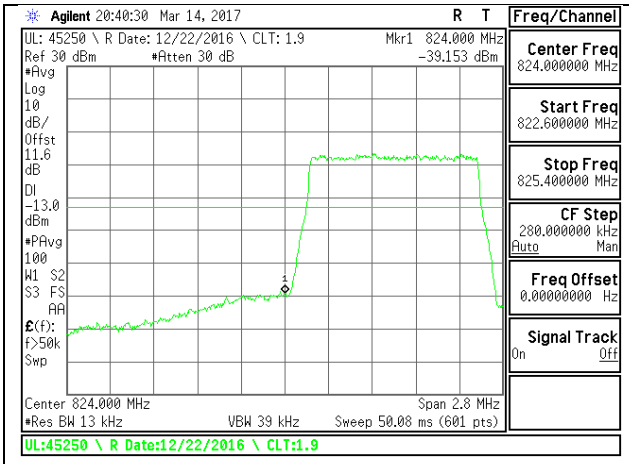

LTE B5 1.4MHz QPSK High Channel FRB



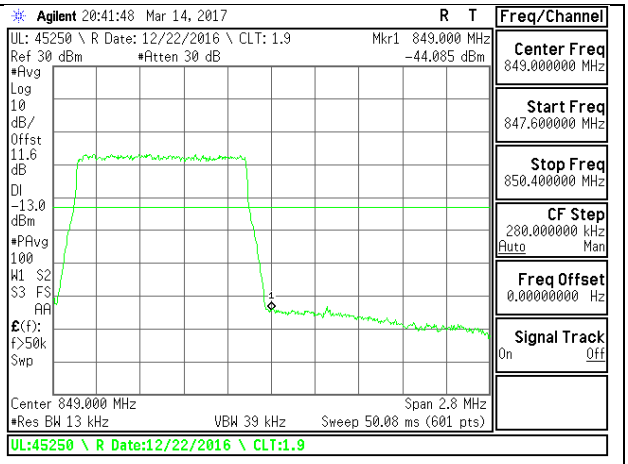

LTE B5 1.4MHz 16QAM Low Channel 1RB



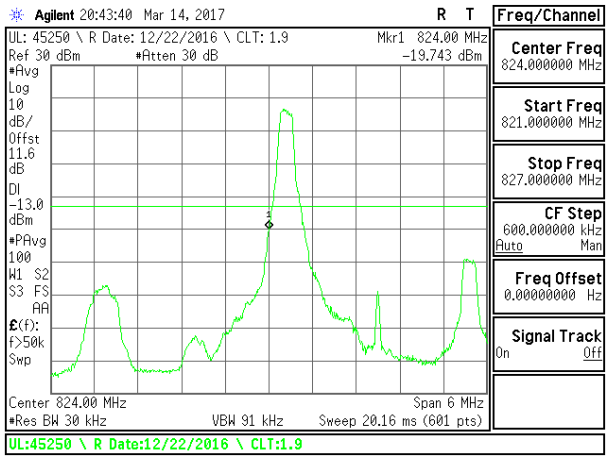

LTE B5 1.4MHz 16QAM High Channel 1RB



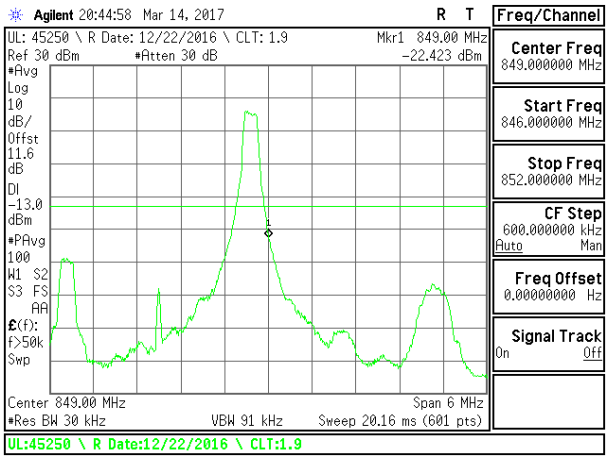

LTE B5 1.4MHz 16QAM Low Channel FRB




LTE B5 1.4MHz 16QAM High Channel FRB




LTE B5 3MHz QPSK Low Channel 1RB

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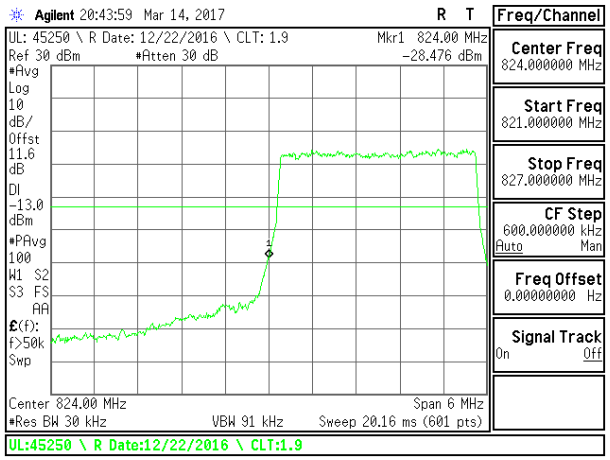
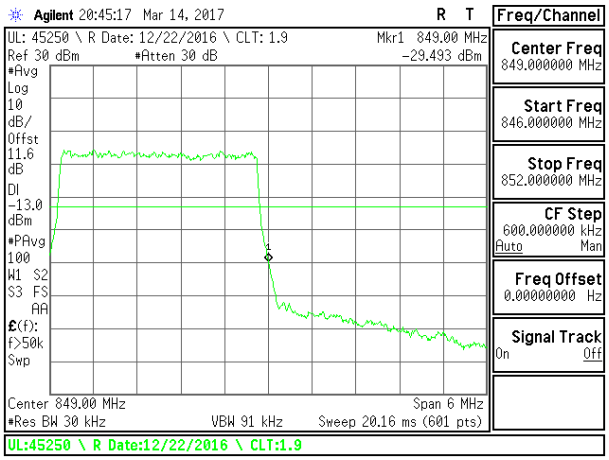
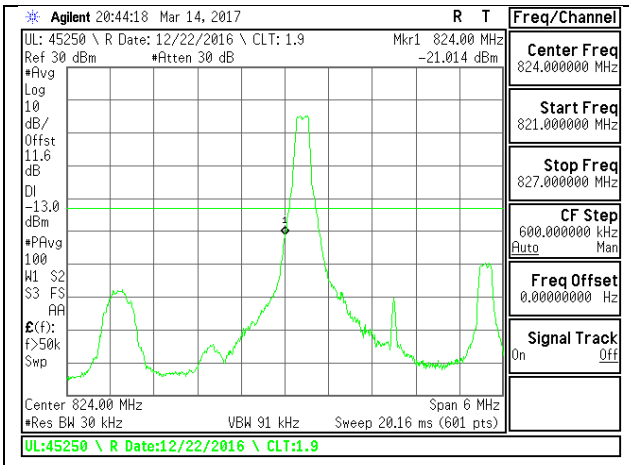


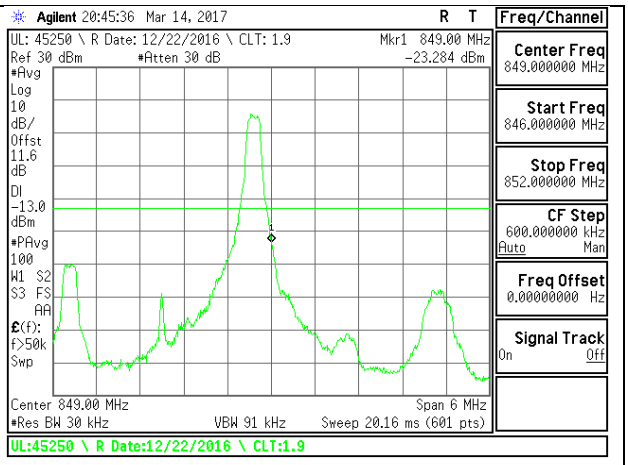

LTE B5 3MHz QPSK Low Channel FRB



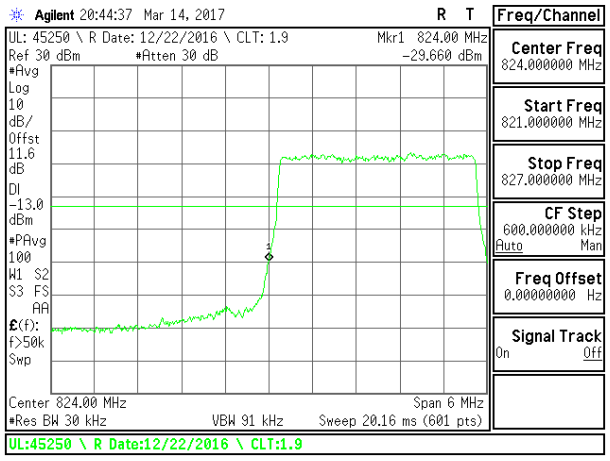

LTE B5 3MHz QPSK High Channel FRB



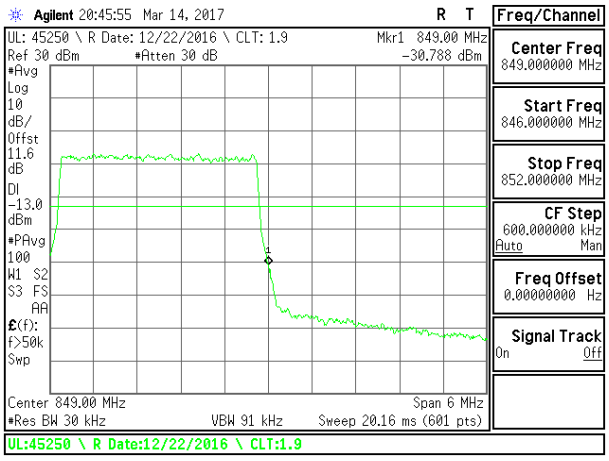

LTE B5 3MHz 16QAM Low Channel 1RB



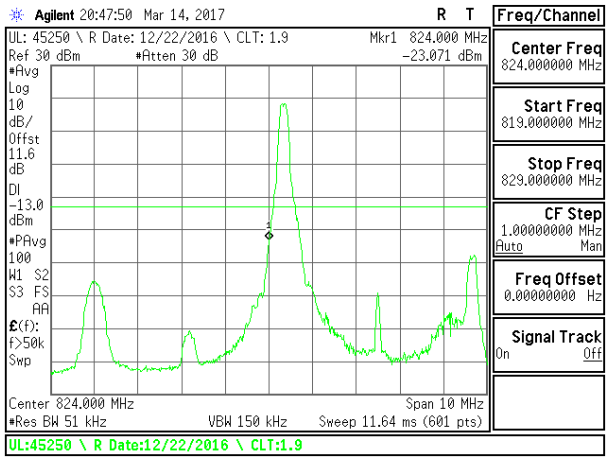

LTE B5 3MHz 16QAM High Channel 1RB



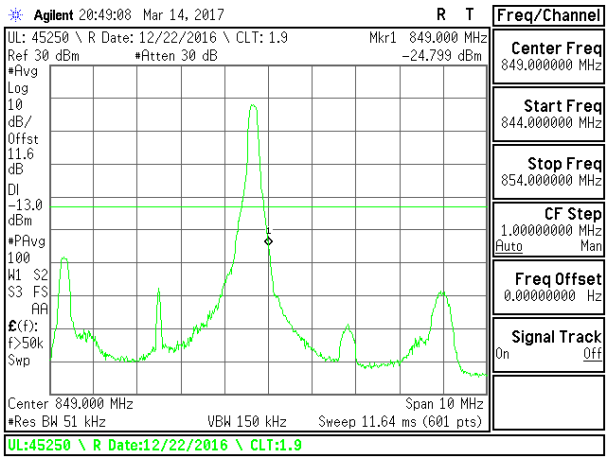

LTE B5 3MHz 16QAM Low Channel FRB




LTE B5 3MHz 16QAM High Channel FRB




LTE B5 5MHz QPSK Low Channel 1RB

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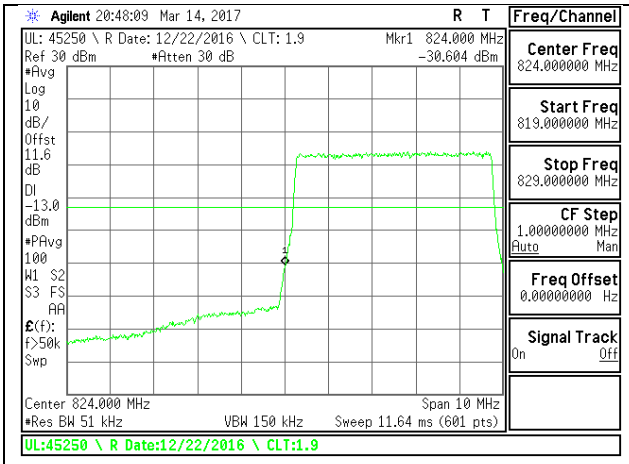
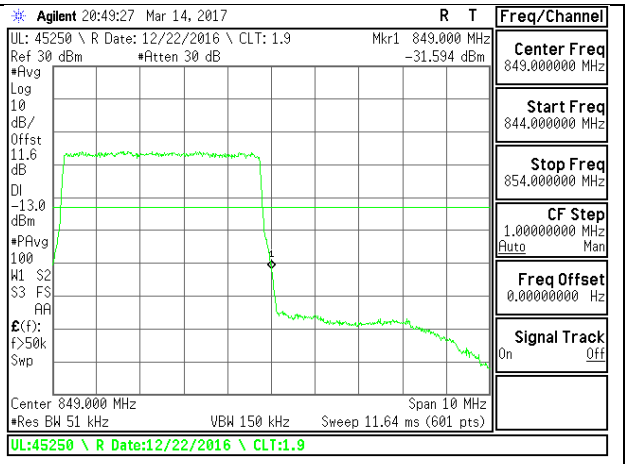
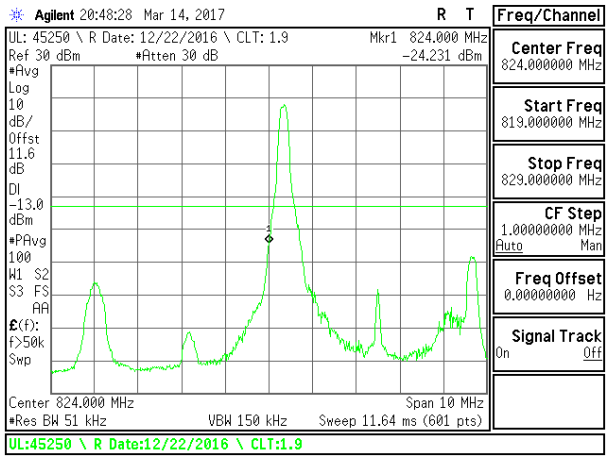


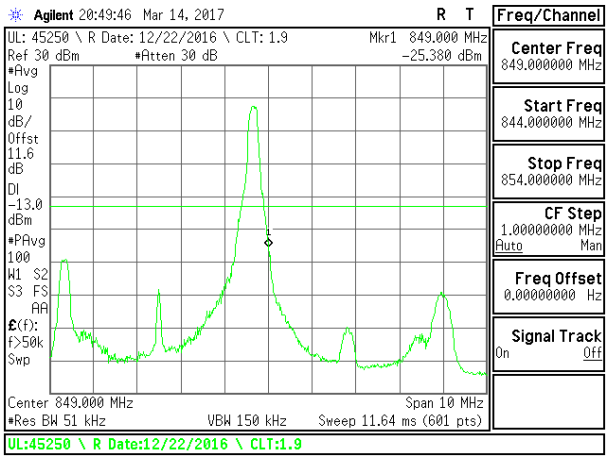

LTE B5 5MHz QPSK Low Channel FRB



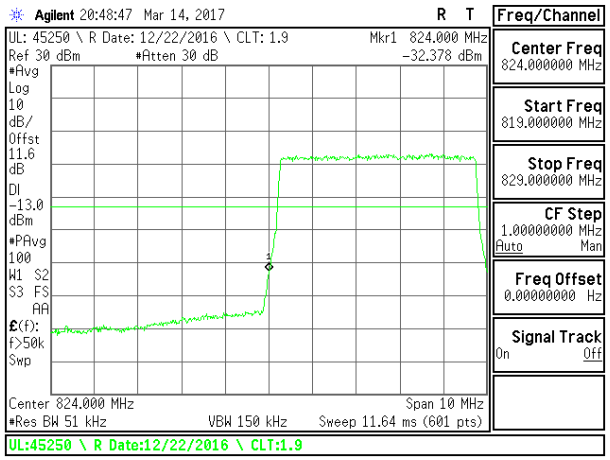

LTE B5 5MHz QPSK High Channel FRB



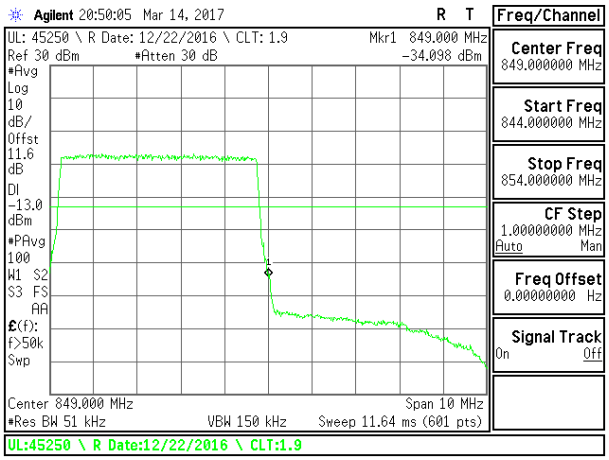

LTE B5 5MHz 16QAM Low Channel 1RB



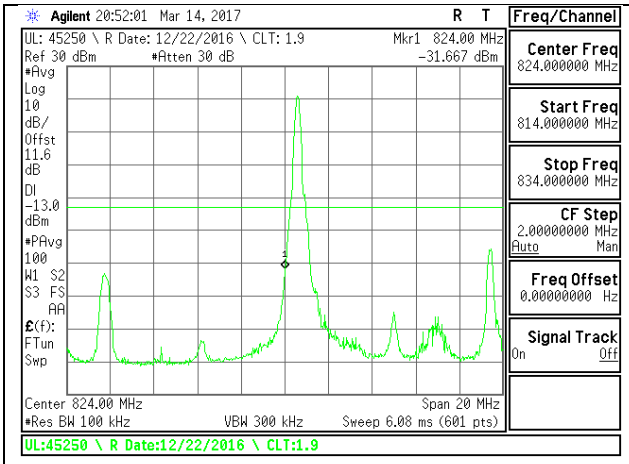

LTE B5 5MHz 16QAM High Channel 1RB



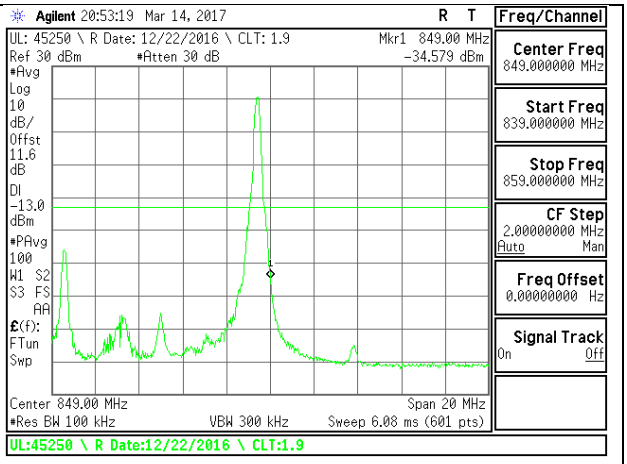

LTE B5 5MHz 16QAM Low Channel FRB



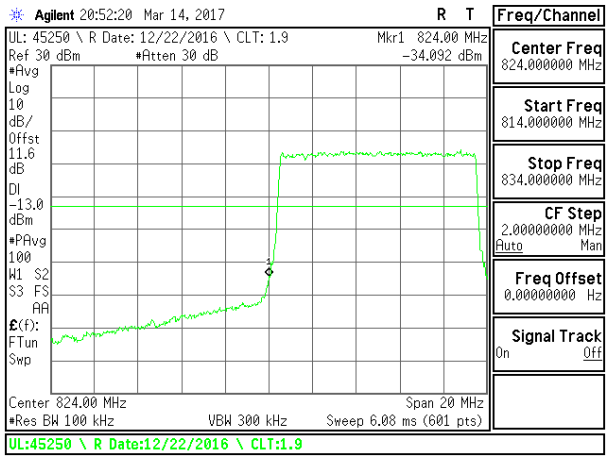

LTE B5 5MHz 16QAM High Channel FRB



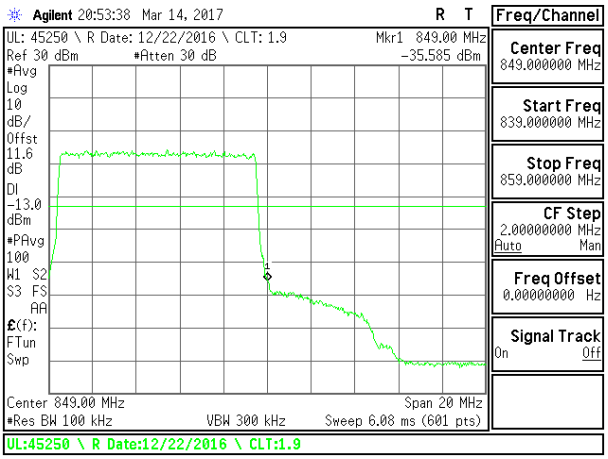

LTE B5 10MHz QPSK Low Channel 1RB



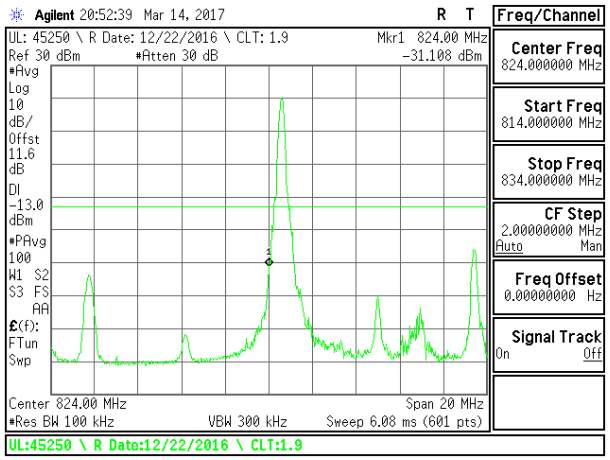

LTE B5 10MHz QPSK High Channel 1RB



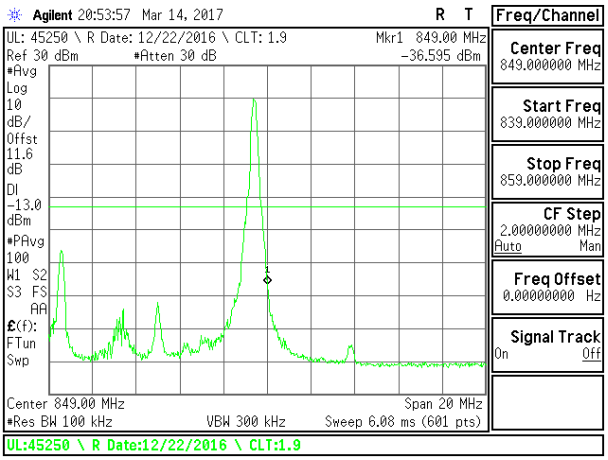

LTE B5 10MHz QPSK Low Channel FRB



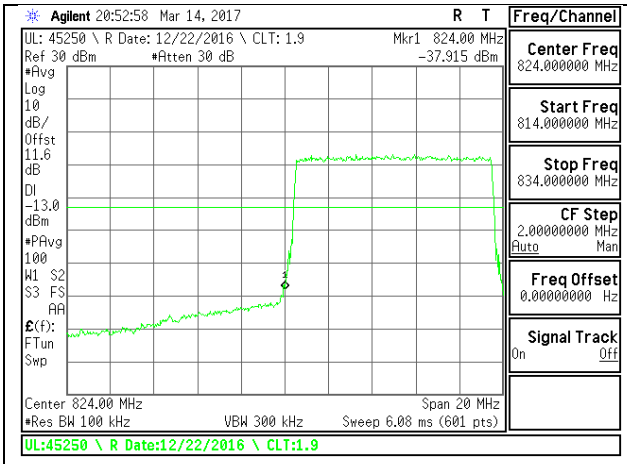

LTE B5 10MHz QPSK High Channel FRB



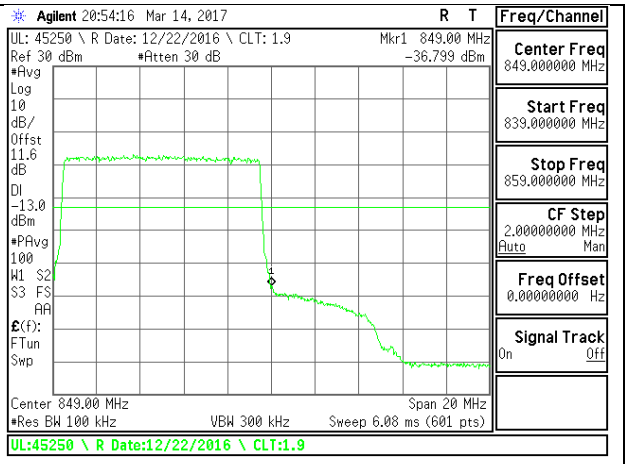

LTE B5 10MHz 16QAM Low Channel 1RB




LTE B5 10MHz 16QAM High Channel 1RB

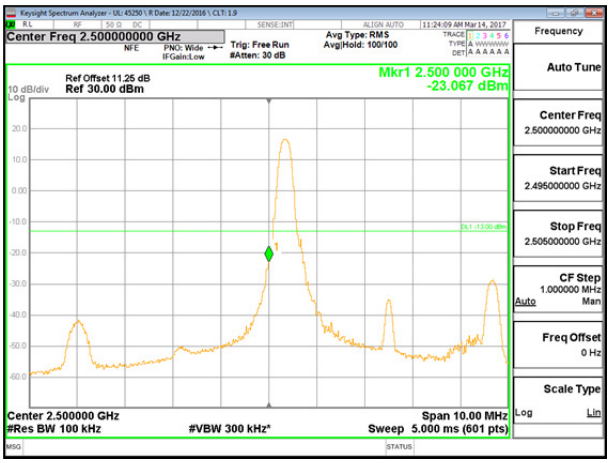



LTE B5 10MHz 16QAM Low Channel FRB

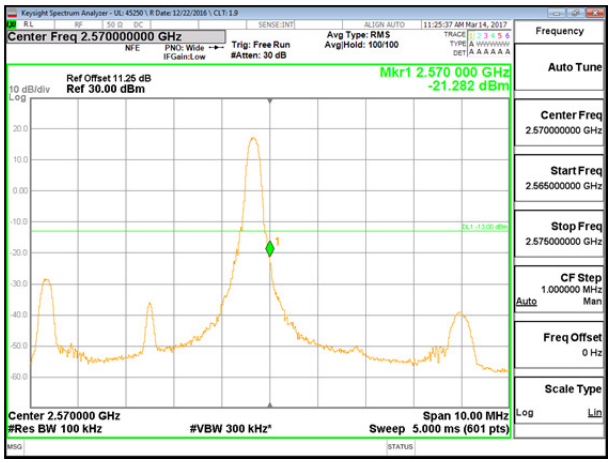



LTE B5 10MHz 16QAM High Channel FRB

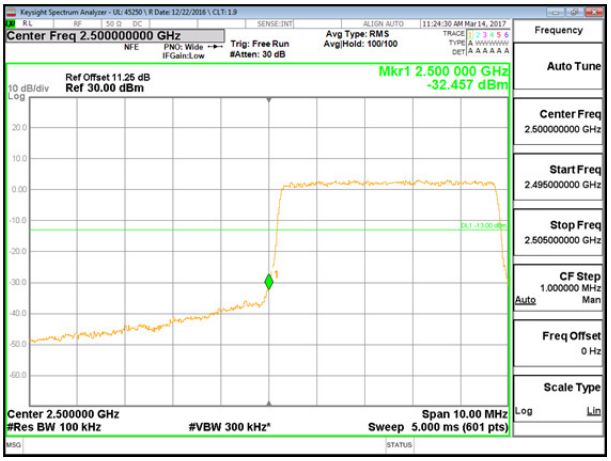
**LTE Band 7**



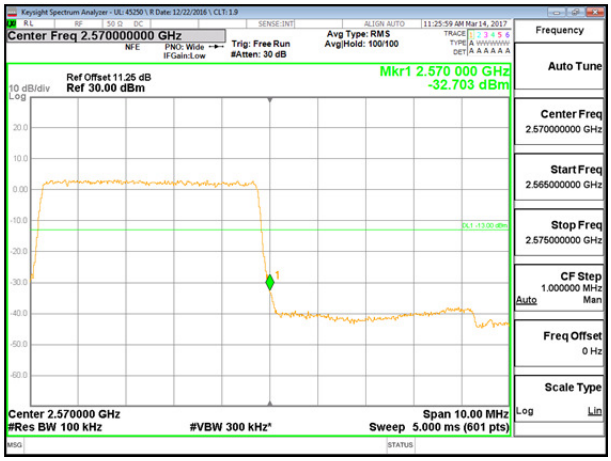

LTE B7 5MHz QPSK Low Channel 1RB



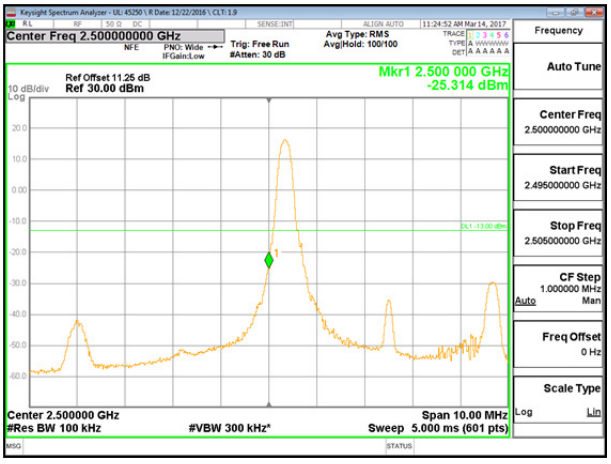

LTE B7 5MHz QPSK High Channel 1RB



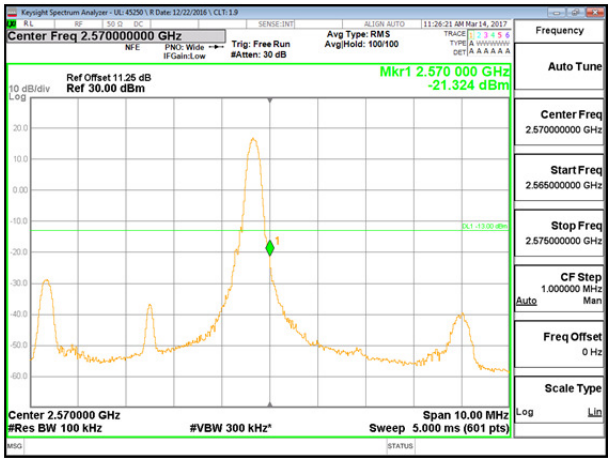

LTE B7 5MHz QPSK Low Channel FRB



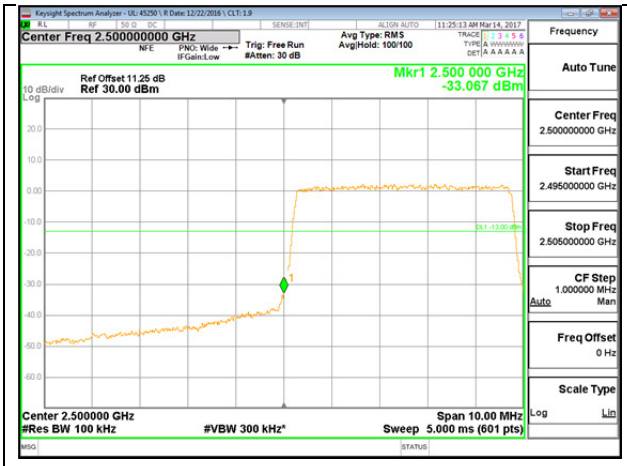

LTE B7 5MHz QPSK High Channel FRB



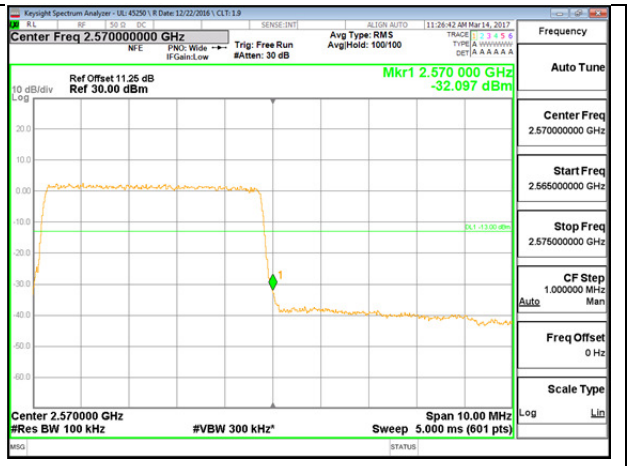

LTE B7 5MHz 16QAM Low Channel 1RB



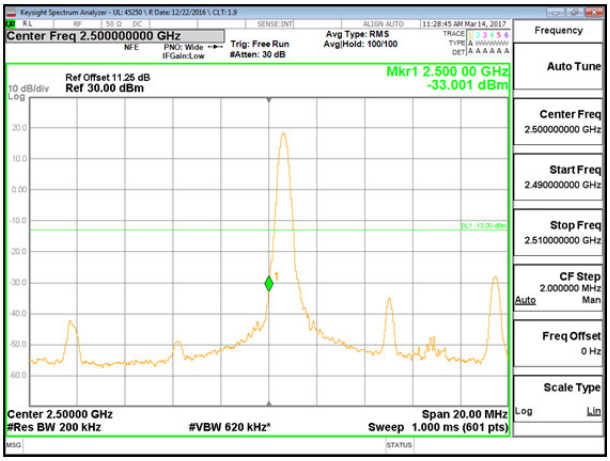

LTE B7 5MHz 16QAM High Channel 1RB



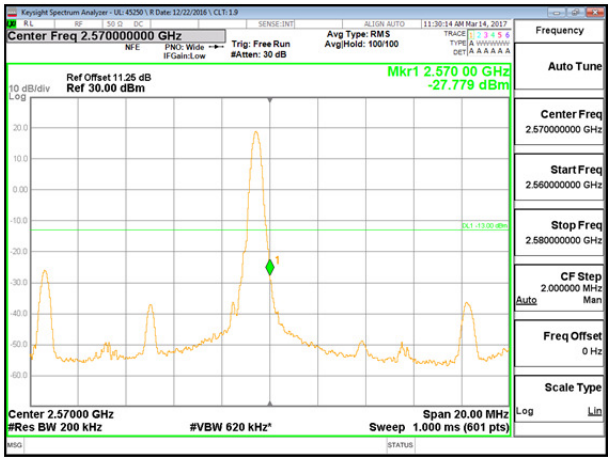

LTE B7 5MHz 16QAM Low Channel FRB



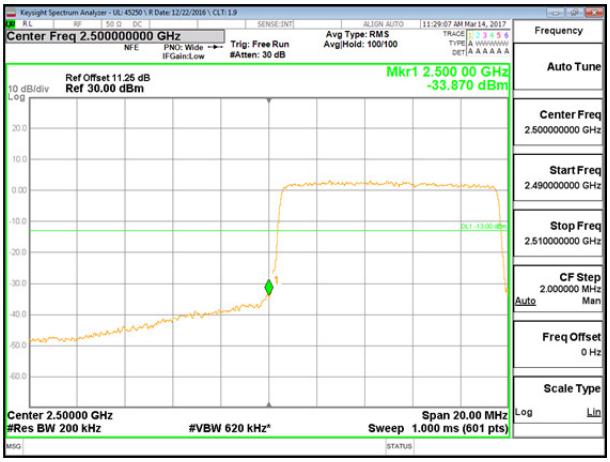

LTE B7 5MHz 16QAM High Channel FRB



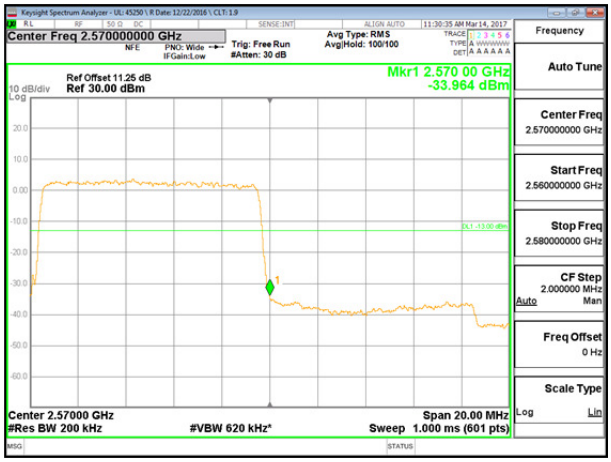

LTE B7 10MHz QPSK Low Channel 1RB



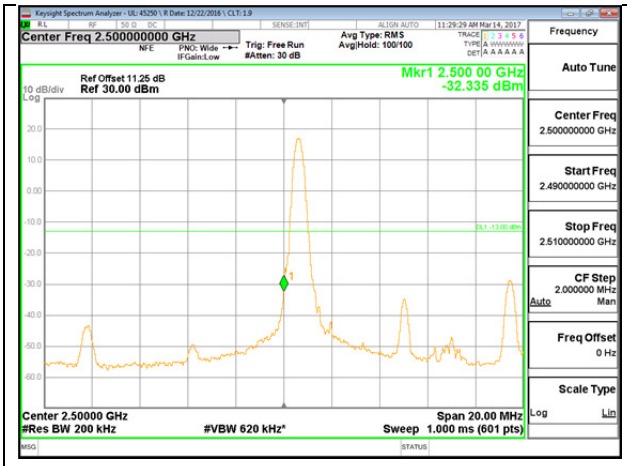

LTE B7 10MHz QPSK High Channel 1RB



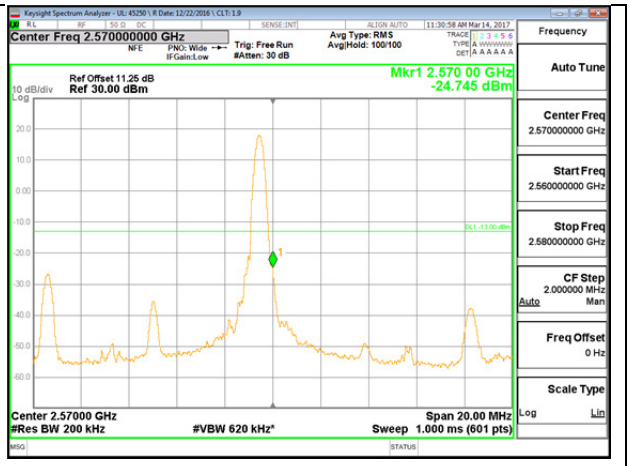

LTE B7 10MHz QPSK Low Channel FRB



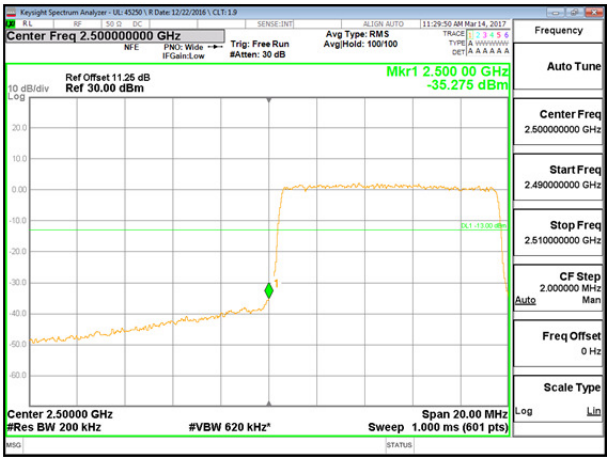

LTE B7 10MHz QPSK High Channel FRB



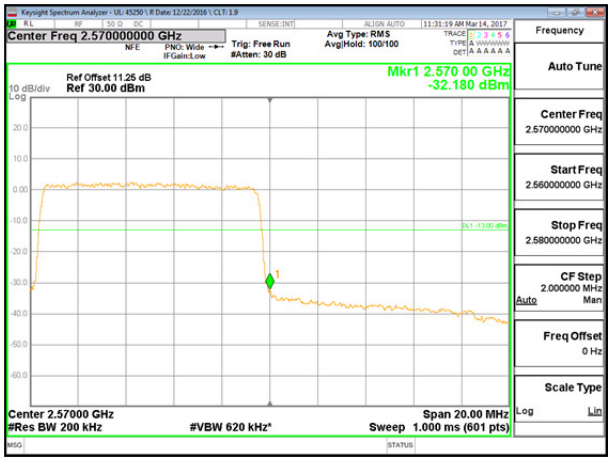

LTE B7 10MHz 16QAM Low Channel 1RB



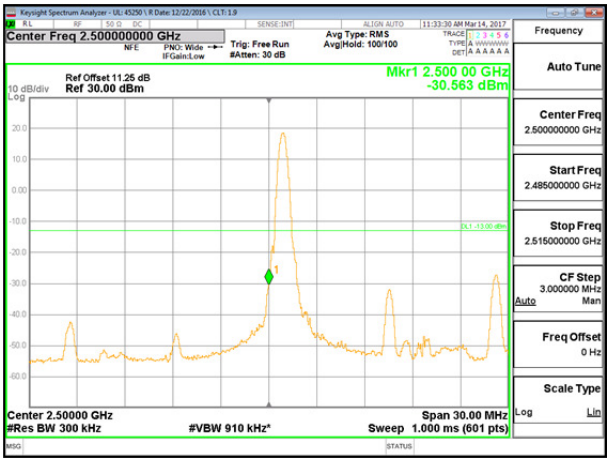

LTE B7 10MHz 16QAM High Channel 1RB



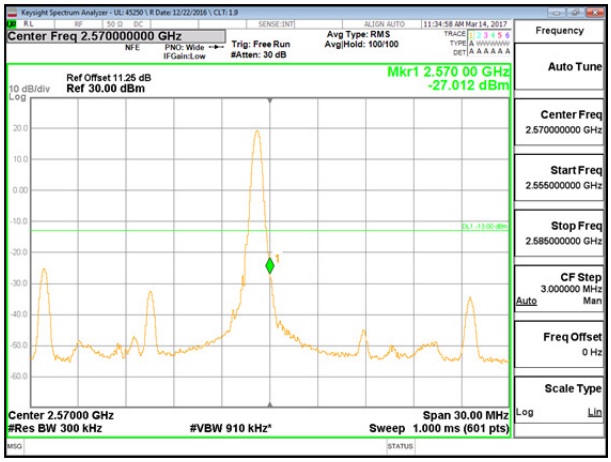

LTE B7 10MHz 16QAM Low Channel FRB




LTE B7 10MHz 16QAM High Channel FRB




LTE B7 15MHz QPSK Low Channel 1RB

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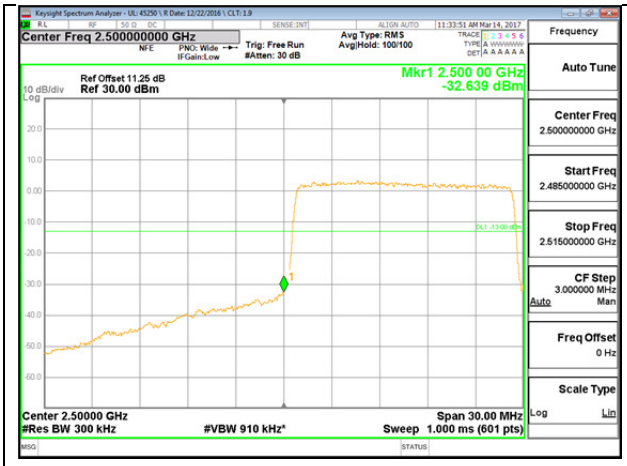
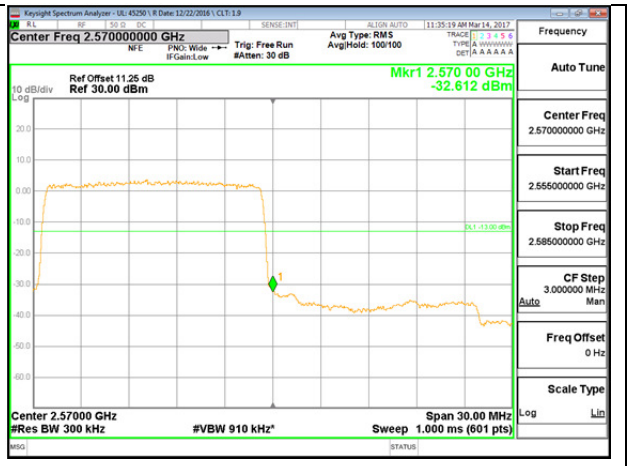
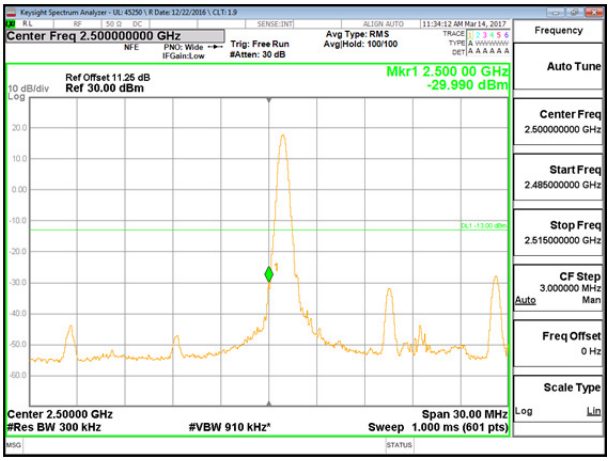


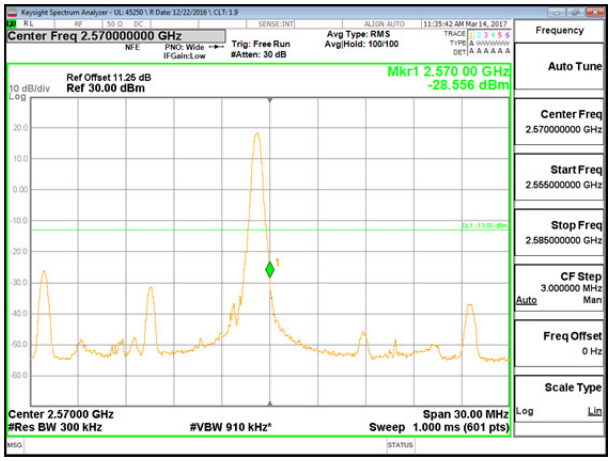

LTE B7 15MHz QPSK Low Channel FRB



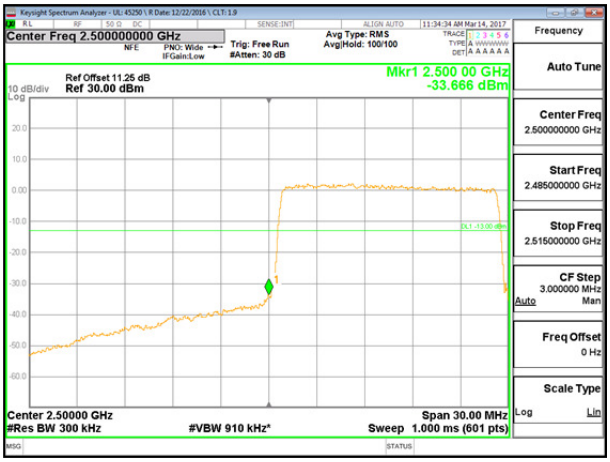

LTE B7 15MHz QPSK High Channel FRB



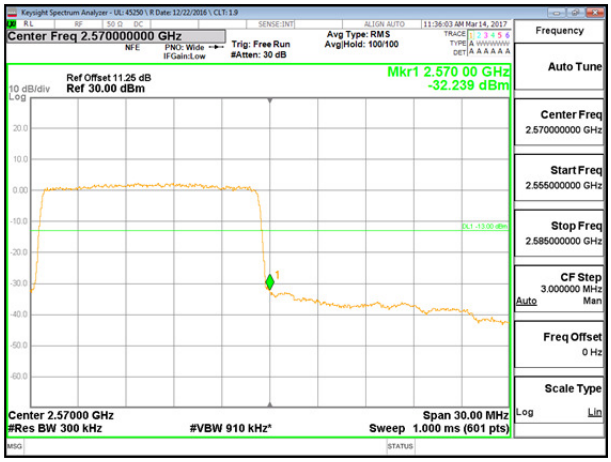

LTE B7 15MHz 16QAM Low Channel 1RB



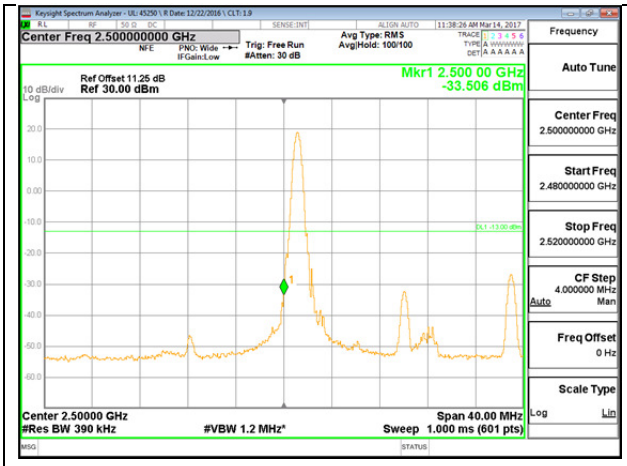

LTE B7 15MHz 16QAM High Channel 1RB



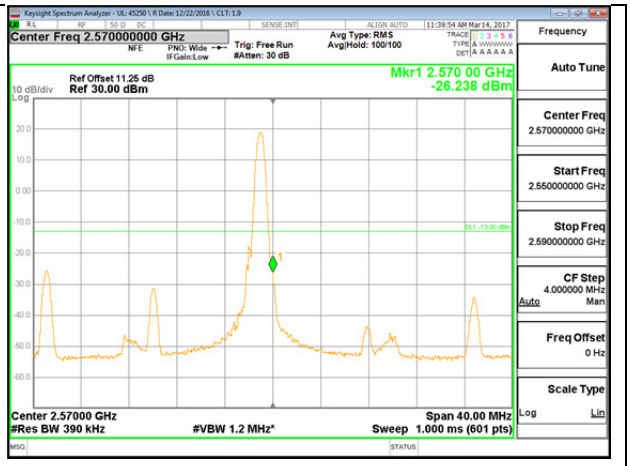

LTE B7 15MHz 16QAM Low Channel FRB



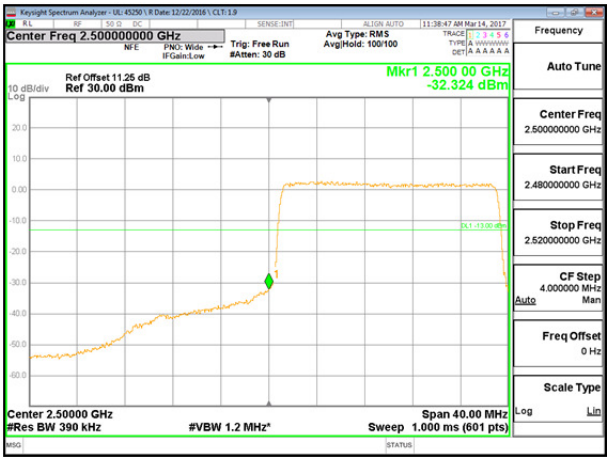

LTE B7 15MHz 16QAM High Channel FRB



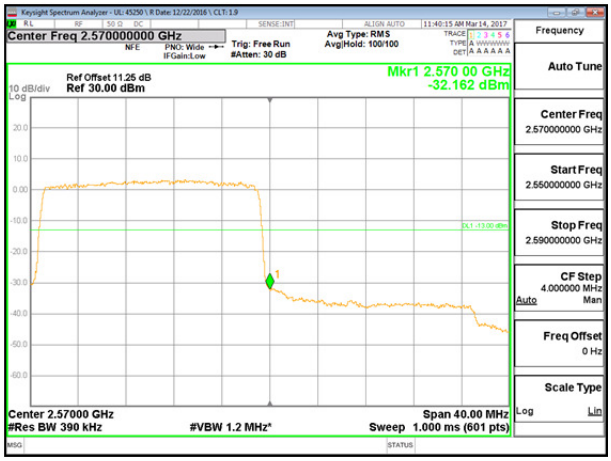

LTE B7 20MHz QPSK Low Channel 1RB



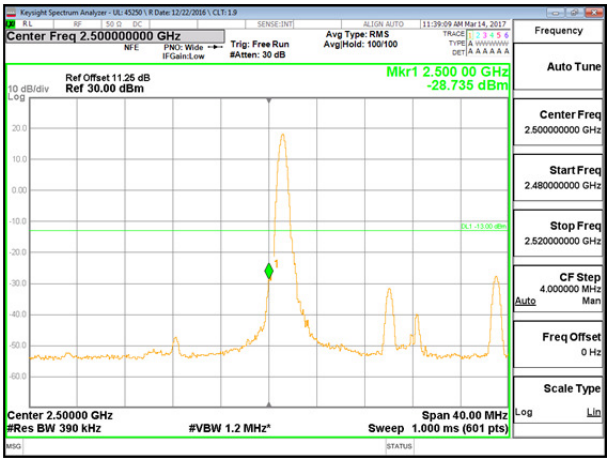

LTE B7 20MHz QPSK High Channel 1RB



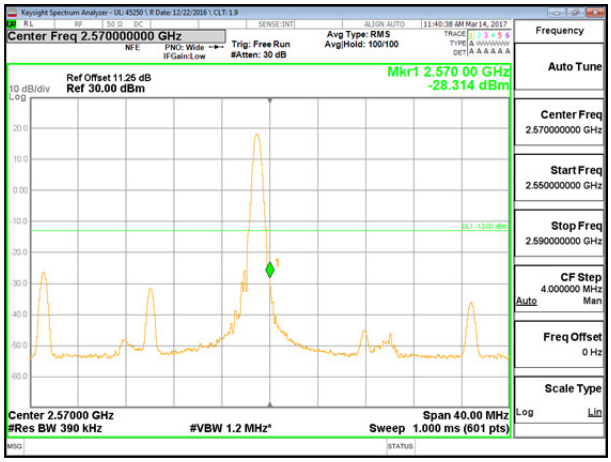

LTE B7 20MHz QPSK Low Channel FRB



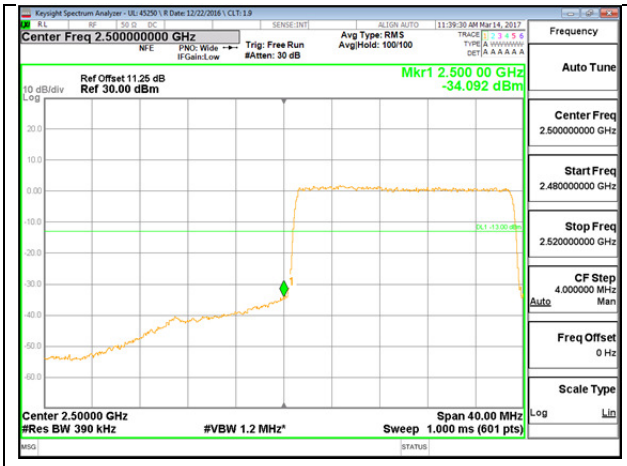

LTE B7 20MHz QPSK High Channel FRB



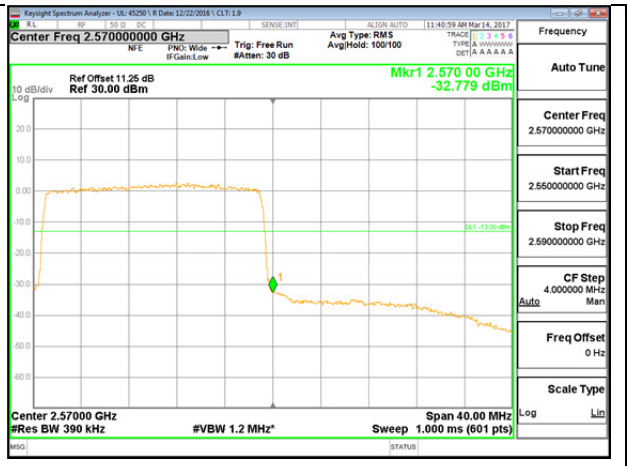

LTE B7 20MHz 16QAM Low Channel 1RB




LTE B7 20MHz 16QAM High Channel 1RB




LTE B7 20MHz 16QAM Low Channel FRB




LTE B7 20MHz 16QAM High Channel FRB