# TEST REPORT

**Report Number. :** 13129294-E6V2

**Applicant :** MICROSOFT CORPORATION
ONE MICROSOFT WAY
REDMOND, WA 98052, U.S.A.

**Model :** 1930

**FCC ID :** C3K1930

**EUT Description :** PHABLET DEVICE

**Test Standard(s) :** FCC CFR47 PART 22H, 24E, 27, 90

**Date Of Issue:**
JUNE 09, 2020

**Prepared by:**
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NVLAP Lab code: 200065-0
NVLAP Lab code: 200246-0

## Revision History

| Rev. | Issue Date | Revisions | Revised By |
|---|---|---|---|
| V1 | 5/29/2020 | Initial Review | --- |
| V2 | 6/9/2020 | EUT updated | Grace Rincand |



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# 1. ATTESTATION OF TEST RESULTS

| | |
|---|---|
| Applicant Name and Address | MICROSOFT CORPORATION<br>ONE MICROSOFT WAY<br>REDMOND, WA 98052, U.S.A. |
| Model | 1930 |
| FCC ID | C3K1930 |
| EUT Description | PHABLET DEVICE |
| Serial Number | 901139500365, 901245700365, 90006061165, 900065101165, 900304501465 |
| Date Tested | FEBRUARY 26, 2020 to MAY 28, 2020 |
| Applicable Standards | FCC CFR47 PART 22H, 24E, 27, 90 |
| Test Results | COMPLIES |

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

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 the U.S. government.

| Approved & Released By: | Reviewed By: | Prepared By: |
|---|---|---|
| Choose an item.<br>Operations Leader<br>UL Verification Services Inc. | Tina Chu<br>Senior Project Engineer<br>UL Verification Services Inc. | Rolly Alegre<br>Laboratory Engineer<br>UL Verification Services Inc. |



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# 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with the following:

- ANSI C63.26:2015
- FCC CFR 47 Part 2, Part 22H, Part 24E, Part 27, Part 90.
- FCC KDB 971168 D01 v03r01: Power Meas License Digital Systems
- FCC KDB 971168 D02 v02r01: Misc Rev Approv License Devices
- FCC KDB 412172 D01 v01r01. Determining ERP and EIRP

# 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA, and 2800 Suite Perimeter Park Dr., Morrisville, North Carolina, USA .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 | 47658 Kato Road |
|---|---|---|
| ☐ Chamber A | ☐ Chamber D | ☐ Chamber I |
| ☐ Chamber B | ☐ Chamber E | ☐ Chamber J |
| ☐ Chamber C | ☐ Chamber F | ☐ Chamber K |
| | ☐ Chamber G | ☐ Chamber L |
| | ☐ Chamber H | ☐ Chamber M |

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

UL Verification Services Inc test sites and facilities are covered under FCC Test Firm Registration # 208313. Chambers above are covered under Industry Canada company address and respective code: 2324A.

| 2800 Suite Perimeter Park Dr. |
|---|
| ☒ North Chamber |
| ☒ South Chamber |

UL LLC (RTP) is accredited by NVLAP, Laboratory Code 200246-0

UL LLC (RTP) test sites and facilities are covered under FCC Test Firm Registration # 703469. Chambers above are covered under Industry Canada company address and respective code: 2180C.




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# 4. DECISION RULES AND MEASUREMENT UNCERTAINTY

## 4.1. METROLOGICAL TRACEABILITY

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, with a maximum time between calibrations of one year or the manufacturers' recommendation, whichever is less, and where applicable is traceable to recognized national standards.

## 4.2. DECISION RULES

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4:2012 Clause 8.2. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

## 4.3. MEASUREMENT UNCERTAINTY

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

| PARAMETER | $U_{Lab}$ |
|---|---|
| Conducted Disturbance, 9KHz to 0.15 MHz | 3.39 dB |
| Conducted Disturbance, 0.15 to 30 MHz | 3.07 dB |
| Radiated Disturbance, 9KHz to 30 MHz | 2.52 dB |
| Radiated Disturbance, 30 to 1000 MHz | 4.88 dB |
| Radiated Disturbance,1000 to 18000 MHz | 4.24 dB |
| Radiated Disturbance,18000 to 26000 MHz | 4.37 dB |
| Radiated Disturbance,26000 to 40000 MHz | 5.17 dB |
| Occupied Channel Bandwidth | ±0.39 % |
| Temperature | ±0.9 °C |
| Supply voltages | ±0.45 % |
| Time | ±0.02 % |

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

## 4.4. SAMPLE CALCULATION

**RADIATED EMISSIONS**

Where relevant, the following sample calculation is provided:
Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

**MAINS CONDUCTED EMISSIONS**

Where relevant, the following sample calculation is provided:
Final Voltage (dBuV) = Measured Voltage (dBuV) + Cable Loss (dB) + Limiter Factor (dB) + LISN Insertion Loss.
36.5 dBuV + 0 dB +10.1 dB+ 0 dB = 46.6 dBuV



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# 5. EQUIPMENT UNDER TEST

## 5.1. DESCRIPTION OF EUT

The EUT is a Phablet Device with 802.11 a/b/g/n/ac 2x2 WLAN, Bluetooth, Bluetooth LE, GSM, WCDMA, and LTE radios.

## 5.2. MAXIMUM OUTPUT POWER

**EIRP/ERP TEST PROCEDURE**

ANSI C63.26:2015
KDB 971168 D01 Section 5.6

ERP/EIRP = PMeas + GT − LC
where: ERP/EIRP = effective or equivalent radiated power, respectively (expressed in the same units as PMeas, typically dBW or dBm);
PMeas = measured transmitter output power or PSD, in dBm or dBW;
GT = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);
LC = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

For devices utilizing multiple antennas, KDB 662911 provides guidance for determining the effective array transmit antenna gain term to be used in the above equation.

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



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**LTE BAND 2**

| Part 24 / RSS 133 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| EIRP Limit (W) | | 2.00 | | | | | | |
| Antenna Gain (dBi) | | 0.40 | | | | | | |
| Bandwidth (MHz) | Modulation | Low Frequency (MHz) | Upper Frequency (MHz) | Conducted Average (dBm) | EIRP Average (dBm) | EIRP Average (W) | 99% BW (kHz) | Emission Designator |
| 1.4 | QPSK | 1850.7 | 1909.3 | 23.9 | 24.30 | 0.269 | 1080.6 | 1M08G7W |
| | 16QAM | | | 23.2 | 23.60 | 0.229 | 1084.6 | 1M08D7W |
| 3.0 | QPSK | 1851.5 | 1908.5 | 23.9 | 24.30 | 0.269 | 2687.2 | 2M69G7W |
| | 16QAM | | | 23.3 | 23.70 | 0.234 | 2686.2 | 2M69D7W |
| 5.0 | QPSK | 1852.5 | 1907.5 | 24.0 | 24.40 | 0.275 | 4497.6 | 4M50G7W |
| | 16QAM | | | 23.4 | 23.80 | 0.240 | 4497.4 | 4M50D7W |
| 10.0 | QPSK | 1855.0 | 1905.0 | 23.9 | 24.30 | 0.269 | 8938.9 | 8M94G7W |
| | 16QAM | | | 23.2 | 23.60 | 0.229 | 8946.1 | 8M95D7W |
| 15.0 | QPSK | 1857.5 | 1902.5 | 24.0 | 24.40 | 0.275 | 13445 | 13M4G7W |
| | 16QAM | | | 23.4 | 23.80 | 0.240 | 13418.2 | 13M4D7W |
| 20.0 | QPSK | 1860.0 | 1900.0 | 24.0 | 24.40 | 0.275 | 17877.9 | 17M9G7W |
| | 16QAM | | | 23.5 | 23.90 | 0.245 | 17862.3 | 17M9D7W |

**LTE BAND 4**

| Part 27 / RSS 139 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| EIRP Limit (W) | | 1.00 | | | | | | |
| Antenna Gain (dBi) | | 0.60 | | | | | | |
| Bandwidth (MHz) | Modulation | Low Frequency (MHz) | Upper Frequency (MHz) | Conducted Average (dBm) | EIRP Average (dBm) | EIRP Average (W) | 99% BW (kHz) | Emission Designator |
| 1.4 | QPSK | 1710.7 | 1754.3 | 23.9 | 24.50 | 0.282 | 1082.5 | 1M08G7W |
| | 16QAM | | | 23.3 | 23.90 | 0.245 | 1092 | 1M09D7W |
| 3.0 | QPSK | 1711.5 | 1753.5 | 23.9 | 24.50 | 0.282 | 2687.2 | 2M69G7W |
| | 16QAM | | | 23.2 | 23.80 | 0.240 | 2682.3 | 2M68D7W |
| 5.0 | QPSK | 1712.5 | 1752.5 | 24.0 | 24.60 | 0.288 | 4490.2 | 4M49G7W |
| | 16QAM | | | 23.4 | 24.00 | 0.251 | 4489.6 | 4M49D7W |
| 10.0 | QPSK | 1715.0 | 1750.0 | 23.9 | 24.50 | 0.282 | 8958.7 | 8M96G7W |
| | 16QAM | | | 23.3 | 23.90 | 0.245 | 8977.6 | 8M98D7W |
| 15.0 | QPSK | 1717.5 | 1747.5 | 24.1 | 24.70 | 0.295 | 13402.2 | 13M4G7W |
| | 16QAM | | | 23.5 | 24.10 | 0.257 | 13422.8 | 13M4D7W |
| 20.0 | QPSK | 1720.0 | 1745.0 | 24.1 | 24.70 | 0.295 | 17870.5 | 17M9G7W |
| | 16QAM | | | 23.7 | 24.30 | 0.269 | 17892 | 17M9D7W |



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**LTE BAND 5**

| Part 22H | |
|---|---|
| ERP Limit (W) | 7.00 |
| Antenna Gain (dBi) | -1.10 |

| Bandwidth (MHz) | Modulation | Low Frequency (MHz) | Upper Frequency (MHz) | Conducted Average (dBm) | ERP Average (dBm) | ERP Average (W) | 99% BW (kHz) | Emission Designator |
|---|---|---|---|---|---|---|---|---|
| 1.4 | QPSK | 824.7 | 848.3 | 23.8 | 20.55 | 0.114 | 1078.8 | 1M08G7W |
| | 16QAM | | | 23.2 | 19.95 | 0.099 | 1080.1 | 1M08D7W |
| 3.0 | QPSK | 825.5 | 847.5 | 23.9 | 20.65 | 0.116 | 2682.7 | 2M68G7W |
| | 16QAM | | | 23.2 | 19.95 | 0.099 | 2676.9 | 2M68D7W |
| 5.0 | QPSK | 826.5 | 846.5 | 23.9 | 20.65 | 0.116 | 4497.4 | 4M50G7W |
| | 16QAM | | | 23.3 | 20.05 | 0.101 | 4493.4 | 4M49D7W |
| 10.0 | QPSK | 829.0 | 844.0 | 24.0 | 20.75 | 0.119 | 8960 | 8M96G7W |
| | 16QAM | | | 23.3 | 20.05 | 0.101 | 8917.3 | 8M92D7W |

**LTE BAND 7**

| Part 27 / RSS 199 | |
|---|---|
| EIRP Limit (W) | 2.00 |
| Antenna Gain (dBi) | -0.40 |

| Bandwidth (MHz) | Modulation | Low Frequency (MHz) | Upper Frequency (MHz) | Conducted Average (dBm) | EIRP Average (dBm) | EIRP Average (W) | 99% BW (kHz) | Emission Designator |
|---|---|---|---|---|---|---|---|---|
| 5.0 | QPSK | 2502.5 | 2567.5 | 23.9 | 23.50 | 0.224 | 4500.7 | 4M50G7W |
| | 16QAM | | | 23.5 | 23.10 | 0.204 | 4480.4 | 4M48D7W |
| 10.0 | QPSK | 2505.0 | 2565.0 | 23.9 | 23.50 | 0.224 | 8983.9 | 8M98G7W |
| | 16QAM | | | 23.3 | 22.90 | 0.195 | 8979.6 | 8M98D7W |
| 15.0 | QPSK | 2507.5 | 2562.5 | 24.0 | 23.60 | 0.229 | 13421 | 13M4G7W |
| | 16QAM | | | 23.3 | 22.90 | 0.195 | 13418 | 13M4D7W |
| 20.0 | QPSK | 2510.0 | 2560.0 | 24.0 | 23.60 | 0.229 | 17877 | 17M9G7W |
| | 16QAM | | | 23.5 | 23.10 | 0.204 | 17901 | 17M9D7W |

**LTE BAND 12**

| Part 27 / RSS 130 | |
|---|---|
| ERP Limit (W) | 3.00 |
| Antenna Gain (dBi) | -4.60 |

| Bandwidth (MHz) | Modulation | Low Frequency (MHz) | Upper Frequency (MHz) | Conducted Average (dBm) | ERP Average (dBm) | ERP Average (W) | 99% BW (kHz) | Emission Designator |
|---|---|---|---|---|---|---|---|---|
| 1.4 | QPSK | 699.7 | 715.3 | 24.6 | 17.85 | 0.061 | 1081.7 | 1M08G7W |
| | 16QAM | | | 23.9 | 17.15 | 0.052 | 1084.9 | 1M08D7W |
| 3.0 | QPSK | 700.5 | 714.5 | 24.5 | 17.75 | 0.060 | 2684.3 | 2M68G7W |
| | 16QAM | | | 24.0 | 17.25 | 0.053 | 2681 | 2M68D7W |
| 5.0 | QPSK | 701.5 | 713.5 | 24.6 | 17.85 | 0.061 | 4495.2 | 4M50G7W |
| | 16QAM | | | 24.1 | 17.35 | 0.054 | 4486.1 | 4M49D7W |
| 10.0 | QPSK | 704.0 | 711.0 | 24.6 | 17.85 | 0.061 | 8940.3 | 8M94G7W |
| | 16QAM | | | 23.9 | 17.15 | 0.052 | 8941.3 | 8M94D7W |



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**LTE BAND 13**

| Part 27 / RSS 130 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| ERP Limit (W) | | 3.00 | | | | | | |
| Antenna Gain (dBi) | | -2.30 | | | | | | |
| Bandwidth (MHz) | Modulation | Low Frequency (MHz) | Upper Frequency (MHz) | Conducted Average (dBm) | ERP Average (dBm) | ERP Average (W) | 99% BW (kHz) | Emission Designator |
| 5.0 | QPSK | 779.5 | 784.5 | 24.4 | 19.95 | 0.099 | 4503.9 | 4M50G7W |
| | 16QAM | | | 23.9 | 19.45 | 0.088 | 4493.3 | 4M49D7W |
| 10.0 | QPSK | 782.0 | 782.0 | 24.4 | 19.95 | 0.099 | 8955.6 | 8M96G7W |
| | 16QAM | | | 23.5 | 19.05 | 0.080 | 8927.4 | 8M93D7W |

**LTE BAND 14**

| Part 90R / RSS 140 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| ERP Limit (W) | | 3.00 | | | | | | |
| Antenna Gain (dBi) | | -2.50 | | | | | | |
| Bandwidth (MHz) | Modulation | Low Frequency (MHz) | Upper Frequency (MHz) | Conducted Average (dBm) | ERP Average (dBm) | ERP Average (W) | 99% BW (kHz) | Emission Designator |
| 5.0 | QPSK | 790.5 | 795.5 | 24.5 | 19.85 | 0.097 | 4526.3 | 4M53G7W |
| | 16QAM | | | 24.0 | 19.35 | 0.086 | 4488.6 | 4M49D7W |
| 10.0 | QPSK | 793.0 | 793.0 | 24.5 | 19.85 | 0.097 | 8995.1 | 9M00G7W |
| | 16QAM | | | 23.5 | 18.85 | 0.077 | 8932 | 8M93D7W |

**LTE BAND 25**

| Part 24 / RSS 133 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| EIRP Limit (W) | | 2.00 | | | | | | |
| Antenna Gain (dBi) | | 0.40 | | | | | | |
| Bandwidth (MHz) | Modulation | Low Frequency (MHz) | Upper Frequency (MHz) | Conducted Average (dBm) | EIRP Average (dBm) | EIRP Average (W) | 99% BW (kHz) | Emission Designator |
| 1.4 | QPSK | 1850.7 | 1914.3 | 24.0 | 24.40 | 0.275 | 1087 | 1M09G7W |
| | 16QAM | | | 23.2 | 23.60 | 0.229 | 1088.8 | 1M09D7W |
| 3.0 | QPSK | 1851.5 | 1913.5 | 24.0 | 24.40 | 0.275 | 2676.2 | 2M68G7W |
| | 16QAM | | | 23.2 | 23.60 | 0.229 | 2688.7 | 2M69D7W |
| 5.0 | QPSK | 1852.5 | 1912.5 | 24.1 | 24.50 | 0.282 | 4497 | 4M50G7W |
| | 16QAM | | | 23.5 | 23.90 | 0.245 | 4485.5 | 4M49D7W |
| 10.0 | QPSK | 1855.0 | 1910.0 | 24.1 | 24.50 | 0.282 | 8952.1 | 8M95G7W |
| | 16QAM | | | 23.4 | 23.80 | 0.240 | 8956.3 | 8M96D7W |
| 15.0 | QPSK | 1857.5 | 1907.5 | 24.2 | 24.60 | 0.288 | 13408.4 | 13M4G7W |
| | 16QAM | | | 23.6 | 24.00 | 0.251 | 13448.1 | 13M4D7W |
| 20.0 | QPSK | 1860.0 | 1905.0 | 24.2 | 24.60 | 0.288 | 17883.5 | 17M9G7W |
| | 16QAM | | | 23.7 | 24.10 | 0.257 | 17888.6 | 17M9D7W |



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## LTE BAND 26 (FCC Part 90S)

| Part 90S | | | | | | | |
|---|---|---|---|---|---|---|---|
| Conducted Limit (W) | | 100.00 | | | | | |
| Bandwidth (MHz) | Modulation | Low Frequency (MHz) | Upper Frequency (MHz) | Conducted Average (dBm) | Conducted Average (W) | 99% BW (kHz) | Emission Designator |
| 1.4 | QPSK | 814.7 | 823.3 | 23.9 | 0.245 | 1086.7 | 1M09G7W |
| | 16QAM | | | 23.2 | 0.209 | 1094.6 | 1M09D7W |
| 3.0 | QPSK | 815.5 | 822.5 | 23.8 | 0.240 | 2682 | 2M68G7W |
| | 16QAM | | | 23.2 | 0.209 | 2684.4 | 2M68D7W |
| 5.0 | QPSK | 816.5 | 821.5 | 23.9 | 0.245 | 4495.2 | 4M50G7W |
| | 16QAM | | | 23.4 | 0.219 | 4499.2 | 4M50D7W |
| 10.0 | QPSK | 819.0 | 819.0 | 23.9 | 0.245 | 8942.3 | 8M94G7W |
| | 16QAM | | | 22.9 | 0.195 | 8932.3 | 8M93D7W |

## LTE BAND 26 (FCC Part 22)

| Part 22 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| ERP Limit (W) | | 7.00 | | | | | | |
| Antenna Gain (dBi) | | -1.10 | | | | | | |
| Bandwidth (MHz) | Modulation | Low Frequency (MHz) | Upper Frequency (MHz) | Conducted Average (dBm) | ERP Average (dBm) | ERP Average (W) | 99% BW (kHz) | Emission Designator |
| 1.4 | QPSK | 824.7 | 848.3 | 23.8 | 20.55 | 0.114 | 1080.3 | 1M08G7W |
| | 16QAM | | | 23.2 | 19.95 | 0.099 | 1086.8 | 1M09D7W |
| 3.0 | QPSK | 825.5 | 847.5 | 23.8 | 20.55 | 0.114 | 2690.7 | 2M69G7W |
| | 16QAM | | | 23.2 | 19.95 | 0.099 | 2686.7 | 2M69D7W |
| 5.0 | QPSK | 826.5 | 846.5 | 23.9 | 20.65 | 0.116 | 4494.5 | 4M49G7W |
| | 16QAM | | | 23.3 | 20.05 | 0.101 | 4490.8 | 4M49D7W |
| 10.0 | QPSK | 829.0 | 844.0 | 23.9 | 20.65 | 0.116 | 8958.2 | 8M96G7W |
| | 16QAM | | | 23.2 | 19.95 | 0.099 | 8951.3 | 8M95D7W |
| 15.0 | QPSK | 831.5 | 841.5 | 24.0 | 20.75 | 0.119 | 13397.3 | 13M4G7W |
| | 16QAM | | | 23.4 | 20.15 | 0.104 | 13353.8 | 13M4D7W |

## LTE BAND 30

| Part 27 / RSS 195 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| EIRP Limit (W) | | 0.25 | | | | | | |
| Antenna Gain (dBi) | | 0.00 | | | | | | |
| Bandwidth (MHz) | Modulation | Low Frequency (MHz) | Upper Frequency (MHz) | Conducted Average (dBm) | EIRP Average (dBm) | EIRP Average (W) | 99% BW (kHz) | Emission Designator |
| 5.0 | QPSK | 2307.5 | 2312.5 | 23.0 | 23.00 | 0.200 | 4494.8 | 4M49G7W |
| | 16QAM | | | 22.1 | 22.10 | 0.162 | 4487.2 | 4M49D7W |
| 10.0 | QPSK | 2310.0 | 2310.0 | 22.9 | 22.90 | 0.195 | 8946.7 | 8M95G7W |
| | 16QAM | | | 22.0 | 22.00 | 0.158 | 8943.4 | 8M94D7W |



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**LTE BAND 41**

| Part 27 | |
|---|---|
| EIRP Limit (W) | 2.00 |
| Antenna Gain (dBi) | 0.70 |

| Bandwidth (MHz) | Modulation | Low Frequency (MHz) | Upper Frequency (MHz) | Conducted Average (dBm) | EIRP Average (dBm) | EIRP Average (W) | 99% BW (kHz) | Emission Designator |
|---|---|---|---|---|---|---|---|---|
| 5.0 | QPSK | 2498.5 | 2687.5 | 24.1 | 24.80 | 0.302 | 4505.1 | 4M51G7W |
| | 16QAM | | | 23.0 | 23.70 | 0.234 | 4486.8 | 4M49D7W |
| 10.0 | QPSK | 2501.0 | 2685.0 | 23.9 | 24.60 | 0.288 | 8994.5 | 8M99G7W |
| | 16QAM | | | 22.9 | 23.60 | 0.229 | 8963.5 | 8M96D7W |
| 15.0 | QPSK | 2503.5 | 2682.5 | 24.3 | 25.00 | 0.316 | 13424 | 13M4G7W |
| | 16QAM | | | 23.3 | 24.00 | 0.251 | 13433 | 13M4D7W |
| 20.0 | QPSK | 2506.0 | 2680.0 | 24.2 | 24.90 | 0.309 | 17880 | 17M9G7W |
| | 16QAM | | | 23.3 | 24.00 | 0.251 | 17891 | 17M9D7W |

**LTE BAND 66**

| Part 27 / RSS 139 | |
|---|---|
| EIRP Limit (W) | 1.00 |
| Antenna Gain (dBi) | 0.60 |

| Bandwidth (MHz) | Modulation | Low Frequency (MHz) | Upper Frequency (MHz) | Conducted Average (dBm) | EIRP Average (dBm) | EIRP Average (W) | 99% BW (kHz) | Emission Designator |
|---|---|---|---|---|---|---|---|---|
| 1.4 | QPSK | 1710.7 | 1779.3 | 23.8 | 24.40 | 0.275 | 1078.9 | 1M08G7W |
| | 16QAM | | | 23.0 | 23.60 | 0.229 | 1086.1 | 1M09D7W |
| 3.0 | QPSK | 1711.5 | 1778.5 | 23.7 | 24.30 | 0.269 | 2677.7 | 2M68G7W |
| | 16QAM | | | 23.0 | 23.60 | 0.229 | 2690.7 | 2M69D7W |
| 5.0 | QPSK | 1712.5 | 1777.5 | 24.1 | 24.70 | 0.295 | 4509.5 | 4M51G7W |
| | 16QAM | | | 23.5 | 24.10 | 0.257 | 4497 | 4M50D7W |
| 10.0 | QPSK | 1715.0 | 1775.0 | 23.9 | 24.50 | 0.282 | 8980.1 | 8M98G7W |
| | 16QAM | | | 23.3 | 23.90 | 0.245 | 8948.1 | 8M95D7W |
| 15.0 | QPSK | 1717.5 | 1772.5 | 24.2 | 24.80 | 0.302 | 13410.8 | 13M4G7W |
| | 16QAM | | | 23.6 | 24.20 | 0.263 | 13386 | 13M4D7W |
| 20.0 | QPSK | 1720.0 | 1770.0 | 24.1 | 24.70 | 0.295 | 17826.6 | 17M8G7W |
| | 16QAM | | | 23.7 | 24.30 | 0.269 | 17881.5 | 17M9D7W |



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## 5.3. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was Baseband version is .0.c11-00081.1-SM8150_GEN_PACK-1

## 5.4. MAXIMUM ANTENNA GAIN

Please see table below:

| LTE Bands | Antenna Gain (dBi) |
|---|---|
| LTE Band 2, 1850 – 1910 MHz | 0.4 |
| LTE Band 4, 1710 – 1755 MHz | 0.6 |
| LTE Band 5, 824 – 849 MHz | -1.1 |
| LTE Band 7, 2500 – 2570 MHz | -0.4 |
| LTE Band 12, 699 – 716 MHz | -4.6 |
| LTE Band 13, 777 – 787 MHz | -2.3 |
| LTE Band 14, 788 – 798 MHz | -2.5 |
| LTE Band 25, 1850 – 1915 MHz | 0.4 |
| LTE Band 26, 814 – 849 MHz | -1.1 |
| LTE Band 30, 2305 – 2315 MHz | 0.0 |
| LTE Band 41, 2496 – 2690 MHz | 0.7 |
| LTE Band 66, 1710 – 1780 MHz | 0.6 |

## 5.5. WORST-CASE CONFIGURATION AND MODE

The worst-case scenario for all measurements is based on the average conducted output power measurement investigation results. Output power measurements were measured on QPSK, 16QAM and 64QAM modulations. It was found that QPSK and 16QAM results were worst case. All testing was performed using QPSK and 16QAM modulations to represent the worst case.

The EUT was investigated in three orthogonal orientations X/Y/Z. Additionally, the EUT was investigated in four configurations with both screens: folded and closed/open 90 degrees/flat 180 degrees/folded and open. It was determined that the EUT with both screens folded and closed with X (Flatbed) orientation was worst-case orientation for LTE band 5, LTE band 12, LTE band 13, LTE band 14, and LTE band 26 with the AC/DC adapter; the EUT with both screens flat 180 degrees with Y (Landscape) orientation was worst-case orientation for LTE band 2, LTE band 4, LTE band 7, LTE band 25, LTE band 30, LTE band 41, and LTE band 66 with the AC/DC adapter.

Radiated spurious emissions were investigated from 9kHz to 30MHz, 30MHz-1GHz and above 1GHz. There were no emissions found with less than 20dB of margin from 9kHz to 1GHz.

For supported simultaneous transmission of any BT/BLE/WLAN (2.4GHz) and WWAN bands or WLAN 5GHz and WWAN bands, tests were conducted for various configurations having the highest power, least separation in frequencies and widest operation bandwidths. Please refer to 2.4GHz and 5GHz WLAN reports for results.



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## 5.6. DESCRIPTION OF TEST SETUP

| SUPPORT TEST EQUIPMENT | | | | |
|---|---|---|---|---|
| **Description** | **Manufacturer** | **Model** | **Serial Number** | **FCC ID/ DoC** |
| AC/DC adapter | Microsoft | 1847 | 0D130V01NZD9C | DoC |

| I/O CABLES (RF CONDUCTED TEST) | | | | | | |
|---|---|---|---|---|---|---|
| **Cable No.** | **Port** | **# of Identical Ports** | **Connector Type** | **Cable Type** | **Cable Length (m)** | **Remarks** |
| 1 | AC | 1 | 3-prongs | Un-shielded | 2.0 | N/A |
| 2 | DC | 1 | USB-C | Shielded | 1.75 | N/A |
| 3 | RF In/Out | 1 | SMA | Un-shielded | 0.28 | N/A |
| 4 | RF In/Out | 1 | SMA | Un-shielded | 1 | N/A |
| 5 | RF In/Out | 1 | Barrel | N/A | N/A | N/A |

| I/O CABLES (RF RADIATED TEST) | | | | | | |
|---|---|---|---|---|---|---|
| **Cable No.** | **Port** | **# of Identical Ports** | **Connector Type** | **Cable Type** | **Cable Length (m)** | **Remarks** |
| 1 | DC | 1 | USB-C | Shielded | 1.75 | N/A |




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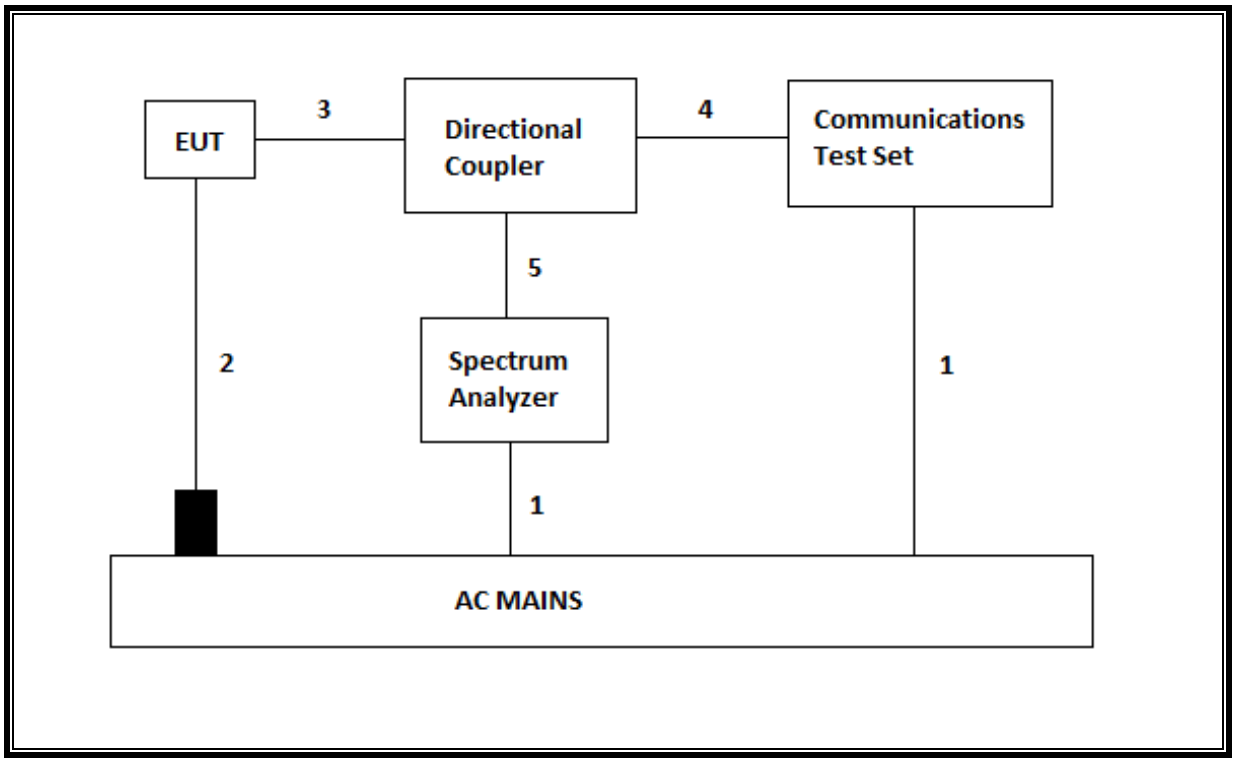
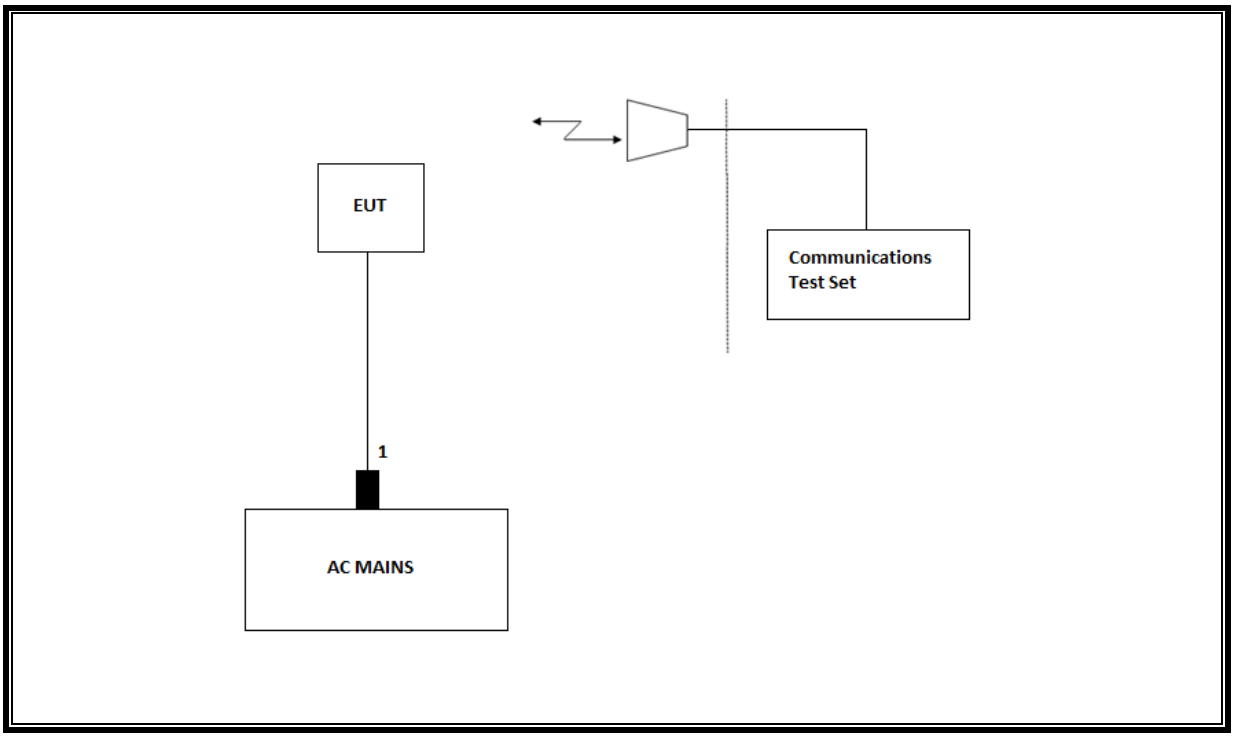
**CONDUCTED SETUP**




**RADIATED SETUP**







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# 6. TEST AND MEASUREMENT EQUIPMENT

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

| TEST EQUIPMENT LIST (Fremont Building 1) | | | | |
|---|---|---|---|---|
| **Description** | **Manufacturer** | **Model** | **Asset** | **Cal Due** |
| Directional Coupler | KRYTAR | 152610 | T922 | 07/05/2020 |
| Directional Coupler | Mini-Circuits | ZUDC10-183+ | PRE0181619 | 08/21/2020 |
| Power Meter, P-series single channel | Keysight | N1911A | T1269 | 01/21/2021 |
| Power Sensor, P - series, 50MHz to 18GHz, Wideband | Keysight | N1921A | T1225 | 02/13/2021 |
| Wideband Communication Test Set, Call Box | R&S | CMW500 | T1871 | 02/25/2021 |
| Wideband Communication Test Set, Call Box | R&S | CMW500 | T260 | 02/19/2021 |
| Wideband Communication Test Set, Call Box | R&S | CMW500 | T979 | 02/26/2021 |
| *Chamber, Environmental | Thermotron | SE-600-10-10 | T80 | 05/07/2020 |
| Spectrum Analyzer, PSA 3Hz to 26.5GHz | Agilent (Keysight) Technologies | E4440A | T200 | 01/24/2021 |
| Spectrum Analyzer, PXA 3Hz to 44GHz | Agilent (Keysight) Technologies | N9030A | T908 | 01/28/2021 |
| DC Power Supply 15V | Sorensen | XT15-4 | T463 | CnR |
| **UL AUTOMATION SOFTWARE** | | | | |
| CLT Software | UL | UL RF | Ver 2.7 and 2.8.1 | |
| Power Measurement Software | UL | UL RF | Ver 2.7, 2019 | |

| TEST EQUIPMENT LIST(Morrisville - South Chamber) | | | | |
|---|---|---|---|---|
| **Description** | **Manufacturer** | **Model** | **Asset** | **Cal Due** |
| Horn Antenna, 18-26.5GHz | ARA | MWH-1826/B | AT0076 | 11/07/2020 |
| *Spectrum Analyzer | Agilent | N9030A | SA0027 | 05/15/2020 |
| Environmental Meter | Fisher Scientific | 15-077-963 | s/n 181474409 | 07/27/2020 |
| Wideband Radio Communications Tester | Rohde and Schwartz | CMW500 | T374 | 07/08/2020 |
| 1GHz high-pass filter, 2W, Fhigh =10GHz | Micro-Tronics | HPM17672 | HPF009 | 02/19/2021 |
| **UL AUTOMATION SOFTWARE** | | | | |
| Radiated test software | UL | UL RF | Ver 9.5 June 12, 2019 | |



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| TEST EQUIPMENT LIST(Morrisville - North Chamber) | | | | |
|---|---|---|---|---|
| **Description** | **Manufacturer** | **Model** | **Asset** | **Cal Due** |
| Active Loop Antenna | ETS-Lindgren | 6502 | AT0079 | 08/08/2020 |
| Hybrid Broadband Antenna | Sunol Sciences Corp. | JB3 | AT0073 | 08/08/2020 |
| *Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz | ETS Lindgren | 3117 | AT0069 | 05/15/2020 |
| Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz | ETS Lindgren | 3117 | AT0072 | 04/27/2021 |
| *Spectrum Analyzer | Agilent | N9030A | SA0026 | 03/30/2020 |
| Spectrum Analyzer | Agilent | N9030A | SA0025 | 03/17/2021 |
| Environmental Meter | Fisher Scientific | 15-077-963 | s/n 181474341 | 07/27/2020 |
| Wideband Radio Communications Tester | Rohde and Schwartz | CMW500 | T959 | 02/19/2021 |
| Wideband Radio Communications Tester | Rohde and Schwartz | CMW500 | T978 | 02/20/2021 |
| Wideband Radio Communications Tester | Rohde and Schwartz | CMW500 | T374 | 07/08/2020 |
| 1GHz high-pass filter, 2W, $F_{high}$ =10GHz | Micro-Tronics | HPM17672 | HPF009 | 02/19/2021 |
| 4GHz high-pass filter, 2W, $F_{high}$ =18GHz | Micro-Tronics | HPM13351 | HPF015 | 02/19/2021 |
| 3GHz high-pass filter | Micro-Tronics | HPM17543 | HPF014 | 02/19/2021 |
| DC-1000MHz low-pass filter | Pasternack | PE8720 | LPF008 | 02/19/2021 |
| 900MHz notch filter, 2W, Fhigh =6GHz | Micro-Tronics | BRM50706 | BRF001 | 02/19/2021 |
| **UL AUTOMATION SOFTWARE** | | | | |
| Radiated test software | UL | UL RF | Ver 9.5 June 12, 2019 | |

**NOTES:**

1. * Testing is completed before equipment expiration date.



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# 7. RF OUTPUT POWER VERIFICATION

## CONDUCTED OUTPUT POWER MEASUREMENT PROCEDURE

All LTE bands conducted average power is obtained from the CMW500 telecommunication test set.

The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS36.101 specification.

UE Power Class: 3 (23 +/- 2dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101.

**Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3**

| Modulation | Channel bandwidth / Transmission bandwidth ($N_{RB}$) | | | | | | MPR (dB) |
|---|---|---|---|---|---|---|---|
| | 1.4 MHz | 3.0 MHz | 5 MHz | 10 MHz | 15 MHz | 20 MHz | |
| QPSK | > 5 | > 4 | > 8 | > 12 | > 16 | > 18 | ≤ 1 |
| 16 QAM | ≤ 5 | ≤ 4 | ≤ 8 | ≤ 12 | ≤ 16 | ≤ 18 | ≤ 1 |
| 16 QAM | > 5 | > 4 | > 8 | > 12 | > 16 | > 18 | ≤ 2 |
| 64 QAM | ≤ 5 | ≤ 4 | ≤ 8 | ≤ 12 | ≤ 16 | ≤ 18 | ≤ 2 |
| 64 QAM | > 5 | > 4 | > 8 | > 12 | > 16 | > 18 | ≤ 3 |
| 256 QAM | ≥ 1 | | | | | | ≤ 5 |

The allowed A-MPR values specified below in Table 6.2.4.-1 of 3GPP TS36.101 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signaling Value of "NS_01".

**Table 6.2.4-1: Additional Maximum Power Reduction (A-MPR)**

| Network Signalling value | Requirements (subclause) | E-UTRA Band | Channel bandwidth (MHz) | Resources Blocks ($N_{RB}$) | A-MPR (dB) |
|---|---|---|---|---|---|
| NS_01 | 6.6.2.1.1 | Table 5.5-1 | 1.4, 3, 5, 10, 15, 20 | Table 5.6-1 | N/A |

## RESULTS

EUT includes different power levels for head use configuration and body use configuration and the below tables contain the highest of all configurations average conducted output powers as follows:




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## 7.1. LTE BAND 2

| Test Engineer ID: | 39005 RA | Test Date: | 2/26/2020 |
|---|---|---|---|

**OUTPUT POWER FOR LTE BAND 2 (1.4 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 18607 | 18900 | 19193 |
| | | | | 1850.7 MHz | 1880.0 MHz | 1909.3 MHz |
| 1.4 | QPSK | 1 | 0 | 23.8 | 23.7 | 23.8 |
| | | 1 | 2 | 23.9 | 23.9 | 23.9 |
| | | 1 | 5 | 23.9 | 23.8 | 23.8 |
| | | 3 | 0 | 23.8 | 23.7 | 23.7 |
| | | 3 | 1 | 23.9 | 23.8 | 23.8 |
| | | 3 | 2 | **23.9** | 23.8 | 23.8 |
| | | 6 | 0 | 22.9 | 22.8 | 22.8 |
| | 16QAM | 1 | 0 | 23.2 | 22.7 | 22.9 |
| | | 1 | 2 | 23.2 | 22.9 | 23.0 |
| | | 1 | 5 | **23.2** | 22.9 | 22.9 |
| | | 3 | 0 | 22.9 | 22.9 | 22.8 |
| | | 3 | 1 | 23.0 | 23.0 | 22.8 |
| | | 3 | 2 | 23.0 | 23.0 | 22.9 |
| | | 6 | 0 | 21.8 | 22.0 | 22.0 |
| | 64QAM | 1 | 0 | 22.0 | 21.7 | 21.7 |
| | | 1 | 2 | **22.1** | 21.8 | 21.8 |
| | | 1 | 5 | 22.0 | 21.8 | 21.8 |
| | | 3 | 0 | 21.9 | 21.7 | 21.5 |
| | | 3 | 1 | 21.9 | 21.8 | 21.6 |
| | | 3 | 2 | 22.0 | 21.8 | 21.6 |
| | | 6 | 0 | 20.7 | 21.0 | 20.7 |

**OUTPUT POWER FOR LTE BAND 2 (3.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 18615 | 18900 | 19185 |
| | | | | 1851.5 MHz | 1880.0 MHz | 1908.5 MHz |
| 3.0 | QPSK | 1 | 0 | 23.8 | 23.8 | 23.8 |
| | | 1 | 7 | 23.8 | 23.8 | 23.8 |
| | | 1 | 14 | 23.9 | **23.9** | 23.9 |
| | | 8 | 0 | 22.9 | 22.9 | 22.9 |
| | | 8 | 4 | 23.0 | 22.9 | 22.9 |
| | | 8 | 7 | 23.0 | 23.0 | 23.0 |
| | | 15 | 0 | 22.9 | 22.9 | 22.9 |
| | 16QAM | 1 | 0 | 22.9 | 22.7 | 23.2 |
| | | 1 | 7 | 22.9 | 22.8 | 23.1 |
| | | 1 | 14 | 22.9 | 22.8 | **23.3** |
| | | 8 | 0 | 21.9 | 21.9 | 22.0 |
| | | 8 | 4 | 22.0 | 22.0 | 22.0 |
| | | 8 | 7 | 22.1 | 22.1 | 22.0 |
| | | 15 | 0 | 21.9 | 21.9 | 21.9 |
| | 64QAM | 1 | 0 | 21.9 | 21.9 | 21.8 |
| | | 1 | 7 | 21.9 | 22.0 | 21.8 |
| | | 1 | 14 | 22.0 | **22.0** | 21.8 |
| | | 8 | 0 | 20.7 | 20.7 | 20.8 |
| | | 8 | 4 | 20.8 | 20.8 | 20.8 |
| | | 8 | 7 | 20.8 | 20.9 | 20.8 |
| | | 15 | 0 | 20.8 | 20.7 | 20.8 |



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**OUTPUT POWER FOR LTE BAND 2 (5.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 18625 | 18900 | 19175 |
| | | | | 1852.5 MHz | 1880.0 MHz | 1907.5 MHz |
| 5.0 | QPSK | 1 | 0 | 23.9 | 23.9 | 23.8 |
| | | 1 | 12 | 23.9 | 24.0 | 23.8 |
| | | 1 | 24 | 24.0 | **24.0** | 23.8 |
| | | 12 | 0 | 23.0 | 22.9 | 22.9 |
| | | 12 | 6 | 23.0 | 22.9 | 23.0 |
| | | 12 | 11 | 23.0 | 23.0 | 22.9 |
| | | 25 | 0 | 23.0 | 22.9 | 22.9 |
| | 16QAM | 1 | 0 | 23.0 | 23.0 | 23.4 |
| | | 1 | 12 | 23.0 | 23.1 | **23.4** |
| | | 1 | 24 | 23.0 | 23.1 | 23.3 |
| | | 12 | 0 | 22.0 | 21.9 | 22.1 |
| | | 12 | 6 | 22.0 | 22.0 | 22.1 |
| | | 12 | 11 | 22.1 | 22.1 | 22.1 |
| | | 25 | 0 | 21.9 | 21.9 | 22.0 |
| | 64QAM | 1 | 0 | 21.9 | 21.6 | 22.0 |
| | | 1 | 12 | 22.0 | 21.7 | 22.0 |
| | | 1 | 24 | **22.0** | 21.7 | 22.0 |
| | | 12 | 0 | 20.8 | 20.7 | 20.7 |
| | | 12 | 6 | 20.9 | 20.8 | 20.7 |
| | | 12 | 11 | 20.9 | 20.8 | 20.7 |
| | | 25 | 0 | 20.8 | 20.7 | 20.7 |

**OUTPUT POWER FOR LTE BAND 2 (10.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 18650 | 18900 | 19150 |
| | | | | 1855.0 MHz | 1880.0 MHz | 1905.0 MHz |
| 10.0 | QPSK | 1 | 0 | 23.7 | 23.7 | **23.9** |
| | | 1 | 24 | 23.7 | 23.9 | 23.9 |
| | | 1 | 49 | 23.8 | 23.8 | 23.8 |
| | | 25 | 0 | 22.9 | 22.9 | 22.9 |
| | | 25 | 12 | 23.0 | 22.9 | 22.9 |
| | | 25 | 24 | 22.9 | 22.9 | 22.9 |
| | | 50 | 0 | 22.9 | 22.9 | 22.9 |
| | 16QAM | 1 | 0 | 23.2 | 22.8 | 22.9 |
| | | 1 | 24 | 23.1 | 22.7 | 22.8 |
| | | 1 | 49 | **23.2** | 22.8 | 22.8 |
| | | 25 | 0 | 22.0 | 22.0 | 21.9 |
| | | 25 | 12 | 22.0 | 22.0 | 21.9 |
| | | 25 | 24 | 21.9 | 22.0 | 21.9 |
| | | 50 | 0 | 21.9 | 22.0 | 21.9 |
| | 64QAM | 1 | 0 | 21.7 | 22.0 | 21.9 |
| | | 1 | 24 | 21.8 | **22.0** | 21.9 |
| | | 1 | 49 | 21.8 | 22.0 | 21.8 |
| | | 25 | 0 | 20.8 | 20.8 | 20.8 |
| | | 25 | 12 | 20.8 | 20.8 | 20.8 |
| | | 25 | 24 | 20.8 | 20.7 | 20.8 |
| | | 50 | 0 | 20.7 | 20.7 | 20.7 |



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**OUTPUT POWER FOR LTE BAND 2 (15.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 18675 | 18900 | 19125 |
| | | | | 1857.5 MHz | 1880.0 MHz | 1902.5 MHz |
| 15.0 | QPSK | 1 | 0 | 24.0 | 24.0 | 24.0 |
| | | 1 | 37 | 23.9 | 23.9 | 23.8 |
| | | 1 | 74 | **24.0** | 23.9 | 24.0 |
| | | 36 | 0 | 23.0 | 23.0 | 23.0 |
| | | 36 | 16 | 23.1 | 23.1 | 23.1 |
| | | 36 | 35 | 23.1 | 23.1 | 23.1 |
| | | 75 | 0 | 23.1 | 23.1 | 23.0 |
| | 16QAM | 1 | 0 | 23.3 | 22.9 | 23.4 |
| | | 1 | 37 | 23.2 | 22.9 | 23.2 |
| | | 1 | 74 | 23.4 | 22.9 | **23.4** |
| | | 36 | 0 | 22.0 | 22.0 | 22.1 |
| | | 36 | 16 | 22.0 | 22.0 | 22.1 |
| | | 36 | 35 | 22.1 | 22.1 | 22.1 |
| | | 75 | 0 | 22.0 | 22.0 | 22.1 |
| | 64QAM | 1 | 0 | 22.3 | 22.1 | 21.9 |
| | | 1 | 37 | 22.3 | 22.0 | 21.8 |
| | | 1 | 74 | **22.4** | 22.1 | 22.0 |
| | | 36 | 0 | 20.8 | 20.8 | 20.9 |
| | | 36 | 16 | 20.9 | 20.9 | 20.9 |
| | | 36 | 35 | 20.9 | 20.9 | 21.0 |
| | | 75 | 0 | 20.9 | 20.8 | 20.9 |

**OUTPUT POWER FOR LTE BAND 2 (20.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 18700 | 18900 | 19100 |
| | | | | 1860.0 MHz | 1880.0 MHz | 1900.0 MHz |
| 20.0 | QPSK | 1 | 0 | 23.9 | 24.0 | 24.0 |
| | | 1 | 49 | 23.9 | 24.0 | 23.9 |
| | | 1 | 99 | 23.9 | 24.0 | **24.0** |
| | | 50 | 0 | 23.0 | 23.0 | 23.0 |
| | | 50 | 24 | 23.0 | 23.1 | 23.0 |
| | | 50 | 49 | 23.0 | 23.1 | 23.1 |
| | | 100 | 0 | 23.0 | 23.0 | 23.0 |
| | 16QAM | 1 | 0 | 23.3 | 23.4 | 23.4 |
| | | 1 | 49 | 23.3 | 23.4 | 23.4 |
| | | 1 | 99 | 23.3 | **23.5** | 23.4 |
| | | 50 | 0 | 22.0 | 22.0 | 22.1 |
| | | 50 | 24 | 22.0 | 22.1 | 22.1 |
| | | 50 | 49 | 22.0 | 22.1 | 22.1 |
| | | 100 | 0 | 22.0 | 22.1 | 22.1 |
| | 64QAM | 1 | 0 | 22.0 | 22.0 | 22.4 |
| | | 1 | 49 | 22.0 | 22.1 | 22.4 |
| | | 1 | 99 | 22.0 | 22.1 | **22.5** |
| | | 50 | 0 | 20.8 | 20.8 | 20.8 |
| | | 50 | 24 | 20.8 | 20.9 | 20.9 |
| | | 50 | 49 | 20.8 | 20.9 | 20.9 |
| | | 100 | 0 | 20.8 | 20.8 | 20.8 |



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## 7.2. LTE BAND 4

| Test Engineer ID: | 39005 RA | Test Date: | 2/26/2020 |
|---|---|---|---|

**OUTPUT POWER FOR LTE BAND 4 (1.4 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 19957 | 20175 | 20393 |
| | | | | 1710.7 MHz | 1732.5 MHz | 1754.3 MHz |
| 1.4 | QPSK | 1 | 0 | 23.8 | 23.8 | 23.8 |
| | | 1 | 2 | 23.9 | 23.9 | 23.9 |
| | | 1 | 5 | 23.8 | 23.8 | 23.8 |
| | | 3 | 0 | 23.9 | 23.9 | 23.8 |
| | | 3 | 1 | 23.9 | 23.9 | 23.9 |
| | | 3 | 2 | **23.9** | 23.9 | 23.9 |
| | | 6 | 0 | 22.9 | 22.9 | 22.8 |
| | 16QAM | 1 | 0 | 23.2 | 22.9 | 22.9 |
| | | 1 | 2 | 23.3 | 23.0 | 23.0 |
| | | 1 | 5 | **23.3** | 23.0 | 23.0 |
| | | 3 | 0 | 23.1 | 23.1 | 22.9 |
| | | 3 | 1 | 23.1 | 23.2 | 23.0 |
| | | 3 | 2 | 23.1 | 23.2 | 23.0 |
| | | 6 | 0 | 21.8 | 22.2 | 22.0 |
| | 64QAM | 1 | 0 | 22.1 | 21.9 | 21.9 |
| | | 1 | 2 | **22.3** | 22.1 | 22.0 |
| | | 1 | 5 | 22.1 | 22.0 | 22.0 |
| | | 3 | 0 | 22.1 | 22.0 | 21.7 |
| | | 3 | 1 | 22.1 | 22.1 | 21.8 |
| | | 3 | 2 | 22.1 | 22.1 | 21.8 |
| | | 6 | 0 | 20.8 | 21.2 | 20.9 |

**OUTPUT POWER FOR LTE BAND 4 (3.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 19965 | 20175 | 20385 |
| | | | | 1711.5 MHz | 1732.5 MHz | 1753.5 MHz |
| 3.0 | QPSK | 1 | 0 | 23.8 | 23.8 | 23.9 |
| | | 1 | 7 | 23.8 | **23.9** | 23.9 |
| | | 1 | 14 | 23.8 | 23.9 | 23.8 |
| | | 8 | 0 | 22.9 | 22.9 | 22.9 |
| | | 8 | 4 | 22.9 | 23.0 | 22.9 |
| | | 8 | 7 | 23.0 | 23.0 | 22.9 |
| | | 15 | 0 | 23.0 | 22.9 | 23.0 |
| | 16QAM | 1 | 0 | 22.9 | 22.7 | **23.2** |
| | | 1 | 7 | 22.9 | 22.8 | 23.2 |
| | | 1 | 14 | 22.9 | 22.8 | 23.2 |
| | | 8 | 0 | 22.0 | 22.0 | 22.0 |
| | | 8 | 4 | 22.0 | 22.1 | 22.1 |
| | | 8 | 7 | 22.0 | 22.2 | 22.1 |
| | | 15 | 0 | 22.0 | 22.0 | 22.0 |
| | 64QAM | 1 | 0 | 22.0 | 22.1 | 21.9 |
| | | 1 | 7 | 22.0 | **22.1** | 22.0 |
| | | 1 | 14 | 21.9 | 22.1 | 22.0 |
| | | 8 | 0 | 20.8 | 20.9 | 20.9 |
| | | 8 | 4 | 20.8 | 20.9 | 20.9 |
| | | 8 | 7 | 20.8 | 21.0 | 20.9 |
| | | 15 | 0 | 20.9 | 20.8 | 20.9 |



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**OUTPUT POWER FOR LTE BAND 4 (5.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 19975 | 20175 | 20375 |
| | | | | 1712.5 MHz | 1732.5 MHz | 1752.5 MHz |
| 5.0 | QPSK | 1 | 0 | 23.9 | 23.9 | 23.8 |
| | | 1 | 12 | 24.0 | **24.0** | 23.9 |
| | | 1 | 24 | 23.8 | 24.0 | 23.8 |
| | | 12 | 0 | 22.9 | 22.9 | 22.9 |
| | | 12 | 6 | 23.0 | 22.9 | 23.0 |
| | | 12 | 11 | 23.0 | 23.0 | 23.0 |
| | | 25 | 0 | 23.0 | 22.9 | 22.9 |
| | 16QAM | 1 | 0 | 23.0 | 23.0 | 23.4 |
| | | 1 | 12 | 23.0 | 23.1 | **23.4** |
| | | 1 | 24 | 23.0 | 23.0 | 23.4 |
| | | 12 | 0 | 22.0 | 22.1 | 22.1 |
| | | 12 | 6 | 22.1 | 22.1 | 22.1 |
| | | 12 | 11 | 22.0 | 22.1 | 22.1 |
| | | 25 | 0 | 22.0 | 22.0 | 22.0 |
| | 64QAM | 1 | 0 | 22.0 | 21.8 | 22.1 |
| | | 1 | 12 | 22.1 | 21.9 | **22.2** |
| | | 1 | 24 | 22.0 | 21.8 | 22.1 |
| | | 12 | 0 | 20.8 | 20.9 | 20.8 |
| | | 12 | 6 | 20.9 | 21.0 | 20.8 |
| | | 12 | 11 | 20.9 | 21.0 | 20.9 |
| | | 25 | 0 | 20.9 | 20.9 | 20.8 |

**OUTPUT POWER FOR LTE BAND 4 (10.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 20000 | 20175 | 20350 |
| | | | | 1715.0 MHz | 1732.5 MHz | 1750.0 MHz |
| 10.0 | QPSK | 1 | 0 | 23.7 | 23.8 | 23.8 |
| | | 1 | 24 | 23.7 | **23.9** | 23.8 |
| | | 1 | 49 | 23.8 | 23.8 | 23.7 |
| | | 25 | 0 | 22.9 | 23.0 | 23.0 |
| | | 25 | 12 | 22.9 | 23.0 | 23.0 |
| | | 25 | 24 | 22.9 | 22.9 | 22.9 |
| | | 50 | 0 | 22.9 | 23.0 | 22.9 |
| | 16QAM | 1 | 0 | 22.7 | 23.2 | 22.9 |
| | | 1 | 24 | 22.8 | **23.3** | 23.0 |
| | | 1 | 49 | 22.7 | 23.2 | 22.9 |
| | | 25 | 0 | 22.0 | 22.1 | 22.1 |
| | | 25 | 12 | 22.0 | 22.1 | 22.1 |
| | | 25 | 24 | 21.9 | 22.0 | 22.0 |
| | | 50 | 0 | 21.9 | 22.0 | 22.0 |
| | 64QAM | 1 | 0 | 21.9 | 22.1 | 21.9 |
| | | 1 | 24 | 22.0 | 22.0 | 21.8 |
| | | 1 | 49 | 21.9 | **22.2** | 21.9 |
| | | 25 | 0 | 20.9 | 21.0 | 21.0 |
| | | 25 | 12 | 20.9 | 21.0 | 21.0 |
| | | 25 | 24 | 20.8 | 20.9 | 20.9 |
| | | 50 | 0 | 20.8 | 20.9 | 20.9 |



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**OUTPUT POWER FOR LTE BAND 4 (15.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 20025 | 20175 | 20325 |
| | | | | 1717.5 MHz | 1732.5 MHz | 1747.5 MHz |
| 15.0 | QPSK | 1 | 0 | 23.9 | 24.0 | 24.0 |
| | | 1 | 37 | 23.8 | 23.9 | 23.9 |
| | | 1 | 74 | 23.9 | **24.1** | 24.0 |
| | | 36 | 0 | 23.0 | 23.1 | 23.1 |
| | | 36 | 16 | 23.0 | 23.1 | 23.1 |
| | | 36 | 35 | 23.0 | 23.1 | 23.0 |
| | | 75 | 0 | 23.0 | 23.1 | 23.0 |
| | 16QAM | 1 | 0 | 23.0 | **23.5** | 23.4 |
| | | 1 | 37 | 23.0 | 23.3 | 23.3 |
| | | 1 | 74 | 23.0 | 23.4 | 23.4 |
| | | 36 | 0 | 22.1 | 22.2 | 22.1 |
| | | 36 | 16 | 22.1 | 22.2 | 22.1 |
| | | 36 | 35 | 22.0 | 22.2 | 22.0 |
| | | 75 | 0 | 22.1 | 22.1 | 22.1 |
| | 64QAM | 1 | 0 | 22.5 | 22.3 | 22.2 |
| | | 1 | 37 | 22.4 | 22.1 | 22.2 |
| | | 1 | 74 | **22.6** | 22.4 | 22.1 |
| | | 36 | 0 | 20.9 | 21.0 | 21.0 |
| | | 36 | 16 | 20.9 | 21.0 | 21.0 |
| | | 36 | 35 | 20.9 | 21.0 | 21.0 |
| | | 75 | 0 | 21.0 | 21.0 | 21.0 |

**OUTPUT POWER FOR LTE BAND 4 (20.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 20050 | 20175 | 20300 |
| | | | | 1720.0 MHz | 1732.5 MHz | 1745.0 MHz |
| 20.0 | QPSK | 1 | 0 | 24.1 | 24.0 | **24.1** |
| | | 1 | 49 | 24.0 | 24.0 | 23.9 |
| | | 1 | 99 | 24.0 | 24.1 | 23.9 |
| | | 50 | 0 | 23.1 | 23.1 | 23.1 |
| | | 50 | 24 | 23.1 | 23.2 | 23.1 |
| | | 50 | 49 | 23.1 | 23.1 | 23.1 |
| | | 100 | 0 | 23.1 | 23.1 | 23.0 |
| | 16QAM | 1 | 0 | 23.4 | 23.7 | 23.6 |
| | | 1 | 49 | 23.3 | 23.6 | 23.5 |
| | | 1 | 99 | 23.4 | **23.7** | 23.4 |
| | | 50 | 0 | 22.1 | 22.2 | 22.2 |
| | | 50 | 24 | 22.1 | 22.2 | 22.2 |
| | | 50 | 49 | 22.1 | 22.2 | 22.1 |
| | | 100 | 0 | 22.1 | 22.2 | 22.1 |
| | 64QAM | 1 | 0 | 22.2 | 22.4 | **22.6** |
| | | 1 | 49 | 22.1 | 22.4 | 22.6 |
| | | 1 | 99 | 22.2 | 22.4 | 22.6 |
| | | 50 | 0 | 20.9 | 21.1 | 21.0 |
| | | 50 | 24 | 21.0 | 21.1 | 21.1 |
| | | 50 | 49 | 21.0 | 21.1 | 21.0 |
| | | 100 | 0 | 20.9 | 21.0 | 21.0 |



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## 7.3. LTE BAND 5

| Test Engineer ID: | 39005 RA | Test Date: | 2/28/2020 |
|---|---|---|---|

**OUTPUT POWER FOR LTE BAND 5 (1.4 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 20407 | 20525 | 20643 |
| | | | | 824.7 MHz | 836.5 MHz | 848.3 MHz |
| 1.4 | QPSK | 1 | 0 | 23.8 | 23.7 | 23.5 |
| | | 1 | 2 | 23.8 | 23.8 | 23.7 |
| | | 1 | 5 | 23.8 | 23.8 | 23.7 |
| | | 3 | 0 | 23.7 | 23.7 | 23.6 |
| | | 3 | 1 | 23.8 | 23.8 | 23.7 |
| | | 3 | 2 | 23.8 | **23.8** | 23.7 |
| | | 6 | 0 | 22.8 | 22.8 | 22.7 |
| | 16QAM | 1 | 0 | 22.8 | 23.0 | 22.6 |
| | | 1 | 2 | 22.9 | **23.2** | 22.7 |
| | | 1 | 5 | 22.9 | 23.2 | 22.8 |
| | | 3 | 0 | 22.8 | 22.9 | 22.8 |
| | | 3 | 1 | 22.9 | 23.0 | 22.9 |
| | | 3 | 2 | 22.9 | 23.0 | 22.9 |
| | | 6 | 0 | 22.0 | 21.8 | 21.9 |
| | 64QAM | 1 | 0 | 21.9 | 21.8 | 22.0 |
| | | 1 | 2 | 22.0 | 22.0 | **22.2** |
| | | 1 | 5 | 21.9 | 22.0 | 22.0 |
| | | 3 | 0 | 21.9 | 21.6 | 21.9 |
| | | 3 | 1 | 21.9 | 21.7 | 22.0 |
| | | 3 | 2 | 21.9 | 21.8 | 22.1 |
| | | 6 | 0 | 21.1 | 20.9 | 20.6 |

**OUTPUT POWER FOR LTE BAND 5 (3.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 20415 | 20525 | 20635 |
| | | | | 825.5 MHz | 836.5 MHz | 847.5 MHz |
| 3.0 | QPSK | 1 | 0 | 23.7 | 23.7 | 23.7 |
| | | 1 | 7 | 23.7 | 23.8 | 23.8 |
| | | 1 | 14 | 23.8 | **23.9** | 23.8 |
| | | 8 | 0 | 22.8 | 22.8 | 22.7 |
| | | 8 | 4 | 22.9 | 22.8 | 22.8 |
| | | 8 | 7 | 23.0 | 23.0 | 22.9 |
| | | 15 | 0 | 22.9 | 22.9 | 22.8 |
| | 16QAM | 1 | 0 | 22.8 | 22.7 | 23.1 |
| | | 1 | 7 | 22.8 | 22.7 | 23.2 |
| | | 1 | 14 | 22.9 | 22.7 | **23.2** |
| | | 8 | 0 | 21.9 | 22.0 | 21.9 |
| | | 8 | 4 | 21.9 | 22.0 | 21.9 |
| | | 8 | 7 | 22.0 | 22.1 | 22.0 |
| | | 15 | 0 | 21.9 | 21.9 | 21.9 |
| | 64QAM | 1 | 0 | 21.9 | 22.0 | 21.8 |
| | | 1 | 7 | 22.0 | 22.1 | 21.9 |
| | | 1 | 14 | 22.1 | **22.1** | 21.8 |
| | | 8 | 0 | 20.8 | 20.8 | 20.8 |
| | | 8 | 4 | 20.8 | 20.8 | 20.8 |
| | | 8 | 7 | 20.9 | 20.9 | 20.9 |
| | | 15 | 0 | 20.9 | 20.8 | 20.8 |



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**OUTPUT POWER FOR LTE BAND 5 (5.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 20425 | 20525 | 20625 |
| | | | | 826.5 MHz | 836.5 MHz | 846.5 MHz |
| 5.0 | QPSK | 1 | 0 | 23.8 | 23.9 | 23.7 |
| | | 1 | 12 | 23.9 | **23.9** | 23.8 |
| | | 1 | 24 | 23.9 | 23.9 | 23.8 |
| | | 12 | 0 | 22.8 | 22.8 | 22.8 |
| | | 12 | 6 | 23.0 | 22.9 | 22.9 |
| | | 12 | 11 | 23.0 | 23.0 | 22.9 |
| | | 25 | 0 | 22.9 | 22.9 | 22.8 |
| | 16QAM | 1 | 0 | 22.9 | 23.0 | 23.3 |
| | | 1 | 12 | 23.0 | 23.0 | **23.3** |
| | | 1 | 24 | 23.0 | 23.0 | 23.3 |
| | | 12 | 0 | 21.9 | 21.9 | 22.0 |
| | | 12 | 6 | 22.0 | 22.0 | 22.0 |
| | | 12 | 11 | 22.1 | 22.0 | 22.1 |
| | | 25 | 0 | 21.9 | 21.9 | 21.9 |
| | 64QAM | 1 | 0 | 22.0 | 21.7 | 22.0 |
| | | 1 | 12 | 22.1 | 21.8 | 22.1 |
| | | 1 | 24 | **22.1** | 21.8 | 22.1 |
| | | 12 | 0 | 20.9 | 20.8 | 20.7 |
| | | 12 | 6 | 21.0 | 20.8 | 20.7 |
| | | 12 | 11 | 21.0 | 20.9 | 20.8 |
| | | 25 | 0 | 20.9 | 20.8 | 20.7 |

**OUTPUT POWER FOR LTE BAND 5 (10.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 20450 | 20525 | 20600 |
| | | | | 829.0 MHz | 836.5 MHz | 844.0 MHz |
| 10.0 | QPSK | 1 | 0 | 23.7 | 23.8 | **24.0** |
| | | 1 | 24 | 23.6 | 23.9 | 23.8 |
| | | 1 | 49 | 23.6 | 23.8 | 23.7 |
| | | 25 | 0 | 22.9 | 22.9 | 22.9 |
| | | 25 | 12 | 22.9 | 22.9 | 22.9 |
| | | 25 | 24 | 22.9 | 22.9 | 22.8 |
| | | 50 | 0 | 22.9 | 22.9 | 22.9 |
| | 16QAM | 1 | 0 | 22.8 | 22.9 | **23.3** |
| | | 1 | 24 | 22.7 | 22.7 | 23.0 |
| | | 1 | 49 | 22.7 | 22.7 | 23.1 |
| | | 25 | 0 | 22.0 | 22.0 | 22.0 |
| | | 25 | 12 | 22.0 | 22.0 | 22.0 |
| | | 25 | 24 | 22.0 | 21.9 | 21.9 |
| | | 50 | 0 | 22.0 | 21.9 | 21.9 |
| | 64QAM | 1 | 0 | 22.0 | **22.2** | 22.0 |
| | | 1 | 24 | 22.1 | 22.2 | 22.0 |
| | | 1 | 49 | 22.0 | 22.2 | 21.8 |
| | | 25 | 0 | 20.9 | 20.9 | 20.9 |
| | | 25 | 12 | 21.0 | 20.9 | 20.9 |
| | | 25 | 24 | 20.9 | 20.8 | 20.8 |
| | | 50 | 0 | 20.8 | 20.8 | 20.8 |



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## 7.4. LTE BAND 7

| Test Engineer ID: | 39005 RA | Test Date: | 2/28/2020 |
|---|---|---|---|

**OUTPUT POWER FOR LTE BAND 7 (5.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 20775 | 21100 | 21425 |
| | | | | 2502.5 MHz | 2535.0 MHz | 2567.5 MHz |
| 5.0 | QPSK | 1 | 0 | 23.7 | 23.8 | 23.7 |
| | | 1 | 12 | 23.8 | 23.8 | 23.8 |
| | | 1 | 24 | 23.8 | 23.9 | **23.9** |
| | | 12 | 0 | 22.7 | 22.8 | 22.8 |
| | | 12 | 6 | 22.9 | 22.8 | 22.9 |
| | | 12 | 11 | 22.8 | 22.8 | 22.9 |
| | | 25 | 0 | 22.8 | 22.8 | 22.9 |
| | 16QAM | 1 | 0 | 22.8 | 22.9 | 23.3 |
| | | 1 | 12 | 22.9 | 22.9 | 23.4 |
| | | 1 | 24 | 22.9 | 23.0 | **23.5** |
| | | 12 | 0 | 21.8 | 21.9 | 22.0 |
| | | 12 | 6 | 21.9 | 22.0 | 22.1 |
| | | 12 | 11 | 21.9 | 21.9 | 22.1 |
| | | 25 | 0 | 21.7 | 21.9 | 22.0 |
| | 64QAM | 1 | 0 | 21.5 | 21.9 | 21.7 |
| | | 1 | 12 | 21.5 | 22.0 | 21.9 |
| | | 1 | 24 | 21.6 | 21.9 | **22.1** |
| | | 12 | 0 | 20.6 | 20.6 | 20.4 |
| | | 12 | 6 | 20.7 | 20.6 | 20.6 |
| | | 12 | 11 | 20.6 | 20.6 | 20.8 |
| | | 25 | 0 | 20.6 | 20.6 | 20.5 |

**OUTPUT POWER FOR LTE BAND 7 (10.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 20800 | 21100 | 21400 |
| | | | | 2505.0 MHz | 2535.0 MHz | 2565.0 MHz |
| 10.0 | QPSK | 1 | 0 | 23.6 | 23.7 | 23.7 |
| | | 1 | 24 | 23.7 | 23.5 | **23.9** |
| | | 1 | 49 | 23.6 | 23.6 | 23.8 |
| | | 25 | 0 | 22.7 | 22.8 | 22.8 |
| | | 25 | 12 | 22.7 | 22.8 | 22.8 |
| | | 25 | 24 | 22.7 | 22.7 | 22.8 |
| | | 50 | 0 | 22.7 | 22.8 | 22.8 |
| | 16QAM | 1 | 0 | 22.7 | 22.7 | 23.1 |
| | | 1 | 24 | 22.5 | 22.5 | 23.2 |
| | | 1 | 49 | 22.7 | 22.6 | **23.3** |
| | | 25 | 0 | 21.8 | 21.8 | 21.9 |
| | | 25 | 12 | 21.8 | 21.8 | 21.9 |
| | | 25 | 24 | 21.8 | 21.8 | 21.9 |
| | | 50 | 0 | 21.7 | 21.8 | 21.9 |
| | 64QAM | 1 | 0 | 21.6 | 21.8 | 21.6 |
| | | 1 | 24 | 21.7 | 21.8 | 21.7 |
| | | 1 | 49 | 21.7 | 21.8 | **21.9** |
| | | 25 | 0 | 20.6 | 20.6 | 20.4 |
| | | 25 | 12 | 20.6 | 20.6 | 20.7 |
| | | 25 | 24 | 20.6 | 20.6 | 20.7 |
| | | 50 | 0 | 20.5 | 20.6 | 20.7 |



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**OUTPUT POWER FOR LTE BAND 7 (15.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 20825 | 21100 | 21375 |
| | | | | 2507.5 MHz | 2535.0 MHz | 2562.5 MHz |
| 15.0 | QPSK | 1 | 0 | **24.0** | 23.9 | 23.9 |
| | | 1 | 37 | 23.8 | 23.7 | 23.8 |
| | | 1 | 74 | 23.8 | 23.8 | 23.9 |
| | | 36 | 0 | 22.8 | 22.9 | 22.9 |
| | | 36 | 16 | 22.9 | 22.9 | 22.9 |
| | | 36 | 35 | 22.9 | 22.8 | 22.9 |
| | | 75 | 0 | 22.9 | 22.9 | 22.9 |
| | 16QAM | 1 | 0 | 23.2 | 22.8 | 23.3 |
| | | 1 | 37 | 23.2 | 22.8 | 23.1 |
| | | 1 | 74 | 23.2 | 22.7 | **23.3** |
| | | 36 | 0 | 21.8 | 21.9 | 22.0 |
| | | 36 | 16 | 21.9 | 21.9 | 22.0 |
| | | 36 | 35 | 21.9 | 21.8 | 22.0 |
| | | 75 | 0 | 21.9 | 21.9 | 22.0 |
| | 64QAM | 1 | 0 | 22.2 | 22.0 | 21.8 |
| | | 1 | 37 | 22.1 | 22.0 | 21.6 |
| | | 1 | 74 | **22.3** | 22.0 | 22.0 |
| | | 36 | 0 | 20.6 | 20.7 | 20.6 |
| | | 36 | 16 | 20.7 | 20.8 | 20.7 |
| | | 36 | 35 | 20.7 | 20.7 | 20.8 |
| | | 75 | 0 | 20.7 | 20.7 | 20.7 |

**OUTPUT POWER FOR LTE BAND 7 (20.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 20850 | 21100 | 21350 |
| | | | | 2510.0 MHz | 2535.0 MHz | 2560.0 MHz |
| 20.0 | QPSK | 1 | 0 | 23.8 | 23.9 | 24.0 |
| | | 1 | 49 | 23.9 | 23.9 | 23.8 |
| | | 1 | 99 | 23.9 | 23.9 | **24.0** |
| | | 50 | 0 | 22.8 | 22.9 | 23.0 |
| | | 50 | 24 | 22.9 | 22.9 | 22.9 |
| | | 50 | 49 | 22.9 | 22.8 | 22.9 |
| | | 100 | 0 | 22.9 | 22.9 | 22.9 |
| | 16QAM | 1 | 0 | 23.3 | 23.4 | 23.4 |
| | | 1 | 49 | 23.2 | 23.4 | 23.2 |
| | | 1 | 99 | 23.2 | **23.5** | 23.4 |
| | | 50 | 0 | 21.8 | 21.9 | 22.0 |
| | | 50 | 24 | 21.9 | 22.0 | 22.0 |
| | | 50 | 49 | 21.9 | 21.9 | 21.9 |
| | | 100 | 0 | 21.9 | 21.9 | 21.9 |
| | 64QAM | 1 | 0 | 21.8 | 22.0 | 22.3 |
| | | 1 | 49 | 21.9 | 21.9 | 22.2 |
| | | 1 | 99 | 21.9 | 22.1 | **22.5** |
| | | 50 | 0 | 20.7 | 20.7 | 20.7 |
| | | 50 | 24 | 20.7 | 20.8 | 20.7 |
| | | 50 | 49 | 20.8 | 20.7 | 20.7 |
| | | 100 | 0 | 20.7 | 20.7 | 20.7 |



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## 7.5. LTE BAND 12

| Test Engineer ID: | 39005 RA | Test Date: | 2/28/2020 |
|---|---|---|---|

**OUTPUT POWER FOR LTE BAND 12 (1.4 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 23017 | 23095 | 23173 |
| | | | | 699.7 MHz | 707.5 MHz | 715.3 MHz |
| 1.4 | QPSK | 1 | 0 | 24.5 | 24.4 | 24.3 |
| | | 1 | 2 | 24.5 | 24.6 | 24.5 |
| | | 1 | 5 | 24.5 | 24.5 | 24.4 |
| | | 3 | 0 | 24.5 | 24.5 | 24.4 |
| | | 3 | 1 | 24.5 | 24.5 | 24.4 |
| | | 3 | 2 | 24.5 | **24.6** | 24.5 |
| | | 6 | 0 | 23.5 | 23.5 | 23.4 |
| | 16QAM | 1 | 0 | 23.6 | 23.8 | 23.4 |
| | | 1 | 2 | 23.6 | **23.9** | 23.5 |
| | | 1 | 5 | 23.6 | 23.9 | 23.5 |
| | | 3 | 0 | 23.6 | 23.7 | 23.6 |
| | | 3 | 1 | 23.6 | 23.7 | 23.6 |
| | | 3 | 2 | 23.6 | 23.8 | 23.7 |
| | | 6 | 0 | 22.7 | 22.4 | 22.7 |
| | 64QAM | 1 | 0 | 22.5 | 22.8 | 22.5 |
| | | 1 | 2 | 22.6 | **23.0** | 22.6 |
| | | 1 | 5 | 22.6 | 22.8 | 22.5 |
| | | 3 | 0 | 22.4 | 22.7 | 22.5 |
| | | 3 | 1 | 22.4 | 22.7 | 22.6 |
| | | 3 | 2 | 22.4 | 22.8 | 22.6 |
| | | 6 | 0 | 21.5 | 21.4 | 21.7 |

**OUTPUT POWER FOR LTE BAND 12 (3.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 23025 | 23095 | 23165 |
| | | | | 700.5 MHz | 707.5 MHz | 714.5 MHz |
| 3.0 | QPSK | 1 | 0 | 24.4 | 24.5 | 24.4 |
| | | 1 | 7 | **24.5** | 24.5 | 24.5 |
| | | 1 | 14 | 24.5 | 24.5 | 24.4 |
| | | 8 | 0 | 23.5 | 23.6 | 23.5 |
| | | 8 | 4 | 23.6 | 23.5 | 23.6 |
| | | 8 | 7 | 23.6 | 23.6 | 23.6 |
| | | 15 | 0 | 23.7 | 23.5 | 23.5 |
| | 16QAM | 1 | 0 | 23.4 | 23.8 | 23.5 |
| | | 1 | 7 | 23.5 | **24.0** | 23.6 |
| | | 1 | 14 | 23.4 | 23.9 | 23.5 |
| | | 8 | 0 | 22.7 | 22.6 | 22.6 |
| | | 8 | 4 | 22.8 | 22.7 | 22.6 |
| | | 8 | 7 | 22.8 | 22.8 | 22.7 |
| | | 15 | 0 | 22.7 | 22.6 | 22.5 |
| | 64QAM | 1 | 0 | 21.5 | 22.6 | 22.6 |
| | | 1 | 7 | **22.8** | 22.7 | 22.7 |
| | | 1 | 14 | 22.8 | 22.6 | 22.6 |
| | | 8 | 0 | 21.5 | 21.5 | 21.4 |
| | | 8 | 4 | 21.6 | 21.5 | 21.5 |
| | | 8 | 7 | 21.6 | 21.6 | 21.5 |
| | | 15 | 0 | 21.5 | 21.5 | 21.5 |



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**OUTPUT POWER FOR LTE BAND 12 (5.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 23035 | 23095 | 23155 |
| | | | | 701.5 MHz | 707.5 MHz | 713.5 MHz |
| 5.0 | QPSK | 1 | 0 | 24.4 | 24.5 | 24.6 |
| | | 1 | 12 | 24.5 | **24.6** | 24.6 |
| | | 1 | 24 | 24.5 | 24.5 | 24.6 |
| | | 12 | 0 | 23.5 | 23.6 | 23.5 |
| | | 12 | 6 | 23.6 | 23.6 | 23.6 |
| | | 12 | 11 | 23.6 | 23.6 | 23.6 |
| | | 25 | 0 | 23.6 | 23.5 | 23.5 |
| | 16QAM | 1 | 0 | 24.0 | 23.5 | 23.7 |
| | | 1 | 12 | **24.1** | 23.6 | 23.7 |
| | | 1 | 24 | 24.0 | 23.6 | 23.7 |
| | | 12 | 0 | 22.7 | 22.6 | 22.6 |
| | | 12 | 6 | 22.8 | 22.7 | 22.7 |
| | | 12 | 11 | 22.8 | 22.7 | 22.7 |
| | | 25 | 0 | 22.6 | 22.6 | 22.6 |
| | 64QAM | 1 | 0 | 22.7 | 22.6 | 22.4 |
| | | 1 | 12 | **22.8** | 22.7 | 22.4 |
| | | 1 | 24 | 22.8 | 22.7 | 22.4 |
| | | 12 | 0 | 21.4 | 21.5 | 21.5 |
| | | 12 | 6 | 21.5 | 21.6 | 21.6 |
| | | 12 | 11 | 21.5 | 21.6 | 21.6 |
| | | 25 | 0 | 21.5 | 21.5 | 21.4 |

**OUTPUT POWER FOR LTE BAND 12 (10.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 23060 | 23095 | 23130 |
| | | | | 704.0 MHz | 707.5 MHz | 711.0 MHz |
| 10.0 | QPSK | 1 | 0 | **24.6** | 24.5 | 24.5 |
| | | 1 | 24 | 24.3 | 24.2 | 24.5 |
| | | 1 | 49 | 24.5 | 24.4 | 24.5 |
| | | 25 | 0 | 23.6 | 23.6 | 23.6 |
| | | 25 | 12 | 23.6 | 23.6 | 23.6 |
| | | 25 | 24 | 23.6 | 23.6 | 23.5 |
| | | 50 | 0 | 23.6 | 23.6 | 23.6 |
| | 16QAM | 1 | 0 | **23.9** | 23.6 | 23.5 |
| | | 1 | 24 | 23.7 | 23.7 | 23.5 |
| | | 1 | 49 | 23.8 | 23.5 | 23.4 |
| | | 25 | 0 | 22.7 | 22.7 | 22.6 |
| | | 25 | 12 | 22.7 | 22.7 | 22.6 |
| | | 25 | 24 | 22.6 | 22.7 | 22.6 |
| | | 50 | 0 | 22.6 | 22.7 | 22.6 |
| | 64QAM | 1 | 0 | 22.8 | 22.8 | 22.7 |
| | | 1 | 24 | **22.9** | **22.9** | 22.7 |
| | | 1 | 49 | 22.9 | 22.9 | 22.7 |
| | | 25 | 0 | 21.6 | 21.6 | 21.6 |
| | | 25 | 12 | 21.6 | 21.6 | 21.6 |
| | | 25 | 24 | 21.6 | 21.6 | 21.6 |
| | | 50 | 0 | 21.5 | 21.5 | 21.5 |



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## 7.6. LTE BAND 13

| Test Engineer ID: | 39005 RA | Test Date: | 2/28/2020 |
|---|---|---|---|

**OUTPUT POWER FOR LTE BAND 13 (5.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 23205 | 23230 | 23255 |
| | | | | 779.5 MHz | 782.0 MHz | 784.5 MHz |
| 5.0 | QPSK | 1 | 0 | 24.3 | 24.3 | 24.4 |
| | | 1 | 12 | 24.3 | 24.4 | 24.4 |
| | | 1 | 24 | 24.4 | 24.4 | **24.4** |
| | | 12 | 0 | 23.4 | 23.4 | 23.4 |
| | | 12 | 6 | 23.5 | 23.4 | 23.4 |
| | | 12 | 11 | 23.4 | 23.5 | 23.4 |
| | | 25 | 0 | 23.5 | 23.4 | 23.5 |
| | 16QAM | 1 | 0 | 23.8 | 23.4 | 23.5 |
| | | 1 | 12 | **23.9** | 23.5 | 23.5 |
| | | 1 | 24 | 23.9 | 23.5 | 23.6 |
| | | 12 | 0 | 22.6 | 22.5 | 22.4 |
| | | 12 | 6 | 22.6 | 22.5 | 22.6 |
| | | 12 | 11 | 22.6 | 22.5 | 22.6 |
| | | 25 | 0 | 22.6 | 22.4 | 22.5 |
| | 64QAM | 1 | 0 | 22.4 | 22.5 | 22.3 |
| | | 1 | 12 | 22.3 | 22.6 | 22.2 |
| | | 1 | 24 | **22.6** | 22.6 | 22.3 |
| | | 12 | 0 | 21.0 | 21.4 | 21.4 |
| | | 12 | 6 | 21.2 | 21.4 | 21.5 |
| | | 12 | 11 | 21.3 | 21.5 | 21.4 |
| | | 25 | 0 | 21.4 | 21.4 | 21.4 |

**OUTPUT POWER FOR LTE BAND 13 (10.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | N/A | 23230 | N/A |
| | | | | N/A | 782.0 MHz | N/A |
| 10.0 | QPSK | 1 | 0 | | 24.4 | |
| | | 1 | 24 | | **24.4** | |
| | | 1 | 49 | | 24.4 | |
| | | 25 | 0 | | 23.4 | |
| | | 25 | 12 | | 23.4 | |
| | | 25 | 24 | | 23.4 | |
| | | 50 | 0 | | 23.4 | |
| | 16QAM | 1 | 0 | | 23.5 | |
| | | 1 | 24 | | **23.5** | |
| | | 1 | 49 | | 23.5 | |
| | | 25 | 0 | | 22.6 | |
| | | 25 | 12 | | 22.5 | |
| | | 25 | 24 | | 22.5 | |
| | | 50 | 0 | | 22.5 | |
| | 64QAM | 1 | 0 | | 22.5 | |
| | | 1 | 24 | | 22.6 | |
| | | 1 | 49 | | **22.6** | |
| | | 25 | 0 | | 21.5 | |
| | | 25 | 12 | | 21.5 | |
| | | 25 | 24 | | 21.5 | |
| | | 50 | 0 | | 21.4 | |



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## 7.7. LTE BAND 14

| Test Engineer ID: | 39005 RA | Test Date: | 2/28/2020 |
|---|---|---|---|

**OUTPUT POWER FOR LTE BAND 14 (5.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 23305 | 23330 | 23355 |
| | | | | 790.5 MHz | 793.0 MHz | 795.5 MHz |
| 5.0 | QPSK | 1 | 0 | 24.3 | 24.4 | 24.4 |
| | | 1 | 12 | 24.4 | **24.5** | 24.4 |
| | | 1 | 24 | 24.4 | 24.5 | 24.5 |
| | | 12 | 0 | 23.4 | 23.4 | 23.4 |
| | | 12 | 6 | 23.5 | 23.5 | 23.5 |
| | | 12 | 11 | 23.5 | 23.5 | 23.5 |
| | | 25 | 0 | 23.5 | 23.5 | 23.5 |
| | 16QAM | 1 | 0 | 23.8 | 23.5 | 23.5 |
| | | 1 | 12 | 24.0 | 23.6 | 23.5 |
| | | 1 | 24 | **24.0** | 23.6 | 23.7 |
| | | 12 | 0 | 22.6 | 22.5 | 22.5 |
| | | 12 | 6 | 22.7 | 22.6 | 22.6 |
| | | 12 | 11 | 22.7 | 22.6 | 22.6 |
| | | 25 | 0 | 22.6 | 22.5 | 22.5 |
| | 64QAM | 1 | 0 | 22.3 | 22.7 | 22.6 |
| | | 1 | 12 | 22.4 | **22.8** | 22.6 |
| | | 1 | 24 | 22.5 | 22.7 | 22.7 |
| | | 12 | 0 | 21.4 | 21.4 | 21.4 |
| | | 12 | 6 | 21.6 | 21.4 | 21.5 |
| | | 12 | 11 | 21.6 | 21.4 | 21.6 |
| | | 25 | 0 | 21.4 | 21.4 | 21.5 |

**OUTPUT POWER FOR LTE BAND 14 (10.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | N/A | 23330 | N/A |
| | | | | N/A | 793.0 MHz | N/A |
| 10.0 | QPSK | 1 | 0 | | 24.4 | |
| | | 1 | 24 | | **24.5** | |
| | | 1 | 49 | | 24.4 | |
| | | 25 | 0 | | 23.5 | |
| | | 25 | 12 | | 23.5 | |
| | | 25 | 24 | | 23.5 | |
| | | 50 | 0 | | 23.5 | |
| | 16QAM | 1 | 0 | | **23.5** | |
| | | 1 | 24 | | 23.5 | |
| | | 1 | 49 | | 23.4 | |
| | | 25 | 0 | | 22.7 | |
| | | 25 | 12 | | 22.6 | |
| | | 25 | 24 | | 22.5 | |
| | | 50 | 0 | | 22.5 | |
| | 64QAM | 1 | 0 | | 22.7 | |
| | | 1 | 24 | | **22.7** | |
| | | 1 | 49 | | 22.6 | |
| | | 25 | 0 | | 21.6 | |
| | | 25 | 12 | | 21.5 | |
| | | 25 | 24 | | 21.5 | |
| | | 50 | 0 | | 21.5 | |



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## 7.8. LTE BAND 25

| Test Engineer ID: | 39005 RA | Test Date: | 2/27/2020 |
|---|---|---|---|

**OUTPUT POWER FOR LTE BAND 25 (1.4 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 26047 | 26365 | 26683 |
| | | | | 1850.7 MHz | 1882.5 MHz | 1914.3 MHz |
| 1.4 | QPSK | 1 | 0 | 23.8 | 23.9 | 23.8 |
| | | 1 | 2 | 23.9 | **24.0** | 23.9 |
| | | 1 | 5 | 23.9 | 24.0 | 23.8 |
| | | 3 | 0 | 23.9 | 23.8 | 23.8 |
| | | 3 | 1 | 23.9 | 23.9 | 23.9 |
| | | 3 | 2 | 24.0 | 24.0 | 23.9 |
| | | 6 | 0 | 23.0 | 23.0 | 22.9 |
| | 16QAM | 1 | 0 | 22.9 | 23.0 | 23.2 |
| | | 1 | 2 | 23.0 | 23.1 | **23.2** |
| | | 1 | 5 | 22.9 | 23.0 | 23.2 |
| | | 3 | 0 | 23.0 | 22.9 | 23.0 |
| | | 3 | 1 | 23.1 | 23.1 | 23.0 |
| | | 3 | 2 | 23.1 | 23.0 | 23.1 |
| | | 6 | 0 | 22.2 | 22.1 | 21.8 |
| | 64QAM | 1 | 0 | 22.1 | 21.8 | 21.8 |
| | | 1 | 2 | **22.2** | 22.0 | 21.9 |
| | | 1 | 5 | 22.2 | 21.9 | 21.9 |
| | | 3 | 0 | 22.0 | 21.8 | 21.6 |
| | | 3 | 1 | 22.1 | 22.0 | 21.7 |
| | | 3 | 2 | 22.1 | 22.0 | 21.7 |
| | | 6 | 0 | 20.9 | 21.1 | 20.8 |

**OUTPUT POWER FOR LTE BAND 25 (3.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 26055 | 26365 | 26675 |
| | | | | 1851.5 MHz | 1882.5 MHz | 1913.5 MHz |
| 3.0 | QPSK | 1 | 0 | 23.9 | 23.8 | 23.9 |
| | | 1 | 7 | 23.9 | 24.0 | 23.9 |
| | | 1 | 14 | 24.0 | **24.0** | 23.8 |
| | | 8 | 0 | 23.0 | 23.0 | 23.0 |
| | | 8 | 4 | 23.1 | 23.1 | 23.0 |
| | | 8 | 7 | 23.1 | 23.1 | 23.0 |
| | | 15 | 0 | 23.1 | 23.1 | 23.0 |
| | 16QAM | 1 | 0 | 23.0 | 22.8 | 23.2 |
| | | 1 | 7 | 23.0 | 22.9 | **23.2** |
| | | 1 | 14 | 23.0 | 22.9 | 23.2 |
| | | 8 | 0 | 22.1 | 22.1 | 22.0 |
| | | 8 | 4 | 22.2 | 22.1 | 22.1 |
| | | 8 | 7 | 22.2 | 22.3 | 22.1 |
| | | 15 | 0 | 22.0 | 22.1 | 22.1 |
| | 64QAM | 1 | 0 | 21.9 | 22.0 | 21.8 |
| | | 1 | 7 | 22.1 | **22.1** | 21.9 |
| | | 1 | 14 | 22.0 | 22.1 | 21.8 |
| | | 8 | 0 | 20.8 | 20.9 | 20.8 |
| | | 8 | 4 | 20.9 | 21.0 | 20.9 |
| | | 8 | 7 | 21.0 | 21.0 | 20.9 |
| | | 15 | 0 | 20.9 | 20.8 | 20.8 |



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**OUTPUT POWER FOR LTE BAND 25 (5.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 26065 | 26365 | 26665 |
| | | | | 1852.5 MHz | 1882.5 MHz | 1912.5 MHz |
| 5.0 | QPSK | 1 | 0 | 24.0 | 24.0 | 23.8 |
| | | 1 | 12 | 24.0 | 24.1 | 23.9 |
| | | 1 | 24 | 24.1 | **24.1** | 23.8 |
| | | 12 | 0 | 23.0 | 23.0 | 23.0 |
| | | 12 | 6 | 23.1 | 23.1 | 23.0 |
| | | 12 | 11 | 23.1 | 23.1 | 23.0 |
| | | 25 | 0 | 23.1 | 23.0 | 23.0 |
| | 16QAM | 1 | 0 | 23.1 | 23.1 | 23.4 |
| | | 1 | 12 | 23.2 | 23.2 | **23.5** |
| | | 1 | 24 | 23.1 | 23.3 | 23.3 |
| | | 12 | 0 | 22.1 | 22.1 | 22.2 |
| | | 12 | 6 | 22.2 | 22.2 | 22.2 |
| | | 12 | 11 | 22.2 | 22.2 | 22.2 |
| | | 25 | 0 | 22.0 | 22.1 | 22.1 |
| | 64QAM | 1 | 0 | 22.0 | 21.7 | 22.0 |
| | | 1 | 12 | 22.1 | 21.8 | 22.0 |
| | | 1 | 24 | **22.1** | 21.9 | 21.9 |
| | | 12 | 0 | 20.9 | 20.8 | 20.7 |
| | | 12 | 6 | 21.0 | 20.9 | 20.8 |
| | | 12 | 11 | 21.0 | 21.0 | 20.8 |
| | | 25 | 0 | 21.0 | 20.8 | 20.7 |

**OUTPUT POWER FOR LTE BAND 25 (10.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 26090 | 26365 | 26640 |
| | | | | 1855.0 MHz | 1882.5 MHz | 1910.0 MHz |
| 10.0 | QPSK | 1 | 0 | 23.8 | 24.0 | 23.9 |
| | | 1 | 24 | 23.8 | **24.1** | 23.8 |
| | | 1 | 49 | 24.0 | 23.9 | 23.9 |
| | | 25 | 0 | 23.1 | 23.1 | 23.0 |
| | | 25 | 12 | 23.1 | 23.1 | 23.0 |
| | | 25 | 24 | 23.1 | 23.1 | 23.0 |
| | | 50 | 0 | 23.1 | 23.1 | 23.0 |
| | 16QAM | 1 | 0 | 22.8 | 23.4 | 22.9 |
| | | 1 | 24 | 22.9 | **23.4** | 23.0 |
| | | 1 | 49 | 22.8 | 23.3 | 22.9 |
| | | 25 | 0 | 22.1 | 22.1 | 22.1 |
| | | 25 | 12 | 22.1 | 22.1 | 22.1 |
| | | 25 | 24 | 22.0 | 22.1 | 22.1 |
| | | 50 | 0 | 22.0 | 22.1 | 22.0 |
| | 64QAM | 1 | 0 | **22.1** | 22.0 | 21.8 |
| | | 1 | 24 | 21.9 | 21.9 | 21.8 |
| | | 1 | 49 | 22.0 | 22.0 | 21.9 |
| | | 25 | 0 | 20.9 | 21.0 | 20.9 |
| | | 25 | 12 | 20.9 | 21.0 | 20.9 |
| | | 25 | 24 | 20.9 | 21.0 | 20.9 |
| | | 50 | 0 | 20.9 | 20.9 | 20.8 |



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**OUTPUT POWER FOR LTE BAND 25 (15.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 26115 | 26365 | 26615 |
| | | | | 1857.5 MHz | 1882.5 MHz | 1907.5 MHz |
| 15.0 | QPSK | 1 | 0 | 24.1 | **24.2** | 24.2 |
| | | 1 | 37 | 24.0 | 24.1 | 24.1 |
| | | 1 | 74 | 24.1 | 24.1 | 24.1 |
| | | 36 | 0 | 23.1 | 23.2 | 23.2 |
| | | 36 | 16 | 23.2 | 23.3 | 23.2 |
| | | 36 | 35 | 23.2 | 23.3 | 23.2 |
| | | 75 | 0 | 23.2 | 23.2 | 23.2 |
| | 16QAM | 1 | 0 | 23.0 | **23.6** | 23.5 |
| | | 1 | 37 | 23.1 | 23.5 | 23.5 |
| | | 1 | 74 | 23.0 | 23.5 | 23.4 |
| | | 36 | 0 | 22.1 | 22.2 | 22.1 |
| | | 36 | 16 | 22.2 | 22.3 | 22.2 |
| | | 36 | 35 | 22.2 | 22.3 | 22.2 |
| | | 75 | 0 | 22.2 | 22.3 | 22.2 |
| | 64QAM | 1 | 0 | **22.5** | 22.4 | 22.1 |
| | | 1 | 37 | 22.4 | 22.4 | 22.1 |
| | | 1 | 74 | 22.5 | 22.3 | 22.1 |
| | | 36 | 0 | 21.0 | 21.1 | 21.0 |
| | | 36 | 16 | 21.1 | 21.1 | 21.1 |
| | | 36 | 35 | 21.1 | 21.2 | 21.1 |
| | | 75 | 0 | 21.0 | 21.1 | 21.0 |

**OUTPUT POWER FOR LTE BAND 25 (20.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 26140 | 26365 | 26590 |
| | | | | 1860.0 MHz | 1882.5 MHz | 1905.0 MHz |
| 20.0 | QPSK | 1 | 0 | **24.2** | 24.1 | 24.2 |
| | | 1 | 49 | 24.2 | 24.2 | 24.2 |
| | | 1 | 99 | 24.1 | 24.1 | 24.2 |
| | | 50 | 0 | 23.2 | 23.2 | 23.2 |
| | | 50 | 24 | 23.2 | 23.3 | 23.2 |
| | | 50 | 49 | 23.2 | 23.3 | 23.2 |
| | | 100 | 0 | 23.1 | 23.2 | 23.2 |
| | 16QAM | 1 | 0 | **23.7** | 23.5 | 23.5 |
| | | 1 | 49 | 23.6 | 23.5 | 23.5 |
| | | 1 | 99 | 23.6 | 23.5 | 23.4 |
| | | 50 | 0 | 22.2 | 22.3 | 22.1 |
| | | 50 | 24 | 22.2 | 22.3 | 22.2 |
| | | 50 | 49 | 22.2 | 22.3 | 22.2 |
| | | 100 | 0 | 22.2 | 22.2 | 22.2 |
| | 64QAM | 1 | 0 | **22.7** | 22.2 | 22.3 |
| | | 1 | 49 | 22.5 | 22.3 | 22.3 |
| | | 1 | 99 | 22.5 | 22.3 | 22.3 |
| | | 50 | 0 | 21.0 | 21.1 | 21.0 |
| | | 50 | 24 | 21.0 | 21.1 | 21.1 |
| | | 50 | 49 | 21.0 | 21.1 | 21.1 |
| | | 100 | 0 | 20.9 | 21.0 | 21.0 |



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## 7.9. LTE BAND 26 (FCC Part 90S)

| Test Engineer ID: | 50820 EC | Test Date: | 3/2/2020 |
|---|---|---|---|

**OUTPUT POWER FOR LTE BAND 26 (1.4 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 26697 | 26740 | 26783 |
| | | | | 814.7 MHz | 819.0 MHz | 823.3 MHz |
| 1.4 | QPSK | 1 | 0 | 23.8 | 23.8 | 23.6 |
| | | 1 | 2 | **23.9** | 23.8 | 23.7 |
| | | 1 | 5 | 23.7 | 23.7 | 23.7 |
| | | 3 | 0 | 23.8 | 23.8 | 23.7 |
| | | 3 | 1 | 23.8 | 23.8 | 23.8 |
| | | 3 | 2 | 23.8 | 23.8 | 23.8 |
| | | 6 | 0 | 22.8 | 22.8 | 22.8 |
| | 16QAM | 1 | 0 | 22.9 | 23.2 | 22.7 |
| | | 1 | 2 | 22.9 | **23.2** | 22.8 |
| | | 1 | 5 | 22.9 | 23.1 | 22.8 |
| | | 3 | 0 | 22.9 | 23.0 | 22.9 |
| | | 3 | 1 | 22.9 | 23.0 | 23.0 |
| | | 3 | 2 | 22.9 | 23.0 | 23.0 |
| | | 6 | 0 | 22.0 | 21.8 | 22.0 |
| | 64QAM | 1 | 0 | 22.0 | 22.1 | 21.8 |
| | | 1 | 2 | 22.0 | **22.3** | 21.9 |
| | | 1 | 5 | 21.9 | 22.2 | 21.8 |
| | | 3 | 0 | 21.8 | 22.1 | 21.8 |
| | | 3 | 1 | 21.8 | 22.2 | 21.9 |
| | | 3 | 2 | 21.8 | 22.1 | 21.9 |
| | | 6 | 0 | 20.9 | 20.8 | 21.1 |

**OUTPUT POWER FOR LTE BAND 26 (3.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 26705 | 26740 | 26775 |
| | | | | 815.5 MHz | 819.0 MHz | 822.5 MHz |
| 3.0 | QPSK | 1 | 0 | 23.7 | 23.8 | 23.8 |
| | | 1 | 7 | **23.8** | 23.8 | 23.7 |
| | | 1 | 14 | 23.8 | 23.8 | 23.8 |
| | | 8 | 0 | 22.8 | 22.9 | 22.8 |
| | | 8 | 4 | 22.9 | 22.9 | 22.9 |
| | | 8 | 7 | 22.9 | 22.9 | 22.9 |
| | | 15 | 0 | 22.9 | 22.9 | 22.9 |
| | 16QAM | 1 | 0 | 22.6 | **23.2** | 22.9 |
| | | 1 | 7 | 22.8 | 23.1 | 22.8 |
| | | 1 | 14 | 22.7 | 23.2 | 22.8 |
| | | 8 | 0 | 22.0 | 22.0 | 21.9 |
| | | 8 | 4 | 22.0 | 22.0 | 22.0 |
| | | 8 | 7 | 22.1 | 22.0 | 22.0 |
| | | 15 | 0 | 22.0 | 22.0 | 21.9 |
| | 64QAM | 1 | 0 | 22.0 | 22.1 | 21.8 |
| | | 1 | 7 | 22.0 | **22.1** | 21.9 |
| | | 1 | 14 | 22.0 | 22.1 | 21.9 |
| | | 8 | 0 | 20.8 | 20.9 | 20.8 |
| | | 8 | 4 | 20.9 | 21.0 | 20.9 |
| | | 8 | 7 | 20.9 | 21.0 | 20.9 |
| | | 15 | 0 | 21.0 | 20.9 | 20.9 |



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**OUTPUT POWER FOR LTE BAND 26 (5.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 26715 | 26740 | 26765 |
| | | | | 816.5 MHz | 819.0 MHz | 821.5 MHz |
| 5.0 | QPSK | 1 | 0 | 23.8 | 23.9 | 23.8 |
| | | 1 | 12 | 23.9 | 23.9 | 23.8 |
| | | 1 | 24 | **23.9** | 23.9 | 23.8 |
| | | 12 | 0 | 22.9 | 22.9 | 22.9 |
| | | 12 | 6 | 23.0 | 22.9 | 23.0 |
| | | 12 | 11 | 23.0 | 22.9 | 22.9 |
| | | 25 | 0 | 22.9 | 23.0 | 22.9 |
| | 16QAM | 1 | 0 | 22.9 | 23.0 | 23.3 |
| | | 1 | 12 | 23.0 | 23.0 | **23.4** |
| | | 1 | 24 | 23.0 | 23.0 | 23.3 |
| | | 12 | 0 | 22.0 | 22.0 | 22.0 |
| | | 12 | 6 | 22.0 | 22.0 | 22.1 |
| | | 12 | 11 | 22.0 | 22.0 | 22.1 |
| | | 25 | 0 | 21.9 | 22.0 | 22.0 |
| | 64QAM | 1 | 0 | 22.0 | 21.8 | 22.1 |
| | | 1 | 12 | 22.1 | 21.8 | 22.1 |
| | | 1 | 24 | **22.1** | 21.8 | 22.1 |
| | | 12 | 0 | 21.0 | 20.9 | 20.8 |
| | | 12 | 6 | 21.1 | 21.0 | 20.9 |
| | | 12 | 11 | 21.0 | 21.0 | 20.9 |
| | | 25 | 0 | 20.9 | 20.9 | 20.9 |

**OUTPUT POWER FOR LTE BAND 26 (10.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | N/A | 26740 | N/A |
| | | | | N/A | 819.0 MHz | N/A |
| 10.0 | QPSK | 1 | 0 | | **23.9** | |
| | | 1 | 24 | | 23.9 | |
| | | 1 | 49 | | 23.8 | |
| | | 25 | 0 | | 22.9 | |
| | | 25 | 12 | | 22.9 | |
| | | 25 | 24 | | 22.9 | |
| | | 50 | 0 | | 22.9 | |
| | 16QAM | 1 | 0 | | **22.9** | |
| | | 1 | 24 | | 22.9 | |
| | | 1 | 49 | | 22.7 | |
| | | 25 | 0 | | 22.0 | |
| | | 25 | 12 | | 22.0 | |
| | | 25 | 24 | | 21.9 | |
| | | 50 | 0 | | 21.9 | |
| | 64QAM | 1 | 0 | | **22.0** | |
| | | 1 | 24 | | 21.8 | |
| | | 1 | 49 | | 21.9 | |
| | | 25 | 0 | | 21.0 | |
| | | 25 | 12 | | 21.0 | |
| | | 25 | 24 | | 21.0 | |
| | | 50 | 0 | | 20.9 | |



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## 7.10. LTE BAND 26 (FCC Part 22)

| Test Engineer ID: | 50820 EC | Test Date: | 3/2/2020 |
|---|---|---|---|

**OUTPUT POWER FOR LTE BAND 26 (1.4 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 26797 | 26915 | 27033 |
| | | | | 824.7 MHz | 836.5 MHz | 848.3 MHz |
| 1.4 | QPSK | 1 | 0 | 23.7 | 23.7 | 23.6 |
| | | 1 | 2 | 23.8 | 23.7 | 23.8 |
| | | 1 | 5 | 23.7 | 23.7 | 23.6 |
| | | 3 | 0 | 23.8 | 23.6 | 23.6 |
| | | 3 | 1 | **23.8** | 23.7 | 23.6 |
| | | 3 | 2 | 23.8 | 23.7 | 23.7 |
| | | 6 | 0 | 22.8 | 22.8 | 22.7 |
| | 16QAM | 1 | 0 | 23.1 | 22.7 | 22.7 |
| | | 1 | 2 | **23.2** | 22.8 | 22.8 |
| | | 1 | 5 | 23.1 | 22.8 | 22.7 |
| | | 3 | 0 | 23.0 | 22.8 | 22.7 |
| | | 3 | 1 | 23.0 | 22.9 | 22.7 |
| | | 3 | 2 | 23.0 | 22.9 | 22.8 |
| | | 6 | 0 | 21.8 | 22.0 | 21.8 |
| | 64QAM | 1 | 0 | 22.1 | 21.8 | 21.2 |
| | | 1 | 2 | **22.2** | 21.9 | 21.1 |
| | | 1 | 5 | 22.1 | 21.8 | 20.7 |
| | | 3 | 0 | 22.0 | 21.8 | 20.9 |
| | | 3 | 1 | 22.1 | 21.9 | 20.9 |
| | | 3 | 2 | 22.1 | 21.8 | 20.8 |
| | | 6 | 0 | 20.9 | 21.0 | 19.9 |

**OUTPUT POWER FOR LTE BAND 26 (3.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 26805 | 26915 | 27025 |
| | | | | 825.5 MHz | 836.5 MHz | 847.5 MHz |
| 3.0 | QPSK | 1 | 0 | 23.7 | 23.7 | 23.7 |
| | | 1 | 7 | 23.8 | 23.7 | 23.7 |
| | | 1 | 14 | **23.8** | 23.7 | 23.5 |
| | | 8 | 0 | 22.8 | 22.8 | 22.7 |
| | | 8 | 4 | 22.9 | 22.8 | 22.8 |
| | | 8 | 7 | 22.9 | 22.9 | 22.8 |
| | | 15 | 0 | 22.8 | 22.8 | 22.8 |
| | 16QAM | 1 | 0 | 23.1 | 22.8 | 22.6 |
| | | 1 | 7 | 23.2 | 22.8 | 22.6 |
| | | 1 | 14 | **23.2** | 22.8 | 22.5 |
| | | 8 | 0 | 21.9 | 21.8 | 21.9 |
| | | 8 | 4 | 22.0 | 21.9 | 21.9 |
| | | 8 | 7 | 22.0 | 21.9 | 22.0 |
| | | 15 | 0 | 22.0 | 21.8 | 21.9 |
| | 64QAM | 1 | 0 | 22.0 | 22.1 | 21.8 |
| | | 1 | 7 | 22.0 | **22.1** | 21.4 |
| | | 1 | 14 | 22.0 | 22.1 | 20.7 |
| | | 8 | 0 | 20.8 | 20.9 | 20.6 |
| | | 8 | 4 | 20.9 | 20.9 | 20.4 |
| | | 8 | 7 | 20.9 | 20.9 | 20.3 |
| | | 15 | 0 | 20.9 | 20.8 | 20.4 |




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**OUTPUT POWER FOR LTE BAND 26 (5.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 26815 | 26915 | 27015 |
| | | | | 826.5 MHz | 836.5 MHz | 846.5 MHz |
| 5.0 | QPSK | 1 | 0 | 23.8 | 23.8 | 23.8 |
| | | 1 | 12 | 23.8 | 23.8 | **23.9** |
| | | 1 | 24 | 23.7 | 23.8 | 23.7 |
| | | 12 | 0 | 22.8 | 22.8 | 22.7 |
| | | 12 | 6 | 22.9 | 22.9 | 22.8 |
| | | 12 | 11 | 22.9 | 22.9 | 22.8 |
| | | 25 | 0 | 22.9 | 22.8 | 22.8 |
| | 16QAM | 1 | 0 | 23.3 | 22.9 | 22.9 |
| | | 1 | 12 | **23.3** | 22.9 | 22.9 |
| | | 1 | 24 | 23.3 | 22.9 | 22.9 |
| | | 12 | 0 | 22.0 | 21.9 | 21.9 |
| | | 12 | 6 | 22.1 | 21.9 | 21.9 |
| | | 12 | 11 | 22.1 | 21.9 | 21.9 |
| | | 25 | 0 | 21.9 | 21.8 | 21.8 |
| | 64QAM | 1 | 0 | 22.0 | 21.7 | 21.6 |
| | | 1 | 12 | **22.1** | 21.8 | 22.0 |
| | | 1 | 24 | 22.0 | 21.8 | 20.9 |
| | | 12 | 0 | 20.9 | 20.8 | 20.5 |
| | | 12 | 6 | 21.0 | 20.9 | 20.6 |
| | | 12 | 11 | 20.9 | 20.9 | 20.4 |
| | | 25 | 0 | 20.9 | 20.8 | 20.4 |

**OUTPUT POWER FOR LTE BAND 26 (10.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 26840 | 26915 | 26990 |
| | | | | 829.0 MHz | 836.5 MHz | 844.0 MHz |
| 10.0 | QPSK | 1 | 0 | 23.8 | 23.8 | **23.9** |
| | | 1 | 24 | 23.6 | 23.5 | 23.8 |
| | | 1 | 49 | 23.7 | 23.6 | 23.7 |
| | | 25 | 0 | 22.9 | 22.9 | 22.8 |
| | | 25 | 12 | 22.9 | 22.9 | 22.8 |
| | | 25 | 24 | 22.9 | 22.9 | 22.8 |
| | | 50 | 0 | 22.9 | 22.9 | 22.8 |
| | 16QAM | 1 | 0 | **23.2** | 22.9 | 22.8 |
| | | 1 | 24 | 23.0 | 22.7 | 22.5 |
| | | 1 | 49 | 23.2 | 22.7 | 22.5 |
| | | 25 | 0 | 21.9 | 22.0 | 21.9 |
| | | 25 | 12 | 22.0 | 22.0 | 21.9 |
| | | 25 | 24 | 21.9 | 21.9 | 21.8 |
| | | 50 | 0 | 21.9 | 21.9 | 21.8 |
| | 64QAM | 1 | 0 | **22.2** | 22.1 | 21.7 |
| | | 1 | 24 | 22.0 | 22.0 | 21.4 |
| | | 1 | 49 | 22.1 | 21.4 | 21.0 |
| | | 25 | 0 | 20.9 | 21.0 | 20.3 |
| | | 25 | 12 | 21.0 | 20.9 | 20.4 |
| | | 25 | 24 | 21.0 | 20.9 | 20.5 |
| | | 50 | 0 | 20.9 | 20.9 | 20.3 |



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**OUTPUT POWER FOR LTE BAND 26 (15.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 26865 | 26915 | 26965 |
| | | | | 831.5 MHz | 836.5 MHz | 841.5 MHz |
| 15.0 | QPSK | 1 | 0 | 24.0 | 24.0 | **24.0** |
| | | 1 | 37 | 23.9 | 23.7 | 23.7 |
| | | 1 | 74 | 23.9 | 23.8 | 23.8 |
| | | 36 | 0 | 23.0 | 23.0 | 23.0 |
| | | 36 | 16 | 23.0 | 23.0 | 23.0 |
| | | 36 | 35 | 22.9 | 22.9 | 22.9 |
| | | 75 | 0 | 23.0 | 22.9 | 22.9 |
| | 16QAM | 1 | 0 | 22.9 | 23.3 | **23.4** |
| | | 1 | 37 | 22.9 | 23.1 | 23.0 |
| | | 1 | 74 | 22.9 | 23.2 | 23.1 |
| | | 36 | 0 | 22.0 | 22.1 | 22.0 |
| | | 36 | 16 | 22.0 | 22.0 | 22.0 |
| | | 36 | 35 | 21.9 | 22.0 | 21.9 |
| | | 75 | 0 | 22.0 | 22.0 | 21.9 |
| | 64QAM | 1 | 0 | **22.5** | 22.2 | 22.2 |
| | | 1 | 37 | 22.3 | 22.0 | 21.2 |
| | | 1 | 74 | 22.5 | 21.5 | 21.2 |
| | | 36 | 0 | 20.8 | 21.0 | 21.0 |
| | | 36 | 16 | 21.0 | 21.0 | 20.5 |
| | | 36 | 35 | 20.9 | 20.7 | 20.4 |
| | | 75 | 0 | 21.0 | 20.9 | 20.6 |



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## 7.11. LTE BAND 30

| Test Engineer ID: | 84445 / 21193 | Test Date: | 5/22/2020 |
|---|---|---|---|

**OUTPUT POWER FOR LTE BAND 30 (5.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 27685 | 27710 | 27735 |
| | | | | 2307.5 MHz | 2310.0 MHz | 2312.5 MHz |
| 5 MHz | QPSK | 1 | 0 | 21.1 | 21.2 | 21.2 |
| | | 1 | 12 | 21.2 | 21.3 | 21.3 |
| | | 1 | 24 | 21.2 | 21.1 | 21.2 |
| | | 8 | 0 | 22.8 | 22.8 | 22.9 |
| | | 8 | 8 | 22.9 | 22.9 | **23.0** |
| | | 8 | 17 | 22.9 | 22.8 | 22.9 |
| | | 9 | 0 | 21.9 | 21.9 | 22.0 |
| | | 9 | 8 | 22.0 | 22.0 | 22.0 |
| | | 9 | 16 | 22.0 | 21.9 | 22.0 |
| | | 12 | 0 | 21.9 | 22.0 | 22.0 |
| | | 12 | 6 | 22.0 | 22.0 | 22.0 |
| | | 12 | 11 | 22.0 | 22.0 | 22.0 |
| | | 25 | 0 | 22.0 | 21.9 | 22.0 |
| | 16QAM | 1 | 0 | 21.6 | 21.2 | 21.3 |
| | | 1 | 12 | 21.7 | 21.4 | 21.3 |
| | | 1 | 24 | 21.7 | 21.2 | 21.3 |
| | | 8 | 0 | 21.9 | 22.0 | 22.1 |
| | | 8 | 8 | 22.0 | **22.1** | **22.1** |
| | | 8 | 17 | 22.0 | 22.0 | 22.1 |
| | | 9 | 0 | 20.9 | 21.0 | 21.0 |
| | | 9 | 8 | 21.1 | 21.0 | 21.0 |
| | | 9 | 16 | 21.0 | 20.9 | 21.0 |
| | | 12 | 0 | 21.1 | 21.0 | 21.0 |
| | | 12 | 6 | 21.1 | 21.0 | 21.0 |
| | | 12 | 11 | 21.1 | 21.0 | 21.0 |
| | | 25 | 0 | 21.1 | 20.9 | 20.9 |
| | 64QAM | 1 | 0 | 21.2 | 21.1 | 21.2 |
| | | 1 | 12 | **21.3** | 21.2 | 21.2 |
| | | 1 | 24 | 21.2 | 21.1 | 21.1 |
| | | 8 | 0 | 20.9 | 21.0 | 21.1 |
| | | 8 | 8 | 21.1 | 21.1 | 21.1 |
| | | 8 | 17 | 21.0 | 21.0 | 21.0 |
| | | 9 | 0 | 20.0 | 19.9 | 20.0 |
| | | 9 | 8 | 20.1 | 20.0 | 20.0 |
| | | 9 | 16 | 20.0 | 19.9 | 19.9 |
| | | 12 | 0 | 19.9 | 20.1 | 20.1 |
| | | 12 | 6 | 20.0 | 20.1 | 20.1 |
| | | 12 | 11 | 19.9 | 20.0 | 20.1 |
| | | 25 | 0 | 20.0 | 20.0 | 20.0 |



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**OUTPUT POWER FOR LTE BAND 30 (10.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | N/A | 27710 | N/A |
| | | | | N/A | 2310.0 MHz | N/A |
| 10 MHz | QPSK | 1 | 0 | | 21.1 | |
| | | 1 | 24 | | 21.3 | |
| | | 1 | 49 | | 21.2 | |
| | | 8 | 0 | | 22.8 | |
| | | 8 | 21 | | **22.9** | |
| | | 8 | 42 | | 22.8 | |
| | | 15 | 0 | | 21.9 | |
| | | 15 | 17 | | 21.9 | |
| | | 15 | 35 | | 21.9 | |
| | | 25 | 0 | | 22.0 | |
| | | 25 | 12 | | 22.0 | |
| | | 25 | 24 | | 21.9 | |
| | | 50 | 0 | | 21.9 | |
| | 16QAM | 1 | 0 | | 21.8 | |
| | | 1 | 24 | | 21.3 | |
| | | 1 | 49 | | 21.7 | |
| | | 8 | 0 | | **22.0** | |
| | | 8 | 21 | | 22.0 | |
| | | 8 | 42 | | 21.9 | |
| | | 15 | 0 | | 21.0 | |
| | | 15 | 17 | | 21.0 | |
| | | 15 | 35 | | 20.9 | |
| | | 25 | 0 | | 21.0 | |
| | | 25 | 12 | | 21.0 | |
| | | 25 | 24 | | 20.9 | |
| | | 50 | 0 | | 20.9 | |
| | 64QAM | 1 | 0 | | **21.4** | |
| | | 1 | 24 | | 21.3 | |
| | | 1 | 49 | | 21.2 | |
| | | 8 | 0 | | 21.0 | |
| | | 8 | 21 | | 21.0 | |
| | | 8 | 42 | | 20.9 | |
| | | 15 | 0 | | 20.0 | |
| | | 15 | 17 | | 20.0 | |
| | | 15 | 35 | | 19.9 | |
| | | 25 | 0 | | 20.0 | |
| | | 25 | 12 | | 20.0 | |
| | | 25 | 24 | | 20.0 | |
| | | 50 | 0 | | 20.0 | |




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## 7.12. LTE BAND 41

| Test Engineer ID: | 50820 EC | Test Date: | 3/3/2020 |
|---|---|---|---|

**OUTPUT POWER FOR LTE BAND 41 (5.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 39675 | 40620 | 41565 |
| | | | | 2498.5 MHz | 2593.0 MHz | 2687.5 MHz |
| 5.0 | QPSK | 1 | 0 | 23.7 | 23.8 | 24.0 |
| | | 1 | 12 | 23.8 | 23.9 | 24.0 |
| | | 1 | 24 | 23.8 | 23.8 | **24.1** |
| | | 12 | 0 | 22.8 | 22.9 | 23.1 |
| | | 12 | 6 | 22.9 | 23.0 | 23.1 |
| | | 12 | 11 | 22.9 | 22.9 | 23.1 |
| | | 25 | 0 | 22.9 | 22.9 | 23.1 |
| | 16QAM | 1 | 0 | 22.8 | 22.8 | 23.0 |
| | | 1 | 12 | 23.0 | 22.8 | 23.0 |
| | | 1 | 24 | 22.9 | 22.8 | **23.0** |
| | | 12 | 0 | 21.9 | 21.9 | 22.0 |
| | | 12 | 6 | 22.0 | 22.0 | 22.1 |
| | | 12 | 11 | 22.0 | 22.0 | 22.1 |
| | | 25 | 0 | 21.9 | 21.9 | 22.1 |
| | 64QAM | 1 | 0 | 21.6 | 21.3 | 22.2 |
| | | 1 | 12 | 21.6 | 21.3 | 22.2 |
| | | 1 | 24 | 21.6 | 21.3 | **22.2** |
| | | 12 | 0 | 20.4 | 20.6 | 20.9 |
| | | 12 | 6 | 20.5 | 20.6 | 20.9 |
| | | 12 | 11 | 20.5 | 20.6 | 21.0 |
| | | 25 | 0 | 20.4 | 20.6 | 20.8 |

**OUTPUT POWER FOR LTE BAND 41 (10.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 39700 | 40620 | 41540 |
| | | | | 2501.0 MHz | 2593.0 MHz | 2685.0 MHz |
| 10.0 | QPSK | 1 | 0 | 23.8 | 23.7 | 23.9 |
| | | 1 | 24 | 23.7 | 23.6 | 23.7 |
| | | 1 | 49 | 23.7 | 23.7 | **23.9** |
| | | 25 | 0 | 22.9 | 22.9 | 23.1 |
| | | 25 | 12 | 22.9 | 22.9 | 23.1 |
| | | 25 | 24 | 22.8 | 22.9 | 23.0 |
| | | 50 | 0 | 22.8 | 22.9 | 23.0 |
| | 16QAM | 1 | 0 | 22.8 | 22.7 | **22.9** |
| | | 1 | 24 | 22.6 | 22.6 | 22.7 |
| | | 1 | 49 | 22.7 | 22.7 | 22.8 |
| | | 25 | 0 | 21.9 | 21.9 | 22.1 |
| | | 25 | 12 | 21.9 | 21.9 | 22.1 |
| | | 25 | 24 | 21.8 | 21.9 | 22.0 |
| | | 50 | 0 | 21.9 | 21.9 | 22.1 |
| | 64QAM | 1 | 0 | 21.5 | 21.1 | 22.0 |
| | | 1 | 24 | 21.4 | 21.1 | 22.0 |
| | | 1 | 49 | 21.5 | 21.2 | **22.1** |
| | | 25 | 0 | 20.5 | 20.6 | 20.8 |
| | | 25 | 12 | 20.5 | 20.6 | 20.8 |
| | | 25 | 24 | 20.4 | 20.6 | 20.8 |
| | | 50 | 0 | 20.5 | 20.6 | 20.8 |




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**OUTPUT POWER FOR LTE BAND 41 (15.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 39725 | 40620 | 41515 |
| | | | | 2503.5 MHz | 2593.0 MHz | 2682.5 MHz |
| 15.0 | QPSK | 1 | 0 | 24.1 | 23.9 | 24.1 |
| | | 1 | 37 | 24.0 | 23.7 | 24.2 |
| | | 1 | 74 | 24.0 | 23.9 | **24.3** |
| | | 36 | 0 | 22.9 | 23.0 | 23.1 |
| | | 36 | 16 | 23.0 | 23.1 | 23.2 |
| | | 36 | 35 | 23.0 | 23.1 | 23.2 |
| | | 75 | 0 | 23.0 | 23.0 | 23.1 |
| | 16QAM | 1 | 0 | 23.1 | 23.1 | 23.2 |
| | | 1 | 37 | 23.1 | 23.1 | 23.2 |
| | | 1 | 74 | 23.1 | 23.0 | **23.3** |
| | | 36 | 0 | 22.0 | 22.0 | 22.1 |
| | | 36 | 16 | 22.0 | 22.1 | 22.2 |
| | | 36 | 35 | 22.0 | 22.0 | 22.2 |
| | | 75 | 0 | 22.0 | 22.0 | 22.2 |
| | 64QAM | 1 | 0 | 21.4 | 21.4 | 22.2 |
| | | 1 | 37 | 21.2 | 21.4 | 22.3 |
| | | 1 | 74 | 21.4 | 21.4 | **22.4** |
| | | 36 | 0 | 20.6 | 20.8 | 21.0 |
| | | 36 | 16 | 20.6 | 20.9 | 21.1 |
| | | 36 | 35 | 20.6 | 20.9 | 21.1 |
| | | 75 | 0 | 20.7 | 20.8 | 21.0 |

**OUTPUT POWER FOR LTE BAND 41 (20.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 39750 | 40620 | 41490 |
| | | | | 2506.0 MHz | 2593.0 MHz | 2680.0 MHz |
| 20.0 | QPSK | 1 | 0 | 24.0 | 24.0 | 23.9 |
| | | 1 | 49 | 23.9 | 24.0 | 24.0 |
| | | 1 | 99 | 23.9 | 24.0 | **24.2** |
| | | 50 | 0 | 23.0 | 23.1 | 23.1 |
| | | 50 | 24 | 23.0 | 23.1 | 23.2 |
| | | 50 | 49 | 23.0 | 23.0 | 23.2 |
| | | 100 | 0 | 23.0 | 23.0 | 23.2 |
| | 16QAM | 1 | 0 | 22.8 | **23.3** | 23.0 |
| | | 1 | 49 | 22.8 | 23.3 | 23.0 |
| | | 1 | 99 | 22.8 | 23.2 | 23.2 |
| | | 50 | 0 | 22.0 | 22.1 | 22.1 |
| | | 50 | 24 | 22.0 | 22.1 | 22.2 |
| | | 50 | 49 | 22.0 | 22.0 | 22.1 |
| | | 100 | 0 | 22.0 | 22.0 | 22.2 |
| | 64QAM | 1 | 0 | 22.0 | 21.5 | 22.0 |
| | | 1 | 49 | 21.9 | 21.5 | 22.1 |
| | | 1 | 99 | 22.0 | 21.6 | **22.3** |
| | | 50 | 0 | 20.6 | 20.7 | 20.9 |
| | | 50 | 24 | 20.7 | 20.8 | 21.0 |
| | | 50 | 49 | 20.7 | 20.8 | 21.0 |
| | | 100 | 0 | 20.6 | 20.7 | 21.0 |



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## 7.13. LTE BAND 66

| Test Engineer ID: | 39005 RA | Test Date: | 3/3/2020 |
|---|---|---|---|

**OUTPUT POWER FOR LTE BAND 66 (1.4 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 131979 | 132322 | 132665 |
| | | | | 1710.7 MHz | 1745.0 MHz | 1779.3 MHz |
| 1.4 | QPSK | 1 | 0 | 23.6 | 23.7 | 23.6 |
| | | 1 | 2 | 23.6 | **23.8** | 23.6 |
| | | 1 | 5 | 23.6 | 23.7 | 23.6 |
| | | 3 | 0 | 23.6 | 23.7 | 23.5 |
| | | 3 | 1 | 23.6 | 23.7 | 23.6 |
| | | 3 | 2 | 23.6 | 23.7 | 23.6 |
| | | 6 | 0 | 22.7 | 22.7 | 22.6 |
| | 16QAM | 1 | 0 | 22.6 | 22.8 | 22.9 |
| | | 1 | 2 | 22.7 | 22.9 | **23.0** |
| | | 1 | 5 | 22.7 | 22.8 | 22.9 |
| | | 3 | 0 | 22.8 | 22.7 | 22.7 |
| | | 3 | 1 | 22.8 | 22.8 | 22.8 |
| | | 3 | 2 | 22.8 | 22.8 | 22.8 |
| | | 6 | 0 | 21.9 | 21.9 | 21.6 |
| | 64QAM | 1 | 0 | 22.1 | 21.9 | 21.8 |
| | | 1 | 2 | **22.2** | 22.1 | 21.9 |
| | | 1 | 5 | 22.1 | 21.9 | 21.9 |
| | | 3 | 0 | 22.0 | 21.9 | 21.6 |
| | | 3 | 1 | 22.1 | 22.0 | 21.7 |
| | | 3 | 2 | 22.1 | 22.0 | 21.7 |
| | | 6 | 0 | 20.8 | 21.1 | 20.8 |

**OUTPUT POWER FOR LTE BAND 66 (3.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 131987 | 132322 | 132657 |
| | | | | 1711.5 MHz | 1745.0 MHz | 1778.5 MHz |
| 3.0 | QPSK | 1 | 0 | 23.6 | 23.6 | 23.6 |
| | | 1 | 7 | 23.6 | 23.7 | 23.6 |
| | | 1 | 14 | 23.6 | **23.7** | 23.6 |
| | | 8 | 0 | 22.7 | 22.8 | 22.6 |
| | | 8 | 4 | 22.7 | 22.8 | 22.7 |
| | | 8 | 7 | 22.8 | 22.8 | 22.7 |
| | | 15 | 0 | 22.7 | 22.8 | 22.7 |
| | 16QAM | 1 | 0 | 22.7 | 22.6 | 23.0 |
| | | 1 | 7 | 22.7 | 22.6 | 23.0 |
| | | 1 | 14 | 22.7 | 22.6 | **23.0** |
| | | 8 | 0 | 21.8 | 21.9 | 21.7 |
| | | 8 | 4 | 21.8 | 21.9 | 21.8 |
| | | 8 | 7 | 21.8 | 22.0 | 21.8 |
| | | 15 | 0 | 21.7 | 21.8 | 21.7 |
| | 64QAM | 1 | 0 | 22.0 | 22.1 | 21.8 |
| | | 1 | 7 | 21.9 | 22.1 | 21.8 |
| | | 1 | 14 | 22.0 | **22.2** | 21.9 |
| | | 8 | 0 | 20.8 | 20.9 | 20.8 |
| | | 8 | 4 | 20.8 | 20.9 | 20.8 |
| | | 8 | 7 | 20.9 | 21.0 | 20.9 |
| | | 15 | 0 | 20.9 | 20.9 | 20.8 |



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**OUTPUT POWER FOR LTE BAND 66 (5.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 131997 | 132322 | 132647 |
| | | | | 1712.5 MHz | 1745.0 MHz | 1777.5 MHz |
| 5.0 | QPSK | 1 | 0 | 23.9 | 23.9 | 23.9 |
| | | 1 | 12 | 24.0 | 23.9 | 23.9 |
| | | 1 | 24 | **24.1** | 24.0 | 23.9 |
| | | 12 | 0 | 23.0 | 23.0 | 22.9 |
| | | 12 | 6 | 23.0 | 23.0 | 23.0 |
| | | 12 | 11 | 23.0 | 23.0 | 23.0 |
| | | 25 | 0 | 23.0 | 23.0 | 22.9 |
| | 16QAM | 1 | 0 | 23.0 | 23.4 | 22.9 |
| | | 1 | 12 | 23.1 | 23.5 | 23.0 |
| | | 1 | 24 | 23.2 | **23.5** | 23.0 |
| | | 12 | 0 | 22.1 | 22.1 | 22.0 |
| | | 12 | 6 | 22.1 | 22.2 | 22.0 |
| | | 12 | 11 | 22.1 | 22.2 | 22.0 |
| | | 25 | 0 | 22.0 | 22.0 | 21.9 |
| | 64QAM | 1 | 0 | 22.0 | 21.8 | 22.1 |
| | | 1 | 12 | 22.1 | 21.8 | 22.1 |
| | | 1 | 24 | 22.1 | 21.9 | **22.1** |
| | | 12 | 0 | 20.9 | 20.9 | 20.7 |
| | | 12 | 6 | 20.9 | 20.9 | 20.8 |
| | | 12 | 11 | 20.9 | 20.9 | 20.8 |
| | | 25 | 0 | 20.9 | 20.8 | 20.8 |

**OUTPUT POWER FOR LTE BAND 66 (10.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 132022 | 132322 | 132622 |
| | | | | 1715.0 MHz | 1745.0 MHz | 1775.0 MHz |
| 10.0 | QPSK | 1 | 0 | 23.8 | **23.9** | 23.9 |
| | | 1 | 24 | 23.6 | 23.8 | 23.7 |
| | | 1 | 49 | 23.8 | 23.9 | 23.8 |
| | | 25 | 0 | 23.0 | 23.0 | 22.9 |
| | | 25 | 12 | 23.0 | 23.0 | 22.9 |
| | | 25 | 24 | 22.9 | 23.0 | 22.9 |
| | | 50 | 0 | 23.0 | 23.0 | 22.9 |
| | 16QAM | 1 | 0 | 22.8 | **23.3** | 22.8 |
| | | 1 | 24 | 22.8 | 23.3 | 22.7 |
| | | 1 | 49 | 22.7 | 23.2 | 22.8 |
| | | 25 | 0 | 22.0 | 22.1 | 22.0 |
| | | 25 | 12 | 22.0 | 22.1 | 22.0 |
| | | 25 | 24 | 21.9 | 22.0 | 22.0 |
| | | 50 | 0 | 21.9 | 22.0 | 21.9 |
| | 64QAM | 1 | 0 | **22.1** | 22.0 | 22.0 |
| | | 1 | 24 | 21.9 | 22.0 | 22.0 |
| | | 1 | 49 | 22.1 | 22.0 | 21.9 |
| | | 25 | 0 | 20.8 | 21.0 | 20.9 |
| | | 25 | 12 | 20.8 | 21.0 | 20.9 |
| | | 25 | 24 | 20.8 | 20.9 | 20.8 |
| | | 50 | 0 | 20.8 | 20.9 | 20.8 |



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**OUTPUT POWER FOR LTE BAND 66 (15.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 132047 | 132322 | 132597 |
| | | | | 1717.5 MHz | 1745.0 MHz | 1772.5 MHz |
| 15.0 | QPSK | 1 | 0 | 24.2 | **24.2** | 24.2 |
| | | 1 | 37 | 24.0 | 24.0 | 23.8 |
| | | 1 | 74 | 24.1 | 24.1 | 23.9 |
| | | 36 | 0 | 23.1 | 23.2 | 23.1 |
| | | 36 | 16 | 23.1 | 23.2 | 23.1 |
| | | 36 | 35 | 23.1 | 23.1 | 23.0 |
| | | 75 | 0 | 23.1 | 23.1 | 23.1 |
| | 16QAM | 1 | 0 | 23.5 | **23.6** | 23.0 |
| | | 1 | 37 | 23.3 | 23.3 | 22.8 |
| | | 1 | 74 | 23.4 | 23.4 | 22.8 |
| | | 36 | 0 | 22.2 | 22.2 | 22.1 |
| | | 36 | 16 | 22.2 | 22.1 | 22.1 |
| | | 36 | 35 | 22.1 | 22.1 | 22.0 |
| | | 75 | 0 | 22.2 | 22.2 | 22.1 |
| | 64QAM | 1 | 0 | 22.2 | **22.7** | 22.3 |
| | | 1 | 37 | 22.0 | 22.6 | 22.2 |
| | | 1 | 74 | 22.1 | 22.5 | 22.2 |
| | | 36 | 0 | 21.1 | 21.1 | 21.0 |
| | | 36 | 16 | 21.0 | 21.1 | 21.0 |
| | | 36 | 35 | 21.0 | 21.0 | 20.9 |
| | | 75 | 0 | 21.0 | 21.1 | 21.0 |

**OUTPUT POWER FOR LTE BAND 66 (20.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 132072 | 132322 | 132572 |
| | | | | 1720.0 MHz | 1745.0 MHz | 1770.0 MHz |
| 20.0 | QPSK | 1 | 0 | 24.0 | 24.1 | **24.1** |
| | | 1 | 49 | 24.0 | 24.1 | 24.0 |
| | | 1 | 99 | 24.1 | 24.1 | 23.9 |
| | | 50 | 0 | 23.1 | 23.2 | 23.1 |
| | | 50 | 24 | 23.1 | 23.2 | 23.1 |
| | | 50 | 49 | 23.1 | 23.1 | 23.0 |
| | | 100 | 0 | 23.1 | 23.1 | 23.1 |
| | 16QAM | 1 | 0 | 23.5 | 23.5 | **23.7** |
| | | 1 | 49 | 23.4 | 23.5 | 23.6 |
| | | 1 | 99 | 23.4 | 23.4 | 23.5 |
| | | 50 | 0 | 22.2 | 22.2 | 22.2 |
| | | 50 | 24 | 22.1 | 22.2 | 22.1 |
| | | 50 | 49 | 22.1 | 22.0 | 22.0 |
| | | 100 | 0 | 22.1 | 22.2 | 22.1 |
| | 64QAM | 1 | 0 | 22.5 | 22.3 | 22.3 |
| | | 1 | 49 | 22.6 | 22.2 | 22.3 |
| | | 1 | 99 | **22.6** | 22.2 | 22.1 |
| | | 50 | 0 | 21.0 | 21.1 | 21.0 |
| | | 50 | 24 | 21.0 | 21.1 | 21.0 |
| | | 50 | 49 | 20.9 | 21.0 | 20.9 |
| | | 100 | 0 | 21.0 | 21.0 | 20.9 |



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# 8. CONDUCTED TEST RESULTS

## 8.1. 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 middle channel in each band. The 99% and -26dB bandwidths was also measured and recorded.

**RESULTS**

There is no limit required and power is the same for low, middle and high channel; therefore, only middle channel was tested. Worst-case plots are reported only.



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**LTE BAND 2**

| Band | Mode | RB Allocation/RB Offset | f(MHz) | 99% BW (MHz) | -26dB BW (MHz) |
|---|---|---|---|---|---|
| LTE BAND 2 | 1.4MHz, QPSK | 6/0 | 1880.0 | 1.0806 | 1.220 |
| | 1.4MHz,16QAM | | | 1.0846 | 1.225 |
| | 3MHz, QPSK | 15/0 | | 2.6872 | 2.968 |
| | 3MHz, 16QAM | | | 2.6862 | 2.978 |
| | 5MHz, QPSK | 25/0 | | 4.4976 | 4.881 |
| | 5MHz, 16QAM | | | 4.4974 | 4.926 |
| | 10MHz, QPSK | 50/0 | | 8.9389 | 9.696 |
| | 10MHz, 16QAM | | | 8.9461 | 9.731 |
| | 15MHz, QPSK | 75/0 | | 13.4450 | 14.512 |
| | 15MHz, 16QAM | | | 13.4182 | 14.492 |
| | 20MHz, QPSK | 100/0 | | 17.8779 | 19.245 |
| | 20MHz, 16QAM | | | 17.8623 | 19.408 |
| | 20MHz, QPSK | 1/0 | | 0.261 | 0.478 |

**LTE BAND 4**

| Band | Mode | RB Allocation/RB Offset | f(MHz) | 99% BW (MHz) | -26dB BW (MHz) |
|---|---|---|---|---|---|
| LTE BAND 4 | 1.4MHz, QPSK | 6/0 | 1732.5 | 1.0825 | 1.217 |
| | 1.4MHz,16QAM | | | 1.0920 | 1.240 |
| | 3MHz, QPSK | 15/0 | | 2.6872 | 2.968 |
| | 3MHz, 16QAM | | | 2.6823 | 2.973 |
| | 5MHz, QPSK | 25/0 | | 4.4902 | 4.914 |
| | 5MHz, 16QAM | | | 4.4896 | 4.926 |
| | 10MHz, QPSK | 50/0 | | 8.9587 | 9.742 |
| | 10MHz, 16QAM | | | 8.9776 | 9.664 |
| | 15MHz, QPSK | 75/0 | | 13.4022 | 14.540 |
| | 15MHz, 16QAM | | | 13.4228 | 14.366 |
| | 20MHz, QPSK | 100/0 | | 17.8705 | 19.364 |
| | 20MHz, 16QAM | | | 17.8920 | 19.272 |
| | 20MHz, QPSK | 1/0 | | 0.265 | 0.437 |

**LTE BAND 5**

| Band | Mode | RB Allocation/RB Offset | f(MHz) | 99% BW (MHz) | -26dB BW (MHz) |
|---|---|---|---|---|---|
| LTE BAND 5 | 1.4MHz, QPSK | 6/0 | 836.5 | 1.0788 | 1.213 |
| | 1.4MHz,16QAM | | | 1.0801 | 1.224 |
| | 3MHz, QPSK | 15/0 | | 2.6827 | 2.962 |
| | 3MHz, 16QAM | | | 2.6769 | 2.972 |
| | 5MHz, QPSK | 25/0 | | 4.4974 | 4.962 |
| | 5MHz, 16QAM | | | 4.4934 | 4.879 |
| | 10MHz, QPSK | 50/0 | | 8.9600 | 9.657 |
| | 10MHz, 16QAM | | | 8.9173 | 9.667 |
| | 10MHz, QPSK | 1/0 | | 0.235 | 0.376 |



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**LTE BAND 7**

| Band | Mode | RB Allocation/RB Offset | f(MHz) | 99% BW (MHz) | -26dB BW (MHz) |
|---|---|---|---|---|---|
| LTE BAND 7 | 5MHz, QPSK | 25/0 | 2535.0 | 4.5007 | 4.931 |
| | 5MHz, 16QAM | | | 4.4804 | 4.908 |
| | 10MHz, QPSK | 50/0 | | 8.9839 | 9.730 |
| | 10MHz, 16QAM | | | 8.9796 | 9.778 |
| | 15MHz, QPSK | 75/0 | | 13.421 | 14.62 |
| | 15MHz, 16QAM | | | 13.418 | 14.52 |
| | 20MHz, QPSK | 100/0 | | 17.877 | 19.29 |
| | 20MHz, 16QAM | | | 17.901 | 19.42 |

**LTE BAND 12**

| Band | Mode | RB Allocation/RB Offset | f(MHz) | 99% BW (MHz) | -26dB BW (MHz) |
|---|---|---|---|---|---|
| LTE BAND 12 | 1.4 MHz, QPSK | 6/0 | 707.5 | 1.0817 | 1.201 |
| | 1.4 MHz,16QAM | | | 1.0849 | 1.221 |
| | 3 MHz, QPSK | 15/0 | | 2.6843 | 2.995 |
| | 3 MHz, 16QAM | | | 2.6810 | 2.992 |
| | 5 MHz, QPSK | 25/0 | | 4.4952 | 4.919 |
| | 5 MHz, 16QAM | | | 4.4861 | 4.900 |
| | 10 MHz, QPSK | 50/0 | | 8.9403 | 9.662 |
| | 10 MHz, 16QAM | | | 8.9413 | 9.725 |
| | 10 MHz, QPSK | 1/0 | | 0.236 | 0.367 |

**LTE BAND 13**

| Band | Mode | RB Allocation/RB Offset | f(MHz) | 99% BW (MHz) | -26dB BW (MHz) |
|---|---|---|---|---|---|
| LTE BAND 13 | 5 MHz, QPSK | 25/0 | 782.0 | 4.5039 | 4.910 |
| | 5 MHz, 16QAM | | | 4.4933 | 4.953 |
| | 10 MHz, QPSK | 50/0 | | 8.9556 | 9.856 |
| | 10 MHz, 16QAM | | | 8.9274 | 9.726 |
| | 10 MHz, QPSK | 1/0 | | 0.239 | 0.395 |

**LTE BAND 14**

| Band | Mode | RB Allocation/RB Offset | f(MHz) | 99% BW (MHz) | -26dB BW (MHz) |
|---|---|---|---|---|---|
| LTE BAND 14 | 5 MHz, QPSK | 25/0 | 793.0 | 4.5263 | 4.896 |
| | 5 MHz, 16QAM | | | 4.4886 | 4.939 |
| | 10 MHz, QPSK | 50/0 | | 8.9951 | 9.749 |
| | 10 MHz, 16QAM | | | 8.9320 | 9.712 |
| | 10 MHz, QPSK | 1/0 | | 0.240 | 0.388 |



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**LTE BAND 25**

| Band | Mode | RB Allocation/RB Offset | f(MHz) | 99% BW (MHz) | -26dB BW (MHz) |
|---|---|---|---|---|---|
| LTE BAND 25 | 1.4MHz, QPSK | 6/0 | 1882.5 | 1.0870 | 1.231 |
| | 1.4MHz,16QAM | | | 1.0888 | 1.229 |
| | 3MHz, QPSK | 15/0 | | 2.6762 | 2.958 |
| | 3MHz, 16QAM | | | 2.6887 | 2.970 |
| | 5MHz, QPSK | 25/0 | | 4.4970 | 4.902 |
| | 5MHz, 16QAM | | | 4.4855 | 4.940 |
| | 10MHz, QPSK | 50/0 | | 8.9521 | 9.597 |
| | 10MHz, 16QAM | | | 8.9563 | 9.718 |
| | 15MHz, QPSK | 75/0 | | 13.4084 | 14.395 |
| | 15MHz, 16QAM | | | 13.4481 | 14.458 |
| | 20MHz, QPSK | 100/0 | | 17.8835 | 19.253 |
| | 20MHz, 16QAM | | | 17.8886 | 19.246 |
| | 20MHz, QPSK | 1/0 | | 0.249 | 0.463 |

**LTE BAND 26(FCC PART 90S)**

| Band | Mode | RB Allocation/RB Offset | f(MHz) | 99% BW (MHz) | -26dB BW (MHz) |
|---|---|---|---|---|---|
| | 1.4 MHz, QPSK | 6/0 | 819.0 | 1.0867 | 1.213 |
| | 1.4 MHz,16QAM | | | 1.0946 | 1.230 |
| | 3 MHz, QPSK | 15/0 | | 2.6820 | 2.971 |
| | 3 MHz, 16QAM | | | 2.6844 | 2.985 |
| | 5 MHz, QPSK | 25/0 | | 4.4952 | 4.875 |
| | 5 MHz, 16QAM | | | 4.4992 | 4.916 |
| | 10 MHz, QPSK | 50/0 | | 8.9423 | 9.714 |
| | 10 MHz, 16QAM | | | 8.9323 | 9.601 |
| | 10 MHz, QPSK | 1/0 | | 0.234 | 0.390 |

**LTE BAND 26 (FCC PART 22)**

| Band | Mode | RB Allocation/RB Offset | f(MHz) | 99% BW (MHz) | -26dB BW (MHz) |
|---|---|---|---|---|---|
| LTE BAND 26 | 1.4 MHz, QPSK | 6/0 | 836.5 | 1.0803 | 1.216 |
| | 1.4 MHz,16QAM | | | 1.0868 | 1.236 |
| | 3 MHz, QPSK | 15/0 | | 2.6907 | 3.001 |
| | 3 MHz, 16QAM | | | 2.6867 | 2.980 |
| | 5 MHz, QPSK | 25/0 | | 4.4945 | 4.932 |
| | 5 MHz, 16QAM | | | 4.4908 | 4.961 |
| | 10 MHz, QPSK | 50/0 | | 8.9582 | 9.707 |
| | 10 MHz, 16QAM | | | 8.9513 | 9.719 |
| | 15 MHz, QPSK | 75/0 | | 13.3973 | 14.278 |
| | 15 MHz, 16QAM | | | 13.3538 | 14.485 |



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**LTE BAND 30**

| Band | Mode | RB Allocation/RB Offset | f(MHz) | 99% BW (MHz) | -26dB BW (MHz) |
|---|---|---|---|---|---|
| LTE BAND 30 | 5MHz, QPSK | 25/0 | 2310.0 | 4.4948 | 4.880 |
| | 5MHz, 16QAM | | | 4.4872 | 4.920 |
| | 10MHz, QPSK | 50/0 | | 8.9467 | 9.814 |
| | 10MHz, 16QAM | | | 8.9434 | 9.639 |

**LTE BAND 41**

| Band | Mode | RB Allocation/RB Offset | f(MHz) | 99% BW (MHz) | -26dB BW (MHz) |
|---|---|---|---|---|---|
| LTE BAND 41 | 5MHz, QPSK | 25/0 | 2593.0 | 4.5051 | 4.874 |
| | 5MHz, 16QAM | | | 4.4868 | 4.916 |
| | 10MHz, QPSK | 50/0 | | 8.9945 | 9.776 |
| | 10MHz, 16QAM | | | 8.9635 | 9.738 |
| | 15MHz, QPSK | 75/0 | | 13.424 | 14.58 |
| | 15MHz, 16QAM | | | 13.433 | 14.53 |
| | 20MHz, QPSK | 100/0 | | 17.880 | 19.27 |
| | 20MHz, 16QAM | | | 17.891 | 19.32 |

**LTE BAND 66**

| Band | Mode | RB Allocation/RB Offset | f(MHz) | 99% BW (MHz) | -26dB BW (MHz) |
|---|---|---|---|---|---|
| LTE BAND 66 | 1.4MHz, QPSK | 6/0 | 1745.0 | 1.0789 | 1.221 |
| | 1.4MHz,16QAM | | | 1.0861 | 1.220 |
| | 3MHz, QPSK | 15/0 | | 2.6777 | 2.962 |
| | 3MHz, 16QAM | | | 2.6907 | 2.958 |
| | 5MHz, QPSK | 25/0 | | 4.5095 | 5.002 |
| | 5MHz, 16QAM | | | 4.4970 | 4.919 |
| | 10MHz, QPSK | 50/0 | | 8.9801 | 9.714 |
| | 10MHz, 16QAM | | | 8.9481 | 9.696 |
| | 15MHz, QPSK | 75/0 | | 13.4108 | 14.339 |
| | 15MHz, 16QAM | | | 13.3860 | 14.478 |
| | 20MHz, QPSK | 100/0 | | 17.8266 | 19.298 |
| | 20MHz, 16QAM | | | 17.8815 | 19.296 |
| | 20MHz, QPSK | 1/0 | | 0.257 | 0.459 |



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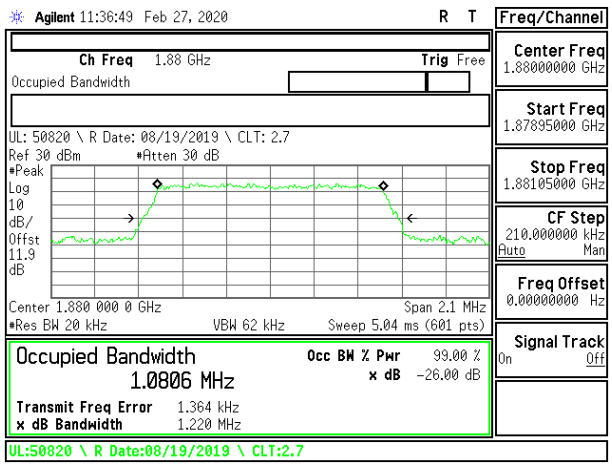
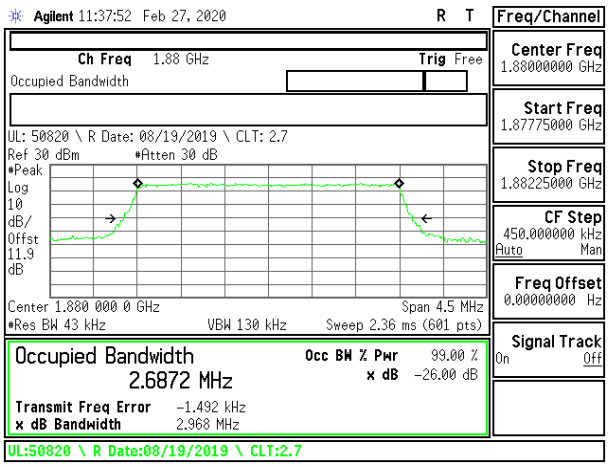
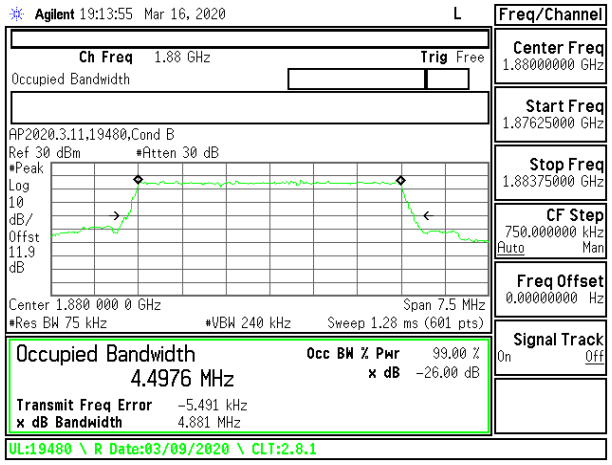
## 8.1.1. LTE BAND 2



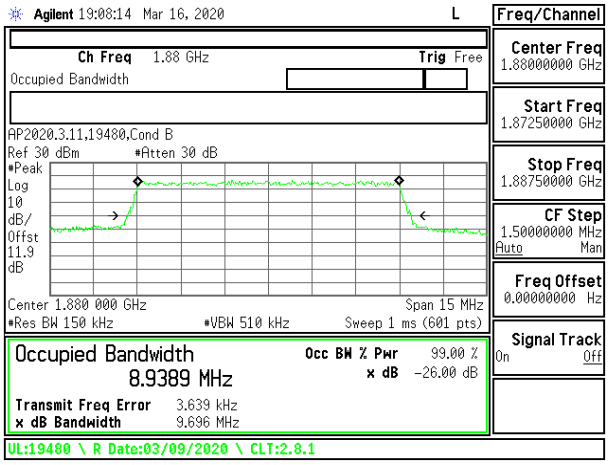

LTE B2 1.4MHz QPSK Middle Channel RB6-0



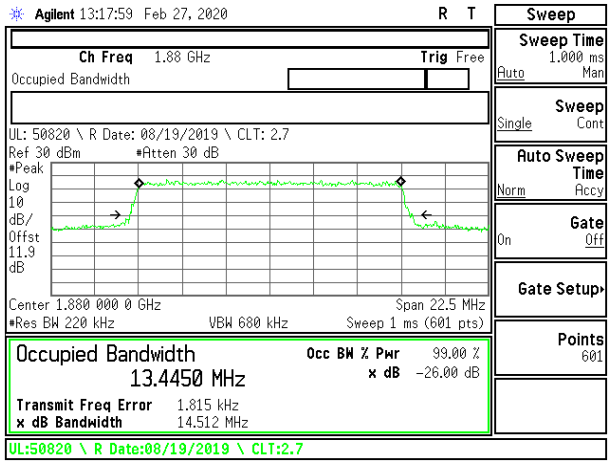

LTE B2 3MHz QPSK Middle Channel RB15-0



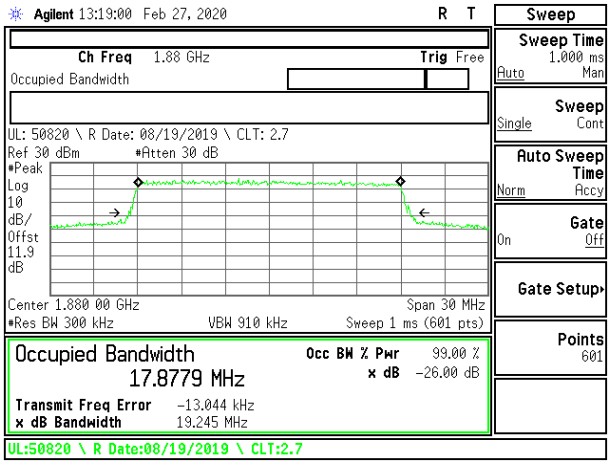

LTE B2 5MHz QPSK Middle Channel RB25-0




LTE B2 10MHz QPSK Middle Channel RB50-0




LTE B2 15MHz QPSK Middle Channel RB75-0




LTE B2 20MHz QPSK Middle Channel RB100-0



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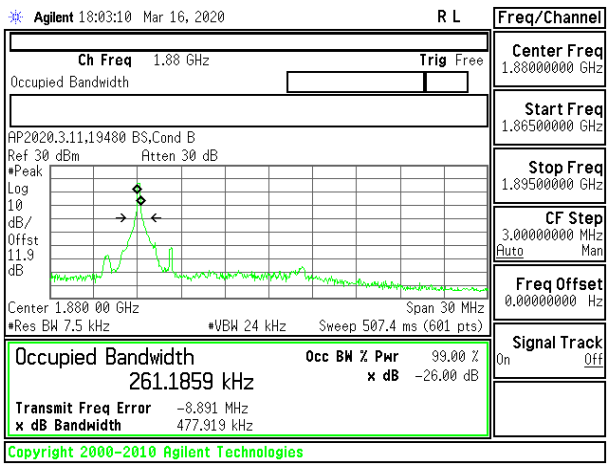


LTE B2 20MHz QPSK Middle Channel RB1-0





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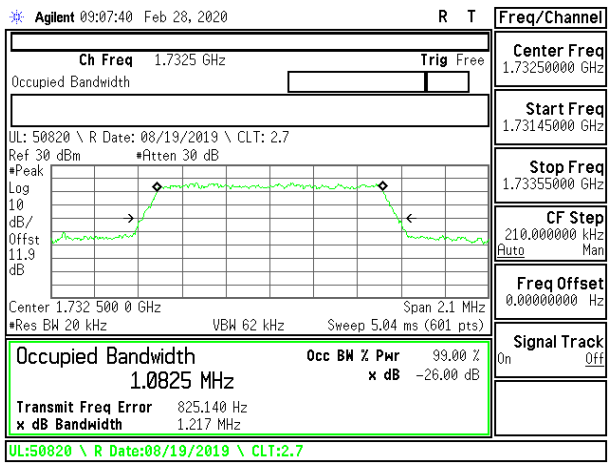
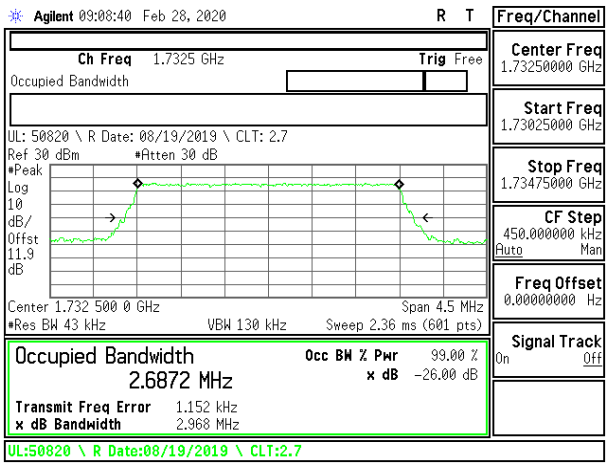
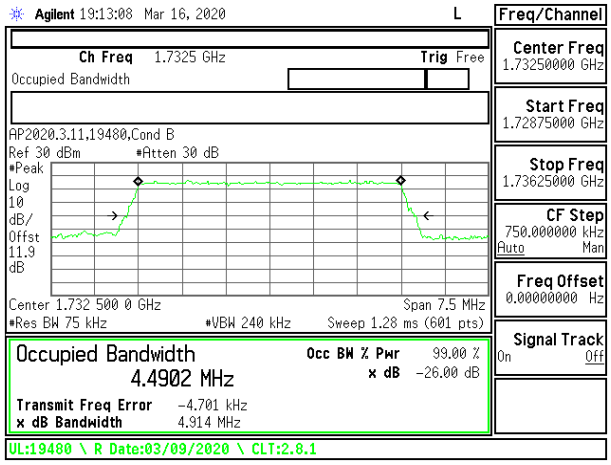
## 8.1.2. LTE BAND 4



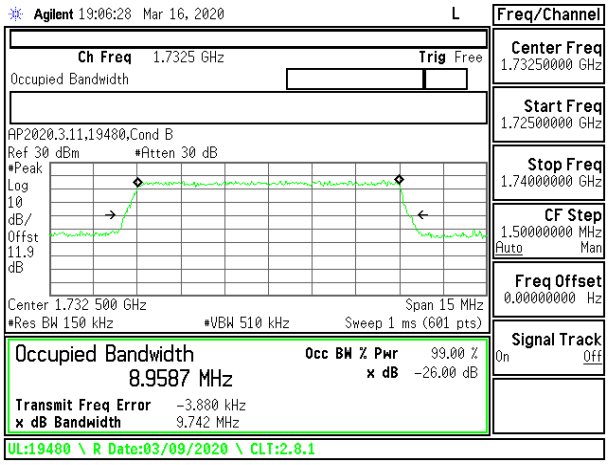

LTE B4 1.4MHz QPSK Middle Channel RB6-0



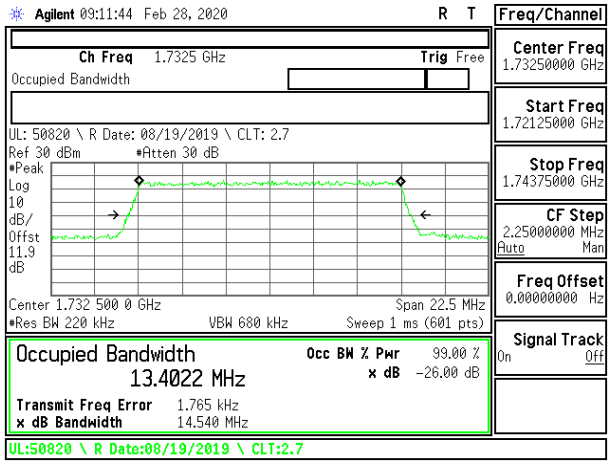

LTE B4 3MHz QPSK Middle Channel RB15-0



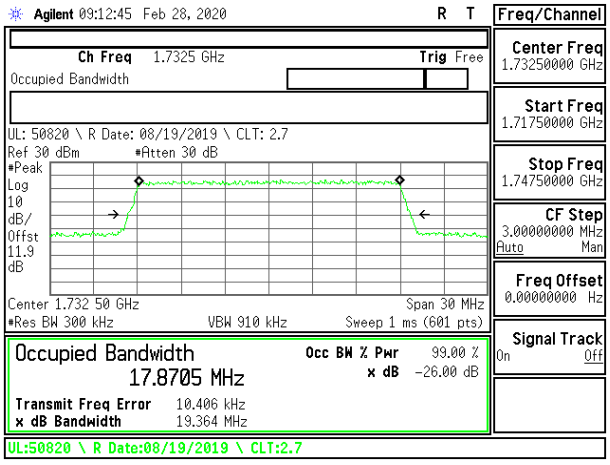

LTE B4 5MHz QPSK Middle Channel RB25-0




LTE B4 10MHz QPSK Middle Channel RB50-0




LTE B4 15MHz QPSK Middle Channel RB75-0




LTE B4 20MHz QPSK Middle Channel RB100-0



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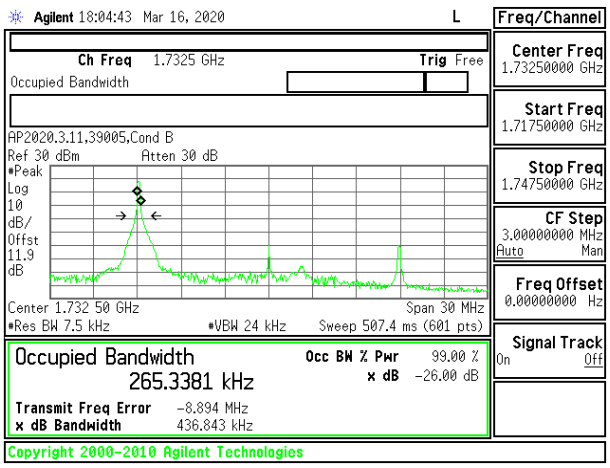


LTE B4 20MHz QPSK Middle Channel RB1-0





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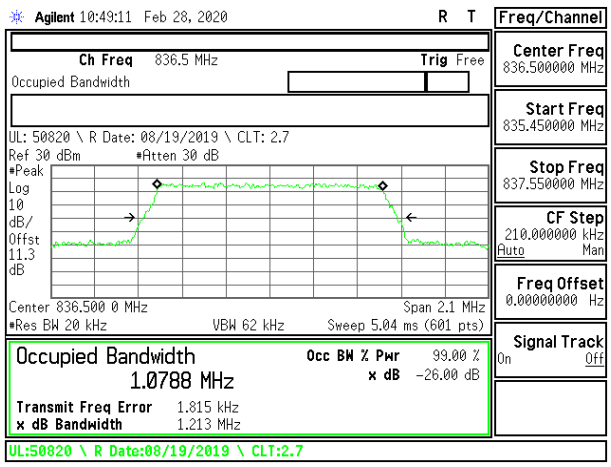
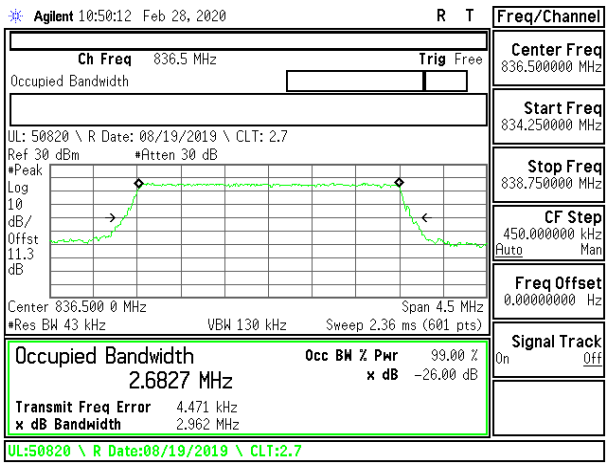
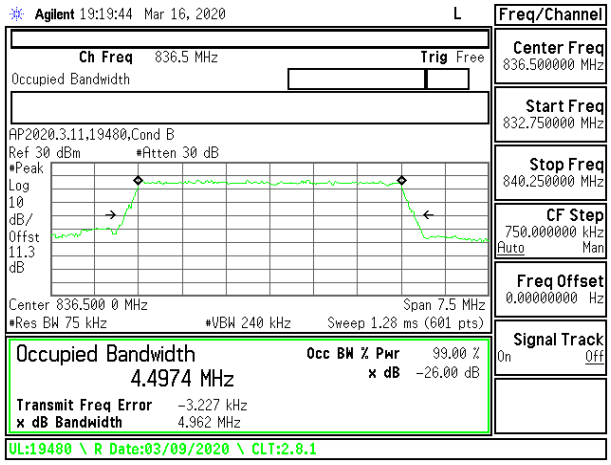
## 8.1.3. LTE BAND 5



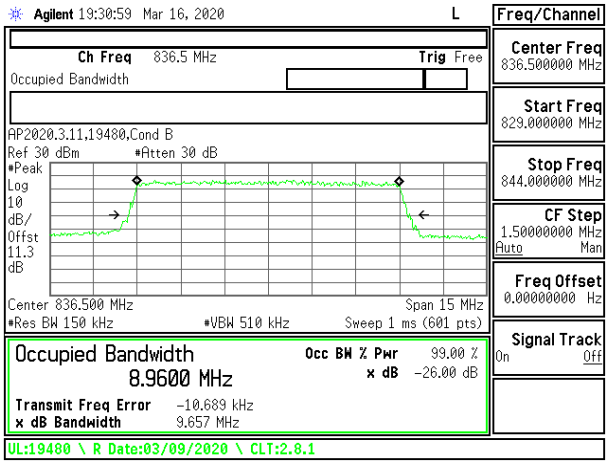

LTE B5 1.4MHz QPSK Middle Channel RB6-0



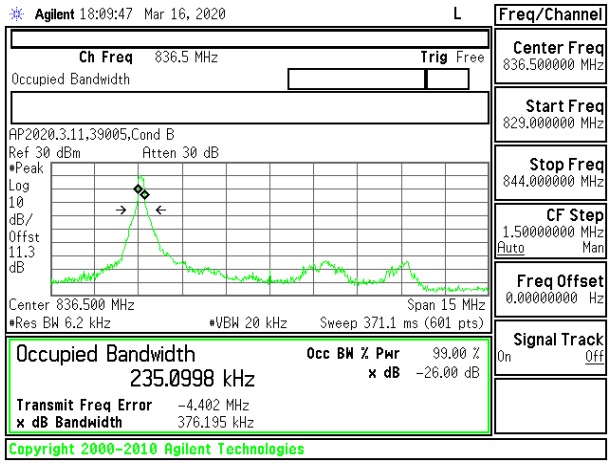

LTE B5 3MHz QPSK Middle Channel RB15-0




LTE B2 5MHz QPSK Middle Channel RB25-0




LTE B5 10MHz QPSK Middle Channel RB50-0




LTE B5 10MHz QPSK Middle Channel RB1-0



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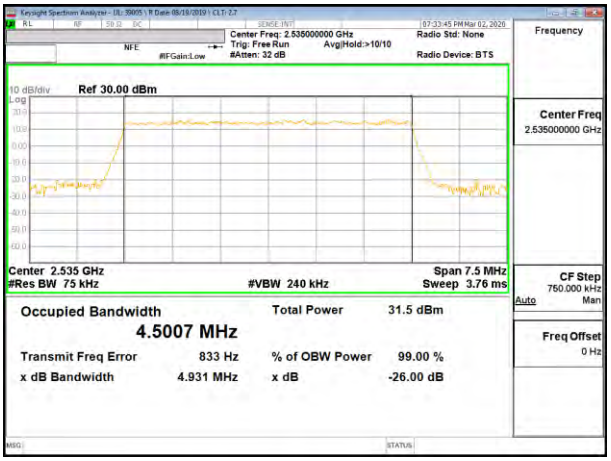
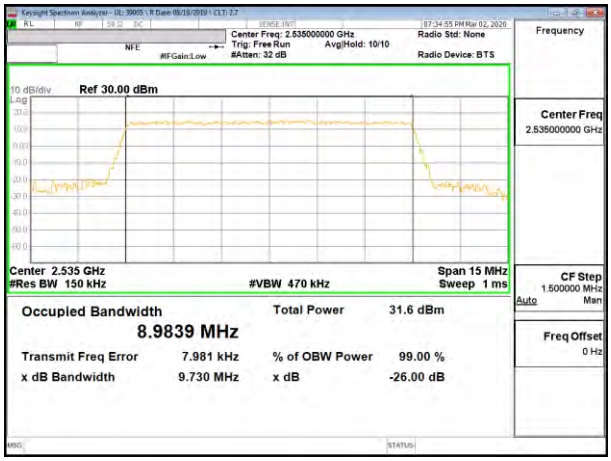
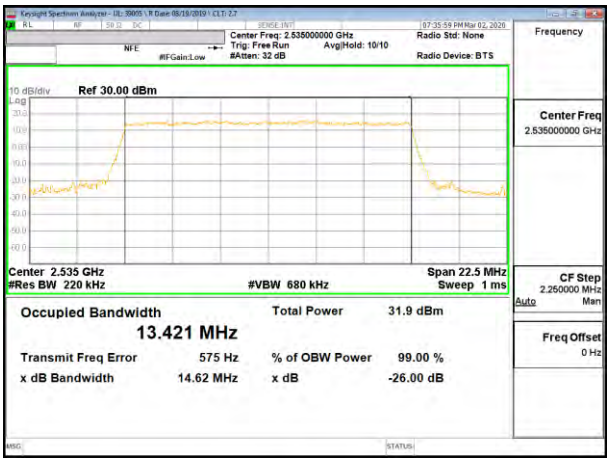
## 8.1.4. LTE BAND 7



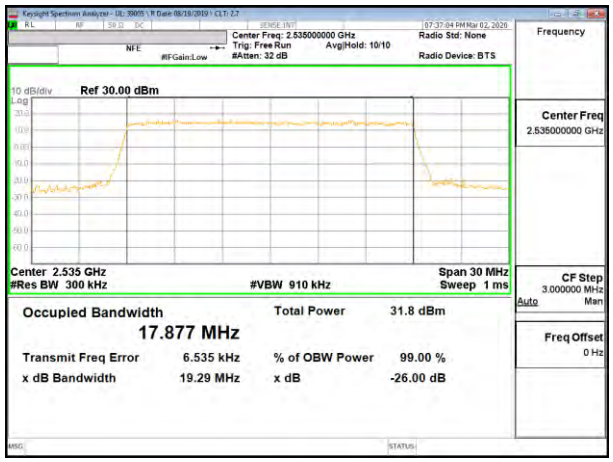

LTE B7 5MHz QPSK Middle Channel RB25-0




LTE B7 10MHz QPSK Middle Channel RB50-0




LTE B7 15MHz QPSK Middle Channel RB75-0




LTE B7 20MHz QPSK Middle Channel RB100-0



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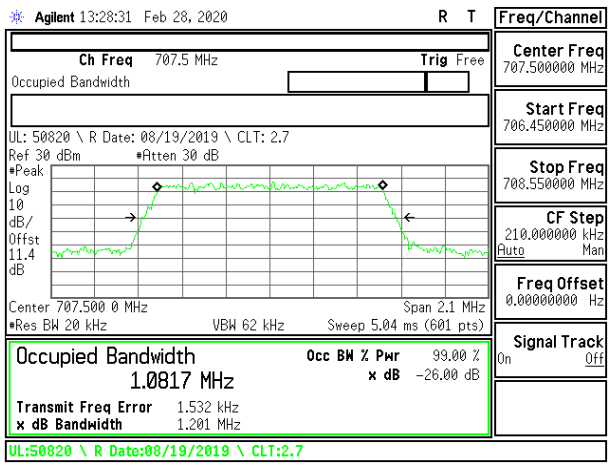
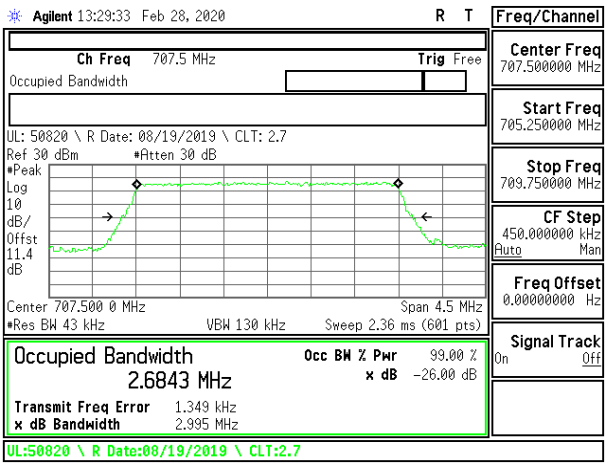
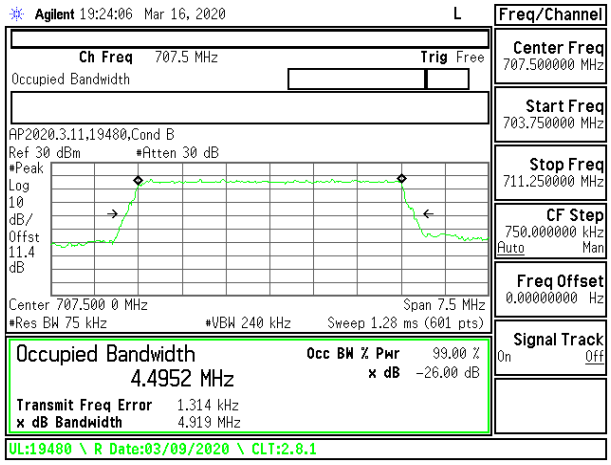
## 8.1.5. LTE BAND 12



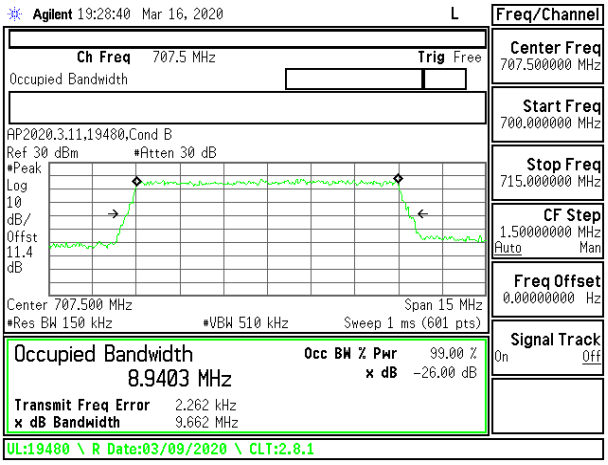

LTE B12 1.4MHz QPSK Middle Channel RB6-0



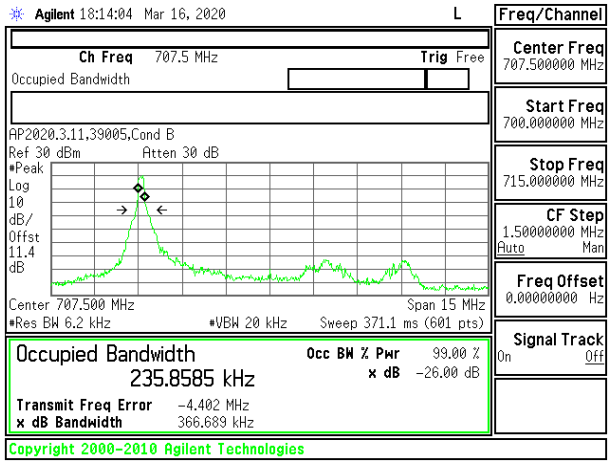

LTE B12 3MHz QPSK Middle Channel RB15-0




LTE B12 5MHz QPSK Middle Channel RB25-0




LTE B12 10MHz QPSK Middle Channel RB50-0




LTE B12 10MHz QPSK Middle Channel RB1-0



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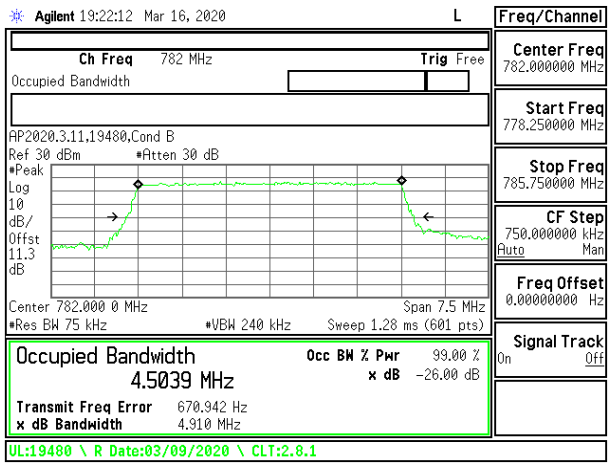
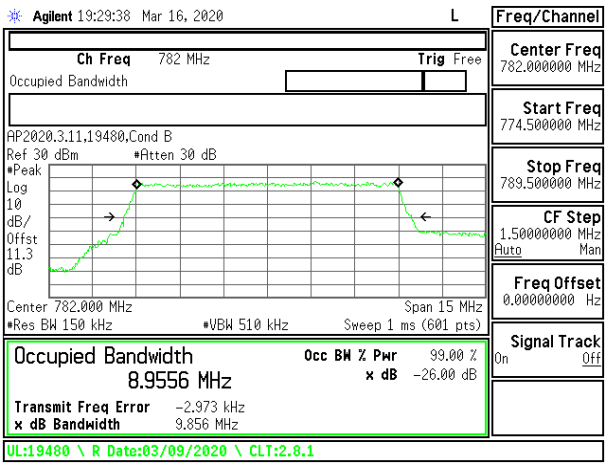
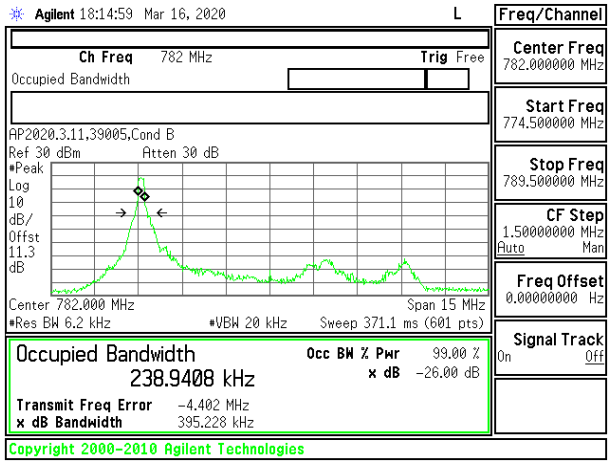
## 8.1.6. LTE BAND 13




LTE B13 5MHz QPSK Middle Channel RB25-0




LTE B13 10MHz QPSK Middle Channel RB50-0




LTE B13 10MHz QPSK Middle Channel RB1-0



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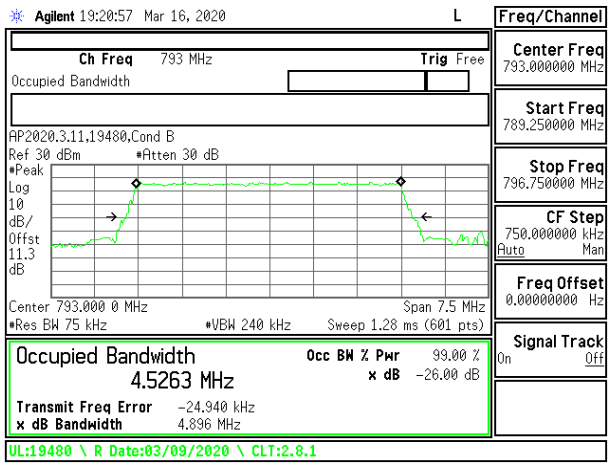
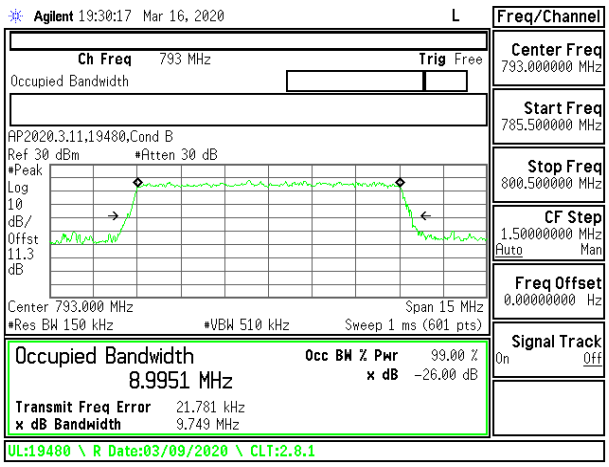
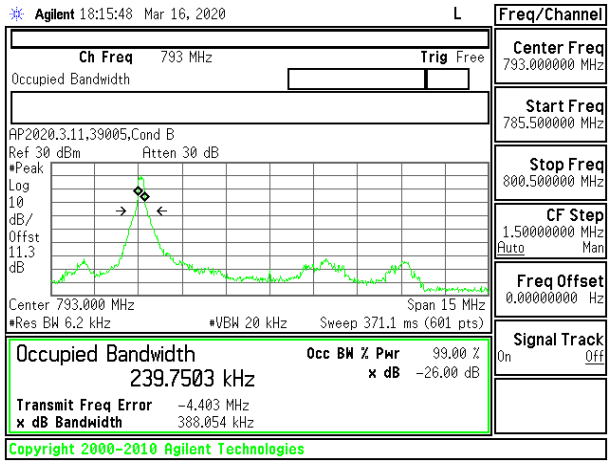
## 8.1.7. LTE BAND 14




LTE B14 5MHz QPSK Middle Channel RB25-0




LTE B14 10MHz QPSK Middle Channel RB50-0




LTE B14 10MHz QPSK Middle Channel RB1-0



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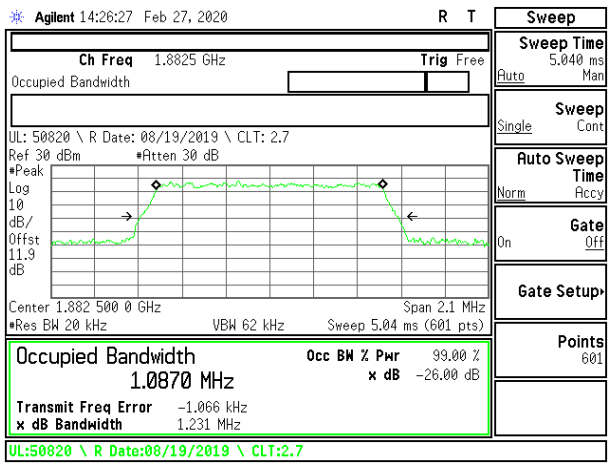
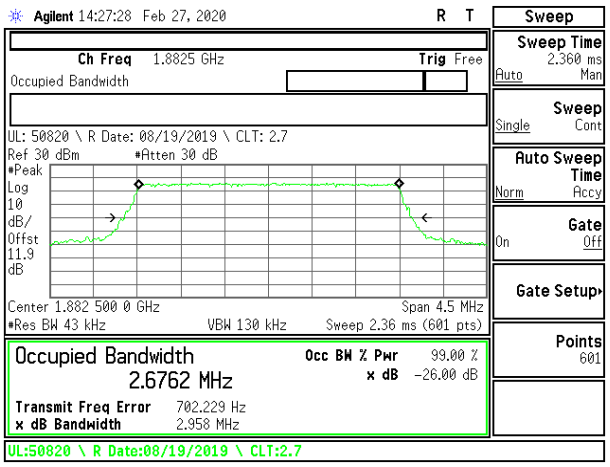
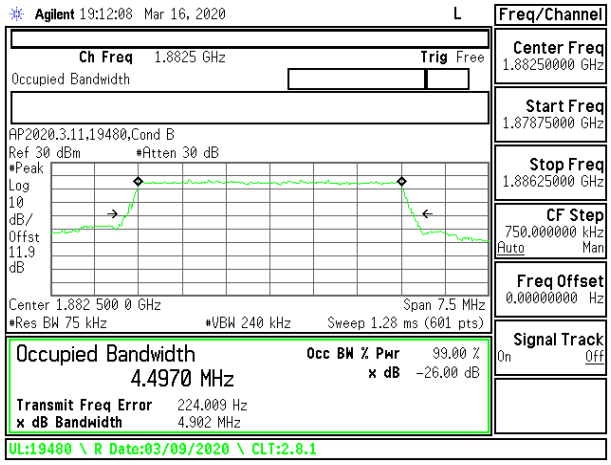
## 8.1.8. LTE BAND 25



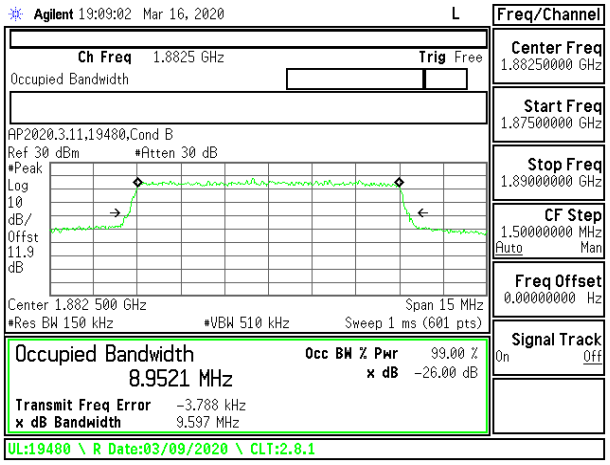

LTE B25 1.4MHz QPSK Middle Channel RB6-0



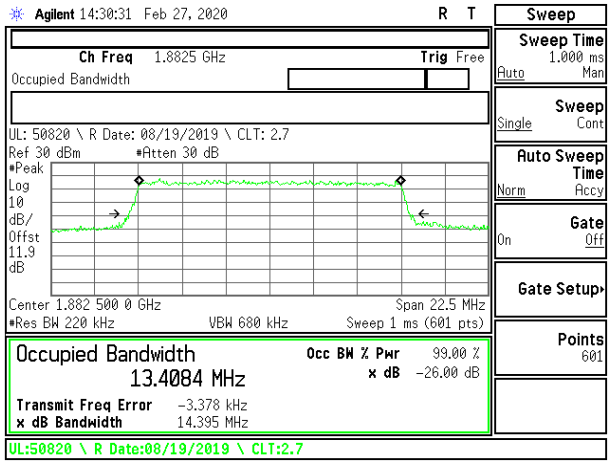

LTE B25 3MHz QPSK Middle Channel RB15-0



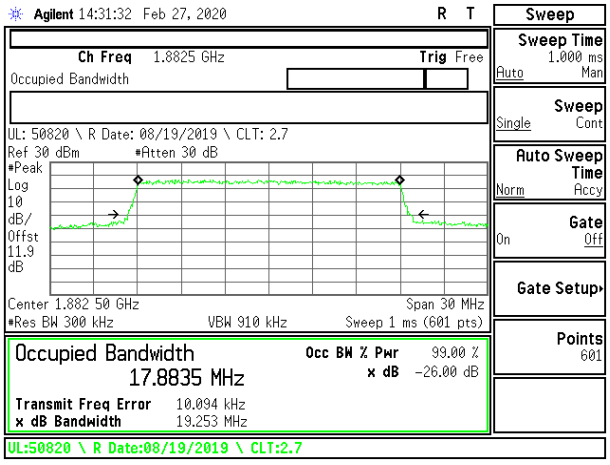

LTE B25 5MHz QPSK Middle Channel RB25-0




LTE B25 10MHz QPSK Middle Channel RB50-0




LTE B25 15MHz QPSK Middle Channel RB75-0




LTE B25 20MHz QPSK Middle Channel RB100-0



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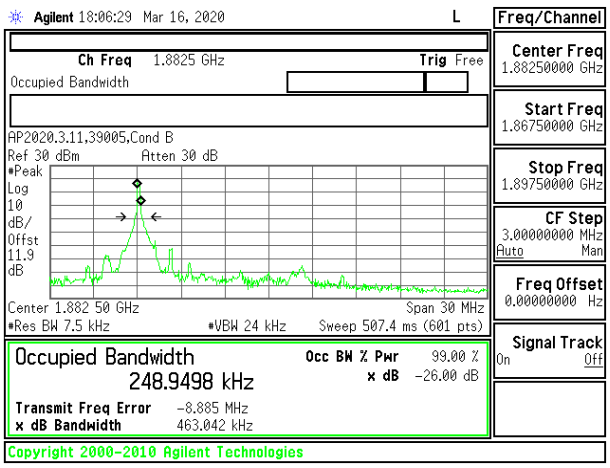


LTE B25 20MHz QPSK Middle Channel RB1-0



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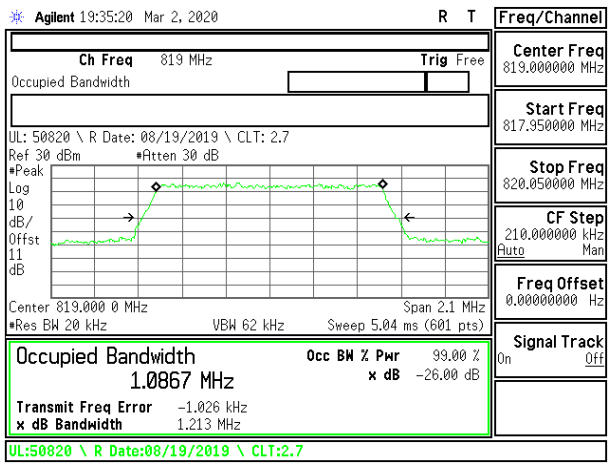
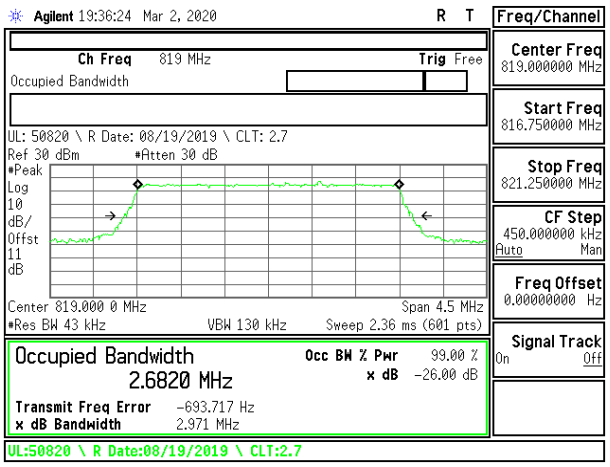
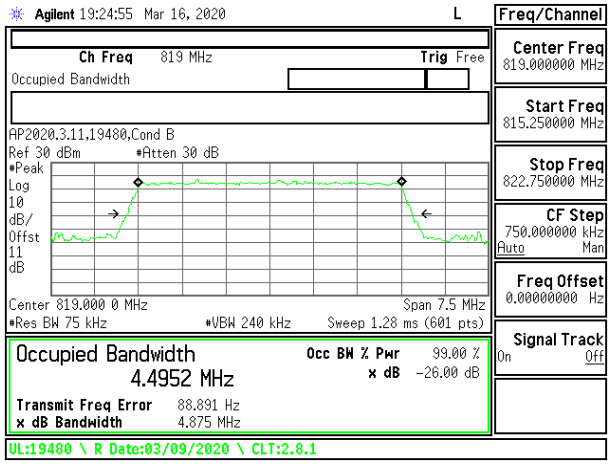
## 8.1.9. LTE BAND 26 (FCC PART 90S)



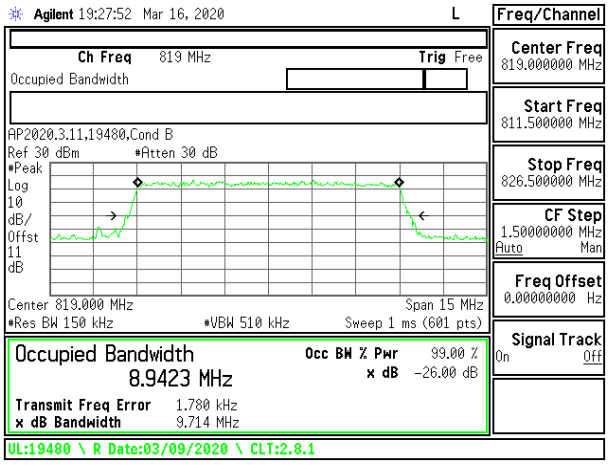

LTE B26 1.4MHz QPSK Middle Channel RB6-0



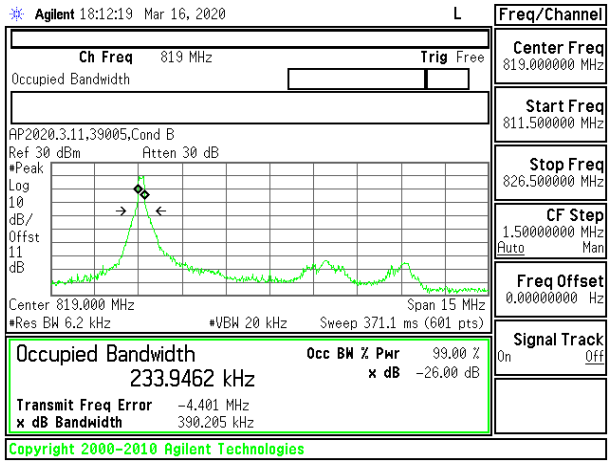

LTE B26 3MHz QPSK Middle Channel RB15-0




LTE B26 5MHz QPSK Middle Channel RB25-0




LTE B26 10MHz QPSK Middle Channel RB50-0




LTE B26 10MHz QPSK Middle Channel RB1-0



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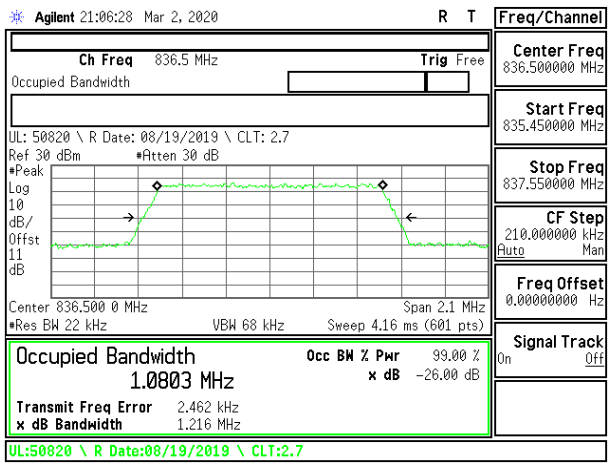
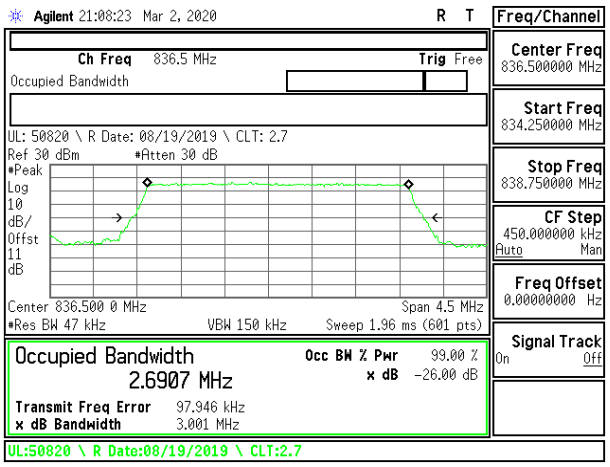
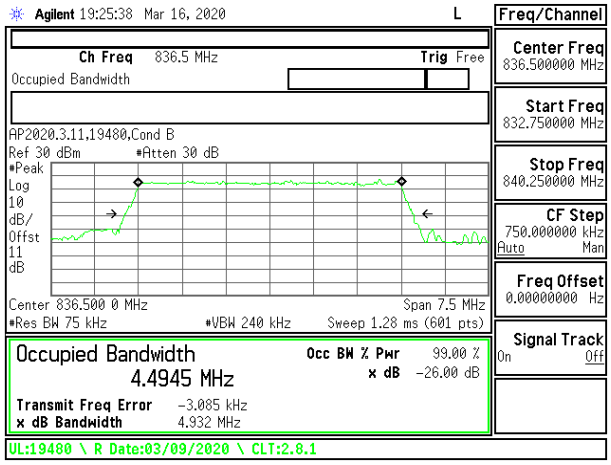
## 8.1.10. LTE BAND 26 (FCC PART 22)



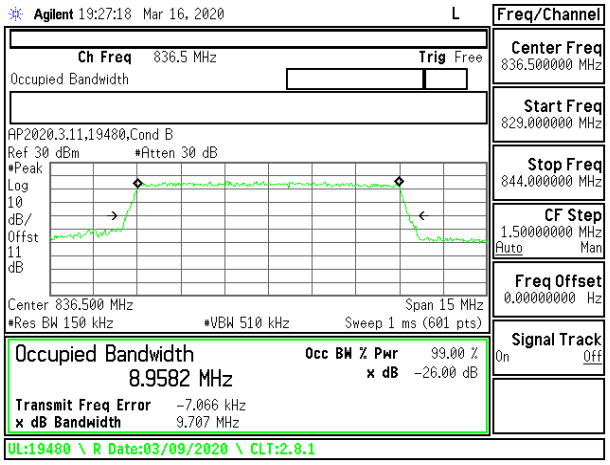

LTE B26 1.4MHz QPSK Middle Channel RB6-0



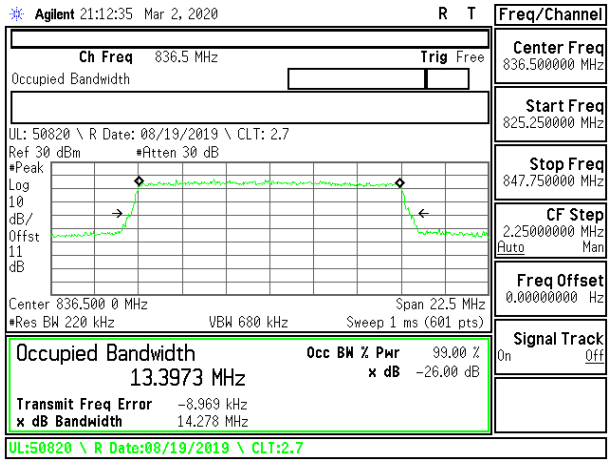

LTE B26 3MHz QPSK Middle Channel RB15-0




LTE B26 5MHz QPSK Middle Channel RB25-0




LTE B26 10MHz QPSK Middle Channel RB50-0




LTE B26 15MHz QPSK Middle Channel RB75-0



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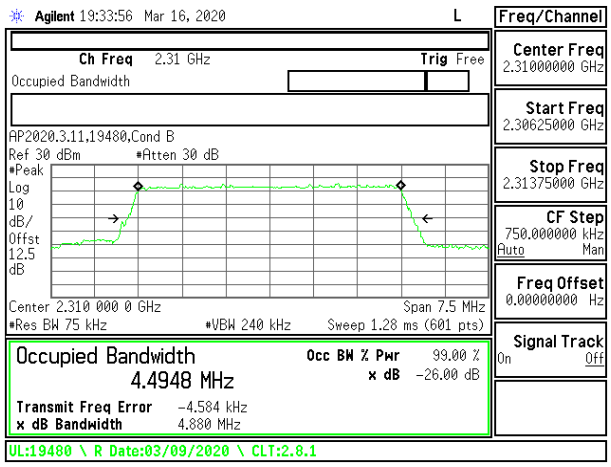
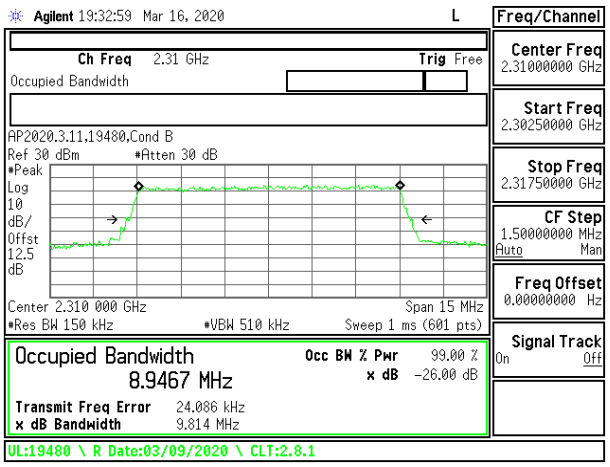
## 8.1.11. LTE BAND 30




LTE B30 5MHz QPSK Middle Channel RB25-0




LTE B30 10MHz QPSK Middle Channel RB50-0

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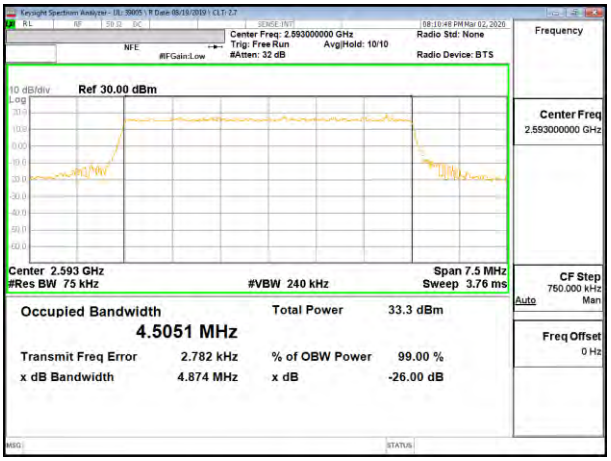
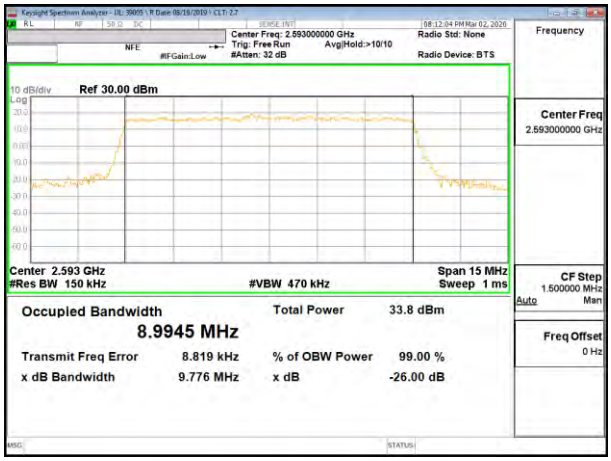
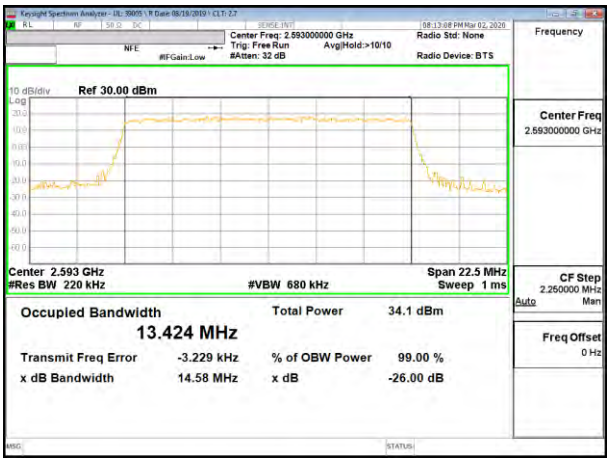
## 8.1.12. LTE BAND 41



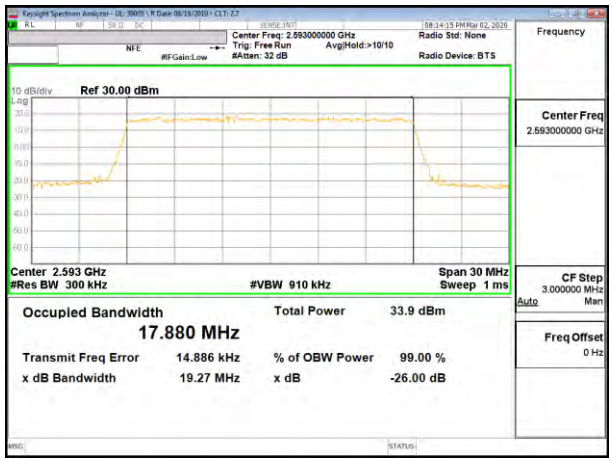

LTE B41 5MHz QPSK Middle Channel RB25-0




LTE B41 10MHz QPSK Middle Channel RB50-0




LTE B41 15MHz QPSK Middle Channel RB75-0




LTE B41 20MHz QPSK Middle Channel RB100-0



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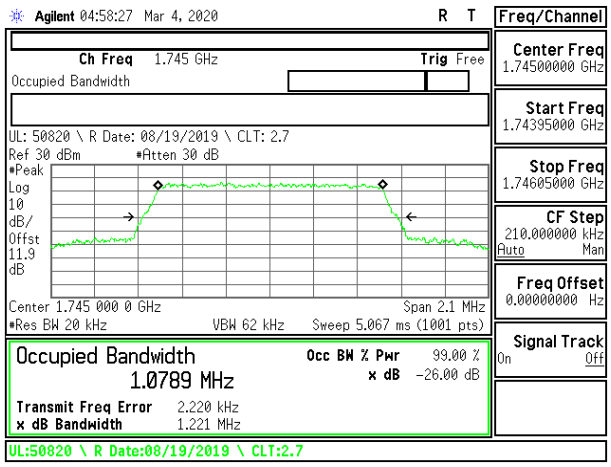
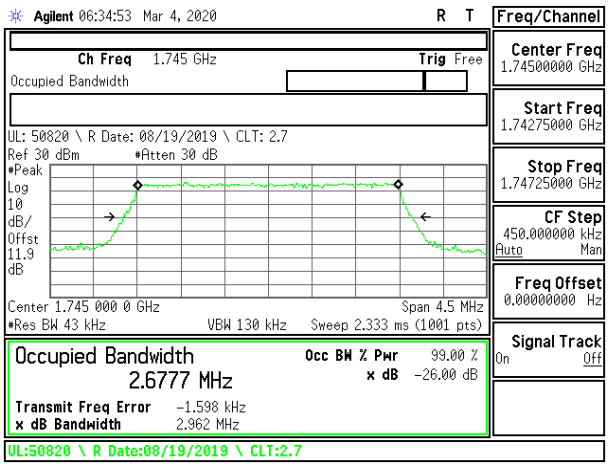
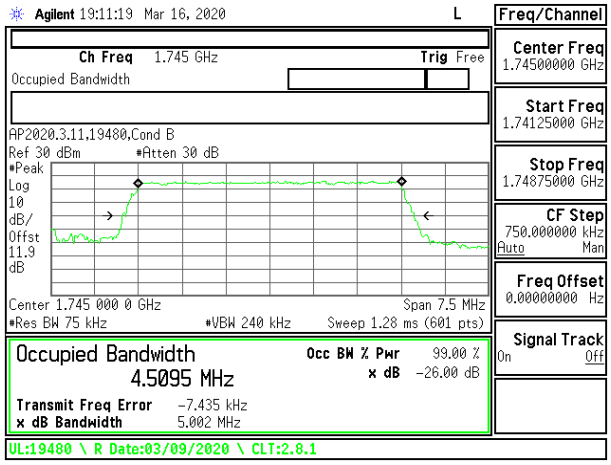
## 8.1.13. LTE BAND 66



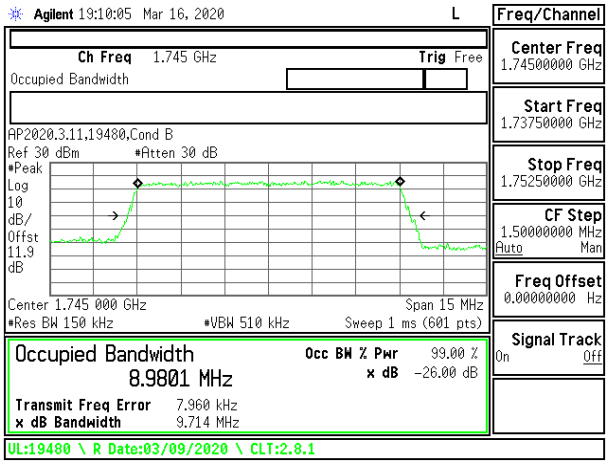

LTE B66 1.4MHz QPSK Middle Channel RB6-0



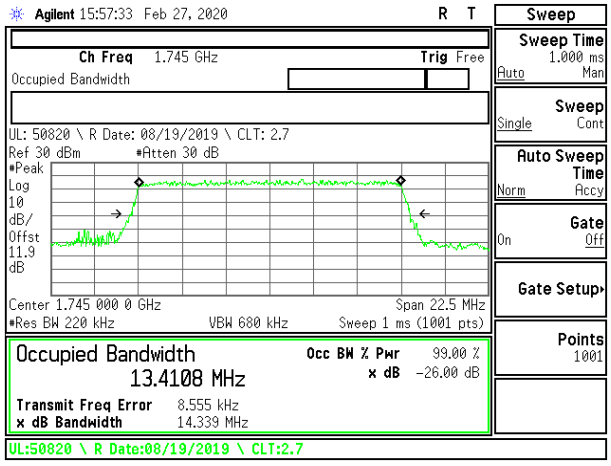

LTE B66 3MHz QPSK Middle Channel RB15-0



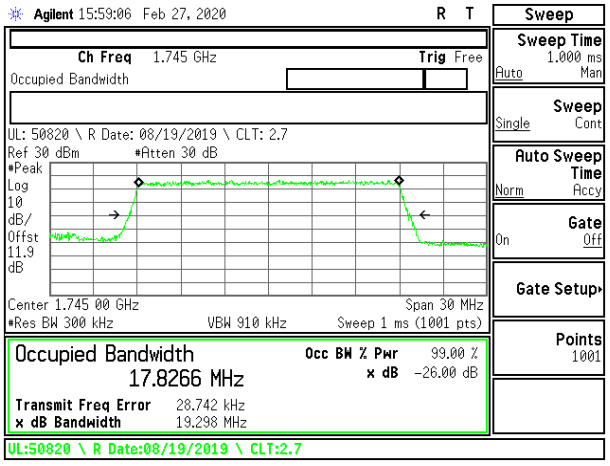

LTE B66 5MHz QPSK Middle Channel RB25-0




LTE B66 10MHz QPSK Middle Channel RB50-0




LTE B66 15MHz QPSK Middle Channel RB75-0




LTE B66 20MHz QPSK Middle Channel RB100-0



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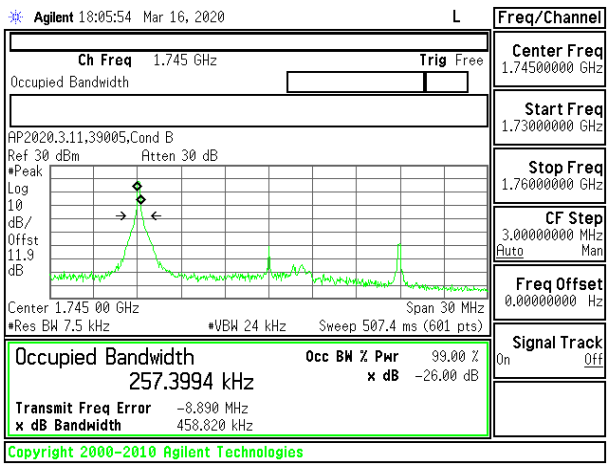


LTE B66 20MHz QPSK Middle Channel RB1-0



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## 8.2. BAND EDGE AND EMISSION MASK

**TEST PROCEDURE**

The transmitter output was connected to a CMW500Test 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:

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

**TEST PROCEDURE (FCC LTE BAND 14)**

(b)ACP measurement procedure. The following are the procedures for making the transmitter ACP measurements. For all measurements modulate the transmitter as it would be modulated in normal operating conditions. For time division multiple access (TDMA) systems, the measurements are to be made under TDMA operation only during time slots when the transmitter is active. All measurements are made at the transmitter's output port. If a transmitter has an integral antenna, a suitable power coupling device shall be used to couple the RF signal to the measurement instrument. The coupling device shall substantially maintain the proper transmitter load impedance. The ACP measurements may be made with a spectrum analyzer capable of making direct ACP measurements. “Measurement bandwidth”, as used for non-swept measurements, implies an instrument that measures the power in many narrow bandwidths equal to the nominal resolution bandwidth and integrates these powers to determine the total power in the specified measurement bandwidth.

(1)Setting reference level. Set transmitter to maximum output power. Using a spectrum analyzer capable of ACP measurements, set the measurement bandwidth to the channel size. For example, for a 6.25 kHz transmitter set the measurement bandwidth to 6.25 kHz. Set the frequency offset of the measurement bandwidth to zero and adjust the center frequency of the instrument to the assigned center frequency to measure the average power level of the transmitter. Record this power level in dBm as the “reference power level.”

(2)Non-swept power measurement. Using a spectrum analyzer capable of ACP measurements, set the measurement bandwidth and frequency offset from the assigned center frequency as shown in the tables in §90.543 (a) above. Any value of resolution bandwidth may be used as long as it does not exceed 2 percent of the specified measurement bandwidth. Measure the power level in dBm. These measurements should be made at maximum power. Calculate ACP by subtracting the reference power level measured in (b)(1) from the measurements made in this step. The absolute value of the calculated ACP must be greater than or equal to the absolute value of the ACP given in the table for each condition above.

(3)Swept power measurement. Set a spectrum analyzer to 30 kHz resolution bandwidth, 1 MHz video bandwidth and average, sample, or RMS detection. Set the reference level of the spectrum analyzer to the RMS value of the transmitter power. Sweep above and below the carrier frequency to the limits defined in the tables. Calculate ACP by subtracting the reference power level measured in (b)(1) from the measurements made in this step. The absolute value of the calculated ACP must be greater than or equal to the absolute value of the ACP given in the table for each condition above.

**TEST PROCEDURE (FCC LTE BAND 7, 41)**

(m)(6) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed; for mobile digital stations, in the 1 megahertz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least two percent may be employed, except when the 1 megahertz band is 2495-2496 MHz, in which case a resolution bandwidth of at least one percent may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the




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measured power is integrated over the full required measurement bandwidth (i.e. 1 megahertz or 1 percent of emission bandwidth, as specified; or 1 megahertz or 2 percent for mobile digital stations, except in the band 2495-2496 MHz). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. With respect to television operations, measurements must be made of the separate visual and aural operating powers at sufficiently frequent intervals to ensure compliance with the rules.

**TEST PROCEDURE (FCC LTE BAND 30)**

(5) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the channel blocks at 2305, 2310, 2315, 2320, 2345, 2350, 2355, and 2360 MHz, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (*i.e.,* 1 MHz). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

**RESULTS**



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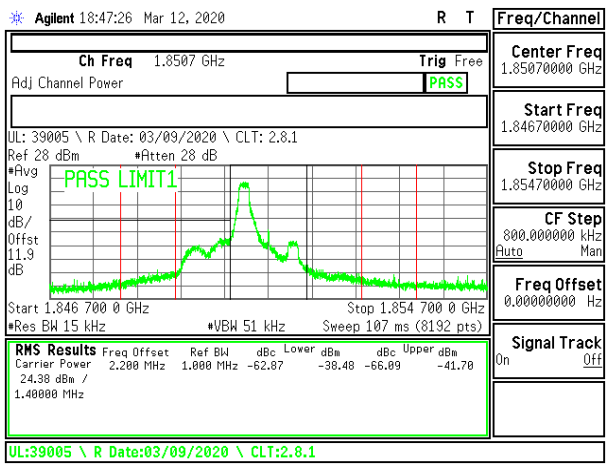
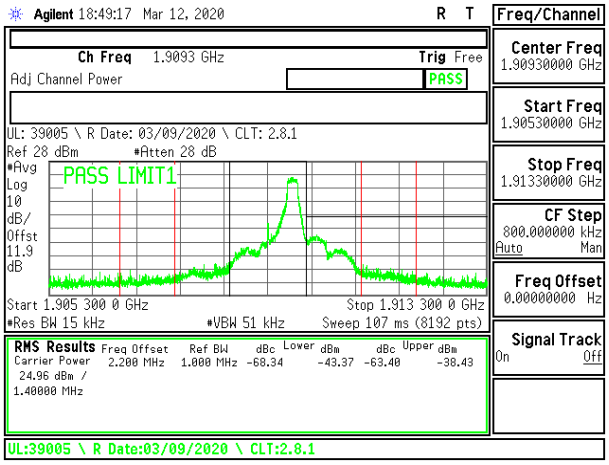
## 8.2.1. LTE BAND 2 BANDEDGE

**LIMITS**

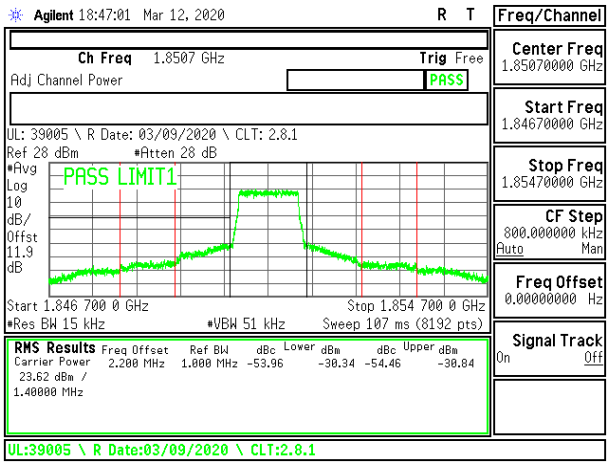
FCC: §24.238
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.



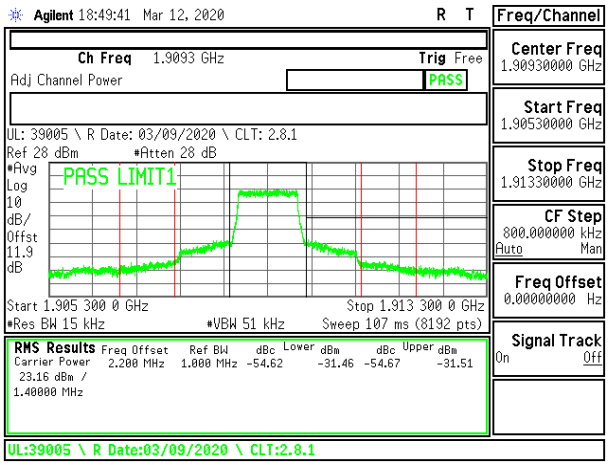
LTE B2 1.4MHz QPSK Low Channel RB1-0



LTE B2 1.4MHz QPSK High Channel RB1-5



LTE B2 1.4MHz QPSK Low Channel RB6-0



LTE B2 1.4MHz QPSK High Channel RB6-0

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