

Spectrum Plot of Worst Value

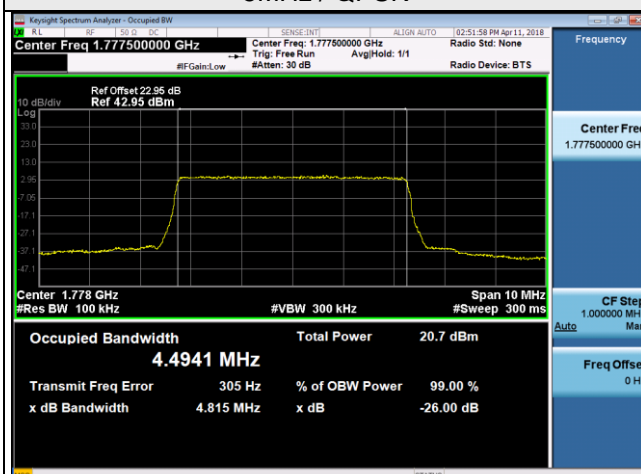
1.4MHz / QPSK



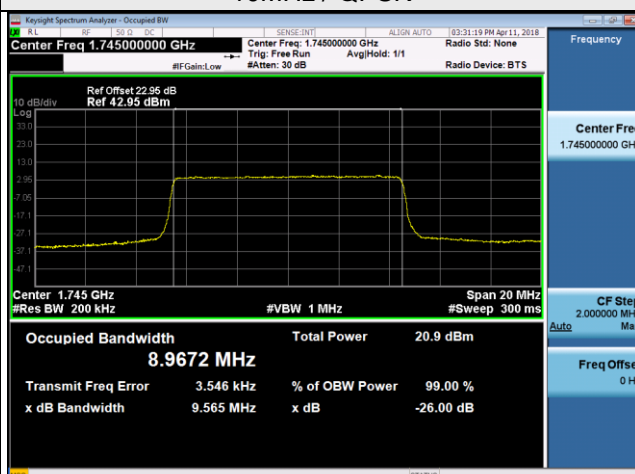
3MHz / QPSK



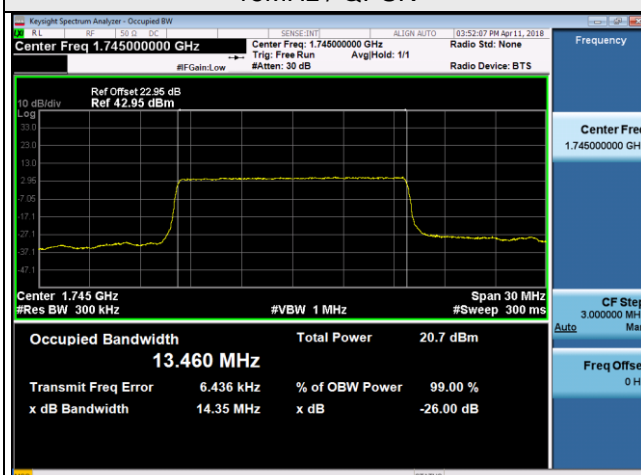
5MHz / QPSK



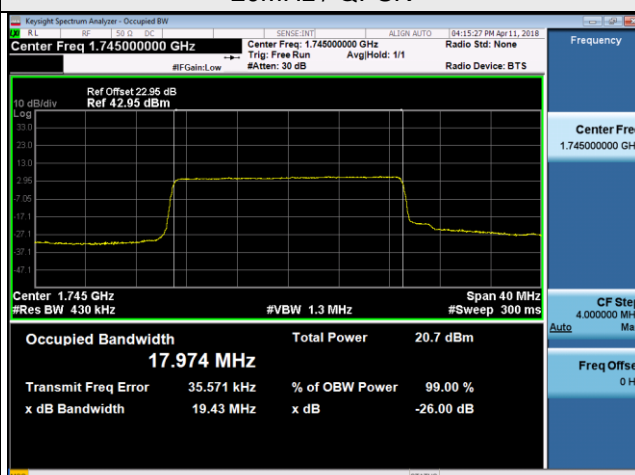
10MHz / QPSK



15MHz / QPSK



20MHz / QPSK



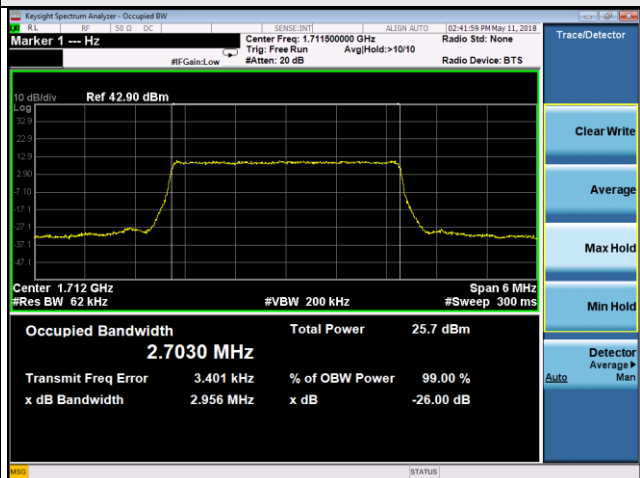
| LTE Band 4 | | | | | | | | | |
|--------------------------|-----------------|--------------------------|-------|-------|-------------------------|-----------------|--------------------------|-------|-------|
| Channel Bandwidth 1.4MHz | | | | | Channel Bandwidth 3MHz | | | | |
| Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | | | Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM | | | QPSK | 16QAM | 64QAM |
| 19957 | 1710.7 | 1.09 | 1.09 | 1.09 | 19965 | 1711.5 | 2.70 | 2.70 | 2.70 |
| 20175 | 1732.5 | 1.09 | 1.09 | 1.09 | 20175 | 1732.5 | 2.70 | 2.70 | 2.70 |
| 20393 | 1754.3 | 1.09 | 1.09 | 1.09 | 20385 | 1753.5 | 2.70 | 2.70 | 2.70 |
| Channel Bandwidth 5MHz | | | | | Channel Bandwidth 10MHz | | | | |
| Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | | | Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM | | | QPSK | 16QAM | 64QAM |
| 19975 | 1712.5 | 4.49 | 4.49 | 4.50 | 20000 | 1715 | 8.97 | 8.97 | 8.97 |
| 20175 | 1732.5 | 4.49 | 4.49 | 4.49 | 20175 | 1732.5 | 8.97 | 8.97 | 8.96 |
| 20375 | 1752.5 | 4.49 | 4.50 | 4.50 | 20350 | 1750 | 8.98 | 8.98 | 8.98 |
| Channel Bandwidth 15MHz | | | | | Channel Bandwidth 20MHz | | | | |
| Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | | | Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM | | | QPSK | 16QAM | 64QAM |
| 20025 | 1717.5 | 13.44 | 13.44 | 13.43 | 20050 | 1720 | 17.88 | 17.91 | 17.91 |
| 20175 | 1732.5 | 13.46 | 13.45 | 13.45 | 20175 | 1732.5 | 17.94 | 17.96 | 17.96 |
| 20325 | 1747.5 | 13.48 | 13.48 | 13.47 | 20300 | 1745 | 17.97 | 17.96 | 17.96 |

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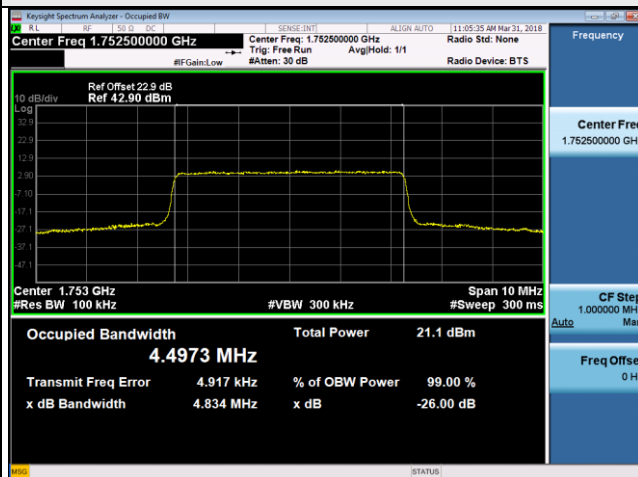
1.4MHz / QPSK



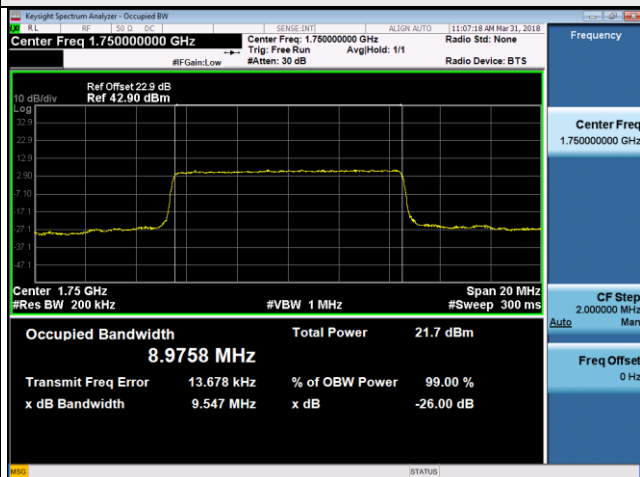
3MHz / QPSK



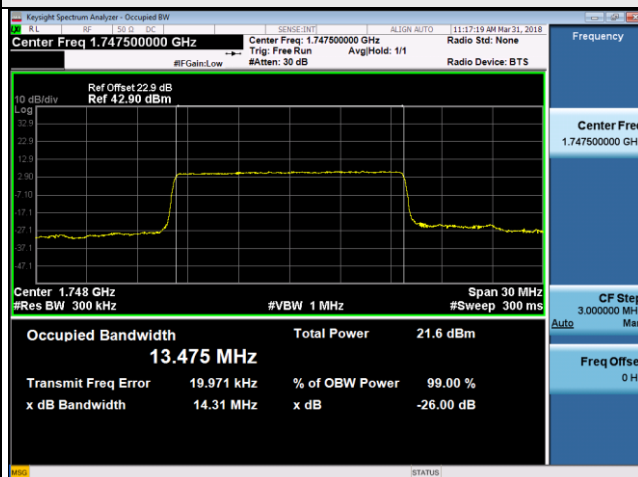
5MHz / 16QAM



10MHz / QPSK



15MHz / QPSK



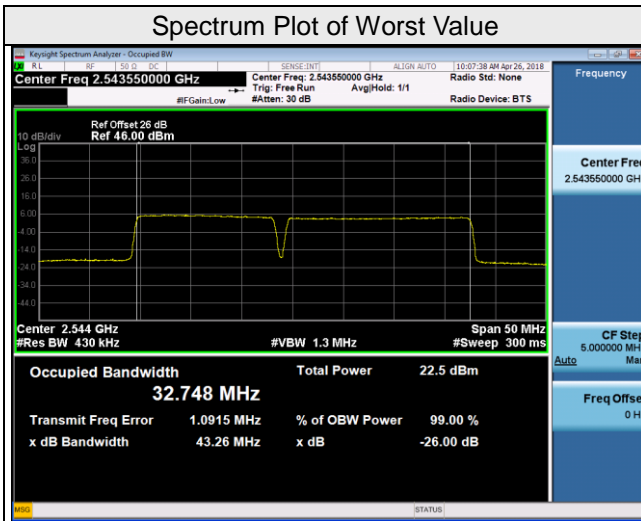
20MHz / QPSK



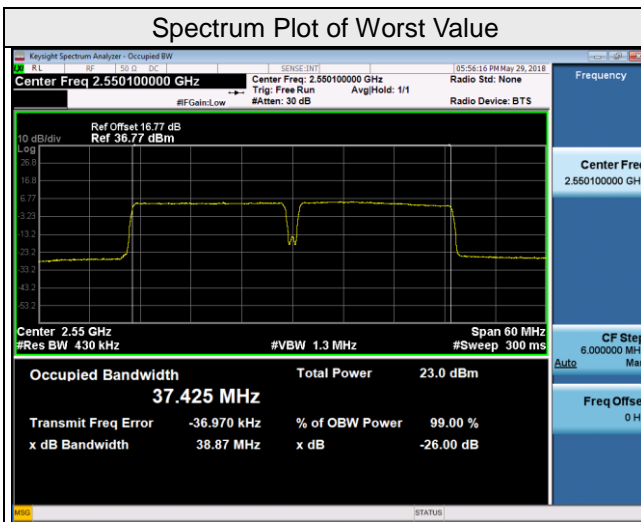
| LTE Band 7 | | | | | | | | | |
|-------------------------|-----------------|--------------------------|-------|-------|-------------------------|-----------------|--------------------------|-------|-------|
| Channel Bandwidth 5MHz | | | | | Channel Bandwidth 10MHz | | | | |
| Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | | | Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM | | | QPSK | 16QAM | 64QAM |
| 20775 | 2502.5 | 4.49 | 4.49 | 4.49 | 20800 | 2505 | 8.97 | 8.98 | 8.97 |
| 21100 | 2535 | 4.49 | 4.49 | 4.49 | 21100 | 2535 | 8.97 | 8.97 | 8.96 |
| 21425 | 2567.5 | 4.49 | 4.48 | 4.49 | 21400 | 2565 | 8.95 | 8.95 | 8.95 |
| Channel Bandwidth 15MHz | | | | | Channel Bandwidth 20MHz | | | | |
| Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | | | Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM | | | QPSK | 16QAM | 64QAM |
| 20825 | 2507.5 | 13.50 | 13.46 | 13.49 | 20850 | 2510 | 17.99 | 17.98 | 18.02 |
| 21100 | 2535 | 13.47 | 13.45 | 13.45 | 21100 | 2535 | 17.93 | 17.95 | 17.95 |
| 21375 | 2562.5 | 13.42 | 13.41 | 13.40 | 21350 | 2560 | 17.86 | 17.89 | 17.89 |



| LTE CA_7C (15+20MHz) | | |
|----------------------|-------------|--------------------------|
| Channel | FREQ. (MHz) | Occupied Bandwidth (MHz) |
| | | QPSK |
| 21100+21271 | 2535+2552.1 | 32.75 |

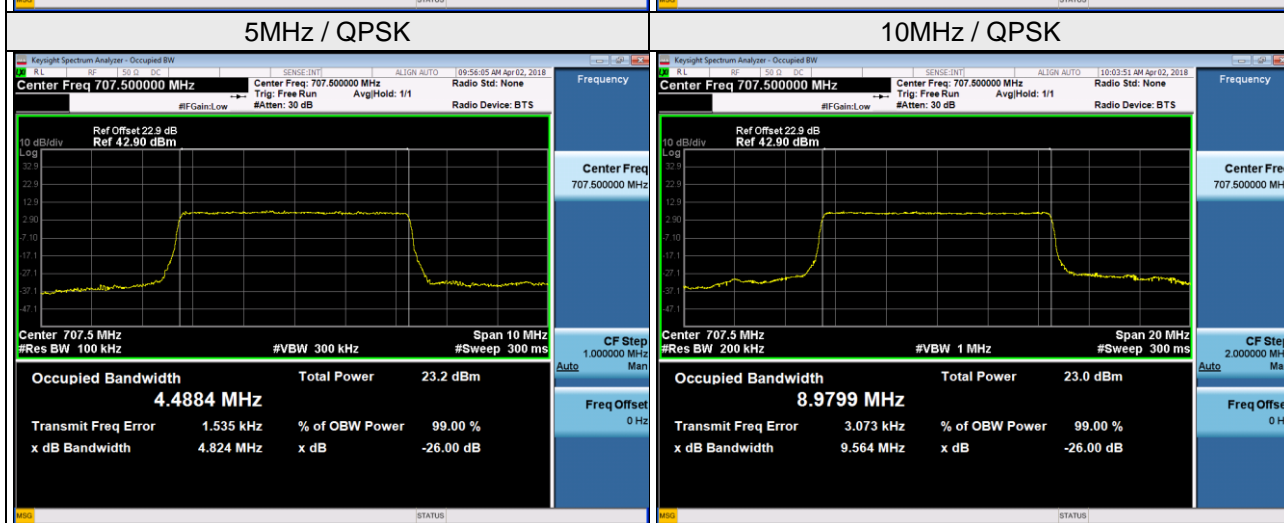
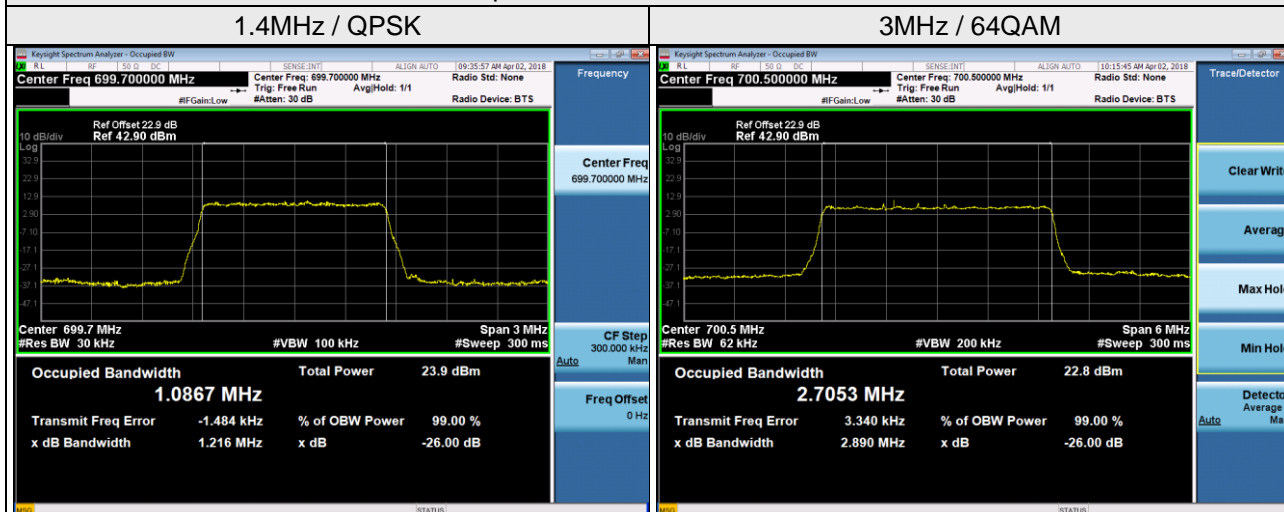


| LTE CA_7C (20+20MHz) | | |
|----------------------|-------------|--------------------------|
| Channel | FREQ. (MHz) | Occupied Bandwidth (MHz) |
| | | QPSK |
| 21152+21350 | 2540.2+2560 | 37.43 |



| LTE Band 12 | | | | | | | | | |
|--------------------------|-----------------|--------------------------|-------|-------|-------------------------|-----------------|--------------------------|-------|-------|
| Channel Bandwidth 1.4MHz | | | | | Channel Bandwidth 3MHz | | | | |
| Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | | | Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM | | | QPSK | 16QAM | 64QAM |
| 23017 | 699.7 | 1.09 | 1.09 | 1.09 | 23025 | 700.5 | 2.70 | 2.70 | 2.71 |
| 23095 | 707.5 | 1.09 | 1.09 | 1.09 | 23095 | 707.5 | 2.70 | 2.70 | 2.70 |
| 23173 | 715.3 | 1.09 | 1.09 | 1.09 | 23165 | 714.5 | 2.70 | 2.69 | 2.70 |
| Channel Bandwidth 5MHz | | | | | Channel Bandwidth 10MHz | | | | |
| Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | | | Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM | | | QPSK | 16QAM | 64QAM |
| 23035 | 701.5 | 4.48 | 4.49 | 4.49 | 23060 | 704 | 8.95 | 8.96 | 8.95 |
| 23095 | 707.5 | 4.49 | 4.49 | 4.49 | 23095 | 707.5 | 8.98 | 8.98 | 8.98 |
| 23155 | 713.5 | 4.48 | 4.48 | 4.48 | 23130 | 711 | 8.97 | 8.97 | 8.97 |

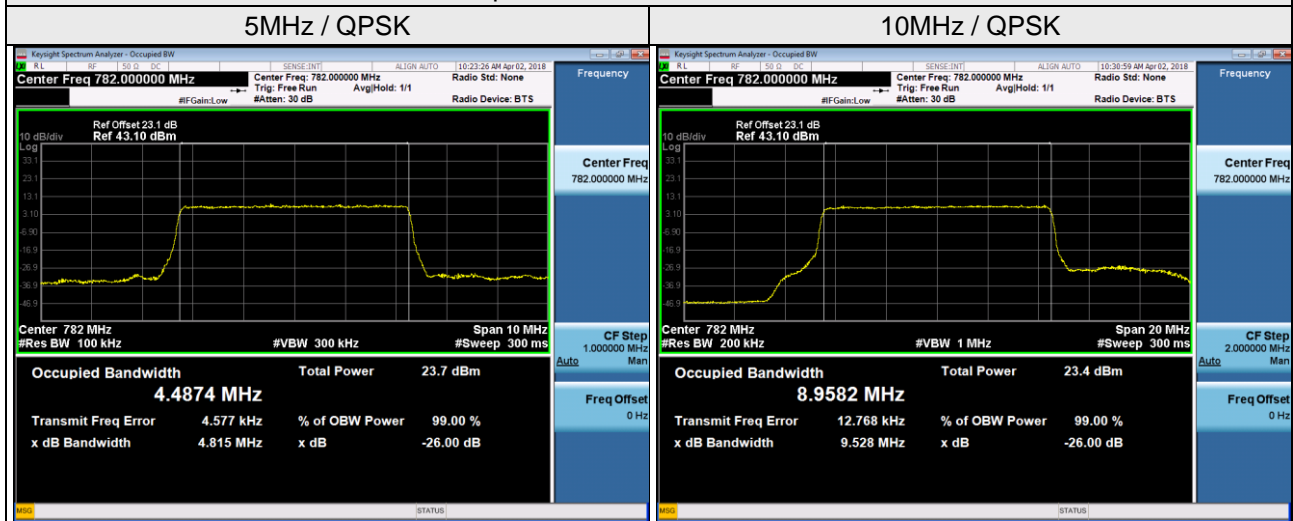
Spectrum Plot of Worst Value



LTE Band 13

| Channel Bandwidth 5MHz | | | | | Channel Bandwidth 10MHz | | | | |
|------------------------|-----------------|--------------------------|-------|-------|-------------------------|-----------------|--------------------------|-------|-------|
| Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | | | Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM | | | QPSK | 16QAM | 64QAM |
| 23205 | 779.5 | 4.48 | 4.48 | 4.49 | 23230 | 782 | 8.96 | 8.96 | 8.95 |
| 23230 | 782 | 4.49 | 4.49 | 4.49 | | | | | |
| 23255 | 784.5 | 4.48 | 4.49 | 4.49 | | | | | |

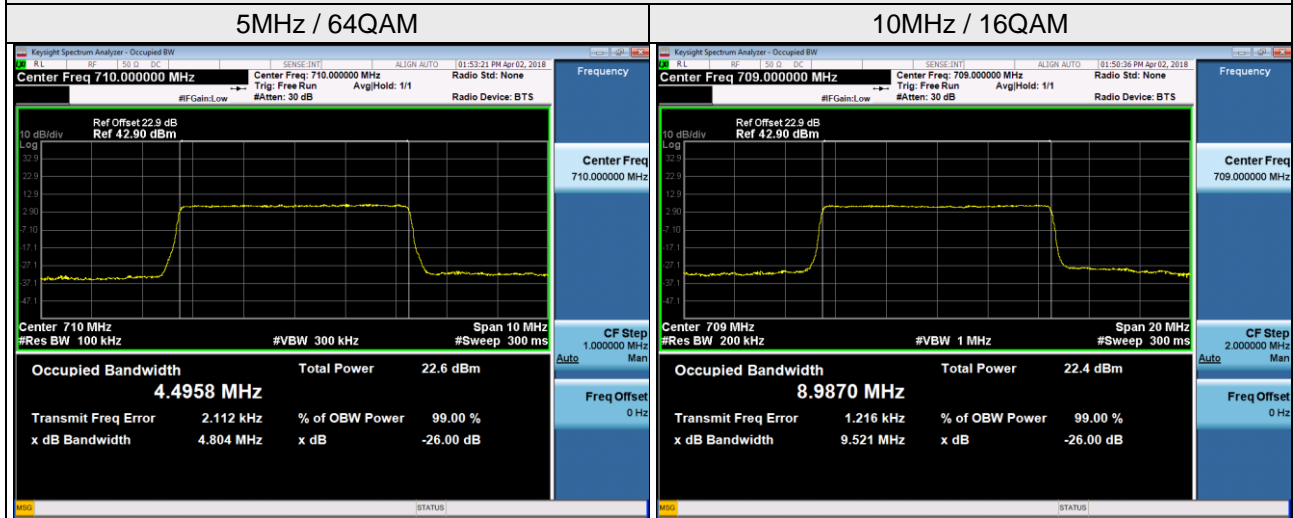
Spectrum Plot of Worst Value



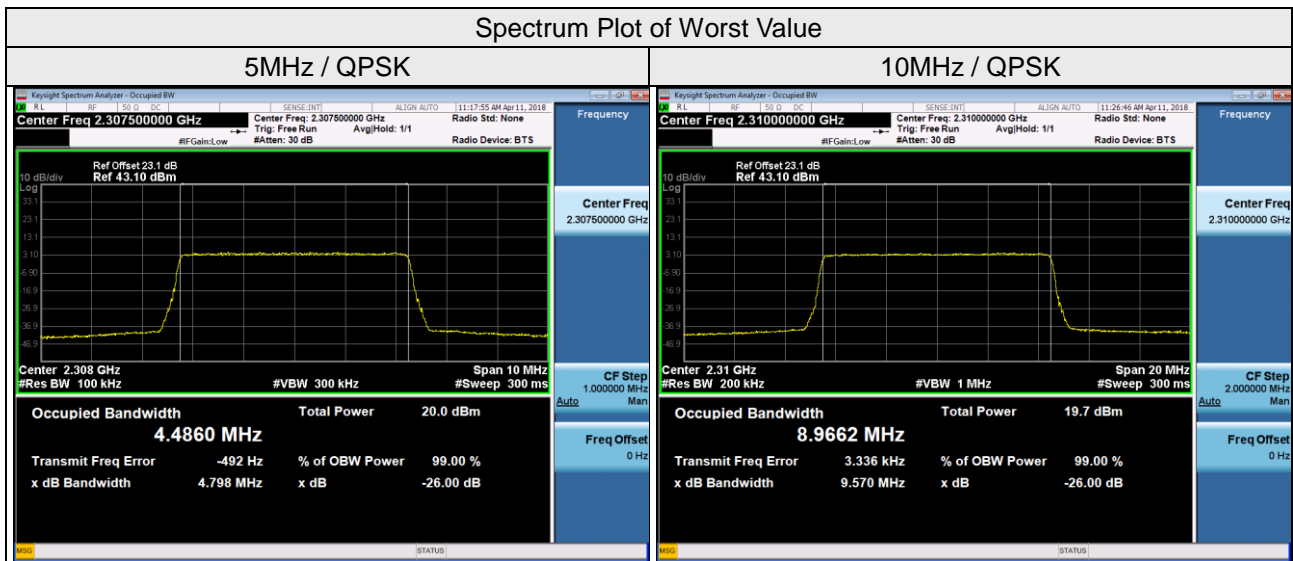
LTE Band 17

| Channel Bandwidth 5MHz | | | | | Channel Bandwidth 10MHz | | | | |
|------------------------|-----------------|--------------------------|-------|-------|-------------------------|-----------------|--------------------------|-------|-------|
| Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | | | Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM | | | QPSK | 16QAM | 64QAM |
| 23755 | 706.5 | 4.49 | 4.49 | 4.49 | 23780 | 709 | 8.98 | 8.99 | 8.98 |
| 23790 | 710 | 4.49 | 4.49 | 4.50 | 23790 | 710 | 8.98 | 8.98 | 8.98 |
| 23825 | 713.5 | 4.48 | 4.48 | 4.48 | 23800 | 711 | 8.97 | 8.97 | 8.97 |

Spectrum Plot of Worst Value



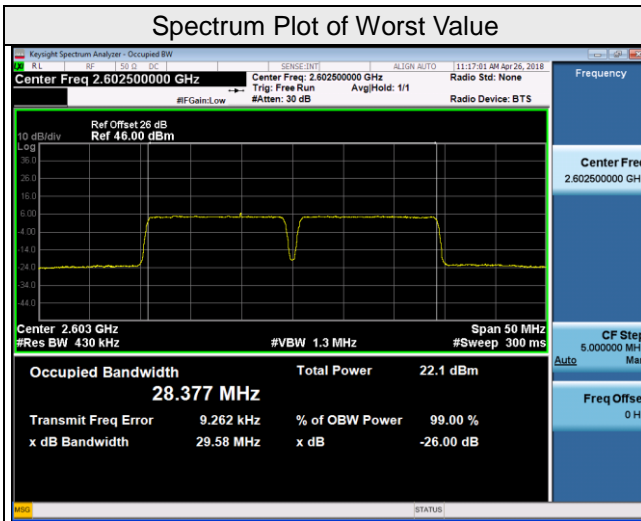
| LTE Band 30 | | | | | | | | | |
|------------------------|-----------------|--------------------------|-------|-------|-------------------------|-----------------|--------------------------|-------|-------|
| Channel Bandwidth 5MHz | | | | | Channel Bandwidth 10MHz | | | | |
| Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | | | Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM | | | QPSK | 16QAM | 64QAM |
| 27685 | 2307.5 | 4.49 | 4.49 | 4.48 | 27710 | 2310 | 8.97 | 8.96 | 8.97 |
| 27710 | 2310 | 4.49 | 4.49 | 4.49 | | | | | |
| 27735 | 2312.5 | 4.48 | 4.49 | 4.49 | | | | | |



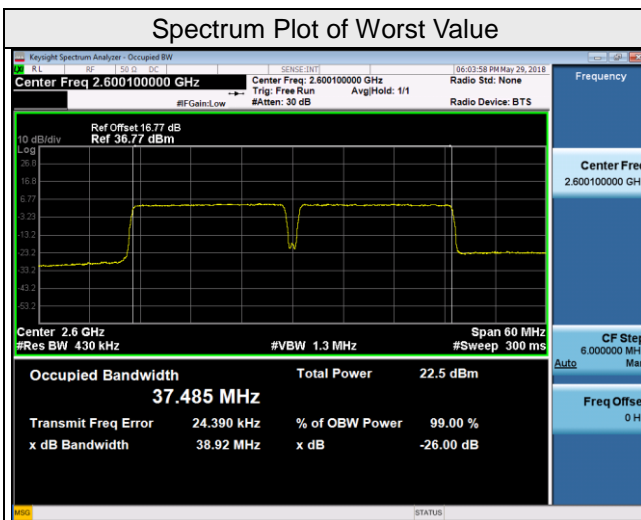
| LTE Band 38 | | | | | | | | | |
|-------------------------|-----------------|--------------------------|-------|-------|-------------------------|-----------------|--------------------------|-------|-------|
| Channel Bandwidth 5MHz | | | | | Channel Bandwidth 10MHz | | | | |
| Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | | | Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM | | | QPSK | 16QAM | 64QAM |
| 37775 | 2572.5 | 4.49 | 4.48 | 4.48 | 37800 | 2575 | 8.95 | 8.97 | 8.96 |
| 38000 | 2595 | 4.49 | 4.49 | 4.48 | 38000 | 2595 | 8.95 | 8.96 | 8.96 |
| 38225 | 2617.5 | 4.49 | 4.49 | 4.48 | 38200 | 2615 | 8.95 | 8.96 | 8.96 |
| Channel Bandwidth 15MHz | | | | | Channel Bandwidth 20MHz | | | | |
| Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | | | Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM | | | QPSK | 16QAM | 64QAM |
| 37825 | 2577.5 | 13.44 | 13.43 | 13.43 | 37850 | 2580 | 17.91 | 17.90 | 17.91 |
| 38000 | 2595 | 13.44 | 13.43 | 13.43 | 38000 | 2595 | 17.91 | 17.90 | 17.91 |
| 38175 | 2612.5 | 13.44 | 13.43 | 13.43 | 38150 | 2610 | 17.90 | 17.90 | 17.91 |



| LTE CA_38C (15+15MHz) | | |
|-----------------------|-------------|--------------------------|
| Channel | FREQ. (MHz) | Occupied Bandwidth (MHz) |
| | | QPSK |
| 38000+38150 | 2595+2610 | 28.38 |



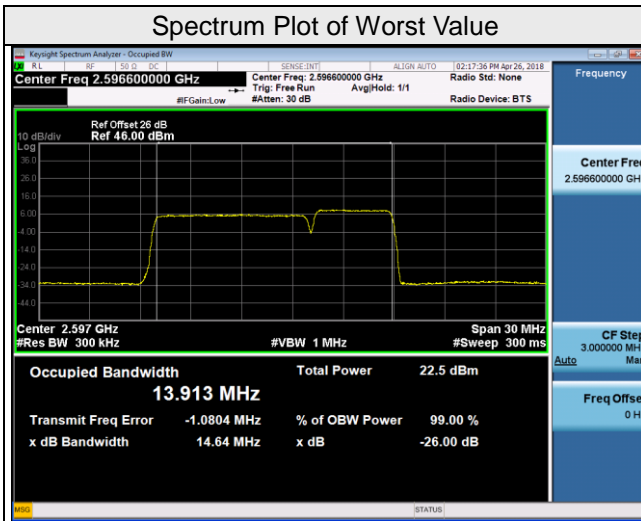
| LTE CA_38C(20+20MHz) | | |
|----------------------|-------------|--------------------------|
| Channel | FREQ. (MHz) | Occupied Bandwidth (MHz) |
| | | QPSK |
| 37952+38150 | 2590.2+2610 | 37.49 |



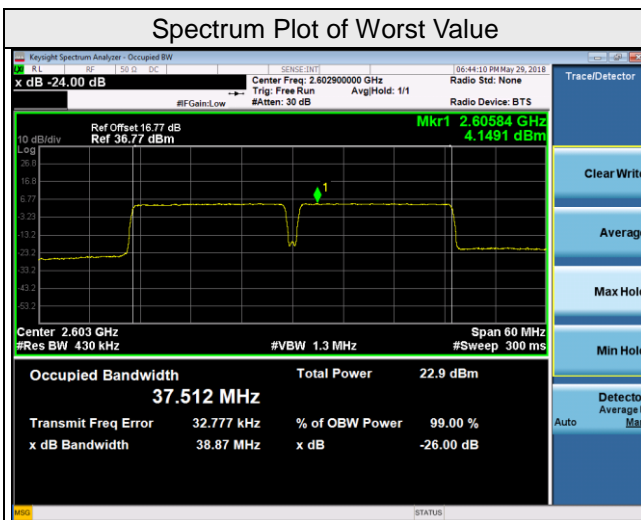
| LTE Band 41 | | | | | | | | | |
|-------------------------|-----------------|--------------------------|-------|-------|-------------------------|-----------------|--------------------------|-------|-------|
| Channel Bandwidth 5MHz | | | | | Channel Bandwidth 10MHz | | | | |
| Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | | | Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM | | | QPSK | 16QAM | 64QAM |
| 39675 | 2498.5 | 4.49 | 4.49 | 4.48 | 39700 | 2501 | 8.95 | 8.96 | 8.96 |
| 40620 | 2593 | 4.49 | 4.48 | 4.48 | 50620 | 2593 | 8.95 | 8.96 | 8.96 |
| 41565 | 2687.5 | 4.49 | 4.49 | 4.48 | 41540 | 2685 | 8.95 | 8.96 | 8.96 |
| Channel Bandwidth 15MHz | | | | | Channel Bandwidth 20MHz | | | | |
| Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | | | Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM | | | QPSK | 16QAM | 64QAM |
| 39725 | 2503.5 | 13.43 | 13.42 | 13.42 | 39750 | 2506 | 17.90 | 17.89 | 17.88 |
| 40620 | 2593 | 13.45 | 13.43 | 13.43 | 40620 | 2593 | 17.91 | 17.90 | 17.91 |
| 41515 | 2682.5 | 13.45 | 13.43 | 13.44 | 41490 | 2680 | 17.88 | 17.86 | 17.88 |



| LTE CA_41C (10+5MHz) | | |
|----------------------|-------------|--------------------------|
| Channel | FREQ. (MHz) | Occupied Bandwidth (MHz) |
| | | QPSK |
| 40620+40692 | 2593+2600.2 | 13.91 |



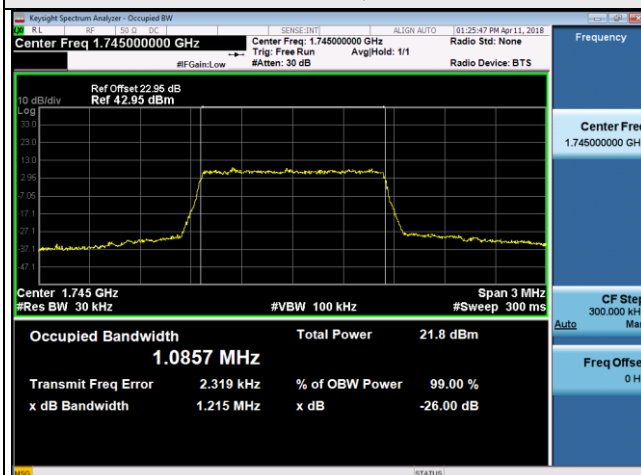
| TE CA_41C (20+20MHz) | | |
|----------------------|-------------|--------------------------|
| Channel | FREQ. (MHz) | Occupied Bandwidth (MHz) |
| | | QPSK |
| 40620+40818 | 2593+2612.8 | 37.51 |



| LTE Band 66 | | | | | | | | | |
|--------------------------|-----------------|--------------------------|-------|-------|-------------------------|-----------------|--------------------------|-------|-------|
| Channel Bandwidth 1.4MHz | | | | | Channel Bandwidth 3MHz | | | | |
| Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | | | Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM | | | QPSK | 16QAM | 64QAM |
| 131979 | 1710.7 | 1.08 | 1.09 | 1.09 | 131987 | 1711.5 | 2.70 | 2.69 | 2.70 |
| 132322 | 1745 | 1.09 | 1.09 | 1.09 | 132322 | 1745 | 2.70 | 2.69 | 2.70 |
| 132665 | 1779.3 | 1.08 | 1.09 | 1.09 | 132657 | 1778.5 | 2.70 | 2.69 | 2.70 |
| Channel Bandwidth 5MHz | | | | | Channel Bandwidth 10MHz | | | | |
| Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | | | Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM | | | QPSK | 16QAM | 64QAM |
| 131997 | 1712.5 | 4.49 | 4.49 | 4.49 | 132022 | 1715 | 8.96 | 8.96 | 8.98 |
| 132322 | 1745 | 4.49 | 4.49 | 4.50 | 132322 | 1745 | 8.97 | 8.98 | 8.99 |
| 132647 | 1777.5 | 4.49 | 4.49 | 4.50 | 132622 | 1775 | 8.97 | 8.97 | 8.98 |
| Channel Bandwidth 15MHz | | | | | Channel Bandwidth 20MHz | | | | |
| Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | | | Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM | | | QPSK | 16QAM | 64QAM |
| 132047 | 1717.5 | 13.43 | 13.44 | 13.43 | 132072 | 1720 | 17.89 | 17.89 | 17.88 |
| 132322 | 1745 | 13.46 | 13.47 | 13.47 | 132322 | 1745 | 17.97 | 17.99 | 17.98 |
| 132597 | 1722.5 | 13.44 | 13.45 | 13.45 | 132572 | 1770 | 17.91 | 17.91 | 17.90 |

Spectrum Plot of Worst Value

1.4MHz / QPSK



3MHz / QPSK



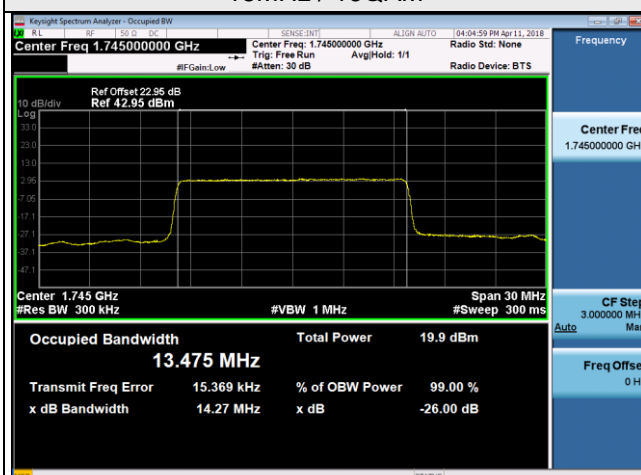
5MHz / 64QAM



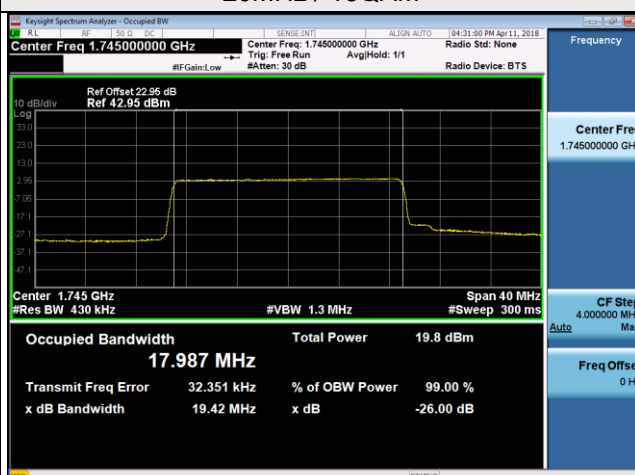
10MHz / 64QAM



15MHz / 16QAM



20MHz / 16QAM



4.5 Channel Edge Measurement

4.5.1 Limits of Channel Edge Measurement

According to FCC 27.53(a)(4) For mobile and portable stations operating in the 2305-2315 MHz and 2350-2360 MHz bands: (i) By a factor of not less than: $43 + 10 \log (P)$ dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than $55 + 10 \log (P)$ dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz, not less than $61 + 10 \log (P)$ dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz, and not less than $67 + 10 \log (P)$ dB on all frequencies between 2328 and 2337 MHz; (ii) By a factor of not less than $43 + 10 \log (P)$ dB on all frequencies between 2300 and 2305 MHz, $55 + 10 \log (P)$ dB on all frequencies between 2296 and 2300 MHz, $61 + 10 \log (P)$ dB on all frequencies between 2292 and 2296 MHz, $67 + 10 \log (P)$ dB on all frequencies between 2288 and 2292 MHz, and $70 + 10 \log (P)$ dB below 2288 MHz; (iii) By a factor of not less than $43 + 10 \log (P)$ dB on all frequencies between 2360 and 2365 MHz, and not less than $70 + 10 \log (P)$ dB above 2365 MHz.

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

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

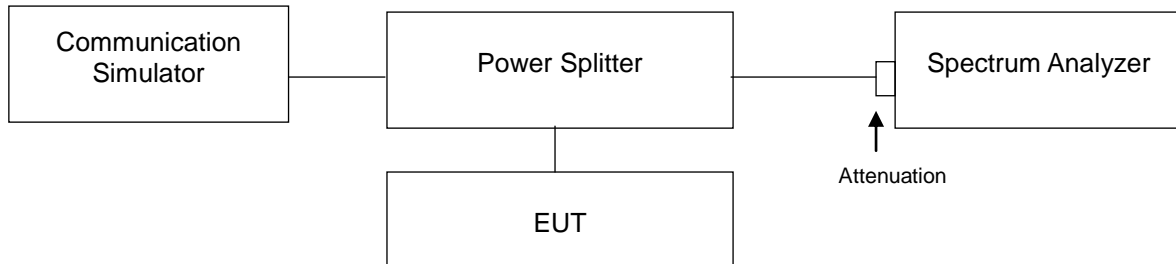
According to FCC 27.53(f) For operations in the 746–758 MHz, 775–788 MHz, and 805–806 MHz bands, emissions in the band 1559–1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth.

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

According to FCC 27.53(h) AWS emission limits— General protection levels. Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10} (P)$ dB.

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

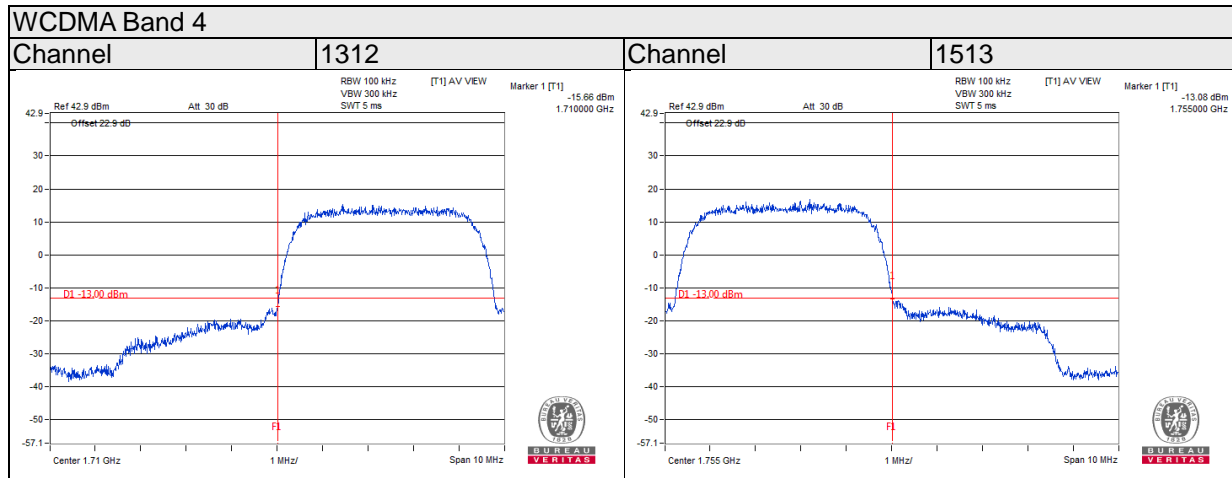
4.5.2 Test Setup



4.5.3 Test Procedures

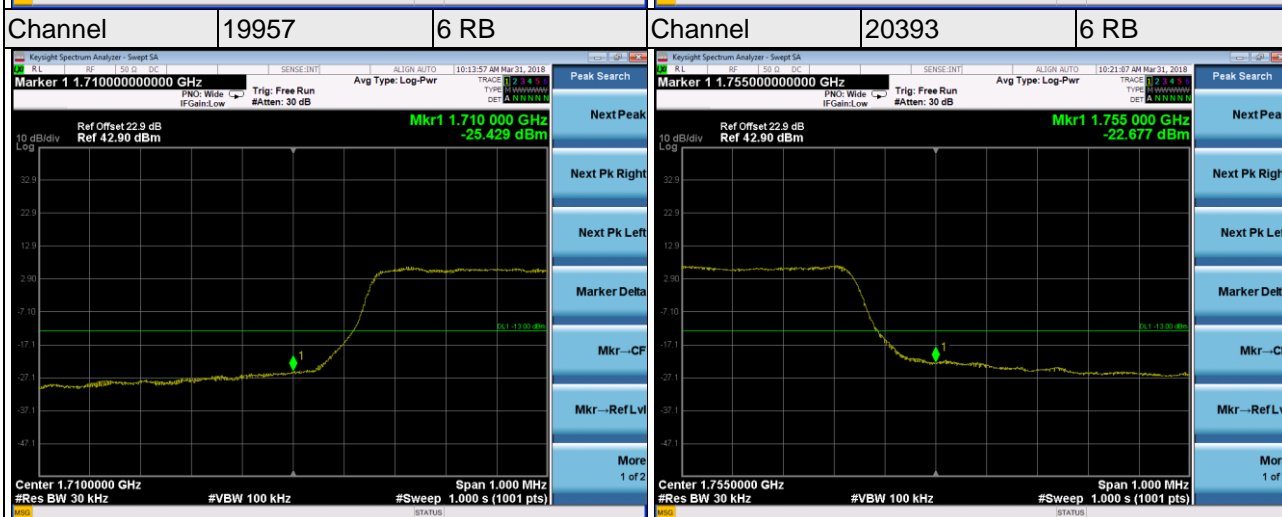
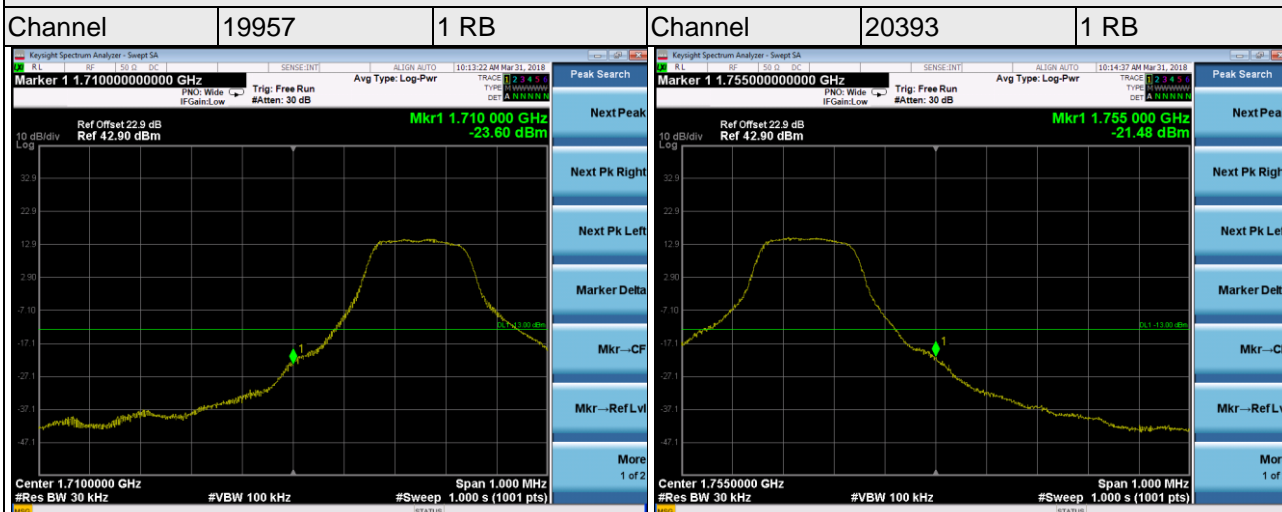
- a. All measurements were done at low and high operational frequency range.
- b. The center frequency of spectrum is the band edge frequency and s RB of the spectrum is >1% emission bandwidth and VB of the spectrum is $\geq 3*RB$.
- c. Record the max trace plot into the test report.

4.5.4 Test Results



LTE Band 4

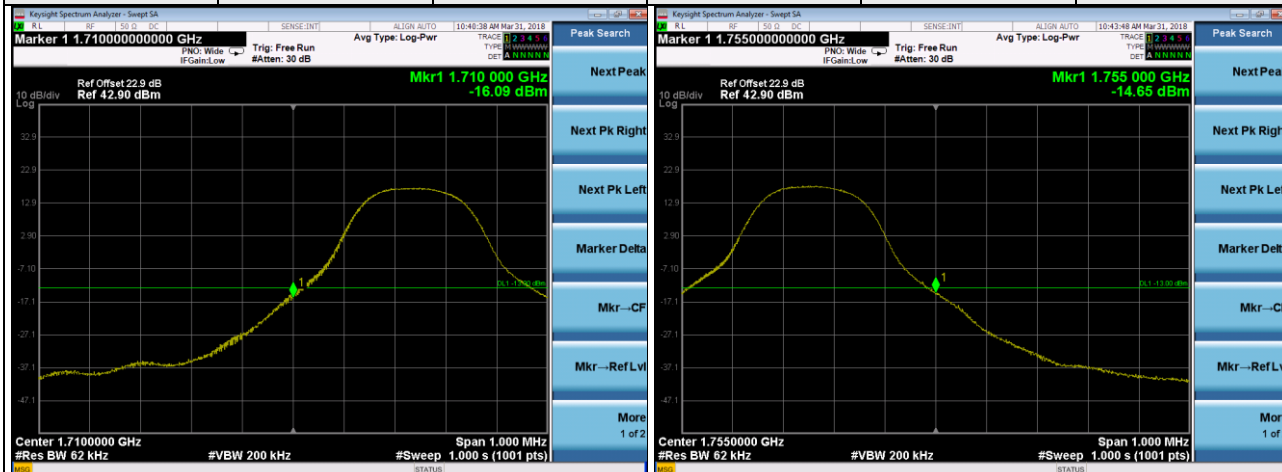
Channel Bandwidth 1.4MHz



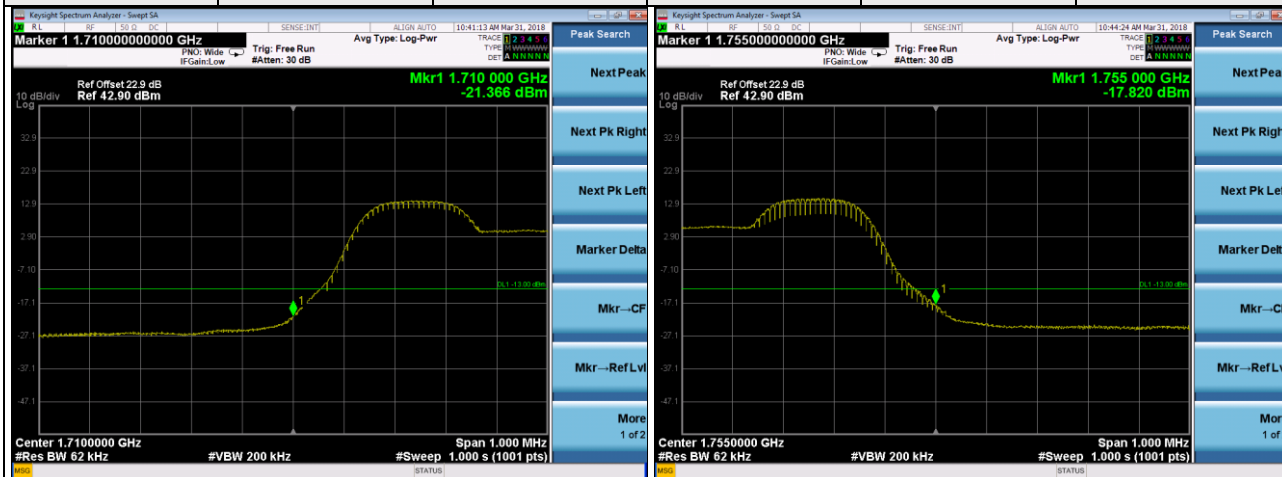
LTE Band 4

Channel Bandwidth 3MHz

| | | | | | |
|---------|-------|------|---------|-------|------|
| Channel | 19965 | 1 RB | Channel | 20385 | 1 RB |
|---------|-------|------|---------|-------|------|



| | | | | | |
|---------|-------|-------|---------|-------|-------|
| Channel | 19965 | 15 RB | Channel | 20385 | 15 RB |
|---------|-------|-------|---------|-------|-------|



LTE Band 4

Channel Bandwidth 5MHz

