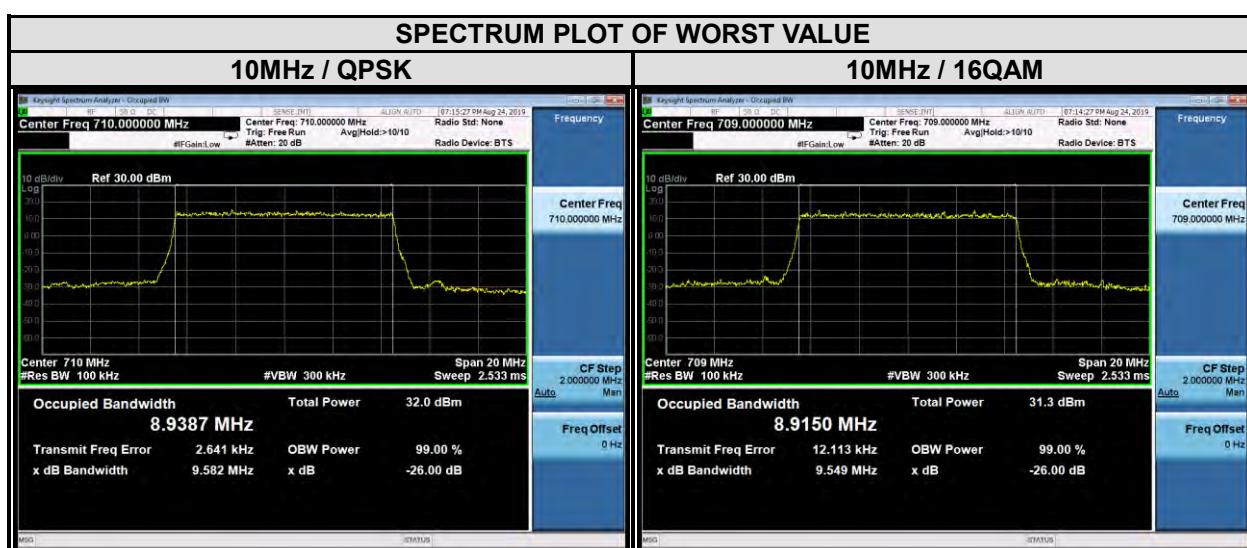




Test Report No.: RF190522W005-4

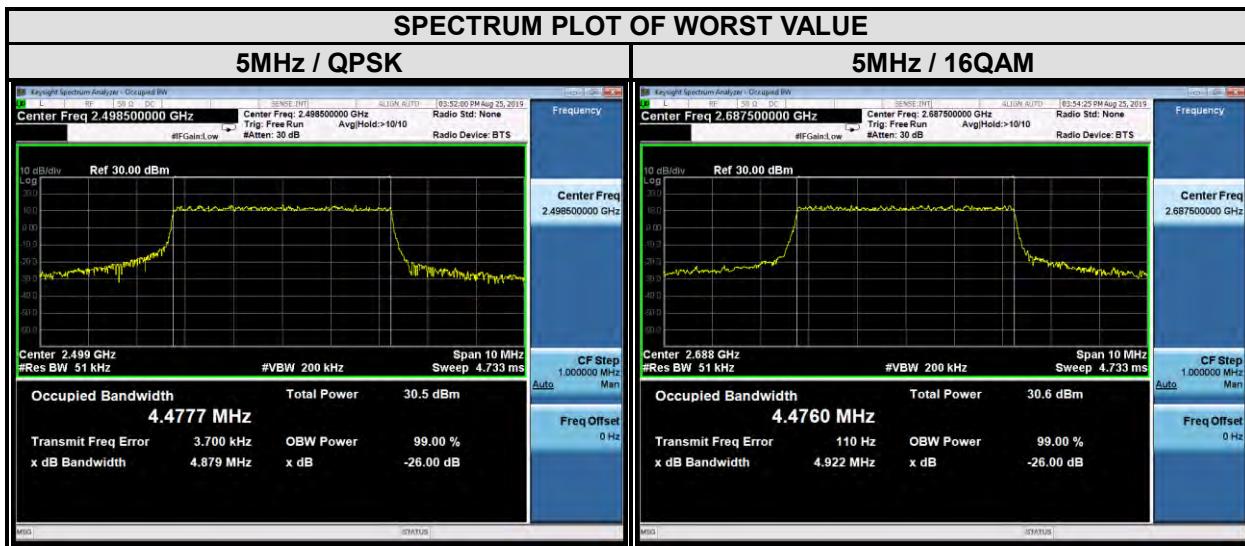
| LTE band 17 | | | | | |
|---------------------------|--------------------|------------------------------------|-------|--------------------------|-------|
| Channel Bandwidth : 10MHz | | | | | |
| Channel | Frequency (MHz) | 99% Occupied bandwidth (MHz) | | 26 dB bandwidth (MHz) | |
| | | QPSK | 16QAM | QPSK | 16QAM |
| 23780 | 709 | 8.93 | 8.92 | 9.65 | 9.55 |
| 23790 | 710 | 8.94 | 8.92 | 9.58 | 9.56 |
| 23800 | 711 | 8.93 | 8.91 | 9.61 | 9.56 |





Test Report No.: RF190522W005-4

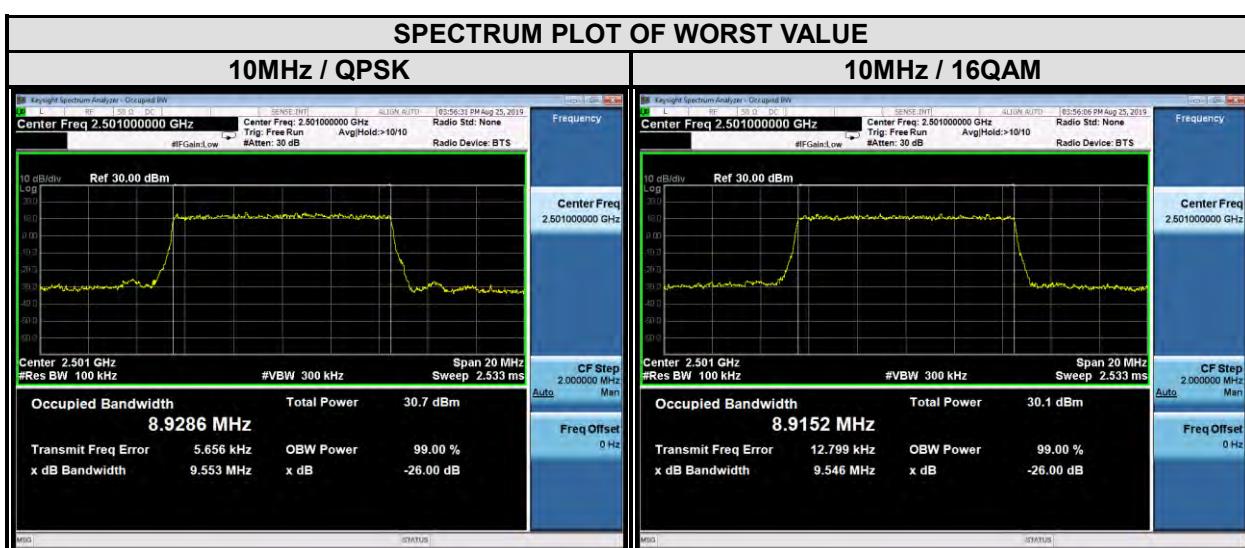
| LTE band 41 | | | | | |
|--------------------------|--------------------|------------------------------------|-------|--------------------------|-------|
| Channel Bandwidth : 5MHz | | | | | |
| Channel | Frequency (MHz) | 99% Occupied bandwidth (MHz) | | 26 dB bandwidth (MHz) | |
| | | QPSK | 16QAM | QPSK | 16QAM |
| 39675 | 2498.5 | 4.48 | 4.47 | 4.88 | 4.84 |
| 40620 | 2593 | 4.47 | 4.47 | 4.89 | 4.85 |
| 41565 | 2687.5 | 4.48 | 4.48 | 4.92 | 4.92 |





Test Report No.: RF190522W005-4

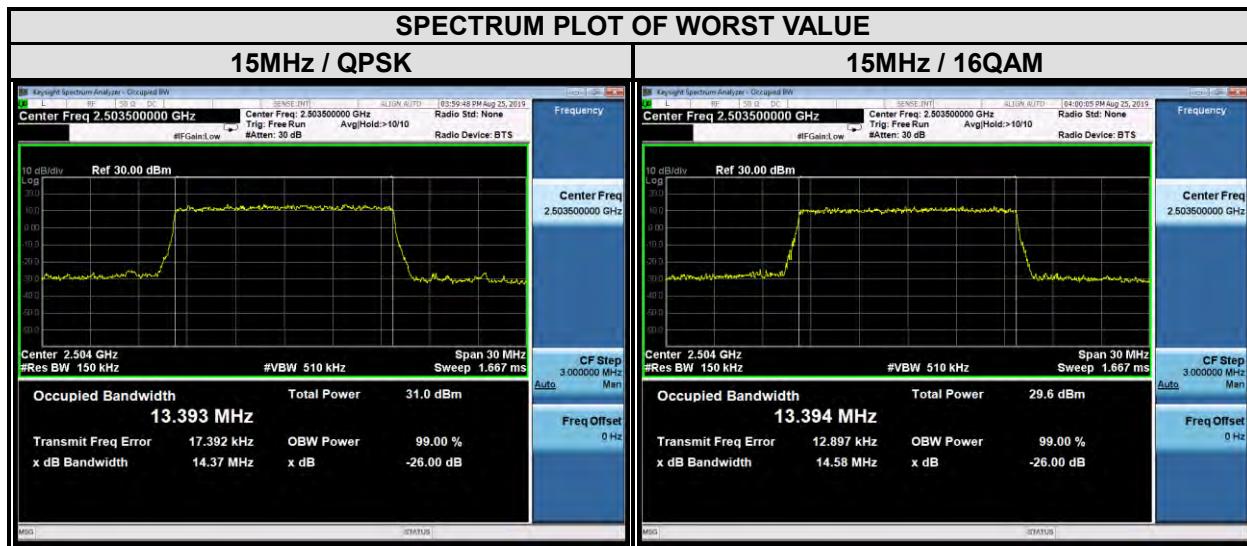
| LTE band 41 | | | | | |
|---------------------------|--------------------|------------------------------------|-------|--------------------------|-------|
| Channel Bandwidth : 10MHz | | | | | |
| Channel | Frequency (MHz) | 99% Occupied bandwidth (MHz) | | 26 dB bandwidth (MHz) | |
| | | QPSK | 16QAM | QPSK | 16QAM |
| 39700 | 2501 | 8.93 | 8.92 | 9.55 | 9.55 |
| 40620 | 2593 | 8.93 | 8.92 | 9.49 | 9.56 |
| 41540 | 2685 | 8.93 | 8.92 | 9.55 | 9.55 |





Test Report No.: RF190522W005-4

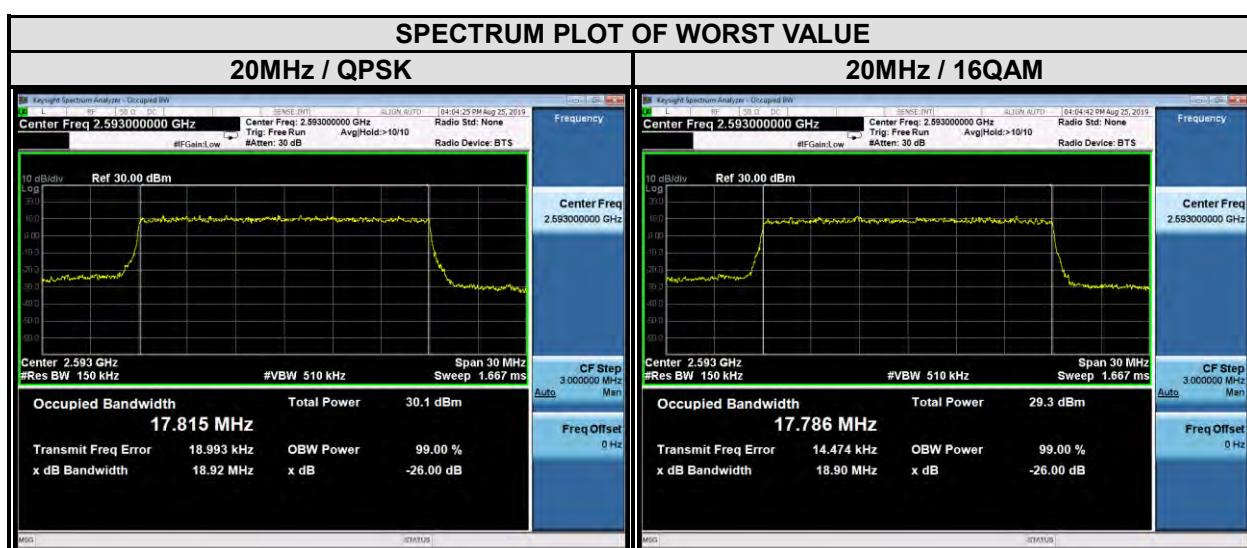
| LTE band 41 | | | | | |
|---------------------------|--------------------|------------------------------------|-------|--------------------------|-------|
| Channel Bandwidth : 15MHz | | | | | |
| Channel | Frequency (MHz) | 99% Occupied bandwidth (MHz) | | 26 dB bandwidth (MHz) | |
| | | QPSK | 16QAM | QPSK | 16QAM |
| 39725 | 2503.5 | 13.39 | 13.39 | 14.37 | 14.58 |
| 40620 | 2593 | 13.37 | 13.38 | 14.31 | 14.51 |
| 41515 | 2682.5 | 13.39 | 13.39 | 14.29 | 14.52 |





Test Report No.: RF190522W005-4

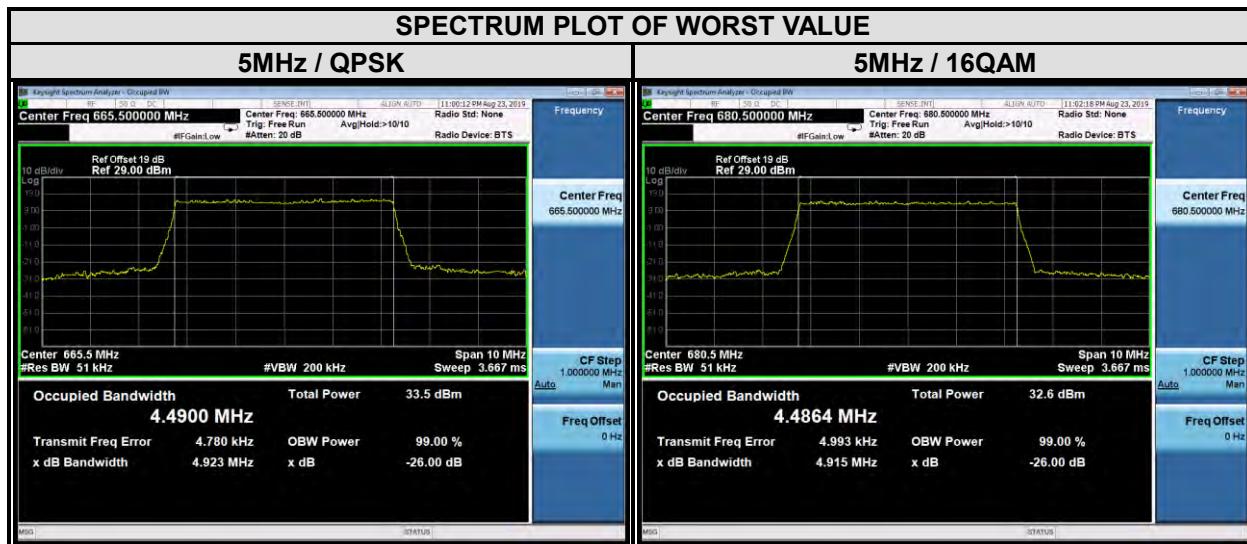
| LTE band 41 | | | | | |
|---------------------------|--------------------|------------------------------------|-------|--------------------------|-------|
| Channel Bandwidth : 20MHz | | | | | |
| Channel | Frequency (MHz) | 99% Occupied bandwidth (MHz) | | 26 dB bandwidth (MHz) | |
| | | QPSK | 16QAM | QPSK | 16QAM |
| 39750 | 2506 | 17.80 | 17.78 | 18.89 | 18.97 |
| 40620 | 2593 | 17.82 | 17.79 | 18.92 | 18.90 |
| 41490 | 2680 | 17.79 | 17.79 | 18.74 | 18.65 |





Test Report No.: RF190522W005-4

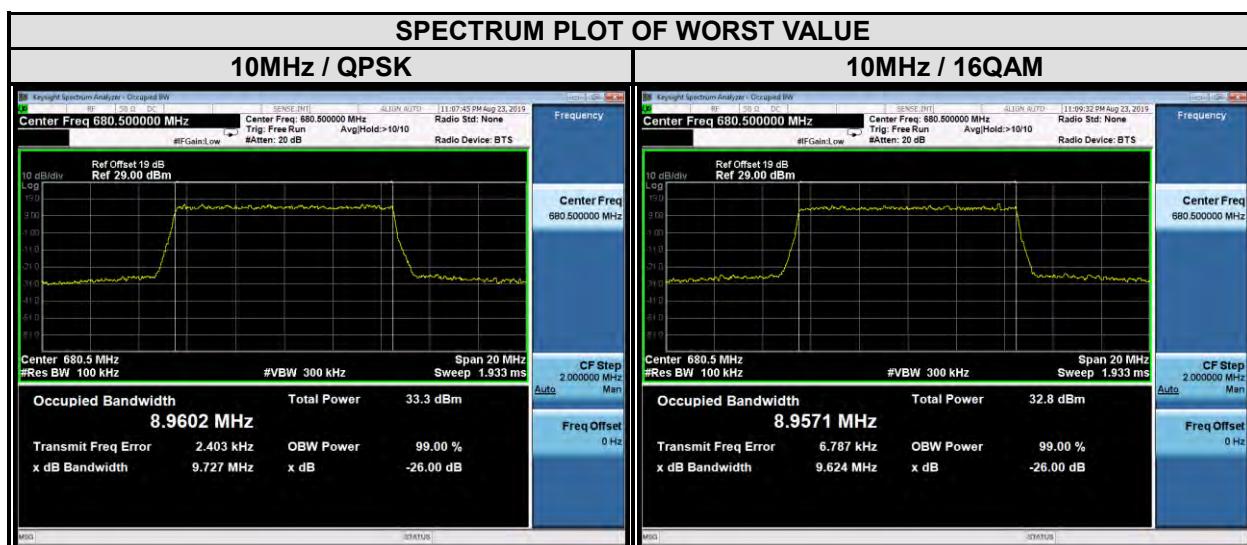
| LTE band 71 | | | | | |
|--------------------------|--------------------|------------------------------------|-------|--------------------------|-------|
| Channel Bandwidth : 5MHz | | | | | |
| Channel | Frequency (MHz) | 99% Occupied bandwidth (MHz) | | 26 dB bandwidth (MHz) | |
| | | QPSK | 16QAM | QPSK | 16QAM |
| 133147 | 665.5 | 4.49 | 4.48 | 4.92 | 4.90 |
| 133297 | 680.5 | 4.49 | 4.49 | 4.91 | 4.92 |
| 133447 | 695.5 | 4.47 | 4.48 | 4.87 | 4.93 |





Test Report No.: RF190522W005-4

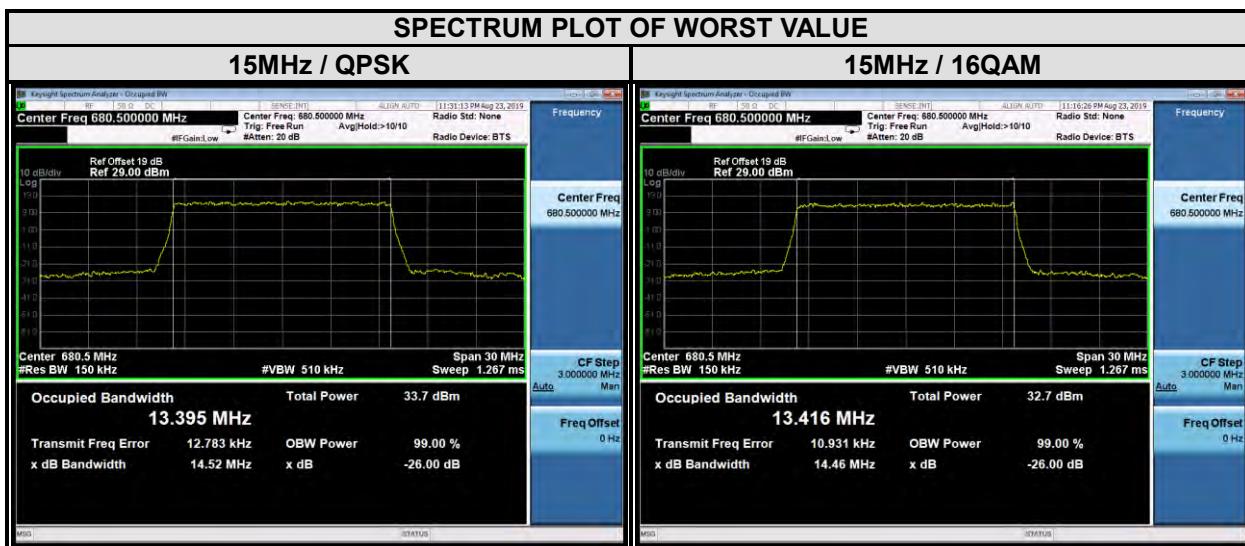
| LTE band 71 | | | | | |
|---------------------------|--------------------|------------------------------------|-------|--------------------------|-------|
| Channel Bandwidth : 10MHz | | | | | |
| Channel | Frequency (MHz) | 99% Occupied bandwidth (MHz) | | 26 dB bandwidth (MHz) | |
| | | QPSK | 16QAM | QPSK | 16QAM |
| 133172 | 668 | 8.94 | 8.95 | 9.70 | 9.68 |
| 133297 | 680.5 | 8.96 | 8.96 | 9.73 | 9.62 |
| 133422 | 693 | 8.94 | 8.94 | 9.68 | 9.65 |





Test Report No.: RF190522W005-4

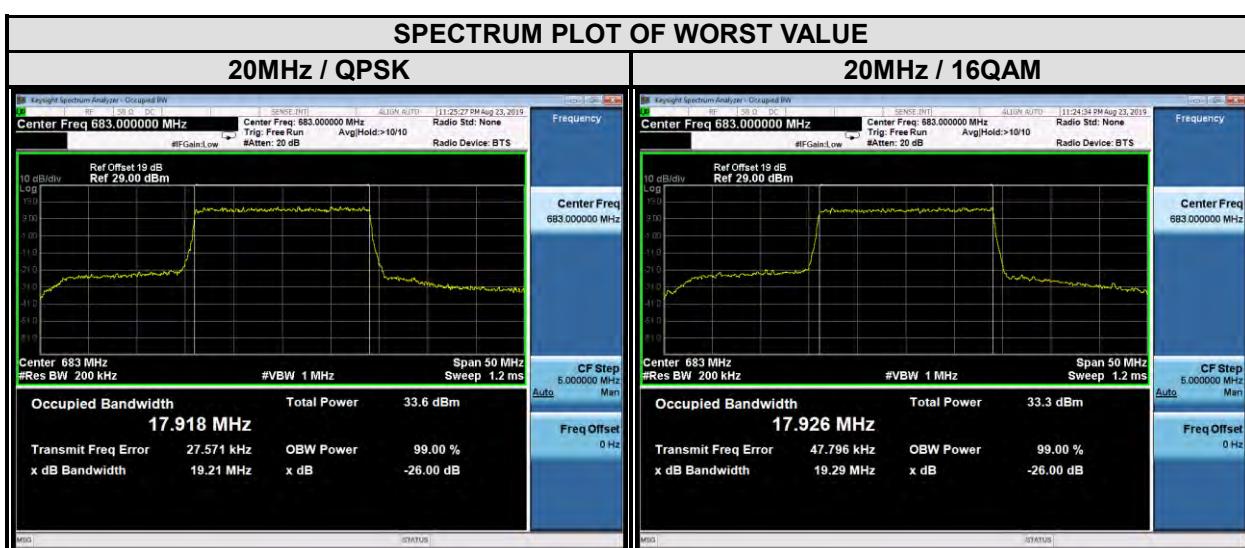
| LTE band 71 | | | | | |
|---------------------------|--------------------|------------------------------------|-------|--------------------------|-------|
| Channel Bandwidth : 15MHz | | | | | |
| Channel | Frequency (MHz) | 99% Occupied bandwidth (MHz) | | 26 dB bandwidth (MHz) | |
| | | QPSK | 16QAM | QPSK | 16QAM |
| 133197 | 670.5 | 13.38 | 13.40 | 14.48 | 14.43 |
| 133297 | 680.5 | 13.40 | 13.42 | 14.52 | 14.46 |
| 133397 | 690.5 | 13.40 | 13.40 | 14.47 | 14.41 |





Test Report No.: RF190522W005-4

| LTE band 71 | | | | | |
|---------------------------|--------------------|------------------------------------|-------|--------------------------|-------|
| Channel Bandwidth : 20MHz | | | | | |
| Channel | Frequency (MHz) | 99% Occupied bandwidth (MHz) | | 26 dB bandwidth (MHz) | |
| | | QPSK | 16QAM | QPSK | 16QAM |
| 133222 | 673 | 17.82 | 17.84 | 19.12 | 19.30 |
| 133322 | 683 | 17.92 | 17.93 | 19.21 | 19.29 |
| 133372 | 688 | 17.90 | 17.88 | 19.36 | 19.23 |





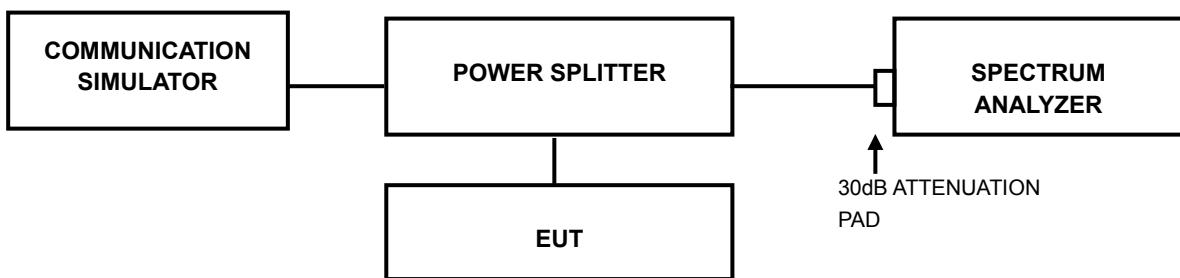
Test Report No.: RF190522W005-4

3.4 PEAK TO AVERAGE RATIO

3.4.1 LIMITS OF PEAK TO AVERAGE RATIO MEASUREMENT

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB

3.4.2 TEST SETUP



3.4.3 TEST PROCEDURES

1. Set resolution/measurement bandwidth \geq signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1%.



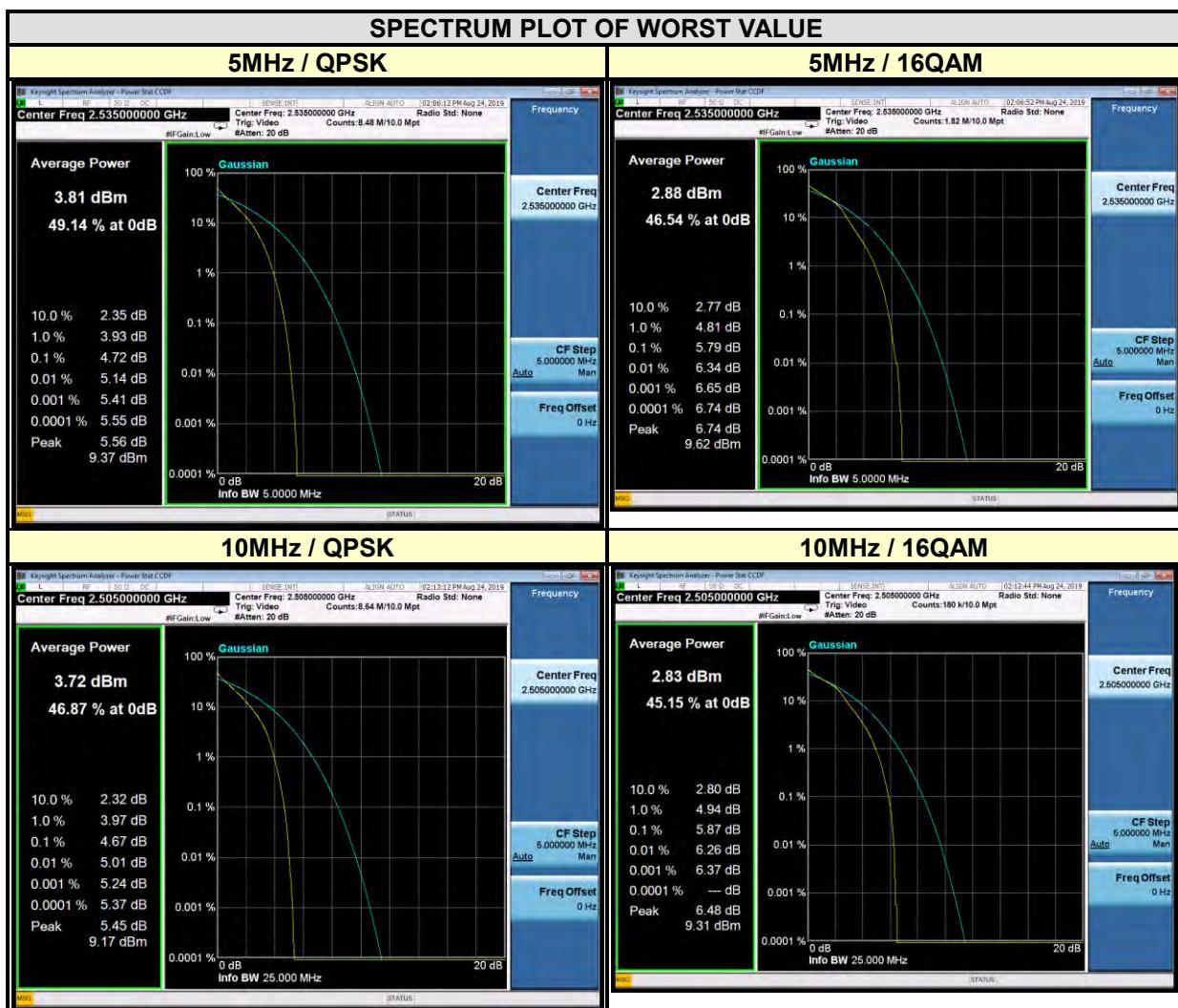
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Test Report No.: RF190522W005-4

3.4.4 TEST RESULTS

LTE BAND 7

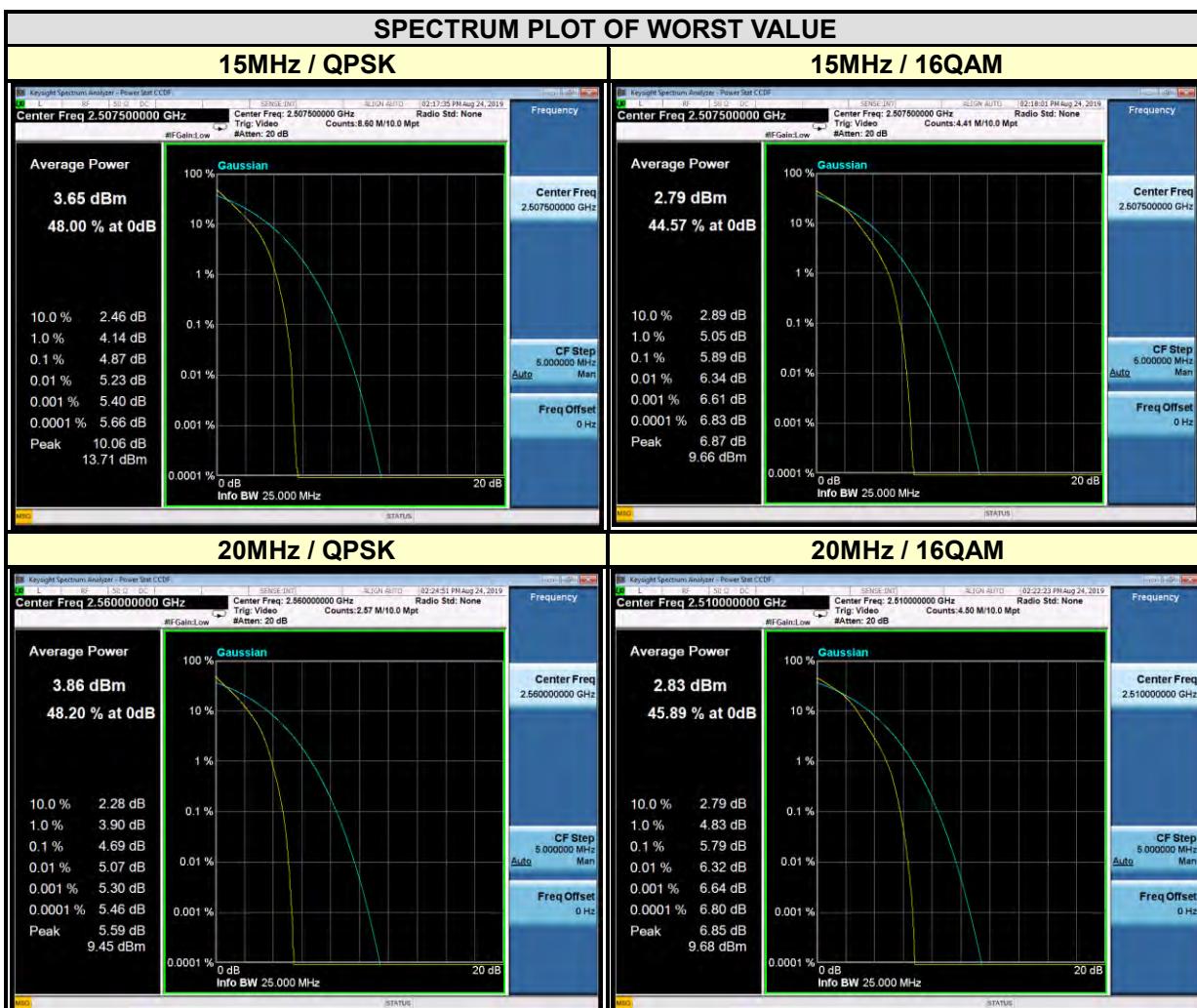
| CHANNEL BANDWIDTH: 5MHz | | | | CHANNEL BANDWIDTH: 10MHz | | | |
|-------------------------|-----------------|----------------------------|-------|--------------------------|-----------------|----------------------------|-------|
| CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) | | CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) | |
| | | QPSK | 16QAM | | | QPSK | 16QAM |
| 20775 | 2502.5 | 4.68 | 5.74 | 20800 | 2505 | 4.67 | 5.87 |
| 21100 | 2535 | 4.72 | 5.79 | 21100 | 2535 | 4.55 | 5.65 |
| 21425 | 2567.5 | 4.62 | 5.68 | 21400 | 2565 | 4.42 | 5.55 |





Test Report No.: RF190522W005-4

| CHANNEL BANDWIDTH: 15MHz | | | | CHANNEL BANDWIDTH: 20MHz | | | |
|--------------------------|--------------------|-------------------------------|-------|--------------------------|--------------------|-------------------------------|-------|
| CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) | | CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) | |
| | | QPSK | 16QAM | | | QPSK | 16QAM |
| 20825 | 2507.5 | 4.87 | 5.89 | 20850 | 2510 | 4.62 | 5.79 |
| 21100 | 2535 | 4.71 | 5.77 | 21100 | 2535 | 4.61 | 5.73 |
| 21375 | 2562.5 | 4.57 | 5.63 | 21350 | 2560 | 4.69 | 5.61 |



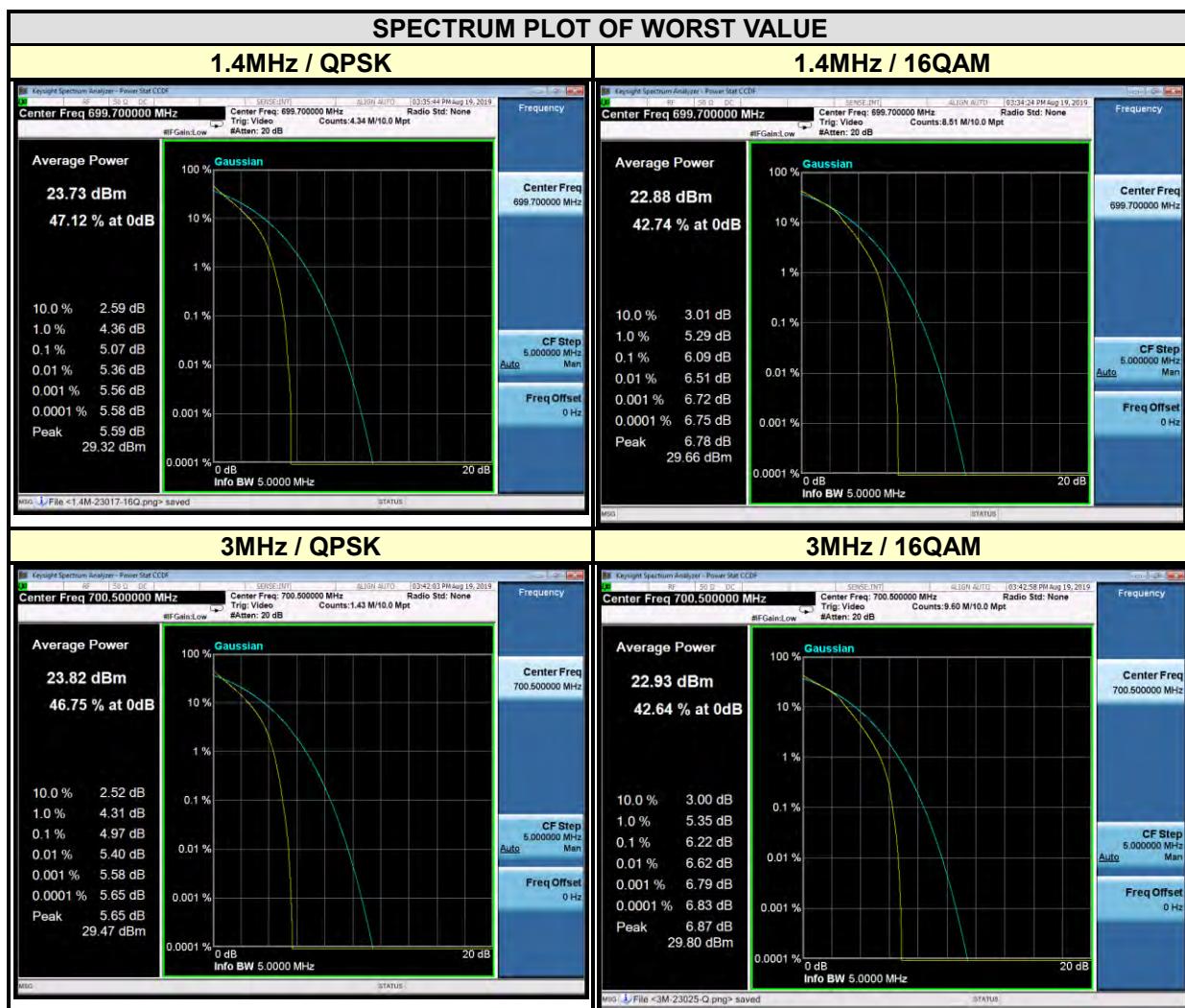


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LTE BAND 12

| CHANNEL BANDWIDTH: 1.4MHz | | | | CHANNEL BANDWIDTH: 3MHz | | | |
|---------------------------|--------------------|-------------------------------|-------|-------------------------|--------------------|-------------------------------|-------|
| CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) | | CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) | |
| | | QPSK | 16QAM | | | QPSK | 16QAM |
| 23017 | 699.7 | 5.07 | 6.09 | 23025 | 700.5 | 4.97 | 6.22 |
| 23095 | 707.5 | 4.55 | 5.50 | 23095 | 707.5 | 4.46 | 5.62 |
| 23173 | 715.3 | 4.80 | 5.77 | 23165 | 714.5 | 4.79 | 5.96 |

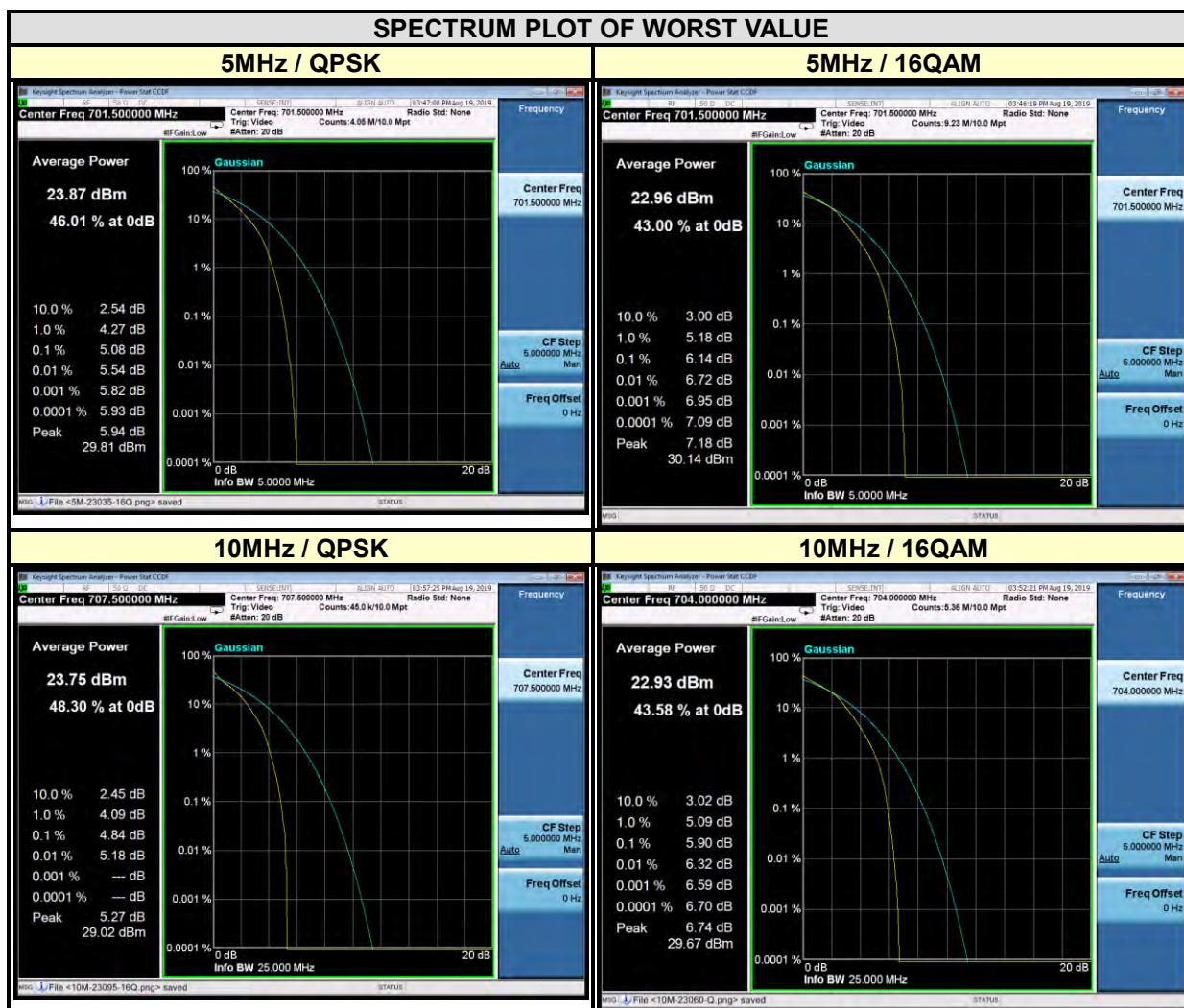




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| CHANNEL BANDWIDTH: 5MHz | | | | CHANNEL BANDWIDTH: 10MHz | | | |
|-------------------------|--------------------|-------------------------------|-------|--------------------------|--------------------|-------------------------------|-------|
| CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) | | CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) | |
| | | QPSK | 16QAM | | | QPSK | 16QAM |
| 23035 | 701.5 | 5.08 | 6.14 | 23060 | 704 | 4.82 | 5.90 |
| 23095 | 707.5 | 4.72 | 5.70 | 23095 | 707.5 | 4.84 | 5.81 |
| 23155 | 713.5 | 4.95 | 5.99 | 23130 | 711 | 4.77 | 5.79 |

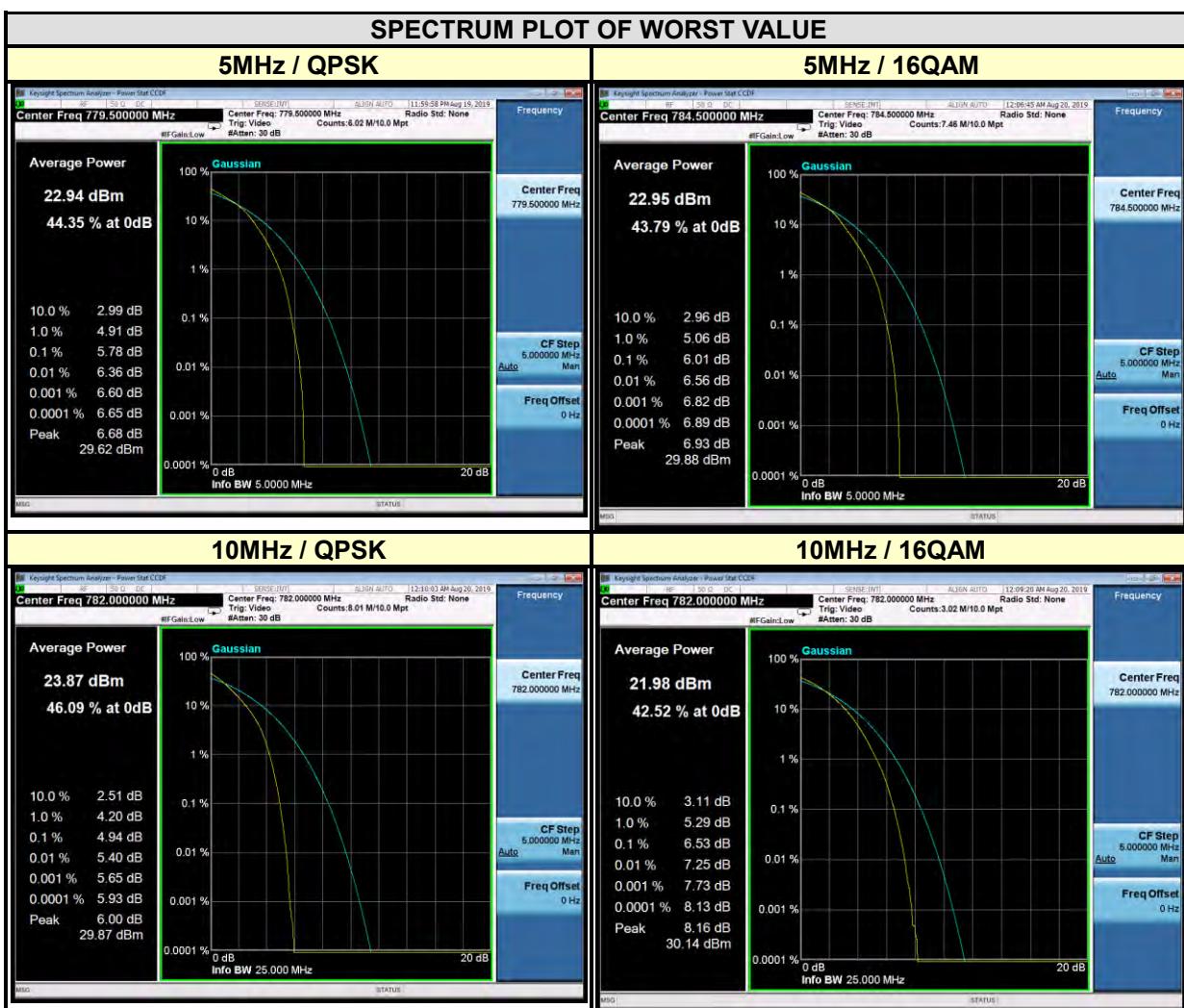




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LTE BAND 13

| CHANNEL BANDWIDTH: 5MHz | | | | CHANNEL BANDWIDTH: 10MHz | | | |
|-------------------------|--------------------|-------------------------------|-------|--------------------------|--------------------|-------------------------------|-------|
| CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) | | CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) | |
| | | QPSK | 16QAM | | | QPSK | 16QAM |
| 23205 | 779.5 | 5.78 | 5.80 | N/A | N/A | - | - |
| 23230 | 793 | 4.87 | 5.99 | 23230 | 782 | 4.94 | 6.53 |
| 23255 | 784.5 | 4.90 | 6.01 | N/A | N/A | - | - |



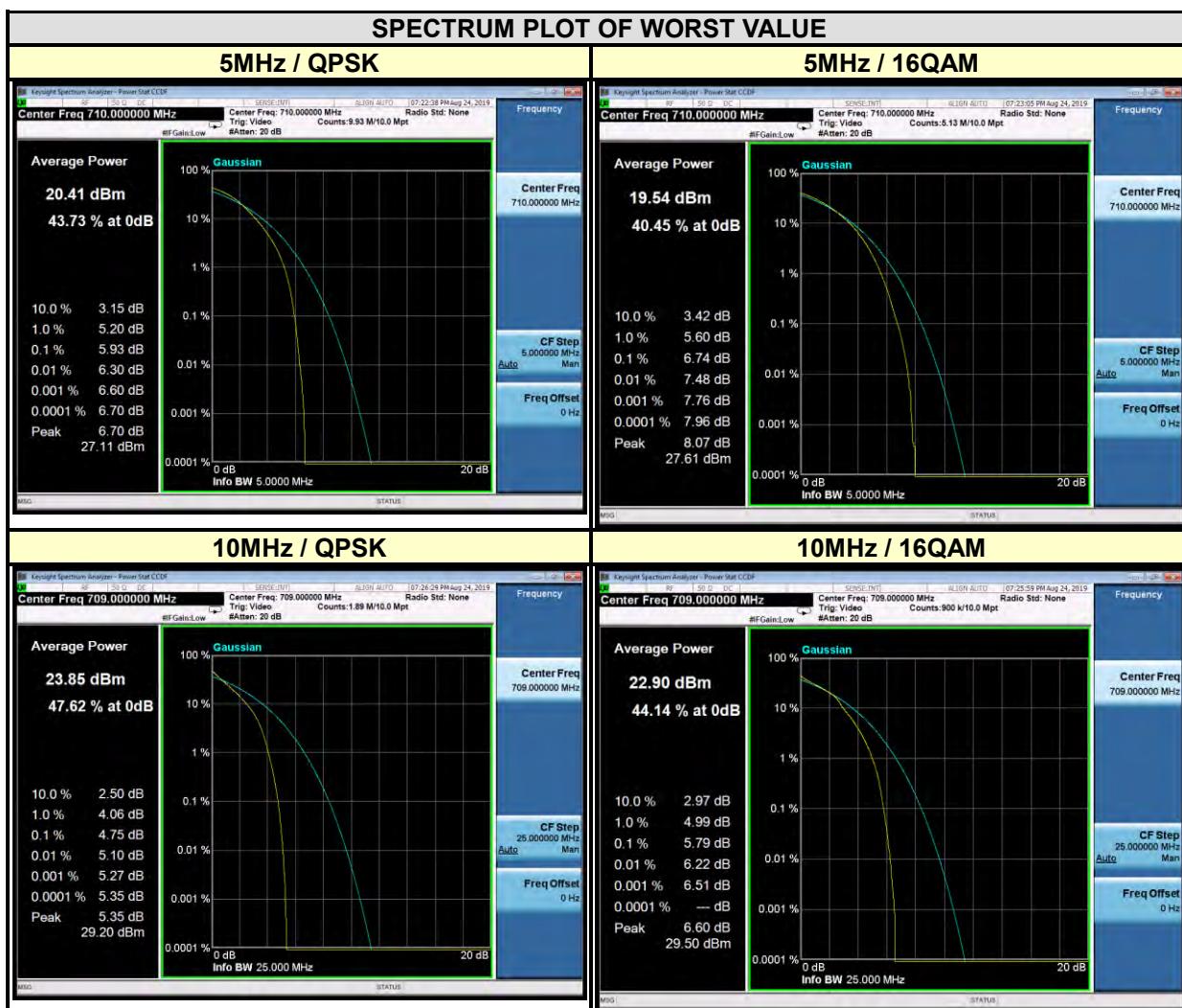


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LTE BAND 17

| CHANNEL BANDWIDTH: 5MHz | | | | CHANNEL BANDWIDTH: 10MHz | | | |
|-------------------------|--------------------|-------------------------------|-------|--------------------------|--------------------|-------------------------------|-------|
| CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) | | CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) | |
| | | QPSK | 16QAM | | | QPSK | 16QAM |
| 23755 | 706.5 | 4.79 | 5.81 | 23780 | 709 | 4.75 | 5.79 |
| 23790 | 710 | 4.79 | 5.79 | 23790 | 710 | 4.72 | 5.72 |
| 23825 | 713.5 | 5.93 | 6.74 | 23800 | 711 | 4.67 | 5.69 |



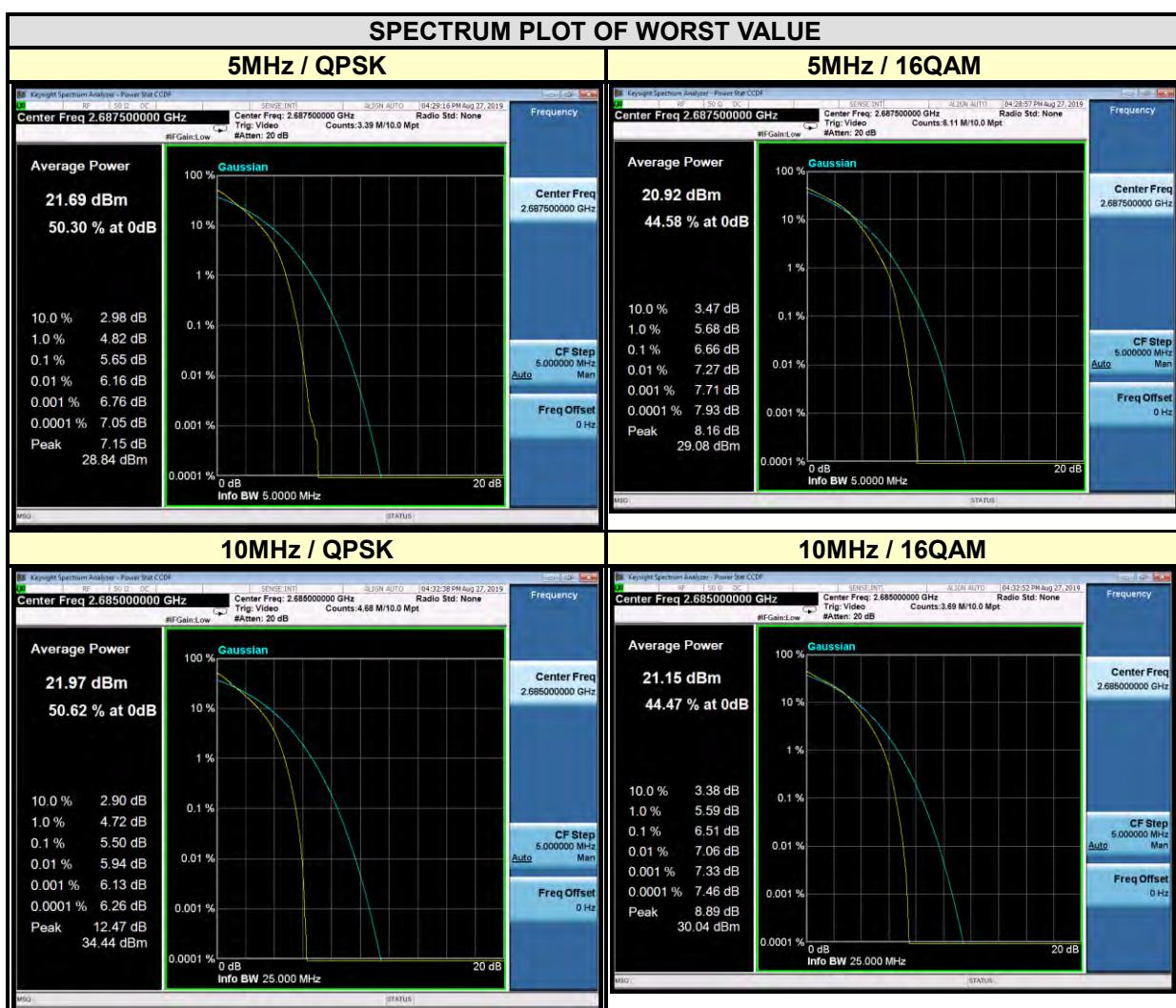


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LTE BAND 41

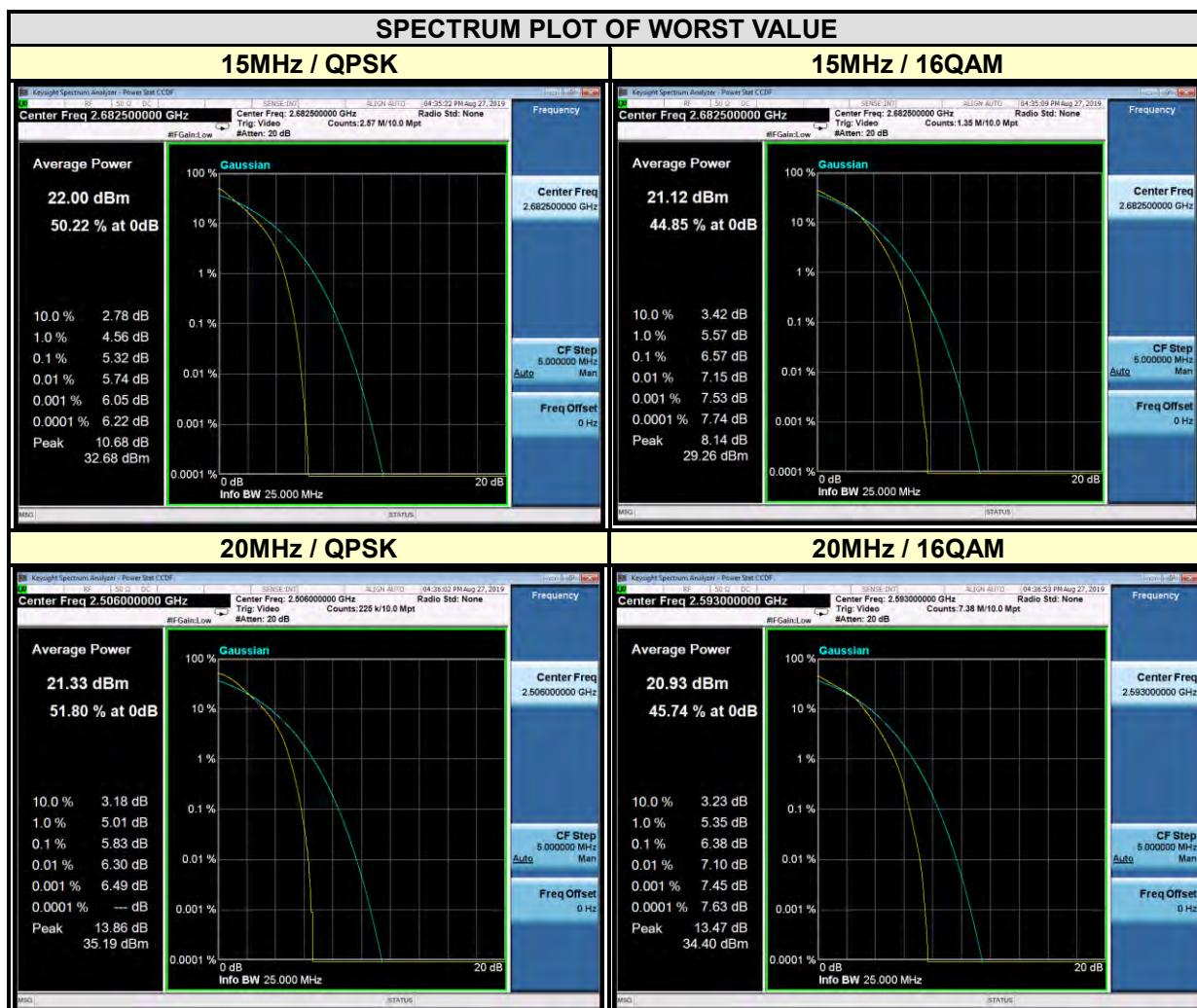
| CHANNEL BANDWIDTH: 5MHz | | | | CHANNEL BANDWIDTH: 10MHz | | | |
|-------------------------|--------------------|-------------------------------|-------|--------------------------|--------------------|-------------------------------|-------|
| CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) | | CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) | |
| | | QPSK | 16QAM | | | QPSK | 16QAM |
| 39675 | 2498.5 | 5.49 | 6.60 | 39700 | 2501 | 5.30 | 6.28 |
| 40620 | 2593 | 5.59 | 6.63 | 40620 | 2593 | 5.26 | 6.27 |
| 41565 | 2687.5 | 5.65 | 6.66 | 41540 | 2685 | 5.50 | 6.51 |





Test Report No.: RF190522W005-4

| CHANNEL BANDWIDTH: 15MHz | | | | CHANNEL BANDWIDTH: 20MHz | | | |
|--------------------------|--------------------|-------------------------------|-------|--------------------------|--------------------|-------------------------------|-------|
| CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) | | CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) | |
| | | QPSK | 16QAM | | | QPSK | 16QAM |
| 39725 | 2503.5 | 5.03 | 6.21 | 39750 | 2506 | 5.83 | 6.37 |
| 40620 | 2593 | 4.88 | 6.26 | 40620 | 2593 | 5.32 | 6.38 |
| 41515 | 2682.5 | 5.32 | 6.57 | 41490 | 2680 | 5.07 | 6.28 |



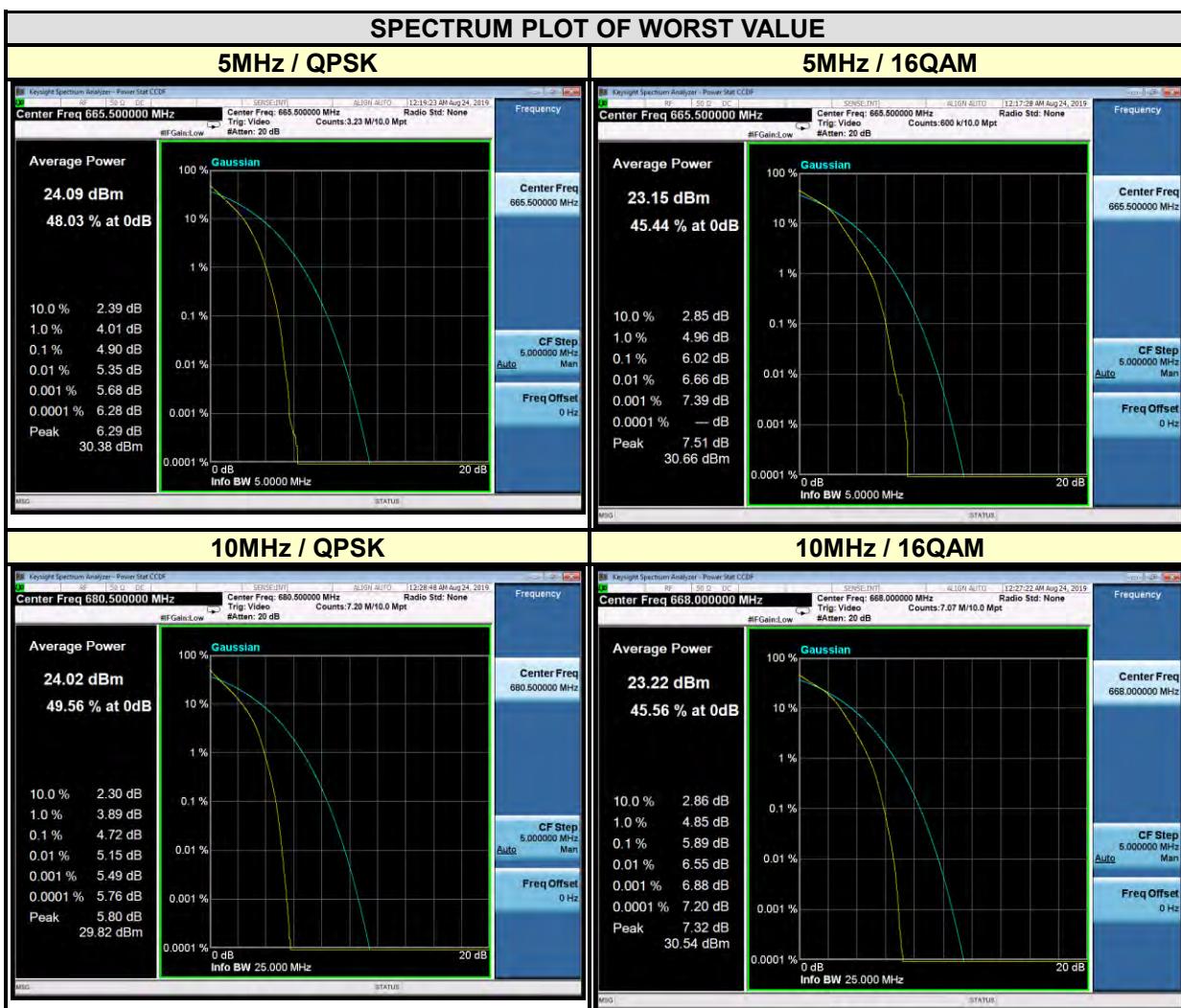


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LTE BAND 71

| CHANNEL BANDWIDTH: 5MHz | | | | CHANNEL BANDWIDTH: 10MHz | | | |
|-------------------------|--------------------|-------------------------------|-------|--------------------------|--------------------|-------------------------------|-------|
| CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) | | CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) | |
| | | QPSK | 16QAM | | | QPSK | 16QAM |
| 133147 | 665.5 | 4.90 | 6.02 | 133172 | 668 | 4.70 | 5.89 |
| 133297 | 680.5 | 4.80 | 5.95 | 133297 | 680.5 | 4.72 | 5.89 |
| 133447 | 695.5 | 4.77 | 5.92 | 133422 | 693 | 4.69 | 5.85 |

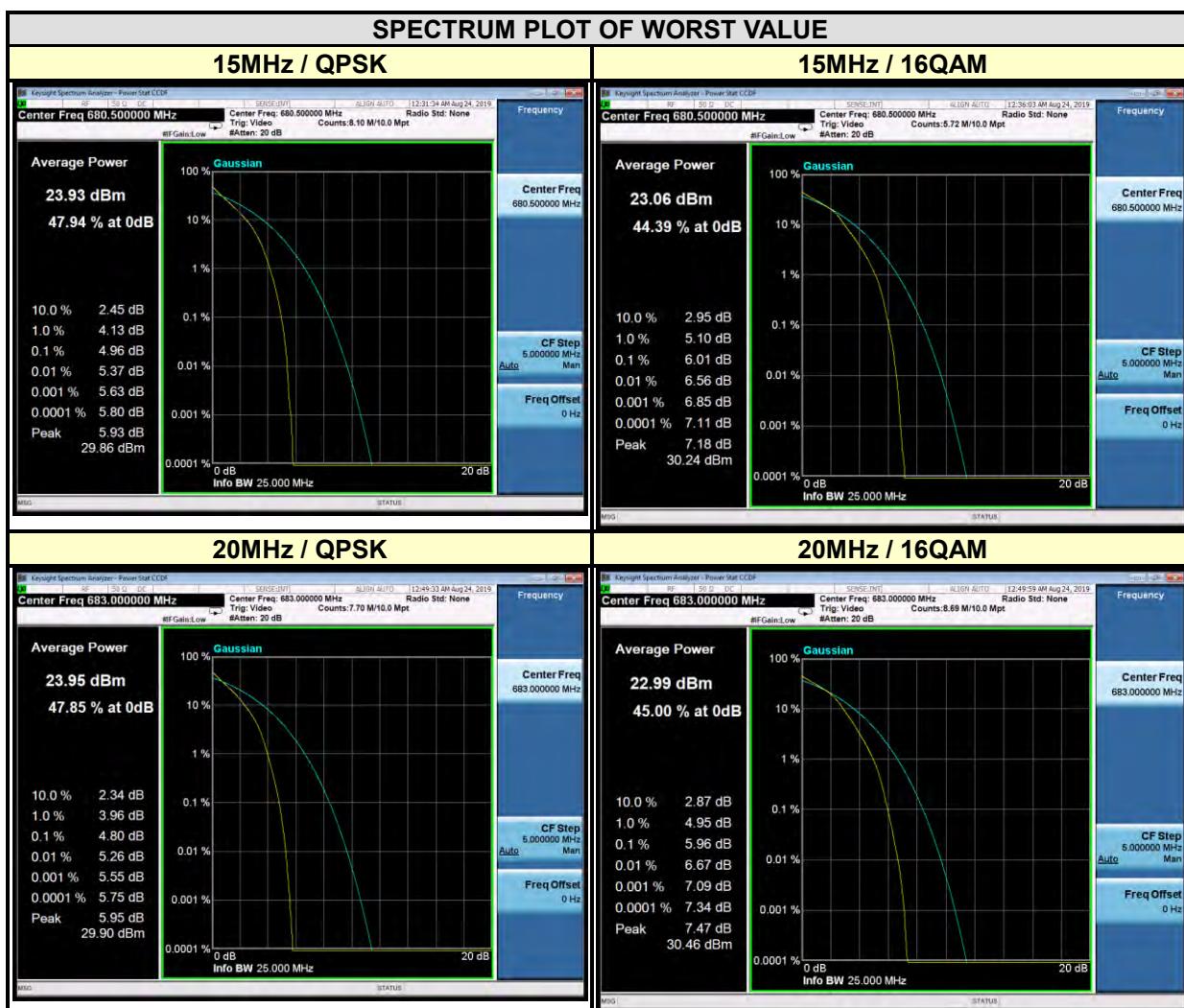




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| CHANNEL BANDWIDTH: 15MHz | | | | CHANNEL BANDWIDTH: 20MHz | | | |
|--------------------------|--------------------|-------------------------------|-------|--------------------------|--------------------|-------------------------------|-------|
| CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) | | CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) | |
| | | QPSK | 16QAM | | | QPSK | 16QAM |
| 133197 | 670.5 | 4.80 | 5.93 | 133222 | 673 | 4.73 | 5.91 |
| 133297 | 680.5 | 4.96 | 6.01 | 133322 | 683 | 4.80 | 5.96 |
| 133397 | 690.5 | 4.84 | 5.96 | 133372 | 688 | 4.76 | 5.94 |





3.5 BAND EDGE MEASUREMENT

3.5.1 LIMITS OF BAND EDGE MEASUREMENT

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.

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

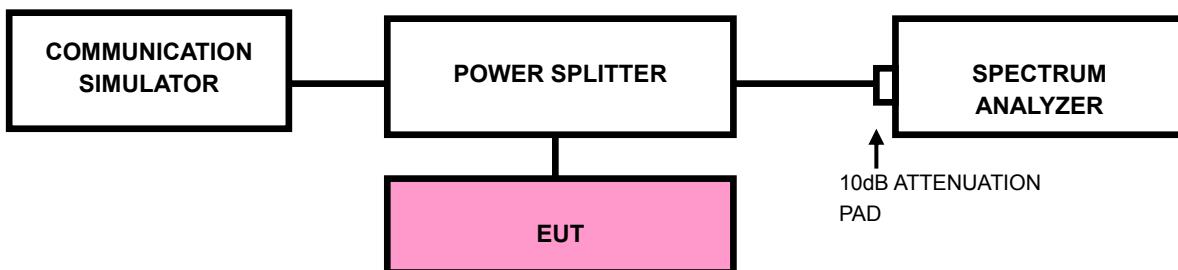


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27.53(g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured 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.

27.53(m)(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.

3.5.2 TEST SETUP





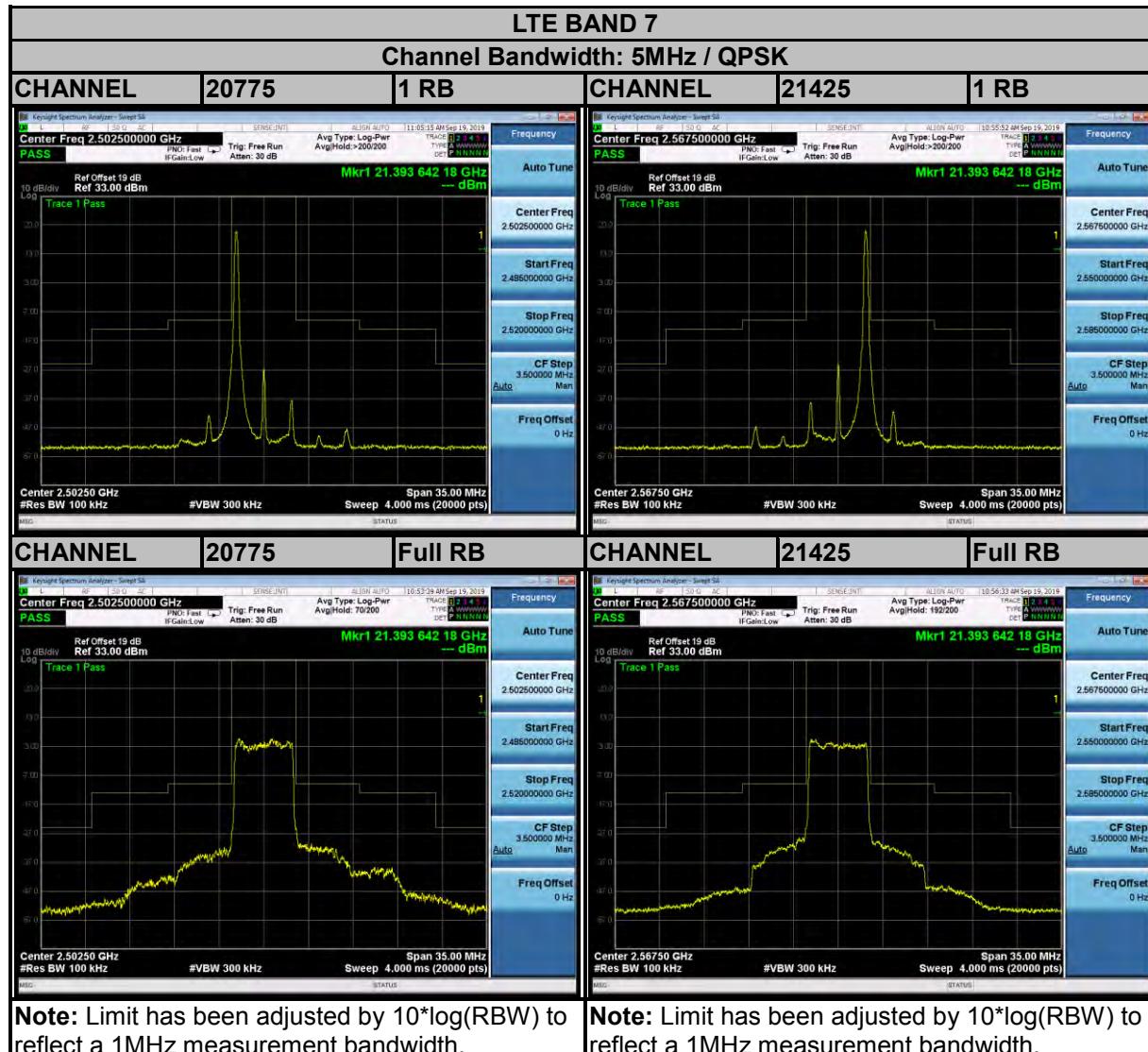
3.5.3 TEST PROCEDURES

- a. The EUT was set up for the maximum peak power with LTE link data modulation. The power was measured with R&S Spectrum Analyzer. All measurements were done at 2 channels (low and high operational frequency range.).
- b. The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- c. The center frequency of spectrum is the band edge frequency and span is 35MHz. RBW of the spectrum is 100kHz and VBW of the spectrum is 300kHz (Channel bandwidth 5MHz).
- d. The center frequency of spectrum is the band edge frequency and span is 50MHz. RBW of the spectrum is 200kHz and VBW of the spectrum is 1MHz (Channel bandwidth 10MHz).
- e. The center frequency of spectrum is the band edge frequency and span is 60MHz. RBW of the spectrum is 300kHz and VBW of the spectrum is 1MHz (Channel bandwidth 15MHz).
- f. The center frequency of spectrum is the band edge frequency and span is 80MHz. RBW of the spectrum is 500kHz and VBW of the spectrum is 2MHz (Channel bandwidth 20MHz).
- g. Record the max trace plot into the test report.



Test Report No.: RF190522W005-4

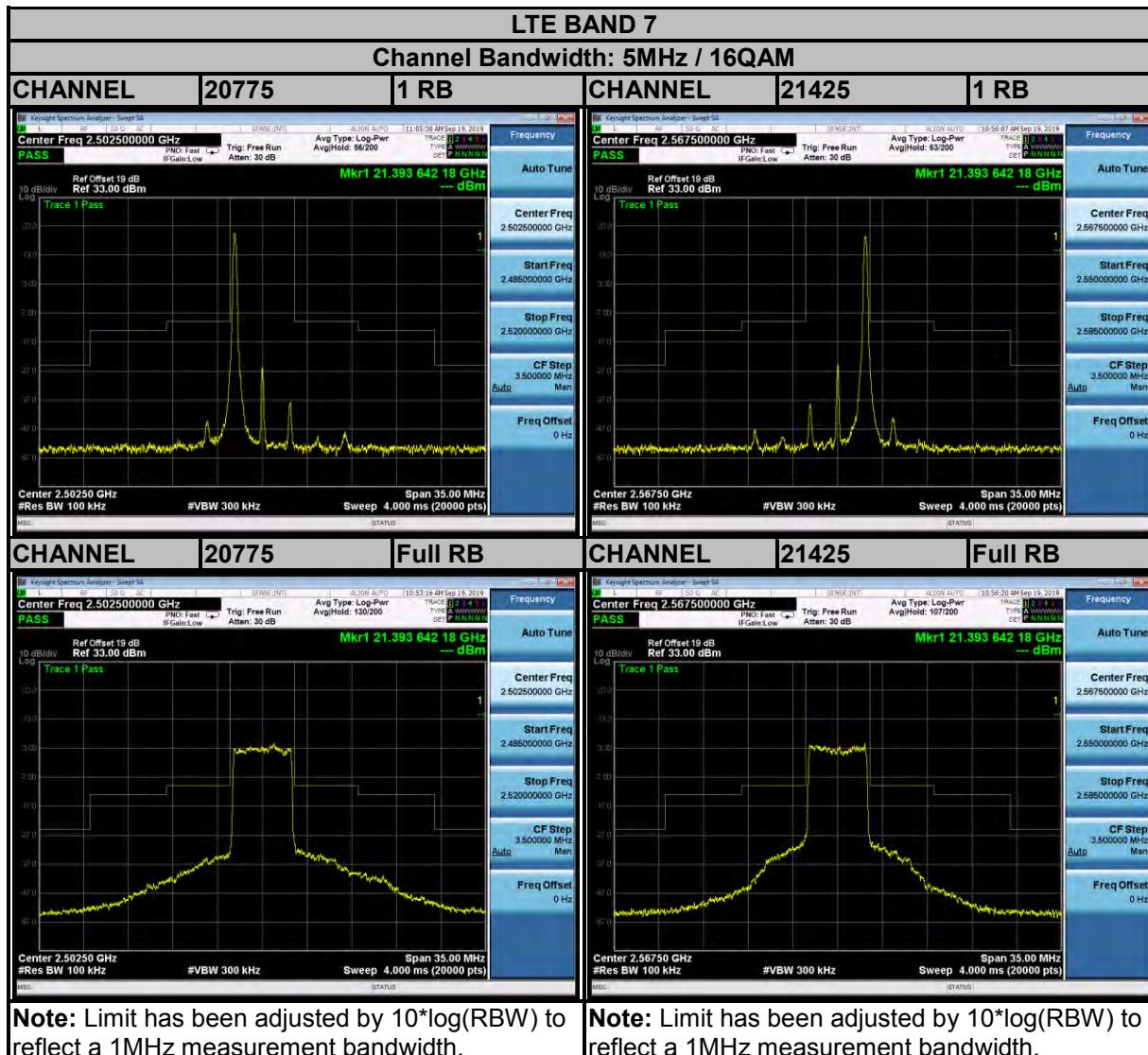
3.5.4 TEST RESULTS





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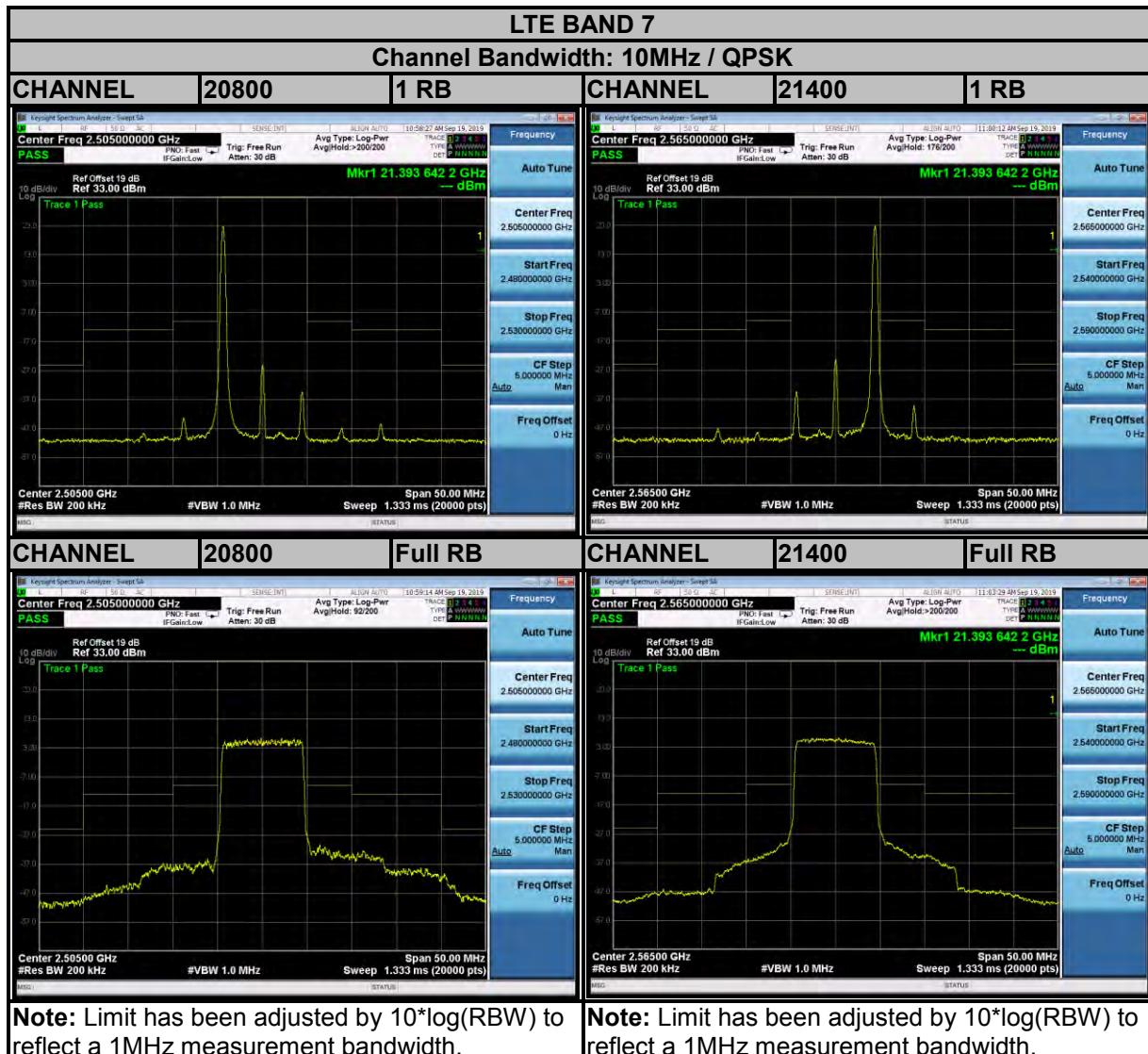
Test Report No.: RF190522W005-4





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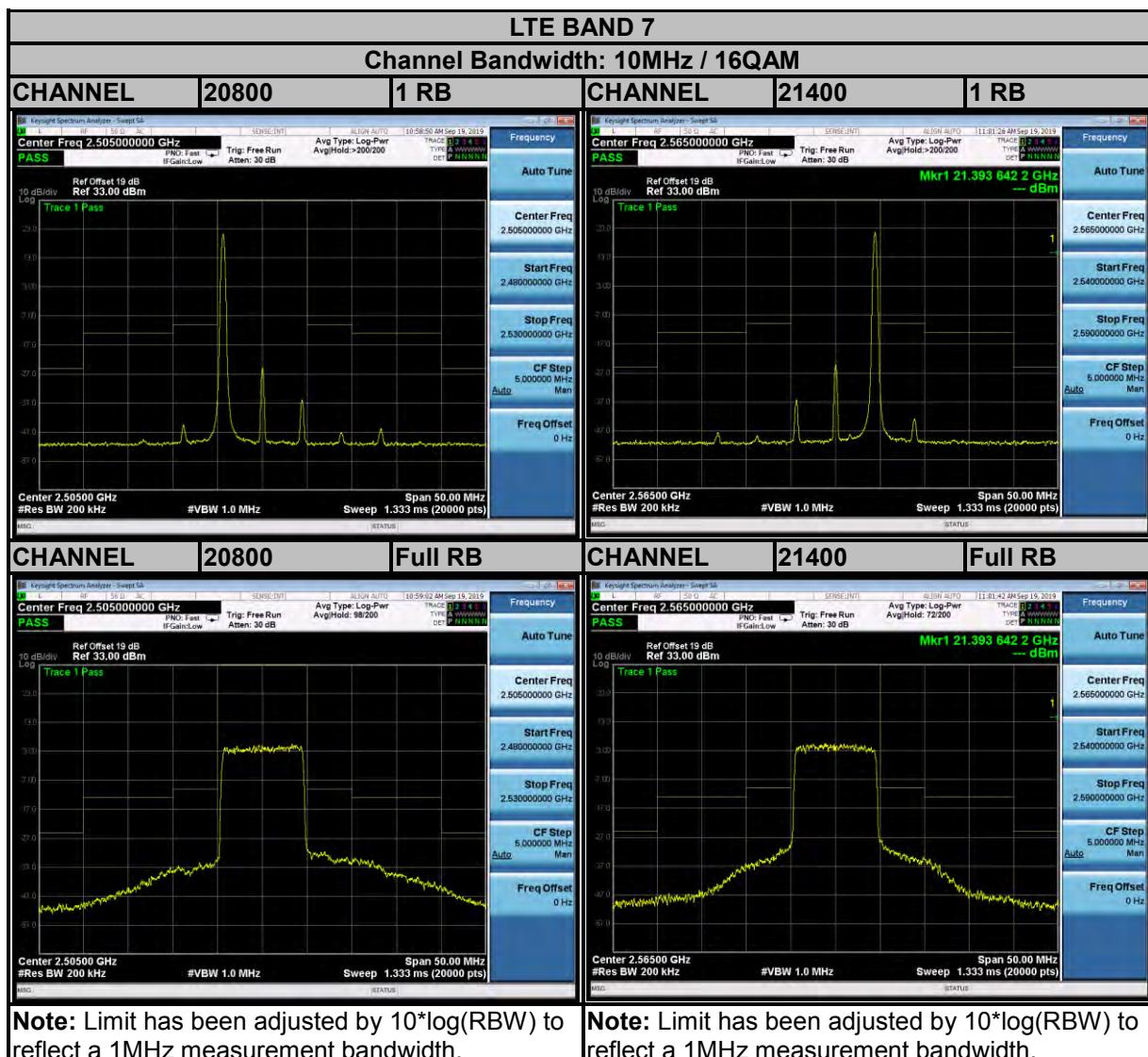
Test Report No.: RF190522W005-4





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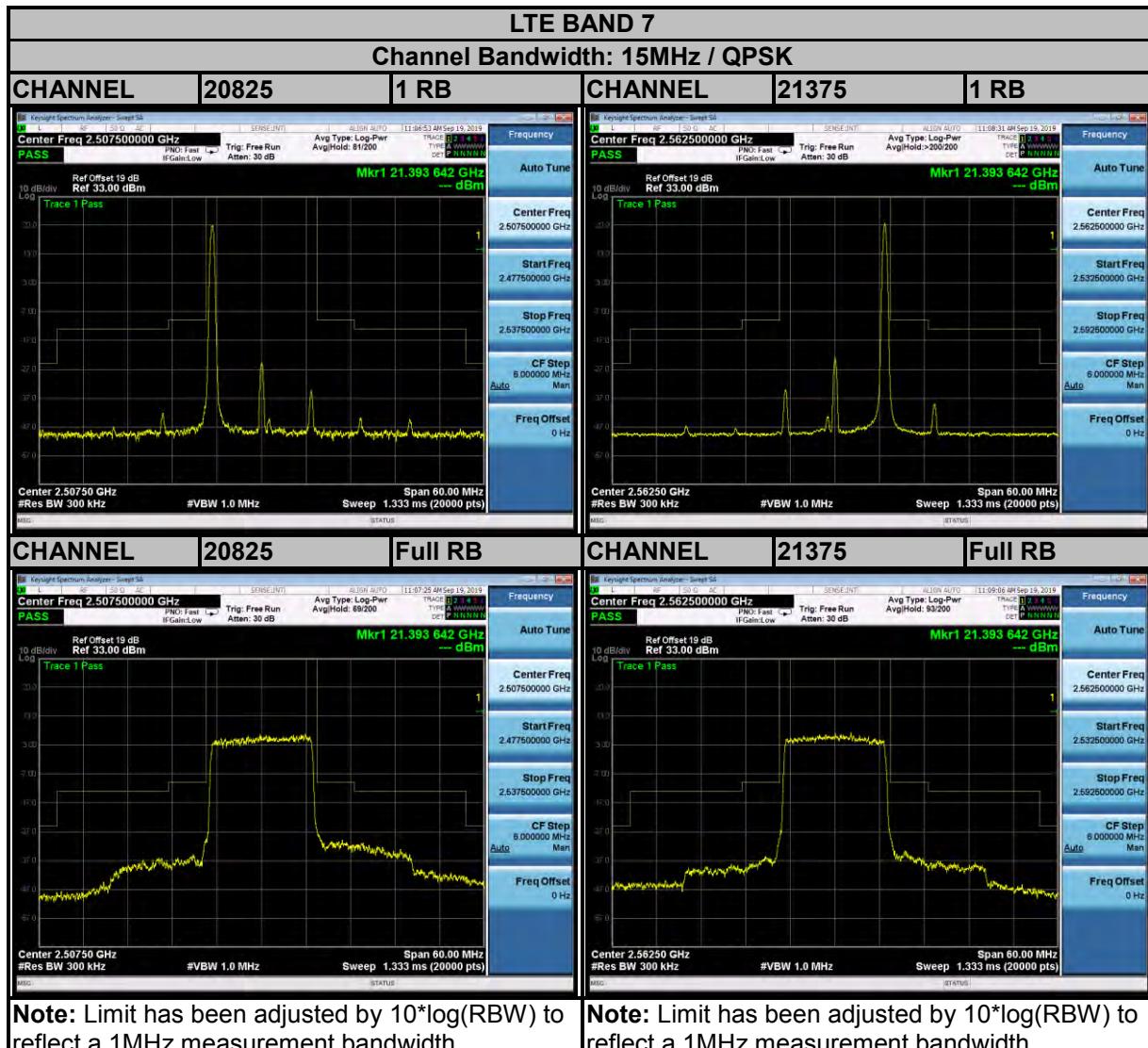
Test Report No.: RF190522W005-4





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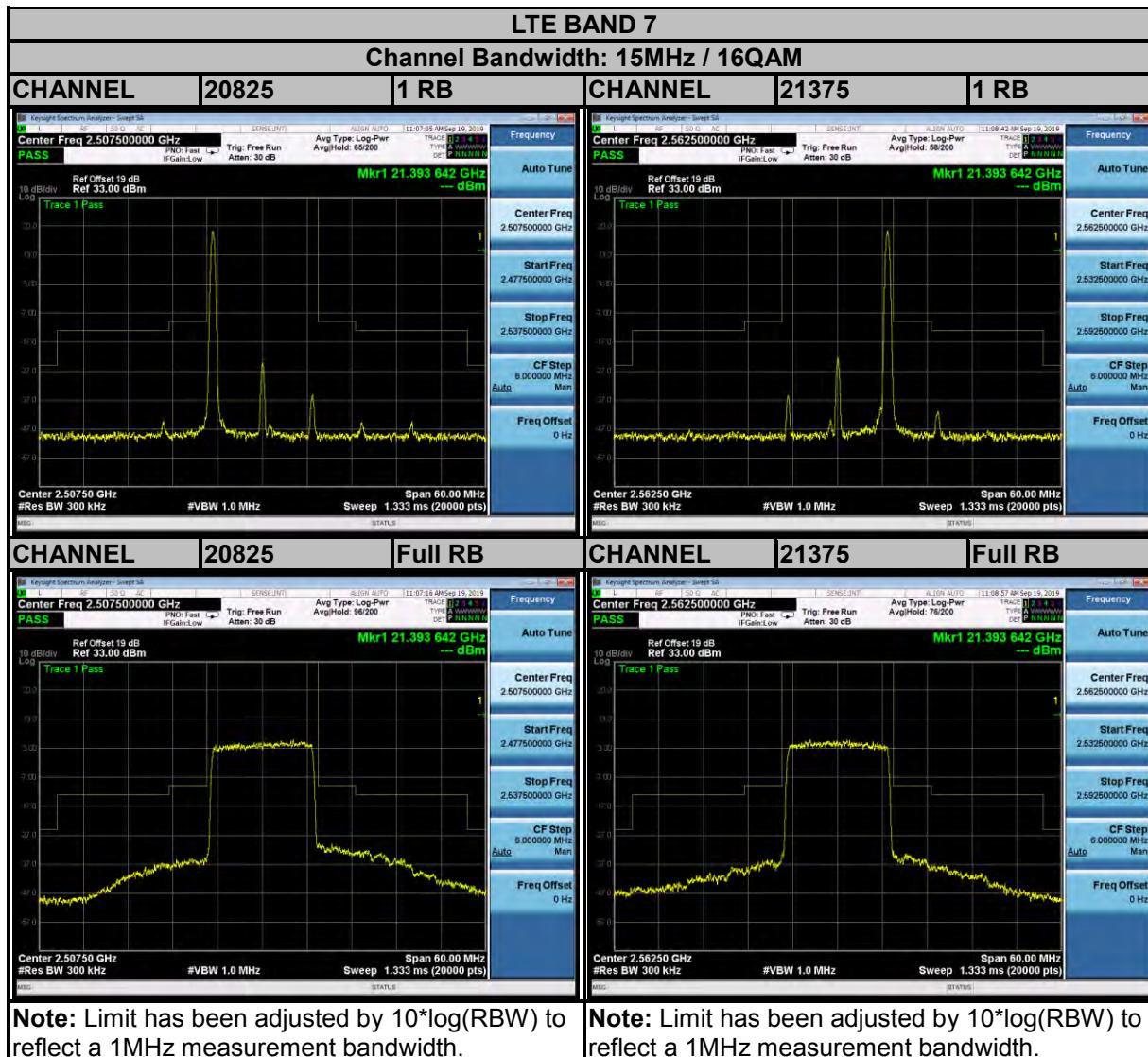
Test Report No.: RF190522W005-4





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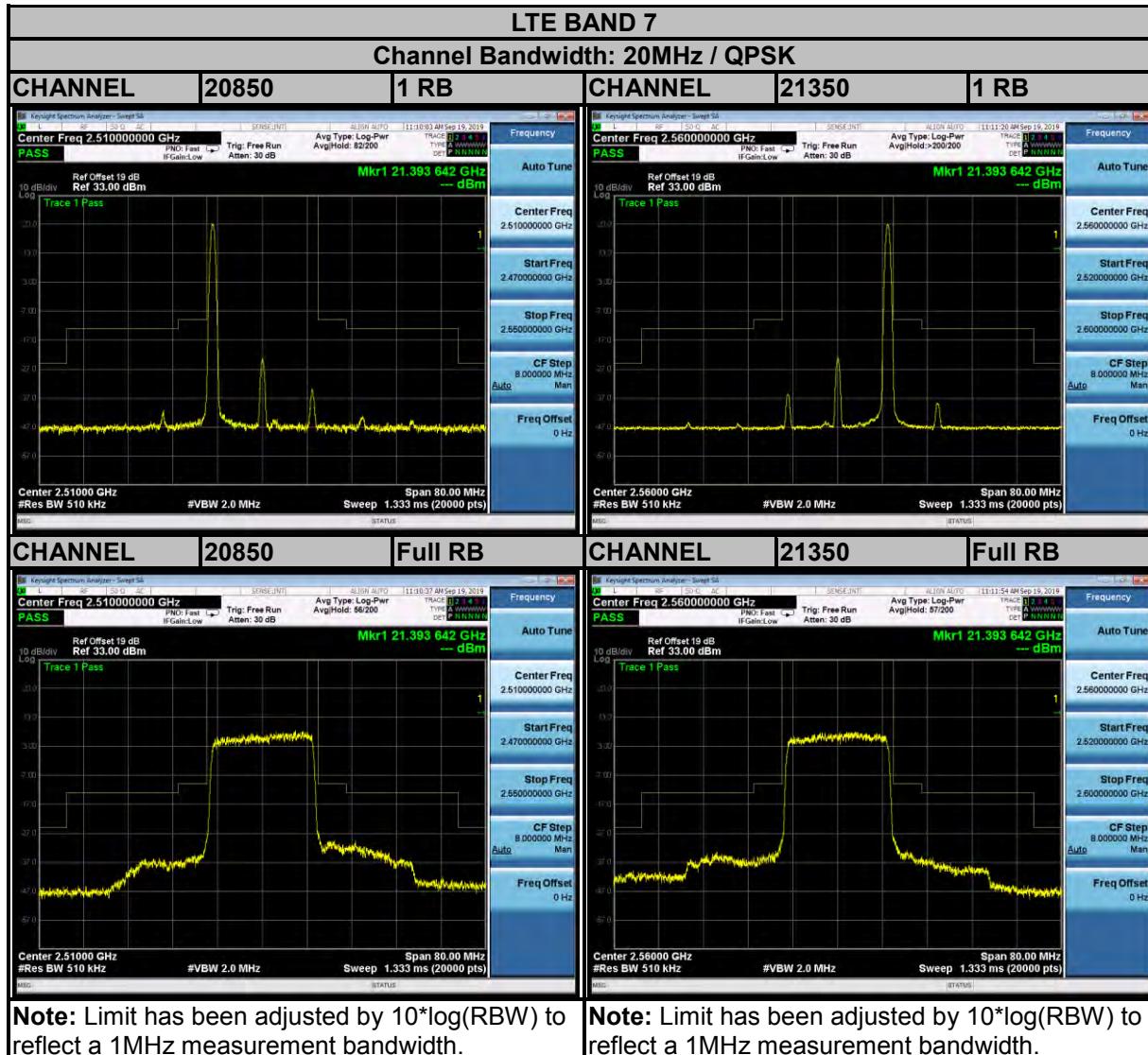
Test Report No.: RF190522W005-4





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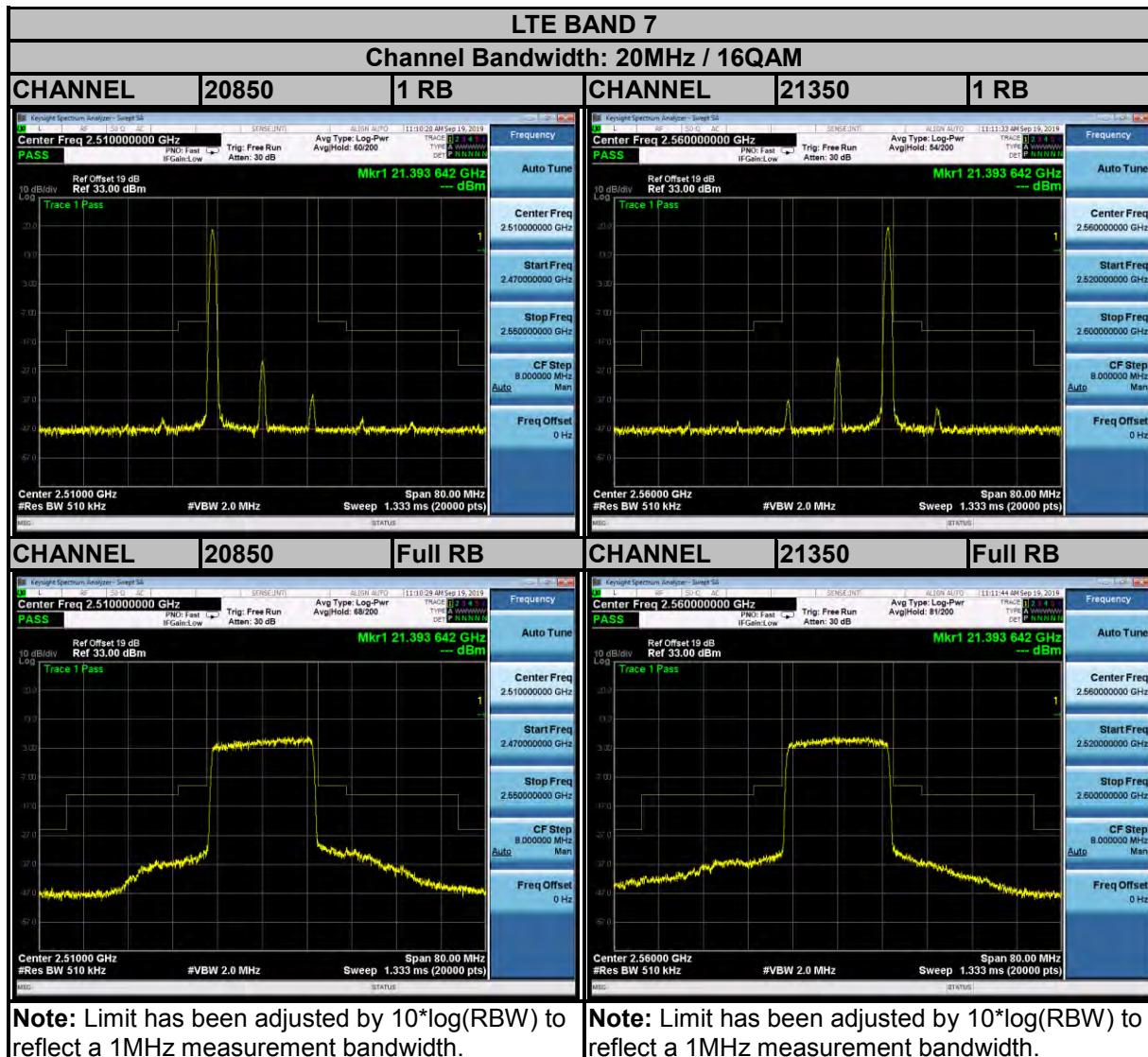
Test Report No.: RF190522W005-4





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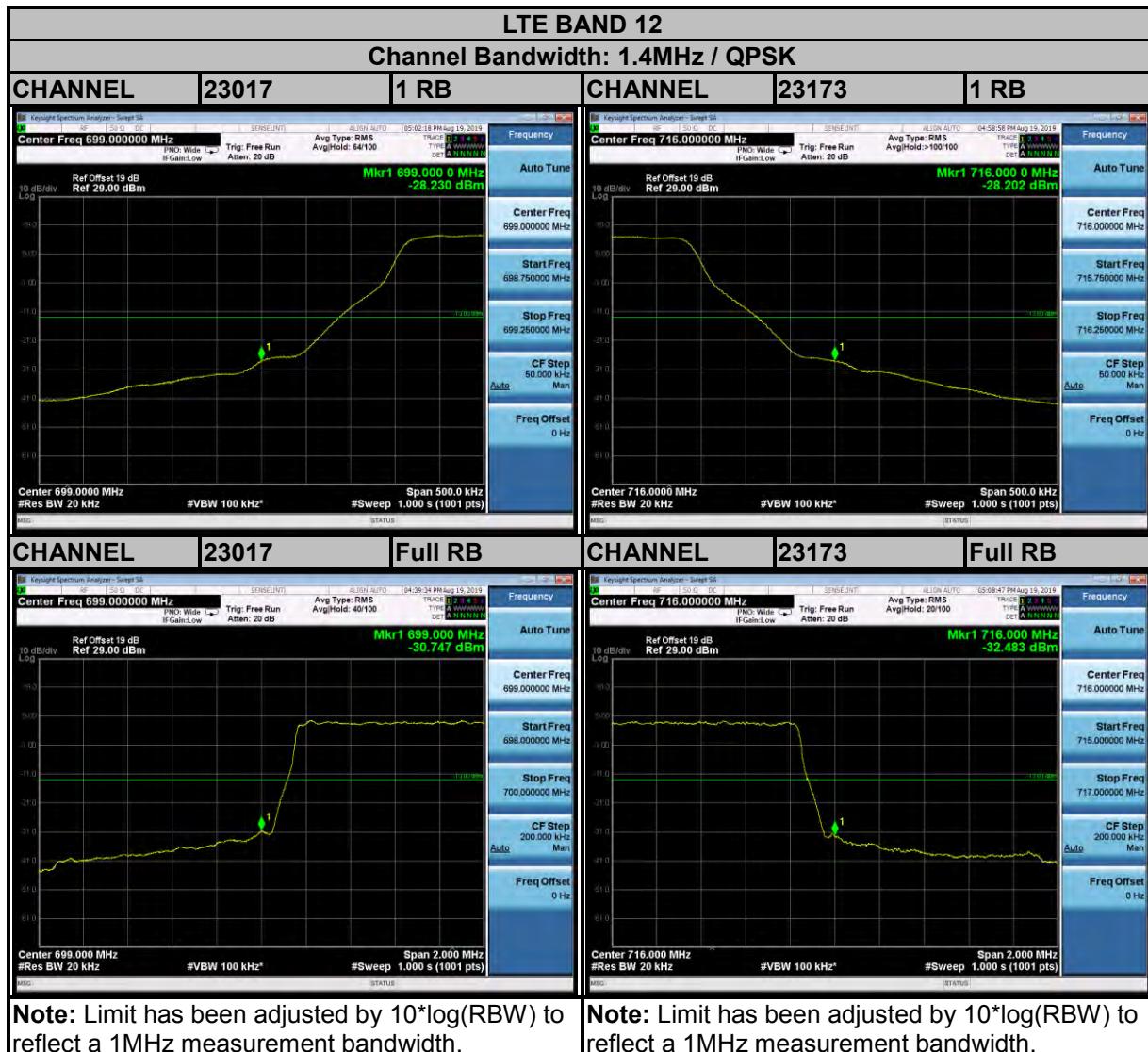
Test Report No.: RF190522W005-4





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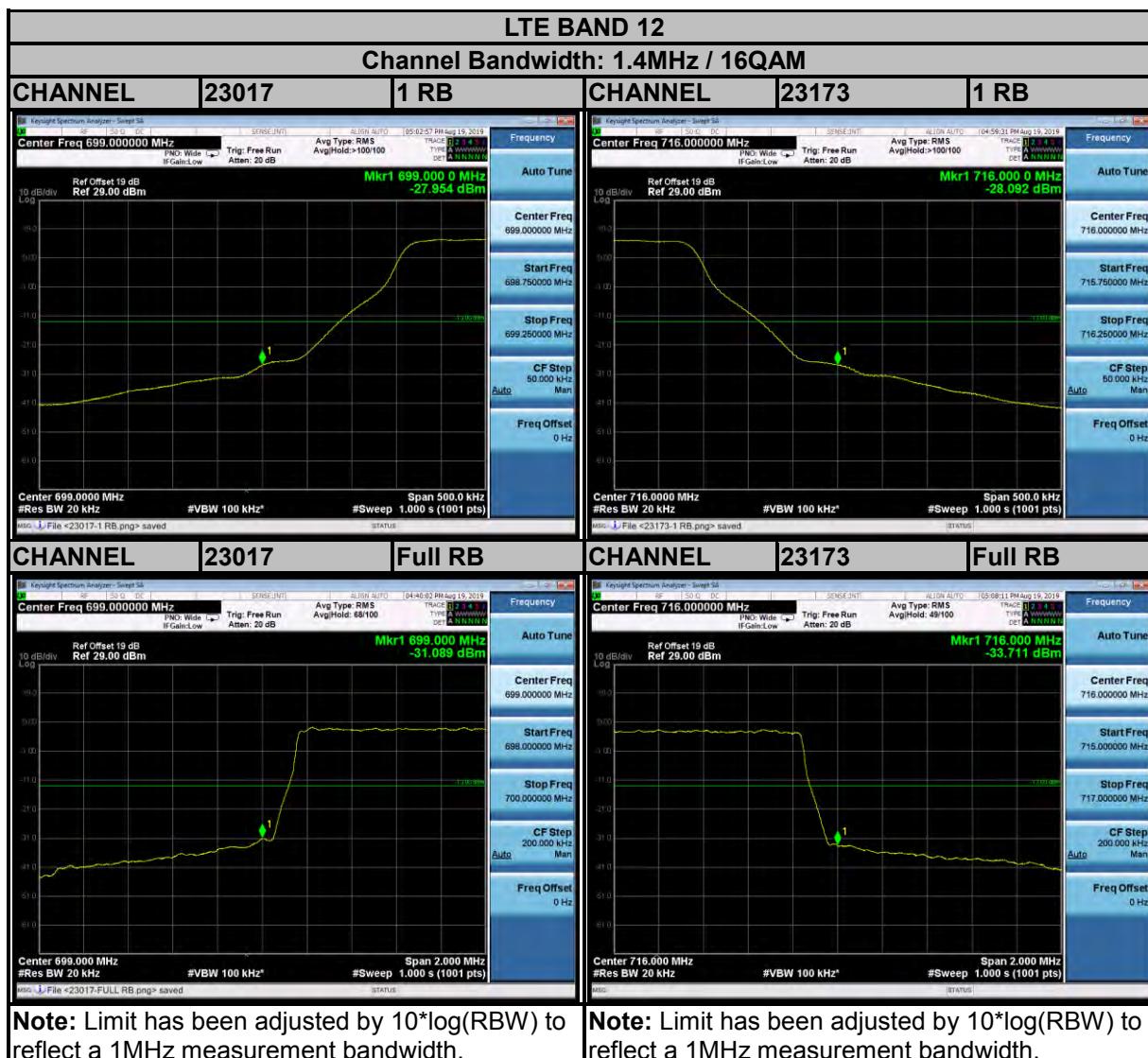
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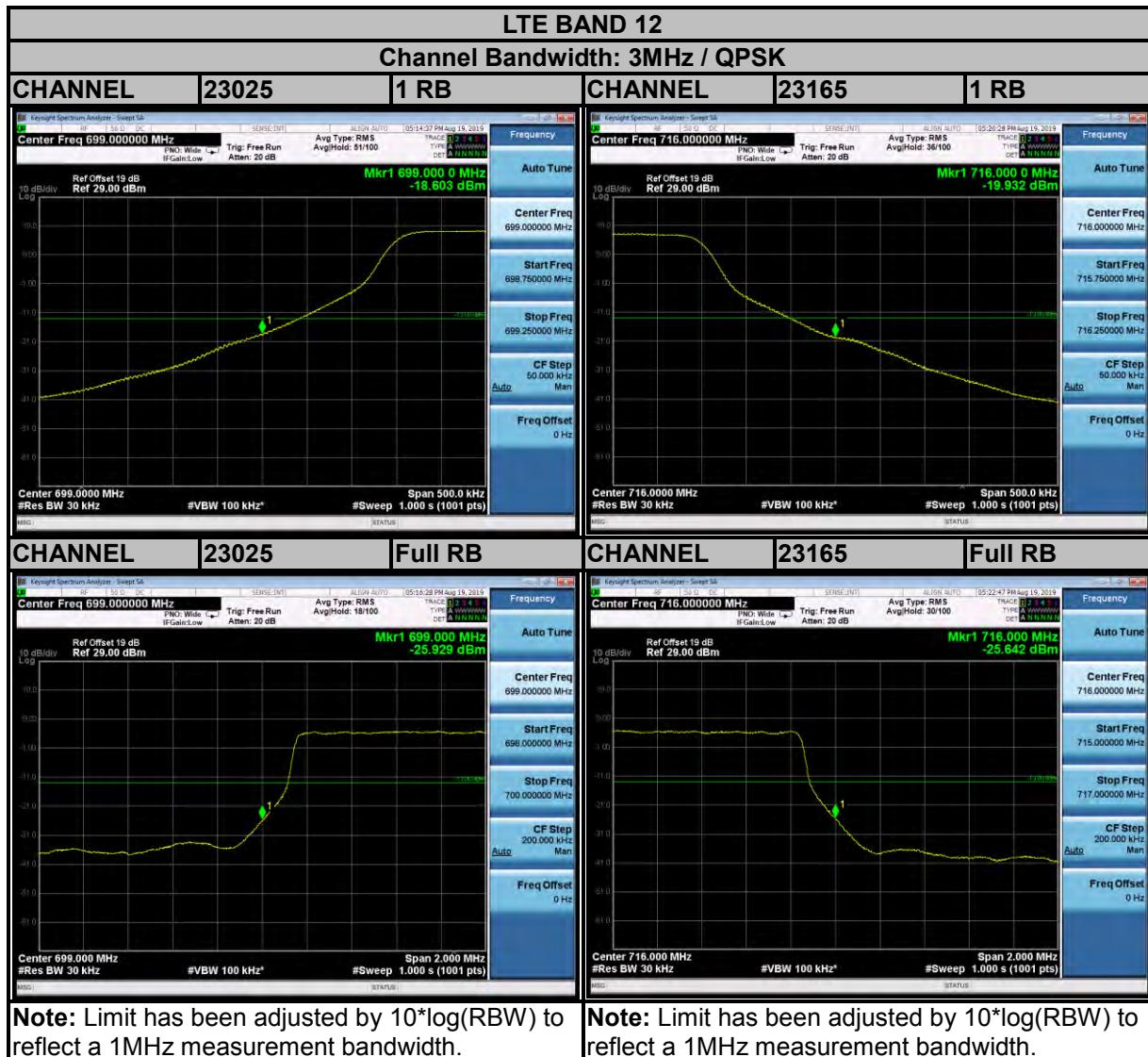
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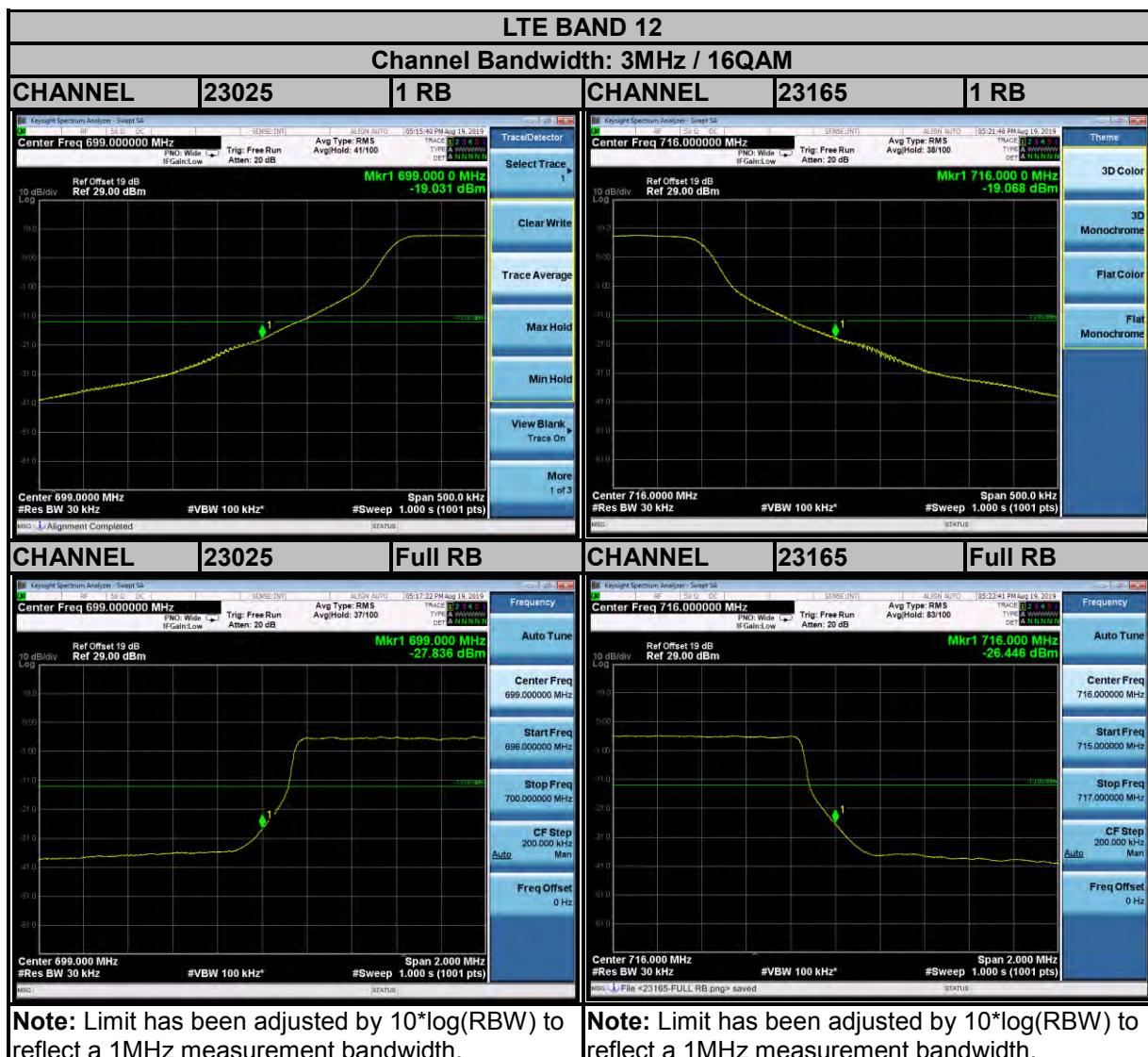
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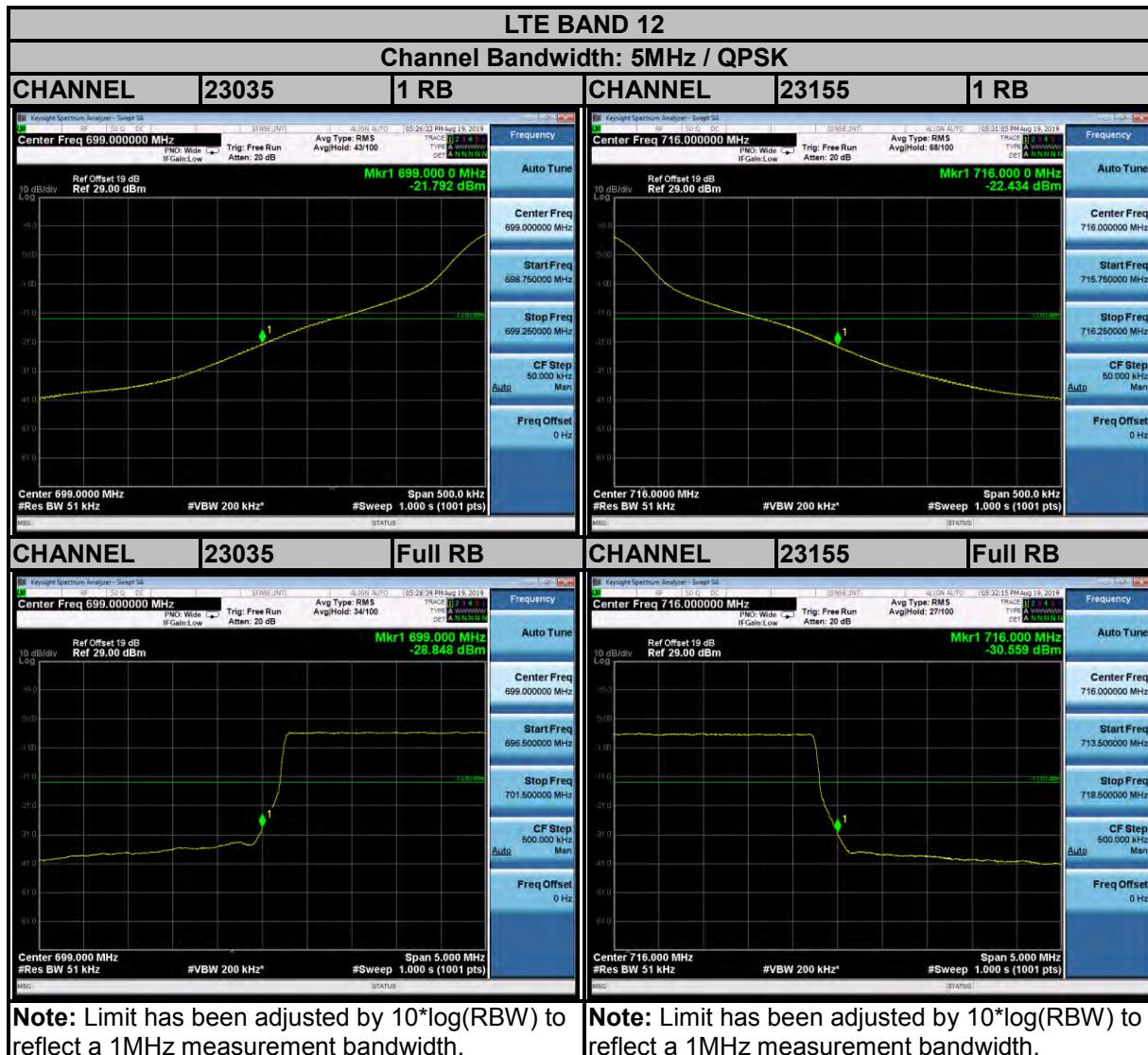
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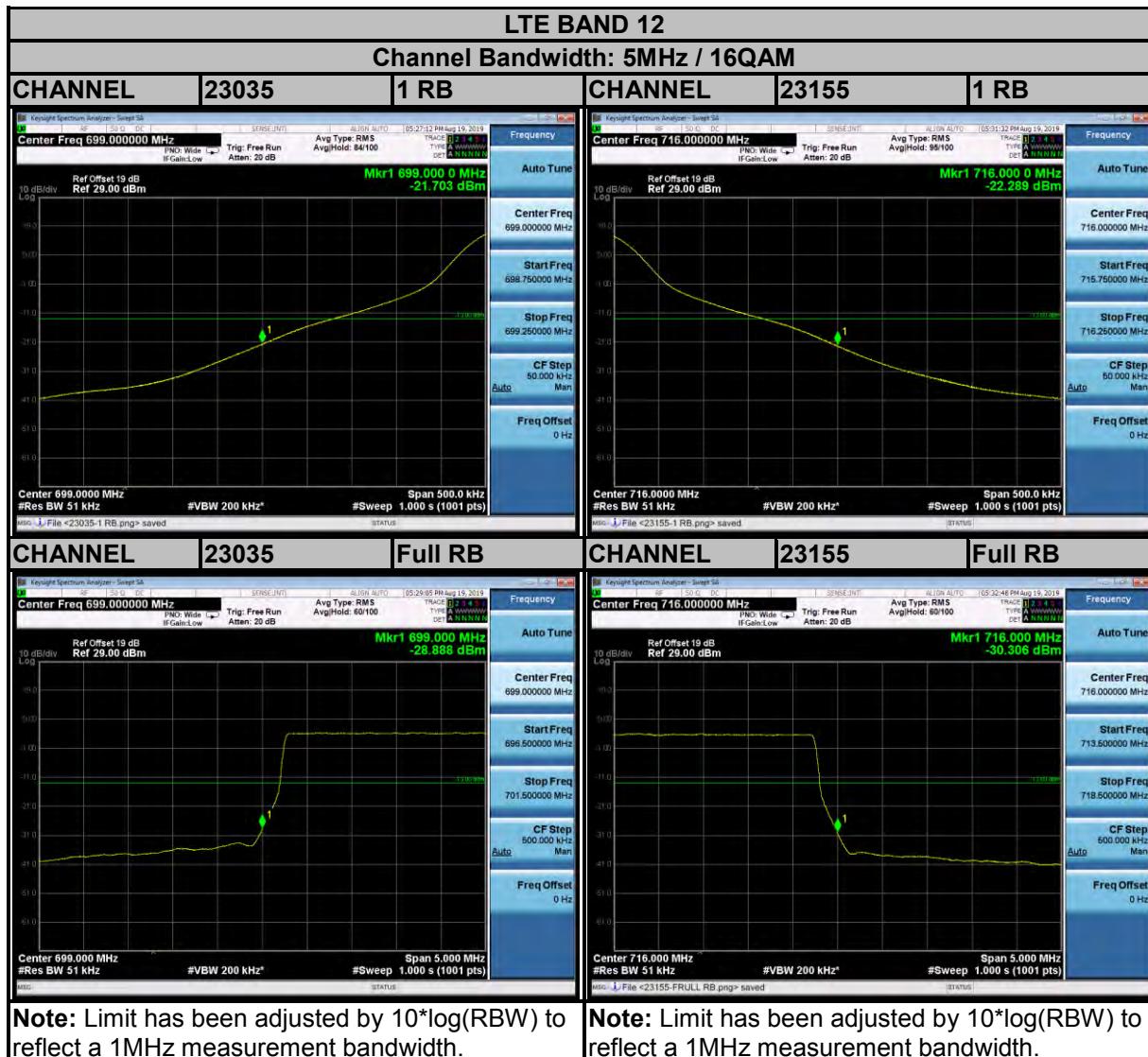
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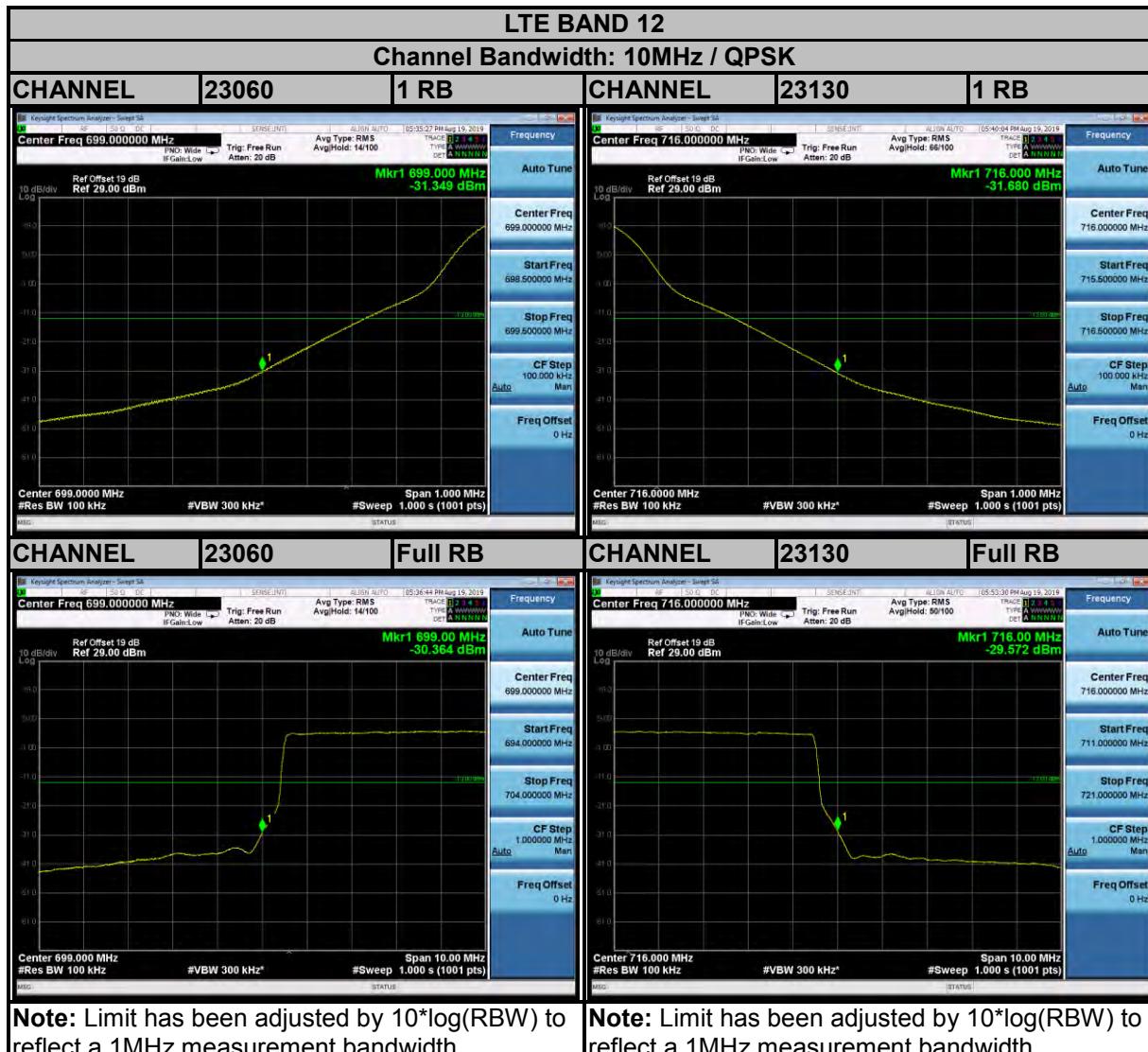
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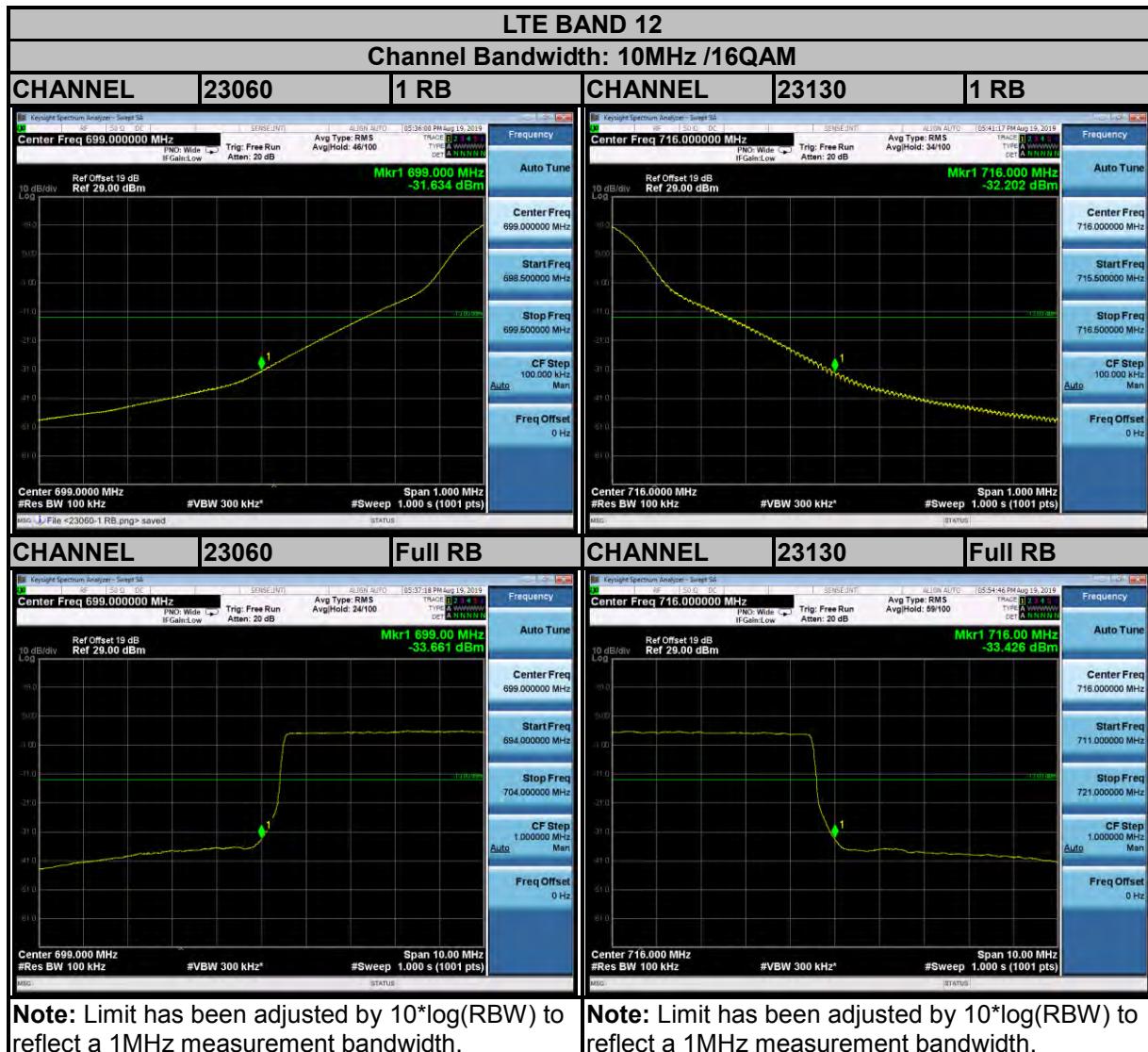
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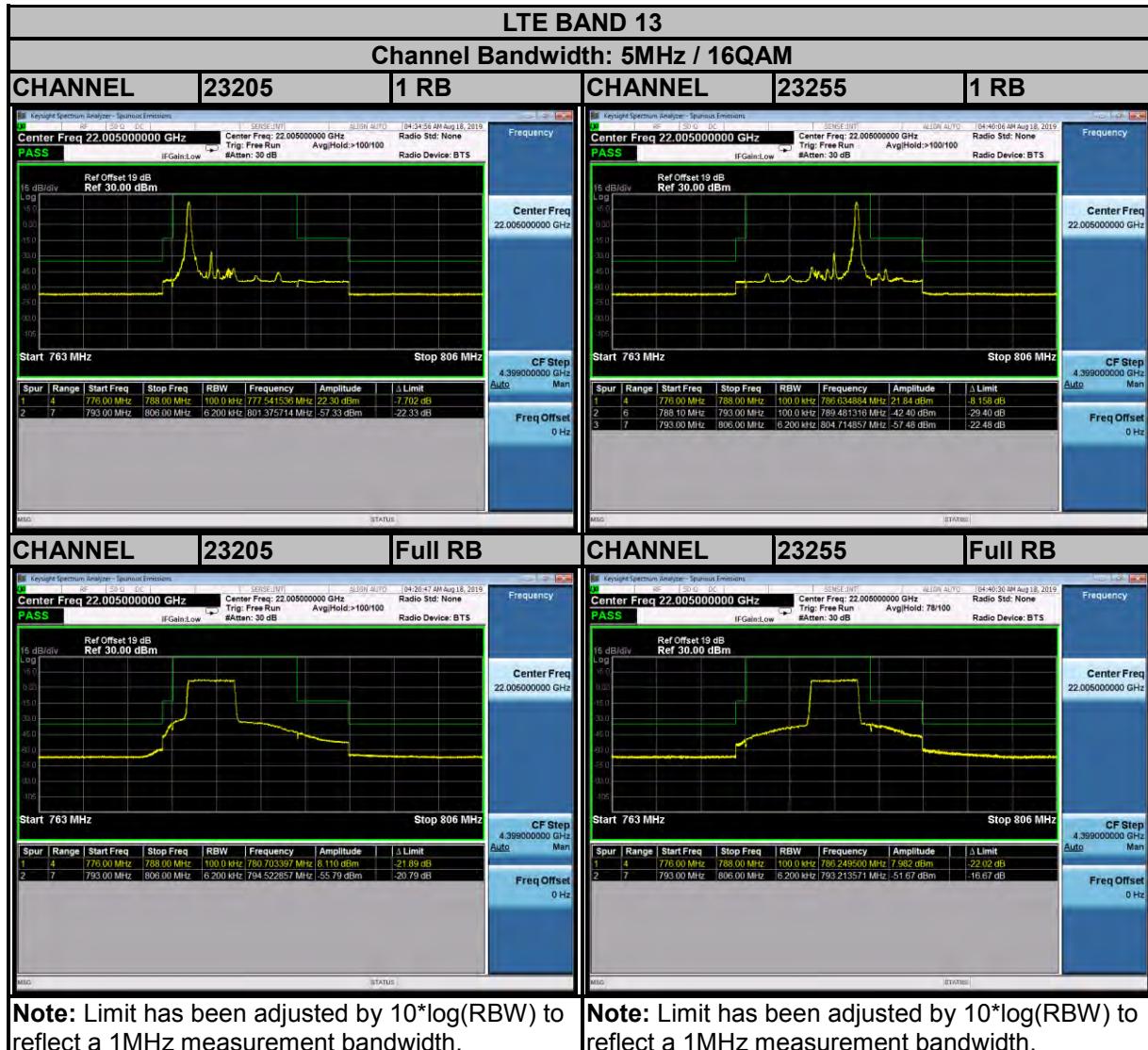
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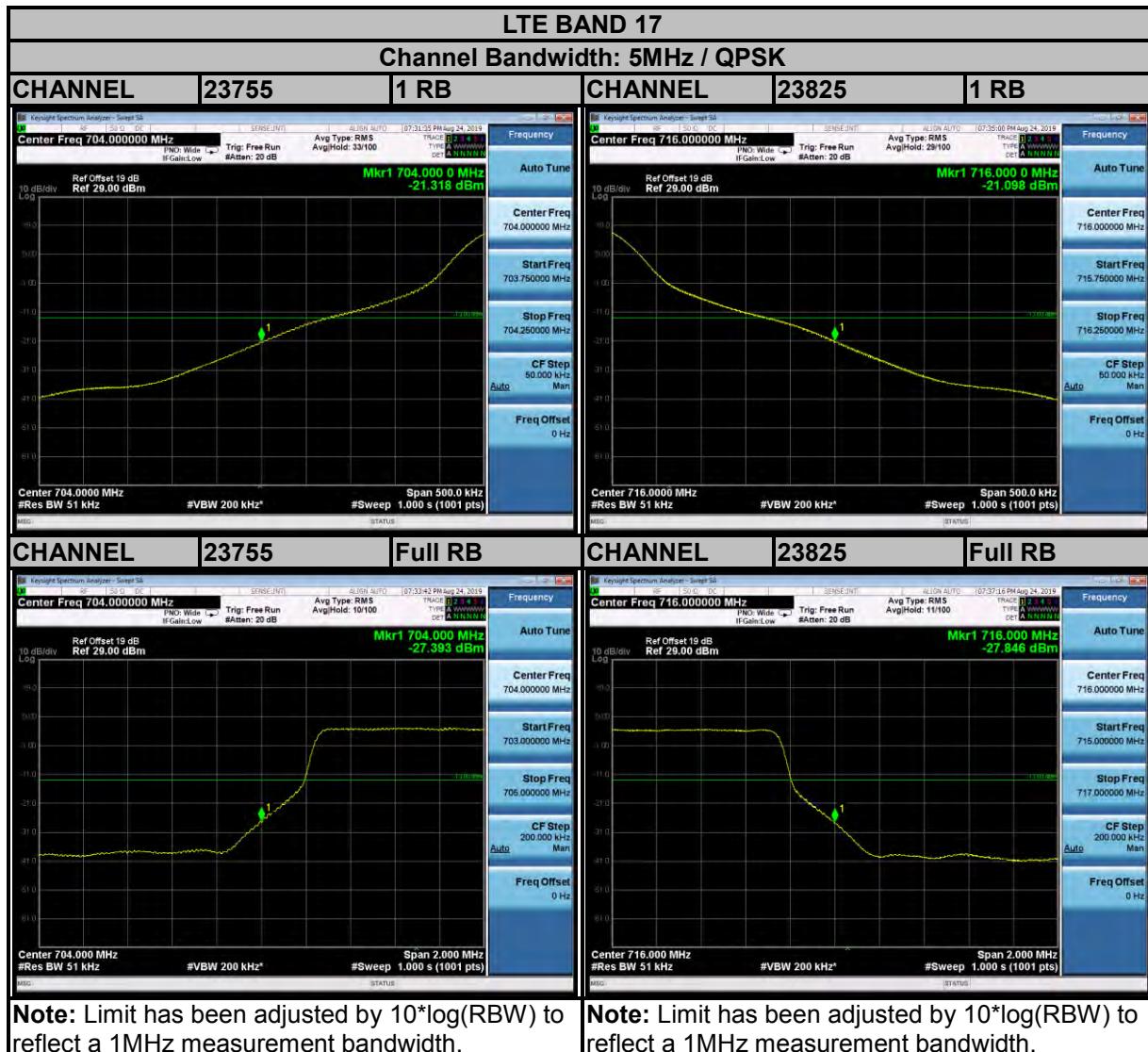
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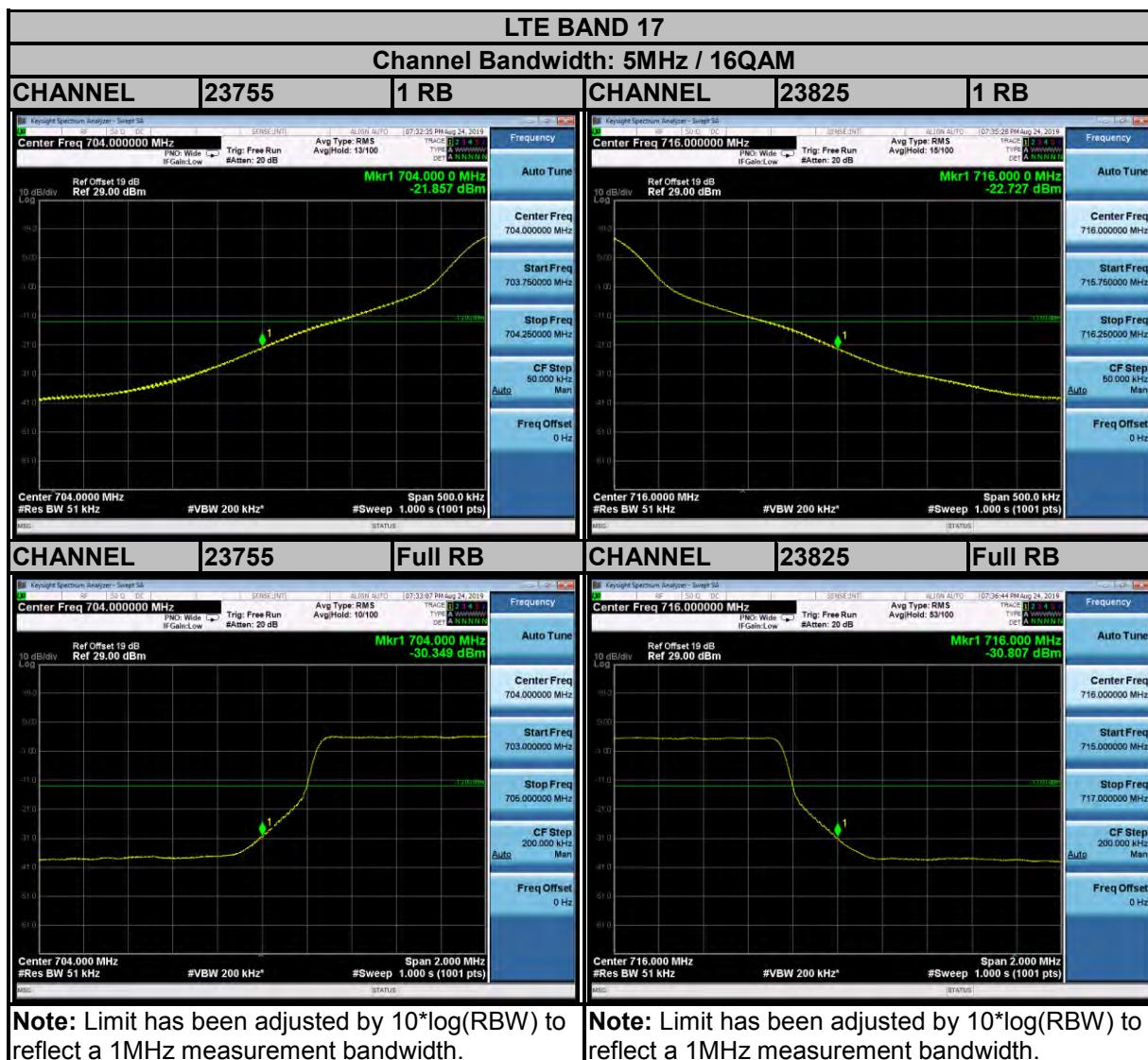
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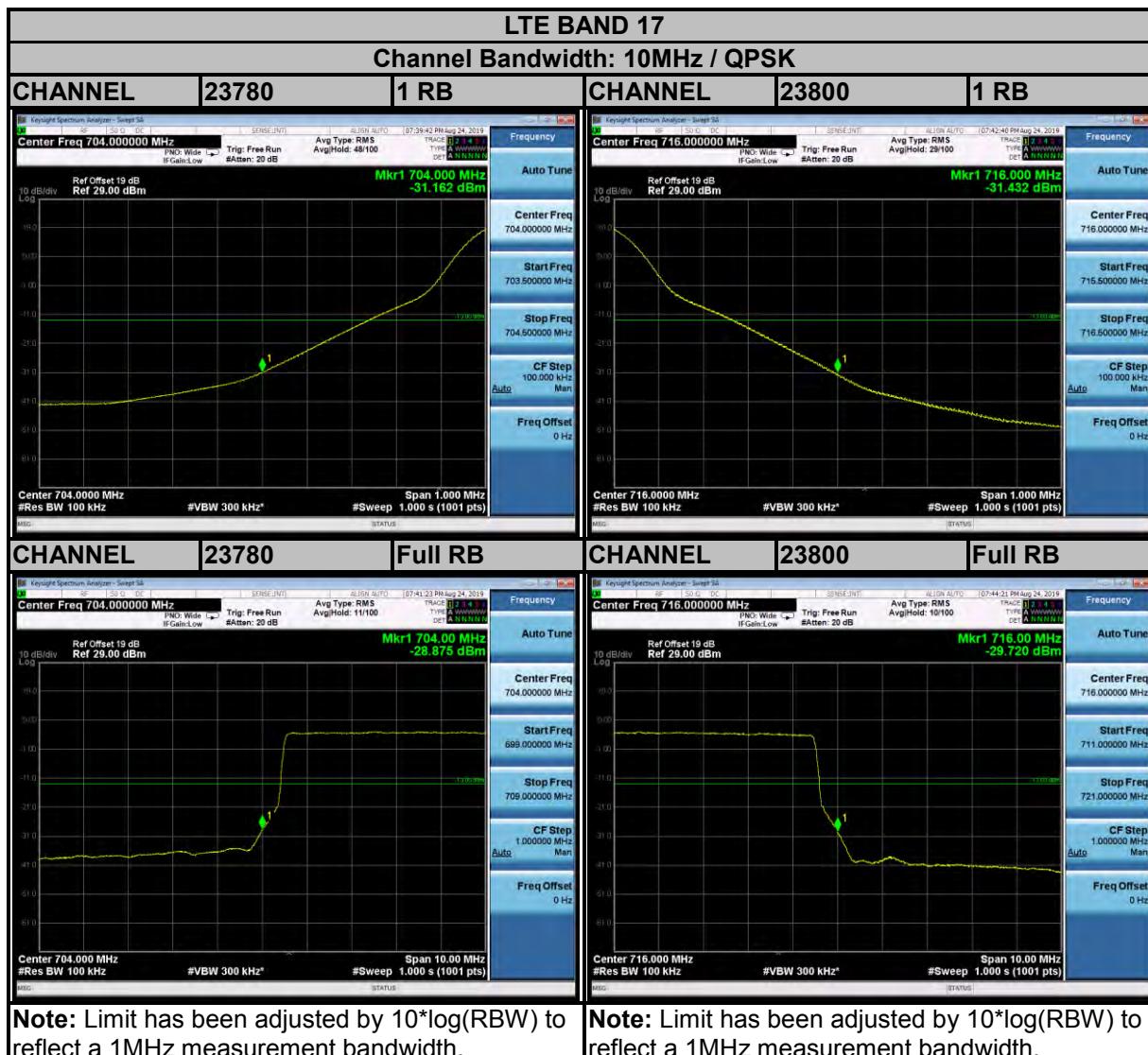
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BV 7Layers Communications Technology
(Shenzhen) Co., Ltd

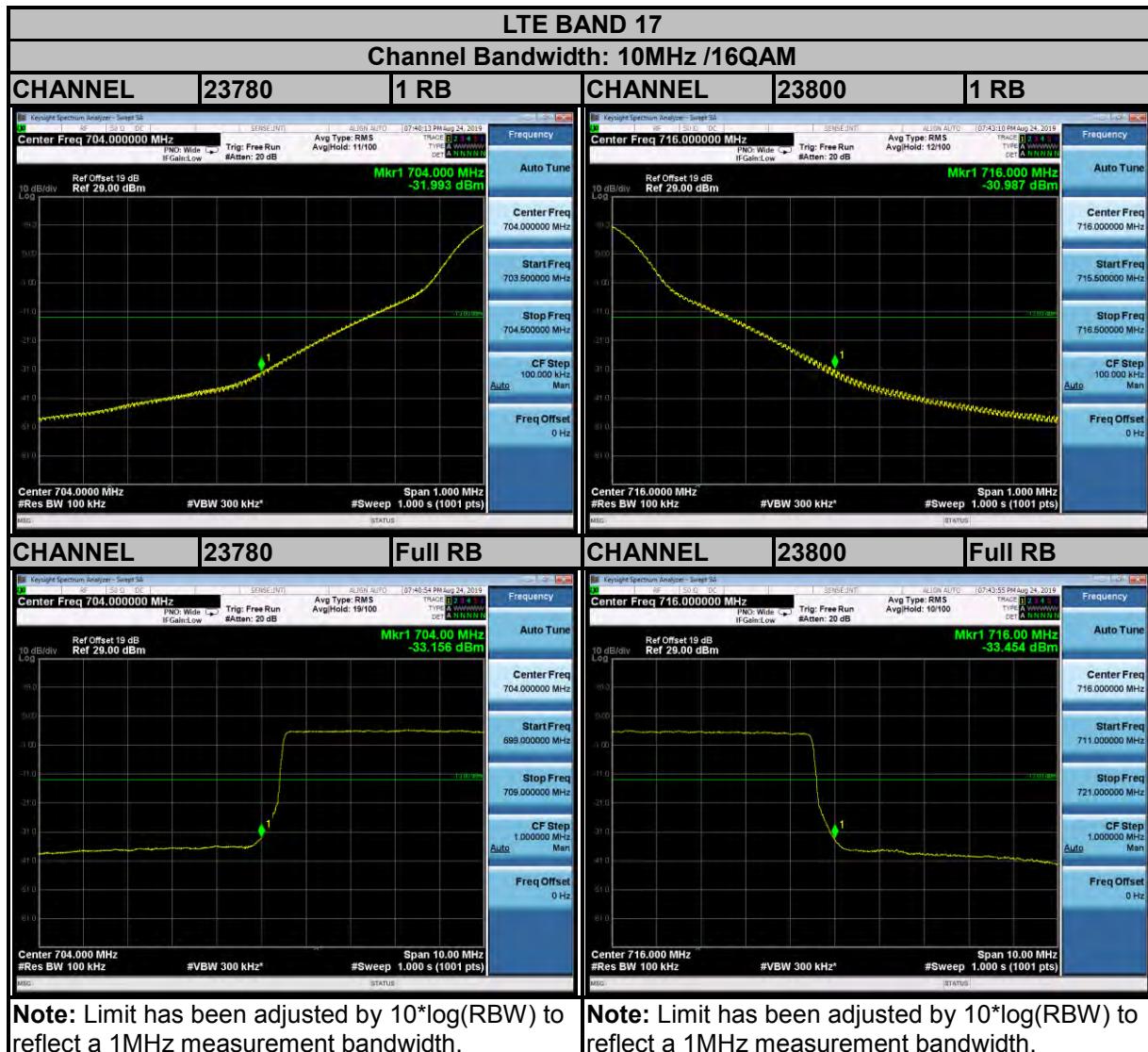
No.B102, Dazu Chuangxin Mansion, North of Beihuan Avenue, North Area, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, China

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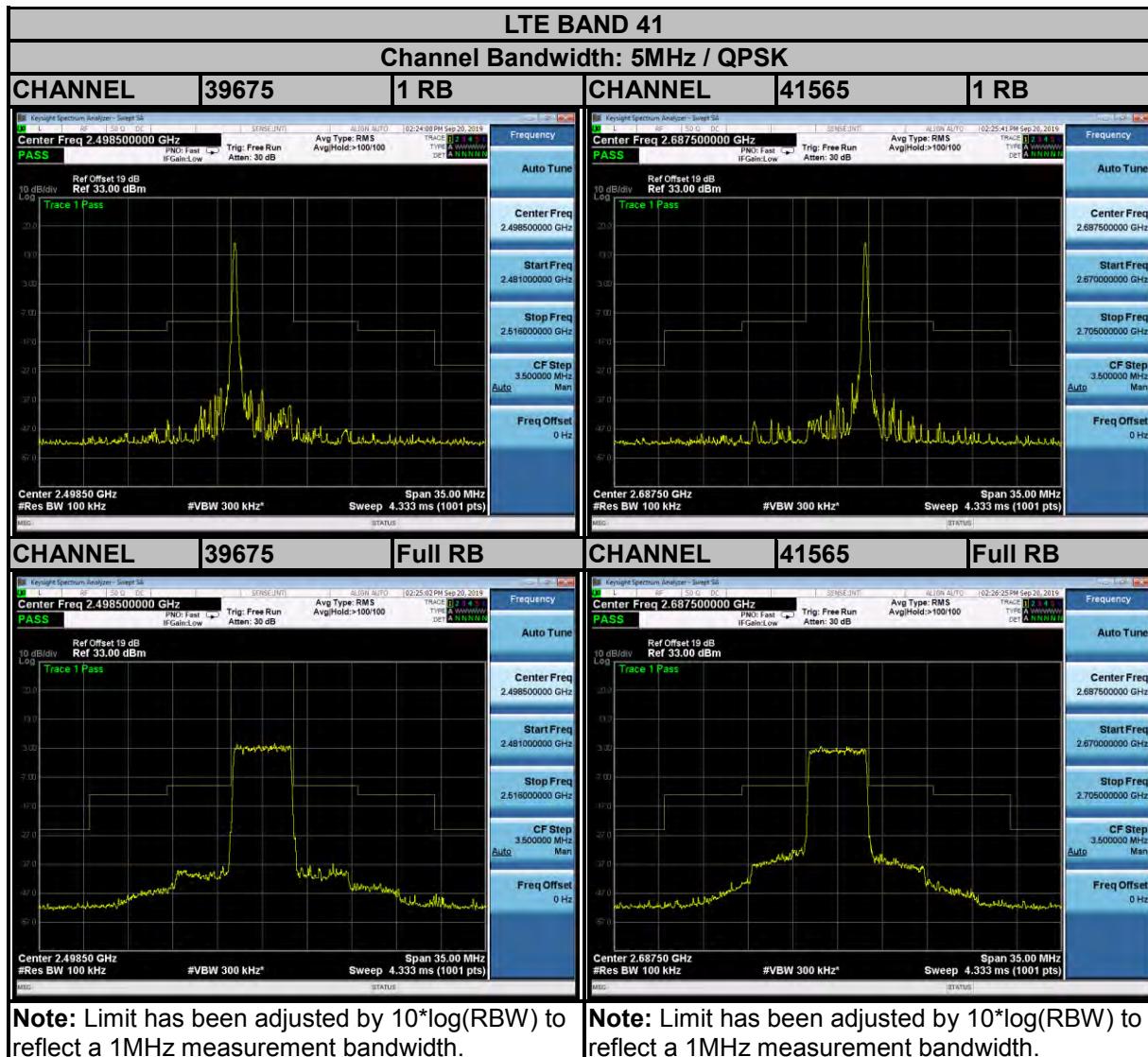
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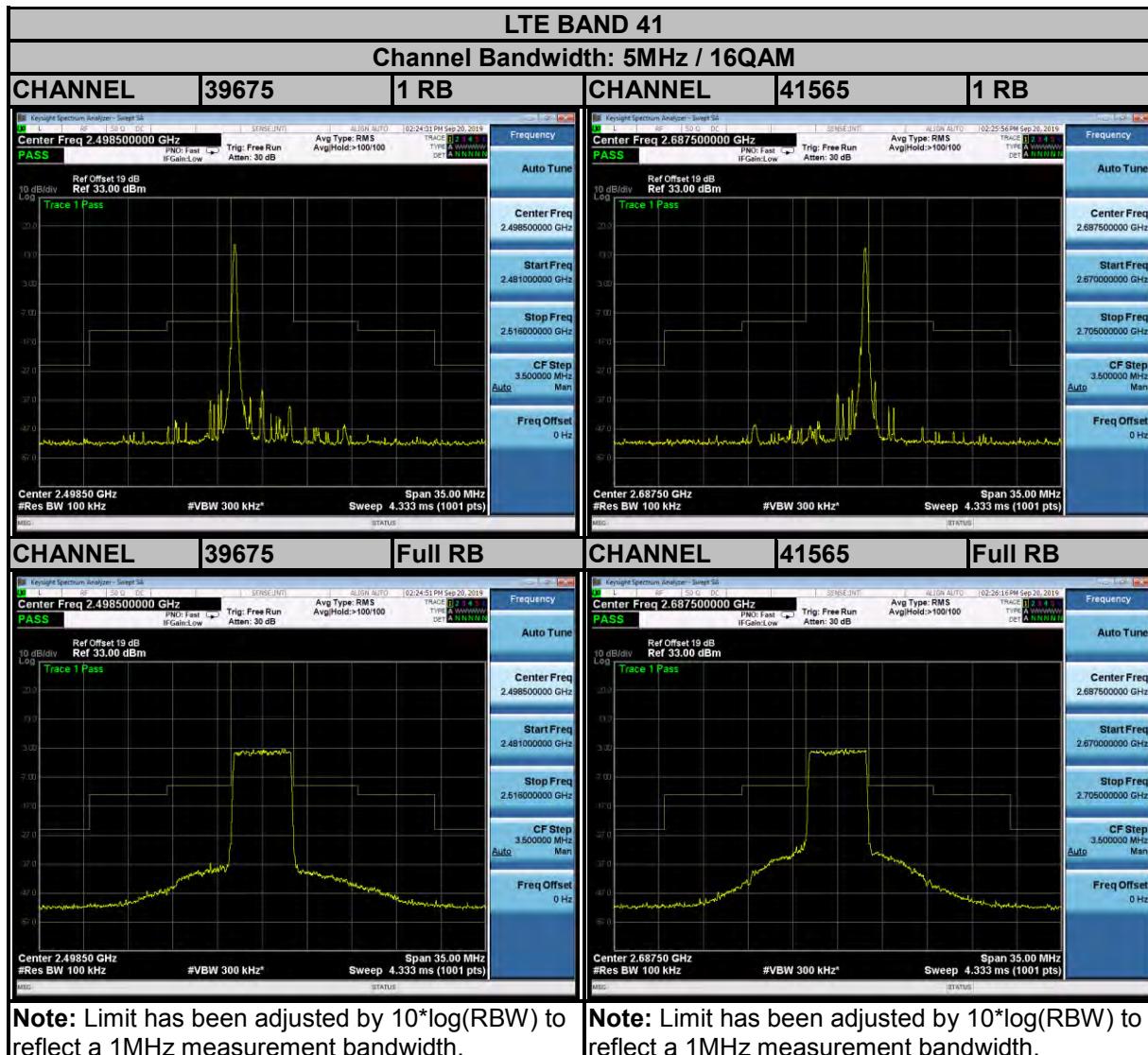
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