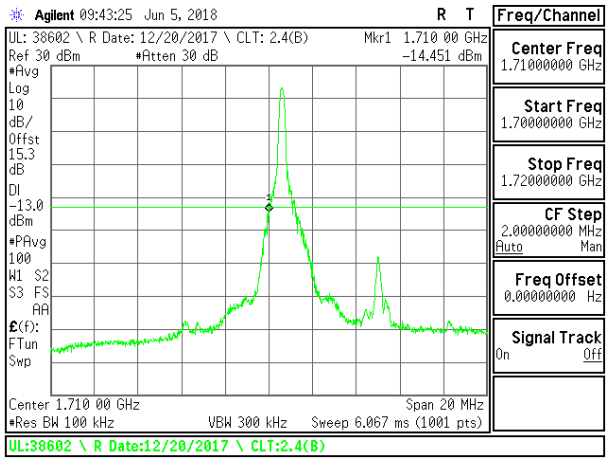
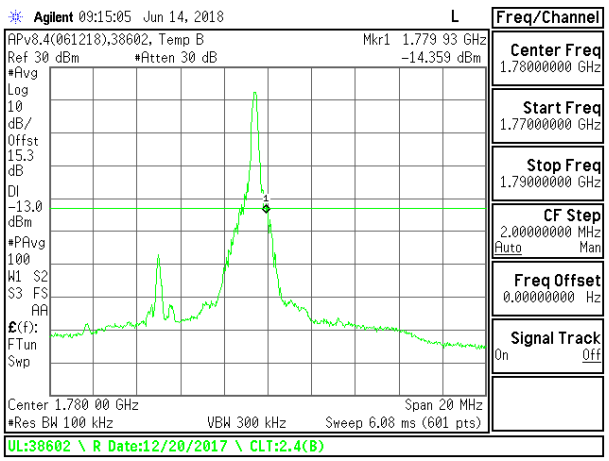


LTE B66 10MHz QPSK Low Channel RB1-0



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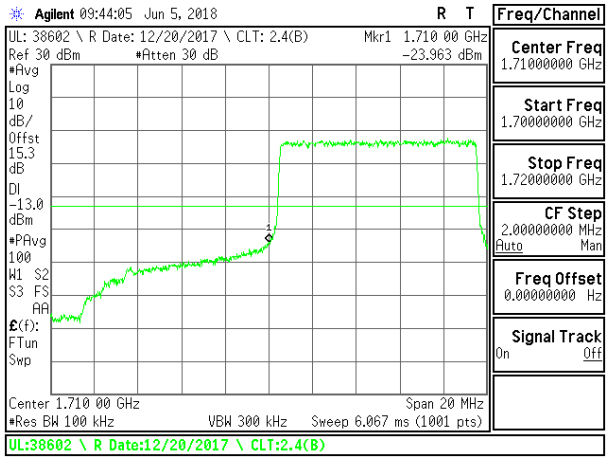

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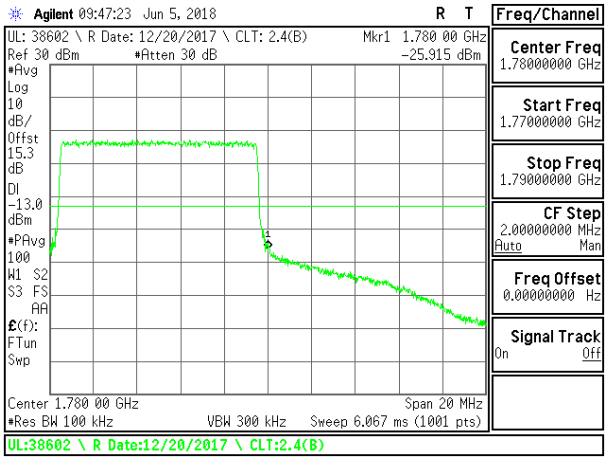

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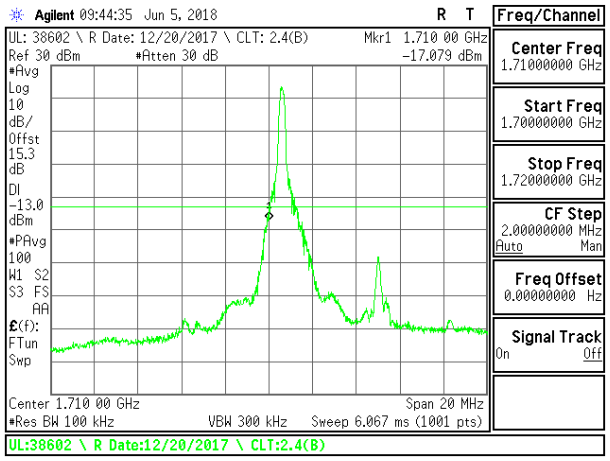
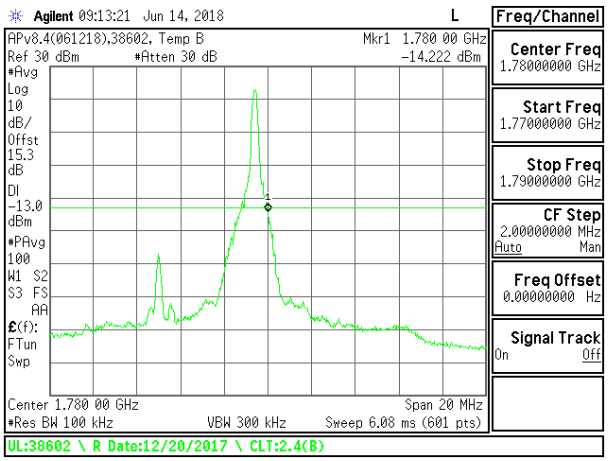


LTE B66 10MHz 16QAM Low Channel RB1-0



LTE B66 10MHz 16QAM High Channel RB1-49

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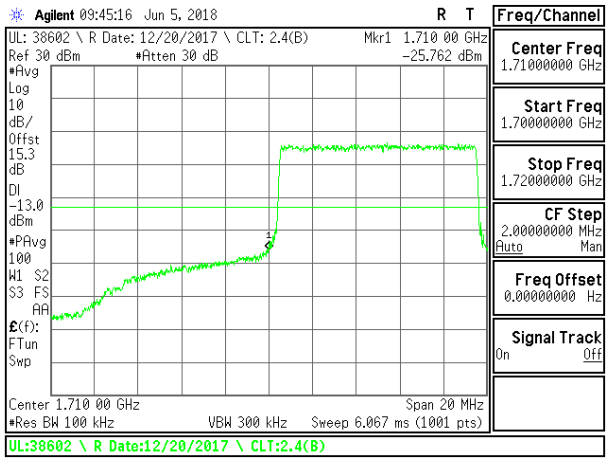

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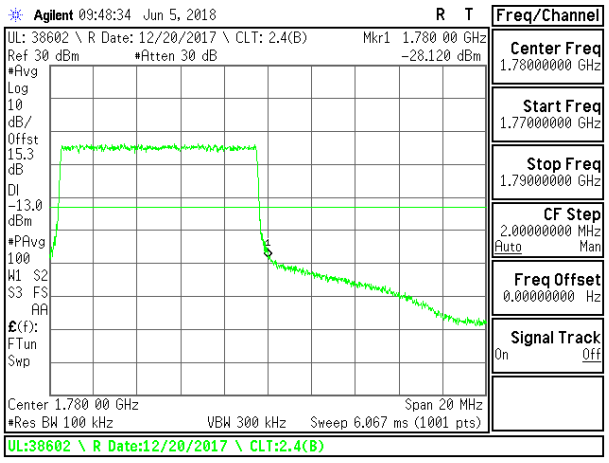
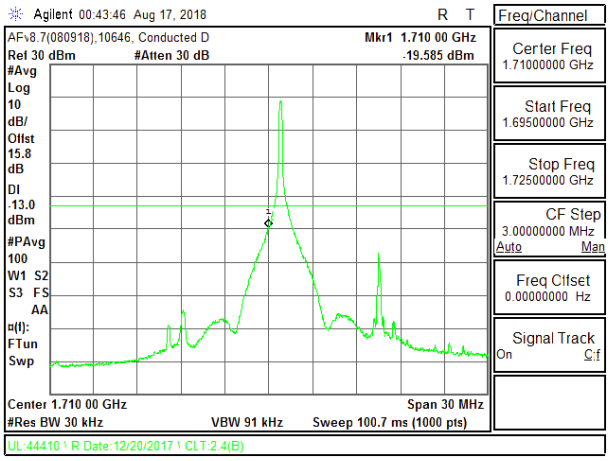
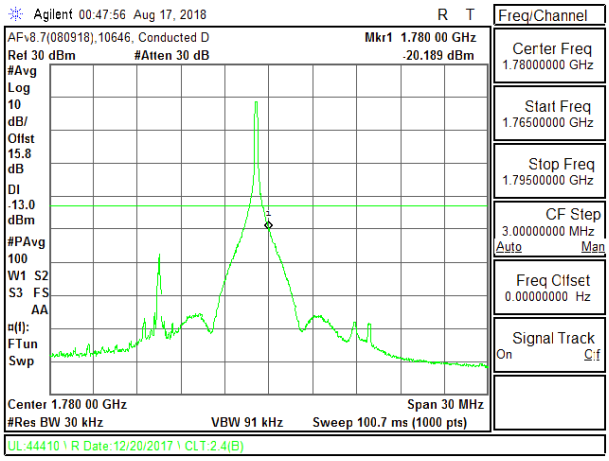


LTE B66 10MHz 16QAM High Channel RB50-0



LTE B66 15MHz QPSK Low Channel RB1-0



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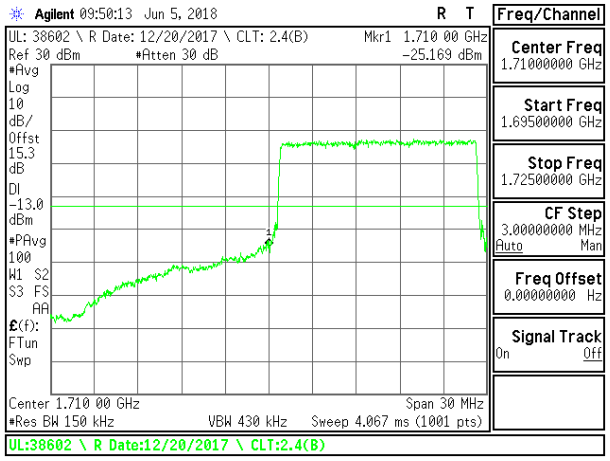

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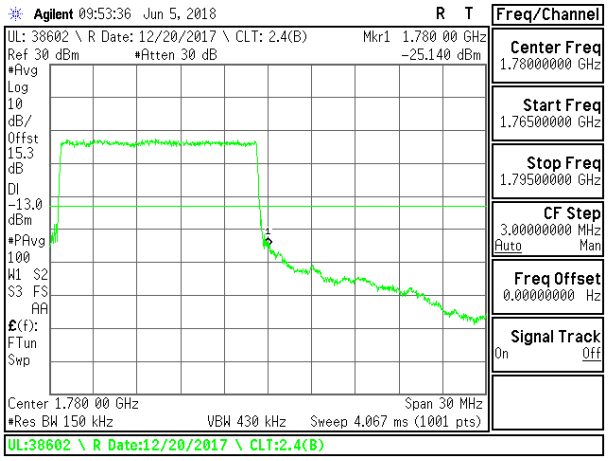

LTE B66 15MHz QPSK High Channel RB75-0

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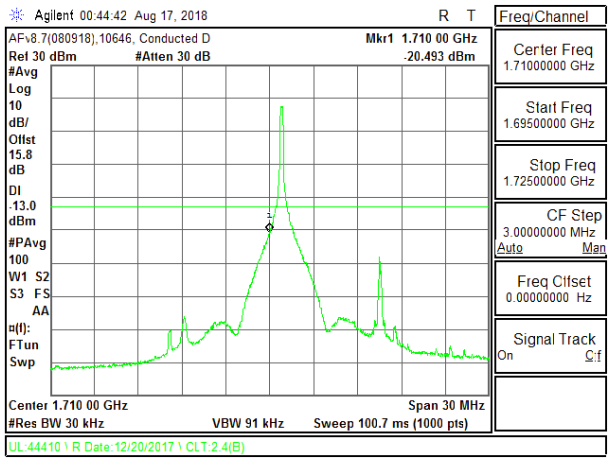

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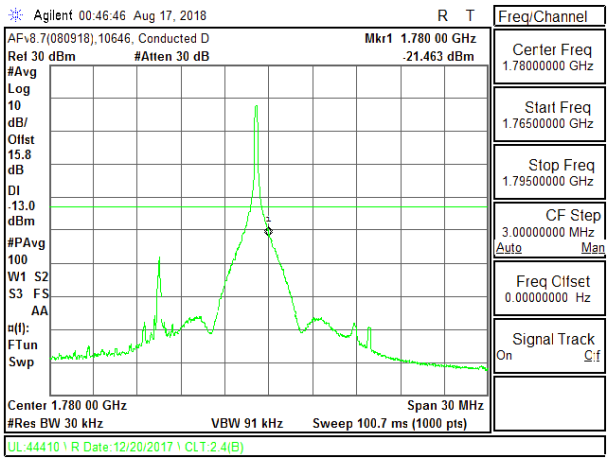

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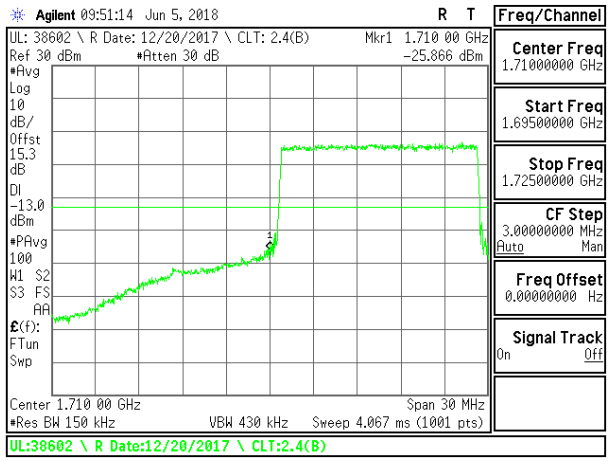

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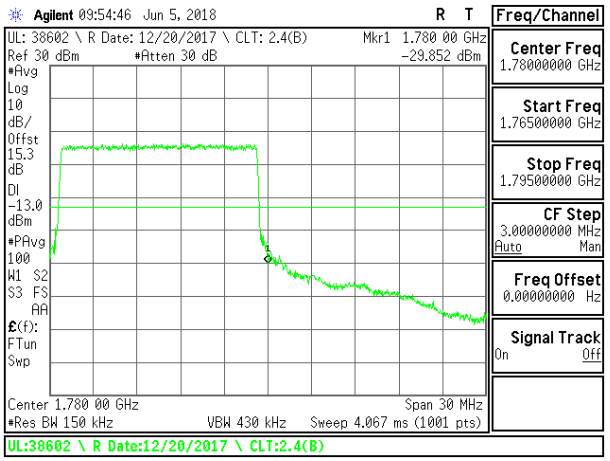
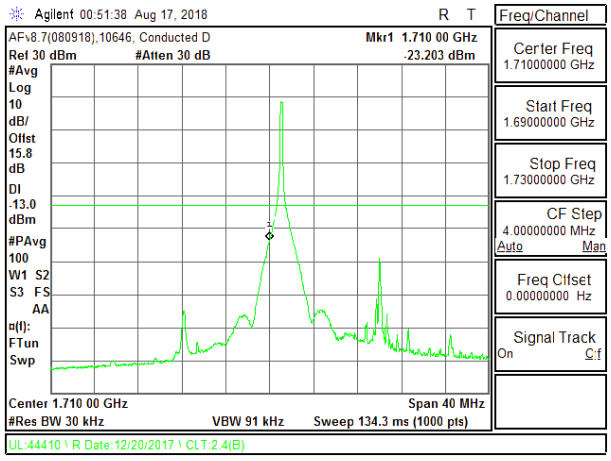
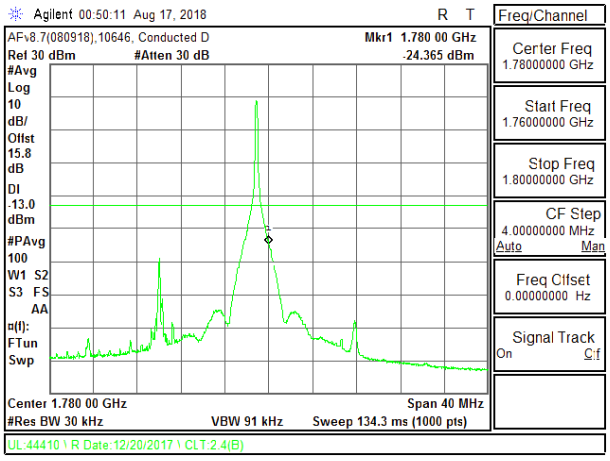


LTE B66 15MHz 16QAM High Channel RB75-0



LTE B66 20MHz QPSK Low Channel RB1-0



LTE B66 20MHz QPSK High Channel RB1-99

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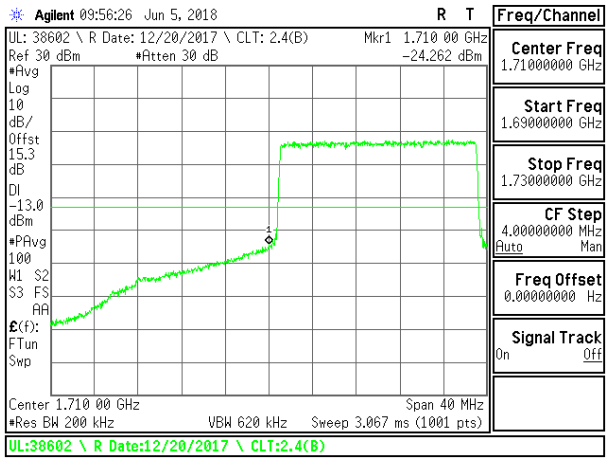

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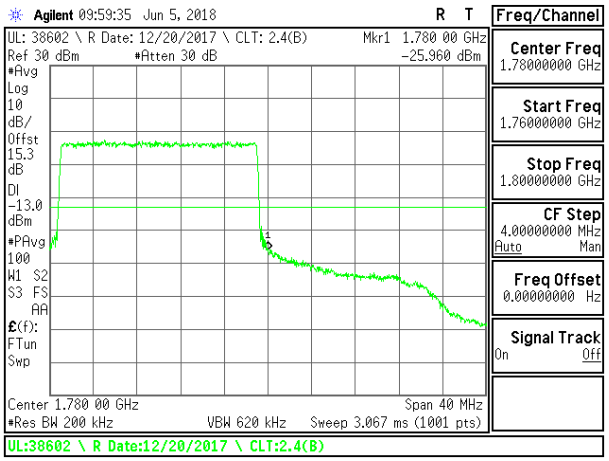

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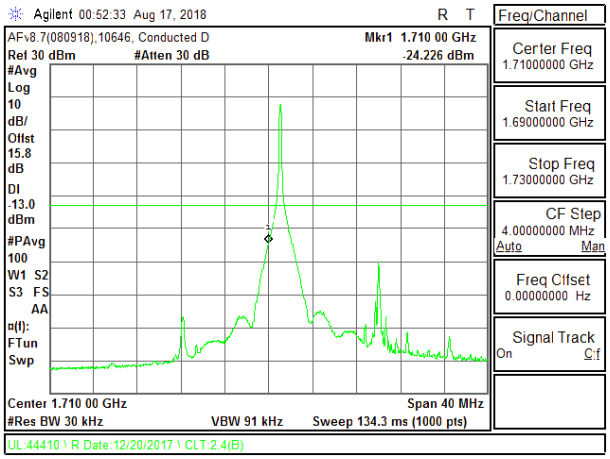
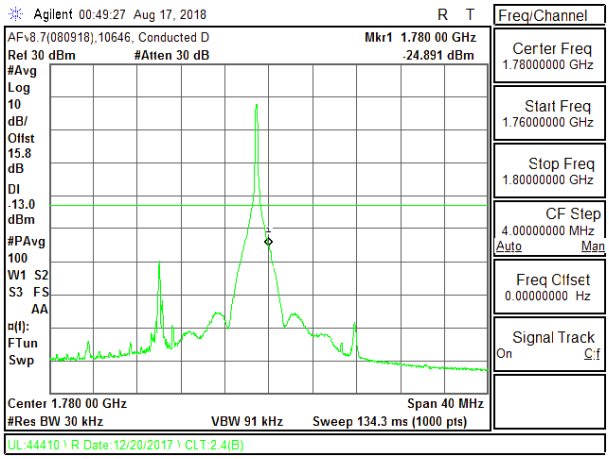
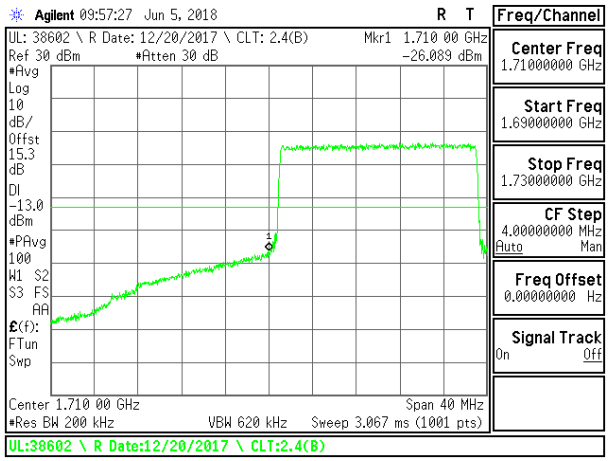


LTE B66 20MHz 16QAM Low Channel RB1-0



LTE B66 20MHz 16QAM High Channel RB1-99



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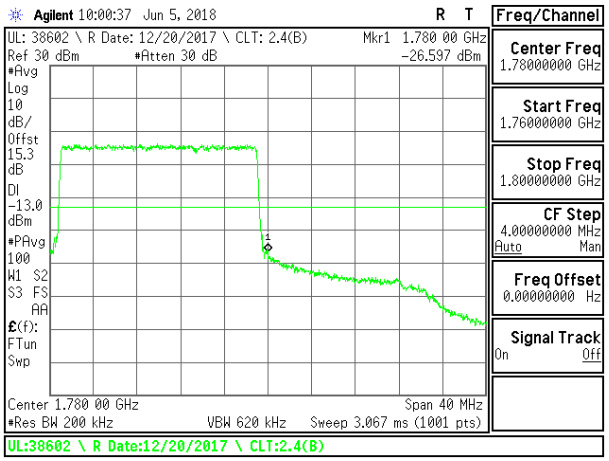

LTE B66 20MHz 16QAM High Channel RB100-0

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8.3. OUT OF BAND EMISSIONS

RULE PART(S)

§2.1051, §22.901, §22.917, §24.238, §27.53, §90.691 and §90.543

LIMITS

§22.917, §24.238, §27.53 (c), (g), (h), §90.691, §90.543 (Band 14)
The minimum permissible attenuation level of any spurious emissions is 43 + 10 log (P) dB where transmitting power (P) in Watts.

§27.53 (a) (Band 30)
The minimum permissible attenuation level of any spurious emissions is 70 + 10 log (P) dB where transmitting power (P) in Watts.

§27.53 (m) (Band 7, 41)
The minimum permissible attenuation level of any spurious emissions is 55 + 10 log (P) dB where transmitting power (P) in Watts.

TEST PROCEDURE

The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic. Multiple sweeps were recorded in maximum hold mode using a peak detector to ensure that the worst-case emissions were caught.

For each out of band emissions measurement:

- Set display line at -13 dBm, -25dBm and -40dBm according to the band Limit
- Set RBW & VBW to 100 kHz for the measurement below 1 GHz, and 1 MHz for the measurement above 1 GHz. (NOTE: Worst case set RBW/VBW to 1MHz/3MHz)

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MODES TESTED

- LTE Band 2
- LTE Band 5
- LTE Band 7
- LTE Band 12
- LTE Band 13
- LTE Band 14
- LTE Band 17
- LTE Band 25
- LTE Band 26
- LTE Band 30
- LTE Band 41
- LTE Band 66

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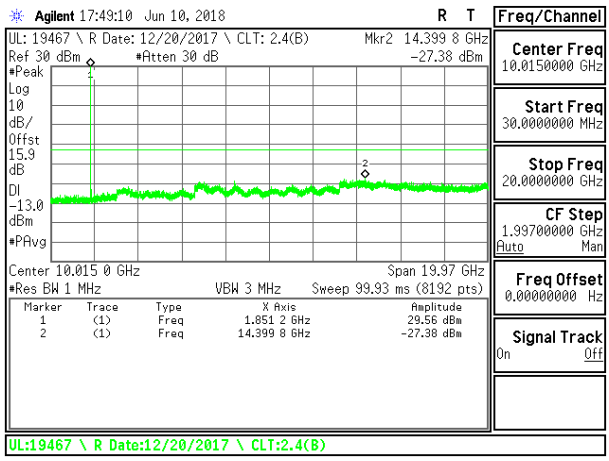
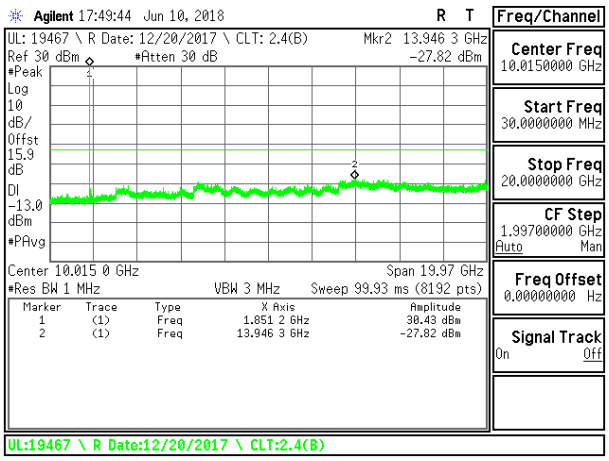
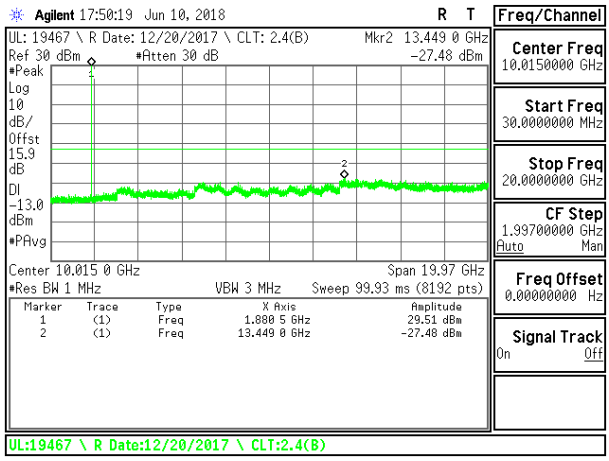
8.3.1. LTE BAND 2



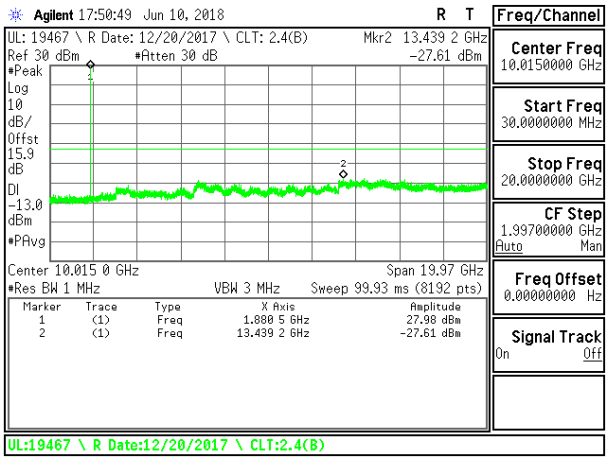
LTE B2 1.4MHz QPSK Low Channel RB1-0



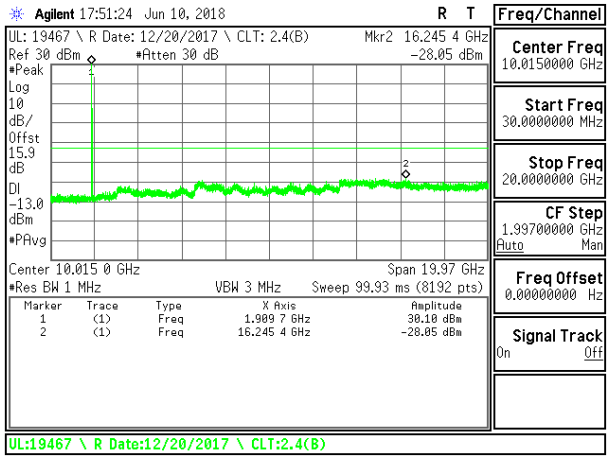
LTE B2 1.4MHz 16QAM Low Channel RB1-0



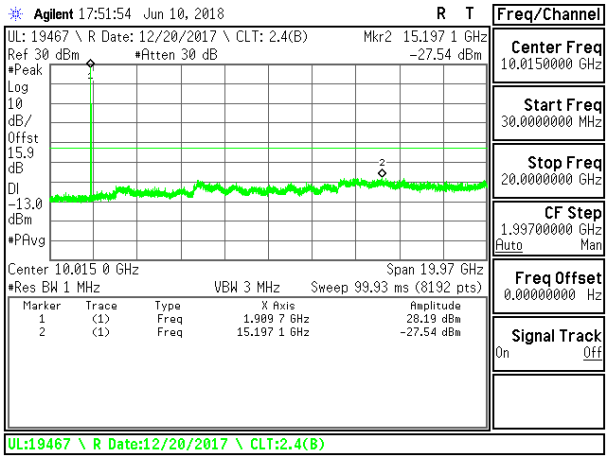
LTE B2 1.4MHz QPSK Middle Channel RB1-0



LTE B2 1.4MHz 16QAM Middle Channel RB1-0



LTE B2 1.4MHz QPSK High Channel RB1-0



LTE B2 1.4MHz 16QAM High Channel RB1-0

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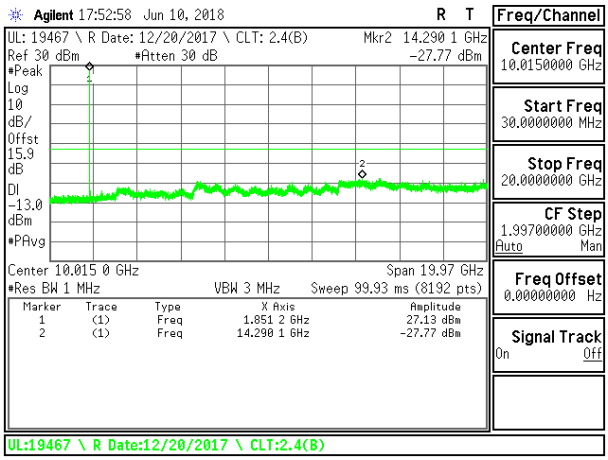
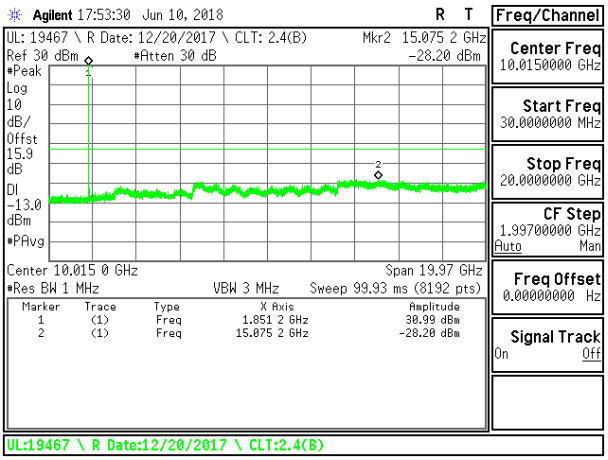
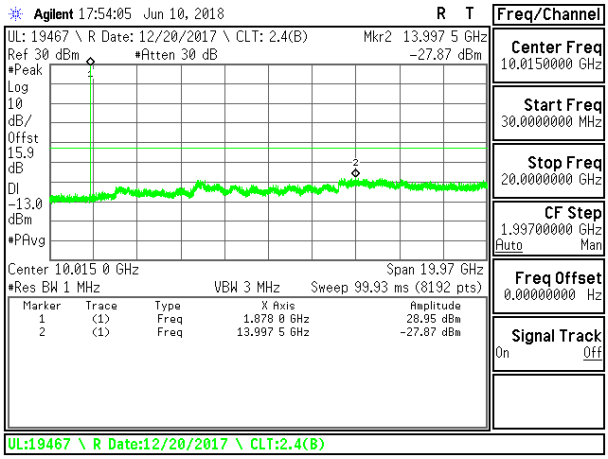


LTE B2 3MHz QPSK Low Channel RB1-0



LTE B2 3MHz 16QAM Low Channel RB1-0



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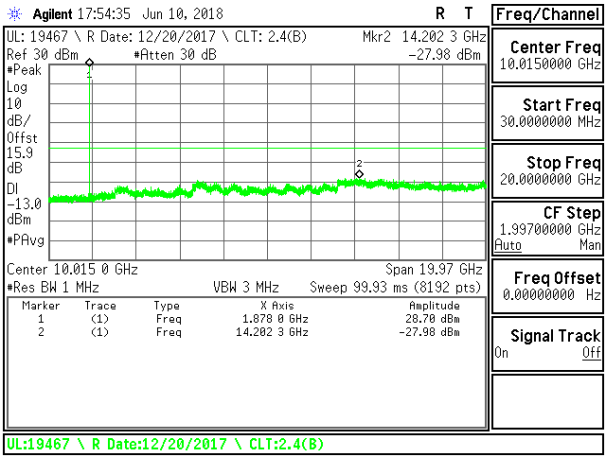
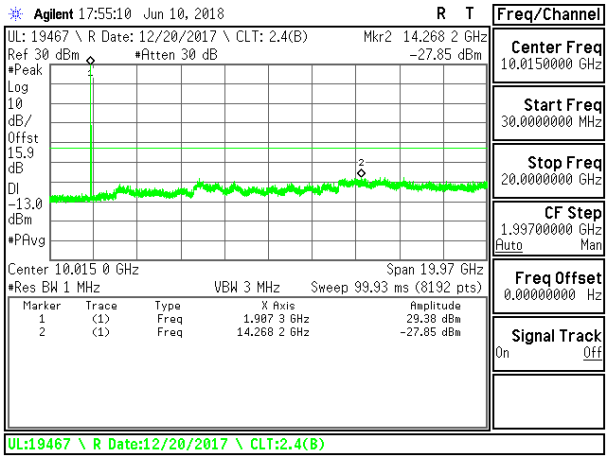
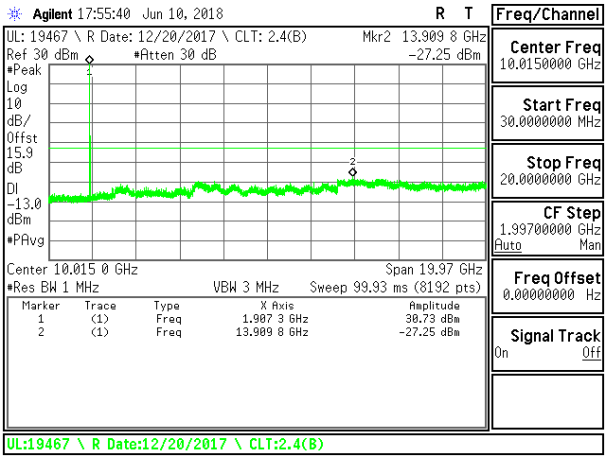


LTE B2 3MHz 16QAM Middle Channel RB1-0



LTE B2 3MHz QPSK High Channel RB1-0



LTE B2 3MHz 16QAM High Channel RB1-0

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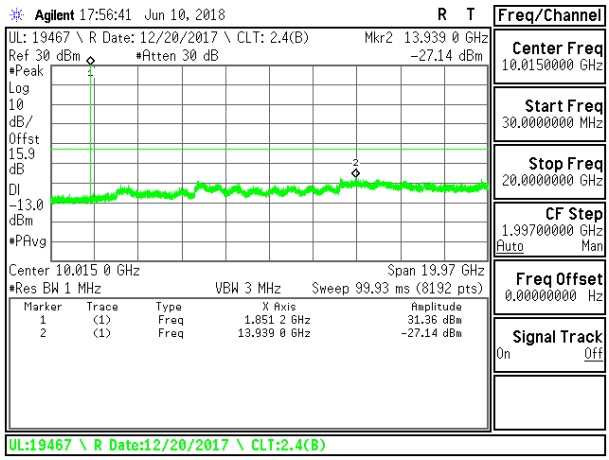
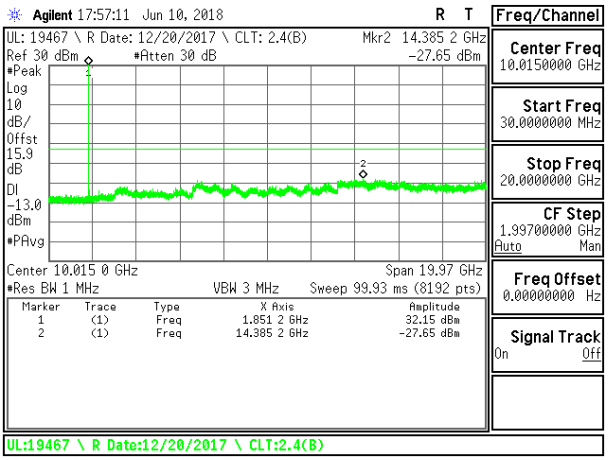
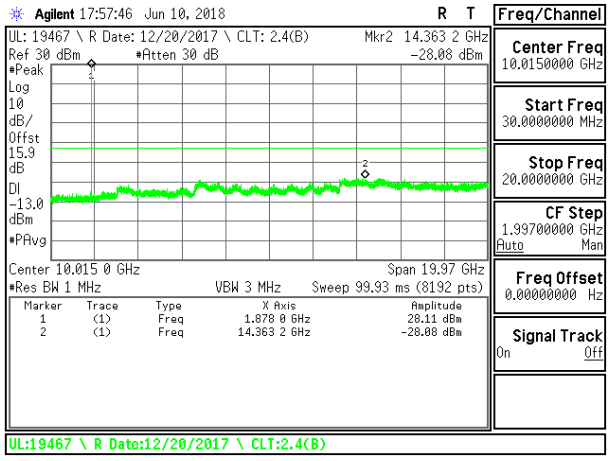


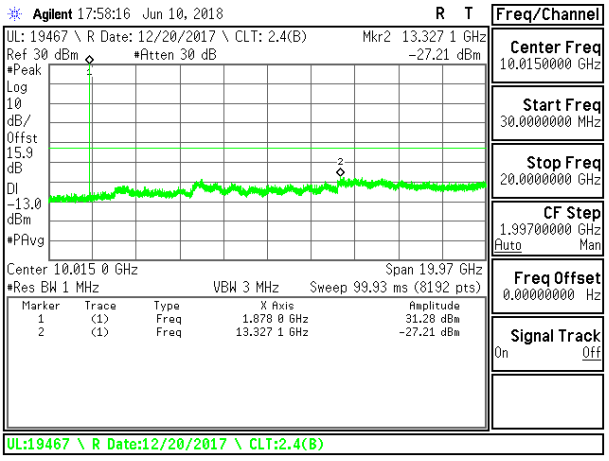
LTE B2 5MHz QPSK Low Channel RB1-0



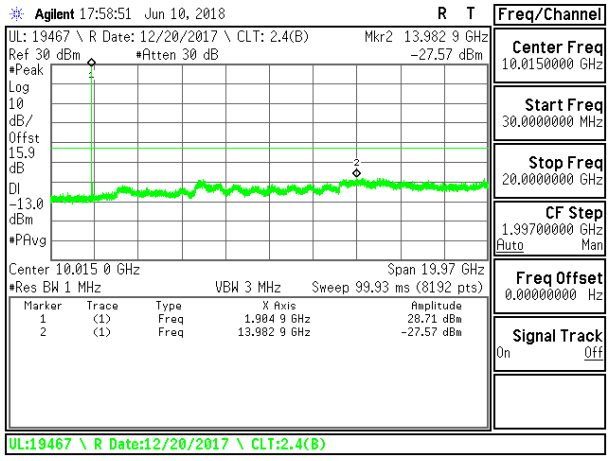
LTE B2 5MHz 16QAM Low Channel RB1-0



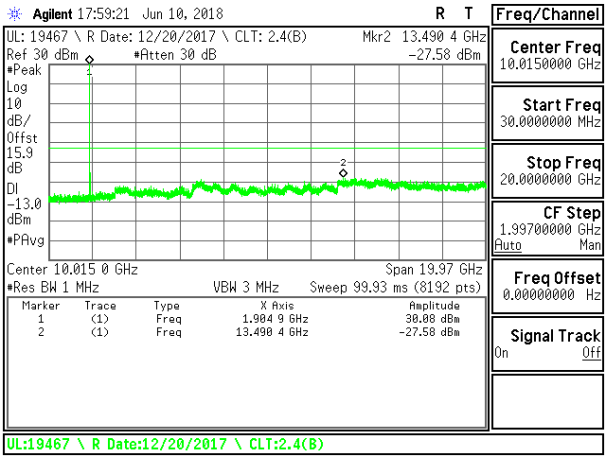
LTE B2 5MHz QPSK Middle Channel RB1-0



LTE B2 5MHz 16QAM Middle Channel RB1-0



LTE B2 5MHz QPSK High Channel RB1-0



LTE B2 5MHz 16QAM High Channel RB1-0

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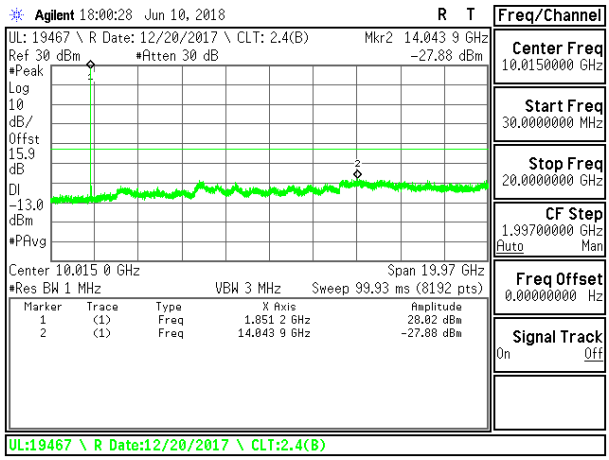
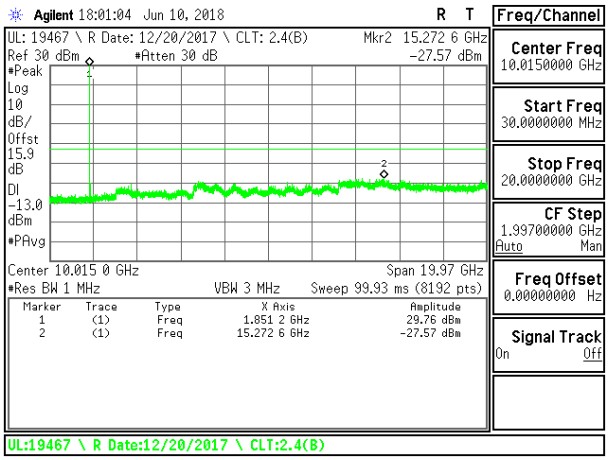
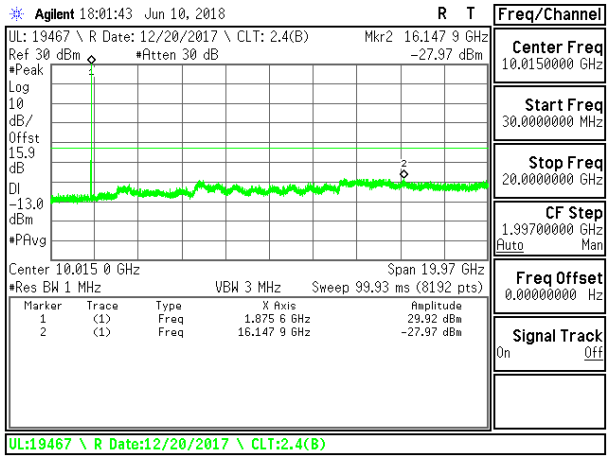


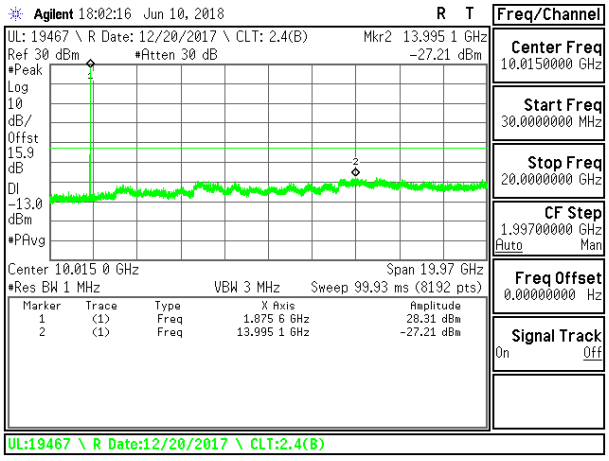
LTE B2 10MHz QPSK Low Channel RB1-0



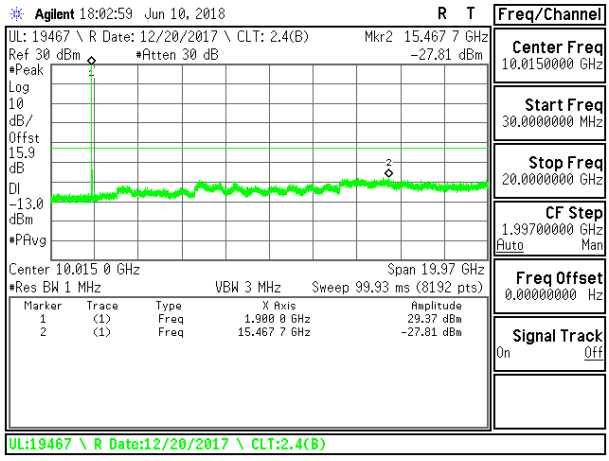
LTE B2 10MHz 16QAM Low Channel RB1-0



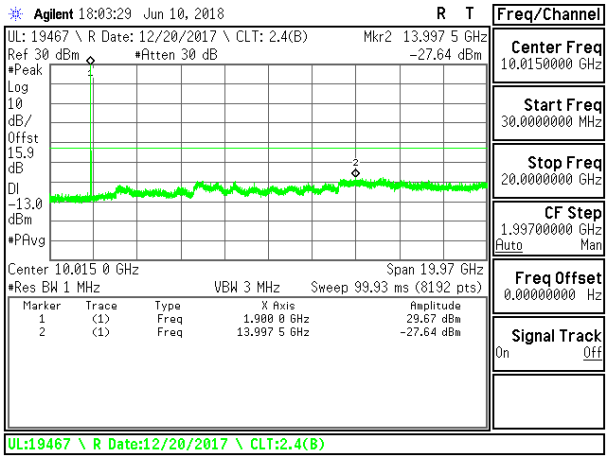
LTE B2 10MHz QPSK Middle Channel RB1-0



LTE B2 10MHz 16QAM Middle Channel RB1-0



LTE B2 10MHz QPSK High Channel RB1-0



LTE B2 10MHz 16QAM High Channel RB1-0

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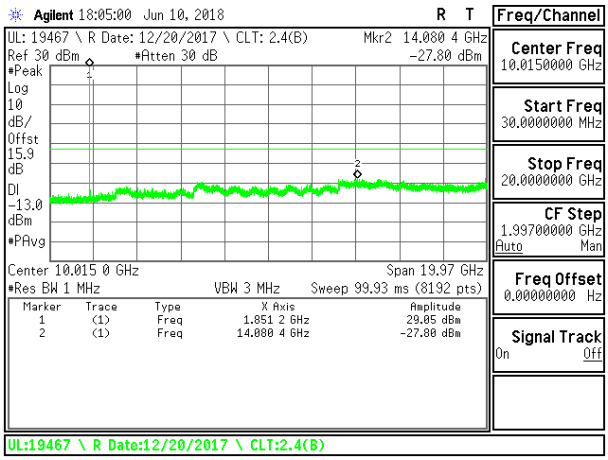
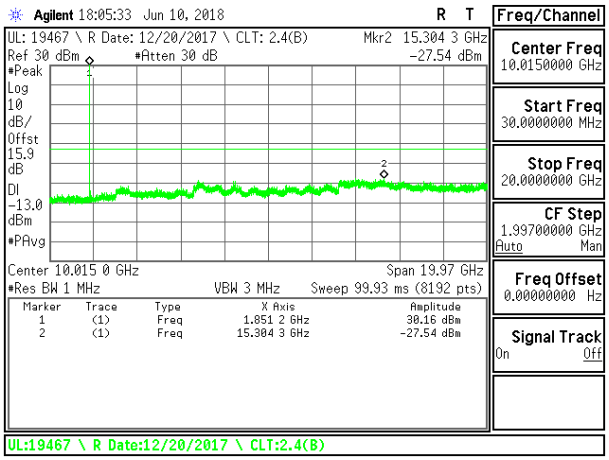
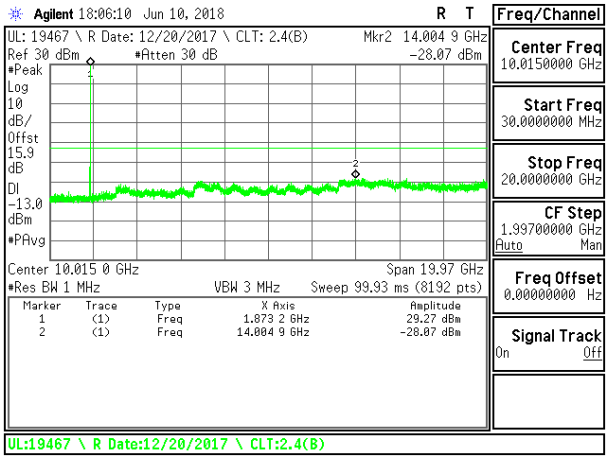


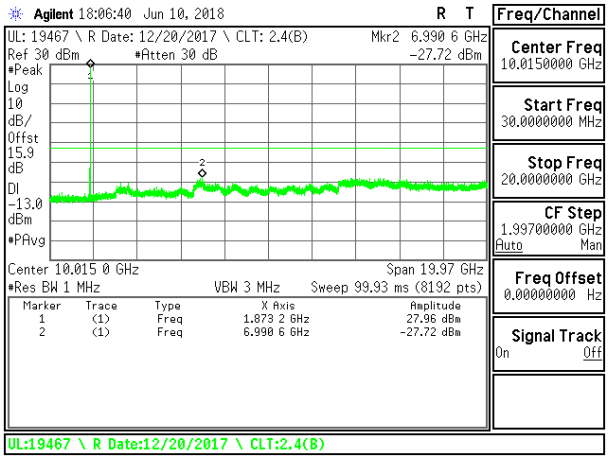
LTE B2 15MHz QPSK Low Channel RB1-0



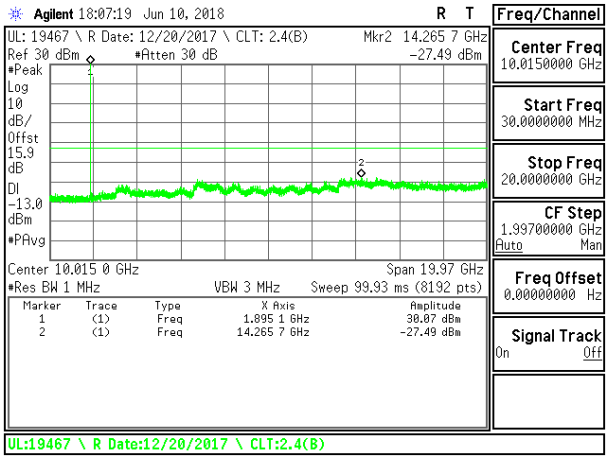
LTE B2 15MHz 16QAM Low Channel RB1-0



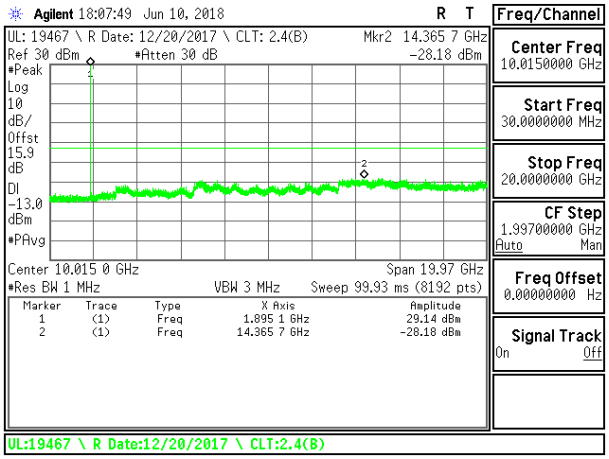
LTE B2 15MHz QPSK Middle Channel RB1-0



LTE B2 15MHz 16QAM Middle Channel RB1-0



LTE B2 15MHz QPSK High Channel RB1-0



LTE B2 15MHz 16QAM High Channel RB1-0

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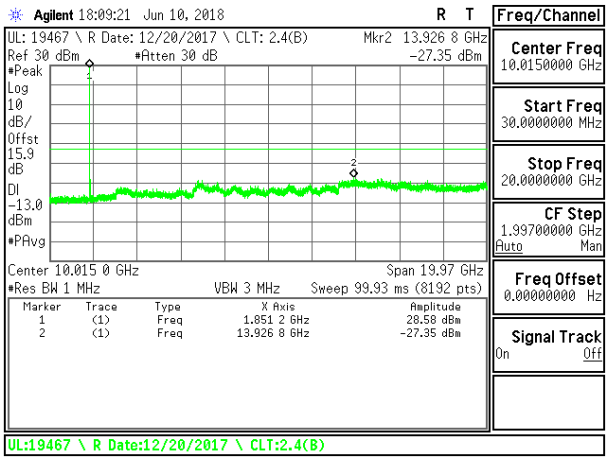
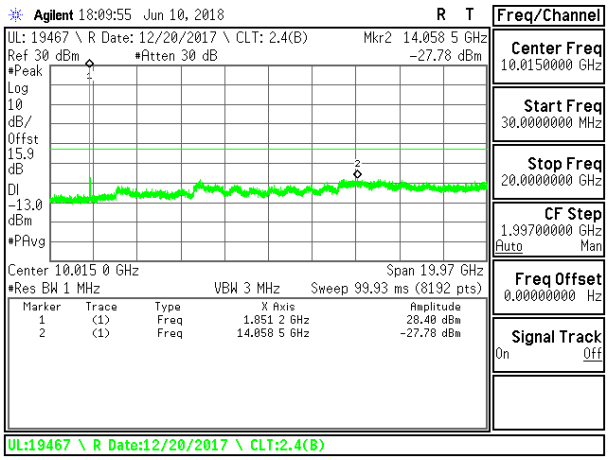
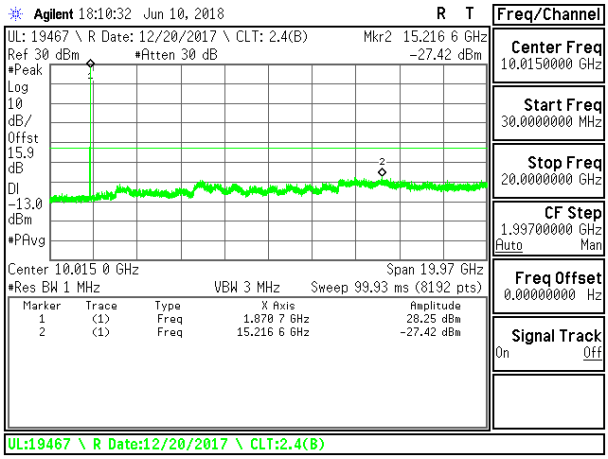


LTE B2 20MHz QPSK Low Channel RB1-0



LTE B2 20MHz 16QAM Low Channel RB1-0



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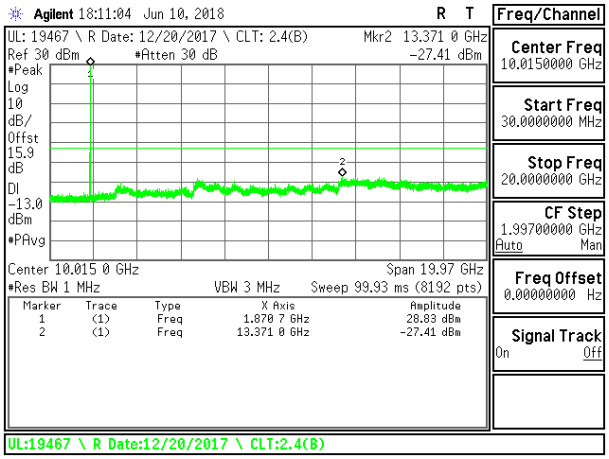

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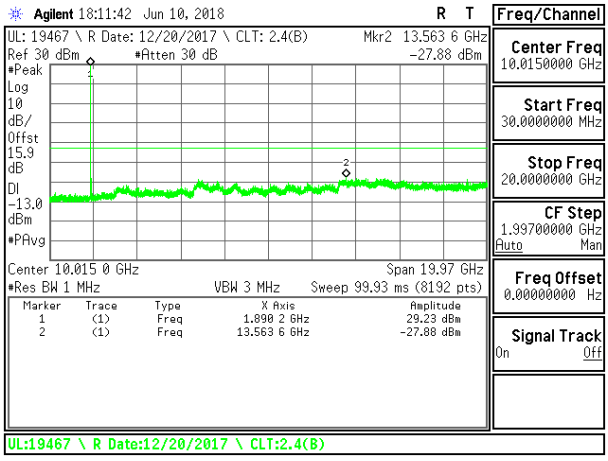
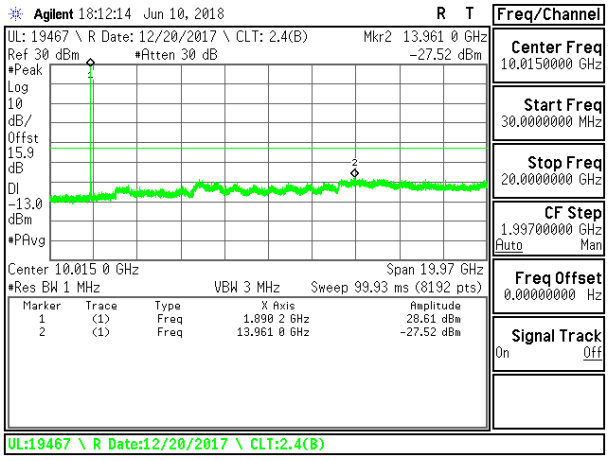


LTE B2 20MHz QPSK High Channel RB1-0



LTE B2 20MHz 16QAM High Channel RB1-0

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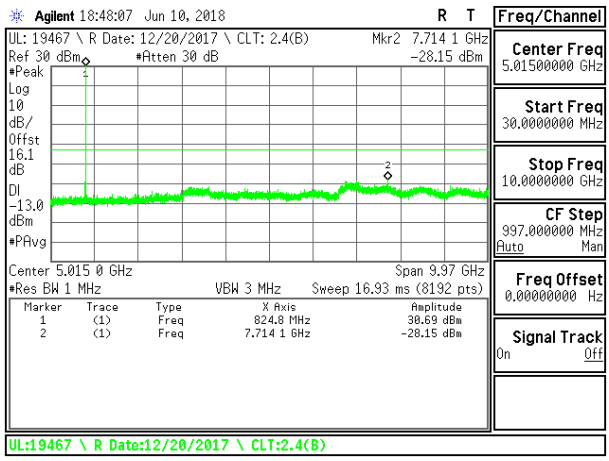
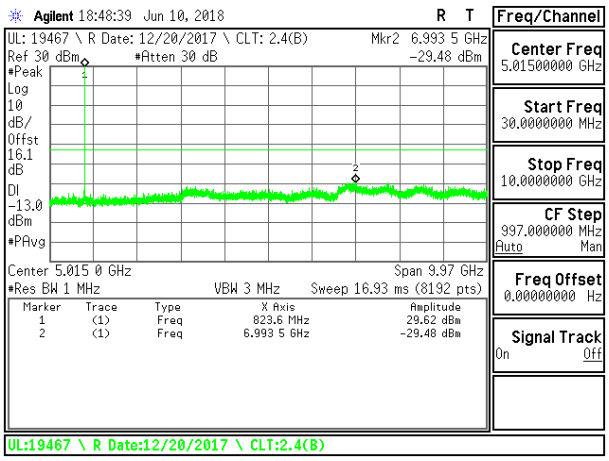
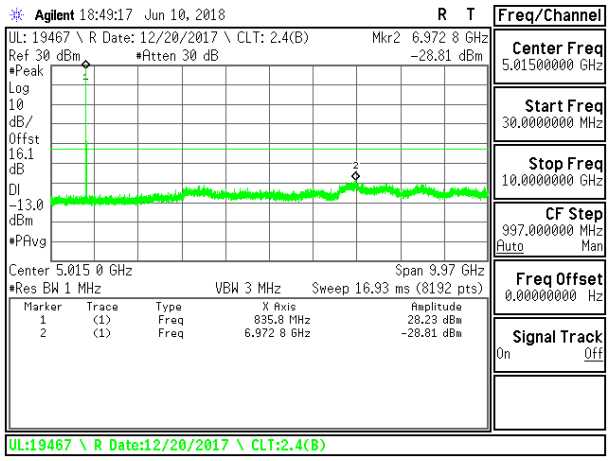
8.3.2. LTE BAND 5



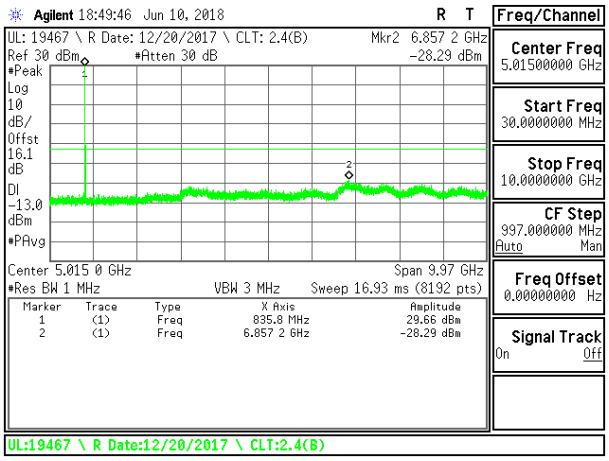
LTE B5 1.4MHz QPSK Low Channel RB1-0



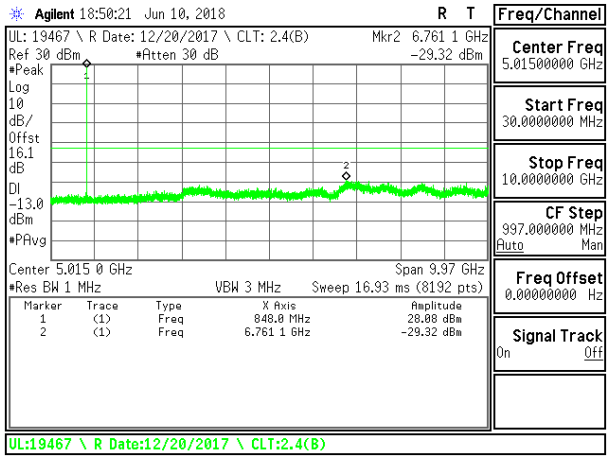
LTE B5 1.4MHz 16QAM Low Channel RB1-0



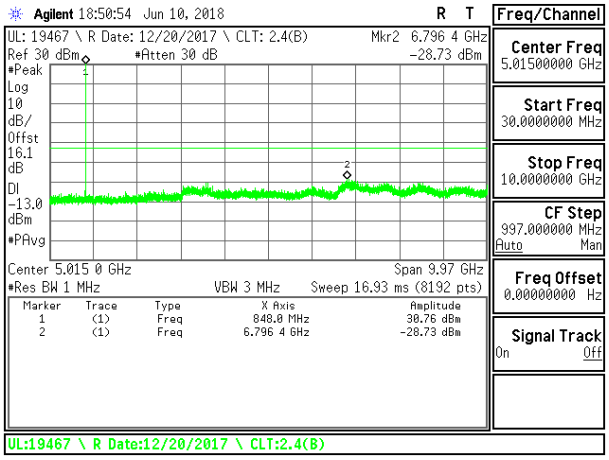
LTE B5 1.4MHz QPSK Middle Channel RB1-0



LTE B5 1.4MHz 16QAM Middle Channel RB1-0



LTE B5 1.4MHz QPSK High Channel RB1-0



LTE B5 1.4MHz 16QAM High Channel RB1-0

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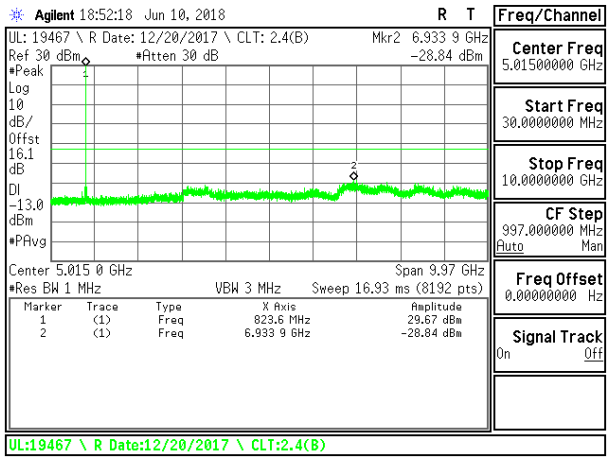
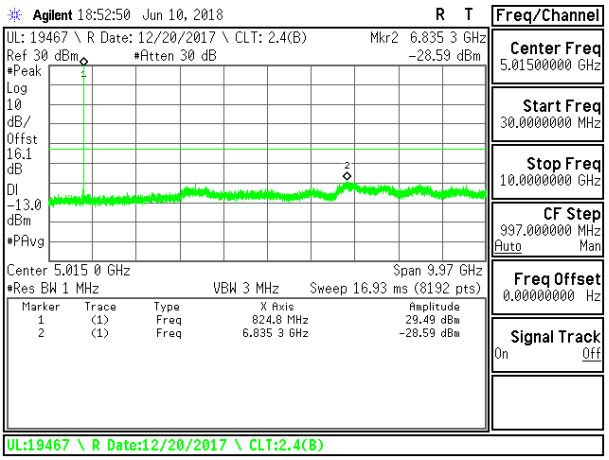
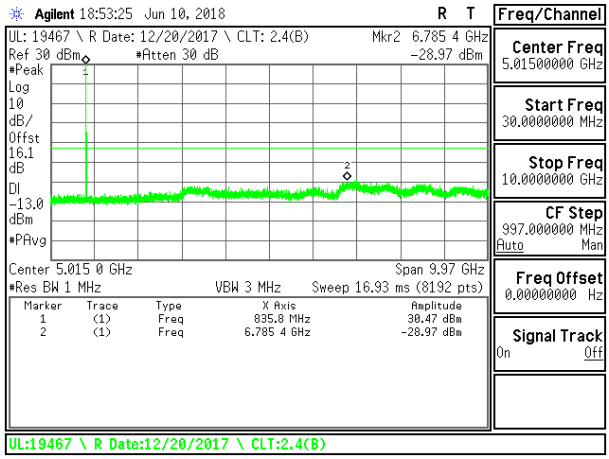


LTE B5 3MHz QPSK Low Channel RB1-0



LTE B5 3MHz 16QAM Low Channel RB1-0



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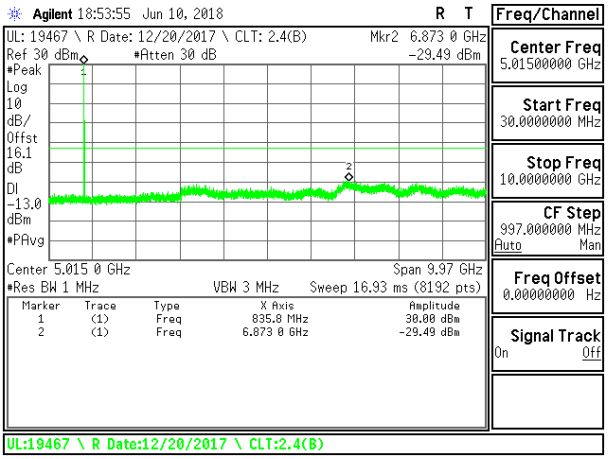
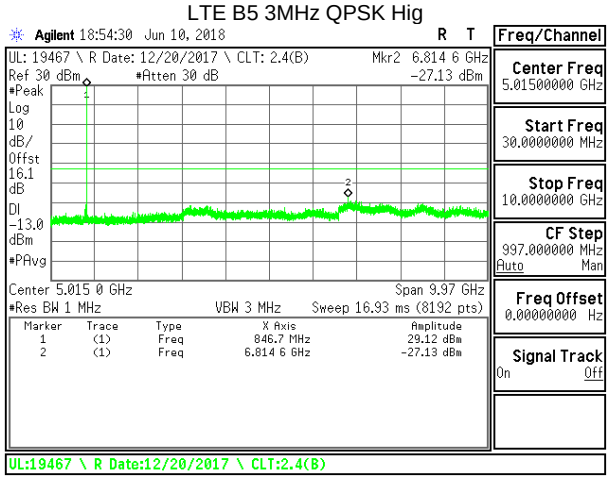
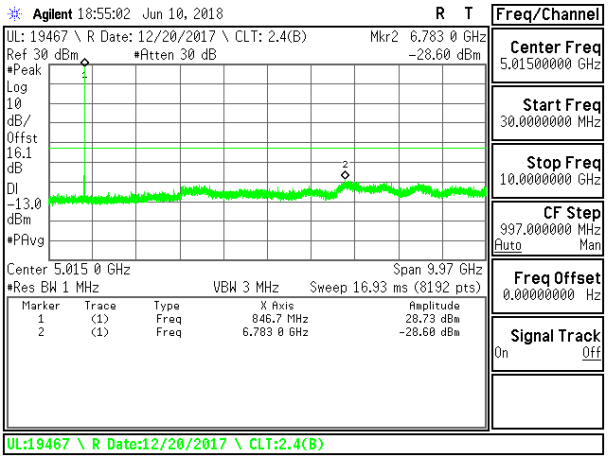


LTE B5 3MHz 16QAM Middle Channel RB1-0

LTE B5 3MHz QPSK Hig



h Channel RB1-0



LTE B5 3MHz 16QAM High Channel RB1-0

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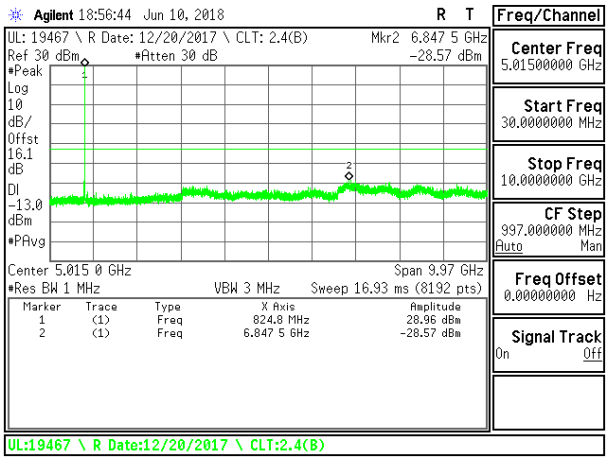
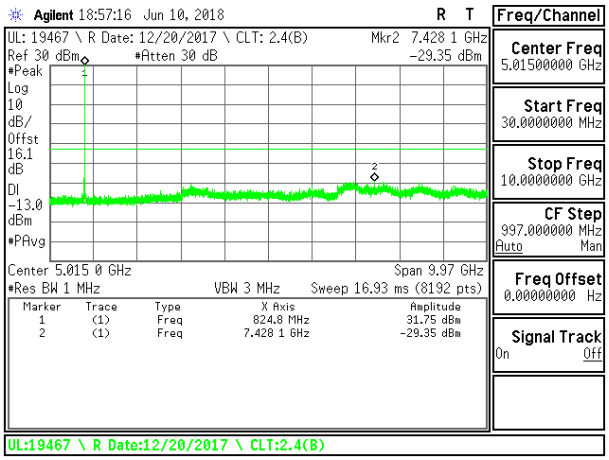
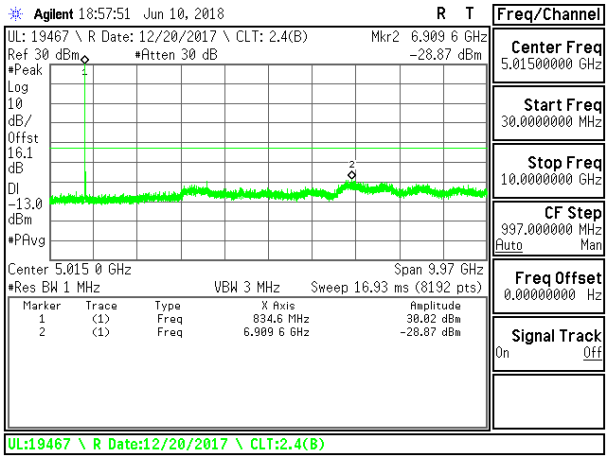


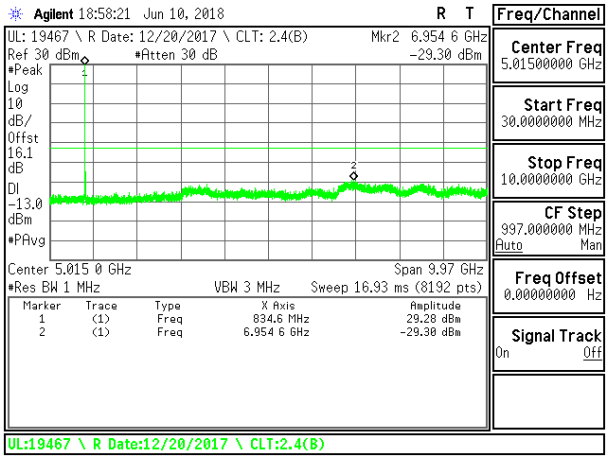
LTE B5 5MHz QPSK Low Channel RB1-0



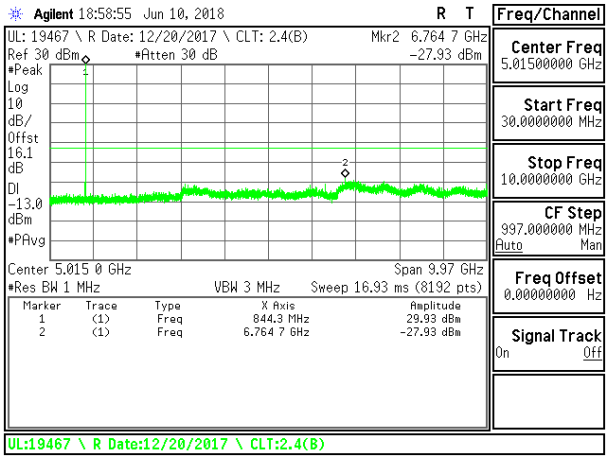
LTE B5 5MHz 16QAM Low Channel RB1-0



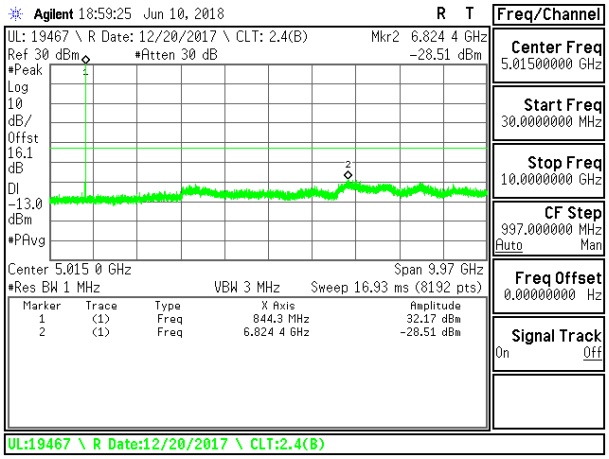
LTE B5 5MHz QPSK Middle Channel RB1-0



LTE B5 5MHz 16QAM Middle Channel RB1-0



LTE B5 5MHz QPSK High Channel RB1-0



LTE B5 5MHz 16QAM High Channel RB1-0

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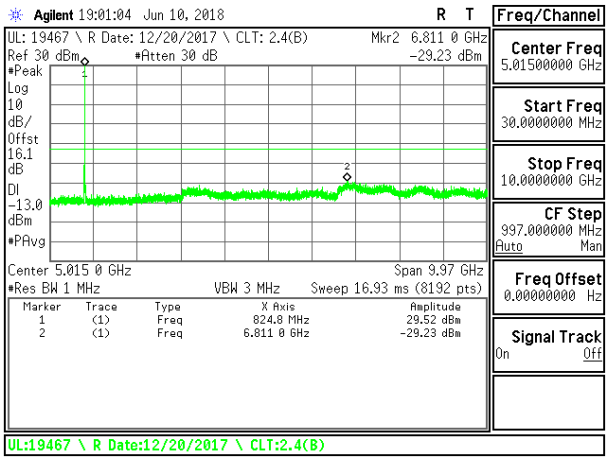
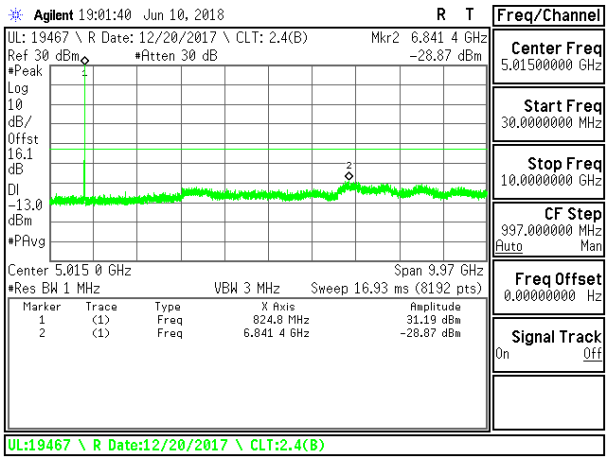
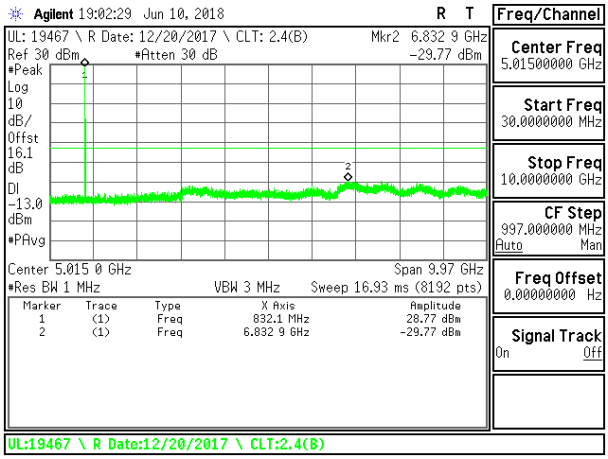


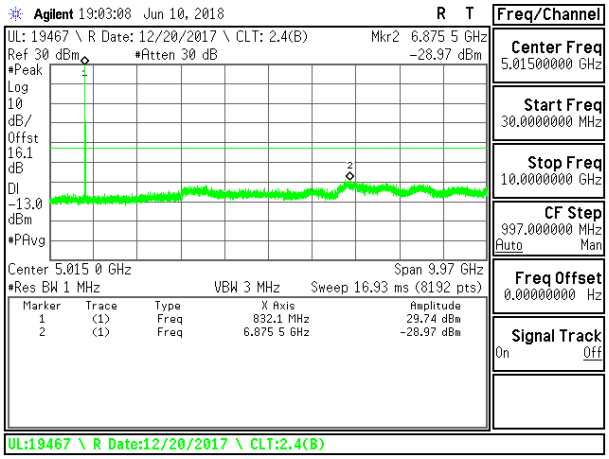
LTE B5 10MHz QPSK Low Channel RB1-0



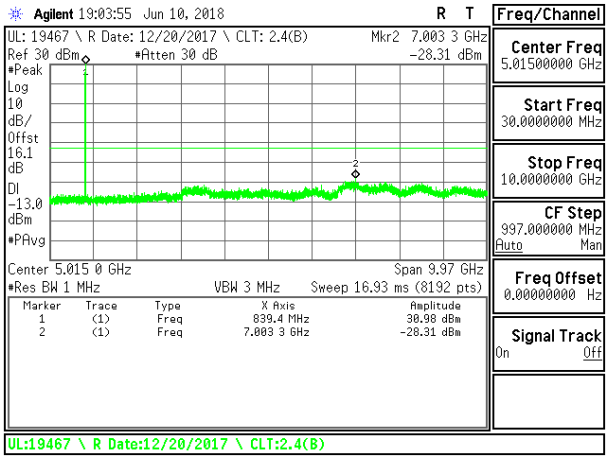
LTE B5 10MHz 16QAM Low Channel RB1-0



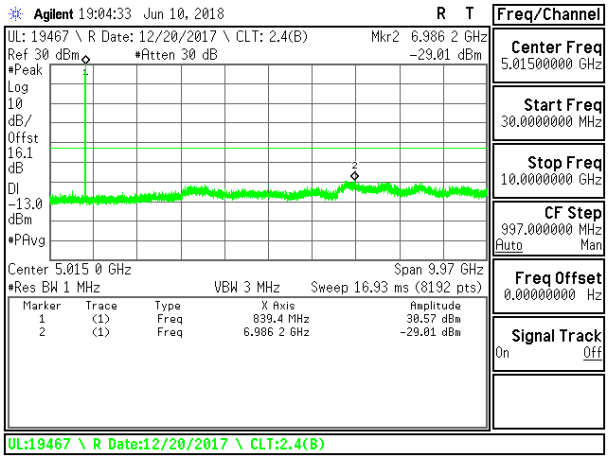
LTE B5 10MHz QPSK Middle Channel RB1-0



LTE B5 10MHz 16QAM Middle Channel RB1-0



LTE B5 10MHz QPSK High Channel RB1-0



LTE B5 10MHz 16QAM High Channel RB1-0

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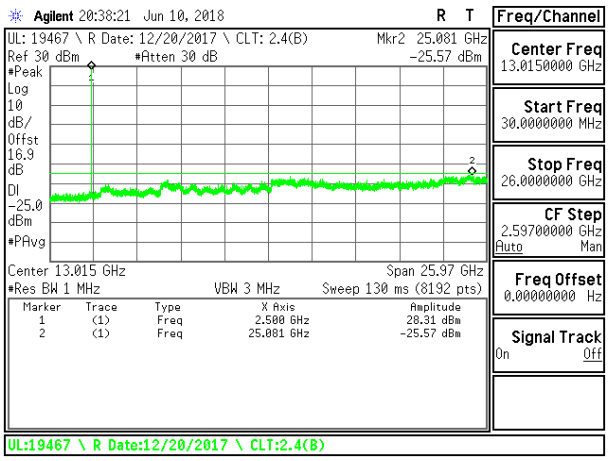
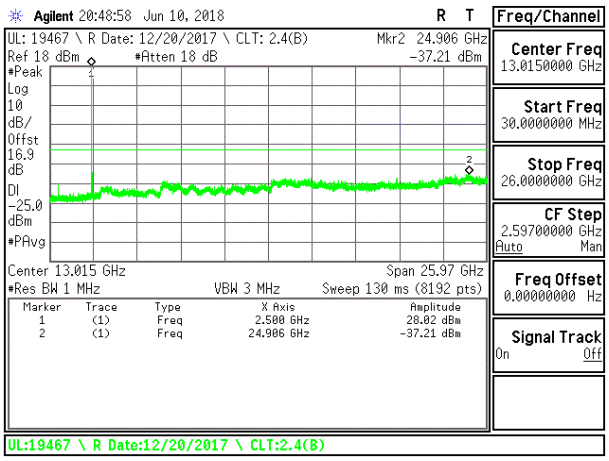
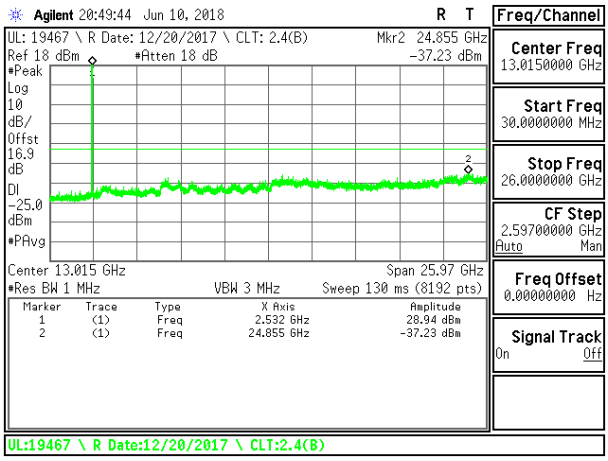
8.3.3. LTE BAND 7



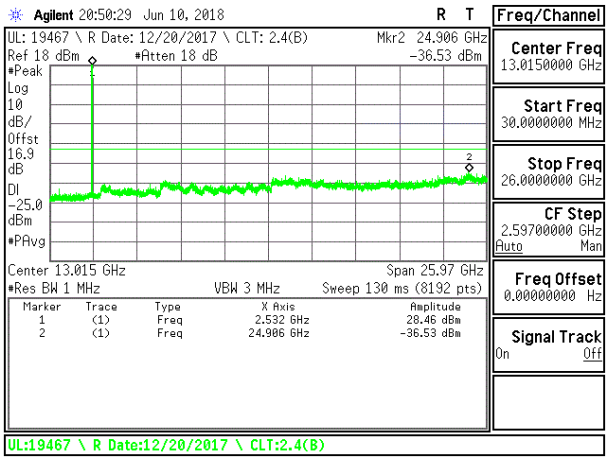
LTE B7 5MHz QPSK Low Channel RB1-0



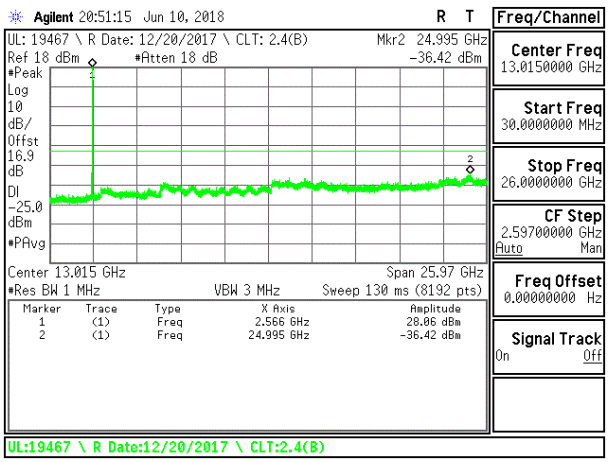
LTE B7 5MHz 16QAM Low Channel RB1-0



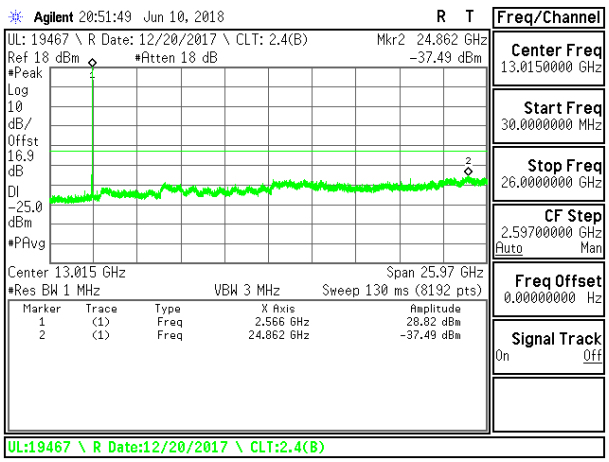
LTE B7 5MHz QPSK Middle Channel RB1-0



LTE B7 5MHz 16QAM Middle Channel RB1-0



LTE B7 5MHz QPSK High Channel RB1-0



LTE B7 5MHz 16QAM High Channel RB1-0

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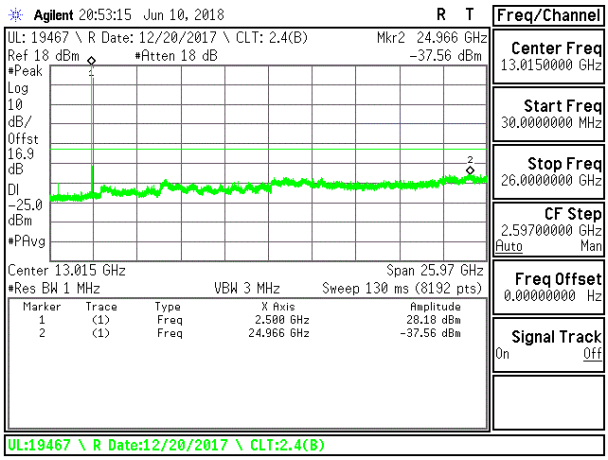
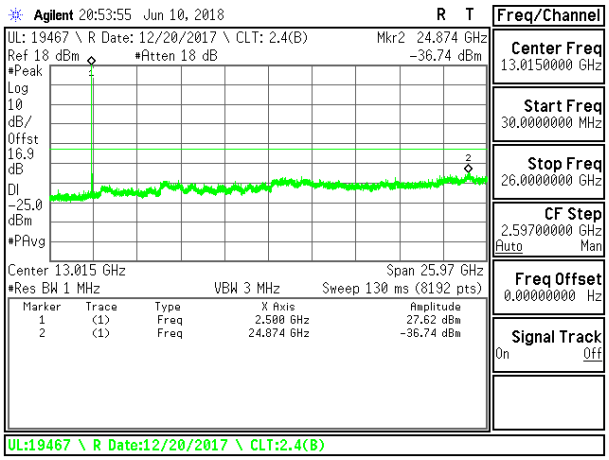
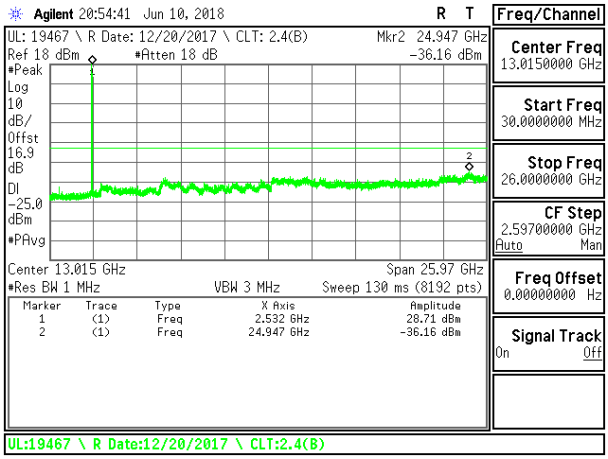


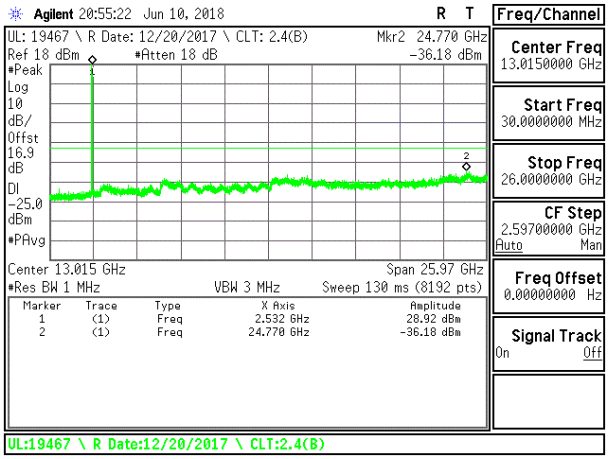
LTE B7 10MHz QPSK Low Channel RB1-0



LTE B7 10MHz 16QAM Low Channel RB1-0



LTE B7 10MHz QPSK Middle Channel RB1-0



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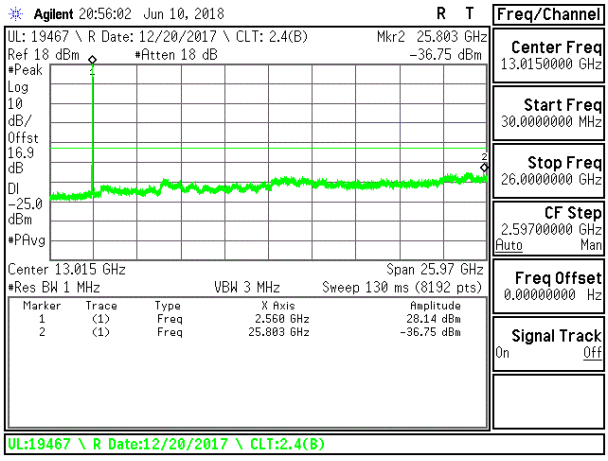

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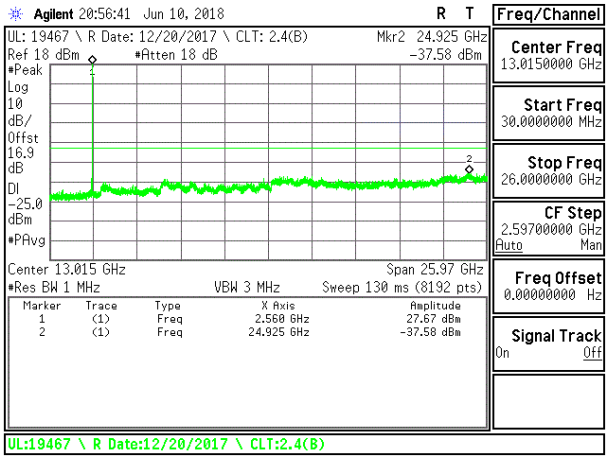

LTE B7 10MHz 16QAM High Channel RB1-0

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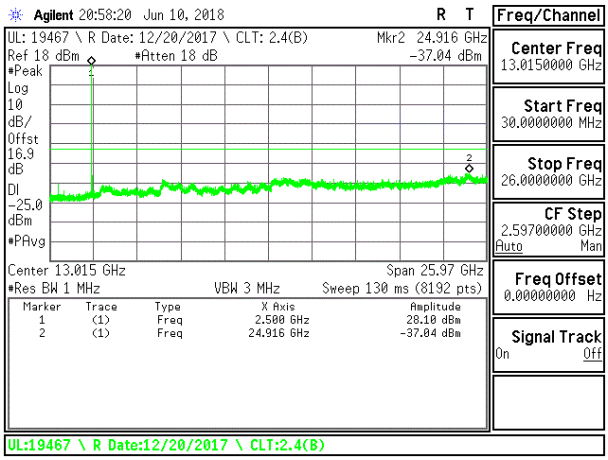

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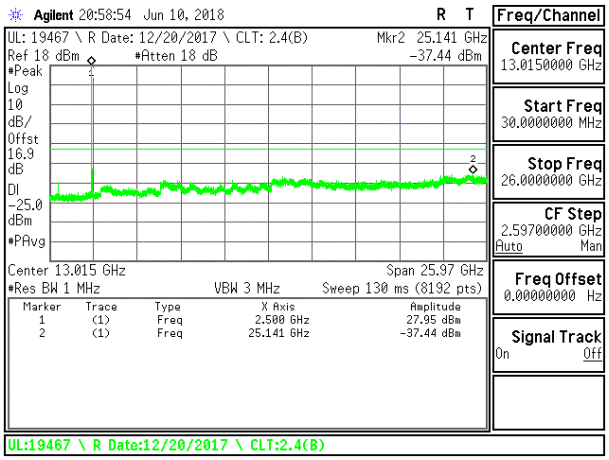

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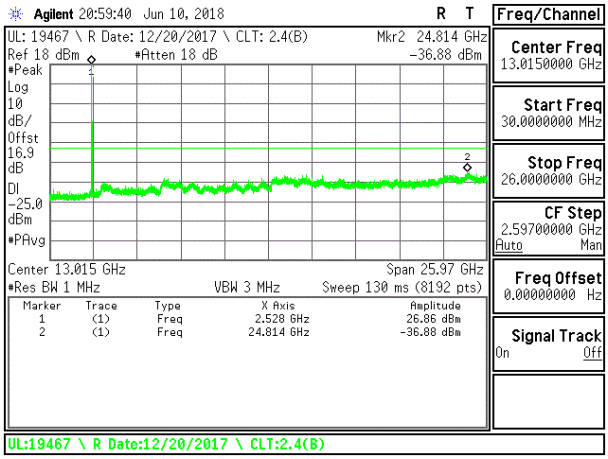

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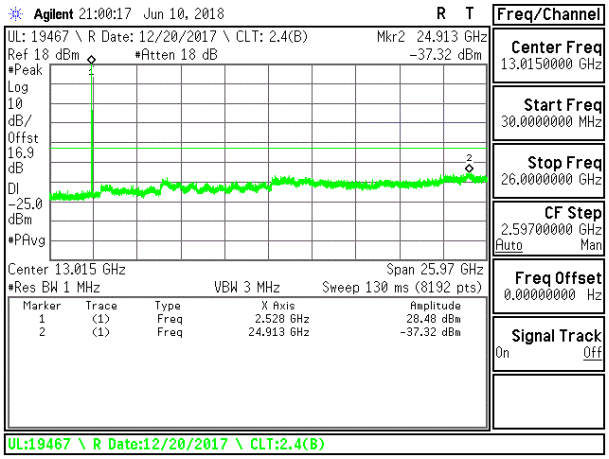
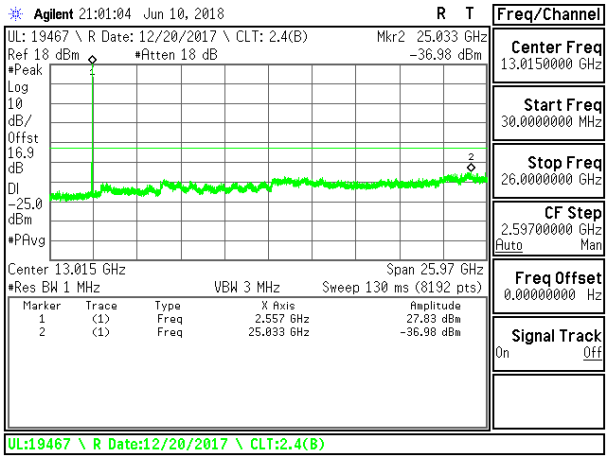
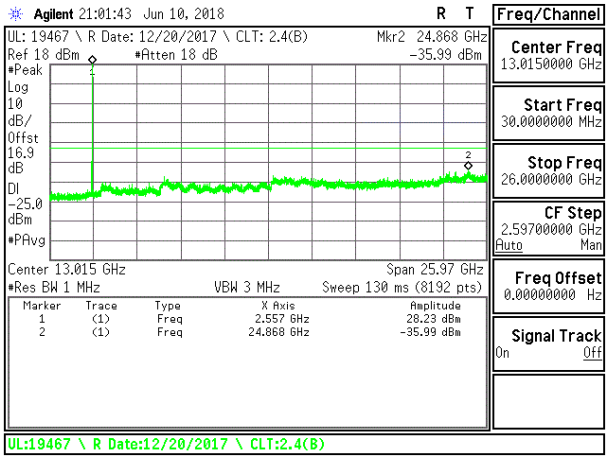


LTE B7 15MHz 16QAM Middle Channel RB1-0



LTE B7 15MHz QPSK High Channel RB1-0



LTE B7 15MHz 16QAM High Channel RB1-0

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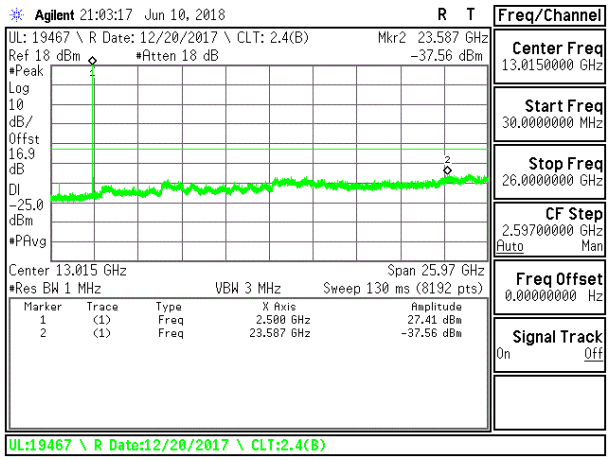

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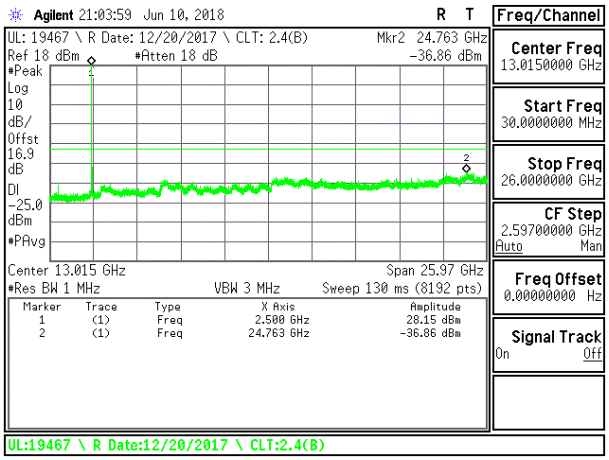

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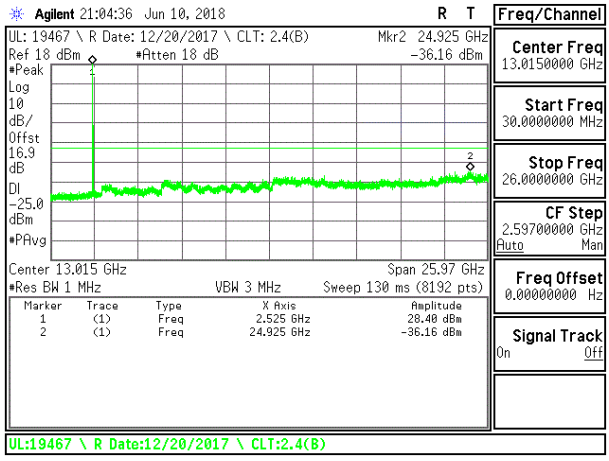
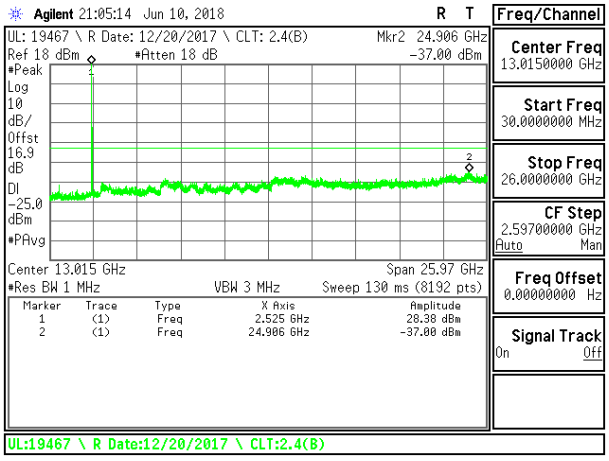


LTE B7 20MHz QPSK Middle Channel RB1-0



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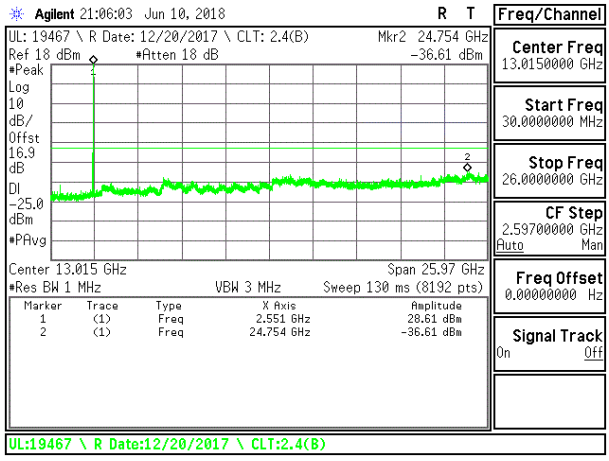
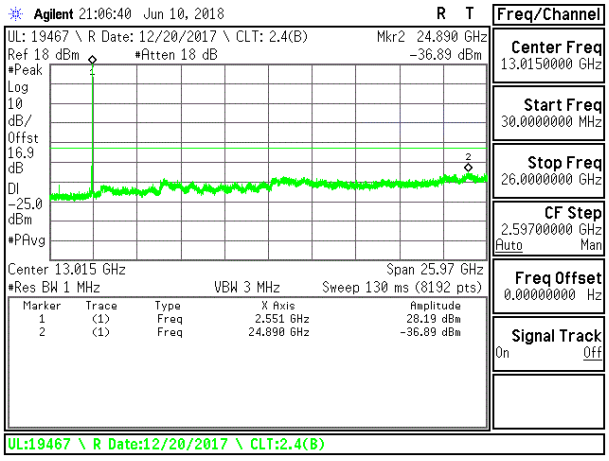


LTE B7 20MHz QPSK High Channel RB1-0



LTE B7 20MHz 16QAM High Channel RB1-0

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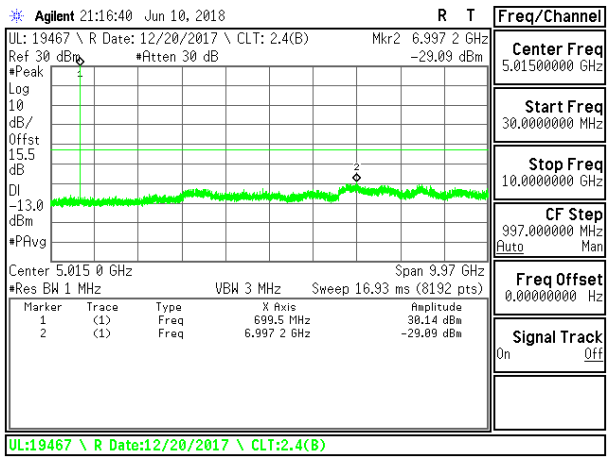
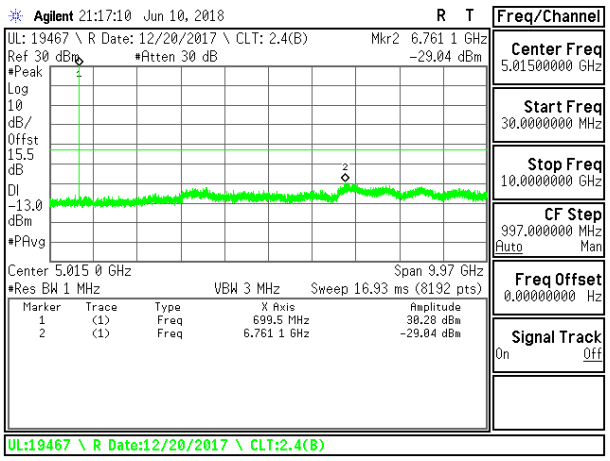
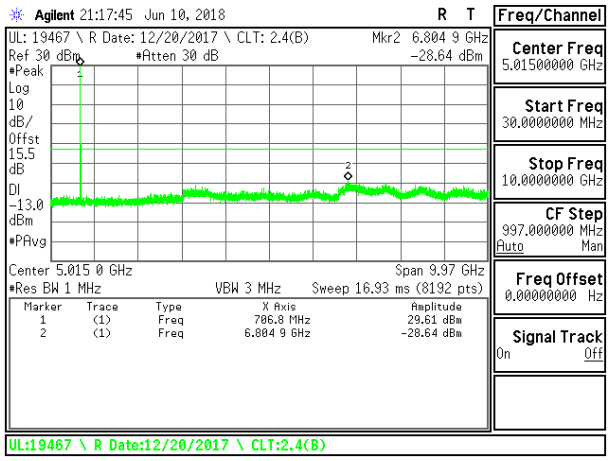
8.3.4. LTE BAND 12



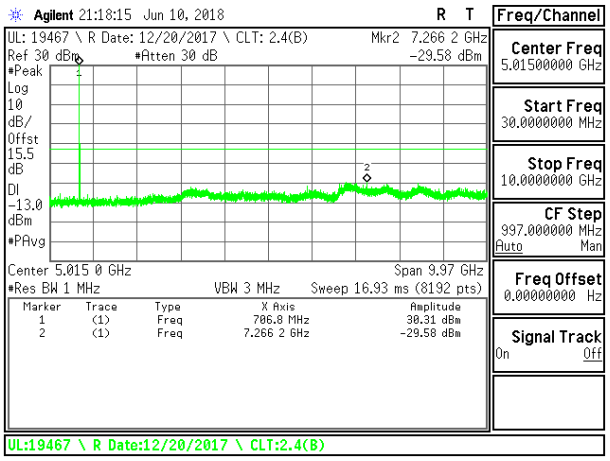
LTE B12 1.4MHz QPSK Low Channel RB1-0



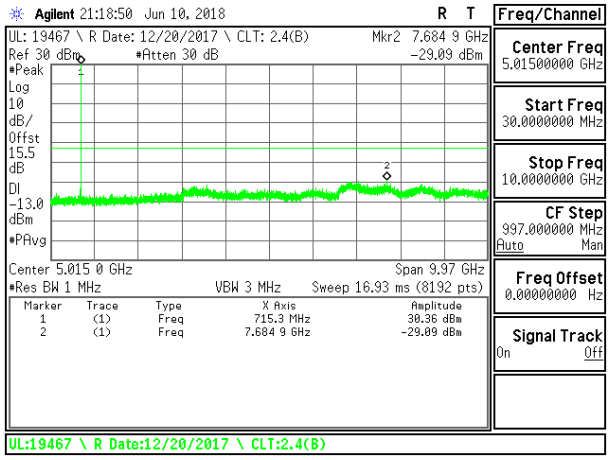
LTE B12 1.4MHz 16QAM Low Channel RB1-0



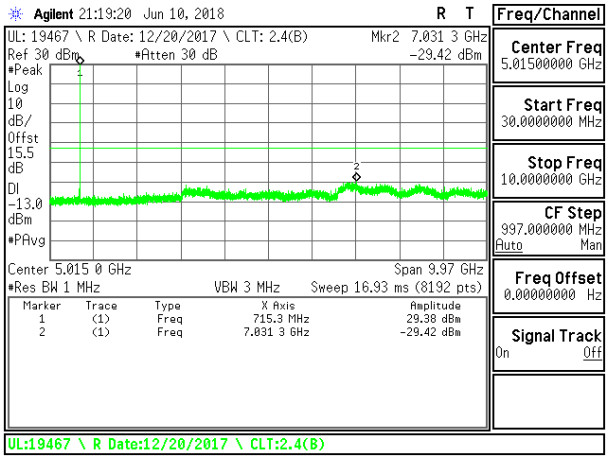
LTE B12 1.4MHz QPSK Middle Channel RB1-0



LTE B12 1.4MHz 16QAM Middle Channel RB1-0



LTE B12 1.4MHz QPSK High Channel RB1-0



LTE B12 1.4MHz 16QAM High Channel RB1-0

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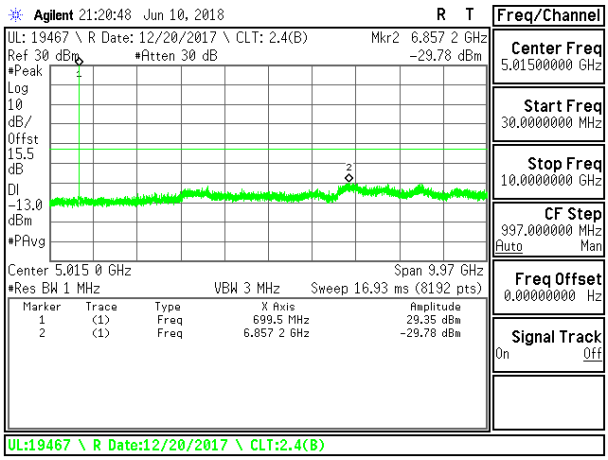
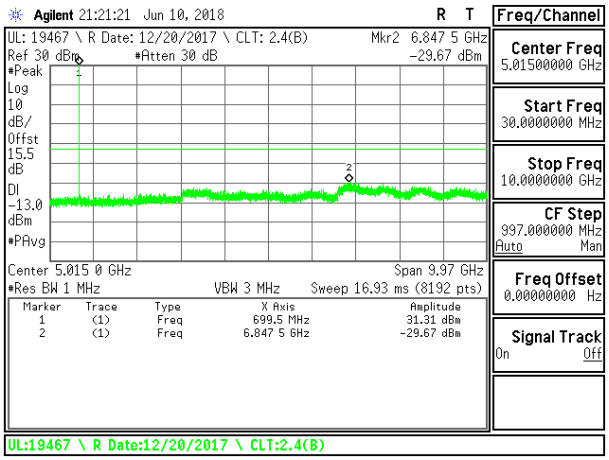
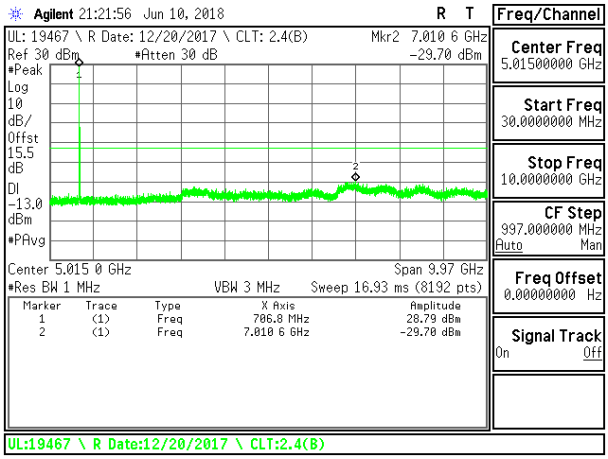


LTE B12 3MHz QPSK Low Channel RB1-0



LTE B12 3MHz 16QAM Low Channel RB1-0



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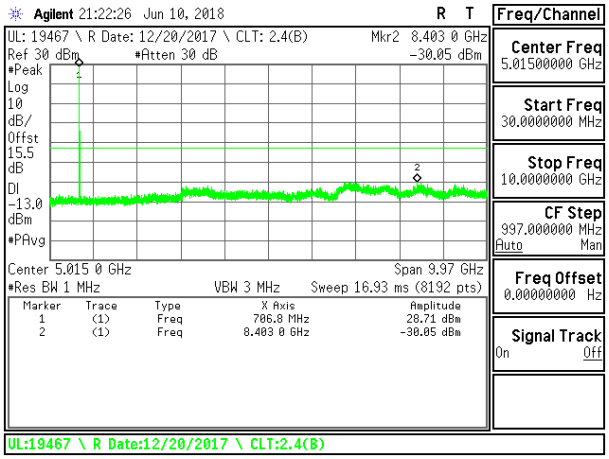

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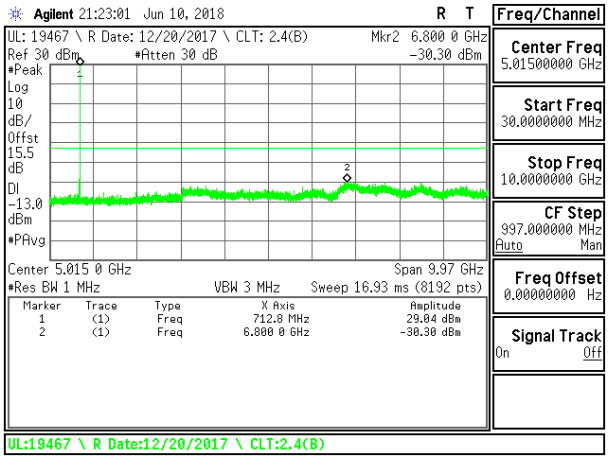
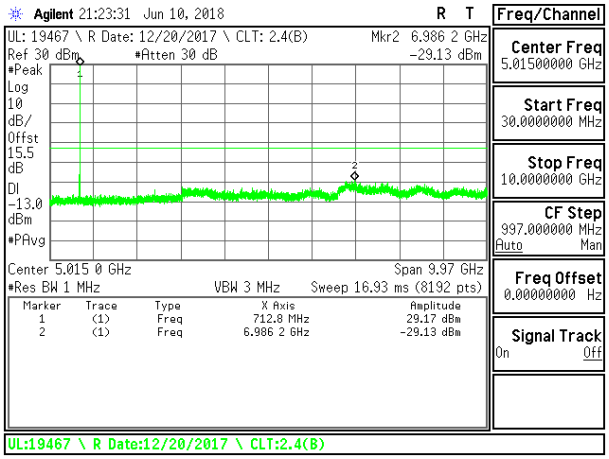


LTE B12 3MHz QPSK High Channel RB1-0



LTE B12 3MHz 16QAM High Channel RB1-0

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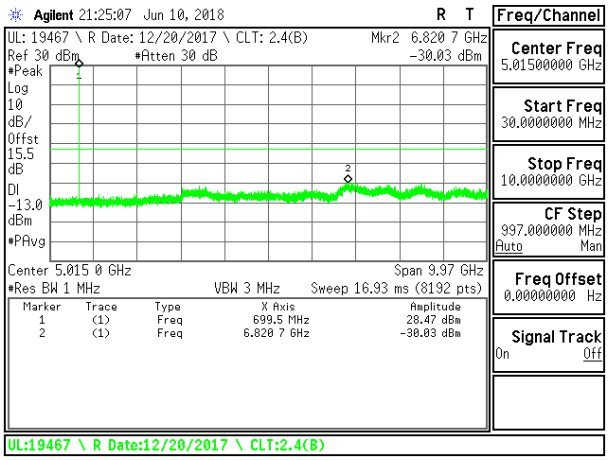
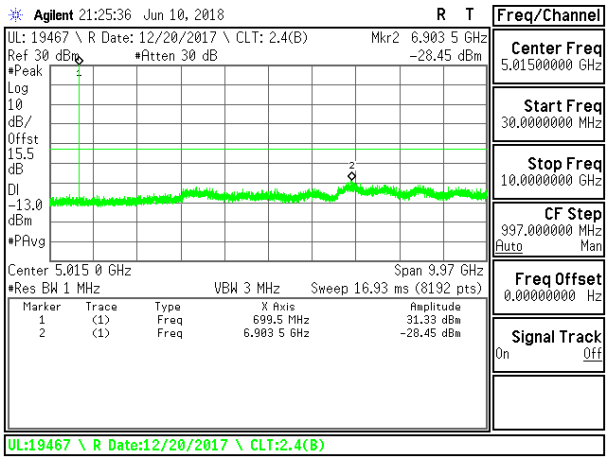
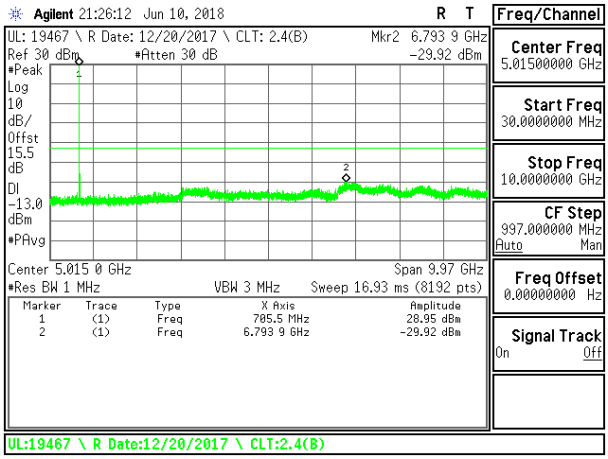


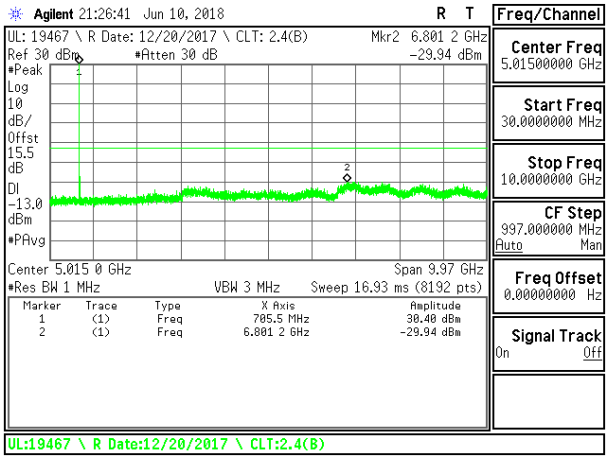
LTE B12 5MHz QPSK Low Channel RB1-0



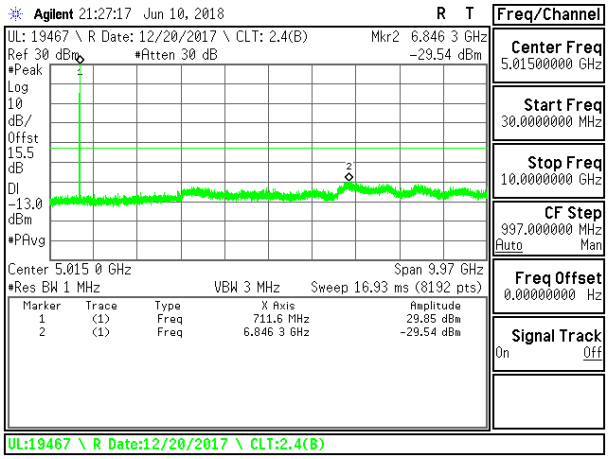
LTE B12 5MHz 16QAM Low Channel RB1-0



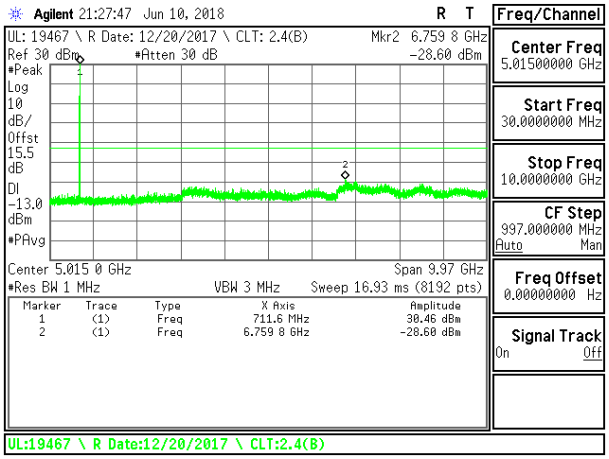
LTE B12 5MHz QPSK Middle Channel RB1-0



LTE B12 5MHz 16QAM Middle Channel RB1-0



LTE B12 5MHz QPSK High Channel RB1-0



LTE B12 5MHz 16QAM High Channel RB1-0

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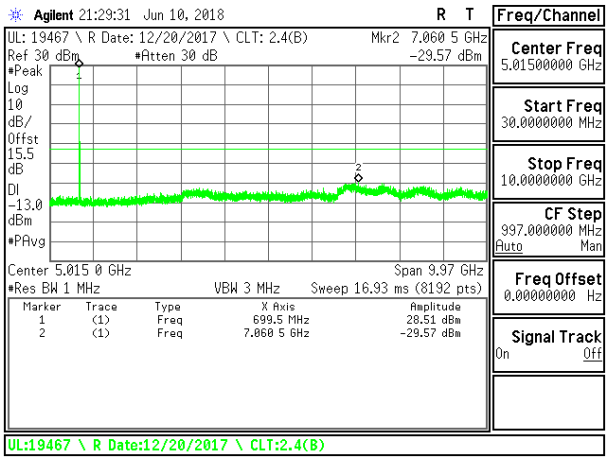
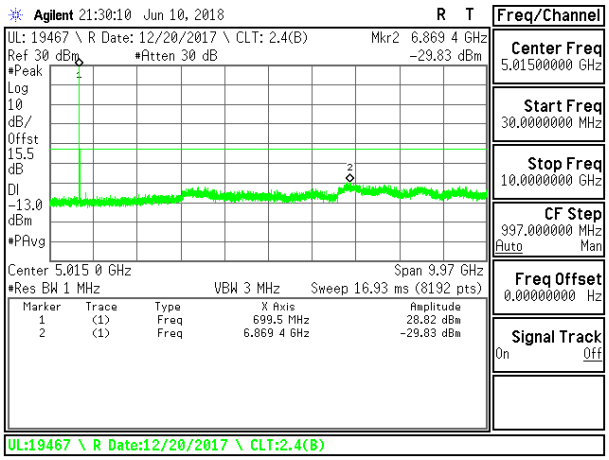
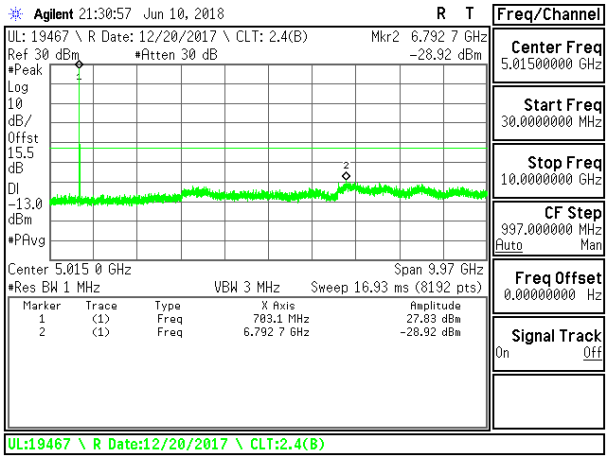


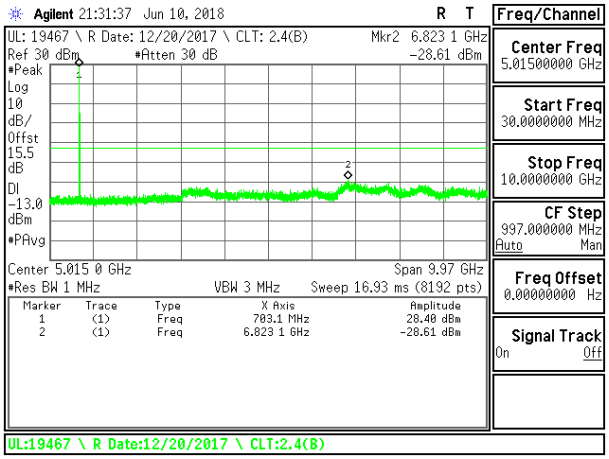
LTE B12 10MHz QPSK Low Channel RB1-0



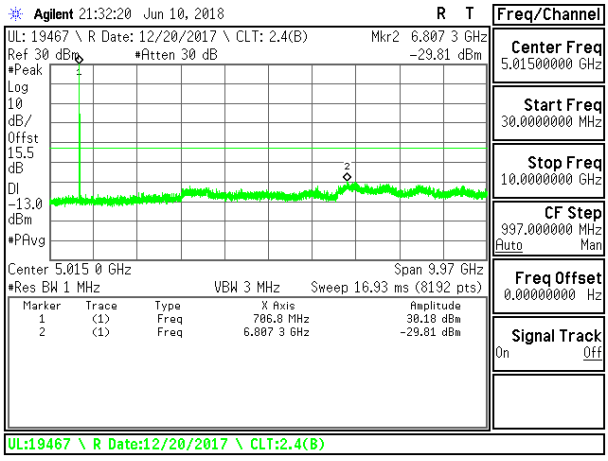
LTE B12 10MHz 16QAM Low Channel RB1-0



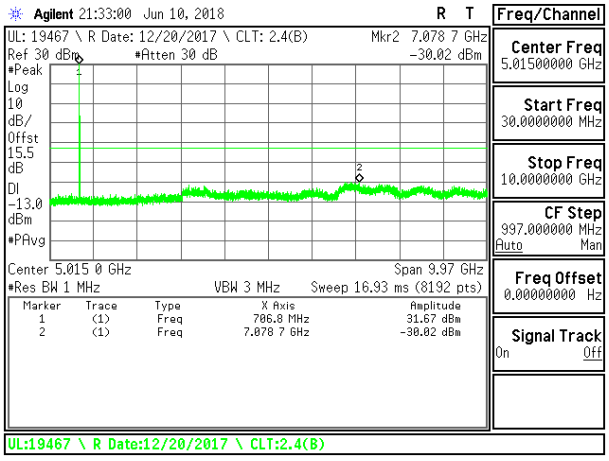
LTE B12 10MHz QPSK Middle Channel RB1-0



LTE B12 10MHz 16QAM Middle Channel RB1-0



LTE B12 10MHz QPSK High Channel RB1-0



LTE B12 10MHz 16QAM High Channel RB1-0

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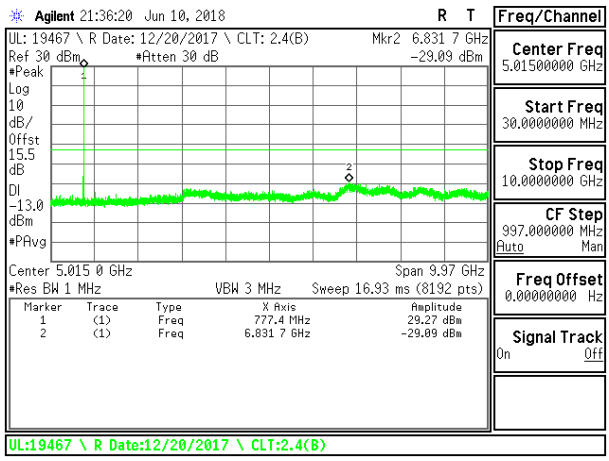
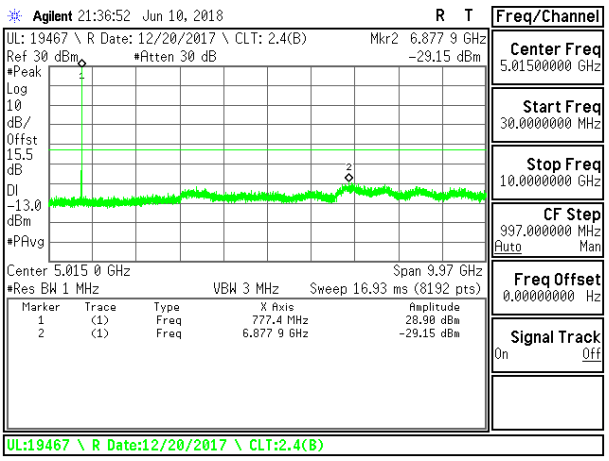
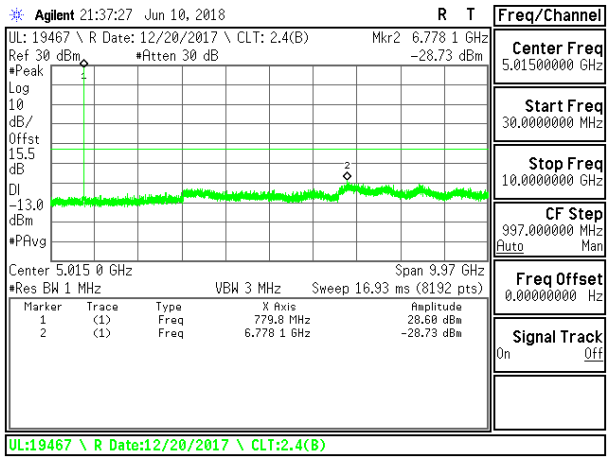
8.3.5. LTE BAND 13



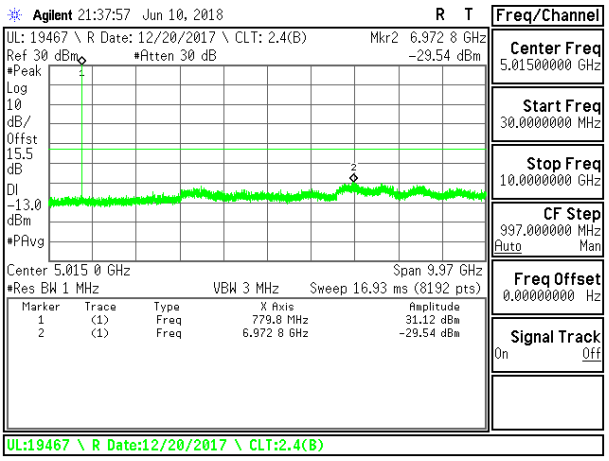
LTE B13 5MHz QPSK Low Channel RB1-0



LTE B13 5MHz 16QAM Low Channel RB1-0

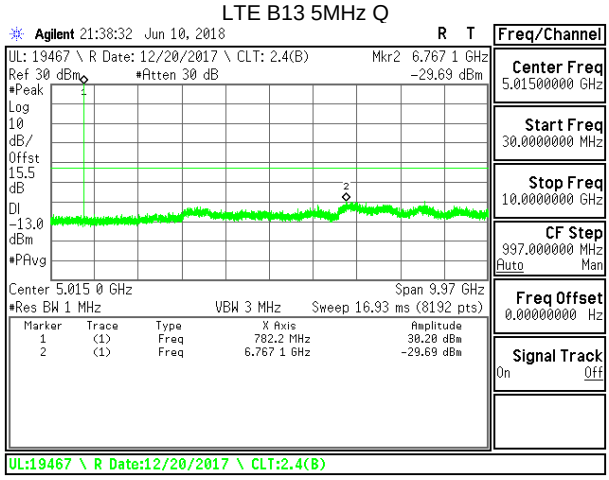


LTE B13 5MHz QPSK Middle Channel RB1-0

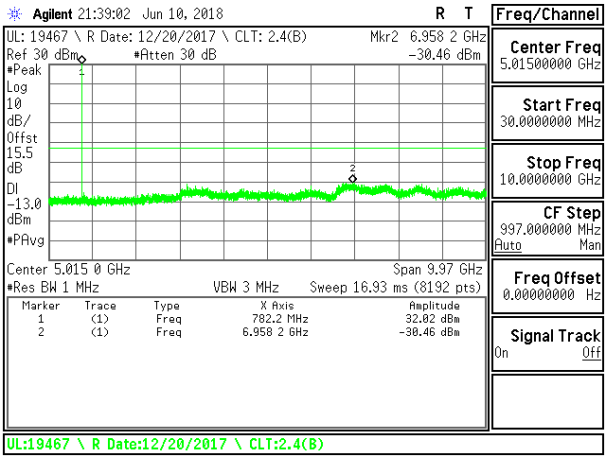


LTE B13 5MHz 16QAM Middle Channel RB1-0

LTE B13 5MHz Q



PSK High Channel RB1-0



LTE B13 5MHz 16QAM High Channel RB1-0

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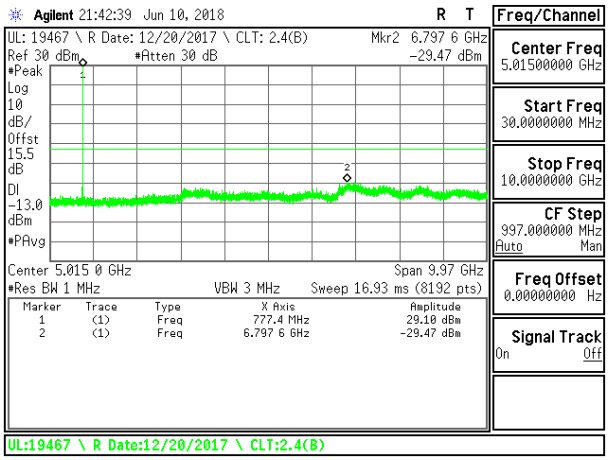
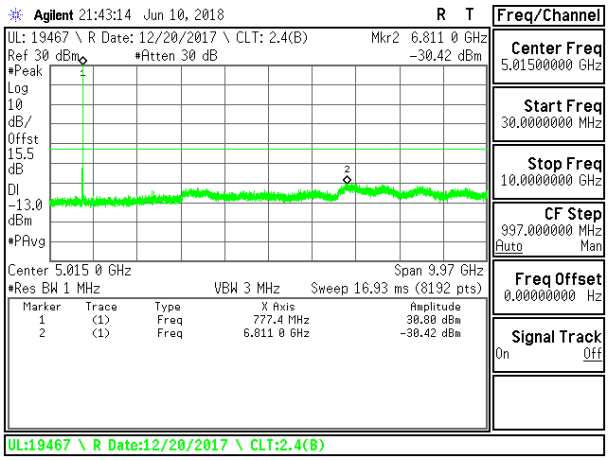


LTE B13 10MHz QPSK Middle Channel RB1-0



LTE B13 10MHz 16QAM Middle Channel RB1-0

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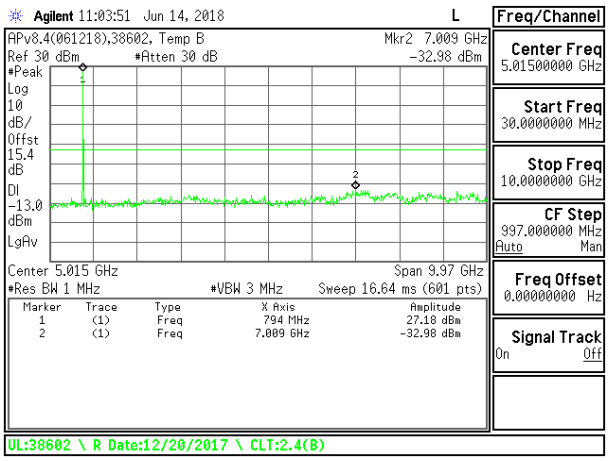
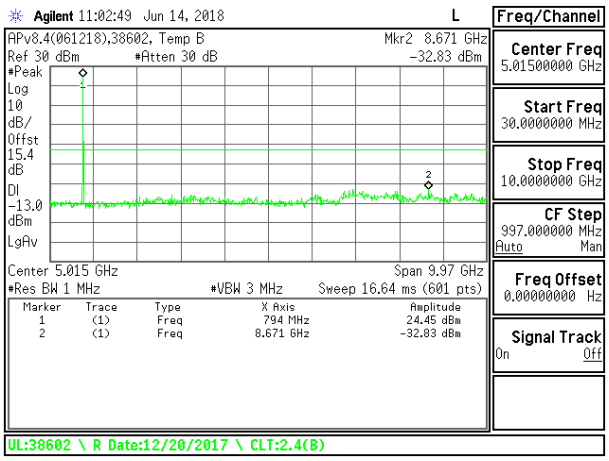
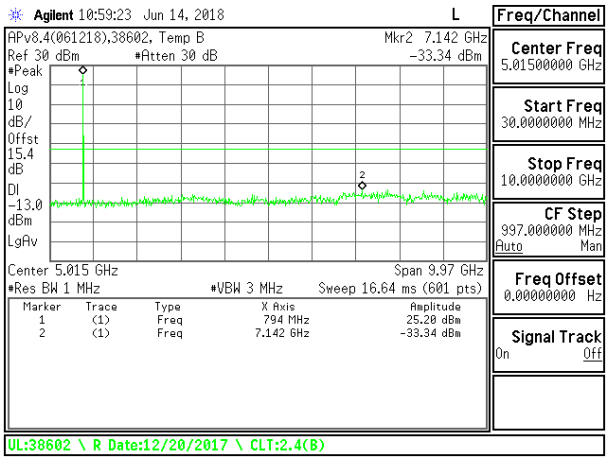
8.3.6. LTE BAND 14



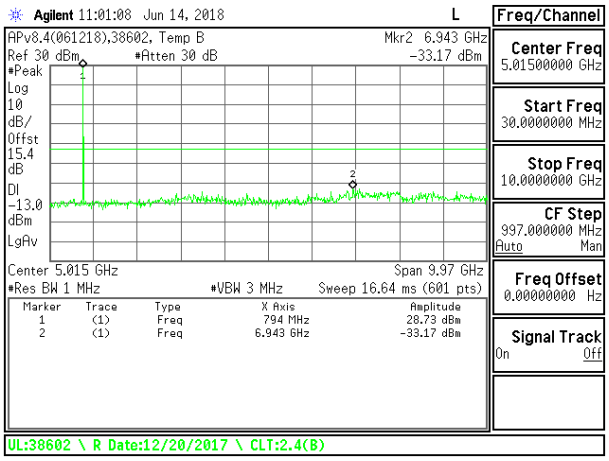
LTE B14 5MHz QPSK Low Channel RB1-0



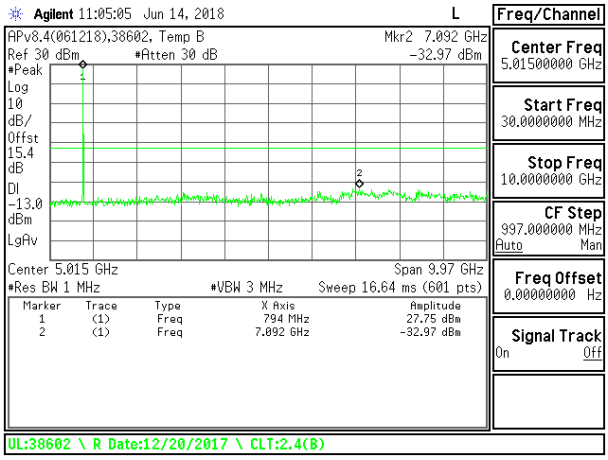
LTE B14 5MHz 16QAM Low Channel RB1-0



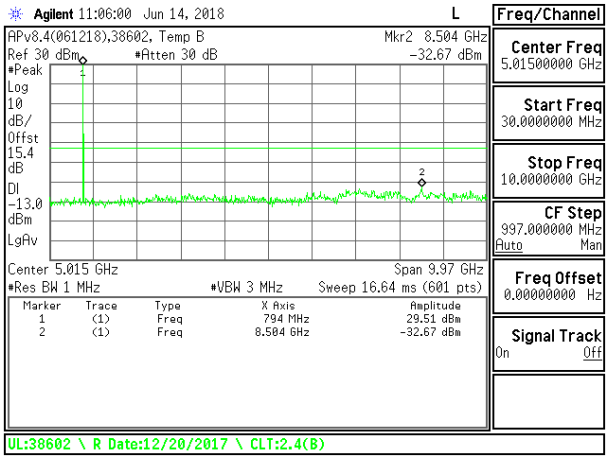
LTE B14 5MHz QPSK Middle Channel RB1-0



LTE B14 5MHz 16QAM Middle Channel RB1-0



LTE B14 5MHz QPSK High Channel RB1-0



LTE B14 5MHz 16QAM High Channel RB1-0

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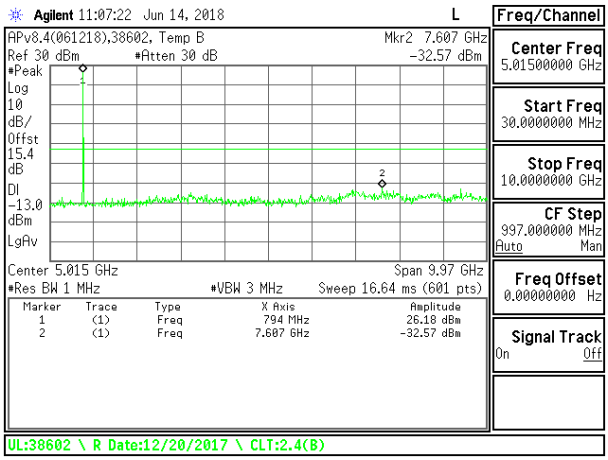
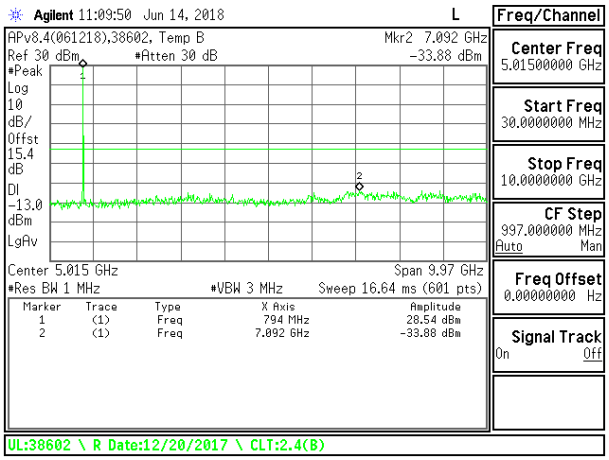


LTE B14 10MHz QPSK Middle Channel RB1-0



LTE B14 10MHz 16QAM Middle Channel RB1-0

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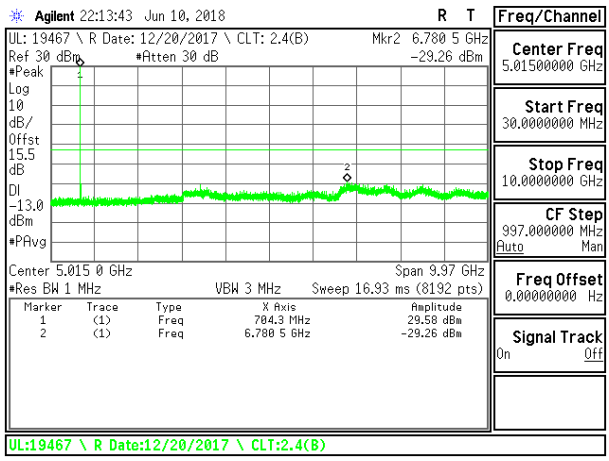
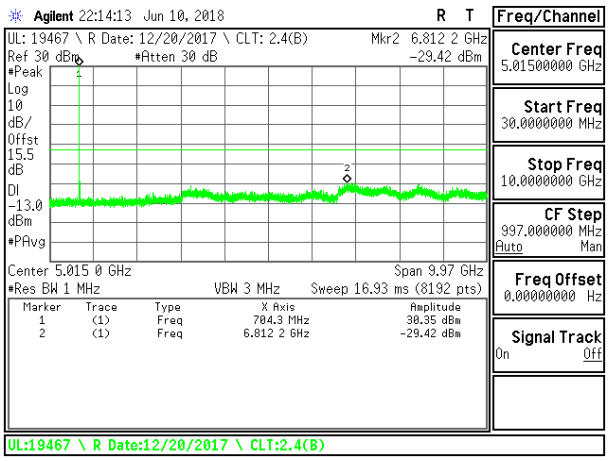
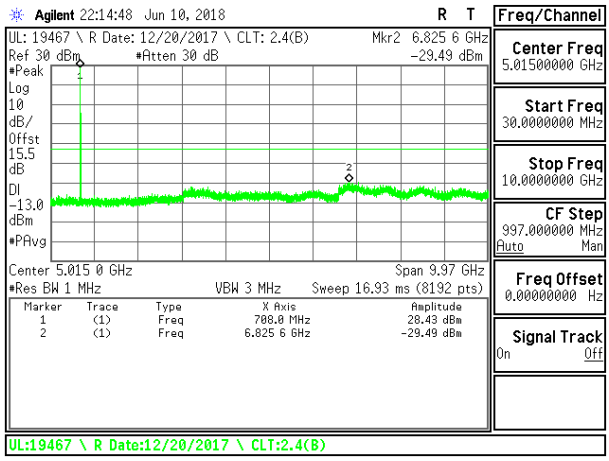
8.3.7. LTE BAND 17



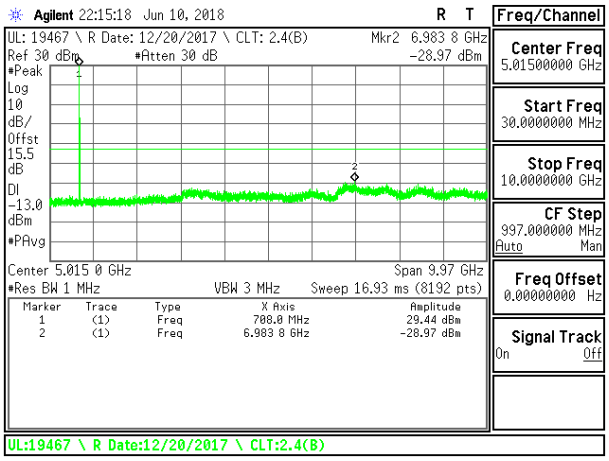
LTE B17 5MHz QPSK Low Channel RB1-0



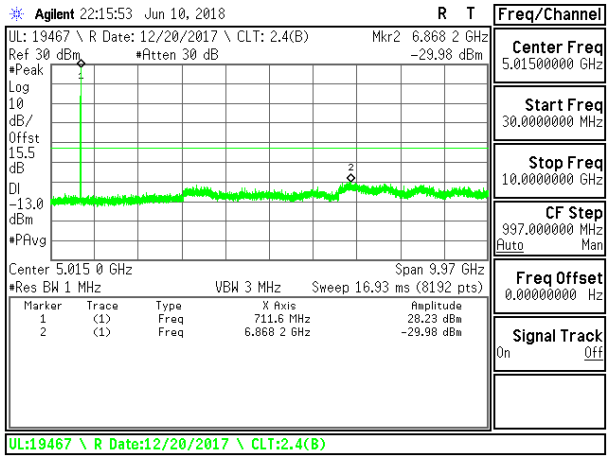
LTE B17 5MHz 16QAM Low Channel RB1-0



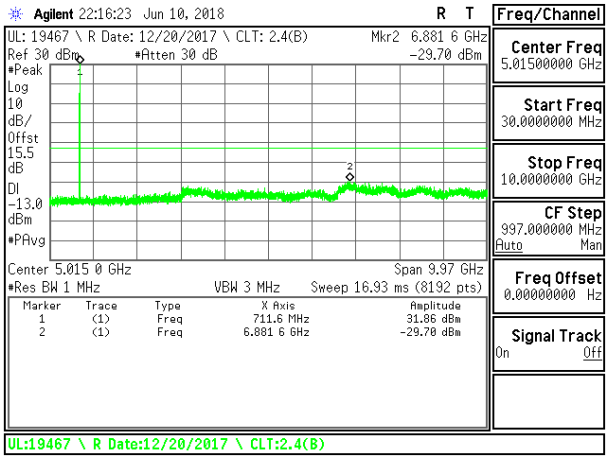
LTE B17 5MHz QPSK Middle Channel RB1-0



LTE B17 5MHz 16QAM Middle Channel RB1-0



LTE B17 5MHz QPSK High Channel RB1-0



LTE B17 5MHz 16QAM High Channel RB1-0

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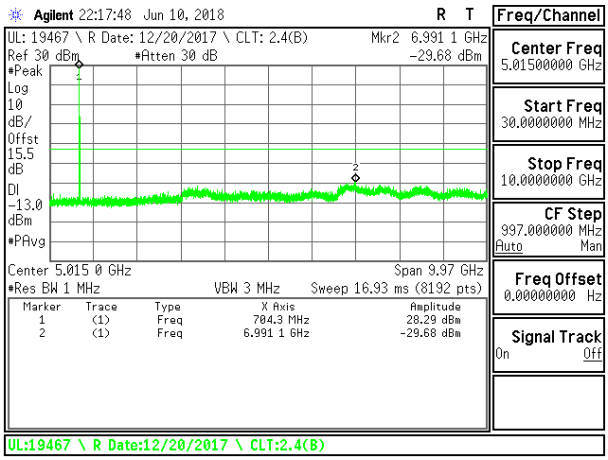
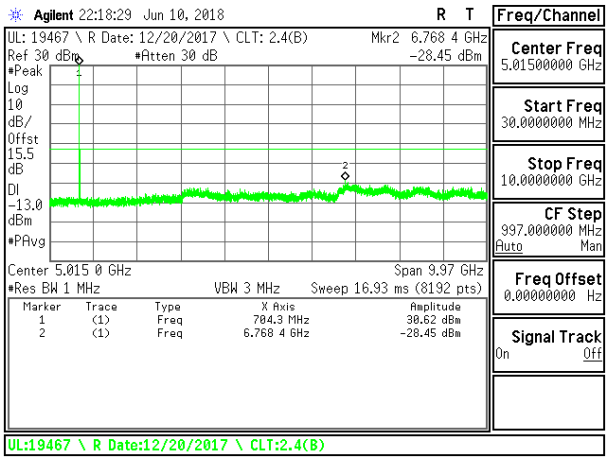
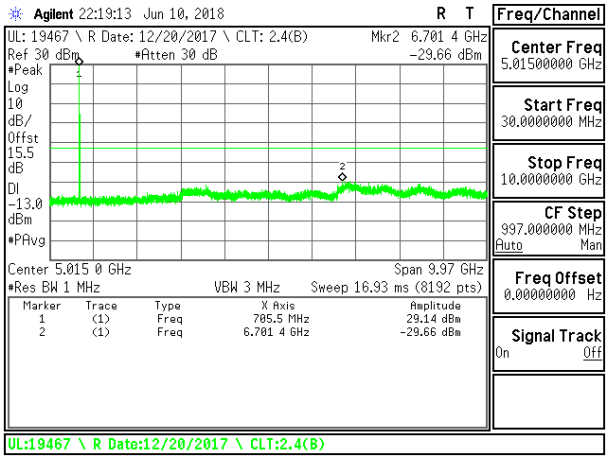


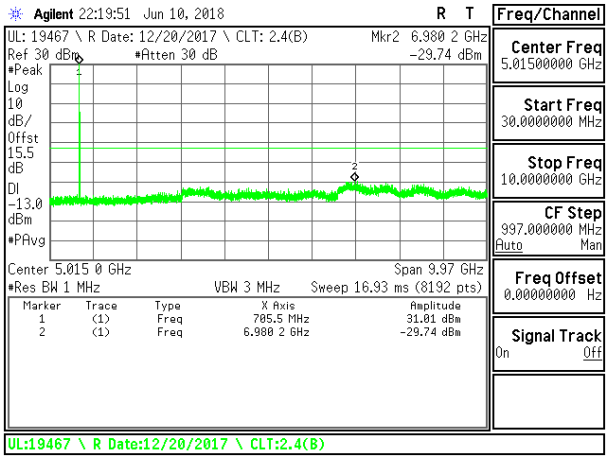
LTE B17 10MHz QPSK Low Channel RB1-0



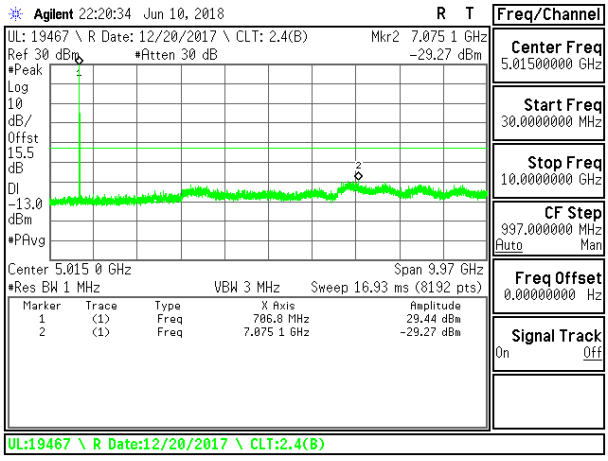
LTE B17 10MHz 16QAM Low Channel RB1-0



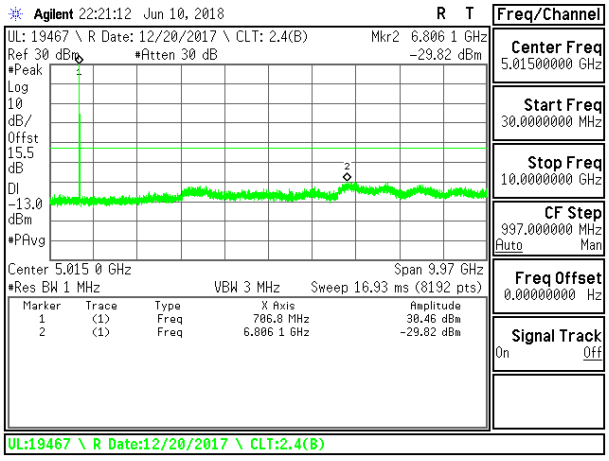
LTE B17 10MHz QPSK Middle Channel RB1-0



LTE B17 10MHz 16QAM Middle Channel RB1-0



LTE B17 10MHz QPSK High Channel RB1-0



LTE B17 10MHz 16QAM High Channel RB1-0

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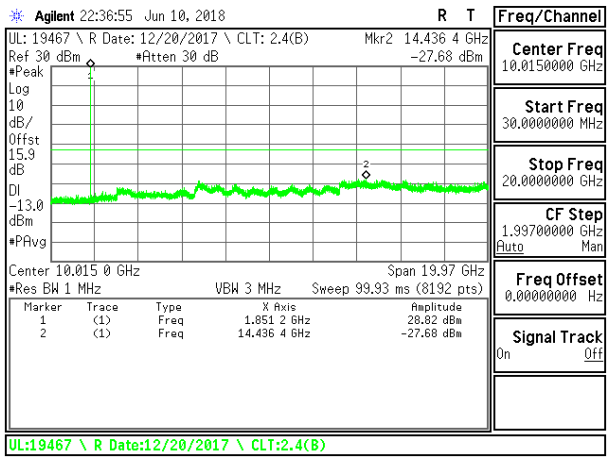
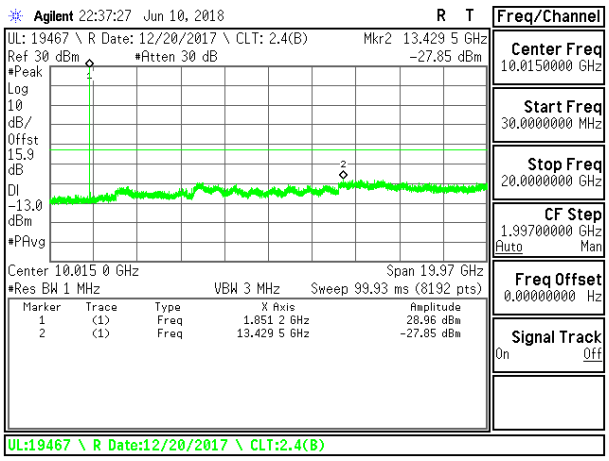
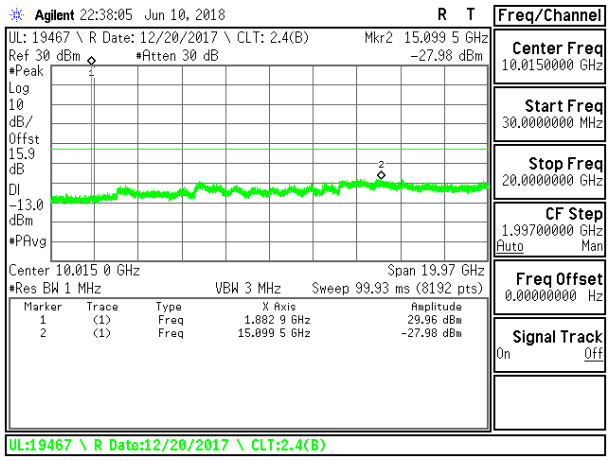
8.3.8. LTE BAND 25



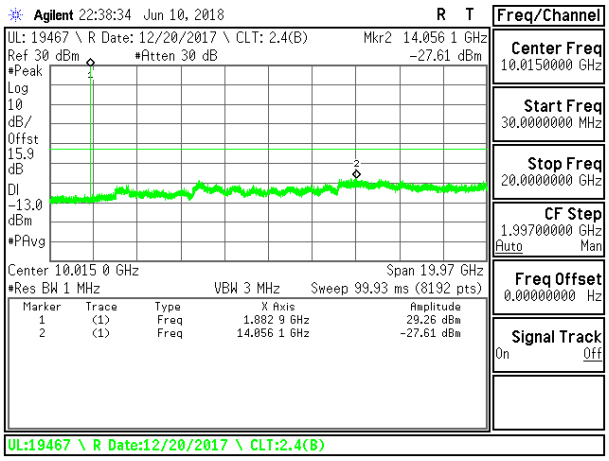
LTE B25 1.4MHz QPSK Low Channel RB1-0



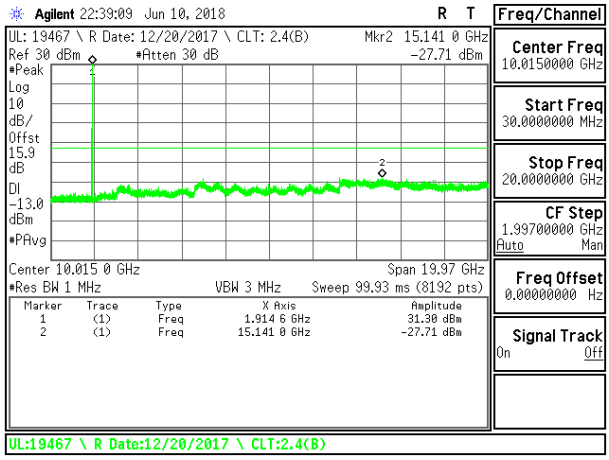
LTE B25 1.4MHz 16QAM Low Channel RB1-0



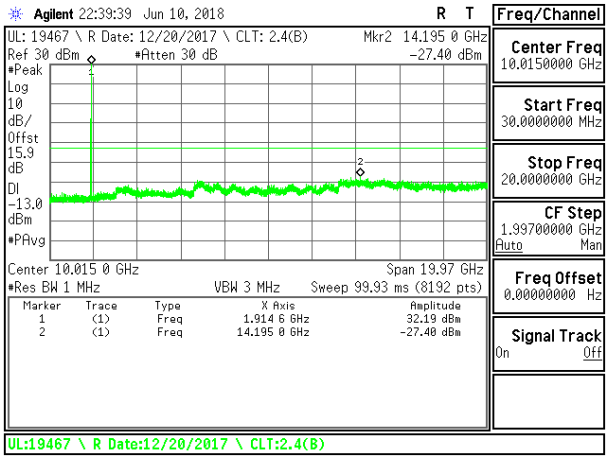
LTE B25 1.4MHz QPSK Middle Channel RB1-0



LTE B25 1.4MHz 16QAM Middle Channel RB1-0



LTE B25 1.4MHz QPSK High Channel RB1-0



LTE B25 1.4MHz 16QAM High Channel RB1-0

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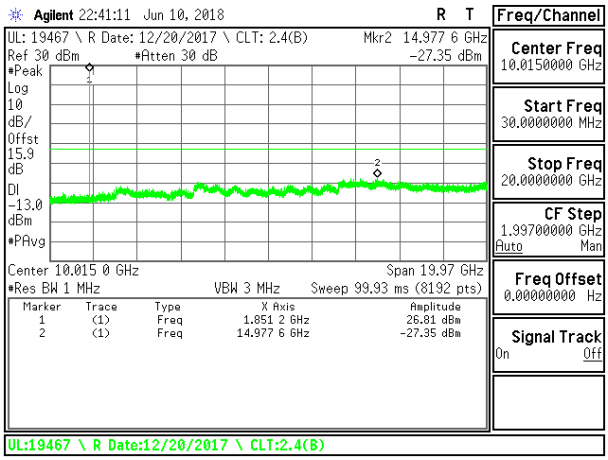
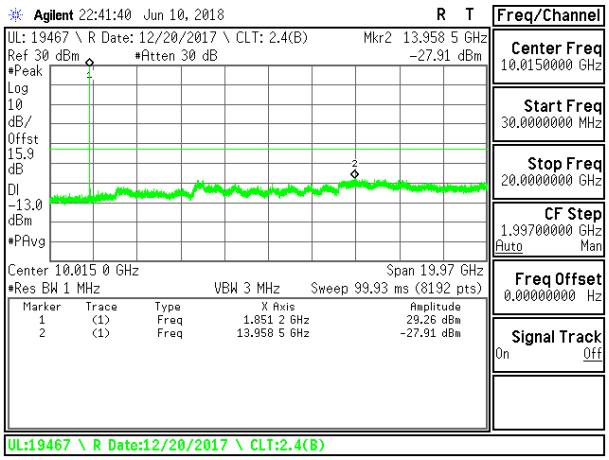
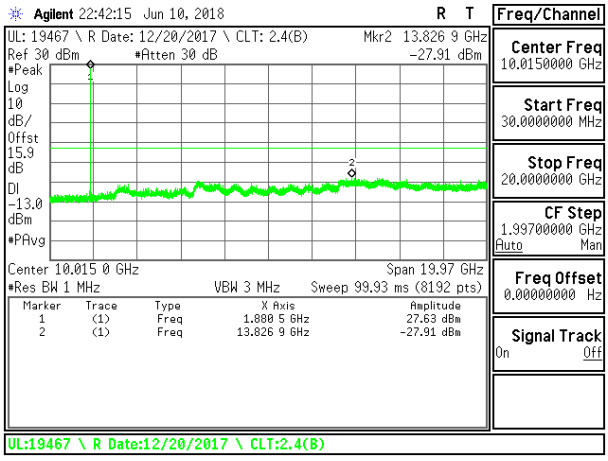


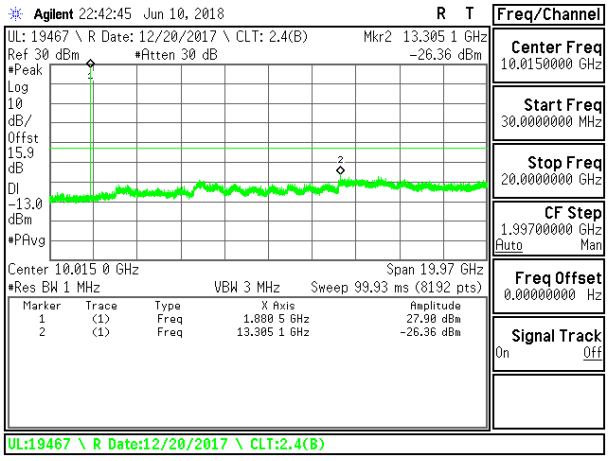
LTE B25 3MHz QPSK Low Channel RB1-0



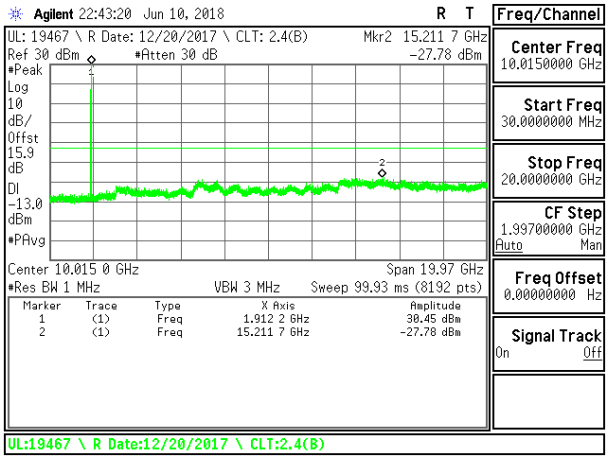
LTE B25 3MHz 16QAM Low Channel RB1-0



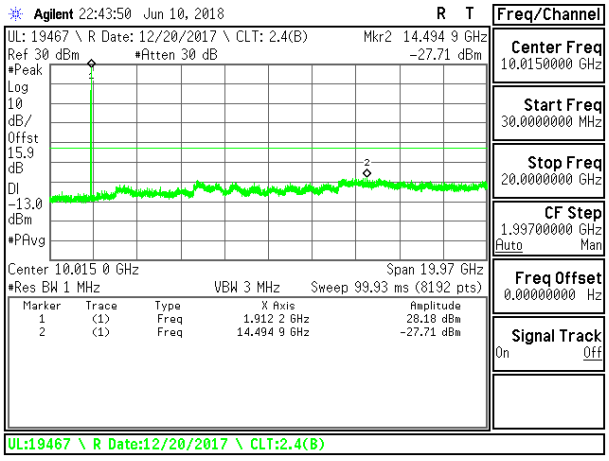
LTE B25 3MHz QPSK Middle Channel RB1-0



LTE B25 3MHz 16QAM Middle Channel RB1-0



LTE B25 3MHz QPSK High Channel RB1-0



LTE B25 3MHz 16QAM High Channel RB1-0

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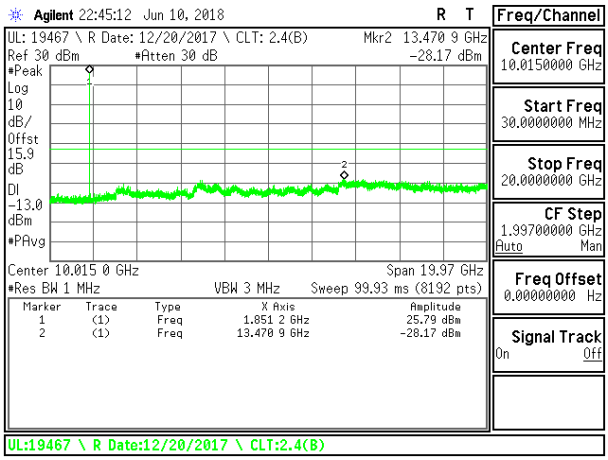
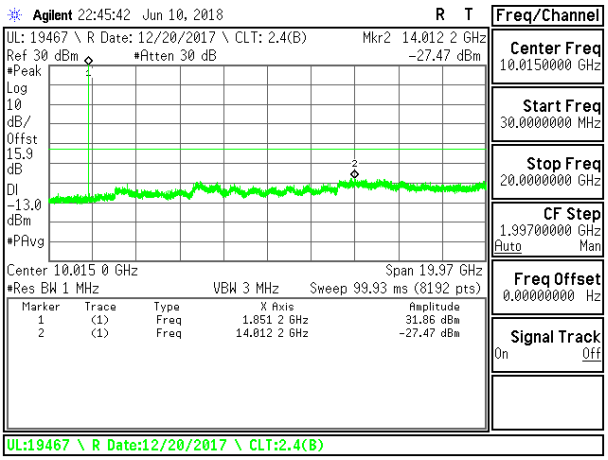
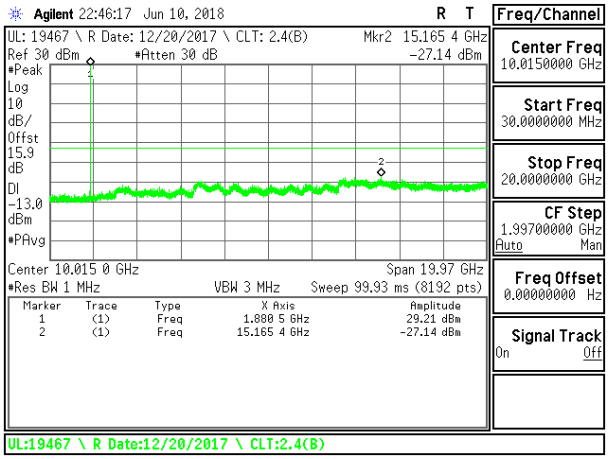


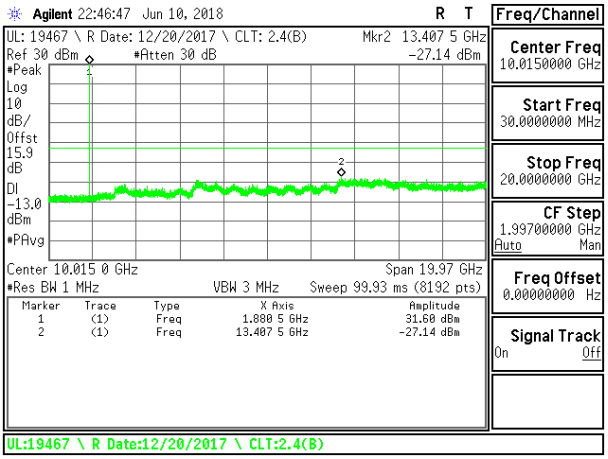
LTE B25 5MHz QPSK Low Channel RB1-0



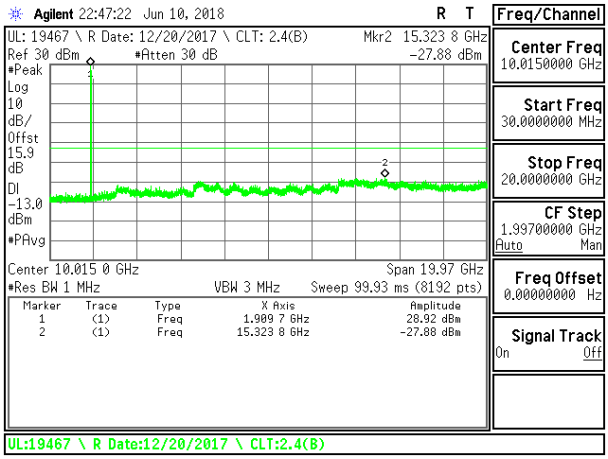
LTE B25 5MHz 16QAM Low Channel RB1-0



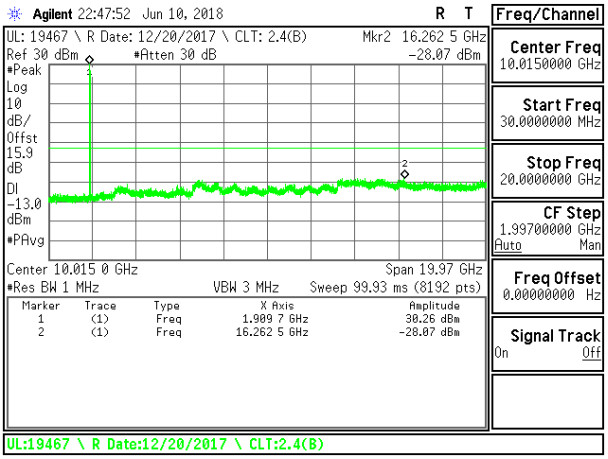
LTE B25 5MHz QPSK Middle Channel RB1-0



LTE B25 5MHz 16QAM Middle Channel RB1-0



LTE B25 5MHz QPSK High Channel RB1-0



LTE B25 5MHz 16QAM High Channel RB1-0

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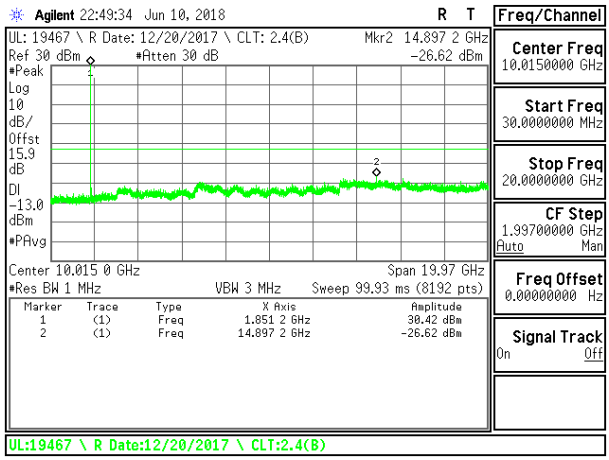
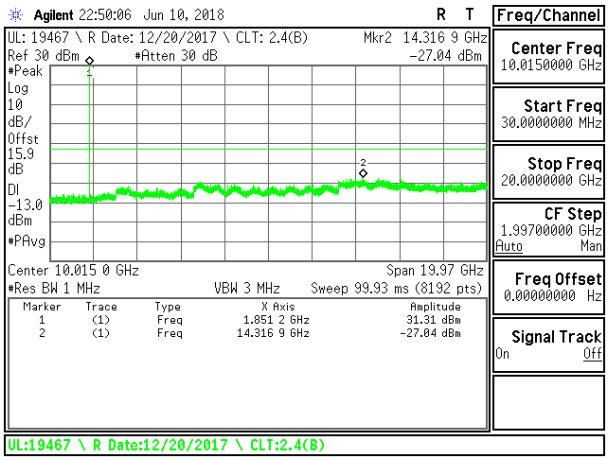
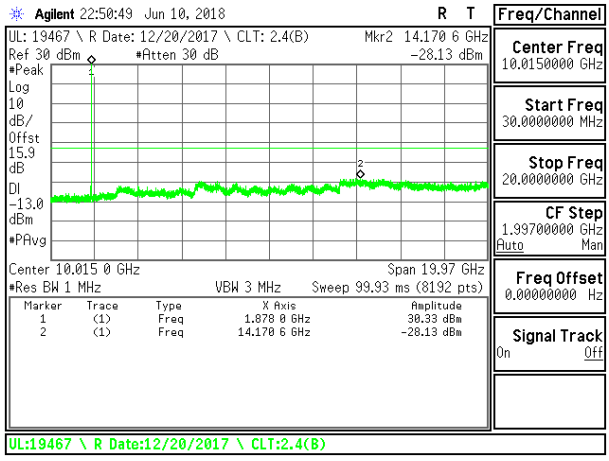


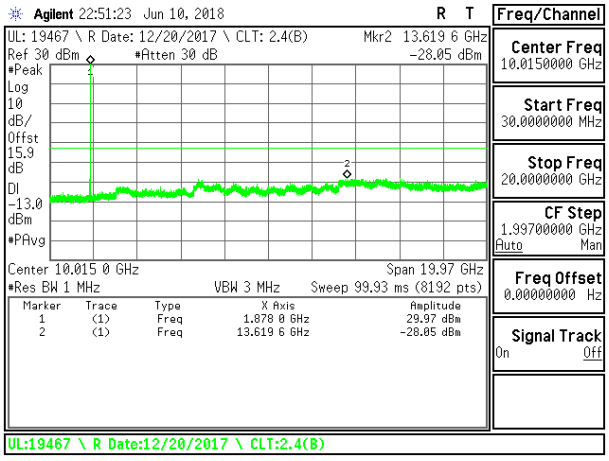
LTE B25 10MHz QPSK Low Channel RB1-0



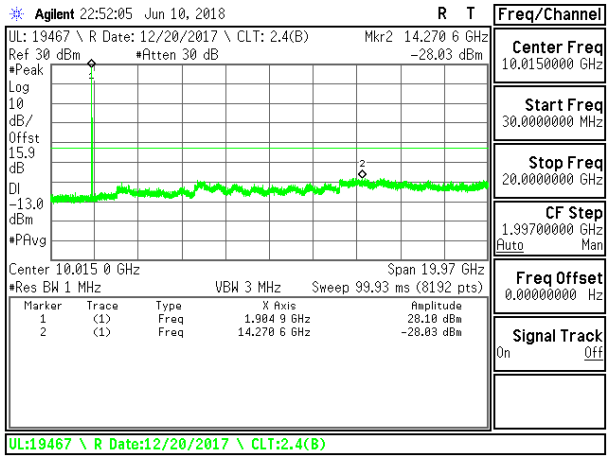
LTE B25 10MHz 16QAM Low Channel RB1-0



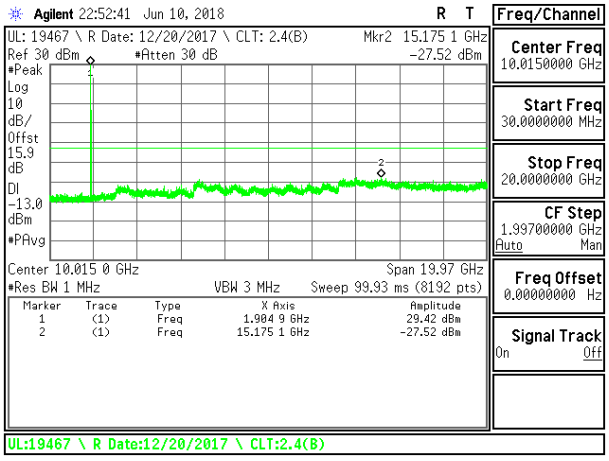
LTE B25 10MHz QPSK Middle Channel RB1-0



LTE B25 10MHz 16QAM Middle Channel RB1-0



LTE B25 10MHz QPSK High Channel RB1-0



LTE B25 10MHz 16QAM High Channel RB1-0

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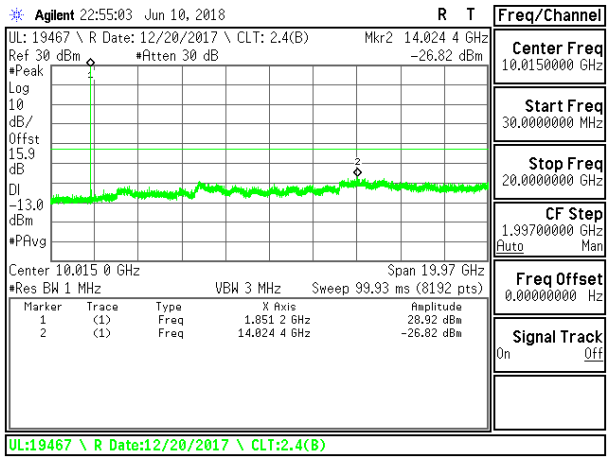
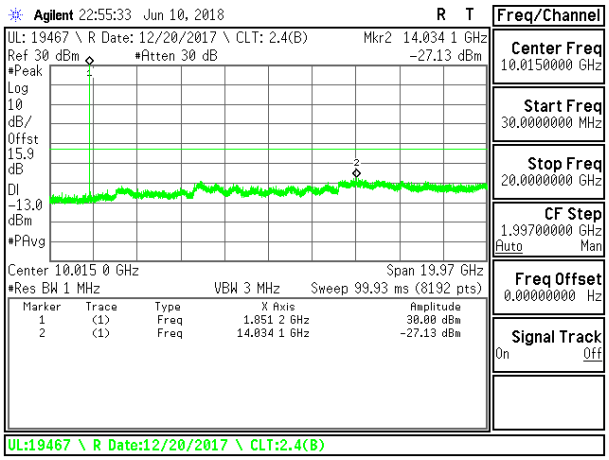
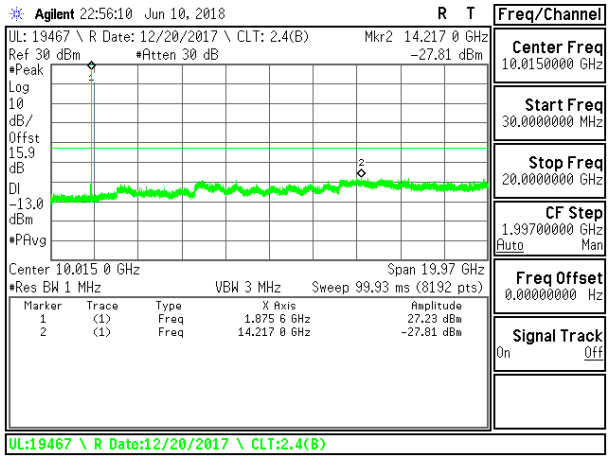


LTE B25 15MHz QPSK Low Channel RB1-0



LTE B25 15MHz 16QAM Low Channel RB1-0



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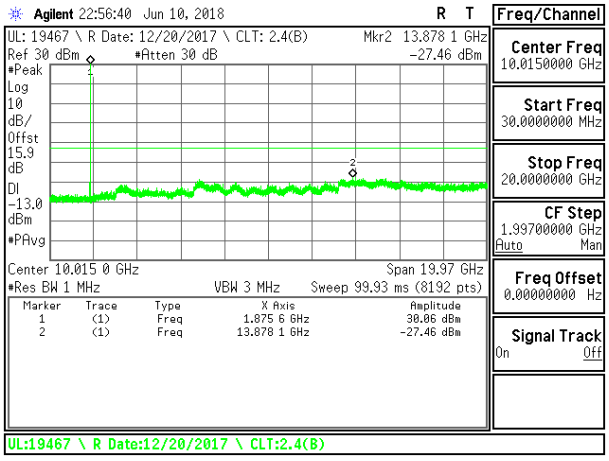

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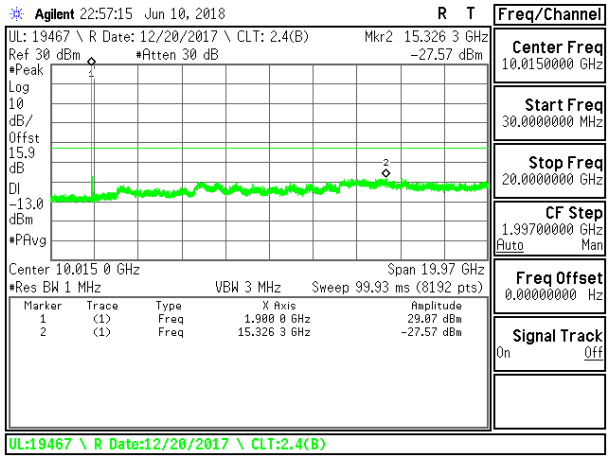
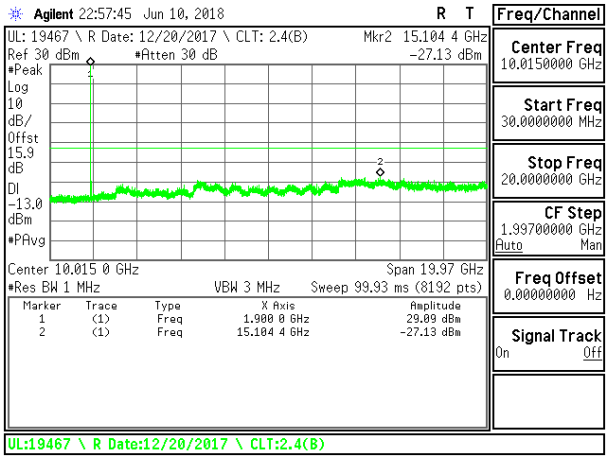


LTE B25 15MHz QPSK High Channel RB1-0



LTE B25 15MHz 16QAM High Channel RB1-0

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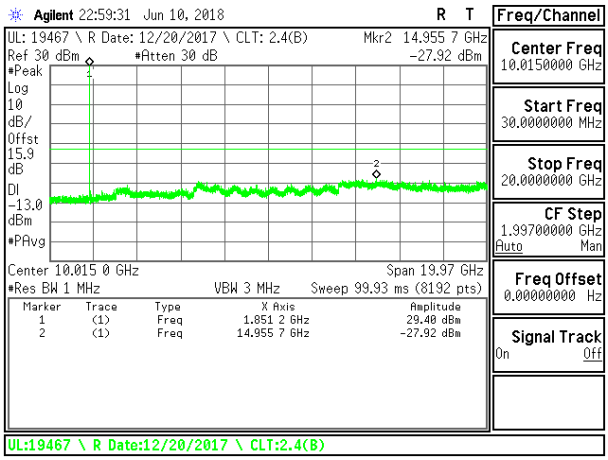

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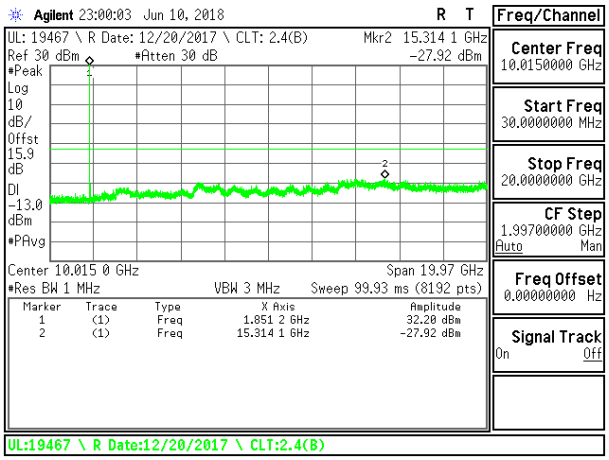

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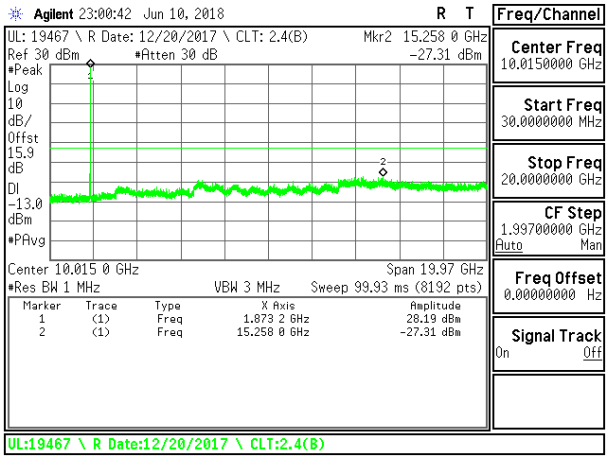

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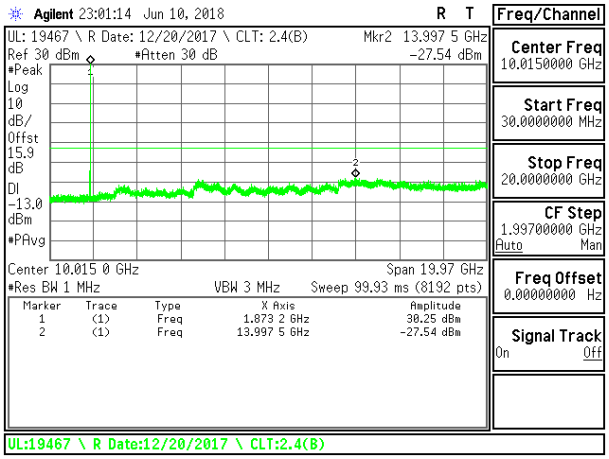

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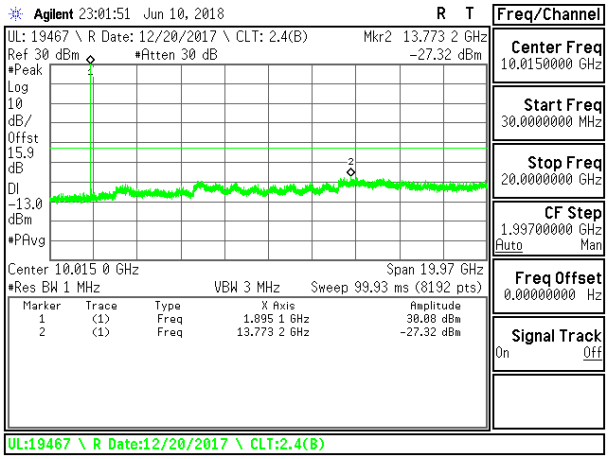

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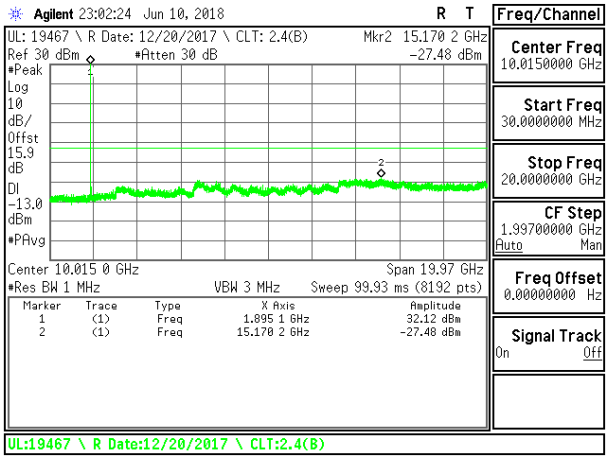

LTE B25 20MHz 16QAM High Channel RB1-0

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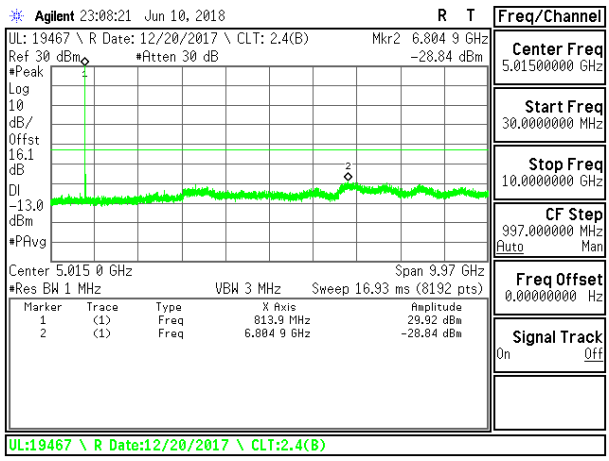
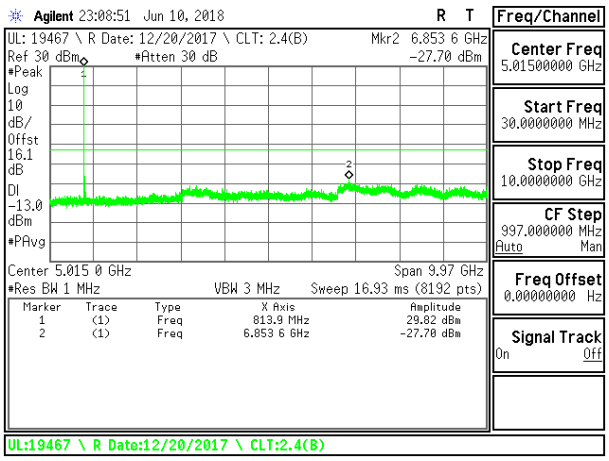
8.3.9. LTE BAND 26 (PART 90S)



LTE B26 1.4MHz QPSK Low Channel RB1-0



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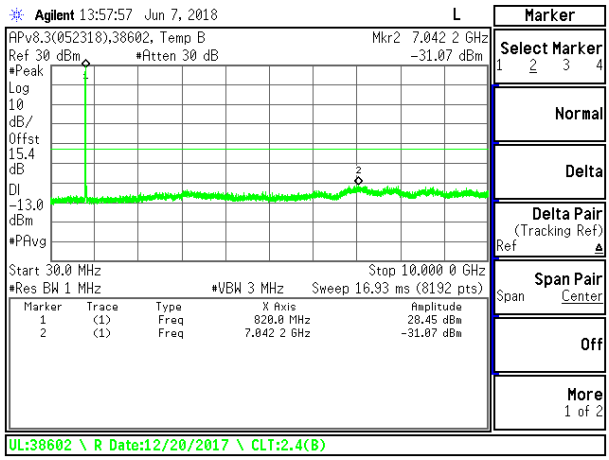
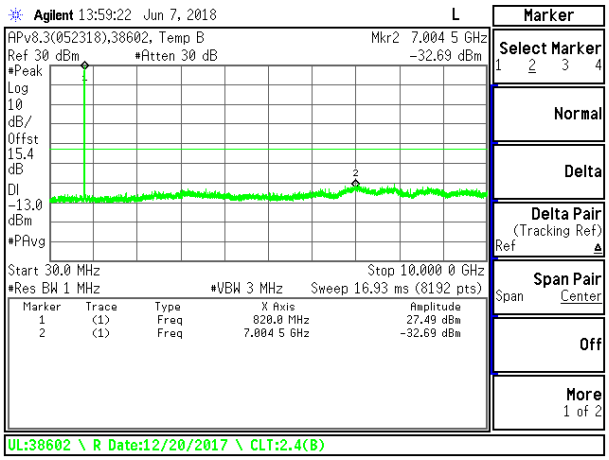


LTE B26 1.4MHz QPSK Middle Channel RB1-0



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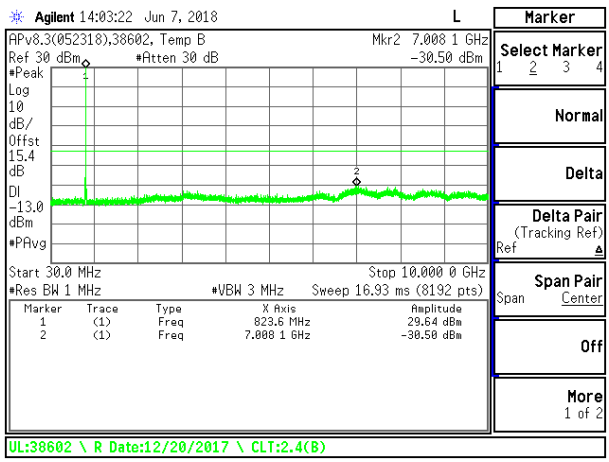
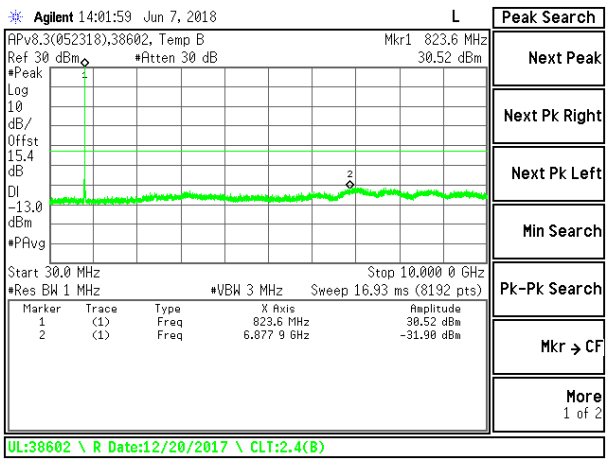


LTE B26 1.4MHz QPSK High Channel RB1-0



LTE B26 1.4MHz 16QAM High Channel RB1-0

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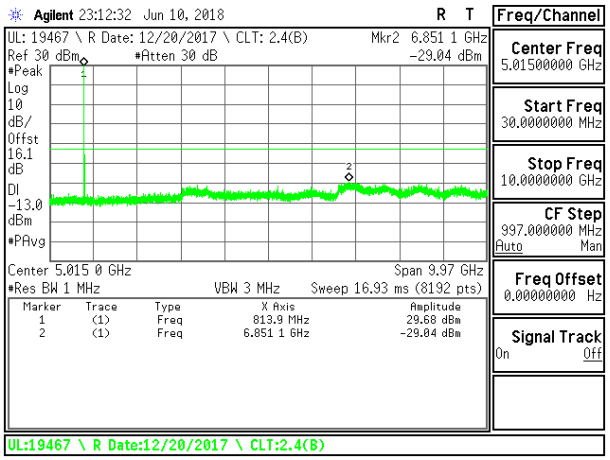

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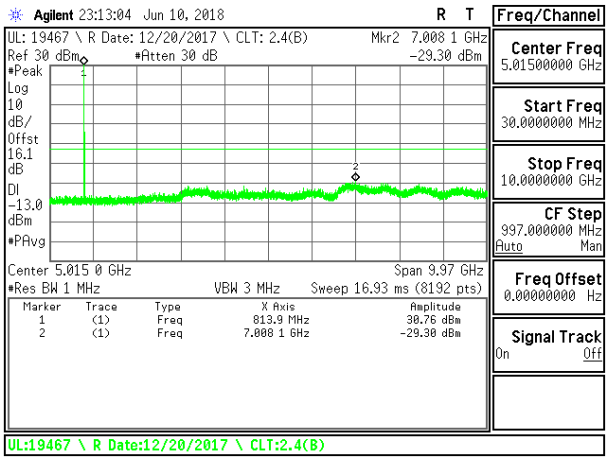

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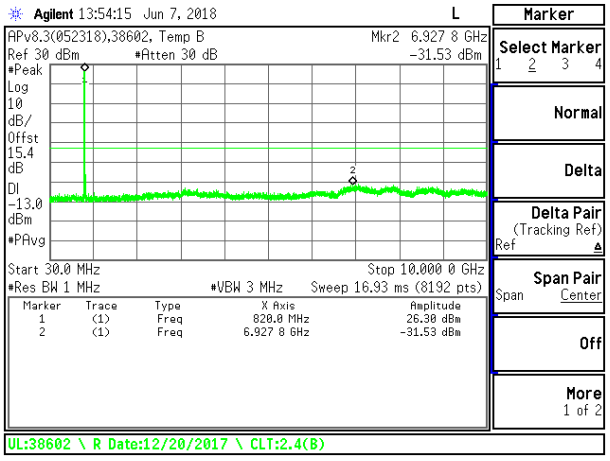

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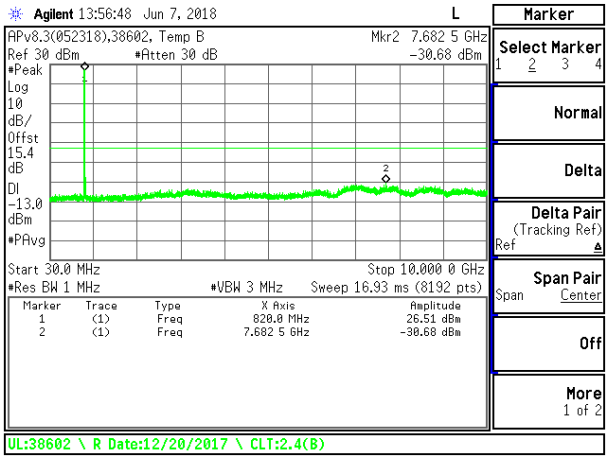

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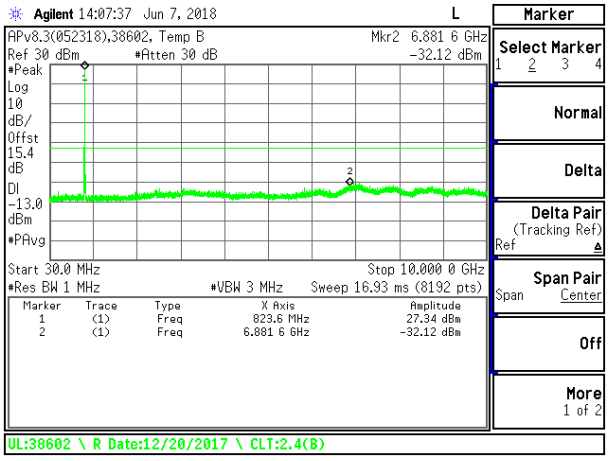
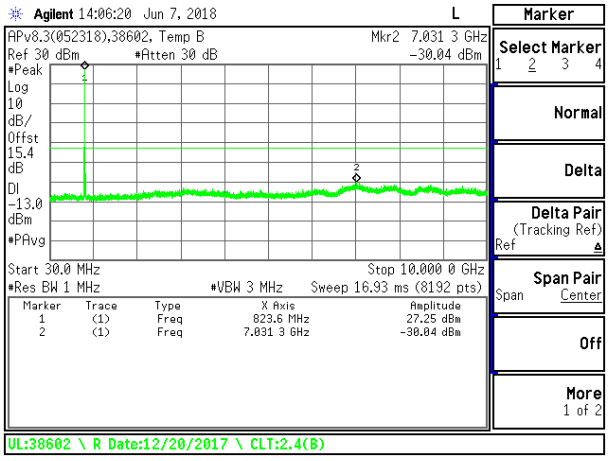


LTE B26 3MHz QPSK High Channel RB1-0



LTE B26 3MHz 16QAM High Channel RB1-0

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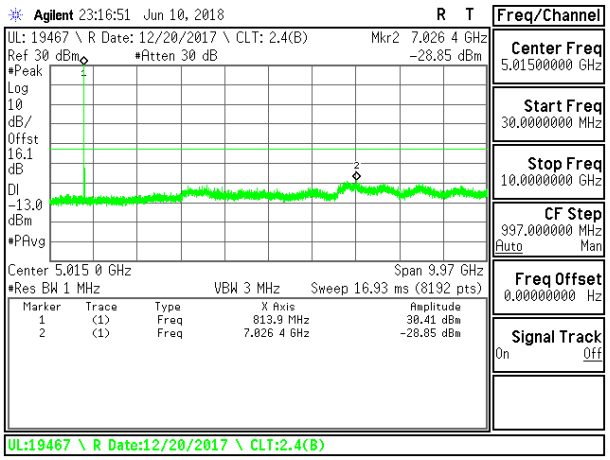
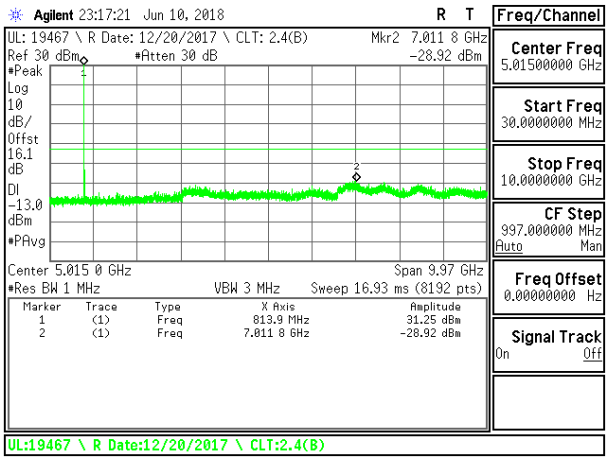
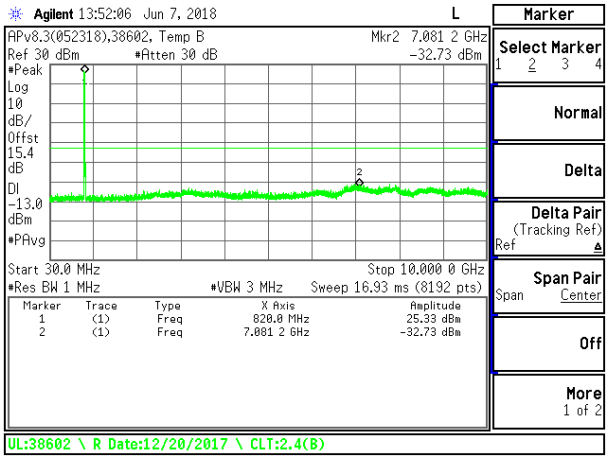


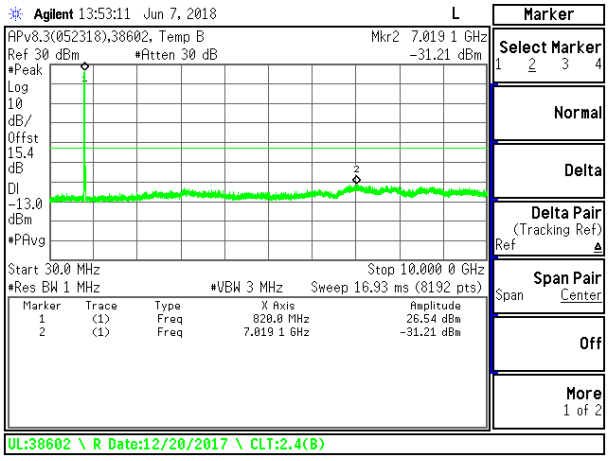
LTE B26 5MHz QPSK Low Channel RB1-0



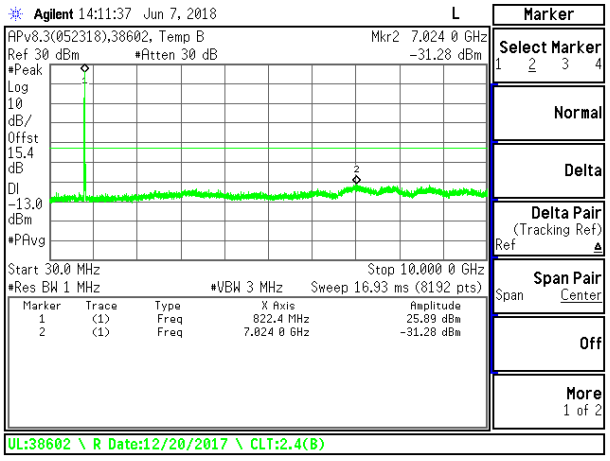
LTE B26 5MHz 16QAM Low Channel RB1-0



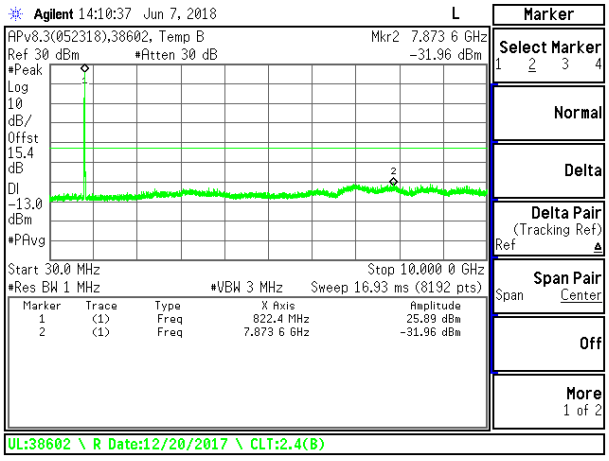
LTE B26 5MHz QPSK Middle Channel RB1-0



LTE B26 5MHz 16QAM Middle Channel RB1-0



LTE B26 5MHz QPSK High Channel RB1-0



LTE B26 5MHz 16QAM High Channel RB1-0

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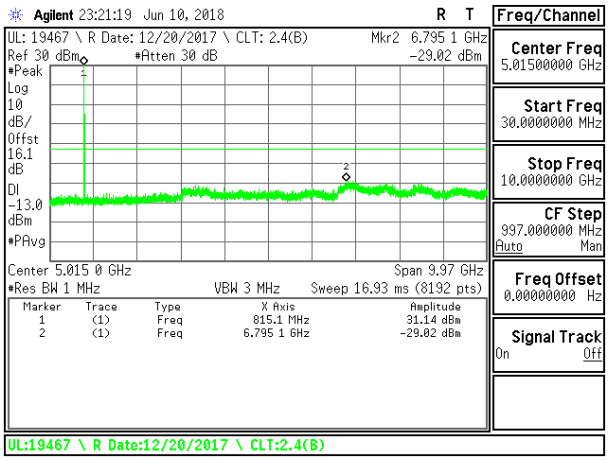
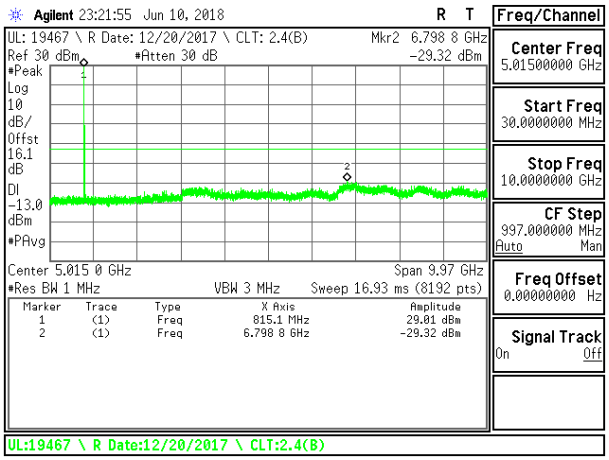


LTE B26 10MHz QPSK Middle Channel RB1-0



LTE B26 10MHz 16QAM Middle Channel RB1-0

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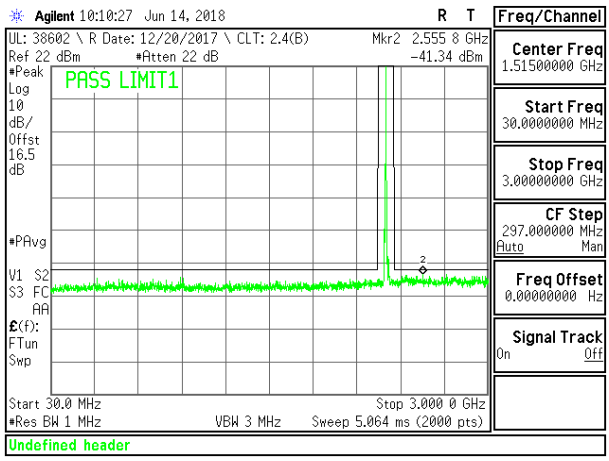
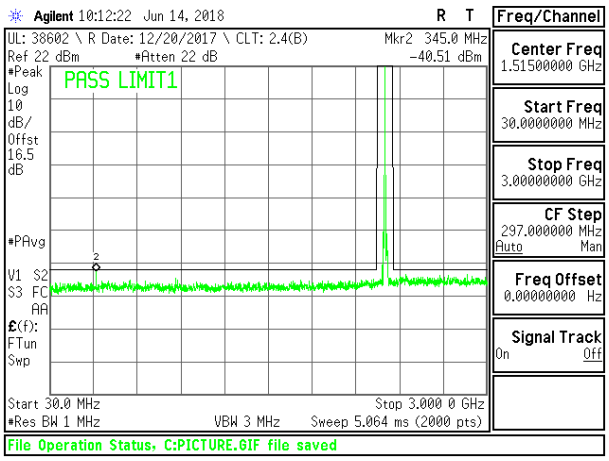
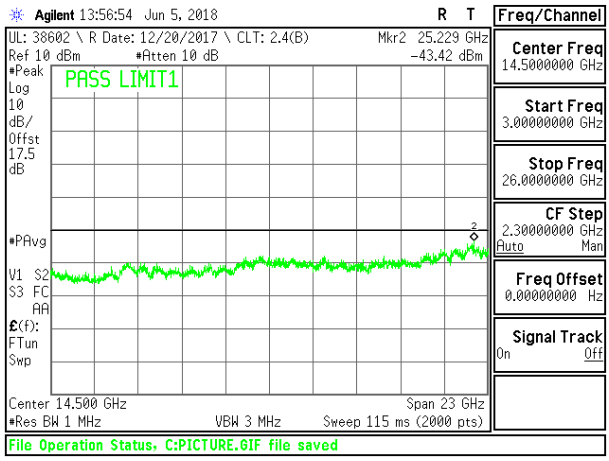
8.3.10. LTE BAND 30



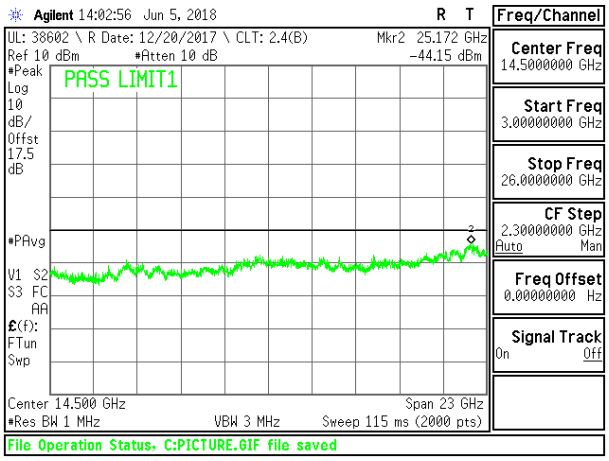
LTE B30 5MHz QPSK Low Channel RB1-0



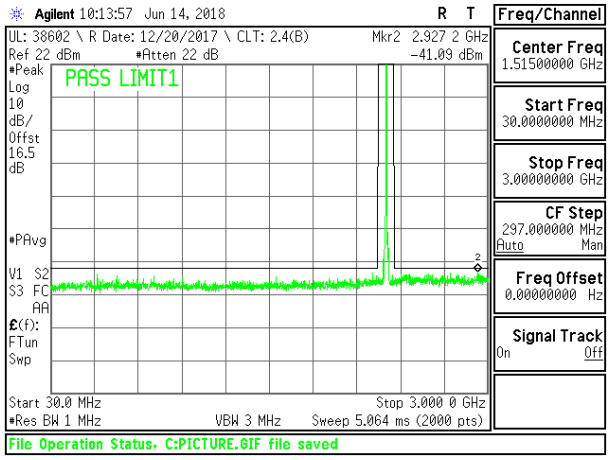
LTE B30 5MHz 16QAM Low Channel RB1-0



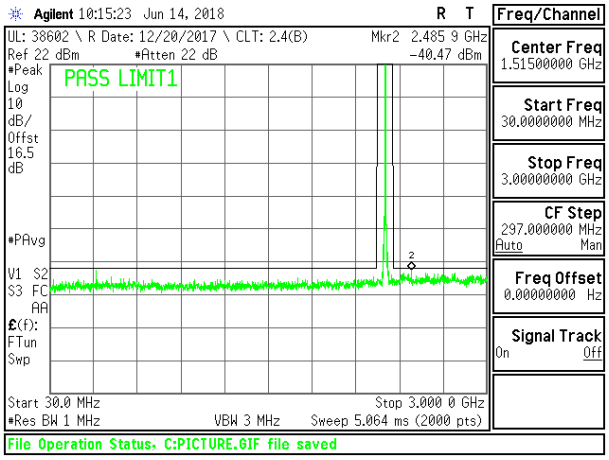
LTE B30 5MHz QPSK Low Channel RB1-0



LTE B30 5MHz 16QAM Low Channel RB1-0



LTE B30 5MHz QPSK Middle Channel RB1-0



LTE B30 5MHz 16QAM Middle Channel RB1-0

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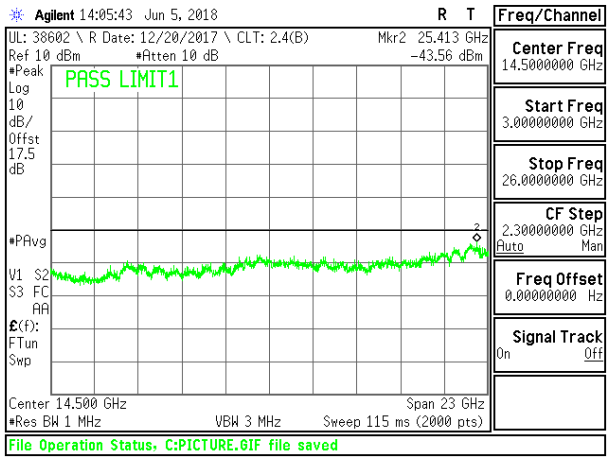
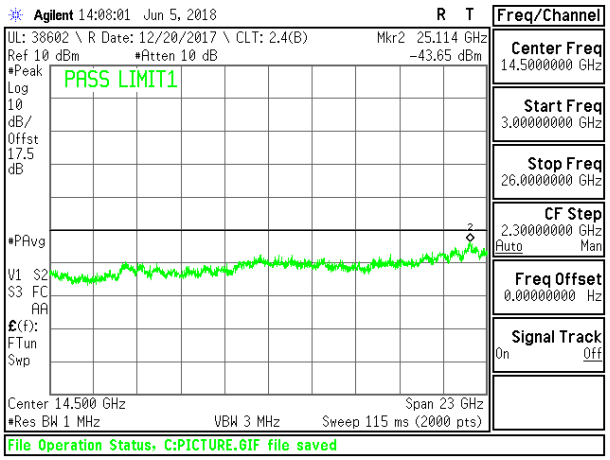
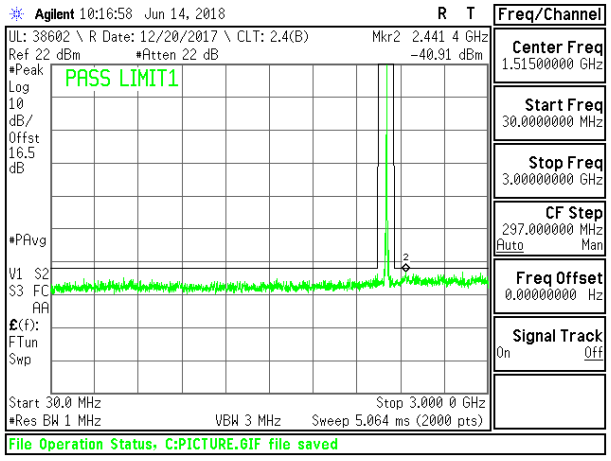


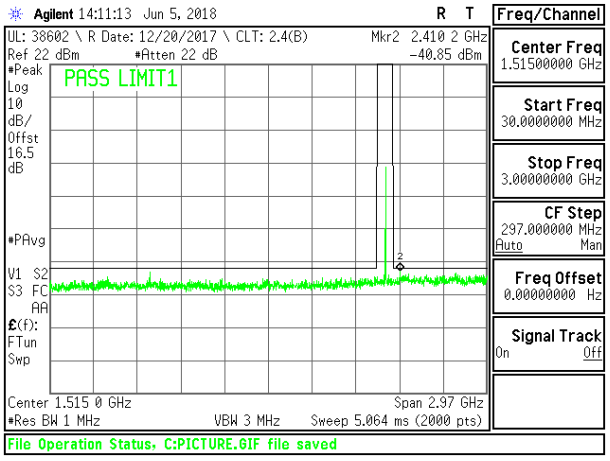
LTE B30 5MHz QPSK Middle Channel RB1-0



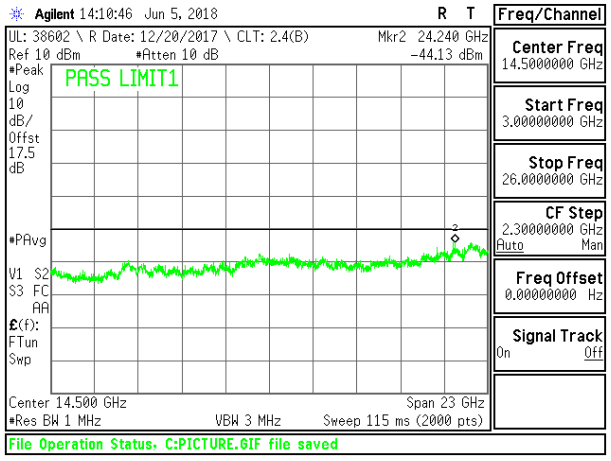
LTE B30 5MHz 16QAM Middle Channel RB1-0



LTE B30 5MHz QPSK High Channel RB1-0



LTE B30 5MHz 16QAM High Channel RB1-0



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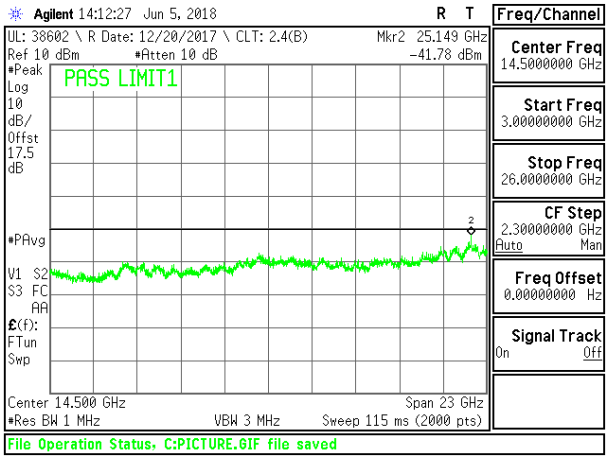

LTE B30 5MHz 16QAM High Channel RB1-0

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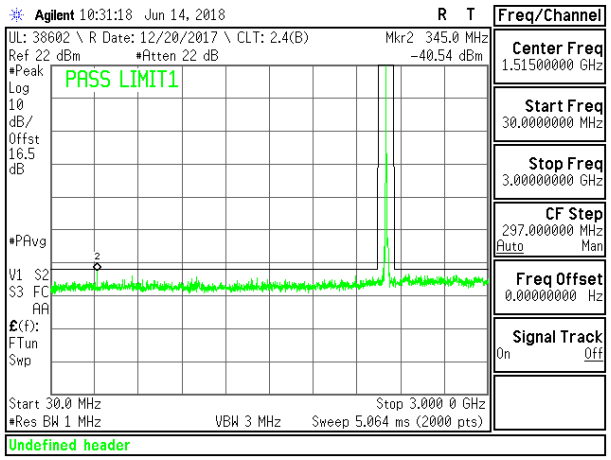
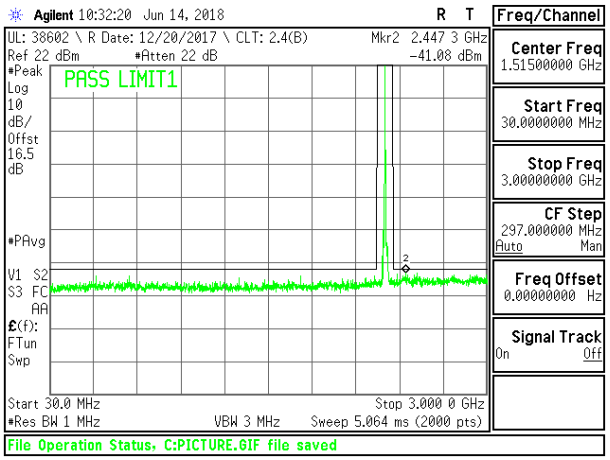
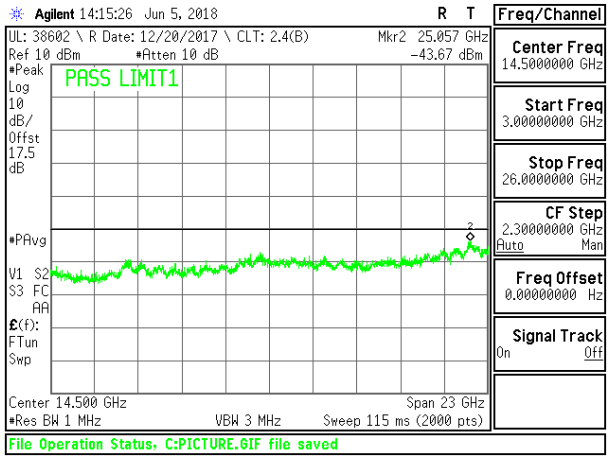


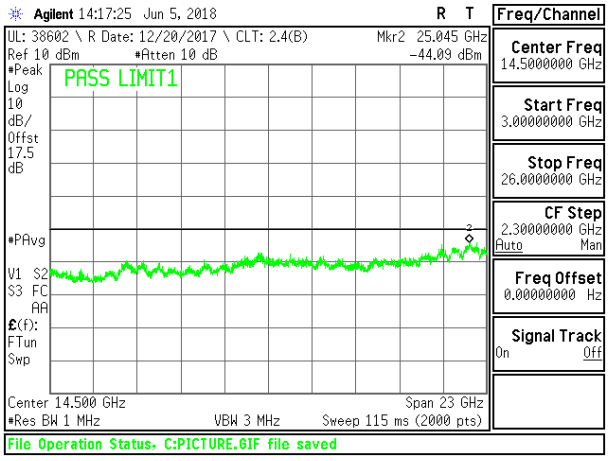
LTE B30 10MHz QPSK Middle Channel RB1-0



LTE B30 10MHz 16QAM Middle Channel RB1-0



LTE B30 10MHz QPSK Middle Channel RB1-0



LTE B30 10MHz 16QAM Middle Channel RB1-0

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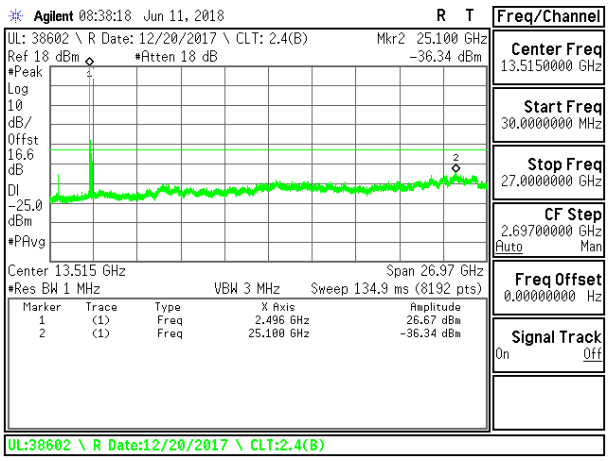
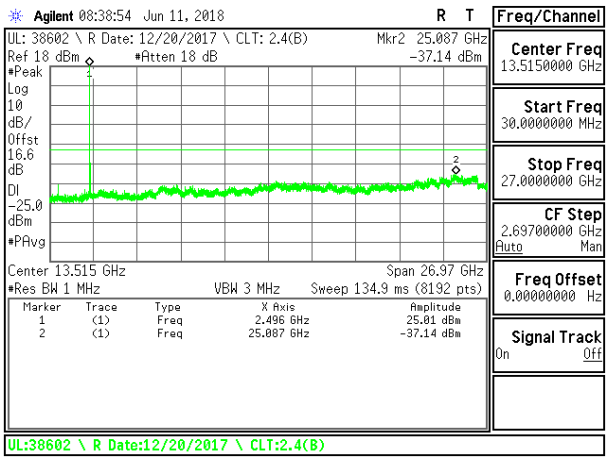
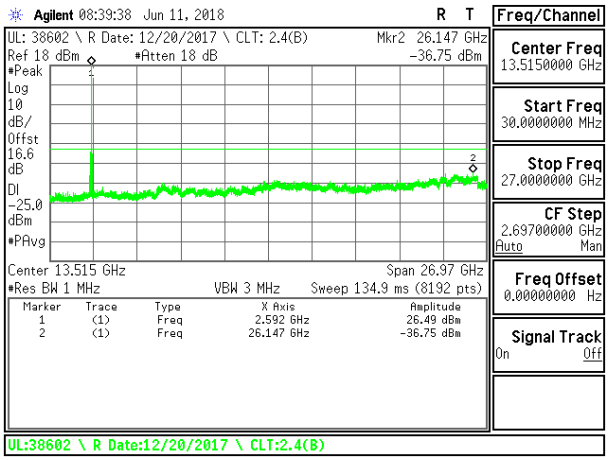
8.3.11. LTE BAND 41



LTE B41 5MHz QPSK Low Channel RB1-0



LTE B41 5MHz 16QAM Low Channel RB1-0



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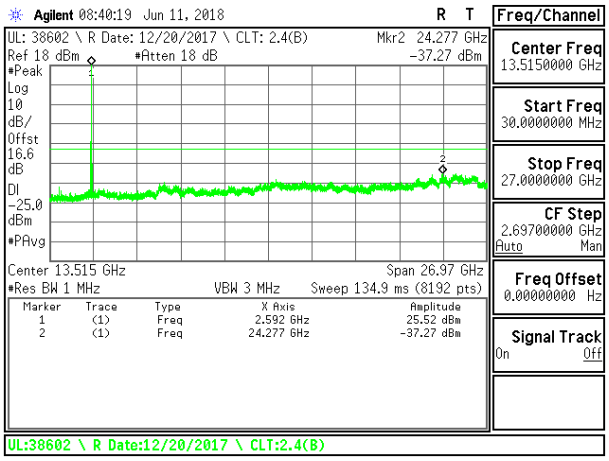
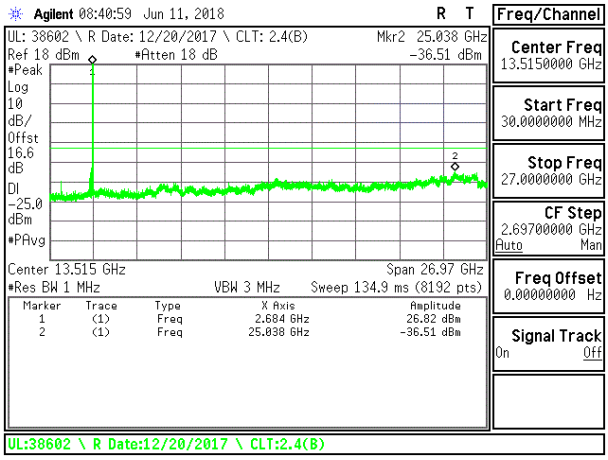
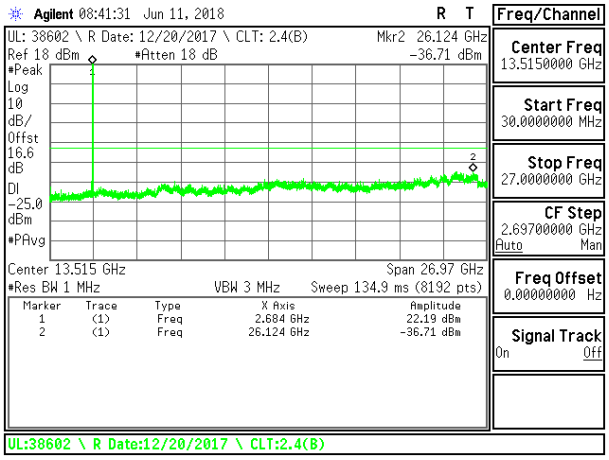


LTE B41 5MHz 16QAM Middle Channel RB1-0



LTE B41 5MHz QPSK High Channel RB1-0



LTE B41 5MHz 16QAM High Channel RB1-0

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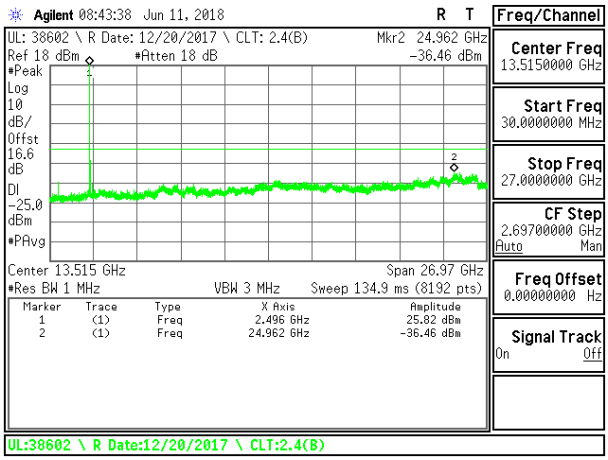
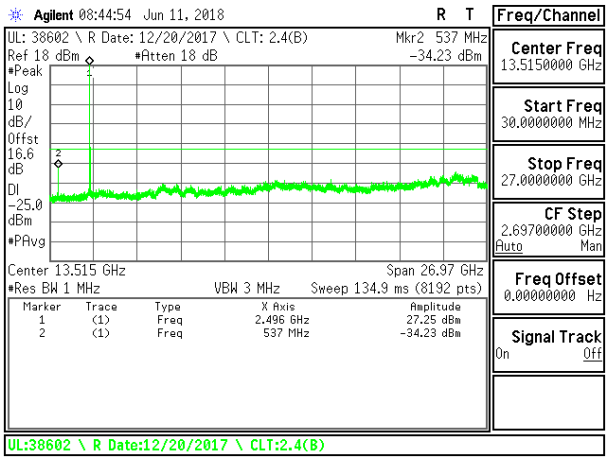
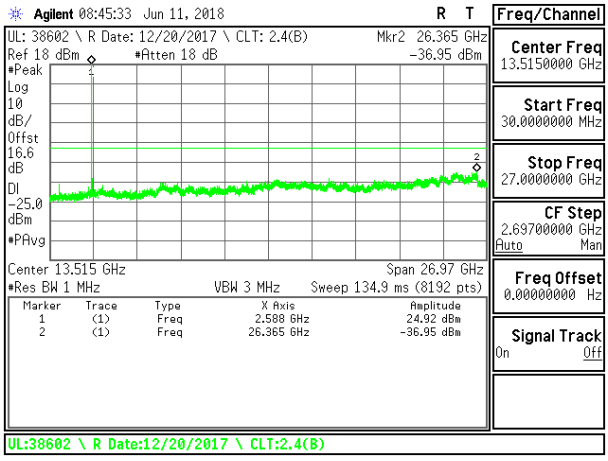


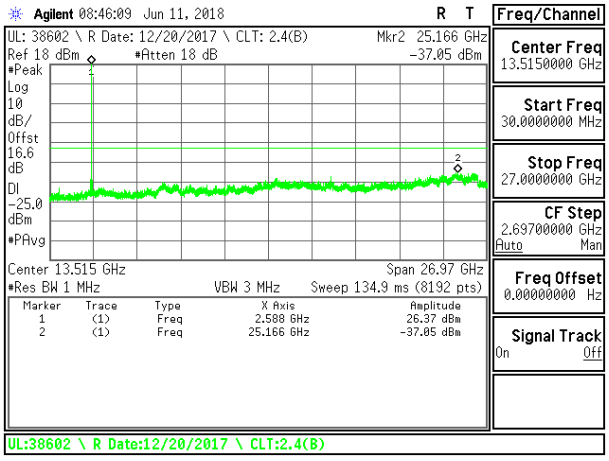
LTE B41 10MHz QPSK Low Channel RB1-0



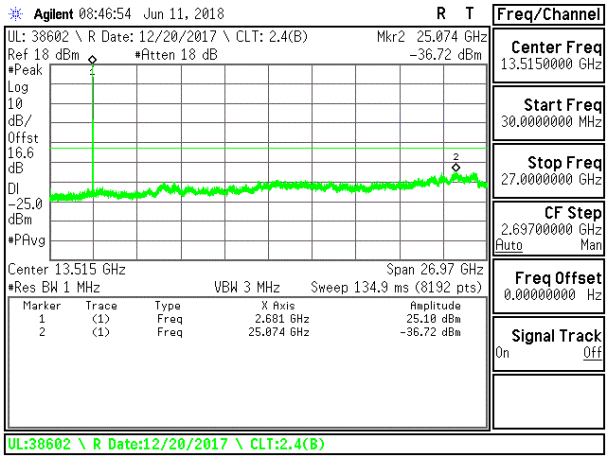
LTE B41 10MHz 16QAM Low Channel RB1-0



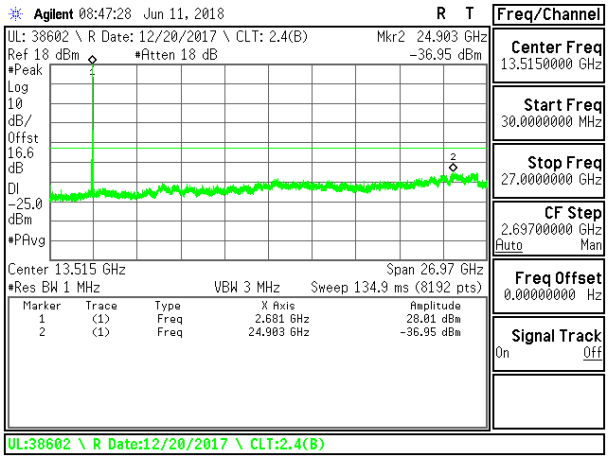
LTE B41 10MHz QPSK Middle Channel RB1-0



LTE B41 10MHz 16QAM Middle Channel RB1-0



LTE B41 10MHz QPSK High Channel RB1-0



LTE B41 10MHz 16QAM High Channel RB1-0

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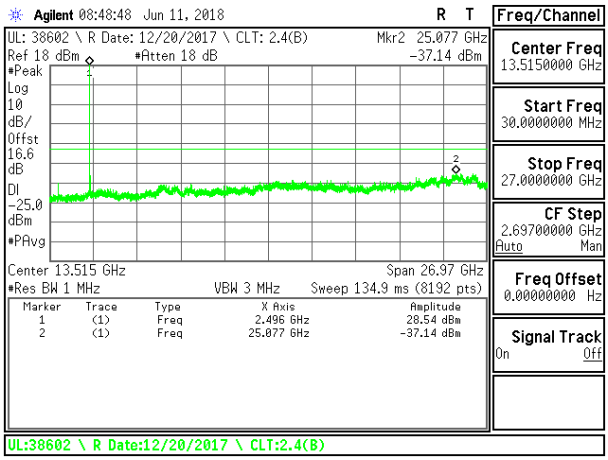
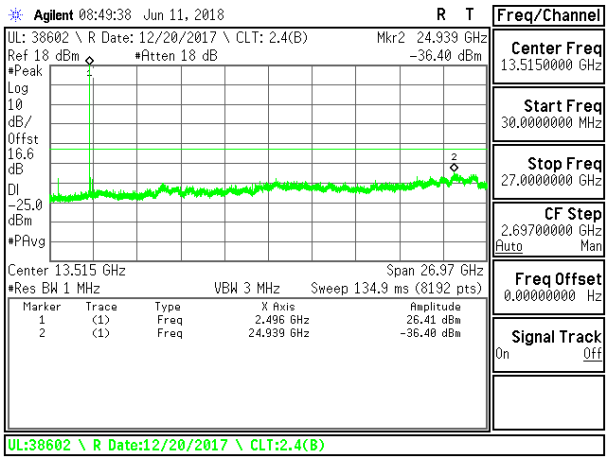
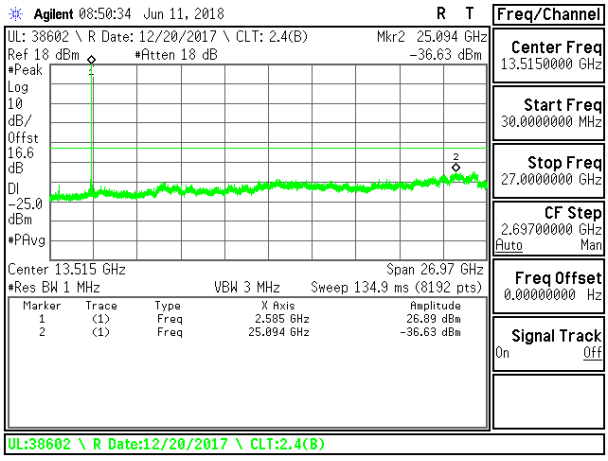


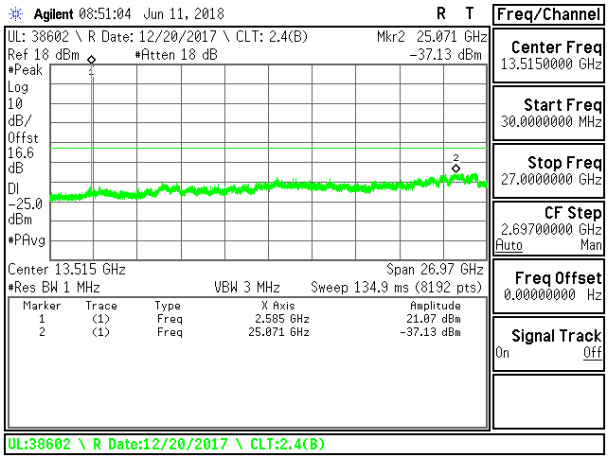
LTE B41 15MHz QPSK Low Channel RB1-0



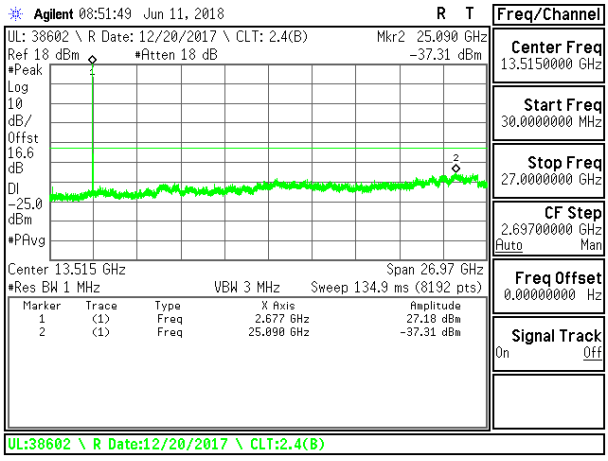
LTE B41 15MHz 16QAM Low Channel RB1-0



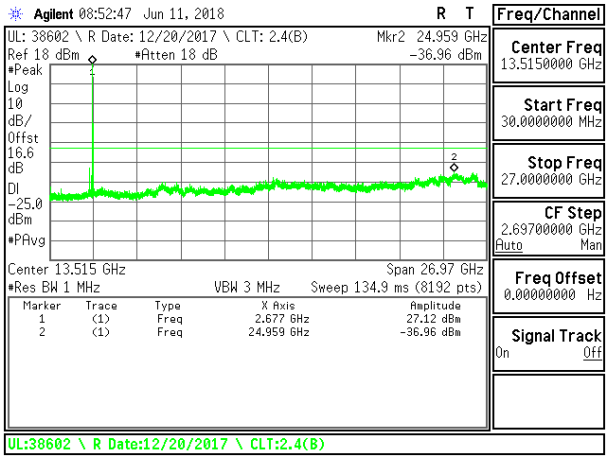
LTE B41 15MHz QPSK Middle Channel RB1-0



LTE B41 15MHz 16QAM Middle Channel RB1-0



LTE B41 15MHz QPSK High Channel RB1-0



LTE B41 15MHz 16QAM High Channel RB1-0

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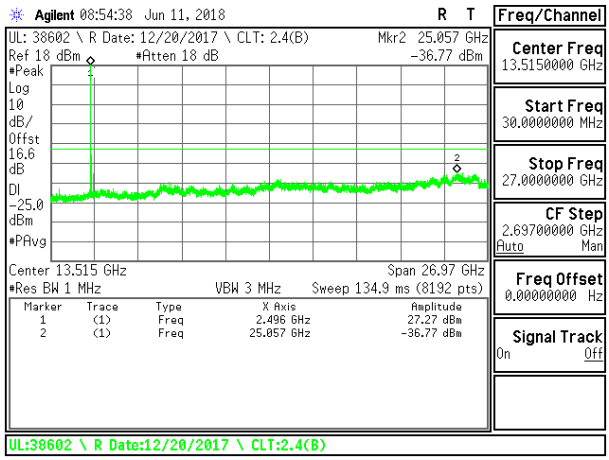
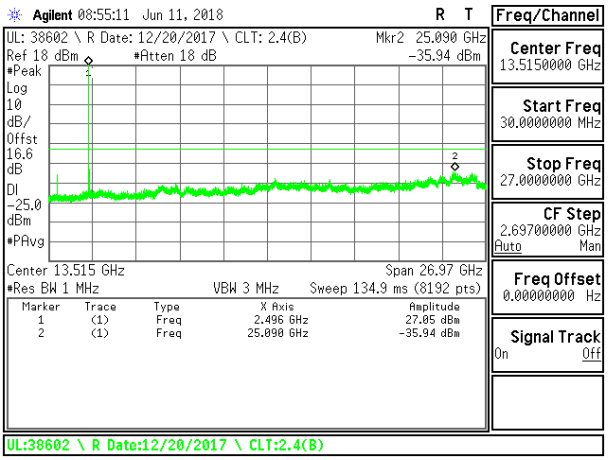
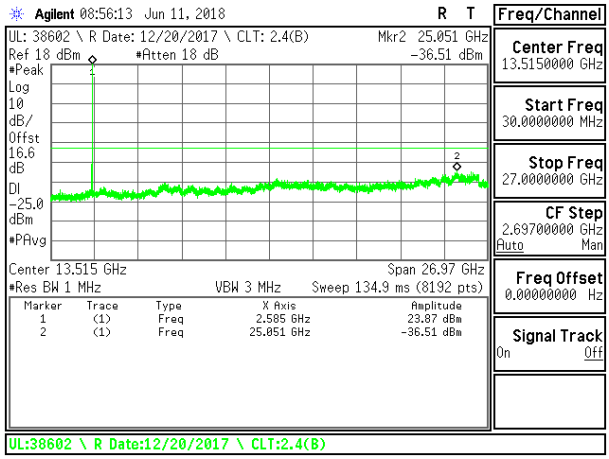


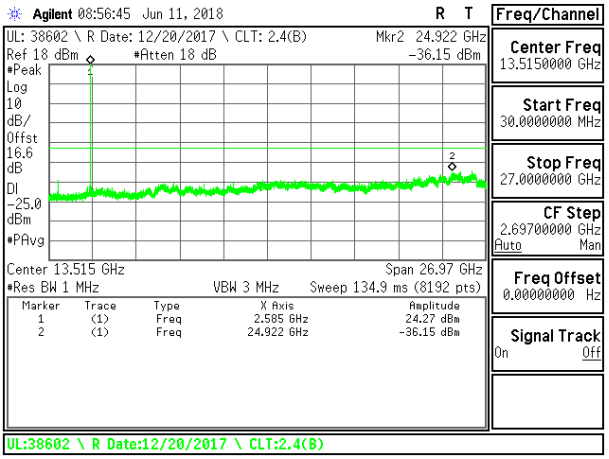
LTE B41 20MHz QPSK Low Channel RB1-0



LTE B41 20MHz 16QAM Low Channel RB1-0



LTE B41 20MHz QPSK Middle Channel RB1-0



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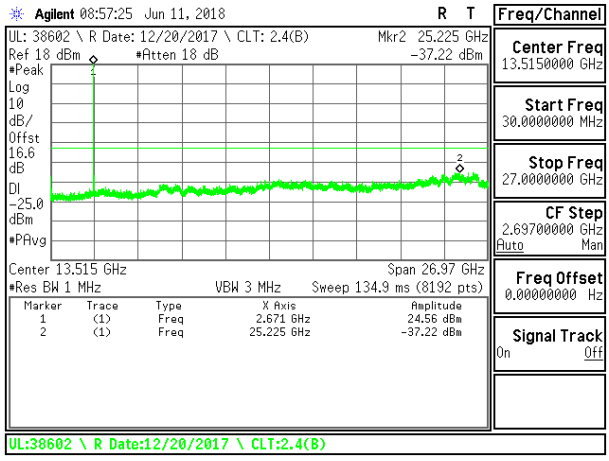

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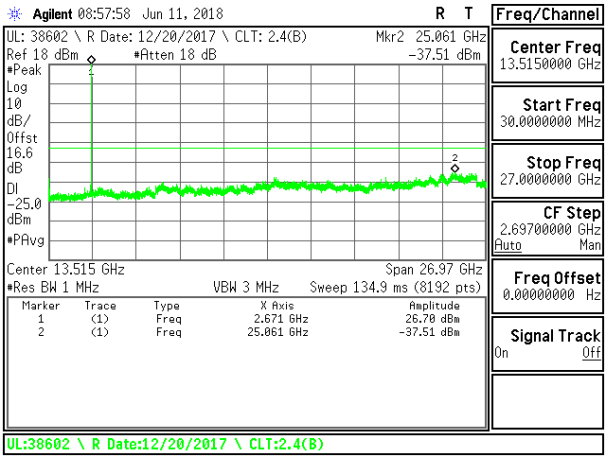

LTE B41 20MHz 16QAM High Channel RB1-0

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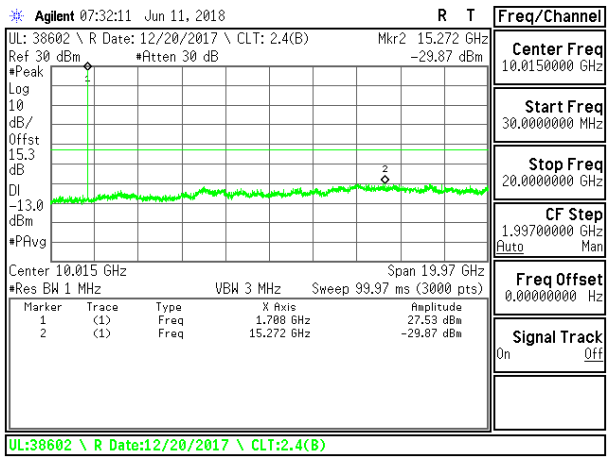
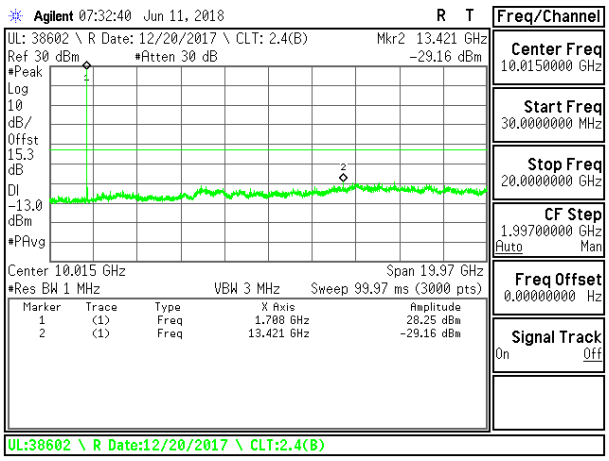
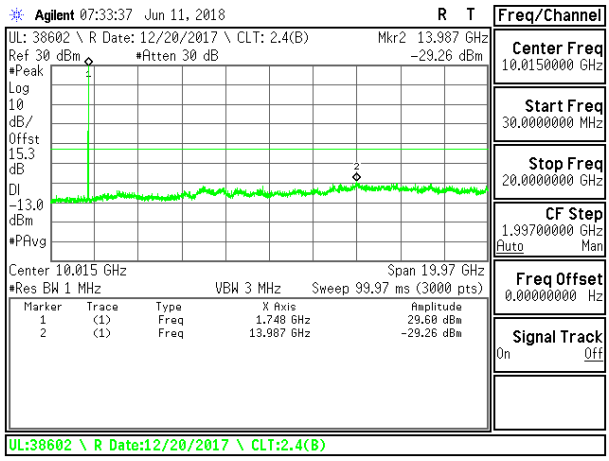
8.3.12. LTE BAND 66



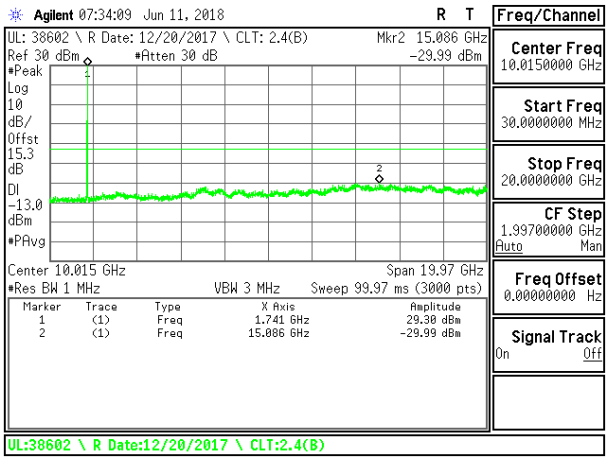
LTE B66 1.4MHz QPSK Low Channel RB1-0



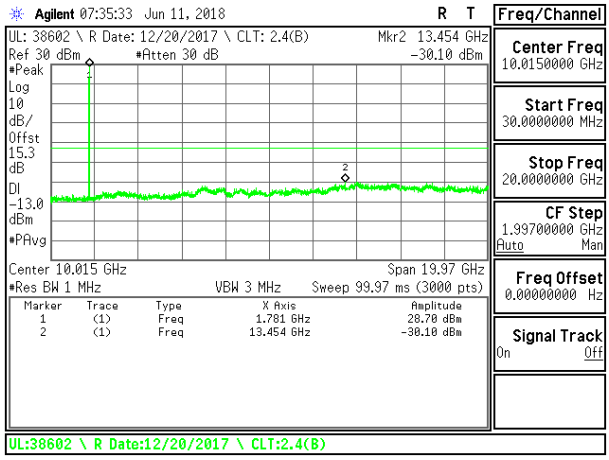
LTE B66 1.4MHz 16QAM Low Channel RB1-0



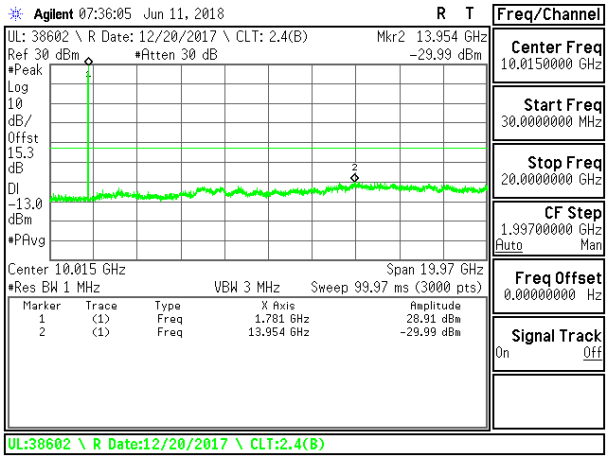
LTE B66 1.4MHz QPSK Middle Channel RB1-0



LTE B66 1.4MHz 16QAM Middle Channel RB1-0



LTE B66 1.4MHz QPSK High Channel RB1-0



LTE B66 1.4MHz 16QAM High Channel RB1-0

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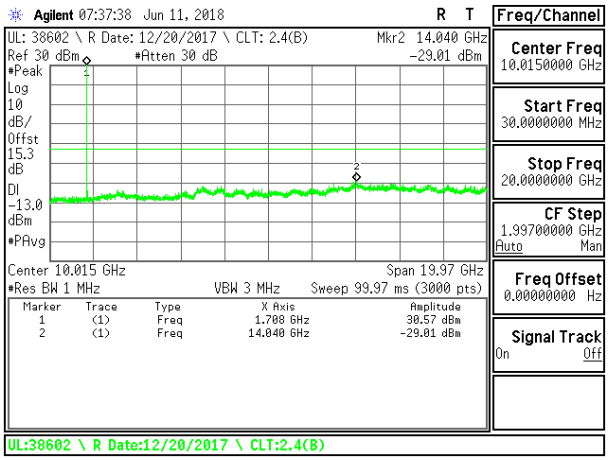
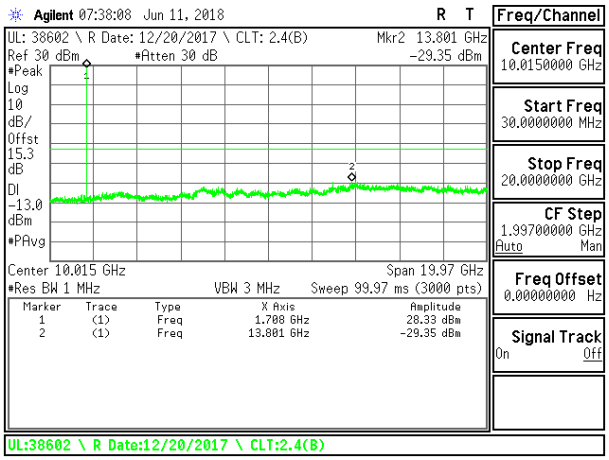
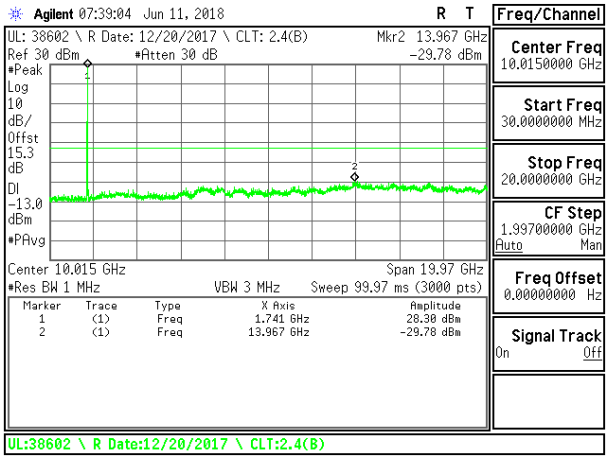


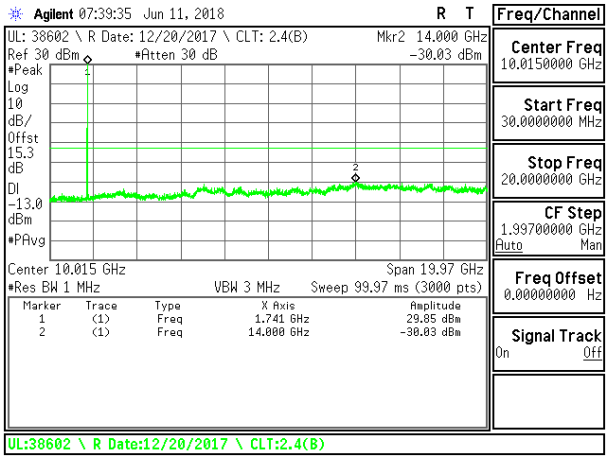
LTE B66 3MHz QPSK Low Channel RB1-0



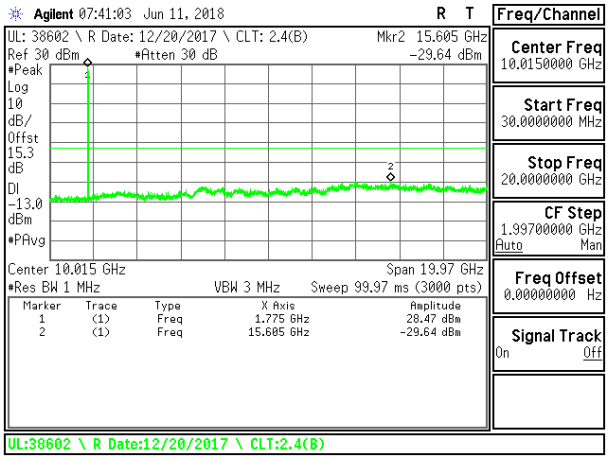
LTE B66 3MHz 16QAM Low Channel RB1-0



LTE B66 3MHz QPSK Middle Channel RB1-0



LTE B66 3MHz 16QAM Middle Channel RB1-0



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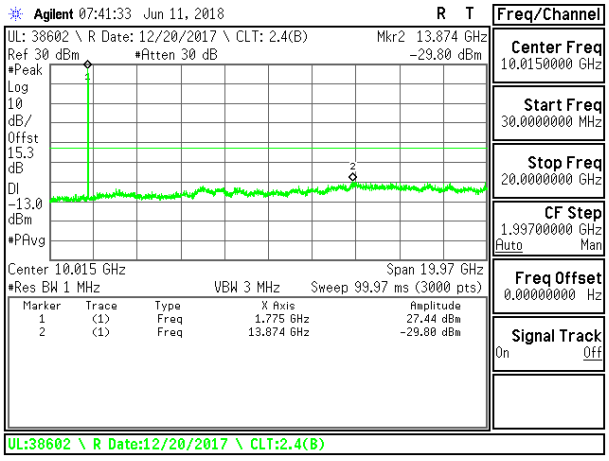

LTE B66 3MHz 16QAM High Channel RB1-0

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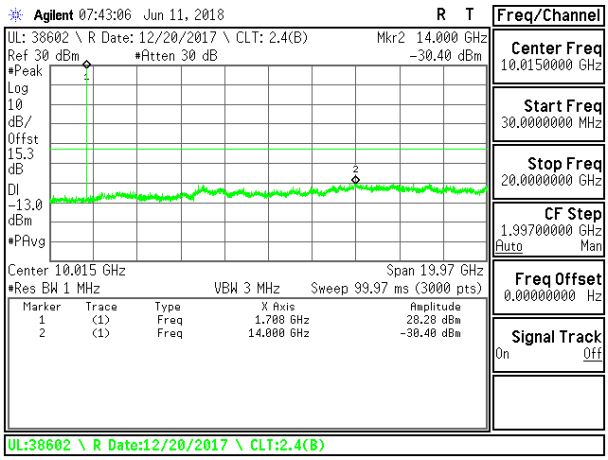
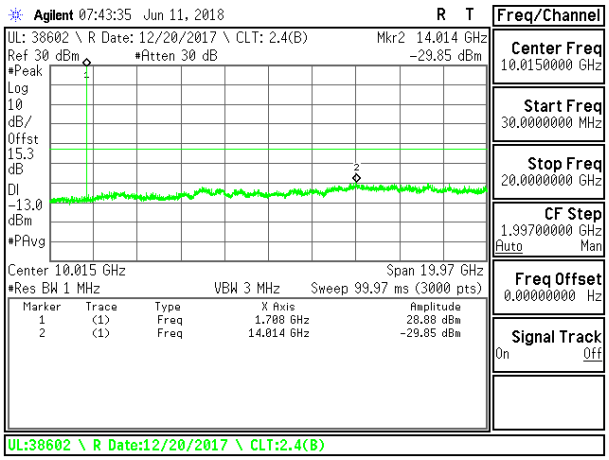
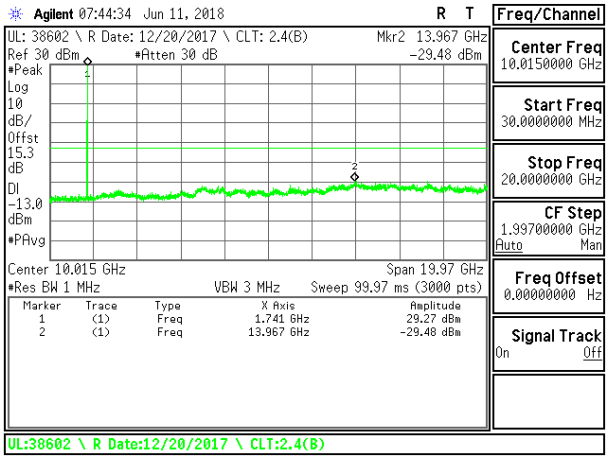


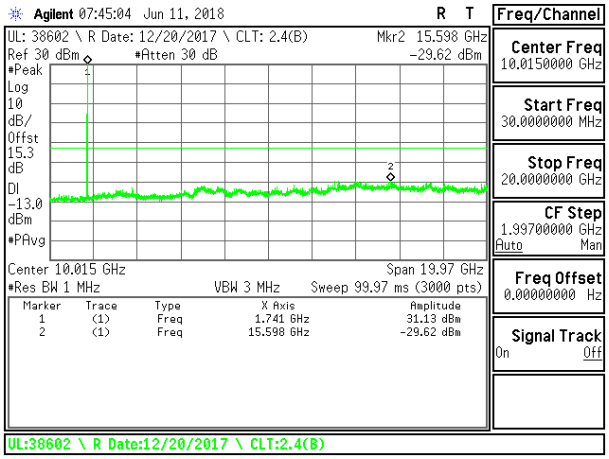
LTE B66 5MHz QPSK Low Channel RB1-0



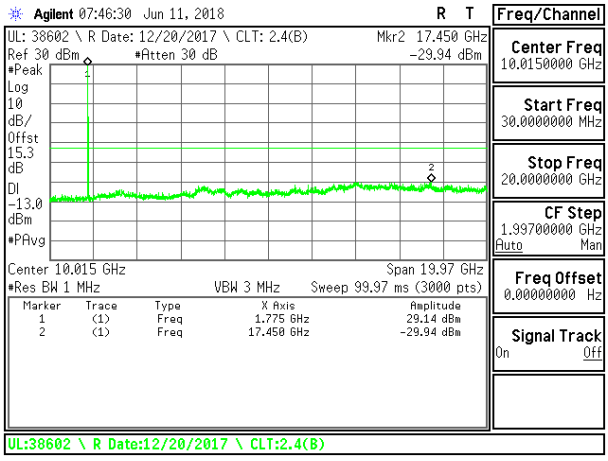
LTE B66 5MHz 16QAM Low Channel RB1-0



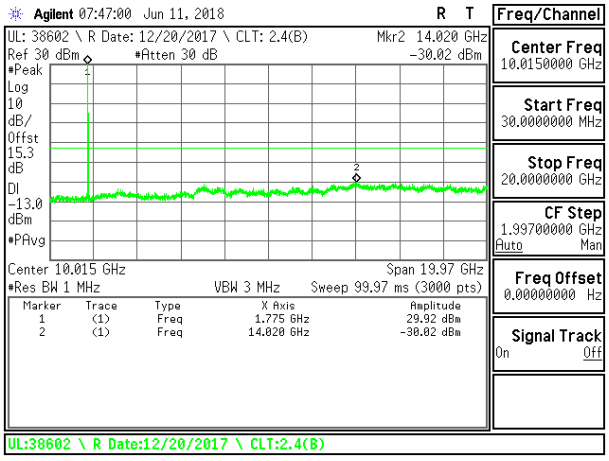
LTE B66 5MHz QPSK Middle Channel RB1-0



LTE B66 5MHz 16QAM Middle Channel RB1-0



LTE B66 5MHz QPSK High Channel RB1-0



LTE B66 5MHz 16QAM High Channel RB1-0

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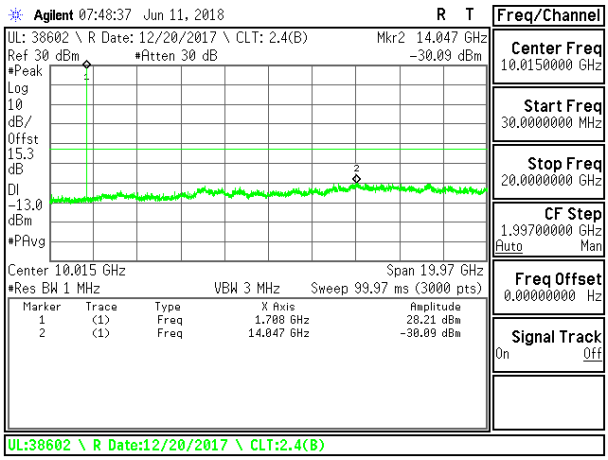
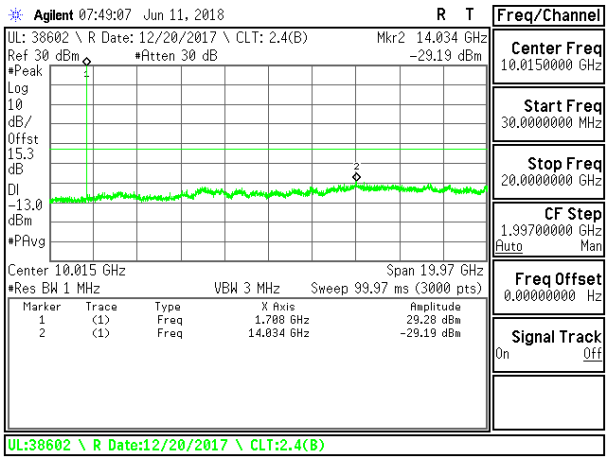
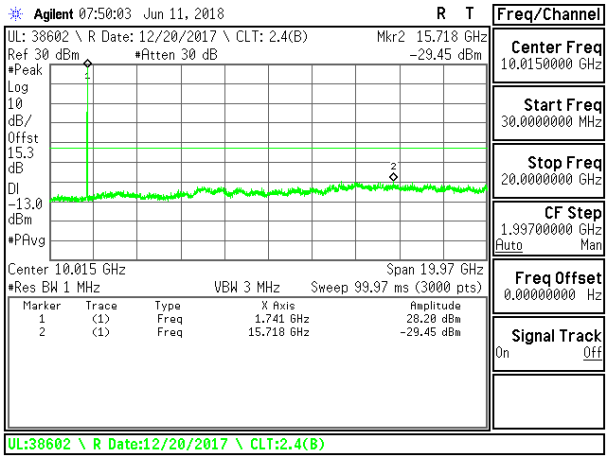


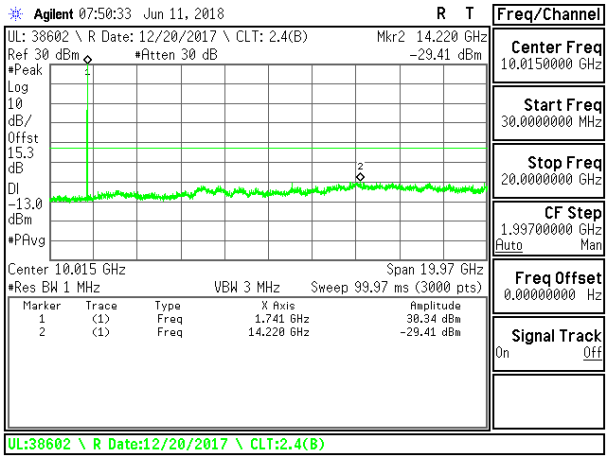
LTE B66 10MHz QPSK Low Channel RB1-0



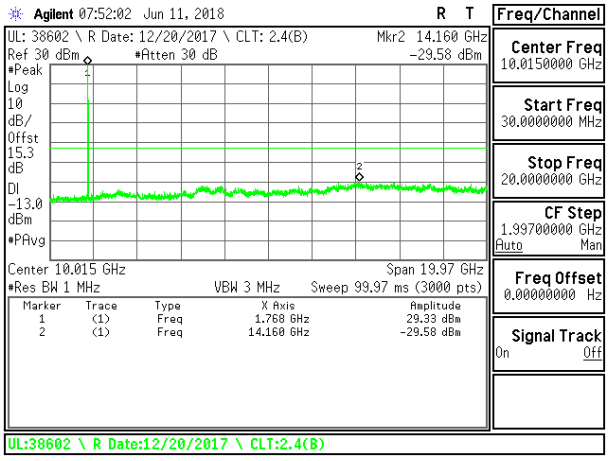
LTE B66 10MHz 16QAM Low Channel RB1-0



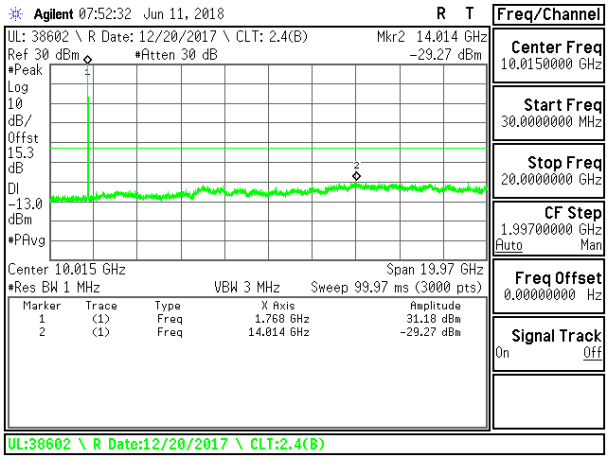
LTE B66 10MHz QPSK Middle Channel RB1-0



LTE B66 10MHz 16QAM Middle Channel RB1-0



LTE B66 10MHz QPSK High Channel RB1-0



LTE B66 10MHz 16QAM High Channel RB1-0

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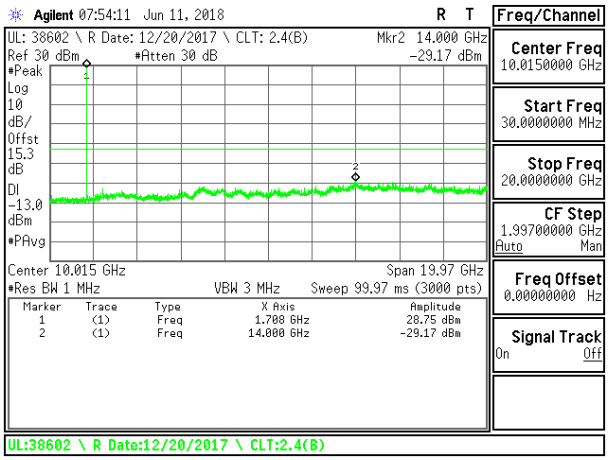
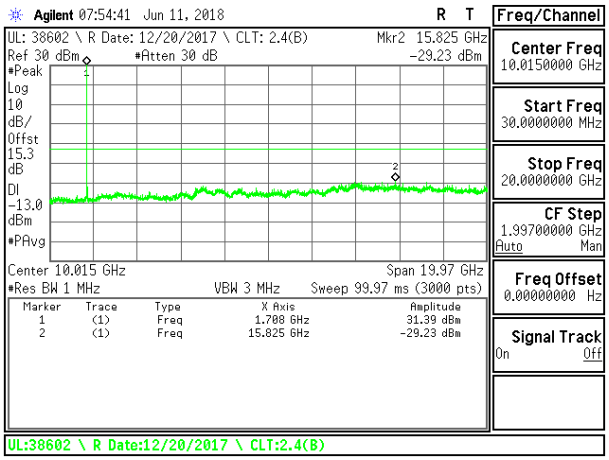
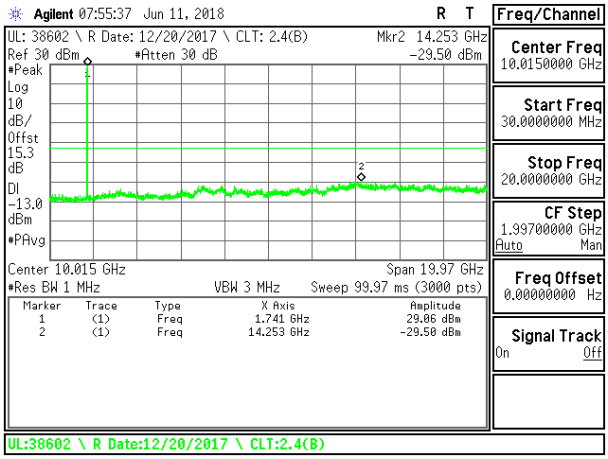


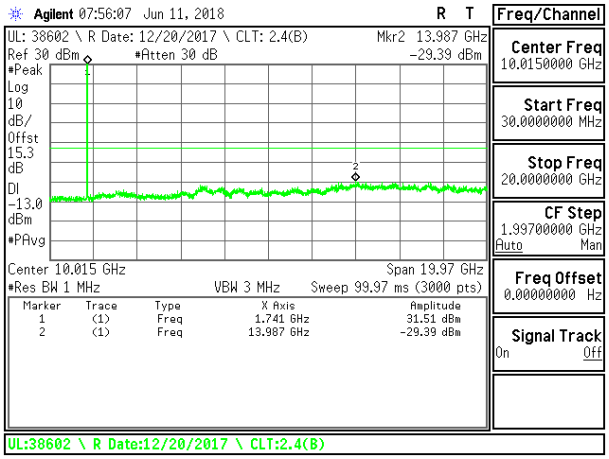
LTE B66 15MHz QPSK Low Channel RB1-0



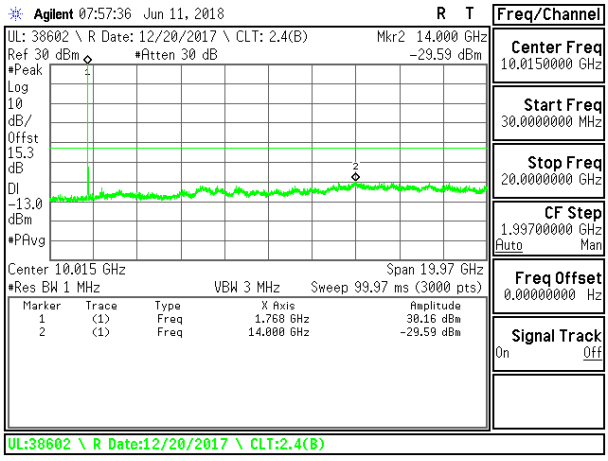
LTE B66 15MHz 16QAM Low Channel RB1-0



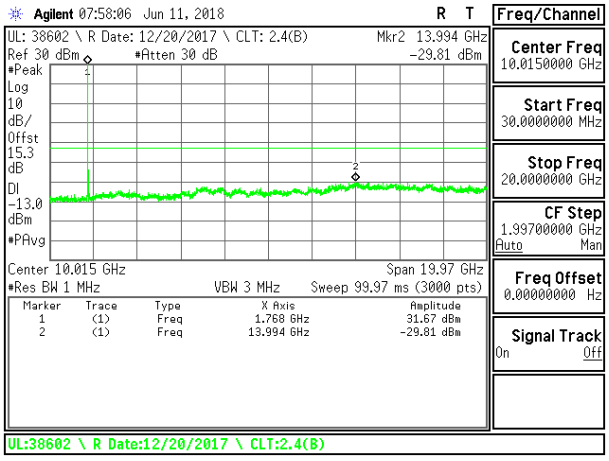
LTE B66 15MHz QPSK Middle Channel RB1-0



LTE B66 15MHz 16QAM Middle Channel RB1-0



LTE B66 15MHz QPSK High Channel RB1-0



LTE B66 15MHz 16QAM High Channel RB1-0

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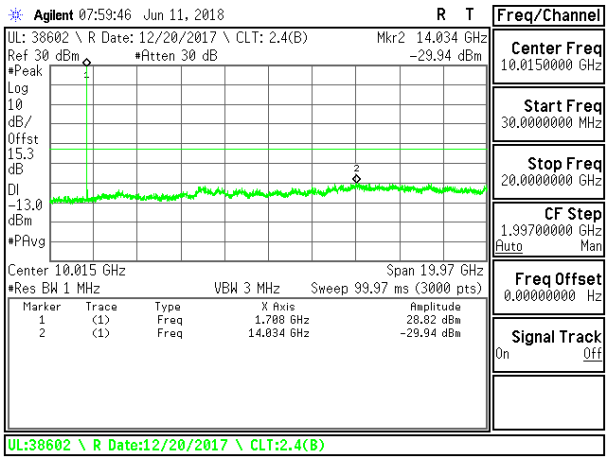
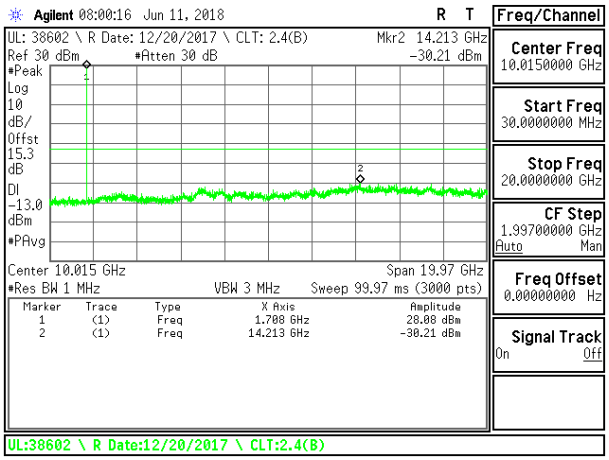
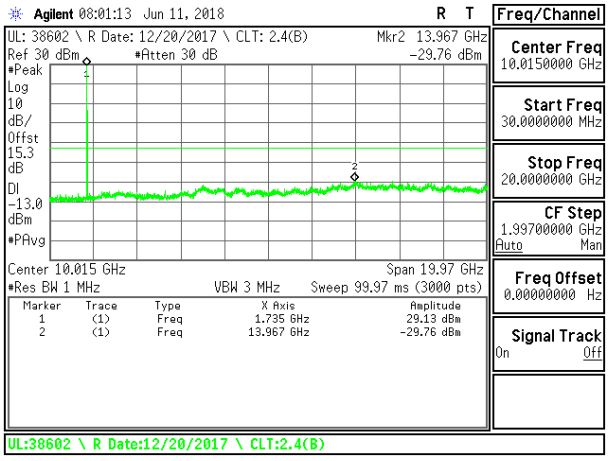


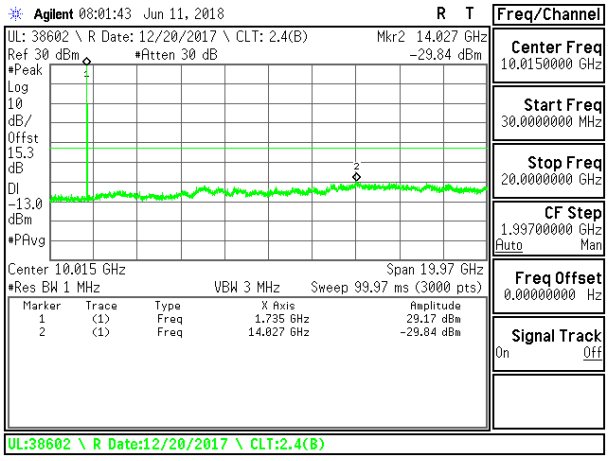
LTE B66 20MHz QPSK Low Channel RB1-0



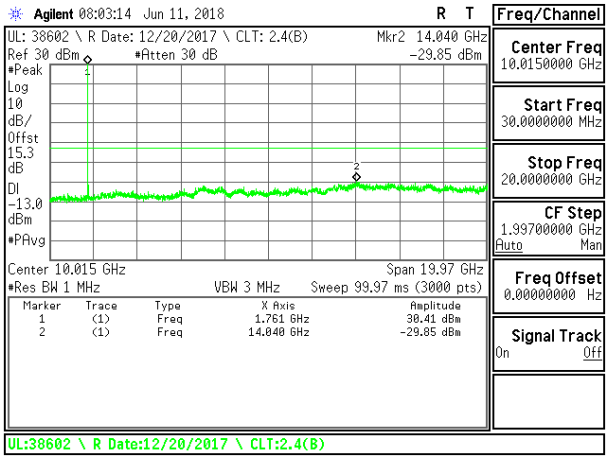
LTE B66 20MHz 16QAM Low Channel RB1-0



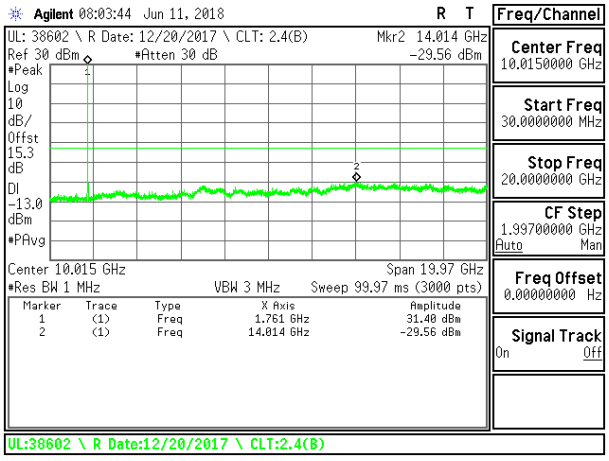
LTE B66 20MHz QPSK Middle Channel RB1-0



LTE B66 20MHz 16QAM Middle Channel RB1-0



LTE B66 20MHz QPSK High Channel RB1-0



LTE B66 20MHz 16QAM High Channel RB1-0

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8.4. FREQUENCY STABILITY

RULE PART(S)

§2.1055, §22.355, §24.235, §27.54, §90.213 and §90.539

LIMITS

§22.355, §90.213
The carrier frequency shall not depart from the reference frequency in excess of ±2.5 ppm for mobile stations.

§90.539
(e) The frequency stability of mobile, portable and control transmitters operating in the wideband segment must be 1.25 ppm or better when AFC is locked to a base station, and 5 ppm or better when AFC is not locked.

§24.235 & §27.54
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

TEST PROCEDURE

Use CMW 500 with Frequency Error measurement capability.

- Temp. = −30°C to +50°C
- Voltage = (85% - 115%)

  Low voltage, 3.23VDC, Normal, 3.8VDC and High voltage, 4.37VDC.
  End Voltage, 3.2VDC.

Frequency Stability vs Temperature:
The EUT is place inside a temperature chamber. The temperature is set to 20ºC and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize and soak, and then the measurement is repeated. This is repeated until +50ºC is reached.

Frequency Stability vs Voltage:
The peak frequency error is recorded (worst-case).

MODES TESTED

- LTE Band 2
- LTE Band 5
- LTE Band 7
- LTE Band 12
- LTE Band 13
- LTE Band 17
- LTE Band 25
- LTE Band 26
- LTE Band 30
- LTE Band 41
- LTE Band 66

RESULTS

See the following pages.

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8.4.1. LTE BAND 2

ID:	50893 / 44410	Date:	3/12/18

QPSK, (20MHz BANDWIDTH)

Limit		1850	1910	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1850.7631	1909.2478		
Extreme (50C)		1850.7630	1909.2477	-111.2	-0.059
Extreme (40C)		1850.7632	1909.2478	21.9	0.012
Extreme (30C)		1850.7631	1909.2478	-14.5	-0.008
Extreme (10C)		1850.7631	1909.2478	-17.8	-0.009
Extreme (0C)		1850.7632	1909.2478	26.8	0.014
Extreme (-10C)		1850.7632	1909.2478	27.7	0.015
Extreme (-20C)		1850.7631	1909.2478	-24.5	-0.013
Extreme (-30C)		1850.7632	1909.2478	20.7	0.011
20C	15%	1850.7632	1909.2478	22.9	0.012
	-15%	1850.7631	1909.2478	-21.4	-0.011
	End Point	1850.7632	1909.2478	26.9	0.014

8.4.2. LTE BAND 5

ID:	50893 / 44410	Date:	3/12/18

QPSK, (10MHz BANDWIDTH)

Limit		824	849	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	824.2709	848.7341		
Extreme (50C)		824.2709	848.7341	37.4	0.045
Extreme (40C)		824.2709	848.7341	22.6	0.027
Extreme (30C)		824.2709	848.7341	28.3	0.034
Extreme (10C)		824.2709	848.7341	24.0	0.029
Extreme (0C)		824.2708	848.7340	-44.4	-0.053
Extreme (-10C)		824.2708	848.7340	-28.6	-0.034
Extreme (-20C)		824.2709	848.7341	35.3	0.042
Extreme (-30C)		824.2708	848.7340	-26.2	-0.031
20C	15%	824.2709	848.7341	24.1	0.029
	-15%	824.2709	848.7341	14.4	0.017
	End Point	824.2709	848.7341	20.4	0.024

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8.4.3. LTE BAND 7

ID:	50893 / 44410	Date:	3/12/18

QPSK, (20MHz BANDWIDTH)

Limit		2500	2570	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	2500.7579	2569.1895		
Extreme (50C)		2500.7579	2569.1895	-23.7	-0.009
Extreme (40C)		2500.7579	2569.1895	-49.3	-0.019
Extreme (30C)		2500.7580	2569.1896	39.7	0.016
Extreme (10C)		2500.7579	2569.1895	-18.1	-0.007
Extreme (0C)		2500.7580	2569.1895	17.7	0.007
Extreme (-10C)		2500.7580	2569.1896	18.4	0.007
Extreme (-20C)		2500.7579	2569.1895	-20.3	-0.008
Extreme (-30C)		2500.7580	2569.1896	18.9	0.007
20C	15%	2500.7580	2569.1896	22.3	0.009
	-15%	2500.7580	2569.1896	21.5	0.008
	End Point	2500.7580	2569.1895	17.2	0.007

8.4.4. LTE BAND 12

ID:	44410	Date:	3/13/18

QPSK, (10MHz BANDWIDTH)

Limit		699	716	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	699.3047	715.6991		
Extreme (50C)		699.3048	715.6991	13.5	0.019
Extreme (40C)		699.3047	715.6991	11.8	0.017
Extreme (30C)		699.3047	715.6991	12.7	0.018
Extreme (10C)		699.3048	715.6991	13.3	0.019
Extreme (0C)		699.3048	715.6991	13.7	0.019
Extreme (-10C)		699.3048	715.6991	16.4	0.023
Extreme (-20C)		699.3048	715.6991	13.3	0.019
Extreme (-30C)		699.3048	715.6991	20.0	0.028
20C	15%	699.3047	715.6991	11.8	0.017
	-15%	699.3047	715.6991	11.6	0.016
	End Point	699.3047	715.6991	11.2	0.016

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8.4.5. LTE BAND 13

ID:	44410	Date:	3/13/18

QPSK, (10MHz BANDWIDTH)

Limit		777	787	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	777.0994	786.8797		
Extreme (50C)		777.0994	786.8797	13.1	0.017
Extreme (40C)		777.0994	786.8797	19.9	0.025
Extreme (30C)		777.0994	786.8797	15.3	0.020
Extreme (10C)		777.0994	786.8797	14.6	0.019
Extreme (0C)		777.0993	786.8796	-62.9	-0.080
Extreme (-10C)		777.0993	786.8796	-59.3	-0.076
Extreme (-20C)		777.0994	786.8797	16.2	0.021
Extreme (-30C)		777.0994	786.8797	17.1	0.022
20C	15%	777.0994	786.8797	12.4	0.016
	-15%	777.0994	786.8797	12.3	0.016
	End Point	777.0994	786.8797	14.2	0.018

8.4.6. LTE BAND 14

ID:	50893 / 44410	Date:	3/12/18

QPSK, (10MHz BANDWIDTH)

Limit		788	798	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	788.0400	797.9500		
Extreme (50C)		788.0400	797.9500	35.5	0.045
Extreme (40C)		788.0400	797.9500	34.7	0.044
Extreme (30C)		788.0400	797.9500	49.4	0.062
Extreme (10C)		788.0400	797.9500	31.9	0.040
Extreme (0C)		788.0400	797.9500	-23.7	-0.030
Extreme (-10C)		788.0400	797.9500	29.2	0.037
Extreme (-20C)		788.0400	797.9500	6.0	0.008
Extreme (-30C)		788.0400	797.9500	11.2	0.014
20C	15%	788.0400	797.9500	11.7	0.015
	-15%	788.0400	797.9500	10.9	0.014
	End Point	788.0400	797.9500	9.9	0.013

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8.4.7. LTE BAND 17

ID:	44410	Date:	3/13/18

QPSK, (10MHz BANDWIDTH)

Limit		704	716	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	704.1170	715.8800		
Extreme (50C)		704.1170	715.8800	13.5	0.019
Extreme (40C)		704.1170	715.8800	11.8	0.017
Extreme (30C)		704.1170	715.8800	12.7	0.018
Extreme (10C)		704.1170	715.8800	13.3	0.019
Extreme (0C)		704.1170	715.8800	13.7	0.019
Extreme (-10C)		704.1170	715.8800	16.4	0.023
Extreme (-20C)		704.1170	715.8800	13.3	0.019
Extreme (-30C)		704.1170	715.8800	20.0	0.028
20C	15%	704.1170	715.8800	11.8	0.017
	-15%	704.1170	715.8800	11.6	0.016
	End Point	704.1170	715.8800	11.2	0.016

8.4.8. LTE BAND 25

ID:	50893 / 44410	Date:	3/12/18

QPSK, (20MHz BANDWIDTH)

Limit		1850	1915	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1850.6125	1914.3550		
Extreme (50C)		1850.6124	1914.3549	-111.2	-0.059
Extreme (40C)		1850.6125	1914.3550	21.9	0.012
Extreme (30C)		1850.6125	1914.3550	-14.5	-0.008
Extreme (10C)		1850.6125	1914.3550	-17.8	-0.009
Extreme (0C)		1850.6125	1914.3550	26.8	0.014
Extreme (-10C)		1850.6125	1914.3550	27.7	0.015
Extreme (-20C)		1850.6125	1914.3550	-24.5	-0.013
Extreme (-30C)		1850.6125	1914.3550	20.7	0.011
20C	15%	1850.6125	1914.3550	22.9	0.012
	-15%	1850.6125	1914.3550	-21.4	-0.011
	End Point	1850.6125	1914.3550	26.9	0.014

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8.4.9. LTE BAND 26 (PART 90S)

ID:	50893 / 44410	Date:	3/12/18

QPSK, (10MHz BANDWIDTH)

Limit		814	824	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	814.0975	823.9050		
Extreme (50C)		814.0975	823.9050	37.4	0.046
Extreme (40C)		814.0975	823.9050	22.6	0.028
Extreme (30C)		814.0975	823.9050	28.3	0.034
Extreme (10C)		814.0975	823.9050	24.0	0.029
Extreme (0C)		814.0975	823.9050	-44.4	-0.054
Extreme (-10C)		814.0975	823.9050	-28.6	-0.035
Extreme (-20C)		814.0975	823.9050	35.3	0.043
Extreme (-30C)		814.0975	823.9050	-26.2	-0.032
20C	15%	814.0975	823.9050	24.1	0.029
	-15%	814.0975	823.9050	14.4	0.018
	End Point	814.0975	823.9050	20.4	0.025

8.4.10. LTE BAND 30

ID:	50893 / 44410	Date:	3/12/18

QPSK, (10MHz BANDWIDTH)

Limit		2305	2315	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	2305.0366	2314.9529		
Extreme (50C)		2305.0367	2314.9529	31.4	0.014
Extreme (40C)		2305.0367	2314.9529	38.0	0.016
Extreme (30C)		2305.0367	2314.9529	38.9	0.017
Extreme (10C)		2305.0367	2314.9529	32.6	0.014
Extreme (0C)		2305.0367	2314.9529	26.3	0.011
Extreme (-10C)		2305.0366	2314.9529	24.5	0.011
Extreme (-20C)		2305.0366	2314.9528	-29.0	-0.013
Extreme (-30C)		2305.0366	2314.9529	-24.4	-0.011
20C	15%	2305.0366	2314.9529	21.6	0.009
	-15%	2305.0366	2314.9529	-24.3	-0.011
	End Point	2305.0366	2314.9529	-24.2	-0.010

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8.4.11. LTE BAND 41

ID:	44410	Date:	3/13/18

QPSK, (20MHz BANDWIDTH)

Limit		2496	2690	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	2496.5890	2675.8780		
Extreme (50C)		2496.5890	2675.8780	30.4	0.012
Extreme (40C)		2496.5890	2675.8780	26.8	0.010
Extreme (30C)		2496.5889	2675.8779	-65.9	-0.025
Extreme (10C)		2496.5890	2675.8780	29.6	0.011
Extreme (0C)		2496.5890	2675.8780	31.2	0.012
Extreme (-10C)		2496.5890	2675.8780	30.5	0.012
Extreme (-20C)		2496.5890	2675.8780	34.9	0.013
Extreme (-30C)		2496.5890	2675.8780	24.7	0.010
20C	15%	2496.5890	2675.8780	-33.9	-0.013
	-15%	2496.5890	2675.8780	-37.0	-0.014
	End Point	2496.5889	2675.8779	-84.5	-0.033

8.4.12. LTE BAND 66

ID:	44410	Date:	3/13/18

QPSK, (20MHz BANDWIDTH)

Limit		1710	1780	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1710.5750	1779.3750		
Extreme (50C)		1710.5750	1779.3750	20.7	0.012
Extreme (40C)		1710.5750	1779.3750	16.3	0.009
Extreme (30C)		1710.5750	1779.3750	17.1	0.010
Extreme (10C)		1710.5750	1779.3750	16.7	0.010
Extreme (0C)		1710.5750	1779.3750	20.2	0.012
Extreme (-10C)		1710.5750	1779.3750	19.9	0.011
Extreme (-20C)		1710.5750	1779.3750	20.0	0.011
Extreme (-30C)		1710.5750	1779.3750	18.9	0.011
20C	15%	1710.5750	1779.3750	12.9	0.007
	-15%	1710.5750	1779.3750	16.9	0.010
	End Point	1710.5750	1779.3750	16.1	0.009

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8.5. PEAK-TO-AVERAGE POWER RATIO

LIMIT

In addition, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time and shall use a signal corresponding to the highest PAPR during periods of continuous transmission.

MODES TESTED

- LTE Band 2
- LTE Band 5
- LTE Band 7
- LTE Band 12
- LTE Band 13
- LTE Band 14
- LTE Band 17
- LTE Band 25
- LTE Band 26
- LTE Band 30
- LTE Band 40
- LTE Band 41
- LTE Band 66

RESULT

Antenna 1 was used to measure as the worst case; full resource block (FRB) for each bandwidth was used to measure as the worst case. The results from all CCDF measurements are passed with 13dB peak-to-average power ratio criteria.

ID:	50893	**Date:**	6/6/18

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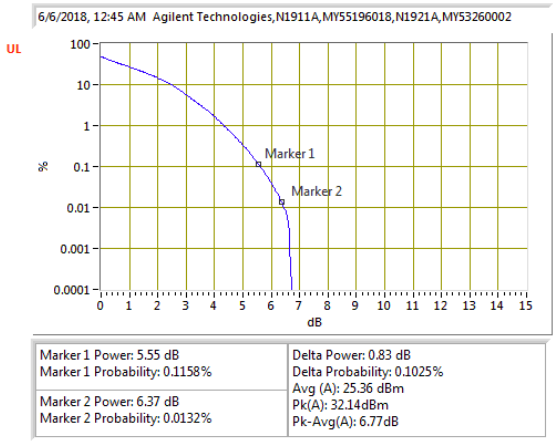
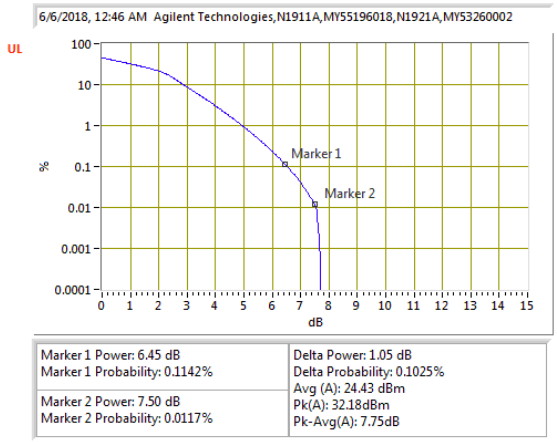
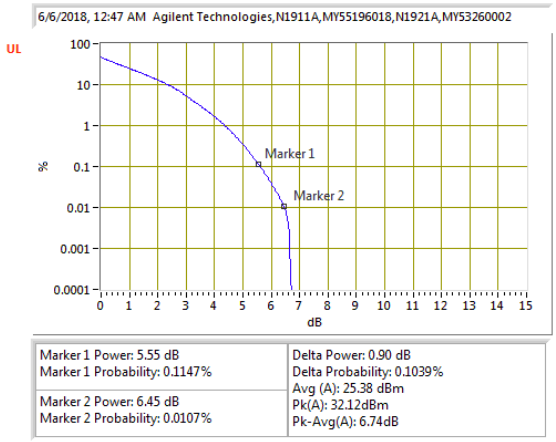
8.5.1. LTE BAND 2



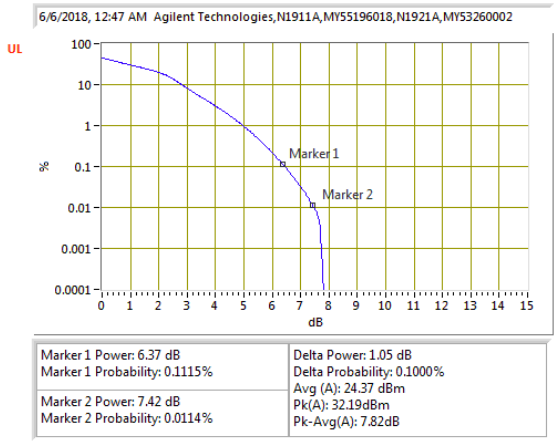
LTE B2 1.4MHz QPSK Middle Channel



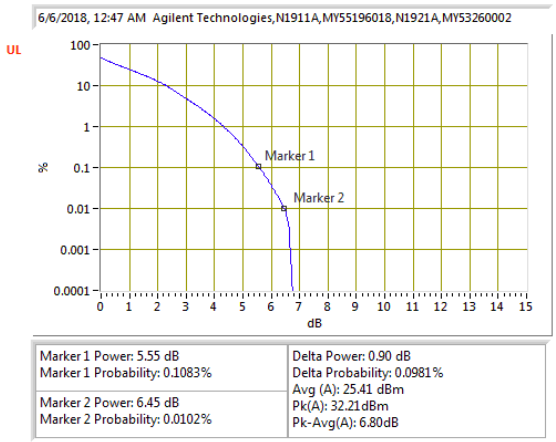
LTE B2 1.4MHz 16QAM Middle Channel



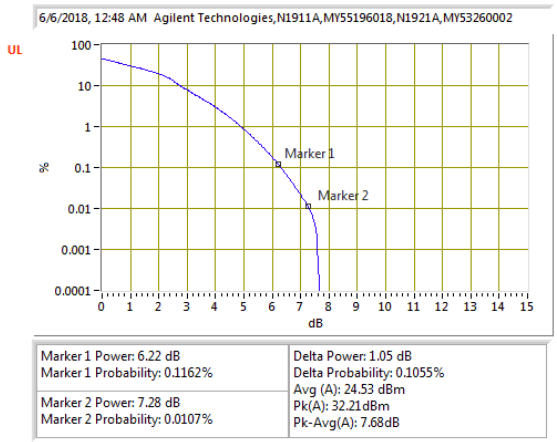
LTE B2 3MHz QPSK Middle Channel



LTE B2 3MHz 16QAM Middle Channel



LTE B2 5MHz QPSK Middle Channel



LTE B2 5MHz 16QAM Middle Channel

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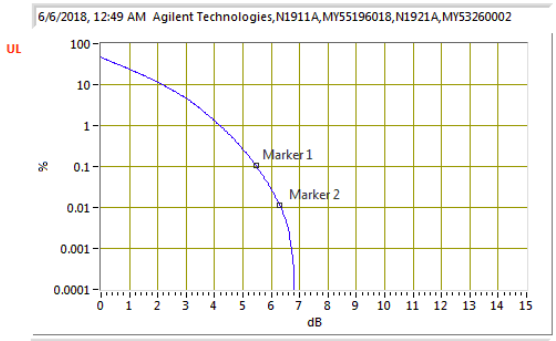
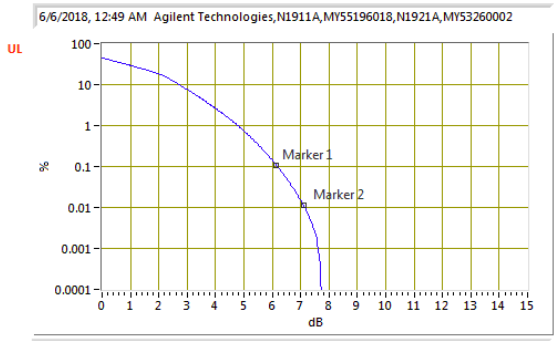


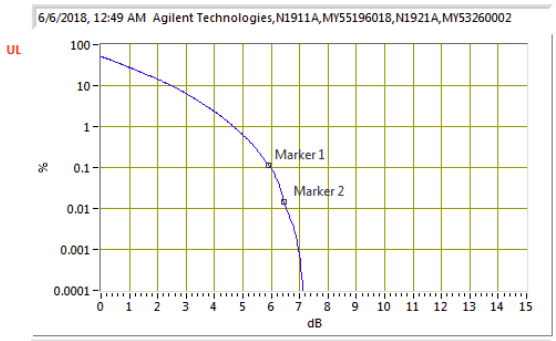
Marker 1 Power: 5.47 dB Marker 1 Probability: 0.1006%	Delta Power: 0.82 dB Delta Probability: 0.0892% Avg (A): 25.34 dBm Pk(A): 32.22dBm Pk-Avg(A): 6.88dB
Marker 2 Power: 6.30 dB Marker 2 Probability: 0.0114%	

LTE B2 10MHz QPSK Middle Channel



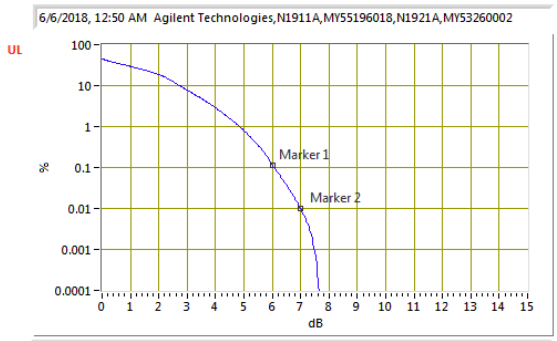
Marker 1 Power: 6.15 dB Marker 1 Probability: 0.1066%	Delta Power: 0.98 dB Delta Probability: 0.0958% Avg (A): 24.42 dBm Pk(A): 32.24dBm Pk-Avg(A): 7.81dB
Marker 2 Power: 7.12 dB Marker 2 Probability: 0.0107%	

LTE B2 10MHz 16QAM Middle Channel



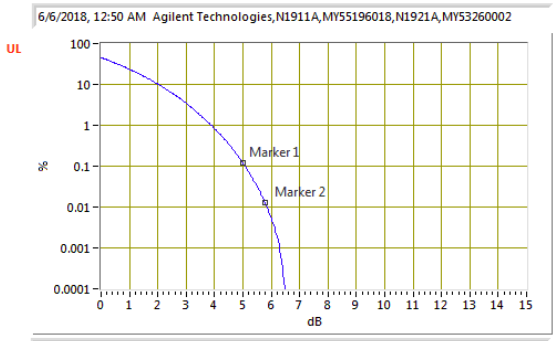
Marker 1 Power: 5.92 dB Marker 1 Probability: 0.1132%	Delta Power: 0.53 dB Delta Probability: 0.0990% Avg (A): 24.96 dBm Pk(A): 32.21dBm Pk-Avg(A): 7.25dB
Marker 2 Power: 6.45 dB Marker 2 Probability: 0.0142%	

LTE B2 15MHz QPSK Middle Channel



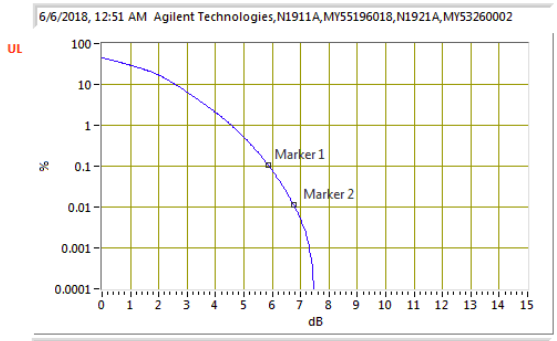
Marker 1 Power: 6.00 dB Marker 1 Probability: 0.1156%	Delta Power: 0.98 dB Delta Probability: 0.1050% Avg (A): 24.40 dBm Pk(A): 32.18dBm Pk-Avg(A): 7.78dB
Marker 2 Power: 6.97 dB Marker 2 Probability: 0.0107%	

LTE B2 15MHz 16QAM Middle Channel



Marker 1 Power: 5.03 dB Marker 1 Probability: 0.1130%	Delta Power: 0.75 dB Delta Probability: 0.0997% Avg (A): 25.40 dBm Pk(A): 32.04dBm Pk-Avg(A): 6.63dB
Marker 2 Power: 5.78 dB Marker 2 Probability: 0.0133%	

LTE B2 20MHz QPSK Middle Channel



Marker 1 Power: 5.85 dB Marker 1 Probability: 0.1069%	Delta Power: 0.90 dB Delta Probability: 0.0953% Avg (A): 24.45 dBm Pk(A): 32.14dBm Pk-Avg(A): 7.69dB
Marker 2 Power: 6.75 dB Marker 2 Probability: 0.0116%	

LTE B2 20MHz 16QAM Middle Channel

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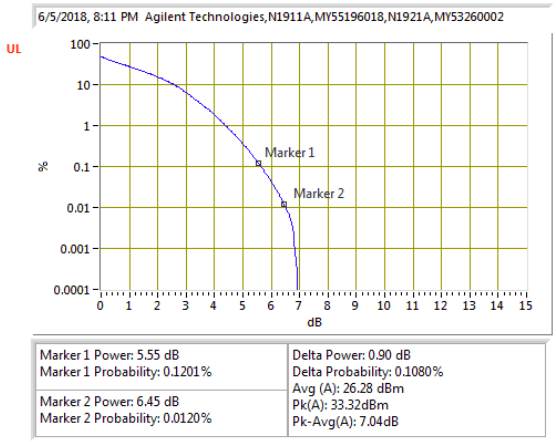
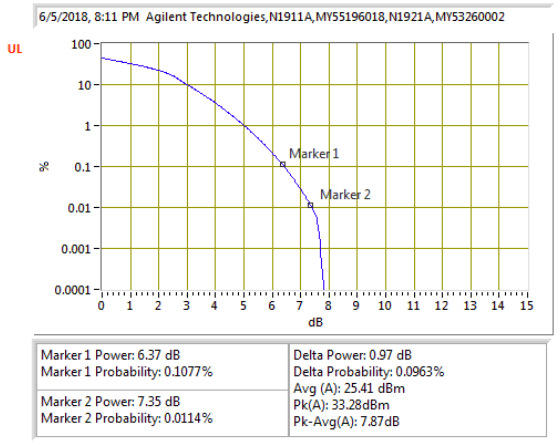
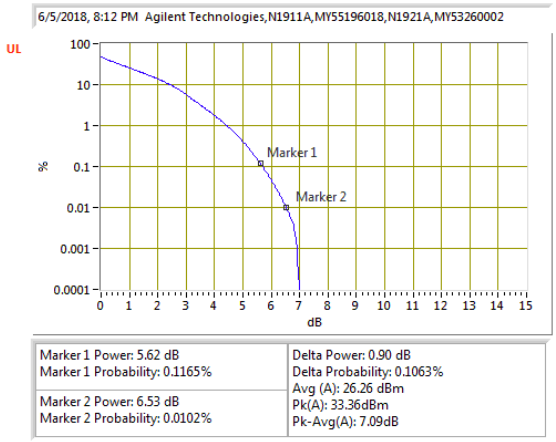
8.5.2. LTE BAND 5



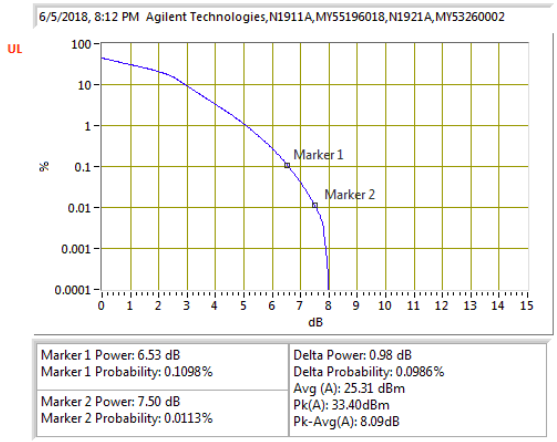
LTE B5 1.4MHz QPSK Middle Channel



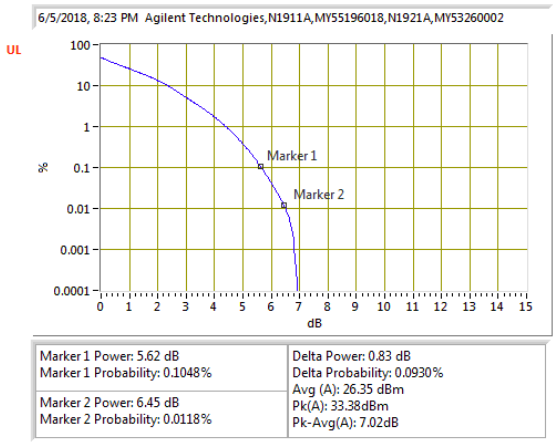
LTE B5 1.4MHz 16QAM Middle Channel



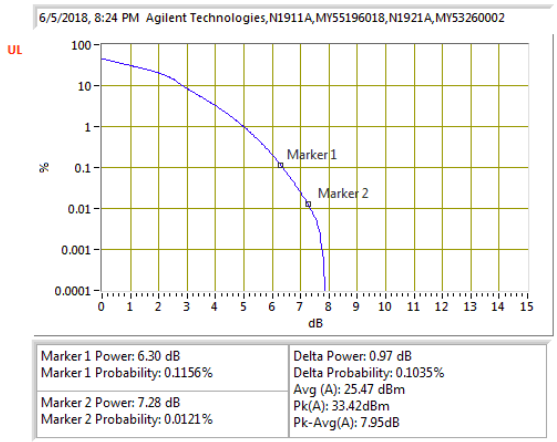
LTE B5 3MHz QPSK Middle Channel



LTE B5 3MHz 16QAM Middle Channel



LTE B5 5MHz QPSK Middle Channel



LTE B5 5MHz 16QAM Middle Channel

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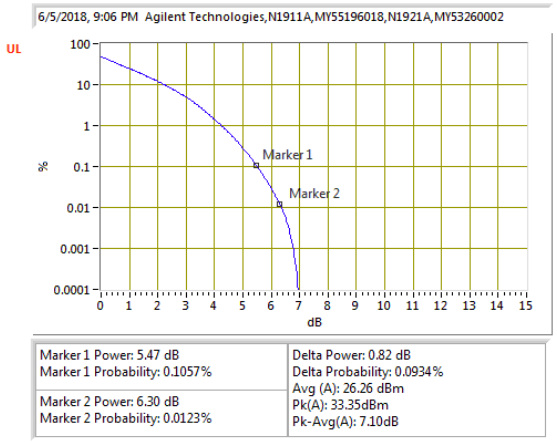
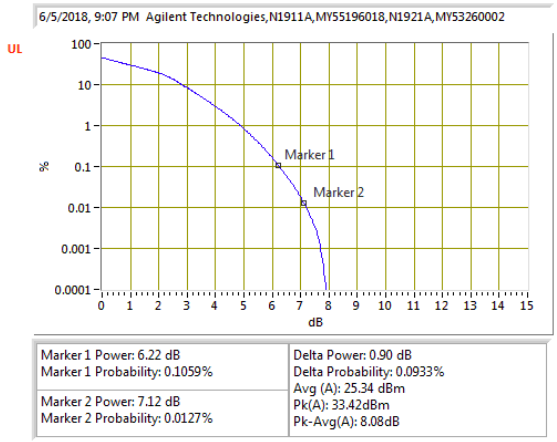


LTE B5 10MHz QPSK Middle Channel



LTE B5 10MHz 16QAM Middle Channel

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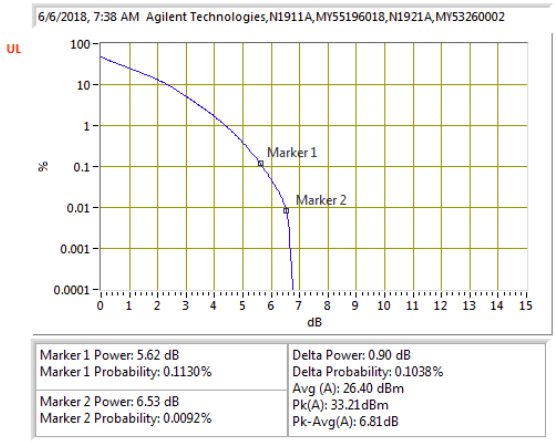
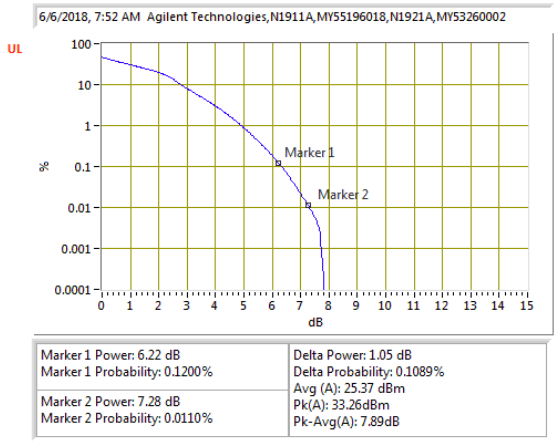
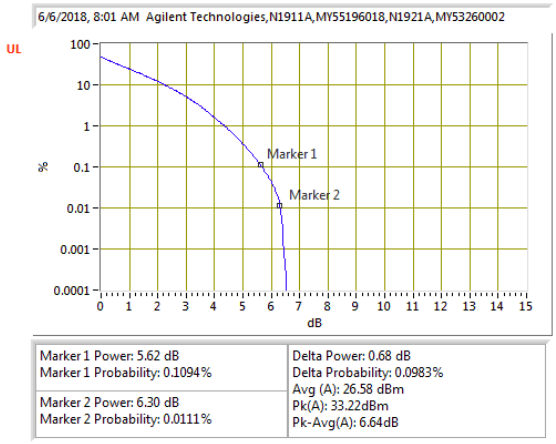
8.5.3. LTE BAND 7



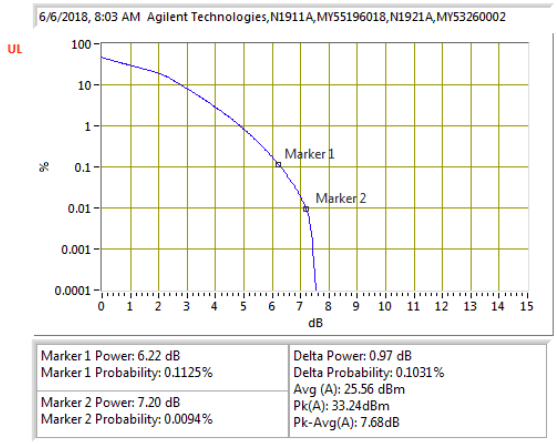
LTE B7 5MHz QPSK Middle Channel



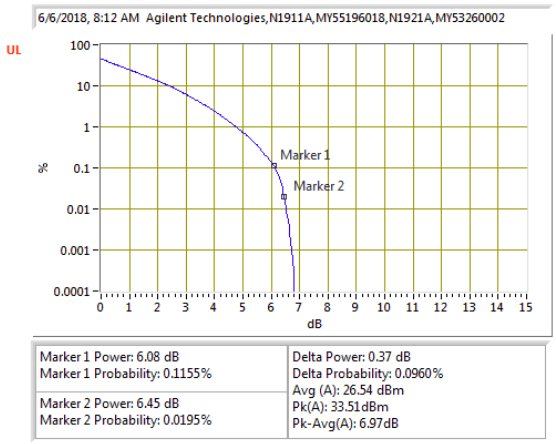
LTE B7 5MHz 16QAM Middle Channel



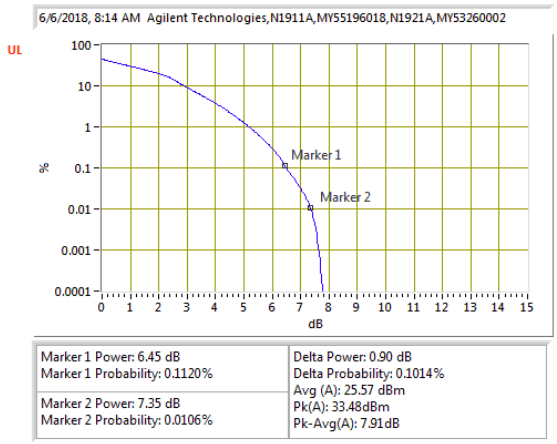
LTE B7 10MHz QPSK Middle Channel



LTE B7 10MHz 16QAM Middle Channel



LTE B7 15MHz QPSK Middle Channel



LTE B7 15MHz 16QAM Middle Channel

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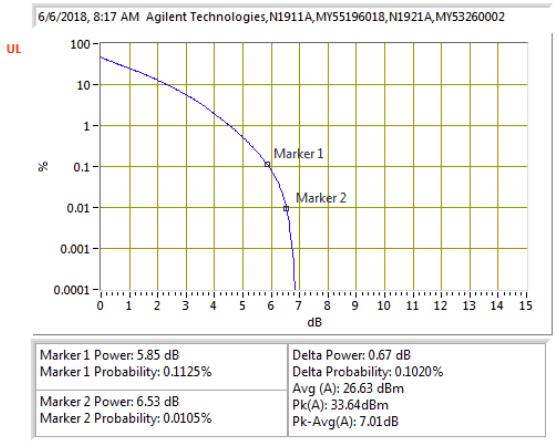
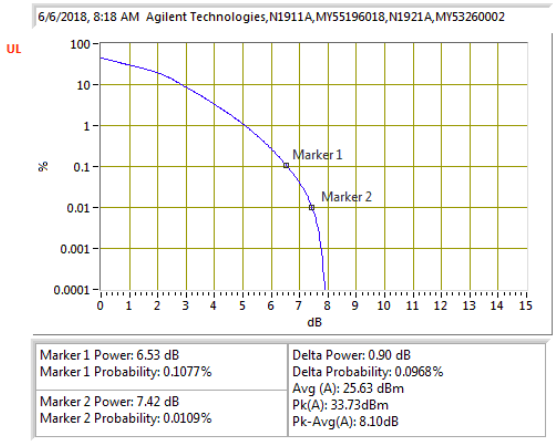


LTE B7 20MHz QPSK Middle Channel



LTE B7 20MHz 16QAM Middle Channel

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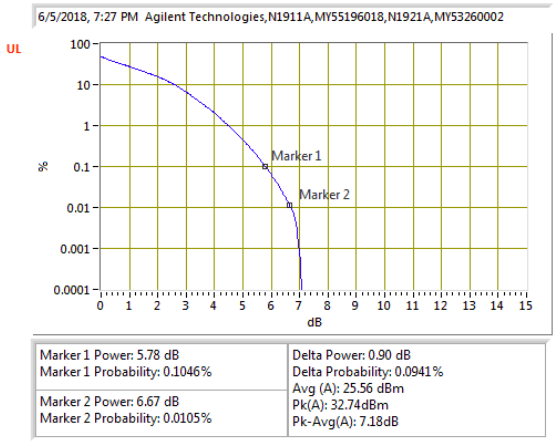
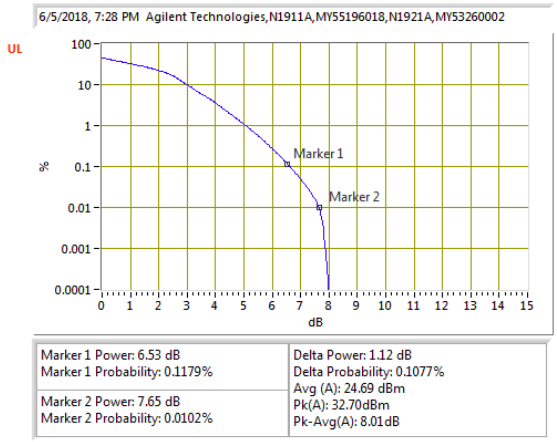
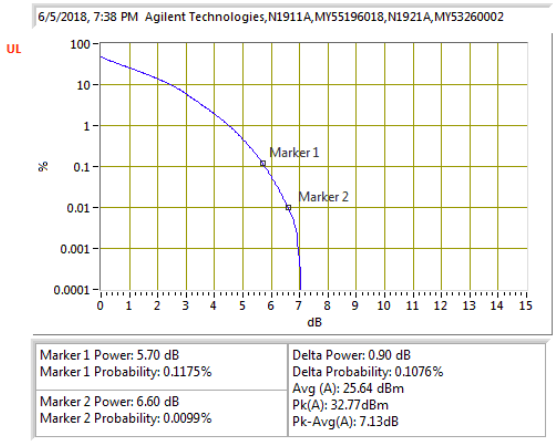
8.5.4. LTE BAND 12



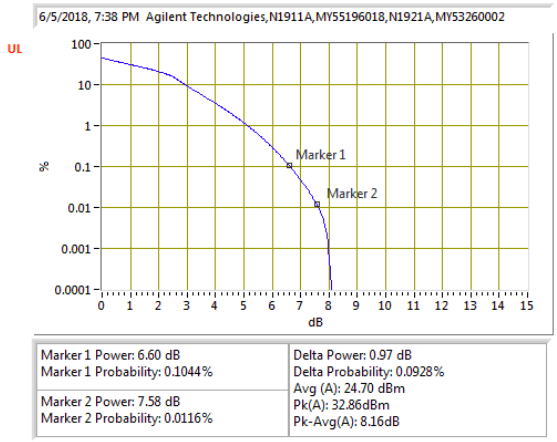
LTE B12 1.4MHz QPSK Middle Channel



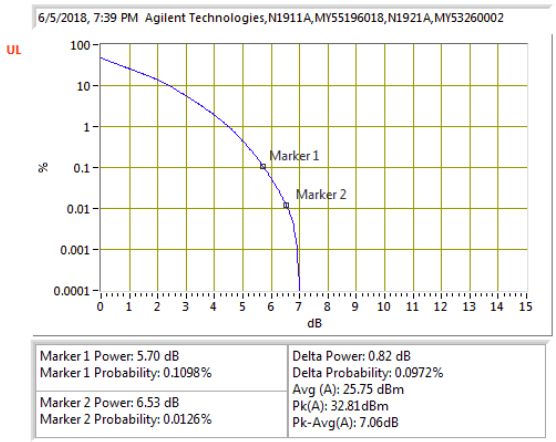
LTE B12 1.4MHz 16QAM Middle Channel



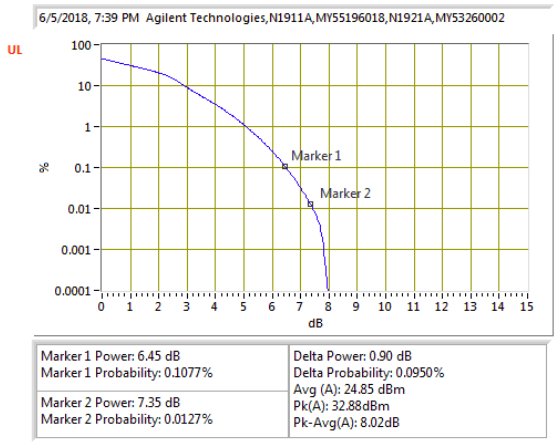
LTE B12 3MHz QPSK Middle Channel



LTE B12 3MHz 16QAM Middle Channel



LTE B12 5MHz QPSK Middle Channel



LTE B12 5MHz 16QAM Middle Channel

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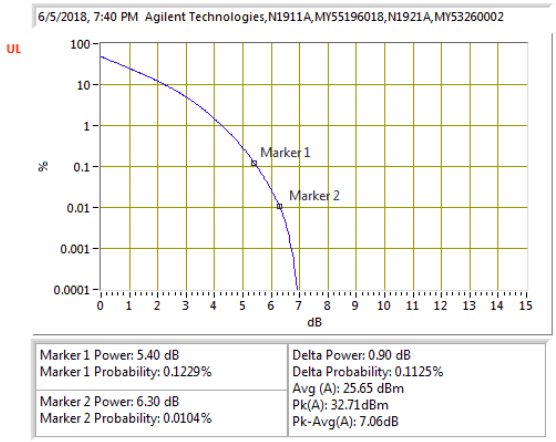
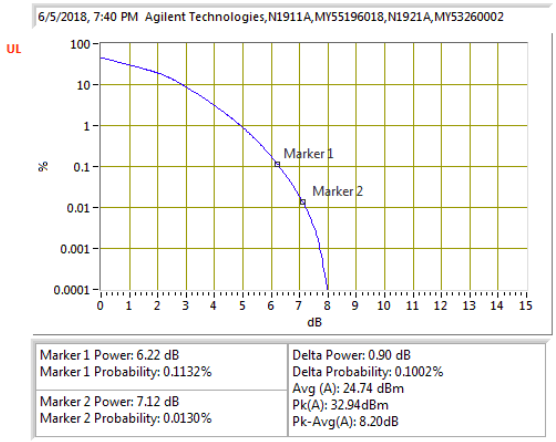


LTE B12 10MHz QPSK Middle Channel



LTE B12 10MHz 16QAM Middle Channel

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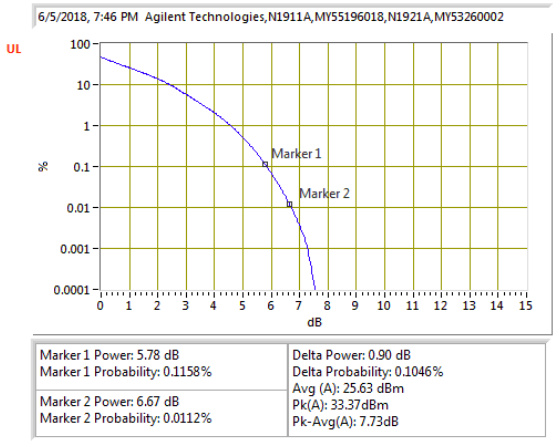
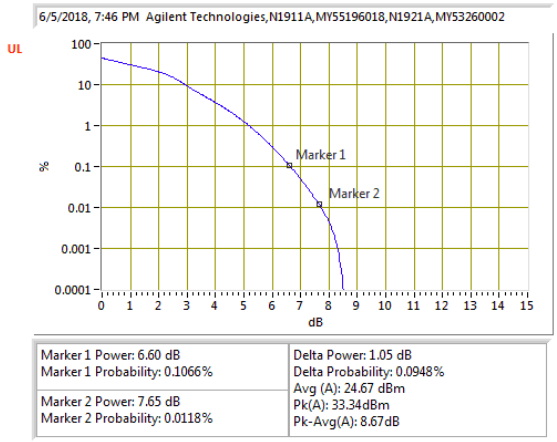
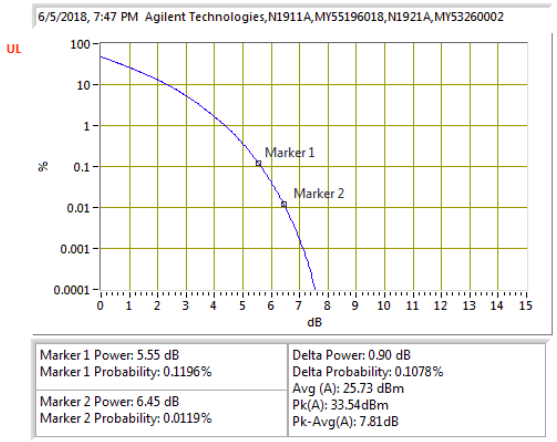
8.5.5. LTE BAND 13



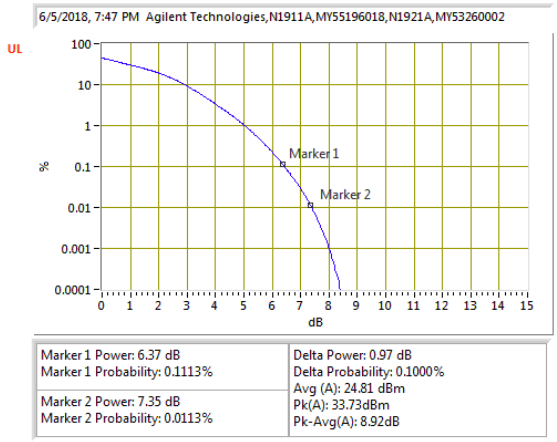
LTE B13 5MHz QPSK Middle Channel



LTE B13 5MHz 16QAM Middle Channel



LTE B13 10MHz QPSK Middle Channel



LTE B13 10MHz 16QAM Middle Channel

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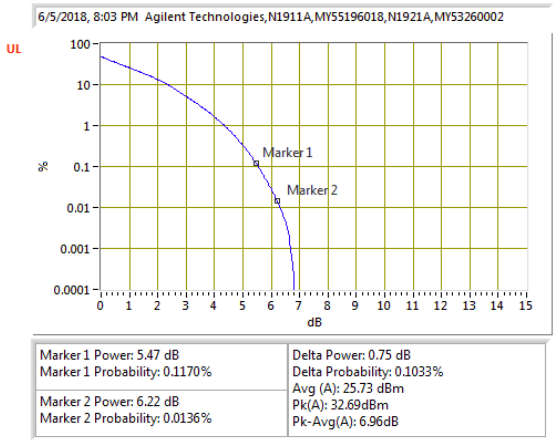
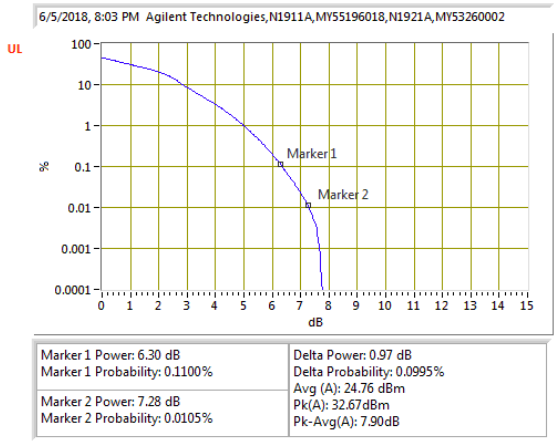
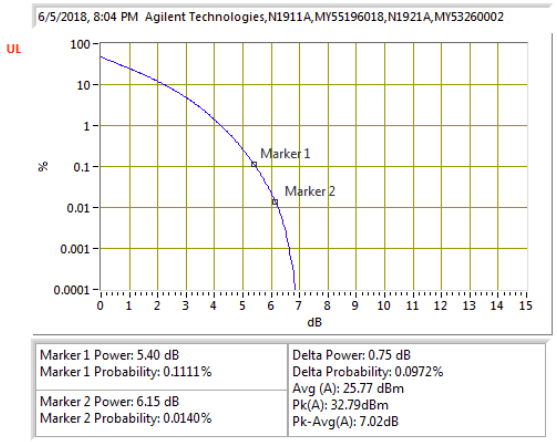
8.5.6. LTE BAND 14



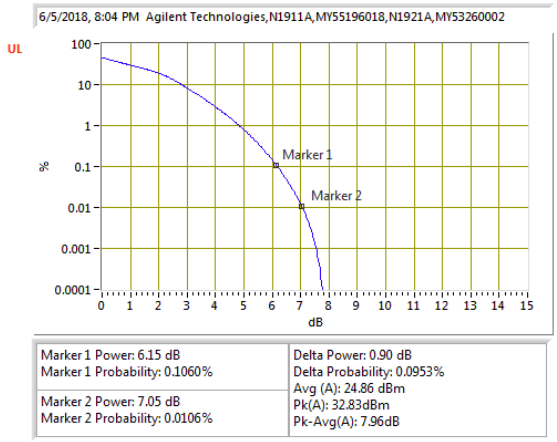
LTE B14 5MHz QPSK Middle Channel



LTE B14 5MHz 16QAM Middle Channel



LTE B14 10MHz QPSK Middle Channel



LTE B14 10MHz 16QAM Middle Channel

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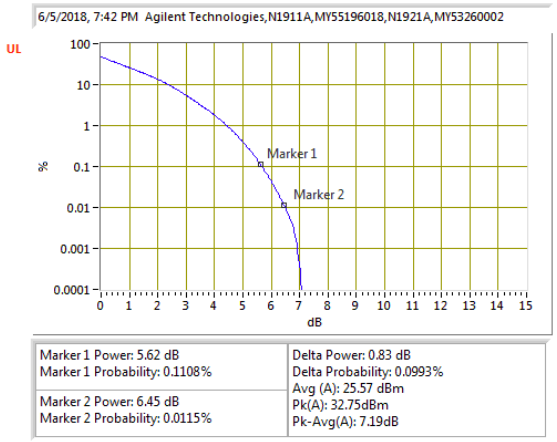
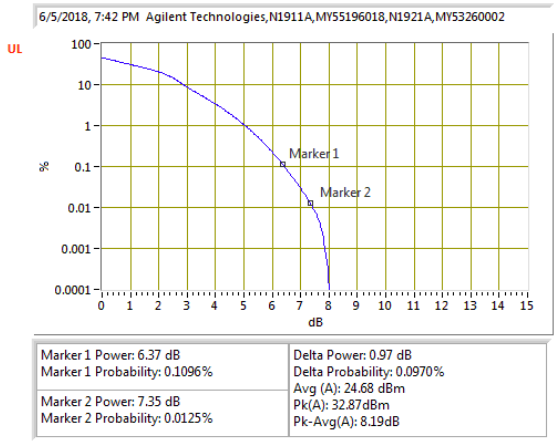
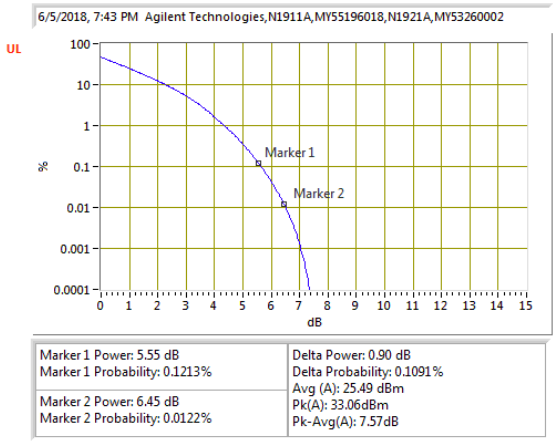
8.5.7. LTE BAND 17



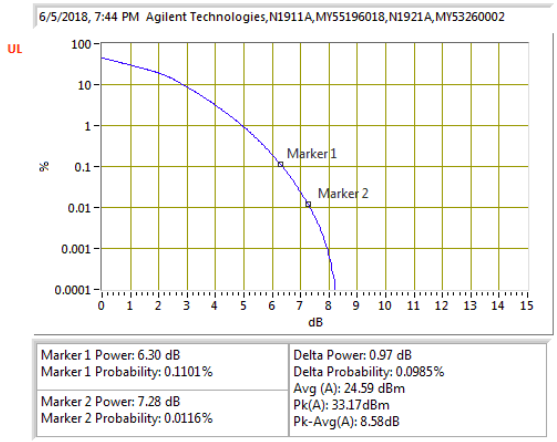
LTE B17 5MHz QPSK Middle Channel



LTE B17 5MHz 16QAM Middle Channel



LTE B17 10MHz QPSK Middle Channel



LTE B17 10MHz 16QAM Middle Channel

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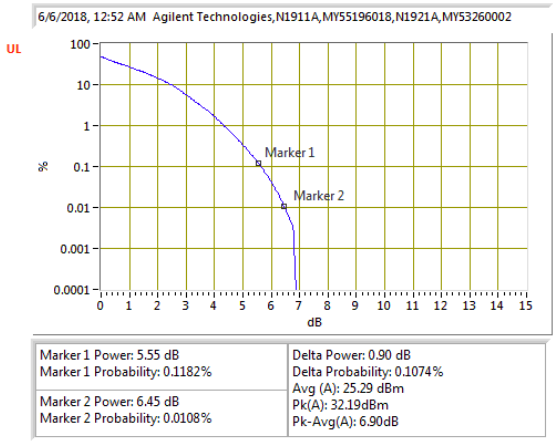
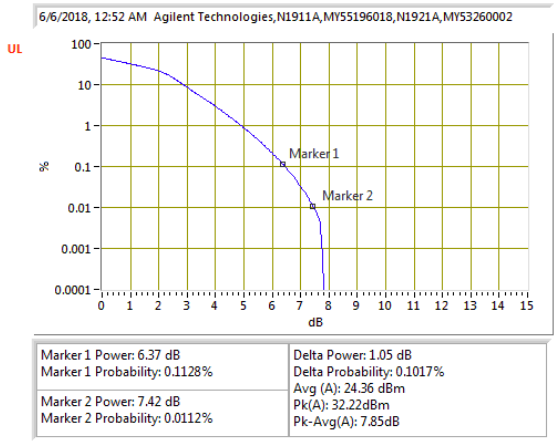
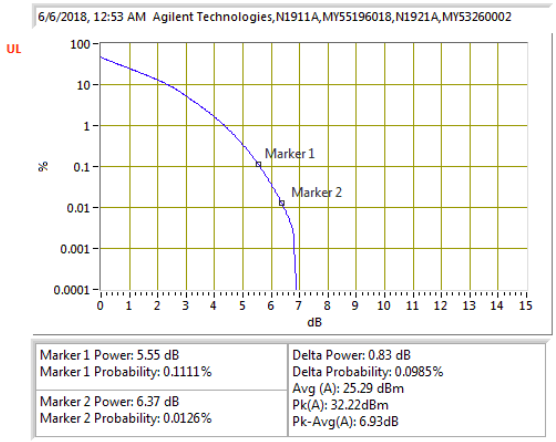
8.5.8. LTE BAND 25



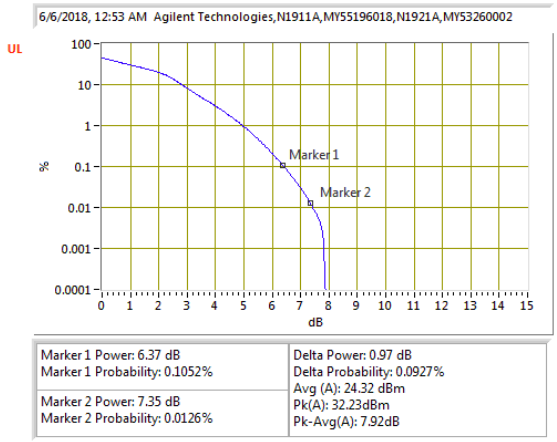
LTE B25 1.4MHz QPSK Middle Channel



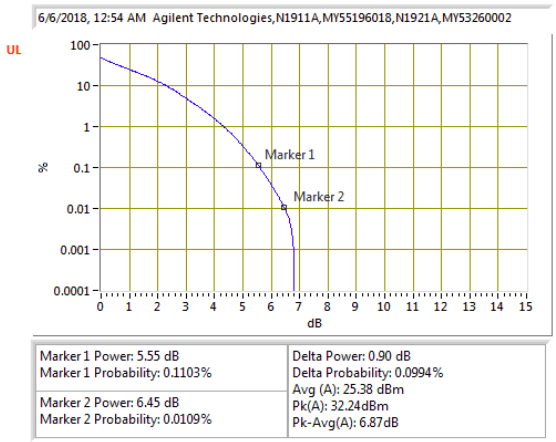
LTE B25 1.4MHz 16QAM Middle Channel



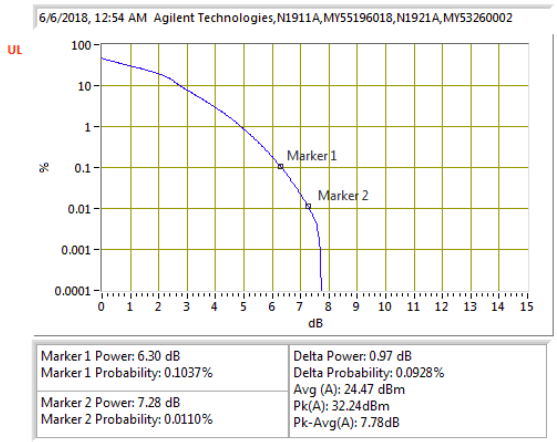
LTE B25 3MHz QPSK Middle Channel



LTE B25 3MHz 16QAM Middle Channel



LTE B2 5MHz QPSK Middle Channel



LTE B2 5MHz 16QAM Middle Channel

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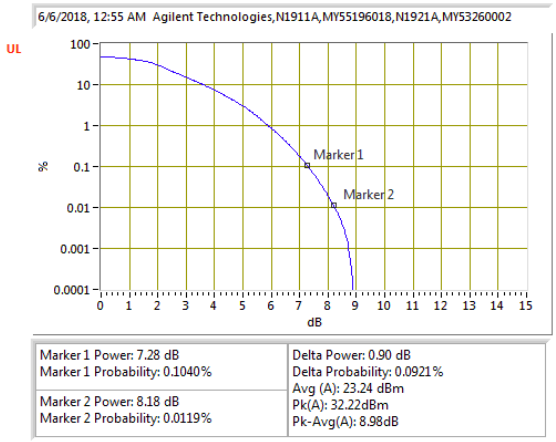
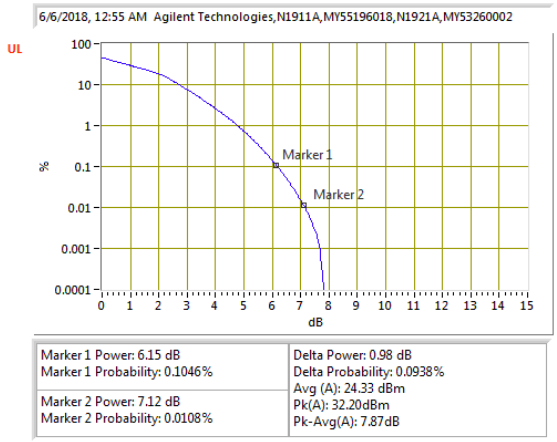
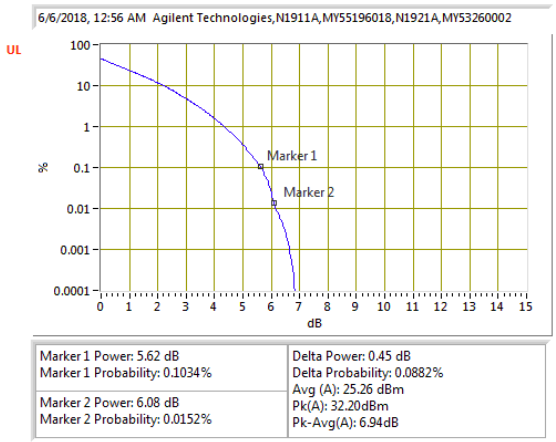


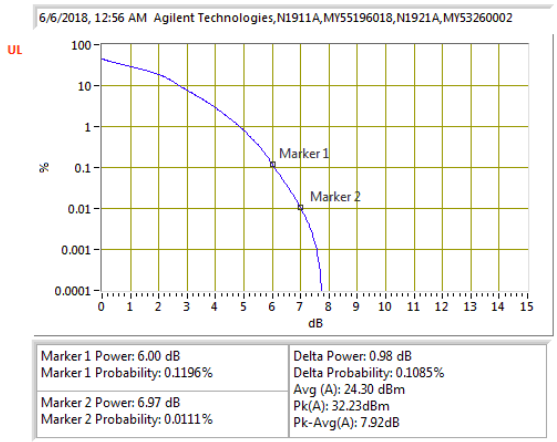
LTE B25 10MHz QPSK Middle Channel



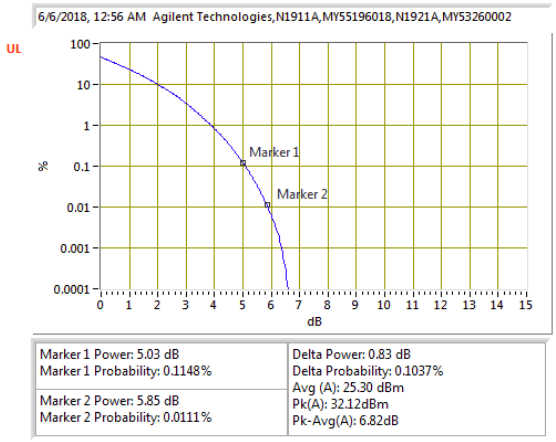
LTE B25 10MHz 16QAM Middle Channel



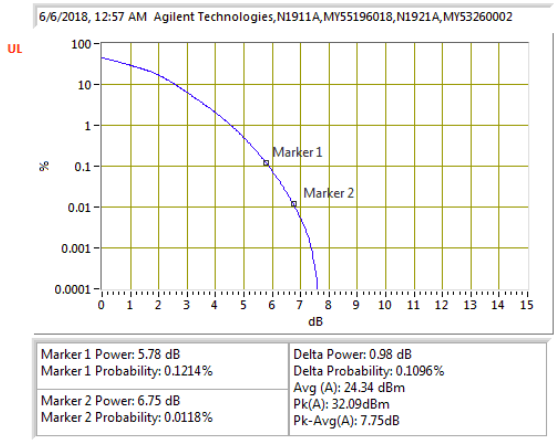
LTE B25 15MHz QPSK Middle Channel



LTE B25 15MHz 16QAM Middle Channel



LTE B25 20MHz QPSK Middle Channel



LTE B25 20MHz 16QAM Middle Channel

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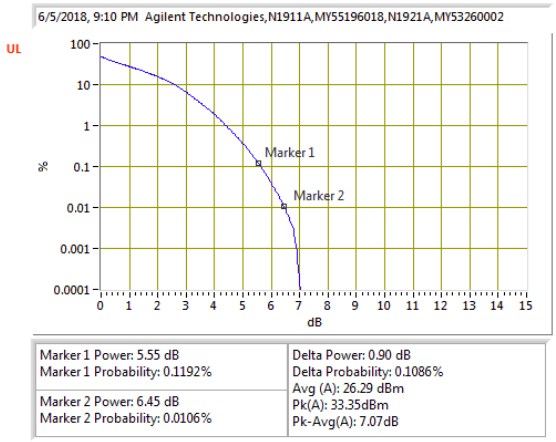
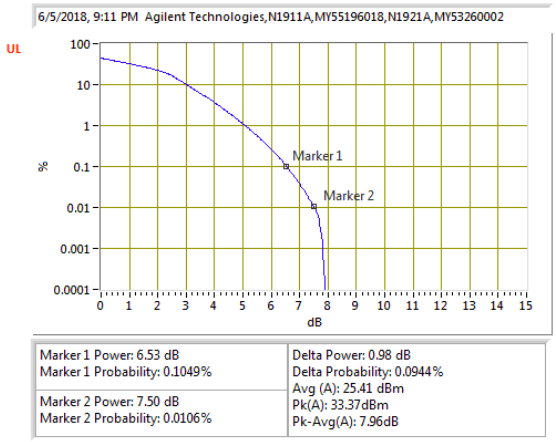
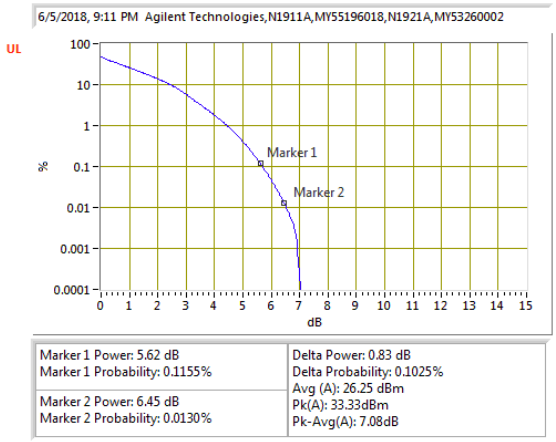
8.5.9. LTE BAND 26 (PART 90S)



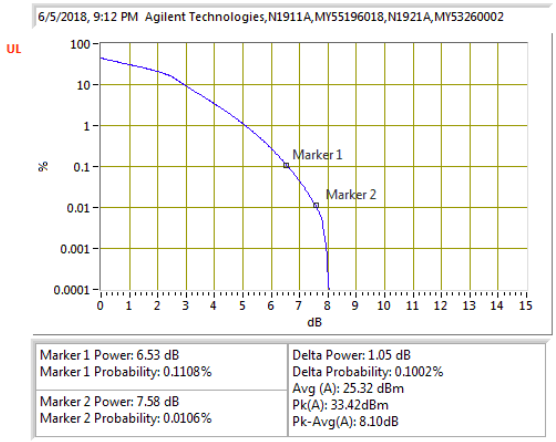
LTE B26 1.4MHz QPSK Middle Channel



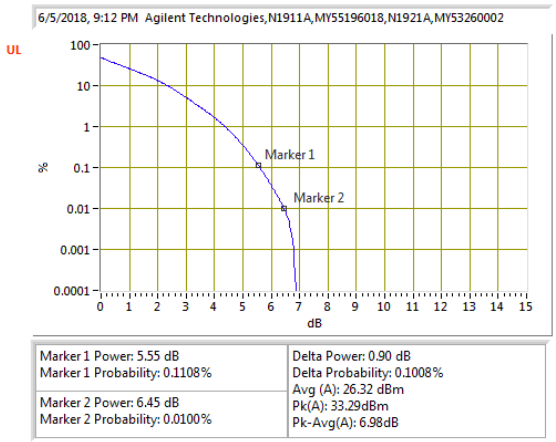
LTE B26 1.4MHz 16QAM Middle Channel



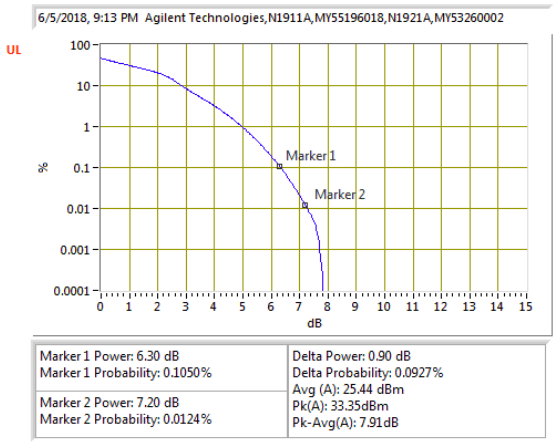
LTE B26 3MHz QPSK Middle Channel



LTE B26 3MHz 16QAM Middle Channel



LTE B26 5MHz QPSK Middle Channel



LTE B26 5MHz 16QAM Middle Channel

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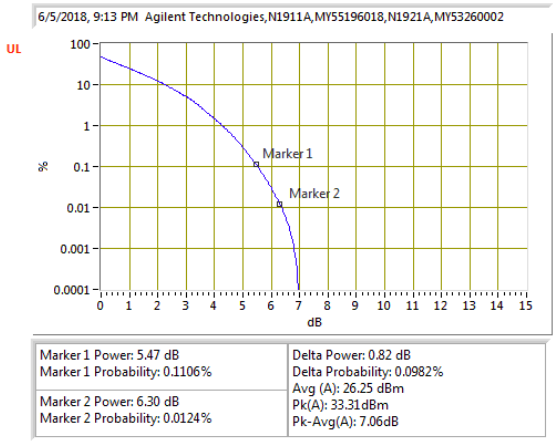
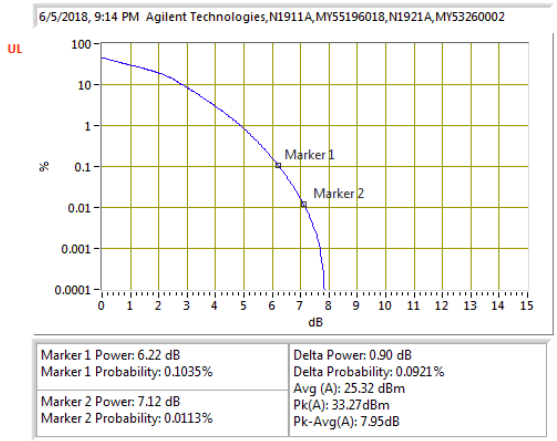


LTE B26 10MHz QPSK Middle Channel



LTE B26 10MHz 16QAM Middle Channel

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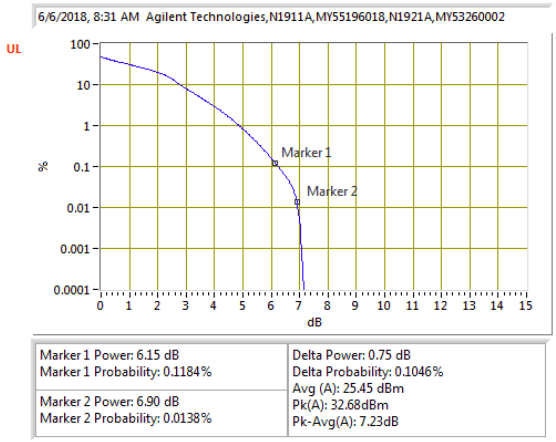
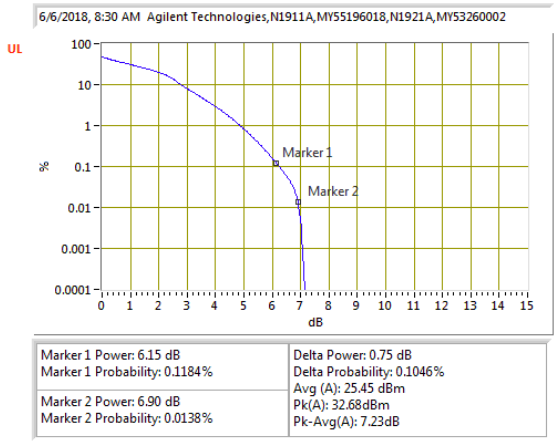
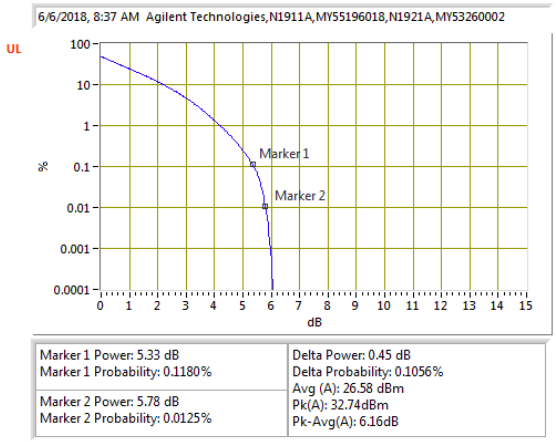
8.5.10. LTE BAND 30



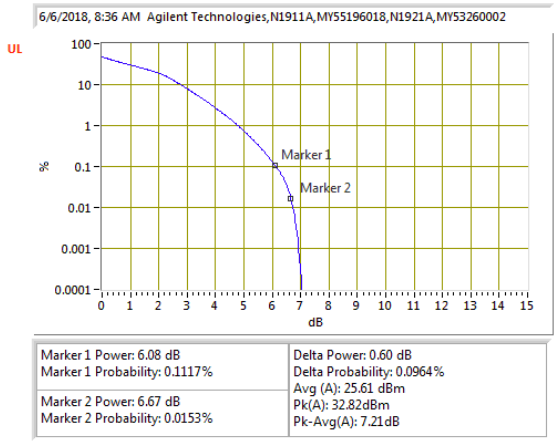
LTE B30 5MHz QPSK Middle Channel



LTE B30 5MHz 16QAM Middle Channel



LTE B30 10MHz QPSK Middle Channel



LTE B30 10MHz 16QAM Middle Channel

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8.5.11. LTE BAND 41

ID:	39004	Date:	5/14/18

Band	Bandwidth (MHz)	Frequency (MHz)	RB Allocation	RB OffSet	Modulation	Conducted Power (dBm)		Peak-to-Average Power Ratio (dB)
						Peak	Average	
Band 41	5MHz	2593.0	25	0	QPSK	32.39	22.94	2.46
					16QAM	32.32	21.87	3.46
	10MHz		50	0	QPSK	32.31	22.84	2.48
					16QAM	32.39	21.94	3.46
	15MHz		75	0	QPSK	32.32	22.88	2.45
					16QAM	32.32	21.93	3.40
	20MHz		100	0	QPSK	32.27	22.89	2.39
					16QAM	32.31	21.94	3.38
Duty Cycle Correction Factor (dB) =			6.99					
Peak-to-Average Power Ratio= Peak Reading - Average Reading - Duty Cycle Correction Factor								

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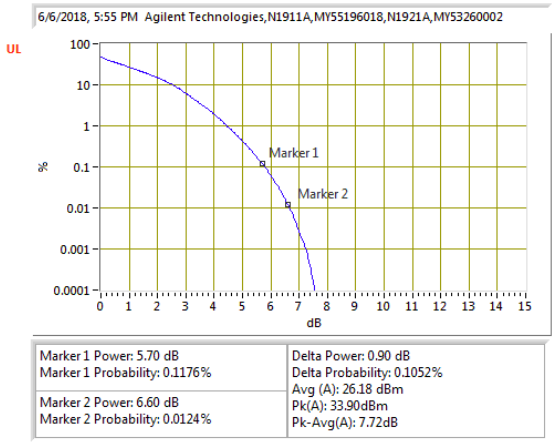
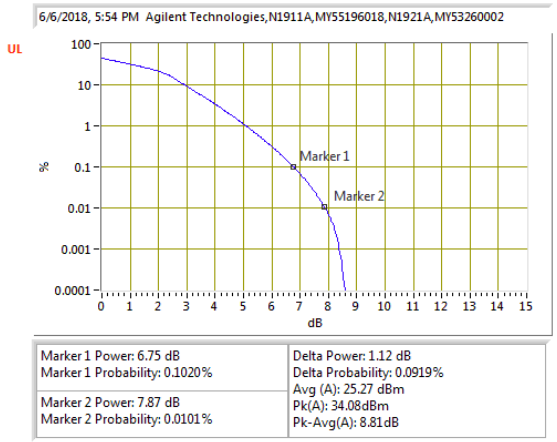
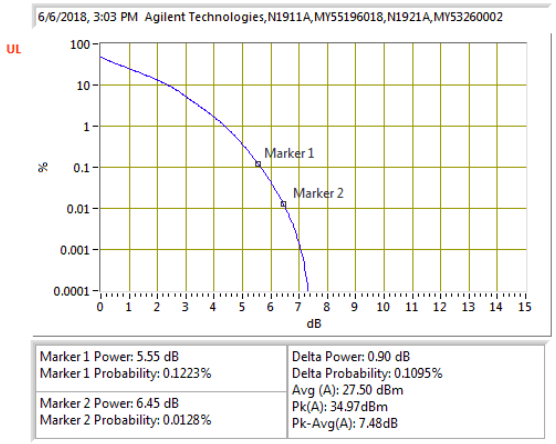
8.5.12. LTE BAND 66



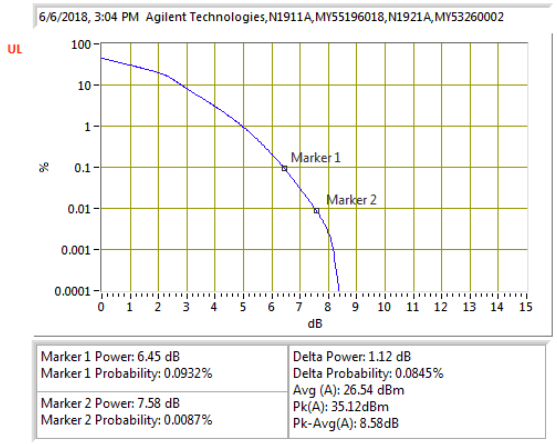
LTE B66 1.4MHz QPSK Middle Channel



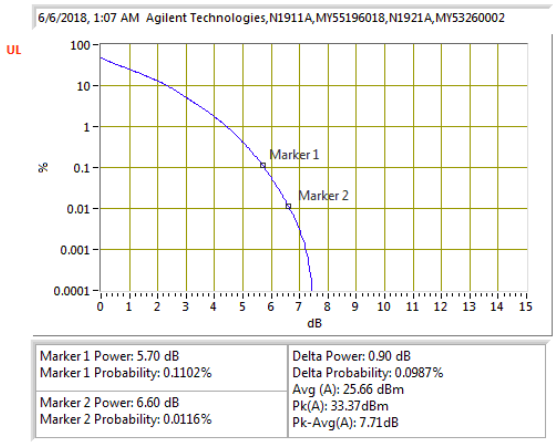
LTE B66 1.4MHz 16QAM Middle Channel



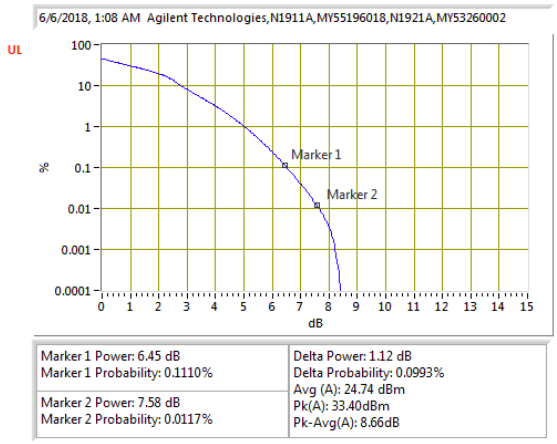
LTE B66 3MHz QPSK Middle Channel



LTE B66 3MHz 16QAM Middle Channel



LTE B66 5MHz QPSK Middle Channel



LTE B66 5MHz 16QAM Middle Channel

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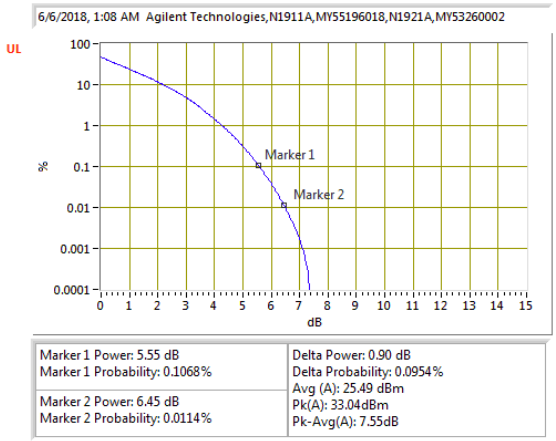
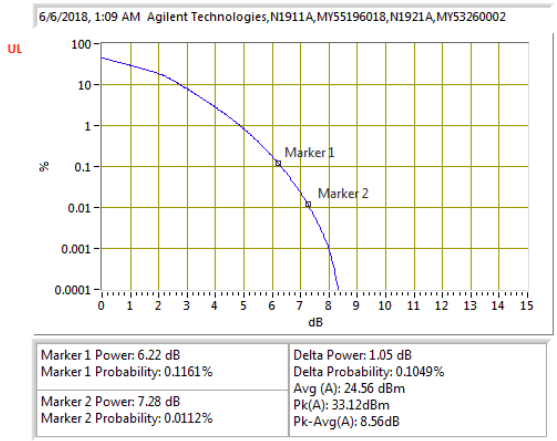
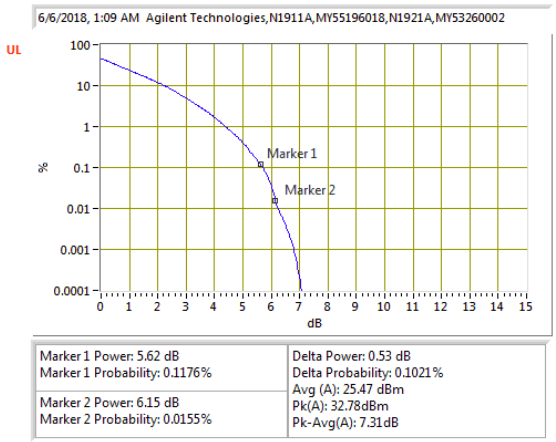


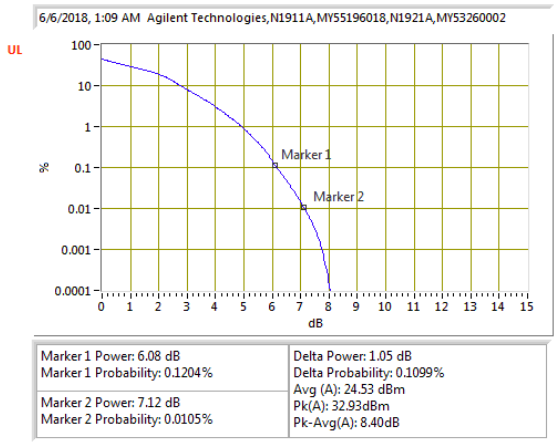
LTE B66 10MHz QPSK Middle Channel



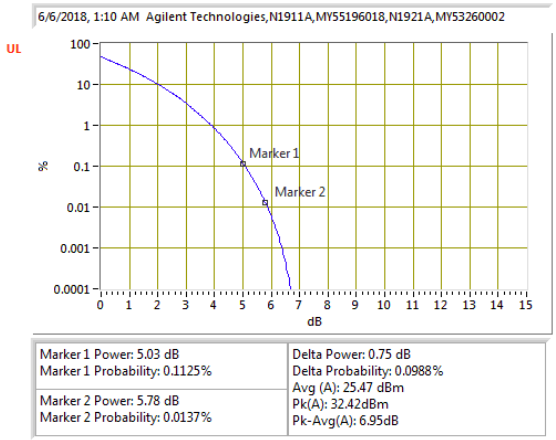
LTE B66 10MHz 16QAM Middle Channel



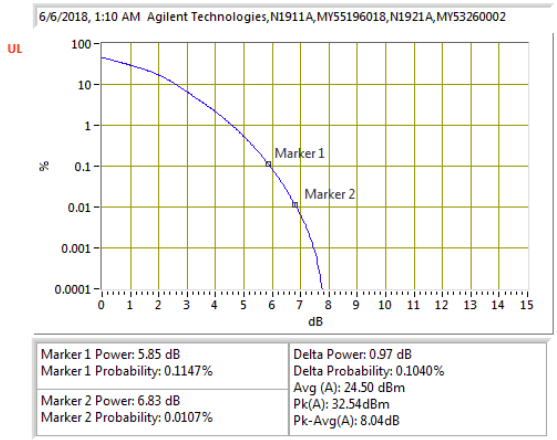
LTE B66 15MHz QPSK Middle Channel



LTE B66 15MHz 16QAM Middle Channel



LTE B66 20MHz QPSK Middle Channel



LTE B66 20MHz 16QAM Middle Channel

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9. RADIATED TEST RESULTS

9.1. FIELD STRENGTH OF SPURIOUS RADIATION, Ant 1

RULE PART(S)

§2.1053, §22.917, §24.238, §27.53, §90.691 and §90.543

LIMIT

§22.917(a), §24.238(a), §27.53 (g), (h), §90.691
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.

§27.53 (Band 13)
(c) 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.
(f) Emissions in the band 1559-1610 MHz shall be limited to −70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals. (-70 dBW/MHz = -40dBm/MHz).

§90.543(Band 14)
(e) (3) On any frequency between 775-788 MHz, above 805 MHz, and below 758 MHz, by at least 43 + 10 log (P) dB.
(f) For operations in the 758-775 MHz and 788-805 MHz bands, all emissions including harmonics 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.

§27.53 (a) (Band 30, Band 40)
For mobile and portable stations operating in the 2305-2315 MHz: 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.

§27.53 (m) (Band 7, 41)
At least 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.

TEST PROCEDURE

KDB 971168 D01/D02 v02r01

MODES TESTED

- LTE Band 2
- LTE Band 5
- LTE Band 7
- LTE Band 12
- LTE Band 13
- LTE Band 14
- LTE Band 17
- LTE Band 25
- LTE Band 26
- LTE Band 30
- LTE Band 41
- LTE Band 66

RESULTS

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9.1.1. LTE BAND 2

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 2, 20MHz QPSK

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1860MHz)										
3.72	-69.7	H	3.0	-19.7	34.1	1.0	-52.8	-13.0	-39.8	
5.58	-71.5	H	3.0	-17.5	33.3	1.0	-49.8	-13.0	-36.8	
7.44	-73.3	H	3.0	-15.8	33.1	1.0	-47.9	-13.0	-34.9	
3.72	-71.5	V	3.0	-21.1	34.1	1.0	-54.3	-13.0	-41.3	
5.58	-71.7	V	3.0	-17.7	33.3	1.0	-50.0	-13.0	-37.0	
7.44	-72.3	V	3.0	-14.8	33.1	1.0	-46.9	-13.0	-33.9	
Mid Channel (1880MHz)										
3.76	-70.9	H	3.0	-20.8	34.1	1.0	-53.9	-13.0	-40.9	
5.64	-71.1	H	3.0	-16.9	33.3	1.0	-49.2	-13.0	-36.2	
7.52	-72.7	H	3.0	-15.1	33.0	1.0	-47.2	-13.0	-34.2	
3.76	-70.3	V	3.0	-19.9	34.1	1.0	-52.9	-13.0	-39.9	
5.64	-71.1	V	3.0	-17.0	33.3	1.0	-49.3	-13.0	-36.3	
7.52	-72.3	V	3.0	-14.7	33.0	1.0	-46.7	-13.0	-33.7	
High Channel (1900MHz)										
3.80	-70.7	H	3.0	-20.5	34.0	1.0	-53.5	-13.0	-40.5	
5.70	-71.9	H	3.0	-17.6	33.3	1.0	-49.9	-13.0	-36.9	
7.60	-73.3	H	3.0	-15.6	33.0	1.0	-47.6	-13.0	-34.6	
3.80	-70.6	V	3.0	-20.1	34.0	1.0	-53.1	-13.0	-40.1	
5.70	-70.9	V	3.0	-16.7	33.3	1.0	-49.0	-13.0	-36.0	
7.60	-73.2	V	3.0	-15.5	33.0	1.0	-47.5	-13.0	-34.5	

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LTE B2 20MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 2, 20MHz 16QAM

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1860MHz)										
3.72	-71.5	H	3.0	-21.5	34.1	1.0	-54.6	-13.0	-41.6	
5.58	-71.4	H	3.0	-17.4	33.3	1.0	-49.7	-13.0	-36.7	
7.44	-73.3	H	3.0	-15.8	33.1	1.0	-47.9	-13.0	-34.9	
3.72	-71.2	V	3.0	-20.8	34.1	1.0	-54.0	-13.0	-41.0	
5.58	-71.6	V	3.0	-17.6	33.3	1.0	-49.9	-13.0	-36.9	
7.44	-71.7	V	3.0	-14.2	33.1	1.0	-46.3	-13.0	-33.3	
Mid Channel (1880MHz)										
3.76	-70.6	H	3.0	-20.5	34.1	1.0	-53.6	-13.0	-40.6	
5.64	-71.0	H	3.0	-16.8	33.3	1.0	-49.1	-13.0	-36.1	
7.52	-72.5	H	3.0	-14.9	33.0	1.0	-47.0	-13.0	-34.0	
3.76	-70.8	V	3.0	-20.4	34.1	1.0	-53.4	-13.0	-40.4	
5.64	-71.7	V	3.0	-17.6	33.3	1.0	-49.9	-13.0	-36.9	
7.52	-71.3	V	3.0	-13.7	33.0	1.0	-45.7	-13.0	-32.7	
High Channel (1900MHz)										
3.80	-70.4	H	3.0	-20.2	34.0	1.0	-53.2	-13.0	-40.2	
5.70	-70.8	H	3.0	-16.5	33.3	1.0	-48.8	-13.0	-35.8	
7.60	-73.7	H	3.0	-16.0	33.0	1.0	-48.0	-13.0	-35.0	
3.80	-68.6	V	3.0	-19.1	34.0	1.0	-52.1	-13.0	-39.1	
5.70	-70.7	V	3.0	-16.5	33.3	1.0	-48.8	-13.0	-35.8	
7.60	-73.0	V	3.0	-15.3	33.0	1.0	-47.3	-13.0	-34.3	

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LTE B2 20MHz 16QAM

9.1.2. LTE BAND 5

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 5, 10MHz QPSK

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (829MHz)										
1.66	-70.2	H	3.0	-28.3	36.5	1.0	-63.8	-13.0	-50.8	
2.49	-69.5	H	3.0	-23.7	35.2	1.0	-57.9	-13.0	-44.9	
3.32	-71.1	H	3.0	-22.2	34.6	1.0	-55.8	-13.0	-42.8	
1.66	-70.0	V	3.0	-27.3	36.5	1.0	-62.8	-13.0	-49.8	
2.49	-70.7	V	3.0	-24.9	35.2	1.0	-59.0	-13.0	-46.0	
3.32	-70.5	V	3.0	-21.0	34.6	1.0	-54.6	-13.0	-41.6	
Mid Channel (836.5MHz)										
1.67	-70.0	H	3.0	-28.0	36.5	1.0	-63.5	-13.0	-50.5	
2.51	-69.8	H	3.0	-23.9	35.1	1.0	-58.0	-13.0	-45.0	
3.35	-71.3	H	3.0	-22.3	34.6	1.0	-55.9	-13.0	-42.9	
1.67	-69.3	V	3.0	-26.5	36.5	1.0	-62.0	-13.0	-49.0	
2.51	-70.9	V	3.0	-25.0	35.1	1.0	-59.1	-13.0	-46.1	
3.35	-71.8	V	3.0	-22.2	34.6	1.0	-55.8	-13.0	-42.8	
High Channel (844MHz)										
1.69	-69.8	H	3.0	-27.7	36.4	1.0	-63.1	-13.0	-50.1	
2.53	-69.9	H	3.0	-23.9	35.1	1.0	-58.0	-13.0	-45.0	
3.38	-71.7	H	3.0	-22.6	34.5	1.0	-56.2	-13.0	-43.2	
1.69	-71.0	V	3.0	-28.1	36.4	1.0	-63.5	-13.0	-50.5	
2.53	-70.5	V	3.0	-24.4	35.1	1.0	-58.6	-13.0	-45.6	
3.38	-70.1	V	3.0	-20.5	34.5	1.0	-54.0	-13.0	-41.0	

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LTE B5 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 5, 10MHz 16QAM

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (829MHz)										
1.66	-70.3	H	3.0	-28.8	36.5	1.0	-64.3	-13.0	-51.3	
2.49	-70.2	H	3.0	-27.0	35.2	1.0	-61.2	-13.0	-48.2	
3.32	-69.5	H	3.0	-23.5	34.6	1.0	-57.1	-13.0	-44.1	
1.66	-67.3	V	3.0	-25.5	36.5	1.0	-61.0	-13.0	-48.0	
2.49	-65.4	V	3.0	-21.3	35.2	1.0	-55.4	-13.0	-42.4	
3.32	-66.3	V	3.0	-20.4	34.6	1.0	-54.0	-13.0	-41.0	
Mid Channel (836.5MHz)										
1.67	-70.3	H	3.0	-28.8	36.5	1.0	-64.3	-13.0	-51.3	
2.51	-70.4	H	3.0	-27.2	35.1	1.0	-61.3	-13.0	-48.3	
3.35	-71.4	H	3.0	-25.4	34.6	1.0	-58.9	-13.0	-45.9	
1.67	-67.4	V	3.0	-25.7	36.5	1.0	-61.1	-13.0	-48.1	
2.51	-66.4	V	3.0	-22.1	35.1	1.0	-56.3	-13.0	-43.3	
3.35	-67.2	V	3.0	-21.1	34.6	1.0	-54.7	-13.0	-41.7	
High Channel (844MHz)										
1.69	-70.9	H	3.0	-29.4	36.4	1.0	-64.8	-13.0	-51.8	
2.53	-71.3	H	3.0	-28.0	35.1	1.0	-62.1	-13.0	-49.1	
3.38	-69.8	H	3.0	-23.7	34.5	1.0	-57.2	-13.0	-44.2	
1.69	-69.7	V	3.0	-27.9	36.4	1.0	-63.4	-13.0	-50.4	
2.53	-71.0	V	3.0	-26.7	35.1	1.0	-60.9	-13.0	-47.9	
3.38	-71.3	V	3.0	-25.2	34.5	1.0	-58.7	-13.0	-45.7	

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LTE B5 10MHz 16QAM

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9.1.3. LTE BAND 7

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 10649
Configuration: EUT Only
Mode: LTE Band 7, 20MHz QPSK

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	LTE B7

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (2510MHz)										
5.02	-64.8	H	3.0	-11.9	33.4	1.0	-44.3	-25.0	-19.3	
7.53	-66.0	H	3.0	-8.4	33.0	1.0	-40.4	-25.0	-15.4	
10.04	-66.1	H	3.0	-5.3	32.6	1.0	-36.9	-25.0	-11.9	
5.02	-65.1	V	3.0	-12.3	33.4	1.0	-44.7	-25.0	-19.7	
7.53	-64.7	V	3.0	-7.0	33.0	1.0	-39.1	-25.0	-14.1	
10.04	-65.9	V	3.0	-4.8	32.6	1.0	-36.4	-25.0	-11.4	
Mid Channel (2535MHz)										
5.07	-65.7	H	3.0	-12.6	33.4	1.0	-45.0	-25.0	-20.0	
7.61	-65.7	H	3.0	-8.0	33.0	1.0	-40.1	-25.0	-15.1	
10.14	-66.2	H	3.0	-5.3	32.6	1.0	-36.9	-25.0	-11.9	
5.07	-66.0	V	3.0	-13.1	33.4	1.0	-45.5	-25.0	-20.5	
7.61	-65.6	V	3.0	-7.9	33.0	1.0	-39.9	-25.0	-14.9	
10.14	-66.3	V	3.0	-5.1	32.6	1.0	-36.7	-25.0	-11.7	
High Channel (2560MHz)										
5.12	-66.9	H	3.0	-13.7	33.4	1.0	-46.1	-25.0	-21.1	
7.68	-66.3	H	3.0	-8.5	33.0	1.0	-40.6	-25.0	-15.6	
10.24	-67.0	H	3.0	-6.0	32.5	1.0	-37.5	-25.0	-12.5	
5.12	-65.9	V	3.0	-12.9	33.4	1.0	-45.3	-25.0	-20.3	
7.68	-65.8	V	3.0	-8.0	33.0	1.0	-40.0	-25.0	-15.0	
10.24	-65.9	V	3.0	-4.7	32.5	1.0	-36.2	-25.0	-11.2	

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LTE B7 20MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 10649
Configuration: EUT Only
Mode: LTE Band 7, 20MHz 16QAM

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	LTE B7

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (2510MHz)										
5.02	-64.1	H	3.0	-11.2	33.4	1.0	-43.7	-25.0	-18.7	
7.53	-64.7	H	3.0	-7.1	33.0	1.0	-39.1	-25.0	-14.1	
10.04	-65.9	H	3.0	-5.1	32.6	1.0	-36.8	-25.0	-11.8	
5.02	-64.9	V	3.0	-12.0	33.4	1.0	-44.4	-25.0	-19.4	
7.53	-64.9	V	3.0	-7.2	33.0	1.0	-39.3	-25.0	-14.3	
10.04	-65.3	V	3.0	-4.2	32.6	1.0	-35.8	-25.0	-10.8	
Mid Channel (2535MHz)										
5.07	-65.9	H	3.0	-12.9	33.4	1.0	-45.3	-25.0	-20.3	
7.61	-66.9	H	3.0	-9.2	33.0	1.0	-41.3	-25.0	-16.3	
10.14	-65.6	H	3.0	-4.7	32.6	1.0	-36.2	-25.0	-11.2	
5.07	-65.9	V	3.0	-13.0	33.4	1.0	-45.4	-25.0	-20.4	
7.61	-66.1	V	3.0	-8.4	33.0	1.0	-40.4	-25.0	-15.4	
10.14	-66.2	V	3.0	-5.0	32.6	1.0	-36.6	-25.0	-11.6	
High Channel (2560MHz)										
5.12	-65.3	H	3.0	-12.2	33.4	1.0	-44.6	-25.0	-19.6	
7.68	-66.5	H	3.0	-8.7	33.0	1.0	-40.7	-25.0	-15.7	
10.24	-66.6	H	3.0	-5.5	32.5	1.0	-37.1	-25.0	-12.1	
5.12	-65.5	V	3.0	-12.4	33.4	1.0	-44.8	-25.0	-19.8	
7.68	-65.2	V	3.0	-7.4	33.0	1.0	-39.4	-25.0	-14.4	
10.24	-65.9	V	3.0	-4.7	32.5	1.0	-36.2	-25.0	-11.2	

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LTE B7 20MHz 16QAM

9.1.4. LTE BAND 12

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 10649
Configuration: EUT Only
Mode: LTE Band 12, 10MHz QPSK

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (704MHz)										
1.41	-66.8	H	3.0	-26.6	36.7	1.0	-62.2	-13.0	-49.2	
2.11	-66.2	H	3.0	-21.3	35.8	1.0	-56.1	-13.0	-43.1	
2.82	-66.9	H	3.0	-19.7	35.0	1.0	-53.7	-13.0	-40.7	
1.41	-65.9	V	3.0	-25.2	36.7	1.0	-60.9	-13.0	-47.9	
2.11	-67.5	V	3.0	-21.8	35.8	1.0	-56.5	-13.0	-43.5	
2.82	-66.6	V	3.0	-18.8	35.0	1.0	-52.9	-13.0	-39.9	
Mid Channel (707.5MHz)										
1.42	-65.9	H	3.0	-25.6	36.7	1.0	-61.3	-13.0	-48.3	
2.12	-66.6	H	3.0	-21.7	35.7	1.0	-56.4	-13.0	-43.4	
2.83	-66.7	H	3.0	-19.4	35.0	1.0	-53.5	-13.0	-40.5	
1.42	-66.0	V	3.0	-25.3	36.7	1.0	-60.9	-13.0	-47.9	
2.12	-66.9	V	3.0	-21.2	35.7	1.0	-55.9	-13.0	-42.9	
2.83	-66.5	V	3.0	-18.6	35.0	1.0	-52.7	-13.0	-39.7	
High Channel (711MHz)										
1.42	-66.8	H	3.0	-26.6	36.7	1.0	-62.3	-13.0	-49.3	
2.13	-66.5	H	3.0	-21.6	35.7	1.0	-56.3	-13.0	-43.3	
2.84	-66.2	H	3.0	-17.8	35.0	1.0	-51.8	-13.0	-38.8	
1.42	-66.4	V	3.0	-25.6	36.7	1.0	-61.3	-13.0	-48.3	
2.13	-65.6	V	3.0	-19.9	35.7	1.0	-54.6	-13.0	-41.6	
2.84	-66.5	V	3.0	-18.6	35.0	1.0	-52.6	-13.0	-39.6	

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LTE B12 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 10649
Configuration: EUT Only
Mode: LTE Band 12, 10MHz 16QAM

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (704MHz)										
1.41	-67.7	H	3.0	-27.5	36.7	1.0	-63.2	-13.0	-50.2	
2.11	-67.1	H	3.0	-22.2	35.8	1.0	-56.9	-13.0	-43.9	
2.82	-67.4	H	3.0	-20.2	35.0	1.0	-54.2	-13.0	-41.2	
1.41	-68.0	V	3.0	-27.3	36.7	1.0	-63.0	-13.0	-50.0	
2.11	-67.9	V	3.0	-22.1	35.8	1.0	-56.9	-13.0	-43.9	
2.82	-67.0	V	3.0	-19.2	35.0	1.0	-53.2	-13.0	-40.2	
Mid Channel (707.5MHz)										
1.42	-67.1	H	3.0	-26.9	36.7	1.0	-62.5	-13.0	-49.5	
2.12	-66.9	H	3.0	-22.0	35.7	1.0	-56.7	-13.0	-43.7	
2.83	-66.4	H	3.0	-19.1	35.0	1.0	-53.1	-13.0	-40.1	
1.42	-67.9	V	3.0	-27.2	36.7	1.0	-62.9	-13.0	-49.9	
2.12	-67.7	V	3.0	-22.0	35.7	1.0	-56.7	-13.0	-43.7	
2.83	-67.1	V	3.0	-19.2	35.0	1.0	-53.3	-13.0	-40.3	
High Channel (711MHz)										
1.42	-66.1	H	3.0	-25.8	36.7	1.0	-61.5	-13.0	-48.5	
2.13	-65.7	H	3.0	-20.8	35.7	1.0	-55.5	-13.0	-42.5	
2.84	-66.7	H	3.0	-19.4	35.0	1.0	-53.4	-13.0	-40.4	
1.42	-66.4	V	3.0	-25.6	36.7	1.0	-61.3	-13.0	-48.3	
2.13	-66.3	V	3.0	-20.5	35.7	1.0	-55.3	-13.0	-42.3	
2.84	-66.0	V	3.0	-18.1	35.0	1.0	-52.1	-13.0	-39.1	

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LTE B12 10MHz 16QAM

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9.1.5. LTE BAND 13

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 10649
Configuration: EUT Only
Mode: LTE Band 13, 10MHz QPSK

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	LTE B13

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (782MHz)										
1.56	-67.0	H	3.0	-26.0	36.6	1.0	-61.6	-40.0	-21.6	
2.35	-67.7	H	3.0	-22.4	35.3	1.0	-56.7	-13.0	-43.7	
3.13	-65.8	H	3.0	-17.5	34.8	1.0	-51.3	-13.0	-38.3	
1.56	-66.9	V	3.0	-25.1	36.6	1.0	-60.8	-40.0	-20.8	
2.35	-67.4	V	3.0	-21.9	35.3	1.0	-56.2	-13.0	-43.2	
3.13	-66.2	V	3.0	-17.1	34.8	1.0	-50.9	-13.0	-37.9	

Rev. 05.21.15

LTE B13 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 10649
Configuration: EUT Only
Mode: LTE Band 13, 10MHz 16QAM

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	LTE B13

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (782MHz)										
1.56	-67.8	H	3.0	-26.7	36.6	1.0	-62.4	-40.0	-22.4	
2.35	-66.6	H	3.0	-21.3	35.3	1.0	-55.6	-13.0	-42.6	
3.13	-66.7	H	3.0	-18.3	34.8	1.0	-52.2	-13.0	-39.2	
1.56	-66.7	V	3.0	-24.9	36.6	1.0	-60.5	-40.0	-20.5	
2.35	-67.6	V	3.0	-22.1	35.3	1.0	-56.4	-13.0	-43.4	
3.13	-65.7	V	3.0	-16.6	34.8	1.0	-50.4	-13.0	-37.4	

Rev. 05.21.15

LTE B13 10MHz 16QAM

9.1.6. LTE BAND 14

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/14/18
Test Engineer: 10649
Configuration: EUT Only
Mode: LTE Band 14, 10MHz QPSK

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	LTE B14

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (793MHz)										
1.59	-67.2	H	3.0	-25.9	36.6	1.0	-61.5	-40.0	-21.5	
2.38	-66.8	H	3.0	-21.4	35.2	1.0	-55.7	-13.0	-42.7	
3.17	-66.6	H	3.0	-18.1	34.8	1.0	-51.9	-13.0	-38.9	
1.59	-67.4	V	3.0	-25.4	36.6	1.0	-61.0	-40.0	-21.0	
2.38	-66.5	V	3.0	-21.0	35.2	1.0	-55.2	-13.0	-42.2	
3.17	-66.4	V	3.0	-17.1	34.8	1.0	-50.9	-13.0	-37.9	

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LTE B14 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/14/18
Test Engineer: 10649
Configuration: EUT Only
Mode: LTE Band 14, 10MHz 16QAM

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	LTE B14

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (793MHz)										
1.59	-66.8	H	3.0	-25.6	36.6	1.0	-61.1	-40.0	-21.1	
2.38	-67.3	H	3.0	-21.9	35.2	1.0	-56.1	-13.0	-43.1	
3.17	-65.9	H	3.0	-17.4	34.8	1.0	-51.1	-13.0	-38.1	
1.59	-67.4	V	3.0	-25.4	36.6	1.0	-61.0	-40.0	-21.0	
2.38	-66.7	V	3.0	-21.2	35.2	1.0	-55.4	-13.0	-42.4	
3.17	-65.6	V	3.0	-16.4	34.8	1.0	-50.1	-13.0	-37.1	

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9.1.7. LTE BAND 17

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 10649
Configuration: EUT Only
Mode: LTE Band 17, 10MHz QPSK

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (710MHz)										
1.42	-67.1	H	3.0	-26.9	36.7	1.0	-62.6	-13.0	-49.6	
2.13	-66.6	H	3.0	-21.7	35.7	1.0	-56.4	-13.0	-43.4	
2.84	-68.0	H	3.0	-20.7	35.0	1.0	-54.7	-13.0	-41.7	
1.42	-66.5	V	3.0	-25.8	36.7	1.0	-61.5	-13.0	-48.5	
2.13	-67.4	V	3.0	-21.7	35.7	1.0	-56.4	-13.0	-43.4	
2.84	-66.5	V	3.0	-18.6	35.0	1.0	-52.6	-13.0	-39.6	

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LTE B17 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 10649
Configuration: EUT Only
Mode: LTE Band 17, 10MHz 16QAM

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (710MHz)										
1.42	-66.7	H	3.0	-26.4	36.7	1.0	-62.1	-13.0	-49.1	
2.13	-67.7	H	3.0	-22.8	35.7	1.0	-57.5	-13.0	-44.5	
2.84	-67.8	H	3.0	-20.5	35.0	1.0	-54.5	-13.0	-41.5	
1.42	-67.5	V	3.0	-26.7	36.7	1.0	-62.4	-13.0	-49.4	
2.13	-67.3	V	3.0	-21.6	35.7	1.0	-56.3	-13.0	-43.3	
2.84	-67.3	V	3.0	-19.4	35.0	1.0	-53.5	-13.0	-40.5	

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LTE B17 10MHz 16QAM

9.1.8. LTE BAND 25

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 10649
Configuration: EUT Only
Mode: LTE Band 25, 20MHz QPSK

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	3m Chamber F	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1860MHz)										
3.72	-69.2	H	3.0	-19.4	34.4	1.0	-52.8	-13.0	-39.8	
5.58	-70.9	H	3.0	-17.4	34.1	1.0	-50.5	-13.0	-37.5	
7.44	-73.0	H	3.0	-16.6	33.6	1.0	-49.2	-13.0	-36.2	
3.72	-70.0	V	3.0	-20.1	34.4	1.0	-53.5	-13.0	-40.5	
5.58	-70.0	V	3.0	-16.3	34.1	1.0	-49.5	-13.0	-36.5	
7.44	-72.2	V	3.0	-16.1	33.6	1.0	-48.7	-13.0	-35.7	
Mid Channel (1882.5MHz)										
3.77	-70.7	H	3.0	-20.7	34.4	1.0	-54.1	-13.0	-41.1	
5.65	-70.2	H	3.0	-16.6	34.1	1.0	-49.7	-13.0	-36.7	
7.53	-72.7	H	3.0	-16.2	33.5	1.0	-48.7	-13.0	-35.7	
3.77	-70.5	V	3.0	-20.4	34.4	1.0	-53.8	-13.0	-40.8	
5.65	-70.3	V	3.0	-16.5	34.1	1.0	-49.7	-13.0	-36.7	
7.53	-72.4	V	3.0	-16.1	33.5	1.0	-48.6	-13.0	-35.6	
High Channel (1905MHz)										
3.81	-70.3	H	3.0	-20.1	34.4	1.0	-53.5	-13.0	-40.5	
5.72	-71.0	H	3.0	-17.3	34.1	1.0	-50.4	-13.0	-37.4	
7.62	-72.7	H	3.0	-16.1	33.4	1.0	-48.5	-13.0	-35.5	
3.81	-70.2	V	3.0	-20.0	34.4	1.0	-53.3	-13.0	-40.3	
5.72	-71.4	V	3.0	-17.6	34.1	1.0	-50.7	-13.0	-37.7	
7.62	-72.5	V	3.0	-16.1	33.4	1.0	-48.5	-13.0	-35.5	

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LTE B25 20MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 10649
Configuration: EUT Only
Mode: LTE Band 25, 20MHz 16QAM

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	3m Chamber F	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1860MHz)										
3.72	-67.7	H	3.0	-17.9	34.4	1.0	-51.3	-13.0	-38.3	
5.58	-70.8	H	3.0	-17.3	34.1	1.0	-50.4	-13.0	-37.4	
7.44	-71.3	H	3.0	-14.9	33.6	1.0	-47.5	-13.0	-34.5	
3.72	-69.8	V	3.0	-19.9	34.4	1.0	-53.3	-13.0	-40.3	
5.58	-69.4	V	3.0	-15.7	34.1	1.0	-48.9	-13.0	-35.9	
7.44	-73.0	V	3.0	-16.8	33.6	1.0	-49.4	-13.0	-36.4	
Mid Channel (1882.5MHz)										
3.77	-69.2	H	3.0	-19.2	34.4	1.0	-52.6	-13.0	-39.6	
5.65	-71.1	H	3.0	-17.5	34.1	1.0	-50.6	-13.0	-37.6	
7.53	-72.2	H	3.0	-15.7	33.5	1.0	-48.2	-13.0	-35.2	
3.77	-70.1	V	3.0	-20.0	34.4	1.0	-53.4	-13.0	-40.4	
5.65	-70.8	V	3.0	-17.0	34.1	1.0	-50.1	-13.0	-37.1	
7.53	-72.4	V	3.0	-16.1	33.5	1.0	-48.6	-13.0	-35.6	
High Channel (1905MHz)										
3.81	-70.0	H	3.0	-19.8	34.4	1.0	-53.2	-13.0	-40.2	
5.72	-71.0	H	3.0	-17.3	34.1	1.0	-50.4	-13.0	-37.4	
7.62	-72.9	H	3.0	-16.3	33.4	1.0	-48.7	-13.0	-35.7	
3.81	-70.2	V	3.0	-20.0	34.4	1.0	-53.4	-13.0	-40.4	
5.72	-72.2	V	3.0	-18.4	34.1	1.0	-51.5	-13.0	-38.5	
7.62	-73.0	V	3.0	-16.6	33.4	1.0	-49.0	-13.0	-36.0	

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LTE B25 20MHz 16QAM

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9.1.9. LTE BAND 26 (PART 90S)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 10649
Configuration: EUT Only
Mode: LTE Band 26 (90S), 10MHz QPSK

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (819MHz)										
1.64	-67.0	H	3.0	-25.3	36.5	1.0	-60.8	-13.0	-47.8	
2.46	-66.7	H	3.0	-21.1	35.2	1.0	-55.2	-13.0	-42.2	
3.28	-66.8	H	3.0	-18.0	34.7	1.0	-51.6	-13.0	-38.6	
1.64	-65.9	V	3.0	-23.4	36.5	1.0	-59.0	-13.0	-46.0	
2.46	-66.8	V	3.0	-21.1	35.2	1.0	-55.3	-13.0	-42.3	
3.28	-65.9	V	3.0	-16.4	34.7	1.0	-50.1	-13.0	-37.1	

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LTE B26 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 10649
Configuration: EUT Only
Mode: LTE Band 26 (90S), 10MHz 16QAM

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (819MHz)										
1.64	-67.1	H	3.0	-25.4	36.5	1.0	-60.9	-13.0	-47.9	
2.46	-67.1	H	3.0	-21.4	35.2	1.0	-55.6	-13.0	-42.6	
3.28	-66.4	H	3.0	-17.6	34.7	1.0	-51.3	-13.0	-38.3	
1.64	-66.3	V	3.0	-23.9	36.5	1.0	-59.4	-13.0	-46.4	
2.46	-66.4	V	3.0	-20.7	35.2	1.0	-54.9	-13.0	-41.9	
3.28	-64.7	V	3.0	-15.3	34.7	1.0	-48.9	-13.0	-35.9	

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LTE B26 10MHz 16QAM

9.1.10. LTE BAND 30

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 10649
Configuration: EUT only
Mode: LTE Band 30, 10MHz QPSK

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	LTE B30

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (2310MHz)										
4.62	-68.6	H	3.0	-14.8	37.9	1.0	-51.7	-40.0	-11.7	
6.93	-68.7	H	3.0	-10.1	36.5	1.0	-45.6	-40.0	-5.6	
9.24	-69.8	H	3.0	-8.3	34.9	1.0	-42.1	-40.0	-2.1	
4.62	-67.6	V	3.0	-13.8	37.9	1.0	-50.7	-40.0	-10.7	
6.93	-68.3	V	3.0	-8.8	36.5	1.0	-44.3	-40.0	-4.3	
9.24	-70.1	V	3.0	-8.3	34.9	1.0	-42.2	-40.0	-2.2	

Rev. 05.21.15

LTE B30 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 10649
Configuration: EUT only
Mode: LTE Band 30, 10MHz 16QAM

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	LTE B30

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (2310MHz)										
4.62	-68.3	H	3.0	-14.6	37.9	1.0	-51.5	-40.0	-11.5	
6.93	-68.8	H	3.0	-10.2	36.5	1.0	-45.6	-40.0	-5.6	
9.24	-69.8	H	3.0	-8.3	34.9	1.0	-42.1	-40.0	-2.1	
4.62	-68.8	V	3.0	-15.0	37.9	1.0	-52.0	-40.0	-12.0	
6.93	-69.0	V	3.0	-9.5	36.5	1.0	-44.9	-40.0	-4.9	
9.24	-69.9	V	3.0	-8.1	34.9	1.0	-42.0	-40.0	-2.0	

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LTE B30 10MHz 16QAM

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9.1.11. LTE BAND 41

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 10649
Configuration: EUT Only
Mode: LTE Band 41, 20MHz QPSK

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	LTE B41

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (2506MHz)										
5.01	-64.0	H	3.0	-11.1	33.4	1.0	-43.5	-25.0	-18.5	
7.52	-65.1	H	3.0	-7.5	33.0	1.0	-39.6	-25.0	-14.6	
10.02	-65.8	H	3.0	-5.0	32.7	1.0	-36.7	-25.0	-11.7	
5.01	-65.0	V	3.0	-12.2	33.4	1.0	-44.6	-25.0	-19.6	
7.52	-65.2	V	3.0	-7.6	33.0	1.0	-39.6	-25.0	-14.6	
10.02	-66.8	V	3.0	-5.7	32.7	1.0	-37.4	-25.0	-12.4	
Mid Channel (2593MHz)										
5.19	-64.6	H	3.0	-11.3	33.4	1.0	-43.7	-25.0	-18.7	
7.78	-65.6	H	3.0	-7.7	33.0	1.0	-39.7	-25.0	-14.7	
10.37	-64.7	H	3.0	-3.6	32.4	1.0	-35.0	-25.0	-10.0	
5.19	-63.4	V	3.0	-10.2	33.4	1.0	-42.6	-25.0	-17.6	
7.78	-65.8	V	3.0	-7.9	33.0	1.0	-39.9	-25.0	-14.9	
10.37	-64.4	V	3.0	-3.1	32.4	1.0	-34.6	-25.0	-9.6	
High Channel (2680MHz)										
5.36	-66.9	H	3.0	-13.3	33.3	1.0	-45.6	-25.0	-20.6	
8.04	-65.4	H	3.0	-7.2	33.0	1.0	-39.2	-25.0	-14.2	
10.72	-64.7	H	3.0	-3.2	32.2	1.0	-34.5	-25.0	-9.5	
5.36	-67.0	V	3.0	-13.5	33.3	1.0	-45.8	-25.0	-20.8	
8.04	-64.5	V	3.0	-6.2	33.0	1.0	-38.2	-25.0	-13.2	
10.72	-64.4	V	3.0	-2.9	32.2	1.0	-34.1	-25.0	-9.1	

Rev. 05.21.15

LTE B41 20MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 10649
Configuration: EUT Only
Mode: LTE Band 41, 20MHz 16QAM

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	LTE B41

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (2506MHz)										
5.01	-64.0	H	3.0	-11.1	33.4	1.0	-43.5	-25.0	-18.5	
7.52	-65.2	H	3.0	-7.6	33.0	1.0	-39.7	-25.0	-14.7	
10.02	-65.7	H	3.0	-4.9	32.7	1.0	-36.5	-25.0	-11.5	
5.01	-65.0	V	3.0	-12.1	33.4	1.0	-44.5	-25.0	-19.5	
7.52	-64.5	V	3.0	-6.8	33.0	1.0	-38.9	-25.0	-13.9	
10.02	-66.1	V	3.0	-5.0	32.7	1.0	-36.7	-25.0	-11.7	
Mid Channel (2593MHz)										
5.19	-64.6	H	3.0	-11.4	33.4	1.0	-43.7	-25.0	-18.7	
7.78	-65.4	H	3.0	-7.5	33.0	1.0	-39.5	-25.0	-14.5	
10.37	-64.1	H	3.0	-2.9	32.4	1.0	-34.4	-25.0	-9.4	
5.19	-64.8	V	3.0	-11.6	33.4	1.0	-44.0	-25.0	-19.0	
7.78	-65.9	V	3.0	-7.9	33.0	1.0	-39.9	-25.0	-14.9	
10.37	-64.4	V	3.0	-3.1	32.4	1.0	-34.5	-25.0	-9.5	
High Channel (2680MHz)										
5.36	-65.4	H	3.0	-11.8	33.3	1.0	-44.1	-25.0	-19.1	
8.04	-65.3	H	3.0	-7.1	33.0	1.0	-39.0	-25.0	-14.0	
10.72	-65.1	H	3.0	-3.6	32.2	1.0	-34.9	-25.0	-9.9	
5.36	-65.6	V	3.0	-12.1	33.3	1.0	-44.4	-25.0	-19.4	
8.04	-65.3	V	3.0	-7.0	33.0	1.0	-38.9	-25.0	-13.9	
10.72	-64.6	V	3.0	-3.1	32.2	1.0	-34.3	-25.0	-9.3	

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LTE B41 20MHz 16QAM

9.1.12. LTE BAND 66

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/14/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 66, 20MHz QPSK

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1720.0MHz)										
3.44	-81.2	H	3.0	-32.0	34.5	1.0	-65.4	-13.0	-52.4	
5.16	-76.1	H	3.0	-22.9	33.4	1.0	-55.3	-13.0	-42.3	
6.88	-77.3	H	3.0	-20.6	33.1	1.0	-52.8	-13.0	-39.8	
3.44	-80.4	V	3.0	-30.6	34.5	1.0	-64.1	-13.0	-51.1	
5.16	-76.9	V	3.0	-23.8	33.4	1.0	-56.1	-13.0	-43.1	
6.88	-77.1	V	3.0	-20.5	33.1	1.0	-52.6	-13.0	-39.6	
Mid Channel (1745.0MHz)										
3.49	-80.5	H	3.0	-31.1	34.4	1.0	-64.5	-13.0	-51.5	
5.24	-76.2	H	3.0	-22.8	33.3	1.0	-55.2	-13.0	-42.2	
6.98	-75.7	H	3.0	-18.8	33.1	1.0	-50.9	-13.0	-37.9	
3.49	-81.0	V	3.0	-31.1	34.4	1.0	-64.5	-13.0	-51.5	
5.24	-75.7	V	3.0	-22.4	33.3	1.0	-54.8	-13.0	-41.8	
6.98	-77.1	V	3.0	-20.3	33.1	1.0	-52.4	-13.0	-39.4	
High Channel (1770.0MHz)										
3.54	-80.1	H	3.0	-30.6	34.3	1.0	-63.9	-13.0	-50.9	
5.31	-76.8	H	3.0	-23.3	33.3	1.0	-55.6	-13.0	-42.6	
7.08	-77.7	H	3.0	-20.7	33.1	1.0	-52.8	-13.0	-39.8	
3.54	-80.6	V	3.0	-30.6	34.3	1.0	-63.9	-13.0	-50.9	
5.31	-77.0	V	3.0	-23.6	33.3	1.0	-55.9	-13.0	-42.9	
7.08	-76.9	V	3.0	-19.9	33.1	1.0	-52.0	-13.0	-39.0	

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LTE B66 20MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/14/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 66, 20MHz 16QAM

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1720.0MHz)										
3.44	-80.5	H	3.0	-31.3	34.5	1.0	-64.7	-13.0	-51.7	
5.16	-77.0	H	3.0	-23.8	33.4	1.0	-56.2	-13.0	-43.2	
6.88	-76.6	H	3.0	-19.9	33.1	1.0	-52.1	-13.0	-39.1	
3.44	-79.7	V	3.0	-29.9	34.5	1.0	-63.4	-13.0	-50.4	
5.16	-76.4	V	3.0	-23.3	33.4	1.0	-55.6	-13.0	-42.6	
6.88	-77.6	V	3.0	-21.0	33.1	1.0	-53.1	-13.0	-40.1	
Mid Channel (1745.0MHz)										
3.49	-81.1	H	3.0	-31.7	34.4	1.0	-65.1	-13.0	-52.1	
5.24	-76.1	H	3.0	-22.7	33.3	1.0	-55.1	-13.0	-42.1	
6.98	-76.0	H	3.0	-19.1	33.1	1.0	-51.2	-13.0	-38.2	
3.49	-80.1	V	3.0	-30.2	34.4	1.0	-63.6	-13.0	-50.6	
5.24	-75.4	V	3.0	-22.1	33.3	1.0	-54.5	-13.0	-41.5	
6.98	-76.5	V	3.0	-19.7	33.1	1.0	-51.8	-13.0	-38.8	
High Channel (1770.0MHz)										
3.54	-80.2	H	3.0	-30.7	34.3	1.0	-64.0	-13.0	-51.0	
5.31	-77.2	H	3.0	-23.7	33.3	1.0	-56.0	-13.0	-43.0	
7.08	-78.2	H	3.0	-21.2	33.1	1.0	-53.3	-13.0	-40.3	
3.54	-80.7	V	3.0	-30.7	34.3	1.0	-64.0	-13.0	-51.0	
5.31	-76.9	V	3.0	-23.5	33.3	1.0	-55.8	-13.0	-42.8	
7.08	-76.8	V	3.0	-19.8	33.1	1.0	-51.9	-13.0	-38.9	

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LTE B66 20MHz 16QAM

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9.2. FIELD STRENGTH OF SPURIOUS RADIATION, Ant 2

9.2.1. LTE BAND 2

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 2, 20MHz QPSK

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1860MHz)										
3.72	-70.9	H	3.0	-20.9	34.1	1.0	-54.0	-13.0	-41.0	
5.58	-70.7	H	3.0	-16.7	33.3	1.0	-49.0	-13.0	-36.0	
7.44	-73.2	H	3.0	-15.7	33.1	1.0	-47.8	-13.0	-34.8	
3.72	-70.3	V	3.0	-19.9	34.1	1.0	-53.1	-13.0	-40.1	
5.58	-71.1	V	3.0	-17.1	33.3	1.0	-49.4	-13.0	-36.4	
7.44	-73.9	V	3.0	-16.4	33.1	1.0	-48.5	-13.0	-35.5	
Mid Channel (1880MHz)										
3.76	-71.1	H	3.0	-21.0	34.1	1.0	-54.1	-13.0	-41.1	
5.64	-71.2	H	3.0	-17.0	33.3	1.0	-49.3	-13.0	-36.3	
7.52	-72.0	H	3.0	-14.4	33.0	1.0	-46.5	-13.0	-33.5	
3.76	-71.2	V	3.0	-20.8	34.1	1.0	-53.8	-13.0	-40.8	
5.64	-72.3	V	3.0	-18.2	33.3	1.0	-50.5	-13.0	-37.5	
7.52	-72.2	V	3.0	-14.6	33.0	1.0	-46.6	-13.0	-33.6	
High Channel (1900MHz)										
3.80	-70.0	H	3.0	-19.8	34.0	1.0	-52.8	-13.0	-39.8	
5.70	-71.5	H	3.0	-17.2	33.3	1.0	-49.5	-13.0	-36.5	
7.60	-72.1	H	3.0	-14.4	33.0	1.0	-46.4	-13.0	-33.4	
3.80	-70.8	V	3.0	-20.3	34.0	1.0	-53.3	-13.0	-40.3	
5.70	-70.8	V	3.0	-16.6	33.3	1.0	-48.9	-13.0	-35.9	
7.60	-71.9	V	3.0	-14.2	33.0	1.0	-46.2	-13.0	-33.2	

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LTE B2 20MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 2, 20MHz 16QAM

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1860MHz)										
3.72	-70.9	H	3.0	-20.9	34.1	1.0	-54.0	-13.0	-41.0	
5.58	-72.3	H	3.0	-18.3	33.3	1.0	-50.6	-13.0	-37.6	
7.44	-72.7	H	3.0	-15.2	33.1	1.0	-47.3	-13.0	-34.3	
3.72	-71.5	V	3.0	-21.1	34.1	1.0	-54.3	-13.0	-41.3	
5.58	-72.3	V	3.0	-18.3	33.3	1.0	-50.6	-13.0	-37.6	
7.44	-73.1	V	3.0	-15.6	33.1	1.0	-47.7	-13.0	-34.7	
Mid Channel (1880MHz)										
3.76	-71.0	H	3.0	-20.9	34.1	1.0	-54.0	-13.0	-41.0	
5.64	-71.0	H	3.0	-16.8	33.3	1.0	-49.1	-13.0	-36.1	
7.52	-72.0	H	3.0	-14.4	33.0	1.0	-46.5	-13.0	-33.5	
3.76	-70.5	V	3.0	-20.1	34.1	1.0	-53.1	-13.0	-40.1	
5.64	-71.1	V	3.0	-17.0	33.3	1.0	-49.3	-13.0	-36.3	
7.52	-72.3	V	3.0	-14.7	33.0	1.0	-46.7	-13.0	-33.7	
High Channel (1900MHz)										
3.80	-70.4	H	3.0	-20.2	34.0	1.0	-53.2	-13.0	-40.2	
5.70	-72.0	H	3.0	-17.7	33.3	1.0	-50.0	-13.0	-37.0	
7.60	-73.4	H	3.0	-15.7	33.0	1.0	-47.7	-13.0	-34.7	
3.80	-70.4	V	3.0	-19.9	34.0	1.0	-52.9	-13.0	-39.9	
5.70	-71.9	V	3.0	-17.7	33.3	1.0	-50.0	-13.0	-37.0	
7.60	-73.5	V	3.0	-15.8	33.0	1.0	-47.8	-13.0	-34.8	

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LTE B2 20MHz 16QAM

9.2.2. LTE BAND 5

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 5, 10MHz QPSK

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (829MHz)										
1.66	-70.2	H	3.0	-28.3	36.5	1.0	-63.8	-13.0	-50.8	
2.49	-70.8	H	3.0	-25.0	35.2	1.0	-59.2	-13.0	-46.2	
3.32	-71.6	H	3.0	-22.7	34.6	1.0	-56.3	-13.0	-43.3	
1.66	-70.2	V	3.0	-27.5	36.5	1.0	-63.0	-13.0	-50.0	
2.49	-68.9	V	3.0	-23.1	35.2	1.0	-57.2	-13.0	-44.2	
3.32	-71.5	V	3.0	-22.0	34.6	1.0	-55.6	-13.0	-42.6	
Mid Channel (836.5MHz)										
1.67	-68.6	H	3.0	-26.6	36.5	1.0	-62.1	-13.0	-49.1	
2.51	-71.0	H	3.0	-25.1	35.1	1.0	-59.2	-13.0	-46.2	
3.35	-70.7	H	3.0	-21.7	34.6	1.0	-55.3	-13.0	-42.3	
1.67	-68.3	V	3.0	-25.5	36.5	1.0	-61.0	-13.0	-48.0	
2.51	-70.1	V	3.0	-24.2	35.1	1.0	-58.3	-13.0	-45.3	
3.35	-71.8	V	3.0	-22.2	34.6	1.0	-55.8	-13.0	-42.8	
High Channel (844MHz)										
1.69	-70.7	H	3.0	-28.6	36.4	1.0	-64.0	-13.0	-51.0	
2.53	-70.2	H	3.0	-24.2	35.1	1.0	-58.3	-13.0	-45.3	
3.38	-71.3	H	3.0	-22.2	34.5	1.0	-55.8	-13.0	-42.8	
1.69	-70.6	V	3.0	-27.7	36.4	1.0	-63.1	-13.0	-50.1	
2.53	-70.4	V	3.0	-24.3	35.1	1.0	-58.5	-13.0	-45.5	
3.38	-71.5	V	3.0	-21.9	34.5	1.0	-55.4	-13.0	-42.4	

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LTE B5 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 5, 10MHz 16QAM

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (829MHz)										
1.66	-69.5	H	3.0	-28.0	36.5	1.0	-63.5	-13.0	-50.5	
2.49	-71.5	H	3.0	-28.3	35.2	1.0	-62.5	-13.0	-49.5	
3.32	-70.5	H	3.0	-24.5	34.6	1.0	-58.1	-13.0	-45.1	
1.66	-69.9	V	3.0	-28.1	36.5	1.0	-63.6	-13.0	-50.6	
2.49	-70.3	V	3.0	-26.2	35.2	1.0	-60.3	-13.0	-47.3	
3.32	-71.1	V	3.0	-25.1	34.6	1.0	-58.8	-13.0	-45.8	
Mid Channel (836.5MHz)										
1.67	-69.7	H	3.0	-28.2	36.5	1.0	-63.7	-13.0	-50.7	
2.51	-70.4	H	3.0	-27.2	35.1	1.0	-61.3	-13.0	-48.3	
3.35	-71.3	H	3.0	-25.3	34.6	1.0	-58.8	-13.0	-45.8	
1.67	-68.8	V	3.0	-27.0	36.5	1.0	-62.5	-13.0	-49.5	
2.51	-70.5	V	3.0	-26.3	35.1	1.0	-60.4	-13.0	-47.4	
3.35	-70.1	V	3.0	-24.1	34.6	1.0	-57.6	-13.0	-44.6	
High Channel (844MHz)										
1.69	-69.5	H	3.0	-28.0	36.4	1.0	-63.4	-13.0	-50.4	
2.53	-70.8	H	3.0	-27.5	35.1	1.0	-61.6	-13.0	-48.6	
3.38	-71.6	H	3.0	-25.5	34.5	1.0	-59.0	-13.0	-46.0	
1.69	-70.4	V	3.0	-28.6	36.4	1.0	-64.1	-13.0	-51.1	
2.53	-70.0	V	3.0	-25.7	35.1	1.0	-59.9	-13.0	-46.9	
3.38	-70.8	V	3.0	-24.7	34.5	1.0	-58.2	-13.0	-45.2	

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LTE B5 10MHz 16QAM

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9.2.3. LTE BAND 7

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 7, 20MHz QPSK

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	LTE B7

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (2510MHz)										
5.02	-73.1	H	3.0	-20.2	33.4	1.0	-52.6	-25.0	-27.6	
7.53	-71.3	H	3.0	-13.7	33.0	1.0	-45.7	-25.0	-20.7	
10.04	-74.8	H	3.0	-14.0	32.6	1.0	-45.6	-25.0	-20.6	
5.02	-73.3	V	3.0	-20.4	33.4	1.0	-52.9	-25.0	-27.9	
7.53	-72.7	V	3.0	-15.1	33.0	1.0	-47.1	-25.0	-22.1	
10.04	-74.2	V	3.0	-13.1	32.6	1.0	-44.8	-25.0	-19.8	
Mid Channel (2535MHz)										
5.07	-70.9	H	3.0	-17.9	33.4	1.0	-50.3	-25.0	-25.3	
7.61	-73.7	H	3.0	-16.0	33.0	1.0	-48.0	-25.0	-23.0	
10.14	-75.1	H	3.0	-14.2	32.6	1.0	-45.8	-25.0	-20.8	
5.07	-71.3	V	3.0	-18.4	33.4	1.0	-50.8	-25.0	-25.8	
7.61	-73.5	V	3.0	-15.8	33.0	1.0	-47.8	-25.0	-22.8	
10.14	-73.6	V	3.0	-12.4	32.6	1.0	-44.0	-25.0	-19.0	
High Channel (2560MHz)										
5.12	-71.1	H	3.0	-18.0	33.4	1.0	-50.4	-25.0	-25.4	
7.68	-73.4	H	3.0	-15.6	33.0	1.0	-47.6	-25.0	-22.6	
10.24	-76.1	H	3.0	-15.1	32.5	1.0	-46.6	-25.0	-21.6	
5.12	-70.5	V	3.0	-17.5	33.4	1.0	-49.8	-25.0	-24.8	
7.68	-73.3	V	3.0	-15.5	33.0	1.0	-47.5	-25.0	-22.5	
10.24	-75.8	V	3.0	-14.6	32.5	1.0	-46.1	-25.0	-21.1	

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LTE B7 20MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 7, 20MHz 16QAM

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	LTE B7

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (2510MHz)										
5.02	-71.9	H	3.0	-19.0	33.4	1.0	-51.4	-25.0	-26.4	
7.53	-72.2	H	3.0	-14.6	33.0	1.0	-46.6	-25.0	-21.6	
10.04	-74.7	H	3.0	-13.9	32.6	1.0	-45.5	-25.0	-20.5	
5.02	-73.4	V	3.0	-20.5	33.4	1.0	-53.0	-25.0	-28.0	
7.53	-70.9	V	3.0	-13.3	33.0	1.0	-45.3	-25.0	-20.3	
10.04	-75.7	V	3.0	-14.6	32.6	1.0	-46.3	-25.0	-21.3	
Mid Channel (2535MHz)										
5.07	-71.2	H	3.0	-18.2	33.4	1.0	-50.6	-25.0	-25.6	
7.61	-73.3	H	3.0	-15.6	33.0	1.0	-47.6	-25.0	-22.6	
10.14	-74.3	H	3.0	-13.4	32.6	1.0	-45.0	-25.0	-20.0	
5.07	-70.6	V	3.0	-17.7	33.4	1.0	-50.1	-25.0	-25.1	
7.61	-72.2	V	3.0	-14.5	33.0	1.0	-46.5	-25.0	-21.5	
10.14	-73.5	V	3.0	-12.3	32.6	1.0	-43.9	-25.0	-18.9	
High Channel (2560MHz)										
5.12	-71.3	H	3.0	-18.2	33.4	1.0	-50.6	-25.0	-25.6	
7.68	-73.1	H	3.0	-15.3	33.0	1.0	-47.3	-25.0	-22.3	
10.24	-75.3	H	3.0	-14.3	32.5	1.0	-45.8	-25.0	-20.8	
5.12	-71.0	V	3.0	-18.0	33.4	1.0	-50.3	-25.0	-25.3	
7.68	-73.1	V	3.0	-15.3	33.0	1.0	-47.3	-25.0	-22.3	
10.24	-75.0	V	3.0	-13.8	32.5	1.0	-45.3	-25.0	-20.3	

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LTE B7 20MHz 16QAM

9.2.4. LTE BAND 12

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 12, 10MHz QPSK

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (704MHz)										
1.41	-69.1	H	3.0	-28.9	36.7	1.0	-64.6	-13.0	-51.6	
2.11	-71.8	H	3.0	-26.9	35.8	1.0	-61.7	-13.0	-48.7	
2.82	-70.3	H	3.0	-23.1	35.0	1.0	-57.1	-13.0	-44.1	
1.41	-70.5	V	3.0	-29.8	36.7	1.0	-65.5	-13.0	-52.5	
2.11	-71.4	V	3.0	-25.7	35.8	1.0	-60.4	-13.0	-47.4	
2.82	-70.1	V	3.0	-22.3	35.0	1.0	-56.4	-13.0	-43.4	
Mid Channel (707.5MHz)										
1.42	-70.2	H	3.0	-30.0	36.7	1.0	-65.6	-13.0	-52.6	
2.12	-69.5	H	3.0	-24.6	35.7	1.0	-59.3	-13.0	-46.3	
2.83	-71.0	H	3.0	-23.7	35.0	1.0	-57.8	-13.0	-44.8	
1.42	-68.9	V	3.0	-28.2	36.7	1.0	-63.8	-13.0	-50.8	
2.12	-70.5	V	3.0	-24.8	35.7	1.0	-59.5	-13.0	-46.5	
2.83	-70.9	V	3.0	-23.1	35.0	1.0	-57.1	-13.0	-44.1	
High Channel (711MHz)										
1.42	-69.0	H	3.0	-28.7	36.7	1.0	-64.4	-13.0	-51.4	
2.13	-71.3	H	3.0	-26.4	35.7	1.0	-61.1	-13.0	-48.1	
2.84	-71.6	H	3.0	-24.3	35.0	1.0	-58.3	-13.0	-45.3	
1.42	-69.9	V	3.0	-29.1	36.7	1.0	-64.8	-13.0	-51.8	
2.13	-70.3	V	3.0	-24.6	35.7	1.0	-59.3	-13.0	-46.3	
2.84	-71.3	V	3.0	-23.4	35.0	1.0	-57.4	-13.0	-44.4	

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LTE B12 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 12, 10MHz 16QAM

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (704MHz)										
1.41	-69.3	H	3.0	-29.1	36.7	1.0	-64.8	-13.0	-51.8	
2.11	-70.9	H	3.0	-26.0	35.8	1.0	-60.8	-13.0	-47.8	
2.82	-70.7	H	3.0	-23.5	35.0	1.0	-57.5	-13.0	-44.5	
1.41	-69.4	V	3.0	-28.7	36.7	1.0	-64.4	-13.0	-51.4	
2.11	-70.9	V	3.0	-25.2	35.8	1.0	-59.9	-13.0	-46.9	
2.82	-71.4	V	3.0	-23.6	35.0	1.0	-57.7	-13.0	-44.7	
Mid Channel (707.5MHz)										
1.42	-69.0	H	3.0	-28.8	36.7	1.0	-64.4	-13.0	-51.4	
2.12	-70.0	H	3.0	-25.1	35.7	1.0	-59.8	-13.0	-46.8	
2.83	-69.5	H	3.0	-22.2	35.0	1.0	-56.3	-13.0	-43.3	
1.42	-69.5	V	3.0	-28.8	36.7	1.0	-64.4	-13.0	-51.4	
2.12	-70.0	V	3.0	-24.3	35.7	1.0	-59.0	-13.0	-46.0	
2.83	-71.2	V	3.0	-23.4	35.0	1.0	-57.4	-13.0	-44.4	
High Channel (711MHz)										
1.42	-70.3	H	3.0	-30.0	36.7	1.0	-65.7	-13.0	-52.7	
2.13	-70.5	H	3.0	-25.6	35.7	1.0	-60.3	-13.0	-47.3	
2.84	-70.8	H	3.0	-23.5	35.0	1.0	-57.5	-13.0	-44.5	
1.42	-69.6	V	3.0	-28.8	36.7	1.0	-64.5	-13.0	-51.5	
2.13	-70.5	V	3.0	-24.8	35.7	1.0	-59.5	-13.0	-46.5	
2.84	-71.5	V	3.0	-23.6	35.0	1.0	-57.6	-13.0	-44.6	

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LTE B12 10MHz 16QAM

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9.2.5. LTE BAND 13

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 13, 10MHz QPSK

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	LTE B13

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (782MHz)										
1.56	-69.7	H	3.0	-28.6	36.6	1.0	-64.3	-40.0	-24.3	
2.35	-71.5	H	3.0	-26.2	35.3	1.0	-60.5	-13.0	-47.5	
3.13	-70.3	H	3.0	-21.9	34.8	1.0	-55.8	-13.0	-42.8	
1.56	-69.9	V	3.0	-28.1	36.6	1.0	-63.7	-40.0	-23.7	
2.35	-70.7	V	3.0	-25.1	35.3	1.0	-59.4	-13.0	-46.4	
3.13	-70.4	V	3.0	-21.3	34.8	1.0	-55.1	-13.0	-42.1	

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LTE B13 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 13, 10MHz 16QAM

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	LTE B13

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (782MHz)										
1.56	-70.0	H	3.0	-28.9	36.6	1.0	-64.6	-40.0	-24.6	
2.35	-70.3	H	3.0	-25.0	35.3	1.0	-59.3	-13.0	-46.3	
3.13	-70.6	H	3.0	-22.2	34.8	1.0	-56.1	-13.0	-43.1	
1.56	-70.8	V	3.0	-29.0	36.6	1.0	-64.6	-40.0	-24.6	
2.35	-71.0	V	3.0	-25.4	35.3	1.0	-59.7	-13.0	-46.7	
3.13	-70.3	V	3.0	-21.2	34.8	1.0	-55.0	-13.0	-42.0	

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LTE B13 10MHz 16QAM

9.2.6. LTE BAND 14

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/14/18
Test Engineer: 10649
Configuration: EUT Only
Mode: LTE Band 14, 10MHz QPSK

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	LTE B14

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (793MHz)										
1.59	-65.3	H	3.0	-24.0	36.6	1.0	-59.6	-40.0	-19.6	
2.38	-64.5	H	3.0	-19.1	35.2	1.0	-53.3	-13.0	-40.3	
3.17	-66.1	H	3.0	-17.6	34.8	1.0	-51.4	-13.0	-38.4	
1.59	-64.8	V	3.0	-22.8	36.6	1.0	-58.4	-40.0	-18.4	
2.38	-66.0	V	3.0	-20.5	35.2	1.0	-54.7	-13.0	-41.7	
3.17	-66.7	V	3.0	-17.5	34.8	1.0	-51.2	-13.0	-38.2	

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LTE B14 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/14/18
Test Engineer: 10649
Configuration: EUT Only
Mode: LTE Band 14, 10MHz 16QAM

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	LTE B14

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (793MHz)										
1.59	-65.0	H	3.0	-23.7	36.6	1.0	-59.3	-40.0	-19.3	
2.38	-66.7	H	3.0	-21.3	35.2	1.0	-55.5	-13.0	-42.5	
3.17	-60.2	H	3.0	-11.7	34.8	1.0	-45.5	-13.0	-32.5	
1.59	-65.5	V	3.0	-23.5	36.6	1.0	-59.1	-40.0	-19.1	
2.38	-66.3	V	3.0	-20.8	35.2	1.0	-55.0	-13.0	-42.0	
3.17	-66.2	V	3.0	-17.0	34.8	1.0	-50.7	-13.0	-37.7	

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LTE B14 10MHz 16QAM

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9.2.7. LTE BAND 17

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 17, 10MHz QPSK

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (710MHz)										
1.42	-68.9	H	3.0	-29.6	36.7	1.0	-65.3	-13.0	-52.3	
2.13	-70.4	H	3.0	-25.5	35.7	1.0	-60.2	-13.0	-47.2	
2.84	-71.6	H	3.0	-24.3	35.0	1.0	-58.3	-13.0	-45.3	
1.42	-69.6	V	3.0	-28.8	36.7	1.0	-64.5	-13.0	-51.5	
2.13	-70.2	V	3.0	-24.5	35.7	1.0	-59.2	-13.0	-46.2	
2.84	-71.3	V	3.0	-23.4	35.0	1.0	-57.4	-13.0	-44.4	

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LTE B17 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 17, 10MHz 16QAM

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (710MHz)										
1.42	-70.0	H	3.0	-29.7	36.7	1.0	-65.4	-13.0	-52.4	
2.13	-70.3	H	3.0	-25.4	35.7	1.0	-60.1	-13.0	-47.1	
2.84	-71.5	H	3.0	-24.2	35.0	1.0	-58.2	-13.0	-45.2	
1.42	-69.1	V	3.0	-28.3	36.7	1.0	-64.0	-13.0	-51.0	
2.13	-70.5	V	3.0	-24.8	35.7	1.0	-59.5	-13.0	-46.5	
2.84	-71.2	V	3.0	-23.3	35.0	1.0	-57.3	-13.0	-44.3	

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LTE B17 10MHz 16QAM

9.2.8. LTE BAND 25

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 25, 20MHz QPSK

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	3m Chamber F	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1860MHz)										
3.72	-69.2	H	3.0	-19.4	34.4	1.0	-52.8	-13.0	-39.8	
5.58	-70.9	H	3.0	-17.4	34.1	1.0	-50.5	-13.0	-37.5	
7.44	-73.0	H	3.0	-16.6	33.6	1.0	-49.2	-13.0	-36.2	
3.72	-70.0	V	3.0	-20.1	34.4	1.0	-53.5	-13.0	-40.5	
5.58	-70.0	V	3.0	-16.3	34.1	1.0	-49.5	-13.0	-36.5	
7.44	-72.2	V	3.0	-16.1	33.6	1.0	-48.7	-13.0	-35.7	
Mid Channel (1882.5MHz)										
3.77	-70.7	H	3.0	-20.7	34.4	1.0	-54.1	-13.0	-41.1	
5.65	-70.2	H	3.0	-16.6	34.1	1.0	-49.7	-13.0	-36.7	
7.53	-72.7	H	3.0	-16.2	33.5	1.0	-48.7	-13.0	-35.7	
3.77	-70.5	V	3.0	-20.4	34.4	1.0	-53.8	-13.0	-40.8	
5.65	-70.3	V	3.0	-16.5	34.1	1.0	-49.7	-13.0	-36.7	
7.53	-72.4	V	3.0	-16.1	33.5	1.0	-48.6	-13.0	-35.6	
High Channel (1905MHz)										
3.81	-70.3	H	3.0	-20.1	34.4	1.0	-53.5	-13.0	-40.5	
5.72	-71.0	H	3.0	-17.3	34.1	1.0	-50.4	-13.0	-37.4	
7.62	-72.7	H	3.0	-16.1	33.4	1.0	-48.5	-13.0	-35.5	
3.81	-70.2	V	3.0	-20.0	34.4	1.0	-53.3	-13.0	-40.3	
5.72	-71.4	V	3.0	-17.6	34.1	1.0	-50.7	-13.0	-37.7	
7.62	-72.5	V	3.0	-16.1	33.4	1.0	-48.5	-13.0	-35.5	

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LTE B25 20MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 25, 20MHz 16QAM

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	3m Chamber F	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1860MHz)										
3.72	-67.7	H	3.0	-17.9	34.4	1.0	-51.3	-13.0	-38.3	
5.58	-70.8	H	3.0	-17.3	34.1	1.0	-50.4	-13.0	-37.4	
7.44	-71.3	H	3.0	-14.9	33.6	1.0	-47.5	-13.0	-34.5	
3.72	-69.8	V	3.0	-19.9	34.4	1.0	-53.3	-13.0	-40.3	
5.58	-69.4	V	3.0	-15.7	34.1	1.0	-48.9	-13.0	-35.9	
7.44	-73.0	V	3.0	-16.8	33.6	1.0	-49.4	-13.0	-36.4	
Mid Channel (1882.5MHz)										
3.77	-69.2	H	3.0	-19.2	34.4	1.0	-52.6	-13.0	-39.6	
5.65	-71.1	H	3.0	-17.5	34.1	1.0	-50.6	-13.0	-37.6	
7.53	-72.2	H	3.0	-15.7	33.5	1.0	-48.2	-13.0	-35.2	
3.77	-70.1	V	3.0	-20.0	34.4	1.0	-53.4	-13.0	-40.4	
5.65	-70.8	V	3.0	-17.0	34.1	1.0	-50.1	-13.0	-37.1	
7.53	-72.4	V	3.0	-16.1	33.5	1.0	-48.6	-13.0	-35.6	
High Channel (1905MHz)										
3.81	-70.0	H	3.0	-19.8	34.4	1.0	-53.2	-13.0	-40.2	
5.72	-71.0	H	3.0	-17.3	34.1	1.0	-50.4	-13.0	-37.4	
7.62	-72.9	H	3.0	-16.3	33.4	1.0	-48.7	-13.0	-35.7	
3.81	-70.2	V	3.0	-20.0	34.4	1.0	-53.4	-13.0	-40.4	
5.72	-72.2	V	3.0	-18.4	34.1	1.0	-51.5	-13.0	-38.5	
7.62	-73.0	V	3.0	-16.6	33.4	1.0	-49.0	-13.0	-36.0	

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LTE B25 20MHz 16QAM

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9.2.9. LTE BAND 26 (PART 90S)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 6/13/2018
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 26 (90S), 10MHz QPSK

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (819MHz)										
1.64	-70.1	H	3.0	-28.4	36.5	1.0	-63.9	-13.0	-50.9	
2.46	-69.9	H	3.0	-24.2	35.2	1.0	-58.4	-13.0	-45.4	
3.28	-70.2	H	3.0	-21.4	34.7	1.0	-55.1	-13.0	-42.1	
1.64	-70.1	V	3.0	-27.6	36.5	1.0	-63.1	-13.0	-50.1	
2.46	-70.4	V	3.0	-24.7	35.2	1.0	-58.9	-13.0	-45.9	
3.28	-70.0	V	3.0	-20.6	34.7	1.0	-54.2	-13.0	-41.2	

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LTE B26 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 26 (90S), 10MHz 16QAM

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (819MHz)										
1.64	-69.9	H	3.0	-28.2	36.5	1.0	-63.7	-13.0	-50.7	
2.46	-69.8	H	3.0	-24.1	35.2	1.0	-58.3	-13.0	-45.3	
3.28	-71.3	H	3.0	-22.5	34.7	1.0	-56.2	-13.0	-43.2	
1.64	-69.7	V	3.0	-27.2	36.5	1.0	-62.7	-13.0	-49.7	
2.46	-71.1	V	3.0	-25.4	35.2	1.0	-59.6	-13.0	-46.6	
3.28	-70.9	V	3.0	-21.5	34.7	1.0	-55.1	-13.0	-42.1	

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LTE B26 10MHz 16QAM

9.2.10. LTE BAND 30

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 10649
Configuration: EUT only
Mode: LTE Band 30, 10MHz QPSK

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	LTE B30

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (2310MHz)										
4.62	-68.0	H	3.0	-14.2	37.9	1.0	-51.2	-40.0	-11.2	
6.93	-68.5	H	3.0	-8.9	36.5	1.0	-45.3	-40.0	-5.3	
9.24	-70.7	H	3.0	-9.2	34.9	1.0	-43.0	-40.0	-3.0	
4.62	-68.8	V	3.0	-15.1	37.9	1.0	-52.0	-40.0	-12.0	
6.93	-68.8	V	3.0	-9.3	36.5	1.0	-44.8	-40.0	-4.8	
9.24	-71.0	V	3.0	-9.2	34.9	1.0	-43.1	-40.0	-3.1	

Rev. 05.21.15

LTE B30 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 10649
Configuration: EUT only
Mode: LTE Band 30, 10MHz 16QAM

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	LTE B30

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (2310MHz)										
4.62	-68.8	H	3.0	-15.1	37.9	1.0	-52.0	-40.0	-12.0	
6.93	-68.1	H	3.0	-9.5	36.5	1.0	-44.9	-40.0	-4.9	
9.24	-70.8	H	3.0	-9.3	34.9	1.0	-43.1	-40.0	-3.1	
4.62	-67.8	V	3.0	-14.1	37.9	1.0	-51.0	-40.0	-11.0	
6.93	-68.7	V	3.0	-9.2	36.5	1.0	-44.7	-40.0	-4.7	
9.24	-71.1	V	3.0	-9.3	34.9	1.0	-43.2	-40.0	-3.2	

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LTE B30 10MHz 16QAM

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9.2.11. LTE BAND 41

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 10649
Configuration: EUT Only
Mode: LTE Band 41, 20MHz QPSK

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	LTE B41

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (2506MHz)										
5.01	-64.7	H	3.0	-11.8	33.4	1.0	-44.2	-25.0	-19.2	
7.52	-65.8	H	3.0	-8.2	33.0	1.0	-40.3	-25.0	-15.3	
10.02	-65.9	H	3.0	-5.1	32.7	1.0	-36.8	-25.0	-11.8	
5.01	-64.7	V	3.0	-11.8	33.4	1.0	-44.3	-25.0	-19.3	
7.52	-65.6	V	3.0	-8.0	33.0	1.0	-40.0	-25.0	-15.0	
10.02	-65.6	V	3.0	-4.5	32.7	1.0	-36.1	-25.0	-11.1	
Mid Channel (2593MHz)										
5.19	-65.9	H	3.0	-12.6	33.4	1.0	-45.0	-25.0	-20.0	
7.78	-65.9	H	3.0	-8.0	33.0	1.0	-40.0	-25.0	-15.0	
10.37	-64.8	H	3.0	-3.7	32.4	1.0	-35.1	-25.0	-10.1	
5.19	-65.9	V	3.0	-12.7	33.4	1.0	-45.1	-25.0	-20.1	
7.78	-66.2	V	3.0	-8.2	33.0	1.0	-40.2	-25.0	-15.2	
10.37	-63.6	V	3.0	-2.3	32.4	1.0	-33.7	-25.0	-8.7	
High Channel (2680MHz)										
5.36	-67.4	H	3.0	-13.8	33.3	1.0	-46.1	-25.0	-21.1	
8.04	-65.1	H	3.0	-6.9	33.0	1.0	-38.8	-25.0	-13.8	
10.72	-65.4	H	3.0	-3.9	32.2	1.0	-35.1	-25.0	-10.1	
5.36	-67.0	V	3.0	-13.5	33.3	1.0	-45.8	-25.0	-20.8	
8.04	-65.2	V	3.0	-6.8	33.0	1.0	-38.8	-25.0	-13.8	
10.72	-64.7	V	3.0	-3.2	32.2	1.0	-34.4	-25.0	-9.4	

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LTE B41 20MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 10649
Configuration: EUT Only
Mode: LTE Band 41, 20MHz 16QAM

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	LTE B41

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (2506MHz)										
5.01	-64.7	H	3.0	-11.8	33.4	1.0	-44.2	-25.0	-19.2	
7.52	-65.5	H	3.0	-7.9	33.0	1.0	-40.0	-25.0	-15.0	
10.02	-65.9	H	3.0	-5.1	32.7	1.0	-36.7	-25.0	-11.7	
5.01	-64.3	V	3.0	-11.5	33.4	1.0	-43.9	-25.0	-18.9	
7.52	-65.6	V	3.0	-8.0	33.0	1.0	-40.1	-25.0	-15.1	
10.02	-66.0	V	3.0	-4.9	32.7	1.0	-36.6	-25.0	-11.6	
Mid Channel (2593MHz)										
5.19	-67.4	H	3.0	-14.1	33.4	1.0	-46.5	-25.0	-21.5	
7.78	-67.3	H	3.0	-9.4	33.0	1.0	-41.4	-25.0	-16.4	
10.37	-64.5	H	3.0	-3.3	32.4	1.0	-34.8	-25.0	-9.8	
5.19	-66.4	V	3.0	-13.3	33.4	1.0	-45.6	-25.0	-20.6	
7.78	-66.2	V	3.0	-8.2	33.0	1.0	-40.2	-25.0	-15.2	
10.37	-64.5	V	3.0	-3.2	32.4	1.0	-34.7	-25.0	-9.7	
High Channel (2680MHz)										
5.36	-67.2	H	3.0	-13.6	33.3	1.0	-45.9	-25.0	-20.9	
8.04	-66.0	H	3.0	-7.8	33.0	1.0	-39.7	-25.0	-14.7	
10.72	-64.3	H	3.0	-2.8	32.2	1.0	-34.1	-25.0	-9.1	
5.36	-67.0	V	3.0	-13.5	33.3	1.0	-45.8	-25.0	-20.8	
8.04	-66.3	V	3.0	-7.9	33.0	1.0	-39.9	-25.0	-14.9	
10.72	-65.2	V	3.0	-3.6	32.2	1.0	-34.9	-25.0	-9.9	

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LTE B41 20MHz 16QAM

9.2.12. LTE BAND 66

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 66, 20MHz QPSK

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1720.0MHz)										
3.44	-70.7	H	3.0	-21.5	34.5	1.0	-54.9	-13.0	-41.9	
5.16	-69.3	H	3.0	-16.1	33.4	1.0	-48.5	-13.0	-35.5	
6.88	-72.6	H	3.0	-15.9	33.1	1.0	-48.1	-13.0	-35.1	
3.44	-70.8	V	3.0	-21.0	34.5	1.0	-54.5	-13.0	-41.5	
5.16	-71.4	V	3.0	-18.3	33.4	1.0	-50.6	-13.0	-37.6	
6.88	-72.3	V	3.0	-15.7	33.1	1.0	-47.8	-13.0	-34.8	
Mid Channel (1745.0MHz)										
3.49	-72.1	H	3.0	-22.7	34.4	1.0	-56.1	-13.0	-43.1	
5.24	-70.9	H	3.0	-17.5	33.3	1.0	-49.9	-13.0	-36.9	
6.98	-72.5	H	3.0	-15.6	33.1	1.0	-47.7	-13.0	-34.7	
3.49	-72.3	V	3.0	-22.4	34.4	1.0	-55.8	-13.0	-42.8	
5.24	-71.8	V	3.0	-18.5	33.3	1.0	-50.9	-13.0	-37.9	
6.98	-72.9	V	3.0	-16.1	33.1	1.0	-48.2	-13.0	-35.2	
High Channel (1770.0MHz)										
3.54	-72.2	H	3.0	-22.7	34.3	1.0	-56.0	-13.0	-43.0	
5.31	-71.6	H	3.0	-18.1	33.3	1.0	-50.4	-13.0	-37.4	
7.08	-73.1	H	3.0	-16.1	33.1	1.0	-48.2	-13.0	-35.2	
3.54	-71.0	V	3.0	-21.0	34.3	1.0	-54.3	-13.0	-41.3	
5.31	-71.4	V	3.0	-18.0	33.3	1.0	-50.3	-13.0	-37.3	
7.08	-72.5	V	3.0	-15.5	33.1	1.0	-47.6	-13.0	-34.6	

Rev. 02.24.17

LTE B66 20MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 66, 20MHz 16QAM

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1720.0MHz)										
3.44	-71.7	H	3.0	-22.5	34.5	1.0	-55.9	-13.0	-42.9	
5.16	-71.6	H	3.0	-18.4	33.4	1.0	-50.8	-13.0	-37.8	
6.88	-71.9	H	3.0	-15.2	33.1	1.0	-47.4	-13.0	-34.4	
3.44	-70.2	V	3.0	-20.4	34.5	1.0	-53.9	-13.0	-40.9	
5.16	-71.5	V	3.0	-18.4	33.4	1.0	-50.7	-13.0	-37.7	
6.88	-72.3	V	3.0	-15.7	33.1	1.0	-47.8	-13.0	-34.8	
Mid Channel (1745.0MHz)										
3.49	-71.6	H	3.0	-22.2	34.4	1.0	-55.6	-13.0	-42.6	
5.24	-71.3	H	3.0	-17.9	33.3	1.0	-50.3	-13.0	-37.3	
6.98	-72.7	H	3.0	-15.8	33.1	1.0	-47.9	-13.0	-34.9	
3.49	-70.6	V	3.0	-20.7	34.4	1.0	-54.1	-13.0	-41.1	
5.24	-71.7	V	3.0	-18.4	33.3	1.0	-50.8	-13.0	-37.8	
6.98	-71.3	V	3.0	-14.5	33.1	1.0	-46.6	-13.0	-33.6	
High Channel (1770.0MHz)										
3.54	-71.7	H	3.0	-22.2	34.3	1.0	-55.5	-13.0	-42.5	
5.31	-70.7	H	3.0	-17.2	33.3	1.0	-49.5	-13.0	-36.5	
7.08	-72.1	H	3.0	-15.1	33.1	1.0	-47.2	-13.0	-34.2	
3.54	-71.8	V	3.0	-21.8	34.3	1.0	-55.1	-13.0	-42.1	
5.31	-70.0	V	3.0	-16.6	33.3	1.0	-48.9	-13.0	-35.9	
7.08	-72.3	V	3.0	-15.3	33.1	1.0	-47.4	-13.0	-34.4	

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END OF REPORT

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10. SETUP PHOTOS

Please refer to 12216366-EP1V1

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