







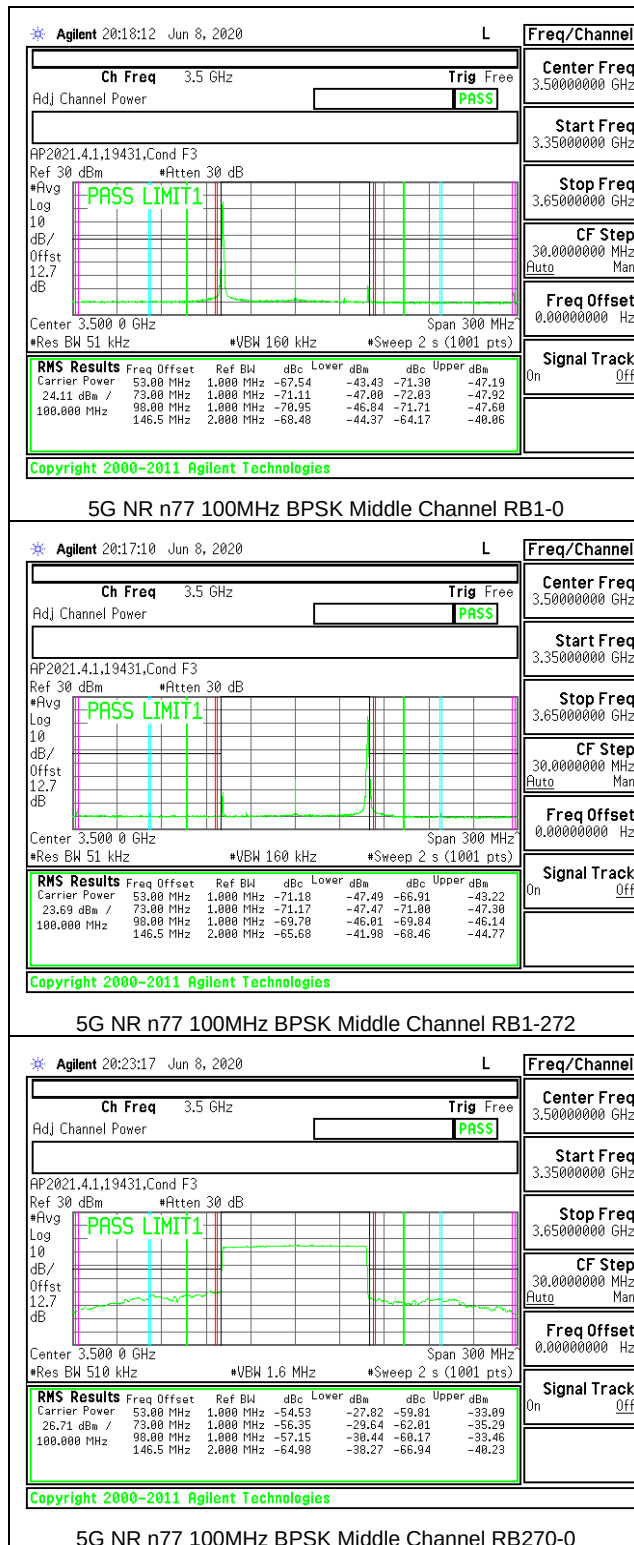












9.2.16. 5G NR n77 ADJACENT CHANNEL POWER AND EMISSION MASK (Part 27 3700-3980MHz)

LIMITS

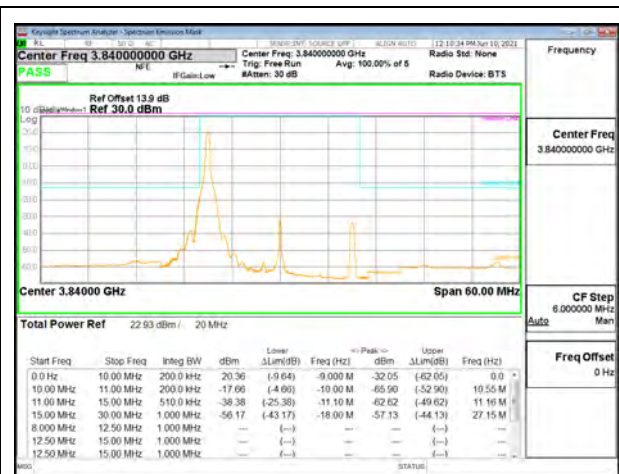
FCC: §27.53

(1) 3.7 GHz Service. The following emission limits apply to stations transmitting in the 3700-3980 MHz band:

(2) For mobile operations in the 3700-3980 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed -13 dBm/MHz. Compliance with this paragraph (1)(2) is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be either one percent of the emission bandwidth of the fundamental emission of the transmitter or 350 kHz. In the bands between 1 and 5 MHz removed from the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be 500 kHz. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.



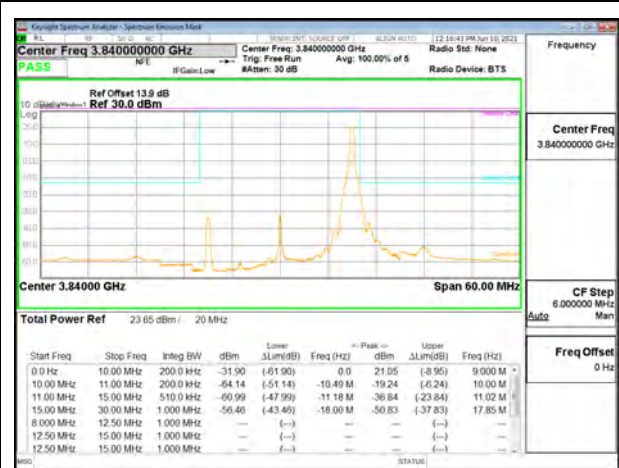
5G NR n77 20MHz BPSK Low Channel RB1-0



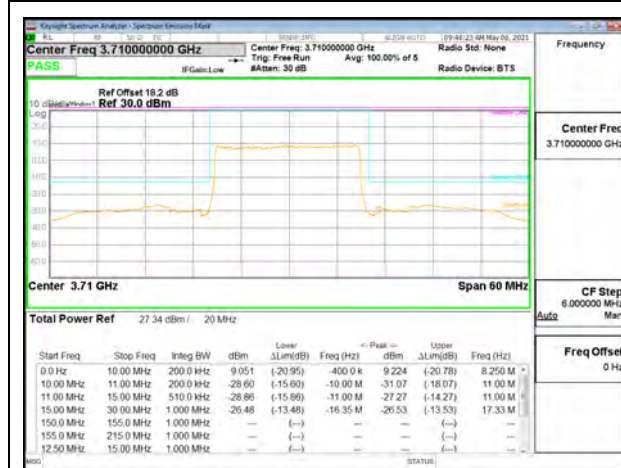
5G NR n77 20MHz BPSK Middle Channel RB1-0



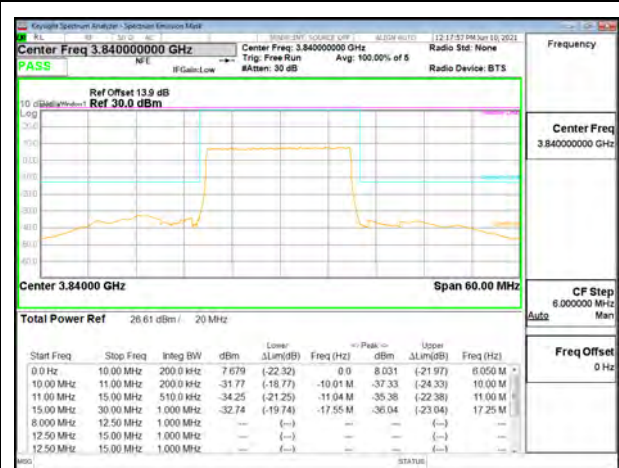
5G NR n77 20MHz BPSK Low Channel RB1-50



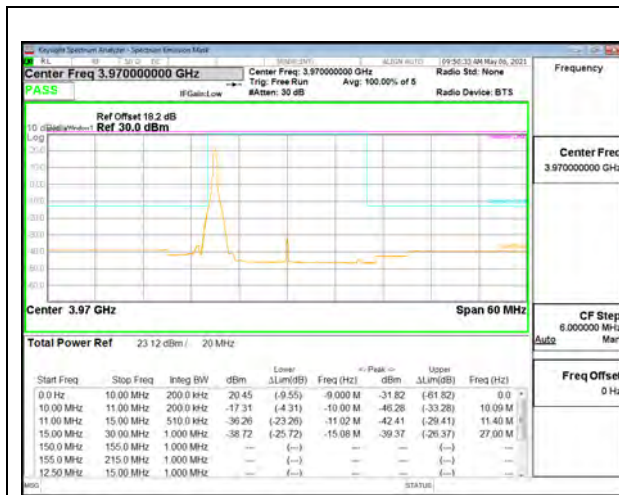
5G NR n77 20MHz BPSK Middle Channel RB1-50



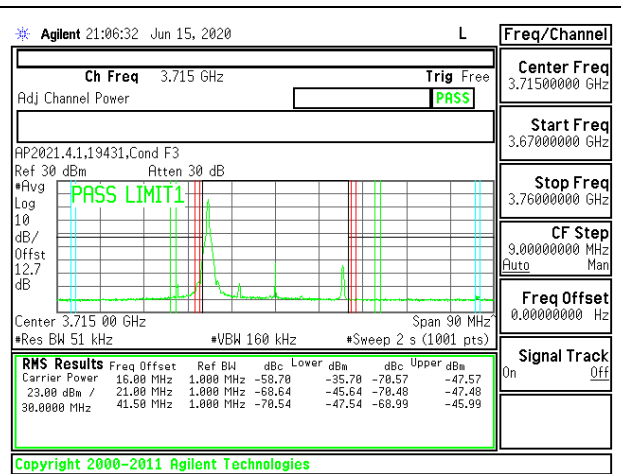
5G NR n77 20MHz BPSK Low Channel RB50-0



5G NR n77 20MHz BPSK Middle Channel RB50-0



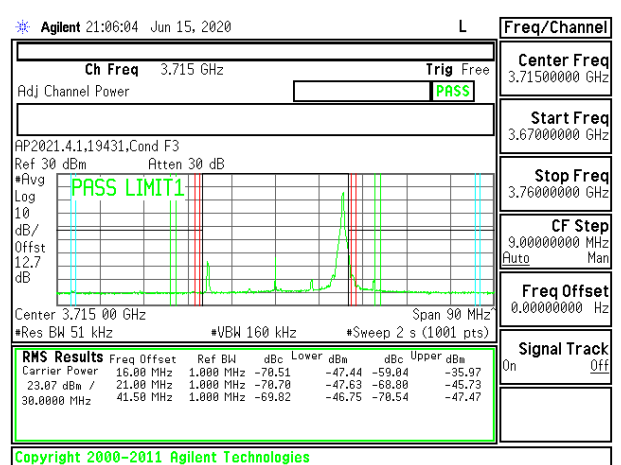
5G NR n77 20MHz BPSK High Channel RB1-0



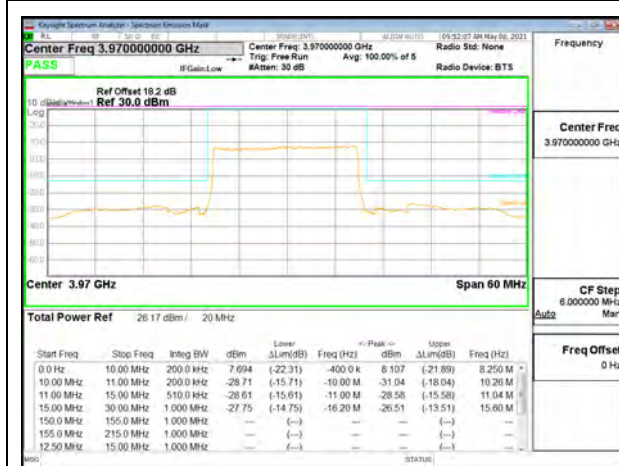
5G NR n77 30MHz BPSK Low Channel RB1-0



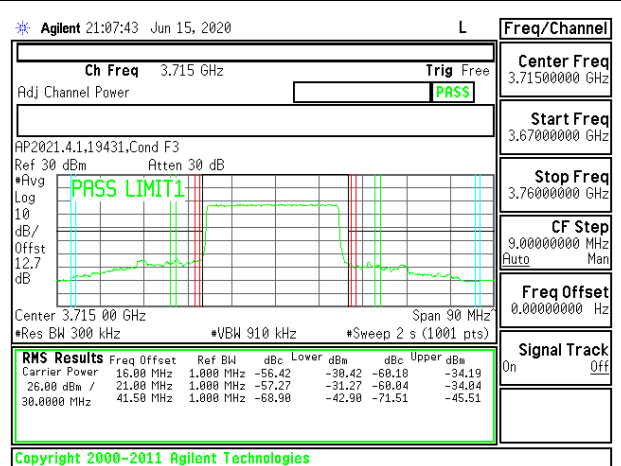
5G NR n77 20MHz BPSK High Channel RB1-50



5G NR n77 30MHz BPSK Low Channel RB1-77



5G NR n77 20MHz BPSK High Channel RB50-0

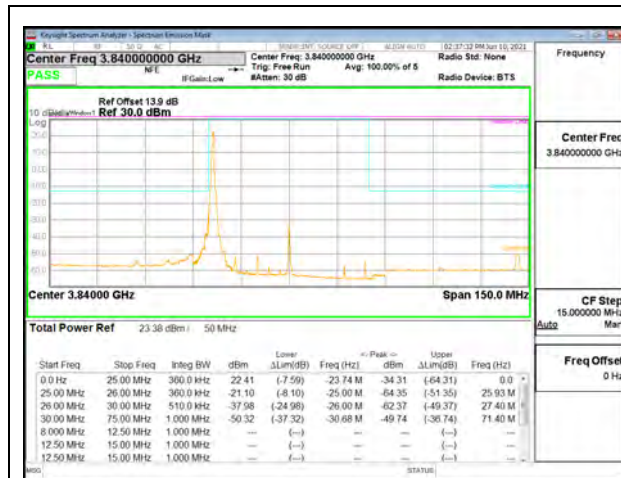


5G NR n77 30MHz BPSK Low Channel RB75-0

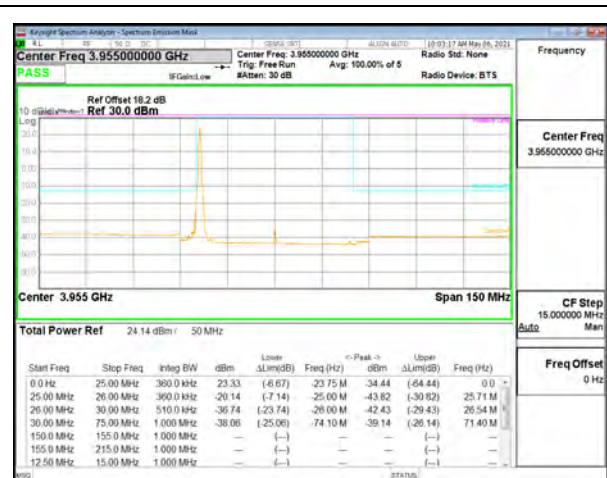




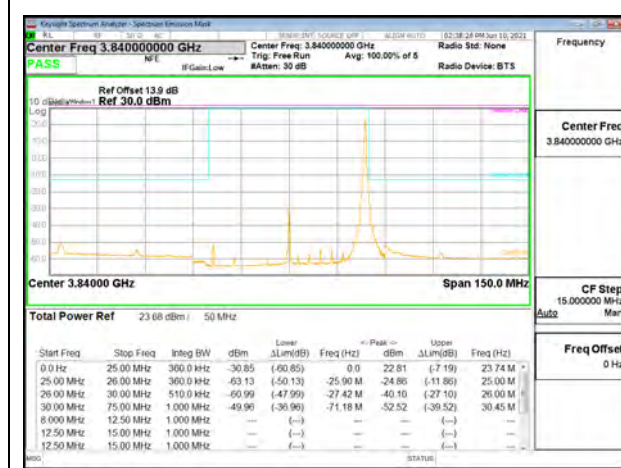




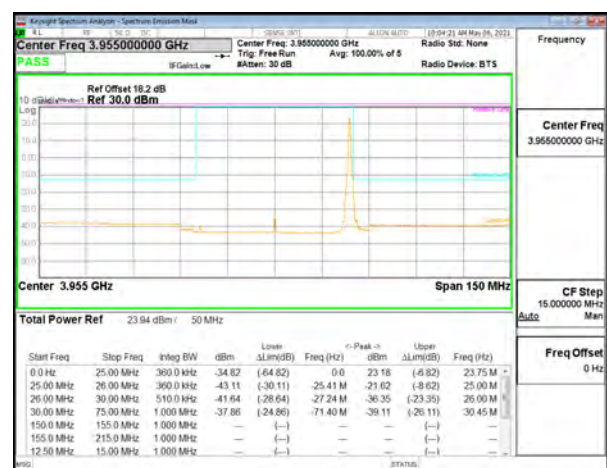
5G NR n77 50MHz BPSK Middle Channel RB1-0



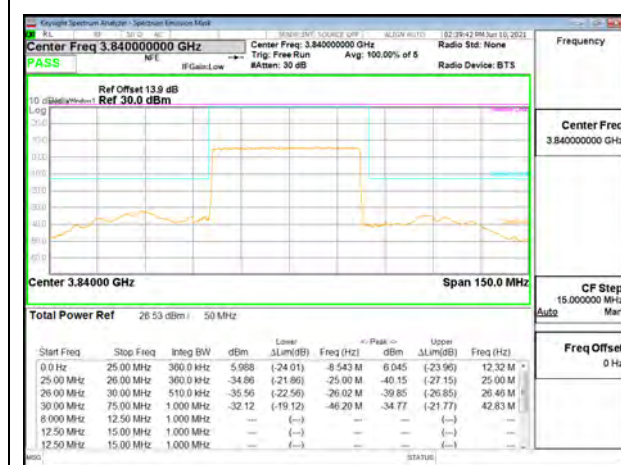
5G NR n77 50MHz BPSK High Channel RB1-0



5G NR n77 50MHz BPSK Middle Channel RB1-132



5G NR n77 50MHz BPSK High Channel RB1-132



5G NR n77 50MHz BPSK Middle Channel RB128-0

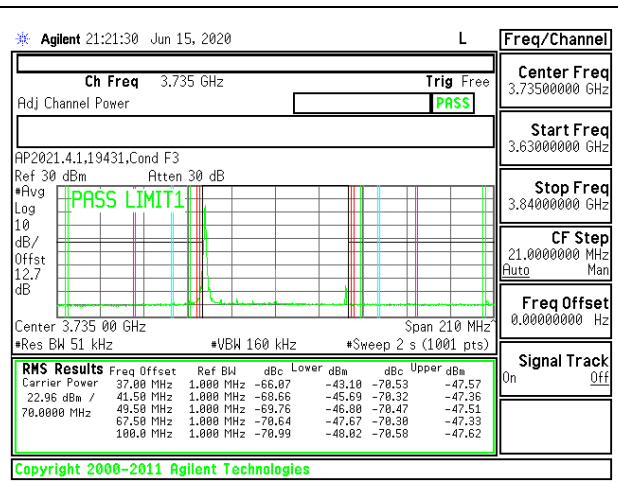


5G NR n77 50MHz BPSK High Channel RB128-0





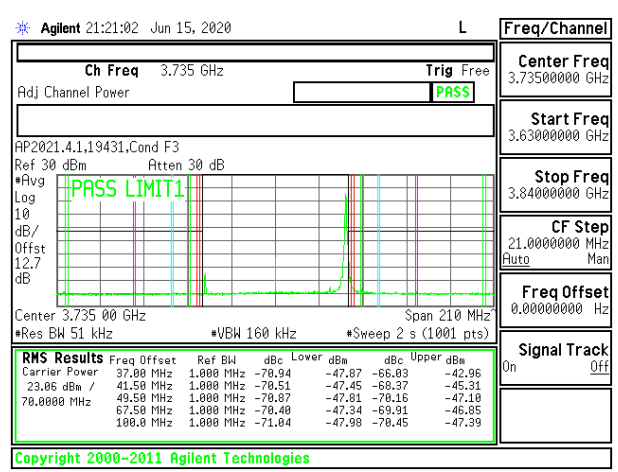
5G NR n77 60MHz BPSK High Channel RB1-0



5G NR n77 70MHz BPSK Low Channel RB1-0



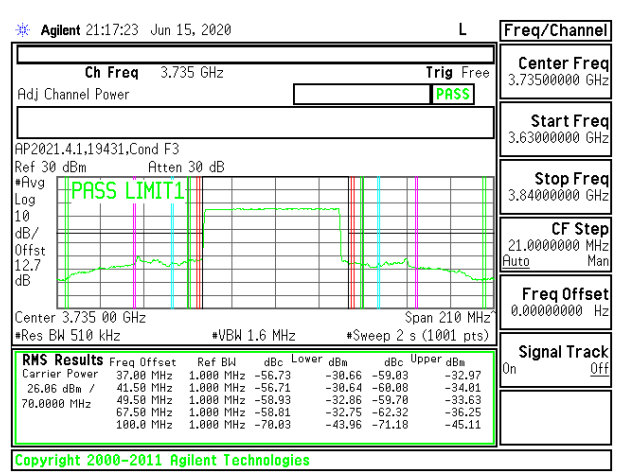
5G NR n77 60MHz BPSK High Channel RB1-161



5G NR n77 70MHz BPSK Low Channel RB1-188



5G NR n77 60MHz BPSK High Channel RB162-0



5G NR n77 70MHz BPSK Low Channel RB180-0



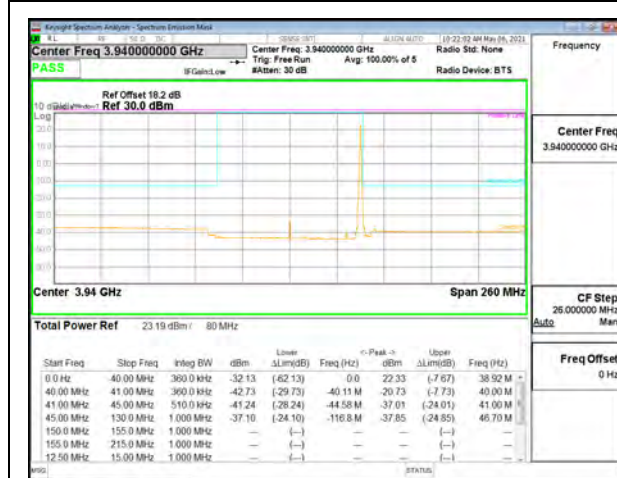




5G NR n77 80MHz BPSK High Channel RB1-0



5G NR n77 90MHz BPSK Low Channel RB1-0



5G NR n77 80MHz BPSK High Channel RB1-216



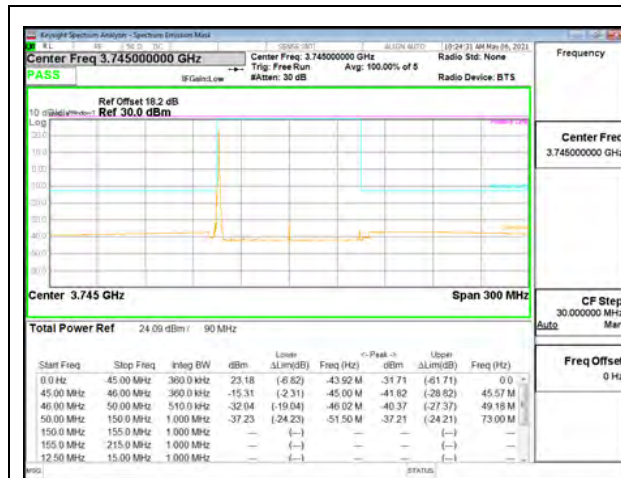
5G NR n77 90MHz BPSK Low Channel RB1-244



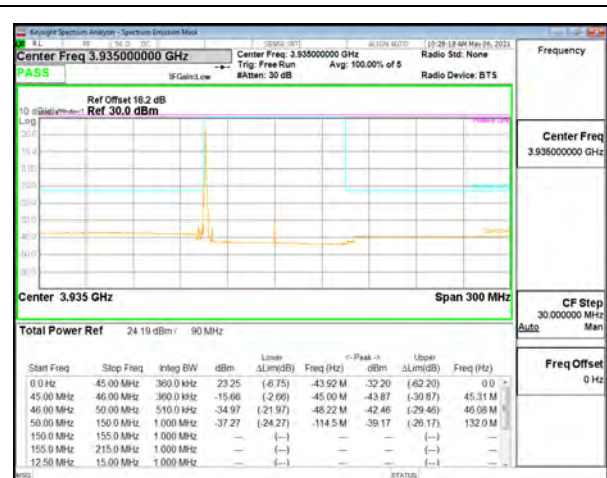
5G NR n77 80MHz BPSK High Channel RB216-0



5G NR n77 90MHz BPSK Low Channel RB243-0



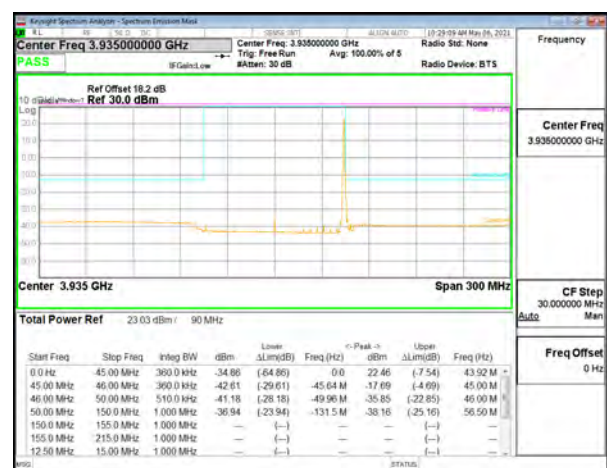
5G NR n77 90MHz BPSK Middle Channel RB1-0



5G NR n77 90MHz BPSK High Channel RB1-0



5G NR n77 90MHz BPSK Middle Channel RB1-244



5G NR n77 90MHz BPSK High Channel RB1-244



5G NR n77 90MHz BPSK Middle Channel RB243-0

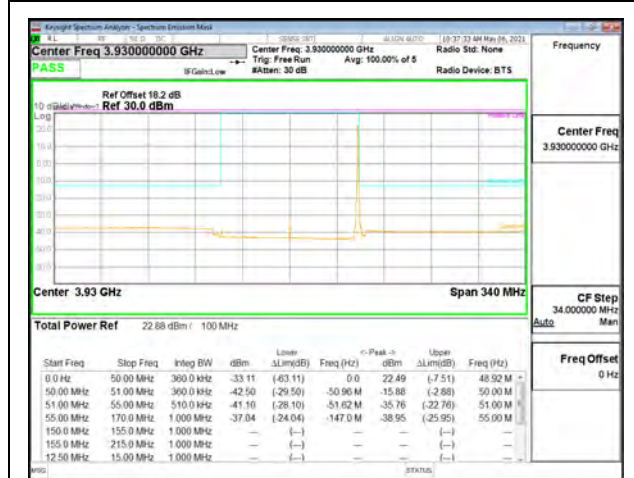


5G NR n77 90MHz BPSK High Channel RB243-0





5G NR n77 100MHz BPSK High Channel RB1-0



5G NR n77 100MHz BPSK High Channel RB1-272



5G NR n77 100MHz BPSK High Channel RB270-0

9.3. OUT OF BAND EMISSIONS

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)

RESULTS

9.3.1. LTE BAND 5 AND 5G NR n5

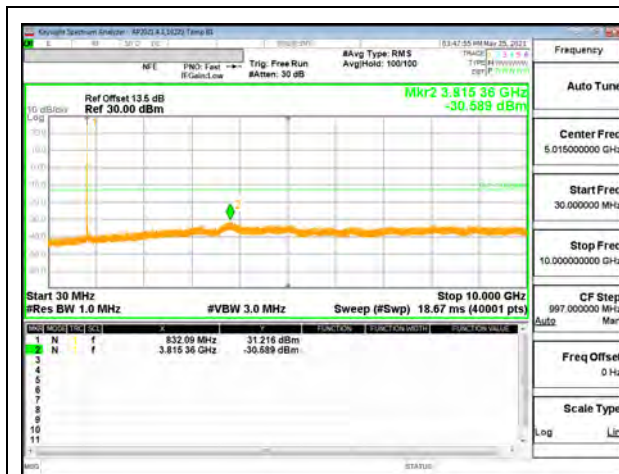
LIMITS

FCC: §22.917 (a)

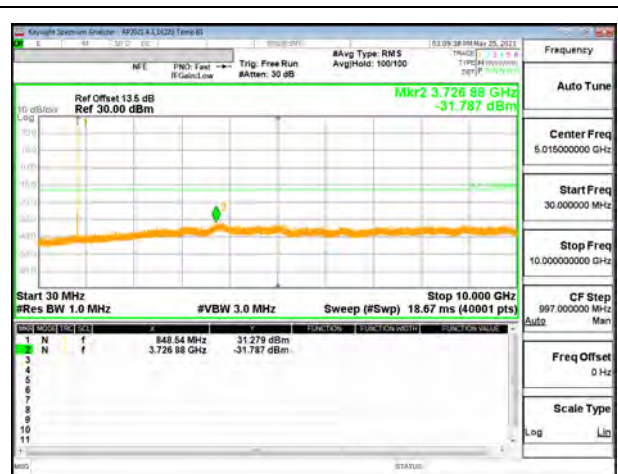
The minimum permissible attenuation level of any spurious emissions is $43 + 10 \log (P)$ dB where transmitting power (P) in Watts.

5G NR n5





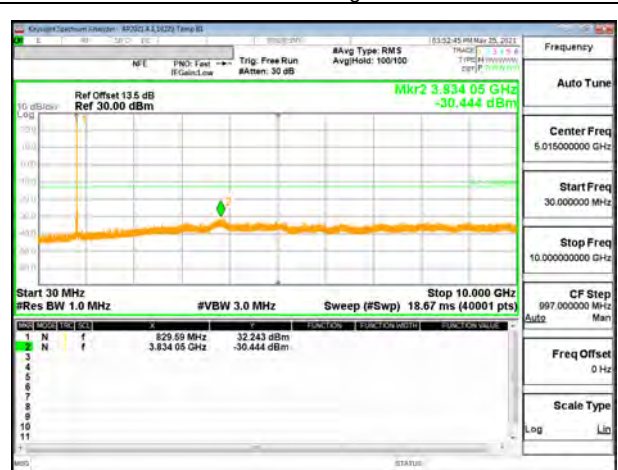
5G NR n5 10MHz BPSK Middle Channel RB1-1



5G NR n5 10MHz BPSK High Channel RB1-51



5G NR n5 15MHz BPSK Low Channel RB1-0



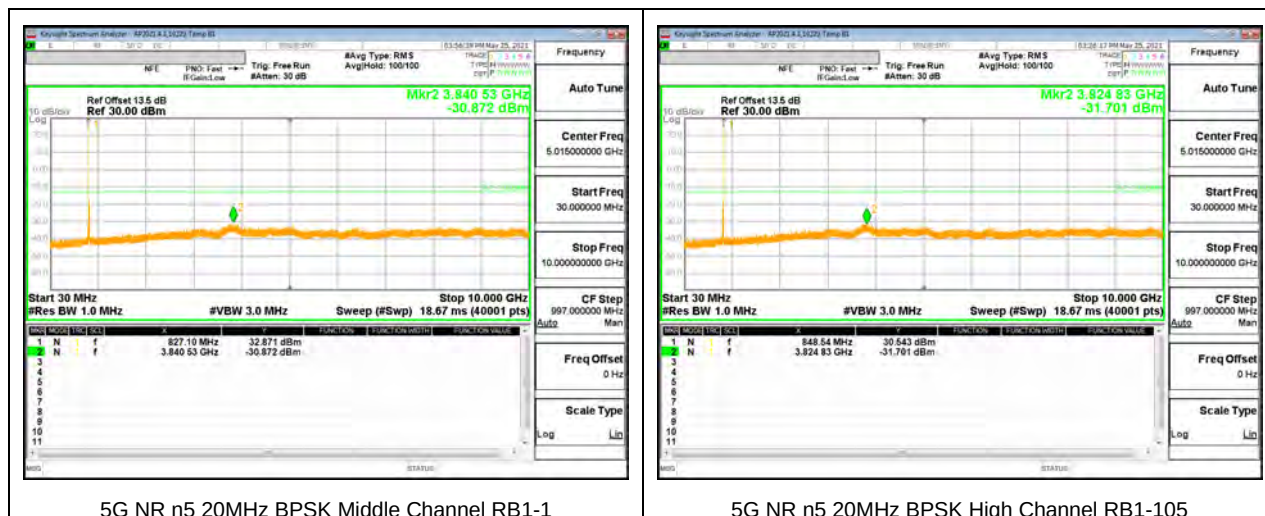
5G NR n5 15MHz BPSK Middle Channel RB1-1



5G NR n5 15MHz BPSK High Channel RB1-78



5G NR n5 20MHz BPSK Low Channel RB1-0



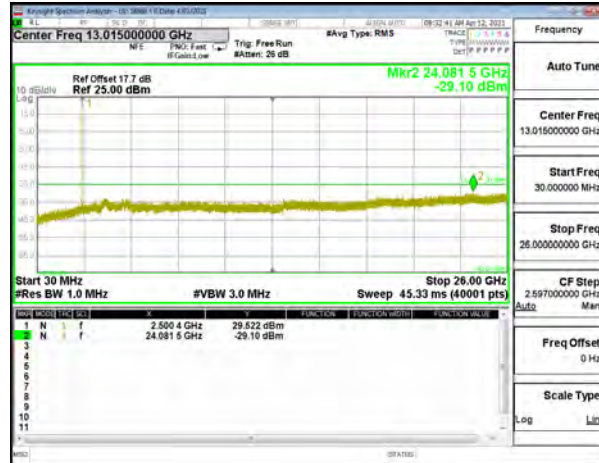
9.3.2. LTE BAND 7 AND 5G NR n7

LIMITS

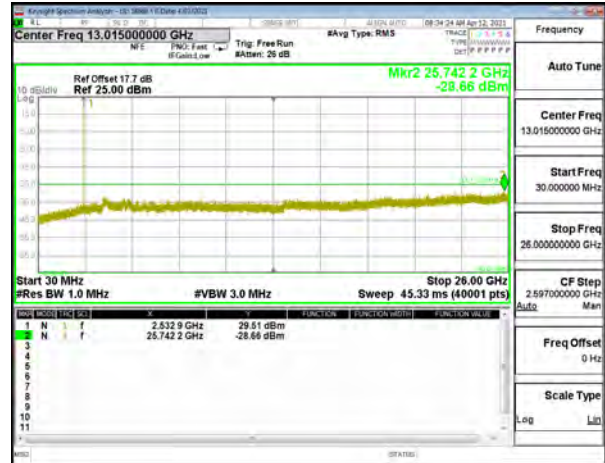
FCC: §27.53 (m)

The minimum permissible attenuation level of any spurious emissions is $55 + 10 \log (P)$ dB where transmitting power (P) in Watts.

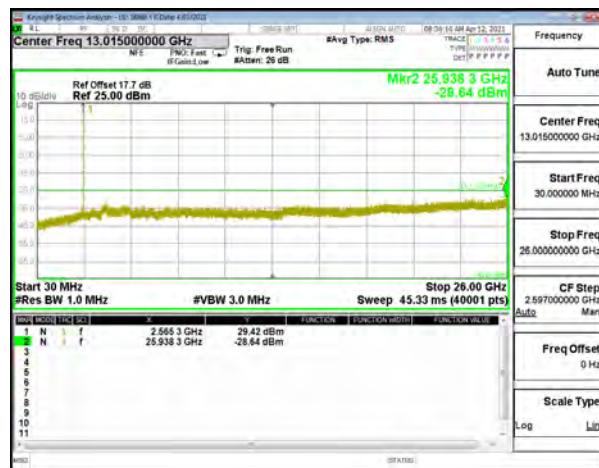
LTE BAND 7



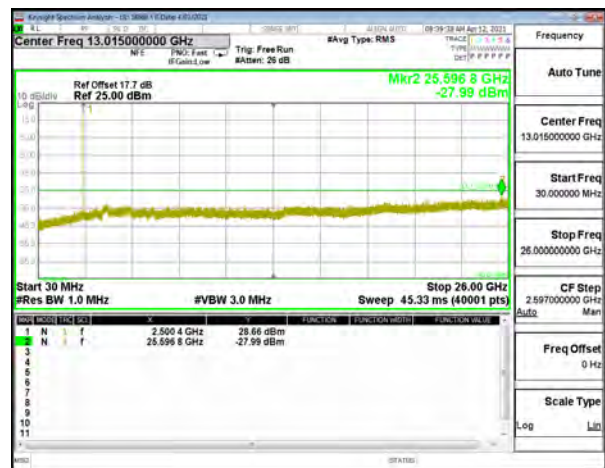
LTE B7 5MHz QPSK Low Channel RB1-0



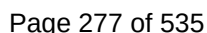
LTE B7 5MHz QPSK Middle Channel RB1-0

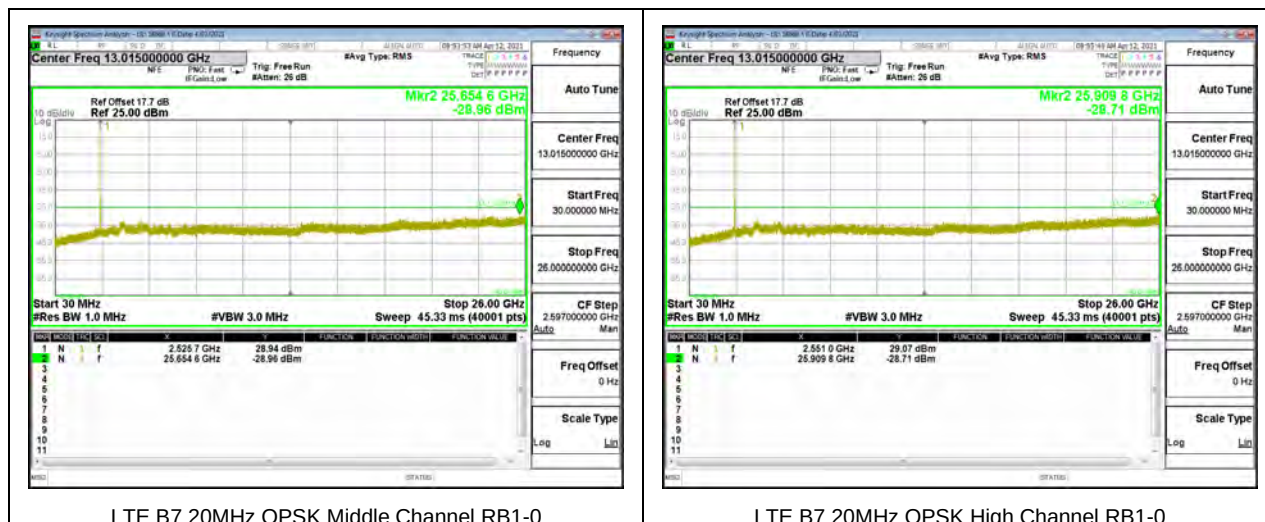


LTE B7 5MHz QPSK High Channel RB1-0

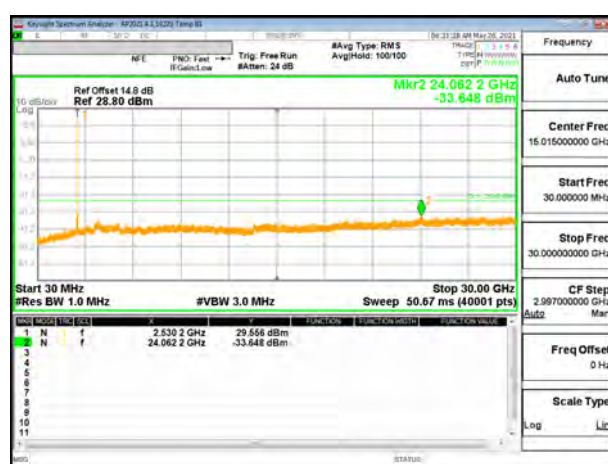
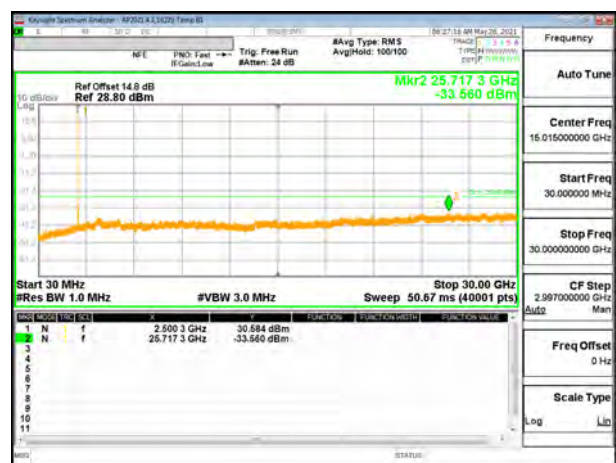
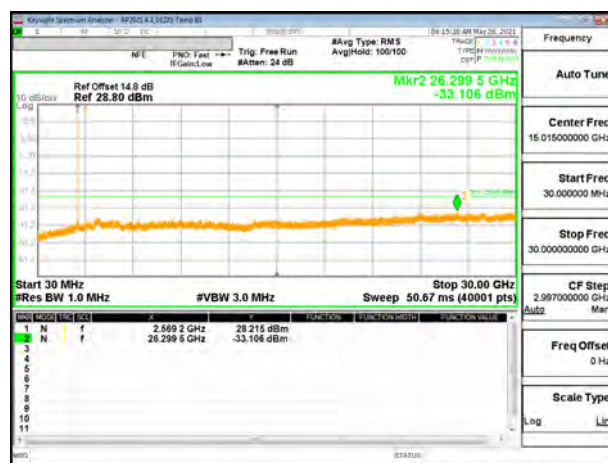
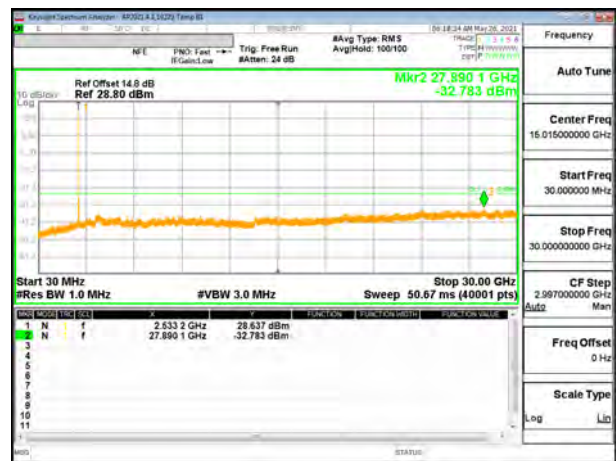
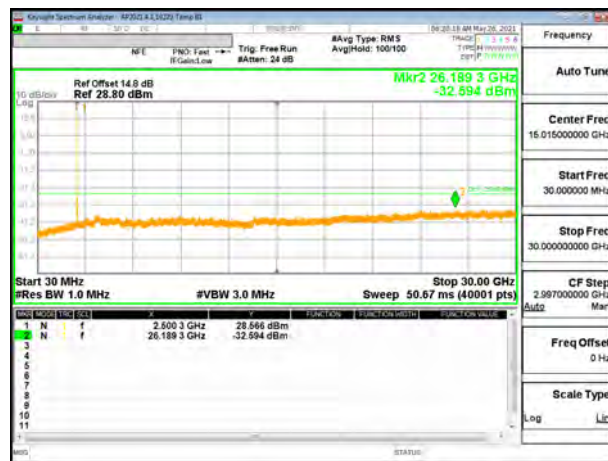


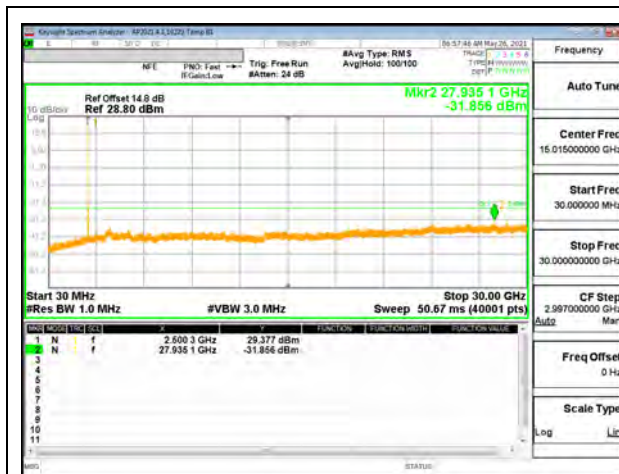
LTE B7 10MHz QPSK Low Channel RB1-0



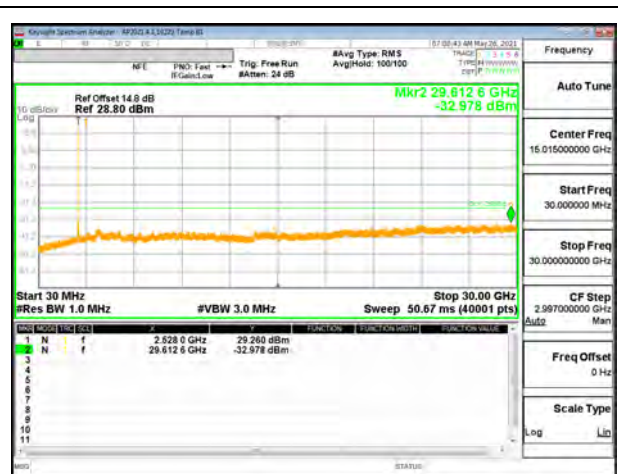


5G NR 7

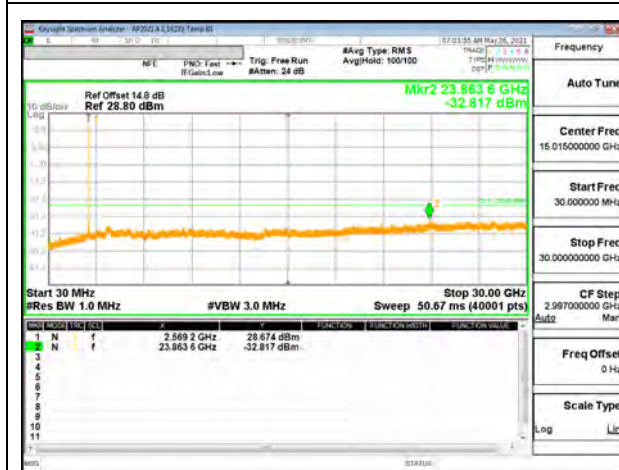




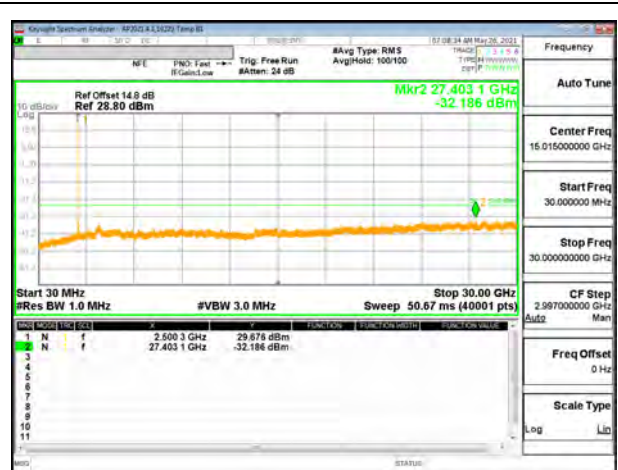
5G NR n7 15MHz BPSK Low Channel RB1-0



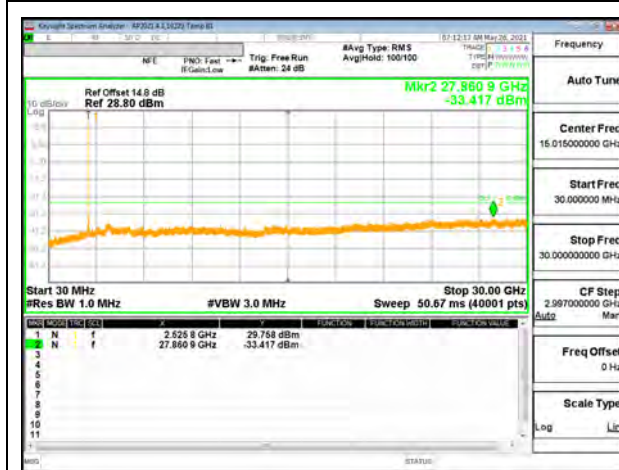
5G NR n7 15MHz BPSK Middle Channel RB1-1



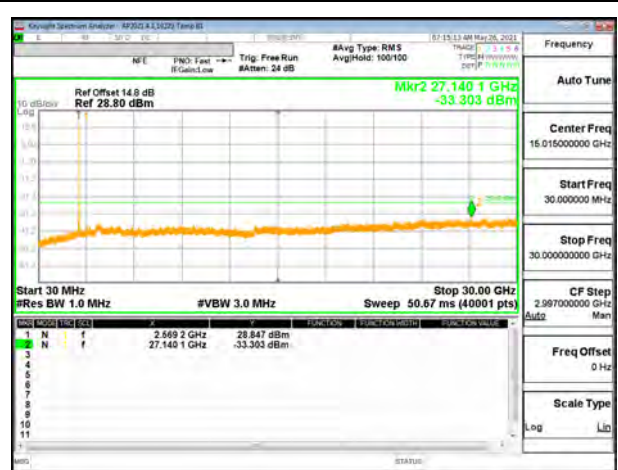
5G NR n7 15MHz BPSK High Channel RB1-78



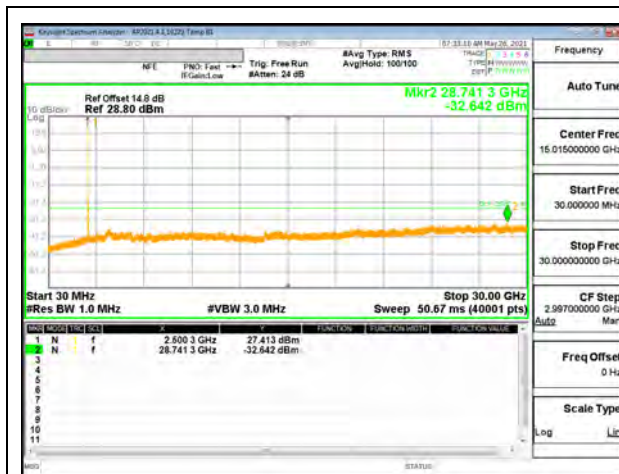
5G NR n7 20MHz BPSK Low Channel RB1-0



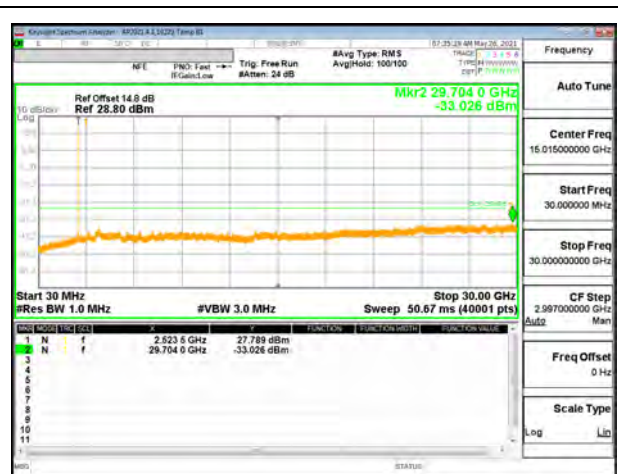
5G NR n7 20MHz BPSK Middle Channel RB1-1



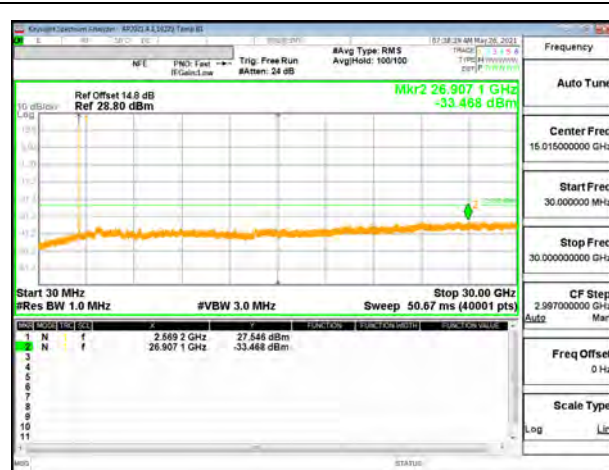
5G NR n7 20MHz BPSK High Channel RB1-105



5G NR n7 25MHz BPSK Low Channel RB1-0



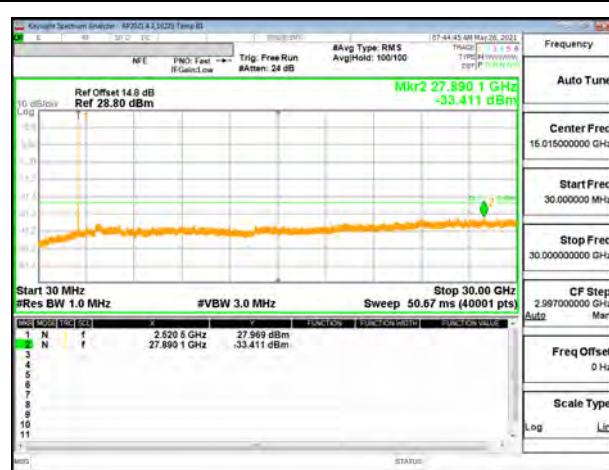
5G NR n7 25MHz BPSK Middle Channel RB1-1



5G NR n7 25MHz BPSK High Channel RB1-132



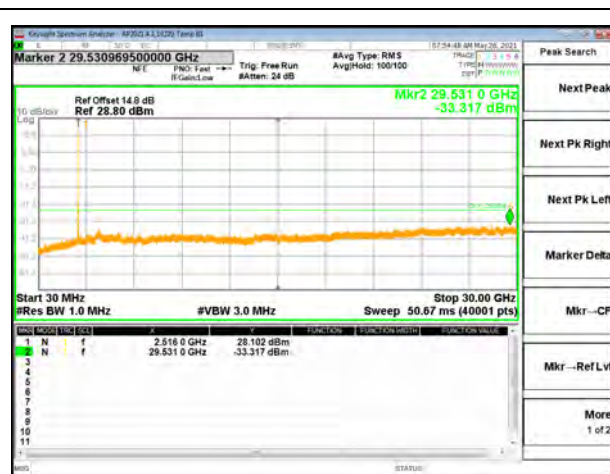
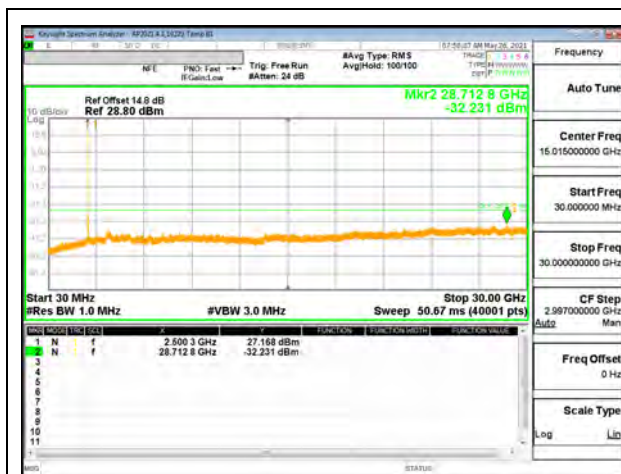
5G NR n7 30MHz BPSK Low Channel RB1-0



5G NR n7 30MHz BPSK Middle Channel RB1-1



5G NR n7 30MHz BPSK High Channel RB1-159



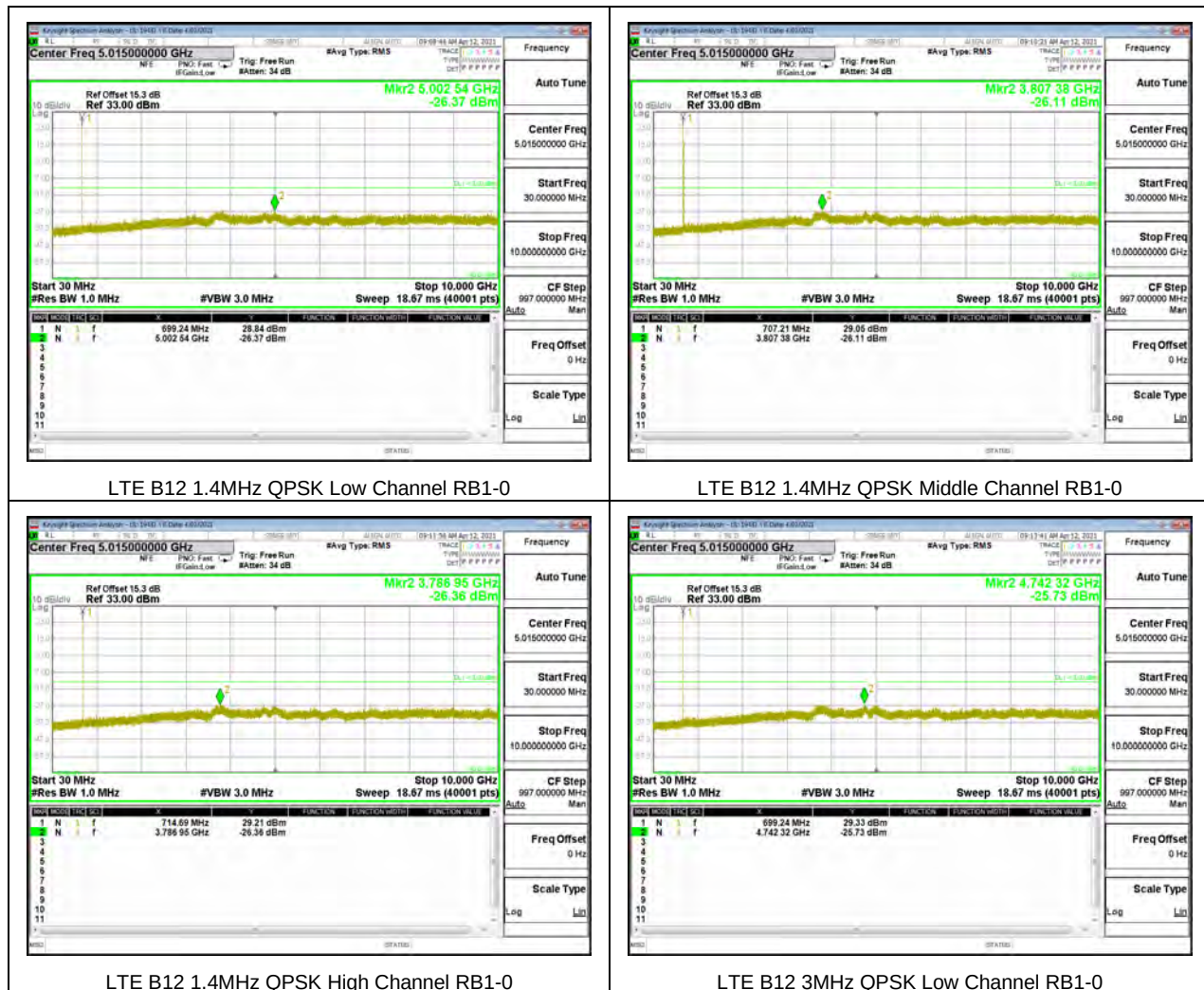
9.3.3. LTE BAND 12 AND 5G NR n12

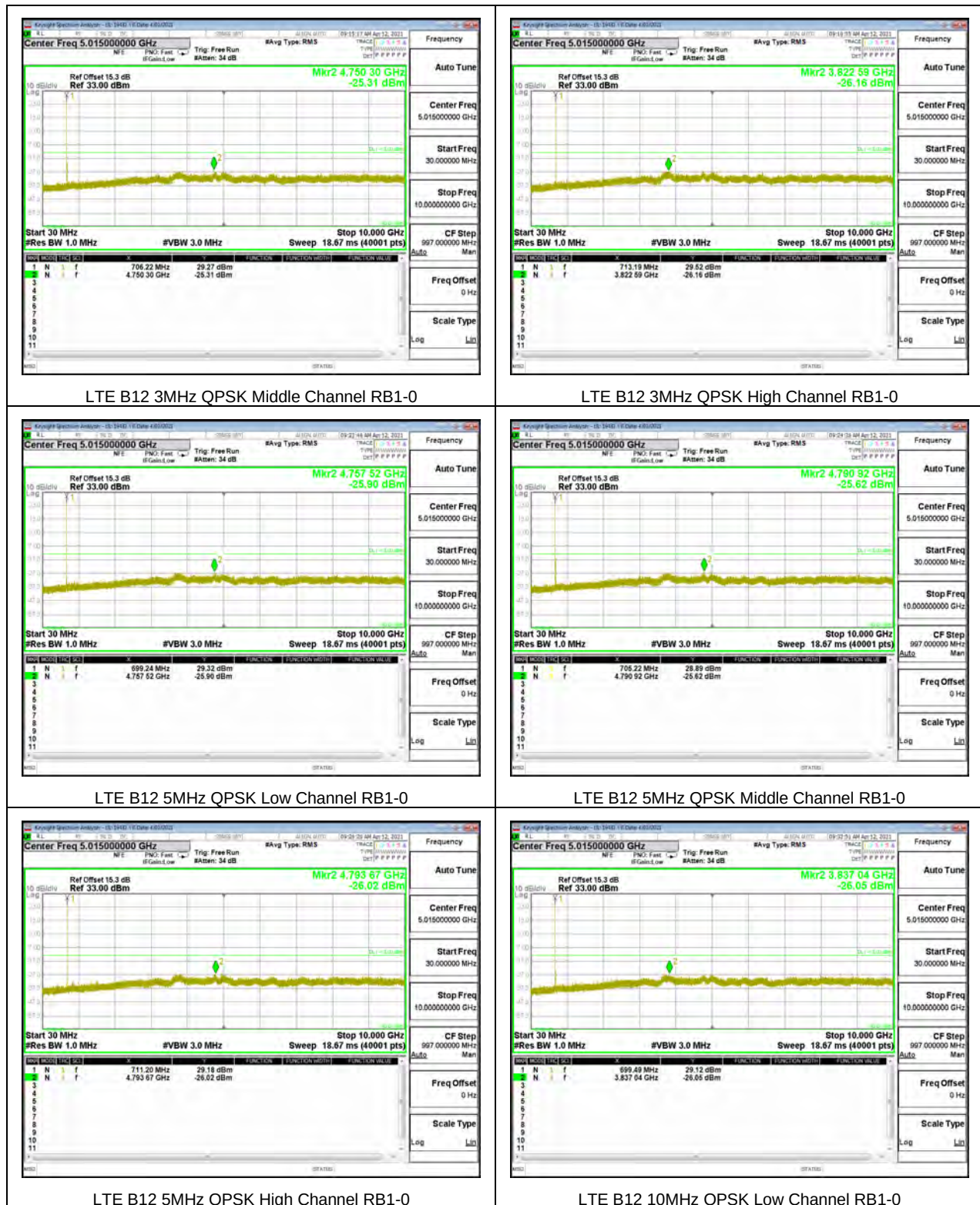
LIMITS

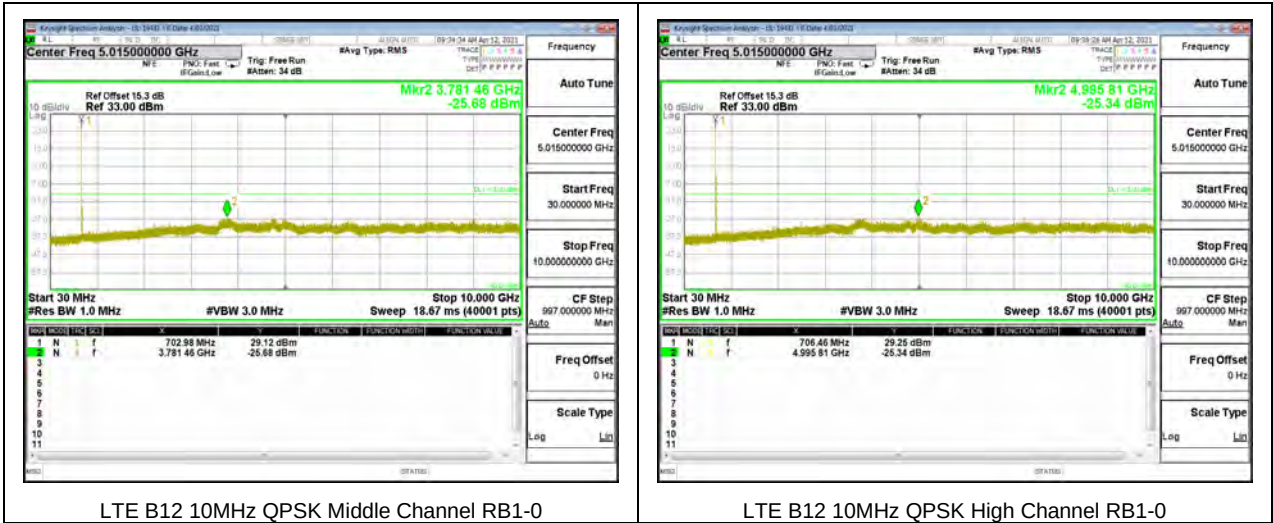
FCC: §27.53 (g)

The minimum permissible attenuation level of any spurious emissions is $43 + 10 \log (P)$ dB where transmitting power (P) in Watts.

LTE BAND 12







5G NR n12



5G NR n12 5MHz BPSK Low Channel RB1-0



5G NR n12 5MHz BPSK Middle Channel RB1-1



5G NR n12 5MHz BPSK High Channel RB1-24



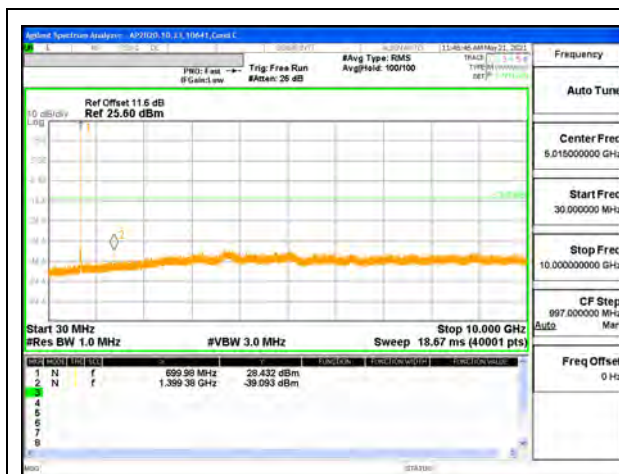
5G NR n12 10MHz BPSK Low Channel RB1-0



5G NR n12 10MHz BPSK Middle Channel RB1-1



5G NR n12 10MHz BPSK High Channel RB1-51



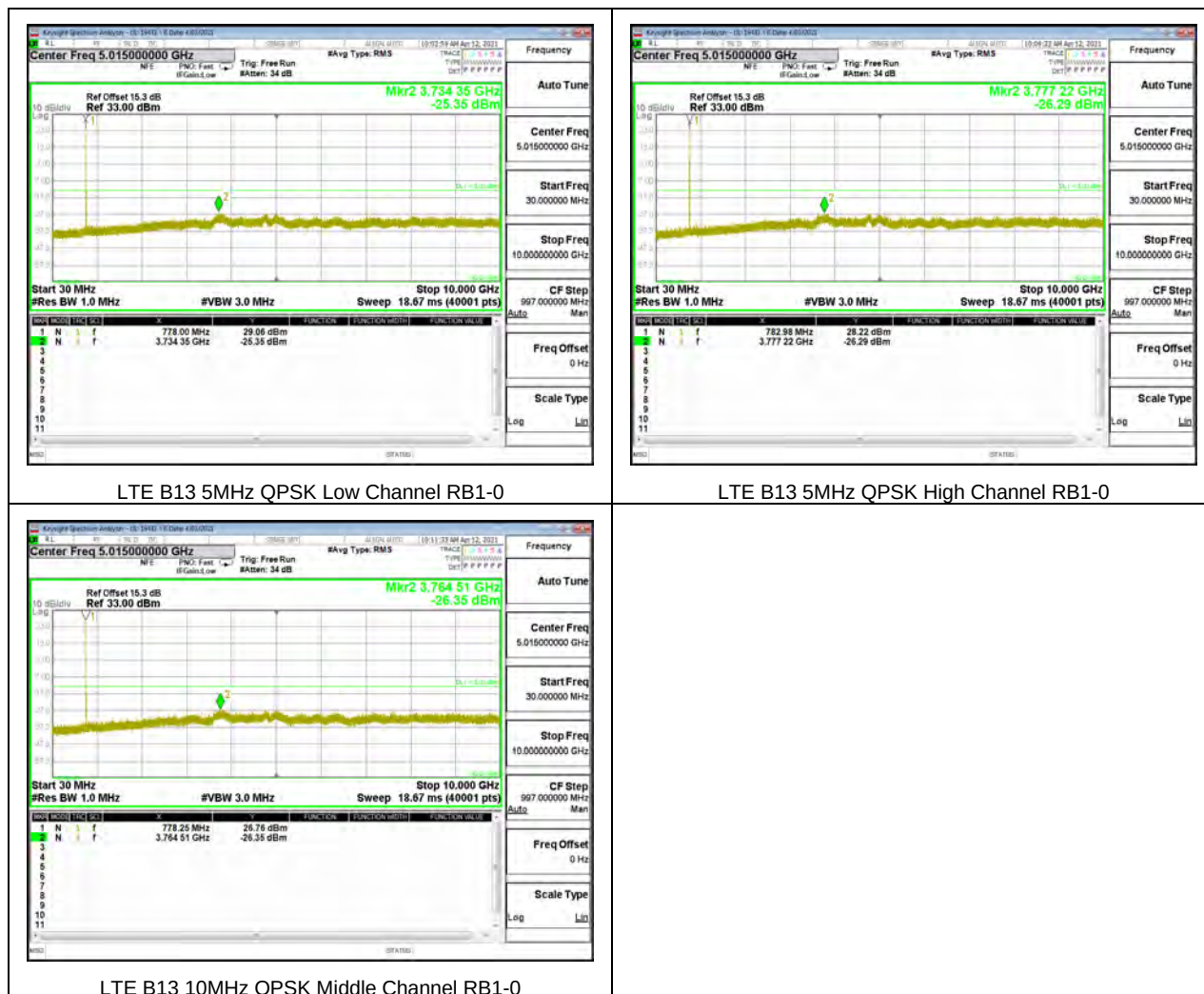
9.3.4. LTE BAND 13

LIMITS

FCC: §27.53 (c), (f)

The minimum permissible attenuation level of any spurious emissions is $43 + 10 \log (P)$ dB where transmitting power (P) in Watts. 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.

Note: Radiated data confirms a compliance for the emissions in GPS 1559-1610 MHz band were wideband emissions therefore the -40 dBm/MHz limit was used.



Note: Radiated data in section 9.1.6 confirms a compliance with narrowband limits for GPS1559-1610 MHz band.

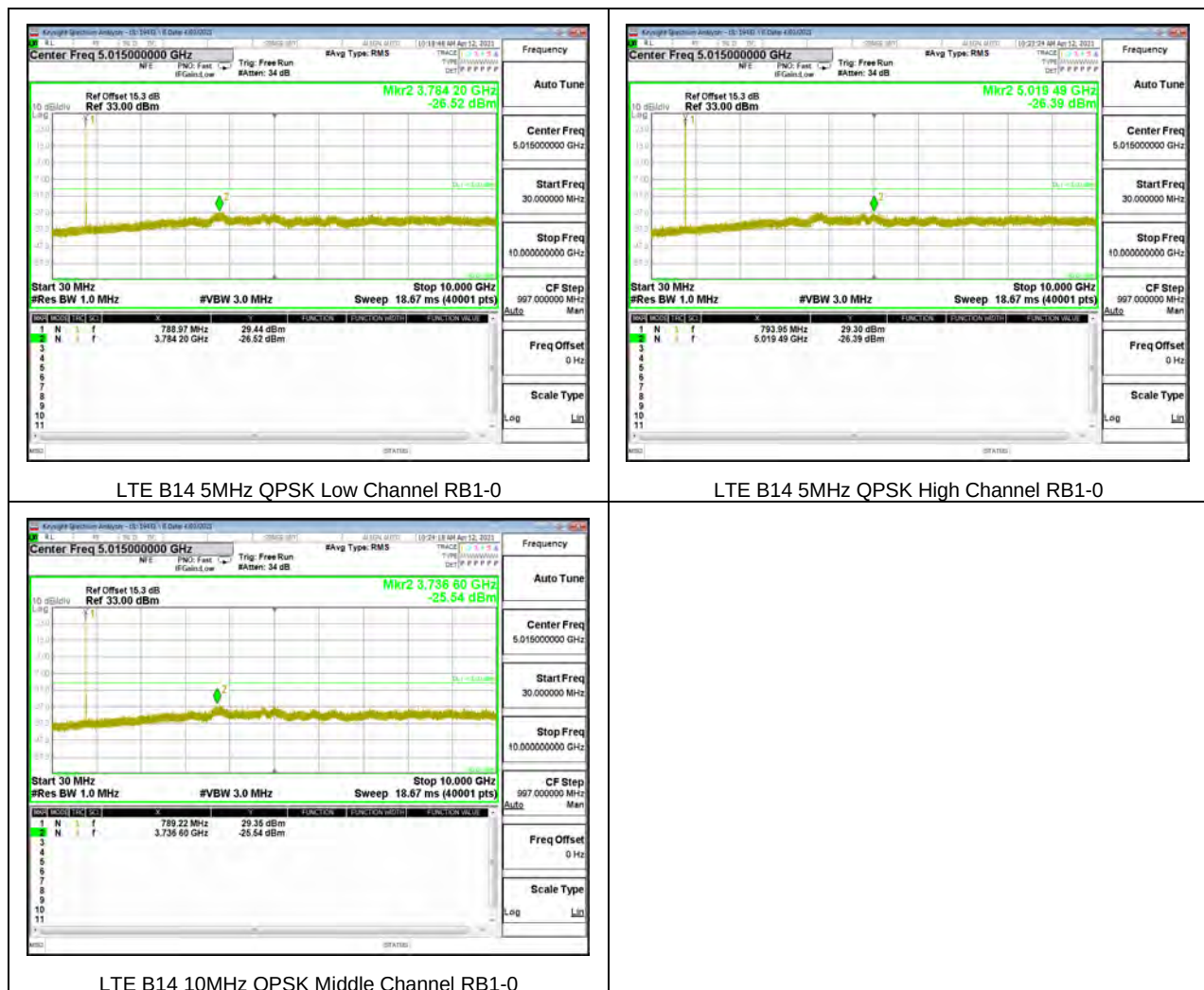
9.3.5. LTE BAND 14

LIMITS

FCC: §90.543 (e), (f)

The minimum permissible attenuation level of any spurious emissions is $43 + 10 \log (P)$ dB where transmitting power (P) in Watts. 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.

Note: Radiated data confirms a compliance for the emissions in GPS 1559-1610 MHz band were wideband emissions therefore the -40 dBm/MHz limit was used.



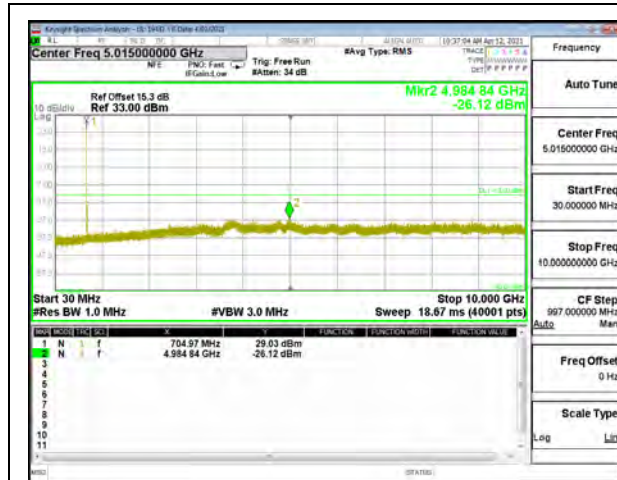
Note: Radiated data in section 9.1.7 confirms a compliance with narrowband limits for GPS1559-1610 MHz band.

9.3.6. LTE BAND 17

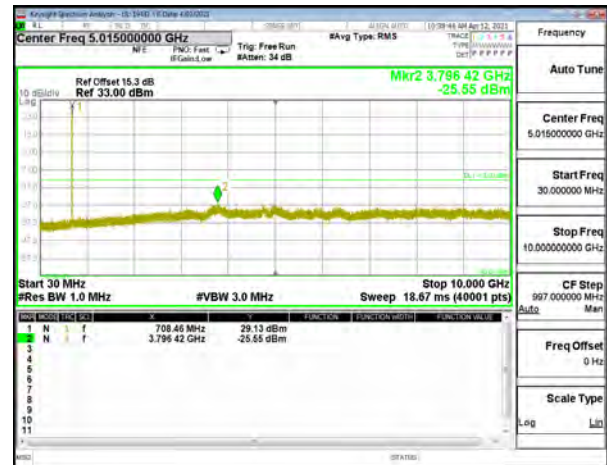
LIMITS

FCC: §27.53 (g)

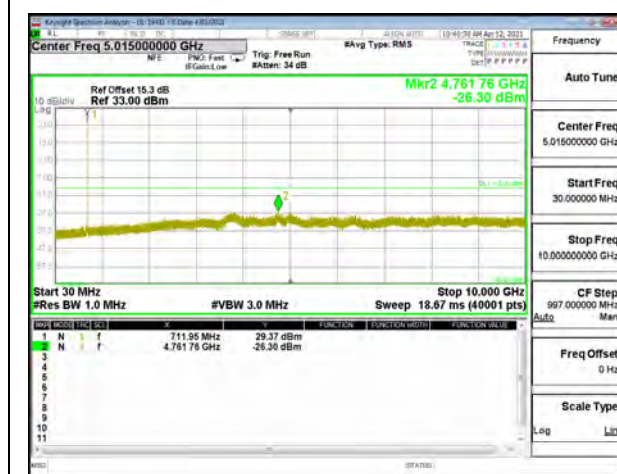
The minimum permissible attenuation level of any spurious emissions is $43 + 10 \log (P)$ dB where transmitting power (P) in Watts.



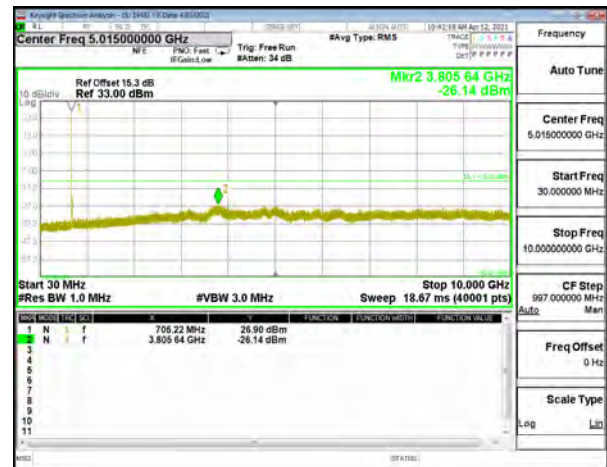
LTE B17 5MHz QPSK Low Channel RB1-0



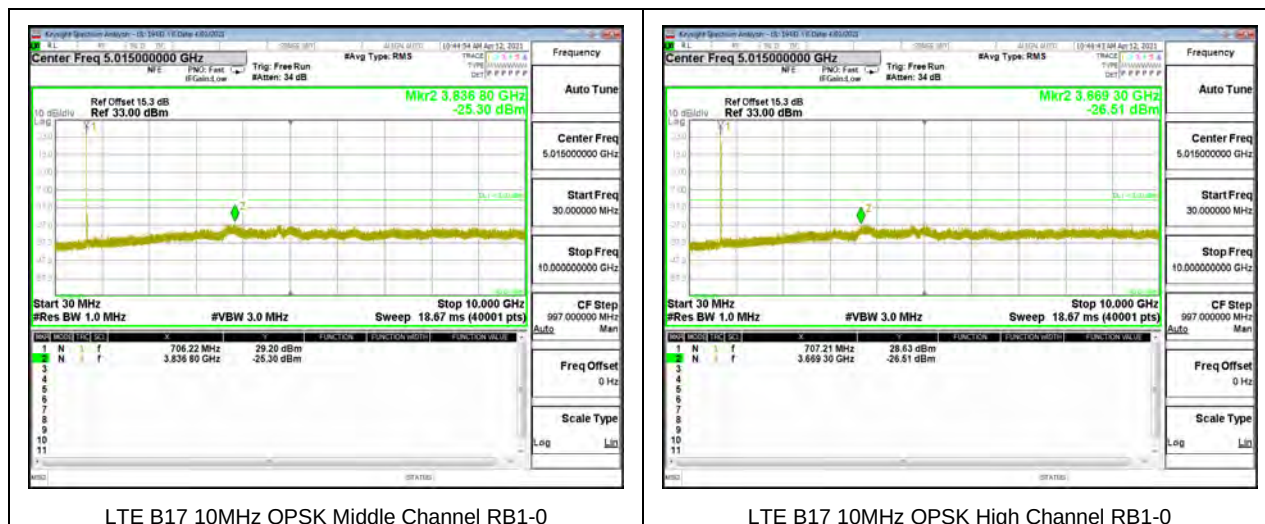
LTE B17 5MHz QPSK Middle Channel RB1-0



LTE B17 5MHz QPSK High Channel RB1-0



LTE B17 10MHz QPSK Low Channel RB1-0



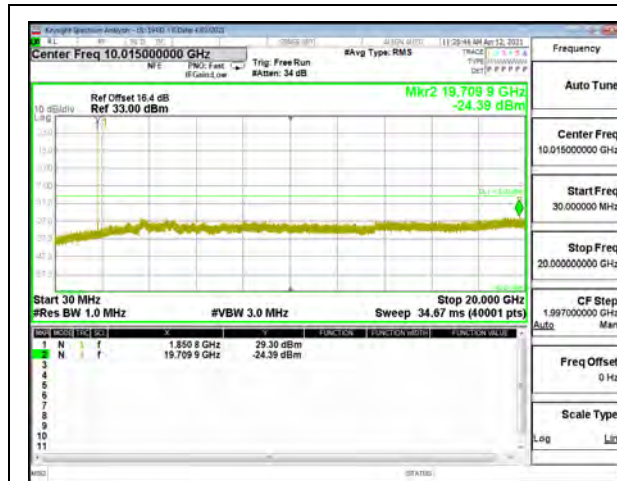
9.3.7. LTE BAND 25 AND 5G NR n25

LIMITS

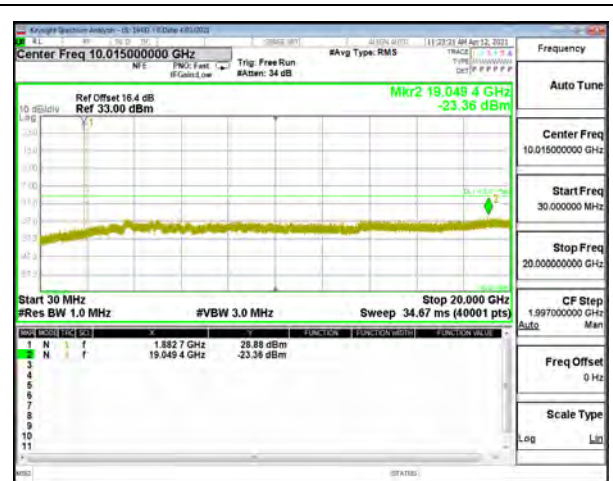
FCC: §24.238 (a)

The minimum permissible attenuation level of any spurious emissions is $43 + 10 \log (P)$ dB where transmitting power (P) in Watts.

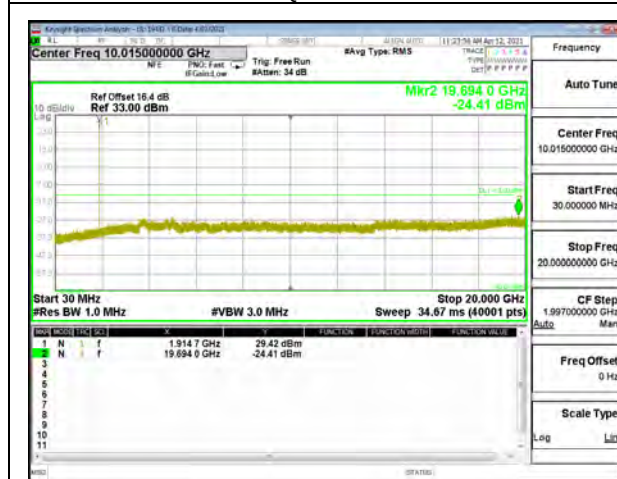
LTE BAND 25



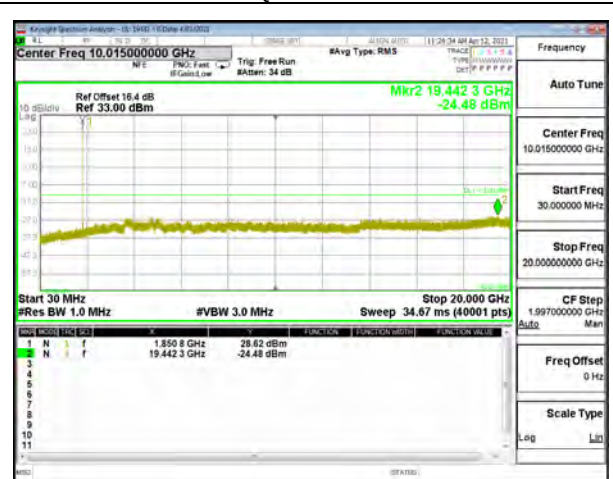
LTE B25 1.4MHz QPSK Low Channel RB1-0



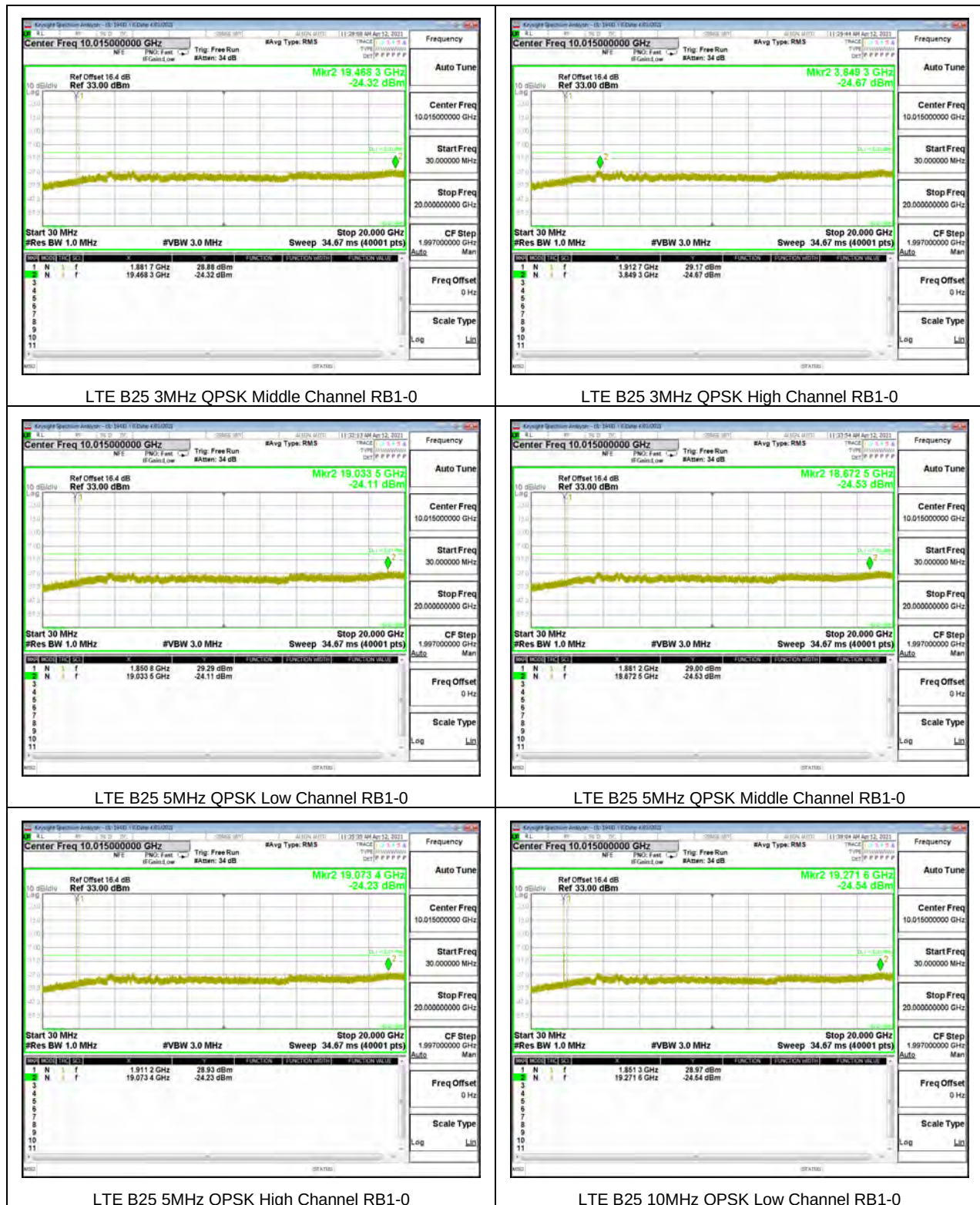
LTE B25 1.4MHz QPSK Middle Channel RB1-0

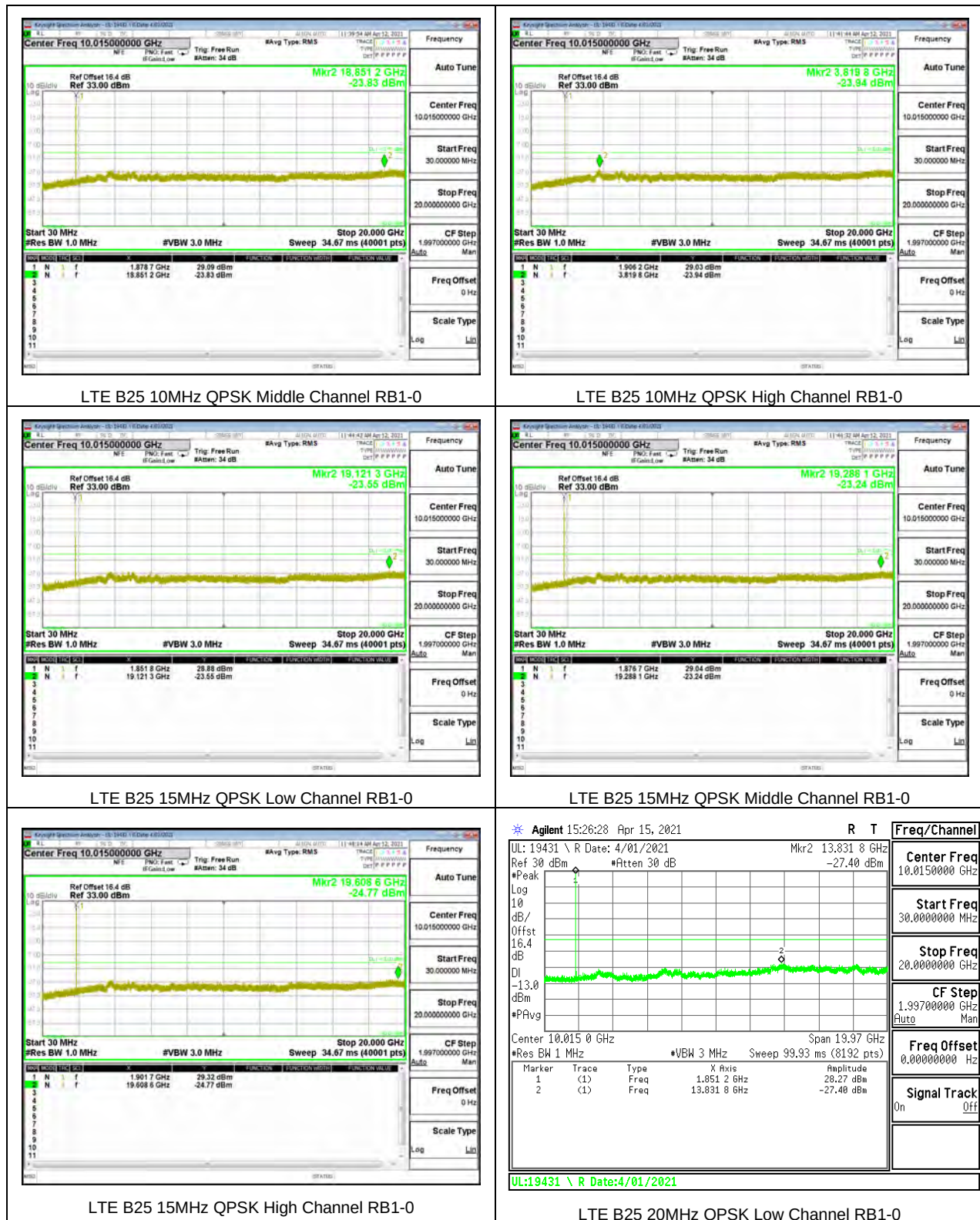


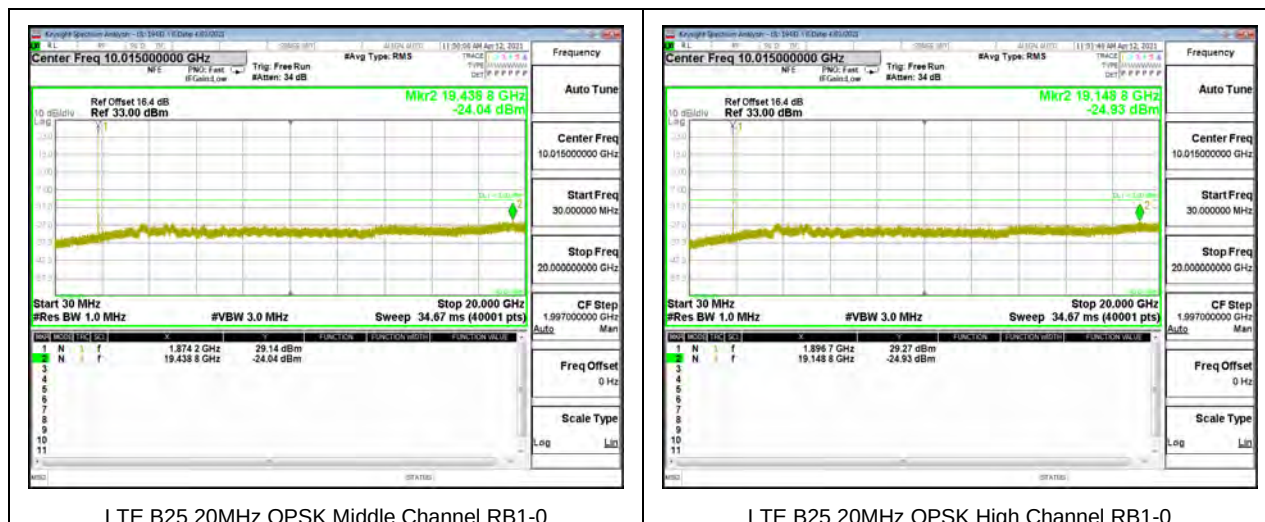
LTE B25 1.4MHz QPSK High Channel RB1-0



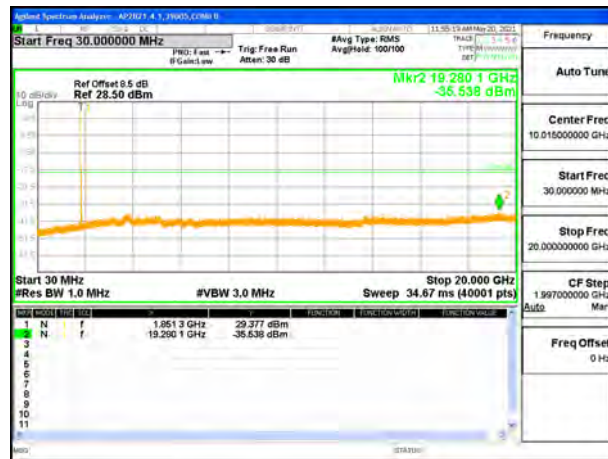
LTE B25 3MHz QPSK Low Channel RB1-0



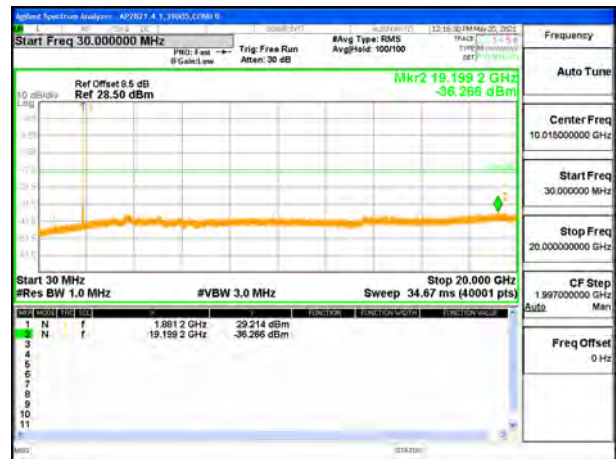




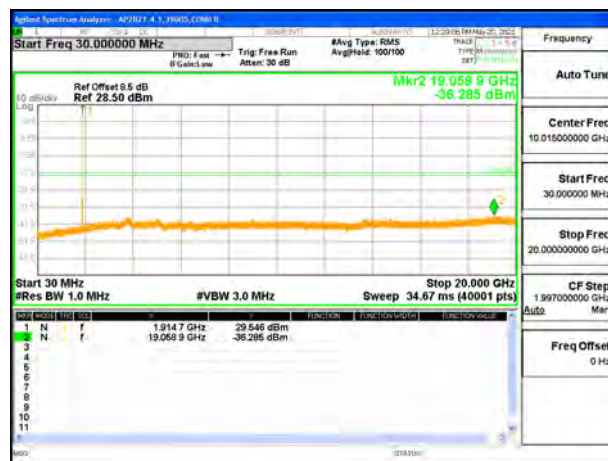
5G NR 25



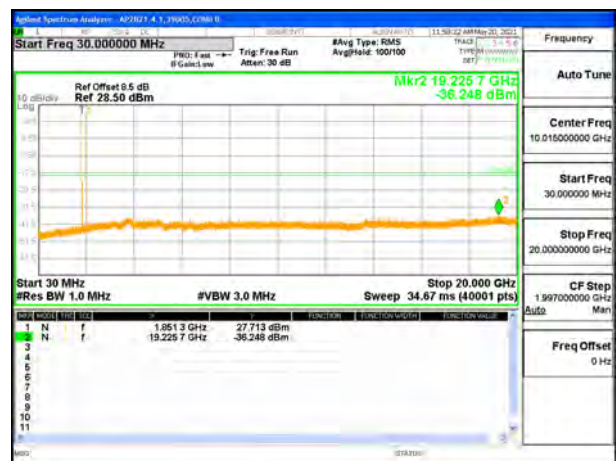
5G NR n25 5MHz BPSK Low Channel RB1-0



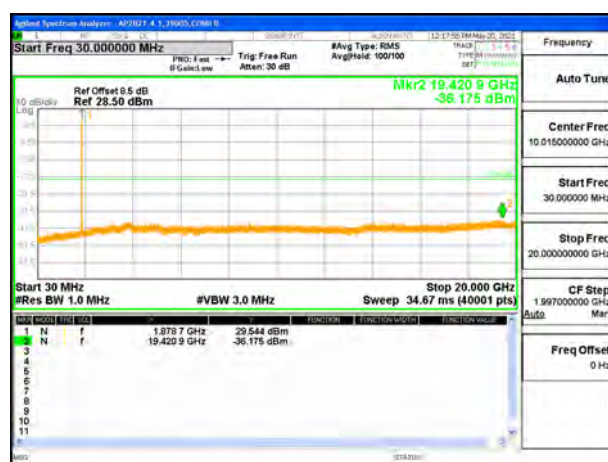
5G NR n25 5MHz BPSK Middle Channel RB1-1



5G NR n25 5MHz BPSK High Channel RB1-24



5G NR n25 10MHz BPSK Low Channel RB1-0



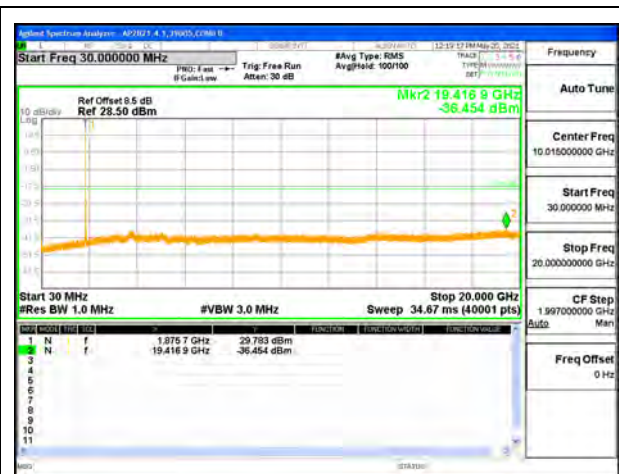
5G NR n25 10MHz BPSK Middle Channel RB1-1



5G NR n25 10MHz BPSK High Channel RB1-51



5G NR n25 15MHz BPSK Low Channel RB1-0



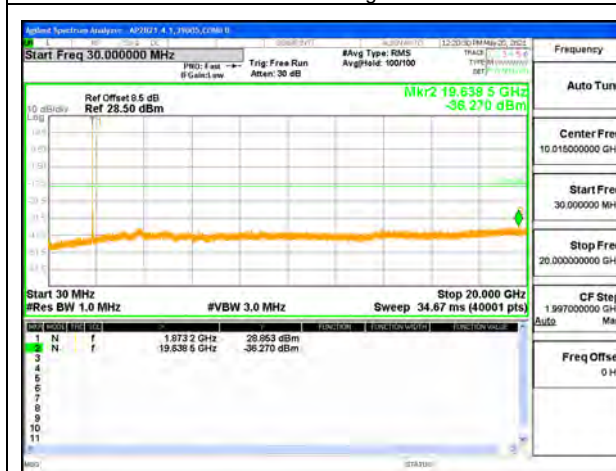
5G NR n25 15MHz BPSK Middle Channel RB1-1



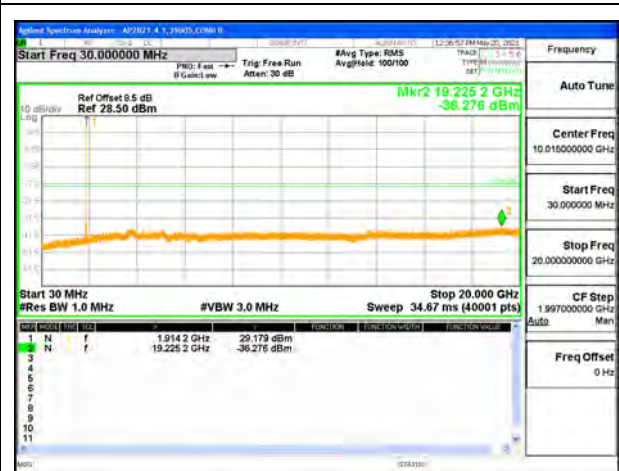
5G NR n25 15MHz BPSK High Channel RB1-78



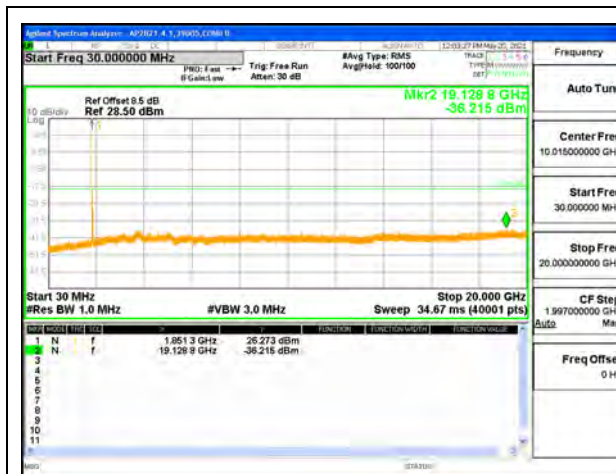
5G NR n25 20MHz BPSK Low Channel RB1-0



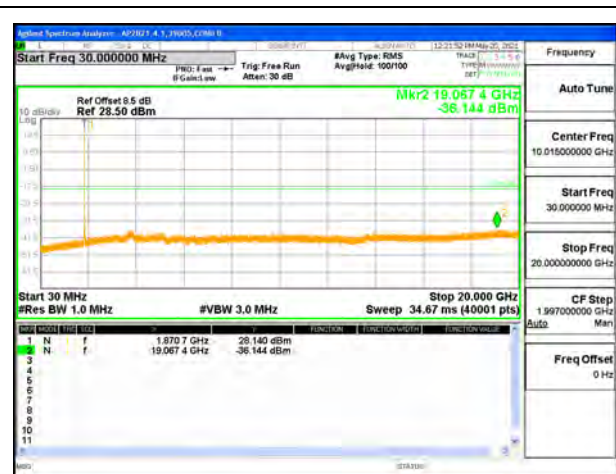
5G NR n25 20MHz BPSK Middle Channel RB1-1



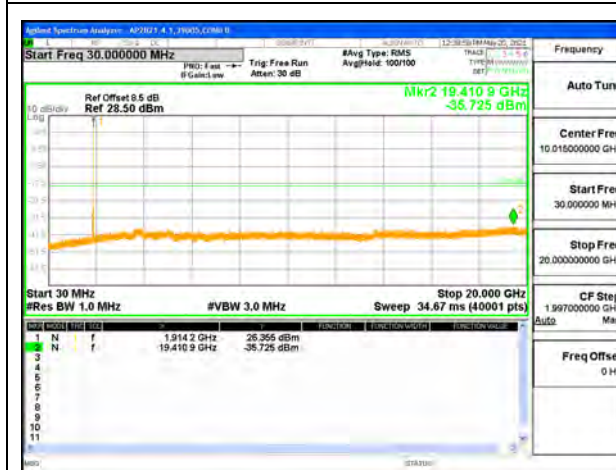
5G NR n25 20MHz BPSK High Channel RB1-105



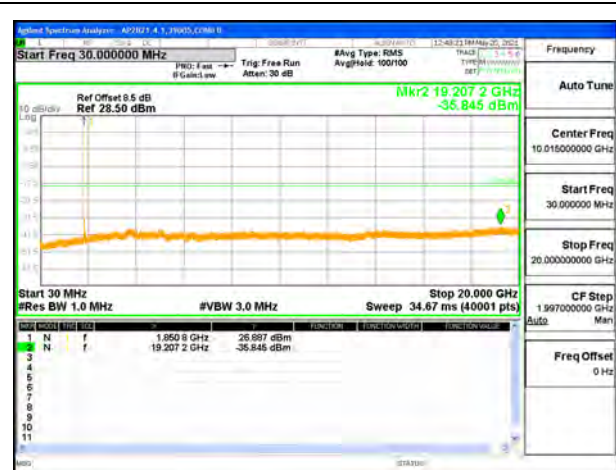
5G NR n25 25MHz BPSK Low Channel RB1-0



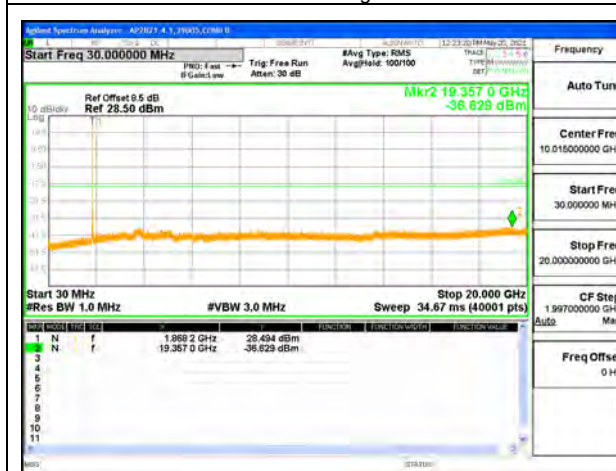
5G NR n25 25MHz BPSK Middle Channel RB1-1



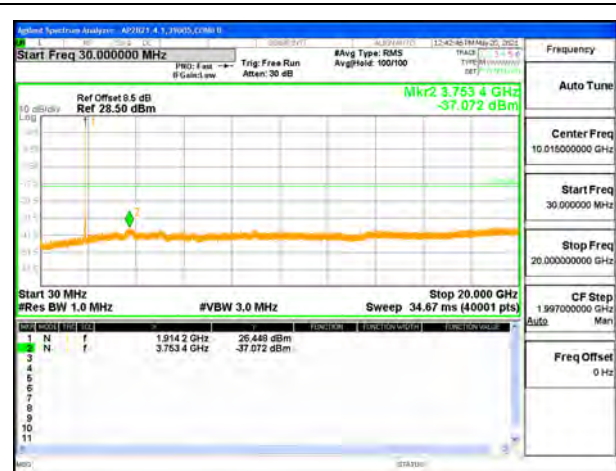
5G NR n25 25MHz BPSK High Channel RB1-132



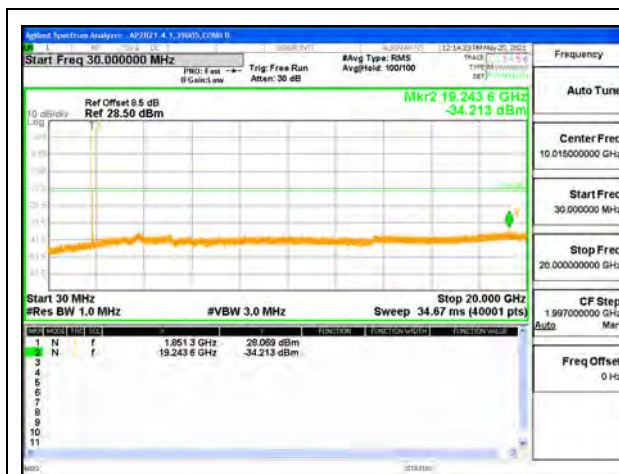
5G NR n25 30MHz BPSK Low Channel RB1-0



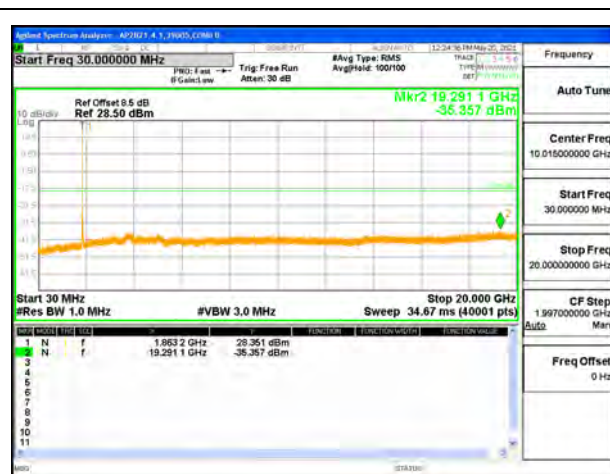
5G NR n25 30MHz BPSK Middle Channel RB1-1



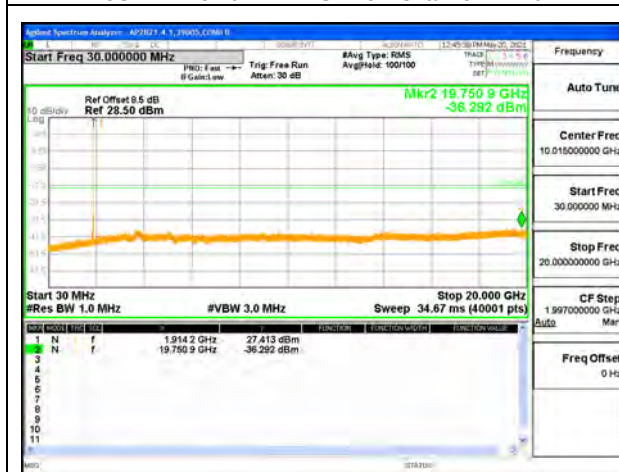
5G NR n25 30MHz BPSK High Channel RB1-159



5G NR n25 40MHz BPSK Low Channel RB1-0



5G NR n25 40MHz BPSK Middle Channel RB1-1



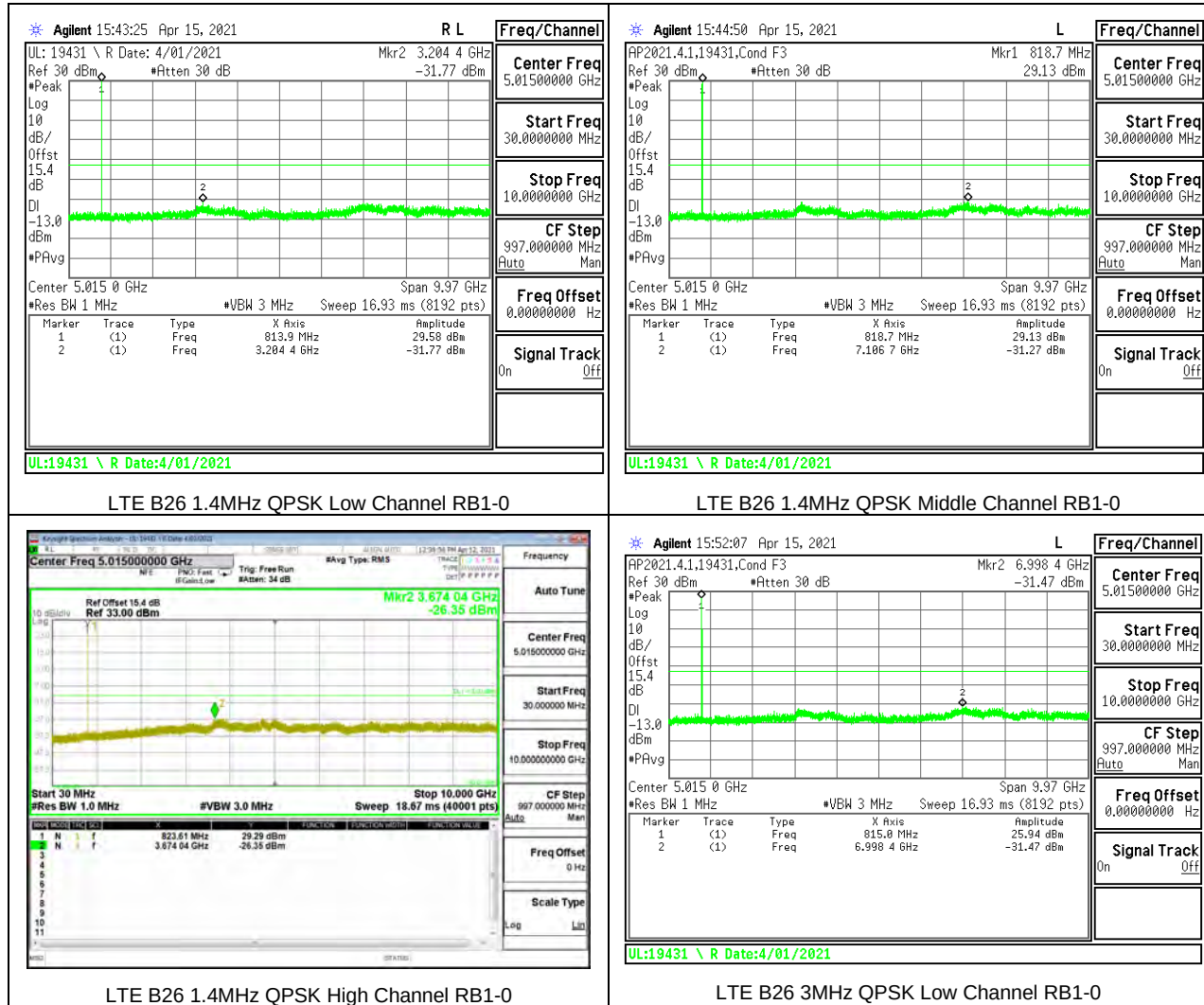
5G NR n25 40MHz BPSK High Channel RB1-215

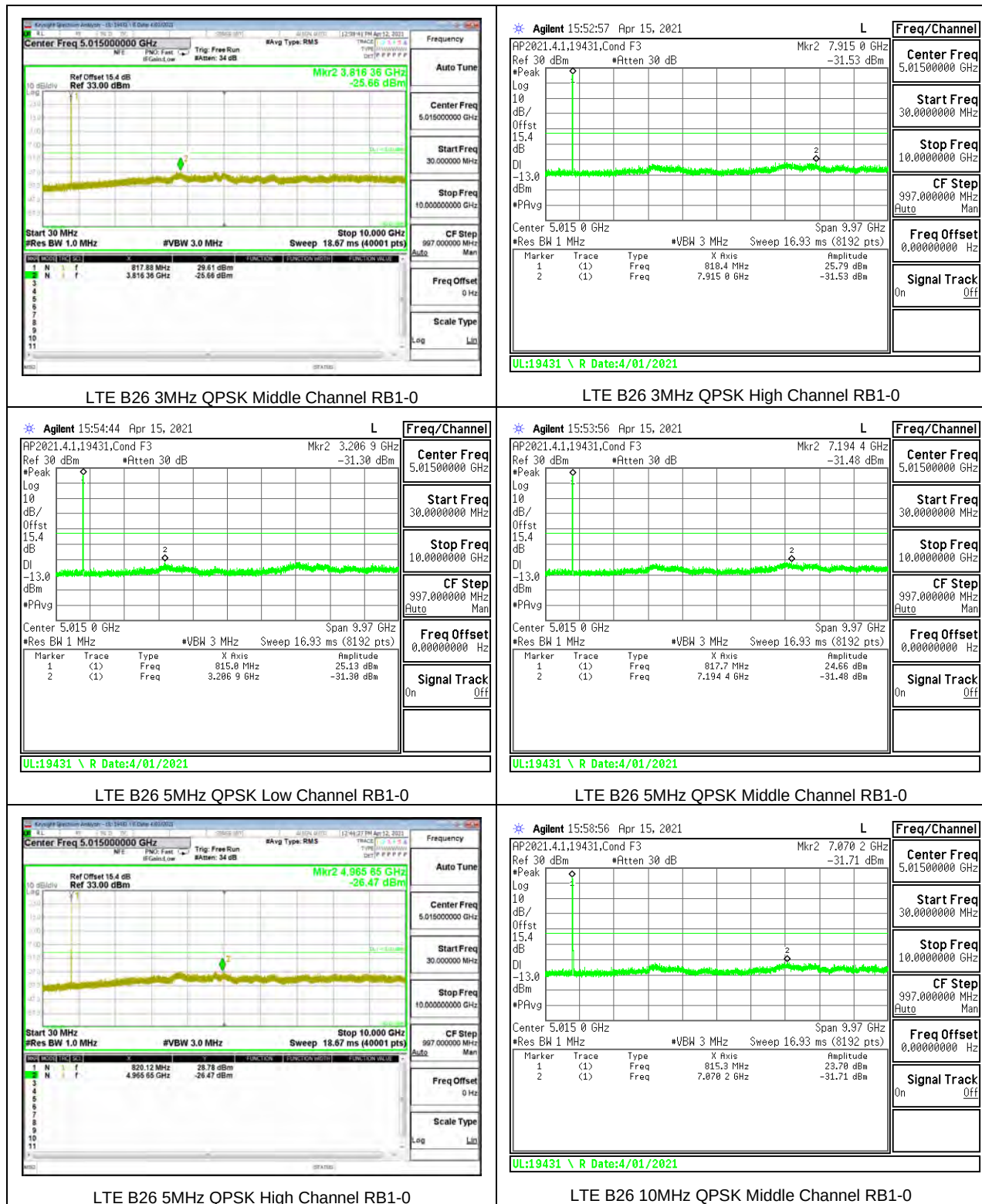
9.3.8. LTE BAND 26 (PART 90S)

LIMITS

FCC: §90.691

The minimum permissible attenuation level of any spurious emissions is $43 + 10 \log (P)$ dB where transmitting power (P) in Watts.



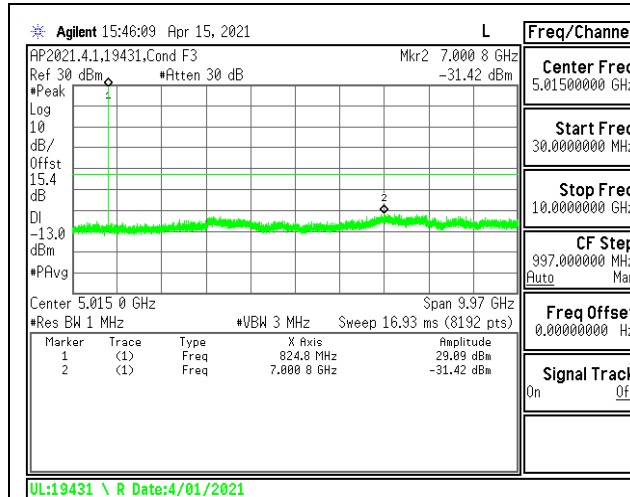


9.3.9. LTE BAND 26 (PART 22)

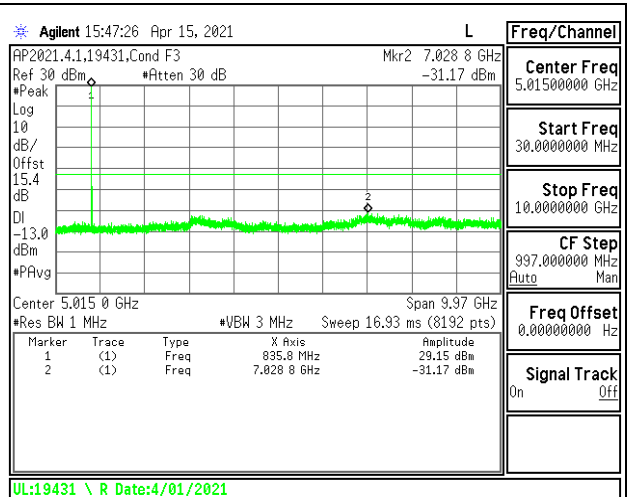
LIMITS

FCC: §22.917 (a)

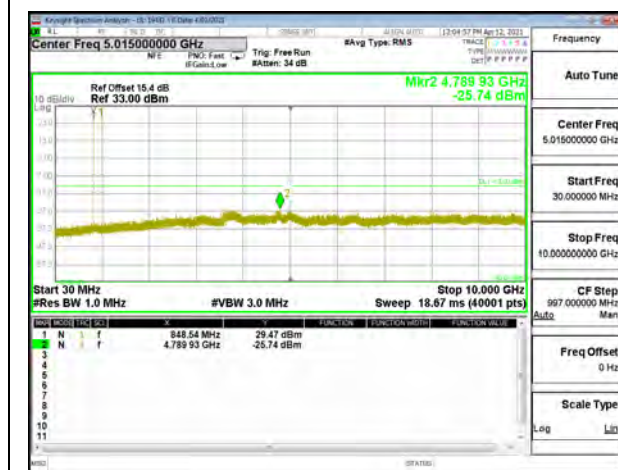
The minimum permissible attenuation level of any spurious emissions is $43 + 10 \log (P)$ dB where transmitting power (P) in Watts.



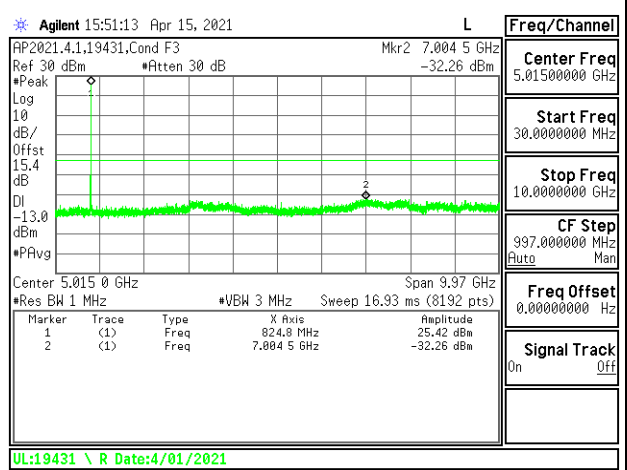
LTE B26 1.4MHz QPSK Low Channel RB1-0



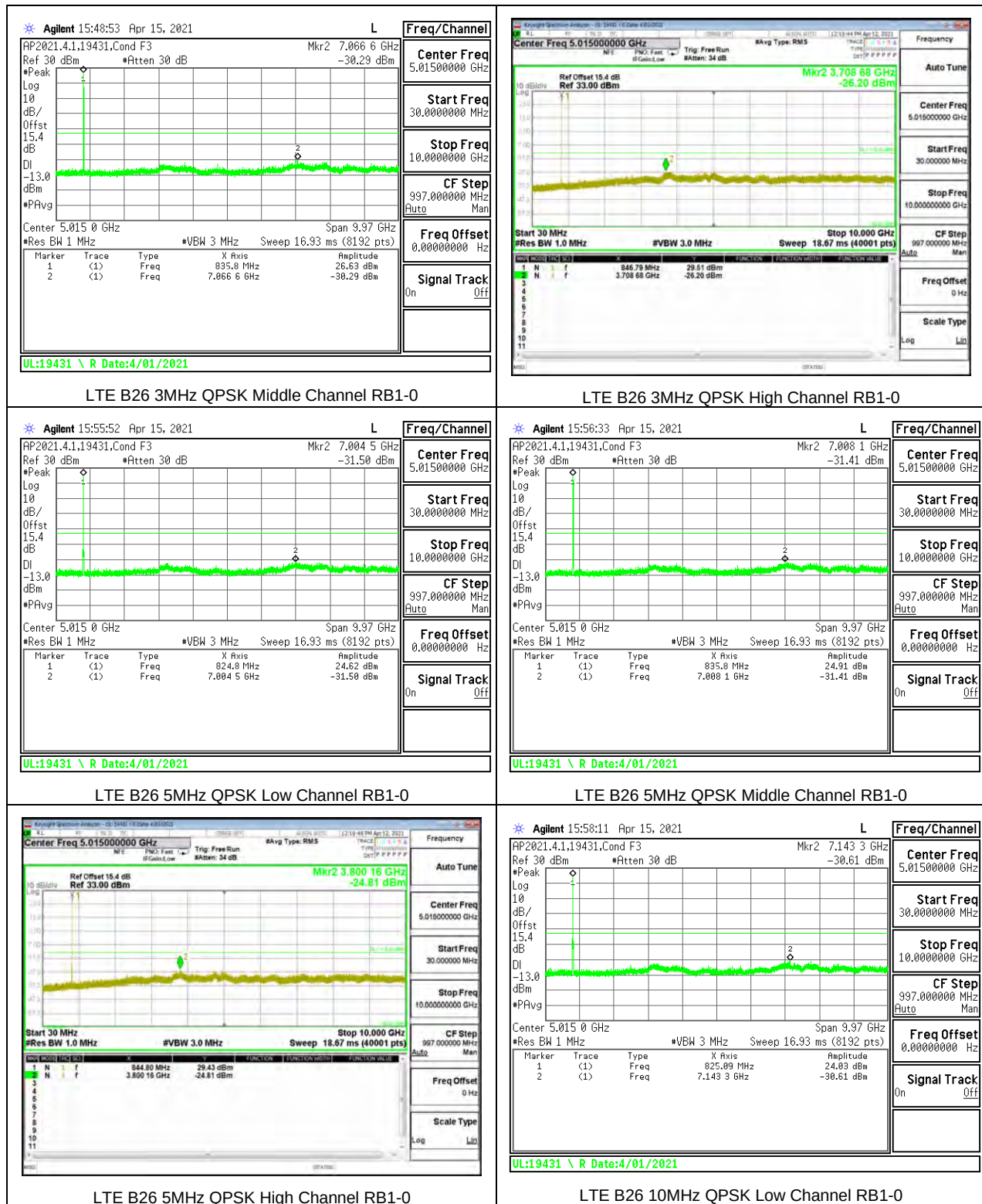
LTE B26 1.4MHz QPSK Middle Channel RB1-0

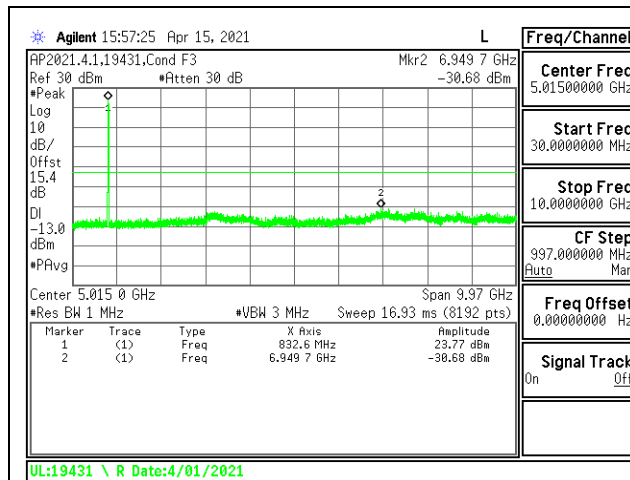


LTE B26 1.4MHz QPSK High Channel RB1-0

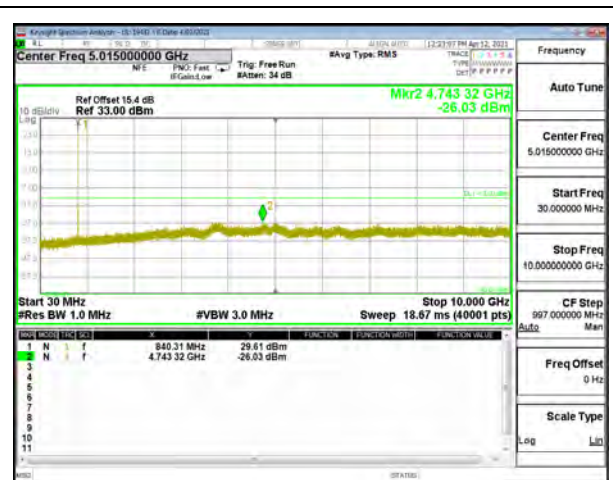


LTE B26 3MHz QPSK Low Channel RB1-0

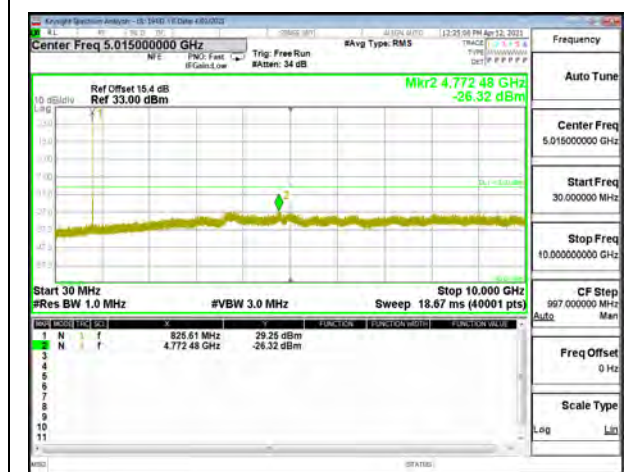




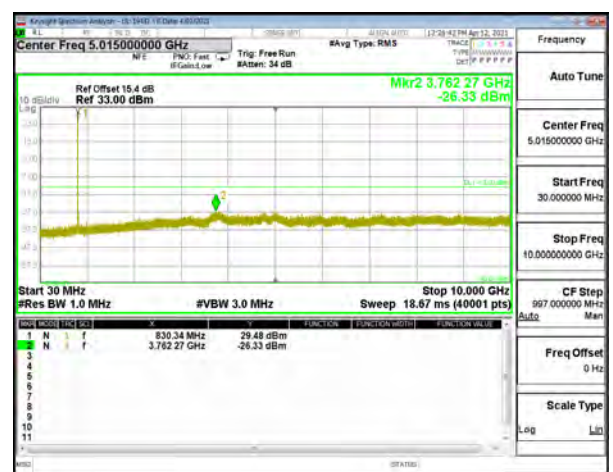
LTE B26 10MHz QPSK Middle Channel RB1-0



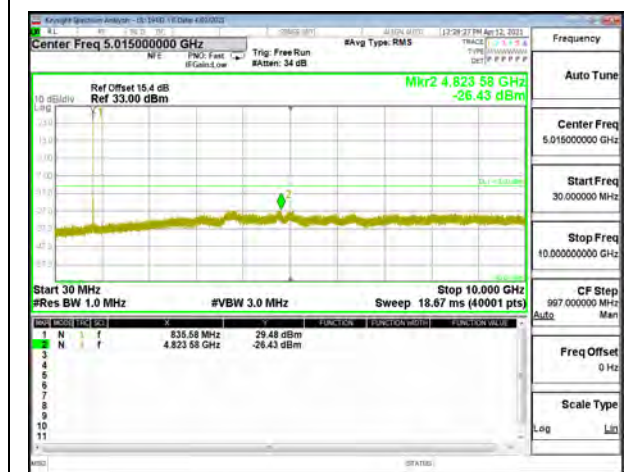
LTE B26 10MHz QPSK High Channel RB1-0



LTE B26 15MHz QPSK Low Channel RB1-0



LTE B26 15MHz QPSK Middle Channel RB1-0



LTE B26 15MHz QPSK High Channel RB1-0

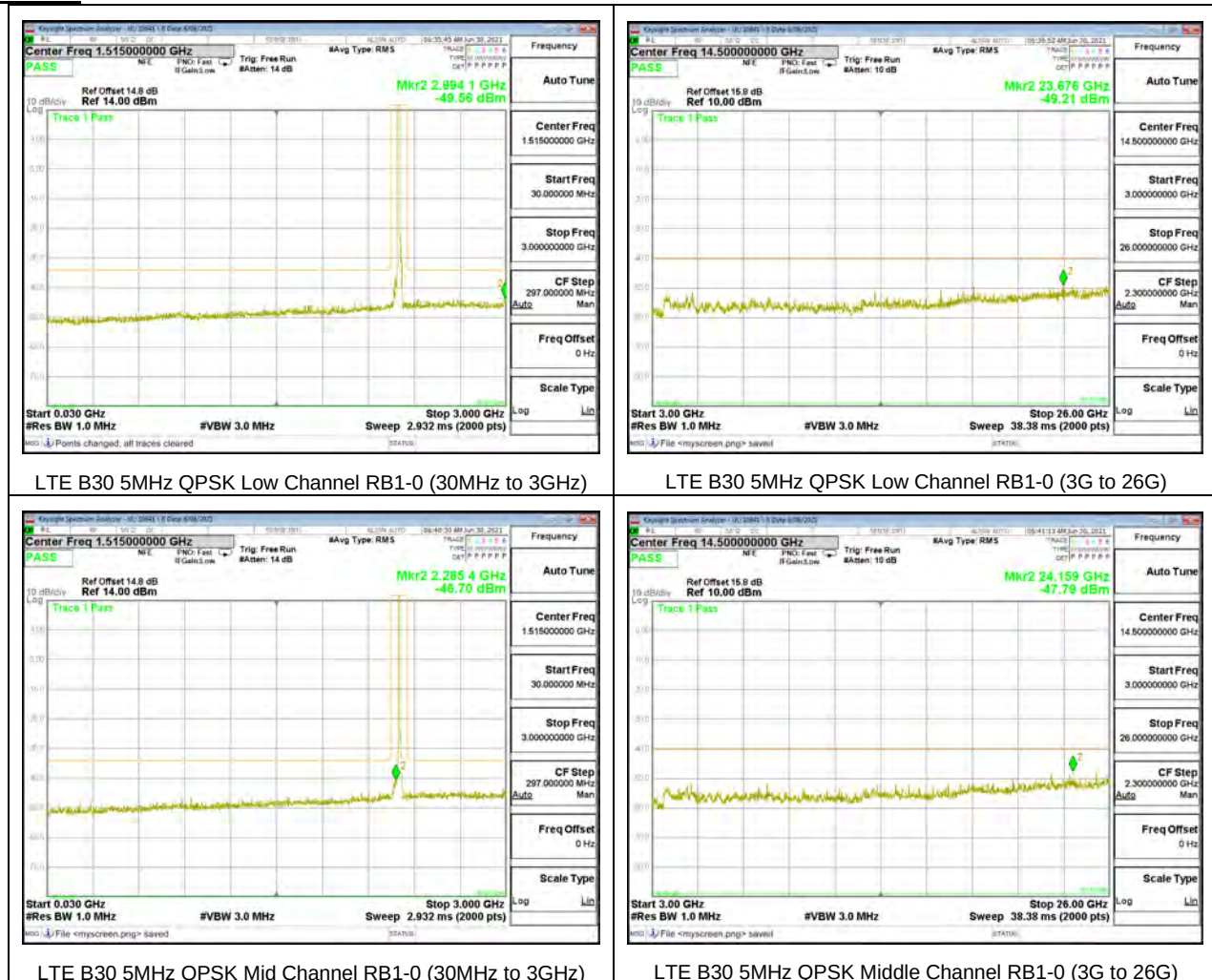
9.3.10. LTE BAND 30

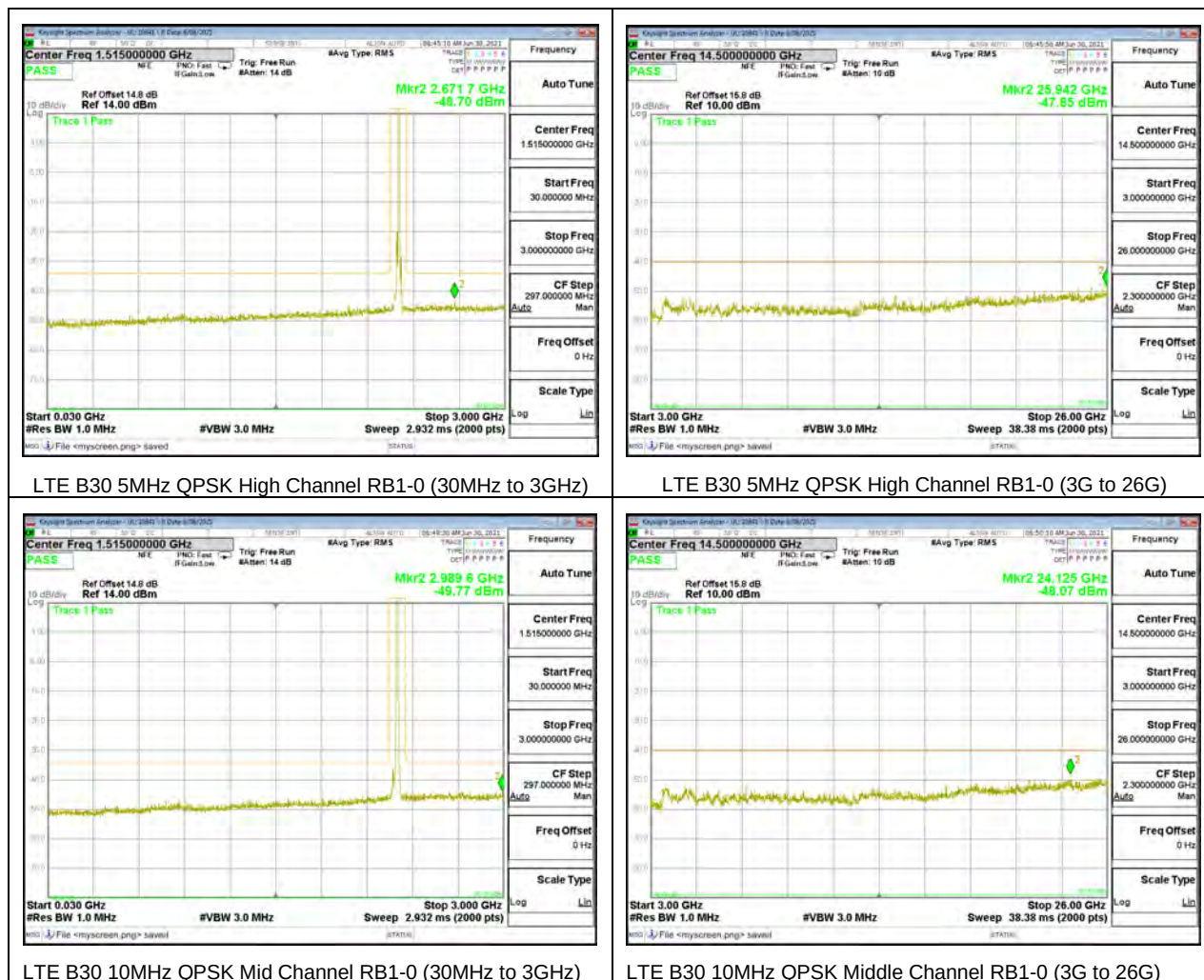
LIMITS

FCC: §27.53 (a)

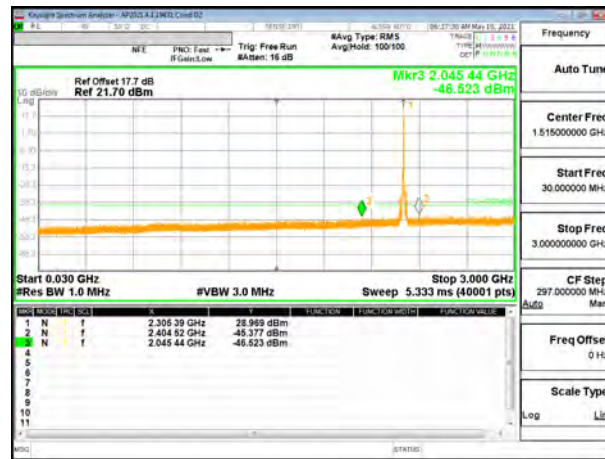
The minimum permissible attenuation level of any spurious emissions is $70 + 10 \log(P)$ dB where transmitting power (P) in Watts.

LTE Band 30

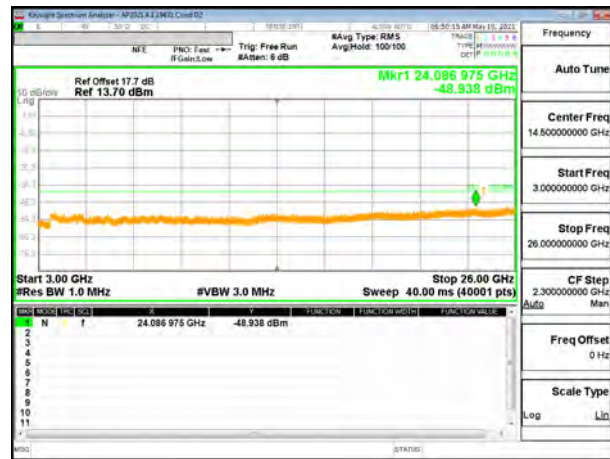




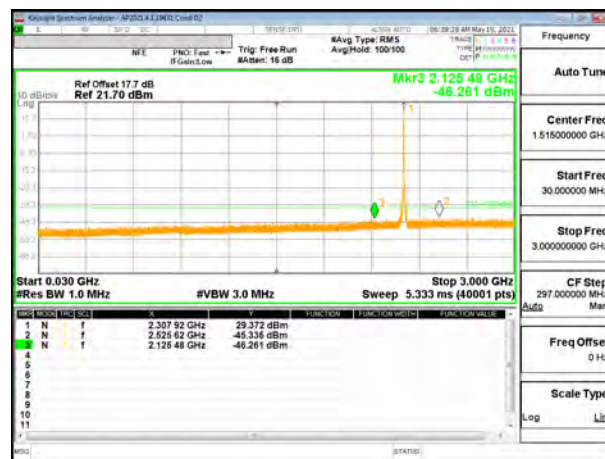
5G NR n30



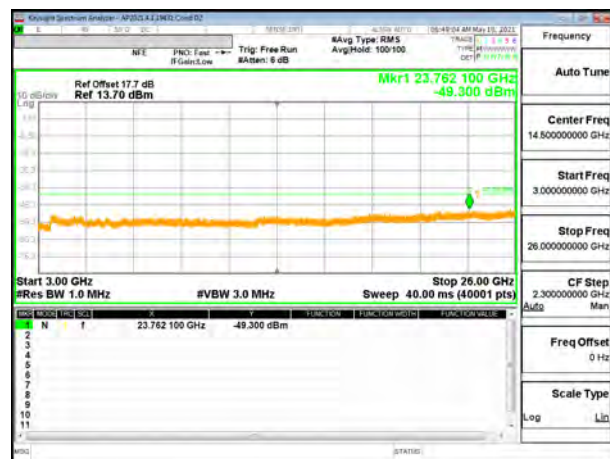
LTE B30 5MHz BPSK Low Channel RB1-0 (30MHz to 3GHz)



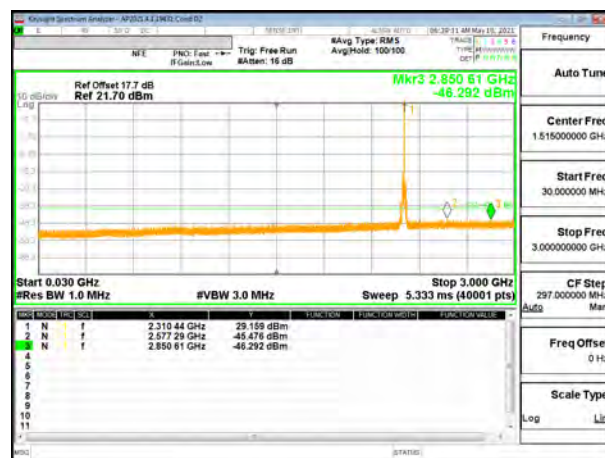
LTE B30 5MHz BPSK Low Channel RB1-0 (3G to 26G)



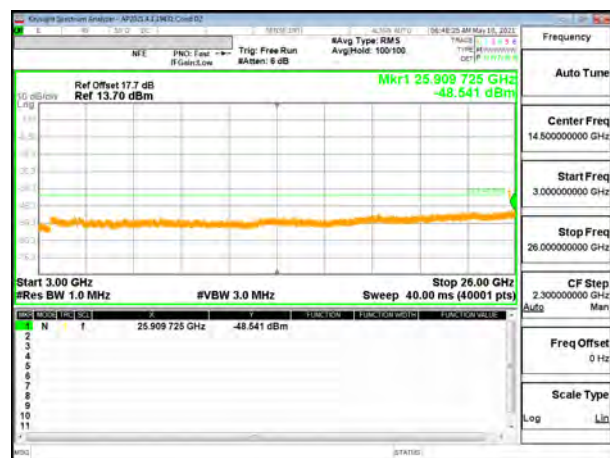
LTE B30 5MHz BPSK Mid Channel RB1-0 (30MHz to 3GHz)



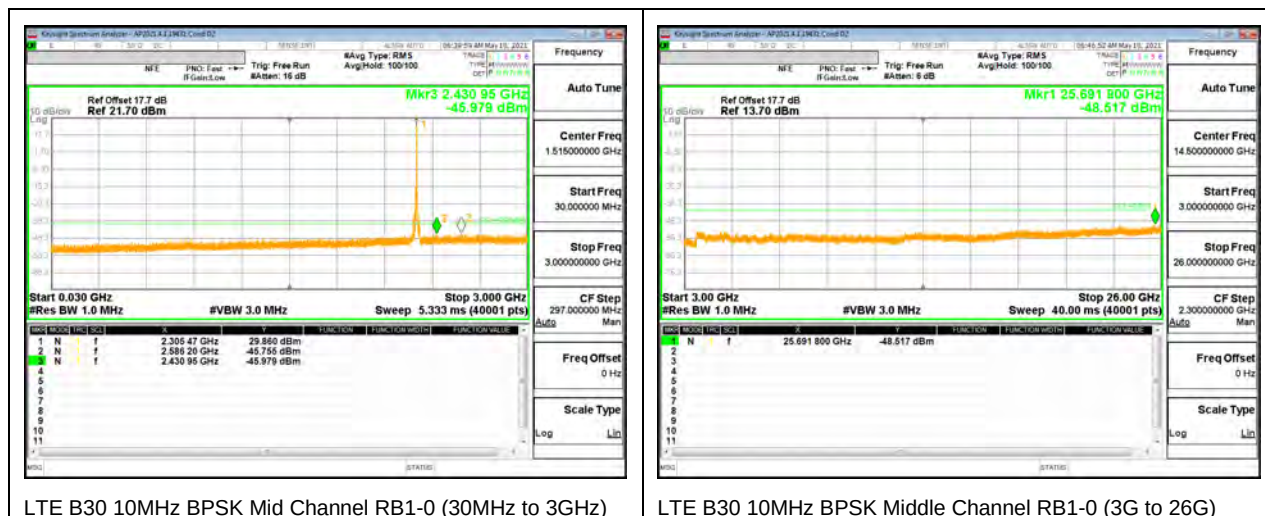
LTE B30 5MHz BPSK Middle Channel RB1-0 (3G to 26G)



LTE B30 5MHz BPSK High Channel RB1-0 (30MHz to 3GHz)



LTE B30 5MHz BPSK High Channel RB1-0 (3G to 26G)



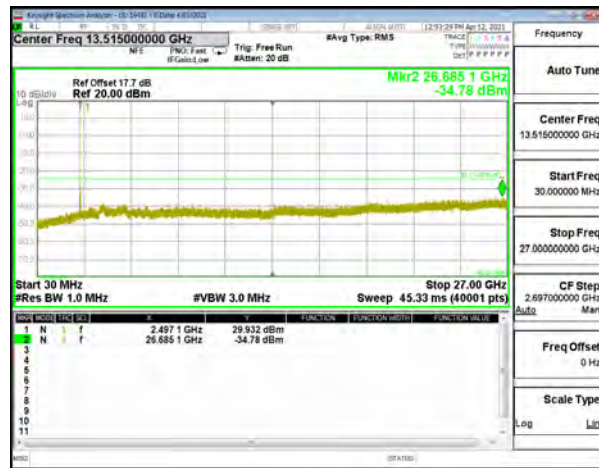
9.3.11. LTE BAND 41 AND 5G NR n41

LIMITS

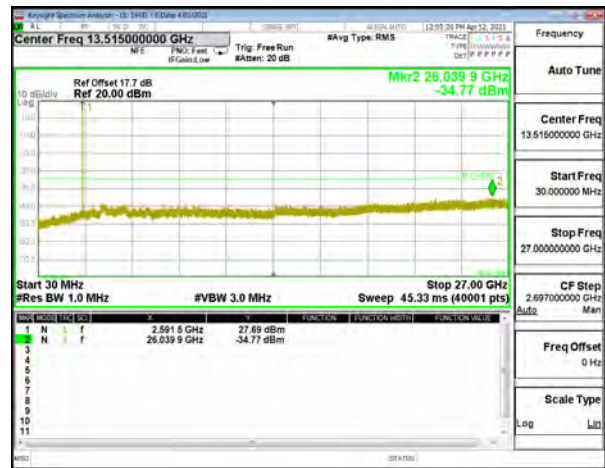
FCC: §27.53 (m)

The minimum permissible attenuation level of any spurious emissions is $55 + 10 \log (P)$ dB where transmitting power (P) in Watts.

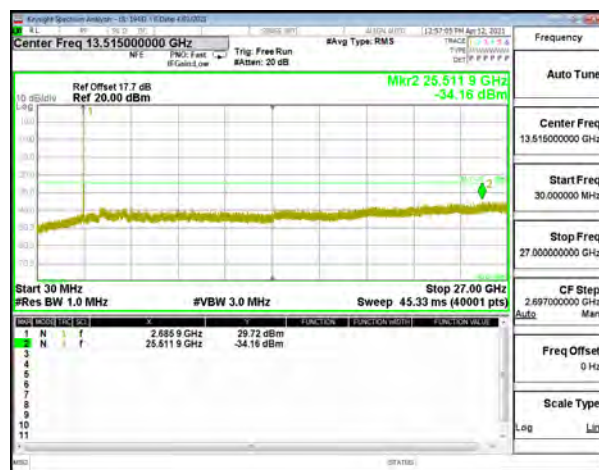
LTE BAND 41



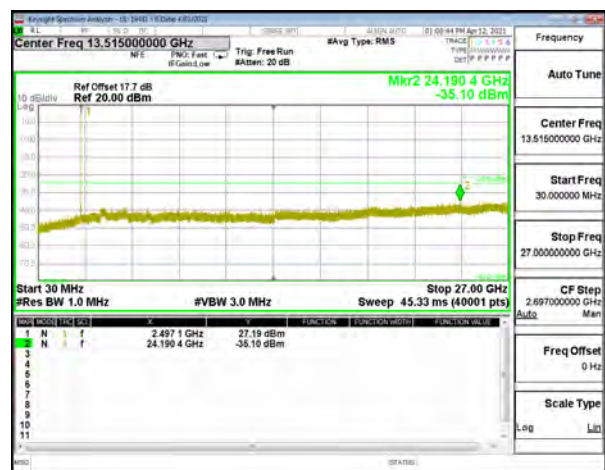
LTE B41 5MHz QPSK Low Channel RB1-0



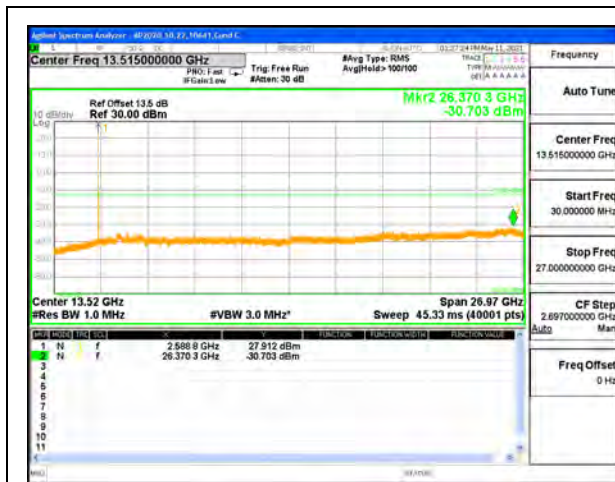
LTE B41 5MHz QPSK Middle Channel RB1-0



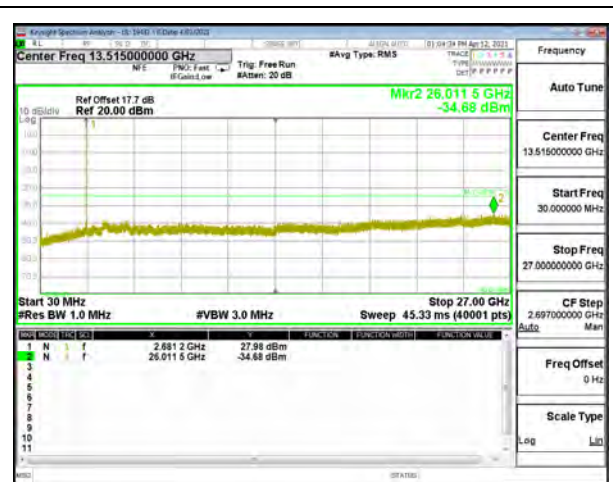
LTE B41 5MHz QPSK High Channel RB1-0



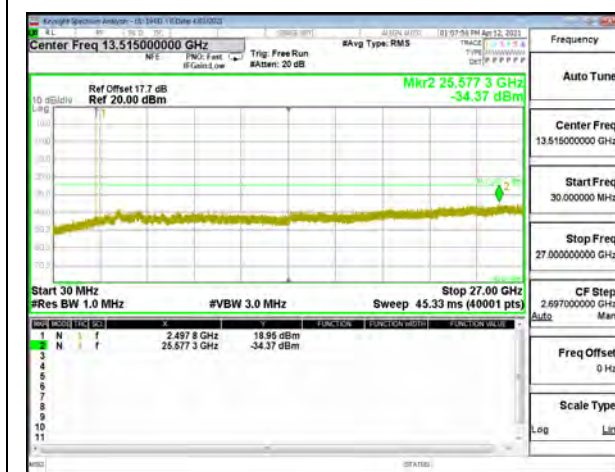
LTE B41 10MHz QPSK Low Channel RB1-0



LTE B41 10MHz QPSK Middle Channel RB1-0



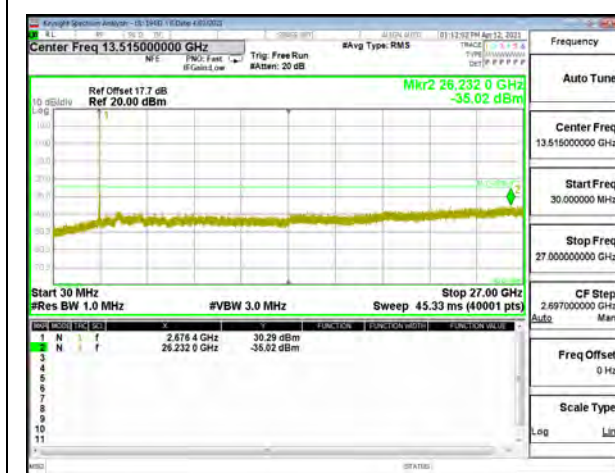
LTE B41 10MHz QPSK High Channel RB1-0



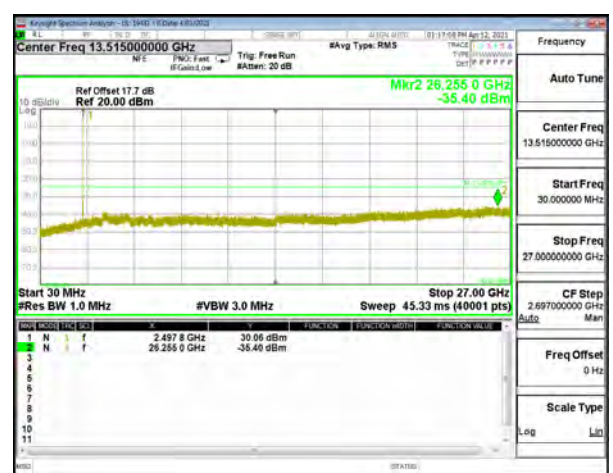
LTE B41 15MHz QPSK Low Channel RB1-0



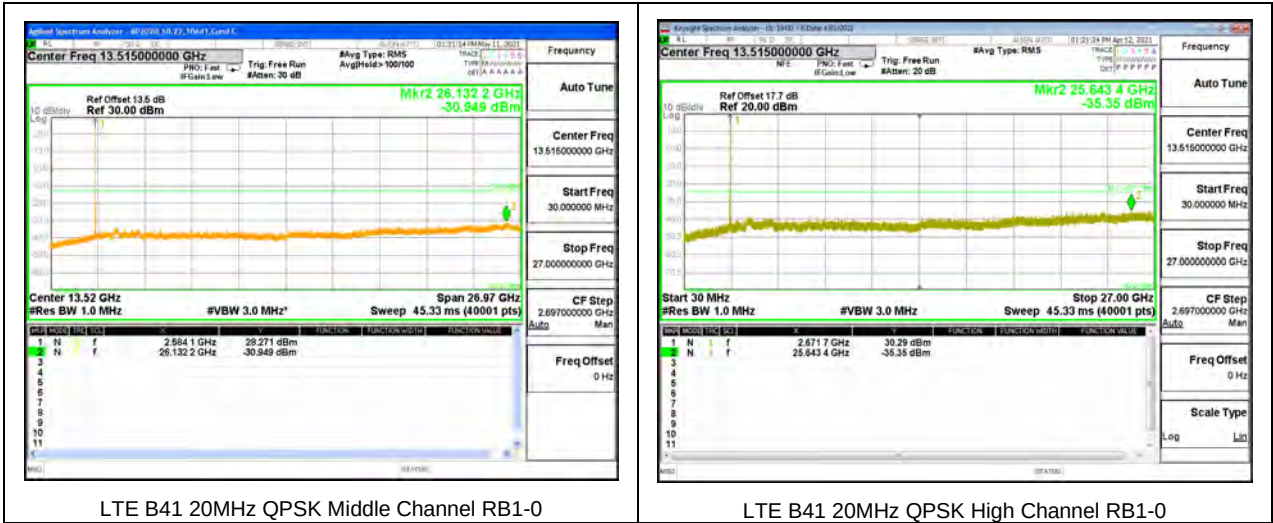
LTE B41 15MHz QPSK Middle Channel RB1-0



LTE B41 15MHz QPSK High Channel RB1-0



LTE B41 20MHz QPSK Low Channel RB1-0



5G NR n41



5G NR n41 20MHz BPSK Low Channel RB1-0



5G NR n41 20MHz BPSK Middle Channel RB1-1



5G NR n41 20MHz BPSK High Channel RB1-50



5G NR n41 30MHz BPSK Low Channel RB1-0



5G NR n41 30MHz BPSK Mid Channel RB1-1



5G NR n41 30MHz BPSK High Channel RB1-76



5G NR n41 40MHz BPSK Low Channel RB1-0



5G NR n41 40MHz BPSK Middle Channel RB1-1



5G NR n41 40MHz BPSK High Channel RB1-105



5G NR n41 50MHz BPSK Low Channel RB1-0



5G NR n41 50MHz BPSK Middle Channel RB1-1



5G NR n41 50MHz BPSK High Channel RB1-132



5G NR n41 60MHz BPSK Low Channel RB1-0



5G NR n41 60MHz BPSK Middle Channel RB1-1



5G NR n41 60MHz BPSK High Channel RB1-78



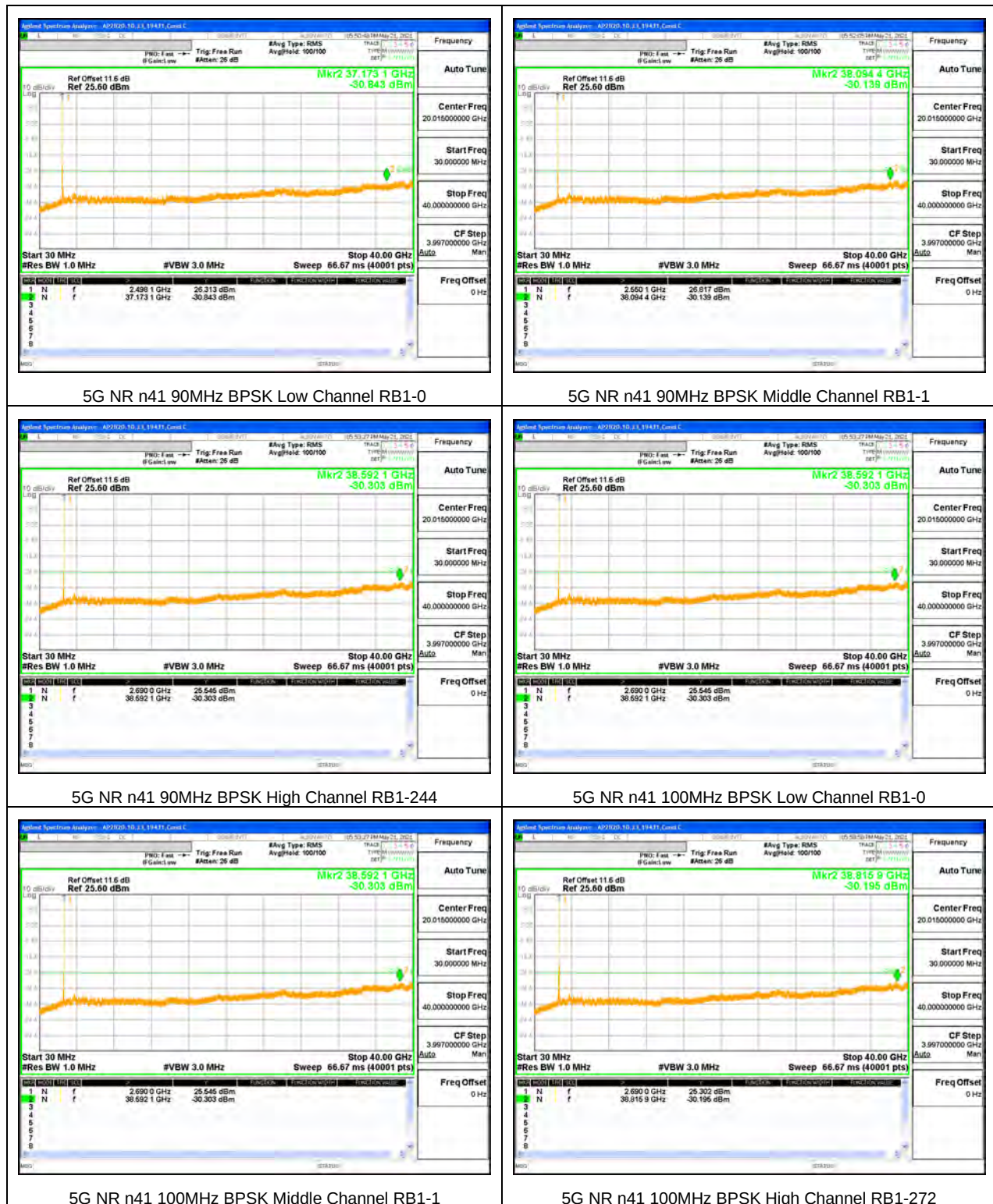
5G NR n41 80MHz BPSK Low Channel RB1-0



5G NR n41 80MHz BPSK Middle Channel RB1-1



5G NR n41 80MHz BPSK High Channel RB1-216



9.3.12. LTE BAND 48 LIMITS

FCC: §96.41

(e) 3.5 GHz Emissions and Interference Limits—

(2) Additional protection levels. Notwithstanding paragraph (e)(1) of this section, for CBSDs and End User Devices, the conducted power of emissions below 3540 MHz or above 3710 MHz shall not exceed -25 dBm/MHz, and the conducted power of emissions below 3530 MHz or above 3720 MHz shall not exceed -40 dBm/MHz.

LTE BAND 48

