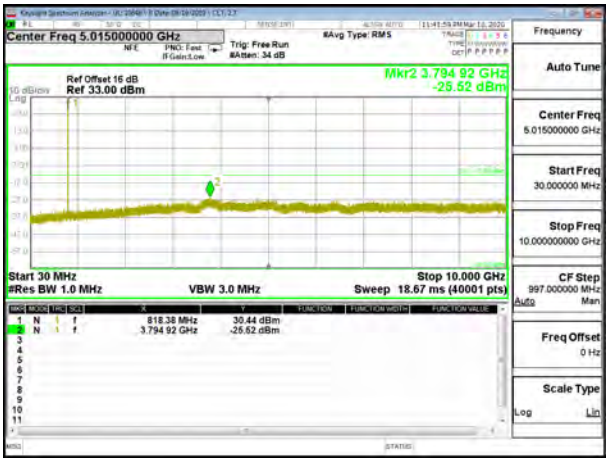
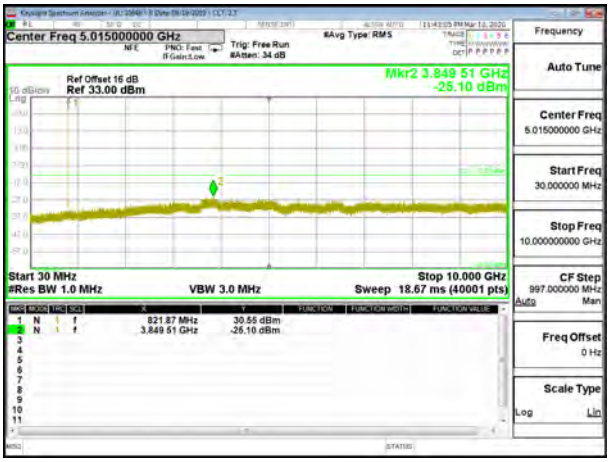
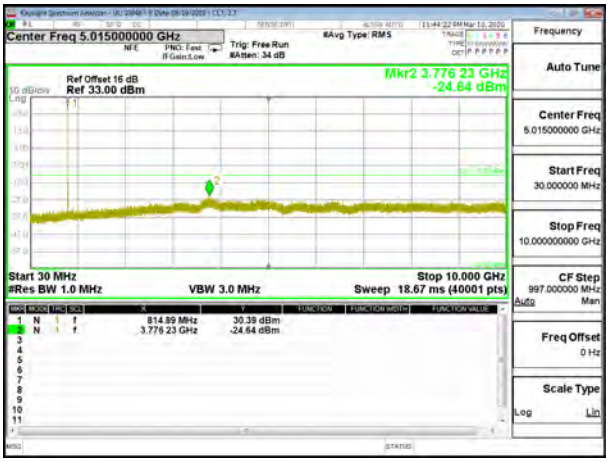


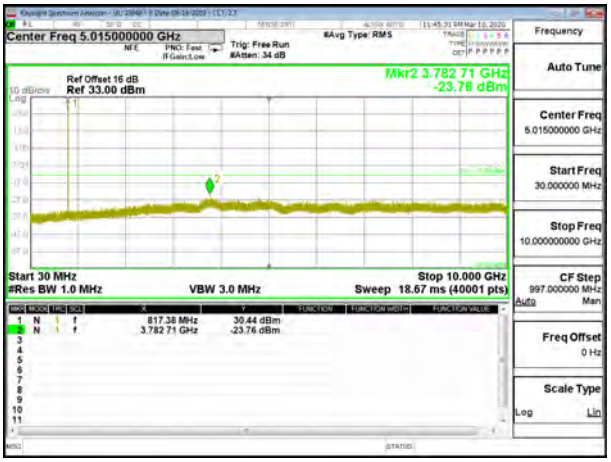
LTE B26 3MHz QPSK Middle Channel RB1-0



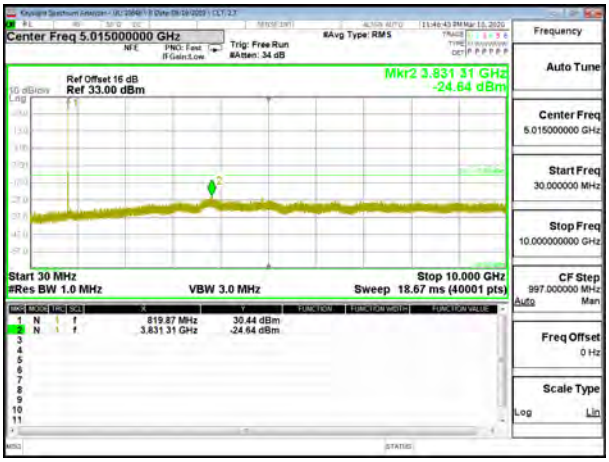
LTE B26 3MHz QPSK High Channel RB1-0



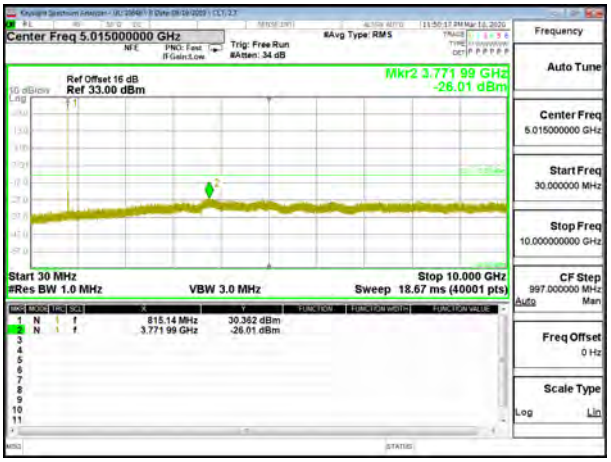
LTE B26 5MHz QPSK Low Channel RB1-0



LTE B26 5MHz QPSK Middle Channel RB1-0



LTE B26 5MHz QPSK High Channel RB1-0

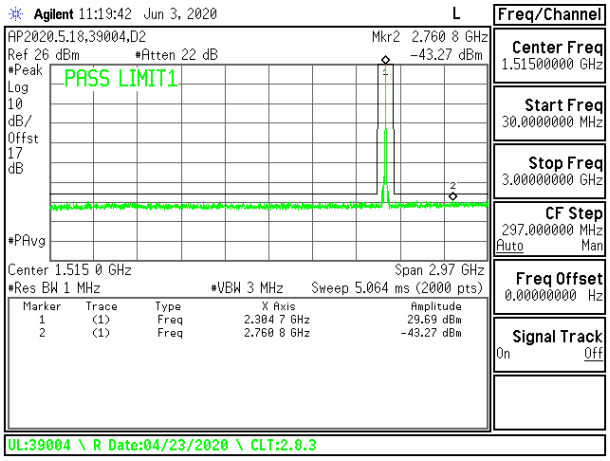


LTE B26 10MHz QPSK Middle Channel RB1-0

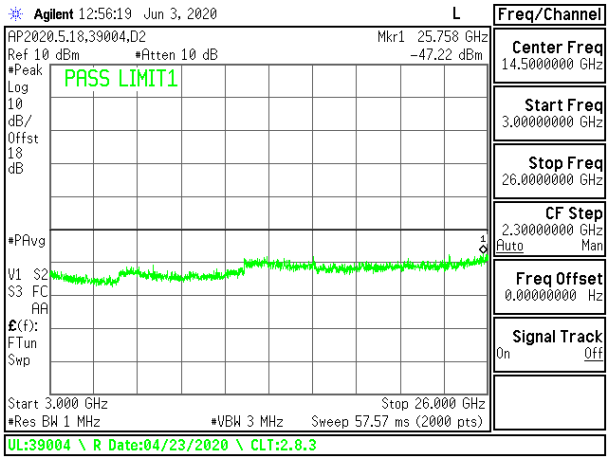
8.3.10. LTE BAND 30

LIMITS

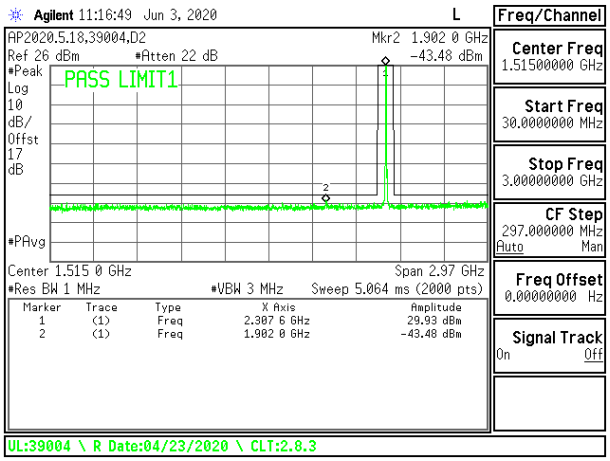
FCC: §27.53 (a)
The minimum permissible attenuation level of any spurious emissions is 70 + 10 log (P) dB where transmitting power (P) in Watts.



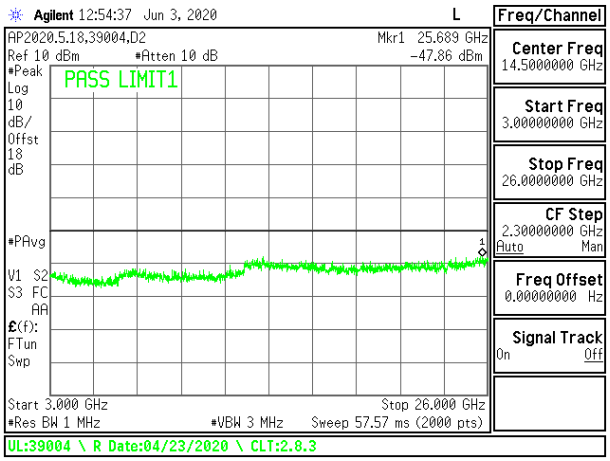
LTE B30 5MHz QPSK Low Channel RB1-0 (30MHz to 3GHz)



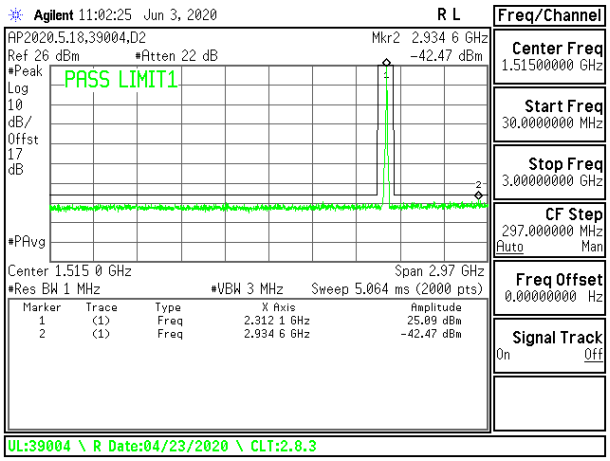
LTE B30 5MHz QPSK Low Channel RB1-0 (3G to 26G)



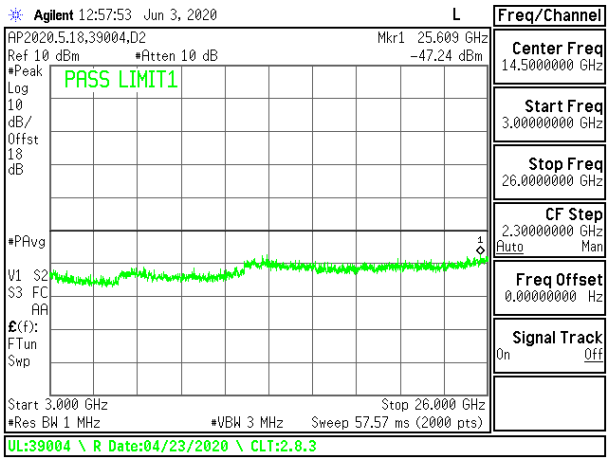
LTE B30 5MHz QPSK Mid Channel RB1-0 (30MHz to 3GHz)



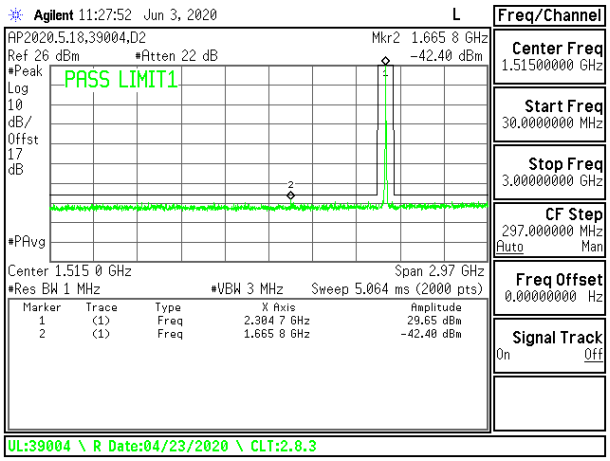
LTE B30 5MHz QPSK Mid Channel RB1-0 (3G to 26G)



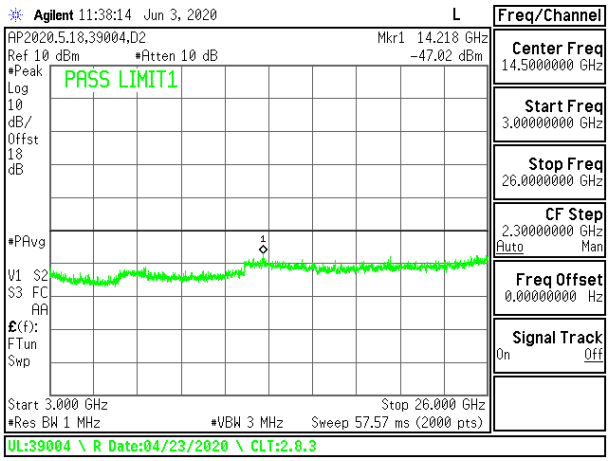
LTE B30 5MHz QPSK High Channel RB1-0 (30MHz to 3GHz)



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



LTE B30 10MHz QPSK Mid Channel RB1-0 (30MHz to 3GHz)



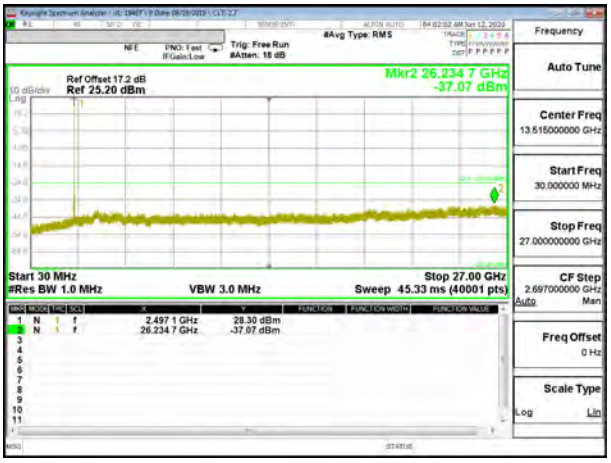
LTE B30 10MHz QPSK Mid Channel RB1-0 (3G to 26G)

8.3.11. LTE BAND 41 AND 5G NR Band n41

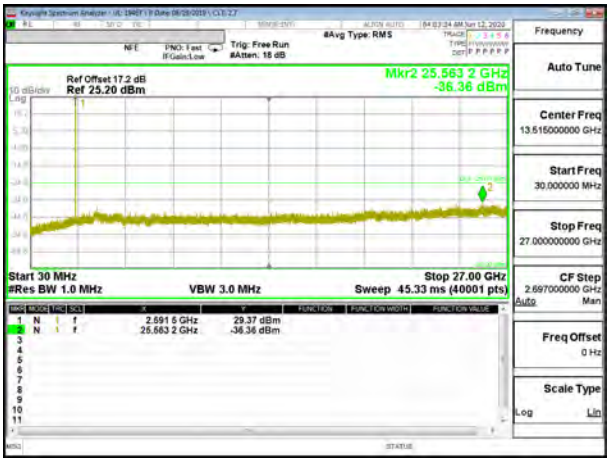
LIMITS

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.

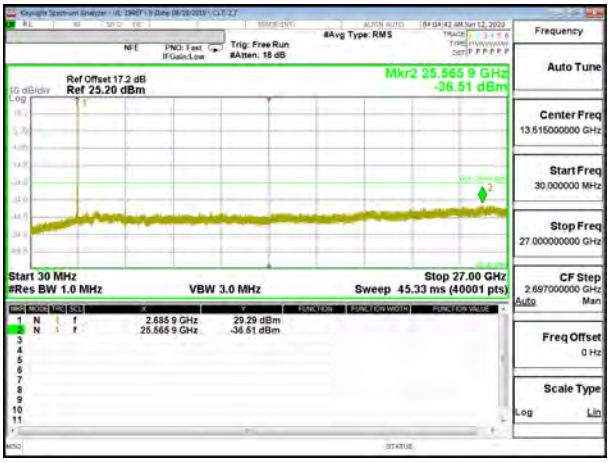
LTE BAND 41



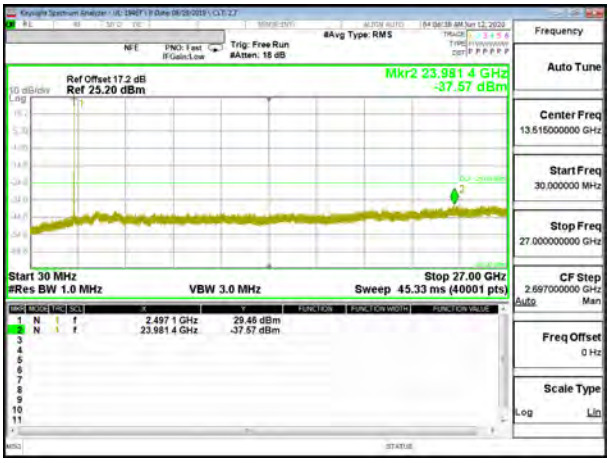
LTE B41 5MHz QPSK Low Channel RB1-0



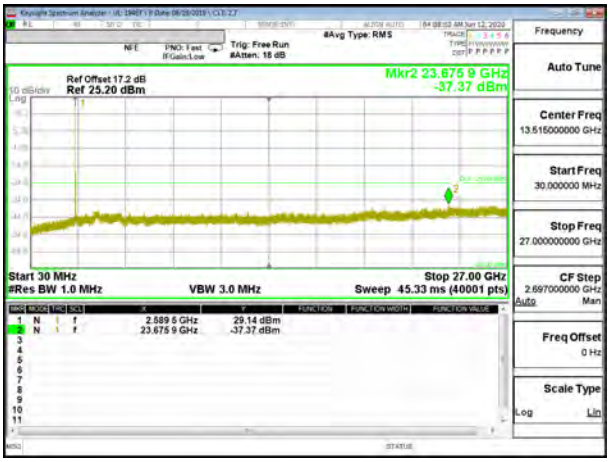
LTE B41 5MHz QPSK Middle Channel RB1-0



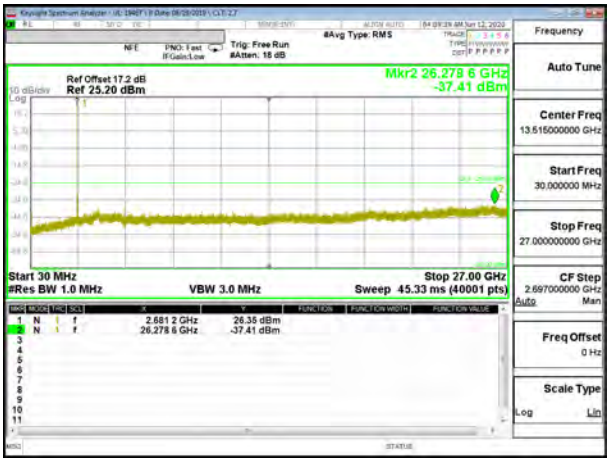
LTE B41 5MHz QPSK High Channel RB1-0



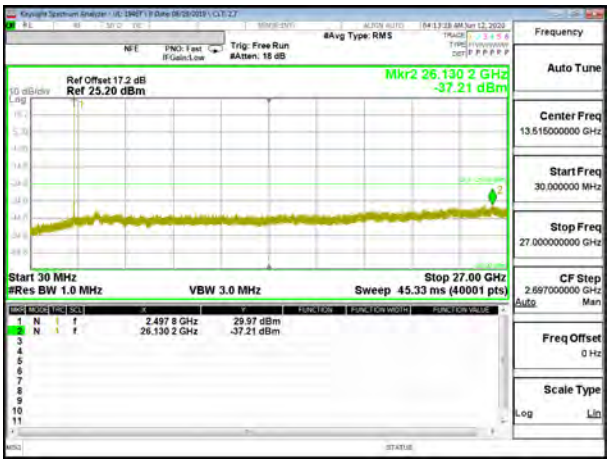
LTE B41 10MHz QPSK Low Channel RB1-0



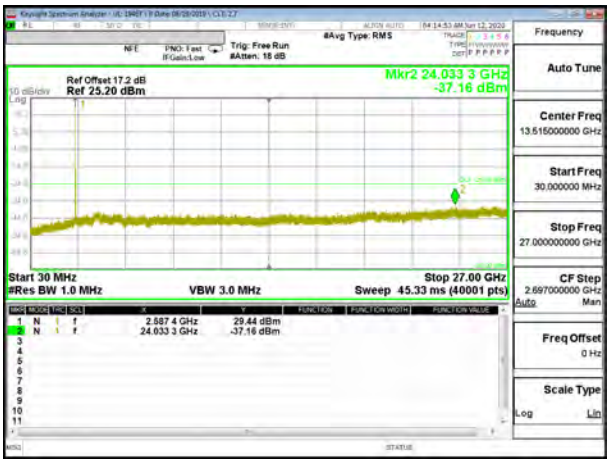
LTE B41 10MHz QPSK Middle Channel RB1-0



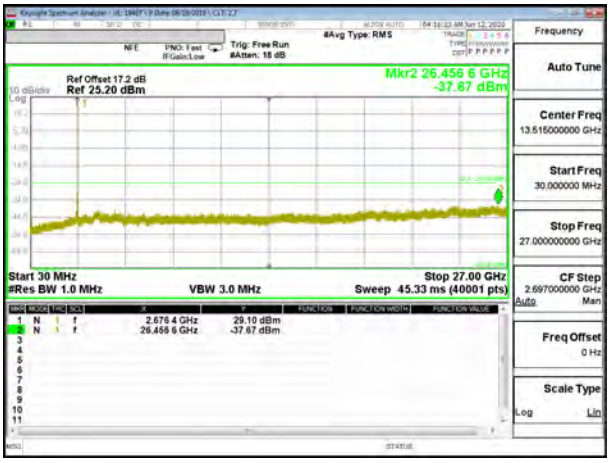
LTE B41 10MHz QPSK High Channel RB1-0



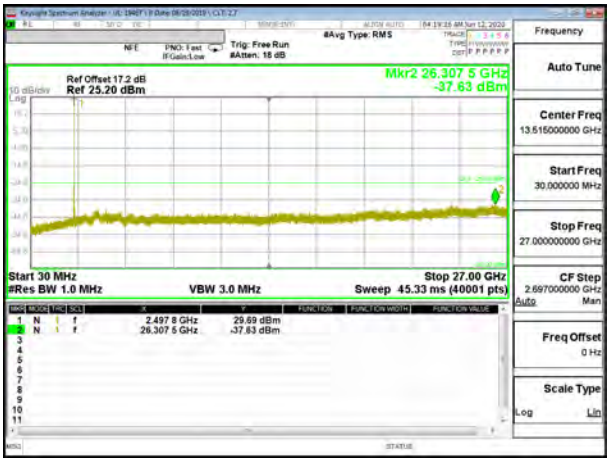
LTE B41 15MHz QPSK Low Channel RB1-0



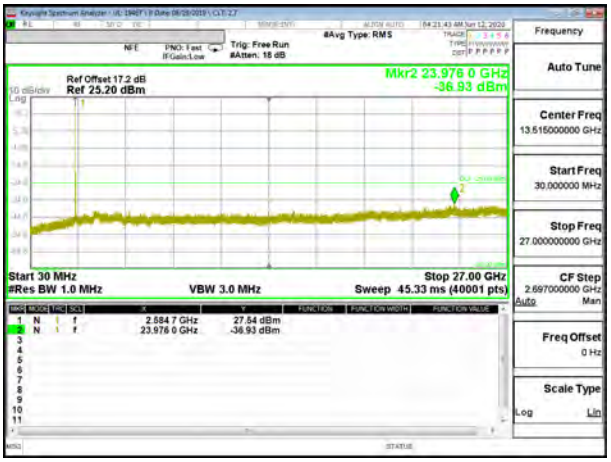
LTE B41 15MHz QPSK Middle Channel RB1-0



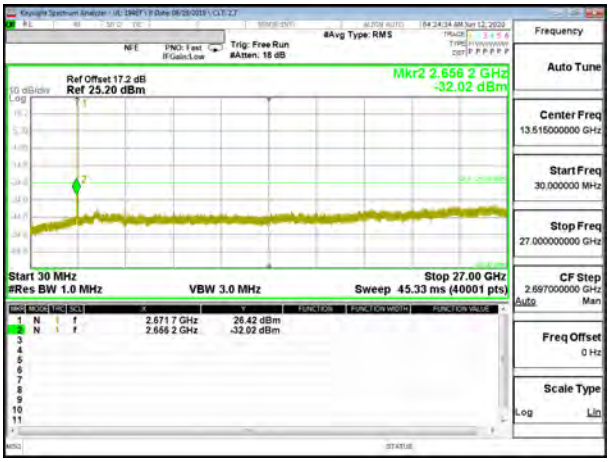
LTE B41 15MHz QPSK High Channel RB1-0



LTE B41 20MHz QPSK Low Channel RB1-0

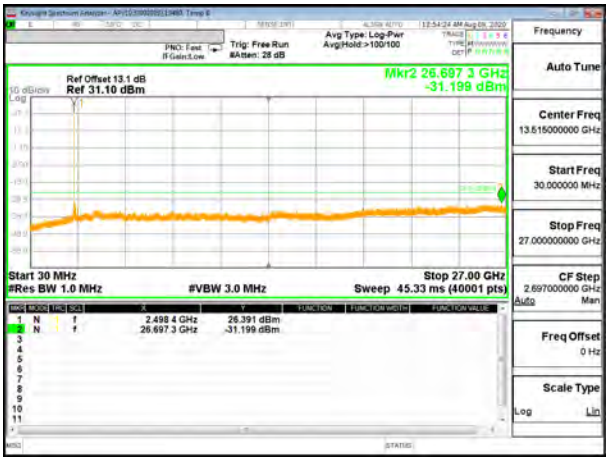


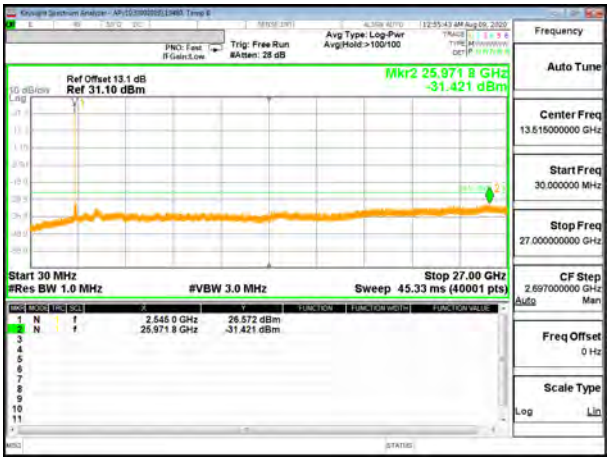
LTE B41 20MHz QPSK Middle Channel RB1-0

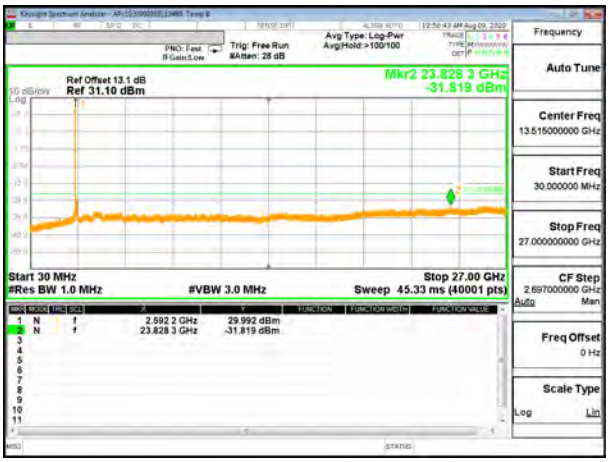


LTE B41 20MHz QPSK High Channel RB1-0

5G NR Band n41

<table>
<tr>
<td> 

5G NR Band n41 100MHz QPSK Low Channel RB1-1</td>
<td> 

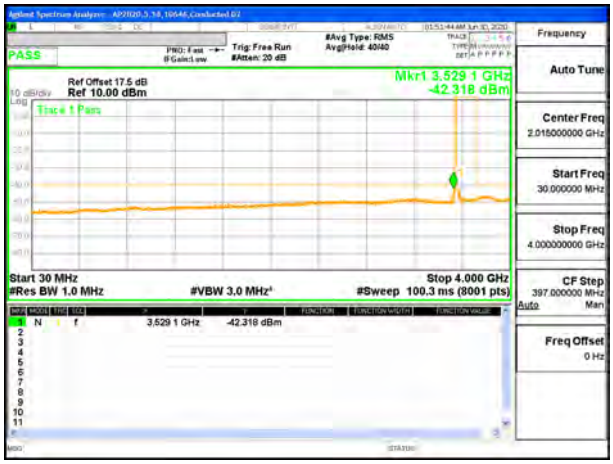
5G NR Band n41 100MHz QPSK Middle Channel RB1-1</td>
</tr>
<tr>
<td> 

5G NR Band n41 100MHz QPSK High Channel RB1-1</td>
<td>INTENTIONALLY VOID</td>
</tr>
</table>

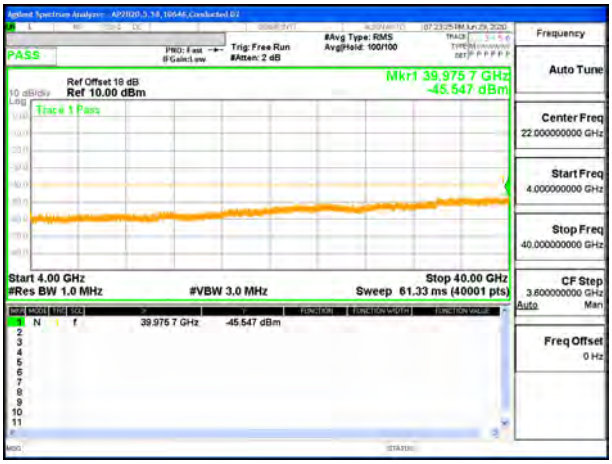
8.3.12. LTE BAND 48

LIMITS

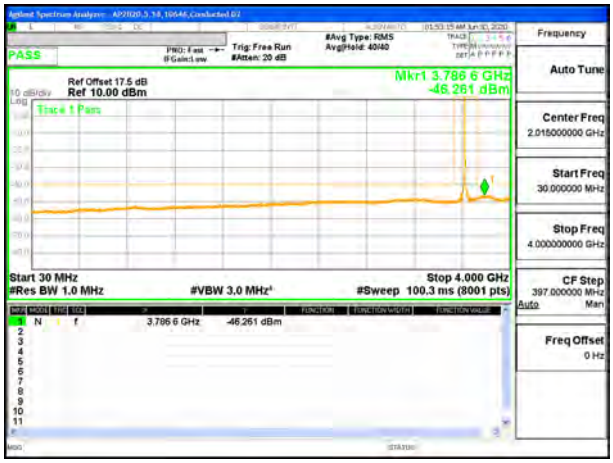
FCC: §96.41
(e) 3.5 GHz Emissions and Interference Limits—
(2) Additional protection levels. Notwithstanding paragraph (e)(1) of this section, for CBSDs and End User Devices, the conducted power of emissions below 3540 MHz or above 3710 MHz shall not exceed −25 dBm/MHz, and the conducted power of emissions below 3530 MHz or above 3720 MHz shall not exceed −40dBm/MHz.



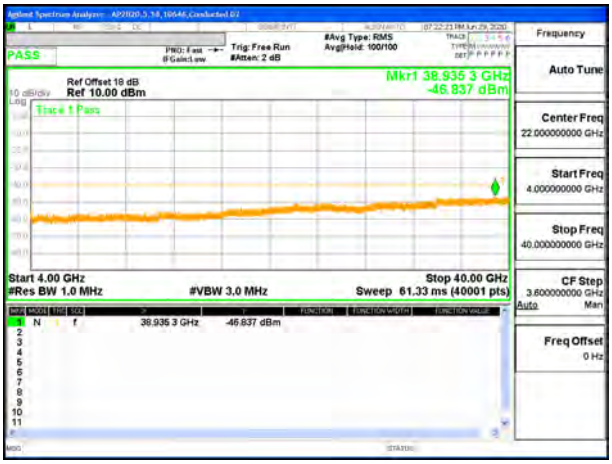
LTE B48 5MHz QPSK Low Channel RB1-0 (30MHz to 4GHz)



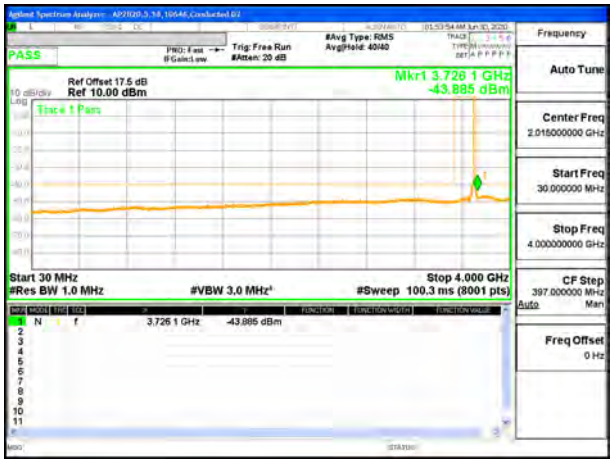
LTE B48 5MHz QPSK Low Channel RB1-0 (4G to 40G)



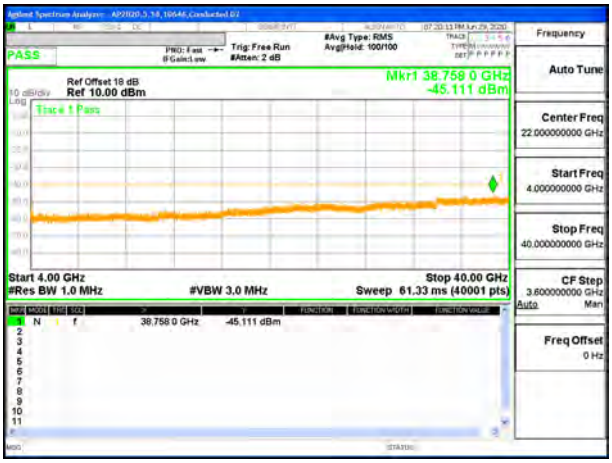
LTE B48 5MHz QPSK Mid Channel RB1-0 (30MHz to 4GHz)



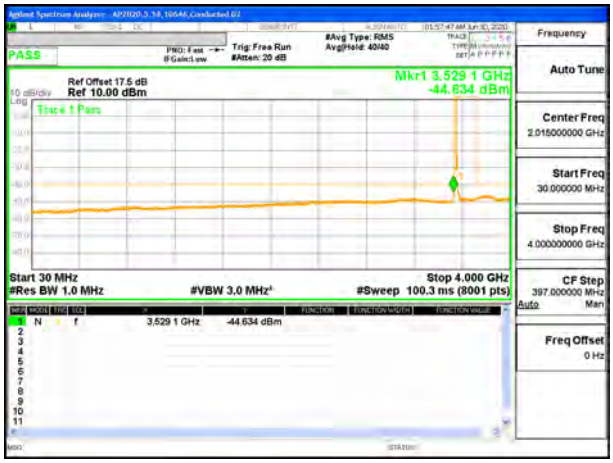
LTE B48 5MHz QPSK Mid Channel RB1-0 (4G to 40G)



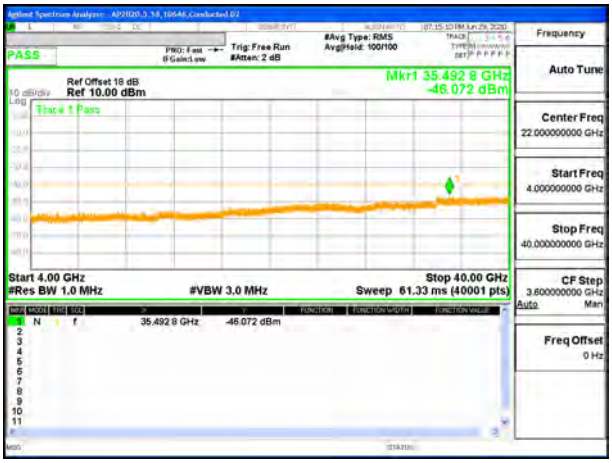
LTE B48 5MHz QPSK High Channel RB1-0 (30MHz to 4GHz)



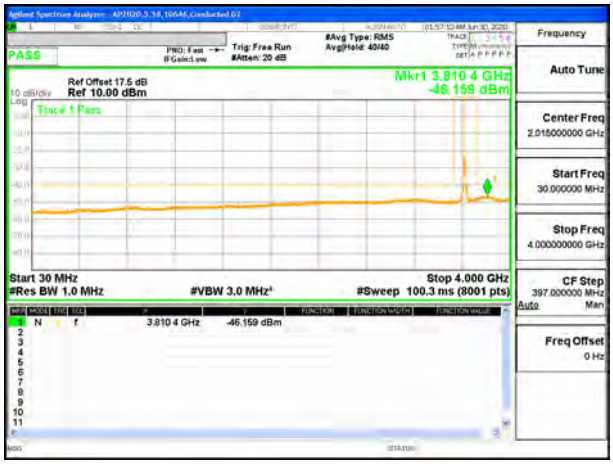
LTE B48 5MHz QPSK High Channel RB1-0 (4G to 40G)



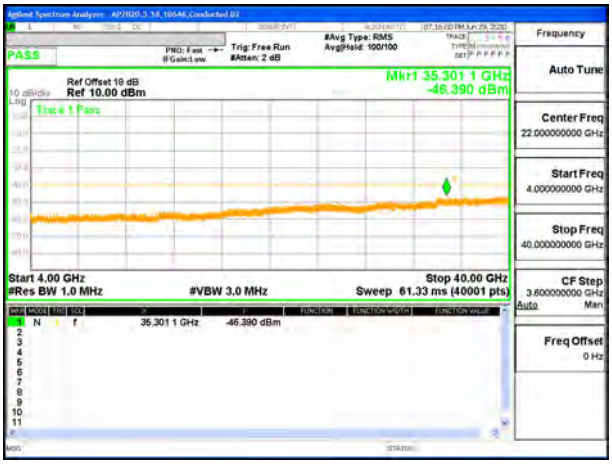
LTE B48 10MHz QPSK Low Channel RB1-0 (30MHz to 4GHz)



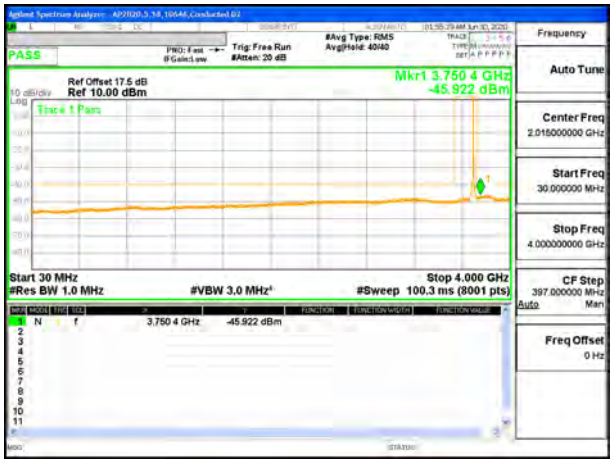
LTE B48 10MHz QPSK Low Channel RB1-0 (4G to 40G)



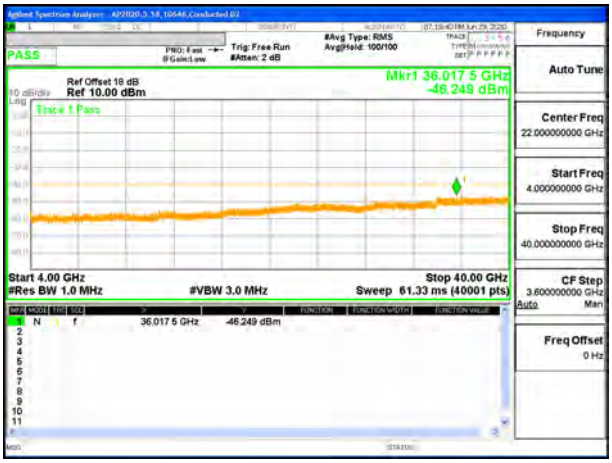
LTE B48 10MHz QPSK Mid Channel RB1-0 (30MHz to 4GHz)



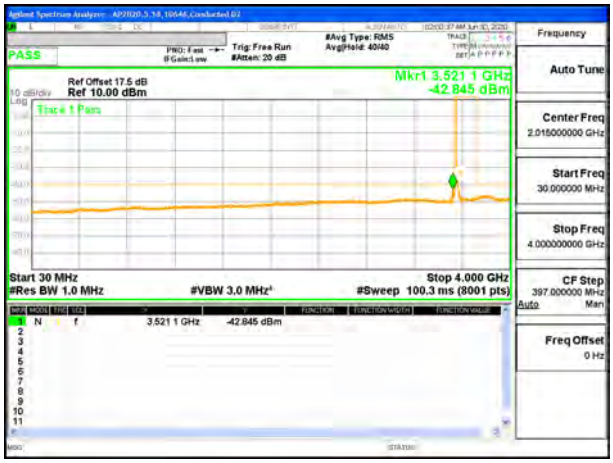
LTE B48 10MHz QPSK Mid Channel RB1-0 (4G to 40G)



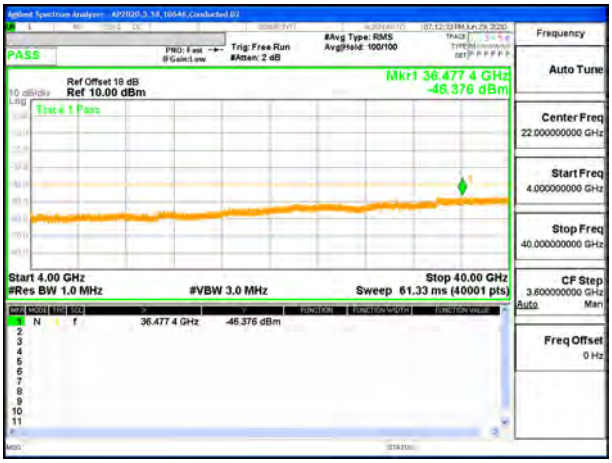
LTE B48 10MHz QPSK High Channel RB1-0 (30MHz to 4GHz)



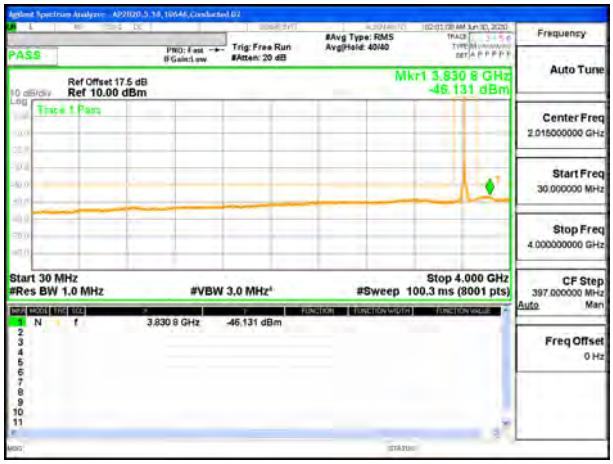
LTE B48 10MHz QPSK High Channel RB1-0 (4G to 40G)



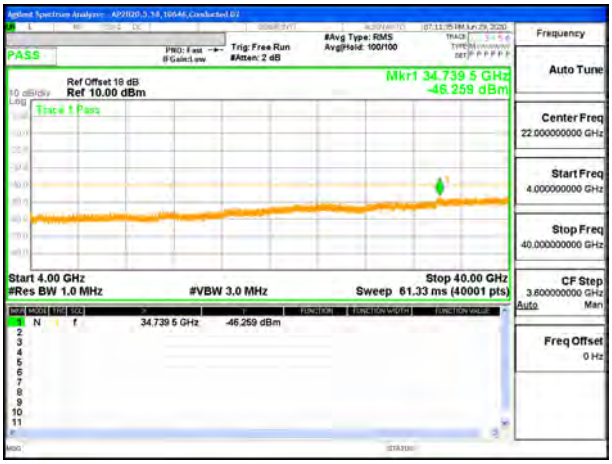
LTE B48 15MHz QPSK Low Channel RB1-0 (30MHz to 4GHz)



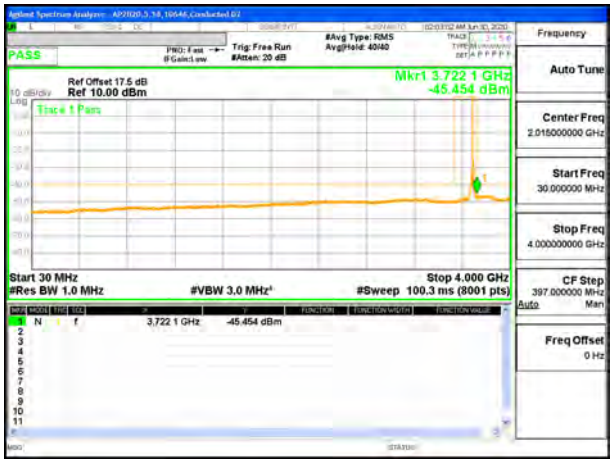
LTE B48 15MHz QPSK Low Channel RB1-0 (4G to 40G)



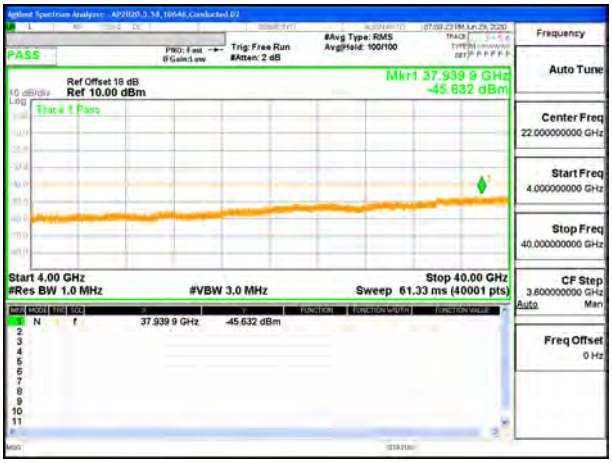
LTE B48 15MHz QPSK Mid Channel RB1-0 (30MHz to 4GHz)



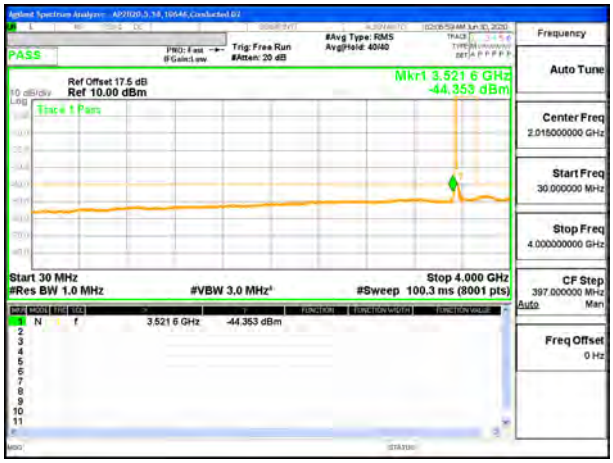
LTE B48 15MHz QPSK Mid Channel RB1-0 (4G to 40G)



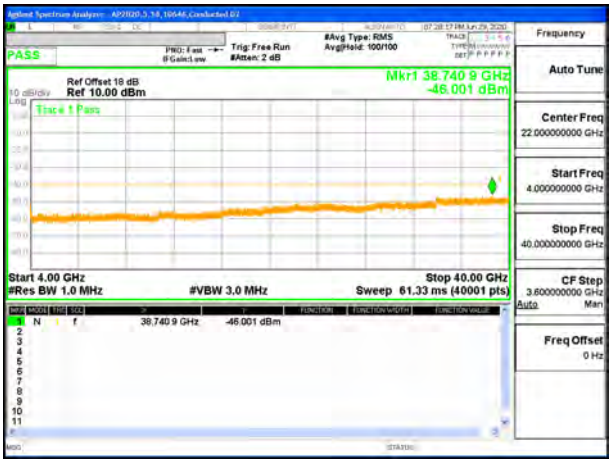
LTE B48 15MHz QPSK High Channel RB1-0 (30MHz to 4GHz)



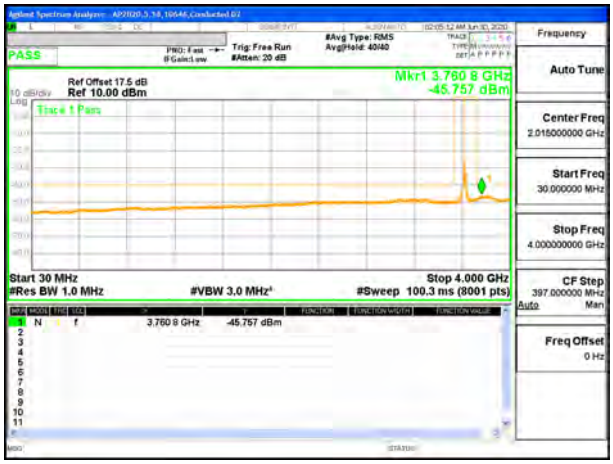
LTE B48 15MHz QPSK High Channel RB1-0 (4G to 40G)



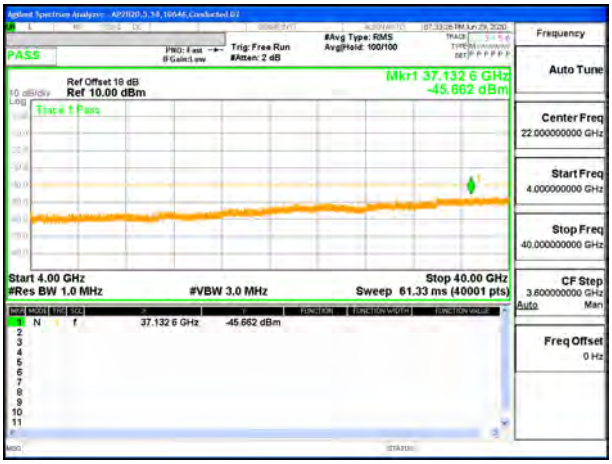
LTE B48 20MHz QPSK Low Channel RB1-0 (30MHz to 4GHz)



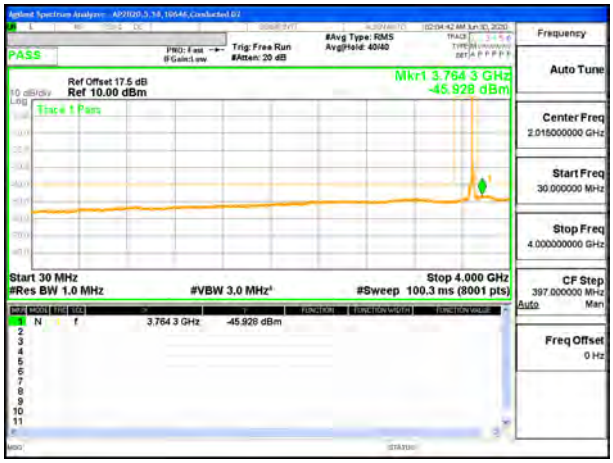
LTE B48 20MHz QPSK Low Channel RB1-0 (4G to 40G)



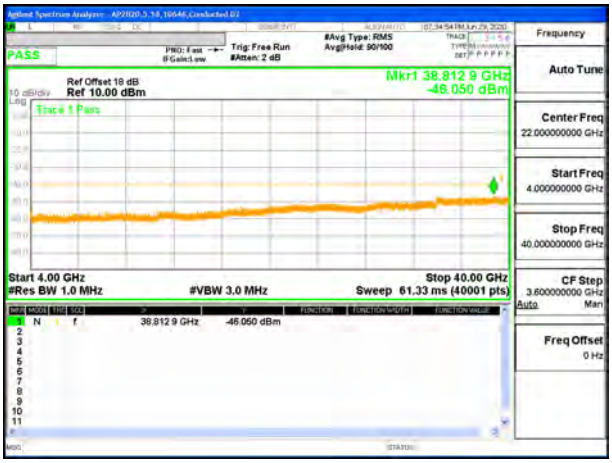
LTE B48 20MHz QPSK Mid Channel RB1-0 (30MHz to 4GHz)



LTE B48 20MHz QPSK Mid Channel RB1-0 (4G to 40G)



LTE B48 20MHz QPSK High Channel RB1-0 (30MHz to 4GHz)

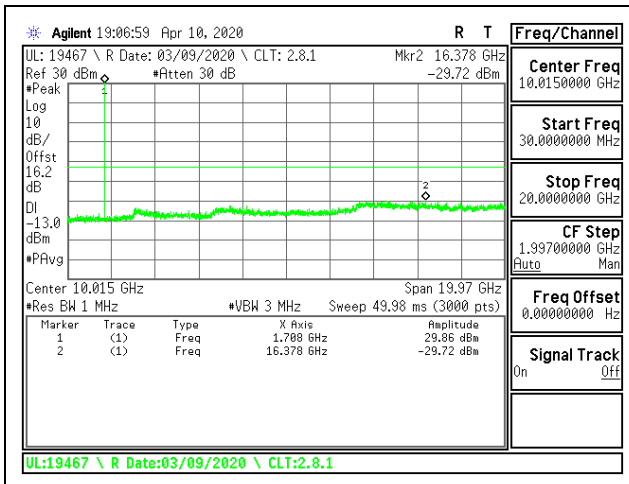


LTE B48 20MHz QPSK High Channel RB1-0 (4G to 40G)

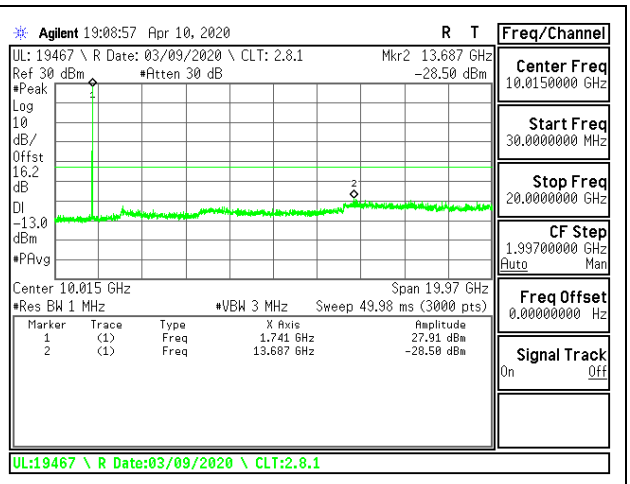
8.3.13. LTE BAND 66

LIMITS

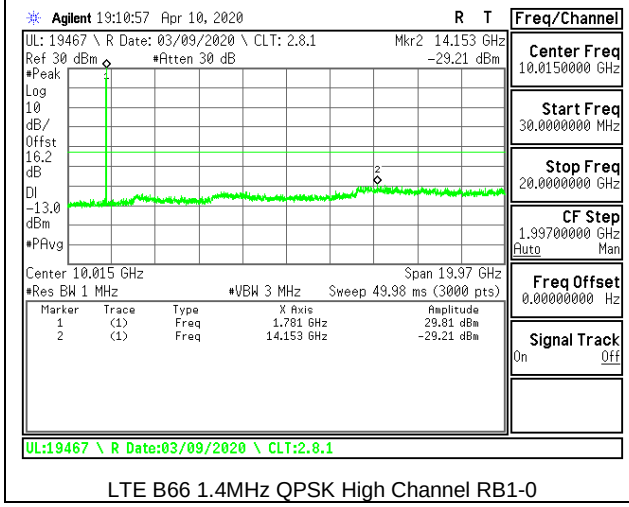
FCC: §27.53 (h)
The minimum permissible attenuation level of any spurious emissions is 43 + 10 log (P) dB where transmitting power (P) in Watts.



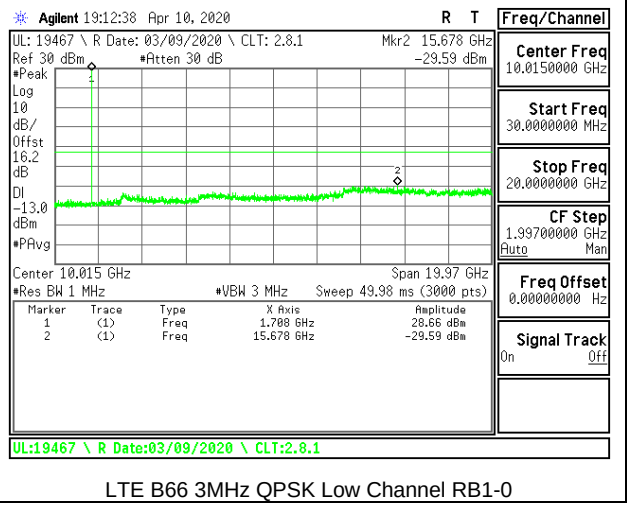
LTE B66 1.4MHz QPSK Low Channel RB1-0



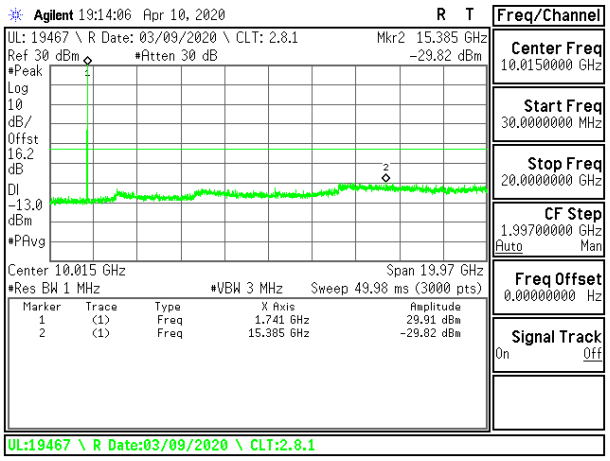
LTE B66 1.4MHz QPSK Middle Channel RB1-0



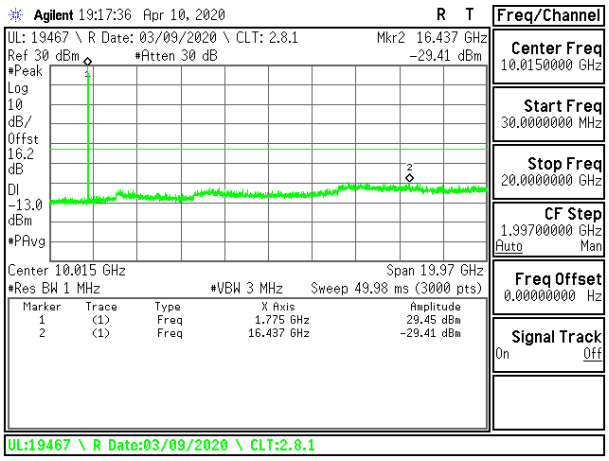
LTE B66 1.4MHz QPSK High Channel RB1-0



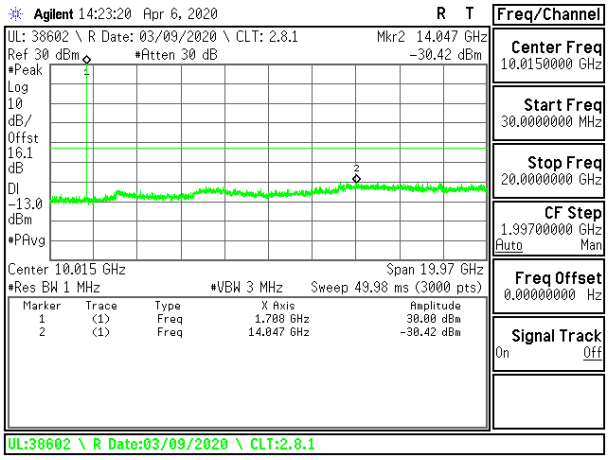
LTE B66 3MHz QPSK Low Channel RB1-0



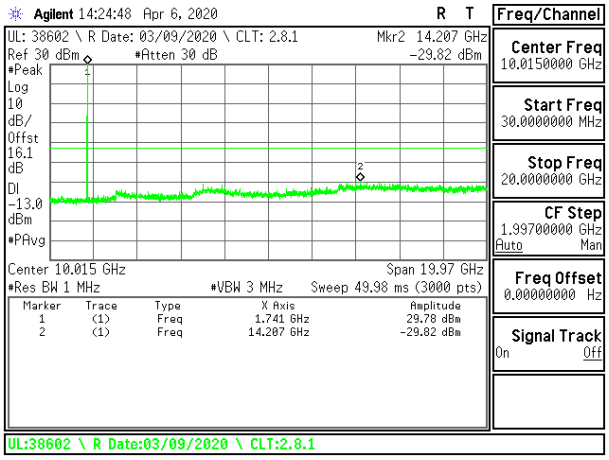
LTE B66 3MHz QPSK Middle Channel RB1-0



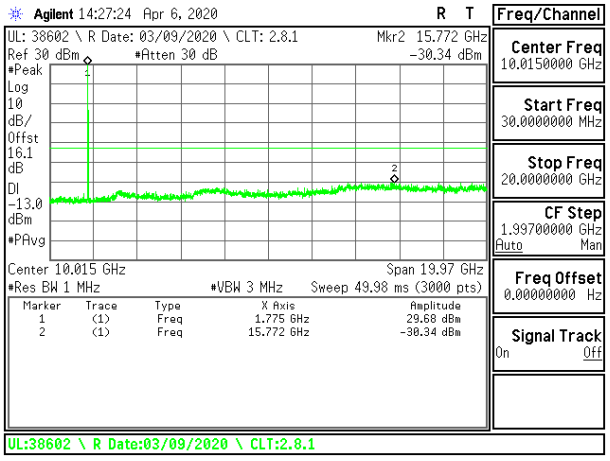
LTE B66 3MHz QPSK High Channel RB1-0



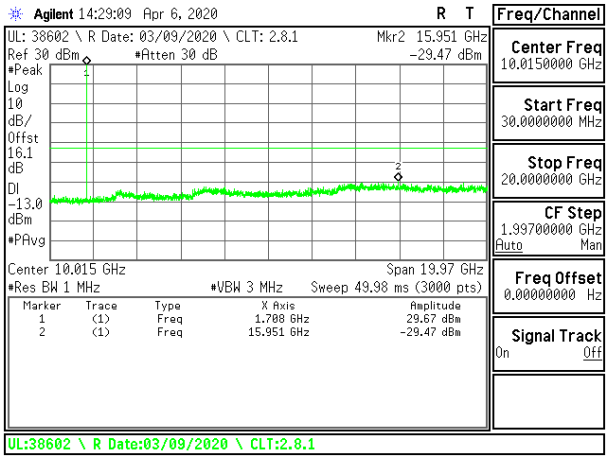
LTE B66 5MHz QPSK Low Channel RB1-0



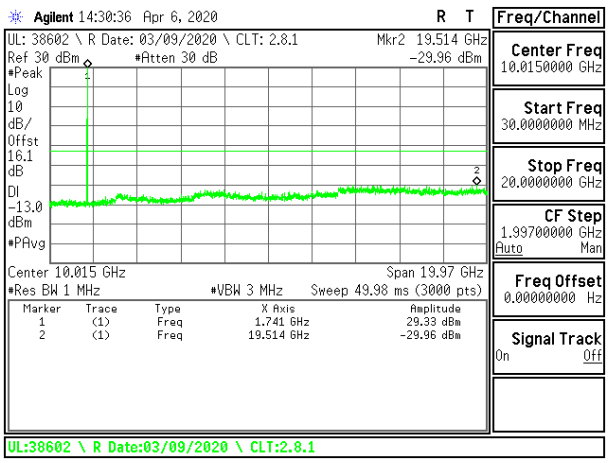
LTE B66 5MHz QPSK Middle Channel RB1-0



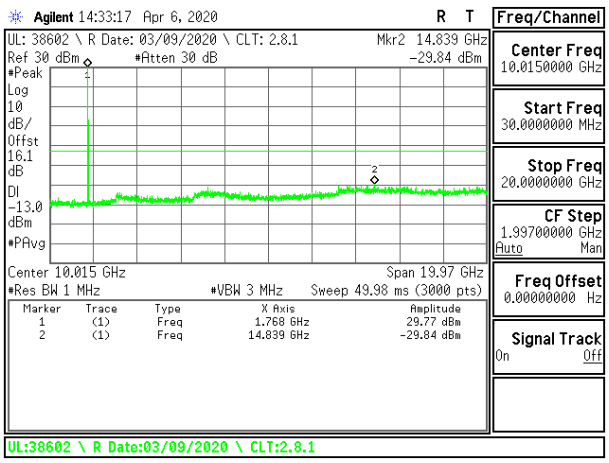
LTE B66 5MHz QPSK High Channel RB1-0



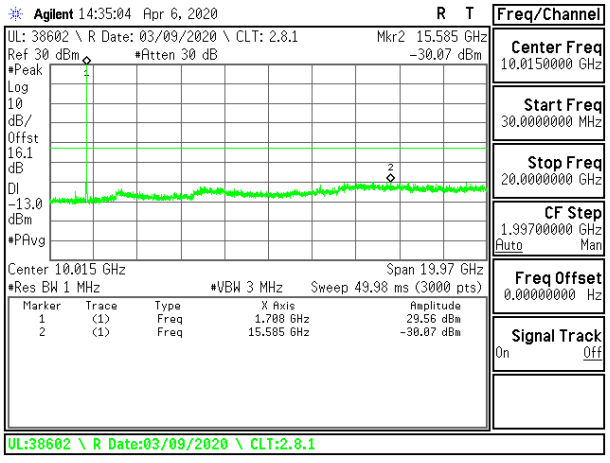
LTE B66 10MHz QPSK Low Channel RB1-0



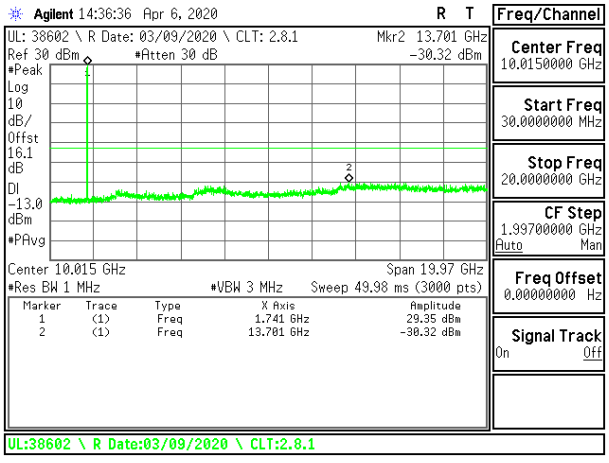
LTE B66 10MHz QPSK Middle Channel RB1-0



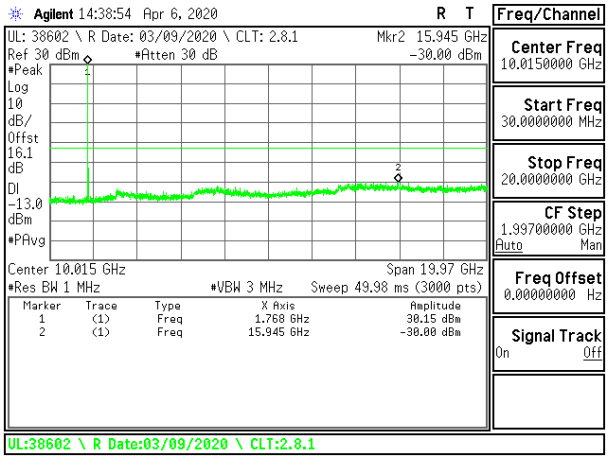
LTE B66 10MHz QPSK High Channel RB1-0



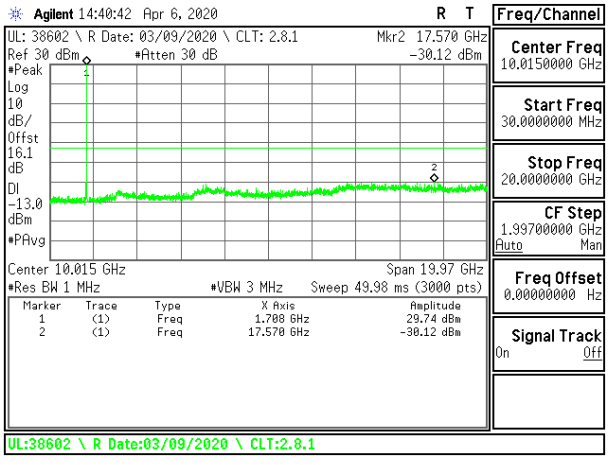
LTE B66 15MHz QPSK Low Channel RB1-0



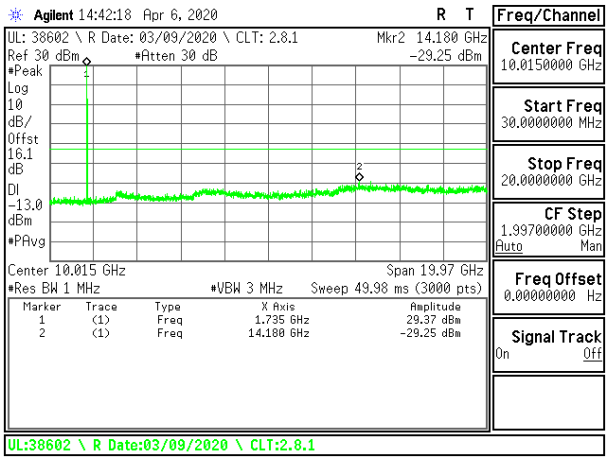
LTE B66 15MHz QPSK Middle Channel RB1-0



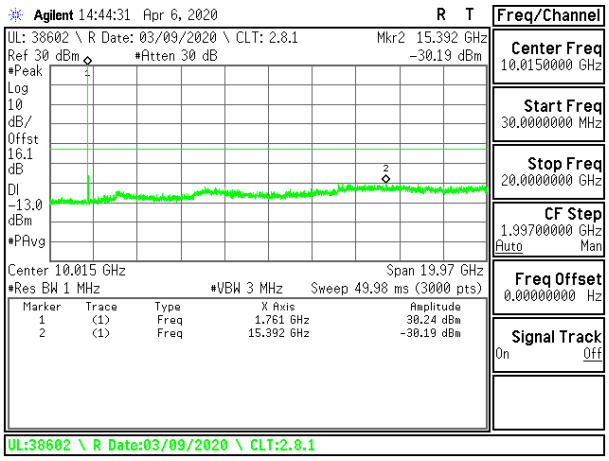
LTE B66 15MHz QPSK High Channel RB1-0



LTE B66 20MHz QPSK Low Channel RB1-0



LTE B66 20MHz QPSK Middle Channel RB1-0

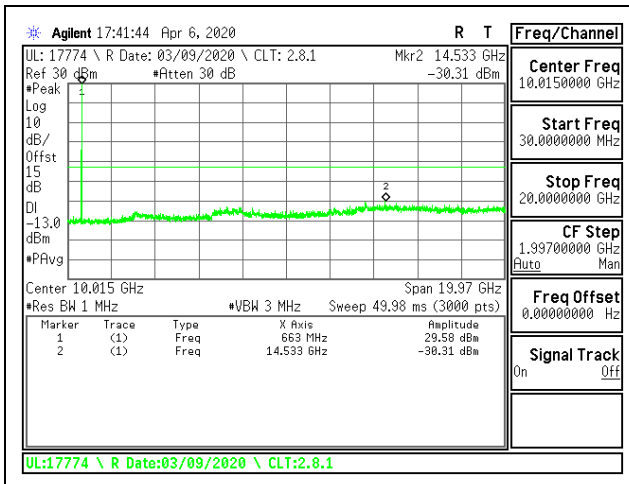


LTE B66 20MHz QPSK High Channel RB1-0

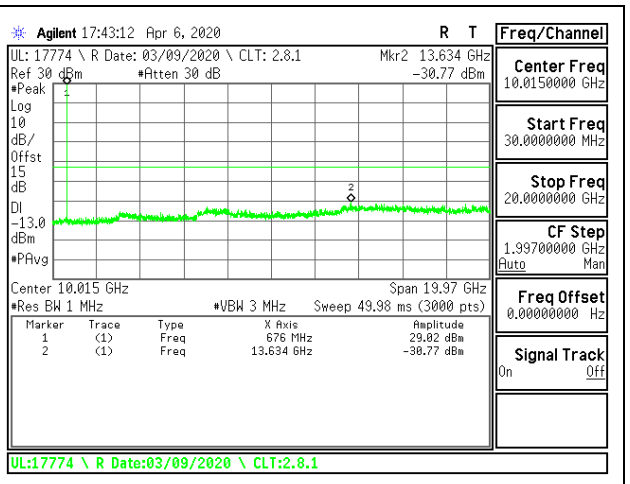
8.3.14. LTE BAND 71

LIMITS

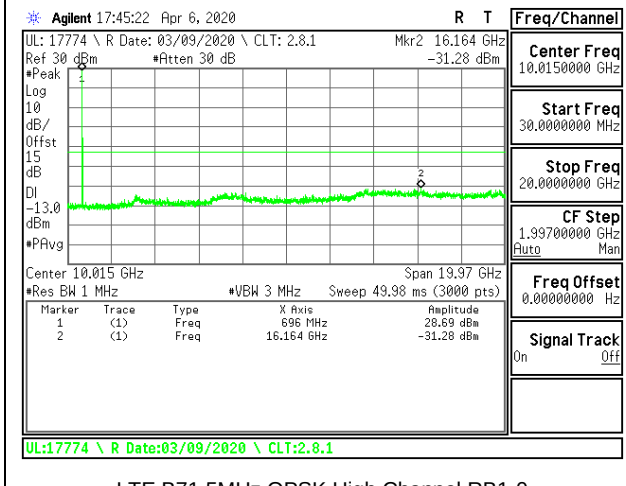
FCC: §27.53 (g)
The minimum permissible attenuation level of any spurious emissions is 43 + 10 log (P) dB where transmitting power (P) in Watts.



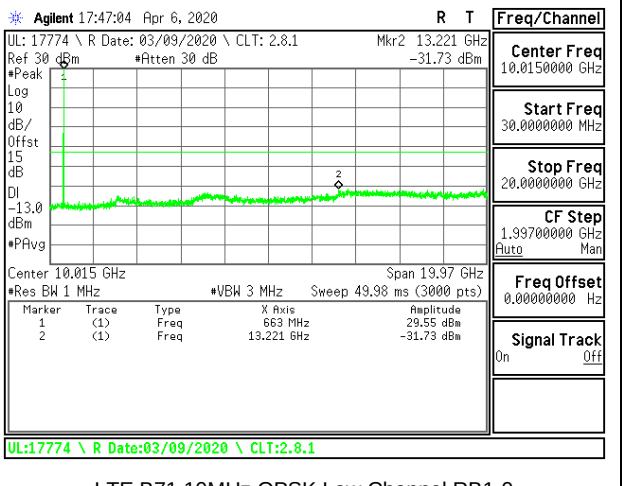
LTE B71 5MHz QPSK Low Channel RB1-0



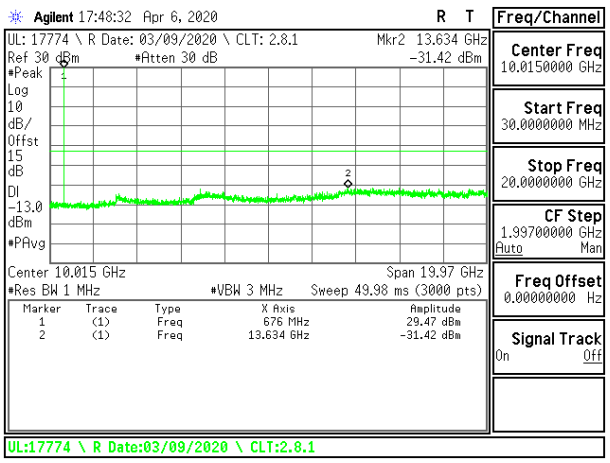
LTE B71 5MHz QPSK Middle Channel RB1-0



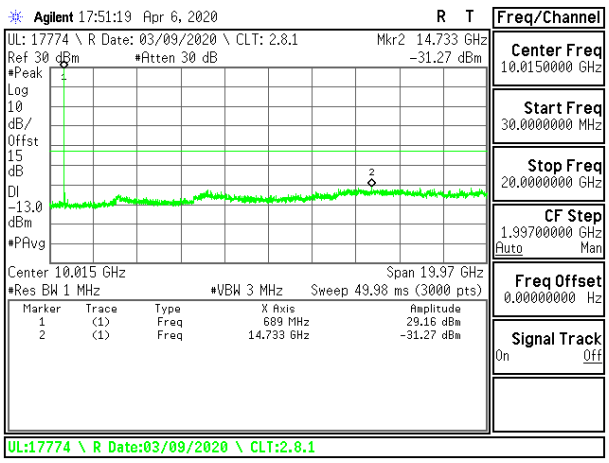
LTE B71 5MHz QPSK High Channel RB1-0



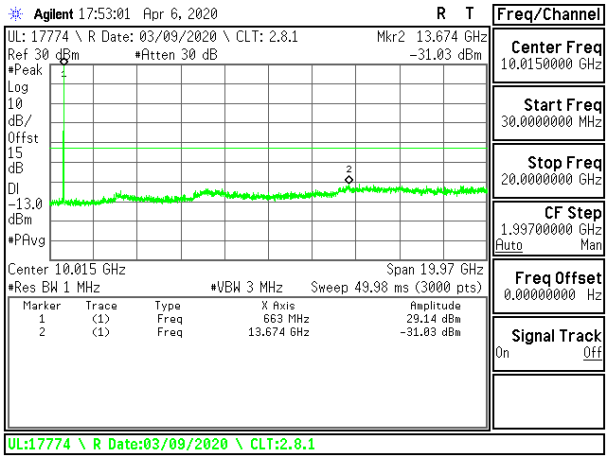
LTE B71 10MHz QPSK Low Channel RB1-0



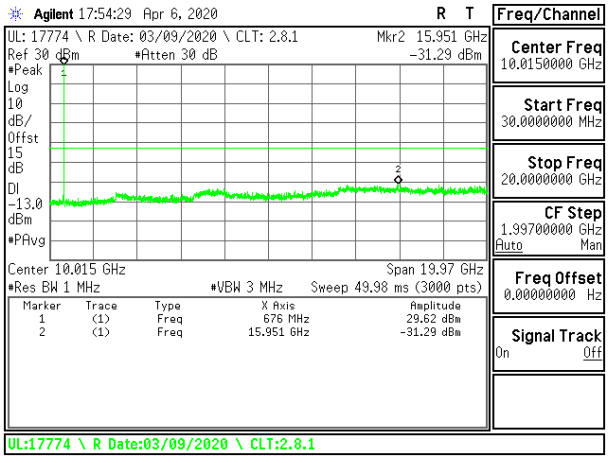
LTE B71 10MHz QPSK Middle Channel RB1-0



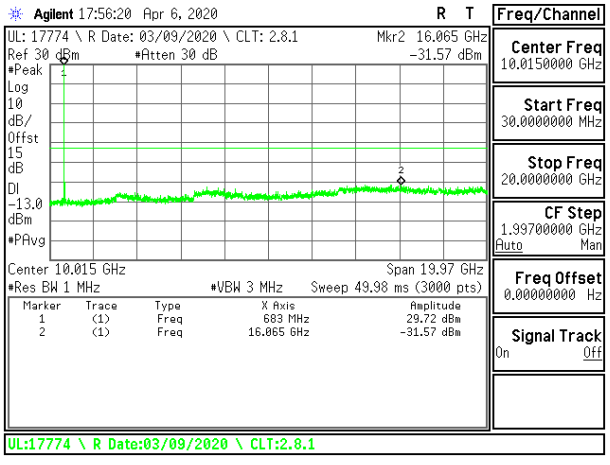
LTE 71 10MHz QPSK High Channel RB1-0



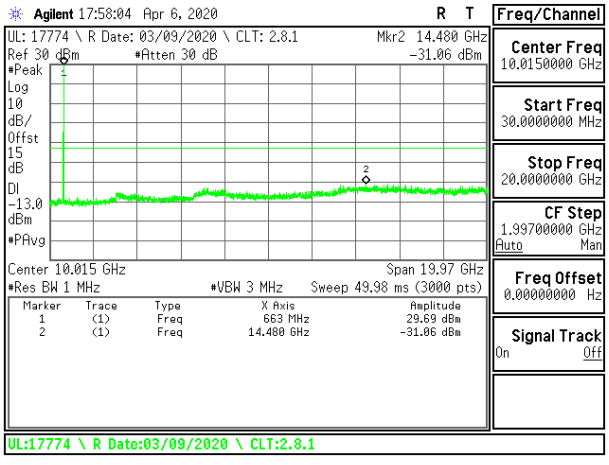
LTE B71 15MHz QPSK Low Channel RB1-0



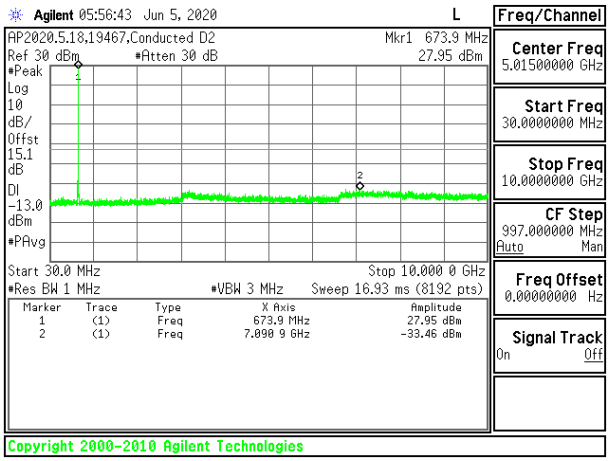
LTE B71 15MHz QPSK Middle Channel RB1-0



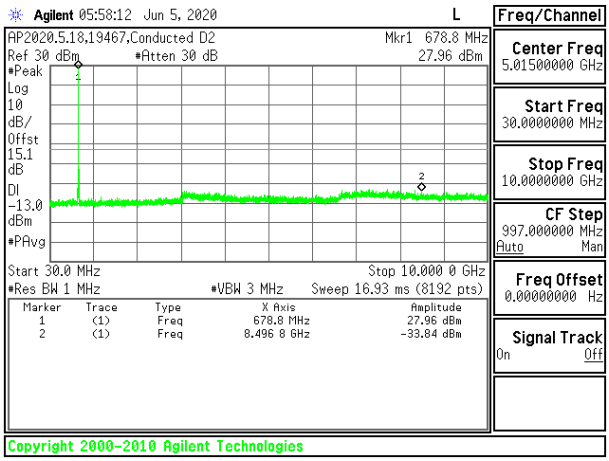
LTE B71 15MHz QPSK High Channel RB1-0



LTE B71 20MHz QPSK Low Channel RB1-0



LTE B71 20MHz QPSK Middle Channel RB1-0



LTE B71 20MHz QPSK High Channel RB1-0

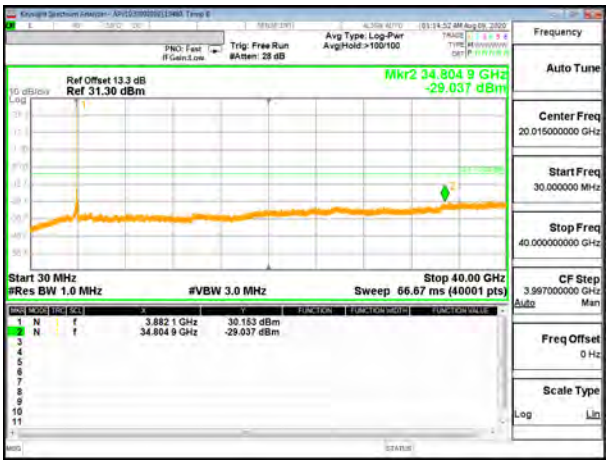
8.3.15. 5G NR Band n77

LIMITS

FCC: §27.53
Emission limits
(l) 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.

5G NR Band n77 100MHz QPSK Low Channel RB1-1

5G NR Band n77 100MHz QPSK Mid Channel RB1-1



5G NR Band n77 100MHz QPSK High Channel RB1-1

8.4. FREQUENCY STABILITY

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).

RESULTS

See the following pages.

8.4.1. LTE BAND 2

LIMITS

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

Test Engineer ID: 19178 **Test Date:** 6/20/2020

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	1850.9882	1905.9904		
Extreme (50C)		1850.9882	1905.9904	-12.4	-0.007
Extreme (40C)		1850.9882	1905.9904	-12.6	-0.007
Extreme (30C)		1850.9882	1905.9904	-13.3	-0.007
Extreme (10C)		1850.9882	1905.9904	-9.3	-0.005
Extreme (0C)		1850.9882	1905.9904	10.4	0.006
Extreme (-10C)		1850.9882	1905.9904	-11.1	-0.006
Extreme (-20C)		1850.9882	1905.9904	-10.8	-0.006
Extreme (-30C)		1850.9882	1905.9904	-11.8	-0.006
20C	15%	1850.9882	1905.9904	-13.0	-0.007
	-15%	1850.9882	1905.9904	-10.3	-0.005
	End Point	1850.9882	1905.9904	-12.8	-0.007

8.4.2. LTE BAND 5 AND 5G NR Band n5

LIMITS

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

Test Engineer ID: 19178 **Test Date:** 6/20/2020

LTE BAND 5 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	824.4908	848.5131		
Extreme (50C)		824.4908	848.5131	-8.0	-0.010
Extreme (40C)		824.4908	848.5131	-7.1	-0.008
Extreme (30C)		824.4908	848.5131	6.3	0.008
Extreme (10C)		824.4908	848.5131	6.4	0.008
Extreme (0C)		824.4908	848.5131	7.7	0.009
Extreme (-10C)		824.4908	848.5131	7.0	0.008
Extreme (-20C)		824.4908	848.5131	-4.0	-0.005
Extreme (-30C)		824.4908	848.5131	6.4	0.008
20C	15%	824.4908	848.5131	6.7	0.008
	-15%	824.4908	848.5131	-8.6	-0.010
	End Point	824.4908	848.5131	-5.6	-0.007

5G NR Band n5 QPSK (20MHz BANDWIDTH)

Limit		824	849	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	824.4688	847.4390		
Extreme (50C)		824.4688	847.4390	-11.6	-0.014
Extreme (40C)		824.4688	847.4390	-11.6	-0.014
Extreme (30C)		824.4688	847.4390	-12.4	-0.015
Extreme (10C)		824.4688	847.4390	-10.6	-0.013
Extreme (0C)		824.4688	847.4390	-10.4	-0.012
Extreme (-10C)		824.4688	847.4390	-10.5	-0.013
Extreme (-20C)		824.4688	847.4390	-10.4	-0.012
Extreme (-30C)		824.4688	847.4390	-10.4	-0.012
20C	15%	824.4688	847.4390	-11.7	-0.014
	-15%	824.4688	847.4390	-12.0	-0.014
	End Point	824.4688	847.4390	-10.2	-0.012

8.4.3. LTE BAND 7

LIMITS

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

Test Engineer ID: 19178 **Test Date:** 6/20/2020

QPSK (20MHz BANDWIDTH)

Limit		2500	2570		
Condition		F low @ -13dBm	F high @ -13dBm	Delta (Hz)	Frequency Stability (ppm)
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	2500.9480	2569.0016		
Extreme (50C)		2500.9480	2569.0016	-12.6	-0.005
Extreme (40C)		2500.9480	2569.0016	-14.6	-0.006
Extreme (30C)		2500.9480	2569.0016	-14.2	-0.006
Extreme (10C)		2500.9480	2569.0016	-13.7	-0.005
Extreme (0C)		2500.9480	2569.0016	-13.9	-0.005
Extreme (-10C)		2500.9480	2569.0016	-15.5	-0.006
Extreme (-20C)		2500.9480	2569.0016	14.9	0.006
Extreme (-30C)		2500.9480	2569.0016	14.7	0.006
20C	15%	2500.9480	2569.0016	-15.2	-0.006
	-15%	2500.9480	2569.0016	-14.9	-0.006
	End Point	2500.9480	2569.0016	-13.8	-0.005

8.4.4. LTE BAND 12 AND 5G NR Band n12

LIMITS

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

Test Engineer ID: 19178 **Test Date:** 6/20/2020

QPSK (10MHz BANDWIDTH)

Limit		699	716	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	699.4832	715.4926		
Extreme (50C)		699.4832	715.4926	3.9	0.005
Extreme (40C)		699.4832	715.4926	-8.4	-0.012
Extreme (30C)		699.4832	715.4926	-6.7	-0.009
Extreme (10C)		699.4832	715.4926	-7.8	-0.011
Extreme (0C)		699.4832	715.4926	-6.1	-0.009
Extreme (-10C)		699.4832	715.4926	3.5	0.005
Extreme (-20C)		699.4832	715.4926	5.2	0.007
Extreme (-30C)		699.4832	715.4926	5.5	0.008
20C	15%	699.4832	715.4926	-7.7	-0.011
	-15%	699.4832	715.4926	-5.6	-0.008
	End Point	699.4832	715.4926	-5.8	-0.008

5G NR Band n12 QPSK (15MHz BANDWIDTH)

Limit		699	716	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	699.3861	714.8681		
Extreme (50C)		699.3861	714.8681	-14.2	-0.020
Extreme (40C)		699.3861	714.8681	-13.9	-0.020
Extreme (30C)		699.3861	714.8681	-13.5	-0.019
Extreme (10C)		699.3861	714.8681	-12.1	-0.017
Extreme (0C)		699.3861	714.8681	-13.6	-0.019
Extreme (-10C)		699.3861	714.8681	-13.1	-0.018
Extreme (-20C)		699.3861	714.8681	-13.4	-0.019
Extreme (-30C)		699.3861	714.8681	-16.3	-0.023
20C	15%	699.3861	714.8681	-16.6	-0.023
	-15%	699.3861	714.8681	-14.2	-0.020
	End Point	699.3861	714.8681	-15.1	-0.021

8.4.5. LTE BAND 13

LIMITS

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

Test Engineer ID: 19178 **Test Date:** 6/20/2020

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	777.4813	786.5034		
Extreme (50C)		777.4813	786.5034	4.3	0.005
Extreme (40C)		777.4813	786.5034	4.4	0.006
Extreme (30C)		777.4813	786.5034	-6.0	-0.008
Extreme (10C)		777.4813	786.5034	-5.9	-0.008
Extreme (0C)		777.4813	786.5034	-6.6	-0.008
Extreme (-10C)		777.4813	786.5034	6.2	0.008
Extreme (-20C)		777.4813	786.5034	-7.9	-0.010
Extreme (-30C)		777.4813	786.5034	5.8	0.007
20C	15%	777.4813	786.5034	-6.8	-0.009
	-15%	777.4813	786.5034	-5.2	-0.007
	End Point	777.4813	786.5034	-6.4	-0.008

8.4.6. LTE BAND 14

LIMITS

FCC: §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.

Test Engineer ID: 19178 **Test Date:** 6/20/2020

QPSK (10MHz BANDWIDTH)

Limit		788	798		
Condition		F low @ -13dBm	F high @ -13dBm	Delta (Hz)	Frequency Stability (ppm)
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	788.3001	797.6981		
Extreme (50C)		788.3001	797.6981	-4.1	-0.005
Extreme (40C)		788.3001	797.6981	-4.8	-0.006
Extreme (30C)		788.3001	797.6981	-4.8	-0.006
Extreme (10C)		788.3001	797.6981	-4.7	-0.006
Extreme (0C)		788.3001	797.6981	-2.4	-0.003
Extreme (-10C)		788.3001	797.6981	2.1	0.003
Extreme (-20C)		788.3001	797.6981	2.1	0.003
Extreme (-30C)		788.3001	797.6981	-2.9	-0.004
20C	15%	788.3001	797.6981	-5.0	-0.006
	-15%	788.3001	797.6981	-3.6	-0.005
	End Point	788.3001	797.6981	-4.1	-0.005

8.4.7. LTE BAND 17

LIMITS

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

Test Engineer ID: 19178 **Test Date:** 6/20/2020

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	704.4893	715.5222		
Extreme (50C)		704.4893	715.5222	3.7	0.005
Extreme (40C)		704.4893	715.5222	-7.3	-0.010
Extreme (30C)		704.4893	715.5222	4.0	0.006
Extreme (10C)		704.4893	715.5222	-7.1	-0.010
Extreme (0C)		704.4893	715.5222	-7.7	-0.011
Extreme (-10C)		704.4893	715.5222	-4.3	-0.006
Extreme (-20C)		704.4893	715.5222	-4.9	-0.007
Extreme (-30C)		704.4893	715.5222	6.1	0.009
20C	15%	704.4893	715.5222	-2.2	-0.003
	-15%	704.4893	715.5222	-3.4	-0.005
	End Point	704.4893	715.5222	-8.3	-0.012

8.4.8. LTE BAND 25

LIMITS

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

Test Engineer ID: 19178 **Test Date:** 6/20/2020

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	1850.9939	1913.9905		
Extreme (50C)		1850.9939	1913.9905	8.0	0.004
Extreme (40C)		1850.9939	1913.9905	-15.7	-0.008
Extreme (30C)		1850.9939	1913.9905	-14.3	-0.008
Extreme (10C)		1850.9939	1913.9905	-13.5	-0.007
Extreme (0C)		1850.9939	1913.9905	-12.8	-0.007
Extreme (-10C)		1850.9939	1913.9905	-13.2	-0.007
Extreme (-20C)		1850.9939	1913.9905	-13.4	-0.007
Extreme (-30C)		1850.9939	1913.9905	-15.0	-0.008
20C	15%	1850.9939	1913.9905	-14.0	-0.007
	-15%	1850.9939	1913.9905	7.5	0.004
	End Point	1850.9939	1913.9905	-9.4	-0.005

8.4.9. LTE BAND 26 (PART 90S)

LIMITS

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

Test Engineer ID: 19178 **Test Date:** 6/20/2020

QPSK (10MHz BANDWIDTH)

Limit		814	824	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	814.4997	823.5121		
Extreme (50C)		814.4997	823.5121	-4.8	-0.006
Extreme (40C)		814.4997	823.5121	-7.9	-0.010
Extreme (30C)		814.4997	823.5121	-9.2	-0.011
Extreme (10C)		814.4997	823.5121	-7.2	-0.009
Extreme (0C)		814.4997	823.5121	-4.0	-0.005
Extreme (-10C)		814.4997	823.5121	-7.9	-0.010
Extreme (-20C)		814.4997	823.5121	-8.4	-0.010
Extreme (-30C)		814.4997	823.5121	-8.4	-0.010
20C	15%	814.4997	823.5121	-6.8	-0.008
	-15%	814.4997	823.5121	-9.2	-0.011
	End Point	814.4997	823.5121	-11.6	-0.014

8.4.10. LTE BAND 30

LIMITS

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

Test Engineer ID: 19178 **Test Date:** 6/20/2020

QPSK (10MHz BANDWIDTH)

Limit		2305	2315	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	2305.4975	2314.5289		
Extreme (50C)		2305.4975	2314.5289	-16.4	-0.007
Extreme (40C)		2305.4975	2314.5289	-17.2	-0.007
Extreme (30C)		2305.4975	2314.5289	-15.2	-0.007
Extreme (10C)		2305.4975	2314.5289	-13.7	-0.006
Extreme (0C)		2305.4975	2314.5289	-13.2	-0.006
Extreme (-10C)		2305.4975	2314.5289	-15.2	-0.007
Extreme (-20C)		2305.4975	2314.5289	10.9	0.005
Extreme (-30C)		2305.4975	2314.5289	-15.5	-0.007
20C	15%	2305.4975	2314.5289	-17.7	-0.008
	-15%	2305.4975	2314.5289	16.5	0.007
	End Point	2305.4975	2314.5289	-15.3	-0.007

8.4.11. LTE BAND 41 AND 5G NR Band n41

LIMITS

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

Test Engineer ID: 19178 **Test Date:** 6/20/2020

LTE BAND 41 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	2496.8828	2689.1939		
Extreme (50C)		2496.8828	2689.1939	-16.2	-0.006
Extreme (40C)		2496.8828	2689.1939	-23.8	-0.009
Extreme (30C)		2496.8828	2689.1939	-18.3	-0.007
Extreme (10C)		2496.8828	2689.1939	-25.0	-0.010
Extreme (0C)		2496.8828	2689.1939	-15.3	-0.006
Extreme (-10C)		2496.8828	2689.1939	-18.6	-0.007
Extreme (-20C)		2496.8828	2689.1939	-15.8	-0.006
Extreme (-30C)		2496.8828	2689.1939	-19.9	-0.008
20C	15%	2496.8828	2689.1939	-22.1	-0.009
	-15%	2496.8828	2689.1939	-23.5	-0.009
	End Point	2496.8828	2689.1939	-24.1	-0.009

5G NR Band n41 QPSK (100MHz BANDWIDTH)

Limit		2496	2690	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	2497.0086	2687.9440		
Extreme (50C)		2497.0086	2687.9440	-29.7	-0.011
Extreme (40C)		2497.0086	2687.9440	-37.1	-0.014
Extreme (30C)		2497.0086	2687.9440	-27.1	-0.010
Extreme (10C)		2497.0086	2687.9440	-31.0	-0.012
Extreme (0C)		2497.0086	2687.9440	-34.1	-0.013
Extreme (-10C)		2497.0086	2687.9440	-28.8	-0.011
Extreme (-20C)		2497.0086	2687.9440	-30.0	-0.012
Extreme (-30C)		2497.0086	2687.9440	-36.2	-0.014
20C	15%	2497.0086	2687.9440	-30.3	-0.012
	-15%	2497.0086	2687.9440	-31.8	-0.012
	End Point	2497.0086	2687.9440	-34.1	-0.013

8.4.12. LTE BAND 48

Test Engineer ID: 19178 **Test Date:** 6/20/2020

QPSK (20MHz BANDWIDTH)

Limit		3550	3700	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	3550.9327	3699.7246		
Extreme (50C)		3550.9327	3699.7246	-18.5	-0.005
Extreme (40C)		3550.9326	3699.7245	-22.4	-0.006
Extreme (30C)		3550.9327	3699.7246	-15.6	-0.004
Extreme (10C)		3550.9327	3699.7246	-9.7	-0.003
Extreme (0C)		3550.9327	3699.7246	-13.5	-0.004
Extreme (-10C)		3550.9327	3699.7246	-19.3	-0.005
Extreme (-20C)		3550.9326	3699.7245	-24.1	-0.007
Extreme (-30C)		3550.9327	3699.7246	-16.4	-0.005
20C	15%	3550.9327	3699.7246	14.4	0.004
	-15%	3550.9327	3699.7246	16.8	0.005
	End Point	3550.9326	3699.7245	-21.8	-0.006

8.4.13. LTE BAND 66

LIMITS

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

Test Engineer ID: 19178 **Test Date:** 6/20/2020

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	1710.9539	1779.0106		
Extreme (50C)		1710.9539	1779.0106	-7.1	-0.004
Extreme (40C)		1710.9539	1779.0106	-12.1	-0.007
Extreme (30C)		1710.9539	1779.0106	-12.4	-0.007
Extreme (10C)		1710.9539	1779.0106	8.9	0.005
Extreme (0C)		1710.9539	1779.0106	-11.4	-0.007
Extreme (-10C)		1710.9539	1779.0106	-14.5	-0.008
Extreme (-20C)		1710.9539	1779.0106	-10.9	-0.006
Extreme (-30C)		1710.9539	1779.0106	-12.9	-0.007
20C	15%	1710.9539	1779.0106	-14.6	-0.008
	-15%	1710.9539	1779.0106	-11.8	-0.007
	End Point	1710.9539	1779.0106	-10.6	-0.006

8.4.14. LTE BAND 71

LIMITS

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

Test Engineer ID: 19178 **Test Date:** 6/20/2020

QPSK (20MHz BANDWIDTH)

Limit		663	698		
Condition		F low @ -13dBm	F high @ -13dBm	Delta (Hz)	Frequency Stability (ppm)
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	664.0041	696.9964		
Extreme (50C)		664.0041	696.9964	-5.4	-0.008
Extreme (40C)		664.0041	696.9964	-4.5	-0.007
Extreme (30C)		664.0041	696.9964	3.9	0.006
Extreme (10C)		664.0041	696.9964	-4.2	-0.006
Extreme (0C)		664.0041	696.9964	4.1	0.006
Extreme (-10C)		664.0041	696.9964	4.7	0.007
Extreme (-20C)		664.0041	696.9964	4.2	0.006
Extreme (-30C)		664.0041	696.9964	5.9	0.009
20C	15%	664.0041	696.9964	-3.6	-0.005
	-15%	664.0041	696.9964	-4.0	-0.006
	End Point	664.0041	696.9964	-4.1	-0.006

8.4.15. 5G NR Band n77

LIMITS

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

Test Engineer ID: 19480 **Test Date:** 8/5/2020

5G NR Band n77 QPSK (100MHz BANDWIDTH)

Limit		3700	3980	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	3700.9181	3977.9774		
Extreme (50C)		3700.9181	3977.9774	-31.8	-0.008
Extreme (40C)		3700.9181	3977.9774	30.1	0.008
Extreme (30C)		3700.9181	3977.9774	-34.9	-0.009
Extreme (10C)		3700.9181	3977.9774	29.6	0.008
Extreme (0C)		3700.9181	3977.9774	34.2	0.009
Extreme (-10C)		3700.9181	3977.9774	-34.7	-0.009
Extreme (-20C)		3700.9181	3977.9774	31.9	0.008
Extreme (-30C)		3700.9180	3977.9773	-53.5	-0.014
20C	15%	3700.9181	3977.9774	-34.9	-0.009
	-15%	3700.9181	3977.9774	42.6	0.011
	End Point	3700.9181	3977.9774	33.0	0.009

8.5. PEAK-TO-AVERAGE POWER RATIO

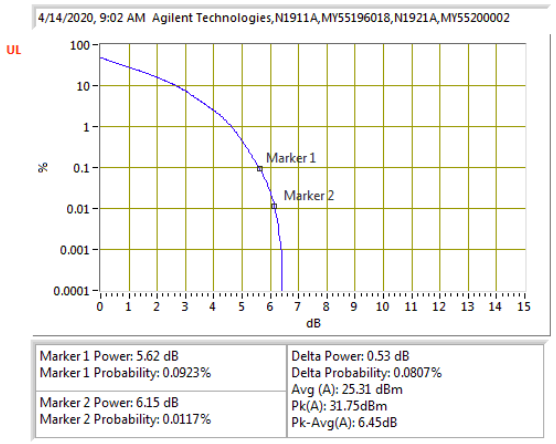
LIMIT

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.

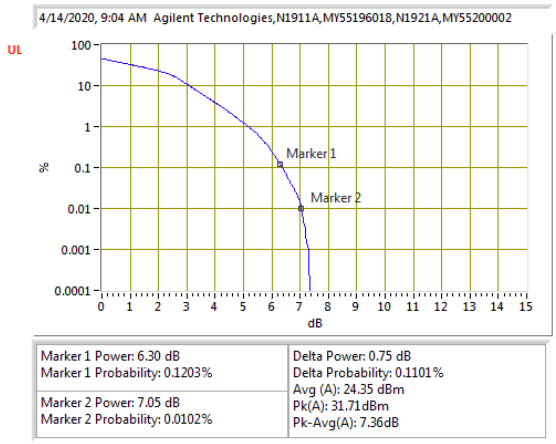
RESULT

The highest output power antenna port 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.

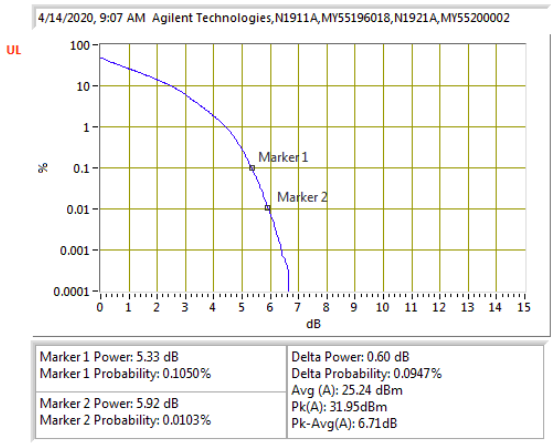
8.5.1. LTE BAND 2



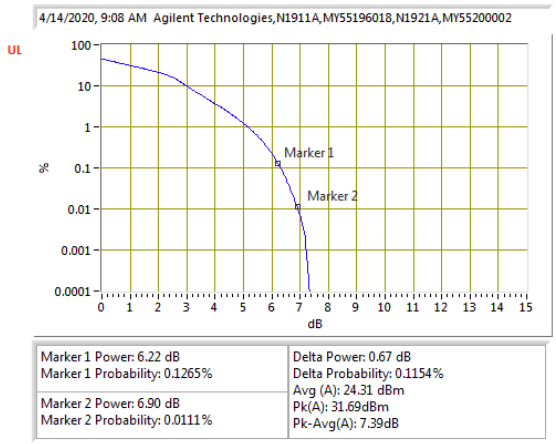
LTE B2 1.4MHz QPSK Middle Channel



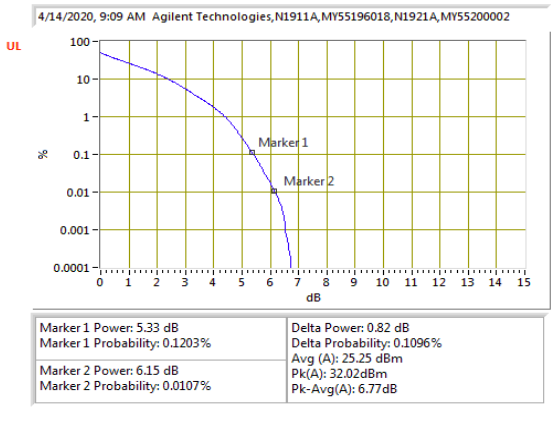
LTE B2 1.4MHz 16QAM Middle Channel



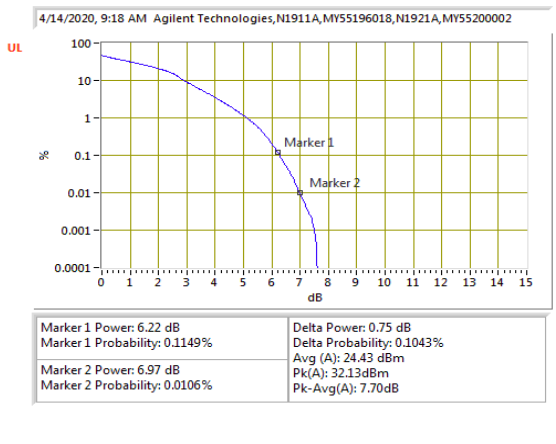
LTE B2 3MHz QPSK Middle Channel



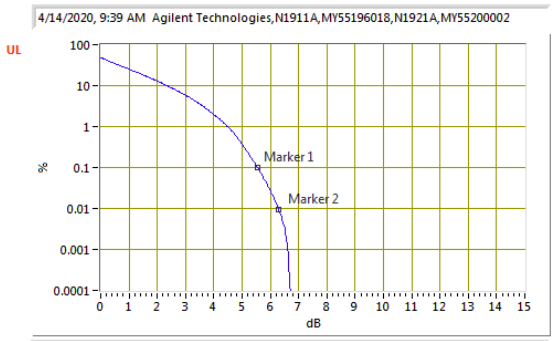
LTE B2 3MHz 16QAM Middle Channel



LTE B2 5MHz QPSK Middle Channel

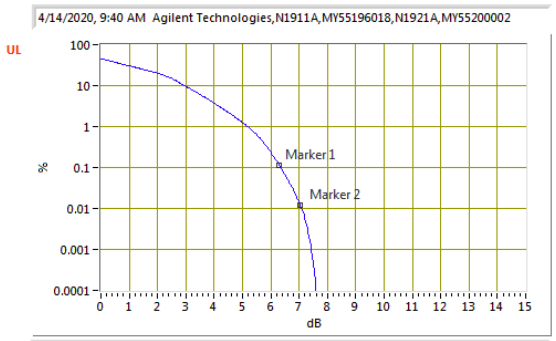


LTE B2 5MHz 16QAM Middle Channel



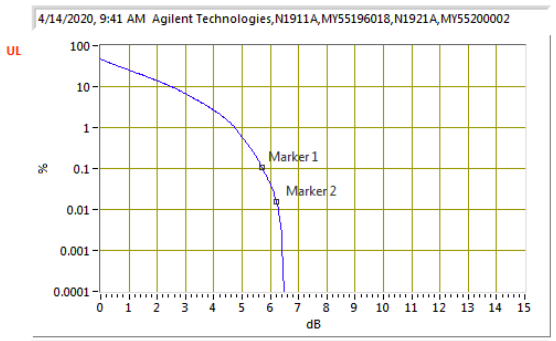
Marker 1 Power: 5.55 dB Marker 1 Probability: 0.0997%	Delta Power: 0.75 dB Delta Probability: 0.0902% Avg (A): 25.36 dBm Pk(A): 32.13dBm Pk-Avg(A): 6.77dB
Marker 2 Power: 6.30 dB Marker 2 Probability: 0.0095%	

LTE B2 10MHz QPSK Middle Channel



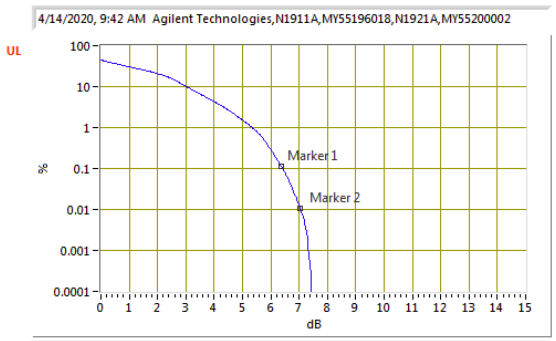
Marker 1 Power: 6.30 dB Marker 1 Probability: 0.1140%	Delta Power: 0.75 dB Delta Probability: 0.1021% Avg (A): 24.40 dBm Pk(A): 32.13dBm Pk-Avg(A): 7.73dB
Marker 2 Power: 7.05 dB Marker 2 Probability: 0.0120%	

LTE B2 10MHz 16QAM Middle Channel



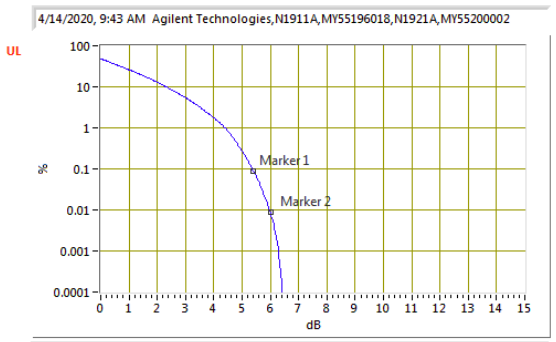
Marker 1 Power: 5.70 dB Marker 1 Probability: 0.1089%	Delta Power: 0.53 dB Delta Probability: 0.0946% Avg (A): 25.52 dBm Pk(A): 32.05dBm Pk-Avg(A): 6.53dB
Marker 2 Power: 6.22 dB Marker 2 Probability: 0.0143%	

LTE B2 15MHz QPSK Middle Channel



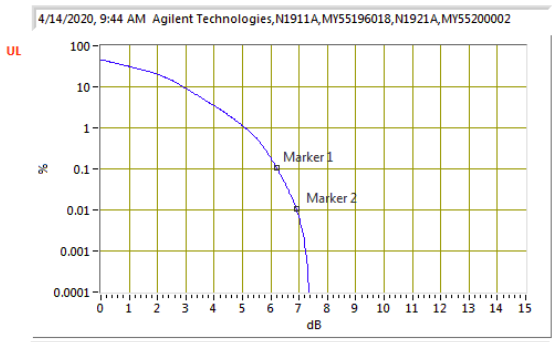
Marker 1 Power: 6.37 dB Marker 1 Probability: 0.1103%	Delta Power: 0.67 dB Delta Probability: 0.0998% Avg (A): 24.54 dBm Pk(A): 32.04dBm Pk-Avg(A): 7.50dB
Marker 2 Power: 7.05 dB Marker 2 Probability: 0.0105%	

LTE B2 15MHz 16QAM Middle Channel



Marker 1 Power: 5.40 dB Marker 1 Probability: 0.0908%	Delta Power: 0.60 dB Delta Probability: 0.0820% Avg (A): 25.47 dBm Pk(A): 31.94dBm Pk-Avg(A): 6.47dB
Marker 2 Power: 6.00 dB Marker 2 Probability: 0.0087%	

LTE B2 20MHz QPSK Middle Channel

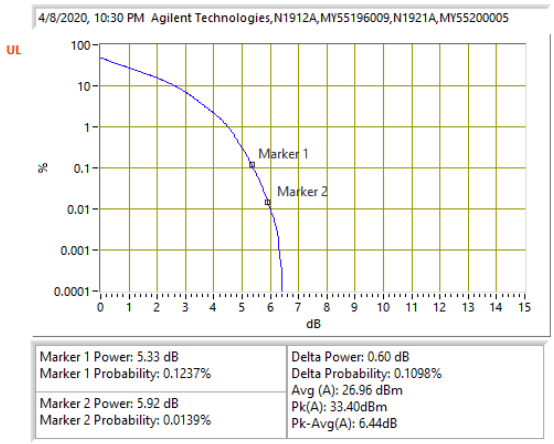


Marker 1 Power: 6.22 dB Marker 1 Probability: 0.0998%	Delta Power: 0.67 dB Delta Probability: 0.0891% Avg (A): 24.52 dBm Pk(A): 31.96dBm Pk-Avg(A): 7.43dB
Marker 2 Power: 6.90 dB Marker 2 Probability: 0.0107%	

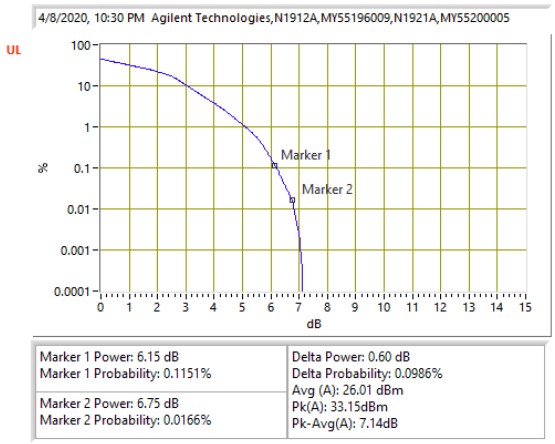
LTE B2 20MHz 16QAM Middle Channel

8.5.2. LTE BAND 5 AND 5G NR Band n5

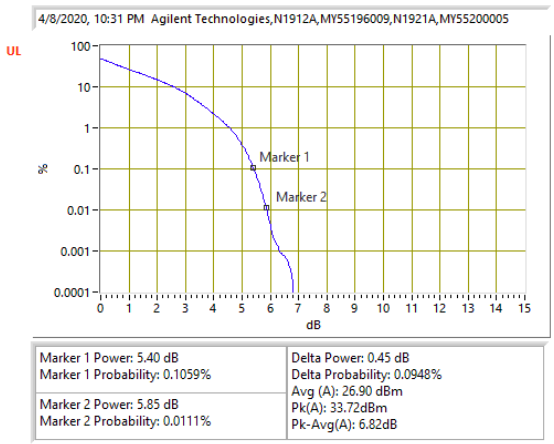
LTE BAND 5



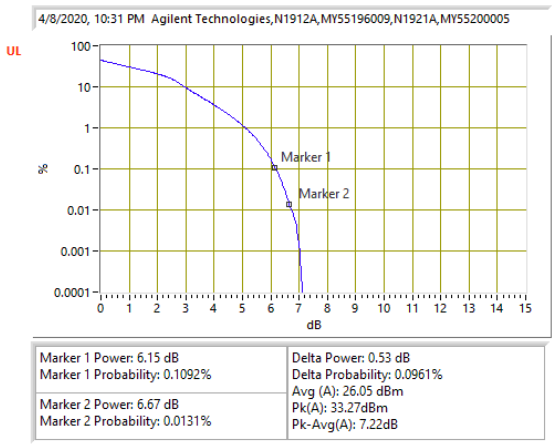
LTE B5 1.4MHz QPSK Middle Channel



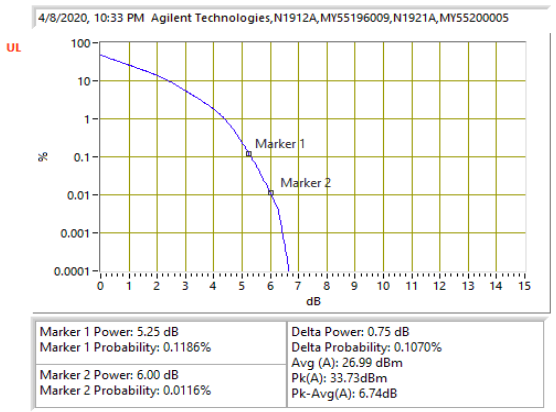
LTE B5 1.4MHz 16QAM Middle Channel



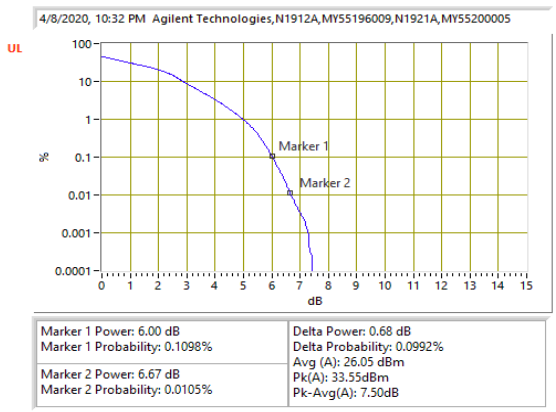
LTE B5 3MHz QPSK Middle Channel



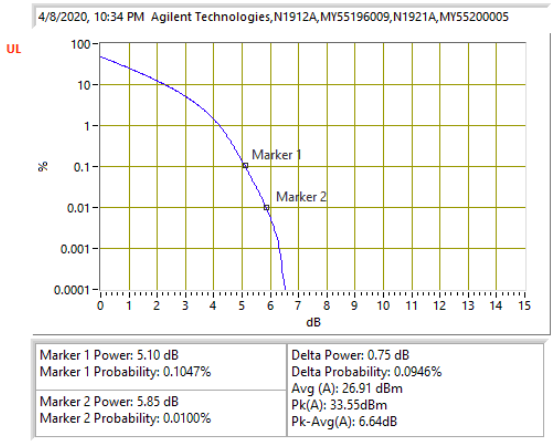
LTE B5 3MHz 16QAM Middle Channel



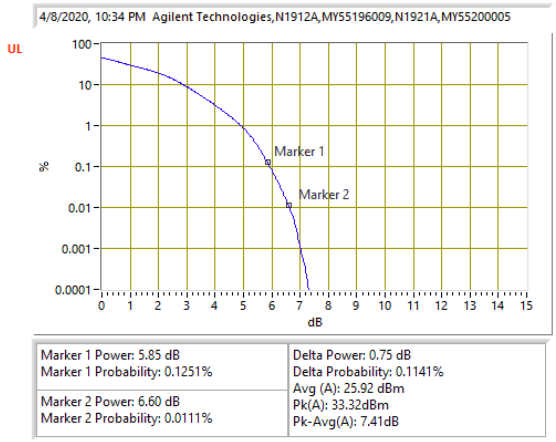
LTE B5 5MHz QPSK Middle Channel



LTE B5 5MHz 16QAM Middle Channel

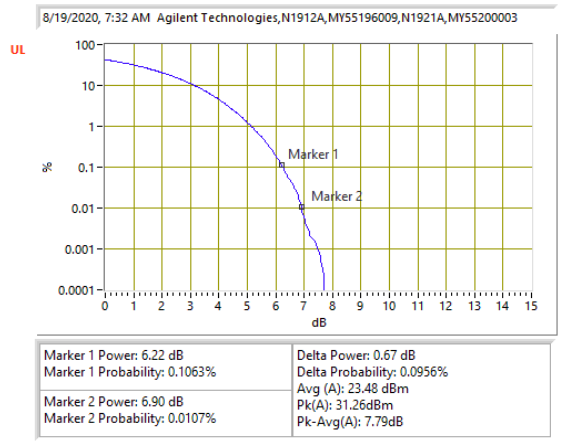


LTE B5 10MHz QPSK Middle Channel

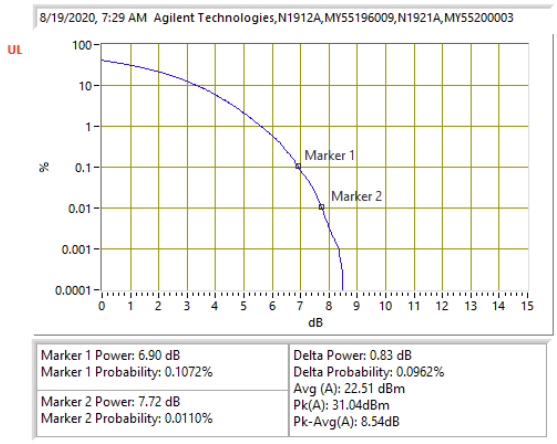


LTE B5 10MHz 16QAM Middle Channel

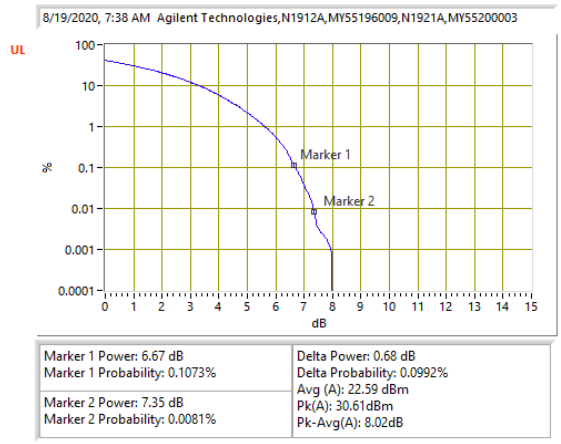
5G NR Band n5



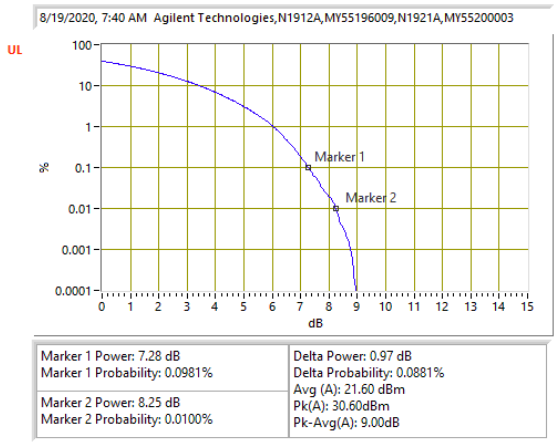
5G NR Band n5 15MHz QPSK Middle Channel



5G NR Band n5 15MHz 16QAM Middle Channel

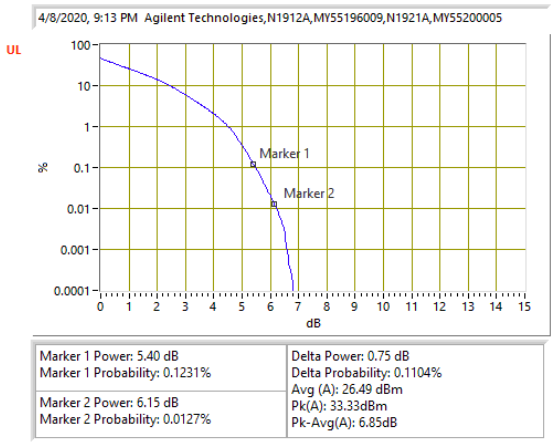


5G NR Band n5 20MHz QPSK Middle Channel

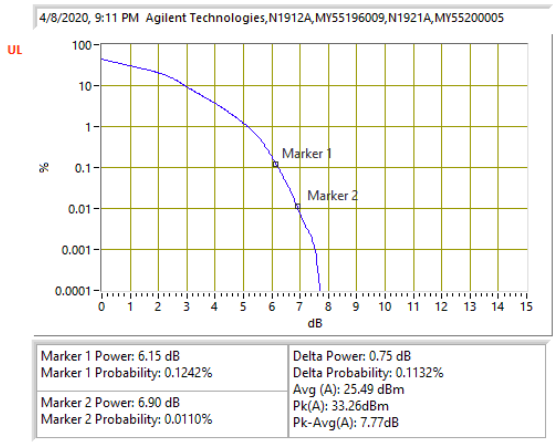


5G NR Band n5 20MHz 16QAM Middle Channel

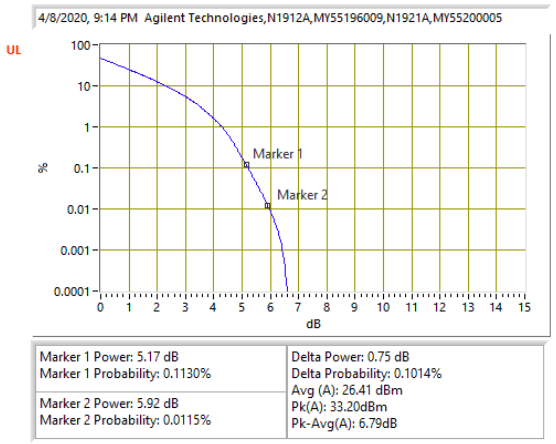
8.5.3. LTE BAND 7



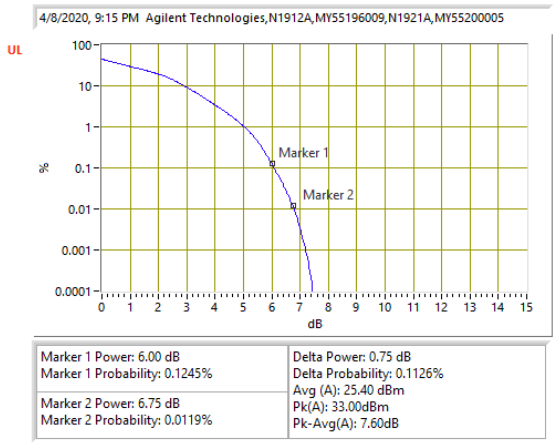
LTE B7 5MHz QPSK Middle Channel



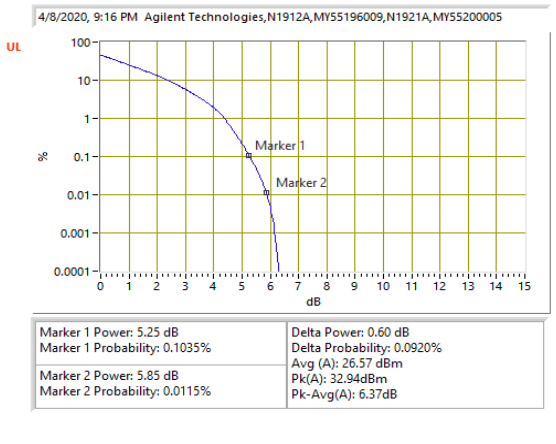
LTE B7 5MHz 16QAM Middle Channel



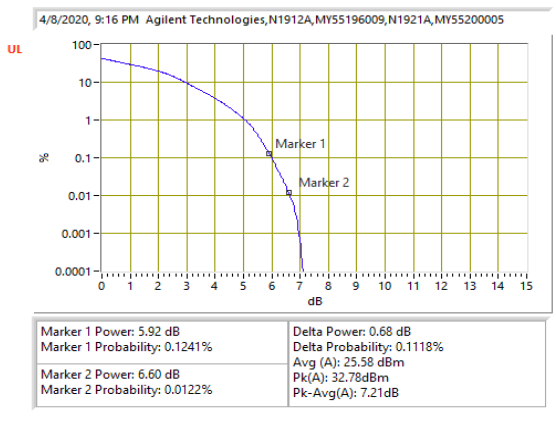
LTE B7 10MHz QPSK Middle Channel



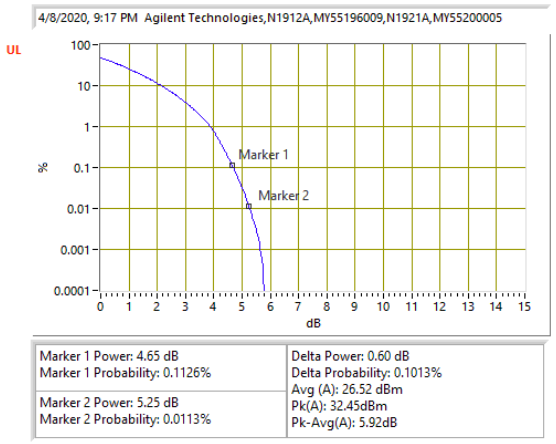
LTE B7 10MHz 16QAM Middle Channel



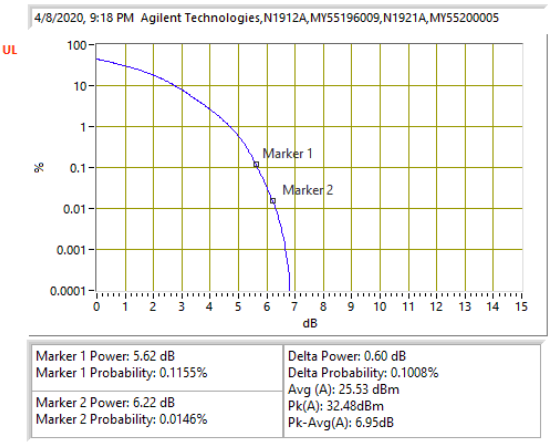
LTE B7 15MHz QPSK Middle Channel



LTE B7 15MHz 16QAM Middle Channel



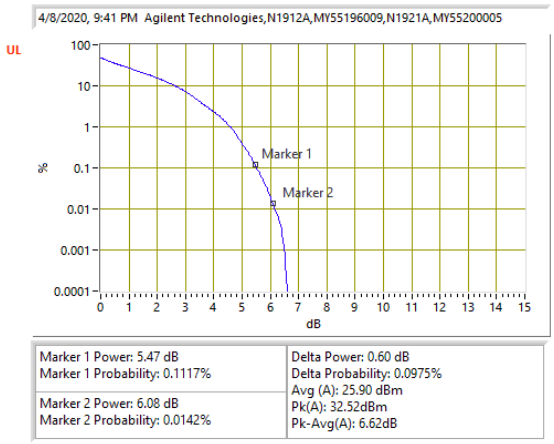
LTE B7 20MHz QPSK Middle Channel



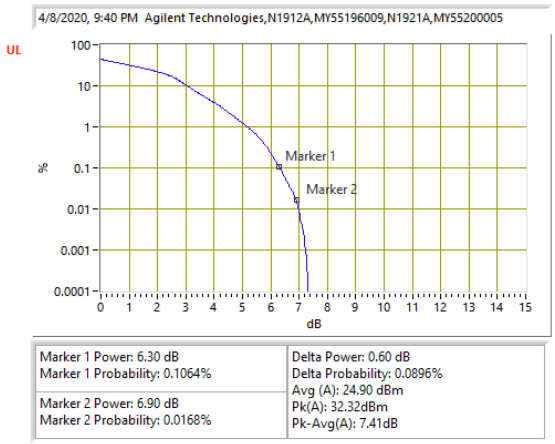
LTE B7 20MHz 16QAM Middle Channel

8.5.4. LTE BAND 12 AND 5G NR Band n12

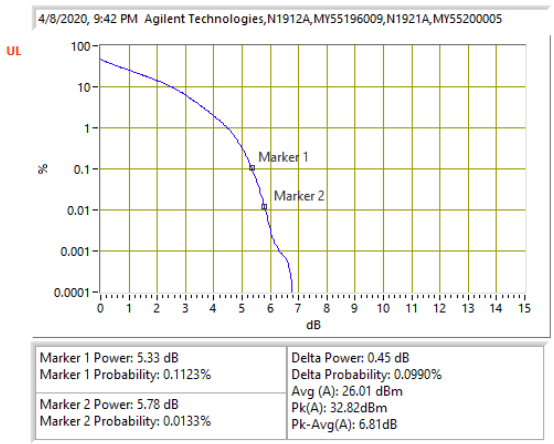
LTE BAND 12



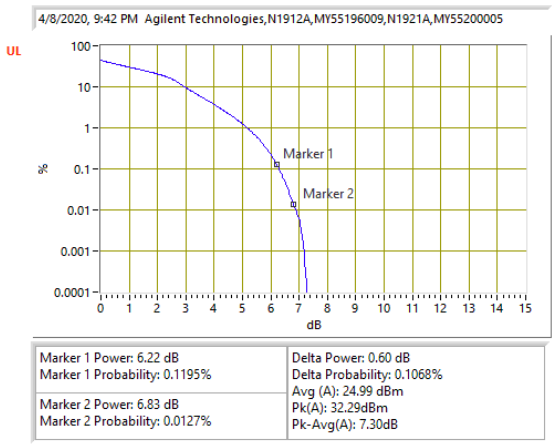
LTE B12 1.4MHz QPSK Middle Channel



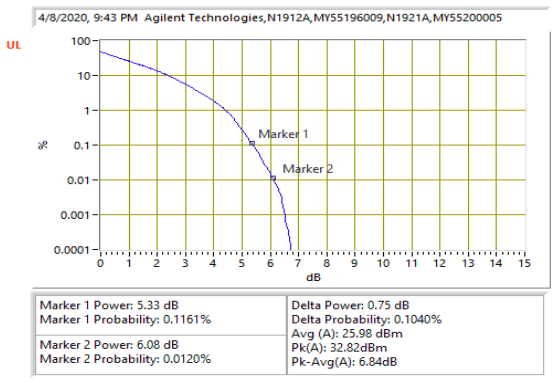
LTE B12 1.4MHz 16QAM Middle Channel



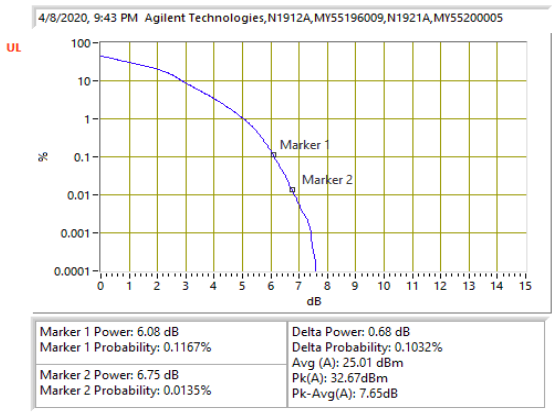
LTE B12 3MHz QPSK Middle Channel



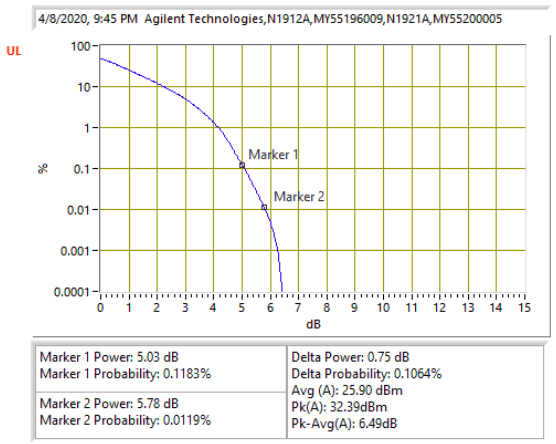
LTE B12 3MHz 16QAM Middle Channel



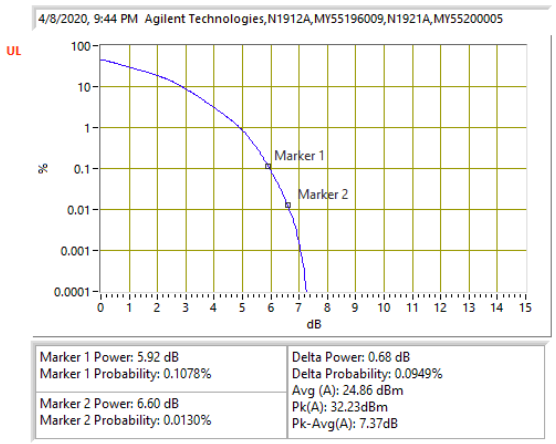
LTE B12 5MHz QPSK Middle Channel



LTE B12 5MHz 16QAM Middle Channel

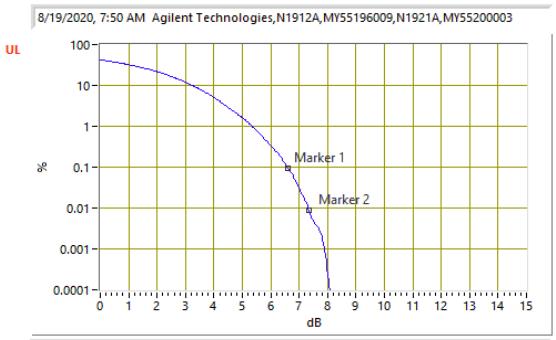


LTE B12 10MHz QPSK Middle Channel

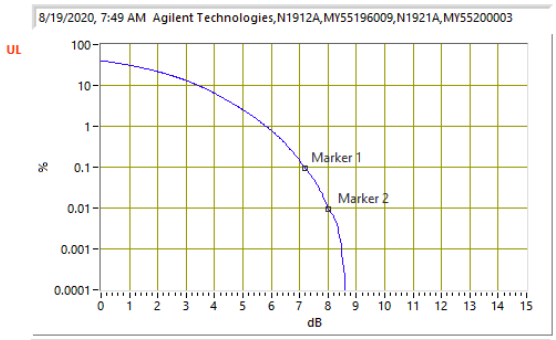


LTE B12 10MHz 16QAM Middle Channel

5G NR Band n12

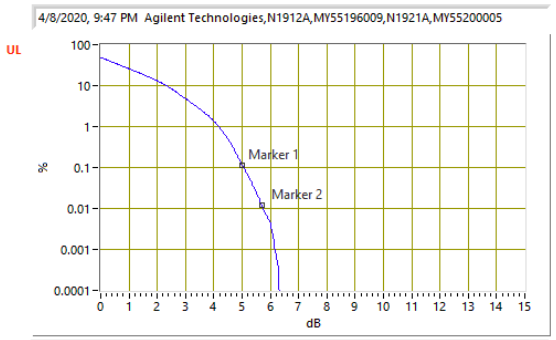


5G NR Band n12 15MHz QPSK Middle Channel



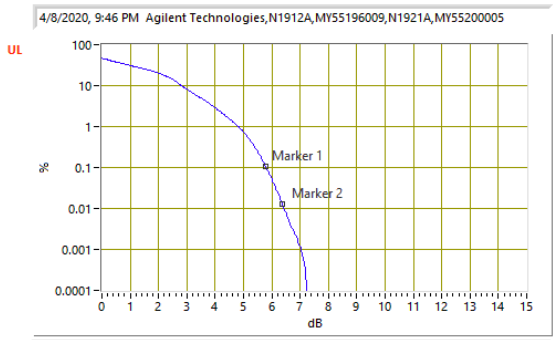
5G NR Band n12 15MHz 16QAM Middle Channel

8.5.5. LTE BAND 13



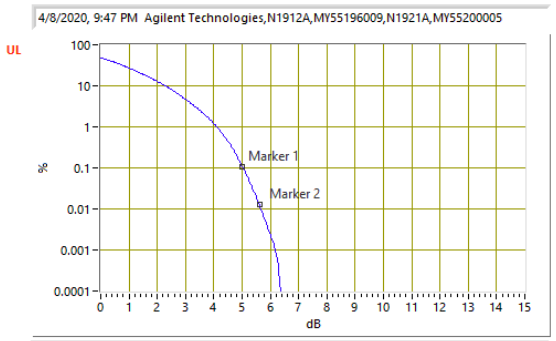
Marker 1 Power: 5.03 dB Marker 1 Probability: 0.1108%	Delta Power: 0.68 dB Delta Probability: 0.0986% Avg (A): 26.12 dBm Pk(A): 32.51dBm Pk-Avg(A): 6.39dB
Marker 2 Power: 5.70 dB Marker 2 Probability: 0.0123%	

LTE B13 5MHz QPSK Middle Channel



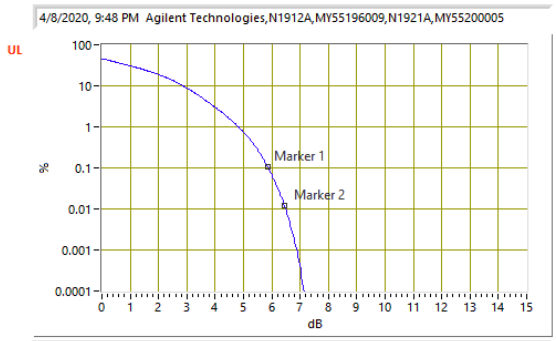
Marker 1 Power: 5.78 dB Marker 1 Probability: 0.1087%	Delta Power: 0.60 dB Delta Probability: 0.0965% Avg (A): 25.18 dBm Pk(A): 32.46dBm Pk-Avg(A): 7.28dB
Marker 2 Power: 6.37 dB Marker 2 Probability: 0.0122%	

LTE B13 5MHz 16QAM Middle Channel



Marker 1 Power: 5.03 dB Marker 1 Probability: 0.1046%	Delta Power: 0.60 dB Delta Probability: 0.0925% Avg (A): 26.07 dBm Pk(A): 32.53dBm Pk-Avg(A): 6.46dB
Marker 2 Power: 5.62 dB Marker 2 Probability: 0.0121%	

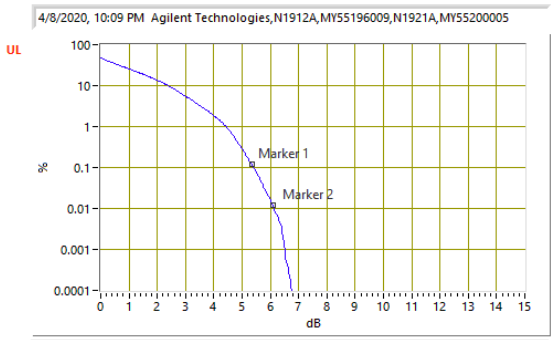
LTE B13 10MHz QPSK Middle Channel



Marker 1 Power: 5.85 dB Marker 1 Probability: 0.1079%	Delta Power: 0.60 dB Delta Probability: 0.0959% Avg (A): 25.06 dBm Pk(A): 32.32dBm Pk-Avg(A): 7.27dB
Marker 2 Power: 6.45 dB Marker 2 Probability: 0.0121%	

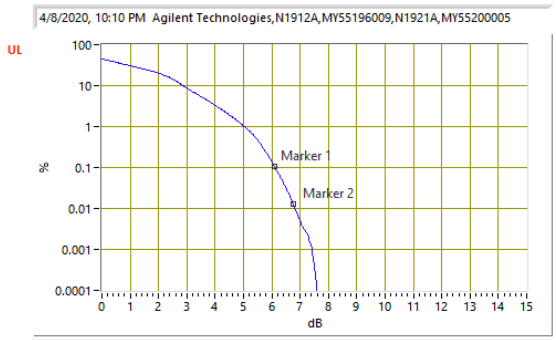
LTE B13 10MHz 16QAM Middle Channel

8.5.6. LTE BAND 14



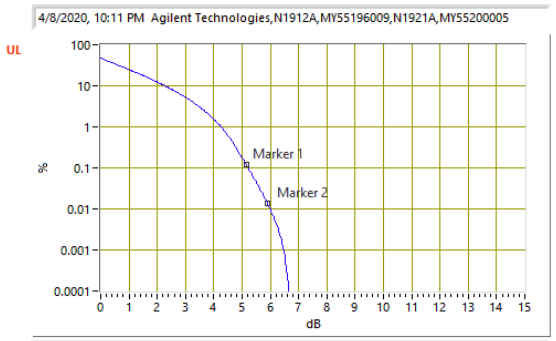
Marker 1 Power: 5.33 dB Marker 1 Probability: 0.1221%	Delta Power: 0.75 dB Delta Probability: 0.1096% Avg (A): 26.12 dBm Pk(A): 32.91dBm Pk-Avg(A): 6.79dB
Marker 2 Power: 6.08 dB Marker 2 Probability: 0.0125%	

LTE B14 5MHz QPSK Middle Channel



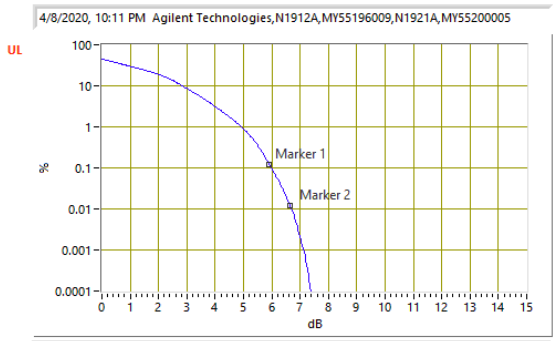
Marker 1 Power: 6.08 dB Marker 1 Probability: 0.1130%	Delta Power: 0.68 dB Delta Probability: 0.0998% Avg (A): 25.12 dBm Pk(A): 32.76dBm Pk-Avg(A): 7.64dB
Marker 2 Power: 6.75 dB Marker 2 Probability: 0.0132%	

LTE B14 5MHz 16QAM Middle Channel



Marker 1 Power: 5.17 dB Marker 1 Probability: 0.1143%	Delta Power: 0.75 dB Delta Probability: 0.1018% Avg (A): 25.98 dBm Pk(A): 32.74dBm Pk-Avg(A): 6.76dB
Marker 2 Power: 5.92 dB Marker 2 Probability: 0.0126%	

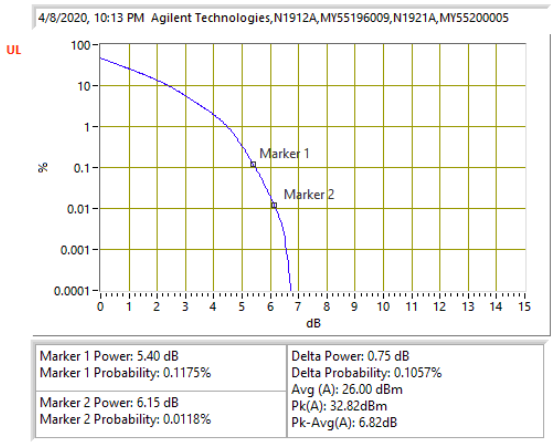
LTE B14 10MHz QPSK Middle Channel



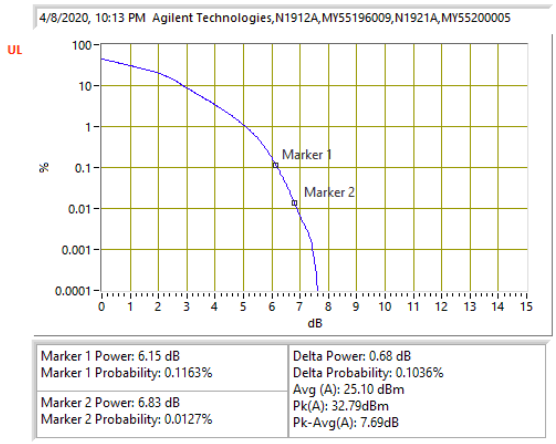
Marker 1 Power: 5.92 dB Marker 1 Probability: 0.1174%	Delta Power: 0.75 dB Delta Probability: 0.1061% Avg (A): 24.97 dBm Pk(A): 32.50dBm Pk-Avg(A): 7.54dB
Marker 2 Power: 6.67 dB Marker 2 Probability: 0.0113%	

LTE B14 10MHz 16QAM Middle Channel

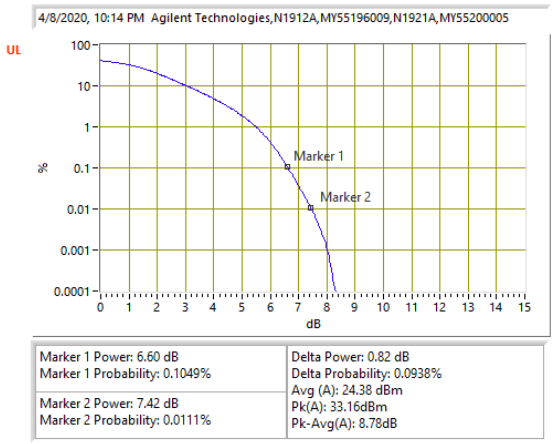
8.5.7. LTE BAND 17



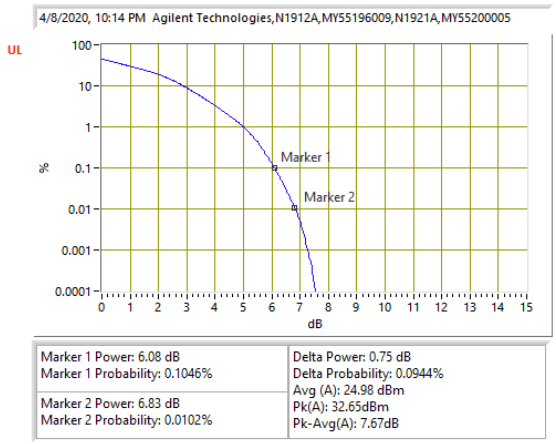
LTE B17 5MHz QPSK Middle Channel



LTE B17 5MHz 16QAM Middle Channel

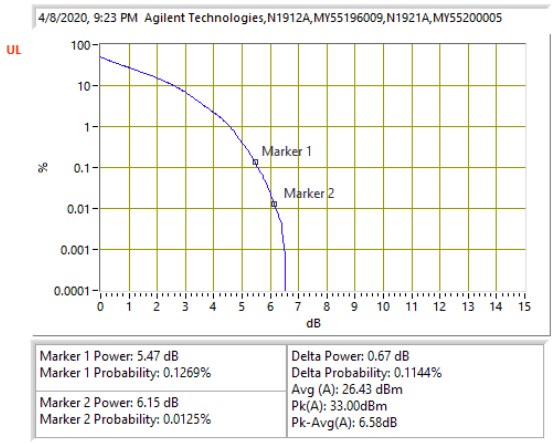


LTE B17 10MHz QPSK Middle Channel

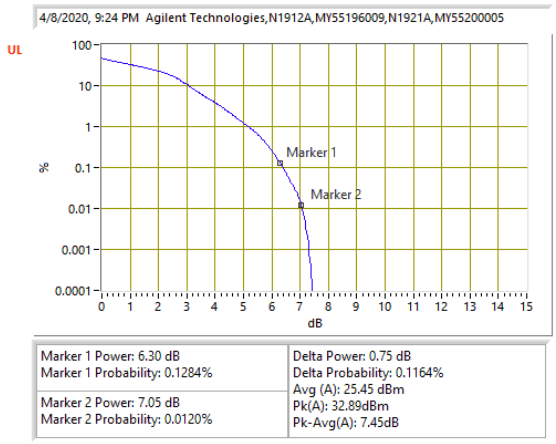


LTE B17 10MHz 16QAM Middle Channel

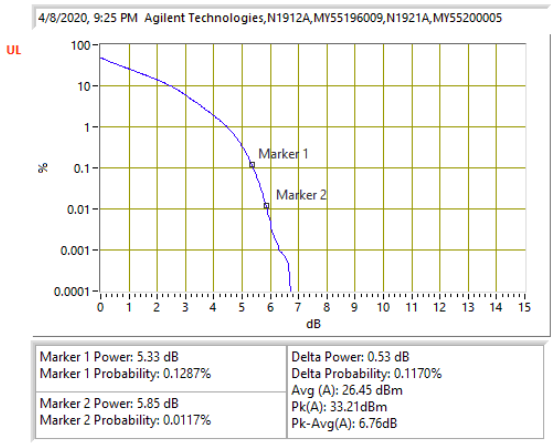
8.5.8. LTE BAND 25



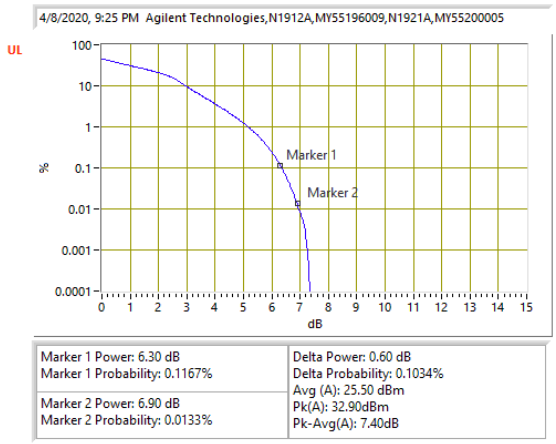
LTE B25 1.4MHz QPSK Middle Channel



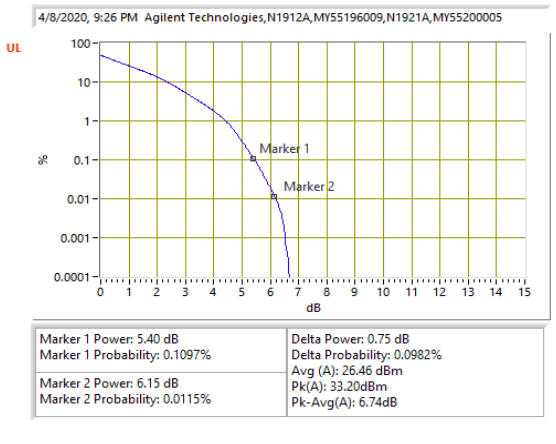
LTE B25 1.4MHz 16QAM Middle Channel



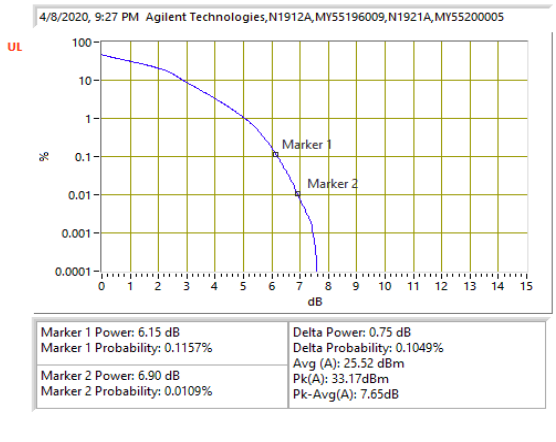
LTE B25 3MHz QPSK Middle Channel



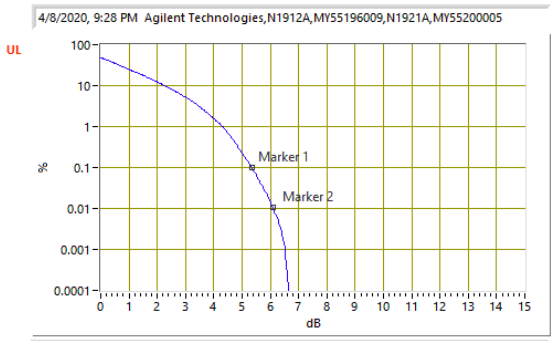
LTE B25 3MHz 16QAM Middle Channel



LTE B2 5MHz QPSK Middle Channel

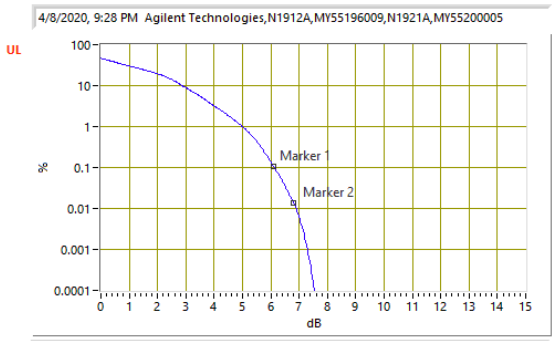


LTE B2 5MHz 16QAM Middle Channel



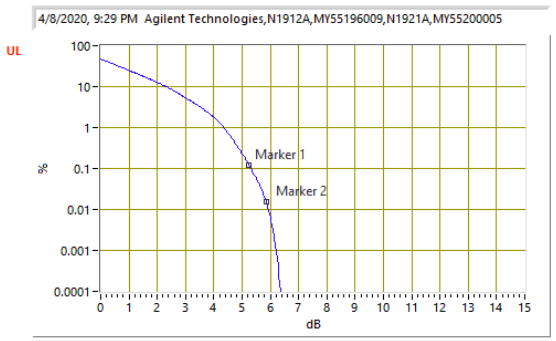
Marker 1 Power: 5.33 dB Marker 1 Probability: 0.1048%	Delta Power: 0.75 dB Delta Probability: 0.0936%
Marker 2 Power: 6.08 dB Marker 2 Probability: 0.0112%	Avg (A): 26.37 dBm Pk(A): 33.10dBm Pk-Avg(A): 6.73dB

LTE B25 10MHz QPSK Middle Channel



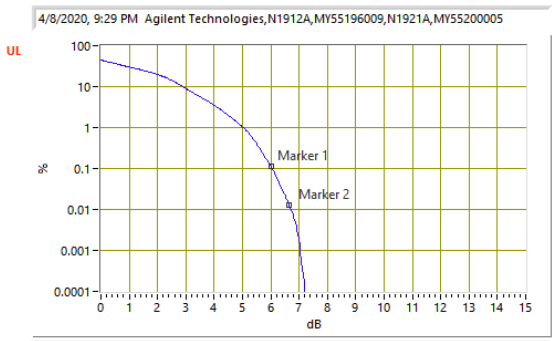
Marker 1 Power: 6.08 dB Marker 1 Probability: 0.1131%	Delta Power: 0.75 dB Delta Probability: 0.0999%
Marker 2 Power: 6.83 dB Marker 2 Probability: 0.0131%	Avg (A): 25.40 dBm Pk(A): 33.04dBm Pk-Avg(A): 7.65dB

LTE B25 10MHz 16QAM Middle Channel



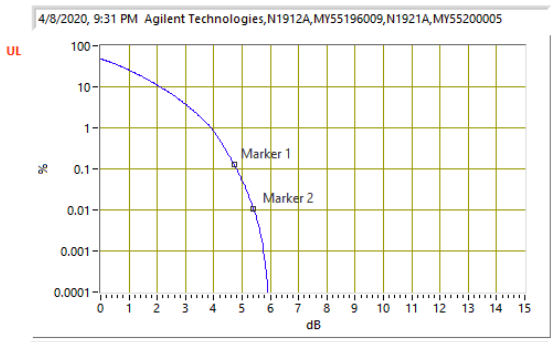
Marker 1 Power: 5.25 dB Marker 1 Probability: 0.1232%	Delta Power: 0.60 dB Delta Probability: 0.1073%
Marker 2 Power: 5.85 dB Marker 2 Probability: 0.0158%	Avg (A): 26.52 dBm Pk(A): 32.95dBm Pk-Avg(A): 6.42dB

LTE B25 15MHz QPSK Middle Channel



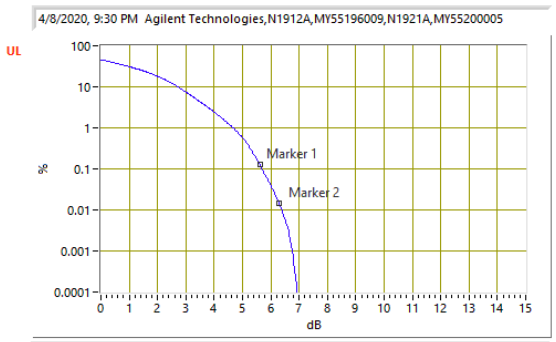
Marker 1 Power: 6.00 dB Marker 1 Probability: 0.1137%	Delta Power: 0.68 dB Delta Probability: 0.1016%
Marker 2 Power: 6.67 dB Marker 2 Probability: 0.0121%	Avg (A): 25.56 dBm Pk(A): 32.86dBm Pk-Avg(A): 7.31dB

LTE B25 15MHz 16QAM Middle Channel



Marker 1 Power: 4.72 dB Marker 1 Probability: 0.1246%	Delta Power: 0.67 dB Delta Probability: 0.1137%
Marker 2 Power: 5.40 dB Marker 2 Probability: 0.0109%	Avg (A): 26.48 dBm Pk(A): 32.47dBm Pk-Avg(A): 5.98dB

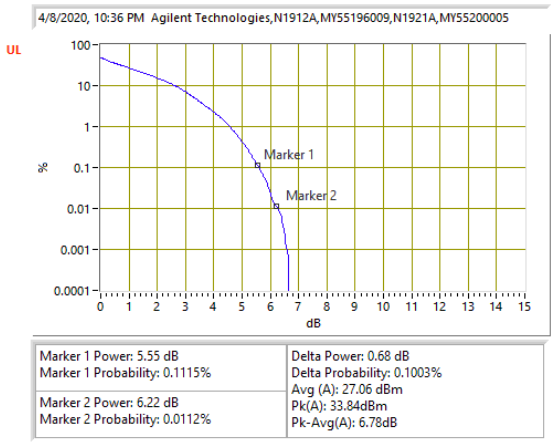
LTE B25 20MHz QPSK Middle Channel



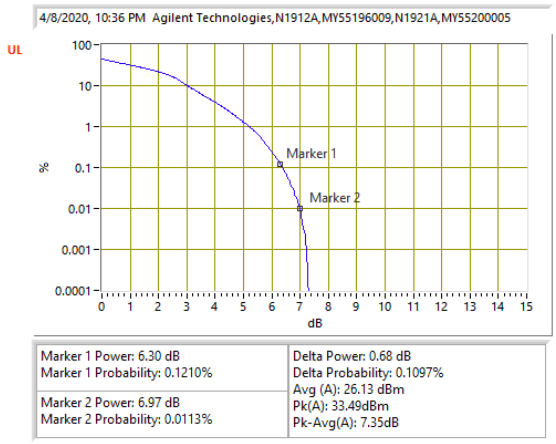
Marker 1 Power: 5.62 dB Marker 1 Probability: 0.1207%	Delta Power: 0.68 dB Delta Probability: 0.1062%
Marker 2 Power: 6.30 dB Marker 2 Probability: 0.0144%	Avg (A): 25.46 dBm Pk(A): 32.49dBm Pk-Avg(A): 7.04dB

LTE B25 20MHz 16QAM Middle Channel

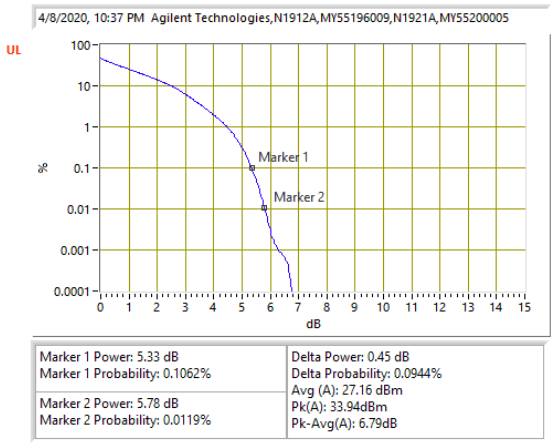
8.5.9. LTE BAND 26 (PART 90S)



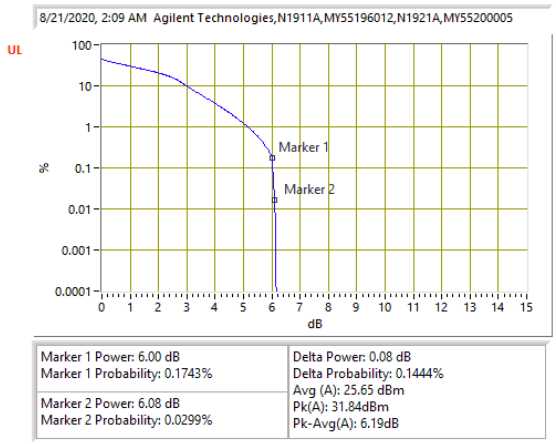
LTE B26 1.4MHz QPSK Middle Channel



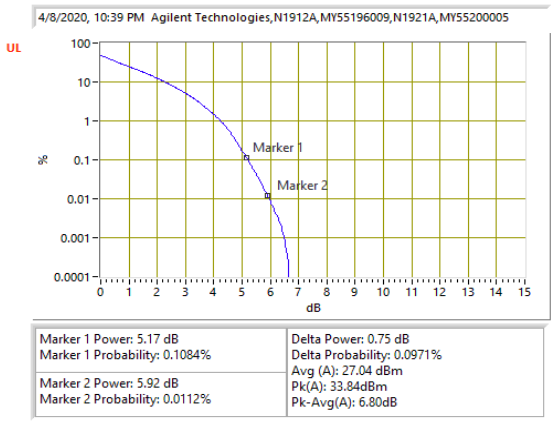
LTE B26 1.4MHz 16QAM Middle Channel



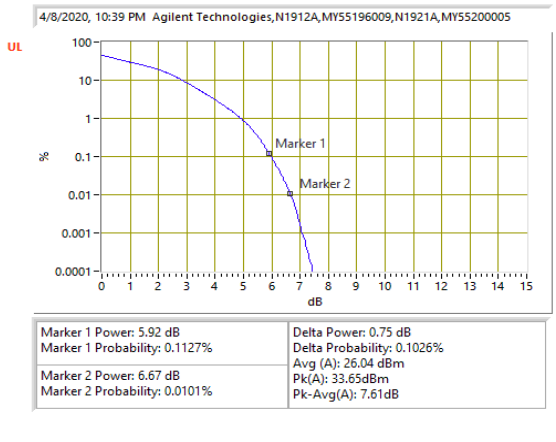
LTE B26 3MHz QPSK Middle Channel



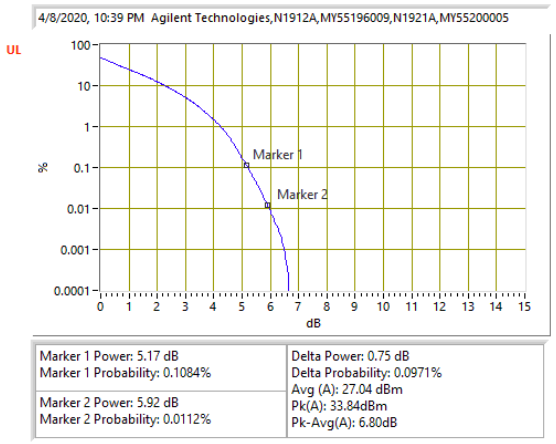
LTE B26 3MHz 16QAM Middle Channel



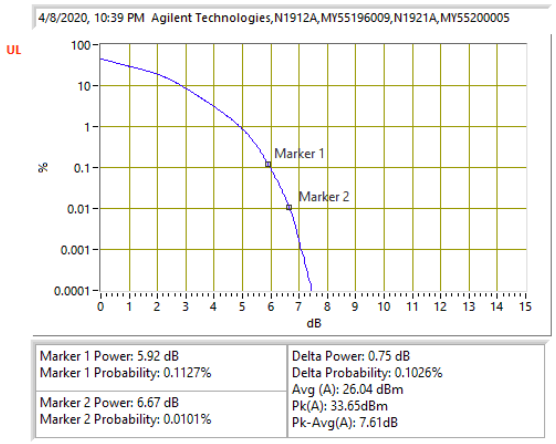
LTE B26 5MHz QPSK Middle Channel



LTE B26 5MHz 16QAM Middle Channel

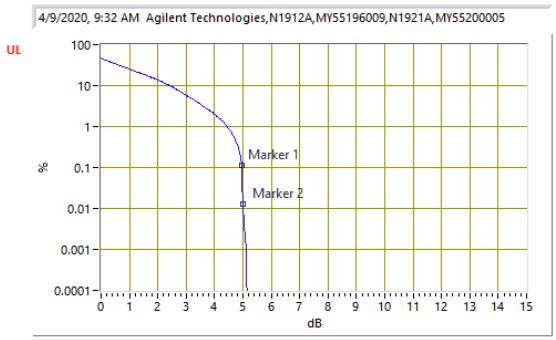


LTE B26 10MHz QPSK Middle Channel

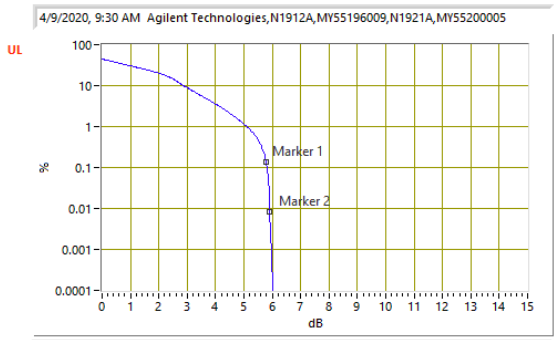


LTE B26 10MHz 16QAM Middle Channel

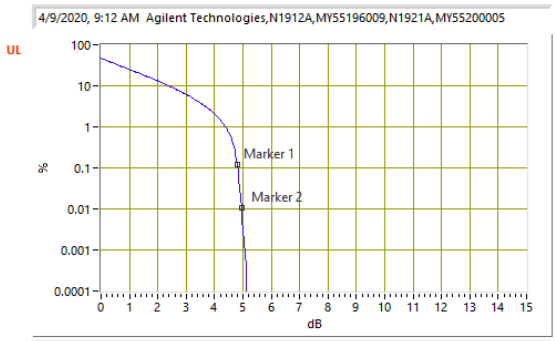
8.5.10. LTE BAND 30



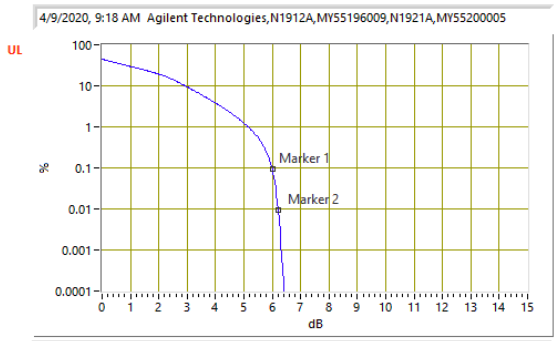
LTE B30 5MHz QPSK Middle Channel



LTE B30 5MHz 16QAM Middle Channel



LTE B30 10MHz QPSK Middle Channel



LTE B30 10MHz 16QAM Middle Channel

8.5.11. LTE BAND 41 AND 5G NR Band n41

Test Engineer ID: 39004 **Test Date:** 4/9/2020

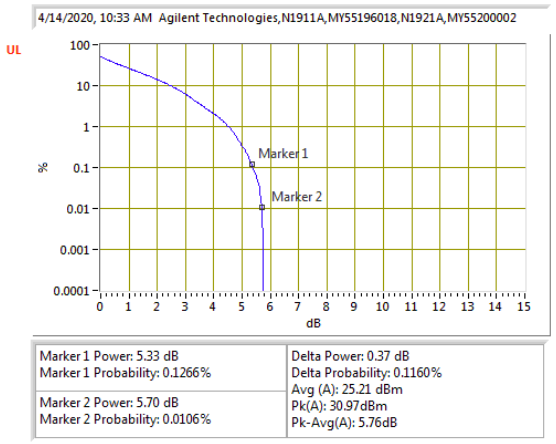
Band	Bandwidth (MHz)	Frequency (MHz)	RB Allocation	RB OffSet	Modulation	Conducted Power (dBm)		Peak-to-Average Power Ratio (dB)
						Peak	Average	
Band 41	5MHz	2593.0	25	0	QPSK	32.44	26.35	6.09
					16QAM	32.84	26.34	6.50
	10MHz		50	0	QPSK	33.04	26.19	6.85
					16QAM	33.11	26.32	6.79
	15MHz		75	0	QPSK	32.52	26.00	6.52
					16QAM	32.86	26.22	6.64
	20MHz		100	0	QPSK	32.97	26.33	6.64
					16QAM	33.06	26.47	6.59
Band n41	40MHz		100	0	QPSK	32.69	27.83	4.86
					16QAM	33.16	27.32	5.84
	50MHz		128	0	QPSK	32.72	28.05	4.67
					16QAM	33.22	27.64	5.58
	60MHz		162	0	QPSK	32.61	28.13	4.48
					16QAM	32.92	27.39	5.53
	80MHz		216	0	QPSK	32.61	28.53	4.08
					16QAM	32.95	27.74	5.21
	90MHz		240	0	QPSK	32.41	28.44	3.97
					16QAM	32.93	27.72	5.21
	100MHz		270	0	QPSK	32.25	28.4	3.85
					16QAM	32.72	27.61	5.11
Duty Cycle Correction Factor (dB) =			6.99					
Peak-to-Average Power Ratio= Peak Reading - Average Reading - Duty Cycle Correction Factor								

8.5.12. LTE BAND 48

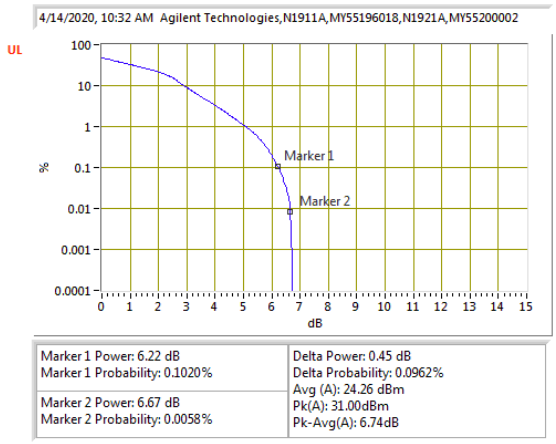
Test Engineer ID: 12482 **Test Date:** 8/2/2020

Band	Bandwidth (MHz)	Frequency (MHz)	RB Allocation	RB OffSet	Modulation	Conducted Power (dBm)		Peak-to-Average Power Ratio (dB)
						Peak	Average	
Band 48	5MHz	3625.0	25	0	QPSK	31.16	15.55	8.62
					16QAM	32.38	17.61	7.78
	10MHz		50	0	QPSK	31.45	18.56	5.90
					16QAM	30.57	17.8	5.78
	15MHz		75	0	QPSK	30.86	17.46	6.41
					16QAM	31.96	17.4	7.57
	20MHz		100	0	QPSK	30.65	17.38	6.28
					16QAM	31.24	17.33	6.92
Duty Cycle Correction Factor (dB) =			6.99					
Peak-to-Average Power Ratio= Peak Reading - Average Reading - Duty Cycle Correction Factor								

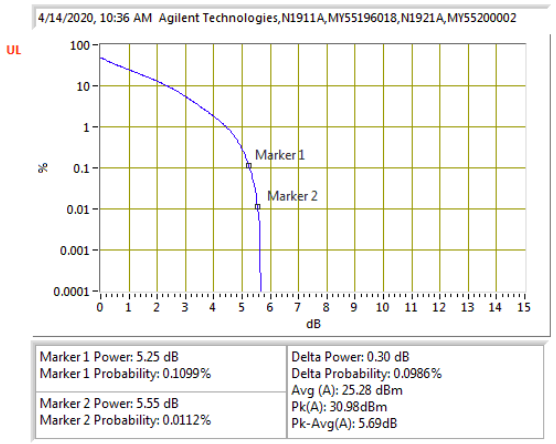
8.5.13. LTE BAND 66



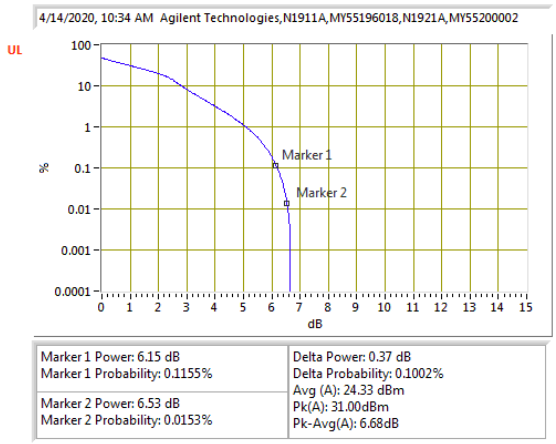
LTE B66 1.4MHz QPSK Middle Channel



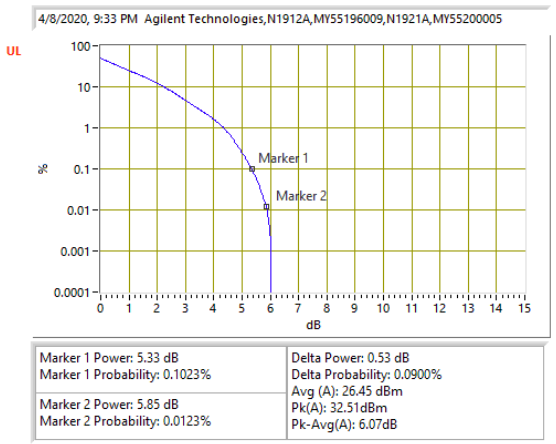
LTE B66 1.4MHz 16QAM Middle Channel



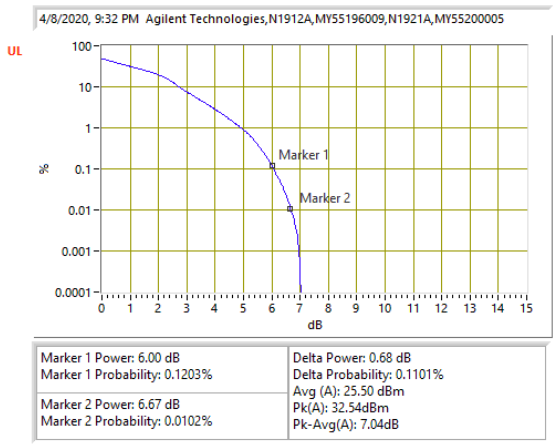
LTE B66 3MHz QPSK Middle Channel



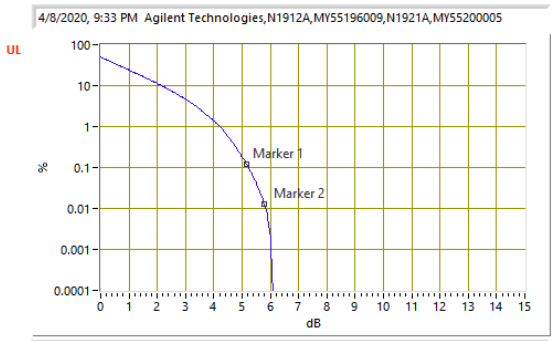
LTE B66 3MHz 16QAM Middle Channel



LTE B66 5MHz QPSK Middle Channel

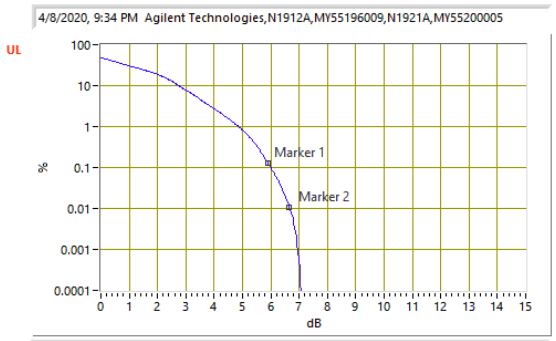


LTE B66 5MHz 16QAM Middle Channel



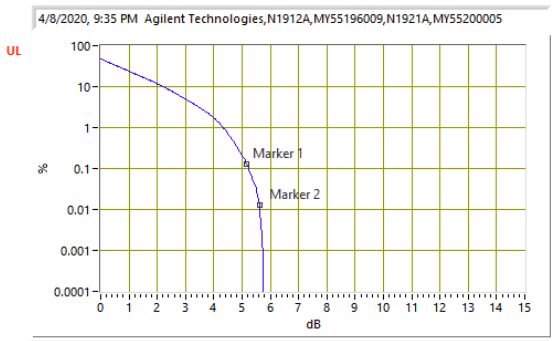
Marker 1 Power: 5.17 dB Marker 1 Probability: 0.1172%	Delta Power: 0.60 dB Delta Probability: 0.1034% Avg (A): 26.36 dBm Pk(A): 32.48dBm Pk-Avg(A): 6.12dB
Marker 2 Power: 5.78 dB Marker 2 Probability: 0.0138%	

LTE B66 10MHz QPSK Middle Channel



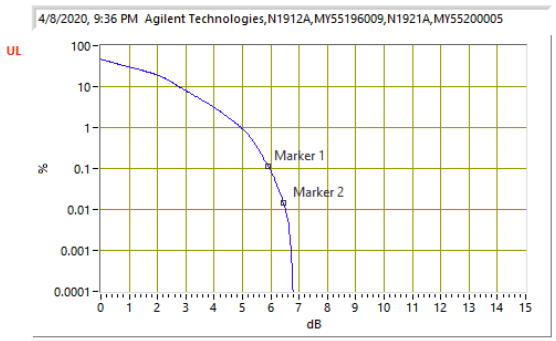
Marker 1 Power: 5.92 dB Marker 1 Probability: 0.1209%	Delta Power: 0.75 dB Delta Probability: 0.1107% Avg (A): 25.37 dBm Pk(A): 32.50dBm Pk-Avg(A): 7.13dB
Marker 2 Power: 6.67 dB Marker 2 Probability: 0.0102%	

LTE B66 10MHz 16QAM Middle Channel



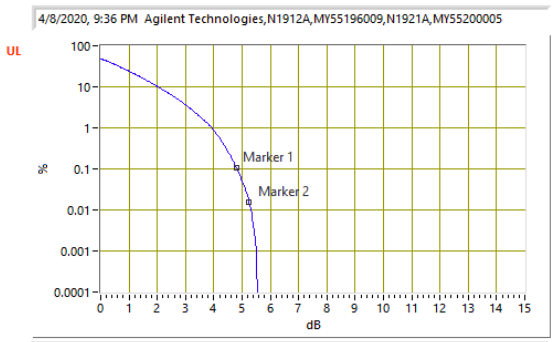
Marker 1 Power: 5.17 dB Marker 1 Probability: 0.1242%	Delta Power: 0.45 dB Delta Probability: 0.1135% Avg (A): 26.51 dBm Pk(A): 32.31dBm Pk-Avg(A): 5.80dB
Marker 2 Power: 5.62 dB Marker 2 Probability: 0.0107%	

LTE B66 15MHz QPSK Middle Channel



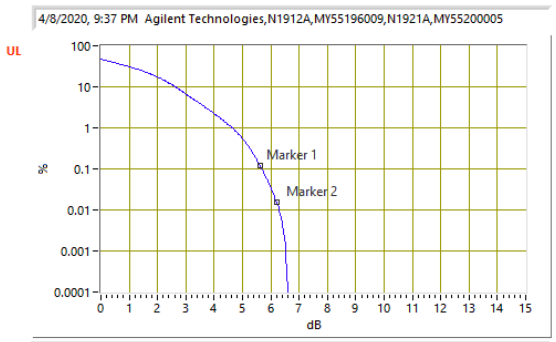
Marker 1 Power: 5.92 dB Marker 1 Probability: 0.1100%	Delta Power: 0.53 dB Delta Probability: 0.0955% Avg (A): 25.51 dBm Pk(A): 32.31dBm Pk-Avg(A): 6.80dB
Marker 2 Power: 6.45 dB Marker 2 Probability: 0.0145%	

LTE B66 15MHz 16QAM Middle Channel



Marker 1 Power: 4.80 dB Marker 1 Probability: 0.1090%	Delta Power: 0.45 dB Delta Probability: 0.0931% Avg (A): 26.47 dBm Pk(A): 32.06dBm Pk-Avg(A): 5.59dB
Marker 2 Power: 5.25 dB Marker 2 Probability: 0.0159%	

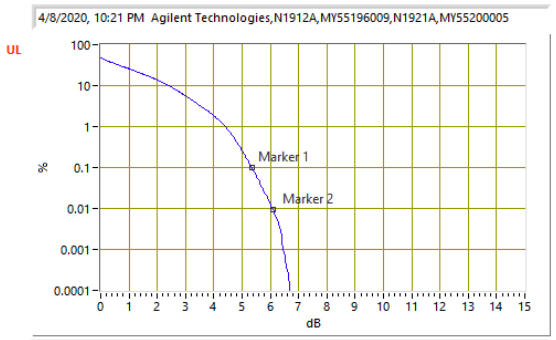
LTE B66 20MHz QPSK Middle Channel



Marker 1 Power: 5.62 dB Marker 1 Probability: 0.1181%	Delta Power: 0.60 dB Delta Probability: 0.1037% Avg (A): 25.48 dBm Pk(A): 32.15dBm Pk-Avg(A): 6.67dB
Marker 2 Power: 6.22 dB Marker 2 Probability: 0.0144%	

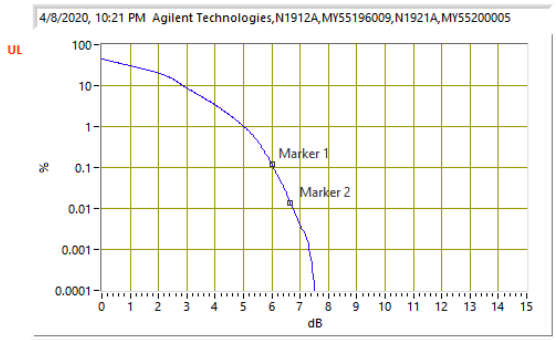
LTE B66 20MHz 16QAM Middle Channel

8.5.14. LTE BAND 71



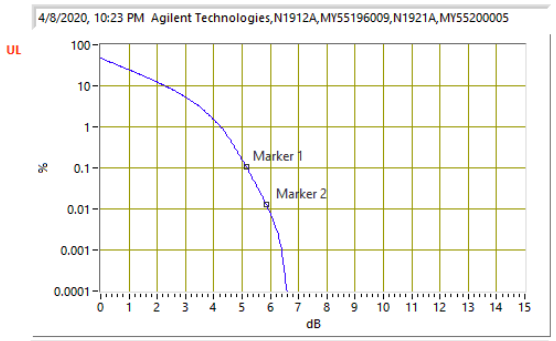
Marker 1 Power: 5.33 dB Marker 1 Probability: 0.1049%	Delta Power: 0.75 dB Delta Probability: 0.0948% Avg (A): 25.85 dBm Pk(A): 32.59dBm Pk-Avg(A): 6.74dB
Marker 2 Power: 6.08 dB Marker 2 Probability: 0.0101%	

LTE B71 5MHz QPSK Middle Channel



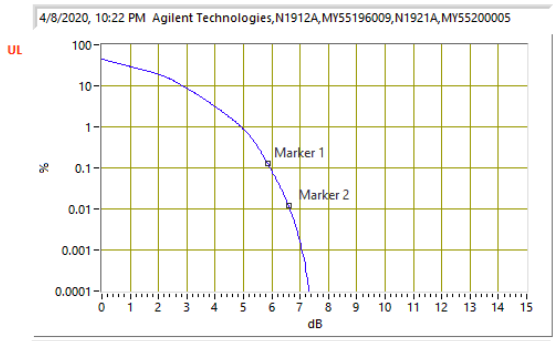
Marker 1 Power: 6.00 dB Marker 1 Probability: 0.1205%	Delta Power: 0.68 dB Delta Probability: 0.1077% Avg (A): 24.86 dBm Pk(A): 32.48dBm Pk-Avg(A): 7.62dB
Marker 2 Power: 6.67 dB Marker 2 Probability: 0.0128%	

LTE B71 5MHz 16QAM Middle Channel



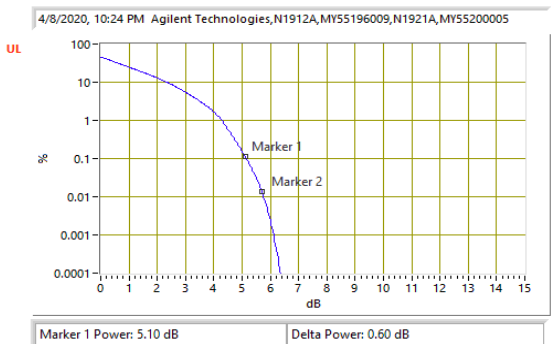
Marker 1 Power: 5.17 dB Marker 1 Probability: 0.1016%	Delta Power: 0.68 dB Delta Probability: 0.0886% Avg (A): 25.74 dBm Pk(A): 32.45dBm Pk-Avg(A): 6.71dB
Marker 2 Power: 5.85 dB Marker 2 Probability: 0.0130%	

LTE B71 10MHz QPSK Middle Channel



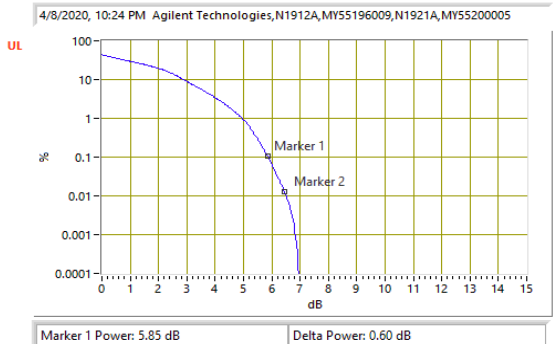
Marker 1 Power: 5.85 dB Marker 1 Probability: 0.1297%	Delta Power: 0.75 dB Delta Probability: 0.1178% Avg (A): 24.72 dBm Pk(A): 32.13dBm Pk-Avg(A): 7.41dB
Marker 2 Power: 6.60 dB Marker 2 Probability: 0.0120%	

LTE B71 10MHz 16QAM Middle Channel



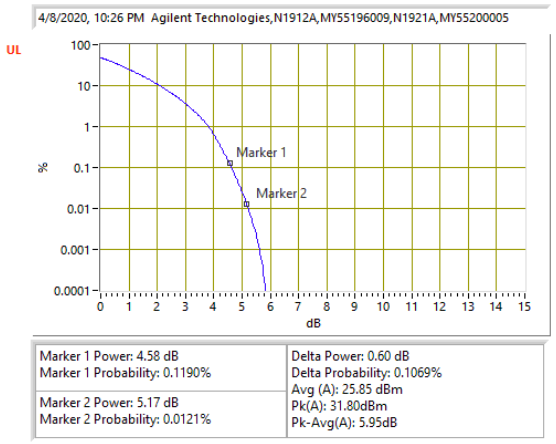
Marker 1 Power: 5.10 dB Marker 1 Probability: 0.1167%	Delta Power: 0.60 dB Delta Probability: 0.1027% Avg (A): 25.89 dBm Pk(A): 32.37dBm Pk-Avg(A): 6.48dB
Marker 2 Power: 5.70 dB Marker 2 Probability: 0.0139%	

LTE B71 15MHz QPSK Middle Channel

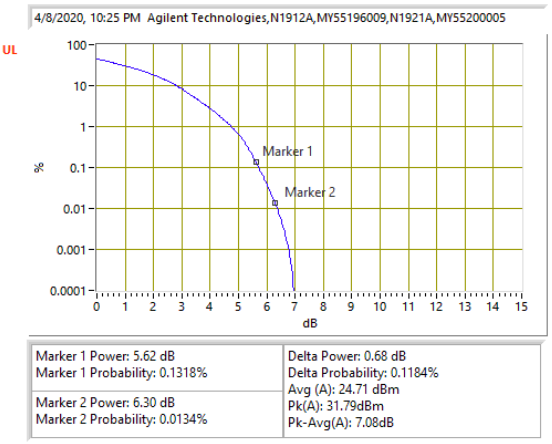


Marker 1 Power: 5.85 dB Marker 1 Probability: 0.1076%	Delta Power: 0.60 dB Delta Probability: 0.0949% Avg (A): 24.90 dBm Pk(A): 31.97dBm Pk-Avg(A): 7.07dB
Marker 2 Power: 6.45 dB Marker 2 Probability: 0.0128%	

LTE B71 15MHz 16QAM Middle Channel



LTE B71 20MHz QPSK Middle Channel



LTE B71 20MHz 16QAM Middle Channel

8.5.15. 5G NR Band n77

Test Engineer ID: 19171 **Test Date:** 8/19/2020

Band	Bandwidth (MHz)	Frequency (MHz)	RB Allocation	RB OffSet	Modulation	Conducted Power (dBm)		Peak-to-Average Power Ratio (dB)
						Peak	Average	
n77	20MHz	3840.0	50	0	QPSK	31.03	24.74	6.29
					16QAM	31.36	23.96	7.40
	40MHz		100	0	QPSK	30.96	24.95	6.01
					16QAM	30.24	23.63	6.61
	50MHz		128	0	QPSK	30.25	25.25	5.00
					16QAM	30.25	24.15	6.10
	60MHz		162	0	QPSK	29.72	24.89	4.83
					16QAM	30.12	23.89	6.23
	80MHz		216	0	QPSK	29.31	24.7	4.61
					16QAM	29.57	23.65	5.92
	90MHz		240	0	QPSK	28.98	24.46	4.52
					16QAM	28.94	23.42	5.52
	100MHz		270	0	QPSK	28.51	24.28	4.23
					16QAM	28.69	23.32	5.37
Duty Cycle Correction Factor (dB) =								
Peak-to-Average Power Ratio= Peak Reading - Average Reading - Duty Cycle Correction Factor								

9. RADIATED TEST RESULTS

Radiated measurement using the Field Strength Method

Using the test configuration shown in Figure 6 below, We measure the radiated emissions directly from the EUT and convert the measured field strength or received power to ERP or EIRP, as required, for comparison to the applicable limits. As stated in 5.5.1 of ANSI C63.26-2015, the field strength measurement method using a test site validated to the requirements of ANSI C63.4 is an alternative to the substitution measurement method.

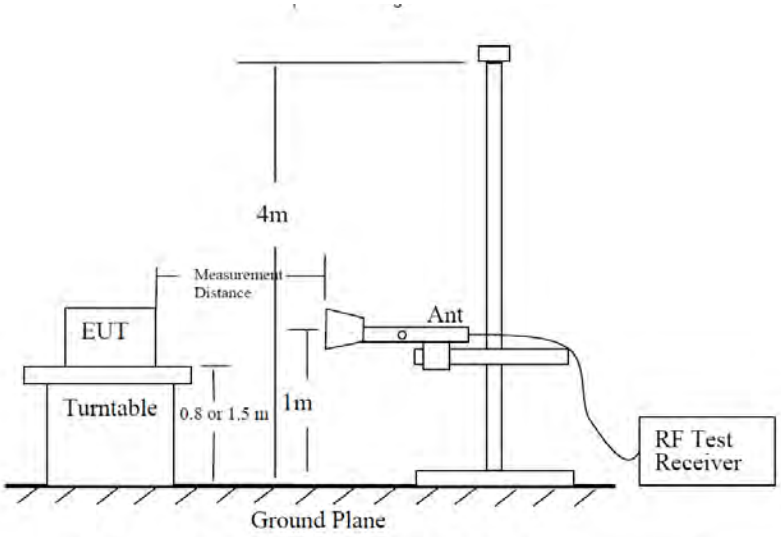


Figure 6—Test site-up for radiated ERP and/or EIRP measurements

Radiated Power Measurement Calculation According to ANSI C63.26-2015

a) E (dBμV/m) = Measured amplitude level (dBμV) + Cable Loss (dB) + Antenna Factor (dB/m).

b) E (dBμV/m) = Measured amplitude level (dBm) + 107 + Cable Loss (dB) + Antenna Factor (dB/m).

c) E (dBμV/m) = EIRP (dBm) − 20log(D) + 104.8; where D is the measurement distance (in the far field region) in m.

d) EIRP (dBm) = E (dBμV/m) + 20log(D) − 104.8; where D is the measurement distance (in the far field region) in m.

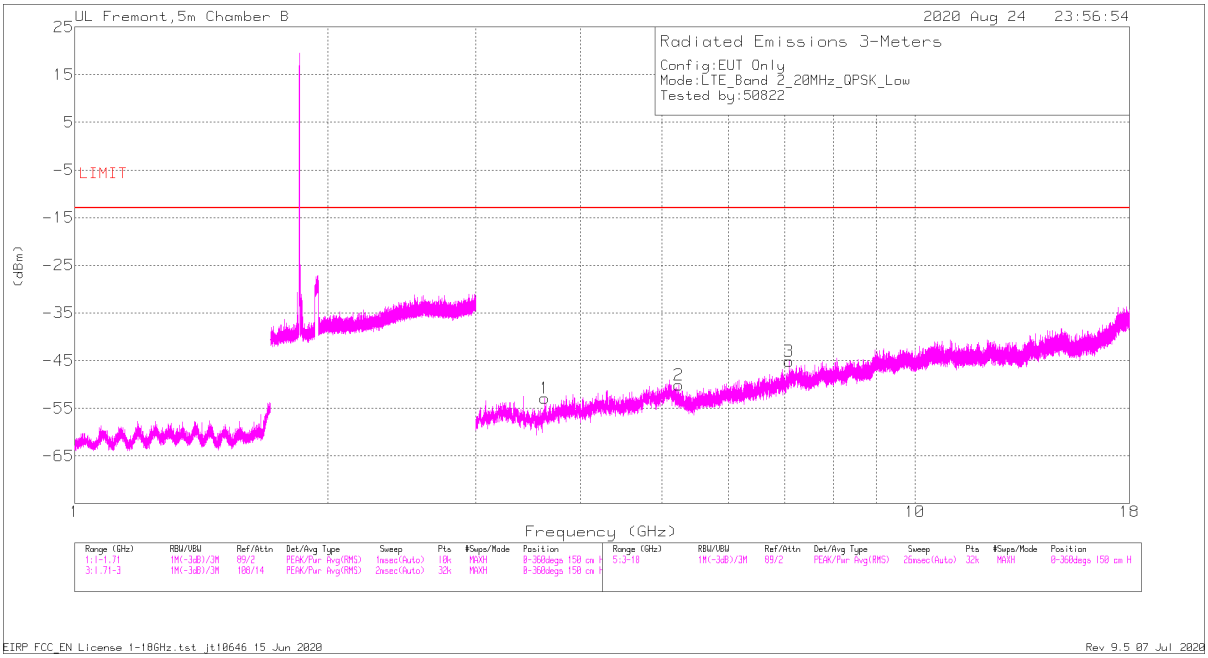
So, from d)

The measuring distance is usually at 3m, then 20*Log(3)=9.5424

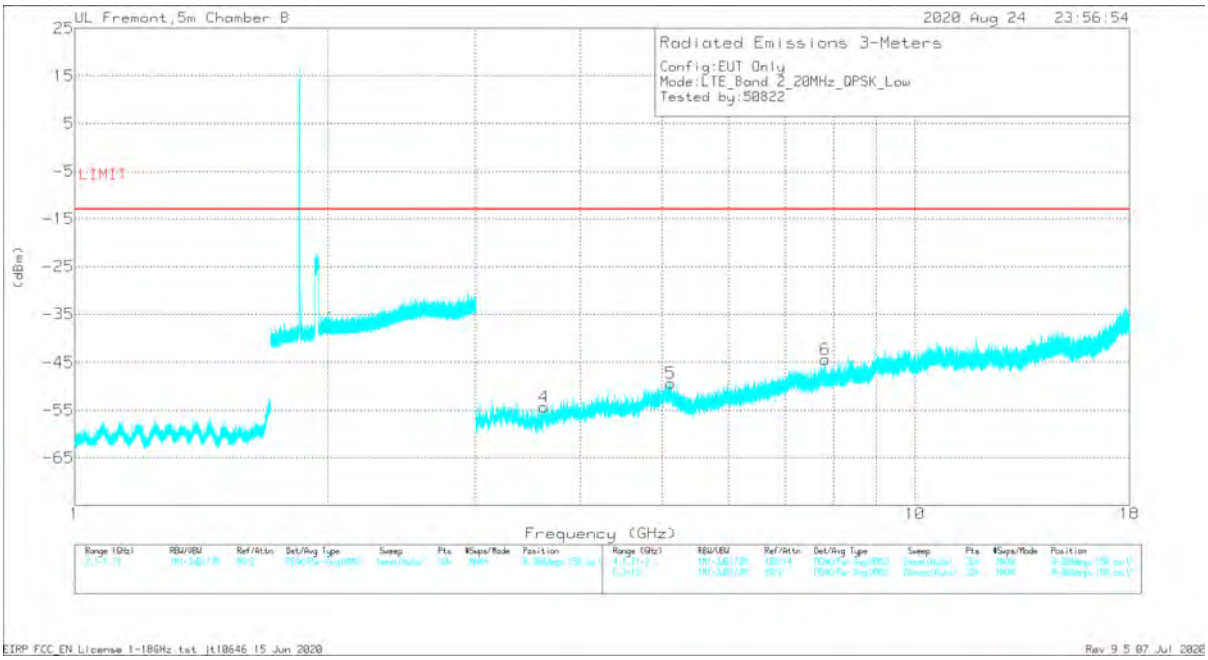
Then, EIRP (dBm) = E (dBμV/m) + 9.5424 − 104.8 = E (dBμV/m) – 95.2576

Note that: we do confidence check to our chambers every day to see if any degradation from expected/normal reading reference data. Also we do ambient check to all our chambers every month.

9.1. Example Plot



Horizontal Polarity



Vertical Polarity

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T962 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	EIRP CF	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
4	3.61781	37.92	Pk	30.1	-27.1	-95.2	-54.28	-13	-41.28	V
1	3.62531	39.45	Pk	30.1	-27.2	-95.2	-52.85	-13	-39.85	H
5	5.12109	36.64	Pk	33.9	-24.7	-95.2	-49.36	-13	-36.36	V
2	5.23969	38.02	Pk	33.5	-26.4	-95.2	-50.08	-13	-37.08	H
3	7.08797	36.42	Pk	36.7	-23.1	-95.2	-45.18	-13	-32.18	H
6	7.82625	35.83	Pk	37.3	-22.3	-95.2	-44.37	-13	-31.37	V

Pk - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T962 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	EIRP CF	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
3.61468	39.27	Pk	30.1	-27.2	-95.2	-53.03	-13	-40.03	V
3.62443	39.05	Pk	30.1	-27.2	-95.2	-53.25	-13	-40.25	H
5.12547	37.13	Pk	33.8	-24.8	-95.2	-49.07	-13	-36.07	V
5.24135	38.07	Pk	33.5	-26.4	-95.2	-50.03	-13	-37.03	H
7.09205	36.44	Pk	36.6	-23	-95.2	-45.16	-13	-32.16	H
7.83003	34.99	Pk	37.3	-22.4	-95.2	-45.31	-13	-32.31	V

Pk - Peak detector

EIRP FCC_EN License 1-18GHz.tst jt10646 15 Jun 2020

Rev 9.5 07 Jul 2020

9.2. FIELD STRENGTH OF SPURIOUS RADIATION, ANT1

TEST PROCEDURE

KDB 971168 D01 v03r01/D02 v02/r01

All tests above 1GHz were done with a Resolution Bandwidth of 1MHz, and a Video Bandwidth of 3MHz.

All tests below 1GHz were done with a Resolution Bandwidth of 100kHz, and a Video Bandwidth of 300kHz.

RESULTS

Both QPSK and 16QAM modes are tested, widest QPSK bandwidths results are reported as worst case

9.2.1. LTE BAND 2

LIMITS

FCC: §24.238(a)
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.

QPSK LTE BAND 2 (20.0MHZ BANDWIDTH)

Project #:	13179116
Date:	4/23/2020
Test Engineer:	20792
Configuration:	EUT only
Mode	LTE2 QPSK 20MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 1860MHz									
3.61468	39.27	Pk	30.1	-27.2	-95.2	-53.03	-13	-40.03	V
3.62443	39.05	Pk	30.1	-27.2	-95.2	-53.25	-13	-40.25	H
5.12547	37.13	Pk	33.8	-24.8	-95.2	-49.07	-13	-36.07	V
5.24135	38.07	Pk	33.5	-26.4	-95.2	-50.03	-13	-37.03	H
7.09205	36.44	Pk	36.6	-23	-95.2	-45.16	-13	-32.16	H
7.83003	34.99	Pk	37.3	-22.4	-95.2	-45.31	-13	-32.31	V
Mid Channel, 1880MHz									
3.72073	41.55	Pk	33.3	-29.9	-95.2	-50.25	-13	-37.25	H
3.72204	41.05	Pk	33.3	-29.9	-95.2	-50.75	-13	-37.75	V
5.64009	39.11	Pk	34.8	-28	-95.2	-49.29	-13	-36.29	V
5.642	39.44	Pk	34.9	-28	-95.2	-48.86	-13	-35.86	H
7.51804	36.45	Pk	35.7	-24.4	-95.2	-47.45	-13	-34.45	V
7.51974	36.58	Pk	35.7	-24.4	-95.2	-47.32	-13	-34.32	H
High Channel, 1900MHz									
3.77978	40.61	Pk	33.6	-30.1	-95.2	-51.09	-13	-38.09	V
3.78032	40.97	Pk	33.6	-30.1	-95.2	-50.73	-13	-37.73	H
5.6979	39.06	Pk	34.8	-28.3	-95.2	-49.64	-13	-36.64	V
5.70072	40.06	Pk	34.9	-28.2	-95.2	-48.44	-13	-35.44	H
7.59882	36.64	Pk	35.7	-24.5	-95.2	-47.36	-13	-34.36	V
7.60112	37.56	Pk	35.8	-24.6	-95.2	-46.44	-13	-33.44	H

9.2.3. LTE BAND 5 AND 5G NR Band n5

LIMITS

FCC: §22.917(a)
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.

QPSK LTE BAND 5 (10.0MHZ BANDWIDTH)

Project #:	13179116
Date:	4/24/2020
Test Engineer:	20792
Configuration:	EUT only
Mode	LTE5 QPSK 10MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 829MHz									
1.66442	41.81	Pk	28.7	-32.8	-95.2	-57.49	-13	-44.49	V
1.66507	54.65	Pk	28.7	-32.8	-95.2	-44.65	-13	-31.65	H
2.48513	41.64	Pk	32.6	-32	-95.2	-52.96	-13	-39.96	H
2.49518	41.08	Pk	32.6	-31.9	-95.2	-53.42	-13	-40.42	V
3.32077	40.64	Pk	32.8	-30.7	-95.2	-52.46	-13	-39.46	V
3.32088	39.59	Pk	32.8	-30.7	-95.2	-53.51	-13	-40.51	H
Mid Channel, 836.5MHz									
1.66835	41.7	Pk	28.8	-32.8	-95.2	-57.5	-13	-44.5	V
1.66851	56.56	Pk	28.8	-32.8	-95.2	-42.64	-13	-29.64	H
2.50243	40.18	Pk	32.6	-31.9	-95.2	-54.32	-13	-41.32	V
2.50515	40.24	Pk	32.7	-31.8	-95.2	-54.06	-13	-41.06	H
3.33848	40.73	Pk	32.8	-30.8	-95.2	-52.47	-13	-39.47	H
3.34802	40.96	Pk	32.8	-30.7	-95.2	-52.14	-13	-39.14	V
High Channel, 844MHz									
1.68233	41.75	Pk	28.9	-32.8	-95.2	-57.35	-13	-44.35	V
1.68343	52.47	Pk	28.9	-32.8	-95.2	-46.63	-13	-33.63	H
2.52926	41.03	Pk	32.6	-31.8	-95.2	-53.37	-13	-40.37	V
2.53821	41.57	Pk	32.6	-31.7	-95.2	-52.73	-13	-39.73	H
3.37479	39.77	Pk	32.8	-30.7	-95.2	-53.33	-13	-40.33	V
3.3766	39.42	Pk	32.8	-30.7	-95.2	-53.68	-13	-40.68	H

QPSK 5G NR Band n5 (20.0MHZ BANDWIDTH)

Project #:	13179116
Date:	7/22/2020
Test Engineer:	20792
Configuration:	EUT only
Mode	5G NR Band n5 QPSK 20MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 834MHz									
1.66715	41.32	Pk	28.9	-32.2	-95.2	-56.48	-13	-43.48	V
1.66876	41.33	Pk	28.9	-32.2	-95.2	-56.47	-13	-43.47	H
2.50165	42.81	Pk	33.5	-31.3	-95.2	-49.59	-13	-36.59	H
2.50179	41.34	Pk	33.5	-31.3	-95.2	-51.06	-13	-38.06	V
3.33667	39.73	Pk	33	-30.2	-95.2	-52.07	-13	-39.07	H
3.33696	40.42	Pk	33	-30.2	-95.2	-51.38	-13	-38.38	V
Mid Channel, 836.5MHz									
1.67189	41.63	Pk	29	-32.2	-95.2	-56.07	-13	-43.07	V
1.67479	41.62	Pk	29	-32.2	-95.2	-56.08	-13	-43.08	H
2.50945	42.4	Pk	33.5	-31.4	-95.2	-50	-13	-37	V
2.50955	43.71	Pk	33.5	-31.4	-95.2	-48.69	-13	-35.69	H
3.34557	39.73	Pk	33	-30.1	-95.2	-51.97	-13	-38.97	V
3.34575	40.88	Pk	33	-30.1	-95.2	-50.82	-13	-37.82	H
High Channel, 839MHz									
1.6762	42.23	Pk	29	-32.2	-95.2	-55.47	-13	-42.47	V
1.67833	42.12	Pk	28.9	-32.2	-95.2	-55.68	-13	-42.68	H
2.51673	46.56	Pk	33.5	-31.4	-95.2	-45.74	-13	-32.74	H
2.51754	41.27	Pk	33.5	-31.3	-95.2	-50.93	-13	-37.93	V
3.35616	40.13	Pk	33	-30.1	-95.2	-51.57	-13	-38.57	V
3.35636	40.2	Pk	33	-30.1	-95.2	-51.5	-13	-38.5	H

9.2.4. LTE BAND 7

LIMITS

FCC: §27.53 (m)
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.

QPSK LTE BAND 7 (20.0MHZ BANDWIDTH)

Project #:	13179116
Date:	4/24/2020
Test Engineer:	50822
Configuration:	EUT only
Mode	LTE7 QPSK 20MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 2510MHz									
5.02753	40.01	Pk	34.3	-28.8	-95.2	-49.69	-25	-24.69	V
5.03029	40.1	Pk	34.3	-28.8	-95.2	-49.6	-25	-24.6	H
7.53056	37.13	Pk	35.8	-24.6	-95.2	-46.87	-25	-21.87	H
7.53469	36.35	Pk	35.8	-24.6	-95.2	-47.65	-25	-22.65	V
10.04494	34.89	Pk	37.1	-22.1	-95.2	-45.31	-25	-20.31	H
10.13111	36.2	Pk	37.2	-22	-95.2	-43.8	-25	-18.8	V
Mid Channel, 2535MHz									
5.06923	39.41	Pk	34.3	-28.6	-95.2	-50.09	-25	-25.09	H
5.08552	39.5	Pk	34.4	-28.6	-95.2	-49.9	-25	-24.9	V
7.60605	37.17	Pk	35.8	-24.6	-95.2	-46.83	-25	-21.83	H
7.66324	36.81	Pk	35.8	-24.3	-95.2	-46.89	-25	-21.89	V
10.11515	36.15	Pk	37.2	-22.1	-95.2	-43.95	-25	-18.95	V
10.12988	35.67	Pk	37.2	-22	-95.2	-44.33	-25	-19.33	H
High Channel, 2560MHz									
5.11024	38.77	Pk	34.4	-28.7	-95.2	-50.73	-25	-25.73	V
5.13682	39.73	Pk	34.6	-28.5	-95.2	-49.37	-25	-24.37	H
7.69142	36.03	Pk	35.8	-23.8	-95.2	-47.17	-25	-22.17	H
7.74522	36.43	Pk	35.9	-24.1	-95.2	-46.97	-25	-21.97	V
10.25096	35.47	Pk	37.4	-21.6	-95.2	-43.93	-25	-18.93	H
10.29732	36.07	Pk	37.3	-21.5	-95.2	-43.33	-25	-18.33	V

9.2.5. LTE BAND 12 AND 5G NR Band n12

LIMITS

FCC: §27.53 (g)
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.

QPSK LTE BAND 12 (10.0MHZ BANDWIDTH)

Project #:	13179116
Date:	4/24/2020
Test Engineer:	20792
Configuration:	EUT only
Mode	LTE12 QPSK 10MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 704MHz									
1.40629	42.03	Pk	28.8	-33.1	-95.2	-57.47	-13	-44.47	H
1.40973	42.41	Pk	28.7	-33.1	-95.2	-57.19	-13	-44.19	V
2.11334	41.27	Pk	31.7	-32.2	-95.2	-54.43	-13	-41.43	V
2.11368	40.18	Pk	31.7	-32.2	-95.2	-55.52	-13	-42.52	H
2.81703	40.69	Pk	32.5	-31.3	-95.2	-53.31	-13	-40.31	H
2.81713	39.88	Pk	32.5	-31.3	-95.2	-54.12	-13	-41.12	V
Mid Channel, 707.5MHz									
1.41358	41.36	Pk	28.7	-33.1	-95.2	-58.24	-13	-45.24	H
1.41526	43.29	Pk	28.6	-33.1	-95.2	-56.41	-13	-43.41	V
2.12337	40.35	Pk	31.7	-32.2	-95.2	-55.35	-13	-42.35	H
2.12455	42.13	Pk	31.7	-32.2	-95.2	-53.57	-13	-40.57	V
2.82943	41.64	Pk	32.4	-31.2	-95.2	-52.36	-13	-39.36	H
2.8315	40.56	Pk	32.4	-31.2	-95.2	-53.44	-13	-40.44	V
High Channel, 711MHz									
1.42084	44.36	Pk	28.6	-33	-95.2	-55.24	-13	-42.24	V
1.42875	43.76	Pk	28.5	-33	-95.2	-55.94	-13	-42.94	H
2.13463	41.3	Pk	31.7	-32.1	-95.2	-54.3	-13	-41.3	V
2.14262	40.49	Pk	31.7	-32	-95.2	-55.01	-13	-42.01	H
2.83383	41.29	Pk	32.4	-31.2	-95.2	-52.71	-13	-39.71	V
2.8349	40.01	Pk	32.4	-31.2	-95.2	-53.99	-13	-40.99	H

QPSK 5G NR Band n12 (15.0MHZ BANDWIDTH)

Project #:	13179116
Date:	7/20/2020
Test Engineer:	30606
Configuration:	EUT only
Mode	5G NR Band n12 QPSK 10MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	HPF 1.2GHz T1737 1- 18GHz	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel,706.5MHz										
1.42067	41.8	Pk	29	-32.6	.9	-95.2	-56.1	-13	-43.1	H
1.43191	41.49	Pk	29	-32.5	.9	-95.2	-56.31	-13	-43.31	V
2.09945	40.76	Pk	31.9	-31.8	.5	-95.2	-53.84	-13	-40.84	H
2.10932	40.7	Pk	31.7	-31.9	.5	-95.2	-54.2	-13	-41.2	V
2.818	40.96	Pk	32.6	-30.7	.6	-95.2	-51.74	-13	-38.74	H
2.82605	40.45	Pk	32.6	-30.6	.7	-95.2	-52.05	-13	-39.05	V
Mid Channel, 707.5MHz										
1.4085	41.65	Pk	29.1	-32.7	.9	-95.2	-56.25	-13	-43.25	H
1.41462	42.67	Pk	29.1	-32.7	.9	-95.2	-55.23	-13	-42.23	V
2.12027	41.52	Pk	31.6	-31.7	.5	-95.2	-53.28	-13	-40.28	H
2.1289	40.45	Pk	31.5	-31.5	.5	-95.2	-54.25	-13	-41.25	V
2.83486	40.1	Pk	32.5	-30.6	.7	-95.2	-52.5	-13	-39.5	H
1.4085	41.65	Pk	29.1	-32.7	.9	-95.2	-56.25	-13	-43.25	V
High Channel, 708.5MHz										
1.4148	42.03	Pk	29.1	-32.7	.9	-95.2	-55.87	-13	-42.87	H
1.41816	42.03	Pk	29.1	-32.6	.9	-95.2	-55.77	-13	-42.77	V
2.11478	41.75	Pk	31.7	-31.8	.5	-95.2	-53.05	-13	-40.05	H
2.11646	41.42	Pk	31.7	-31.8	.5	-95.2	-53.38	-13	-40.38	V
2.83381	40.36	Pk	32.5	-30.6	.7	-95.2	-52.24	-13	-39.24	H
2.83524	39.95	Pk	32.5	-30.6	.7	-95.2	-52.65	-13	-39.65	V

9.2.1. LTE BAND 13

LIMITS

FCC: §27.53
(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, and −80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth.

QPSK LTE BAND 13 (10.0MHZ BANDWIDTH)

Project #:	13179116
Date:	4/24/2020
Test Engineer:	20792
Configuration:	EUT Only
Mode	LTE 13 QPSK 10MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Mid Channel, 782MHz									
1.56219	41.94	Pk	28	-33	-95.2	-58.26	-40	-18.26	V
1.56395	44.54	Pk	28	-33	-95.2	-55.66	-40	-15.66	H
2.34059	39.83	Pk	31.8	-31.9	-95.2	-55.47	-13	-42.47	H
2.34371	41.18	Pk	31.9	-31.9	-95.2	-54.02	-13	-41.02	V
3.11919	40.26	Pk	33.1	-31	-95.2	-52.84	-13	-39.84	H
3.1275	39.38	Pk	33.1	-31	-95.2	-53.72	-13	-40.72	V

*** Emissions in the GPS band were wideband emissions therefore the -40dBm/MHz limit was used.**

9.2.2. LTE BAND 14

LIMITS

FCC: §90.543 Emission Limitations. (Band 14)
(e) For operations in the 758-768 MHz and the 788-798 MHz bands, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:
(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

QPSK LTE BAND 14 (10.0MHZ BANDWIDTH)

Project #:	13179116
Date:	4/27/2020
Test Engineer:	20792
Configuration:	EUT Only
Mode	LTE14 QPSK 10MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Mid Channel, 793MHz									
1.5857	41.47	Pk	28.1	-32.9	-95.2	-58.53	-40	-18.53	V
1.58734	41.89	Pk	28.1	-32.9	-95.2	-58.11	-40	-18.11	H
2.37501	42.18	Pk	32.2	-31.8	-95.2	-52.62	-13	-39.62	V
2.37933	40.93	Pk	32.2	-31.8	-95.2	-53.87	-13	-40.87	H
3.17054	40.43	Pk	32.9	-30.9	-95.2	-52.77	-13	-39.77	H
3.17059	40.7	Pk	32.9	-30.9	-95.2	-52.5	-13	-39.5	V

*** Emissions in the GPS band were wideband emissions therefore the -40dBm/MHz limit was used.**

9.2.3. LTE BAND 17

LIMITS

FCC: §27.53 (g)
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.

QPSK LTE BAND 17 (10.0MHZ BANDWIDTH)

Project #:	13179116
Date:	4/27/2020
Test Engineer:	20792
Configuration:	EUT Only
Mode	LTE 17 QPSK 10MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Mid Channel, 710MHz									
1.42048	41.79	Pk	28.6	-33	-95.2	-57.81	-13	-44.81	H
1.4217	42.27	Pk	28.6	-33	-95.2	-57.33	-13	-44.33	V
2.13461	42.12	Pk	31.7	-32.1	-95.2	-53.48	-13	-40.48	V
2.13582	41.94	Pk	31.7	-32.1	-95.2	-53.66	-13	-40.66	H
2.83499	40.59	Pk	32.4	-31.2	-95.2	-53.41	-13	-40.41	H
2.84043	40.98	Pk	32.4	-31.1	-95.2	-52.92	-13	-39.92	V

9.2.4. LTE BAND 25

LIMITS

FCC: §24.238(a)
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.

QPSK LTE BAND 25 (20.0MHZ BANDWIDTH)

Project #:	13179116
Date:	4/27/2020
Test Engineer:	20792
Configuration:	EUT Only
Mode	LTE 25 QPSK 20MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 1860MHz									
3.71195	40.43	Pk	33.3	-29.9	-95.2	-51.37	-13	-38.37	V
3.71478	40.99	Pk	33.3	-29.9	-95.2	-50.81	-13	-37.81	H
5.55452	38.97	Pk	34.8	-27.8	-95.2	-49.23	-13	-36.23	V
5.5915	39.28	Pk	34.9	-28	-95.2	-49.02	-13	-36.02	H
7.428	37.22	Pk	35.7	-24.9	-95.2	-47.18	-13	-34.18	V
7.45362	36.27	Pk	35.7	-24.6	-95.2	-47.83	-13	-34.83	H
Mid Channel, 1882.5MHz									
3.76124	40.38	Pk	33.6	-30.1	-95.2	-51.32	-13	-38.32	V
3.77551	40.74	Pk	33.6	-30.1	-95.2	-50.96	-13	-37.96	H
5.65985	38.77	Pk	34.9	-28	-95.2	-49.53	-13	-36.53	V
5.66745	38.25	Pk	34.8	-27.9	-95.2	-50.05	-13	-37.05	H
7.54663	36.2	Pk	35.8	-24.7	-95.2	-47.9	-13	-34.9	H
7.57733	36.7	Pk	35.7	-24.4	-95.2	-47.2	-13	-34.2	V
High Channel, 1905MHz									
3.8216	41.14	Pk	33.7	-30	-95.2	-50.36	-13	-37.36	V
3.82193	41.3	Pk	33.7	-30	-95.2	-50.2	-13	-37.2	H
5.73836	37.92	Pk	34.9	-28.1	-95.2	-50.48	-13	-37.48	H
5.76171	38.56	Pk	35	-28.2	-95.2	-49.84	-13	-36.84	V
7.62675	36.41	Pk	35.8	-24.2	-95.2	-47.19	-13	-34.19	H
7.64347	36.32	Pk	35.8	-24.1	-95.2	-47.18	-13	-34.18	V

9.2.5. LTE BAND 26 (PART 90S)

LIMITS

FCC: §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.

QPSK LTE BAND 26 (10.0MHZ BANDWIDTH)

Project #:	13179116
Date:	4/27/2020
Test Engineer:	20792
Configuration:	EUT Only
Mode	LTE 26 QPSK 10MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Mid Channel, 819MHz									
1.63948	43.07	Pk	28.6	-32.8	-95.2	-56.33	-13	-43.33	H
1.63996	42.91	Pk	28.6	-32.8	-95.2	-56.49	-13	-43.49	V
2.4527	41.69	Pk	32.5	-31.8	-95.2	-52.81	-13	-39.81	H
2.45778	41.11	Pk	32.5	-31.9	-95.2	-53.49	-13	-40.49	V
3.27457	40.29	Pk	32.9	-30.7	-95.2	-52.71	-13	-39.71	H
3.27529	40.37	Pk	32.9	-30.8	-95.2	-52.73	-13	-39.73	V

9.2.6. LTE BAND 30

LIMITS

FCC: §27.53 (a)
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.

QPSK LTE BAND 30 (10.0MHZ BANDWIDTH)

Project #:	13179116
Date:	4/28/2020
Test Engineer:	50822
Configuration:	EUT Only
Mode	LTE30 QPSK 10MHz
Chamber #:	Chamber I

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Mid Channel, 2310MHz									
4.63954	36.99	Pk	33.9	-27.7	-95.2	-52.01	-40	-12.01	H
6.92984	34.59	Pk	35.6	-24.7	-95.2	-49.71	-40	-9.71	H
9.24662	33.42	Pk	36.3	-21.7	-95.2	-47.18	-40	-7.18	H
4.63433	38.01	Pk	33.9	-27.7	-95.2	-50.99	-40	-10.99	V
6.92065	35.69	Pk	35.5	-24.8	-95.2	-48.81	-40	-8.81	V
9.25982	33.21	Pk	36.4	-21.7	-95.2	-47.29	-40	-7.29	V

9.2.7. LTE BAND 41 and 5G NR Band n41

LIMITS

FCC: §27.53 (m)
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.

QPSK LTE BAND 41 (20.0MHZ BANDWIDTH)

Project #:	13179116
Date:	4/23/2020
Test Engineer:	50822
Configuration:	EUT Only
Mode	LTE 41 QPSK 20MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 2506MHz									
4.91664	40.08	Pk	34.2	-29.3	-95.2	-50.22	-25	-25.22	H
4.94594	39.17	Pk	34.2	-29.2	-95.2	-51.03	-25	-26.03	V
7.53158	36.07	Pk	35.8	-24.6	-95.2	-47.93	-25	-22.93	H
7.5671	36.67	Pk	35.8	-24.5	-95.2	-47.23	-25	-22.23	V
10.0046	35.13	Pk	37	-21.8	-95.2	-44.87	-25	-19.87	H
10.01808	35.4	Pk	37	-21.9	-95.2	-44.7	-25	-19.7	V
Mid Channel, 2593MHz									
4.79886	40.47	Pk	34.3	-29.2	-95.2	-49.63	-25	-24.63	V
4.80355	40.39	Pk	34.3	-29.2	-95.2	-49.71	-25	-24.71	H
7.15859	36.33	Pk	36.2	-24.9	-95.2	-47.57	-25	-22.57	V
7.16623	36.82	Pk	36	-24.7	-95.2	-47.08	-25	-22.08	H
10.30264	34.83	Pk	37.4	-21.6	-95.2	-44.57	-25	-19.57	H
10.31578	35.25	Pk	37.4	-21.7	-95.2	-44.25	-25	-19.25	V
High Channel, 2680MHz									
5.37313	39	Pk	34.9	-28.7	-95.2	-50	-25	-25	H
5.39029	38.58	Pk	34.9	-28.8	-95.2	-50.52	-25	-25.52	V
8.01666	36.77	Pk	35.8	-24.1	-95.2	-46.73	-25	-21.73	V
8.06625	36.71	Pk	35.8	-24	-95.2	-46.69	-25	-21.69	H
10.70939	35.26	Pk	37.9	-21.3	-95.2	-43.34	-25	-18.34	V
10.72021	35.03	Pk	37.9	-21.4	-95.2	-43.67	-25	-18.67	H

QPSK 5G NR Band n41 (100.0MHZ BANDWIDTH)

Project #:	13179116
Date:	07/23/2020
Test Engineer:	30606
Configuration:	EUT Only
Mode	5G NR Band n41 QPSK 100MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 2546MHz									
5.17145	39.25	Pk	34.6	-27.8	-95.2	-48.45	-25	-23.45	V
5.17448	39.77	Pk	34.6	-27.8	-95.2	-47.93	-25	-22.93	H
7.76937	35.8	Pk	35.9	-23.5	-95.2	-46.7	-25	-21.7	V
7.79543	35.59	Pk	36	-23.4	-95.2	-46.61	-25	-21.61	H
10.36382	35.44	Pk	37.7	-20.2	-95.2	-41.46	-25	-16.46	H
10.37375	34.92	Pk	37.7	-20.2	-95.2	-41.98	-25	-16.98	V
Mid Channel, 2593MHz									
5.07884	39.5	Pk	34.4	-27.8	-95.2	-48.4	-25	-23.4	H
5.10783	38.96	Pk	34.5	-27.8	-95.2	-48.74	-25	-23.74	V
7.6202	36.91	Pk	35.9	-23.5	-95.2	-45.49	-25	-20.49	V
7.65557	36.81	Pk	35.8	-23.5	-95.2	-45.79	-25	-20.79	H
10.17815	35.31	Pk	37.5	-20.9	-95.2	-42.69	-25	-17.69	H
10.17907	35.78	Pk	37.5	-20.9	-95.2	-42.22	-25	-17.22	V
High Channel, 2640MHz									
5.28017	39.12	Pk	34.7	-27.9	-95.2	-48.98	-25	-23.98	V
5.28198	39.17	Pk	34.7	-28	-95.2	-49.03	-25	-24.03	H
7.91885	36.29	Pk	36.2	-23.4	-95.2	-45.91	-25	-20.91	V
7.91976	36.41	Pk	36.2	-23.4	-95.2	-45.79	-25	-20.79	H
10.55898	35.42	Pk	37.7	-20.5	-95.2	-41.88	-25	-16.88	H
10.55936	35.41	Pk	37.7	-20.5	-95.2	-41.89	-25	-16.89	V

9.2.8. LTE BAND 66

LIMITS

FCC: §27.53 (h)
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.

QPSK LTE BAND 66 (20.0MHZ BANDWIDTH)

Project #:	13179116
Date:	4/27/2020
Test Engineer:	50822
Configuration:	EUT Only
Mode	LTE 66 QPSK 20MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 1720MHz									
3.42585	37.66	Pk	32.7	-29.3	-95.2	-54.14	-13	-41.14	H
5.12649	36.55	Pk	34.4	-27.1	-95.2	-51.35	-13	-38.35	H
6.84248	34.79	Pk	35.6	-25.3	-95.2	-50.11	-13	-37.11	H
3.43295	37.98	Pk	32.7	-29.3	-95.2	-53.82	-13	-40.82	V
5.18397	36.74	Pk	34.4	-27	-95.2	-51.06	-13	-38.06	V
6.88821	34.74	Pk	35.5	-24.9	-95.2	-49.86	-13	-36.86	V
Mid Channel, 1745MHz									
3.49168	37.45	Pk	32.9	-28.9	-95.2	-53.75	-13	-40.75	H
5.24543	36.19	Pk	34.5	-26.9	-95.2	-51.41	-13	-38.41	H
6.98658	35.13	Pk	35.6	-24.8	-95.2	-49.27	-13	-36.27	H
3.46012	38.28	Pk	32.8	-29.2	-95.2	-53.32	-13	-40.32	V
5.23206	36.12	Pk	34.5	-26.7	-95.2	-51.28	-13	-38.28	V
6.9806	34.7	Pk	35.6	-24.9	-95.2	-49.8	-13	-36.8	V
High Channel, 1770MHz									
3.57048	-69.06	Pk	33	-28.5	11.2	-53.36	-13	-40.36	H
5.36534	-70.84	Pk	34.6	-26.8	12.2	-50.84	-13	-37.84	H
7.1404	-72.56	Pk	35.7	-24.5	11.7	-49.66	-13	-36.66	H
3.57762	-69.18	Pk	33.1	-28.5	11.5	-53.08	-13	-40.08	V
5.34559	-69.93	Pk	34.6	-26.7	12	-50.03	-13	-37.03	V
7.19184	-72.29	Pk	35.6	-24.7	11.6	-49.79	-13	-36.79	V

9.2.9. LTE BAND 71

LIMITS

FCC: §27.53 (g)
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.

QPSK LTE BAND 71 (20.0MHZ BANDWIDTH)

Project #:	13179116
Date:	4/27/2020
Test Engineer:	20792
Configuration:	EUT Only
Mode	LTE 71 QPSK 20MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 673.0MHz									
1.34537	41.26	Pk	29.3	-33.2	-95.2	-57.84	-13	-44.84	H
1.35413	41.42	Pk	29.6	-33.1	-95.2	-57.28	-13	-44.28	V
2.02101	43.35	Pk	31.7	-32.4	-95.2	-52.55	-13	-39.55	V
2.0232	42.93	Pk	31.7	-32.3	-95.2	-52.87	-13	-39.87	H
2.69067	41.41	Pk	32.4	-31.6	-95.2	-52.99	-13	-39.99	H
2.69553	41.17	Pk	32.4	-31.6	-95.2	-53.23	-13	-40.23	V
Mid Channel, 680.5MHz									
1.3727	42.71	Pk	29.4	-33.2	-95.2	-56.29	-13	-43.29	V
1.38281	42.14	Pk	29.3	-33.2	-95.2	-56.96	-13	-43.96	H
2.06153	40.94	Pk	31.6	-32.4	-95.2	-55.06	-13	-42.06	V
2.06998	41.1	Pk	31.7	-32.4	-95.2	-54.8	-13	-41.8	H
2.74571	40.56	Pk	32.4	-31.4	-95.2	-53.64	-13	-40.64	H
2.75395	40.36	Pk	32.5	-31.4	-95.2	-53.74	-13	-40.74	V
High Channel, 688.0MHz									
1.37054	42.42	Pk	29.5	-33.1	-95.2	-56.38	-13	-43.38	V
1.37263	42.15	Pk	29.4	-33.2	-95.2	-56.85	-13	-43.85	H
2.06787	41.83	Pk	31.7	-32.4	-95.2	-54.07	-13	-41.07	V
2.06879	41.41	Pk	31.7	-32.4	-95.2	-54.49	-13	-41.49	H
2.74603	40.05	Pk	32.4	-31.4	-95.2	-54.15	-13	-41.15	V
2.74949	40.32	Pk	32.4	-31.4	-95.2	-53.88	-13	-40.88	H

FIELD STRENGTH OF SPURIOUS RADIATION, ANT2

TEST PROCEDURE

KDB 971168 D01 v03r01/D02 v02/r01

All tests above 1GHz were done with a Resolution Bandwidth of 1MHz, and a Video Bandwidth of 3MHz.

RESULTS

Both QPSK and 16QAM modes are tested, widest QPSK bandwidths results are reported as worst case.

9.2.10. LTE BAND 2

LIMITS

FCC: §24.238(a)
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.

QPSK LTE BAND 2 (20.0MHZ BANDWIDTH)

Project #:	13179116
Date:	4/27/2020
Test Engineer:	50822
Configuration:	EUT only
Mode	LTE2 QPSK 20MHz
Chamber #:	Chamber i

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 1860MHz									
3.71617	37.53	Pk	33	-28.5	-95.2	-53.17	-13	-40.17	H
5.58556	36.47	Pk	35.2	-26.7	-95.2	-50.23	-13	-37.23	H
7.44266	34.5	Pk	35.6	-24.3	-95.2	-49.4	-13	-36.4	H
3.70899	38.18	Pk	33	-28.5	-95.2	-52.52	-13	-39.52	V
5.60255	36.56	Pk	35.2	-26.8	-95.2	-50.24	-13	-37.24	V
7.43765	34.76	Pk	35.6	-24.3	-95.2	-49.14	-13	-36.14	V
Mid Channel, 1880MHz									
3.75315	38.36	Pk	32.9	-28.4	-95.2	-52.34	-13	-39.34	H
5.65759	36.63	Pk	35.1	-26.8	-95.2	-50.27	-13	-37.27	H
7.52782	35.14	Pk	35.6	-23.9	-95.2	-48.36	-13	-35.36	H
3.75832	37.44	Pk	32.9	-28.4	-95.2	-53.26	-13	-40.26	V
5.56194	36.36	Pk	35.1	-26.7	-95.2	-50.44	-13	-37.44	V
7.55901	33.87	Pk	35.6	-23.8	-95.2	-49.53	-13	-36.53	V
High Channel, 1900MHz									
3.84824	37.48	Pk	33	-28.4	-95.2	-53.12	-13	-40.12	H
5.69362	36.3	Pk	34.9	-26.5	-95.2	-50.5	-13	-37.5	H
7.65136	34.73	Pk	35.6	-24.1	-95.2	-48.97	-13	-35.97	H
3.85188	38.02	Pk	33	-28.3	-95.2	-52.48	-13	-39.48	V
5.72022	36.71	Pk	35	-26.7	-95.2	-50.19	-13	-37.19	V
7.68796	34.51	Pk	35.6	-23.8	-95.2	-48.89	-13	-35.89	V

9.2.12. LTE BAND 5 AND 5G NR Band n5

LIMITS

FCC: §22.917(a)
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.

QPSK LTE BAND 5 (10.0MHZ BANDWIDTH)

Project #:	13179116
Date:	4/27/2020
Test Engineer:	20792
Configuration:	EUT only
Mode	LTE5 QPSK 10MHz
Chamber #:	Chamber I

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 829MHz									
1.65982	38.97	Pk	28.7	-31.6	-95.2	-59.13	-13	-46.13	H
2.48359	39.16	Pk	32.4	-30.5	-95.2	-54.14	-13	-41.14	H
3.31175	37.18	Pk	32.7	-29.3	-95.2	-54.62	-13	-41.62	H
1.65941	39.65	Pk	28.7	-31.6	-95.2	-58.45	-13	-45.45	V
2.48289	38.43	Pk	32.4	-30.5	-95.2	-54.87	-13	-41.87	V
3.31159	38.47	Pk	32.7	-29.3	-95.2	-53.33	-13	-40.33	V
Mid Channel, 836.5MHz									
1.6769	39.39	Pk	28.9	-31.6	-95.2	-58.51	-13	-45.51	H
2.50995	39.26	Pk	32.3	-30.1	-95.2	-53.74	-13	-40.74	H
3.34007	38.28	Pk	32.7	-29.2	-95.2	-53.42	-13	-40.42	H
1.66766	40.95	Pk	28.7	-31.6	-95.2	-57.15	-13	-44.15	V
2.51247	38.68	Pk	32.3	-30.1	-95.2	-54.32	-13	-41.32	V
3.3487	38.53	Pk	32.7	-29.2	-95.2	-53.17	-13	-40.17	V
High Channel, 844MHz									
1.68745	40.3	Pk	29.1	-31.6	-95.2	-57.4	-13	-44.4	H
2.53228	39.62	Pk	32.2	-30.1	-95.2	-53.48	-13	-40.48	H
3.37577	38.53	Pk	32.7	-29.2	-95.2	-53.17	-13	-40.17	H
1.68974	40.75	Pk	29.2	-31.6	-95.2	-56.85	-13	-43.85	V
2.53229	38.26	Pk	32.2	-30.1	-95.2	-54.84	-13	-41.84	V
3.37658	37.95	Pk	32.7	-29.3	-95.2	-53.85	-13	-40.85	V

QPSK 5G NR Band n5 (20.0MHZ BANDWIDTH)

Project #:	13179116
Date:	7/18/2020
Test Engineer:	19169
Configuration:	EUT only
Mode	5G NR Band n5 QPSK 20MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 834MHz									
1.64434	41.75	Pk	29.1	-32.5	-95.2	-56.15	-13	-43.15	H
1.64479	41.66	Pk	29.1	-32.5	-95.2	-56.24	-13	-43.24	V
2.46737	41.22	Pk	33.3	-31.4	-95.2	-51.58	-13	-38.58	V
2.46931	40.99	Pk	33.3	-31.4	-95.2	-51.81	-13	-38.81	H
3.29077	40.03	Pk	33	-30.1	-95.2	-51.47	-13	-38.47	V
3.29079	40.34	Pk	33	-30.1	-95.2	-51.16	-13	-38.16	H
Mid Channel, 836.5MHz									
1.673	41.78	Pk	29	-32.2	-95.2	-55.92	-13	-42.92	V
1.67494	41.49	Pk	29	-32.2	-95.2	-56.21	-13	-43.21	H
2.50877	40.37	Pk	33.5	-31.4	-95.2	-52.03	-13	-39.03	H
2.50957	40.61	Pk	33.5	-31.4	-95.2	-51.79	-13	-38.79	V
3.34611	40.56	Pk	33	-30.1	-95.2	-51.14	-13	-38.14	H
3.34697	39.9	Pk	33	-30.1	-95.2	-51.8	-13	-38.8	V
High Channel, 839MHz									
1.6763	41.66	Pk	29	-32.2	-95.2	-56.04	-13	-43.04	H
1.67937	41.49	Pk	28.9	-32.2	-95.2	-56.31	-13	-43.31	V
2.51684	40.26	Pk	33.5	-31.4	-95.2	-52.04	-13	-39.04	V
2.51821	40.55	Pk	33.5	-31.3	-95.2	-51.65	-13	-38.65	H
3.35562	39.81	Pk	33	-30.1	-95.2	-51.89	-13	-38.89	H
3.35689	40.09	Pk	33	-30.1	-95.2	-51.61	-13	-38.61	V

9.2.13. LTE BAND 7

LIMITS

FCC: §27.53 (m)
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.

QPSK LTE BAND 7 (20.0MHZ BANDWIDTH)

Project #:	13179116
Date:	4/27/2020
Test Engineer:	50822
Configuration:	EUT only
Mode	LTE7 QPSK 20MHz
Chamber #:	Chamber I

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 2510MHz									
5.11202	36.76	Pk	34.3	-26.9	-95.2	-51.04	-25	-26.04	H
7.66114	34.46	Pk	35.7	-23.9	-95.2	-48.94	-25	-23.94	H
10.26015	31.97	Pk	37.3	-20.3	-95.2	-46.23	-25	-21.23	H
5.1364	38.1	Pk	34.5	-27	-95.2	-49.6	-25	-24.6	V
7.7019	34.5	Pk	35.7	-23.8	-95.2	-48.8	-25	-23.8	V
10.33179	33.04	Pk	37.4	-20.2	-95.2	-44.96	-25	-19.96	V
Mid Channel, 2535MHz									
5.08182	36.65	Pk	34.4	-27	-95.2	-51.15	-25	-26.15	H
7.60624	35.38	Pk	35.7	-24.1	-95.2	-48.22	-25	-23.22	H
10.14846	31.89	Pk	37.1	-20.2	-95.2	-46.41	-25	-21.41	H
5.11738	36.29	Pk	34.4	-27.1	-95.2	-51.61	-25	-26.61	V
7.64603	34.36	Pk	35.6	-24.1	-95.2	-49.34	-25	-24.34	V
10.24602	31.99	Pk	37.3	-20.3	-95.2	-46.21	-25	-21.21	V
High Channel, 2560MHz									
5.12861	36.37	Pk	34.4	-27.1	-95.2	-51.53	-25	-26.53	H
7.69192	33.76	Pk	35.7	-23.8	-95.2	-49.54	-25	-24.54	H
10.25154	32.01	Pk	37.4	-20.4	-95.2	-46.19	-25	-21.19	H
5.12461	36.89	Pk	34.4	-27	-95.2	-50.91	-25	-25.91	V
7.6909	34.71	Pk	35.6	-23.8	-95.2	-48.69	-25	-23.69	V
10.26956	32.39	Pk	37.4	-20.5	-95.2	-45.91	-25	-20.91	V

9.2.14. LTE BAND 12 AND 5G NR Band n12

LIMITS

FCC: §27.53 (g)
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.

QPSK LTE BAND 12 (10.0MHZ BANDWIDTH)

Project #:	13179116
Date:	7/29/2020
Test Engineer:	50820
Configuration:	EUT only
Mode	5G NR Band n12 QPSK 15MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 704MHz									
1.40566	40.62	Pk	28.8	-32.2	-95.2	-57.98	-13	-44.98	H
2.11267	40.7	Pk	31.2	-30.9	-95.2	-54.2	-13	-41.2	H
2.81469	38.91	Pk	32.2	-29.8	-95.2	-53.89	-13	-40.89	H
1.39702	40.62	Pk	28.9	-32.3	-95.2	-57.98	-13	-44.98	V
2.10424	40.22	Pk	31.1	-30.8	-95.2	-54.68	-13	-41.68	V
2.82081	38.77	Pk	32.2	-29.8	-95.2	-54.03	-13	-41.03	V
Mid Channel, 707.5MHz									
1.41728	40.77	Pk	28.7	-32.1	-95.2	-57.83	-13	-44.83	H
2.1233	39.61	Pk	31.1	-31	-95.2	-55.49	-13	-42.49	H
2.85544	39.16	Pk	32.1	-29.8	-95.2	-53.74	-13	-40.74	H
1.40861	40.26	Pk	28.8	-32.2	-95.2	-58.34	-13	-45.34	V
2.10832	40.21	Pk	31.1	-30.9	-95.2	-54.79	-13	-41.79	V
2.82877	39.45	Pk	32.2	-29.9	-95.2	-53.45	-13	-40.45	V
High Channel, 711MHz									
1.41822	40.82	Pk	28.7	-32.1	-95.2	-57.78	-13	-44.78	H
2.13779	39.58	Pk	31.1	-30.8	-95.2	-55.32	-13	-42.32	H
2.83099	39.12	Pk	32.2	-30	-95.2	-53.88	-13	-40.88	H
1.41268	41.07	Pk	28.8	-32.2	-95.2	-57.53	-13	-44.53	V
2.11972	40.33	Pk	31.1	-31	-95.2	-54.77	-13	-41.77	V
2.82339	38.96	Pk	32.2	-29.9	-95.2	-53.94	-13	-40.94	V

QPSK 5G NR Band n12 (15.0MHZ BANDWIDTH)

Project #:	13179116
Date:	7/28/2020
Test Engineer:	30606
Configuration:	EUT only
Mode	5G NR Band n12 QPSK 10MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel,706.5MHz									
1.4082	42.16	Pk	29.1	-32.7	-95.2	-55.74	-13	-42.74	V
1.42017	41.62	Pk	29.1	-32.6	-95.2	-56.18	-13	-43.18	H
2.10735	40.78	Pk	31.7	-31.9	-95.2	-54.12	-13	-41.12	H
2.11386	41.53	Pk	31.7	-31.8	-95.2	-53.27	-13	-40.27	V
2.8188	40.13	Pk	32.6	-30.7	-95.2	-52.57	-13	-39.57	H
2.82818	41.11	Pk	32.5	-30.6	-95.2	-51.49	-13	-38.49	V
Mid Channel, 707.5MHz									
1.41186	41.52	Pk	29.1	-32.7	-95.2	-56.38	-13	-43.38	H
1.41807	41.34	Pk	29.1	-32.6	-95.2	-56.46	-13	-43.46	V
2.12295	45.98	Pk	31.6	-31.7	-95.2	-48.82	-13	-35.82	H
2.12365	42.4	Pk	31.6	-31.7	-95.2	-52.4	-13	-39.4	V
2.83107	40.87	Pk	32.5	-30.6	-95.2	-51.73	-13	-38.73	H
2.83331	40.01	Pk	32.5	-30.6	-95.2	-52.59	-13	-39.59	V
High Channel, 708.5MHz									
1.40809	41.54	Pk	29.1	-32.7	-95.2	-56.36	-13	-43.36	V
1.40985	41.6	Pk	29.1	-32.7	-95.2	-56.3	-13	-43.3	H
2.1096	41.03	Pk	31.7	-31.9	-95.2	-53.87	-13	-40.87	V
2.11382	40.58	Pk	31.7	-31.8	-95.2	-54.22	-13	-41.22	H
2.82644	42.32	Pk	32.6	-30.6	-95.2	-50.18	-13	-37.18	V
2.8388	40.2	Pk	32.5	-30.6	-95.2	-52.4	-13	-39.4	H

9.2.15. LTE BAND 13

LIMITS

FCC: §27.53
(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, and −80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth.

QPSK LTE BAND 13 (10.0MHZ BANDWIDTH)

Project #:	13179116
Date:	4/28/2020
Test Engineer:	20792
Configuration:	EUT only
Mode	LTE13 QPSK 10MHz
Chamber #:	Chamber I

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Mid Channel, 782MHz									
1.56389	44.12	Pk	27.9	-31.7	-95.2	-54.88	-40	-14.88	H
2.34834	39.47	Pk	31.7	-30.7	-95.2	-54.73	-13	-41.73	H
3.13217	38.02	Pk	32.7	-29.3	-95.2	-53.78	-13	-40.78	H
1.56377	46.04	Pk	27.9	-31.7	-95.2	-52.96	-40	-12.96	V
2.34402	39.27	Pk	31.7	-30.6	-95.2	-54.83	-13	-41.83	V
3.12358	37.31	Pk	32.7	-29.3	-95.2	-54.49	-13	-41.49	V

9.2.16. LTE BAND 14

LIMITS

FCC: §90.543 Emission Limitations. (Band 14)
(e) For operations in the 758-768 MHz and the 788-798 MHz bands, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:
(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

QPSK LTE BAND 14 (10.0MHZ BANDWIDTH)

Project #:	13179116
Date:	4/28/2020
Test Engineer:	20792
Configuration:	EUT only
Mode	LTE14 QPSK 10MHz
Chamber #:	Chamber I

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Mid Channel, 793MHz									
1.59051	39.57	Pk	27.9	-31.8	-95.2	-59.53	-40	-19.53	H
2.37146	27.81	Pk	31.9	-30.7	-95.2	-66.19	-13	-53.19	H
3.1717	37.43	Pk	32.7	-28.9	-95.2	-53.97	-13	-40.97	H
1.58604	42.15	Pk	27.9	-31.8	-95.2	-56.95	-40	-16.95	V
2.37324	38.82	Pk	31.9	-30.5	-95.2	-54.98	-13	-41.98	V
3.16322	37.1	Pk	32.7	-28.9	-95.2	-54.3	-13	-41.3	V

9.2.17. LTE BAND 17

LIMITS

FCC: §27.53 (g)
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.

QPSK LTE BAND 17 (10.0MHZ BANDWIDTH)

Project #:	13179116
Date:	4/28/2020
Test Engineer:	20792
Configuration:	EUT only
Mode	LTE17 QPSK 10MHz
Chamber #:	Chamber I

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Mid Channel, 710MHz									
1.42337	40.13	Pk	28.6	-32.1	-95.2	-58.57	-13	-45.57	H
2.1361	39.64	Pk	31.1	-30.8	-95.2	-55.26	-13	-42.26	H
2.83937	39.05	Pk	32.2	-30	-95.2	-53.95	-13	-40.95	H
1.42117	41	Pk	28.6	-32.1	-95.2	-57.7	-13	-44.7	V
2.12772	38.21	Pk	31.2	-30.9	-95.2	-56.69	-13	-43.69	V
2.83711	38.47	Pk	32.2	-30.1	-95.2	-54.63	-13	-41.63	V

9.2.18. LTE BAND 25

LIMITS

FCC: §24.238(a)
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.

QPSK LTE BAND 25 (20.0MHZ BANDWIDTH)

Project #:	13179116
Date:	4/27/2020
Test Engineer:	50822
Configuration:	EUT only
Mode	LTE25 QPSK 20MHz
Chamber #:	Chamber I

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 1860MHz									
3.72539	38.59	Pk	32.9	-28.5	-95.2	-52.21	-13	-39.21	H
5.58674	37.08	Pk	35.2	-26.7	-95.2	-49.62	-13	-36.62	H
7.44095	34.92	Pk	35.6	-24.3	-95.2	-48.98	-13	-35.98	H
3.70149	38.31	Pk	33	-28.7	-95.2	-52.59	-13	-39.59	V
5.55508	36.4	Pk	35.1	-26.7	-95.2	-50.4	-13	-37.4	V
7.4159	35.26	Pk	35.6	-24.4	-95.2	-48.74	-13	-35.74	V
Mid Channel, 1882.5MHz									
3.76834	37.82	Pk	33	-28.2	-95.2	-52.58	-13	-39.58	H
5.64729	36.46	Pk	35.1	-26.5	-95.2	-50.14	-13	-37.14	H
7.53946	35.14	Pk	35.5	-24	-95.2	-48.56	-13	-35.56	H
3.77554	37.89	Pk	33	-28.3	-95.2	-52.61	-13	-39.61	V
5.67115	36.88	Pk	35	-26.7	-95.2	-50.02	-13	-37.02	V
7.58126	34.99	Pk	35.5	-24.2	-95.2	-48.91	-13	-35.91	V
High Channel, 1905MHz									
3.81522	37.81	Pk	32.9	-28.4	-95.2	-52.89	-13	-39.89	H
5.72448	36.36	Pk	34.9	-26.7	-95.2	-50.64	-13	-37.64	H
7.62499	34.61	Pk	35.7	-24.1	-95.2	-48.99	-13	-35.99	H
3.84399	38	Pk	33	-28.4	-95.2	-52.6	-13	-39.6	V
5.72848	36.35	Pk	34.9	-26.6	-95.2	-50.55	-13	-37.55	V
7.64014	35.03	Pk	35.6	-24.1	-95.2	-48.67	-13	-35.67	V

9.2.19. LTE BAND 26 (PART 90S)

LIMITS

FCC: §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.

QPSK LTE BAND 26 (10.0MHZ BANDWIDTH)

Project #:	13179116
Date:	4/27/2020
Test Engineer:	20792
Configuration:	EUT Only
Mode	LTE 26 QPSK 10MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Mid Channel, 819MHz									
1.63548	41.61	Pk	28.5	-32.8	-95.2	-57.89	-13	-44.89	V
1.63814	44.05	Pk	28.5	-32.8	-95.2	-55.45	-13	-42.45	H
2.45311	40.96	Pk	32.5	-31.8	-95.2	-53.54	-13	-40.54	V
2.46012	41.48	Pk	32.6	-31.9	-95.2	-53.02	-13	-40.02	H
3.26842	40.54	Pk	33	-30.7	-95.2	-52.36	-13	-39.36	V
3.27361	40.46	Pk	32.9	-30.7	-95.2	-52.54	-13	-39.54	H

9.2.20. LTE BAND 30

LIMITS

FCC: §27.53 (a)
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.

QPSK LTE BAND 30 (10.0MHZ BANDWIDTH)

Project #:	13179116
Date:	4/28/2020
Test Engineer:	50822
Configuration:	EUT Only
Mode:	LTE30 QPSK 10MHz
Chamber #:	Chamber I

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Mid Channel, 2310MHz									
3.51419	39.57	Pk	32.8	-28.7	-95.2	-51.53	-40	-11.53	H
5.24563	36.7	Pk	34.5	-26.9	-95.2	-50.9	-40	-10.9	H
6.98985	35.86	Pk	35.7	-24.8	-95.2	-48.44	-40	-8.44	H
3.49171	37.43	Pk	32.9	-28.9	-95.2	-53.77	-40	-13.77	V
5.23179	37.92	Pk	34.5	-26.7	-95.2	-49.48	-40	-9.48	V
6.96457	36.08	Pk	35.7	-24.8	-95.2	-48.22	-40	-8.22	V

9.2.21. LTE BAND 41 AND 5G NR Band n41

LIMITS

FCC: §27.53 (m)
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.

QPSK LTE BAND 41 (20.0MHZ BANDWIDTH)

Project #:	13179116
Date:	4/28/2020
Test Engineer:	50822
Configuration:	EUT Only
Mode	LTE 41 QPSK 20MHz
Chamber #:	Chamber I

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 2506MHz									
5.02098	36.8	Pk	34.2	-27.1	-95.2	-51.3	-25	-26.3	H
7.51802	34.45	Pk	35.5	-23.9	-95.2	-49.15	-25	-24.15	H
10.19117	31.34	Pk	37.2	-20.1	-95.2	-46.76	-25	-21.76	H
5.04987	36.26	Pk	34.4	-27	-95.2	-51.54	-25	-26.54	V
7.52966	34.52	Pk	35.6	-23.9	-95.2	-48.98	-25	-23.98	V
10.20796	32.24	Pk	37.3	-20.2	-95.2	-45.86	-25	-20.86	V
Mid Channel, 2593MHz									
4.51218	37.53	Pk	33.7	-27.5	-95.2	-51.47	-25	-26.47	H
7.77855	34.67	Pk	35.7	-23.8	-95.2	-48.63	-25	-23.63	H
10.37418	31.71	Pk	37.5	-20	-95.2	-45.99	-25	-20.99	H
4.50485	37.32	Pk	33.7	-27.4	-95.2	-51.58	-25	-26.58	V
7.79486	34.49	Pk	35.7	-23.6	-95.2	-48.61	-25	-23.61	V
10.37654	31.65	Pk	37.5	-20	-95.2	-46.05	-25	-21.05	V
High Channel, 2680MHz									
5.36397	37.27	Pk	34.6	-26.8	-95.2	-50.13	-25	-25.13	H
8.02934	34.14	Pk	35.8	-23	-95.2	-48.26	-25	-23.26	H
10.7293	32.23	Pk	37.9	-19.7	-95.2	-44.77	-25	-19.77	H
5.38784	36.45	Pk	34.6	-26.5	-95.2	-50.65	-25	-25.65	V
8.00997	34.32	Pk	35.8	-23.6	-95.2	-48.68	-25	-23.68	V
10.85192	31.8	Pk	37.9	-20.2	-95.2	-45.7	-25	-20.7	V

QPSK 5G NR Band n41 (100.0MHZ BANDWIDTH)

Project #:	13179116
Date:	7/23/202
Test Engineer:	30606
Configuration:	EUT Only
Mode	5G NR Band n41 FCC QPSK 100MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBm)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 2546MHz									
5.07884	39.5	Pk	34.4	-27.8	-95.2	-48.4	-25	-23.4	H
5.10783	38.96	Pk	34.5	-27.8	-95.2	-48.74	-25	-23.74	V
7.6202	36.91	Pk	35.9	-23.5	-95.2	-45.49	-25	-20.49	V
7.65557	36.81	Pk	35.8	-23.5	-95.2	-45.79	-25	-20.79	H
10.17815	35.31	Pk	37.5	-20.9	-95.2	-42.69	-25	-17.69	H
10.17907	35.78	Pk	37.5	-20.9	-95.2	-42.22	-25	-17.22	V
Mid Channel, 2593MHz									
5.17145	39.25	Pk	34.6	-27.8	-95.2	-48.45	-25	-23.45	V
5.17448	39.77	Pk	34.6	-27.8	-95.2	-47.93	-25	-22.93	H
7.76937	35.8	Pk	35.9	-23.5	-95.2	-46.7	-25	-21.7	V
7.79543	35.59	Pk	36	-23.4	-95.2	-46.61	-25	-21.61	H
10.36382	35.44	Pk	37.7	-20.2	-95.2	-41.46	-25	-16.46	H
10.37375	34.92	Pk	37.7	-20.2	-95.2	-41.98	-25	-16.98	V
High Channel, 2640MHz									
5.28017	39.12	Pk	34.7	-27.9	-95.2	-48.98	-25	-23.98	V
5.28198	39.17	Pk	34.7	-28	-95.2	-49.03	-25	-24.03	H
7.91885	36.29	Pk	36.2	-23.4	-95.2	-45.91	-25	-20.91	V
7.91976	36.41	Pk	36.2	-23.4	-95.2	-45.79	-25	-20.79	H
10.55898	35.42	Pk	37.7	-20.5	-95.2	-41.88	-25	-16.88	H
10.55936	35.41	Pk	37.7	-20.5	-95.2	-41.89	-25	-16.89	V

9.2.22. LTE BAND 66

LIMITS

FCC: §27.53 (h)
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.

QPSK LTE BAND 66 (20.0MHZ BANDWIDTH)

Project #:	13179116
Date:	4/28/2020
Test Engineer:	50822
Configuration:	EUT Only
Mode	LTE 66 QPSK 20MHz
Chamber #:	Chamber I

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 1720MHz									
3.42372	39.08	Pk	32.7	-29.2	-95.2	-52.62	-13	-39.62	H
5.18541	37.06	Pk	34.4	-27	-95.2	-50.74	-13	-37.74	H
6.81666	36.76	Pk	35.5	-25.1	-95.2	-48.04	-13	-35.04	H
3.4115	39.27	Pk	32.7	-29.3	-95.2	-52.53	-13	-39.53	V
5.19668	37.25	Pk	34.4	-27	-95.2	-50.55	-13	-37.55	V
6.78737	35.63	Pk	35.6	-25	-95.2	-48.97	-13	-35.97	V
Mid Channel, 1745MHz									
3.75396	38.49	Pk	32.9	-28.3	-95.2	-52.11	-13	-39.11	H
5.34742	37.27	Pk	34.6	-26.7	-95.2	-50.03	-13	-37.03	H
7.49108	35	Pk	35.6	-24	-95.2	-48.6	-13	-35.6	H
3.75964	38.52	Pk	32.9	-28.4	-95.2	-52.18	-13	-39.18	V
5.34076	37.73	Pk	34.6	-26.7	-95.2	-49.57	-13	-36.57	V
7.54843	34.63	Pk	35.6	-23.9	-95.2	-48.87	-13	-35.87	V
High Channel, 1770MHz									
3.55215	38.6	Pk	33	-28.4	-95.2	-52	-13	-39	H
5.35045	38.26	Pk	34.6	-26.7	-95.2	-49.04	-13	-36.04	H
7.1331	35.36	Pk	35.6	-24.5	-95.2	-48.74	-13	-35.74	H
3.56241	38.08	Pk	33	-28.5	-95.2	-52.62	-13	-39.62	V
5.33595	37.07	Pk	34.6	-26.7	-95.2	-50.23	-13	-37.23	V
7.18777	35.56	Pk	35.6	-24.6	-95.2	-48.64	-13	-35.64	V

9.2.23. LTE BAND 71

LIMITS

FCC: §27.53 (g)
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.

QPSK LTE BAND 71 (20.0MHZ BANDWIDTH)

Project #:	13179116
Date:	4/28/2020
Test Engineer:	20792
Configuration:	EUT Only
Mode	LTE 71 QPSK 20MHz
Chamber #:	Chamber I

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 673.0MHz									
1.3452	40.16	Pk	29.5	-32.3	-95.2	-57.84	-13	-44.84	H
2.02012	38.7	Pk	30.9	-30.9	-95.2	-56.5	-13	-43.5	H
2.69329	38.25	Pk	32.4	-29.9	-95.2	-54.45	-13	-41.45	H
1.34695	40.07	Pk	29.5	-32.3	-95.2	-57.93	-13	-44.93	V
2.01908	39.48	Pk	30.9	-31	-95.2	-55.82	-13	-42.82	V
2.69006	38.92	Pk	32.4	-30	-95.2	-53.88	-13	-40.88	V
Mid Channel, 680.5MHz									
1.36245	39.21	Pk	29.6	-32.2	-95.2	-58.59	-13	-45.59	H
2.04165	38.86	Pk	31	-30.9	-95.2	-56.24	-13	-43.24	H
2.72418	38.46	Pk	32.5	-30	-95.2	-54.24	-13	-41.24	H
1.36012	39.15	Pk	29.6	-32.3	-95.2	-58.75	-13	-45.75	V
2.04277	39.7	Pk	31	-30.9	-95.2	-55.4	-13	-42.4	V
2.72374	36.6	Pk	32.5	-30.1	-95.2	-56.2	-13	-43.2	V
High Channel, 688.0MHz									
1.37457	40.38	Pk	29.3	-32.3	-95.2	-57.82	-13	-44.82	H
2.06349	39.16	Pk	31.1	-31	-95.2	-55.94	-13	-42.94	H
2.75142	36.63	Pk	32.5	-30	-95.2	-56.07	-13	-43.07	H
1.37777	40	Pk	29.2	-32.3	-95.2	-58.3	-13	-45.3	V
2.06631	38.65	Pk	31.1	-31	-95.2	-56.45	-13	-43.45	V
2.75385	38.84	Pk	32.5	-30	-95.2	-53.86	-13	-40.86	V

9.3. FIELD STRENGTH OF SPURIOUS RADIATION, ANT3

TEST PROCEDURE

KDB 971168 D01 v03r01/D02 v02/r01

All tests above 1GHz were done with a Resolution Bandwidth of 1MHz, and a Video Bandwidth of 3MHz.

RESULTS

Both QPSK and 16QAM modes are tested, widest QPSK bandwidths results are reported as worst case.

9.3.1. LTE BAND 2

LIMITS

FCC: §24.238(a)
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.

QPSK LTE BAND 2 (20.0MHZ BANDWIDTH)

Project #:	13179116
Date:	4/30/2020
Test Engineer:	20792
Configuration:	EUT only
Mode	LTE2 QPSK 20MHz
Chamber #:	Chamber I

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 1860MHz									
3.72006	36.81	Pk	32.9	-28.4	-95.2	-53.89	-13	-40.89	H
5.58143	34.64	Pk	35.2	-26.7	-95.2	-52.06	-13	-39.06	H
7.44153	34.46	Pk	35.6	-24.3	-95.2	-49.44	-13	-36.44	H
3.72067	36.78	Pk	32.9	-28.4	-95.2	-53.92	-13	-40.92	V
5.57909	35.58	Pk	35.2	-26.7	-95.2	-51.12	-13	-38.12	V
7.43931	32.53	Pk	35.6	-24.3	-95.2	-51.37	-13	-38.37	V
Mid Channel, 1880MHz									
3.7613	37.18	Pk	33	-28.3	-95.2	-53.32	-13	-40.32	H
5.63969	36.02	Pk	35.1	-26.6	-95.2	-50.68	-13	-37.68	H
7.51915	33.22	Pk	35.5	-23.9	-95.2	-50.38	-13	-37.38	H
3.76138	36.81	Pk	33	-28.3	-95.2	-53.69	-13	-40.69	V
5.64031	35.7	Pk	35.1	-26.7	-95.2	-51.1	-13	-38.1	V
7.51888	33.51	Pk	35.5	-23.9	-95.2	-50.09	-13	-37.09	V
High Channel, 1900MHz									
3.79896	36.56	Pk	33	-28.3	-95.2	-53.94	-13	-40.94	H
5.69896	34.43	Pk	35	-26.6	-95.2	-52.37	-13	-39.37	H
7.60026	33.24	Pk	35.6	-24.1	-95.2	-50.46	-13	-37.46	H
3.80177	38.29	Pk	32.9	-28.3	-95.2	-52.31	-13	-39.31	V
5.69976	35.82	Pk	35	-26.6	-95.2	-50.98	-13	-37.98	V
7.59949	34.81	Pk	35.6	-24.1	-95.2	-48.89	-13	-35.89	V

9.3.3. LTE BAND 7

LIMITS

FCC: §27.53 (m)
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.

QPSK LTE BAND 7 (20.0MHZ BANDWIDTH)

Project #:	13179116
Date:	4/30/2020
Test Engineer:	50822
Configuration:	EUT only
Mode	LTE7 QPSK 20MHz
Chamber #:	Chamber i

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 2510MHz									
5.02791	36.09	Pk	34.3	-27	-95.2	-51.81	-25	-26.81	H
7.54374	33.77	Pk	35.6	-23.9	-95.2	-49.73	-25	-24.73	H
10.41617	31.97	Pk	37.6	-20.8	-95.2	-46.43	-25	-21.43	H
5.02454	36.95	Pk	34.2	-27	-95.2	-51.05	-25	-26.05	V
7.54952	33.78	Pk	35.6	-23.8	-95.2	-49.62	-25	-24.62	V
10.48594	32.6	Pk	37.7	-20.6	-95.2	-45.5	-25	-20.5	V
Mid Channel, 2535MHz									
5.07004	35.89	Pk	34.3	-27.1	-95.2	-52.11	-25	-27.11	H
7.16077	34.29	Pk	35.7	-24.5	-95.2	-49.71	-25	-24.71	H
11.42963	31.09	Pk	38.1	-20.3	-95.2	-46.31	-25	-21.31	H
5.03978	36.21	Pk	34.3	-26.8	-95.2	-51.49	-25	-26.49	V
7.21227	34.49	Pk	35.6	-24.8	-95.2	-49.91	-25	-24.91	V
11.47822	32.15	Pk	38.1	-20.3	-95.2	-45.25	-25	-20.25	V
High Channel, 2560MHz									
5.1297	35.93	Pk	34.4	-27.1	-95.2	-51.97	-25	-26.97	H
7.67378	33.93	Pk	35.6	-23.9	-95.2	-49.57	-25	-24.57	H
10.27626	31.63	Pk	37.3	-20.5	-95.2	-46.77	-25	-21.77	H
5.10013	35.54	Pk	34.4	-26.8	-95.2	-52.06	-25	-27.06	V
7.70277	34.13	Pk	35.7	-23.8	-95.2	-49.17	-25	-24.17	V
10.32803	31.72	Pk	37.4	-20.1	-95.2	-46.18	-25	-21.18	V

9.3.4. LTE BAND 25

LIMITS

FCC: §24.238(a)
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.

QPSK LTE BAND 25 (20.0MHZ BANDWIDTH)

Project #:	13179116
Date:	4/30/2020
Test Engineer:	20792
Configuration:	EUT only
Mode	LTE25 QPSK 20MHz
Chamber #:	Chamber I

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 1860MHz									
3.71988	37.35	Pk	32.9	-28.4	-95.2	-53.35	-13	-40.35	H
5.58222	36.29	Pk	35.2	-26.7	-95.2	-50.41	-13	-37.41	H
7.44286	34.27	Pk	35.6	-24.3	-95.2	-49.63	-13	-36.63	H
3.71962	36.92	Pk	32.9	-28.4	-95.2	-53.78	-13	-40.78	V
5.57876	36.42	Pk	35.2	-26.7	-95.2	-50.28	-13	-37.28	V
7.44222	33.98	Pk	35.6	-24.3	-95.2	-49.92	-13	-36.92	V
Mid Channel, 1882.5MHz									
3.71988	37.35	Pk	32.9	-28.4	-95.2	-53.35	-13	-40.35	H
5.58222	36.29	Pk	35.2	-26.7	-95.2	-50.41	-13	-37.41	H
7.44286	34.27	Pk	35.6	-24.3	-95.2	-49.63	-13	-36.63	H
3.71962	36.92	Pk	32.9	-28.4	-95.2	-53.78	-13	-40.78	V
5.57876	36.42	Pk	35.2	-26.7	-95.2	-50.28	-13	-37.28	V
7.44222	33.98	Pk	35.6	-24.3	-95.2	-49.92	-13	-36.92	V
High Channel, 1905MHz									
3.80984	36.51	Pk	32.9	-28.4	-95.2	-54.19	-13	-41.19	H
5.71695	35.59	Pk	35	-26.7	-95.2	-51.31	-13	-38.31	H
7.62053	33.08	Pk	35.7	-24.1	-95.2	-50.52	-13	-37.52	H
3.81078	37.47	Pk	32.9	-28.4	-95.2	-53.23	-13	-40.23	V
5.71722	37.22	Pk	35	-26.7	-95.2	-49.68	-13	-36.68	V
7.61953	33.78	Pk	35.6	-24.1	-95.2	-49.92	-13	-36.92	V

9.3.5. LTE BAND 30

LIMITS

FCC: §27.53 (a)
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.

QPSK LTE BAND 30 (10.0MHZ BANDWIDTH)

Project #:	13179116
Date:	4/30/2020
Test Engineer:	20792
Configuration:	EUT Only
Mode:	LTE30 QPSK 10MHz
Chamber #:	Chamber I

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Mid Channel, 2310MHz									
4.62009	36.52	Pk	33.9	-27.6	-95.2	-52.38	-40	-12.38	H
6.93015	34.88	Pk	35.6	-24.7	-95.2	-49.42	-40	-9.42	H
9.23919	33.09	Pk	36.4	-21.6	-95.2	-47.31	-40	-7.31	H
4.61922	36.97	Pk	33.9	-27.7	-95.2	-52.03	-40	-12.03	V
6.92928	35.62	Pk	35.6	-24.7	-95.2	-48.68	-40	-8.68	V
9.24045	33.12	Pk	36.3	-21.6	-95.2	-47.38	-40	-7.38	V

9.3.6. LTE BAND 41 AND 5G NR Band n41

LIMITS

FCC: §27.53 (m)
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.

QPSK LTE BAND 41 (20.0MHZ BANDWIDTH)

Project #:	13179116
Date:	4/30/2020
Test Engineer:	20792
Configuration:	EUT Only
Mode:	LTE41FCC QPSK 20MHz
Chamber #:	Chamber I

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 2506MHz									
5.01343	35.95	Pk	34.3	-27.1	-95.2	-52.05	-25	-27.05	H
7.51767	33.52	Pk	35.5	-23.9	-95.2	-50.08	-25	-25.08	H
10.02316	33.06	Pk	37.1	-20.8	-95.2	-45.84	-25	-20.84	H
5.01037	35.8	Pk	34.3	-27.2	-95.2	-52.3	-25	-27.3	V
7.51943	33.52	Pk	35.5	-23.9	-95.2	-50.08	-25	-25.08	V
10.02383	31.77	Pk	37.1	-20.7	-95.2	-47.03	-25	-22.03	V
Mid Channel, 2593MHz									
5.18607	35.48	Pk	34.4	-27	-95.2	-52.32	-25	-27.32	H
7.77994	32.84	Pk	35.7	-23.8	-95.2	-50.46	-25	-25.46	H
10.37209	31.6	Pk	37.4	-20	-95.2	-46.2	-25	-21.2	H
5.1849	35.86	Pk	34.4	-27	-95.2	-51.94	-25	-26.94	V
7.77739	33.39	Pk	35.7	-23.7	-95.2	-49.81	-25	-24.81	V
10.37095	31.52	Pk	37.4	-20.1	-95.2	-46.38	-25	-21.38	V
High Channel, 2680MHz									
5.36157	34.78	Pk	34.6	-26.8	-95.2	-52.62	-25	-27.62	H
8.03934	33.21	Pk	35.7	-22.9	-95.2	-49.19	-25	-24.19	H
10.72136	31.45	Pk	37.9	-19.8	-95.2	-45.65	-25	-20.65	H
5.35862	36.7	Pk	34.6	-26.8	-95.2	-50.7	-25	-25.7	V
8.03999	33.69	Pk	35.7	-23	-95.2	-48.81	-25	-23.81	V
10.71968	32.24	Pk	37.9	-19.7	-95.2	-44.76	-25	-19.76	V

QPSK 5G NR Band n41 (100.0MHZ BANDWIDTH)

Project #:	13179116
Date:	7/17/2020
Test Engineer:	19169
Configuration:	EUT Only
Mode	5G NR Band n41 FCC QPSK 100MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 2546MHz									
4.99274	39.22	Pk	34.1	-28.4	-95.2	-50.28	-25	-25.28	H
4.99374	39.28	Pk	34.1	-28.4	-95.2	-50.22	-25	-25.22	V
7.45751	36.76	Pk	36.2	-24	-95.2	-46.24	-25	-21.24	V
7.45931	36.53	Pk	36.2	-24	-95.2	-46.47	-25	-21.47	H
9.9843	35.01	Pk	37.2	-20.9	-95.2	-43.89	-25	-18.89	H
9.98464	35.72	Pk	37.2	-20.9	-95.2	-43.18	-25	-18.18	V
Mid Channel, 2593MHz									
5.18442	38.71	Pk	34.6	-27.7	-95.2	-49.59	-25	-24.59	V
5.18708	38.36	Pk	34.6	-27.7	-95.2	-49.94	-25	-24.94	H
7.77909	35.88	Pk	35.9	-23.4	-95.2	-46.82	-25	-21.82	H
7.7792	36.46	Pk	35.9	-23.4	-95.2	-46.24	-25	-21.24	V
10.36982	34.58	Pk	37.7	-20.2	-95.2	-43.12	-25	-18.12	H
10.37104	34.49	Pk	37.7	-20.2	-95.2	-43.21	-25	-18.21	V
High Channel, 2640MHz									
5.37942	-67.99	Pk	34.8	-27.8	10.5	-50.49	-25	-25.49	197
5.38203	-68.4	Pk	34.8	-27.8	10.6	-50.8	-25	-25.8	12
8.06898	-70.85	Pk	36.2	-23.2	11.2	-46.65	-25	-21.65	324
8.0694	-70.06	Pk	36.2	-23.2	11.4	-45.66	-25	-20.66	212
10.76057	-71.62	Pk	37.8	-20.2	10.3	-43.72	-25	-18.72	204
10.76138	-71.3	Pk	37.8	-20.2	10.6	-43.1	-25	-18.1	40

9.3.7. LTE BAND 66

LIMITS

FCC: §27.53 (h)
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.

QPSK LTE BAND 66 (20.0MHZ BANDWIDTH)

Project #:	13179116
Date:	4/28/2020
Test Engineer:	50822
Configuration:	EUT Only
Mode	LTE 66 QPSK 20MHz
Chamber #:	Chamber I

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 1720MHz									
3.42372	39.08	Pk	32.7	-29.2	-95.2	-52.62	-13	-39.62	H
5.18541	37.06	Pk	34.4	-27	-95.2	-50.74	-13	-37.74	H
6.81666	36.76	Pk	35.5	-25.1	-95.2	-48.04	-13	-35.04	H
3.4115	39.27	Pk	32.7	-29.3	-95.2	-52.53	-13	-39.53	V
5.19668	37.25	Pk	34.4	-27	-95.2	-50.55	-13	-37.55	V
6.78737	35.63	Pk	35.6	-25	-95.2	-48.97	-13	-35.97	V
Mid Channel, 1745MHz									
3.75396	38.49	Pk	32.9	-28.3	-95.2	-52.11	-13	-39.11	H
5.34742	37.27	Pk	34.6	-26.7	-95.2	-50.03	-13	-37.03	H
7.49108	35	Pk	35.6	-24	-95.2	-48.6	-13	-35.6	H
3.76052	38.5	Pk	33	-28.4	-95.2	-52.1	-13	-39.1	V
5.34076	37.73	Pk	34.6	-26.7	-95.2	-49.57	-13	-36.57	V
7.54843	34.63	Pk	35.6	-23.9	-95.2	-48.87	-13	-35.87	V
High Channel, 1770MHz									
3.55215	38.6	Pk	33	-28.4	-95.2	-52	-13	-39	H
5.35045	38.26	Pk	34.6	-26.7	-95.2	-49.04	-13	-36.04	H
7.1331	35.36	Pk	35.6	-24.5	-95.2	-48.74	-13	-35.74	H
3.56241	38.08	Pk	33	-28.5	-95.2	-52.62	-13	-39.62	V
5.33595	37.07	Pk	34.6	-26.7	-95.2	-50.23	-13	-37.23	V
7.18777	35.56	Pk	35.6	-24.6	-95.2	-48.64	-13	-35.64	V

9.4. FIELD STRENGTH OF SPURIOUS RADIATION, ANT4

TEST PROCEDURE

KDB 971168 D01 v03r01/D02 v02/r01

All tests above 1GHz were done with a Resolution Bandwidth of 1MHz, and a Video Bandwidth of 3MHz.

RESULTS

Both QPSK and 16QAM modes are tested, widest QPSK bandwidths results are reported as worst case.

9.4.1. LTE BAND 2

LIMITS

FCC: §24.238(a)
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.

QPSK LTE BAND 2 (20.0MHZ BANDWIDTH)

Project #:	13179116
Date:	4/30/2020
Test Engineer:	50822
Configuration:	EUT only
Mode	LTE2 QPSK 20MHz
Chamber #:	Chamber I

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 1860MHz									
3.73168	37.24	Pk	32.9	-28.4	-95.2	-53.46	-13	-40.46	H
5.5532	38.52	Pk	35.1	-26.8	-95.2	-48.38	-13	-35.38	H
7.45559	33.85	Pk	35.6	-24.2	-95.2	-49.95	-13	-36.95	H
3.75151	37.32	Pk	33	-28.4	-95.2	-53.28	-13	-40.28	V
5.54852	36.2	Pk	35.1	-26.8	-95.2	-50.7	-13	-37.7	V
7.53359	33.98	Pk	35.6	-23.9	-95.2	-49.52	-13	-36.52	V
Mid Channel, 1880MHz									
3.74822	37.45	Pk	33	-28.3	-95.2	-53.05	-13	-40.05	H
5.65376	35.73	Pk	35	-26.8	-95.2	-51.27	-13	-38.27	H
7.5313	33.89	Pk	35.6	-23.9	-95.2	-49.61	-13	-36.61	H
3.74329	37.62	Pk	32.9	-28.3	-95.2	-52.98	-13	-39.98	V
5.64142	36.13	Pk	35.1	-26.6	-95.2	-50.57	-13	-37.57	V
7.52552	33.92	Pk	35.6	-23.9	-95.2	-49.58	-13	-36.58	V
High Channel, 1900MHz									
3.80702	37.51	Pk	32.9	-28.3	-95.2	-53.09	-13	-40.09	H
5.67331	39.99	Pk	35	-26.8	-95.2	-47.01	-13	-34.01	H
7.59364	34.46	Pk	35.6	-24.3	-95.2	-49.44	-13	-36.44	H
3.80658	37.48	Pk	32.9	-28.3	-95.2	-53.12	-13	-40.12	V
5.67293	36.71	Pk	35	-26.8	-95.2	-50.29	-13	-37.29	V
7.63948	34.03	Pk	35.6	-24.1	-95.2	-49.67	-13	-36.67	V

9.4.3. LTE BAND 7

LIMITS

FCC: §27.53 (m)
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.

QPSK LTE BAND 7 (20.0MHZ BANDWIDTH)

Project #:	13179116
Date:	4/30/2020
Test Engineer:	50822
Configuration:	EUT only
Mode	LTE7 QPSK 20MHz
Chamber #:	Chamber I

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 2510MHz									
5.02847	36.72	Pk	34.3	-27	-95.2	-51.18	-25	-26.18	H
7.49819	34.55	Pk	35.5	-23.9	-95.2	-49.05	-25	-24.05	H
10.07136	31.92	Pk	37	-20.9	-95.2	-47.18	-25	-22.18	H
5.0227	36.12	Pk	34.2	-27	-95.2	-51.88	-25	-26.88	V
7.52843	34.17	Pk	35.6	-23.9	-95.2	-49.33	-25	-24.33	V
10.07886	32.39	Pk	37.1	-20.8	-95.2	-46.51	-25	-21.51	V
Mid Channel, 2535MHz									
5.06499	36.29	Pk	34.3	-27	-95.2	-51.61	-25	-26.61	H
7.639	33.72	Pk	35.6	-24	-95.2	-49.88	-25	-24.88	H
10.17801	31.26	Pk	37.2	-20.2	-95.2	-46.94	-25	-21.94	H
5.04595	36.36	Pk	34.4	-26.9	-95.2	-51.34	-25	-26.34	V
7.63871	34.38	Pk	35.6	-24.1	-95.2	-49.32	-25	-24.32	V
10.15161	31.43	Pk	37.1	-20.3	-95.2	-46.97	-25	-21.97	V
High Channel, 2560MHz									
5.11911	36.13	Pk	34.4	-27	-95.2	-51.67	-25	-26.67	H
7.69246	33.78	Pk	35.7	-23.7	-95.2	-49.42	-25	-24.42	H
10.27163	31.82	Pk	37.4	-20.5	-95.2	-46.48	-25	-21.48	H
5.13875	37.15	Pk	34.5	-27.1	-95.2	-50.65	-25	-25.65	V
7.70879	34.72	Pk	35.6	-23.8	-95.2	-48.68	-25	-23.68	V
10.2839	31.83	Pk	37.4	-20.6	-95.2	-46.57	-25	-21.57	V

9.4.4. LTE BAND 25

LIMITS

FCC: §24.238(a)
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.

QPSK LTE BAND 25 (20.0MHZ BANDWIDTH)

Project #:	13179116
Date:	4/30/2020
Test Engineer:	50822
Configuration:	EUT only
Mode	LTE25 QPSK 20MHz
Chamber #:	Chamber I

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 1860MHz									
3.7233	37.21	Pk	32.9	-28.5	-95.2	-53.59	-13	-40.59	H
5.55317	38.58	Pk	35.1	-26.8	-95.2	-48.32	-13	-35.32	H
7.45443	34.41	Pk	35.6	-24.3	-95.2	-49.49	-13	-36.49	H
3.74592	37.7	Pk	32.9	-28.4	-95.2	-53	-13	-40	V
5.55381	36.43	Pk	35.1	-26.8	-95.2	-50.47	-13	-37.47	V
7.50174	33.76	Pk	35.5	-23.9	-95.2	-49.84	-13	-36.84	V
Mid Channel, 1882.5MHz									
3.80698	37.23	Pk	32.9	-28.3	-95.2	-53.37	-13	-40.37	H
5.62086	39.4	Pk	35.1	-26.7	-95.2	-47.4	-13	-34.4	H
7.62596	33.91	Pk	35.7	-24.2	-95.2	-49.79	-13	-36.79	H
3.80208	37.29	Pk	32.9	-28.3	-95.2	-53.31	-13	-40.31	V
5.64924	35.64	Pk	35	-26.6	-95.2	-51.16	-13	-38.16	V
7.61013	33.97	Pk	35.7	-24.1	-95.2	-49.63	-13	-36.63	V
High Channel, 1905MHz									
3.80636	37.83	Pk	32.9	-28.3	-95.2	-52.77	-13	-39.77	H
5.68827	40.55	Pk	35	-26.6	-95.2	-46.25	-13	-33.25	H
7.63206	34.02	Pk	35.6	-24	-95.2	-49.58	-13	-36.58	H
3.79633	37.68	Pk	33	-28.3	-95.2	-52.82	-13	-39.82	V
5.7313	35.8	Pk	34.9	-26.5	-95.2	-51	-13	-38	V
7.64218	34.25	Pk	35.6	-24.1	-95.2	-49.45	-13	-36.45	V

9.4.5. LTE BAND 30

LIMITS

FCC: §27.53 (a)
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.

QPSK LTE BAND 30 (10.0MHZ BANDWIDTH)

Project #:	13179116
Date:	4/30/2020
Test Engineer:	50822
Configuration:	EUT Only
Mode:	LTE30 QPSK 10MHz
Chamber #:	Chamber I

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Mid Channel, 2310MHz									
4.62493	37.72	Pk	33.9	-27.6	-95.2	-51.18	-40	-12.18	H
6.94715	34.37	Pk	35.6	-24.5	-95.2	-49.73	-40	-9.73	H
9.27023	32.28	Pk	36.4	-21.7	-95.2	-48.22	-40	-8.22	H
4.60662	36.69	Pk	33.9	-27.7	-95.2	-52.31	-40	-12.31	V
6.97284	34.48	Pk	35.7	-24.9	-95.2	-49.92	-40	-9.92	V
9.35786	32.71	Pk	36.4	-21.4	-95.2	-47.49	-40	-7.49	V

9.4.6. LTE BAND 41 AND 5G NR Band n41

LIMITS

FCC: §27.53 (m)
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.

QPSK LTE BAND 41 (20.0MHZ BANDWIDTH)

Project #:	13179116
Date:	5/1/2020
Test Engineer:	50822
Configuration:	EUT Only
Mode:	LTE41 FCC QPSK 20MHz
Chamber #:	Chamber I

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 2506MHz									
5.02465	37.34	Pk	34.2	-27	-95.2	-50.66	-25	-25.66	H
7.52572	33.46	Pk	35.6	-24	-95.2	-50.14	-25	-25.14	H
10.01261	31.57	Pk	37	-20.8	-95.2	-47.43	-25	-22.43	H
5.0277	36.37	Pk	34.3	-27	-95.2	-51.53	-25	-26.53	V
7.46427	34.07	Pk	35.5	-24.2	-95.2	-49.83	-25	-24.83	V
10.02746	31.92	Pk	37	-20.9	-95.2	-47.18	-25	-22.18	V
Mid Channel, 2593MHz									
5.19146	36.57	Pk	34.4	-27	-95.2	-51.23	-25	-26.23	H
7.79298	33.34	Pk	35.7	-23.6	-95.2	-49.76	-25	-24.76	H
10.36107	31.37	Pk	37.5	-20.2	-95.2	-46.53	-25	-21.53	H
5.20535	35.49	Pk	34.3	-26.8	-95.2	-52.21	-25	-27.21	V
7.79456	33.69	Pk	35.7	-23.6	-95.2	-49.41	-25	-24.41	V
10.35677	31.92	Pk	37.5	-20.2	-95.2	-45.98	-25	-20.98	V
High Channel, 2680MHz									
5.3574	35.98	Pk	34.6	-26.8	-95.2	-51.42	-25	-26.42	H
8.032	33.44	Pk	35.7	-23	-95.2	-49.06	-25	-24.06	H
10.72739	31.48	Pk	37.9	-19.7	-95.2	-45.52	-25	-20.52	H
5.36414	36.17	Pk	34.6	-26.8	-95.2	-51.23	-25	-26.23	V
8.03505	33.64	Pk	35.7	-23	-95.2	-48.86	-25	-23.86	V
10.72802	31.45	Pk	37.9	-19.8	-95.2	-45.65	-25	-20.65	V

QPSK 5G NR Band n41 (100.0MHZ BANDWIDTH)

Project #:	13179116
Date:	7/23/202
Test Engineer:	19169
Configuration:	EUT Only
Mode	5G NR Band n41 FCC QPSK 100MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 2546MHz									
5.08018	40.32	Pk	34.4	-27.8	-95.2	-47.58	-25	-22.58	H
5.08393	39.47	Pk	34.4	-27.8	-95.2	-48.33	-25	-23.33	V
7.64304	30.12	Pk	35.9	-23.6	-95.2	-52.38	-25	-27.38	V
7.64629	37.36	Pk	35.9	-23.6	-95.2	-45.14	-25	-20.14	H
10.16924	36.52	Pk	37.5	-20.9	-95.2	-41.58	-25	-16.58	H
10.17985	28.94	Pk	37.5	-20.9	-95.2	-49.06	-25	-24.06	V
Mid Channel, 2593MHz									
5.1994	31.96	Pk	34.6	-27.5	-95.2	-55.24	-25	-30.24	V
5.20041	39.97	Pk	34.6	-27.5	-95.2	-47.23	-25	-22.23	H
7.78136	36.99	Pk	35.9	-23.4	-95.2	-45.41	-25	-20.41	H
7.787	29.82	Pk	36	-23.4	-95.2	-52.38	-25	-27.38	V
10.39194	35.24	Pk	37.7	-20.3	-95.2	-41.76	-25	-16.76	H
10.41178	28.28	Pk	37.7	-20.1	-95.2	-48.52	-25	-23.52	V
High Channel, 2640MHz									
5.27962	38.94	Pk	34.7	-27.9	-95.2	-49.16	-25	-24.16	V
5.27992	38.52	Pk	34.7	-27.9	-95.2	-49.58	-25	-24.58	H
7.91801	36.58	Pk	36.2	-23.4	-95.2	-45.62	-25	-20.62	V
7.92194	36.49	Pk	36.2	-23.4	-95.2	-45.71	-25	-20.71	H
10.55879	35.15	Pk	37.7	-20.5	-95.2	-42.15	-25	-17.15	V
10.56008	34.93	Pk	37.7	-20.5	-95.2	-42.37	-25	-17.37	H

9.4.7. LTE BAND 48

LIMITS

FCC: §96.41
(e) 3.5 GHz Emissions and Interference Limits—
(2) Additional protection levels. Notwithstanding paragraph (d)(1) of this section, the conducted power of any emissions below 3530 MHz or above 3720 MHz shall not exceed −40dBm/MHz.

QPSK LTE BAND 48 (20.0MHZ BANDWIDTH)

Project #:	13179116
Date:	5/6/2020
Test Engineer:	50822
Configuration:	EUT Only
Mode:	LTE48 QPSK 20MHz
Chamber #:	Chamber I

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 3560MHz									
7.12085	33.07	Pk	35.7	-22.5	-95.2	-48.93	-40	-8.93	H
10.67967	31.45	Pk	37.9	-19.1	-95.2	-44.95	-40	-4.95	H
14.24215	31.99	Pk	39.4	-20.6	-95.2	-44.41	-40	-4.41	H
7.11852	33.74	Pk	35.7	-22.5	-95.2	-48.26	-40	-8.26	V
10.67944	31.55	Pk	37.9	-19.1	-95.2	-44.85	-40	-4.85	V
14.24178	31.31	Pk	39.4	-20.6	-95.2	-45.09	-40	-5.09	V
Mid Channel, 3625MHz									
7.24873	32.65	Pk	35.6	-22.3	-95.2	-49.25	-40	-9.25	H
10.87653	30.34	Pk	37.8	-18.9	-95.2	-45.96	-40	-5.96	H
14.49891	32.61	Pk	39.7	-20	-95.2	-42.89	-40	-2.89	H
7.24894	32.84	Pk	35.6	-22.3	-95.2	-49.06	-40	-9.06	V
10.8774	30.34	Pk	37.8	-18.9	-95.2	-45.96	-40	-5.96	V
14.50171	31.4	Pk	39.8	-20	-95.2	-44.00	-40	-4.00	V
High Channel, 3690MHz									
7.38	33.13	Pk	35.6	-22	-95.2	-48.47	-40	-8.47	H
11.07016	31.83	Pk	37.9	-19.3	-95.2	-44.77	-40	-4.77	H
14.76078	30.89	Pk	39.9	-20.5	-95.2	-44.91	-40	-4.91	H
7.37974	32.34	Pk	35.6	-22	-95.2	-49.26	-40	-9.26	V
11.06903	30.88	Pk	37.9	-19.3	-95.2	-45.72	-40	-5.72	V
14.76069	30.48	Pk	39.9	-20.5	-95.2	-45.32	-40	-5.32	V

9.4.8. LTE BAND 66

LIMITS

FCC: §27.53 (h)
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.

QPSK LTE BAND 66 (20.0MHZ BANDWIDTH)

Project #:	13179116
Date:	4/29/2020
Test Engineer:	50822
Configuration:	EUT Only
Mode	LTE 66 QPSK 20MHz
Chamber #:	Chamber I

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 1720MHz									
3.43388	37.6	Pk	32.7	-29.3	-95.2	-54.2	-13	-41.2	H
5.13328	37.75	Pk	34.4	-26.9	-95.2	-49.95	-13	-36.95	H
6.85813	35.2	Pk	35.6	-25.2	-95.2	-49.6	-13	-36.6	H
3.42705	37.49	Pk	32.7	-29.3	-95.2	-54.31	-13	-41.31	V
5.10801	36.02	Pk	34.4	-26.8	-95.2	-51.58	-13	-38.58	V
6.92874	34.71	Pk	35.6	-24.7	-95.2	-49.59	-13	-36.59	V
Mid Channel, 1745MHz									
3.51303	27.86	Pk	32.8	-28.7	-95.2	-63.24	-13	-50.24	H
5.24525	35.87	Pk	34.5	-26.8	-95.2	-51.63	-13	-38.63	H
6.99634	34.98	Pk	35.6	-24.8	-95.2	-49.42	-13	-36.42	H
3.55531	36.71	Pk	33	-28.5	-95.2	-53.99	-13	-40.99	V
5.20861	36.11	Pk	34.4	-26.8	-95.2	-51.49	-13	-38.49	V
6.92853	34.47	Pk	35.6	-24.7	-95.2	-49.83	-13	-36.83	V
High Channel, 1770MHz									
3.53841	38.08	Pk	30.2	-27.8	-95.2	-54.72	-13	-41.72	H
3.54105	38.65	Pk	30.2	-27.8	-95.2	-54.15	-13	-41.15	V
5.31087	37.78	Pk	33.2	-26.5	-95.2	-50.72	-13	-37.72	V
5.31104	37.74	Pk	33.2	-26.5	-95.2	-50.76	-13	-37.76	H
7.07909	36.19	Pk	36.6	-23.7	-95.2	-46.11	-13	-33.11	V
7.07917	36	Pk	36.6	-23.7	-95.2	-46.3	-13	-33.3	H

9.4.18. 5G NR Band n77

LIMITS

FCC: §27.53
(l) 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.

QPSK 5G NR Band n77 (100.0MHZ BANDWIDTH)

Project #:	13179116
Date:	7/22/2020
Test Engineer:	30606
Configuration:	EUT Only
Mode	5G NR Band n77 QPSK 100MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 3750MHz									
7.50349	36.29	Pk	36	-23.2	-95.2	-46.11	-13	-33.11	V
7.52728	35.98	Pk	36	-23.3	-95.2	-46.52	-13	-33.52	H
11.23494	33.61	Pk	38	-19.4	-95.2	-42.99	-13	-29.99	H
11.2582	33.92	Pk	38	-19.7	-95.2	-42.98	-13	-29.98	V
14.99592	34.26	Pk	39.8	-19.6	-95.2	-40.74	-13	-27.74	V
15.00918	34.78	Pk	39.9	-19.7	-95.2	-40.22	-13	-27.22	H
Mid Channel, 3840MHz									
7.6714	19.09	Av	35.9	-23.1	-95.2	-63.31	-13	-50.31	H
7.6841	18.98	Av	35.9	-22.8	-95.2	-63.12	-13	-50.12	V
11.50966	15.79	Av	38.4	-19.6	-95.2	-60.61	-13	-47.61	H
11.53507	15.77	Av	38.4	-19.8	-95.2	-60.83	-13	-47.83	V
15.35961	16.28	Av	41	-20.1	-95.2	-58.02	-13	-45.02	H
15.3629	16.02	Av	41	-20	-95.2	-58.18	-13	-45.18	V
High Channel, 3930MHz									
7.85926	36.11	Pk	36	-23.6	-95.2	-46.69	-13	-33.69	V
7.86116	37.2	Pk	36	-23.6	-95.2	-45.6	-13	-32.6	H
11.74278	33.86	Pk	38.7	-19.7	-95.2	-42.34	-13	-29.34	H
11.78452	33.98	Pk	38.8	-19.6	-95.2	-42.02	-13	-29.02	V
15.72361	34.66	Pk	40.7	-18.6	-95.2	-38.44	-13	-25.44	H
15.72963	34.28	Pk	40.7	-18.6	-95.2	-38.82	-13	-25.82	V

9.5. FIELD STRENGTH OF SPURIOUS RADIATION, ANT7

TEST PROCEDURE

KDB 971168 D01 v03r01/D02 v02/r01

All tests above 1GHz were done with a Resolution Bandwidth of 1MHz, and a Video Bandwidth of 3MHz.

All tests below 1GHz were done with a Resolution Bandwidth of 100kHz, and a Video Bandwidth of 300kHz.

9.5.1. LTE BAND 48

LIMITS

FCC: §96.41
(e) 3.5 GHz Emissions and Interference Limits—
(2) Additional protection levels. Notwithstanding paragraph (d)(1) of this section, the conducted power of any emissions below 3530 MHz or above 3720 MHz shall not exceed −40dBm/MHz.

QPSK LTE BAND 48 (20.0MHZ BANDWIDTH)

Project #:	13179116
Date:	7/28/2020
Test Engineer:	50822
Configuration:	EUT Only
Mode	LTE 48 QPSK 20MHz
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346(dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 3560MHz									
5.07056	37.45	Pk	34.3	-28.6	-95.2	-52.05	-40	-12.05	H
5.17788	37.11	Pk	34.6	-28.6	-95.2	-52.09	-40	-12.09	V
6.76415	35.76	Pk	36	-25.6	-95.2	-49.04	-40	-9.04	V
6.81179	35.34	Pk	35.8	-25.4	-95.2	-49.46	-40	-9.46	H
9.4779	33.46	Pk	36.6	-22	-95.2	-47.14	-40	-7.14	H
9.48312	33.37	Pk	36.6	-22	-95.2	-47.23	-40	-7.23	V
Mid Channel, 3625MHz									
4.80004	37.06	Pk	34.3	-29.2	-95.2	-53.04	-40	-13.04	H
4.81125	37.5	Pk	34.3	-29.3	-95.2	-52.7	-40	-12.7	V
6.18785	36.14	Pk	35.7	-27.1	-95.2	-50.46	-40	-10.46	H
6.50658	36.34	Pk	35.8	-26.3	-95.2	-49.36	-40	-9.36	V
8.27822	34.64	Pk	35.9	-23.6	-95.2	-48.26	-40	-8.26	V
8.58355	34.22	Pk	35.9	-23.6	-95.2	-48.68	-40	-8.68	H
High Channel, 3690MHz									
5.21638	35.53	Pk	34.6	-28.5	-95.2	-53.57	-40	-13.57	V
5.22058	35.31	Pk	34.6	-28.5	-95.2	-53.79	-40	-13.79	H
6.48596	34.73	Pk	35.9	-26	-95.2	-50.57	-40	-10.57	V
6.87786	35.56	Pk	35.9	-25.1	-95.2	-48.84	-40	-8.84	H
9.47517	33.17	Pk	36.6	-22	-95.2	-47.43	-40	-7.43	V
9.5192	33.76	Pk	36.6	-22.4	-95.2	-47.24	-40	-7.24	H

9.5.2. 5G NR Band n77

LIMITS

FCC: §27.53
(l) 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.

QPSK 5G NR Band n77 (100.0MHZ BANDWIDTH)

Project #:	13179116
Date:	7/22/2020
Test Engineer:	30606
Configuration:	EUT Only
Mode	5G NR Band n77 QPSK 100MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 3750MHz									
7.50308	18.36	Av	36	-23.2	-95.2	-64.04	-13	-51.04	V
7.51459	18.69	Av	36	-23.3	-95.2	-63.81	-13	-50.81	H
11.24769	14.33	Av	38	-19.5	-95.2	-62.37	-13	-49.37	H
11.26752	14.45	Av	38	-19.7	-95.2	-62.45	-13	-49.45	V
15.01015	14.15	Av	39.9	-19.7	-95.2	-60.85	-13	-47.85	H
15.02952	13.95	Av	39.9	-19.6	-95.2	-60.95	-13	-47.95	V
Mid Channel, 3840MHz									
7.68089	18.81	Av	35.9	-22.9	-95.2	-63.39	-13	-50.39	H
7.68882	18.77	Av	35.8	-22.7	-95.2	-63.33	-13	-50.33	V
11.51613	15.53	Av	38.4	-19.6	-95.2	-60.87	-13	-47.87	H
11.52466	15.74	Av	38.4	-19.7	-95.2	-60.76	-13	-47.76	V
15.3503	16.6	Av	40.9	-20	-95.2	-57.7	-13	-44.7	V
15.38793	15.57	Av	41	-19.8	-95.2	-58.43	-13	-45.43	H
High Channel, 3930MHz									
7.85173	35.68	Pk	36	-23.7	-95.2	-47.22	-13	-34.22	V
7.8738	35.96	Pk	36.1	-23.5	-95.2	-46.64	-13	-33.64	H
11.72249	33.89	Pk	38.7	-19.9	-95.2	-42.51	-13	-29.51	H
11.80882	33.96	Pk	38.9	-19.3	-95.2	-41.64	-13	-28.64	V
15.69921	34.48	Pk	40.7	-19.2	-95.2	-39.22	-13	-26.22	H
15.70885	33.87	Pk	40.7	-19	-95.2	-39.63	-13	-26.63	V

9.6. FIELD STRENGTH OF SPURIOUS RADIATION, ANT8

TEST PROCEDURE

KDB 971168 D01 v03r01/D02 v02/r01

All tests above 1GHz were done with a Resolution Bandwidth of 1MHz, and a Video Bandwidth of 3MHz.

All tests below 1GHz were done with a Resolution Bandwidth of 100kHz, and a Video Bandwidth of 300kHz.

9.6.1. LTE BAND 48

LIMITS

FCC: §96.41
(e) 3.5 GHz Emissions and Interference Limits—
(2) Additional protection levels. Notwithstanding paragraph (d)(1) of this section, the conducted power of any emissions below 3530 MHz or above 3720 MHz shall not exceed −40dBm/MHz.

QPSK LTE BAND 48 (20.0MHZ BANDWIDTH)

Project #:	13179116
Date:	5/6/2020
Test Engineer:	20792
Configuration:	EUT Only
Mode:	LTE48 QPSK 20MHz
Chamber #:	Chamber I

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 3560MHz									
7.1184	32.77	Pk	35.7	-22.5	-95.2	-49.23	-40	-9.23	H
10.67951	31.02	Pk	37.9	-19.1	-95.2	-45.38	-40	-5.38	H
14.2406	31.09	Pk	39.4	-20.6	-95.2	-45.31	-40	-5.31	H
7.11949	32.3	Pk	35.7	-22.5	-95.2	-49.7	-40	-9.7	V
10.67883	31.22	Pk	37.9	-19.1	-95.2	-45.18	-40	-5.18	V
14.23953	30.62	Pk	39.4	-20.6	-95.2	-45.78	-40	-5.78	V
Mid Channel, 3625MHz									
7.25118	32.58	Pk	35.6	-22.3	-95.2	-49.32	-40	-9.32	H
10.87503	30.5	Pk	37.8	-18.9	-95.2	-45.8	-40	-5.8	H
14.50034	31.55	Pk	39.7	-20	-95.2	-43.95	-40	-3.95	H
7.249	32.96	Pk	35.6	-22.3	-95.2	-48.94	-40	-8.94	V
10.8756	30.11	Pk	37.8	-18.9	-95.2	-46.19	-40	-6.19	V
14.50027	31.79	Pk	39.7	-20	-95.2	-43.71	-40	-3.71	V
High Channel, 3690MHz									
7.37929	32.42	Pk	35.6	-22	-95.2	-49.18	-40	-9.18	H
11.06848	31.69	Pk	37.9	-19.3	-95.2	-44.91	-40	-4.91	H
14.76174	30.57	Pk	39.9	-20.5	-95.2	-45.23	-40	-5.23	H
7.38024	32.84	Pk	35.6	-22	-95.2	-48.76	-40	-8.76	V
11.07041	31.46	Pk	37.9	-19.3	-95.2	-45.14	-40	-5.14	V
14.76035	30.49	Pk	39.9	-20.5	-95.2	-45.31	-40	-5.31	V

9.6.2. 5G NR Band n77

LIMITS

FCC: §27.53
(l) 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.

QPSK 5G NR Band n77 (100.0MHZ BANDWIDTH)

Project #:	13179116
Date:	7/23/2020
Test Engineer:	30606
Configuration:	EUT Only
Mode	5G NR Band n77 QPSK 100MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 3750MHz									
7.49777	35.48	Pk	36	-23.1	-95.2	-46.82	-13	-33.82	V
7.51047	35.91	Pk	36	-23.3	-95.2	-46.59	-13	-33.59	H
11.22566	26.33	Pk	38	-19.4	-95.2	-50.27	-13	-37.27	H
11.27719	34.16	Pk	38	-19.5	-95.2	-42.54	-13	-29.54	V
15.00917	35.11	Pk	39.9	-19.7	-95.2	-39.89	-13	-26.89	V
15.06425	34.22	Pk	40	-19.5	-95.2	-40.48	-13	-27.48	H
Mid Channel, 3840MHz									
7.68005	35.78	Pk	35.9	-22.9	-95.2	-46.42	-13	-33.42	V
7.68245	35.97	Pk	35.9	-22.8	-95.2	-46.13	-13	-33.13	H
11.51976	34.82	Pk	38.4	-19.6	-95.2	-41.58	-13	-28.58	V
11.52006	34.24	Pk	38.4	-19.6	-95.2	-42.16	-13	-29.16	H
15.35811	34.85	Pk	41	-20.1	-95.2	-39.45	-13	-26.45	V
15.36055	35.48	Pk	41	-20.1	-95.2	-38.82	-13	-25.82	H
High Channel, 3930MHz									
7.8471	35.92	Pk	36	-23.7	-95.2	-46.98	-13	-33.98	H
7.8702	35.96	Pk	36.1	-23.5	-95.2	-46.64	-13	-33.64	V
11.80285	33.94	Pk	38.8	-19.3	-95.2	-41.76	-13	-28.76	H
11.82308	34.61	Pk	38.8	-19.6	-95.2	-41.39	-13	-28.39	V
15.72951	35.24	Pk	40.7	-18.6	-95.2	-37.86	-13	-24.86	V
15.75636	36.46	Pk	40.7	-19.5	-95.2	-37.54	-13	-24.54	H

9.7. FIELD STRENGTH OF SPURIOUS RADIATION, ANT9

TEST PROCEDURE

KDB 971168 D01 v03r01/D02 v02/r01

All tests above 1GHz were done with a Resolution Bandwidth of 1MHz, and a Video Bandwidth of 3MHz.

All tests below 1GHz were done with a Resolution Bandwidth of 100kHz, and a Video Bandwidth of 300kHz.

9.7.1. LTE BAND 48

LIMITS

FCC: §96.41
(e) 3.5 GHz Emissions and Interference Limits—
(2) Additional protection levels. Notwithstanding paragraph (d)(1) of this section, the conducted power of any emissions below 3530 MHz or above 3720 MHz shall not exceed −40dBm/MHz.

QPSK LTE BAND 48 (20.0MHZ BANDWIDTH)

Project #:	13179116
Date:	5/6/2020
Test Engineer:	50822
Configuration:	EUT Only
Mode:	LTE48 QPSK 20MHz
Chamber #:	Chamber I

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 3560MHz									
7.12943	34.09	Pk	35.6	-22.4	-95.2	-47.91	-40	-7.91	H
10.65014	31.51	Pk	37.9	-19	-95.2	-44.79	-40	-4.79	H
14.21584	31.65	Pk	39.3	-20.6	-95.2	-44.85	-40	-4.85	H
7.13029	33.9	Pk	35.6	-22.4	-95.2	-48.1	-40	-8.1	V
10.70698	31.41	Pk	37.8	-18.7	-95.2	-44.69	-40	-4.69	V
14.19554	32.1	Pk	39.3	-20.7	-95.2	-44.5	-40	-4.5	V
Mid Channel, 3625MHz									
7.24873	32.65	Pk	35.6	-22.3	-95.2	-49.25	-40	-9.25	H
10.87653	30.34	Pk	37.8	-18.9	-95.2	-45.96	-40	-5.96	H
14.49891	32.61	Pk	39.7	-20	-95.2	-42.89	-40	-2.89	H
7.24894	32.84	Pk	35.6	-22.3	-95.2	-49.06	-40	-9.06	V
10.8774	30.34	Pk	37.8	-18.9	-95.2	-45.96	-40	-5.96	V
14.50171	31.4	Pk	39.8	-20	-95.2	-44	-40	-4	V
High Channel, 3690MHz									
7.38	33.13	Pk	35.6	-22	-95.2	-48.47	-40	-8.47	H
11.07016	31.83	Pk	37.9	-19.3	-95.2	-44.77	-40	-4.77	H
14.76078	30.89	Pk	39.9	-20.5	-95.2	-44.91	-40	-4.91	H
7.37974	32.34	Pk	35.6	-22	-95.2	-49.26	-40	-9.26	V
11.06903	30.88	Pk	37.9	-19.3	-95.2	-45.72	-40	-5.72	V
14.76069	30.48	Pk	39.9	-20.5	-95.2	-45.32	-40	-5.32	V

9.7.2. 5G NR Band n77

LIMITS

FCC: §27.53
(l) 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.

QPSK 5G NR Band n77 (100.0MHZ BANDWIDTH)

Project #:	13179116
Date:	7/22/2020
Test Engineer:	30606
Configuration:	EUT Only
Mode	5G NR Band n77 QPSK 100MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 3750MHz									
7.51433	35.64	Pk	36	-23.3	-95.2	-46.86	-13	-33.86	H
7.518	35.97	Pk	36	-23.3	-95.2	-46.53	-13	-33.53	V
11.23577	34.1	Pk	38	-19.4	-95.2	-42.5	-13	-29.5	H
11.24686	34.32	Pk	38	-19.5	-95.2	-42.38	-13	-29.38	V
14.98928	35.67	Pk	39.8	-19.5	-95.2	-39.23	-13	-26.23	V
14.99152	34.68	Pk	39.8	-19.5	-95.2	-40.22	-13	-27.22	H
Mid Channel, 3840MHz									
7.67354	19.22	Av	35.9	-23	-95.2	-63.08	-13	-50.08	H
11.5309	16.35	Av	38.5	-19.8	-95.2	-60.15	-13	-47.15	H
15.35512	16.25	Av	40.9	-20.1	-95.2	-58.15	-13	-45.15	H
7.69056	19.02	Av	35.8	-22.7	-95.2	-63.08	-13	-50.08	V
11.52662	16.31	Av	38.4	-19.7	-95.2	-60.19	-13	-47.19	V
15.32202	15.81	Av	40.9	-19.8	-95.2	-58.29	-13	-45.29	V
High Channel, 3930MHz									
7.84651	36.78	Pk	36	-23.7	-95.2	-46.12	-13	-33.12	H
7.86841	36.34	Pk	36.1	-23.5	-95.2	-46.26	-13	-33.26	V
11.68335	34.7	Pk	38.7	-19.7	-95.2	-41.5	-13	-28.5	V
11.75936	34.35	Pk	38.8	-19.7	-95.2	-41.75	-13	-28.75	H
15.68075	34.57	Pk	40.7	-19.4	-95.2	-39.33	-13	-26.33	H
15.69912	34.22	Pk	40.7	-19.2	-95.2	-39.48	-13	-26.48	V

10. SETUP PHOTOS

Please refer to 13179116-EP1V1 for setup photos

END OF REPORT