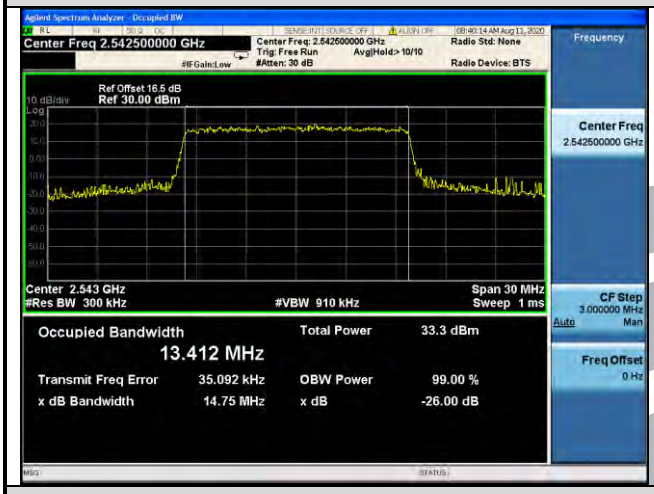
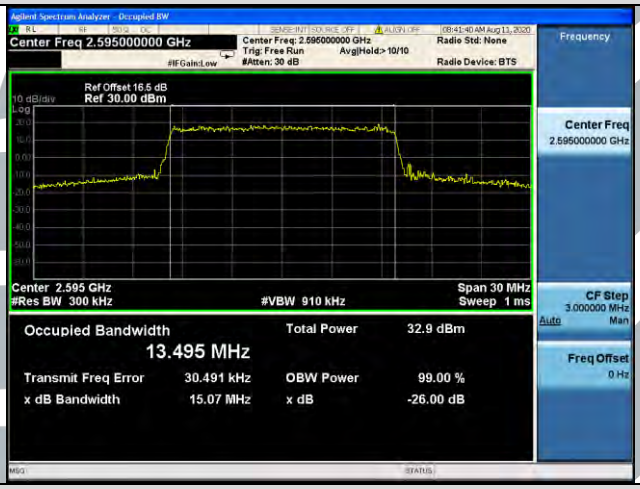
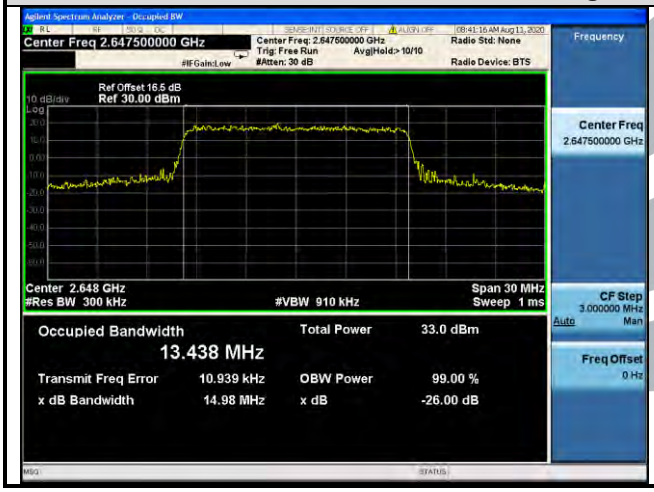
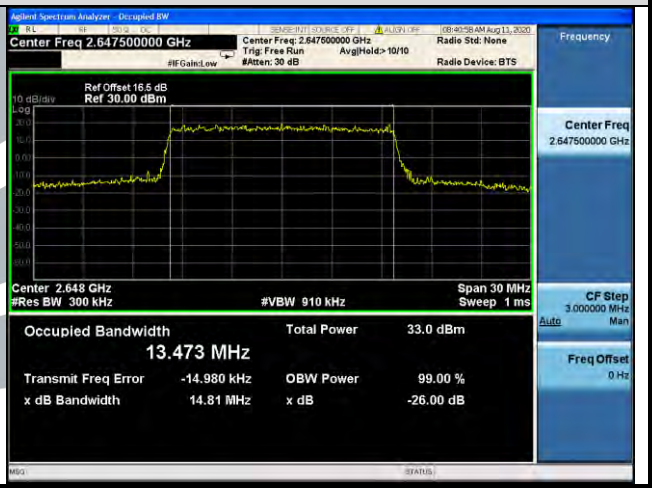
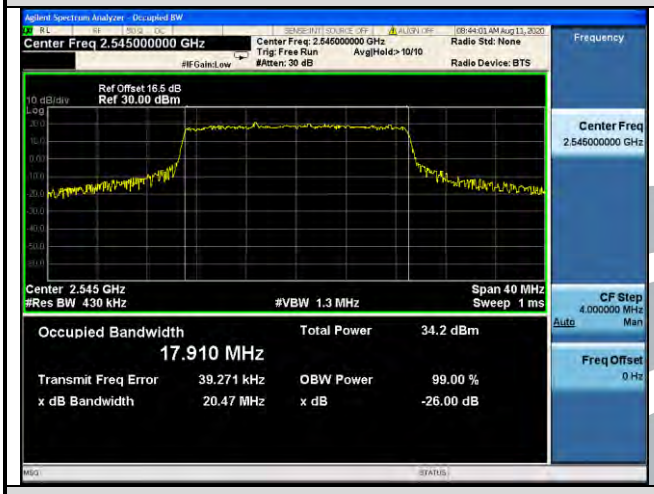
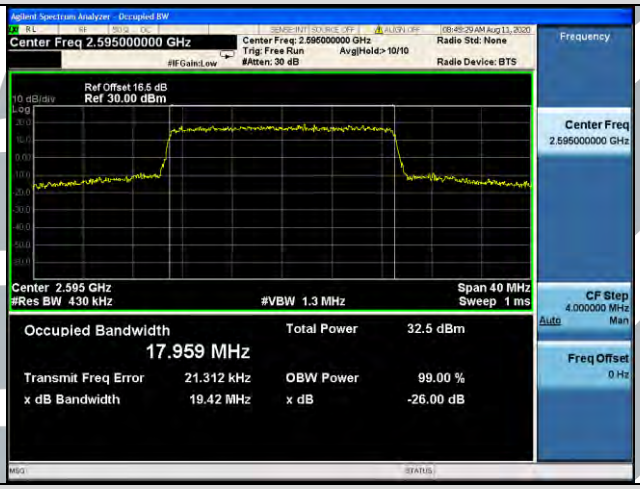
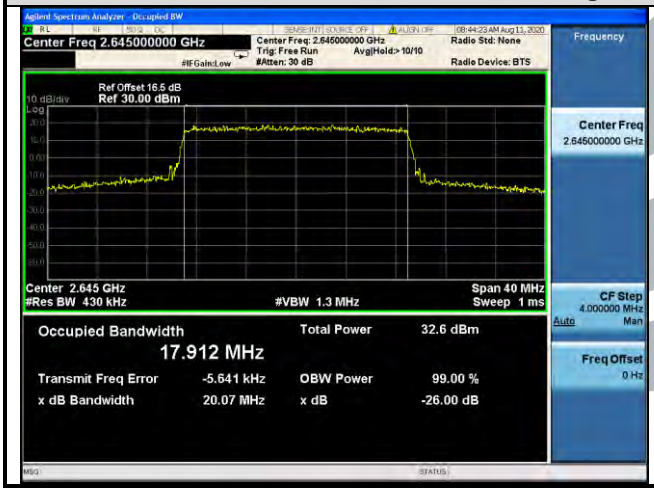
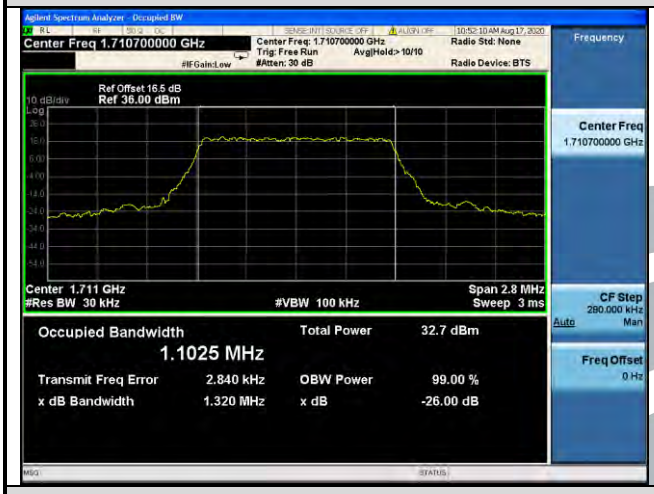
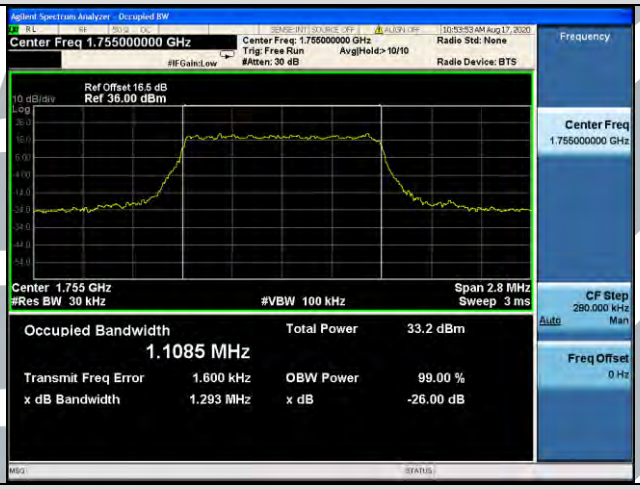
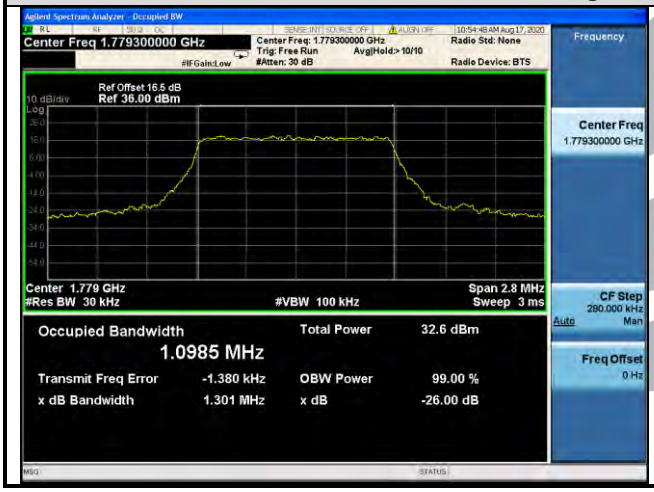
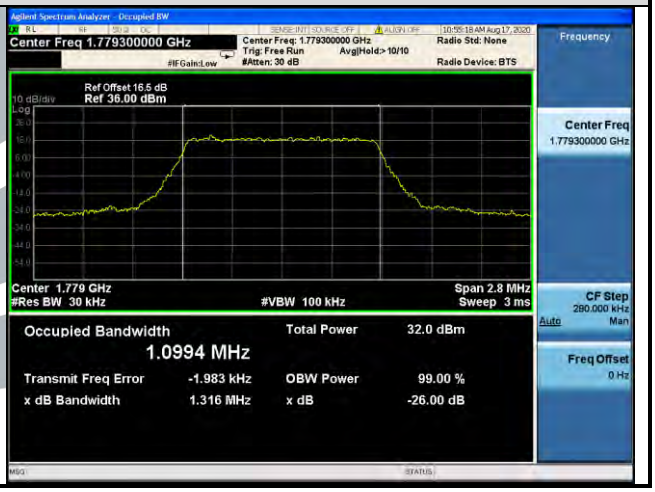
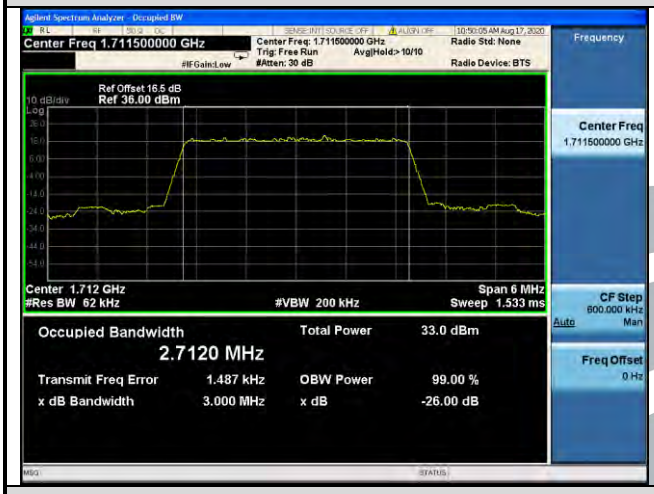
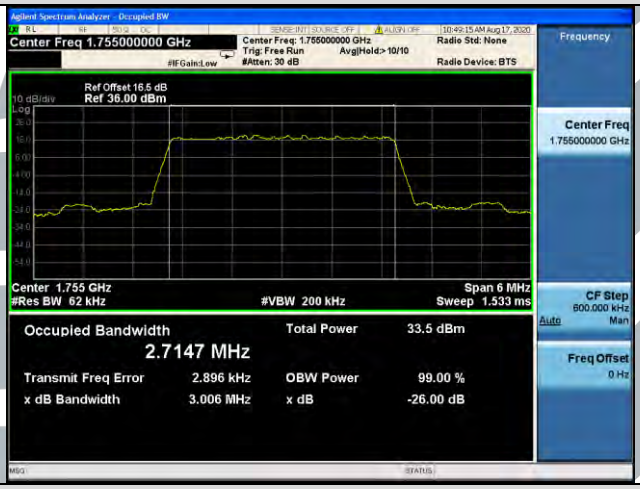
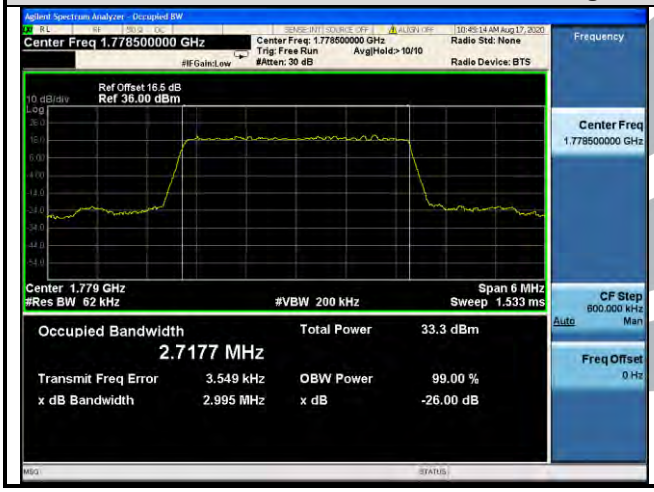
LTE Band 41_ Channel Bandwidth: 15 MHz	
QPSK	16QAM
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

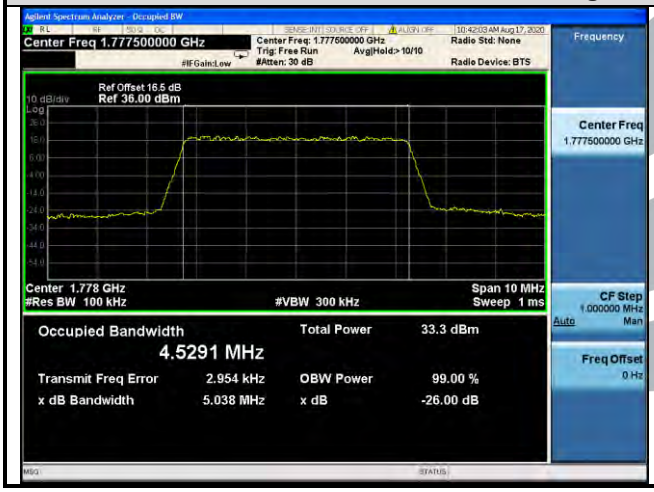
LTE Band 41_ Channel Bandwidth: 20 MHz	
QPSK	16QAM
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

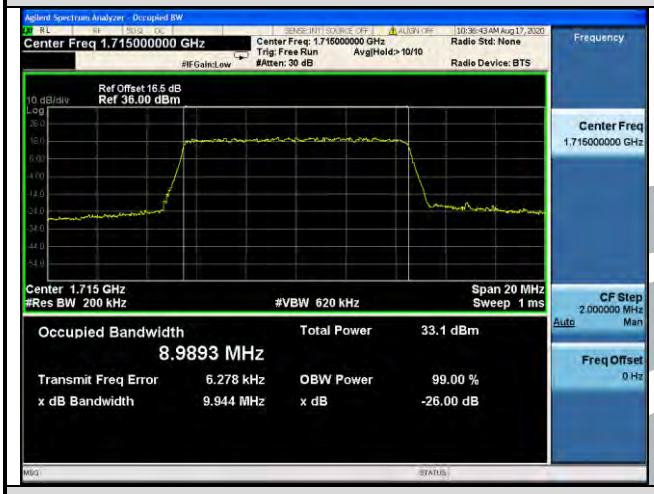
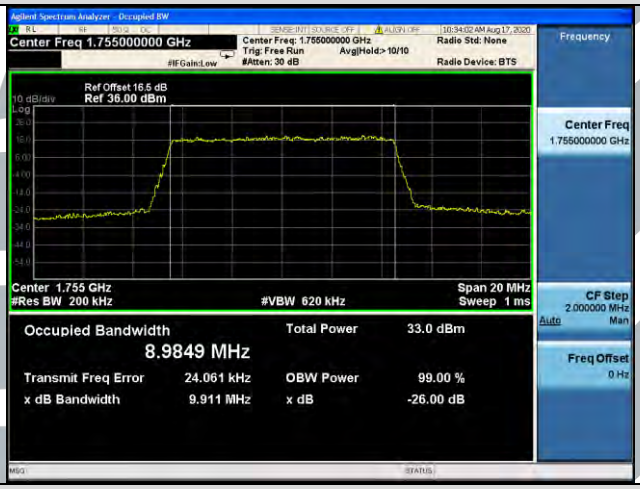
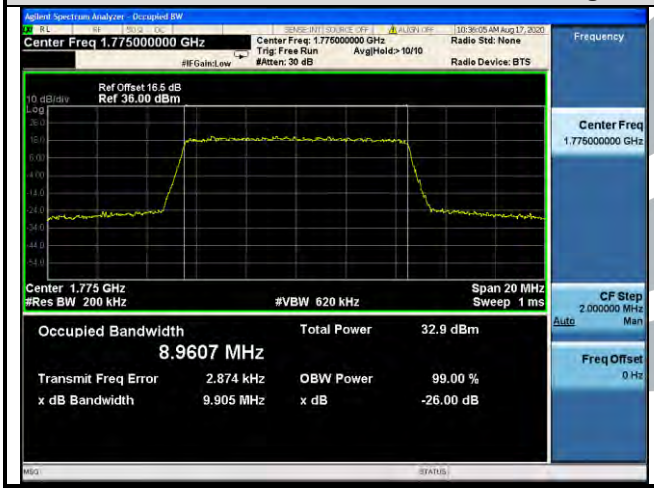
5.5.11 LTE Band 66

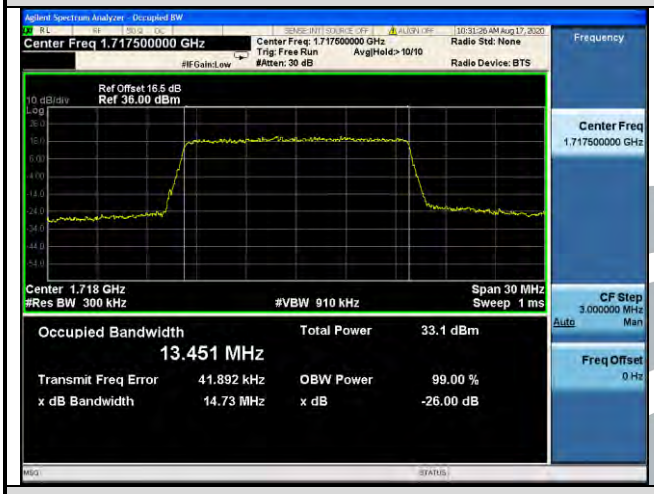
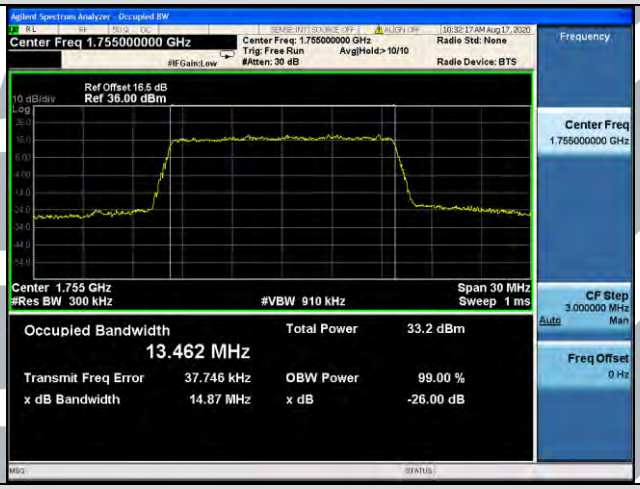
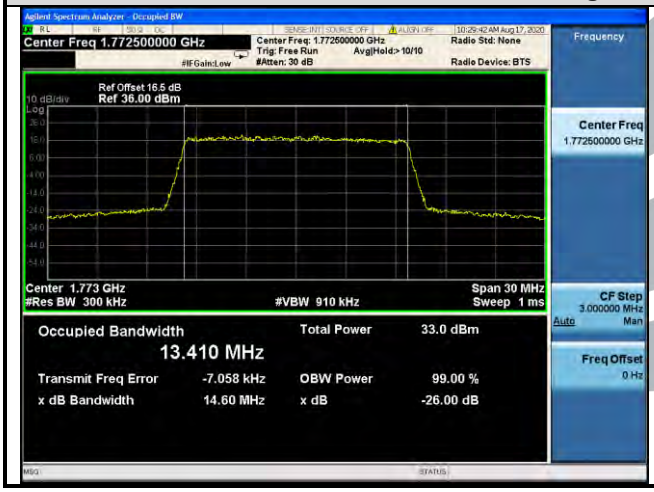
LTE Band 66								
Channel	RB Configuration		26 dB BW (MHz)			99% BW (MHz)		
	Size	Offset	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
Channel Bandwidth: 1.4 MHz								
Lowest	6	0	1.320	1.285	/	1.1025	1.0999	/
Middle	6	0	1.293	1.298	/	1.1085	1.0960	/
Highest	6	0	1.301	1.316	/	1.0985	1.0994	/
Channel Bandwidth: 3 MHz								
Lowest	15	0	3.000	3.001	/	2.7120	2.7215	/
Middle	15	0	3.006	3.014	/	2.7147	2.7087	/
Highest	15	0	2.995	3.004	/	2.7177	2.7064	/
Channel Bandwidth: 5 MHz								
Lowest	25	0	5.016	5.051	/	4.5158	4.5376	/
Middle	25	0	5.018	5.030	/	4.5125	4.5304	/
Highest	25	0	5.038	5.010	/	4.5291	4.5018	/
Channel Bandwidth: 10 MHz								
Lowest	50	0	9.944	9.921	/	8.9893	8.9756	/
Middle	50	0	9.911	9.859	/	8.9849	8.9816	/
Highest	50	0	9.905	9.878	/	8.9607	8.9706	/
Channel Bandwidth: 15 MHz								
Lowest	75	0	14.73	14.50	/	13.451	13.475	/
Middle	75	0	14.87	14.69	/	13.462	13.416	/
Highest	75	0	14.60	14.68	/	13.410	13.455	/
Channel Bandwidth: 20 MHz								
Lowest	100	0	19.42	19.51	/	17.913	17.889	/
Middle	100	0	19.73	19.50	/	17.943	17.904	/
Highest	100	0	19.42	19.55	/	17.889	17.879	/

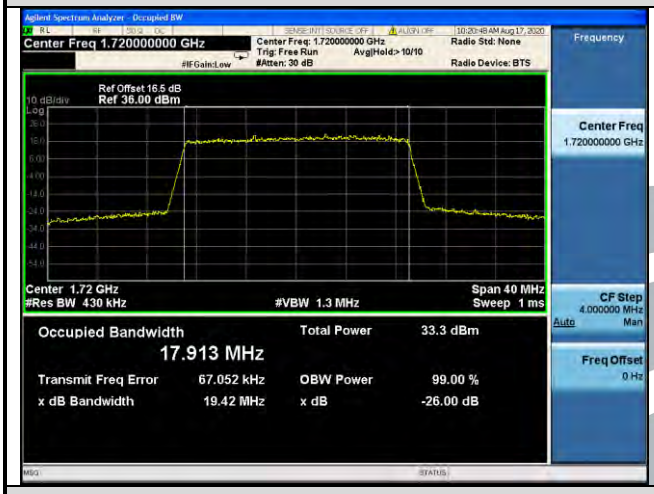
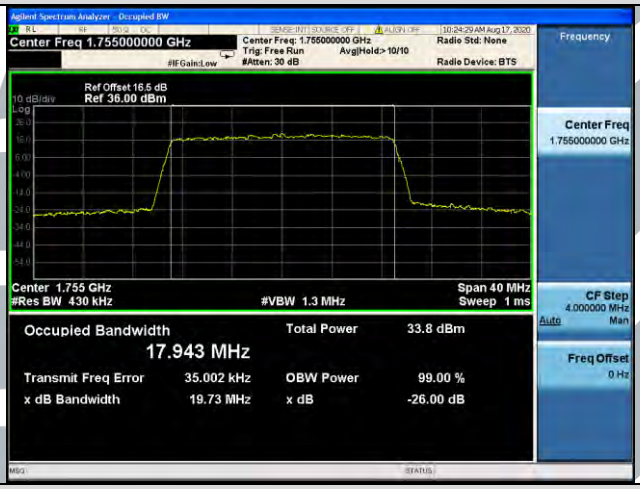
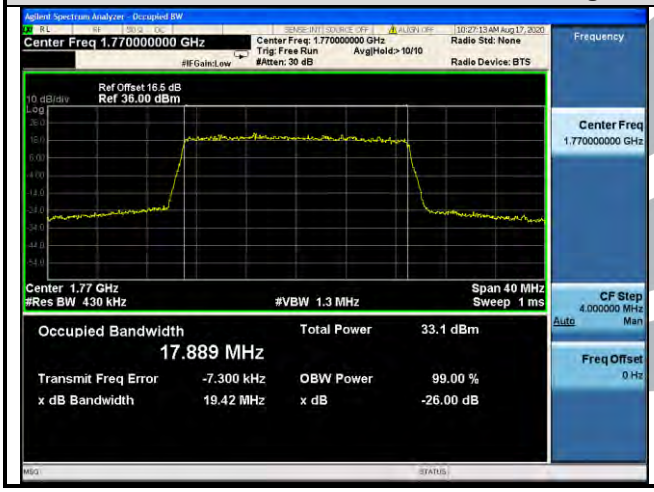
LTE Band 66_ Channel Bandwidth: 1.4 MHz	
QPSK	16QAM
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

LTE Band 66_ Channel Bandwidth: 3 MHz	
QPSK	16QAM
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

LTE Band 66_ Channel Bandwidth: 5 MHz	
QPSK	16QAM
Lowest Channel	
Middle Channel	
Highest Channel	
	

LTE Band 66_ Channel Bandwidth: 10 MHz	
QPSK	16QAM
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

LTE Band 66_ Channel Bandwidth: 15 MHz	
QPSK	16QAM
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

LTE Band 66_ Channel Bandwidth: 20 MHz	
QPSK	16QAM
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

5.6 BAND EDGE AT ANTENNA TERMINALS

Test Requirement: **LTE Band 2:** FCC 47 CFR Part 24.238(a), RSS-133 Issue 6, Section 6.5
LTE Band 4 & LTE Band 66: FCC 47 CFR Part 27.53(h)(1), RSS-139 Issue 3, Section 6.6
LTE Band 5 & LTE Band 26: FCC 47 CFR Part 22.917(a), RSS-132 Issue 3, Section 5.5
LTE Band 7 & Band 38 & Band 41: FCC 47 CFR Part 27.53(m)(4), RSS-199 Issue 3, Section 4.5
LTE Band 12: FCC 47 CFR Part 27.53(g), RSS-130 Issue 2, Section 4.7
LTE Band 13: FCC 47 CFR Part 27.53(c)(2), RSS-130 Issue 2, Section 4.7
LTE Band 26: FCC 47 CFR Part 90.691

Test Method: ANSI C63.26-2015 & KDB 971168 D01v03r01

Limit:

FCC 47 CFR Part 24.238(a), 27.53(h)(1), 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. The emission limit equal to -13 dBm.

FCC 47 CFR Part 27.53(m)(4):
For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

FCC 47 CFR Part 27.53(g):
For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

FCC 47 CFR Part 27.53(c)(2):
On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;

FCC 47 CFR Part 90.691:
(a)(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116 Log10(f/6.1) decibels or 50 + 10 Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.
(a)(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 43 + 10Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

Test Procedure:
The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer.
For each band edge measurement:
1) Set the spectrum analyzer span to include the block edge frequency.
2) Set a marker to point the corresponding band edge frequency in each test case.
3) Set display line at -13 dBm
4) Set resolution bandwidth to at least 1% of emission bandwidth.
5) Set spectrum analyzer with RMS detector.

6) Record the max trace plot into the test report

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

RSS-130 Issue 2, Section 4.7,
General unwanted emissions limits: The unwanted emissions in any 100 kHz bandwidth on any frequency outside the low frequency edge and the high frequency edge of each frequency block range(s), shall be attenuated below the transmitter power, P (dBW), by at least 43 + 10 log10 p (watts), dB. However, in the 100 kHz band immediately outside of the equipment's frequency block range, a resolution bandwidth of 30 kHz may be employed.

Additional unwanted emissions limits:
In addition to the limit outlined in section 4.7.1 above, equipment operating in the frequency bands 746- 756 MHz and 777-787 MHz shall also comply with the following restrictions:

a) The power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power, P (dBW), by at least:
   i. 76 + 10 log10 p (watts), dB, for base and fixed equipment, and
   ii. 65 + 10 log10 p (watts), dB, for mobile and portable equipment.
b) The e.i.r.p. in the band 1559-1610 MHz shall not exceed -70 dBW/MHz for wideband signal and -80 dBW for discrete emission with bandwidth less than 700 Hz.

RSS-132 Issue 3, Section 5.5,
In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands specified in Section 5.1, the power of emissions per any 1% of the occupied bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10 p (watts).

After the first 1.0 MHz immediately outside and adjacent to each of the sub-bands, the power of emissions in any 100 kHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10 p (watts). If the measurement is performed using 1% of the occupied bandwidth, power integration over 100 kHz is required.

RSS-133 Issue 6, Section 6.5,
In the 1.0 MHz bands immediately outside and adjacent to the equipment's operating frequency block, the emission power per any 1% of the emission bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10 p(watts).

After the first 1.0 MHz, the emission power in any 1 MHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10 p(watts). If the measurement is performed using 1% of the emission bandwidth, power integration over 1.0 MHz is required.

RSS-139 Issue 3, Section 6.6,
In the first 1.0 MHz bands immediately outside and adjacent to the equipment's smallest operating frequency block,2 which can contain the equipment's occupied bandwidth, the emission power per any 1% of the emission bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least 43 + 10 log10 p (watts) dB.
After the first 1.0 MHz outside the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power in any 1 MHz bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least 43 + 10 log10 p (watts) dB.

RSS-199 Issue 3, Section 4.5
In the 1 MHz band immediately outside and adjacent to the channel edge, the unwanted emission power shall be measured with a resolution bandwidth of at least 1% of the occupied bandwidth for base station and fixed subscriber equipment, and 2% for mobile subscriber equipment. Beyond the 1 MHz band, a resolution bandwidth of 1 MHz shall be used. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full required measurement bandwidth of 1 MHz, or 1% or 2% of the occupied bandwidth, as applicable.

Equipment shall comply with the following unwanted emission limits:

(a) for base station and fixed subscriber equipment, the power of any unwanted emissions measured as above shall be attenuated (in dB) below the transmitter power, P (dBW), by at least 43 + 10 log10 p.

(b) for mobile subscriber equipment, the power of any unwanted emissions measured as above shall be attenuated (in dB) below the transmitter power, P (dBW), by at least:

(i) 40 + 10 log10 p from the channel edges to 5 MHz away

(ii) 43 + 10 log10 p between 5 MHz and X MHz from the channel edges, and

(iii) 55 + 10 log10 p at X MHz and beyond from the channel edges

In addition, the attenuation shall not be less than 43 + 10 log10 p on all frequencies between 2490.5 MHz and 2496 MHz, and 55 + 10 log10 p at or below 2490.5 MHz.

In (a) and (b), p is the transmitter power measured in watts and X is 6 MHz or the equipment occupied bandwidth, whichever is greater.

Test Setup: Refer to section 4.2.2 for details.

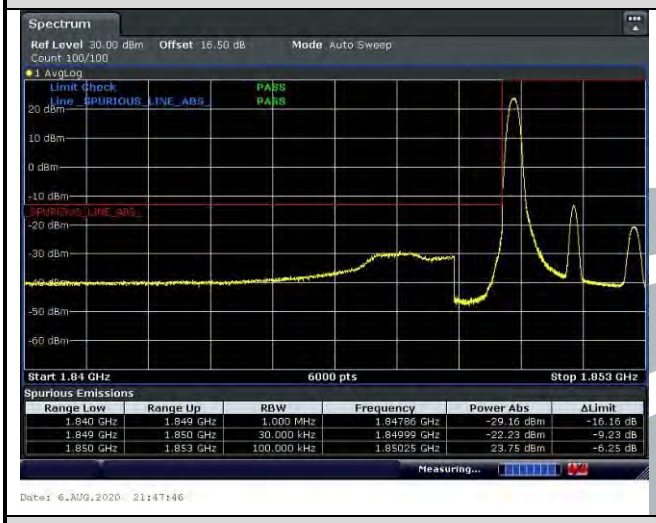
Instruments Used: Refer to section 3 for details

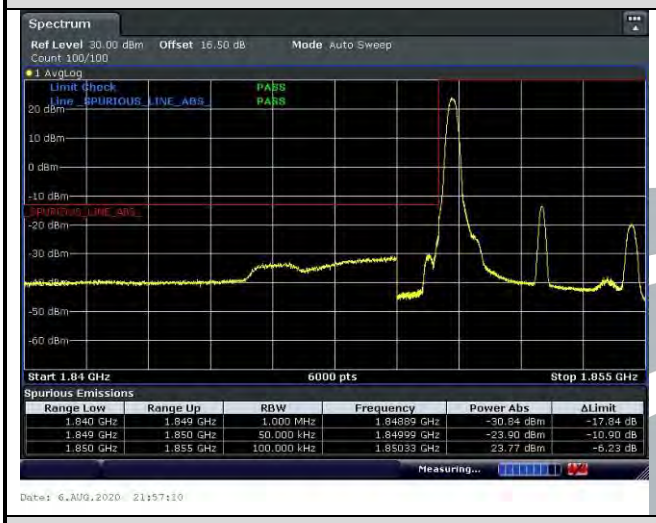
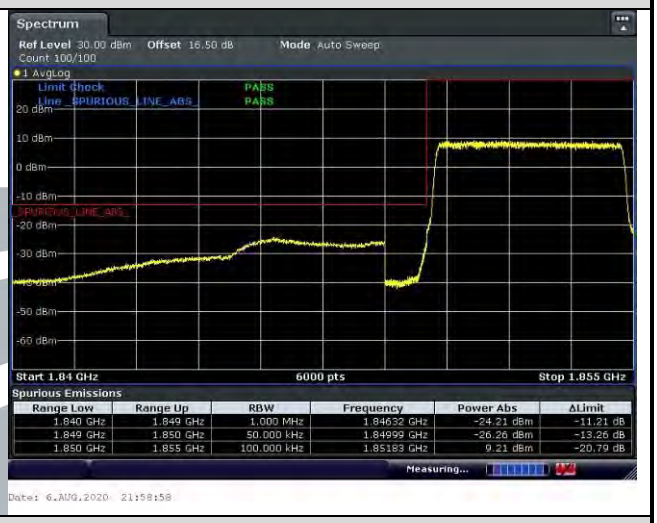
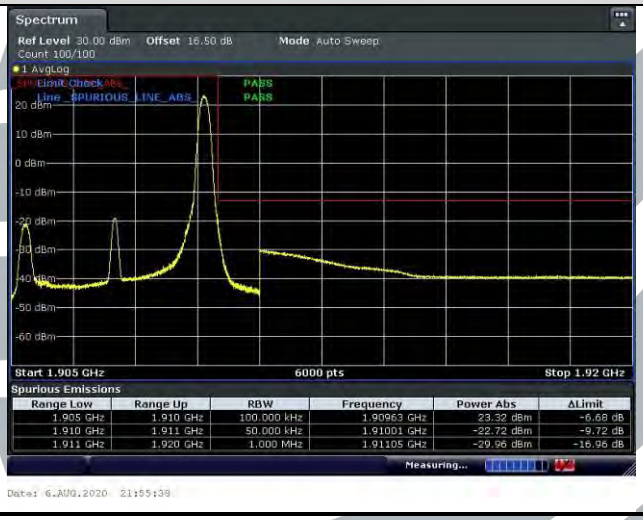
Test Mode: Link mode

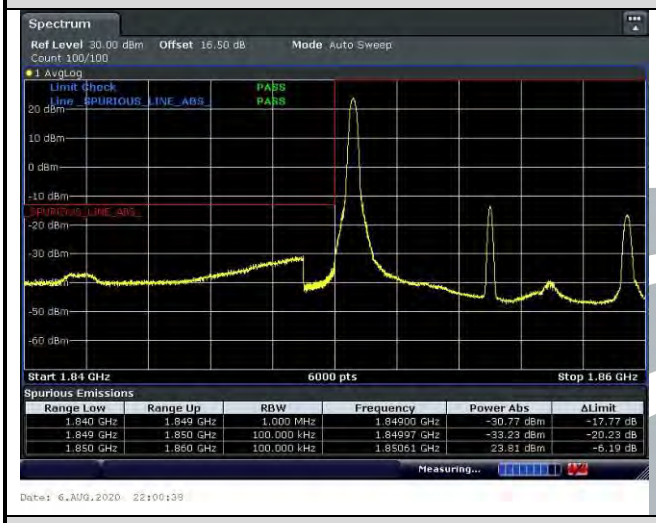
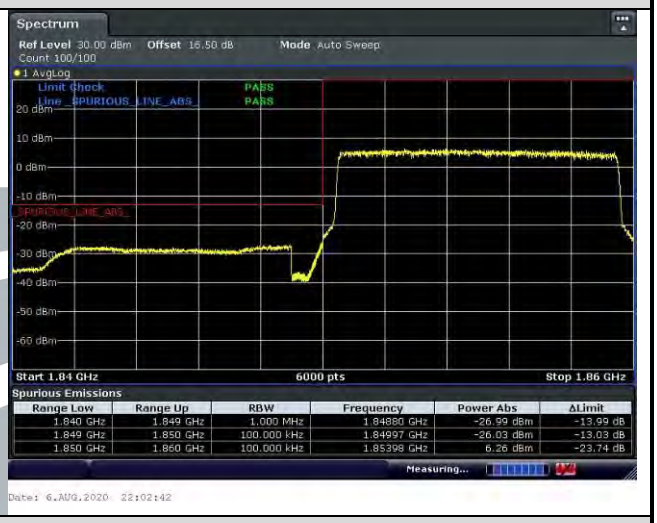
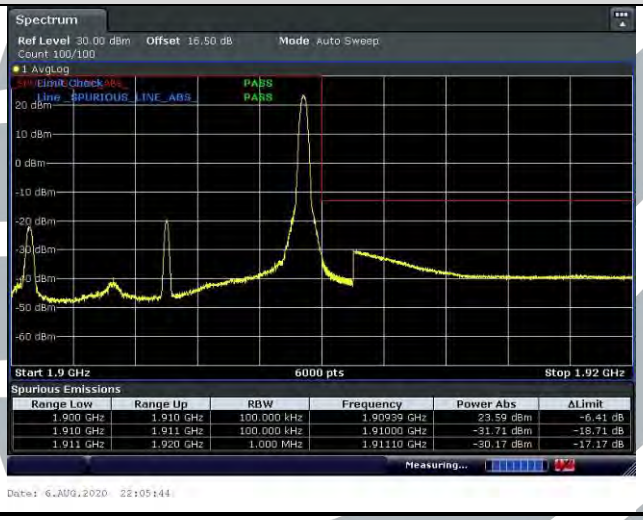
Test Results: Pass

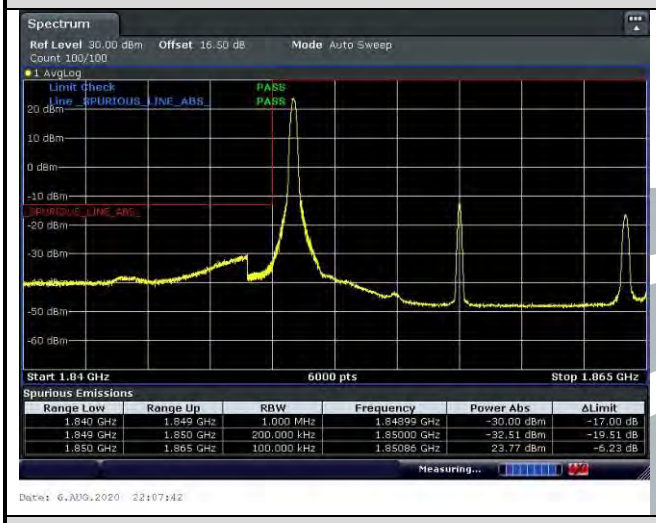
5.6.1 LTE Band 2

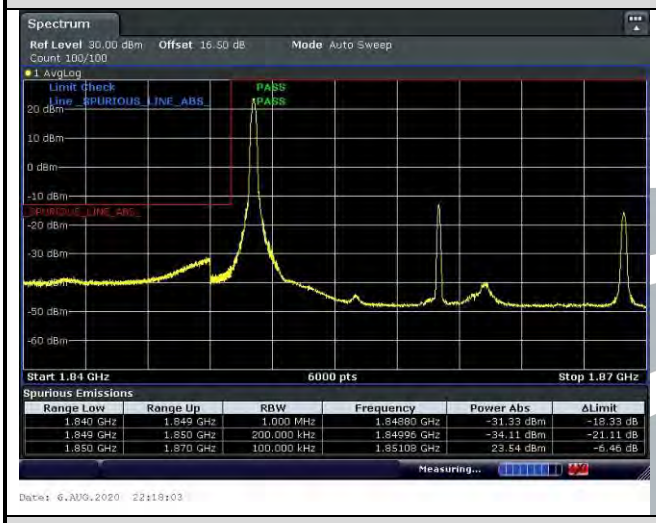
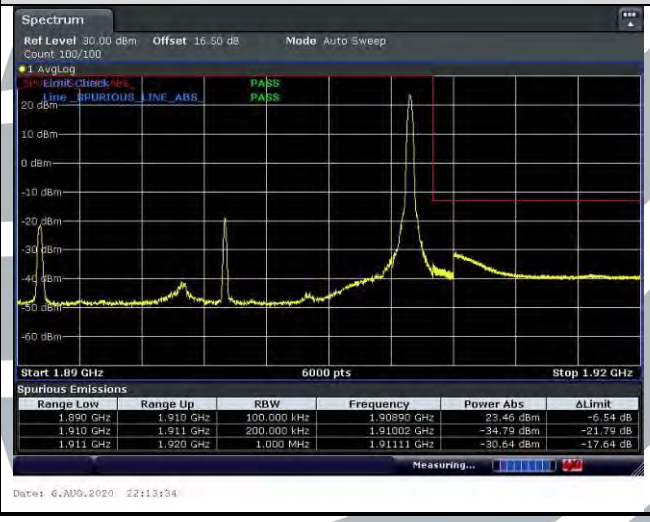
LTE Band 2 / 1.4 MHz / QPSK	
1 RB	Full RB
Lowest Channel	
Highest Channel	

LTE Band 2 / 3 MHz / QPSK	
1 RB	Full RB
Lowest Channel	
	
Highest Channel	

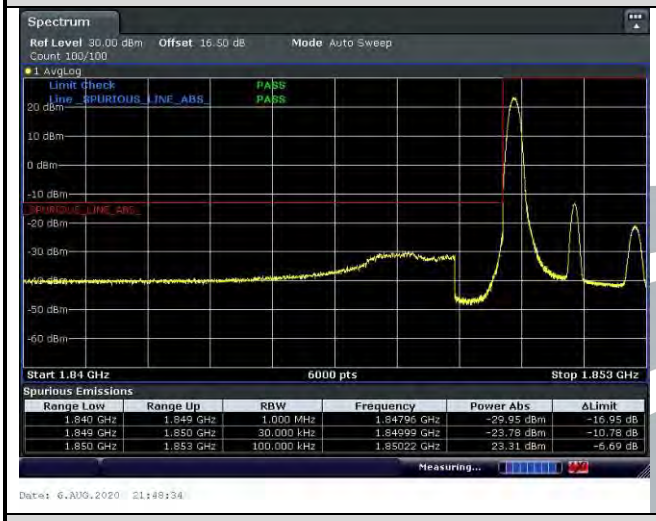
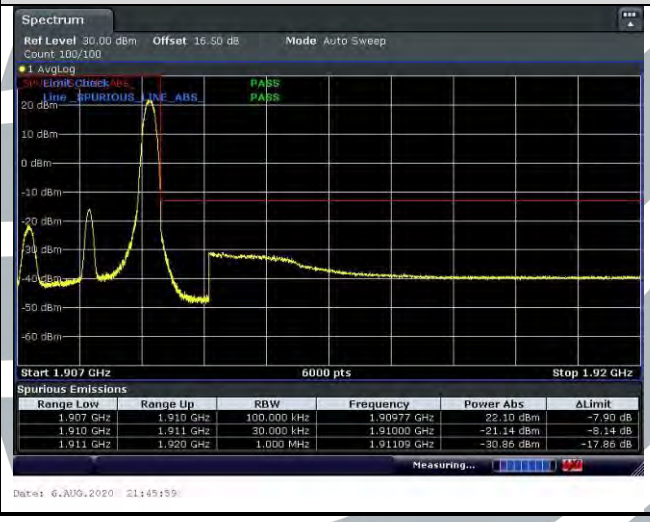
LTE Band 2 / 5 MHz / QPSK	
1 RB	Full RB
Lowest Channel	
	
Highest Channel	
	

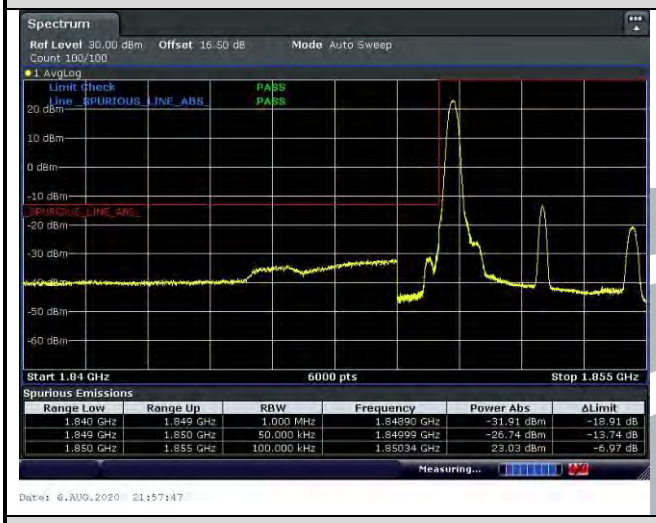
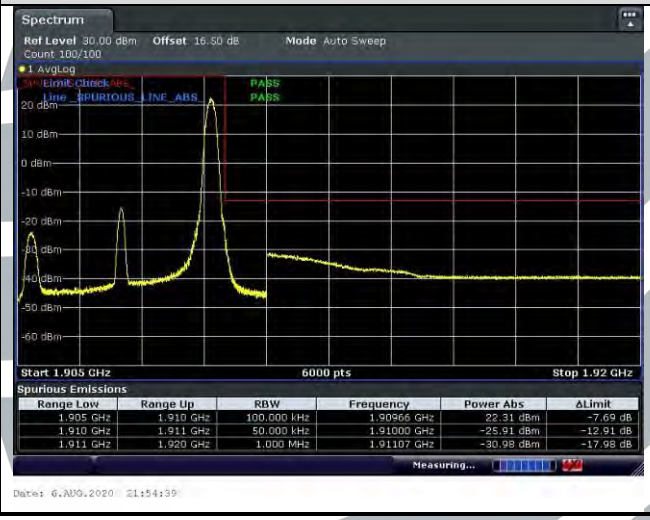
LTE Band 2 / 10 MHz / QPSK	
1 RB	Full RB
Lowest Channel	
	
Highest Channel	
	

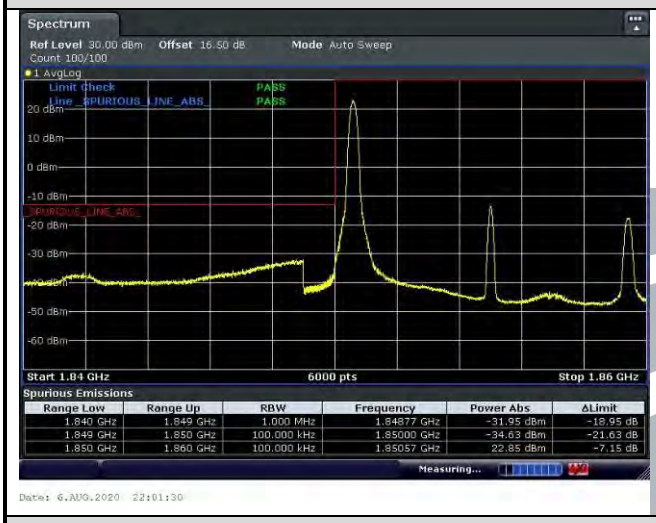
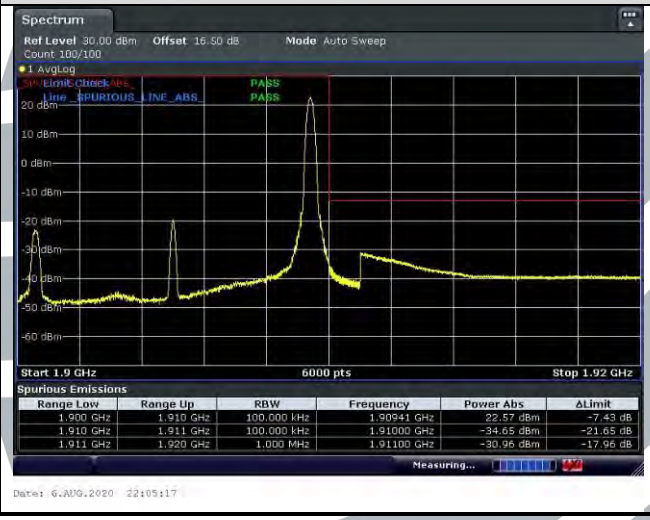
LTE Band 2 / 15 MHz / QPSK	
1 RB	Full RB
Lowest Channel	
	
Highest Channel	

LTE Band 2 / 20 MHz / QPSK	
1 RB	Full RB
Lowest Channel	
	
Highest Channel	
	

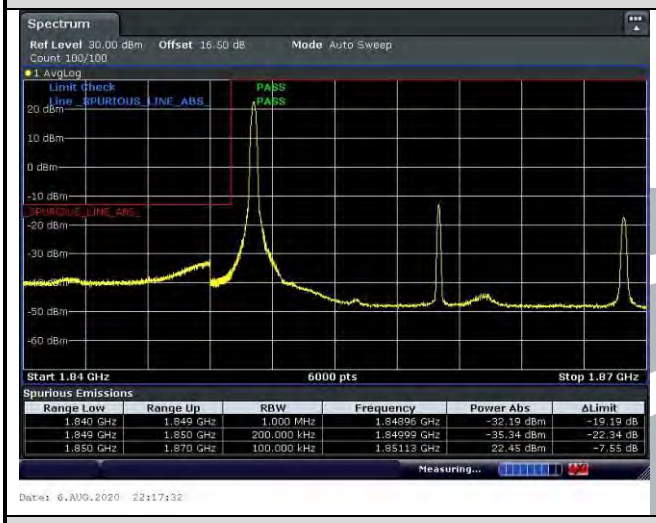
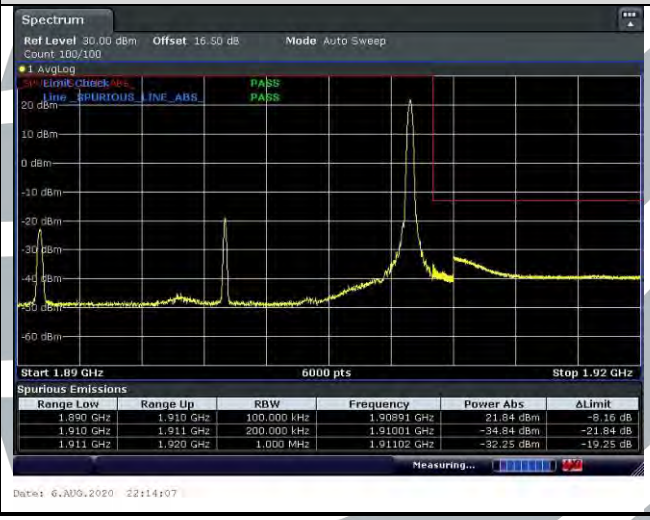
LTE Band 2 / 1.4 MHz / 16QAM	
1 RB	Full RB
Lowest Channel	
Highest Channel	

LTE Band 2 / 3 MHz / 16QAM	
1 RB	Full RB
Lowest Channel	
	
Highest Channel	
	

LTE Band 2 / 5 MHz / 16QAM	
1 RB	Full RB
Lowest Channel	
	
Highest Channel	
	

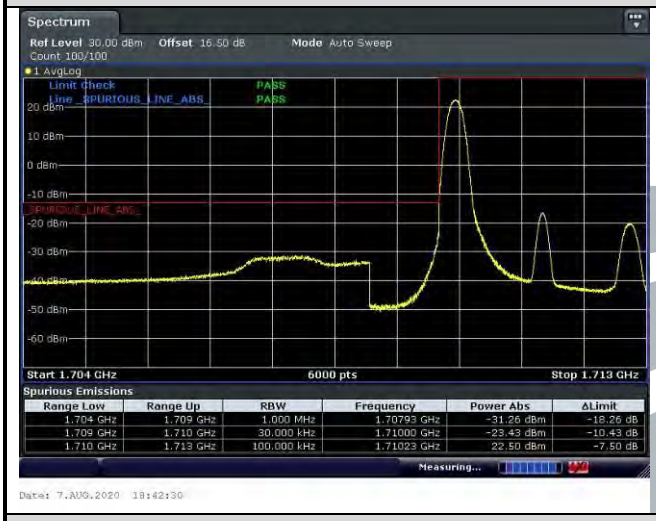
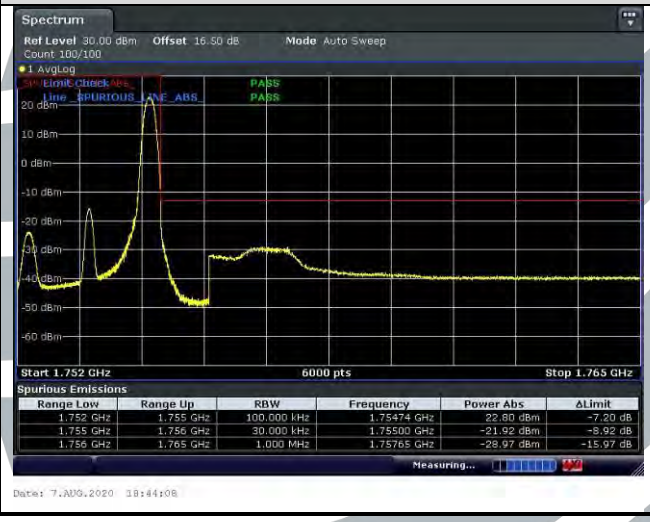
LTE Band 2 / 10 MHz / 16QAM	
1 RB	Full RB
Lowest Channel	
	
Highest Channel	
	

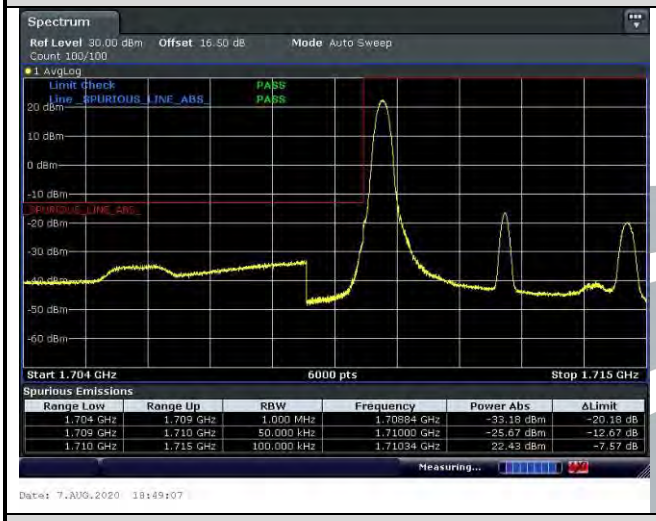
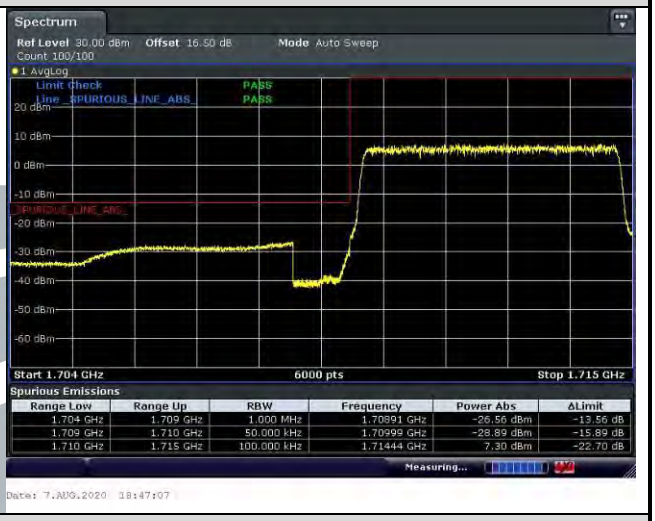
LTE Band 2 / 15 MHz / 16QAM	
1 RB	Full RB
Lowest Channel	
Highest Channel	

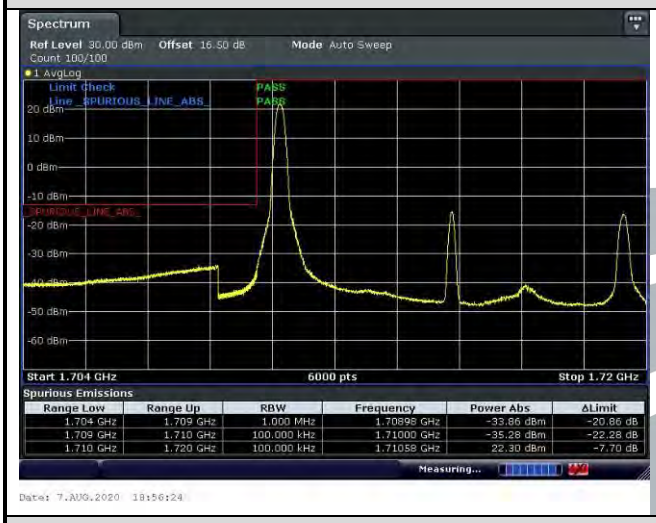
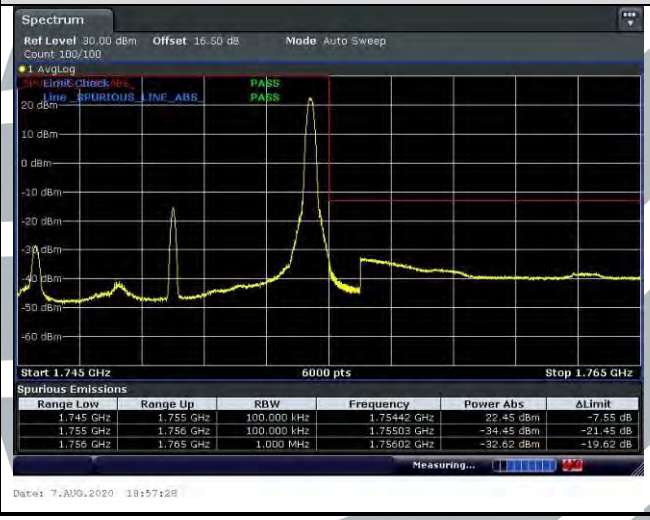
LTE Band 2 / 20 MHz / 16QAM	
1 RB	Full RB
Lowest Channel	
	
Highest Channel	
	

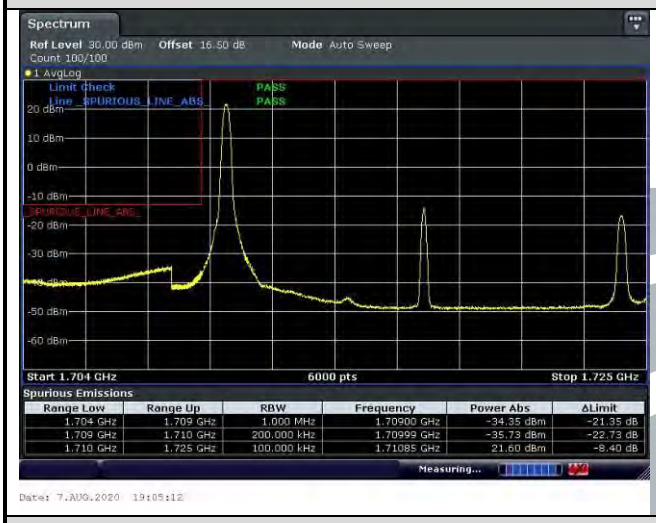
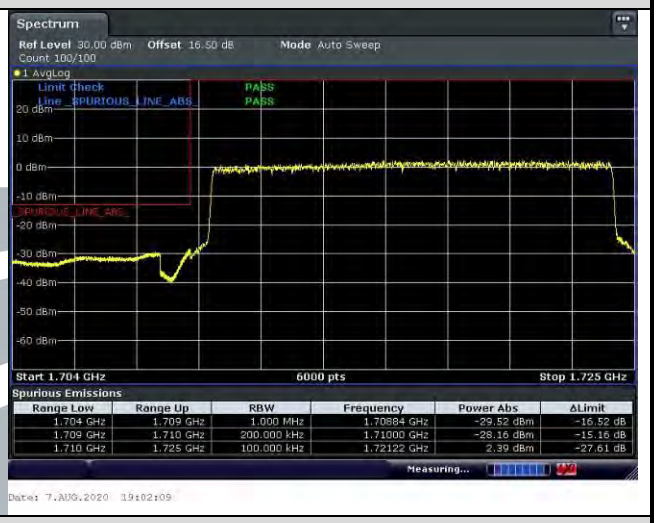
5.6.2 LTE Band 4

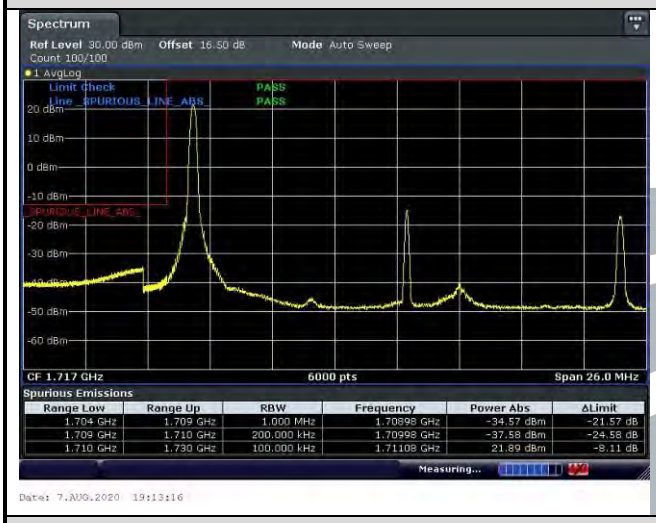
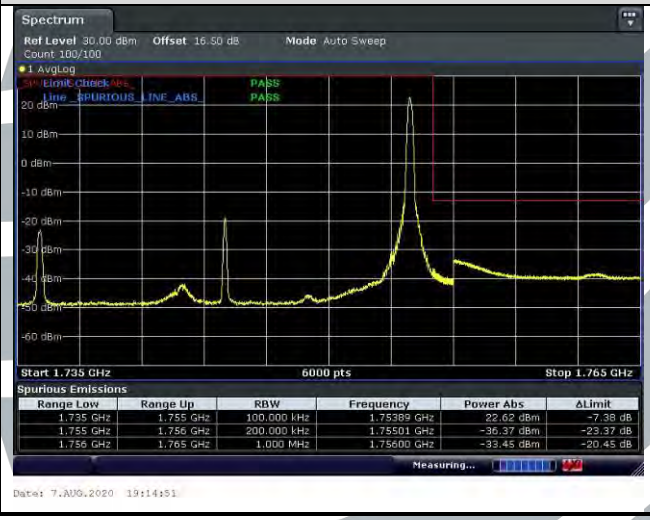
LTE Band 4 / 1.4 MHz / QPSK	
1 RB	Full RB
Lowest Channel	
Highest Channel	

LTE Band 4 / 3 MHz / QPSK	
1 RB	Full RB
Lowest Channel	
	
Highest Channel	
	

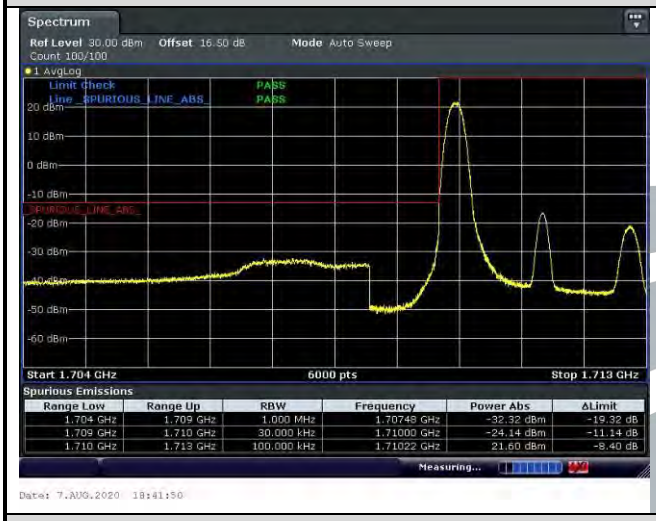
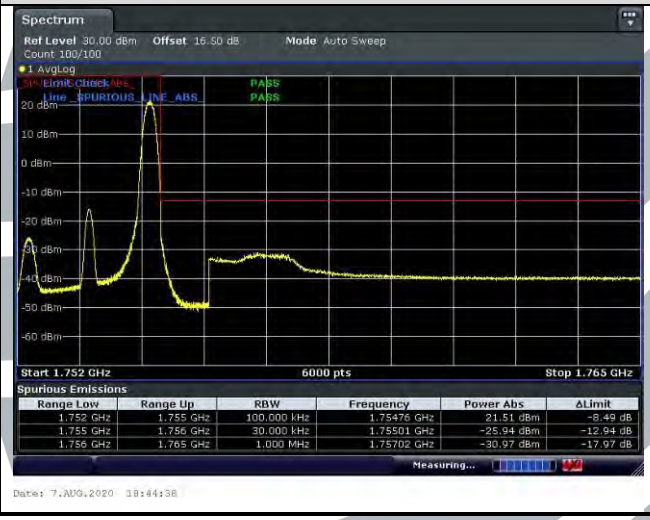
LTE Band 4 / 5 MHz / QPSK	
1 RB	Full RB
Lowest Channel	
	
Highest Channel	

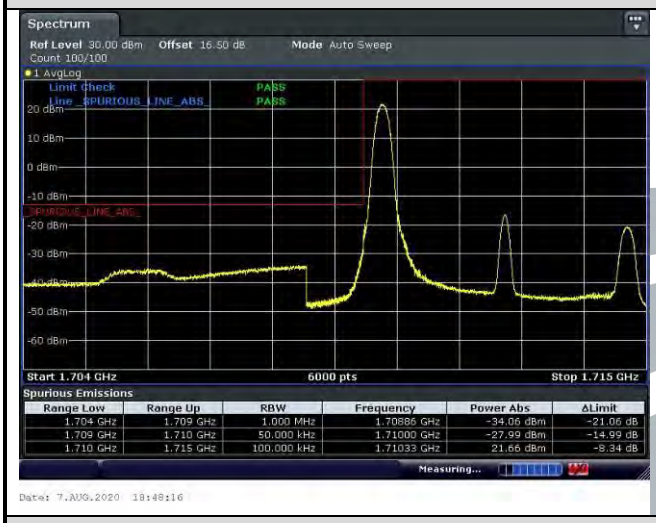
LTE Band 4 / 10 MHz / QPSK	
1 RB	Full RB
Lowest Channel	
	
Highest Channel	
	

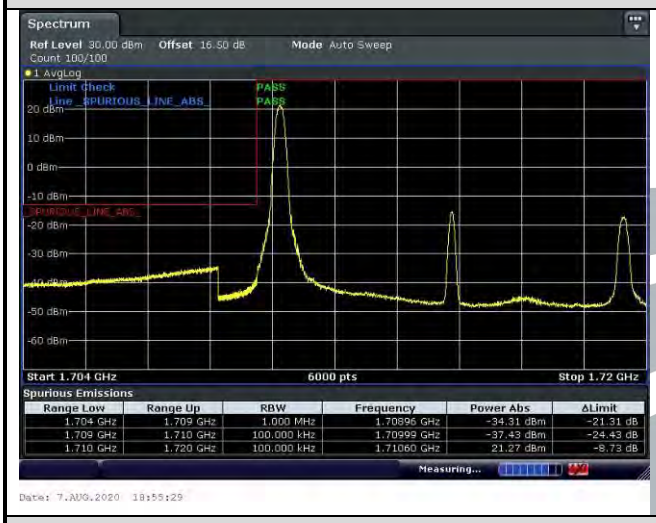
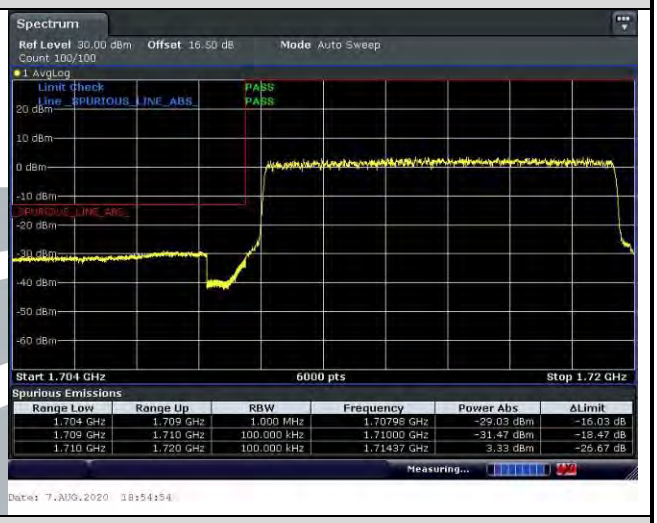
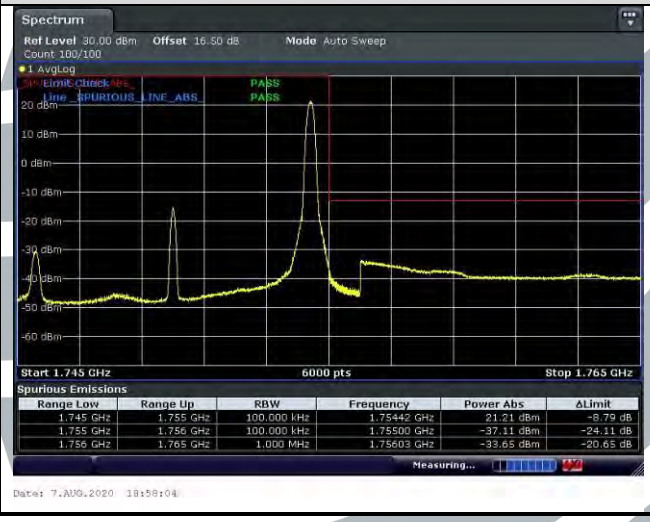
LTE Band 4 / 15 MHz / QPSK	
1 RB	Full RB
Lowest Channel	
	
Highest Channel	

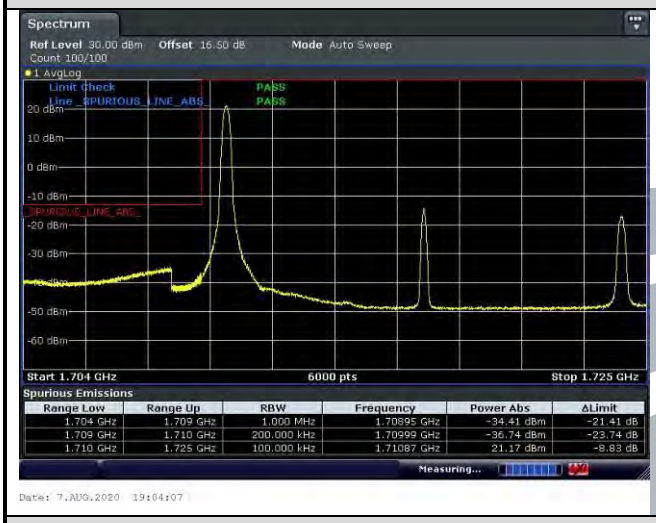
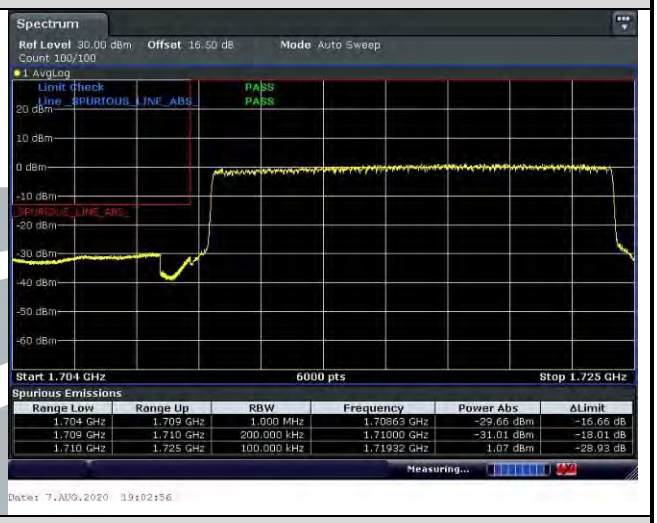
LTE Band 4 / 20 MHz / QPSK	
1 RB	Full RB
Lowest Channel	
	
Highest Channel	
	

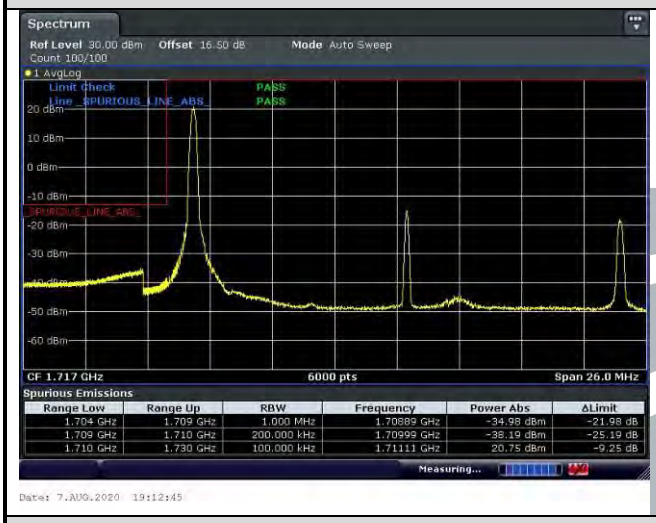
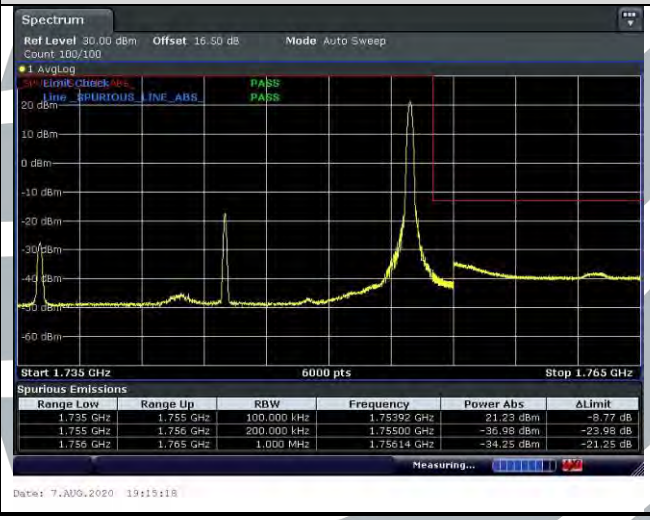
LTE Band 4 / 1.4 MHz / 16QAM	
1 RB	Full RB
Lowest Channel	
Highest Channel	

LTE Band 4 / 3 MHz / 16QAM	
1 RB	Full RB
Lowest Channel	
	
Highest Channel	
	

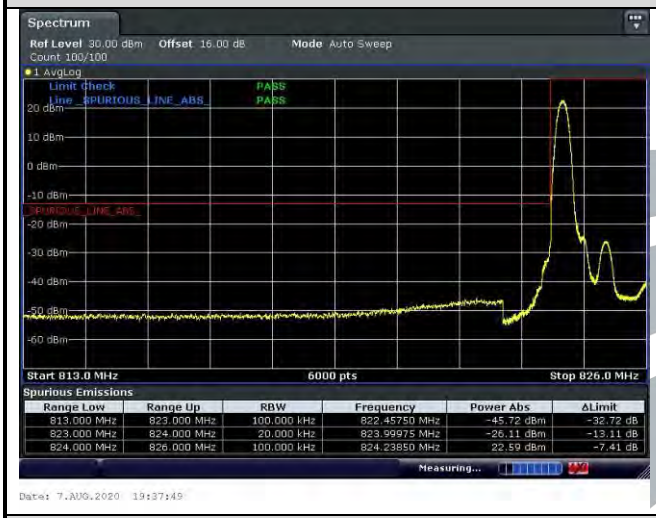
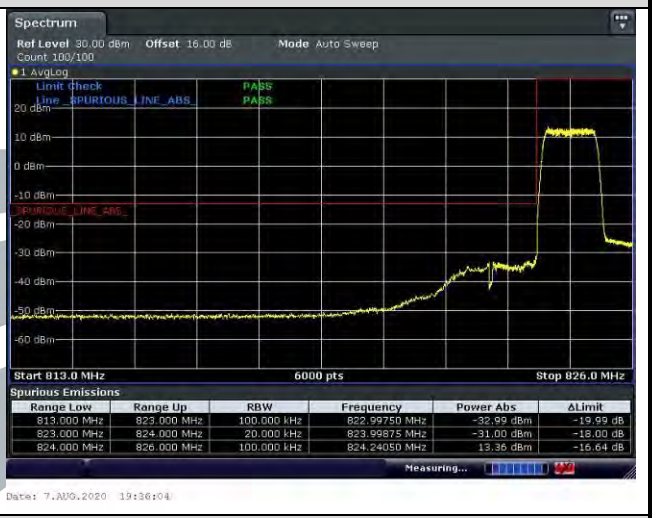
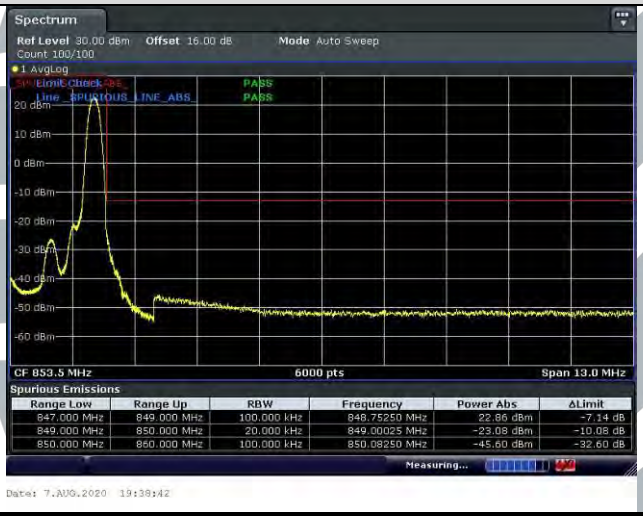
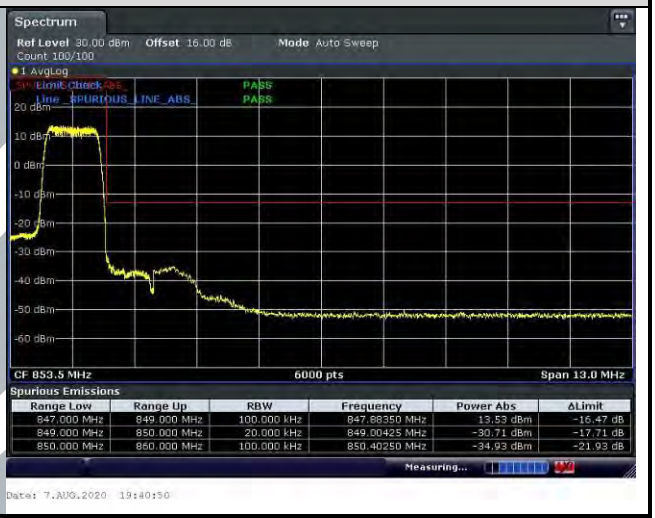
LTE Band 4 / 5 MHz / 16QAM	
1 RB	Full RB
Lowest Channel	
	
Highest Channel	

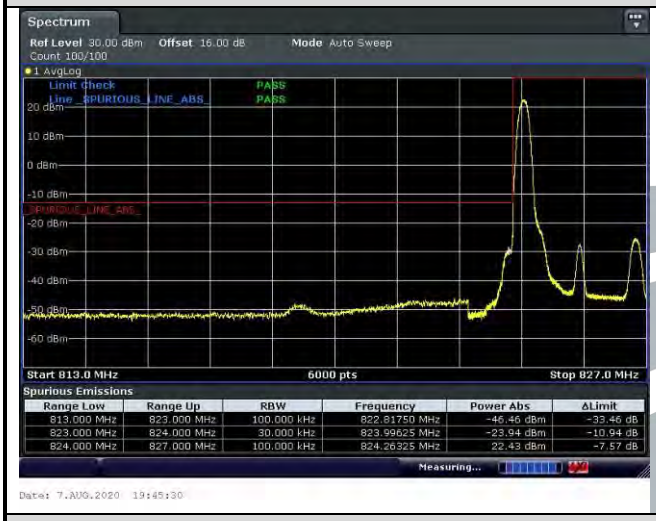
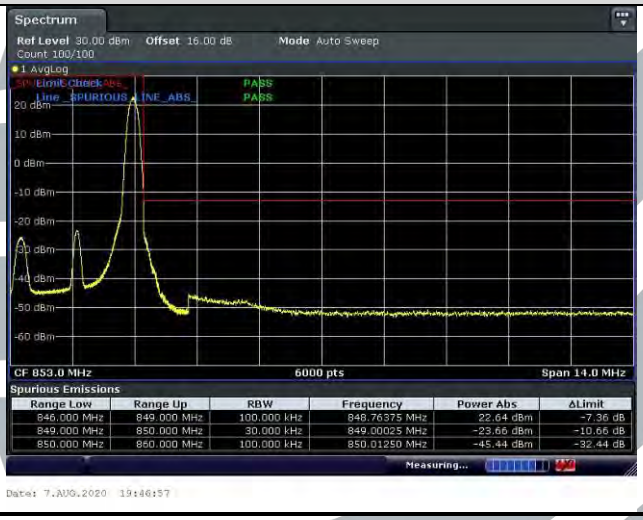
LTE Band 4 / 10 MHz / 16QAM	
1 RB	Full RB
Lowest Channel	
	
Highest Channel	
	

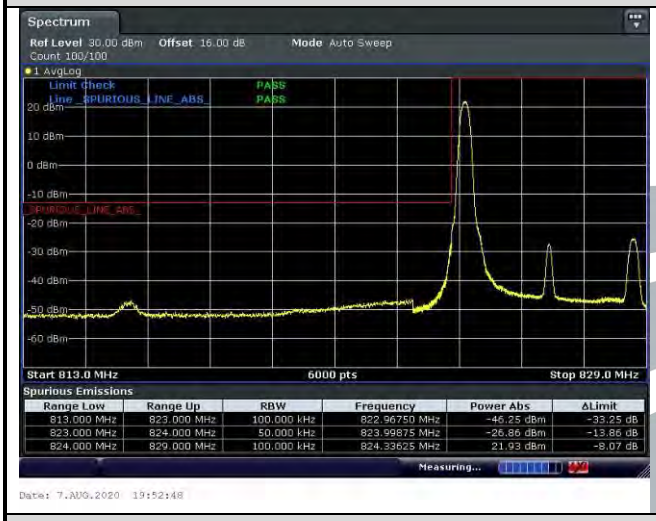
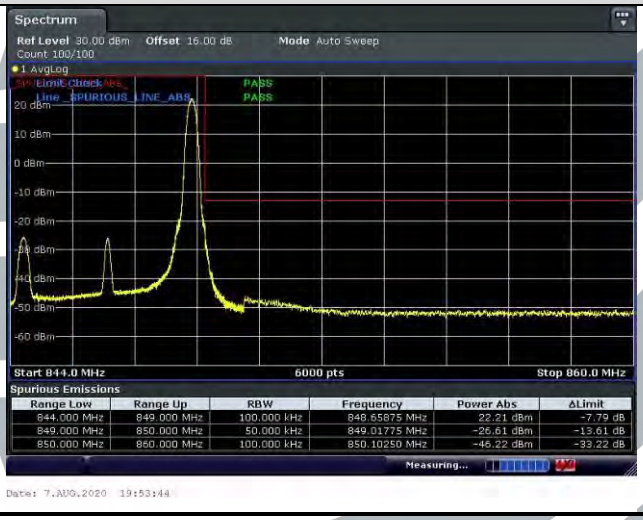
LTE Band 4 / 15 MHz / 16QAM	
1 RB	Full RB
Lowest Channel	
	
Highest Channel	

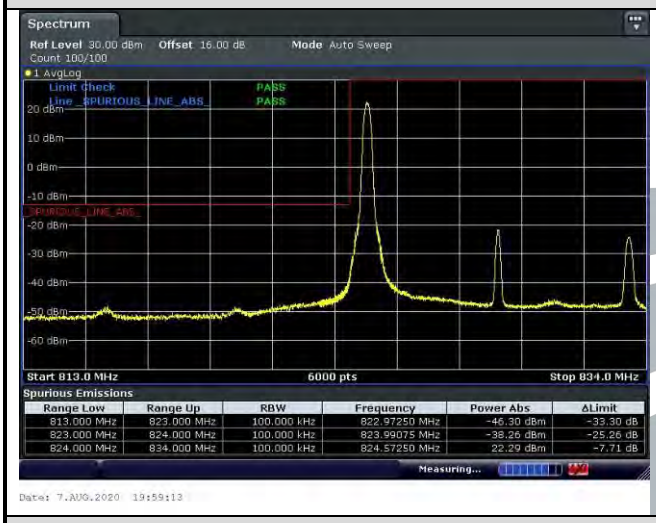
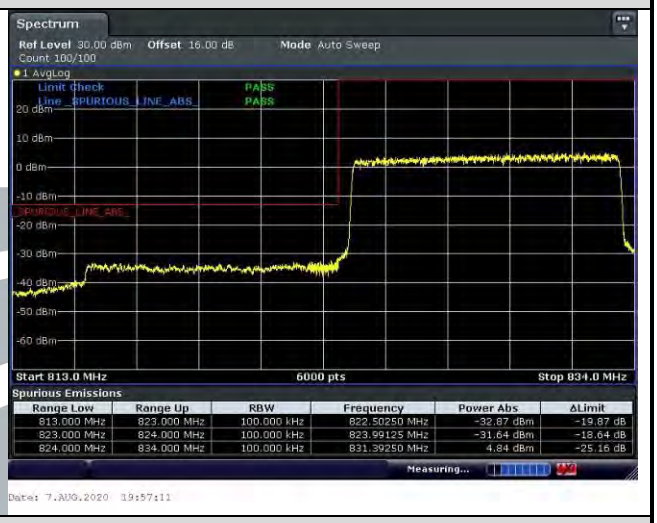
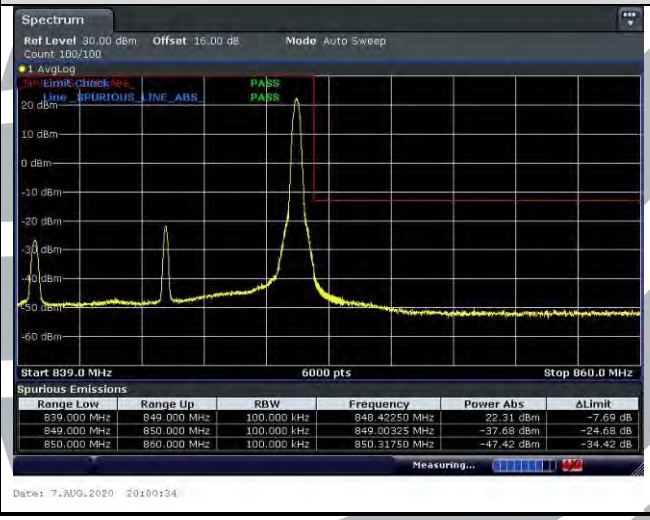
LTE Band 4 / 20 MHz / 16QAM	
1 RB	Full RB
Lowest Channel	
	
Highest Channel	
	

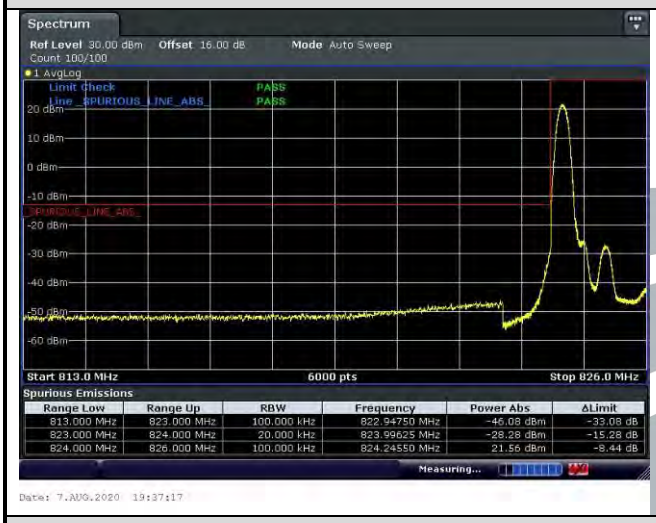
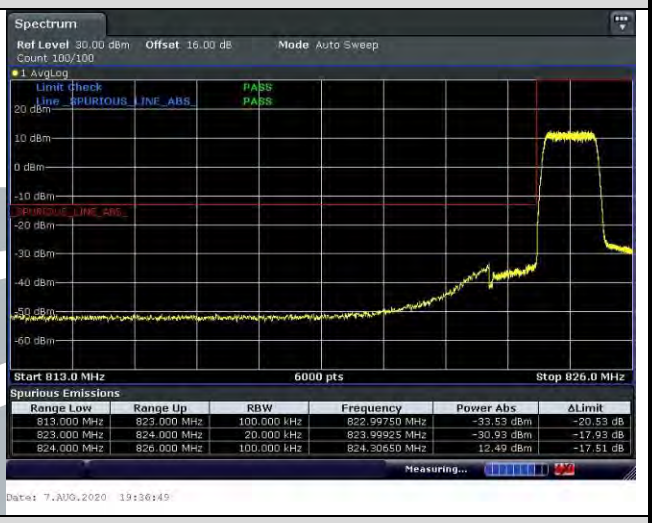
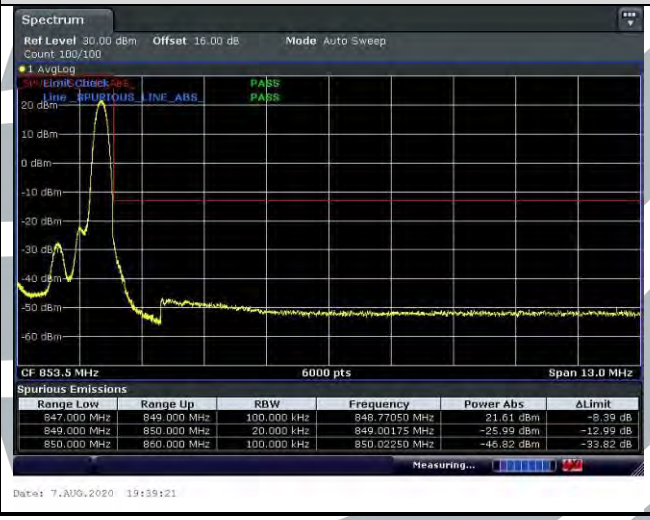
5.6.3 LTE Band 5

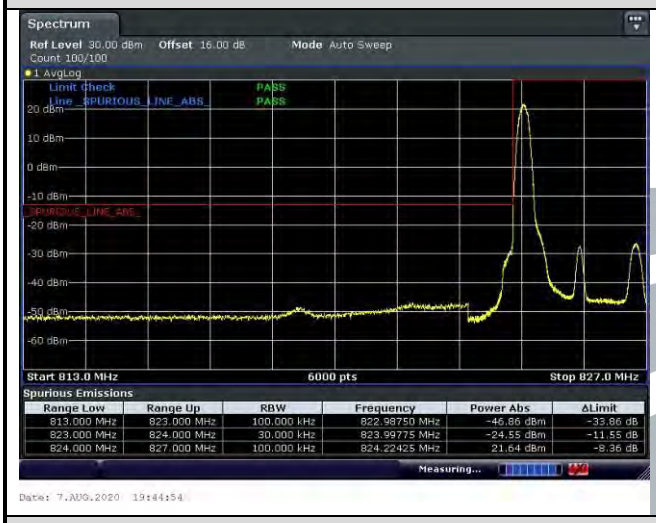
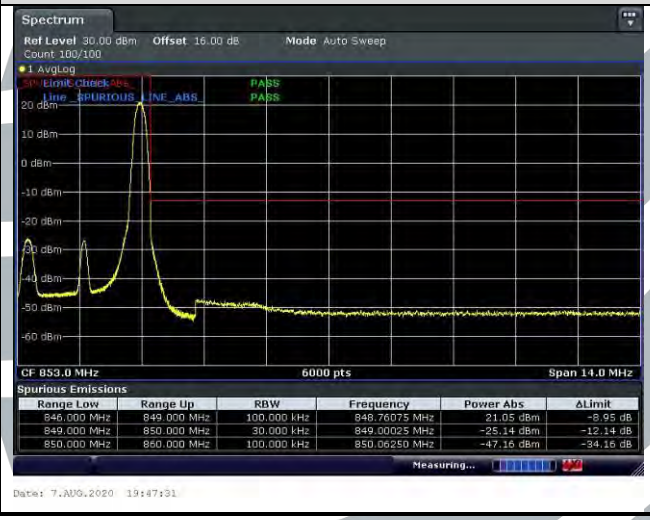
LTE Band 5 / 1.4 MHz / QPSK	
1 RB	Full RB
Lowest Channel	
	
Highest Channel	
	

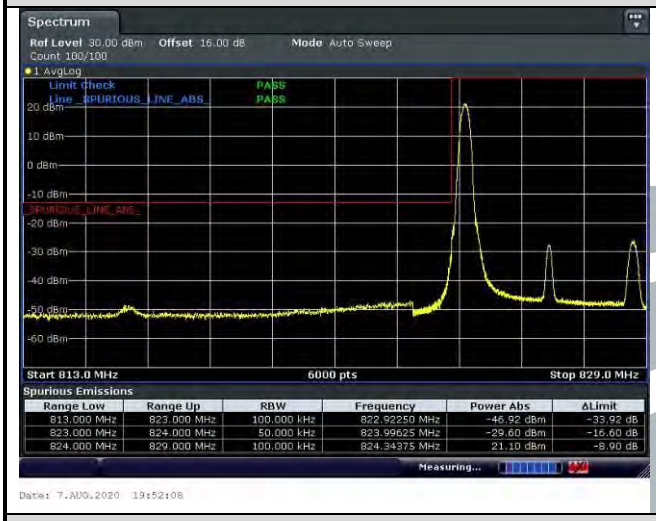
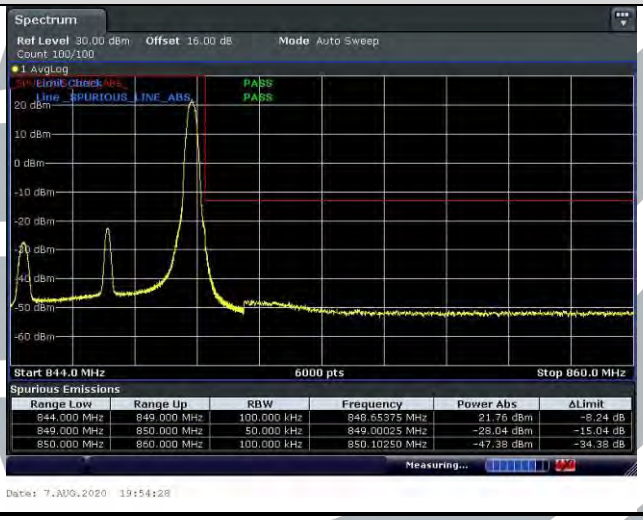
LTE Band 5 / 3 MHz / QPSK	
1 RB	Full RB
Lowest Channel	
	
Highest Channel	
	

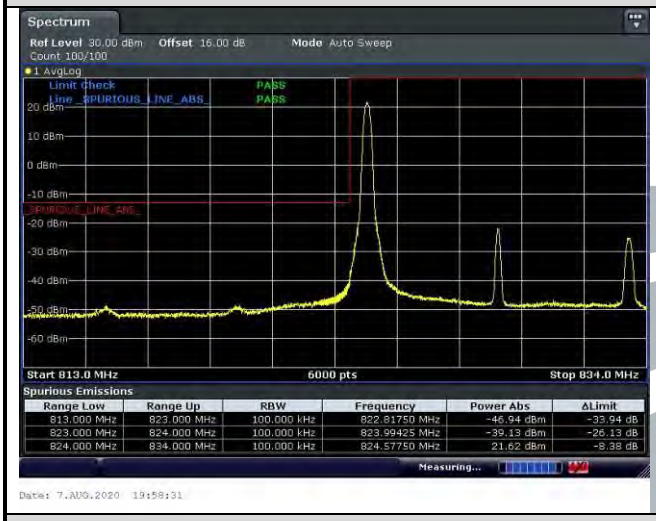
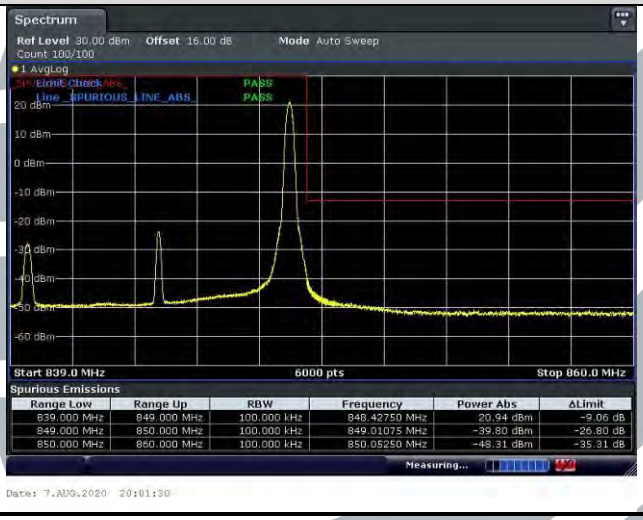
LTE Band 5 / 5 MHz / QPSK	
1 RB	Full RB
Lowest Channel	
	
Highest Channel	
	

LTE Band 5 / 10 MHz / QPSK	
1 RB	Full RB
Lowest Channel	
	
Highest Channel	
	

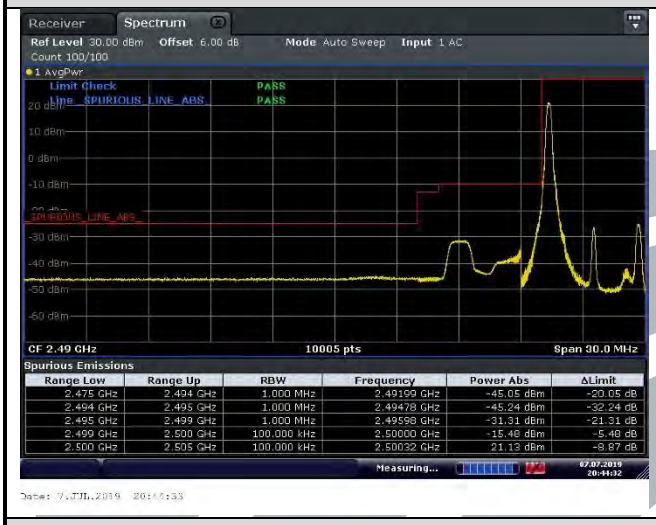
LTE Band 5 / 1.4 MHz / 16QAM	
1 RB	Full RB
Lowest Channel	
	
Highest Channel	
	

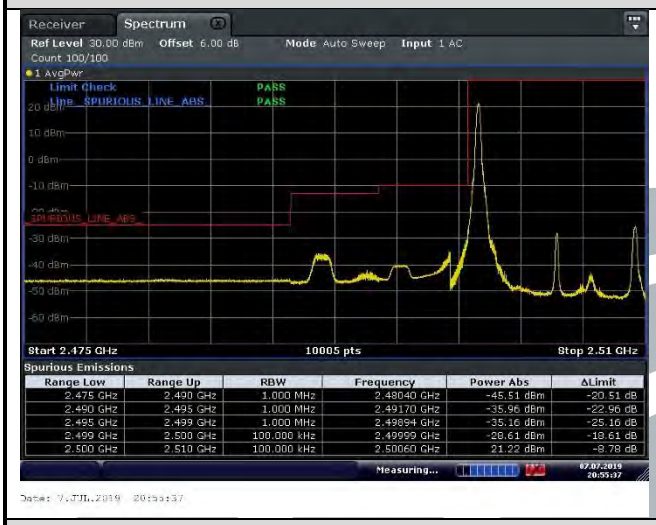
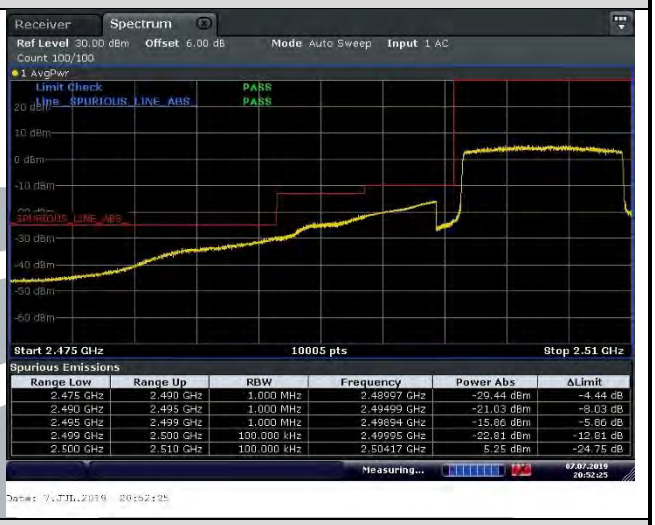
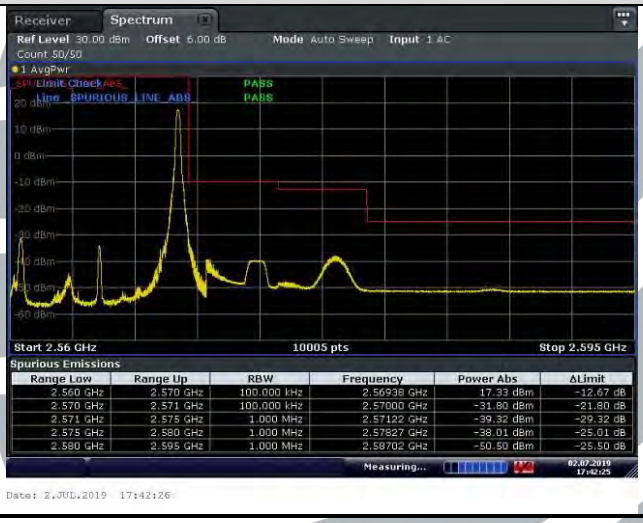
LTE Band 5 / 3 MHz / 16QAM	
1 RB	Full RB
Lowest Channel	
	
Highest Channel	
	

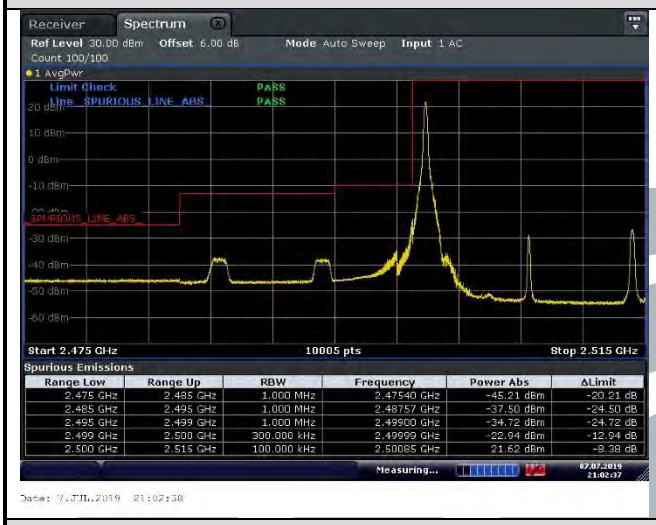
LTE Band 5 / 5 MHz / 16QAM	
1 RB	Full RB
Lowest Channel	
	
Highest Channel	
	

LTE Band 5 / 10 MHz / 16QAM	
1 RB	Full RB
Lowest Channel	
	
Highest Channel	
	

5.6.4 LTE Band 7

LTE Band 7 / 5 MHz / QPSK	
1 RB	Full RB
Lowest Channel	
	
Highest Channel	

LTE Band 7 / 10 MHz / QPSK	
1 RB	Full RB
Lowest Channel	
	
Highest Channel	
	

LTE Band 7 / 15 MHz / QPSK	
1 RB	Full RB
Lowest Channel	
	
Highest Channel	