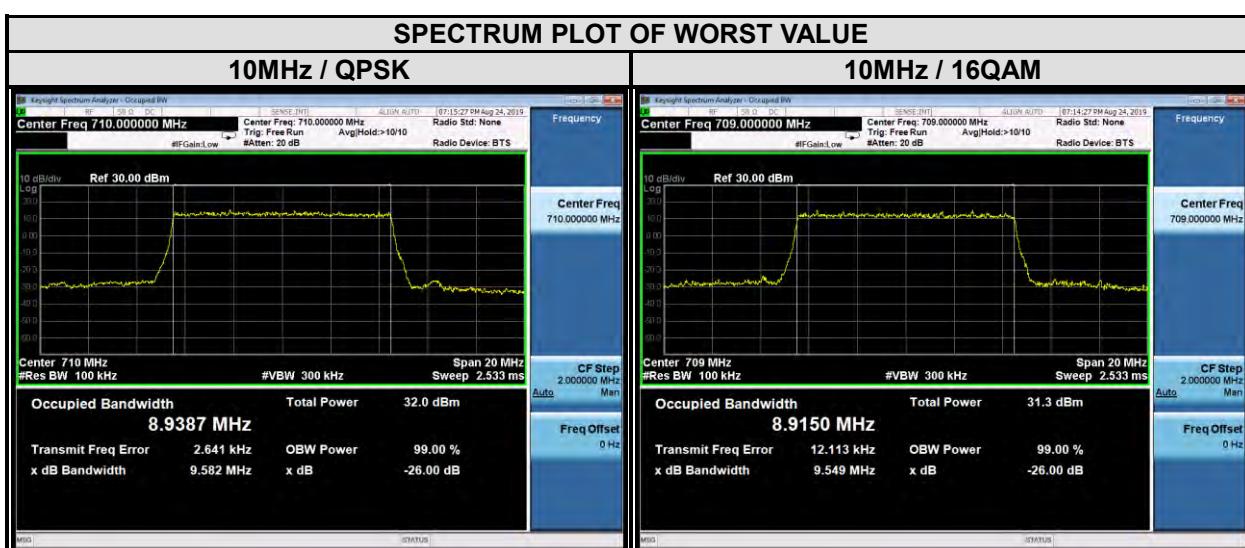




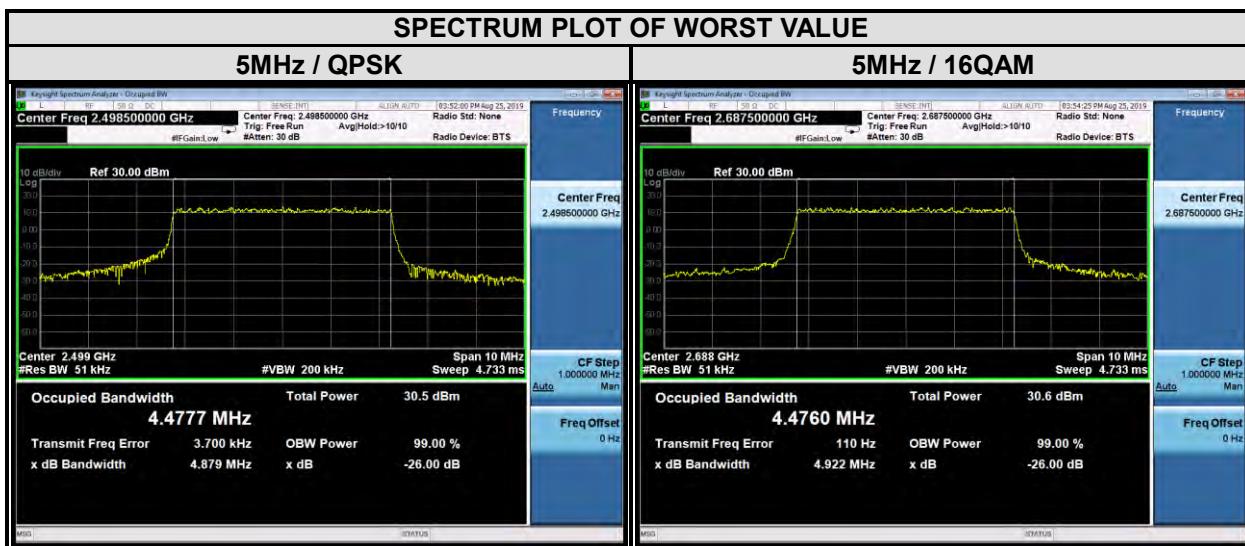
Test Report No.: RF190522W005-4

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





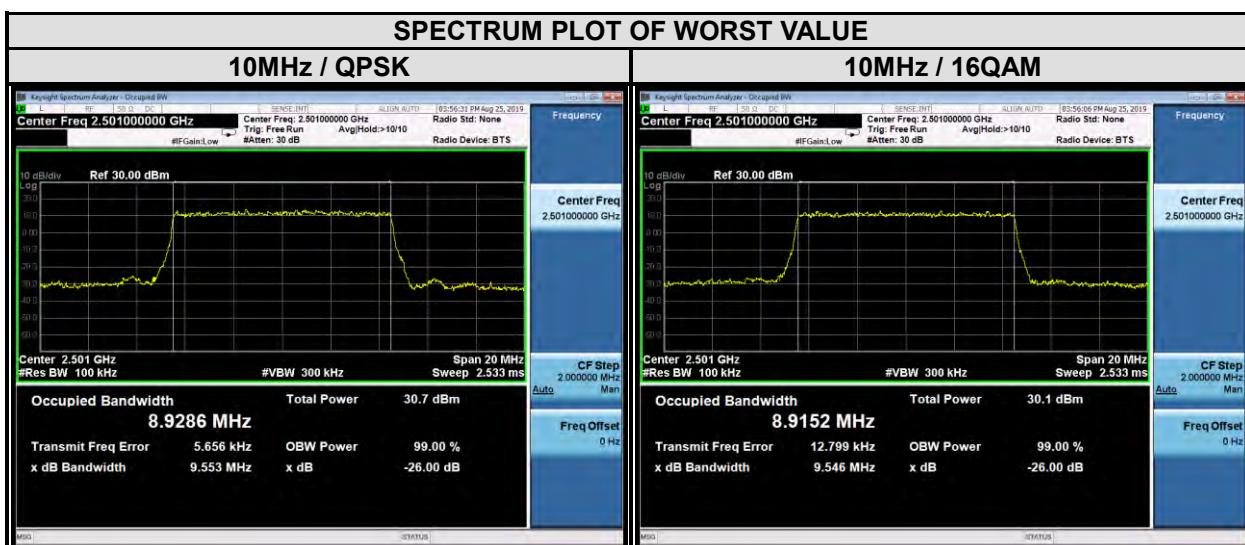
LTE band 41					
Channel Bandwidth : 5MHz					
Channel	Frequency (MHz)	99% Occupied bandwidth (MHz)		26 dB bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
39675	2498.5	4.48	4.47	4.88	4.84
40620	2593	4.47	4.47	4.89	4.85
41565	2687.5	4.48	4.48	4.92	4.92





Test Report No.: RF190522W005-4

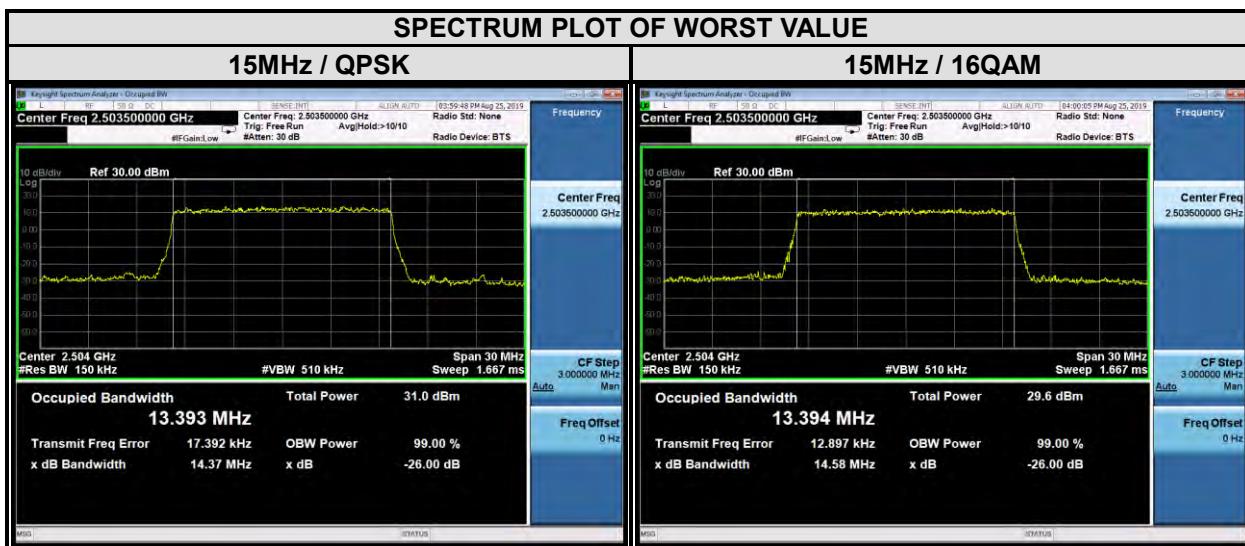
LTE band 41					
Channel Bandwidth : 10MHz					
Channel	Frequency (MHz)	99% Occupied bandwidth (MHz)		26 dB bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
39700	2501	8.93	8.92	9.55	9.55
40620	2593	8.93	8.92	9.49	9.56
41540	2685	8.93	8.92	9.55	9.55





Test Report No.: RF190522W005-4

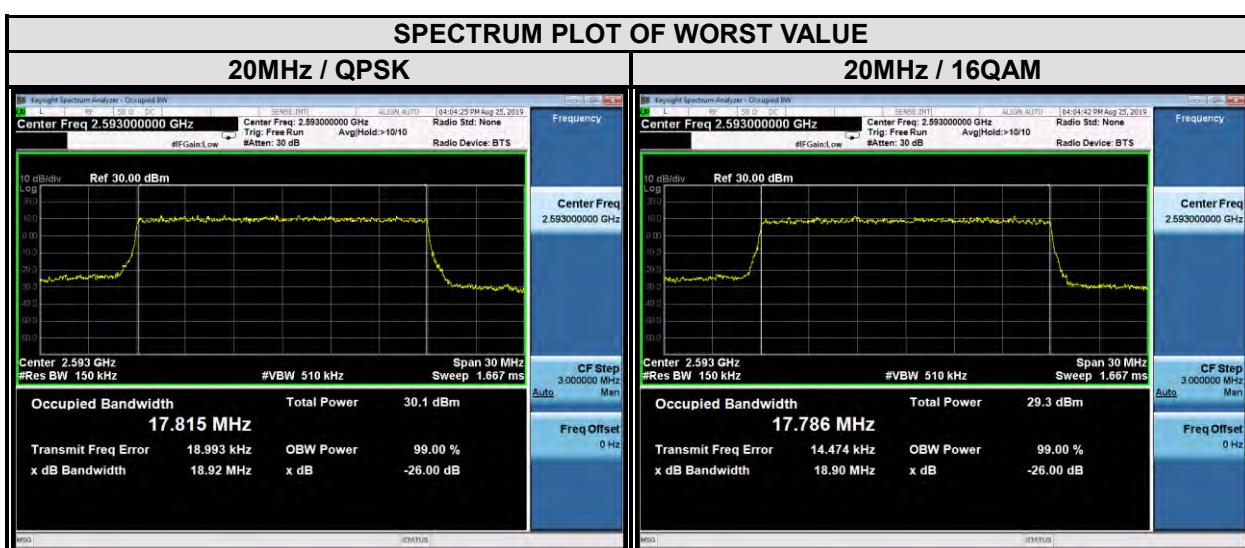
LTE band 41					
Channel Bandwidth : 15MHz					
Channel	Frequency (MHz)	99% Occupied bandwidth (MHz)		26 dB bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
39725	2503.5	13.39	13.39	14.37	14.58
40620	2593	13.37	13.38	14.31	14.51
41515	2682.5	13.39	13.39	14.29	14.52





Test Report No.: RF190522W005-4

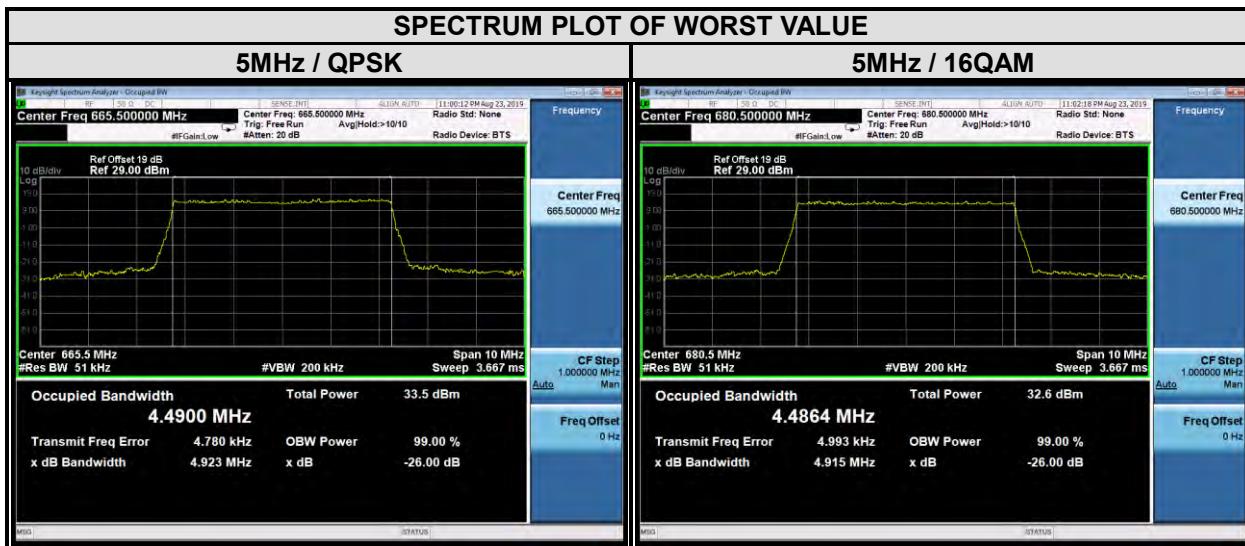
LTE band 41					
Channel Bandwidth : 20MHz					
Channel	Frequency (MHz)	99% Occupied bandwidth (MHz)		26 dB bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
39750	2506	17.80	17.78	18.89	18.97
40620	2593	17.82	17.79	18.92	18.90
41490	2680	17.79	17.79	18.74	18.65





Test Report No.: RF190522W005-4

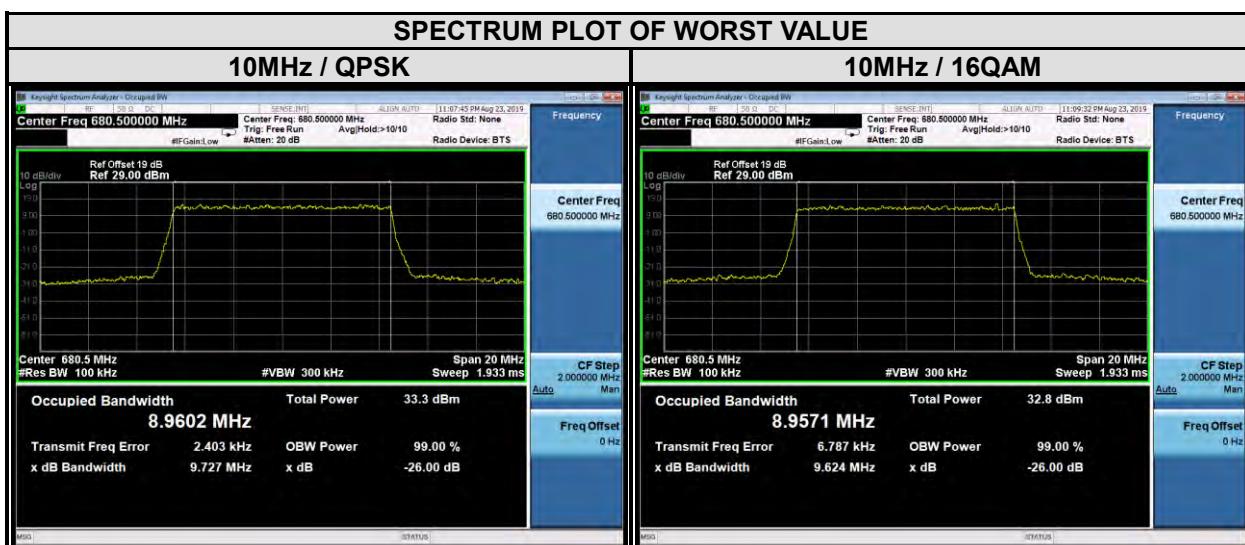
LTE band 71					
Channel Bandwidth : 5MHz					
Channel	Frequency (MHz)	99% Occupied bandwidth (MHz)		26 dB bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
133147	665.5	4.49	4.48	4.92	4.90
133297	680.5	4.49	4.49	4.91	4.92
133447	695.5	4.47	4.48	4.87	4.93





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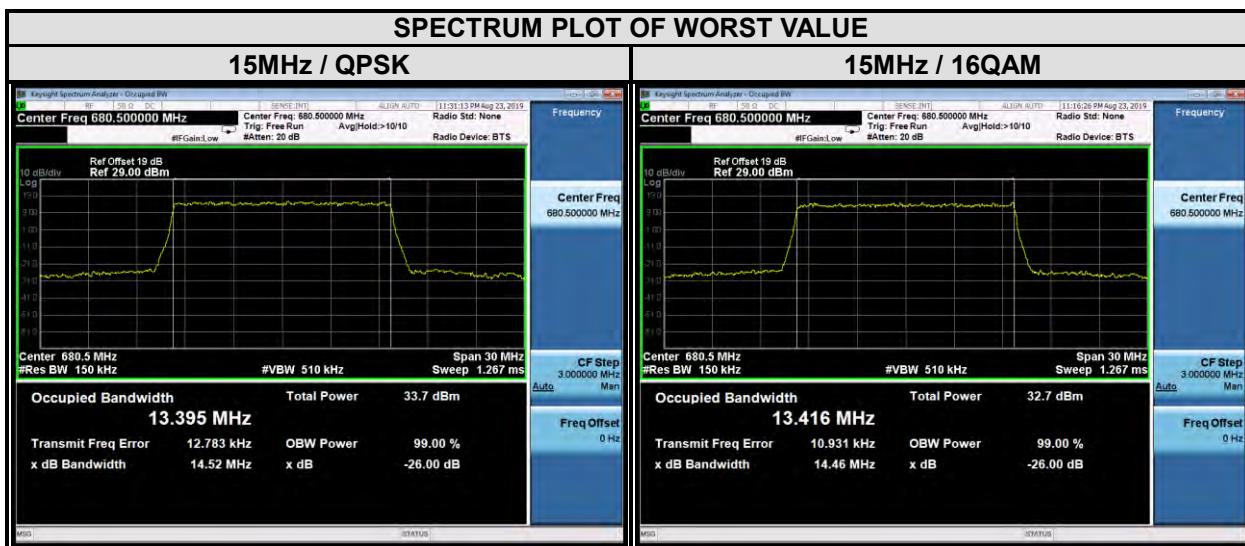
LTE band 71					
Channel Bandwidth : 10MHz					
Channel	Frequency (MHz)	99% Occupied bandwidth (MHz)		26 dB bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
133172	668	8.94	8.95	9.70	9.68
133297	680.5	8.96	8.96	9.73	9.62
133422	693	8.94	8.94	9.68	9.65





Test Report No.: RF190522W005-4

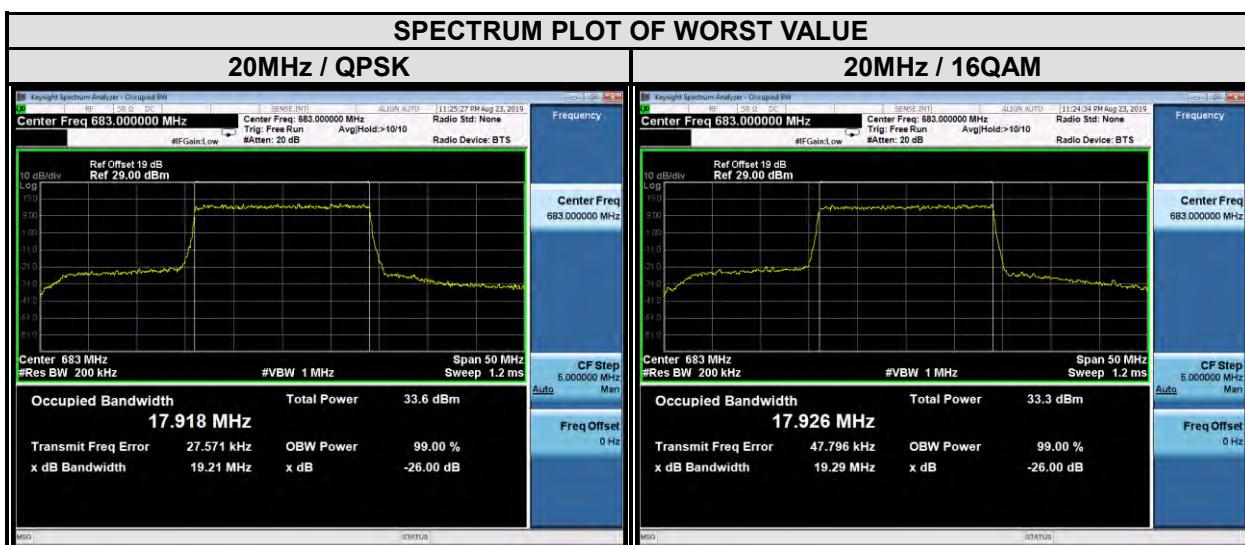
LTE band 71					
Channel Bandwidth : 15MHz					
Channel	Frequency (MHz)	99% Occupied bandwidth (MHz)		26 dB bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
133197	670.5	13.38	13.40	14.48	14.43
133297	680.5	13.40	13.42	14.52	14.46
133397	690.5	13.40	13.40	14.47	14.41





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

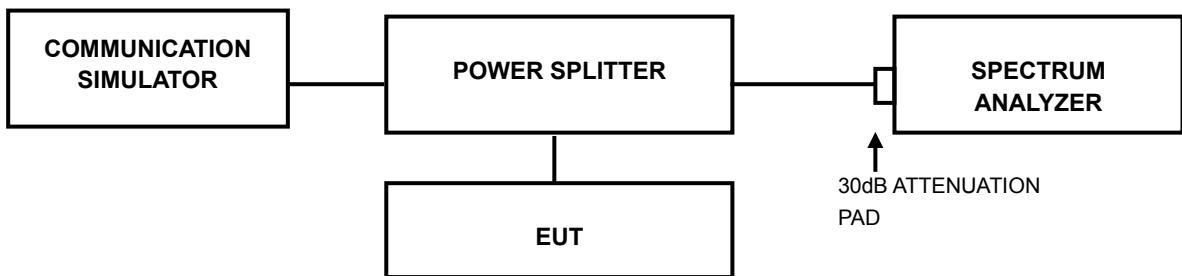


3.4 PEAK TO AVERAGE RATIO

3.4.1 LIMITS OF PEAK TO AVERAGE RATIO MEASUREMENT

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

3.4.2 TEST SETUP



3.4.3 TEST PROCEDURES

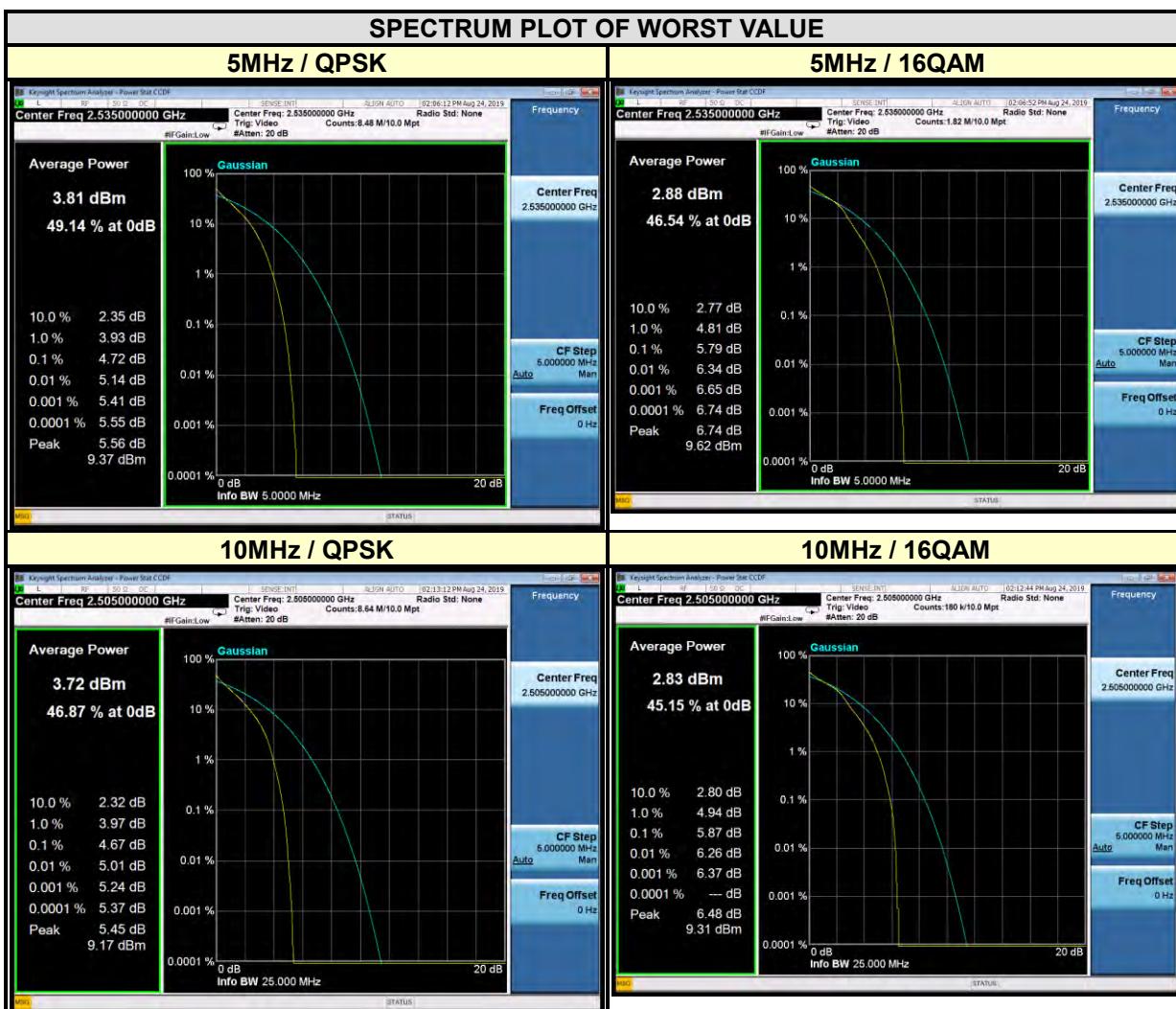
1. Set resolution/measurement bandwidth \geq signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1%.



3.4.4 TEST RESULTS

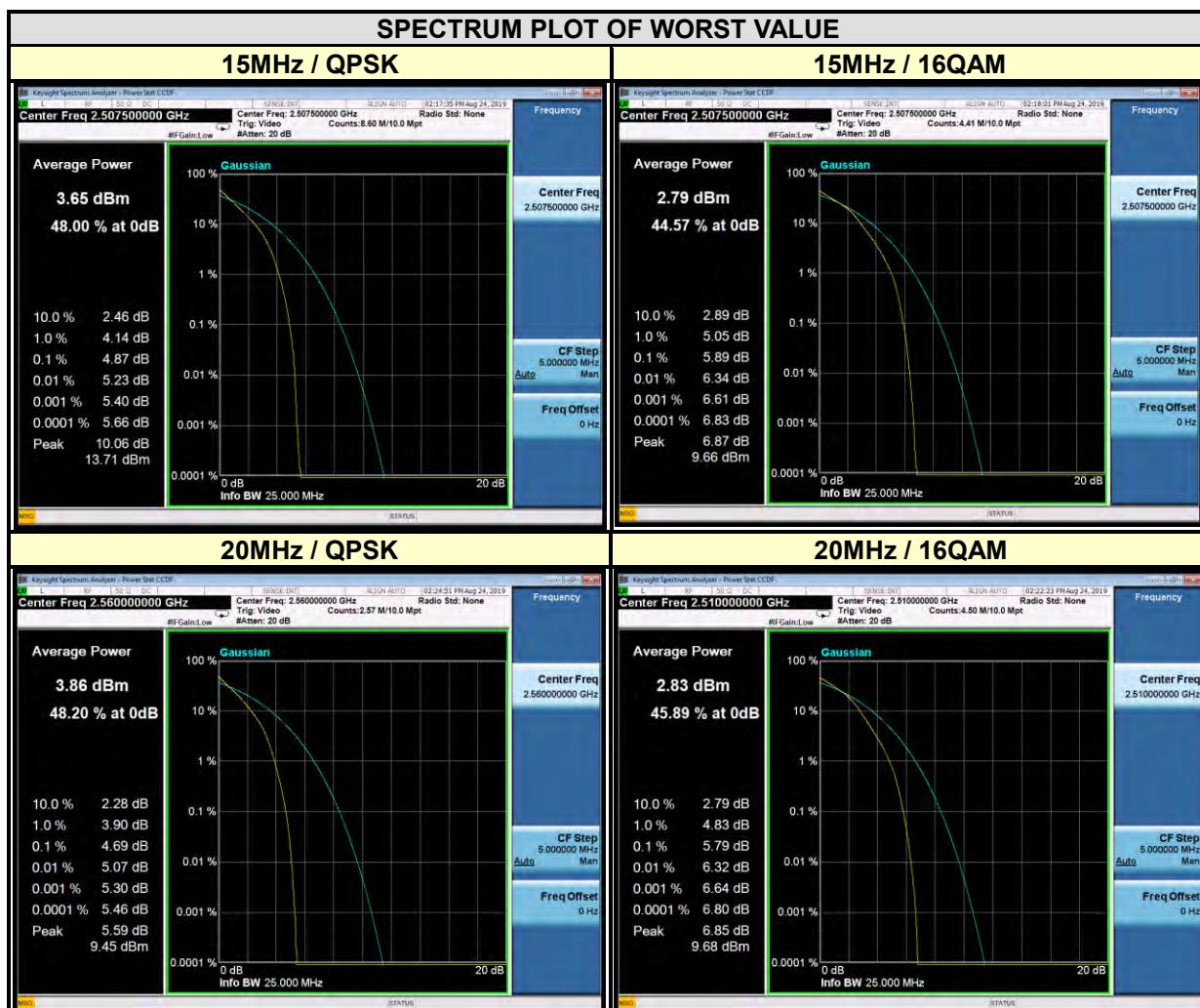
LTE BAND 7

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





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



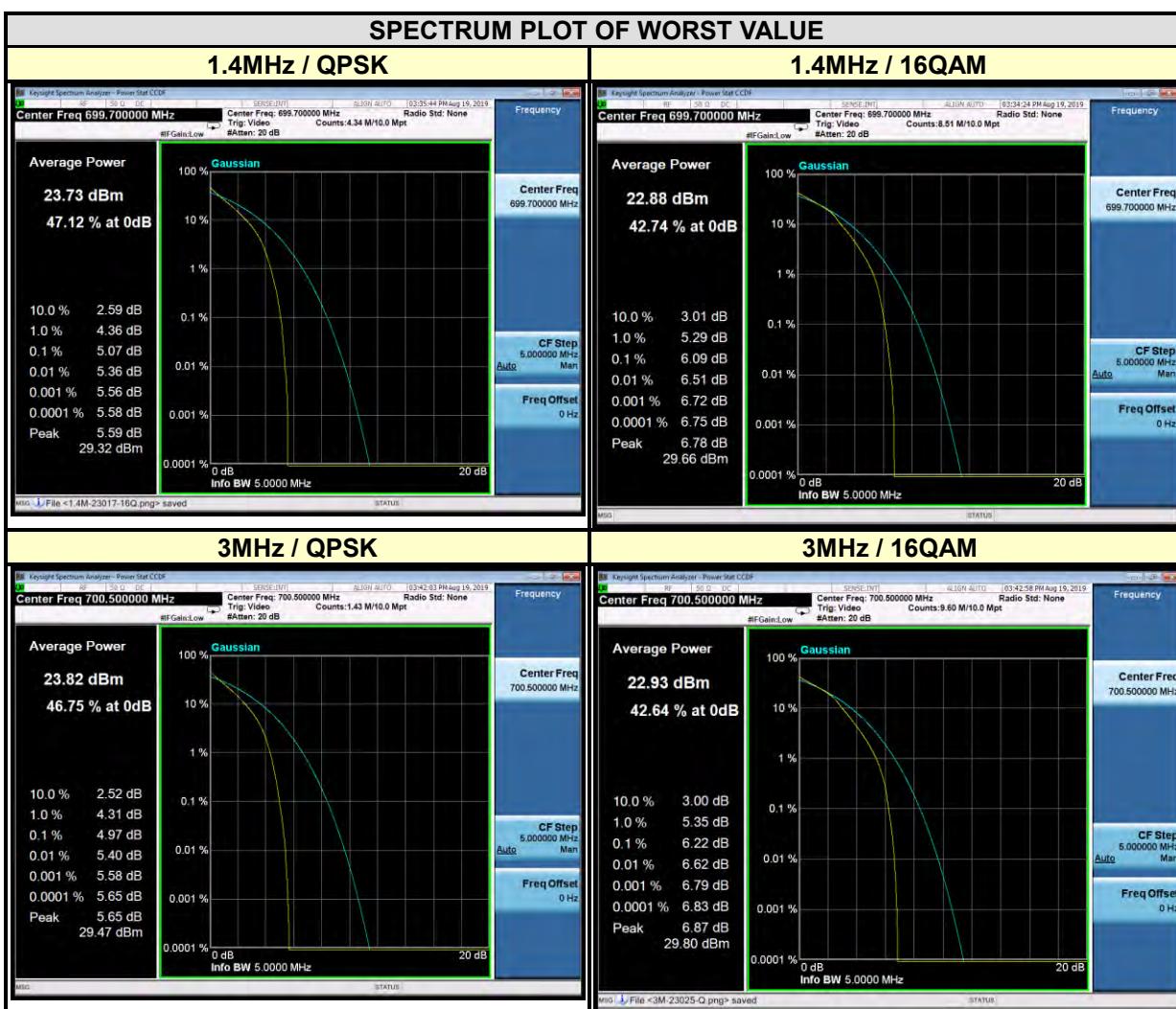


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LTE BAND 12

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

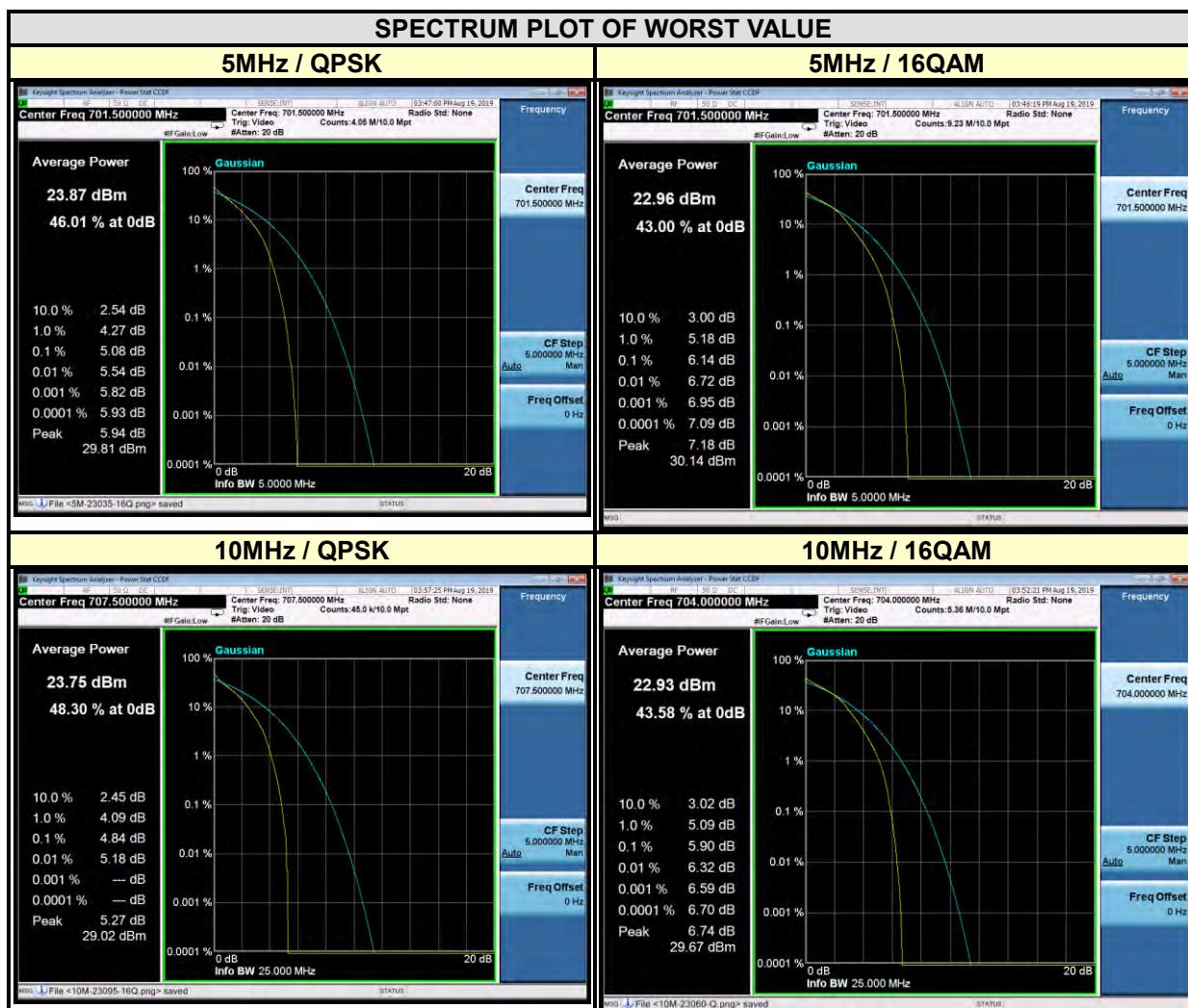




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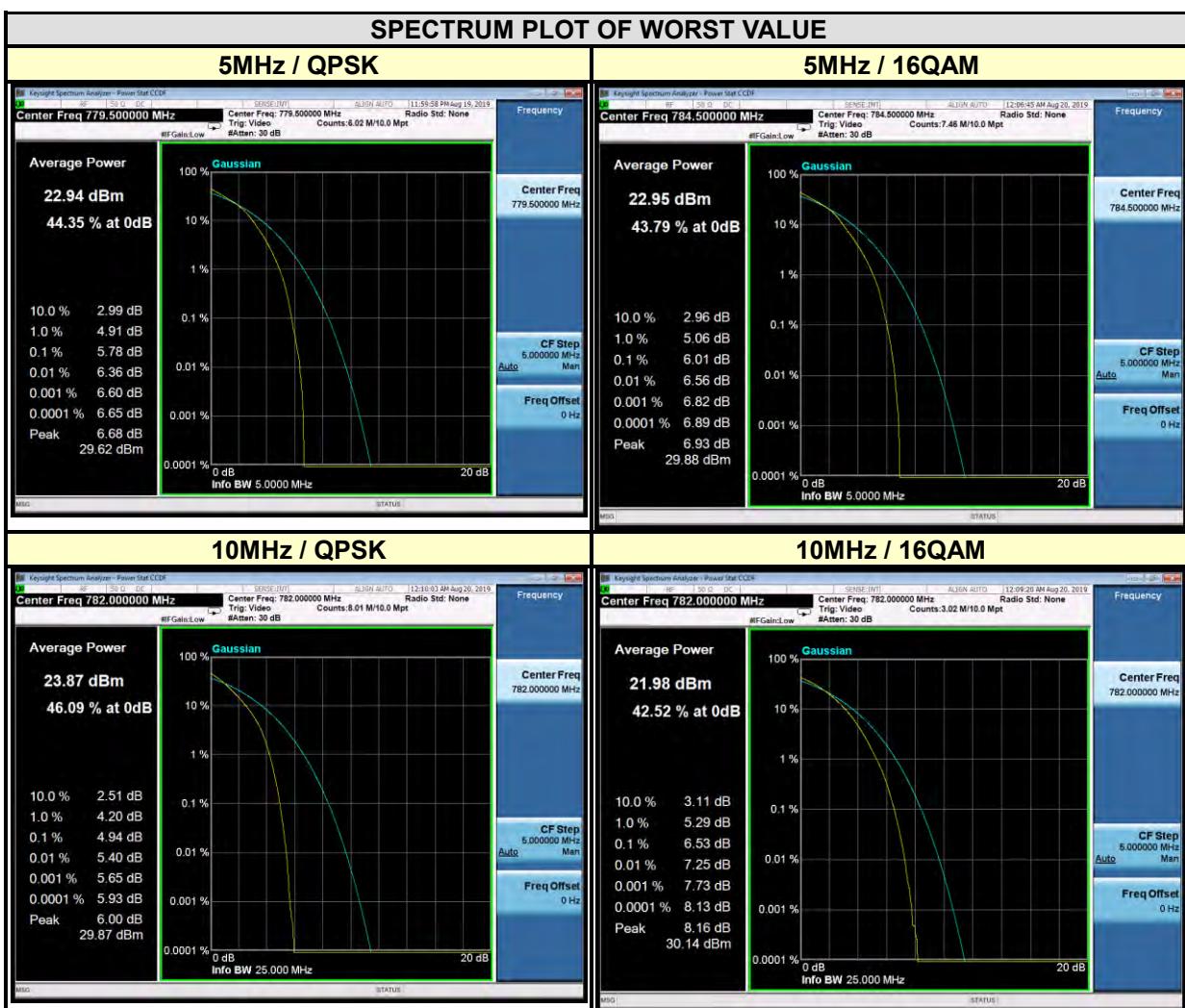
CHANNEL BANDWIDTH: 5MHz				CHANNEL BANDWIDTH: 10MHz			
CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)		CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM			QPSK	16QAM
23035	701.5	5.08	6.14	23060	704	4.82	5.90
23095	707.5	4.72	5.70	23095	707.5	4.84	5.81
23155	713.5	4.95	5.99	23130	711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





LTE BAND 13

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



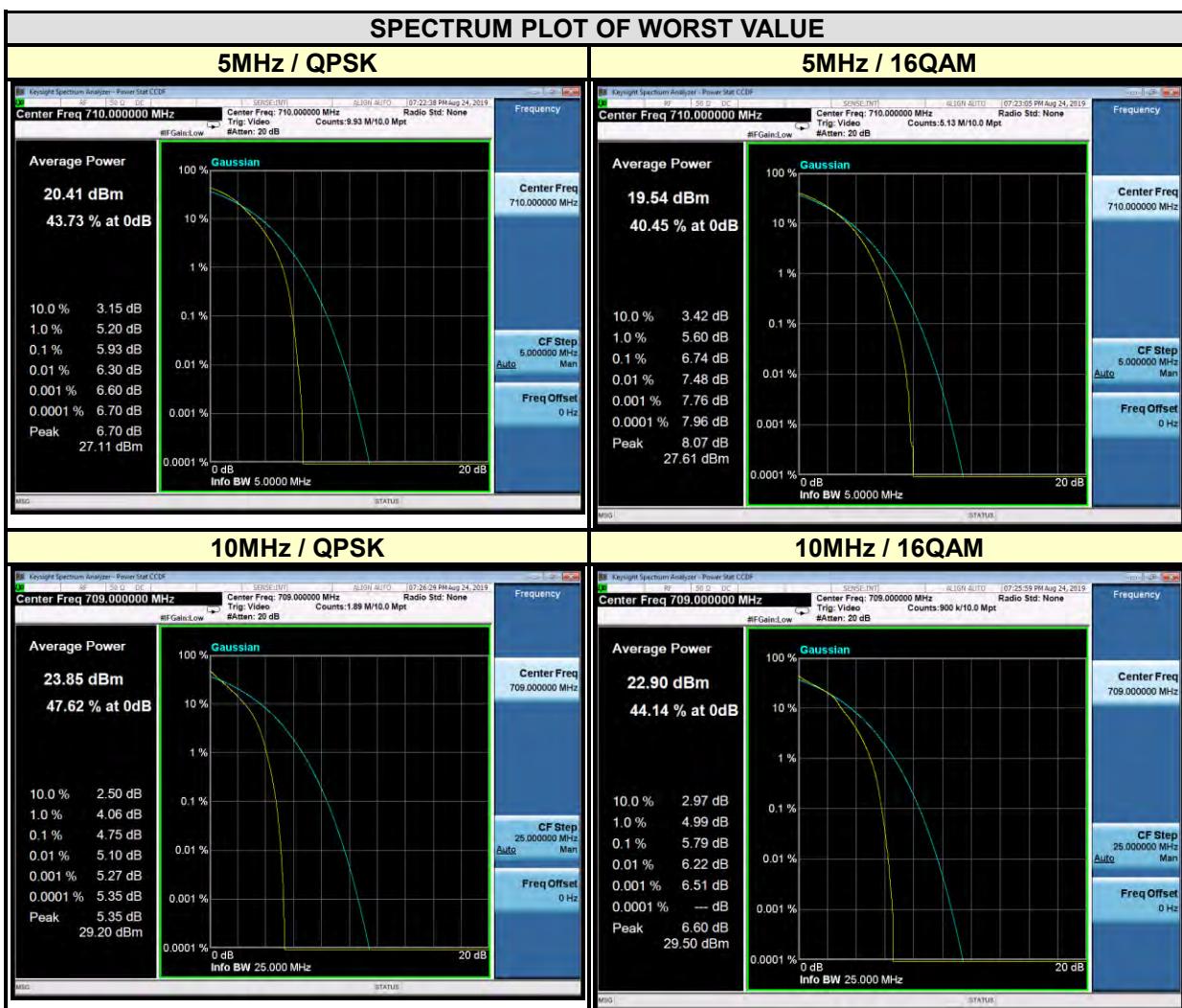


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LTE BAND 17

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



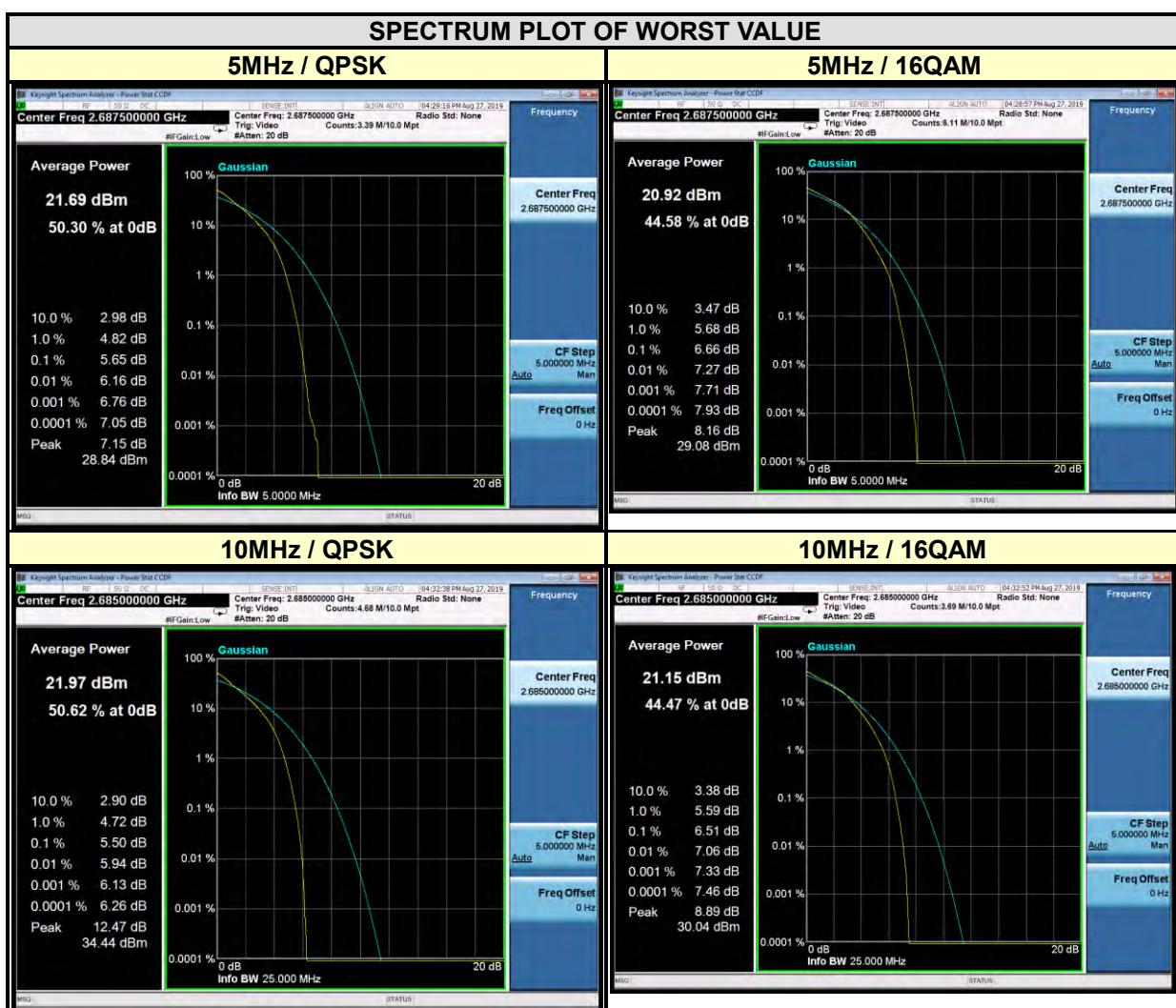


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Test Report No.: RF190522W005-4

LTE BAND 41

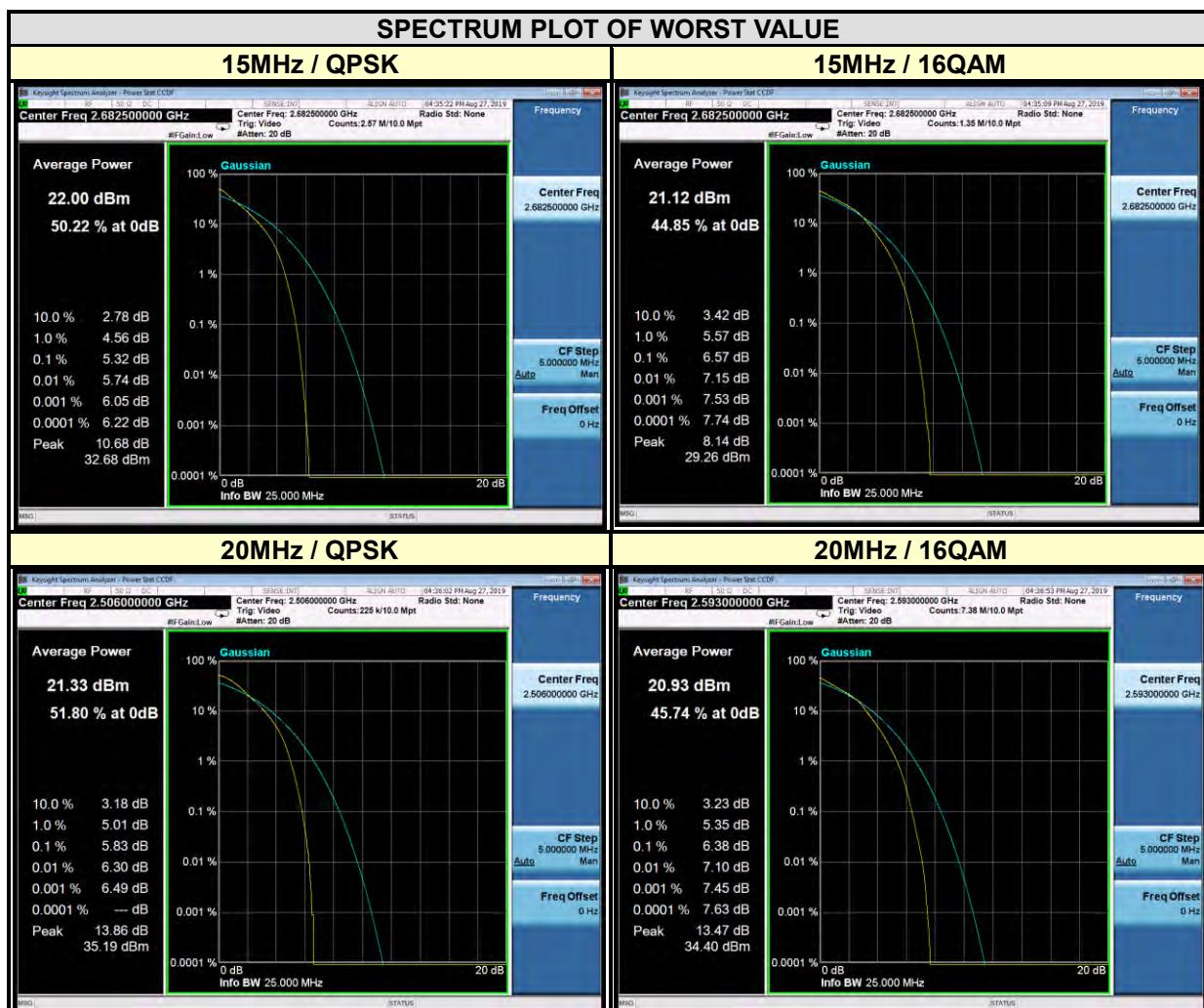
CHANNEL BANDWIDTH: 5MHz				CHANNEL BANDWIDTH: 10MHz			
CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)		CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM			QPSK	16QAM
39675	2498.5	5.49	6.60	39700	2501	5.30	6.28
40620	2593	5.59	6.63	40620	2593	5.26	6.27
41565	2687.5	5.65	6.66	41540	2685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





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



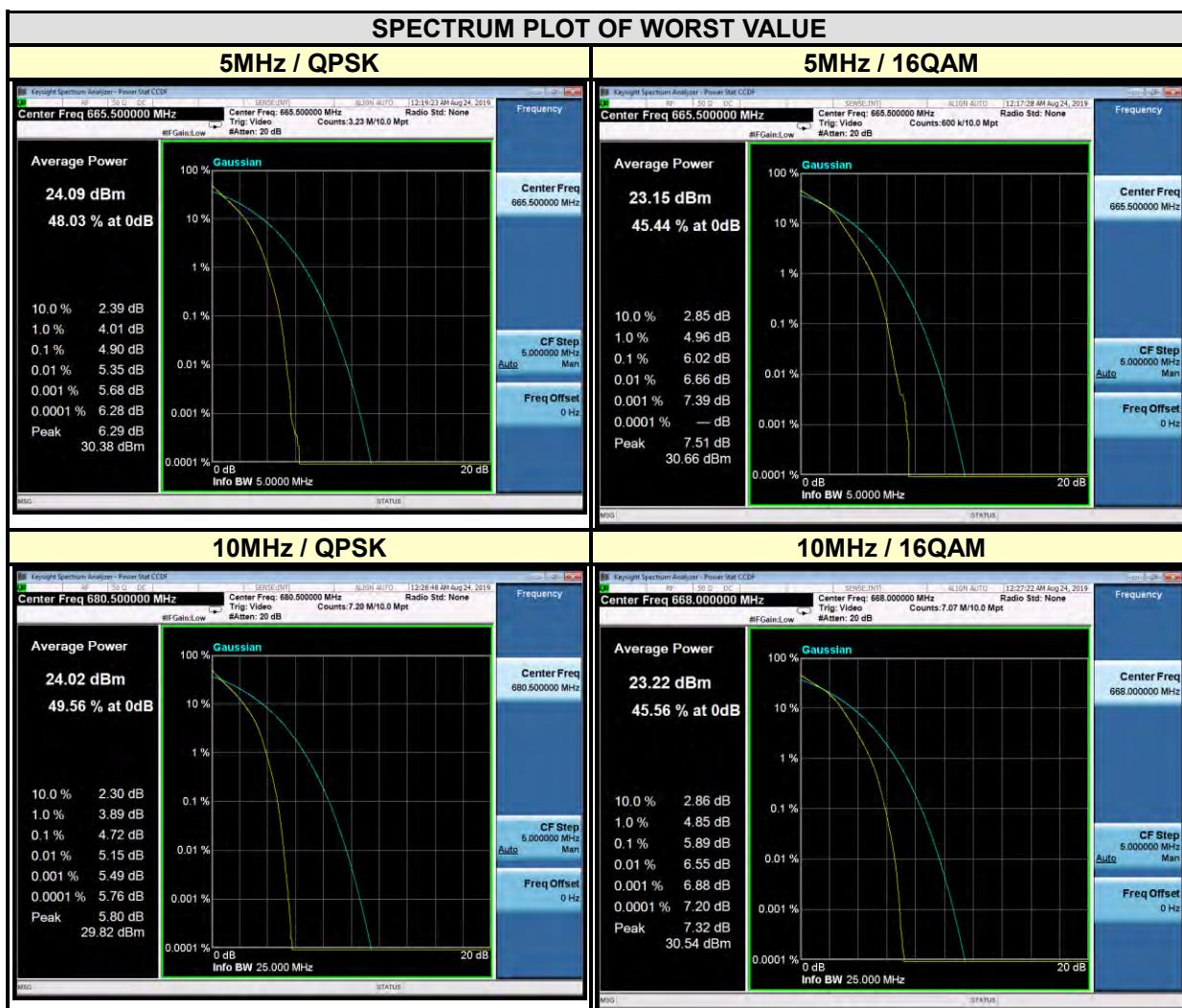


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LTE BAND 71

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

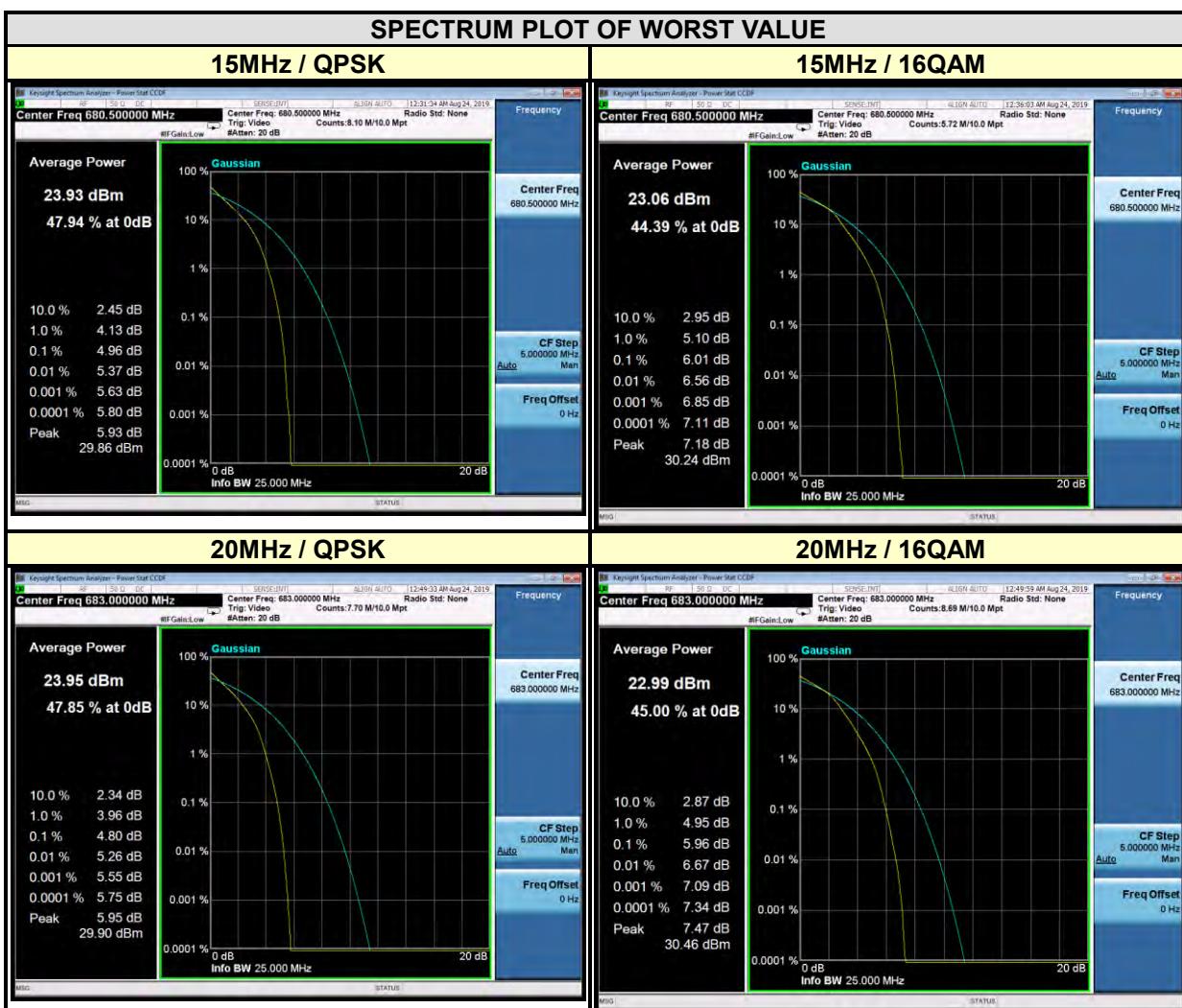




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Test Report No.: RF190522W005-4

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





3.5 BAND EDGE MEASUREMENT

3.5.1 LIMITS OF BAND EDGE MEASUREMENT

27.53(c) For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log (P)$ dB;

(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log (P)$ dB;

(3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $76 + 10 \log (P)$ dB in a 6.25 kHz band segment, for base and fixed stations;

(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $65 + 10 \log (P)$ dB in a 6.25 kHz band segment, for mobile and portable stations;

(5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

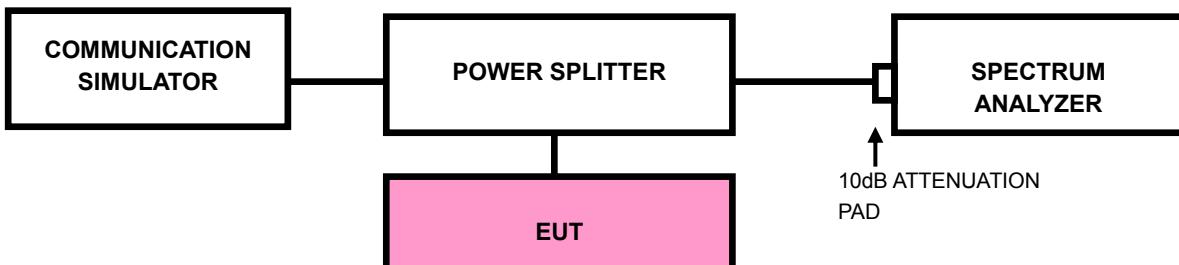
(6) Compliance with the provisions of paragraphs (c)(3) and (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

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

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

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

3.5.2 TEST SETUP





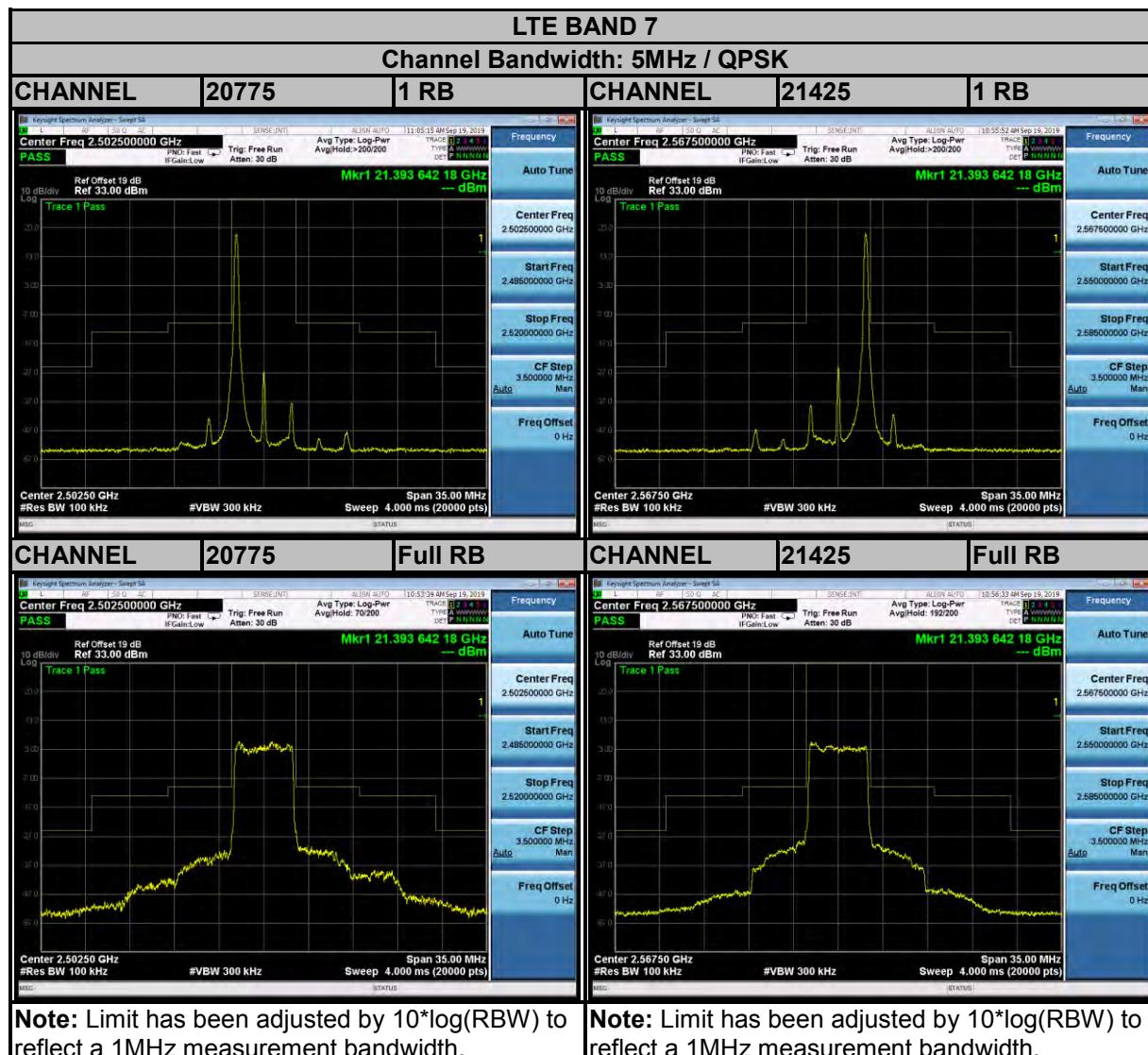
3.5.3 TEST PROCEDURES

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



Test Report No.: RF190522W005-4

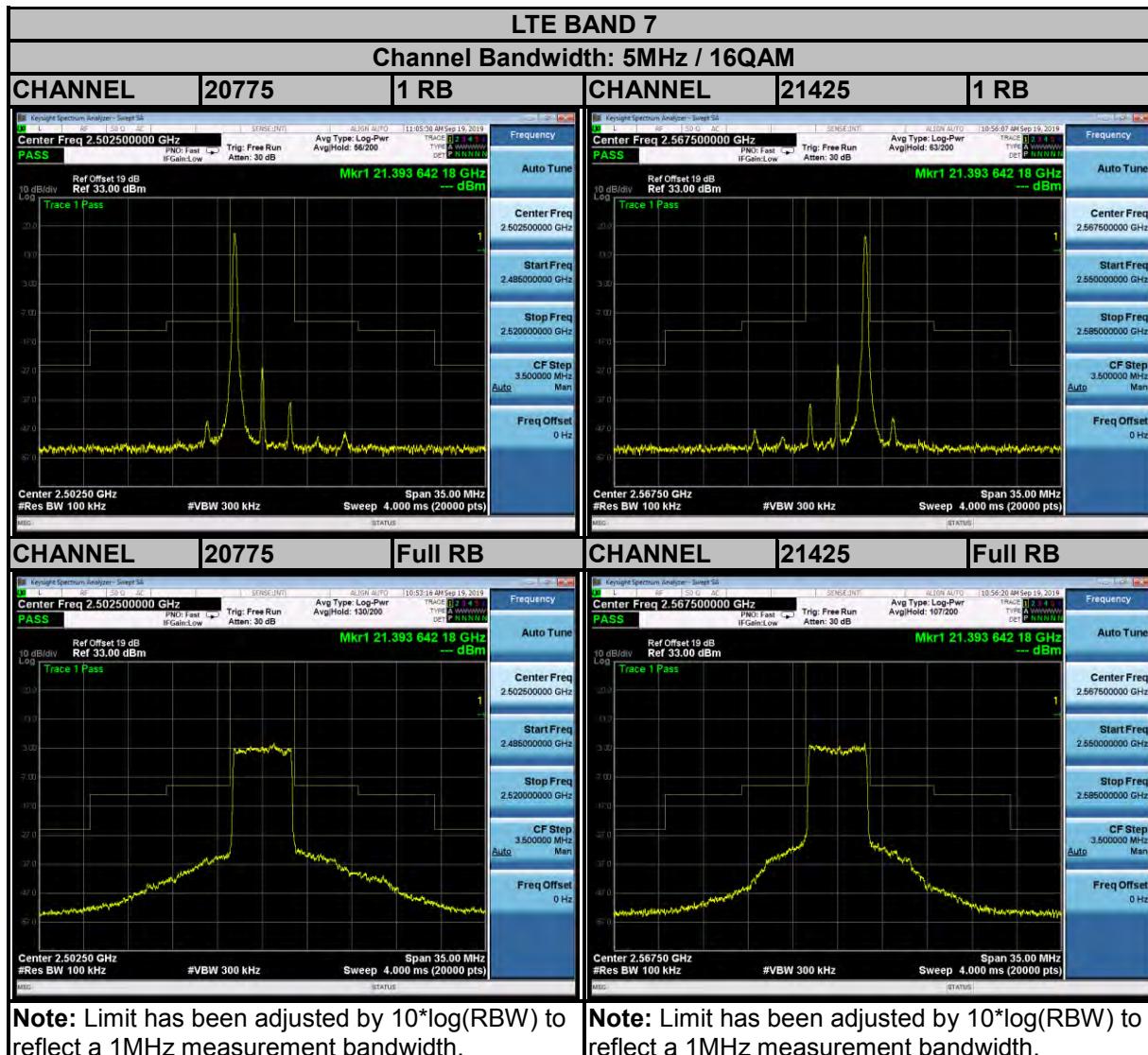
3.5.4 TEST RESULTS





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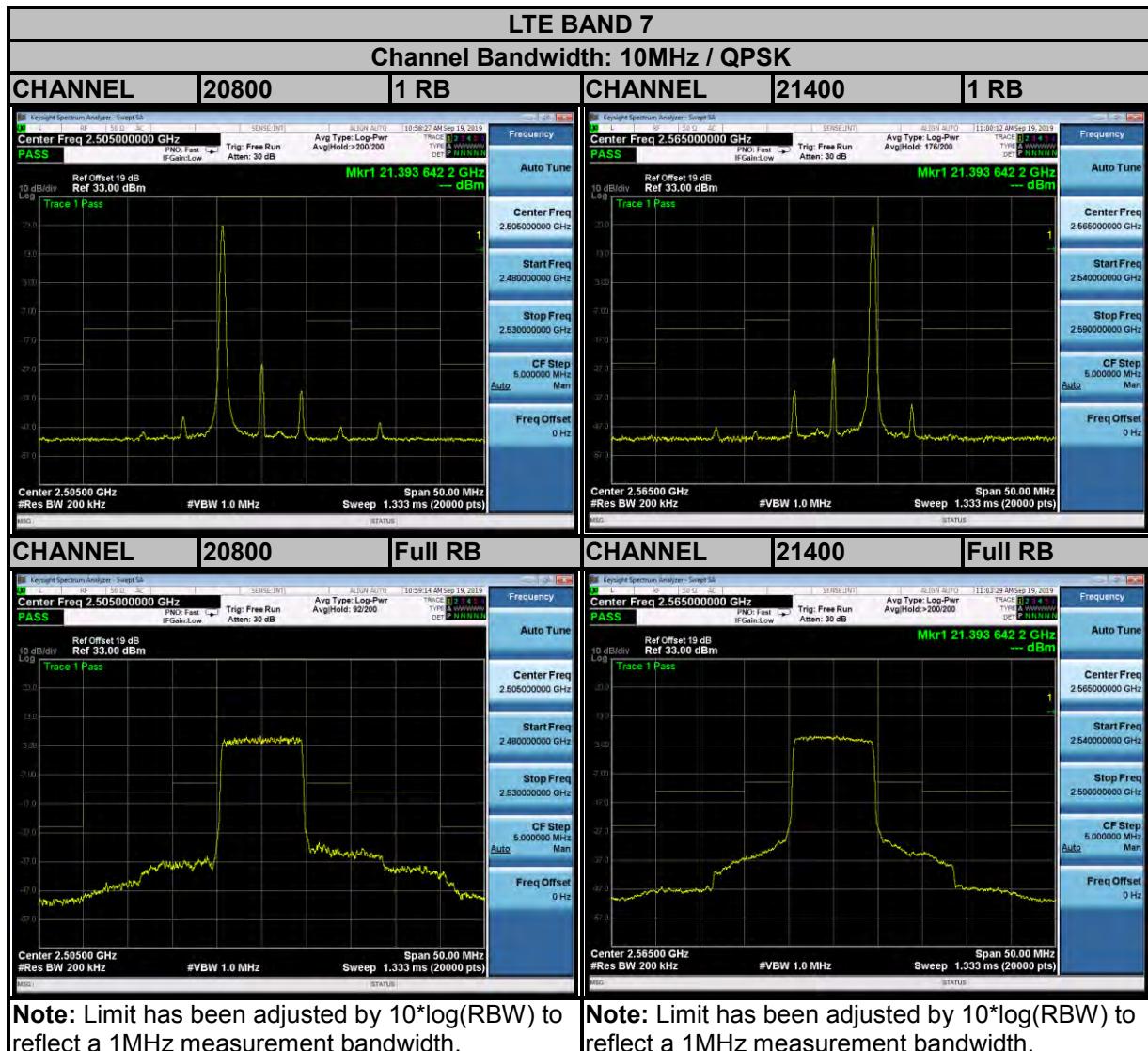
Test Report No.: RF190522W005-4





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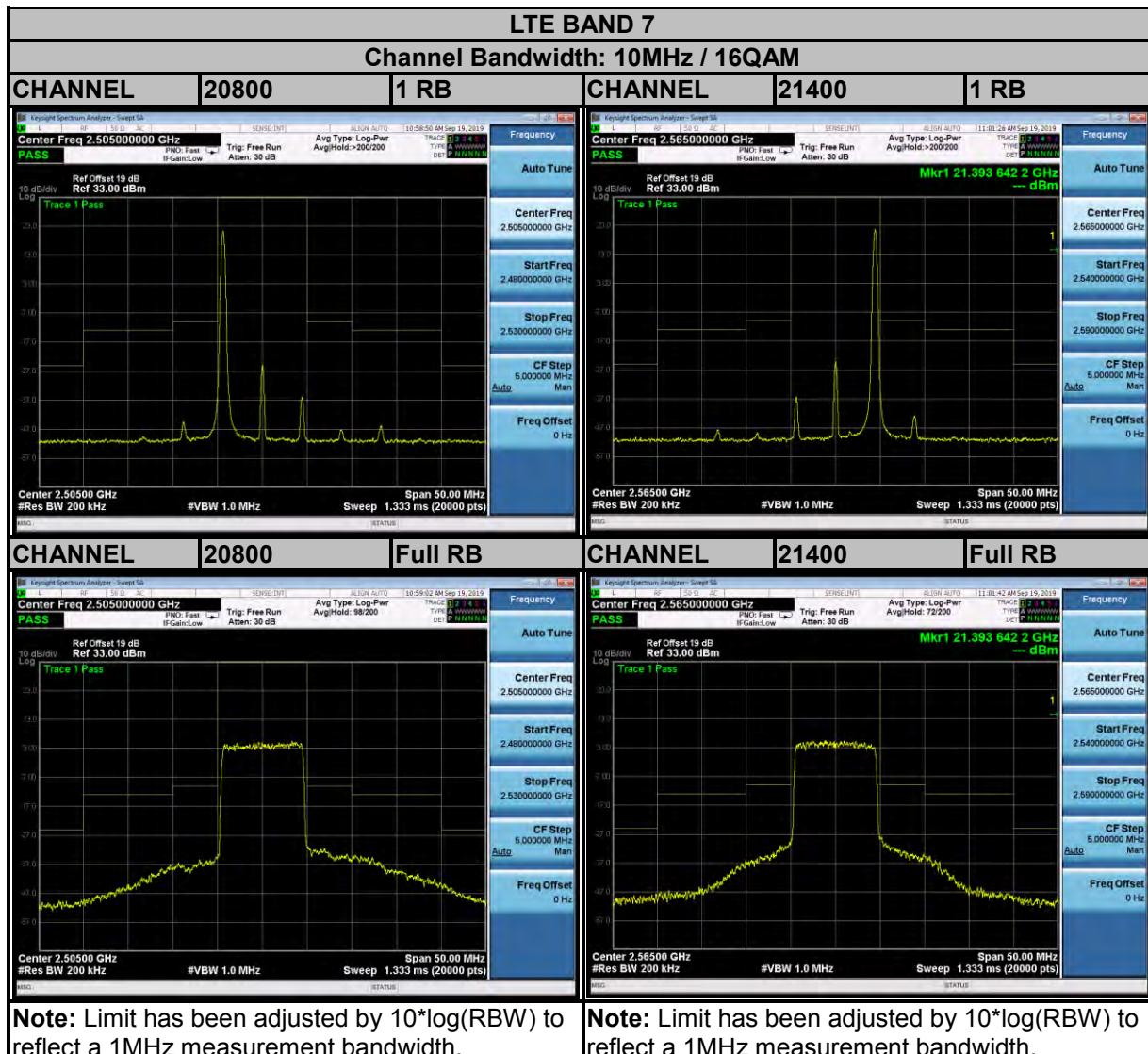
Test Report No.: RF190522W005-4





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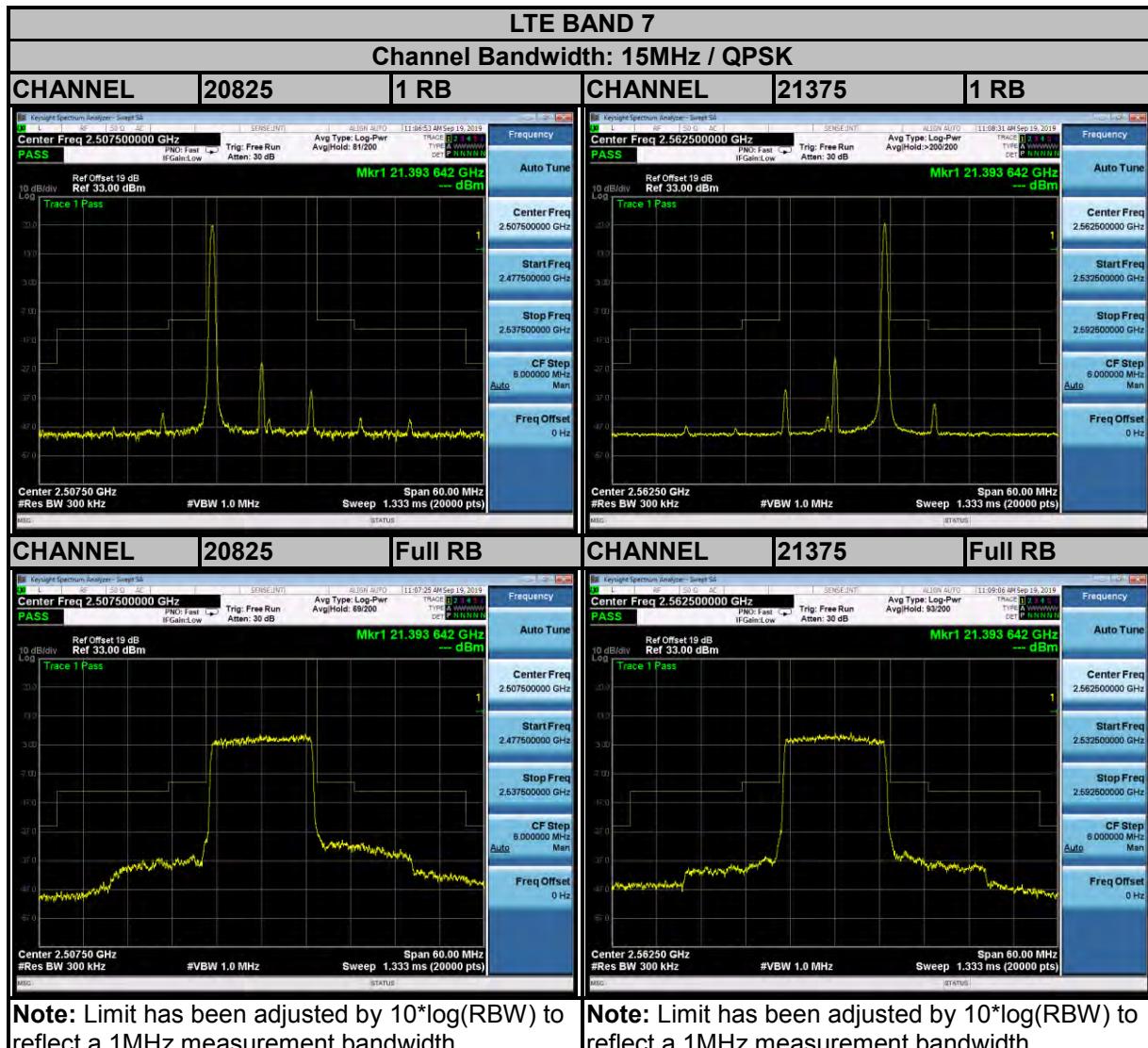
Test Report No.: RF190522W005-4





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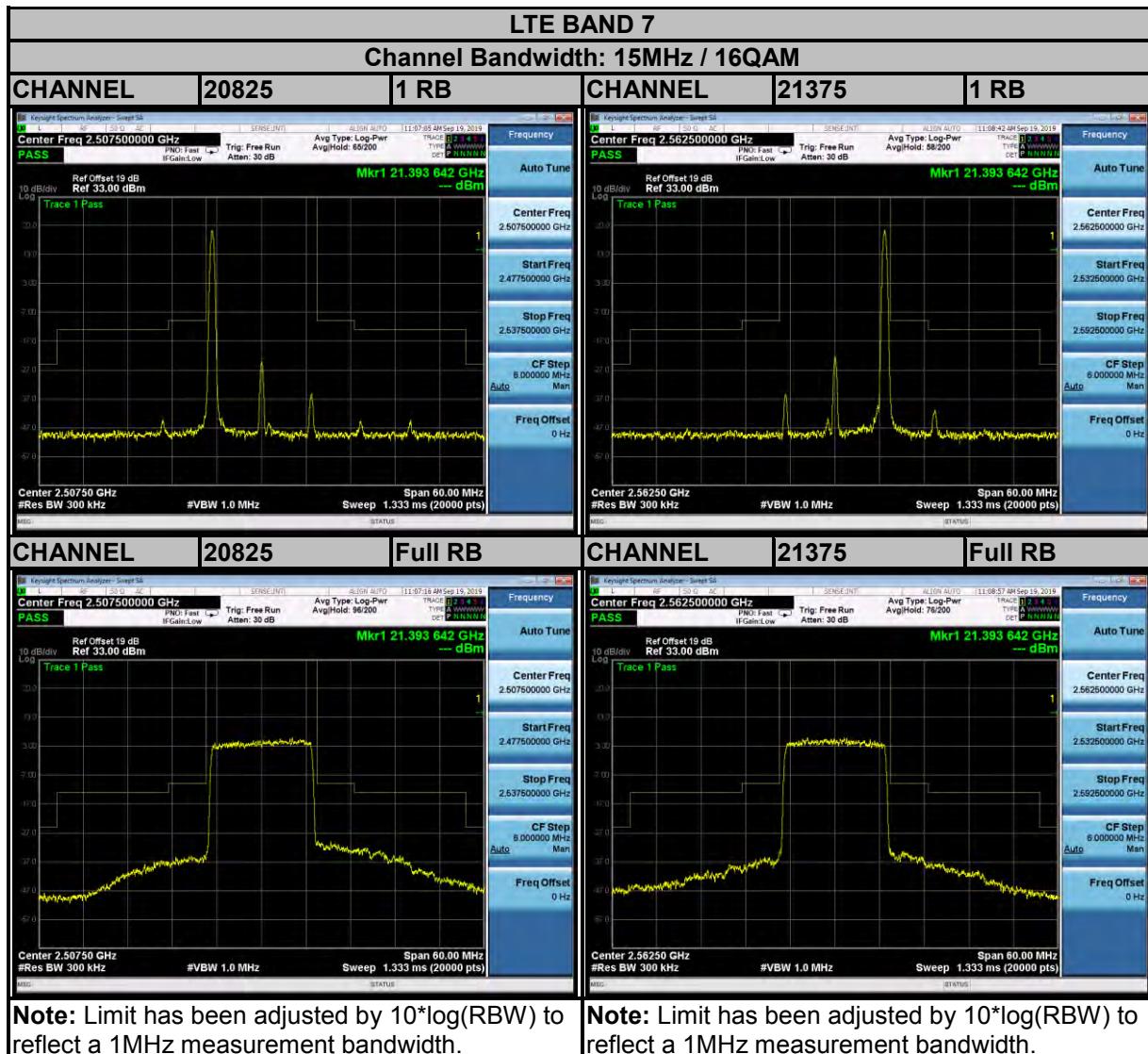
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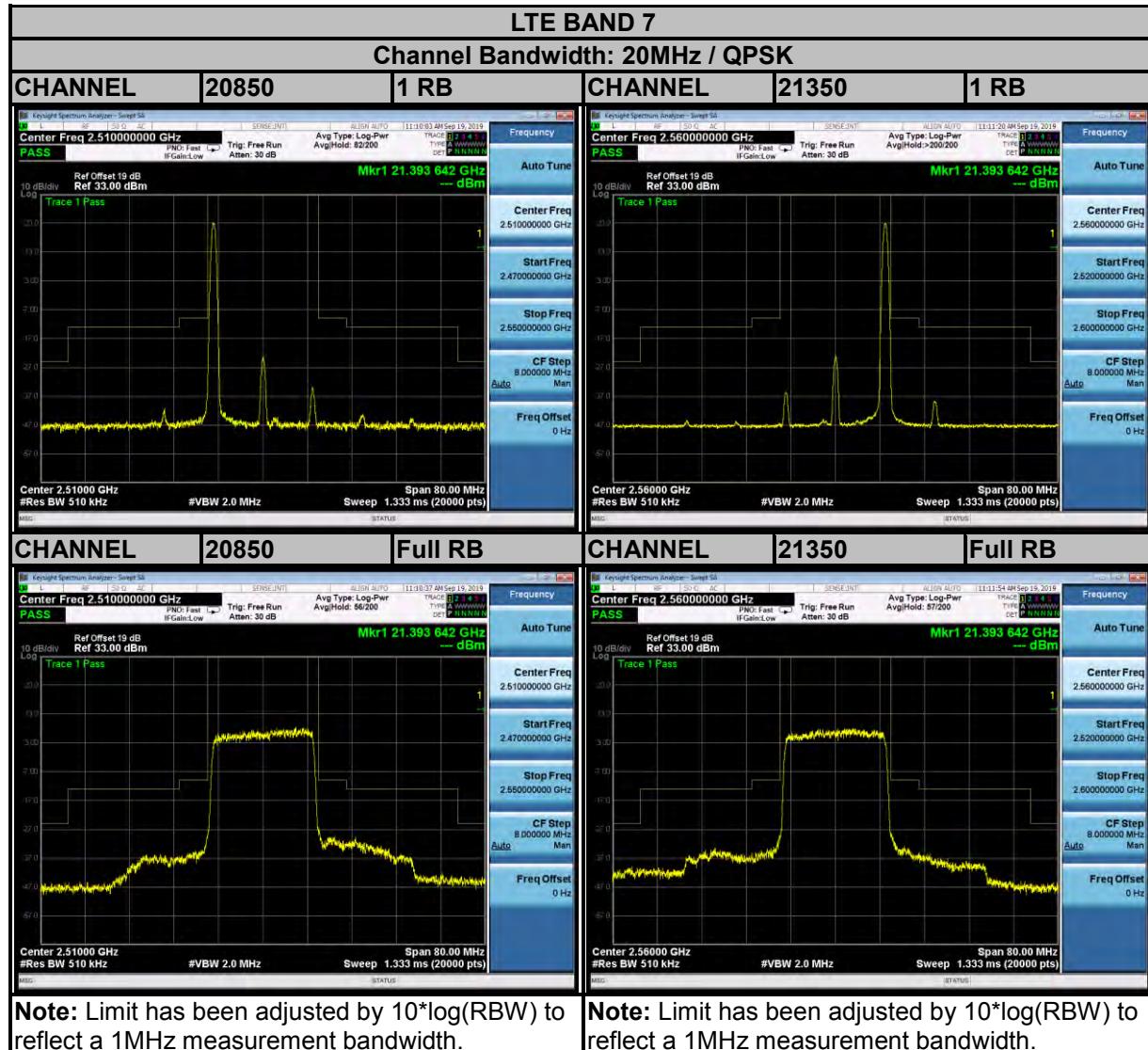
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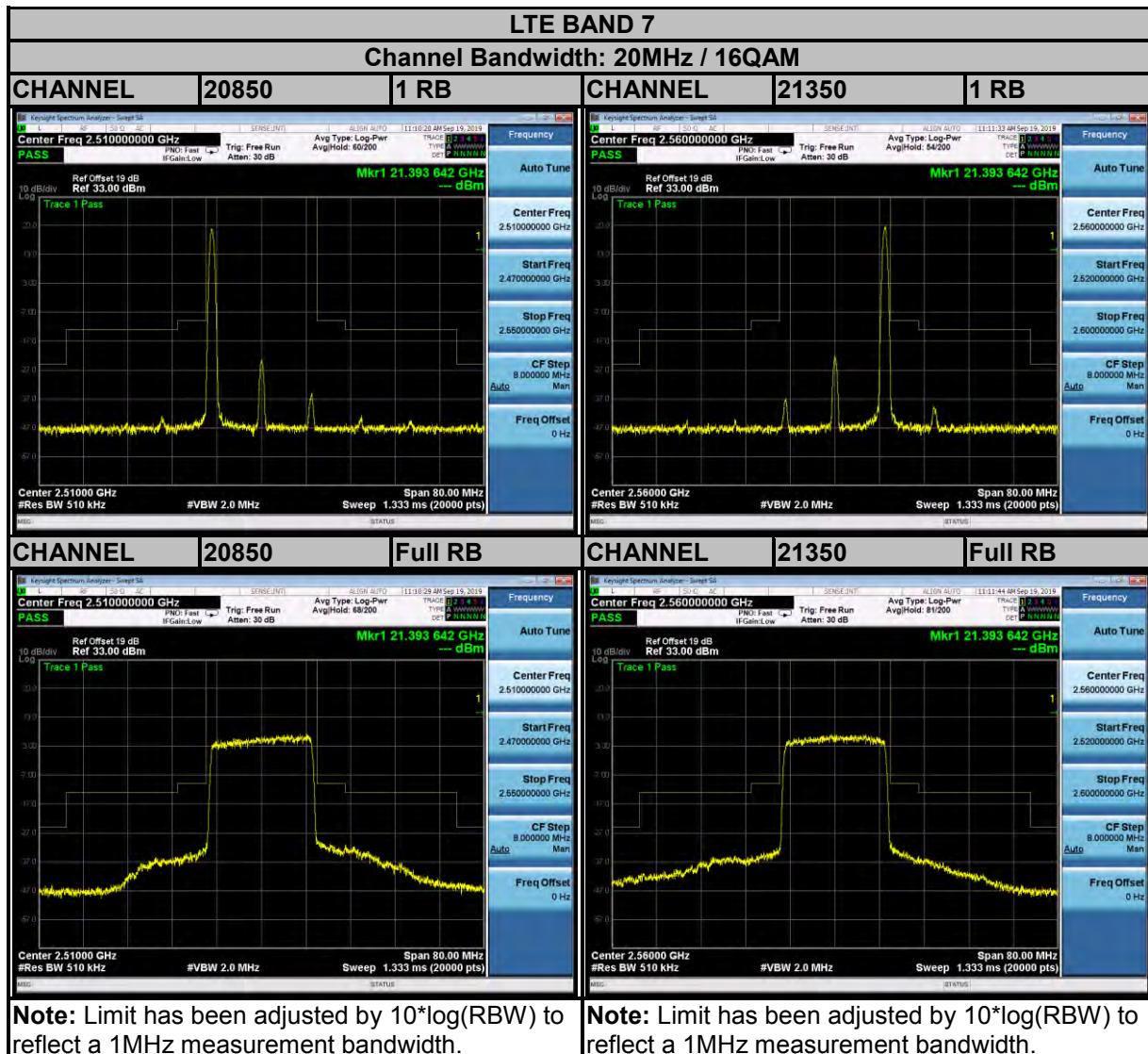
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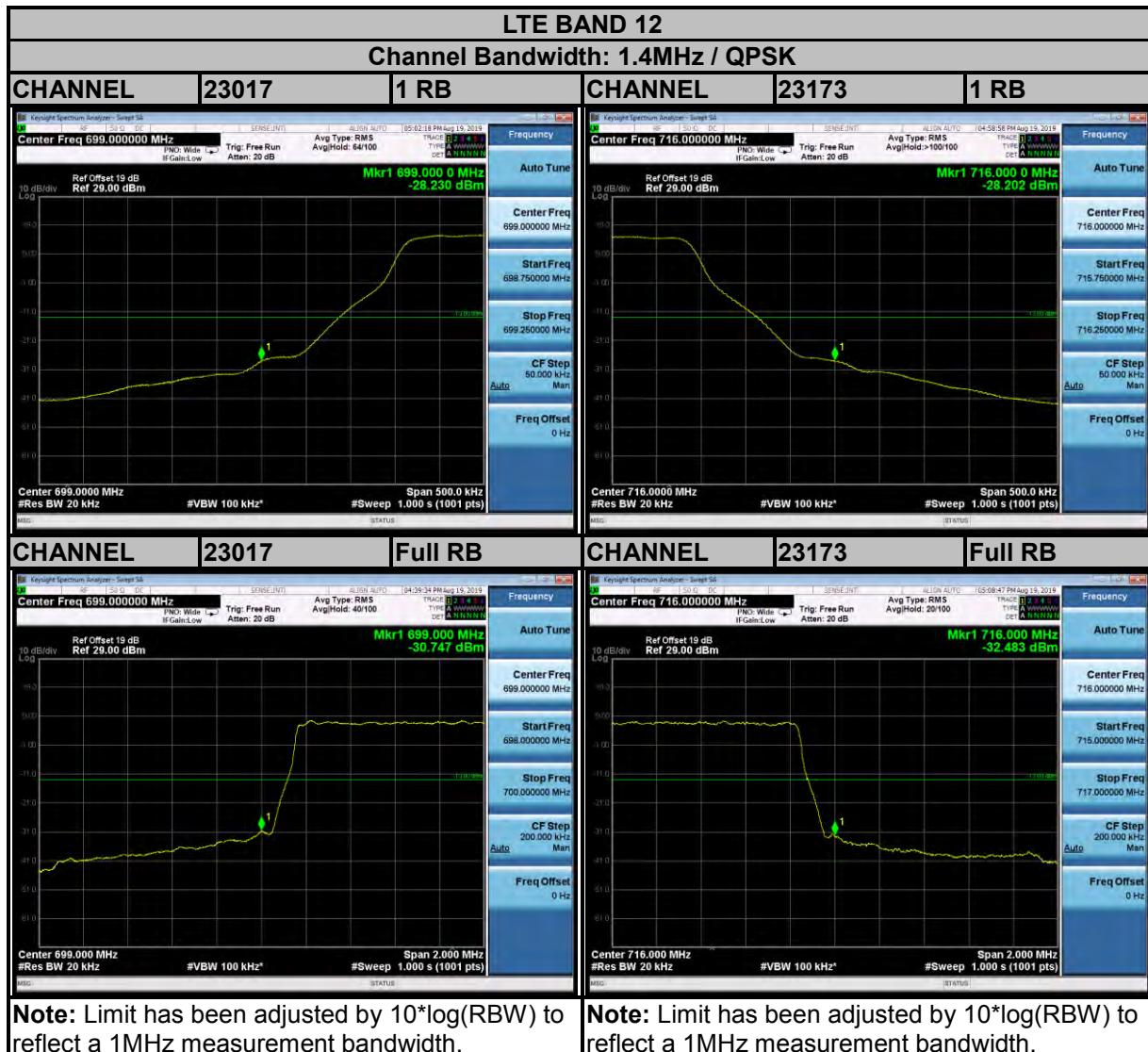
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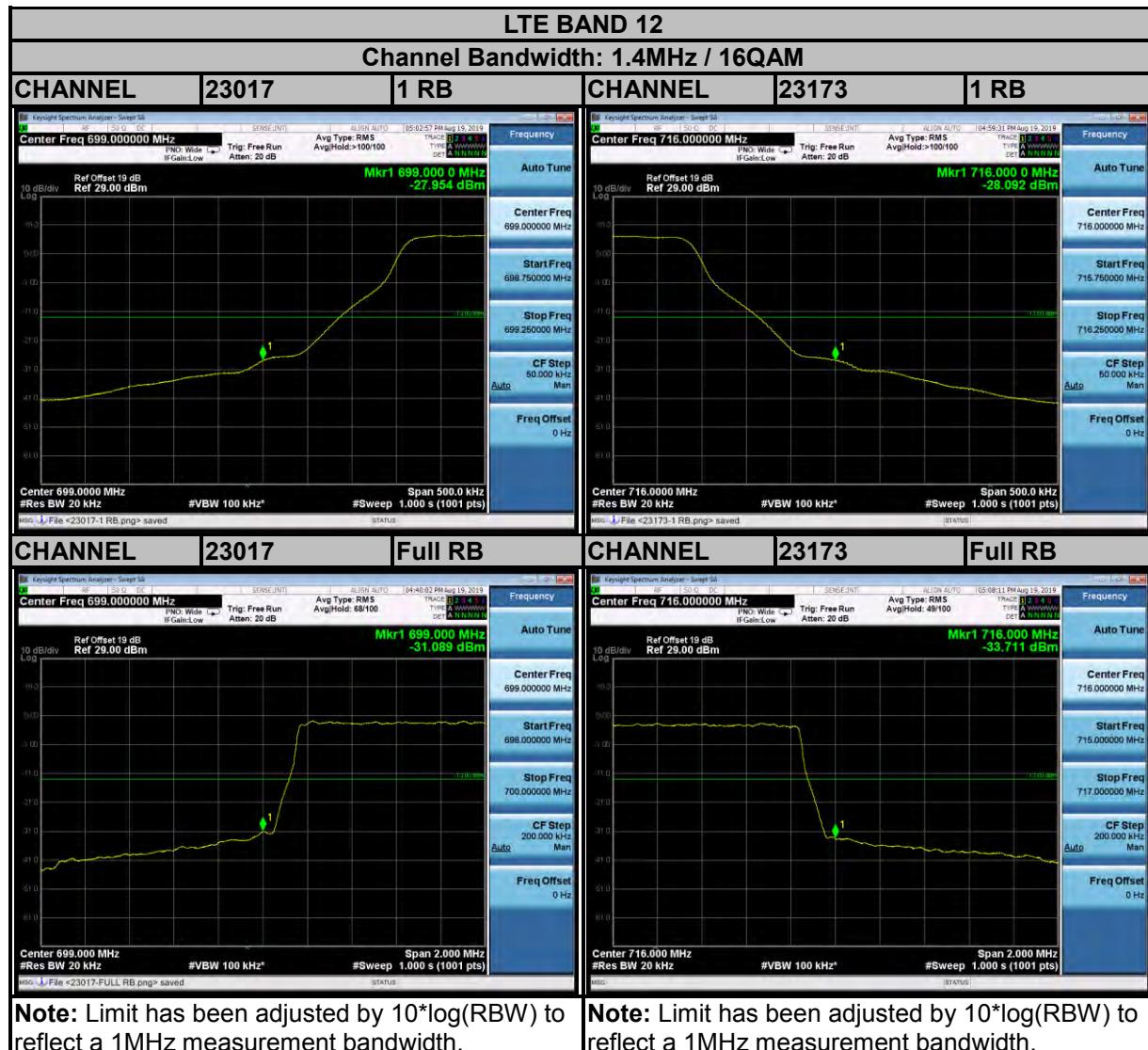
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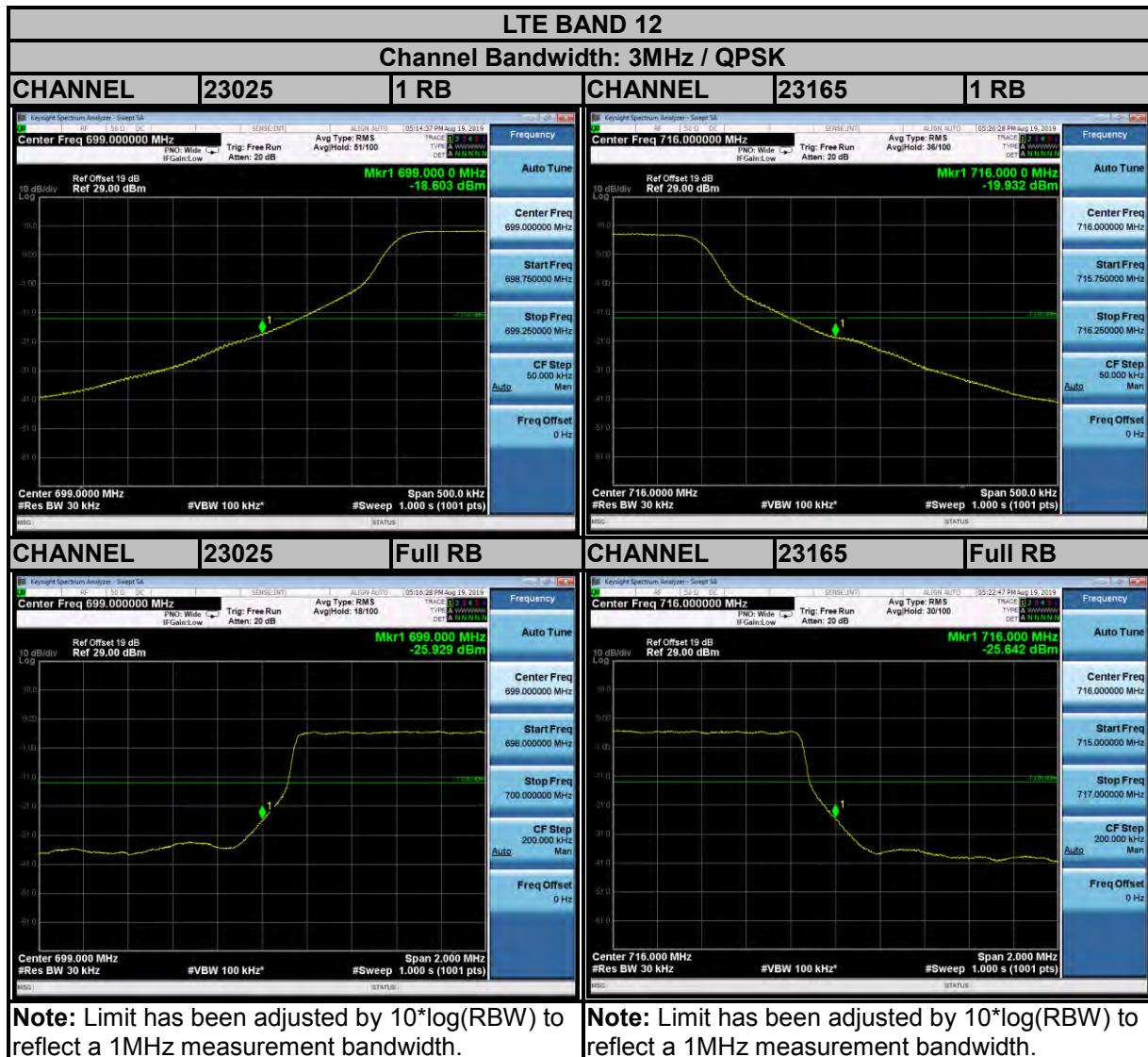
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VERITAS

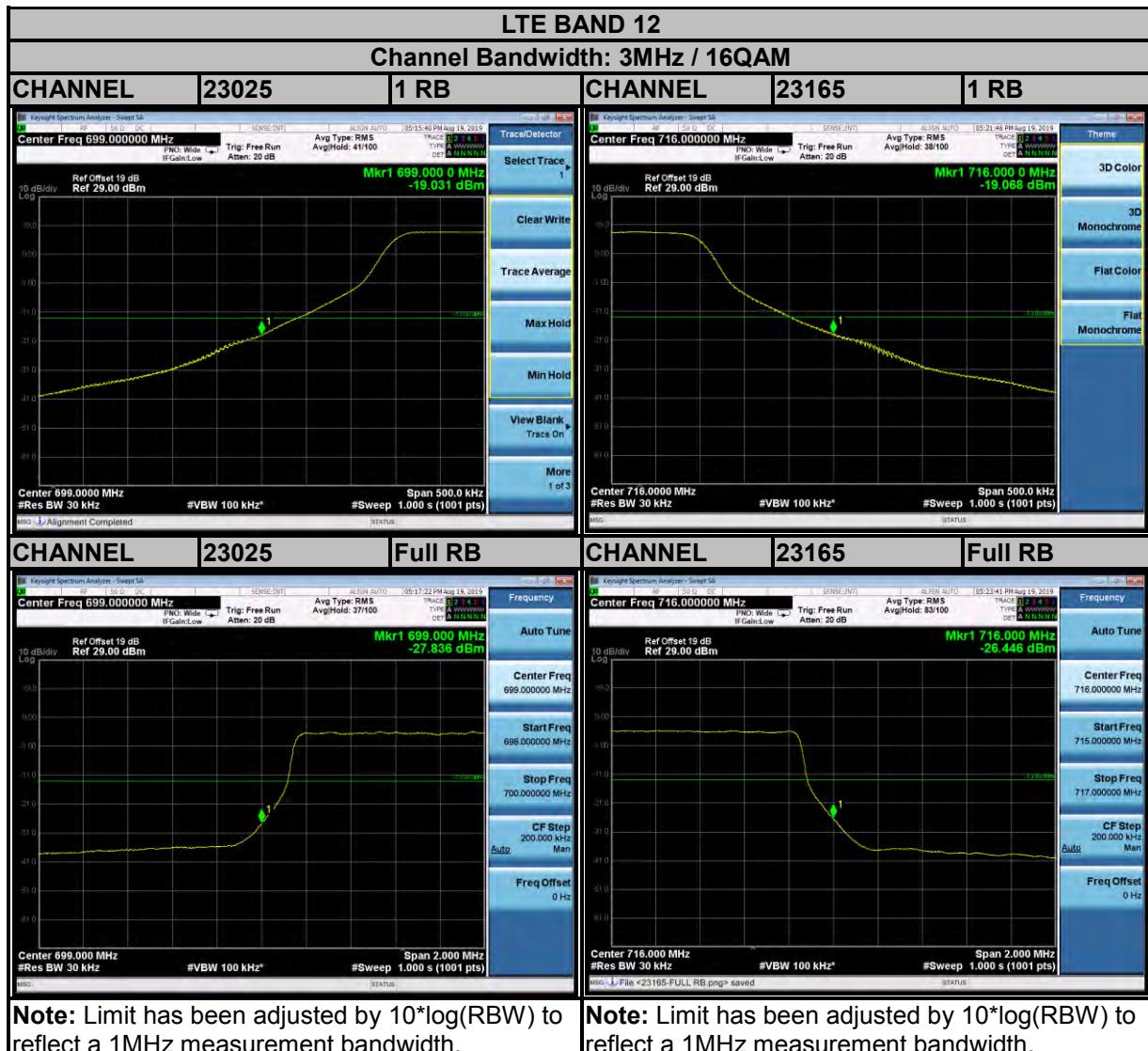
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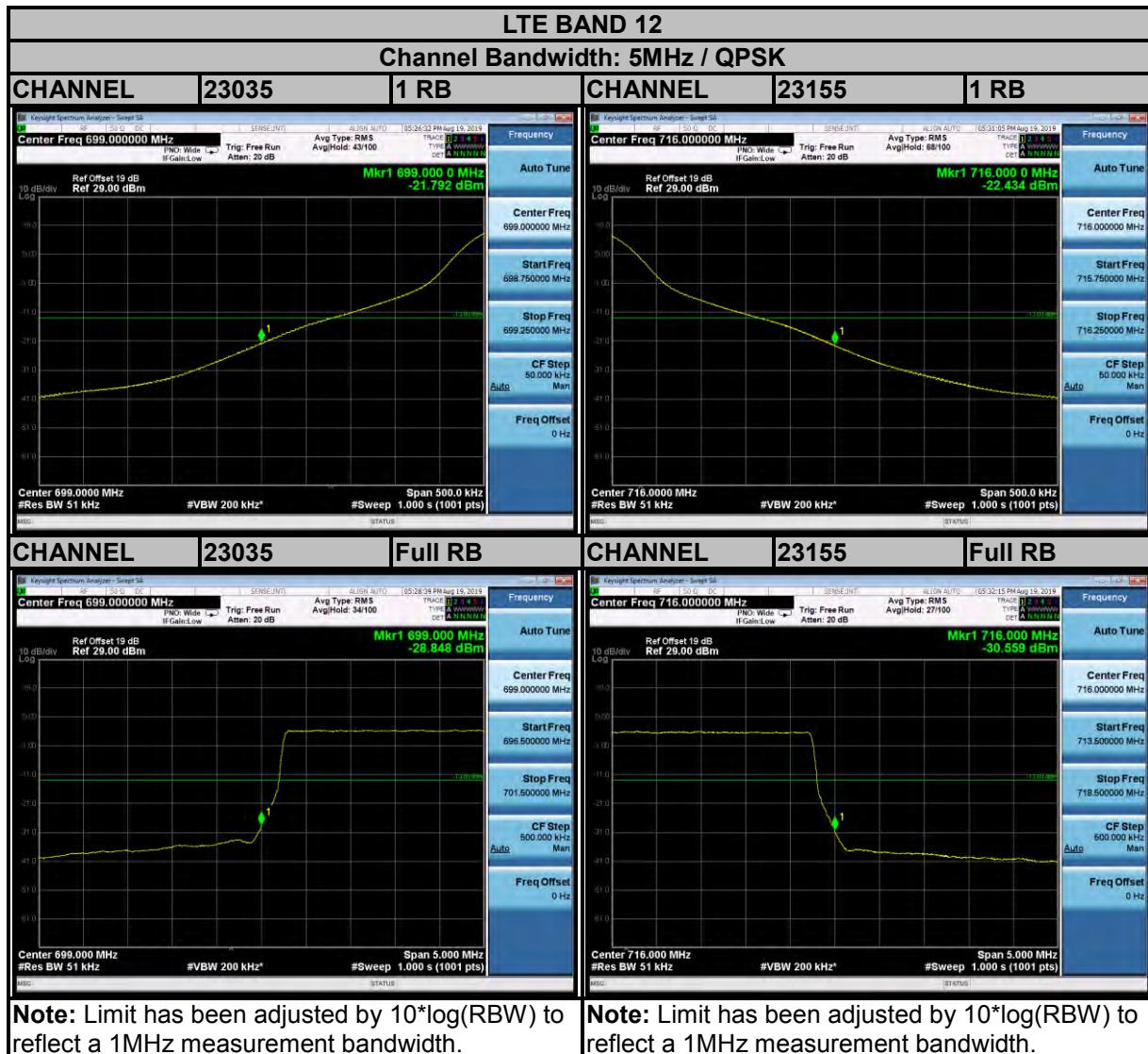
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Test Report No.: RF190522W005-4

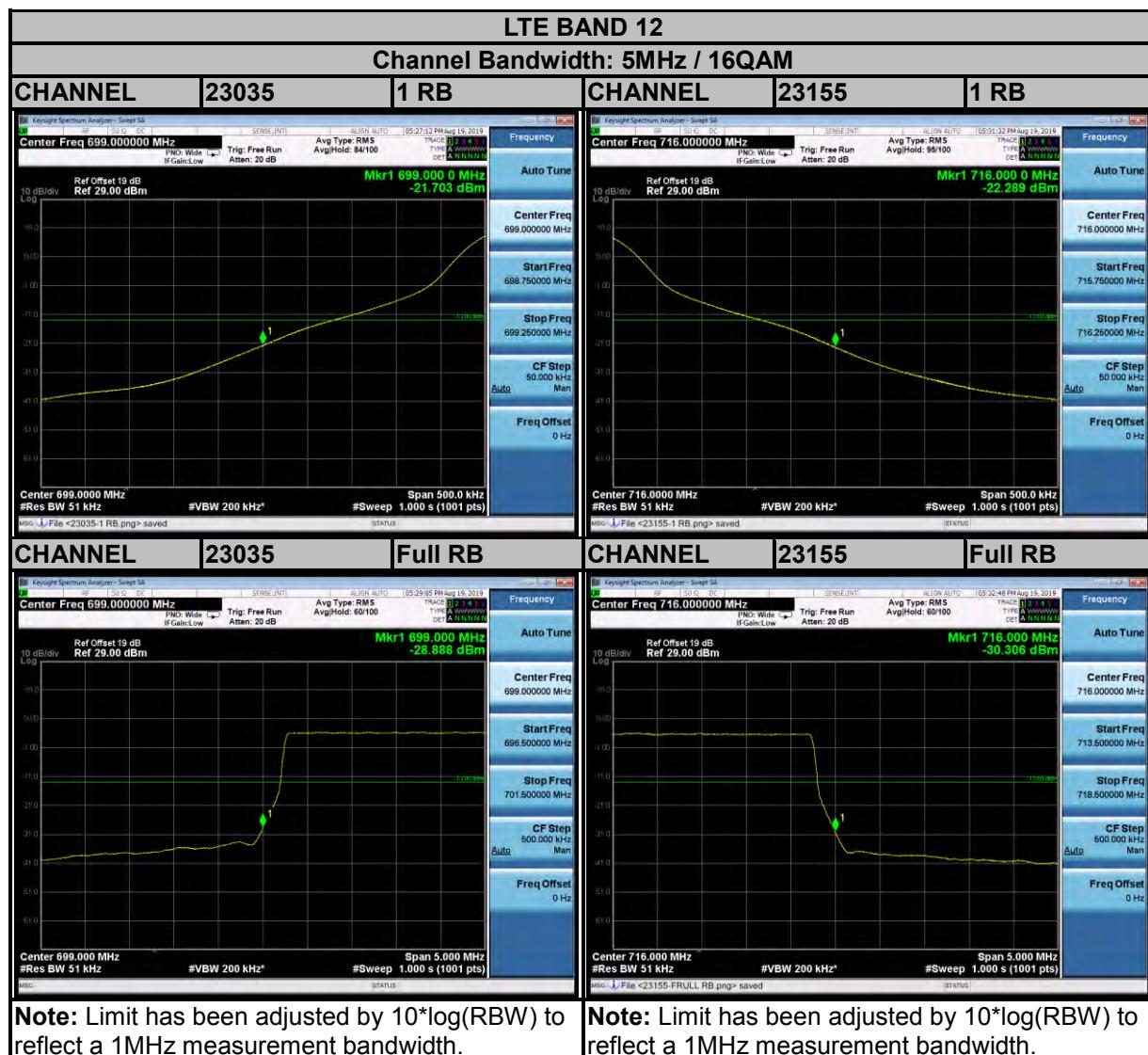
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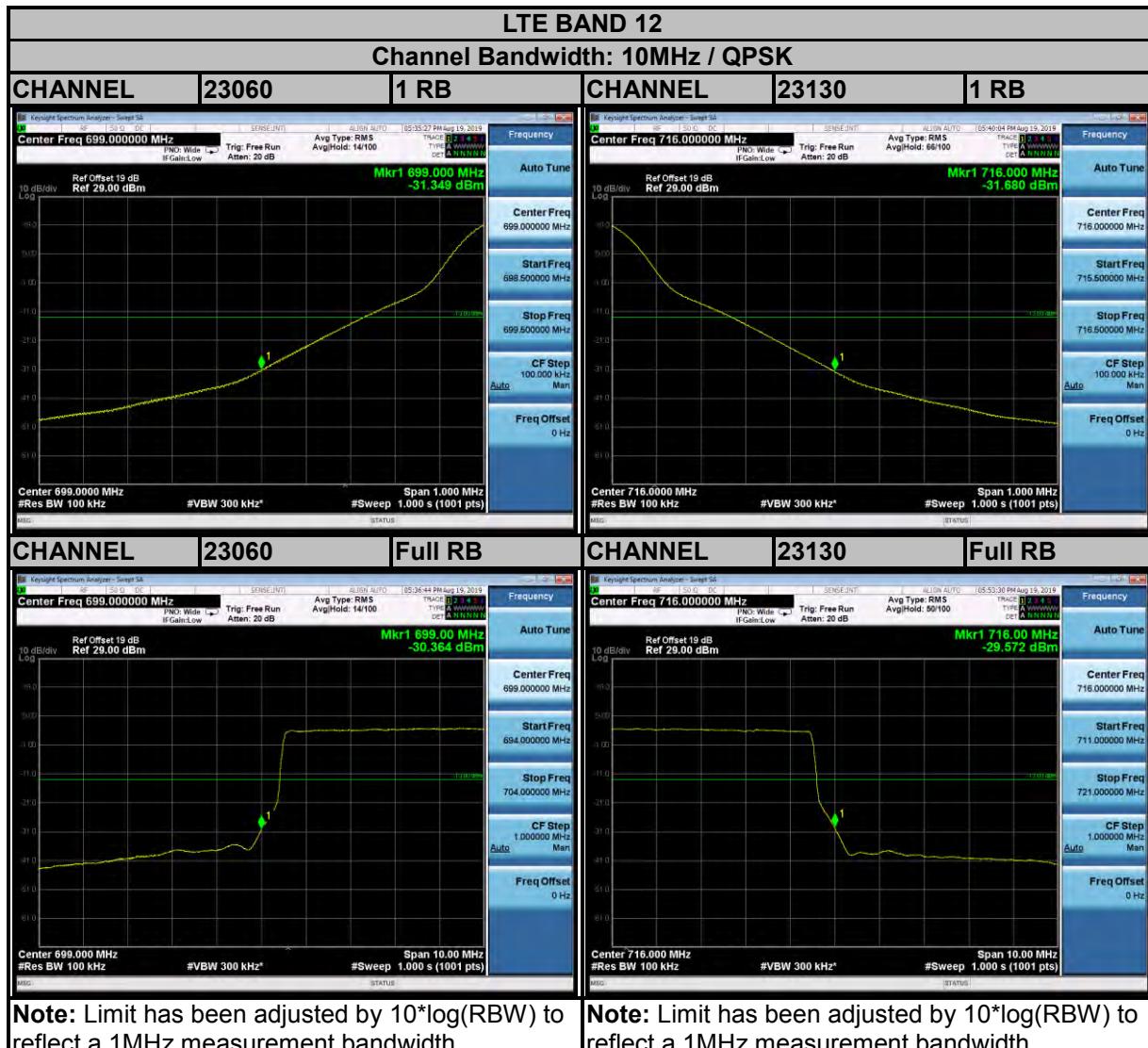
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VERITAS

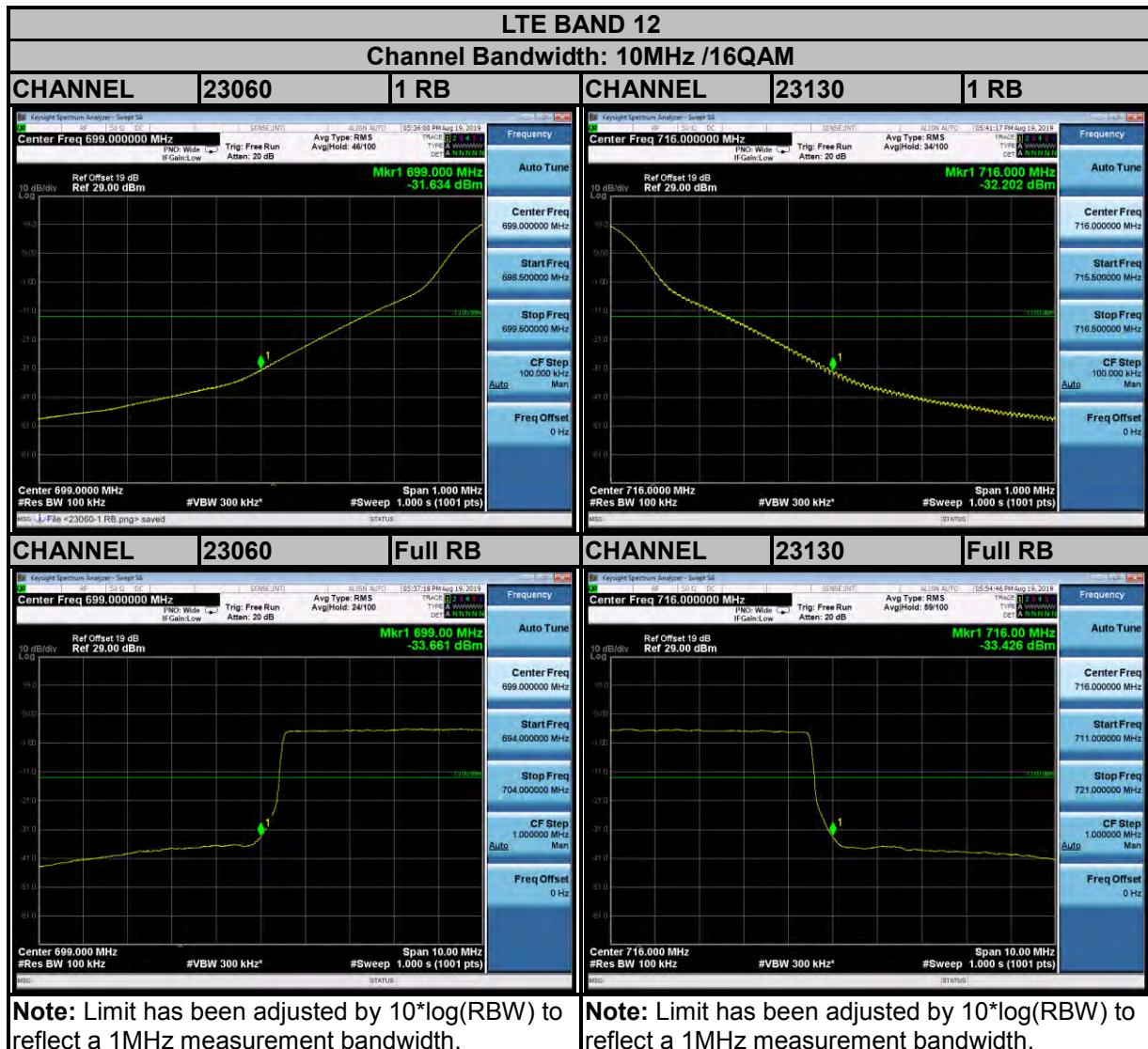
Test Report No.: RF190522W005-4





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LTE BAND 13

Channel Bandwidth: 5MHz / QPSK

CHANNEL 23205 **23205** **1 RB**

CHANNEL 23255 **23255** **1 RB**

CHANNEL 23205 **23205** **Full RB**

CHANNEL 23255 **23255** **Full RB**

Note: Limit has been adjusted by $10 \cdot \log(RBW)$ to reflect a 1MHz measurement bandwidth.

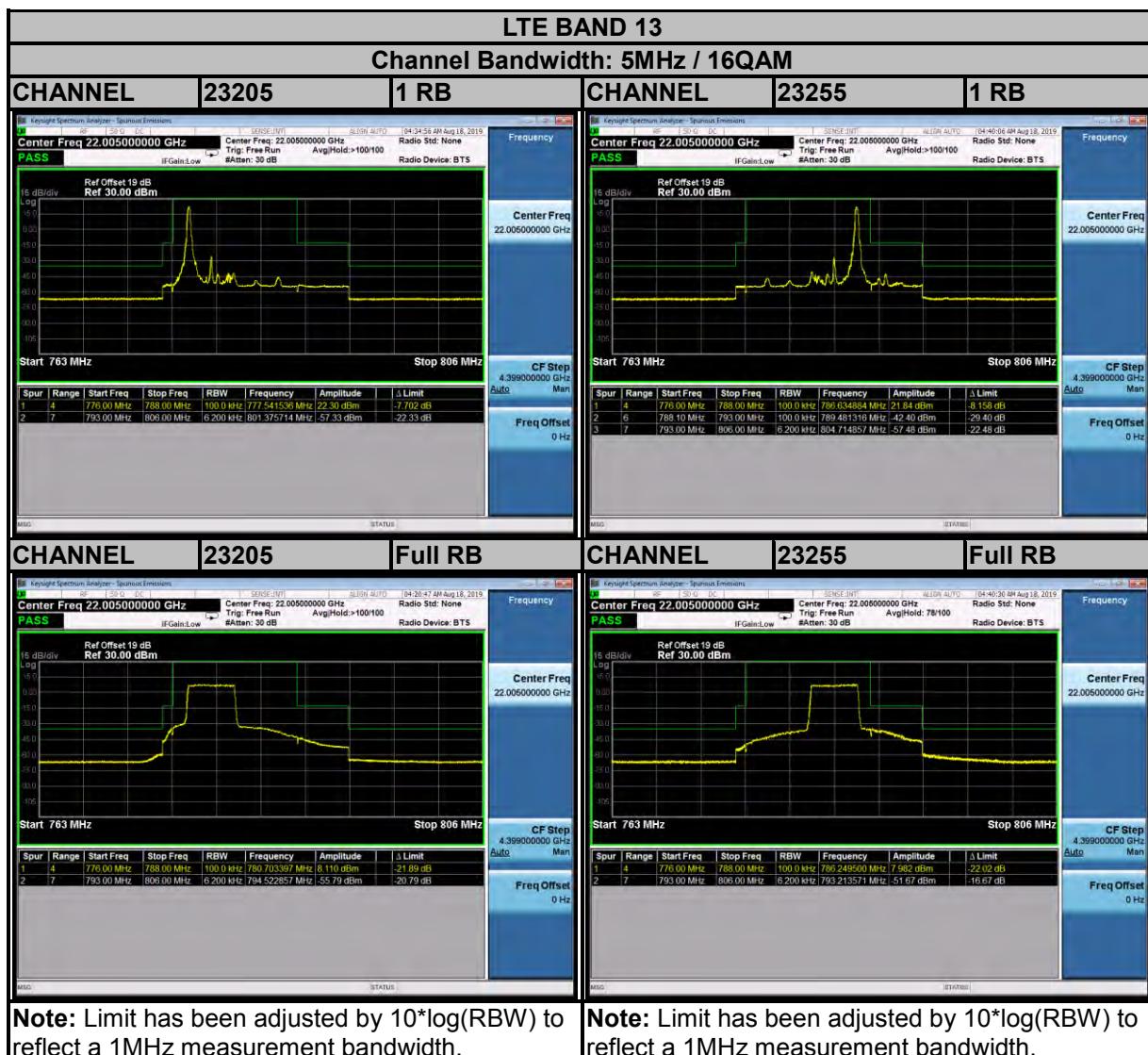
Note: Limit has been adjusted by $10 \cdot \log(RBW)$ to reflect a 1MHz measurement bandwidth.

Note: Limit has been adjusted by $10 \cdot \log(RBW)$ to reflect a 1MHz measurement bandwidth.



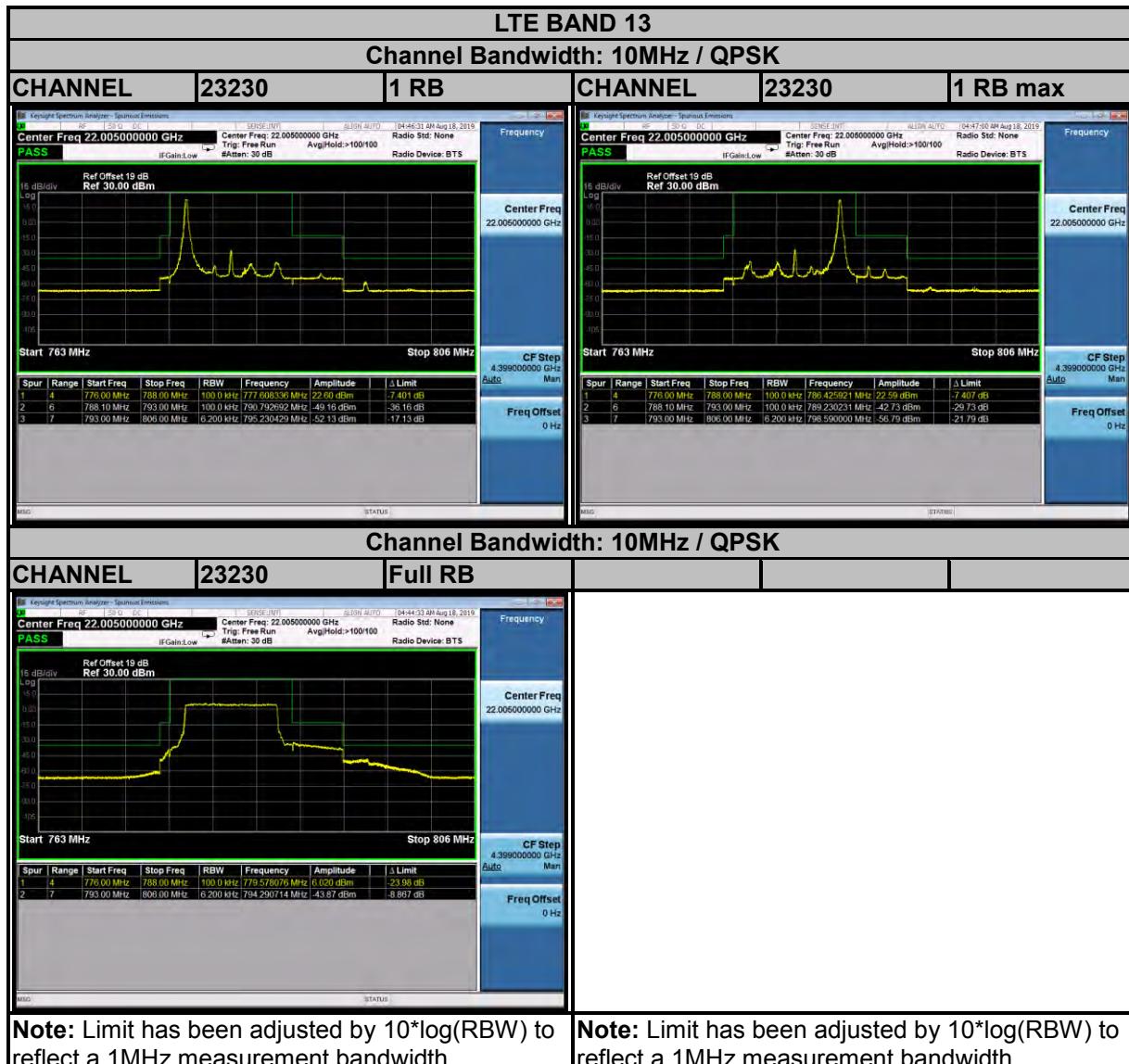
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Test Report No.: RF190522W005-4





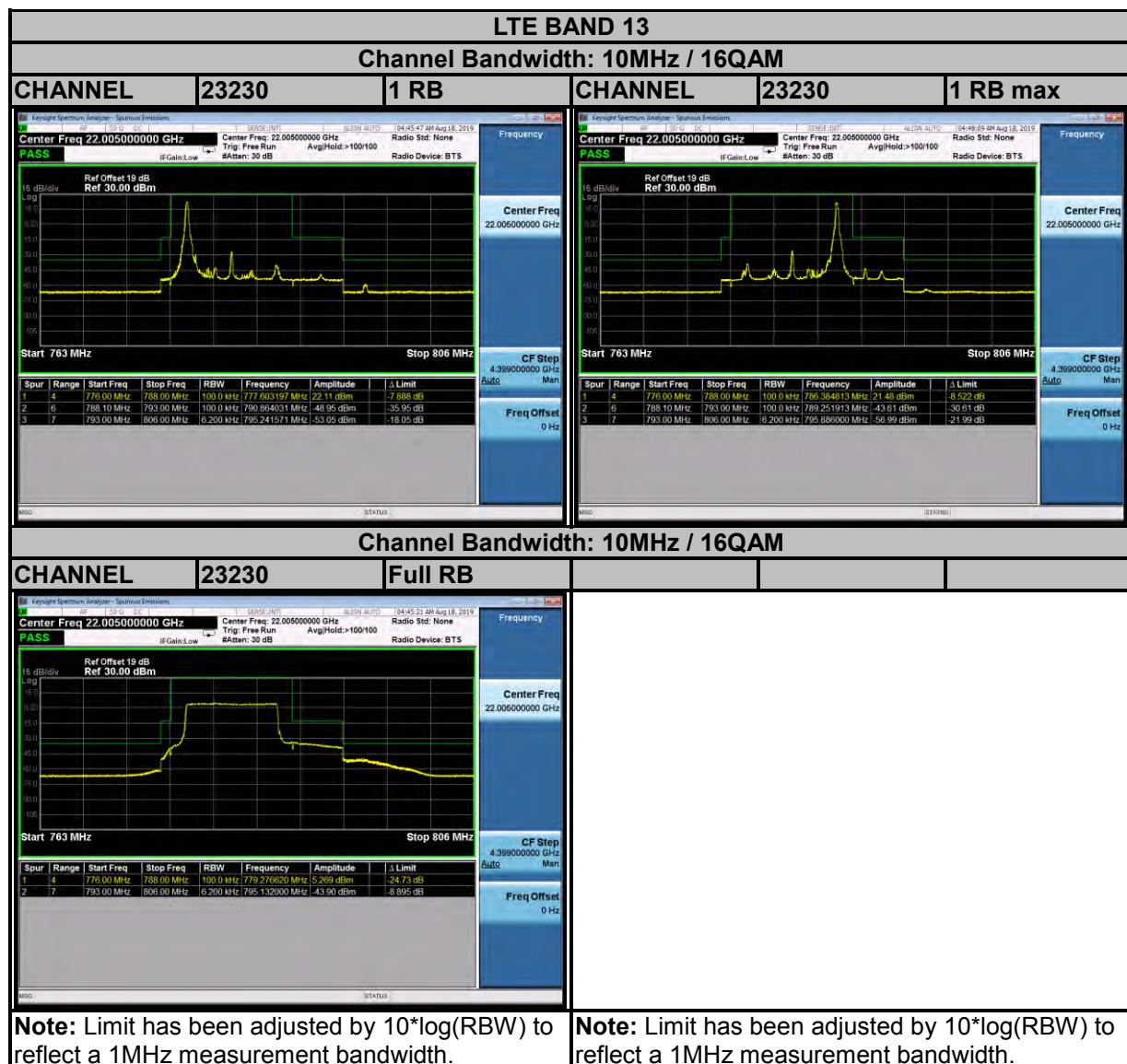
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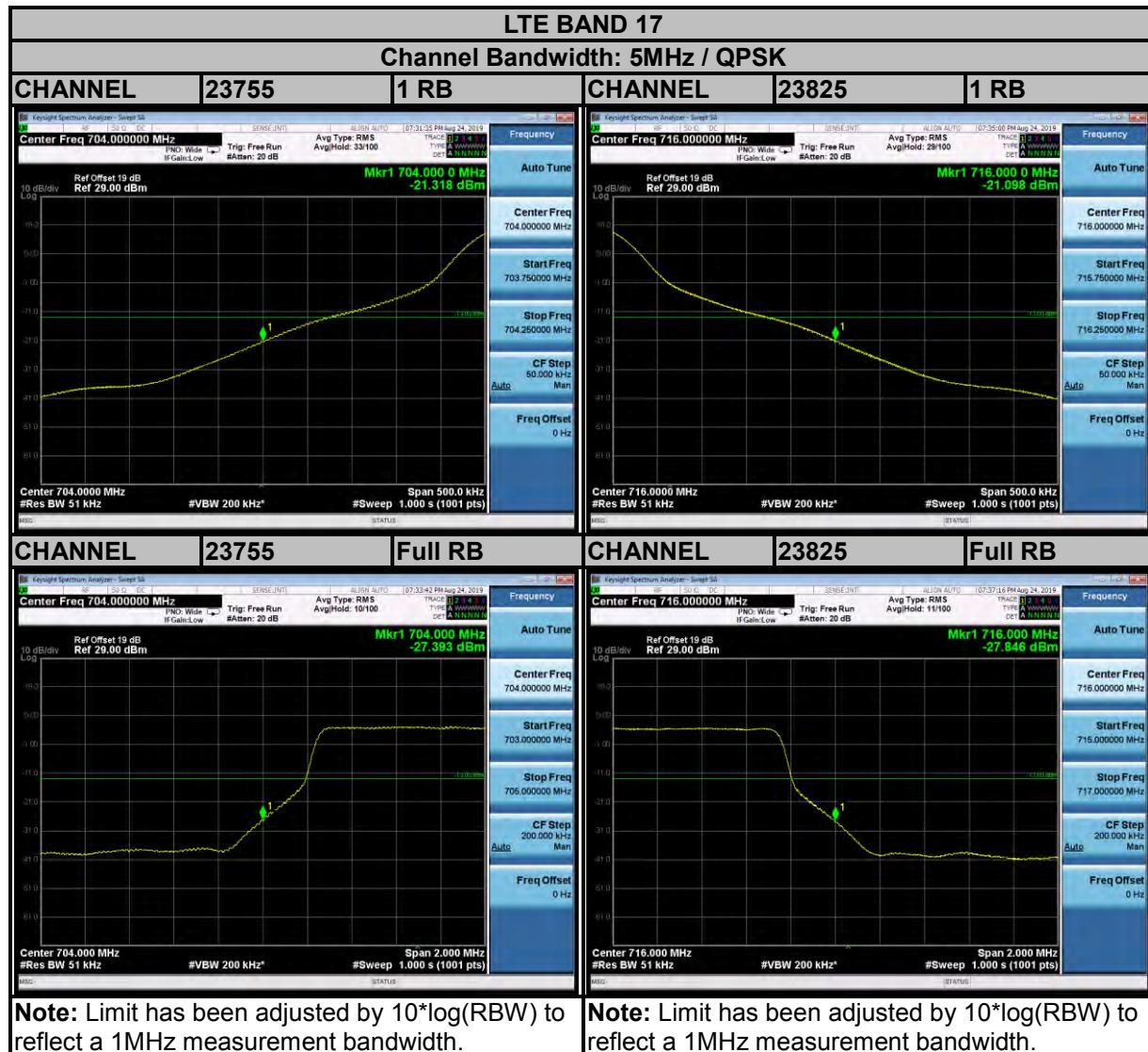
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Test Report No.: RF190522W005-4

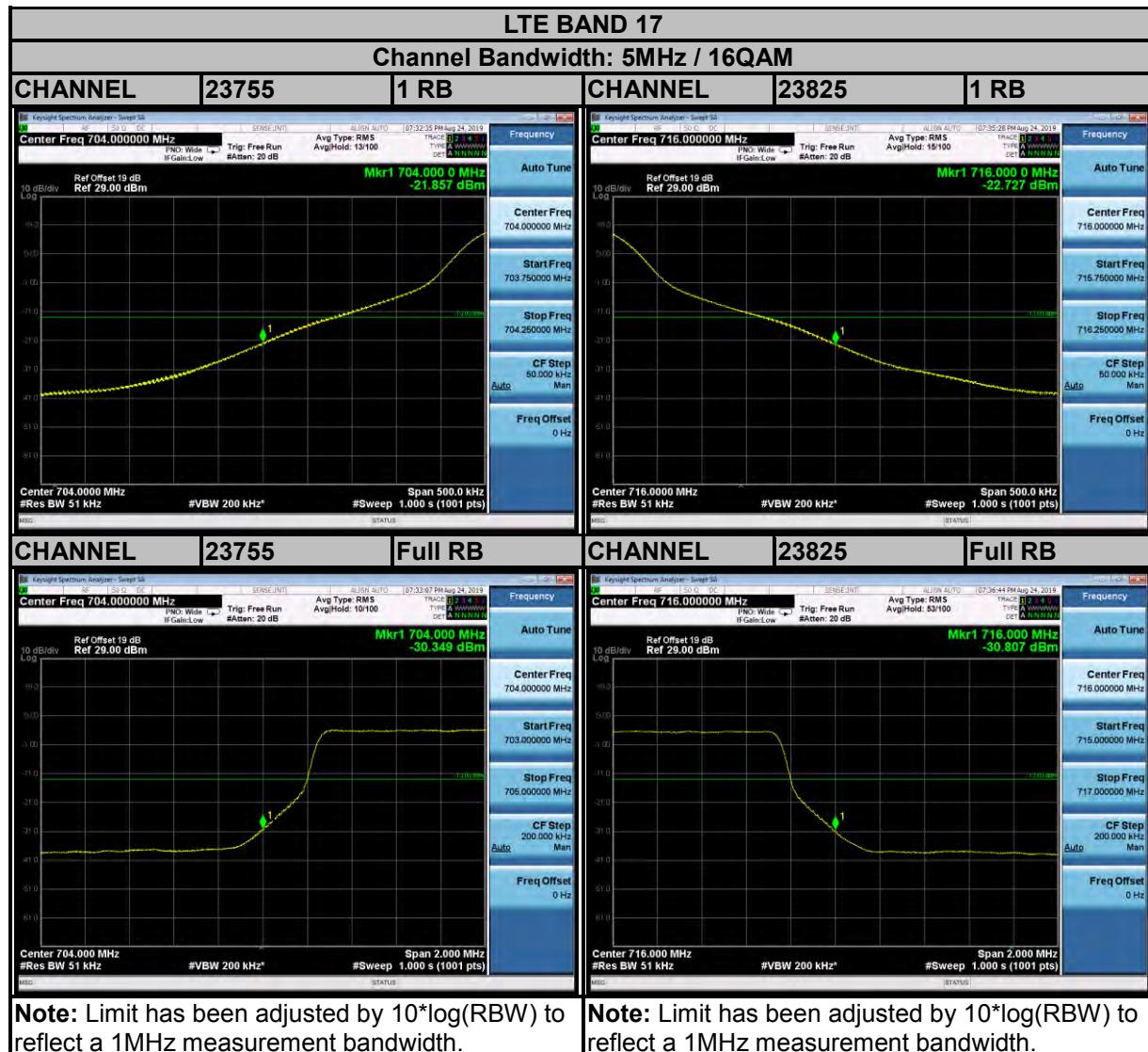
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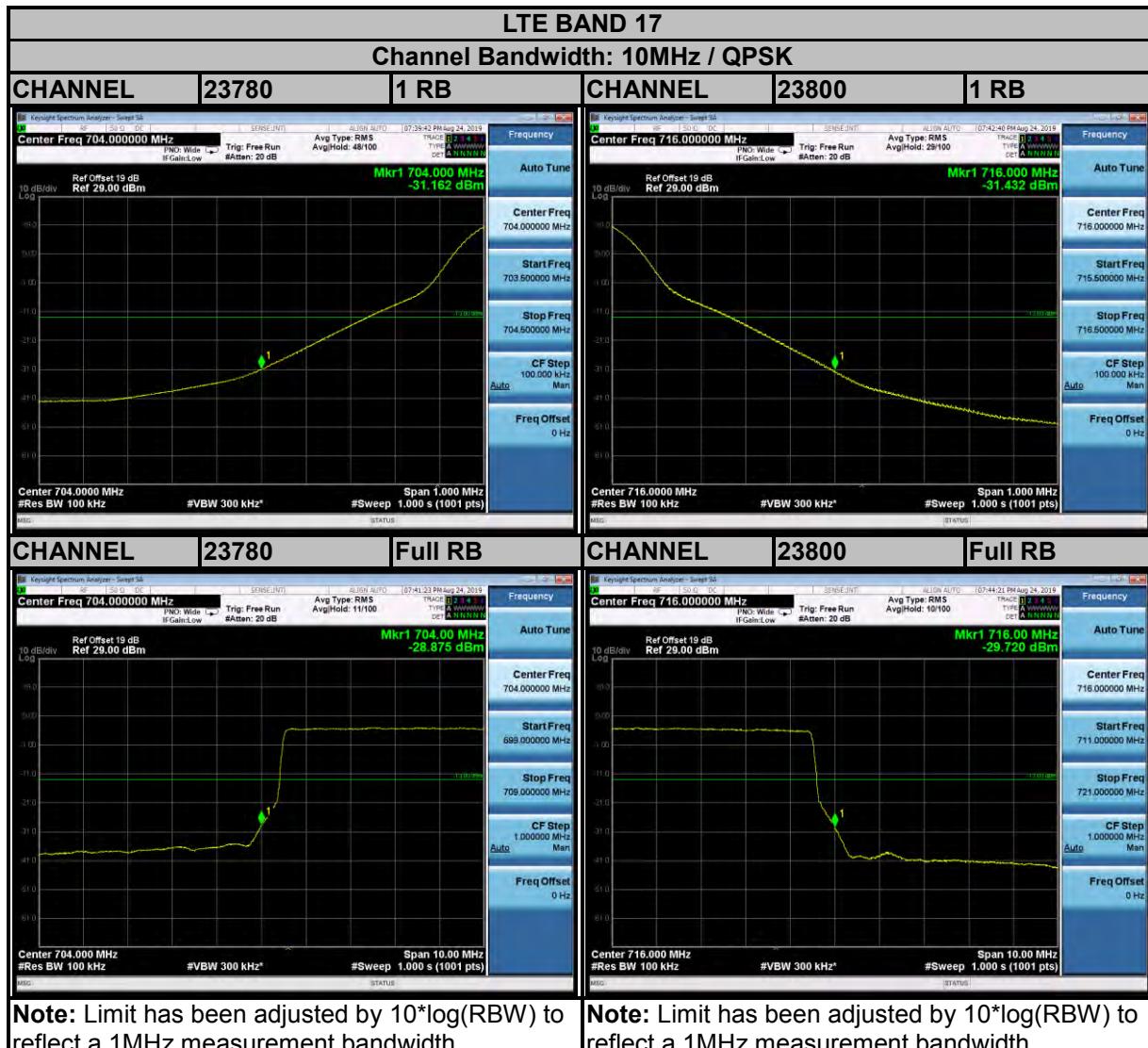
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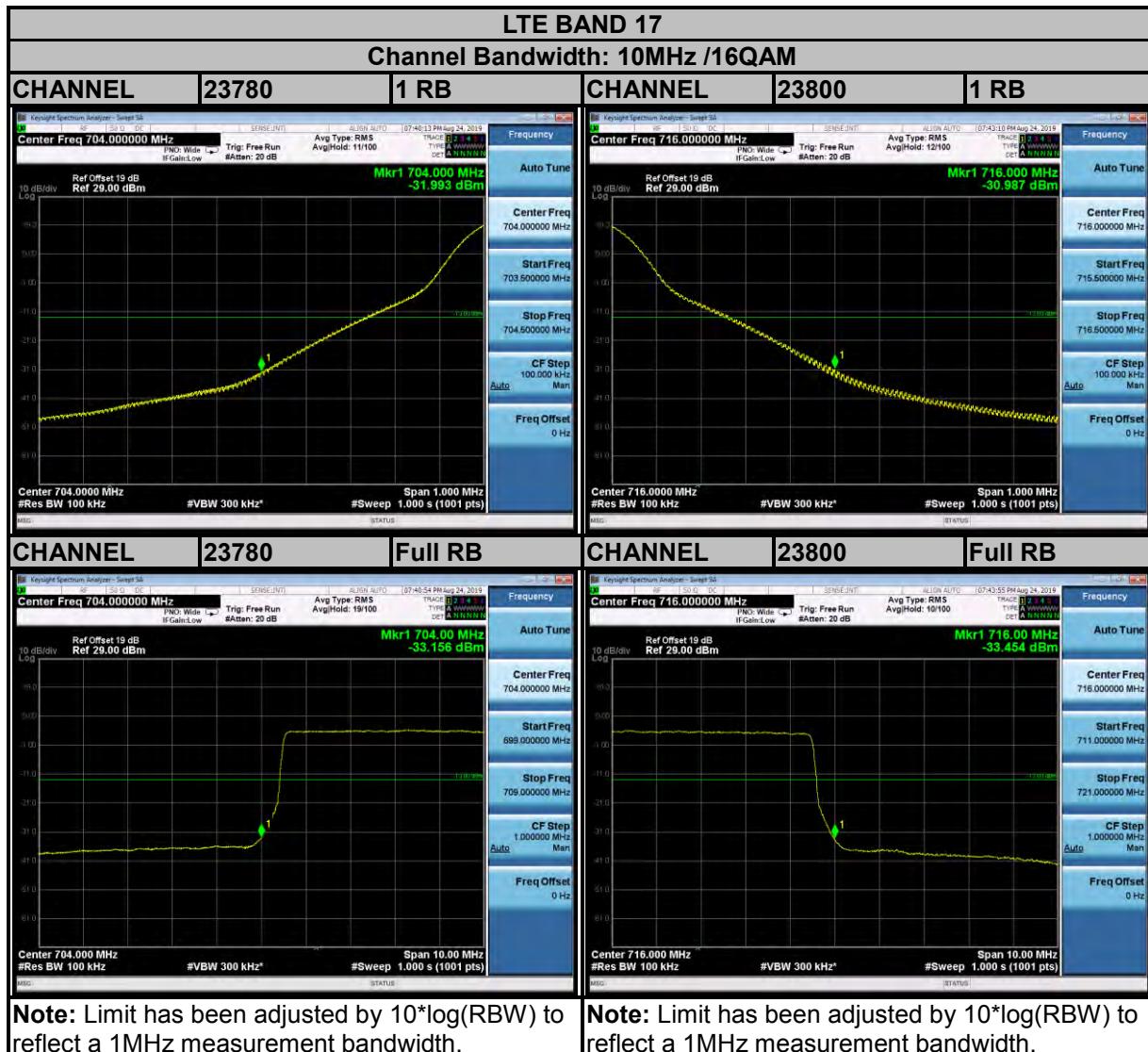
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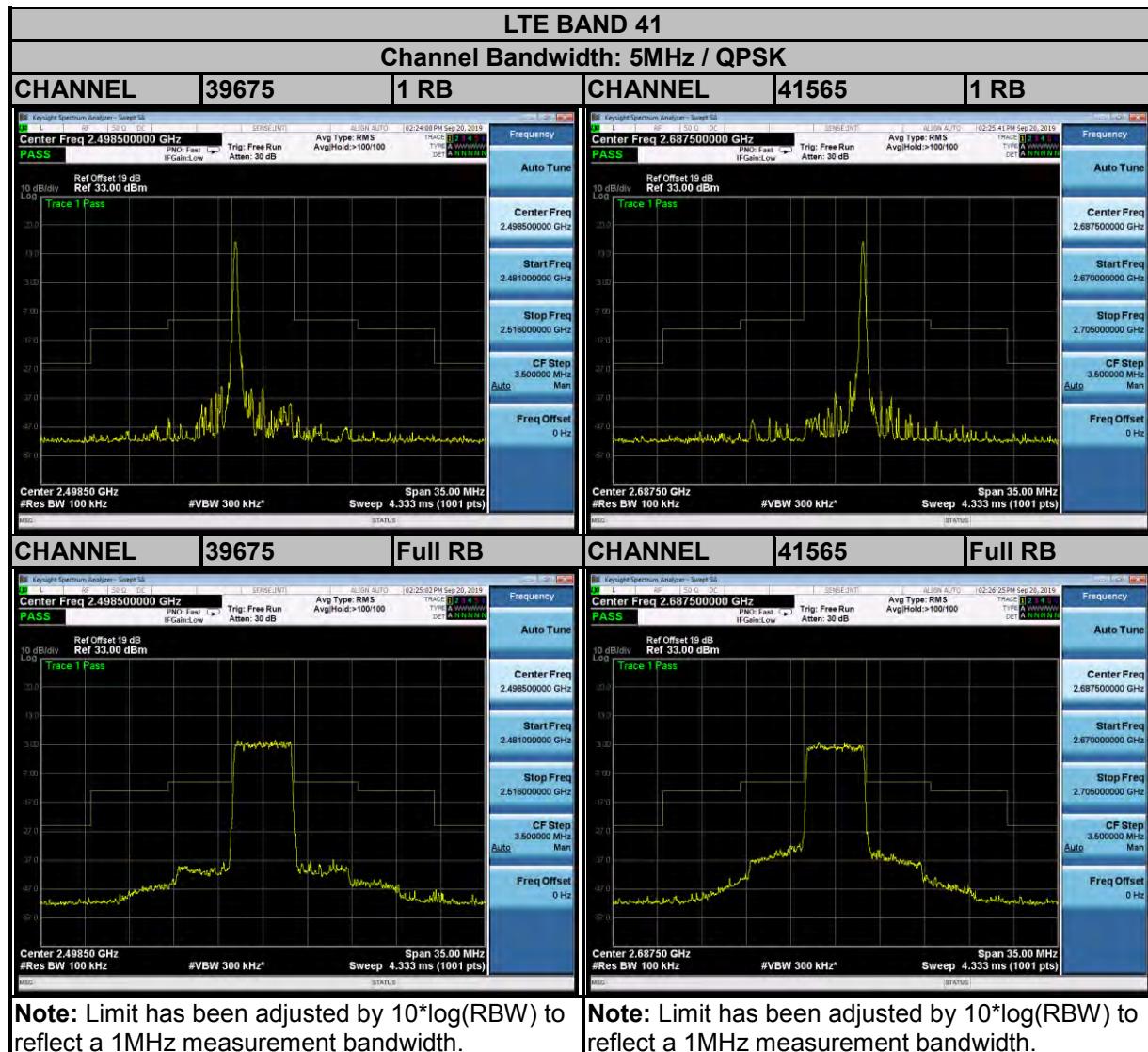
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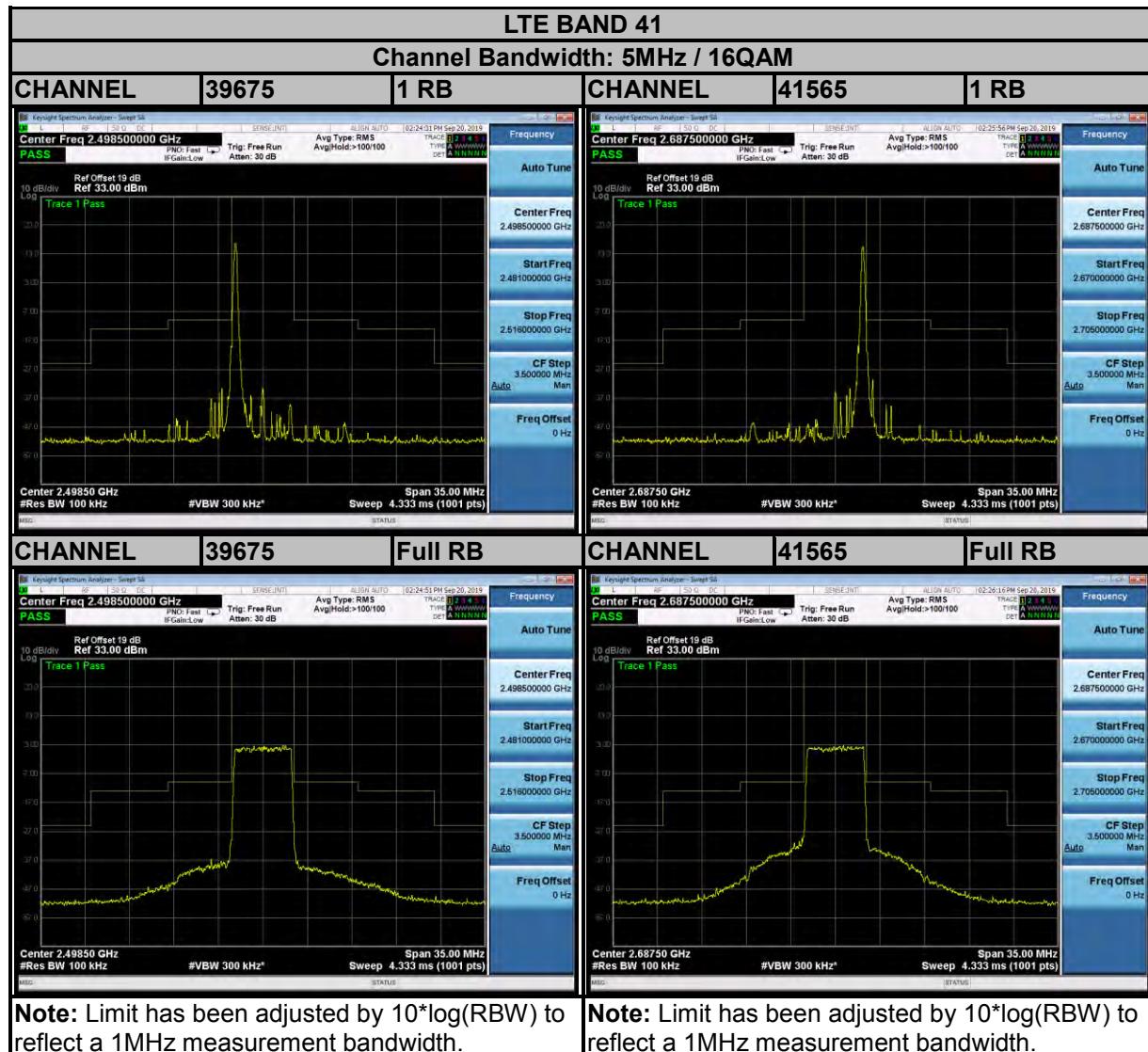
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