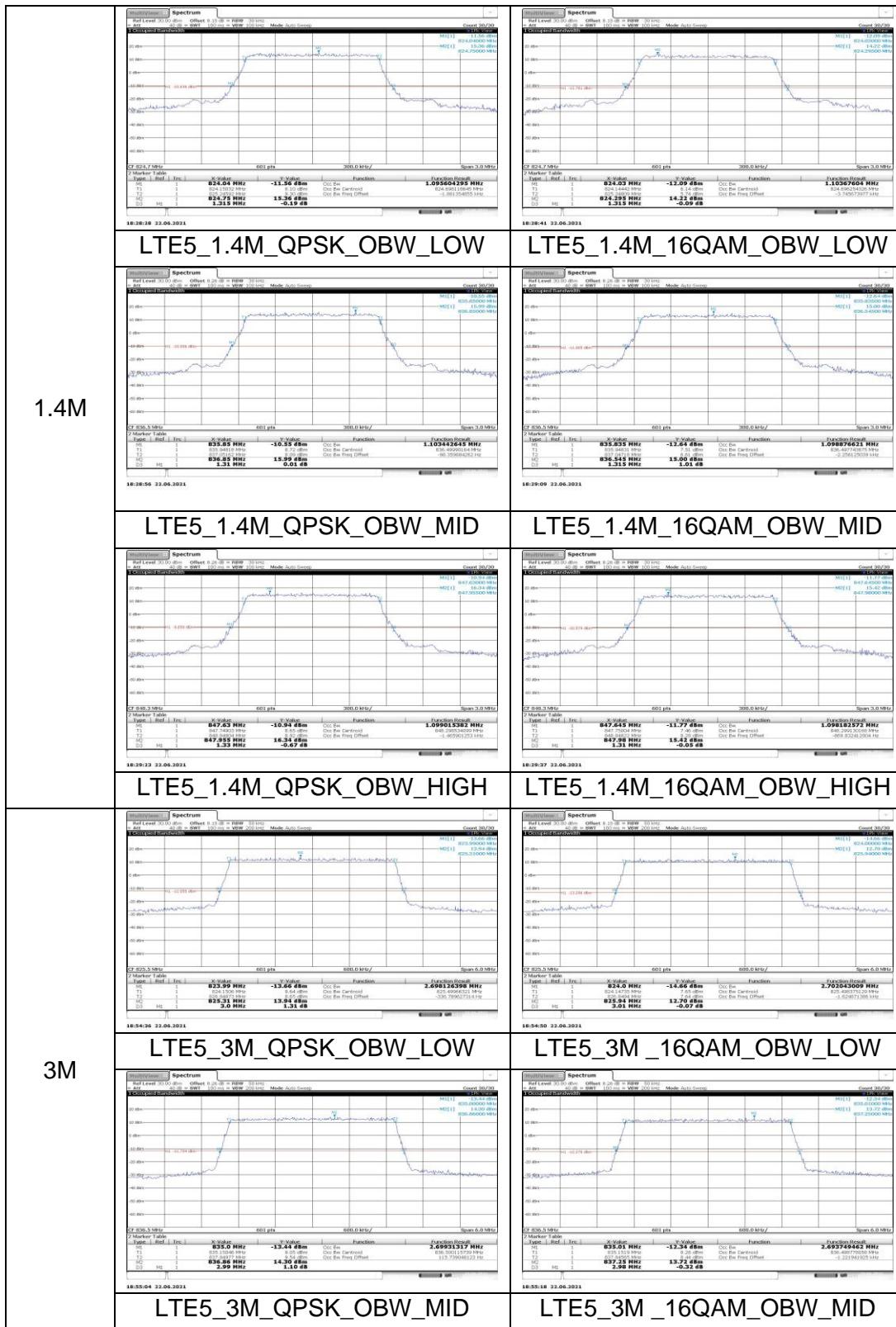
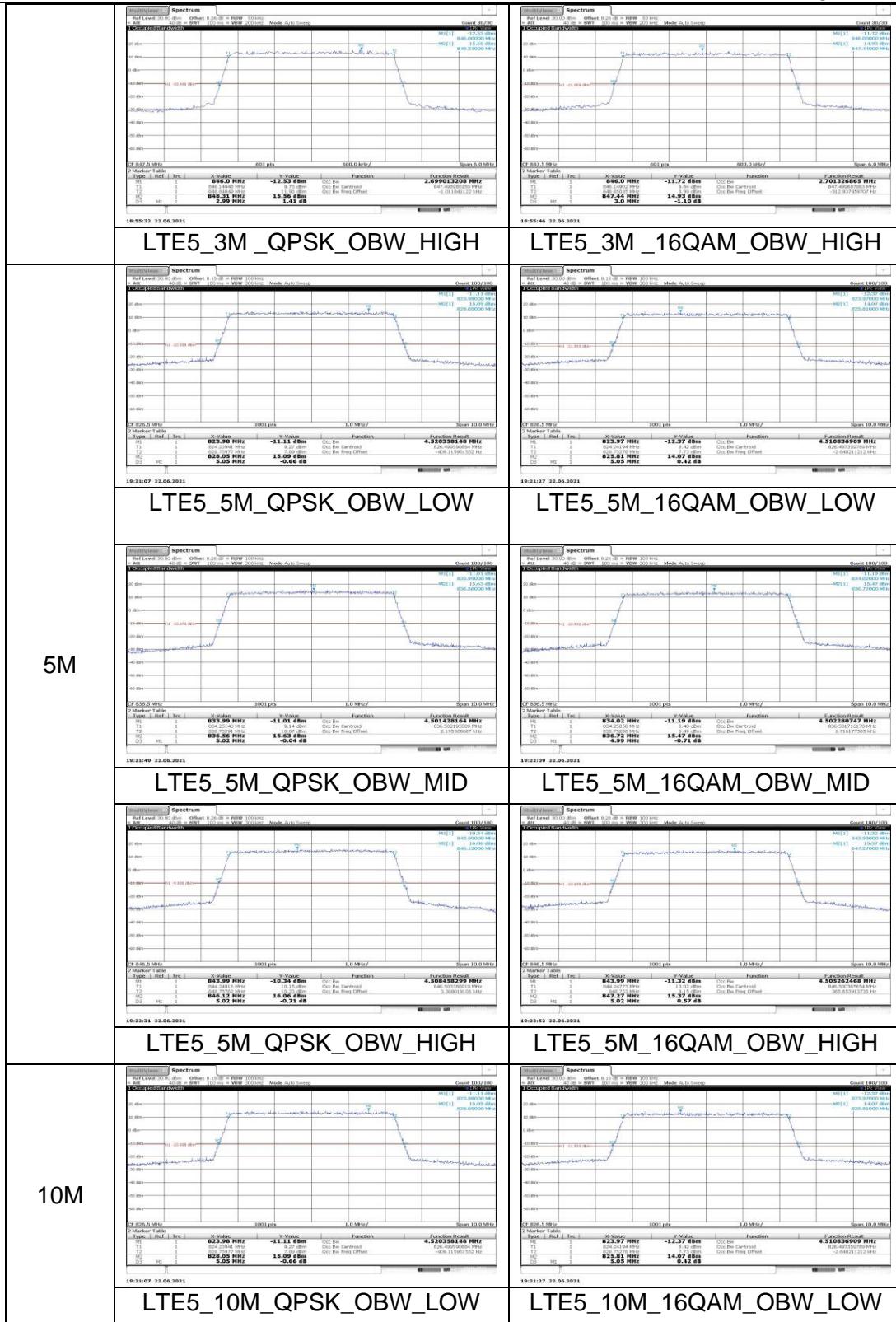
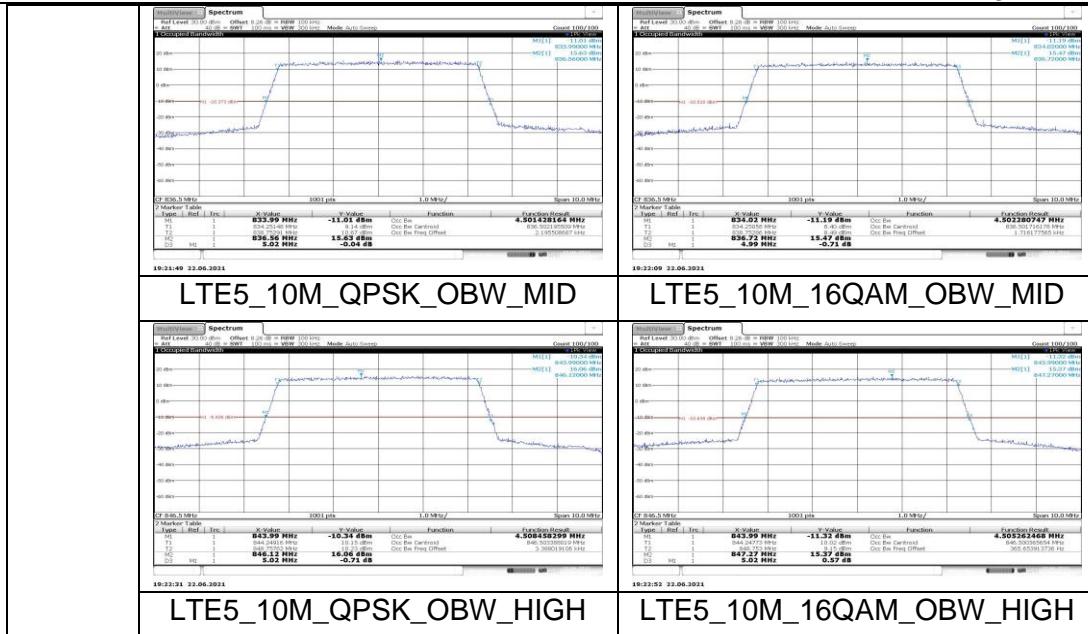


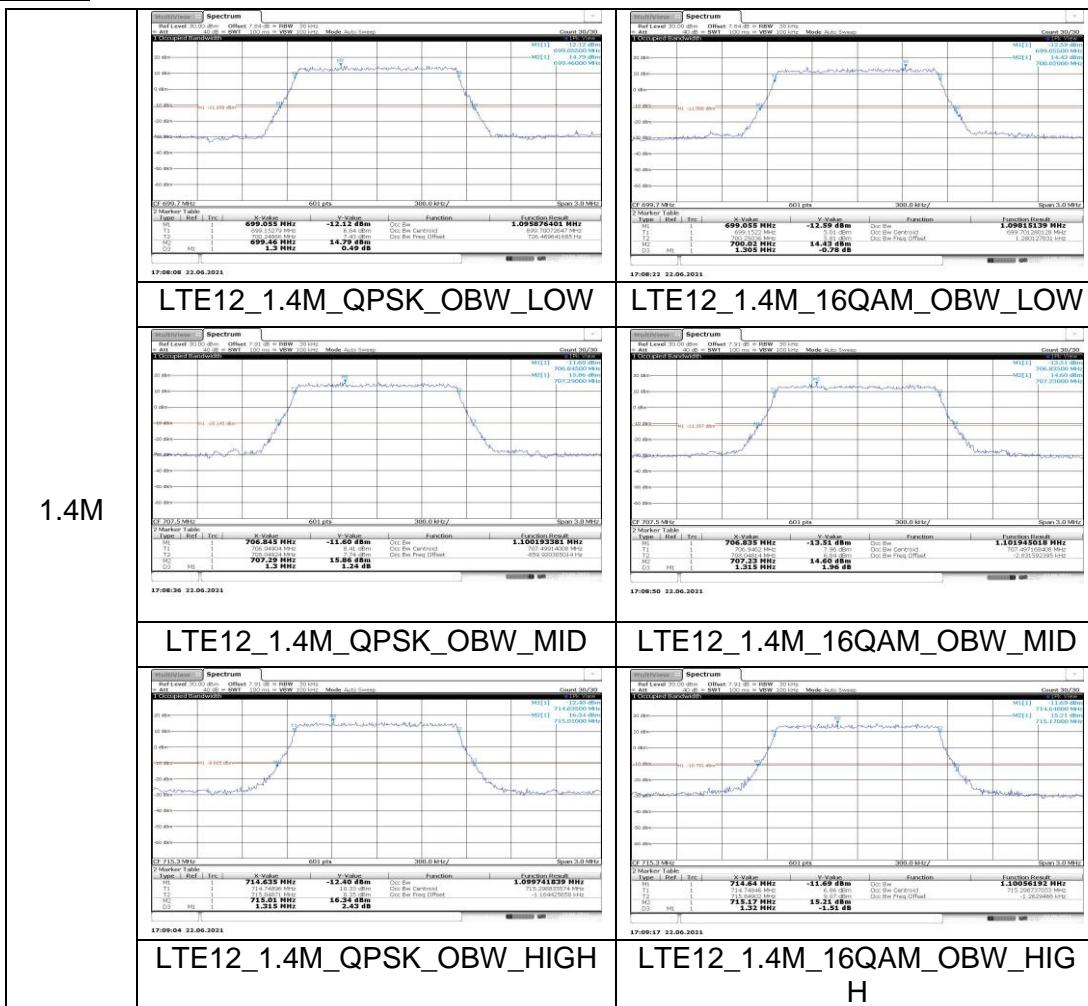
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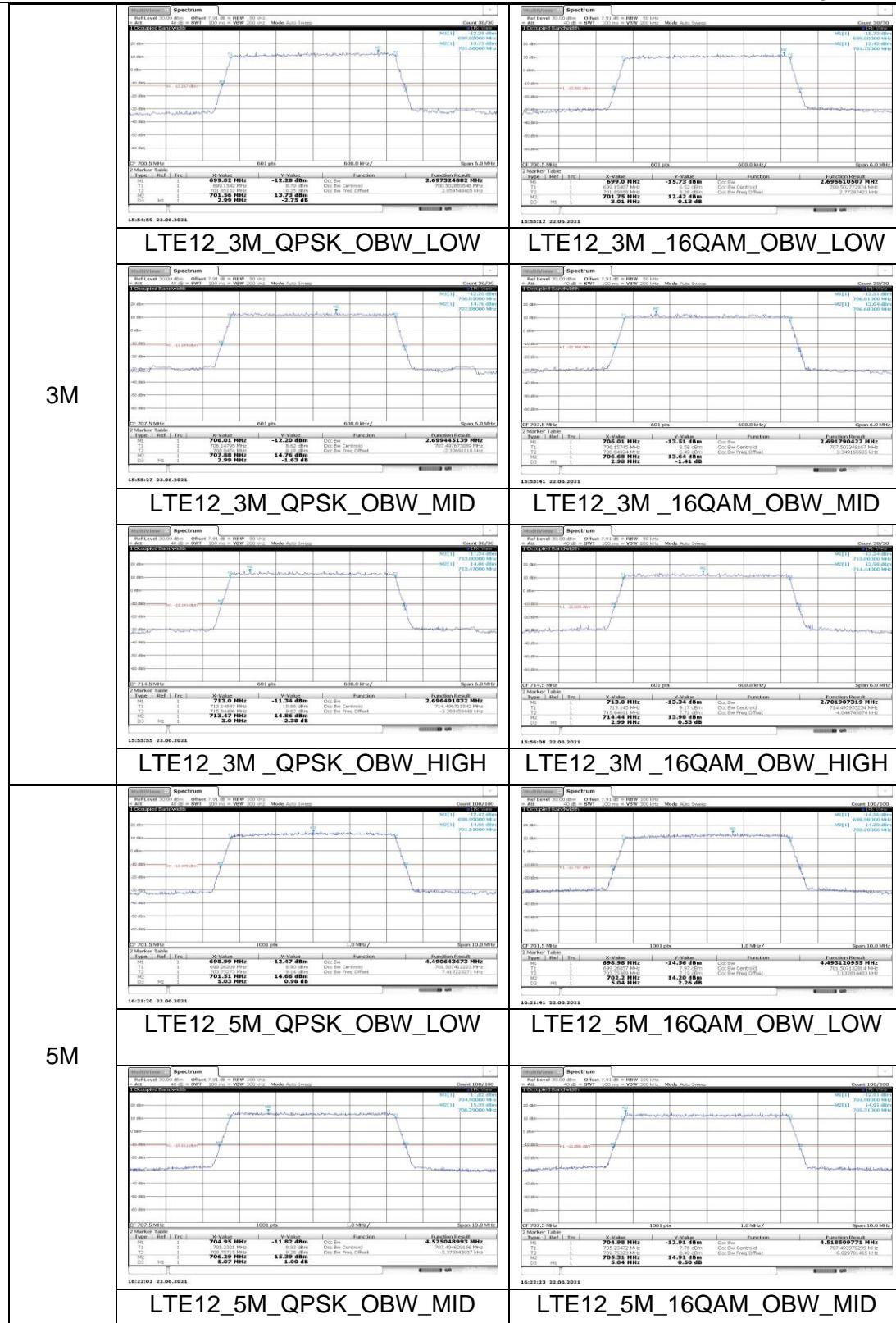


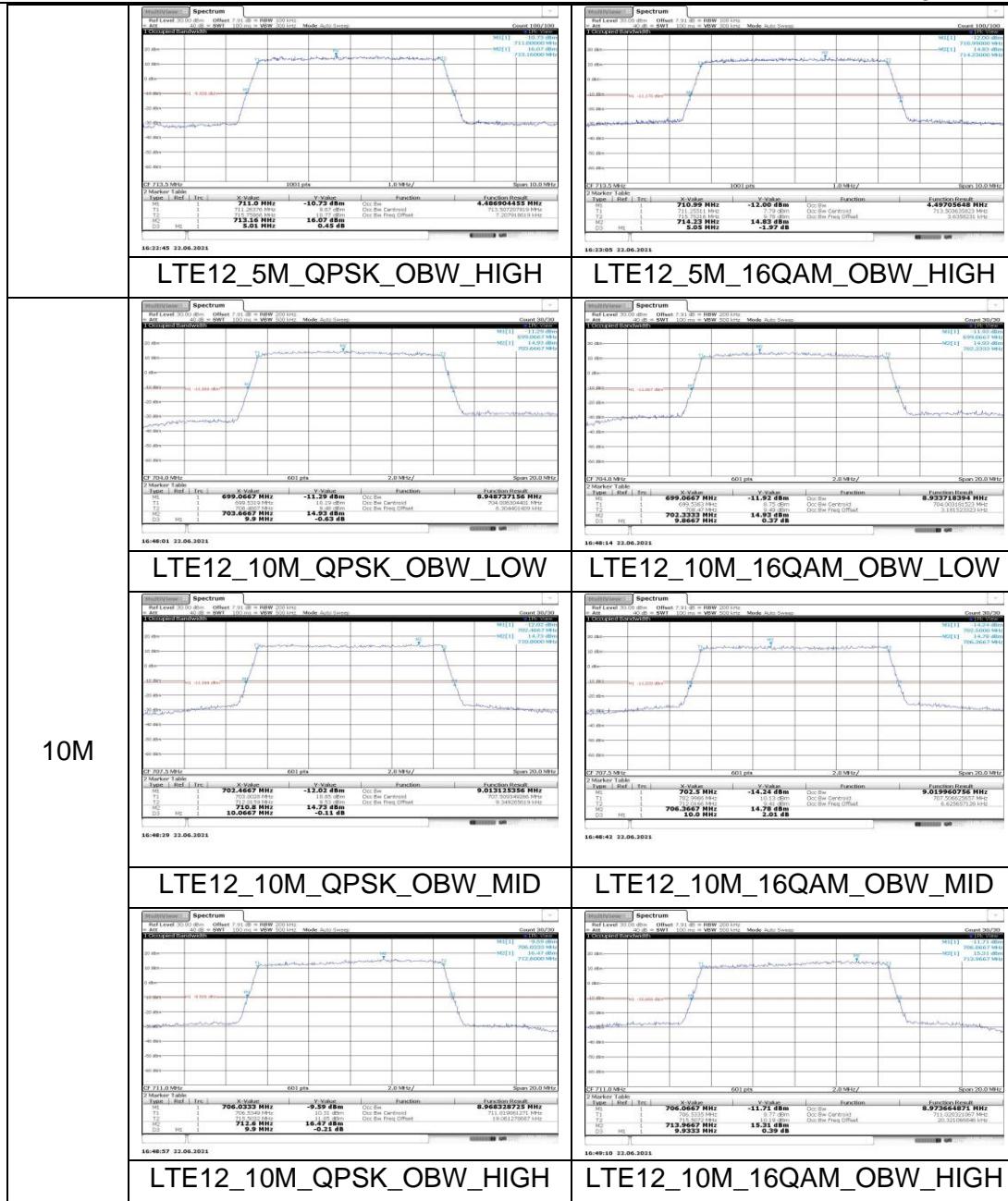




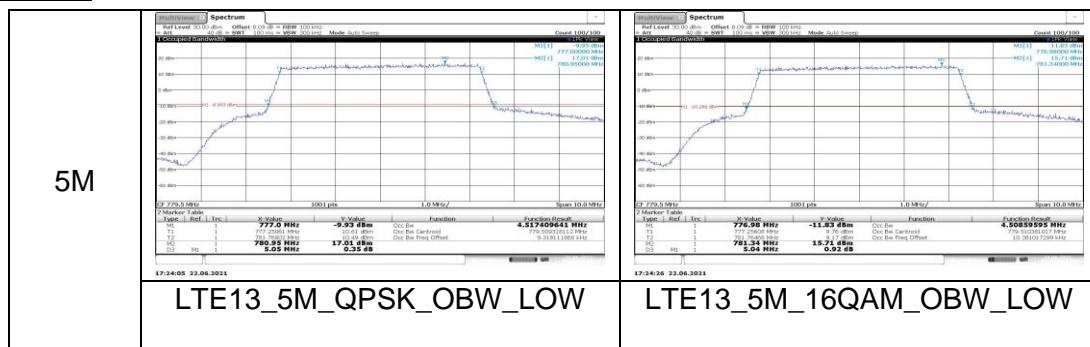
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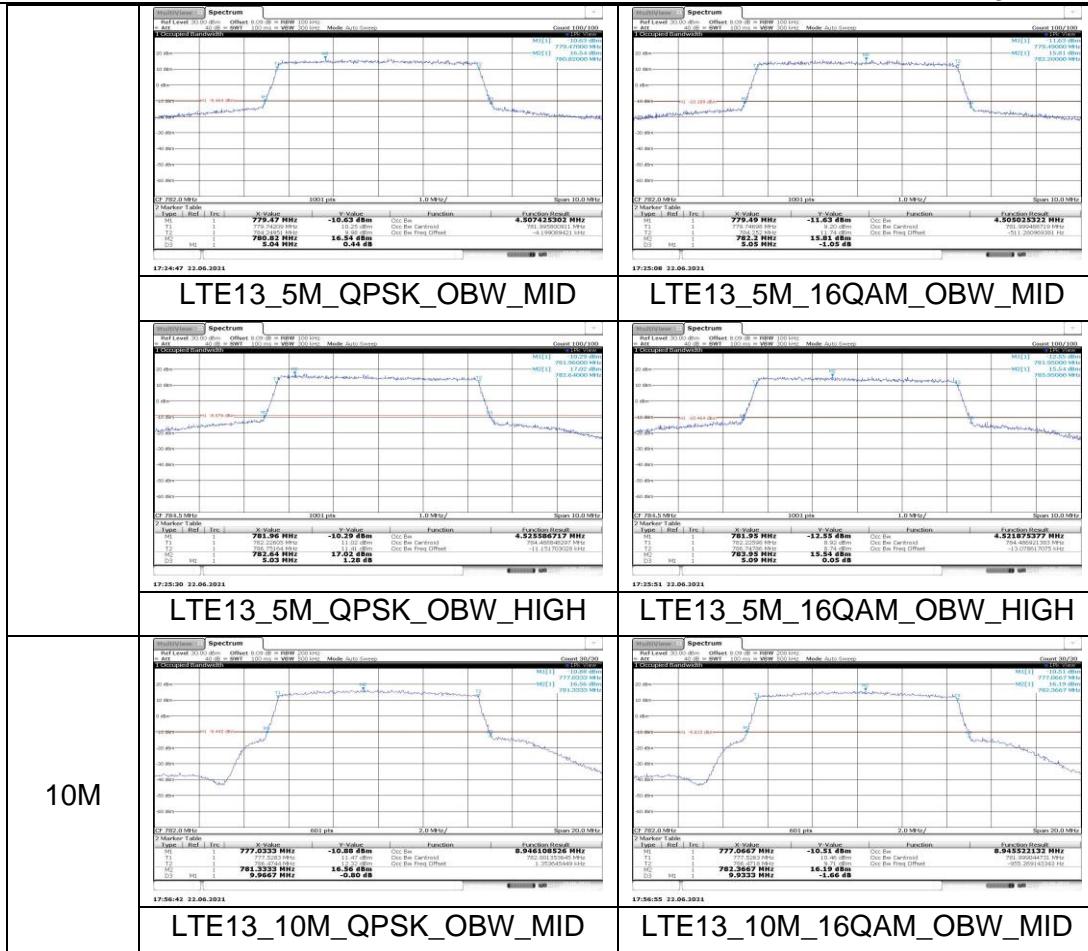




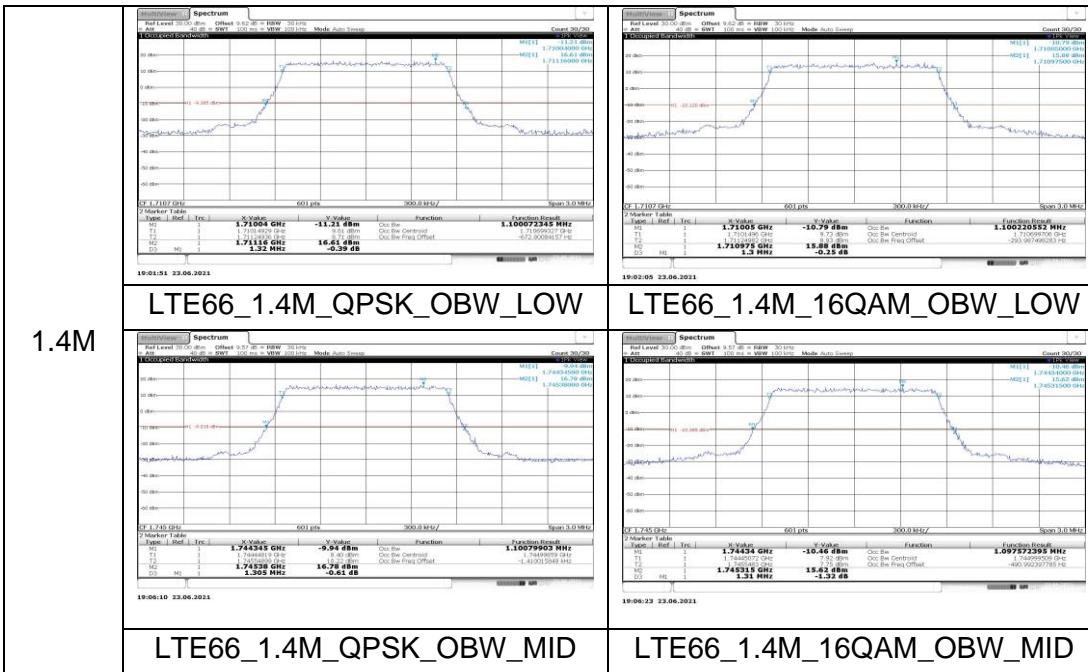


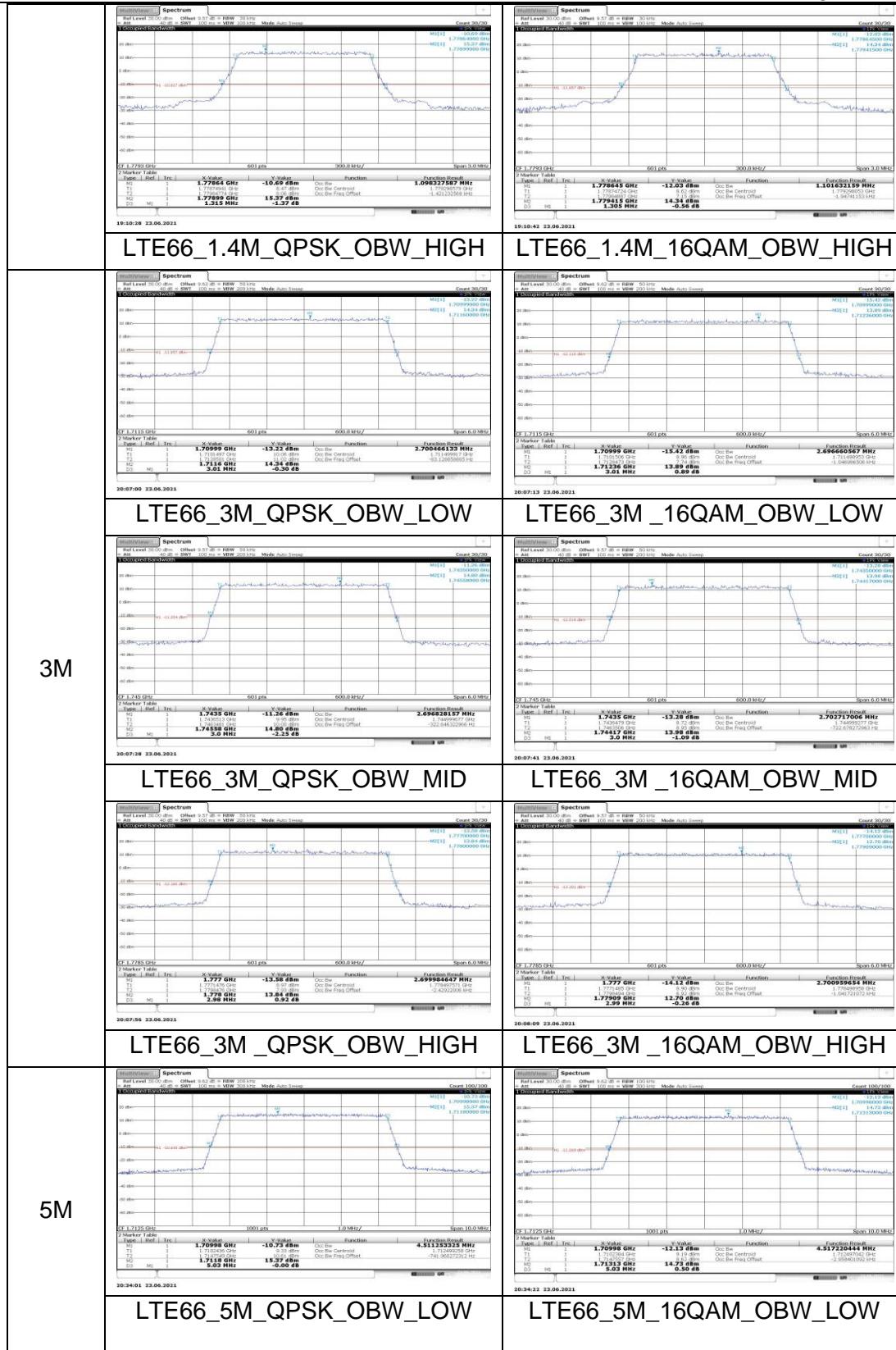
### LTE Band 13

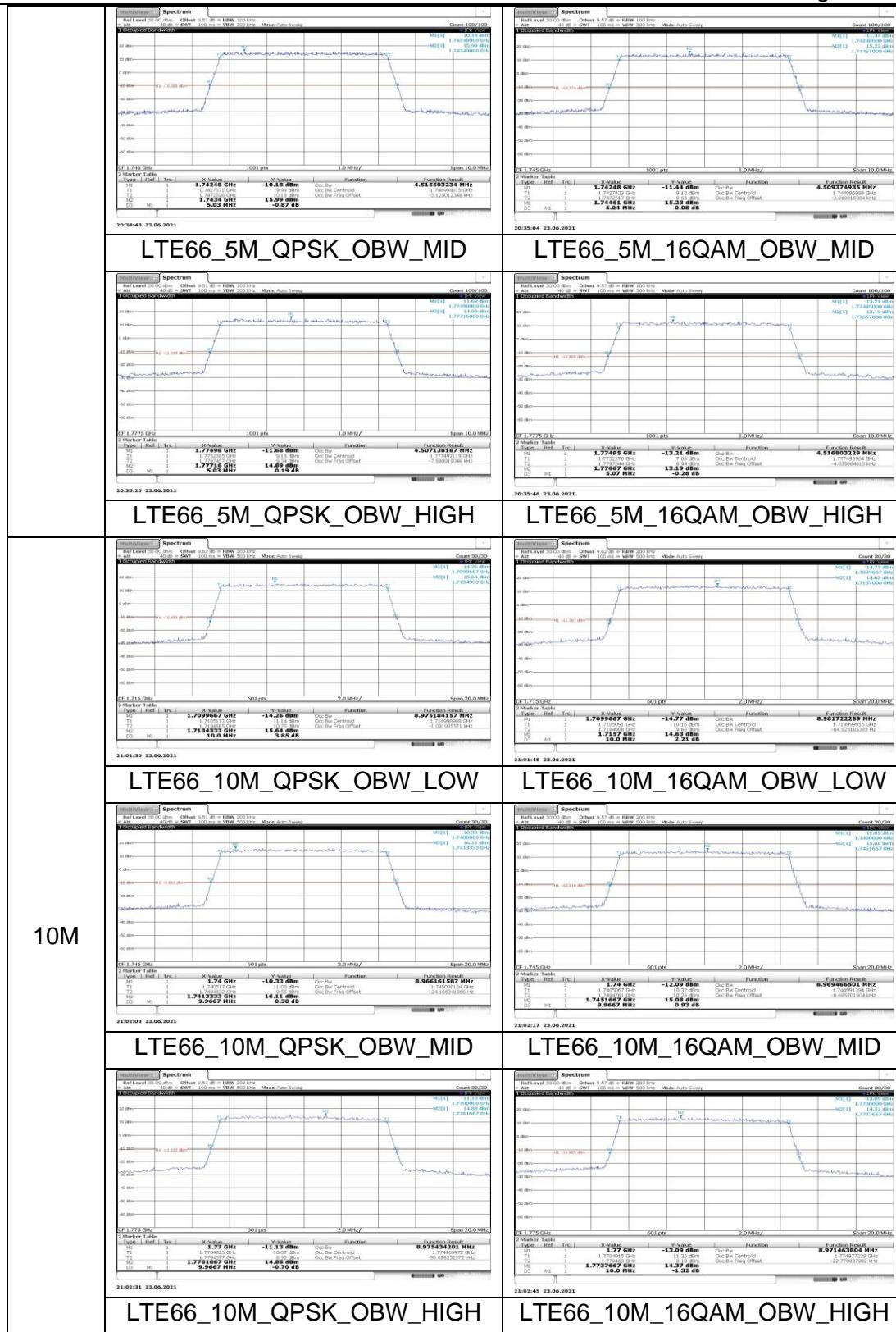


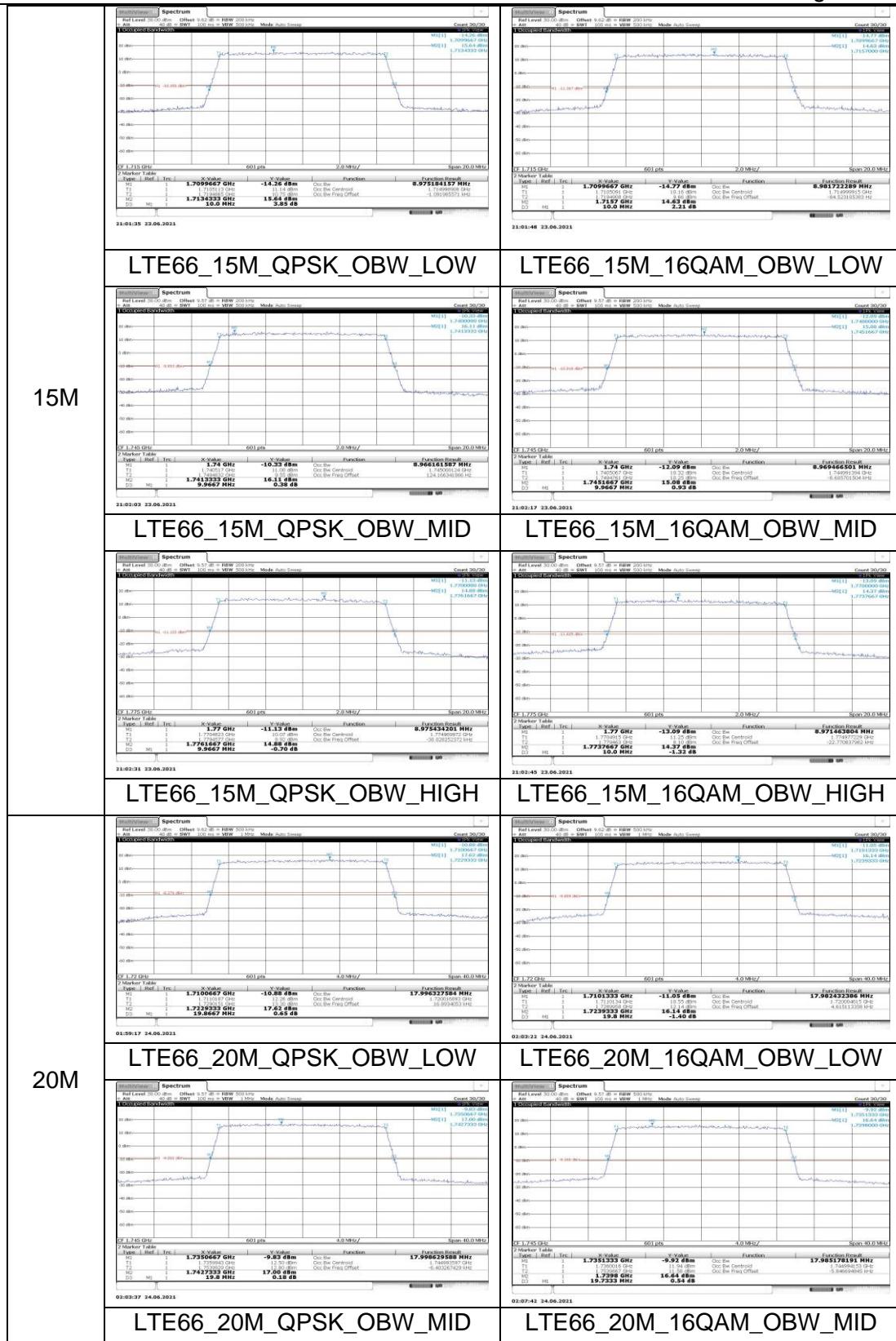


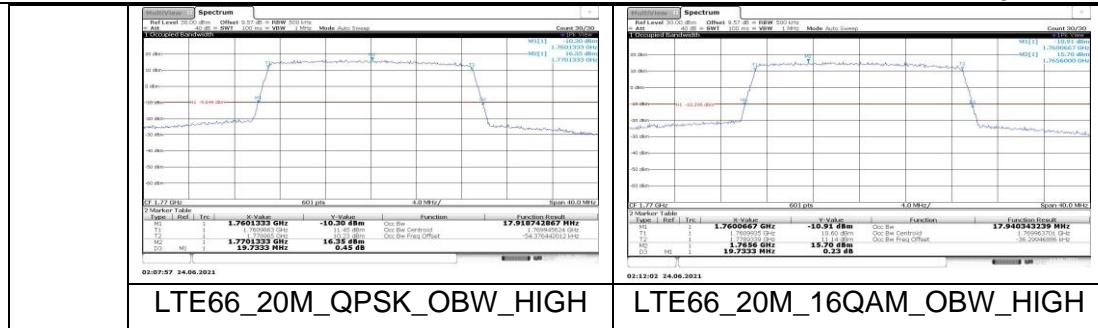
### LTE Band 66











## 6.4 FREQUENCY STABILITY

### RULE PART(S)

FCC: §2.1055, §22.355, §24.235, §27.54.

ISED: RSS-GEN, RSS-132, RSS-133, RSS-139.

### LIMITS

§22.355 - The carrier frequency shall not depart from the reference frequency in excess of  $\pm 2.5$  ppm for mobile stations.

§24.235 and §27.54 - The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

§90.213 - The carrier frequency shall not depart from the reference frequency in excess of  $\pm 2.5$  ppm for mobile stations.

### TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v03r01.

### RESULTS

See the following pages.

Test Mode	Test Conditions		Frequency Deviation Middle Channel		
	Power (VDC)	Temperature (°C)	Frequency Error	Frequency Error	Limit
LTE Band 2			Hz	ppm	ppm
VN	-30	-4.98	-0.002691	2.5	
	-20	2.03	0.001097		
	-10	-2.53	-0.001367		
	0	-5.29	-0.002858		
	+10	-2.62	-0.001416		
	+20	3.28	0.001772		
	+30	-3.36	-0.001816		
	+40	-4.19	-0.002264		
	+50	2.15	0.001162		
LTE Band 4	VL	TN	-4.16	-0.002248	2.5
	VH		-4.86	-0.002626	
	End Point		5.51	0.002977	

Test Mode	Test Conditions		Frequency Deviation Middle Channel		
	Power (VDC)	Temperature (°C)	Frequency Error	Frequency Error	Limit
LTE Band 4			Hz	ppm	ppm
VN	-30	6.47	0.003782	2.5	
	-20	-2.53	-0.001479		
	-10	4.23	0.002473		
	0	-3.68	-0.002151		
	+10	8.14	0.004758		
	+20	-3.36	-0.001964		
	+30	4.02	0.002350		
	+40	3.71	0.002169		
	+50	3.93	0.002297		
LTE Band 2	VL	TN	3.29	0.001923	2.5
	VH		-3.95	-0.002309	
	End Point		4.08	0.002385	

Test Mode	Test Conditions		Frequency Deviation Middle Channel		
	Power (VDC)	Temperature (°C)	Frequency Error	Frequency Error	Limit
LTE Band 5			Hz	ppm	ppm
VN	-30	-4.36	-0.005287	2.5	
	-20	-2.39	-0.002898		
	-10	-2.66	-0.003225		
	0	-5.41	-0.006560		
	+10	-4.71	-0.005711		
	+20	-4.02	-0.004874		
	+30	-6.31	-0.007651		
	+40	-2.57	-0.003116		
	+50	-3.71	-0.004499		
LTE Band 12	VL	TN	2.06	0.002498	2.5
	VH		-3.68	-0.004462	
	End Point		-2.89	-0.003504	

Test Mode	Test Conditions		Frequency Deviation Middle Channel		
	Power (VDC)	Temperature (°C)	Frequency Error	Frequency Error	Limit
LTE Band 12			Hz	ppm	ppm
VN	-30	-2.78	-0.003973	2.5	
	-20	-2.06	-0.002944		
	-10	-1.26	-0.001801		
	0	1.50	0.002144		
	+10	-2.32	-0.003316		
	+20	-3.55	-0.005074		
	+30	-3.19	-0.004559		
	+40	-1.65	-0.002358		
	+50	-2.07	-0.002958		
LTE Band 5	VL	TN	-3.12	-0.004459	2.5
	VH		-1.49	-0.002129	
	End Point		-2.35	-0.003359	

Test Mode	Test Conditions		Frequency Deviation Middle Channel		
	Power (VDC)	Temperature (°C)	Frequency Error	Frequency Error	Limit
LTE Band 13			Hz	ppm	ppm
VN	-30	-3.09	-0.003964	2.5	
	-20	-3.23	-0.004144		
	-10	-4.52	-0.005799		
	0	-4.11	-0.005273		
	+10	-4.11	-0.005273		
	+20	-3.15	-0.004041		
	+30	-3.81	-0.004888		
	+40	-4.39	-0.005632		
	+50	-3.72	-0.004772		
LTE Band 66	VL	TN	-3.29	-0.004221	2.5
	VH		-5.02	-0.006440	
	End Point		-2.37	-0.003040	

Test Mode	Test Conditions		Frequency Deviation Middle Channel		
	Power (VDC)	Temperature (°C)	Frequency Error	Frequency Error	Limit
LTE Band 66			Hz	ppm	ppm
VN	-30	4.29	0.002508	2.5	
	-20	4.94	0.002888		
	-10	4.08	0.002385		
	0	3.81	0.002227		
	+10	3.98	0.002327		
	+20	4.61	0.002695		
	+30	3.25	0.001900		
	+40	3.29	0.001923		
	+50	-4.02 -	0.002350		
LTE Band 13	VL	TN	2.95	0.001724	2.5
	VH		4.01	0.002344	
	End Point		3.89	0.002274	

## 6.5 BAND EDGE EMISSIONS

### RULE PART(S)

FCC: §2.1051, §22.917, §24.238, §27.53.  
ISED: RSS-130, RSS-132, RSS-133, RSS-139

### LIMITS

FCC: §2.1051, §22.917, §24.238, §27.53

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.

FCC: §90.691 Emission mask requirements for EA-based systems.

(a) Out-of-band emission requirement shall apply only to the "outer" channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

(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  $116 \log_{10}(f/6.1)$  decibels or  $50 + 10 \log_{10}(P)$  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.

(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  $43 + 10 \log_{10}(P)$  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

Per KDB 971168 D01 Power Meas License Digital Systems v03r01:

The transmitter output was connected to a CMW500 Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.

Set the RBW = 1 ~ 1.5 % of OBW (Typically limited to a minimum RBW of 1% of the OBW)

- b) Set VBW  $\geq 3 \times$  RBW;
- c) Set span  $\geq 1.5$  times the OBW;
- d) Sweep time = Auto;
- e) Detector = RMS;
- f) Ensure that the number of measurement points  $\geq 2 \times$  Span/RBW;
- g) Trace mode = Average (100).

### RESULTS

See the following pages.

LTE Band	Bandwidth (MHz)	Channel	Modulation	RB Cfg	Test Results (dBm)	Limit (dBm)	Verdict
2	1.4	HIGH	QPSK	1RB#High	-21.4	-13	PASS
			16QAM	1RB#High	-23.66	-13	PASS
		LOW	QPSK	1RB#Low	-21.88	-13	PASS
		HIGH	16QAM	1RB#Low	-23.23	-13	PASS
			QPSK	1RB#High	17.06	-13	PASS
		LOW	16QAM	1RB#High	-20.33	-13	PASS
		LOW	QPSK	1RB#Low	18.08	-13	PASS

	5	HIGH	16QAM	1RB#Low	-20.01	-13	PASS
			QPSK	1RB#High	-17.66	-13	PASS
		16QAM	1RB#High	-19.24	-13	PASS	
		LOW	QPSK	1RB#Low	-17.80	-13	PASS
			16QAM	1RB#Low	-18.87	-13	PASS
	10	HIGH	QPSK	1RB#High	-24.60	-13	PASS
			16QAM	1RB#High	-26.44	-13	PASS
		LOW	QPSK	1RB#Low	-24.84	-13	PASS
			16QAM	1RB#Low	-25.89	-13	PASS
	15	HIGH	QPSK	1RB#High	-23.32	-13	PASS
			16QAM	1RB#High	-24.33	-13	PASS
		LOW	QPSK	1RB#Low	-23.06	-13	PASS
			16QAM	1RB#Low	-24.29	-13	PASS
	20	HIGH	QPSK	1RB#High	-22.16	-13	PASS
			16QAM	1RB#High	-22.69	-13	PASS
		LOW	QPSK	1RB#Low	-22.12	-13	PASS
			16QAM	1RB#Low	-22.81	-13	PASS

LTE Band	Bandwidth (MHz)	Channel	Modulation	RB Cfg	Test Results (dBm)	Limit (dBm)	Verdict
4	1.4	HIGH	QPSK	1RB#High	-21.63	-13	PASS
			16QAM	1RB#High	-23.92	-13	PASS
		LOW	QPSK	1RB#Low	-21.11	-13	PASS
			16QAM	1RB#Low	-22.21	-13	PASS
	3	HIGH	QPSK	1RB#High	-18.90	-13	PASS
			16QAM	1RB#High	-20.03	-13	PASS
		LOW	QPSK	1RB#Low	-18.09	-13	PASS
			16QAM	1RB#Low	-19.06	-13	PASS
	5	HIGH	QPSK	1RB#High	-17.28	-13	PASS
			16QAM	1RB#High	-18.82	-13	PASS
		LOW	QPSK	1RB#Low	-17.46	-13	PASS
			16QAM	1RB#Low	-18.09	-13	PASS
	10	HIGH	QPSK	1RB#High	-25.23	-13	PASS
			16QAM	1RB#High	-26.25	-13	PASS
		LOW	QPSK	1RB#Low	-24.83	-13	PASS
			16QAM	1RB#Low	-26.01	-13	PASS
	15	HIGH	QPSK	1RB#High	-22.99	-13	PASS
			16QAM	1RB#High	-24.29	-13	PASS
		LOW	QPSK	1RB#Low	-23.15	-13	PASS
			16QAM	1RB#Low	-24.34	-13	PASS
	20	HIGH	QPSK	1RB#High	-21.90	-13	PASS
			16QAM	1RB#High	-22.82	-13	PASS
		LOW	QPSK	1RB#Low	-22.28	-13	PASS
			16QAM	1RB#Low	-23.23	-13	PASS

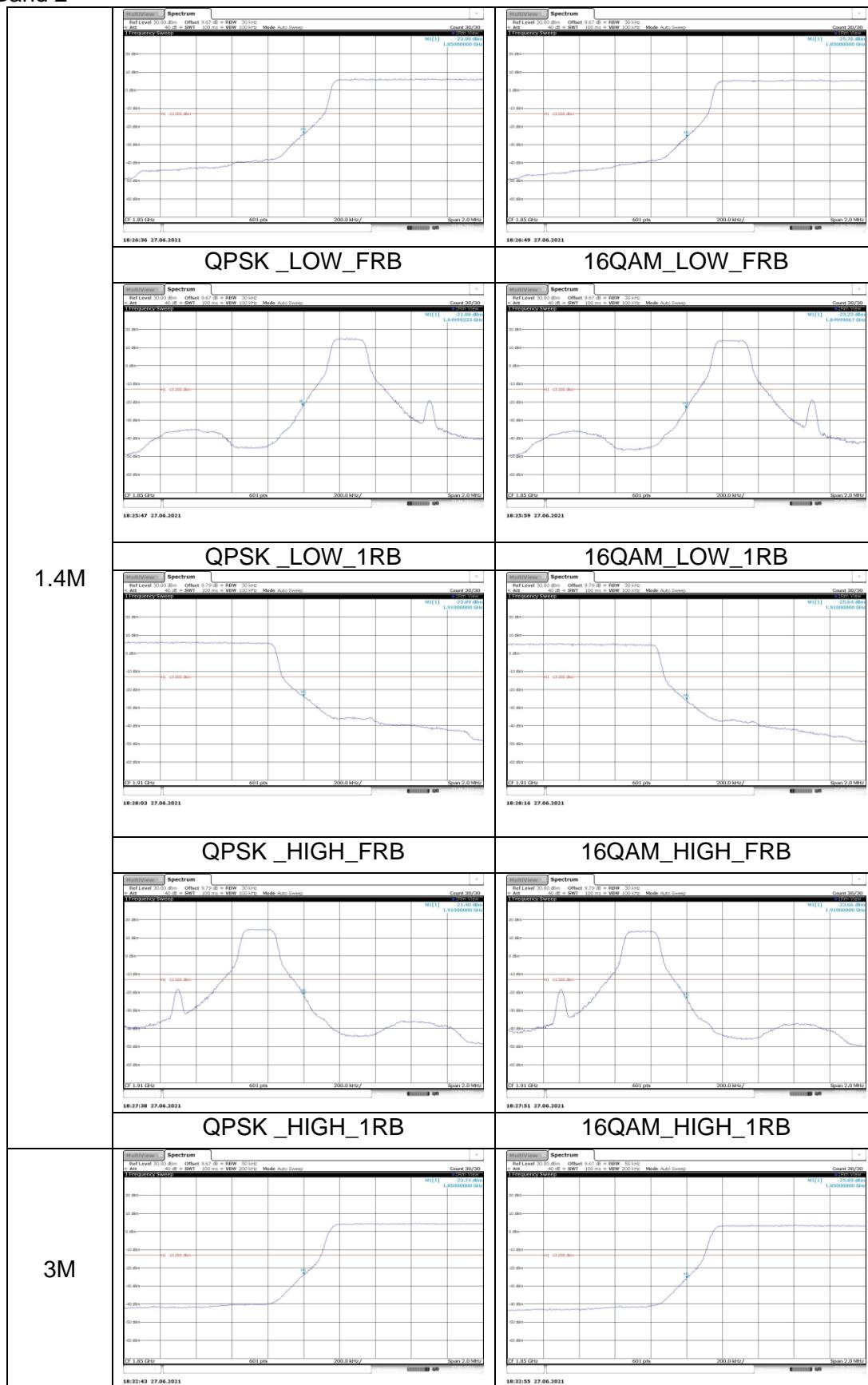
LTE Band	Bandwidth (MHz)	Channel	Modulation	RB Cfg	Test Results (dBm)	Limit (dBm)	Verdict
5	1.4	HIGH	QPSK	1RB#High	-23.31	-13	PASS
			16QAM	1RB#High	-24.91	-13	PASS
		LOW	QPSK	1RB#Low	-21.34	-13	PASS
			16QAM	1RB#Low	-25.03	-13	PASS
	3	HIGH	QPSK	1RB#High	-18.64	-13	PASS
			16QAM	1RB#High	-20.60	-13	PASS
		LOW	QPSK	1RB#Low	-19.72	-13	PASS
			16QAM	1RB#Low	-21.35	-13	PASS
	5	HIGH	QPSK	1RB#High	-18.22	-13	PASS
			16QAM	1RB#High	-19.44	-13	PASS
		LOW	QPSK	1RB#Low	-19.62	-13	PASS
			16QAM	1RB#Low	-20.73	-13	PASS
	10	HIGH	QPSK	1RB#High	-25.72	-13	PASS
			16QAM	1RB#High	-26.49	-13	PASS
		LOW	QPSK	1RB#Low	-27.16	-13	PASS
			16QAM	1RB#Low	-27.94	-13	PASS

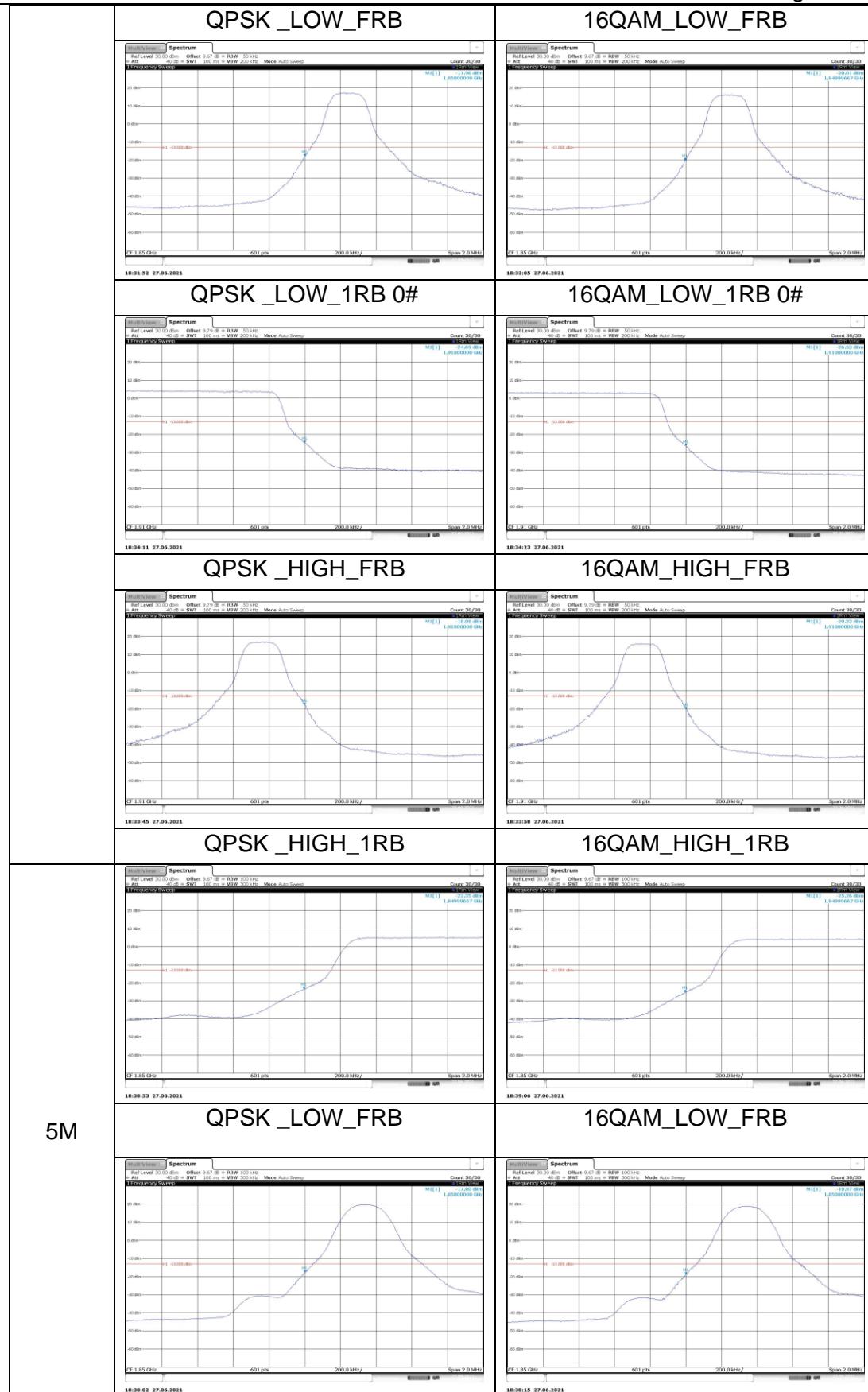
LTE Band	Bandwidth (MHz)	Channel	Modulation	RB Cfg	Test Results (dBm)	Limit (dBm)	Verdict
12	1.4	HIGH	QPSK	1RB#High	-61.81	-13	PASS
			16QAM	1RB#High	-61.98	-13	PASS
		LOW	QPSK	1RB#Low	-61.91	-13	PASS
			16QAM	1RB#Low	-61.83	-13	PASS
	3	HIGH	QPSK	1RB#High	-18.87	-13	PASS
			16QAM	1RB#High	-20.36	-13	PASS
		LOW	QPSK	1RB#Low	-18.88	-13	PASS
			16QAM	1RB#Low	-34.61	-13	PASS
	5	HIGH	QPSK	1RB#High	-18.87	-13	PASS
			16QAM	1RB#High	-19.77	-13	PASS
		LOW	QPSK	1RB#Low	-20.14	-13	PASS
			16QAM	1RB#Low	-21.02	-13	PASS
	10	HIGH	QPSK	1RB#High	-26.55	-13	PASS
			16QAM	1RB#High	-26.98	-13	PASS
		LOW	QPSK	1RB#Low	-34.51	-13	PASS
			16QAM	1RB#Low	-36.00	-13	PASS

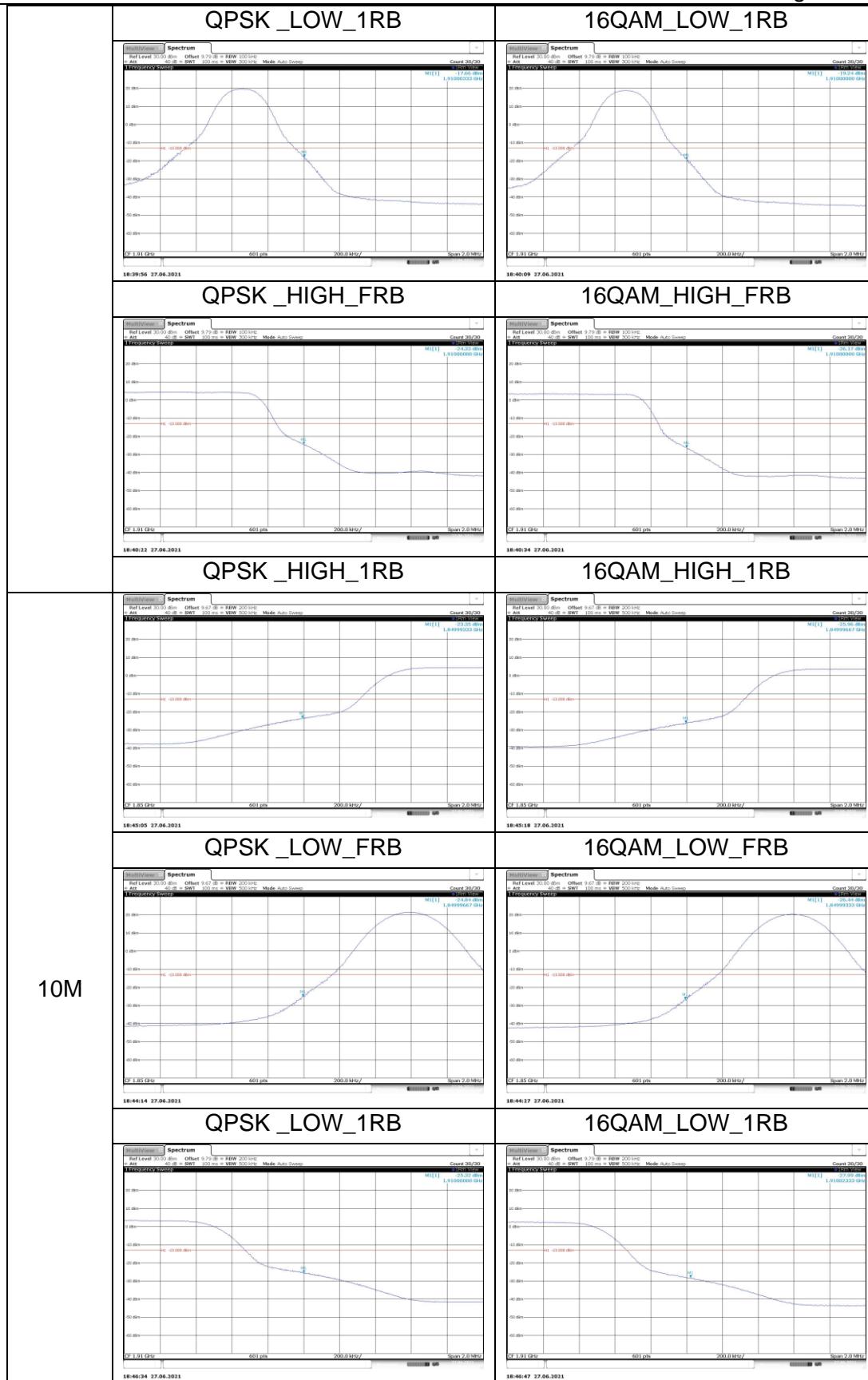
LTE Band	Bandwidth (MHz)	Channel	Modulation	RB Cfg	Test Results (dBm)	Limit (dBm)	Verdict
13	5	HIGH	QPSK	1RB#High	-16.22	-13	PASS
			16QAM	1RB#High	-18.14	-13	PASS
	5	LOW	QPSK	1RB#Low	-16.18	-13	PASS
			16QAM	1RB#Low	-18.24	-13	PASS

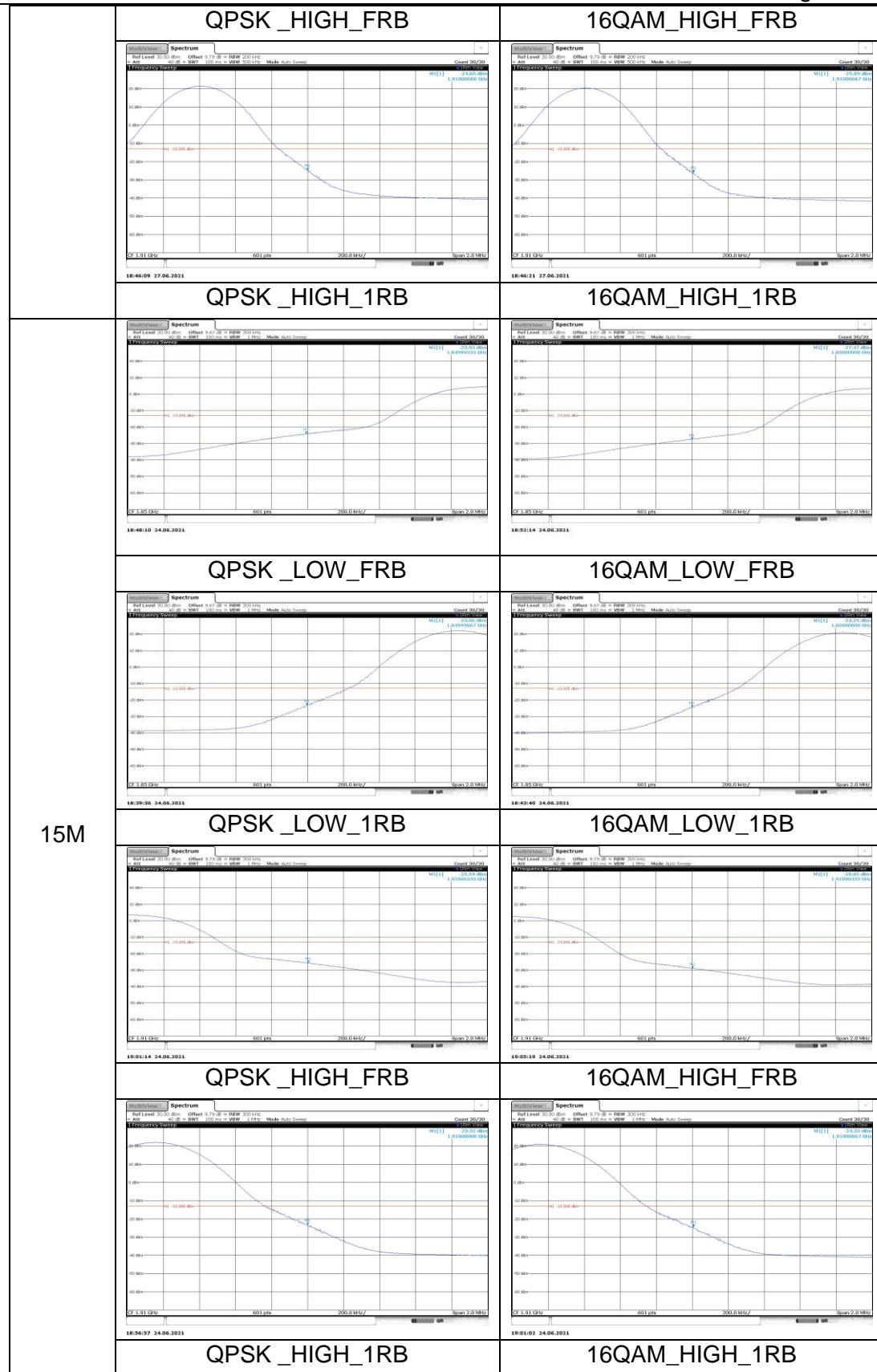
LTE Band	Bandwidth (MHz)	Channel	Modulation	RB Cfg	Test Results (dBm)	Limit (dBm)	Verdict
66	1.4	HIGH	QPSK	1RB#High	-23.18	-13	PASS
			16QAM	1RB#High	-25.26	-13	PASS
		LOW	QPSK	1RB#Low	-22.65	-13	PASS
			16QAM	1RB#Low	-23.59	-13	PASS
	3	HIGH	QPSK	1RB#High	-20.00	-13	PASS
			16QAM	1RB#High	-22.12	-13	PASS
		LOW	QPSK	1RB#Low	-20.30	-13	PASS
			16QAM	1RB#Low	-19.68	-13	PASS
	5	HIGH	QPSK	1RB#High	-19.59	-13	PASS
			16QAM	1RB#High	-20.42	-13	PASS
		LOW	QPSK	1RB#Low	-19.19	-13	PASS
			16QAM	1RB#Low	-19.78	-13	PASS
	10	HIGH	QPSK	1RB#High	-27.57	-13	PASS
			16QAM	1RB#High	-28.85	-13	PASS
		LOW	QPSK	1RB#Low	-27.21	-13	PASS
			16QAM	1RB#Low	-27.72	-13	PASS
	15	HIGH	QPSK	1RB#High	-25.51	-13	PASS
			16QAM	1RB#High	-26.52	-13	PASS
		LOW	QPSK	1RB#Low	-24.24	-13	PASS
			16QAM	1RB#Low	-25.16	-13	PASS
	20	HIGH	QPSK	1RB#High	-24.11	-13	PASS
			16QAM	1RB#High	-24.75	-13	PASS
		LOW	QPSK	1RB#Low	-22.64	-13	PASS
			16QAM	1RB#Low	-24.08	-13	PASS

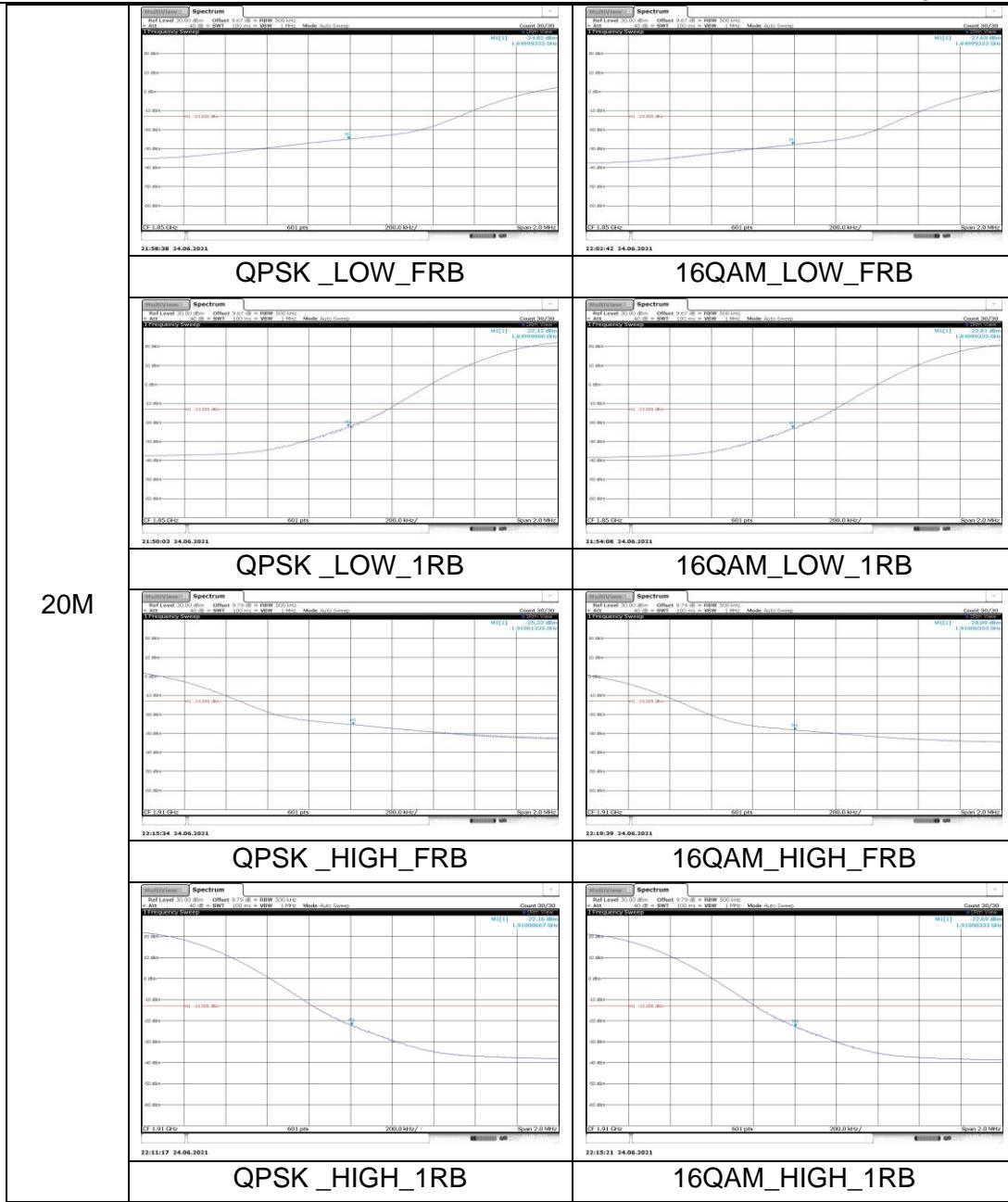
## LTE Band 2











#### LTE Band 4



