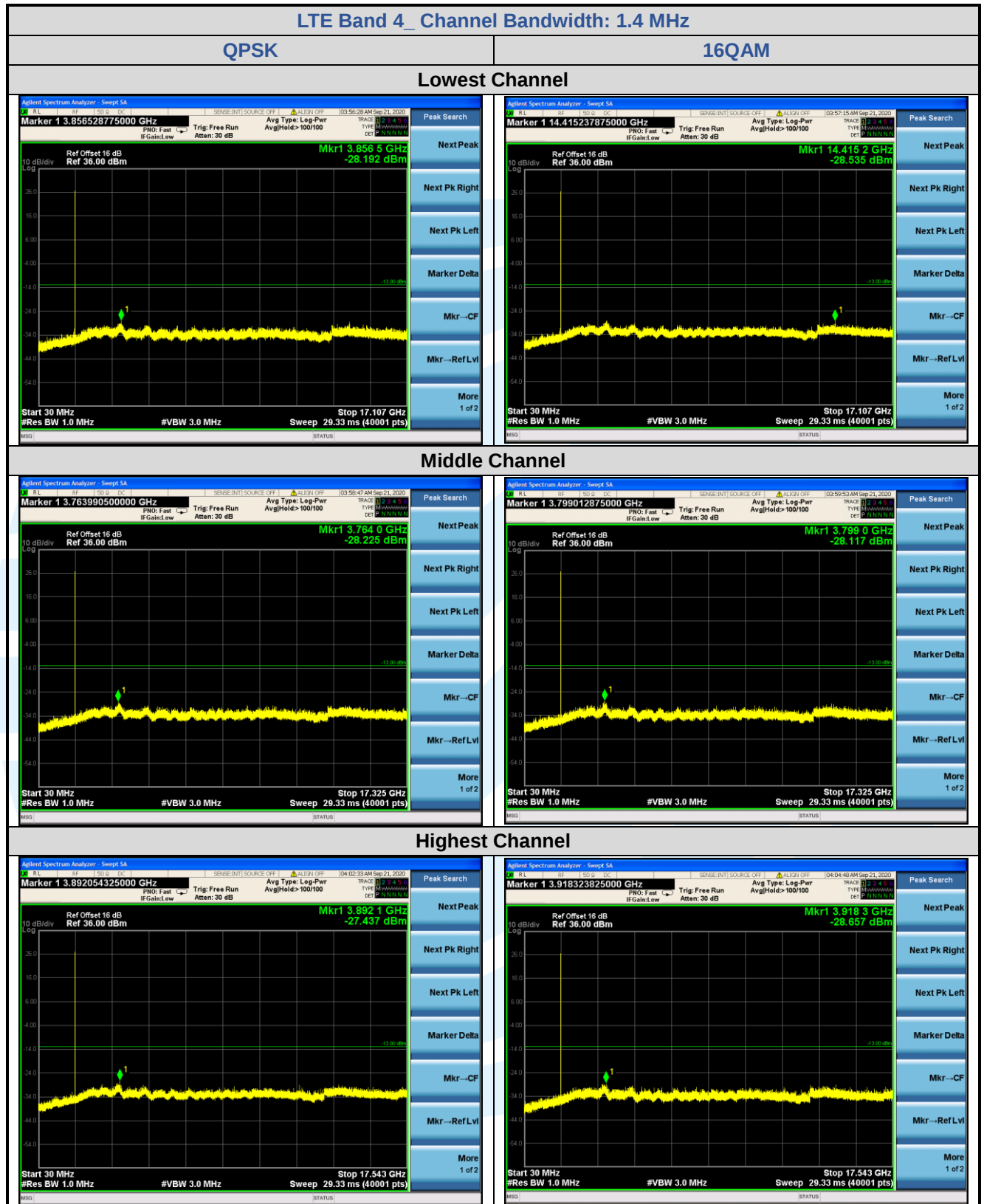


5.7.1 LTE Band 4



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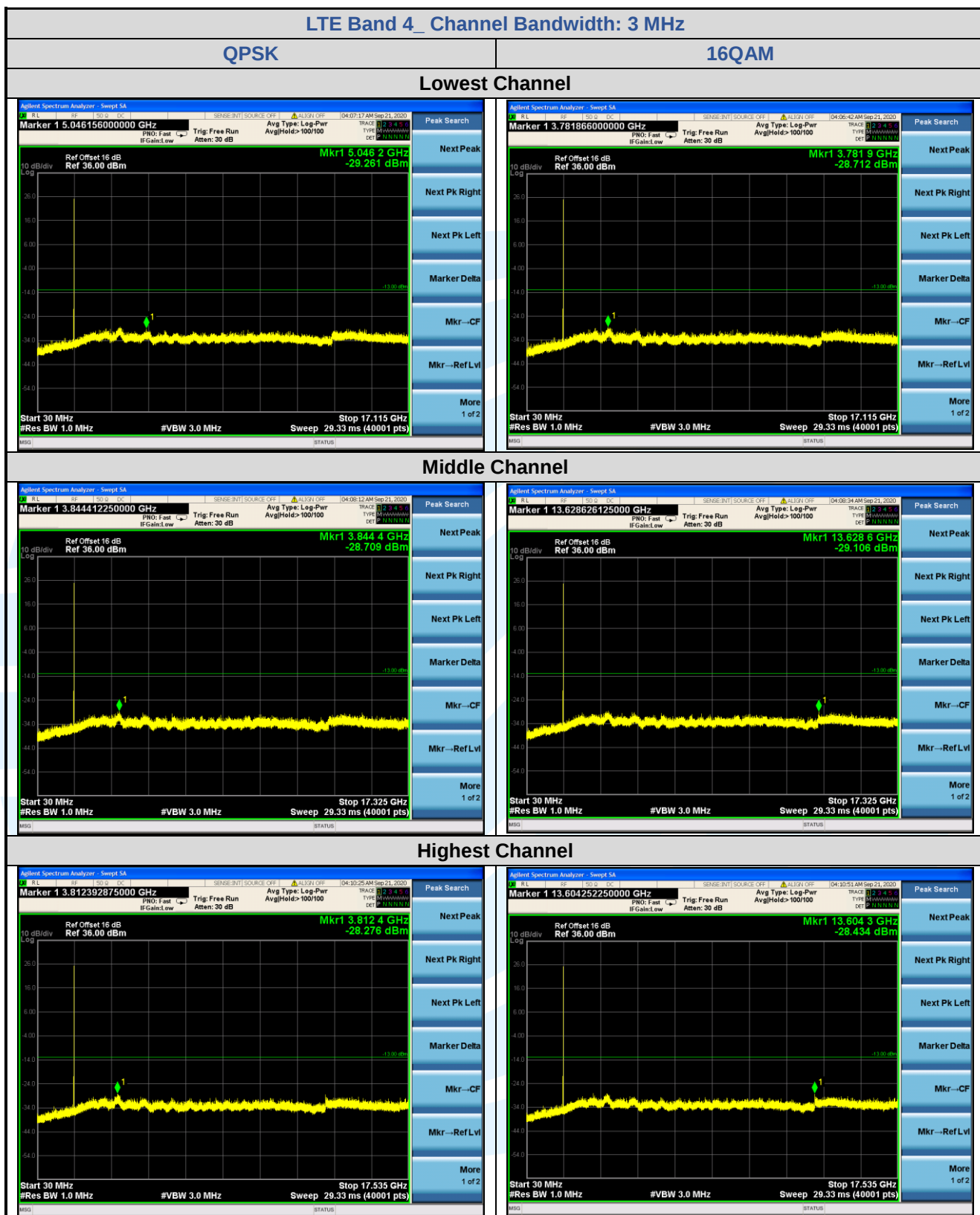
Tel: +86-755-28230888

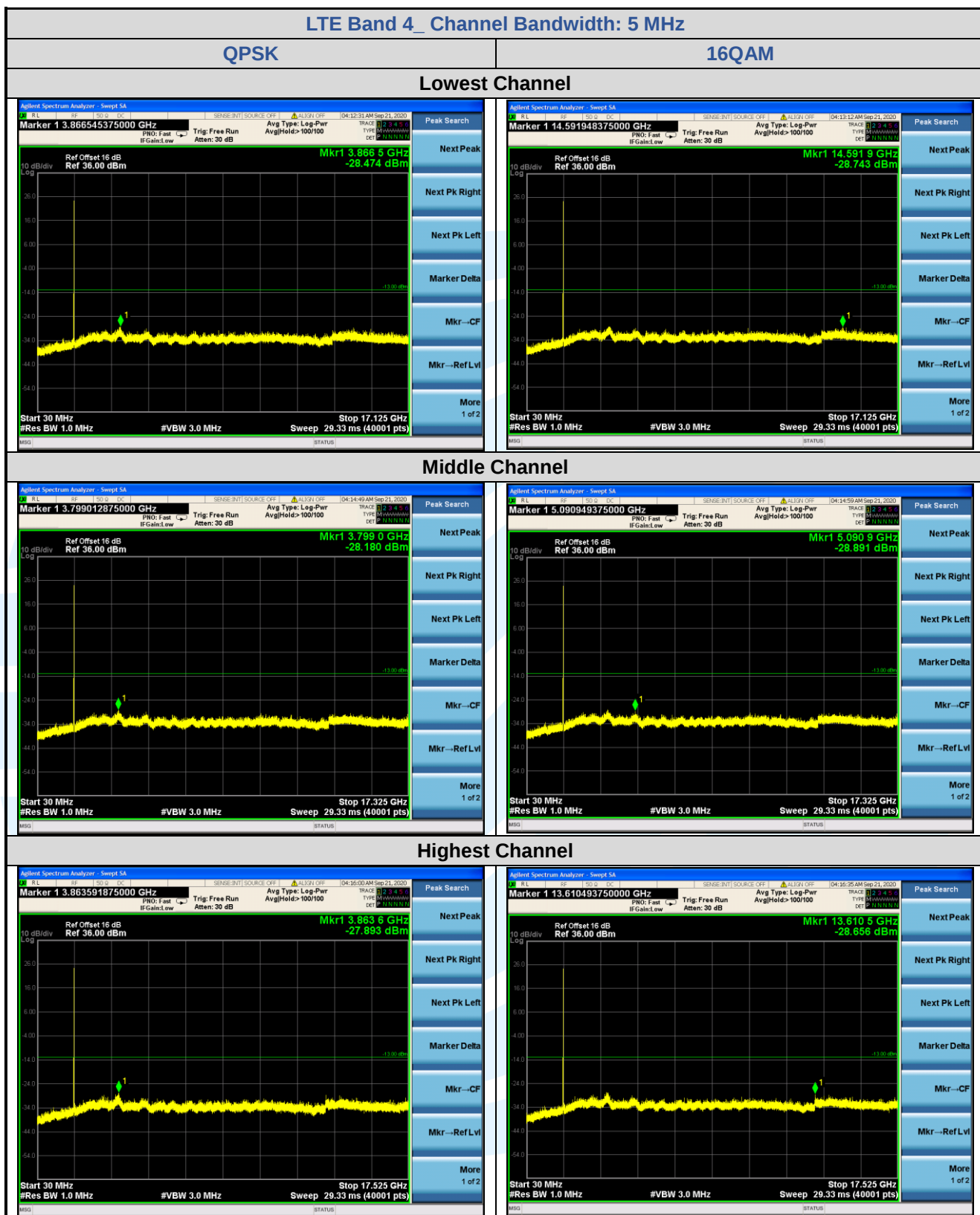
Fax: +86-755-28230886

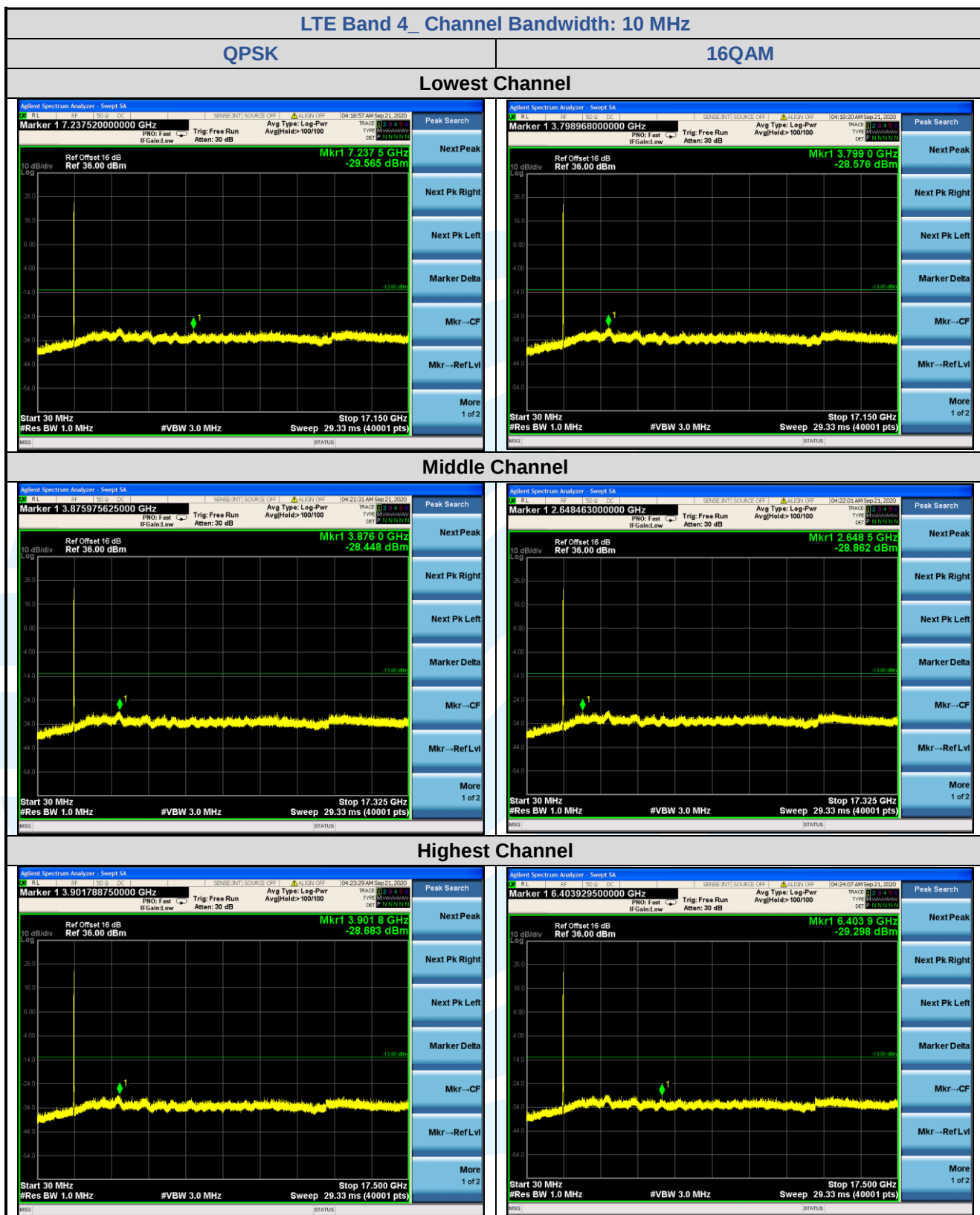
E-mail: info@uttlab.com

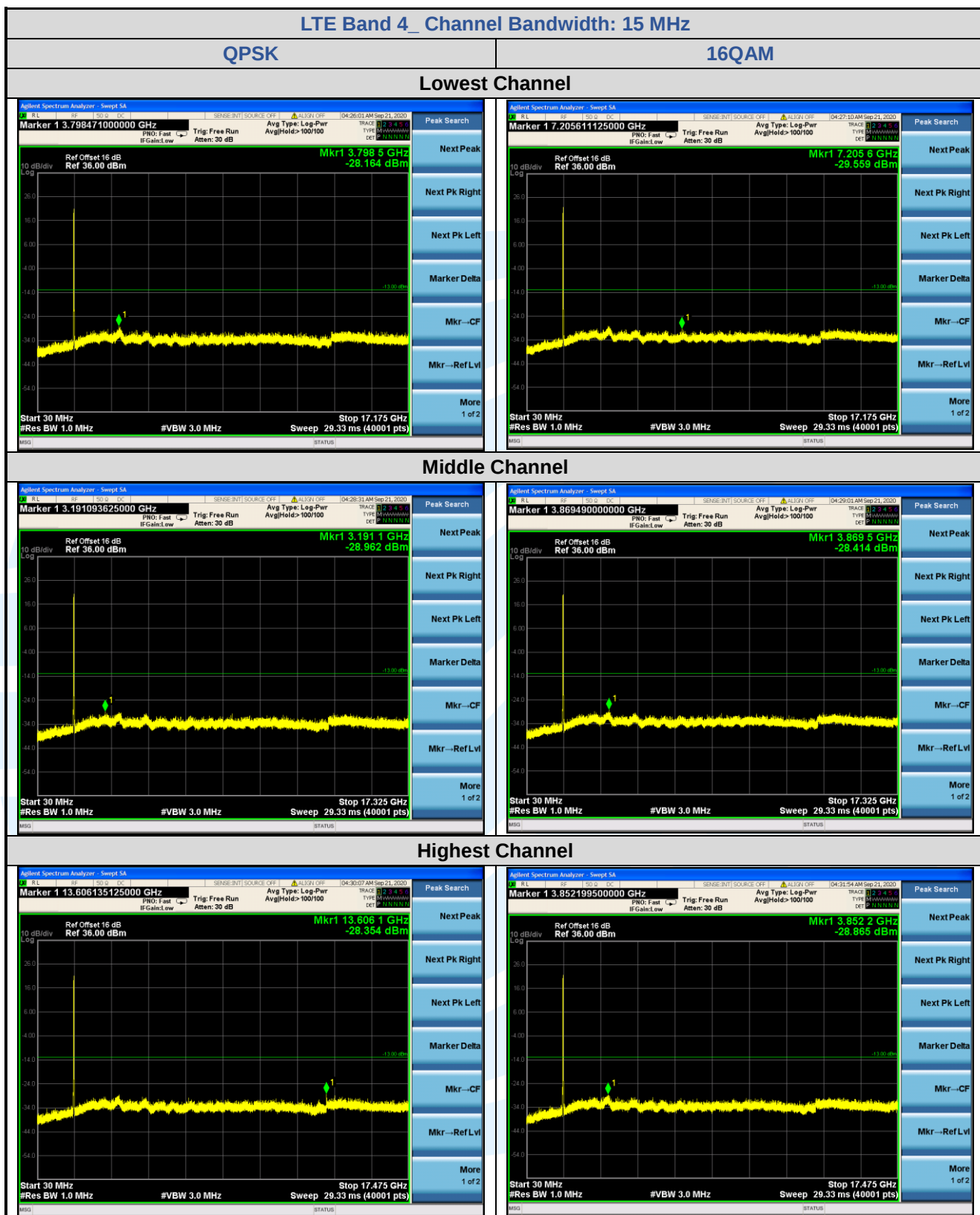
<http://www.uttlab.com>

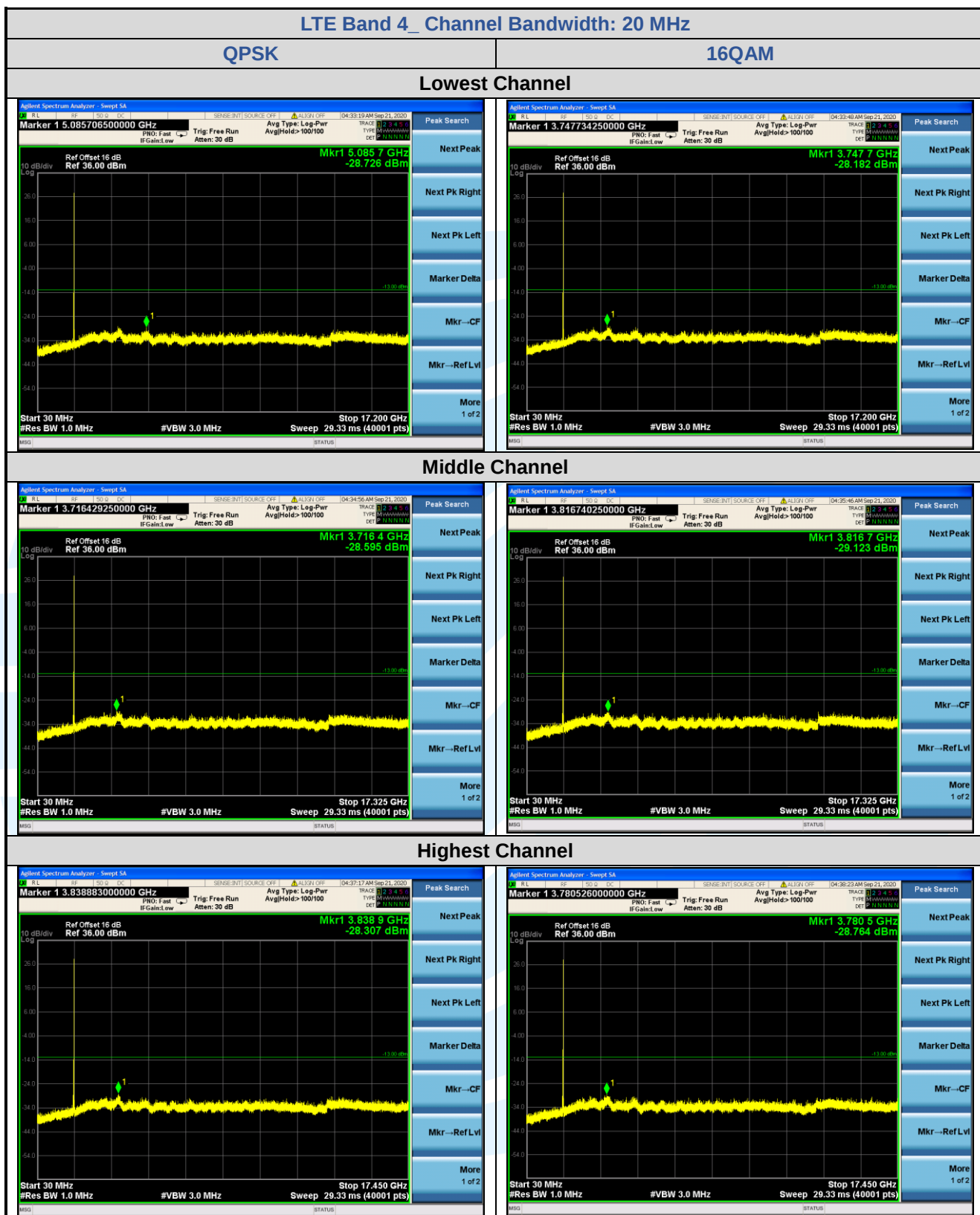
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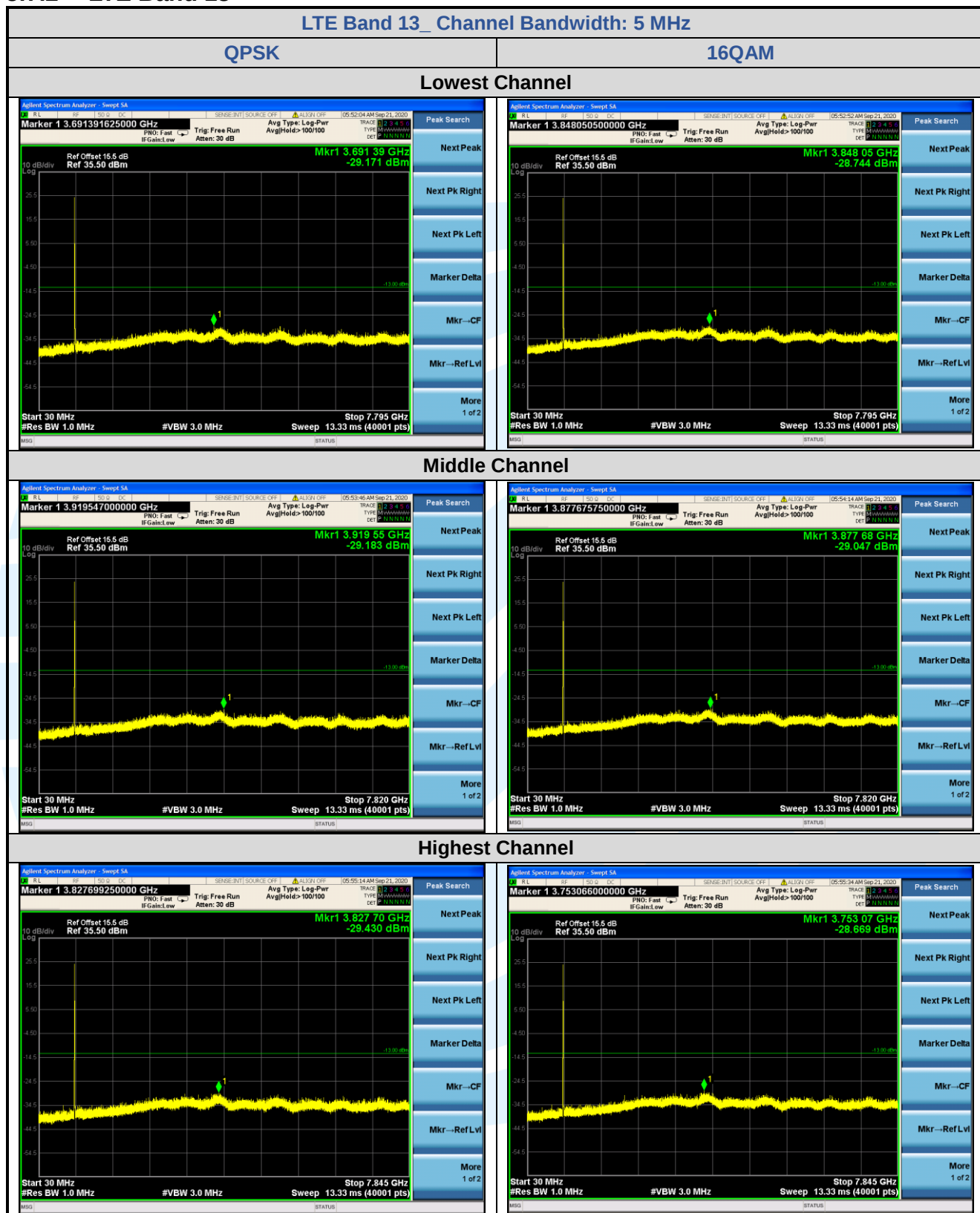


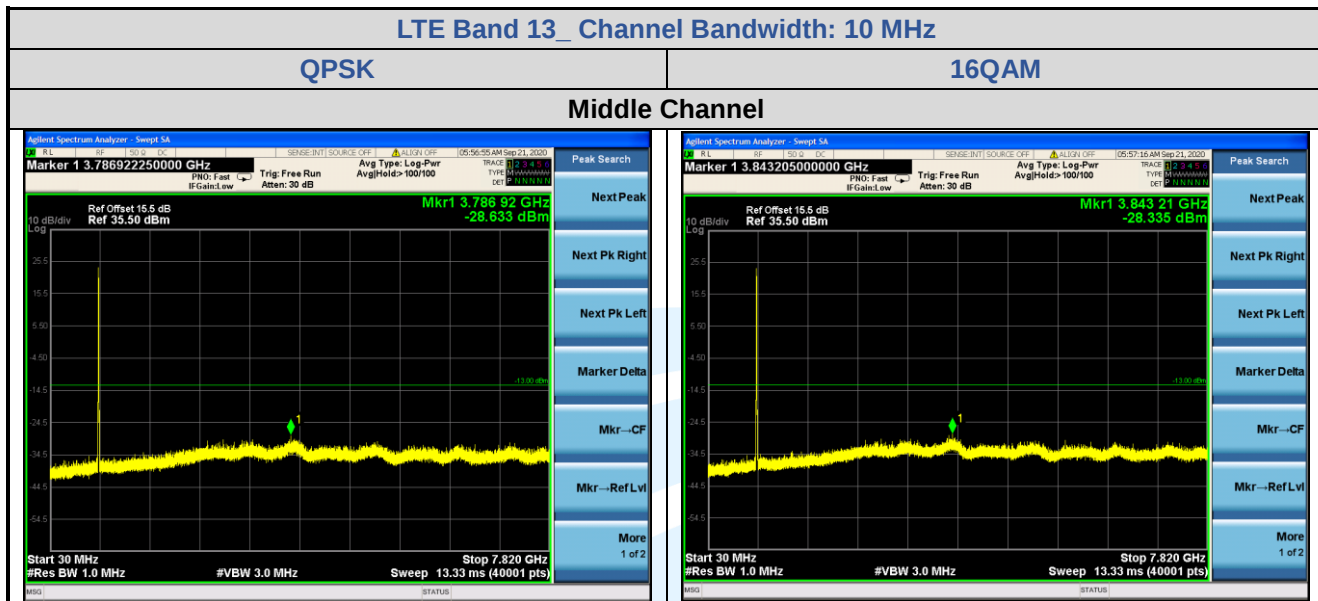






5.7.2 LTE Band 13





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5.8 FIELD STRENGTH OF SPURIOUS RADIATION

Test Requirement: LTE Band 4: FCC 47 CFR Part 27.53(h), RSS-139 Issue 3, Section 6.6
LTE Band 13: FCC 47 CFR Part 27.53, RSS-130 Issue 2, Section 4.7

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

Receiver Setup:

Frequency	Detector	RBW	VBW	Remark
0.009 MHz-30 MHz	Peak	10 kHz	30 KHz	Peak
30 MHz-1 GHz	Quasi-peak	100 kHz	300 KHz	Peak
Above 1 GHz	Peak	1 MHz	3 MHz	Peak

Limits:

FCC 47 CFR Part 27.53(h)(1), 27.53(c)(2):

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:

(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. (-70 dBW/MHz = -40dBm/MHz).

RSS-139 Issue 3, Section 6.6,

RSS-130 Issue 2, Section 4.7:

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.

Test Setup: Refer to section 4.2.1 for details.

Test Procedures: KDB 971168 D01v03r01 Section 7

Equipment Used: Refer to section 3 for details.

Test Result: Pass

The measurement data as follows:

5.8.1 LTE Band 4

LTE Band 4_ 20 MHz_ QPSK_ Below 1G							
No.	Frequency	SA Reading	Correction factor	EIRP Result	Limit	Margin	Ant. Pol.
	(MHz)	(dBm)	(dB/m)	(dBm)	(dBm)	(dB)	
Lowest Channel							
1	53.756	-69.02	-5.49	-74.51	-13.00	-61.51	Horizontal
2	75.321	-73.40	-4.90	-78.30	-13.00	-65.30	Horizontal
3	945.334	-81.71	14.30	-67.41	-13.00	-54.41	Horizontal
4	53.379	-65.18	-5.56	-70.74	-13.00	-57.74	Vertical
5	73.233	-70.57	-4.97	-75.54	-13.00	-62.54	Vertical
6	899.958	-82.16	12.75	-69.41	-13.00	-56.41	Vertical
Middle Channel							
1	53.756	-68.03	-5.49	-73.52	-13.00	-60.52	Horizontal
2	250.486	-79.34	1.55	-77.79	-13.00	-64.79	Horizontal
3	899.958	-81.02	13.05	-67.97	-13.00	-54.97	Horizontal
4	53.379	-65.51	-5.56	-71.07	-13.00	-58.07	Vertical
5	73.233	-70.35	-4.97	-75.32	-13.00	-62.32	Vertical
6	925.613	-81.65	13.01	-68.64	-13.00	-55.64	Vertical
Highest Channel							
1	53.756	-69.33	-5.49	-74.82	-13.00	-61.82	Horizontal
2	250.486	-79.04	1.55	-77.49	-13.00	-64.49	Horizontal
3	965.474	-81.75	14.13	-67.62	-13.00	-54.62	Horizontal
4	53.006	-65.33	-5.56	-70.89	-13.00	-57.89	Vertical
5	72.720	-68.95	-4.99	-73.94	-13.00	-60.94	Vertical
6	965.474	-81.85	13.00	-68.85	-13.00	-55.85	Vertical

LTE Band 4_ 20 MHz_ QPSK _ Above 1G							
No.	Frequency	SA Reading	Correction factor	EIRP Result	Limit	Margin	Ant. Pol.
	(MHz)	(dBm)	(dB/m)	(dBm)	(dBm)	(dB)	
Lowest Channel							
1	3440.000	-64.49	5.94	-58.55	-13.00	-45.55	Horizontal
2	5160.000	-66.47	9.17	-57.30	-13.00	-44.30	Horizontal
3	3440.000	-65.00	5.75	-59.25	-13.00	-46.25	Vertical
4	5160.000	-65.12	9.53	-55.59	-13.00	-42.59	Vertical
Middle Channel							
1	3465.000	-63.54	6.02	-57.52	-13.00	-44.52	Horizontal
2	5197.500	-64.42	9.31	-55.11	-13.00	-42.11	Horizontal
3	3465.000	-65.17	5.87	-59.30	-13.00	-46.30	Vertical
4	5197.500	-65.43	9.69	-55.74	-13.00	-42.74	Vertical
Highest Channel							
1	3490.000	-64.63	6.11	-58.52	-13.00	-45.52	Horizontal
2	5235.000	-64.84	9.50	-55.34	-13.00	-42.34	Horizontal
3	3490.000	-64.76	5.99	-58.77	-13.00	-45.77	Vertical
4	5235.000	-66.45	9.89	-56.56	-13.00	-43.56	Vertical

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5.8.2 LTE Band 13

LTE Band 13_5 MHz_QPSK_Below 1G							
No.	Frequency	SA Reading	Correction factor	EIRP Result	Limit	Margin	Ant. Pol.
	(MHz)	(dBm)	(dB/m)	(dBm)	(dBm)	(dB)	
Lowest Channel							
1	32.184	-92.71	31.61	-61.10	-13.00	-48.10	Horizontal
2	415.449	-89.32	34.87	-54.45	-13.00	-41.45	Horizontal
3	972.283	-87.53	42.96	-44.57	-13.00	-31.57	Horizontal
4	34.285	-91.89	30.29	-61.60	-13.00	-48.60	Vertical
5	531.291	-88.74	37.40	-51.34	-13.00	-38.34	Vertical
6	952.000	-87.57	41.99	-45.58	-13.00	-32.58	Vertical
Middle Channel							
1	30.855	-92.54	32.28	-60.26	-13.00	-47.26	Horizontal
2	186.468	-89.62	27.05	-62.57	-13.00	-49.57	Horizontal
3	965.474	-87.40	43.12	-44.28	-13.00	-31.28	Horizontal
4	30.639	-92.74	32.61	-60.13	-13.00	-47.13	Vertical
5	175.040	-89.32	26.85	-62.47	-13.00	-49.47	Vertical
6	979.139	-86.31	42.01	-44.30	-13.00	-31.30	Vertical
Highest Channel							
1	31.073	-92.85	32.17	-60.68	-13.00	-47.68	Horizontal
2	160.885	-90.39	27.16	-63.23	-13.00	-50.23	Horizontal
3	952.000	-88.87	43.44	-45.43	-13.00	-32.43	Horizontal
4	30.212	-91.68	32.88	-58.80	-13.00	-45.80	Vertical
5	113.220	-89.45	25.24	-64.21	-13.00	-51.21	Vertical
6	938.714	-87.84	42.04	-45.80	-13.00	-32.80	Vertical

LTE Band 13_5 MHz_QPSK_Above 1G							
No.	Frequency	SA Reading	Correction factor	EIRP Result	Limit	Margin	Ant. Pol.
	(MHz)	(dBm)	(dB/m)	(dBm)	(dBm)	(dB)	
Lowest Channel							
1	1559.000	-64.98	-0.43	-65.41	-13.00	-52.41	Horizontal
2	2338.500	-65.06	2.39	-62.67	-13.00	-49.67	Horizontal
3	1559.000	-64.90	-1.28	-66.18	-13.00	-53.18	Vertical
4	2338.500	-65.37	1.96	-63.41	-13.00	-50.41	Vertical
Middle Channel							
1	1564.000	-65.00	-0.41	-65.41	-13.00	-52.41	Horizontal
2	2346.000	-64.99	2.41	-62.58	-13.00	-49.58	Horizontal
3	1564.000	-65.15	-1.26	-66.41	-13.00	-53.41	Vertical
4	2346.000	-65.47	1.98	-63.49	-13.00	-50.49	Vertical
Highest Channel							
1	1569.000	-65.36	-0.39	-65.75	-13.00	-52.75	Horizontal
2	2353.500	-65.77	2.43	-63.34	-13.00	-50.34	Horizontal
3	1569.000	-66.29	-1.24	-67.53	-13.00	-54.53	Vertical
4	2353.500	-65.24	2.01	-63.23	-13.00	-50.23	Vertical

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Remark:

1. Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain, the value was added to Original Receiver Reading by the software automatically.
2. Result = Reading + Correct Factor.
3. Margin = Result – Limit



5.9 FREQUENCY STABILITY

Test Requirement: FCC 47 CFR Part 2.1055 &
FCC 47 CFR Part 27.54,
RSS-139 Issue 3, Section 6.4
RSS-130 Issue 2, Section 4.5

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

Limits:

FCC 47 CFR Part 27.54

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

RSS-139 Issue 3, Section 6.4, RSS-130 Issue 2, Section 4.5:

The frequency stability shall be sufficient to ensure that the occupied bandwidth stays within the operating frequency block when tested to the temperature and supply voltage variations specified in RSS-Gen.

Test Setup: Refer to section 4.2.2 for details.

Test Procedures:

- 1) Use CMW 500 or CMU 200 with Frequency Error measurement capability.
 - a) Temp. = -30° to $+50^{\circ}\text{C}$
 - b) Voltage = low voltage, 3.2 Vdc, Normal, 3.8Vdc and High voltage, 4.5 Vdc.

- 2) Frequency Stability vs Temperature:

The EUT is placed inside a temperature chamber. The temperature is set to 20°C 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 $+50^{\circ}\text{C}$ is reached.

- 3) Frequency Stability vs Voltage:

The peak frequency error is recorded (worst-case).

Equipment Used: Refer to section 3 for details.

Test Result: Pass

5.9.1 LTE Band 4

Modulation	Channel/ Frequency	Voltage	Temperature	Deviation	Deviation	Limit	Pass/ Fail
	(MHz)	(Vdc)	(°C)	(Hz)	(ppm)	(ppm)	
LTE Band 4 / 20MHz / Full RB							
QPSK	20175 / 1732.5	VL	TN	-13	-0.0075	N/A	Pass
		VN		-13	-0.0075		Pass
		VH		-11	-0.0063		Pass
		VN	50	-16	-0.0092		Pass
			40	-19	-0.0110		Pass
			30	-9	-0.0052		Pass
			20	-11	-0.0063		Pass
			10	-15	-0.0087		Pass
			0	-17	-0.0098		Pass
			-10	-18	-0.0104		Pass
			-20	-13	-0.0075		Pass
			-30	-14	-0.0081		Pass

5.9.2 LTE Band 13

Modulation	Channel/ Frequency	Voltage	Temperature	Deviation	Deviation	Limit	Result
	(MHz)	(Vdc)	(°C)	(Hz)	(ppm)	(ppm)	
LTE Band 13 / 10MHz / Full RB							
QPSK	23230 / 782	VL	TN	-5	-0.0064	N/A	Pass
		VN		-4	-0.0051		Pass
		VH		-8	-0.0102		Pass
		VN	50	-12	-0.0153		Pass
			40	-9	-0.0115		Pass
			30	-11	-0.0141		Pass
			20	-10	-0.0128		Pass
			10	-6	-0.0077		Pass
			0	-8	-0.0102		Pass
			-10	-13	-0.0166		Pass
			-20	-12	-0.0153		Pass
			-30	-10	-0.0128		Pass

APPENDIX 1 PHOTOS OF TEST SETUP

See test photos attached in Appendix 1 for the actual connections between Product and support equipment.

APPENDIX 2 PHOTOS OF EUT CONSTRUCTIONAL DETAILS

Refer to Appendix 2 for EUT external and internal photos.

*** End of Report ***

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