

## Appendix I

# Test Results of LTE Band 5

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### 1. Test Conditions

Item	Environment	Test Channel	RB size	Modulation	BW (MHz)	Test by
Conducted Output Power	<input checked="" type="checkbox"/> N.T / N.V.	<input checked="" type="checkbox"/> Low <input checked="" type="checkbox"/> Mid <input checked="" type="checkbox"/> High	<input checked="" type="checkbox"/> 1 <input checked="" type="checkbox"/> Half <input checked="" type="checkbox"/> Full	<input checked="" type="checkbox"/> QPSK <input checked="" type="checkbox"/> 16QAM	<input checked="" type="checkbox"/> 1.4 <input checked="" type="checkbox"/> 3 <input checked="" type="checkbox"/> 5 <input checked="" type="checkbox"/> 10	Sean
EIRP/ERP	<input checked="" type="checkbox"/> N.T / N.V.	<input checked="" type="checkbox"/> Low <input checked="" type="checkbox"/> Mid <input checked="" type="checkbox"/> High	<input checked="" type="checkbox"/> 1 <input checked="" type="checkbox"/> Half <input checked="" type="checkbox"/> Full	<input checked="" type="checkbox"/> QPSK <input checked="" type="checkbox"/> 16QAM	<input checked="" type="checkbox"/> 1.4 <input checked="" type="checkbox"/> 3 <input checked="" type="checkbox"/> 5 <input checked="" type="checkbox"/> 10	Sean
Peak-to-Average Ratio	<input checked="" type="checkbox"/> N.T / N.V.	<input checked="" type="checkbox"/> Low <input checked="" type="checkbox"/> Mid <input checked="" type="checkbox"/> High	<input checked="" type="checkbox"/> 1 <input type="checkbox"/> Half <input checked="" type="checkbox"/> Full	<input checked="" type="checkbox"/> QPSK <input checked="" type="checkbox"/> 16QAM	<input checked="" type="checkbox"/> 10	Sean
Occupied Bandwidth	<input checked="" type="checkbox"/> N.T / N.V.	<input checked="" type="checkbox"/> Low <input checked="" type="checkbox"/> Mid <input checked="" type="checkbox"/> High	<input type="checkbox"/> 1 <input type="checkbox"/> Half <input checked="" type="checkbox"/> Full	<input checked="" type="checkbox"/> QPSK <input checked="" type="checkbox"/> 16QAM	<input checked="" type="checkbox"/> 1.4 <input checked="" type="checkbox"/> 3 <input checked="" type="checkbox"/> 5 <input checked="" type="checkbox"/> 10	Sean
Conducted Band Edge	<input checked="" type="checkbox"/> N.T / N.V.	<input checked="" type="checkbox"/> Low <input type="checkbox"/> Mid <input checked="" type="checkbox"/> High	<input checked="" type="checkbox"/> 1 <input type="checkbox"/> Half <input checked="" type="checkbox"/> Full	<input checked="" type="checkbox"/> QPSK <input checked="" type="checkbox"/> 16QAM	<input checked="" type="checkbox"/> 1.4 <input checked="" type="checkbox"/> 3 <input checked="" type="checkbox"/> 5 <input checked="" type="checkbox"/> 10	Sean
Spurious Emission at Antenna Terminal	<input checked="" type="checkbox"/> N.T / N.V.	<input checked="" type="checkbox"/> Low <input checked="" type="checkbox"/> Mid <input checked="" type="checkbox"/> High	<input checked="" type="checkbox"/> 1 <input type="checkbox"/> Half <input type="checkbox"/> Full	<input checked="" type="checkbox"/> QPSK <input checked="" type="checkbox"/> 16QAM	<input checked="" type="checkbox"/> 10	Sean
Field Strength of Spurious Radiation	<input checked="" type="checkbox"/> N.T / N.V.	<input checked="" type="checkbox"/> Low <input checked="" type="checkbox"/> Mid <input checked="" type="checkbox"/> High	<input checked="" type="checkbox"/> worst case			Sean
Frequency Stability	<input checked="" type="checkbox"/> N.T / N.V. <input checked="" type="checkbox"/> L.T / L.V. <input checked="" type="checkbox"/> L.T / H.V. <input checked="" type="checkbox"/> H.T / L.V. <input checked="" type="checkbox"/> H.T / H.V.	<input type="checkbox"/> Low <input checked="" type="checkbox"/> Mid <input type="checkbox"/> High	<input type="checkbox"/> 1 <input type="checkbox"/> Half <input checked="" type="checkbox"/> Full	<input checked="" type="checkbox"/> QPSK <input type="checkbox"/> 16QAM	<input checked="" type="checkbox"/> 10	Sean

NOTE: All settings for RB allocation, modulation mode, channel, channel bandwidth and environment required by the standard are considered and tested; only the worst case and normal test plots are shown on the report.

## 2. Conducted Output Power and EIRP

BW (MHz)	Modulation	Channel	RB Allocation		Average Power (dBm)	GT - LC (dB)	ERP (dBm)	Limit (dBm)	Result		
			Size	Offset							
1.4	QPSK	Low	1	0	24.81	0.22	22.88	38.45	Pass		
				3	24.90	0.22	22.97		Pass		
				5	24.81	0.22	22.88		Pass		
			3	0	24.47	0.22	22.54		Pass		
				1	24.41	0.22	22.48		Pass		
				3	24.50	0.22	22.57		Pass		
		6	0	23.42	0.22	21.49	Pass				
		Mid	1	0	24.97	0.22	23.04		Pass		
				3	25.02	0.22	23.09		Pass		
				5	24.96	0.22	23.03		Pass		
			3	0	24.78	0.22	22.85		Pass		
				1	24.86	0.22	22.93		Pass		
				3	24.87	0.22	22.94		Pass		
		6	0	23.81	0.22	21.88	Pass				
		High	1	0	25.17	0.22	<b>23.24</b>		Pass		
				3	24.93	0.22	23.00		Pass		
				5	24.93	0.22	23.00		Pass		
			3	0	25.00	0.22	23.07		Pass		
				1	25.02	0.22	23.09		Pass		
				3	24.82	0.22	22.89		Pass		
		6	0	23.88	0.22	21.95	Pass				
		16QAM	Low	1	0	24.03	0.22		22.10	38.45	Pass
					3	24.05	0.22		22.12		Pass
					5	23.78	0.22		21.85		Pass
	3			0	23.32	0.22	21.39	Pass			
				1	23.46	0.22	21.53	Pass			
				3	23.51	0.22	21.58	Pass			
	6		0	22.43	0.22	20.50	Pass				
	Mid		1	0	24.16	0.22	22.23	Pass			
				3	24.18	0.22	22.25	Pass			
				5	24.19	0.22	22.26	Pass			
			3	0	23.43	0.22	21.50	Pass			
				1	23.55	0.22	21.62	Pass			
				3	23.57	0.22	21.64	Pass			
	6		0	22.84	0.22	20.91	Pass				
	High		1	0	23.93	0.22	22.00	Pass			
				3	23.92	0.22	21.99	Pass			
				5	23.85	0.22	21.92	Pass			
			3	0	23.76	0.22	21.83	Pass			
				1	23.78	0.22	21.85	Pass			
				3	23.85	0.22	21.92	Pass			
	6		0	22.61	0.22	20.68	Pass				

BW (MHz)	Modulation	Channel	RB Allocation		Average Power (dBm)	GT - LC (dB)	ERP (dBm)	Limit (dBm)	Result		
			Size	Offset							
3.0	QPSK	Low	1	0	24.38	0.22	22.45	38.45	Pass		
				8	24.73	0.22	22.80		Pass		
				14	24.88	0.22	22.95		Pass		
			8	0	23.40	0.22	21.47		Pass		
				4	23.56	0.22	21.63		Pass		
				7	23.68	0.22	21.75		Pass		
		15	0	23.51	0.22	21.58	Pass				
		Mid	1	0	24.77	0.22	22.84		Pass		
				8	24.63	0.22	22.70		Pass		
				14	24.73	0.22	22.80		Pass		
			8	0	23.69	0.22	21.76		Pass		
				4	23.71	0.22	21.78		Pass		
				7	23.77	0.22	21.84		Pass		
		15	0	23.81	0.22	21.88	Pass				
		High	1	0	24.87	0.22	22.94		Pass		
				8	24.94	0.22	<b>23.01</b>		Pass		
				14	24.85	0.22	22.92		Pass		
			8	0	23.84	0.22	21.91		Pass		
				4	22.87	0.22	20.94		Pass		
				7	23.90	0.22	21.97		Pass		
		15	0	23.83	0.22	21.90	Pass				
		16QAM	Low	1	0	23.15	0.22		21.22	38.45	Pass
					8	23.51	0.22		21.58		Pass
					14	23.73	0.22		21.80		Pass
	8			0	22.45	0.22	20.52	Pass			
				4	22.57	0.22	20.64	Pass			
				7	22.61	0.22	20.68	Pass			
	15		0	22.41	0.22	20.48	Pass				
	Mid		1	0	23.97	0.22	22.04	Pass			
				8	23.98	0.22	22.05	Pass			
				14	23.94	0.22	22.01	Pass			
			8	0	22.56	0.22	20.63	Pass			
				4	22.68	0.22	20.75	Pass			
				7	22.89	0.22	20.96	Pass			
	15		0	22.56	0.22	20.63	Pass				
	High		1	0	24.45	0.22	22.52	Pass			
				8	24.43	0.22	22.50	Pass			
				14	24.41	0.22	22.48	Pass			
			8	0	22.78	0.22	20.85	Pass			
				4	22.70	0.22	20.77	Pass			
				7	22.74	0.22	20.81	Pass			
	15		0	22.67	0.22	20.74	Pass				

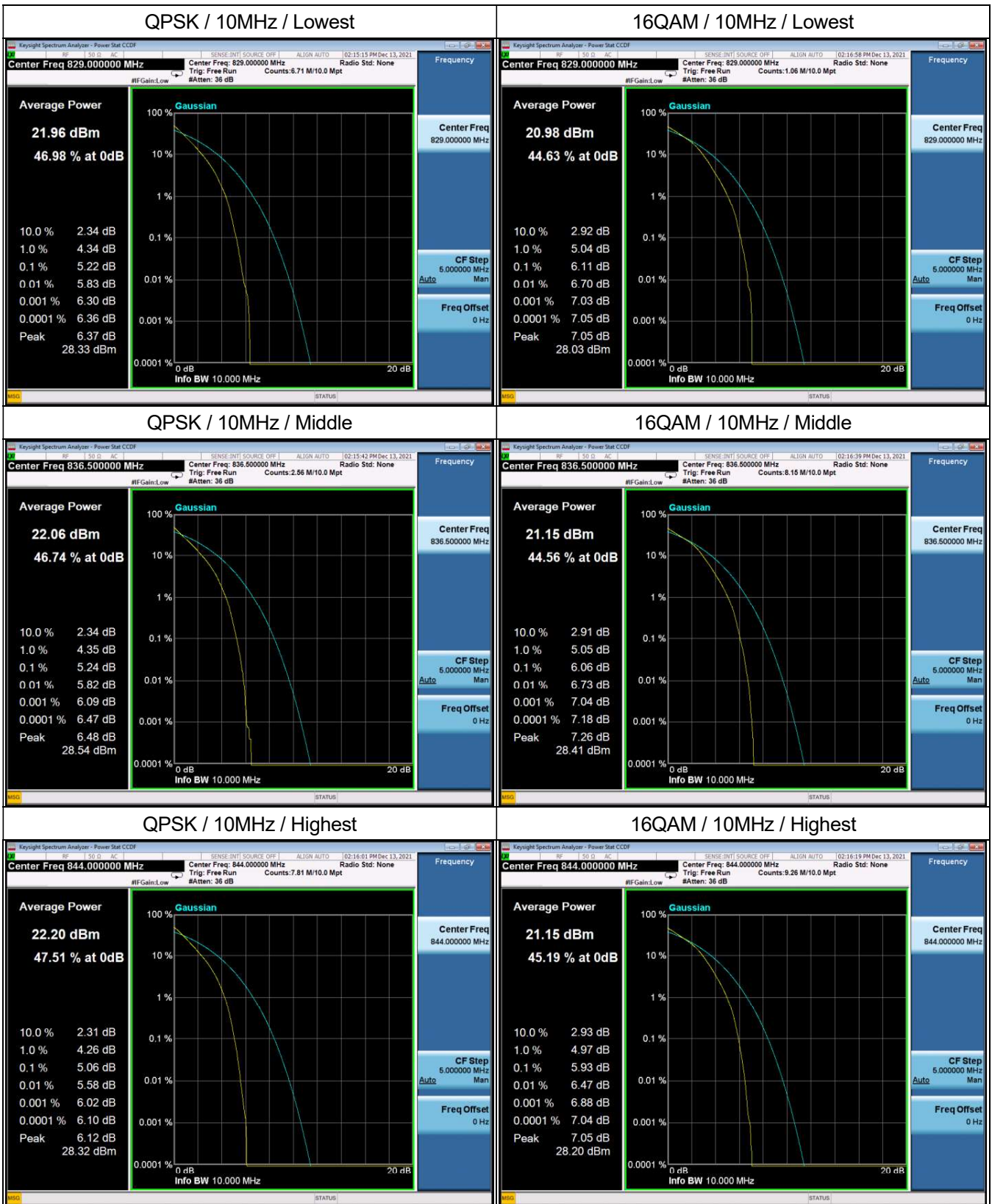
BW (MHz)	Modulation	Channel	RB Allocation		Average Power (dBm)	GT - LC (dB)	ERP (dBm)	Limit (dBm)	Result			
			Size	Offset								
5.0	QPSK	Low	1	0	24.27	0.22	22.34	38.45	Pass			
				12	24.62	0.22	22.69		Pass			
				24	24.20	0.22	22.27		Pass			
			12	0	23.40	0.22	21.47		Pass			
				7	23.43	0.22	21.50		Pass			
				13	23.46	0.22	21.53		Pass			
			25	0	23.33	0.22	21.40		Pass			
			Mid	1	0	24.29	0.22		22.36	Pass		
					12	24.62	0.22		22.69	Pass		
		24			24.65	0.22	22.72		Pass			
		12		0	23.65	0.22	21.72		Pass			
				7	23.73	0.22	21.80		Pass			
				13	23.71	0.22	21.78		Pass			
		25		0	23.67	0.22	21.74		Pass			
		High		1	0	24.68	0.22		<b>22.75</b>	Pass		
					12	24.63	0.22		22.70	Pass		
			24		24.66	0.22	22.73		Pass			
			12	0	23.81	0.22	21.88		Pass			
				7	22.75	0.22	20.82		Pass			
				13	23.77	0.22	21.84		Pass			
			25	0	23.81	0.22	21.88		Pass			
			16QAM	Low	1	0	23.01		0.22	21.08	38.45	Pass
						12	23.37		0.22	21.44		Pass
		24				23.03	0.22		21.10	Pass		
	12	0			22.25	0.22	20.32	Pass				
		7			22.19	0.22	20.26	Pass				
		13			22.33	0.22	20.40	Pass				
	25	0			22.32	0.22	20.39	Pass				
	Mid	1			0	23.02	0.22	21.09	Pass			
					12	23.22	0.22	21.29	Pass			
				24	23.30	0.22	21.37	Pass				
		12		0	22.44	0.22	20.51	Pass				
				7	22.32	0.22	20.39	Pass				
				13	22.40	0.22	20.47	Pass				
		25		0	22.51	0.22	20.58	Pass				
		High		1	0	23.78	0.22	21.85	Pass			
					12	24.43	0.22	22.50	Pass			
	24				24.30	0.22	22.37	Pass				
	12			0	22.75	0.22	20.82	Pass				
				7	22.48	0.22	20.55	Pass				
				13	22.63	0.22	20.70	Pass				
	25			0	22.54	0.22	20.61	Pass				

BW (MHz)	Modulation	Channel	RB Allocation		Average Power (dBm)	GT - LC (dB)	ERP (dBm)	Limit (dBm)	Result		
			Size	Offset							
10	QPSK	Low	1	0	24.77	0.22	22.84	38.45	Pass		
				25	24.83	0.22	<b>22.90</b>		Pass		
				49	24.63	0.22	22.70		Pass		
			25	0	23.84	0.22	21.91		Pass		
				12	23.61	0.22	21.68		Pass		
				25	23.57	0.22	21.64		Pass		
		50	0	23.65	0.22	21.72	Pass				
		Mid	1	0	24.53	0.22	22.60		Pass		
				25	24.70	0.22	22.77		Pass		
				49	24.70	0.22	22.77		Pass		
			25	0	23.89	0.22	21.96		Pass		
				12	23.80	0.22	21.87		Pass		
				25	23.75	0.22	21.82		Pass		
		50	0	23.71	0.22	21.78	Pass				
		High	1	0	24.63	0.22	22.70		Pass		
				25	24.69	0.22	22.76		Pass		
				49	24.74	0.22	22.81		Pass		
			25	0	24.02	0.22	22.09		Pass		
				12	23.66	0.22	21.73		Pass		
				25	23.71	0.22	21.78		Pass		
		50	0	23.84	0.22	21.91	Pass				
		16QAM	Low	1	0	23.07	0.22		21.14	38.45	Pass
					25	23.35	0.22		21.42		Pass
					49	23.28	0.22		21.35		Pass
	25			0	23.00	0.22	21.07	Pass			
				12	22.76	0.22	20.83	Pass			
				25	22.61	0.22	20.68	Pass			
	50		0	22.58	0.22	20.65	Pass				
	Mid		1	0	23.32	0.22	21.39	Pass			
				25	24.03	0.22	22.10	Pass			
				49	23.62	0.22	21.69	Pass			
			25	0	22.58	0.22	20.65	Pass			
				12	22.62	0.22	20.69	Pass			
				25	22.63	0.22	20.70	Pass			
	50		0	22.60	0.22	20.67	Pass				
	High		1	0	23.77	0.22	21.84	Pass			
				25	24.06	0.22	22.13	Pass			
				49	24.15	0.22	22.22	Pass			
			25	0	23.07	0.22	21.14	Pass			
				12	22.95	0.22	21.02	Pass			
				25	22.63	0.22	20.70	Pass			
	50		0	22.72	0.22	20.79	Pass				

### 3. Peak-to-Average Ratio

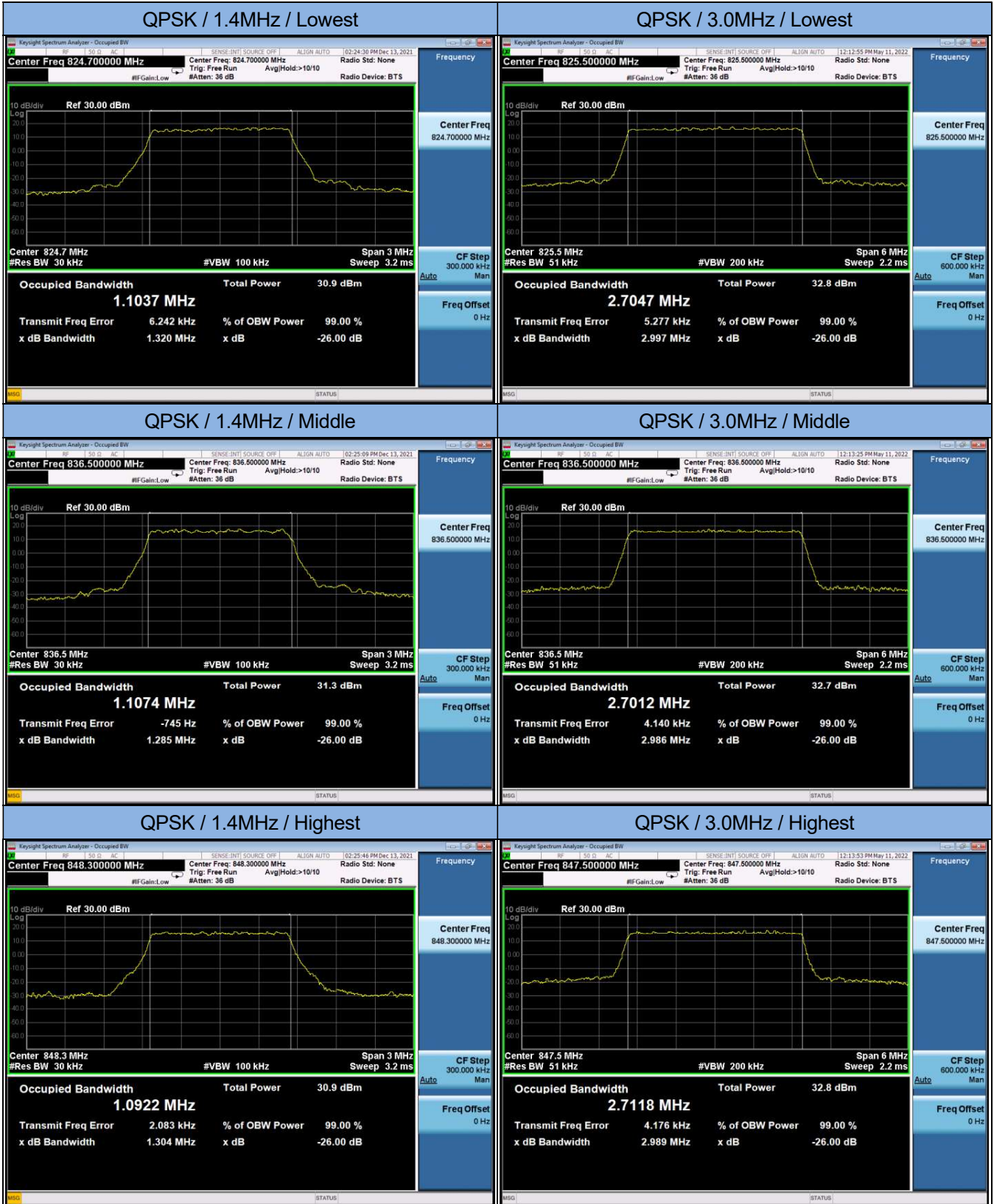
BW (MHz)	Modulation	Channel	RB Allocation		Peak-to-Average Ratio (dB)	Limit (dBm)	Result
			Size	Offset			
10	QPSK	Low	Full	0	5.22	13.0	Pass
		Mid	Full	0	5.24		Pass
		High	Full	0	5.06		Pass
	16QAM	Low	Full	0	6.11	13.0	Pass
		Mid	Full	0	6.06		Pass
		High	Full	0	5.93		Pass





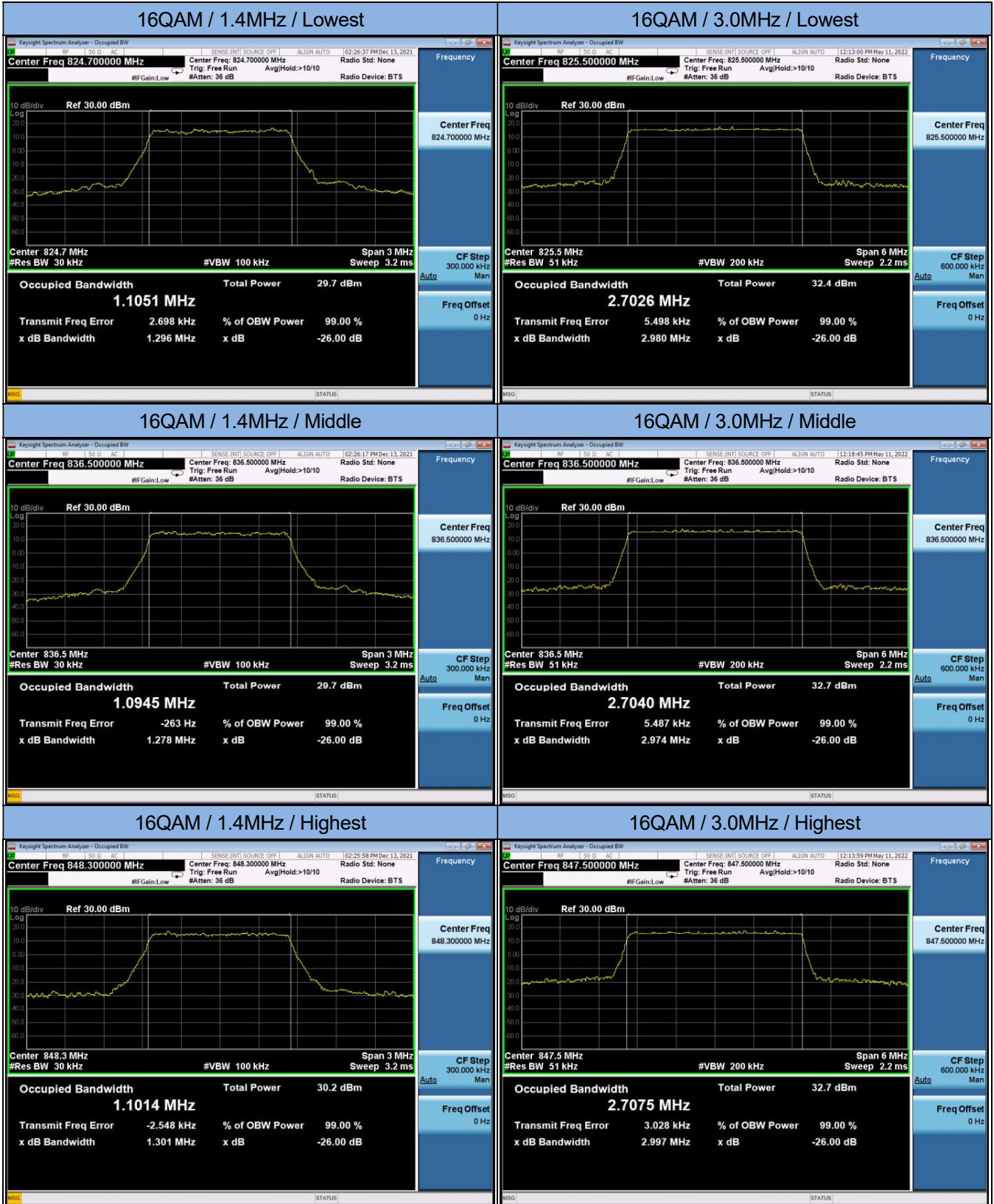
#### 4. Occupied Bandwidth

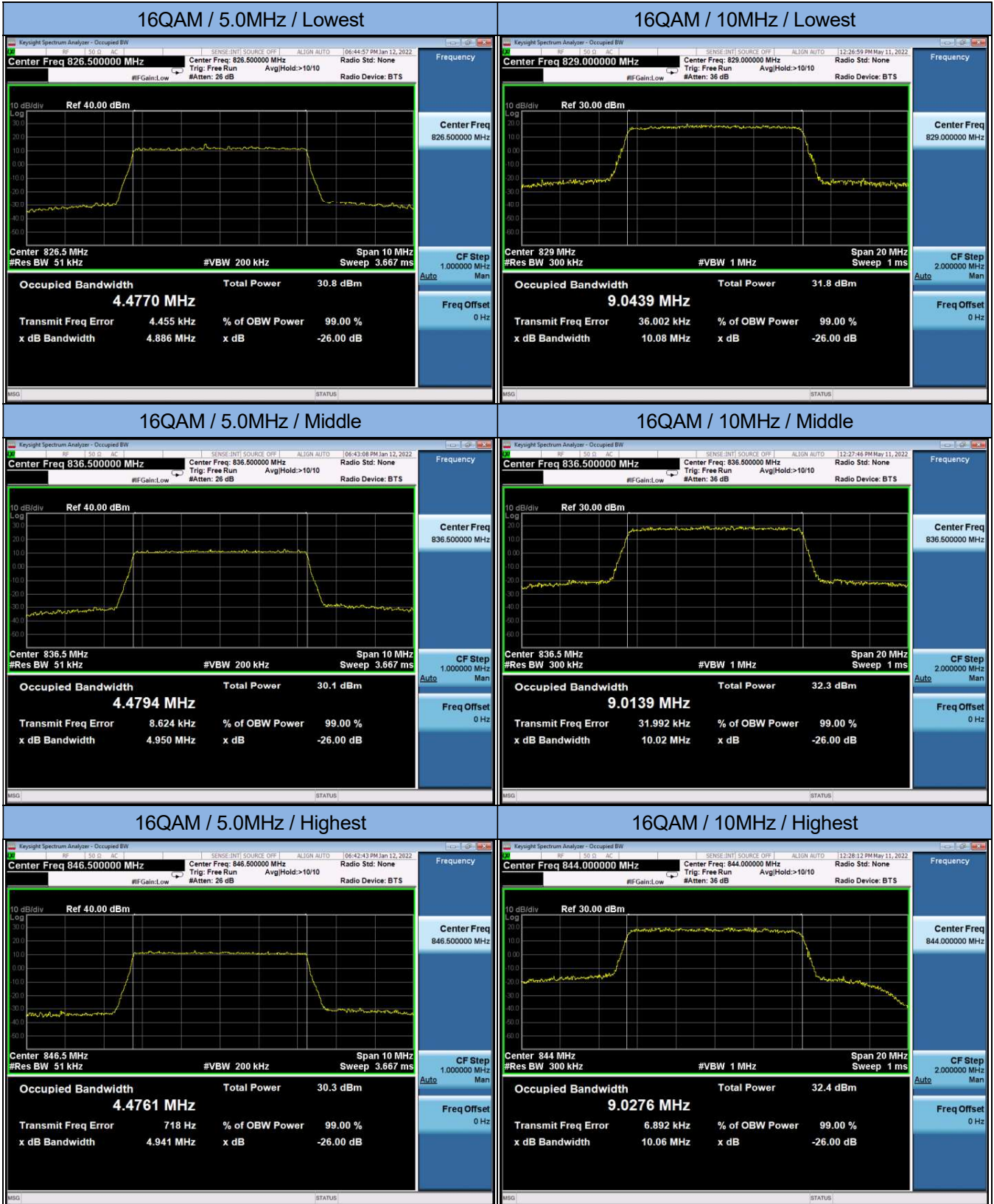
BW (MHz)	Modulation	Channel	RB Allocation		26dB BW (MHz)	99% OBW (MHz)	Limit (dBm)	Result
			Size	Offset				
1.4	QPSK	Low	Full	0	1.320	1.1037	---	Pass
		Mid	Full	0	1.285	1.1074		Pass
		High	Full	0	1.304	1.0922		Pass
	16QAM	Low	Full	0	1.296	1.1051	---	Pass
		Mid	Full	0	1.278	1.0945		Pass
		High	Full	0	1.301	1.1014		Pass
3.0	QPSK	Low	Full	0	2.997	2.7047	---	Pass
		Mid	Full	0	2.986	2.7012		Pass
		High	Full	0	2.989	2.7118		Pass
	16QAM	Low	Full	0	2.980	2.7026	---	Pass
		Mid	Full	0	2.974	2.7040		Pass
		High	Full	0	2.997	2.7075		Pass
5.0	QPSK	Low	Full	0	4.909	4.4681	---	Pass
		Mid	Full	0	4.947	4.4918		Pass
		High	Full	0	4.929	4.4889		Pass
	16QAM	Low	Full	0	4.886	4.4770	---	Pass
		Mid	Full	0	4.950	4.4794		Pass
		High	Full	0	4.941	4.4761		Pass
10	QPSK	Low	Full	0	10.120	9.0312	---	Pass
		Mid	Full	0	10.100	9.0123		Pass
		High	Full	0	10.080	9.0308		Pass
	16QAM	Low	Full	0	10.080	9.0439	---	Pass
		Mid	Full	0	10.020	9.0139		Pass
		High	Full	0	10.060	9.0276		Pass



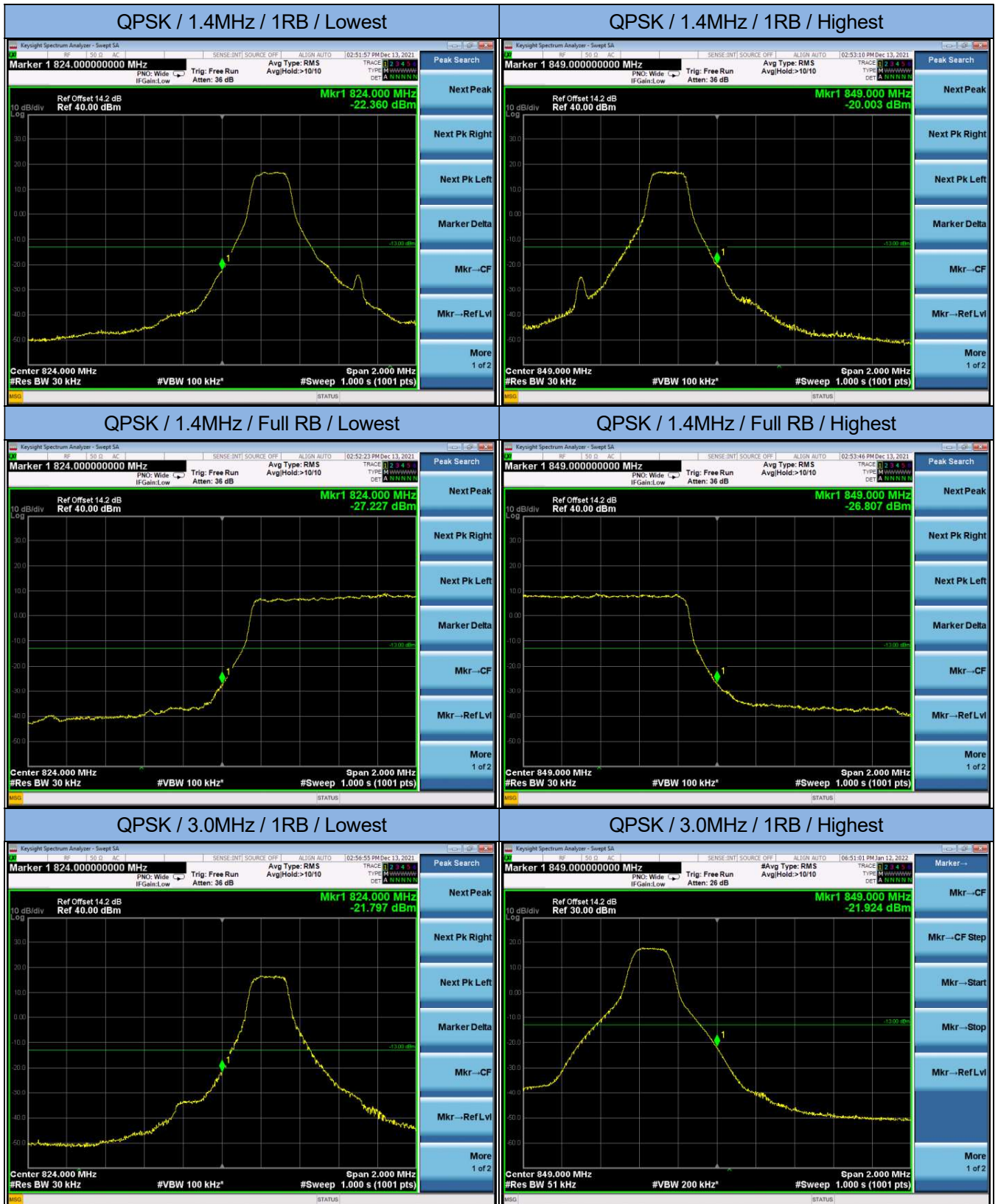




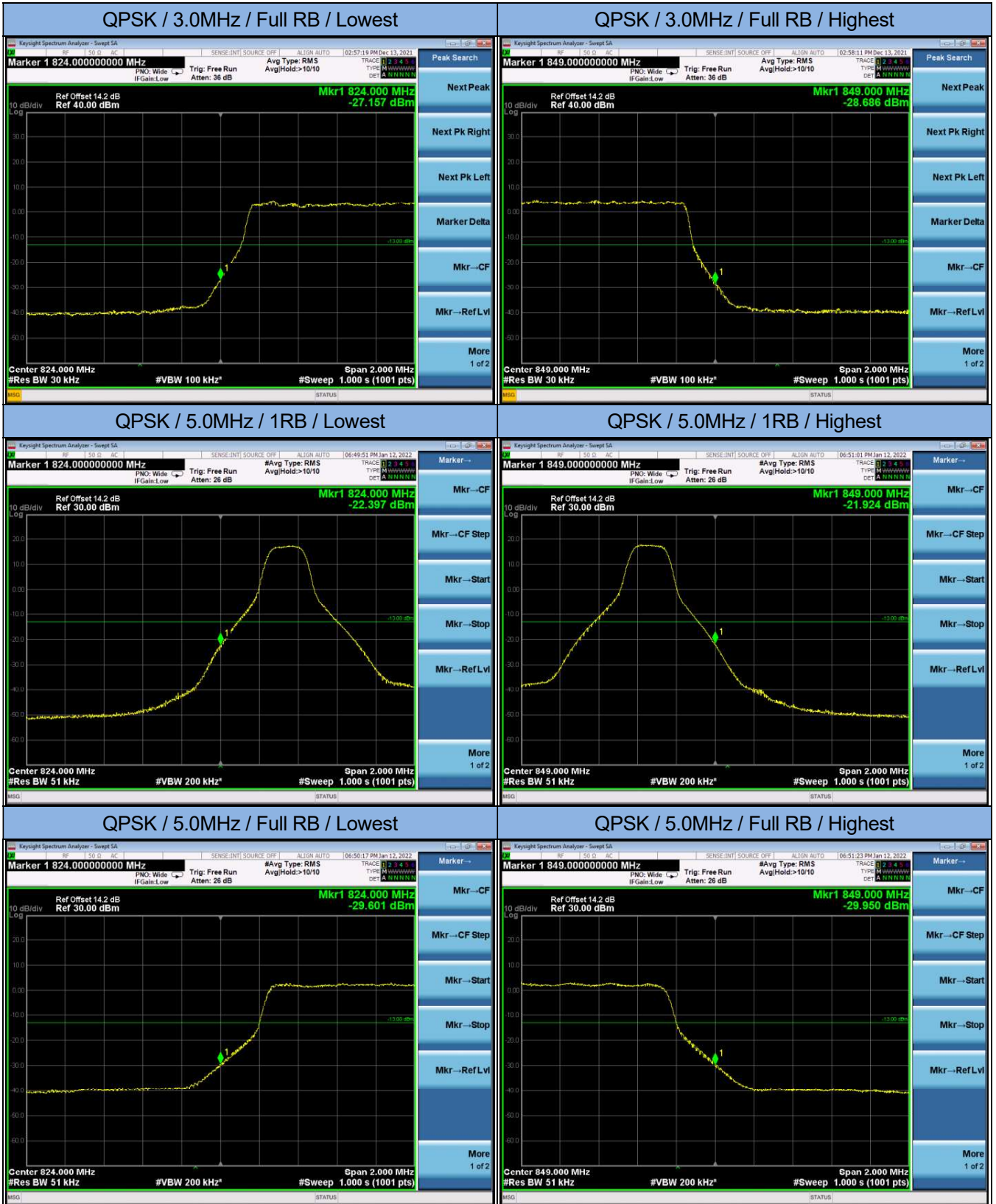




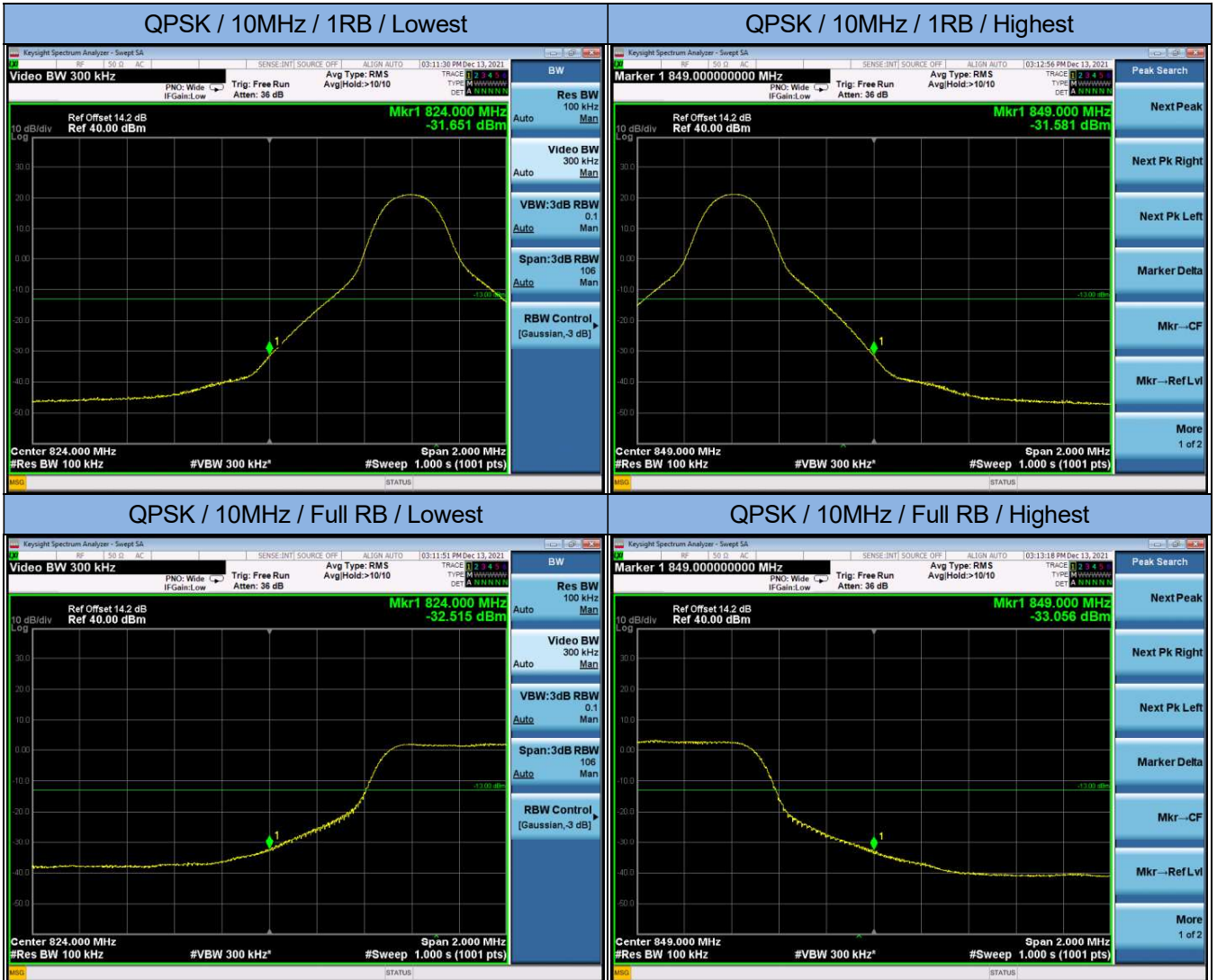
### 5. Band Edge

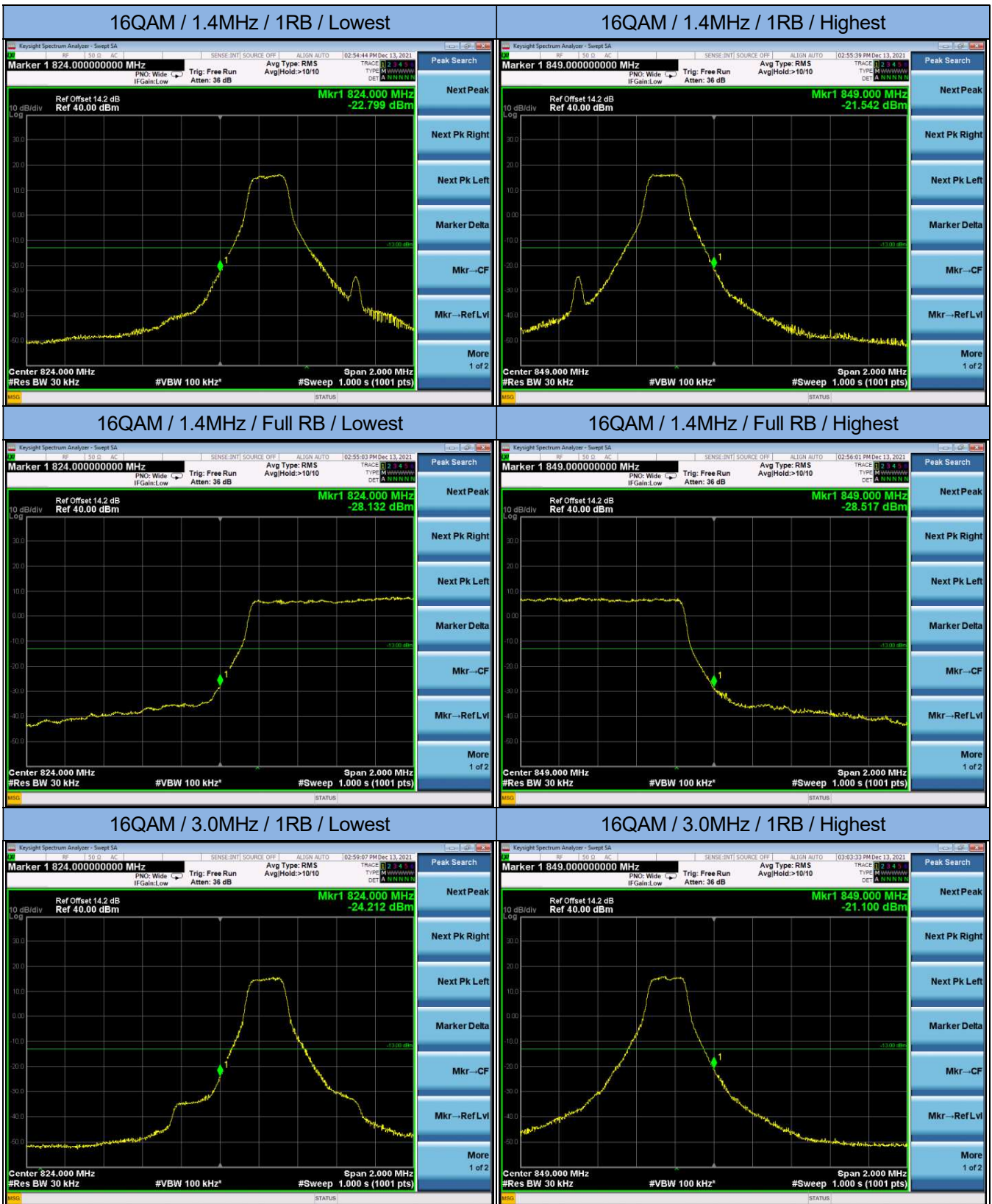


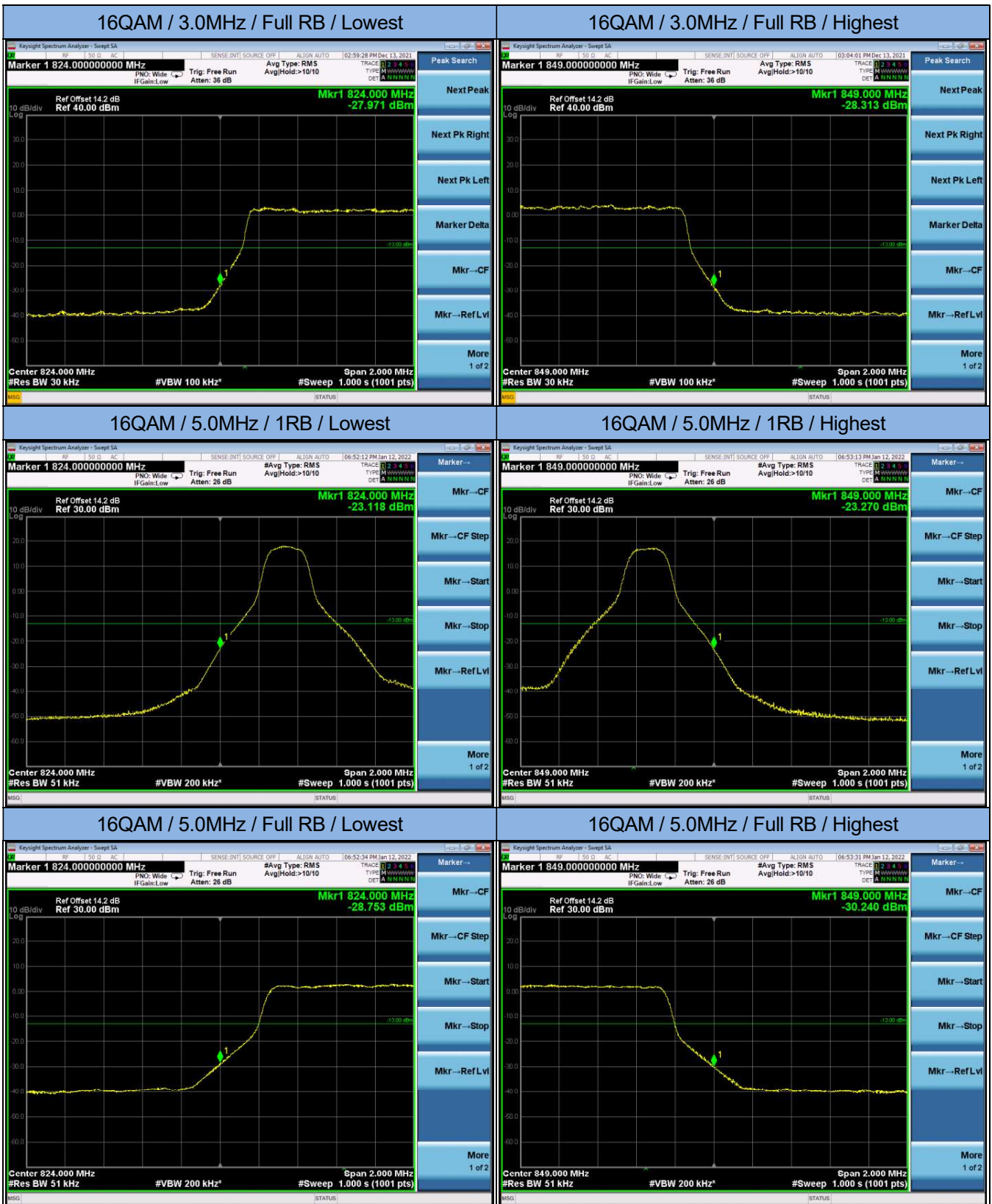


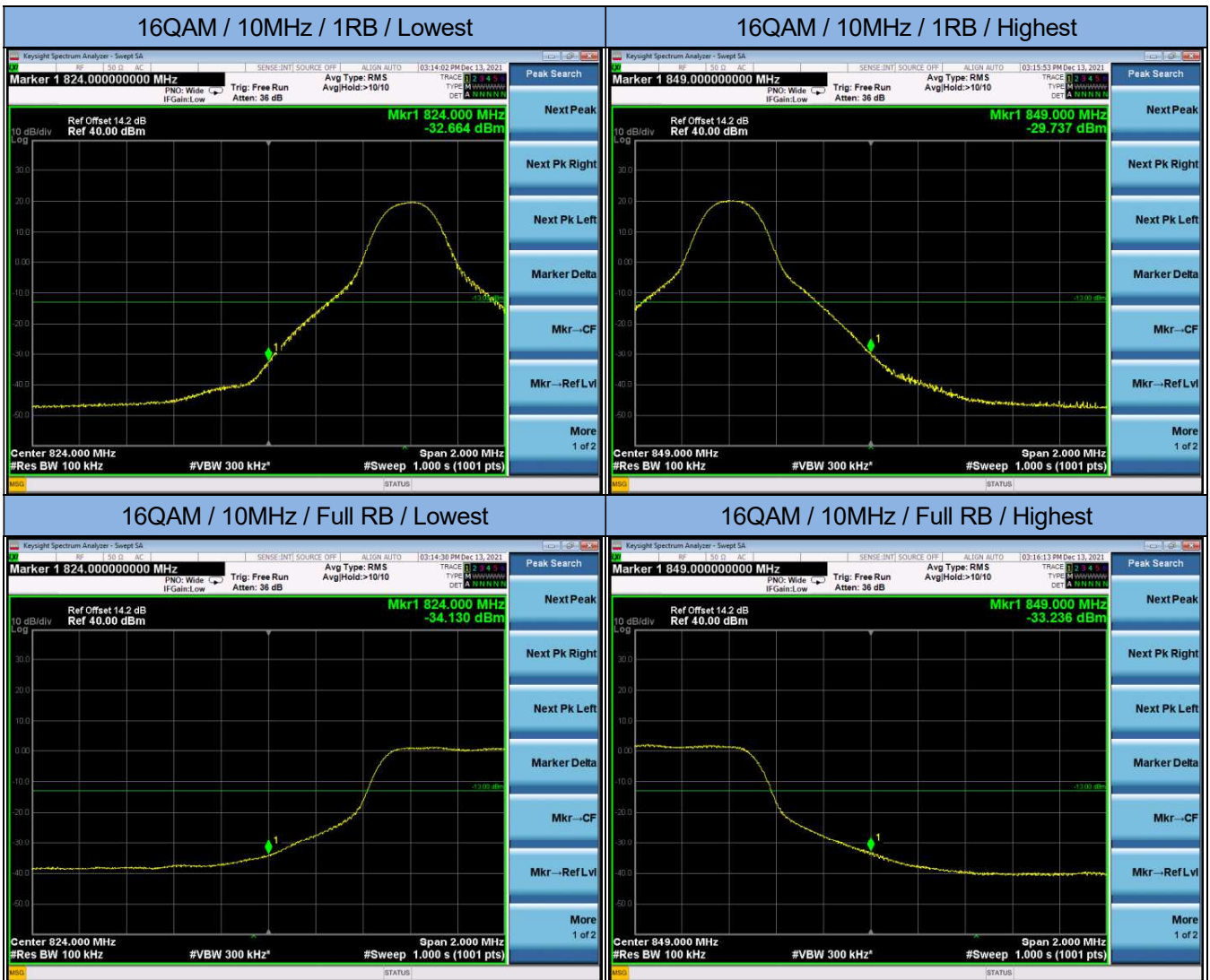






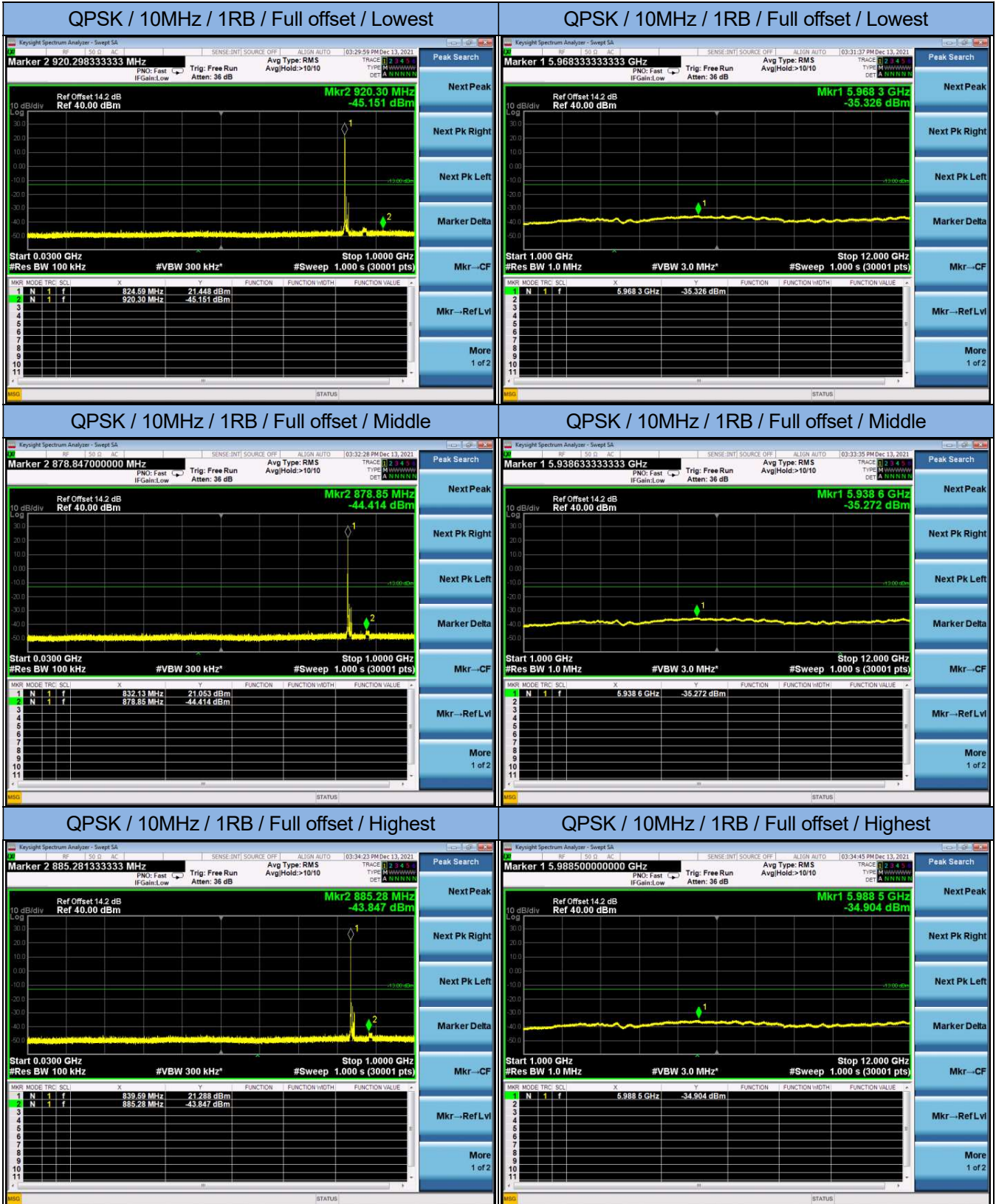


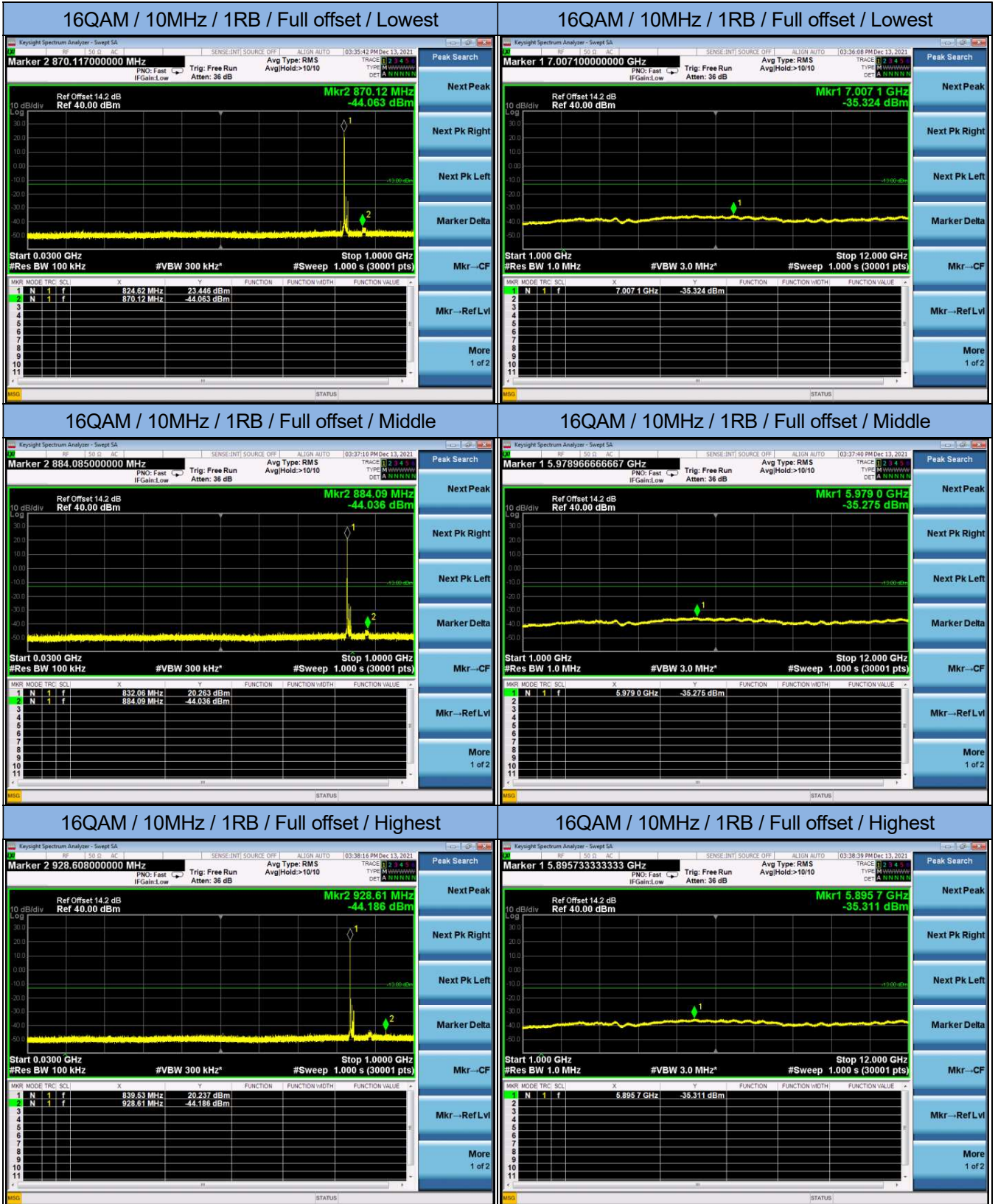






### 6. Transmitter Spurious Emissions





## 7. Field Strength of Spurious Radiation

LTE Band 5 / 10M / QPSK					
Channel	Frequency (MHz)	Polarization (H/V)	Meas. Level (dBm)	Limit (dBm)	Margin (dBm)
Lowest	149.3100	H	-65.26	-13	-52.26
	1658	H	-41.66	-13	-28.66
	2487	H	-47.53	-13	-34.53
	3316	H	-47.92	-13	-34.92
	544.7600	V	-69.27	-13	-56.27
	1658	V	-42.05	-13	-29.05
	2487	V	-46.46	-13	-33.46
	3316	V	-52.24	-13	-39.24
Middle	149.3100	H	-63.75	-13	-50.75
	1673	H	-40.56	-13	-27.56
	2509.5	H	-46.77	-13	-33.77
	3346	H	-48.21	-13	-35.21
	584.5540	V	-65.83	-13	-52.83
	1673	V	-41.36	-13	-28.36
	2509.5	V	-47.12	-13	-34.12
	3346	V	-50.83	-13	-37.83
Highest	149.3100	H	-64.88	-13	-51.88
	1688	H	-40.80	-13	-27.80
	2532	H	-47.12	-13	-34.12
	3376	H	-49.07	-13	-36.07
	578.2390	V	-66.91	-13	-53.91
	1688	V	-41.53	-13	-28.53
	2532	V	-48.28	-13	-35.28
	3376	V	-51.16	-13	-38.16

## 8. Frequency Stability

LTE Band 5 / 10M / QPSK / Full RB					
Middle channel, $f_o = 836.5$ MHz					
Temperature (°C)	Power Supplied (Vdc)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (dBm)	Result
-30	12	3.2	0.003825	±2.5	PASS
-20		-4.6	-0.005499	±2.5	PASS
-10		-1.5	-0.001793	±2.5	PASS
0		-2.3	-0.002750	±2.5	PASS
20		-4.6	-0.005499	±2.5	PASS
30		1.7	0.002032	±2.5	PASS
40		2.3	0.002750	±2.5	PASS
50		1.5	0.001793	±2.5	PASS
20		10.8	1.4	0.001674	±2.5
	52.8	2.0	0.002391	±2.5	PASS

---End---