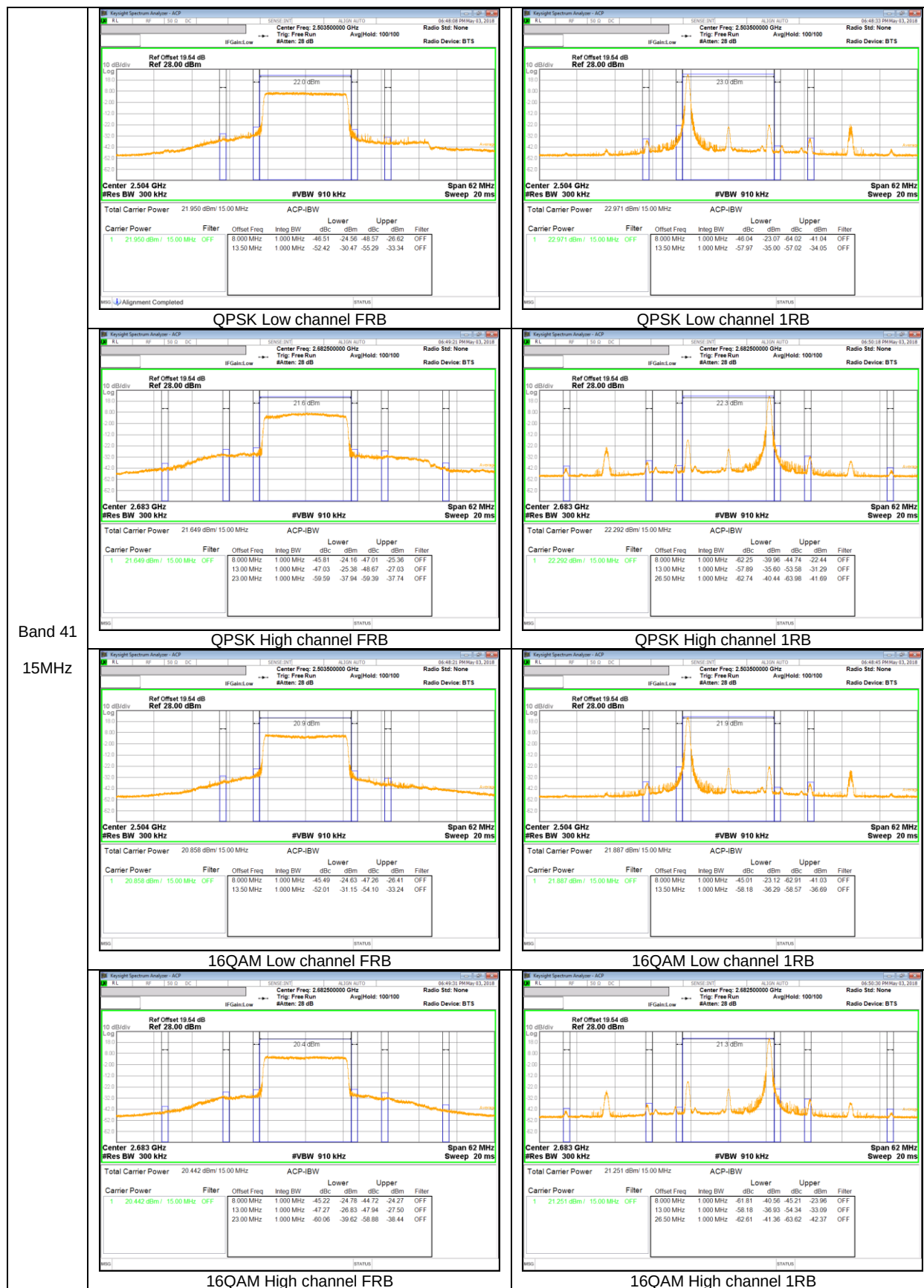
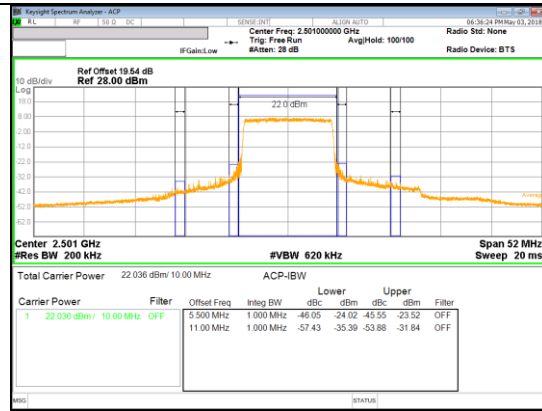
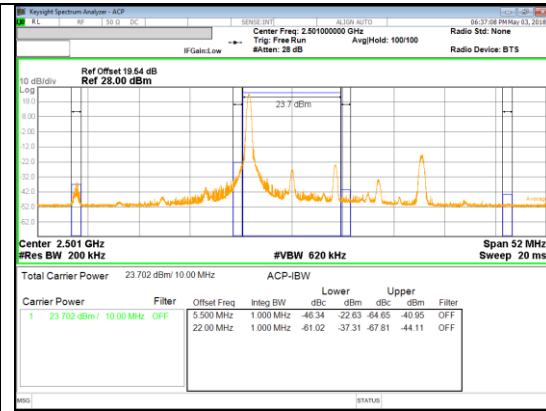




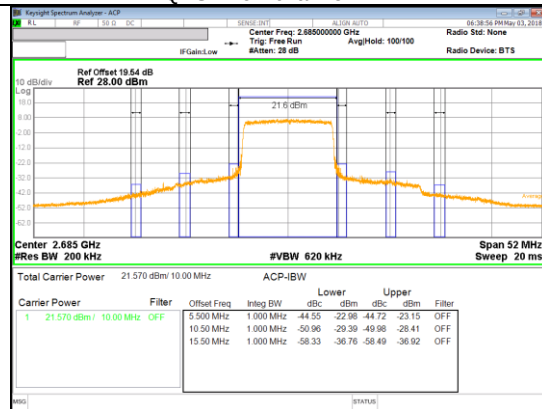
Band 41
10MHz



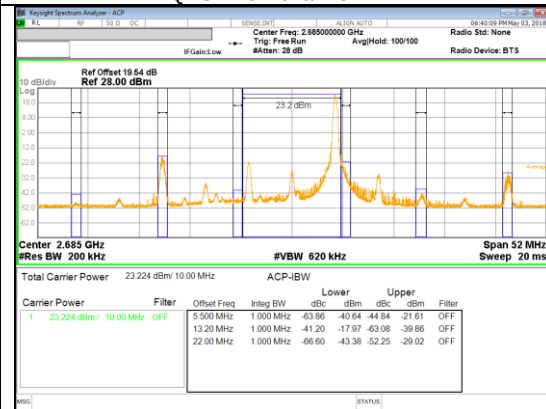
QPSK Low channel FRB



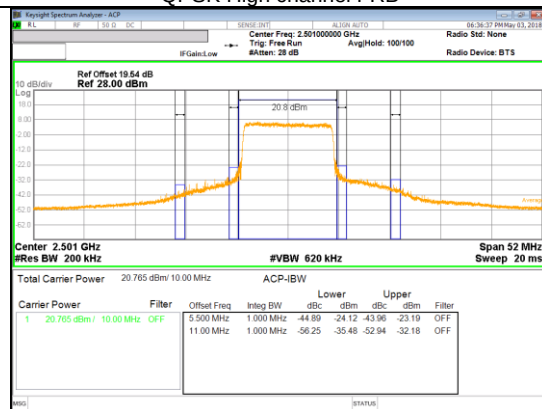
QPSK Low channel 1RB



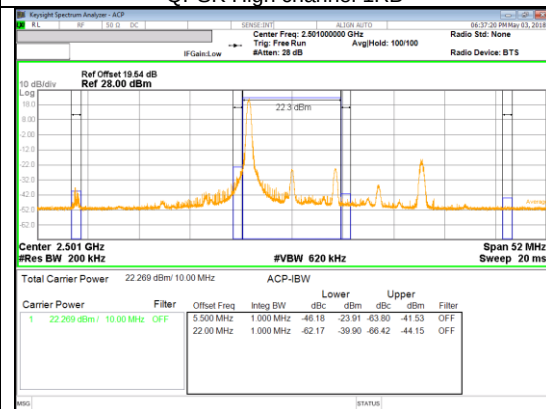
QPSK High channel FRB



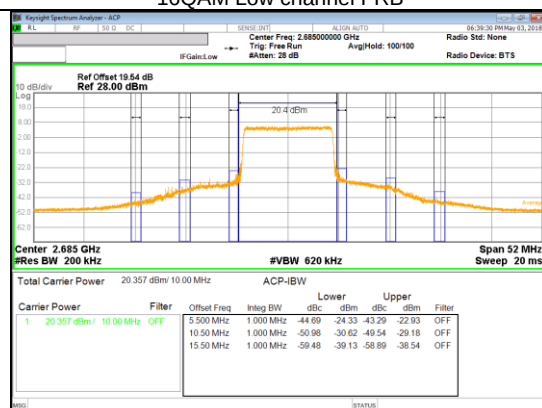
QPSK High channel 1RB



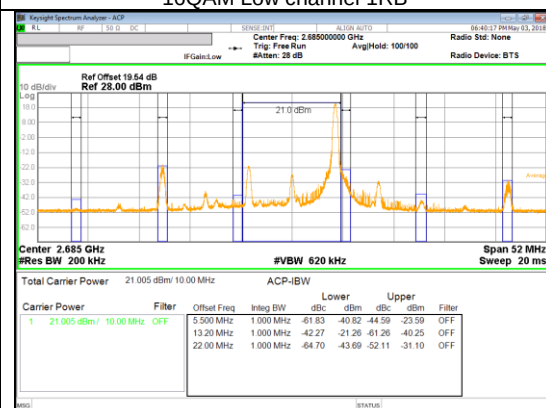
16QAM Low channel FRB



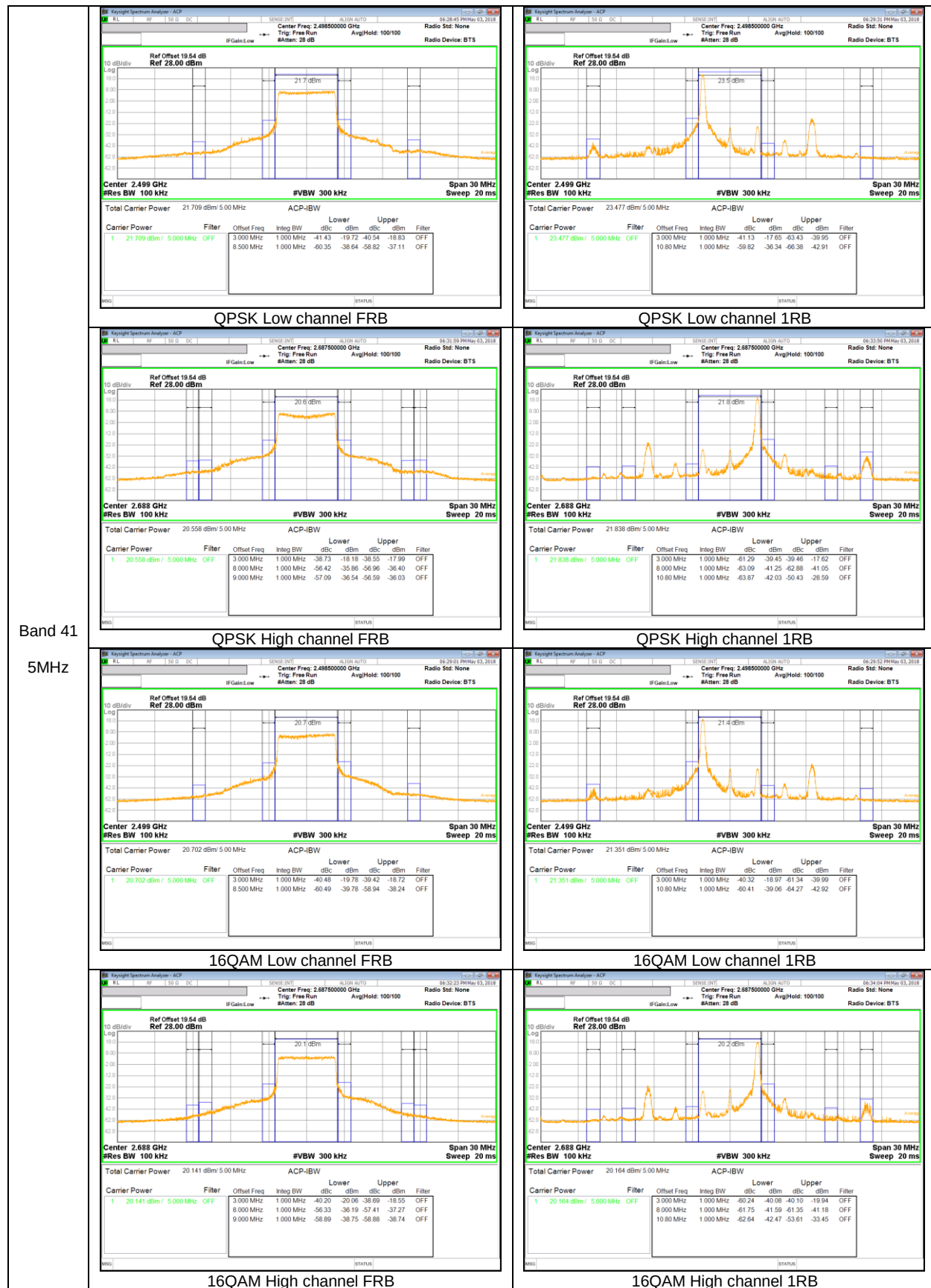
16QAM Low channel 1RB



16QAM High channel FRB



16QAM High channel 1RB



9.3. OUT OF BAND EMISSIONS

RULE PART(S)

FCC: §2.1051, §22.901, §22.917, §24.238 and §27. 53

LIMITS

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.

Part 27: (m)(4) For mobile station, the attenuation factor shall be not less than $43 + 10 \log (P)$ dB at the channel edge and $(55 + 10 \log (P))$ dB at the 5.5 MHz from the channel edges.

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v03r01

The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic. Multiple sweeps were recorded in maximum hold mode using a peak detector to ensure that the worst-case emissions were caught.

- a) Set the RBW = 100KHz for emission below 1GHz and 1MHz for emissions above 1GHz
(Tests were performed 1MHz [Worst case], to sweep 1 time for all frequency range)
- b) Set VBW $\geq 3 \times$ RBW;
- c) Set span ≥ 1.5 times the OBW;
- d) Sweep time = auto couple;
- e) Detector = rms;
- f) Ensure that the number of measurement points = Max (40001);
- g) Trace mode = average(WCDMA, LTE), Maxhold(GSM, LTE Band41);

RESULTS

GSM

Band	Mode	f [MHz]	Spurious [dBm]	Limit [dBm]
GSM1900	GPRS	1850.2	-23.66	-13.00
		1880.0	-23.93	
		1909.8	-24.28	
	EGPRS	1850.2	-23.52	
		1880.0	-24.20	
		1909.8	-24.26	

WCDMA

Band	Mode	f [MHz]	Spurious [dBm]	Limit [dBm]
Band 5	REL99	826.4	-42.728	-13.00
		836.6	-42.693	
		846.6	-42.666	
	HSDPA	826.4	-42.843	
		836.6	-42.758	
		846.6	-42.650	
Band 2	REL99	1852.4	-42.595	
		1880.0	-42.415	
		1907.6	-42.335	
	HSDPA	1852.4	-42.475	
		1880.0	-42.333	
		1907.6	-42.494	

LTE 5

Bandwidth	Mode	f [MHz]	Spurious [dBm]	Limit [dBm]
10 MHz	QPSK	829.0	-40.856	-13.00
		836.5	-40.593	
		844.0	-40.830	
	16QAM	829.0	-40.467	
		836.5	-40.892	
		844.0	-40.891	
5 MHz	QPSK	826.5	-40.893	
		836.5	-40.562	
		846.5	-40.867	
	16QAM	826.5	-40.575	
		836.5	-40.310	
		846.5	-40.752	
3 MHz	QPSK	825.5	-40.710	
		836.5	-40.716	
		847.5	-40.688	
	16QAM	825.5	-40.926	
		836.5	-40.581	
		847.5	-40.875	
1.4 MHz	QPSK	824.7	-40.774	
		836.5	-40.797	
		848.3	-40.576	
	16QAM	824.7	-40.600	
		836.5	-40.700	
		848.3	-40.561	

LTE 17

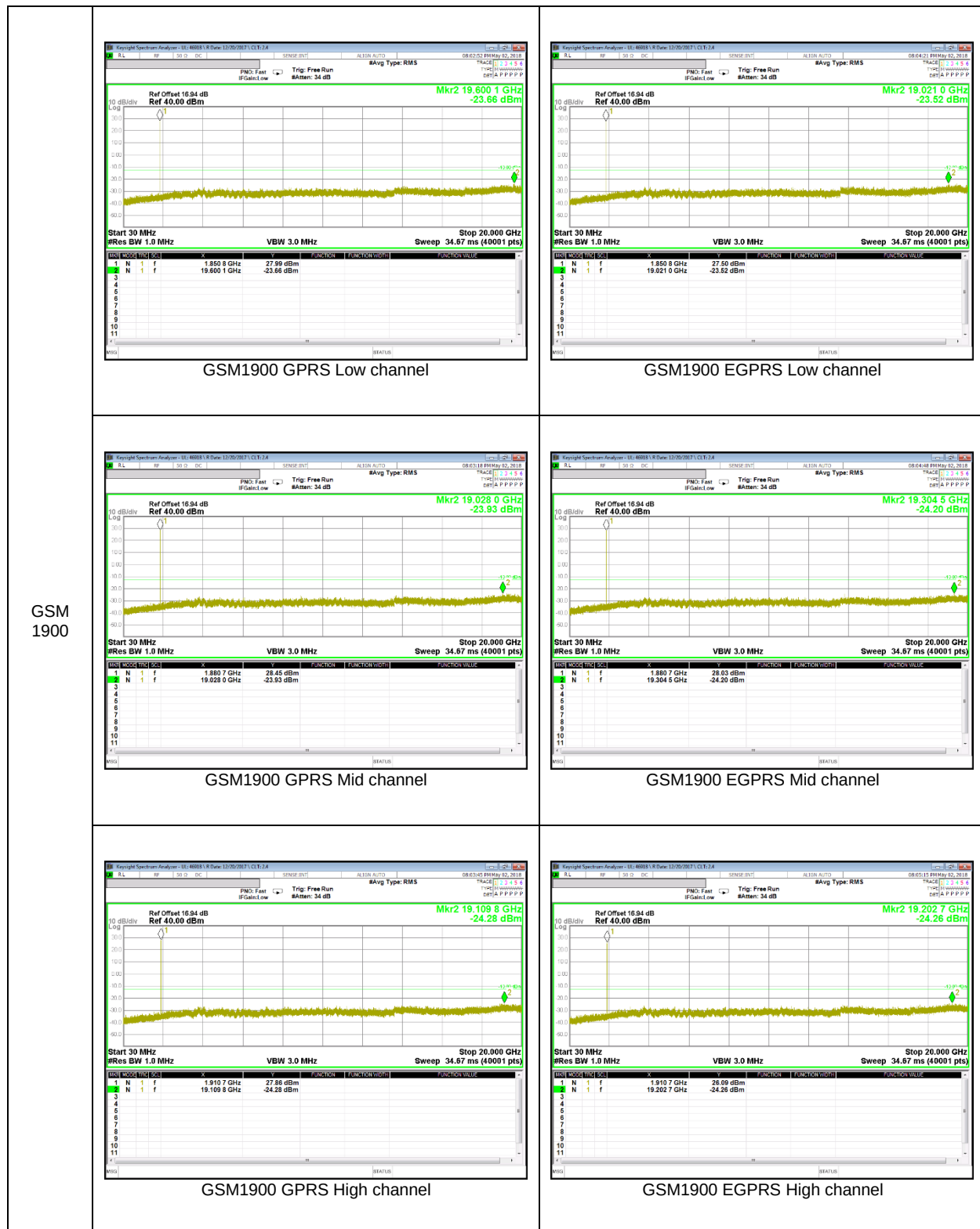
Bandwidth	Mode	f [MHz]	Spurious [dBm]	Limit [dBm]
10 MHz	QPSK	709.0	-40.848	-13.00
		710.0	-40.827	
		711.0	-40.769	
	16QAM	709.0	-40.823	
		710.0	-40.848	
		711.0	-40.711	
5 MHz	QPSK	706.5	-40.743	
		710.0	-40.295	
		713.5	-40.776	
	16QAM	706.5	-40.706	
		710.0	-40.809	
		713.5	-40.727	

LTE 41

Bandwidth	Mode	f [MHz]	Spurious [dBm]	Limit [dBm]
20 MHz	QPSK	2506.0	-33.48	-25.00
		2593.0	-33.43	
		2680.0	-33.42	
	16QAM	2506.0	-32.86	
		2593.0	-32.14	
		2680.0	-33.22	
15 MHz	QPSK	2503.5	-33.23	
		2593.0	-32.90	
		2682.5	-33.27	
	16QAM	2503.5	-33.19	
		2593.0	-33.67	
		2682.5	-32.61	
10 MHz	QPSK	2501.0	-32.96	
		2593.0	-33.39	
		2685.0	-32.50	
	16QAM	2501.0	-32.95	
		2593.0	-32.98	
		2685.0	-32.79	
5 MHz	QPSK	2498.5	-32.19	
		2593.0	-32.33	
		2687.5	-32.73	
	16QAM	2498.5	-32.87	
		2593.0	-32.53	
		2687.5	-33.32	

9.3.1. OUT OF BAND EMISSIONS PLOTS

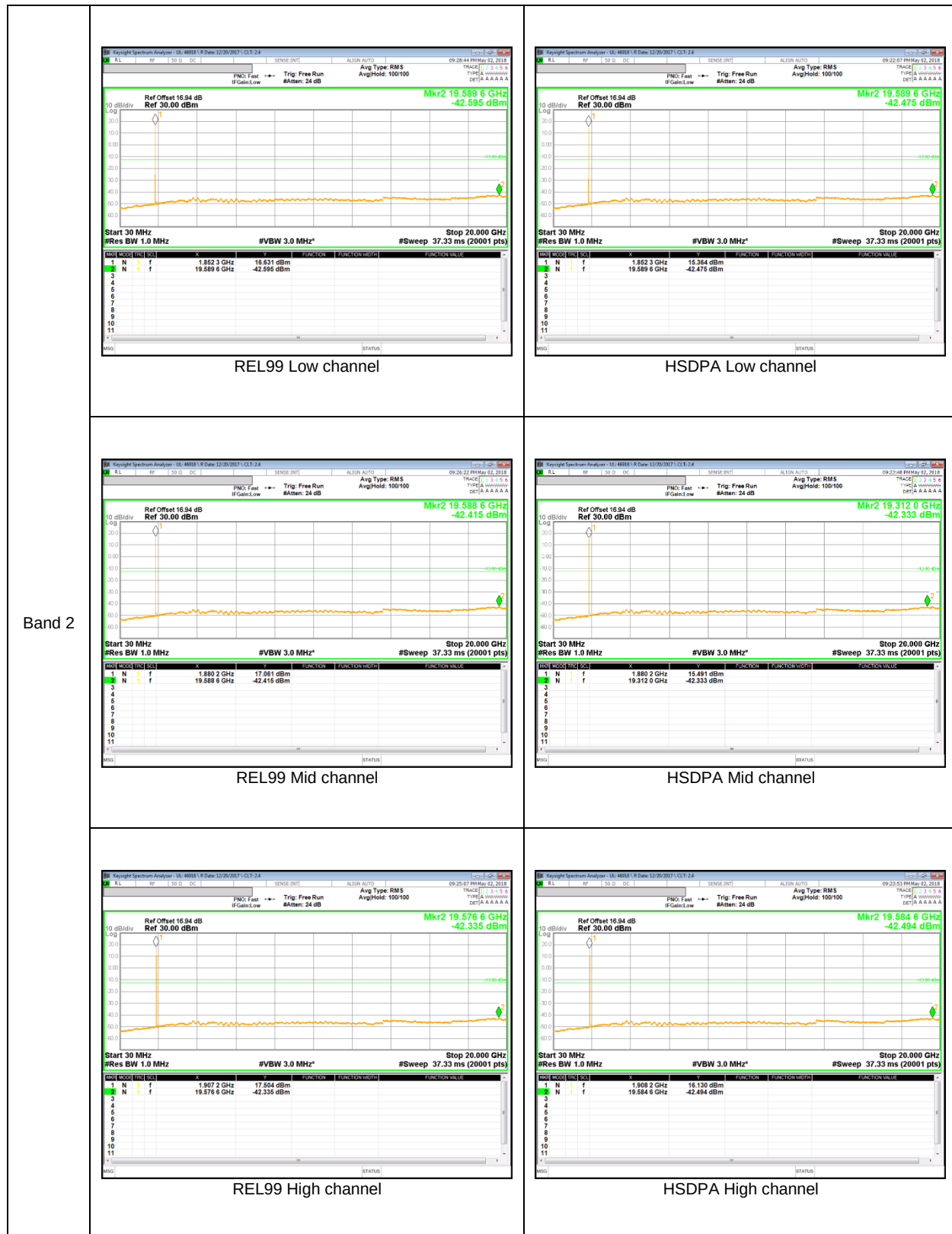
GSM 1900



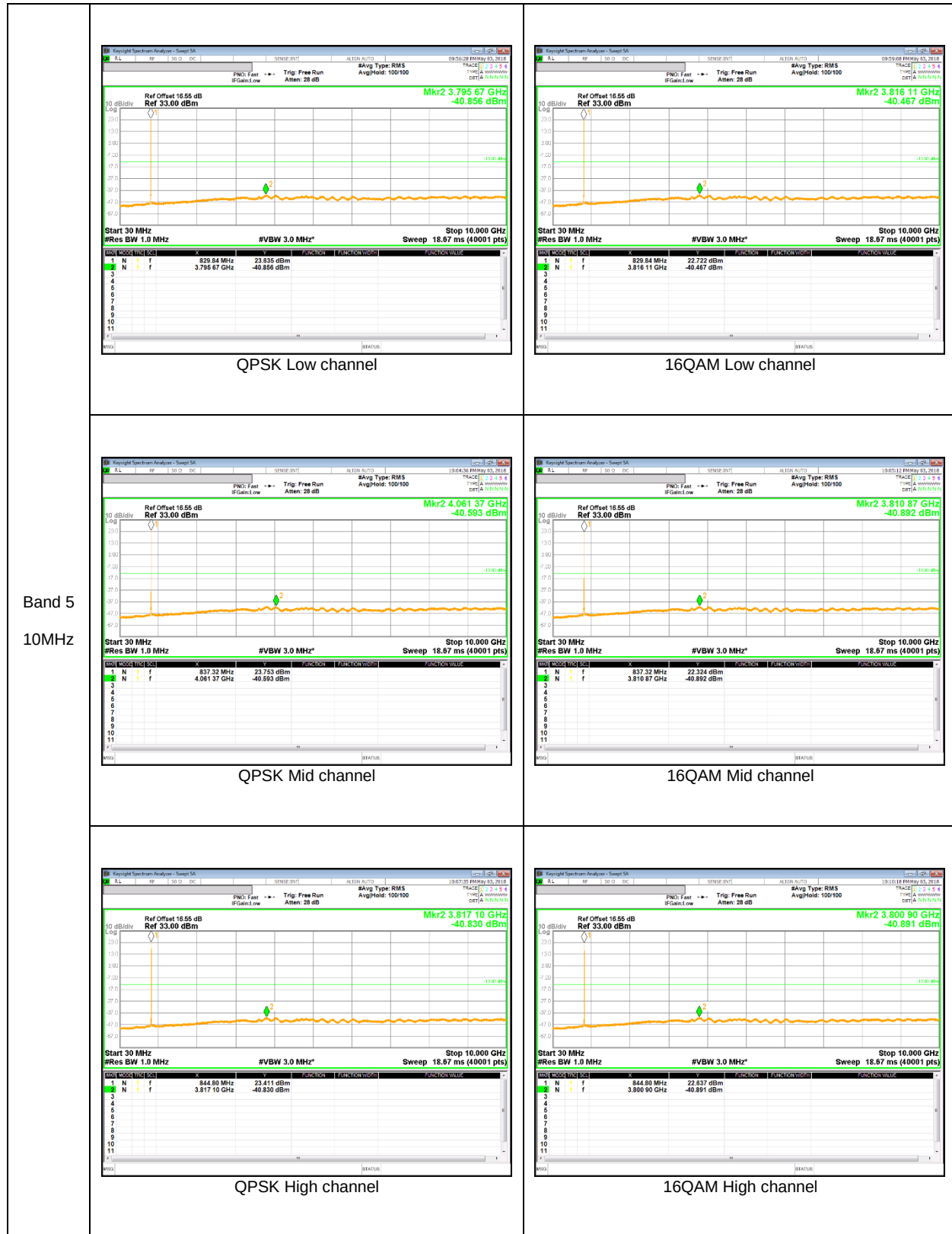
WCDMA Band 5

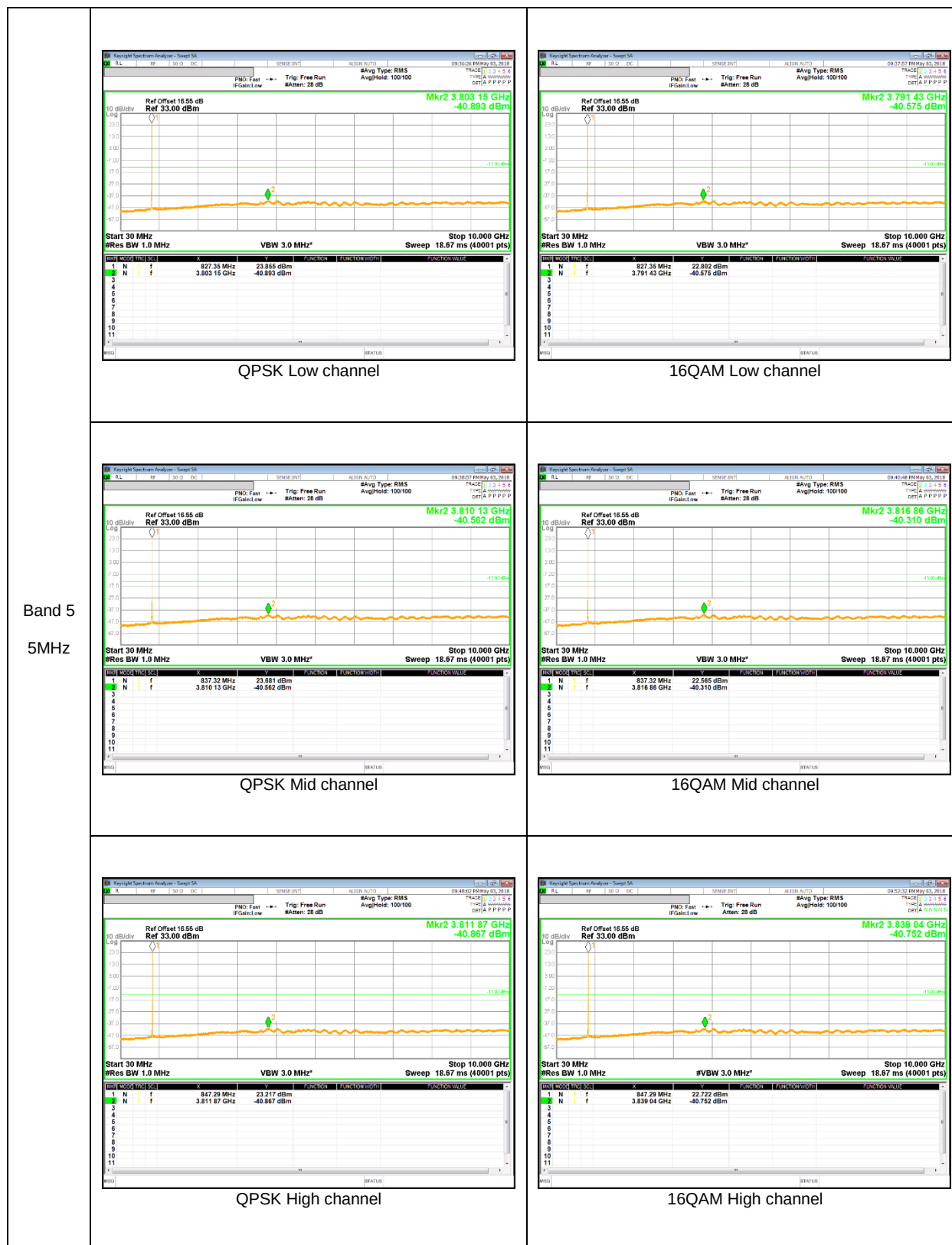


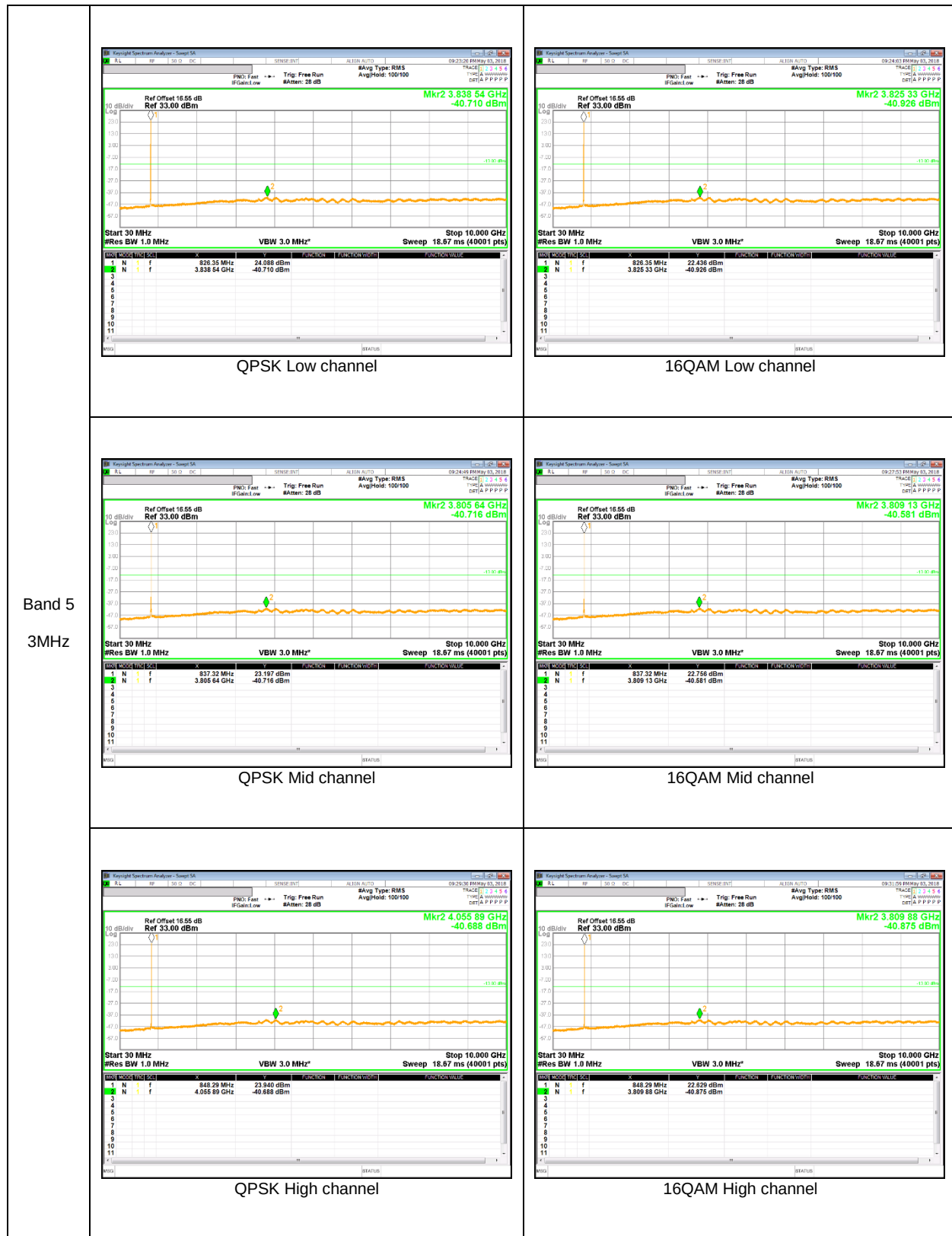
WCDMA Band 2

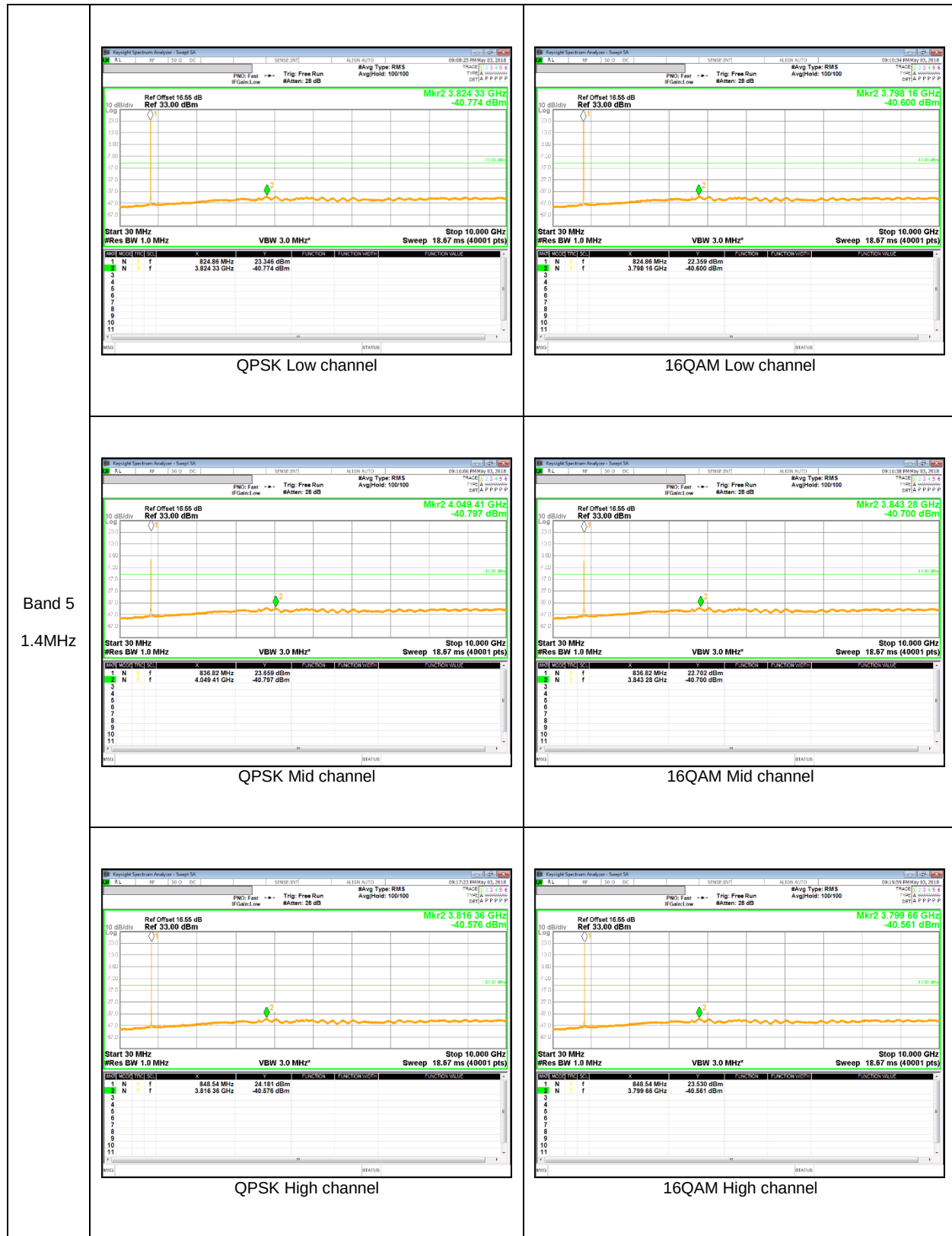


LTE Band 5

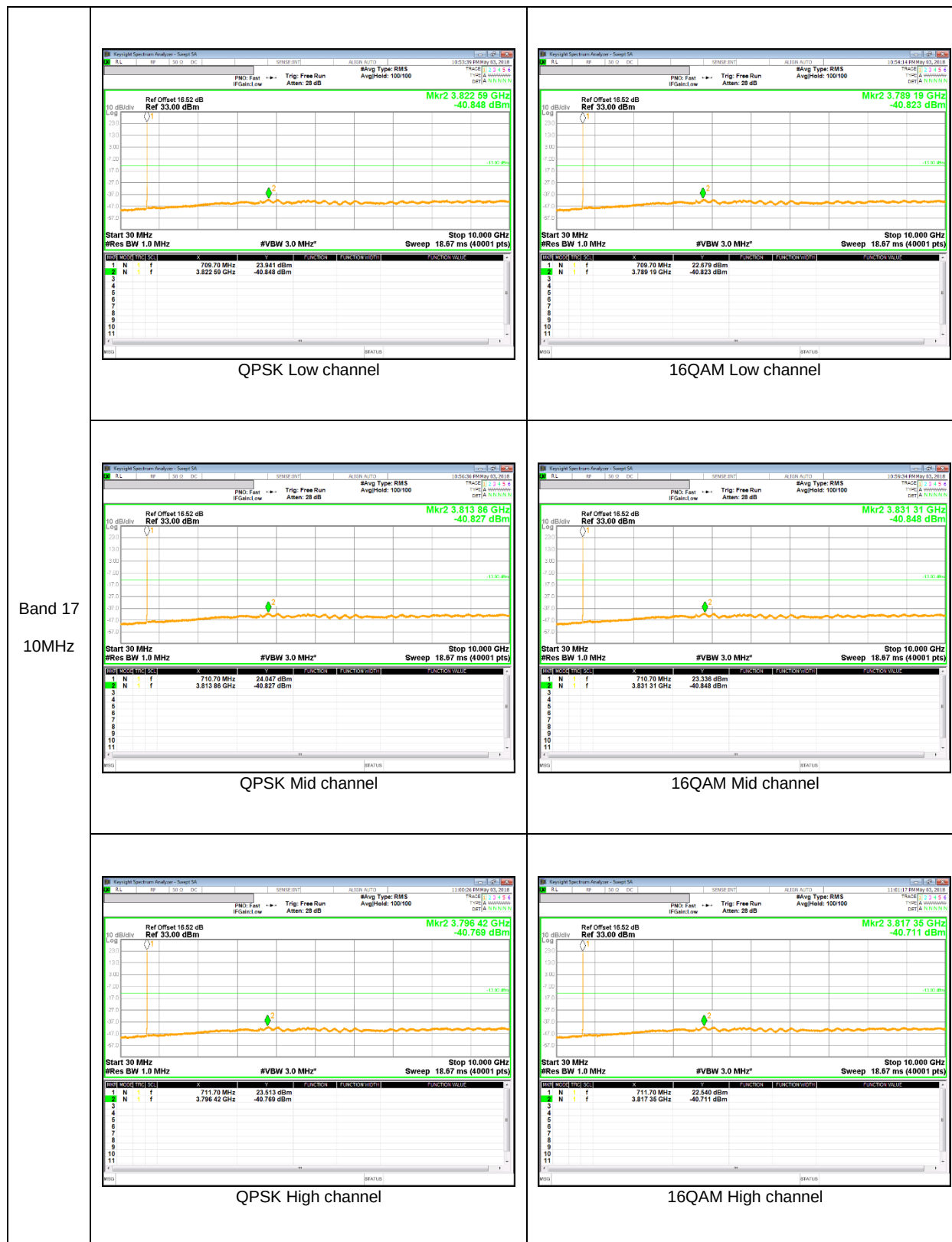


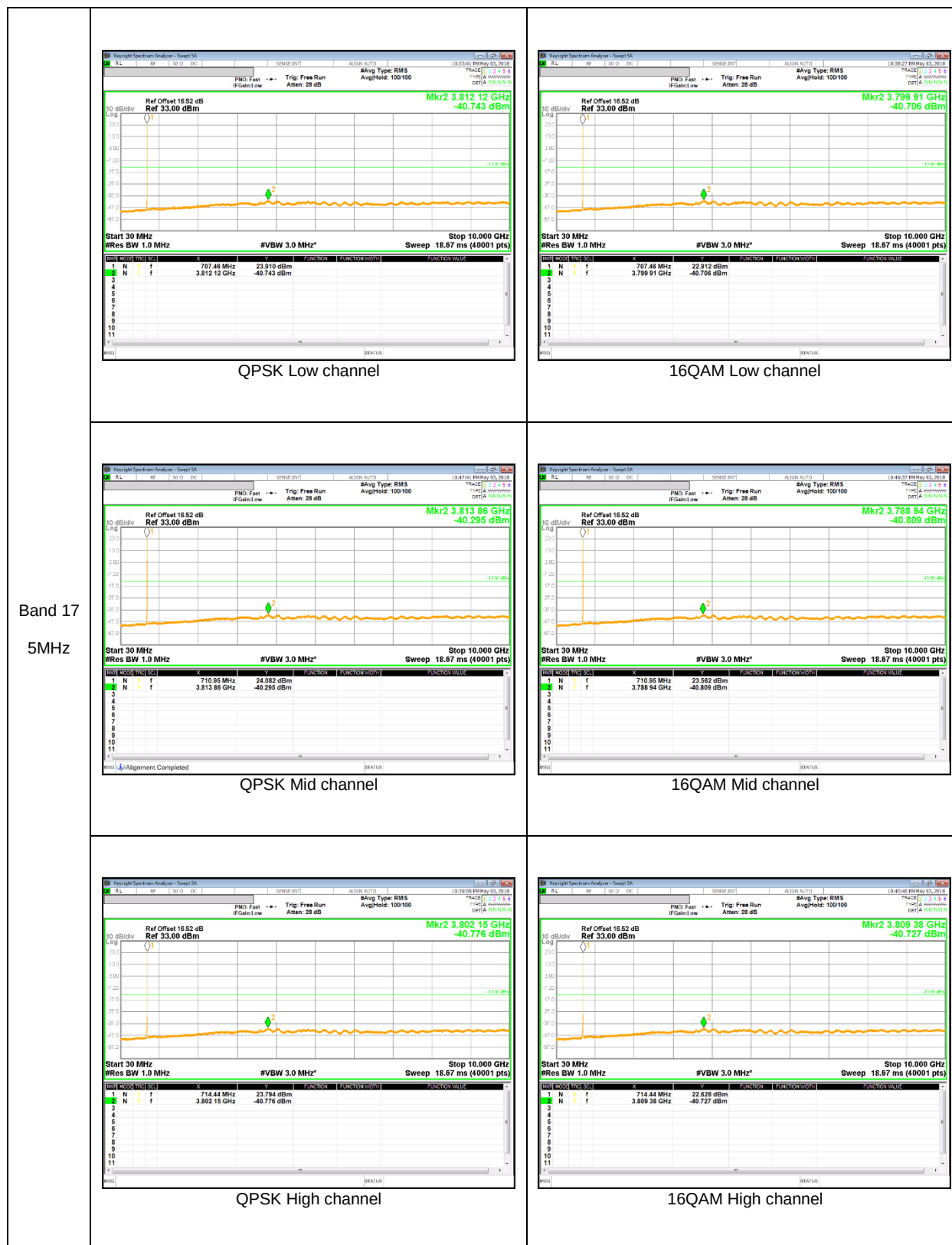




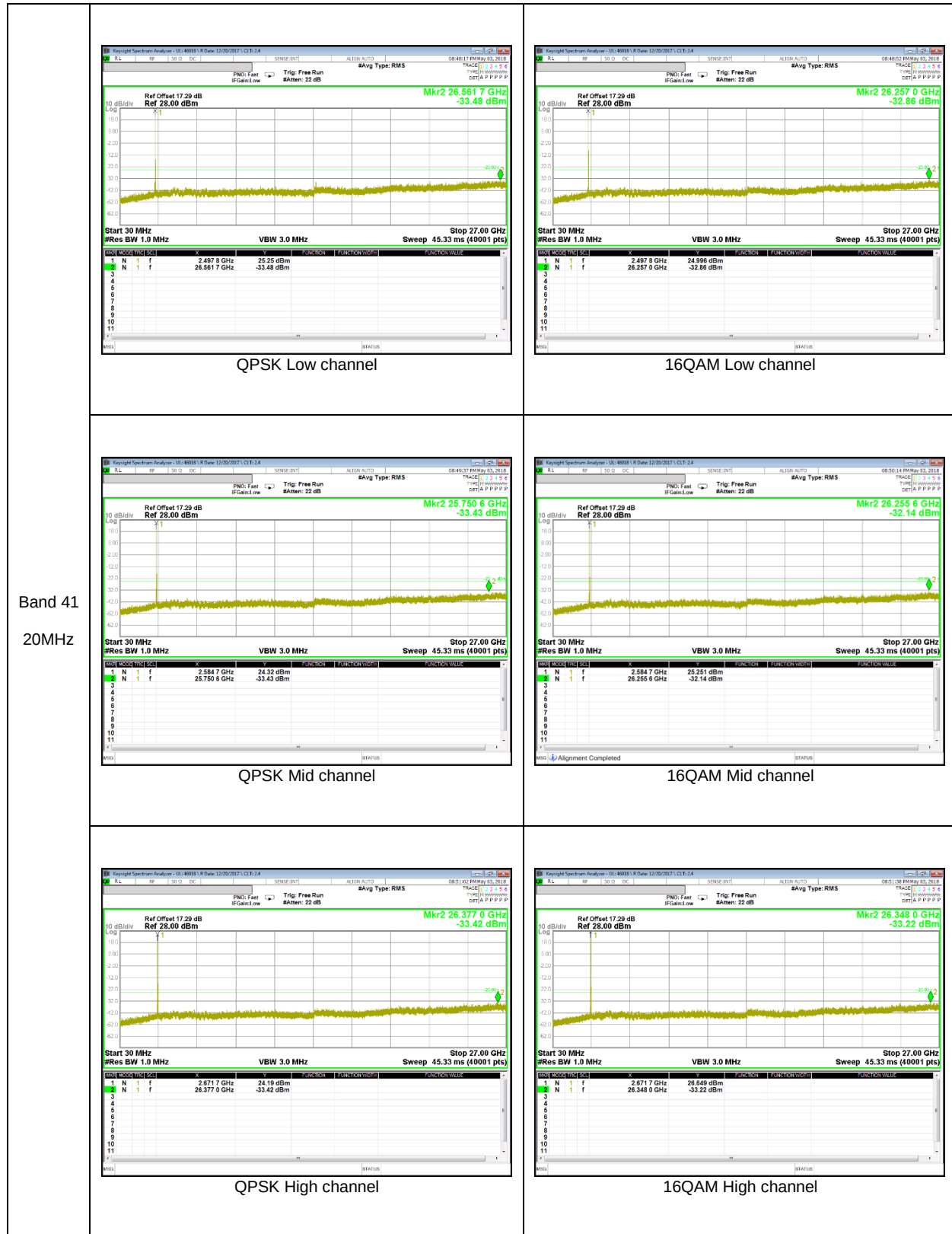


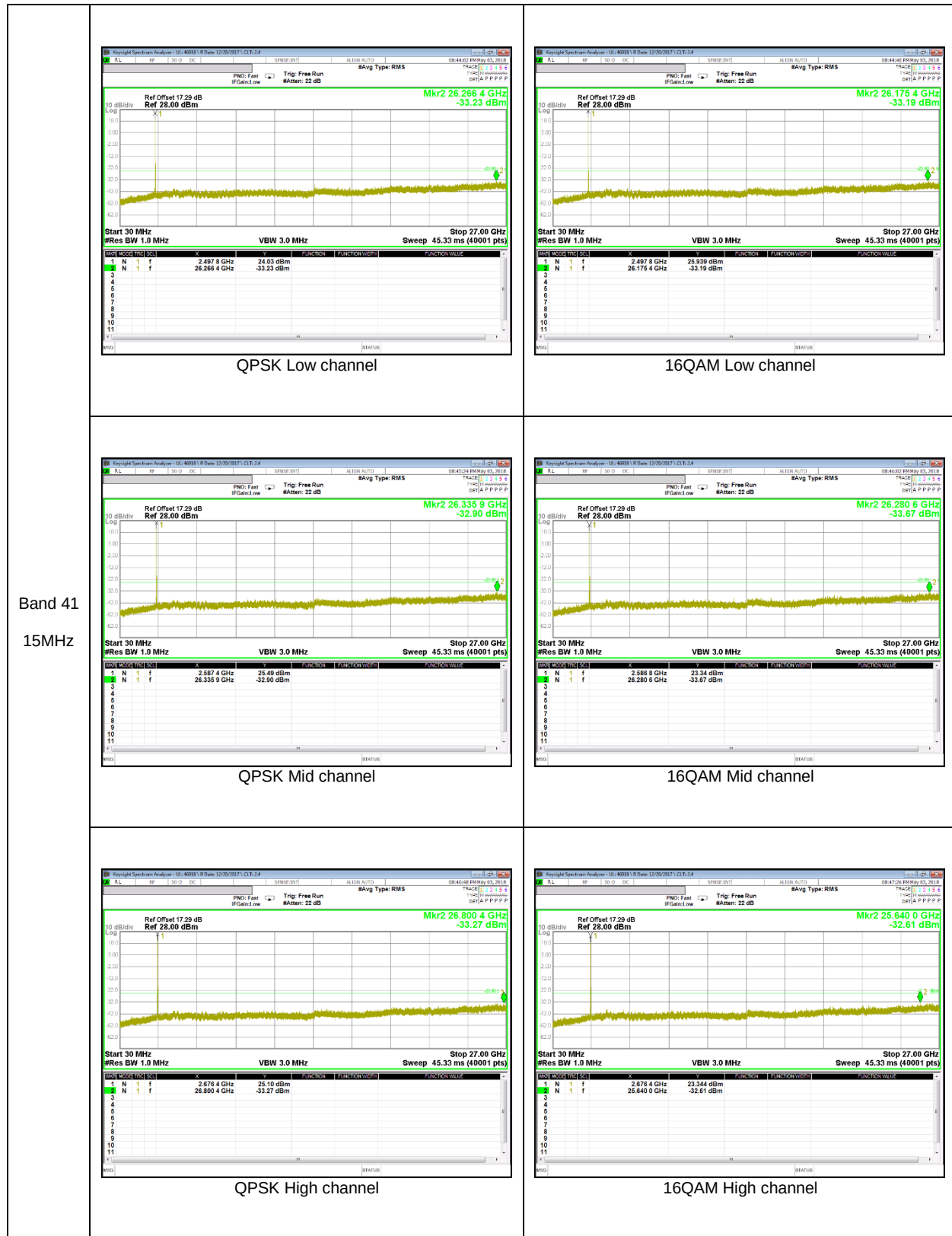
LTE Band 17

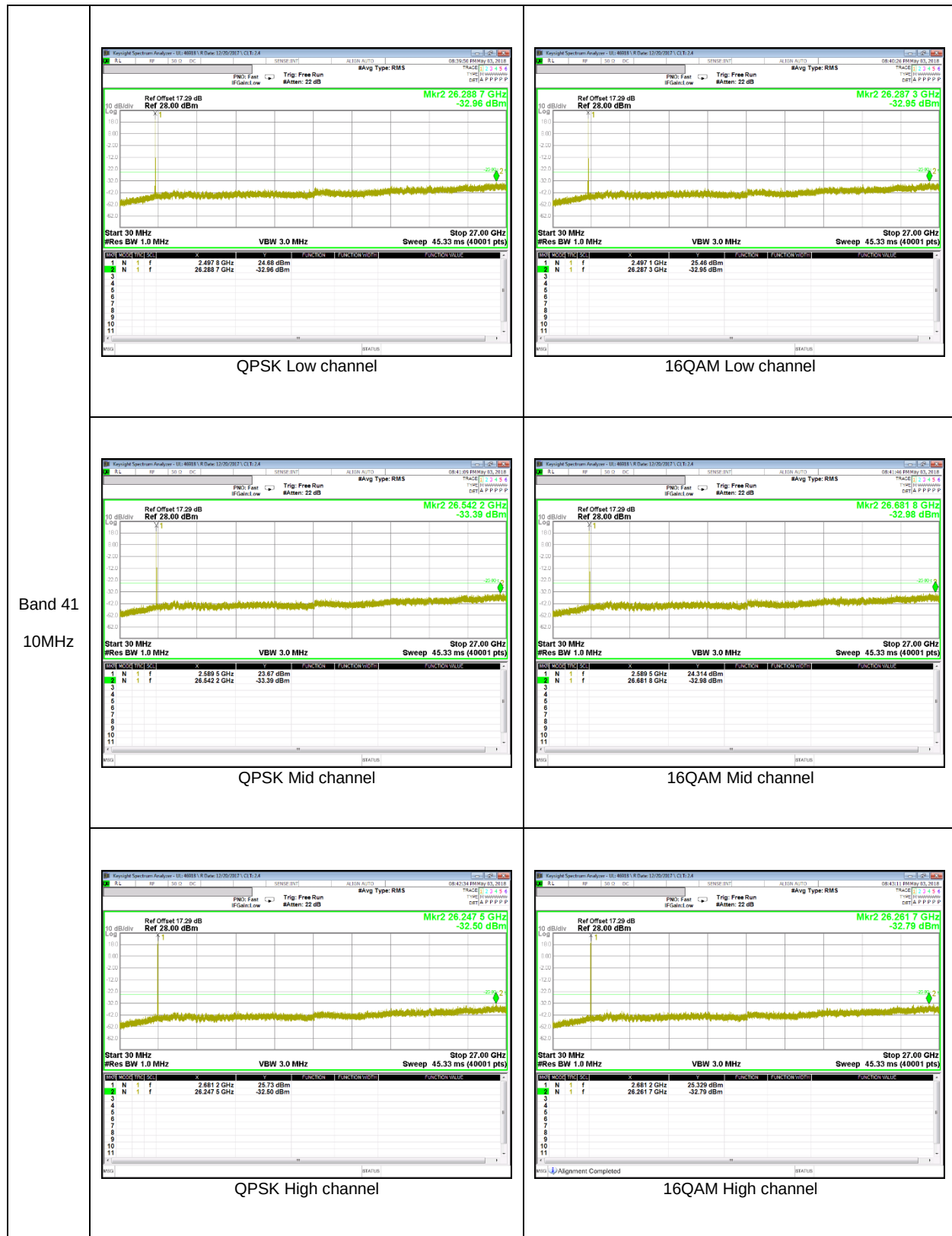


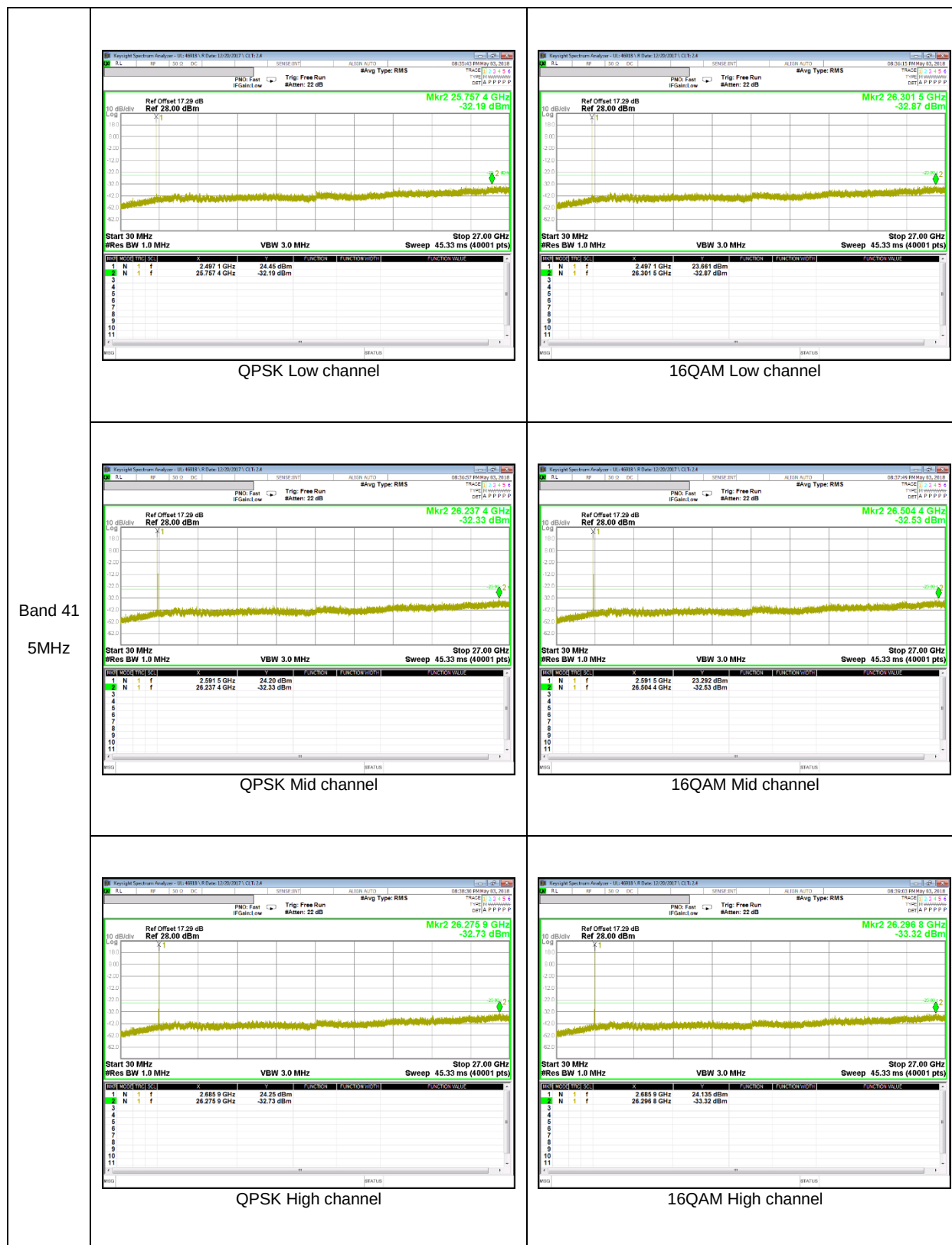


LTE Band 41









9.4. FREQUENCY STABILITY

RULE PART(S)

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

LIMITS

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

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

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

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v03r01

RESULTS

See the following pages.

9.4.1. FREQUENCY STABILITY RESULTS

GSM 1900 (Lowest Frequency : GPRS / Highest Frequency : EGPRS)

Limit		1850	1910	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1850.0808	1909.9223		
Extreme (50C)		1850.0808	1909.9223	-27.5	-0.015
Extreme (40C)		1850.0808	1909.9223	-29.5	-0.016
Extreme (30C)		1850.0808	1909.9223	-29.7	-0.016
Extreme (10C)		1850.0808	1909.9223	-28.7	-0.015
Extreme (0C)		1850.0808	1909.9223	-28.7	-0.015
Extreme (-10C)		1850.0808	1909.9223	-25.7	-0.014
Extreme (-20C)		1850.0808	1909.9223	-28.1	-0.015
Extreme (-30C)		1850.0808	1909.9223	-24.8	-0.013
20C	15%	1850.0808	1909.9223	-23.7	-0.013
	-15%	1850.0808	1909.9223	-23.3	-0.012
	End Point	1850.0808	1909.9223	-28.0	-0.015