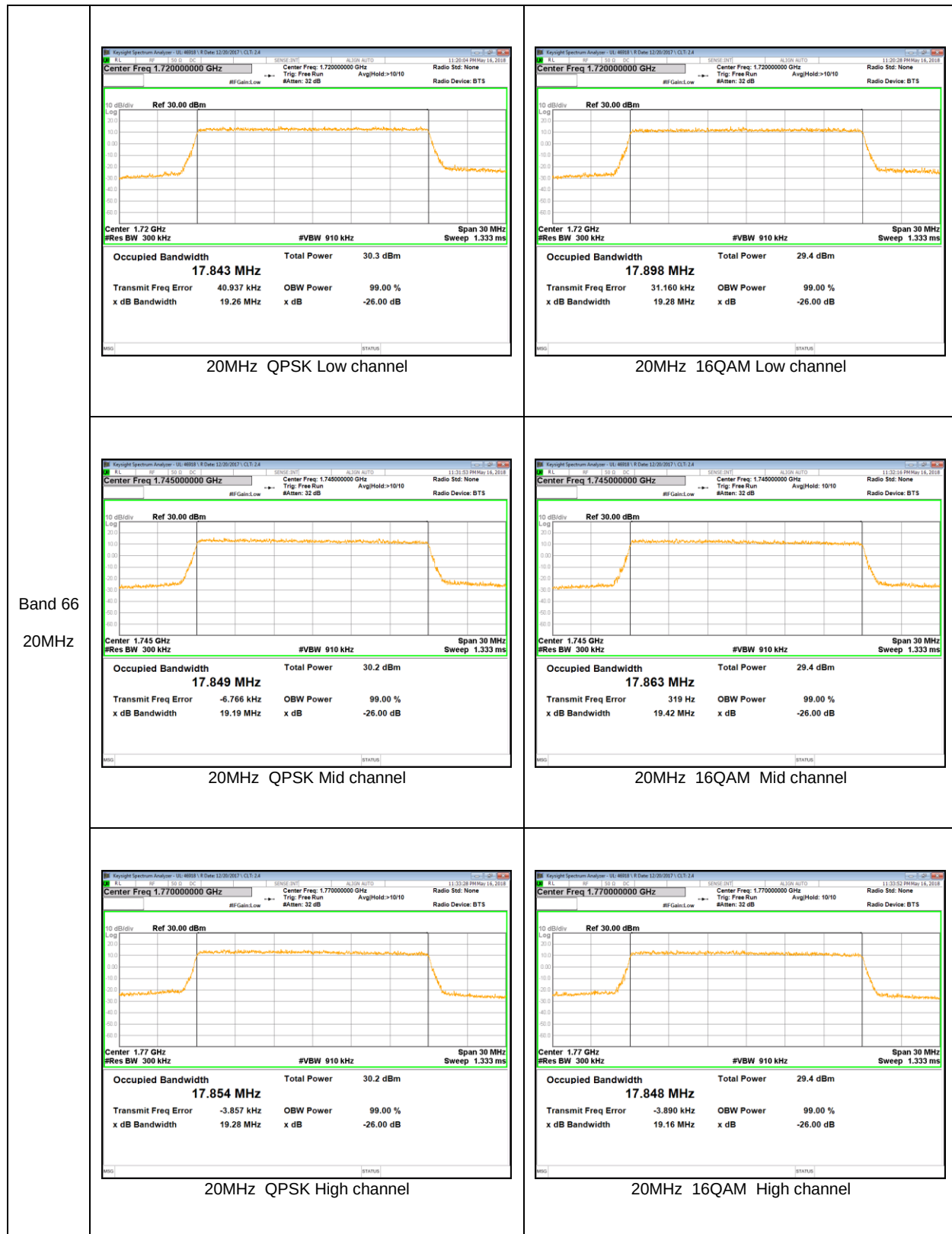
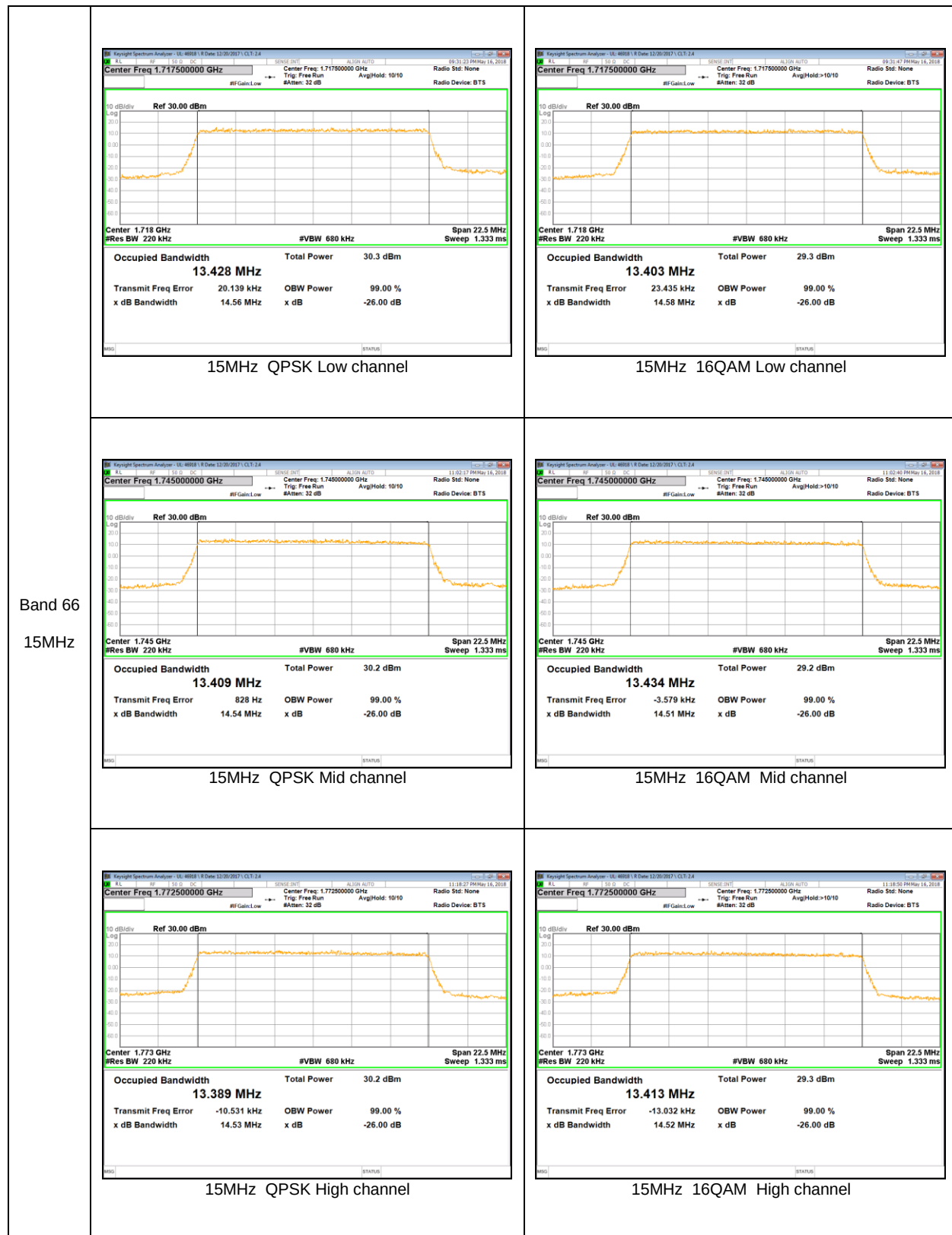
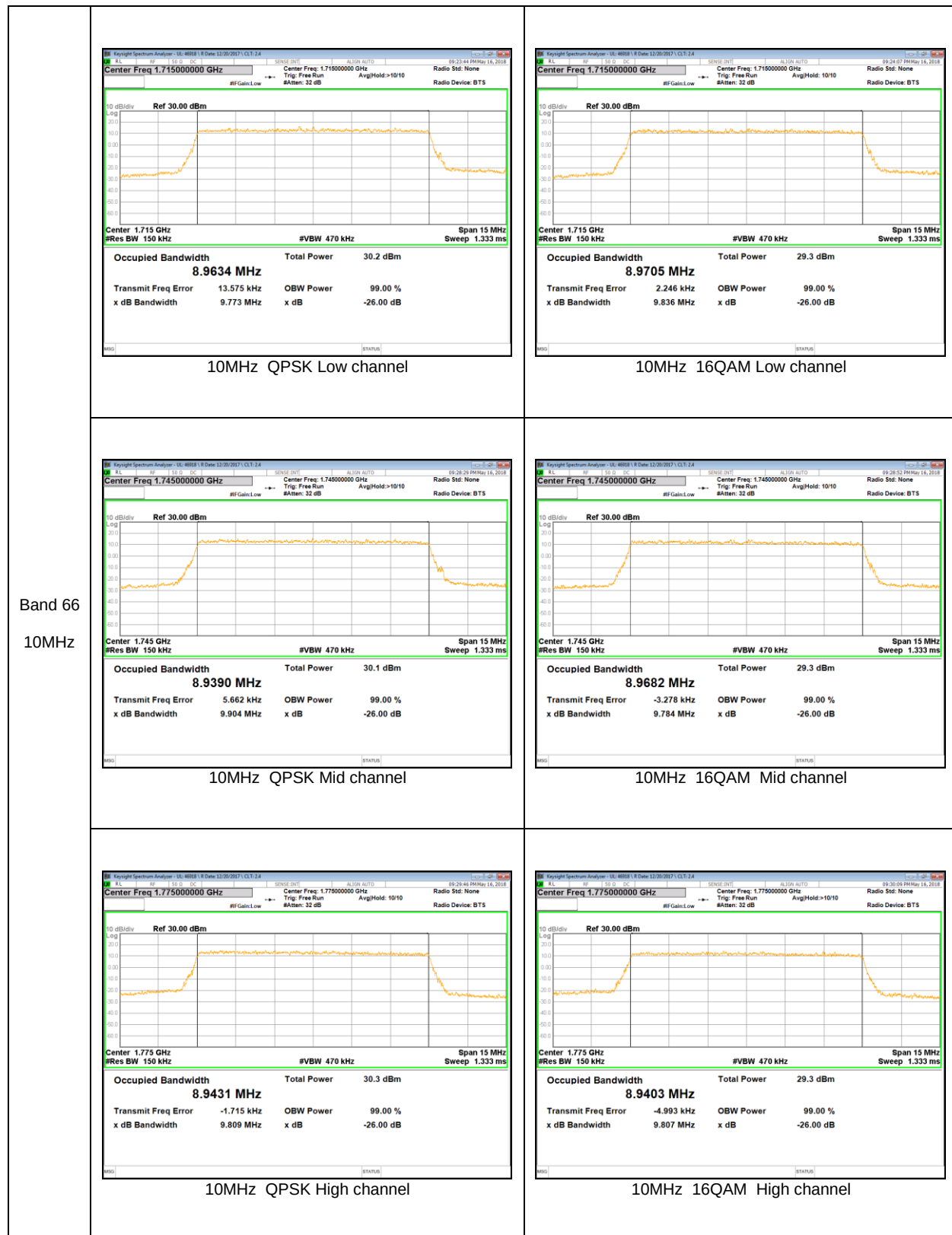
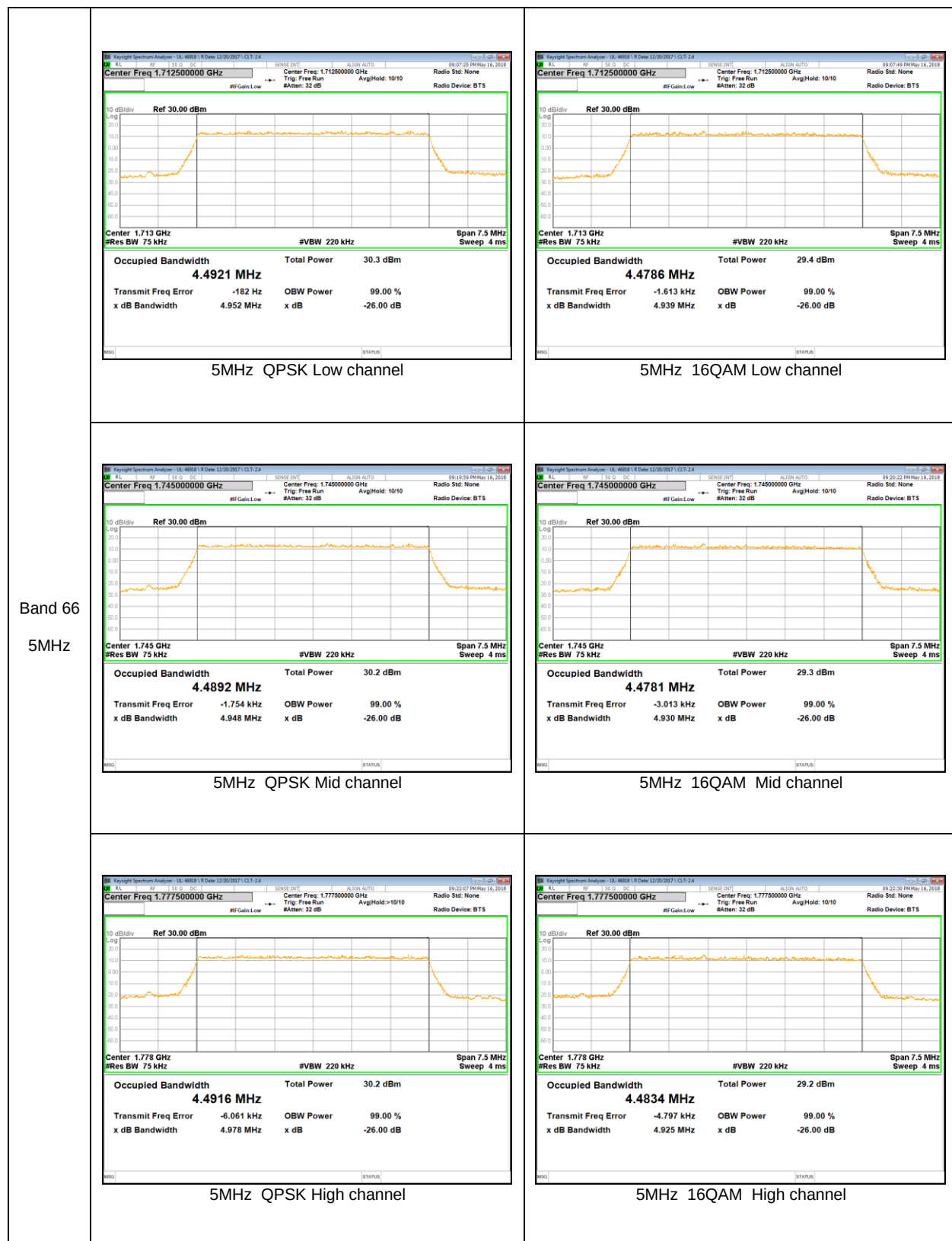


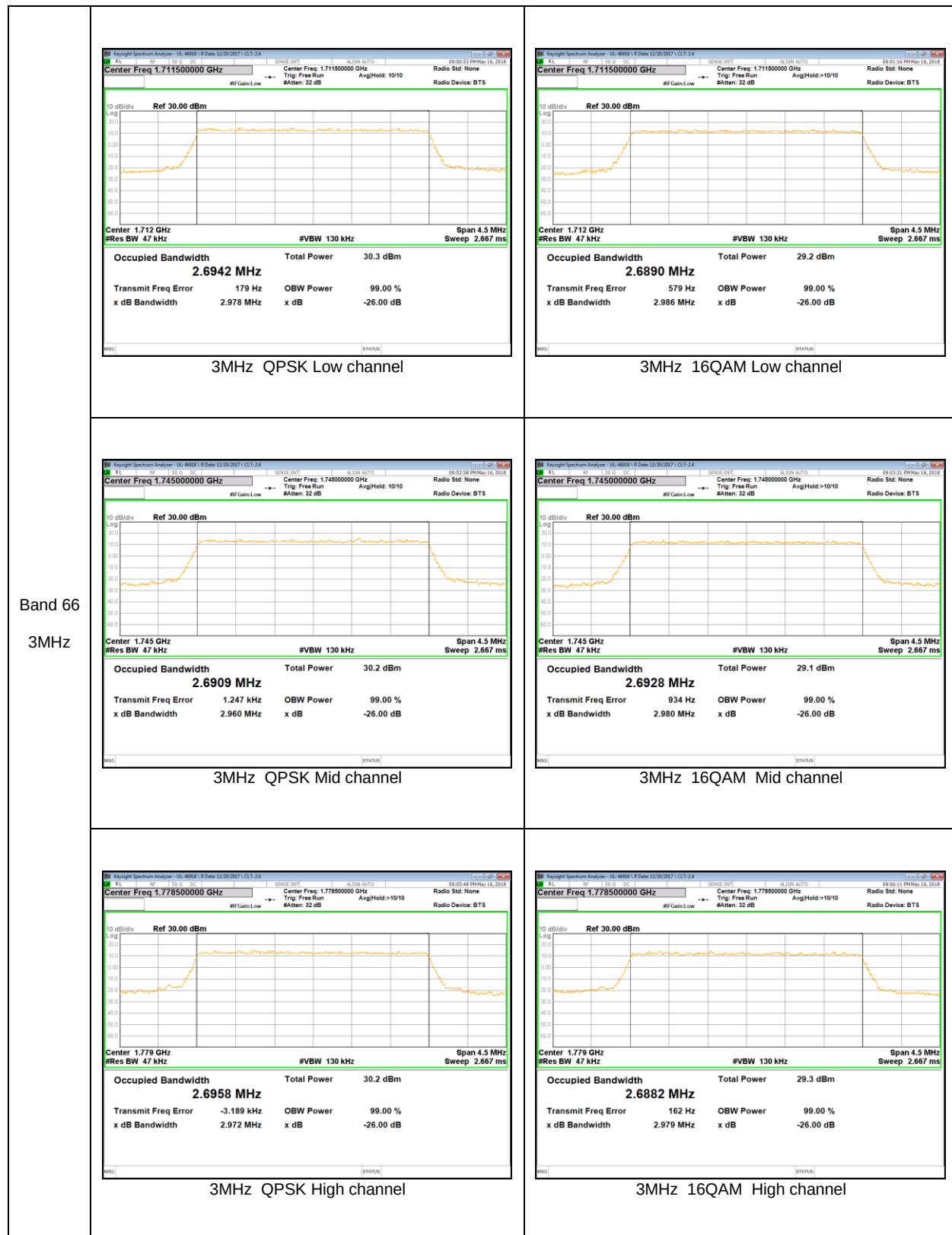
LTE Band 66













9.2. BAND EDGE EMISSIONS

RULE PART(S)

FCC: §22.359, §24.238

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 27.53(m) 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.

(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:

(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;

(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;

(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.

(h) The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10} (P)$ dB.

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.

GSM

- a) Set the RBW = 1 ~ 5% of OBW(GSM850 – 8.2KHz, GSM1900 – 9.1KHz)
- b) Set VBW $\geq 3 \times$ RBW;
- c) Set span ≥ 1.5 times the OBW;
- d) Sweep time = 1S ;
- e) Detector = RMS;
- f) Ensure that the number of measurement points $\geq 2 \times$ Span/RBW;
- g) Trace mode = Average(100);
- h) Add duty cycle correction factor (9dB)

WCDMA/LTE

- b) 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 ≥ 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);

NOTE1

LTE Band 41 - Duty cycle correction factor(2.25dB) already applied on the plot.

RESULTS

GSM

Band	Mode	Side	f [MHz]	Level [dBm]	Limit [dBm]
GSM850	GPRS	Lower	823.982	-15.632	-13.00
		Upper	849.023	-15.530	
	EGPRS	Lower	823.987	-25.065	
		Upper	849.023	-22.054	
GSM1900	GPRS	Lower	1849.982	-19.127	
		Upper	1910.023	-18.140	
	EGPRS	Lower	1849.992	-24.347	
		Upper	1910.008	-22.989	

WCDMA

Band	Mode	Side	f [MHz]	Level [dBm]	Limit [dBm]
Band 5	REL99	Lower	824.000	-25.296	-13.00
		Upper	849.000	-26.813	
	HSDPA	Lower	824.000	-29.230	
		Upper	849.000	-28.916	
Band 4	REL99	Lower	1710.000	-27.687	
		Upper	1710.000	-29.177	
	HSDPA	Lower	1755.000	-30.299	
		Upper	1755.000	-29.975	
Band 2	REL99	Lower	1850.000	-24.951	
		Upper	1910.000	-26.284	
	HSDPA	Lower	1850.000	-28.974	
		Upper	1910.000	-28.190	

LTE 2

Bandwidth	Mode	Side	RB Status	f [MHz]	Level [dBm]	Limit [dBm]
20 MHz	QPSK	Lower	1RB	1850.000	-31.171	-13.00
			FRB	1850.000	-31.434	
		Upper	1RB	1910.000	-30.525	
			FRB	1910.000	-30.413	
	16QAM	Lower	1RB	1850.000	-33.185	
			FRB	1850.000	-33.332	
		Upper	1RB	1910.000	-35.341	
			FRB	1910.000	-32.054	
15 MHz	QPSK	Lower	1RB	1850.000	-31.260	
			FRB	1850.000	-29.849	
		Upper	1RB	1910.000	-28.118	
			FRB	1910.000	-29.547	
	16QAM	Lower	1RB	1850.000	-33.064	
			FRB	1850.000	-34.018	
		Upper	1RB	1910.000	-29.384	
			FRB	1910.000	-31.853	
10 MHz	QPSK	Lower	1RB	1850.000	-34.048	
			FRB	1850.000	-29.672	
		Upper	1RB	1910.000	-30.890	
			FRB	1910.000	-29.357	
	16QAM	Lower	1RB	1850.000	-34.760	
			FRB	1850.000	-33.199	
		Upper	1RB	1910.000	-29.411	
			FRB	1910.000	-31.311	
5 MHz	QPSK	Lower	1RB	1850.000	-22.152	
			FRB	1850.000	-29.332	
		Upper	1RB	1910.000	-19.921	
			FRB	1910.000	-27.822	
	16QAM	Lower	1RB	1850.000	-23.747	
			FRB	1850.000	-28.123	
		Upper	1RB	1910.000	-22.754	
			FRB	1910.000	-28.607	

Bandwidth	Mode	Side	RB Status	f [MHz]	Level [dBm]	Limit [dBm]
3 MHz	QPSK	Lower	1RB	1850.000	-21.611	-13.00
			FRB	1850.000	-26.219	
		Upper	1RB	1910.000	-19.756	
			FRB	1910.000	-25.253	
	16QAM	Lower	1RB	1850.000	-19.374	
			FRB	1850.000	-28.016	
		Upper	1RB	1910.000	-19.804	
			FRB	1910.000	-27.411	
1.4 MHz	QPSK	Lower	1RB	1850.000	-26.172	-13.00
			FRB	1850.000	-27.993	
		Upper	1RB	1910.000	-24.561	
			FRB	1910.000	-26.885	
	16QAM	Lower	1RB	1850.000	-25.377	
			FRB	1850.000	-29.178	
		Upper	1RB	1910.000	-23.570	
			FRB	1910.000	-27.671	

LTE 5

Bandwidth	Mode	Side	RB Status	f [MHz]	Level [dBm]	Limit [dBm]
10 MHz	QPSK	Lower	1RB	824.000	-33.420	-13.00
			FRB	824.000	-28.969	
		Upper	1RB	849.000	-29.234	
			FRB	849.000	-32.337	
	16QAM	Lower	1RB	824.000	-33.556	
			FRB	824.000	-31.558	
		Upper	1RB	849.000	-28.631	
			FRB	849.000	-33.291	
5 MHz	QPSK	Lower	1RB	824.000	-20.251	
			FRB	824.000	-29.145	
		Upper	1RB	849.000	-20.180	
			FRB	849.000	-28.932	
	16QAM	Lower	1RB	824.000	-22.590	
			FRB	824.000	-29.514	
		Upper	1RB	849.000	-19.060	
			FRB	849.000	-30.573	
3 MHz	QPSK	Lower	1RB	824.000	-19.643	
			FRB	824.000	-28.837	
		Upper	1RB	849.000	-19.136	
			FRB	849.000	-27.972	
	16QAM	Lower	1RB	824.000	-20.532	
			FRB	824.000	-29.060	
		Upper	1RB	849.000	-19.598	
			FRB	849.000	-29.491	
1.4 MHz	QPSK	Lower	1RB	824.000	-21.584	
			FRB	824.000	-29.643	
		Upper	1RB	849.000	-21.243	
			FRB	849.000	-29.853	
	16QAM	Lower	1RB	824.000	-23.248	
			FRB	824.000	-30.896	
		Upper	1RB	849.000	-23.964	
			FRB	849.000	-31.294	

LTE 12

Bandwidth	Mode	Side	RB Status	f [MHz]	Level [dBm]	Limit [dBm]
10 MHz	QPSK	Lower	1RB	699.000	-34.663	-13.00
			FRB	699.000	-36.339	
		Upper	1RB	716.000	-32.804	
			FRB	716.000	-35.192	
	16QAM	Lower	1RB	699.000	-33.785	
			FRB	699.000	-35.151	
		Upper	1RB	716.000	-28.351	
			FRB	716.000	-36.205	
5 MHz	QPSK	Lower	1RB	699.000	-21.688	
			FRB	699.000	-31.649	
		Upper	1RB	716.000	-23.148	
			FRB	716.000	-31.476	
	16QAM	Lower	1RB	699.000	-24.002	
			FRB	699.000	-32.567	
		Upper	1RB	716.000	-21.811	
			FRB	716.000	-33.603	
3 MHz	QPSK	Lower	1RB	699.000	-21.919	
			FRB	699.000	-30.124	
		Upper	1RB	716.000	-21.229	
			FRB	716.000	-29.880	
	16QAM	Lower	1RB	699.000	-23.233	
			FRB	699.000	-31.066	
		Upper	1RB	716.000	-20.903	
			FRB	716.000	-30.011	
1.4 MHz	QPSK	Lower	1RB	699.000	-27.654	
			FRB	699.000	-32.497	
		Upper	1RB	716.000	-26.822	
			FRB	716.000	-32.967	
	16QAM	Lower	1RB	699.000	-27.184	
			FRB	699.000	-32.332	
		Upper	1RB	716.000	-27.055	
			FRB	716.000	-34.384	

LTE 66

Bandwidth	Mode	Side	RB Status	f [MHz]	Level [dBm]	Limit [dBm]
20 MHz	QPSK	Lower	1RB	1710.000	-35.190	-13.00
			FRB	1710.000	-36.074	
		Upper	1RB	1780.000	-31.155	
			FRB	1780.000	-31.763	
	16QAM	Lower	1RB	1710.000	-33.130	
			FRB	1710.000	-36.353	
		Upper	1RB	1780.000	-30.259	
			FRB	1780.000	-34.746	
15 MHz	QPSK	Lower	1RB	1710.000	-28.579	
			FRB	1710.000	-34.422	
		Upper	1RB	1780.000	-30.687	
			FRB	1780.000	-32.830	
	16QAM	Lower	1RB	1710.000	-27.157	
			FRB	1710.000	-35.641	
		Upper	1RB	1780.000	-34.604	
			FRB	1780.000	-34.752	
10 MHz	QPSK	Lower	1RB	1710.000	-35.437	
			FRB	1710.000	-31.510	
		Upper	1RB	1780.000	-31.220	
			FRB	1780.000	-29.310	
	16QAM	Lower	1RB	1710.000	-35.771	
			FRB	1710.000	-33.462	
		Upper	1RB	1780.000	-33.596	
			FRB	1780.000	-32.689	
5 MHz	QPSK	Lower	1RB	1710.000	-22.185	
			FRB	1710.000	-28.000	
		Upper	1RB	1780.000	-22.440	
			FRB	1780.000	-26.961	
	16QAM	Lower	1RB	1710.000	-23.253	
			FRB	1710.000	-29.557	
		Upper	1RB	1780.000	-22.656	
			FRB	1780.000	-29.141	

Bandwidth	Mode	Side	RB Status	f [MHz]	Level [dBm]	Limit [dBm]
3 MHz	QPSK	Lower	1RB	1710.000	-20.228	-13.00
			FRB	1710.000	-27.065	
		Upper	1RB	1780.000	-17.511	
			FRB	1780.000	-26.449	
	16QAM	Lower	1RB	1710.000	-19.865	
			FRB	1710.000	-28.567	
		Upper	1RB	1780.000	-18.763	
			FRB	1780.000	-27.934	
1.4 MHz	QPSK	Lower	1RB	1710.000	-24.813	-13.00
			FRB	1710.000	-26.048	
		Upper	1RB	1780.000	-20.883	
			FRB	1780.000	-25.816	
	16QAM	Lower	1RB	1710.000	-25.096	
			FRB	1710.000	-27.844	
		Upper	1RB	1780.000	-21.612	
			FRB	1780.000	-26.676	

LTE Band 4

LTE Band 4 (Frequency range: 1710-1755 MHz) is covered by LTE Band 66 (Frequency range: 1710-1780 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

LTE Band 4

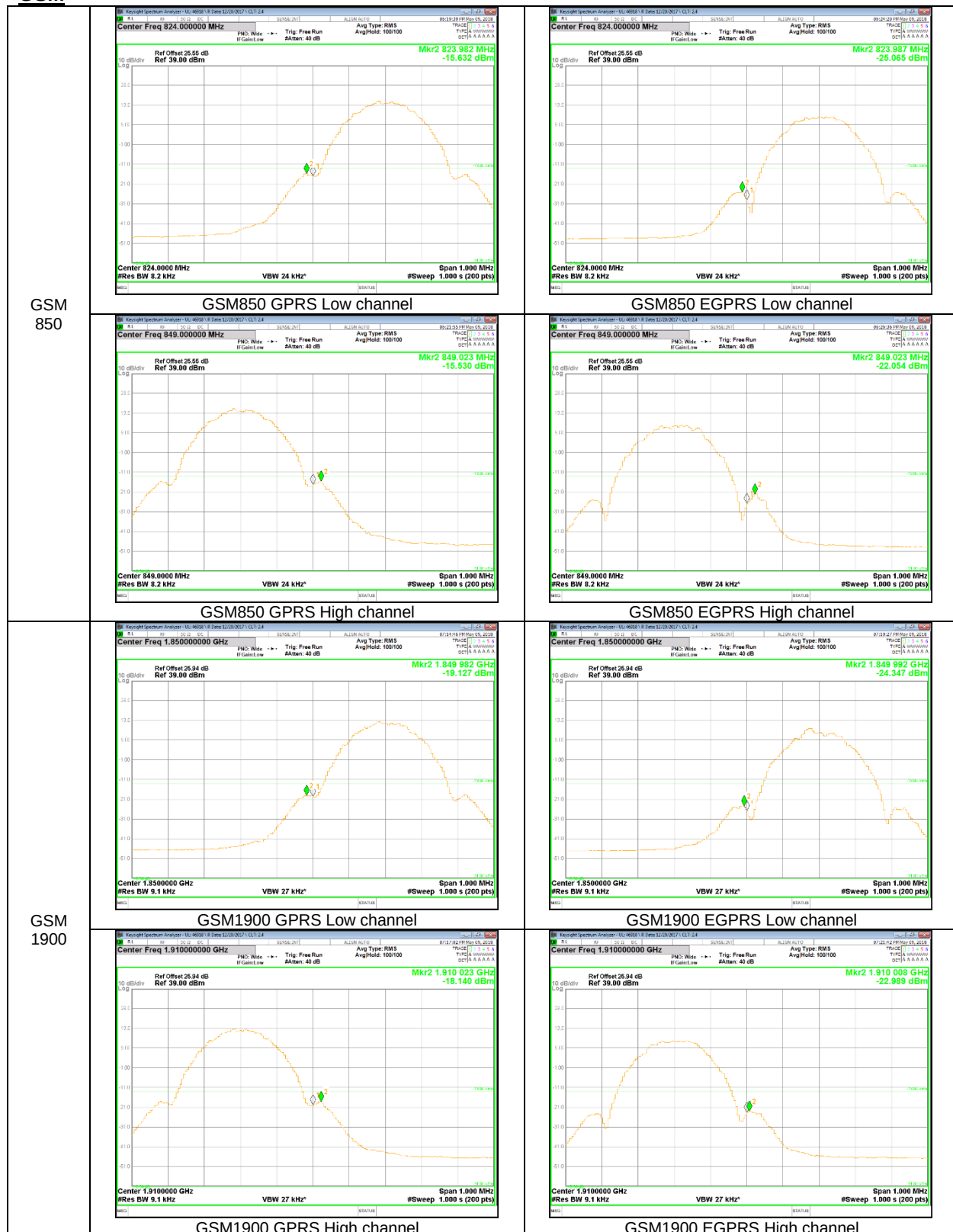
LTE Band 4 (Frequency range: 1710-1755 MHz) is covered by LTE Band 66 (Frequency range: 1710-1780 MHz) due to overlapping frequency range, lower(0.5dB) maximum tune-up limit and same channel bandwidth.

LTE 41

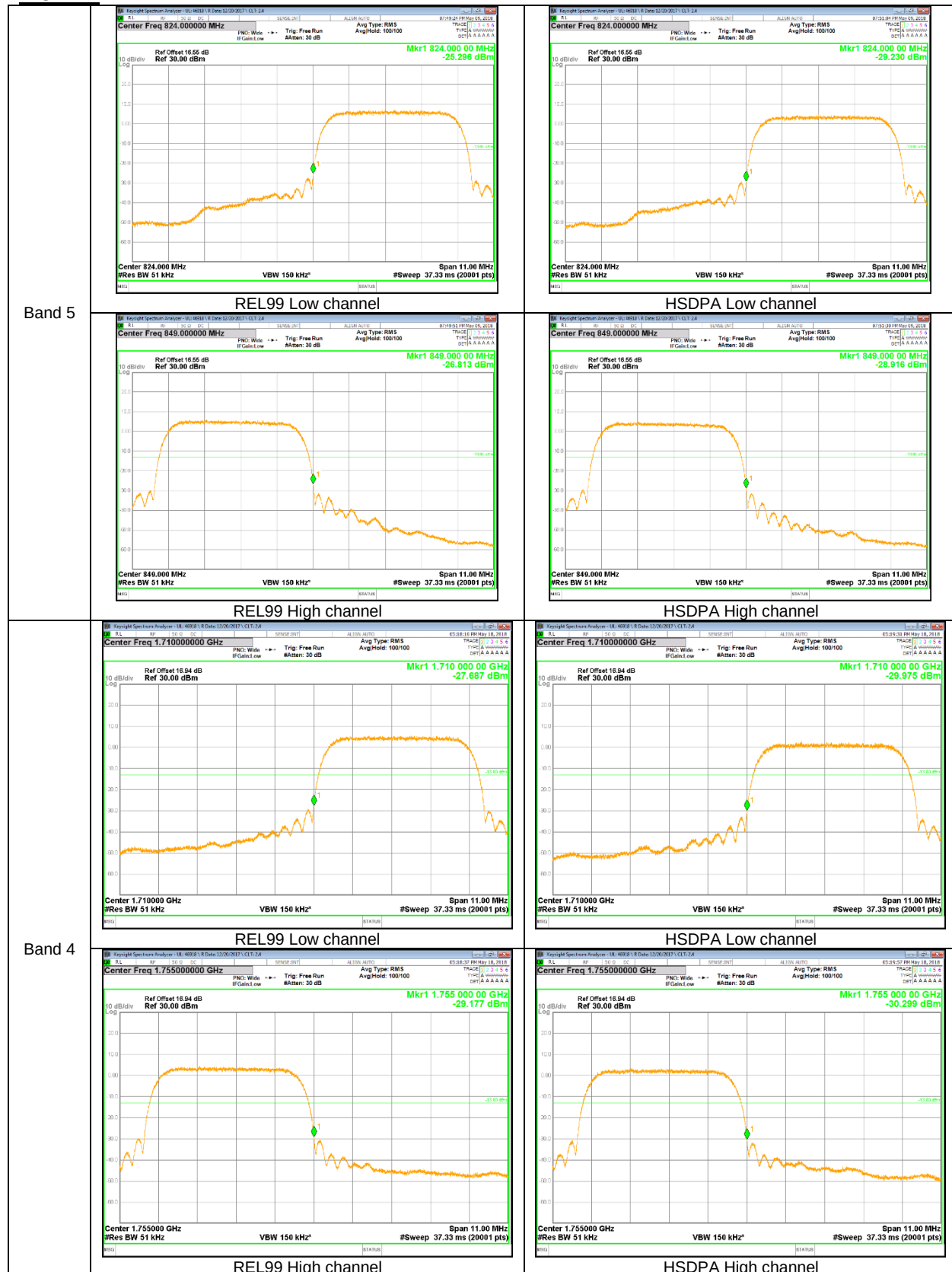
Please refer to Emission Mask Plots.

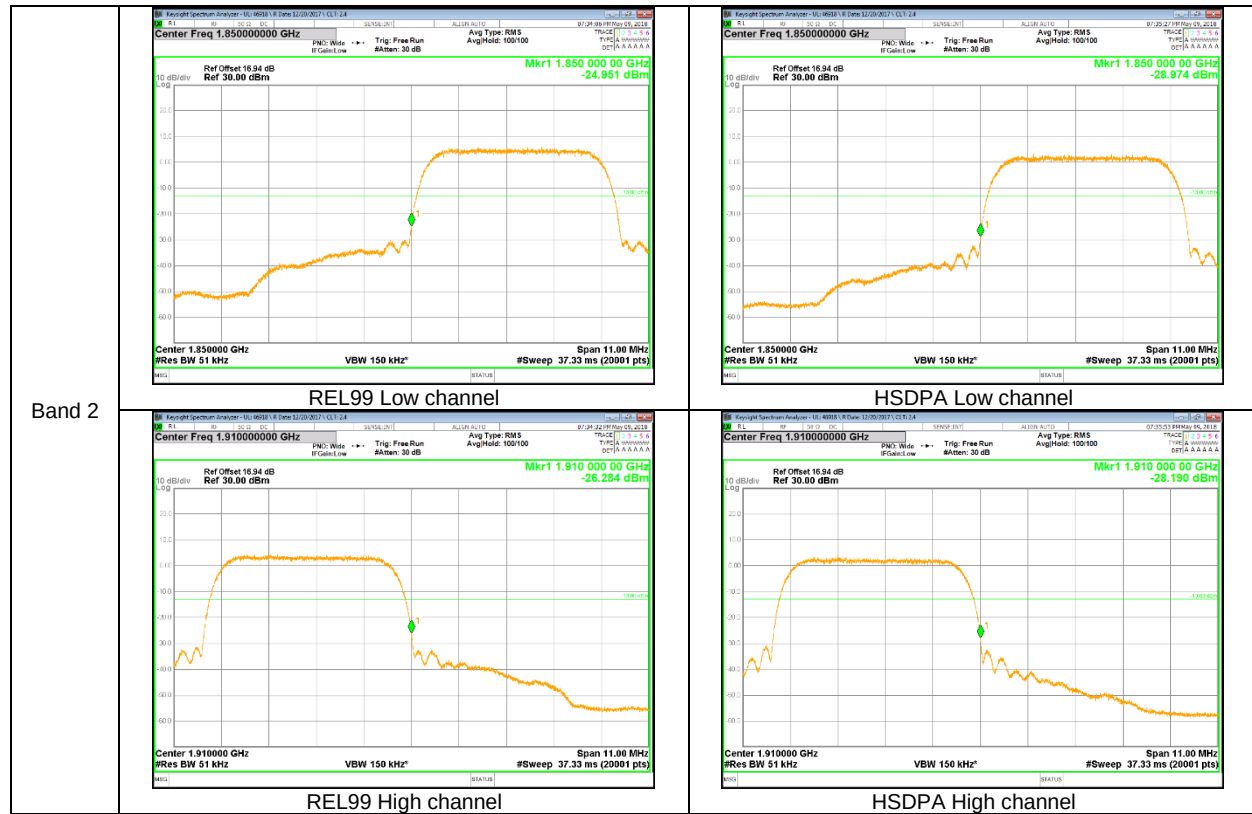
9.2.1. BAND EDGE PLOTS

GSM

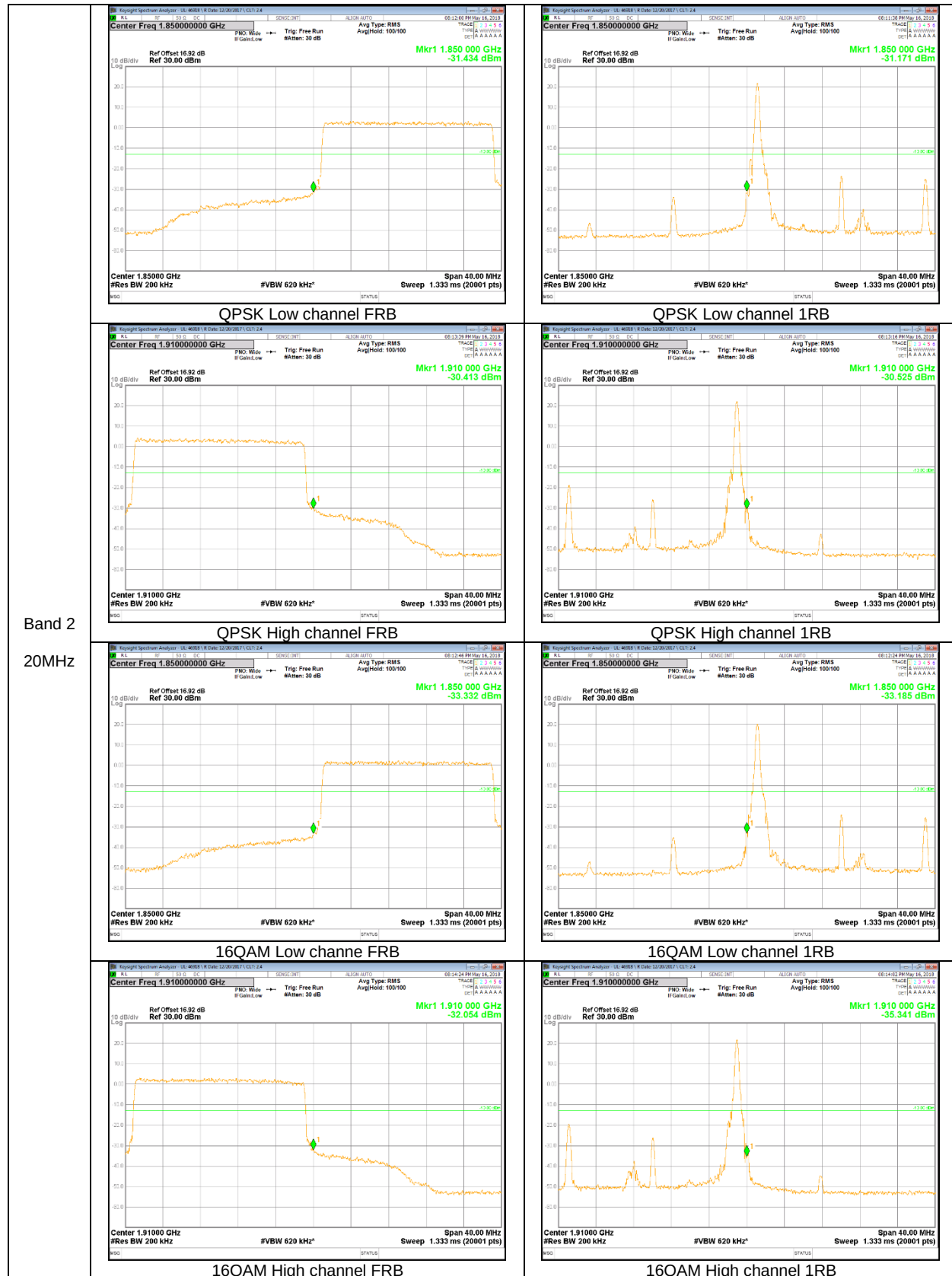


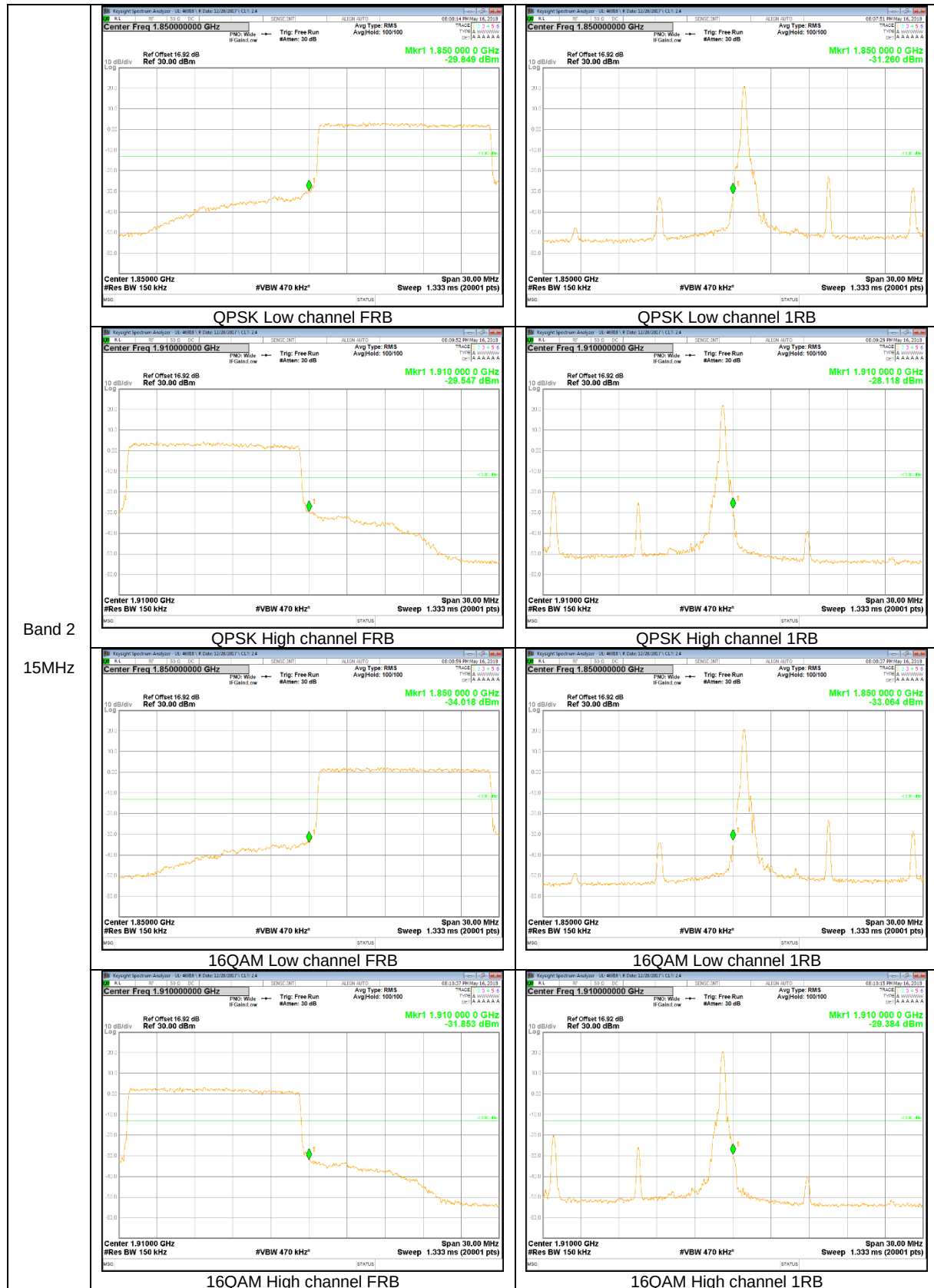
WCDMA

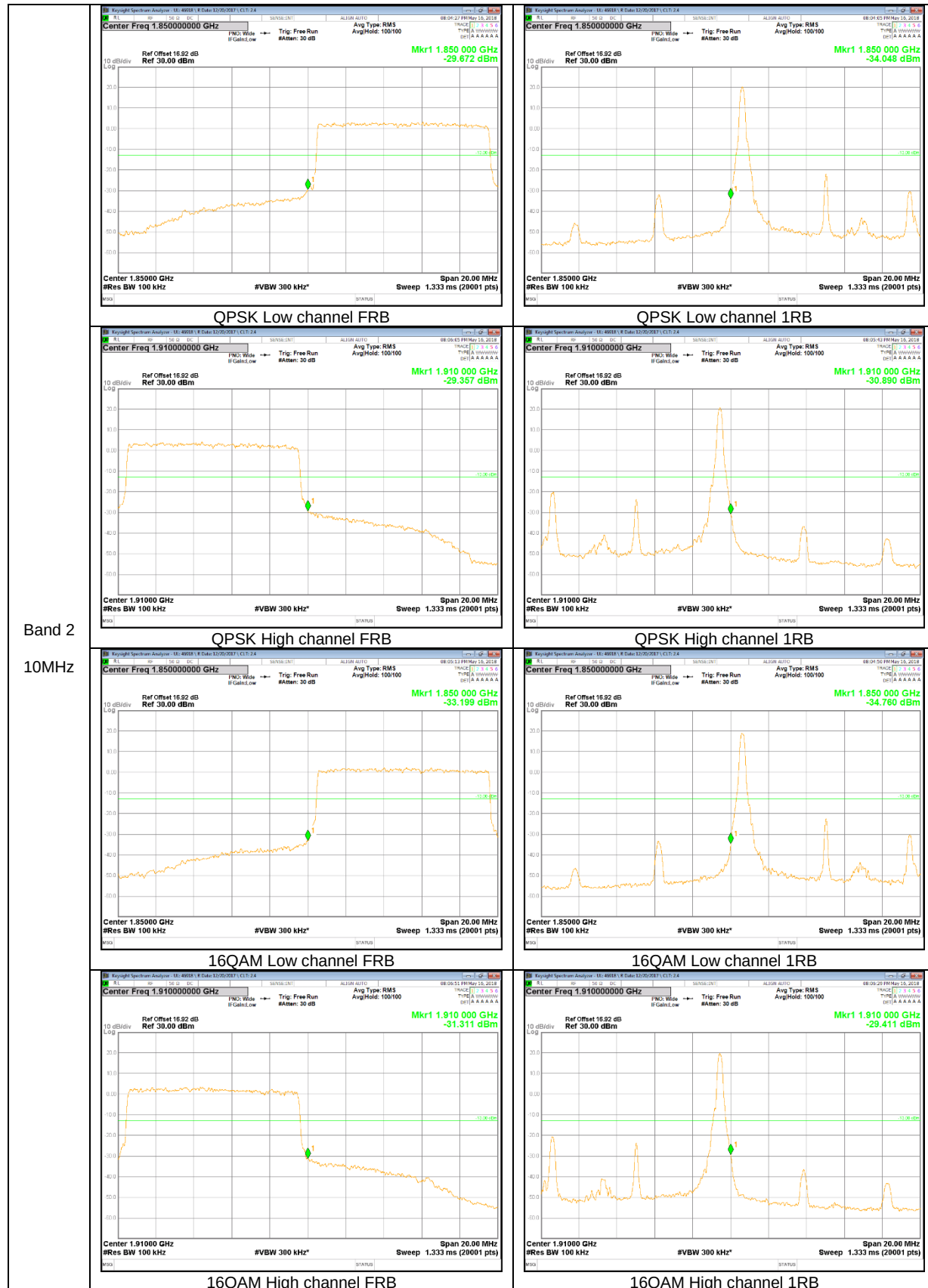


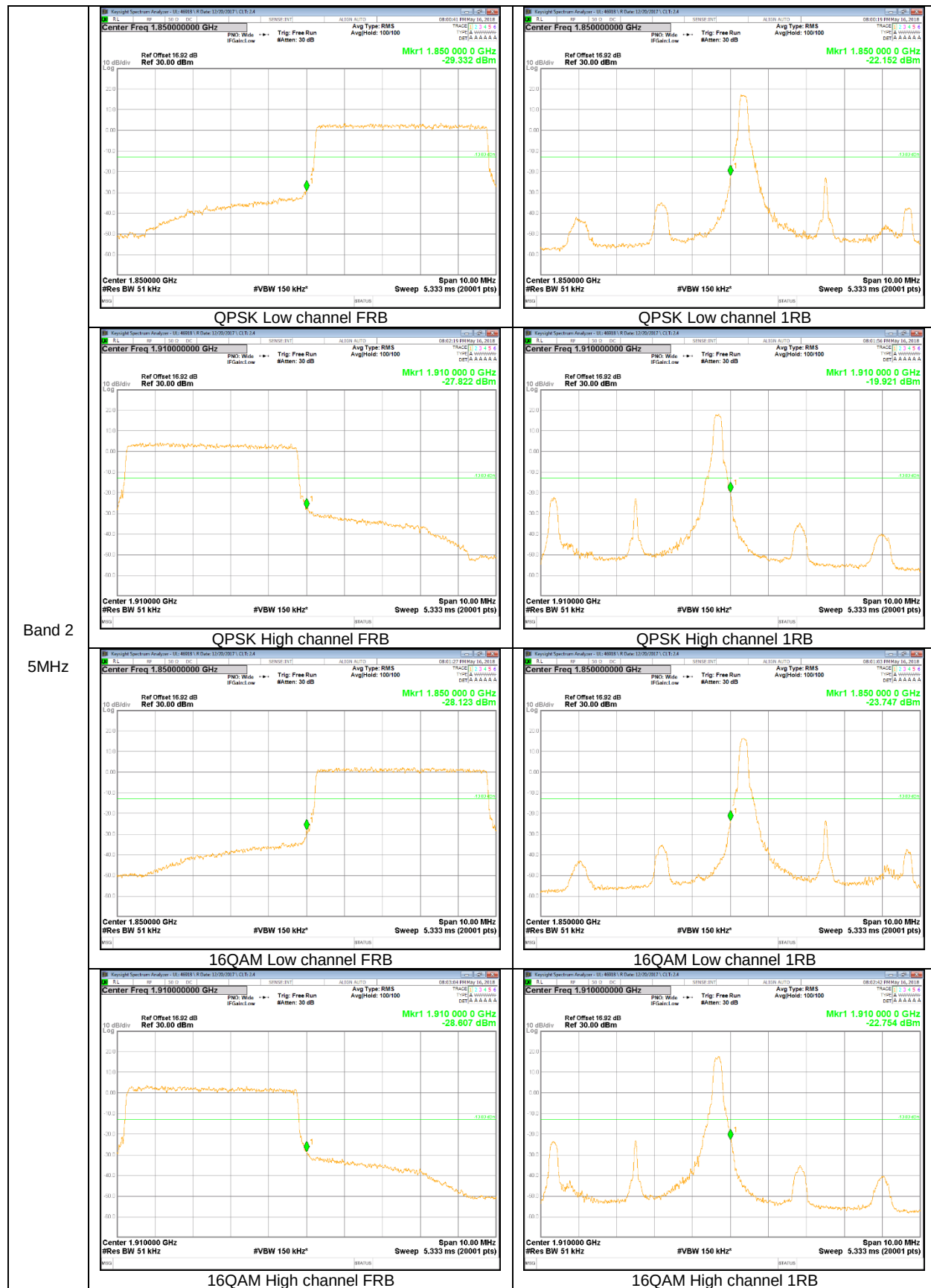


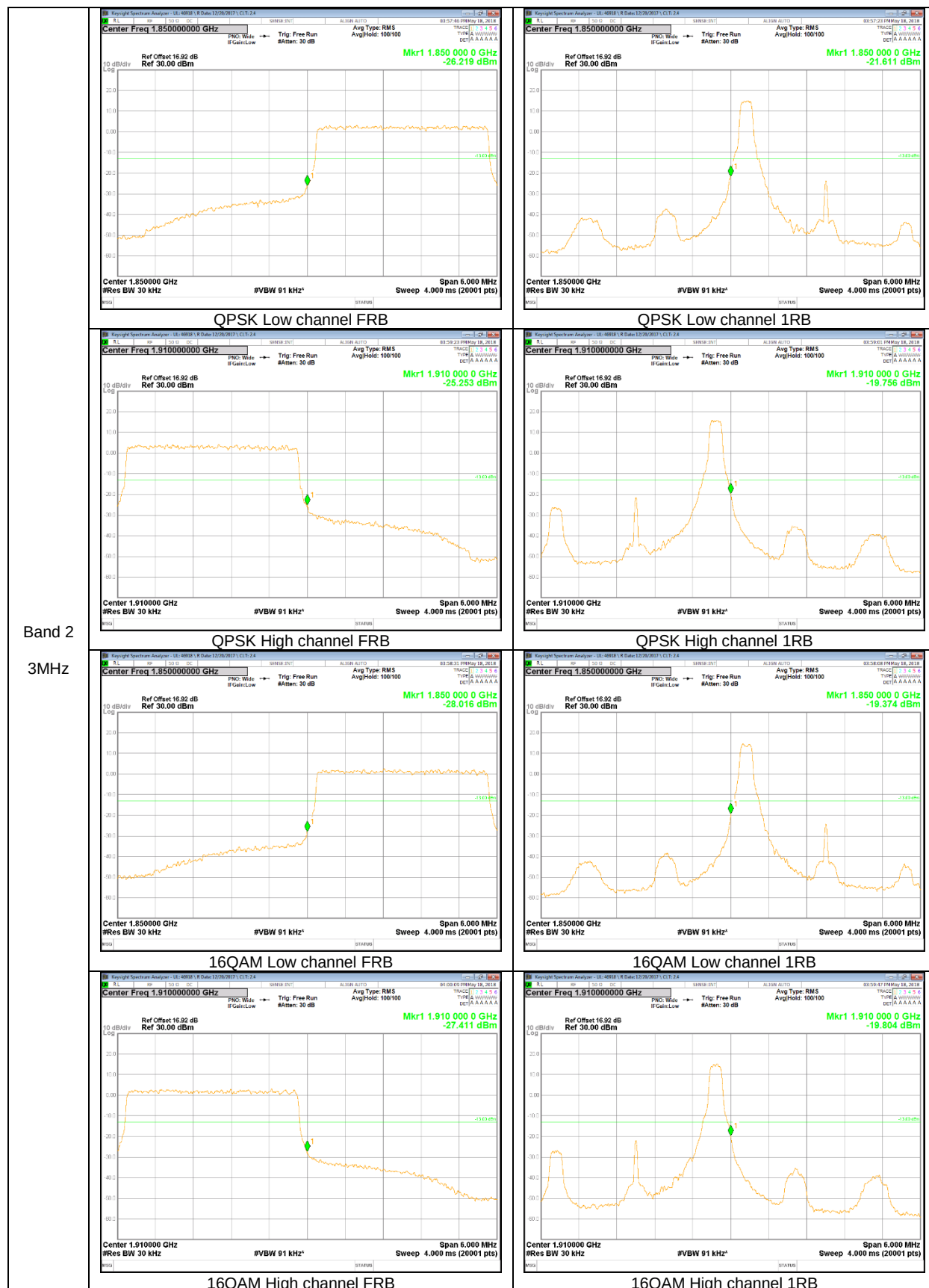
LTE Band 2

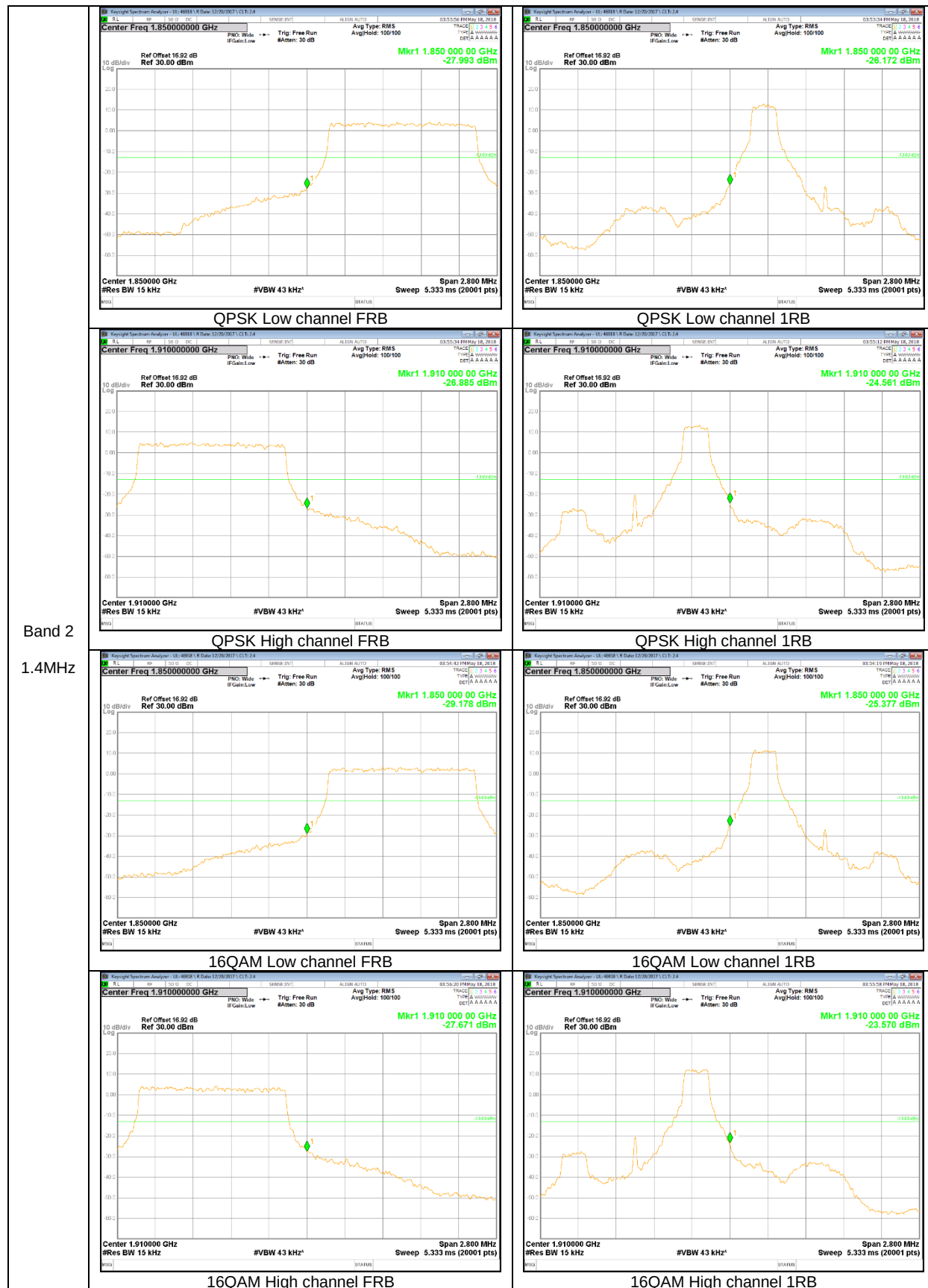












LTE Band 5

