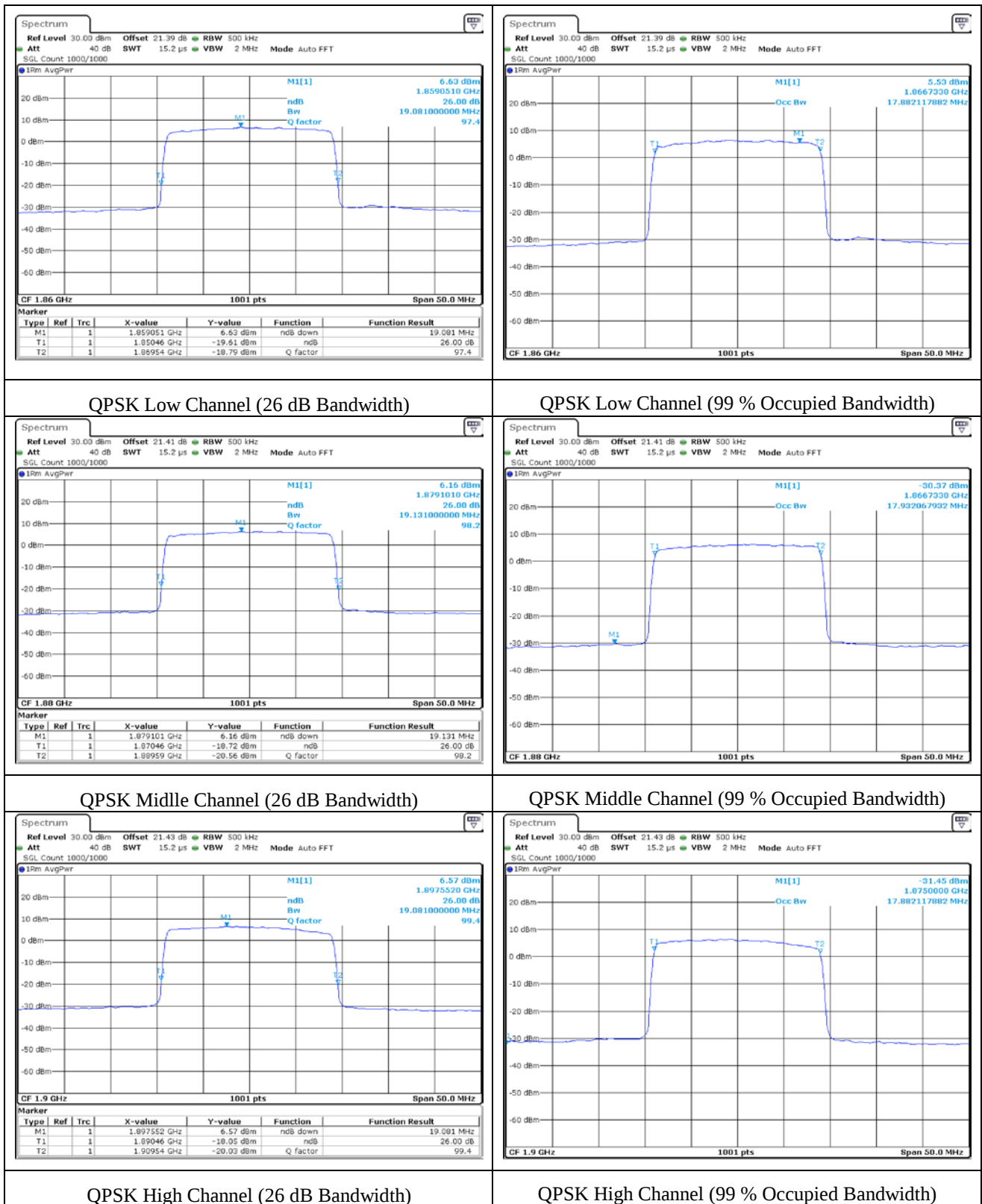
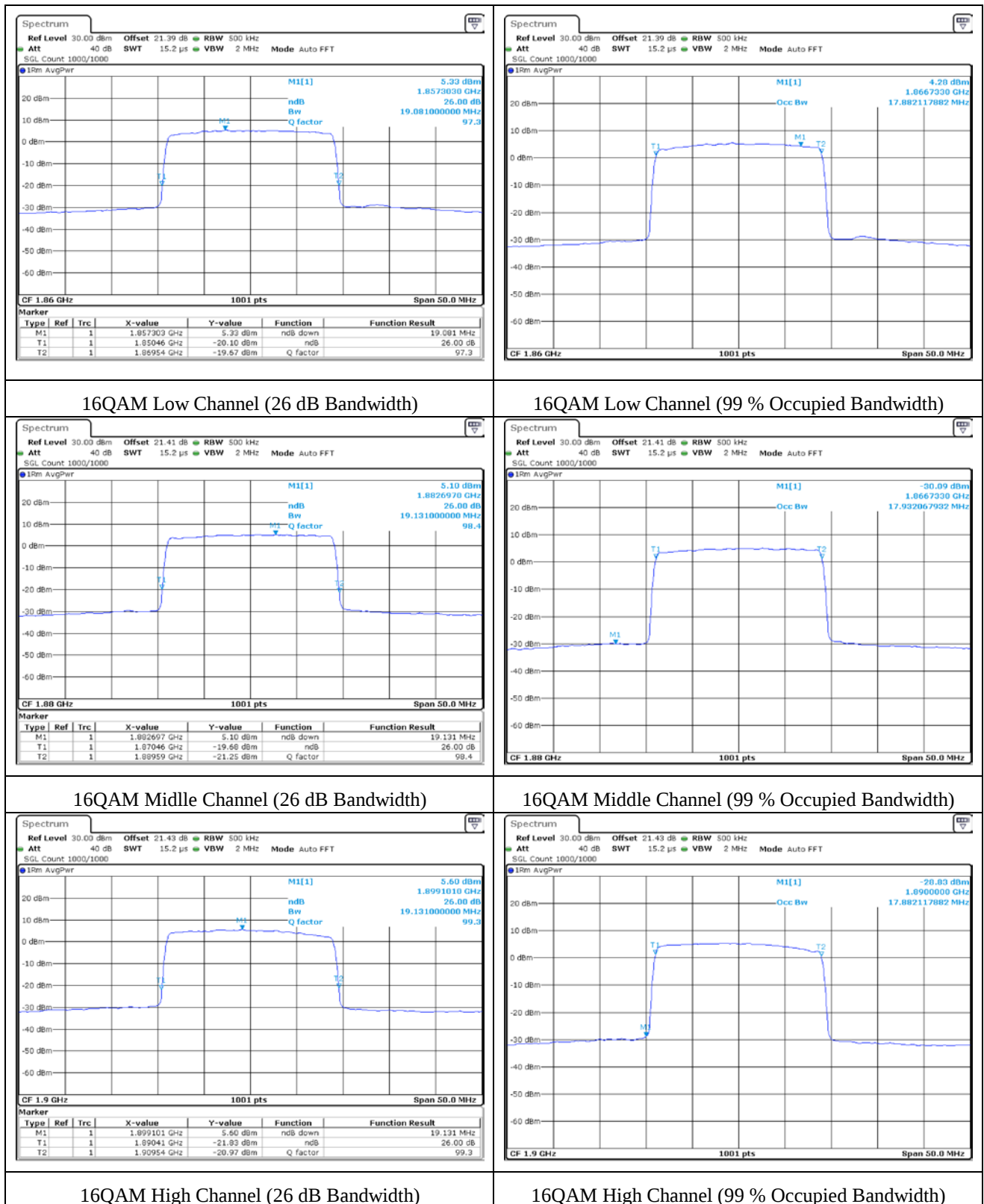


11.9 Test data for Band 2_Bandwidth 20 MHz

-. Test Result : Pass

Test Mode	Channel	26 dB Bandwidth (MHz)	99 % Occupied Bandwidth (MHz)	Result
QPSK	18700	19.08	17.88	PASS
	18900	19.13	17.93	PASS
	19100	19.08	17.88	PASS
16QAM	18700	19.08	17.88	PASS
	18900	19.13	17.93	PASS
	19100	19.13	17.88	PASS

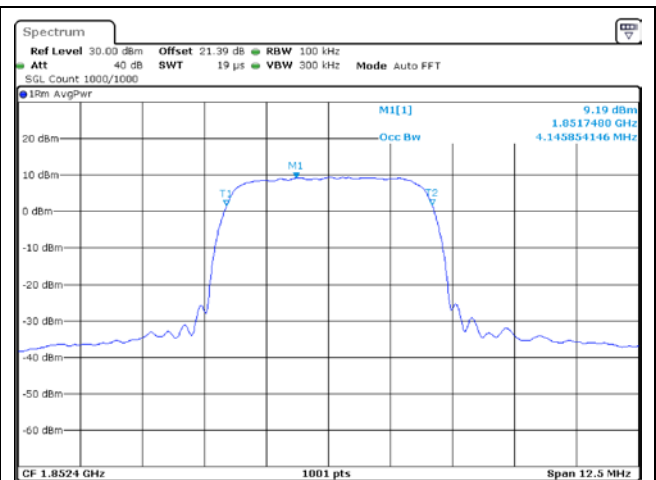
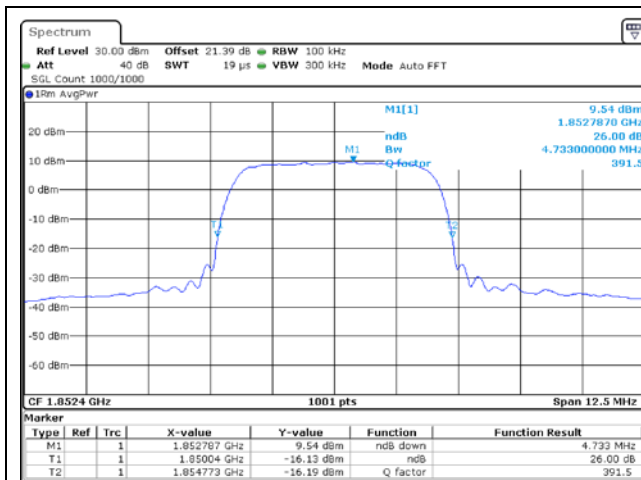




11.10 Test data for WCDMA

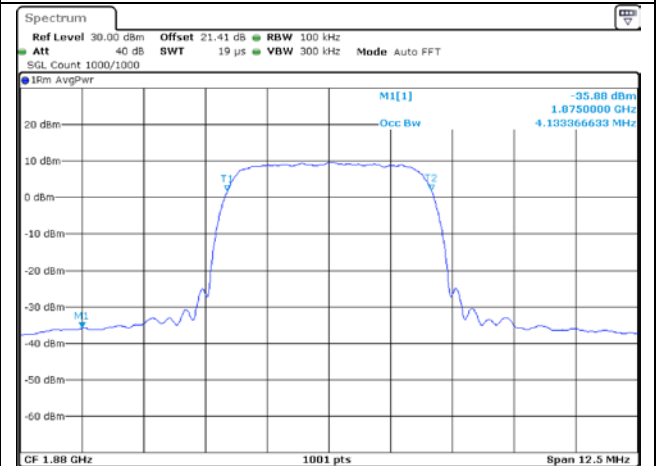
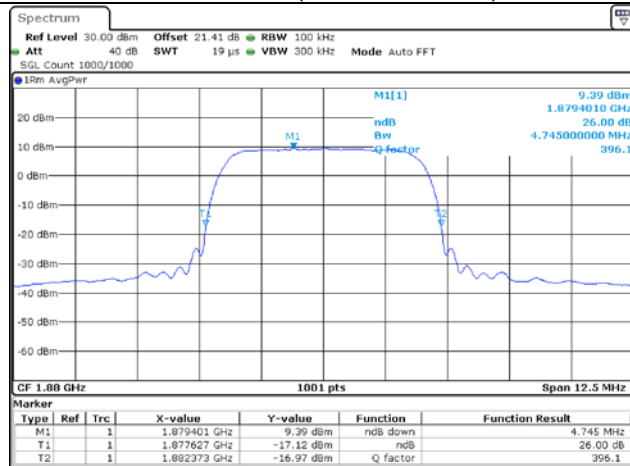
-. Test Result : Pass

Test Mode	Channel	26 dB Bandwidth (MHz)	99 % Occupied Bandwidth (MHz)	Result
RMC	9262	4.73	4.15	PASS
	9400	4.75	4.13	PASS
	9538	4.75	4.15	PASS



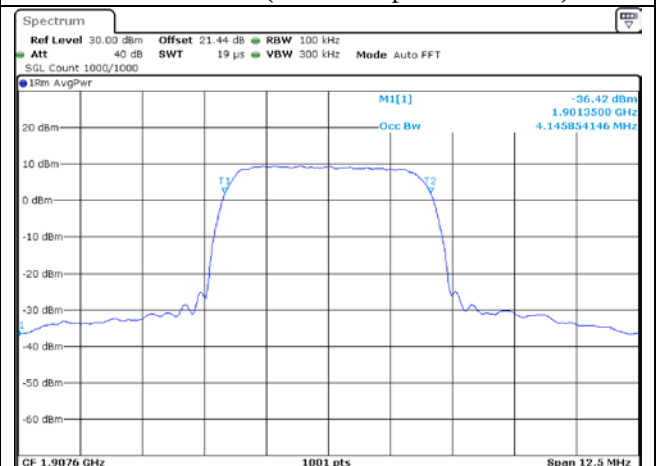
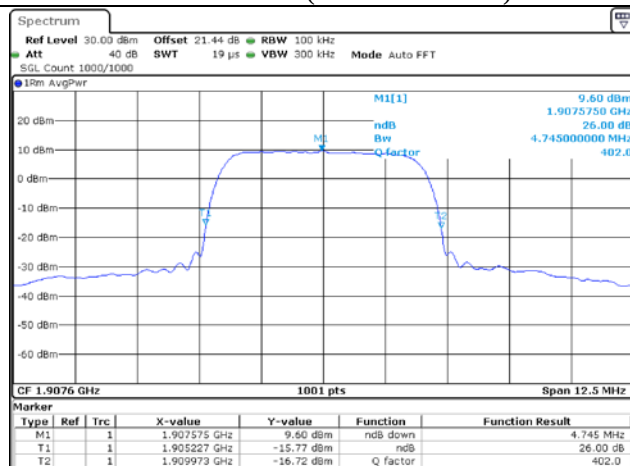
Low Channel (26 dB Bandwidth)

Low Channel (99 % Occupied Bandwidth)



Middle Channel (26 dB Bandwidth)

Middle Channel (99 % Occupied Bandwidth)



High Channel (26 dB Bandwidth)

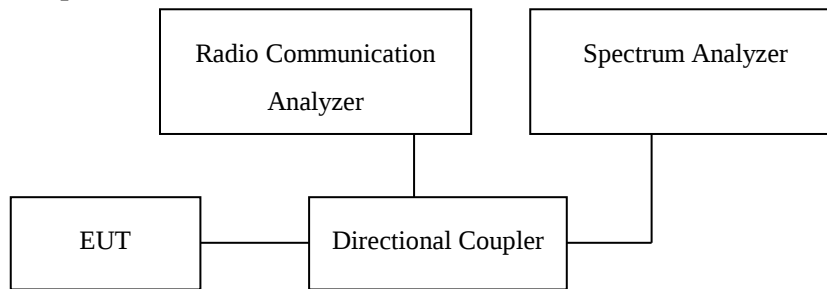
High Channel (99 % Occupied Bandwidth)

12. Conducted Band Edge

12.1 Operating environment

Temperature : 23 °C
Relative humidity : 47 % R.H.

12.2 Test set-up



(Configuration of conducted Emission measurement)

Conducted Spurious Emissions is tested in accordance with KDB971168 D01 Power Meas License Digital Systems v04, April 9, 2018, Section 6.

The EUT makes a call to the communication simulator. The power was measured with R&S Spectrum Analyzer. All measurements were done at 3 channels(low, middle and high operational range.)

The Conducted Spurious Emissions used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency.

12.3 Methods of Measurement

1. All measurements were done at low and high operational frequency range.
2. Set spectrum analyzer with RMS detector.
3. The center frequency of spectrum is the band edge frequency and set RBW of the spectrum is 1 % of the 26 dB bandwidth and VBW of the spectrum is 3 times of RBW.

12.4 Limits

Rule Part 24.238(a) specifies that “on any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB.”

$$\begin{aligned}
 &= P(W) - [43 + 10\log(P)](\text{dB}) \\
 &= [30+10\text{Log}(P)] (\text{dBm}) - [43 + 10\log(P)](\text{dB}) \\
 &= -13 \text{ dBm}
 \end{aligned}$$

Limit	-13 dBm
-------	---------

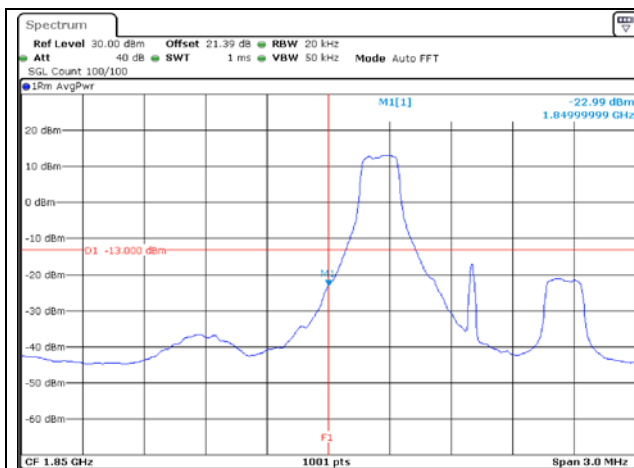
12.5 Test Date

May 17, 2021 ~ May 28, 2021

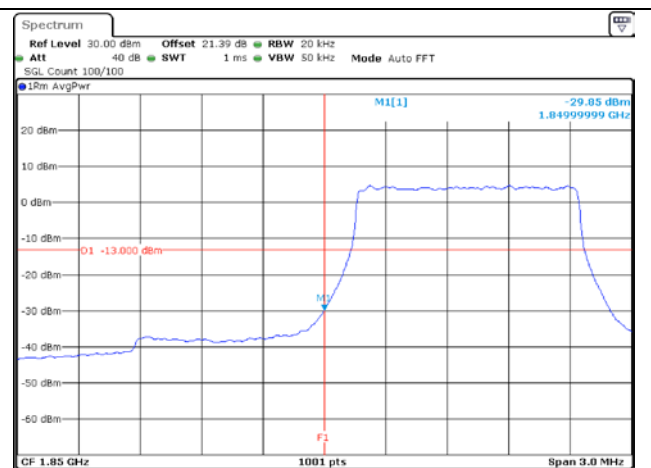
12.6 Test data for Band 2_Bandwidth 1.4 MHz

-. Test Result : Pass

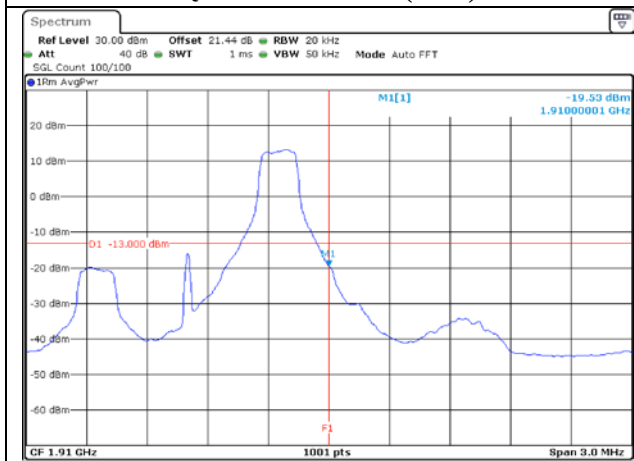
Test Mode	Channel	Edge Frequency (MHz)	Measured Value (dBm)	Limit (dBm)	Result
LTE Band 2 QPSK					
1 RB	Low	1 850	-22.99	-13.00	PASS
	High	1 910	-19.53	-13.00	PASS
Full RB	Low	1 850	-29.85	-13.00	PASS
	High	1 910	-27.82	-13.00	PASS
LTE Band 2 16QAM					
1 RB	Low	1 850	-25.03	-13.00	PASS
	High	1 910	-22.55	-13.00	PASS
Full RB	Low	1 850	-31.11	-13.00	PASS
	High	1 910	-30.54	-13.00	PASS



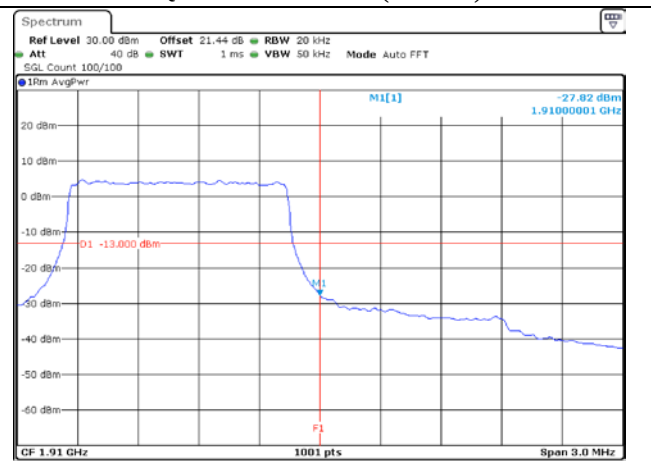
QPSK Low Channel (1 RB)



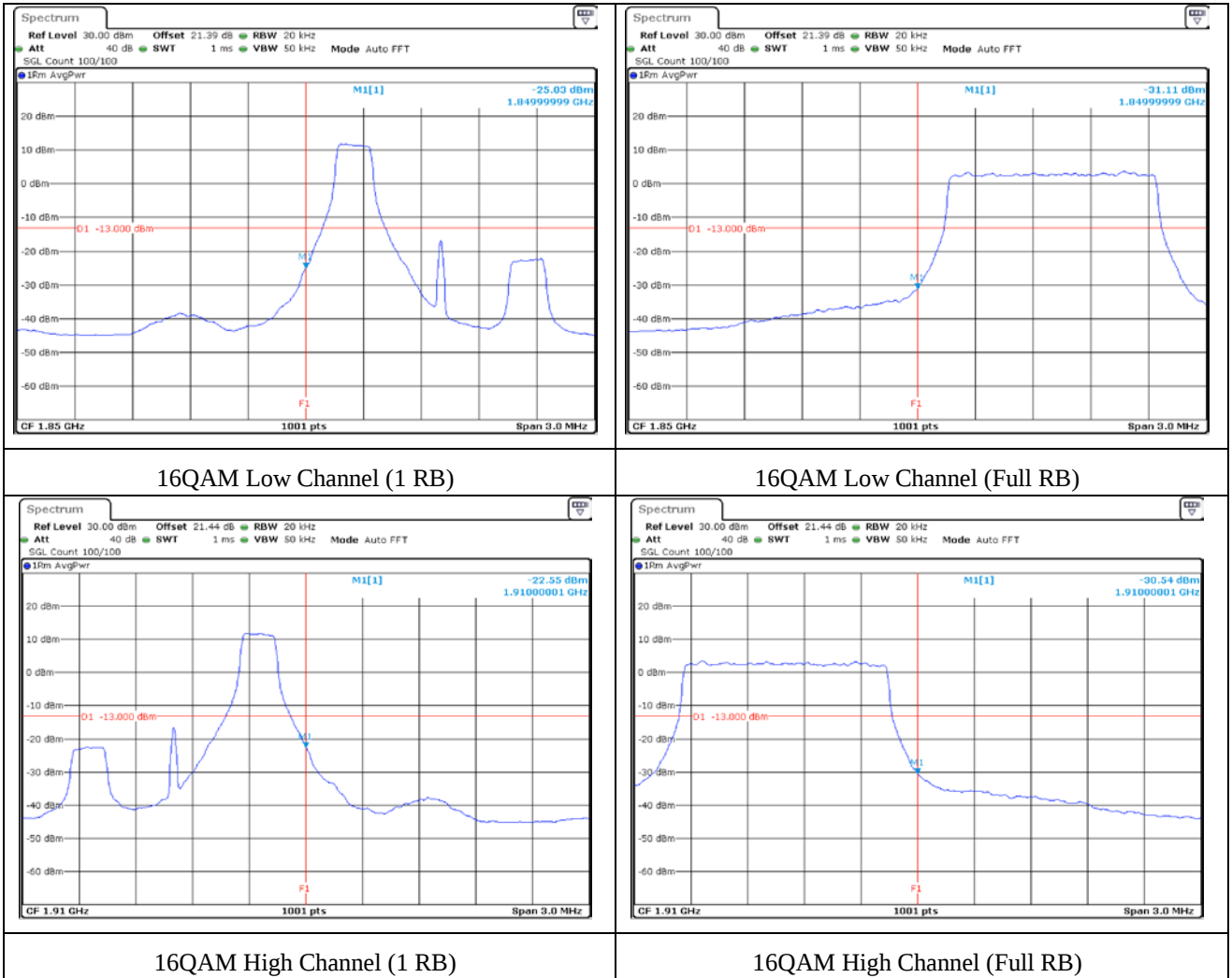
QPSK Low Channel (Full RB)



QPSK High Channel (1 RB)



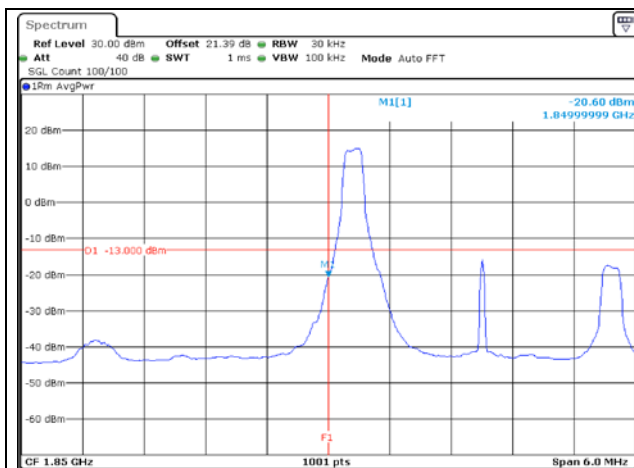
QPSK High Channel (Full RB)



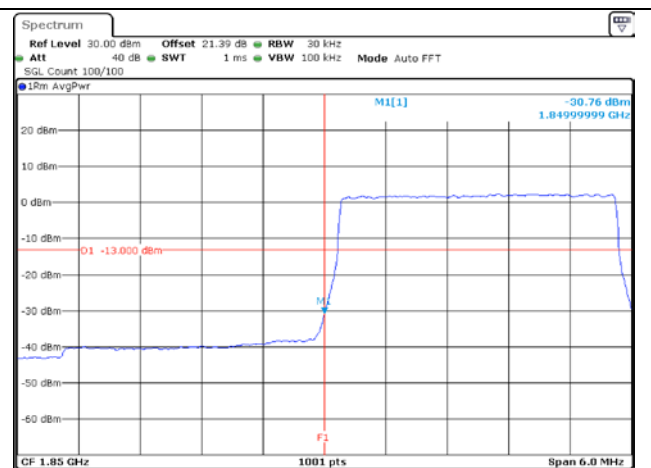
12.7 Test data for Band 2_Bandwidth 3 MHz

-. Test Result : Pass

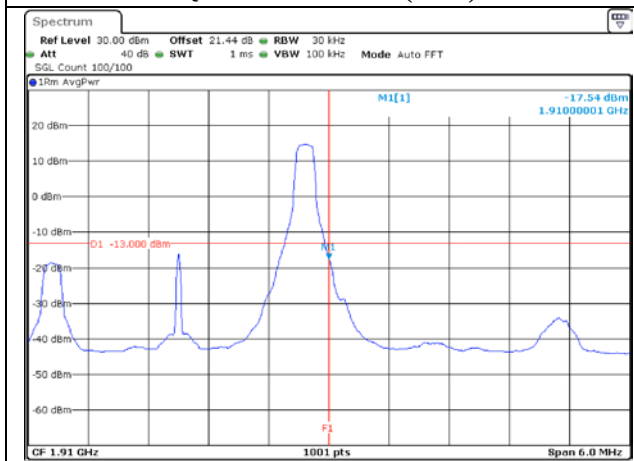
Test Mode	Channel	Edge Frequency (MHz)	Measured Value (dBm)	Limit (dBm)	Result
LTE Band 2 QPSK					
1 RB	Low	1 850	-20.60	-13.00	PASS
	High	1 910	-17.54	-13.00	PASS
Full RB	Low	1 850	-30.76	-13.00	PASS
	High	1 910	-29.46	-13.00	PASS
LTE Band 2 16QAM					
1 RB	Low	1 850	-22.80	-13.00	PASS
	High	1 910	-20.94	-13.00	PASS
Full RB	Low	1 850	-31.03	-13.00	PASS
	High	1 910	-30.66	-13.00	PASS



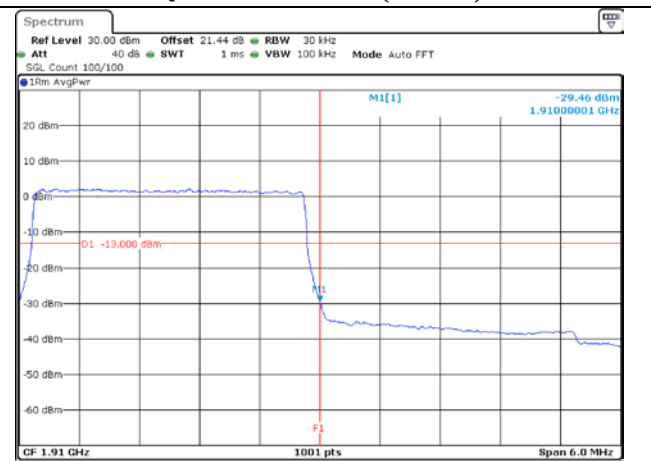
QPSK Low Channel (1 RB)



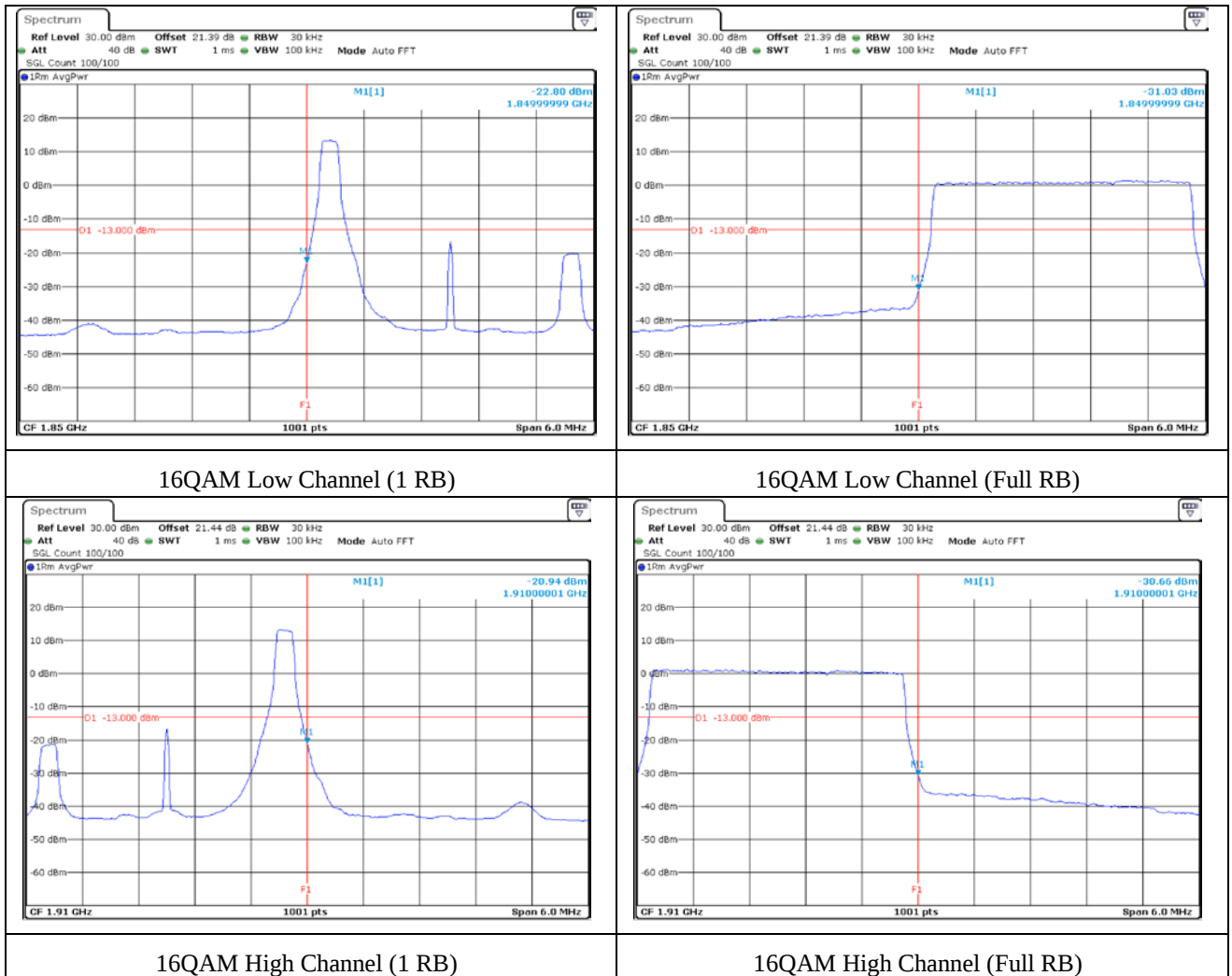
QPSK Low Channel (Full RB)



QPSK High Channel (1 RB)



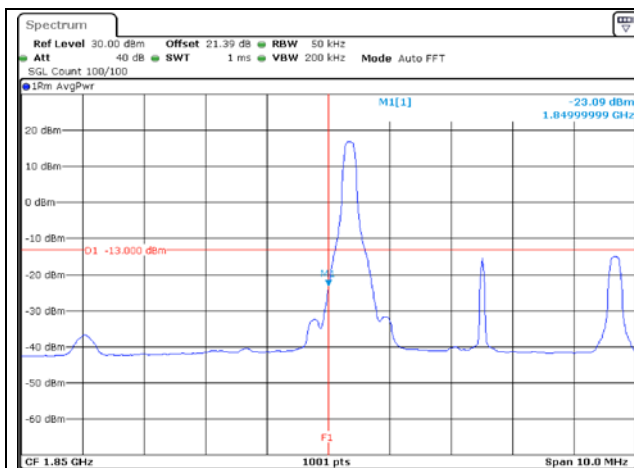
QPSK High Channel (Full RB)



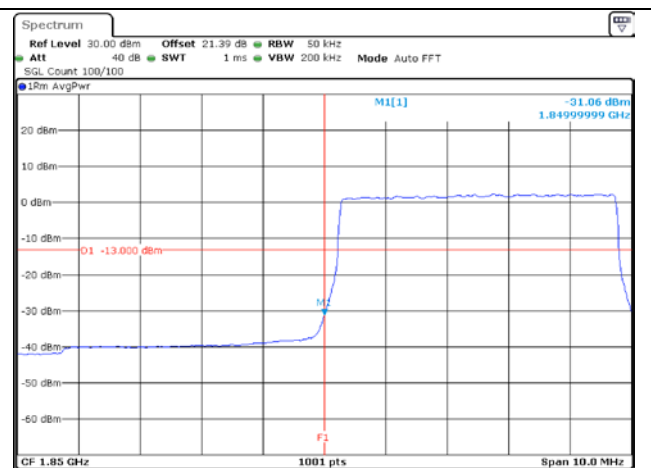
12.8 Test data for Band 2_Bandwidth 5 MHz

-. Test Result : Pass

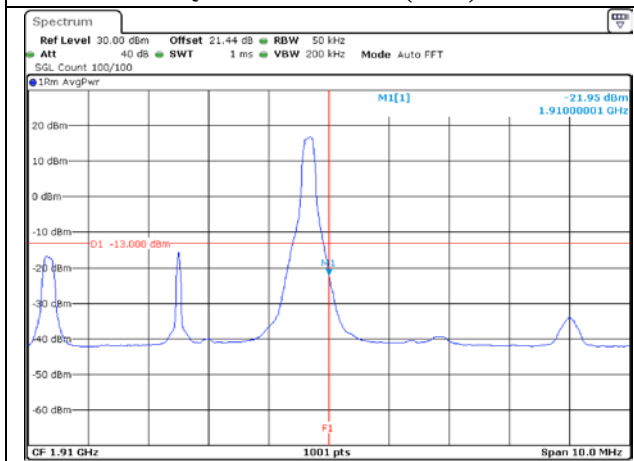
Test Mode	Channel	Edge Frequency (MHz)	Measured Value (dBm)	Limit (dBm)	Result
LTE Band 2 QPSK					
1 RB	Low	1 850	-23.09	-13.00	PASS
	High	1 910	-21.95	-13.00	PASS
Full RB	Low	1 850	-31.06	-13.00	PASS
	High	1 910	-30.42	-13.00	PASS
LTE Band 2 16QAM					
1 RB	Low	1 850	-23.81	-13.00	PASS
	High	1 910	-24.05	-13.00	PASS
Full RB	Low	1 850	-31.69	-13.00	PASS
	High	1 910	-32.17	-13.00	PASS



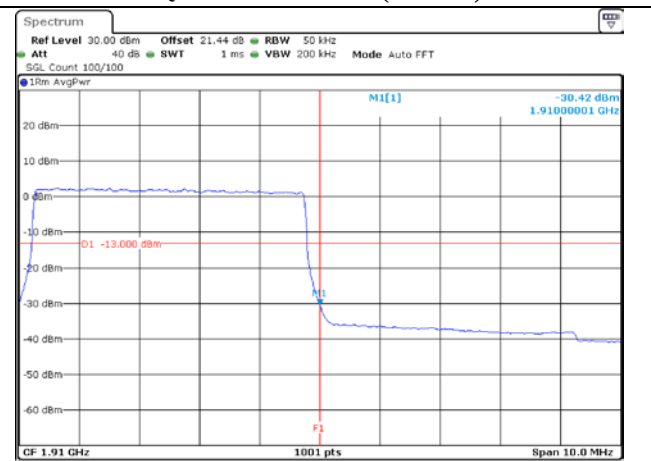
QPSK Low Channel (1 RB)



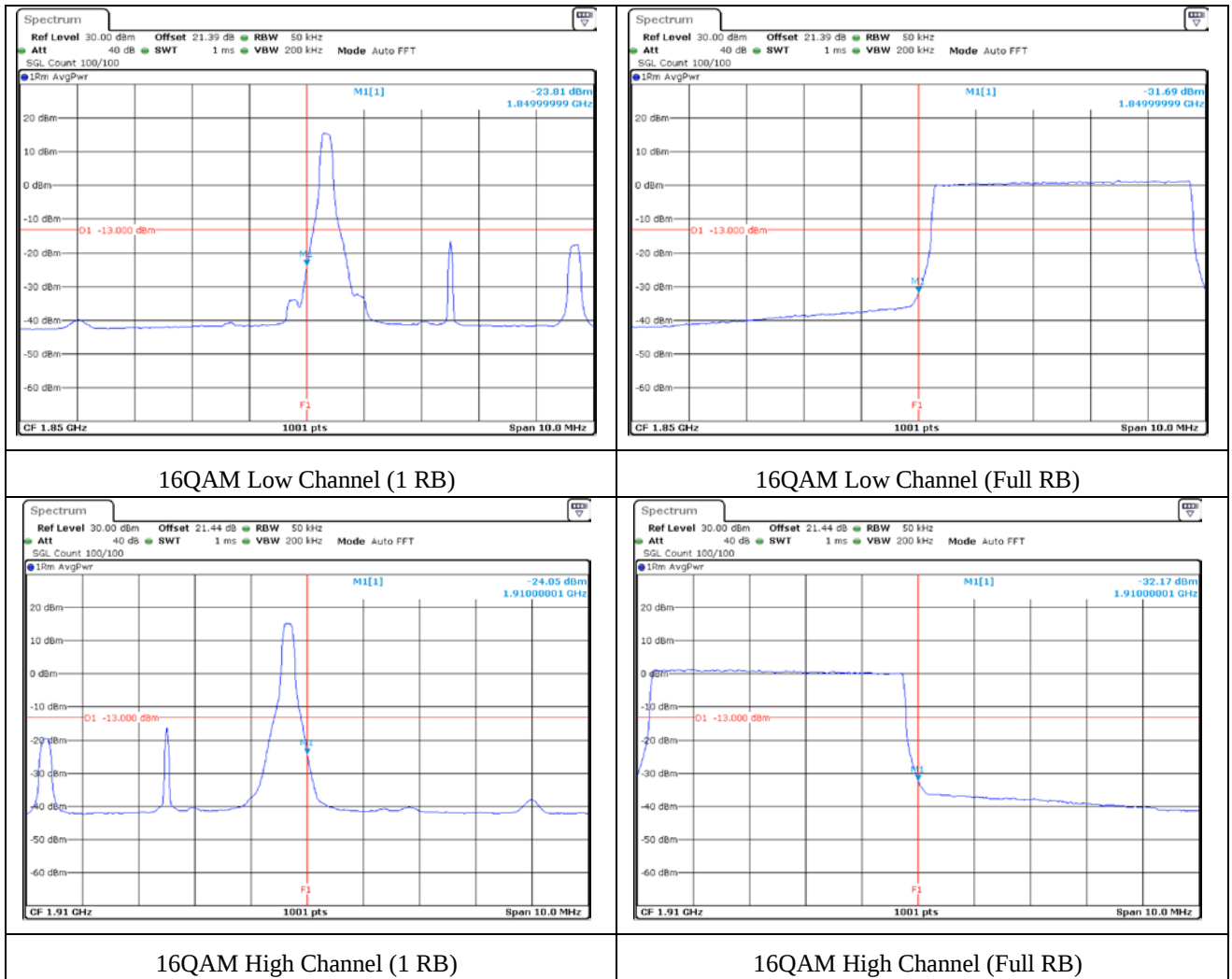
QPSK Low Channel (Full RB)



QPSK High Channel (1 RB)



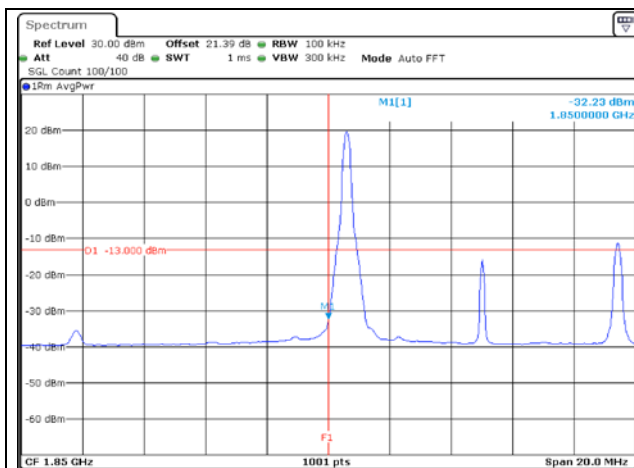
QPSK High Channel (Full RB)



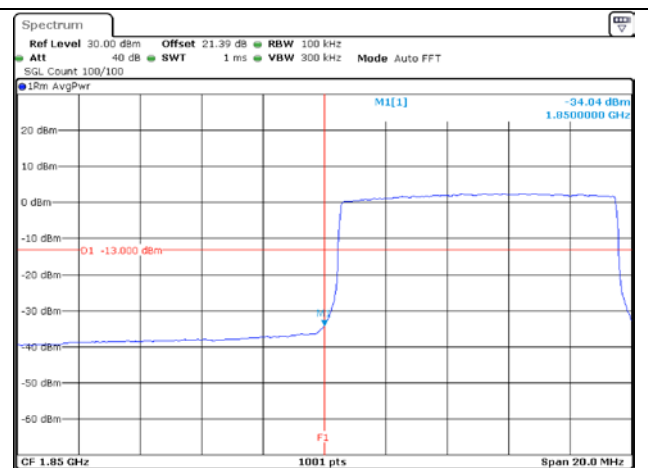
12.9 Test data for Band 2_Bandwidth 10 MHz

-. Test Result : Pass

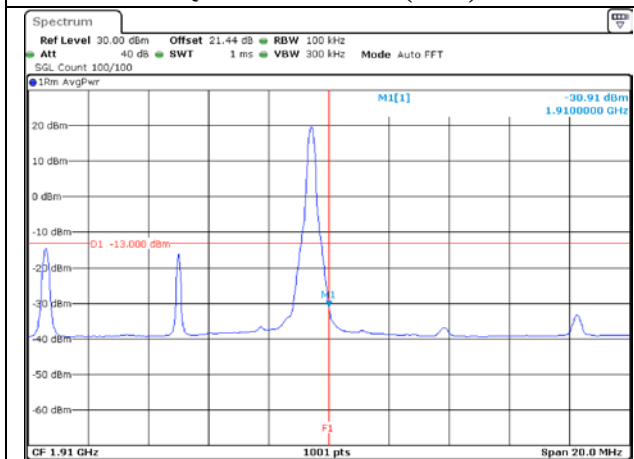
Test Mode	Channel	Edge Frequency (MHz)	Measured Value (dBm)	Limit (dBm)	Result
LTE Band 2 QPSK					
1 RB	Low	1 850	-32.23	-13.00	PASS
	High	1 910	-30.91	-13.00	PASS
Full RB	Low	1 850	-34.04	-13.00	PASS
	High	1 910	-33.38	-13.00	PASS
LTE Band 2 16QAM					
1 RB	Low	1 850	-32.83	-13.00	PASS
	High	1 910	-32.54	-13.00	PASS
Full RB	Low	1 850	-33.87	-13.00	PASS
	High	1 910	-34.06	-13.00	PASS



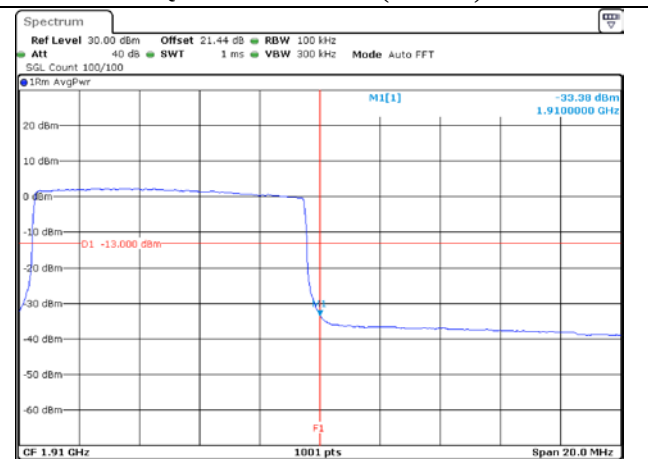
QPSK Low Channel (1 RB)



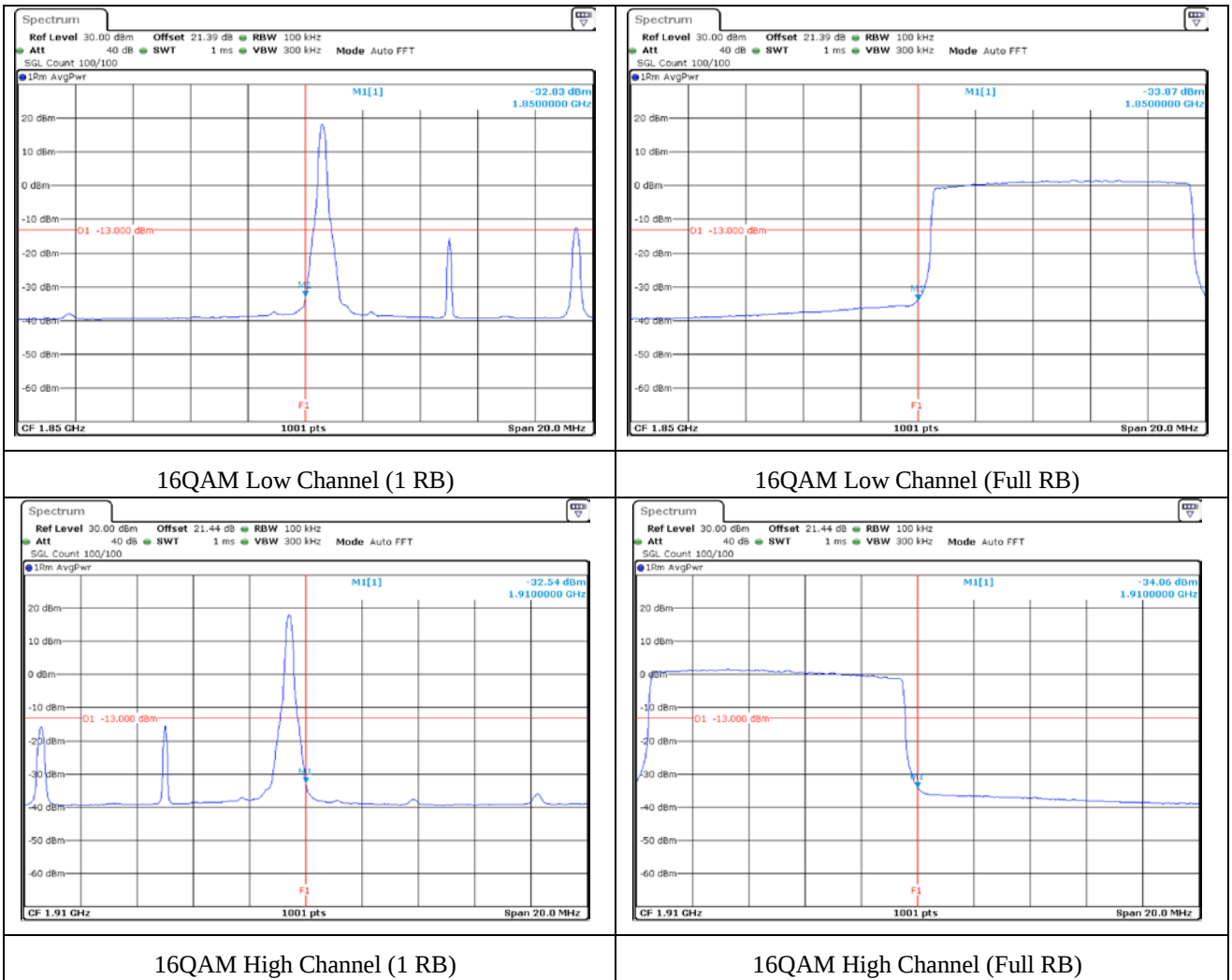
QPSK Low Channel (Full RB)



QPSK High Channel (1 RB)



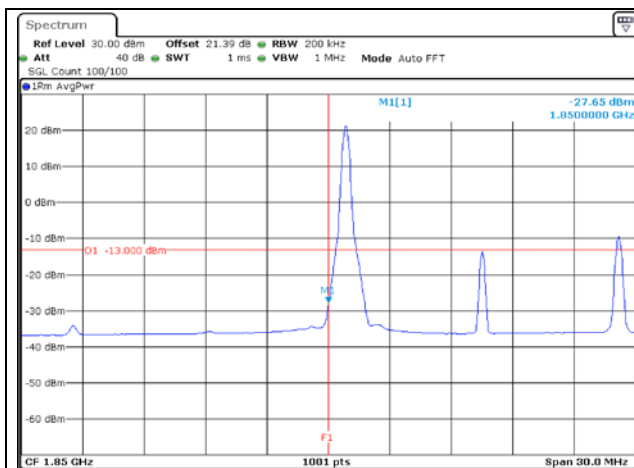
QPSK High Channel (Full RB)



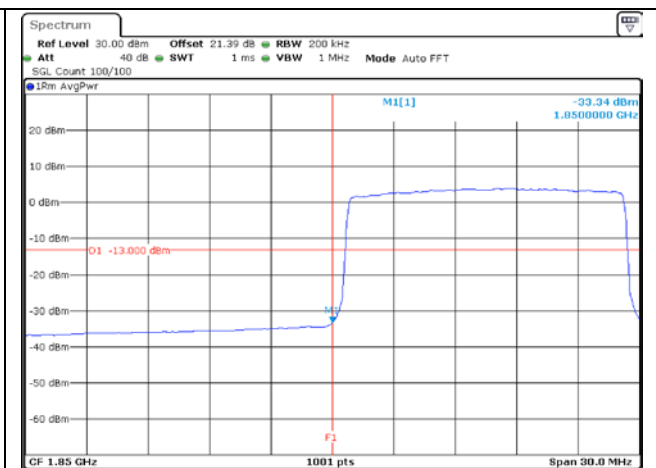
12.10 Test data for Band 2_Bandwidth 15 MHz

-. Test Result : Pass

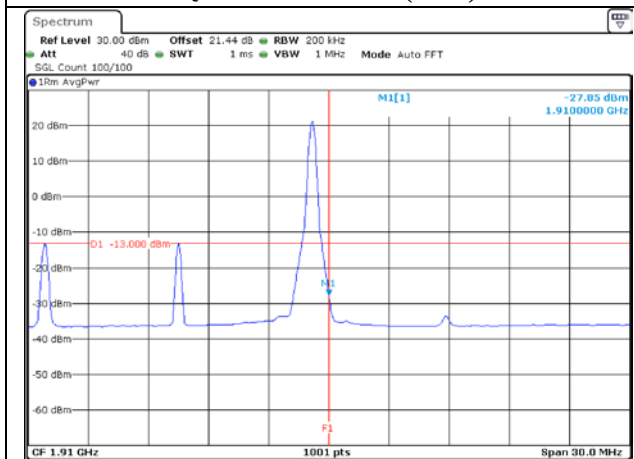
Test Mode	Channel	Edge Frequency (MHz)	Measured Value (dBm)	Limit (dBm)	Result
LTE Band 2 QPSK					
1 RB	Low	1 850	-27.65	-13.00	PASS
	High	1 910	-27.85	-13.00	PASS
Full RB	Low	1 850	-33.34	-13.00	PASS
	High	1 910	-32.01	-13.00	PASS
LTE Band 2 16QAM					
1 RB	Low	1 850	-29.03	-13.00	PASS
	High	1 910	-28.74	-13.00	PASS
Full RB	Low	1 850	-32.94	-13.00	PASS
	High	1 910	-33.23	-13.00	PASS



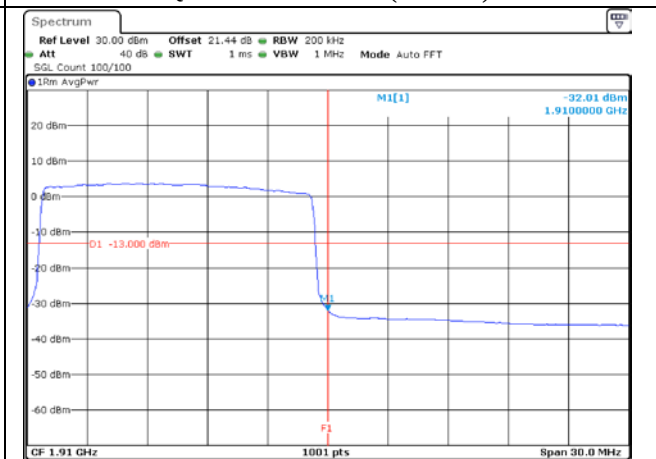
QPSK Low Channel (1 RB)



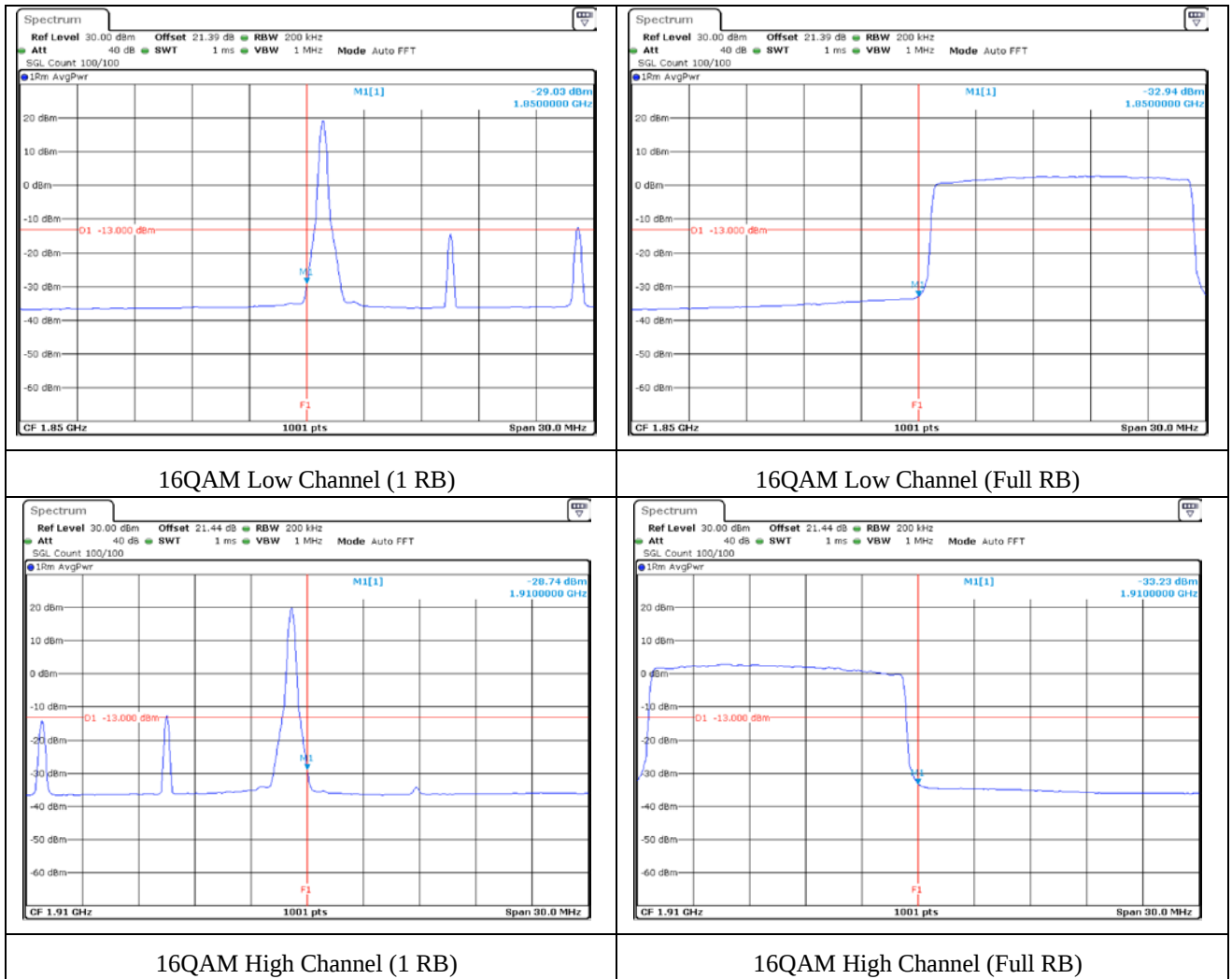
QPSK Low Channel (Full RB)



QPSK High Channel (1 RB)



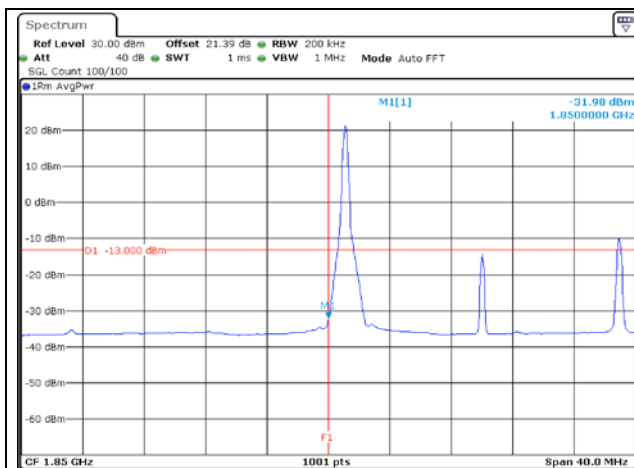
QPSK High Channel (Full RB)



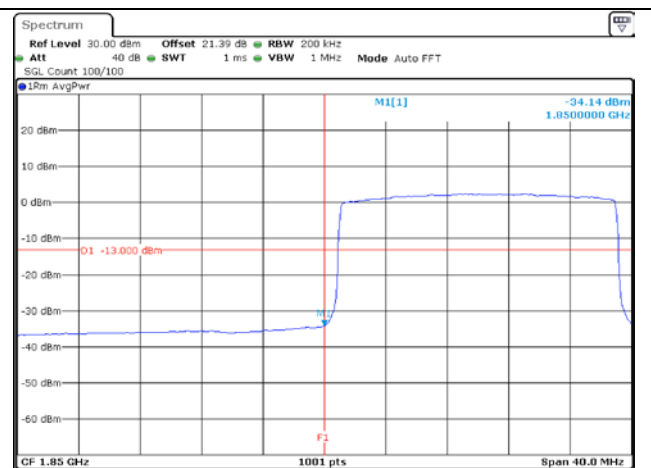
12.11 Test data for Band 2_Bandwidth 20 MHz

-. Test Result : Pass

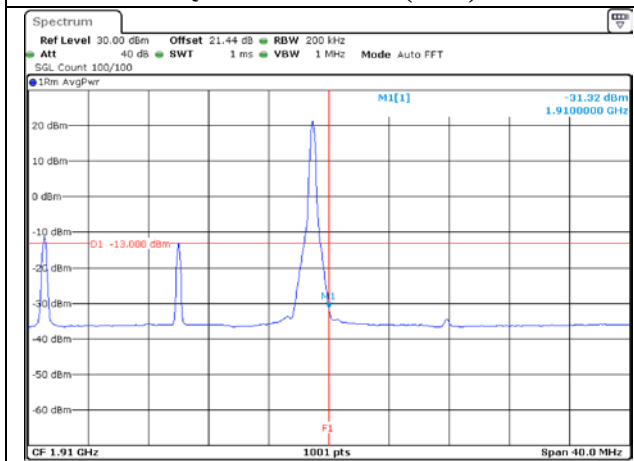
Test Mode	Channel	Edge Frequency (MHz)	Measured Value (dBm)	Limit (dBm)	Result
LTE Band 2 QPSK					
1 RB	Low	1 850	-31.98	-13.00	PASS
	High	1 910	-31.32	-13.00	PASS
Full RB	Low	1 850	-34.14	-13.00	PASS
	High	1 910	-33.66	-13.00	PASS
LTE Band 2 16QAM					
1 RB	Low	1 850	-32.63	-13.00	PASS
	High	1 910	-32.25	-13.00	PASS
Full RB	Low	1 850	-33.66	-13.00	PASS
	High	1 910	-34.31	-13.00	PASS



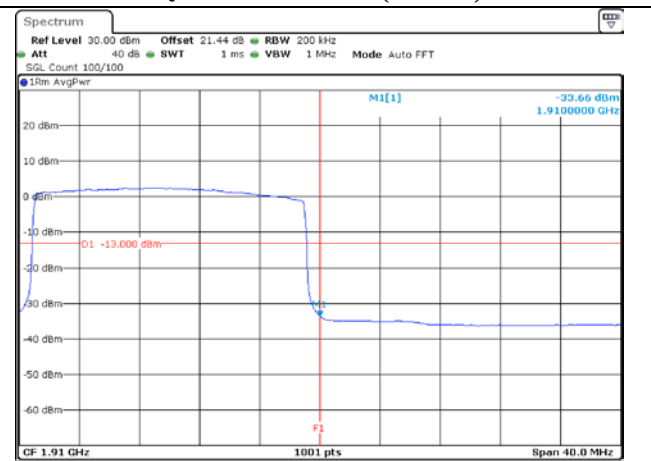
QPSK Low Channel (1 RB)



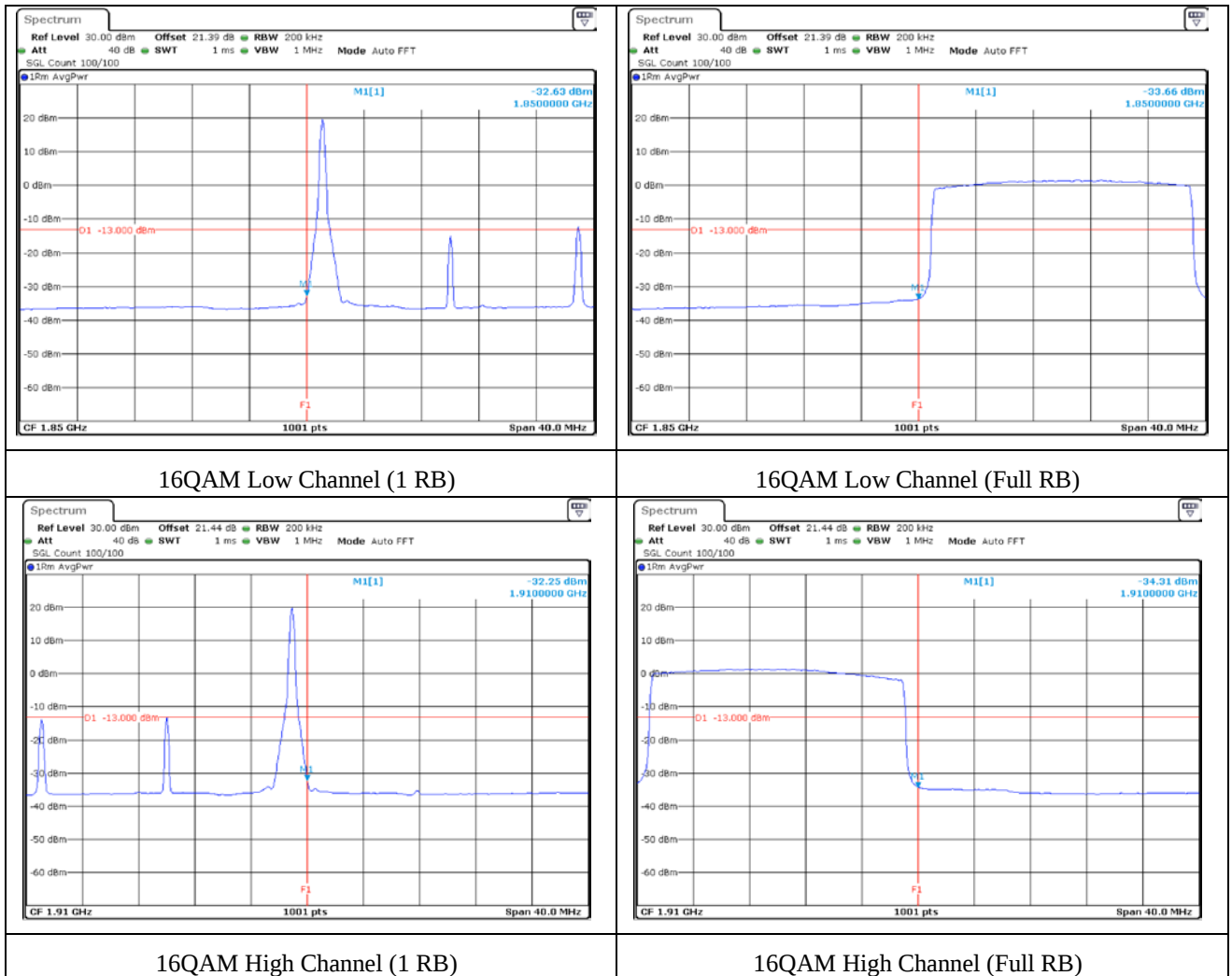
QPSK Low Channel (Full RB)



QPSK High Channel (1 RB)



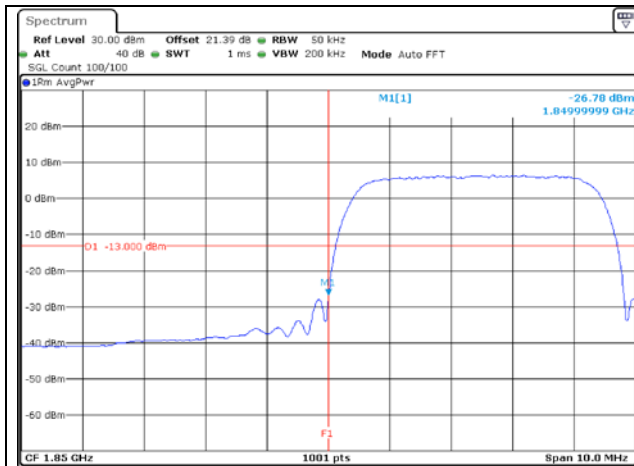
QPSK High Channel (Full RB)



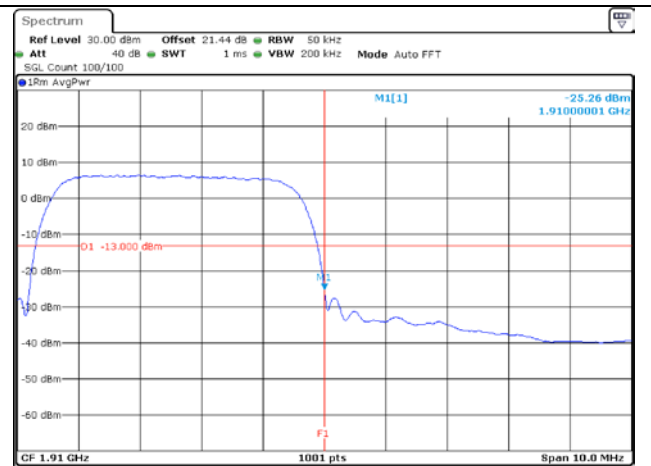
12.12 Test data for WCDMA

-. Test Result : Pass

Test Mode	Channel	Edge Frequency (MHz)	Measured Value (dBm)	Limit (dBm)	Result
RMC	Low	1 850	-26.78	-13.00	PASS
	High	1 910	-25.26	-13.00	PASS



Low Channel (RMC)



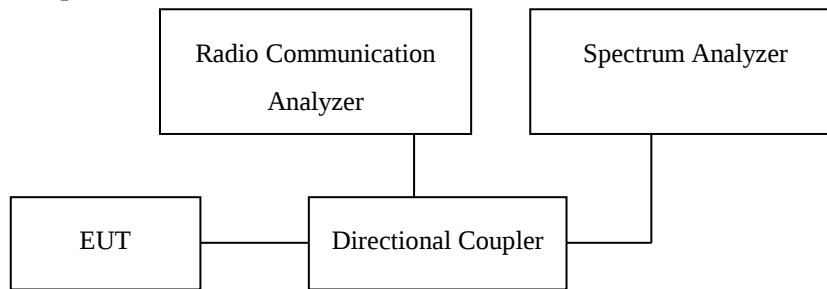
High Channel (RMC)

13. Conducted Spurious and Harmonic Emissions at Antenna Termianl

13.1 Operating environment

Temperature : 23 °C
Relative humidity : 47 % R.H.

13.2 Test set-up



(Configuration of conducted Emission measurement)

Conducted Spurious Emissions is tested in accordance with KDB971168 D01 Power Meas License Digital Systems v04, April 9, 2018, Section 6.

The EUT makes a call to the communication simulator. The power was measured with R&S Spectrum Analyzer. All measurements were done at 3 channels(low, middle and high operational range.)

The Conducted Spurious Emissions used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency.

Conducted spurious emissions

The EUT was setup to maximum output power. The 100 kHz RBW and 300 kHz VBW was used to scan from 30 MHz to 1 GHz. Also, the 1 MHz RBW and 3 MHz VBW was used to scan from 1 GHz to 20 GHz. The high, low and a middle channel were tested for out of band measurements.

13.3 Limits

Rule Part 24.238(a) specifies that “on any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB.”

$$\begin{aligned} &= P(W) - [43 + 10\log(P)](\text{dB}) \\ &= [30+10\text{Log}(P)] (\text{dBm}) - [43 + 10\log(P)](\text{dB}) \\ &= -13 \text{ dBm} \end{aligned}$$

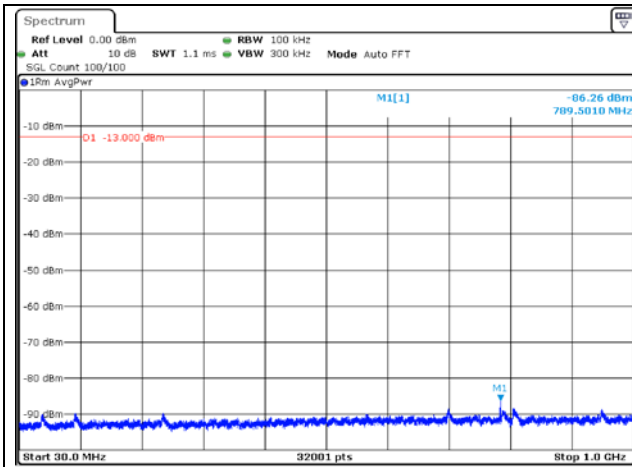
Limit	-13 dBm
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13.4 Test Date

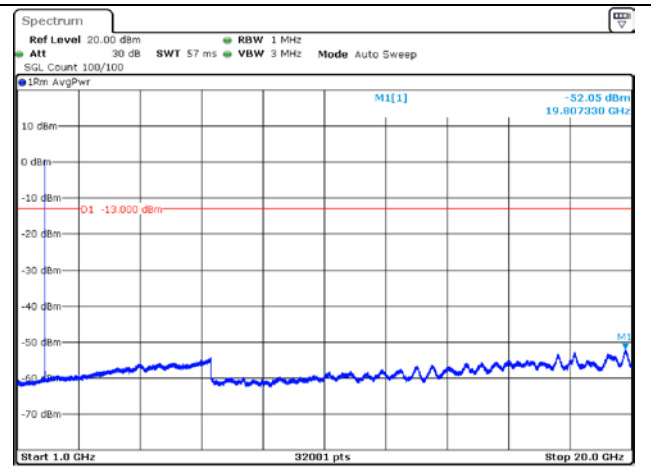
May 17, 2021 ~ May 28, 2021

13.5 Test data for Band 2_Bandwidth 1.4 MHz

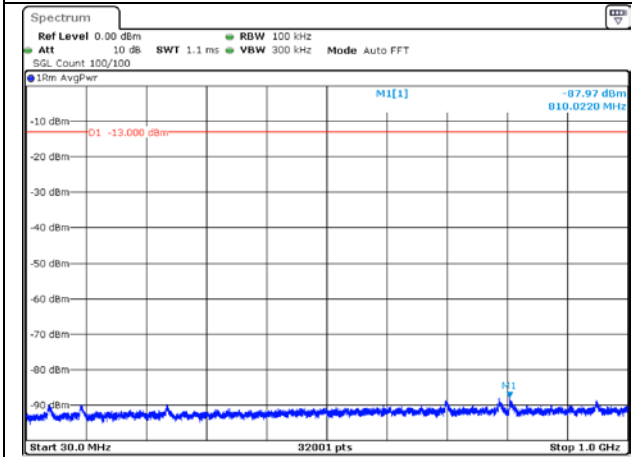
Test Mode	Channel	Frequency Range	Measured Value (dBm)	Cable Loss (dB)	Total Value (dBm)	Limit (dBm)	Result
LTE Band 2 QPSK							
1 RB	Low	30 MHz ~ 1 GHz	-86.26	20.67	-65.59	-13.00	PASS
		1 GHz ~ 20 GHz	-52.05	22.58	-29.47		PASS
	Middle	30 MHz ~ 1 GHz	-87.81	20.68	-67.13		PASS
		1 GHz ~ 20 GHz	-51.93	22.57	-29.36		PASS
	High	30 MHz ~ 1 GHz	-88.21	20.68	-67.53		PASS
		1 GHz ~ 20 GHz	-51.93	22.59	-29.34		PASS
Full RB	Low	30 MHz ~ 1 GHz	-87.97	20.68	-67.29	-13.00	PASS
		1 GHz ~ 20 GHz	-52.10	22.57	-29.53		PASS
	Middle	30 MHz ~ 1 GHz	-88.27	20.68	-67.59		PASS
		1 GHz ~ 20 GHz	-51.96	22.57	-29.39		PASS
	High	30 MHz ~ 1 GHz	-88.44	20.68	-67.76		PASS
		1 GHz ~ 20 GHz	-52.08	22.57	-29.51		PASS
LTE Band 2 16QAM							
1 RB	Low	30 MHz ~ 1 GHz	-87.78	20.67	-67.11	-13.00	PASS
		1 GHz ~ 20 GHz	-52.04	22.59	-29.45		PASS
	Middle	30 MHz ~ 1 GHz	-88.37	20.68	-67.69		PASS
		1 GHz ~ 20 GHz	-51.68	22.59	-29.09		PASS
	High	30 MHz ~ 1 GHz	-88.14	20.68	-67.46		PASS
		1 GHz ~ 20 GHz	-51.89	22.57	-29.32		PASS
Full RB	Low	30 MHz ~ 1 GHz	-88.26	20.77	-67.49	-13.00	PASS
		1 GHz ~ 20 GHz	-52.01	22.58	-29.43		PASS
	Middle	30 MHz ~ 1 GHz	-88.51	20.67	-67.84		PASS
		1 GHz ~ 20 GHz	-51.85	22.57	-29.28		PASS
	High	30 MHz ~ 1 GHz	-88.20	20.67	-67.53		PASS
		1 GHz ~ 20 GHz	-52.02	22.55	-29.47		PASS



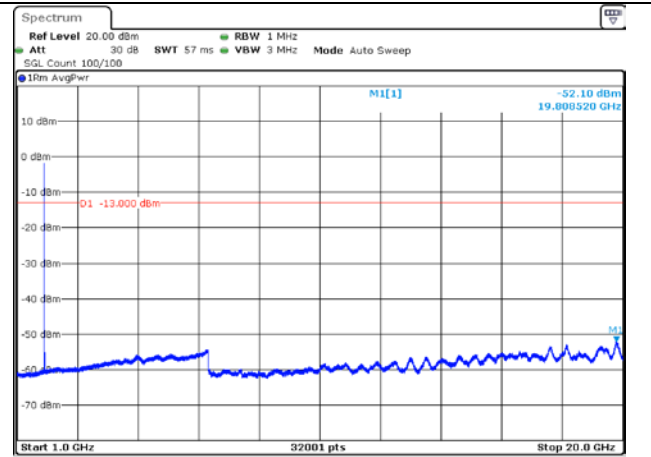
QPSK Low Channel_1G under (1 RB)



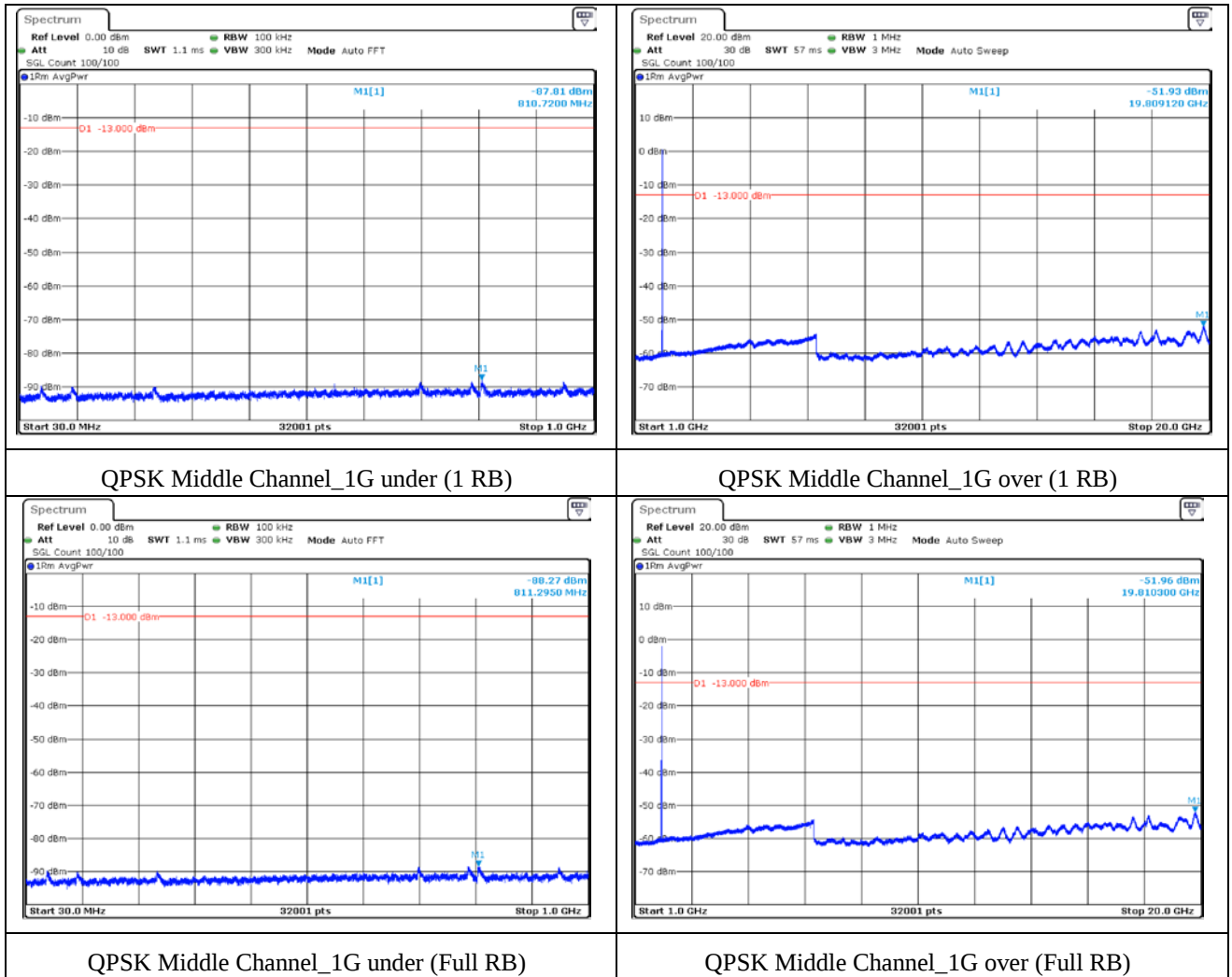
QPSK Low Channel_1G over (1 RB)

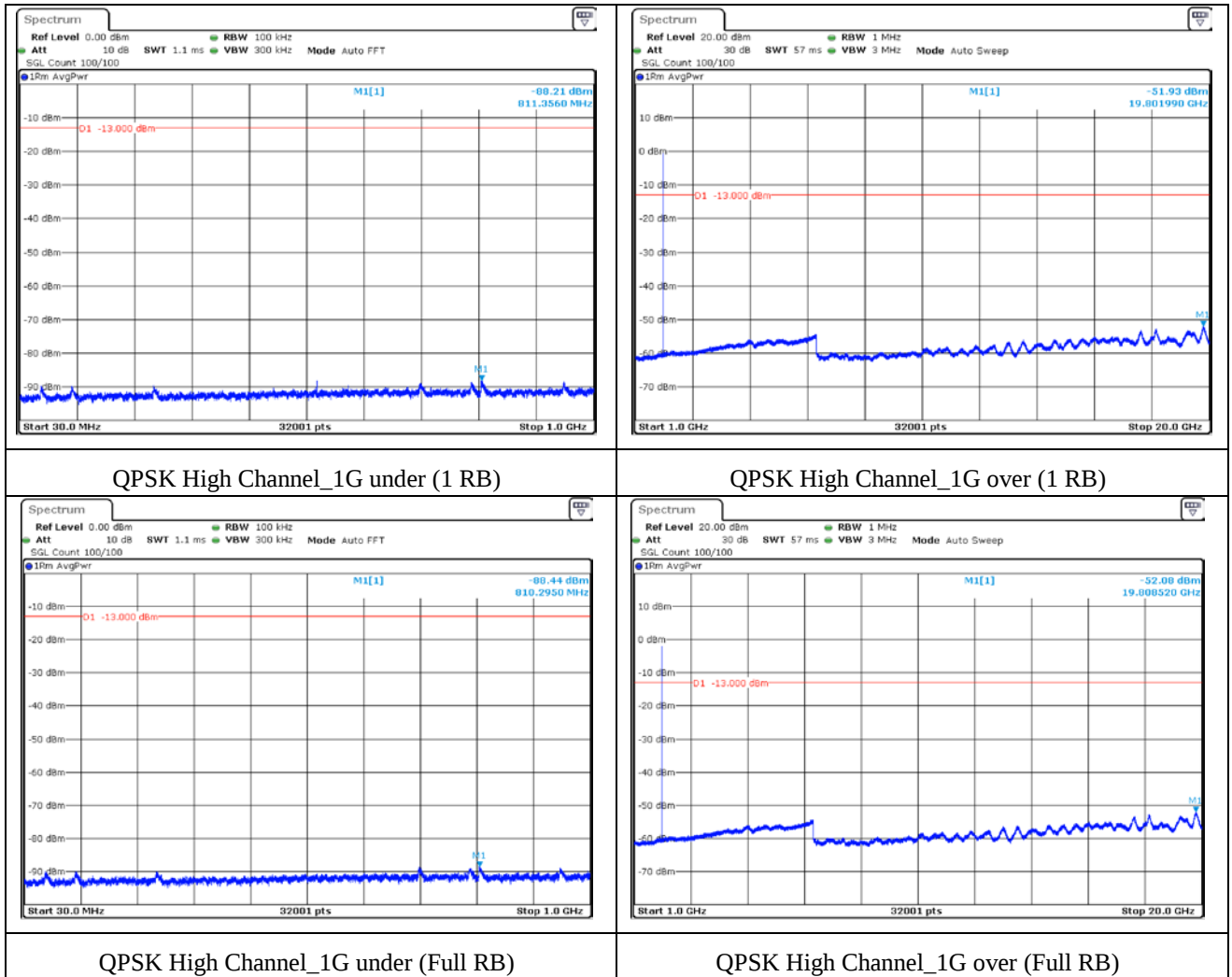


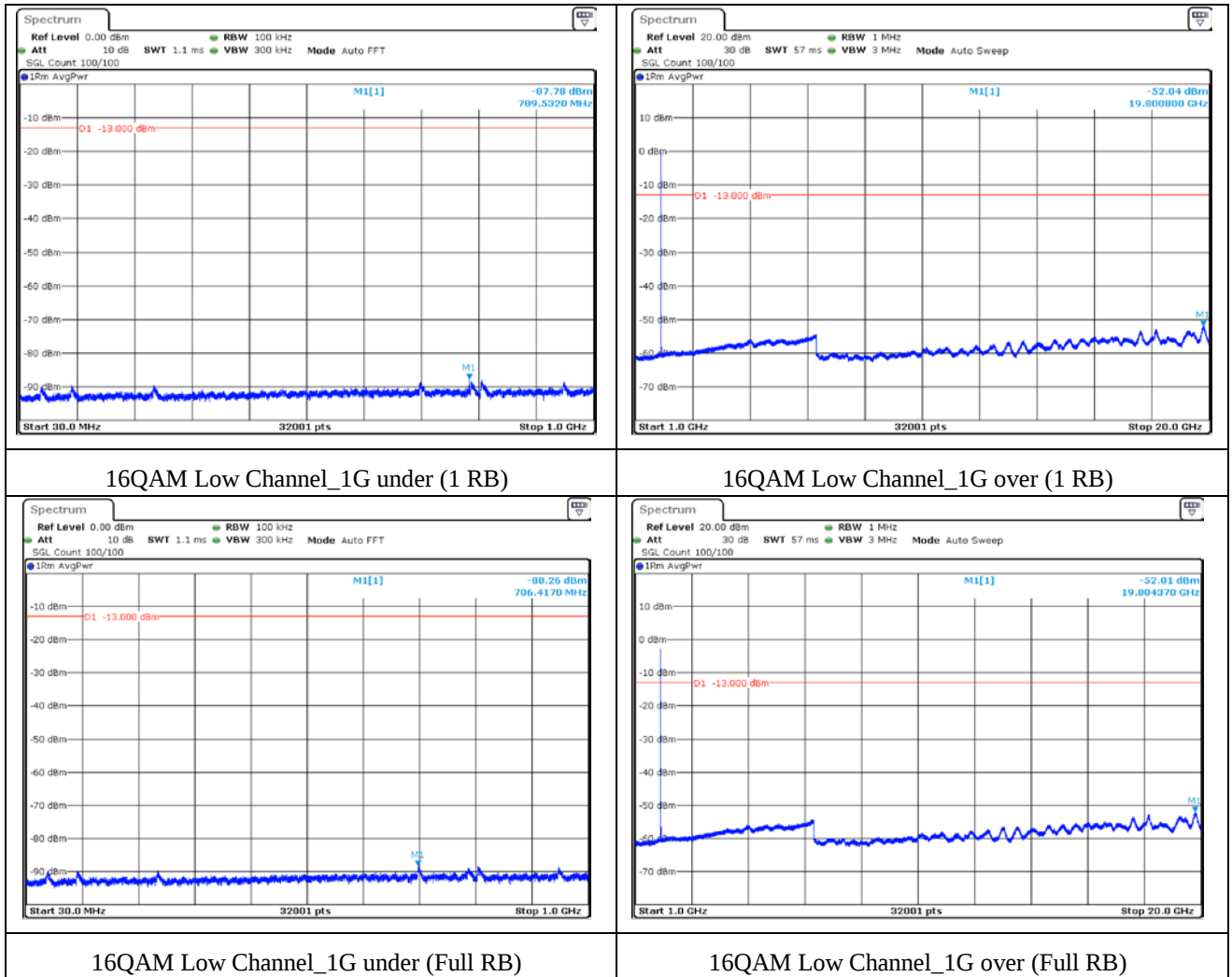
QPSK Low Channel_1G under (Full RB)

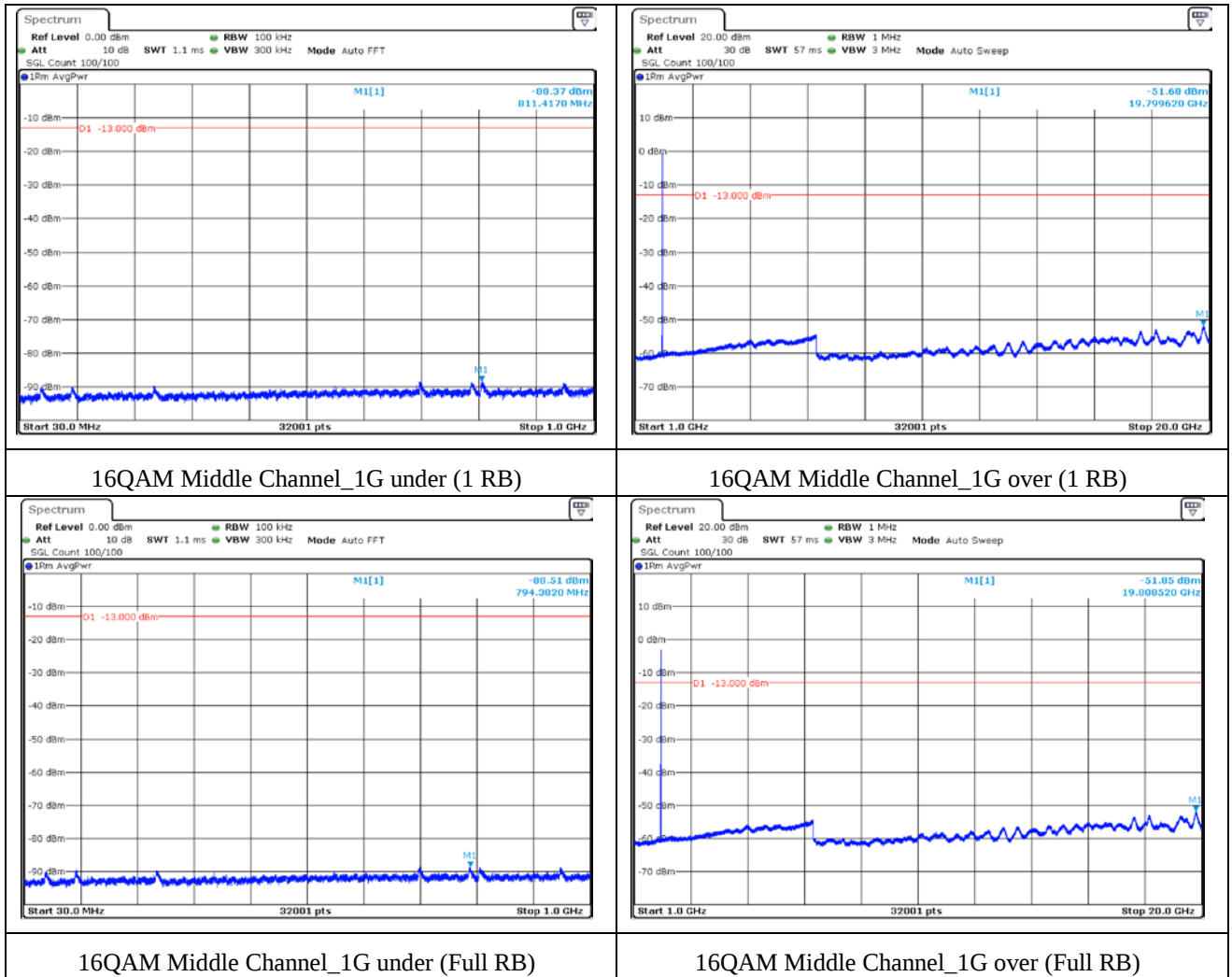


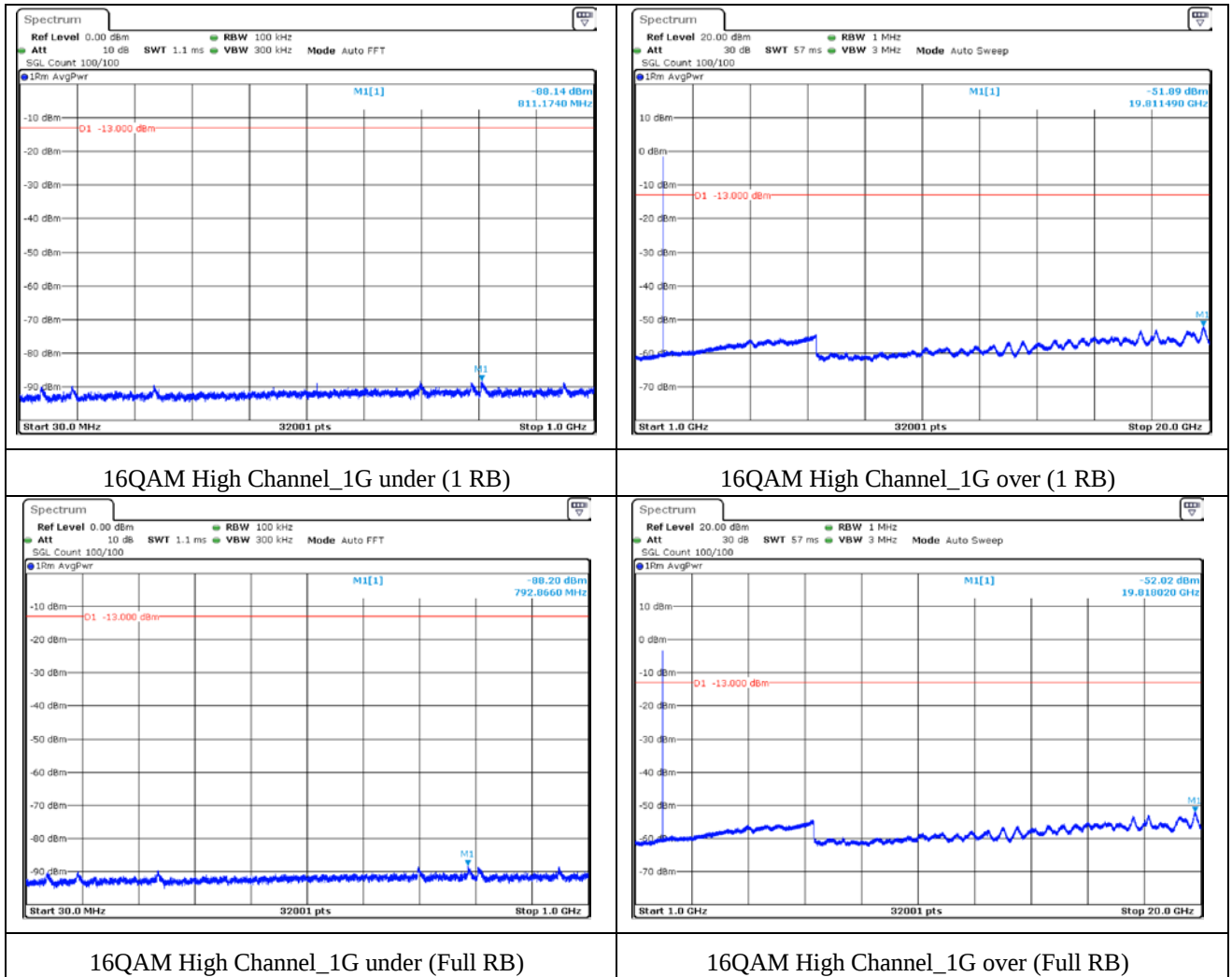
QPSK Low Channel_1G over (Full RB)





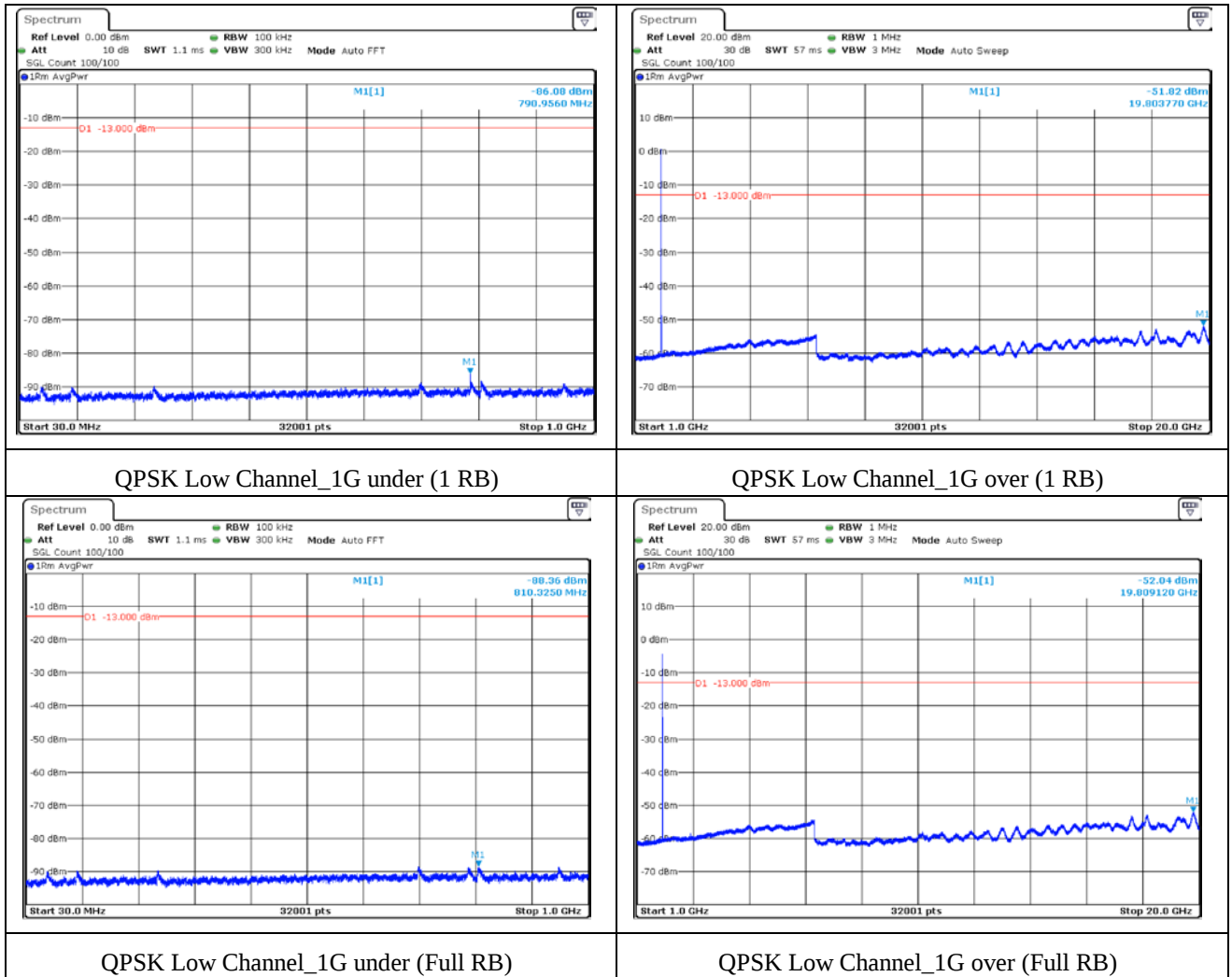


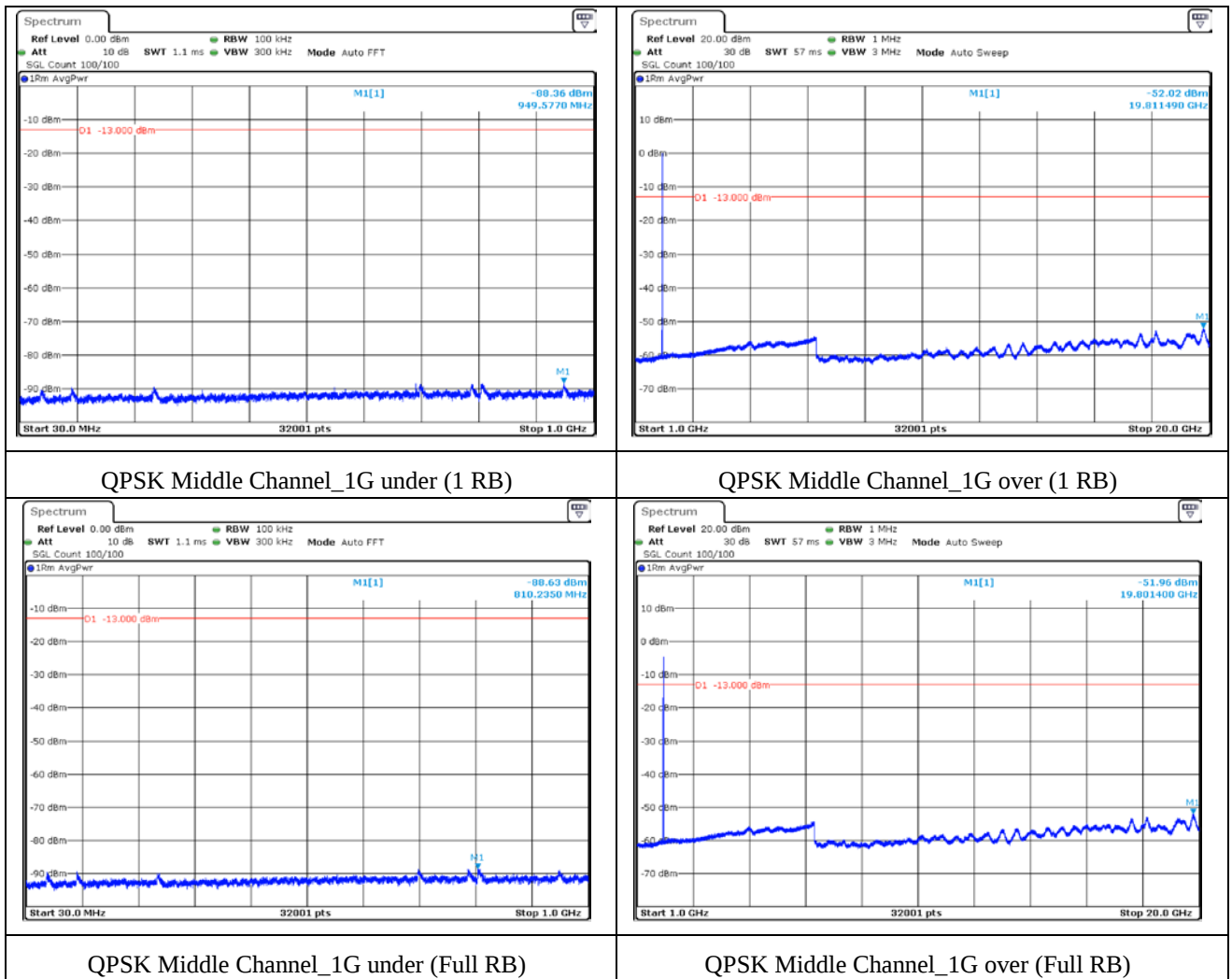


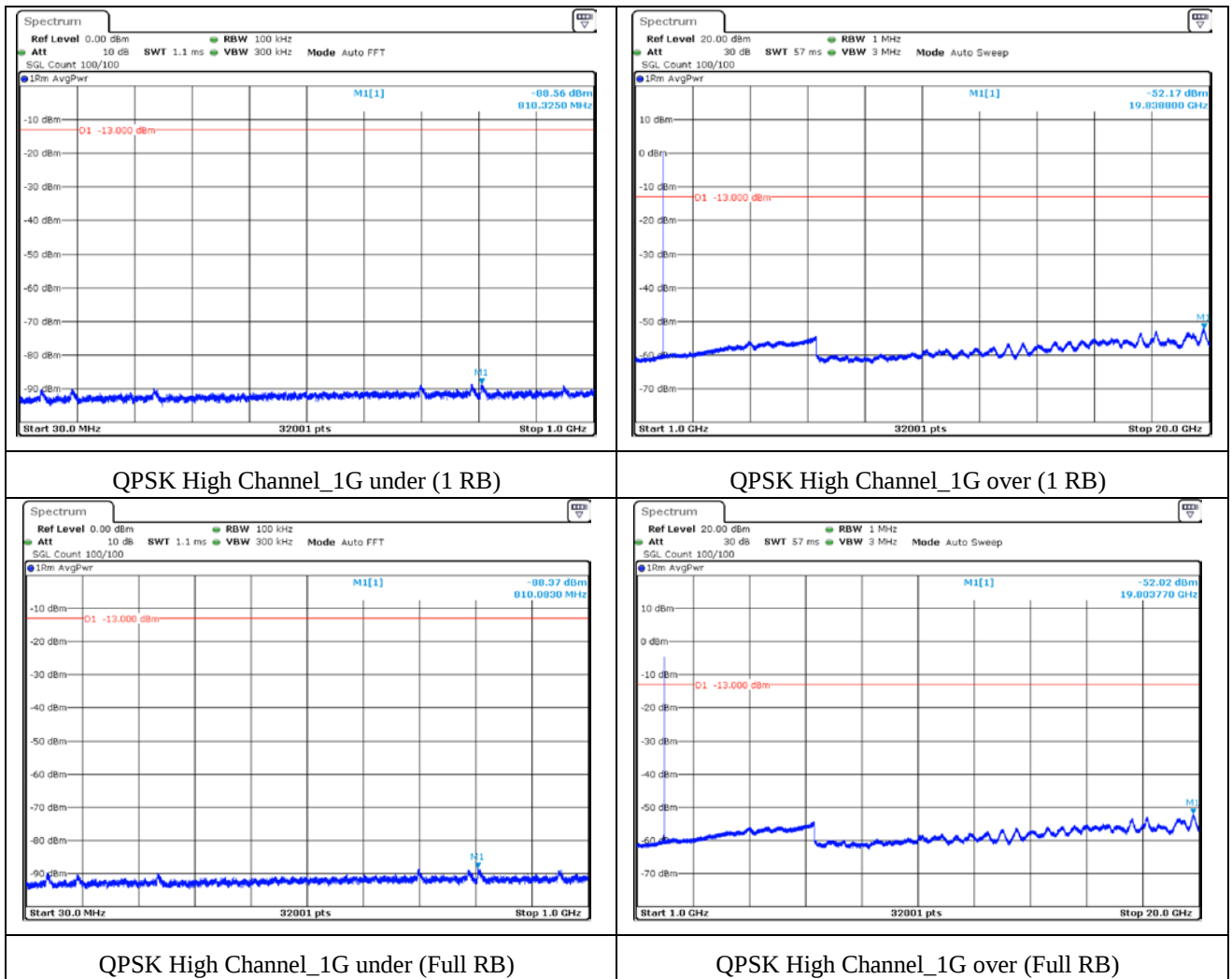


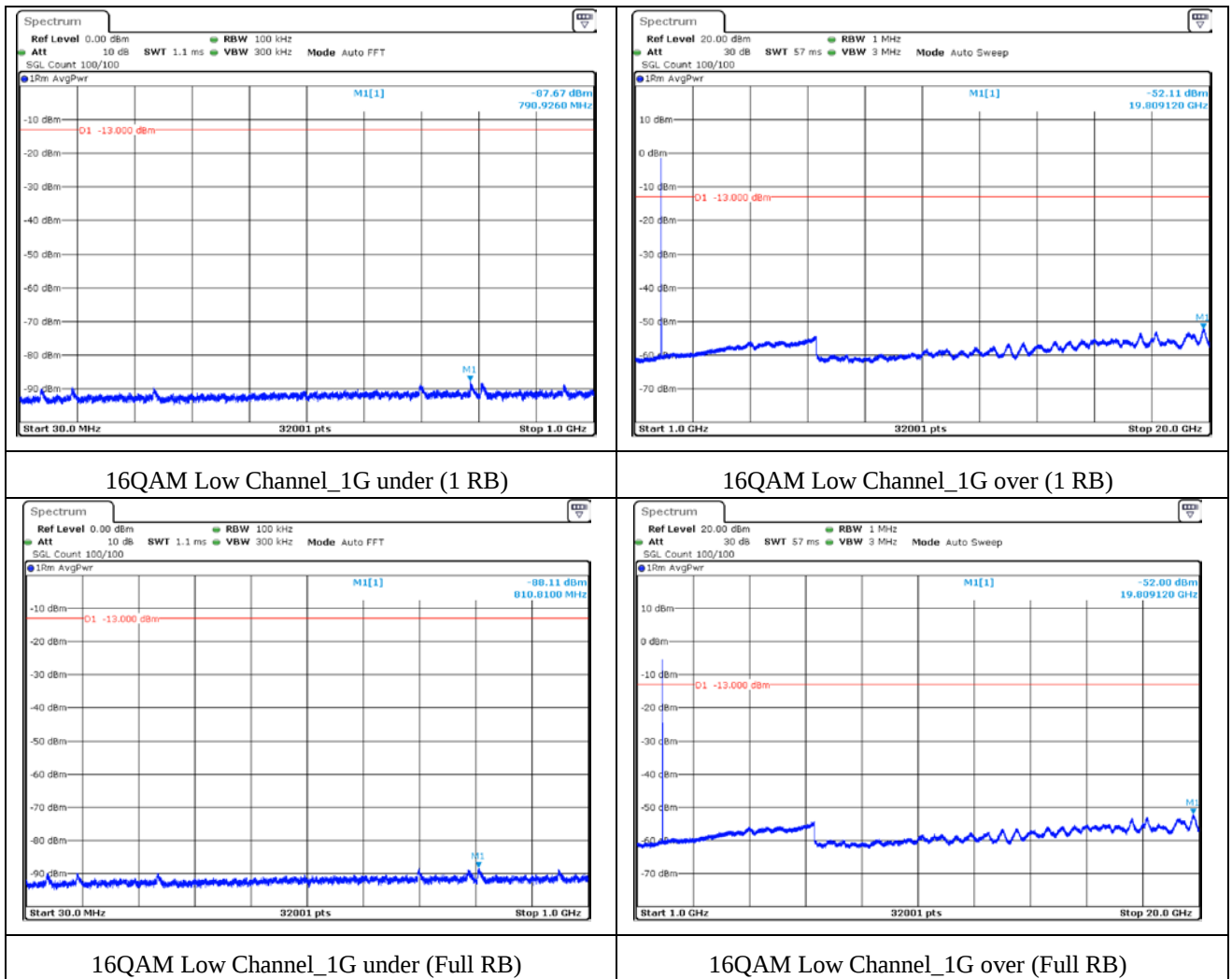
13.6 Test data for Band 2_Bandwidth 3 MHz

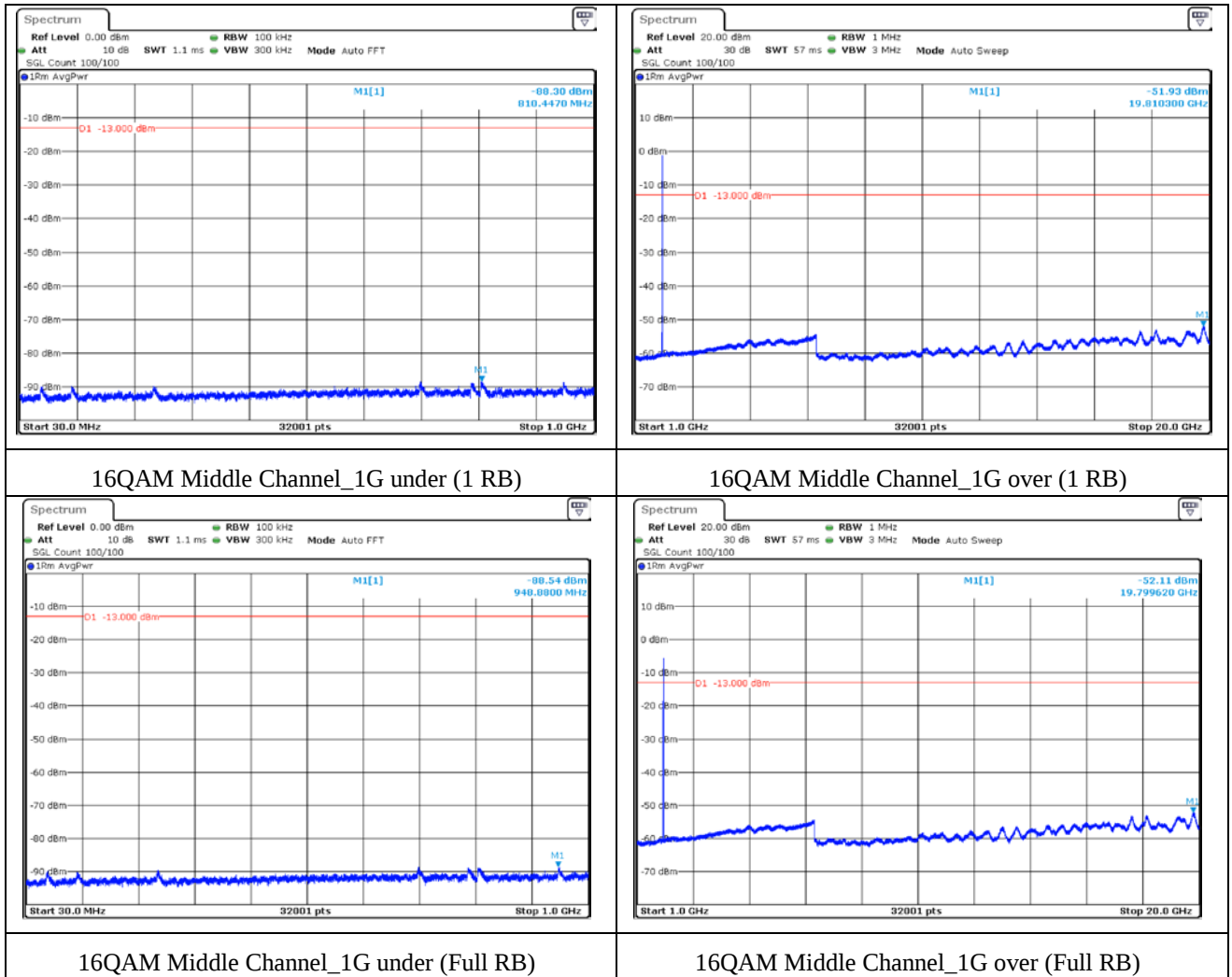
Test Mode	Channel	Frequency Range	Measured Value (dBm)	Cable Loss (dB)	Total Value (dBm)	Limit (dBm)	Result
LTE Band 2 QPSK							
1 RB	Low	30 MHz ~ 1 GHz	-86.08	20.67	-65.41	-13.00	PASS
		1 GHz ~ 20 GHz	-51.82	22.58	-29.24		PASS
	Middle	30 MHz ~ 1 GHz	-88.36	20.88	-67.48		PASS
		1 GHz ~ 20 GHz	-52.02	22.57	-29.45		PASS
	High	30 MHz ~ 1 GHz	-88.56	20.68	-67.88		PASS
		1 GHz ~ 20 GHz	-52.17	22.50	-29.67		PASS
Full RB	Low	30 MHz ~ 1 GHz	-88.36	20.68	-67.68	-13.00	PASS
		1 GHz ~ 20 GHz	-52.04	22.57	-29.47		PASS
	Middle	30 MHz ~ 1 GHz	-88.63	20.68	-67.95		PASS
		1 GHz ~ 20 GHz	-51.96	22.59	-29.37		PASS
	High	30 MHz ~ 1 GHz	-88.37	20.68	-67.69		PASS
		1 GHz ~ 20 GHz	-52.02	22.58	-29.44		PASS
LTE Band 2 16QAM							
1 RB	Low	30 MHz ~ 1 GHz	-87.67	20.67	-67.00	-13.00	PASS
		1 GHz ~ 20 GHz	-52.11	22.57	-29.54		PASS
	Middle	30 MHz ~ 1 GHz	-88.30	20.68	-67.62		PASS
		1 GHz ~ 20 GHz	-51.93	22.57	-29.36		PASS
	High	30 MHz ~ 1 GHz	-88.62	20.77	-67.85		PASS
		1 GHz ~ 20 GHz	-52.10	22.55	-29.55		PASS
Full RB	Low	30 MHz ~ 1 GHz	-88.11	20.68	-67.43	-13.00	PASS
		1 GHz ~ 20 GHz	-52.00	22.57	-29.43		PASS
	Middle	30 MHz ~ 1 GHz	-88.54	20.88	-67.66		PASS
		1 GHz ~ 20 GHz	-52.11	22.59	-29.52		PASS
	High	30 MHz ~ 1 GHz	-88.37	20.68	-67.69		PASS
		1 GHz ~ 20 GHz	-52.02	22.59	-29.43		PASS

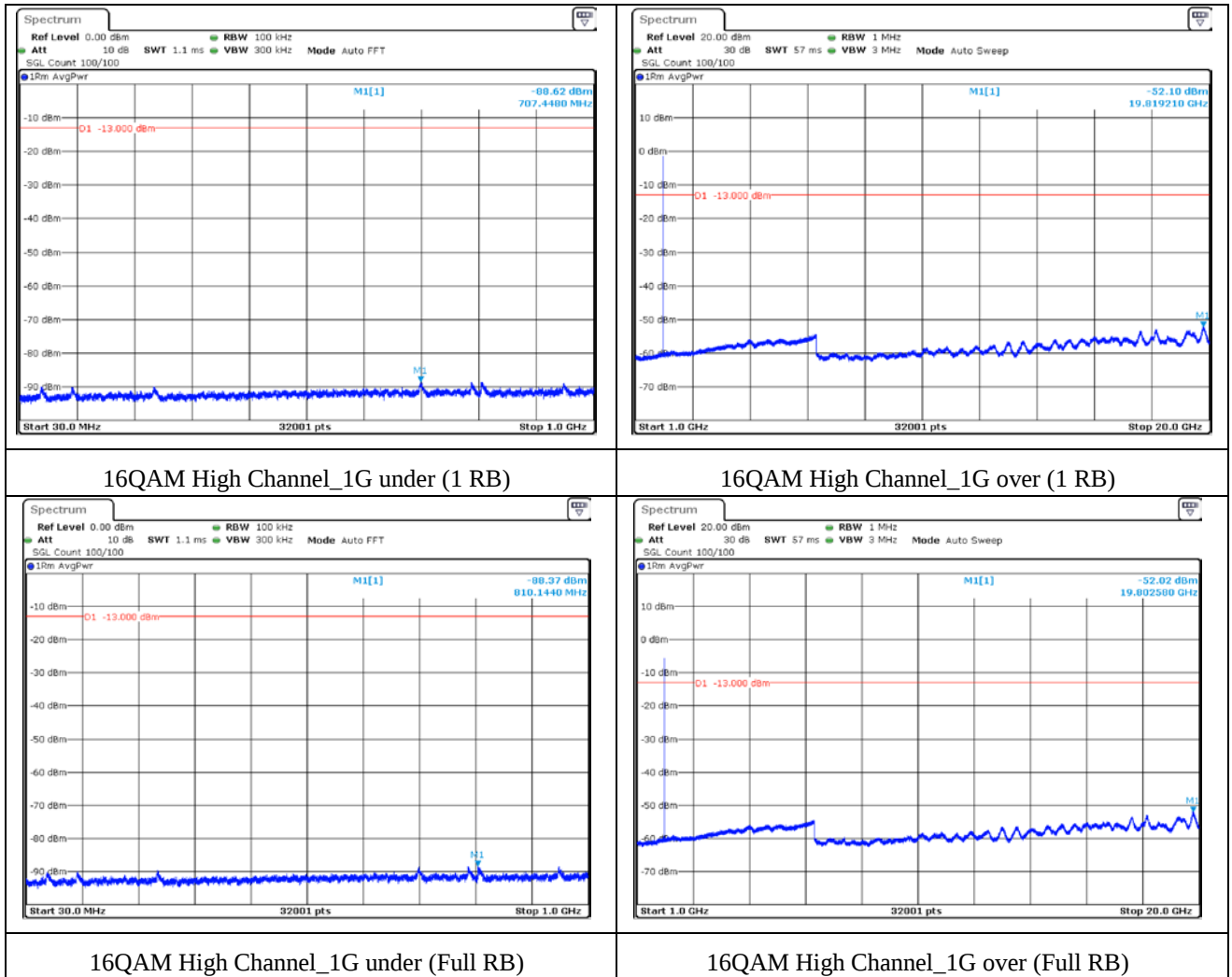






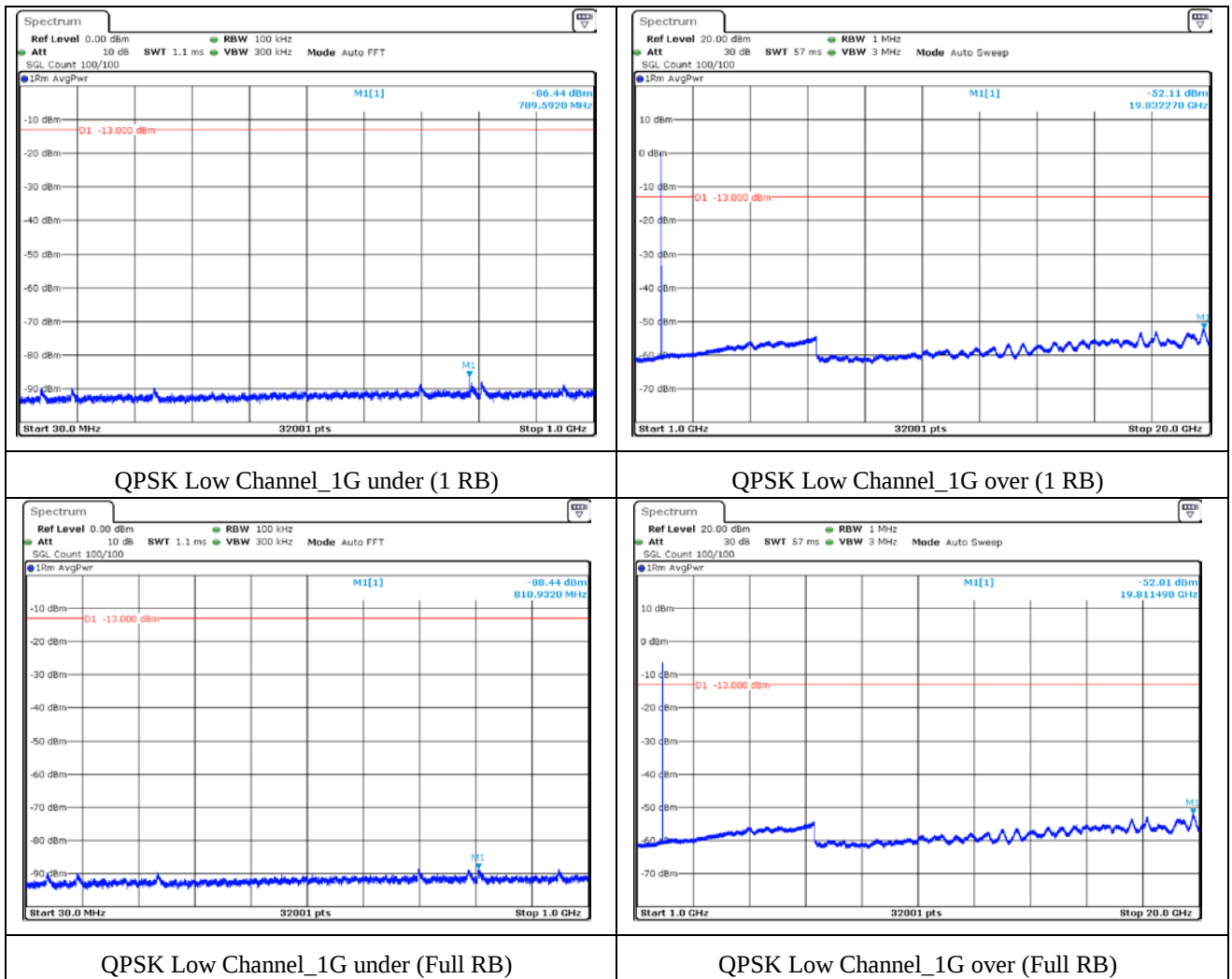


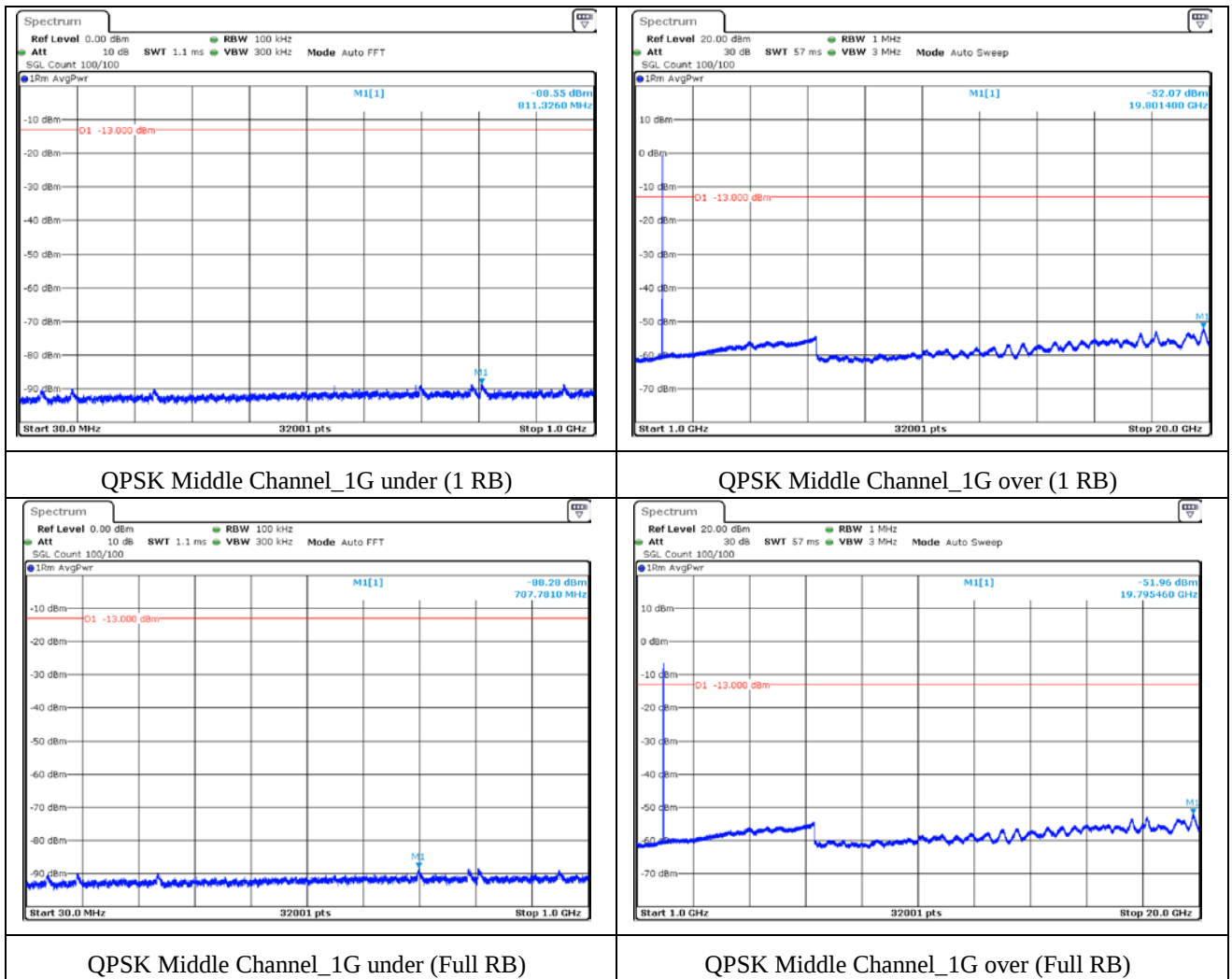


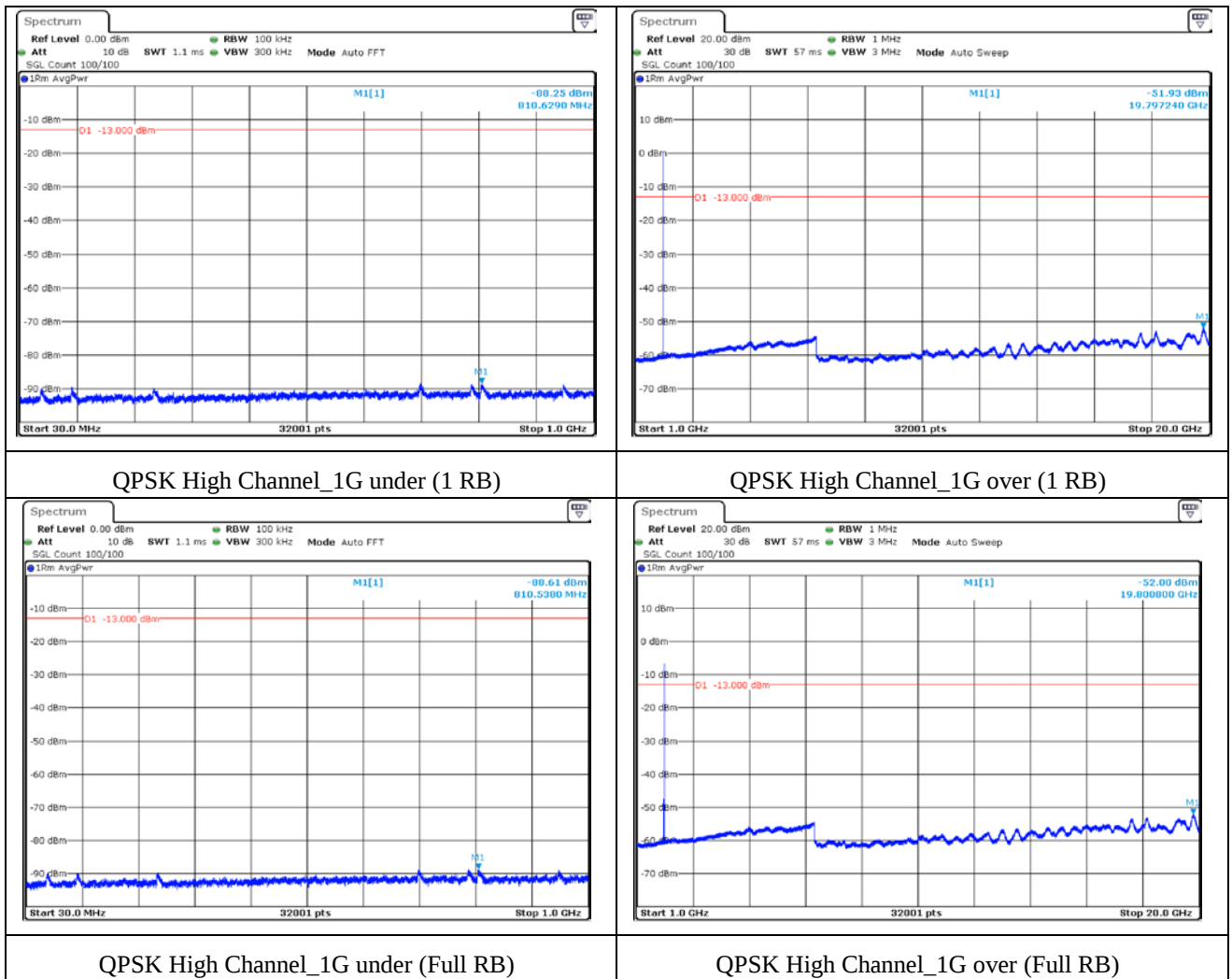


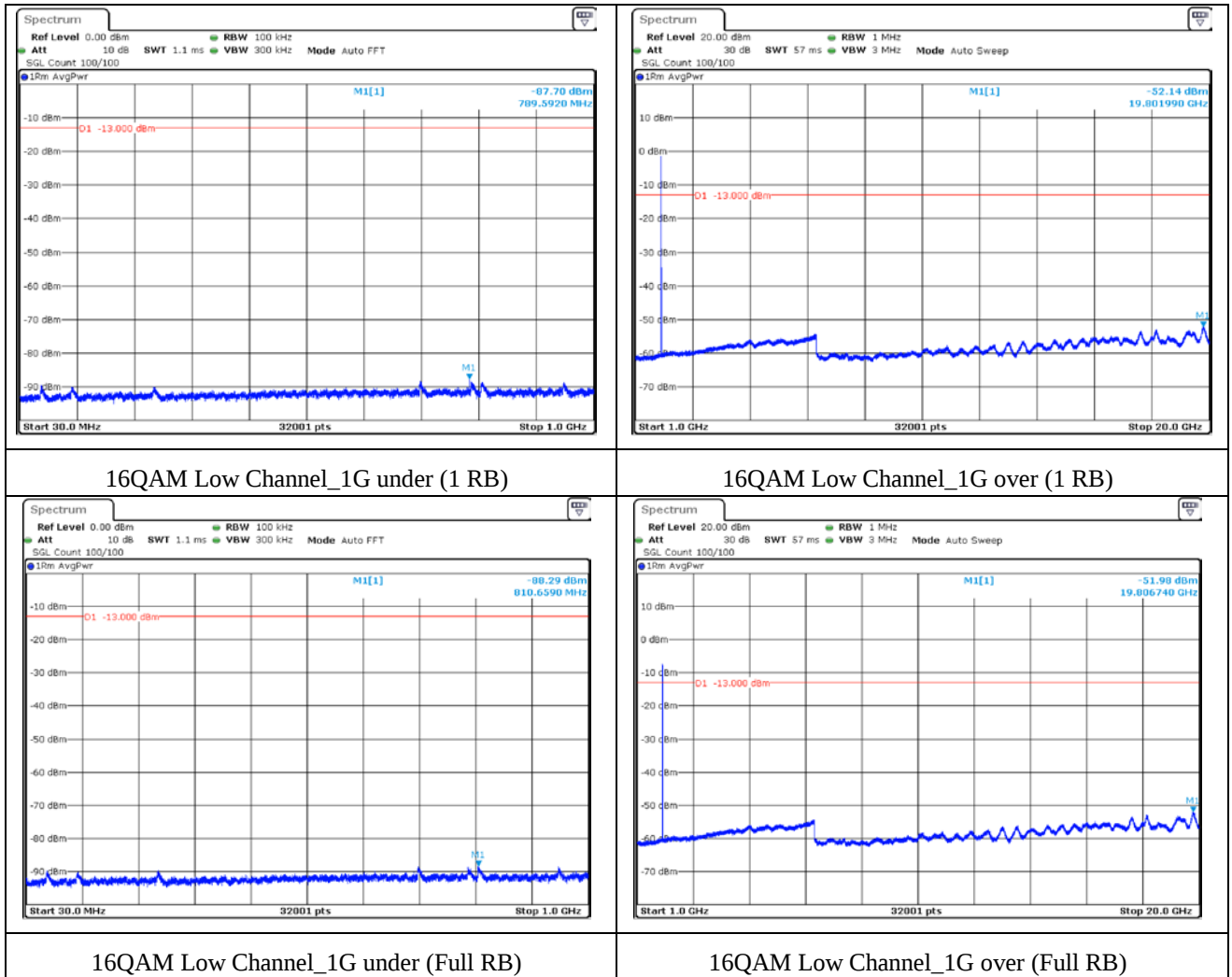
13.7 Test data for Band 2_Bandwidth 5 MHz

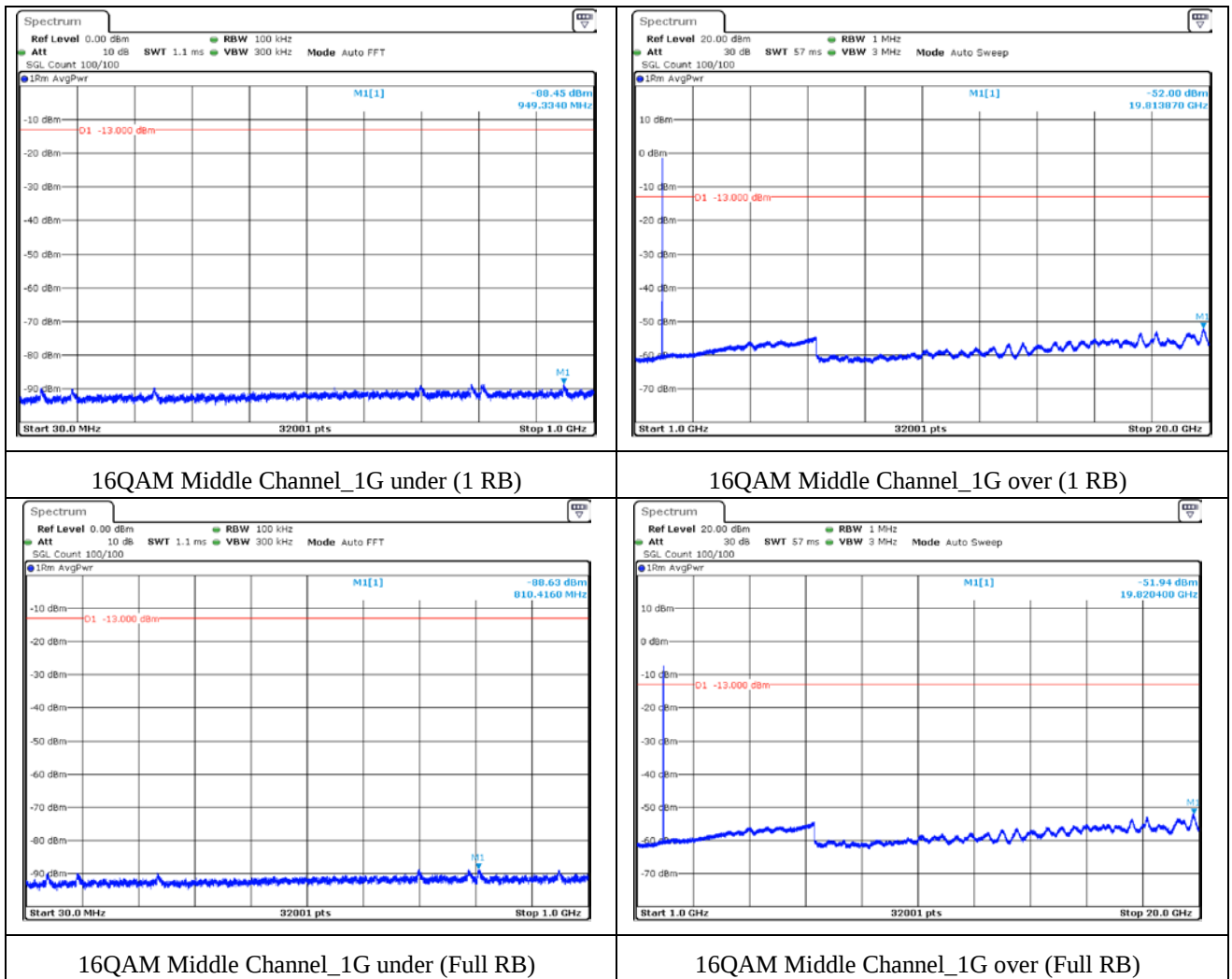
Test Mode	Channel	Frequency Range	Measured Value (dBm)	Cable Loss (dB)	Total Value (dBm)	Limit (dBm)	Result
LTE Band 2 QPSK							
1 RB	Low	30 MHz ~ 1 GHz	-86.44	20.67	-65.77	-13.00	PASS
		1 GHz ~ 20 GHz	-52.11	22.52	-29.59		PASS
	Middle	30 MHz ~ 1 GHz	-88.55	20.68	-67.87		PASS
		1 GHz ~ 20 GHz	-52.07	22.59	-29.48		PASS
	High	30 MHz ~ 1 GHz	-88.25	20.68	-67.57		PASS
		1 GHz ~ 20 GHz	-51.93	22.60	-29.33		PASS
Full RB	Low	30 MHz ~ 1 GHz	-88.44	20.68	-67.76	-13.00	PASS
		1 GHz ~ 20 GHz	-52.01	22.57	-29.44		PASS
	Middle	30 MHz ~ 1 GHz	-88.28	20.77	-67.51		PASS
		1 GHz ~ 20 GHz	-51.96	22.60	-29.36		PASS
	High	30 MHz ~ 1 GHz	-88.61	20.68	-67.93		PASS
		1 GHz ~ 20 GHz	-52.00	22.59	-29.41		PASS
LTE Band 2 16QAM							
1 RB	Low	30 MHz ~ 1 GHz	-87.70	20.67	-67.03	-13.00	PASS
		1 GHz ~ 20 GHz	-52.14	22.59	-29.55		PASS
	Middle	30 MHz ~ 1 GHz	-88.45	20.88	-67.57		PASS
		1 GHz ~ 20 GHz	-52.00	22.56	-29.44		PASS
	High	30 MHz ~ 1 GHz	-88.60	20.68	-67.92		PASS
		1 GHz ~ 20 GHz	-51.81	22.58	-29.23		PASS
Full RB	Low	30 MHz ~ 1 GHz	-88.29	20.68	-67.61	-13.00	PASS
		1 GHz ~ 20 GHz	-51.98	22.58	-29.40		PASS
	Middle	30 MHz ~ 1 GHz	-88.63	20.68	-67.95		PASS
		1 GHz ~ 20 GHz	-51.94	22.55	-29.39		PASS
	High	30 MHz ~ 1 GHz	-88.48	20.68	-67.80		PASS
		1 GHz ~ 20 GHz	-52.09	22.57	-29.52		PASS

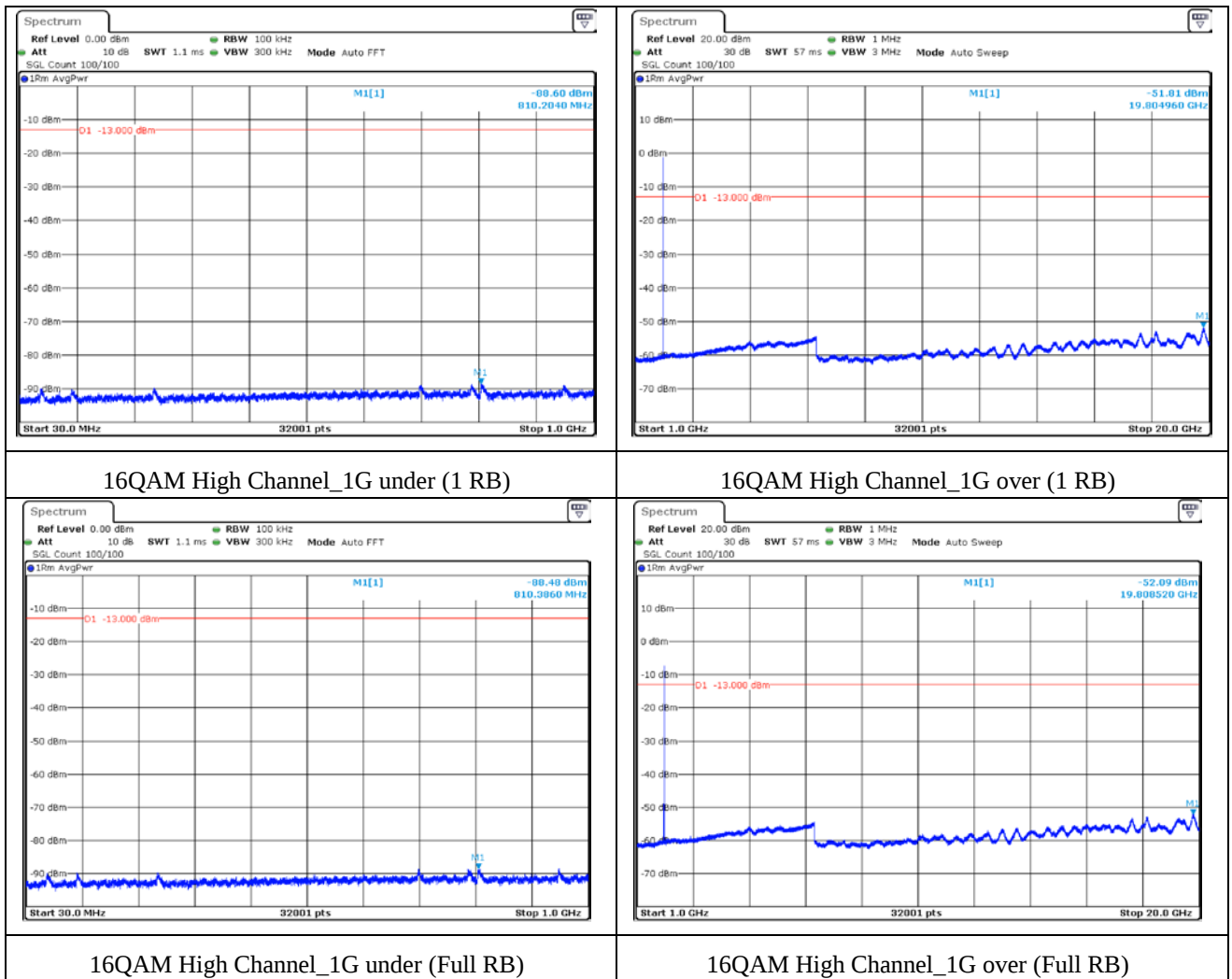












13.8 Test data for Band 2_Bandwidth 10 MHz

Test Mode	Channel	Frequency Range	Measured Value (dBm)	Cable Loss (dB)	Total Value (dBm)	Limit (dBm)	Result
LTE Band 2 QPSK							
1 RB	Low	30 MHz ~ 1 GHz	-88.40	20.68	-67.72	-13.00	PASS
		1 GHz ~ 20 GHz	-51.97	22.59	-29.38		PASS
	Middle	30 MHz ~ 1 GHz	-88.12	20.68	-67.44		PASS
		1 GHz ~ 20 GHz	-51.91	22.54	-29.37		PASS
	High	30 MHz ~ 1 GHz	-88.47	20.67	-67.80		PASS
		1 GHz ~ 20 GHz	-52.09	22.59	-29.50		PASS
Full RB	Low	30 MHz ~ 1 GHz	-88.43	20.68	-67.75	-13.00	PASS
		1 GHz ~ 20 GHz	-52.04	22.60	-29.44		PASS
	Middle	30 MHz ~ 1 GHz	-88.22	20.68	-67.54		PASS
		1 GHz ~ 20 GHz	-51.98	22.59	-29.39		PASS
	High	30 MHz ~ 1 GHz	-88.33	20.68	-67.65		PASS
		1 GHz ~ 20 GHz	-51.93	22.56	-29.37		PASS
LTE Band 2 16QAM							
1 RB	Low	30 MHz ~ 1 GHz	-88.30	20.67	-67.63	-13.00	PASS
		1 GHz ~ 20 GHz	-51.83	22.58	-29.25		PASS
	Middle	30 MHz ~ 1 GHz	-88.17	20.68	-67.49		PASS
		1 GHz ~ 20 GHz	-51.98	22.58	-29.40		PASS
	High	30 MHz ~ 1 GHz	-88.23	20.68	-67.55		PASS
		1 GHz ~ 20 GHz	-51.60	22.57	-29.03		PASS
Full RB	Low	30 MHz ~ 1 GHz	-88.55	20.77	-67.78	-13.00	PASS
		1 GHz ~ 20 GHz	-52.10	22.58	-29.52		PASS
	Middle	30 MHz ~ 1 GHz	-88.42	20.68	-67.74		PASS
		1 GHz ~ 20 GHz	-52.03	22.57	-29.46		PASS
	High	30 MHz ~ 1 GHz	-88.53	20.68	-67.85		PASS
		1 GHz ~ 20 GHz	-52.21	22.59	-29.62		PASS

