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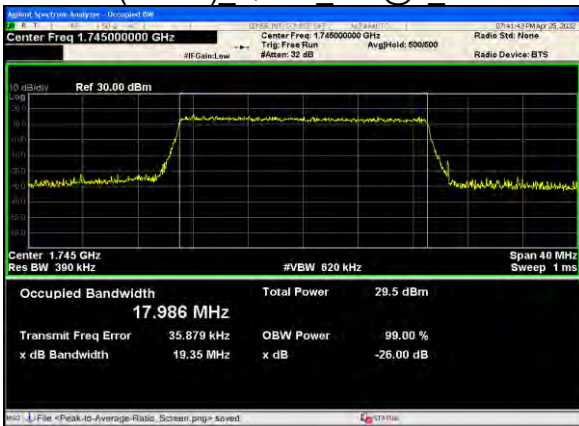
<http://www.uttlab.com>

UTTR-RF-FCC4G-V1.1

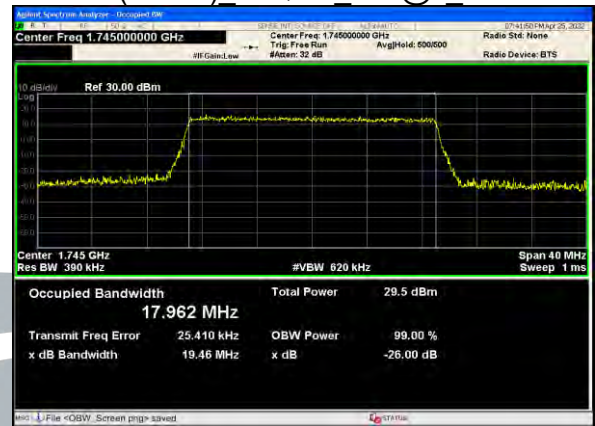
5.5.13 LTE Band 66

Bandwidth (MHz)	Freq. (MHz)	Modulation	RB	OBW (MHz)	26dB BW (MHz)
1.4	1745.0	QPSK	6@0	1.09	1.27
1.4	1745.0	16QAM	6@0	1.09	1.27
1.4	1745.0	64QAM	6@0	1.09	1.26
1.4	1779.3	QPSK	6@0	1.10	1.65
1.4	1779.3	16QAM	6@0	1.10	1.65
1.4	1779.3	64QAM	6@0	1.10	1.66
1.4	1710.7	QPSK	6@0	1.10	1.27
1.4	1710.7	16QAM	6@0	1.10	1.26
1.4	1710.7	64QAM	6@0	1.09	1.27
3	1745.0	QPSK	15@0	2.69	2.91
3	1745.0	16QAM	15@0	2.69	2.93
3	1745.0	64QAM	15@0	2.69	2.92
3	1778.5	QPSK	15@0	2.70	2.95
3	1778.5	16QAM	15@0	2.70	2.93
3	1778.5	64QAM	15@0	2.70	2.96
3	1711.5	QPSK	15@0	2.70	2.90
3	1711.5	16QAM	15@0	2.68	2.91
3	1711.5	64QAM	15@0	2.69	2.93
5	1745.0	QPSK	25@0	4.52	5.11
5	1745.0	16QAM	25@0	4.52	5.13
5	1745.0	64QAM	25@0	4.52	5.12
5	1777.5	QPSK	25@0	4.54	5.21
5	1777.5	16QAM	25@0	4.53	5.21
5	1777.5	64QAM	25@0	4.54	5.18
5	1712.5	QPSK	25@0	4.52	5.18
5	1712.5	16QAM	25@0	4.53	5.17
5	1712.5	64QAM	25@0	4.52	5.17
10	1745.0	QPSK	50@0	9.02	10.41
10	1745.0	16QAM	50@0	8.99	10.08
10	1745.0	64QAM	50@0	9.01	10.14
10	1775.0	QPSK	50@0	9.01	10.27
10	1775.0	16QAM	50@0	9.01	10.10
10	1775.0	64QAM	50@0	9.00	10.07
10	1715.0	QPSK	50@0	8.98	10.00
10	1715.0	16QAM	50@0	8.98	9.94
10	1715.0	64QAM	50@0	8.98	9.98
15	1745.0	QPSK	75@0	13.50	14.88
15	1745.0	16QAM	75@0	13.48	15.04
15	1745.0	64QAM	75@0	13.48	15.06
15	1772.5	QPSK	75@0	13.50	14.82
15	1772.5	16QAM	75@0	13.52	15.42
15	1772.5	64QAM	75@0	13.47	14.81
15	1717.5	QPSK	75@0	13.44	14.94
15	1717.5	16QAM	75@0	13.47	14.84
15	1717.5	64QAM	75@0	13.46	14.65
20	1745.0	QPSK	100@0	17.99	19.35
20	1745.0	16QAM	100@0	17.96	19.46
20	1745.0	64QAM	100@0	18.00	19.40
20	1770.0	QPSK	100@0	17.94	19.40
20	1770.0	16QAM	100@0	17.98	19.34
20	1770.0	64QAM	100@0	17.98	19.55
20	1720.0	QPSK	100@0	17.95	19.41
20	1720.0	16QAM	100@0	17.92	19.69
20	1720.0	64QAM	100@0	18.00	19.52

B66(20.0M) QPSK 100@0 Middle



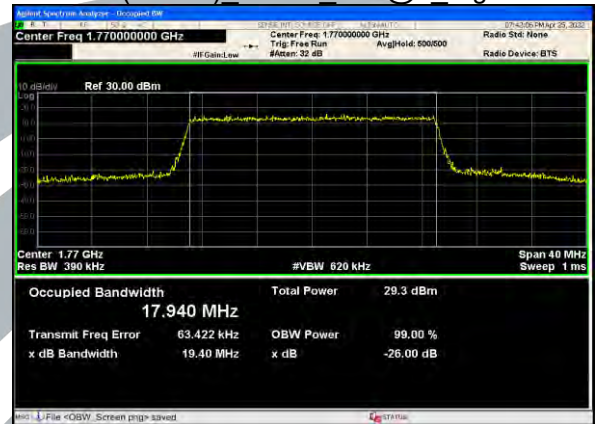
B66(20.0M) 16QAM 100@0 Middle



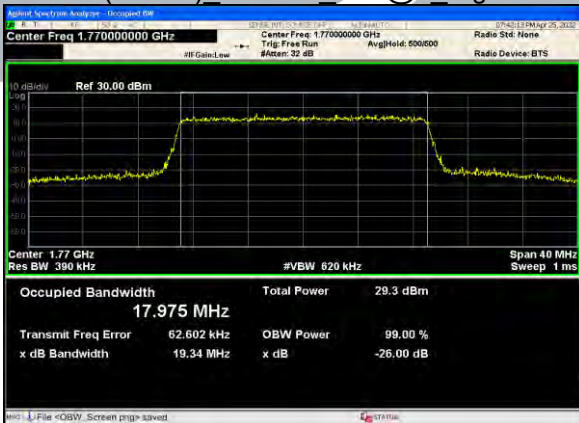
B66(20.0M) 64QAM 100@0 Middle



B66(20.0M) QPSK 100@0 Highest



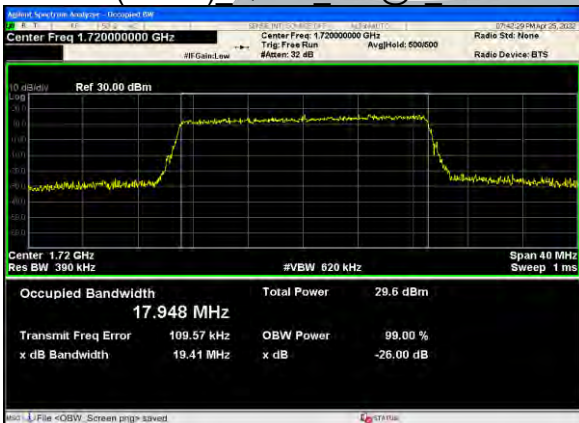
B66(20.0M) 16QAM 100@0 Highest



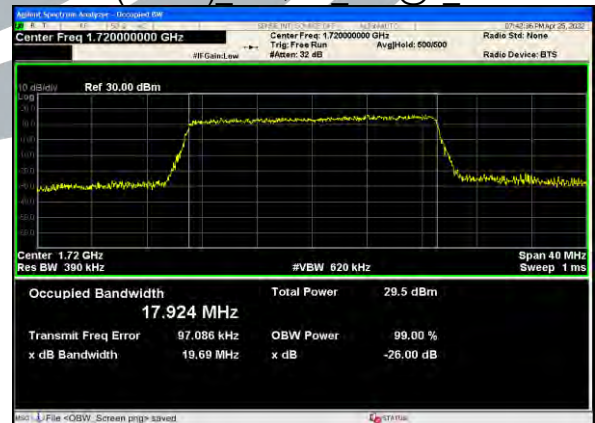
B66(20.0M) 64QAM 100@0 Highest



B66(20.0M) QPSK 100@0 Lowest



B66(20.0M) 16QAM 100@0 Lowest



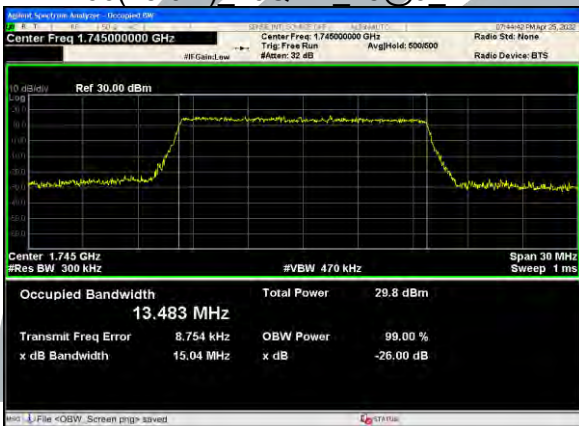
B66(20.0M) 64QAM 100@0 Lowest



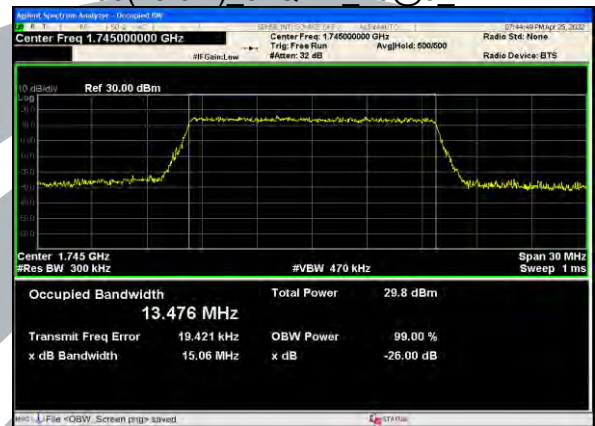
B66(15.0M) QPSK 75@0 Middle



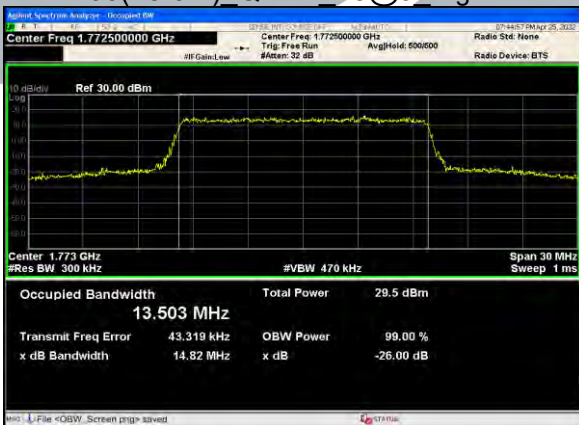
B66(15.0M) 16QAM 75@0 Middle



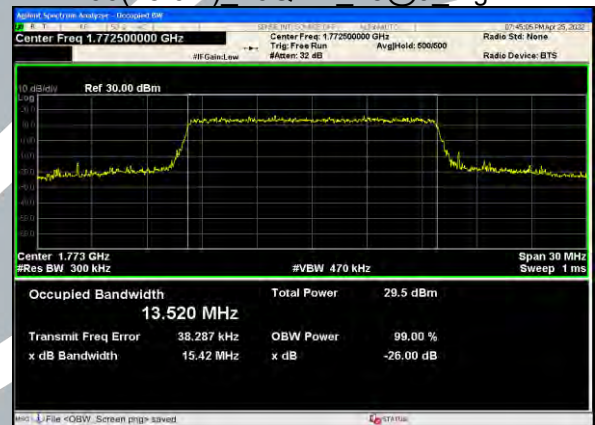
B66(15.0M) 64QAM 75@0 Middle



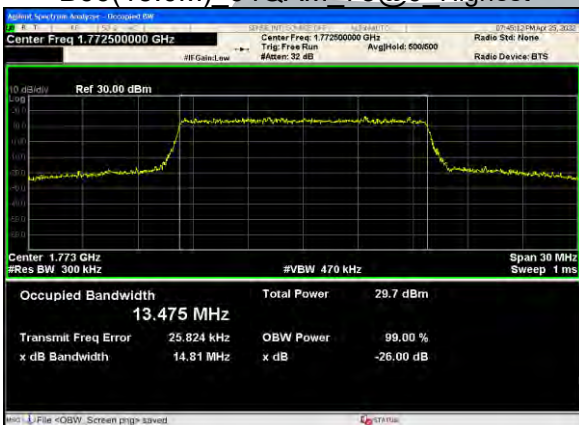
B66(15.0M) QPSK 75@0 Highest



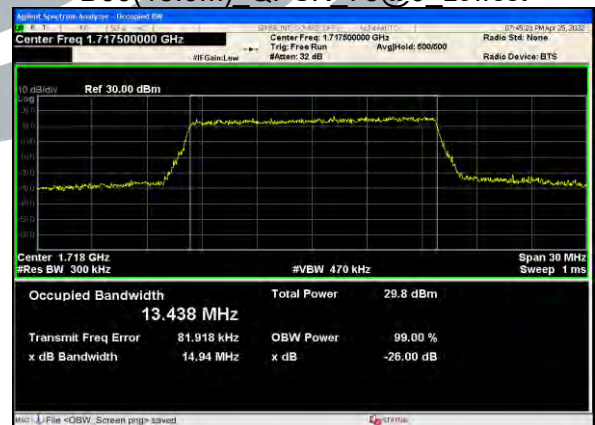
B66(15.0M) 16QAM 75@0 Highest



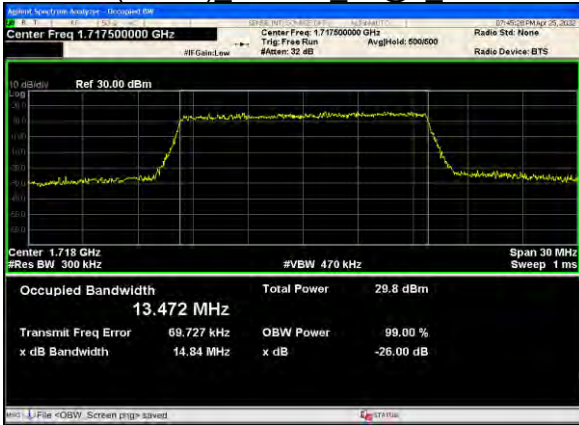
B66(15.0M) 64QAM 75@0 Highest



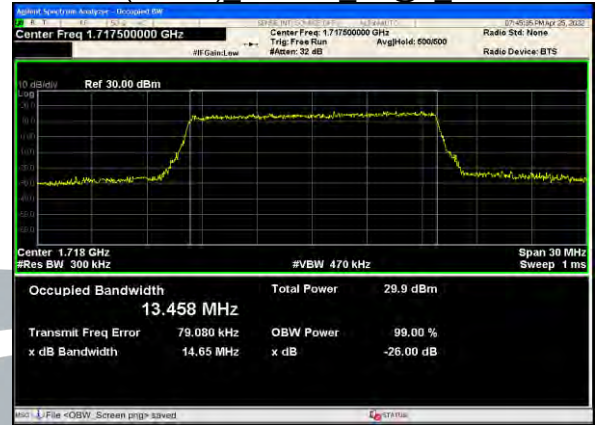
B66(15.0M) QPSK 75@0 Lowest



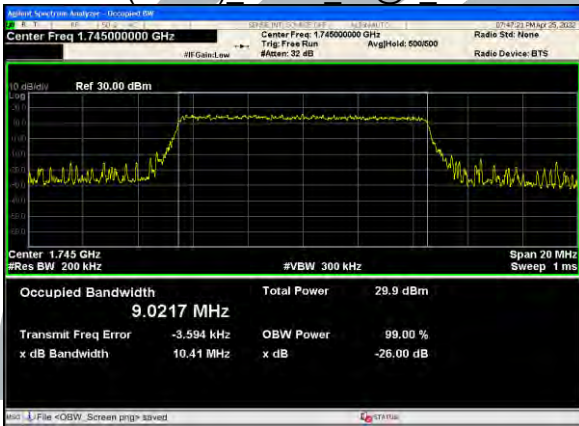
B66(15.0M) 16QAM 75@0 Lowest



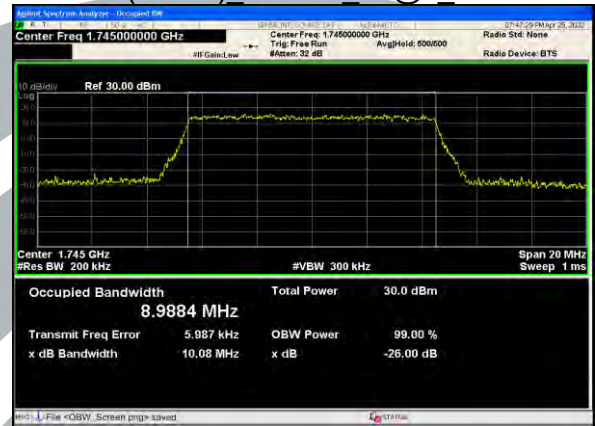
B66(15.0M) 64QAM 75@0 Lowest



B66(10.0M) QPSK 50@0 Middle



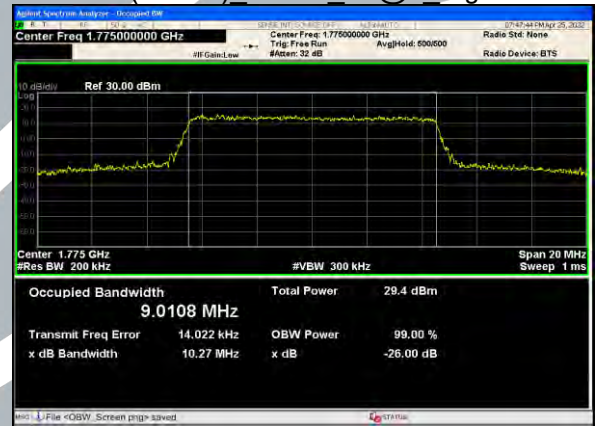
B66(10.0M) 16QAM 50@0 Middle



B66(10.0M) 64QAM 50@0 Middle



B66(10.0M) QPSK 50@0 Highest



B66(10.0M) 16QAM 50@0 Highest



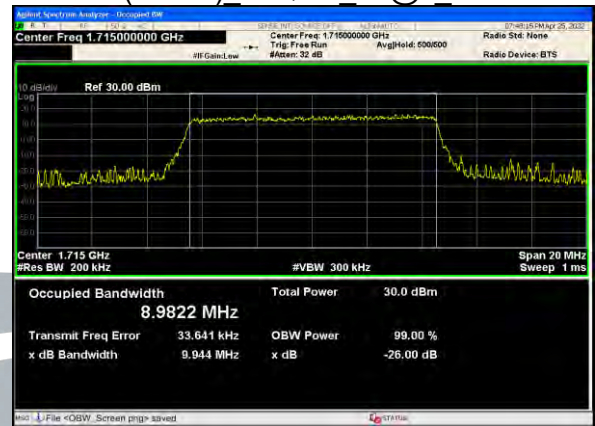
B66(10.0M) 64QAM 50@0 Highest



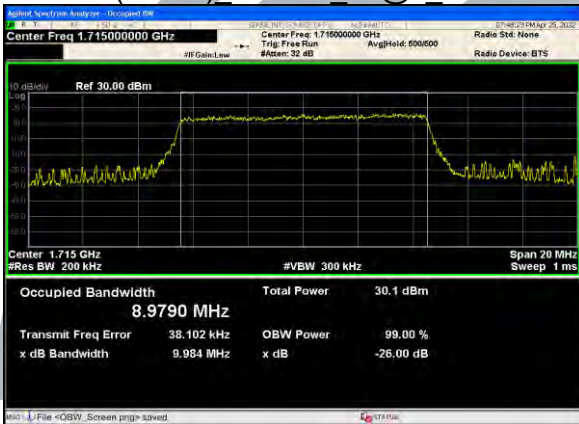
B66(10.0M) QPSK 50@0 Lowest



B66(10.0M) 16QAM 50@0 Lowest



B66(10.0M) 64QAM 50@0 Lowest



B66(5.0M) QPSK 25@0 Middle



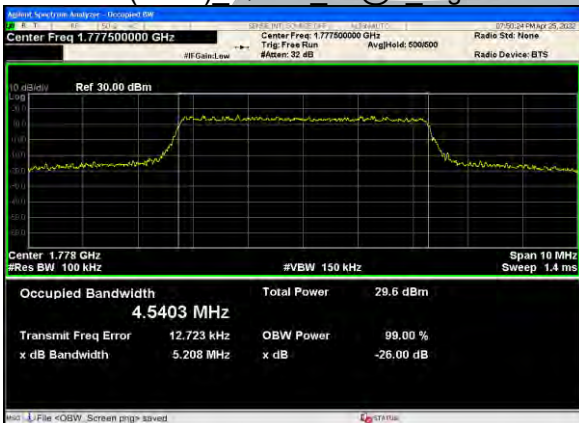
B66(5.0M) 16QAM 25@0 Middle



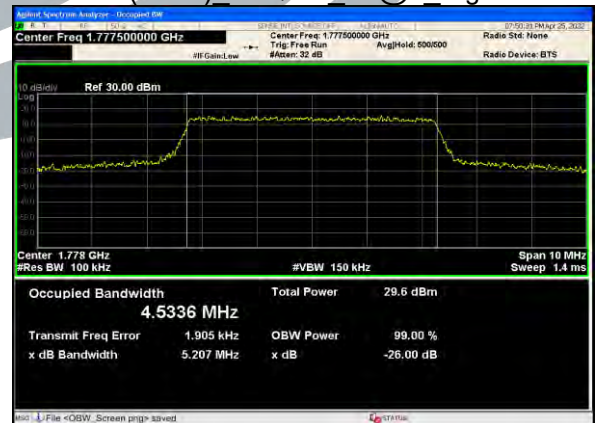
B66(5.0M) 64QAM 25@0 Middle



B66(5.0M) QPSK 25@0 Highest



B66(5.0M) 16QAM 25@0 Highest



B66(5.0M) 64QAM 25@0 Highest



B66(5.0M) QPSK 25@0 Lowest



B66(5.0M) 16QAM 25@0 Lowest



B66(5.0M) 64QAM 25@0 Lowest



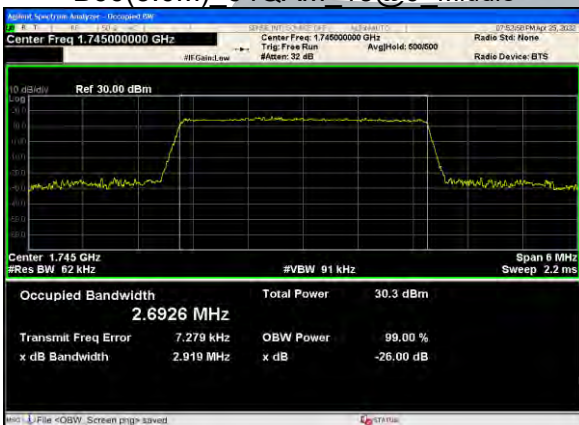
B66(3.0M) QPSK 15@0 Middle



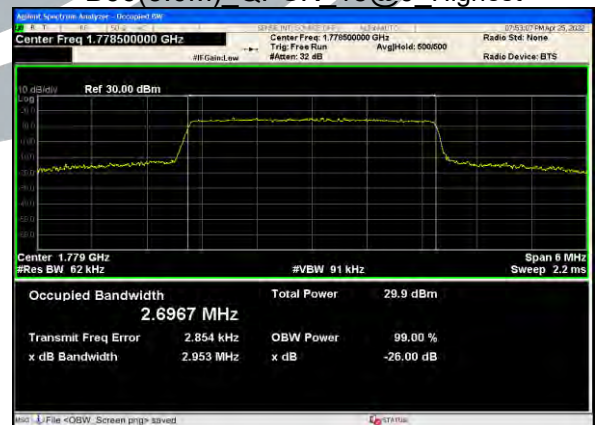
B66(3.0M) 16QAM 15@0 Middle



B66(3.0M) 64QAM 15@0 Middle



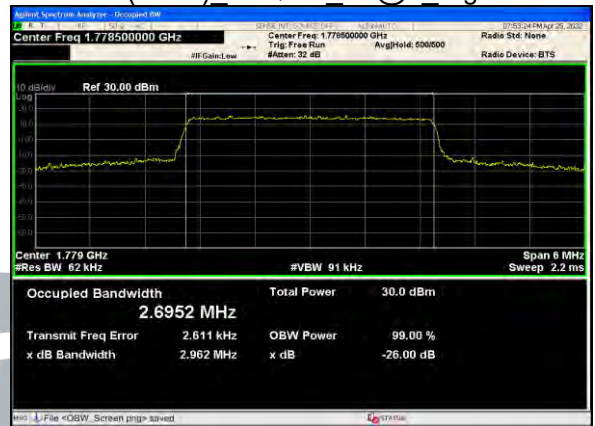
B66(3.0M) QPSK 15@0 Highest



B66(3.0M) 16QAM 15@0 Highest



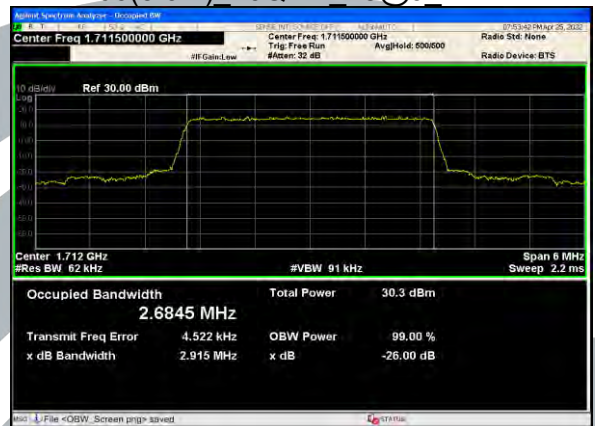
B66(3.0M) 64QAM 15@0 Highest



B66(3.0M) QPSK 15@0 Lowest



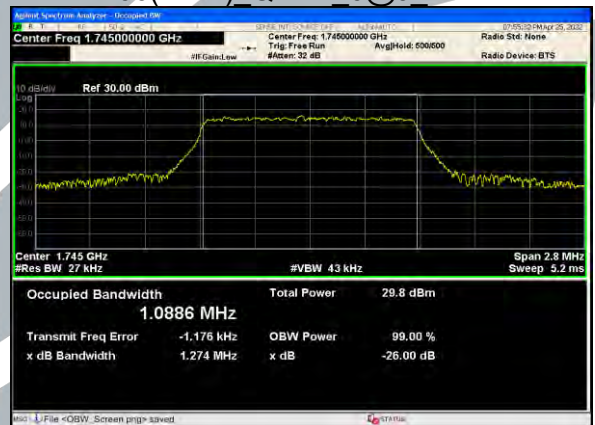
B66(3.0M) 16QAM 15@0 Lowest



B66(3.0M) 64QAM 15@0 Lowest



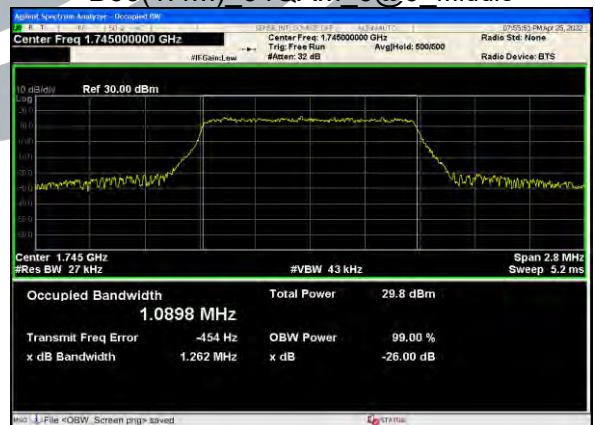
B66(1.4M) QPSK 6@0 Middle



B66(1.4M) 16QAM 6@0 Middle



B66(1.4M) 64QAM 6@0 Middle



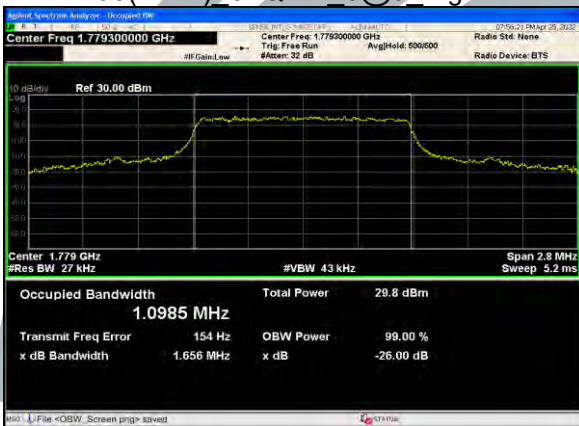
B66(1.4M) QPSK 6@0 Highest



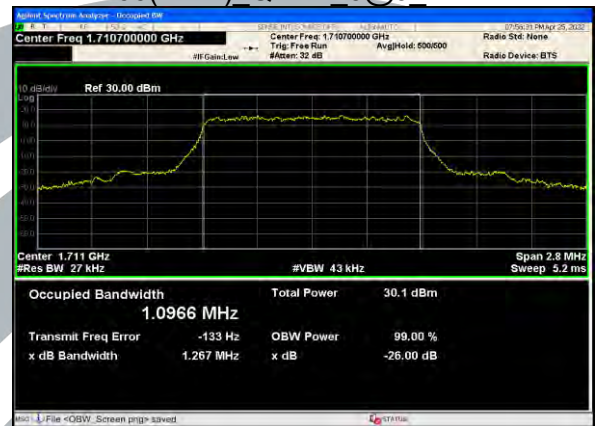
B66(1.4M) 16QAM 6@0 Highest



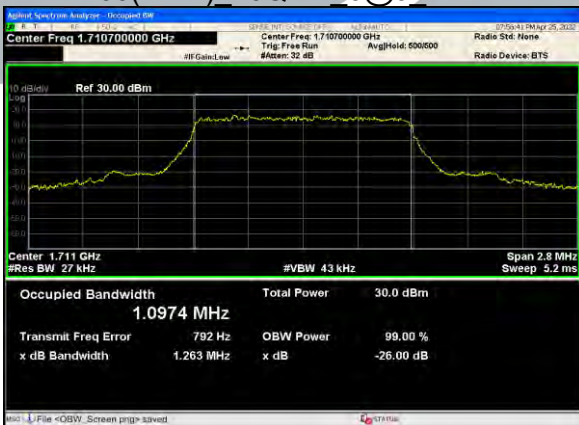
B66(1.4M) 64QAM 6@0 Highest



B66(1.4M) QPSK 6@0 Lowest



B66(1.4M) 16QAM 6@0 Lowest



B66(1.4M) 64QAM 6@0 Lowest



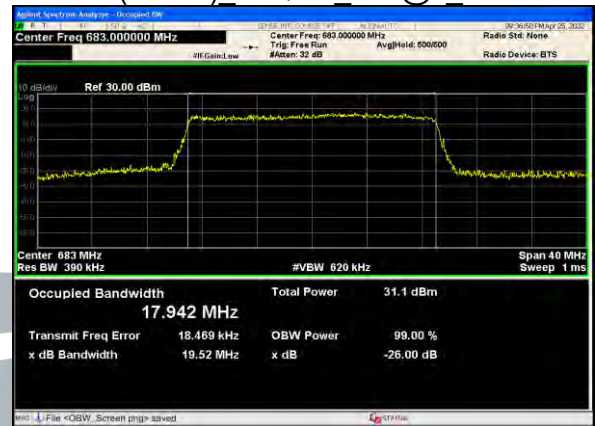
5.5.14 LTE Band 71

Bandwidth (MHz)	Freq. (MHz)	Modulation	RB	OBW (MHz)	26dB BW (MHz)
5	680.5	QPSK	25@0	4.51	5.18
5	680.5	16QAM	25@0	4.51	5.09
5	680.5	64QAM	25@0	4.51	5.11
5	695.5	QPSK	25@0	4.52	5.18
5	695.5	16QAM	25@0	4.53	5.14
5	695.5	64QAM	25@0	4.53	5.15
5	665.5	QPSK	25@0	4.52	5.15
5	665.5	16QAM	25@0	4.52	5.1
5	665.5	64QAM	25@0	4.51	5.09
10	680.5	QPSK	50@0	9.0	10.12
10	680.5	16QAM	50@0	9.03	10.18
10	680.5	64QAM	50@0	9.01	9.95
10	693.0	QPSK	50@0	9.06	10.03
10	693.0	16QAM	50@0	9.05	10.19
10	693.0	64QAM	50@0	9.03	10.13
10	668.0	QPSK	50@0	8.94	10.05
10	668.0	16QAM	50@0	8.96	9.8
10	668.0	64QAM	50@0	8.97	10.04
15	680.5	QPSK	75@0	13.52	15.02
15	680.5	16QAM	75@0	13.51	16.29
15	680.5	64QAM	75@0	13.51	15.06
15	690.5	QPSK	75@0	13.52	14.99
15	690.5	16QAM	75@0	13.48	14.84
15	690.5	64QAM	75@0	13.49	14.9
15	670.5	QPSK	75@0	13.42	14.63
15	670.5	16QAM	75@0	13.42	14.76
15	670.5	64QAM	75@0	13.43	14.74
20	683.0	QPSK	100@0	17.97	19.53
20	683.0	16QAM	100@0	17.94	19.52
20	683.0	64QAM	100@0	17.94	19.46
20	688.0	QPSK	100@0	17.92	20.35
20	688.0	16QAM	100@0	17.92	22.07
20	688.0	64QAM	100@0	17.92	19.78
20	673.0	QPSK	100@0	17.92	19.62
20	673.0	16QAM	100@0	17.94	19.53
20	673.0	64QAM	100@0	17.92	19.54

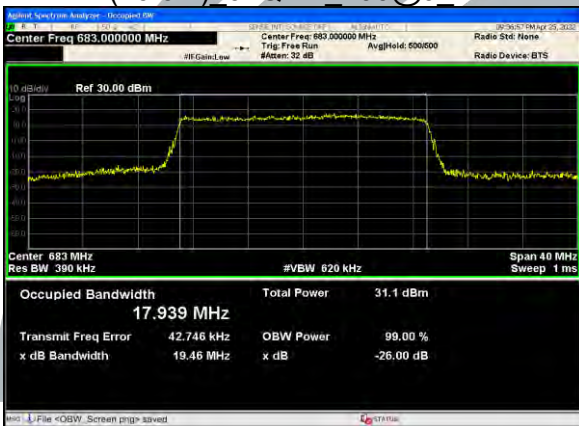
B71(20.0M) QPSK 100@0 Middle



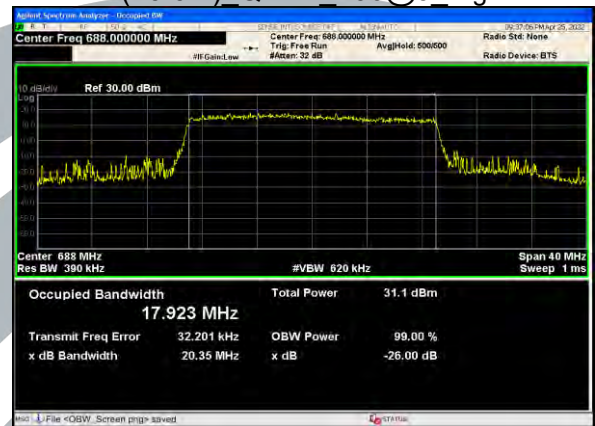
B71(20.0M) 16QAM 100@0 Middle



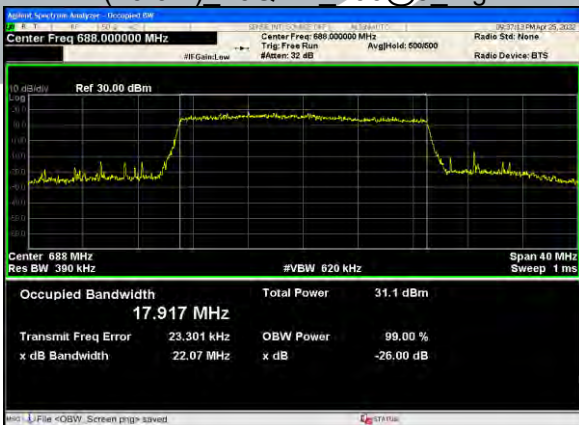
B71(20.0M) 64QAM 100@0 Middle



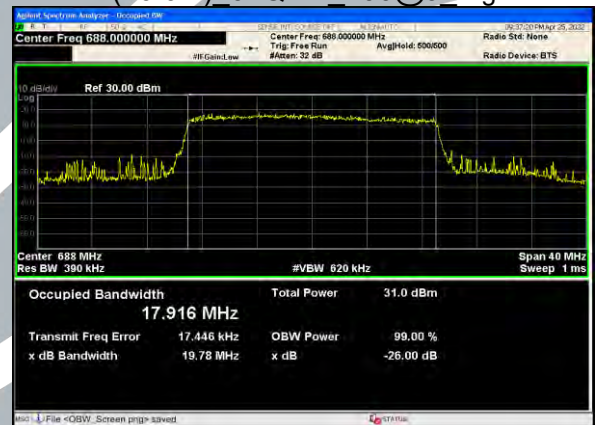
B71(20.0M) QPSK 100@0 Highest



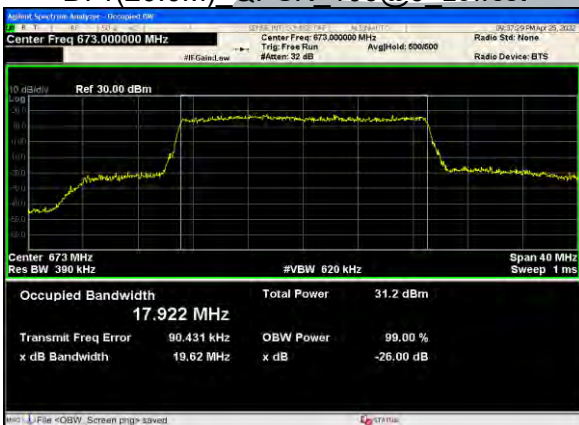
B71(20.0M) 16QAM 100@0 Highest



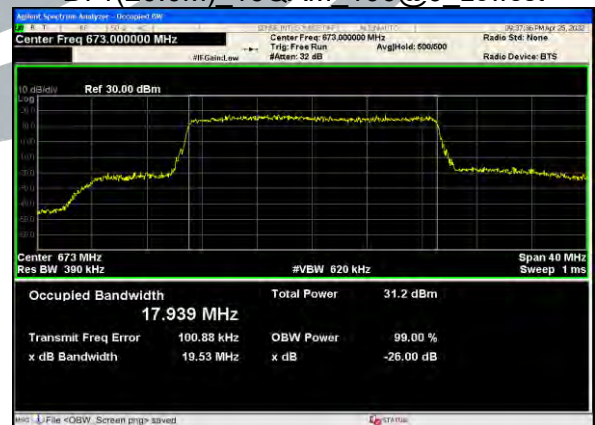
B71(20.0M) 64QAM 100@0 Highest



B71(20.0M) QPSK 100@0 Lowest



B71(20.0M) 16QAM 100@0 Lowest



B71(20.0M) 64QAM 100@0 Lowest



B71(15.0M) QPSK 75@0 Middle



B71(15.0M) 16QAM 75@0 Middle



B71(15.0M) 64QAM 75@0 Middle



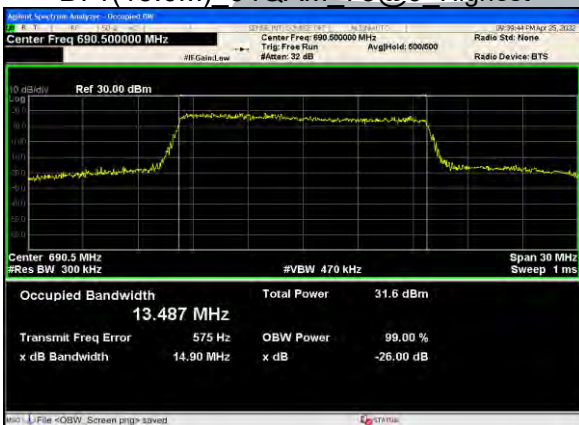
B71(15.0M) QPSK 75@0 Highest



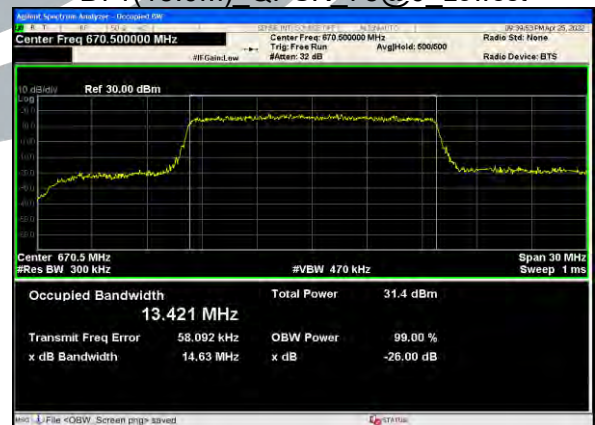
B71(15.0M) 16QAM 75@0 Highest



B71(15.0M) 64QAM 75@0 Highest



B71(15.0M) QPSK 75@0 Lowest



B71(15.0M) 16QAM 75@0 Lowest



B71(15.0M) 64QAM 75@0 Lowest



B71(10.0M) QPSK 50@0 Middle



B71(10.0M) 16QAM 50@0 Middle



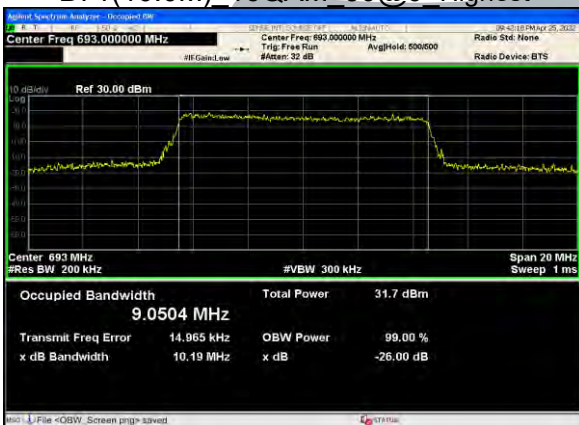
B71(10.0M) 64QAM 50@0 Middle



B71(10.0M) QPSK 50@0 Highest



B71(10.0M) 16QAM 50@0 Highest



B71(10.0M) 64QAM 50@0 Highest



B71(10.0M) QPSK 50@0 Lowest



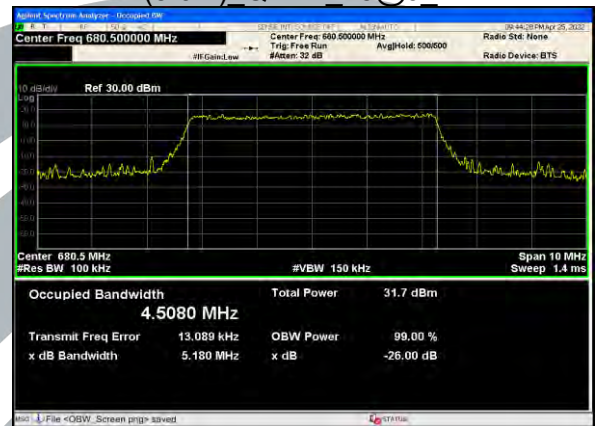
B71(10.0M) 16QAM 50@0 Lowest



B71(10.0M) 64QAM 50@0 Lowest



B71(5.0M) QPSK 25@0 Middle



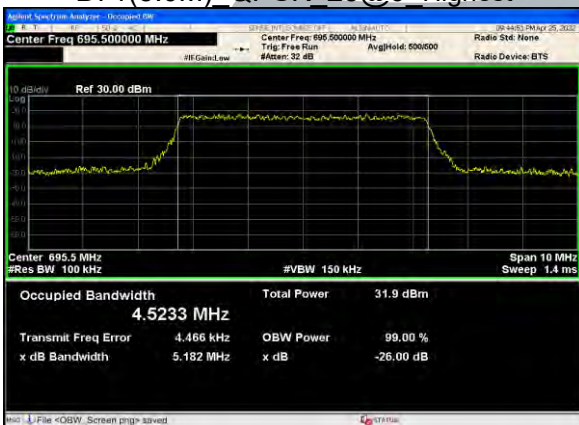
B71(5.0M) 16QAM 25@0 Middle



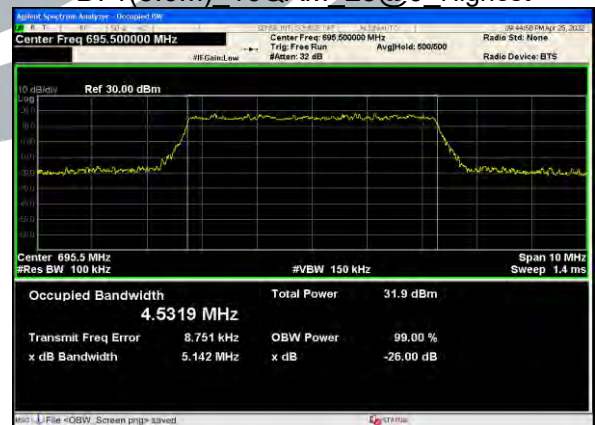
B71(5.0M) 64QAM 25@0 Middle



B71(5.0M) QPSK 25@0 Highest



B71(5.0M) 16QAM 25@0 Highest



B71(5.0M) 64QAM 25@0 Highest



B71(5.0M) QPSK 25@0 Lowest



B71(5.0M) 16QAM 25@0 Lowest



B71(5.0M) 64QAM 25@0 Lowest



5.6 BAND EDGE AT ANTENNA TERMINALS

Test Requirement: LTE Band 2 & LTE Band 25: FCC 47 CFR Part 24.238(a)
LTE Band 4 & LTE Band 66: FCC 47 CFR Part 27.53(h)(1)
LTE Band 5 & LTE Band 26: FCC 47 CFR Part 22.917(a)
LTE Band 7 & Band 41: FCC 47 CFR Part 27.53(m)(4)
LTE Band 12 & Band 17 & Band 71: FCC 47 CFR Part 27.53(g)
LTE Band 13: FCC 47 CFR Part 27.53(c)(2)
LTE Band 26: FCC 47 CFR Part 90.691
LTE Band 30: FCC 47 CFR Part 27.53(a)(4)
Test Method: ANSI C63.26-2015 & KDB 971168 D01v03r01

Limit:

FCC 47 CFR Part 24.238(a), 27.53(h)(1), 22.917(a):

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(a)(4): For mobile and portable stations operating in the 2305-2315 MHz and 2350-2360 MHz bands:

(i) By a factor of not less than $43 + 10 \log(P)$ dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than $55 + 10 \log(P)$ dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz, not less than $61 + 10 \log(P)$ dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz, and not less than $67 + 10 \log(P)$ dB on all frequencies between 2328 and 2337 MHz;

(ii) By a factor of not less than $43 + 10 \log(P)$ dB on all frequencies between 2300 and 2305 MHz, $55 + 10 \log(P)$ dB on all frequencies between 2296 and 2300 MHz, $61 + 10 \log(P)$ dB on all frequencies between 2292 and 2296 MHz, $67 + 10 \log(P)$ dB on all frequencies between 2288 and 2292 MHz, and $70 + 10 \log(P)$ dB below 2288 MHz;

(iii) By a factor of not less than $43 + 10 \log(P)$ dB on all frequencies between 2360 and 2365 MHz, and not less than $70 + 10 \log(P)$ dB above 2365 MHz.

FCC 47 CFR Part 27.53(m)(4):

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.

FCC 47 CFR Part 27.53(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. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

FCC 47 CFR Part 27.53(c)(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;

FCC 47 CFR Part 90.691:

(a)(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $116 \log_{10}(f/6.1)$ decibels or $50 + 10 \log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

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UTTR-RF-FCC4G-V1.1

(a)(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $43 + 10\log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

Test Procedure:

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer.

For each band edge measurement:

- 1) Set the spectrum analyzer span to include the block edge frequency.
- 2) Set a marker to point the corresponding band edge frequency in each test case.
- 3) Set display line at -13 dBm
- 4) Set resolution bandwidth to at least 1% of emission bandwidth.
- 5) Set spectrum analyzer with RMS detector.
- 6) Record the max trace plot into the test report

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

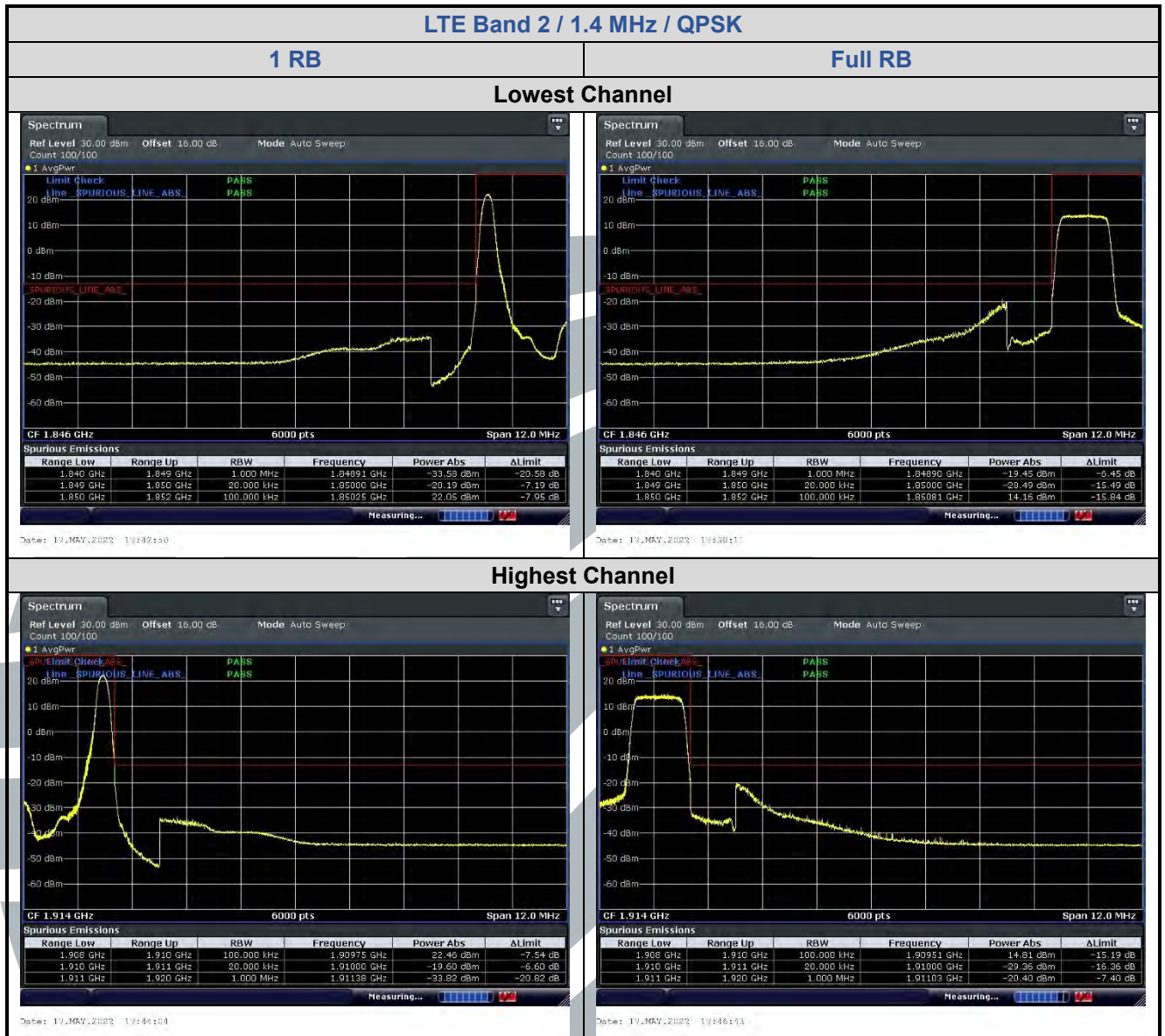
Test Setup: Refer to section 4.2.2 for details.

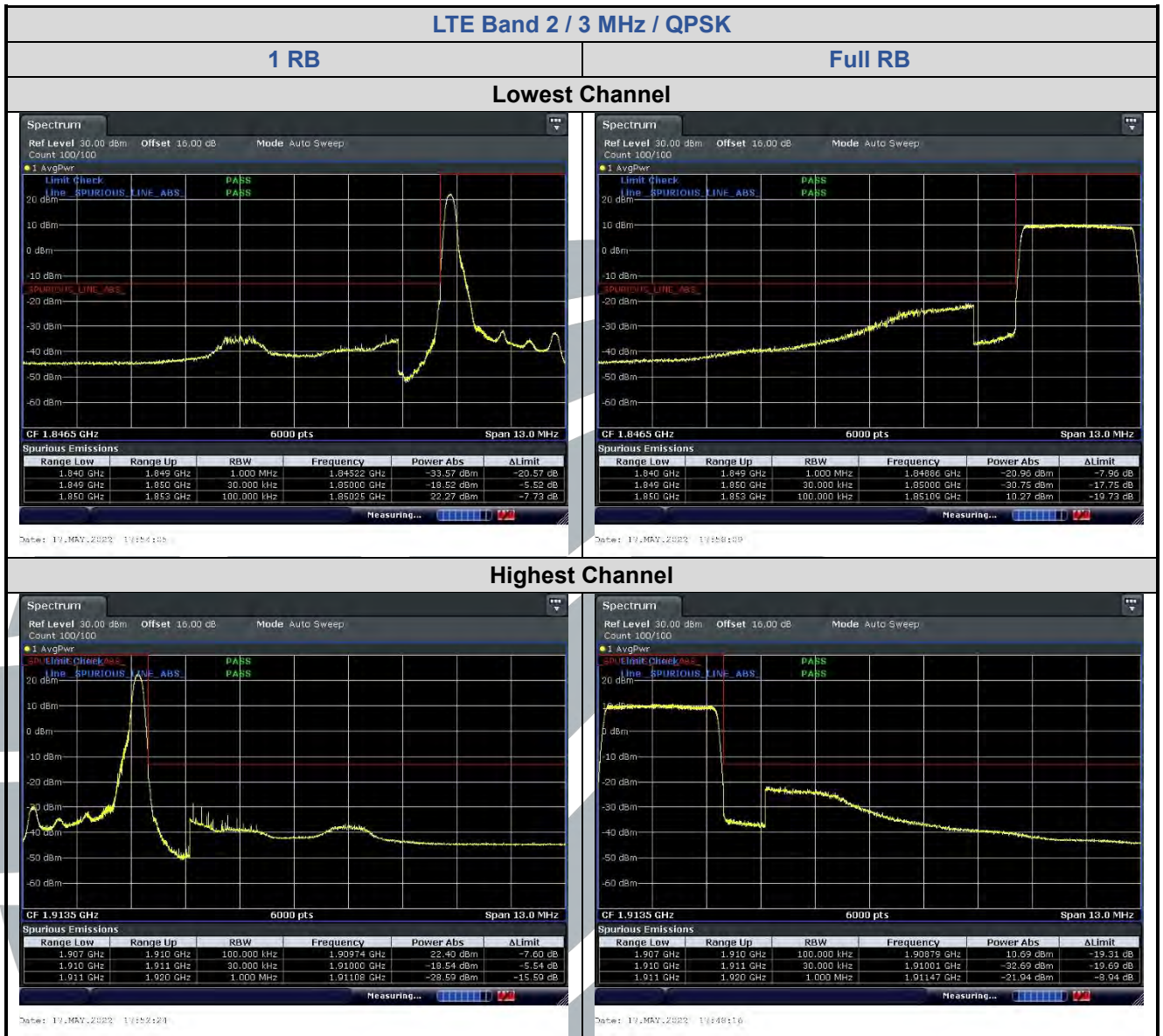
Instruments Used: Refer to section 3 for details

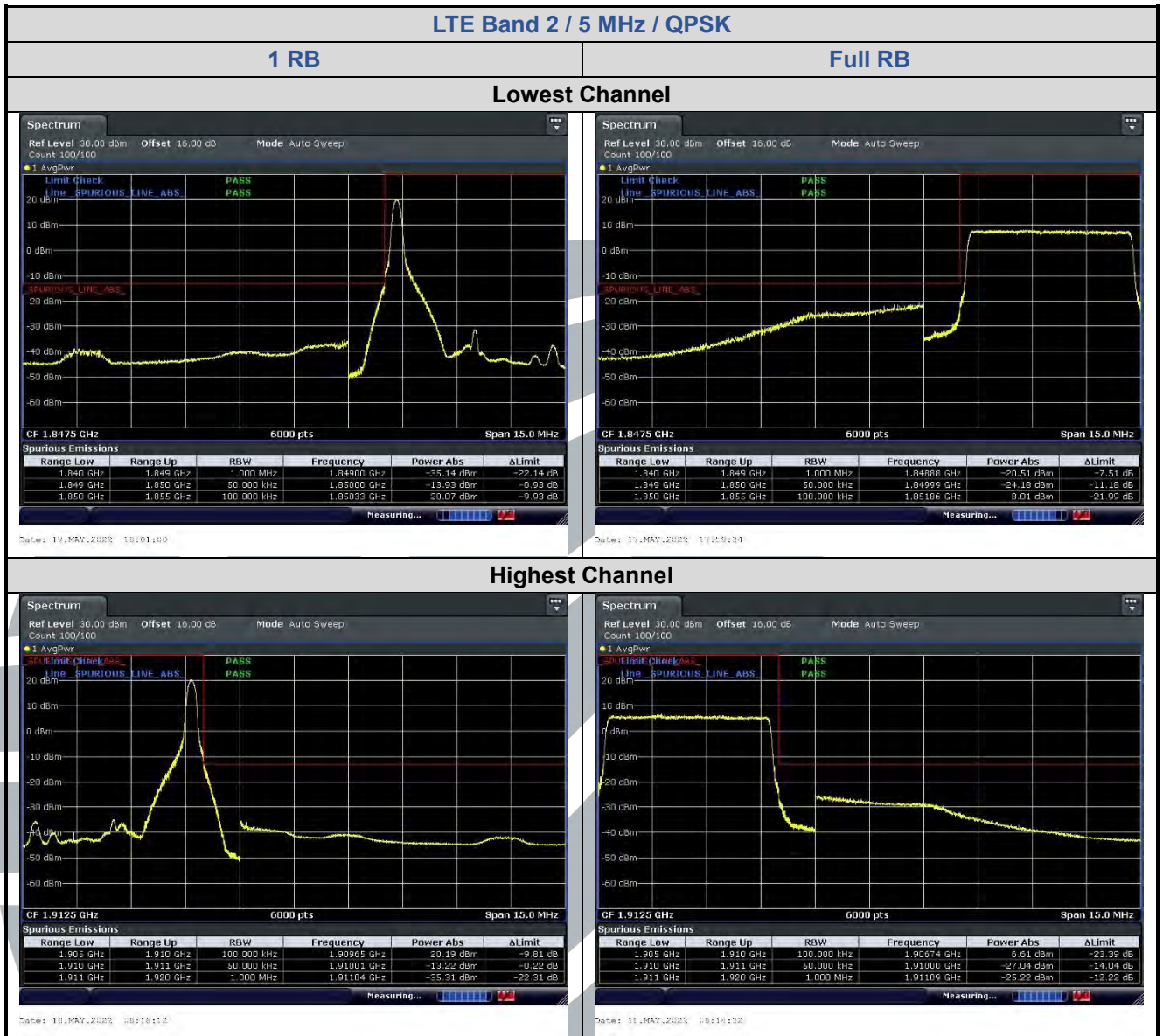
Test Mode: Link mode

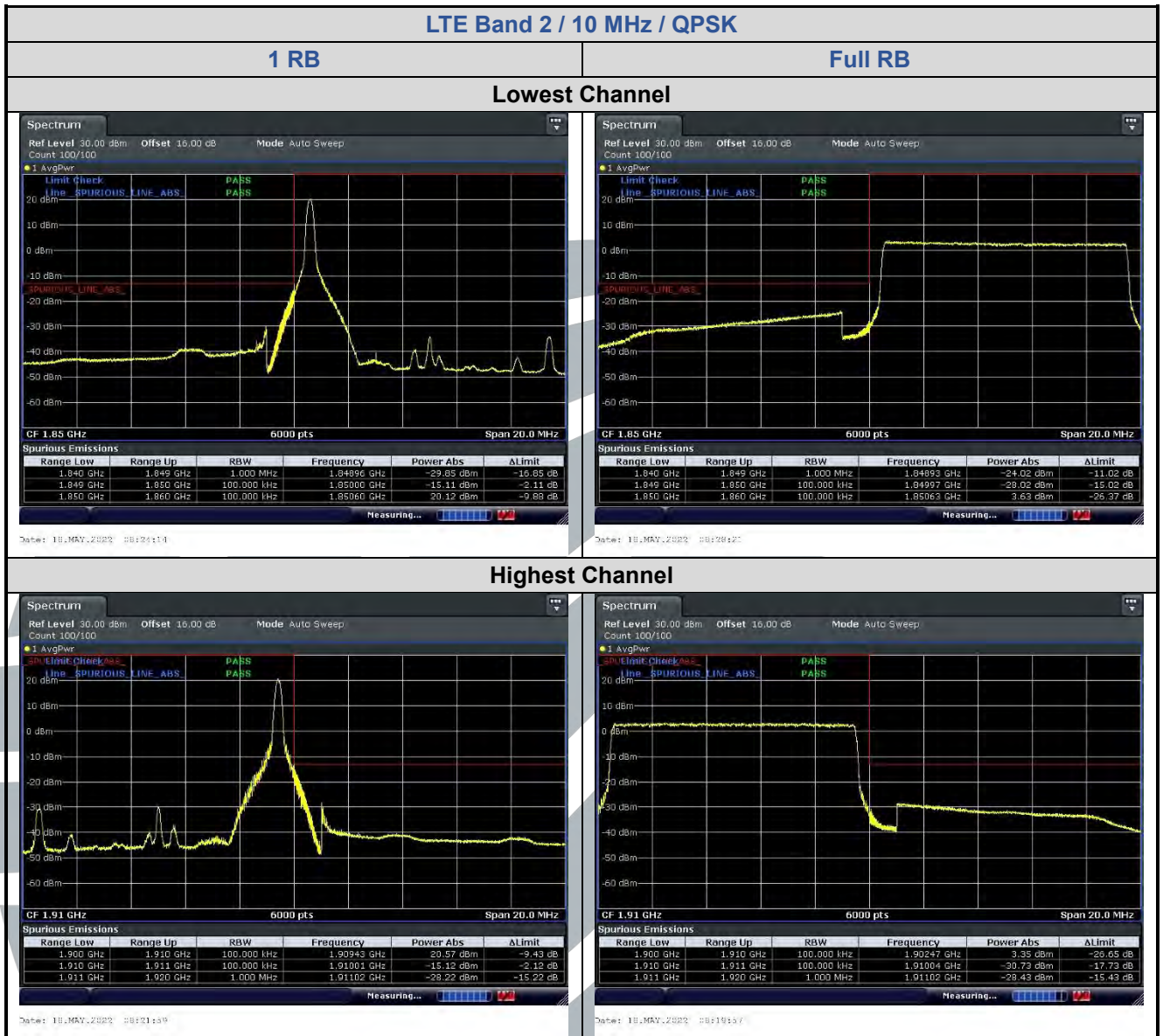
Test Results: Pass

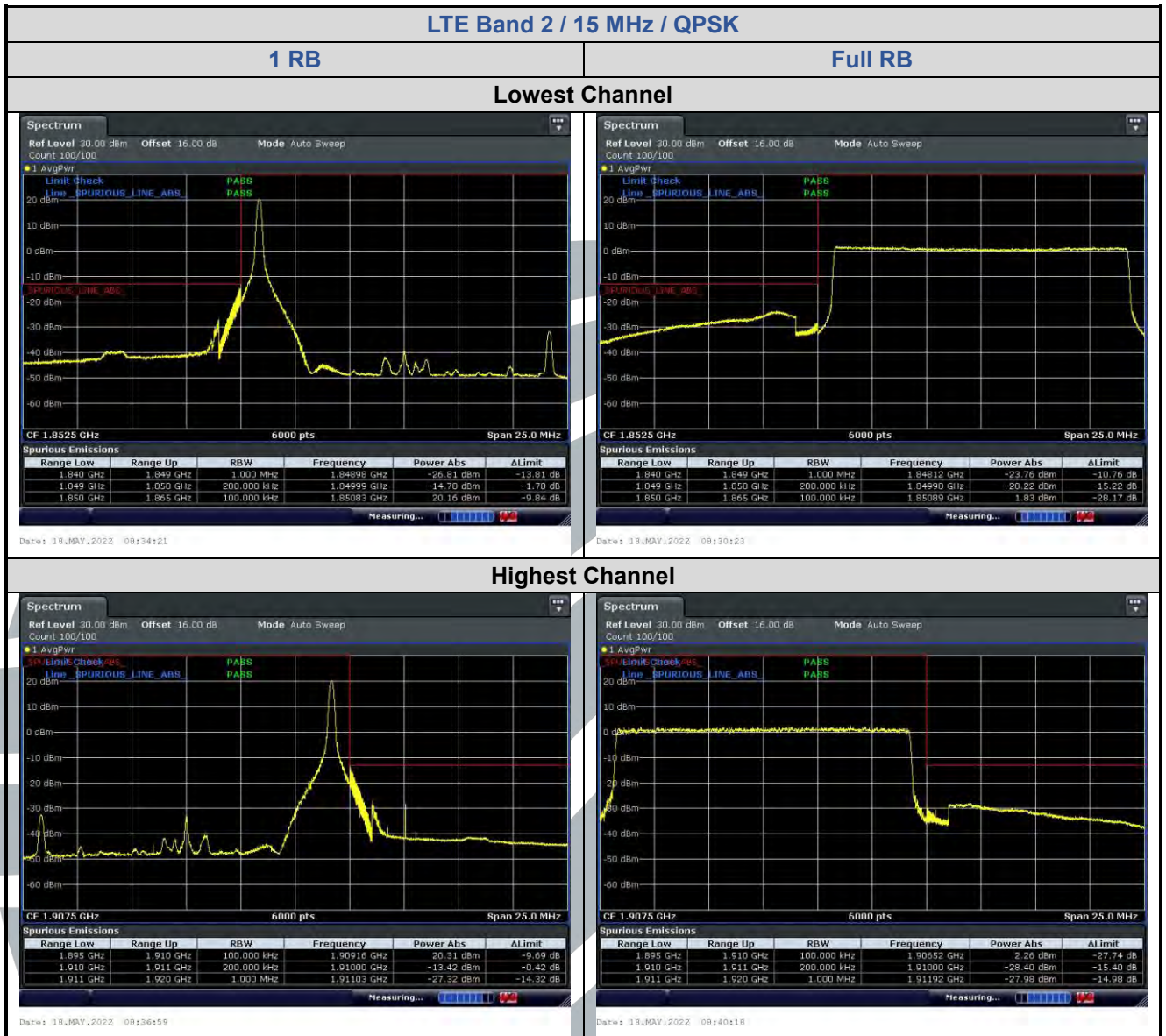
5.6.1 LTE Band 2

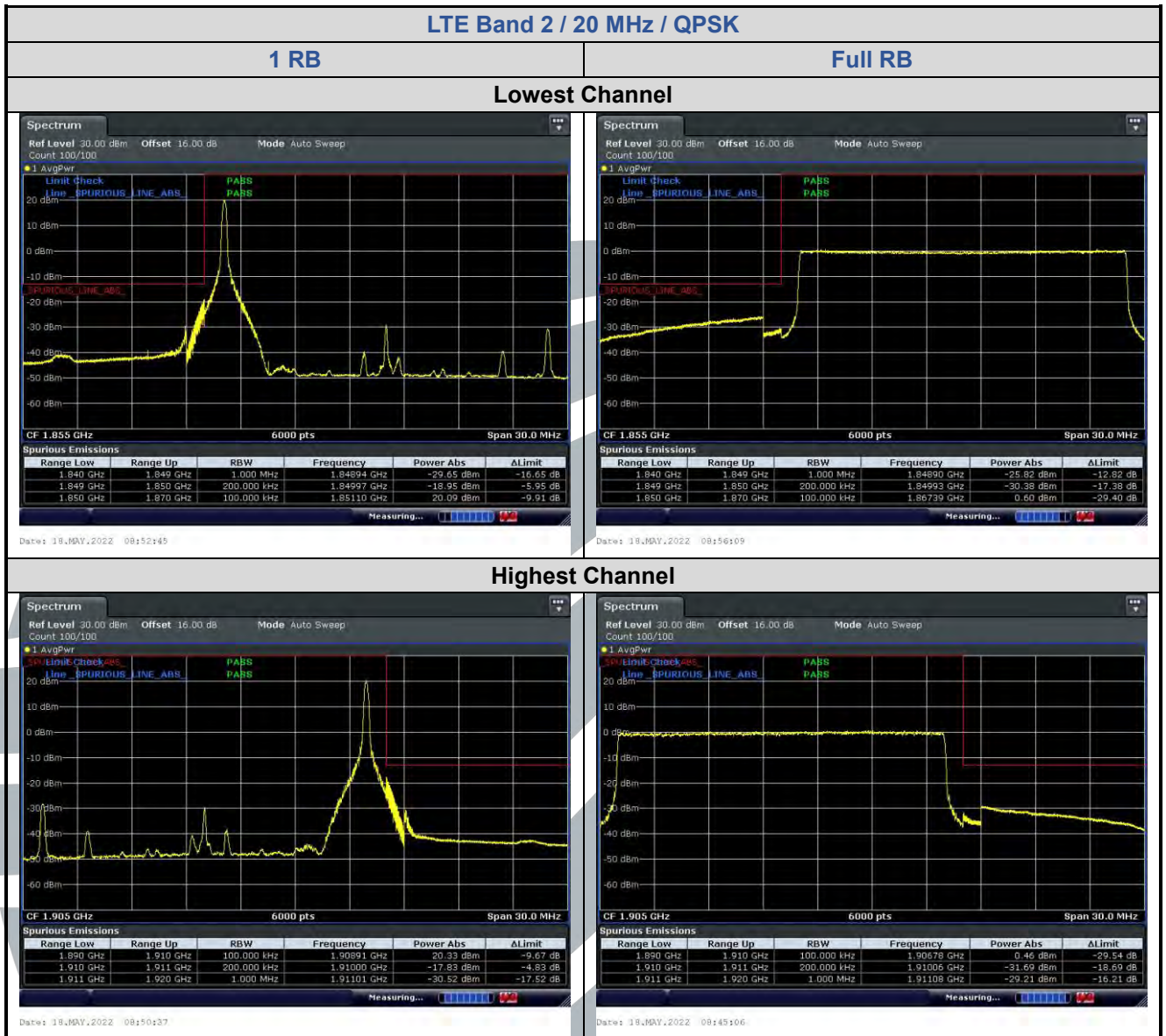


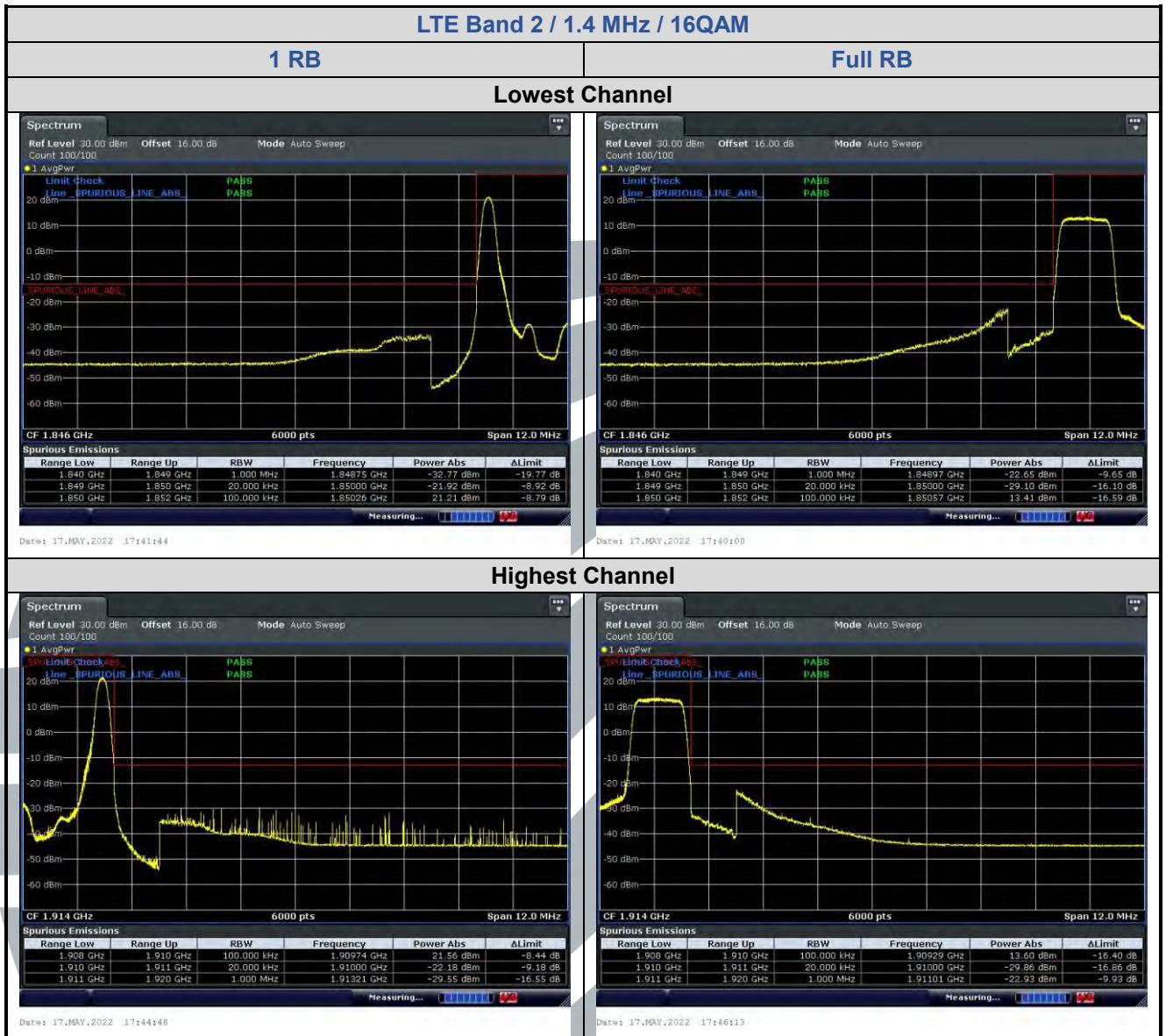


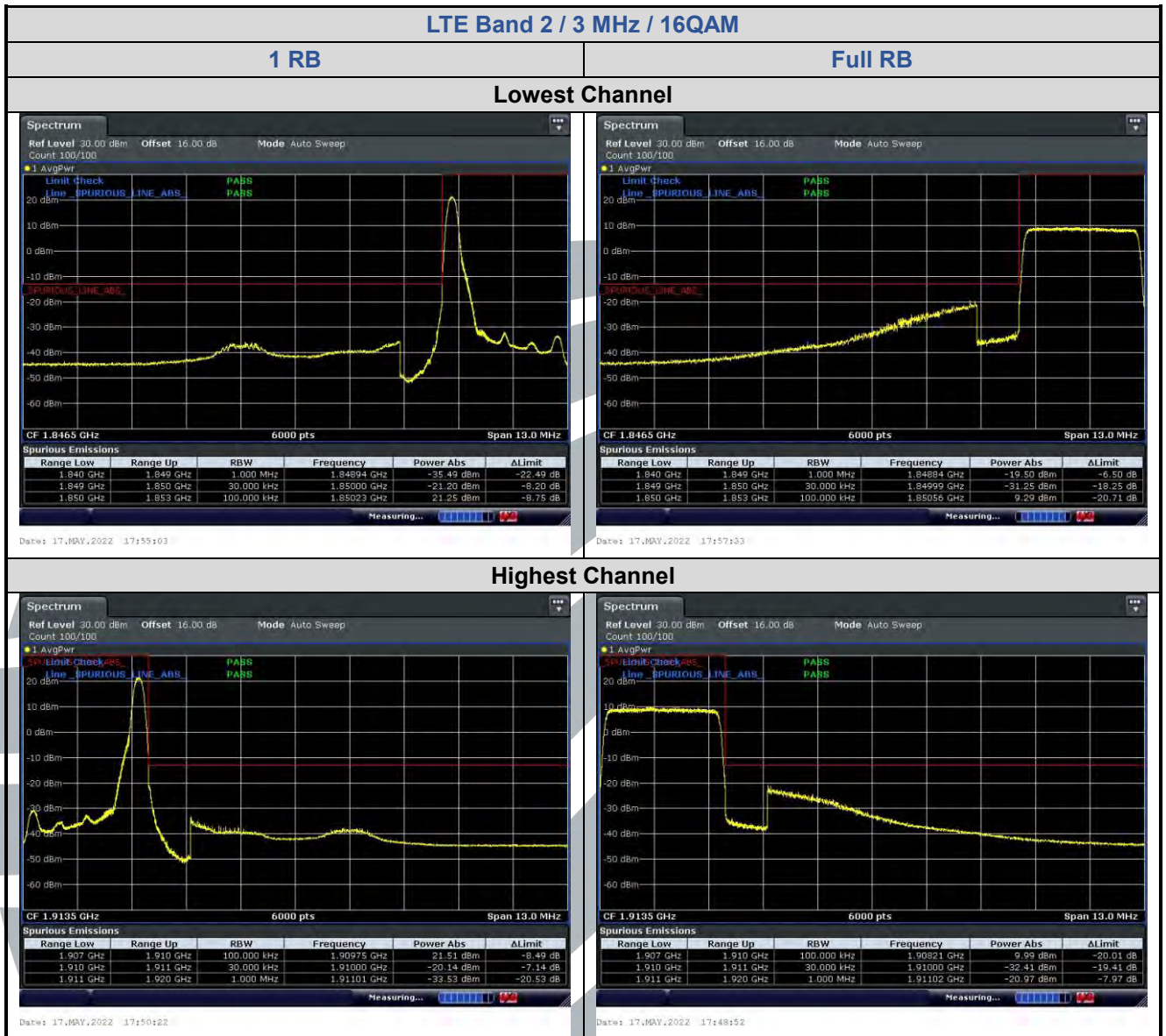


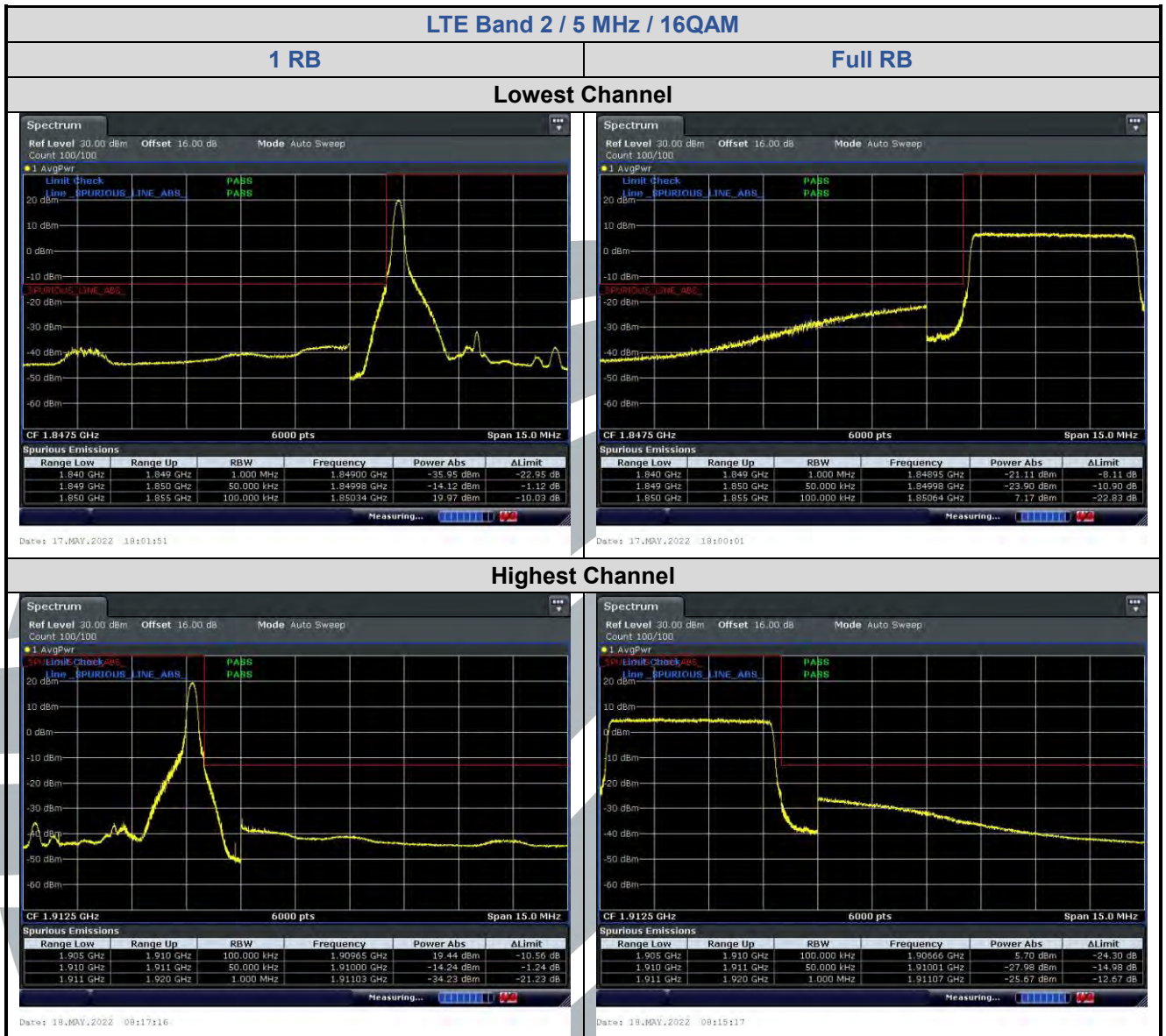


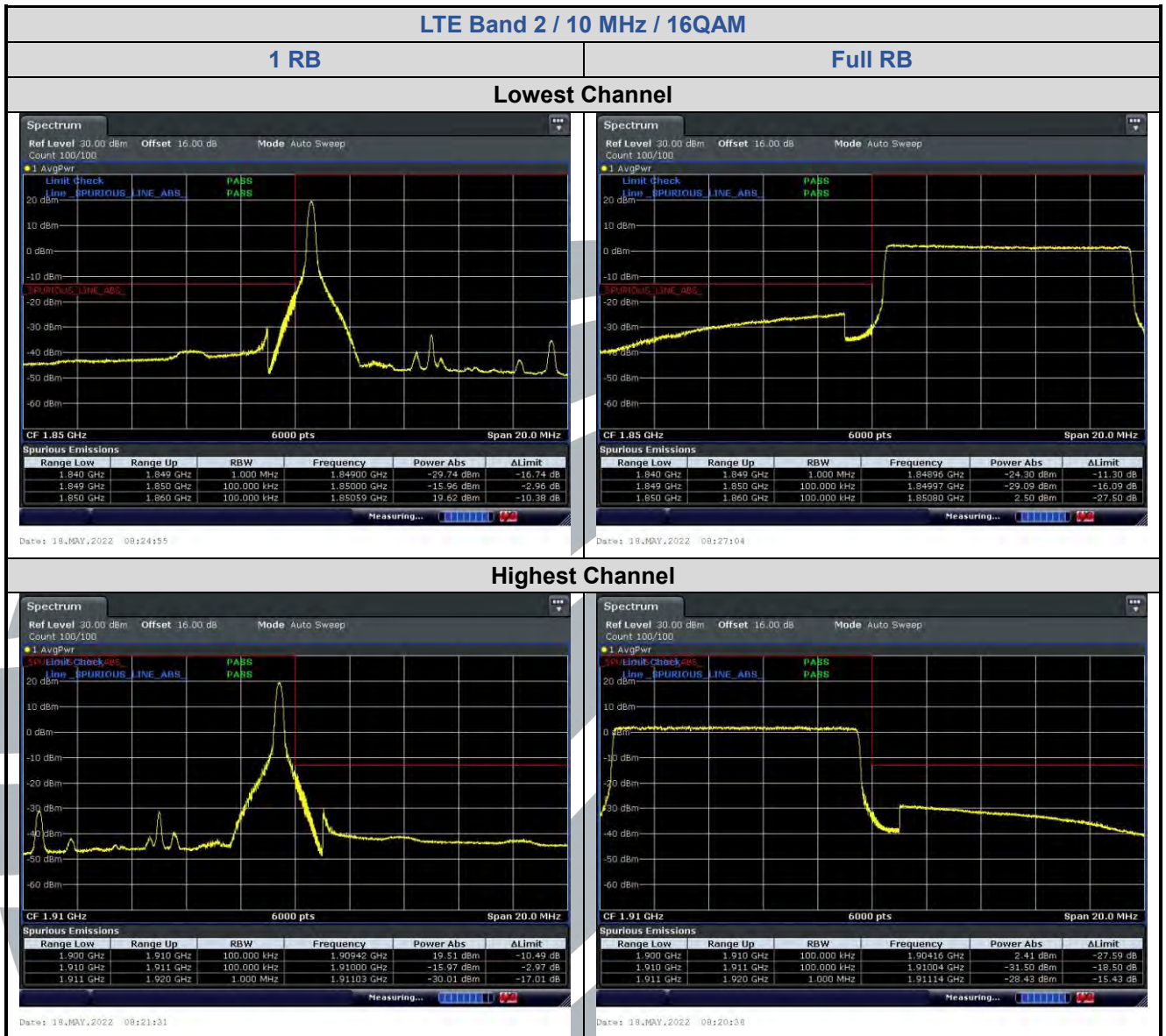


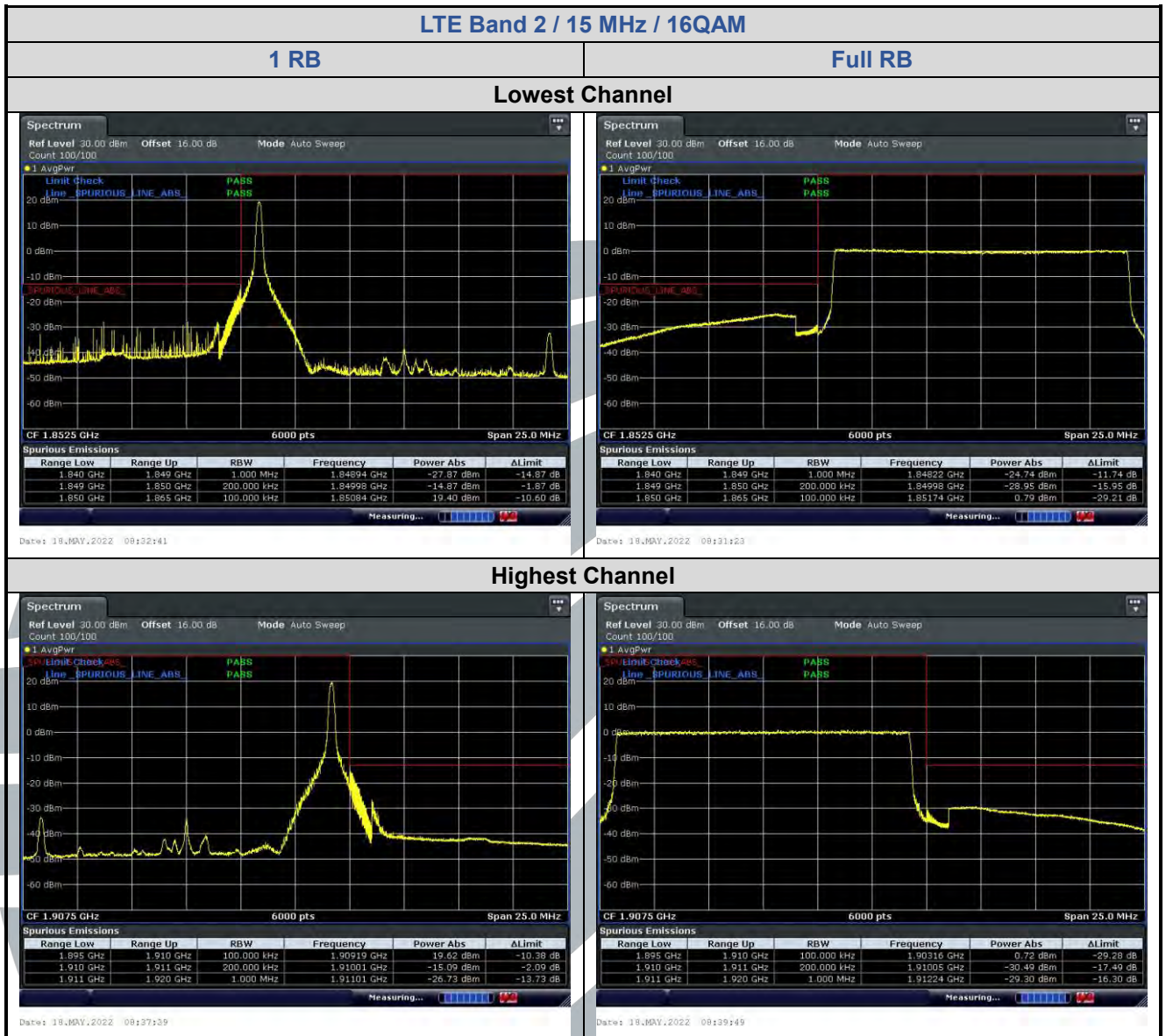


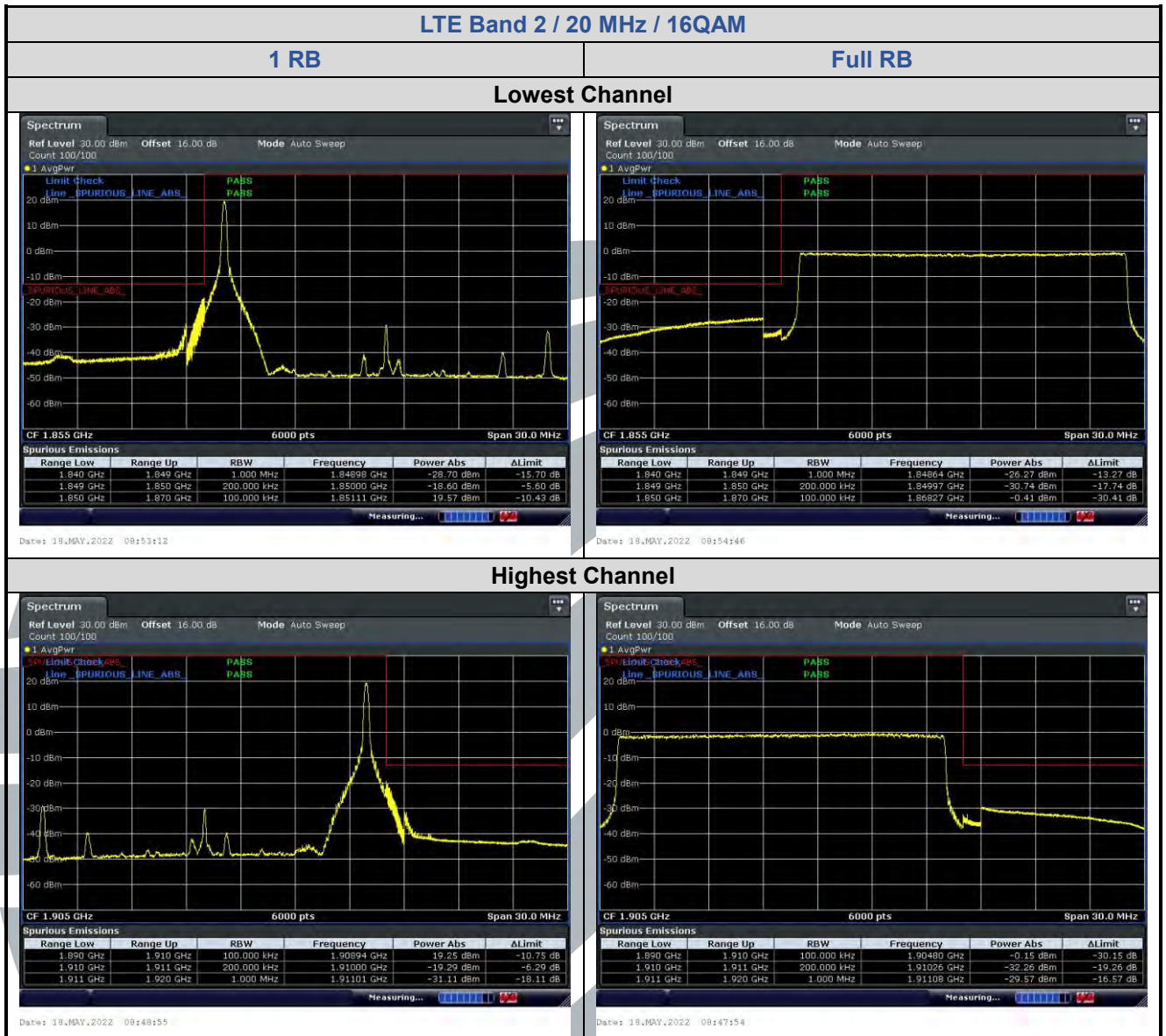


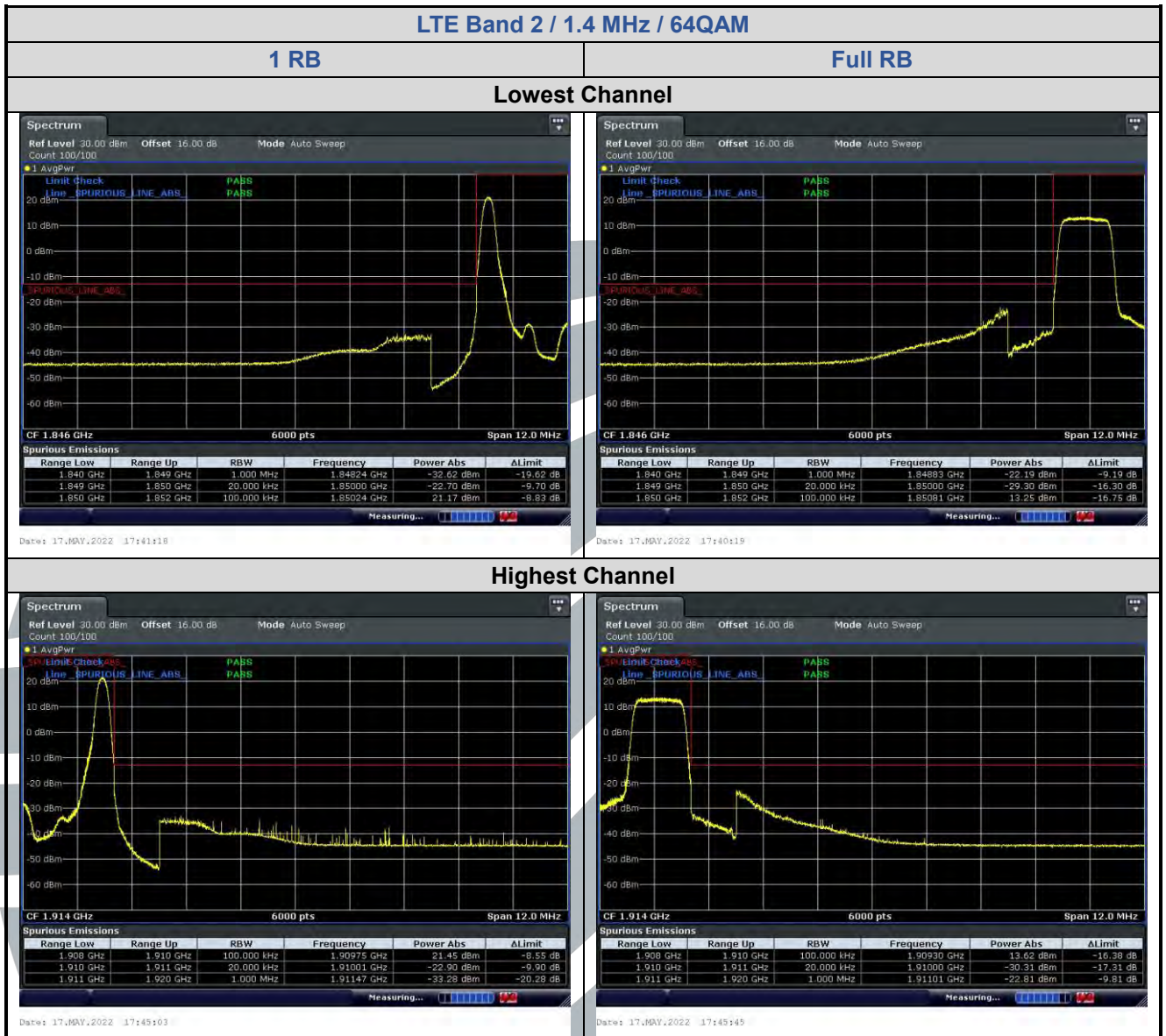


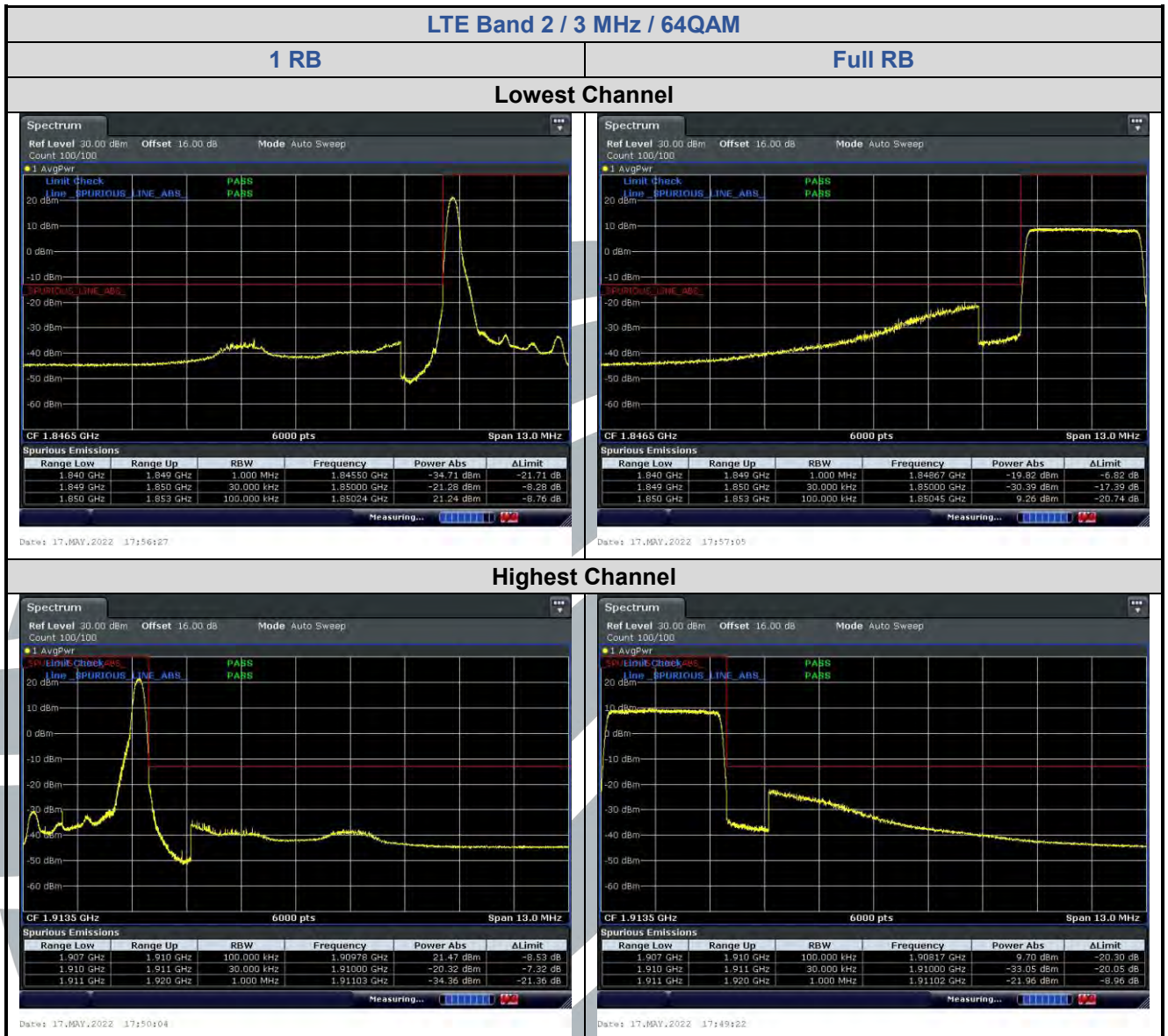


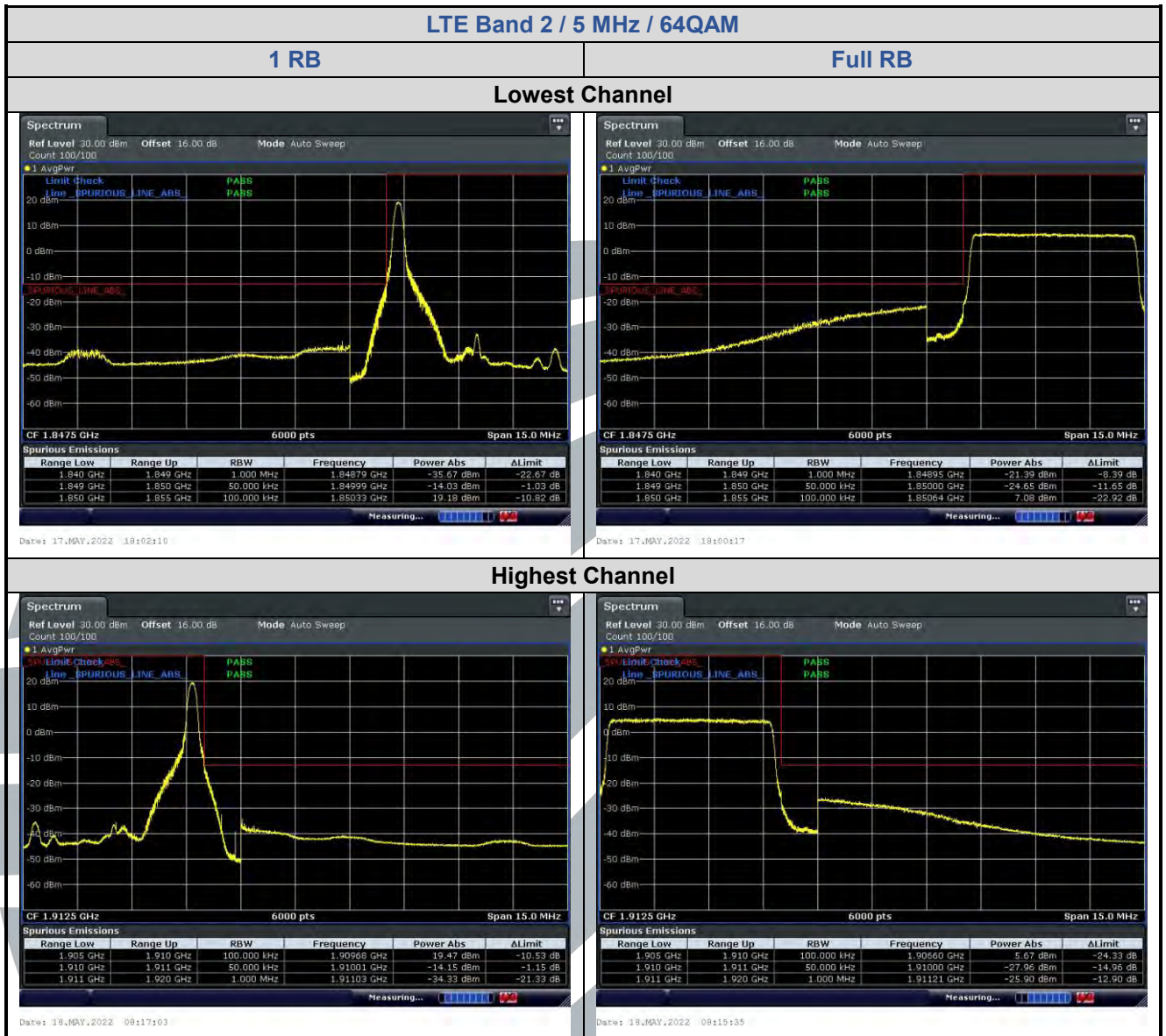


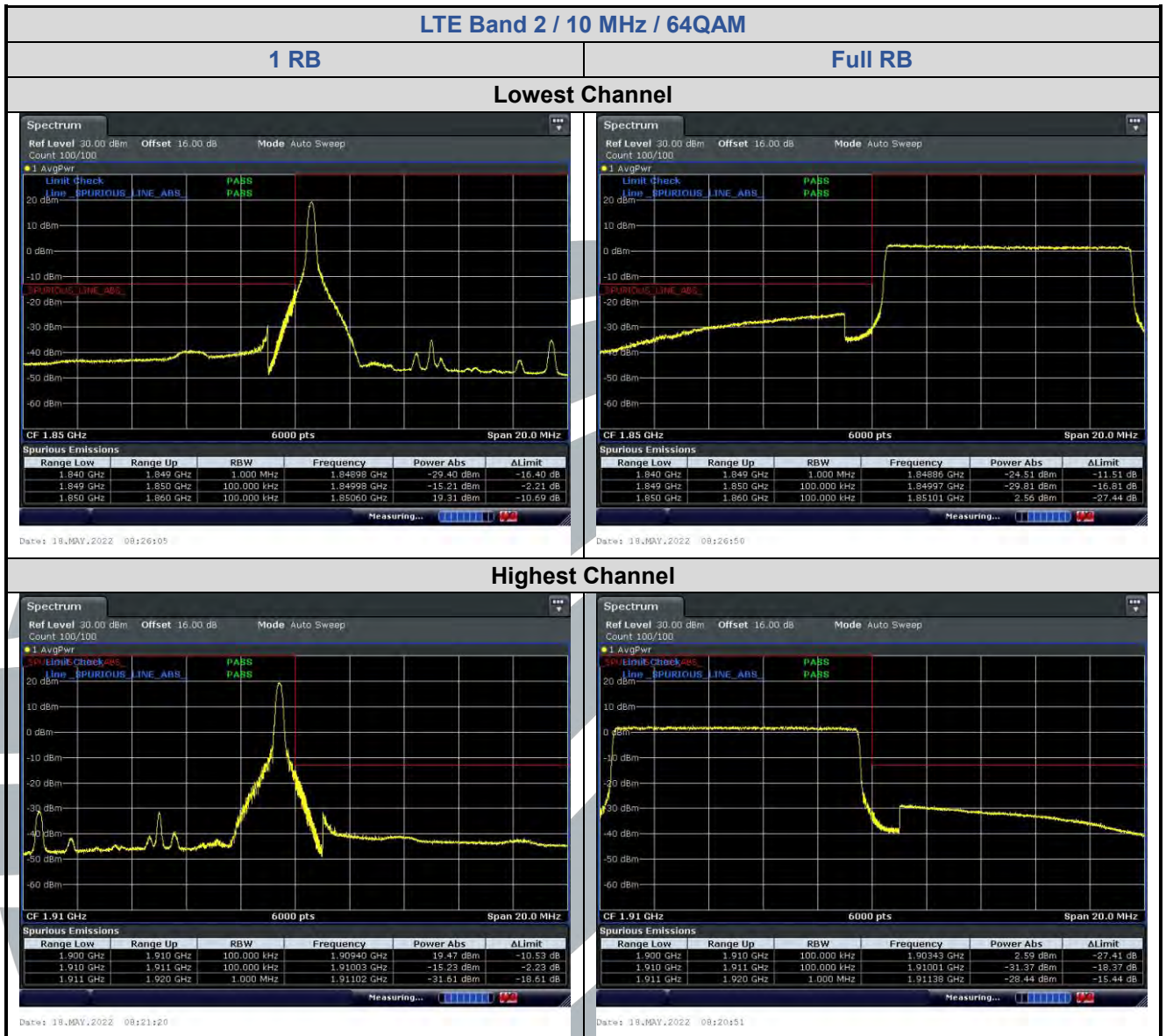


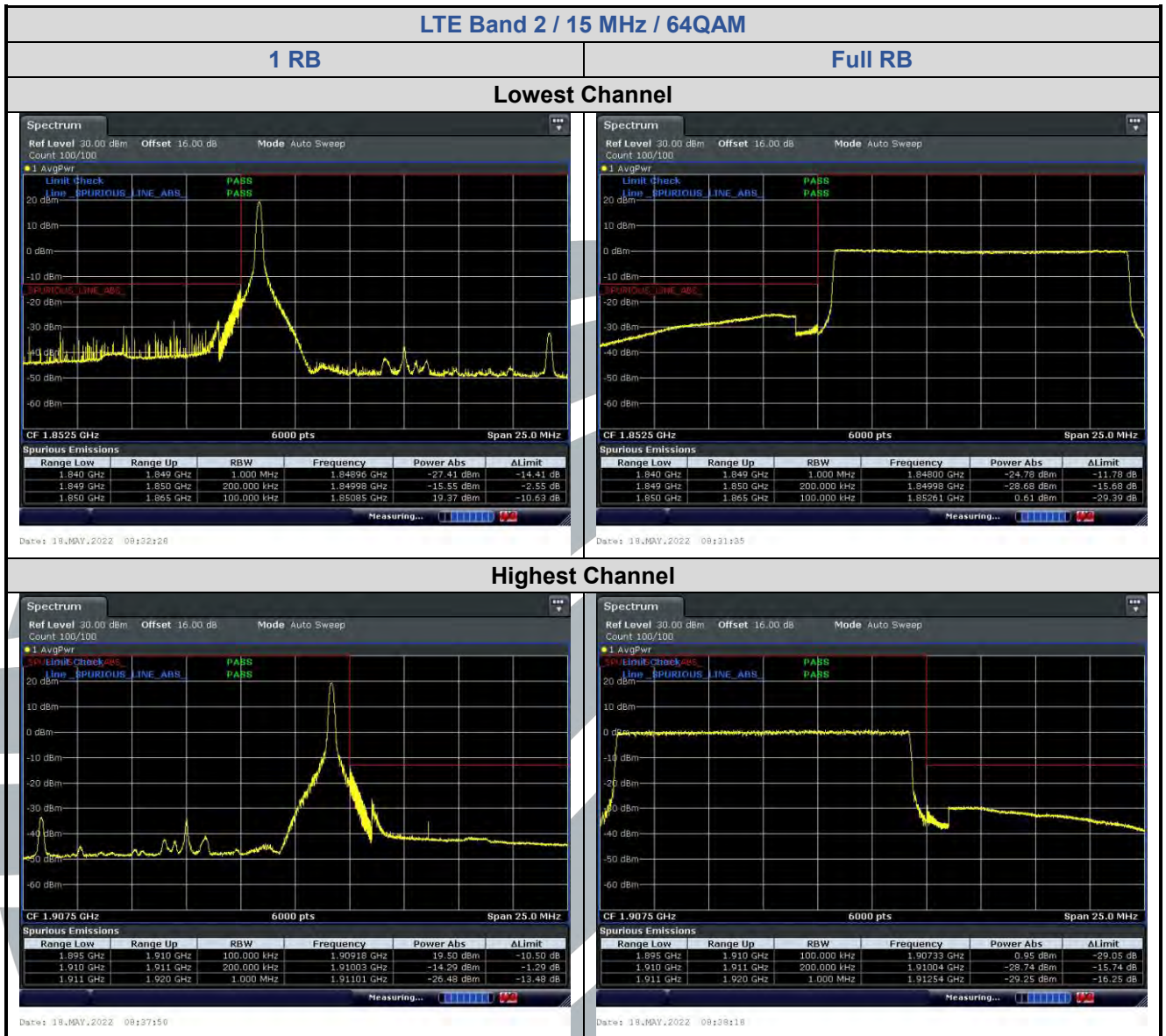


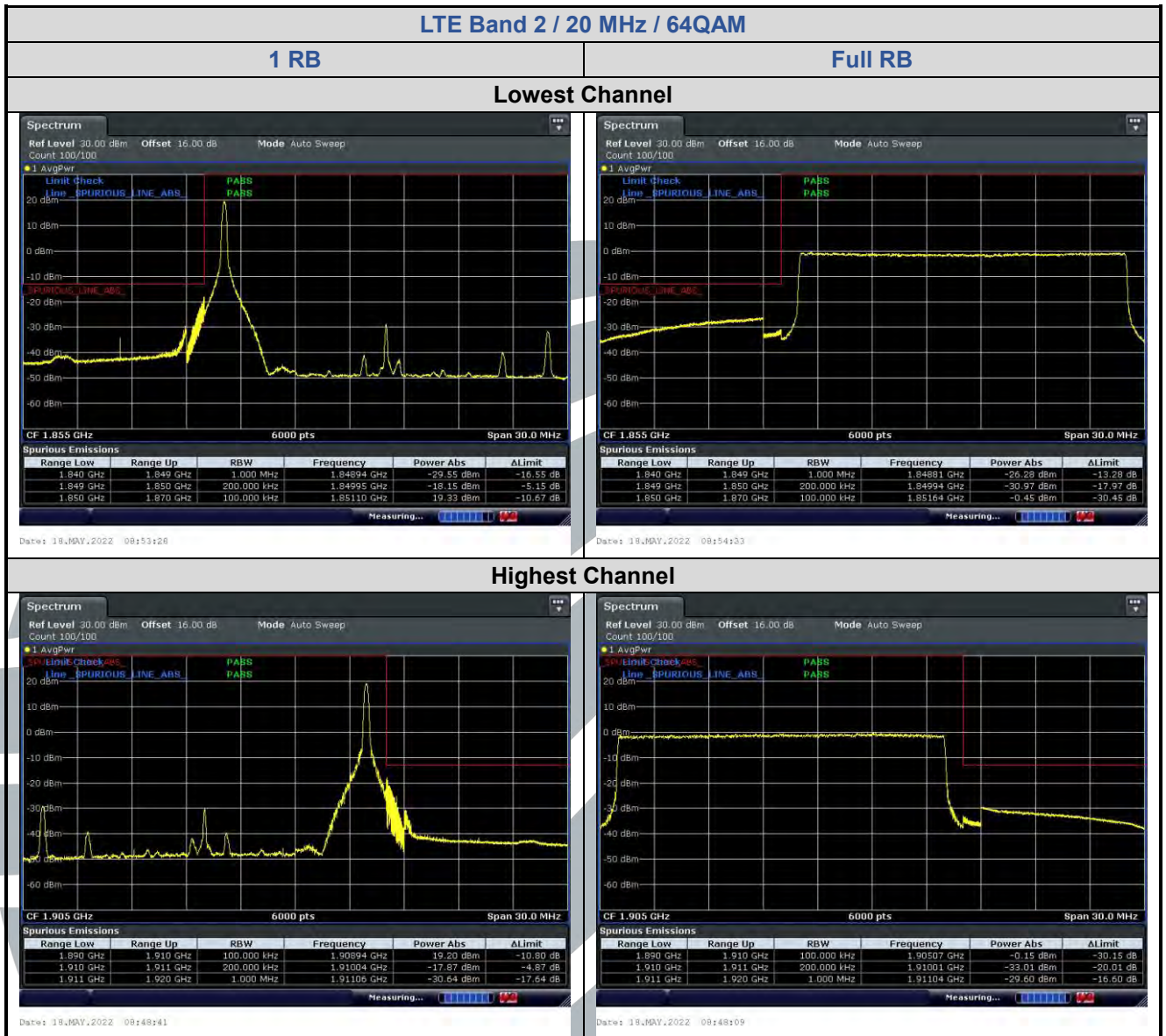












5.6.2 LTE Band 4

